



TECHNICAL MANUAL

2009

MYSTERE

MX151D

BRITISH COLUMBIA



GM EXPRESS

www.demers-ambulances.com

REV : 1



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 - Carson**
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 - Rico Suction Labs**
 - Ohio Medical Corporation**
 - Thomas**
 - White-Rodgers**
 - Transportation Safety Technologies**
 - Sound Off Signal**
 - Viper**



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• PART 1 : INTRODUCTION - PAUL DEMERS & FILS INC.

Welcome to the growing family of new PAUL DEMERS & FILS INC (Demers Ambulances) owners. This vehicle is delivered to you with confidence. It was produced using the latest techniques and strict quality control.

This manual was prepared to help you understand the operation and maintenance of your vehicle so that you may enjoy many kilometers of driving pleasure. Please read through this manual before operating your vehicle.

Demers Ambulances knows your vehicle best. When you require any service or have any questions, they will be glad to assist you with the extensive resources available.

The information contained in this section describes the ambulance conversion particularities and should be read by all ambulance operators.

In addition of this section, we recommend to read the chassis operator's manual. If, for any reason, you have doubt on the operation or maintenance of your ambulance, please do not hesitate to call us :

Web site _____ www.demers-ambulances.com

Phone number _____ 1-450-467-4683

Watts line (North America) _____ 1-800-363-7591

Fax number _____ 1-450-467-6526

After sales service :

- Parts, Service & Warranty _____ ext. 241

- Sales _____ ext. 310

- General information _____ ext. 221

- Quality Control _____ ext. 282

- 24 hours emergency _____ ext. 8

Address : **Demers Ambulances**
Consumer Services Department
28, Richelieu Street
Beloeil, Quebec, Canada
J3G 4N5



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• PART 1 : INTRODUCTION - BRITISH COLUMBIA AUTHORIZED AGENTS

BRITISH COLUMBIA AUTHORIZED AGENTS

KNIGHTHILL LEISURE GROUP

Knighthill Leisure Group has been providing automotive mechanical repairs for customers in the lower mainland since 1965. We were among the founding members of BCAA approved repair facilities established in 1974. Knighthill Leisure Group has continued to maintain the reputation for quality workmanship and fair pricing expected by their membership.

Knighthill Leisure Group specializes in Fleet Maintenance and RV Repairs and will design a maintenance program to best suit all requirements.

Knighthill establishment of 25000 sq feet includes hoist capacity to 27000 lbs, a body and paint facility to 40 feet, an onsite woodworking shop, upholstery repairs, sales and installation. Knighthill Leisure Group has secured onsite parking to accommodate cars, trucks and recreational vehicles of all types.

To contact Knighthill Leisure Group :

Web site : _____ <http://www.knighthill.com/>

Phone number : _____ (604) 273-1820

Fax number : _____ (604) 273-1848

Toll Free : _____ 1-888-546-8333

Email : _____ contact@knighthill.com

Address : _____ Knighthill Leisure Group
10751 River Driver
Richmond, British Columbia, Canada
V6X 1Z2

To contact the warranty administrator :

Name : _____ Denise Hnatyszen

Phone number : _____ (604) 273-0061

Email : _____ denise@knighthill.com



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• PART 1 : INTRODUCTION - GENERAL INFORMATION

READ FIRST – THEN DRIVE SAFELY

Before driving your vehicle please read this Owner's Manual carefully. This will ensure familiarity with controls and maintenance requirements, assisting you in safe operation of your vehicle.



WARNING

Important safety information reminders!

Follow these important driving rules to help ensure a safe and complete trip for you and your passengers!

- Never drive under the influence of alcohol or drugs
- Always respect local speed limits and never drive too fast in difficult weather conditions.
- Always use your seat belts and appropriate child restraint systems.
- Always provide information about the proper use of the vehicle safety features to all occupants of the vehicle.
- Always review this owner's manual for important safety information.

MODIFICATION OF YOUR VEHICLE

This vehicle should not be modified. Modification could affect its performance, safety or durability, and may even violate governmental regulations. In addition, damage or performance problems resulting from modifications may not be covered under DEMERS AMBULANCES warranties.

BREAKING-IN YOUR VEHICLE

There are no particular guidelines for breaking-in your vehicle. During the first 1600 kilometers (1000 miles) of driving, vary speeds frequently. This is recommended to give the moving parts a chance to break in.



WARNING

- The utility vehicles (like an ambulance) have a significantly higher rollover rate than other types of vehicles.

Before you drive your vehicle, please, read the vehicle chassis manufacturer owner's guide carefully. Your vehicle is not a passenger car. As with other vehicles of this type, failure to operate this vehicle correctly may result in loss of vehicle control, vehicle rollover, personal injury or death.

MAINTENANCE IMPORTANT NOTICE

Maintenance of materials originally assembled by other than DEMERS AMBULANCES are recommend as per their respective manufacturers documentation.



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• PART 1 : INTRODUCTION - SAFETY AND SECURITY

IN GENERAL CASES OF EMERGENCY

- Always use the seat belts.
- Do not smoke or produce spark near the batteries or when using oxygen.
- Never use oil grease on oxygen cylinder or other outlets. High pressure oxygen in contact with petroleum product may cause immediate explosion.
- If you suspect carbon monoxide infiltration inside your ambulance, immediate inspection should be done to rectify this problem. If you have to pursue your trip, open all ambulance windows for aeration.
- We recommend inspecting your vehicle on regularly basis. We have provided you, in part 5, a minimum of recommended inspections.

FLAT TIRE

If you get a flat tire while driving:

- Do not brake heavily.
- Gradually decrease the vehicle's speed.
- Hold the steering wheel firmly.
- Slowly move to a safe place on the side of the road and away from traffic.
- Turn on the hazard warning flashers.
- Park on a level surface and apply the parking brake. Place the automatic transmission into P (park).
- Raise the hood to warn other traffic and to signal professional road assistance personnel that you need assistance.
- Have all passengers get out of the vehicle and stand in a safe place, away from traffic and clear of the vehicle.

WARNING



- Make sure the parking brake is securely applied and the automatic transmission into P (park).
- Never change tires when the vehicle is on a slope, ice or slippery areas. This is hazardous.
- Never change tires if oncoming traffic is close to your vehicle. Wait for professional road assistance.

BLOCKING WHEELS

Place suitable blocks at both the front and the back of the wheel diagonally opposite the flat tire to prevent the vehicle from rolling when it is jacked up.

WARNING



- Be sure to block the wheel as the vehicle may move and result in personal injury.



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• PART 1 : INTRODUCTION - SAFETY AND SECURITY

TO REMOVE THE SPARE TIRE (under the vehicle)

The spare tire for your vehicle is stowed under the rear of your vehicle.

Remove the crankshaft handle on the electrical panel compartment door (G1) and insert the tip of the crankshaft handle through the access hole and into the tube.

Turn the crankshaft handle counterclockwise until the cable is slack and the tire can be slid from under the vehicle.

Remove the retainer from the spare tire.

To stow the cable retainer with the spare removed, turn the crankshaft handle clockwise until all slack is removed.

MAINTENANCE

Twice a year, check, test and, if necessary, adjust the mechanism of the spare tire located on under the module of the vehicle.

PREPARING TO CHANGE THE TIRE

Always refer to proper illustrations for the correct placement and jack-up points for your specific vehicle model and jack type.



WARNING

- Never get under the vehicle while it is supported only by the jack.
- Use only the jack provided with your vehicle to lift the vehicle. Do not use the jack provided with your vehicle on other vehicles. The jack is designed for lifting only your vehicle during a tire change.
- Use the correct jack-up points. Never use any other part of the vehicle for jack support.
- Never use blocks on or under the jack.
- Don't start the engine while vehicle is on the jack. It may cause the vehicle to move. This is especially true for your vehicle equipped with a limited slip differential carrier.
- Do not allow passengers to stay in the vehicle while it is on the jack.
- Never run the engine with a wheel(s) off the ground. It may cause the vehicle to move.
- The jack should be used on firm and level ground
- Incorrect wheel nuts or improperly tightened wheel nuts can cause the wheel to become loose or come off. This could cause an accident.
- Do not use oil or grease on the wheel nuts. This could cause the nuts to become loose.
- Always make sure that the spare tire and jacking equipment are properly secured after use. Such items can become dangerous projectiles in an accident or sudden stop.



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• PART 1 : INTRODUCTION - SAFETY AND SECURITY

IMPORTANT POINT TO CHECK BEFORE DRIVING

FUEL FILLER CAP

The fuel filler cap is a ratchet type. Turn the cap counter clockwise to remove. To tighten, turn the cap clockwise until ratchet clicks are heard.



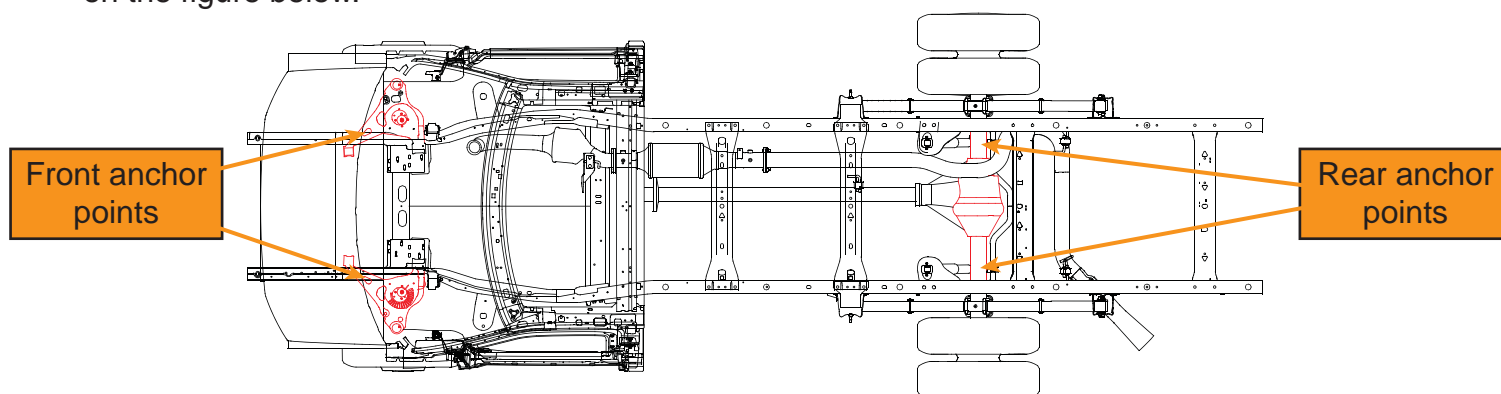
WARNING

- Fuel is extremely flammable and highly explosive under certain conditions. You could be burned or seriously injured if it is misused or mishandled. Always stop the engine and do not smoke or allow open flames or sparks near the vehicle when refuelling.
- Fuel may be under pressure. Turn the cap one-half turn, and wait for any “hissing” sound to stop to prevent fuel from spraying out and possibly causing personal injury. Then remove the cap.
- Use only an original equipment type fuel filler cap as a replacement. It has a built-in safety valve needed for proper operation of the fuel system and emission control system. An incorrect cap can result in serious malfunction and possible injury. It could also cause the malfunction indicator lamp to come on.
- Never pour fuel into the throttle body to attempt to start your vehicle.
- Do not fill a portable fuel container in the vehicle or trailer. Static electricity can cause an explosion or flammable liquid, vapour or gas in any vehicle or trailer. To reduce the risk of serious injury or death when filling portable fuel containers :
 - Always place the container on the ground when filling.
 - Do not use electronic devices when filling.
 - Keep the pump nozzle in contact with the container while you are filling it.
 - Use only approved portable fuel containers for flammable liquid.

• PART 1 : INTRODUCTION - TOWING

TOWING

DEMERS AMBULANCES recommends that your vehicle must be towed with a flatbed truck. The vehicle must be towed by the front or the rear of the vehicle. The points of anchoring are showed on the figure below.



FRONT

To tow the vehicle by the front, it is important to fix the towing device (steel cable, chain, etc) on the low suspension bracket.



WARNING

- Never fix the towing device (steel cable, chain) on the torsion bar.
- Never use ropes or canvas straps to tow the vehicle.

REAR

To tow the vehicle by the rear, it is important to fix the towing device (steel cable, chain, etc) on the rear wheels axle.



WARNING

- Never fix the towing device (steel cable, chain) on the torsion bar.
- The brake lines and the differential vent line are near to the rear axle, be careful.
- Never use ropes or canvas straps to tow the vehicle.

When towing your vehicle, all provincial and local regulations for towing must be followed. Incorrect towing equipment could damage your vehicle. Local service operators are generally familiar with the applicable laws and procedures for towing. To assure proper towing and to prevent accidental damage to your vehicle, DEMERS AMBULANCES recommends having a specialized service operator tow your vehicle.



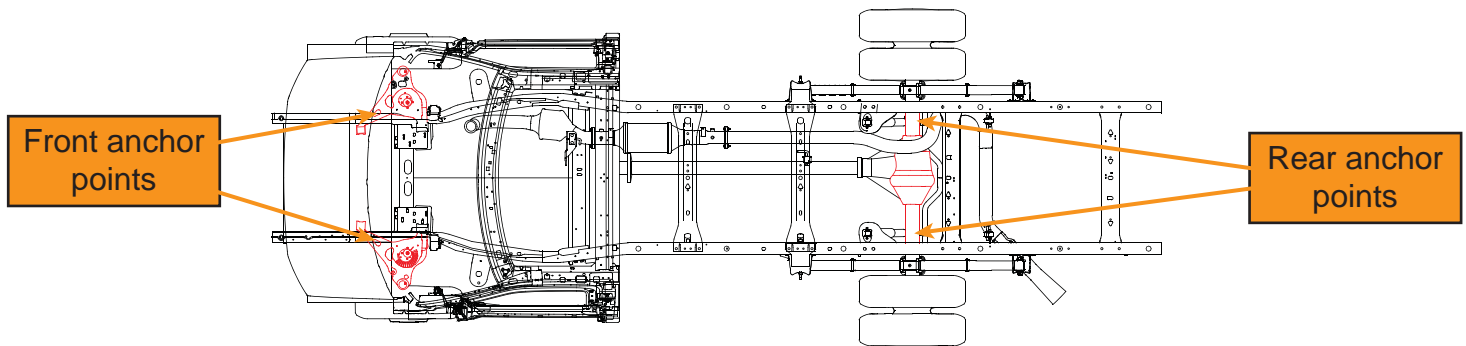
WARNING

- Never ride in a vehicle that is being towed.
- Never get under your vehicle after it has been lifted by a tow truck.

• PART 1 : INTRODUCTION - TOWING

VEHICLE RECOVERY (freeing a stuck vehicle)

DEMERS AMBULANCES recommends must be towed by the front or the rear of the vehicle. The points of anchoring are showed on the figure below.



FRONT

To tow the vehicle by the front, it is important to fix the towing device (steel cable, chain, etc) on the low suspension bracket.

REAR

To tow the vehicle by the rear, it is important to fix the towing device (steel cable, chain, etc) on the rear wheels axle.

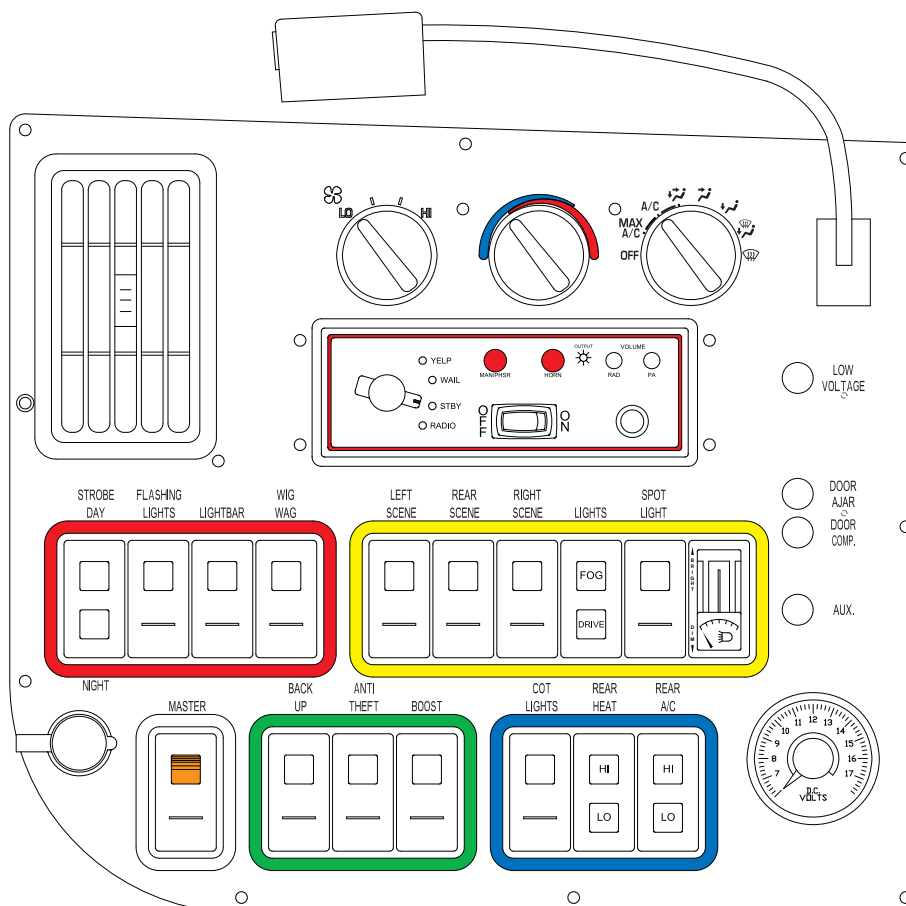


WARNING

- Stand clear of a stuck vehicle.
- Do not spin your tires at high speed. This could cause the tire to explode and result in serious injury. Parts of your vehicle could also overheat and be damaged.
- Use the towing hook only, not other parts of the vehicle. Otherwise, the vehicle body will be damaged.
- Pulling devices should be routed so they do not touch any part of the suspension, steering, brake or cooling systems.
- Never use ropes or canvas straps to tow the vehicle.
- Always pull the cable straight out from the front or rear of the vehicle. Never pull the vehicle at an angle.
- When the vehicle is towed by the front, never fix the towing device (steel cable, chain) on the torsion bar.
- When the vehicle is towed by the rear, the brake lines and the differential vent line are near to the rear axle, be careful.

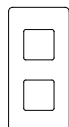
When freeing your vehicle, all provincial and local regulations for towing must be followed. Incorrect towing equipment could damage your vehicle. Local service operators are generally familiar with the applicable laws and procedures for towing and freeing a stuck vehicle. To assure proper towing and to prevent accidental damage to your vehicle, DEMERS AMBULANCES recommends having a specialized service operator tow your vehicle.

• PART 2 : ELECTRICAL SECTION - FRONT CONSOLE



MASTER

When the engine is running, push the "MASTER" switch up to activate the master ambulance power. The master power indicator light on the switch comes on. Push the switch down to deactivate the master ambulance power.



STROBE

Note : The emergency strobe lights are always available to be activated. The following modes can be selected :

Day mode (*high intensity*)

Push the "STROBE" switch up to activate the emergency strobe lights in high intensity mode (day mode). The indicator light on the switch comes on. Push the switch down once to deactivate the emergency strobe lights, or push the switch down twice to change to the night mode.

Night mode (*low intensity*)

Push the "STROBE" switch down to activate the emergency strobe lights in low intensity mode (night mode). The indicator light on the switch comes on. Push the switch up once to deactivate the emergency strobe lights, or push the switch up twice to change to the day mode.

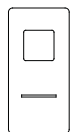


TECHNICAL MANUAL

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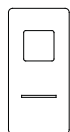
• PART 2 : ELECTRICAL SECTION - FRONT CONSOLE



FLASHING LIGHTS

Note : The engine must be running and the "MASTER" switch must be in the ON position to activate all the emergency lights.

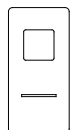
Push the "FLASHING LIGHTS" switch up to activate the emergency lights on the module and the rear light bar. The indicator light on the switch comes on. Push the switch down to deactivate all the emergency lights on the module and the rear light bar.



LIGHTBAR

Note : The engine must be running and the "MASTER" switch must be in the ON position to activate the front light bar.

Push the "LIGHTBAR" switch up to activate the front light bar. The indicator light on the switch comes on. Push the switch down to deactivate the front light bar.



WIG WAG

Note : The engine must be running, the "MASTER" switch must be in the ON position and the OEM high beam must be OFF to activate the wig wag lights.

Push the "WIG WAG" switch up to activate the wig wag lights. The indicator light on the switch comes on. Push the switch down to deactivate the wig wag lights.

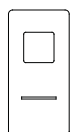


TECHNICAL MANUAL

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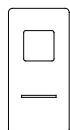
• PART 2 : ELECTRICAL SECTION - FRONT CONSOLE



LEFT SCENE

Note : The engine must be running and the "MASTER" switch must be in the ON position to activate the left scene lights.

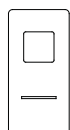
Push the "LEFT SCENE" switch up to activate the left scene lights. The indicator light on the switch comes on. Push the switch down to deactivate the left scene lights.



REAR SCENE

Note : The engine must be running and the "MASTER" switch must be in the ON position to activate the loading lights (rear scene lights).

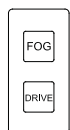
Push the "REAR SCENE" switch up to activate the loading lights (rear scene lights). The indicator light on the switch comes on. Push the switch down to deactivate the loading lights (rear scene lights).



RIGHT SCENE

Note : The engine must be running and the "MASTER" switch must be in the ON position to activate the right scene lights.

Push the "RIGHT SCENE" switch up to activate the right scene lights. The indicator light on the switch comes on. Push the switch down to deactivate the right scene lights.



FOG LIGHTS / DRIVING LIGHTS

Fog lights :

Note : The OEM high beams must be OFF to activate the fog lights.

Push the "FOG LIGHTS" switch up to activate the fog lights. The indicator light on the switch comes on. Push the switch down once to deactivate the fog lights.

The fog lights will be automatically deactivate when the OEM high beams are ON.

Driving lights :

Note : The OEM high beams must be ON to activate the driving lights.

Push the "FOG LIGHTS" switch down to activate the driving lights. The indicator light on the switch comes on. Push the switch up once to deactivate the driving lights.

The driving lights will be automatically deactivate when the OEM high beams are OFF.

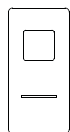


TECHNICAL MANUAL

MX151D - GM



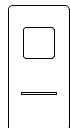
• PART 2 : ELECTRICAL SECTION - FRONT CONSOLE



SPOTLIGHT

Note : The engine must be running and the "MASTER" switch must be in the ON position to activate the hand spotlight.

Push the "SPOTLIGHT" switch up to activate the hand spotlight. The indicator light on the switch comes on. Push the switch down to deactivate the hand spotlight.



BACK-UP

The engine must be running and the "MASTER" switch must be in the ON position to activate the mute function to be activated.

With the shift selector lever in the R (reverse) position, push the "BACK-UP" switch up to deactivate the back-up alarm. The back-up alarm will be deactivated until the user change the shift selector lever position.

The mute function has an autoreset after sixty (60) to ninety (90) seconds.



CAUTION

- This vehicle is equipped with a back-up alarm. The operator is responsible for the safe use of this vehicle.
- Back-up alarms should be listed on the daily maintenance report. The units on operating vehicles must be tested each day prior to the vehicles operation.

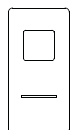


TECHNICAL MANUAL

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• PART 2 : ELECTRICAL SECTION - FRONT CONSOLE



ANTI-THEFT

Note : The engine must be running and the "MASTER" switch must be in the ON position to activate the anti-theft mode.

To leave the vehicle in idle mode

With the engine running and the shift selector lever in the P (Park) position, push the "ANTI-THEFT" switch up to activate the idle mode. The indicator light on the switch comes on. Remove the key from the ignition and exit the vehicle. The engine will continue running.

The engine will continue running until the user re-enters the vehicle and deactivate the idle mode or until user press the brake pedal.

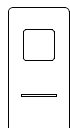


CAUTION

- Do not leave children or pets unattended in a vehicle standing in idle mode.
- Do not leave the "ANTI-THEFT" switch in the ON position after use. The vehicle may not start. If this happens, push the "ANTI-THEFT" switch down.

To remove the vehicle from idle mode

Put the key back in the ignition and turn the key toward the ON position. Push the "ANTI-THEFT" switch down to deactivate the idle mode.



BOOST

If the engine has difficulty to start or if the OEM batteries are low, push and hold the "BOOST" switch up to activate the boost mode. The boost mode allows to use all the four (4) batteries at the same time (the two (2) OEM batteries and the two (2) conversion batteries). Start the engine. When the engine is running, release the "BOOST" switch and the boost mode is deactivate.



CAUTION

- Use the boost mode only if it is necessary.
- Do not use the boost mode each starting of the engine. That can damage on electrical components.

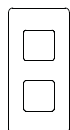


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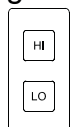
• PART 2 : ELECTRICAL SECTION - FRONT CONSOLE



COT LIGHTS

Note : The engine must be running and the "MASTER" switch must be in the ON position to activate all the incandescent ceiling lights and all fluorescent lights in the patient compartment.

Push the "COT LIGHTS" switch up to activate the incandescent ceiling lights and all fluorescent lights in the patient compartment in low intensity mode. The indicator light on the switch comes on. Push the switch down once to deactivate the incandescent ceiling lights and all fluorescent lights in the patient compartment.



REAR HEAT

Note : The engine must be running, the "MASTER" switch must be in the ON position and the temperature at the thermostat should be lower than his preset temperature to activate the heating system (the standard heating unit and the Espar heating system) in the patient compartment.

High speed mode :

Push the "REAR HEAT" switch up to activate the heating system in the patient compartment in high speed mode (dependently of the preset temperature of the thermostat). The indicator light on the switch comes on. Push the switch down once to deactivate the heating system, or push the switch down twice to decrease the speed of the heating system (low speed mode).

Low speed mode :

Push the "REAR HEAT" switch down to activate the heating system in the patient compartment in low speed mode (dependently of the preset temperature of the thermostat). The indicator light on the switch comes on. Push the switch up once to deactivate the heating system, or push the switch up twice to increase the speed of the heating system (high speed mode).

When the temperature in the patient compartment is lower than the preset temperature on the thermostat, the heating system can be activated. The heating system will be activated until the temperature in the patient compartment is equal or higher than the preset temperature on the thermostat. At this time, the heating system will be deactivated.



WARNING

- The engine must be running to activate the heating system (the standard heating unit and the Espar heating system) in the patient compartment.
- Do not leave children, impaired adults, or pets alone in your vehicle. They could accidentally injure themselves or others through inadvertent operation of the vehicle. Also, on hot, sunny days, temperatures in closed vehicle could quickly become high enough to cause severe or possibly fatal injuries to people or animals.

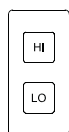


TECHNICAL MANUAL

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• PART 2 : ELECTRICAL SECTION - FRONT CONSOLE



REAR A/C

Note : The engine must be running, the "MASTER" switch must be in the ON position and the temperature at the thermostat should be higher than his preset temperature to activate the air conditioning system in the patient compartment.

High speed mode :

Push the "REAR A/C" switch up to activate the air conditioning system in the patient compartment in high speed mode (dependently of the preset temperature of the thermostat). The indicator light on the switch comes on. Push the switch down once to deactivate the air conditioning system, or push the switch down twice to decrease the speed of the air conditioning system (low speed mode).

Low speed mode :

Push the "REAR A/C" switch down to activate the air conditioning system in the patient compartment in low speed mode (dependently of the preset temperature of the thermostat). The indicator light on the switch comes on. Push the switch up once to deactivate the air conditioning system, or push the switch up twice to increase the speed of the air conditioning system (high speed mode).

When the temperature in the patient compartment is higher than the preset temperature on the thermostat, the air conditioning system can be activated. The air conditioning system will be activated until the temperature in the patient compartment is equal or higher than the preset temperature on the thermostat. At this time, the air conditioning system will be deactivated.

WARNING



- The engine must be running to activate the air conditioning system in the patient compartment.
- Do not leave children, impaired adults, or pets alone in your vehicle. They could accidentally injure themselves or others through inadvertent operation of the vehicle. Also, on hot, sunny days, temperatures in closed vehicle could quickly become high enough to cause severe or possibly fatal injuries to people or animals.

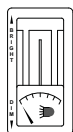


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• PART 2 : ELECTRICAL SECTION - FRONT CONSOLE



DIMMER

The light dimmer allows to adjust the intensity of the backlight of the front console.



VOLTMETER

The voltmeter shows the voltage of the conversion batteries.



12 VOLTS D.C. OUTLET

For more information, see 12 volts DC outlets in the electrical section.



TOW/HAUL

Tow/haul is designed to assist while the vehicle is pulling a large or heavy load or trailer. Tow/haul is most useful while pulling such a load in rolling terrain, in stop-and-go traffic or when you need improved low-speed control, such as when parking. The purpose of the tow/haul mode is to :

- reduce the frequency and improve the predictability of transmission shift,
- provide the same solid shift feel when pulling a heavy load as when the vehicle is unloaded,
- improve control of the vehicle speed while requiring less throttle pedal activity.

Press the "TOW/HAUL" button to activate tow/haul mode. The indicator light on the instrument panel comes on. Press the "TOW/HAUL" button again to deactivate tow/haul mode.



TECHNICAL MANUAL

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• PART 2 : ELECTRICAL SECTION - FRONT CONSOLE



LOW VOLTAGE

Note : The "LOW VOLTAGE" warning light is always available to be activated.

The "LOW VOLTAGE" warning light and the audible alarm are activated when the voltage of the two (2) OEM batteries is under 12 volts DC. The "LOW VOLTAGE" warning light is flashing when activated.



DOOR AJAR

Note : The "DOOR AJAR" warning light is always available to be activated.

The "DOOR AJAR" warning light is activated when any access doors are open. The "DOOR AJAR" warning light is flashing when activated.



DOOR COMPARTMENT

Note : The "DOOR COMP." warning light is always available to be activated.

The "DOOR COMP." warning light is activated when any compartment doors are open. The "DOOR COMP." warning light is flashing when activated.



AUXILIARY

The "AUX." warning light is a pre-wired warning light for a future application.

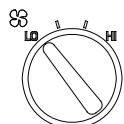


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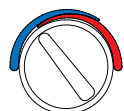
• PART 2 : ELECTRICAL SECTION - FRONT CONSOLE



FAN SPEED CONTROL

Note: The engine must be running for the fan speed control knob to be activated.

The fan speed control knob makes it possible to change the speed of the fan (heater or air conditioning fan) in the front cabin of the vehicle. Turn the knob right (clockwise) to increase the speed of the fan. Turn it left to decrease the speed of the fan.



TEMPERATURE CONTROL

Note: The engine must be running for the temperature control knob to be activated.

The temperature control knob allows you to adjust the temperature in the front cabin of the vehicle. Turn the temperature control knob clockwise to increase temperature. Turn the temperature control knob counterclockwise to decrease temperature.



AIR DELIVERY MODE CONTROL

Note: The engine must be running for the air delivery mode control knob to be activated.

Turn the air delivery mode control knob clockwise or counterclockwise to change the current airflow mode.

OFF Off : Turns the heating or air conditioning system off.



Vent : Air is directed to the instrument panel outlets.



Bi-level : Air is divided between the instrument panel and floor outlets, with some air directed toward the windshield.



Floor : Air is directed to the floor outlets with some air directed to the windshield and side windows.



Defog : This mode clears the windows of fog or moisture. Outside air is directed to the floor and defroster outlets. Adjust the temperature knob for warmer or cooler air. The air conditioning compressor might turn on in this setting to dehumidify the air.



Defrost : This mode clears the windshield of fog or frost more quickly. Air is directed to the windshield, with some to the floor outlets and front side windows. The air conditioning compressor might turn on in the setting to dehumidify the air.

A/C Air conditioning : Cools and dehumidifies the air inside the vehicle.

MAX A/C Max air conditioning : Cools the air inside the vehicle faster, by recirculating the inside air.

• PART 2 : ELECTRICAL SECTION - FRONT CONSOLE

MAINTENANCE

The front console panel can be cleaned by washing gently with a soft cloth moistened with water. Dry with a soft cloth or moist cellulose sponge to prevent water spotting.



WARNING

- Do not scrub or use brushes or squeegee.
- Do not use gasoline or acetone to remove glazing compound or grease.
- Make sure that no liquid recipient (glass, bottle, etc) is near to the front console to prevent spilling the liquid. That can generate breaks on electrical components.

To remove the front console

To remove the front console, follow these operations :



Remove the ten (10) screws.



Remove the front console to have access to all connectors.

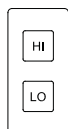
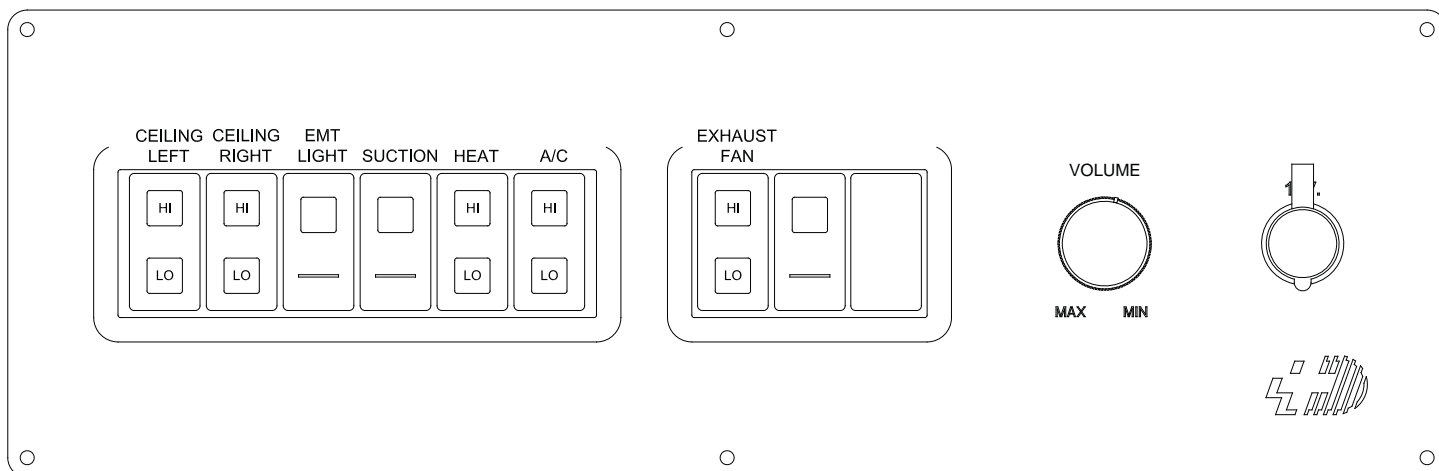


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• PART 2 : ELECTRICAL SECTION - REAR CONSOLE



CEILING LEFT

Note : The left incandescent ceiling lights (over the primary patient cot) are always available to be activated.

High intensity mode :

Push the "CEILING LEFT" switch up to activate the left incandescent ceiling lights in high intensity mode. The indicator light on the switch comes on. Push the switch down once to deactivate the left incandescent ceiling lights, or push the switch down twice to decrease the intensity of the left incandescent ceiling lights (low intensity mode).

Low intensity mode :

Push the "CEILING LEFT" switch down to activate the left incandescent ceiling lights in low intensity mode. The indicator light on the switch comes on. Push the switch up once to deactivate the left incandescent ceiling lights, or push the switch up twice to increase the intensity of the left incandescent ceiling lights (high intensity mode).

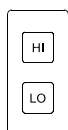


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• PART 2 : ELECTRICAL SECTION - REAR CONSOLE



CEILING RIGHT

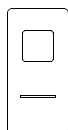
Note : The engine must be running and the "MASTER" switch must be in the ON position to activate the right incandescent ceiling lights and the fluorescent lights (over the squad bench).

High intensity mode :

Push the "CEILING RIGHT" switch up to activate all the right ceiling lights in high intensity mode. The indicator light on the switch comes on. Push the switch down once to deactivate all the right ceiling lights, or push the switch down twice to decrease the intensity of all the right ceiling lights (low intensity mode).

Low intensity mode :

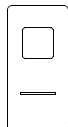
Push the "CEILING RIGHT" switch down to activate all the right ceiling lights in low intensity mode. The indicator light on the switch comes on. Push the switch up once to deactivate all the right ceiling lights, or push the switch up twice to increase the intensity of all the right ceiling lights (high intensity mode).



EMT LIGHT

Note : The engine must be running and the "MASTER" switch must be in the ON position to activate the EMT reading light.

Push the "EMT LIGHT" switch up to activate the EMT reading light. The indicator light on the switch comes on. Push the switch down once to deactivate the EMT reading light.



SUCTION

Note : The suction device is always available to be activated.

Push the "SUCTION" switch up to activate the suction device. The indicator light on the switch comes on. Push the switch down to deactivate the suction device.



CAUTION

- Suctioned contents may contain infectious waste and biohazard material. Suction catheter and patient tubing are disposable. Discard in accordance with applicable CDC and OSHA procedures. To prevent risk from cross contamination, disposable items are not to be reused.
- Clean the suction module periodically, or after each use, with a damp, soapy cloth. Do not use alcohol or harsh solvents. Do not use abrasive pads, abrasive powder cleaners or antiseptics solutions containing phenol, other organic solvents or steam autoclave.

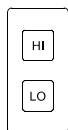


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• PART 2 : ELECTRICAL SECTION - REAR CONSOLE



HEAT

Note : The engine must be running, the "MASTER" switch must be in the ON position and the temperature at the thermostat should be lower than his preset temperature to activate the heating system (the standard heating unit and the Espar heating system) in the patient compartment.

High speed mode :

Push the "HEAT" switch up to activate the heating system in the patient compartment in high speed mode (dependently of the preset temperature of the thermostat). The indicator light on the switch comes on. Push the switch down once to deactivate the heating system, or push the switch down twice to decrease the speed of the heating system (low speed mode).

Low speed mode :

Push the "HEAT" switch down to activate the heating system in the patient compartment in low speed mode (dependently of the preset temperature of the thermostat). The indicator light on the switch comes on. Push the switch up once to deactivate the heating system, or push the switch up twice to increase the speed of the heating system (high speed mode).

When the temperature in the patient compartment is lower than the preset temperature on the thermostat, the heating system can be activated. The heating system will be activated until the temperature in the patient compartment is equal or higher than the preset temperature on the thermostat. At this time, the heating system will be deactivated.



WARNING

- The engine must be running to activate the heating system (the standard heating unit and the Espar heating system) in the patient compartment.
- Do not leave children, impaired adults, or pets alone in your vehicle. They could accidentally injure themselves or others through inadvertent operation of the vehicle. Also, on hot, sunny days, temperatures in closed vehicle could quickly become high enough to cause severe or possibly fatal injuries to people or animals.

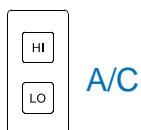


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• PART 2 : ELECTRICAL SECTION - REAR CONSOLE



Note : The engine must be running, the "MASTER" switch must be in the ON position and the temperature at the thermostat should be higher than his preset temperature to activate the air conditioning system in the patient compartment.

High speed mode :

Push the "A/C" switch up to activate the air conditioning system in the patient compartment in high speed mode (dependently of the preset temperature of the thermostat). The indicator light on the switch comes on. Push the switch down once to deactivate the air conditioning system, or push the switch down twice to decrease the speed of the air conditioning system (low speed mode).

Low speed mode :

Push the "A/C" switch down to activate the air conditioning system in the patient compartment in low speed mode (dependently of the preset temperature of the thermostat). The indicator light on the switch comes on. Push the switch up once to deactivate the air conditioning system, or push the switch up twice to increase the speed of the air conditioning system (high speed mode).

When the temperature in the patient compartment is higher than the preset temperature on the thermostat, the air conditioning system can be activated. The air conditioning system will be activated until the temperature in the patient compartment is equal or higher than the preset temperature on the thermostat. At this time, the air conditioning system will be deactivated.



WARNING

- The engine must be running to activate the air conditioning system.
- Do not leave children, impaired adults, or pets alone in your vehicle. They could accidentally injure themselves or others through inadvertent operation of the vehicle. Also, on hot, sunny days, temperatures in closed vehicle could quickly become high enough to cause severe or possibly fatal injuries to people or animals.

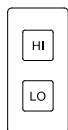


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• PART 2 : ELECTRICAL SECTION - REAR CONSOLE



EXHAUST FAN

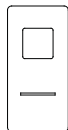
Note : The engine must be running and the "MASTER" switch must be in the ON position to activate the exhaust fan.

High speed mode :

Push the "EXHAUST FAN" switch up to activate the exhaust fan in the patient compartment in high speed mode. The indicator light on the switch comes on. Push the switch down once to deactivate the exhaust fan, or push the switch down twice to decrease the speed of the exhaust fan (low speed mode).

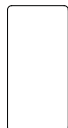
Low speed mode :

Push the "EXHAUST FAN" switch down to activate the exhaust fan in the patient compartment in low speed mode. The indicator light on the switch comes on. Push the switch up once to deactivate the exhaust fan, or push the switch up twice to increase the speed of the exhaust fan (high speed mode).



SPARE SWITCH

The "SPARE" switch is a pre-wired switch added for a future addition.



SPARE SWITCH LOCATION

The spare switch location allows to add for a future option.



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- PART 2 : ELECTRICAL SECTION - REAR CONSOLE

REAR
SPEAKER
VOLUME



REAR SPEAKER KNOB

Note : The ignition switch must be in the ON position to activate the OEM radio, in the front cabin of the vehicle. The radio in the vehicle front cabin must be in the ON position for the rear speaker knob to be activated.

Turn the rear speaker knob to the clockwise to increase volume or to the counterclockwise to decrease volume.

It is impossible to raise the level of the sound (higher than the OEM radio level) with the volume control on the rear console.



12 VOLTS D.C. OUTLET

For more information, see 12 volts DC outlets in the electrical section.



THERMOSTAT

For more information, see thermostat in the electrical section.

• PART 2 : ELECTRICAL SECTION - REAR CONSOLE

MAINTENANCE

The rear console panel can be cleaned by washing gently with a soft cloth moistened with water. Dry with a soft cloth or moist cellulose sponge to prevent water spotting.



WARNING

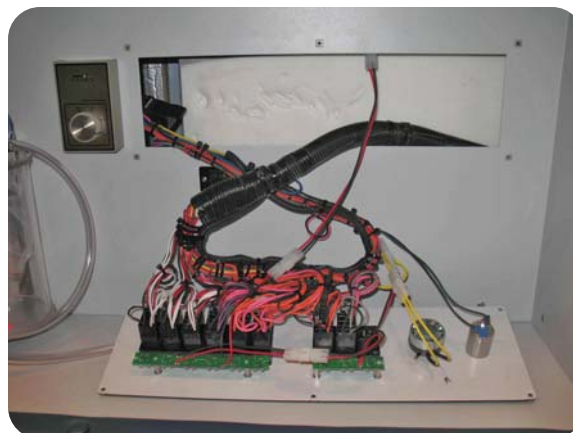
- Do not scrub or use brushes or squeegee.
- Do not use gasoline or acetone to remove glazing compound or grease.
- Make sure that no liquid recipient (glass, bottle, etc) is near to the rear console to prevent spilling the liquid. That can generate breaks on electrical components.

To remove the rear console

To remove the rear console, follow these following operations :



Remove the six (6) screws.



Remove the rear console to have access to all connectors.



TECHNICAL MANUAL

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- PART 2 : ELECTRICAL SECTION - SIREN AMPLIFIER

CARSON SA-500 CRUISER

Note : The engine must be running and the "MASTER" switch must be in the ON position to activate the siren amplifier.



GENERAL

The siren amplifier is located in the front console, in the front cabin of the vehicle.

The siren amplifier is a unit designed for dual 100 Watts speaker use.

The siren amplifier features a rotary switch for selecting siren tones and radio, one momentary push button for tone override, separate volume controls knobs for Radio.

The siren amplifier also features LED backlighting for night visibility, the new Horn Ring Cyclor 2 (HRC2) function that enables the driver hands-free control of the siren by cycling through the tones with the vehicles horn, and Siren Cutout / Park Kill to disable the siren when exiting the vehicle.



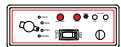
TECHNICAL MANUAL

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• PART 2 : ELECTRICAL SECTION - SIREN AMPLIFIER

OPERATION



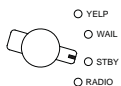
General :

This siren amplifier is designed for easy operation under the stress associated with high-speed pursuit. Most siren functions are accessible with one simple motion without repetitive activation of switches or automatic timed switching that can interfere with desired operation.



Power switch :

This switch has two positions. Left (OFF) & Right (ON). When this switch is off, the unit will not function. When the switch is on, the siren amplifier is functional and may be activated at the operator's discretion.



Rotary selector switch :

The rotary selector switch controls the primary operating mode of the siren amplifier.

Yelp : A rapidly changing tone used in congested areas.

Wail : A slower changing tone used on highways.

Stby : A silent mode that allows Manual, Horn and Public Address operation.

Radio : Also known as Radio Repeat, this mode amplifies a radio speaker input for re-broadcast outside the vehicle. No siren tones or PA operation are available in this mode.



Man/Phsr :

This momentary push-button switch provides a very rapid changing tone (Phaser) when the selector switch is in the Yelp or Wail positions. This tone is used at intersections and very highly congested areas. Pressing the button once changes to the Phaser tone and pressing again changes the tone back to Yelp or Wail.

With the selector switch in the Stby position this switch provides Manual siren tone control, rising when pressed and falling when released. This is used to momentarily alert motorists or in low noise areas. Phaser may be replaced by Two-Tone or disabled.



Horn :

This momentary push-button switch provides a simulated air-horn tone while pressed. This can be used to supplement the normal vehicle horn and is useful at intersections or in low noise areas. This tone overrides other siren tones. Horn may be disabled. See OPTION SWITCHES section.



TECHNICAL MANUAL

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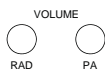


• PART 2 : ELECTRICAL SECTION - SIREN AMPLIFIER



Microphone :

Not available.



Volume controls :

Controls are provided for radio repeat volume and public address volume (not available). These should be set when the vehicle is parked. Set the RAD volume with the selector switch in the Radio position and the radio volume set to desired level. Set the PA volume to the maximum level with no feedback (squeal). The PA function is not available in this vehicle.

Auxiliary input :

During installation an auxiliary input may be connected to the horn ring or other switching device. It provides the same operation as pressing the Horn button or optionally the Man/Phsr button.

Cutout :

During installation, a cutout input may be connected to a door switch. It turns off any siren tone when the door is opened. The siren tone will continue to be cut off even when the door is closed. Changing any switch or input will restore normal function.

Horn ring function :

When the "FLASHING LIGHTS" switch is in the ON position, push and maintain the horn ring to activate the WAIL, YELP or PHASER (depending the rotary selector switch position). Release the horn ring to deactivate the WAIL, YELP or PHASER (depending the rotary selector switch position).



WARNING

- Sound Hazard - Sound level from siren speaker (>120dBA at 10 feet) may cause hearing damage. Minimize exposure.
- Do not operate siren without adequate hearing protection for you and anyone in immediate vicinity.



TECHNICAL MANUAL

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• PART 2 : ELECTRICAL SECTION - SIREN AMPLIFIER

TROUBLESHOOTING

This unit is designed to provide years of reliable service under even the worst conditions. Many times there may appear to be a problem with the unit when the true problem is in the speaker(s) or improper installation. The following chart shows typical symptoms and possible causes.

A blown internal fuse doesn't necessarily mean that the unit is bad. If a speaker or speaker lead is shorted the internal fuse will blow before the unit is damaged. Disconnect the SPKR leads and replace the fuse. If the OUTPUT light comes on (dim lighting to see) with power on and Yelp selected it is OK. Check the speaker(s) or leads for possible shorting.

Symptoms	Possible Cause	Check
No power or siren output	Power switch not turned on Bad speaker(s) Connector loose Internal fuse blown Loose connection at power source	Does backlighting come on? Do you hear a "pop" when turned on? Is the OUTPUT light on front panel coming on in Yelp? Is an external fuse or circuit breaker used? Are the negative leads connected to a good ground?
No siren tone - PA works (not available)	High Voltage Protection Mic button stuck Cutout activated Cutout Polarity Option set wrong	Input voltage must be less than highest rated voltage. Does mic button release properly? Does the siren work when Cutout input is disconnected? Is the CUT_P option properly configured?
No PA (not available)	PA volume not set properly Selector in Radio position	Have you tried turning the PA volume control? PA is not available in the Radio position
Distorted siren sound	Speaker assembly loose Intermittent Aux Input connection Low vehicle voltage	Is the speaker bell or tip loose? Is the Auxiliary Input used and wired properly? Input voltage must be greater than lowest rated voltage.
Intermittent siren tone	High Voltage Protection Connector loose Bad power connection Mic button activation Circuit breaker in supply connection	Is the vehicle voltage regulator working properly? Is the connector tight on the back of the unit? Is there a loose connection on a power lead? Is something lying on the microphone? Is a circuit breaker used with at least a 50A rating?
Horn function or Manual or Phaser stuck on	Horn switch stuck Man/Phsr switch stuck Aux Input improperly connected Aux Input Polarity Option set wrong	Does the horn switch return fully when released? Does the Man/Phsr switch return fully when released? Is the Aux Input used and wired properly? Is the AUX_P option properly configured?
No Radio	Unit not connected to radio Radio volume too low	Is the radio connected properly to the unit? Can you here the radio in the vehicle? Have you tried turning the RAD volume control?
Wrong siren tone	Two-Tone option installed Aux Input set to wrong function Yelp Override option installed	Is the T-T option selected? Is the AUX_I option configured properly? Is the YLP_O option selected?
Phaser not working	Phaser disabled	Is the P_I option selected?
Horn not working	Horn disabled	Is the H_I option selected?



TECHNICAL MANUAL

MX151D - GM



• PART 2 : ELECTRICAL SECTION - SIREN AMPLIFIER

SPEAKERS

WHELEN SA315P

Note : The engine must be running and the "MASTER" switch must be in the ON position to activate the siren amplifier and the speakers.



The two (2) speakers are located behind the front grille of the vehicle. The speakers are made in nylon composite. Weight: 4 lbs. 11 oz. (2.12kg)

Specifications : • Output : 100 Watts
 • Weight : 4.6 lbs (2.12kg)



WARNING

- Sound Hazard - Sound level from siren speaker (>120dBA at 10 feet) may cause hearing damage. Minimize exposure.
- Do not operate siren without adequate hearing protection for you and anyone in immediate vicinity.

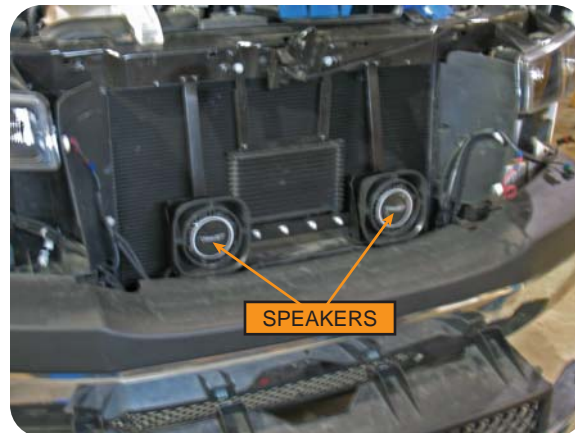
• PART 2 : ELECTRICAL SECTION - SIREN AMPLIFIER

MAINTENANCE

To have access to the speakers, follow these operations :



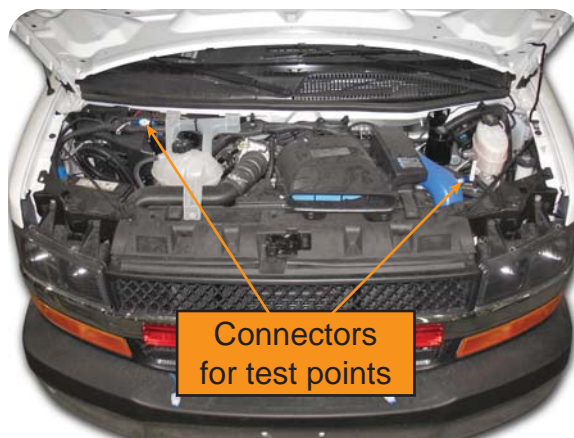
Remove the GM front grille to have access to the speakers.



The speakers are mounted on a support.

Connectors for test points

The connectors for test points of the speakers are located each side of the engine compartment.



CAUTION



• When you connect on the connections test points of the speakers, it's is very important to put dielectric grease in the connectors before plugging.



TECHNICAL MANUAL

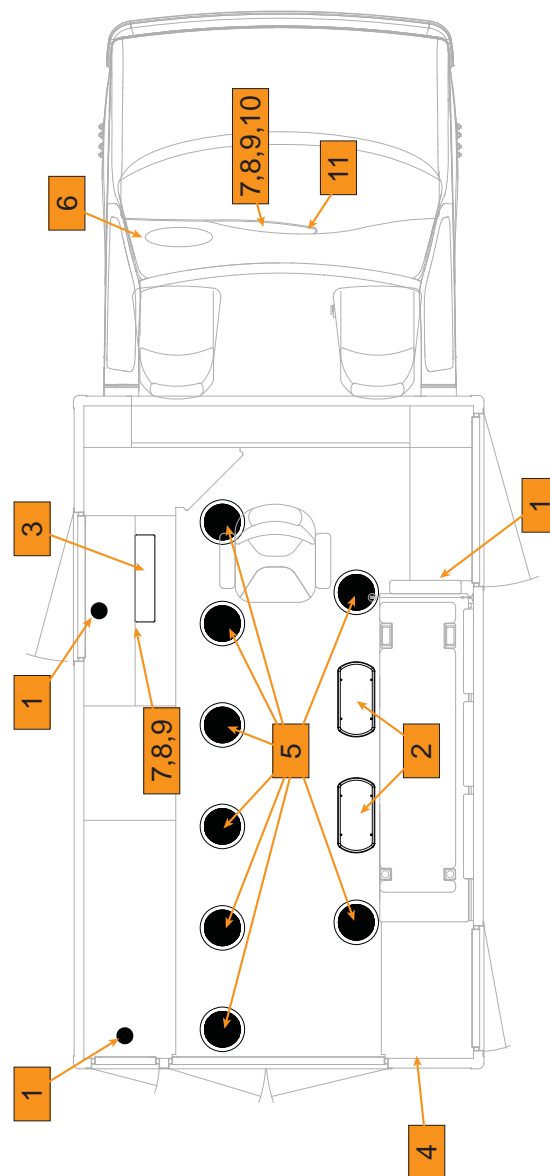
MX151D - GM



• PART 2 : ELECTRICAL SECTION - INTERIOR LIGHTS

INTERIOR LAMP ASSEMBLIES SUMMARY

#	DESCRIPTION	DEMERS P/N	SUPPLIER	SUPPLIER P/N
1	BACK UP LIGHT 4"	E503019	TRUCK-LITE CO. INC	40003
2	HIGH INTENSITY FLUORESCENT 24W/2 30% LOW TUBE LENS	A010234 E503156 D004809	DEMERS AMBULANCES TRADELCO INC DEMERS AMBULANCES	A010234 F15T8CW D004809
3	FLUORESCENT TUBE BALLAST LENS	E503232 E503156 N/A N/A	THIN-LITE CORPORATION TRADELCO INC THIN-LITE CORPORATION THIN-LITE CORPORATION	MODEL 173 F15T8CW IB-173 D-173
4	LED CABINET LIGHT	E507032	WHELEN ENGINEERING CO	OACOEDCR
5	7" INCANDESCENT INTERIOR LIGHT 1157 LAMP ASSY LENS BULB	E503372 N/A N/A	WELDON TECHNOLOGIES WELDON TECHNOLOGIES WELDON TECHNOLOGIES	8040-0520-8 1003-0000-80 9018-0020-00
6	RED FLASHING LIGHT BULB	E509029 E508009	PRODUITS ÉLECTRONIQUES 2000 LTEE PRODUITS ÉLECTRONIQUES 2000 LTEE	55-342 256
7	CONSOLE ILLUMINATION FOR 3 SWITCHES	E302003	DEMERS AMBULANCES	E302003
8	CONSOLE ILLUMINATION FOR 4 SWITCHES	E302017	DEMERS AMBULANCES	E302017
9	CONSOLE ILLUMINATION FOR 6 SWITCHES	E302004	DEMERS AMBULANCES	E302004
10	CONSOLE ILLUM. & INDICATOR (8)	E302005	DEMERS AMBULANCES	E302005
11	GOOSE NECK READING LIGHT 10" LONG BULB	E507010 E507004	HELLA INC. HELLA INC.	4532171 H83010011



- PART 2 : ELECTRICAL SECTION - INTERIOR LIGHTS

FRONT CABIN

SPOTLIGHT *(if equipped)*

Note : The engine must be running and the "MASTER" switch and the "SPOTLIGHT" switch must be in the ON position to activate the spotlight.



This is an example of a spotlight

The spotlight is located in the front cabin of the vehicle, between the driver seat and the passenger seat.

The spotlight must be connected in the spotlight 12 volts DC outlet located on the driver seat base.

OEM CEILING LIGHT

Note : The OEM ceiling light is always available to be activated.



Push the right button to activate the right side of the light. Push the left button to activate the left side of the light. The central light is activated when one of the front doors is opened.



CAUTION

• Do not use the OEM ceiling light for extended periods of time with the engine stopped. This could result in a discharged battery.

- PART 2 : ELECTRICAL SECTION - INTERIOR LIGHTS

READING LIGHT

Note : The engine must be running and the "MASTER" switch must be in the ON position to activate the reading light (gooseneck type).



The reading light is fixed on the front console, in the front cabin of the vehicle.

To activate the reading light, press the switch located on the top of the light. To deactivate the reading light, press the switch located on the top of the light once again.

PARKING LIGHT

Note : The ignition must be in the ON position, the shift selector lever must be on "P" position and the brake pedal and emergency brake must not be in use to activate the parking light.



The parking light is fixed on the GM's dashboard, left to the steering wheel.

To deactivate the parking light, change the shift selector lever position.



TECHNICAL MANUAL

MX151D - GM

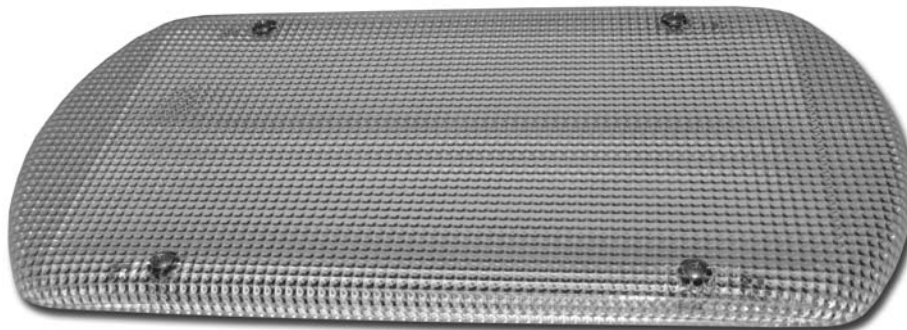


- **PART 2 : ELECTRICAL SECTION - INTERIOR LIGHTS**

PATIENT COMPARTMENT

FLUORESCENTS

Note : The engine must be running and the "MASTER" switch must be in the ON position to activate the two (2) fluorescent lights, located on the ceiling in the patient compartment.



On the front console :

Push the "COT LIGHTS" switch up to activate the fluorescent lights (and all the incandescent ceiling lights) in the patient compartment in low intensity mode. The indicator light on the switch comes on. Push the switch down once to deactivate the fluorescent lights (and all the incandescent ceiling lights) in the patient compartment.

On the rear console :

High intensity mode

Push the "CEILING RIGHT" switch up to activate the fluorescent lights (and the right incandescent ceiling lights) in high intensity mode. The indicator light on the switch comes on. Push the switch down once to deactivate the fluorescent lights (and the right incandescent ceiling lights), or push the switch down twice to change the intensity of the fluorescent lights (and the right incandescent ceiling lights) to low intensity mode.

Low intensity mode

Push the "CEILING RIGHT" switch down to activate the fluorescent lights (and the right incandescent ceiling lights) in low intensity mode. The indicator light on the switch comes on. Push the switch up once to deactivate the fluorescent lights (and the right incandescent ceiling lights), or push the switch up twice to change the intensity of the fluorescent lights (and the right incandescent ceiling lights) to high intensity mode.



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• PART 2 : ELECTRICAL SECTION - INTERIOR LIGHTS

INCANDESCENT CEILING LIGHTS

Note : The six (6) left incandescent ceiling lights (over the primary patient cot) are always available to be activated.

Note : The engine must be running and the "MASTER" switch must be in the ON position to activate the two (2) right incandescent ceiling lights (over the squad bench).



On the front console :

Push the "COT LIGHTS" switch up to activate all the incandescent ceiling lights (and the fluorescent lights) in the patient compartment in low intensity mode. The indicator light on the switch comes on. Push the switch down once to deactivate all the incandescent ceiling lights (and the fluorescent lights) in the patient compartment.

On the rear console :

High intensity mode

Push the "CEILING RIGHT" switch up to activate the two (2) right incandescent ceiling lights (and the fluorescent lights) in high intensity mode. The indicator light on the switch comes on. Push the switch down once to deactivate the right incandescent ceiling lights (and the fluorescent lights), or push the switch down twice to change the intensity of the right incandescent ceiling lights (and the fluorescent lights) to low intensity mode.

Push the "CEILING LEFT" switch up to activate the six (6) left incandescent ceiling lights in high intensity mode. The indicator light on the switch comes on. Push the switch down once to deactivate the left incandescent ceiling lights, or push the switch down twice to change the intensity of the left incandescent ceiling lights to low intensity mode.

Low intensity mode

Push the "CEILING RIGHT" switch down to activate the two (2) right incandescent ceiling lights (and the fluorescent lights) in low intensity mode. The indicator light on the switch comes on. Push the switch up once to deactivate right incandescent ceiling lights (and the fluorescent lights), or push the switch up twice to change the intensity of the right incandescent ceiling lights (and the fluorescent lights) to high intensity mode.

Push the "CEILING LEFT" switch down to activate the six (6) left incandescent ceiling lights in low intensity mode. The indicator light on the switch comes on. Push the switch up once to deactivate the left incandescent ceiling lights, or push the switch up twice to change the intensity of the left incandescent ceiling lights to high intensity mode.

The left incandescent ceiling lights can be activated in low intensity mode when the access doors (A2 or D1) are opened. As soon the door is closed, the left incandescent ceiling lights will be deactivated.



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- PART 2 : ELECTRICAL SECTION - INTERIOR LIGHTS

EMT READING LIGHT

Note : The engine must be running and the "MASTER" switch must be in the ON position to activate the EMT reading light.



The EMT reading light is located on the medical cabinet, over the rear console.

Push the "EMT LIGHT" switch up to activate the EMT reading light. The indicator light on the switch comes on. Push the switch down once to deactivate the EMT reading light. The EMT reading light can also be deactivated with the switch located on the side (forwards) of the light. The EMT reading light will be always deactivated until its switch changes to ON.

- PART 2 : ELECTRICAL SECTION - INTERIOR LIGHTS

"KIT TREE" COMPARTMENT LIGHTS

Note : The engine must be running and the "MASTER" switch must be in the ON position to activate the two (2) "kit tree" compartment lights.



The two (2) "kit tree" compartment lights are located in the "kit tree" compartment (2).

As soon as the right equipment compartment door (D2) is opened, the lights (inside the "kit tree" compartment) will be activated. The "kit tree" compartment lights are deactivated when the door is closed.



TECHNICAL MANUAL

MX151D - GM



- PART 2 : ELECTRICAL SECTION - INTERIOR LIGHTS

EXTERIOR COMPARTMENT LIGHTS

Note : The engine must be running and the "MASTER" switch must be in the ON position to activate the three (3) exterior compartment lights.



The three (3) exterior compartment lights are located in the electrical panel compartment G1 (1), in the stretcher and spineboard compartment A3 (1) and on the inside step of the right access door D1 (1).

As soon the door G1 is opened, the light (inside the electrical panel compartment) will be activated. The exterior compartment light is deactivated when the door G1 is closed.

As soon the door A3 is opened, the light (inside the stretcher and spineboard compartment) will be activated. The exterior compartment light is deactivated when the door A3 is closed.

As soon the door D1 is opened, the light (on the inside step) will be activated. The light is deactivated when the door D1 is closed.



TECHNICAL MANUAL

MX151D - GM



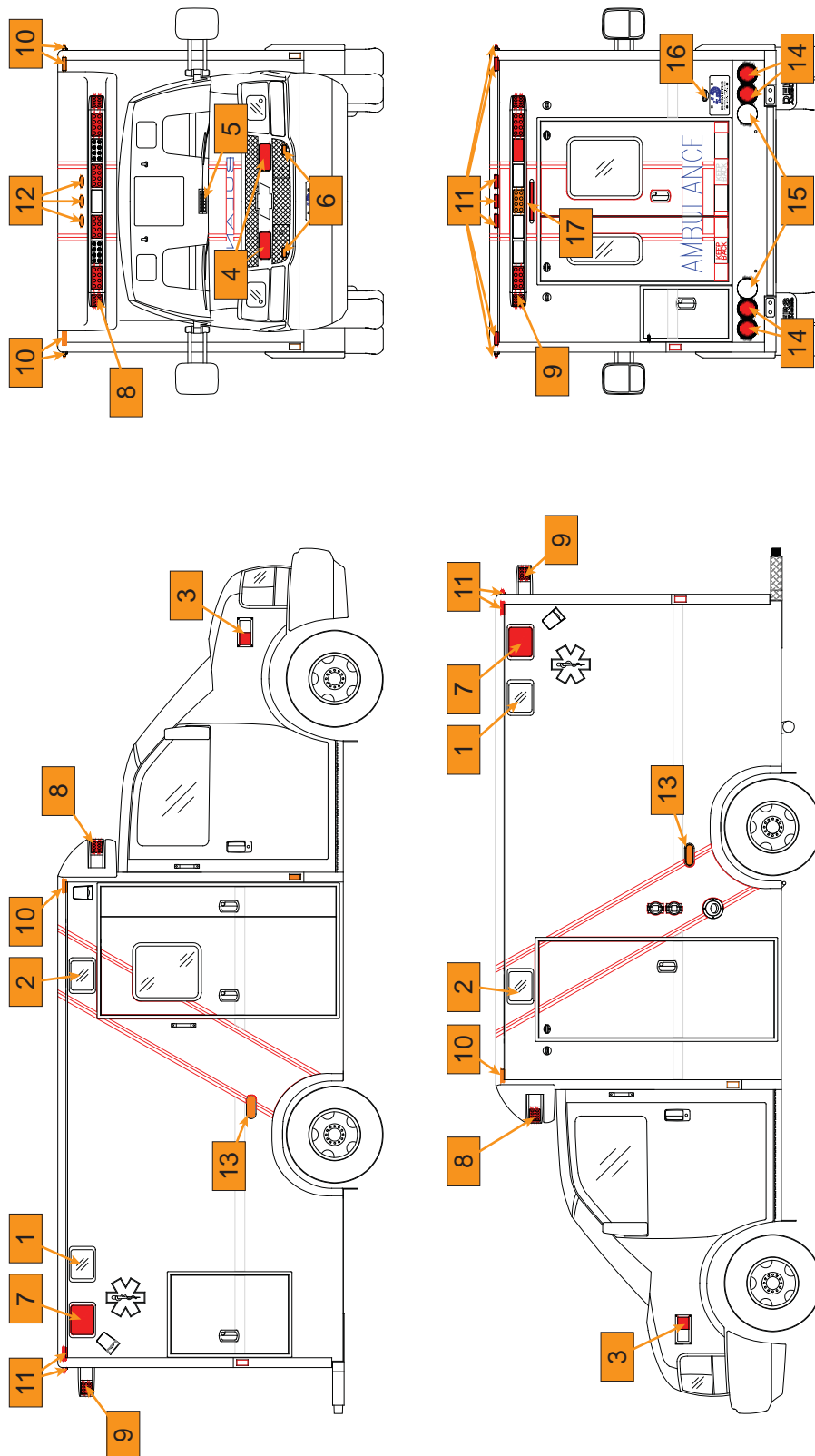
• PART 2 : ELECTRICAL SECTION - EXTERIOR LIGHTS

EXTERIOR LAMP ASSEMBLIES SUMMARY

#	DESCRIPTION	DEMERS P/N	SUPPLIER	SUPPLIER P/N
1	900 SERIES 8 TO 32 DEG SCENE LIGHT BULB LENS HOUSING GASKET	E503200 E502064 N/A N/A N/A	WHELEN ENGINEERING CO WHELEN ENGINEERING CO WHELEN ENGINEERING CO WHELEN ENGINEERING CO WHELEN ENGINEERING CO	90E000ZR H50SN12 68-1983892-30A 02-0283694-00C 38-0481690-00E
2	900 SERIES HALOGEN CLEAR BULB LENS HOUSING GASKET	E503298 E502064 N/A N/A N/A	WHELEN ENGINEERING CO WHELEN ENGINEERING CO WHELEN ENGINEERING CO WHELEN ENGINEERING CO WHELEN ENGINEERING CO	90F000CR H60SN12 68-1183542-30A 02-0283694-00C 38-0481690-00E
3	WHELEN RED/CLEAR 3X7 STROBE HOUSING LENS GASKET	E502136 N/A N/A N/A	WHELEN ENGINEERING CO WHELEN ENGINEERING CO WHELEN ENGINEERING CO WHELEN ENGINEERING CO	702000DU 7ELTUBE 02-0363418RCS0 38-0463342-00C
4	700 SERIES LINEAR LED RED LENS GASKET	E503301 N/A N/A	WHELEN ENGINEERING CO WHELEN ENGINEERING CO WHELEN ENGINEERING CO	70R02FRR 68-1183582-5S 38-0463342-00C
5	RED/CLEAR WHELEN AVENGER LIGHT	E502134	WHELEN ENGINEERING CO	AVN1D
6	LIN3 CLEAR LED LIGHT #RSC02ZCR GASKET FLANGE	E503376 N/A N/A	WHELEN ENGINEERING CO WHELEN ENGINEERING CO WHELEN ENGINEERING CO	RSC02ZCR 38-0443063-00A 11-764677-0000
7	900 SERIES LINEAR LED RED LENS GASKET	E503257 N/A N/A	WHELEN ENGINEERING CO WHELEN ENGINEERING CO WHELEN ENGINEERING CO	90RR5SRR 68-1984100-50 38-0481690-00E
8	BC FRONT LIGHTBAR ANGLED RED LED LENS RED LED LENS WHITE LED LENS WHITE STROBE	E502137 N/A N/A N/A N/A N/A N/A	BLUE MAX LIGHTING & EMERGENCY BLUE MAX LIGHTING & EMERGENCY BLUE MAX LIGHTING & EMERGENCY BLUE MAX LIGHTING & EMERGENCY BLUE MAX LIGHTING & EMERGENCY BLUE MAX LIGHTING & EMERGENCY BLUE MAX LIGHTING & EMERGENCY	465H-6407-0121 Front RECT-34CL-R RECT-34L-R-LENS RECT-37CL-R RECT-37L-R-LENS RECT-37L-W RECT-37L-WLENS RECT-37SWP-C
9	BC REAR LIGHTBAR ANGLED RED LED LENS RED LED LENS CLEAR STROBE RED STROBE SCENE LIGHT BULB LENS AMBER LED LENS	E502138 N/A N/A N/A N/A N/A N/A N/A E502068 N/A N/A N/A	BLUE MAX LIGHTING & EMERGENCY BLUE MAX LIGHTING & EMERGENCY BLUE MAX LIGHTING & EMERGENCY BLUE MAX LIGHTING & EMERGENCY BLUE MAX LIGHTING & EMERGENCY BLUE MAX LIGHTING & EMERGENCY BLUE MAX LIGHTING & EMERGENCY BLUE MAX LIGHTING & EMERGENCY BLUE MAX LIGHTING & EMERGENCY BLUE MAX LIGHTING & EMERGENCY BLUE MAX LIGHTING & EMERGENCY	465H-6407-0121 Rear RECT-34CL-R RECT-34CL-R-LENS RECT-37CL-R RECT-37L-R-LENS RECT-37SWP WHITE RECT-37SWP RED RECT-37H13-C 890-BP RECT-37C-C RECT-37CL-A RECT-37L-A-LENS
10	MARKER LIGHT YELLOW 4" X 1"	E503017	GROTE INDUSTRIES CO.	47093-3
11	MARKER LIGHT RED 4" X 1"	E503016	GROTE INDUSTRIES CO.	47092-3
12	MARKER LIGHT AMBER FORD BULB	E509010 E503113	BARIL LINCOLN INC PIECES D'AUTOS ROBITAILLE 1997 INC	F81Z-15442-CA 194
13	POSITION LIGHT YELLOW LIGHT WITH HOUSING GROMMET	E509006 N/A N/A	TRUCK-LITE CO. INC TRUCK-LITE CO. INC TRUCK-LITE CO. INC	60075Y 60275Y 60700
14	STOP TURN LAMP RED LED 24 DIODES	E509127	GROTE INDUSTRIES CO.	4050 R
15	BACK UP LIGHT GROMMET	E509016 N/A	GROTE INDUSTRIES CO. GROTE INDUSTRIES CO.	62181-3 91740
16	LICENSE PLATE LIGHT BULB	E509013 N/A	TRUCK-LITE CO. INC TRUCK-LITE CO. INC	15011 15208
17	OPTRONICS BRAKE LIGHT	E511027	OPTRONICS INTERNATIONAL LLC	STL-69RB

• PART 2 : ELECTRICAL SECTION - EXTERIOR LIGHTS

EXTERIOR LAMP ASSEMBLIES SUMMARY





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• PART 2 : ELECTRICAL SECTION - EXTERIOR LIGHTS

EMERGENCY LIGHTS

The emergency lighting system (LED) provides the ambulance with 360 degrees of visibility for safety during its missions. The system displays highly perceptible and attention getting signals that function in a modal system, and convey the message in the "All Emergency Lights Mode" - "Clear the Right-of-Way" and in the "All Corners mode" - "Hazard, Vehicle Stopped on Right-of-Way."

Note: Emergency lights configurations and flashing patterns may vary in accordance with local specifications and/or regulations.

AERODYNAMIC FRONT LIGHT BAR

The front light bar is recessed in a aerodynamic support. The aerodynamic front light bar is located over the top of the front cabin and it is fixed on the front face of the module. In the aerodynamic front light bar, there are eight (8) red LED lights, two (2) clear LED lights and one (1) clear strobe light.

The LED lights can be controlled by the "FLASHING LIGHTS" switch and the "LIGHT-BAR" switch in the front console. The strobe lights can be controlled by the "STROBE LIGHTS" switch in the front console.

Note : The aerodynamic front light bar operates in conjunction with the emergency lights system and the strobe lights system.



Tomar 465H lightbar 1625 millimeters (64 inches)

REAR LIGHT BAR

The rear light bar is located over the rear access doors and it is fixed on the rear face of the module. In the rear light bar, there are four (4) red LED lights, two (2) clear LED lights, one (1) amber LED light, one (1) clear strobe light and one (1) red strobe light.

The LED lights can be controlled by the "FLASHING LIGHTS" switch in the front console. The strobe lights can be controlled by the "STROBE LIGHTS" switch in the front console. The halogen lights can be controlled by the "REAR SCENE" switch in the front console.

Note : These lights operate in conjunction with the emergency lights system, the strobe lights system and scene lights system.



Tomar 465H lightbar 1625 millimeters (64 inches)



TECHNICAL MANUAL

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• PART 2 : ELECTRICAL SECTION - EXTERIOR LIGHTS

MODULE EMERGENCY LIGHTS

The module emergency lights are located on each sides of the module. There are two (2) red LED lights (one (1) each sides of the vehicle) and two (2) clear halogen lights (one (1) each sides of the vehicle).

The LED lights can be controlled by the "FLASHING LIGHTS" switch in the front console. The halogen lights can be controlled by the "FLASHING LIGHTS", the "LEFT SCENE" or "RIGHT SCENE" switches in the front console.

Note : • The module emergency lights operate in conjunction with the emergency lights system.

• The "LEFT SCENE" and "RIGHT SCENE" functions override the "FLASHING LIGHTS" function.

INTERSECTION LIGHTS

The intersection clear/red strobe lights are located on the fender, each sides of the vehicle.

The strobe lights can be controlled by the "STROBE LIGHTS" switch in the front console.

Note : The intersection lights operate in conjunction with the strobe lights system and the vehicle flasher lights.

FRONT GRILLE LIGHTS

The two (2) red LED lights and two (2) clear strobe lights are located on the front grille of the vehicle.

The LED lights can be controlled by the "FLASHING LIGHTS" switch in the front console. The strobe lights can be controlled by the "STROBE LIGHTS" switch in the front console.

Note : The front grille lights operate in conjunction with the emergency lights system and the strobe lights system.

FRONT SPLIT EMERGENCY LIGHT

The red/clear LED light is located on the windshield, just over the dashboard of the front cabin of the vehicle.

The LED lights can be controlled by the "FLASHING LIGHTS" switch in the front console.

Note : The split emergency light operates in conjunction with the emergency lights system.



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- **PART 2 : ELECTRICAL SECTION - EXTERIOR LIGHTS**

SCENE LIGHTS

The halogen scene lights are located on the right, left and rear sides of the module.

Note : Scene lights configurations may vary in accordance with local specifications and/or regulations.

RIGHT SCENE LIGHTS

The two (2) right clear halogen scene lights are located on the right face of the module.

The clear halogen scene lights operate automatically when the right access door (D1) is opened.

The clear halogen scene lights can be controlled by the "RIGHT SCENE LIGHTS" switch in the front console.

The clear halogen scene light (the front one) can be activated by the "FLASHING LIGHTS" switch in the front console.

Note : The and "RIGHT SCENE" functions override the "FLASHING LIGHTS" function.

LEFT SCENE LIGHTS

The two (2) left clear halogen scene lights are located on the left face of the module.

The scene lights operate automatically when the left compartment door (G1) is opened.

The scene lights can be controlled by the "LEFT SCENE LIGHTS" switch in the front console.

The clear halogen scene light (the front one) can be activated by the "FLASHING LIGHTS" switch in the front console.

Note : The and "LEFT SCENE" functions override the "FLASHING LIGHTS" function.

LOADING LIGHTS

The two (2) clear halogen loading lights are located on the rear light bar.

The loading lights operate automatically when the rear access doors are opened. To deactivate the loading lights, pull the three (3) positions access switch located on the right side, on the module (door A2).

The loading lights can be controlled by the "RIGHT SCENE LIGHTS" switch in the front console.

The loading lights and the back up lights can be activated when the shift selector lever in the R (reverse) position.



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- **PART 2 : ELECTRICAL SECTION - EXTERIOR LIGHTS**

HIGH MOUNT BRAKE LIGHT

The red LED light is located on the rear face of the module, between the rear light bar and the rear access doors.

Note : The high mount brake light operates in conjunction with the brake signal.

LATERAL AMBER TURNING LIGHTS

The amber LED lights are located on each lateral sides of the vehicle.

Note : The rear combination lights operate in conjunction with the turn signals.

FOG LIGHTS / DRIVING LIGHTS

Note : The fog lights and the driving lights are always available to be activated.

The halogen fog lights connectors are located on the front bumper of the vehicle.

Fog lights :

On the front console, push the "FOG LIGHTS" switch up to activate the fog lights. The indicator light on the switch comes on. Push the switch down once to deactivate the fog lights, or push the switch down twice to activate the driving lights.

Driving lights :

On the front console, push the "FOG LIGHTS" switch down to activate the driving lights. The indicator light on the switch comes on. Push the switch up once to deactivate the driving lights, or push the switch up twice to activate the fog lights.

INSTALLATION OF THE FOG LIGHTS

When you connect the fog lights, it's is very important to put dielectric grease in the connectors before plugging.

WIG WAG LIGHTS

Note : The engine must be running, the "MASTER" switch must be in the ON position and the OEM high beam must be OFF to activate the wig wag lights.

The wig wag lights are located in the OEM headlights of the vehicle.

On the front console, push the "WIG WAG" switch up to activate the wig wag lights. The indicator light on the switch comes on. Push the switch down to deactivate the wig wag lights.

• PART 2 : ELECTRICAL SECTION - LIGHTS SYSTEM MODULES

FLASHING MODULE

Note : The engine must be running and the "MASTER" switch must be in the ON position to activate the flashing module of all the emergency lights.



The flashing module is located in the electrical panel compartment (G1).

The flashing module provides the attention-getting patterns in emergency and service vehicle lighting systems.

OPERATION

Push the "FLASHING LIGHTS" switch up to activate the emergency lights on the module and the rear light bar. The indicator light on the switch comes on. Push the switch down to deactivate all the emergency lights on the module and the rear light bar.

TROUBLESHOOTING

PROBLEM	ITEMS TO CHECK
All outputs do not flash	<ul style="list-style-type: none"> • Is the battery voltage less than 10 volts DC? • Are the wire and light connections proper? • Do you have more than the rated number of lights on the outputs? • Is the remote ground switch wired correctly?
One output does not flash	<ul style="list-style-type: none"> • Is the battery voltage less than 10 volts DC? • Is the affected output shorted or overloaded?

- PART 2 : ELECTRICAL SECTION - LIGHTS SYSTEM MODULES

STROBE POWER SUPPLY

Note : The emergency strobe lights are always available to be activated.



The strobe power supply is located in the electrical panel compartment (G1).

The strobe power supply provides the attention-getting patterns in strobe lighting systems.

OPERATION

Day mode (high intensity)

Push the "STROBE" switch up to activate the emergency strobe lights in high intensity mode (day mode). The indicator light on the switch comes on. Push the switch down once to deactivate the emergency strobe lights, or push the switch down twice to change to the night mode.

Night mode (low intensity)

Push the "STROBE" switch down to activate the emergency strobe lights in low intensity mode (night mode). The indicator light on the switch comes on. Push the switch up once to deactivate the emergency strobe lights, or push the switch up twice to change to the day mode.

• PART 2 : ELECTRICAL SECTION - LIGHTS SYSTEM MODULES

WIG WAG MODULE

Note : The engine must be running and the "MASTER" switch must be in the ON position to activate wig wag module of the wig wag lights.



The wig wag module is located in the electrical panel compartment (G1).

The wig wag module provides the flashing patterns of the vehicle's headlights.

OPERATION

Push the "WIG WAG" switch up to activate the wig wag lights. The indicator light on the switch comes on. Push the switch down to deactivate the wig wag lights.

TROUBLESHOOTING

SYMPTOM	SOLUTION
No Operation	<ul style="list-style-type: none"> • Verify fuse is not open. • Verify voltage of 8-30 volts DC is present on Red wire and • Flash enable wire.
Interference with radio equipment	<ul style="list-style-type: none"> • Verify power and ground wires are not connected to same circuit as radio equipment. Connect ground wire as close to ground terminal of battery as practical
Flasher stops functioning when marker lights are turned ON	<ul style="list-style-type: none"> • NTCO (Night Time cut-off) wire is connected to parking / marker lights. If flashing of headlights is allowed at night, remove NTCO wire from marker light wiring.
Headlights turn ON for short time then OFF for a couple of seconds and repeats	<ul style="list-style-type: none"> • Over-current shutdown of the flasher has detected too much load on the flasher. Verify a maximum of 2-55 Watt lamps are connected to each output

- PART 2 : ELECTRICAL SECTION - AIR CONDITIONING SYSTEM

THERMOSTAT

Note : The engine must be running and the "MASTER" switch must be in the ON position to activate the thermostat.



The thermostat is located on the medical cabinet, next to the rear console.

The thermostat allows you to adjust the temperature in the patient compartment of the vehicle.

Turn the thermostat knob clockwise to increase temperature. Turn the temperature control knob counterclockwise to decrease temperature.

Dependently of the preset temperature of the thermostat, the heating systems (standard and Espar) or the air conditioning will be activated.

The thermostat only controls the temperature in the patient compartment.

OPERATION IN COOL MODE

When the temperature in the patient compartment is higher than the preset temperature and the "AC" switch or the "REAR AC" switch is activated, the thermostat will activate the air conditioning system.

When the temperature in the patient compartment is equal or lower than the preset temperature, the thermostat will deactivate the air conditioning system.

- PART 2 : ELECTRICAL SECTION - AIR CONDITIONING SYSTEM

STANDARD AIR CONDITIONING SYSTEM

Note : The engine must be running, the "MASTER" switch and the "A/C" switch (or the "REAR A/C" switch) must be in the ON position and the thermostat must be in cool mode to activate the standard air conditioning system.



The standard air conditioning system is located in the medical cabinet, over the angle compartment.

The standard air conditioning system is an extension of the OEM air conditioning system (see the GM owner's manual for more information). The standard air conditioning system only cools the area in the patient compartment.

The standard air conditioning system consist of the cooling system, the blower and the two (2) evacuation drains.

Cooling system : The cooling system allows to distribute cool air into the patient compartment.

Blower : The blower controls the cool air flow of the standard air conditioning system. The blower has two (2) speeds : LOW or HIGH. The blower speed is controlled by the "A/C" switch on the rear console and the "REAR A/C" switch on the front console.

Evacuation drains : The two (2) evacuation drains allow to evacuate the water located into the condensers.



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• PART 2 : ELECTRICAL SECTION - AIR CONDITIONING SYSTEM

OPERATION (front console)

The standard air conditioning system is dependant of the rear thermostat and the "REAR AC" switch on the front console.

High speed mode

Push the "REAR AC" switch up to activate the standard air conditioning system in the patient compartment in high speed mode. The indicator light on the switch comes on. Push the switch down once to deactivate the standard air conditioning system, or push the switch down twice to decrease the speed of the standard air conditioning system (low speed mode).

Low speed mode

Push the "REAR AC" switch down to activate the standard air conditioning system in the patient compartment in low speed mode. The indicator light on the switch comes on. Push the switch up once to deactivate the standard air conditioning system, or push the switch up twice to increase the speed of the standard air conditioning system (high speed mode).

When the temperature in the patient compartment is higher than the preset temperature on the thermostat, the standard air conditioning system will be activated. When the temperature in the patient compartment is equal or lower than the preset temperature on the rear thermostat, the standard air conditioning system will be deactivated.



WARNING

- The engine must be running to activate the air conditioning system.
- Do not leave children, impaired adults, or pets alone in your vehicle. They could accidentally injure themselves or others through inadvertent operation of the vehicle. Also, on hot, sunny days, temperatures in closed vehicle could quickly become high enough to cause severe or possibly fatal injuries to people or animals.



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• PART 2 : ELECTRICAL SECTION - AIR CONDITIONING SYSTEM

OPERATION (rear console)

The standard air conditioning system is dependant of the rear thermostat and the "AC" switch on the rear console.

High speed mode

Push the "AC" switch up to activate the standard air conditioning system in the patient compartment in high speed mode. The indicator light on the switch comes on. Push the switch down once to deactivate the standard air conditioning system, or push the switch down twice to decrease the speed of the standard air conditioning system (low speed mode).

Low speed mode

Push the "AC" switch down to activate the standard air conditioning system in the patient compartment in low speed mode. The indicator light on the switch comes on. Push the switch up once to deactivate the standard air conditioning system, or push the switch up twice to increase the speed of the standard air conditioning system (high speed mode).

When the temperature in the patient compartment is higher than the preset temperature on the thermostat, the standard air conditioning system will be activated. When the temperature in the patient compartment is equal or lower than the preset temperature on the rear thermostat, the standard air conditioning system will be deactivated.



WARNING

- The engine must be running to activate the air conditioning system.
- Do not leave children, impaired adults, or pets alone in your vehicle. They could accidentally injure themselves or others through inadvertent operation of the vehicle. Also, on hot, sunny days, temperatures in closed vehicle could quickly become high enough to cause severe or possibly fatal injuries to people or animals.

• PART 2 : ELECTRICAL SECTION - AIR CONDITIONING SYSTEM

MAINTENANCE

To have access and to remove to the air conditioning system, follow these operations :



Before to remove the air conditioning system, remove all freon in the air conditioning system.



Remove the A/C panel.



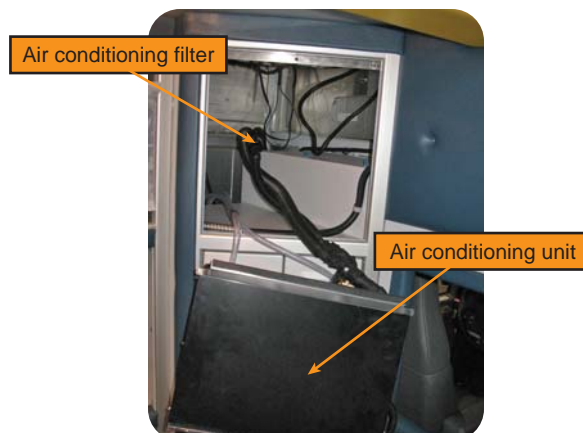
Remove the three (3) screws on the support.



Slowly slide the A/C unit forwards and downwards and disconnect the electrical connector.



Slowly swivel counterclockwise ($\pm 90^\circ$) the A/C unit.



Extract the A/C unit. Unplug the A/C lines and the evacuation drains and remove (or, if necessary, replace) the A/C unit.

- PART 2 : ELECTRICAL SECTION - HEATING SYSTEMS

THERMOSTAT

Note : The engine must be running and the "MASTER" switch must be in the ON position to activate the thermostat.



The thermostat is located on the medical cabinet, next to the rear console.

The thermostat allows you to adjust the temperature in the patient compartment of the vehicle.

Turn the thermostat knob clockwise to increase temperature. Turn the temperature control knob counterclockwise to decrease temperature.

Dependently of the preset temperature of the rear thermostat, the heating systems (standard and Espar) or the air conditioning will be activated.

The thermostat only controls the temperature in the patient compartment.

OPERATION IN HEAT MODE

When the temperature in the patient compartment is lower than the preset temperature and the "HEAT" switch or the "REAR HEAT" switch is activated, the thermostat will activate the standard heating system and the Espar heating system.

When the temperature in the patient compartment is equal or higher than the preset temperature, the thermostat will deactivate the standard heating system and the Espar heating system.

- PART 2 : ELECTRICAL SECTION - HEATING SYSTEMS

STANDARD HEATING SYSTEM

Note : The engine must be running, the "MASTER" switch and the "HEAT" switch (or the "REAR HEAT" switch) must be in the ON position and the thermostat must be in heat mode to activate the standard heating system.



The standard heating system is located in the squad bench, in the patient compartment.

The standard heating system is an extension of the OEM heating system (see the GM owner's manual for more information). The standard heating system only heats the area in the patient compartment.

The standard heating system consist of the heater, the blower, the electronic valve and the manual valve.

Heater : The heater allows to distribute warm air into the patient compartment.

Blower : The blower controls the heat air flow of the standard heating system. The blower has two (2) speeds : LOW or HIGH. The blower speed is controlled by the "HEAT" switch on the rear console and the "REAR HEAT" switch on the front console.

Electronic valve : The electronic valve automatically allows the heat fluid to circulate in the standard heating system. The electronic valve is controlled by the thermostat.

Manual valve : The manual valve allows the heat fluid to circulate in the standard heating system. When the manual valve handle is parallel to the line, the line is opened. When the manual valve handle is perpendicular to the line, the line is closed. The manual valve must be used during maintenance.



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• PART 2 : ELECTRICAL SECTION - HEATING SYSTEMS

OPERATION (front console)

The standard heating system and the Espar heating system are dependant of the rear thermostat and the "REAR HEAT" switch on the front console.

High speed mode

Push the "REAR HEAT" switch up to activate the standard heating system and the Espar heating system in the patient compartment in high speed mode. The indicator light on the switch comes on. Push the switch down once to deactivate the heating systems, or push the switch down twice to decrease the speed of the heating systems (low speed mode).

Low speed mode

Push the "REAR HEAT" switch down to activate the standard heating system and the Espar heating system in the patient compartment in low speed mode. The indicator light on the switch comes on. Push the switch up once to deactivate the heating systems, or push the switch up twice to increase the speed of the heating systems (high speed mode).

When the temperature in the patient compartment is lower than the preset temperature on the thermostat, the standard heating system and the Espar heating system will be activated. When the temperature in the patient compartment is equal or higher than the preset temperature on the rear thermostat, the standard heating system and the Espar heating system will be deactivated.



WARNING

- The engine must be running to activate the standard heating system and the Espar heating system.
- Do not leave children, impaired adults, or pets alone in your vehicle. They could accidentally injure themselves or others through inadvertent operation of the vehicle. Also, on hot, sunny days, temperatures in closed vehicle could quickly become high enough to cause severe or possibly fatal injuries to people or animals.



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• PART 2 : ELECTRICAL SECTION - HEATING SYSTEMS

OPERATION (rear console)

The standard heating system and the Espar heating system are dependant of the rear thermostat and the "HEAT" switch on the rear console.

High speed mode

Push the "HEAT" switch up to activate the standard heating system and the Espar heating system in the patient compartment in high speed mode. The indicator light on the switch comes on. Push the switch down once to deactivate the heating systems, or push the switch down twice to decrease the speed of the heating systems (low speed mode).

Low speed mode

Push the "HEAT" switch down to activate the standard heating system and the Espar heating system in the patient compartment in low speed mode. The indicator light on the switch comes on. Push the switch up once to deactivate the heating systems, or push the switch up twice to increase the speed of the heating systems (high speed mode).

When the temperature in the patient compartment is lower than the preset temperature on the thermostat, the standard heating system and the Espar heating system will be activated. When the temperature in the patient compartment is equal or higher than the preset temperature on the rear thermostat, the standard heating system and the Espar heating system will be deactivated.



WARNING

- The engine must be running to activate the standard heating system and the Espar heating system.
- Do not leave children, impaired adults, or pets alone in your vehicle. They could accidentally injure themselves or others through inadvertent operation of the vehicle. Also, on hot, sunny days, temperatures in closed vehicle could quickly become high enough to cause severe or possibly fatal injuries to people or animals.

• PART 2 : ELECTRICAL SECTION - HEATING SYSTEMS

MAINTENANCE

To have access to the standard heating system, follow these operations :



Open the squad bench.



To have access to the standard heating unit, remove the seven (7) screws and remove of the heater protector cover.



Close the manual valve.



Use vice-clamps to clamp the hoses.



Unplug all hoses and electrical connector and remove (or, if necessary, replace) the standard heating system.

• PART 2 : ELECTRICAL SECTION - HEATING SYSTEMS

ESPAR HEATING SYSTEM

Note : The engine must be running, the "MASTER" switch and the thermostat must be in heat mode to activate the Espar heating system.



The Espar heating unit is located below the left medical cabinet.

The Espar heating system is a compact fuel-fired 13,650 BTU/hr air heater. This heater is uniquely designed for inside mounting and ease of installation.

These heaters provide hot air to the interior of vehicles for passenger comfort.

The Espar heating unit is operated by the rear thermostat next to the rear console. The Espar heating system functions only with his highest speed to maintain the temperature desired.

Temperature and overheat sensors, and a specially designed heat exchanger are among the safety features which make this heater a safe and dependable unit.



WARNING

- Heater must be turned off while re-fuelling.
- Do not install heater in enclosed areas where combustible fumes may be present.
- Install heater so it will maintain a minimum distance of 50.8 millimeters (2 inches) from any flammable or heat sensitive material.
- Install the exhaust system so it will maintain a minimum distance of 50.8 millimeters (2 inches) from any flammable or heat sensitive material.
- Ensure that the fuel system is intact and there are no leaks.
- Route the heater exhaust so that exhaust fumes can not enter any passenger compartments.
- Ensure an air tight seal will be maintained between the heater and mounting surface and at any exhaust connection points.
- Ensure that heating air supply is taken from an area where poisonous gases will not be present.
- If running exhaust components through an enclosed compartment, ensure that it is vented to the outside.



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• PART 2 : ELECTRICAL SECTION - HEATING SYSTEMS

OPERATION

The Espar heating system is fully dependant on the rear thermostat, located next to the rear console. The Espar heating system functions only with his highest speed to maintain the temperature desired.

When the temperature in the patient compartment is lower than the preset temperature on the thermostat, the Espar heating system will be activated.

When the temperature in the patient compartment is equal or higher than the preset temperature on the rear thermostat, the Espar heating system will be deactivated.



WARNING

- The engine must be running to activate the Espar heating system.
- Do not leave children, impaired adults, or pets alone in your vehicle. They could accidentally injure themselves or others through inadvertent operation of the vehicle. Also, on hot, sunny days, temperatures in closed vehicle could quickly become high enough to cause severe or possibly fatal injuries to people or animals.

START UP

On start up the following sequences take place :

- Control unit does a systems check of the glow pin, flame sensor/temperature sensor, fuel metering pump and control unit.
- Glow pin is energized and starts preheating the combustion chamber.
- Blower starts slowly and begins to accelerate.
- After a delay the fuel pump delivers fuel (approximatively sixty (60) seconds).
- Ignition will take place as the fuel/air mixture begins to burn.
- Blower speed and fuel delivery are slowly increased.
- Once flame sensor has detected a flame the glow pin will switch off, after approximatively sixty (60) seconds.
- After another hundred twenty (120) seconds, heater will reach maximum power.

TEMPERATURE CONTROL

- The temperature is monitored constantly at the heater's process air inlet or external sensor.
- This temperature is compared to the set temperature on the from the thermostat.
- If the desired temperature is exceeded while the heater is operating in "standby" mode. This is a comfort feature.
- The heater will re-start once heat is required again.



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• PART 2 : ELECTRICAL SECTION - HEATING SYSTEMS

SHUT DOWN CYCLE

When the heater begins the shut down cycle.

- Fuel pump stops delivering fuel.
- The glow pin is re-energized for a forty (40) seconds after-glow to burn off any combustion residue.
- The blower will continue to run for four (4) minutes and will automatically switch off.

CONTROL AND SAFETY EQUIPMENT

- If the heater fails to ignite within two ninety (90) seconds start attempts, a "no start" shut down occurs.
- If a flame out occurs after the heater has started, the heater will attempt one restart.
- If repeated flame outs occur within ten (10) minutes the heater will not restart.
- Overheat shut down will occur if there is a restriction of the heating air flow (i.e. blocked inlet or outlet). The overheat sensor will automatically reset once the heater has cooled down.
- Once the air flow restriction is removed, the heater can be re-started by switching the heater off then back on.
- If the voltage drops below 10.5 volts DC or raises above 16 volts DC the heater will shut down.
- If the glow pin circuit or fuel metering pump circuit is interrupted the heater will not start.
- The blower motor is checked continuously during operation. Shut down will occur if the blower does not start or maintain proper speed.
- The heater will automatically shut down during ten (10) seconds when the ignition turned OFF.

• PART 2 : ELECTRICAL SECTION - HEATING SYSTEMS

MAINTENANCE

Recommended Periodic Maintenance

- Remove the glow pin and inspect for carbon build up. Clean or replace.
- Remove the glow pin screen and inspect for carbon build up. Replace.
- Make sure vent hole is open. ESPAR recommends the use of non-detergent 100% volatile carburetor cleaner, an air gun will also help. Remove loose carbon from the glow pin chamber.
- Inspect the ducting, the air intake screen and air outlet for restriction or blockage.
- Inspect combustion air intake and exhaust for blockage.
- Operate your heater for a minimum of twenty (20) minutes each month.
- Maintain your batteries and all electrical connections in good condition. With insufficient power the heater will not start. Low and high voltage cutouts will shut the heater down automatically.
- Use fuel suitable for the climate (see engine manufacturer's recommendations). Blending used engine oil with diesel fuel is not permitted.

To have access to the Espar heating system, follow these operation :



Remove the silicone on all borders of the panel, located under the action wall.



Unplug the hose of the Espar outlet.



The Espar heating system is now accessed.



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• PART 2 : ELECTRICAL SECTION - HEATING SYSTEMS

TROUBLESHOOTING

Heater does not ignite

1- Blower motor does not run

- Check:
- Fuse in power harness.
 - Power to control unit.
 - Power to and from switch.
 - Electrical connections of the Espar heater unit.
 - Electrical connections of the thermostat.
 - If conditions are respected (engine must be running, the "MASTER" switch must be ON and the thermostat must be in heat mode).

2- Blower motor runs approximately twenty (20) seconds and then shuts off

- Check:
- Ensure voltage at control unit remains above 10 volts DC during start up with glow pin circuit on.

3- Blower motor runs/fuel metering pump starts and then shuts down after two (2) start up attempts

- Check:
- Fuel lines and fuel filter.
 - Fuel quantity.
 - Combustion air or exhaust tube blockage.

4- Blower motor runs/no fuel metering pump

- Check:
- For electrical pulses at fuel metering pump.
 - If pump is frozen.
 - Blocked fuel line.

Heater ignites

1- Shuts down at random

- Check:
- Fuel metering pump quantity.
 - Possible overheat.
 - Control unit input voltage.

2- Heater smokes and carbons up

- Check:
- Exhaust pipe blocked.
 - Combustion air intake blocked.
 - Exhaust entering combustion air intake pipe.
 - Short cycling, rapid on/off operation.
 - Fuel system.
 - Fuel metering pump position and quantity.
 - Motor rpm.

- PART 2 : ELECTRICAL SECTION - HEATING SYSTEMS

110 VOLTS A.C. HEATING SYSTEM

Note: The 110 volts AC external shoreline must be connected to the vehicle to activate the 110 volts AC heating system.



The 110 volts AC heating system is located in the front wall, between the front cabin and the patient compartment. The heater outlet is in the patient compartment.

The 110 volts AC heating system is a standard residential wall heater. The compact and multi-purpose heater is designed for areas where space is limited.

The 110 volts AC heating system is equipped with a silent axial fan that blows air over a durable tubular heating element with fins producing warm air circulation throughout the patient compartment.

The 110 volts AC heating system is powered by the 110 volts AC circuit of the vehicle.

On the up side 110 volts AC heating system, there is a thermostat. The thermostat allows you to adjust the temperature of the 110 volts AC heating system. Turn the temperature selector knob clockwise to decrease temperature or turn knob counterclockwise to increase temperature.



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• PART 2 : ELECTRICAL SECTION - HEATING SYSTEMS

AUTOMATIC MODE

Note : The external shoreline must be connected to the vehicle to activate the automatic mode of the auxiliary heating system.

The automatic mode allows heating the patient compartment, without discharging the batteries. The automatic mode activates 110 volts AC heater and his thermostat.

Heater : The 110 volts AC heater is located on the front wall and it allows heating the patient compartment.

Thermostat : The temperature of the 110 volts AC heater can be adjusted with the thermostat located on the heater.

OPERATION

- 1- To initiate the automatic mode, connect the external shoreline to the vehicle.
- 2- The 110 volts AC heater is activated and it will begin to heat the patient compartment. The temperature of the 110 volts AC heater is adjusted on the thermostat.
- 3- When the temperature in the patient compartment is equal or higher than the preset temperature on the thermostat, the 110 volts AC heater will be deactivated.
- 4- When the temperature in the patient compartment is lower than the preset temperature on the thermostat, the 110 volts AC heater will be re-activated.
- 5- The automatic mode cycle will be repeated until the external shoreline is disconnected.



WARNING

- The engine must be OFF to activate the 110 volts AC heating system.
- Do not leave children, impaired adults, or pets alone in your vehicle. They could accidentally injure themselves or others through inadvertent operation of the vehicle. Also, on hot, sunny days, temperatures in closed vehicle could quickly become high enough to cause severe or possibly fatal injuries to people or animals.



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• PART 2 : ELECTRICAL SECTION - HEATING SYSTEMS

MAINTENANCE

The auxiliary heating system requires little care, however to maintain it in optimum condition follow this :

Each three (3) month, remove the grill and use a vacuum cleaner to remove the dust accumulation inside the heater. Cleaning should be done while the heater is disconnected from the supply circuit.



CAUTION

- Read all instructions before using this heater.
- This heater is hot when in use. To avoid burns, do not let bare skin touch hot surfaces. Keep combustible materials, such as furniture, pillows, bedding, papers, clothes, and curtains at least 1220 millimeters (48 inches) from the front of the heater.
- Do not use outdoors.
- Do not insert or allow foreign objects to enter any ventilation or exhaust opening as this may cause an electric shock or fire, or damage the heater.
- To prevent a possible fire, do not block air intakes or exhaust in any manner.
- A heater has hot and arcing or sparking parts inside. Do not use it in areas where gasoline, paint, or flammable liquids are used or stored.
- Use this heater only as described in this manual. Any other use not recommended by the manufacturer may cause fire, electric shock, or injury to persons.

- PART 2 : ELECTRICAL SECTION - HEATING SYSTEMS

MAINTENANCE

To have access to the 110 volts AC heating system, follow these operations :



The 110 volts ac heating system is located on the front wall, in the patient compartment. To have access to the inside of the 110 volts ac heating system, remove the two (2) screws and the thermostat knob.



The view of the 110 volts ac heating system when it is opened.

- PART 2 : ELECTRICAL SECTION - 12 VOLTS D.C. SYSTEM AND COMPONENTS

INCUBATOR 12 VOLTS D.C. OUTLET

Note : The incubator 12 volts DC outlet is always available to be activated.



The incubator outlet (1) is rated for 12 volts DC. The outlet is on a separately protected circuit.
The incubator 12 volts DC outlet is located on the medical cabinet, below the rear console.



CAUTION

- Do not use the incubator 12 volts DC outlet for extended periods of time with the engine stopped. This could result in a discharged battery.

- PART 2 : ELECTRICAL SECTION - 12 VOLTS D.C. SYSTEM AND COMPONENTS

SPOTLIGHT 12 VOLTS D.C. OUTLET

Note : The engine must be running and the "MASTER" switch and the "SPOTLIGHT" switch must be in the ON position to activate the spotlight 12 volts DC outlet.



The spotlight outlet (1) is rated for 12 volts DC. The outlet is on a separately protected circuit. The spotlight 12 volts DC outlet is located on the passenger seat base, in the front cabin.



CAUTION

- Do not use the spotlight 12 volts DC outlet for extended periods of time with the engine stopped. This could result in a discharged battery.



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- PART 2 : ELECTRICAL SECTION - 12 VOLTS D.C. SYSTEM AND COMPONENTS

12 VOLTS D.C. OUTLET

Note : The engine must be running and the "MASTER" switch must be in the ON position to activate the 12 volts DC outlets.



The outlets (2) are rated for 12 volts DC. The outlets are on a separately protected circuit.

The 12 volts DC outlets are located on the front console (1) and the rear console (1).

• PART 2 : ELECTRICAL SECTION - 12 VOLTS D.C. SYSTEM AND COMPONENTS

BATTERIES

In the vehicle, there are four (4) batteries : original equipment manufacturer OEM (2) and conversion (2).

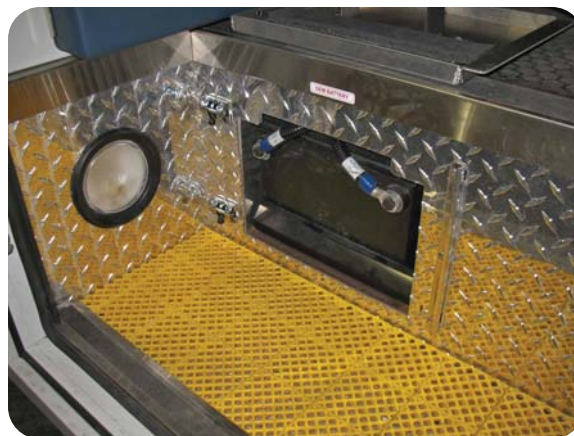
OEM BATTERIES

The OEM batteries' capacity is rated 12 volts DC.

The OEM batteries are located in the battery compartment in the lateral step, right side of the vehicle (1) and in the engine compartment (1).



The OEM battery located in the engine compartment.



The OEM battery located in the battery compartment, right side of the vehicle.

Maintenance

The OEM battery located in battery compartment needs a quarterly maintenance.

- Clean the right battery compartment of all dirtiness.
- Check all connection of the OEM batteries.
- Verify the torque of all connection of the OEM batteries. The torque must be 15 lbf.ft.

- PART 2 : ELECTRICAL SECTION - 12 VOLTS D.C. SYSTEM AND COMPONENTS

CONVERSION BATTERIES

The conversion batteries' capacity is rated 12 volts DC and the conversion batteries are in the 27 series size group and deep cycle type.

The two (2) conversion batteries are located in the electrical panel compartment G1.



The conversion batteries (the sliding tray closed) in the electrical panel compartment.



The conversion batteries (the sliding tray opened) in the electrical panel compartment.

Maintenance

The conversion batteries located in left battery compartment need a quarterly maintenance.

- Clean the right battery compartment of all dirtiness.
- Check all connection of the conversion batteries.
- Verify the torque of all connection of the conversion batteries. The torque must be 15 lbf-ft.
- Lubricate the sliding tray with "*Fluid Film*".

- PART 2 : ELECTRICAL SECTION - 12 VOLTS D.C. SYSTEM AND COMPONENTS

BATTERIES' ISOLATOR

The batteries' isolator is located in the electrical panel compartment (G1).



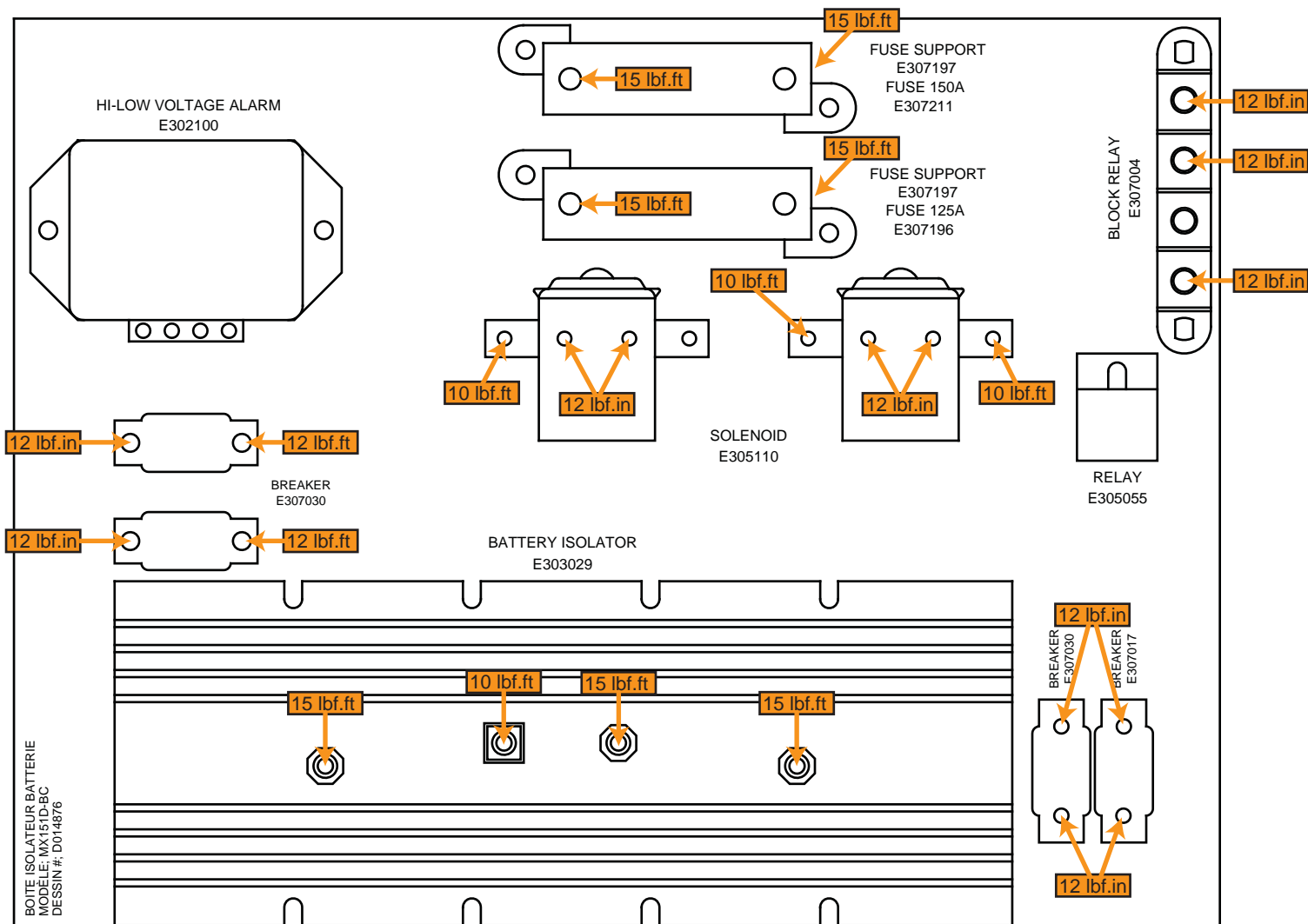
The batteries' isolator allows the recharge of the OEM batteries (2) and the conversion batteries (2) with the engine running.

• PART 2 : ELECTRICAL SECTION - 12 VOLTS D.C. SYSTEM AND COMPONENTS

MAINTENANCE

- Make sure that no liquid receptient (glass, bottle, etc) is near to the batteries' isolator to prevent spilling the liquid. That can generate breaks on electrical components.
- Twice a year, check all connection in the batteries' isolator.
- Twice a year, verify the torque of all components in the batteries' isolator. See the torque chart below.

TORQUE CHART





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- PART 2 : ELECTRICAL SECTION - 12 VOLTS D.C. SYSTEM AND COMPONENTS

VOLTMETER

Note : The engine must be running and the "MASTER" switch must be in the ON position to activate the voltmeter.



The voltmeter is located on the front console, in the front cabin of the vehicle.

The voltmeter shows the voltage of the conversion batteries.

- PART 2 : ELECTRICAL SECTION - 12 VOLTS D.C. SYSTEM AND COMPONENTS

BATTERIES CHARGER

Note : The exterior 110 volts AC shoreline must be connected to the vehicle to activate all functions of the batteries charger.



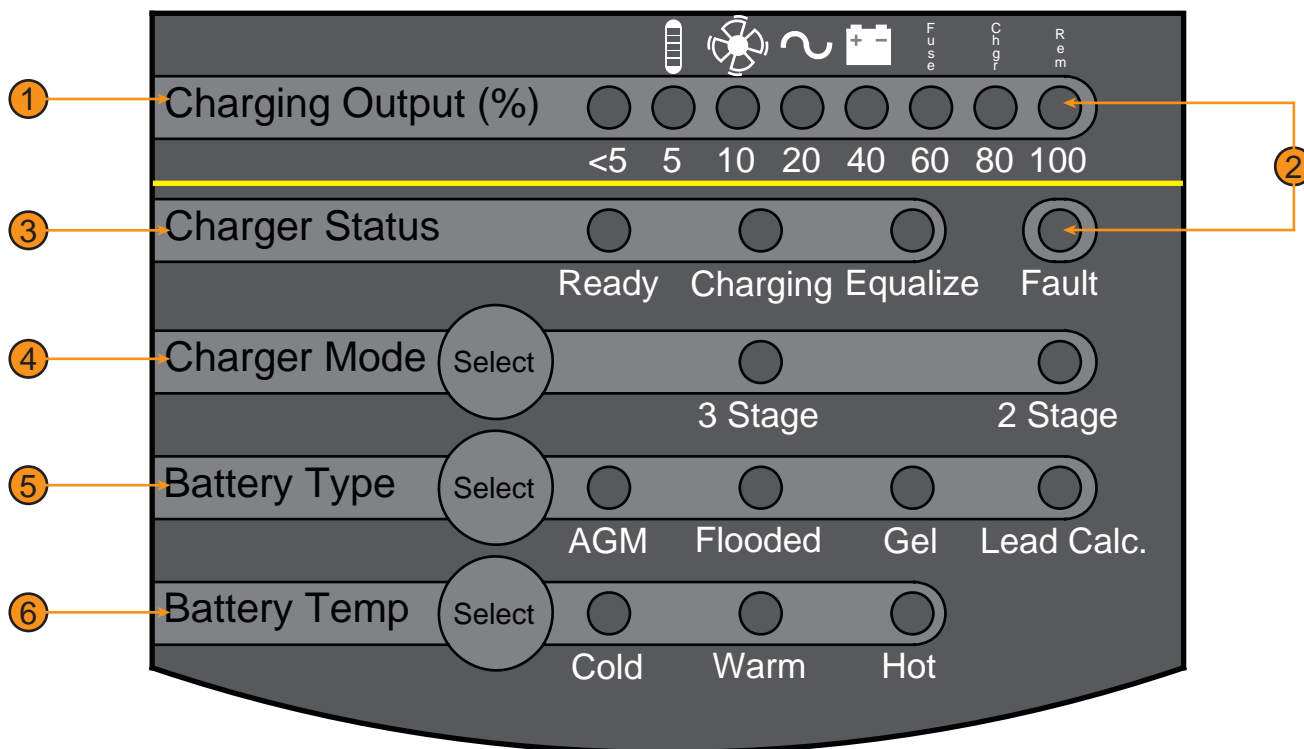
The batteries charger is fixed in the electrical panel compartment G1, next to the inverter.

The batteries charger is designed to convert the 110 volts AC electricity from the exterior 110 volts AC shoreline to 12 volts DC electricity to recharge the two (2) OEM batteries and the two (2) conversion batteries of the vehicle.

At once that the exterior 110 volts AC shoreline on the vehicle, the batteries charger will allow to recharge the two (2) OEM batteries and the two (2) conversion batteries.

• PART 2 : ELECTRICAL SECTION - 12 VOLTS D.C. SYSTEM AND COMPONENTS

OPERATION



Onboard Control and Status Display Panel

1- Charging Output (%) indicator lights

The indicator LED lights illuminate like a progress bar displaying the present total output charge current as a percentage of the set maximum charge current. The numbers below the indicator LED lights represent the percentage values (<5%, 5%, 10%, 20%, 40%, 60%, 80% and 100%).

A single indicator LED light may flash intermittently in combination with a solid "FAULT" indicator LED light (indicating a fault) or with a flashing "FAULT" indicator LED light (indicating a warning). The icons above the indicator LED lights represent all the various types of fault and warning conditions (Battery, Fan, AC, Battery, Fuse, Comm, Rem).

2- "FAULT" indicator light

The "FAULT" indicator LED light may illuminate a solid light (indicating a fault) or flash intermittently (indicating a warning) in combination with flashing Charging Output (%) indicator LED lights.



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• PART 2 : ELECTRICAL SECTION - 12 VOLTS D.C. SYSTEM AND COMPONENTS

3- Charger Status indicator lights

The charger status indicator LED lights displays the current status of the batteries charger.

Ready	<ul style="list-style-type: none">• a solid indicator LED light indicates the two (2) OEM batteries and the two (2) conversion batteries are fully charged and in rest stage.
Ready and Charging	<ul style="list-style-type: none">• a solid indicator LED lights indicate the two (2) OEM batteries and the two (2) conversion batteries are fully charged and in float stage.
Charging	<ul style="list-style-type: none">• a solid indicator LED light indicates charger is performing a normal charge cycle.
Equalize	<ul style="list-style-type: none">• a solid indicator LED light indicates that the charger is performing an equalization cycle.• a flashing indicator LED light indicates that the equalization cycle will begin after the absorption stage is done.

4- Charger Mode Select button

Press and hold the "SELECT" button for three seconds to select either of two settings. An indicator LED light corresponds to each setting. Each setting optimizes the charging sequence differently in charging the two (2) OEM batteries and the two (2) conversion batteries by stages.

•Three-stage	Bulk, Absorption and Float. (<u>default setting</u>)
•Two-stage	Bulk and Absorption only.

When setting or cancelling an Equalization program, press and hold both the Battery Temp "SELECT" button and Charger Mode "SELECT" button.

5- Battery Type Select button

Press and hold the button for three seconds to select either of five settings. An indicator LED corresponds to each setting. Each setting maximizes charger performance for its corresponding battery type.

• AGM	Absorbent Glass Mat lead-acid batteries.
• Flooded	Lead-acid batteries. (<u>default setting</u>)
• GEL	Gel-type lead-acid batteries.
• Lead Calc.	Lead-calcium batteries.
• Custom	If a custom battery type has been programmed then all indicator LED lights will illuminate.



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• PART 2 : ELECTRICAL SECTION - 12 VOLTS D.C. SYSTEM AND COMPONENTS

6- Battery Temp Select button

Press and hold the button for three seconds to select one of three settings. An indicator LED corresponds to each setting. Each setting will change the charger's internal threshold to compensate for variance in battery voltage due to a change in temperature.

- Cold Battery temperature below 5°C (41°F)
- Warm Battery temperature between 5 and 30°C (41 and 86°F)
(default setting)
- Hot Battery temperature above 30°C (86°F)

When setting or cancelling an Equalization program, press and hold both the Battery Temp "SELECT" button and Charger Mode "SELECT" button.



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• PART 2 : ELECTRICAL SECTION - 12 VOLTS D.C. SYSTEM AND COMPONENTS

TROUBLESHOOTING

Fault and Warning Indicator LED lights

Fault or Warning Condition	Temp 	Fan 	AC 	Battery 	Fuse Fuse	Charger Chg	Remote Rem	Fault
High Battery Temp warning (>50°C)								
High Battery Temp fault (>70°C)								
Low Battery Temp warning (<0°C)								
Low Battery Temp fault (< -25°C)								
AC input out of range Warning (<104V and >90V) or (<264V and >255V)								
AC input out of range fault (<90V or >265V)								
AC frequency out of range fault								
High Battery voltage fault (>16.6V)								
High Charger Temp warning (>50°C)								
High Charger Temp fault (>70°C)								
Locked Fan fault								
Loss of Remote Connection warning								
Reverse Polarity Fuse fault								
Internal fault								



Flashing LED



Solid LED

- PART 2 : ELECTRICAL SECTION - 110 VOLTS A.C. SYSTEM AND COMPONENTS

BREAKERS BOX

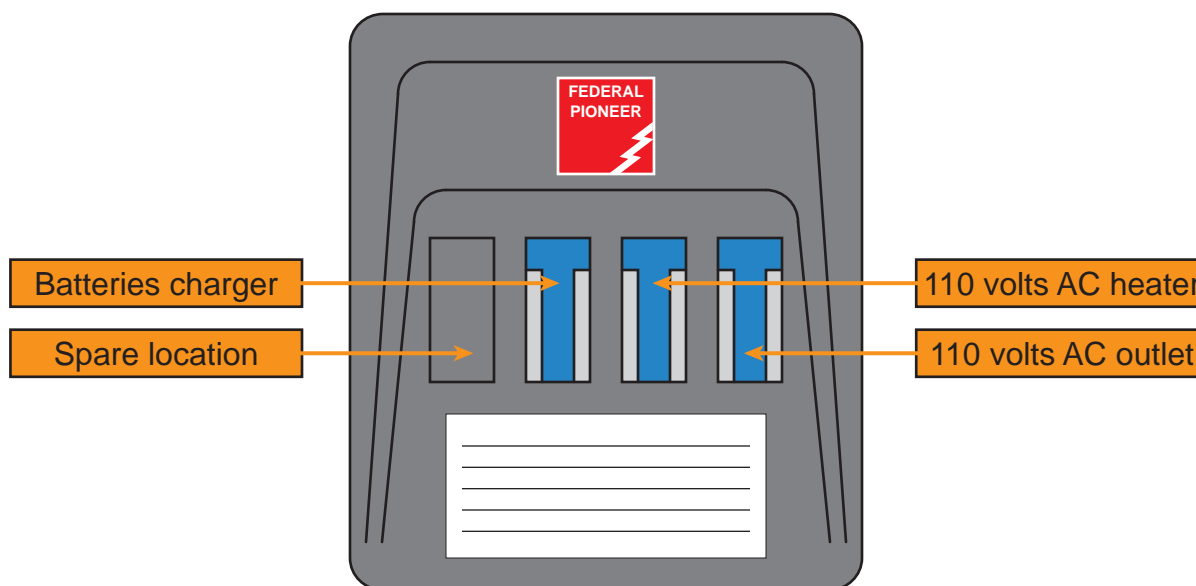


The breakers box is a component of the 110 volts AC system, while providing a protective breaker for the three (3) 110 volts AC circuits.

The breakers box is located in the electrical panel compartment, next to the inverter.

In the breakers box, there are three (3) breakers. The first breaker protects the batteries charger 110 volts AC circuit. The second breaker protects the 110 volts AC heating system circuit. The third breaker protects the 110 volts AC outlets circuit.

When there is overload or short-circuit on the 110 volts AC circuit, the breaker will shut down the circuit to protect all components connected on the 110 volts AC circuit. When there is a over-charge, the breaker is tripped and the 110 volts AC circuit is closed.



Note : The breakers must stay in up position to be able to activate the the 110 volts AC system and components.

- **PART 2 : ELECTRICAL SECTION - 110 VOLTS A.C. SYSTEM AND COMPONENTS**

110 VOLTS A.C. OUTLETS

ORANGE 110 VOLTS A.C. OUTLETS (Isolated Ground)

Note : The main power switch on the inverter must be in the ON position to activate the orange 110 volts AC outlet.

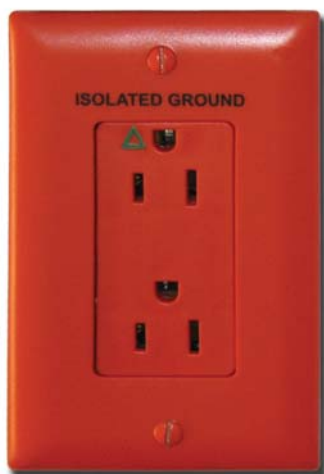
The orange 110 volts AC outlet is connected to the inverter.

The orange 110 volts AC outlet is located in the storage compartment over the rear console (1).

WHITE 110 VOLTS A.C. OUTLETS (GFCI)

The white 110 volts AC outlets are connected to the exterior shoreline.

The white 110 volts AC outlets are located in the storage compartment over the rear console (1) and on the right wall, in the "kit tree" compartment (1).



*Orange 110 volts AC
connected to the inverter*



*White 110 volts AC
connected to the exterior shoreline*



CAUTION

• Do not use the 110 volts AC outlets for extended periods of time with the engine stopped. This could result in a discharged battery.

MAINTENANCE

Once a year, the 110 volts AC outlets must be verified and reset (if necessary, repaired).



TECHNICAL MANUAL

MX151D - GM



- **PART 2 : ELECTRICAL SECTION - 110 VOLTS A.C. SYSTEM AND COMPONENTS**

EXTERNAL 110 VOLTS A.C. SHORELINE

BATTERY CHARGER SHORELINE

The external 110 volts AC shoreline is located on the left side (street side) of the vehicle, at mid height, near the electrical panel compartment.



This external 110 volts AC shoreline is connected to the battery charger and it allows to recharge the two (2) OEM and the two (2) conversion batteries.

PATIENT COMPARTMENT HEATER SHORELINE

The external 110 volts AC shoreline is located on the left side (street side) of the vehicle, at mid height, near the electrical panel compartment.



This external 110 volts AC shoreline is connected to the white 110 volts AC outlets and 110 volts AC heating system.

- PART 2 : ELECTRICAL SECTION - 110 VOLTS A.C. SYSTEM AND COMPONENTS

INVERTER

Note : The main power switch in the inverter must be in the ON position to activate all functions of the inverter.



The inverter is fixed in the electrical panel compartment G1, next to the batteries charger.

The inverter is designed to convert the 12 volts DC electricity from the two (2) conversion batteries to 110 volts AC electricity.

At once that the main power switch on the inverter, the inverter will allow to feed the 110 volts AC circuit and the orange 110 volts AC outlet.

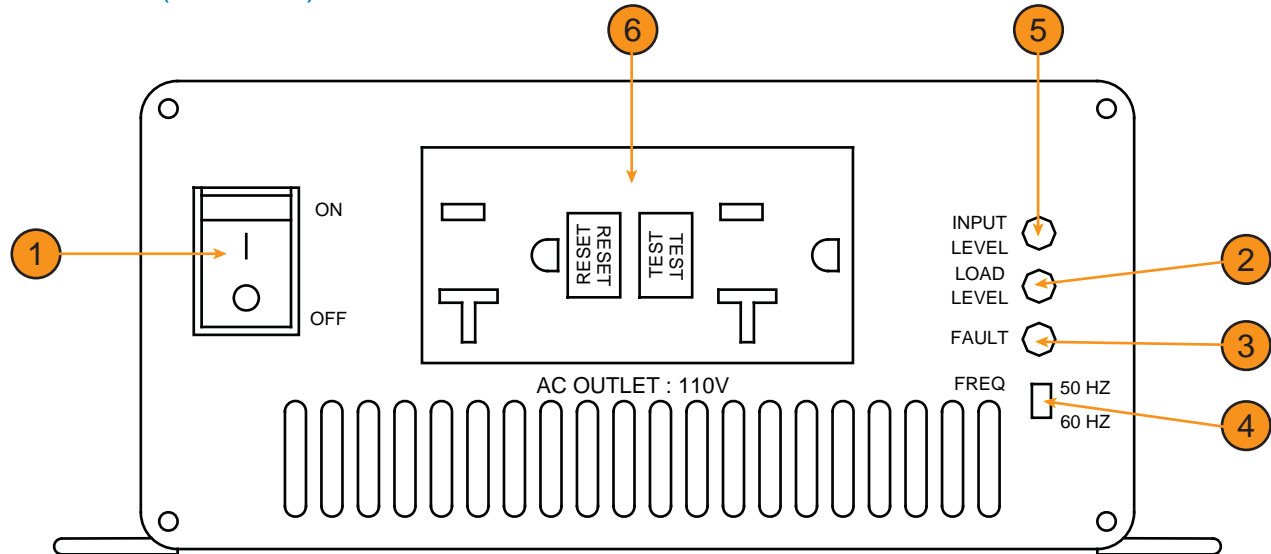


WARNING

• Operation of the inverter without a proper ground connection may result in an electrical safety hazard. Always verify the ground connection.

• PART 2 : ELECTRICAL SECTION - 110 VOLTS A.C. SYSTEM AND COMPONENTS

OPERATION (front view)



1- Main power switch

When the main power switch is in the OFF position, the inverter is deactivated and draws no current from the battery. The main power switch in the inverter must be in the ON position to activate all functions of the inverter.

2- "LOAD LEVEL" indicator light

The "LOAD LEVEL" indicator LED light shows the load on the inverter.

When the "LOAD LEVEL" light is green, the inverter works in normal operation. When the "LOAD LEVEL" light is yellow, the inverter works in mid or high operation. When the "LOAD LEVEL" light is red, the inverter is in overload.

If the load rises to dangerous levels (overload), the inverter will protect itself and shut down.

3- "FAULT" indicator light

The "FAULT" indicator LED light indicates a possible error (overload or overtemp) has been detected and the inverter has shut down to protect itself and the electrical system. The source of the error must be corrected before restarting the inverter five (5) seconds.

4- "FREQUENCY" switch

The switch can change the output frequency, 50 Hertz or 60 Hertz. In North America, the setting must be 60 Hertz.



TECHNICAL MANUAL

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- **PART 2 : ELECTRICAL SECTION - 110 VOLTS A.C. SYSTEM AND COMPONENTS**

5- "INPUT LEVEL" indicator light

The "INPUT LEVEL" indicator LED light indicates the level of the two (2) conversion batteries.

When the "INPUT LEVEL" light is green, the level of the conversion batteries is normal. When the "INPUT LEVEL" light is yellow, the level of the conversion batteries is mid or low. When the "INPUT LEVEL" light is red, the level of the conversion batteries is under voltage.

6- 110 volts AC outlet

The 110 volts AC outlet will allow to feed the 110 volts AC circuit and the orange 110 volts AC outlet.

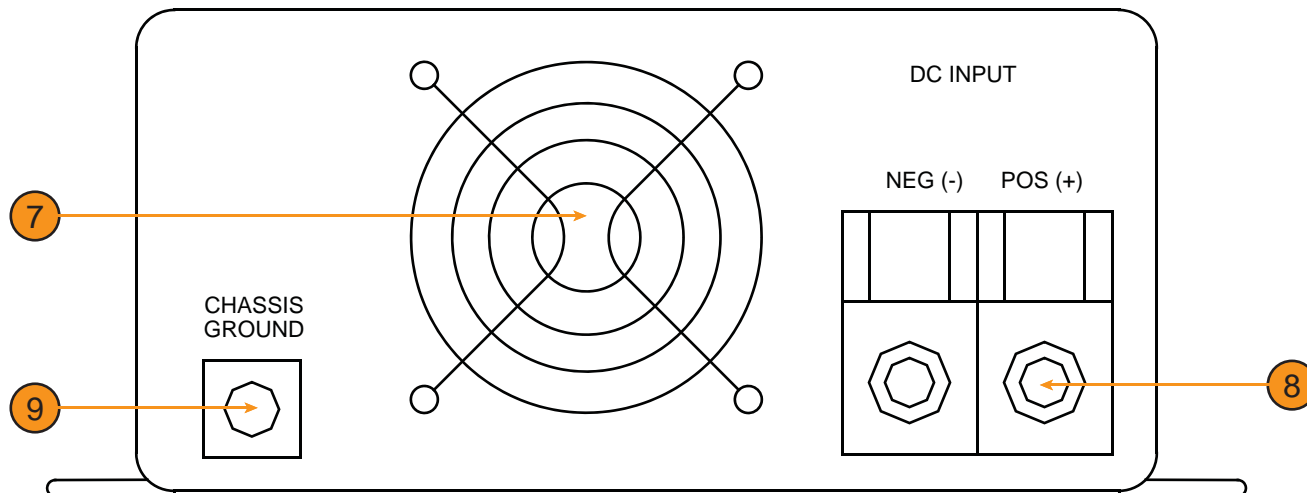


WARNING

• Operation of the inverter without a proper ground connection may result in an electrical safety hazard. Always verify the ground connection.

• PART 2 : ELECTRICAL SECTION - 110 VOLTS A.C. SYSTEM AND COMPONENTS

OPERATION (rear view)



7- Ventilation port

The ventilation port allows to vent (with cool airflow) the inside of the inverter.

8- Battery terminals

The battery terminals is where the the 12 volts DC (from the two (2) conversion batteries) input are connected. There are two (2) terminals, the positive [+] and the negative [-].



WARNING

- Do not reverse the polarity connection. It will blow the internal fuse and may damage inverter permanently.

9- Chassis Ground

This terminal is the ground of the inverter. The ground must be connected to the vehicle chassis using #8 wire.



WARNING

- Operation of the inverter without a proper ground connection may result in an electrical safety hazard. Always verify the ground connection.



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- PART 2 : ELECTRICAL SECTION - 110 VOLTS A.C. SYSTEM AND COMPONENTS

MAINTENANCE

- The inverter requires a very little maintenance to keep your inverter operating properly.
- You should clean the exterior of the unit periodically with a damp cloth to prevent accumulation of dust and dirt.
- Make sure that the screws on the DC input terminals are tight.
- Make sure Ventilation port is open. DEMERS AMBULANCES recommends the use of non-de-greaser 100% volatile carburetor cleaner, an air gun will also help.
- Maintain your batteries and all electrical connections in good condition. With insufficient power the inverter will not start. Low and high voltage cutouts will shut the inverter down automatically.



TECHNICAL MANUAL

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• PART 2 : ELECTRICAL SECTION - 110 VOLTS A.C. SYSTEM AND COMPONENTS

TROUBLESHOOTING

- Make sure that the chassis ground lug on the back of the power inverter is solidly connected to the ground system of your vehicle.
- Keep the cables between the battery and the power inverter as short as possible and twist them together with about two to three twists per foot. This minimizes radiated interference from the cables.

Troubleshooting guide

Problem and Symptoms	Possible Cause	Solution
No output voltage, no voltage indication.	Inverter switched off. No power to inverter	Turn inverter ON. Check wiring to inverter.
	Internal fuse open	Have qualified service technician check and replace.
	Reverse DC polarity	Have qualified service technician check and replace fuse, OBSERVE CORRECT POLARITY.
No output voltage, Over Voltage indicator on	High input voltage	Make sure that inverter is connected to 12V battery. Check regulation of charging system.
Low battery alarm on all the time.	Poor DC wiring, poor battery condition.	Use proper cable and make solid connections. Use new battery. Reduce load.
No output voltage and Under Voltage indicator on	Low input voltage	Recharge battery, check connections and cable.
No output voltage, Over Temp indicator on, load in excess of : 600 Watts : 60 Amps (12 Volts).	Thermal shutdown	Allow inverter to cool off. Reduce load if continuous operation required.
No output voltage, Over Temp indicator on, load less than : 600 Watts : 60 Amps (12 Volts).	Thermal shutdown	Improve ventilation, make sure ventilation openings in inverter are not obstructed, reduce ambient temperature.
No output voltage, Over Load indicator on.	Short circuit or wiring error.	Check AC wiring for short circuit or improper polarity (hot and neutral reversed).
	Very high power load	Remove or reduce load



TECHNICAL MANUAL

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- PART 2 : ELECTRICAL SECTION - ON-BOARD COMPUTER SYSTEM

CPC IV ON-BOARD COMPUTER

Note : The on-board computer system is always available to be activated.



The on-board computer system is located in the electrical panel compartment (G1).

The on-board computer system represents the ultimate design for a Black Box. The on-board computer system is an advanced data acquisition system that collects and stores data for any type of vehicle. It records the data generated by the vehicle in a real time mode via sensors and/or via an interface to the Electronic Control Module (ECM) of the vehicle.

Thanks to its large data storage capacity, the on-board computer further enables significant savings in communications costs by transmitting only the required data, such as GPS positioning, in a real-time mode or on-demand while other data will be downloaded via RF to a reading station when the vehicle returns to its base. Downloaded data is stored in a database for further monitoring and analysis of the operations of the vehicle with the help of the CPC+ Diagnostic Software.

Another important feature of the on-board computer system resides in its accident/crash analysis capability. This will provide the experts in crash analysis information of paramount importance to help determine what caused the accident by providing information to the second about the direction, speed, acceleration, flashers, braking of the vehicle involved in the accident.



TECHNICAL MANUAL

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• PART 2 : ELECTRICAL SECTION - ON-BOARD COMPUTER SYSTEM

DATA RECORDING PLUG

The data recording plug is located in the electrical panel compartment, in the left side of the electric panel. The data recording plug is directly connected to many vehicle parameters. There is the specification of this connector.

Circular connector : 206838-1 AMP

Contact : 66359-6 AMP

Accessories : 206512-1 AMP

PIN OUT OF DATA RECORDING PLUG

PIN no.	WIRE no.	COLOR	DESCRIPTION	TYPE
Pin 1	FU1-A6	Pink	Ignition signal	+12 VDC
Pin 2	FU7-A2	Yellow	Left flasher signal	Pulse
Pin 3	FU7-A4	Green	Right flasher signal	Pulse
Pin 4	B2	Green	Back-up signal	+12 VDC
Pin 5	RPM1	Grey	RPM signal	Frequency
Pin 6	SPEED1	Grey	VSS signal	Frequency
Pin 7	MW5	Grey	High beam signal	+12 VDC
Pin 8	OVERD1	Grey	Overdrive signal	Frequency
Pin 9	WW1	Grey	Wiper signal	+12 VDC
Pin 10	K6	Green	Manual horn signal	+12 VDC
Pin 11	-	-	-	-
Pin 12	-	-	-	-
Pin 13	-	-	-	-
Pin 14	K1	Green	Siren speaker signal (-)	Frequency
Pin 15	K2	Green	Siren speaker signal (+)	Frequency
Pin 16	MS2	Red	Strobe lights signal	+12 VDC
Pin 17	TACH1	Red	Flashing lights signal	+12 VDC
Pin 18	TACH2	Red	Light bar signal	+12 VDC
Pin 19	GOLD	Clear	Alarm signal	+12 VDC
Pin 20	SILVER	Clear	Alarm signal	+12 VDC
Pin 21	B5	Grey	Brake signal (+)	+ 12 VDC
Pin 22	VOLT1	Red	Low voltage signal	+12 VDC
Pin 23	FU7-A6	Red / Black	12 volts DC from conversion batteries	+ 12 VDC
Pin 24	GR10	Black	Ground	Ground

MATING PARTS

The data recording is located in the electrical panel compartment, in the right side. The data recording is directly connected to the data recording plug. There is the specification of this connector.

Circular connector : 206837-1 AMP

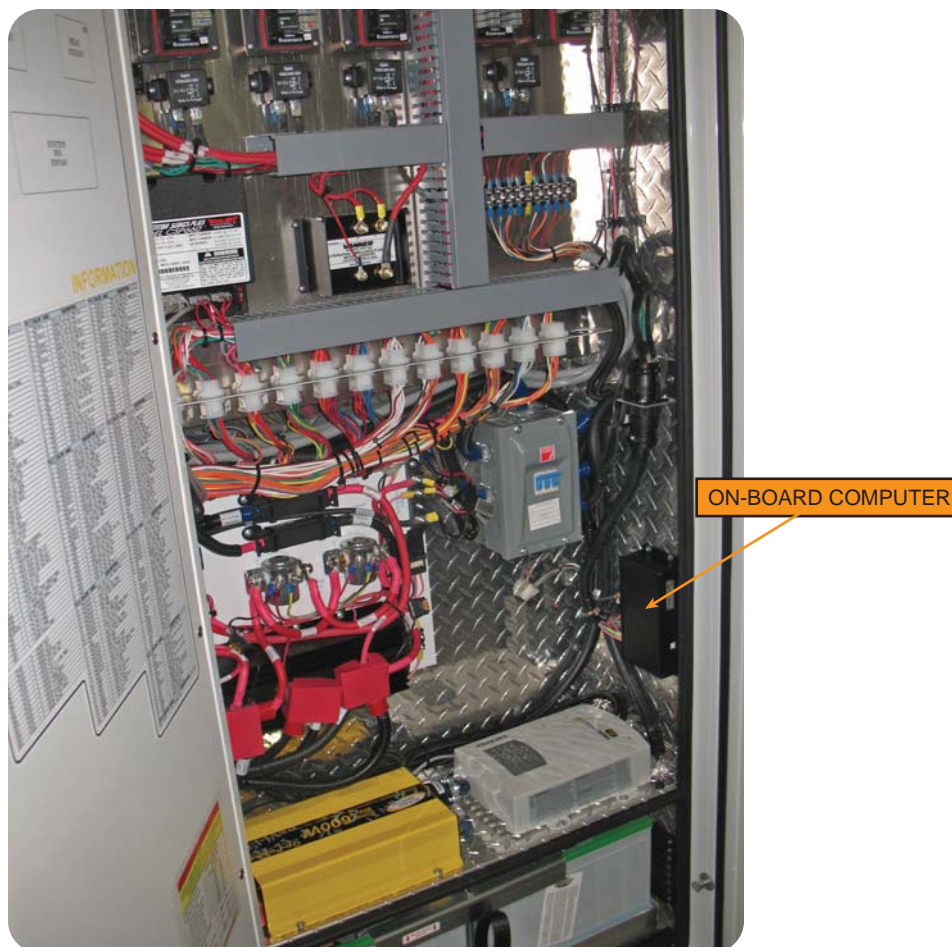
Contact : 66358-6 AMP

Accessories : 206512-1 AMP

- PART 2 : ELECTRICAL SECTION - ON-BOARD COMPUTER SYSTEM

MAINTENANCE

To have access to the on-board computer, follow these operations :



The on-board computer is located in the electrical panel compartment (G1).

- PART 2 : ELECTRICAL SECTION - EXHAUST FAN

EXHAUST FAN

Note : The engine must be running and the "MASTER" switch must be in the ON position to activate the exhaust fan.



The two (2) exhaust fans are located in the patient compartment. The first exhaust fan is located behind medical cabinet, on the rear side. The other exhaust fan is located behind the "kit tree" compartment.

OPERATION

High speed mode :

On the rear console, push the "EXHAUST FAN" switch up to activate the exhaust fan in the patient compartment in high speed mode. The indicator light on the switch comes on. Push the switch down once to deactivate the exhaust fan, or push the switch down twice to decrease the speed of the exhaust fan (low speed mode).

Low speed mode :

On the rear console, push the "EXHAUST FAN" switch down to activate the exhaust fan in the patient compartment in low speed mode. The indicator light on the switch comes on. Push the switch up once to deactivate the exhaust fan, or push the switch up twice to increase the speed of the exhaust fan (high speed mode).

- PART 2 : ELECTRICAL SECTION - EXHAUST FAN

MAINTENANCE

Right exhaust fan

To have access to the right exhaust fan, follow these operations :



Remove the two (2) cabinet windows.



Remove the eight (8) screws.



Remove the access panel.



The right exhaust fan is located on the bottom of the compartment. To remove the exhaust fan, disconnect first the all vent ducts.

• PART 2 : ELECTRICAL SECTION - EXHAUST FAN

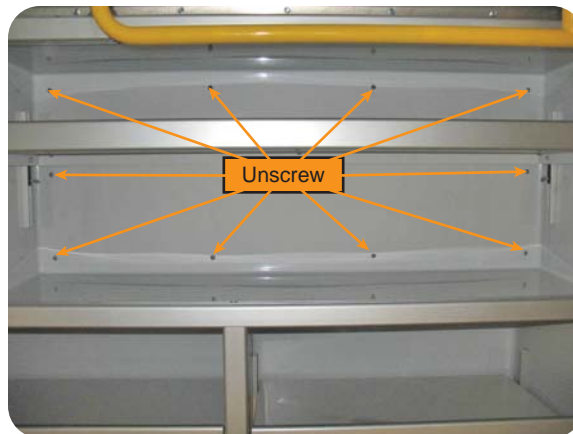
MAINTENANCE

Left exhaust fan

To have access to the left exhaust fan, follow these operations :



Remove the two (2) cabinet windows.



Remove the ten (10) screws.



Remove the access panel.

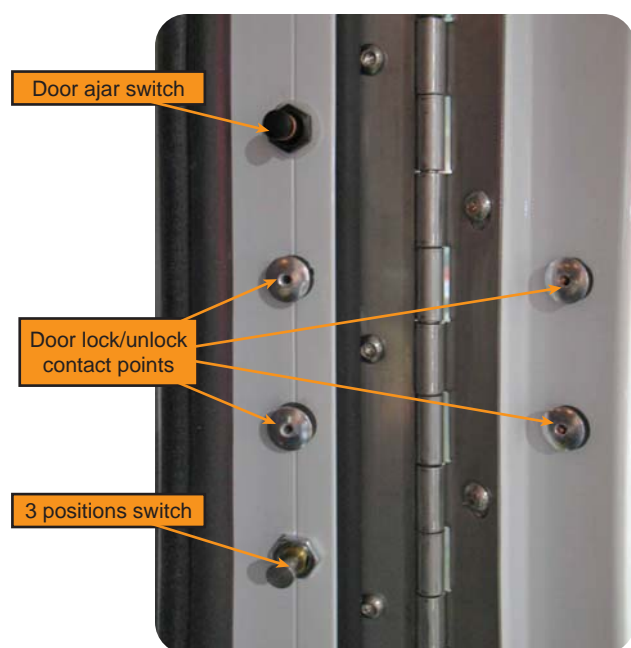


The left exhaust fan is located on the left side of the compartment. To remove the exhaust fan, disconnect first the all vent ducts.

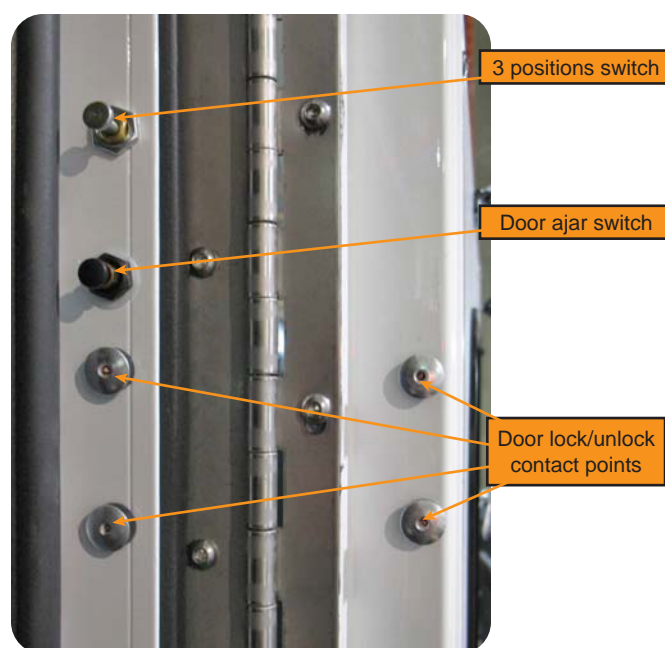
• PART 2 : ELECTRICAL SECTION - ACCESS DOOR SWITCH

ACCESS DOOR SWITCHES

The access door switches and the door lock/unlock contact points are located on the module, at the right side of the doors D1 and A2.



Rear access door A2



Right access door D1

Three (3) positions switch :

The three (3) positions switch controls the left incandescent ceiling lights inside patient compartment and the scene lights (right or rear). When the door (D1 or A2) is closed, the left incandescent ceiling lights inside patient compartment and the scene lights are deactivated. When the door (D1 or A2) is opened, the left incandescent ceiling lights inside patient compartment will be activated in low intensity and the scene lights are activated. When the door (D1 or A2) is opened, pull the switch to deactivated the left incandescent ceiling lights inside patient compartment and the scene lights. The switch has three (3) positions OFF-ON-OFF

Door ajar switch :

The door ajar switch controls the "DOOR AJAR" warning light. When the door (D1 or A2) is closed, the "DOOR AJAR" warning light is deactivated. When the door (D1 or A2) is opened, the "DOOR AJAR" warning light will be activated.

Door lock/unlock contact points :

The door lock/unlock contact points allows to lock or unlock the access doors (D1 or A2).

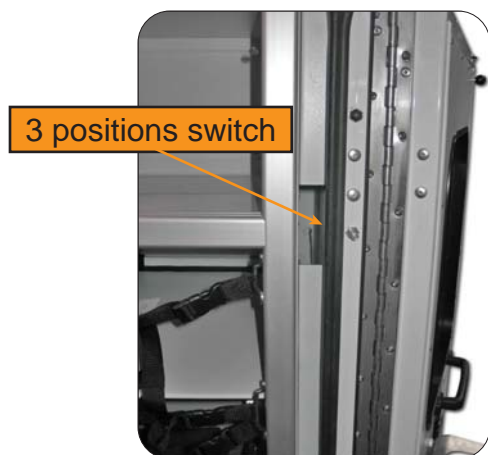
• PART 2 : ELECTRICAL SECTION - ACCESS DOOR SWITCH

MAINTENANCE

There is a monthly maintenance on the access door switches and the door lock/unlock contact points.

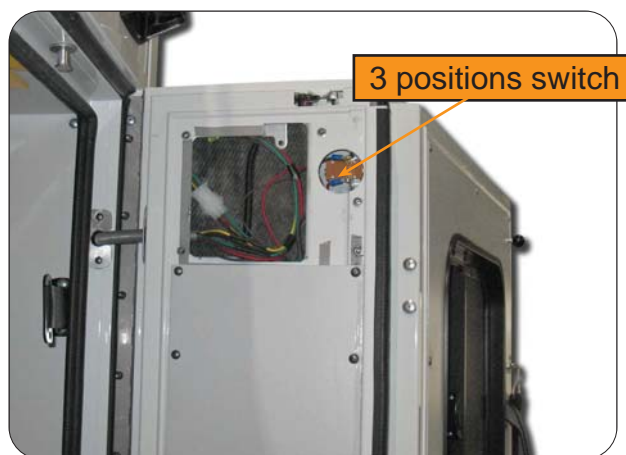
- Clean the access door switches and the door lock/unlock contact points of all dirtiness.
- Lubricate the three (3) positions door switches with "*Fluid Film*".
- Lubricate the door ajar switches with "*Moovit*" penetrating lubricant.
- Lubricate the door lock/unlock contact points with dielectric grease.

To have access to the three (3) positions switches, follow these operations :



Rear door (A2)

Remove the access panel to have access to the three (3) positions switch



Right door (D1)

Remove the access panel to have access to the three (3) positions switch

• PART 2 : ELECTRICAL SECTION - COMPARTMENT DOOR SWITCH

COMPARTMENT DOOR SWITCHES

Right equipment compartment door (D2) :

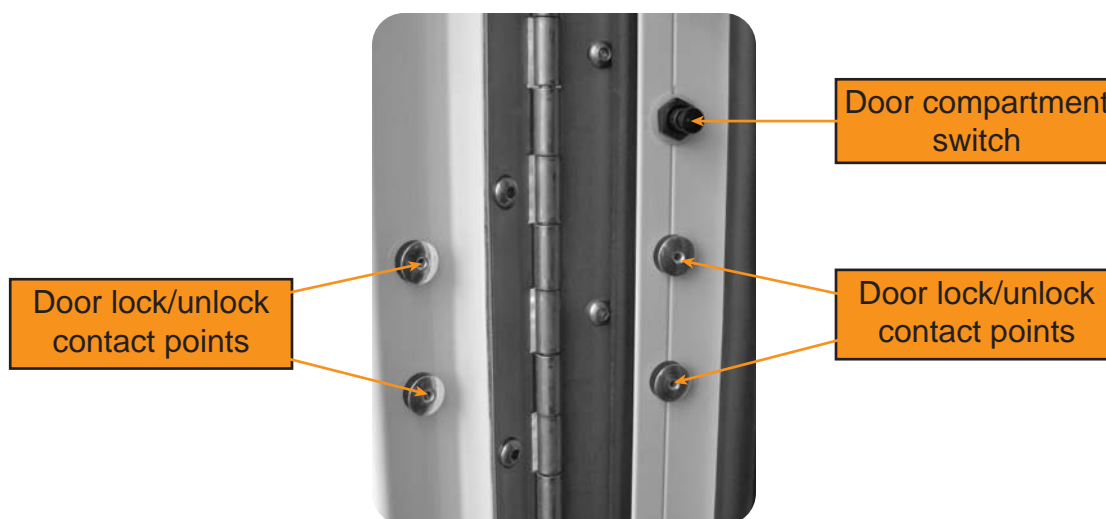
The compartment door switch and the door lock/unlock contact points are located on the module, at the right side of the door.

Electrical panel compartment door (G1) :

The compartment door switch is located on the module, at the left side of the door.

Stretcher and spineboard compartment door (A3) :

The compartment door switch and the door lock/unlock contact points are located on the module, at the left side of the door.



Door compartment switch :

The door ajar switch controls the "DOOR COMP" warning light. When the door (D2,G1 or A3) is closed, the "DOOR COMP" warning light is deactivated. When the door (D2,G1 or A3) is opened, the "DOOR COMP" warning light will be activated.

Door lock/unlock contact points :

The door lock/unlock contact points allows to lock or unlock the compartment doors (D2,G1 or A3).

MAINTENANCE

There is a monthly maintenance on the compartment door switches and the door lock/unlock contact points.

- Clean the compartment door switches and the door lock/unlock contact points of all dirtiness.
- Lubricate the compartment door switches with "Moovit" penetrating lubricant.
- Lubricate the door lock/unlock contact points with dielectric grease.

- PART 2 : ELECTRICAL SECTION - RECESSED RADIO SPEAKER

RECESSED RADIO SPEAKER

Note : The engine must be running and the "MASTER" switch must be in the ON position to activate the radio speaker.



The recessed radio speaker (1) is located in the ceiling of the patient compartment.

The speaker operates in conjunction with the OEM front radio, in the front cabin. In the patient compartment, there is no control for the OEM front radio, except for the volume control (in the rear console only).

Turn the rear speaker knob to the clockwise to increase volume or to the counterclockwise to decrease volume.

It is impossible to raise the level of the sound (higher than the OEM radio level) with the volume control on the rear console.



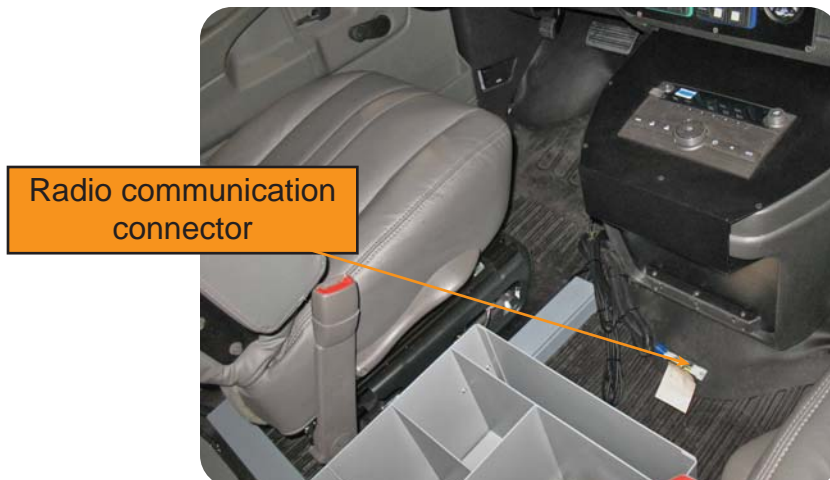
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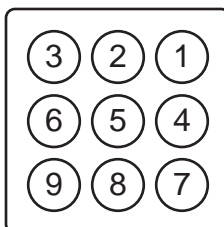


• PART 2 : ELECTRICAL SECTION - RADIO COMMUNICATION

RADIO COMMUNICATION



The radio communication connector (9 pins) is located between the driver seat and the passenger seat, in the front cabin.



1-	Red	6-	Gold
2-	N/A	7-	Black
3-	N/A	8-	Black
4-	Silver	9-	Red/White
5-	N/A		

For more information about the radio communication, check the wiring schematic SE19-038.

• PART 2 : ELECTRICAL SECTION - ELECTRONIC THROTTLE MODULE

ELECTRONIC THROTTLE MODULE

The electronic throttle module can be used to increase the engine idle speed.

The electronic throttle module is activated when the following conditions are met :

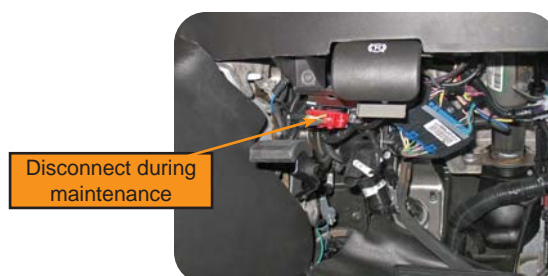
- Parking brake is set
- Gear shift in "Park" position
- Foot is off service brake
- Foot is off the accelerator pedal
- Vehicle is stationary (no speed)
- Engine is started and idling below 900 RPM

On the electronic throttle module, there are eight (8) LED indicators provide status and problem detection information.

<u>LED</u>	<u>Status</u>	<u>Indication</u>
RPM	On solid Flashing	Fixed speed mode selected, engine at fast idle Fixed speed mode selected, engine <u>not</u> at fast idle
CHRG	On solid Flashing	Automatic mode speed selected, engine at fast idle Automatic mode speed selected, engine <u>not</u> at fast idle
PARK	On solid Flashing	Transmission in PARK position Transmission <u>not</u> in PARK position
PK BRK	On solid Flashing	Park Brake set Park Brake <u>not</u> set
SBRK	On solid Flashing	Service Brake at rest (not activated) Service Brake activated
VSPEED	On solid Flashing	Vehicle stationary Vehicle moving
ACL	On solid Flashing	Accelerator at rest (<u>not</u> depressed) Accelerator depressed
VIN	Flashing	Vehicle is supported Vehicle is not supported, has invalid VIN, or loss of communication

MAINTENANCE

The electronic throttle module must be disconnected from the vehicle when any maintenance checks are being made through the OBD connector. If the electronic throttle module is connected to the vehicle during a maintenance check, the module can give false readings and disrupt diagnostic results.

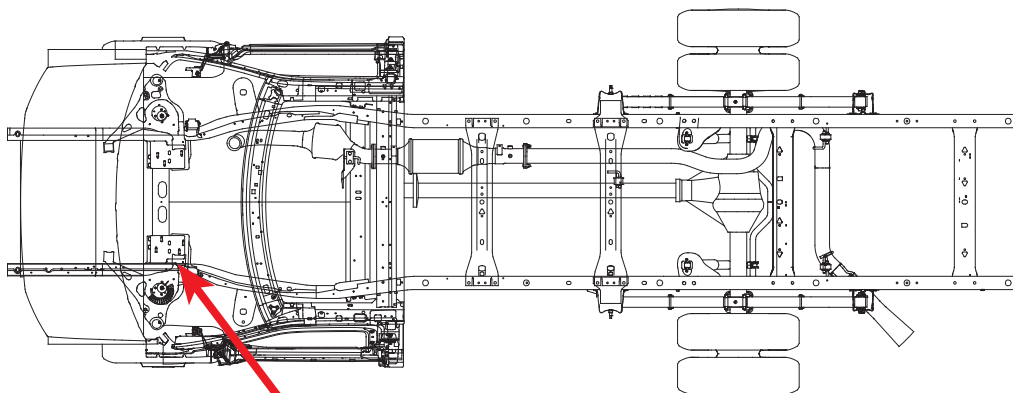


- PART 2 : ELECTRICAL SECTION - OIL PRESSURE SWITCH

OIL PRESSURE SWITCH

Note : The engine must be running to activate the oil pressure switch.

The oil pressure switch is located under the GM chassis, next to the front wheels axle, driver side.



Under the front cabin of the vehicle,
driver side.



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• PART 3 : OXYGEN SECTION - OXYGEN SYSTEM

OXYGEN OUTLETS

DISS STYLE



DISS style

The oxygen outlets (DISS style) are located in the action wall area (2), below the rear console. The oxygen outlets can be used with a flowmeter (with or without humidifier) or with positive pressure apparatuses, incubators, etc. or for quick disconnect plug-in devices not requiring humidification.



CAUTION

- To avoid injury, be sure to close the protective window when the overhead oxygen outlet is not in used.

OXYGEN LINES

All oxygen lines are conceived of PVC tube reinforced with polyester. All oxygen lines are 6.3 millimeters (0.25 inch) in diameter and tested at 200 lbs/sq.in.

At each outlet, an additional length of 20 centimeters (7.87 inches) of line is provided for maintenance purposes. No joint or split is made behind any of the walls or ceiling of the vehicle to ensure that any repairs can be done easily.



WARNING

- Properly secure all oxygen cylinders to help prevent it from sliding or shifting. In a sudden stop or collision, unsecured cargo could cause personal injury.



CAUTION

- Before connecting the regulator, it is very important to open slightly a very short moment (a few milliseconds) the valve of the oxygen cylinder. That makes to eliminate all the contaminants accumulated on the valve exit.
- When the use of the applicant using oxygen systems, it is necessary to open very slowly the valve of the cylinder to avoid undesirable accidents.

- PART 3 : OXYGEN SECTION - MAIN OXYGEN CYLINDER

VERTICAL HOLDER FOR MAIN OXYGEN CYLINDER

The vertical holder for main oxygen cylinder consists of two (2) separate parts (straps and slide-out flip-down ramp). Four (4) heavy duty straps hold cylinders securely. The oxygen bottle is accessible for changing from the front right door (D1).



The vertical holder for main oxygen cylinder can be spaced apart to accommodate a cylinder type "M" or "K". Heavy duty straps can accommodate cylinder diameters of 17.1 centimeters (6.75 inches) to 23.4 centimeters (9.25 inches).

The cylinder controls are accessible from the inside as well as the outside of the vehicle. The bottle pressure gauge or equivalent device is visible from the attendant head seat and the squad bench.

WARNING



- Properly secure all oxygen cylinders to help prevent it from sliding or shifting. In a sudden stop or collision, unsecured cargo could cause personal injury.
- Do not step on the slide-out flip-down ramp.

CAUTION



- Before connecting the regulator, it is very important to open slightly a very short moment (a few milliseconds) the valve of the oxygen cylinder. That makes to eliminate all the contaminants accumulated on the valve exit.
- When the use of the applicant using oxygen systems, it is necessary to open very slowly the valve of the cylinder to avoid undesirable accidents.

- PART 3 : OXYGEN SECTION - MAIN OXYGEN CYLINDER

HOW TO CHANGE THE MAIN OXYGEN CYLINDER



The main oxygen cylinder is located on the right side of the vehicle, door D1.



Open the first door D1 (the bigger one).



Open the second door D1 (the small one).



Unlock the ramp.



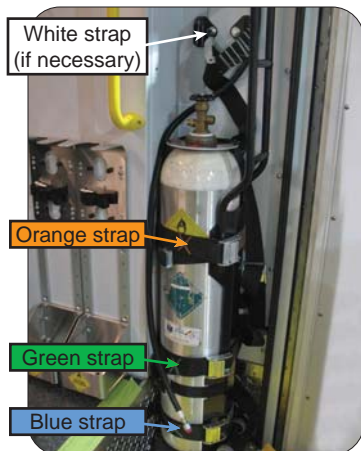
Go down slowly and swivel the ramp.



Unplug the oxygen regulator on the main oxygen cylinder.

• PART 3 : OXYGEN SECTION - MAIN OXYGEN CYLINDER

HOW TO CHANGE THE MAIN OXYGEN CYLINDER



Remove all straps on the main oxygen cylinder.



Remove the upper holder on the main oxygen cylinder.
NOTE : The upper holder must be always install in the same direction. Watch the indicator sticker on the holder.



Fix (with Velcro) the upper holder on the wall, over the main oxygen cylinder.



The wheels of the dolly and the trails of the ramp must be aligned.



Go down slowly the dolly of the main oxygen cylinder.



Remove all straps on the dolly of the main oxygen cylinder.



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- PART 3 : OXYGEN SECTION - PORTABLE OXYGEN CYLINDERS

BRACKET FOR PORTABLE OXYGEN CYLINDERS



There are three (3) brackets for portable oxygen cylinders in the patient compartment.

There are two (2) brackets for portable oxygen cylinders located on the front wall. There is a cylinder controls are accessible from the attendant head seat.

There is an other bracket for portable oxygen cylinders located on the interior panel of the right rear door (A2). There is a cylinder controls are accessible from the squad bench.

The brackets can accommodate two (2) "D" or "E" cylinders.



WARNING

- Properly secure all oxygen cylinders to help prevent sliding or shifting. In a sudden stop or collision, unsecured cargo could cause personal injury.



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• PART 3 : OXYGEN SECTION - OXYGEN WARNINGS



WARNING

- No smoking in the vehicle.
- No open flame in the vehicle.
- Oxygen is an odourless and colourless.
- Oxygen vigorously accelerates combustion.
- Breathing 80% or more oxygen at atmospheric pressure for more than a few hours may cause cough, sore throat, chest pain and breathing difficulty.
- Breathing oxygen at higher pressure increases the likelihood of adverse effects within a shorter time period. Breathing pure oxygen under pressure may cause lung damage and also central nervous system effects resulting in dizziness, poor coordination, tingling sensation, visual and hearing disturbances, muscular twitching, unconsciousness and convulsions.
- Breathing oxygen under pressure may cause prolonged adaptation to darkness and reduced peripheral vision.
- Oxygen can create an explosive mixture once exposed to certain substances like: fuel, grease, oil and other substances containing hydrocarbon.
- During an exposure to an intense heat or a flame, the cylinder will be emptied very quickly and/or can burst violently.
- All the cylinders are provided with a safety device to avoid an overpressure inside the cylinder. If the cylinder is exposed to high temperatures, the safety valve can open and let escape oxygen in the atmosphere. If however the valve does not function, the cylinder can explode.
- Pressure in a container can build up due to heat and it may rupture if pressure relief devices should fail to function.
- Ensure adequate ventilation.
- Protect cylinders from physical damage; do not drag, roll, slide or drop.
- Never attempt to lift a cylinder by its valve protection cap.
- Never insert an object (e.g., wrench, screwdriver, pry, bar, etc.) into valve cap openings. Doing so may damage valve, causing a leak to occur.
- Never strike an arc on a compressed gas cylinder or make a cylinder a part of an electrical circuit.
- Use an adjustable strap wrench to remove over-tight or rusted caps.

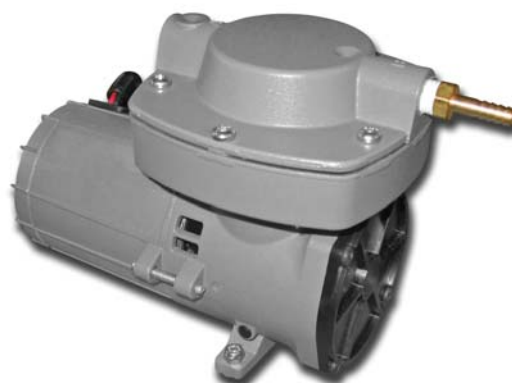
• PART 4 : EQUIPMENT SECTION - SUCTION DEVICE

SUCTION DEVICE

Note : The suction device is always available to be activated.



*Suction device
on the action wall*



*Suction pump
in the medical cabinet*

In the suction device, there are :

- Suction pump
- Canister
- Suction gauge
- Bracket
- Hose

The canister, the bracket, the suction gauge and the hose are installed on the medical cabinet, below the rear console.

The suction pump is located in the medical cabinet, next to the cardiopulmonary resuscitation seat.

OPERATION

Verify if both ends of the suction hose are properly connected.

On the rear console, push the "SUCTION" switch up to activate the suction device. The indicator light on the switch comes on. Push the switch down to deactivate the suction device.

Crimp suction hose and adjust vacuum regulator control to set maximum deliverable vacuum.

Begin suctioning in accordance with procedures.



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• PART 4 : EQUIPMENT SECTION - SUCTION DEVICE

CLEANING

Remove bag liner from vacuum bottle and dispose of in accordance with CDC and OSHA regulation for biohazard.

Wash vacuum container bottle with warm soapy water or suitable approved antiseptic solution. Do not use alcohol or harsh solvents.

Following each use, apply a commercially available spray disinfectant to the suction system :

- On the rear console, push the "SUCTION" switch up to activate the suction device. The indicator light on the switch comes on.
- Spray a small amount of disinfectant into loose end of hose. Allow pump to run for approximately ten (10) or fifteen (15) seconds.
- On the rear console, push the "SUCTION" switch down to deactivate the suction device. The indicator light on the switch comes off.



CAUTION

- Suctioned contents may contain infectious waste and biohazard material. Suction catheter and patient tubing are disposable. Discard in accordance with applicable CDC and OSHA procedures. To prevent risk from cross contamination, disposable items are not to be reused.
- Clean the suction module periodically, or after each use, with a damp, soapy cloth. Do not use alcohol or harsh solvents.
- Do not use abrasive pads, abrasive powder cleaners or antiseptics solutions containing phenol, other organic solvents or steam autoclave.

Disposable bag liner installation instruction

- Remove collection canister lid.
- The disposable bag liner has a hole through its two sides.
- Spread the disposable bag liner to separate the holes.
- Slip one hole of the disposable bag liner over the patient connector's fitting.
- Carefully insert the attached disposable bag liner and canister lid into collection jar and secure.
- Insure that the disposable bag liner is not caught between the jar and the lid.
- Connect suction hoses and test for proper operation.
- During operation, negative pressure will cause the disposable bag liner to inflate. This is normal.
- Replace the disposable bag liner after each use.

- PART 4 : EQUIPMENT SECTION - SUCTION DEVICE

MAINTENANCE

To have access to the suction pump, follow these operation :



Remove the silicone on all borders of the panel, located under the action wall. Remove the panel.



Unplug the hose of the Espar outlet.



The suction pump is located under the Espar heating system.



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• PART 4 : EQUIPMENT SECTION - SUCTION DEVICE

TROUBLESHOOTING

Fault Condition	Diagnostic
No vacuum at vacuum outlet fitting	<ul style="list-style-type: none">• Verify operating power, Power Switch illuminates.• Listen and verify that pump motor is turning.• Make sure regulator knob is turned fully clockwise (maximum vacuum position).• Reset circuit breaker (located adjacent to fitting).• Contact factory for further instructions.
Is there suction at the end of the tubing that connects to the pump (vacuum) port?	<ul style="list-style-type: none">• Check for cracks or crimps in connecting tube.
Is there suction at the collection canister port marked patient?	<ul style="list-style-type: none">• Insure proper seal between collection jar and lid. If this cannot be corrected, replace jar and lid.
General degradation in overall performance, vacuum source tests good	<ul style="list-style-type: none">• Check for crimped or cracked vacuum tubing or improperly sealed collection canister components.



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• PART 4 : EQUIPMENT SECTION - COT FASTENER SYSTEM

STRETCHER FASTENER SYSTEM

The cot fastener system installed in your vehicle is designed to be compatible only with cots which conform to the installation specification listed in the installation/operation instructions manual furnished with the cot fastener system. Ambulance cots which currently meet these specifications are for example :

Ferno

- Model 29-M Three Level Roll-In Cot
- Model 93 ES Squadmate
- Model 35-A, 35-P, 35-X Mobile Transporter
- Model 35-IT Incubator Transporter



WARNING

- Injury may result, if a non compatible cot is used in the cot fastener system.

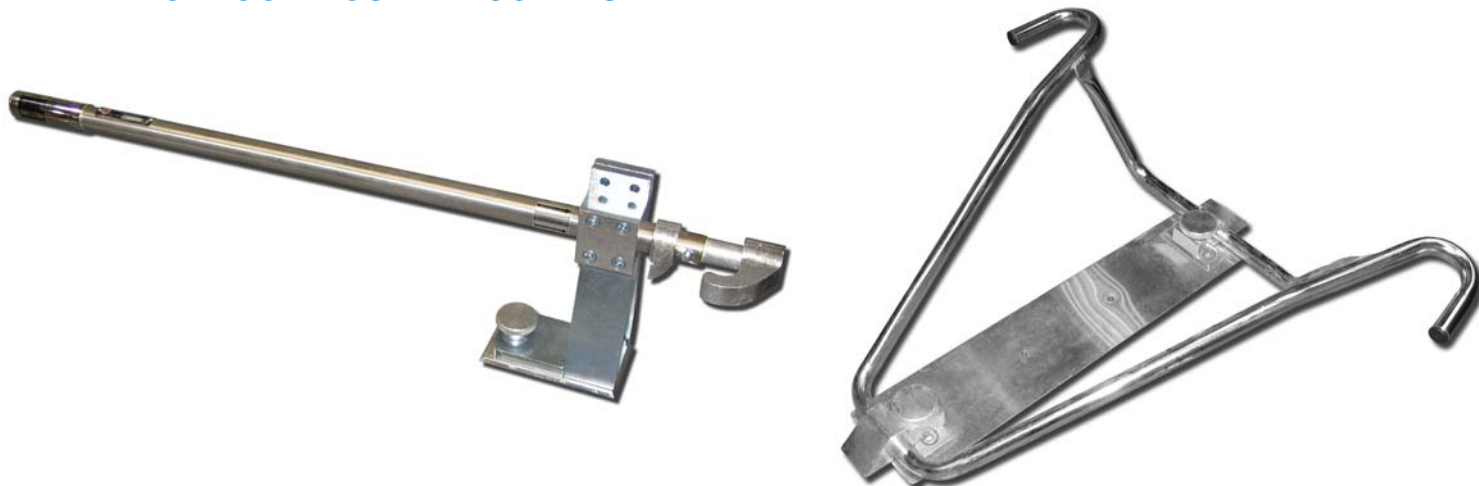


CAUTION

- Adjustment of the rail clamp assembly may be required in order to compensate for any variation in cot retaining post position depending on the ambulance cot manufacturer and model number.
- Always refer to the Ferno User's Manual and the Training Video for proper use of the cot fastener system.

- PART 4 : EQUIPMENT SECTION - COT FASTENER SYSTEM

FERNO FLOOR MOUNTED COT FASTENER



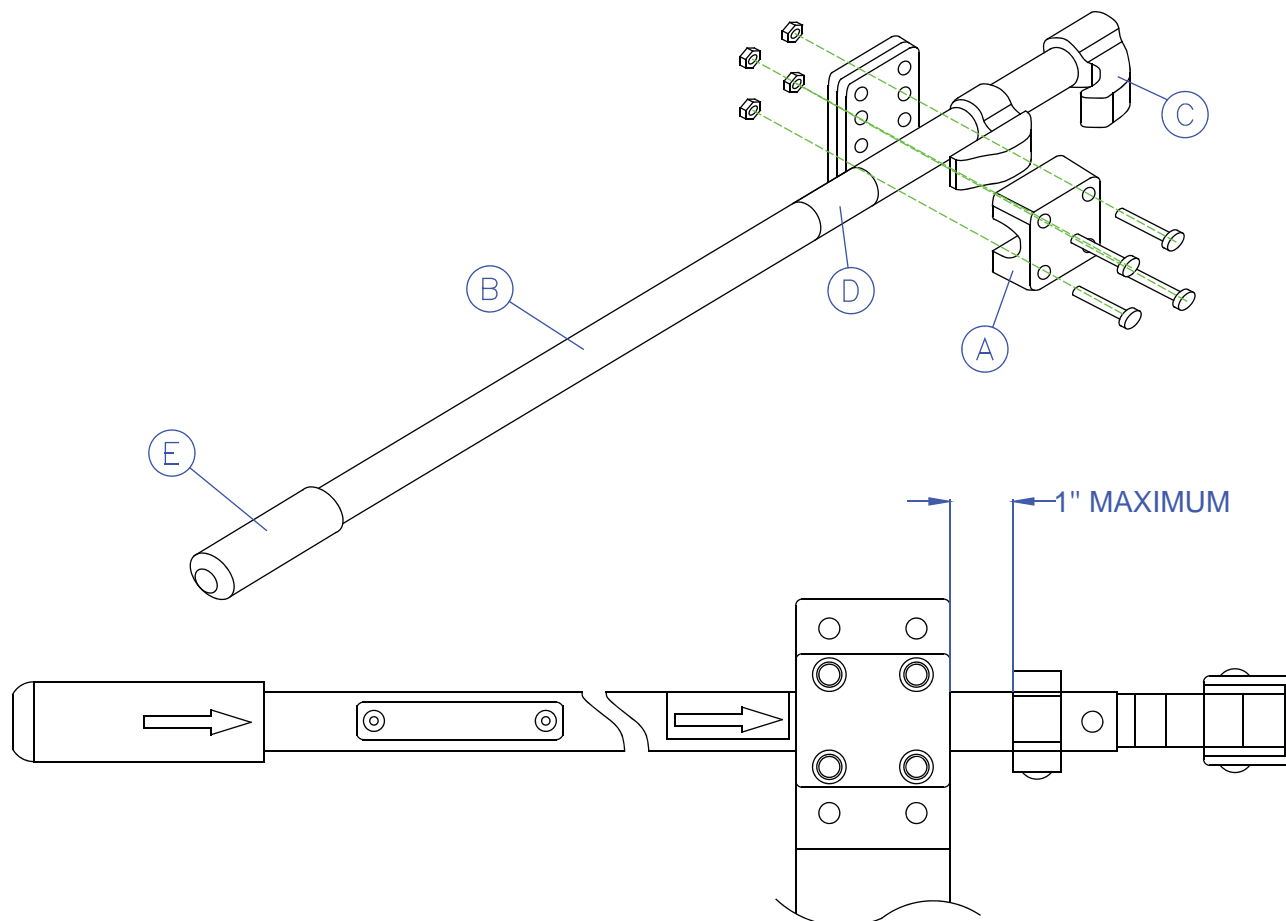
CAUTION

- The rail assembly is not designed to be a repairable item.
- It must be purchased as a complete assembly. Individual components are not available for order.

• PART 4 : EQUIPMENT SECTION - COT FASTENER SYSTEM

ADJUSTMENT AND OPERATION

Adjustment of the rail assembly may be required to compensate for slight variation in the position of the cot post.



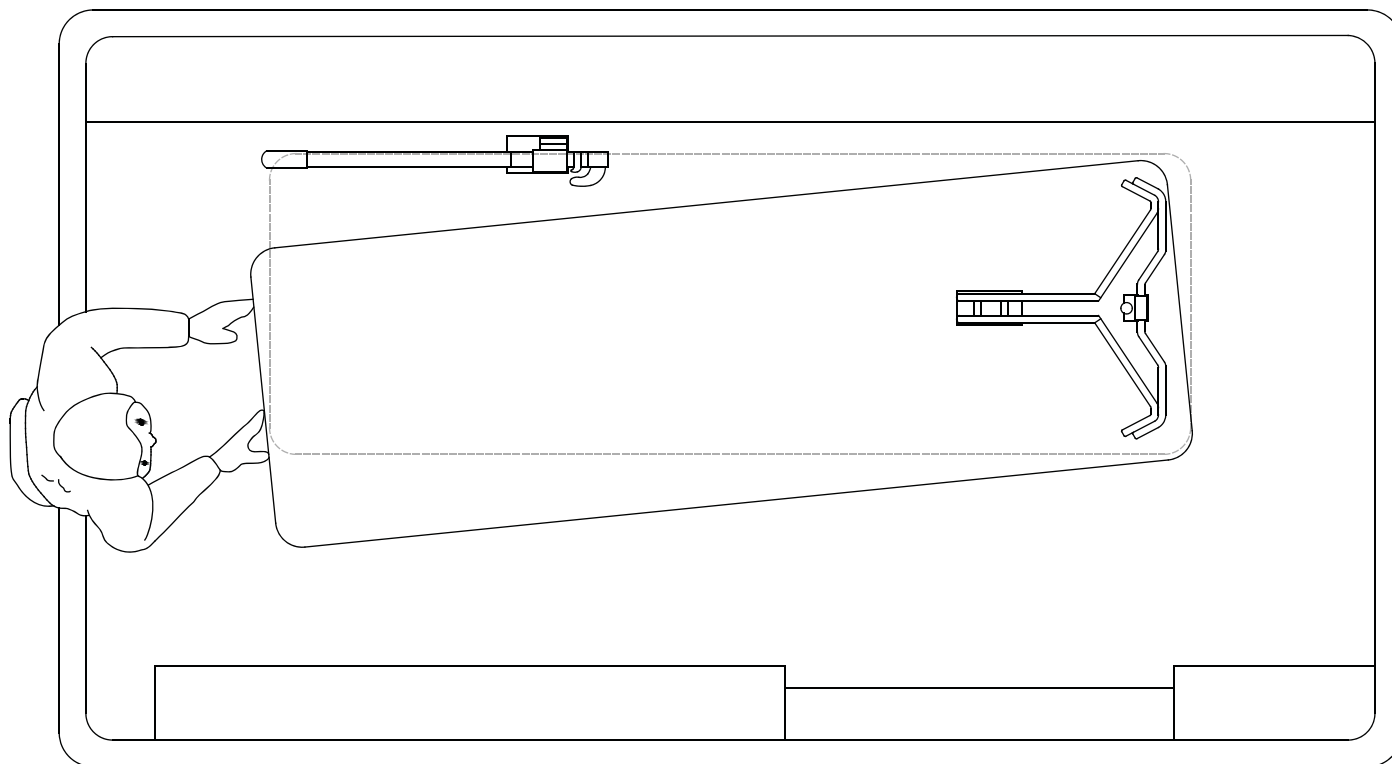
- Adjustment is made vertically by removing the rail clamp (A) and rail assembly (B) from the existing mounting holes and moving it to the set of holes that will align the clamp jaws (C) with the post on the cot. Position the rail assembly front/back. Adjustment is limited to 12.7 millimeters (0.5 inch) front/back or 25.4 millimeters (1 inch) total movement. Do not overlap the adjustment limit label (D) on the rail assembly. When adjustment is complete, rotate the rail assembly so the jaws are parallel with the floor and tighten the mounting screws until the rail clamps is drawn firmly against the support bracket. Check the adjustment by using the handle (E).



WARNING

- To prevent the cot frame from coming out of the rail jaws, the space between the rail clamp and the rail stationary jaw must **NEVER** exceed 25.4 millimeters (1 inch). To prevent the cot from coming out of the rail jaws and causing possible injury to the patient or user, the rail clamp must not overlap the red adjustment limit label on the rail tube.

• PART 4 : EQUIPMENT SECTION - COT FASTENER SYSTEM



- Guide the cot into the fastener at a slight angle, as shown above, engaging the loading wheels with the antler. Move the foot end of the cot sideways until the cot post enters the rail jaws and presses the release button. The rail jaws will close, locking the cot securely in position.
- Cot bedding may prevent the attendants from seeing the rail jaws close around the post. The properly installed and adjusted fastener closes with a “positive” sound and feels that serves as a good indicator of proper engagement. Check for a positive engagement by grasping the cot frame and pushing/pulling with sufficient force to disengage the cot if the fastener jaws are not completely closed.
- To remove the cot, use one hand to actuate the push handle forward, far enough for the jaws to release the cot post. With the other hand, grasp the cot and roll it away from the rail.



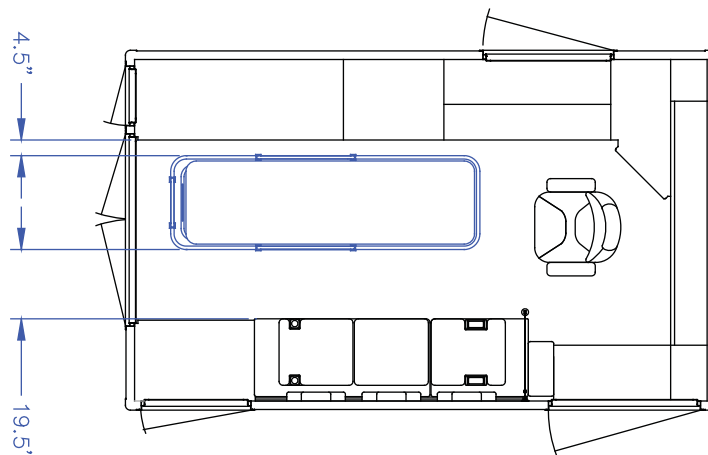
WARNING

- The fastener closes with a strong spring action. To avoid injury, do not use hand or fingers to depress the release button when the rail jaws are open.
- Always refer to the Ferno User's Manual and the Training Video for proper use of the cot fastener system.

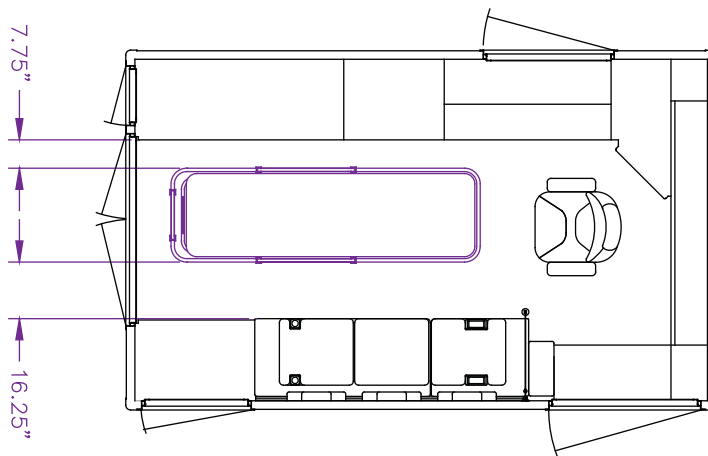
- PART 4 : EQUIPMENT SECTION - COT FASTENER SYSTEM

COT CONFIGURATION

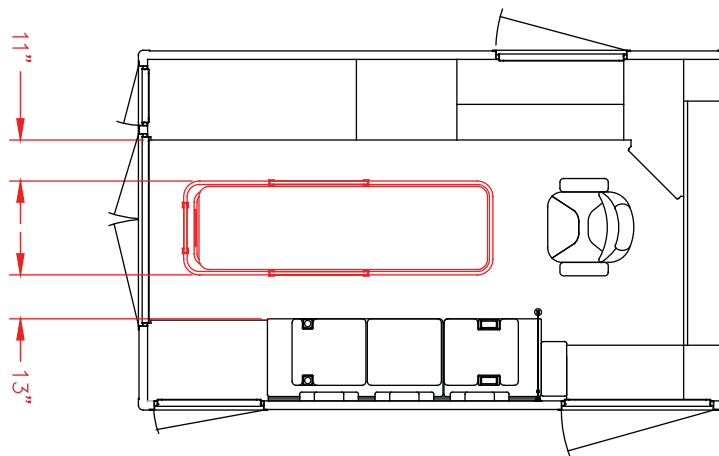
The cot fastener system can be relocated in the patient compartment. There are three (3) different cot configurations : left, center or right.



Configuration #1 - Left



Configuration #2 - Center



Configuration #3 - Right



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• PART 4 : EQUIPMENT SECTION - COT FASTENER SYSTEM

MAINTENANCE

There is a regular maintenance on the cot fastener system.

- Every six (6) months, verify and apply "Anti-Seize" on the two (2) tie-down knobs of the antler hook and on the tie-down knob (1) of the rail assembly.



WARNING

- Improper or inadequate installation can cause injury. The installer must test the fastener setup to meet or exceed all applicable guidelines before using the setup in an ambulance.
- A fastener installed without backing plates can fail in a crash. Use properly installed backing plates to secure the fastener at all mounting points.
- Improperly installed backing plates can fail in a crash. Secure the backing plates to primary structural members of the vehicle at all mounting points.
- An improper cot can cause injury. Use only Ferno cots designed for use with the fastener.
- Improper adjustment can cause injury. Stay within the range between the jaw and the adjustment limit label.
- Improper parts and service can cause injury. Use only Ferno-approved parts. Approved parts can be obtained from DEMERS AMBULANCES.
- Modifying the fastener can cause injury and damage. Use the fastener only as designed by Ferno.



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- PART 4 : EQUIPMENT SECTION - COT FASTENER SYSTEM

COT FERNO WASHINGTON MODEL #35-A



The cot Ferno Washington model #35-A must be properly installed in the cot fastener system, the patient compartment.

The cot Ferno Washington model #35-A provides exceptional value for X-frame cot users. The cot Ferno Washington model #35-A has an adjustable backrest angle from 0 to 75 degrees that allows patient to be in a comfortable position. The cot Ferno Washington model #35-A can be easily moved with its lubrication-free wheels, for greater cot mobility.

Specifications :

Length :	Max	200 centimeters (79 inches)
	Min	160 centimeters (63 inches)
Width		61 centimeters (24 inches)
Height :	Max	101 centimeters (40 inches)
	Min	23 centimeters (9 inches)
Loading :		80 centimeters (32 inches)
Weight :		34 kilograms (74 pounds)
Load Limit :		227 kilograms (500 pounds)



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- PART 4 : EQUIPMENT SECTION - COT FASTENER SYSTEM

STRETCHER FERNO WASHINGTON MODEL #107-B4



The stretcher Ferno Washington model #107-B4 (combination stretcher/chairs), when it is not used, is located on the right access door (D1). The stretcher #107-B4 , when it is used, can be installed on the squad bench.

The stretcher Ferno Washington model #107-B4 is designed to serve as three patient handling devices in one : a wheeled chair, a stair chair and a flat stretcher. Sturdy, lightweight aluminum frames provides long-term durability, while the vinylcoated nylon cover wears well and is easy to clean and maintain. Folds in half for compact storage. Features a high-back chair design that supports the patient's head so the technician can maintain proper posture when moving the patient. Stationary or hinged 102 millimeters (4 inches) wheels enable easy movement over most surfaces.

The stretcher Ferno Washington model #107-B4 can be installed on the squad bench. In order to secure patient and stretcher during transport, use the two (2) safety belts located just over the squad bench.



CAUTION

- To avoid injury, be sure to secure the stretcher Ferno Washington model #107-B4 when the stretcher is in used.

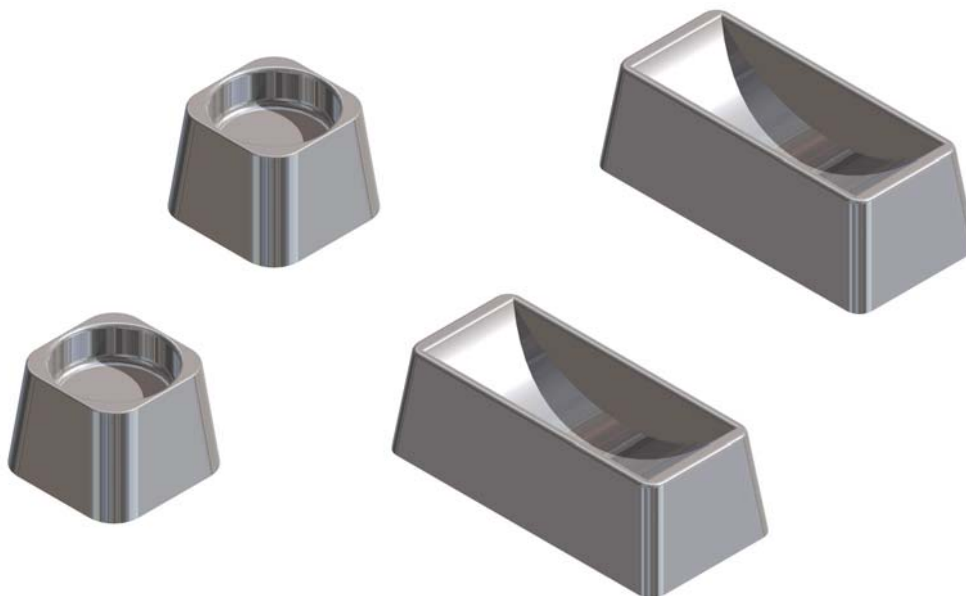
- PART 4 : EQUIPMENT SECTION - COT FASTENER SYSTEM

STRETCHER FERNO WASHINGTON MODEL #9



The stretcher Ferno Washington model #9 (adjustable backrest emergency stretcher), when it is not used, is located in the medical cabinet. The stretcher FW #9, when it is used, can be installed on the squad bench, in a set of fixed cups.

The Ferno Washington stretcher model #9 is designed for one (1) patient. The flat stretcher is made with lightweight and heavyduty aluminum frames and, bacteriostatic, vinyl-coated nylon covers. Exclusive slimline center hinges enable the stretchers to fold for compact storage. Includes two 1.52 meter (5 feet) quickrelease patient restraints.



The stretcher Ferno Washington model #9 can be installed on the squad bench. In order to secure patient and stretcher during transport, use the two (2) safety belts located just over the squad bench.

• PART 4 : EQUIPMENT SECTION - COT FASTENER SYSTEM

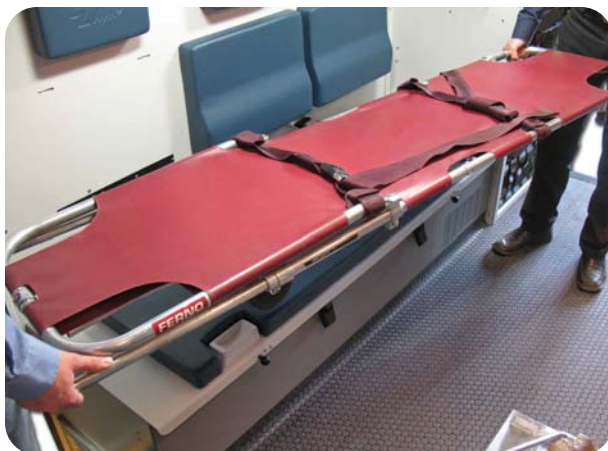
INSTALLATION OF THE STRETCHER FW#9



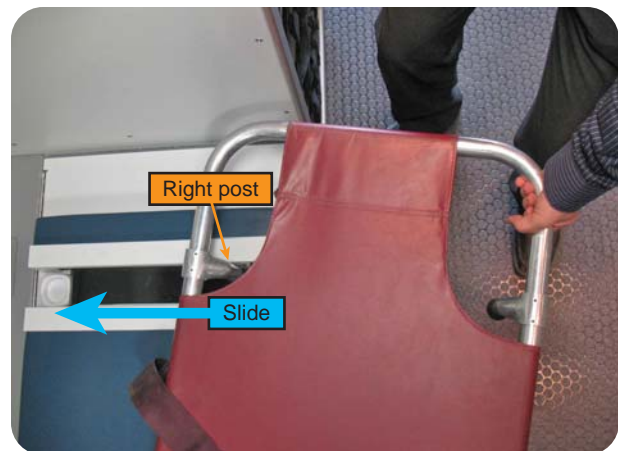
First, remove the safety net, the backrest and the front protector of the squad bench.



Install the sliders on the squad bench. The sliders must be stored in the squad bench.



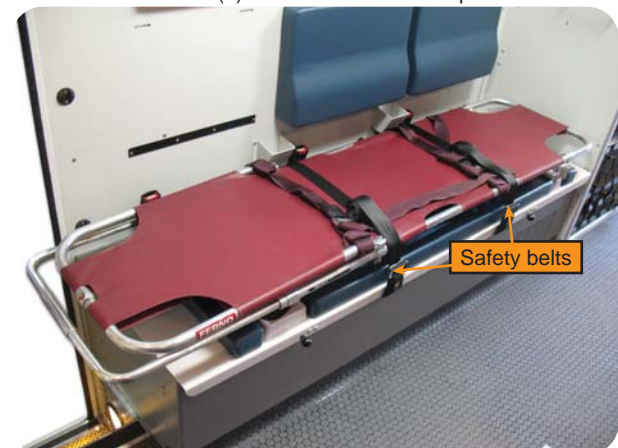
Enter the stretcher FW#9 into the vehicle following the BCAS procedures.



Put the right post and the right wheel of the stretcher FW#9 on the sliders. Slide the stretcher FW#9 until the two (2) posts and the two (2) wheels enters in all cups.



Make sur that the stretcher FW#9 is anchored in all cups.



Secure the stretcher FW#9 with two (2) non-retractable safety belts.

- PART 4 : EQUIPMENT SECTION - COT FASTENER SYSTEM

STRETCHER FERNO SCOOP EXL



The Ferno Washington Scoop EXL stretcher is located in the medical cabinet.

The Ferno Washington Scoop EXL stretcher provides superior comfort and safety to patients who need spinal immobilization. The stretcher eliminates the need for log-roll maneuvers, which significantly decreases movement to the cervical spine.

Features :

Durable :

- Made from lightweight, high-impact composite materials
- Twin Safety Lock hinge for smooth and nonbinding locking and unlocking
- Includes three (3) burgundy restraints

Safe :

- Two (2) hinged, interlocking pieces allow operators to gently scoop up a patient without having to roll them, decreasing movement to the cervical spine
- Head section recessed to maintain proper cervical alignment
- Supports a patient in the position found, reducing risk of further injury
- Easy-to clean surface is impervious to fluids.

Comfortable

- Thermally-treated polymer construction does not get too hot or cold, allowing for greater patient comfort.
- Four (4) adjustable length options accommodate patients of different heights.

Maneuverable

- Narrow foot end and split-apart design provide easier use in confined space immobilization.
- Oval profile and angled handles provide ergonomic ease of use
- Folds to 1.19 meter (47 inches) for compact carrying and storage

• PART 4 : EQUIPMENT SECTION - COT FASTENER SYSTEM

SPINEBOARD REDIHOLD NAJO



The RediHold Najo spineboard is located in the medical cabinet.

The RediHold Najo spineboard is designed to meet the needs of all storage situations. There are two (2) oversized handholds at the tapered end of RediHold board. The spineboard is floatable.

Features and Specifications:

- One-piece seamless polyethylene prevents body fluids from entering and contaminating the board and meets OSHA standards
- 100% X-ray translucent
- Compatible with all head immobilization devices
- Lightweight and rigid
- Angled edge allows for quick and easy handling
- Weighs only 7.25 kilograms (16 pounds)
- Measures 406 x 1828 x 45 millimeters (16 x 72 x 1.75 inches)
- Foam-filled
- Can be used as a flotation device
- Holds 250 kilograms (550 pounds)
- Non-slip surface
- Provides buoyancy, floats 57 kilograms (125 pounds)

- PART 4 : EQUIPMENT SECTION - SHARPS CONTAINERS

SHARPS CONTAINERS

The two (2) sharps containers is located in the patient compartment. The sharps containers can be filled with used medical needles (and other sharp medical instruments, such as an IV catheter).



The first sharps container is located on the front wall, right to the communication passthrough.

The second sharps container is located on the rear wall of the "kit tree" compartments, next to the squad bench.

WARNING



- The sharps containers are puncture-resistant, but not puncture-proof. To avoid injury examine the container carefully before you fill, carry, or dispose of it.
- Forcing or overfilling sharps into container may cause serious injury.

CAUTION



- Contents may contain infectious waste and biohazard material. This sharps containers are disposable. Discard in accordance with applicable CDC and OSHA procedures. To prevent risk from cross contamination, disposable items are not to be reused.



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• PART 4 : EQUIPMENT SECTION - TRASH CONTAINERS SUPPORTS

TRASH CONTAINERS SUPPORTS



There are two (2) trash containers support in the patient compartment of the vehicle.

The first trash container support is located on the medical cabinet, near the attendant head seat and at the head of the primary patient.

The second trash container support is fixed on the A2 door (under the window), on the interior panel of the door.



WARNING

• The trash container support must not be filled with medical needles or other sharp medical instruments.



CAUTION

• Contents may contain infectious waste and biohazard material. Discard in accordance with applicable CDC and OSHA procedures.



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• PART 4 : EQUIPMENT SECTION - INTRAVENOUS HOLDERS

INTRAVENOUS HOLDERS



Recessed IV holders on the ceiling (2)



IV holders on the right wall (2) and left wall (1)

The three (3) intravenous holders are located on the medical cabinet (1) and on the right wall (2), in the patient compartment. Secure the intravenous to the provided anchor point with Velcro straps.

The two (2) recessed intravenous holders are located on the ceiling, in the patient compartment.



WARNING

• Intravenous holder anchor points are designed to withstand only those loads imposed by correctly fitted intravenous fluid containers. Under no circumstances are they to be used for other purposes.



CAUTION

• Contents may contain infectious waste and biohazard material. Discard in accordance with applicable CDC and OSHA procedures.

• PART 4 : EQUIPMENT SECTION - SEATING

POWER SEATS

There are two (2) power seats, located in the front cabin of the vehicle.

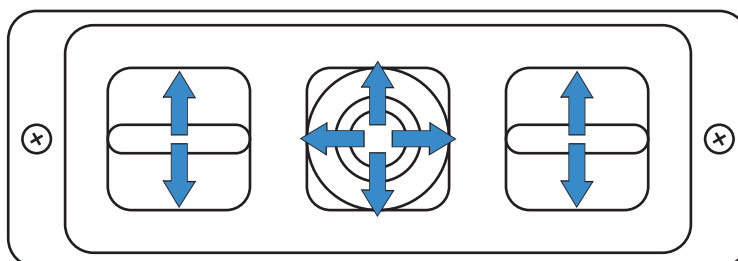


ELECTRICAL CONTROL

The electrical control is located at the front center of the power seats cushion.

To raise or lower the power seat, move the center knob up or down. To move the power seat forward or rearward, move the center knob toward the right or left.

To raise or lower the front of the power seat cushion, move the right lever up or down. To raise the rear of the power seat cushion, move the lever up or down.



WARNING

- Every person who drives or rides in the vehicle should use a seat belt at all times.
- For the most effective protection when the vehicle is in motion, the seat should always be upright. Always sit well back in the seat and adjust the seat belt properly.
- Never let a child stand or kneel on any seat while the vehicle is moving. The child could be seriously injured or killed in an accident or sudden stop.
- Do not wear the seat belt inside out or twisted. Doing so may reduce its effectiveness.
- Do not allow more than one person to use the same seat belt.
- Never carry more people in the vehicle than there are seat belts.
- Do not adjust the power seat when the vehicle is moving.
- Once a year, clean the base of the power seat of all dirtiness.
- Once a year, check if all functions of the power seat are fully operational.

- PART 4 : EQUIPMENT SECTION - SEATING

ATTENDANT HEAD SEAT

THERMOFORMED SEAT WITH SAFETY BELT

The thermoformed seat with safety belt is located at the head of the primary patient, front side of the patient compartment.



Pull the front lever up and hold it while you slide the seat forward or backward to the desired position. Release the lever to lock the seat in position.

DEMERS AMBULANCES recommends that a pregnant woman use seat belts. The seat belt should be worn snug, and always position the lap belt as low as possible around the hips.



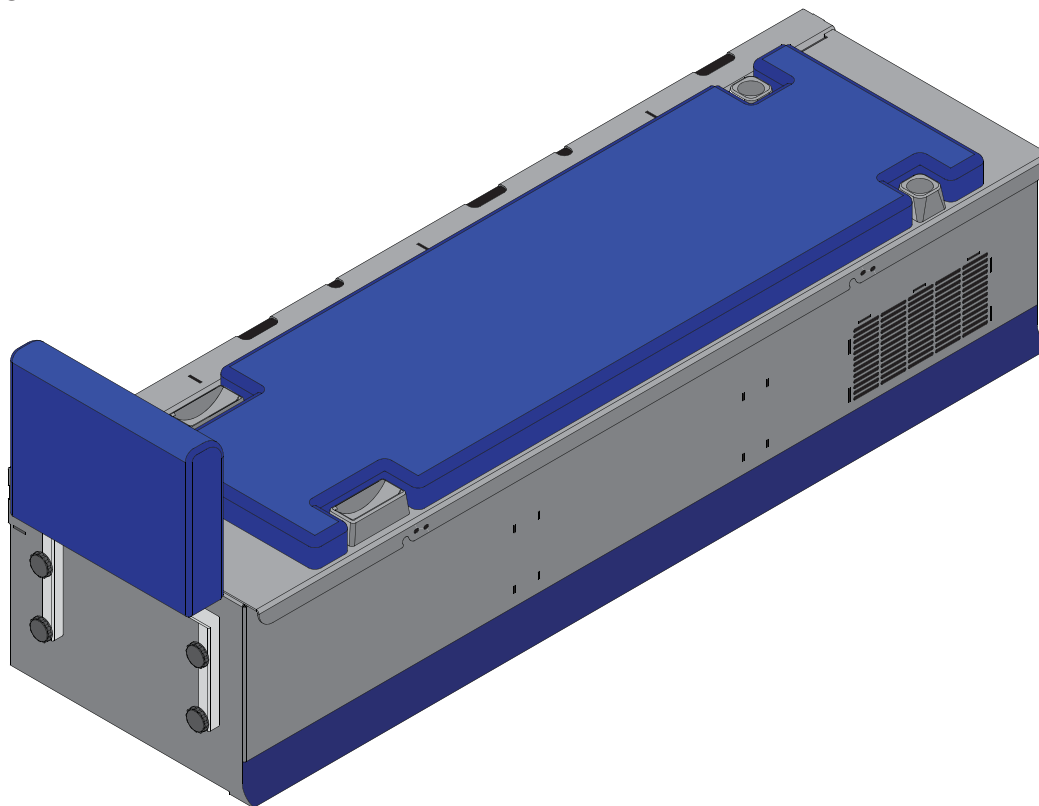
WARNING

- Every person who drives or rides in the vehicle should use a seat belt at all times.
- For the most effective protection when the vehicle is in motion, the seat should always be upright. Always sit well back in the seat and adjust the seat belt properly.
- Never let a child stand or kneel on any seat while the vehicle is moving. The child could be seriously injured or killed in an accident or sudden stop.
- Do not wear the seat belt inside out or twisted. Doing so may reduce its effectiveness.
- Do not allow more than one person to use the same seat belt.
- Never carry more people in the vehicle than there are seat belts.

• PART 4 : EQUIPMENT SECTION - SEATING

SQUAD BENCH

The squad bench is located, at the right side of the primary patient and it is designed to sit three (3) persons.



The squad bench can accept one stretcher FW model #9, mounted on the set of fixed cups and restrained by two (2) non-retractable safety belts (of the squad bench).

The squad bench can also accept one stretcher FW model #107-B4, restrained by two (2) non-retractable safety belts (of the squad bench).

In the squad bench, there is the standard heating system, the jack and jacking tools and some storage compartments.

Note : The squad bench is only available with a single cot configuration.



WARNING

- Every person who drives or is in the vehicle should use a seat belt at all times.
- For the most effective protection when the vehicle is in motion, the seat should always be upright. Always sit well back in the seat and adjust the seat belt properly.
- Never let a child stand or kneel on any seat while the vehicle is moving. The child could be seriously injured or killed in an accident or sudden stop.



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• PART 4 : EQUIPMENT SECTION - SEATING

CARDIOPULMONARY RESUSCITATION SEAT



The cardiopulmonary resuscitation (CPR) seat is located in the medical cabinet, on the left wall.

The cardiopulmonary resuscitation seat is also located at right side of the primary patient.



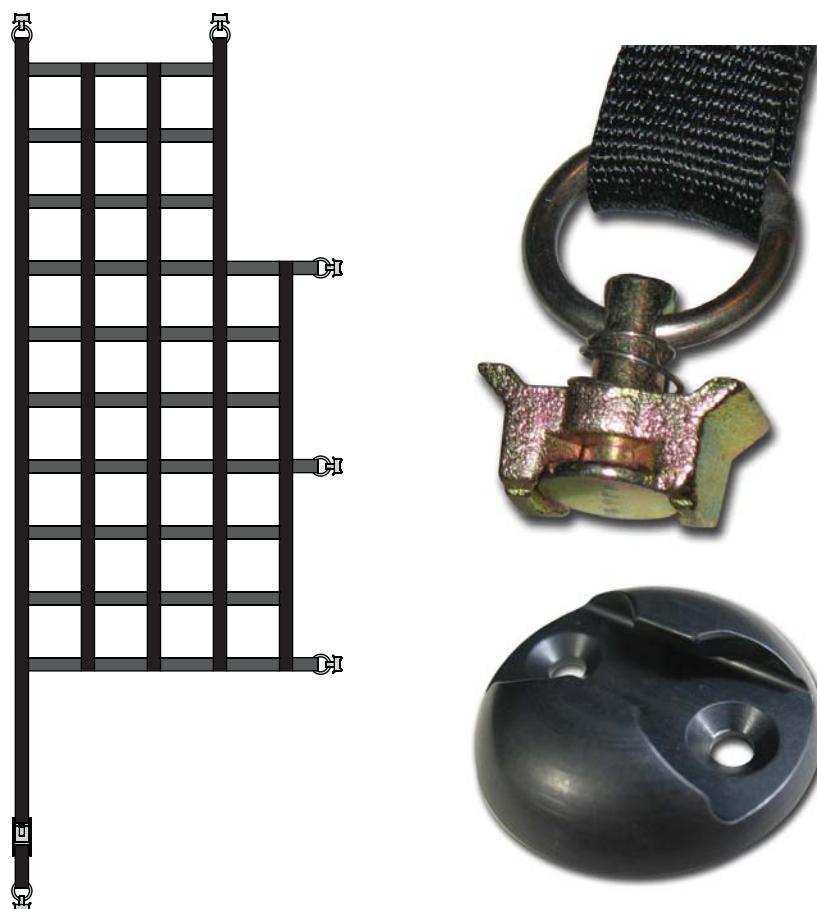
WARNING

- Every person who drives or is in the vehicle should use a seat belt at all times.
- For the most effective protection when the vehicle is in motion, the seat should always be upright. Always sit well back in the seat and adjust the seat belt properly.
- Never let a child stand or kneel on any seat while the vehicle is moving. The child could be seriously injured or killed in an accident or sudden stop.

• PART 4 : EQUIPMENT SECTION - SAFETY NET

RIGHT SAFETY NET

A removable safety net is installed at the front end of the squad bench for passive protection of the passenger in the patient compartment.



To remove the safety net, lift the retainer of the tie down fitting and slide the tie down fitting from the anchor plate.

- The safety net has to be removed when the stretcher FW model #107-B4 fastener system is in use on the squad bench.
- The safety net has to be removed when the stretcher FW model #9 fastener system is in use on the squad bench.



WARNING

- The safety net is only intended to supplement the seat belts provided on the squad bench and does not replace them.



CAUTION

- Cleaning of the safety net should be done by using a mild detergent with lukewarm water.



TECHNICAL MANUAL

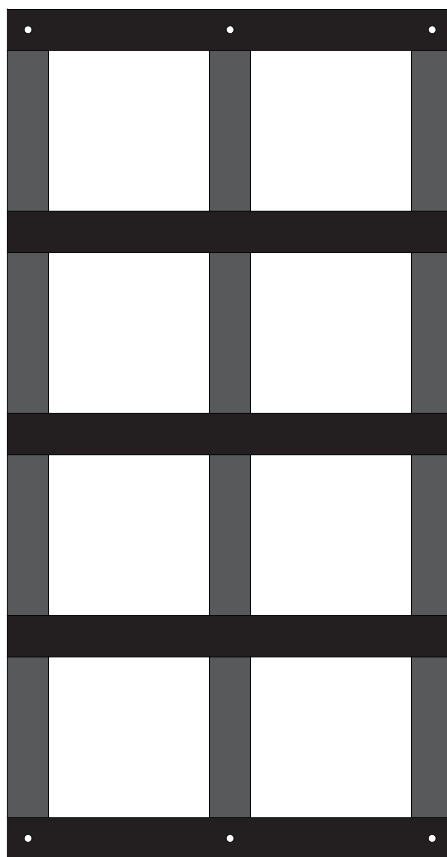
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• PART 4 : EQUIPMENT SECTION - SAFETY NET

LEFT SAFETY NET

A removable safety net is installed at the left side of the cardiopulmonary resuscitation (CPR) seat for passive protection of the passenger in the patient compartment.



Note : The safety net was not designed to be removed easily.



WARNING

• The safety net is only intended to supplement the seat belts provided on the cardiopulmonary resuscitation (CPR) seat and does not replace them.



CAUTION

• Cleaning of the safety net should be done by using a mild detergent with lukewarm water.

- PART 4 : EQUIPMENT SECTION - EXTERIOR MIRRORS

EXTERIOR MIRRORS

The OEM exterior lateral mirrors has been replaced by Hadley mirrors.



Right mirror
Hadley CS-15-U811MFCX



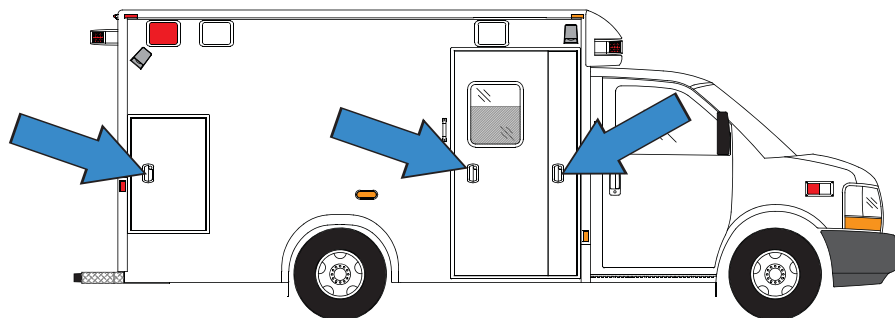
Left mirror
Hadley RS-15-U8MFCX

MAINTENANCE

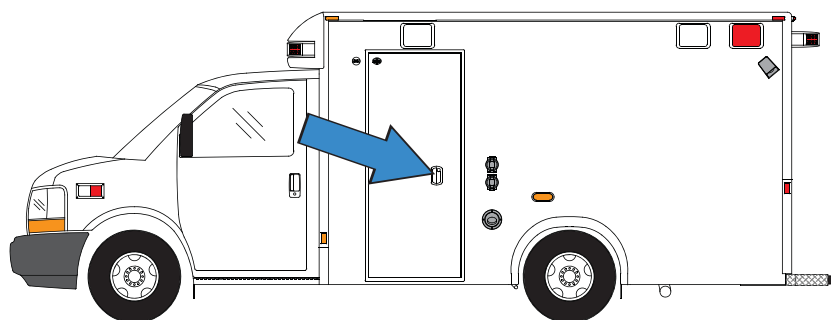
Twice a year, check and, if necessary, adjust the tension of the each mirrors.

- PART 4 : EQUIPMENT SECTION - DOORS OF THE MODULE

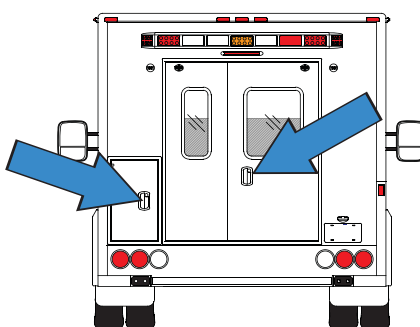
EXTERIOR DOORS' HANDLE AND LOCK



Right side view



Left side view



Rear end view

The exterior doors' handle and lock are located on all exterior doors (except the A1 door) of the module of the vehicle.



CAUTION

- The exterior doors' handle and lock need a regular maintenance to avoid the appearance of rust. See next pages for maintenance.

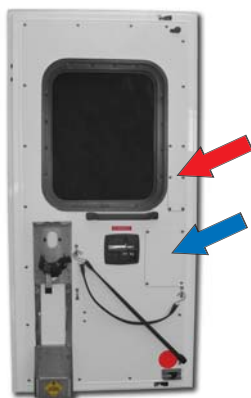
• PART 4 : EQUIPMENT SECTION - DOORS OF THE MODULE

MAINTENANCE

There is a regular maintenance on the door handles and locks.

- Frequently verify if the door handles and locks are fully functional.
- Frequently clean the door door handles and locks of all dirtiness.
- Every three (3) months, lubricate the door handles with "*Fluid Film*".
- Every three (3) months, lubricate the door locks and lock barrel with "*Fluid Film*". In winter, every month, lubricate the door locks and lock barrel with "*Fluid Film*".

To have access to the door handle mechanism :



To have access to the mechanism of the door handle.



To have access to the electrical actuator.



To remove the lock barrel, use the maintenance key.

- PART 4 : EQUIPMENT SECTION - DOORS OF THE MODULE

EMERGENCY DOOR RELEASES

The emergency door releases are located on interior panel of all the access door, the right access door (D1) and rear access doors (A1 and A2).



*Rear right access
door A1*



*Rear left access
door A2*



*Right access
door D1*

- PART 4 : EQUIPMENT SECTION - DOORS OF THE MODULE

LOCKABLE COMPARTMENT LOCK

The lockable compartment is located in the rear end of the medical cabinet, on the top. The lockable compartment has a lockable aluminium door. On the door, there is a lock.



MAINTENANCE

- Frequently verify if the door handles and locks are fully functional.
- Frequently clean the door lock of all dirtiness.
- Lubricate the door lock with "Moovit" penetrating lubricant.





TECHNICAL MANUAL

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• PART 4 : EQUIPMENT SECTION - DOORS OF THE MODULE

DOOR SEALS (WEATHERSTRIPS)

On each exterior doors, two (2) different models of seals are used on the module door frames. They both work together to provide a highly effective seal.

On the right access door (D1) and on the rear access doors (A1 and A2), there is an additional seal on the top of the doors.

MAINTENANCE

There is a regular maintenance on the door weatherstrips every three (3) months.

- Verify the door weatherstrips if there are tears or if the door weatherstrips are well installed (that they did not fall apart).
- Clean the door weatherstrips of all dirtiness.
- Lubricate the door weatherstrips with silicone emulsion.



WARNING

- Do not scrub or use brushes.
- Do not use strong chemical soap, gasoline or acetone to clean the door weatherstrips.

- PART 4 : EQUIPMENT SECTION - DOORS OF THE MODULE

DOOR HINGES

On each exterior doors, there is high quality and heavy duty stainless steel hinge. The hinges are installed on the side of the doors.



MAINTENANCE

There is a regular maintenance on the door hinge every three (3) months.

- Visually check all door hinges.
- Clean door hinges of all dirtiness.

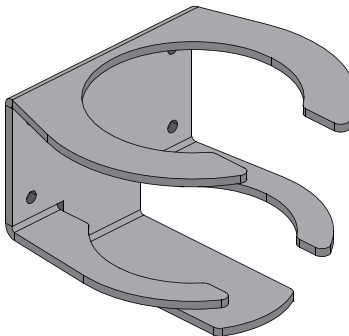
Note : If necessary, lubricate all door hinges.

• PART 4 : EQUIPMENT SECTION - EQUIPMENT STORAGE

FRONT CABIN

CUP HOLDERS

The two (2) cup holders (mounted on the multifunction case) are located in the front cabin, between the driver seat and the passenger seat.



WARNING



- The cup holder should not be used while driving so full attention may be given to vehicle operation.

CAUTION



- Avoid abrupt starting and braking when the cup holder is being used to prevent spilling the drink. If the liquid is hot, it can scald you or your passenger.
- Use only soft cups in the cup holder. Hard objects can injure you in an accident.

OEM DOOR COMPARTMENTS

The OEM door compartments are located on the interior of the lateral access doors, in the front cabin.



OEM left door



OEM right door

WARNING



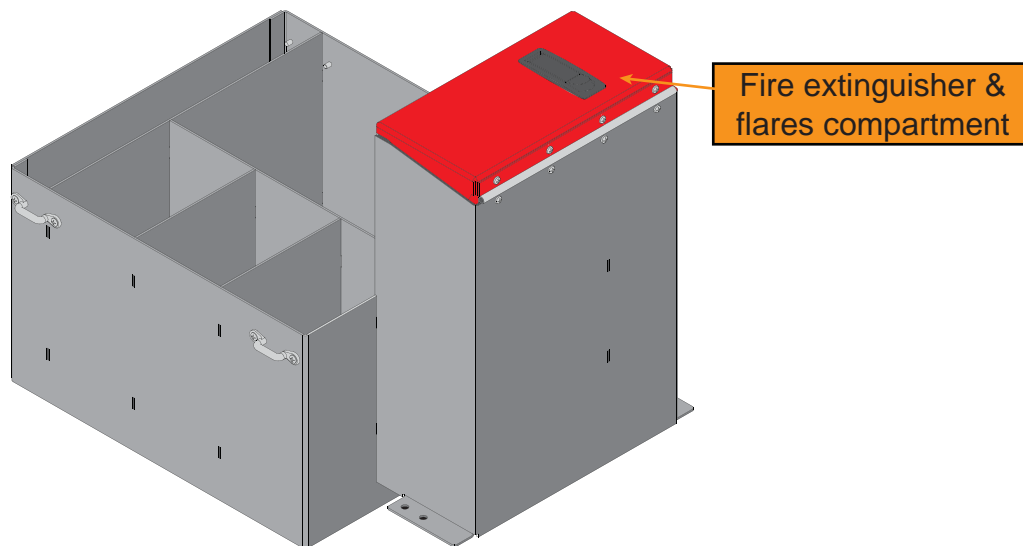
- Properly secure all cargo in the OEM door compartments. In a sudden stop or collision, unsecured cargo could cause personal injury.

• PART 4 : EQUIPMENT SECTION - EQUIPMENT STORAGE

MULTIFUNCTION CASE

The multifunction case is located between the front driver seat and the passenger seat. In the multifunction case, there is a compartment for the fire extinguisher and for the flares.

Note : The multifunction case configuration may change.



WARNING

• Properly secure all cargo in the multifunction case. In a sudden stop or collision, unsecured cargo could cause personal injury.

MAP HOLDERS

The map holders (4) are located on the front wall behind the driver and the passenger seats, in the front cabin. There three (3) different sizes of map holders.



WARNING

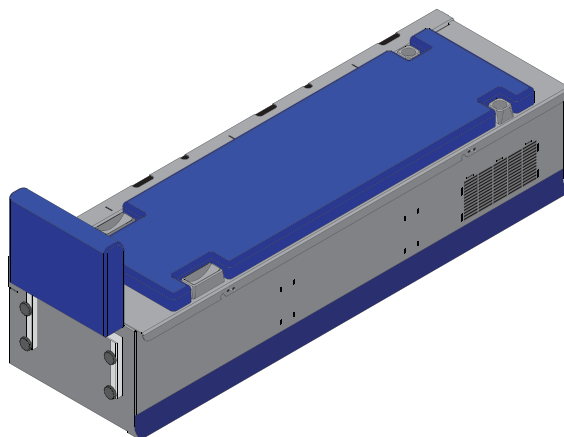
• Properly secure all cargo in the map holders. In a sudden stop or collision, unsecured cargo could cause personal injury.

- PART 4 : EQUIPMENT SECTION - EQUIPMENT STORAGE

PATIENT COMPARTMENT

SQUAD BENCH COMPARTMENT

The squad bench compartment is located under each seats of the squad bench, right side of the vehicle.



WARNING

- Properly secure all cargo in the squad bench compartment. In a sudden stop or collision, unsecured cargo could cause personal injury.

ATTENDANT HEAD SEAT COMPARTMENT

The attendant head seat compartment is located under the attendant head seat. To have access to the attendant head seat compartment, open the door of the compartment, located right side of the vehicle.



WARNING

- Properly secure all cargo in the attendant head seat. In a sudden stop or collision, unsecured cargo could cause personal injury.



TECHNICAL MANUAL

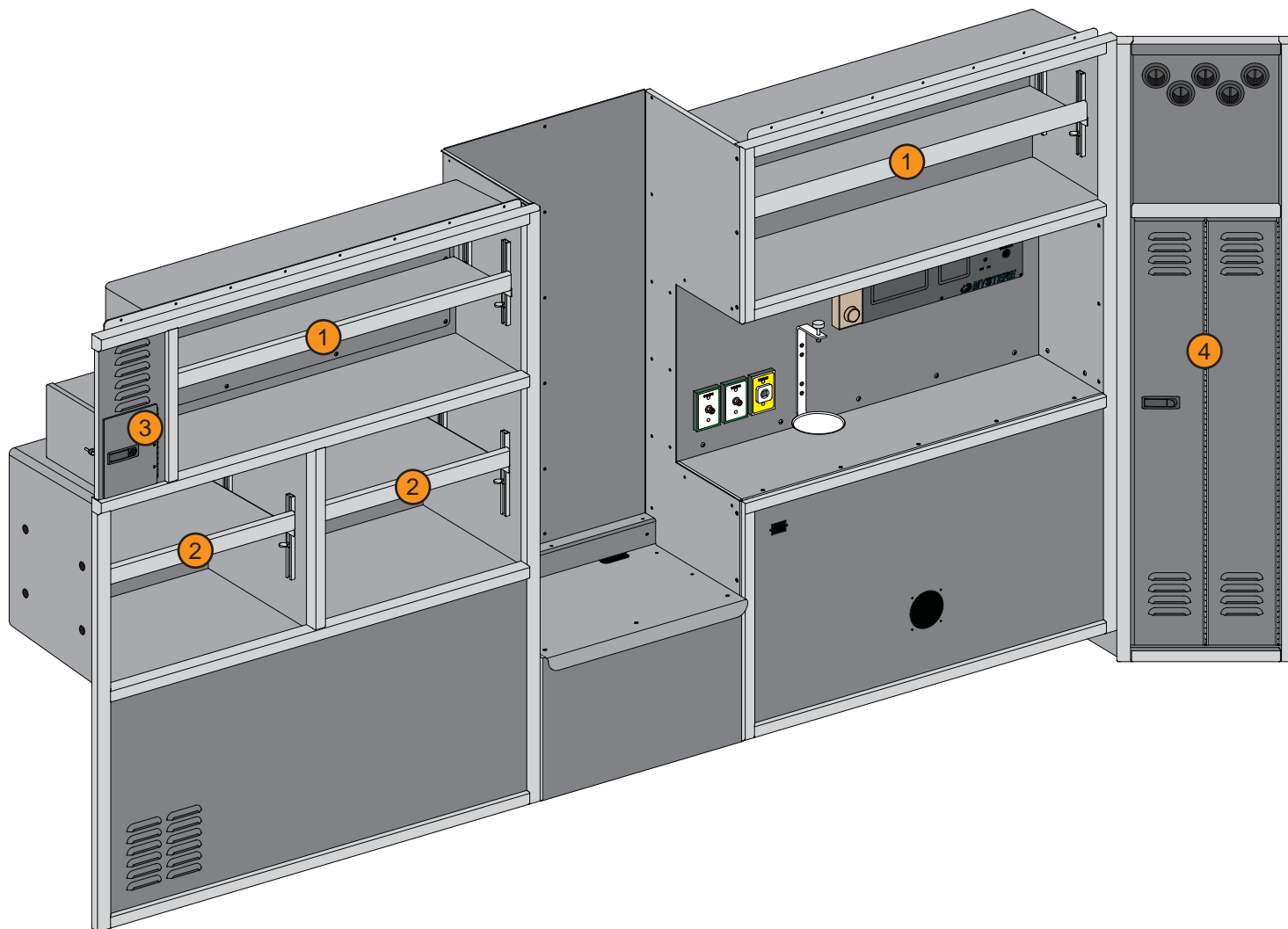
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• PART 4 : EQUIPMENT SECTION - EQUIPMENT STORAGE

MEDICAL CABINET

The medical cabinet is located on the left wall.



- 1- Large medical cabinets
- 2- Small medical cabinets
- 3- Lockable compartment
- 4- Angle compartment



TECHNICAL MANUAL

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• PART 4 : EQUIPMENT SECTION - EQUIPMENT STORAGE

1- Large medical cabinets

The two (2) large medical cabinets are located in the medical cabinet, in the top, each side of the cardiopulmonary resuscitation seat. The large medical cabinets have tinted polycarbonate sliding windows. In the large medical cabinets, there is an adjustable shelf that weighs a maximum of 5 kilograms (11 pounds).

Dimension :	Access	1054mm. W x 406mm. H (41.5"W x 16"H)
	Inside	1041mm. W x 424mm. H x 279mm. D (41"W x 16.7"H x 11"D)



WARNING

• Properly secure all cargo in the large medical cabinets. In a sudden stop or collision, unsecured cargo could cause personal injury.

2- Small medical cabinets

The two (2) small medical cabinets are located in the medical cabinet, mid-height, left of the cardiopulmonary resuscitation seat. The small medical cabinets have tinted polycarbonate sliding windows. In the small medical cabinets, there is an adjustable shelf that weighs a maximum of 5 kilograms (11 pounds).

Dimension :	Access	609mm. W x 482mm. H (24"W x 19"H)
	Inside	622mm. W x 419mm. H x 412mm. D (24.5"W x 16.5"H x 16.25"D)



WARNING

• Properly secure all cargo in the small medical cabinets. In a sudden stop or collision, unsecured cargo could cause personal injury.



TECHNICAL MANUAL

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• PART 4 : EQUIPMENT SECTION - EQUIPMENT STORAGE

3- Lockable compartment

The lockable compartment is located in the rear end of the medical cabinet, on the top. The lockable compartment has a lockable aluminium door.

Dimension :	Access	152mm. W x 190mm. H (6"W x 7.5"H)
	Inside	152mm. W x 190mm. H x 254mm. D (6"W x 7.5"H x 10"D)



WARNING

• Properly secure all cargo in the lockable compartment. In a sudden stop or collision, unsecured cargo could cause personal injury.

4- Angle compartment

The angle compartment is located in the front end of the medical cabinet, between the left wall and the front wall. The angle compartment has a aluminium door with ventilation louvers.

Dimension :	Access	355mm. W x 1168mm. H (14"W x 46"H)
	Inside	355mm. W x 1231mm. H x 355mm. D (14"W x 48.5"H x 14"D)



WARNING

• Properly secure all cargo in the angle compartment. In a sudden stop or collision, unsecured cargo could cause personal injury.



TECHNICAL MANUAL

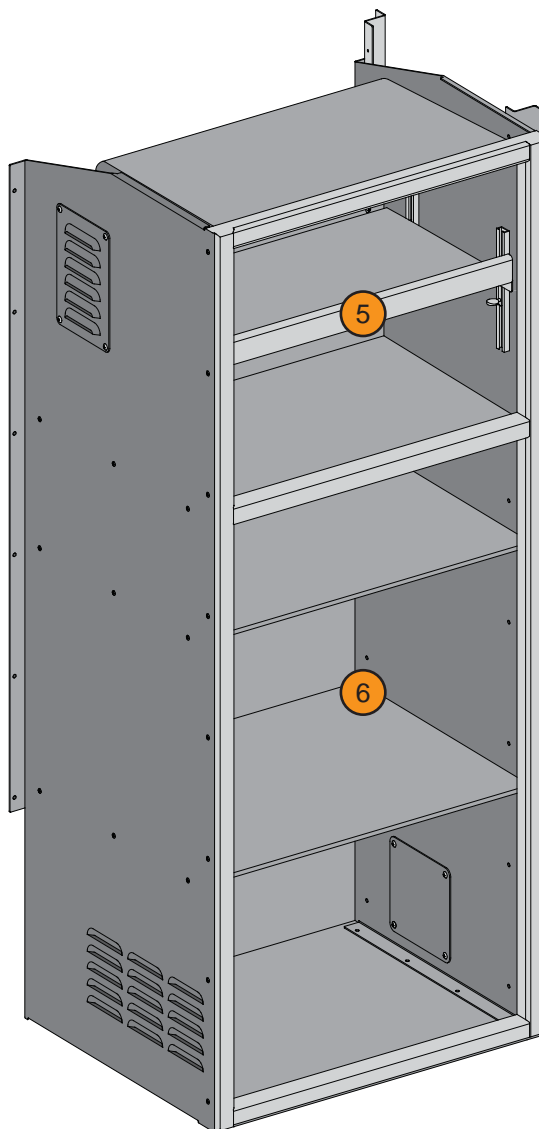
MX151D - GM



- PART 4 : EQUIPMENT SECTION - EQUIPMENT STORAGE

"KIT TREE" COMPARTMENTS

The "kit tree" compartments are located in the rear end of the right wall.



5- Upper compartment

6- Lower compartment



TECHNICAL MANUAL

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• PART 4 : EQUIPMENT SECTION - EQUIPMENT STORAGE

5- Upper compartment

The upper compartment is located in the "kit tree" compartment, in the top. The upper compartment has tinted polycarbonate sliding windows. In the upper compartment, there is an adjustable shelf that weighs a maximum of 5 kilograms (11 pounds).

Dimension :	Access	609mm. W x 482mm. H (24"W x 19"H)
	Inside	622mm. W x 495mm. H x 388mm. D (24.5"W x 19.5"H x 15.3"D)



WARNING

• Properly secure all cargo in the upper compartment of the "kit tree" compartment. In a sudden stop or collision, unsecured cargo could cause personal injury.

6- Lower compartment

The lower compartment is located in the "kit tree" compartment, in the bottom. The lower compartment is divided in three (3) sections. The two (2) lower sections have inside access and outside access (D2). All sections of the lower compartment have protector safety net. In the lower compartment, there is an adjustable shelf that weighs a maximum of 5 kilograms (11 pounds).

Dimension :	Access	609mm. W x 1092mm. H (24"W x 43"H)
	Inside	685mm. W x 1130mm. H x 533mm. D (27"W x 44.5"H x 21"D)



WARNING

• Properly secure all cargo in the lower compartment of the "kit tree" compartment. In a sudden stop or collision, unsecured cargo could cause personal injury.



TECHNICAL MANUAL

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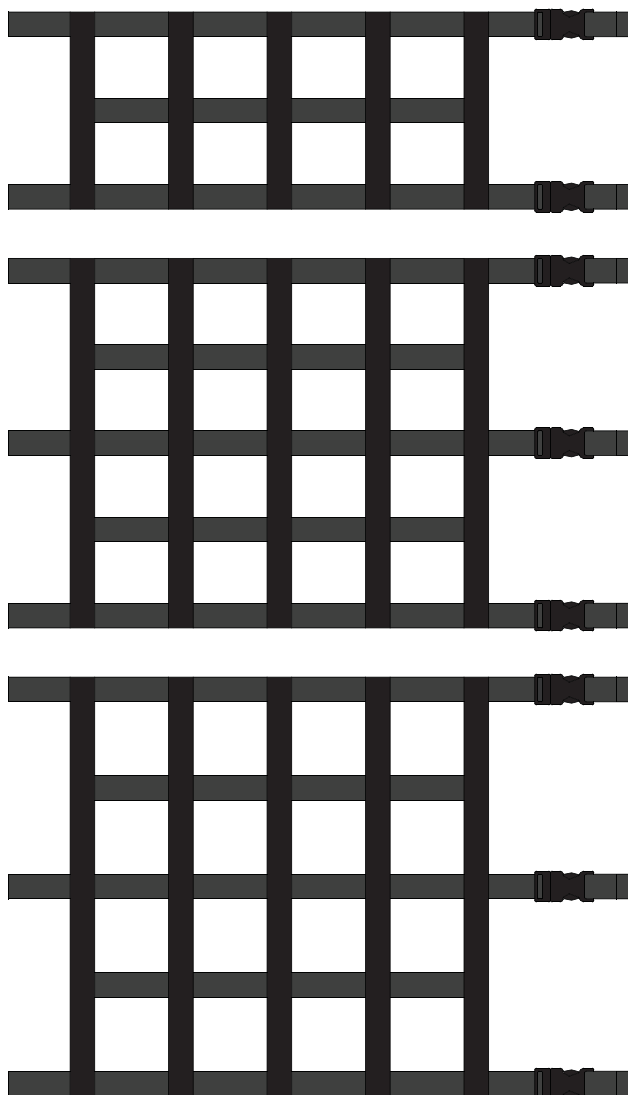


• PART 4 : EQUIPMENT SECTION - EQUIPMENT STORAGE

Protector safety nets (lower compartment)

There are three (3) protector safety nets in the lower compartment of the "kit tree" compartment. All sections of the lower compartment have his own protector safety net. The protector safety nets secure all cargo in the lower compartment of the "kit tree" compartment.

To have access to the cargo inside the lower compartment of the "kit tree" compartment, unclip the safety net. All the clips of the protector safety nets are located on the right side of the "kit tree" compartment.



WARNING

• Properly secure all cargo in the lower compartment of the "kit tree" compartment. In a sudden stop or collision, unsecured cargo could cause personal injury.



TECHNICAL MANUAL

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• PART 4 : EQUIPMENT SECTION - EQUIPMENT STORAGE

GLOVES BOX HOLDERS

The gloves box holders are located in the protector pad on the right wall, over the squad bench.



WARNING

• Properly secure all cargo in the gloves box holders. In a sudden stop or collision, unsecured cargo could cause personal injury.

- PART 4 : EQUIPMENT SECTION - EQUIPMENT STORAGE

SAFETY VEST HOLDER

The safety vest holder is fixed on the front wall, in the patient compartment.



WARNING

- Properly secure all cargo in the safety vest holder. In a sudden stop or collision, unsecured cargo could cause personal injury.



TECHNICAL MANUAL

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- PART 4 : EQUIPMENT SECTION - EQUIPMENT STORAGE

PLASTIC RECEPTACLE FOR OXYGEN MASKS

The plastic receptacle (for oxygen masks) is fixed on the A1 door (under the window), in the patient compartment.



The plastic receptacle (for oxygen masks) is mounted and restrained with a bungee cable and a support.

Dimension : 254mm x 178mm x 252mm (10" x 7" x 9.9")

Volume : 5.7 liters (1.25 gallon)

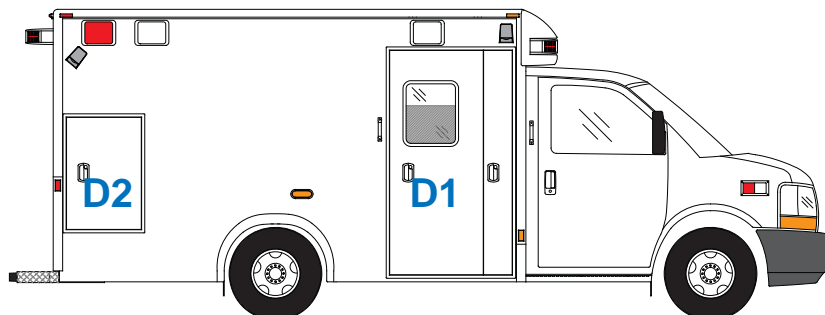


WARNING

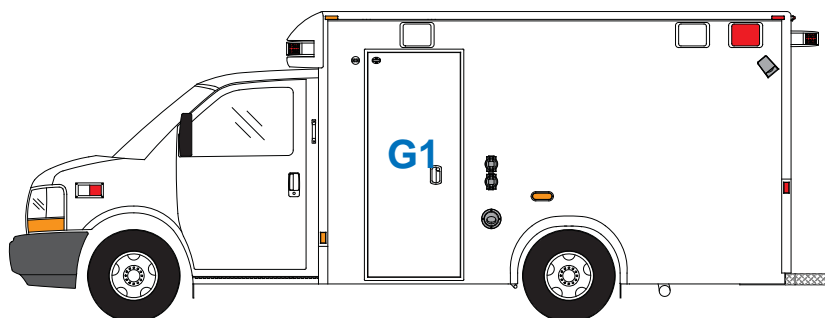
- Properly secure all cargo in the plastic receptacle (for oxygen masks). In a sudden stop or collision, unsecured cargo could cause personal injury.

- PART 4 : EQUIPMENT SECTION - EQUIPMENT STORAGE

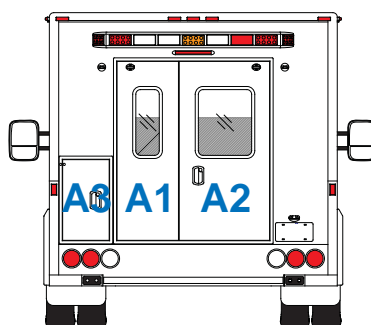
EXTERIOR COMPARTMENTS



Right side view



Left side view



Rear end view

D1 - Lateral access door and oxygen compartment

D2 - Right equipment compartment

G1 - Electrical panel compartment

A1 - Rear left access door

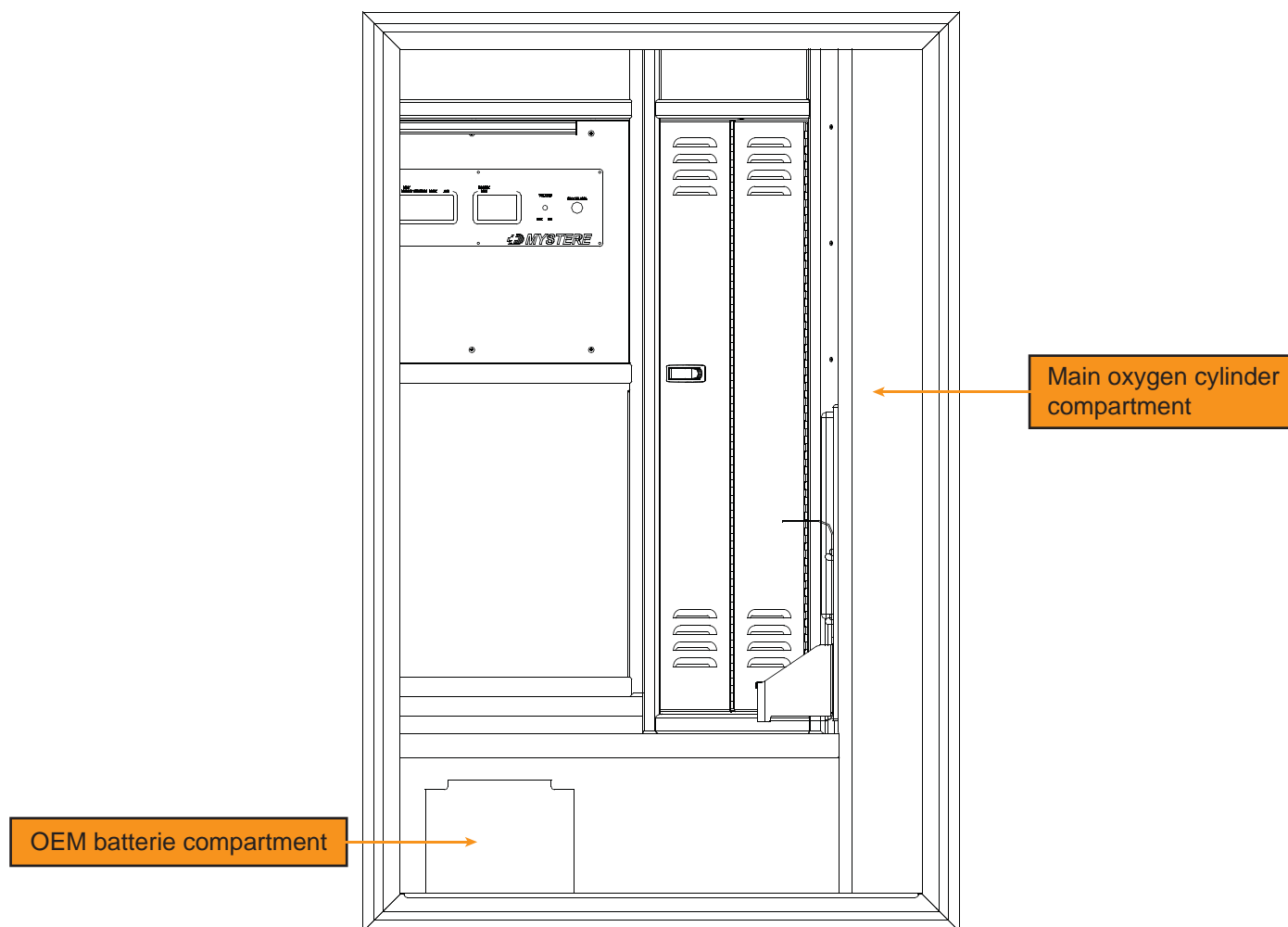
A2 - Rear right access door

A3 - Stretcher and spineboard compartment

- PART 4 : EQUIPMENT SECTION - EQUIPMENT STORAGE

D1 - Lateral access door and oxygen compartment

The lateral access door and oxygen compartment is located at the front right of the module.



In the the lateral access door and oxygen compartment, there is the vertical holder for main oxygen cylinder and the ramp. For more information, see the oxygen section.

In the the lateral access door and oxygen compartment, there is one (1) OEM batterie, located in the right battery compartment, in the interior step.

Note : The compartment configuration may change.



WARNING

- Properly secure the main oxygen cylinder ramp. In a sudden stop or collision, unsecured cargo could cause personal injury.



TECHNICAL MANUAL

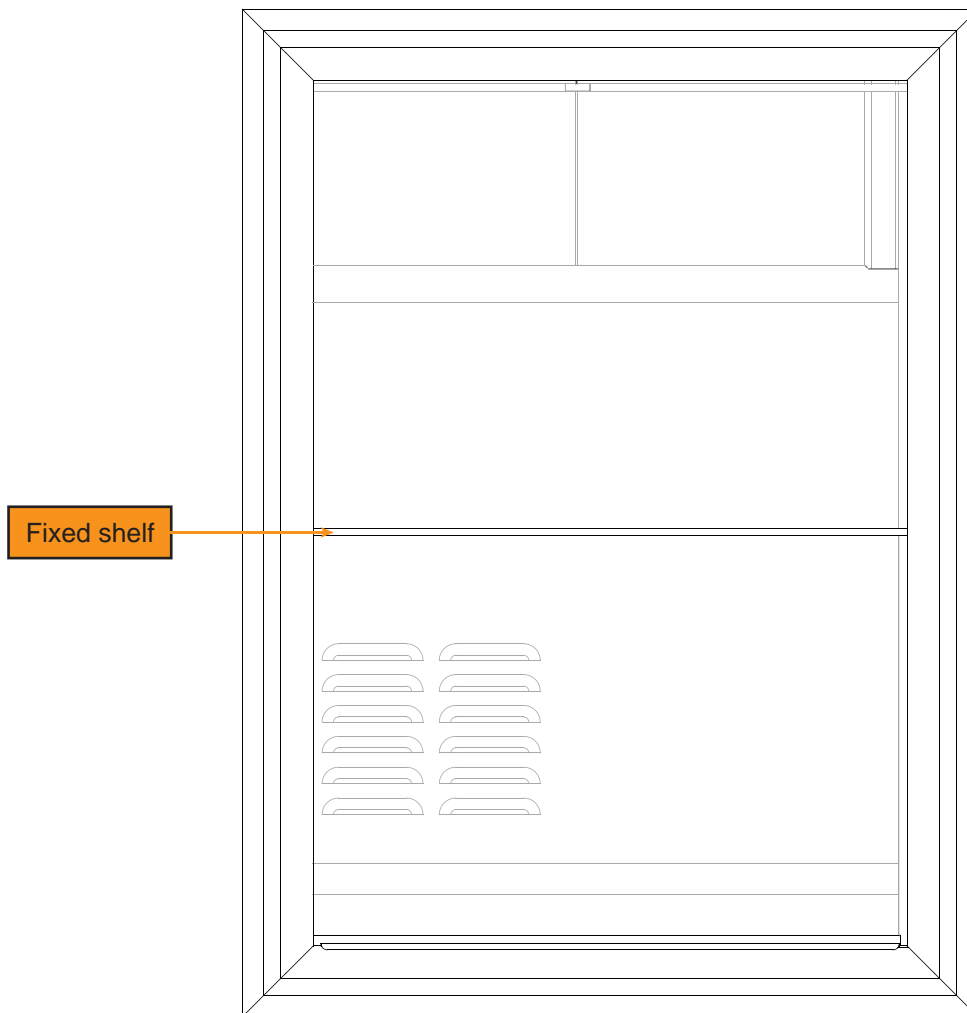
MX151D - GM



• PART 4 : EQUIPMENT SECTION - EQUIPMENT STORAGE

D2 - Right equipment compartment

The right equipment compartment is located at the rear right of the module.



The right equipment compartment (D2) gives access to the lower sections of "kit tree" compartment. In the right equipment compartment (D2), there is a fixed shelf.

Note : The compartment configuration may change.



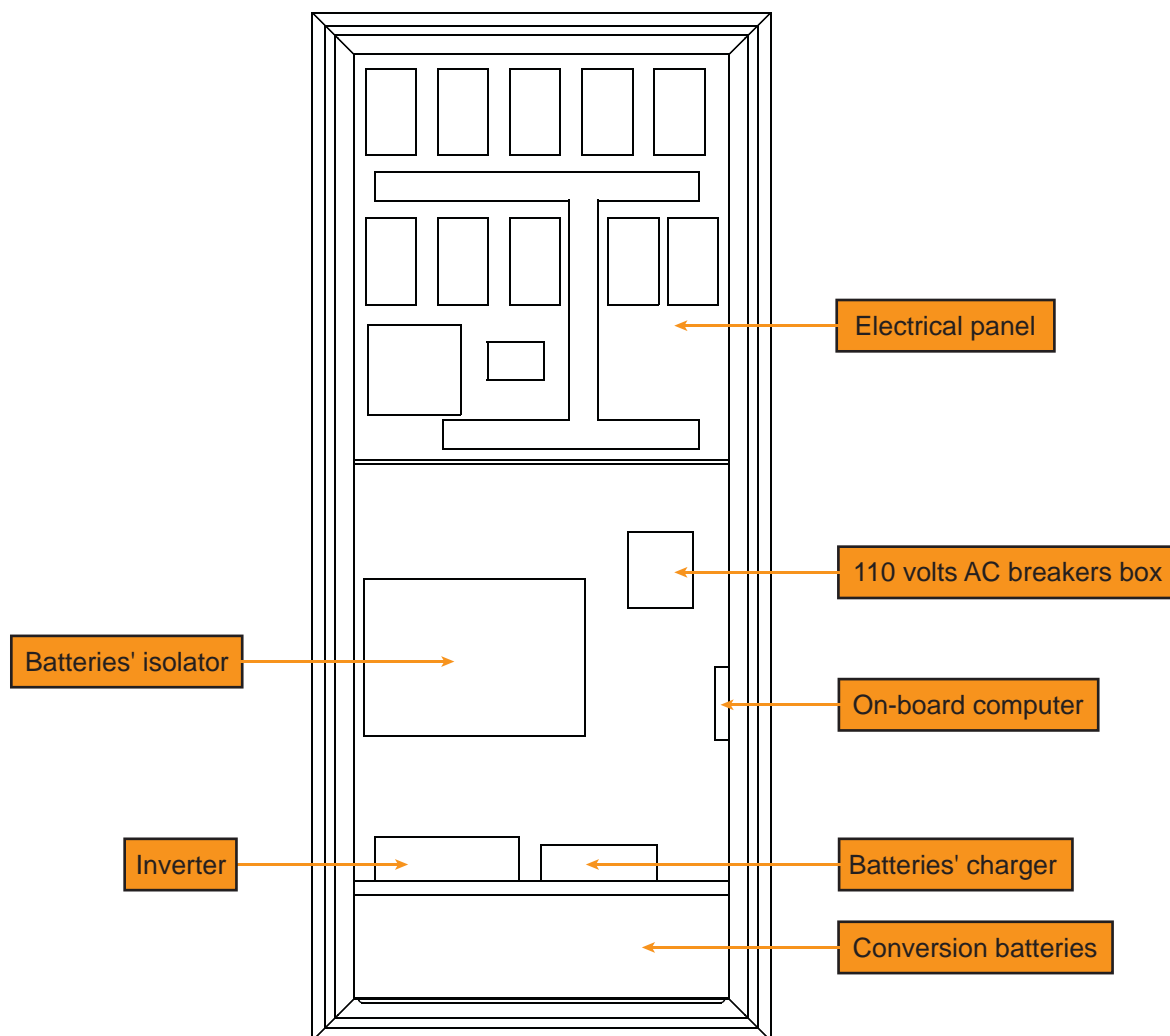
WARNING

- Properly secure all cargo in the right equipment compartment. In a sudden stop or collision, unsecured cargo could cause personal injury.

• PART 4 : EQUIPMENT SECTION - EQUIPMENT STORAGE

G1 - Electrical panel compartment

The electrical panel compartment is located at the front left of the module.



The electrical panel compartment (G1) gives access to almost electrical components of the vehicle. In the electrical panel compartment (G1), there are the electrical panel, the batteries charger, the inverter, the batteries' isolator, the 110 volts AC breakers box, the on-board computer system, the two (2) conversion batteries and many more.

Note : The compartment configuration may change.



WARNING

• Properly secure all cargo in the electrical panel compartment. In a sudden stop or collision, unsecured cargo could cause personal injury.



TECHNICAL MANUAL

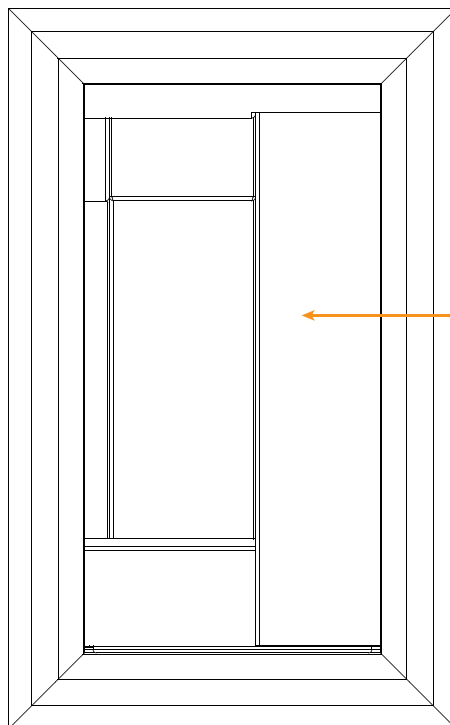
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• PART 4 : EQUIPMENT SECTION - EQUIPMENT STORAGE

A3 - Stretcher and spineboard compartment

The stretcher and spineboard compartment is located at the rear face of the module, left side.



- FW model #9
- FW EXL scoop
- RediHold Najo spineboard

In the stretcher and spineboard compartment (A3), there is a storage space for the stretcher FW model #9, the FW EXL scoop stretcher and a spineboard RediHold Najo.

Note : The compartment configuration may change.



WARNING

- Properly secure all cargo in the stretcher and spineboard compartment. In a sudden stop or collision, unsecured cargo could cause personal injury.



TECHNICAL MANUAL

MX151D - GM



• PART 5 : MAINTENANCE AND CLEANING - MAINTENANCE

WHY MAINTAIN YOUR VEHICLE?

This guide describes the scheduled maintenance required for your vehicle. Carefully following this schedule helps protect against major repair expenses resulting from neglect or inadequate maintenance and may also help to increase the value of your vehicle when you sell or trade it.

It is your responsibility to see that all scheduled maintenance is performed and that the materials used meet DEMERS AMBULANCES engineering specifications. Failure to perform scheduled maintenance specified in this guide will invalidate warranty coverage on parts affected by the lack of maintenance. Be sure receipts or records for completed maintenance are kept with the vehicle and confirmation of the work performed is always recorded in this guide.

Your DEMERS AMBULANCES dealership has trained technicians who can perform the required maintenance using genuine DEMERS AMBULANCES parts. They are committed to meeting your service needs and to assuring your continuing satisfaction.

PROTECTING YOUR INVESTMENT

Maintenance is an investment that will pay dividends in the form of improved reliability, durability and performance. To assure the proper performance of your vehicle and its emission control systems, it is imperative that scheduled maintenance be completed at the designated intervals. DEMERS AMBULANCES strongly recommends the use of genuine DEMERS AMBULANCES replacement parts. Parts other than DEMERS AMBULANCES, or DEMERS AMBULANCES authorized remanufactured parts that are used for maintenance replacement or for the service must be equivalent to genuine DEMERS AMBULANCES parts in performance and durability. It is the owner's responsibility to determine the equivalency of such parts. Please consult your Warranty Guide for complete warranty information.

DEMERS AMBULANCES SERVICE

When you need maintenance for your DEMERS AMBULANCES vehicle, there's only one thing to remember: Service and care, available at your DEMERS AMBULANCES dealership. From scheduled maintenance to more complicated repair work, nobody knows your vehicle better. Protect your investment by choosing DEMERS AMBULANCES service.

THE RIGHT PEOPLE

The difference is training and equipment, which means nobody, is more qualified to work on your DEMERS AMBULANCES than our service technicians. They'll fix it right the first time.

THE RIGHT PARTS

From emergency lights to scene lights and everything in between, nothing fits like an original. With DEMERS AMBULANCES service, you'll get the parts made especially for your vehicle – genuine DEMERS AMBULANCES parts.



TECHNICAL MANUAL

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• PART 5 : MAINTENANCE AND CLEANING - APPEARANCE AND CARE

CLEANING EXTERIOR

To preserve and to maintain the appearance of your vehicle, it is important to take proper care of it.

In the following cases, it is important to wash your vehicle as soon as possible to protect the paint surface :

- After a rainfall to prevent possible damage from acid rain.
- After driving on coastal roads.
- When contaminants such as soot, bird droppings, tree sap, metal particles or bugs get on the paint surface.
- When dust, sand or mud builds up on the surface.

Whenever possible, store or park your vehicle inside a garage or covered area. When it is necessary to park outside, park in a shady area.

WASHING THE VEHICLE

Do not wash the vehicle in direct sunlight. Use a car washing soap. Do not use cleaning agents that are petroleum based or that contain acid or abrasives, as they can damage the paint, metal or plastic on the vehicle. Approved cleaning products can be obtained from DEMERS AMBULANCES. Follow all manufacturers' directions regarding correct products usage, necessary safety precautions and appropriate disposal of any vehicle care product.



CAUTION

- Do not wash the vehicle with strong household soap, strong chemical detergents, gasoline or solvents.
- Do not wash the vehicle in direct sunlight or while the vehicle body is hot, as the surface may become water-spotted.
- Avoid using tight-napped or rough cloths, such as washing mitts. Care must be taken when removing caked-on dirt or other foreign substances so the paint surface is not scratched or damaged.

Rinse the vehicle well, before washing and after to remove all cleaning agents completely. If they are allowed to dry on the surface, they could stain.

Dry the finish with a soft, clean chamois or an all-cotton towel to avoid surface scratches and water spotting.

Inside flanges, seams and folds on the doors, hatches and hood are particularly vulnerable to effects of road salt. Therefore, these areas must be cleaned regularly. Take care that the drain holes in the lower edge of the doors are open. Spray water under the body and in the wheel wells to loosen the dirt and wash away road salt.



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• PART 5 : MAINTENANCE AND CLEANING - APPEARANCE AND CARE

EXTERIOR LENSES

Use lukewarm or cold water, a soft cloth and a car washing soap to clean exterior lenses. Approved cleaning products can be obtained from DEMERS AMBULANCES. Follow all manufacturers' directions regarding correct products usage, necessary safety precautions and appropriate disposal of any vehicle care product.



CAUTION

- Do not wash the exterior lenses with strong household soap, strong chemical detergents, gasoline or solvents.
- Do not wash the exterior lenses in direct sunlight or while the vehicle body is hot, as the surface may become water-spotted.
- Avoid using tight-napped or rough cloths, such as washing mitts. Care must be taken when removing caked-on dirt or other foreign substances so the paint surface is not scratched or damaged.

Rinse the exterior lenses well, before washing and after to remove all cleaning agents completely. If they are allowed to dry on the surface, they could stain.

Dry the finish with a soft, clean chamois or an all-cotton towel to avoid surface scratches and water spotting.



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• PART 5 : MAINTENANCE AND CLEANING - APPEARANCE AND CARE

CHROME VENTS

Use lukewarm or cold water, a soft cloth and a car washing soap to clean chrome vents. When the cleaning of the vehicle with high pressure water, do not direct the high pressure water in the opening of the chrome vents.

Approved cleaning products can be obtained from DEMERS AMBULANCES. Follow all manufacturers' directions regarding correct products usage, necessary safety precautions and appropriate disposal of any vehicle care product.

Rinse the chrome vents well, before washing and after to remove all cleaning agents completely. If they are allowed to dry on the surface, they could stain.

Dry the finish with a soft, clean chamois or an all-cotton towel to avoid surface scratches and water spotting.

Every six (6) months, verify and, if necessary, repair the opening grille of each chrome vents.



CAUTION

- Do not direct the high pressure water in the opening of the chrome vents.
- Do not wash the chrome vents with strong household soap, strong chemical detergents, gasoline or solvents.
- Do not wash the chrome vents in direct sunlight or while the vehicle body is hot, as the surface may become water-spotted.



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• PART 5 : MAINTENANCE AND CLEANING - APPEARANCE AND CARE

WAXING

Regular waxing or mild polishing protects the paint surface and helps retain new vehicle appearance. After waxing, polishing is recommended to remove built up residue and to avoid a “weathered” appearance. Approved cleaning products can be obtained from DEMERS AMBULANCES.

If the vehicle has a basecoat/clearcoat paint finish, the clearcoat gives more depth and gloss to the colored basecoat. Always use waxes and polishes that are non-abrasive and made for a basecoat/clearcoat paint finish.



CAUTION

- Do not use machine compounding or aggressive polishing on basecoat/clearcoat paint finish may damage it.
- Use only non-abrasive waxes and polishes that are made for a basecoat/clearcoat paint finish on the vehicle and the module.

Foreign materials such as calcium chloride and other salts, ice melting agents, road oil and tar, tree sap, bird droppings, chemicals from chimneys, etc., can damage the vehicle's finish if they remain on painted surfaces. Wash the vehicle as soon as possible. If necessary, use non-abrasive cleaners that are marked safe for painted surfaces to remove foreign matter.

Exterior painted surfaces are subject to aging, weather and chemical fallout that can take their toll over a period of years. To help keep the paint finish looking new, keep the vehicle garaged or covered whenever possible.



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• PART 5 : MAINTENANCE AND CLEANING - APPEARANCE AND CARE

WINDSHIELD

Clean the outside of the windshield with glass cleaner.

Clean the rubber blades using a lint free cloth or paper towel soaked with windshield washer fluid or a mild detergent. Wash the windshield thoroughly when cleaning the blades. Bugs, road grime, sap, and a buildup of vehicle wash/wax treatments may cause wiper streaking. Replace the wiper blades if they are worn or damaged.

Wipers can be damaged by :

- Extreme dusty conditions
- Sand and salt
- Heat and sun
- Snow and ice, without proper removal

TIRE

To clean the tires, use a stiff brush with tire cleaner.



CAUTION

- Using petroleum-based tire dressing products on the vehicle may damage the tires. When applying a tire dressing, always wipe off any overspray from all painted surfaces on the vehicle.



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• PART 5 : MAINTENANCE AND CLEANING - APPEARANCE AND CARE

ALUMINIUM WHEELS



CAUTION

- Using strong soaps, chemicals, abrasive, polishes, cleaners, brushes or cleaners that contain acid on aluminium or chrome-plated wheels, could damage the surface of the wheels.
- The repairs would not be covered by the warranty. Use only approved cleaners on aluminium or chrome-plated wheels.

Keep the wheels clean using a soft clean cloth with mild soap and water. Rinse with clean water. After rinsing thoroughly, dry with a soft clean towel. A wax may then be applied.



WARNING

- Using chrome polish on aluminium wheels could damage the wheels.
- Use chrome polish on chrome wheels only.

The surface of these wheels is similar to the painted surface of the vehicle. Do not use strong soaps, chemicals, abrasive polishes, abrasive cleaners, cleaners with acid or abrasive cleaning brushes on them because the surface could be damaged. Do not use chrome polish on aluminium wheels.



CAUTION

- Driving the vehicle through an automatic car wash that has silicone carbide tire cleaning brushes, could damage the aluminium or chrome-plated wheels.
- Never drive a vehicle equipped with aluminium or chrome-plated wheels through an automatic car wash that has silicone carbide tire cleaning brushes.



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• PART 5 : MAINTENANCE AND CLEANING - APPEARANCE AND CARE

CLEANING INTERIOR

The vehicle's interior will continue to look its best if it is cleaned often. Although not always visible, dust and dirt can accumulate on the upholstery. Dirt can damage carpet, fabric and plastic surfaces. Regular vacuuming is recommended to remove particles from the upholstery. It is important to keep the upholstery from becoming and remaining heavily soiled. Soils should be removed as quickly as possible. The vehicle's interior may experience extremes of heat that could cause stains to set rapidly.

Lighter colored interiors may require more frequent cleaning. Use care because newspapers and garments that color to home furnishings may also transfer color to the vehicle's interior.

When cleaning the vehicle's interior, only use cleaners specifically designed for the surfaces being cleaned. Permanent damage may result from using cleaners on surfaces for which they were not intended. Use glass cleaner only on glass. Remove any accidental over-spray from other surfaces immediately. To prevent over-spray, apply cleaner directly to the cleaning cloth.



CAUTION

• Using abrasive cleaners when cleaning glass surfaces on the vehicle, could scratch the glass and/or cause damage to the rear window defogger. When cleaning the on the vehicle, use only a soft cloth and glass cleaner.

Many cleaners contain solvents that may become concentrated in the vehicle's breathing space. Before using cleaners, read and adhere to all safety instructions on the label. While cleaning the vehicle's interior, maintain adequate ventilation by opening the vehicle's doors and windows.

Dust may be removed from small buttons and knobs using a small brush with soft bristles.

Products that remove odors from the vehicle's upholstery and clean the vehicle's glass can be obtained from DEMERS AMBULANCES.

Do not clean the vehicle using :

- A knife or any other sharp object to remove a soil from any interior surfaces.
- A stiff brush. It can cause damage to the vehicle's interior surfaces.
- Heavy pressure or aggressive rubbing with a cleaning cloth. Use of heavy pressure can damage the interior and does not improve the effectiveness of soil removal.
- Laundry detergents or dishwashing soaps with the degreasers can leave residue that streaks and attracts dirt. Use only mild, neutral (pH) soaps.
- Too much cleaner that saturates the upholstery.
- Organic solvents such as naphtha or alcohol that can damage the vehicle's interior.



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- PART 5 : MAINTENANCE AND CLEANING - APPEARANCE AND CARE

SEAT BELTS

The seat belts can be cleaned by wiping them with a sponge dampened in a mild soap solution. Allow belt to dry completely in the shade before using them.



WARNING

- Do not allow wet seat belts to roll up in the retractor. Never use bleach, dye or chemical solvents to clean the seat belts, since these products may severely weaken the seat belt webbing.

Periodically check to see that the seat belt and the metal components, such as buckles, tongues, retractors, flexible wires and anchors, work properly. If loose parts, deterioration, cuts or other damage on the webbing is found, the entire seat belt assembly should be replaced.



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• PART 5 : MAINTENANCE AND CLEANING - APPEARANCE AND CARE

VINYL AND PLASTIC

A soft cloth dampened with water may be used to remove dust. If a more thorough cleaning is necessary, a clean soft cloth dampened with a mild soap solution can be used to gently remove dust and dirt. Never use spot lifters or removers on plastic surfaces. Many commercial cleaners and coatings that are sold preserve and protect soft plastic that surfaces may permanently change the appearance and feel of the interior and are not recommended.

Do not use silicone or wax-based products or those containing organic solvents to clean the vehicle's interior because they can alter the appearance by increasing the gloss in a non-uniform manner.

Some commercial products may increase gloss on the instrument panel. The increase in gloss may cause annoying reflections in the windshield and even make it difficult to see through the windshield under certain conditions.



WARNING

- Do not scrub or use brushes or squeegee.
- Do not use gasoline or acetone to remove glazing compound or grease.



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• PART 5 : MAINTENANCE AND CLEANING - APPEARANCE AND CARE

FLOOR COVERING

The initial clean of your floor covering is essential. A poor initial clean will make routine maintenance more difficult.

Cleaning and maintenance practices will ultimately determine the general appearance and functional benefits offered by your floor covering. The following procedures will help to keep your floor covering looking good and functioning correctly at a reasonable cost.

Maintenance method :

- Mop, sweep or vacuum thoroughly to remove all dust and debris.
- Apply recommended alkaline cleaning agent in correct dilution and leave for several minutes to emulsify the surface soil. Do not let cleaning agent dry.
- Scrub with deck scrubbing brush or a medium nylon scrubbing pad.
- Wet vacuum or mop up residue using twin compartment bucket and wringer.
- Rinse using clean mop and clean water or a neutralizing rinse.
- Wet vacuum or mop and allow drying.

Special grades :

Excessive cleaning or the use of floor finishes and sealers can adversely affect the electrical properties of the floor. Also, some cleaning agents can leave a film and are unsuitable for the use with static dissipative floors – check with the manufacturer of the cleaning agent before use.

Recommended maintenance products :

Some types of cleaning agent should not be used on vinyl, such as pine oil cleaning agents and quaternary cleaners which can cause the floor to stain or become brittle and shrink. Also, some cleaning agents used for the antiseptic properties in operating rooms, showers, Jacuzzis, swimming pool decks and footbaths can have a lubricating effect, resulting in most flooring materials becoming more slippery when wet, even when used in concentrations below 3%.

Compatible cleaning agents :

- | | |
|-----------------------|------------------------------|
| • Altro 44 Cleaner | • Impact Detergent Degreaser |
| • Johnsons Break-Up | • Oasis 115XP |
| • Center Cut | • Blue Thunder |
| • Super Grease Buster | • Taski Profi |



WARNING

- Do not scrub or use brushes or squeegee.
- Do not use gasoline or acetone to remove glazing compound or grease.



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• PART 5 : MAINTENANCE AND CLEANING - APPEARANCE AND CARE

WINDOWS OF THE MEDICAL CABINET

The windows of the medical cabinet can be cleaned by washing gently with a mild soap or detergent and lukewarm water, using a soft cloth or sponge. Rinse again. Dry with a soft cloth or moist cellulose sponge to prevent water spotting.

To remove glazing compound or grease, rub lightly with a good grade of VM&P naphtha or isopropyl alcohol, then wash and rinse.

Compatible cleaning agents :

- | | |
|--------------------|-----------------|
| • Fantastik | • Windex |
| • Formula 409 | • Top Job |
| • Hexcel, F.O. 554 | • PineSol |
| • Joy | • Neleco-Placer |
| • Lysol | • Mr. Clean |



WARNING

- Do not scrub or use brushes or squeegee.
- Do not use gasoline or acetone to remove glazing compound or grease.



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• PART 5 : MAINTENANCE AND CLEANING - APPEARANCE AND CARE

FIBERGLASS

The interior fiberglass can be cleaned by washing gently with a mild soap or detergent and lukewarm water, using a soft cloth or sponge. Rinse again. Dry with a soft cloth or moist cellulose sponge to prevent water spotting.

To remove glazing compound or grease, rub lightly with a good grade of VM&P naphtha or isopropyl alcohol, then wash and rinse.

Compatible cleaning agents :

- | | |
|--------------------|-----------------|
| • Fantastik | • Windex |
| • Formula 409 | • Top Job |
| • Hexcel, F.O. 554 | • PineSol |
| • Joy | • Neleco-Placer |
| • Lysol | • Mr. Clean |



WARNING

- Do not scrub or use brushes or squeegee.
- Do not use gasoline or acetone to remove glazing compound or grease.



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• PART 5 : MAINTENANCE AND CLEANING - APPEARANCE AND CARE

CORROSION PROTECTION

MOST COMMON FACTORS CONTRIBUTING TO VEHICLE CORROSION

1. The accumulation of moisture-retaining dirt and debris in body panel sections, cavities, and other areas.
2. Damage to paint and other protective coatings caused by gravel and stone chips or minor traffic accidents.

ENVIRONMENTAL FACTORS INFLUENCE THE RATE OF CORROSION

Moisture :

Accumulation of sand, dirt and water on the vehicle body underside can accelerate corrosion. Wet floor coverings will not dry completely inside the vehicle, and should be removed for drying to avoid floor panel corrosion.

Relative humidity :

Corrosion will be accelerated :

- In areas of high relative humidity.
- In areas where the temperature stays above freezing.
- Where atmospheric pollution exists.
- Where road salt is used.
- In areas of salty air.

Temperature :

High temperatures accelerate the rate of corrosion to those parts which are not well ventilated.

Air pollution :

Industrial pollution, the presence of salt in the air in coastal areas, or heavy road salt use accelerates the corrosion process. Road salt also accelerates the disintegration of paint surfaces.



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• PART 5 : MAINTENANCE AND CLEANING - APPEARANCE AND CARE

TO PROTECT YOUR VEHICLE FROM CORROSION

- Wash and wax your vehicle often to keep the vehicle clean.
- Always check for minor damage to the paint and repair it as soon as possible.
- Keep drain holes at the bottom of the doors open to avoid water accumulation.
- Check the underbody for accumulation of sand, dirt or salt.



CAUTION

- Never remove dirt, sand or other debris from the patient compartment by washing it out with a hose. Remove dirt with a vacuum cleaner or broom.
- Never allow water or other liquids to come in contact with electronic components inside the vehicle as this may damage them.

Chemicals used for road surface de-icing are extremely corrosive. They accelerate corrosion and deterioration of underbody components such as the exhaust system, fuel and brake lines, brake cables, floor pan and fenders.

For additional protection against rust and corrosion, which may be required in some areas, consult your DEMERS AMBULANCES dealership.



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• PART 5 : MAINTENANCE AND CLEANING - PAINT

PAINT MAINTENANCE

To preserve and to maintain the appearance of the vehicle, it is important to use a soft and clean cloths or an all-cotton towel to avoid surface scratches.

Hazing, chalking or loss of gloss can be caused by improper care, abrasive polishes, cleaning agents, very high pressure washing or aggressive mechanical wash systems. They should no be used.

Approved cleaning products can be obtained from DEMERS AMBULANCES. Follow all manufacturers' directions regarding correct products usage, necessary safety precautions and appropriate disposal of any vehicle care product.

Since galvanic corrosion is a naturally occurring process and not a preparation or paint applications problem, it should be repaired as soon it is noticed.

Accidents, scratches, chips, bruises and gloss reduction should be identify and repair as soon they are notice to prevent deterioration of the paint.



CAUTION

- Do not wash the vehicle with strong household soap, strong chemical detergents, gasoline or solvents.
- Do not wash the vehicle in direct sunlight or while the vehicle body is hot, as the surface may become water-spotted.
- Avoid using tight-napped or rough cloths, such as washing mitts. Care must be taken when removing caked-on dirt or other foreign substances so the paint surface is not scratched or damaged



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• PART 5 : MAINTENANCE AND CLEANING - PAINT

PAINT REPAIR PROCEDURES

ALUMINUM PREPARATION PROCEDURE

- 1- Every place showing corrosion as well must be treated to a 70 grain minimum sandblast or equivalent, ex: medium size glass.
- 2- Sand down with P-180 grain by using a random orbit sander.
- 3- Remove sander dust surplus with the help of a blower and compressed air without oil and/or water.

ALUMINUM CHEMICAL TREATMENT WITH ALUMIPREP OF HENKEL PROCEDURE

- 4- Dilute 5 parts of Alumiprep 33 with 95 parts of water (5%) as hot as possible (1300F) and mix well.
- 5- Vaporize product on all raw aluminum surfaces to be painted.
- 6- Leave product on surfaces for 2 to 3 minutes. Do not let dry.
- 7- Rinse with water pressure ex.: garden gun so that traces of pre-treatment disappear.
- 8- Dry up with the help of a blower and compressed air without oil and/or water.
- 9- Clean with a FW-190 solvent or DX-440 of PPG or equivalent.
- 10- Vaporize primer within 8 hours.

This procedure is a critical step to insure adhesive performances of the primer on the unit, in order to prevent corrosion of the unit.



CAUTION

- Always use personal protection equipment to make this operation.



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• PART 5 : MAINTENANCE AND CLEANING - PAINT

STARPOXY 420 AND 480 PRIMER APPLICATION PROCEDURE

- 11- Apply one (1) coat of Starpoxy 420 primer in a way to obtain a dry thin layer that varies between 0.8 and 1.5 mils. Never go over 1.5 mils dry.
- 12- Let evaporate for about 10 minutes.
- 13- If the Starpoxy 420 primer is older than 36 hours, you must sand it lightly with a new Scotch Brite and remove all traces of dust on surface.
- 14- Apply 1 or 2 coats of Starpoxy 480 primer in a way to build a dry thin layer
- 15- between 2.5 and 5.0 mils dry before sanding.
Let dry all night and apply one guide coat of paint if necessary. Sand with a grade P320 paper.

Reduction :

- Mix 420C0078 catalyst and 425P0076 primer before mixture. Mix 1 part of 420C0076 with 1 part of 425P0076 and add 2.4 oz of aluminum adhesion promoter 190A7718 for each 2 gallons of mixed primer. Let stand about 15 minutes before application.
- Mix 480C9042HB catalyst and 431P7743 primer before mixture. Mix 1 part of 480C9042HB with 2 parts of 431P7743. Let stand about 15 minutes before application.

STARATHANE 550 FINISH COAT APPLICATION PROCEDURE

- 16- Check the primer coat to detect the presence of dust or drippings. To remove dust or drippings, manually sand with grain P400 sanding paper and blow with compressed air to remove the sanding residue.
- 17- Clean surface with a tag rag.
- 18- Apply 2 coats of Starathane 550 finish letting it evaporate between each coats.

Reduction :

4 parts of 550 paint for 1 part of 550C7469 and mix well. Add 1 part of SB-50, 51 or 52 reducing agent for the white and for the yellow. Measure reducing agent as per our recommendation for all new colors.

The 550 finishing coat requires a dry layer that varies between 1.8 mils and 3 mils thickness.



CAUTION

- Pulverize the 550 finishing coat by using a clean air supplied personal breathing system, an antistatic overall and gloves.



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• PART 5 : MAINTENANCE & CLEANING - RECOMMENDED MAINTENANCE SCHEDULE

	Check Every Month on your Vehicle :
	Check tires for wear and proper air pressure
	Check and lubricate the door switches with "Moovit" penetrating lubricant.
	Check and lubricate the three (3) positions door switches with "Fluid Film".
	Check and lubricate the door lock/unlock contact points with dielectric grease.
	In winter, check and lubricate the door locks and lock barrel with "Fluid Film".
	Check safety warning lamps (door ajar, speed, etc) for operation
	Check the standard heating system and clean if necessary
	Check the Espar heating system and clean if necessary
	Check the 110 volts A.C. heating system and clean if necessary
	Check primary stretcher fastener system (single cot)

✓	Check Every Three Months on your Vehicle :
	Check suction device
	Check siren speakers
	Clean and check all connections of the OEM batteries (the torque must be 15 lbf-ft).
	Clean and check all connections of the conversion batteries (the torque must be 15 lbf-ft).
	Lubricate the sliding tray of the conversion batteries with "Fluid Film".
	Check oxygen system and hoses
	Check lap/shoulder belts and seat latches for wear and function
	Check safety net webbing and anchors for wear and function
	Check and lubricate the stretcher FW model #107-C fastener system
	Check and lubricate the stretcher FW model #9 fastener system (sliding wheel and post cups)
	Check and lubricate the rear flip-up step swivels with "Fluid Film".
	Check and lubricate the door handles with "Fluid Film".
	Check and lubricate the door locks and lock barrel with "Fluid Film". (except in winter)
	Check, clean and lubricate the door weatherstrips with silicone emulsion.

NOTE

- Maintenance of materials originally assembled by other than DEMERS AMBULANCES are recommend as per their respective manufacturers documentation.
- During any regular maintenance it is recommended that a visual inspection of all components be performed to identify and prevent any potential problems. It is the responsibility of the owner to fix and repair these issues as soon as they appear to prevent further damaging of the ambulance components. For example, during a visual inspection, any water infiltration, loose screws or damage parts should be noticed and repair to prevent additional cost and damage to other related parts. If appropriate a warranty sheet \ claim should be completed and submitted for DEMERS AMBULANCES to action.



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• PART 5 : MAINTENANCE & CLEANING - RECOMMENDED MAINTENANCE SCHEDULE

✓	Check Every Six Months on your Vehicle :
	Check air pressure in spare tire
	Check all connections of all components in the electrical panel.
	Check and, if necessary, repair the opening grille of each chrome vents.
	Verify and apply "Anti-Seize" on the two (2) tie-down knob of the antler hook.
	Check washer spray, wiper operation, and clean all wiper blades (replace blades as necessary).
	Check and, if necessary, adjust the tension of the each mirrors.
	Check door emergency release latches
	Check cooling system fluid level and coolant strength
	Check cooling system hoses
	Check and clean body and door drain holes
	Check, test and, if necessary, adjust the mechanism of the spare tire.
	Clean and check the power seats in the front cabin.

✓	Check Every Twelve Months on your Vehicle :
	Check and wax all interior surfaces (aluminium, ABS and fiberglass).
	Check quick release oxygen cylinder bracket and tight if necessary
	Clean and check all connection in the batteries' isolator.
	Check, reset and, if necessary, repair all 110 volts AC outlets.

NOTE

- Maintenance of materials originally assembled by other than DEMERS AMBULANCES are recommend as per their respective manufacturers documentation.
- During any regular maintenance it is recommended that a visual inspection of all components be performed to identify and prevent any potential problems. It is the responsibility of the owner to fix and repair these issues as soon as they appear to prevent further damaging of the ambulance components. For example, during a visual inspection, any water infiltration, loose screws or damage parts should be noticed and repair to prevent additional cost and damage to other related parts. If appropriate a warranty sheet \ claim should be completed and submitted for DEMERS AMBULANCES to action.



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• PART 6 : WARRANTY SECTION - WARRANTY GUIDE

DEMERS AMBULANCES BCAS WARRANTY GUIDE

2009 MODEL UNDERSTANDING YOUR DEMERS LIMITED WARRANTIES

Your satisfaction is very important to us.

If you have questions or concerns with your vehicle, we suggest you follow these steps :

1. Contact your authorized DEMERS Service Dealer at :

Knighthill Automotive
10751 River Drive
Richmond, BC V6X 1Z2
888-546-8333

2. If the inquiry or concern is not resolved in a reasonable period of time, please contact the Demers Customer Assistance Centre at :

ARVI, Inc
303 Jessop Ave.
Saskatoon SK S7N 1Y5
877-373-4464

Demers Ambulances
Customer Assistance Center
info@demers-ambulances.com
1-800-363-7591 (toll free)

1. INTRODUCTION

Demers Ambulances (DEMERS) thanks you for buying a Demers Ambulance.

When you need warranty repairs you may take your vehicle to any DEMERS authorized service centre (see separate sheet setting for these locations). Certain warranty repairs require special training though, so not all service centres are authorized to perform all warranty repairs. That means that, depending on the warranty repair needed, the vehicle may need to be taken to another centre. If a particular centre cannot assist you, then contact the DEMERS Customer Assistance Centre as set forth above.

This guide explains in detail the warranty coverages that apply to your 2009 model year Demers Ambulance.

DEMERS provides the following Limited Warranties (Hereafter collectively referred to as the "Limited Warranties") :

1. Modular Body Structure Limited Warranty
2. Ambulance Workmanship/ Materials Limited Warranty
3. Modular body Paint Limited Warranty
4. Electrical Limited Warranty
5. Structural Workmanship/ Materials assembled by other than Demers Limited Warranty

General Motors Corporation provides the New Vehicle Limited Warranty as well as the Federal and California Emissions Defect Warranties and Emissions Performance Warranties.

Please see the separate GM warranty booklet for the chassis coverages.



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• PART 6 : WARRANTY SECTION - WARRANTY GUIDE

Access to Service

Demers Ambulances and/or authorized dealer(s) will be available to the ambulance services for warranty claims, service advice or parts sales via a toll-free telephone number, Monday to Friday, 8:00 a.m. to 4:30 p.m. Pacific Standard Time (PST). An answering machine will be connected to the telephone during the hours not specified above and monitored daily.

If the distance (or travel time) from the assigned work address of an ambulance to the Demers Ambulances or authorized agent's premises is more than 100 km (or three-hours travel) outside the GVRD, or within the GVRD 40 km (25 miles) (or one-hour travel time), BCAS should contact Demers or its authorized dealer to verify if a local service is qualified with Demers. If not, Demers or its agent will provide the address of another location that meets our qualification.

The warranty work will then be undertaken at the nearest qualified service outlet acceptable to BCAS and Demers. Warranty reimbursement rates and parts used in the service work will be negotiated by Demers and/or its authorized agent.

Fleet failure

Demers Ambulances warrants that should any individual part, component, assembly or system fail on fifteen (15) percent (or a minimum quantity of eight (8), whichever is greater) of the vehicles supplied under a single contract during the first 12 months in service, that such a failure will be expected to be deemed a 'Fleet Failure'. The 12-month period will commence, at the latest, when the prototype unit is delivered to BCAS.

A Fleet Failure will be remedied by replacement or repair of the failed part, component, assembly or system in a manner approved by BCAS in all vehicles supplied under the same contract, whether or not each vehicle has experienced similar failure, at no additional cost to BCAS.

Component Inventory

For the anticipated service life of the ambulance, as determined by BCAS policy, Demers Ambulances (through ARVI and/or Knighthill Automotive) will maintain sufficient components in stock and deliver the necessary components to facilitate a repair within 48 hours of a vehicle breakdown.

Extended Warranty

Since Demers Ambulances does not have data on past performances similare modular units in the BC market condition, an extended warranty for BCAS units can be made available at a competitive price only upon determination and approval of the final Prototype configuration and by exchanging information with BCAS on their past experience. Prices for extended warranties in other markets where Demers has experience have ranged between 1500\$ to 3000\$ depending on the coverage and length of time required by the customer.



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• PART 6 : WARRANTY SECTION - WARRANTY GUIDE

2. IMPORTANT INFORMATION YOU SHOULD KNOW :

IF YOU NEED CUSTOMER ASSISTANCE :

For customer assistance, please follow the procedure outlined in section 3 of this warranty guide.

KNOW WHEN EACH LIMITED WARRANTY BEGINS AND HOW LONG IT LASTS :

The In Service Date for each Limited Warranty is the day it is first put into service or a maximum of 90 days from date of acceptance by the owner, whichever occurs first. Each Limited Warranty lasts for the length of time specified in that Limited Warranty or until any applicable mileage stated in that Limited Warranty, whichever occurs first.

CHECK YOUR VEHICLE :

We check vehicles carefully at the assembly facility and make every effort to correct any damage to paint, sheet metal, upholstery, or other appearance items. But occasionally something may slip past us, and a customer may find that a vehicle was damaged before retail delivery. If you see any damage when you receive your vehicle, notify your DEMERS DEALER immediately.

MAINTAIN YOUR VEHICLE PROPERLY :

Your vehicle contains an Owner's Manual and a Scheduled Maintenance Guide which indicates the scheduled maintenance required for your vehicle. Proper maintenance guards against major repair expenses resulting from neglect or inadequate maintenance.

It is your responsibility to make sure that all of the scheduled maintenances are performed and that the materials used meet applicable engineering specifications. Failure to perform scheduled maintenance as specified in the Service Guide will invalidate warranty coverage on parts affected by the lack of maintenance. Make sure that receipts for completed maintenance work are retained with the vehicle and confirmation of maintenance work is always kept.

COVERAGE UNDER THE LIMITED WARRANTIES :

During a Limited Warranty coverage period, the authorized DEMERS service centre will repair, replace, or adjust all parts on your vehicle (except as excluded in the exclusions section of each Limited Warranty) that are defective in factory-supplied materials or workmanship. Items and conditions that are not covered by the Limited Warranties are described in each Limited Warranty.

When making warranty repairs on your vehicle, the authorized service centre will use new or remanufactured DEMERS parts or other parts authorized by DEMERS.

WHO PAYS FOR WARRANTY REPAIRS?

You will not be charged for covered warranty repairs made during the coverage periods of the Limited Warranties.

Some states/provinces may require a tax on all or a portion of warranty repairs. Where state/province law allows, the tax must be paid by you, the owner of the vehicle.

VEHICLES TO WHICH THE LIMITED WARRANTIES DO APPLY :

The Limited Warranties described in this booklet apply to your vehicle if :

- it was originally sold or leased in the province of British Columbia, Canada and
- it was originally registered/licensed in British Columbia, Canada and
- it is being operated in British Columbia, Canada.



TECHNICAL MANUAL

MX151D - GM



• PART 6 : WARRANTY SECTION - WARRANTY GUIDE

LIMITATIONS ON ALL OF YOUR LIMITED WARRANTIES :

ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE APPLICABLE TO THE VEHICLE IS LIMITED TO THE DURATION OF THE APPLICABLE LIMITED WARRANTY. THE PERFORMANCE OF REPAIRS AND NEEDED ADJUSTMENTS ARE THE EXCLUSIVE REMEDIES UNDER ALL THE LIMITED WARRANTIES. DEMERS SHALL NOT BE RESPONSIBLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGE, SUCH AS LOSS OF TIME, INCONVENIENCE, LOSS OF USE OF THE VEHICLE, LOANER VEHICLES, LODGING, FOOD, TOWING, PERSONAL PROPERTY, OR LOSS OF BUSINESS PROFITS.

The implied warranties are limited, to the extent allowed by law, to the time period covered by the written warranties, or to the applicable time period provided by state/province law, whichever period is shorter.

Some states/provinces do not allow DEMERS to limit how long an implied warranty lasts or to exclude or limit incidental or consequential damages, so the limitation and exclusions described above may not apply to you.

NOTE

This information about the limitation of implied warranties and the exclusion of incidental and consequential damages is applicable to all the Limited Warranties.

Your Limited Warranties give you specific legal rights. You may have other rights that vary from state to state or from province to province. The Limited Warranties are the only express warranties from DEMERS applicable to your vehicle. DEMERS does not authorize anyone to assume for it any other obligation or liability in connection with your vehicle or the Limited Warranties.

DEMERS reserves the unrestricted right at any time and from time to time to make changes in design of and/or improvements on its products without thereby imposing any obligation on itself to make corresponding changes or improvements in or on its products theretofore manufactured.

WHAT IS NOT COVERED UNDER ANY OF THE LIMITED WARRANTIES :

1. Abuse, negligence or unapproved alteration of original parts.
2. Damage from accidents.
3. Proven failure of a third party to adhere to comprehensively detailed remount instructions of the proponent that results in any impairment is also exempted.
4. Accidents, collision or objects striking the vehicle.
5. Theft, vandalism, or riot.
6. Fire or explosion.
7. Freezing.
8. Misusing the vehicle, such as driving over curbs, overloading.
9. Altering or modifying the vehicle – including the engine, body, chassis, or components – after the vehicle leaves DEMERS's control.
10. Non-Demers approved parts installed after the vehicle leaves DEMERS's control. For example, but not limited to, cellular phones, alarm systems, sun visors, fog lights and automatic starting systems.
11. Tampering with the vehicle.
12. Disconnecting or altering the odometer or allowing the odometer to be inoperative for an extended period of time with the result that the actual mileage cannot be determined.
13. Using contaminated or improper fuel/fluids.
14. Customer-applied chemicals or accidental spills.



TECHNICAL MANUAL

MX151D - GM



• PART 6 : WARRANTY SECTION - WARRANTY GUIDE

STEPS YOU MUST FOLLOW IN ORDER TO OBTAIN WARRANTY SERVICE

To obtain warranty service, you must :

1. First contact the authorized DEMERS DEALER which is Knighthill Automotive. They will be able to handle your service needs first. In the event that they are not available or you require additional assistance, contact a DEMERS Warranty Service Representative directly :

1-800-363-7591 (toll free - Canada & U.S.)
info@demers-ambulances.com

- Have all pertinent information ready for the representative, including:
- Vehicle make and model (GM G3500 chassis);
- Demers model (Mystere MX160D);
- DEMERS stock number;
- VIN (Vehicle Identification Number);
- Date of delivery;
- Current mileage;
- And any other pertinent information associated with the purchase of your ambulance.

2. To be eligible for any warranty service, you or your dealer (which ever applies) must send the claim form (via fax; email or regular mail) found in your Owner's Manual with the proper information.

3. Your warranty replacement parts will be sent as soon as possible. The returned defective part must be received by your DEMERS DEALER within 30 days of shipment of the replacement part. If the defective part is received within the required 30 day period, and is confirmed as being defective by DEMERS technical personnel, there will be no charge to you whatsoever.

NOTE

If the claimed defective part or the claim form is not received by your DEMERS DEALER within 30 days of shipment of the warranty replacement part, or if the part is determined not to be defective, your DEMERS DEALER will invoice you for the entire cost, plus handling, for the replacement part. It is your responsibility to return the claimed defective part to your DEMERS DEALER within 30 days of receipt of the replacement part in order to avoid being invoiced for the replacement part.

4. All approved warranty work must be completed by a DEMERS authorized service centre or by DEMERS in Quebec, Canada. Occasionally, your dealer may need to obtain authorization from DEMERS for major work to be completed. Please do not take it upon yourself to make arrangements for the completion of warranty work. By doing so, and without the appropriate approval from a DEMERS Warranty Service representative, you may be responsible for the total cost of the service completed.

5. If you have any questions concerning DEMERS's warranty policies, please contact a DEMERS Warranty Service representative.



TECHNICAL MANUAL MX151D - GM



• PART 6 : WARRANTY SECTION - LIMITED WARRANTIES

DEMERS AMBULANCES LIMITED WARRANTIES

2009 MODEL LIMITED WARRANTIES

TEN YEARS (10) UNLIMITED MILEAGE MODULAR BODY STRUCTURE LIMITED WARRANTY

WHAT IS COVERED?

DEMERS warrants against parts failure or malfunction due to design and construction, to the original retail purchaser only, that each new modular ambulance body manufactured by DEMERS, shall be structurally sound and free of all structural defects of both material and workmanship, under normal use and service and further warrants that it will maintain such structural integrity for a period of ten (10) years from the in-service date to the original purchaser by an authorized DEMERS distributor or dealer. The obligations of DEMERS under this warranty is limited to repairing and replacing, at its option, any component as a whole or any part related to the modular ambulance body. Parts may be replaced with refurbished parts of like kind and quality. Service will be provided during normal business hours.

Also, Demers warrants against parts failure or malfunction due to design and construction, to the original retail purchaser only, that each new ambulance manufactured by DEMERS, shall be free from defects in all Demers-integral components, including access and compartments doors and hinges; under normal use and service and for any impairment related to workmanship and/or materials originally assembled by Demers, including but not limited to the replacement of the component as a whole or any part thereof.

In the event a modular body remount by the original owner is performed prior to the expiration of the original Body Warranty, this Structural Body Warranty shall remain in effect providing the remount work is completed by DEMERS personnel or at a facility approved by DEMERS.

Should repairs become necessary under the term of this warranty, the extent of that repair shall be determined solely by DEMERS and shall be performed solely by DEMERS or a repair facility designated by DEMERS. The expense of any transportation to or from such repair facility shall be that of the purchaser and is not an item covered by this warranty.

This warranty is conditioned upon :

- normal use and proper maintenance of such modular body.
- prompt written notice of any defects submitted to DEMERS or one of its authorized dealers in the area.
- no alteration or additions to the modular structure except by DEMERS or authorized by it.

If any of such conditions are not complied with, this warranty shall become void and unenforceable.

WHAT IS NOT COVERED?

1. Abuse, negligence or unapproved alteration of original parts.
2. Damage from accidents.
3. Proven failure of a third party to adhere to comprehensively detailed remount instructions of the proponent that results in any impairment is also exempted.



TECHNICAL MANUAL

MX151D - GM



• PART 6 : WARRANTY SECTION - LIMITED WARRANTIES

FIVE YEAR (5) UNLIMITED MILEAGE WORKMANSHIP/ MATERIALS LIMITED WARRANTY

WHAT IS COVERED?

DEMERS warrants against parts failure or malfunction due to design and construction, to the original retail purchaser only, that each new ambulance manufactured by DEMERS, shall be free from defects in all Demers-supplied materials and workmanship, under normal use and service for a period of five (5) YEARS from the in-service date to the original purchaser by an authorized DEMERS distributor or dealer. The obligations of DEMERS under this warranty is limited to repairing and replacing, at its option, any component as a whole or any part thereof which shall be returned with transportation charges prepaid to an authorized DEMERS distributor or dealer, and which examination shall disclose to have been defective. except as hereinafter provided. Parts may be replaced with refurbished parts of like kind and quality. Service will be provided during normal business hours.

Should repairs become necessary under the terms of this warranty, the extent of that repair shall be determined solely by DEMERS and shall be performed solely by DEMERS or a repair facility designated by DEMERS. The expense of any transportation to or from such repair facility shall be that of the vehicle owner and is not an item covered by this warranty.

Note : A six (6) month adjustment, from date of in-service, of door latches and pins is covered under this warranty.

WHAT IS NOT COVERED?

1. Abuse, negligence or unapproved alteration of original parts.
2. Damage from accidents.
3. Proven failure of a third party to adhere to comprehensively detailed remount instructions of the proponent that results in any impairment is also exempted.



TECHNICAL MANUAL

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• PART 6 : WARRANTY SECTION - LIMITED WARRANTIES

FIVE-YEAR (5) UNLIMITED MILEAGE MODULAR BODY PAINT LIMITED WARRANTY

WHAT IS COVERED?

DEMERS AMBULANCES warrants to each original owner, that under normal use and service, new modular body paintwork provided by a DEMERS AMBULANCES PAINT & COATING ACCREDITED MANUFACTURER shall be free from defects in material and workmanship as set forth below for a period of FIVE (5) YEARS. The following paint failures are covered :

- Peeling or delaminating of the topcoat and/or other layers of paint
- Cracking or checking
- Loss of gloss caused by cracking, checking, and hazing
- Any paint failure caused by defective paint
- Rust
- Corrosion

WHAT IS NOT COVERED?

The following items are specifically excluded from the DEMERS Modular Body Paint Limited Warranty :

1. Abuse, negligence or unapproved alteration of original parts.
2. Damage from accidents.
3. Proven failure of a third party to adhere to comprehensively detailed remount instructions of the proponent that results in any impairment is also exempted.

Should repairs become necessary under the terms of this warranty, the extent of that repair shall be determined solely by DEMERS and shall be performed by DEMERS or a repair facility designated by DEMERS. The expense of any transportation to or from such repair facility shall be that of the purchaser and is not an item covered by this warranty.



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• PART 6 : WARRANTY SECTION - LIMITED WARRANTIES

FIVE-YEAR (5) UNLIMITED MILEAGE ELECTRICAL LIMITED WARRANTY

WHAT IS COVERED?

DEMERS warrants against parts failure or malfunction due to design and construction, to the original purchaser only, that the electrical system on each new ambulance manufactured by DEMERS shall be free from defects in materials and workmanship, under normal use and service for a period of Five (5) YEARS from the in-service date by an authorized DEMERS distributor or dealer. The obligations of DEMERS under this warranty is limited to repairing and replacing, at its option, any component as a whole or any part thereof which shall be returned with transportation charges prepaid to an authorized DEMERS distributor or dealer, and which examination shall disclose to have been defective except as hereinafter provided.

Should repairs become necessary under the terms of this warranty, the extent of that repair shall be determined solely by DEMERS and shall be performed solely by DEMERS or a repair facility designated by DEMERS. The expense of any transportation to or from such repair facility shall be that of the vehicle owner and is not an item covered by this warranty.

Items specifically covered under the DEMERS AMBULANCES Electrical Warranty include :

- Electrical harnesses and harness installation
- Printed circuit board(s)
- Switches
- Circuit breakers and relays

Note: Conversion bulbs have a one (1) year warranty replacement coverage.

WHAT IS NOT COVERED?

The following items are specifically excluded from the DEMERS Electrical Limited Warranty :

1. Abuse, negligence or unapproved alteration of original parts.
2. Damage from accidents.
3. Proven failure of a third party to adhere to comprehensively detailed remount instructions of the proponent that results in any impairment is also exempted.



TECHNICAL MANUAL

MX151D - GM



• PART 6 : WARRANTY SECTION - LIMITED WARRANTIES

TWO-YEAR (2) /UNLIMITED MILEAGE AMBULANCE WORKMANSHIP/ MATERIALS ON ASSEMBLED COMPONENTS OTHER THAN DEMERS LIMITED WARRANTY

WHAT IS COVERED?

DEMERS warrants against parts failure or malfunction due to design and construction, to the original retail purchaser only, that each new ambulance manufactured by DEMERS shall be free from defects in all materials which were originally assembled by other than DEMERS, under normal use and service for a period of TWO (2) Years from the in service date to the original purchaser by an authorized DEMERS distributor or dealer. The obligations of DEMERS under this warranty is limited to repairing and replacing , at its option, any component as a whole or any part thereof which shall be returned with transportation charges prepaid to an authorized DEMERS distributor or dealer, and which examination shall disclose to have been defective, except as hereinafter provided. Parts may be replaced with refurbished parts of like kind and quality. Service will be provided during normal business hours.

These items include, but are not limited to, the following : battery chargers; sirens; inverters; batteries; light bars and similar OEM equipment. These excluded items are typically covered by separate warranties supplied by the OEM manufacturer of the component. When necessary, DEMERS Customer Service personnel will assist you in pursuing warranty assistance with the OEM manufacturers of these components, should their stated warranty be in excess of the basic DEMERS warranties.

Should repairs become necessary under the terms of this warranty, the extent of that repair shall be determined solely by DEMERS and shall be performed solely by DEMERS or a repair facility designated by DEMERS. The expense of any transportation to or from such repair facility shall be that of the vehicle owner and is not an item covered by this warranty.

WHAT IS NOT COVERED?

The following items are specifically excluded from the DEMERS Special Conditions Ambulance Features Limited Warranty :

1. Abuse, negligence or unapproved alteration of original parts.
2. Damage from accidents.
3. Proven failure of a third party to adhere to comprehensively detailed remount instructions of the proponent that results in any impairment is also exempted.



TECHNICAL MANUAL MX151D - GM



- PART 6 : WARRANTY SECTION - RECEIPT AND ACKNOWLEDGMENT OF LIMITED WARRANTIES

DEMERS AMBULANCES RECEIPT AND ACKNOWLEDGMENT OF BCAS LIMITED WARRANTIES

The undersigned acknowledges receipt and understanding of DEMERS AMBULANCES Ambulance Workmanship/ materials Limited Warranty, Structural Body Integrity Limited Warranty, Modular Body Paint Limited Warranty and Electrical Limited Warranty. These Limited Warranties have been reviewed in detail and I understand the policies and procedures outlined in each warranty.

Accepted and agreed to this day of _____, _____.

OWNER INFORMATION	DEALERSHIP INFORMATION
Name : _____	Name : _____
Address : _____ _____ _____	Address : _____ _____ _____
Representative Name : _____	Dealership Representative : _____
Representative Signature : _____	Dealership Signature : _____

VEHICLE INFORMATION

BCAS Vehicle Identification Number : _____
Vehicle Identification Number (VIN) : _____
In Service Date : _____
Mileage on the vehicle at date of delivery : _____


DEMERS AMBULANCES (reserved section)
Date : _____
Signature : _____



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• PART 6 : WARRANTY SECTION - BCAS CLAIM FORM

 DEMERS AMBULANCES www.demers-ambulances.com	<h1>BCAS Claim form</h1>	AQ-F-SC.2 rev.0
		Page : 1 of 1

BCAS UNIT N° :	<input type="text"/>	Warranty : <input type="checkbox"/>
		Non-conformity : <input type="checkbox"/>

- Vehicle serial number (V.I.N.) (Number on dash, driver side)
- Demers stock number :
- Kilometers :
- Date in service (YY/MM/DD) :
- Date of failure (YY/MM/DD) :
- Date of claim (YY/MM/DD) :
- Description of the problem :
- Cause(s) of the problem :
- Corrective(s) action(s) taken :

Part N°	QTY	DESCRIPTION

		Invoice N° :	
--	--	--------------	--

DEMERS RESERVED SECTION	
Claim authorization N°	<input type="text"/>
Time allowed for repairs	<input type="text"/>
Claim authorization date	<input type="text"/>

28 Richelieu, Beloeil (Québec) Canada J3G 5P7 450.467.4683 Fax 450.467.6526 www.demers-ambulances.com 1.800.363.7591
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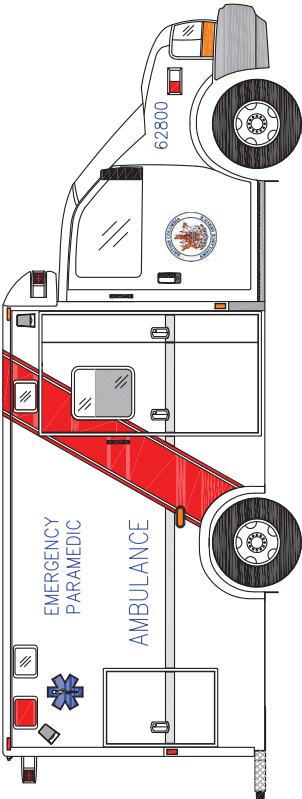
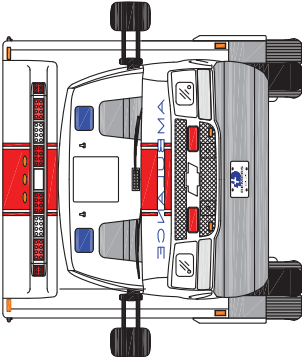
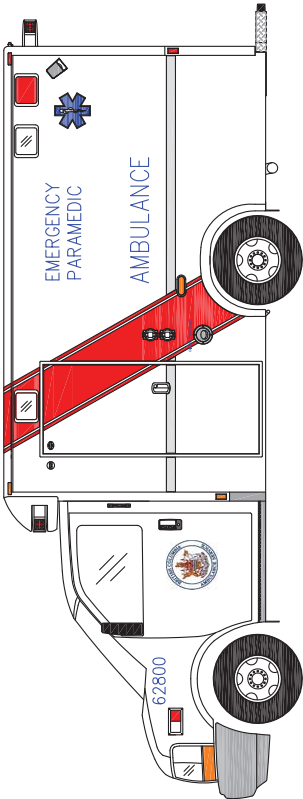
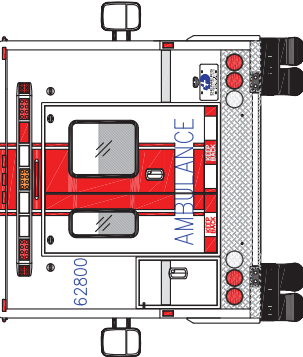
TECHNICAL MANUAL

MX151D - GM



- PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - SALE DRAWINGS

GENERAL EXTERIOR VIEWS

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 		CHASSIS/FRAME CHEVROLET		DESS./DRAW. : RENAUD CARRIER		REV.: 0	
		ECH./SCALE 1 : 50		VENT./SALES : YVES MARTIN		DATE: 28/11/08	
		PAGE 2 / 16		INGEN./ENGIN. : RENAUD CARRIER		# BOITE : TBA	



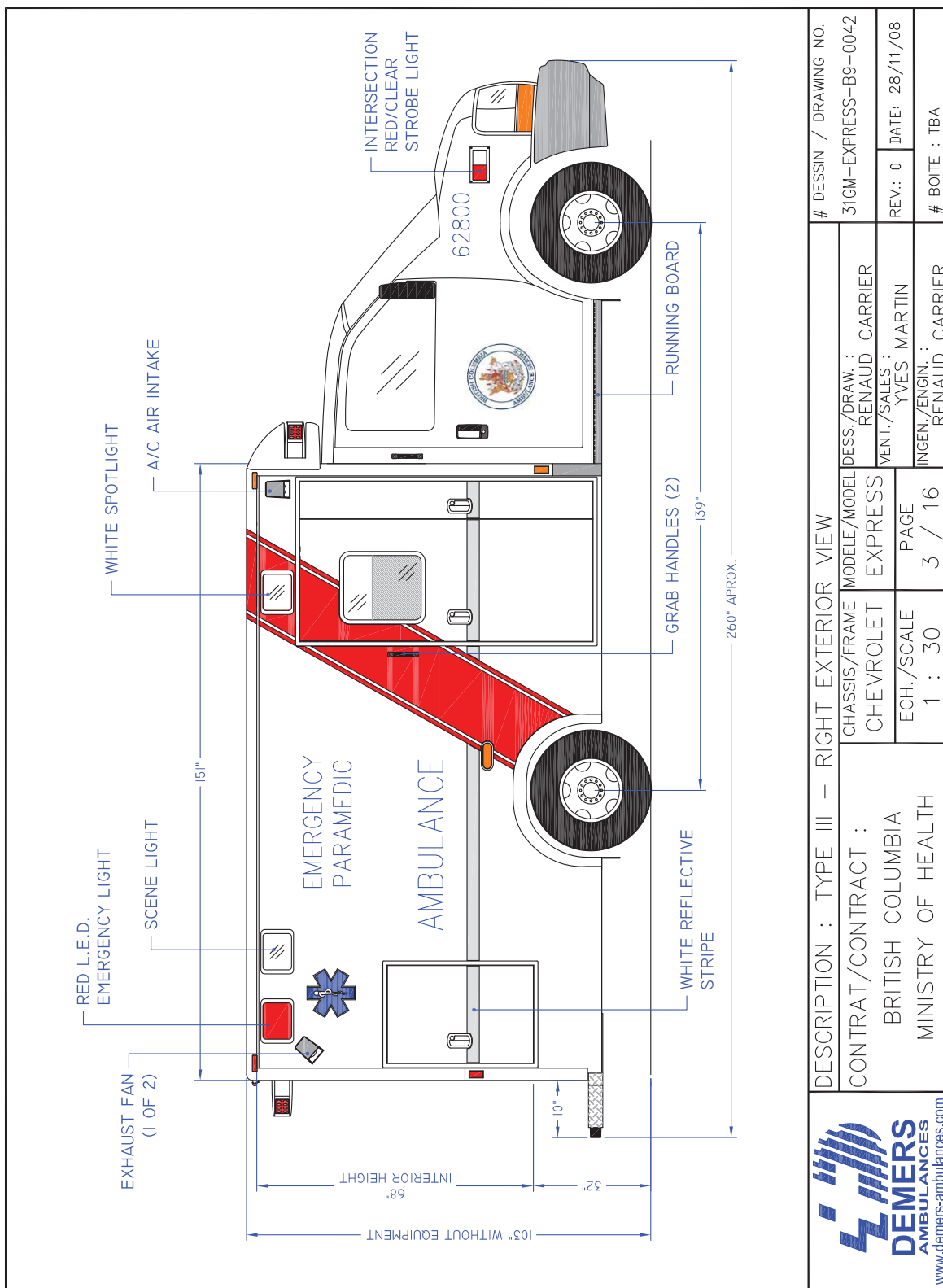
TECHNICAL MANUAL

MX151D - GM



• PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - SALE DRAWINGS

RIGHT EXTERIOR VIEW



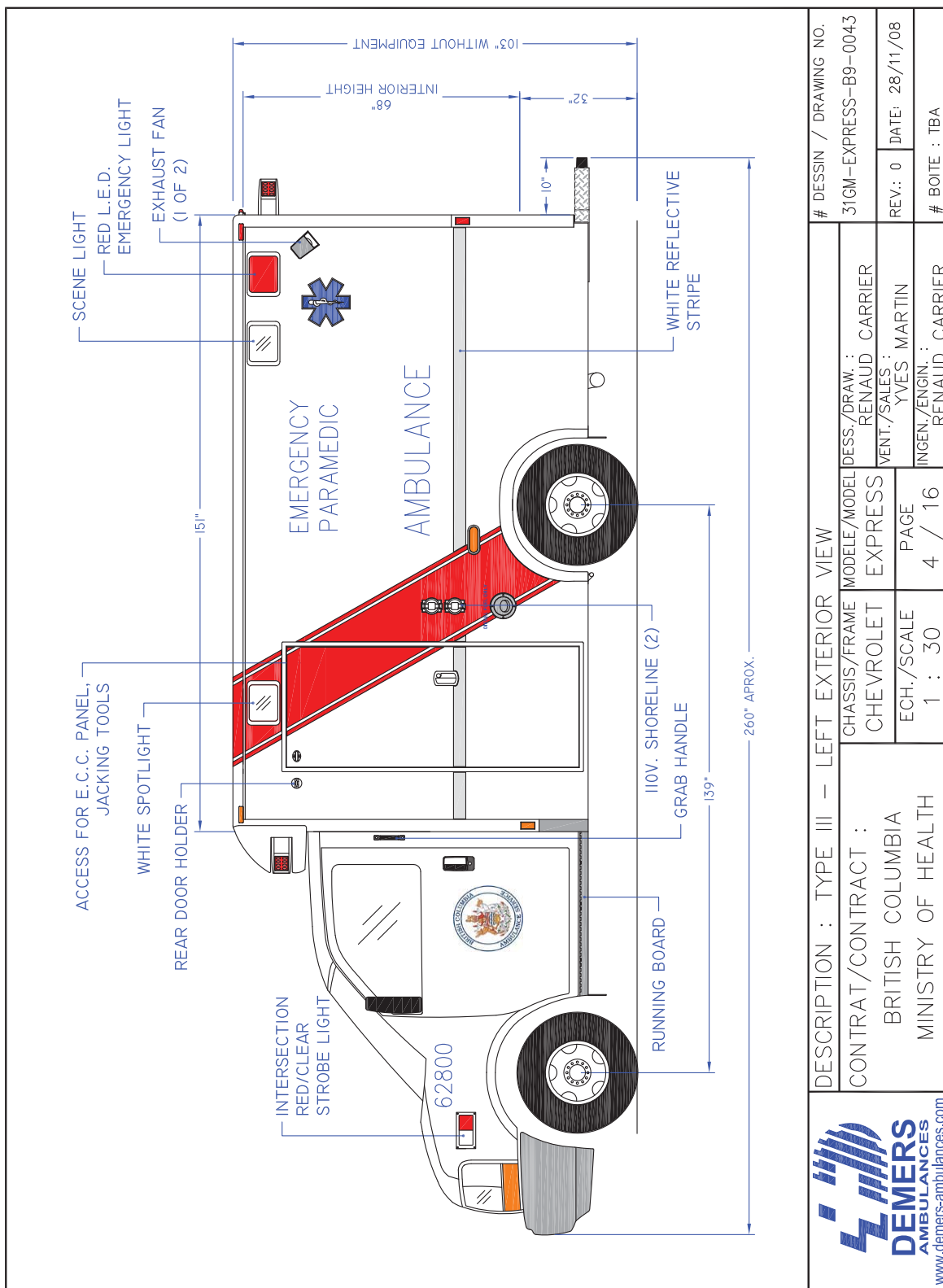


TECHNICAL MANUAL MX151D - GM



• PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - SALE DRAWINGS

LEFT EXTERIOR VIEW





TECHNICAL MANUAL

MX151D - GM



• PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - SALE DRAWINGS

FRONT FACE EXTERIOR VIEW

WHITE STROBE EMERGENCY LIGHT

WHITE L.E.D. EMERGENCY LIGHT

92"

RED L.E.D. EMERGENCY LIGHT

ANGLED RED L.E.D. EMERGENCY LIGHT

FRONT SPLIT RED/CLEAR L.E.D. EMERGENCY LIGHT

AMBER L.E.D. LIGHT (2)

RED L.E.D. EMERGENCY LIGHTS (2)

WIRING PREPARATION FOR FOG LIGHTS (2)

DESCRIPTION : TYPE III – FRONT FACE EXTERIOR VIEW	# DESSIN / DRAWING NO.	
	31GM – EXPRESS – B9 – 0044	
	CHASSIS/FRAME	MODELE/MODEL
	CHEVROLET	EXPRESS
CONTRAT/CONTRACT : BRITISH COLUMBIA MINISTRY OF HEALTH	VENT./SALES :	RENAUD CARRIER
	YVES MARTIN	
	INGEN./ENGIN. :	RENAUD CARRIER
ECH./SCALE	PAGE	
1 : 25	5 / 16	



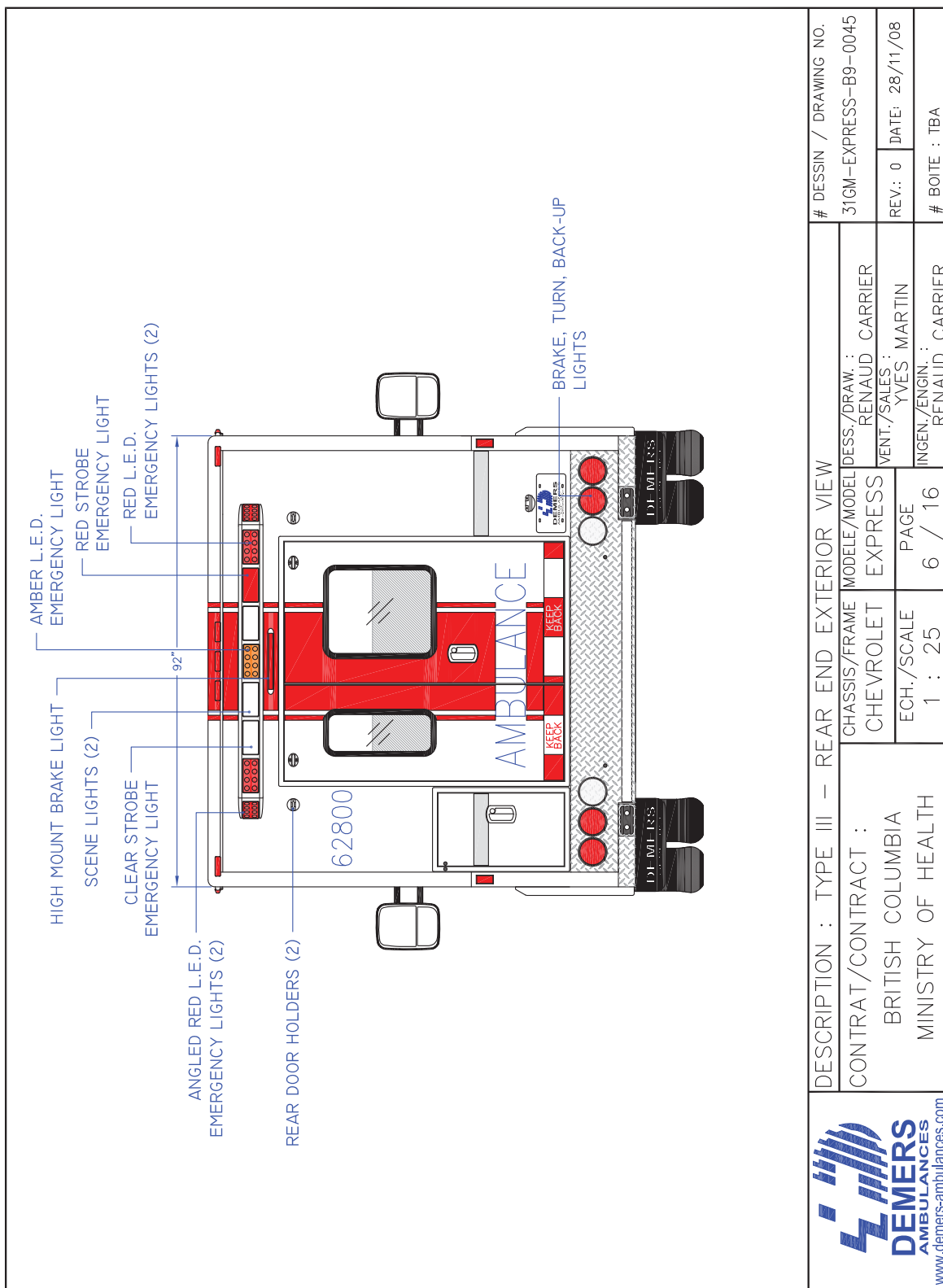
TECHNICAL MANUAL

MX151D - GM



• PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - SALE DRAWINGS

REAR END EXTERIOR VIEW



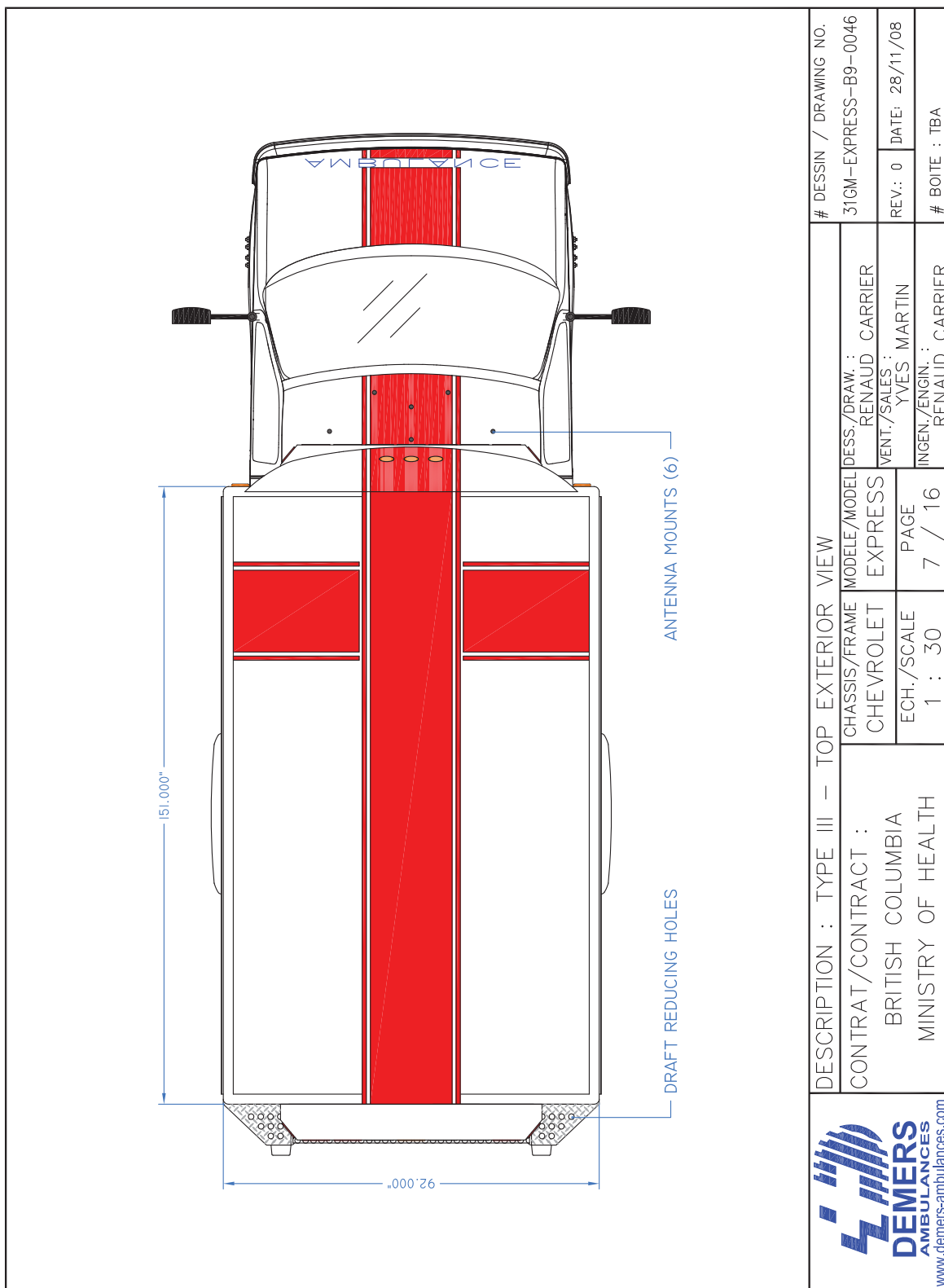


TECHNICAL MANUAL MX151D - GM



• PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - SALE DRAWINGS

TOP EXTERIOR VIEW





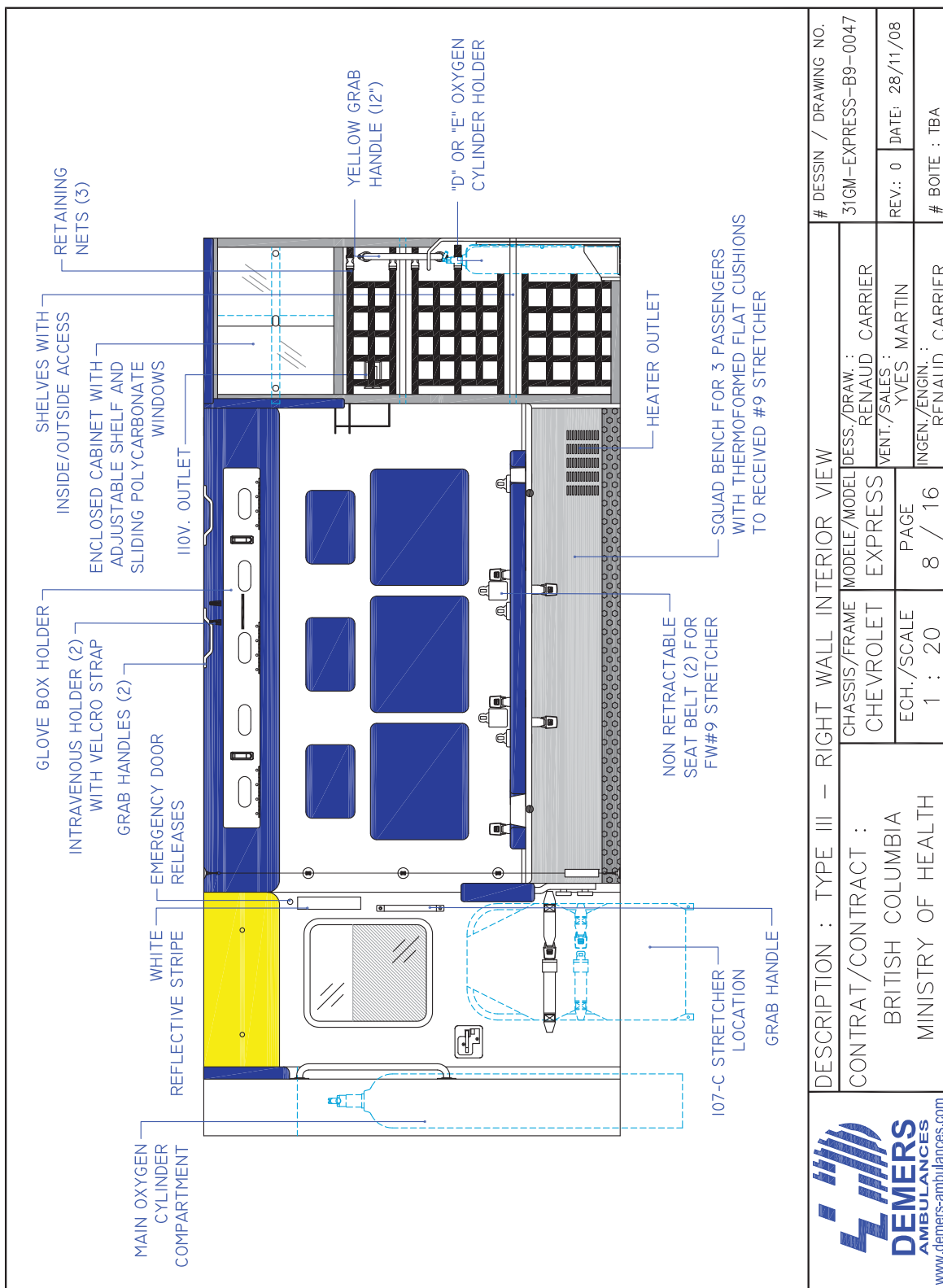
TECHNICAL MANUAL

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• PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - SALE DRAWINGS

RIGHT WALL INTERIOR VIEW





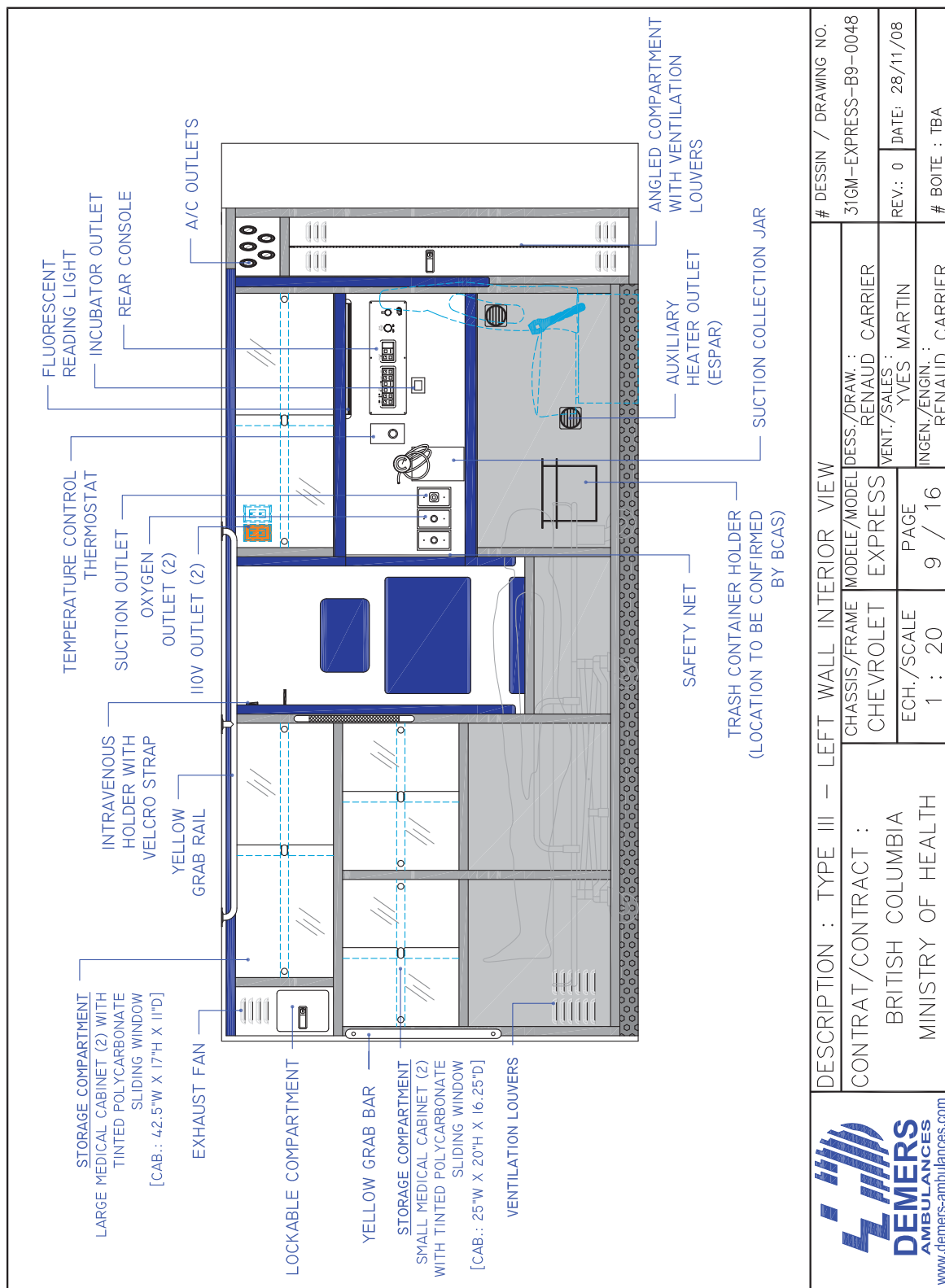
TECHNICAL MANUAL

MX151D - GM



• PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - SALE DRAWINGS

LEFT WALL INTERIOR VIEW





TECHNICAL MANUAL

MX151D - GM



• PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - SALE DRAWINGS

FRONT WALL INTERIOR VIEW

A/C OUTLETS

COMMUNICATION PASSTHROUGH

YELLOW GRAB BAR

SHARPS CONTAINER HOLDER (LOCATION TO BE CONFIRMED WITH BCAS)

ACCESS WINDOW FOR OXYGEN CYLINDER (2)

MAIN OXYGEN CYLINDER COMPARTMENT

SAFETY VEST HOLDER (BEHIND ATTENDANT SEAT)

110V. HEATER

DESCRIPTION : TYPE III – FRONT WALL INTERIOR VIEW		# DESSIN / DRAWING NO.
CONTRAT/CONTRACT : BRITISH COLUMBIA MINISTRY OF HEALTH	CHASSIS/FRAME CHEVROLET	31GM-EXPRESS-B9-0049
	MODELE/MODEL EXPRESS	REV.: 0
	ECH./SCALE 1 : 15	DATE: 28/11/08
		# BOITE : TBA

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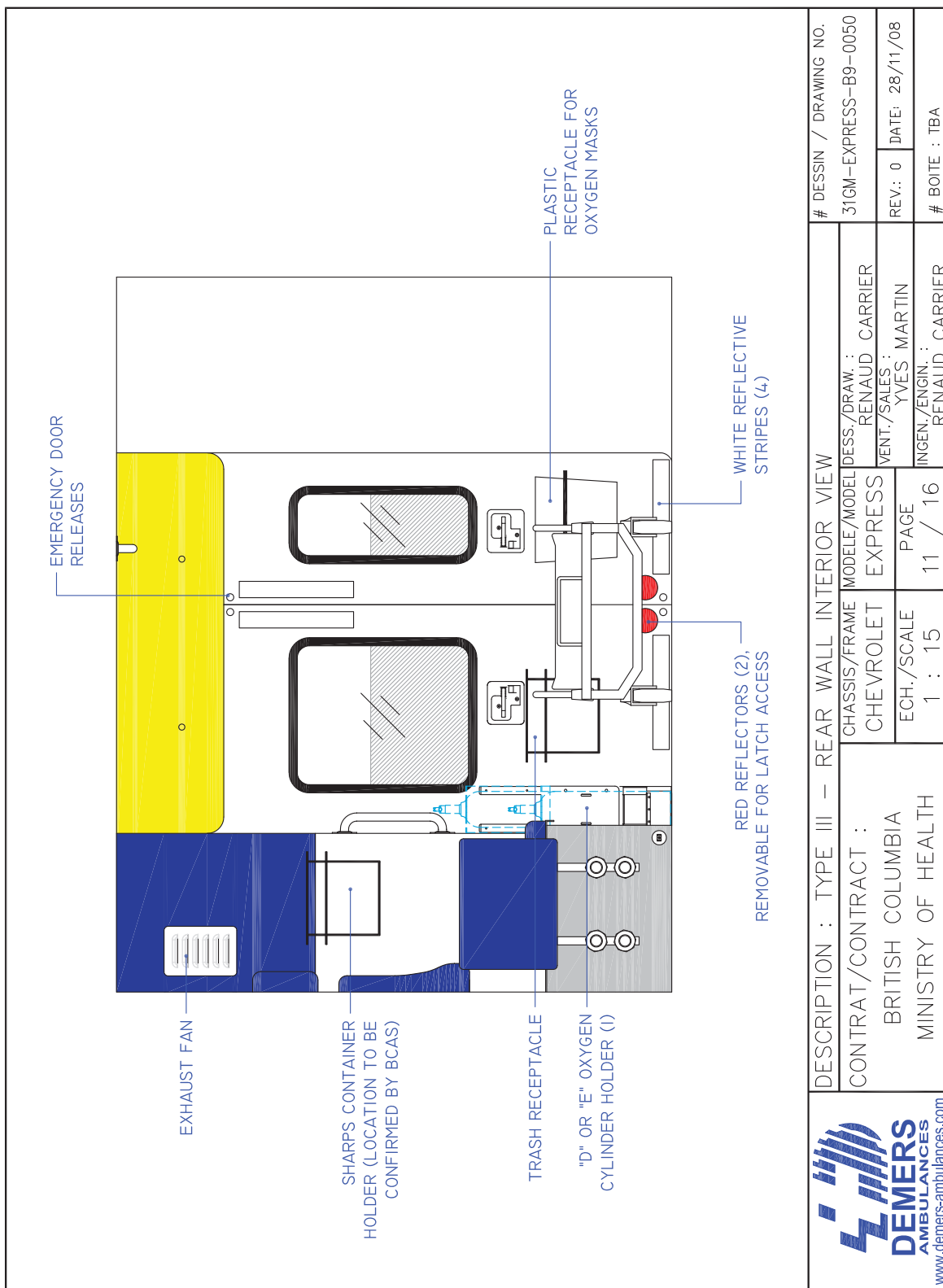


TECHNICAL MANUAL MX151D - GM



• PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - SALE DRAWINGS

REAR WALL INTERIOR VIEW





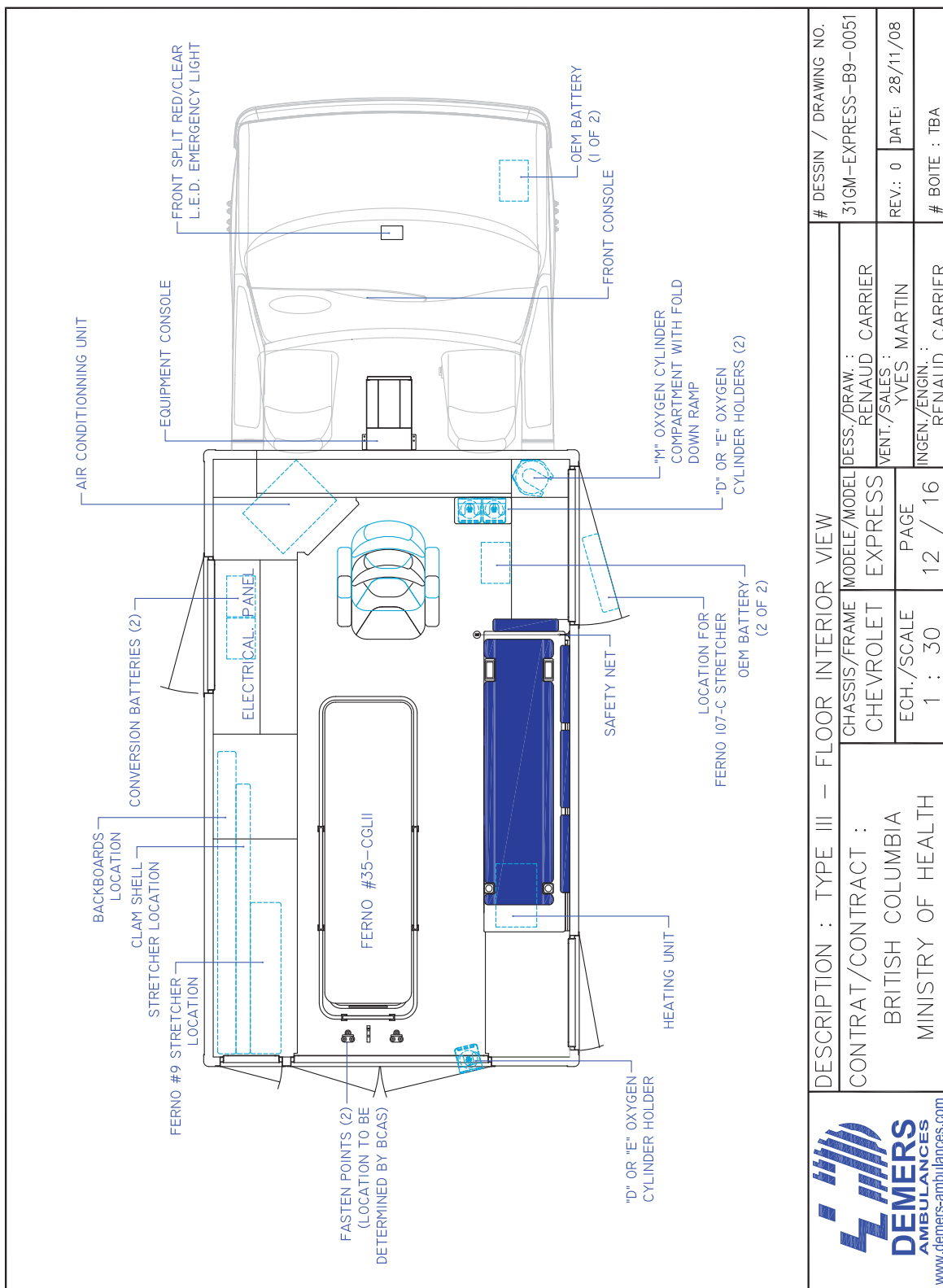
TECHNICAL MANUAL

MX151D - GM



• PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - SALE DRAWINGS

FLOOR INTERIOR VIEW





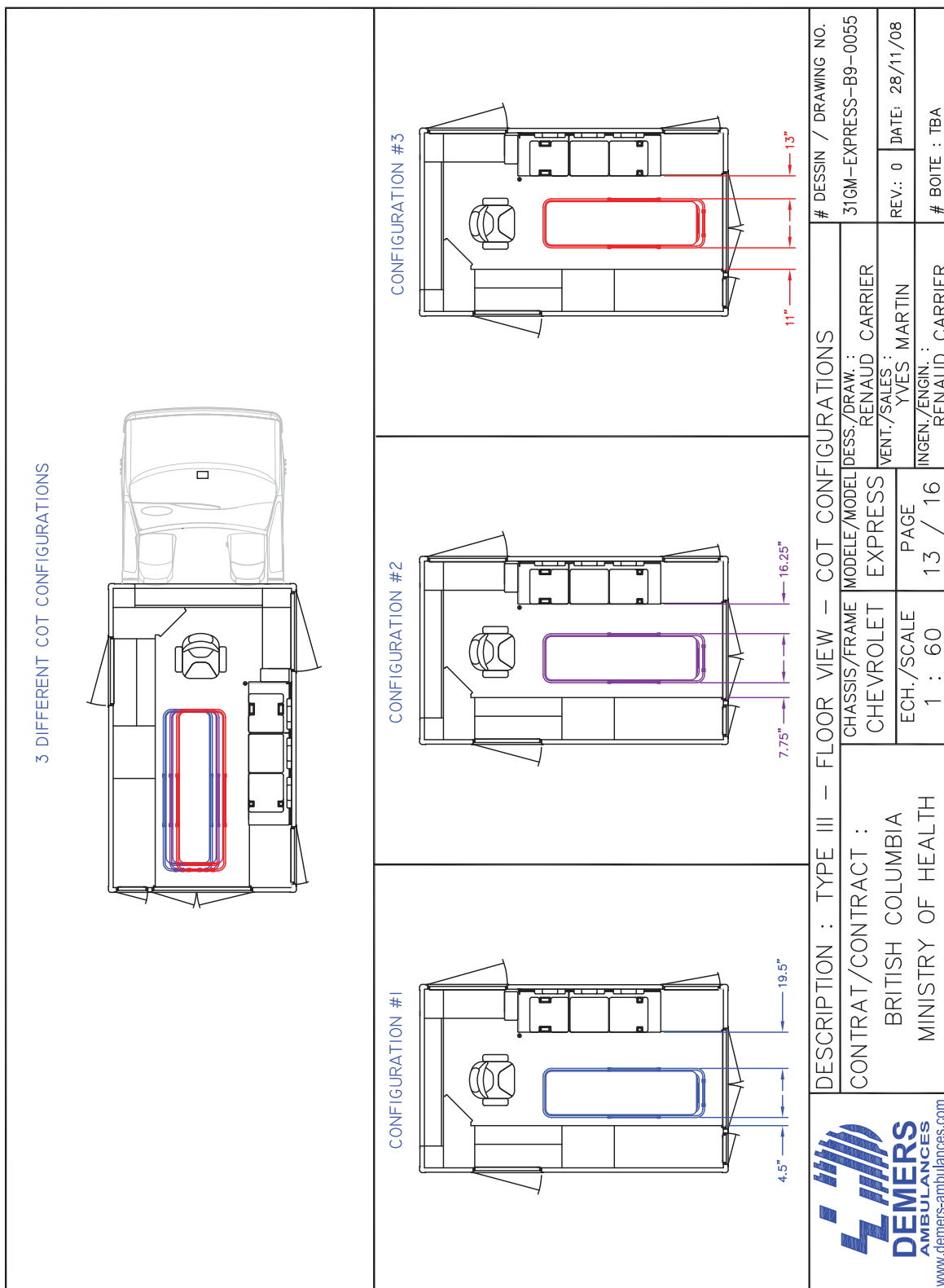
TECHNICAL MANUAL

MX151D - GM



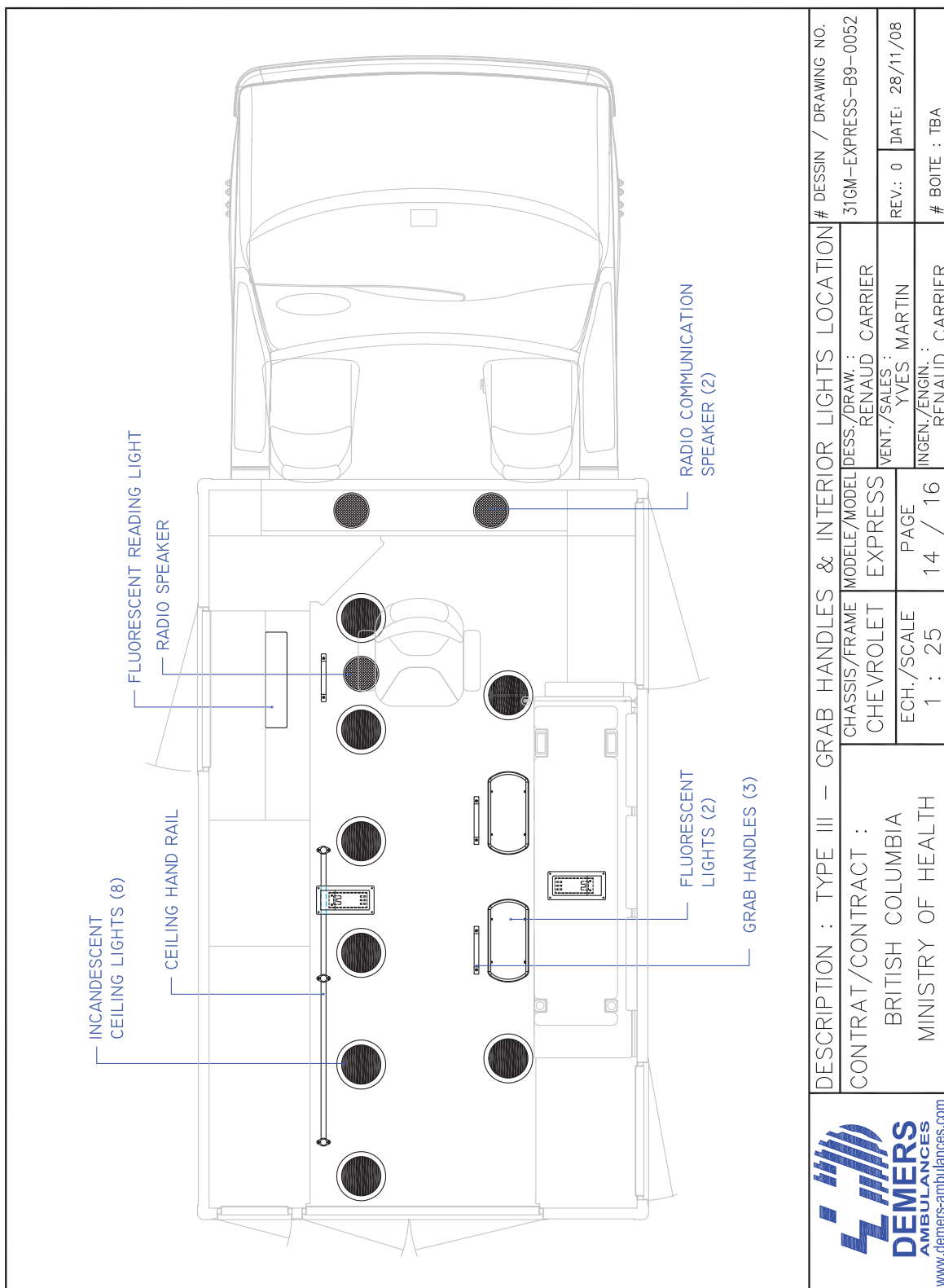
• PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - SALE DRAWINGS

FLOOR VIEW - COT CONFIGURATIONS



• PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - SALE DRAWINGS

CEILING INTERIOR VIEW



DESCRIPTION : TYPE III – GRAB HANDLES & INTERIOR LIGHTS LOCATION		# DESSIN / DRAWING NO.
CONTRAT/CONTRACT :		31GM-EXPRESS-B9-0052
BRITISH COLUMBIA MINISTRY OF HEALTH	CHASSIS/FRAME CHEVROLET	DESS./DRAW. : RENAUD CARRIER
	ECH./SCALE 1 : 25	VENT./SALES : YVES MARTIN
		INGEN./ENGIN. : RENAUD CARRIER
		REV.: 0 DATE: 28/11/08
		# BOITE : TBA



TECHNICAL MANUAL

MX151D - GM



• PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - SALE DRAWINGS

FRONT CONSOLE

12 VOLT OUTLET
CIGARETTE LIGHTER TYPE

NOTE:
EXACT LOCATION OF SWITCHES
TO BE DETERMINED AND
APPROVED BY BCAS

DESCRIPTION : TYPE III – FRONT CONSOLE		# DESSIN / DRAWING NO.
CONTRAT/CONTRACT :	CHASSIS/FRAME	31GM-EXPRESS-B9-0053
BRITISH COLUMBIA	CHEVROLET	RENAUD CARRIER
MINISTRY OF HEALTH	ECH./SCALE	VENT./SALES :
	N.T.S.	YVES MARTIN
	15 / 16	DATE: 28/11/08
		# BOITE : N/A



TECHNICAL MANUAL

MX151D - GM



• PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - SALE DRAWINGS

REAR CONSOLE

12 VOLT OUTLET
CIGARETTE LIGHTER TYPE

VOLUME

MAX MIN

EXHAUST FAN

CEILING LEFT HI LO

CEILING RIGHT HI LO

EMT HI LO

LIGHT HI LO

SUCTION HI LO

HEAT HI LO

A/C HI LO

Demers Ambulances

NOTE:
EXACT LOCATION OF SWITCHES
TO BE DETERMINED AND
APPROVED BY BCAS

DESCRIPTION : TYPE III – REAR CONSOLE		# DESSIN / DRAWING NO. 31GM-EXPRESS-B9-0054	
CONTRAT/CONTRACT : BRITISH COLUMBIA MINISTRY OF HEALTH	CHASSIS/FRAME CHEVROLET	MODELE/MODEL EXPRESS	DESS./DRAW. : RENAUD CARRIER
	ECH./SCALE N.T.S.	PAGE 16 / 16	VENT./SALES : YVES MARTIN
	INGEN./ENGIN. : RENAUD CARRIER		
		REV.: 0	DATE: 28/11/08
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AMBULANCES
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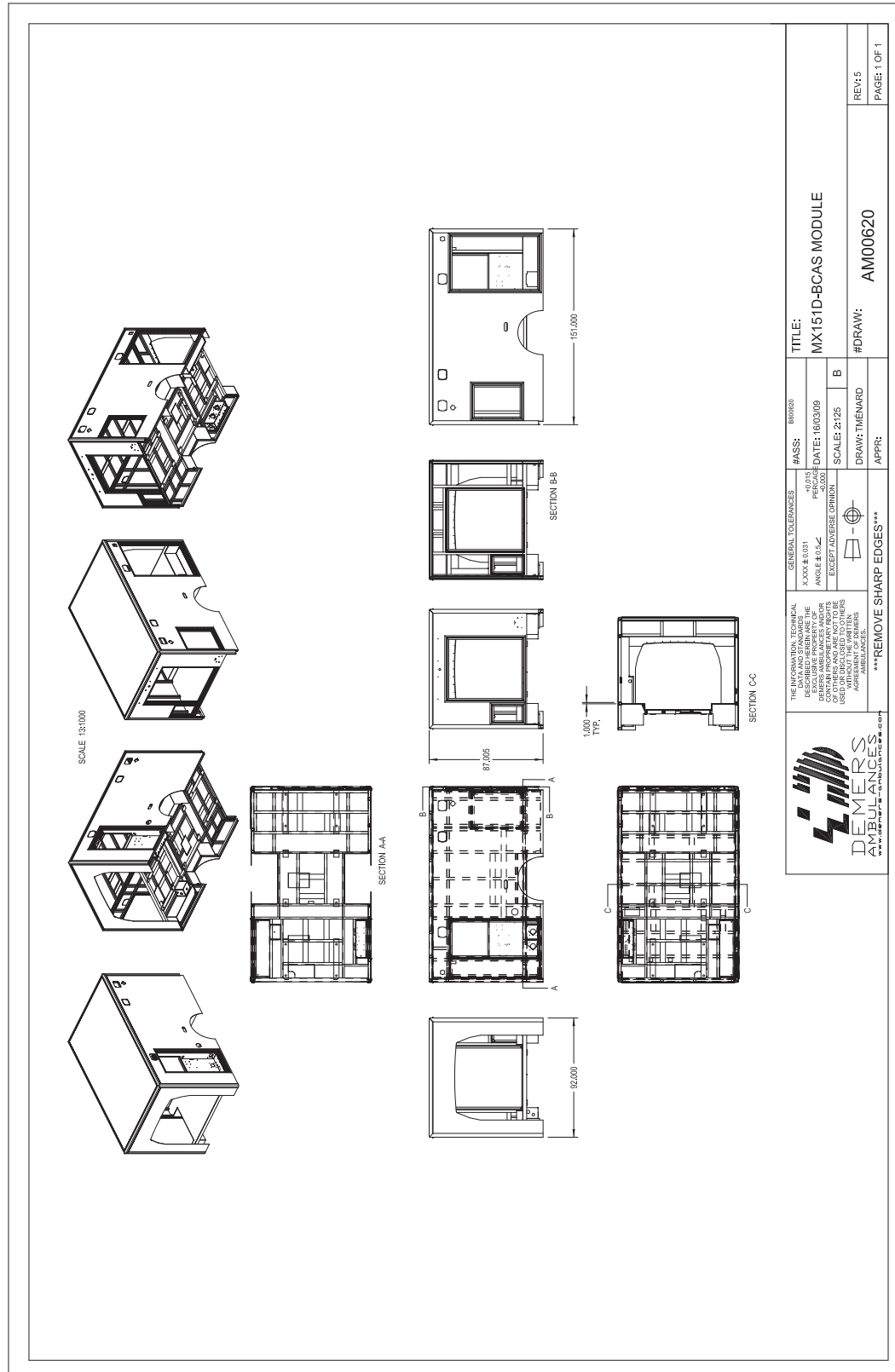


TECHNICAL MANUAL MX151D - GM



• PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - TECHNICAL DRAWINGS

STRUCTURE OF THE MODULE - GENERAL



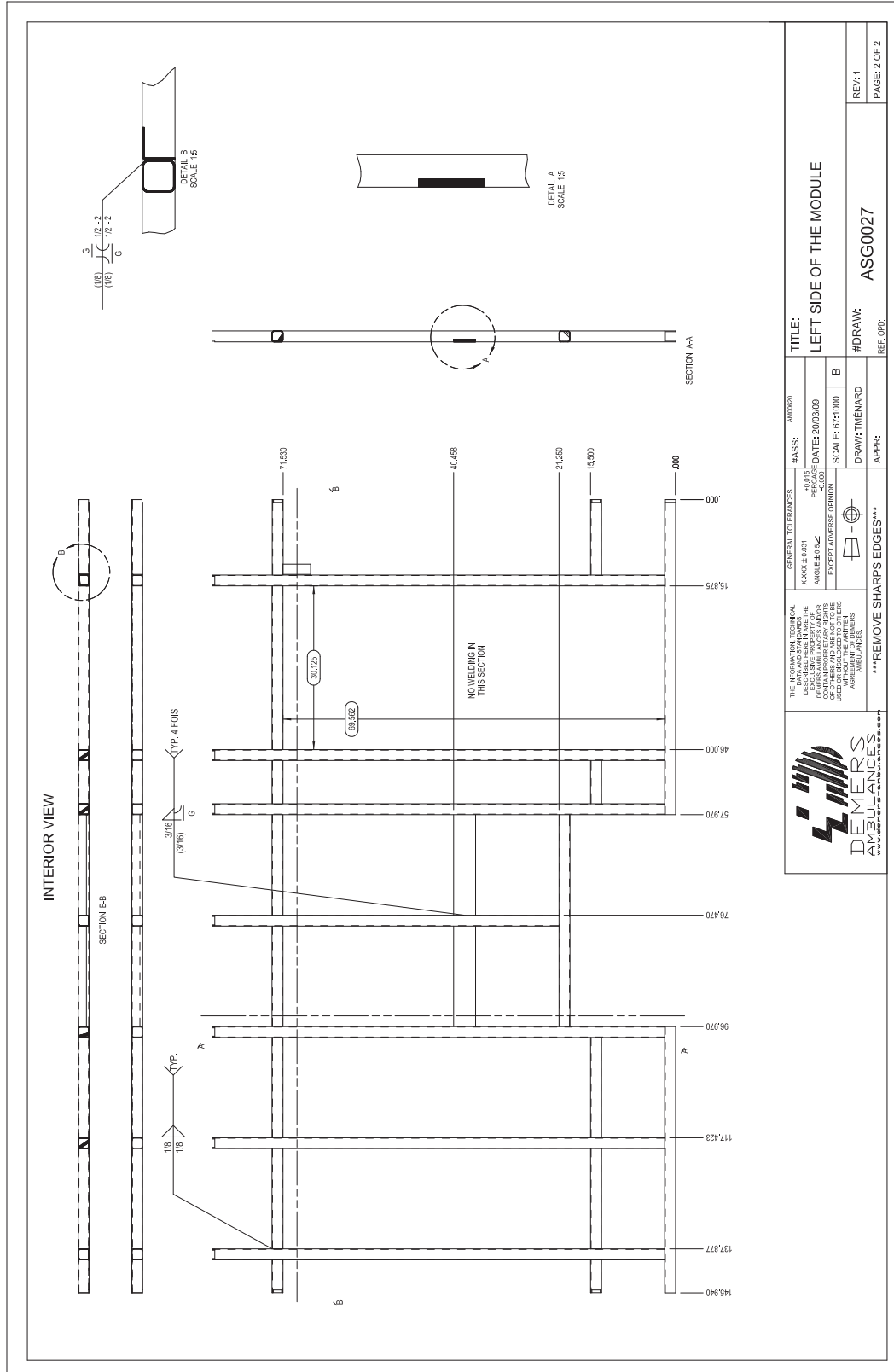


TECHNICAL MANUAL MX151D - GM



• PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - TECHNICAL DRAWINGS

STRUCTURE OF THE MODULE - LEFT SIDE





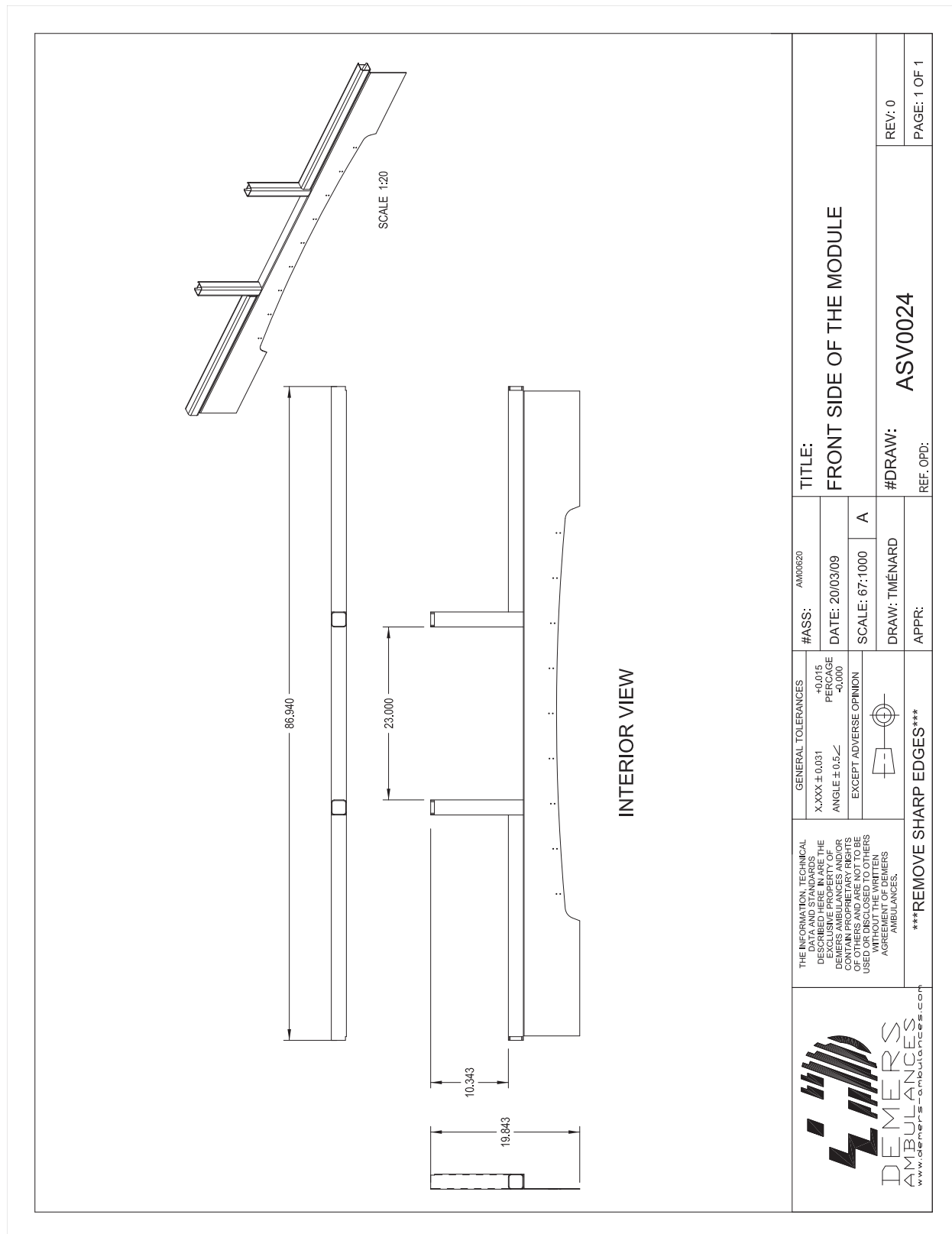
TECHNICAL MANUAL

MX151D - GM



- PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - TECHNICAL DRAWINGS

STRUCTURE OF THE MODULE - FRONT SIDE



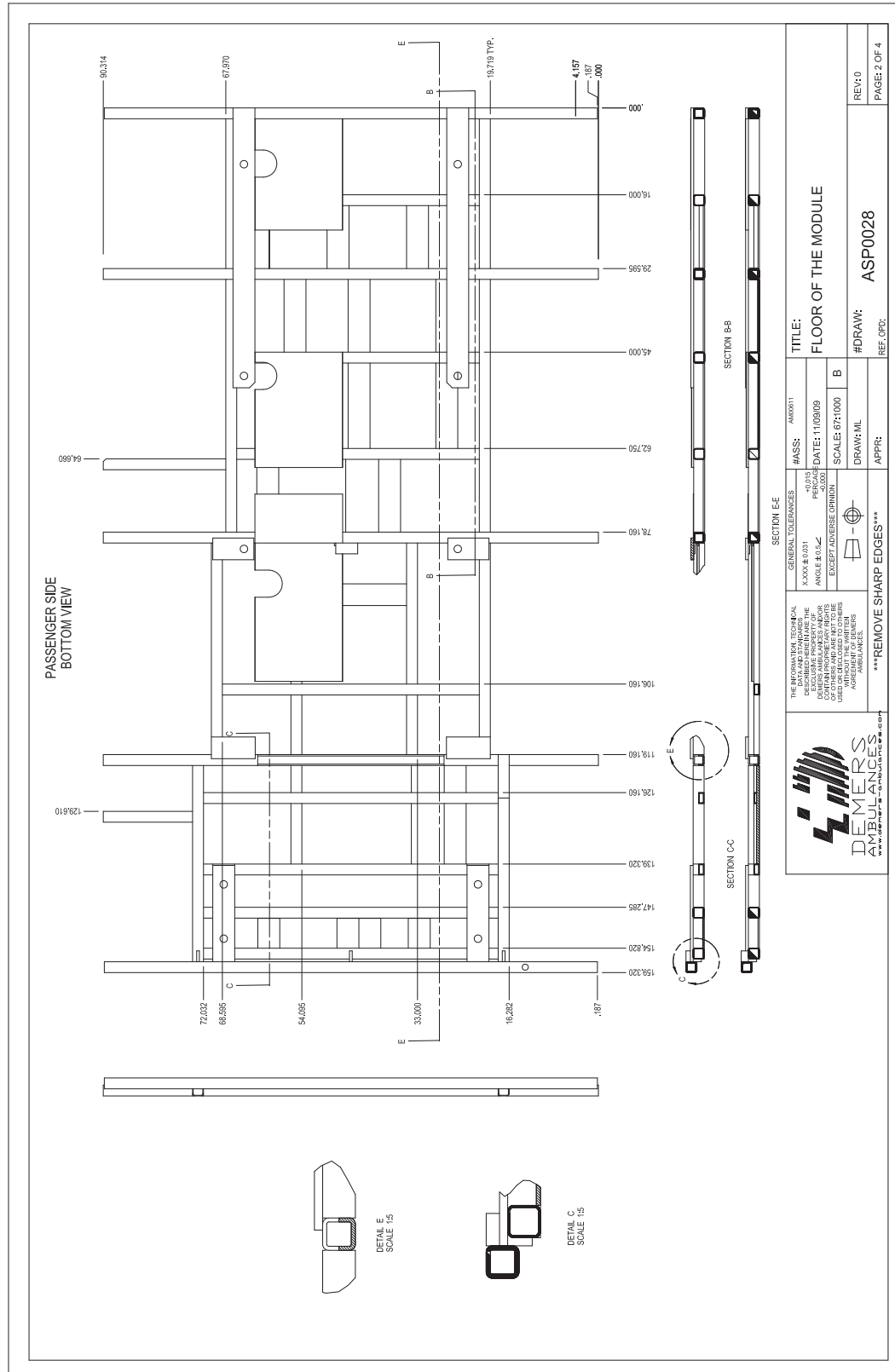


TECHNICAL MANUAL MX151D - GM



• PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - TECHNICAL DRAWINGS

STRUCTURE OF THE MODULE - FLOOR



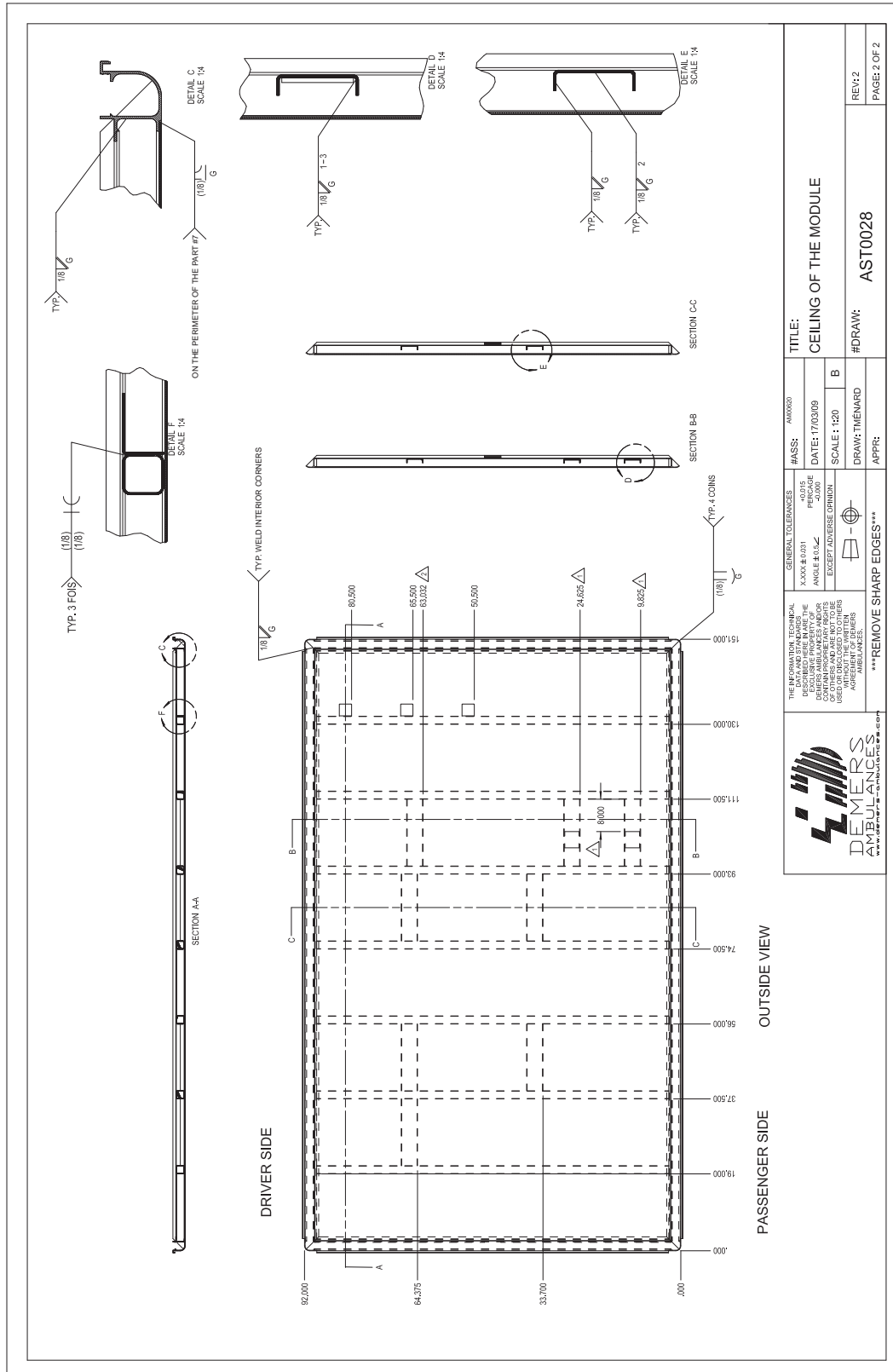


TECHNICAL MANUAL MX151D - GM



• PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - TECHNICAL DRAWINGS

STRUCTURE OF THE MODULE - CEILING





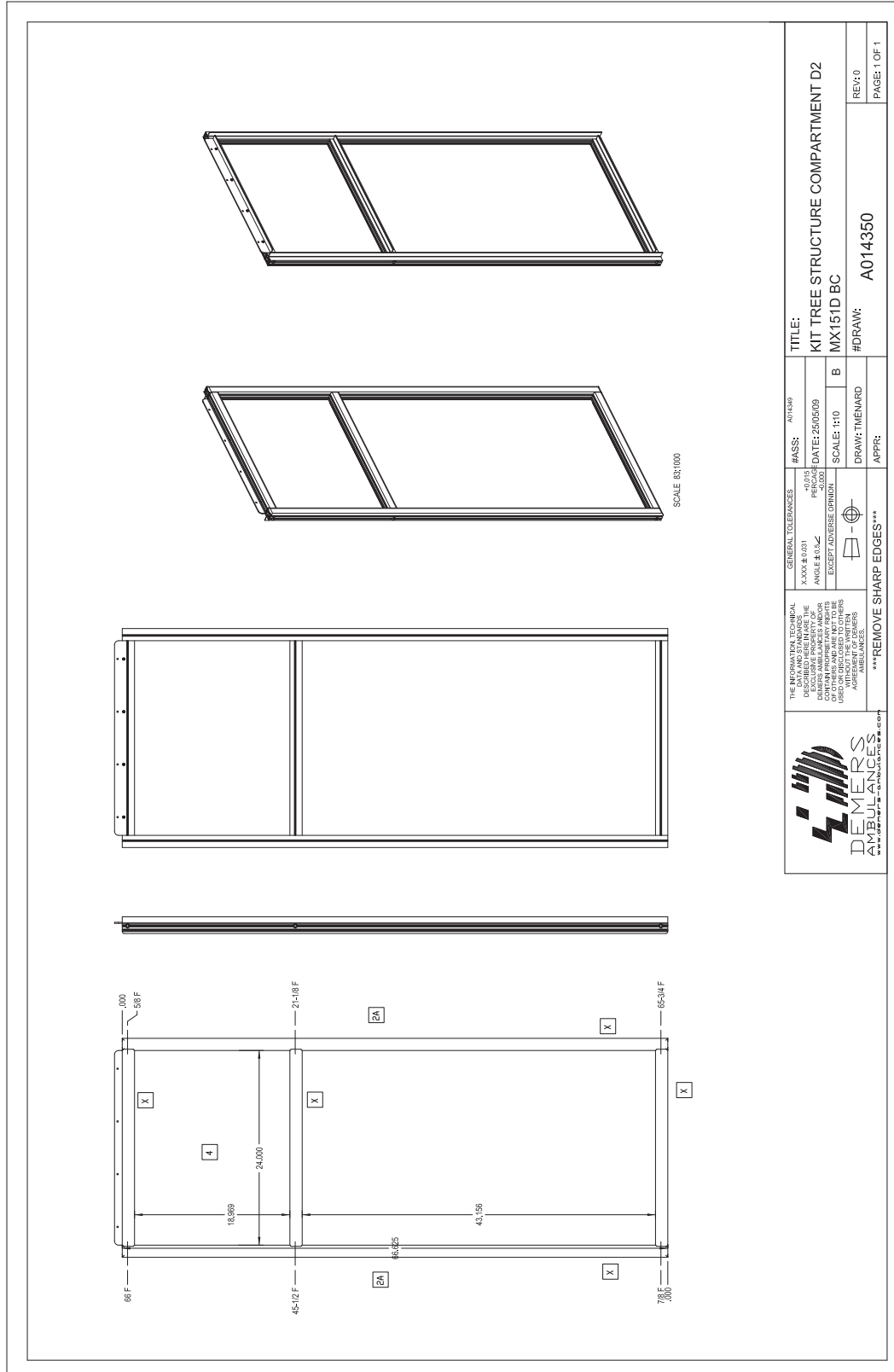
TECHNICAL MANUAL

MX151D - GM



• PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - TECHNICAL DRAWINGS

CABINETRY - "KIT TREE" COMPARTMENT





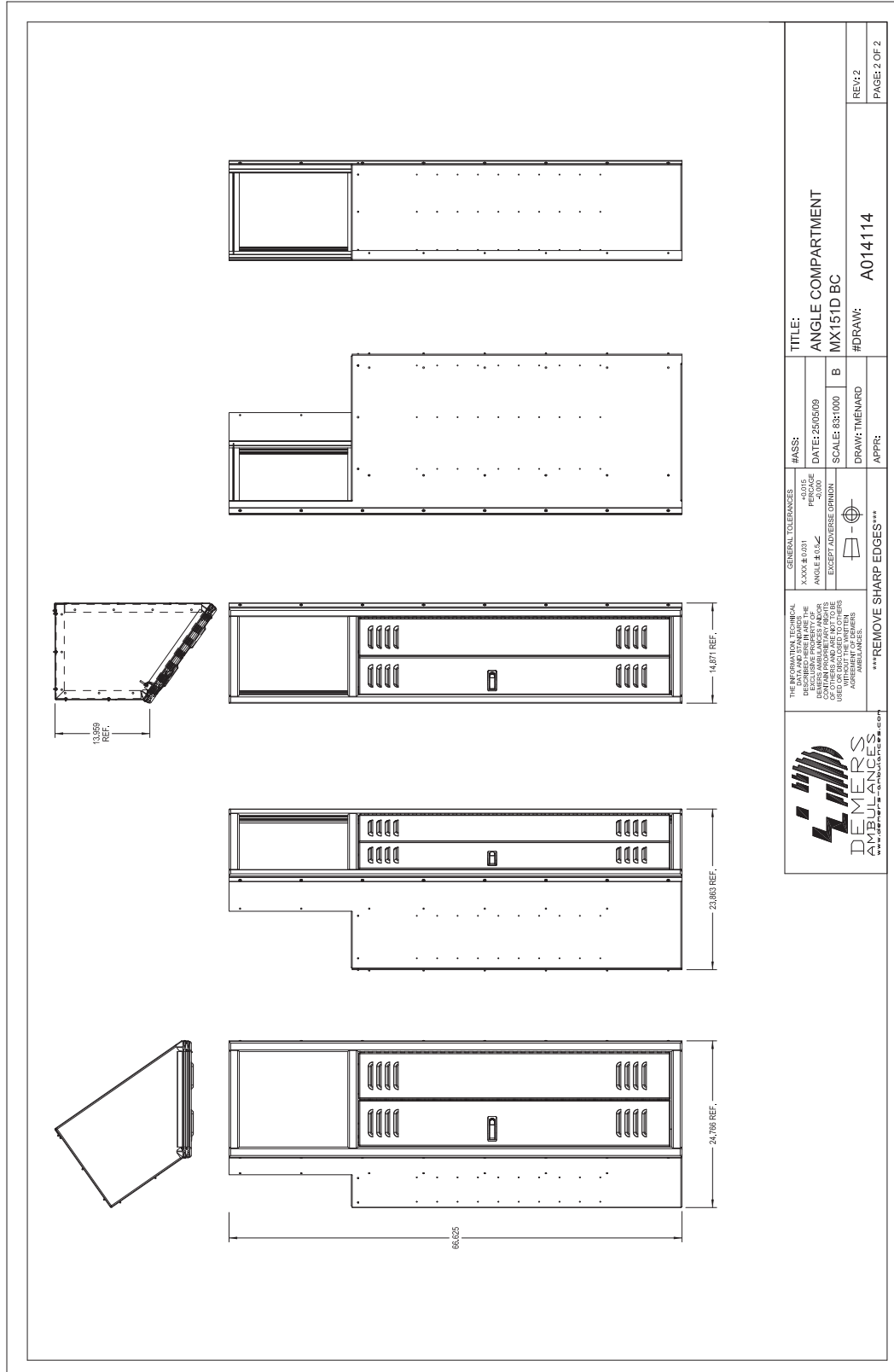
TECHNICAL MANUAL

MX151D - GM



• PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - TECHNICAL DRAWINGS

CABINETRY - ANGLE COMPARTMENT



• PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - OEM MODIFICATIONS

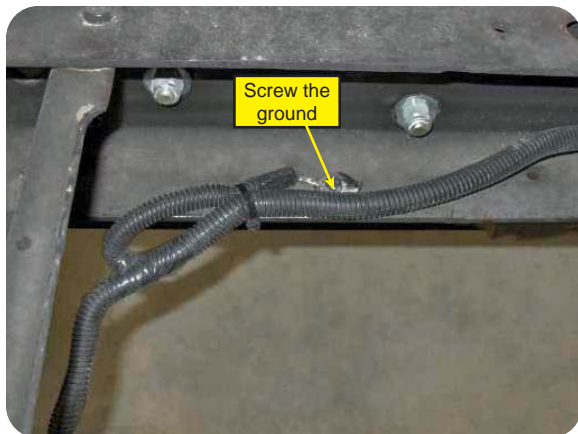
GM CHASSIS MODIFICATIONS



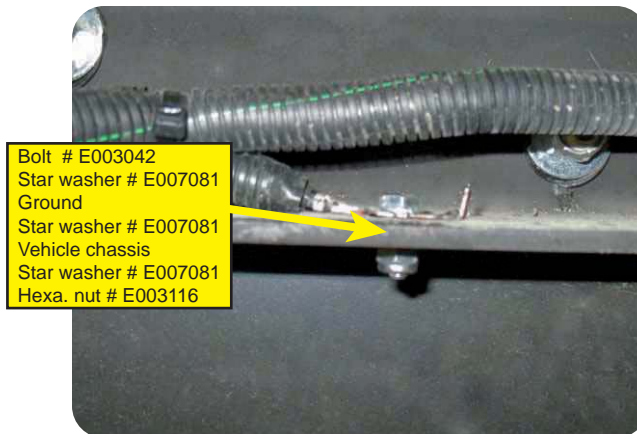
Unscrew the ground on the rear left side.



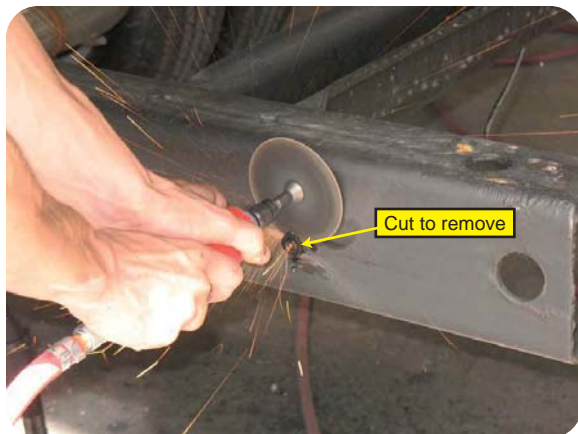
Remove the plastic nail that holds harness in place.



Screw the GM original ground in the existing hole of the plastic nail (see next picture for needed parts).



Fix the ground as shown on picture above.



Cut to remove the ground support.

- PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - OEM MODIFICATIONS

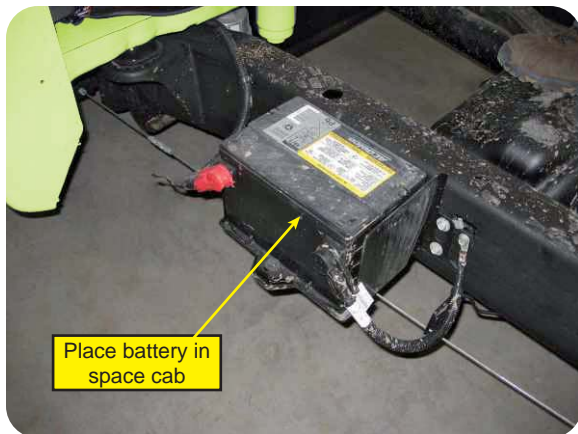
GM CHASSIS MODIFICATIONS



Use jig G-101229 to mark the drilling location on the GM chassis.



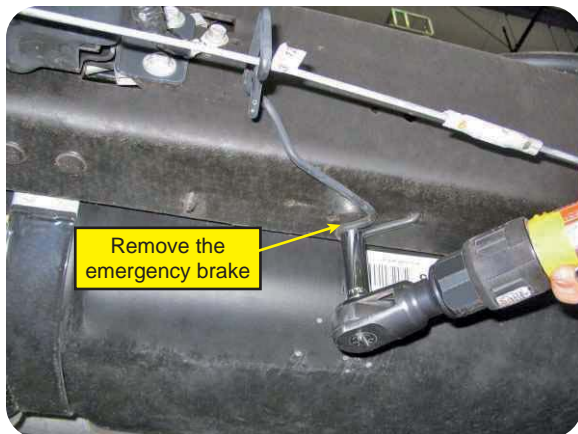
Use jig G-101229 to mark the drilling location on the GM chassis.



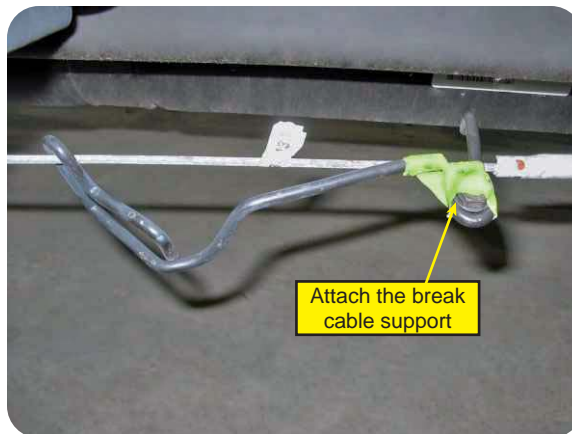
Remove the battery and place it in the space cab. insulate the positive cable and send the battery box and the ground cable to the recycling.

- PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - OEM MODIFICATIONS

GM CHASSIS MODIFICATIONS



Remove the emergency brake cable support.



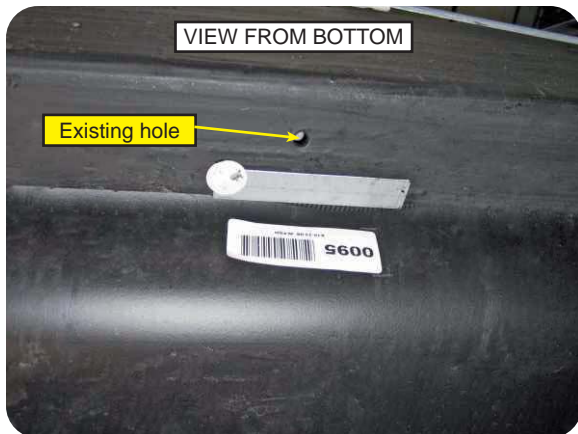
Attach with tape the break cable support as shown on picture.



Clean the surface (to rest the drill against).



Use a plate to protect the gas tank.



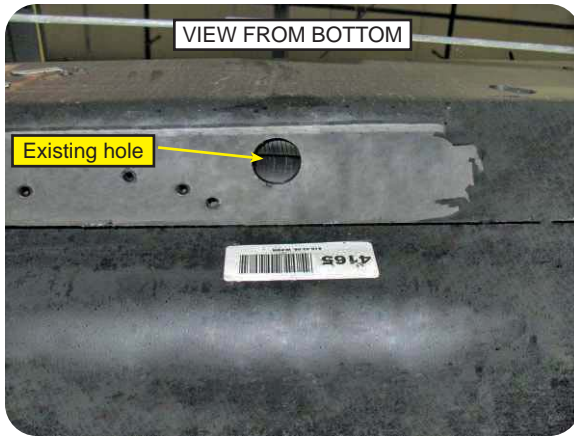
Locate the protective plate under the chassis.



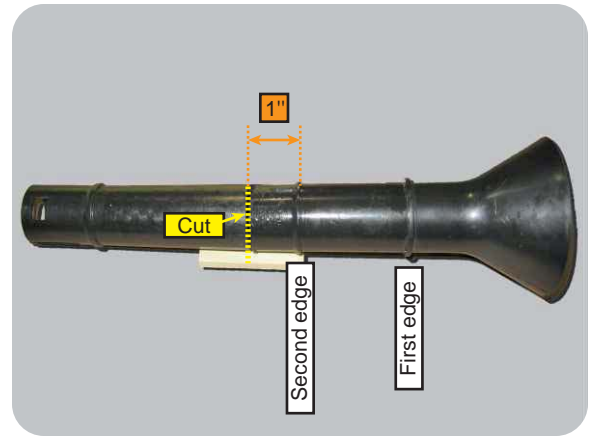
Enlarge the existing hole to 1 1/4"

• PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - OEM MODIFICATIONS

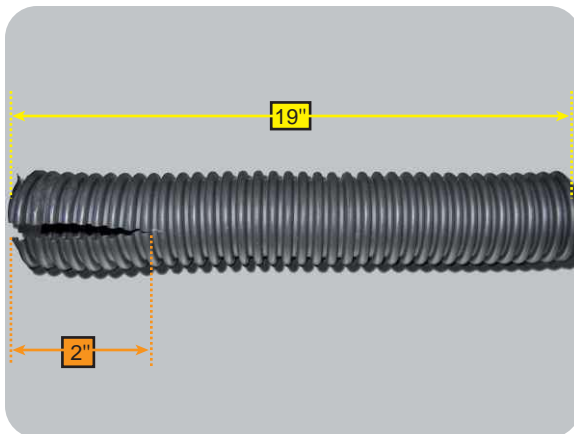
GM CHASSIS MODIFICATIONS



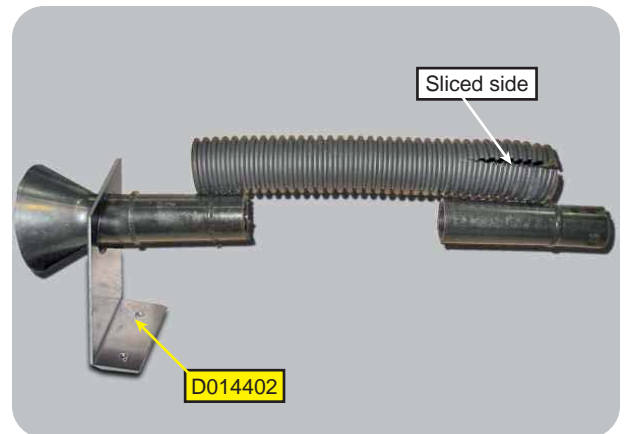
Enlarge the existing hole to 1 1/4"



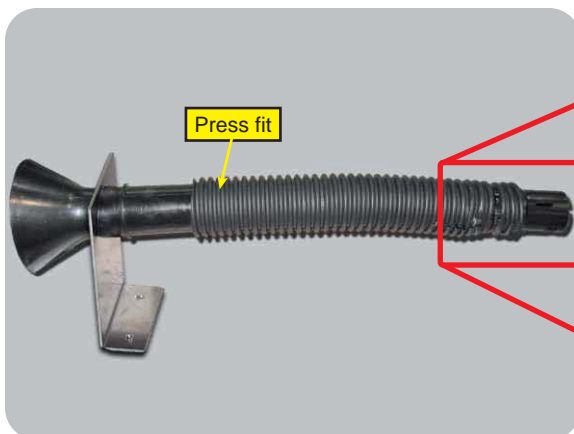
Cut crankshaft conduit at 1" from second edge (from opening) as shown on picture.



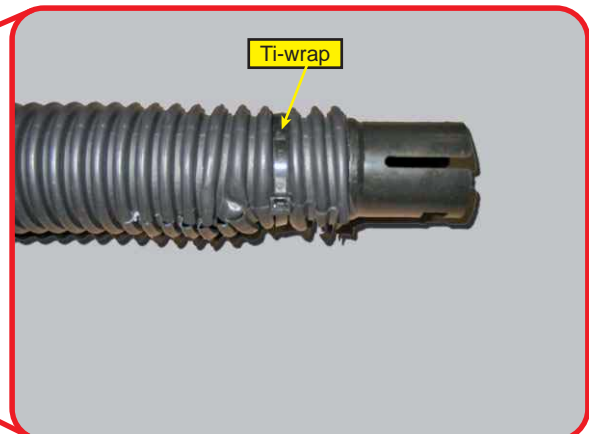
Take 19" of drain hose, cut 2" on one side.



Drain hose as to be connected to crankshaft conduit. The un-cut side goes beside opening of crankshaft conduit.



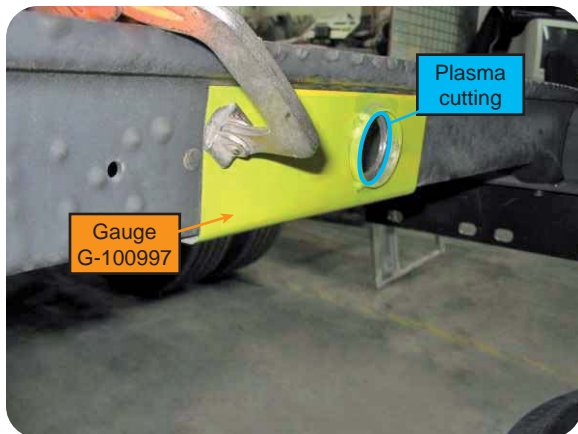
Connect two pieces with drain hose. connect by applying pressure until clip.



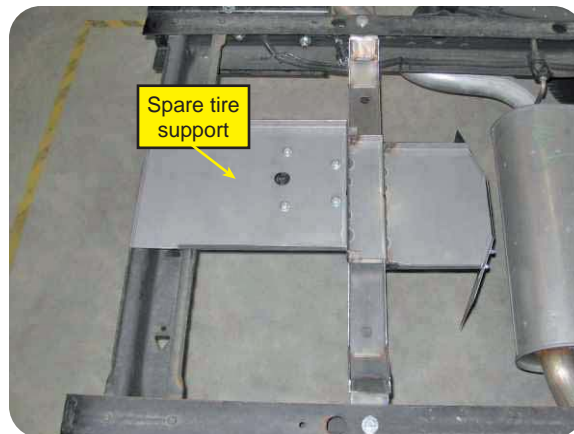
On sliced side, install tie-wrap.

• PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - OEM MODIFICATIONS

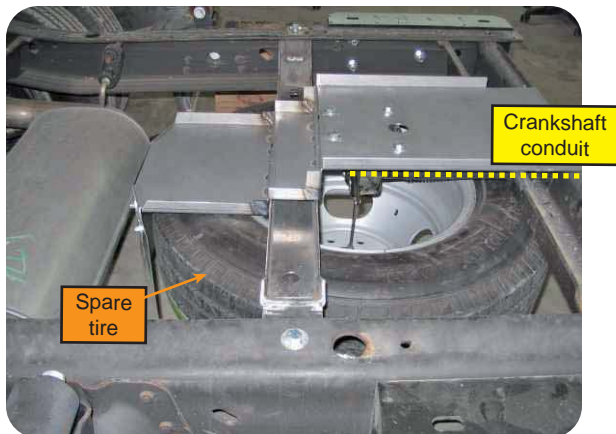
GM CHASSIS MODIFICATIONS



With gauge G-100997, cut GM chassis for crankshaft conduit access.



Attach spare tire support to chassis.



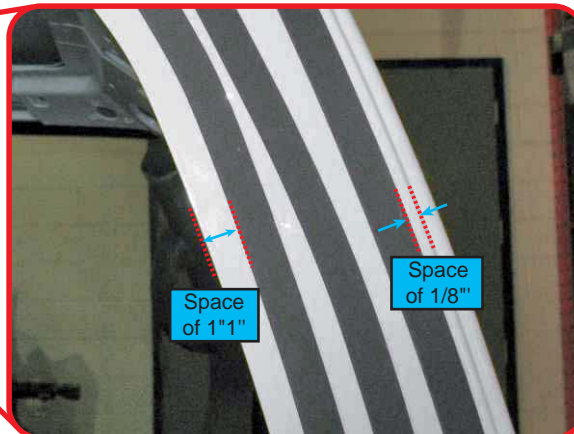
Install crankshaft mechanism, the conduit and the spare tire support.



Attach crankshaft conduit to chassis with tie-wrap.



Install the etafoam 1/8" X 3/4" # 204032 on front cabin wall .



- PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - OEM MODIFICATIONS

EXHAUST SYSTEM MODIFICATIONS



Use jig G-101021 for the exhaust cut out.



Cut exhaust pipe support on top of the weld as shown on the pic.



View after the exhaust cut out.



After the module box is installed, install the extension of the exhaust system and fix it with two (2) clamps.



Weld the exhaust pipe support between the GM chassis and the exhaust system extension.

- PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - OEM MODIFICATIONS

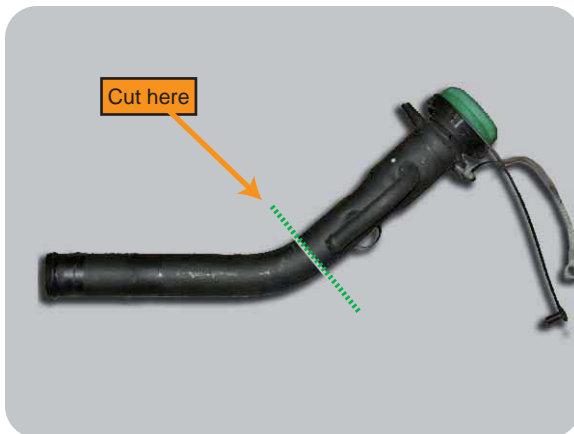
FUEL SYSTEM MODIFICATIONS



Remove the gas inlet pipe with cap.



Cut off 12" off the original gas inlet pipe.



Cut the gas inlet pipe as shown.



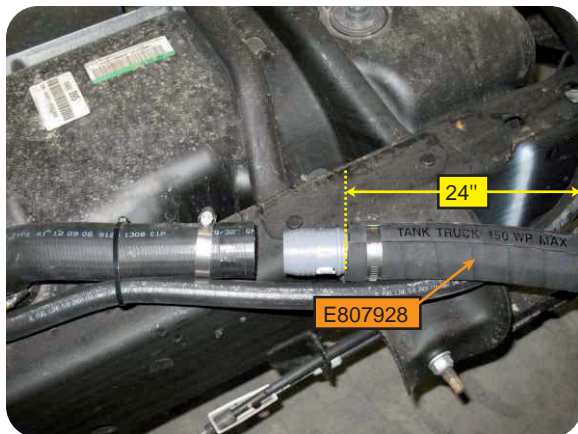
View of modified gas inlet pipe.



Remove the original vent pipe and install the new pipe (#E408111 X 40"). Reinstall the GM original clamp.

• PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - OEM MODIFICATIONS

FUEL SYSTEM MODIFICATIONS



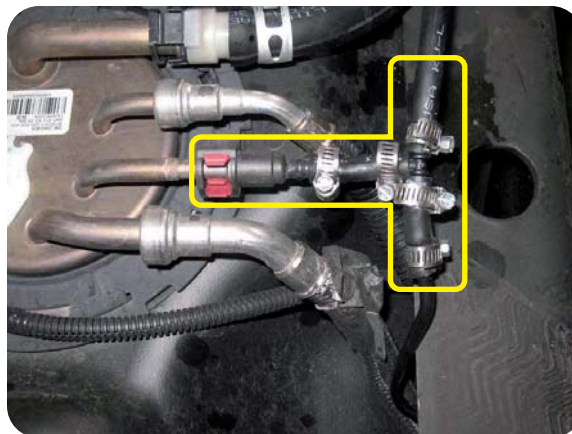
Connect the new pipe with the GM original pipe.



Connect the new pipe with the gas inlet pipe.



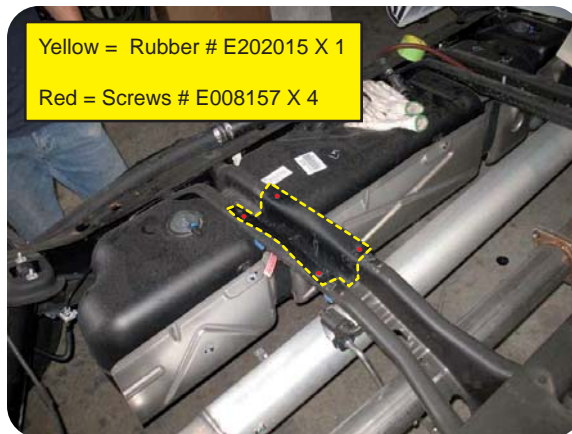
Locate the GM fuel hose as shown on picture.



Connect the Espar heater fuel hose with the GM fuel hose as shown on picture.



Cut the top of the bolt holding fuel tank.



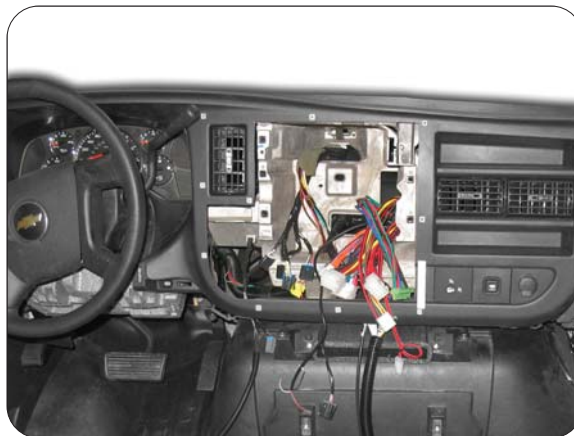
With (4) screws #E008157, install the rubber E202015 as shown on picture.

- PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - OEM MODIFICATIONS

GM DASHBOARD MODIFICATIONS



The OEM GM dashboard before the cuts.



Cut the OEM GM dashboard to install the front console.



Install the front console.

- PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - OEM MODIFICATIONS

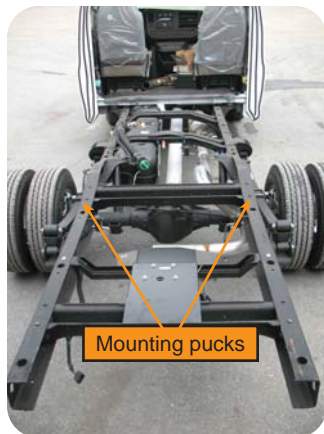
SUSPENSION MODIFICATIONS



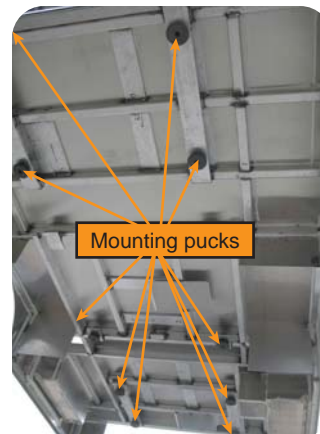
Replace the OEM leaf springs suspension by the "HD PLUS" leaf springs suspension

- PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - OEM MODIFICATIONS

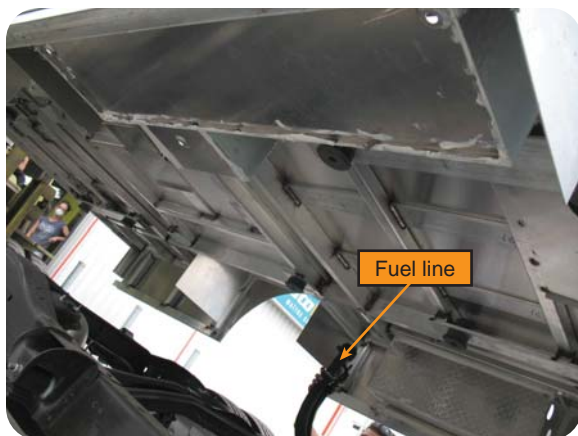
MODULE INSTALLATION



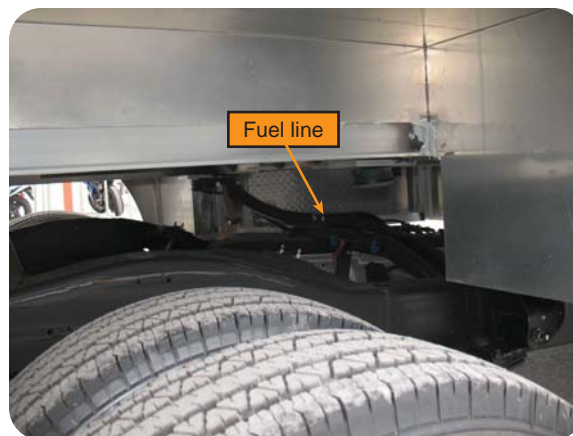
The GM chassis is ready to receive the module. There are two (2) mounting pucks stuck on the GM chassis.



THE module is ready to be installed on the GM chassis. There are ten (10) rubber mounting pucks under the module.



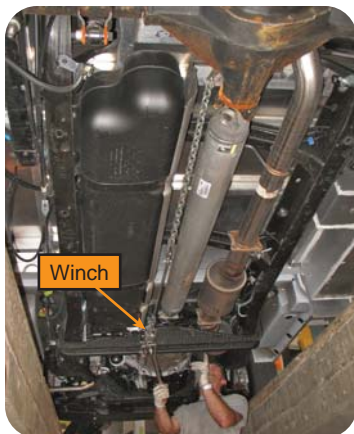
Slowly install the module on the GM chassis with a forklift. Pay attention to the fuel line.



Pay attention to the fuel line.

- PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - OEM MODIFICATIONS

MODULE INSTALLATION



With a winch, firmly press the module on the front cabin.



Verify if the module is perfectly centered on the chassis.



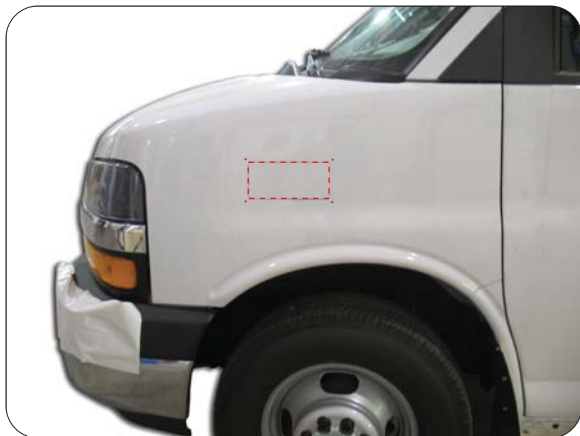
Verify if the module is perfectly centered on the chassis.



Verify if the module is perfectly centered on the chassis. After, bolt the module on the GM chassis.

- PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - OEM MODIFICATIONS

FENDER MODIFICATIONS



Use jig G-101250 (right side) or jig G-101251 (left side) to mark the cutting area.



Cut the fender and apply zinc chromate on each cutting edges.



Install the red/clear strobe lights on the fenders.



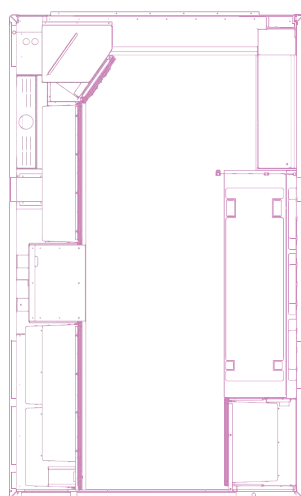
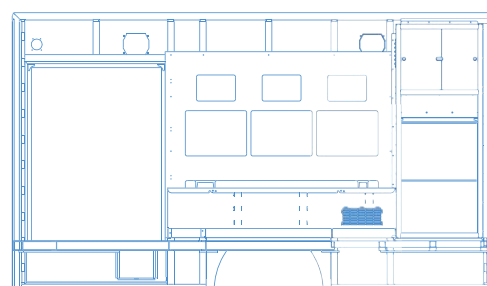
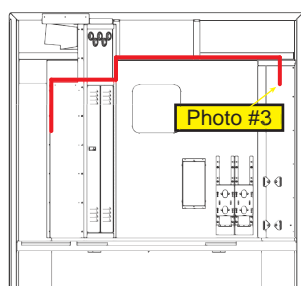
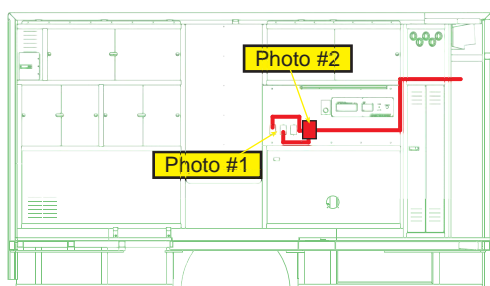
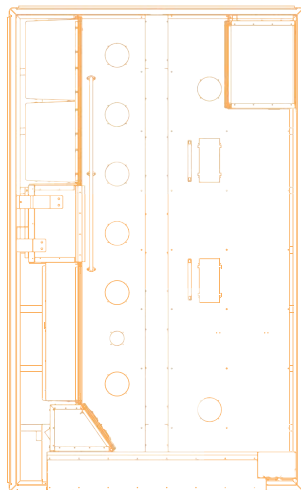
TECHNICAL MANUAL

MX151D - GM



• PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - SYSTEM LOCATION

OXYGEN SYSTEM



Front wall
Right wall
Left wall

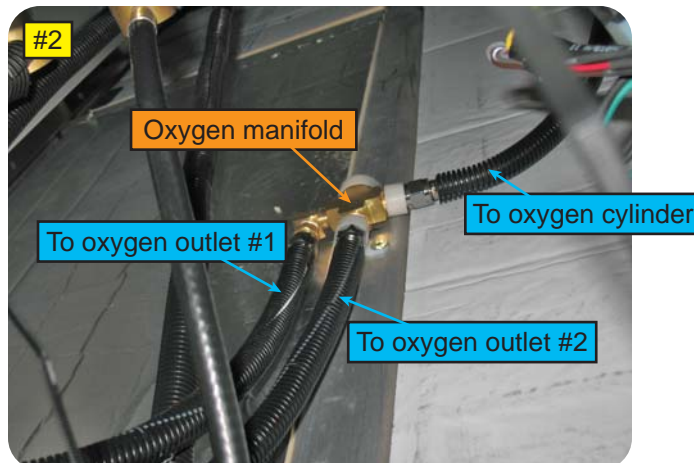
Ceiling view
Floor view
Oxygen lines —

- PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - SYSTEM LOCATION

OXYGEN SYSTEM ACCESS POINTS



The two (2) oxygen outlets located on the action wall, on the medical cabinet.



The oxygen manifold located behind the medical cabinet.



The oxygen line is connected to the main oxygen cylinder, in the patient compartment.



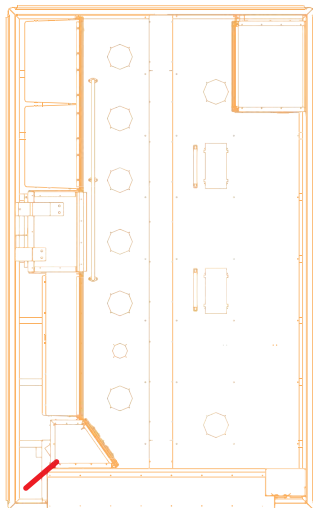
TECHNICAL MANUAL

MX151D - GM

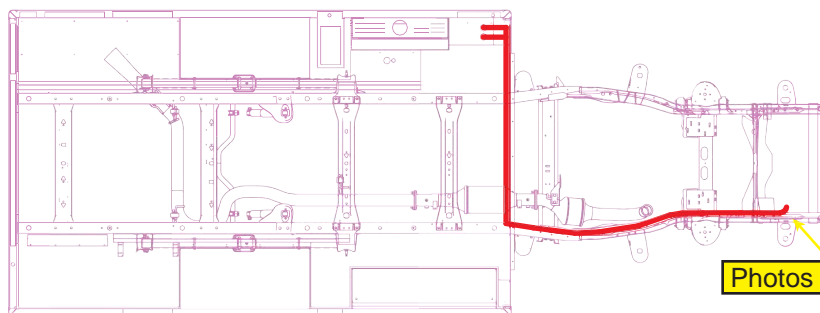
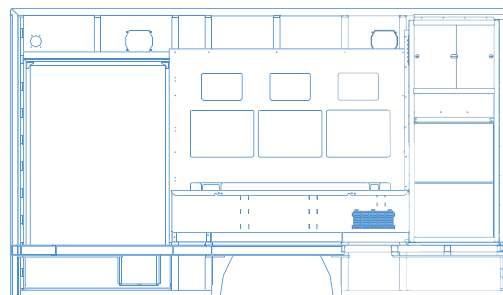
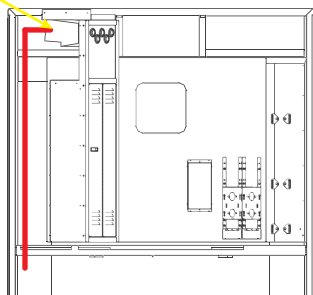
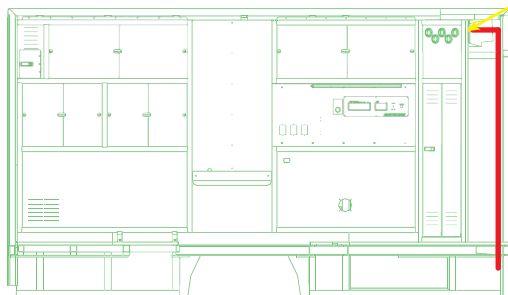


• PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - SYSTEM LOCATION

AIR CONDITIONING SYSTEM



Photos #3 & #4



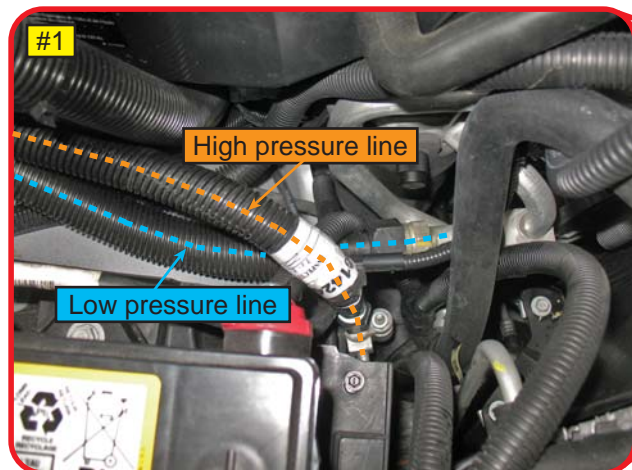
Photos #1 & #2

Front wall
Right wall
Left wall

Ceiling view
Floor view
A/C lines

- PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - SYSTEM LOCATION

AIR CONDITIONING SYSTEM ACCESS POINTS



The air conditioning system is connected in the engine compartment, behind the OEM battery.



The air conditioning system is connected in the engine compartment, right side.



To have access behind the air conditioning unit, follow the procedure in the air conditioning system section (in part 2 of the Technical Manual)



The A/C hoses and the evacuation drains are located behind the air conditioning unit. The electrical connector is located on the right side of the air conditioning unit.



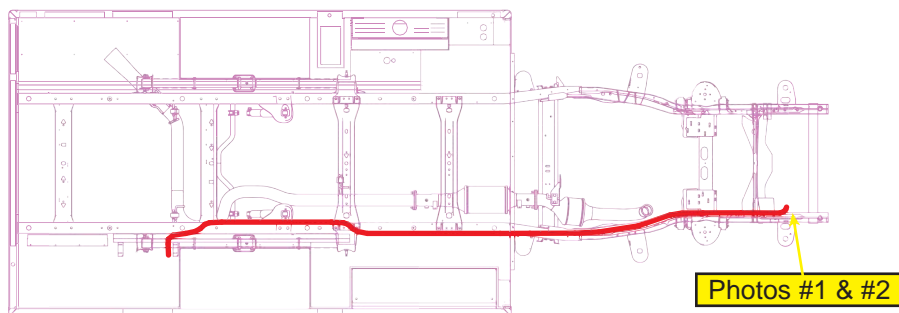
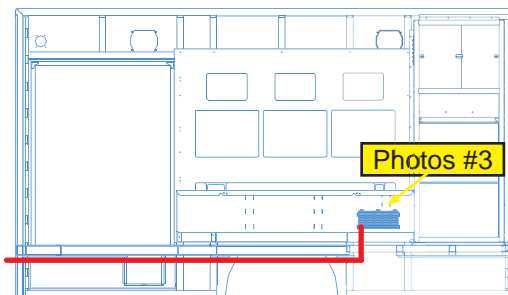
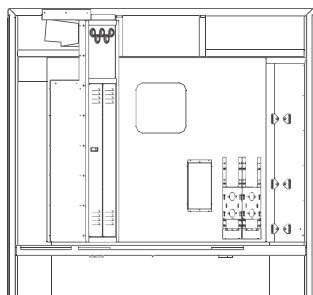
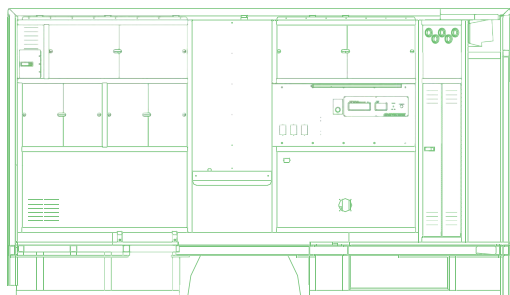
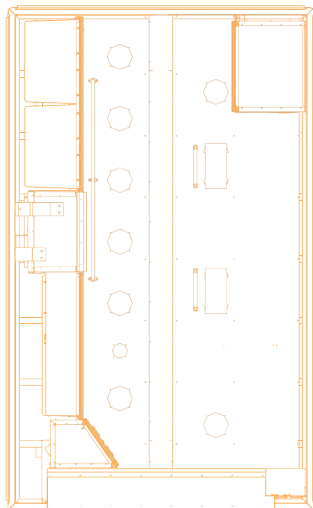
TECHNICAL MANUAL

MX151D - GM



• PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - SYSTEM LOCATION

STANDARD HEATING SYSTEM



Front wall
Right wall
Left wall

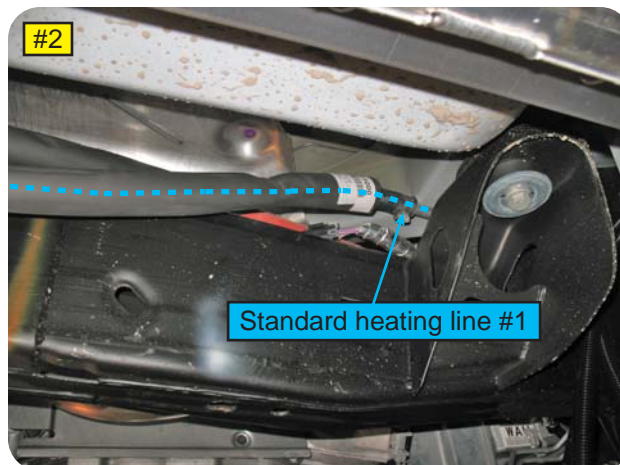
Ceiling view
Floor view
Standard heating lines —

- PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - SYSTEM LOCATION

STANDARD HEATING SYSTEM ACCESS POINTS



The standard heating system is connected under the vehicle, next to the right front wheel.



The standard heating system is connected under the vehicle, next to the right front wheel.



The standard heating unit is connected in the squad bench, in the patient compartment.



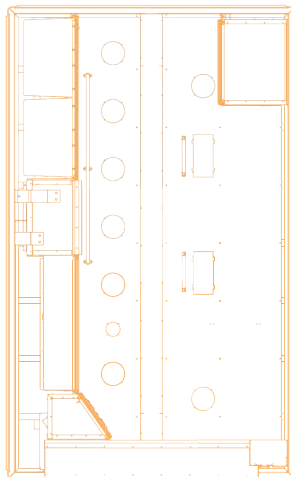
TECHNICAL MANUAL

MX151D - GM



• PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - SYSTEM LOCATION

110 VOLTS A.C. LINES (ORANGE OUTLETS)



Photos #1 & #2

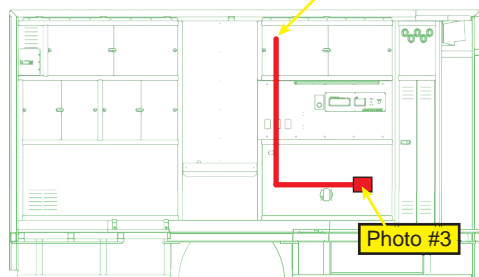
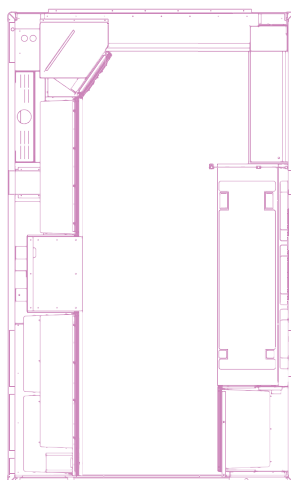
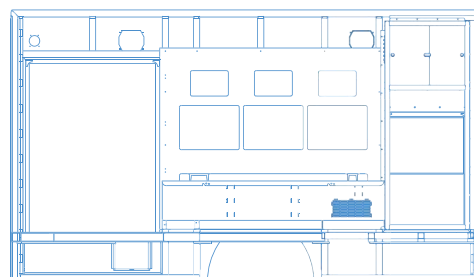
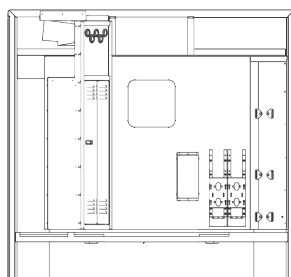


Photo #3



Front wall
Right wall
Left wall

Ceiling view
Floor view
110 volts AC lines

• PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - SYSTEM LOCATION

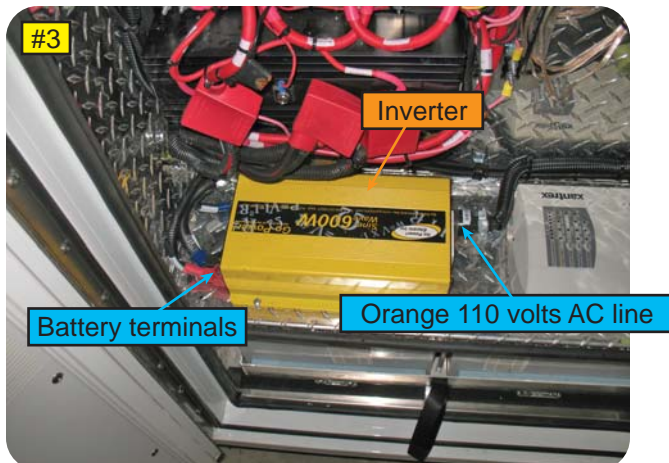
110 VOLTS A.C. LINES ACCESS POINTS (orange outlets)



The orange 110 volts AC outlet is located on the medical cabinet, in the compartment over action wall.



The orange 110 volts AC outlet is located on the medical cabinet, in the compartment over action wall.



The inverter is located in the electrical panel compartment (G1). The inverter is only accessible from the outside of the vehicle.



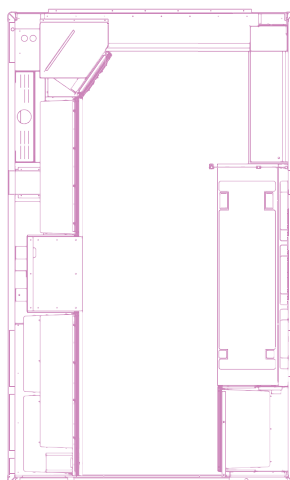
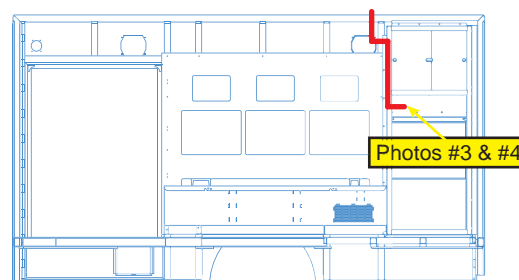
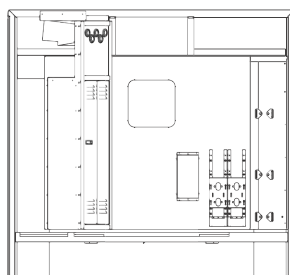
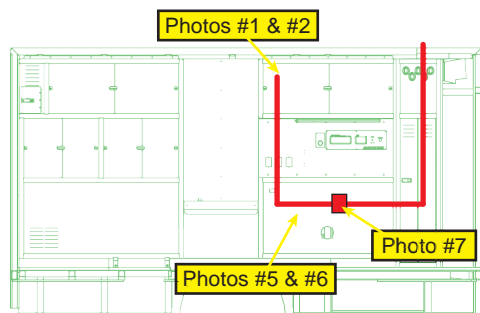
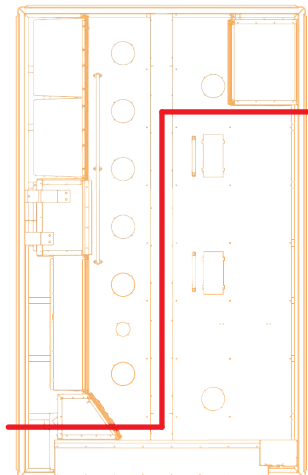
TECHNICAL MANUAL

MX151D - GM



- PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - SYSTEM LOCATION**

110 VOLTS A.C. LINES (WHITE OUTLETS)



Front wall
Right wall
Left wall

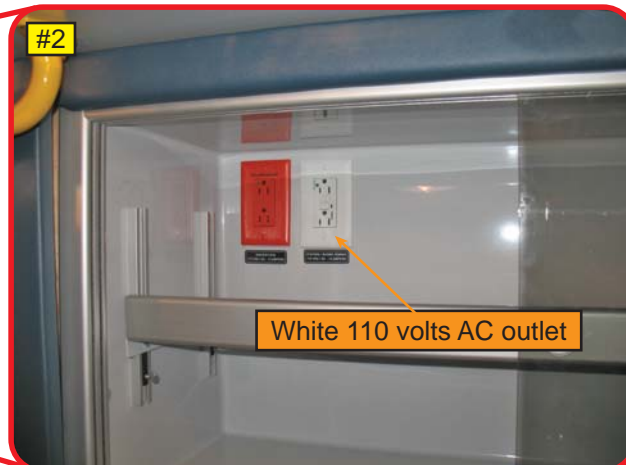
Ceiling view
Floor view
110 volts AC lines

• PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - SYSTEM LOCATION

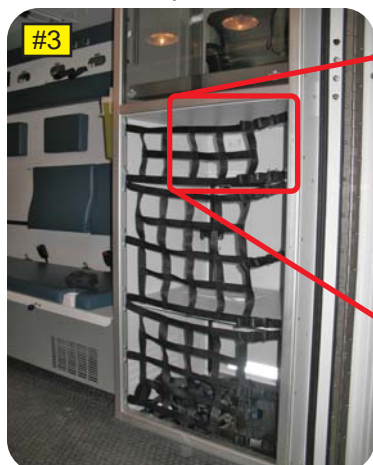
110 VOLTS A.C. LINES ACCESS POINTS (white outlets)



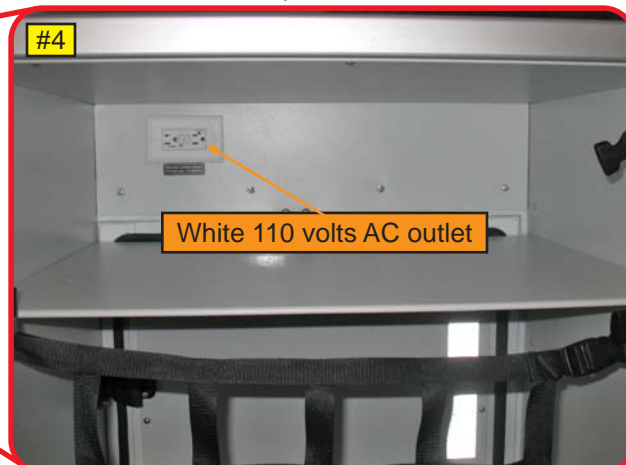
The white 110 volts AC outlet is located on the medical cabinet, in the compartment over action wall.



The white 110 volts AC outlet is located on the medical cabinet, in the compartment over action wall.



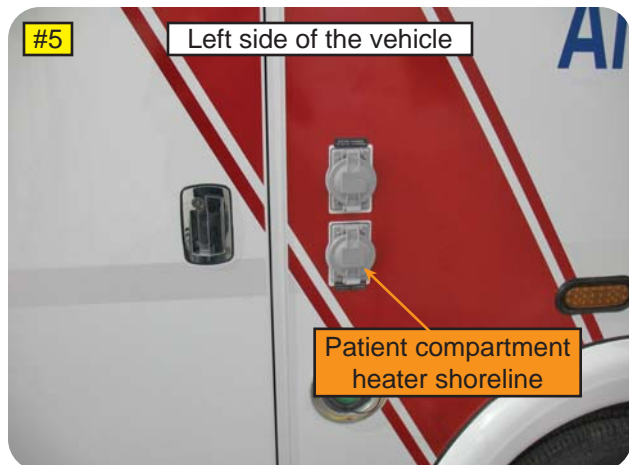
The white 110 volts AC outlet is located on the "kit tree" compartments, in the patient compartment.



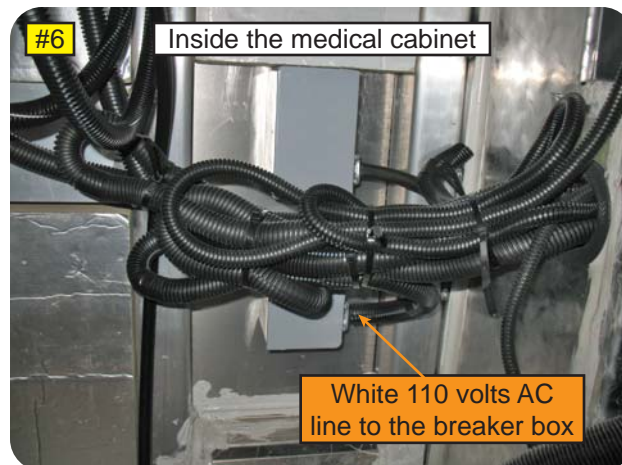
The white 110 volts AC outlet is located on the "kit tree" compartments, in the patient compartment.

• PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - SYSTEM LOCATION

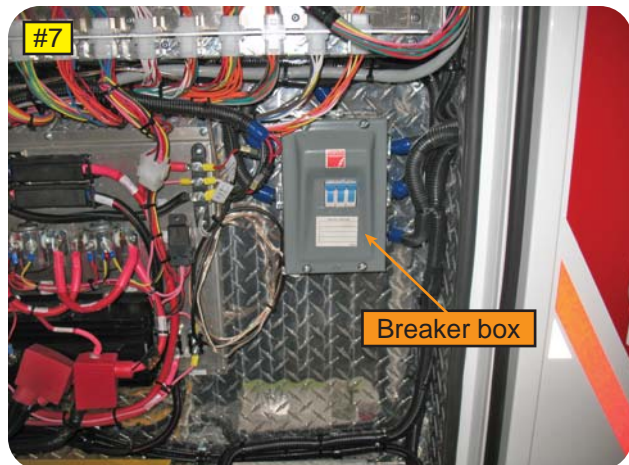
110 VOLTS A.C. LINES ACCESS POINTS (white outlets)



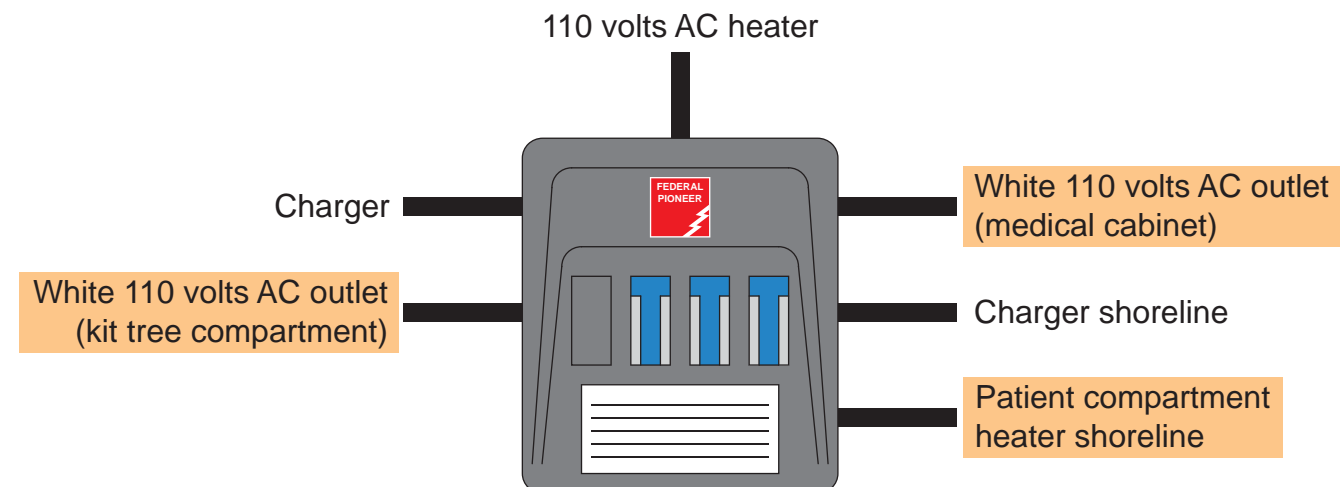
The patient compartment heater shoreline is located on the left side (driver side) of the vehicle.



The patient compartment heater shoreline is located on the left side (driver side) of the vehicle.



The breaker box is located in the electrical panel compartment (G1). The breaker box is only accessible from the outside of the vehicle.





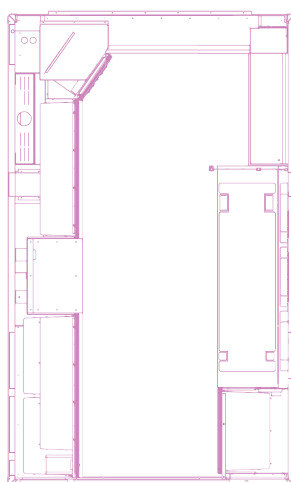
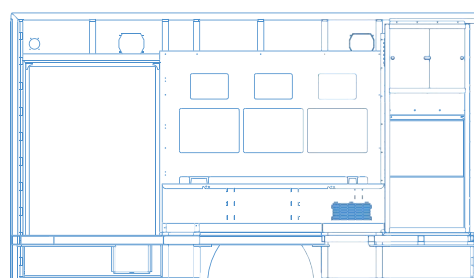
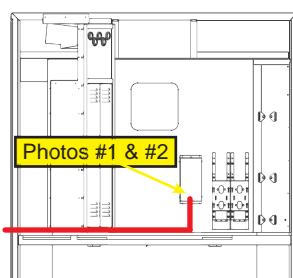
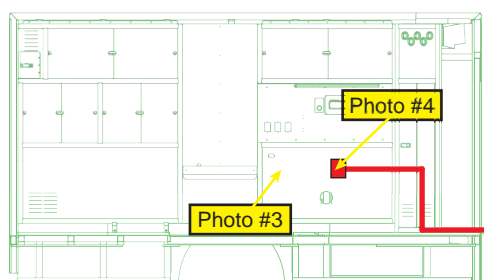
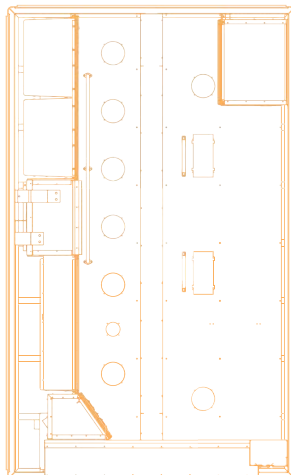
TECHNICAL MANUAL

MX151D - GM



• PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - SYSTEM LOCATION

110 VOLTS A.C. LINES (HEATER)



Front wall
Right wall
Left wall

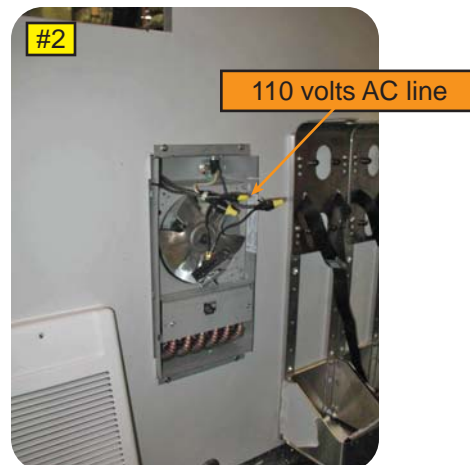
Ceiling view
Floor view
110 volts AC lines

• PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - SYSTEM LOCATION

110 VOLTS A.C. LINES ACCESS POINTS (heater)



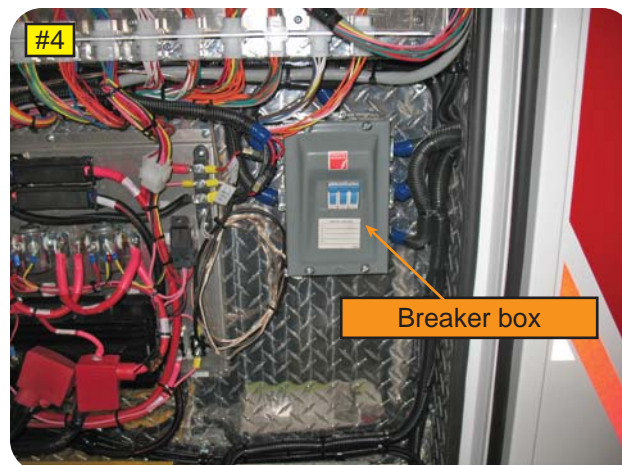
The 110 volts AC heater unit is located on the front wall, in the patient compartment



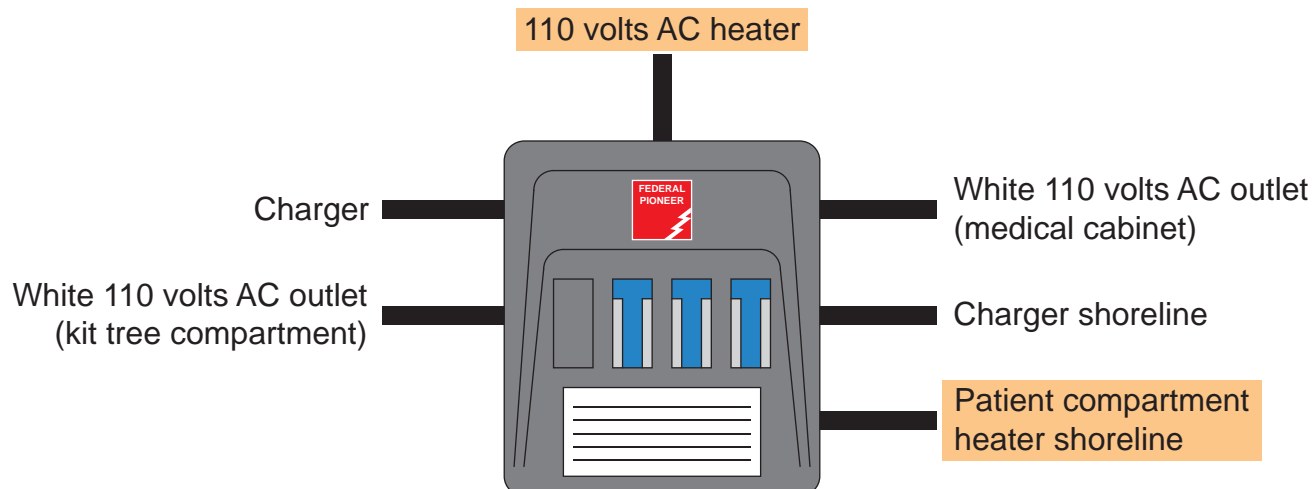
Remove the panel to have access to the 110 volts AC line.



The patient compartment heater shoreline is located on the left side (driver side) of the vehicle.

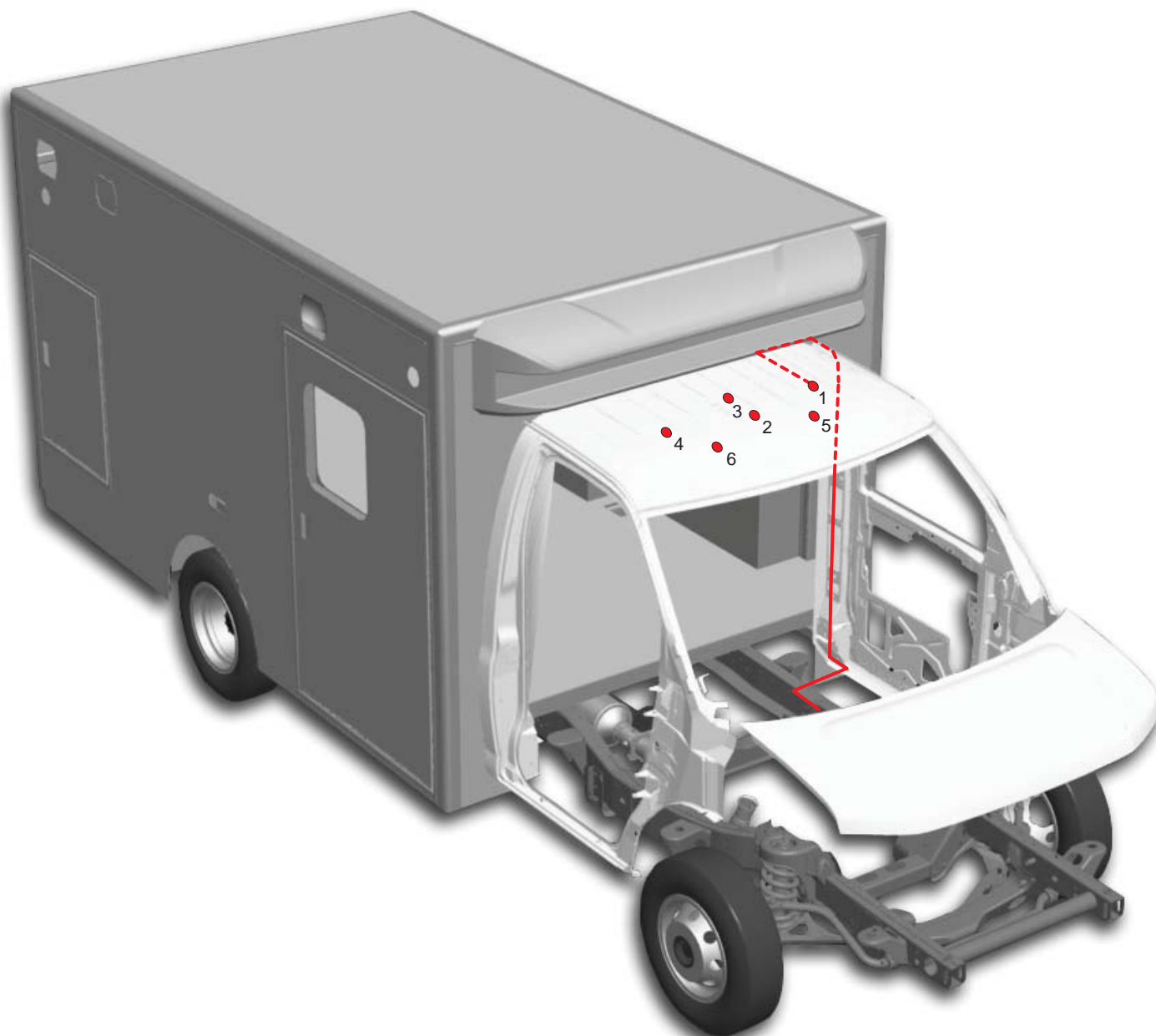


The breaker box is located in the electrical panel compartment (G1). The breaker box is only accessible from the outside of the vehicle.



- PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - SYSTEM LOCATION

ANTENNAS SYSTEM



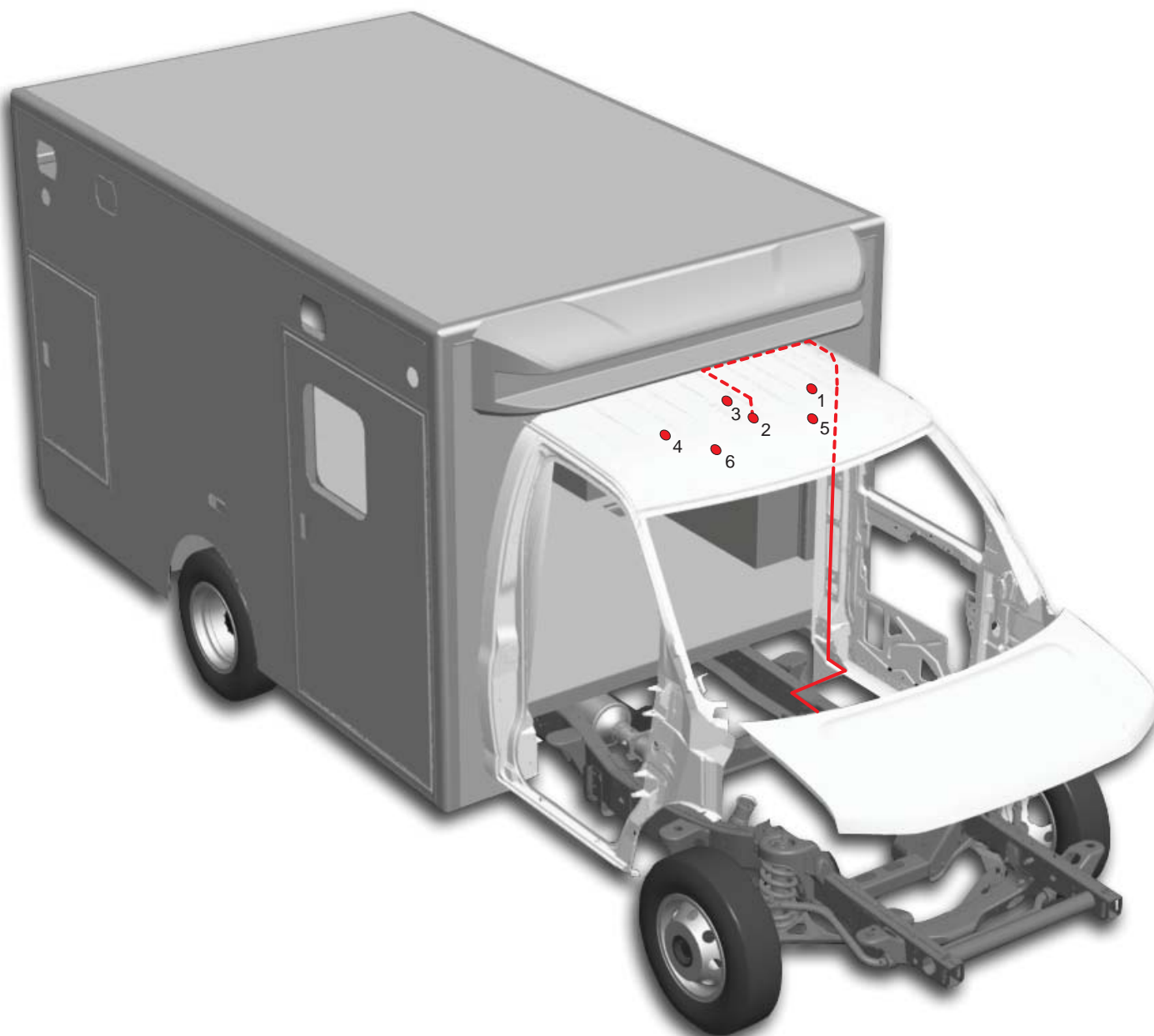
RADIO #1

The antenna #1 is located on the roof of the front cabin.

The antenna wire #1 goes from the antenna to the front console.

- PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - SYSTEM LOCATION

ANTENNAS SYSTEM



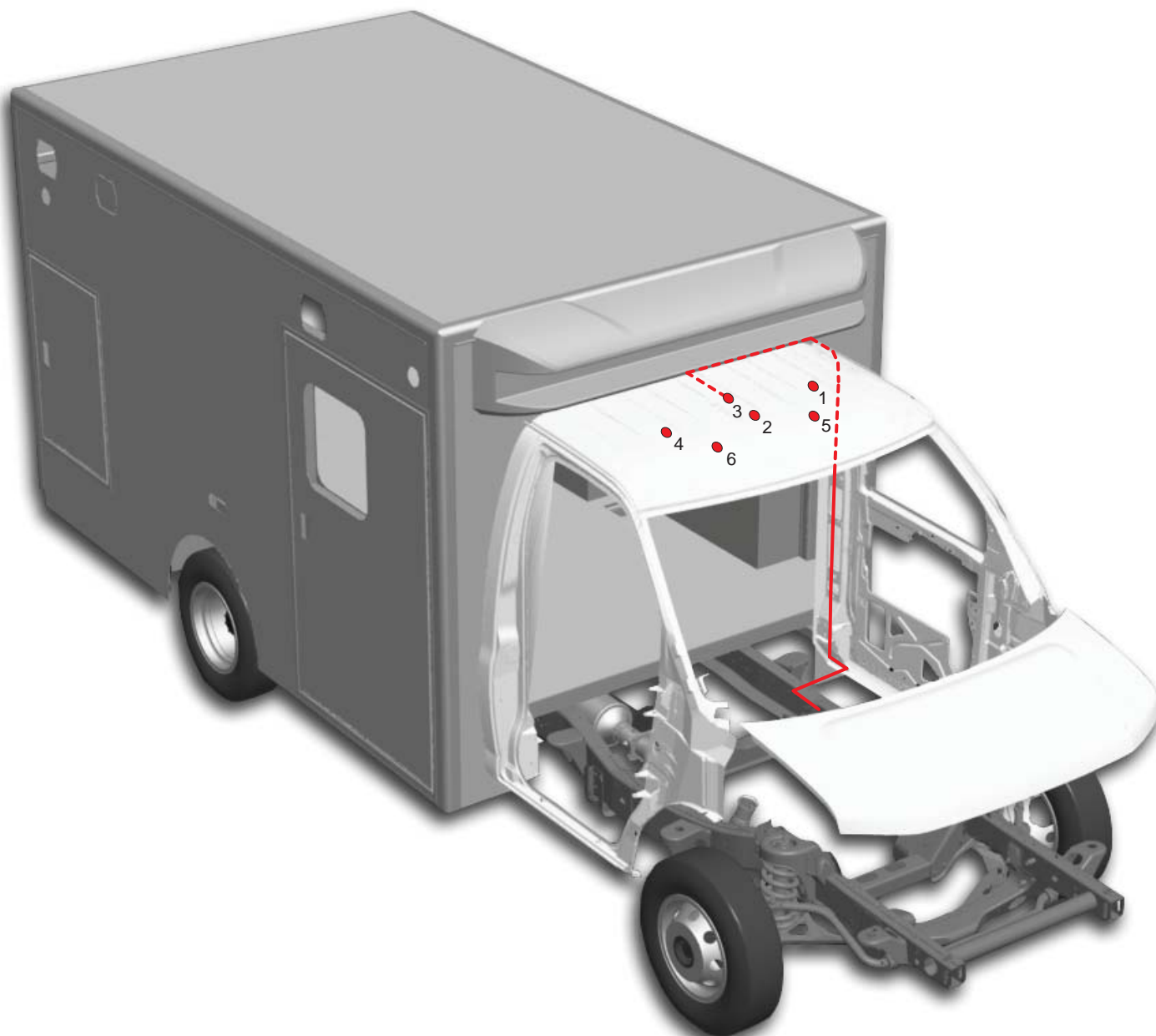
GPS

The antenna #2 is located on the roof of the front cabin.

The antenna wire #2 goes from the antenna to the front console.

- PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - SYSTEM LOCATION

ANTENNAS SYSTEM



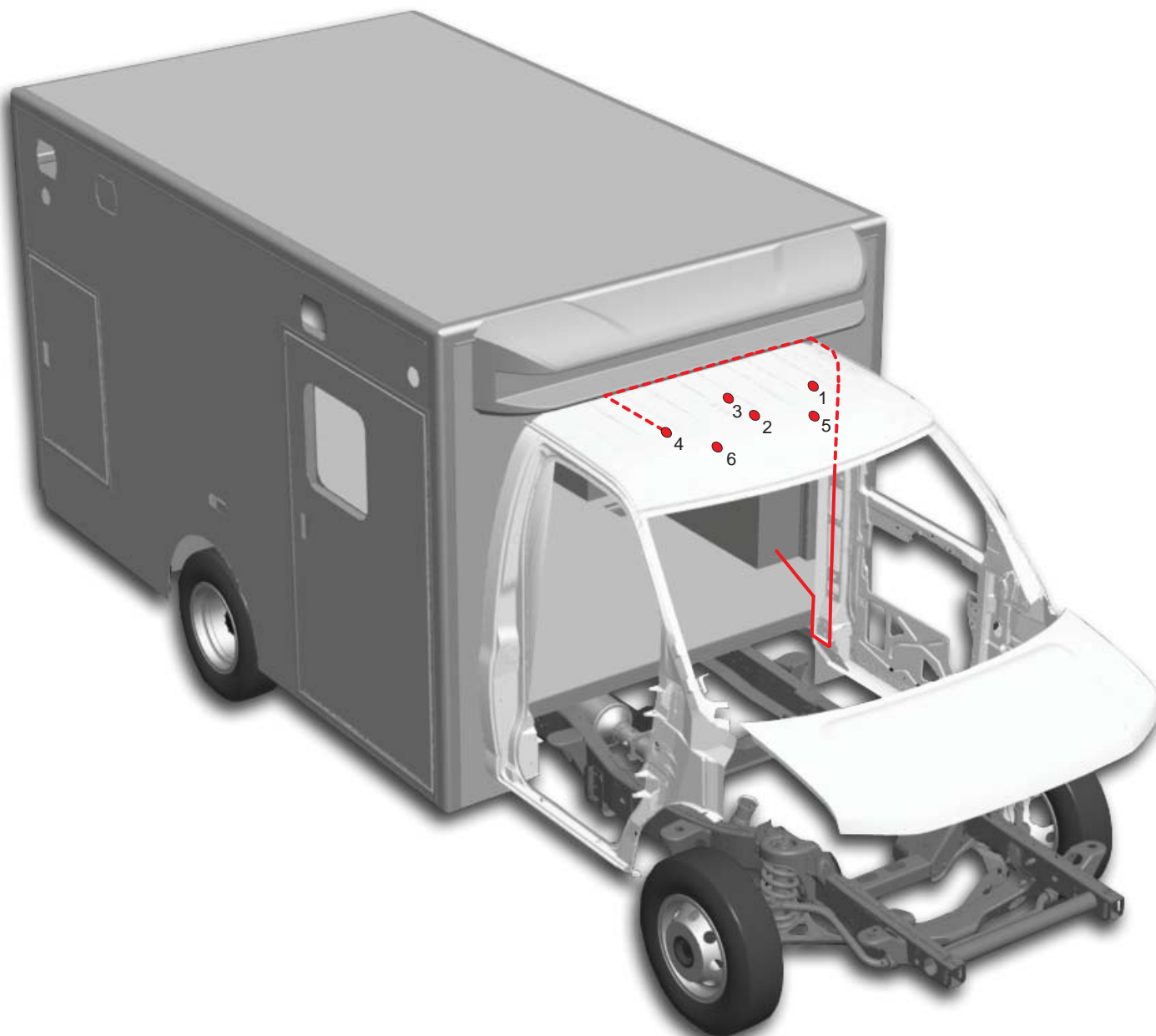
CELL #1

The antenna #3 is located on the roof of the front cabin.

The antenna wire #3 goes from the antenna to the front console.

- PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - SYSTEM LOCATION

ANTENNAS SYSTEM



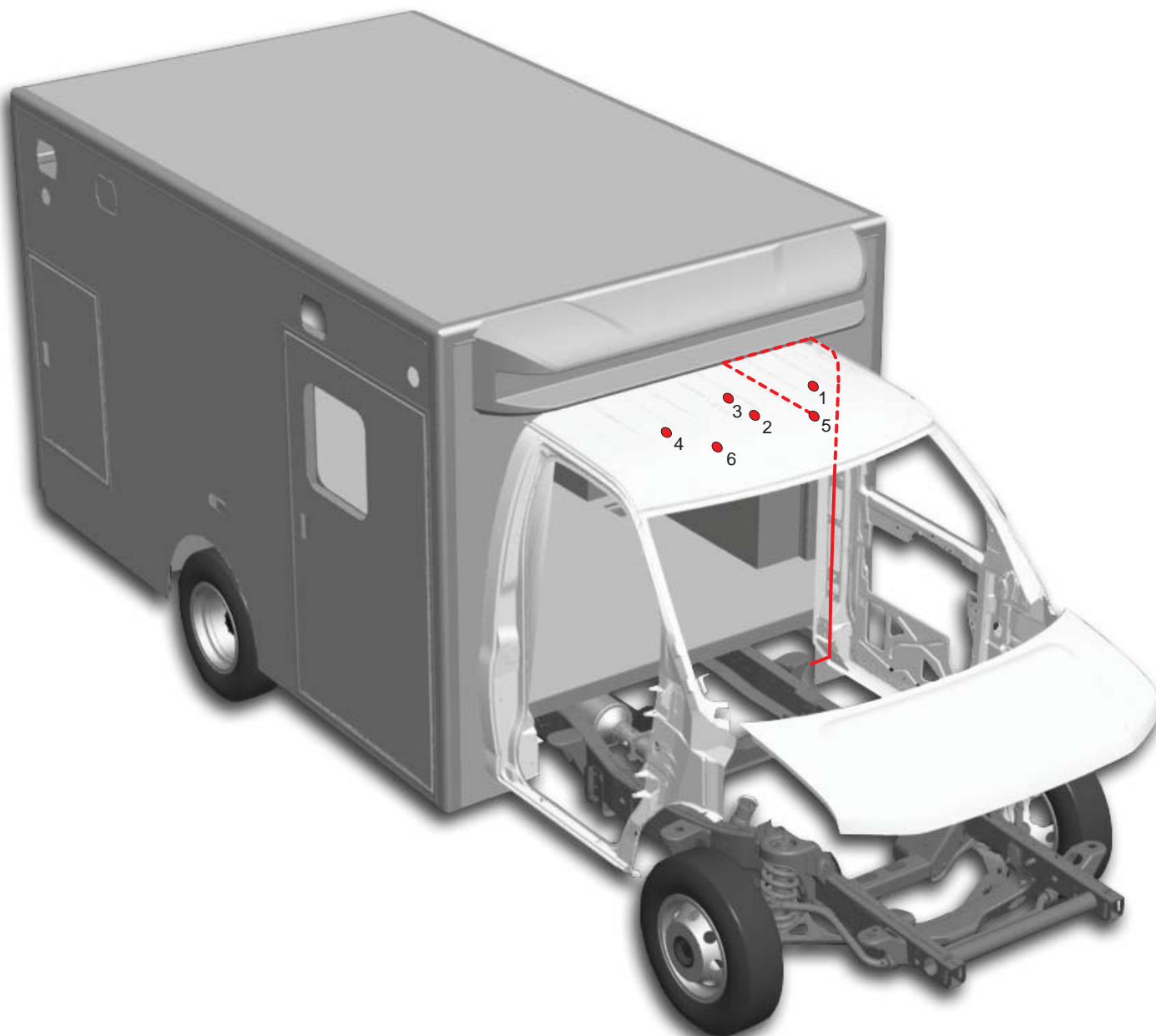
RADIO #2

The antenna #4 is located on the roof of the front cabin.

The antenna wire #4 goes from the antenna to the electrical panel compartment (G1).

- PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - SYSTEM LOCATION

ANTENNAS SYSTEM



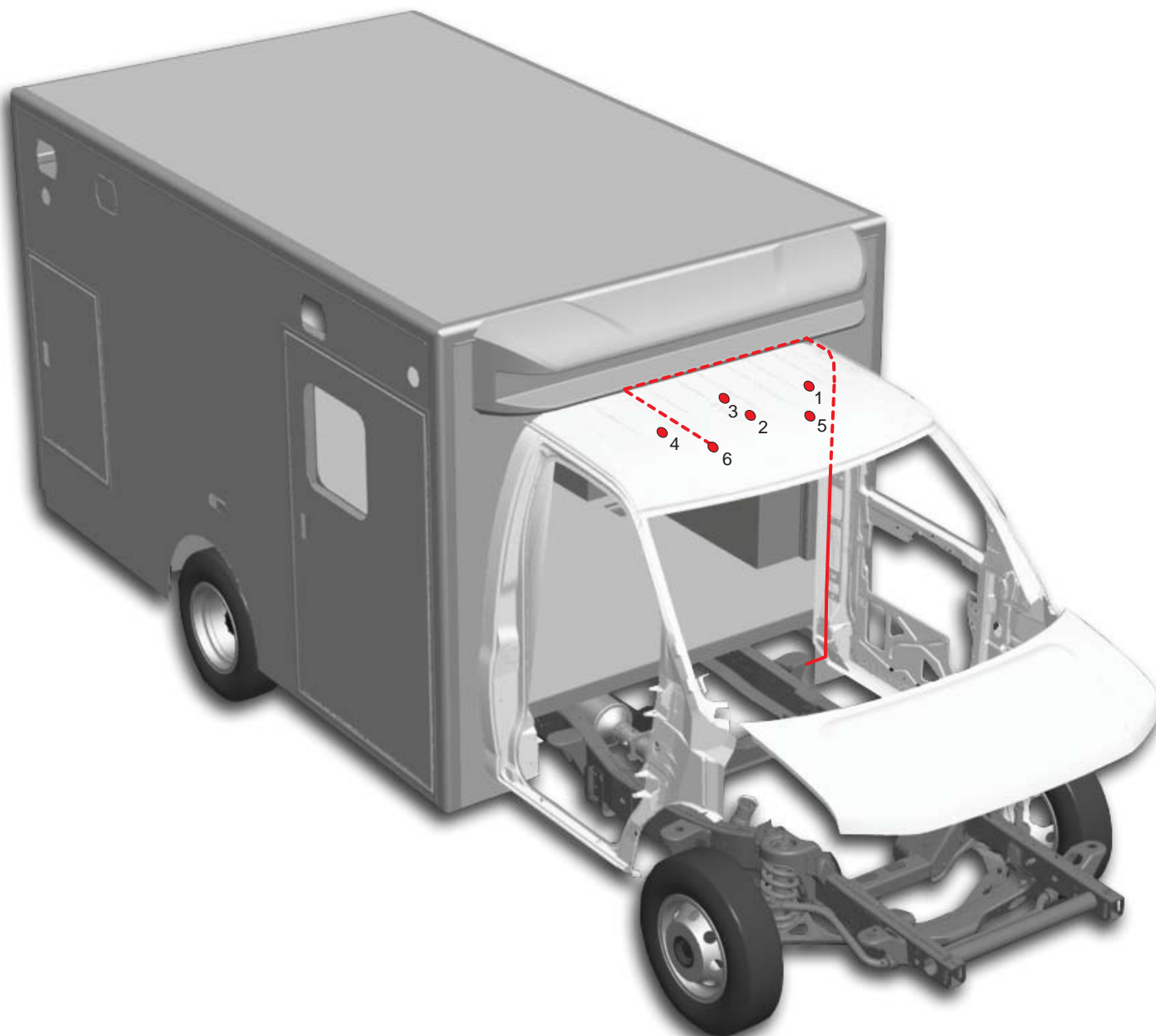
CELL #2

The antenna #5 is located on the roof of the front cabin.

The antenna wire #5 goes from the antenna to the driver seat (behind).

- PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - SYSTEM LOCATION

ANTENNAS SYSTEM



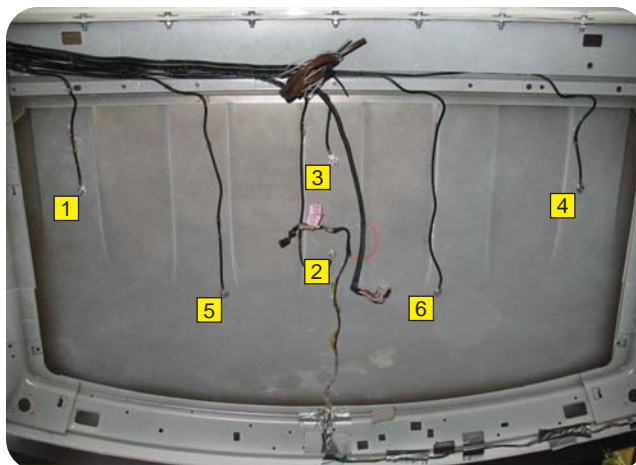
CELL #3

The antenna #6 is located on the roof of the front cabin.

The antenna wire #6 goes from the antenna to the driver seat (behind).

- PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - SYSTEM LOCATION

ANTENNAS ACCESS POINTS

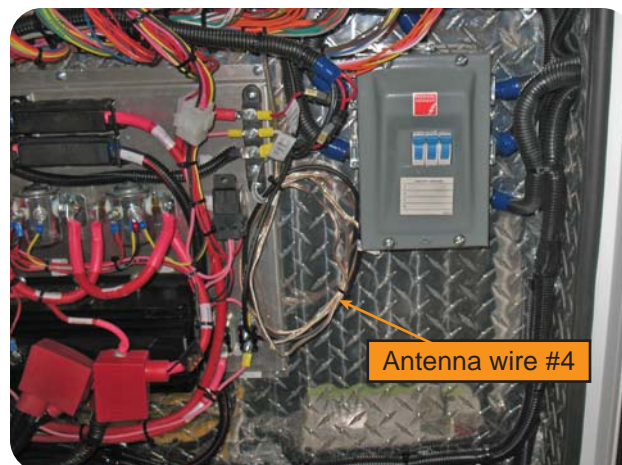


Remove the ceiling of the front cabin to have access to the six (6) antennas.



Antenna wires #1, #2 & #3

The antennas wires #1, #2 & #3 is located near to the front console, in front cabin.



Antenna wire #4

The antenna wire #4 is located in the electrical panel compartment.



Antenna wires #5 & #6

The antennas wires #5 & #6 is located behind the driver seat, in front cabin.

• PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - ELECTRICAL PANEL

ELECTRICAL PANEL SCHEMATICS



Note : The electrical panel schematics sticker is located on the G1 door interior panel.



TECHNICAL MANUAL MX151D - GM



• PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - ELECTRICAL PANEL

ELECTRICAL PANEL SCHEMATICS

	COLOR	AWG	DESCRIPTION
JCT6	GREY	18	SPEAKER(TACHOGRAPH)
JCT7	GREY	18	SPEAKER(TACHOGRAPH)
J8	BROWN	18	DOOR AJAR
SQ1	RED	18	STROBE MODULE DIODE
SQ1-A	RED	18	STROBE MODULE
TACH1	RED	16	SWITCH FLASHING LIGHT
TACH2	RED	16	SWITCH LIGHT BAR
K2	GREEN	16	SIREN SPEAKER (+)
MS2	RED	18	STROBE MODULE DIODE
MS3	WHITE	18	FLASH PATTERN OF MODULE STROBE
K6	GREEN	16	HORN
OVER.D1	GREY	18	OVER DRIVE SIGNAL
RPM1	GREY	18	RPM SIGNAL
WW1	GREY	18	WIPER SIGNAL
SPEED1	GREY	18	SPEEDOMETER SIGNAL
MW5	GREY	16	HIGH BEAM SIGNAL
H5	RED	14	LEFT HIGH BEAM
H6	RED	14	RIGHT HIGH BEAM
SZ3	RED	16	SWITCH LIGHT BAR
SY3	RED	16	SWITCH FLASHING LIGHT
SS2	BROWN	16	SWITCH MASTER(HOURMETER)
SS3	BROWN	16	SWITCH MASTER
SR3	RED	18	SWITCH WIG WAG
SV3	PINK	16	SWITCH ANTITHEFT
SD3	WHITE	18	SWITCH FRONT CEILING LIGHT
SH3	WHITE	18	SWITCH REAR SCENE
SO3	RED	18	SWITCH STROBE LIGHT
SE3	WHITE	18	SWITCH LEFT SCENE
SF3	WHITE	18	SWITCH RIGHT SCENE
SW1	BROWN	16	RIGHT DOOR SWITCH
SW5	BROWN	16	BACK DOOR SWITCH
SW6	BROWN	16	DOOR AJAR
SW7	BROWN	16	DOOR AJAR
RD+	RED	18	RIGHT RADIO
RG+	YELLOW	18	LEFT RADIO
SD-	PINK	16	RIGHT SPEAKER -
SQ-	BLUE	16	LEFT SPEAKER -
P13	ORANGE	12	HEATER HIGH
P14	ORANGE	12	A/C HIGH
B5	GREY	16	BRAKE LIGHT (TACHOGRAPH)
B2	GREEN	16	BACK UP ALARM SIGNAL
COMP1	BROWN	16	COMPARTMENT SWITCH
SB1	WHITE	16	SWITCH CEILING LIGHT SIDE LEFT
SB3	WHITE	16	SWITCH CEILING LIGHT SIDE LEFT
SA1	WHITE	18	SWITCH CEILING LIGHT SIDE RIGHT
SA3	WHITE	18	SWITCH CEILING LIGHT SIDE RIGHT
SC1	WHITE	16	SWITCH EMT LIGHT
SC3	WHITE	16	SWITCH EMT LIGHT
O7	PINK	16	IGNITION SIGNAL
SJ2	ORANGE	16	HEATER SWITCH FRONT CONSOLE POWER
SK2	ORANGE	16	A/C SWITCH FRONT CONSOLE POWER
TH1	ORANGE	16	A/C COMPRESSOR SIGNAL
CHARG1	RED/BLACK	12	BATTERY CHARGER
RA30	RED	6	75A RELAY POWER
RB30	RED	6	75A RELAY POWER
RC30	RED	6	75A RELAY POWER
RD30	RED	6	75A RELAY POWER
MF12V	RED	6	FLASHER MODULE POWER

	COLOR	AWG	DESCRIPTION
GR1	BLACK	16	GROUND RELAY
GR2	BLACK	14	GROUND LOCK
GR3	BLACK	14	GROUND UNLOCK
GR4	BLACK	12	GROUND FRONT LIGHT BAR
GR5	BLACK	12	GROUND REAR LIGHT BAR
GR6	BLACK	16	GROUND RELAY
GR7	BLACK	16	GROUND BACK UP ALARM TIMER
GR8	BLACK	16	GROUND 75A RELAY
GR9	BLACK	16	GROUND STROBE MODULE
GR10	BLACK	16	GROUND TACHOGRAPH
GR11	BLACK	16	GROUND OF HOURMETER
GR12	BLACK	12	GROUND INCUBATOR PLUG
GR13	BLACK	14	GROUND WIG WAG MODULE
GR14	BLACK	14	GROUND SUCTION

FU 1	COLOR	AWG	DESCRIPTION
AA1	RED/BLACK	16	CEILING LIGHT LEFT HIGH POWER RELAY
AA2	RED	16	EMERGENCY LIGHT RIGHT FRONT
AA3	RED/BLACK	16	CEILING LIGHT LEFT LOW POWER RELAY
AA4	RED	16	EMERGENCY LIGHT RIGHT BACK
AA5	RED/BLACK	16	CEILING LIGHT LEFT LOW POWER RELAY
AA7	RED/BLACK	14	CEILING LIGHT LEFT HIGH POWER RELAY
AA8	RED	16	EMERGENCY LIGHT LEFT BACK
AA9	RED/BLACK	16	CEILING LIGHT LEFT HIGH POWER RELAY
AA10	RED	16	EMERGENCY LIGHT GRILLE LEFT SIDE
A1	WHITE	16	CEILING LIGHT LEFT SIDE HIGH
A2	RED	16	EMERGENCY LIGHT LEFT SIDE FRONT
A3	WHITE	16	CEILING LIGHT LEFT SIDE LOW
A4	RED	16	EMERGENCY LIGHT RIGHT SIDE BACK
A5	WHITE	16	CEILING LIGHT LEFT LOW POWER RELAY
A6	PINK	18	TACHOGRAPH POWER
A7	WHITE	14	CEILING LIGHT LEFT HIGH POWER RELAY
A8	RED	16	EMERGENCY LIGHT LEFT SIDE BACK
A9	WHITE	16	CEILING LIGHT LEFT HIGH POWER RELAY
A10	RED	16	EMERGENCY LIGHT GRILLE RIGHT SIDE
D1	WHITE	16	SWITCH EMT LIGHT
D2	WHITE	16	CEILING LIGHT FRONT LEFT SIDE HIGH
D3	WHITE	16	SWITCH EMT LIGHT
D4	WHITE	16	CEILING LIGHT FRONT LEFT SIDE LOW
D5	WHITE	16	SWITCH CEILING LIGHT LEFT
D6	WHITE	16	CEILING LIGHT LEFT SIDE LOW (5)
D8	WHITE	14	CEILING LIGHT LEFT SIDE HIGH (3)
D10	WHITE	16	CEILING LIGHT LEFT SIDE HIGH (2)

FU 2	COLOR	AWG	DESCRIPTION
AA1	RED/BLACK	16	CEILING LIGHT RIGHT SIDE LOW POWER RELAY
AA2	RED/BLACK	16	DOOR SWITCH POWER RIGHT AND BACK
AA3	RED/BLACK	16	CEILING LIGHT RIGHT SIDE HIGH POWER RELAY
AA4	RED/BLACK	16	COMPARTMENT LIGHT POWER
AA5	RED/BLACK	16	FLUORESCENT HIGH POWER RELAY
AA6	RED/BLACK	16	BACK UP ALARM SWITCH POWER
AA7	RED/BLACK	14	RIGHT SCENE LIGHT POWER RELAY
AA8	RED/BLACK	18	SCENE LIGHT SWITCH POWER
AA9	RED/BLACK	12	INCUBATOR PLUG POWER
AA10	RED/BLACK	16	BYPASS POWER
A1	WHITE	16	CEILING LIGHT RIGHT SIDE LOW
A2	RED/BLACK	16	DOOR SWITCH POWER RIGHT AND BACK
A3	WHITE	16	CEILING LIGHT RIGHT SIDE HIGH
A4	RED/BLACK	16	COMPARTMENT LIGHT POWER
A5	RED	16	FLUORESCENT HIGH POWER RELAY
A6	RED/BLACK	16	BACK UP ALARM SWITCH POWER
A7	RED/BLACK	14	RIGHT SCENE LIGHT POWER RELAY
A8	RED/BLACK	18	SCENE LIGHT SWCH POWER
A9	GREEN	12	INCUBATOR PLUG
A10	BROWN	16	BYPASS
B9	WHITE	14	SCENE LIGHT RIGHT SIDE FRONT
D1	WHITE	18	SWITCH CEILING LIGHT RIGHT SIDE
D2	WHITE	16	CEILING LIGHT AND NEON RIGHT SIDE LOW
D3	WHITE	18	SWITCH CEILING LIGHT RIGHT SIDE
D4	WHITE	16	CEILING LIGHT RIGHT SIDE HIGH
D5	WHITE	18	SWITCH CEILING LIGHT RIGHT SIDE
D6	WHITE	16	FLUORESCENT RIGHT SIDE HIGH
D7	WHITE	18	SCENE LIGHT RIGHT SIDE RELAY
D8	WHITE	14	SCENE LIGHT RIGHT SIDE
D9	WHITE	18	SCENE LIGHT RIGHT SIDE RELAY

FU 3	COLOR	AWG	DESCRIPTION
AA1	RED/BLACK	14	SCENE LIGHT LEFT SIDE POWER RELAY
AA2	RED/BLACK	16	12 VOLTS PLUG 10A
AA3	RED/BLACK	16	SWITCH FLASHING LIGHT POWER
AA5	RED/BLACK	14	SCENE LIGHT BACK POWER RELAY
AA6	RED/BLACK	14	SIREN POWER
AA7	RED/BLACK	14	SIREN POWER
AA8	RED/BLACK	18	CAB LIGHT SWITCH POWER
AA9	RED/BLACK	14	FOG LIGHT POWER RELAY
AA10	RED/BLACK	18	FOG LIGHT AND STROBE POWER SWITCH
A1	RED	14	SCENE LIGHT RIGHT POWER RELAY
A2	GREEN	16	12 VOLTS PLUG 10A
A3	RED/BLACK	16	SWITCH FLASHING LIGHT POWER
A5	RED/BLACK	14	SCENE LIGHT BACK POWER RELAY
A6	RED/BLACK	14	SIREN POWER
A7	RED/BLACK	14	SIREN POWER
A8	RED/BLACK	18	SWITCH CAB LIGHT POWER
A9	RED/BLACK	14	FOG LIGHT POWER RELAY
A10	RED/BLACK	18	SWITCH FOG LIGHT AND STROBE POWER
B3	WHITE	14	SCENE LIGHT LEFT SIDE FRONT (1)
B7	GREEN	16	BACK UP ALARM RELAY
C8	GREEN	16	BACK UP ALARM
D2	WHITE	14	SCENE LIGHT LEFT
D5	WHITE	18	SCENE LIGHT BACK RELAY
D6	WHITE	14	SCENE LIGHT BACK
D7	GREEN	16	BACK UP ALARM
D8	GREEN	16	BACK UP ALARM RELAY
D9	BLUE	18	SWITCH FOG LIGHT
D10	BLUE	14	FOG LIGHT

FU 4	COLOR	AWG	DESCRIPTION
AA1	RED/BLACK	14	DRIVING LIGHT POWER RELAY
AA2	RED/BLACK	18	SWITCH CEILING LIGHT RIGHT POWER RELAY
AA3	RED/BLACK	14	HEATER LOW POWER RELAY
AA5	RED/BLACK	14	A/C LOW POWER RELAY
AA6	BROWN	16	PARKING LIGHT SIGNAL
AA7	RED/BLACK	12	A/C HIGH POWER RELAY
AA8	RED	16	EMERGENCY LIGHT LEFT SIDE FRONT (1)
AA9	RED/BLACK	12	A/C HIGH POWER RELAY
AA10	RED/BLACK	16	STROBE MODULE POWER
A1	RED/BLACK	14	DRIVING LIGHT POWER RELAY
A2	RED/BLACK	18	SWITCH CEILING LIGHT RIGHT POWER
A3	RED/BLACK	14	HEATER LOW POWER RELAY
A5	RED/BLACK	14	A/C LOW POWER RELAY
A6	BROWN	16	PARKING LIGHT
A7	RED/BLACK	12	A/C HIGH POWER RELAY
A8	RED	16	EMERGENCY LIGHT LEFT SIDE FRONT (1)
A9	RED/BLACK	12	A/C HIGH POWER RELAY
A10	RED/BLACK	16	STROBE MODULE POWER
D1	BLUE	18	SWITCH DRIVING LIGHT
D2	BLUE	14	DRIVING LIGHT
D3	ORANGE	16	HEATER LOW
D4	ORANGE	14	HEATER LOW
D5	ORANGE	16	A/C LOW
D6	ORANGE	14	A/C LOW
D7	ORANGE	16	A/C HIGH
D8	ORANGE	14	A/C HIGH
D10	ORANGE	14	A/C HIGH

FU 5	COLOR	AWG	DESCRIPTION
AA1	RED/BLACK	12	HEATER HIGH POWER RELAY
AA2	RED/BLACK	16	VOLTMETER
AA3	RED/BLACK	12	HEATER HIGH POWER RELAY
AA4	RED/BLACK	14	WIG WAG MODULE POWER
AA5	RED/BLACK	18	SWITCH WIG WAG POWER
AA6	RED/BLACK	14	SWITCH SPOT LIGHT POWER
AA7	RED/BLACK	16	EXHAUST FAN LOW POWER RELAY
AA8	RED/BLACK	18	SWITCH EXHAUST FAN POWER
AA9	RED/BLACK	14	EXHAUST FAN HIGH POWER RELAY
A1	RED/BLACK	12	HEATER HIGH POWER RELAY
A2	RED/BLACK	16	VOLTMETER
A3	RED/BLACK	12	HEATER HIGH POWER RELAY
A4	RED/BLACK	14	WIG WAG MODULE POWER
A5	RED/BLACK	18	SWITCH WIG WAG POWER
A6	RED/BLACK	14	SWITCH SPOT LIGHT POWER
A7	RED/BLACK	16	EXHAUST FAN LOW POWER RELAY
A8	RED/BLACK	18	SWITCH EXHAUST FAN POWER
A9	RED/BLACK	14	EXHAUST FAN HIGH POWER RELAY
D1	ORANGE	16	SWITCH HEATER HIGH
D2	ORANGE	12	HEATER HIGH POWER RELAY
D4	ORANGE	12	HEATER HIGH POWER RELAY
D5	RED	16	SWITCH FLASHING LIGHT
D6	RED	16	FLASHING LIGHT MODULE
D7	ORANGE	18	SWITCH EXHAUST FAN LOW
D8	ORANGE	16	EXHAUST FAN LOW (2)
D9	ORANGE	18	SWITCH EXHAUST FAN HIGH
D10	ORANGE	14	EXHAUST FAN HIGH (2)

FU 6	COLOR	AWG	DESCRIPTION
AA1	RED/BLACK	16	OIL PRESSURE SWITCH POWER
AA2	RED/BLACK	16	SWITCH LIGHT BAR POWER
AA3	RED/BLACK	14	SUCTION POWER RELAY
AA4	RED/BLACK	16	EMERGENCY LIGHT GRILLE RIGHT SIDE
AA5	RED/BLACK	12	DOOR LOCK POWER RELAY
AA6	RED/BLACK	16	SWITCH SPARE POWER
AA7	RED/BLACK	18	SWITCH SPARE POWER
AA8	RED	16	EMERGENCY LIGHT LIGHT BAR
AA10	RED	16	EMERGENCY LIGHT LIGHT BAR
A1	RED/BLACK	16	OIL PRESSURE SWITCH POWER
A2	RED/BLACK	16	SWITCH LIGHT BAR POWER
A3	RED/BLACK	14	SUCTION POWER RELAY
A4	RED	16	EMERGENCY LIGHT GRILLE RIGHT SIDE
A5	RED/BLACK	12	DOOR LOCK POWER RELAY
A6	RED/BLACK	16	SWITCH SPARE POWER
A7	RED/BLACK	18	SWITCH SPARE POWER
A8	RED	16	EMERGENCY LIGHT LIGHT BAR
A9	RED/BLACK	16	EMERGENCY LIGHT LIGHT BAR
A10	RED	16	EMERGENCY LIGHT LIGHT BAR
B5	YELLOW	14	DOOR LOCK ACTUATOR
B7	GREEN	14	DOOR UNLOCK ACTUATOR
C10	PINK	16	ANTITHEFT
D1	ORANGE	16	HEATER VALVE RELAY
D2	ORANGE	16	HEATER VALVE
D3	PURPLE	18	SWITCH SUCTION
D4	PURPLE	14	SUCTION RELAY OUTPUT
D5	YELLOW	18	SIGNAL LOCK(+)
D7	GREEN	18	SIGNAL UNLOCK(+)
D9	PINK	16	ANTITHEFT RELAY
D10	PINK	16	ANTITHEFT RELAY

FU 7	COLOR	AWG	DESCRIPTION
AA1	RED	16	EMERGENCY LIGHT BACK LIGHT BAR
AA2	YELLOW	16	LEFT FLASHER
AA3	RED	16	EMERGENCY LIGHT BACK LIGHT BAR
AA4	GREEN	16	RIGHT FLASHER
AA5	RED/BLACK	18	TACHOGRAPH POWER
A1	RED	16	EMERGENCY LIGHT BACK LIGHT BAR
A2	YELLOW	16	LEFT FLASHER
A3	RED	16	EMERGENCY LIGHT BACK LIGHT BAR
A4	GREEN	16	RIGHT FLASHER
A5	RED/BLACK	18	TACHOGRAPH POWER
B3	RED	16	EMERGENCY LIGHT LIGHT BAR RELAY
B5	RED	16	EMERGENCY LIGHT LIGHT BAR RELAY
B7	RED	16	FLASHING LIGHT RELAY
B9	RED	16	FLASHING LIGHT RELAY
D2	GREEN	18	HORN SIGNAL FOR SIREN
D3	RED	16	SWITCH LIGHT BAR
D7	RED	16	SWITCH FLASHING LIGHT
FU 9	COLOR	AWG	DESCRIPTION
D10	BLUE	14	DRIVING LIGHT

Note : The electrical panel schematics sticker is located on the G1 door interior panel.

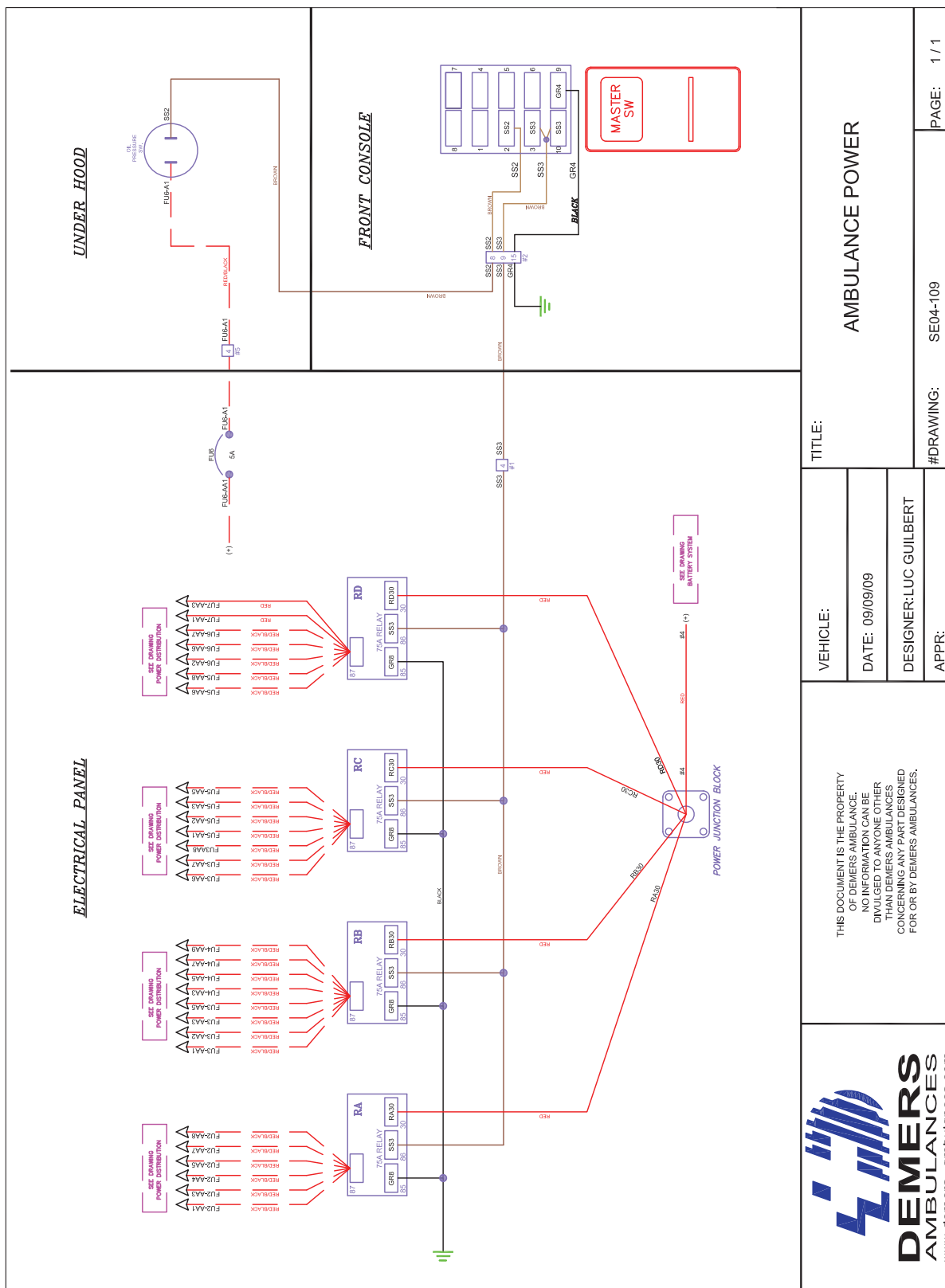


TECHNICAL MANUAL MX151D - GM



• PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - WIRING SCHEMATICS

POWER AMBULANCE



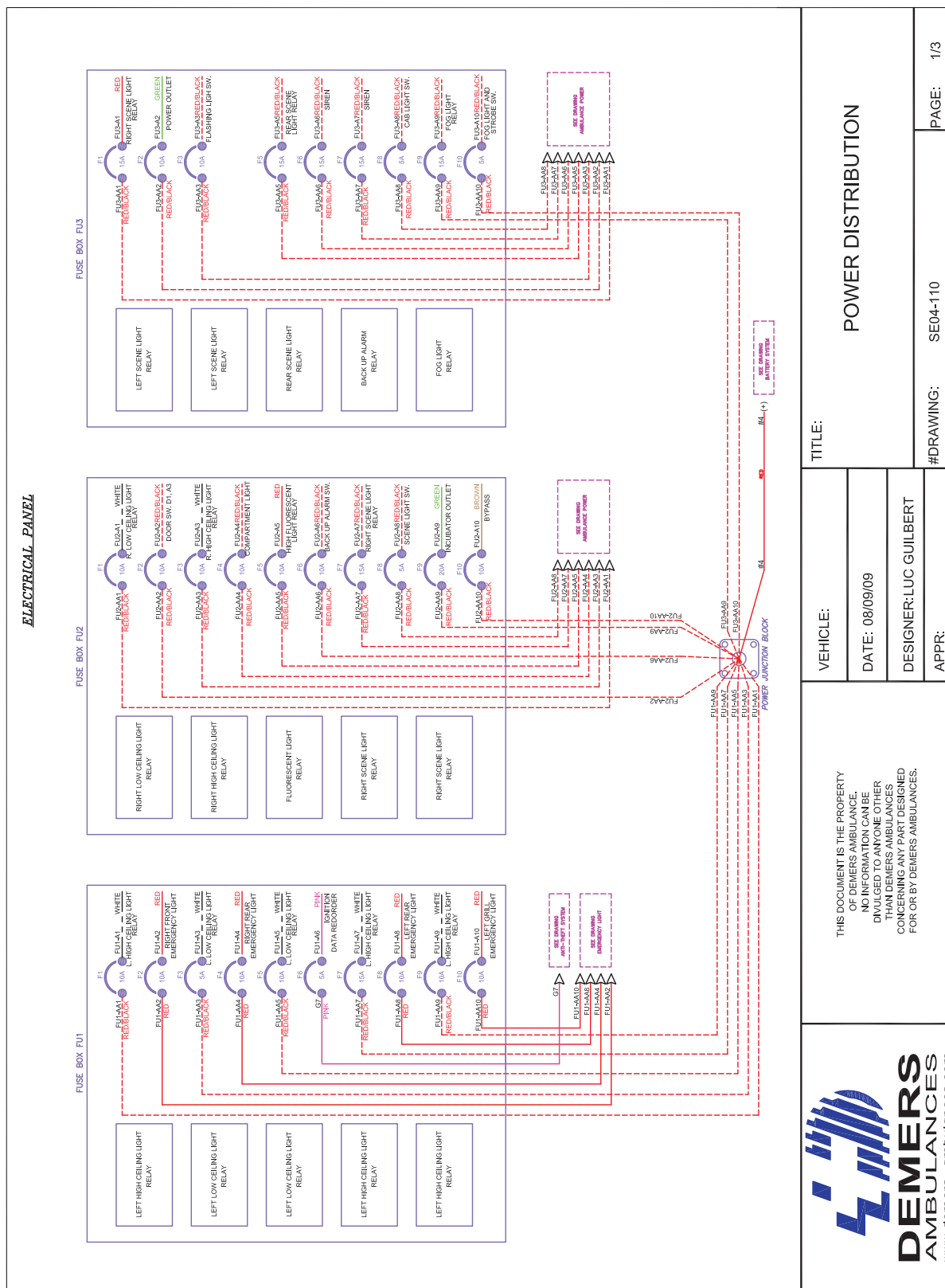


TECHNICAL MANUAL MX151D - GM



• PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - WIRING SCHEMATICS

POWER DISTRIBUTION



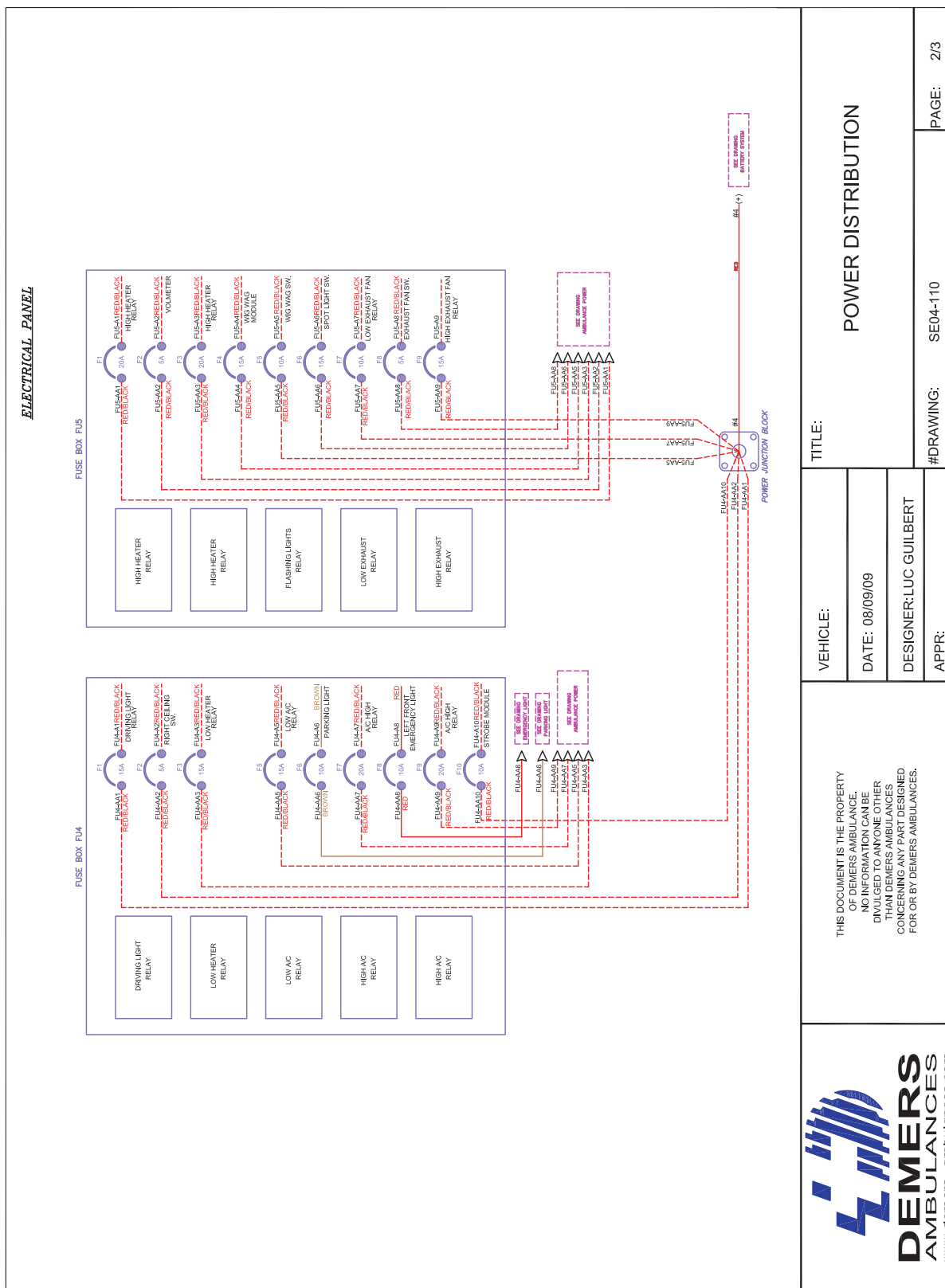


TECHNICAL MANUAL MX151D - GM



• PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - WIRING SCHEMATICS

POWER DISTRIBUTION



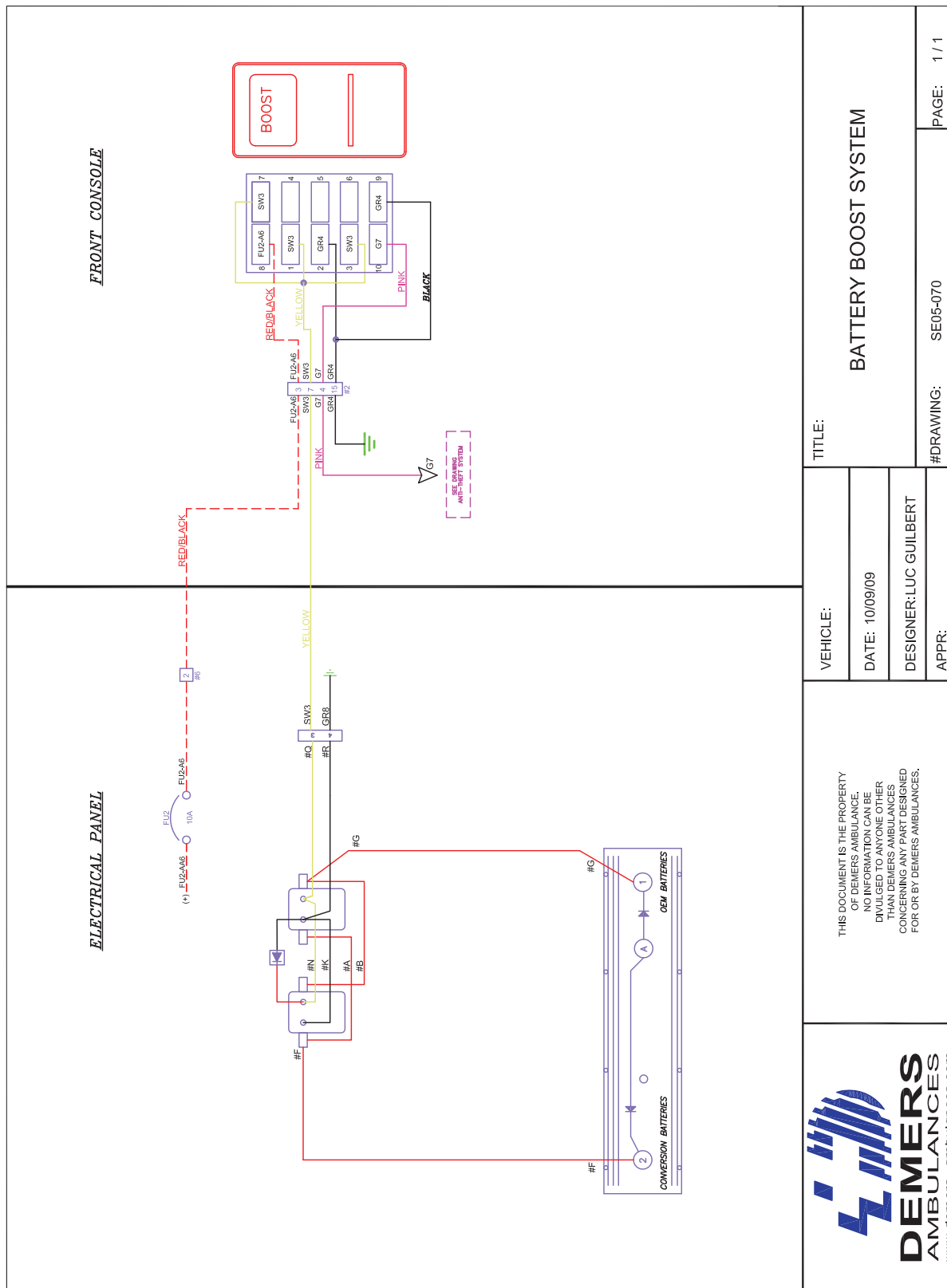


TECHNICAL MANUAL MX151D - GM



• PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - WIRING SCHEMATICS

BATTERY BOOST SYSTEM





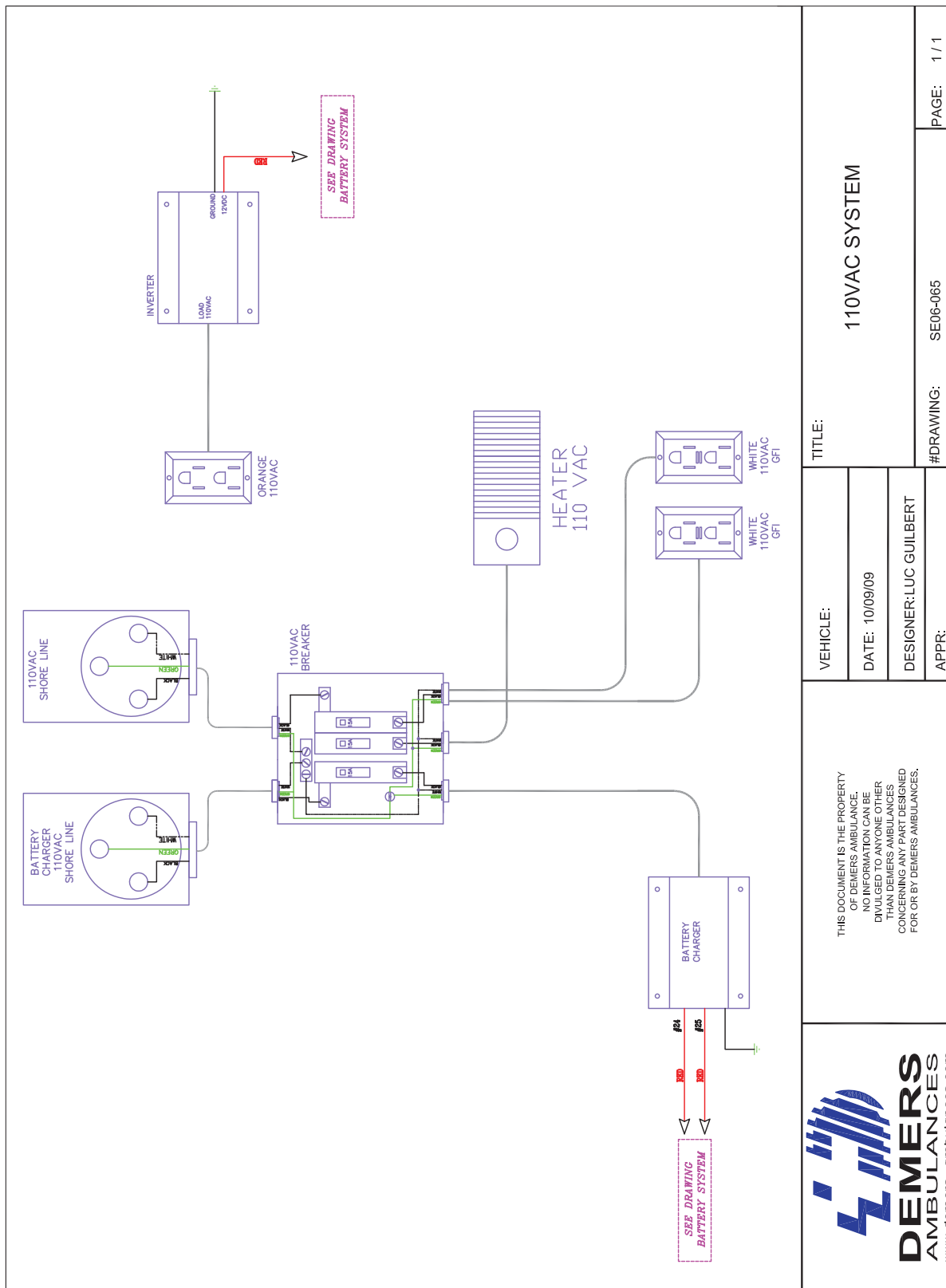
TECHNICAL MANUAL

MX151D - GM



• PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - WIRING SCHEMATICS

110 VOLTS A.C. SYSTEM



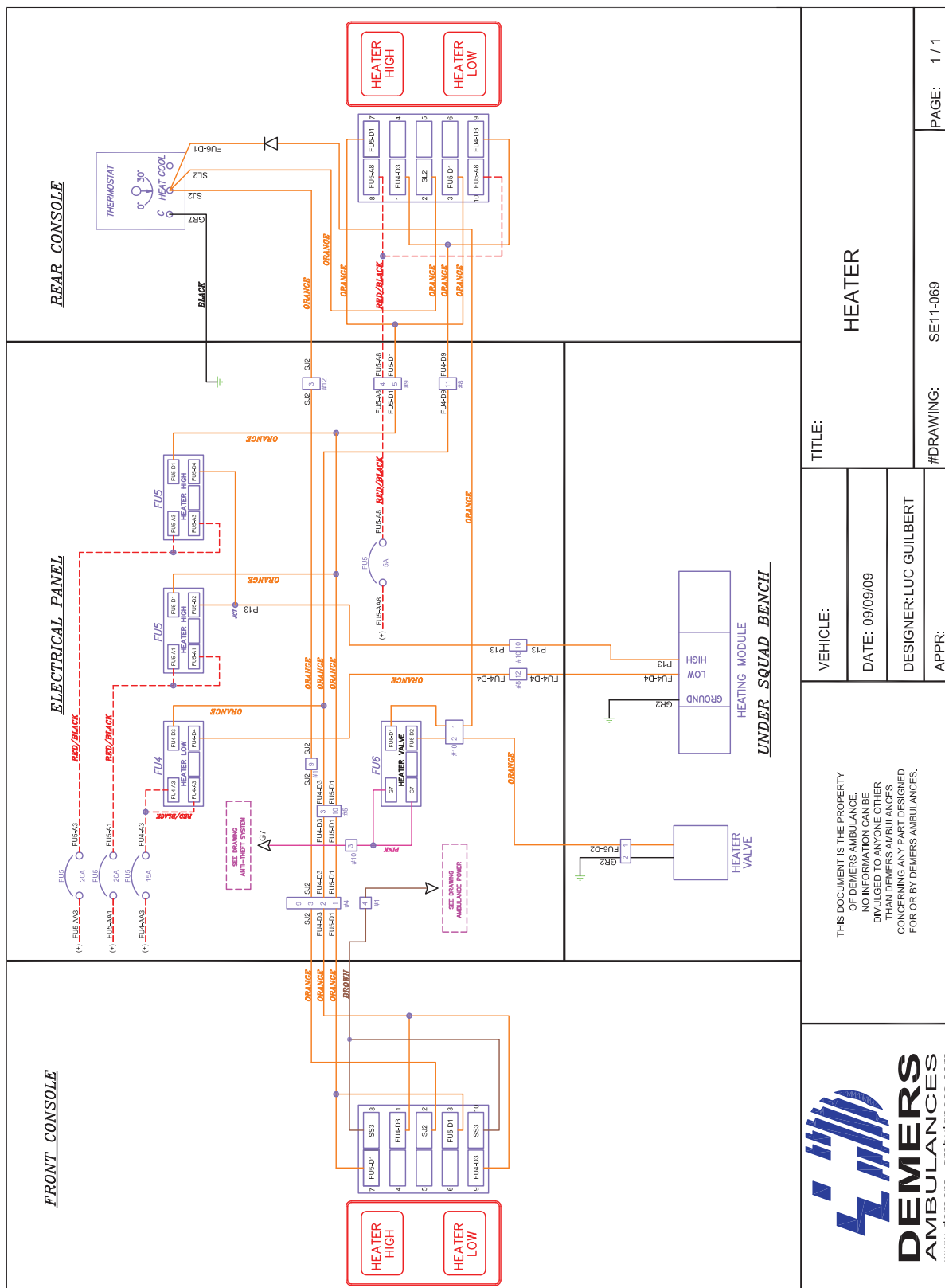


TECHNICAL MANUAL MX151D - GM



• PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - WIRING SCHEMATICS

HEATER





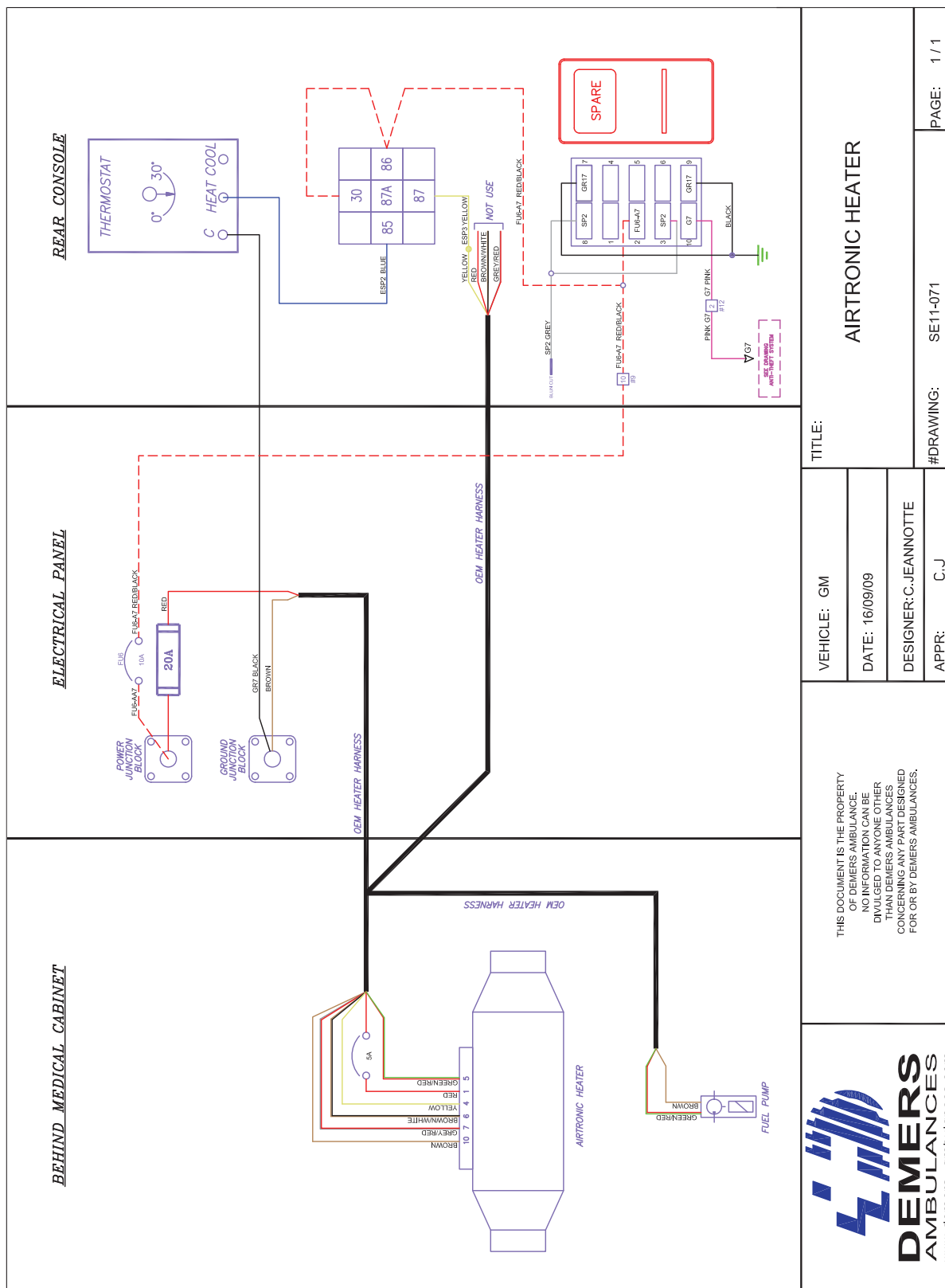
TECHNICAL MANUAL

MX151D - GM



• PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - WIRING SCHEMATICS

AIRTRONIC HEATER





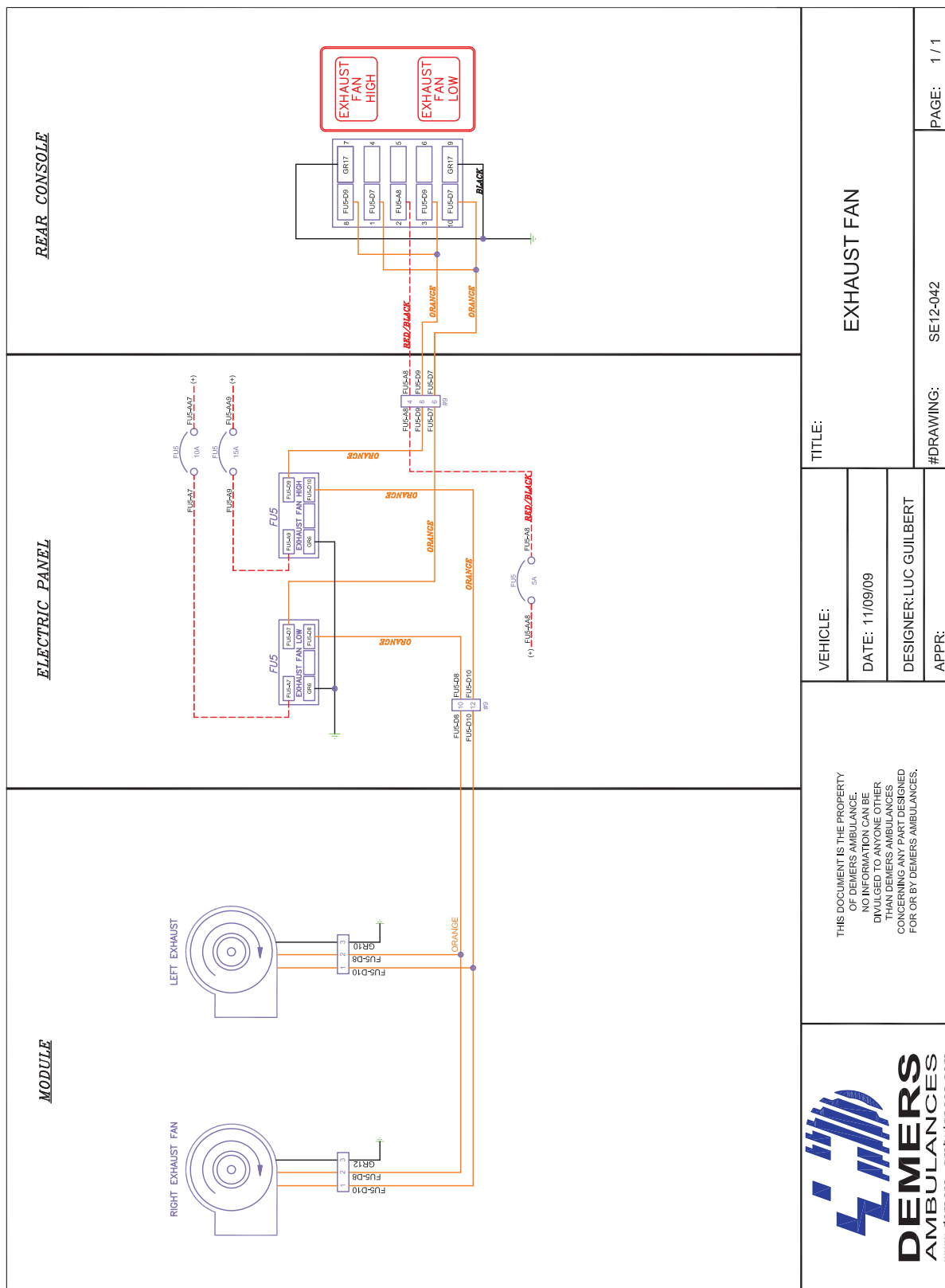
TECHNICAL MANUAL

MX151D - GM



• PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - WIRING SCHEMATICS

EXHAUST FAN





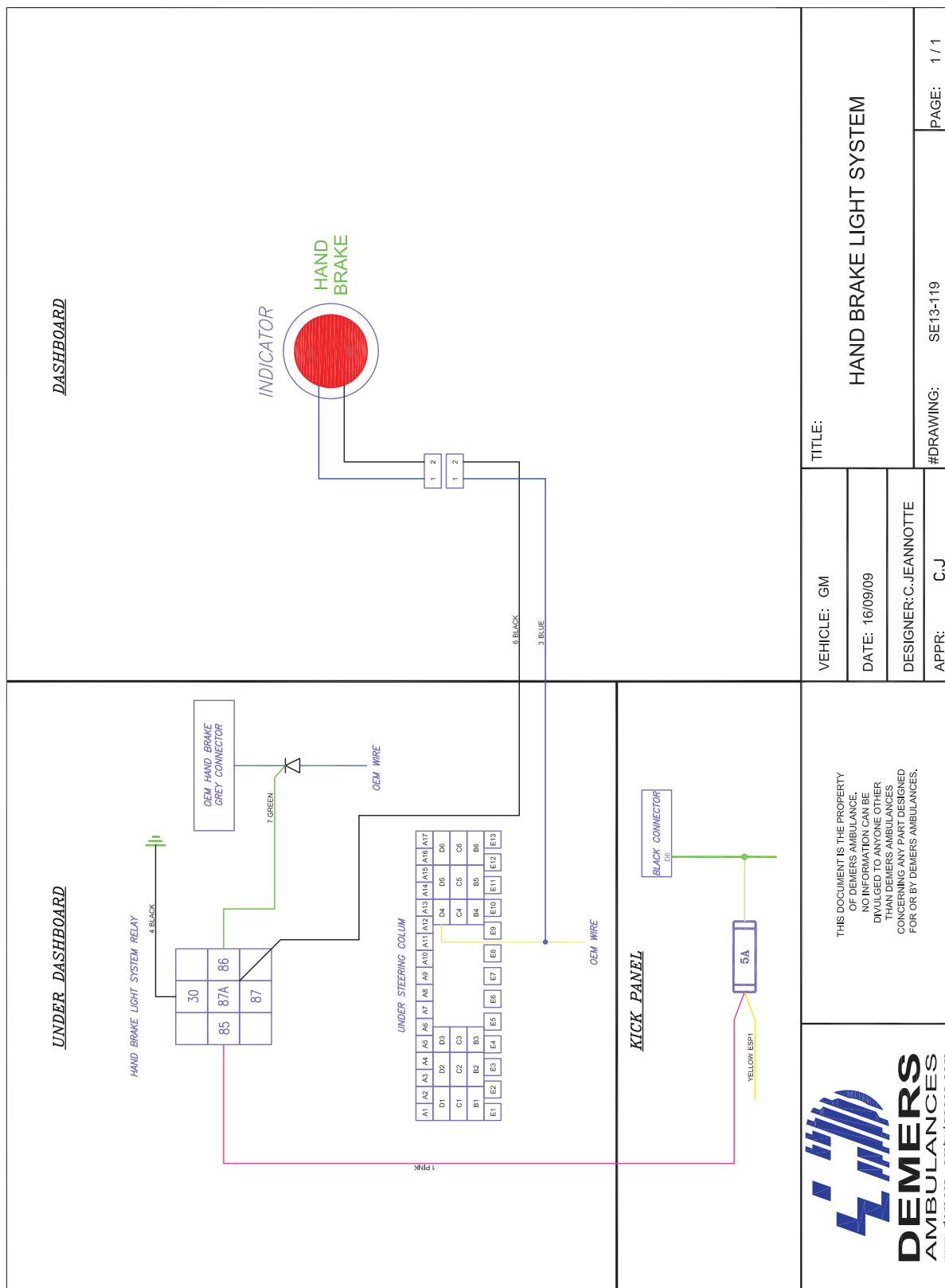
TECHNICAL MANUAL

MX151D - GM



• PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - WIRING SCHEMATICS

HAND BRAKE LIGHT SYSTEM





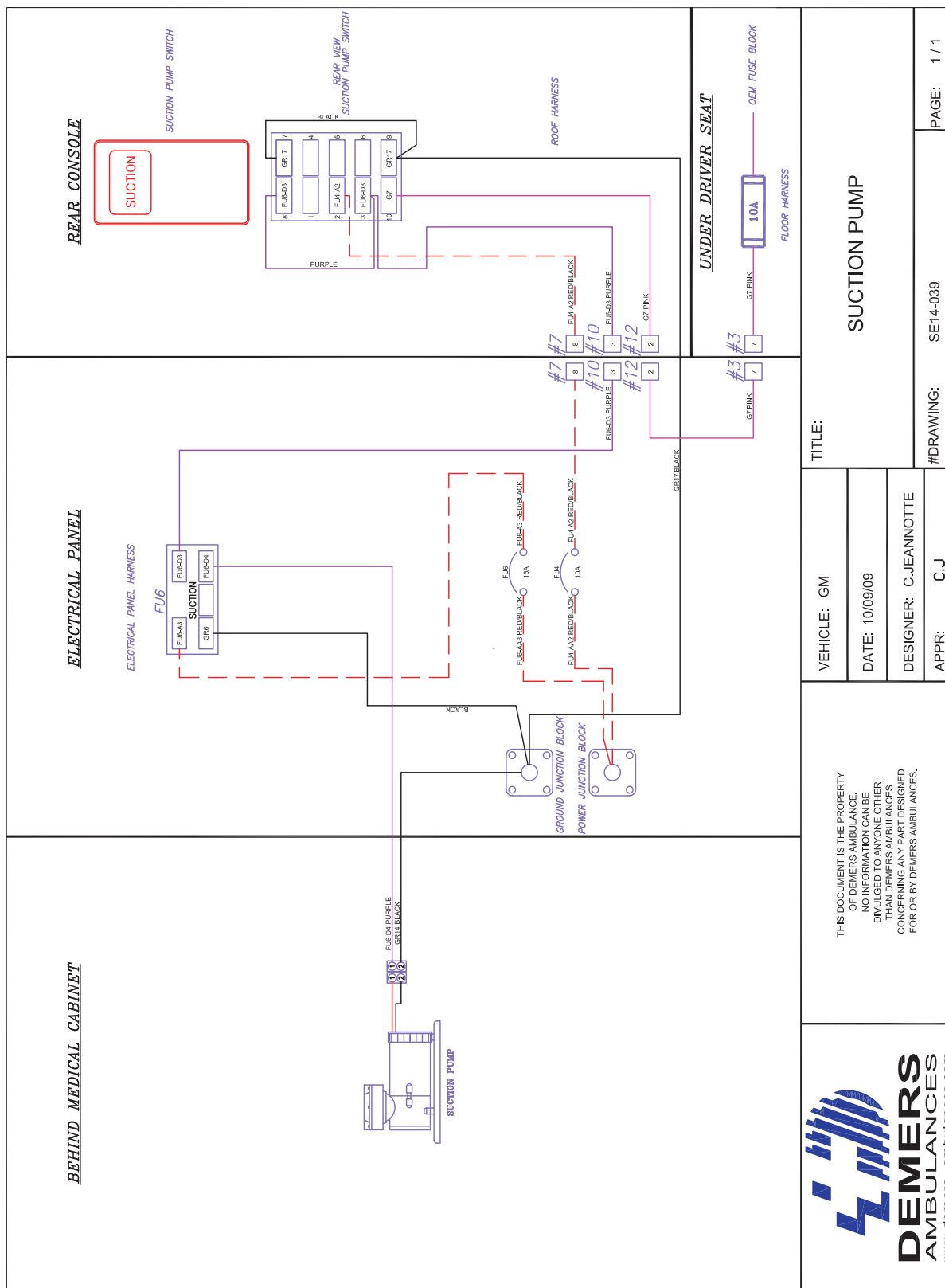
TECHNICAL MANUAL

MX151D - GM



• PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - WIRING SCHEMATICS

SUCTION PUMP



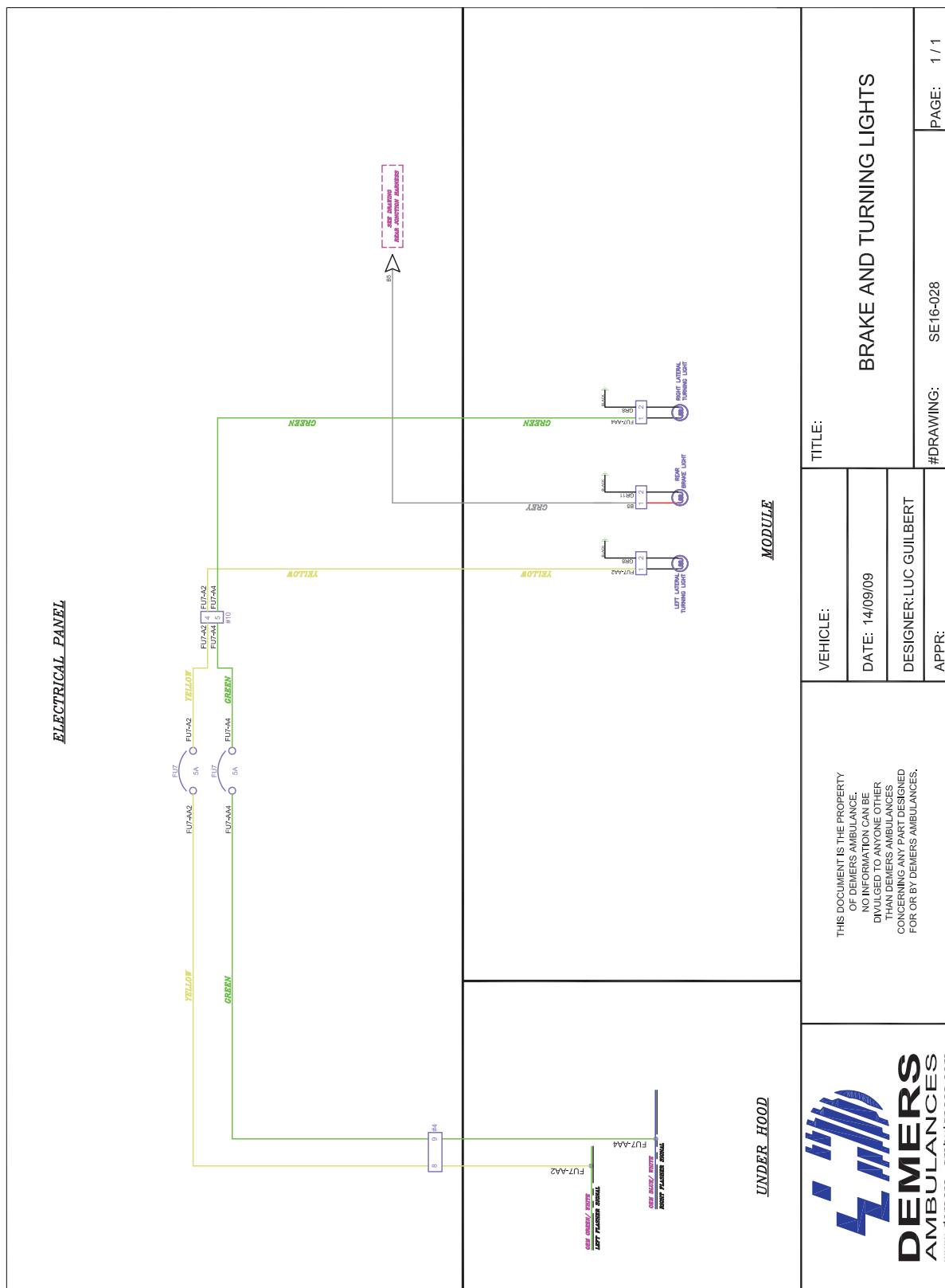


TECHNICAL MANUAL MX151D - GM



• PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - WIRING SCHEMATICS

BRAKE AND TURNING LIGHTS



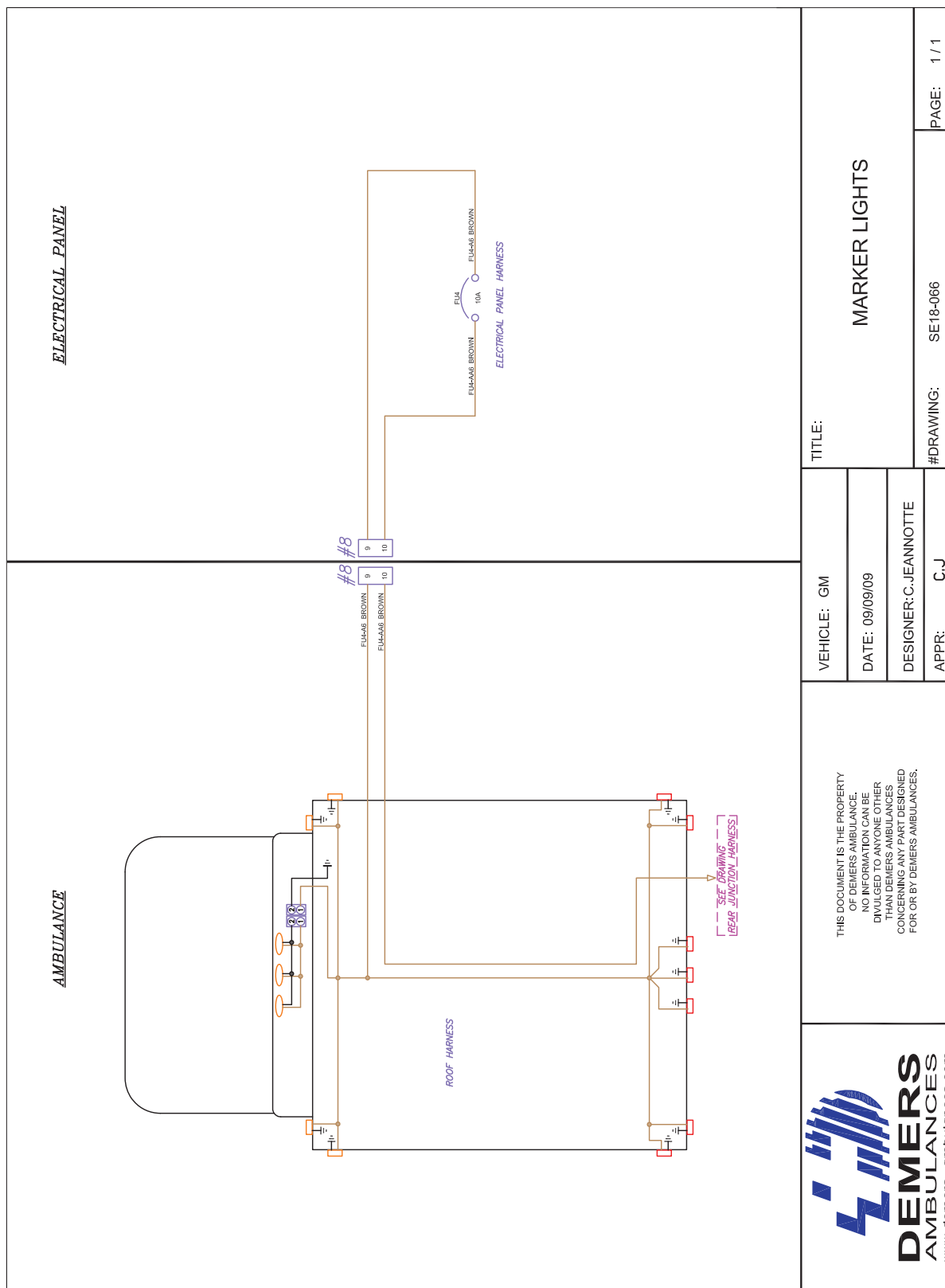


TECHNICAL MANUAL MX151D - GM



• PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - WIRING SCHEMATICS

MARKER LIGHTS





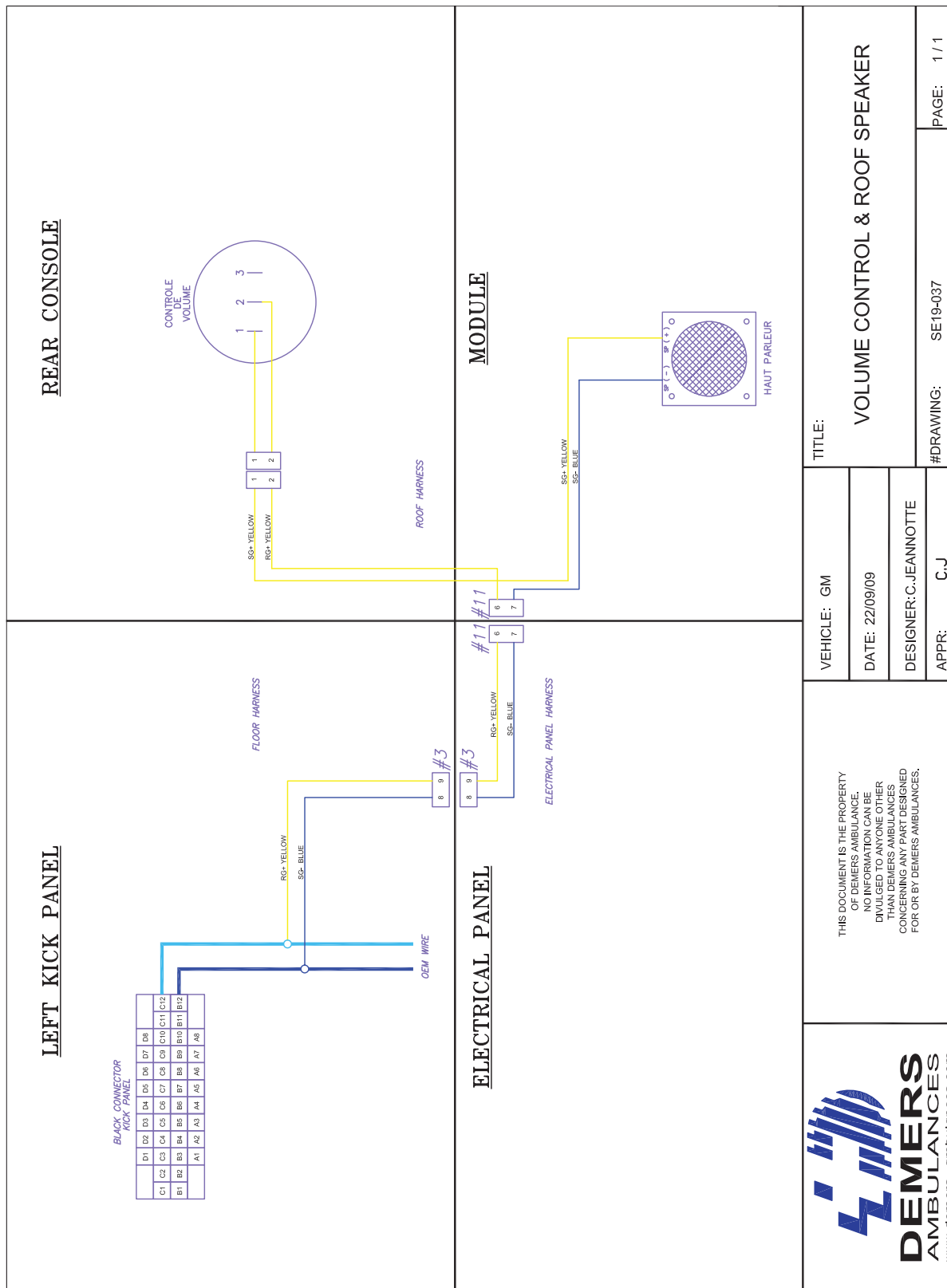
TECHNICAL MANUAL

MX151D - GM



• PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - WIRING SCHEMATICS

VOLUME CONTROL & ROOF SPEAKER



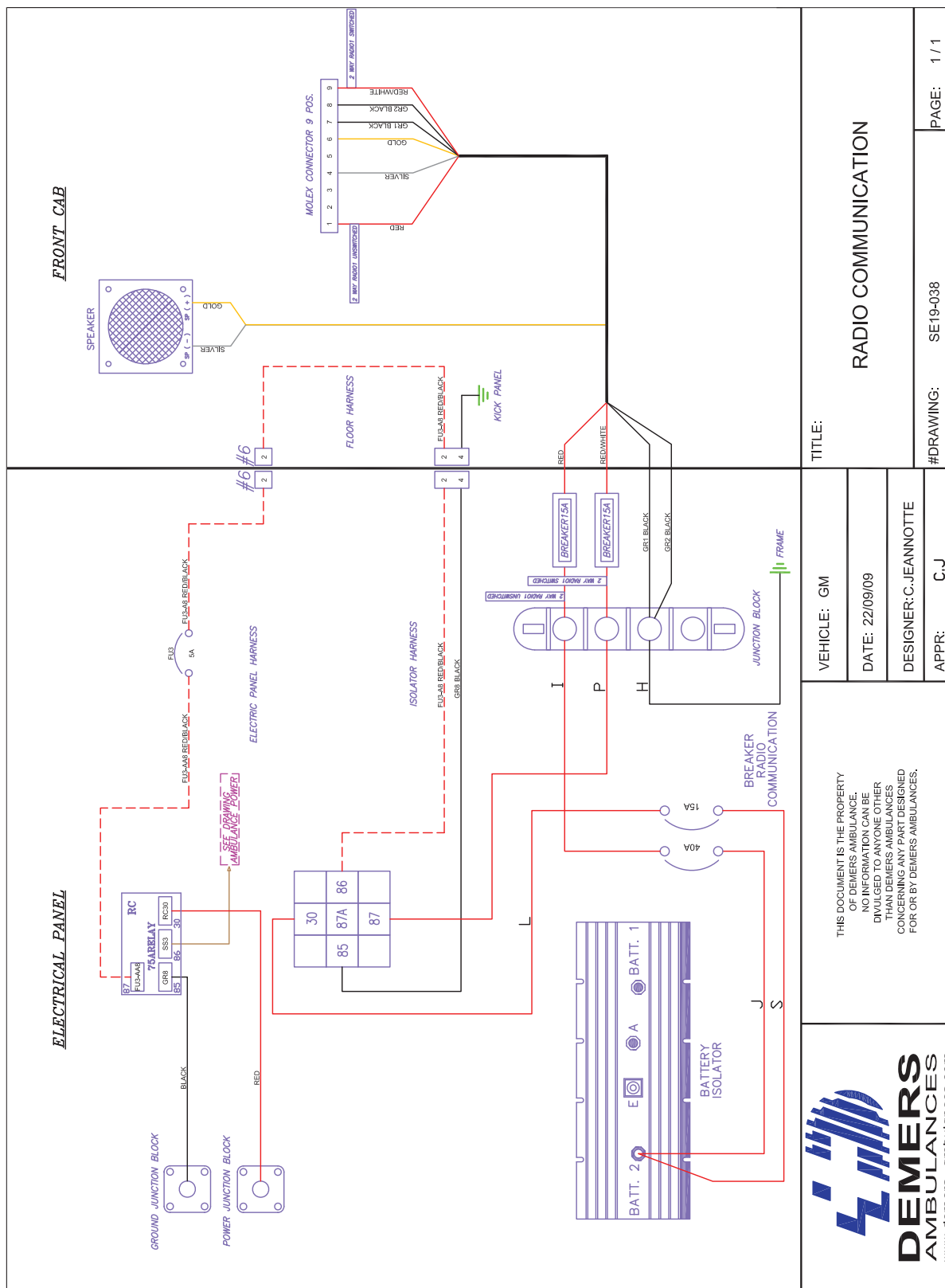


TECHNICAL MANUAL MX151D - GM



• PART 7 : TECHNICAL SPECIFICATIONS AND DRAWINGS - WIRING SCHEMATICS

RADIO COMMUNICATION





TECHNICAL MANUAL

MX151D - GM



• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
101504	ABS 90 DEGRE EXHAUST PORT	DEMERS AMBULANCES P/N : 101504
E710053	ABS PIPE 1 1/2" ID	MATCO RAVARY INC P/N : 77604
E710007	ABS COUPLING 1 1/2" ID	PLOMBERIE G. LETOURNEAU (1990) INC P/N : 102048
D002360	FILTER FOR VENTILATION	DEMERS AMBULANCES P/N : D002360
E710023	90 DEGRE COUPLER 1 1/2" OD	PLOMBERIE G. LETOURNEAU (1990) INC P/N : 102047
102148	IVY SUPPORT	DEMERS AMBULANCES P/N : 102148
102505	A IV HOOK	DEMERS AMBULANCES P/N : 102505
102480	B SOLUTION BASE	DEMERS AMBULANCES P/N : 102480
E804034	ADJUSTABLE HINGE BLACK	FAUCHER INDUSTRIES P/N : E6-10-501-20 (754-0157)
E205029	1" HOOK BLACK T.W.E.	APLIX FASTENERS INC P/N : A800R0025H008V--
102709	LOOP 1" X 16"	DEMERS AMBULANCES P/N : 102709



TECHNICAL MANUAL

MX151D - GM



• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
E205031	1" BLACK LOOP -P- 50 YARD ROLLS	APLIX FASTENERS INC P/N : A800R0025L008=P=
150395	SOLUTION VELCRO (HOLE)	DEMERS AMBULANCES P/N : 150395
175521	BELT FOR O2 CYLINDER BRACKET	DEMERS AMBULANCES P/N : 175521
E404056	CAM BUCKLE 1"	CORDAGE BARRY P/N : K608
E404055	WEBBING 1"	ERICKSON MANUFACTURING LTD. P/N : 119-3303 BLACK
500002	ANGLE 1 " X 1" X 1/8"	DEMERS AMBULANCES P/N : 500002
500005	BATTERY ACCESS SUPPORT	DEMERS AMBULANCES P/N : 500005
500052	MUD-GUARD TYPE III ONT	DEMERS AMBULANCES P/N : 500052
560349	LIGHT BAR REINFORCEMENT	DEMERS AMBULANCES P/N : 560349
560370	LATERAL AMBER FLASHER	DEMERS AMBULANCES P/N : 560370
E509006	POSITION LIGHT YELLOW	TRUCK-LITE CO. INC P/N : 60075Y



TECHNICAL MANUAL

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• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
E307118	MATE-N-LOCK MALE TERMINAL 350416-1	PRODAM P/N : 350416-1
E307075	FEMALE CONNECTOR 2 WAY 770069-1	PRODAM P/N : 770069-1
560536	SIDE FLASHER SHIM	DEMERS AMBULANCES P/N : 560536
750151	LEFT FLOOR EXTRUSION TIP	DEMERS AMBULANCES P/N : 750151
750290	LOCK SPACER	DEMERS AMBULANCES P/N : 750290
A000056	NUT PLATE 3/8-16UNC	DEMERS AMBULANCES P/N : A000056
A001141-2	APPUI-TÊTE ASS.	DEMERS AMBULANCES P/N : A001141-2
A150254-2	SMALL HEAD REST COBALT	DEMERS AMBULANCES P/N : A150254-2
E205040	2" BLACK LOOP -P- 50 YARD ROLL	APLIX FASTENERS INC P/N : A800R0050L008=P=
A002315-10	BOUTON FINITION SUN YELLOW	DEMERS AMBULANCES P/N : A002315-10
E107097	VINYL SUN YELLOW M-43	MORBERN P/N : M43 SUN YELLOW



TECHNICAL MANUAL

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• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
A002315-2	COBALT BUTTON	DEMERS AMBULANCES P/N : A002315-2
A003467	BATTERY CABLE RING	DEMERS AMBULANCES P/N : A003467
E710008	ABS RING 2" ID	MATCO RAVARY INC P/N : 102076
E710056	ABS PIPE 2" ID	MATCO RAVARY INC P/N : 3460115
A004249	RETENU DE PORTE/CABINE AVANT FORD	DEMERS AMBULANCES P/N : A004249
D004278	DOOR BELT PLATE	DEMERS AMBULANCES P/N : D004278
E404015	BLACK SEAT BELT 2"	DEMERS AMBULANCES P/N : E404015
A004664	EVS SEAT ANCHOR	DEMERS AMBULANCES P/N : A004664
A005365	BACKPLATE LIGHT LEFT HARNESS	DEMERS AMBULANCES P/N : A005365
E307375	FEMALE CONNECTOR 6 WAY 1-480705	PRODAM P/N : 1-480705
E305119	LEFT SIDE FLASHER HARNESS 72" / 24"	TRUCK-LITE CO. INC P/N : 514450072



TECHNICAL MANUAL

MX151D - GM



• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
E307147	FEMALE PIN 350537-1	PRODAM P/N : 350537-1
E307376	GASKET (1-480705)	PRODAM P/N : 794276-1
A005366	BACKPLATE LIGHT RIGHT HARNESS	DEMERS AMBULANCES P/N : A005366
E307375	FEMALE CONNECTOR 6 WAY 1-480705	PRODAM P/N : 1-480705
E305120	RIGHT SIDE FLASHER HARNESS 36" / 24"	TRUCK-LITE CO. INC P/N : QTE0039815
E307147	FEMALE PIN 350537-1	PRODAM P/N : 350537-1
E307376	GASKET (1-480705)	PRODAM P/N : 794276-1
A008488	FRONT SIREN BASE	DEMERS AMBULANCES P/N : A008488
A009447	900 SERIES LINEAR LED RED ASSY	DEMERS AMBULANCES P/N : A009447
E503257	900 SERIES LINEAR LED RED	WHELEN ENGINEERING CO P/N : 90RR5SRR
E502099	PIN HOUSING CAP (441)	PRODAM P/N : 1-480305-0



TECHNICAL MANUAL

MX151D - GM



• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
E502100	TERMINAL FOR 441 (PIN)	HDI TECHNOLOGIES P/N : CN0763
A009876	RICO SUCTION WITH HOSE ASSY	DEMERS AMBULANCES P/N : A009876
102320	SUCTION SUPPORT	DEMERS AMBULANCES P/N : 102320
E307118	MATE-N-LOCK MALE TERMINAL 350416-1	PRODAM P/N : 350416-1
E307075	FEMALE CONNECTOR 2 WAY 770069-1	PRODAM P/N : 770069-1
A010234	HIGH INTENSITY NEON 24W/2 30% LOW	DEMERS AMBULANCES P/N : A010234
A010602	DOOR OPEN DEVICE HOLDER	DEMERS AMBULANCES P/N : A010602
D010599	DOOR CYLINDER RETAINER	DEMERS AMBULANCES P/N : D010599
E603058	BALL STUD FOR GAS CYLINDER	JIMEXS INC. P/N : 299-936
A010964	RETENU BAGUE NYLON / COURTE ASS.	DEMERS AMBULANCES P/N : A010964
D010963	RETENU BAGUE NYLON / COURTE	DEMERS AMBULANCES P/N : D010963



TECHNICAL MANUAL

MX151D - GM



• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
A011007	RUNNING BOARD 41.125 ASS. FRONT CABINE	DEMERS AMBULANCES P/N : A011007
A011409	DOOR RETAINING CABLE ASS.	DEMERS AMBULANCES P/N : A011409
D011340	GAS CYLINDER SUPPORT	DEMERS AMBULANCES P/N : D011340
E603058	BALL STUD FOR GAS CYLINDER	JIMEXS INC. P/N : 299-936
A011461	10MM ADAPTOR MODIFIED GM	DEMERS AMBULANCES P/N : A011461
E314033	STRAIGHT FEMALE O RING # 10 S/S	TRANS-F-AIR DIV. FRIGO-REMORQUES INC P/N : 70R4401S
A011476	GM SPARE TIRE SUPPORT	DEMERS AMBULANCES P/N : A011476
A011737	FRONT CABINE POST TRIMMING GM	DEMERS AMBULANCES P/N : A011737
A011735	FRONT CABINE POST TRIMMING	DEMERS AMBULANCES P/N : A011735
E107093	VINYL DURATION ASH (DU 162)	MORBERN P/N : DU162
A011738	CABINE CEILING EXTENSION MX-GM	DEMERS AMBULANCES P/N : A011738



TECHNICAL MANUAL

MX151D - GM



• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
D011734	DOME LIGHT TRIMMING GM	DEMERS AMBULANCES P/N : D011734
E205059	VELOUR & FOAM 1/4"(GRIS)	DISTRIBUTION D.N.R. ENR P/N : NFH 6174
A012873	WHEEL FLARE ASSY WHITE	DEMERS AMBULANCES P/N : A012873
A013002	DOOR / SEAT BASE ASS.	DEMERS AMBULANCES P/N : A013002
D013001	DOOR / SEAT BASE	DEMERS AMBULANCES P/N : D013001
E602070	PLASTIC HINGE 1.5" X 2"	NORMONT INDUSTRIELLE CANADA LTEE P/N : 1.5" X 2"
E602009	LATCH AJUSTABLE W/O KEY	FAUCHER INDUSTRIES P/N : C2-33-15-3 (699-9205)
E006021	RUBBER PLUG 50-65 DURO	WHITESELL P/N : SNRB25
A013229	RETAINING STRAP 7½"	DEMERS AMBULANCES P/N : A013229
E404015	BLACK SEAT BELT 2"	DEMERS AMBULANCES P/N : E404015
E203028	BLACK THREAD CANSEW 6.6	REMI CARRIER INC P/N : CBB69CSS-15



TECHNICAL MANUAL

MX151D - GM



• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
D004278	DOOR BELT PLATE	DEMERS AMBULANCES P/N : D004278
A014083	SQUAD BENCH MX151D BC	DEMERS AMBULANCES P/N : A014083
A014073	SQUAD BENCH STRUCTURE MX151D BC	DEMERS AMBULANCES P/N : A014073
D014972	FINISHING PART SQUAD BENCH MX151D BC	DEMERS AMBULANCES P/N : D014972
D006020	HINGE S/S 22" X 1 1/2"	DEMERS AMBULANCES P/N : D006020
D014079	SQUAD BENCH LID MX151D BC	DEMERS AMBULANCES P/N : D014079
E601060	MINI ROTARY LATCH STEEL LEFT HAND	JIMEXS INC. P/N : 224-426
E010021	BLACK BALL KNOB	CAVERHILL LEARMONT/G.S. TOOLS (2003) P/N : E010021
E601058	STRIKER BOLT 1.5 IN L ZINC PLATED	JIMEXS INC. P/N : 224-459
E603100	GAS SPRING 60 LBS	JIMEXS INC. P/N : 299-141
E404047	8', BUCKLE END w/6" SLEEVE	INTERTEK INDUSTRIAL CORP. P/N : ZA-2608-B-1-1092



TECHNICAL MANUAL

MX151D - GM



• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
102496	AUXILIARY COT SHORT SUPPORT	DEMERS AMBULANCES P/N : 102496
102497	AUXILIARY COT LONG SUPPORT	DEMERS AMBULANCES P/N : 102497
E603005	ANCHOR PLATE	ANCRA INTERNATIONAL LLC P/N : 40000-11/W
A014088-2	FLAT BACK 19,000 X 14,000 MX151D BC	DEMERS AMBULANCES P/N : A014088-2
A150652-2	FLAT BACK ET SEAT COBALT	DEMERS AMBULANCES P/N : A150652-2
D013065	CUSHION HOLDER BRACKET	DEMERS AMBULANCES P/N : D013065
E205030	1" BLACK HOOK -PRESSURE SENSITIVE NYLON 50 YARD ROLL	APLIX FASTENERS INC P/N : A800R0025H008=P=
E204011	DOOR RUBBER GASKET	ELASTO PROXY INC. P/N : EC12-005-EMT1
A014089-2	HEAD REST 12,000 X 8,000 MX151D BC	DEMERS AMBULANCES P/N : A014089-2
A150254-2	SMALL HEAD REST COBALT	DEMERS AMBULANCES P/N : A150254-2
D013065	CUSHION HOLDER BRACKET	DEMERS AMBULANCES P/N : D013065



TECHNICAL MANUAL

MX151D - GM



• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
E205030	1" BLACK HOOK -PRESSURE SENSITIVE NYLON 50 YARD ROLL	APLIX FASTENERS INC P/N : A800R0025H008=P=
E204059	EPDM .216 X .354 WEATHERSTRIP	CLEAN SEAL INC P/N : 1085ST-100
A014090	FRONT MEDICAL CABINETRY MX151D BC	DEMERS AMBULANCES P/N : A014090
E104004	MEDICAL CABINET EXTRUSION (ANODISED) 20'	SAPA P/N : MH-38447
D014092	FRONT CABINETRY ANCHORAGE MX151D BC	DEMERS AMBULANCES P/N : D014092
E103030	SCHLEGEL ROLL 8420 270mm(1/4")	ALUMINIUM NOTRE-DAME INC P/N : PB8420
D007506	MEDICAL CABINET / LOWER CAVITY	DEMERS AMBULANCES P/N : D007506
D004021	AJUSTABLE SLIDING SHELF RAIL	DEMERS AMBULANCES P/N : D004021
E607022	SLIDE TRACK	DISTRIBUTION D.N.R. ENR P/N : 601 BN
A014097	ADJUSTABLE SHELF 41,000	DEMERS AMBULANCES P/N : A014097
D009253	SELF EXTRUSION 41"	DEMERS AMBULANCES P/N : D009253



TECHNICAL MANUAL

MX151D - GM



• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
D010053	MEDICAL CABINET UPPER SHELF	DEMERS AMBULANCES P/N : D010053
D014311	ACTION WALL LOWER PART MX151D BC	DEMERS AMBULANCES P/N : D014311
D014312	ACTION WALL UPPER PART MX151D BC	DEMERS AMBULANCES P/N : D014312
D014313	ACTION WALL MX151D BC	DEMERS AMBULANCES P/N : D014313
E311001	ELEC. BOX 2 1/2"	TRADELCO INC P/N : 1104LA
A014091	REAR MEDICAL CABINETRY MX151D BC	DEMERS AMBULANCES P/N : A014091
E104004	MEDICAL CABINET EXTRUSION (ANODISED) 20'	SAPA P/N : MH-38447
D014094	REAR CABINETRY ANCHORAGE MX151D BC	DEMERS AMBULANCES P/N : D014094
E103030	SCHLEGEL ROLL 8420 270mm(1/4")	ALUMINIUM NOTRE-DAME INC P/N : PB8420
D014529	42,500 X 17,000 CAVITY WITH REAR ACCES	DEMERS AMBULANCES P/N : D014529
D014530-B	D014529 CAVITY ACCES PANEL	DEMERS AMBULANCES P/N : D014530-B



TECHNICAL MANUAL

MX151D - GM



• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
D004021	AJUSTABLE SLIDING SHELF RAIL	DEMERS AMBULANCES P/N : D004021
D014096	MASTER CAVITY	DEMERS AMBULANCES P/N : D014096
E607022	SLIDE TRACK	DISTRIBUTION D.N.R. ENR P/N : 601 BN
A014097	ADJUSTABLE SHELF 41,000	DEMERS AMBULANCES P/N : A014097
D009253	SELF EXTRUSION 41"	DEMERS AMBULANCES P/N : D009253
D010053	MEDICAL CABINET UPPER SHELF	DEMERS AMBULANCES P/N : D010053
A014102	BUILT LOCKABLE COMPARTMENT MX151D BC	DEMERS AMBULANCES P/N : A014102
A014103	LOCKABLE COMPARTMENT	DEMERS AMBULANCES P/N : A014103
D014110	HINGE	DEMERS AMBULANCES P/N : D014110
D014107	DOOR	DEMERS AMBULANCES P/N : D014107
E602008	LATCH LEVER AJUSTABLE BLACK	FAUCHER INDUSTRIES P/N : C2-33-25 (699-6268)



TECHNICAL MANUAL

MX151D - GM



• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
A012465	COMPARTMENT SHELF ASS.	DEMERS AMBULANCES P/N : A012465
D012466	SHELF FOR STANDARD CAVITY	DEMERS AMBULANCES P/N : D012466
D012467	SHELF EXTRUSION	DEMERS AMBULANCES P/N : D012467
E206009	WHITE SIKAFLEX #221 305ML TUBE	AGRO-115 REVETEMENTS INC P/N : 0SF-0221-0305 Blanc
E402003	18" GRAB BAR CHROME KN	ELCOMA METAL FABRICATING LTD P/N : 01-1118 KH
D014668	ADAPTER FOR YELLOW VERTICAL ROD	DEMERS AMBULANCES P/N : D014668
D014669	YELLOW VERTICAL ROD	DEMERS AMBULANCES P/N : D014669
A014114	FRONT LEFT COMPARTMENT MX151D BC	DEMERS AMBULANCES P/N : A014114
A014115	FRONT LEFT COMPARTMENT FRAME MX151D BC	DEMERS AMBULANCES P/N : A014115
E104004	MEDICAL CABINET EXTRUSION (ANODISED) 20'	SAPA P/N : MH-38447
D014908	FRONT LEFT CEILING TRIM SUPPORT BRACKET MX151D0BC	DEMERS AMBULANCES P/N : D014908



TECHNICAL MANUAL

MX151D - GM



• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
E103030	SCHLEGEL ROLL 8420 270mm(1/4")	ALUMINIUM NOTRE-DAME INC P/N : PB8420
D014123	LOWER DOOR STOPPER MX151D BC	DEMERS AMBULANCES P/N : D014123
D014116	LEFT SIDE LEFT FRONT COMPARTMENT MX151D BC	DEMERS AMBULANCES P/N : D014116
D014117	RIGHT SIDE LEFT FRONT COMPARTMENT MX151D BC	DEMERS AMBULANCES P/N : D014117
D014118	LEFT FRONT COMPARTMENT SHELF MX151D BC	DEMERS AMBULANCES P/N : D014118
E206009	WHITE SIKAFLEX #221 305ML TUBE	AGRO-115 REVETEMENTS INC P/N : 0SF-0221-0305 Blanc
D014119	FRONT COMPARTMENT LOWER #1 DOOR MX151D BC	DEMERS AMBULANCES P/N : D014119
D014120	FRONT COMPARTMENT #2 DOOR MX151D BC	DEMERS AMBULANCES P/N : D014120
D014121	LOWER DOOR HINGE MX151D BC	DEMERS AMBULANCES P/N : D014121
E602009	LATCH AJUSTABLE W/O KEY	FAUCHER INDUSTRIES P/N : C2-33-15-3 (699-9205)
A014235	AIR CONDITIONER ASS. MX151D	DEMERS AMBULANCES P/N : A014235



TECHNICAL MANUAL

MX151D - GM



• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
E701105	MCC 13-1153 AIR CONDITIONING UNIT	MOBILE CLIMATE CONTROL P/N : 13-1153
E307078	FEMALE CONNECTOR 3 WAY 1-480701-0 AMP	HDI P/N : 1-480701-0
E307147	FEMALE PIN 350537-1	PRODAM P/N : 350537-1
E710063	REINFORCED PVC 3/8" CLEAR PIPING	MATCO RAVARY INC P/N : 843-10
D006293	A/C REAR SUPPORT	DEMERS AMBULANCES P/N : D006293
E207002	QUICKEDGE TRIMS	FAUCHER INDUSTRIES P/N : 622-4462
E312006	LOOMEX 3/8" X 2000'	TECHSPAN INDUSTRIES INC P/N : 769902B
E204039	SELF SEALING RUBBER	SPAE NAUR INC P/N : 892-456
A014236	ISOLATOR BOX ASSY	DEMERS AMBULANCES P/N : A014236
D014844	ISOLATOR HOLDING PLATE MX151D-BC	DEMERS AMBULANCES P/N : D014844
D014876	ISOLATOR BOX DECAL BC	DEMERS AMBULANCES P/N : D014876



TECHNICAL MANUAL

MX151D - GM



• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
E303029	BATTERY ISOLATOR (NOT FOR SALE)	DEMERS AMBULANCES P/N : E303029
E207001	CHANNEL QUICKEDGE 2 LIPS	SPA E NAUR INC P/N : 825-509
E305110	RELAY 200 AMPS	DOCAP 1985 CORP. P/N : 24143
H007157	200 AMP DIODE CONNECTOR	DEMERS AMBULANCES P/N : H007157
E307211	FUSE 150 AMG	WES-GARDE COMPONENTS GROUP, INC. P/N : AMG-150
E307196	FUSE 125 AMG	WES-GARDE COMPONENTS GROUP, INC. P/N : AMG125
E307197	AMG FUSE HOLDER	WES-GARDE COMPONENTS GROUP, INC. P/N : HMG-211
H014233	ISOLATOR BOX HARNESS	DEMERS AMBULANCES P/N : H014233
E307096	FUSE HOLDER M-30147	DOCAP 1985 CORP. P/N : 705-805
E307092	FUSE ATO 5	PIECES D'AUTOS ROBITAILLE 1997 INC P/N : ATO-5
E302100	HIGH-LOW VOLTAGE ALARM	TRANSPORTATION SAFETY TECHNOLOGIES, INC. P/N : HLVA



TECHNICAL MANUAL

MX151D - GM



• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
E307030	40A CIRCUIT BREAKER 30055-40	DOCAP 1985 CORP. P/N : 703-175
E303008	JUNCTION BOX	DOCAP 1985 CORP. P/N : 700-978
E305055	RELAY 30 AMPS	ROBERT BOSCH P/N : 332019150
A014237	ELECTRICAL PANEL ASSY	DEMERS AMBULANCES P/N : A014237
H014215	ELECTRIC PANEL	DEMERS AMBULANCES P/N : H014215
E603063	NYLON TIE WRAP WITH PUSH MOUNT	TRADELCO INC P/N : PLWP3HTL (PANDUIT)
E508019	ROAD RUNNER FLASHER	SOUND OFF INC P/N : ETHFSS-SP
E307375	FEMALE CONNECTOR 6 WAY 1-480705	PRODAM P/N : 1-480705
E307147	FEMALE PIN 350537-1	PRODAM P/N : 350537-1
E502141	STROBE POWER SUPPLY 6 OUTLETS WHELEN CSP660	WHELEN ENGINEERING CO P/N : CSP660
E508008	ALT.FLASHER 50 AMP.(3250)	EQUIPEMENTS POLYTEK INC P/N : 3250 GCP



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• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
E315045	60/90 SEC TIMER	DEMERS AMBULANCES P/N : E315045
A014238	FRONT CONSOLE GM BC ASSY	DEMERS AMBULANCES P/N : A014238
H014445	FRONT CONSOLE HARNESS BC (2009)	DEMERS AMBULANCES P/N : H014445
D014239	FRONT CONSOLE FACADE GM BC	DEMERS AMBULANCES P/N : D014239
E506073	CARSON SA-500 SIREN	CARSON MANUFACTURING COMPANY, INC. P/N : SA-500-2014
D014509	SIREN SUPPORT MX151D BC	DEMERS AMBULANCES P/N : D014509
E308111	CONTURA SWITCH BEZEL (6)	WES-GARDE COMPONENTS GROUP, INC. P/N : VM6
E308110	CONTURA SWITCH BEZEL (3)	WES-GARDE COMPONENTS GROUP, INC. P/N : VM3
E307416	END SNAP-IN BRACKET VME CONTURA	WES-GARDE COMPONENTS GROUP, INC. P/N : VME
E307432	CENTER SNAP-IN BRACKET VMM CONTURA	WES-GARDE COMPONENTS GROUP, INC. P/N : VMM-01
E308107	SNAP-IN BRACKET FOR CARLING SWITCH	WES-GARDE COMPONENTS GROUP, INC. P/N : VMS-01



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• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
E308090	SWITCH # 15	SYSTEMES PRAN INC. P/N : PR99016-01
E308147	CONTURA SWITCH ON/OFF/ON	SYSTEMES PRAN INC. P/N : V6D2-UHN1-1AA00-000
E308950	SWITCH CONTURA II ON/OFF	SYSTEMES PRAN INC. P/N : V1D2-UHNB-AAC00-000
E308108	SWITCH CONTURA II ON/OFF MOMENTARY	SYSTEMES PRAN INC. P/N : V8D2-UHNB-AAC00-000
E302005	CONSOLE ILLUM & INDICATEUR (8)	DEMERS AMBULANCES P/N : E302005
E305124	CLIGNOTANT POUR TÉMOIN PORTE OUVERTE ET COMPARTIMENT	SYSTECK ELECTRO-CONCEPTION INC P/N : E305124
E313035	VOLTMETER BLACK BEZEL	TRANSPORTATION SAFETY TECHNOLOGIES, INC. P/N : 180-0344
E302003	CONSOLE ILLUMINATION FOR 3 SWITCHES	DEMERS AMBULANCES P/N : E302003
E302017	CONSOLE ILLUMINATION FOR 4 SWITCHES	DEMERS AMBULANCES P/N : E302017
E302004	CONSOLE ILLUMINATION FOR 6 SWITCHES	DEMERS AMBULANCES P/N : E302004
E007871	STANDOFF(NICKEL)MALE/FEMALE 4-40	SPAE NAUR INC P/N : 605-014



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• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
E302001	PIEZO-ELECTRIC VIBRATOR	ADD-TRONIQUE INC P/N : E302001
E507010	GOOSE NECK READING LIGHT 10" LONG	HELLA INC P/N : 4532171
E307075	FEMALE CONNECTOR 2 WAY 770069-1	PRODAM P/N : 770069-1
E307118	MATE-N-LOCK MALE TERMINAL 350416-1	PRODAM P/N : 350416-1
E003212	BODY NUTS "GM" #8 NYLON	PIECES D'AUTOS ROBITAILLE 1997 INC P/N : 9829
A014240	REAR CONSOLE GM BC ASSY	DEMERS AMBULANCES P/N : A014240
D014241	REAR CONSOLE FACADE GM BC	DEMERS AMBULANCES P/N : D014241
E308111	CONTURA SWITCH BEZEL (6)	WES-GARDE COMPONENTS GROUP, INC. P/N : VM6
E308110	CONTURA SWITCH BEZEL (3)	WES-GARDE COMPONENTS GROUP, INC. P/N : VM3
E308147	CONTURA SWITCH ON/OFF/ON	SYSTEMES PRAN INC. P/N : V6D2-UHN1-1AA00-000
E308950	SWITCH CONTURA II ON/OFF	SYSTEMES PRAN INC. P/N : V1D2-UHNB-AAC00-000



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• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
E307417	BLANK FOR CONTURA SWITCH	WES-GARDE COMPONENTS GROUP, INC. P/N : VHP
E302003	CONSOLE ILLUMINATION FOR 3 SWITCHES	DEMERS AMBULANCES P/N : E302003
E302017	CONSOLE ILLUMINATION FOR 4 SWITCHES	DEMERS AMBULANCES P/N : E302017
E302004	CONSOLE ILLUMINATION FOR 6 SWITCHES	DEMERS AMBULANCES P/N : E302004
E007871	STANDOFF(NICKEL)MALE/FEMALE 4-40	SPAE NAUR INC P/N : 605-014
E311011	STAINLESS-STEEL 12V RECEPTACLE	WEST MARINE P/N : 371849 MODEL
E501001	MONO RADIO VOLUME CONTROL(ONTARIO)	MEGASTAR ELECTRIQUE P/N : 40-980
E307075	FEMALE CONNECTOR 2 WAY 770069-1	PRODAM P/N : 770069-1
A014243	A/C HOSE 1/2" ASS. GM 0DEG. FEM	DEMERS AMBULANCES P/N : A014243
A014244	A/C HOSE 5/16" ASS. GM 0 DEG FEM / 0 DEG FEM	DEMERS AMBULANCES P/N : A014244
A014248	SIREN SPEAKERS GM ASS.	DEMERS AMBULANCES P/N : A014248



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• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
D010130	DOUBLE SIREN BASE EXTENSION	DEMERS AMBULANCES P/N : D010130
A014911	FRONT SPEAKER BRACKET ASSY MX151D BC	DEMERS AMBULANCES P/N : A014911
E515035	# SA315P WHELEN SPEAKERS	WHELEN ENGINEERING CO P/N : SA315P
E307118	MATE-N-LOCK MALE TERMINAL 350416-1	PRODAM P/N : 350416-1
E307075	FEMALE CONNECTOR 2 WAY 770069-1	PRODAM P/N : 770069-1
A014317	REAR BUMPER STRUCTURE MX151D BC	DEMERS AMBULANCES P/N : A014317
A014324-2	SQUAD BENCH SEAT MX151D BC	DEMERS AMBULANCES P/N : A014324-2
A014326	REAR BACKPLATE MX151D BC	DEMERS AMBULANCES P/N : A014326
A014328	MX151D BC FLIP UP STEP	DEMERS AMBULANCES P/N : A014328
A014338	GAS ENTRY COVER	DEMERS AMBULANCES P/N : A014338
A014349	STORAGE UNIT D2 MX151D BC	DEMERS AMBULANCES P/N : A014349



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• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
A014350	FRAME STORAGE UNIT D2 MX151D BC	DEMERS AMBULANCES P/N : A014350
E104004	MEDICAL CABINET EXTRUSION (ANODISED) 20'	SAPA P/N : MH-38447
D014355	ANCHORAGE STORAGE UNIT D2 MX151D BC	DEMERS AMBULANCES P/N : D014355
E103030	SCHLEGEL ROLL 8420 270mm(1/4")	ALUMINIUM NOTRE-DAME INC P/N : PB8420
D014359	MASTER CAVITY DEPTH 15,250	DEMERS AMBULANCES P/N : D014359
D014528-B	D014359 CAVITY ACCES PANEL	DEMERS AMBULANCES P/N : D014528-B
D004021	AJUSTABLE SLIDING SHELF RAIL	DEMERS AMBULANCES P/N : D004021
E607022	SLIDE TRACK	DISTRIBUTION D.N.R. ENR P/N : 601 BN
A012465	COMPARTMENT SHELF ASS.	DEMERS AMBULANCES P/N : A012465
D012466	SHELF FOR STANDARD CAVITY	DEMERS AMBULANCES P/N : D012466
D012467	SHELF EXTRUSION	DEMERS AMBULANCES P/N : D012467



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• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
E206009	WHITE SIKAFLEX #221 305ML TUBE	AGRO-115 REVETEMENTS INC P/N : OSF-0221-0305 Blanc
D014352	RIGHT WALL STORAGE UNIT D2 MX151D BC	DEMERS AMBULANCES P/N : D014352
D014353	INSIDE PANEL STORAGE UNIT D2 MX151D BC	DEMERS AMBULANCES P/N : D014353
D014354	LOWER SHELF STORAGE UNIT D2 MX151D BC	DEMERS AMBULANCES P/N : D014354
D014539	UPPER SHELF STORAGE UNIT D2 MX151D BC	DEMERS AMBULANCES P/N : D014539
D014358	ACCESS PLATE STORAGE UNIT D2 MX151D BC	DEMERS AMBULANCES P/N : D014358
A015100	REAR GRAB HANDLE ASSY MX151D-BC	DEMERS AMBULANCES P/N : A015100
E402010	GRAB BAR 12" SAFETY YELLOW	ELCOMA METAL FABRICATING LTD P/N : E402010
D014986	GRAB HANDLE ADAPTOR MX151D BC	DEMERS AMBULANCES P/N : D014986
A014835	8" NETTING FOR KIT TREE MX151D-BC	DEMERS AMBULANCES P/N : A014835
A014836	17" NETTING FOR KIT TREE MX151D-BC	DEMERS AMBULANCES P/N : A014836



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• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
A014837	15" NETTING FOR KIT TREE MX151D-BC	DEMERS AMBULANCES P/N : A014837
E602023	SMALL NET HOOK	FAUCHER INDUSTRIES P/N : 682-0987
E602018	LONG HOOK	FAUCHER INDUSTRIES P/N : 682-1204
A015039	LED CABINET LIGHT ASSY	DEMERS AMBULANCES P/N : A015039
E307118	MATE-N-LOCK MALE TERMINAL 350416-1	PRODAM P/N : 350416-1
E307075	FEMALE CONNECTOR 2 WAY 770069-1	PRODAM P/N : 770069-1
D014989	CABINET LIGHT FINISHING PLATE	DEMERS AMBULANCES P/N : D014989
H014878	REAR RIGHT CABINET LIGHT HARNESS	DEMERS AMBULANCES P/N : H014878
E311001	ELEC. BOX 2 1/2"	TRADELCO INC P/N : 1104LA
A014362	BUILT RIGHT SOLE MX151D BC	DEMERS AMBULANCES P/N : A014362
D014061	RIGHT FLOOR SOLE MX151D BC	DEMERS AMBULANCES P/N : D014061



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• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
D014081	HEATING UNIT HOLDING BRACKET MX151D-BC	DEMERS AMBULANCES P/N : D014081
A014364	BUILT A/C FACADE MX151D BC	DEMERS AMBULANCES P/N : A014364
D014363	A/C FACADE MX151D BC	DEMERS AMBULANCES P/N : D014363
E710011	BALL LOUVER BLACK SHORT	CARY PRODUCTS P/N : 10-557-11
A014375	BALL VALVE DUCT ASS. - HEATING SYSTEM SOLENOID GM-DIESEL	DEMERS AMBULANCES P/N : A014375
A014374	DUCT (WITH BALL VALVE) - HEATING SYSTEM SOLENOID GM-DIESEL	DEMERS AMBULANCES P/N : A014374
E710152	PRIMER 210-T	MOBILE CLIMATE CONTROL P/N : 25-0493
E307075	FEMALE CONNECTOR 2 WAY 770069-1	PRODAM P/N : 770069-1
E307118	MATE-N-LOCK MALE TERMINAL 350416-1	PRODAM P/N : 350416-1
A014376	HEATING SYSTEM DUCT (NOOMEX-RUBATEX) GM-DIESEL 229"	DEMERS AMBULANCES P/N : A014376
A014378	GRILLE GM BC ASS	DEMERS AMBULANCES P/N : A014378



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• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
E503301	700 SERIES LINEAR LED RED PROGRAMMABLE	WHELEN ENGINEERING CO P/N : 70R02FRR
E502099	PIN HOUSING CAP (441)	PRODAM P/N : 1-480305-0
E502100	TERMINAL FOR 441 (PIN)	HDI TECHNOLOGIES P/N : CN0763
E503376	LIN3 CLEAR LED LIGHT #RSC02ZCR	WHELEN ENGINEERING CO P/N : RSC02ZCR
D014634	TIR 3 LIGHT SUPPORT GM GRILLE	DEMERS AMBULANCES P/N : D014634
D014997	LIN3 GRILLE LIGHT HOLDING BRACKET BC	DEMERS AMBULANCES P/N : D014997
A014379	GM DASH BOARD WITH HAND BRAKE LIGHT	DEMERS AMBULANCES P/N : A014379
E509029	RED FLASHING LIGHT	PRODUITS ELECTRONIQUES 2000 LTEE P/N : 55-342
E508009	FLASHING LIGHT	PRODUITS ELECTRONIQUES 2000 LTEE P/N : 256
E307118	MATE-N-LOCK MALE TERMINAL 350416-1	PRODAM P/N : 350416-1
E307075	FEMALE CONNECTOR 2 WAY 770069-1	PRODAM P/N : 770069-1



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• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
D014916-D	BUTTON PROTECTION MX151D BC	DEMERS AMBULANCES P/N : D014916-D
A014393	DOOR G1 MX151D-BC (COMPARTMENT)	DEMERS AMBULANCES P/N : A014393
A014046	DOOR G1 (B800620)	DEMERS AMBULANCES P/N : A014046
E105005	ACOUSTIC FIBER GLASS (TUF SKIN)-	DISPRO INC. P/N : 20TS1
E602042	LEFT LATCH "SLIM LINE" TRI-MARK 11657-16	JIMEXS INC. P/N : JX-11657-16
E602043	RIGHT LATCH "SLIM LINE" TRI-MARK 11656-16	JIMEXS INC. P/N : JX-11656-16
E601082	LEFT SIDE EXTERIOR DOOR HANDLE TRIMARK - FULL CHROME	JIMEXS INC. P/N : JX-22675-01
D013600-7	DOOR ROD TYPE "A"	DEMERS AMBULANCES P/N : D013600-7
D013601-7	DOOR ROD TYPE "B"	DEMERS AMBULANCES P/N : D013601-7
D014052	INTERIOR DOOR WALL G1 (B800620)	DEMERS AMBULANCES P/N : D014052
D013199-B	DOOR ACCESS TRAP	DEMERS AMBULANCES P/N : D013199-B



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• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
D001900-43	PENTURE DE PORTE, 68.5" LONG	DEMERS AMBULANCES P/N : D001900-43
A014394	DOOR D2 MX151D-BC (COMPARTMENT)	DEMERS AMBULANCES P/N : A014394
A014045	DOOR D2 (B800620)	DEMERS AMBULANCES P/N : A014045
E105005	ACOUSTIC FIBER GLASS (TUF SKIN)-	DISPRO INC. P/N : 20TS1
E602042	LEFT LATCH "SLIM LINE" TRI-MARK 11657-16	JIMEXS INC. P/N : JX-11657-16
E602043	RIGHT LATCH "SLIM LINE" TRI-MARK 11656-16	JIMEXS INC. P/N : JX-11656-16
E601081	RIGHT SIDE EXTERIOR DOOR HANDLE TRIMARK - FULL CHROME	JIMEXS INC. P/N : JX-22676-02
D013600-4	DOOR ROD TYPE "A"	DEMERS AMBULANCES P/N : D013600-4
D013601-4	DOOR ROD TYPE "B"	DEMERS AMBULANCES P/N : D013601-4
E602026	ELECT. DOOR LOCK ACTIVATOR	COUTURE VITRE D' AUTO INC P/N : 524N
D014051	INTERIOR DOOR WALL D2 (B800620)	DEMERS AMBULANCES P/N : D014051



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• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
D001900-41	DOOR PIANO HINGE, 38" LONG	DEMERS AMBULANCES P/N : D001900-41
A014395	DOOR A3 MX151D-BC (COMPARTMENT)	DEMERS AMBULANCES P/N : A014395
A014041	DOOR A3 (B800620)	DEMERS AMBULANCES P/N : A014041
E105005	ACOUSTIC FIBER GLASS (TUF SKIN)-	DISPRO INC. P/N : 20TS1
E602042	LEFT LATCH "SLIM LINE" TRI-MARK 11657-16	JIMEXS INC. P/N : JX-11657-16
E602043	RIGHT LATCH "SLIM LINE" TRI-MARK 11656-16	JIMEXS INC. P/N : JX-11656-16
E601082	LEFT SIDE EXTERIOR DOOR HANDLE TRIMARK - FULL CHROME	JIMEXS INC. P/N : JX-22675-01
D013600-4	DOOR ROD TYPE "A"	DEMERS AMBULANCES P/N : D013600-4
D013601-4	DOOR ROD TYPE "B"	DEMERS AMBULANCES P/N : D013601-4
E602026	ELECT. DOOR LOCK ACTIVATOR	COUTURE VITRE D' AUTO INC P/N : 524N
D014047	INTERIOR DOOR WALL A3 (B800620)	DEMERS AMBULANCES P/N : D014047



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• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
D001900-42	DOOR PIANO HINGE, 24.5" LONG	DEMERS AMBULANCES P/N : D001900-42
A014396	DOOR A1 MX151D-BC (PATIENT ACCESS REAR LEFT)	DEMERS AMBULANCES P/N : A014396
A014042	DOOR A1 (B800620)	DEMERS AMBULANCES P/N : A014042
E105005	ACOUSTIC FIBER GLASS (TUF SKIN).	DISPRO INC. P/N : 20TS1
E602042	LEFT LATCH "SLIM LINE" TRI-MARK 11657-16	JIMEXS INC. P/N : JX-11657-16
E602043	RIGHT LATCH "SLIM LINE" TRI-MARK 11656-16	JIMEXS INC. P/N : JX-11656-16
D013600-7	DOOR ROD TYPE "A"	DEMERS AMBULANCES P/N : D013600-7
D013601-9	DOOR ROD TYPE "B"	DEMERS AMBULANCES P/N : D013601-9
D014950	ROD Ø,214 X 24" ZP	DEMERS AMBULANCES P/N : D014950
D014048	INTERIOR DOOR WALL A1 (B800620)	DEMERS AMBULANCES P/N : D014048
D001900-35	DOOR PIANO HINGE, 59" LONG	DEMERS AMBULANCES P/N : D001900-35



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• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
E010021	BLACK BALL KNOB	CAVERHILL LEARMONT/G.S. TOOLS (2003) P/N : E010021
E601030	PIVOT PLATE FOR DOOR RODS	JIMEXS INC. P/N : JX-12382-16
E601084	LEFT SIDE INTERIOR DOOR HANDLE WITHOUT LOCK TRIMARK - CHROME	JIMEXS INC. P/N : JX-23015-01
A014397	DOOR A2 MX151D-BC (PATIENT ACCESS REAR RIGHT)	DEMERS AMBULANCES P/N : A014397
A014043	DOOR A3 (B800620)	DEMERS AMBULANCES P/N : A014043
E105005	ACOUSTIC FIBER GLASS (TUF SKIN)-	DISPRO INC. P/N : 20TS1
E601081	RIGHT SIDE EXTERIOR DOOR HANDLE TRIMARK - FULL CHROME	JIMEXS INC. P/N : JX-22676-02
E602042	LEFT LATCH "SLIM LINE" TRI-MARK 11657-16	JIMEXS INC. P/N : JX-11657-16
E602043	RIGHT LATCH "SLIM LINE" TRI-MARK 11656-16	JIMEXS INC. P/N : JX-11656-16
E601083	RIGHT SIDE INTERIOR DOOR HANDLE WITH LOCK TRIMARK - CHROME	JIMEXS INC. P/N : JX-21431-08
D013600-9	DOOR ROD TYPE "A"	DEMERS AMBULANCES P/N : D013600-9



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• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
D013601-4	DOOR ROD TYPE "B"	DEMERS AMBULANCES P/N : D013601-4
D014950	ROD Ø,214 X 24" ZP	DEMERS AMBULANCES P/N : D014950
E602026	ELECT. DOOR LOCK ACTIVATOR	COUTURE VITRE D' AUTO INC P/N : 524N
D014049	INTERIOR DOOR WALL A2 (B800620)	DEMERS AMBULANCES P/N : D014049
D002010	EMERGENCY DOOR ENTRY PROTECTOR	DEMERS AMBULANCES P/N : D002010
E010021	BLACK BALL KNOB	CAVERHILL LEARMONT/G.S. TOOLS (2003) P/N : E010021
D013199-B	DOOR ACCESS TRAP	DEMERS AMBULANCES P/N : D013199-B
D001900-35	DOOR PIANO HINGE, 59" LONG	DEMERS AMBULANCES P/N : D001900-35
D015074-B	ACTUATOR ACCESS TRAP A2 DOOR MX151D-BC	DEMERS AMBULANCES P/N : D015074-B
A014444	HEATER ASSY. MX151D-BC	DEMERS AMBULANCES P/N : A014444
E701008	HEATER #12-1203	MOBILE CLIMATE CONTROL P/N : 12-1203



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• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
E307147	FEMALE PIN 350537-1	PRODAM P/N : 350537-1
E307078	FEMALE CONNECTOR 3 WAY 1-480701-0 AMP	HDI TECHNOLOGIES P/N : 1-480701-0
E312006	LOOMEX 3/8" X 2000'	TECHSPAN INDUSTRIES INC P/N : 769902B
A014460	BUILT A/C SUPPORT MX151D BC	DEMERS AMBULANCES P/N : A014460
A014473	MAP HOLDERS VELCRO STRAP MX151D-BC	DEMERS AMBULANCES P/N : A014473
E404015	BLACK SEAT BELT 2"	DEMERS AMBULANCES P/N : E404015
E205040	2" BLACK LOOP -P- 50 YARD ROLL	APLIX FASTENERS INC P/N : A800R0050L008=P=
E203028	BLACK THREAD CANSEW 6.6	REMI CARRIER INC P/N : CBB69CSS-15
A014484	2 OUTLET OXYGEN NETWORK + SUCTION MX151D-BC	DEMERS AMBULANCES P/N : A014484
A014494	EXHAUST OUTLET ASSY MX151D BC	DEMERS AMBULANCES P/N : A014494
E710186	PERKO CHROMED AIR EXHAUST	PERKO INC P/N : 1312000CHR



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• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
E710029	LOUVER 3" S/S ANODIZED DOZ	MIDGET LOUVER COMPANY P/N : 30LDSSAD
E107073	BLACK STRIP CAULK 1/4 X 12" X 60'	VALLIERES PEINTURE D'AUTO P/N : PF300
E710006	AIR HOSE 3"	MOBILE CLIMATE CONTROL P/N : 23-0025
A014497	MODIFIED EXHAUST FAN MX151D-BC	DEMERS AMBULANCES P/N : A014497
E605003	BLOWER 12VOLTS 2 SPEED	MOBILE CLIMATE CONTROL P/N : 15-0311
E307076	PLUG CONNECTOR 3POS.	HDI TECHNOLOGIES P/N : 770074-1
E307118	MATE-N-LOCK MALE TERMINAL 350416-1	PRODAM P/N : 350416-1
E312006	LOOMEX 3/8" X 2000'	TECHSPAN INDUSTRIES INC P/N : 769902B
E710006	AIR HOSE 3"	MOBILE CLIMATE CONTROL P/N : 23-0025
E203032	LARGE TIE WRAP	TRADELCO INC P/N : PLT3S-M0
E710078	4" DRAFT BLOCKER	MATCO RAVARY INC P/N : 74290



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• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
E710077	HOSE REDUCER 4" TO 3"	MATCO RAVARY INC P/N : 2832182
A014511-2	2" POLYPRO WEBBING WITH CAM BUCKLE (7" LENGTH) BLUE THREAD	DEMERS AMBULANCES P/N : A014511-2
E404075	2" BLACK POLYPROPYLENE WEBBING (1428 LBS CAP.)	KOUTOU LTEE P/N : 9737
E404074	2" METAL CAM BUCKLE	KOUTOU LTEE P/N : MCB2 STRAPWORKS
D014505	2" STRAP ANCHORAGE	DEMERS AMBULANCES P/N : D014505
A014512-2	2" POLYPRO WEBBING (26.5" LENGTH) BLUE THREAD	DEMERS AMBULANCES P/N : A014512-2
E404075	2" BLACK POLYPROPYLENE WEBBING (1428 LBS CAP.)	KOUTOU LTEE P/N : 9737
D014505	2" STRAP ANCHORAGE	DEMERS AMBULANCES P/N : D014505
A014514	SECURITY NET 68" MX151D BC	DEMERS AMBULANCES P/N : A014514
A014515	PRIMED AIR OUTLET SPACER MX251D BC	DEMERS AMBULANCES P/N : A014515
D014516	AIR OUTLET SPACER MX251D BC	DEMERS AMBULANCES P/N : D014516



TECHNICAL MANUAL

MX151D - GM



• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
A014517	LEFT BUILT CPR BELT ANCHORAGE MX151D BC	DEMERS AMBULANCES P/N : A014517
A014518	RIGHT BUILT CPR BELT ANCHORAGE MX151D BC	DEMERS AMBULANCES P/N : A014518
A014522	BUILT LEFT WALL STORING UNIT D2 MX151D BC	DEMERS AMBULANCES P/N : A014522
A014545-10	LATERAL DOOR OVERHEAD PAD MX151D-BC	DEMERS AMBULANCES P/N : A014545-10
D014546	MAIN PART	DEMERS AMBULANCES P/N : D014546
E104026	POPLAR PLYWOOD 12.5MM	GOODFELLOW INC P/N : 804-15
E107097	VINYL SUN YELLOW M-43	MORBERN P/N : M43 SUN YELLOW
A014548-2	KIT TREE PAD MX151D-BC	DEMERS AMBULANCES P/N : A014548-2
D014549	MAIN PART	DEMERS AMBULANCES P/N : D014549
E104026	POPLAR PLYWOOD 12.5MM	GOODFELLOW INC P/N : 804-15
E107082	VINYL COBALT DURATION	MORBERN P/N : DU116



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MX151D - GM



• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
A014550-2	BULKHEAD OVERHEAD PAD MX151D-BC	DEMERS AMBULANCES P/N : A014550-2
D014551	MAIN PART	DEMERS AMBULANCES P/N : D014551
D014992	SECONDARY PART	DEMERS AMBULANCES P/N : D014992
E104026	POPLAR PLYWOOD 12.5MM	GOODFELLOW INC P/N : 804-15
E107082	VINYL COBALT DURATION	MORBERN P/N : DU116
D013154	PALQUE D'AÉRATION 8" X 26 3/4" MX160	DEMERS AMBULANCES P/N : D013154
E710084	BALL LOUVER	DCM MANUFACTURING, INC. P/N : 2381-A-3
A014552-10	REAR BOLSTER MX151D-BC	DEMERS AMBULANCES P/N : A014552-10
D014553	MAIN PART	DEMERS AMBULANCES P/N : D014553
E104026	POPLAR PLYWOOD 12.5MM	GOODFELLOW INC P/N : 804-15
E107097	VINYL SUN YELLOW M-43	MORBERN P/N : M43 SUN YELLOW



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MX151D - GM



• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
A014554-2	UPPER LEFT CPR PAD MX151D-BC	DEMERS AMBULANCES P/N : A014554-2
D014555	MAIN PART	DEMERS AMBULANCES P/N : D014555
E104026	POPLAR PLYWOOD 12.5MM	GOODFELLOW INC P/N : 804-15
E107082	VINYL COBALT DURATION	MORBERN P/N : DU116
A014557-2	MIDDLE LEFT CPR PAD MX151D-BC	DEMERS AMBULANCES P/N : A014557-2
D014558	MAIN PART	DEMERS AMBULANCES P/N : D014558
E104026	POPLAR PLYWOOD 12.5MM	GOODFELLOW INC P/N : 804-15
E107082	VINYL COBALT DURATION	MORBERN P/N : DU116
A014559-2	LOWER LEFT CPR PAD MX151D-BC	DEMERS AMBULANCES P/N : A014559-2
D014560	MAIN PART	DEMERS AMBULANCES P/N : D014560
E104026	POPLAR PLYWOOD 12.5MM	GOODFELLOW INC P/N : 804-15



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MX151D - GM



• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
E107082	VINYL COBALT DURATION	MORBERN P/N : DU116
A014633	AERODYNAMIC NOSE ASSY MX151D-BC	DEMERS AMBULANCES P/N : A014633
D014055	AERODYNAMIC NOSE MX151D-BC	DEMERS AMBULANCES P/N : D014055
E502137	BC FRONT LIGHTBAR	BLUE MAX LIGHTING & EMERGENCY P/N : 465H-6407-0121 Front
D014513	LIGHT BAR SUPPORT MX151D BC	DEMERS AMBULANCES P/N : D014513
E202019	SPONGE RUBBER	SPAE NAUR INC P/N : 892-457
E509010	MARKER LIGHT AMBER FORD	BARIL LINCOLN INC P/N : F81Z-15442-CA
H002938	CABRISER POSTION LIGHT HARNESS	DEMERS AMBULANCES P/N : H002938
E206009	WHITE SIKAFLEX #221 305ML TUBE	AGRO-115 REVETEMENTS INC P/N : 0SF-0221-0305 Blanc
E010036	CAP 1,105 X 0,809 X 0,114 PLAS	SPAE NAUR INC P/N : 315-377
A014635	BOX FOR EXTERIOR INLET BC ASSY	DEMERS AMBULANCES P/N : A014635



TECHNICAL MANUAL

MX151D - GM



• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
E307014	BOX FOR PLUG	NOEL MARTIN ENR P/N : FD PVC
E307165	ONT. CONNECTOR CI-804	TRADELCO INC P/N : C500
A014708	RAMP ASSEMBLY - OXYGEN RAMP	DEMERS AMBULANCES P/N : A014708
A014830	OXYGEN RAMP ASS.	DEMERS AMBULANCES P/N : A014830
D014699	ACCESS DOOR - OXYGEN RAMP	DEMERS AMBULANCES P/N : D014699
E204059	EPDM .216 X .354 WEATHERSTRIP	CLEAN SEAL INC P/N : 1085ST-100
E602093	SELF-CLOSING HINGE (RICHELIEU)	MATCO RAVARY INC P/N : 2510714
E601046	PULL-DOWN LATCH STEEL ZINC PLATED	FAUCHER INDUSTRIES P/N : 772-0086
E601053	STRIKER PLATE STEEL ZINC PLATED	FAUCHER INDUSTRIES P/N : 772-0079
A014709	TRUCK BASE ASSEMBLY - OXYGEN RAMP	DEMERS AMBULANCES P/N : A014709
A014707	MECHANICALLY WELDED BASE - OXYGEN RAMP	DEMERS AMBULANCES P/N : A014707



TECHNICAL MANUAL

MX151D - GM



• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
E607079	LOW PROFILE 360 DEGREES SWIVEL BASE (500 LBS CAP.)	McMASTER-CARR P/N : 1544T11
D014695	ROTATIVE PLATE - OXYGEN RAMP	DEMERS AMBULANCES P/N : D014695
750026	SQUAD BENCH 5 HOLE HINGE	DEMERS AMBULANCES P/N : 750026
D014696	TOP PLATE - OXYGEN RAMP	DEMERS AMBULANCES P/N : D014696
E202029	RUBBER MAT 36" X 105 FEET	IMATECH & MOORE INC. P/N : E202029
A014713	TRUCK ASSEMBLY - OXYGEN RAMP	DEMERS AMBULANCES P/N : A014713
A014710	MECHANICALLY WELDED TRUCK - OXYGEN RAMP	DEMERS AMBULANCES P/N : A014710
A014533	1-1/2" POLYPRO WEBBING WITH CAM BUCKLE (37.5" LENGTH)	DEMERS AMBULANCES P/N : A014533
D014703	OXYGEN TROLLEY SHAFT MX151D-BC	DEMERS AMBULANCES P/N : D014703
E607080	2" URETHANE WHEEL (8MM CORE DIA.)	MONSIEUR ROULETTES INC. P/N : P21
E009020	RETAINING RING FOR 5/16 SHAFT DIA.	SPAE NAUR INC P/N : R3100-312P



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MX151D - GM



• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
A014714	SLIDING BATTERY TRAY ASSY. MX151D-BC	DEMERS AMBULANCES P/N : A014714
A014718	BATTERY TRAY MX151D-BC	DEMERS AMBULANCES P/N : A014718
E607078	8" SLIDE	POMAR HARDWARE & SUPPLY INC. P/N : 330008ZN (ONE PAIR)
D014716	BATTERY COMPARTMENT SLIDE HOLDER MX151D-BC	DEMERS AMBULANCES P/N : D014716
A014717	STRAP FOR BATTERY TRAY MX151D-BC	DEMERS AMBULANCES P/N : A014717
E404021	1" BLACK NYLON BELT #N251B0-999 50YD	ERICKSON MANUFACTURING LTD. P/N : 119-TDSWBLK
E205030	1" BLACK HOOK -PRESSURE SENSITIVE NYLON 50 YARD ROLL	APLIX FASTENERS INC P/N : A800R0025H008=P=
E205031	1" BLACK LOOP -P- 50 YARD ROLLS	APLIX FASTENERS INC P/N : A800R0025L008=P=
E203028	BLACK THREAD CANSEW 6.6	REMI CARRIER INC P/N : CBB69CSS-15
D014722	BATTERY COMPARTMENT DRY CARPET MX151D-BC	DEMERS AMBULANCES P/N : D014722
A014736	ESPAR AUXILIARY HEATER ASSY MX151D-BC	DEMERS AMBULANCES P/N : A014736



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MX151D - GM



• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
D013802	AUXILIARY HEATER BRACKET MX144 / MX151	DEMERS AMBULANCES P/N : D013802
E701098	AIR HEATER ESPAR «AIRTRONIC 4»	TRANS ARTIK INC P/N : ESPAR D4
E710188	FLEXIBLE AIR HOSE 3.5"	PIECES D'AUTOS ROBITAILLE 1997 INC P/N : 80173 DAYCO
A014737	EXTERIOR SIGNAGE WITH INSTALLATION MX151D-BC	DEMERS AMBULANCES P/N : A014737
A014741	A/C HOSE 5/16" ASS. GM (TOP) 90DEG FEM / 0 DEG FLARE FEM	DEMERS AMBULANCES P/N : A014741
A014746	DRIVER SIDE SEAT ASSY MX151D-BC	DEMERS AMBULANCES P/N : A014746
E310065	GM OEM VINYL DRIVER ELECTRICAL SEAT	LUSSIER PONTIAC BUICK GMC P/N : N/A
A014820	FRONT SEAT ARMREST GM MEDIUM PEWTER	DEMERS AMBULANCES P/N : A014820
A014537	DRIVER'S ARMREST BRACKET ASSEMBLY	DEMERS AMBULANCES P/N : A014537
A014567	ARMREST PLATE ASSEMBLY (LEFT AND RIGHT) MX151D-BC	DEMERS AMBULANCES P/N : A014567
A014747	PASSENGER SIDE SEAT ASSY MX151D-BC	DEMERS AMBULANCES P/N : A014747



TECHNICAL MANUAL

MX151D - GM



• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
A014820	FRONT SEAT ARMREST GM MEDIUM PEWTER	DEMERS AMBULANCES P/N : A014820
A014564	LEFT ARMREST BRACKET ASSEMBLY SEAT SIDE MX151D-BC	DEMERS AMBULANCES P/N : A014564
A014567	ARMREST PLATE ASSEMBLY (LEFT AND RIGHT) MX151D-BC	DEMERS AMBULANCES P/N : A014567
E310066	GM OEM VINYL PASSENGER ELECTRIC SEAT	LUSSIER PONTIAC BUICK GMC P/N : N/A
A014772-2	HEAD REST 12,000 X 8,000 MX151D BC CPR SIDE	DEMERS AMBULANCES P/N : A014772-2
A150254-2	SMALL HEAD REST COBALT	DEMERS AMBULANCES P/N : A150254-2
D013065	CUSHION HOLDER BRACKET	DEMERS AMBULANCES P/N : D013065
E205030	1" BLACK HOOK -PRESSURE SENSITIVE NYLON 50 YARD ROLL	APLIX FASTENERS INC P/N : A800R0025H008=P=
E204059	EPDM .216 X .354 WEATHERSTRIP	CLEAN SEAL INC P/N : 1085ST-100
A014822	SECURITY VEST HOLDER	DEMERS AMBULANCES P/N : A014822
A014841-2	RIGHT CPR PAD MX151D-BC	DEMERS AMBULANCES P/N : A014841-2



TECHNICAL MANUAL

MX151D - GM



• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
D014842	MAIN PART	DEMERS AMBULANCES P/N : D014842
E104026	POPLAR PLYWOOD 12.5MM	GOODFELLOW INC P/N : 804-15
E107082	VINYL COBALT DURATION	MORBERN P/N : DU116
A014845	BC EQUIPMENT CONSOLE ASSY	DEMERS AMBULANCES P/N : A014845
A014958	EQUIPMENT CONSOLE WITH COVER MX151D-BC	DEMERS AMBULANCES P/N : A014958
D001447	ARRÊT SUPPORT EXTINCTEUR	DEMERS AMBULANCES P/N : D001447
E202020	SBR OPEN CELL SPONGE 7/16"X2"	SPAE NAUR INC P/N : 376
D006902	FOND COMPARTIMENT FEUX BENGALÉ	DEMERS AMBULANCES P/N : D006902
A014846	EQUIPMENT CONSOLE NET MX151D-BC	DEMERS AMBULANCES P/N : A014846
E602023	SMALL NET HOOK	FAUCHER INDUSTRIES P/N : 682-0987
E602009	LATCH AJUSTABLE W/O KEY	FAUCHER INDUSTRIES P/N : C2-33-15-3 (699-9205)



TECHNICAL MANUAL

MX151D - GM



• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
A014877	AIR EXHAUST PORT MX151 BC	DEMERS AMBULANCES P/N : A014877
E710186	PERKO CHROMED AIR EXHAUST	PERKO INC P/N : 1312000CHR
E710006	AIR HOSE 3"	MOBILE CLIMATE CONTROL P/N : 23-0025
E710029	LOUVER 3" S/S ANODIZED DOZ	MIDGET LOUVER COMPANY P/N : 30LDSSAD
E107073	BLACK STRIP CAULK 1/4 X 12" X 60'	VALLIERES PEINTURE D'AUTO P/N : PF300
A014888	CPR SEAT MX151D-BC ASSY	DEMERS AMBULANCES P/N : A014888
D014126	CPR SEAT MX151D BC	DEMERS AMBULANCES P/N : D014126
A150652-2	FLAT BACK ET SEAT COBALT	DEMERS AMBULANCES P/N : A150652-2
A014896	FRONT PARTITION ASSY MX151D-BC	DEMERS AMBULANCES P/N : A014896
D014063	FRONT CAB LEFT TRIMMING MX151D BC	DEMERS AMBULANCES P/N : D014063
E207008	BLACK DOOR EDGE 50' ROLL	PIECES D'AUTOS ROBITAILLE 1997 INC P/N : T715002



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MX151D - GM



• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
D014064	FRONT CAB RIGHT TRIMMING MX151D BC	DEMERS AMBULANCES P/N : D014064
D014062	FRONT CAB UPPER TRIMMING MX151D BC	DEMERS AMBULANCES P/N : D014062
A014065	CAB SIDE FRONT BULKHEAD MX151D BC	DEMERS AMBULANCES P/N : A014065
D014071	MAIN PART MODULE FINISH MX151D BC	DEMERS AMBULANCES P/N : D014071
A014744	2" POLYPRO WEBBING (90" LENGTH)	DEMERS AMBULANCES P/N : A014744
E404075	2" BLACK POLYPROPYLENE WEBBING (1428 LBS CAP.)	KOUTOU LTEE P/N : 9737
E203028	BLACK THREAD CANSEW 6.6	REMI CARRIER INC P/N : CBB69CSS-15
D014505	2" STRAP ANCHORAGE	DEMERS AMBULANCES P/N : D014505
E205040	2" BLACK LOOP -P- 50 YARD ROLL	APLIX FASTENERS INC P/N : A800R0050L008=P=
D014534	OXYGEN CYLINDRE STRAP COVER MX151D BC	DEMERS AMBULANCES P/N : D014534
A014897	OXYGEN CYLINDER WALL ASSY MX151D BC	DEMERS AMBULANCES P/N : A014897



TECHNICAL MANUAL

MX151D - GM



• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
A014502	OXYGEN CYLINDER WALL MX151D BC	DEMERS AMBULANCES P/N : A014502
A014511-4	2" POLYPRO WEBBING WITH CAM BUCKLE (7" LENGTH) GREEN THREAD	DEMERS AMBULANCES P/N : A014511-4
E404075	2" BLACK POLYPROPYLENE WEBBING (1428 LBS CAP.)	KOUTOU LTEE P/N : 9737
D014505	2" STRAP ANCHORAGE	DEMERS AMBULANCES P/N : D014505
A014511-6	2" POLYPRO WEBBING WITH CAM BUCKLE (7" LENGTH) WHITE THREAD	DEMERS AMBULANCES P/N : A014511-6
E404075	2" BLACK POLYPROPYLENE WEBBING (1428 LBS CAP.)	KOUTOU LTEE P/N : 9737
D014505	2" STRAP ANCHORAGE	DEMERS AMBULANCES P/N : D014505
A014511-8	2" POLYPRO WEBBING WITH CAM BUCKLE (7" LENGTH) ORANGE THREAD	DEMERS AMBULANCES P/N : A014511-8
E404075	2" BLACK POLYPROPYLENE WEBBING (1428 LBS CAP.)	KOUTOU LTEE P/N : 9737
E404074	2" METAL CAM BUCKLE	KOUTOU LTEE P/N : MCB2 STRAPWORKS
D014505	2" STRAP ANCHORAGE	DEMERS AMBULANCES P/N : D014505



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MX151D - GM



• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
A014512-4	2" POLYPRO WEBBING (26.5" LENGTH) GREEN THREAD	DEMERS AMBULANCES P/N : A014512-4
E404075	2" BLACK POLYPROPYLENE WEBBING (1428 LBS CAP.)	KOUTOU LTEE P/N : 9737
D014505	2" STRAP ANCHORAGE	DEMERS AMBULANCES P/N : D014505
A014512-6	2" POLYPRO WEBBING (26.5" LENGTH) WHITE THREAD	DEMERS AMBULANCES P/N : A014512-6
E404075	2" BLACK POLYPROPYLENE WEBBING (1428 LBS CAP.)	KOUTOU LTEE P/N : 9737
D014505	2" STRAP ANCHORAGE	DEMERS AMBULANCES P/N : D014505
A014512-8	2" POLYPRO WEBBING (26.5" LENGTH) ORANGE THREAD	DEMERS AMBULANCES P/N : A014512-8
E404075	2" BLACK POLYPROPYLENE WEBBING (1428 LBS CAP.)	KOUTOU LTEE P/N : 9737
D014505	2" STRAP ANCHORAGE	DEMERS AMBULANCES P/N : D014505
A014743	2" POLYPRO WEBBING WITH INV. CAM BUCKLE (7" LENGTH)	DEMERS AMBULANCES P/N : A014743
E404075	2" BLACK POLYPROPYLENE WEBBING (1428 LBS CAP.)	KOUTOU LTEE P/N : 9737



TECHNICAL MANUAL

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• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
E203028	BLACK THREAD CANSEW 6.6	REMI CARRIER INC P/N : CBB69CSS-15
D014505	2" STRAP ANCHORAGE	DEMERS AMBULANCES P/N : D014505
A014899	HEATING UNIT BOX ASSY MX151D-BC	DEMERS AMBULANCES P/N : A014899
D014086	HEATING UNIT PROTECTION MX151D BC	DEMERS AMBULANCES P/N : D014086
E202015	RUBBER 1/8"X12" DURO 60	PRODUITS DE CAOUTCHOUC A & J P/N : NEOPR 60DU
A014900-2	KIT TREE CEILING TRIM PAD MX151D-BC	DEMERS AMBULANCES P/N : A014900-2
D014901	MAIN PART	DEMERS AMBULANCES P/N : D014901
E107082	VINYL COBALT DURATION	MORBERN P/N : DU116
E205047	DUAL LOCK 250 - 1"	EMBALLAGES JEAN CARTIER P/N : 47200422 1"
A014902-2	REAR MEDICAL CABINET CEILING TRIM PAD MX151D-BC	DEMERS AMBULANCES P/N : A014902-2
D014903	MAIN PART	DEMERS AMBULANCES P/N : D014903



TECHNICAL MANUAL

MX151D - GM



• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
E107082	VINYL COBALT DURATION	MORBERN P/N : DU116
E205047	DUAL LOCK 250 - 1"	EMBALLAGES JEAN CARTIER P/N : 47200422 1"
A014904-2	CPR SEAT CEILING TRIM PAD MX151D-BC	DEMERS AMBULANCES P/N : A014904-2
D014905	MAIN PART	DEMERS AMBULANCES P/N : D014905
E107082	VINYL COBALT DURATION	MORBERN P/N : DU116
E205047	DUAL LOCK 250 - 1"	EMBALLAGES JEAN CARTIER P/N : 47200422 1"
A014906-2	FRONT MEDICAL CABINET CEILING TRIM PAD MX151D-BC	DEMERS AMBULANCES P/N : A014906-2
D014907	MAIN PART	DEMERS AMBULANCES P/N : D014907
E107082	VINYL COBALT DURATION	MORBERN P/N : DU116
E205047	DUAL LOCK 250 - 1"	EMBALLAGES JEAN CARTIER P/N : 47200422 1"
A014909-2	FRONT LEFT CABINET CEILING TRIM PAD MX151D-BC	DEMERS AMBULANCES P/N : A014909-2



TECHNICAL MANUAL

MX151D - GM



• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
D014910	MAIN PART	DEMERS AMBULANCES P/N : D014910
E107082	VINYL COBALT DURATION	MORBERN P/N : DU116
E205047	DUAL LOCK 250 - 1"	EMBALLAGES JEAN CARTIER P/N : 47200422 1"
A014912-2	SQUAD BENCH PAD MX151D BC	DEMERS AMBULANCES P/N : A014912-2
D014913	SQUAD BENCH SUPPORT MX151D BC	DEMERS AMBULANCES P/N : D014913
D014914	FRAME SQUAD BENCH PAD MX151D BC	DEMERS AMBULANCES P/N : D014914
A014918-2	UPPER AND LOWER DIVISION PADS MX151D-BC	DEMERS AMBULANCES P/N : A014918-2
D014919	MAIN PART	DEMERS AMBULANCES P/N : D014919
A014920-2	SIDE DIVISION PAD MX151D-BC	DEMERS AMBULANCES P/N : A014920-2
D014928	MAIN PART	DEMERS AMBULANCES P/N : D014928
A014921	BATTERY DOOR ASSEMBLY MX151D BC	DEMERS AMBULANCES P/N : A014921



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MX151D - GM



• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
A014924-2	CONTROL CENTER PAD MX151D-BC	DEMERS AMBULANCES P/N : A014924-2
D014925	MAIN PART	DEMERS AMBULANCES P/N : D014925
E107082	VINYL COBALT DURATION	MORBERN P/N : DU116
A014927	CPR SEAT SAFETY NET MX151D-BC	DEMERS AMBULANCES P/N : A014927
A014939	UPHOLSTERED CENTER PART CEILING MX151D BC	DEMERS AMBULANCES P/N : A014939
D014130	CENTER PART CEILING MX151D BC	DEMERS AMBULANCES P/N : D014130
E107097	VINYL SUN YELLOW M-43	MORBERN P/N : M43 SUN YELLOW
A014940	7" INCANDESCENT INTERIOR LIGHT 1157 LAMP ASSY	DEMERS AMBULANCES P/N : A014940
E503372	7" INCANDESCENT INTERIOR LIGHT 1157 LAMP	WELDON TECHNOLOGIES P/N : 8040-0520-8
E307076	PLUG CONNECTOR 3POS.	HDI TECHNOLOGIES P/N : 770074-1
E307118	MATE-N-LOCK MALE TERMINAL 350416-1	PRODAM P/N : 350416-1



TECHNICAL MANUAL

MX151D - GM



• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
A014955	CONTROL CENTER FUORESCENT ASSY	DEMERS AMBULANCES P/N : A014955
E503036	FLUORESCENT	OPTRONICS INTERNATIONAL LLC P/N : 17918190
E307118	MATE-N-LOCK MALE TERMINAL 350416-1	PRODAM P/N : 350416-1
E307075	FEMALE CONNECTOR 2 WAY 770069-1	PRODAM P/N : 770069-1
A014961	INCUBATOR PLUG ASSY	DEMERS AMBULANCES P/N : A014961
E311013	PRISE D'INCUBATEUR	PRODUITS ELECTRONIQUES 2000 LTEE P/N : S-2406-SB
E307118	MATE-N-LOCK MALE TERMINAL 350416-1	PRODAM P/N : 350416-1
E307075	FEMALE CONNECTOR 2 WAY 770069-1	PRODAM P/N : 770069-1
A014962	FW9 SLIDER ASSEMBLY MX151D BC	DEMERS AMBULANCES P/N : A014962
D014963	FW9 SLIDER MX151D BC	DEMERS AMBULANCES P/N : D014963
D014964	FW9 SLIDER SURFACE MX151D BC	DEMERS AMBULANCES P/N : D014964



TECHNICAL MANUAL

MX151D - GM



• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
A014965	SEAT BASE ASSY MX151D BC	DEMERS AMBULANCES P/N : A014965
D014974	CAVITRON CONNECTOR HOLDER MX151D BC	DEMERS AMBULANCES P/N : D014974
E311065	CAVITRON CONNECTOR	PRODUIT ELECTRONIQUE 2000 P/N : C3F
E307195	CONNECTEUR MALE 2 POSITION	PRODAM P/N : 1-480698-0
E307112	TERMINAL	PRODAM P/N : 350538-1
A014966	COMPARTMENT LIGHT ASSY MC151 BC	DEMERS AMBULANCES P/N : A014966
E503019	BACK-UP LIGHT 4"	TRUCK-LITE CO. INC P/N : 40003
E309006	DIODE 3 AMP.	PRODUIT ELECTRONIQUE 2000 P/N : 1N5408
E307075	FEMALE CONNECTOR 2 WAY 770069-1	PRODAM P/N : 770069-1
E307118	MATE-N-LOCK MALE TERMINAL 350416-1	PRODAM P/N : 350416-1
D014973-B	107C BACKER PLATE MX151D BC	DEMERS AMBULANCES P/N : D014973-B



TECHNICAL MANUAL

MX151D - GM



• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
A014988	OEM RADIO ON DOGHOUSE ASSY.	DEMERS AMBULANCES P/N : A014988
A014981	UPPER CONSOLE MX151D BC	DEMERS AMBULANCES P/N : A014981
D014985	OEM RADIO SUPPORT BRACKET	DEMERS AMBULANCES P/N : D014985
D014993-C	FIXED SEAT BELT TRIM	DEMERS AMBULANCES P/N : D014993-C
D014995-C	RETRACTABLE SEAT BELT TRIM	DEMERS AMBULANCES P/N : D014995-C
A015068-2	BACKREST 19 X 14 WITH LOMBAR SUPPORT ASSY.	DEMERS AMBULANCES P/N : A015068-2
A014898-2	BACKREST WITH LUMBAR SUPPORT COBALT	DEMERS AMBULANCES P/N : A014898-2
D013065	CUSHION HOLDER BRACKET	DEMERS AMBULANCES P/N : D013065
E205030	1" BLACK HOOK -PRESSURE SENSITIVE NYLON 50 YARD ROLL	APLIX FASTENERS INC P/N : A800R0025H008=P=
E204011	DOOR RUBBER GASKET	ELASTO PROXY INC. P/N : EC12-005-EMT1
A015073	RAMP SUPPORT PLATE ASSY	DEMERS AMBULANCES P/N : A015073



TECHNICAL MANUAL

MX151D - GM



• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
D014739	RAMP SUPPORT PLATE - OXYGEN RAMP	DEMERS AMBULANCES P/N : D014739
A015077	DOOR D1A MX151D-BC (SERVICE ACCESS RIGHT SIDE)	DEMERS AMBULANCES P/N : A015077
A014941	DOOR D1A (B800620)	DEMERS AMBULANCES P/N : A014941
E105005	ACOUSTIC FIBER GLASS (TUF SKIN)-	DISPRO INC. P/N : 20TS1
E602042	LEFT LATCH "SLIM LINE" TRI-MARK 11657-16	JIMEXS INC. P/N : JX-11657-16
E602043	RIGHT LATCH "SLIM LINE" TRI-MARK 11656-16	JIMEXS INC. P/N : JX-11656-16
E601081	RIGHT SIDE EXTERIOR DOOR HANDLE TRIMARK - FULL CHROME	JIMEXS INC. P/N : JX-22676-02
D013600-7	DOOR ROD TYPE "A"	DEMERS AMBULANCES P/N : D013600-7
D013601-9	DOOR ROD TYPE "B"	DEMERS AMBULANCES P/N : D013601-9
D014943	INTERIOR DOOR WALL D1A (B800620)	DEMERS AMBULANCES P/N : D014943
D001900-43	PENTURE DE PORTE, 68.5" LONG	DEMERS AMBULANCES P/N : D001900-43



TECHNICAL MANUAL

MX151D - GM



• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
H015058	RIGHT DOOR HARNESS BC	DEMERS AMBULANCES P/N : H015058
E308006	DOOR SWITCH	PIECES D'AUTOS ROBITAILLE 1997 INC P/N : 52-620
E308010	DOOR SWITCH WITH STATIONARY OFF POSITION	DOCAP 1985 CORP. P/N : 704-720
E710148	BAGUE PLAST.875 X 1 1/16 X 29/64 X .125	SPAENAUER P/N : 315-733
A010964	RETENU BAGUE NYLON / COURTE ASS.	DEMERS AMBULANCES P/N : A010964
D010963	RETENU BAGUE NYLON / COURTE	DEMERS AMBULANCES P/N : D010963
A015078	DOOR D1B MX151D-BC (PATIENT ACCESS RIGHT SIDE)	DEMERS AMBULANCES P/N : A015078
A014942	DOOR D1B (B800620)	DEMERS AMBULANCES P/N : A014942
E105005	ACOUSTIC FIBER GLASS (TUF SKIN)-	DISPRO INC. P/N : 20TS1
E602042	LEFT LATCH "SLIM LINE" TRI-MARK 11657-16	JIMEXS INC. P/N : JX-11657-16
E602043	RIGHT LATCH "SLIM LINE" TRI-MARK 11656-16	JIMEXS INC. P/N : JX-11656-16



TECHNICAL MANUAL

MX151D - GM



• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
E601081	RIGHT SIDE EXTERIOR DOOR HANDLE TRIMARK - FULL CHROME	JIMEXS INC. P/N : JX-22676-02
E601083	RIGHT SIDE INTERIOR DOOR HANDLE WITH LOCK TRIMARK - CHROME	JIMEXS INC. P/N : JX-21431-08
D013600-7	DOOR ROD TYPE "A"	DEMERS AMBULANCES P/N : D013600-7
D013601-7	DOOR ROD TYPE "B"	DEMERS AMBULANCES P/N : D013601-7
D014951	ROD Ø,214 X 48" ZP	DEMERS AMBULANCES P/N : D014951
E602026	ELECT. DOOR LOCK ACTIVATOR	COUTURE VITRE D' AUTO INC P/N : 524N
D013670	HORIZONTAL REINFORCEMENT / DOOR D2	DEMERS AMBULANCES P/N : D013670
D014944	INTERIOR DOOR WALL D1B (B800620)	DEMERS AMBULANCES P/N : D014944
D014975-B	BACKER PLATE, UPPER MX151D BC	DEMERS AMBULANCES P/N : D014975-B
D013200-B	DOOR ACTUATOR ACCESS TRAP	DEMERS AMBULANCES P/N : D013200-B
D001900-43	PENTURE DE PORTE, 68.5" LONG	DEMERS AMBULANCES P/N : D001900-43



TECHNICAL MANUAL

MX151D - GM



• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
E010021	BLACK BALL KNOB	CAVERHILL LEARMONT/G.S. TOOLS (2003) P/N : E010021
A015111-2	SQUAD BENCH OVERHEAD PAD WITH INTEGRATED GLOVE BOX HOLDER	DEMERS AMBULANCES P/N : A015111-2
A014543-2	SQUAD BENCH OVERHEAD PAD MX151D-BC	DEMERS AMBULANCES P/N : A014543-2
D014544	MAIN PART	DEMERS AMBULANCES P/N : D014544
E104026	POPLAR PLYWOOD 12.5MM	GOODFELLOW INC P/N : 804-15
E107082	VINYL COBALT DURATION	MORBERN P/N : DU116
D011574	GLOVE COMPARTMENT	DEMERS AMBULANCES P/N : D011574
D011575	GLOVE COMPARTMENT FACADE	DEMERS AMBULANCES P/N : D011575
D008572	SQUAD BENCH HINGE	DEMERS AMBULANCES P/N : D008572
E602009	LATCH AJUSTABLE W/O KEY	FAUCHER INDUSTRIES P/N : C2-33-15-3 (699-9205)
A015140	GM CAB HEADLINER WITH GPS MOUNT	DEMERS AMBULANCES P/N : A015140



TECHNICAL MANUAL

MX151D - GM



• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
D015141	GPS MOUNT REINFORCING PLATE	DEMERS AMBULANCES P/N : D015141
E206009	WHITE SIKAFLEX #221 305ML TUBE	AGRO-115 REVETEMENTS INC P/N : 0SF-0221-0305 Blanc
500020	MODIFIED LIGHTER PLUG	DEMERS AMBULANCES P/N : 500020
E311011	STAINLESS-STEEL 12V RECEPTACLE	WEST MARINE P/N : 371849 MODEL
E307075	FEMALE CONNECTOR 2 WAY 770069-1	PRODAM P/N : 770069-1
E307118	MATE-N-LOCK MALE TERMINAL 350416-1	PRODAM P/N : 350416-1
E307062	CONNECTOR 18-14 X3/16	TRADELCO INC P/N : PV14-10R-M
A015142	D1 DOOR GAS CYLINDER HOLDING BRACKET ASSY MX151D-BC	DEMERS AMBULANCES P/N : A015142
A014978	D1 DOOR GAS CYLINDER HOLDING BRACKET ASSY MX151D-BC	DEMERS AMBULANCES P/N : A014978
E603058	BALL STUD FOR GAS CYLINDER	JIMEXS INC. P/N : 299-936
A015145	FAST IDLE CONTROL MODULE ASSY ETM-52	DEMERS AMBULANCES P/N : A015145



TECHNICAL MANUAL

MX151D - GM



• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
E313083	FAST IDLE CONTROL MODULE ETM-52	EQUIPEMENT POLYTECK P/N : ETM-52
A015146	D1 DOOR STEP LIGHT	DEMERS AMBULANCES P/N : A015146
E503019	BACK-UP LIGHT 4"	TRUCK-LITE CO. INC P/N : 40003
E307194	FEMALE CONNECTOR 2 WAY	HDI TECHNOLOGIES P/N : 1-480699-0
E307147	FEMALE PIN 350537-1	PRODAM P/N : 350537-1
E307214	JOINT ETANCHEITE 2 POS. ARR.	PRODAM P/N : 794270-1
A015148	49" LOWER REAR DOOR FRAME PROTECTEUR ASSY	DEMERS AMBULANCES P/N : A015148
D015147	49" LOWER REAR DOOR FRAME PROTECTEUR	DEMERS AMBULANCES P/N : D015147
A015149	RED/CLEAR AVENGER LIGHT ASSY	DEMERS AMBULANCES P/N : A015149
E502134	RED/CLEAR WHELEN AVENGER LIGHT	WHELEN ENGINEERING CO P/N : AVN1J
E307118	MATE-N-LOCK MALE TERMINAL 350416-1	PRODAM P/N : 350416-1



TECHNICAL MANUAL

MX151D - GM



• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
E307075	FEMALE CONNECTOR 2 WAY 770069-1	PRODAM P/N : 770069-1
A102521	PORTABLE O2 BRACKET	DEMERS AMBULANCES P/N : A102521
B800620-PGB	151" X 92" X 69" MODULE, PAINTED GM WHITE	DEMERS AMBULANCES P/N : B800620-PGB
D000224	POCHETTE PROFONDE POUR CEINTURE DE SÉCUR	DEMERS AMBULANCES P/N : D000224
D000348	CABINE FRONT LEFT WALL TRIMMING	DEMERS AMBULANCES P/N : D000348
D000750	CABINE FRONT RIGHT WALL TRIMMING	DEMERS AMBULANCES P/N : D000750
D003353	BATTERY COVER SUPPORT	DEMERS AMBULANCES P/N : D003353
D003844	AUTOCOLLANT (ANG) FORMAT GANT DE TRAVAIL	DEMERS AMBULANCES P/N : D003844
D003882	MODULE CORNER PROTECTOR SAINLESS STEEL	DEMERS AMBULANCES P/N : D003882
D004287	RED DECAL / INSIDE DOOR REFLECTOR	DEMERS AMBULANCES P/N : D004287
D004809	FLUORESCENT LENS	DEMERS AMBULANCES P/N : D004809



TECHNICAL MANUAL

MX151D - GM



• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
D007481	FRONT CORNER PROTECTOR 10"	DEMERS AMBULANCES P/N : D007481
D010357	FRONT CABIN FLOOR FINISH	DEMERS AMBULANCES P/N : D010357
D011012	RIGHT FRONT MUD GUARD / GM	DEMERS AMBULANCES P/N : D011012
D011013	LEFT FRONT MUD GUARD / GM	DEMERS AMBULANCES P/N : D011013
D011080	FRONT CABIN FLOOR ADD ON GM	DEMERS AMBULANCES P/N : D011080
D011145	MODULE TO CAB TRIM	DEMERS AMBULANCES P/N : D011145
D011464	FRONT MODULE STAINLESS STEEL PROTECTOR MX GM	DEMERS AMBULANCES P/N : D011464
D011480	SPARE TIRE HEAT DEFLECTOR	DEMERS AMBULANCES P/N : D011480
D011661-D	PASSENGER SEAT FRONT ABS TRIMMING GM	DEMERS AMBULANCES P/N : D011661-D
D011662-D	DRIVER SEAT FRONT ABS TRIMMING GM	DEMERS AMBULANCES P/N : D011662-D
D011709	BENT FLAT WASHER FOR MODULE ANCHORAGE TYPE III GM	DEMERS AMBULANCES P/N : D011709



TECHNICAL MANUAL

MX151D - GM



• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
D012480	ANCRAGE PROTECTEUR DE TÊTE 12.000"	DEMERS AMBULANCES P/N : D012480
D013838	22" BELT FOR ACCESSORIES	DEMERS AMBULANCES P/N : D013838
E404016	2 X 41.5 BLACK BELT	AM-SAFE COMMERCIAL PRODUCTS P/N : I-5038-02
D014056	REAR LEFT FLOOR MX151D BC	DEMERS AMBULANCES P/N : D014056
D014057	REAR RIGHT FLOOR MX151D BC	DEMERS AMBULANCES P/N : D014057
D014058	CENTRAL FLOOR MX151D BC	DEMERS AMBULANCES P/N : D014058
D014059	FRONT FLOOR MX151D BC	DEMERS AMBULANCES P/N : D014059
D014060	LEFT FLOOR SOLE MX151D BC	DEMERS AMBULANCES P/N : D014060
D014080	HEATER UNIT CASING	DEMERS AMBULANCES P/N : D014080
D014084	RIGHT WALL MX151D BC	DEMERS AMBULANCES P/N : D014084
D014085	WHEEL WELL COVER MX151D BC	DEMERS AMBULANCES P/N : D014085



TECHNICAL MANUAL

MX151D - GM



• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
D014087	HEATING UNIT LID MX151D BC	DEMERS AMBULANCES P/N : D014087
D014093	FRONT CABINETRY CEILING ANCHORAGE MX151D BC	DEMERS AMBULANCES P/N : D014093
D014095	REAR CABINETRY CEILING ANCHORAGE MX151D BC	DEMERS AMBULANCES P/N : D014095
D014098	LEFT WINDOW MASTER CAVITY MX151D BC	DEMERS AMBULANCES P/N : D014098
D014099	RIGHT WINDOW MASTER CAVITY MX151D BC	DEMERS AMBULANCES P/N : D014099
D014100	LEFT WINDOW LOWER CAVITY MX151D BC	DEMERS AMBULANCES P/N : D014100
D014101	RIGHT WINDOW LOWER CAVITY MX151D BC	DEMERS AMBULANCES P/N : D014101
D014112	FRONT LOWER PANEL MX151D BC	DEMERS AMBULANCES P/N : D014112
D014113	REAR LOWER PANEL MX151D BC	DEMERS AMBULANCES P/N : D014113
D014125	CPR SEAT BASE MX151D BC	DEMERS AMBULANCES P/N : D014125
D014127	LEFT WALL MX151D BC	DEMERS AMBULANCES P/N : D014127



TECHNICAL MANUAL

MX151D - GM



• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
D014128	LEFT WALL CPR SEAT MX151D BC	DEMERS AMBULANCES P/N : D014128
D014129	RIGHT WALL CPR SEAT MX151D BC	DEMERS AMBULANCES P/N : D014129
D014211	HALF SLEEVE 2"	DEMERS AMBULANCES P/N : D014211
D014314	LEFT SIDE CEILING MX151D BC	DEMERS AMBULANCES P/N : D014314
D014315	RIGHT SIDE CEILING MX151D BC	DEMERS AMBULANCES P/N : D014315
D014316	CPR SEAT CEILING ANCHORAGE MX151D BC	DEMERS AMBULANCES P/N : D014316
D014322	LEFT REAR BUMPER COVER MX151D BC	DEMERS AMBULANCES P/N : D014322
D014323	RIGHT REAR BUMPER COVER MX151D BC	DEMERS AMBULANCES P/N : D014323
D014333	A1 FLOOR THRESHOLD MX151D BC	DEMERS AMBULANCES P/N : D014333
D014334	A2/A3 FLOOR THRESHOLD MX151D BC	DEMERS AMBULANCES P/N : D014334
D014335	D1 DOORSTEP MX151D BC	DEMERS AMBULANCES P/N : D014335



TECHNICAL MANUAL

MX151D - GM



• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
D014336	D2 FLOOR THRESHOLD MX151D BC	DEMERS AMBULANCES P/N : D014336
D014337	G1 DOORSTEP MX151D BC	DEMERS AMBULANCES P/N : D014337
D014342	PART 1 COMPARTMENT A1 MX151D BC	DEMERS AMBULANCES P/N : D014342
D014343	PART 2 COMPARTMENT A1 MX151D BC	DEMERS AMBULANCES P/N : D014343
D014344	PART 3 COMPARTMENT A1 MX151D BC	DEMERS AMBULANCES P/N : D014344
D014345	PART 4 COMPARTMENT A1 MX151D BC	DEMERS AMBULANCES P/N : D014345
D014346	PART 5 COMPARTMENT A1 MX151D BC	DEMERS AMBULANCES P/N : D014346
D014347	PART 6 COMPARTMENT A1 MX151D BC	DEMERS AMBULANCES P/N : D014347
D014348	PART 7 COMPARTMENT A1 MX151D BC	DEMERS AMBULANCES P/N : D014348
D014356	D2 STORAGE UNIT CEILING ANCHOR MX151D BC	DEMERS AMBULANCES P/N : D014356
D014357	D2 STORAGE UNIT REAR ANCHOR MX151D BC	DEMERS AMBULANCES P/N : D014357



TECHNICAL MANUAL

MX151D - GM



• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
D014361	LEFT WALL SUPPORT MX151D BC	DEMERS AMBULANCES P/N : D014361
D014368	CEILING GUIDE MX151D BC	DEMERS AMBULANCES P/N : D014368
D014369	D1 FLOOR THRESHOLD #1 MX151D BC	DEMERS AMBULANCES P/N : D014369
D014370	D1 FLOOR THRESHOLD #2 MX151D BC	DEMERS AMBULANCES P/N : D014370
D014382	FENDER CLIP	DEMERS AMBULANCES P/N : D014382
D014401	BOTTOM SINGLE BATTERY BOX BC	DEMERS AMBULANCES P/N : D014401
D014402	CRANKSHAFT GUIDE HOLDER	DEMERS AMBULANCES P/N : D014402
D014470	MAP HOLDER #1 MX151D-BC	DEMERS AMBULANCES P/N : D014470
D014471	MAP HOLDER #2 MX151D-BC	DEMERS AMBULANCES P/N : D014471
D014472	MAP HOLDER #3 MX151D-BC	DEMERS AMBULANCES P/N : D014472
D014504	REINFORCEMENT	DEMERS AMBULANCES P/N : D014504



TECHNICAL MANUAL

MX151D - GM



• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
D014506	OXYGEN CYLINDER COMPARTMENT ANCHORAGE MX151D BC	DEMERS AMBULANCES P/N : D014506
D014507	D1 FINISHING PLATE #1 MX151D BC	DEMERS AMBULANCES P/N : D014507
D014508	D1 FINISHING PLATE #2 MX151D BC	DEMERS AMBULANCES P/N : D014508
D014510	OVERHEAD PART D1 MX151D BC	DEMERS AMBULANCES P/N : D014510
D014520	FRONT PROTECTIVE PLATE COT ANCHORAGE MX151D BC	DEMERS AMBULANCES P/N : D014520
D014521	REAR PROTECTIVE PLATE COT ANCHORAGE MX151D BC	DEMERS AMBULANCES P/N : D014521
D014523	AIR EXHAUST PLATE MX151D BC	DEMERS AMBULANCES P/N : D014523
D014526	LEFT FRONT COMPARTMENT FLOOR TRIM MX151D BC	DEMERS AMBULANCES P/N : D014526
D014527	D2 STORAGE UNIT FLOOR TRIM MX151D BC	DEMERS AMBULANCES P/N : D014527
D014531	107C STRETCHER HOLDER MX151D BC	DEMERS AMBULANCES P/N : D014531
D014532	107C STRETCHER HOLDER MAT MX151D BC	DEMERS AMBULANCES P/N : D014532



TECHNICAL MANUAL

MX151D - GM



• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
D014535	PART 8 A1 COMPARTMENT MX151D BC	DEMERS AMBULANCES P/N : D014535
D014536	PART 9 A1 COMPARTMENT MX151D BC	DEMERS AMBULANCES P/N : D014536
D014540	REAR SHIM EQUIPMENT CONSOLE A000531	DEMERS AMBULANCES P/N : D014540
D014556	CEILING REINFORCEMENT MX151D BC	DEMERS AMBULANCES P/N : D014556
D014687	AMBULANCE CONVERSION BATTERIES DECAL	DEMERS AMBULANCES P/N : D014687
D014688	OPEN THIS DOOR FIRST DECAL	DEMERS AMBULANCES P/N : D014688
D014689	PATIENT COMPARTMENT HEATER DECAL	DEMERS AMBULANCES P/N : D014689
D014690	BATTERY CHARGER DECAL	DEMERS AMBULANCES P/N : D014690
D014706	LINK PLATE - OXYGEN RAMP	DEMERS AMBULANCES P/N : D014706
D014711	VERTICAL RETAINING PLATE - OXYGEN RAMP	DEMERS AMBULANCES P/N : D014711
D014720	BATTERY HOLDER MX151D-BC	DEMERS AMBULANCES P/N : D014720



TECHNICAL MANUAL

MX151D - GM



• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
D014721	BATTERY STOPPER FIXING PLATE MX151D-BC	DEMERS AMBULANCES P/N : D014721
D014723	MODIFIED SPRING HOOK MX151D-BC	DEMERS AMBULANCES P/N : D014723
D014724	ELECTRICAL COMPARTMENT SHELF MX151D-BC	DEMERS AMBULANCES P/N : D014724
D014828	STATION / SHORE POWER DECAL	DEMERS AMBULANCES P/N : D014828
D014832	WHEEL WELL ISOLATION 18" X 38.5"	DEMERS AMBULANCES P/N : D014832
D014833	WHEEL WELL ISOLATION 18" X 15.75"	DEMERS AMBULANCES P/N : D014833
D014834	WHEEL WELL ISOLATION 4.5" X 36"	DEMERS AMBULANCES P/N : D014834
D014838	LEFT FRONT COMPARTMENT ADJUSTABLE SHELF MX151D BC	DEMERS AMBULANCES P/N : D014838
D014839	WASTE CONTAINER HOLDER ON DOOR	DEMERS AMBULANCES P/N : D014839
D014843	FRONT PROTECTION HOLDER MX151D BC	DEMERS AMBULANCES P/N : D014843
D014890	ADH LOOP 1" X 10"	DEMERS AMBULANCES P/N : D014890



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MX151D - GM



• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
D014895	JACK HOLDING BRACKET	DEMERS AMBULANCES P/N : D014895
D014917	WIRE GUIDE FRONT BULKHEAD MX151D-BC	DEMERS AMBULANCES P/N : D014917
D014929	COT GUIDE RAIL MX151D-BC	DEMERS AMBULANCES P/N : D014929
D014932	ANTI-LOCK BRAKE EQUIPPED DECAL	DEMERS AMBULANCES P/N : D014932
D014933	EQUIPPED WITH TACHOGRAPH DECAL	DEMERS AMBULANCES P/N : D014933
D014935	TURN OVERDRIVE OFF DECAL	DEMERS AMBULANCES P/N : D014935
D014937	MAXIMUM HEIGHT - 2.62M (8'7") DECAL	DEMERS AMBULANCES P/N : D014937
D014938	D1 COMPARTMENT DRY CARPET MX151D-BC	DEMERS AMBULANCES P/N : D014938
D014946	KIT TREE REAR UPPER ANCHOR MX151D BC MX151D-BC	DEMERS AMBULANCES P/N : D014946
D014947	KIT TREE REAR LOWER ANCHOR MX151D BC MX151D-BC	DEMERS AMBULANCES P/N : D014947
D014971	BATTERIES SPACER MX151D BC	DEMERS AMBULANCES P/N : D014971



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MX151D - GM



• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
D014984	LOWER CONSOLE MX151D BC	DEMERS AMBULANCES P/N : D014984
D014987	EXHAUST SYSTEM UNION MX151D BC	DEMERS AMBULANCES P/N : D014987
D014990	FRONT LEFT COMPARTMENT DIVIDER MX151D BC	DEMERS AMBULANCES P/N : D014990
D014998	WINDSHIELD LIGHT ANTI-GLARE PLATE BC	DEMERS AMBULANCES P/N : D014998
D015035	PINCH POINT DECAL	DEMERS AMBULANCES P/N : D015035
D015036	WIRING DUCT MODIFIED	DEMERS AMBULANCES P/N : D015036
D015037	COVER WIRING DUCT MODIFIED	DEMERS AMBULANCES P/N : D015037
D015038	WHEEL WELL INSULATION 14" X 17 5/8"	DEMERS AMBULANCES P/N : D015038
D015059	ANTENNA 1 DECAL	DEMERS AMBULANCES P/N : D015059
D015060	ANTENNA 2 DECAL	DEMERS AMBULANCES P/N : D015060
D015061	ANTENNA 3 DECAL	DEMERS AMBULANCES P/N : D015061



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• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
D015062	ANTENNA 4 DECAL	DEMERS AMBULANCES P/N : D015062
D015063	ANTENNA 5 DECAL	DEMERS AMBULANCES P/N : D015063
D015064	ANTENNA 6 DECAL	DEMERS AMBULANCES P/N : D015064
D015065	SIREN TEST POINT DECAL	DEMERS AMBULANCES P/N : D015065
D015067	HEAT SHIELD	DEMERS AMBULANCES P/N : D015067
D015069	DECAL "BATTERIES INSIDE COMPARTMENT"	DEMERS AMBULANCES P/N : D015069
D015070	DECAL "NO STEP"	DEMERS AMBULANCES P/N : D015070
D015071	DECAL "THIS SIDE UP"	DEMERS AMBULANCES P/N : D015071
D015072	DECAL "TOWARDS REAR"	DEMERS AMBULANCES P/N : D015072
D015075	2" BUMPERETTE	DEMERS AMBULANCES P/N : D015075
D015099	DECAL "WEAR YOUR SAFETY VEST"	DEMERS AMBULANCES P/N : D015099



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• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
D015102-D	GM SIDE SEAT BASE COVER	DEMERS AMBULANCES P/N : D015102-D
D015103	6.5" DOOR SPRING	DEMERS AMBULANCES P/N : D015103
D101519	DECAL "INVERTER 115V"	DEMERS AMBULANCES P/N : D101519
D175615	INCUBATOR HOOK ANCHOR PLATE	DEMERS AMBULANCES P/N : D175615
D500060	MUD GUARD REINFORCEMENT	DEMERS AMBULANCES P/N : D500060
E103002	1/8" 4'X8' ALU SHEET	METAUX RUSSEL INC P/N : 11195
D500175	DECAL "OXYGEN-OXYGÈNE"	DEMERS AMBULANCES P/N : D500175
E003133-SERVICE	LOWER RETAINER	UNITED GROUP P/N : BM N807248-S100
E003212	BODY NUTS "GM" #8 NYLON	PIECES D'AUTOS ROBITAILLE 1997 INC P/N : 9829
E008264	RUBBER VIBRATION DAMPING SANDWICH 8-32	McMASTER-CARR P/N : 9376K112
E010032	GREY PLASTIC NAIL INSERT	DEMERS AMBULANCES P/N : E010032



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• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
E010051	BUTTON THREADED 1/4-20 X 1"	SPAE NAUR INC P/N : 135-237
E010052	RIM KNOB 5/16-18 1/2"	McMASTER-CARR P/N : 6479K38
E106032	LONCOIN II FLECKS ONYX FLOOR COVERING	LONSEAL, INC. P/N : LONCOIN II FLECKS
E112068	SET PARKING BRAKE DECAL	LETTRATECH 9033-4749 QUEBEC INC P/N : E112068
E112077	SECURITY BELT DECAL	ENSEIGNES FIBRETEC INC. P/N : E112077
E112080	NO SMOKING DECAL	ENSEIGNES FIBRETEC INC. P/N : E112080
E112084	OEM BATTERY DECAL	ENSEIGNES FIBRETEC INC. P/N : E112084
E202008	ROUNDED END RUBBER DOORSTOP	FAUCHER INDUSTRIES P/N : 624-6003
E202015	RUBBER 1/8"X12" DURO 60	PRODUITS DE CAOUTCHOUC A & J P/N : NEOPR 60DU
E202019	SPONGE RUBBER	SPAE NAUR INC P/N : 892-457
E202020	SBR OPEN CELL SPONGE 7/16"X2"	SPAE NAUR INC P/N : 376



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• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
E202028	21" RUBBER STRAP	FAUCHER INDUSTRIES P/N : 774-0029
E202033	RUBBER STRIP 109 HATS-1M	ELASTO PROXY INC. P/N : EC12-050-EMT1
E202036	DOOR RUBBER (S-2570-1)	ELASTO PROXY INC. P/N : EC28-260-EM
E202042	RUBBER STRAP 15"	FAUCHER INDUSTRIES P/N : 774-0011
E202047	RUBBER 1/8" X 1 1/2" X 100'	PRODUITS DE CAOUTCHOUC A & J P/N : E202047
E202048	41" RUBBER STRAP	FAUCHER INDUSTRIES P/N : 774-0068
E203012	MALE PRESSURE KNOB 9531	CAVERHILL LEARMONT/G.S. TOOLS (2003) P/N : E203012
E203032	LARGE TIE WRAP	TRADELCO INC P/N : PLT3S-M0
E203033	MEDIUM TIE WRAP	TRADELCO INC P/N : PLT2S-M0
E203034	SMALL TIE WRAP	TRADELCO INC P/N : PLT1.5I-MO
E204011	DOOR RUBBER GASKET	ELASTO PROXY INC. P/N : EC12-005-EMT1



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• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
E204013	RUBBER GASKET	CLEAN SEAL INC P/N : 2123ST-A
E204055	GASKET SILICONE #8325 TAPED	CLEAN SEAL INC P/N : ZR-8325T
E205003	NON-CLOG AUTOBODY FILLER (COL R FLO) 3 LITRES	VALLIERES PEINTURE D'AUTO P/N : 20535
E205041	2" BLACK HOOK -P- 50 YARD ROLL	APLIX FASTENERS INC P/N : A800R0050H008=P=
E206004	732 CLEAR SEALANT	KINECOR INC P/N : 732 CLAIR
E206006	SIKAFLEX 221 WHITE	AGRO-115 REVETEMENTS INC P/N : 0SF-0221-0590 Blanc
E206009	WHITE SIKAFLEX #221 305ML TUBE	AGRO-115 REVETEMENTS INC P/N : 0SF-0221-0305 Blanc
E206010	BLACK SIKAFLEX #221	AGRO-115 REVETEMENTS INC P/N : 221N
E207002	QUICKEDGE TRIMS	FAUCHER INDUSTRIES P/N : 622-4462
E303004	INTERSTATE SRM-27 BATTERY	INTERSTATE BATTERIES P/N : SRM-27
E303014	DRAIN BTE BATT.AUX.	SPAÉ NAUR INC P/N : 315-548



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• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
E303017	EYELET PERKO	PERKO INC P/N : 1242000CHR
E304004	GM RADIO EXTENSION 08-UP	DEMERS AMBULANCES P/N : E304004
E305046	HARNESS M/C BLK/WHT 72"	TRUCK-LITE CO. INC P/N : 50303
E305055	RELAY 30 AMPS	ROBERT BOSCH P/N : 332019150
E305121	FLAG CLAMP RED	GROTE INDUSTRIES CO. P/N : 84-9145
E305122	PROTECTEUR TERMINAL A BATTERIE ROUGE	GROTE INDUSTRIES CO. P/N : 84-9147
E305123	COUDE DROIT	GROTE INDUSTRIES CO. P/N : 84-9149
E307075	FEMALE CONNECTOR 2 WAY 770069-1	PRODAM P/N : 770069-1
E307118	MATE-N-LOCK MALE TERMINAL 350416-1	PRODAM P/N : 350416-1
E307165	ONT. CONNECTOR CI-804	TRADELCO INC P/N : C500
E307170	ISOLATED TERMINAL	TRADELCO INC P/N : DNF14-110-M



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• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
E307216	BUTT SPLICE AWG 14-16	TRADELCO INC P/N : BSH14-Q
E307373	TERMINAL MALE DNF14/205FIB	TRADELCO INC P/N : DNF14/205FIBM
E307412	CONNECTEUR AMP 12POS. MALE	HDI TECHNOLOGIES P/N : 1-480706-0
E307439	BUTT SPLICE NON INSULATED SIZE 16-14	TRADELCO INC P/N : BS14-M
E308006	DOOR SWITCH	PIECES D'AUTOS ROBITAILLE 1997 INC P/N : 52-620
E308010	DOOR SWITCH WITH STATIONARY OFF POSITION	DOCAP 1985 CORP. P/N : 704-720
E308032	SCREW TERMINAL PRESSURE SWITCH	STEWART WARNER P/N : 76575-4-05
E308157	SWITCH HEATER (O/F)	SYSTEMES PRAN INC. P/N : V1D2-UHNB-AAC00-000-P28
E308168	OIL PRESSURE SWITCH FITTING	PIECES D'AUTOS ROBITAILLE 1997 INC P/N : X124-C
E308888	OIL PRESSURE SWITCH ADAPTATOR	PIECES D'AUTOS ROBITAILLE 1997 INC P/N : 110-CA
E308951	GM 2008 ANTI THEFT MODULE	DEMERS AMBULANCES P/N : E308951



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• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
E310060	ROAD SIDE HADLEY MIRROR	HADLEY PRODUCTS P/N : S1024 / RS-15-U811MFCX
E310061	CURB SIDE HADLEY MIRROR	HADLEY PRODUCTS P/N : S1025 / CS-15-U811MFCX
E311007	ORANGE ELECTRIC PLATE	TRADELCO INC P/N : TP26OR
E311015	DOUBLE ORANGE SWITCH	TRADELCO INC P/N : IG26262
E311044	WHITE ELECTRICAL OUTLET WITH INDICATOR	TRADELCO INC P/N : 1595WL
E311086	PASS & SEYMOUR 110V 15A EXTERIOR INLET	TRADELCO INC P/N : 5278-SS
E311087	COVER FOR PASS & SEYMOUR EXTERIOR INLET	TRADELCO INC P/N : WPG-1
E313029	HEATING THERMOSTAT 120VAC	TRADELCO INC P/N : OVSTB1
E313030	HEATER & A/C THERMOSTAT	TRADELCO INC P/N : 1A10-651
E401113	HOLDER FOR SHARPS CONTAINER 8506Y	ALLIED MEDICAL P/N : 8519C
E402023	GRAB BAR 59 1/2" SAFETY YELLOW	ELCOMA METAL FABRICATING LTD P/N : E402023



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• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
E402041	24" GRAB BAR SAFETY YELLOW WITH OVAL FLANGE	ELCOMA METAL FABRICATING LTD P/N : 01-1524SH06
E403004	MOUNT KIT #175-4	FERNO CANADA E.M.S. INC P/N : 056-1754
E403016	FERNO LONG FLOOR PLATE	FERNO CANADA E.M.S. INC P/N : 090-0266-00
E403026	COT HOLDER FOR 35A	FERNO CANADA E.M.S. INC P/N : 809-6060
E403031	175-S STAINLESS STEEL RAIL / ANTLER	FERNO CANADA E.M.S. INC P/N : 056-7037
E403194	FERNO SPARE ANCHOR PROTECTOR	FERNO CANADA E.M.S. INC P/N : 081-9734
E404069	12" FLOPPY BUCKLE END	AM-SAFE COMMERCIAL PRODUCTS P/N : 80185802
E404071	8.5" CABLE SEAT BELT BUCKLE	AM-SAFE COMMERCIAL PRODUCTS P/N : 10117-02
E404072	SEAT BELT RETRACTOR 52"	AM-SAFE COMMERCIAL PRODUCTS P/N : I-2054-02
E404076	FERNO BCAS BELT FOR OXYGEN CYLINDER	FERNO CANADA E.M.S. INC P/N : 039-0247BC
E404077	NON-RETRACTABLE 90" BELT	AM-SAFE COMMERCIAL PRODUCTS P/N : deviation 90"



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• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
E406045-2	SEAMLESS HEAD SEAT COBALT(DU116)	E.V.S. LTD P/N : 175307
E406095-2	ARMREST LEFT COBALT	E.V.S. LTD P/N : B170CN204
E406096-2	ARMREST RIGHT COBALT	E.V.S. LTD P/N : B170RCN204
E406118	CABINET BASE FOR 1700 SERIES	E.V.S. LTD P/N : REGULAR CABINET BASE
E407003	30 MINUTES FLARE	C.I.L ORION P/N : # 2730
E408111	DIESEL RETURN HOSE 5/8"	PIECES D'AUTOS ROBITAILLE 1997 INC P/N : 93037
E411007	FIRE EXTINGUISHER	DESCHENES & FILS LTEE P/N : WBDLABC5
E502086	TWIN SIDE 3 X 7 STROBE RED /CLEAR	WHELEN ENGINEERING CO P/N : 702000DR
E502138	BC REAR LIGHTBAR	BLUE MAX LIGHTING & EMERGENCY P/N : 465H-6407-0121 Rear
E503016	MARKER LIGHT RED 4" X 1"	GROTE INDUSTRIES CO. P/N : 47092-3
E503017	MARKER LIGHT YELLOW 4" X 1"	GROTE INDUSTRIES CO. P/N : 47093-3



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• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
E503167	BEZEL 3 X 7	WHELEN ENGINEERING CO P/N : 7E CHROME FLANGE
E503200	900 SERIES 8 TO 32 DEG SCENE LIGHT	WHELEN ENGINEERING CO P/N : 90E000ZR
E503298	900 SERIES HALOGEN CLEAR	WHELEN ENGINEERING CO P/N : 90F000CR
E505001	AMBER REFLECTOR	PETERSON MFG CO P/N : B 484 A
E505003	RED REFLECTOR	PETERSON MFG CO P/N : B484R
E506042	BACK UP ALARM 112 DB	FEDERAL SIGNAL CORP P/N : 210335
E509013	LICENSE PLATE LIGHT	TRUCK-LITE CO. INC P/N : 15011
E509016	BACK UP LIGHT	GROTE INDUSTRIES CO. P/N : 62181-3
E509038	LIGHT GASKET 4"	GROTE INDUSTRIES CO. P/N : 91740
E509127	STOP TURN LAMP RED LED 24 DIODES	TRUCK-LITE CO. INC P/N : 4050 R
E510033	POSITION LIGHT CHROME BEZEL	GROTE INDUSTRIES CO. P/N : 43783



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• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
E510037	20" PIGTAIL FOR POSITION LIGHT	GROTE INDUSTRIES CO. P/N : 01-6698-72
E511024	LEFT REAR WINDOW, FIXED, MX151D-BC	INDUSTRIES SPECTAL P/N : K-90108216RF-AB
E511025	RIGHT REAR WINDOW, FIXED, MX151D-BC	INDUSTRIES SPECTAL P/N : K-90117216RF-AB
E511026	LATERAL WINDOW, SLIDING, MX151D-BC	INDUSTRIES SPECTAL P/N : K-90119196RCDAB
E511027	OPTRONICS BRAKE LIGHT	OPTRONICS INTERNATIONAL LLC P/N : STL-69RB
E511028	OPTRONICS BRAKE LIGHT BEZEL	OPTRONICS INTERNATIONAL LLC P/N : A-69CB
E514027	BC LARSEN ANTENNA MOUNT	ORIZON MOBILE P/N : NMOKHFUD
E514028	BC ANTENNA BASE CAP	ORIZON MOBILE P/N : NMOCAPB
E516006	SPEAKER 100 WATT 5-1/4" DIA.	ADD-TRONIQUE INC P/N : LS-552MK (LEGACY)
E601023	DOOR LATCH STRIKER	JIMEXS INC. P/N : JX-10335-16
E601070	REINFORCED BLACK HANDLE 10 3/4"	JIMEXS INC. P/N : 221-911



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• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
E602018	LONG HOOK	FAUCHER INDUSTRIES P/N : 682-1204
E602021	FENDER HOOK	PERKO INC P/N : 1309000CHR
E602030	LATCH M/F	PERKO INC P/N : 1244000CHR
E602099	COAT HANGER	NORMONT INDUSTRIELLE CANADA LTEE P/N : 6210056
E602123	4½ DOOR HOLDERS (CAST)	CAST PRODUCTS INC. P/N : DH0017-1
E602124	3" DOOR HOLDERS (CAST)	CAST PRODUCTS INC. P/N : DH0016
E603005	ANCHOR PLATE	ANCRA INTERNATIONAL LLC P/N : 40000-11/W
E603036	PADEYES	WPG CANADA P/N : 6505
E603052	DOOR HOLDER MALE PART	FAUCHER INDUSTRIES P/N : 771-0151
E603053	DOOR HOLDER FEMALE PART	FAUCHER INDUSTRIES P/N : 771-0112
E603063	NYLON TIE WRAP WITH PUSH MOUNT	TRADELCO INC P/N : PLWP3HTL (PANDUIT)



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• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
E603088	GAS CYLINDER LOCKING PIN	JIMEXS INC. P/N : 299-043/P68-00011
E603100	GAS SPRING 60 LBS	JIMEXS INC. P/N : 299-141
E603110	60 LBS GAS CYLINDER WITH METAL HEAD AND 4" STROKE X 0,9 SEC.	NORMONT INDUSTRIELLE CANADA LTEE P/N : XP7900-1C
E603111	GAS CYLINDRE 40 LBS END METAL 6 " (SLOW MOTION)	NORMONT INDUSTRIELLE CANADA LTEE #N/A
E607076	GM LOOSE WHEEL NUT INDICATOR	PIECES D'AUTOS ROBITAILLE 1997 INC P/N : WLCHC
E608001	LEVER SYSTEM WINCH	BARIL LINCOLN INC P/N : 6C2Z 1A131 AA
E608002	TUBE FOR WINCH	BARIL LINCOLN INC P/N : XC2Z-1A433-AA
E611016	DRY FOOD KEEPER	ALISAN DISTRIBUTION INC P/N : RB-2953-00WHT
E611031	6.5L RACK SACK	CANADIAN TIRE P/N : 42-3100-4
E701005	HEATER 120V / 1500WATTS	TRADELCO INC P/N : OVS1502BL
E701100	«T» SHAPED 3/16" OD CONNECTOR FOR FUEL HOSE 3/16" ID	PIECES D'AUTOS ROBITAILLE 1997 INC P/N : 80633



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• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
E701101	3/16" ID FUEL HOSE	PIECES D'AUTOS ROBITAILLE 1997 INC P/N : 80055
E701109	CATCH-ALL FILTER DRIER	TRANS-F-AIR DIV. FRIGO-REMORQUES INC P/N : C-033
E701111	ESPAR AIR INTAKE ADAPTER	TRANSARTICK P/N : 25-1822-89-00-01
E710040	DRAIN TUBING 1 1/4"	MATCO RAVARY INC P/N : 350354
E710076	GRILLE 769	CARY PRODUCTS P/N : 769
E710148	BAGUE PLAST.875 X 1 1/16 X 29/64 X .125	SPAE NAUR INC P/N : 315-733
E710187	ESPAR EXHAUST OUTLET	TRANSARTICK P/N : 20-1609-80-09-00
E710998	HOSE COUPLING 1 1/2" OD	MATCO RAVARY INC P/N : 3360329
E802004	278 BATTERY TERMINAL PROTECTOR	PIECES D'AUTOS ROBITAILLE 1997 INC P/N : 278
E803006	REFRIGERANT COMPRESSOR OIL R134A	BARIL LINCOLN INC P/N : YN-12D
E803008	SYNT. GREASE	PIECES D'AUTOS ROBITAILLE 1997 INC P/N : 21033



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• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
E804006	CREAM HARDENER	VALLIERES PEINTURE D'AUTO P/N : 101702
E804096	UNDERCOATING CORROSION PROTECTION TECTYL 5164 200 L.	CORROSION CONTROL COATINGS LTD P/N : 5164
E807065-SERVICE	MOUNTING PUCK SPACER	UNITED GROUP P/N : BM F2UZ-1000157
E807066-SERVICE	LOWER MOUNTING PUCK	UNITED GROUP P/N : BM-8C2Z-1000154-A
E807075-SERVICE	UPPER MOUNTING PUCK	UNITED GROUP P/N : BM D5UZ-100155-AA
E807092	MED DENSITY MOUNTING PUCK	DUPONT FORD LTEE P/N : 8C2Z-1000154-B
E807116	GAS TANK ENTRY PROTECTOR	CAST PRODUCTS INC. P/N : FG4202-1-225
E807140	KEY FOB MX151D-BC	GAGNON LEVESQUE INC. P/N : MP-166
E807141	SPRING LEAF KIT GM 3500	SOUDURE ET SUSPENSION ST-BRUNO INC. P/N : 22-1175 HD
E807930	GAS PIPE 1 1/2" INT. DIAMETER	PIECES D'AUTOS ROBITAILLE 1997 INC P/N : TLB150
E900301	JACK DOUBLE PISTON 4 TONS FORD	BARIL LINCOLN INC P/N : 6C3Z-17080BA



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• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
E900302	TIRE IRON 13/16	BARIL LINCOLN INC P/N : F2UZ-17035A
E900304	EXTENSION FOR TIRE JACK	BARIL LINCOLN INC P/N : 4C2Z-17081AA
H012321	DIRECTION LIGHTS HARNESS GM 2008	DEMERS AMBULANCES P/N : H012321
H014139	ROOF HARNESS MX151D	DEMERS AMBULANCES P/N : H014139
H014140	MAIN HARNESS MX151D 2009	DEMERS AMBULANCES P/N : H014140
H014200	HAND BRAKE LIGHT HARNESS	DEMERS AMBULANCES P/N : H014200
H014230	110V OUTLET HARNESS	DEMERS AMBULANCES P/N : H014230
H014231	QUADRUPLE BREAKER HARNESS	DEMERS AMBULANCES P/N : H014231
H014234	BATTERY CABLE HARNESS	DEMERS AMBULANCES P/N : H014234
H014388	COMMUNICATION RADIO HARNESS MX151D-BC	DEMERS AMBULANCES P/N : H014388
K014486	LEFT WALL ISOLATION KIT MX151D BC	DEMERS AMBULANCES P/N : K014486



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• PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
K014487	RIGHT WALL ISOLATION KIT MX151D BC	DEMERS AMBULANCES P/N : K014487
K014488	FRONT WALL INSULATION KIT MX151D-BC	DEMERS AMBULANCES P/N : K014488
K014489	REAR WALL ISOLATION KIT MX151D BC	DEMERS AMBULANCES P/N : K014489
K014490	CEILING INSULATION KIT MX151D-BC	DEMERS AMBULANCES P/N : K014490
N/S-002255	LONG BLACK HANDLE	DEMERS AMBULANCES P/N : N/S-002255
N/S-002264	CAP HANDLE	DEMERS AMBULANCES P/N : N/S-002264
N/S-002288	SMALL FERNO FLOOR PLATE	DEMERS AMBULANCES P/N : N/S-002288
E305111	35A OMRON RELAY	WES-GARDE COMPONENTS GROUP, INC. P/N : G8V-RH-1C7T-R-DC12
E305127	75A TYCO RELAY	WES-GARDE COMPONENTS GROUP, INC. P/N : V23232-A0001-X003
E307444	5A BREAKER	WES-GARDE COMPONENTS GROUP, INC. P/N : 22305-200
E307445	10A BREAKER	WES-GARDE COMPONENTS GROUP, INC. P/N : 22310-200



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- PART 8 : PARTS LIST

DEMERS P/N	DESCRIPTION	SUPPLIER
E307446	15A BREAKER	WES-GARDE COMPONENTS GROUP, INC. P/N : 22315-200
E307447	20A BREAKER	WES-GARDE COMPONENTS GROUP, INC. P/N : 22320-200
E307448	6A DIODE	WES-GARDE COMPONENTS GROUP, INC. P/N : 22903-6



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• PART 9 : COLOUR AND FINISH SAMPLES

<p>Product : Vinyl</p> <p>Colour : Blue cobalt</p> <p>Demers P/N : E107082</p> <p>Supplier : Morbern</p> <p>Supplier P/N : DU116</p> <p>Application : Bolsters, cushions</p>	
<p>Product : Vinyl</p> <p>Colour : Yellow</p> <p>Demers P/N : E107097</p> <p>Supplier : Morbern</p> <p>Supplier P/N : M43 SUN YELLOW</p> <p>Application : Bolsters</p>	
<p>Product : Floor covering</p> <p>Colour : Onyx</p> <p>Demers P/N : E106032</p> <p>Supplier : Lonseal Flooring</p> <p>Supplier P/N : LONCOIN II FLECKS</p> <p>Application : Floor covering</p>	
<p>Product : ABS</p> <p>Colour : Light grey</p> <p>Demers P/N : Various</p> <p>Supplier : Spartech Plastiques</p> <p>Supplier P/N : Various</p> <p>Application : Various trims and access traps</p>	



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• PART 9 : COLOUR AND FINISH SAMPLES

<p>Product : Polycarbonate</p> <p>Colour : 3/16" tinted</p> <p>Demers P/N : E108005</p> <p>Supplier : Placeteco Inc.</p> <p>Supplier P/N : N/A</p> <p>Application : Sliding windows, oxygen tank window</p>	
<p>Product : Interior insulation</p> <p>Colour : 1" polyisocyanurate</p> <p>Demers P/N : E105013</p> <p>Supplier : Dispro Inc.</p> <p>Supplier P/N : 37148</p> <p>Application : Insulation</p>	
<p>Product : Gelcoat</p> <p>Colour : White gelcoat</p> <p>Demers P/N : N/A</p> <p>Supplier : Progress Plastiques</p> <p>Supplier P/N : 944X4051</p> <p>Application : Interior medical cabinetry</p>	



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• PART 9 : COLOUR AND FINISH SAMPLES

Product : Interior paint Colour : White Demers P/N : N/A Supplier : Protech Chemicals Supplier P/N : HS212W52 Application : Ceiling panels	
Product : Interior paint Colour : Light grey Demers P/N : N/A Supplier : Protech Chemicals Supplier P/N : PX512AK17 Application : Interior walls, partition, interior door panels	
Product : Interior paint Colour : Dark grey Demers P/N : N/A Supplier : Protech Chemicals Supplier P/N : PX512AK18 Application : Squad bench, lower cabinet panels, equipment console	
Product : Interior paint Colour : Yellow Demers P/N : N/A Supplier : Sixpro Supplier P/N : PS212Y13 Application : Oxygen ramp	

• PART 9 : COLOUR AND FINISH SAMPLES

<p>Product : Flooring</p> <p>Colour : N/A</p> <p>Demers P/N : E104042</p> <p>Supplier : Goodfellow Inc.</p> <p>Supplier P/N : G-74265</p> <p>Application : Flooring</p>	
<p>Product : Aluminium sheet</p> <p>Colour : N/A</p> <p>Demers P/N : Various</p> <p>Supplier : Various</p> <p>Supplier P/N : Various</p> <p>Application : Various components, walls, floor, ceiling</p>	
<p>Product : Extrusion structure</p> <p>Colour : Anodized</p> <p>Demers P/N : E104004</p> <p>Supplier : Indalex, Div. Caradon Ltee</p> <p>Supplier P/N : MH-38447</p> <p>Application : Cabinet structures</p>	
<p>Product : Aluminium beam (6061-T6)</p> <p>Colour : N/A</p> <p>Demers P/N : Various</p> <p>Supplier : Various</p> <p>Supplier P/N : Various</p> <p>Application : Module beams</p>	







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• PART 9 : COLOUR AND FINISH SAMPLES

<p>Product : Reflective decals</p> <p>Colour : Red</p> <p>Demers P/N : N/A</p> <p>Supplier : Multilettrage Inc.</p> <p>Supplier P/N : N/A</p> <p>Application : Exterior decals</p>	
<p>Product : Reflective decals</p> <p>Colour : Blue</p> <p>Demers P/N : N/A</p> <p>Supplier : Multilettrage Inc.</p> <p>Supplier P/N : N/A</p> <p>Application : Exterior decals</p>	
<p>Product : Reflective decals</p> <p>Colour : White</p> <p>Demers P/N : N/A</p> <p>Supplier : Multilettrage Inc.</p> <p>Supplier P/N : N/A</p> <p>Application : Exterior decals</p>	
<p>Product : Reflective decals</p> <p>Colour : Grey</p> <p>Demers P/N : N/A</p> <p>Supplier : Multilettrage Inc.</p> <p>Supplier P/N : N/A</p> <p>Application : Exterior decals</p>	



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• PART 9 : COLOUR AND FINISH SAMPLES

<p>Product : Non-reflective decals</p> <p>Colour : Red</p> <p>Demers P/N : N/A</p> <p>Supplier : Multilettrage Inc.</p> <p>Supplier P/N : N/A</p> <p>Application : Exterior decals</p>	
<p>Product : Non-reflective decals</p> <p>Colour : Blue</p> <p>Demers P/N : N/A</p> <p>Supplier : Multilettrage Inc.</p> <p>Supplier P/N : N/A</p> <p>Application : Exterior decals</p>	
<p>Product : Non-reflective decals</p> <p>Colour : White</p> <p>Demers P/N : N/A</p> <p>Supplier : Multilettrage Inc.</p> <p>Supplier P/N : N/A</p> <p>Application : Exterior decals</p>	
<p>Product : Non-reflective decals</p> <p>Colour : Grey</p> <p>Demers P/N : N/A</p> <p>Supplier : Multilettrage Inc.</p> <p>Supplier P/N : N/A</p> <p>Application : Exterior decals</p>	




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• PART 10 : CERTIFICATIONS - COT RETENTION

COT RETENTION (E2)

 DEMERS AMBULANCES 28, Richelieu, Beloeil QC (Canada) J3G 4N5	<u>STRETCHER RETENTION TESTS</u> (BCAS – E2)
---	--

Standard(s): Ambulance Performance Test Criteria, Appendix E British Columbia Ambulance Service

Test date: 2009-06-25

Test Location: Demers Ambulances Plant

Information of the parts and equipments tested

Part number	Description	Quantity
B800620	Module	1
E403004	Mount kit #175-4	1
E403026	Cot Holder For 35A	1
E403031	175-S Stainless Steel Rail / Antler	1
A000056	Anchorage Plate	2
D500955	Spacer	4
E003082	Bolt 6P 3/8-16 x 2 ZP HK	8



Test method: A cot jig was used to apply the load of 2500lbs. as rapidly as possible in vertical upward, Longitudinal and Lateral directions with a hydraulic cylinder.

Measuring devices used

Description	Brand	Model	Serial number	Demers number	Calibration due date
Data screen	Was	M2000A-SC	S1610	B-004	March 2010
Load cell	STS	5K15	141804	B-004	March 2010
Cot dummy	-	-	-	AE-001	N/A

Results

Cot position	Vertical upward	Longitudinal	Lateral	Goal	Results
Centre (lbs.)	2582	2590	2646	2500	Pass
Time to reach goal (sec.)	3.5	2.2	1.05	< 5	Pass

After comparison and verification we can ensure that the MX151D meets or exceeds the required performance standard.

NOTE : The approved and digitally signed test certificats are in the Technical Manual CD-Rom.




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• PART 10 : CERTIFICATIONS - STATIC ROOF LOAD TEST

STATIC ROOF LOAD TEST (E3)

 DEMERS AMBULANCES 28, Richelieu, Beloeil QC (Canada) J3G 4N5	STATIC LOAD TESTS FOR BODYSTRUCTURES (BCAS – E3)
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Standard(s): Ambulance Performance Test Criteria, Appendix E British Columbia Ambulance Service

Test date: 2009-06-23 **Test Location:** Demers Ambulances Plant

Information of the parts and equipments tested

Part number	Description	Serial number
B800620	Module	DOP-620-2009-214
A014396	Door A2 (left back door)	DOP-620-2009-214
A014937	Door A3 (right back door)	DOP-620-2009-214
A014392	Door D1 (right side door)	DOP-620-2009-214



Test method: With all doors fully closed, we applied a load of approximately 500 lbs. (225 kg.), then 50% and 100% of the 1.5 times the load of the vehicle curb weight establishes at 10600 lbs., not more than .5 inches (13mm). per second in respect of longitudinal and lateral centrelines. We have taken readings of all four corners during the test. We opened and closed the exit doors with the maximum load apply.

Measuring devices used

Description	Brand	Model	Serial number	Demers number	Calibration due date
Hydraulic gauge	Dwyer	DPG-100	N456	B-009	March 2013

Results

Description	Load (Goal)	Load applied	Readings				Doors (A2, A3 & D1)
			Right front corner	Left front corner	Left rear corner	Right rear corner	
Initial force	500	570	90.625	90.500	90.500	90.375	ok
50% load	7 950	10 682	90.125	90.125	90.375	90.125	ok
100% load	15 900	21 158	89.375	89.375	90.125	89.875	ok
0% load	0	0	89.750	89.250	90.500	89.875	ok
Permanent deformation			0.875	1.25	0	0.5	

After comparison and verification we can ensure that the MX151D meets or exceeds the required performance standard.

NOTE : The approved and digitally signed test certificats are in the Technical Manual CD-Rom.




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• PART 10 : CERTIFICATIONS - ENVIRONMENTAL CLIMATIC SYSTEMS

ENVIRONMENTAL CLIMATIC SYSTEMS (E4)

 DEMERS AMBULANCES 28, Richelieu, Beloeil QC (Canada) J3G 4N5	<u>ENVIRONMENTAL CLIMATIC CONTROL</u> <u>SYSTEM (HEATER AND A/C SYSTEM)</u> (BCAS – E4)
---	---

Standard(s): Ambulance Performance Test Criteria, Appendix E British Columbia Ambulance Service

Test date: 2009-06-22

Test Location: PMG Technologies and Demers Ambulances Plant

Information of the vehicle tested

GM
G33503 CUTAWAY
2009
MX151D-GM-DIESEL
G099C-568
1GBJG316091175574
Duramax 6.6 liters V8 Diesel



Information of the parts or equipments tested

Manufacturer	Description	Supplier Number	Demers Number	Quantity
Mobile Climate Control	Heater Unit	12-1203	E701008	1
Espar	Heater Unit	D4	E701098	1
Mobile Climate Control	A/C Unit	13-1153	E701105	1
Mobile Climate Control	Exhaust Fan	15-0311	E605003	2

Test method: HVAC (Heating and Air conditioning system)

The vehicle has been cold and heat soaked for a sufficient period so as to obtain a temperature of -30°C or + 35°C / -2.5°C in both compartments, measured by 9 probes in module and 3 in the cabin.

Ventilating system:

With all doors and cabinets closed, Volumetric flow of air out from the outlets of exhaust fans has been calculated by measuring the velocity of air out of vents and multiplying by velocity and the size of outlets. The time required for changing the volume of air in the ambulance module was calculated from the volume flow and air volume of the module ambulance.

Measuring devices used

Manufacturer	Description	Model	Serial number	Calibration due date
Fluke	Data Logging System	2686A	9628004	2010-03-16
Kestrel	Anemometer	1000	1704349	2010-03

Results (HEATER)

Location	Position	Start time (°C)	10 minutes (°C)	20 minutes (°C)	30 minutes (°C)
Driver compartment	Top mid.	-28.96	23.74	30.26	32.02
	Mid. mid.	-29.18	27.6	33.5	36.93
	Bottom mid.	-28.79	22.73	29.31	31.5
Patient compartment	Top front	-28.44	11.26	18.48	23.21
	Mid. Front	-28.92	10.42	17.94	23.7
	Bottom front	-28.52	9.64	16.79	22.75
	Top mid.	-29.33	11.97	18.9	24.46
	Mid. mid.	-29.28	11.87	18.97	24.7
	Bottom mid.	-27.9	11.71	19.44	24.43
	Top back	-29.94	11.98	19.2	24.61
	Mid. Back	-30.21	12.03	19.52	24.76
	Bottom back	-30.39	12.09	19.02	24.98
Room	Ambient temp.	-31.74	-31.46	-33.4	-29.52




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• PART 10 : CERTIFICATIONS - ENVIRONMENTAL CLIMATIC SYSTEMS

ENVIRONMENTAL CLIMATIC SYSTEMS (E4)

 DEMERS AMBULANCES 28, Richelieu, Beloeil QC (Canada) J3G 4N5	ENVIRONMENTAL CLIMATIC CONTROL SYSTEM (HEATER AND A/C SYSTEM) (BCAS – E4)
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Results (A/C)

Location	Position	Start time (°C)	10 minutes (°C)	20 minutes (°C)	30 minutes (°C)
Driver compartment	Top mid.	33.86	23.12	22.26	22.11
	Mid. mid.	33.43	22.84	21.79	22.13
	Bottom mid.	33.77	22.27	21.4	21.99
Patient compartment	Top front	34.05	25.32	23.87	23.11
	Mid. Front	34.3	25.83	24.4	23.65
	Bottom front	33.76	25.67	24.19	23.51
	Top mid.	34.08	25.16	23.73	22.96
	Mid. mid.	33.99	25.18	23.76	22.99
	Bottom mid.	33.46	25.71	24.27	23.58
	Top back	34.11	26.15	24.6	23.76
	Mid. Back	33.82	25.31	23.8	23.04
	Bottom back	33.88	25.14	23.6	22.85
Room	Ambient temp.	37.86	37.98	38.16	37.57

Air conditioner gas pressure:

Start of test	32 PSI Suction	255 PSI Discharge
End of test	32 PSI Suction	245 PSI Discharge

Max OEM coolant pressures: High side: 3.53 MPA (512 PSI)
 Low side 1.67 MPA (242 PSI)

Ventilating system:

Test Method

Measurement of static air pressure and fan performance of ventilation system.

Interior volume of the module

$$67 \text{ in.} \times 67 \text{ in.} \times 136 \text{ in.} = 610504 \text{ po.}^3 / 1728 = 353 \text{ ft.}^3$$

Ventilation fan performance

Individual fan performance (air flow rate):	64 CFM
Total air flow rate (2 fans):	128 CFM

Goal

Complete change of ambient air within vehicle every three (3) minutes.

Results

$$\text{Interior volume of the module (353 ft.}^3\text{)} \\ 353 \text{ ft.}^3 / 128 \text{ CFM} = 2.76 \text{ minutes}$$


The complete change of ambient air is evaluated at every 2.76 minutes.

After comparison and verification we can ensure that the MX151D meets or exceeds the required performance standard.

NOTE : The approved and digitally signed test certificats are in the Technical Manual CD-Rom.

• PART 10 : CERTIFICATIONS - OXYGEN TANK RETENTION

OXYGEN TANK RETENTION (E5)

 DEMERS AMBULANCES 28, Richelieu, Beloeil QC (Canada) J3G 4N5	<u>OXYGEN TANKS RETENTION SYSTEMS</u> (BCAS – E5)
---	---

Standard(s): Ambulance Performance Test Criteria, Appendix E British Columbia Ambulance Service

Test date: 2009-07-10 --- 2009-08-05

Test Location: Demers Ambulances Plant

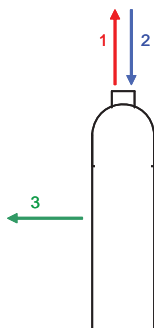
Information of the parts and equipments tested

Pressure vessel	Location	Description	Part number	Quantity
"M" Cylinder	- In storage compartment for oxygen accessible by the outside door (D1)	OXYGEN CYLINDER COMPARTMENT ANCHORAGE MX151D BC	D014506	1
		OXYGEN CYLINDER WALL MX151D BC	A014502	1
		TAPPING SCREW #8 X 1/2"	E008157	1
		2" POLYPRO WEBBING WITH CAM BUCKLE (7" LENGTH)	A014511	4
		2" POLYPRO WEBBING (26.5" LENGTH)	A014512	3
		2" POLYPRO WEBBING (90" LENGTH)	A014744	1
		HEX BOLT 3/8-16 X 1 1/4 ZC/FT GR5	E003084	7
		HEX BOLT 3/8-16 X 3/4 ZC/FT GR5	E003047	1
		HEX NUT 3/8"-16	E003107	1
		TRUCK ASSEMBLY - OXYGEN RAMP	A014713	1
"E" bracket	- On the rear door A2; - On the front partition	PORTABLE O2 BRACKET	A102521	3
		CYLINDER BELT	E008341	3
		TAPPING SCREW #14 X 1 1/4"	E008174	18
Extinguisher 5 lbs inside the floor console	- Between the two seats in the front cab.	Screw 14 x 1 TR Phil ZP	E008170	2
		Cab centre extinguisher box	A010882	1
		Screw TAR B PAN PHI 14 x 11/2	E008097	4
		Hex bolt 1/4"-20 x 1 3/4"	E003035	2
		Flat washer 1/4" x 11/16" SS	E007041	6
		Washer 1/4" x 1 1/4"	E007039	2
		Nylon nut 1/4"-20	E003116	2

Test method: We used a cylinder dummy size as necessary, depending on tank holder dimension, and apply the force equal of 25 times of fully loaded tank(s) plus 10 times the weight of the tank holder. We applied the forces in longitudinal centreline, perpendicular centreline plus, for "M" cylinder only, on vertical upward centreline directions with a hydraulic cylinder.


Here is a schematic of the way we applied the loads:

- 1 Vertical upward
- 2 Vertical downward
- 3 Perpendicular



• PART 10 : CERTIFICATIONS - OXYGEN TANK RETENTION

OXYGEN TANK RETENTION (E5)

 DEMERS AMBULANCES 28, Richelieu, Beloeil QC (Canada) J3G 4N5	<u>OXYGEN TANKS RETENTION SYSTEMS</u> (BCAS – E5)
---	---



Measuring devices used

Description	Brand	Model	Serial number	Demers number	Calibration due date
Load cell 20K	Lebow	3187	2291	B-002	March 2010
Load cell 5K	STS	5K15	141804	B-004	March 2010

Results

Description	Oxygen Tank holder for "M" cylinder	Oxygen tank holder for "E" bracket	Oxygen tank holder for "E" bracket	Extinguisher box (5 lbs.)
Demers part number	See table in section 3.	A102521	A102521	A010882
Location	In storage compartment for oxygen	- On the front partition	-On the rear door A2	-Between seats
Weight of cylinder (lbs.)	121	17.4	17.4	9
X 25 times (lbs.)	3025	435	435	225
Weight of the holder (lbs.)	15	13	13	17.3
X 10 times (lbs.)	150	130	130	173
Final load to be tested (lbs.)	3175	565	565	398
Load applied in the direction 1	3240	612	634	470
Load applied in the direction 2	N/A	858	912	600
Load applied in the direction 3	3258	742	764	652
Results	Pass	Pass	Pass	Pass

After comparison and verification we can ensure that the MX151D meets or exceeds the required performance standard.

NOTE : The approved and digitally signed test certificats are in the Technical Manual CD-Rom.




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• PART 10 : CERTIFICATIONS - INTERIOR SOUND

INTERIOR SOUND (E6)

 DEMERS AMBULANCES 28, Richelieu, Beloeil QC (Canada) J3G 4N5	<u>INTERIOR SOUND LEVEL</u> (BCAS – E6)
---	---

Standard(s): Ambulance Performance Test Criteria, Appendix E British Columbia Ambulance Service

Test date: 2009-09-28

Test Location: Demers Ambulances Plant

Information of the vehicle tested

GM
 G33503 CUTAWAY
 2009
 MX151D-GM-DIESEL
 G099C-568
 1GBJG316091175574
 Duramax 6.6 liters V8 Diesel



Information of the parts or equipments tested

Manufacturer	Description	Supplier Number	Demers Number	Quantity
Carson	Siren	SA-500	E506073	1
Whelen	Speaker	SA-315P	E515035	2
Mobile Climate Control	Heater Unit	12-1203	E701008	1
Espar	Heater Unit	D4	E701098	1
Mobile Climate Control	A/C Unit	13-1153	E701105	1

Test method:

In accordance with the E6 criteria, loudest mode of the siren was used for this test, all the warning lights were turned on, and air conditioner/heater blower switch in patient and/or driver compartments was placed at the highest speed and the engine on neutral position run to 50-60% of the RPM. The tests were performed near Demers Ambulance office and in the weather conditions specified by the standard.

Measuring devices used

Description	Brand	Model	Serial number	Demers Number	Calibration due date
Sound Meter	REED	SL-4022	R147239	SO-003	June 2010

We used a sound level meter that meets the OH&S requirements (IEC 651) of a type 1 meter operating on the A-weighting network with a slow meter response.

Results

Tested with Carson siren in the loudest mode (Wail) and heater fan at high				
Test	#1	#2	Goal	Result
Patient compartment	79.2 db *	79.2 db *	Max. 80 db	Pass
Driver compartment	83.2 db *	82.6 db *	Max. 84 db	Pass
Driver compartment with windows open	87.2 db *	87.4 db *	Max. 89 db	Pass

After comparison and verification we can ensure that the MX151D meets or exceeds the required performance standard.

NOTE : The approved and digitally signed test certificates are in the Technical Manual CD-Rom.




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• PART 10 : CERTIFICATIONS - WEIGHT DISTRIBUTION

WEIGHT DISTRIBUTION (E7)

 DEMERS AMBULANCES 28, Richelieu, Beloeil QC (Canada) J3G 4N5	<u>VEHICLE WEIGHT DISTRIBUTION</u> (BCAS – E7)
---	--

Standard(s): Ambulance Performance Test Criteria, Appendix E British Columbia Ambulance Service

Test date: 2009-10-05

Test Location: Demers Ambulances Plant

Information of the vehicle tested

GM
 G33503 CUTAWAY
 2009
 MX151D-GM-DIESEL
 G099C-560
 1GBJG316591174520
 Duramax 6.6 liters V8 Diesel



Test method:

The vehicle should be 30% - 50% of the weight on the front suspension, and there should not be more than a 5% difference right to left. We use scales under each wheels with carrying its maximum capacity of fuel, oil, coolant and including the weight of all the equipments that the vehicle is sold with. The minimum payload requires is 1098 kg (2,420 lbs)

Measuring devices

Description	Brand	Model	Serial Number	Demers Number	Calibration due date
Pad scale	Rice Lake	920 I	1514300049	B-011	July 2010

Results

- (1) Gross Vehicle Weight Rating 5579 kg
- (2) Chassis Curb Weight Distribution:
 - (a) Chassis Curb Weight 1773 kg
 - (b) Front Axle
 - Gross Axle Weight Rating 2087 kg
 - Chassis Curb Axle Weight 1366 kg
 - Chassis Curb Left Side Wt. 683 kg
 - Chassis Curb Right Side Wt. 638 kg
 - (c) Rear Axle
 - Gross Axle Weight Rating 3901 kg
 - Chassis Curb Axle Weight 737 kg
 - Chassis Curb Left Side Wt. 368 kg
 - Chassis Curb Right Side Wt. 368 kg
- (3) Converted Curb Weight Distribution:
 - (a) Front Axle
 - Converted Curb Axle Weight 1775 kg
 - Converted Curb Left Side Wt 930 kg
 - Converted Curb Right Side Wt 845 kg
 - (b) Rear Axle
 - Converted Curb Axle Weight 2388 kg
 - Converted Curb Left Side Wt 1205 kg
 - Converted Curb Right Side Wt 1183 kg
 - (c) Converted Curb Weight 4160 kg
 - (d) Payload (GVWR - Converted Curb Wt.) 1416 kg

Calculations

Front/Rear weight distribution calculated as per paragraph 7.5
 Percent weight on front axle = **42.6% (PASS)**

Requirement: Must be between 30% and 50%.

Front axle left/right weight distribution per paragraph 7.5
 Percent difference side to side = **4.79% (PASS)**

Requirement: Must be 5% or less

Rear axle left/right weight distribution per paragraph 7.5
 Percent difference side to side = **.9 % (PASS)**

Requirement: Must be 5% or less

GVWR: 5579 Kg.

Vehicle Curb Weight: 4160 Kg.

Total Payload: **1416 Kg. (PASS)**

Requirement: Minimum 1098 Kg.

After comparison and verification we can ensure that the MX151D meets or exceeds the required performance standard.

Supervise by: Richard Potvin Demers Ambulances

NOTE : The approved and digitally signed test certificats are in the Technical Manual CD-Rom.




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• PART 10 : CERTIFICATIONS - CENTER OF GRAVITY AND STABILITY FACTOR

CENTER OF GRAVITY AND STABILITY FACTOR (E8 & E9)

 DEMERS AMBULANCES 28, Richelieu, Beloeil QC (Canada) J3G 4N5	<u>CENTRE OF GRAVITY and SSF</u> (BCAS – E8,E9)
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Standard(s): Ambulance Performance Test Criteria, Appendix E British Columbia Ambulance Service

Test date: 2009-10-05

Test Location: Demers Ambulances Plant

Information of the vehicle tested

GM
G33503 CUTAWAY
2009
MX151D-GM-DIESEL
G099C-560
1GBJG316591174520
Duramax 6.6 liters V8 Diesel



Test method

After weighted the entire complete ambulance we raised the rear of the ambulance (10 inches) and we calculated the new repartition of the weight and find the center of gravity by trigonometry.

Measuring devices

Description	Brand	Model	Serial Number	Demers Number	Calibration due date
Pad scale	Rice Lake	920 I	1514300049	B-011	July 2010

Results

In accordance to the incomplete vehicle manufactured manual, the center of gravity must be inside shaded area as follow dimensions:

- A) 119 cm from C and 122 cm from the ground
- B) 289 cm from C and 122 cm from the ground
- C) Front axle
- D) 269 cm from C and 30 cm from the ground
- E) 99 cm from C and 30 cm from the ground

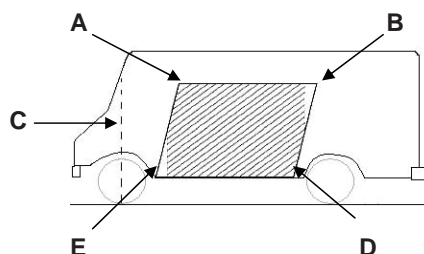
Centre of gravity

From the line C: **226 cm**

From the ground: **94.5 cm**
(max. allow by BC = 119,5 cm)

Stability Factor (SSF:Static Stability Factor)

$$SSF = (track\ width / 2(\text{center-of-gravity})) = (189,8\ cm) / 2 * (94,5\ cm) = 1,00$$



After comparison and verification we can ensure that the MX151D meets or exceeds the required performance standard.

NOTE : The approved and digitally signed test certificats are in the Technical Manual CD-Rom.




TECHNICAL MANUAL

MX151D - GM



• PART 10 : CERTIFICATIONS - ELECTRO MAGNETIC RADIATION

ELECTRO MAGNETIC RADIATION (E10)

 DEMERS AMBULANCES <small>28, Richelieu, Beloeil QC (Canada) J3G 4N5</small>	<u>ELECTRO MAGNETIC RADIATION</u> (BCAS – E10)
--	--

Standard(s): Ambulance Performance Test Criteria, Appendix E British Columbia Ambulance Service

Test date: 2009-09-30

Test Location: Demers Ambulances Plant

Information of the vehicle tested

GM
G33503 CUTAWAY
2009
MX151D-GM-DIESEL
G099C-568
1GBJG316091175574
Duramax 6.6 liters V8 Diesel



Test method

The test of the electromagnetic radiation has been done in accordance with the article E10 of Ambulance Performance Test Criteria, Appendix E British Columbia Ambulance Service, by Metro-Com external contractor.

Measuring devices

Monitor R2590 259LDS0005 was used for this purpose. This equipment has been calibrated in april 24 2009.

Results

The tests were conducted in the following frequency ranges 138-174 MHz, 406 – 420 MHz and 800 - 900 MHz and no interference has been detected.

After comparison and verification we can ensure that the MX151D meets or exceeds the required performance standard.

NOTE : The approved and digitally signed test certificats are in the Technical Manual CD-Rom.




TECHNICAL MANUAL

MX151D - GM



• PART 10 : CERTIFICATIONS - ANTENNA SYSTEM

ANTENNA SYSTEM (E11)

 DEMERS AMBULANCES <small>28, Richelieu, Beloeil QC (Canada) J3G 4N5</small>	<u>ANTENNA SYSTEM</u> (BCAS – E11)
--	--

Standard(s): Ambulance Performance Test Criteria, Appendix E British Columbia Ambulance Service

Test date: 2009-10-30

Test Location: Demers Ambulances Plant

Information of the vehicle tested

GM
G33503 CUTAWAY
2009
MX151D-GM-DIESEL
G099C-568
1GBJG316091175574
Duramax 6.6 liters V8 Diesel



Test method

The test was conducted in accordance with Ambulance Performance Test Criteria, Appendix E British Columbia Ambulance Service article E11.

Measuring devices

Description	Brand	Model	Serial number	Demers Number	Calibration due date
Multi-Meter	REED	ST-333	8041795	MU-007	November 2009

Results

The cables have been tested to ensure that the continuity of the conductors of the cables is good and no short has been detected with the ground.

The antenna ground plane has been tested and is properly grounded.


The Antenna cables system, when installed, are verified and tested on each vehicle as per requirements by final inspection department.

After comparison and verification we can ensure that the MX151D meets or exceeds the required performance standard.

NOTE : The approved and digitally signed test certificats are in the Technical Manual CD-Rom.

• PART 10 : CERTIFICATIONS - INTERIOR LIGHT TEST

INTERIOR LIGHT TEST (E12)

 DEMERS AMBULANCES 28, Richelieu, Beloeil QC (Canada) J3G 4N5	INTERIOR LIGHTING (BCAS – E12)
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Standard(s): Ambulance Performance Test Criteria, Appendix E British Columbia Ambulance Service

Test date: 2009-10-01

Test Location: Demers Ambulances Plant

Information of the parts and equipments tested

Description	Supplier part number	Demers part number	Qty
High intensity neon light 24w/2	A010234	A010234	2
Lens	D004809	D004809	2
Weldon Incandescent light # 1157	8040-0520-8	E503372	8



Test method

A cot was installed with a flat non-reflective surface on top of it. We divided the surface into 48 squares of 15cm. The Patient compartment ceiling Lights were set at the "high" setting. The windows were blocked to stop any outside ambient light to influence the readings. Readings were recorded from the centre of each square on top of the cot and along the centerline of the floor. Voltage reading was taken on the conversion battery through out the test.

Measuring devices used

Description	Brand	Model	Serial number	Demers Number	Calibration due date
Light meter	REED	LX-1102	Q280063 / PROBE Q280064	LU-002	November 2009
Clamp meter	REED	ST-333	8041795	MU-007	November 2009

Results

FLOOR											
Rear	304	339	414	422	408	373	378	321	Front		
COT											
Rear	484	520	542	637	666	679	636	536	547	606	568
	494	507	609	698	686	666	632	595	635	624	568
	386	459	543	595	567	578	560	562	580	539	489
	350	418	497	509	512	528	519	517	512	489	464
Front											
Main cot				Floor				Voltage			
Total of readings				48	Total of readings				48	13.6 V	
Lowest reading (lux)				350	Lowest reading (lux)				304		
Highest reading (lux)				698	Highest reading (lux)				422		
Number of reading under 376 lux				1	Number of reading under 160 lux				0		
Number of reading over 376 lux				47	Number of reading over 160 lux				8		
Total %				98	Total %				100		

After comparison and verification we can ensure that the MX151D meets or exceeds the required performance standard.

NOTE : The approved and digitally signed test certificats are in the Technical Manual CD-Rom.




TECHNICAL MANUAL

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• PART 10 : CERTIFICATIONS - OXYGEN SYSTEM PRESSURE TEST

OXYGEN SYSTEM PRESSURE TEST (E13)

 DEMERS AMBULANCES <small>28, Richelieu, Beloeil QC (Canada) J3G 4N5</small>	<u>OXYGEN SYSTEM</u> (BCAS – E13)
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Standard(s): Ambulance Performance Test Criteria, Appendix E British Columbia Ambulance Service

Test date: 2009-10-13

Test Location: Demers Ambulances Plant

Information of the vehicle tested

GM
G33503 CUTAWAY
2009
MX151D-GM-DIESEL
G099C-568
1GBJG316091175574
Duramax 6.6 liters V8 Diesel



Test method

The test of Oxygen System has been done in accordance with the article E13 of Ambulance Performance Test Criteria, Appendix E British Columbia Ambulance Service.

Measuring devices

Description	Brand	Model	Serial number	Demers Number	Calibration due date
Oxygen regulator	WESTERN	RS-4-9	1203	MA-005	August 2010

Results

After 30 mins. at 150 lbs. no leak was detected on the Oxygen System.

The oxygen systems pressure are verified and tested on each vehicle as per requirements by final inspection department. A tag and a copy of results are delivered with unit.

After comparison and verification we can ensure that the MX151D meets or exceeds the required performance standard.

NOTE : The approved and digitally signed test certificats are in the Technical Manual CD-Rom.




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MX151D - GM



• PART 10 : CERTIFICATIONS - SUCTION ASPIRATION

SUCTION ASPIRATION (E14)

 DEMERS AMBULANCES <small>28, Richelieu, Beloeil QC (Canada) J3G 4N5</small>	<u>SUCTION ASPIRATION SYSTEM</u> <i>(BCAS – E14)</i>
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Standard(s): Ambulance Performance Test Criteria, Appendix E British Columbia Ambulance Service

Test date: 2009-10-13

Test Location: Demers Ambulances Plant

Information of the vehicle tested

GM
G33503 CUTAWAY
2009
MX151D-GM-DIESEL
G099C-568
1GBJG316091175574
Duramax 6.6 liters V8 Diesel



Test method

The test of Suction Aspiration System has been done in accordance with the article E14 of Ambulance Performance Test Criteria, Appendix E British Columbia Ambulance Service.

Results

The Suction unit provided a free airflow of at least 30 litres per minute, but not more than 38 Lpm . It achieved a vacuum of at least 40 kPa (300 mm Hg) within four seconds after than the suction tube is closed.

The Suction Aspiration Systems are verified and tested on each vehicle as per requirements by final inspection department. A tag and a copy of results are delivered with unit.

After comparison and verification we can ensure that the MX151D meets or exceeds the required performance standard.

NOTE : The approved and digitally signed test certificats are in the Technical Manual CD-Rom.




TECHNICAL MANUAL

MX151D - GM



• PART 10 : CERTIFICATIONS - ROAD TEST

ROAD TEST (E15)

 DEMERS AMBULANCES <small>28, Richelieu, Beloeil QC (Canada) J3G 4N5</small>	<u>ROAD TEST</u> (BCAS – E15)
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Standard(s): Ambulance Performance Test Criteria, Appendix E British Columbia Ambulance Service

Test date: 2009-10-13

Test Location: Demers Ambulances Plant

Information of the vehicle tested

GM
G33503 CUTAWAY
2009
MX151D-GM-DIESEL
G099C-568
1GBJG316091175574
Duramax 6.6 liters V8 Diesel



Test method

The Stationary and Road Test has been done in accordance with the article E15 of Ambulance Performance Test Criteria, Appendix E British Columbia Ambulance Service.

Results

A Stationary Test has been done to the ambulance for a period of three hours at high idle engine setting. During the test electrical system has been loaded to the greatest possible load and the air conditioning and heater was verified for a period of one hour and a half on each system.

A Road Test of 315 km. was done on 2009-09-29 and 2009-10-01 in the surrounding of Demers Ambulances plant over varying road surfaces, to verify there are no squeaks, rattles or vibration. Components are checked to verify they are operational. Deficiencies are noted and corrected on an inspection plan report.

Starting mileage: 102 km
Ending mileage: 417 km
Total: 315 km

The Run-in and Road Test are performed on each vehicle as per requirements by final inspection department and a copy of results is delivered with unit.

After comparison and verification we can ensure that the MX151D meets or exceeds the required performance standard.

NOTE : The approved and digitally signed test certificats are in the Technical Manual CD-Rom.




TECHNICAL MANUAL

MX151D - GM



• PART 10 : CERTIFICATIONS - BODY DOOR RETENTION

BODY DOOR RETENTION (E16)

 DEMERS AMBULANCES 28, Richelieu, Beloeil QC (Canada) J3G 4N5	<u>BODY DOOR RETENTION</u> <u>COMPONENTS TEST</u> (BCAS – E16)
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Standard(s): Ambulance Performance Test Criteria, Appendix E British Columbia Ambulance Service

Test date: 2009-06-23 **Test Location:** Demers Ambulances Plant

Information of the parts and equipments tested

Demers part number	Supplier part number	Description	Serial number
B800620	B800620	Module	DOP-620-2009-214
A014396	A014396	Door A2 (left back door)	DOP-620-2009-214
A014937	A014937	Door A3 (right back door)	DOP-620-2009-214
A014392	A014392	Door D1 (right side door)	DOP-620-2009-214
E601023	10335-16	Stryker	N/A
E602042	11657-16	Left Latch	N/A
E602043	11653-16	Right Latch	N/A
D001900-35	D001900-35	Stainless steel hinge (rear doors)	N/A
D001900-43	D001900-43	Stainless steel hinge (side door)	N/A



Test method

We applied the forces of 1500 lbs. on the secondary latch and 2500 lbs. on the full latch as specified by CMVSS 206 and AMD 002, on transverse and longitudinal directions to verify the rigidity of the door assemblies. All tests of door hinges, door latches and door strikers were also performed independently as FMVSS 206 by an external test laboratory and reports were supplied to Demers by the suppliers.

Measuring devices used

Description	Brand	Model	Serial number	Demers number	Calibration due date
Data screen	Was	M2000A-SC	S1610	B-004	March 2010
Load cell	STS	5K15	141804	B-004	March 2010

Results

	Left Back Door			Right Back Door		Side Door	
	Goal (lbs.)	Transverse Load (lbs.)	Longitudinal Load (lbs.)	Transverse Load (lbs.)	Longitudinal Load (lbs.)	Transverse Load (lbs.)	Longitudinal Load (lbs.)
Secondary latched Position	2500	2572	2578	2522	2590	2600	2522
Fully latched Position	1500	1530	1684	1702	1624	1588	1624

After comparison and verification we can ensure that the MX151D meets or exceeds the required performance standard.

NOTE : The approved and digitally signed test certificats are in the Technical Manual CD-Rom.




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MX151D - GM



• PART 10 : CERTIFICATIONS - CARBON MONOXIDE

CARBON MONOXIDE (E17)

 DEMERS AMBULANCES 28, Richelieu, Beloeil QC (Canada) J3G 4N5	<u>CARBON MONOXYDE LEVELS</u> (BCAS – E17)
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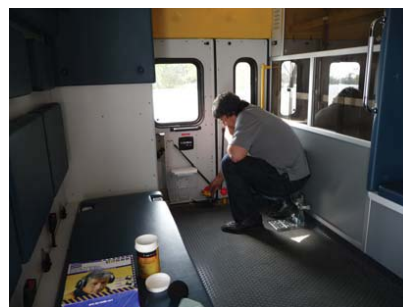
Standard(s): Ambulance Performance Test Criteria, Appendix E British Columbia Ambulance Service

Test date: 2009-09-28

Test Location: Demers Ambulances Plant

Information of the vehicle tested

GM
G33503 CUTAWAY
2009
MX151D-GM-DIESEL
G099C-568
1GBJG316091175574
Duramax 6.6 liters V8 Diesel



Test method:

Before the test, we calibrated the gas detector according to the Single Gas Detector.

We opened vehicle doors and auxiliary windows and ventilated with fresh air for 10 minutes with engine off.

At first, we sampled ambient air around vehicle and recorded.

We closed windows and doors, started and idle engine in parked position for 15 minutes and perform measurements.

After, a person drove the vehicle for 15 minutes on traffic-laden city streets (urban speeds of 30 to 60 km/h) and perform measurements.

After, a person drove the vehicle for 15 minutes at highway speeds of 80 to 100 km/h. and perform measurements

After, we stopped the vehicle, and perform measurements.

Finally, we sampled ambient air around vehicle and recorded.

The test was done on September 28 2009 at 1:30 PM.

Temperature 19.0°C
Barometric pressure 99.4 kPa
Wind speed 13.0 km/h
Humidity 78%
Wind direction South
Weather Cloudy

Measuring devices used

Description	Brand	Model	Serial Number	Demers Number	Calibration due date
Single Gas Detector	BW Technologies	GasAlert Extreme	J305-M023493	DE-003	November 2009

Results

Elapsed time (minutes)	Activity	CO reading (ppm)	Goal	Result
0	Sample ambient air around vehicle	0	less than 10 ppm	Pass
0-15	Idle engine parked position			
0-5	CO levels monitored throughout driver compartment	0	less than 10 ppm	Pass
5-10	CO levels monitored at head of main cot	0	less than 10 ppm	Pass
10-15	CO levels monitored throughout patient compartment	0	less than 10 ppm	Pass




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MX151D - GM



• PART 10 : CERTIFICATIONS - CARBON MONOXIDE

CARBON MONOXIDE (E17)

 DEMERS AMBULANCES 28, Richelieu, Beloeil QC (Canada) J3G 4N5	<u>CARBON MONOXYDE LEVELS</u> (BCAS – E17)
---	--

Elapsed time (minutes)	Activity	CO reading (ppm)	Goal	Result
15-30 (while driving)	City driving 30 to 60 km			
15-20 (while driving)	CO levels monitored throughout driver compartment	0	less than 10 ppm	Pass
20-25 (while driving)	CO levels monitored at head of main cot	0	less than 10 ppm	Pass
10-15 (While driving)	CO levels monitored throughout patient compartment	0	less than 10 ppm	Pass
30-45 (while driving)	Highway driving 80 to 100 km			
30-35 (while driving)	CO levels monitored throughout driver compartment	0	less than 10 ppm	Pass
35-40 (while driving)	CO levels monitored at head of main cot	0	less than 10 ppm	Pass
10-15 (While driving)	CO levels monitored throughout patient compartment	0	less than 10 ppm	Pass
45-60	Stopped vehicle			
0-5	CO levels monitored throughout driver compartment	0	less than 10 ppm	Pass
5-10	CO levels monitored at head of main cot	0	less than 10 ppm	Pass
10-15	CO levels monitored throughout patient compartment	0	less than 10 ppm	Pass
60	Sample ambient air around vehicle	0	less than 10 ppm	Pass

After comparison and verification we can ensure that the MX151D meets or exceeds the required performance standard.

NOTE : The approved and digitally signed test certificats are in the Technical Manual CD-Rom.




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MX151D - GM



• PART 10 : CERTIFICATIONS - LOAD TEST FOR GRAB RAILS/HANDLES

LOAD TEST FOR GRAB RAILS/HANDLES (E18)

 DEMERS AMBULANCES 28, Richelieu, Beloeil QC (Canada) J3G 4N5	<u>LOAD TEST FOR GRAB RAIL</u> <u>HANDLES</u> (BCAS – E18)
---	--

Standard(s): Ambulance Performance Test Criteria, Appendix E British Columbia Ambulance Service

Test date: 2009-05-25 and 2009-10-13 **Revision 1**

Test Location: Demers Ambulances Plant

Information of the vehicle tested

GM
 G33503 CUTAWAY
 2009
 MX151D-GM-DIESEL
 G099C-568
 1GBJG316091175574
 Duramax 6.6 liters V8 Diesel



Information of the parts and equipments tested

Description	Demers part number	Quantity	Location
Grab bar 59 1/2"	E402023	1	Ceiling
Tapping screw #14 x 1 1/4"	E008174	6	
Grab Handle 9"	N/S-002255	3 / 1	Ceiling / Door D1
Tapping screw #14 x 5/8"	E008171	6 / 2	
* Yellow Grab Handle 24"	D014668	1	*medical cabinet (left rear door)
* Adaptor	D014669	2	
* Bolts 3/8-16 x 3.5 " HEX 6P HK	E507021	2	Rear doors
Grab Handle 10" 3/4"	E601070	2	
Tapping screw #14 x 5/8"	E008171	4	

Description	Demers part number	Quantity	Location
Yellow Grab Handle 12"	E402010	1	Right rear compartment
Handle Bracket	D014010	1	
Screw 1/4 -20	E008062	4	
Capnut 1/4 -20	E003088	4	
Tapping screw #14 x 5/8"	E008171	4	Front partition
Yellow Grab Handle 24"	E402041	1	
Tapping screw #14 x 1"	E008209	4	

* Revision 1

Test method

We applied a minimum load of 660 N (150lbs.) with an application device to all midpoints between two securing points in a parallel and perpendicular plane and hold the load for minimum of two (2) minutes.

Measuring devices used

Description	Brand	Model	Serial number	Demers number	Calibration due date
Data screen	Was	M2000A-SC	S1610	B-004	March 2010
Load cell	STS	5K15	141804	B-004	March 2010




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MX151D - GM



• PART 10 : CERTIFICATIONS - LOAD TEST FOR GRAB RAILS/HANDLES

LOAD TEST FOR GRAB RAILS/HANDLES (E18)

 DEMERS AMBULANCES <small>28, Richelieu, Beloeil QC (Canada) J3G 4N5</small>	<u>LOAD TEST FOR GRAB RAIL</u> <u>HANDLES</u> (BCAS – E18)
--	--

Results

Description	Demers part number	Location	Parallel force applied lbs. (lbs.)	Perpendicular force applied lbs. (lbs.)	Goal lbs. (lbs.)	Time maintained (Sec)	Detach, loosen or deform
Grab bar 59 1/2"	E402023	Ceiling	200	176	150	125 / 126	No
Grab bar 59 1/2"	E402023	Ceiling	192	180	150	126 / 129	No
Grab Handle 9"	N/S-002255	Ceiling	390	322	150	131 / 125	No
Grab Handle 9"	N/S-002255	Door D1	240	240	150	124 / 125	No
Grab Handle 10 3/4"	E601070	Rear doors	240	240	150	124 / 125	No
Yellow Grab Handle 12"	E402010	Right rear compartment	195	220	150	125 / 121	No
Yellow Grab Handle 24"	E402041	Front partition	210	240	150	130 / 121	No
* Yellow Grab Handle 24"	D014668	*medical cabinet (left rear door)	240	310	150	121 / 121	No

* Revision 1

After comparison and verification we can ensure that the MX151D meets or exceeds the required performance standard.

NOTE : The approved and digitally signed test certificates are in the Technical Manual CD-Rom.




TECHNICAL MANUAL

MX151D - GM



• PART 10 : CERTIFICATIONS - SIREN SYSTEM

SIREN SYSTEM (E19)

 DEMERS AMBULANCES <small>28, Richelieu, Beloeil QC (Canada) J3G 4N5</small>	<u>SIREN SYSTEM</u> (BCAS – E19)
--	--

Standard(s): Ambulance Performance Test Criteria, Appendix E British Columbia Ambulance Service

Test date: 2009-09-28

Test Location: Demers Ambulances Plant

Information of the vehicle tested

GM
 G33503 CUTAWAY
 2009
 MX151D-GM-DIESEL
 G099C-568
 1GBJG316091175574
 Duramax 6.6 liters V8 Diesel



Information of the parts or equipments tested

Manufacturer	Description	Supplier Number	Demers Number	Quantity
Carson	Siren	SA-500	E506073	1
Whelen	Speaker	SA-315P	E515035	2

Test method:

We measured the outdoor sound level in accordance with the E19 criteria: all doors, windows and vents was closed, the siren was sounded in its loudest mode of operation, the engine on neutral position run to 50-60% of the RPM. The tests were performed near Demers Ambulance office and in the weather conditions specified by the standard.

Measuring devices used

Description	Brand	Model	Serial number	Demers Number	Calibration due date
Sound Meter	REED	SL-4022	R147239	SO-003	June 2010

We used a sound level meter that meets the OH&S requirements (IEC 651) of a type 1 meter operating on the A-weighting network with a slow meter response.

Results

Sound	#1	#2	Goal	Voltage	Result
Yelp	122.8 db *	122.4 db *	118 db	13.5	Pass
Wail	124.6 db *	124.8 db *	118 db		Pass
PHSR	122.1 db *	121.5 db *	118 db		Pass

After comparison and verification we can ensure that the MX151D meets or exceeds the required performance standard.

NOTE : The approved and digitally signed test certificats are in the Technical Manual CD-Rom.




TECHNICAL MANUAL

MX151D - GM



• PART 10 : CERTIFICATIONS - PASSENGER AND PATIENT SAFETY RESTRAINTS

PASSENGER AND PATIENT SAFETY RESTRAINTS (E20)

 DEMERS AMBULANCES 28, Richelieu, Beloeil QC (Canada) J3G 4N5	<u>PASSENGER AND PATIENT SAFETY</u> <u>RESTRAINTS</u> (BCAS – E20)
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Standard(s): Ambulance Performance Test Criteria, Appendix E British Columbia Ambulance Service

Test date: 2009-07-09, 10, 14 and 2009-10-20

Test Location: Demers Ambulances Plant

Information of the vehicle tested

GM
 G33503 CUTAWAY
 2009
 MX151D-GM-DIESEL
 G099C-568
 1GBJG316091175574
 Duramax 6.6 liters V8 Diesel



Information of the parts or equipments tested

Seating position	Description	Part number	Quantity
HEAD SEAT	CABINET BASE FOR 1700 SERIES	E406118	1
	EVS SEAT ANCHIR	A004664	2
	HEX BOLT 1/2"-13 X 2 1/2" G8	E003028	4
	FLAT WASHER 1/2" - 1 1/4"	E007036	4
	NYLON NUT 1/2"-13	E003114	2
CPR SEAT	LEFT BUILT CPR BELT ANCHORAGE MX151D BC	A014517	1
	RIGHT BUILT CPR BELT ANCHORAGE MX151D BC	A014518	1
	HEX BOLT 7/16"-20 X 1" G8 F	E003068	4
	LOCK WASHER 7/16"	E007065	8
	FLAT WASHER 3/8" X .062	E007047	8
	BOLT HEX 7/16X20X1 1/4 GR8 UNF	E003070	4
	HEX NUT 7/16"-20	E003111	4
	8.5" CABLE SEAT BELT BUCKLE	E404071	1
	SEAT BELT RETRACTOR 52"	E404072	1
SQUAD BENCH	HEX BOLT 7/16"-20 X 3/4" G8 F	E003069	2
	LOCK WASHER 7/16"	E007065	2
	BUILT RIGHT SOLE MX151D BC	A014362	1
	SCREW TAR B PAN PHI 14X11/2	E008097	16
	SQUAD BENCH STRUCTURE MX151D BC	A014073	1
	8.5" CABLE SEAT BELT BUCKLE	E404071	3
	SEAT BELT RETRACTOR 52"	E404072	3
	SEAT BELT 90" (PRONE POSITION)	E404077	2
SAFETY NET	BOUL. HEX 3/8-16 X ZC/FT GR5	E003047	2
	ROND. RESS 0.762 X 0.4375 X 0.114 ZP	E007065	2
	SAFETY NET	A014514	1
	ANCHOR	E603005	6
	SCREW	E008273	10
	SCREW	E008274	2




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MX151D - GM



• PART 10 : CERTIFICATIONS - PASSENGER AND PATIENT SAFETY RESTRAINTS

PASSENGER AND PATIENT SAFETY RESTRAINTS (E20)

 DEMERS AMBULANCES 28, Richelieu, Beloeil QC (Canada) J3G 4N5	<u>PASSENGER AND PATIENT SAFETY</u> <u>RESTRAINTS</u> (BCAS – E20)
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Part used for installation		
Part number	Description	Serial number
B800620	Module	DOP-620-2009-214

Measuring devices used

Description	Brand	Model	Serial number	Demers number	Calibration due date
Load cell 20K	Lebow	3187	2291	B-002	March 2010
Data screen	Western Scale	M2000H-SL	S1611	B-002	March 2010
Load cell 5K	STS	5K15	141804	B-004	March 2010
Data screen	Was	M2000A-SC	S1610	B-004	March 2010
Pelvic body block	-	-	-	AE-009	N/A
Seat base dummy	-	-	-	-	N/A

Test method

Head seat (H₁ as rearward direction of seat and H₂ as forward direction of seat):

We used a solid test dummy to simulate the effect of the seat on the floor of the ambulance during the application of the forces required by the CMVSS 207/210 (revision January 2006) and to validate that the module structure and attachments could withstand the load. The equivalence of forces used on the dummy are explained in annexe 1 and the certificate from the seat supplier can be found in annexe 2.

Other seating positions (A, B, C and G):

We used a pelvic body block for the lap belt and applied the force of 5000 lbs. at each seating position. We applied the forces with an angle between 5° to 15° in direction specified in the CMVSS 207/210 (revision January 2006) and in the spirit of CMVSS 207/210 (revision January 2006) for side-facing seat, with a hydraulic cylinder.

Prone position on squad bench (D and E):

We used a jig for the lap belt and applied the force of 5000 lbs. divided by 2 belts for a total force of 2500 lbs. on each seat belt. We applied the forces in the spirit of CMVSS 207/210 (revision January 2006) with a forklift.

Safety net (F):

We used a solid block installed in the centre of the safety net to distribute the required load to withstand of 3000 lbs.




TECHNICAL MANUAL

MX151D - GM

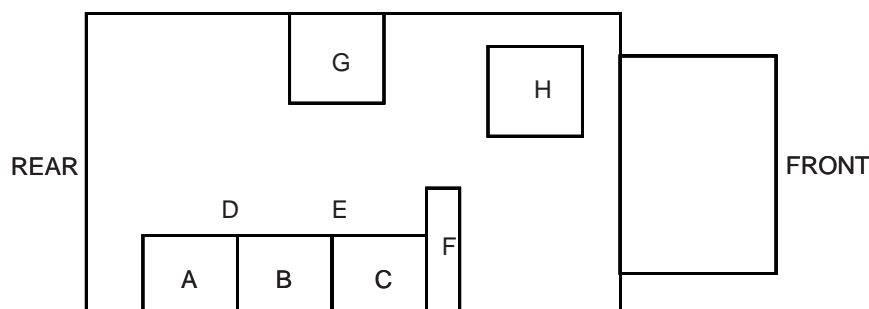


• PART 10 : CERTIFICATIONS - PASSENGER AND PATIENT SAFETY RESTRAINTS

PASSENGER AND PATIENT SAFETY RESTRAINTS (E20)

 DEMERS AMBULANCES 28, Richelieu, Beloeil QC (Canada) J3G 4N5	<u>PASSENGER AND PATIENT SAFETY</u> <u>RESTRAINTS</u> (BCAS – E20)
---	--

Results



Seating (testing) position	Required load (lbs.)	Load applied (lbs.)	Max. Time to reach load	Time to reached load	Time to last (sec.)	Time maintained (sec.)	Goal (angle)	Angle	Result
A	5000	5032	30	19.9	10	20	5° to 15°	7.8°	PASS
B	5000	5022	30	26	10	17	5° to 15°	7.0°	PASS
C	5000	5030	30	20	10	20	5° to 15°	7.0°	PASS
D	2500*	3200	30	12	10	12	n/a	/	PASS
E	2500*	3200	30	12	10	12	n/a	/	PASS
F	3000	3324	n/a	/	n/a	/	n/a	/	PASS
G	5000	5033	30	10	10	16	5° to 15°	6.1°	PASS
H ₁	831**	904	30	7	10	45	n/a	/	PASS
H ₂	4165**	4310	30	12	10	17	n/a	/	PASS

*The goal for prone position (D and E) has been calculated as:

5000 lbs / 2 seat belts = 2500 lbs/seat belt

**The goal for the head seat has been calculated as on calculation sheet in Annexe 1 based on CMVSS 207 and 210.

Our seat belt restraint test procedure uses a test jig designed by Demers to provide a safe and repeatable method to perform the required tests. In order to apply the correct amount of bending Moment (or Torque) to the floor structure, we must translate the required forces applied as per CMVSS at the specified locations to equivalent forces applied on the Demers test jig. For comprehension purposes, here is an example of an equivalent force calculation:




TECHNICAL MANUAL

MX151D - GM



• PART 10 : CERTIFICATIONS - PASSENGER AND PATIENT SAFETY RESTRAINTS

PASSENGER AND PATIENT SAFETY RESTRAINTS (E20)

 DEMERS AMBULANCES <small>28, Richelieu, Beloeil QC (Canada) J3G 4N5</small>	<u>PASSENGER AND PATIENT SAFETY</u> <u>RESTRAINTS</u> <i>(BCAS – E20)</i>
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Test requirements:

Required force: 2200 lbs

Distance above floor to apply force : 17 inches

Bending Moment (Force x Distance) : $2200 \times 17 = 37\,400$ lbs-in

Equivalent force applied at 45 inches above floor:

Bending Moment: 37 400 lbs-in

Distance above floor: 45 inches

Force (Moment / Distance): $37\,400 / 45 = 831.1$ lbs

The exact required load of tests can be found in Annexe 1.

The weight of the actual head seat assembly installed in the vehicle is 107lbs. The test was performed for a seat assembly of 110 lbs or less.

To comply with the specifications, all seat assemblies (base and seat) should have a certification test report by an independent laboratory. The reports from the seat supplier are in the annexe 2.

Article 207-210 of Federal Motor Vehicle Safety Standard (FMVSS) is the Canadian equivalence of the article 207-210 of Canadian Motor Vehicle Safety Standard (CMVSS).

Conclusion

After comparison and verification we can ensure that the MX151D meets or exceeds the required performance standard.

Supervise by: Jean Handfield, P.eng.
Demers Ambulances

NOTE : The approved and digitally signed test certificates are in the Technical Manual CD-Rom.




TECHNICAL MANUAL

MX151D - GM



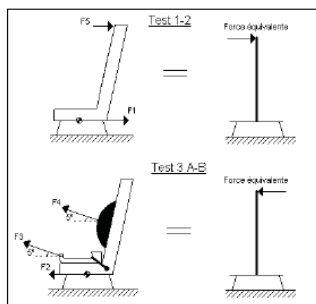
• PART 10 : CERTIFICATIONS - PASSENGER AND PATIENT SAFETY RESTRAINTS

PASSENGER AND PATIENT SAFETY RESTRAINTS (E20)

 DEMERS AMBULANCES 28, Richelieu, Beloeil QC (Canada) J3G 4N5	<u>PASSENGER AND PATIENT SAFETY</u> <u>RESTRAINTS</u> (BCAS – E20)
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Annexe 1

Calculation file for CMVSS 207 and 210									
Same test for all seats in comparison with the ground									
Unit				Test 1	Description	CMVSS specified Force (N)	Bending Moment calculation	Bending Moment (N-m) at floor	
Total weight of the seat assy. (with base)	M1	49.90 kg	110 lbs.	F1	Force (F1) through centre of gravity (CG) (M1 x 6.91 x 20)	9 789	F1 x D1	4 227	
Height of Centre of gravity	D1	0.4318 m	17 inches						
Height of abdominal dummy (from floor)	D2	0.6842 m	23 inches	Test 2	Description	CMVSS specified	Bending Moment	Bending Moment (N-m) at	
Height of torso dummy (from floor)	D3	0.6856 m	27 inches	F5	* Force (F5) at the high level of the seat	474	F5 x D4	589	
Height of seating plane	D4	0.4572 m	18 inches		Application of force towards the front of the vehicle	Total		4 816	
Height of backrest (from floor)	D5	1.2446 m	49 inches		* Calculated with the force specified in the CMVSS spec. (372,8 N-m) ** Since the required load is much lower than Test 1, we only use the Test 1 loading scenario				
Height of equivalent force application with reference to the floor	D6	1.1430 m	45 inches	A case of seat with 3 point seat belts					
				Test 3 A	Description	Force (N)	Bending Moment calculation	Bending Moment (N-m) at floor	
				F2	Force (F2) passing through the CG	9 789	F2 x D1	4 227	
				F3	Force (F3) of abdominal dummy	13 344	F3 x D2	7 796	
				F4	Force (F4) of torso dummy	13 344	F4 x D3	9 151	
Bending Moment at the seating point with an application force at the top of the backrest					Application of force towards the back of the vehicle	Total		21 174	
A case of seat with 2 point seat belts									
				Test 3 B	Description	Force (N)	Bending Moment calculation	Moment (N-m)	
				F2	Force (F2) passing through the CG	9 789	F2 x D1	4 227	
				F3	Force (F3) of abdominal dummy	22 240	F3 x D2	12 993	
					Application of force towards the back of the vehicle	Total		17 220	
				Test 1	Force (N)		Force (lbs.)		
				Equivalent force					
				F(eq) = 4227 N-m / 1,143 m	3 698		831		
				Test 3 A	Force (N)		Force (lbs.)		
				Equivalent force for 3 point belts					
				F(eq) = 21 174 N-m / 1,143 m	18 525		4 165		
				Test 3 B	Force (N)		Force (lbs.)		
				Equivalent force for 2 point belts					
				F(eq) = 17 220 N-m / 1,143 m	15 055		3 387		





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- PART 10 : CERTIFICATIONS - PASSENGER AND PATIENT SAFETY RESTRAINTS

PASSENGER AND PATIENT SAFETY RESTRAINTS (E20)



DEMERS
AMBULANCES

28, Richelieu, Beloeil QC (Canada) J3G 4N5

PASSENGER AND PATIENT SAFETY

RESTRAINTS

(BCAS – E20)

ANNEXE 2

FMVSS 207 SEATING SYSTEM & 210 SEAT BELT ANCHORAGE STRENGTH TEST

TEST ITEMS:

ADNIK 71302 SEAT BACK
ADNIK 7226 SEAT BOTTOM
JOHNSON STD T SLIDETRACKS
VOYAGER TOP PLATE (SBTP)
VOYAGER RISER BASE (SBBS)

PERFORMED FOR:

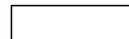
EVS LIMITED
3702 WEST SAMPLE
SOUTH BEND, IN 46619

PERFORMED BY:

NORCO INDUSTRIES
53236 COUNTY ROAD 13
ELKHART, IN 46514

4.

07031601 Norco Industries, Inc.






TECHNICAL MANUAL

MX151D - GM



• PART 10 : CERTIFICATIONS - PASSENGER AND PATIENT SAFETY RESTRAINTS

PASSENGER AND PATIENT SAFETY RESTRAINTS (E20)

 DEMERS AMBULANCES 28, Richelieu, Beloeil QC (Canada) J3G 4N5	<u>PASSENGER AND PATIENT SAFETY</u> <u>RESTRAINTS</u> (BCAS – E20)
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ANNEXE 2

FMVSS 207 SEATING SYSTEM & 210 SEAT BELT ANCHORAGE STRENGTH TEST

Description Of Location In Vehicle: N/A

Direction That Seat Faced (Forward/Rearward): Forward

Distance Between Seatbelt Anchorage More Than 6.50" (y/n): N/A

Seatbelt Angle From Contact Point Between 30 and 75 degrees (y/n): Not Measured

Seat Adjusted Rearward (y/n): (y)

Seat In Most Upright Position (y/n): (y)

Angle Of Pelvic Body Block Between 5 and 15 Degrees (y/n) (y)

Target Load Value Of Pelvic Block: 5000 lbs

Target Load Of CG Load (Full Stack): 1800 lbs

Weight Of Full Stack: 90 lbs

Center-Of-Gravity Location: 13.00" From Floor (Approx.)

Time To Reach All Target Loads: 6 seconds approx.

Minimum Time Period Held (y/n): (y)

Is Seat & Adjacent Seats Required To Be Pulled Simultaneous (y/n): N/A

Was Test Pulled With Adjacent Seats If Required (y/n): N/A

Results Of Anchorage Strength Test (Pass/Fail): Pass

This test does not certify to all sections of FMVSS 207 and 210. This test shows that the product meets all strength requirements of anchorage when tested simultaneously per these sections.

Test Approvals:

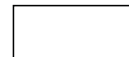
Test Technician: [Signature] Date: 03/30/07

Engineering Director: [Signature] P.E. Date: 3/30/07

Brand Manager: [Signature] Date: 3/30/07

*

07031601 Norco Industries, Inc.






TECHNICAL MANUAL

MX151D - GM



- PART 10 : CERTIFICATIONS - PASSENGER AND PATIENT SAFETY RESTRAINTS

PASSENGER AND PATIENT SAFETY RESTRAINTS (E20)

 DEMERS AMBULANCES <small>28, Richelieu, Beloeil QC (Canada) J3G 4N5</small>	<u>PASSENGER AND PATIENT SAFETY</u> <u>RESTRAINTS</u> (BCAS – E20)
--	--

ANNEXE 2

FMVSS 207 SEATING SYSTEM & 210 SEAT BELT ANCHORAGE STRENGTH TEST

TEST ITEMS:

ADNIK 71307 SEAT BACK
ADNIK 71309 SEAT BOTTOM
LTU6 JOHNSON INTERNATIONAL SLIDE TRACKS
ARM180R CABINET BASE (10 GA – 50 KSI MATL.)
AMFAB AM1470STD FIXED HINGE BRKTS (50 KSI)
OPENING OF CABINET TOWARDS LEFT SIDE

PERFORMED FOR:

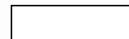
EVS LIMITED
3702 WEST SAMPLE
SOUTH BEND, IN 46619

PERFORMED BY:

NORCO INDUSTRIES, INC.
53236 COUNTY ROAD 13
ELKHART, IN 46514

8:

06090101 Norco Industries, Inc.





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- PART 10 : CERTIFICATIONS - PASSENGER AND PATIENT SAFETY RESTRAINTS

PASSENGER AND PATIENT SAFETY RESTRAINTS (E20)



**DEMERS
AMBULANCES**

28, Richelieu, Beloeil QC (Canada) J3G 4N5

PASSENGER AND PATIENT SAFETY

RESTRAINTS

(BCAS – E20)

ANNEXE 2

FMVSS 207 SEATING SYSTEM & 210 SEAT BELT ANCHORAGE STRENGTH TEST

TEST ITEMS:

ADNIK 71307 SEAT BACK
ADNIK 71309 SEAT BOTTOM
AMFAB AM1470STD HINGE BRACKETS (50 KSI YIELD)
JOHNSON LTU7 SLIDETRACKS
VOYAGER TOP PLATE (SBTP)
VOYAGER RISER BASE (SBBS)

PERFORMED FOR:

EVS LIMITED
3702 WEST SAMPLE
SOUTH BEND, IN 46619

PERFORMED BY:

NORCO INDUSTRIES
53236 COUNTY ROAD 13
ELKHART, IN 46514

*

07022001 Norco Industries, Inc.

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MX151D - GM



• PART 10 : CERTIFICATIONS - PASSENGER AND PATIENT SAFETY RESTRAINTS

PASSENGER AND PATIENT SAFETY RESTRAINTS (E20)



DEMERS
AMBULANCES

28, Richelieu, Beloeil QC (Canada) J3G 4N5

PASSENGER AND PATIENT SAFETY

RESTRAINTS

(BCAS – E20)

ANNEXE 2

FMVSS 207 SEATING SYSTEM & 210 SEAT BELT ANCHORAGE STRENGTH TEST

Description Of Location In Vehicle: N/A

Direction That Seat Faced (Forward/Rearward): Forward

Distance Between Seatbelt Anchorage More Than 6.50" (y/n): N/A

Seatbelt Angle From Contact Point Between 30 and 75 degrees (y/n): Not Measured

Seat Adjusted Rearward (y/n): (y)

Seat In Most Upright Position (y/n): (y)

Angle Of Pelvic Body Block Between 5 and 15 Degrees (y/n) (y)

Angle Of Torso Body Block Between 5 and 15 Degrees (y/n): (y)

Target Load Value Of Torso Block: 3000 lbs

Target Load Value Of Pelvic Block: 3000 lbs

Target Load Of CG Load (Full Stack): 1880 lbs

Weight Of Full Stack: 94 lbs

Center-Of-Gravity Location: 14.88" From Floor (Approx.)

Time To Reach All Target Loads: 21 seconds

Minimum Time Period Held (y/n): (y)

Is Seat & Adjacent Seats Required To Be Pulled Simultaneous (y/n): N/A

Was Test Pulled With Adjacent Seats If Required (y/n): N/A

Results Of Anchorage Strength Test (Pass/Fail): Pass

This test does not certify to all sections of FMVSS 207 and 210. This test shows that the product meets all strength requirements of anchorage when tested simultaneously per these sections.

Test Approvals:

Test Technician:

[Signature]

Date:

03/27/07

Engineering Director:

[Signature]

Date:

3/27/07

Brand Manager:

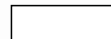
[Signature]

Date:

3/27/07

4:

07022001 Norco Industries, Inc.






TECHNICAL MANUAL

MX151D - GM



• PART 10 : CERTIFICATIONS - ENGINE COLD START

ENGINE COLD START (E21)

 DEMERS AMBULANCES 28, Richelieu, Beloeil QC (Canada) J3G 4N5	<u>ENGINE COLD STARTS</u> (BCAS – E21)
---	--

Standard(s): Ambulance Performance Test Criteria, Appendix E British Columbia Ambulance Service

Test date: 2008-07-10

Test Location: PMG Technologies at Blainville, Qc.

Information of the vehicle tested

GM
G33503 CUTAWAY
2008
MX151D-GM-DIESEL
G099C-568
1GBJG316091175574
Duramax 6.6 liters V8 Diesel



Test method

The test used as equivalence has been made on a GM with diesel engine option LMM in 2008-07-10. The test was conducted in accordance with Federal Specification for the Star-of-Life Ambulance, KKK-A-1822F Article 3.6.3.2 with a soaking at -35°C for 6 hours and -18°C for 1 hour.

Measuring devices

Manufacturer	Description	Model	Serial number	Calibration due date
Fluke	Data Logging System	2635A	6115300	2008-07-25

Results

Description	Soaking time	Temperature
10:34 am at 6:59 pm	8.5 hrs.	-35°C
6:59 pm at 8:50 pm	1.5 hrs.	-18°C

After a soaking period of 10 hours the engine was started properly without the aid of engine block preheating devices.

After comparison and verification we can ensure that the MX151D meets or exceeds the required performance standard.

NOTE : The approved and digitally signed test certificats are in the Technical Manual CD-Rom.




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MX151D - GM



• PART 10 : CERTIFICATIONS - GROUND CLEARANCE

GROUND CLEARANCE (E22)

 DEMERS AMBULANCES <small>28, Richelieu, Beloeil QC (Canada) J3G 4N5</small>	<u>GROUND CLEARANCE</u> (BCAS – E22)
--	--

Standard(s): Ambulance Performance Test Criteria, Appendix E British Columbia Ambulance Service

Test date: 2009-10-30

Test Location: Demers Ambulances Plant

Information of the vehicle tested

GM
G33503 CUTAWAY
2008
MX151D-GM-DIESEL
G099C-568
1GBJG316091175574
Duramax 6.6 liters V8 Diesel



Test method

The vehicle, loaded to the GVWR, has been placed on a floor level surface and the ground clearance has been measured.

Measuring device

Manufacturer	Description	Model	Identification number	Calibration due date
Stanley	Measuring Tape	16 Feet	RM-POTR-1	2010-07

Results

The lowest point of the vehicle was determined to be the differential. This point has been measured at 6.875" from the ground. The lowest point of the vehicle body (skirts) has been determined at the step well of the cab and has been measured at 9.625" from the ground. The minimums required are 6.0" for the vehicle and 8.0" for the vehicle's body.

After comparison and verification we can ensure that the MX151D meets or exceeds the required performance standard.

NOTE : The approved and digitally signed test certificats are in the Technical Manual CD-Rom.




TECHNICAL MANUAL

MX151D - GM



• PART 10 : CERTIFICATIONS - TIRE CHAIN CLEARANCE

TIRE CHAIN CLEARANCE (E23)

 DEMERS AMBULANCES 28, Richelieu, Beloeil QC (Canada) J3G 4N5	<u>TIRE CHAIN CLEARANCE</u> (BCAS – E23)
---	--

Standard(s): Ambulance Performance Test Criteria, Appendix E British Columbia Ambulance Service

Test date: 2009-10-30

Test Location: Demers Ambulances Plant

Information of the vehicle tested

GM
G33503 CUTAWAY
2008
MX151D-GM-DIESEL
G099C-568
1GBJG316091175574
Duramax 6.6 liters V8 Diesel



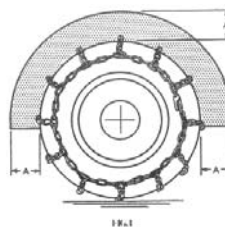
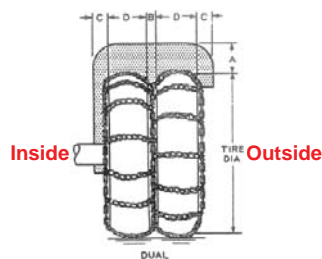
Test method

The vehicle loaded to the GVWR, has been placed on a floor level surface and the Chain Clearance has been verified as per SAE J683.

Measuring device

Manufacturer	Description	Model	Identification number	Calibration due date
Stanley	Measuring Tape	16 Feet	RM-POTR-1	2010-07

Results



Tire Size	Measured A (inches)	Required A (inches)	Measured B (inches)	Required B (inches)	Measured C-inside (inches)	Required C-inside (inches)	Measured C-outside (inches)	Required C-outside (inches)	Results
225/75R16	4.0	2.5	1.5	1.5	2.750	1.5	2.0	1.5	Pass

After comparison and verification we can ensure that the MX151D meets or exceeds the required performance standard.

NOTE : The approved and digitally signed test certificats are in the Technical Manual CD-Rom.



TECHNICAL MANUAL

MX151D - GM



• PART 10 : CERTIFICATIONS - ENVIRONMENTAL CLIMATIC SYSTEMS

EMERGENCY WARNING SYSTEM (E24)

 DEMERS AMBULANCES 28, Richelieu, Beloeil QC (Canada) J3G 4N5	<u>EMERGENCY WARNING SYSTEM</u> (BCAS – E24)
---	--

Standard(s): Ambulance Performance Test Criteria, Appendix E British Columbia Ambulance Service

Date: 2009-09-22

Test Location: Whelen Engineering and Tomar Electronics inc.

Information of the vehicle

GM
G33503 CUTAWAY
2009
MX151D-GM-DIESEL
G099C-568
1GBJG316091175574
Duramax 6.6 liters V8 Diesel



Information of the parts or equipments tested

WHELEN			
# DEMERS	# WHELEN	DESCRIPTION	QT/UNIT
E503200	90E000ZR	SCENE LIGHT 8-32°	2
E503298	90F000CR	SCENE LIGHT 0°	2
E502136	702000DU	7X3 STROBE RED/CLEAR	2
E503301	70R02FRR	7X3 LED RED PROG.	2
E502134	AVN1D	LIGHT AVENGER RED/CLEAR	1
E502141	CSP660	POWER SUPPLY STROBE	1
E503368	RSA02ZCR	LIGHT LED LIN3 AMBRE # RSA02ZCR	2
E503257	90RR5FRR	9 X 7 LIN RED LED	2
TOMAR			
# DEMERS	# TOMAR	DESCRIPTION	QT/UNIT
E502137	465H-6407-0121 Front	FRONT LIGHT BAR	1
E502138	465H-6407-0121 Rear	REAR LIGHT BAR	1

Test method

The data of lighting suppliers has been integrated in a table to calculate value as per requirements.

The requirements of SAE J 845 for each individual light has been verified as per certificates supplied by Whelen and Tomar.

Measuring devices used

Data's has been provided by Whelen Engineering and Tomar Electronics inc. laboratories.




TECHNICAL MANUAL

MX151D - GM



• PART 10 : CERTIFICATIONS - ENVIRONMENTAL CLIMATIC SYSTEMS

EMERGENCY WARNING SYSTEM (E24)

 DEMERS AMBULANCES 28, Richelieu, Beloeil QC (Canada) J3G 4N5	<u>EMERGENCY WARNING SYSTEM</u> (BCAS – E24)
---	--

Results

Emergency Light System as per SAE J2498											
Zone	Whelen number	Qty (by zone)	Total at H Cd/sec (for each light)	Zone total at H (Requirement)	Total	Total at any H point Cd/sec (for each light)	Min. value at any point (requirement)	Total	H at any point Cd/sec (for each light)	Min. Value at Any +/- 5o Point from H	Total
BF/DF lower	702000DU	1	**	75 000	**	**	3 750	**	**	1 300	**
B/D upper	90F000CR	1	827 747	400 000	1 459 090	14 079	10 000	29 300	6 178	3500	16 987
	90RR5FRR	1	631 343			15 221			10 809		
A lower	70R02FRR (01-0684427CRO)	2	341 093	150 000	682 186	8 989	3 750	17 978	5 136	1 300	10 272
Zone	Tomar number	Qty (by zone)	Total at H Cd/sec (for each light)	Zone total at H (Requirement)	Total	Total at any H point Cd/sec (for each light)	Min. value at any point (requirement)	Total	H at any point Cd/sec (for each light)	Min. Value at Any +/- 5o Point from H	Total
Front light bar	465H - 7809 - 0288 - 01 FRONT LIGHT BAR										
A upper	RECT 34CL-RED	2	*	1 000 000	1 592 100	*	10 000	79 070	*	3 500	14 504
	RECT 37CL-RED	4	197 500			*			*		
	RECT 37L-WHITE	2	259 000			39 535			7 252		
	RECT 37SWP-CLEAR	1	284 100			*			*		

* Not applicable ** Waiting for documentation from suppliers




TECHNICAL MANUAL

MX151D - GM



• PART 10 : CERTIFICATIONS - ENVIRONMENTAL CLIMATIC SYSTEMS

EMERGENCY WARNING SYSTEM (E24)

 DEMERS AMBULANCES 28, Richelieu, Beloeil QC (Canada) J3G 4N5	EMERGENCY WARNING SYSTEM (BCAS – E24)
---	---

Zone	Tomar number	Qty (by zone)	Total at H Cd/sec (for each light)	Zone total at H (Requirement)	Total of available data	Total at any H point Cd/sec (for each light)	Min. value at any point (requirement)	Total	H at any point Cd/sec (for each light)	Min. Value at Any +/- 50 Point from H	Total
Rear light bar	REAR LIGHT BAR 465H - 8009 - 0288 - 01										
C upper											
	RECT 34CL-RED	2	*	800 000	943 625	*	10 000	28 072	*	3 500	4 322
	RECT 37CL-RED	2	197 500			*			*		
	RECT 37SWP-CLEAR	1	284 100			*			*		
	RECT 37H13-CLEAR	2	*			*			*		
	RECT 37CL-AMBER	1	193 500			28 072			4322		
	RECT 37SWP-RED	1	71 025			*			*		

* Not applicable ** Waiting for documentation from suppliers

REFERENCES			DATA	CERTIFICATE	
# DEMERS	# WHELEN	DESCRIPTION	PAGE	PAGE	ANNEXE
E503200	90E000ZR	SCENE LIGHT 8-32°	*	*	*
E503298	90F000CR	SCENE LIGHT 0°	1	**	1
E502136	702000DU	7X3 STROBE RED/CLEAR	**	**	1
E503301	70R02FRR (01-0684427CRO)	7X3 LED RED PROG	4	5	1
E502134	AVN1D	AVENGER LIGHT RED/CLEAR	*	*	*
E503368	RSA02ZCR	AMBER LED LIN3 # RSA02ZCR	*	*	*
E503257	90RR5FRR	9 X 7 LIN RED LED	3	6	1

* Not applicable ** Waiting for documentation from suppliers




TECHNICAL MANUAL

MX151D - GM



• PART 10 : CERTIFICATIONS - ENVIRONMENTAL CLIMATIC SYSTEMS

EMERGENCY WARNING SYSTEM (E24)

 DEMERS AMBULANCES <small>28, Richelieu, Beloeil QC (Canada) J3G 4N5</small>	<u>EMERGENCY WARNING SYSTEM</u> (BCAS – E24)
--	--

REFERENCES			DATA	CERTIFICATE	
# DEMERS	# TOMAR	DESCRIPTION	PAGE	PAGE	ANNEXE
E502137	465H-6407-0121 Front	FRONT LIGHT BAR			
	RECT 34CL-R	3x4 LED Red Lense	*	*	*
	RECT 37CL-R	3x7 LED Red Lense	6	6 and 14	2
	RECT 37L-W	3x7 LED White	11	11 and 14	2
	RECT 37SWP-C	3x7 Strobe Clear WP Plug	7	7 and 12	*
E502138	465H-6407-0121 Rear	REAR LIGHT BAR			
	RECT 34CL-R	3x4 LED Red Lense	*	*	*
	RECT 37CL-R	3x7 LED Red Lense	6	6 and 14	2
	RECT 37SWP-W	3x7 Strobe Clear WP Plug	7	7 and 12	*
	RECT 37H13-C	3x7 Halogen Scene 13deg Tilt	*	*	*
	RECT 37CL-A	3x7 LED Amber Lense	11	11 and 14	2
	RECT 37SWP-RED	3x7 Strobe Red WP Plug	7	7 and 12	2

* Not applicable ** Waiting for documentation from suppliers



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• PART 10 : CERTIFICATIONS - ENVIRONMENTAL CLIMATIC SYSTEMS

EMERGENCY WARNING SYSTEM (E24)



ANNEXE 1

REF: PHOTOMETRIC DATA IN CANDELA SECOND MINUTES PER SAE J 2498
INFORMATION

DATE: January 20, 2006 / update 2-14-06 / updated 2-27-06 / updated 10-30-06 / updated 5-6-07

The following is the information you have requested.

CANDELA SECOND MINUTES PER SAE J 2498			
MODEL			
Qty of 1	TOTALS H POINTS	TOTALS @ANY H POINT	TOTALS AT ANY POINT 5° UP & DOWN FROM H
90RR5SRR	461606	11370	7821
90CC5SCR	291223	4925	3186
90CR5FCR (red side)	158386	3493	1880
90CR5FCR (clear side)	143122	3285	1924
70R02SRR	121153	2610	2414
70RC6FCR (red side)	115396	2365	1415
70RC6FCR (clear side)	70120	1542	954
40RR5SRR RED UNDER DEMERS RED LENS	146699	7671	5515
40CC5SCR UNDER DEMERS CLEAR LENS	204102	4082	3024
90F000CR	827747	14079	6178
60F000CR	748171	13258	10454

ROUTE 145, WINTHROP ROAD, CHESTER, CT, USA 06412-0684
TELEPHONE: (860) 526-9504 FAX: (860) 526-6925



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- PART 10 : CERTIFICATIONS - ENVIRONMENTAL CLIMATIC SYSTEMS

EMERGENCY WARNING SYSTEM (E24)

ANNEXE 1



40RR5SRR RED UNDER DEMERS CLEAR LENS	251189	5209	3326
TS200HD CLEAR SIDE	323481	2204	963
TS200HD RED SIDE	98646	669	240

Any further information or descriptions needed please call. Or email me

Phone 860 526-9504 Ext. 2250 / email dkorcak@whelen.com

Dan Korcak
OEM Sales Engineer.
Dan Korcak

ROUTE 145, WINTHROP ROAD, CHESTER, CT, USA 06412-0684
TELEPHONE: (860) 526-9504 FAX: (860) 526-6925



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- PART 10 : CERTIFICATIONS - ENVIRONMENTAL CLIMATIC SYSTEMS

EMERGENCY WARNING SYSTEM (E24)

ANNEXE 1

WHELEN ENGINEERING COMPANY, INC. <i>Engineers for the Emergency Warning Industry</i> OEM Sales Division			Photometric Data Certifications of SAE J2498 and SAE J845 Optical Warning		
CD/SM @H	CD/SM @ ANY H POINT	CD /SM@ ANY±5 DEGREE H POINT	Emergency Warning Lamp	SAE RATING	POWER SUPPLY
631 343	15 221	10 809	90RR5FRR 01-06841378RR0	See attached pdf	Internal



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• PART 10 : CERTIFICATIONS - ENVIRONMENTAL CLIMATIC SYSTEMS

EMERGENCY WARNING SYSTEM (E24)



ANNEXE 1

OEM Sales Division

Standard :	SAE J2498
Apparatus :	Large
Level :	
Right of Way :	
Date:	September 14, 2009

Models

01-0684427CD0 RED SIDE	1
------------------------	---

	Required	Measured
H		132 098
H at any point		2 887
At any point 5° from H		1 501

Models

01-0684427CD0 WHITE SIDE	1
--------------------------	---

	Required	Measured
H		108 710
H at any point		2 710
At any point 5° from H		1 362

Models

01-0684427CR0 RED	1
-------------------	---

	Required	Measured
H		341 093
H at any point		8 989
At any point 5° from H		5 136



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• PART 12 : WHMIS CERTIFICATE - 3M WEATHERSTRIP ADHESIVE

3M WEATHERSTRIP ADHESIVE (E201007)

15 Regulatory Information

WHMIS Classification: B2, D2A, D2B

NOTE:

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

16 Other Information

Reason for Reissue:

The following Sections and topics have been updated or revised:

Section 3 - Hazards Identification - Critical Hazards;

Section 11 - Toxicological Information;

Section 14 - Transportation Information

The information in this Material Safety Data Sheet (MSDS) is believed to be correct as of the date issued. 3M MAKES NO WARRANTIES, EXPRESSED OR IMPLIED, STATUTORY OR OTHERWISE, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OR CONDITION OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR COURSE OF PERFORMANCE OR USAGE OF TRADE. User is responsible for determining whether the 3M product is fit for a particular purpose and suitable for user's method of use or

3M WEATHERSTRIP ADHESIVE (BLACK), P/N 80119 Page 9 of 9

application. Given the variety of factors that can affect the use and application of a 3M product, some of which are uniquely within the user's knowledge and control, it is essential that the user evaluate the 3M product to determine whether it is fit for a particular purpose and suitable for user's method of use or application.

---End---



TECHNICAL MANUAL

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• PART 12 : WHMIS CERTIFICATE - FOAM GLUE

FOAM GLUE (E201030)



Material Safety Data Sheet

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SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: StarStuk™ NS 40 Bulk
MANUFACTURER: NorthStar Chemicals, Inc.
ADDRESS: 19 Smiley Ingram Rd., Cartersville, GA 30120

EMERGENCY PHONE: CHEMTREC 1-800-424-9300

Issue Date: 11-26-07
Supersedes Date: Initial Issue

Document Number: 1000-163

Product Use: Intended Use: Adhesive

SECTION 2: INGREDIENTS

<u>Ingredient</u>	<u>C.A.S. No.</u>	<u>% by Wt.</u>
Hexane	110-54-3	30 - 40%
Toluene	108-88-3	15 - 25%
Rubber/Resin Blend	Trade Secret	15 - 25%
Acetone	67-64-1	15 - 25%
Methyl Ethyl Ketone	78-93-3	1 - 5%

SECTION 3: HAZARDS IDENTIFICATION

3.1 EMERGENCY OVERVIEW

Immediate health, physical, and environmental hazards: Closed containers exposed to heat from fire may build pressure and explode. Extremely flammable liquid and vapor. Contact with aluminum or zinc in a pressurized system may generate hydrogen gas which could create an explosion hazard.

Contains a chemical or chemicals which can cause cancer. May cause target organ effects.

3.2 POTENTIAL HEALTH EFFECTS



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• PART 12 : WHMIS CERTIFICATE - FOAM GLUE

FOAM GLUE (E201030)

Eye Contact:

Moderate Eye Irritation: Signs/symptoms may include redness, swelling, pain, tearing, and blurred or hazy vision.

Skin Contact:

Moderate Skin Irritation: Signs/symptoms may include localized redness, swelling, itching, and dryness.

Inhalation:

Respiratory Tract Irritation: Signs/symptoms may include cough, sneezing, nasal discharge, headache, hoarseness, and nose and throat pain.

Intentional concentration and inhalation may be harmful or fatal.

May be absorbed following inhalation and cause target organ effects.

Ingestion:

Gastrointestinal Irritation: Signs/symptoms may include abdominal pain, stomach upset, nausea, vomiting and diarrhea.

May be absorbed following ingestion and cause target organ effects.

Target Organ Effects:

Central Nervous System (CNS) Depression: Signs/Symptoms may include headache, dizziness, drowsiness, incoordination, nausea, slowed reaction time, slurred speech, giddiness and unconsciousness.

Prolonged or repeated exposure may cause:

Liver Effects: Signs/symptoms may include loss of appetite, weight loss, fatigue, weakness, abdominal tenderness and jaundice.

Kidney/Bladder Effects: Signs/symptoms may include changes in urine production, abdominal or lower back pain, increased protein in urine, increased blood urea nitrogen (BUN), blood in urine, and painful urination

SECTION 4: FIRST AID MEASURES

4.1 FIRST AID PROCEDURES

The following first aid recommendations are based on an assumption that appropriate personal and industrial hygiene practices are followed:

Eye Contact: Flush eyes with large amounts of water. If signs/symptoms persist, get medical attention.

Skin Contact: Remove contaminated clothing and shoes. Immediately flush skin with large amounts of water. Get medical attention. Wash contaminated clothing and clean shoes before reuse.

Inhalation: Remove person to fresh air. If signs/symptoms develop, get medical attention.

If Swallowed: Do not induce vomiting unless instructed to do so by medical personnel. Give victim two glasses of water. Never give anything by mouth to an unconscious person. Get medical attention.

SECTION 5: FIRE FIGHTING MEASURE

5.1 FLAMMABLE PROPERTIES

Flammability	Flammable Liquid
Auto ignition temp	Not Established
Flash Point	<20 degrees F (Test method: Tagliabue Closed Cup)
Flammable Limits-LEL	1%
Flammable Limits-UEL	12.8



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• PART 12 : WHMIS CERTIFICATE - FOAM GLUE

FOAM GLUE (E201030)

5.2 EXTINGUISHING MEDIA

Use fire extinguishers with class B extinguishing agents (e.g., dry chemical, carbon dioxide)

5.3 PROTECTION OF FIRE FIGHTERS

Special Fire Fighting Procedures: Wear full protective equipment (Bunker Gear) and a self-contained breathing apparatus (SCBA).

Unusual Fire and Explosion Hazards: Flammable liquid and vapor. Closed containers exposed to heat from fire may build pressure and explode. Vapors may travel long distances along the ground or floor to an ignition source and flash back.

Note: See STABILITY AND REACTIVITY (SECTION 10) for hazardous combustion and thermal decomposition.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Accidental Release Measures: Evacuate unprotected and untrained personnel from hazard area. The spill should be cleaned up by qualified personnel. Remove all ignition sources such as flames, smoking materials, and electrical spark sources. Use only non-sparking tools. Ventilate the area with fresh air. For large spill, or spills in confined spaces, provide mechanical ventilation to disperse or exhaust vapors, in accordance with good industrial hygiene practice. Warning! A motor could be an ignition source and could cause flammable gases or vapors in the spill area to burn or explode. Contain spill. For larger spills, cover drains and build dikes to prevent entry into sewer systems or bodies of water. Cover spill area with a fire-extinguishing foam. An aqueous film forming foam (AFFF) is recommended. Working from around the edges of the spill inward, cover with bentonite, vermiculite, or commercially available inorganic absorbent material. Mix in sufficient absorbent until it appears dry. Remember, adding an absorbent material does not remove a toxic, corrosivity or flammability hazard. Collect as much of the spilled material as possible using non-sparking tools. Clean up residue with an appropriate solvent selected by a qualified and authorized person. Ventilate the area with fresh air. Read and follow safety precautions on the solvent label and MSDS. Collect the resulting residue containing solution. Place in a metal container approved for transportation by appropriate authorities. Seal the container. Dispose of collected mater as soon as possible.

In the event of a release of this material, the user should determine if the release qualifies as reportable according to local, state, and federal regulations.

SECTION 7: HANDLING AND STORAGE

7.1 HANDLING

Keep away from heat, sparks, open flame, pilot light and other sources of ignition. Ground containers securely when transferring contents. Wear low static or properly grounded shoes. Do not spray near flames or sources of ignition. Avoid breathing of vapors, mists or spray. Avoid static discharge. Avoid eye contact with vapors, mists, or spray. Avoid contact with oxidizing agents.

7.2 STORAGE

Store away from acids. Store away from heat. Store out of direct sunlight. Keep container tightly closed. Store away from oxidizing agents.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 ENGINEERING CONTROLS

Use with appropriate local exhaust ventilation. Provide appropriate local exhaust ventilation on open containers. Use in an enclosed process area is recommended. Do not use in a confined area or areas with little or no air movement. Use general dilution ventilation and/or local exhaust ventilation to control airborne exposures to below Occupational Exposure Limits and/or control mist, vapor, or spray. If ventilation is not adequate, use protection equipment.



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• PART 12 : WHMIS CERTIFICATE - FOAM GLUE

FOAM GLUE (E201030)

8.2 PERSONAL PROTECTIVE EQUIPMENT (PPE)

8.2.1 Eye/Face protection

Avoid eye contact with vapors, mists, or spray.

The following eye protection(s) are recommended: Safety Glasses with side shields. Indirect Vented Goggles.

8.2.2 Skin Protection

Avoid skin contact.

Select and use gloves and/or protective clothing to prevent skin contact based on the results of an exposure assessment. Consult with your glove and/or protective clothing manufacturer for selection of appropriate compatible materials.

Gloves made from the following material(s) are recommended: Polyvinyl Alcohol (PVA), Polyethylene/Ethylene Vinyl Alcohol.

8.2.3 Respiratory Protection

Avoid breathing of vapors, mists or spray.

Conduct air monitoring to determine adequacy of ventilation and the need for respiratory protective equipment. If ventilation is inadequate select one of the following NIOSH approved respirators based on airborne concentration of contaminants and in accordance with OSHA regulations: Half facepiece or fullface pressure demand self-contained breathing apparatus. Consult your personal protection supplier for further information.

8.2.4 Prevention of Swallowing

Do not eat, drink or smoke when using this product. Wash exposed areas thoroughly with soap and water.

8.3 EXPOSURE GUIDELINES

Ingredient	Authority	Type	Limit	Additional Information
Acetone	ACGIH	TWA	500 ppm	Table A4
Acetone	ACGIH	STEL	750 ppm	Table A4
Acetone	OSHA	TWA, Vacated	750 ppm	
Acetone	OSHA	TWA	1000 ppm	Table Z-1
Acetone	OSHA	STEL, Vacated	1000 ppm	
Hexane	ACGIH	TWA	50 ppm	Skin Notation*
Hexane	OSHA	TWA, Vacated	50 ppm	Table Z-1A
Hexane	OSHA	TWA	500 ppm	Table Z-1A
Methyl Ethyl Ketone	ACGIH	TWA	200 ppm	
Methyl Ethyl Ketone	ACGIH	STEL	300 ppm	
Methyl Ethyl Ketone	OSHA	TWA	200 ppm	Table Z-1A
Methyl Ethyl Ketone	OSHA	STEL	300 PPM	Table Z-1A
Toluene	CMRG	STEL	75 ppm	Skin Notation*
Toluene	OSHA	TWA, Vacated	100 ppm	
Toluene	OSHA	STEL, Vacated	150 ppm	
Toluene	OSHA	TWA	200 ppm	Table Z-2
Toluene	OSHA	CEIL	300 ppm	Table Z-2

*Substance(s) refer to the potential contribution to the overall exposure by the cutaneous route including mucous membrane and eye, either by airborne or, more particularly, by direct contact with the substance. Vehicles can alter skin absorption.

VAC Vacated PEL: Vacated Permissible Exposure Limits (PEL) are enforced as the OSHA PEL in some states. Check with your local regulatory agency.

SOURCES OF EXPOSURE LIMIT DATA:

ACGIH:	American Conference of Governmental Industrial Hygienists
AIHA:	American Industrial Hygiene Association Workplace Environmental Exposure Level (WEEL)
CMRG:	Chemical Manufacturer Recommended Guideline
EPA:	Environmental Protection Agency
IARC:	International Agency for the Research on Cancer
NIOSH:	National Institute for Occupational Safety and Health
NTP:	National Toxicology Program
OSHA:	Occupational Safety and Health Administration



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• PART 12 : WHMIS CERTIFICATE - FOAM GLUE

FOAM GLUE (E201030)

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Odor, Color:	Solvent odor, clear
Flash Point	<20 degrees F
Boiling point	133 to 231 degrees F
Vapor Density	Not Established
Vapor Pressure	Not Established
Specific Gravity	.78 to .82gms/cc (6.5 to 6.9 lbs/gal)
Solubility in Water	Negligible
Volatile Organic Compounds	495 g/l

SECTION 10: STABILITY AND REACTIVITY

Stability: Stable.

Materials and Conditions to Avoid: Sparks and/or flames

Hazardous Polymerization: Hazardous polymerization will not occur.

Hazardous Decomposition or By-Products

<u>Substances</u>	<u>Condition</u>
Hydrocarbonws	During Combustion
Carbon monoxide	During Combustion
Carbon dioxide	During Combustion

SECTION 11: TOXICOLOGICAL INFORMATION

Please refer to Section 3.2 for more Toxicological Information.

SECTION 12: ECOLOGICAL INFORMATION

Not determined.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste Disposal Method: Incinerate in a permitted hazardous waste incinerator. As a disposal alternative, dispose of waste product in a permitted hazardous waste facility.

Since regulations vary, consult applicable regulations or authorities before disposal.

SECTION 14: TRANSPORT INFORMATION

Please contact the emergency numbers listed on the first page of the MSDS for Transportation Information for this material.



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• PART 12 : WHMIS CERTIFICATE - FOAM GLUE

FOAM GLUE (E201030)

SECTION 15: REGULATORY INFORMATION

US FEDERAL REGULATIONS

311/312 Hazard Categories:

Fire Hazard - Yes Pressure Hazard - No Reactivity Hazard - No Immediate Hazard - Yes Delayed Hazard - Yes

Section 313 Toxic Chemicals subject to the reporting requirements of that section and 40 CFR part 372 (EPCRA):

<u>Ingredient (Category if applicable)</u>	<u>C.A.S. No.</u>	<u>% by Wt.</u>
Hexane	110-54-3	30 - 40%
Toluene	108-88-3	15 - 25%
Methyl Ethyl Ketone	78-93-3	1 - 5%

STATE REGULATIONS CALIFORNIA PROPOSITION 65

<u>Ingredient (Category if applicable)</u>	<u>C.A.S. No.</u>	<u>Classification.</u>
Toluene	108-88-3	*Developmental Toxin

**WARNING: contains a chemical which can cause cancer.

SECTION 16: OTHER INFORMATION

NFPA Hazard Classification

Health: 2

Flammability: 3

Reactivity: 0

Special Hazard: None

National Fire Protection Association (NFPA) hazard ratings are designed for use by emergency response personnel to address the hazards that are presented by short-term, acute exposure to a material under conditions of fire, spill, or similar emergencies. Hazard ratings are primarily based on the inherent physical and toxic properties of the material but also include the toxic properties of combustion or decomposition products that are known to be generated in significant quantities.

No revision information is available.

DISCLAIMER: This information in this Material Safety Data Sheet (MSDS) is believed to be correct as of the date issued.

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MSDS are available at www.northstarchemicals.com



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• PART 12 : WHMIS CERTIFICATE - URETHANE TAPE 1/8" X 1/2" X 50'

URETHANE TAPE 1/8" X 1/2" X 50' (E204041)

Revised: 6/23/08

Material Safety Data Sheet

I. PRODUCT IDENTIFICATION

Name: This MSDS applies to all **Armacell (Monarch®)** cellular and custom non-expanded synthetic rubber and / or plastic and Evalite® brand products manufactured at the Armacell Spencer, WV location.

Description: Expanded, Closed-cell, Open or Semi open cell foams containing Polyvinyl Chloride/ Nitrile-Butadiene Rubber (PVC/NBR) or Nitrile-Butadiene Rubber (NBR) or Epichlorohydrin (ECH) or Hydrogenated Acrylonitrile Butadiene (HNBR) or Hypalon or Neoprene (CR) or Ethylene-propylene-dienemethylene (EPDM) or Ethylene Vinyl Acetate / Polyethylene (EVA/PE) or Styrene-butadiene rubber (SBR) or blends of aforementioned compounds. Available in blocks & sheets (Solving & EVA/PE only) at various dimensions. Custom non-expanded synthetic rubber and or plastic materials (example: Cork) are also included in the scope of this document.

II. DEPARTMENT OF TRANSPORTATION INFORMATION

Shipping name: Not classified. Hazard Class: N/A ID # N/A

III. HMIS (0 = minimal hazard; 4 = severe hazard)
Health = 0 Flammability = 1 Reactivity = 0

IV. PRODUCT CONTENT

This product is classified as an "article" according to Title 29 of the Code of Federal Regulations, OSHA Part 1910.1200©, page 463.

"Article means a manufactured item other than a fluid or particle: (i) which is formed to a specific shape or design during manufacture; (ii) which has end use function(s) dependent in whole or in part upon its shape or design during end use; and (iii) which under normal conditions of use does not release more than very small quantities, e.g. minute or trace amounts of a hazardous chemical (as determined under paragraph (d) of this section), and does not pose a physical hazard or health risk to employees."

This product does NOT contain asbestos or polychlorinated biphenyls.

V. HAZARDOUS INGREDIENTS

(Chemical Identity: Common Name)
None

C.A.S. No.

%

OSHA PEL

ACGIH TVL

VI. PHYSICAL DATA

APPEARANCE AND COLOR: Black, dark gray, natural or white and other colors. BOILING POINT (°F): N/A. VAPOR PRESSURE (mm Hg @ 20°C): N/A. VAPOR DENSITY (Air = 1): N/A. SOLUBILITY IN WATER: N/A. SPECIFIC GRAVITY (H₂O=1): N/A. PERCENT VOLATILE BY WEIGHT (30 min. @275°F): N/A. EVAPORATION RATE (Butyl Acetate=1) : N/A. pH: N/A VOC: N/A.

VII. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: N/A. RANGE: LEL = N/A. UEL = N/A. EXTINGUISHING MEDIA: Water. SPECIAL FIRE FIGHTING PROCEDURES: Protect fire fighters from toxic products of combustion by wearing self-contained breathing apparatus. UNUSUAL FIRE AND EXPLOSION HAZARDS: None.

VIII. HEALTH HAZARD DATA

PRIMARY ROUTE (S) OF ENTRY: N/A. TARGET ORGANS: N/A. EFFECTS OF OVEREXPOSURE: SKIN AND EYES: N/A. INHALATION: N/A. CARCINOGENICITY: NTP: No IARC Monographs: No OSHA Regulated: No. MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE N/A. FIRST AID PROCEDURES: SKIN AND EYES: N/A. INHALATION N/A. INGESTION N/A.

IX. REACTIVITY DATA

STABILITY N/A. INCOMPATIBILITY: N/A

Armacell (Monarch®)
Cellular &
Non-Expanded rubber
and / or plastic &
Evalite® products
Sheets and Blocks

Prepared on 6/23/08
Replaces all previous versions

Armacell LLC
P.O. Box 1038
7600 Oakwood Street Extension
Mebane, NC 27302
(919) 304-3846

HAZARDOUS DECOMPOSITION PRODUCTS: N/A
HAZARDOUS POLYMERIZATION: N/A

X. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: N/A. WASTE DISPOSAL METHOD: Dispose of container and any unused contents in accordance with Federal, State and Local Waste Disposal Regulations

XI. SPECIAL HANDLING AND USE INFORMATION

VENTILATION: N/A.
RESPIRATORY PROTECTION N/A
SKIN AND EYE PROTECTION: N/A

XII. SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING & STORAGE: N/A. OTHER PRECAUTIONS: N/A
WORK SITE ENVIRONMENT: N/A.

The information presented herein is supplied as a guide to those who handle or use this product. Safe work practices must be employed when working with any materials. It is important that the end user makes a determination regarding the adequacy of the safety procedures employed during the use of this product.

N/A -not applicable or not available
N/K - none known or not known



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• PART 12 : WHMIS CERTIFICATE - ANTI-SEIZE LUBRICANT

ANTI-SEIZE LUBRICANT (E205001)

Material Safety Data Sheet



Revision Number: 003.3

Issue date: 05/27/2009

1. PRODUCT AND COMPANY IDENTIFICATION

Product name: Silver Grade Anti-Seize Lubricant
Product use: Lubricant
Company address:
Henkel Canada Corporation
2225 Meadowpine Boulevard
Mississauga, Ontario L5N 7P2

IDH number: 235005
Item number: 76764
Region: Canada
Contact information:
Telephone: 905.814.6511
Emergency telephone: 905.814.6511
Internet: www.henkelna.com

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Physical state: Paste
Color: Silver
Odor: Hydrocarbon-like

WHMIS hazard class: D.2.A, D.2.B

WARNING: CAUSES EYE, SKIN AND RESPIRATORY TRACT IRRITATION.

Relevant routes of exposure: Skin, Inhalation, Eyes

Potential Health Effects

Inhalation: Moderate respiratory tract irritation.
Skin contact: Moderate skin irritation.
Eye contact: Moderate eye irritation.
Ingestion: Principal hazard of ingestion is aspiration into the lungs and subsequent pneumonitis. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea.

Existing conditions aggravated by exposure: Eye, skin, and respiratory disorders.

See Section 11 for additional toxicological information.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Hazardous components	CAS NUMBER	%
Distillates (petroleum), hydrotreated heavy naphthenic	64742-52-5	10 - 30
Graphite	7782-42-5	10 - 30
Calcium oxide	1305-78-8	10 - 30
Mineral oil light naphthenic hydrotreat. <3% DMSO	64742-53-6	10 - 30
Aluminum not powder, dust or fume	7429-90-5	5 - 10
Distillates (petroleum), straight-run middle	64741-44-2	1 - 5
Quartz (SiO ₂)	14808-60-7	0.1 - 1

4. FIRST AID MEASURES

Inhalation: Move to fresh air. If symptoms persist, seek medical advice.

Skin contact: If symptoms develop and persist, get medical attention. Wash with soap and water.

Eye contact: Immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention.

Ingestion: Do not induce vomiting. Get immediate medical attention.

IDH number: 235005

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Product name: Silver Grade Anti-Seize Lubricant



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• PART 12 : WHMIS CERTIFICATE - ANTI-SEIZE LUBRICANT

ANTI-SEIZE LUBRICANT (E205001)

5. FIRE FIGHTING MEASURES

Flash point:	> 93 °C (> 199.4 °F)
Autoignition temperature:	Not determined
Flammable/Explosive limits - lower:	Not available
Flammable/Explosive limits - upper:	Not available
Extinguishing media:	Dry chemical. Carbon dioxide. Foam.
Special firefighting procedures:	None
Unusual fire or explosion hazards:	None
Hazardous combustion products:	Oxides of carbon. Oxides of nitrogen.
Sensitivity to Mechanical Impact:	Not available
Sensitivity to static discharge:	Not available

6. ACCIDENTAL RELEASE MEASURES

Use personal protection recommended in Section 8, isolate the hazard area and deny entry to unnecessary and unprotected personnel.

Environmental precautions:	Prevent further leakage or spillage if safe to do so.
Clean-up methods:	Store in a partly filled, closed container until disposal. Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Remove all sources of ignition.

7. HANDLING AND STORAGE

Handling:	Keep away from heat, spark and flame. Avoid skin and eye contact.
Storage:	Keep in a cool, well ventilated area.

For information on product shelf life contact Henkel Canada Customer Service at (905) 814-6511.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Employers should complete an assessment of all workplaces to determine the need for, and selection of, proper exposure controls and protective equipment for each task performed.



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• PART 12 : WHMIS CERTIFICATE - ANTI-SEIZE LUBRICANT

ANTI-SEIZE LUBRICANT (E205001)

Hazardous components	ACGIH TLV	OSHA PEL	AIHA WEEL	OTHER
Distillates (petroleum), hydrotreated heavy naphthenic	5 mg/m3 TWA mist 10 mg/m3 STEL mist	5 mg/m3 TWA mist	None	None
Graphite	2 mg/m3 TWA Respirable fraction.	5 mg/m3 TWA Respirable fraction. 15 mg/m3 TWA Total dust. 15 MPPCF TWA	None	None
Calcium oxide	2 mg/m3 TWA	5 mg/m3 TWA	None	None
Mineral oil light naphthenic hydrotreat. <3% DMSO	5 mg/m3 TWA Mist. 10 mg/m3 STEL Mist.	500 ppm (2,000 mg/m3) TWA	None	None
Aluminum not powder, dust or fume	1 mg/m3 TWA Respirable fraction.	15 mg/m3 TWA (as Al) Total dust. 5 mg/m3 TWA (as Al) Respirable dust.	None	None
Distillates (petroleum), straight-run middle	5 mg/m3 TWA mist 10 mg/m3 STEL mist	5 mg/m3 TWA mist	None	None
Quartz (SiO ₂)	0.025 mg/m3 TWA Respirable fraction.	2.4 MPPCF TWA Respirable. 0.1 mg/m3 TWA Respirable. 0.3 mg/m3 TWA Total dust.	None	None

Engineering controls:

Use local ventilation if general ventilation is insufficient to maintain vapor concentration below established exposure limits.

Respiratory protection:

Use NIOSH approved respirator if there is potential to exceed exposure limit(s).

Eye/face protection:

Safety goggles or safety glasses with side shields.

Skin protection:

Neoprene or oil resistant gloves.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state:	Paste
Color:	Silver
Odor:	Hydrocarbon-like
Odor threshold:	Not available
pH:	Not applicable
Vapor pressure:	Not available
Boiling point/range:	Not available
Melting point/ range:	Not available
Specific gravity:	1.25
Vapor density:	Not available
Flash point:	> 93 °C (> 199.4 °F)
Flammable/Explosive limits - lower:	Not available
Flammable/Explosive limits - upper:	Not available
Autoignition temperature:	Not determined
Evaporation rate:	Not available
Solubility in water:	Insoluble
Partition coefficient (n-octanol/water):	Not determined
VOC content:	12.96 %; 162 g/l

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Product name: Silver Grade Anti-Seize Lubricant



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• PART 12 : WHMIS CERTIFICATE - ANTI-SEIZE LUBRICANT

ANTI-SEIZE LUBRICANT (E205001)

10. STABILITY AND REACTIVITY

Stability:	Stable
Hazardous reactions:	Will not occur.
Hazardous decomposition products:	None reasonably foreseeable.
Incompatible materials:	Strong oxidizing agents.
Conditions to avoid:	None known

11. TOXICOLOGICAL INFORMATION

Toxicologically synergistic products:	Not available
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Refer to the following for Irritancy of Product, Sensitization to Product, Carcinogenicity, Reproductive Toxicity, Teratogenicity, and Mutagenicity.

Hazardous components	NTP Carcinogen	IARC Carcinogen	OSHA Carcinogen (Specifically Regulated)	ACGIH Carcinogen
Distillates (petroleum), hydrotreated heavy naphthenic	No	No	No	No
Graphite	No	No	No	No
Calcium oxide	No	No	No	No
Mineral oil light naphthenic hydrotreat. <3% DMSO	No	No	No	No
Aluminum not powder, dust or fume	No	No	No	Group A4
Distillates (petroleum), straight-run middle	No	No	No	No
Quartz (SiO ₂)	Known carcinogen.	Group 1	No	Group A2

Hazardous components	LD50s and LC50s	Health Effects/Target Organs
Distillates (petroleum), hydrotreated heavy naphthenic	None	Irritant
Graphite	None	Lung
Calcium oxide	None	Irritant, Corrosive, Eyes
Mineral oil light naphthenic hydrotreat. <3% DMSO	None	Irritant
Aluminum not powder, dust or fume	None	Central nervous system, Irritant, Lung
Distillates (petroleum), straight-run middle	None	Irritant
Quartz (SiO ₂)	None	Immune system, Lung, Some evidence of carcinogenicity

12. ECOLOGICAL INFORMATION

Ecological information:	Not available
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13. DISPOSAL CONSIDERATIONS

Information provided is for unused product only.

Recommended method of disposal:	Follow all local, state, federal and provincial regulations for disposal.
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14. TRANSPORT INFORMATION

Canada Transportation of Dangerous Goods - Ground

Proper shipping name:	Not regulated
Hazard class or division:	None
Identification number:	None
Packing group:	None

IDH number: 235005

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Product name: Silver Grade Anti-Seize Lubricant



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ANTI-SEIZE LUBRICANT (E205001)

International Air Transportation (ICAO/IATA)

Proper shipping name:	Not regulated
Hazard class or division:	None
Identification number:	None
Packing group:	None

Water Transportation (IMO/IMDG)

Proper shipping name:	Not regulated
Hazard class or division:	None
Identification number:	None
Packing group:	None

15. REGULATORY INFORMATION

Canada Regulatory Information

CEPA DSL/NDSL Status:	All components are listed on or are exempt from listing on the Canadian Domestic Substances List.
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United States Regulatory Information

TSCA 8 (b) Inventory Status:	All components are listed or are exempt from listing on the Toxic Substances Control Act Inventory.
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16. OTHER INFORMATION

This material safety data sheet contains changes from the previous version in sections: Reviewed MSDS. Reissued with new date.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulation (CPR), and the MSDS contains all the information required by the CPR.

Prepared by: C.J. Michaels, Manager, Regulatory Affairs

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TECHNICAL MANUAL

MX151D - GM



• PART 12 : WHMIS CERTIFICATE - BATTERY TERM COATING

BATTERY TERM COATING (E802004)

valspar

Material Safety Data Sheet

1. PRODUCT AND COMPANY IDENTIFICATION

Product Identification

Product ID: 470.0000278.076
Product Name: 278 BATTERY TERM COATING 6U
Product Use: Paint product.
Print date: 30/Jun/2009
Revision Date: 29/Jun/2009

Company Identification

The Valspar Corporation - Architectural Coatings Division
1000 Lake Road
Medina, OH 44256

Manufacturer's Phone: 1-330-725-4511

24-Hour Medical Emergency Phone: 1-888-345-5732

2. HAZARDS IDENTIFICATION

Primary Routes of Exposure:

Inhalation
Ingestion
Skin absorption

Eye Contact:

- Severe eye irritation
- Risk of serious damage to eyes.

Skin Contact:

- Causes skin irritation.
- Dermatitis
- May cause defatting of the skin.
- Can be absorbed through skin.

Ingestion:

- Irritation of the mouth, throat, and stomach.
- Aspiration hazard if swallowed - can enter lungs and cause damage.

Inhalation:

- Causes respiratory tract irritation.
- Harmful by inhalation.
- Asphyxia

Product ID: 470.0000278.076

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• PART 12 : WHMIS CERTIFICATE - BATTERY TERM COATING

BATTERY TERM COATING (E802004)

Acute Other Health Effects:

- Intentional misuse by deliberately concentrating and inhaling the contents may be harmful or fatal.
- May cause frostbite

Target Organ and Other Health Effects:

- Kidney injury may occur.
- Causes headache, drowsiness or other effects to the central nervous system.
- Cardiac arrhythmias
- Blood disorders
- Liver injury may occur.

This product contains ingredients that may contribute to the following potential chronic health effects:

- Notice: Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents may be harmful or fatal.

Teratogens:

- May cause birth defects.

3. COMPOSITION / INFORMATION ON HAZARDOUS INGREDIENTS

Ingredient Name CAS-No.	Approx. Weight %	Chemical Name
DIMETHYL KETONE- EXEMPT SOLVENT 67-64-1	40 - 45	Acetone
PROPANE 74-98-6	10 - 15	Propane
BUTANE 106-97-8	5 - 10	Butane
XYLENE 1330-20-7	5 - 10	Xylenes (o-, m-, p- isomers)
ISOBUTYL ACETATE 110-19-0	5 - 10	Isobutyl acetate
ACETIC ACID ESTER 88230-35-7	5 - 10	Hexanol, acetate, branched and linear
ETHYLBENZENE 100-41-4	1 - 5	Ethyl benzene
TOLUENE 108-88-3	1 - 5	Toluene

If this section is blank there are no hazardous components per OSHA guidelines.

4. FIRST AID MEASURES

Eye Contact:

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. If easy to do, remove contact lenses. If medical assistance is not immediately available, flush an additional 15 minutes. Get medical attention immediately.

Skin Contact:

Remove contaminated clothing and shoes. Wash off immediately with plenty of water for at least 15 minutes. Get medical attention, if symptoms develop or persist.

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• PART 12 : WHMIS CERTIFICATE - BATTERY TERM COATING

BATTERY TERM COATING (E802004)

Ingestion:

Rinse mouth with water. Give one or two glasses of water. Only induce vomiting at the instruction of medical personnel. Do NOT induce vomiting. Never give anything by mouth to an unconscious person. If vomiting occurs, keep head lower than hips to prevent aspiration. Get medical attention immediately.

Inhalation:

Move injured person into fresh air and keep person calm under observation. Get medical attention immediately. For breathing difficulties, oxygen may be necessary. If breathing stops, provide artificial respiration. Do not give direct mouth-to-mouth resuscitation if inhaled. To protect rescuer, use air-viva, oxy-viva or one-way mask. Resuscitate in a well-ventilated area.

Medical conditions aggravated by exposure:

Any respiratory or skin condition.

5. FIRE FIGHTING MEASURES

Flash point (Fahrenheit):	-31°F (-35°C)
Lower explosive limit:	1 %
Upper explosive limit:	13 %
Autoignition temperature:	not determined -°F (°C)
Sensitivity to impact:	no
Sensitivity to static discharge:	Subject to static discharge hazards. Please see bonding and grounding information in Section 7.
Hazardous combustion products:	See Section 10.

Unusual fire and explosion hazards:

None known.

Extinguishing media:

Carbon dioxide, dry chemical, foam and/or water fog.

Fire fighting procedures:

Firefighters should be equipped with self-contained breathing apparatus and turn out gear. Keep containers and surroundings cool with water spray.

6. ACCIDENTAL RELEASE MEASURES

Action to be taken if material is released or spilled:

Ventilate the area. Avoid breathing dust or vapor. Use self-containing breathing apparatus or airmask for large spills in a confined area. Wipe, scrape or soak up in an inert material and put in a container for disposal. See section 7, "Handling and Storage", for proper container and storage procedures. Remove all sources of ignition. Soak up with inert absorbent material. Use only non-sparking tools. Avoid contact with eyes.

7. HANDLING AND STORAGE

Precautions to be taken in handling and storage:

Keep away from heat, sparks and open flame. - No smoking. Keep container closed when not in use. Do not store above 120 degrees F. (49 degrees C). Based on flash point and vapor pressure, suitable storage should be provided in accordance with OSHA regulation 1910.106, Ontario OH&S regulation 851 section 22. Empty containers may contain product residue, including flammable or explosive vapors. Do not cut, puncture or weld on or near container. All label warnings must be observed until the container has been commercially cleaned or reconditioned. If the product is used near or above the flashpoint, an ignition hazard may be present. Activities, uses, or operations which liberate vapor (such as mixing or free fall of liquids) may also present an ignition hazard. Please ensure containers and other interconnected equipment are properly bonded and grounded at all times.

8. PERSONAL PROTECTIVE EQUIPMENT AND EXPOSURE CONTROLS

Personal Protective Equipment

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BATTERY TERM COATING (E802004)

Eye and face protection:

Wear chemical goggles with splash shields or face shield. Contact lenses should not be worn when working with chemicals because contact lenses may contribute to the severity of an eye injury in case of exposure.

Skin protection:

Appropriate chemical resistant gloves should be worn.

Other Personnel Protection Data:

To prevent skin contact wear protective clothing covering all exposed areas. Ensure that eyewash stations and safety showers are close to the workstation location.

Respiratory protection:

If exposure cannot be controlled below applicable limits, use the appropriate NIOSH approved respirator such as an air purifying respirator with organic vapor cartridge and dust/mist filter. Consult the respirator manufacturer's literature to ensure that the respirator will provide adequate protection. Read and follow all respirator manufacturer's instructions.

Ventilation

Use only in well-ventilated areas. Ensure adequate ventilation, especially in confined areas. Ovens used for curing should contain a fresh air purge to prevent vapours from accumulating and creating a possible explosive mixture. Where the product is used in a hazardous classified area, use explosion-proof electrical/ventilating/lighting/equipment.

Exposure Guidelines

OSHA Permissible Exposure Limits (PEL's)

Ingredient Name CAS-No.	Approx. Weight %	TWA (final)	Ceilings limits (final)	Skin designations
DIMETHYL KETONE- EXEMPT SOLVENT 67-64-1	40 - 45	2400 mg/m ³ 1000 ppm		
PROPANE 74-98-6	10 - 15	1800 mg/m ³ 1000 ppm		
XYLENE 1330-20-7	5 - 10	435 mg/m ³ 100 ppm		
ISOBUTYL ACETATE 110-19-0	5 - 10	700 mg/m ³ 150 ppm		
ETHYLBENZENE 100-41-4	1 - 5	435 mg/m ³ 100 ppm		
TOLUENE 108-88-3	1 - 5	200 ppm	300 ppm	

ACGIH Threshold Limit Value (TLV's)

Ingredient Name CAS-No.	Approx. Weight %	TWA	STEL	Ceiling limits	Skin designations
DIMETHYL KETONE- EXEMPT SOLVENT 67-64-1	40 - 45	500 ppm	750 ppm		
PROPANE 74-98-6	10 - 15	1000 ppm			
BUTANE 106-97-8	5 - 10	1000 ppm			
XYLENE 1330-20-7	5 - 10	100 ppm	150 ppm		
ISOBUTYL ACETATE 110-19-0	5 - 10	150 ppm			
ETHYLBENZENE 100-41-4	1 - 5	100 ppm	125 ppm		

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Ingredient Name CAS-No.	Approx. Weight %	TWA	STEL	Ceiling limits	Skin designations
TOLUENE 108-88-3	1 - 5	20 ppm			Can be absorbed through the skin.

9. PHYSICAL PROPERTIES

Odor:	Normal for this product type.
Physical State:	Aerosol
pH:	not determined
Vapor pressure:	NOT DETERMINED mmHg @ 68°F (20°C)
Vapor density (air = 1.0):	5.0
Boiling point:	not determined
Solubility in water:	not determined
Coefficient of water/oil distribution:	not determined
Density (lbs per US gallon):	6.31
Specific Gravity:	.76
Evaporation rate (butyl acetate = 1.0):	5.6
Flash point (Fahrenheit):	-31°F (-35°C)
Lower explosive limit:	1 %
Upper explosive limit:	13 %
Autoignition temperature:	not determined -°F (°C)

10. STABILITY AND REACTIVITY

Stability:	Stable under normal conditions.
Conditions to Avoid:	Heat.
Incompatibility:	Strong oxidizing agents
Hazardous Polymerization:	None anticipated.
Hazardous Decomposition Products:	Carbon monoxide and carbon dioxide.

Sensitivity to static discharge:	Subject to static discharge hazards. Please see bonding and grounding information in Section 7.
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11. TOXICOLOGICAL INFORMATION

Ingredient Name CAS-No.	Approx. Weight %	NIOSH - Selected LD50s and LC50s
DIMETHYL KETONE- EXEMPT SOLVENT 67-64-1	40 - 45	Inhalation LC50 Rat : 50100 mg/m ³ /8H Inhalation LC50 Mouse : 44 gm/m ³ /4H Oral LD50 Rat : 5800 mg/kg Oral LD50 Mouse : 3 gm/kg
BUTANE 106-97-8	5 - 10	Inhalation LC50 Rat : 658 gm/m ³ /4H Inhalation LC50 Mouse : 680 gm/m ³ /2H
XYLENE 1330-20-7	5 - 10	Inhalation LC50 Rat : 5000 ppm/4H Oral LD50 Rat : 4300 mg/kg Dermal LD50 Rabbit : >1700 mg/kg
ISOBUTYL ACETATE 110-19-0	5 - 10	Oral LD50 Rat : 13400 mg/kg Dermal LD50 Rabbit : >17400 mg/kg
ETHYLBENZENE 100-41-4	1 - 5	Oral LD50 Rat : 3500 mg/kg Dermal LD50 Rabbit : 17800 uL/kg

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Ingredient Name CAS-No.	Approx. Weight %	NIOSH - Selected LD50s and LC50s
TOLUENE 108-88-3	1 - 5	Inhalation LC50 Rat : 49 gm/m ³ /4H Inhalation LC50 Mouse : 400 ppm/24H Oral LD50 Rat : 636 mg/kg Dermal LD50 Rabbit : 14100 uL/kg

Mutagens/Teratogens/Carcinogens:

May cause birth defects.

Contains ethylbenzene, which has been determined by NTP to be an animal carcinogen with no known relevance to humans. IARC has classified ethylbenzene as possibly carcinogenic to humans (2b) on the basis of sufficient evidence of carcinogenicity in laboratory animals but inadequate evidence of cancer in humans.

Ingredient Name CAS-No.	Approx. Weight %	California Prop 65 - Developmental Toxicity	California Prop 65 - Reproductive (Male)
TOLUENE 108-88-3	1 - 5	Listed: January 1, 1991 Developmental toxin.	

Ingredient Name CAS-No.	Approx. Weight %	California Prop 65 - Reproductive (Female)	California Prop 65 - Carcinogen
ETHYLBENZENE 100-41-4	1 - 5		Listed: June 11, 2004 Carcinogenic.

Ingredient Name CAS-No.	Approx. Weight %	IARC Group 1 - Human Evidence	IARC Group 2A - Limited Human Data	IARC Group 2B - Sufficient Animal Data
ETHYLBENZENE 100-41-4	1 - 5			Monograph 77, 2000

Ingredient Name CAS-No.	Approx. Weight %	NTP Known Carcinogens	NTP Suspect Carcinogens	NTP Evidence of Carcinogenicity
ETHYLBENZENE 100-41-4	1 - 5			male rat-clear evidence; female rat-some evidence; male mice- some evidence; female mice-some evidence
TOLUENE 108-88-3	1 - 5			MALE RAT - NO EVIDENCE; FEMALE RAT - NO EVIDENCE; MALE MICE - NO EVIDENCE; FEMALE MICE - NO EVIDENCE.

Ingredient Name CAS-No.	Approx. Weight %	OSHA Select Carcinogens	OSHA Possible Select Carcinogens	ACGIH Carcinogens
ETHYLBENZENE 100-41-4	1 - 5			Group A3 Confirmed animal carcinogen with unknown relevance to humans.

12. ECOLOGICAL DATA

No information on ecology is available.

13. DISPOSAL CONSIDERATIONS

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• PART 12 : WHMIS CERTIFICATE - BATTERY TERM COATING

BATTERY TERM COATING (E802004)

Disposal should be made in accordance with federal, state and local regulations.

14. TRANSPORTATION INFORMATION

U.S. Department of Transportation

Proper Shipping Name: CONSUMER COMMODITY ORM-D
UN ID Number: CONCOM

U.S. Highway & Rail Shipments

The supplier may apply one of the following exceptions: Combustible Liquid, Consumer Commodity, Limited Quantity, Viscous Liquid, Does Not Sustain Combustion, or others, as allowed under 49CFR Hazmat Regulations. Please consult 49CFR Subchapter C to ensure that subsequent shipments comply with these exceptions.

Reportable Quantity Description:

International Air Transport Association (IATA):

Proper Shipping Name: AEROSOLS, FLAMMABLE
Hazard Class: 2.1
UN ID Number: UN1950

International Maritime Organization (IMO):

Proper Shipping Name: AEROSOLS
Hazard Class: 2.1
IMO UN/ID Number: UN1950

15. REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS:

Ingredient Name CAS-No.	Approx. Weight %	SARA 302	SARA 313	CERCLA RQ in lbs.
DIMETHYL KETONE- EXEMPT SOLVENT 67-64-1	40 - 45			5000
XYLENE 1330-20-7	5 - 10		form R reporting required for 1.0% de minimis concentration	100
ISOBUTYL ACETATE 110-19-0	5 - 10			5000
ETHYLBENZENE 100-41-4	1 - 5		form R reporting required for 1.0% de minimis concentration	1000
TOLUENE 108-88-3	1 - 5		form R reporting required for 1.0% de minimis concentration	1000

SARA 311/312 Hazard Class:

Acute: yes
Chronic: yes
Flammability: yes
Reactivity: no
Sudden Pressure: yes

U.S. STATE REGULATIONS:

Right to Know:

The specific chemical identity of a component may be withheld as a trade secret under 34 Pennsylvania Code, Chapter 317.

Product ID: 470.0000278.076



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• PART 12 : WHMIS CERTIFICATE - BATTERY TERM COATING

BATTERY TERM COATING (E802004)

Pennsylvania Right To Know:

ETHYLBENZENE	100-41-4
XYLENE	1330-20-7
ISOBUTYL ACETATE	110-19-0
ACETIC ACID ESTER	88230-35-7
DIMETHYL KETONE- EXEMPT SOLVENT	67-64-1
TOLUENE	108-88-3
BUTANE	106-97-8
PROPANE	74-98-6

Additional Non-Hazardous Materials

PROPRIETARY RESIN

Trade Secret

California Proposition 65:

WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

Rule 66 status of product

Not photochemically reactive.

INTERNATIONAL REGULATIONS - Chemical Inventories

US TSCA Inventory:

All components of this product are in compliance with U.S. TSCA Chemical Substance Inventory Requirements.

Canada Domestic Substances List:

All components of this product are listed on the Domestic Substances List.

16. OTHER INFORMATION

HMIS Codes

Health:	2*
Flammability:	4
Reactivity:	1
PPE:	X - See Section 8 for Personal Protective Equipment (PPE).

Abbreviations:

OSHA - Occupational Safety and Health Administration, IARC - International Agency for Research on Cancer, NIOSH - National Institute of Occupational Safety and Health, NTP - National Toxicology Program, ACGIH - American Conference of Governmental Industrial Hygienists, SCAQMD - South Coast Air Quality Management District, TSCA - Toxic Substances Control Act, IATA - International Air Transport Association, IMO - International Maritime Organization, DOT - Department of Transportation, NA - Not applicable, NOT ESTAB - Not established, N.A.V. - Not available, RQ - Reportable quantity, WT - Weight, MG/CU M - Milligrams per cubic meter, G/L - Grams per liter, MM - Millimeters, MPPCF - Millions of particles per cubic foot, PPM - parts per million, PPT - parts per thousand, TCC/PM - Tag closed cup / Pensky-Martens, PB - Lead, PEL - Permissible exposure level, TWA - Time Weighted Average, STEL - Short term exposure limit, C - Celsius, F - Fahrenheit.

Disclaimer:

The data on this sheet represent typical values. Since application variables are a major factor in product performance, this information should serve only as a general guide. Valspar assumes no obligation or liability for use of this information. UNLESS VALSPAR AGREES OTHERWISE IN WRITING, VALSPAR MAKES NO WARRANTIES, EXPRESS OR IMPLIED, AND DISCLAIMS ALL IMPLIED WARRANTIES INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE OR FREEDOM FROM PATENT INFRINGEMENT. VALSPAR WILL NOT BE LIABLE FOR ANY SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES. Your only remedy for any defect in this product is the replacement of the defective product, or a refund of its purchase price, at our option. This MSDS contains additional information required by the state of Pennsylvania.

Preparation Information:

Product ID: 470.0000278.076



TECHNICAL MANUAL MX151D - GM



- PART 12 : WHMIS CERTIFICATE - BATTERY TERM COATING

BATTERY TERM COATING (E802004)

Prepared By:
Print date:
Revision Date:

Regulatory Affairs Department
30/Jun/2009
29/Jun/2009



TECHNICAL MANUAL

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• PART 12 : WHMIS CERTIFICATE - FREON OIL R134A

FREON OIL R134A (E803006)

Material Safety Data Sheet

FIR No.: 173919
Version Number: CA-EN-6

Level: 1
Release Date: 2007-05-08

1. Product and Company Identification

Product Name: PAG Refrigerant Compressor Oil
Product Code: See Attachment
Application: Lubricant for R-134a refrigerant-containing system
Supplier: Ford Motor Company of Canada
Oakville, Ontario L6J 5E4
1-800-392-3673
Emergency Telephone: Poison Control Center: 1-800-959-3673
CHEMTREC: U.S. and Canada: 1-800-424-9300
CHEMTREC: International: 1-703-527-3887

2. Composition/Information on Ingredients

This chemical product is a preparation.

BUTYLATED HYDROXYTOLUENE	128-37-0	1-5	ACGIH HAZCOM PEL WHMIS 1
TRICRESYL PHOSPHATE	1330-78-5	1-5	WHMIS 1
SILICA, AMORPHOUS	7631-86-9	1-5	HAZCOM WHMIS 1

3. Hazards Identification

Health: This product may cause irritation to the eyes, respiratory system, and skin.
Inhalation of mist and vapors may irritate the nose, throat, and lungs.
Ingestion may cause slight stomach irritation and discomfort.
Prolonged and/or repeated skin contact with this product may cause irritation/dermatitis.

Physical and Chemical Hazards: This product is combustible at high temperatures.

4. First-Aid Measures

Inhalation: If gas/fume/vapor/dust/mist from the material is inhaled, remove the affected person immediately to fresh air.
If irritation persists, get medical attention.

Skin Contact: For skin contact flush with large amounts of water.
If irritation persists, get medical attention.

Eye Contact: In case of contact with eyes, rinse immediately with plenty of water for at least 15 minutes and seek medical attention.
If irritation persists, get medical attention.

Ingestion: If the material is swallowed, get immediate medical attention or advice -- Do not induce vomiting.

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• PART 12 : WHMIS CERTIFICATE - FREON OIL R134A

FREON OIL R134A (E803006)

Material Safety Data Sheet

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Version Number: CA-EN-6

Level: 1
Release Date: 2007-05-08

Notes to a Physician: If the affected person is not breathing, apply artificial respiration.

5. Fire-Fighting Measures

Extinguishing Media: Dry chemical, foam, carbon dioxide.

Specific Methods: Shut off the source of fuel, if possible.

Specific Hazards: Empty containers may retain product residue including Flammable or Explosive vapors. Do not cut, drill, grind, or weld near full, partially full, or empty product containers.
Water or foam may cause frothing if the product is heated above 93 degrees C (200 degrees F).

Protection of Firefighters: Fire fighters should be equipped with NIOSH-approved, self-contained breathing apparatus (SCBA) and full protective clothing.

6. Accidental Release Measures

Personal Precautions: Evacuate the area promptly. Keep upwind of the spilled material and isolate exposure.
Eliminate all sources of ignition or flammables that may come into contact with a spill of this material.
Ventilate the contaminated area.
Avoid excessive skin contact with the spilled material.
Wear appropriate protective equipment and clothing during clean-up.

Environmental Precautions: Do not allow the spilled product to enter public drainage system or open water courses.

Methods for Cleaning Up: Stop the flow of material, if this is without risk.
Absorb the spilled material with an inert absorbent (nonflammable) material.
Thoroughly wash the area after a spill or leak clean-up.

7. Handling and Storage

Handling:

Technical Measures: No special precautions necessary.

Precautions and Advice for Safe Handling: Avoid breathing vapor or mist.
Avoid prolonged or repeated skin contact with this material.
Eliminate all sources of ignition.

Storage: Technical Measures: No special precautions necessary.

Storage Conditions: Do not store near heat, spark or open flame.
Do not store this material in open or unlabeled containers.
Store this product in a cool, dry, well-ventilated place.

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8. Exposure Controls/Personal Protection

Engineering Measures:

Use general ventilation.
Local exhaust is suggested for use, where possible, in enclosed or confined spaces.
Eyewash and emergency showers are recommended.

Exposure Limits:

Chemical Name	TWA 8 hr
BUTYLATED HYDROXYTOLUENE	2(mg/m3)

References

ACGIH

Personal Protective Equipment:

Respiratory Protection:

If vaporization or mist is occurring (i.e., under conditions of high temperature, etc.), use an air purifying respirator (mechanical filter with accompanying organic vapor cartridge).
If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker health, an approved respirator must be worn. Respirator selection, use and maintenance should be in accordance with the requirements of OSHA Respiratory Protection Standard 29 CFR 1910.134 and/or Canadian Standard CSA Z94.4.

Hand Protection:

Use of impervious gloves is recommended, such as neoprene.

Eye Protection:

Wear chemical goggles; face shield (if splashing is possible).

Skin and Body Protection:

Light protective clothing is recommended.
Remove contaminated clothing and wash before reuse.

Hygiene Measures:

Wash thoroughly after handling.
When using this material, do not eat, drink or smoke.

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9. Physical and Chemical Properties

Specific Gravity: 1.00
Physical State: LIQUID
Form: OILY
Odor: MILD
Color: CLEAR
pH: ND
Temperature Range During which Changes in Physical State Occur:
Boiling Point: ND
Flash Point: 240 °C ASTM D92
Auto-ignition Temperature: ND
Explosion Properties:
UEL: ND
LEL: ND
Vapor Pressure: ND
Vapor Density: ND
Solubility: INSOLUBLE IN WATER
Viscosity: 49.4 cSt ASTM D445
Evaporation Rate: N.AV

10. Stability and Reactivity

Stability: This is a stable material.
Hazardous polymerization will not occur.
Conditions and Materials to Avoid: This product may react with strong oxidizing agents (bleach--sodium hypochlorite, calcium hypochlorite, hydrogen peroxide, permanganate, nitric acid, concentrated OXYGEN, perchlorates).
Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, and other low molecular weight hydrocarbons.
Irritating and toxic gases or fumes may be released during a fire.

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11. Toxicological Information

7631-86-9 SILICA, AMORPHOUS
Oral, adult rat, LD50 = 3160 mg/kg
1330-78-5 TRICRESYL PHOSPHATE
Oral, adult rat, LD50 = 5190 mg/kg
128-37-0 BUTYLATED HYDROXYTOLUENE
Oral, adult rat, LD50 = 890 mg/kg
1330-78-5 TRICRESYL PHOSPHATE
Skin, adult cat, LD50 = 1500 mg/kg

Skin Contact:

Prolonged and/or repeated skin contact with this product may cause irritation/dermatitis.

12. Ecological Information

No specific aquatic data available for this product.

13. Disposal Considerations

Waste from Residues:

Dispose of waste material according to Local, State, Federal, and Provincial Environmental Regulation.

Contaminated Packaging:

No available information.

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14. Transport Information

U.S. Department of Transportation (DOT) 49 - CFR 172.101

This product is not regulated as a dangerous good.

Canadian Transportation of Dangerous Goods (T.D.G.) - TDGR Schedule II

This product is not regulated as a dangerous good.

Secretary of Communication and Transportation (SCT) - NOM-002-SCT2/1994 (Mexico)

This product is not regulated as a dangerous good.

International and Domestic Air Transportation - ICAO & IATA Section 4.2

This product is not regulated as a dangerous good.

International Water Transportation - IMDG Code Amendment 31-02

This product is not regulated as a dangerous good.

15. Regulatory Information

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

CLASS D DIVISION 2 SUBDIVISION B: Poisonous/Infectious Material Causing Other Toxic Effects - Toxic Material

This product contains ingredients present on the WHMIS (1.0%) Ingredient Disclosure List.

Material contains a chemical which is a Ford Motor Company Material of Concern. Use and release of this material should be minimized to the greatest extent possible.

16. Other Information

Key/Legend: N.AP = Not applicable; N.AV = Not available; ND = Not determined or No data; TLV = Threshold limit value; TWA = Time-weighted average; STEL = Short-term exposure limit; C = Ceiling limit

The following sections contain revisions OR 2

NEW statements. 15
16

Preparation Information:

The chemical identification and properties for this material were provided by the manufacturer. For Canadian locations, a manufacturer's MSDS is available upon request. Health and safety information has been evaluated by the Occupational and Environmental Health Sciences Department, Ford Motor Company, National Parts General Office, MD74, 29500 Plymouth Road, Livonia, MI 48150, USA.

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Disclaimer:

The information on this data sheet represents our current data and is accurate to the best of our knowledge as to the proper handling of this product under normal conditions and in accordance with the application specified on the packaging and/or technical guidance literature. Any other use of the product which involves using the product in combination with any other product or any other process is the responsibility of the user.

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Attachment

Product Code	Container Size	Part of Kit	Kit Product Code
YN-12-D	7 fl. oz. (207 mL)		

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• PART 12 : WHMIS CERTIFICATE - BODY HARDENER FOR MASTIC

BODY HARDENER FOR MASTIC (E804006)

MSDS

SECTION 1 – Chemical Product and Company Identification

CATALYST SYSTEMS
U S Chemical & Plastics
Alco Industries Companies
PO Box 88
2290 Zimmerman Rd SE
Gnadenhutzen, OH 44629
PH: 740-254-4311

CHEMTREC: 1-800-424-9300
CANUTEC: 1-613-996-6666
(For Canada call collect)

PRODUCT NAME: CREAM HARDENER
PRODUCT CODE: 27640/White, 27641/Red, 27642/Green,
27643/Blue, 28050/Black, 28070/Lt. Red
Additional Product Codes on Page 5.
SYNONYM/CROSS REFERENCE: Polyester Cream Hardener/Polyester Catalyst,
Benzoyl Peroxide Paste
SCHEDULE B NUMBER: 3815.90.0000

SECTION 2 – Hazard Identification

OVEREXPOSURE EFFECTS

ACUTE EFFECTS:

EYES: Contact with eyes can cause irritation, redness, tearing, blurred vision, and/or swelling.

SKIN: Contact with skin can cause irritation, (minor itching, burning, and/or redness), dermatitis, defatting may be readily absorbed through the skin.

INHALATION: Inhalation of vapors can cause nasal and respiratory irritation, dizziness, weakness, fatigue, nausea, headache, possible unconsciousness, and/or asphyxiation. Aspiration of material into lungs may result in chemical pneumonitis which can be fatal.

INGESTION: Ingestion can cause gastro-intestinal irritation, nausea, vomiting, diarrhea.

PRIMARY ROUTES OF EXPOSURE: Skin, inhalation

SECTION 3 – Composition, Information or Ingredients

INGREDIENTS

Benzoyl Peroxide

WGT%

47.5 – 50.0

CAS

94-36-0

SECTION 4 – First Aid Measures

INHALATION: If inhaled, remove victim from exposure to a well-ventilated area. Make them comfortably warm, but not hot. Use oxygen or artificial respiration as required. Consult a physician.

SKIN: For skin contact, wash promptly with soap and excess water.

EYES: For eye contact, flush promptly with excess water for at least fifteen minutes. Consult a physician.

INGESTION: If ingested, do not induce vomiting. Give victim a glass of water. Call a physician immediately.

SECTION 5 – Fire-Fighting Measures

FIRE EXTINGUISHING MEDIA: Carbon dioxide, dry chemical, foam

SPECIAL FIRE FIGHTING PROCEDURES: Fight like a fuel oil fire. Cool fire exposed containers with water spray. Firefighter should wear OSHA/NIOSH approved self-contained breathing apparatus.

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MSDS

UNUSUAL FIRE AND EXPLOSION HAZARD: Closed containers exposed to high temperatures, such as fire conditions may rupture.

SECTION 6 – Accidental Release Measures

SPILLS, LEAK OR RELEASE: Ventilate area. Remove all possible sources of ignition. Avoid prolonged breathing of vapor. Contain spill with inert absorbent.

SECTION 7 – Handling and Storage

STORAGE AND HANDLING: Use with adequate ventilation. Avoid contact with eyes and skin. Avoid breathing vapors. Do not store the product above 100°F/38°C. Do not flame, cut, braze weld or melt empty containers. Keep the product away from heat, open flame, and other sources of ignition. Avoid contact with strong acids, alkalis, and oxidizers.

SECTION 8 – Exposure Controls and Personal Protection

INGREDIENTS

CAS

TLV/PEL

Benzoyl Peroxide

47.5 – 50.0

Combustible when dry: TLV 5 mg/m³*

*Refer to 29 CFR 1910.0000, subpart Z.

Also see TLV for Chemical Substances and Physical Agents in the Work Environment (ACGIH).

RESPIRATORY PROTECTION: If component TLV limits are exceeded, use NIOSH/MSHA approved respirator to remove vapors. Use an air-supplied respirator if necessary.

VENTILATION: Use adequate ventilation in volume and pattern to keep TLV/PEL below recommended levels. Explosion-proof ventilation may be necessary.

PROTECTIVE GLOVES: To prevent prolonged exposure use rubber gloves; solvents may be absorbed through the skin.

EYE PROTECTION: Safety Glasses or goggles with splash guards or side shields.

OTHER PROTECTIVE EQUIPMENT: Wear protective clothing as required to prevent skin contact.

SECTION 9 – Physical and Chemical Properties

APPEARANCE: Red, white, blue, green, or light red paste

SPECIFIC GRAVITY: 1.20

VAPOR PRESSURE (mmHG): N/E

BOILING POINT: Decomposes

VAPOR DENSITY: (Air=1) >1

EVAPORATION RATE (Ethyl Ether = 1): <1

VOLATILES BY WEIGHT: 10 - 20%

SOLUBILITY IN WATER: Insoluble

FLASH POINT: 184°F/84°C

LOWER FLAMMABLE LIMIT %: N/E

UPPER FLAMMABLE LIMIT %: N/E

VOC: Grams/Liter = Nil

Lbs/Gallon = Nil

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SECTION 10 – Stability and Reactivity

STABILITY: Stable

CONDITIONS TO AVOID: Open flames, sparks, heat, electrical and static discharge.

INCOMPATIBILITY MATERIALS TO AVOID: Strong acids, alkalis, oxidizers.

HAZARDOUS DECOMPOSITION PRODUCTS: Carbon Dioxide, Carbon Monoxide, and Carbon.

HAZARDOUS POLYMERIZATION: Will not occur.

SECTION 11 – Toxicological Information

CHRONIC EFFECTS: Overexposure to this material has apparently been known to cause the following effects in lab animals: skin damage and tumors.

CARCINOGEN: YES ☐ NO ☒

TERATOGEN: YES ☐ NO ☒

MUTAGEN: YES ☐ NO ☒

Benzoyl Peroxide has caused tumorigenic effects in laboratory animals.

SECTION 12 – Ecological Information

None.

SECTION 13 – Disposal Considerations

WASTE DISPOSAL: Dispose of in accordance with local, state, and federal regulations.

SECTION 14 – Transport Information

For Ground Transport: In USA – In inner containers less than 500 grams each: Consumer Commodity ORM-D. In large containers, UN3108, Organic Peroxide Type E, Solid ($\leq 52\%$ Dibenzoyl Peroxide as a paste), 5.2, PG II.

For Air Transport: Must be re-boxed to UN specified packaging. UN3108, Organic Peroxide Type E, Solid ($\leq 52\%$ Dibenzoyl Peroxide as a paste), 5.2, Packaging Instruction 510 or 513.

For Ocean Transport: UN3108, Organic Peroxide Type E, Solid, 5.2, PG II, EMS#F-J, S-R (the activator is $\leq 52\%$ Dibenzoyl Peroxide as a paste). Limited quantity if inner containers are less than 500 grams each.

SECTION 15 – Regulatory Information

CALIFORNIA PROPOSITION 65:

This product does not contain chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

SECTION 313 SUPPLIER NOTIFICATION:

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BODY HARDENER FOR MASTIC (E804006)

MSDS

This product contains the following toxic chemicals subject to the reporting requirements of the Emergency Planning and Community Right-To-Know Act of 1986 and 40 CFR 372:

CHEMICAL NAME	CAS	% BY WGT
Benzoyl Peroxide	94-36-0	47.5 – 50%

This information must be included in all MSDS that are copied and distributed for this chemical.

SECTION 16 – Other Information

HMIS RATING:	Health	2	4 = Extreme
	Fire	2	3 = High
	Reactivity	2	2 = Moderate
			1 = Slight
			0 = Insignificant

Personal Protection - See Section VIII

NOTE: ADDITIONAL PART NUMBERS:

Bulk Red	27641 27008, 27027, 27110, 27120, 27121, 27125, 27169, 27170, 27172, 27173, 27174, 27607, 27604, 27607, 27610, 27616, 27626, 27632, 27644, 27649, 27663, 27673, 27690, 27690-1, 27697, 27750, 27751, 28015, 28016, 28028, 28139, 28144, 28149, 28164, 28187
Bulk Lt. Red/Red Raspberry	28070 27032, 27034, 27111, 27128, 27171, 27633, 27656, 28071, 28143, 28148, 28153
Bulk Light Blue	27642 27615, 28169
Bulk Blue	27643 27012, 27022, 27041, 27112, 27115, 27122, 27160, 27619, 27622, 27628, 27634, 27646, 27665, 27675, 27676, 27677, 27678, 27679, 28029, 28030, 28136, 28141, 28146, 28151, 28156, 28159, 28163, 28165, 28167
Bulk White	27640 27014, 27024, 27036, 27038, 27114, 27124, 27132, 27168, 27201, 27211, 27621, 27627, 27647, 27648, 27664, 27674, 28025, 28031, 28042, 28043, 28059, 28145, 28150, 28171, 28184, 28185
Bulk Black	28050 27031, 27035, 27037, 27624, 27669, 28032, 28052, 28183, 28186
Bulk Green	27638 27637, 28038, 28147
Bulk Yellow	27636 27614, 28168

ABBREVIATIONS

IARC	= International Agency for Research on Cancer
ACGIH	= American Conference of Governmental Industrial Hygienists
NIOSH	= National Institute of Occupational Safety and Health
TLV	= Threshold Limit Value
PEL	= Permissible Emission Level
DOT	= Department of Transportation

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MSDS

NTP = National Toxicology Program
N/AV = Not Available
N/AP = Not Applicable
N/E = Not Established
N/D = Not Determined

PREPARED BY:

CATALYST SYSTEMS
U S Chemical & Plastics
Alco Industries Companies
PO Box 88
2290 Zimmerman Rd SE
Gnadenhutten, OH 44629
PH: 740-254-4311

DATE REVIEWED: September 18, 2008
DATE REVISED: September 18, 2008
REVISION: Section 15

The information in the Material Safety Data Sheet has been compiled from our experience and from data presented in various technical publications. It is the user's responsibility to determine the suitability of this information for the adoption of the safety precautions as may be necessary. We reserve the right to revise Material Safety Data Sheets from time to time as new technical information becomes available. The user has the responsibility to contact the Company to make sure that the MSDS is the latest one issued.






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• PART 12 : WHMIS CERTIFICATE - MEDIUM REDUCER

MEDIUM REDUCER (E804131)

00000090		MATERIAL SAFETY DATA SHEET		Page 1	
		Tristar Coatings Ltd. 18 Cadetta Rd Brampton, ON; L6T 3Z8 Canada			
PRODUCT: STARATHANE 560 MEDIUM REDUCER- SB52		CODE: SB52			
 					
Section 01: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION					
PRODUCT CODE.....		SB52			
MANUFACTURER.....		Tristar Coatings Ltd 18 Cadetta Rd Brampton ON Canada L6T 3Z8 905-794-1100, 1-800-975-5568			
PRODUCT NAME.....		STARATHANE 560 MEDIUM REDUCER- SB52			
MATERIAL USE.....		COATINGS FOR INDUSTRIAL APPLICATIONS.			
PRODUCT USE.....		REDUCER.			
CHEMICAL FAMILY.....		SOLVENT BLEND.			
24 HOUR EMERGENCY NUMBER:					
Section 02: COMPOSITION/INFORMATION ON INGREDIENTS					
Hazardous Ingredients	%	Exposure Limit	C.A.S.#	LD/50, Route, Species	LC/50 Route, Species
BUTYL ACETATE	15 - 40	150 ppm/710 mg/m ³	123-86-4	14000 mg/kg ORAL RAT	2000 PPM 4 HOURS, INHALATION, RAT
ETHYL 3-ETHOXYPROPIONATE	15-40	50 ppm	763-69-9	5000 mg/kg (oral, rat)	>1000ppm/6hr(rat)
ETHYL ACETATE	15-40	400 ppm	141-78-6	5600 MG/KG ORAL RAT	16000 PPM INHALATION RAT
Section 03: HAZARDS IDENTIFICATION					
ROUTE OF ENTRY		EYE CONTACT. INHALATION. SKIN ABSORPTION. SKIN CONTACT.			
EFFECTS OF ACUTE EXPOSURE.....		INHALATION. HIGH VAPOUR CONCENTRATIONS ARE IRRITATING TO THE EYES, NOSE, THROAT AND LUNGS; MAY CAUSE HEADACHES AND DIZZINESS; MAY BE ANAESTHETIC AND MAY CAUSE OTHER CENTRAL NERVOUS SYSTEM EFFECTS.			
EYE CONTACT.....		IRRITANT.			
SKIN CONTACT.....		FREQUENT OR PROLONGED CONTACT MAY CAUSE DEFATTING, DRYING AND CRACKING OF THE SKIN. BRIEF CONTACT WITH THE LIQUID WILL NOT RESULT IN SIGNIFICANT IRRITATION IF EVAPORATION IS PREVENTED.			
INGESTION.....		SMALL AMOUNT OF THIS LIQUID DRAWN INTO THE LUNGS FROM SWALLOWING OR VOMITING MAY CAUSE SEVERE HEALTH EFFECTS (E.G., BRONCHO-PNEUMONIA OR PULMONARY EDEMA).			
EFFECTS OF CHRONIC EXPOSURE.....		REPEATED EXPOSURE WILL PRODUCE SIMPTOMS OF CHRONIC POISONING, ASSOCIATED WITH DISTURBANCE OF THE CENTRAL NERVOUS SYSTEM, NERVOUS IRRITABILITY, INSOMNIA, NAUSEA AND FATIQUE.			
Section 04: FIRST AID MEASURES					
EYE CONTACT.....		IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES, KEEPING EYELIDS OPEN, WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES. OBTAIN MEDICAL ATTENTION.			
SKIN CONTACT.....		IMMEDIATELY FLUSH SKIN WITH PLENTY OF SOAP AND WATER. REMOVE CONTAMINATED CLOTHING. WASH CLOTHING BEFORE REUSE.			
INHALATION.....		IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN, OBTAIN MEDICAL ATTENTION.			
INGESTION.....		IF SWALLOWED, DO NOT INDUCE VOMITING. GIVE LARGE QUANTITY OF WATER. CALL A PHYSICIAN IMMEDIATELY. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.			



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• PART 12 : WHMIS CERTIFICATE - MEDIUM REDUCER

MEDIUM REDUCER (E804131)

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PRODUCT: STARATHANE 560 MEDIUM REDUCER- SB52		CODE: SB52
Section 04: FIRST AID MEASURES		
ADDITIONAL INFORMATION..... NOTE TO PHYSICIAN: ASPIRATED PRODUCT MAY CAUSE SEVERE LUNG DAMAGE AND PRESENT A SIGNIFICANT HAZARD. STOMACH CONTENTS SHOULD BE EVACUATED QUICKLY IN A MANNER WHICH AVOIDS ASPIRATION. OTHERWISE, TREATMENT IS DIRECTED AT THE CONTROL OF SYMPTOMS AND THE CLINICAL CONDITION.		
Section 05: FIRE FIGHTING MEASURES		
FLASH POINT (deg C), METHOD..... -4 DEG.C (TCC) LOWEST FLASHING COMPONENT. AUTO IGNITION TEMPERATURE (deg C).... NOT TESTED. UPPER FLAMMABLE LIMIT (% VOL)..... 10. LOWER FLAMMABLE LIMIT (% VOL)..... 1.0. HAZARDOUS COMBUSTION PRODUCTS.. CARBON DIOXIDE. TOXIC FUMES. SMOKE. CARBON MONOXIDE. THERMAL DECOMPOSITION OR COMBUSTION MAY PRODUCE . NITROGEN COMPOUNDS. ALDEHYDES. FLAMMABILITY..... YES.		
Section 06: ACCIDENTAL RELEASE MEASURES		
LEAK/SPILL..... ELIMINATE ALL SOURCES OF IGNITION. PREVENT RUNOFF INTO DRAINS, SEWERS, AND OTHER WATERWAYS. VENTILATE AREA TO REMOVE THE REMAINING VAPOURS. WEAR FULL PROTECTIVE EQUIPMENT, INCLUDING RESPIRATORY EQUIPMENT DURING CLEAN-UP. FOR LARGE QUANTITIES, REFER TO THE ENVIRONMENTAL MINISTRY.		
Section 07: HANDLING AND STORAGE		
HANDLING PROCEDURES..... ALWAYS ADOPT PRECAUTIONARY MEASURES AGAINST BUILD-UP OF STATIC WHICH MAY ARISE FROM APPLIANCES, HANDLING AND THE CONTAINERS IN WHICH PRODUCT IS PACKED. EQUIPMENT MUST BE GROUNDED. IN FILLING OPERATIONS TAKE PRECAUTIONARY MEASURES AGAINST STATIC DISCHARGES. STORAGE NEEDS..... KEEP CONTAINERS TIGHTLY CLOSED. STORE DRY AT AMBIENT TEMPERATURE, AWAY FROM EXCESSIVE HEAT, STRONG OXIDIZERS OR COMBUSTIBLE MATERIALS.		
Section 08: EXPOSURE CONTROLS / PERSONAL PROTECTION		
PROTECTIVE EQUIPMENT GLOVES/ TYPE..... NEOPRENE, PVC, POLYETHYLENE OR VITON. RESPIRATORY/TYPE..... USE NIOSH APPROVED RESPIRATOR FOR ORGANIC VAPOURS. EYE/TYPE..... CHEMICAL SAFETY GOGGLES SHOULD BE WORN. PLASTIC FACE SHIELDS SHOULD BE WORN IN ADDITION TO SAFETY GOGGLES FOR COMPLETE FACE PROTECTION. FOOTWEAR/TYPE..... SAFETY BOOTS PER LOCAL REGULATIONS. CLOTHING/TYPE..... WEAR AN APRON AND/OR AN OVERALL. OTHER/TYPE..... EYE BATH AND SAFETY SHOWER. VENTILATION REQUIREMENTS..... LOCAL EXHAUST SHOULD BE USED TO MAINTAIN LEVELS BELOW THE EXPOSURE LIMITS. EXPLOSION-PROOF EXHAUST VENTILATION.		
Section 09: PHYSICAL AND CHEMICAL PROPERTIES		
PHYSICAL STATE..... CLEAR, COLORLESS, MOBILE LIQUID. ODOUR..... SWEET AROMATIC ODOUR. ODOUR THRESHOLD (ppm)..... NOT AVAILABLE. VAPOUR DENSITY (AIR=1)..... NOT AVAILABLE. VAPOUR PRESSURE (mm Hg)..... NOT AVAILABLE. EVAPORATION RATE..... NOT AVAILABLE. BOILING POINT (deg C)..... NOT AVAILABLE. FREEZING POINT (deg C)..... NOT AVAILABLE. SPECIFIC GRAVITY..... 0.91.		



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• PART 12 : WHMIS CERTIFICATE - MEDIUM REDUCER

MEDIUM REDUCER (E804131)

00000090	MATERIAL SAFETY DATA SHEET	Page 3
PRODUCT: STARATHANE 560 MEDIUM REDUCER- SB52		CODE: SB52
Section 10: STABILITY AND REACTIVITY		
STABILITY..... STABLE AT NORMAL TEMPERATURES AND PRESSURES. INCOMPATIBILITY..... STRONG OXIDIZERS. HAZARDOUS PRODUCTS OF SEE HAZARDOUS COMBUSTION PRODUCT. DECOMPOSITION		
Section 11: TOXICOLOGICAL INFORMATION		
IRRITANCY OF MATERIAL..... NOT AVAILABLE. SENSITIZING CAPABILITY OF MATERIAL..... NOT AVAILABLE. CARCINOGENICITY OF MATERIAL..... NOT AVAILABLE. TERATOGENICITY MUTAGENICITY..... NOT AVAILABLE.		
Section 12: ECOLOGICAL INFORMATION		
ENVIRONMENTAL..... DO NOT ALLOW TO ENTER WATERS, WASTEWATER OR SOIL. BIODEGRADABILITY..... NOT AVAILABLE.		
Section 13: DISPOSAL CONSIDERATIONS		
WASTE DISPOSAL..... SPILLED MATERIAL AND WATER RINSES ARE CLASSIFIED AS CHEMICAL WASTE AND MUST BE DISPOSED OF IN ACCORDANCE WITH CURRENT LOCAL, PROVINCIAL AND FEDERAL REGULATIONS.		
Section 14: TRANSPORT INFORMATION		
UN NUMBER..... 1263. TDG CLASSIFICATION..... 3. PG II.		
Section 15: REGULATORY INFORMATION		
WHMIS CLASSIFICATION..... B2. D2B.		
Section 16: OTHER INFORMATION		
TELEPHONE NUMBER..... 905-794-1100. PREPARED BY: Regulatory Affairs PREPARATION DATE: Jan11/05		






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• PART 12 : WHMIS CERTIFICATE - EPOXY CATALYST

EPOXY CATALYST (E804135)

00000076		MATERIAL SAFETY DATA SHEET		Page 1	
		Tristar Coatings Ltd. 18 Cadetta Rd Brampton, ON; L6P 0X4 Canada			
PRODUCT: Starpoxy 420, Epoxy Catalyst		CODE: 420C0078			
 					
Section 01: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION					
PRODUCT CODE.....		420C0078			
MANUFACTURER.....		Tristar Coatings Ltd 18 Cadetta Rd Brampton ON Canada L6P 0X4 905-794-1100, 1-800-975-5568			
PRODUCT NAME.....		Starpoxy 420, Epoxy Catalyst			
MATERIAL USE.....		COATINGS FOR INDUSTRIAL APPLICATIONS.			
PRODUCT USE.....		CROSSLINKING RESIN SOLUTION .			
CHEMICAL FAMILY.....		PROPRIETARY SOLUTION.			
24 HOUR EMERGENCY NUMBER.....		(613) 996-6666 CANUTEC.			
Section 02: COMPOSITION/INFORMATION ON INGREDIENTS					
Hazardous Ingredients	%	Exposure Limit	C.A.S.#	LD/50, Route, Species	LC/50 Route, Species
XYLENE	15-40	100 PPM/435 MG/M3	1330-20-7	4300 mg/kg ORAL RAT	5000 ppm 4 HOURS INHALATION RAT
TOLUENE	15-40	376 MG/M3	108-88-3	5000 mg/kg ORAL (rat)	5320 ppm INHL. 8 HOURS MICE
LIGHT AROMATIC NAPHTHA	7-13	250 MG/M3	64742-95-6	>5600 MG/KG	>10200 MG/M3/4HR
METHYL ETHYL KETONE (MEK)	7-13	590 MG/M3	78-93-3	4g/kg RAT ORAL	2-4,000 PPM/2HR RAT
AROMATIC AMINE	1-5	NOT AVAILABLE	90-72-2	ORL-RAT 2500	NOT AVAILABLE
Section 03: HAZARDS IDENTIFICATION					
ROUTE OF ENTRY		EYE CONTACT. INGESTION. INHALATION. SKIN ABSORPTION.			
EFFECTS OF ACUTE EXPOSURE.....		INHALATION. HIGH VAPOUR CONCENTRATIONS ARE IRRITATING TO THE EYES, NOSE, THROAT AND LUNGS; MAY CAUSE HEADACHES. EYE CONTACT. MAY CAUSE IRRITATION AND BURNING.			
SKIN CONTACT.....		FREQUENT OR PROLONGED CONTACT MAY CAUSE DEFATTING, DRYING AND CRACKING OF THE SKIN. BRIEF CONTACT WITH THE LIQUID WILL NOT RESULT IN SIGNIFICANT IRRITATION IF EVAPORATION IS PREVENTED.			
INGESTION.....		SMALL AMOUNT OF THIS LIQUID DRAWN INTO THE LUNGS FROM SWALLOWING OR VOMITING MAY CAUSE SEVERE HEALTH EFFECTS (E.G., BRONCHO-PNEUMONIA OR PULMONARY EDEMA).			
EFFECTS OF CHRONIC EXPOSURE.....		PROLONGED OR REPEATED CONTACT MAY CAUSE SKIN IRRITATION. VAPOURS ARE MODERATELY IRRITATING TO THE EYS AND RESPIRATORY PASSAGES. PROLONGED EXPOSURE TO HIGH VAPOUR CONCENTRATION CAN CAUSE HEADACHE, DIZZINESS, NAUSEA AND CENTRAL NERVOUS SYSTEM DEPRESSION.			
Section 04: FIRST AID MEASURES					
EYE CONTACT.....		IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES, KEEPING EYELIDS OPEN, WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES. OBTAIN MEDICAL ATTENTION.			
SKIN CONTACT.....		IMMEDIATELY FLUSH SKIN WITH PLENTY OF SOAP AND WATER. REMOVE CONTAMINATED CLOTHING. WASH CLOTHING BEFORE REUSE.			
INHALATION.....		IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN, OBTAIN MEDICAL ATTENTION.			



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• PART 12 : WHMIS CERTIFICATE - EPOXY CATALYST

EPOXY CATALYST (E804135)

00000076	MATERIAL SAFETY DATA SHEET	Page 2
PRODUCT: Starpoxy 420, Epoxy Catalyst		CODE: 420C0078
Section 04: FIRST AID MEASURES		
INGESTION.....	IF SWALLOWED, DO NOT INDUCE VOMITING. GIVE LARGE QUANTITY OF WATER. CALL A PHYSICIAN IMMEDIATELY. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.	
ADDITIONAL INFORMATION.....	NOTE TO PHYSICIAN: ASPIRATED PRODUCT MAY CAUSE SEVERE LUNG DAMAGE AND PRESENT A SIGNIFICANT HAZARD. STOMACH CONTENTS SHOULD BE EVACUATED QUICKLY IN A MANNER WHICH AVOIDS ASPIRATION. OTHERWISE, TREATMENT IS DIRECTED AT THE CONTROL OF SYMPTOMS AND THE CLINICAL CONDITION.	
Section 05: FIRE FIGHTING MEASURES		
FLAMMABILITY.....	YES.	
FLASH POINT (deg C), METHOD.....	(PENSKY-MARTENS CLOSED CUP). 7.	
AUTO IGNITION TEMPERATURE (deg C)...	NOT AVAILABLE.	
UPPER FLAMMABLE LIMIT (% VOL).....	10.	
LOWER FLAMMABLE LIMIT (% VOL).....	1.0.	
HAZARDOUS COMBUSTION PRODUCTS..	CARBON MONOXIDE. CARBON DIOXIDE. SMOKE. TOXIC FUMES. ALDEHYDES. OXIDES OF NITROGEN. AMMONIA. ACIDIC FUMES.	
Section 06: ACCIDENTAL RELEASE MEASURES		
LEAK/SPILL.....	ELIMINATE ALL SOURCES OF IGNITION. PREVENT RUNOFF INTO DRAINS, SEWERS, AND OTHER WATERWAYS. VENTILATE AREA. WEAR FULL PROTECTIVE EQUIPMENT, INCLUDING RESPIRATORY EQUIPMENT DURING CLEAN-UP. USE EXPLOSION-PROOF OR HAND PUMPS AND NON-SPARKING TOOLS AND EQUIPMENT. ABSORB RESIDUAL MATERIAL WITH SAND, OR OTHER ABSORBENT MATERIAL. FOR LARGE QUANTITIES, REFER TO THE ENVIRONMENTAL MINISTRY.	
Section 07: HANDLING AND STORAGE		
HANDLING PROCEDURES.....	PREVENT ACCUMULATION OF ELECTROSTATIC CHARGES. GROUND HANDLING EQUIPMENT.	
STORAGE NEEDS.....	KEEP CONTAINERS TIGHTLY CLOSED. STORE DRY AT AMBIENT TEMPERATURE, AWAY FROM EXCESSIVE HEAT, STRONG OXIDIZERS OR COMBUSTIBLE MATERIALS.	
Section 08: EXPOSURE CONTROLS / PERSONAL PROTECTION		
PROTECTIVE EQUIPMENT		
GLOVES/ TYPE.....	NEOPRENE, PVC, POLYETHYLENE OR VITON.	
RESPIRATORY/TYPE.....	USE NIOSH APPROVED RESPIRATOR FOR ORGANIC VAPOURS.	
EYE/TYPE.....	CHEMICAL SAFETY GOGGLES. FACE SHIELD.	
FOOTWEAR/TYPE.....	SAFETY BOOTS PER LOCAL REGULATIONS.	
CLOTHING/TYPE.....	WEAR AN APRON AND/OR AN OVERALL.	
OTHER/TYPE.....	EYE BATH AND SAFETY SHOWER.	
VENTILATION REQUIREMENTS.....	LOCAL EXHAUST SHOULD BE USED TO MAINTAIN LEVELS BELOW THE EXPOSURE LIMITS.	
Section 09: PHYSICAL AND CHEMICAL PROPERTIES		
PHYSICAL STATE..... CLEAR AMBER MOBILE LIQUID.		
ODOUR..... CHARACTERISTIC ODOUR.		
ODOUR THRESHOLD (ppm)..... NOT AVAILABLE.		
VAPOUR DENSITY (AIR=1)..... > 1.		
VAPOUR PRESSURE (mm Hg)..... NOT AVAILABLE.		
EVAPORATION RATE..... >1.		
BOILING POINT (deg C)..... NOT AVAILABLE.		
FREEZING POINT (deg C)..... -65.		
SPECIFIC GRAVITY..... 0.878.		



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• PART 12 : WHMIS CERTIFICATE - EPOXY CATALYST

EPOXY CATALYST (E804135)

00000076	MATERIAL SAFETY DATA SHEET	Page 3
PRODUCT: Starpoxy 420, Epoxy Catalyst		CODE: 420C0078
Section 10: STABILITY AND REACTIVITY		
STABILITY..... STABLE AT NORMAL TEMPERATURES AND PRESSURES. INCOMPATIBILITY..... STRONG OXIDIZERS. HAZARDOUS PRODUCTS OF SEE HAZARDOUS COMBUSTION PRODUCT. DECOMPOSITION		
Section 11: TOXICOLOGICAL INFORMATION		
IRRITANCY OF MATERIAL..... REFER TO ROUTE OF ENTRY. CARCINOGENICITY OF MATERIAL..... NOT AVAILABLE. TERATOGENICITY..... NOT AVAILABLE. MUTAGENICITY..... NOT AVAILABLE.		
Section 12: ECOLOGICAL INFORMATION		
ENVIRONMENTAL..... DO NOT ALLOW TO ENTER WATERS, WASTEWATER OR SOIL.		
Section 13: DISPOSAL CONSIDERATIONS		
WASTE DISPOSAL..... SPILLED MATERIAL AND WATER RINSES ARE CLASSIFIED AS CHEMICAL WASTE AND MUST BE DISPOSED OF IN ACCORDANCE WITH CURRENT LOCAL, PROVINCIAL AND FEDERAL REGULATIONS.		
Section 14: TRANSPORT INFORMATION		
UN NUMBER..... 1263. TDG CLASSIFICATION..... 3. PG II.		
Section 15: REGULATORY INFORMATION		
WHMIS CLASSIFICATION..... B2. D2B.		
Section 16: OTHER INFORMATION		
TELEPHONE NUMBER..... 905-794-1100. PREPARED BY: Regulatory Affairs PREPARATION DATE: Mar10/08		



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• PART 12 : WHMIS CERTIFICATE - GREY EPOXY PRIMER BASE

GREY EPOXY PRIMER BASE (E804138)

00000059		MATERIAL SAFETY DATA SHEET				Page 1
		Tristar Coatings Ltd. 18 Cadetta Rd Brampton, ON; L6P 0X4 Canada				
PRODUCT: Starpoxy 430, Grey Epoxy Primer Base					CODE: 432P0075	
Section 01: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION						
PRODUCT CODE.....		432P0075				
MANUFACTURER.....		Tristar Coatings Ltd 18 Cadetta Rd Brampton ON Canada L6P 0X4 905-794-1100, 1-800-975-5568				
PRODUCT NAME.....		Starpoxy 430, Grey Epoxy Primer Base				
MATERIAL USE.....		COATINGS FOR INDUSTRIAL APPLICATIONS.				
PRODUCT USE.....		PRIMER.				
CHEMICAL FAMILY.....		EPOXY RESIN.				
24 HOUR EMERGENCY NUMBER.....		(613) 996-6666 CANUTEC.				
Section 02: COMPOSITION/INFORMATION ON INGREDIENTS						
Hazardous Ingredients	%	Exposure Limit	C.A.S.#	LD/50, Route, Species	LC/50 Route, Species	
TOLUENE	5-10	376 MG/M3	108-88-3	5000 mg/kg ORAL (rat)	5320 ppm INHL. 8 HOURS MICE	
XYLENE	3-7	100 PPM/435 MG/M3	1330-20-7	4300 mg/kg ORAL RAT	5000 ppm 4 HOURS INHALATION RAT	
METHYL ISOBUTYL KETONE	3-7	50 ppm	108-10-1	2080 mg/kg RAT ORAL	IHL-HMN TCLo 200PPM TFX:IRR	
METHYL ETHYL KETONE (MEK)	3-7	590 MG/M3	78-93-3	4g/kg RAT ORAL	2-4,000 PPM/2HR RAT	
DIATOMACIOUS EARTH	1-5	NOT AVAILABLE	68855-54-9	NOT AVAILABLE	NOT AVAILABLE	
Section 03: HAZARDS IDENTIFICATION						
ROUTE OF ENTRY		EYE CONTACT. INGESTION. INHALATION. SKIN ABSORPTION.				
EFFECTS OF ACUTE EXPOSURE.....		INHALATION. HIGH VAPOUR CONCENTRATIONS ARE IRRITATING TO THE EYES, NOSE, THROAT AND LUNGS; MAY CAUSE HEADACHES. EYE CONTACT. MAY CAUSE IRRITATION AND BURNING.				
SKIN CONTACT.....		FREQUENT OR PROLONGED CONTACT MAY CAUSE DEFATTING, DRYING AND CRACKING OF THE SKIN. BRIEF CONTACT WITH THE LIQUID WILL NOT RESULT IN SIGNIFICANT IRRITATION IF EVAPORATION IS PREVENTED.				
INGESTION.....		SMALL AMOUNT OF THIS LIQUID DRAWN INTO THE LUNGS FROM SWALLOWING OR VOMITING MAY CAUSE SEVERE HEALTH EFFECTS (E.G., BRONCHO-PNEUMONIA OR PULMONARY EDEMA).				
EFFECTS OF CHRONIC EXPOSURE.....		PROLONGED OR REPEATED CONTACT MAY CAUSE SKIN IRRITATION. VAPOURS ARE MODERATELY IRRITATING TO THE EYES AND RESPIRATORY PASSAGES. PROLONGED EXPOSURE TO HIGH VAPOUR CONCENTRATION CAN CAUSE HEADACHE, DIZZINESS, NAUSEA AND CENTRAL NERVOUS SYSTEM DEPRESSION.				
Section 04: FIRST AID MEASURES						
EYE CONTACT.....		IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES, KEEPING EYELIDS OPEN, WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES. OBTAIN MEDICAL ATTENTION.				
SKIN CONTACT.....		IMMEDIATELY FLUSH SKIN WITH PLENTY OF SOAP AND WATER. REMOVE CONTAMINATED CLOTHING. WASH CLOTHING BEFORE REUSE.				
INHALATION.....		IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN, OBTAIN MEDICAL ATTENTION.				



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• PART 12 : WHMIS CERTIFICATE - GREY EPOXY PRIMER BASE

GREY EPOXY PRIMER BASE (E804138)

00000059	MATERIAL SAFETY DATA SHEET	Page 2
PRODUCT: Starpoxy 430, Grey Epoxy Primer Base		CODE: 432P0075
Section 04: FIRST AID MEASURES		
INGESTION.....	IF SWALLOWED, DO NOT INDUCE VOMITING. GIVE LARGE QUANTITY OF WATER. CALL A PHYSICIAN IMMEDIATELY. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.	
ADDITIONAL INFORMATION.....	NOTE TO PHYSICIAN: ASPIRATED PRODUCT MAY CAUSE SEVERE LUNG DAMAGE AND PRESENT A SIGNIFICANT HAZARD. STOMACH CONTENTS SHOULD BE EVACUATED QUICKLY IN A MANNER WHICH AVOIDS ASPIRATION. OTHERWISE, TREATMENT IS DIRECTED AT THE CONTROL OF SYMPTOMS AND THE CLINICAL CONDITION.	
Section 05: FIRE FIGHTING MEASURES		
FLAMMABILITY.....	YES.	
FLASH POINT (deg C), METHOD.....	2. (PENSKY-MARTENS CLOSED CUP).	
AUTO IGNITION TEMPERATURE (deg C)...	NOT AVAILABLE.	
UPPER FLAMMABLE LIMIT (% VOL).....	10.	
LOWER FLAMMABLE LIMIT (% VOL).....	1.0.	
HAZARDOUS COMBUSTION PRODUCTS..	CARBON MONOXIDE. CARBON DIOXIDE. SMOKE. TOXIC FUMES. ALDEHYDES.	
Section 06: ACCIDENTAL RELEASE MEASURES		
LEAK/SPILL.....	ELIMINATE ALL SOURCES OF IGNITION. PREVENT RUNOFF INTO DRAINS, SEWERS, AND OTHER WATERWAYS. VENTILATE AREA. WEAR FULL PROTECTIVE EQUIPMENT, INCLUDING RESPIRATORY EQUIPMENT DURING CLEAN-UP. USE EXPLOSION-PROOF OR HAND PUMPS AND NON-SPARKING TOOLS AND EQUIPMENT. ABSORB RESIDUAL MATERIAL WITH SAND, OR OTHER ABSORBENT MATERIAL. FOR LARGE QUANTITIES, REFER TO THE ENVIRONMENTAL MINISTRY.	
Section 07: HANDLING AND STORAGE		
HANDLING PROCEDURES.....	PREVENT ACCUMULATION OF ELECTROSTATIC CHARGES. GROUND HANDLING EQUIPMENT.	
STORAGE NEEDS.....	KEEP CONTAINERS TIGHTLY CLOSED. STORE DRY AT AMBIENT TEMPERATURE, AWAY FROM EXCESSIVE HEAT, STRONG OXIDIZERS OR COMBUSTIBLE MATERIALS.	
Section 08: EXPOSURE CONTROLS / PERSONAL PROTECTION		
PROTECTIVE EQUIPMENT		
GLOVES/ TYPE.....	NEOPRENE, PVC, POLYETHYLENE OR VITON.	
RESPIRATORY/TYPE.....	USE NIOSH APPROVED RESPIRATOR FOR ORGANIC VAPOURS.	
EYE/TYPE.....	CHEMICAL SAFETY GOGGLES. FACE SHIELD.	
FOOTWEAR/TYPE.....	SAFETY BOOTS PER LOCAL REGULATIONS.	
CLOTHING/TYPE.....	WEAR AN APRON AND/OR AN OVERALL.	
OTHER/TYPE.....	EYE BATH AND SAFETY SHOWER.	
VENTILATION REQUIREMENTS.....	LOCAL EXHAUST SHOULD BE USED TO MAINTAIN LEVELS BELOW THE EXPOSURE LIMITS.	
Section 09: PHYSICAL AND CHEMICAL PROPERTIES		
PHYSICAL STATE..... GREY OPAQUE VISCOUS LIQUID.		
ODOUR.....	SWEET, SPICY ODOUR.	
ODOUR THRESHOLD (ppm).....	NOT AVAILABLE.	
VAPOUR DENSITY (AIR=1).....	> 1.	
VAPOUR PRESSURE (mm Hg).....	NOT AVAILABLE.	
EVAPORATION RATE.....	>1.	
BOILING POINT (deg C).....	NOT AVAILABLE.	
FREEZING POINT (deg C).....	NOT AVAILABLE.	
SPECIFIC GRAVITY.....	1.495.	



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• PART 12 : WHMIS CERTIFICATE - GREY EPOXY PRIMER BASE

GREY EPOXY PRIMER BASE (E804138)

00000059	MATERIAL SAFETY DATA SHEET	Page 3
PRODUCT: Starpoxy 430, Grey Epoxy Primer Base		CODE: 432P0075
Section 10: STABILITY AND REACTIVITY		
STABILITY..... STABLE AT NORMAL TEMPERATURES AND PRESSURES. INCOMPATIBILITY..... STRONG OXIDIZERS, STRONG LEWIS OR MINERAL ACIDS. HAZARDOUS PRODUCTS OF SEE HAZARDOUS COMBUSTION PRODUCT. DECOMPOSITION		
Section 11: TOXICOLOGICAL INFORMATION		
IRRITANCY OF MATERIAL..... REFER TO ROUTE OF ENTRY. CARCINOGENICITY OF MATERIAL..... NOT AVAILABLE. TERATOGENICITY..... NOT AVAILABLE. MUTAGENICITY..... NOT AVAILABLE.		
Section 12: ECOLOGICAL INFORMATION		
ENVIRONMENTAL..... DO NOT ALLOW TO ENTER WATERS, WASTEWATER OR SOIL.		
Section 13: DISPOSAL CONSIDERATIONS		
WASTE DISPOSAL..... SPILLED MATERIAL AND WATER RINSES ARE CLASSIFIED AS CHEMICAL WASTE AND MUST BE DISPOSED OF IN ACCORDANCE WITH CURRENT LOCAL, PROVINCIAL AND FEDERAL REGULATIONS.		
Section 14: TRANSPORT INFORMATION		
UN NUMBER..... 1263. TDG CLASSIFICATION..... 3. PG II.		
Section 15: REGULATORY INFORMATION		
WHMIS CLASSIFICATION..... B2. D2B.		
Section 16: OTHER INFORMATION		
TELEPHONE NUMBER..... 905-794-1100. PREPARED BY: Regulatory Affairs PREPARATION DATE: Feb07/08		






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• PART 12 : WHMIS CERTIFICATE - H.S. CATALYST

H.S. CATALYST (E804166)

00000188		MATERIAL SAFETY DATA SHEET		Page 1	
		Tristar Coatings Ltd. 18 Cadetta Rd Brampton, ON; L6P 0X4 Canada			
PRODUCT: Starathane 550, H.S. Catalyst		CODE: 550C7469			
 					
Section 01: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION					
PRODUCT CODE.....		550C7469			
MANUFACTURER.....		Tristar Coatings Ltd 18 Cadetta Rd Brampton ON Canada L6P 0X4 905-794-1100, 1-800-975-5568			
PRODUCT NAME.....		Starathane 550, H.S. Catalyst			
MATERIAL USE.....		COATINGS FOR INDUSTRIAL APPLICATIONS.			
PRODUCT USE.....		CATALYST FOR STARATHANE 550 SERIES.			
CHEMICAL FAMILY.....		POLYISOCYANATE RESIN.			
24 HOUR EMERGENCY NUMBER.....		(613) 996-6666 CANUTEC.			
Section 02: COMPOSITION/INFORMATION ON INGREDIENTS					
Hazardous Ingredients	%	Exposure Limit	C.A.S.#	LD/50, Route, Species	LC/50 Route, Species
HOMOPOLYMER OF HDI	60-100	NOT AVAILABLE	28182-81-2	> 10000 MG/KG ORAL RAT	137-1150 MG/M3 4 HR RAT
BUTYL ACETATE	5-10	150 ppm/710 mg/m3	123-86-4	14000 mg/kg ORAL RAT	2000 PPM 4 HOURS, INHALATION, RAT
PARACHLORBENZOTRIFLUORIDE	5-10	N/A	98-56-6	>6.8 G/KG, RAT ORAL	4479 PPM RAT
1-METHOXY-2-PROPANOL ACETATE	5-10	100 PPM	108-65-6	7000 MG/KG RAT	6600 MG/KG ORAL RAT
Section 03: HAZARDS IDENTIFICATION					
HUMAN EFFECTS AND SYMPTOMS OF OVEREXPOSURE :					
ROUTE OF ENTRY		EYE CONTACT. INGESTION. INHALATION. SKIN ABSORPTION. SKIN CONTACT.			
INHALATION (ACUTE).....		SOLVENT VAPOURS MAY BE IRRITATING TO THE EYES, NOSE AND THROAT, RESULTING IN REDNESS, BURNING AND ITCHING OF EYES, DRYNESS OF THE THROAT AND TIGHTNESS IN THE CHEST. MAY RESULT IN NARCOSIS (CENTRAL NERVOUS SYSTEM DEPRESSION). MAY CAUSE RESPIRATORY IRRITATION, SNEEZING, COUGHING, AND RUNNY NOSE. PERSONS WITH PREEXISTING, NONSPECIFIC BRONCHIAL HYPERREACTIVITY CAN RESPOND TO CONCENTRATIONS BELOW THE TLV WITH SIMILAR SYMPTOMS AS WELL AS ASTHMA ATTACK. EXPOSURE WELL ABOVE THE TLV MAY LEAD TO BRONCHITIS, BRONCHIAL SPASM AND PULMONARY EDEMA. EFFECTS ARE USUALLY REVERSIBLE. CHEMICAL OR HYPERSENSITIVE PNEUMONITIS, WITH FLU-LIKE SYMPTOMS HAS ALSO BEEN REPORTED. THESE SYMPTOMS CAN BE DELAYED UP TO SEVERAL HOURS AFTER EXPOSURE. ISOCYANATE VAPOUR/MISTS AT CONCENTRATION ABOVE THE EXPOSURE LIMITS CAN IRRITATE (BURNING SENSATION) THE MUCOUS MEMBRANES IN THE RESPIRATORY TRACT. CAN CAUSE HEADACHE, DIZZINESS AND NAUSEA. MAY CAUSE FATIGUE AND LOSS OF APPETITE.			
INHALATION (CHRONIC).....		CHRONIC EXPOSURE TO ORGANIC SOLVENT VAPORS HAVE BEEN ASSOCIATED WITH VARIOUS NEUROTOXIC EFFECTS INCLUDING PERMANENT BRAIN AND/OR NERVOUS SYSTEM DAMAGE, KIDNEY, LIVER, BLOOD DAMAGE AND			



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• PART 12 : WHMIS CERTIFICATE - H.S. CATALYST

H.S. CATALYST (E804166)

00000188	MATERIAL SAFETY DATA SHEET	Page 2
PRODUCT: Starathane 550, H.S. Catalyst		CODE: 550C7469
Section 03: HAZARDS IDENTIFICATION		
INHALATION (CHRONIC).....	REPRODUCTIVE EFFECTS AMONG WOMEN. SYMPTOMS MAY INCLUDE NAUSEA, VOMITING, ABDOMINAL PAIN, HEADACHE, IMPAIRED MEMORY, LOSS OF COORDINATION, INSOMNIA AND BREATHING DIFFICULTIES. AS A RESULT OF PREVIOUS REPEATED OVEREXPOSURES OR A SINGLE LARGE DOSE, CERTAIN INDIVIDUALS WILL DEVELOP ISOCYANATE SENSITIZATION(CHEMICAL ASTHMA) WHICH WILL CAUSE THEM TO REACT TO A LATER EXPOSURE TO ISOCYANATE AT LEVELS WELL BELOW THE TLVOR MGL. THESE SYMPTOMS, WHICH INCLUDE:CHEST TIGHTNESS, WHEEZING, COUGH, SHORTNESS OF BREATH OR ASTHMATIC ATTACK , COULD BE IMMEDIATE OR DELAYED UPN TO SEEVRAL HOURS AFTER EXPOSURE.SIMILAR TO MANY NON-SPECIFIC ASTHMATIC RESPONSES, THERE ARE REPORTS THAT ONCE SENSITIZED AN INDIVIDUAL CAN EXPERIENCE THESE SYMPTOMS UPON EXPOSURE TO DUST,COLD AIR OR OTHER IRRITANTS. THIS INCREASED LUNG SENSITIVITY CAN PERSIST FOR WEEKS AND IN SEVERE CASES FOR SEVERAL YEARS. CHRONIC OVEREXPOSURE TO ISOCYANATES HAS ALSO BEEN REPORTED TO CAUSE LUNG DAMAGE,INCLUDING DECREASE IN LUNG FUNCTION,WHICH MAY BE PERMANENT. SENSITIZATION MAY BE ETHER TEMPORARY OR PERMANENT.	
SKIN CONTACT.....	ACUTE SKIN CONTACT:. ISOCYANATES REACTS WITH SKIN PROTEIN AND MOISTURE AND CAN CAUSE IRRITATION. CAN CAUSE REDDENING, SWELLING, RASH, SCALING OR BLISTERING. SOME PERSONS MAY DEVELOP SKIN SENSITIZATION FROM SKIN CONTACT. CURED MATERIAL IS DIFFICULT TO REMOVE. REPEATED OR PROLONGED SKIN CONTACT WITH ORGANIC SOLVENTS CAN RESULT IN DRY, DEFFATED AND CRACKED SKIN CAUSING INCREASED SUSCEPTIBILITY TO INFECTION. IN ADDITION, SKIN IRRITATION (IE REDNESS,SWELLING) WHICH MAY DEVELOP INTO DERMATITIS, MAY OCCUR FROM SKIN CONTACT. SOLVENTS MAY PENETRATE THE SKIN AND MAY CAUSE SYSTEMIC EFFECTS SIMILAR TO THOSE IDENTIFIED UNDER ACUTE INHALATION SYMPTOMS. CHRONIC SKIN CONTACT:. PROLONGED CONTACT WITH THE ISOCYANATE CAN CAUSE REDDENING, SWELLING, RASH, SCALLING OR BLISTERING. IN THOSE WHO HAVE DEVELOPED SKIN SENSITIZATION, THESE SYMPTOMS CAN DEVELOP AS A RESULT OF CONTACT WITH VERY SMALL AMOUNTS OF LIQUID MATERIAL OR EVEN AS A RESULT OF VAPOUR-ONLY EXPOSURE. CHRONIC SKIN EXPOSURE TO SOLVENTS MAY CAUSE EFFECTS SIMILAR TO THOSE IDENTIFIED UNDER CHRONIC INHALATION EFFECTS.	
EYE CONTACT.....	ACUTE EYE CONTACT:. LIQUID, AEROSOLS OR VAPOURS OF THIS PRODUCT (ISOCYANATES AND SOLVENTS) ARE IRRITATING AND CAN CAUSE TEARING, REDDENING AND SWELLING ACCOMPANIED BY A STINGING SENSATION AND/OR A FEELING LIKE THAT OF FINE DUST IN THE EYES. CHRONIC EYE CONTACT:. MAY RESULT IN CHRONIC OPACITY (CLOUDING OF THE EYE SURFACE). PROLONGED CONTACT MAY CAUSE CONJUNCTIVITIS.	
INGESTION.....	ACUTE INGESTION:. CAN RESULT IN IRRITATION AND POSSIBLE CORROSIVE ACTION IN THE MOUTH, STOMACH TISSUE AND DIGESTIVE TRACT. VOMITING MAY CAUSE ASPIRATION OF THE SOLVENT RESULTING IN CHEMICAL PNEUMONITIS. CHRONIC INGESTION:. NONE KNOWN.	
EXPOSURE LIMITS.....	NOT ESTABLISHED FOR THE PRODUCT AS A WHOLE. REFER TO EXPOSURE LIMITS OF HAZARDOUS INGRDIENTS. THE GUIDLINE LEVEL OF 0.5 MG/M3 (STEL) FOR THE HOMOPOLYMER OF HDI AND 0.02 PPM CEILING FOR HDI MONOMER ARE INTERNAL GUIDES BASED ON LIMITED DATA ; THEY ARE PROVIDED AS GUIDES PENDING THE REVIEW OF FUTURE DATA.	
ANIMAL TOXICITY DATA:.....	FOR HDI HOMOPOLYMER MATERIALS EXCEPT WHERE INDICATED. LD50 ORAL: ESTIMATED TO BE GREATER THAN 10,000 MG/KG (RATS). (BASED ON THE RESULTS OF ACTUAL TESTS CONDUCTED USING SPECIFIC HDI-HOMOPOLYMER PRODUCTS.) LC50, INHALATION: LOWER RESPIRATORY (PULMONARY) IRRITANT. LC50 VALUES RANGING FROM 137-1150 MG/M3 WERE OBTAINED IN RATS EXPOSED TO AEROSOLS.. EYE EFFECTS: SEVERE IRRITANT CAPABLE OF INDUCING CORNEAL INJURY (RABBIT); MAXIMUM PRIMARY EYE IRRITATION SCORE: 54.6/110 FOR 24 HOURS EXPOSURE. SKIN EFFECTS: MODERATE IRRITANT; PRIMARY DERMAL IRRITATION SCORE: 3.4/8.0 (RABBIT). OTHER ACUTE EFFECTS: AMES TEST: NEGATIVE FOR 100% SOLIDS MATERIAL. SUBCHRONIC	



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H.S. CATALYST (E804166)

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PRODUCT: Starathane 550, H.S. Catalyst				CODE: 550C7469	
Section 03: HAZARDS IDENTIFICATION					
ANIMAL TOXICITY DATA:.....		TOXICITY: RATS EXPOSED TO AN HDI HOMOPOLYMER (BIURET TYPE) AT 3.7, 17.5 AND 76.6 MG/M3 FOR THREE WEEKS (6 HRS/DAY, 5 DAYS A WEEK) EXHIBITED RESPIRATORY DISTRESS AND MANY INFLAMED AREAS OF TISSUE IN THE LUNGS AND UPPER RESPIRATORY TRACT WHEN EXPOSED TO 17.5 MG/M3 AND ABOVE. THE NO OBSERVABLE EFFECT LEVEL (NOEL) WAS 3.7 MG/M3. RATS EXPOSED FOR 3 MONTHS (6 HRS/DAY, 5 DAYS/WK) TO AN HDI HOMOPOLYMER (BIURET TYPE) AT AEROSOLS CONCENTRATIONS of 0.4, 3.4 AND 21 MG/M3 EXHIBITED LUNG WEIGHT INCREASES AT THE HIGHEST DOSE. HISTOPATHOLOGIC DIAGNOSIS OF THE TEST ANIMALS REVEALED SWELLING AND THICKENING IN THE LOWER RESPIRATORY TRACT AS WELL AS THICKENING OF THE BRONCHIO-ALVEOLAR AREAS OF THE LUNG AND THICKENING OF THE SEPTUM IN THE 21 MG/M3 ANIMALS. THERE WERE NO EFFECT NOTED IN THE UPPER AND CENTRAL RESPIRATORY TRACT. THE NOEL IN THIS STUDY IS CONSIDERED TO BE 3.4 MG/M3. OTHER TOXICITY DATA: MICE WERE EXPOSED TO A LIQUID AEROSOL OF AN HDI HOMOPOLYMER (ISOCYANATE TYPE) MIXED WITH ACETONE FOR 3 HOURS. THE IRRITATION POTENTIAL EXPRESSED AS THE RD50 (THE CONCENTRATION WHICH IS PREDICTED TO REDUCE THE RESPIRATORY RATE BY 50%) WAS 20.8 MG/M3 (95% CONFIDENCE INTERVAL = 18.3 TO 23.9 MG/M3). PULMONARY (LUNG) IRRITATION WAS OBSERVED FIRST, FOLLOWED BY SENSORY (EYE, NOSE AND THROAT) IRRITATION. .			
Section 04: FIRST AID MEASURES					
EYE CONTACT.....		IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES, KEEPING EYELIDS OPEN, WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES.			
SKIN CONTACT.....		IMMEDIATELY FLUSH SKIN WITH PLENTY OF SOAP AND WATER. REMOVE CONTAMINATED CLOTHING. WASH CLOTHING BEFORE REUSE.			
INHALATION.....		IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN, OBTAIN MEDICAL ATTENTION.			
INGESTION.....		DILUTE WITH A SMALL AMOUNT (200-250 ML) OF WATER. DO NOT INDUCE VOMITING. GET IMMEDIATE MEDICAL ATTENTION.			
ADDITIONAL INFORMATION.....		NOTE TO PHYSICIAN: EYE: STAIN FOR EVIDENCE OF CORNEAL INJURY. IF CORNEA IS BURNED, INSTILL ANTIBIOTIC STEROID PREPARATION FREQUENTLY. WORKPLACE VAPOURS HAVE PRODUCED REVERSIBLE CORNEAL EPITHELIAL EDEMA IMPAIRING VISION. SKIN: THIS COMPOUND IS A KNOWN SKIN SENSITIZER. TREAT SYMPTOMATICALLY AS FOR CONTACT DERMATITIS OR THERMAL BURNS. IF BURNED, TREAT AS THERMAL BURN. INGESTION: TREAT SYMPTOMATICALLY. THERE IS NO SPECIFIC ANTIDOTE. INDUCING VOMITING IS CONTRAINDICATED BECAUSE OF THE IRRITATING NATURE OF THIS COMPOUND. RESPIRATORY: THIS COMPOUND IS A KNOWN PULMONARY SENSITIZER. TREATMENT IS ESSENTIALLY SYMPTOMATIC. AN INDIVIDUAL HAVING A SKIN OR PULMONARY SENSITIZATION REACTION TO THIS MATERIAL SHOULD BE REMOVED FROM EXPOSURE TO ANY ISOCYANATE.			
Section 05: FIRE FIGHTING MEASURES					
FLASH POINT (deg C), METHOD.....		(PENSKY-MARTENS CLOSED CUP). 44.			
AUTO IGNITION TEMPERATURE (deg C)...		NOT TESTED.			
UPPER FLAMMABLE LIMIT (% VOL).....		11.5.			
LOWER FLAMMABLE LIMIT (% VOL).....		1.1%.			
HAZARDOUS COMBUSTION PRODUCTS..		THERMAL DECOMPOSITION OR COMBUSTION MAY PRODUCE . NITROGEN OXIDES. CARBON DIOXIDE. TRACES OF: HCN, HDI.			
FLAMMABILITY.....		YES.			
SPECIAL FIRE FIGHTING PROCEDURES..		FIREFIGHTER SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE CLOTHING TO PROTECT AGAINST POTENTIALLY TOXIC AND IRRITATING FUMES. DURING A FIRE, ISOCYANATE VAPOURS AND OTHER IRRITATING, HIGHLY TOXIC GASES MAY BE GENERATED BY THERMAL DECOMPOSITION OR COMBUSTION. KEEP AWAY FROM HEAT,			



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H.S. CATALYST (E804166)

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PRODUCT: Starathane 550, H.S. Catalyst				CODE: 550C7469	
Section 05: FIRE FIGHTING MEASURES					
SPECIAL FIRE FIGHTING PROCEDURES..		SPARKS AND FLAME. CLOSED CONTAINER MAY EXPLODE WHEN EXPOSED TO EXTREME HEAT OR BURST WHEN CONTAMINATED WITH WATER (CARBON DIOXIDE EVOLVED). SOLVENT VAPOURS MAY BE HEAVIER THAN AIR AND MAY BUILD UP AND TRAVEL ALONG THE GROUND TO AN IGNITION SOURCE, WHICH MAY RESULT IN A FLASH BACK TO THE SOURCE OF THE VAPOURS. STAGNANT AIR MAY CAUSE VAPOURS TO ACCUMULATE AND TRAVEL ALONG THE GROUND TO AN IGNITION SOURCE WHICH MAY RESULT IN A FLASH BACK TO THE SOURCE OF THE VAPOURS.			
Section 06: ACCIDENTAL RELEASE MEASURES					
LEAK/SPILL.....		EVACUATE ALL NON-ESSENTIAL PERSONNEL. VENTILATE. ELIMINATE ALL SOURCES OF IGNITION. DIKE AREA TO PREVENT SPREADING. WEAR FULL PROTECTIVE EQUIPMENT, INCLUDING RESPIRATORY EQUIPMENT DURING CLEAN-UP. USE A DRY ABSORBENT MATERIAL. SHOVEL INTO SUITABLE UNSEALED CONTAINERS, TRANSPORT TO WELL-VENTILATED AREA (OUTSIDE) AND TREAT WITH NEUTRALIZING SOLUTION: MIXTURE OF WATER (80%) WITH NON-IONIC SURFACTANT TERGITOL TMN-10 (20%), OR; WATER (90%), CONCENTRATED AMMONIA (3-8%) AND DETERGENT (2%).			
CLEAN UP.....		DECONTAMINATE FLOOR WITH DECONTAMINATION SOLUTION, LETTING STAND FOR AT LEAST 15 MINUTES.			
Section 07: HANDLING AND STORAGE					
HANDLING PROCEDURES.....		KEEP AWAY FROM HEAT, SPARKS, AND OPEN FLAME. GROUND HANDLING EQUIPMENT. AVOID SKIN AND EYE CONTACT. EMPLOYEE EDUCATION AND TRAINING ARE IMPORTANT.			
STORAGE NEEDS.....		(MIN/MAX: -34/50C). STORE IN TIGHTLY CLOSED CONTAINERS TO PREVENT MOISTURE CONTAMINATION. DO NOT RESEAL IF CONTAMINATION IS SUSPECTED. IDEAL STORAGE TEMPERATURE IS 10-26.7 DEG C (50-80 DEG F). EXPOSURE TO VAPOURS OF HEATED ISOCYANATES CAN BE EXTREMELY DANGEROUS.			
Section 08: EXPOSURE CONTROLS / PERSONAL PROTECTION					
PROTECTIVE EQUIPMENT					
EYE/TYPE.....		SPLASH PROOF CHEMICAL GOGGLES OR 8" FACE SHIELD. CONTACT LENSES SHOULD NOT BE WORN WHEN WORKING WITH THIS CHEMICAL.			
RESPIRATORY/TYPE.....		A POSITIVE PRESSURE, SUPPLIED-AIR RESPIRATOR OR A SELF-CONTAINED BREATHING APPARATUS IS RECOMMENDED. AT LEAST AN AIR-PURIFYING RESPIRATOR EQUIPPED WITH AN ORGANIC VAPOUR CARTRIDGE AND PARTICULATE PRE-FILTERS MUST BE WORN.			
GLOVES/ TYPE.....		CHEMICAL RESISTANT GLOVES. A BARRIER CREAM. PRACTICE GOOD HYGIENE, WASH THOROUGHLY BEFORE HANDLING ANY FOOD.			
CLOTHING/TYPE.....		WEAR ADEQUATE PROTECTIVE CLOTHES.			
FOOTWEAR/TYPE.....		NOT APPLICABLE.			
OTHER/TYPE.....		EYEWASH FOUNTAIN. EMERGENCY SHOWER SHOULD BE IN CLOSE PROXIMITY.			
VENTILATION REQUIREMENTS.....		VENTILATE ADEQUATELY. EXHAUST AIR MAY NEED TO BE CLEANED BY SCRUBBERS OR FILTERS TO REDUCE ENVIRONMENTAL CONTAMINATION. AVOID BREATHING MISTS; IF GENERAL VENTILATION OR LOCAL EXHAUST IS INADEQUATE, PERSONS EXPOSED TO MISTS SHOULD WEAR APPROVED BREATHING DEVICES.			
MEDICAL SURVELLANCE.....		MEDICAL SUPERVISION OF ALL EMPLOYEES WHO HANDLE OR COME IN CONTACT WITH ISOCYANATES IS RECOMMENDED. PERSONS WITH ASTHMATIC-TYPE CONDITIONS, CHRONIC BRONCHITIS, OTHER CHRONIC RESPIRATORY DISEASES OR RECURRENT SKIN ACZEMA OR SENSITIZATION SHOULD BE EXCLUDED FROM WORKING WITH ISOCYANATES. ONCE A PERSON IS DIAGNOSED AS SENSITIZED TO AN ISOCYANATE, NO FURTHER EXPOSURE CAN BE PERMITTED. THESE SHOULD INCLUDE PREEMPLOYMENT AND PERIODIC MEDICAL EXAMINATIONS WITH PULMONARY FUNCTION TEST (FEV, FVC AS A MINIMUM).			



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Section 08: EXPOSURE CONTROLS / PERSONAL PROTECTION		
<p>NOTE OF ODOUR WARNING PROPERTIES PURE ISOCYANATE MATERIALS HAVE ODOUR THRESHOLDS THAT ARE HIGHER THAN THE TLV, PEL OR MGL. THUS, IF A VAPOUR PARTICULATE AIR PURIFYING RESPIRATOR HAS EXCEEDED ITS SERVICE LIFE, BREAKTHROUGH OF THE FILTER CAN RESULT IN EXPOSURE OVER THE ALLOWABLE LIMIT WITHOUT THE WEARER BEING ABLE TO SMELL THE ISOCYANATE. HOWEVER, WHEN A POLYURETHANE COATING SYSTEM CONTAINS ORGANIC SOLVENTS, THE WEARER OF THE VAPOUR PARTICULATE RESPIRATOR WILL BE WARNED OF FILTER BREAKTHROUGH BY THE ODOUR OF SOLVENTS BEFORE BEING EXPOSED TO ISOCYANATES BECAUSE: 1) ORGANIC SOLVENTS HAVE LOW ODOUR TRESHOLDS, AND 2) TESTING HAS DEMONSTRATED THAT SOLVENTS BREAK THROUGH FILTERS BEFORE ISOCYANATES DO.</p> <p>SPRAY APPLICATION:..... GOOD INDUSTRIAL HYGIENE PRACTICE DICTATES THAT WHEN ISOCYANATES BASED COATINGS ARE SPRAY APPLIED, SOME FORM OF RESPIRATORY PROTECTION SHOULD BE WORN. DURING THE SPRAY APPLICATION OF ORGANIC SOLVENT CONTAINING COATINGS SYSTEMS, THE USE OF A POSITIVE PRESSURE SUPPLIED AIR RESPIRATOR IS MANDATORY WHEN: - THE AIRBORNE ISOCYANATE CONCENTRATIONS ARE NOT KNOWN, OR - THE AIRBORNE HDI MONOMER CONCENTRATIONS EXCEED 0.05 PPM (10 TIMES OF TLV) OR THE POLYISOCYANATE (POLYMERIC, OLIGOMERIC) CONCENTRATIONS EXCEED 5 MG/M3 AVERAGED OVER 8 HOURS OR 10 MG/M3 AVERAGED OVER 15 MINUTES (10 TIMES THE MGL) OR - SPRAYING IS PERFORMED IN A CONFINED SPACE OR IN AN AREA WITH LIMITED VENTILATION A PROPERLY FITTED AIR PURIFYING (COMBINATION ORGANIC VAPOUR AND PARTICULATE) RESPIRATOR, PROVEN BY TEST TO BE EFFECTIVE IN ISOCYANATE CONTAINING SPRAY PAINT ENVIRONMENTS, WILL PROVIDE ADEQUATE PROTECTION WHEN : - THE AIRBORNE HDI MONOMER CONCENTRATIONS ARE KNOWN TO BE BELOW 0.05 PPM (10 TIMES THE TLV) , AND - THE POLYISOCYANATES (POLYMERIC, OLIGOMERIC) CONCENTRATIONS ARE KNOWN TO BE BELOW 5 MG/M3 AVERAGED OVER 8 HOURS OR 10 MG/M3 AVERAGED OVER 15 MINUTES (10 TIMES THE MGL) .</p> <p>NON-SPRAY OPERATIONS:..... EVEN DURING NON-SPRAY OPERATIONS SUCH AS MIXING, BRUSH OR ROLLER APPLICATION, DEPENDING ON THE CONDITIONS (FOR EXAMPLE HEATING OF MATERIAL OR APPLICATION TO A HOT SUBSTRATE) , IT IS POSSIBLE TO BE EXPOSED TO AIRBORNE ISOCYANATE VAPOURS. THEREFORE WHEN THE COATINGS SYSTEM CONTAINS SOLVENTS AND WILL BE APPLIED IN A NON-SPRAY MANNER, A POSSITIVE PRESSURE SUPPLIED AIR RESPIRATOR MUST BE WORN WHEN: - THE AIRBORNE CONCENTRATIONS ARE UNKNOWN; OR - THE AIRBORNE HDI MONOMER CONCENTRATIONS EXCEED THE 0.05 PPM (10 TIMES THE TLV) , OR - THE AIRBORNE CONCENTRATIONS OF THE POLYISOCYANATE (POLIMERIC, OLIGOMERIC) EXCEED 5 MG/M3 AVERAGED OVER 8 HOURS OR 10 MG/M3 AVERAGED OVER 15 MINUTES (10 TIMES THE MGL) , OR - OPERATIONS ARE PERFORMED IN A CONFINED SPACE OR IN THE AREA WITH LIMITED VENTILATION. AT LEAST AN AIR PURIFYING (ORGANIC VAPOUR) RESPIRATOR IS REQUIRED WHEN: - THE AIRBORNE CONCENTRATIONS OF THE HDI MONOMER EXCEED THE TLV OF 0.005 PPM BUT ARE BELOW 0.05 PPM (10 TIMES THE TLV) , OR - THE AIRBORNE CONCENTRATIONS OF THE POLYISOCYANATE (POLYMERIC, OLIGOMERIC) EXCEED THE MGL OF 0.05 MG/M3 AVERAGED OVER 8 HOURS OR 1MG/M3 AVERAGED OVER 15 MINUTES BUT ARE BELOW 10 MG/M3 (10 TIMES THE MGL) .</p>		
Section 09: PHYSICAL AND CHEMICAL PROPERTIES		
<p>PHYSICAL STATE..... CLEAR, COLORLESS, MOBILE LIQUID.</p> <p>ODOUR..... SWEET AROMATIC ODOUR.</p> <p>ODOUR THRESHOLD (ppm)..... NOT AVAILABLE.</p> <p>VAPOUR DENSITY (AIR=1)..... NOT AVAILABLE.</p> <p>VAPOUR PRESSURE (mm Hg)..... NOT AVAILABLE.</p> <p>EVAPORATION RATE..... NOT AVAILABLE.</p> <p>BOILING POINT (deg C)..... NOT AVAILABLE.</p> <p>FREEZING POINT (deg C)..... NOT AVAILABLE.</p>		



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H.S. CATALYST (E804166)

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Section 09: PHYSICAL AND CHEMICAL PROPERTIES		
SPECIFIC GRAVITY..... 1.125.		
Section 10: STABILITY AND REACTIVITY		
HAZARDOUS POLYMERIZATION..... MAY OCCUR WITH. CONTACT WITH MOISTURE OR OTHER MATERIALS WHICH REACT WITH ISOCYANATES MAY CAUSE POLYMERIZATION. TEMPERATURES OVER 204 .		
STABILITY..... STABLE AT NORMAL TEMPERATURES AND PRESSURES.		
INCOMPATIBILITY..... WATER, AMINES, STRONG BASES, ALCOHOLS. METAL COMPOUNDS. SURFACE ACTIVE MATERIALS.		
REACTIVITY CONDITIONS..... REACTS WITH WATER, FORMING CARBON DIOXIDE. EXPOSURE TO HIGH HEAT.		
HAZARDOUS PRODUCTS OF AT HIGH TEMPERATURES: BY FIRE: CARBON MONOXIDE, CARBON DIOXIDE.		
DECOMPOSITION NITROGEN OXIDES. HYDROGEN CYANIDE. HDI.		
Section 11: TOXICOLOGICAL INFORMATION		
IRRITANCY OF MATERIAL..... MODERATE.		
SENSITIZING CAPABILITY OF MATERIAL. ISOCYANATE IS KNOWN TO CAUSE SKIN AND RESPIRATORY SENSITIZATION IN HUMANS.		
CARCINOGENICITY OF MATERIAL..... THIS PRODUCT IS NOT LISTED BY IARC OR NIOSH OR REGULATED AS A CARCINOGEN BY OSHA.		
TERATOGENICITY..... NOT AVAILABLE.		
MUTAGENICITY..... NOT AVAILABLE.		
REPRODUCTIVE EFFECTS..... HIGH LEVEL EXPOSURE TO XYLENE IN SOME ANIMAL STUDIES HAVE BEEN REPORTED TO CAUSE HEALTH EFFECTS ON THE DEVELOPING EMBRYO/FETUS. THE RELEVANCE OF THIS TO HUMANS IS NOT KNOWN.		
Section 12: ECOLOGICAL INFORMATION		
FISH TOXICITY..... ETHYL BENZENE. LC50: 9090 UG/L.		
TEST SPECIES..... FATHEAD MINNOWS.		
INVERTEBRATE TOXICITY..... LC50: 87600 UG/L.		
TESTING TIME..... 96 H.		
Section 13: DISPOSAL CONSIDERATIONS		
WASTE DISPOSAL..... SPILLED MATERIAL AND WATER RINSES ARE CLASSIFIED AS CHEMICAL WASTE AND MUST BE DISPOSED OF IN ACCORDANCE WITH CURRENT LOCAL, PROVINCIAL AND FEDERAL REGULATIONS. INCINERATION IS THE PREFERRED METHOD. EMPTY CONTAINERS MUST BE HANDLED WITH CARE DUE TO PRODUCT RESIDUE. DECONTAMINATE CONTAINERS PRIOR TO DISPOSAL. DO NOT HEAT OR CUT EMPTY CONTAINERS WITH ELECTRIC OR GAS TORCH.		
Section 14: TRANSPORT INFORMATION		
UN NUMBER..... 1263.		
TDG CLASSIFICATION..... 3. PG II.		
Section 15: REGULATORY INFORMATION		
WHMIS CLASSIFICATION..... B2. D2B.		
Section 16: OTHER INFORMATION		
TELEPHONE NUMBER..... 905-794-1100.		
PREPARED BY: Regulatory Affairs		
PREPARATION DATE: Feb18/09		






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• PART 12 : WHMIS CERTIFICATE - HIGH BUILD CATALYST

HIGH BUILD CATALYST (E804169)

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		Tristar Coatings Ltd. 18 Cadetta Rd Brampton, ON; L6P 0X4 Canada			
PRODUCT: Starpoxy 480, High Build Catalyst 2:1		CODE: 480C9042HB			
 					
Section 01: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION					
PRODUCT CODE.....		480C9042HB			
MANUFACTURER.....		Tristar Coatings Ltd 18 Cadetta Rd Brampton ON Canada L6P 0X4 905-794-1100, 1-800-975-5568			
PRODUCT NAME.....		Starpoxy 480, High Build Catalyst 2:1			
MATERIAL USE.....		COATINGS FOR INDUSTRIAL APPLICATIONS.			
PRODUCT USE.....		CATALYST FOR H.S.EPOXY PRIMER (3 TO 1).			
CHEMICAL FAMILY.....		PROPRIETARY SOLUTION.			
24 HOUR EMERGENCY NUMBER.....		(613) 996-6666 CANUTEC.			
Section 02: COMPOSITION/INFORMATION ON INGREDIENTS					
Hazardous Ingredients	%	Exposure Limit	C.A.S.#	LD/50, Route, Species	LC/50 Route, Species
TOLUENE	15-40	376 MG/M3	108-88-3	5000 mg/kg ORAL (rat)	5320 ppm INHL. 8 HOURS MICE
METHYL ETHYL KETONE (MEK) 7-13		590 MG/M3	78-93-3	4g/kg RAT ORAL	2-4,000 PPM/2HR RAT
ETHYL 3-ETHOXYPROPIONATE 7-13		50 ppm	763-69-9	5000 mg/kg (oral, rat)	>1000ppm/6hr(rat)
XYLENE	7-13	100 PPM/435 MG/M3	1330-20-7	4300 mg/kg ORAL RAT	5000 ppm 4 HOURS INHALATION RAT
LIGHT AROMATIC NAPHTHA	5-10	250 MG/M3	64742-95-6	>5600 MG/KG	>10200 MG/M3/4HR
AROMATIC AMINE	3-7	NOT AVAILABLE	90-72-2	ORL-RAT 2500	NOT AVAILABLE
N-BUTYL ALCOHOL	1-5	150 MG/M3 SKIN	71-36-3	2.5-4.4 G/KG RAL RAT	>8000 PPM/4HR RAT
Section 03: HAZARDS IDENTIFICATION					
ROUTE OF ENTRY		EYE CONTACT. INGESTION. INHALATION. SKIN ABSORPTION.			
EFFECTS OF ACUTE EXPOSURE.....		INHALATION. HIGH VAPOUR CONCENTRATIONS ARE IRRITATING TO THE EYES, NOSE, THROAT AND LUNGS; MAY CAUSE HEADACHES. EYE CONTACT. MAY CAUSE IRRITATION AND BURNING.			
SKIN CONTACT.....		FREQUENT OR PROLONGED CONTACT MAY CAUSE DEFATTING, DRYING AND CRACKING OF THE SKIN. BRIEF CONTACT WITH THE LIQUID WILL NOT RESULT IN SIGNIFICANT IRRITATION IF EVAPORATION IS PREVENTED.			
INGESTION.....		SMALL AMOUNT OF THIS LIQUID DRAWN INTO THE LUNGS FROM SWALLOWING OR VOMITING MAY CAUSE SEVERE HEALTH EFFECTS (E.G., BRONCHO-PNEUMONIA OR PULMONARY EDEMA).			
EFFECTS OF CHRONIC EXPOSURE.....		PROLONGED OR REPEATED CONTACT MAY CAUSE SKIN IRRITATION. VAPOURS ARE MODERATELY IRRITATING TO THE EYES AND RESPIRATORY PASSAGES. PROLONGED EXPOSURE TO HIGH VAPOUR CONCENTRATION CAN CAUSE HEADACHE, DIZZINESS, NAUSEA AND CENTRAL NERVOUS SYSTEM DEPRESSION.			
Section 04: FIRST AID MEASURES					
EYE CONTACT.....		IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES, KEEPING EYELIDS OPEN, WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES. OBTAIN MEDICAL ATTENTION.			
SKIN CONTACT.....		IMMEDIATELY FLUSH SKIN WITH PLENTY OF SOAP AND WATER. REMOVE CONTAMINATED CLOTHING. WASH CLOTHING BEFORE REUSE.			



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HIGH BUILD CATALYST (E804169)

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Section 04: FIRST AID MEASURES					
INHALATION.....		IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN, OBTAIN MEDICAL ATTENTION.			
INGESTION.....		IF SWALLOWED, DO NOT INDUCE VOMITING. GIVE LARGE QUANTITY OF WATER. CALL A PHYSICIAN IMMEDIATELY. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.			
ADDITIONAL INFORMATION.....		NOTE TO PHYSICIAN: ASPIRATED PRODUCT MAY CAUSE SEVERE LUNG DAMAGE AND PRESENT A SIGNIFICANT HAZARD. STOMACH CONTENTS SHOULD BE EVACUATED QUICKLY IN A MANNER WHICH AVOIDS ASPIRATION. OTHERWISE, TREATMENT IS DIRECTED AT THE CONTROL OF SYMPTOMS AND THE CLINICAL CONDITION.			
Section 05: FIRE FIGHTING MEASURES					
FLAMMABILITY.....		YES.			
FLASH POINT (deg C), METHOD.....		(PENSKY-MARTENS CLOSED CUP). 3.5.			
AUTO IGNITION TEMPERATURE (deg C)...		NOT AVAILABLE.			
UPPER FLAMMABLE LIMIT (% VOL).....		10.			
LOWER FLAMMABLE LIMIT (% VOL).....		1.0.			
HAZARDOUS COMBUSTION PRODUCTS..		CARBON MONOXIDE. CARBON DIOXIDE. SMOKE. TOXIC FUMES. ALDEHYDES. OXIDES OF NITROGEN. AMMONIA. ACIDIC FUMES.			
Section 06: ACCIDENTAL RELEASE MEASURES					
LEAK/SPILL.....		ELIMINATE ALL SOURCES OF IGNITION. PREVENT RUNOFF INTO DRAINS, SEWERS, AND OTHER WATERWAYS. VENTILATE AREA. WEAR FULL PROTECTIVE EQUIPMENT, INCLUDING RESPIRATORY EQUIPMENT DURING CLEAN-UP. USE EXPLOSION-PROOF OR HAND PUMPS AND NON-SPARKING TOOLS AND EQUIPMENT. ABSORB RESIDUAL MATERIAL WITH SAND, OR OTHER ABSORBENT MATERIAL. FOR LARGE QUANTITIES, REFER TO THE ENVIRONMENTAL MINISTRY.			
Section 07: HANDLING AND STORAGE					
HANDLING PROCEDURES.....		PREVENT ACCUMULATION OF ELECTROSTATIC CHARGES. GROUND HANDLING EQUIPMENT.			
STORAGE NEEDS.....		KEEP CONTAINERS TIGHTLY CLOSED. STORE DRY AT AMBIENT TEMPERATURE, AWAY FROM EXCESSIVE HEAT, STRONG OXIDIZERS OR COMBUSTIBLE MATERIALS.			
Section 08: EXPOSURE CONTROLS / PERSONAL PROTECTION					
PROTECTIVE EQUIPMENT					
GLOVES/ TYPE.....		NEOPRENE, PVC, POLYETHYLENE OR VITON.			
RESPIRATORY/TYPE.....		USE NIOSH APPROVED RESPIRATOR FOR ORGANIC VAPOURS.			
EYE/TYPE.....		CHEMICAL SAFETY GOGGLES. FACE SHIELD.			
FOOTWEAR/TYPE.....		SAFETY BOOTS PER LOCAL REGULATIONS.			
CLOTHING/TYPE.....		WEAR AN APRON AND/OR AN OVERALL.			
OTHER/TYPE.....		EYE BATH AND SAFETY SHOWER.			
VENTILATION REQUIREMENTS.....		LOCAL EXHAUST SHOULD BE USED TO MAINTAIN LEVELS BELOW THE EXPOSURE LIMITS.			
Section 09: PHYSICAL AND CHEMICAL PROPERTIES					
PHYSICAL STATE.....		CLEAR AMBER MOBILE LIQUID.			
ODOUR.....		CHARACTERISTIC ODOUR.			
ODOUR THRESHOLD (ppm).....		NOT AVAILABLE.			
VAPOUR DENSITY (AIR=1).....		> 1.			
VAPOUR PRESSURE (mm Hg).....		NOT AVAILABLE.			
EVAPORATION RATE.....		>1.			
BOILING POINT (deg C).....		NOT AVAILABLE.			
FREEZING POINT (deg C).....		-65.			



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• PART 12 : WHMIS CERTIFICATE - HIGH BUILD CATALYST

HIGH BUILD CATALYST (E804169)

00001263	MATERIAL SAFETY DATA SHEET	Page 3
PRODUCT: Starpoxy 480, High Build Catalyst 2:1		CODE: 480C9042HB
Section 09: PHYSICAL AND CHEMICAL PROPERTIES		
SPECIFIC GRAVITY..... 0.912.		
Section 10: STABILITY AND REACTIVITY		
STABILITY..... STABLE AT NORMAL TEMPERATURES AND PRESSURES.		
INCOMPATIBILITY..... STRONG OXIDIZERS.		
HAZARDOUS PRODUCTS OF SEE HAZARDOUS COMBUSTION PRODUCT.		
DECOMPOSITION		
Section 11: TOXICOLOGICAL INFORMATION		
IRRITANCY OF MATERIAL..... REFER TO ROUTE OF ENTRY.		
CARCINOGENICITY OF MATERIAL..... NOT AVAILABLE.		
TERATOGENICITY..... NOT AVAILABLE.		
MUTAGENICITY..... NOT AVAILABLE.		
Section 12: ECOLOGICAL INFORMATION		
ENVIRONMENTAL..... DO NOT ALLOW TO ENTER WATERS, WASTEWATER OR SOIL.		
Section 13: DISPOSAL CONSIDERATIONS		
WASTE DISPOSAL..... SPILLED MATERIAL AND WATER RINSES ARE CLASSIFIED AS CHEMICAL WASTE AND MUST BE DISPOSED OF IN ACCORDANCE WITH CURRENT LOCAL, PROVINCIAL AND FEDERAL REGULATIONS.		
Section 14: TRANSPORT INFORMATION		
UN NUMBER..... 1263.		
TDG CLASSIFICATION..... 3. PG II.		
Section 15: REGULATORY INFORMATION		
WHMIS CLASSIFICATION..... B2. D2B.		
Section 16: OTHER INFORMATION		
TELEPHONE NUMBER..... 905-794-1100.		
PREPARED BY: Regulatory Affairs		
PREPARATION DATE: Mar10/08		






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• PART 12 : WHMIS CERTIFICATE - SLOW REDUCER-SB51

SLOW REDUCER-SB51 (E804173)

00000091		MATERIAL SAFETY DATA SHEET		Page 1	
		Tristar Coatings Ltd. 18 Cadetta Rd Brampton, ON; L6T 3Z8 Canada			
PRODUCT: STARATHANE 560 SLOW REDUCER-SB51		CODE: SB51			
 					
Section 01: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION					
PRODUCT CODE.....		SB51			
MANUFACTURER.....		Tristar Coatings Ltd 18 Cadetta Rd Brampton ON Canada L6T 3Z8 905-794-1100, 1-800-975-5568			
PRODUCT NAME.....		STARATHANE 560 SLOW REDUCER-SB51			
MATERIAL USE.....		PAINTS.			
PRODUCT USE.....		REDUCER.			
CHEMICAL FAMILY.....		SOLVENT BLEND.			
24 HOUR EMERGENCY NUMBER:					
Section 02: COMPOSITION/INFORMATION ON INGREDIENTS					
Hazardous Ingredients	%	Exposure Limit	C.A.S.#	LD/50, Route, Species	LC/50 Route, Species
ETHYL 3-ETHOXYPROPIONATE	40-70	50 ppm	763-69-9	5000 mg/kg (oral, rat)	>1000ppm/6hr(rat)
BUTYL ACETATE	15 - 40	150 ppm/710 mg/m3	123-86-4	14000 mg/kg ORAL RAT	2000 PPM 4 HOURS, INHALATION, RAT
Section 03: HAZARDS IDENTIFICATION					
ROUTE OF ENTRY		EYE CONTACT. INHALATION. SKIN ABSORPTION. SKIN CONTACT.			
EFFECTS OF ACUTE EXPOSURE.....		INHALATION. HIGH VAPOUR CONCENTRATIONS ARE IRRITATING TO THE EYES, NOSE, THROAT AND LUNGS; MAY CAUSE HEADACHES AND DIZZINESS; MAY BE ANAESTHETIC AND MAY CAUSE OTHER CENTRAL NERVOUS SYSTEM EFFECTS.			
EYE CONTACT.....		IRRITANT.			
SKIN CONTACT.....		FREQUENT OR PROLONGED CONTACT MAY CAUSE DEFATTING, DRYING AND CRACKING OF THE SKIN. BRIEF CONTACT WITH THE LIQUID WILL NOT RESULT IN SIGNIFICANT IRRITATION IF EVAPORATION IS PREVENTED.			
INGESTION.....		SMALL AMOUNT OF THIS LIQUID DRAWN INTO THE LUNGS FROM SWALLOWING OR VOMITING MAY CAUSE SEVERE HEALTH EFFECTS (E.G., BRONCHO-PNEUMONIA OR PULMONARY EDEMA).			
EFFECTS OF CHRONIC EXPOSURE.....		REPEATED EXPOSURE WILL PRODUCE SIMPTOMS OF CHRONIC POISONING, ASSOCIATED WITH DISTURBANCE OF THE CENTRAL NERVOUS SYSTEM, NERVOUS IRRITABILITY, INSOMNIA, NAUSEA AND FATIGUE.			
Section 04: FIRST AID MEASURES					
EYE CONTACT.....		IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES, KEEPING EYELIDS OPEN, WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES. OBTAIN MEDICAL ATTENTION.			
SKIN CONTACT.....		IMMEDIATELY FLUSH SKIN WITH PLENTY OF SOAP AND WATER. REMOVE CONTAMINATED CLOTHING. WASH CLOTHING BEFORE REUSE.			
INHALATION.....		IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN, OBTAIN MEDICAL ATTENTION.			
INGESTION.....		IF SWALLOWED, DO NOT INDUCE VOMITING. GIVE LARGE QUANTITY OF WATER. CALL A PHYSICIAN IMMEDIATELY. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.			



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• PART 12 : WHMIS CERTIFICATE - SLOW REDUCER-SB51

SLOW REDUCER-SB51 (E804173)

00000091		MATERIAL SAFETY DATA SHEET		Page 2	
PRODUCT: STARATHANE 560 SLOW REDUCER-SB51				CODE: SB51	
Section 04: FIRST AID MEASURES					
ADDITIONAL INFORMATION.....		NOTE TO PHYSICIAN: ASPIRATED PRODUCT MAY CAUSE SEVERE LUNG DAMAGE AND PRESENT A SIGNIFICANT HAZARD. STOMACH CONTENTS SHOULD BE EVACUATED QUICKLY IN A MANNER WHICH AVOIDS ASPIRATION. OTHERWISE, TREATMENT IS DIRECTED AT THE CONTROL OF SYMPTOMS AND THE CLINICAL CONDITION.			
Section 05: FIRE FIGHTING MEASURES					
FLASH POINT (deg C), METHOD.....		27 DEG. C (TCC) LOWEST FLASHING COMPONENT			
AUTO IGNITION TEMPERATURE (deg C)...		NOT TESTED.			
UPPER FLAMMABLE LIMIT (% VOL).....		7.60.			
LOWER FLAMMABLE LIMIT (% VOL).....		1.0.			
HAZARDOUS COMBUSTION PRODUCTS..		CARBON DIOXIDE. TOXIC FUMES. SMOKE. CARBON MONOXIDE. THERMAL DECOMPOSITION OR COMBUSTION MAY PRODUCE . NITROGEN COMPOUNDS. ALDEHYDES.			
FLAMMABILITY.....		YES.			
Section 06: ACCIDENTAL RELEASE MEASURES					
LEAK/SPILL.....		ELIMINATE ALL SOURCES OF IGNITION. PREVENT RUNOFF INTO DRAINS, SEWERS, AND OTHER WATERWAYS. VENTILATE AREA TO REMOVE THE REMAINING VAPOURS. WEAR FULL PROTECTIVE EQUIPMENT, INCLUDING RESPIRATORY EQUIPMENT DURING CLEAN-UP. FOR LARGE QUANTITIES, REFER TO THE ENVIRONMENTAL MINISTRY.			
Section 07: HANDLING AND STORAGE					
HANDLING PROCEDURES.....		ALWAYS ADOPT PRECAUTIONARY MEASURES AGAINST BUILD-UP OF STATIC WHICH MAY ARISE FROM APPLIANCES, HANDLING AND THE CONTAINERS IN WHICH PRODUCT IS PACKED. EQUIPMENT MUST BE GROUNDED. IN FILLING OPERATIONS TAKE PRECAUTIONARY MEASURES AGAINST STATIC DISCHARGES.			
STORAGE NEEDS.....		KEEP CONTAINERS TIGHTLY CLOSED. STORE DRY AT AMBIENT TEMPERATURE, AWAY FROM EXCESSIVE HEAT, STRONG OXIDIZERS OR COMBUSTIBLE MATERIALS.			
Section 08: EXPOSURE CONTROLS / PERSONAL PROTECTION					
PROTECTIVE EQUIPMENT					
GLOVES/ TYPE.....		NEOPRENE, PVC, POLYETHYLENE OR VITON.			
RESPIRATORY/TYPE.....		USE NIOSH APPROVED RESPIRATOR FOR ORGANIC VAPOURS.			
EYE/TYPE.....		CHEMICAL SAFETY GOGGLES SHOULD BE WORN. PLASTIC FACE SHIELDS SHOULD BE WORN IN ADDITION TO SAFETY GOGGLES FOR COMPLETE FACE PROTECTION.			
FOOTWEAR/TYPE.....		SAFETY BOOTS PER LOCAL REGULATIONS.			
CLOTHING/TYPE.....		WEAR AN APRON AND/OR AN OVERALL.			
OTHER/TYPE.....		EYE BATH AND SAFETY SHOWER.			
VENTILATION REQUIREMENTS.....		LOCAL EXHAUST SHOULD BE USED TO MAINTAIN LEVELS BELOW THE EXPOSURE LIMITS. EXPLOSION-PROOF EXHAUST VENTILATION.			
Section 09: PHYSICAL AND CHEMICAL PROPERTIES					
PHYSICAL STATE.....		CLEAR, COLORLESS, MOBILE LIQUID.			
ODOUR.....		SWEET AROMATIC ODOUR.			
ODOUR THRESHOLD (ppm).....		NOT AVAILABLE.			
VAPOUR DENSITY (AIR=1).....		NOT AVAILABLE.			
VAPOUR PRESSURE (mm Hg).....		NOT AVAILABLE.			
EVAPORATION RATE.....		< 1.			
BOILING POINT (deg C).....		NOT AVAILABLE.			
FREEZING POINT (deg C).....		NOT AVAILABLE.			
SPECIFIC GRAVITY.....		0.93.			



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• PART 12 : WHMIS CERTIFICATE - SLOW REDUCER-SB51

SLOW REDUCER-SB51 (E804173)

00000091	MATERIAL SAFETY DATA SHEET	Page 3
PRODUCT: STARATHANE 560 SLOW REDUCER-SB51		CODE: SB51
Section 10: STABILITY AND REACTIVITY		
STABILITY..... STABLE AT NORMAL TEMPERATURES AND PRESSURES. INCOMPATIBILITY..... STRONG OXIDIZERS. HAZARDOUS PRODUCTS OF SEE HAZARDOUS COMBUSTION PRODUCT. DECOMPOSITION		
Section 11: TOXICOLOGICAL INFORMATION		
IRRITANCY OF MATERIAL..... NOT AVAILABLE. SENSITIZING CAPABILITY OF MATERIAL..... NOT AVAILABLE. CARCINOGENICITY OF MATERIAL..... NOT AVAILABLE. TERATOGENICITY MUTAGENICITY..... NOT AVAILABLE.		
Section 12: ECOLOGICAL INFORMATION		
ENVIRONMENTAL..... DO NOT ALLOW TO ENTER WATERS, WASTEWATER OR SOIL. BIODEGRADABILITY..... NOT AVAILABLE.		
Section 13: DISPOSAL CONSIDERATIONS		
WASTE DISPOSAL..... SPILLED MATERIAL AND WATER RINSES ARE CLASSIFIED AS CHEMICAL WASTE AND MUST BE DISPOSED OF IN ACCORDANCE WITH CURRENT LOCAL, PROVINCIAL AND FEDERAL REGULATIONS.		
Section 14: TRANSPORT INFORMATION		
UN NUMBER..... 1263. TDG CLASSIFICATION..... 3. PG II.		
Section 15: REGULATORY INFORMATION		
WHMIS CLASSIFICATION..... B2. D2B.		
Section 16: OTHER INFORMATION		
TELEPHONE NUMBER..... 905-794-1100. PREPARED BY: Regulatory Affairs PREPARATION DATE: Jan11/05		



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• PART 12 : WHMIS CERTIFICATE - TURCO ALUMIPREP 33

TURCO ALUMIPREP 33 (E804185)

Material Safety Data Sheet



Revision Number: 007.1

Issue date: 01/27/2009

1. PRODUCT AND COMPANY IDENTIFICATION

Product name: TURCO ALUMIPREP 33
Product use: Cleaner

IDH number: 592770

Region: Canada

Company address:
Henkel Canada Corporation
2225 Meadowpine Boulevard
Mississauga, Ontario L5N 7P2

Contact information:
Telephone: 905.814.6511
Emergency Telephone: CANUTEC 613-996-6666
Internet: www.henkelna.com

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Physical state: Liquid
Color: Colorless
Odor: Solvent

WHMIS hazard class: B.3, D.1.B, D.2.B, E

DANGER -- CORROSIVE!: COMBUSTIBLE!
CAUSES EYE, SKIN, DIGESTIVE TRACT, AND RESPIRATORY TRACT BURNS.
MAY BE HARMFUL IF SWALLOWED, ABSORBED THROUGH SKIN OR INHALED.

Relevant routes of exposure: Skin, Inhalation, Eyes

Potential Health Effects

Inhalation: Mists, vapors or liquid may cause severe irritation or burns. Inhalation of mists or vapors may produce upper airway edema, wheezing, pulmonary edema, pneumonitis and respiratory failure.

Skin contact: Corrosive to the skin. Contact with the skin or mucous membranes may cause severe irritation and burns. Following skin exposure to this product, the sensation of irritation or pain may be delayed. A component in this product may be harmful or fatal if absorbed through the skin.

Eye contact: This product is severely irritating to the eyes and may cause irreversible damage including burns and blindness.

Ingestion: This product may produce corrosive damage to the gastrointestinal tract if it is swallowed. May cause dizziness, incoordination, headache, nausea, and vomiting. Product contains a glycol ether which caused blood disorders in rabbits.

Existing conditions aggravated by exposure: Eye, skin and respiratory disorders.

See Section 11 for additional toxicological information.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Hazardous components	CAS NUMBER	%
Phosphoric acid	7664-38-2	10 - 30
2-Butoxyethanol	111-76-2	10 - 30
Surfactant	Proprietary	1 - 5
Potassium phosphate	Proprietary	1 - 5
Hydrogen fluoride	7664-39-3	0.1 - 1

IDH number: 592770

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Product name: TURCO ALUMIPREP 33



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• PART 12 : WHMIS CERTIFICATE - TURCO ALUMIPREP 33

TURCO ALUMIPREP 33 (E804185)

4. FIRST AID MEASURES

Inhalation:	If mist or vapor of this product is inhaled, remove person immediately to fresh air. Seek medical attention if symptoms develop or persist.
Skin contact:	Remove contaminated clothing and footwear. For skin contact, flush with large amounts of water. Seek immediate medical attention.
Eye contact:	In case of contact with the eyes, rinse immediately with plenty of water for 15 minutes, and seek immediate medical attention.
Ingestion:	Get immediate medical attention. Do not induce vomiting. Give one to two glasses of water or milk. Never give anything by mouth to a victim who is unconscious or is having convulsions.
Notes to physician:	Treat symptomatically and supportively.

5. FIRE FIGHTING MEASURES

Flash point:	62.8 °C (145.04 °F) Tagliabue closed cup
Autoignition temperature:	Not applicable
Flammable/Explosive limits - lower:	Not applicable
Flammable/Explosive limits - upper:	Not applicable
Extinguishing media:	Water spray (fog), foam, dry chemical or carbon dioxide. Use media appropriate for surrounding material.
Special firefighting procedures:	Wear full protective clothing. Wear self-contained breathing apparatus.
Unusual fire or explosion hazards:	Fire and explosion hazards are moderate when this product is exposed to heat or flame. Vapors are heavier than air and may travel along floor to an ignition source.
Hazardous combustion products:	Irritating and toxic gases or fumes may be released during a fire.
Sensitivity to Mechanical Impact:	Not available
Sensitivity to static discharge:	Not available

6. ACCIDENTAL RELEASE MEASURES

Use personal protection recommended in Section 8, isolate the hazard area and deny entry to unnecessary and unprotected personnel.	
Environmental precautions:	Prevent further leakage or spillage if safe to do so. Wear appropriate protective equipment and clothing during clean-up.
Clean-up methods:	Absorb spill with inert material. Shovel material into appropriate container for disposal.

7. HANDLING AND STORAGE

Handling:	Avoid contact with eyes, skin and clothing. Wash thoroughly after handling. Do not inhale vapors and fumes. Keep away from heat, spark and flame. For industrial use only.
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• PART 12 : WHMIS CERTIFICATE - TURCO ALUMIPREP 33

TURCO ALUMIPREP 33 (E804185)

Storage:

Keep container tightly closed and in a cool, well-ventilated place away from incompatible materials. Do not pressurize, cut, heat or weld containers. Empty product containers may contain product residue. Do not reuse empty containers. Manufacturer recommends storing above 4.4 °C (40 °F). Thaw and mix thoroughly if frozen. Do not store above 100 °F (37.7 °C).

For information on product shelf life contact Henkel Canada Customer Service at (905) 814-6511.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Employers should complete an assessment of all workplaces to determine the need for, and selection of, proper exposure controls and protective equipment for each task performed.

Hazardous components	ACGIH TLV	OSHA PEL	AIHA WEEL	OTHER
Phosphoric acid	1 mg/m3 TWA 3 mg/m3 STEL	1 mg/m3 TWA	None	None
2-Butoxyethanol	20 ppm TWA	(SKIN) 50 ppm (240 mg/m3) TWA	None	None
Surfactant	None	None	None	None
Potassium phosphate	None	None	None	None
Hydrogen fluoride	(SKIN) (as F) 0.5 ppm TWA (as F) 2 ppm Ceiling (as F)	3 ppm TWA	None	None

Engineering controls:

Use general ventilation and use local exhaust, where possible, in confined or enclosed spaces.

Respiratory protection:

If ventilation is not sufficient to effectively prevent buildup of aerosols, mists or vapors, appropriate NIOSH/MSHA respiratory protection must be provided.

Eye/face protection:

Wear chemical goggles; face shield (if splashing is possible).

Skin protection:

Wear impervious gloves for prolonged contact. Use of impervious apron and boots are recommended. Gloves should be tested to determine suitability for prolonged contact.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state:	Liquid
Color:	Colorless
Odor:	Solvent
Odor threshold:	Not available
pH:	< 2
Vapor pressure:	Not determined
Boiling point/range:	> 200 °F (> 93.3 °C)
Melting point/ range:	Not available
Specific gravity:	1.12 - 1.16 at 15.6 °C (60.08 °F)
Vapor density:	Not determined
Flash point:	62.8 °C (145.04 °F) Tagliabue closed cup
Flammable/Explosive limits - lower:	Not applicable
Flammable/Explosive limits - upper:	Not applicable
Autoignition temperature:	Not applicable
Evaporation rate:	Not available
Solubility in water:	Complete
Partition coefficient (n-octanol/water):	Not determined
VOC content:	14 % (by weight) (estimated)

IDH number: 592770

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Product name: TURCO ALUMIPREP 33



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• PART 12 : WHMIS CERTIFICATE - TURCO ALUMIPREP 33

TURCO ALUMIPREP 33 (E804185)

10. STABILITY AND REACTIVITY

Stability:	Stable at normal conditions.
Hazardous reactions:	Will not occur.
Hazardous decomposition products:	Upon decomposition, this product emits carbon monoxide, carbon dioxide and/or low molecular weight hydrocarbons. May liberate hydrogen fluoride.
Incompatible materials:	This product may react with strong oxidizing agents.
Conditions to avoid:	Keep away from heat, ignition sources and incompatible materials.

11. TOXICOLOGICAL INFORMATION

Toxicologically synergistic products: Not available

Refer to the following for Irritancy of Product, Sensitization to Product, Carcinogenicity, Reproductive Toxicity, Teratogenicity, and Mutagenicity.

Hazardous components	NTP Carcinogen	IARC Carcinogen	OSHA Carcinogen (Specifically Regulated)	ACGIH Carcinogen
Phosphoric acid	No	No	No	No
2-Butoxyethanol	No	No	No	Group A3
Surfactant	No	No	No	No
Potassium phosphate	No	No	No	No
Hydrogen fluoride	No	No	No	Group A4

Hazardous components	LD50s and LC50s	Health Effects/Target Organs
Phosphoric acid	Oral LD50 (RAT) = 1,530 mg/kg Dermal LD50 (rabbit) = 2,740 mg/kg	Irritant, Corrosive
2-Butoxyethanol	Oral LD50 (rabbit) = 320 mg/kg Oral LD50 (RAT) = 1,480 mg/kg Dermal LD50 (rabbit) = 400 mg/kg	Blood, Central nervous system, Irritant, Kidney, Liver
Surfactant	None	Irritant
Potassium phosphate	None	Gastrointestinal tract, Irritant, Metabolic
Hydrogen fluoride	Inhalation LC50 (RAT, 1 h) = 1,278 mg/l	Allergen, Blood, Bone Marrow, Cardiac, Central nervous system, Corrosive, Irritant, Kidney, Liver, Lung, Muscle, Nervous System, Respiratory, Teeth

12. ECOLOGICAL INFORMATION

Ecological information: Not available

13. DISPOSAL CONSIDERATIONS

Information provided is for unused product only.

Recommended method of disposal: Follow all local, state, federal and provincial regulations for disposal.

14. TRANSPORT INFORMATION

Canada Transportation of Dangerous Goods - Ground

Proper shipping name:	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (Phosphoric acid, Hydrofluoric acid)
Hazard class or division:	8
Identification number:	UN 3264
Packing group:	II

IDH number: 592770

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Product name: TURCO ALUMIPREP 33



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• PART 12 : WHMIS CERTIFICATE - TURCO ALUMIPREP 33

TURCO ALUMIPREP 33 (E804185)

International Air Transportation (ICAO/IATA)

Proper shipping name:	Corrosive liquid, acidic, inorganic, n.o.s. (Phosphoric acid, Hydrofluoric acid)
Hazard class or division:	8
Identification number:	UN 3264
Packing group:	II

Water Transportation (IMO/MDG)

Proper shipping name:	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (Phosphoric acid, Hydrofluoric acid)
Hazard class or division:	8
Identification number:	UN 3264
Packing group:	II

15. REGULATORY INFORMATION

Canada Regulatory Information

CEPA DSL/NDL Status:	All components are listed on or are exempt from listing on the Canadian Domestic Substances List.
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United States Regulatory Information

TSCA 8 (b) Inventory Status:	All components are listed or are exempt from listing on the Toxic Substances Control Act Inventory.
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16. OTHER INFORMATION

This material safety data sheet contains changes from the previous version in sections: New Material Safety Data Sheet format.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulation (CPR), and the MSDS contains all the information required by the CPR.

Prepared by: John DiCerbo, Regulatory Affairs Specialist

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• PART 12 : WHMIS CERTIFICATE - GM WHITE PAINT

GM WHITE PAINT (E804224)

00001498		MATERIAL SAFETY DATA SHEET		Page 1	
		Tristar Coatings Ltd. 18 Cadetta Rd Brampton, ON; L6P 0X4 Canada			
PRODUCT: Starathane 550, GMC 2009 H.S. Acrylic Aliphatic Polyurethane Topcoat		CODE: 551H9239SA			
 					
Section 01: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION					
PRODUCT CODE.....		551H9239SA			
MANUFACTURER.....		Tristar Coatings Ltd 18 Cadetta Rd Brampton ON Canada L6P 0X4 905-794-1100, 1-800-975-5568			
PRODUCT NAME.....		Starathane 550, GMC 2009 H.S. Acrylic Aliphatic Polyurethane Topcoat			
MATERIAL USE.....		COATINGS FOR INDUSTRIAL APPLICATIONS.			
PRODUCT USE.....		PAINTS.			
CHEMICAL FAMILY.....		ACRYLATED URETHANE.			
24 HOUR EMERGENCY NUMBER.....		(613) 996-6666 CANUTEC.			
Section 02: COMPOSITION/INFORMATION ON INGREDIENTS					
Hazardous Ingredients	%	Exposure Limit	C.A.S.#	LD/50, Route, Species	LC/50 Route, Species
BUTYL ACETATE	10-30	150 ppm/710 mg/m3	123-86-4	14000 mg/kg ORAL RAT	2000 PPM 4 HOURS, INHALATION, RAT
ETHYL 3-ETHOXYPROPIONATE	5-10	50 ppm	763-69-9	5000 mg/kg (oral, rat)	>1000ppm/6hr(rat)
ETHYL ACETATE	1-5	400 ppm	141-78-6	5600 MG/KG ORAL RAT	16000 PPM INHALATION RAT
XYLENE	0.5-1.5	100 PPM/435 MG/M3	1330-20-7	4300 mg/kg ORAL RAT	5000 ppm 4 HOURS INHALATION RAT
Section 03: HAZARDS IDENTIFICATION					
ROUTE OF ENTRY		INHALATION. EYE CONTACT. SKIN ABSORPTION. SKIN CONTACT.			
SKIN CONTACT.....		CAN CAUSE MODERATE IRRITATION, DEFATTING AND DERMATITIS.			
SKIN ABSORPTION.....		NOT AVAILABLE.			
EYE CONTACT.....		MAY CAUSE EYE IRRITATION.			
INGESTION.....		CAN CAUSE GASTROINTESTINAL IRRITATION, NAUSEA, VOMITING AND DIARRHEA. CAUSES IRRITATION AND BURNING OF THE MUCOUS MEMBRANES OF THE GASTROINTESTINAL TRACT.			
INHALATION (ACUTE).....		EXCESSIVE INHALATION OF VAPOURS CAN CAUSE RESPIRATORY IRRITATION, DIZZINESS, HEADACHE, VOMITING AND UNCONSCIOUSNESS. BREATHING OF HIGH VAPOUR CONCENTRATIONS MAY CAUSE ANESTHETIC EFFECTS AND SERIOUS HEALTH EFFECTS. MAY AFFECT CENTRAL NERVOUS SYSTEM.			
INHALATION (CHRONIC).....		MAY CAUSE DISORDERS OF THE CENTRAL NERVOUS SYSTEM.			
Section 04: FIRST AID MEASURES					
SKIN CONTACT.....		IMMEDIATELY FLUSH SKIN WITH PLENTY OF SOAP AND WATER. REMOVE CONTAMINATED CLOTHING. WASH CLOTHING BEFORE REUSE.			
INHALATION.....		IF OVEREXPOSURE OCCURS, REMOVE TO FRESH AIR. IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN, OBTAIN MEDICAL ATTENTION.			
INGESTION.....		GIVE 1 TO 2 GLASSES OF WATER TO DRINK. IF SWALLOWED, DO NOT INDUCE VOMITING. GIVE LARGE QUANTITY OF WATER. CALL A PHYSICIAN IMMEDIATELY. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.			
EYE CONTACT.....		CONSULT A PHYSICIAN IF IRRITATION CONTINUES. IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES, KEEPING EYELIDS OPEN, WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES.			



TECHNICAL MANUAL

MX151D - GM



• PART 12 : WHMIS CERTIFICATE - GM WHITE PAINT

GM WHITE PAINT (E804224)

00001498		MATERIAL SAFETY DATA SHEET		Page 2	
PRODUCT: Starathane 550, GMC 2009 H.S. Acrylic Aliphatic Polyurethane Topcoat				CODE: 551H9239SA	
Section 04: FIRST AID MEASURES					
ADDITIONAL INFORMATION.....		NOTE TO PHYSICIAN: ASPIRATED PRODUCT MAY CAUSE SEVERE LUNG DAMAGE AND PRESENT A SIGNIFICANT HAZARD. STOMACH CONTENTS SHOULD BE EVACUATED QUICKLY IN A MANNER WHICH AVOIDS ASPIRATION. OTHERWISE, TREATMENT IS DIRECTED AT THE CONTROL OF SYMPTOMS AND THE CLINICAL CONDITION.			
Section 05: FIRE FIGHTING MEASURES					
FLASH POINT (deg C), METHOD.....		(PENSKY-MARTENS CLOSED CUP). 21.5.			
AUTO IGNITION TEMPERATURE (deg C)...		NOT TESTED.			
UPPER FLAMMABLE LIMIT (% VOL).....		11.5.			
LOWER FLAMMABLE LIMIT (% VOL).....		1.1.			
HAZARDOUS COMBUSTION PRODUCTS..		CARBON DIOXIDE. CARBON MONOXIDE. NITROGEN COMPOUNDS. ALDEHYDES. SMOKE.			
FLAMMABILITY.....		REACTIVE FLAMMABLE MATERIAL.			
EXTINGUISHING MEDIA.....		DRY CHEMICAL. CARBON DIOXIDE. FOAM. WATER FOG. DO NOT USE WATER.			
Section 06: ACCIDENTAL RELEASE MEASURES					
LEAK/SPILL.....		ABSORB RESIDUAL MATERIAL WITH SAND, OR OTHER ABSORBENT MATERIAL. USE EXPLOSION-PROOF OR HAND PUMPS AND NON-SPARKING TOOLS AND EQUIPMENT. SPILLED MATERIAL SHOULD BE CONTAINED AND PUMPED INTO APPROPRIATE CONTAINERS FOR RECOVERY OR DISPOSAL. VENTILATE AREA TO REMOVE THE REMAINING VAPOURS. FOR LARGE QUANTITIES, REFER TO THE ENVIRONMENTAL MINISTRY. PREVENT RUNOFF INTO DRAINS, SEWERS, AND OTHER WATERWAYS. ELIMINATE ALL SOURCES OF IGNITION.			
Section 07: HANDLING AND STORAGE					
HANDLING PROCEDURES.....		ENSURE THAT EQUIPMENT IS PROPERLY BONDED AND GROUNDED DURING FILLING AND TRANSFERRING AS PRODUCT MAY BECOME ELECTROSTATICALLY CHARGED. IN FILLING OPERATIONS TAKE PRECAUTIONARY MEASURES AGAINST STATIC DISCHARGES. EQUIPMENT MUST BE GROUNDED. PREVENT ACCUMULATION OF ELECTROSTATIC CHARGES.			
NOTE STORAGE NEEDS.....		KEEP AWAY FROM HEAT, SPARKS, AND OPEN FLAMES. STORE AWAY FROM OXIDIZING MATERIALS AND ALL SOURCES OF IGNITION. STORE IN A COOL, DRY AND WELL VENTILATED AREA. KEEP CONTAINER CLOSED WHEN NOT IN USE.			
Section 08: EXPOSURE CONTROLS / PERSONAL PROTECTION					
EYE/TYPE.....		CHEMICAL SAFETY GOGGLES SHOULD BE WORN. PLASTIC FACE SHIELDS SHOULD BE WORN IN ADDITION TO SAFETY GOGGLES FOR COMPLETE FACE PROTECTION.			
RESPIRATORY/TYPE.....		AT LEAST AN AIR-PURIFYING RESPIRATOR EQUIPPED WITH AN ORGANIC VAPOUR CARTRIDGE AND PARTICULATE PRE-FILTERS MUST BE WORN.			
GLOVES/ TYPE.....		NEOPRENE, PVC, POLYETHYLENE OR VITON.			
CLOTHING/TYPE.....		WEAR ADEQUATE PROTECTIVE CLOTHES. WEAR AN APRON AND/OR AN OVERALL.			
FOOTWEAR/TYPE.....		SAFETY BOOTS PER LOCAL REGULATIONS.			
OTHER/TYPE.....		EYE BATH AND SAFETY SHOWER.			
VENTILATION REQUIREMENTS.....		LOCAL EXHAUST VENTILATION AT WORK AREA. USE LOCAL EXHAUST OR GENERAL ROOM VENTILATION SUFFICIENT TO PREVENT OVEREXPOSURE.			
Section 09: PHYSICAL AND CHEMICAL PROPERTIES					
PHYSICAL STATE.....		WHITE OPAQUE VISCOUS LIQUID.			
ODOUR.....		AROMATIC ODOUR.			
ODOUR THRESHOLD (ppm).....		NOT TESTED.			
VAPOUR DENSITY (AIR=1).....		NOT AVAILABLE.			
VAPOUR PRESSURE (mm Hg).....		NOT AVAILABLE.			



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• PART 12 : WHMIS CERTIFICATE - GM WHITE PAINT

GM WHITE PAINT (E804224)

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PRODUCT: Starathane 550, GMC 2009 H.S. Acrylic Aliphatic Polyurethane Topcoat CODE: 551H9239SA		
Section 09: PHYSICAL AND CHEMICAL PROPERTIES		
EVAPORATION RATE..... NOT AVAILABLE. BOILING POINT (deg C)..... NOT AVAILABLE. FREEZING POINT (deg C)..... NOT APPLICABLE. SPECIFIC GRAVITY..... 1.414.		
Section 10: STABILITY AND REACTIVITY		
STABILITY..... STABLE AT NORMAL TEMPERATURES AND PRESSURES. INCOMPATIBILITY..... INCOMPATIBLE WITH STRONG OXIDIZERS. REACTIVITY CONDITIONS..... NOT TESTED. HAZARDOUS PRODUCTS OF SEE HAZARDOUS COMBUSTION PRODUCT. DECOMPOSITION		
Section 11: TOXICOLOGICAL INFORMATION		
IRRITANCY OF MATERIAL..... MODERATE. CARCINOGENICITY OF MATERIAL..... NOT AVAILABLE. TERATOGENICITY..... NOT AVAILABLE. MUTAGENICITY..... NONE KNOWN.		
Section 12: ECOLOGICAL INFORMATION		
ENVIRONMENTAL..... DO NOT ALLOW TO ENTER WATERS, WASTEWATER OR SOIL. BIODEGRADABILITY..... NOT READILY BIODEGRADABLE.		
Section 13: DISPOSAL CONSIDERATIONS		
WASTE DISPOSAL..... WASTE MATERIAL MAY BE CONTAMINATED AND MAY REQUIRE SPECIAL DISPOSAL METHODS. CONSULT WITH APPROPRIATE REGULATORY AUTHORITIES.		
Section 14: TRANSPORT INFORMATION		
SHIPPING NAME..... PAINT RELATED MATERIAL. UN NUMBER..... 1263. PACKAGING GROUP..... II. TDG CLASSIFICATION..... 3.		
Section 15: REGULATORY INFORMATION		
WHMIS CLASSIFICATION..... B2, D2B.		
Section 16: OTHER INFORMATION		
TELEPHONE NUMBER..... 905-794-1100. PREPARED BY: Regulatory Affairs PREPARATION DATE: Feb26/09		



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• PART 12 : WHMIS CERTIFICATE - NON-CLOG AUTOBODY FILLER

NON-CLOG AUTOBODY FILLER (E205003)

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Col-R-Flo Lightweight

MSDS Number: 120002

SECTION 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Material Identity

Product Name: Col-R-Flo Lightweight
Product Numbers: 902525, 902535 and 902545
Product Use: Light weight bodyfiller

Company

Fibre Glass-Evercoat
a Division of Illinois Tool Works Inc.
6600 Cornell Road
Cincinnati, Ohio USA
Phone: 513-489-7600

Emergency Telephone Numbers:

CHEMTREC: 1-800-424-9300
CANUTEC: 1-613-996-6666

Prepared By: Safety Department

SECTION 2. COMPOSITION / INFORMATION ON INGREDIENTS

Ingredient(s)	CAS Number	EINECS Number	% (by weight)
Talc	14807-96-6	238-877-9	30 – 35
Polyester Resin (Non-Hazardous)	Proprietary	Proprietary	30 – 35
Styrene	100-42-5	202-851-5	15 – 20
Magnesite	546-93-0	208-915-9	5 – 10
Calcium Carbonate	1317-65-3	215-279-6	5 – 10
Inert Filler	Proprietary	Proprietary	1 – 5
Titanium Dioxide	13463-67-7	236-675-5	0 - 1

OSHA Regulatory Status: This material is classified as hazardous under OSHA regulations.

SECTION 3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

WARNING! FLAMMABLE LIQUID AND VAPOR.
CAUSES EYE, SKIN, NOSE AND THROAT IRRITATION.

Potential Health Effects

Acute Effects (Short Term):

Eye: Contact with liquid or vapor may result in irritation, redness, tearing, and blurred vision.

Skin: May cause mild skin irritation. Prolonged or repeated contact may dry the skin. Symptoms may include redness, burning, drying and cracking of skin, and skin burns.

Swallowing: Ingestion of this material may cause gastrointestinal irritation, nausea, diarrhea, and vomiting. Aspiration of this material into the lungs due to vomiting may produce chemical pneumonitis which can be fatal.



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• PART 12 : WHMIS CERTIFICATE - NON-CLOG AUTOBODY FILLER

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Inhalation: Excessive inhalation of vapors may cause nasal and respiratory irritation, acute nervous system depression, fatigue, weakness, nausea, headache, and dizziness. Symptoms usually occur at air concentrations higher than the recommended exposure limits (See Section 8).

Chronic Effects of Overexposure (Long Term):

Styrene: Excessive overexposure to styrene has been found to cause the following effects in humans and may aggravate pre-existing disorders of these organs; central nervous system effects, effects on hearing, mild effects on color vision and respiratory tract damage.

Cancer Information: The International Agency for Research on Cancer (IARC) has classified styrene as a group 2B carcinogen (possibly carcinogenic to humans). This classification is not based on evidence that styrene may be carcinogenic, but rather on a revised definition for Group 2B, and consideration of new data on styrene oxide (Group 2A). Titanium Dioxide is listed by IARC as possibly carcinogenic to humans (Group 2B). This listing is based on inadequate evidence of carcinogenicity in humans and sufficient evidence in experimental animals. This material may contain trace amounts of chemicals considered to be carcinogenic by OSHA, (1,3- Butadiene- IARC Group 2A and Crystalline Silica- IARC Group 1).

Other Health Effects: NOTICE: Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents may be harmful or fatal.

Primary Route(s) of Entry: Inhalation, Skin contact, Eye contact, Ingestion, Skin absorption.

SECTION 4. FIRST AID MEASURES

Eyes: Flush eyes gently with water for at least 15 minutes. Seek immediate medical attention.

Skin: Remove contaminated clothing. Wash exposed area with soap and water. If symptoms persist, seek medical attention. Launder clothing before reuse.

Swallowing: Consult a physician or poison control center immediately. DO NOT INDUCE VOMITING. If individual is drowsy or unconscious, do not give anything by mouth; place individual on the left side with the head down. If possible, do not leave individual unattended.

Inhalation: If symptoms develop, immediately move individual away from exposure and into fresh air. Seek immediate medical attention; keep person warm and quiet. If person is not breathing, begin



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artificial respiration. If breathing is difficult, oxygen may be beneficial if administered by trained personnel.

SECTION 5. FIRE FIGHTING MEASURES

Flash Point: 95 °F (35 °C)

Explosive Limit: Lower: 1.1% Upper: 6.1%

Autoignition Temperature: 914.0 °F (490.0 °C)

OSHA Flammability Class: Flammable Liquid – Class IC

Hazardous Products of Combustion: May form: carbon dioxide, carbon monoxide, styrene oxide, and various hydrocarbons.

Fire and Explosion Hazards: Vapors are heavier than air and may travel along the ground or may be moved by ventilation and ignited by pilot lights, other flames, sparks, heaters, smoking, electric motors, static discharge, or other ignition sources at locations distant from material handling point.

Extinguishing Media: Regular foam, carbon dioxide, dry chemical.

Fire Fighting Instructions: Water may be used to keep fire-exposed containers cool until fire is out. Wear a self-contained breathing apparatus NIOSH approved with a full facepiece operated in the positive pressure demand mode with appropriate turn-out gear and chemical resistant personal protective equipment.

NFPA Rating: Health - 2, Flammability - 3, Reactivity - 2

SECTION 6. ACCIDENTAL RELEASE MEASURES

In Case of Spill: Eliminate all sources of ignition such as flares, flames (including pilot lights), and electrical sparks. Ventilate the area. Wear proper protective equipment (Section 8). Avoid breathing vapors. Collect with an inert absorbant and dispose of properly.

SECTION 7. HANDLING AND STORAGE

Handling: All hazard precautions given in the data sheet must be observed. Avoid contact with eyes, skin and clothing. Wash thoroughly after handling. Use only with adequate ventilation. Do not breathe sanding dust, vapors or spray mist. Do not take internally. Close container after each use. **Keep out of reach of children.**

Storage: Store material in a cool, well-ventilated area. For maximum product quality, avoid prolonged storage at temperatures above 75°F (25°C). Do not use or



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store near heat, sparks, or open flame. Keep container tightly closed. Avoid contact with incompatible materials.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Eye Protection: Chemical splash goggles in compliance with OSHA regulations are recommended.

Skin Protection: Protective gloves and proper clothing should be worn to prevent skin contact. Gloves should be made of neoprene or natural rubber. A barrier cream may be used for additional skin protection. To prevent repeated or prolonged skin contact, wear impervious clothing and boots.

Respiratory Protection: Use a NIOSH approved respirator designed to remove particulate matter and organic solvent vapors.

Engineering Controls: Provide sufficient mechanical (general and/or local exhaust) ventilation to maintain exposure below acceptable limits. Explosion-proof ventilation system is acceptable.

Exposure Guidelines:

Hazardous Ingredients	CAS Number	OSHA PEL/TWA	ACGIH TLV
Talc	14807-96-6	20 mppcf	2 mg/m ³
Styrene	100-42-5	100 ppm	20 ppm
Magnesite	546-93-0	15 mg/m ³	10 mg/m ³
Inert Filler	Proprietary	5 mg/m ³	10 mg/m ³
Calcium Carbonate	1317-65-3	15 mg/m ³	10 mg/m ³
Titanium Dioxide	13463-67-7	15 mg/m ³	10 mg/m ³

Mppcf- millions of particles per cubic foot of air

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point:	293 °F/ 145 °C (Styrene)	Vapor Density:	Heavier than air.
Specific Gravity / Density:	1.25 / 10.4 lbs/gal	Percent Volatiles by weight:	15 – 20 %
Evaporation Rate:	Slower than ethyl ether.	Physical State:	Paste
Melting Point:	-23.1 °F / -30.6 °C (Styrene)	pH:	Neutral
Odor:	Sharp, aromatic odor.	Solubility:	Insoluble in water.
Vapor Pressure:	5.0 mmHg @ 68 °F / 20 °C	Appearance:	Gray Paste
Octanol/Water Partition Coefficient:	Unknown		



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• PART 12 : WHMIS CERTIFICATE - NON-CLOG AUTOBODY FILLER

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VOC (as packaged- less exempts and water):	1.46 lbs/gal or 175g/L	VOC (as applied*- 2%by wt hardener- less exempts and water):	0.40 lbs/gal or 48 g/L
Percent Solids by weight – as packaged:	85.0%	Percent Solids by weight – as applied* - 2 % by wt hardener:	96.0 %
VHAP Content by weight – as packaged:	15.0 %	VHAP Content by weight – as applied* - 2 % by weight hardener:	4.0 %

*NOTE: The applied VOC and VHAP Content is lower than the packaged VOC and VHAP Content due to a reactive diluent (styrene) that reacts and becomes non-volatile (bonded in the solid material) when the hardener is added.

SECTION 10. STABILITY AND REACTIVITY

Hazardous Polymerization: Product may undergo hazardous polymerization if exposed to extreme heat.

Hazardous Decomposition: May form: carbon dioxide, carbon monoxide, styrene oxide and various hydrocarbons.

Chemical Stability: Stable under normal handling conditions.

Incompatibility: Avoid contact in uncontrolled conditions with: peroxides, strong acids, strong oxidizing agents and polymerization catalysts.

SECTION 11. TOXICOLOGICAL INFORMATION

Acute Toxicity Data:

Ingredient	CAS #	LD ₅₀ Oral-Rat	LC ₅₀ Inhalation-Rat
Styrene	100-42-5	5,000 mg/kg	24 g/m ³ /4H
Calcium Carbonate	1317-65-3	6,450 mg/kg	N/E

N/E-Not Established

Carcinogenicity: See Cancer Information, Section 3.

Mutagenicity: No significant evidence found.

Teratogenicity: No significant risk of birth defects or reproductive toxicity of styrene to humans.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity: Styrene is toxic to aquatic organisms and should not be released to sewage, draining systems or any body of water exceeding concentrations of approved limits under applicable regulations and permits.

SECTION 13. DISPOSAL CONSIDERATION



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RCRA Hazardous Waste: This material as supplied, if discarded, would be regulated as a hazardous waste under RCRA (40 CFR 261). Dispose of in accordance with applicable federal, state, and local regulations.

RCRA Hazard Class: This material would be regulated as EPA Hazardous Waste Number D001 based on the characteristic of ignitability.

SECTION 14. TRANSPORT INFORMATION

DOT Description: The DOT Classification for shipping is dependant on quantity, type of packaging (a kit may include other components), or method of shipment.

SECTION 15. REGULATORY INFORMATION

US Federal Regulations

TSCA (Toxic Substances Control Act) Status

TSCA (USA) The intentional ingredients of this product are listed.

CERCLA RQ - 40 CFR 302.4(a)

Component	RQ (lbs.)
Styrene	1000

SARA Title III: Section 302- Extremely Hazardous Substances
None

SARA Title III: Section 313- Toxic Chemical List

Component	CAS Number	Percentage
Styrene	100-42-5	15 %

EPA Hazardous Air Pollutants (HAPS) 40 CFR 63

Component	CAS Number	Percentage
Styrene	100-42-5	15 %

International Regulations

EINECS (Europe) The intentional ingredients of this product are listed.

DSL (Canada) The intentional ingredients of this product are listed.

WHMIS Classification

Health Hazard: D2A, D2B (Other Toxic Effects)

Physical Hazard: B2 (Flammable)

State and Local Regulations

California Proposition 65:

This product contains the following chemical(s) known to the state of California to cause cancer. STYRENE OXIDE, 1,3-BUTADIENE, ANILINE, CRYSTALLINE SILICA

Styrene, in the presence of air and high temperature or prolonged exposure of styrene/air mixture to sunlight, can react to form styrene oxide.

This product contains the following chemical(s) known to the state of California to cause birth defects or reproductive harm. 1,3-BUTADIENE



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• PART 12 : WHMIS CERTIFICATE - NON-CLOG AUTOBODY FILLER

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SECTION 16. OTHER INFORMATION

HMIS Rating: Health – 1*, Flammability - 3, Reactivity - 2
Key- 0=Least, 1=Slight, 2=Moderate, 3=Serious, 4=Extreme, *=Chronic Effects

Other Precautions for Use: This product must be mixed with Cream Hardener prior to use. Please refer to the Material Safety Data Sheet (#100340) for catalyst before using. If product is to be sanded, the OSHA PEL/TLV of 10 mg/m³ for nuisance dust should be observed.

Additional Information may be obtained by calling the Evercoat MSDS Hotline at 1-800-729-7600.

NOTICE: The information accumulated herein is believed to be correct as of the date issued from sources, which are believed to be accurate and reliable. Since it is not possible to anticipate all circumstances of use, recipients are advised to confirm, in advance of need, that the information is current, applicable and suitable to their circumstances.



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• PART 12 : WHMIS CERTIFICATE - 732 CLEAR SEALANT

732 CLEAR SEALANT (E206004)



DOW CORNING CORPORATION

Material Safety Data Sheet

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Version: 1.9
Revision Date: 2009/03/11

DOW CORNING(R) 732 MULTI -PURPOSE SEALANT CLEAR

1. PRODUCT AND COMPANY IDENTIFICATION

MSDS No.: 01890573

SUPPLIER:
Dow Corning Canada Inc.
15-6400 Millcreek Drive, Suite 416
Mississauga, ON, Canada L5N 3E7

Prepared by Product Safety: (800) 248-2481
NEWALTA: (800) 567-7455
Revision Date: 2009/03/11

MANUFACTURER:
Dow Corning Corporation
South Saginaw Road
Midland, Michigan 48686

24 Hour Emergency Telephone: (989) 496-5900

WHMIS CLASSIFICATION: Class D, Division 2, Subdivision A.
Class D, Division 2, Subdivision B.

Material Usage: Sealant and adhesive

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Generic Description: Silicone elastomer
Physical Form: Paste
Colour: Colorless
Odour: Acetic acid

Acetic acid is formed upon contact with water or humid air. Provide adequate ventilation to control exposures within guidelines of OSHA PEL: TWA 10 ppm and ACGIH TLV: TWA 10 ppm, STEL 15 ppm.

+++++

POTENTIAL HEALTH EFFECTS

Acute Effects

Eye: Direct contact may cause moderate irritation.
Skin: May cause moderate irritation.
Inhalation: Irritates respiratory passages very slightly.
Oral: Low ingestion hazard in normal use.

Prolonged/Repeated Exposure Effects



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• PART 12 : WHMIS CERTIFICATE - 732 CLEAR SEALANT

732 CLEAR SEALANT (E206004)



DOW CORNING CORPORATION Material Safety Data Sheet

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DOW CORNING(R) 732 MULTI -PURPOSE SEALANT CLEAR

Skin: No known applicable information.

Inhalation: No known applicable information.

Oral: No known applicable information.

Signs and Symptoms of Overexposure

No known applicable information.

Medical Conditions Aggravated by Exposure

No known applicable information.

The above listed potential effects of overexposure are based on actual data, results of studies performed upon similar compositions, component data and/or expert review of the product. Please refer to Section 11 for the detailed toxicology information.

3. COMPOSITION/INFORMATION ON INGREDIENTS

<u>CAS Number</u>	<u>Wt %</u>	<u>Component Name</u>
7631-86-9	7.0 - 13.0	Silica, amorphous
17689-77-9	1.0 - 5.0	Ethyltriacetoxysilane
4253-34-3	1.0 - 5.0	Methyltriacetoxysilane
556-67-2	0.1 - 1.0	Octamethylcyclotetrasiloxane

The ingredients listed above are controlled products as defined in CPR, am. SOR/88-555.

4. FIRST AID MEASURES

Eye: Immediately flush with water for 15 minutes. Get medical attention.

Skin: Remove from skin and wash thoroughly with soap and water or waterless cleanser. Get medical attention if irritation or other ill effects develop or persist.

Inhalation: No first aid should be needed.

Oral: No first aid should be needed.

Notes to Physician: Treat according to person's condition and specifics of exposure.

5. FIRE FIGHTING MEASURES



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• PART 12 : WHMIS CERTIFICATE - 732 CLEAR SEALANT

732 CLEAR SEALANT (E206004)

DOW CORNING

DOW CORNING CORPORATION

Material Safety Data Sheet

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DOW CORNING(R) 732 MULTI -PURPOSE SEALANT CLEAR

Flash Point:	Not applicable. Not applicable.
Autoignition Temperature:	Not available.
Flammability Limits in Air:	Not available.
Extinguishing Media:	On large fires use dry chemical, foam or water spray. On small fires use carbon dioxide (CO ₂), dry chemical or water spray. Water can be used to cool fire exposed containers.
Fire Fighting Measures:	Self-contained breathing apparatus and protective clothing should be worn in fighting large fires involving chemicals. Determine the need to evacuate or isolate the area according to your local emergency plan. Use water spray to keep fire exposed containers cool.
Unusual Fire Hazards:	None.

6. ACCIDENTAL RELEASE MEASURES

Containment/Clean up: Observe all personal protection equipment recommendations described in Sections 5 and 8. Wipe up or scrape up and contain for salvage or disposal. Clean area as appropriate since spilled materials, even in small quantities, may present a slip hazard. Final cleaning may require use of steam, solvents or detergents. Dispose of saturated absorbent or cleaning materials appropriately, since spontaneous heating may occur. Local, provincial, federal laws and regulations may apply to releases and disposal of this material, as well as those materials and items employed in the cleanup of releases.

Note: See section 8 for Personal Protective Equipment for Spills. Call (989) 496-5900, if additional information is required.

7. HANDLING AND STORAGE

Use with adequate ventilation. Product evolves acetic acid (HOAc) when exposed to water or humid air. Provide ventilation during use to control HOAc within exposure guidelines or use respiratory protection. Avoid eye contact. Avoid skin contact.

Keep container closed and store away from water or moisture.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Component Exposure Limits

Consult local authorities for acceptable provincial values.

<u>CAS Number</u>	<u>Component Name</u>	<u>Exposure Limits</u>
7631-86-9	Silica, amorphous	OSHA PEL (final rule): TWA 80mg/m ³ /%SiO ₂ . NIOSH REL: TWA 6mg/m ³ .



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• PART 12 : WHMIS CERTIFICATE - 732 CLEAR SEALANT

732 CLEAR SEALANT (E206004)

DOW CORNING

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DOW CORNING(R) 732 MULTI -PURPOSE SEALANT CLEAR

		LC50: > 2.08 mg/L - Inhalation Rat ; 4hr dust/mist LD50: > 3,300 mg/kg - Oral Rat LD50: > 5,000 mg/kg - Dermal Rabbit
17689-77-9	Ethyltriacetoxysilane	See acetic acid comments. LD50: 1,462 mg/kg - Oral Rat
4253-34-3	Methyltriacetoxysilane	See acetic acid comments. LD50: 1,602 mg/kg - Oral Rat
556-67-2	Octamethylcyclotetrasiloxane	Dow Corning guide: TWA 10 ppm. LC50: 36 mg/L - Inhalation Rat ; 4hr vapor LD50: > 5,000 mg/kg - Oral Rat LD50: > 4,640 mg/kg - Dermal Rabbit

Acetic acid is formed upon contact with water or humid air. Provide adequate ventilation to control exposures within guidelines of OSHA PEL: TWA 10 ppm and ACGIH TLV: TWA 10 ppm, STEL 15 ppm.

Engineering Controls

Local Ventilation: None should be needed.
General Ventilation: Recommended.

Personal Protective Equipment for Routine Handling

Eyes: Use proper protection - safety glasses as a minimum.

Skin: Wash at mealtime and end of shift. Contaminated clothing and shoes should be removed as soon as practical and thoroughly cleaned before reuse. Chemical protective gloves are recommended.

Suitable Gloves: Avoid skin contact by implementing good industrial hygiene practices and procedures. Select and use gloves and/or protective clothing to further minimize the potential for skin contact. Consult with your glove and/or personnel protective equipment manufacturer for selection of appropriate compatible materials.

Inhalation: No respiratory protection should be needed.

Suitable Respirator: None should be needed.

Personal Protective Equipment for Spills

Eyes: Use proper protection - safety glasses as a minimum.

Skin: Wash at mealtime and end of shift. Contaminated clothing and shoes should be removed as soon as practical and thoroughly cleaned before reuse. Chemical protective gloves are recommended.



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• PART 12 : WHMIS CERTIFICATE - 732 CLEAR SEALANT

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DOW CORNING(R) 732 MULTI -PURPOSE SEALANT CLEAR

Inhalation/Suitable Respirator:	No respiratory protection should be needed.
Precautionary Measures:	Avoid eye contact. Avoid skin contact. Use reasonable care.
Comments:	Product evolves acetic acid (HOAc) when exposed to water or humid air. Provide ventilation during use to control HOAc within exposure guidelines or use respiratory protection.
Note: These precautions are for room temperature handling. Use at elevated temperature or aerosol/spray applications may require added precautions.	

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical Form:	Paste
Color:	Colorless
Odor:	Acetic acid
Odor Threshold:	Not available.
Specific Gravity @ 25°C:	1.04
Viscosity:	Not available.
Freezing/Melting Point:	Not available.
Boiling Point:	Not available.
Vapor Pressure @ 25°C:	Not available.
Vapor Density:	Not available.
Evaporation Rate:	Not available.
Solubility in Water:	Not available.
Coefficient of Water/Oil	Not available.
Distribution:	
pH:	Not available.
Volatile Content:	Not available.
Flash Point:	Not applicable. Not applicable.
Autoignition Temperature:	Not available.
Flammability Limits in Air:	Not available.
Note: The above information is not intended for use in preparing product specifications. Contact Dow Corning before writing specifications.	

10. STABILITY AND REACTIVITY

Chemical Stability:	Stable.
Hazardous Polymerization:	Hazardous polymerization will not occur.
Conditions to Avoid:	None.
Materials to Avoid:	Oxidizing material can cause a reaction. Water, moisture, or humid air can cause hazardous vapors to form as described in Section 8.



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DOW CORNING(R) 732 MULTI -PURPOSE SEALANT CLEAR

Hazardous Decomposition Products

Thermal breakdown of this product during fire or very high heat conditions may evolve the following decomposition products: Carbon oxides and traces of incompletely burned carbon compounds. Silicon dioxide. Formaldehyde.

11. TOXICOLOGICAL INFORMATION

Component Toxicology Information

Recent results from a 2 year repeated vapour inhalation exposure study to rats of octamethylcyclotetrasiloxane (D4) indicate effects (benign uterine adenomas) in the uterus of female animals. These effects, which have been shown to be rat-specific, occur at the highest exposure dose (700 ppm) only, a level that greatly exceeds typical workplace or consumer exposures. Industrial, commercial, or consumer uses of products containing D4 do not represent a risk to humans.

Octamethylcyclotetrasiloxane administered to rats by inhalation at concentrations of 500 and 700 ppm resulted in statistically significant decreases in the number of pups born and the live litter size in both the first and second generations. Prolonged estrous cycles, and decreased mating and fertility indices were observed following 700 ppm exposure in the second generation only. There were also increases in the incidence of deliveries of offspring extending over an unusually long time period (dystocia). Subsequent mode of action work demonstrated the effect on reproduction in female rats is due to delayed ovulation caused by a treatment-related delay in or blockage of the luteinizing hormone (LH) surge on the day of proestrus. This mode of action is not considered relevant to humans.

Special Hazard Information on Components

Reproductive Effects

<u>CAS Number</u>	<u>Wt %</u>	<u>Component Name</u>	
556-67-2	0.1 - 1.0	Octamethylcyclotetrasiloxane	Evidence of reproductive effects in laboratory animals.

12. ECOLOGICAL INFORMATION

Environmental Fate and Distribution

Complete information is not yet available.

Environmental Effects

Complete information is not yet available.

Fate and Effects in Waste Water Treatment Plants

Complete information is not yet available.



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DOW CORNING(R) 732 MULTI -PURPOSE SEALANT CLEAR

Ecotoxicity Classification Criteria			
Hazard Parameters (LC50 or EC50)	High	Medium	Low
Acute Aquatic Toxicity (mg/L)	<=1	>1 and <=100	>100
Acute Terrestrial Toxicity	<=100	>100 and <= 2000	>2000

This table is adapted from "Environmental Toxicology and Risk Assessment", ASTM STP 1179, p.34, 1993.

This table can be used to classify the ecotoxicity of this product when ecotoxicity data is listed above. Please read the other information presented in the section concerning the overall ecological safety of this material.

13. DISPOSAL CONSIDERATIONS

Can be incinerated in accordance with local regulations.

Call local hazardous waste disposal company or provincial waste authorities for more information.

14. TRANSPORT INFORMATION

Canada Road (Based on IMDG Regulations)

Not subject to local road regulations.

Ocean Shipment (IMDG)

Not subject to IMDG code.

Air Shipment (IATA)

Not subject to IATA regulations.

Call Dow Corning Transportation, (989) 496-8577, if additional information is required.

15. REGULATORY INFORMATION

This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.

WHMIS
CLASSIFICATION: Class D, Division 2, Subdivision A.
Class D, Division 2, Subdivision B.

DSL STATUS: All chemical substances in this material are included on or exempted from the DSL.



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DOW CORNING(R) 732 MULTI -PURPOSE SEALANT CLEAR

16. OTHER INFORMATION

Prepared by: Dow Corning Corporation

These data are offered in good faith as typical values and not as product specifications. No warranty, either expressed or implied, is hereby made. The recommended industrial hygiene and safe handling procedures are believed to be generally applicable. However, each user should review these recommendations in the specific context of the intended use and determine whether they are appropriate.

(R) indicates Registered Trademark



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• PART 12 : WHMIS CERTIFICATE - PRIMER 210-T

PRIMER 210-T (E804037)



Sika Canada Inc.

MATERIAL SAFETY DATA SHEET

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Date: 99/09/30

Appr: S.G.

SECTION I: PRODUCT INFORMATION

PRODUCT: **Sika® Primer-210 T** REVISION DATE: February 15, 2009

USAGE: PRIMER FOR SIKAFLEX® URETHANE BASED SEALANT/ADHESIVE

MANUFACTURER: SIKA CANADA INC.
601, avenue Delmar
Pointe Claire, QC
H9R 4A9

EMERGENCY TELEPHONE NUMBER: CANUTEC (collect) (613) 996-6666

TDG CLASSIFICATION: Resin solution, flammable WHMIS Classification: B2, D1A, D2A
UN NUMBER: 1866 Class: 3
Packaging Group: II

SECTION II: HAZARDOUS INGREDIENTS

Hazardous ingredients	%	T.L.V.	# CAS	LD ₅₀ (species, route)	LC ₅₀ (species, route)
XYLENE	1-5	100 ppm	1330-20-7	4300 (oral, rat)	6350 ppm/4h
POLYOL AND ISOCYANATE PREPOLYMER	10-30	Not Established	Not Available	Not Established	Not Established
ETHYL ACETATE	30-60	400 ppm	141-78-6	5600 (oral, rat)	16000 ppm / 6H
METHANOL	10-30	200 ppm	67-56-1	6200 (oral, rat)	64000 ppm / 4H
DIACETONE ALCOHOL	1-5	50 ppm	123-42-2	4000 (oral, rat)	Not Available

SECTION III: PHYSICAL CHARACTERISTICS

Physical State:	Liquid	Boiling Point:	Not Established
Appearance and Odor:	Aromatic odor amber liquid	Freezing Point:	Not Established
		Density:	0,9 g/ml
Odor Threshold:	Not Established	Water Solubility:	Not Established
Evaporation Rate:	Not Established	pH:	Not Established
Vapor Density:	Not Established	% volatile:	< 80
Vapor Pressure:	Not Established	Water/Oil Distribution:	Not Established



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• PART 12 : WHMIS CERTIFICATE - PRIMER 210-T

PRIMER 210-T (E804037)



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Date: 99/09/30

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PRODUCT: Sika® Primer-210 T			
SECTION IV: FIRE AND EXPLOSION HAZARDS			
Flammability:	Yes	TDG inflammability Class:	3
If Yes, under what conditions:	Flame, spark	Flammable upper limits (% vol.):	Not Established
Extinguishing methods:	Foam, dry chemical products, CO ₂ , water for large flames.	Flammable lower limits (% vol.):	Not Established
Special Methods:	Firefighters must wear complete protective clothing with respiratory equipment and they must protect any exposed skin.	Flash Point (method used):	> -2°C (TCC)
		Auto-ignition temperature:	Not Established
		Dangerous Combustion Products:	Carbon oxides, Aldehydes, Ketones, Nitrogen oxide, IPDI
		Protect from mechanical impact:	No
		Protect from static discharge:	Yes
SECTION V: REACTIVITY DATA			
Chemical stability:	Yes	Dangerous decomposition products:	Carbon oxides, Aldehydes, Ketones, Nitrogen oxide, IPDI
If not, under what conditions			
Incompatibility with other material:	Yes	Polymerization Risks:	No
If Yes, which ones:	Acid, strong oxidizer, amine.		



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• PART 12 : WHMIS CERTIFICATE - PRIMER 210-T

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PRODUCT: Sika® Primer-210 T	
SECTION VI: TOXIC PROPERTIES	
ROUTE OF ENTRY / CONTACT	
Eyes:	Irritating
Carcinogenicity:	No
Skin:	Irritating. Contact may result in dermatitis, allergic reactions, and sensitization. Methanol may be absorbed by the skin at toxic or lethal level.
Toxic effects on reproduction:	Congenital malformations for rats at 20 000 ppm of methanol.
Inhalation:	Vapor or mist from this product may cause irritation.
Teratogenicity	Xylene is classified as a development toxicant (Embryo toxin)
Ingestion:	May cause nausea, vomiting, fainting, diarrhea, lung damage, gastric-intestinal system disorder, constipation, ulcers, and death. Ingestion of methanol may cause blindness.
Mutagenicity:	Limited evidence in vitro.
Product with synergistic Effects:	Not Established
Over exposure may cause breathing difficulties, sensitization, headaches, nausea, vomiting and blindness.	
May aggravate respiratory, skin, eye, lung problems and allergies.	
Xylene is a central nervous system depressor and in rare cases, may cause a sensitization of the heart muscle causing arrhythmia.	
An acute or chronic exposure will increase the toxic effects mentioned in this section and may aggravate respiratory problems. An over exposure may cause death.	



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• PART 12 : WHMIS CERTIFICATE - PRIMER 210-T

PRIMER 210-T (E804037)



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PRODUCT: Sika® Primer-210 T	
SECTION VII: PREVENTIVE MEASURES	
PERSONAL PROTECTIVE EQUIPMENT	OTHERS
Gloves: Use chemical resistant gloves.	Ventilation: Sufficient ventilation required
Respiratory equipment NIOSH approved mask with organic vapor cartridge.	Procedure in case of leaks: Absorb with sand or other absorbent material.
Eyes: Full-face mask or safety glasses	Handling and Equipment methods: Avoid skin, eye and clothing contact
Shoes: Leather	Warehouse Requirements: Keep all containers closed in a cool, dry and well ventilated area. Keep away from heat and open flame.
Clothing: Rubber Apron	Special Shipping Instructions: See TDG class
Other: Eye wash station, shower	Waste Disposal: Dispose of sand and rinse water according to municipal, provincial or federal laws for disposal of chemicals.



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• PART 12 : WHMIS CERTIFICATE - PRIMER 210-T

PRIMER 210-T (E804037)



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PRODUCT: Sika® Primer-210 T

SECTION VIII: FIRST AID

Skin	:	Remove contaminated clothing and shoes. Wash immediately with plenty of water. Wash clothing before re-wearing. Consult a physician if required.
Eyes	:	Rinse eyes immediately with plenty of water for several minutes to ensure a proper wash. See a physician immediately.
Inhalation	:	In the case of overexposure, evacuate to fresh air. Consult a physician if required.
Ingestion	:	Drink plenty of water. Induce vomiting. Do not give anything by mouth to an unconscious person. See a physician immediately.

SECTION IX: PREPARATION INFORMATION

Prepared by : Steve Gosselin
Telephone # : (514) 697-2610
Fax # : (514) 694-2792

Notice To Reader

The information contained in this Material Safety Data Sheet applies only to the actual Sika Canada product identified and described herein. This information is not intended to address, nor does it address the use or application of the identified Sika product in combination with any other material, product or process. All of the information set forth herein is based on technical data regarding the identified product that Sika believes to be reliable as of the date hereof. Prior to each use of any Sika product, the user must always read and follow the warnings and instructions on the product's current Technical Data Sheet, product label and Material Safety Data Sheet for each Sika product, which are available at web site and/or telephone number listed in Section 1 of this MSDS.

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• PART 12 : WHMIS CERTIFICATE - SIKAFLEX

SIKAFLEX (E206006, E206009 & E206010)



Sika Canada Inc.

MATERIAL SAFETY DATA SHEET

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Date: 99/09/30

App S.G.

SECTION I: PRODUCT INFORMATION

PRODUCT: **Sikaflex®-221**

REVISION DATE: February 15, 2009

USAGE: ONE COMPONENT URETHANE BASED ADHESIVE / SEALANT

MANUFACTURER: SIKA CANADA INC.
601, avenue Delmar
Pointe Claire, QC
H9R 4A9

EMERGENCY TELEPHONE NUMBER: CANUTEC (collect) (613) 996-6666

TDG CLASSIFICATION:

Not Regulated

WHMIS Classification:

B3, D2A

UN NUMBER:

Not Established

Class:

Not Applicable

Packaging Group:

Not Applicable

SECTION II: HAZARDOUS INGREDIENTS

Hazardous ingredients	%	T.L.V.	# CAS	LD ₅₀ (species, route)	LC ₅₀ (species, route)
CALCIUM OXIDE	1-5	Not Available	1305-78-8	Not Available	Not Available
XYLENE	3-7	100 ppm	1330-20-7	4300 (oral, rat)	6350 PPM/4H
POLYOL AND ISOCYANATE PREPOLYMER	15-40	Not Established	Not Available	Not Established	Not Established

SECTION III: PHYSICAL CHARACTERISTICS

Physical State: Paste
Appearance and Odor: Aromatic odor colored paste
Odor Threshold: Not Established
Evaporation Rate: Not Established
Vapor Density: Not Established
Vapor Pressure: Not Established

Boiling Point: Not Established
Freezing Point: Not Established
Density: 1.2 g/ml
Water Solubility: Not Established
pH: Not Established
% volatile: < 7
Water/Oil Distribution: Not Established



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• PART 12 : WHMIS CERTIFICATE - SIKAFLEX

SIKAFLEX (E206006, E206009 & E206010)



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PRODUCT: Sikaflex®-221			
SECTION IV: FIRE AND EXPLOSION HAZARDS			
Flammability:	Combustible	TDG flammability Class:	Not Regulated
If Yes, under what conditions:	Flame, spark	Flammable upper limits (% vol.):	Not Established
		Flammable lower limits (% vol.):	Not Established
		Flash Point (method used):	> 80°C
Extinguishing methods:	Foam, dry chemical products, CO ₂ , water for large flames.	Auto-ignition temperature:	Not Established
		Dangerous Combustion Products:	Carbon oxides, Aldehydes, Ketones, HCL, Nitrogen oxide, TDI, MDI.
Special Methods:	Firefighters must wear complete protective clothing with respiratory equipment and they must protect any exposed skin. Heated isocyanates react strongly with water.	Protect from mechanical impact:	No
		Protect from static discharge:	No
SECTION V: REACTIVITY DATA			
Chemical stability:	Yes	Dangerous decomposition products:	Carbon oxides, Aldehydes, Ketones, HCL, nitrogen oxide, TDI, MDI.
If not, under what conditions			
Incompatibility with other material:	Yes	Polymerization Risks:	No
If Yes, which ones:	Acid, strong oxidizer, amine		



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• PART 12 : WHMIS CERTIFICATE - SIKAFLEX

SIKAFLEX (E206006, E206009 & E206010)



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PRODUCT: Sikaflex®-221	
SECTION VI: TOXIC PROPERTIES	
ROUTE OF ENTRY / CONTACT	
Eyes:	Irritating.
Carcinogenicity:	No
Skin:	Irritating. Contact may result in dermatitis, allergic reactions, and sensitization.
Toxic effects on reproduction:	No
Inhalation:	Vapor or mist from this product may cause irritation.
Teratogenicity:	Xylene is classified as a development toxicant (Embryo toxin)
Ingestion:	May cause nausea, vomiting, diarrhea, gastro-intestinal system disorder, constipation.
Mutagenicity:	No
Product with synergistic effects:	Not Established
<p>Over exposure may cause breathing difficulties, sensitization, headaches, nausea, vomiting. May aggravate respiratory, skin, eye, lung problems and allergies.</p> <p>If the product is applied according to the manufacturer, none of these symptoms should be encountered.</p> <p>A person who is sensitized to isocyanate may have a reaction with a level of isocyanate well below the T.L.V.</p> <p>Xylene is a central nervous system depressor and in rare cases, may cause a sensitization of the heart muscle causing arrhythmia.</p>	
An acute or chronic exposure will increase the toxic effects mentioned in this section and may aggravate respiratory problems. An over exposure may cause death.	



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• PART 12 : WHMIS CERTIFICATE - SIKAFLEX

SIKAFLEX (E206006, E206009 & E206010)



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PRODUCT: **Sikaflex®-221**

SECTION VII: PREVENTIVE MEASURES

PERSONAL PROTECTIVE EQUIPMENT

Gloves: Use chemical resistant gloves.
Respiratory equipment: Not necessary under normal use.
Eyes: Full-face mask or safety glasses
Shoes: Leather
Clothing: Rubber Apron
Other: Eye wash station, shower

OTHERS

Ventilation: Sufficient ventilation required
Procedure in case of leaks: Absorb with sand or other absorbent material.
Handling and Equipment methods: Avoid skin, eye and clothing contact
Warehouse Requirements: Keep all containers closed in a cool, dry and well ventilated area.
Special Shipping Instructions: See TDG class
Waste Disposal: Dispose of sand and rinse water according to municipal, provincial or federal laws for disposal of chemicals.



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• PART 12 : WHMIS CERTIFICATE - SIKAFLEX

SIKAFLEX (E206006, E206009 & E206010)



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PRODUCT: **Sikaflex®-221**

SECTION VIII: FIRST AID

Skin : Remove contaminated clothing and shoes.
Wash immediately with plenty of water.
Wash clothing before re-wearing.
Consult a physician if required.

Eyes : Rinse eyes immediately with plenty of water for several minutes to ensure a proper wash.
See a physician immediately.

Inhalation : In the case of overexposure, evacuate to fresh air.
Consult a physician if required.

Ingestion : Drink plenty of water. Do not induce vomiting.
Do not give anything by mouth to an unconscious person.
See a physician immediately.

SECTION IX: PREPARATION INFORMATION

Prepared by : Steve Gosselin
Telephone # : (514) 697-2610
Fax # : (514) 694-2792

Notice To Reader

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TECHNICAL MANUAL

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• PART 12 : WHMIS CERTIFICATE - GREEN FOAM GLUE

GREEN FOAM GLUE (E201017)

MATERIAL SAFETY DATA SHEET 478 FOAM ADHESIVE

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SLUYTER COMPANY LTD.

375 Steelcase Road East
Markham, Ontario L3R 1G3 Canada
Tel (905) 475-6011 Fax (905) 475-3119

SECTION 01: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MANUFACTURER-----SLUYTER COMPANY LTD.
375 Steelcase Road East
Markham, Ontario L3R 1G3
Canada
Tel (905) 475-6011
PRODUCT NAME-----478 FOAM ADHESIVE.
PRODUCT USES-----Foam adhesive.
CHEMICAL FAMILY-----Synthetic Rubbers, Resins, Solvents.

SECTION 02: COMPOSITION / INFORMATION ON INGREDIENTS

INGREDIENTS / %	CAS / TLV	LD/50, ROUTE, SPECIES	LC/50, ROUTE, SPECIES
METHYLENE CHLORIDE 60 - 80	75-09-2 25 ppm	1600 mg/kg Oral (Rat)	14400 ppm 7 hours Inhalation (Mouse)
ACETONE 5 - 10	67-64-1 750 ppm	9750 mg/kg Oral (Rat)	16000 ppm 4 hours Inhalation (Rat)

SECTION 03: HAZARDS IDENTIFICATION

ROUTE OF ENTRY:-----
SKIN CONTACT-----Can cause moderate skin irritation,
defatting and dermatitis.
SKIN ABSORPTION-----Can be absorbed through the skin resulting
in toxic effects.
INHALATION-----As described below.
INHALATION CHRONIC-----Breathing of high vapour concentrations
could cause dizziness, headache or even
unconsciousness. May be anesthetic which
could result in other central nervous
system effects.
INGESTION-----Can cause gastro-intestinal irritation,
nausea, vomiting and diarrhea. Small
amounts of liquid aspirated into
respiratory system could cause severe
health effects (e.g. Bronchopneumonia or
Pulmonary Edema).
EYE CONTACT-----Contains materials that are severely
irritating to the eyes.
EFFECTS OF ACUTE EXPOSURE-----Refer to "ROUTE ENTRY" section.
EFFECTS OF CHRONIC EXPOSURE-----May cause damage to the central nervous
system. Prolonged or repeated skin contact
may cause drying or cracking of the
skin. See "CARCINOGENICITY OF MATERIAL"
heading under TOXICOLOGICAL INFORMATION in SECTION 11.

Ref: 0000206E

Preparation Date : May.30.2009

EMERGENCY - CALL CANUTEC (613) 996-6666 (Collect)



TECHNICAL MANUAL

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• PART 12 : WHMIS CERTIFICATE - GREEN FOAM GLUE

GREEN FOAM GLUE (E201017)

MATERIAL SAFETY DATA SHEET 478 FOAM ADHESIVE

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SECTION 04: FIRST AID MEASURES

EYE CONTACT-----Check for and remove any contact lenses.
Immediately flush with water for a minimum
of 20 minutes and get medical attention.

SKIN CONTACT-----Remove contaminated clothing. Wash
affected area with water and soap. Seek
medical attention if irritation occurs or persists.

INHALATION-----Remove patient to fresh air. If not
breathing, trained personnel should
administer artificial respiration. Get
medical attention.

INGESTION-----Do NOT induce vomiting. Get immediate
medical attention.

ADDITIONAL INFORMATION-----Contact your local poison control centre.

SECTION 05: FIRE FIGHTING MEASURES

FLAMMABILITY-----Non-flammable.

UNDER WHAT CONDITIONS-----Not Applicable.

SPECIAL PROCEDURES-----A self-contained breathing apparatus is
required for fire fighting personnel. Use
water spray to cool fire exposed surfaces
and to protect personnel.

FLASH POINT (METHOD)-----No flash to boiling point.

AUTO IGNITION TEMPERATURE-----Not available.

UPPER FLAMMABLE LIMIT (% VOL)-----Not available.

LOWER FLAMMABLE LIMIT (% VOL)-----Not available.

EXTINGUISHING MEDIA-----Use extinguishing media for surrounding
fire.

HAZARDOUS COMBUSTION PRODUCTS-----Hydrochloric acid. Oxides of Carbon (CO and CO₂). Phosgene.

SENSITIVITY TO MECHANICAL IMPACT-----Unknown.

SENSITIVITY TO STATIC DISCHARGE-----Unknown.

SECTION 06: ACCIDENTAL RELEASE MEASURES

LEAK/SPILL-----Ventilate. Remove all sources of ignition,
open flames, sparks and heaters. Wear
protective gear (See SECTION 8). Large
spills must be collected for
disposal. Small spills can be wiped. Use a
non-combustible absorbent inorganic
material. Prevent run-off into drains,
sewers and other waterways.

SECTION 07: HANDLING AND STORAGE

HANDLING PROCEDURES-----Avoid skin and eye contact. Avoid breathing
vapours. Use adequate ventilation. Keep away
from heat, sparks and open flame.

STORAGE NEEDS-----Store away from all sources of heat and
ignition. Store in well ventilated
area. Keep container closed and out of
reach from children and pets when not in use.

Ref: 0000206E

Preparation Date : May.30.2009

EMERGENCY - CALL CANUTEC (613) 996-6666 (Collect)



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• PART 12 : WHMIS CERTIFICATE - GREEN FOAM GLUE

GREEN FOAM GLUE (E201017)

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SECTION 08: EXPOSURE CONTROLS / PERSONAL PROTECTION

PROTECTIVE EQUIPMENT:-----

EYE/TYPE-----Safety glasses.

RESPIRATORY/TYPE-----None required for normal use if adequate ventilation is maintained. If used indoors on a continuous basis or if the TLV is exceeded, the use of a cartridge type respirator (NIOSH/MSHA approved) is recommended.

GLOVES/ TYPE-----Wear impervious gloves (Neoprene or Rubber).

CLOTHING/TYPE-----Not applicable.

FOOTWEAR/TYPE-----Not applicable.

OTHER/TYPE-----Eye bath and safety shower.

VENTILATION REQUIREMENTS-----Natural or mechanical (Explosion Proof) ventilation to keep vapour levels well below the TLV.

SECTION 09: PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE-----Liquid.

ODOUR-----Petroleum Solvent Odour.

SPECIFIC GRAVITY-----1.15 - 1.25.

ODOUR THRESHOLD (ppm)-----Not available.

VAPOUR PRESSURE-----400 mmHg @ 20°C.

VAPOUR DENSITY (AIR=1)-----> 1.00.

EVAPORATION RATE-----Not available.

BOILING POINT (deg C)-----40°C - 55°C.

pH-----Not applicable.

SOLUBILITY IN WATER (% W/W)-----Negligible.

COEFFICIENT OF WATER\OIL-----Not available.

DISTRIBUTION

FREEZING POINT-----< 0°C.

MELTING POINT (deg C)-----Not applicable.

MOLECULAR WEIGHT-----Not applicable.

SECTION 10: STABILITY AND REACTIVITY

INCOMPATIBILITY-----Aluminum and similar alloys. Strong acids and strong bases. Oxidizing agents.

REACTIVITY CONDITIONS-----Excessive heat, sparks and open flame.

HAZARDOUS PRODUCTS OF-----Oxides of Carbon (CO and CO2).

DECOMPOSITION-----Hydrofluoric acid. Phosgene.

SECTION 11: TOXICOLOGICAL INFORMATION

EXPOSURE LIMIT OF MATERIAL-----See "HAZARDOUS INGREDIENTS" in SECTION 2.

IRRITANCY OF MATERIAL-----Moderate.

SENSITIZING CAPABILITY OF-----Not available.

MATERIAL

CARCINOGENICITY OF MATERIAL-----Methylene Chloride is listed as a potential carcinogen (2B) by IRAC. Results of laboratory animal tests show that Methylene Chloride produced benign tumors in rats and mice exposed to 500 ppm: Cancer in rats and mice exposed to 1500 ppm and higher, limited epidemiology studies failed to show a tumorigen response in plant workers.

Ref: 0000206E

Preparation Date : May.30.2009

EMERGENCY - CALL CANUTEC (613) 996-6666 (Collect)



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TERATOGENICITY-----No effects noted at 1200 and 4500 ppm of Methylene Chloride.
MUTAGENICITY-----Not available.
REPRODUCTIVE EFFECTS-----No effects noted at 1200 and 4500 ppm of Methylene Chloride.
SYNERGISTIC MATERIALS-----Not available.

SECTION 12: ECOLOGICAL INFORMATION

ENVIRONMENTAL-----Not available. Can be dangerous if allowed to enter drinking water intakes. Product has an unaesthetic appearance and can be a nuisance. Do not contaminate domestic or irrigation water supplies, lakes, streams, ponds and rivers.
BIODEGRADABILITY-----Not available. The solvent portion of this product is biodegradable and vaporizes rapidly.

SECTION 13: DISPOSAL CONSIDERATIONS

WASTE DISPOSAL-----Spilled material and water rinses are classified as chemical waste. To be disposed of in accordance with current Local, Provincial and Federal regulations.

SECTION 14: TRANSPORT INFORMATION

T.D.G. CLASSIFICATION-----In containers up to 5 litres - shipped as CONSUMER COMMODITY. If shipment exceeds 500 kg in weight, shipped as CONSUMER COMMODITY - DICHLOROMETHANE (SOLUTION) CLASS 6.1.
In containers over 5 litres - DICHLOROMETHANE (SOLUTION) CLASS 6.1
UN1593 P.G. III.

SECTION 15: REGULATORY INFORMATION

CPR COMPLIANCE-----This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.
WHMIS CLASSIFICATION-----Class D Div.1 Subdiv.B, Class D Div.2 Subdiv.A and Subdiv.B.

SECTION 16: OTHER INFORMATION

IMPORTANT:-----The information on this Material Safety Data Sheet is furnished without warranty, expressed or implied. All the information appearing herein is based upon data obtained from manufacturers and/or recognized technical sources. While the information is believed to be accurate, we make no representations for the accuracy or sufficiency.

Ref: 0000206E

Preparation Date : May.30.2009

EMERGENCY - CALL CANUTEC (613) 996-6666 (Collect)



TECHNICAL MANUAL

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• PART 12 : WHMIS CERTIFICATE - FREON R134A

FREON R134A (E810003)

MATERIAL SAFETY DATA SHEET



PROFI Floor Cleaner/Oil & Grease Remover

HMIS		NFPA	Personal protective equipment
Health	1	1	None / Aucune / Ninguno
Fire Hazard	0	0	
Reactivity	0	0	

Version Number: 1

Preparation date: 2009-06-25

1. PRODUCT AND COMPANY IDENTIFICATION

Product name: PROFI Floor Cleaner/Oil & Grease Remover

MSDS #: MS0300347

Product Code: 4512759

Recommended use: Industrial/Institutional. Floor care. This product is intended to be diluted prior to use.

Manufacturer, importer, supplier:

US Headquarters
JohnsonDiversey, Inc.
8310 16th St.
Sturtevant, Wisconsin 53177-1964
Phone: 1-888-352-2249
MSDS Internet Address:
www.johnsondiversey.com

Canadian Headquarters
JohnsonDiversey - Canada, Inc.
2401 Bristol Circle
Oakville, Ontario L6H 6P1
Phone: 1-800-668-3131

Emergency telephone number: 1-800-851-7145 (U.S.); 1-651-917-6133 (Int'l)

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

CAUTION: MAY BE MILDLY IRRITATING TO EYES. MAY BE MILDLY IRRITATING TO SKIN.

Principle routes of exposure: Eye contact. Skin contact. Inhalation.
Eye contact: May be mildly irritating to eyes.
Skin contact: May be mildly irritating to skin.
Inhalation: None
Ingestion: None known.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous components None

4. FIRST AID MEASURES

Eye contact: Flush immediately with plenty of water. If irritation develops, get medical attention.
Skin contact: Flush immediately with plenty of water. If irritation develops, get medical attention.
Inhalation: No specific first aid measures are required.
Ingestion: No specific first aid measures are required.
Aggravated Medical Conditions: None known.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media: The product is not flammable. Extinguish fire using agent suitable for surrounding fire.
Specific hazards: Not applicable
Unusual hazards: None known
Specific methods: No special methods required

Special protective equipment for firefighters: As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear
Extinguishing media which must not be used for safety reasons: No information available

6. ACCIDENTAL RELEASE MEASURES

Personal precautions: Use personal protective equipment
Environmental precautions and clean-up methods: Soak up with inert absorbent material. Sweep up and shovel into suitable containers for disposal. Use a water rinse for final clean-up.

7. HANDLING AND STORAGE

PROFI Floor Cleaner/Oil & Grease Remover

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• PART 12 : WHMIS CERTIFICATE - FREON R134A

FREON R134A (E810003)

7. HANDLING AND STORAGE

Handling:

Avoid contact with skin and eyes. FOR COMMERCIAL AND INDUSTRIAL USE ONLY.

Storage:

Protect from freezing. Keep tightly closed in a dry, cool and well-ventilated place. KEEP OUT OF REACH OF CHILDREN.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering measures to reduce exposure:

No special ventilation requirements. General room ventilation is adequate.

Personal Protective Equipment**Eye protection:**

No special requirements under normal use conditions.

Hand protection:

No special requirements under normal use conditions.

Skin and body protection:

No special requirements under normal use conditions.

Respiratory protection:

No special requirements under normal use conditions.

Hygiene measures:

Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Liquid
pH: 8.8
Appearance: Liquid
Color: Milky White
Odor: Surfactant
Specific gravity: 1.0
Density: 8.34 lbs/gal 1.0 Kg/L
VOC: 0% *
Flash point: >200°F >93.4°C
Solubility: Dispersible
Viscosity: No information available

Bulk density: No information available
Dilution pH: 8.3 @ (1:12)
Vapor density: No information available
Evaporation Rate: No information available
Boiling point/range: Not determined
Melting point/range: Not determined
Decomposition temperature: Not determined
Autoignition temperature: No information available
Partition coefficient (n-octanol/water): No information available
Solubility in other solvents: No information available
Elemental Phosphorus: 0% by wt.

* - Title 17, California Code of Regulations, Division 3, Chapter 1, Subchapter 8.5, Article 2, Consumer Products, Sections 94508

10. STABILITY AND REACTIVITY

Stability: The product is stable
Polymerization: Hazardous polymerization does not occur
Hazardous decomposition products: None reasonably foreseeable.

11. TOXICOLOGICAL INFORMATION

Acute toxicity: Oral LD50 estimated to be greater than 5000 mg/kg Dermal LD50 estimated to be > 2000 mg/kg
Component Information: See Section 3
Chronic toxicity: None known
Specific effects
Carcinogenic effects: None known
Mutagenic effects: None known
Reproductive toxicity: None known
Target organ effects: None known

12. ECOLOGICAL INFORMATION

Environmental Information: No data available

13. DISPOSAL CONSIDERATIONS

Waste from residues / unused products:

Dispose of according to all federal, state and local applicable regulations

14. TRANSPORT INFORMATION

DOT/TDG: Please refer to the Bill of Lading/receiving documents for up to date shipping information

15. REGULATORY INFORMATION

International Inventories

PROFI Floor Cleaner/Oil & Grease Remover

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FREON R134A (E810003)

15. REGULATORY INFORMATION

All components of this product are listed on the following inventories: U.S.A. (TSCA), Canada (DSL/NDSL).

U.S. Regulations

California Proposition 65: This product is not subject to the reporting requirements under California's Proposition 65

STATE RIGHT TO KNOW

Ingredient(s)	CAS #	MARTK:	NJRTK:	PARTK:	RIRTK:
Water	7732-18-5	-	-	-	-
Tridecyl alcohol ethoxylate	78330-21-9	-	-	-	-
Ethoxylated alcohol	68439-49-6	-	-	-	-
Proprietary	TS*	-	-	-	-

CERCLA/ SARA

SARA 311/312 Hazard Categories

Immediate: -
Delayed: -
Fire: -
Reactivity: -
Sudden Release of Pressure: -

Canada

WHMIS hazard class: Non-controlled.

16. OTHER INFORMATION

Reason for revision: Not applicable
Prepared by: NA PRAC
Additional advice: None

Notice to Reader: This document has been prepared using data from sources considered technically reliable. It does not constitute a warranty, express or implied, as to the accuracy of the information contained within. Actual conditions of use and handling are beyond seller's control. User is responsible to evaluate all available information when using product for any particular use and to comply with all Federal, State, Provincial and Local laws and regulations.



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"SUVA"-134a
CEFS134A Revised 7-Jan-08 Printed 01/08/2008

Substance ID :130000000349

CHEMICAL PRODUCT/COMPANY IDENTIFICATION

Material Identification

Corporate MSDS Number : DU000693
CAS Number : 811-97-2
Formula : CH₂FCF₃
CAS Name : 1,1,1,2-TETRAFLUOROETHANE

Product Use

Refrigerant

Tradenames and Synonyms

TETRAFLUOROETHANE
1,1,1,2-TETRAFLUOROETHANE
Refrigerant
"SUVA" 134a Refrigerant
"SUVA" is a registered trademark of E.I. du Pont de Nemours
and Company, and its affiliates. E.I. du Pont Canada Company
is a licensee.

Company Identification

MANUFACTURER/DISTRIBUTOR
E.I. du Pont Canada Company
P.O. Box 2200
Streetsville
Mississauga, Ontario L5M 2H3

PHONE NUMBERS

Product Information : 1-800-387-2122
Medical Emergency : 1-800-441-3637 (24 hours)

COMPOSITION/INFORMATION ON INGREDIENTS

Components

Material	CAS Number	%
ETHANE, 1,1,1,2-TETRAFLUORO- (HFC-134a)	811-97-2	100 %

HAZARDS IDENTIFICATION

Potential Health Effects



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INHALATION

ETHANE, 1,1,1,2-TETRAFLUORO-

Gross overexposure may cause: Central nervous system depression with dizziness, confusion, incoordination, drowsiness or unconsciousness. Irregular heart beat with a strange sensation in the chest, "heart thumping", apprehension, lightheadedness, feeling of fainting, dizziness, weakness, sometimes progressing to loss of consciousness and death. Suffocation, if air is displaced by vapors.

SKIN CONTACT

ETHANE, 1,1,1,2-TETRAFLUORO-

Immediate effects of overexposure may include: Frostbite, if liquid or escaping vapor contacts the skin.

EYE CONTACT

ETHANE, 1,1,1,2-TETRAFLUORO-

"Frostbite-like" effects may occur if the liquid or escaping vapors contact the eyes.

ADDITIONAL HEALTH EFFECTS

ETHANE, 1,1,1,2-TETRAFLUORO-

Increased susceptibility to the effects of this material may be observed in persons with pre-existing disease of the: central nervous system, cardiovascular system.

Carcinogenicity Information

None of the components present in this material at concentrations equal to or greater than 0.1% are listed by IARC, NTP, OSHA or ACGIH as a carcinogen.

FIRST AID MEASURES

First Aid

INHALATION

If high concentrations are inhaled, immediately remove to fresh air. Keep person calm. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

SKIN CONTACT

In case of contact, immediately flush skin with plenty of water for at least 15 minutes, while removing contaminated clothing and

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shoes. Call a physician. Wash contaminated clothing before reuse. Treat for frostbite if necessary by gently warming affected area.

EYE CONTACT

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

INGESTION

Ingestion is not considered a potential route of exposure.

Notes to Physicians

Because of possible disturbances of cardiac rhythm, catecholamine drugs, such as epinephrine, should only be used with special caution in situations of emergency life support.

FIRE FIGHTING MEASURES

Flammable Properties

Flash Point : No flash point

Flammable Limits in Air, % by Volume:

LEL : None per ASTM E681

UEL : None per ASTM E681

Autoignition : >743 C(>1369 F)

Fire and Explosion Hazards:

Cylinders may rupture under fire conditions. Decomposition may occur.

Contact of welding or soldering torch flame with high concentrations of refrigerant can result in visible changes in the size and color of torch flames. This flame effect will only occur in concentrations of product well above the recommended exposure limit, therefore stop all work and ventilate to disperse refrigerant vapors from the work area before using any open flames.

HFC-134a is not flammable in air at temperatures up to 100 deg. C (212 deg. F) at atmospheric pressure. However, mixtures of HFC-134a with high concentrations of air at elevated pressure and/or temperature can become combustible in the presence of an ignition source. HFC-134a can also become combustible in an oxygen enriched environment (oxygen concentrations greater than that in air). Whether a mixture containing HFC-134a and air, or HFC-134a in

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an oxygen enriched atmosphere become combustible depends on the inter-relationship of 1) the temperature 2) the pressure, and 3) the proportion of oxygen in the mixture. In general, HFC-134a should not be allowed to exist with air above atmospheric pressure or at high temperatures; or in an oxygen enriched environment. For example HFC-134a should NOT be mixed with air under pressure for leak testing or other purposes.

Experimental data have also been reported which indicate combustibility of HFC-134a in the presence of certain concentrations of chlorine.

Extinguishing Media

Use media appropriate for surrounding material.

Fire Fighting Instructions

Cool tank/container with water spray. Self-contained breathing apparatus (SCBA) may be required if cylinders rupture or release under fire conditions.

Water runoff should be contained and neutralized prior to release.

----- ACCIDENTAL RELEASE MEASURES

----- Safeguards (Personnel)

NOTE: Review FIRE FIGHTING MEASURES and HANDLING (PERSONNEL) sections before proceeding with clean-up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean-up.

Ventilate area, especially low or enclosed places where heavy vapors might collect. Remove open flames. Use self-contained breathing apparatus (SCBA) if large spill or leak occurs.

----- HANDLING AND STORAGE

----- Handling (Personnel)

Use with sufficient ventilation to keep employee exposure below recommended limits.

Handling (Physical Aspects)

HFC-134a should not be mixed with air for leak testing or used for any other purpose above atmospheric pressure. See Flammable Properties section. Contact with chlorine or other strong oxidizing agents should also be avoided.

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Storage

Store in a clean, dry place. Do not heat above 52 C (126 F).

Valve protection caps and valve outlet threaded plugs must remain in place unless container is secured with valve outlet piped to use point. Do NOT drag, slide or roll cylinders. Use a suitable hand truck for cylinder movement. Never attempt to lift cylinder by its cap. Use a pressure reducing regulator when connecting cylinder to lower pressure (>3000 psig) piping or systems. Do NOT heat cylinder. Use a check valve or trap in the discharge line to prevent hazardous back flow into the cylinder.

Cylinders should be stored upright and firmly secured to prevent falling or being knocked over. Separate full containers from empty containers. Storage area temperatures should not exceed 125 deg F (52 deg C) and should be free of combustible materials. Avoid area where salt or other corrosive materials are present. Avoid excessive inventory and storage time. Use a first-in first-out system. Keep accurate inventory records.

----- EXPOSURE CONTROLS/PERSONAL PROTECTION -----

Engineering Controls

Normal ventilation for standard manufacturing procedures is generally adequate. Local exhaust should be used when large amounts are released. Mechanical ventilation should be used in low or enclosed places. Refrigerant concentration monitors may be necessary to determine vapor concentrations in work areas prior to use of torches or other open flames, or if employees are entering enclosed areas.

Personal Protective Equipment

Impervious gloves and chemical splash goggles should be used when handling liquid.

Under normal manufacturing conditions, no respiratory protection is required when using this product.

Self-contained breathing apparatus (SCBA) is required if a large release occurs.

Exposure Guidelines

Exposure Limits

"SUVA"-134a

PEL (OSHA)

: None Established

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TLV (ACGIH) : None Established
AEL * (DuPont) : 1000 ppm, 8 & 12 Hr. TWA
WEEL (AIHA) : 1000 ppm, 8 Hr. TWA

* AEL is DuPont's Acceptable Exposure Limit. Where governmentally imposed occupational exposure limits which are lower than the AEL are in effect, such limits shall take precedence.

PHYSICAL AND CHEMICAL PROPERTIES

Physical Data

Boiling Point : -26.5 C (-15.7 F) @ 736 mm Hg
Vapor Pressure : 96 psia @ 25 C (77 F)
Vapor Density : 3.6 (Air=1.0) @ 25 C (77 F)
% Volatiles : 100 WT%
Solubility in Water : 0.15 WT% @ 25 C (77 F)
@ 14.7 psia
Odor : Ether (slight).
Form : Liquified Gas.
Color : Colorless.
Liquid Density : 1.21 g/cm³ @ 25 C (77 F)
Specific Gravity : 1.208 @ 77 F (25 C)

Evaporation Rate : (CCL4 = 1); greater than 1

STABILITY AND REACTIVITY

Chemical Stability

Stable.

Conditions to Avoid

Avoid open flames and high temperatures.

Incompatibility with Other Materials

Incompatible with alkali or alkaline earth metals - powdered Al, Zn, Be, etc.

Decomposition

Decomposition products are hazardous. This material can be decomposed by high temperatures (open flames, glowing metal surfaces, etc.) forming hydrofluoric acid and possibly carbonyl fluoride.

These materials are toxic and irritating. Contact should be avoided.

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Polymerization

Polymerization will not occur.

TOXICOLOGICAL INFORMATION

Animal Data

ETHANE, 1,1,1,2-TETRAFLUORO-

EYE:

A short duration spray of vapor produced very slight eye irritation.

SKIN:

Animal testing indicates this material is a slight skin irritant, but not a skin sensitizer.

INHALATION:

4 hour, ALC, rat: 567,000 ppm.

Single exposure caused: Cardiac sensitization, a potentially fatal disturbance of heart rhythm associated with a heightened sensitivity to the action of epinephrine.

Lowest-Observed-Adverse-Effect-Level for cardiac sensitization:

75,000 ppm. Single exposure caused: Lethargy. Narcosis.

Increased respiratory rates. These effects were temporary.

Single exposure to near lethal doses caused: Pulmonary edema.

Repeated exposure caused: Increased adrenals, liver, spleen

weight. Decreased uterine, prostate weight. Repeated dosing of

higher concentrations caused: the following temporary effects -

Tremors. Incoordination.

CARCINOGENIC, DEVELOPMENTAL, REPRODUCTIVE, MUTAGENIC EFFECTS:

In a two-year inhalation study, HFC-134a, at a concentration of

50,000 ppm, produced an increase in late-occurring benign

testicular tumors, testicular hyperplasia and testicular weight.

The no-effect-level for this study was 10,000 ppm. Animal data

show slight fetotoxicity but only at exposure levels producing

other toxic effects in the adult animal. Reproductive data on

male mice show: No change in reproductive performance. Tests have

shown that this material does not cause genetic damage in

bacterial or mammalian cell cultures, or in animals. In animal

testing, this material has not caused permanent genetic damage in

reproductive cells of mammals (has not produced heritable genetic

damage).

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ECOLOGICAL INFORMATION

Ecotoxicological Information

AQUATIC TOXICITY:

48 hour EC50 - Daphnia magna: 980 mg/L.

96 hour LC50 - Rainbow trout: 450 mg/L

DISPOSAL CONSIDERATIONS

Waste Disposal

Contaminated HFC-134a can be recovered by distillation or removed to a permitted waste disposal facility. Comply with Federal, State, and local regulations.

TRANSPORTATION INFORMATION

Shipping Information

DOT/IMO

Proper Shipping Name : 1,1,1,2-TETRAFLUOROETHANE

Hazard Class : 2.2

UN No. : 3159

DOT/IMO Label : NONFLAMMABLE GAS

Shipping Containers

Tank Cars.

Tank Trucks.

Ton Tanks.

Cylinders.

Shipping Information -- Canada

TDG

Proper Shipping Name : 1, 1, 1, 2-TETRAFLUOROETHANE

TDG Class : 2.2

UN # : 3159

REGULATORY INFORMATION

U.S. Federal Regulations

TSCA Inventory Status : Reported/Included.

TITLE III HAZARD CLASSIFICATIONS SECTIONS 311, 312

Acute : Yes

Chronic : Yes

Fire : No

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Reactivity : No

Pressure : Yes

HAZARDOUS CHEMICAL LISTS

SARA Extremely Hazardous Substance: No
CERCLA Hazardous Substance : No
SARA Toxic Chemical : No

Canadian Regulations

CEPA Status : DSL: REPORTED/INCLUDED.

WHMIS Classification:

CLASS A Compressed Gas

This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

----- OTHER INFORMATION -----

NFPA, NPCA-HMIS

NPCA-HMIS Rating
Health : 1
Flammability : 0
Reactivity : 1

Personal Protection rating to be supplied by user depending on use conditions.

Additional Information

MEDICAL USE: CAUTION: Do not use in medical applications involving permanent implantation in the human body. For other medical applications see DuPont CAUTION Bulletin No. H-50102.

The data in this Material Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process.

Responsibility for MSDS -----

FLUOROPRODUCTS E.I. E.I. du Pont Canada Company Company
Box 2200, Streetsville
Mississauga, Ontario, L5M 2H3
(905) 821-3300.

Indicates updated section.

Printed on 01/08/2008



TECHNICAL MANUAL MX151D - GM



- PART 12 : WHMIS CERTIFICATE - PROFI FLOOR CLEANER/OIL & GREASE REMOVER

PROFI FLOOR CLEANER/OIL & GREASE REMOVER (E810015)

CEFS134A

Du Pont Material Safety Data Sheet

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(Continued)

End of MSDS

Printed on 01/08/2008



TECHNICAL MANUAL

MX151D - GM



• PART 12 : WHMIS CERTIFICATE - GLUE STICK

GLUE STICK (E201002)



MATERIAL SAFETY DATA SHEET
DATED: 4/2000
Emergency Phone: 201-843-6900

Arrow Fastener Co., Inc.
271 Mayhill St.
Saddle Brook, NJ 07663

1. IDENTIFICATION OF THE SUBSTANCE

Item No.: AP5/API0/BAP5/BSS6/API000/AP2000/SS1000
MG12/MG24/MG1000/SS6

Product Class: Thermoplastic Adhesive (Hot Melt)

Supplier: Arrow Fastener Co., Inc., Saddle Brook, NJ USA

2. COMPOSITION / INFORMATION ON COMPONENTS

Chemical Characteristics of Substance: Ethylene Vinyl acetate
Hydrocarbon Resin

3. DESCRIPTION OF HAZARDS

Hazardous Ingredients: This product does not contain regulated levels of hazardous ingredients as defined in 29 CFR 1910.1200.

Material to Avoid: Strong Oxidizing Agents

Hazardous Decomposition Products: Thermal decomposition or combustion may produce carbon monoxide and/or carbon dioxide.

Waste Disposal Method: Check with State Regulations for proper disposal procedures.

4. FIRST AID

Skin Contact: Cool skin quickly using cold water after contact with melted glue. Do not scrape the glue off skin. Call the doctor.

Eyes: If in contact with the eyes, wash immediately in plenty of water and consult an eye specialist.

5. FIRE FIGHTING

Appropriate Extinguisher: Carbon Dioxide (CO₂), dry powder, foam, water

Special Protection for Fire Fighters: In case of fire, wear a self-contained breathing apparatus.



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MX151D - GM



• PART 12 : WHMIS CERTIFICATE - GLUE STICK

GLUE STICK (E201002)

6. HANDLING AND STORAGE

HANDLING

Handling Practice/Precautions	None in normal handling conditions. Solid very difficult to burn.
-------------------------------	--

STORAGE

Storage Practice/Storage Conditions:	None
Storage Conditions:	None
Incompatible Products:	None
Packaging:	None

7. EXPOSURE CONTROLS / PROTECTION OF PERSONNEL

PROTECTION OF PERSONNEL

Protection of Eyes:	Safety Goggles.
Protection of Hands:	Protective gloves where skin burns.
Hygiene:	General precautions applicable to all plastics and elastomers: never inhale fumes from hot glue.

CONTROL PARAMETERS

National Limits for Exposure at Work	
Lung Dust:	TWA (time weighed average)=5mg/m ³ (1987)
Vinyl Acetate:	TWA=10 ml/m ³ =30 mg/m ³ (1987)

8. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Solid
Form:	Stick
Color:	Clear and translucent
Odor:	Ester
Ph Value:	Not Applicable
Melting Point:	200°F
Viscosity:	14,000 cps @ 350°F
Decomposition Temperature:	Approximately 500°F
Danger of Explosion:	Not Applicable
Specific Gravity:	0.95

9. TOXICOLOGICAL INFORMATION

Acute Toxicity:	Information not available.
Local Effects:	Information not available.



TECHNICAL MANUAL

MX151D - GM



- PART 12 : WHMIS CERTIFICATE - GLUE STICK

GLUE STICK (E201002)

10. ECOLOGICAL INFORMATION

Information not available.

11. DISPOSAL

Disposal of Residues/Products not used:	Like most hot melt glues, the glue can be recycled. Whenever possible, recycling is preferable to disposal or incineration. Can be disposed at disposal sites or incinerated, if local regulations permit.
Contaminated Packaging:	Plastic or cardboard boxes can be sent to local recycling companies.

12. INFORMATION FOR NON-STATUTORY TRANSPORT

Non-dangerous product so far as transport regulations is concerned.

The information contained in this Material Safety Data Sheet has been drawn up on the basis of our knowledge at the date of publication. This information is given for guidance only in order to provide satisfactory safety conditions for handling, manufacturing, storage, transport, distribution, preparation, use and disposal, and should not, therefore, be interpreted as a guarantee or considered to be quality specifications. This information applies only to the product specifically named and, unless otherwise stated, is not applicable if said product is mixed with other substances or used for other manufacturing processes.



TECHNICAL MANUAL

MX151D - GM



• PART 12 : WHMIS CERTIFICATE - UNIVERSAL HIGH TEMP REDUCER

UNIVERSAL HIGH TEMP REDUCER (E804093)



Safety data sheet

UR60 HIGH TEMP REDUCER

Revision date : 2008/03/17
Version: 1.0

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(30091269/MDS_GEN_CA/EN)

1. Substance/preparation and company identification

Company
BASF CANADA
100 Milverton Drive
Mississauga, ON L5R 4H1, CANADA

24 Hour Emergency Response Information
CANUTEC (reverse charges): (613) 996-6666
BASF HOTLINE: (800) 454-COPE (2673)

Synonyms: PAINT RELATED MATERIAL

2. Hazardous ingredients

<u>CAS Number</u>	<u>Content (W/W)</u>	<u>Hazardous ingredients</u>
95-63-6	>= 1.0 - <= 5.0 %	1,2,4-trimethylbenzene
108-65-6	>= 30.0 - <= 60.0 %	1-methoxy-2-propylacetate
112-07-2	>= 3.0 - <= 7.0 %	2-butoxyethyl acetate
123-86-4	>= 30.0 - <= 60.0 %	n-Butyl acetate
64742-89-8	>= 5.0 - <= 10.0 %	Solvent naphtha (petroleum), light aliph.
64742-95-6	>= 3.0 - <= 7.0 %	solvent naphtha

3. Hazard identification

Emergency overview

FLAMMABLE. IRRITANT. Irritating to eyes and skin.
Contains a suspect carcinogen.

Potential health effects

Acute toxicity:

Harmful in contact with skin. Virtually nontoxic after a single ingestion. Virtually nontoxic by inhalation.
Vapours have a suffocating effect. Intentional misuse by deliberately concentrating and inhaling this product may be harmful or fatal. Aspiration may result in chemical pneumonitis, which may be fatal.

Irritation:

Irritating to eyes. Irritating to skin. Ingestion may cause irritation of the gastrointestinal tract.

4. First-aid measures

General advice:

Remove contaminated clothing.



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• PART 12 : WHMIS CERTIFICATE - UNIVERSAL HIGH TEMP REDUCER

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If inhaled:

Keep patient calm, remove to fresh air. If breathing difficulties develop, aid in breathing and seek immediate medical attention.

If on skin:

Wash affected areas with water for at least 15 minutes. If irritation develops, seek medical attention.

If in eyes:

Flush with copious amounts of water for at least 15 minutes. Hold eyelids open to facilitate rinsing. Seek medical attention.

If swallowed:

Rinse mouth and then drink plenty of water. Do not induce vomiting due to aspiration hazard. Immediate medical attention required.

5. Fire-fighting measures

Flash point: 27.78 °C (ASTM D3278)

Suitable extinguishing media:

dry extinguishing media, carbon dioxide, foam

Unsuitable extinguishing media for safety reasons:

water spray

Hazards during fire-fighting:

Vapors and/or decomposition products are irritant and/or toxic. If product is heated above decomposition temperature acrid smoke and fumes will be released.

Protective equipment for fire-fighting:

Firefighters should be equipped with self-contained breathing apparatus and turn-out gear.

Further information:

Vapours are heavier than air and may accumulate in low areas and travel a considerable distance up to the source of ignition. Remove product from areas of fire, or otherwise cool sealed containers with water in order to avoid pressure build up due to heat. Do not flood burning material with water due to potential spreading of fire. Contain contaminated water/firefighting water. Run-off water from fire may cause pollution. Notify proper authorities.

6. Accidental release measures

Personal precautions:

Extinguish sources of ignition nearby and downwind. Wear suitable personal protective clothing and equipment. Ensure adequate ventilation. Avoid prolonged inhalation. Avoid contact with skin and eyes. Use antistatic tools.

Environmental precautions:

Do not discharge into drains/surface waters/groundwater.

Cleanup:

Dike spillage. Place into appropriately labeled waste containers. Spills should be contained, solidified, and placed in suitable containers for disposal.



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• PART 12 : WHMIS CERTIFICATE - UNIVERSAL HIGH TEMP REDUCER

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7. Handling and storage

Handling

General advice:

Ensure adequate ventilation. Do not puncture, drop, or slide containers. Use static lines when mixing and transferring material. Handle and open container with care. Avoid contact with the skin, eyes and clothing. WARNING: Empty containers may still contain hazardous residue.

Protection against fire and explosion:

Use antistatic tools. Exhaust fans should be explosion proof. Provide adequate ventilation to remove solvent vapors from lower levels or work areas and to prevent solvent contact with ignition sources. Sealed containers should be protected against heat as this results in pressure build-up. Risk of explosion if heated under confinement. Avoid all sources of ignition: heat, sparks, open flame.

Storage

General advice:

Keep container tightly closed. Protect from direct sunlight.

Storage incompatibility:

General: Segregate from incompatible substances. Segregate from oxidizing agents. Segregate from strong bases. Segregate from strong acids.

Temperature tolerance

Protect from temperatures above: 49 °C

8. Exposure controls and personal protection

Personal protective equipment

Respiratory protection:

Wear respiratory protection if ventilation is inadequate. Wear a NIOSH-certified (or equivalent) organic vapour respirator. Particulate filters should be added during spray operations. Do not exceed the maximum use concentration for the respirator facepiece/cartridge combination.

Hand protection:

Chemical resistant protective gloves

Eye protection:

Tightly fitting safety goggles (chemical goggles). Wear face shield if splashing hazard exists.

Body protection:

Body protection must be chosen based on level of activity and exposure.

General safety and hygiene measures:

Work place should be equipped with a shower and an eye wash. Contact lenses should not be worn. Remove contaminated clothing. Contaminated equipment or clothing should be cleaned after each use or disposed of. Hands and/or face should be washed before breaks and at the end of the shift.

9. Physical and chemical properties

Form:	liquid	
Odour:	ester-like	
Odour threshold:	No data available.	
Colour:	clear	
Boiling range:	115.56 - 186.11 °C	
Vapour pressure:	8.64 mmHg	(20 °C)
Density:	7.5454 lb/USg	(calculated)
Relative density:	0.9041	(calculated)



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% volatiles: 7.545372 lb/US-gal dry

10. Stability and reactivity

Conditions to avoid:

Avoid all sources of ignition: heat, sparks, open flame. Avoid electro-static discharge.

Substances to avoid:

strong bases, strong oxidizing agents, strong acids

Hazardous reactions:

The product is chemically stable.

11. Toxicological information

Acute toxicity

Oral:

LD50/rat: 2,350.000000 mg/kg

Inhalation:

LC50/rat: > 5.000000 mg/l

Dermal:

LD50/rabbit: 1,500.000000 mg/kg

Chronic toxicity

Carcinogenicity:

Contains a suspect carcinogen.

12. Ecological information

Environmental toxicity

Other ecotoxicological advice:

Acutely toxic for aquatic organisms.

13. Disposal considerations

Waste disposal of substance:

Must be dumped or incinerated in accordance with local regulations.

The use and processing of this product, or addition of other constituents, may cause it to be considered a hazardous waste.

Do not discharge into drains/surface waters/groundwater.

Do not incinerate closed containers.

Container disposal:

WARNING: Empty containers may still contain hazardous residue.



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• PART 12 : WHMIS CERTIFICATE - UNIVERSAL HIGH TEMP REDUCER

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14. Transport information

Land transport

TDG

Hazard class: 3
Packing group: III
ID number: UN 1263
Hazard label: 3
Proper shipping name: PAINT RELATED MATERIAL

Sea transport

IMDG

Hazard class: 3
Packing group: III
ID number: UN 1263
Hazard label: 3
Marine pollutant: NO
Proper shipping name: PAINT RELATED MATERIAL

Air transport

IATA/ICAO

Hazard class: 3
Packing group: III
ID number: UN 1263
Hazard label: 3
Proper shipping name: PAINT RELATED MATERIAL

15. Regulatory information

Federal Regulations

Registration status:
DSL, CA released; restriction on quantity / not listed

WHMIS classification: B2: Flammable Liquid

D2A: Materials Causing Other Toxic Effects - Very toxic material

D2B: Materials Causing Other Toxic Effects - Toxic material



THIS PRODUCT HAS BEEN CLASSIFIED IN ACCORDANCE WITH THE HAZARD CRITERIA OF THE CPR AND THE MSDS CONTAINS ALL THE INFORMATION REQUIRED BY THE CPR.



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16. Other information

Local contact information

BASF Canada Product Safety
safety_ecology_canada@basf.com

END OF DATA SHEET



TECHNICAL MANUAL

MX151D - GM



• PART 12 : WHMIS CERTIFICATE - UNDERCOATING CORROSION PROTECTION TECTYL

UNDERCOATING CORROSION PROTECTION TECTYL 5164 (E804096)

MATERIAL SAFETY DATA SHEET

DAUBERT CHEMICAL COMPANY

4700 SOUTH CENTRAL AVENUE
CHICAGO, ILLINOIS 60638
TELEPHONE: (708) 496-7350
FAX: (708) 496-7367

EMERGENCY CONTACT:
CHEMTREC (800) 424-9300

HMIS HAZARD RATING

HEALTH	2
FIRE	2
REACTIVITY	0
PERSONAL PROTECTION	D

Date of Review: March 5, 2007
Date of Preparation: December 10, 2001

Revised: March 5, 2004
By: R. Lauterbach

SECTION I: PRODUCT IDENTIFICATION

Product Name: **TECTYL® 5164**
Chemical Family: Petroleum Solvent/Additive Blend
Material Usage: Corrosion Preventive Compound

EMERGENCY OVERVIEW: Petroleum solvent-based product with solvent odor. Combustible liquid; when product burns it releases typical hydrocarbon products of combustion. Refer to Section 3 for health effects and to Section 5 for fire hazard data.

SECTION II: HAZARDOUS INGREDIENTS

Component	Wt%	Recommended Exposure Limits (TWA)
Aliphatic Petroleum Solvent CAS #64742-88-7 and/or #64742-47-8 and/or #8052-41-3	35-40	OSHA PEL: 100 ppm ACGIH TLV: 100 ppm ACGIH STEL: 200 ppm
^[1] Petroleum Asphalt CAS #8052-42-4	30-34	ACGIH TLV: 5 mg/m ³ (for fumes) NIOSH: 5 mg/m ³ (ceiling limit)
^[1] Hydrous Aluminum Silicate CAS #1332-58-7	22-25	OSHA PEL: 15 mg/m ³ ACGIH TLV: 10 mg/m ³ (^[2] nuisance dust)
Diethylene Glycol Methyl Ether CAS #111-77-3	<1	OSHA PEL (SKIN): 100 ppm
Organophilic Clay CAS #71011-27-3	2-5	OSHA PEL: 15 mg/m ³ (^[2] nuisance dust)
Petroleum Oil (Severely solvent-refined and/or severely hydrotreated) CAS #64741-96-4 and/or #64742-52-5	1-4	OSHA PEL: Not Established ACGIH TLV: 5 mg/m ³ (mists)

TECTYL® 5164 [3215]

3/5/2007

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• PART 12 : WHMIS CERTIFICATE - UNDERCOATING CORROSION PROTECTION TECTYL

UNDERCOATING CORROSION PROTECTION TECTYL 5164 (E804096)

^[1] See Section 3.

^[2] This component poses a hazard only if a dust is formed, i.e., by sawing, sanding, drilling, etc.

SECTION III: HEALTH HAZARD INFORMATION

Primary Routes of Entry: Inhalation, skin absorption.

Acute Effects: Excessive inhalation may produce dizziness, nausea, headache, and incoordination. May cause severe eye irritation and reversible skin irritation. Prolonged skin exposure may cause dermatitis or oil acne. Breathing mists may cause dizziness or pulmonary irritation.

Chronic Effects: Some asphalt solutions have produced skin cancer in laboratory animals. The activity of test materials varies widely, but the activity in general, is weak. Based on the skin painting data, IARC has concluded that there is sufficient evidence for carcinogenicity of asphalts, diluted, dissolved, or liquefied in solvents, in laboratory animals. Workers, therefore, who practice poor personal hygiene and who are repeatedly exposed by direct skin contact to petroleum asphalts over many years, may potentially be at risk of developing skin cancer. Intermittent or occasional skin contact with petroleum asphalts is not expected to have serious health effects as long as good personal hygiene measures, such as those outlined in this Material Safety Data Sheet, are followed. In addition, asphalt vapors may contain polycyclic aromatic hydrocarbons, some of which are known to be carcinogenic. Therefore, prolonged breathing of vapors should be avoided.

Special Remarks: Some asphalts may contain hydrogen sulfide (CAS #7783-06-4) ACGIH TLV = 10 ppm. Hydrogen sulfide (HS) may accumulate in storage tanks and bulk transport compartments containing asphalts. Prolonged breathing of low levels of HS will produce eye/respiratory tract irritation; extremely high levels (1000 ppm) can cause unconsciousness/death.

Carcinogenicity: Asphalt solutions are considered to be animal carcinogens by IARC.

Hydrous Aluminum Silicate may contain less than 0.1% of Silica Crystalline Quartz (CAS #14808-60-7). IARC Monographs on the evaluations of the Carcinogenic Risk of Chemicals to Humans (Volume 42, 1987) concludes that there is "limited evidence" of the carcinogenicity of crystalline silica to humans. IARC classification 2A. Propylene Oxide is listed as an animal carcinogen by IARC/NTP.

Pre-Existing Medical Conditions Aggravated by Exposure: Exposure may aggravate pre-existing respiratory or skin problems.

SECTION IV: FIRST AID PROCEDURES

Inhalation: Move victim to fresh air and call emergency medical care. If not breathing, give artificial respiration; if breathing is difficult, give oxygen.

Eyes: In case of contact with material, immediately flush eyes with running water for at least 15 minutes. Seek immediate medical attention.

Skin: Wash skin with soap and water. Remove and isolate contaminated clothing and shoes at the site.

Ingestion: DO NOT INDUCE VOMITING. Consult a physician. If vomiting occurs spontaneously, keep head below hips to prevent aspiration of liquid into the lungs.

SECTION V: FIRE AND EXPLOSION HAZARD DATA

Flash Point: 105 °F. (TCC)

Explosive Limits: LEL: 0.6 UEL: 7.0

EXTINGUISHING MEDIA: Small Fires: Dry chemical, CO₂, water spray, or regular foam. Large Fires: Water spray, fog, or regular foam. Move container from fire area if you can do it without risk. Apply cooling water to sides of containers that are exposed to flames until well after fire is out. Stay away from ends of tanks. For massive fire in cargo area, use unmanned hose holder or monitor nozzles. If this is impossible, withdraw from area and let fire burn. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tank due to fire.



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MX151D - GM



• PART 12 : WHMIS CERTIFICATE - UNDERCOATING CORROSION PROTECTION TECTYL

UNDERCOATING CORROSION PROTECTION TECTYL 5164 (E804096)

Special Firefighting Protection/Emergency Action: Fire may produce irritating or poisonous gases. Positive pressure self-contained breathing apparatus (SCBA) and structural firefighters' protective clothing will provide limited protection. Keep unnecessary people away; isolate hazard area and deny entry. Stay upwind; keep out of low areas. Isolate for 1/2 mile in all directions if tank, rail car or tank truck is involved in fire. If runoff from fire control occurs, notify the appropriate authorities.

Unusual Fire/Explosion Hazards: Flammable/combustible material; may be ignited by heat, sparks or flames. Vapors may travel to a source of ignition and flash back. Container may explode in heat of fire. Vapor explosion hazard indoors, outdoors or in sewers. Runoff to sewer may create fire or explosion hazard.

Products of Combustion: Carbon monoxide, carbon dioxide, oxides of sulfur, miscellaneous hydrocarbons.

SECTION VI: SPECIAL PRECAUTIONS AND SPILL/LEAK PROCEDURES

Steps to be taken in case Material is Released or Spilled: Shut off ignition sources; no flares, smoking or flames in hazard area. Stop leak if you can do it without risk.

Small Spills: Take up with sand or other noncombustible absorbent material and place into containers for later disposal.

Large Spills: Dike far ahead of liquid spill for later disposal.

SECTION VII: SAFE HANDLING INFORMATION

Precautions To Be Taken In Handling/Storage: Store in cool, well-ventilated area. Keep away from flames, sparks or hot surfaces. Never use a torch to cut or weld on or near container. Empty containers can contain explosive vapors.

Other Precautions: Never wear contaminated clothing. Launder or dry clean before wearing. Discard oil-soaked shoes. Wash thoroughly with soap and water (waterless hand cleaner may be helpful in removing residues) after use and before smoking or eating. Avoid excessive skin contact.

SECTION VIII: EXPOSURE CONTROLS

Respiratory Protection: NIOSH-approved respirator for organic vapor and mist to control exposure where ventilation is inadequate.

Ventilation: General and local exhaust.

Personal Protective Equipment: Protective Gloves: Impervious gloves (Viton, PVOH, etc.) Eye Protection: Safety glasses with sideshields or chemical goggles. Other Protective Clothing or Equipment: If splashing is anticipated, wear rubber apron and boots or other protective equipment to minimize contact.

SECTION IX: REACTIVITY HAZARD DATA

Stability: Stable

Incompatibility: Strong acids, oxidizing agents.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, oxides of sulfur, miscellaneous hydrocarbons.

Hazardous Polymerization: Will not occur.

SECTION X: PHYSICAL AND CHEMICAL PROPERTIES

Color:	Black
Appearance:	Viscous Liquid
Odor:	Petroleum Solvent
Boiling Point (initial):	>300 °F.
Evaporation Rate (n-Butyl Acetate=1):	<1



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• PART 12 : WHMIS CERTIFICATE - UNDERCOATING CORROSION PROTECTION TECTYL

UNDERCOATING CORROSION PROTECTION TECTYL 5164 (E804096)

Vapor Pressure (mmHg @ 20 °C):	Not Determined
Vapor Density (air=1):	>1
Solubility in Water:	Negligible
Specific Gravity:	1.05
pH:	Not Determined
Percent Volatile by Volume:	50

SECTION XI: DISPOSAL CONSIDERATIONS

Waste Disposal Methods: Dispose of in accordance with state, local and federal regulations. Materials may become a hazardous waste through use. If permitted, incineration may be practiced. Consider recycling solvent.

SECTION XII: REGULATORY INFORMATION

Volatile Organic Content: (Calculated Values)

VOC per gallon:	3.4 lbs/gal
VOC per gallon minus exempt solvents and water:	3.4 lbs/gal
EPA Hazardous Waste Number(s) (40CFR Part 261):	D001
EPA Hazard Category (40CFR Part 370):	DELAYED (CHRONIC) FIRE (COMBUSTIBLE)

SARA TITLE III

This product contains the following TOXIC CHEMICALS subject to the *Reporting Requirements of Sec. 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986, and of 40CFR Part 372:*

CHEMICAL	CAS NO.	WT %
Diethylene Glycol Methyl Ether	111-77-3	<1

This product contains the following EXTREMELY HAZARDOUS SUBSTANCE(S) subject to the *Emergency Planning Requirements under Sec. 301-303 (40CFR Parts 300 and 355) and Emergency Release Notification Requirements under Sec. 304:*

CHEMICAL	CAS NO.	WT %	RQ/TPQ Lbs
NONE			

(CERCLA LIST) This product contains the following HAZARDOUS SUBSTANCE(S) subject to *Emergency Release Notification Requirements under Sec. 304 (40 CFR Part 302):*

CHEMICAL	CAS NO.	WT %	Final RQ Lbs
NONE			

CALIFORNIA PROPOSITION 65

This product contains ingredients that are identified by the State of California under the Safe Drinking Water and Toxic Reinforcement Act of 1986 ("Proposition 65") as either a carcinogenic or reproductive hazard.

Although the information contained herein is believed to be reliable, it is furnished without warranty of any kind. This information is not intended to be all-inclusive as to the manner and conditions of use, handling, and storage.





TECHNICAL MANUAL

MX151D - GM



• PART 12 : WHMIS CERTIFICATE - EPOXY MEDIUM REDUCER SB43

EPOXY MEDIUM REDUCER SB43 (E804141)

00000143		MATERIAL SAFETY DATA SHEET		Page 1	
		Tristar Coatings Ltd. 18 Cadetta Rd Brampton, ON; L6P 0X4 Canada			
PRODUCT: Epoxy Medium Reducer		CODE: SB43			
 					
Section 01: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION					
PRODUCT CODE.....		SB43			
MANUFACTURER.....		Tristar Coatings Ltd 18 Cadetta Rd Brampton ON Canada L6P 0X4 905-794-1100, 1-800-975-5568			
PRODUCT NAME.....		Epoxy Medium Reducer			
MATERIAL USE.....		PAINTS.			
PRODUCT USE.....		REDUCER.			
CHEMICAL FAMILY.....		SOLVENT BLEND.			
24 HOUR EMERGENCY NUMBER.....		(613) 996-6666 CANUTEC.			
Section 02: COMPOSITION/INFORMATION ON INGREDIENTS					
Hazardous Ingredients	%	Exposure Limit	C.A.S.#	LD/50, Route, Species	LC/50 Route, Species
TOLUENE	15-40	376 MG/M3	108-88-3	5000 mg/kg ORAL (rat)	5320 ppm INHL. 8 HOURS MICE
XYLENE	15-40	100 PPM/435 MG/M3	1330-20-7	4300 mg/kg ORAL RAT	5000 ppm 4 HOURS INHALATION RAT
ETHYL 3-ETHOXYPROPIONATE	15-40	50 ppm	763-69-9	5000 mg/kg (oral, rat)	>1000ppm/6hr(rat)
METHYL ETHYL KETONE (MEK)	10-30	590 MG/M3	78-93-3	4g/kg RAT ORAL	2-4,000 PPM/2HR RAT
Section 03: HAZARDS IDENTIFICATION					
ROUTE OF ENTRY		EYE CONTACT. INHALATION. SKIN ABSORPTION. SKIN CONTACT.			
EFFECTS OF ACUTE EXPOSURE.....		INHALATION. HIGH VAPOUR CONCENTRATIONS ARE IRRITATING TO THE EYES, NOSE, THROAT AND LUNGS; MAY CAUSE HEADACHES.			
EYE CONTACT.....		IRRITANT.			
SKIN CONTACT.....		FREQUENT OR PROLONGED CONTACT MAY CAUSE DEFATTING, DRYING AND CRACKING OF THE SKIN. BRIEF CONTACT WITH THE LIQUID WILL NOT RESULT IN SIGNIFICANT IRRITATION IF EVAPORATION IS PREVENTED.			
INGESTION.....		SMALL AMOUNT OF THIS LIQUID DRAWN INTO THE LUNGS FROM SWALLOWING OR VOMITING MAY CAUSE SEVERE HEALTH EFFECTS (E.G., BRONCHO-PNEUMONIA OR PULMONARY EDEMA).			
EFFECTS OF CHRONIC EXPOSURE.....		REPEATED EXPOSURE WILL PRODUCE SIMPTOMS OF CHRONIC POISONING, ASSOCIATED WITH DISTURBANCE OF THE CENTRAL NERVOUS SYSTEM, NERVOUS IRRITABILITY, INSOMNIA, NAUSEA AND FATIGUE.			
Section 04: FIRST AID MEASURES					
EYE CONTACT.....		IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES, KEEPING EYELIDS OPEN, WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES. OBTAIN MEDICAL ATTENTION.			
SKIN CONTACT.....		IMMEDIATELY FLUSH SKIN WITH PLENTY OF SOAP AND WATER. REMOVE CONTAMINATED CLOTHING. WASH CLOTHING BEFORE REUSE.			
INHALATION.....		IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN, OBTAIN MEDICAL ATTENTION.			
INGESTION.....		IF SWALLOWED, DO NOT INDUCE VOMITING. GIVE LARGE QUANTITY OF WATER. CALL A PHYSICIAN IMMEDIATELY. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.			



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• PART 12 : WHMIS CERTIFICATE - EPOXY MEDIUM REDUCER SB43

EPOXY MEDIUM REDUCER SB43 (E804141)

00000143	MATERIAL SAFETY DATA SHEET	Page 2
PRODUCT: Epoxy Medium Reducer		CODE: SB43
Section 04: FIRST AID MEASURES		
ADDITIONAL INFORMATION..... NOTE TO PHYSICIAN: ASPIRATED PRODUCT MAY CAUSE SEVERE LUNG DAMAGE AND PRESENT A SIGNIFICANT HAZARD. STOMACH CONTENTS SHOULD BE EVACUATED QUICKLY IN A MANNER WHICH AVOIDS ASPIRATION. OTHERWISE, TREATMENT IS DIRECTED AT THE CONTROL OF SYMPTOMS AND THE CLINICAL CONDITION.		
Section 05: FIRE FIGHTING MEASURES		
FLASH POINT (deg C), METHOD..... 13(TCC). AUTO IGNITION TEMPERATURE (deg C)... NOT TESTED. UPPER FLAMMABLE LIMIT (% VOL)..... 10. LOWER FLAMMABLE LIMIT (% VOL)..... 1.0. HAZARDOUS COMBUSTION PRODUCTS.. CARBON DIOXIDE. TOXIC FUMES. SMOKE. CARBON MONOXIDE. THERMAL DECOMPOSITION OR COMBUSTION MAY PRODUCE . ALDEHYDES. FLAMMABILITY..... YES.		
Section 06: ACCIDENTAL RELEASE MEASURES		
LEAK/SPILL..... ELIMINATE ALL SOURCES OF IGNITION. PREVENT RUNOFF INTO DRAINS, SEWERS, AND OTHER WATERWAYS. VENTILATE AREA TO REMOVE THE REMAINING VAPOURS. WEAR FULL PROTECTIVE EQUIPMENT, INCLUDING RESPIRATORY EQUIPMENT DURING CLEAN-UP. FOR LARGE QUANTITIES, REFER TO THE ENVIRONMENTAL MINISTRY.		
Section 07: HANDLING AND STORAGE		
HANDLING PROCEDURES..... ALWAYS ADOPT PRECAUTIONARY MEASURES AGAINST BUILD-UP OF STATIC WHICH MAY ARISE FROM APPLIANCES, HANDLING AND THE CONTAINERS IN WHICH PRODUCT IS PACKED. EQUIPMENT MUST BE GROUNDED. IN FILLING OPERATIONS TAKE PRECAUTIONARY MEASURES AGAINST STATIC DISCHARGES. STORAGE NEEDS..... KEEP CONTAINERS TIGHTLY CLOSED. STORE DRY AT AMBIENT TEMPERATURE, AWAY FROM EXCESSIVE HEAT, STRONG OXIDIZERS OR COMBUSTIBLE MATERIALS.		
Section 08: EXPOSURE CONTROLS / PERSONAL PROTECTION		
PROTECTIVE EQUIPMENT GLOVES/ TYPE..... NEOPRENE, PVC, POLYETHYLENE OR VITON. RESPIRATORY/TYPE..... USE NIOSH APPROVED RESPIRATOR FOR ORGANIC VAPOURS. EYE/TYPE..... CHEMICAL SAFETY GOGGLES SHOULD BE WORN. PLASTIC FACE SHIELDS SHOULD BE WORN IN ADDITION TO SAFETY GOGGLES FOR COMPLETE FACE PROTECTION. FOOTWEAR/TYPE..... SAFETY BOOTS PER LOCAL REGULATIONS. CLOTHING/TYPE..... WEAR AN APRON AND/OR AN OVERALL. OTHER/TYPE..... EYE BATH AND SAFETY SHOWER. VENTILATION REQUIREMENTS..... LOCAL EXHAUST SHOULD BE USED TO MAINTAIN LEVELS BELOW THE EXPOSURE LIMITS. EXPLOSION-PROOF EXHAUST VENTILATION.		
Section 09: PHYSICAL AND CHEMICAL PROPERTIES		
PHYSICAL STATE..... CLEAR, COLORLESS, MOBILE LIQUID. ODOUR..... SHARP AROMATIC/KETONE ODOUR. ODOUR THRESHOLD (ppm)..... NOT AVAILABLE. VAPOUR DENSITY (AIR=1)..... 2.9. VAPOUR PRESSURE (mm Hg)..... NOT AVAILABLE. EVAPORATION RATE..... < 1. BOILING POINT (deg C)..... 84-251. FREEZING POINT (deg C)..... <-75. SPECIFIC GRAVITY..... 0.874.		



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- PART 12 : WHMIS CERTIFICATE - EPOXY MEDIUM REDUCER SB43

EPOXY MEDIUM REDUCER SB43 (E804141)

00000143	MATERIAL SAFETY DATA SHEET	Page 3
PRODUCT: Epoxy Medium Reducer		CODE: SB43
Section 10: STABILITY AND REACTIVITY		
STABILITY..... STABLE AT NORMAL TEMPERATURES AND PRESSURES. INCOMPATIBILITY..... STRONG OXIDIZERS. HAZARDOUS PRODUCTS OF SEE HAZARDOUS COMBUSTION PRODUCT. DECOMPOSITION		
Section 11: TOXICOLOGICAL INFORMATION		
IRRITANCY OF MATERIAL..... NOT AVAILABLE. SENSITIZING CAPABILITY OF MATERIAL..... NOT AVAILABLE. CARCINOGENICITY OF MATERIAL..... NOT AVAILABLE. TERATOGENICITY MUTAGENICITY..... NOT AVAILABLE.		
Section 12: ECOLOGICAL INFORMATION		
ENVIRONMENTAL..... DO NOT ALLOW TO ENTER WATERS, WASTEWATER OR SOIL. BIODEGRADABILITY..... NOT AVAILABLE.		
Section 13: DISPOSAL CONSIDERATIONS		
WASTE DISPOSAL..... SPILLED MATERIAL AND WATER RINSES ARE CLASSIFIED AS CHEMICAL WASTE AND MUST BE DISPOSED OF IN ACCORDANCE WITH CURRENT LOCAL, PROVINCIAL AND FEDERAL REGULATIONS.		
Section 14: TRANSPORT INFORMATION		
UN NUMBER..... 1263. TDG CLASSIFICATION..... 3. PG II.		
Section 15: REGULATORY INFORMATION		
WHMIS CLASSIFICATION..... B2. D2B.		
Section 16: OTHER INFORMATION		
TELEPHONE NUMBER..... 905-794-1100. PREPARED BY: Regulatory Affairs PREPARATION DATE: Mar24/08		





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• PART 12 : WHMIS CERTIFICATE - STARPOXY 420, EPOXY CATALYST

STARPOXY 420, EPOXY CATALYST (E804133)

00000076		MATERIAL SAFETY DATA SHEET		Page 1	
		Tristar Coatings Ltd. 18 Cadetta Rd Brampton, ON; L6P 0X4 Canada			
PRODUCT: Starpoxy 420, Epoxy Catalyst		CODE: 420C0078			
		 			
Section 01: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION					
PRODUCT CODE.....		420C0078			
MANUFACTURER.....		Tristar Coatings Ltd 18 Cadetta Rd Brampton ON Canada L6P 0X4 905-794-1100, 1-800-975-5568			
PRODUCT NAME.....		Starpoxy 420, Epoxy Catalyst			
MATERIAL USE.....		COATINGS FOR INDUSTRIAL APPLICATIONS.			
PRODUCT USE.....		CROSSLINKING RESIN SOLUTION .			
CHEMICAL FAMILY.....		PROPRIETARY SOLUTION.			
24 HOUR EMERGENCY NUMBER.....		(613) 996-6666 CANUTEC.			
Section 02: COMPOSITION/INFORMATION ON INGREDIENTS					
Hazardous Ingredients	%	Exposure Limit	C.A.S.#	LD/50, Route, Species	LC/50 Route, Species
XYLENE	15-40	100 PPM/435 MG/M3	1330-20-7	4300 mg/kg ORAL RAT	5000 ppm 4 HOURS INHALATION RAT
TOLUENE	15-40	376 MG/M3	108-88-3	5000 mg/kg ORAL (rat)	5320 ppm INHL. 8 HOURS MICE
LIGHT AROMATIC NAPHTHA	7-13	250 MG/M3	64742-95-6	>5600 MG/KG	>10200 MG/M3/4HR
METHYL ETHYL KETONE (MEK)	7-13	590 MG/M3	78-93-3	4g/kg RAT ORAL	2-4,000 PPM/2HR RAT
AROMATIC AMINE	1-5	NOT AVAILABLE	90-72-2	ORL-RAT 2500	NOT AVAILABLE
Section 03: HAZARDS IDENTIFICATION					
ROUTE OF ENTRY		EYE CONTACT. INGESTION. INHALATION. SKIN ABSORPTION.			
EFFECTS OF ACUTE EXPOSURE.....		INHALATION. HIGH VAPOUR CONCENTRATIONS ARE IRRITATING TO THE EYES, NOSE, THROAT AND LUNGS; MAY CAUSE HEADACHES. EYE CONTACT. MAY CAUSE IRRITATION AND BURNING.			
SKIN CONTACT.....		FREQUENT OR PROLONGED CONTACT MAY CAUSE DEFATTING, DRYING AND CRACKING OF THE SKIN. BRIEF CONTACT WITH THE LIQUID WILL NOT RESULT IN SIGNIFICANT IRRITATION IF EVAPORATION IS PREVENTED.			
INGESTION.....		SMALL AMOUNT OF THIS LIQUID DRAWN INTO THE LUNGS FROM SWALLOWING OR VOMITING MAY CAUSE SEVERE HEALTH EFFECTS (E.G., BRONCHO-PNEUMONIA OR PULMONARY EDEMA).			
EFFECTS OF CHRONIC EXPOSURE.....		PROLONGED OR REPEATED CONTACT MAY CAUSE SKIN IRRITATION. VAPOURS ARE MODERATELY IRRITATING TO THE EYES AND RESPIRATORY PASSAGES. PROLONGED EXPOSURE TO HIGH VAPOUR CONCENTRATION CAN CAUSE HEADACHE, DIZZINESS, NAUSEA AND CENTRAL NERVOUS SYSTEM DEPRESSION.			
Section 04: FIRST AID MEASURES					
EYE CONTACT.....		IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES, KEEPING EYELIDS OPEN, WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES. OBTAIN MEDICAL ATTENTION.			
SKIN CONTACT.....		IMMEDIATELY FLUSH SKIN WITH PLENTY OF SOAP AND WATER. REMOVE CONTAMINATED CLOTHING. WASH CLOTHING BEFORE REUSE.			
INHALATION.....		IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN, OBTAIN MEDICAL ATTENTION.			



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• PART 12 : WHMIS CERTIFICATE - STARPOXY 420, EPOXY CATALYST

STARPOXY 420, EPOXY CATALYST (E804133)

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PRODUCT: Starpoxy 420, Epoxy Catalyst		CODE: 420C0078
Section 04: FIRST AID MEASURES		
INGESTION.....	IF SWALLOWED, DO NOT INDUCE VOMITING. GIVE LARGE QUANTITY OF WATER. CALL A PHYSICIAN IMMEDIATELY. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.	
ADDITIONAL INFORMATION.....	NOTE TO PHYSICIAN: ASPIRATED PRODUCT MAY CAUSE SEVERE LUNG DAMAGE AND PRESENT A SIGNIFICANT HAZARD. STOMACH CONTENTS SHOULD BE EVACUATED QUICKLY IN A MANNER WHICH AVOIDS ASPIRATION. OTHERWISE, TREATMENT IS DIRECTED AT THE CONTROL OF SYMPTOMS AND THE CLINICAL CONDITION.	
Section 05: FIRE FIGHTING MEASURES		
FLAMMABILITY.....	YES.	
FLASH POINT (deg C), METHOD.....	(PENSKY-MARTENS CLOSED CUP). 7.	
AUTO IGNITION TEMPERATURE (deg C)...	NOT AVAILABLE.	
UPPER FLAMMABLE LIMIT (% VOL).....	10.	
LOWER FLAMMABLE LIMIT (% VOL).....	1.0.	
HAZARDOUS COMBUSTION PRODUCTS..	CARBON MONOXIDE. CARBON DIOXIDE. SMOKE. TOXIC FUMES. ALDEHYDES. OXIDES OF NITROGEN. AMMONIA. ACIDIC FUMES.	
Section 06: ACCIDENTAL RELEASE MEASURES		
LEAK/SPILL.....	ELIMINATE ALL SOURCES OF IGNITION. PREVENT RUNOFF INTO DRAINS, SEWERS, AND OTHER WATERWAYS. VENTILATE AREA. WEAR FULL PROTECTIVE EQUIPMENT, INCLUDING RESPIRATORY EQUIPMENT DURING CLEAN-UP. USE EXPLOSION-PROOF OR HAND PUMPS AND NON-SPARKING TOOLS AND EQUIPMENT. ABSORB RESIDUAL MATERIAL WITH SAND, OR OTHER ABSORBENT MATERIAL. FOR LARGE QUANTITIES, REFER TO THE ENVIRONMENTAL MINISTRY.	
Section 07: HANDLING AND STORAGE		
HANDLING PROCEDURES.....	PREVENT ACCUMULATION OF ELECTROSTATIC CHARGES. GROUND HANDLING EQUIPMENT.	
STORAGE NEEDS.....	KEEP CONTAINERS TIGHTLY CLOSED. STORE DRY AT AMBIENT TEMPERATURE, AWAY FROM EXCESSIVE HEAT, STRONG OXIDIZERS OR COMBUSTIBLE MATERIALS.	
Section 08: EXPOSURE CONTROLS / PERSONAL PROTECTION		
PROTECTIVE EQUIPMENT		
GLOVES/ TYPE.....	NEOPRENE, PVC, POLYETHYLENE OR VITON.	
RESPIRATORY/TYPE.....	USE NIOSH APPROVED RESPIRATOR FOR ORGANIC VAPOURS.	
EYE/TYPE.....	CHEMICAL SAFETY GOGGLES. FACE SHIELD.	
FOOTWEAR/TYPE.....	SAFETY BOOTS PER LOCAL REGULATIONS.	
CLOTHING/TYPE.....	WEAR AN APRON AND/OR AN OVERALL.	
OTHER/TYPE.....	EYE BATH AND SAFETY SHOWER.	
VENTILATION REQUIREMENTS.....	LOCAL EXHAUST SHOULD BE USED TO MAINTAIN LEVELS BELOW THE EXPOSURE LIMITS.	
Section 09: PHYSICAL AND CHEMICAL PROPERTIES		
PHYSICAL STATE..... CLEAR AMBER MOBILE LIQUID.		
ODOUR..... CHARACTERISTIC ODOUR.		
ODOUR THRESHOLD (ppm)..... NOT AVAILABLE.		
VAPOUR DENSITY (AIR=1)..... > 1.		
VAPOUR PRESSURE (mm Hg)..... NOT AVAILABLE.		
EVAPORATION RATE..... >1.		
BOILING POINT (deg C)..... NOT AVAILABLE.		
FREEZING POINT (deg C)..... -65.		
SPECIFIC GRAVITY..... 0.878.		



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- PART 12 : WHMIS CERTIFICATE - STARPOXY 420, EPOXY CATALYST

STARPOXY 420, EPOXY CATALYST (E804133)

00000076	MATERIAL SAFETY DATA SHEET	Page 3
PRODUCT: Starpoxy 420, Epoxy Catalyst		CODE: 420C0078
Section 10: STABILITY AND REACTIVITY		
STABILITY..... STABLE AT NORMAL TEMPERATURES AND PRESSURES. INCOMPATIBILITY..... STRONG OXIDIZERS. HAZARDOUS PRODUCTS OF SEE HAZARDOUS COMBUSTION PRODUCT. DECOMPOSITION		
Section 11: TOXICOLOGICAL INFORMATION		
IRRITANCY OF MATERIAL..... REFER TO ROUTE OF ENTRY. CARCINOGENICITY OF MATERIAL..... NOT AVAILABLE. TERATOGENICITY..... NOT AVAILABLE. MUTAGENICITY..... NOT AVAILABLE.		
Section 12: ECOLOGICAL INFORMATION		
ENVIRONMENTAL..... DO NOT ALLOW TO ENTER WATERS, WASTEWATER OR SOIL.		
Section 13: DISPOSAL CONSIDERATIONS		
WASTE DISPOSAL..... SPILLED MATERIAL AND WATER RINSES ARE CLASSIFIED AS CHEMICAL WASTE AND MUST BE DISPOSED OF IN ACCORDANCE WITH CURRENT LOCAL, PROVINCIAL AND FEDERAL REGULATIONS.		
Section 14: TRANSPORT INFORMATION		
UN NUMBER..... 1263. TDG CLASSIFICATION..... 3. PG II.		
Section 15: REGULATORY INFORMATION		
WHMIS CLASSIFICATION..... B2. D2B.		
Section 16: OTHER INFORMATION		
TELEPHONE NUMBER..... 905-794-1100. PREPARED BY: Regulatory Affairs PREPARATION DATE: Mar10/08		



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- PART 12 : WHMIS CERTIFICATE - SILICONE SEALANT 786

SILICONE SEALANT 786 (E206022)



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DOW CORNING(R) 786 SILICONE SEALANT - M CLEAR

1. PRODUCT AND COMPANY IDENTIFICATION

MSDS No.: 02023695

SUPPLIER:
Dow Corning Canada Inc.
15-6400 Millcreek Drive, Suite 416
Mississauga, ON, Canada L5N 3E7

Prepared by Product Safety: (800) 248-2481
NEWALTA: (800) 567-7455
Revision Date: 2009/09/30

MANUFACTURER:
Dow Corning Corporation
South Saginaw Road
Midland, Michigan 48686

24 Hour Emergency Telephone: (989) 496-5900

WHMIS CLASSIFICATION: Class D, Division 2, Subdivision A.
Class E.

Material Usage: Sealant and adhesive

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Generic Description: Silicone elastomer
Physical Form: Paste
Colour: Colorless
Odour: Acetic acid

Acetic acid is formed upon contact with water or humid air. Provide adequate ventilation to control exposures within guidelines of OSHA PEL: TWA 10 ppm and ACGIH TLV: TWA 10 ppm, STEL 15 ppm.

+++++

POTENTIAL HEALTH EFFECTS

Acute Effects

Eye: Direct contact may cause moderate irritation.
Skin: May cause moderate irritation.
Inhalation: No significant effects expected from a single short-term exposure.
Oral: Low ingestion hazard in normal use.

Prolonged/Repeated Exposure Effects



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• PART 12 : WHMIS CERTIFICATE - SILICONE SEALANT 786

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DOW CORNING(R) 786 SILICONE SEALANT - M CLEAR

Skin: No known applicable information.

Inhalation: No known applicable information.

Oral: No known applicable information.

Other Health Effects

This product contains a chemical(s) that has the following effect(s):
Reproductive Toxicity

See Section 11 for specific details.

Signs and Symptoms of Overexposure

No known applicable information.

Medical Conditions Aggravated by Exposure

No known applicable information.

The above listed potential effects of overexposure are based on actual data, results of studies performed upon similar compositions, component data and/or expert review of the product. Please refer to Section 11 for the detailed toxicology information.

3. COMPOSITION/INFORMATION ON INGREDIENTS

<u>CAS Number</u>	<u>Wt %</u>	<u>Component Name</u>
7631-86-9	7.0 - 13.0	Silica, amorphous
17689-77-9	1.0 - 5.0	Ethyltriacetoxysilane
4253-34-3	1.0 - 5.0	Methyltriacetoxysilane
556-67-2	0.1 - 1.0	Octamethylcyclotetrasiloxane

The ingredients listed above are controlled products as defined in CPR, am. SOR/88-555.

4. FIRST AID MEASURES

Eye: Immediately flush with water for 15 minutes. Get medical attention.

Skin: Remove from skin and wash thoroughly with soap and water or waterless cleanser. Get medical attention if irritation or other ill effects develop or persist.

Inhalation: No first aid should be needed.

Oral: No first aid should be needed.



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• PART 12 : WHMIS CERTIFICATE - SILICONE SEALANT 786

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DOW CORNING(R) 786 SILICONE SEALANT - M CLEAR

Notes to Physician: Treat according to person's condition and specifics of exposure.

5. FIRE-FIGHTING MEASURES

Flash Point: Not applicable.

Autoignition Temperature: Not available.

Flammability Limits in Air: Not available.

Extinguishing Media: On large fires use dry chemical, foam or water spray. On small fires use carbon dioxide (CO₂), dry chemical or water spray. Water can be used to cool fire exposed containers.

Fire Fighting Measures: Self-contained breathing apparatus and protective clothing should be worn in fighting large fires involving chemicals. Determine the need to evacuate or isolate the area according to your local emergency plan. Use water spray to keep fire exposed containers cool.

Unusual Fire Hazards: None.

6. ACCIDENTAL RELEASE MEASURES

Containment/Clean up: Observe all personal protection equipment recommendations described in Sections 5 and 8. Wipe up or scrape up and contain for salvage or disposal. Clean area as appropriate since spilled materials, even in small quantities, may present a slip hazard. Final cleaning may require use of steam, solvents or detergents. Dispose of saturated absorbant or cleaning materials appropriately, since spontaneous heating may occur. Local, provincial, federal laws and regulations may apply to releases and disposal of this material, as well as those materials and items employed in the cleanup of releases.

Note: See section 8 for Personal Protective Equipment for Spills. Call (989) 496-5900, if additional information is required.

7. HANDLING AND STORAGE

Use with adequate ventilation. Product evolves acetic acid (HOAc) when exposed to water or humid air. Provide ventilation during use to control HOAc within exposure guidelines or use respiratory protection. Avoid eye contact. Avoid skin contact.

Use reasonable care and store away from oxidizing materials. Keep container closed and store away from water or moisture.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Component Exposure Limits

Consult local authorities for acceptable provincial values.



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• PART 12 : WHMIS CERTIFICATE - SILICONE SEALANT 786

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DOW CORNING(R) 786 SILICONE SEALANT - M CLEAR

<u>CAS Number</u>	<u>Component Name</u>	<u>Exposure Limits</u>
7631-86-9	Silica, amorphous	OSHA PEL (final rule): TWA 80mg/m3/%SiO ₂ . NIOSH REL: TWA 6mg/m3. LC50: > 2.08 mg/l - Inhalation Rat ; 4hr dust/mist LD50: > 3,300 mg/kg - Oral Rat LD50: > 5,000 mg/kg - Dermal Rabbit
17689-77-9	Ethyltriacetoxysilane	See acetic acid comments. LD50: 1,462 mg/kg - Oral Rat
4253-34-3	Methyltriacetoxysilane	See acetic acid comments. LD50: 1,602 mg/kg - Oral Rat
556-67-2	Octamethylcyclotetrasiloxane	Dow Corning guide: TWA 10 ppm. LC50: 36 mg/l - Inhalation Rat ; 4hr vapor LD50: > 5,000 mg/kg - Oral Rat LD50: > 4,640 mg/kg - Dermal Rabbit

Acetic acid is formed upon contact with water or humid air. Provide adequate ventilation to control exposures within guidelines of OSHA PEL: TWA 10 ppm and ACGIH TLV: TWA 10 ppm, STEL 15 ppm.

Engineering Controls

Local Ventilation: None should be needed.
General Ventilation: Recommended.

Personal Protective Equipment for Routine Handling

Eyes: Use proper protection - safety glasses as a minimum.

Skin: Wash at mealtime and end of shift. Contaminated clothing and shoes should be removed as soon as practical and thoroughly cleaned before reuse. Chemical protective gloves are recommended.

Suitable Gloves: Avoid skin contact by implementing good industrial hygiene practices and procedures. Select and use gloves and/or protective clothing to further minimize the potential for skin contact. Consult with your glove and/or personnel protective equipment manufacturer for selection of appropriate compatible materials.

Inhalation: No respiratory protection should be needed.

Suitable Respirator: None should be needed.

Personal Protective Equipment for Spills

Eyes: Use proper protection - safety glasses as a minimum.



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• PART 12 : WHMIS CERTIFICATE - SILICONE SEALANT 786

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DOW CORNING(R) 786 SILICONE SEALANT - M CLEAR

Skin:	Wash at mealtime and end of shift. Contaminated clothing and shoes should be removed as soon as practical and thoroughly cleaned before reuse. Chemical protective gloves are recommended.
Inhalation/Suitable Respirator:	No respiratory protection should be needed.
Precautionary Measures:	Avoid eye contact. Avoid skin contact. Use reasonable care.
Comments:	Product evolves acetic acid (HOAc) when exposed to water or humid air. Provide ventilation during use to control HOAc within exposure guidelines or use respiratory protection.
Note: These precautions are for room temperature handling. Use at elevated temperature or aerosol/spray applications may require added precautions.	

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical Form:	Paste
Color:	Colorless
Odor:	Acetic acid
Odor Threshold:	Not available.
Specific Gravity @ 25°C:	1.04
Viscosity:	Not available.
Freezing/Melting Point:	Not available.
Boiling Point:	Not available.
Vapor Pressure @ 25°C:	Not available.
Vapor Density:	Not available.
Evaporation Rate:	Not available.
Solubility in Water:	Not available.
Coefficient of Water/Oil	Not available.
Distribution:	
pH:	Not available.
Volatile Content:	Not available.
Flash Point:	Not applicable.
Autoignition Temperature:	Not available.
Flammability Limits in Air:	Not available.
Note: The above information is not intended for use in preparing product specifications. Contact Dow Corning before writing specifications.	

10. STABILITY AND REACTIVITY

Chemical Stability:	Stable.
Hazardous Polymerization:	Hazardous polymerization will not occur.
Conditions to Avoid:	None.



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• PART 12 : WHMIS CERTIFICATE - SILICONE SEALANT 786

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DOW CORNING(R) 786 SILICONE SEALANT - M CLEAR

Materials to Avoid: Oxidizing material can cause a reaction. Water, moisture, or humid air can cause hazardous vapors to form as described in Section 8.

Hazardous Decomposition Products

Thermal breakdown of this product during fire or very high heat conditions may evolve the following decomposition products: Carbon oxides and traces of incompletely burned carbon compounds. Silicon dioxide. Formaldehyde.

11. TOXICOLOGICAL INFORMATION

Component Toxicology Information

Recent results from a 2 year repeated vapour inhalation exposure study to rats of octamethylcyclotetrasiloxane (D4) indicate effects (benign uterine adenomas) in the uterus of female animals. These effects, which have been shown to be rat-specific, occur at the highest exposure dose (700 ppm) only, a level that greatly exceeds typical workplace or consumer exposures. Industrial, commercial, or consumer uses of products containing D4 do not represent a risk to humans.

Octamethylcyclotetrasiloxane administered to rats by inhalation at concentrations of 500 and 700 ppm resulted in statistically significant decreases in the number of pups born and the live litter size in both the first and second generations. Prolonged estrous cycles, and decreased mating and fertility indices were observed following 700 ppm exposure in the second generation only. There were also increases in the incidence of deliveries of offspring extending over an unusually long time period (dystocia). Subsequent mode of action work demonstrated the effect on reproduction in female rats is due to delayed ovulation caused by a treatment-related delay in or blockage of the luteinizing hormone (LH) surge on the day of proestrus. This mode of action is not considered relevant to humans.

Special Hazard Information on Components

Reproductive Toxicity

<u>CAS Number</u>	<u>Wt %</u>	<u>Component Name</u>	
556-67-2	0.1 - 1.0	Octamethylcyclotetrasiloxane	Evidence of reproductive effects in laboratory animals.

12. ECOLOGICAL INFORMATION

Environmental Fate and Distribution

Complete information is not yet available.

Environmental Effects

Complete information is not yet available.



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• PART 12 : WHMIS CERTIFICATE - SILICONE SEALANT 786

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DOW CORNING(R) 786 SILICONE SEALANT - M CLEAR

Fate and Effects in Waste Water Treatment Plants

Complete information is not yet available.

Ecotoxicity Classification Criteria

Hazard Parameters (LC50 or EC50)	High	Medium	Low
Acute Aquatic Toxicity (mg/L)	<=1	>1 and <=100	>100
Acute Terrestrial Toxicity	<=100	>100 and <= 2000	>2000

This table is adapted from "Environmental Toxicology and Risk Assessment", ASTM STP 1179, p.34, 1993.

This table can be used to classify the ecotoxicity of this product when ecotoxicity data is listed above. Please read the other information presented in the section concerning the overall ecological safety of this material.

13. DISPOSAL CONSIDERATIONS

Can be incinerated in accordance with local regulations.

Call local hazardous waste disposal company or provincial waste authorities for more information.

14. TRANSPORT INFORMATION

Canada Road (Based on IMDG Regulations)

Not subject to local road regulations.

Ocean Shipment (IMDG)

Not subject to IMDG code.

Air Shipment (IATA)

Not subject to IATA regulations.

Call Dow Corning Transportation, (989) 496-8577, if additional information is required.

15. REGULATORY INFORMATION

This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.

WHMIS CLASSIFICATION: Class D, Division 2, Subdivision A.
Class E.

DSL STATUS: All chemical substances in this material are included on or exempted from the DSL.



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- PART 12 : WHMIS CERTIFICATE - SILICONE SEALANT 786

SILICONE SEALANT 786 (E206022)



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Version: 1.6

Revision Date: 2009/09/30

DOW CORNING(R) 786 SILICONE SEALANT - M CLEAR

16. OTHER INFORMATION

Prepared by: Dow Corning Corporation

These data are offered in good faith as typical values and not as product specifications. No warranty, either expressed or implied, is hereby made. The recommended industrial hygiene and safe handling procedures are believed to be generally applicable. However, each user should review these recommendations in the specific context of the intended use and determine whether they are appropriate.

(R) indicates Registered Trademark



TECHNICAL MANUAL

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- PART 12 : WHMIS CERTIFICATE - NON-CORROSIVE SEALANT 748

NON-CORROSIVE SEALANT 748 (E206023)

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Revision Date: 2009/09/22

DOW CORNING(R) 748 NON-CORROSIVE SEALANT

1. PRODUCT AND COMPANY IDENTIFICATION

MSDS No.: 02184346

SUPPLIER:
Dow Corning Canada Inc.
15-6400 Millcreek Drive, Suite 416
Mississauga, ON, Canada L5N 3E7

Prepared by Product Safety: (800) 248-2481
NEWALTA: (800) 567-7455
Revision Date: 2009/09/22

MANUFACTURER:
Dow Corning Corporation
South Saginaw Road
Midland, Michigan 48686

24 Hour Emergency Telephone: (989) 496-5900

WHMIS CLASSIFICATION: Class D, Division 2, Subdivision A.
Class D, Division 2, Subdivision B.

Material Usage: Sealant and adhesive

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Generic Description: Sealant.
Physical Form: Paste
Colour: White
Odour: Alcoholic

Methyl alcohol forms on contact with water or humid air. Provide adequate ventilation to control exposures within guidelines of OSHA PEL: TWA 200 ppm and ACGIH TLV-skin: TWA 200 ppm, STEL 250 ppm.

+++++

POTENTIAL HEALTH EFFECTS

Acute Effects

Eye: Direct contact may cause temporary redness and discomfort.

Skin: May cause mild irritation.

Inhalation: Irritates respiratory passages very slightly. Vapor overexposure may cause drowsiness.

Oral: Low ingestion hazard in normal use.

Prolonged/Repeated Exposure Effects



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• PART 12 : WHMIS CERTIFICATE - NON-CORROSIVE SEALANT 748

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DOW CORNING(R) 748 NON-CORROSIVE SEALANT

Skin: No known applicable information.

Inhalation: Prolonged or repeated exposure by inhalation may injure internally.

Oral: Repeated ingestion or swallowing large amounts may injure internally.

Other Health Effects

This product contains a chemical(s) that has the following effect(s):
Reproductive Toxicity
Carcinogenicity

See Section 11 for specific details.

Signs and Symptoms of Overexposure

No known applicable information.

Medical Conditions Aggravated by Exposure

No known applicable information.

The above listed potential effects of overexposure are based on actual data, results of studies performed upon similar compositions, component data and/or expert review of the product. Please refer to Section 11 for the detailed toxicology information.

3. COMPOSITION/INFORMATION ON INGREDIENTS

<u>CAS Number</u>	<u>Wt %</u>	<u>Component Name</u>
1185-55-3	3.0 - 7.0	Methyltrimethoxysilane
57-11-4	1.0 - 5.0	Stearic acid
556-67-2	0.1 - 1.0	Octamethylcyclotetrasiloxane
14808-60-7	0.1 - 1.0	Quartz

The ingredients listed above are controlled products as defined in CPR, am. SOR/88-555.

4. FIRST AID MEASURES

Eye: Immediately flush with water.

Skin: No first aid should be needed.

Inhalation: Remove to fresh air. Get medical attention if ill effects persist.

Oral: Get medical attention.



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• PART 12 : WHMIS CERTIFICATE - NON-CORROSIVE SEALANT 748

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DOW CORNING(R) 748 NON-CORROSIVE SEALANT

Notes to Physician: Treat according to person's condition and specifics of exposure.

5. FIRE-FIGHTING MEASURES

Flash Point: Not applicable.

Autoignition Temperature: Not available.

Flammability Limits in Air: Not available.

Extinguishing Media: On large fires use dry chemical, foam or water spray. On small fires use carbon dioxide (CO₂), dry chemical or water spray. Water can be used to cool fire exposed containers.

Fire Fighting Measures: Self-contained breathing apparatus and protective clothing should be worn in fighting large fires involving chemicals. Determine the need to evacuate or isolate the area according to your local emergency plan. Use water spray to keep fire exposed containers cool.

Unusual Fire Hazards: None.

6. ACCIDENTAL RELEASE MEASURES

Containment/Clean up: Observe all personal protection equipment recommendations described in Sections 5 and 8. Wipe up or scrape up and contain for salvage or disposal. Clean area as appropriate since spilled materials, even in small quantities, may present a slip hazard. Final cleaning may require use of steam, solvents or detergents. Dispose of saturated absorbant or cleaning materials appropriately, since spontaneous heating may occur. Local, provincial, federal laws and regulations may apply to releases and disposal of this material, as well as those materials and items employed in the cleanup of releases.

Note: See section 8 for Personal Protective Equipment for Spills. Call (989) 496-5900, if additional information is required.

7. HANDLING AND STORAGE

Use with adequate ventilation. Product evolves flammable methyl alcohol when exposed to water or humid air. Provide ventilation during use to control exposure within Section 8 guidelines or use air-supplied or self-contained breathing apparatus. Avoid eye contact. Avoid breathing vapor, mist, dust, or fumes. Keep container closed. Do not take internally.

Use reasonable care and store away from oxidizing materials. Keep container closed and store away from water or moisture.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Component Exposure Limits



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Consult local authorities for acceptable provincial values.

<u>CAS Number</u>	<u>Component Name</u>	<u>Exposure Limits</u>
1185-55-3	Methyltrimethoxysilane	Dow Corning guide: TWA 50 ppm. See methyl alcohol comments. LC50: > 42.1 MG/L - Inhalation Rat ; Vapor 6 Hrs
57-11-4	Stearic acid	None established. LD50: > 5,000 mg/kg - Dermal Rabbit LD50: 23 mg/kg - Intravenous Mouse
556-67-2	Octamethylcyclotetrasiloxane	Dow Corning guide: TWA 10 ppm. LC50: 36 mg/l - Inhalation Rat ; 4hr vapor LD50: > 5,000 mg/kg - Oral Rat LD50: > 4,640 mg/kg - Dermal Rabbit
14808-60-7	Quartz	ACGIH TLV: TWA 0.025 mg/m3 respirable fraction.

Methyl alcohol forms on contact with water or humid air. Provide adequate ventilation to control exposures within guidelines of OSHA PEL: TWA 200 ppm and ACGIH TLV-skin: TWA 200 ppm, STEL 250 ppm.

Engineering Controls

Local Ventilation: Recommended.
General Ventilation: Recommended.

Personal Protective Equipment for Routine Handling

Eyes: Use proper protection - safety glasses as a minimum.

Skin: Washing at mealtime and end of shift is adequate.

Suitable Gloves: Handle in accordance with good industrial hygiene and safety practices.

Inhalation: Use respiratory protection unless adequate local exhaust ventilation is provided or exposure assessment demonstrates that exposures are within recommended exposure guidelines. IH personnel can assist in judging the adequacy of existing engineering controls.

Suitable Respirator: General and local exhaust ventilation is recommended to maintain vapor exposures below recommended limits. Where concentrations are above recommended limits as determined by air sampling or are unknown, appropriate respiratory protection should be worn. Follow CSA Standard Z94.4-93 and use NIOSH/MHSA approved respirators.

Personal Protective Equipment for Spills

Eyes: Use full face respirator.



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• PART 12 : WHMIS CERTIFICATE - NON-CORROSIVE SEALANT 748

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DOW CORNING(R) 748 NON-CORROSIVE SEALANT

Skin:	Washing at mealtime and end of shift is adequate.
Inhalation/Suitable Respirator:	Respiratory protection recommended. Follow CSA Standard Z94.4-93 and use NIOSH/MHSA approved respirators. Protection provided by air purifying respirators against exposure to any hazardous chemical is limited. Use a positive pressure air supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstance where air purifying respirators may not provide adequate protection.
Precautionary Measures:	Avoid eye contact. Avoid breathing vapor, mist, dust, or fumes. Keep container closed. Do not take internally. Use reasonable care.
Comments:	Product evolves flammable methyl alcohol when exposed to water or humid air. Provide ventilation during use to control exposure within Section 8 guidelines or use air-supplied or self-contained breathing apparatus.
Note: These precautions are for room temperature handling. Use at elevated temperature or aerosol/spray applications may require added precautions.	

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical Form:	Paste
Color:	White
Odor:	Alcoholic
Odor Threshold:	Not available.
Specific Gravity @ 25°C:	1.34
Viscosity:	Not available.
Freezing/Melting Point:	Not available.
Boiling Point:	Not available.
Vapor Pressure @ 25°C:	Not available.
Vapor Density:	Not available.
Evaporation Rate:	Not available.
Solubility in Water:	Not available.
Coefficient of Water/Oil	Not available.
Distribution:	
pH:	Not available.
Volatile Content:	Not available.
Flash Point:	Not applicable.
Autoignition Temperature:	Not available.
Flammability Limits in Air:	Not available.
Note: The above information is not intended for use in preparing product specifications. Contact Dow Corning before writing specifications.	

10. STABILITY AND REACTIVITY

Chemical Stability:	Stable.
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DOW CORNING(R) 748 NON-CORROSIVE SEALANT

Hazardous Polymerization:	Hazardous polymerization will not occur.
Conditions to Avoid:	None.
Materials to Avoid:	Oxidizing material can cause a reaction. Water, moisture, or humid air can cause hazardous vapors to form as described in Section 8.

Hazardous Decomposition Products

Thermal breakdown of this product during fire or very high heat conditions may evolve the following decomposition products: Metal oxides. Carbon oxides and traces of incompletely burned carbon compounds. Silicon dioxide. Formaldehyde. Quartz.

11. TOXICOLOGICAL INFORMATION

Component Toxicology Information

Prolonged overexposure to quartz or crystalline silica dust causes fibrotic lung disease (silicosis) and potentially lung cancer.

Recent results from a 2 year repeated vapour inhalation exposure study to rats of octamethylcyclotetrasiloxane (D4) indicate effects (benign uterine adenomas) in the uterus of female animals. These effects, which have been shown to be rat-specific, occur at the highest exposure dose (700 ppm) only, a level that greatly exceeds typical workplace or consumer exposures. Industrial, commercial, or consumer uses of products containing D4 do not represent a risk to humans.

Octamethylcyclotetrasiloxane administered to rats by inhalation at concentrations of 500 and 700 ppm resulted in statistically significant decreases in the number of pups born and the live litter size in both the first and second generations. Prolonged estrous cycles, and decreased mating and fertility indices were observed following 700 ppm exposure in the second generation only. There were also increases in the incidence of deliveries of offspring extending over an unusually long time period (dystocia). Subsequent mode of action work demonstrated the effect on reproduction in female rats is due to delayed ovulation caused by a treatment-related delay in or blockage of the luteinizing hormone (LH) surge on the day of proestrus. This mode of action is not considered relevant to humans.

This material contains methyltrimethoxysilane (MTMS). MTMS was evaluated in a combined repeated-dose toxicity study with the reproduction/developmental toxicity screening test (OECD 422). Sprague-Dawley rats were gavaged daily at dose levels of 0, 50, 250, and 1000 mg MTMS (in corn oil)/kg body weight. Test article-related effects were seen in one or both sexes at the two top dose levels (unless otherwise noted) and included (but not limited to): increased liver weights; increased incidence of hyperplasia and/or hypertrophy in the liver, thyroid and adrenals (high dose only); acanthocytosis (high dose only); increased prothrombin time; elevations in blood platelet count (high dose only), serum total protein and cholesterol. The no observed adverse effect level (NOAEL) was determined to be 50 mg/kg/day for parental toxicity and 1000 mg/kg/day for effects on reproductive performance and on developmental toxicity.

In a 90-day study, five (5) groups of 10 male and 10 female Sprague-Dawley rats were exposed to target methyltrimethoxysilane concentrations of 0 (control), 25, 100, 400 and 1600 ppm for groups 1 through 5, respectively, for six hours per day, five days per week. Additional satellite groups of 10 males and 10 females were included in the 0 and 1600 ppm exposure groups for evaluation of a 28-day post-exposure recovery period. Based on the grossly observed urinary bladder calculi and kidney dilation at the 400 and 1600 ppm exposure levels, the No Observable Effect Level



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(NOEL) for methyltrimethoxysilane was 100 ppm.

Special Hazard Information on Components

Carcinogens

<u>CAS Number</u>	<u>Wt %</u>	<u>Component Name</u>
14808-60-7	0.1 - 1.0	Quartz

IARC Group 1 - Carcinogenic to Humans.
NTP - Known to be a Human Carcinogen.
ACGIH A2 - Suspected Human Carcinogen.

Reproductive Toxicity

<u>CAS Number</u>	<u>Wt %</u>	<u>Component Name</u>
556-67-2	0.1 - 1.0	Octamethylcyclotetrasiloxane

Evidence of reproductive effects in laboratory animals.

12. ECOLOGICAL INFORMATION

Environmental Fate and Distribution

Complete information is not yet available.

Environmental Effects

Complete information is not yet available.

Fate and Effects in Waste Water Treatment Plants

Complete information is not yet available.

Ecotoxicity Classification Criteria

Hazard Parameters (LC50 or EC50)	High	Medium	Low
Acute Aquatic Toxicity (mg/L)	<=1	>1 and <=100	>100
Acute Terrestrial Toxicity	<=100	>100 and <= 2000	>2000

This table is adapted from "Environmental Toxicology and Risk Assessment", ASTM STP 1179, p.34, 1993.

This table can be used to classify the ecotoxicity of this product when ecotoxicity data is listed above. Please read the other information presented in the section concerning the overall ecological safety of this material.

13. DISPOSAL CONSIDERATIONS



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DOW CORNING(R) 748 NON-CORROSIVE SEALANT

Can be incinerated in accordance with local regulations.

Call local hazardous waste disposal company or provincial waste authorities for more information.

14. TRANSPORT INFORMATION

Canada Road (Based on IMDG Regulations)

Not subject to local road regulations.

Ocean Shipment (IMDG)

Not subject to IMDG code.

Air Shipment (IATA)

Not subject to IATA regulations.

Call Dow Corning Transportation, (989) 496-8577, if additional information is required.

15. REGULATORY INFORMATION

This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.

WHMIS
CLASSIFICATION: Class D, Division 2, Subdivision A.
Class D, Division 2, Subdivision B.

DSL STATUS: All chemical substances in this material are included on or exempted from the DSL.

16. OTHER INFORMATION

Prepared by: Dow Corning Corporation

These data are offered in good faith as typical values and not as product specifications. No warranty, either expressed or implied, is hereby made. The recommended industrial hygiene and safe handling procedures are believed to be generally applicable. However, each user should review these recommendations in the specific context of the intended use and determine whether they are appropriate.

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• PART 13 : PHOTOS

EXTERIOR VIEWS

FRONT FACE VIEW



- PART 13 : PHOTOS

EXTERIOR VIEWS

REAR END VIEW WITH ALL DOORS CLOSED





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• PART 13 : PHOTOS

EXTERIOR VIEWS

REAR END VIEW WITH ALL DOORS OPENED





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• PART 13 : PHOTOS

EXTERIOR VIEWS

LEFT SIDE VIEW





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- PART 13 : PHOTOS

EXTERIOR VIEWS

RIGHT SIDE VIEW





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• PART 13 : PHOTOS

EXTERIOR VIEWS

OTHER VIEWS





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- PART 13 : PHOTOS

EXTERIOR VIEWS

OTHER VIEWS



- PART 13 : PHOTOS

INTERIOR VIEWS

FRONT CABIN - LEFT SIDE





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- PART 13 : PHOTOS

INTERIOR VIEWS

FRONT CABIN - RIGHT SIDE



- PART 13 : PHOTOS

INTERIOR VIEWS

FRONT CONSOLE



- PART 13 : PHOTOS

INTERIOR VIEWS

PATIENT COMPARTMENT (FROM REAR DOORS)



- PART 13 : PHOTOS

INTERIOR VIEWS

LEFT WALL VIEW



- PART 13 : PHOTOS

INTERIOR VIEWS

RIGHT WALL VIEW





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• PART 13 : PHOTOS

INTERIOR VIEWS

REAR WALL VIEW





TECHNICAL MANUAL

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- PART 13 : PHOTOS

INTERIOR VIEWS

PATIENT COMPARTMENT (FROM RIGHT DOOR)





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• PART 13 : PHOTOS

INTERIOR VIEWS

REAR CONSOLE



- PART 13 : PHOTOS

INTERIOR VIEWS

CEILING OF THE PATIENT COMPARTMENT





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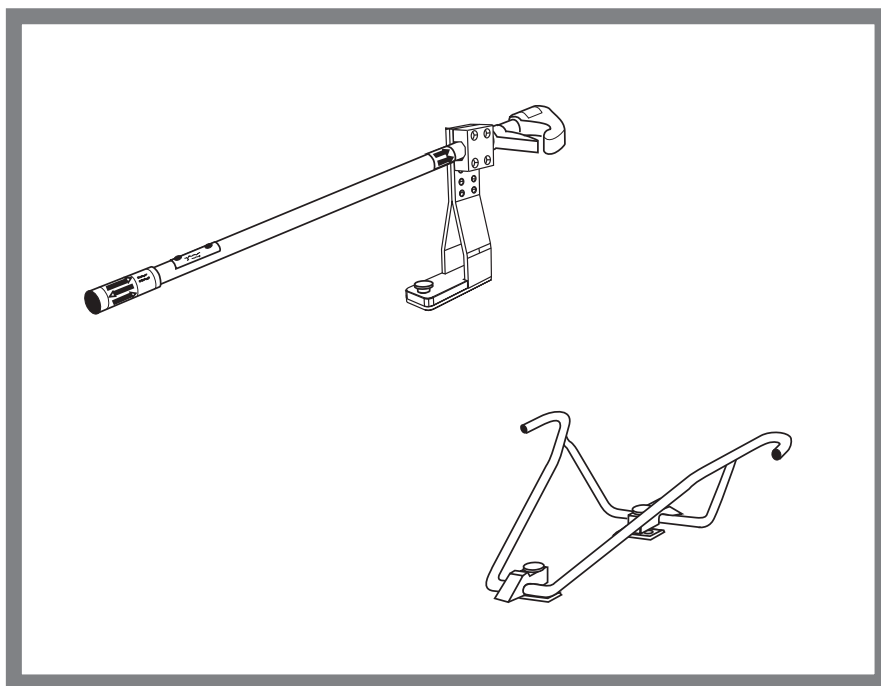


- PART 14 : OEM LITERATURE

FERNO - MODEL 175-3 & 175-4 - COT FASTENING SYSTEM



Installation Manual



Model 175-3 & 175-4 Mounting Kits **175 Cot Fastening System**

November 2004 GLO

Pub. No. 234-2109-02



TECHNICAL MANUAL MX151D - GM



• PART 14 : OEM LITERATURE

FERNO - MODEL 175-3 & 175-4 - COT FASTENING SYSTEM

Model 175-3 and 175-4 Mounting Kits

Disclaimer

This manual contains general instructions for the use, operation and care of this product. The instructions are not all-inclusive. Safe and proper use of this product is solely at the discretion of the user. Safety information is included as a service to the user. All other safety measures taken by the user should be within and under consideration of applicable regulations. It is recommended that training on the proper use of this product be provided before using this product in an actual situation.

Retain this manual for future reference. Include it with the product in the event of transfer to new users. Additional free copies are available upon request from Customer Service.

Proprietary Notice

The information disclosed in this manual is the property of Ferno-Washington, Inc., Wilmington, Ohio, USA. Ferno-Washington, Inc. reserves all patent rights, proprietary design rights, manufacturing rights, reproduction use rights, and sales use rights thereto, and to any article disclosed therein except to the extent those rights are expressly granted to others or where not applicable to vendor proprietary parts.

Additional Instructional Material Available for the Fastener

Users' Manual 234-3163

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TECHNICAL MANUAL

MX151D - GM



• PART 14 : OEM LITERATURE

FERNO - MODEL 175-3 & 175-4 - COT FASTENING SYSTEM

Model 175-3 and 175-4 Mounting Kits

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• PART 14 : OEM LITERATURE

FERNO - MODEL 175-3 & 175-4 - COT FASTENING SYSTEM

Safety Information

Model 175-3 and 175-4 Mounting Kits

1 - SAFETY INFORMATION

1.1 Warning

Warning notices indicate a potentially hazardous situation which, if not avoided, could result in injury.

WARNING

Improper or inadequate installation can cause injury. The installer must test the fastener setup to meet or exceed all applicable guidelines before using the setup in an ambulance.

A fastener installed without backing plates can fail in a crash. Use properly installed backing plates to secure the fastener at all mounting points.

Improperly installed backing plates can fail in a crash. Secure the backing plates to primary structural members of the ambulance at all mounting points.

An improper cot can cause injury. Use only Ferno cots designed for use with the fastener.

Improper adjustment can cause injury. Stay within the range between the jaw and the adjustment limit label.

Improper testing can cause injury. U.S.A. installers must test the fastener setup to pass AMD Standard .004 before installing a fastener in an ambulance.

Improper parts and service can cause injury. Use only Ferno-approved parts and service.

Modifying the fastener can cause injury and damage. Use the fastener only as designed by Ferno.

1.2 Important

Important notices emphasize important usage or maintenance information.

Important

The fastener is designed to be installed with backing plates welded to rigid structural frame members at all mounting points. See Section 3.10.6 in the KKK-A-1822 specifications for more information.

1.3 Cot and Fastener Compatibility

Combining different manufacturer's products into a "mixed-component" cot/cot fastener system can increase the users' risk of injury and damage.

Ferno-Washington, Inc. strongly recommends that only Ferno-manufactured cots be used with Ferno-manufactured cot fasteners, and that only Ferno-manufactured cot fasteners be used to secure Ferno-manufactured cots in ambulances.

ANY COMBINATION OF A FERNO COT OR COT FASTENER WITH A NON-FERNO COT OR COT FASTENER IS MISUSE OF THE FERNO PRODUCT. Responsibility for the outcome of known, intentional misuse rests squarely on the misuser.

(For the purpose of this notice, all Ferno transporters are included under the generic term, "cot.")

For additional information, see the Cot Fastener Disclaimer under the *Limited Warranty*, (page 29) or contact Ferno Customer Relations (page 29).

1.4 Safety Labels

Safety labels place important information from the users' manual on the fastener.

Read and follow safety label instructions. Replace worn or damaged safety labels immediately. New safety labels are available from EMSAR (page 28).



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• PART 14 : OEM LITERATURE

FERNO - MODEL 175-3 & 175-4 - COT FASTENING SYSTEM

Model 175-3 and 175-4 Mounting Kits

Safety Information

1.5 Responsibility of Installer to Create a Safe Fastener System

U.S.A. STANDARDS NOTICE

The fastener is designed to securely hold an ambulance cot inside an ambulance. It has been designed and tested by Ferno to meet or exceed existing ambulance standards from:

- Ambulance Manufacturer's Division (AMD) of the National Truck Equipment Association.
- Federal Ambulance Specification KKK-A-1822.

Note: AMD and KKK-A-1822 standards are updated periodically. Current guidelines are available from these organizations. See page 9.

U.S.A. TESTING NOTICE

The integrity of the fastener system relies heavily on the installer to secure the fastener to the ambulance in a way that meets or exceeds AMD and KKK-A-1822 guidelines.

Ferno's Model 175 fasteners, when installed properly, meet or exceed all applicable KKK-A-1822 specifications and AMD standards. To help the installer achieve a compliant system, **Ferno strongly recommends** the minimum backing plate thicknesses offered in *Installation Requirement and Recommendations*, page 6.

Ambulance construction varies widely. To ensure a quality installation, the installation **MUST BE TESTED AND SHOWN TO MEET OR EXCEED** the pull test specified in AMD Standard .004.

⚠ WARNING

Improper or inadequate installation can cause injury. The installer must test the fastener setup to meet or exceed all applicable guidelines before using the setup in an ambulance.

⚠ WARNING

A fastener installed without backing plates can fail in a crash. Use properly installed backing plates to secure the fastener at all mounting points.

⚠ WARNING

Improperly installed backing plates can fail in a crash. Secure the backing plates to primary structural members of the ambulance at all mounting points.

Important

The fastener is designed to be installed with backing plates welded to rigid structural frame members at all mounting points. See Section 3.10.6 in the KKK-A-1822 specifications for more information.

Important

Ferno offers recommendations on backing plates. However, ambulance construction varies widely. These recommendations do not take the place of testing your setup to meet or exceed all applicable standards.



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• PART 14 : OEM LITERATURE

FERNO - MODEL 175-3 & 175-4 - COT FASTENING SYSTEM

Safety Information

Model 175-3 and 175-4 Mounting Kits

1.6 Installation Requirement and Recommendations

The following Installation Requirement and Guidelines refer to installers in the U.S.A. Installers in other countries: Ferno strongly recommends that you follow the Guidelines below.

INSTALLATION REQUIREMENT:

1. **Ambulance manufacturer or installer:** Install a test fastener as you intend to install the fastener(s) on your ambulance(s) and test this setup to MEET OR EXCEED the pull test specified in AMD .004.

GUIDELINES FOR INSTALLATION:

1. Use backing plates at all mounting points. At minimum, the backing plates should be of A36 grade steel, 6061-T6 grade aluminum, or equivalent. Test a setup with the backing plates you intend to use and make sure it meets or exceeds the AMD .004 test standard. Ferno's recommendations do not replace the need to test your fastener.
2. At all mounting points, use backing plates large enough to be welded at both ends to a rigid structural frame or structural reinforcement. (Table 1 below offers guidelines).
3. When welding the mounting plates, use a **full penetration weld** to secure the mounting plates to the rigid structural frame members. Spot-welding is not sufficient for a quality installation.

TABLE 1 - RECOMMENDED MINIMUM BACKING PLATES

	SPAN BETWEEN TWO RIGID STRUCTURAL FRAME MEMBERS	RECOMMENDED MINIMUM* BACKING PLATE		
		THICKNESS & STYLE	WIDTH	LENGTH
A36 STEEL	Less than 9" (23 cm)	1/2" (12 mm) plate	4" (10 cm)	Appropriate to span distance between two rigid structural frame members
	9" - 21" (23-54 cm)	3/4" (19 mm) plate	4" (10 cm)	
	21" - 38" (54-97 cm)	1" (25 mm) plate	4" (10 cm)	
	38" - 54" (97-137 cm)	Struct. C-channel 7.25 lb/ft 1.721" legs, 0.321" flange	4" (10 cm)	
6061-T6 ALUMINUM	Less than 6" (15 cm)	1/2" (12 mm) plate	4" (10 cm)	
	6" - 13" (15-33 cm)	3/4" (19 mm) plate	4" (10 cm)	
	13" - 24" (33-61 cm)	1" (25 mm) plate	4" (10 cm)	

* These recommendations are guidelines - test your setup to meet or exceed all applicable standards. Contact your ambulance manufacturer for alternate materials of equal or greater strength if needed.

Important

The fastener is designed to be installed with backing plates welded to rigid structural frame members at all mounting points. See Section 3.10.6 in the KKK-A-1822 specifications for more information.

Important

Ferno offers recommendations on backing plates. However, ambulance construction varies widely. These recommendations do not take the place of testing your setup to meet or exceed all applicable standards.



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Model 175-3 and 175-4 Mounting Kits

About the Mounting Kit

2 - ABOUT THE MOUNTING KIT

2.1 Fastener Description

The Model 175 Cot Fastener (fastener) is a device designed to secure a Ferno cot or mobile transporter in the patient compartment of a ground-based ambulance. Included with the fastener is an antler and rail. See the *Model 175 Users' Manual* for more information.

The fastener is designed for use with Ferno cots and mobile transporters. See *Cot and Fastener Compatibility*, page 4, for more information.

2.3 Compatible Cots/Transporters

The fastener is designed for use with Ferno Model series 26, 29, 30, 35, 93, XCalibur, 35-P PROFlexx and 93-P PROFlexx cots and mobile transporters.

WARNING

An improper cot can cause injury. Use only Ferno cots designed for use with the fastener.

2.2 Mounting Kit Description

The Model 175-3 or 175-4 Mounting Kit (kit) is one of five kits designed to properly install the fastener. It is designed to mount the fastener to the floor of a ground-based ambulance. The components are removable for easy cleaning or to change cot setups.

The Model 175-3 Mounting Kit consists of a rail mounting bracket, rail floor plate, a rail clamp, two antler mounting blocks, two antler floor plates and three tie-down knobs. Also included are four socket head cap screws, washers, and nuts to attach the rail to the mounting bracket.

The Model 175-4 Mounting Kit consists of a rail mounting bracket, two rail floor plates, a rail clamp, two antler mounting blocks, four antler floor plates and three tie-down knobs. Also included are four socket head cap screws, washers and nuts to attach the rail to the mounting bracket, two plastic antler floor plate covers and one plastic rail floor plate cover.

The fastener is for professional use only.

U.S.A. INSTALLERS:

The Model 175 fastener is designed for use with ambulances that meet the requirements of the Federal Ambulance Specification KKK-A-1822 (page 9).

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FERNO - MODEL 175-3 & 175-4 - COT FASTENING SYSTEM

About the Fastener

Model 175-3 and 175-4 Mounting Kits

2.4 Items Required

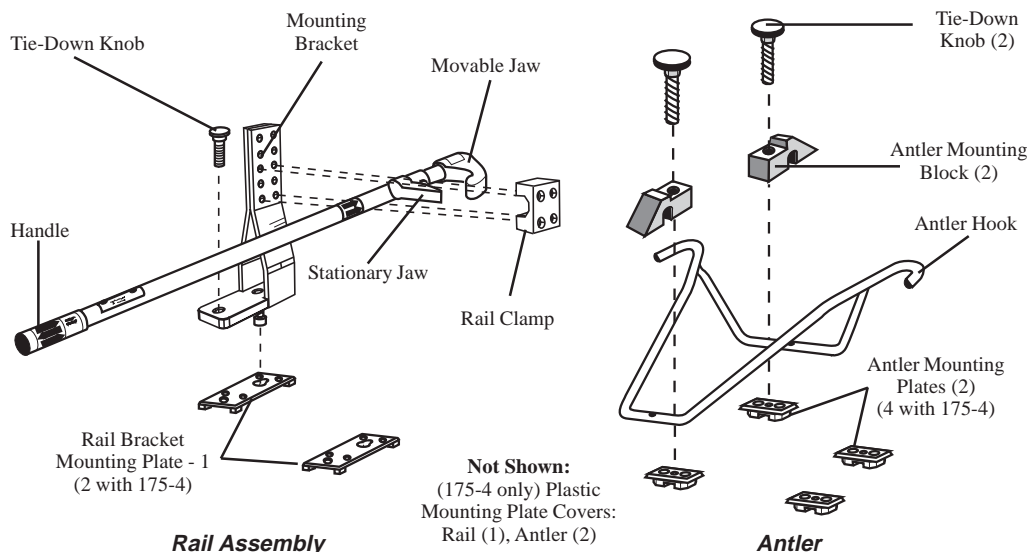
The items shown in Table 2, *Items Required, (Not Supplied)* are required for installation.

TABLE 2 - ITEMS REQUIRED (NOT SUPPLIED)	
FOR 175-3 MOUNTING KIT	
Backing or Anchor plates	*
SAE Grade 5, UNC 2, Zinc-plated fasteners:	
• $\frac{3}{8}$ " Socket head cap screws**	8 ea
• $\frac{3}{8}$ " Jam nuts**	8 ea
$\frac{3}{8}$ " Lock washers	8 ea
FOR 175-4 MOUNTING KIT	
Backing or Anchor plates	*
SAE Grade 5, UNC 2, Zinc-plated fasteners:	
• $\frac{3}{8}$ " Socket head cap screws**	16 ea
• $\frac{3}{8}$ " Jam nuts**	16 ea
$\frac{3}{8}$ " Lock washers	16 ea

* The fastener is designed to be installed with, at minimum: A36 Grade steel backing plates, 6061-T6 Grade aluminum backing plates, or equivalent at all mounting points for the antler and rail. (See *Installation Requirement and Recommendations*, page 6 for more information). If the vehicle in which you are installing the fastener does not have the required backing plates or their equivalent, have them installed. Consult the ambulance manufacturer for installation information.

** The socket head cap screws and nuts should be of at least SAE Grade 5, with a corrosion-resistant coating (zinc plating recommended) and a UNC-2 threading. The length of the screws will be determined by the combined thickness of the mounting plate, patient compartment floor, and the backing plate. When installed, the cap screws should extend beyond the backing plates a minimum of $\frac{3}{4}$ " (6 mm).

2.5 Components





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Model 175-3 and 175-4 Mounting Kits

Before You Begin

3 - BEFORE YOU BEGIN

3.1 Installation Considerations

In order to install the fastener, a skilled professional who is familiar with ambulance construction is required.

Before installing the fastener, consult the ambulance manufacturer for any special installation techniques or considerations for your type of ambulance, and for ambulance warranty information.

The floor to which the mounting components are attached **must** be crashworthy, having sufficient strength to hold the mounted fastener and cot with patient.

The strength of any fastener mounting installation should be confirmed by the installer's own test before a fastener using that installation method is placed in service.

U.S.A. INSTALLERS:

Ferno's Model 175 fasteners, when installed properly, meet or exceed all applicable KKK-A-1822 specifications and AMD standards. The goal of the installer must be to test your setup to meet or exceed these industry standards as well.

Before installing the fastener in an ambulance, test your proposed setup to ensure it meets or exceeds these applicable standards. Place the cot in the fastener, verify that the fastener operates properly, and test the setup to meet or exceed the AMD and KKK-A-1822 testing standards. Then, install a new fastener(s) in your ambulance(s) using the same setup that meets these standards.

WARNING

Improper or inadequate installation can cause injury. The installer must test the fastener setup to meet or exceed all applicable guidelines before using the setup in an ambulance.

U.S.A. GUIDELINES AND STANDARDS

For information about AMD standards, contact:

Ambulance Manufacturer's Division
National Truck Equipment Association
37400 Hills Tech Drive
Farmington Hills, MI, 48331-3414

For information about Federal Ambulance Specification KKK-A-1822, contact:

Federal Supply Services
Specifications Section
Suite 8100, 470 E. L'Enfant Plaza, SW
Washington, DC 20407



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Before You Begin

Model 175-3 and 175-4 Mounting Kits

3.2 Vehicle Requirements

Use these guidelines when installing the fastener:

- ☐ In the U.S.A., comply with the current version of Federal Ambulance Specification KKK-A-1822.
- ☐ In the U.S.A., test the installation setup to comply with all applicable Ambulance Manufacturer's Division (AMD) standards.
- ☐ Consult the ambulance manufacturer for ambulance structural details and ambulance warranty information.
- ☐ Backing (or anchor) plates must be used at all mounting points.
- ☐ Inspect the underside of the ambulance for anything (wiring, brake lines, fuel tank, oxygen lines or other elements) that might interfere with the installation.
- ☐ Install a new fastener when remounting an ambulance box.
- ☐ If the ambulance is involved in a traffic accident, the fastener could sustain **hidden damage** (damage that is not visible to the eye). Replace the fastener if the ambulance is involved in a traffic accident.

For information about U.S.A. guidelines and standards, see page 9.

Important

Inspect the underside of the ambulance for anything (wiring, brake lines, fuel tank, oxygen lines or other items) that might interfere with the installation.

Important

If the ambulance is involved in a traffic accident, replace the fastener.

3.3 Cot Placement Considerations

In the U.S.A., federal guidelines require the cot to be positioned as follows (KKK-A-1822 Section 3.10.4):

- 10" (25 cm) minimum from the end of the mattress to the ambulance rear doors. **Note:** the end of the mattress does not always lie at the end of the cot.
- 25"-30" (64 cm-76 cm) from the front of the attendant's seat to the head end of the cot.

Measurement **B** (Table 4, page 11) is the minimum distance permitted between the doors and the foot end of the cot.

Use the cot lengths shown in Table 3 at right and increase Measurement **B** as needed to satisfy both requirements.

TABLE 3 - COT LENGTH

COT SERIES	OVERALL COT LENGTH	
26	75 1/2"	192 cm
29	85 1/2"	217 cm
30	75 1/2"	190 cm
35A/35A+	79"	201 cm
93ES/93EX	80 1/2"	204 cm
XCalibur	78 3/4"	200 cm
35-P	79 1/2"	202 cm
93-P	83"	211 cm



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Model 175-3 and 175-4 Mounting Kits

Marking the Floor

4 - MARKING THE FLOOR

4.1 Use of 175-3 and 175-4 Mounting Kits

Note: The Model 175-3 or 175-4 mounting kits are designed to be removable for easy cleaning and to allow for multiple fastener setups. Both kits contain a removable floor-mounted rail and a removable floor-mounted antler.

- **The Model 175-3 Mounting Kit** contains one set of fastener mounting components. Additional components are available from EMSAR, page 28. (Also see Table 2 - Items Required, page 8 for a list of additional items that are needed for installation but are not supplied). This kit is appropriate for those who want the convenience of removable fastener mounts for cleaning, whether or not multiple fastener setups are used.
- **The Model 175-4 Mounting Kit** contains two sets of fastener mounting components. Additional components are available from EMSAR, page 28. (Also see Table 2 - Items Required, page 8 for a list of additional items that are needed for installation but are not supplied). This kit provides components for two fastener setups.

4.2 Using this Section

Use Table 4, *Patient Compartment Measurements*, below and Figure 1 (page 12) for reference throughout this section as you mark the ambulance floor for the fastener components.

The instructions will guide you to mark a total of four points on the ambulance floor. When complete, the "A" Points will guide you to place the antler floor mounting plates and the "R" Points will guide you to place the rail mounting plate(s). To begin the installation:

1. Use the set of measurements for your model Ferno cot from Table 4 below.
2. **U.S.A. Installers:** Install a test fastener as you intend to install the fastener for your model cot and test this setup to meet or exceed the pull test specified in AMD .004 as a minimum. When the setup has passed this test, use the same setup when installing the fastener(s) in your ambulance(s).

TABLE 4 - PATIENT COMPARTMENT MEASUREMENTS

MODEL	A Sidewall to Cot Centerline	B Cot End to Doors	C Distance Cot End to A1	D Distance A1 to A2	E A2 to Mark On Centerline	F Centerline to R1, R2	G Distance Btwn R1, R2
26	*14 1/2" *36.8 cm	** 10" ** 25.4 cm	69" 175.3 cm	14 15/16" 37.9 cm	31 3/4" 80.6 cm	12 1/2" 31.8 cm	2 5/8" 6.7 cm
30	*14 1/2" *36.8 cm	** 10" ** 25.4 cm	57 1/4" 145.4 cm	14 15/16" 37.9 cm	19 5/16" 49 cm	12 1/2" 31.8 cm	2 5/8" 6.7 cm
35-A Series	*14 1/2" *36.8 cm	** 7" ** 17.8 cm	73 1/8" 185.7 cm	14 15/16" 37.9 cm	37 3/8" 95 cm	12 1/2" 31.8 cm	2 5/8" 6.7 cm
XCalibur	*14 1/2" *36.8 cm	** 7" ** 17.8 cm	73 1/8" 185.7 cm	14 15/16" 37.9 cm	37 3/8" 95 cm	12 1/2" 31.8 cm	2 5/8" 6.7 cm
29	*14 1/2" *36.8 cm	** 10" ** 25.4 cm	74 3/4" 190 cm	14 15/16" 37.9 cm	37 3/8" 95 cm	12 1/2" 31.8 cm	2 5/8" 6.7 cm
93-ES 93-EX	*14 1/2" *36.8 cm	** 1.5" ** 3.8 cm	74 3/4" 190 cm	14 15/16" 37.9 cm	37 3/8" 95 cm	12 1/2" 31.8 cm	2 5/8" 6.7 cm
35-P Series	*14 1/2" *36.8 cm	** 4.75" ** 12 cm	73 1/8" 185.7 cm	14 15/16" 37.9 cm	37 3/8" 95 cm	12 1/2" 31.8 cm	2 5/8" 6.7 cm
93-P Series	*14 1/2" *36.8 cm	** 1.5" ** 3.8 cm	74 3/4" 190 cm	14 15/16" 37.9 cm	37 1/4" 94.6 cm	12 1/2" 31.8 cm	2 5/8" 6.7 cm

*Indicates minimum measurement.

** Minimum Measurement.

See *Cot Placement Considerations*, page 10.

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Marking the Floor

Model 175-3 and 175-4 Mounting Kits

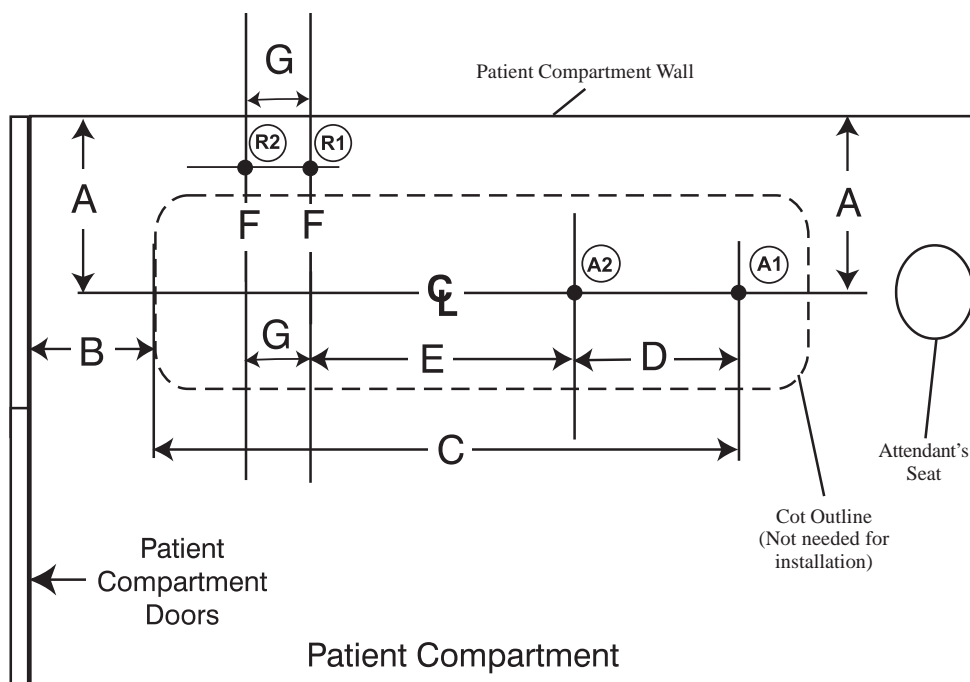


Figure 1 - Patient Compartment Measurements

MEASURING FROM A CONTOURED FLOOR/WALL

If the wall and the floor do not meet at a 90° angle, adjust the starting point for the measurements in Section 4.3 toward the center of the patient compartment as follows:

1. Use a framing square (carpenter's square) to locate and mark the place closest to the wall where the floor becomes flat (Figure 2).
2. Measure from this point when following the instructions in Section 4.3.

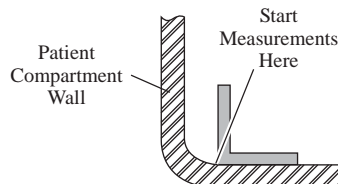


Figure 2 - Measuring on a Contoured Floor/Wall



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Marking the Floor

4.3 Finding the Cot Fastener Centerline

If the wall of your ambulance is contoured to the floor, see “*Measuring from a Contoured Floor/Wall.*”

Before you begin, remove the cot and any existing cot fastener from the ambulance. Then, decide if you want to place the fastener:

- as close to one wall as possible (See *Single, Side Mounted Fastener*).
- in the center of the ambulance (See *Single, Center Mounted Fastener*).
- to prepare for dual mountings (See *Standard Dual Fastener Mounting* or *Alternate Method*, page 14).

Items Needed:

- 1Framing square (carpenter’s square)
- 1Pen, pencil, or etc. to mark the floor
- 1Measuring tape

SINGLE, SIDE-MOUNTED FASTENER

(FASTENER AS CLOSE AS POSSIBLE TO ONE WALL)

1. Starting at the patient compartment wall near the (rear) compartment doors, measure toward the center of the patient compartment and mark a point for Measurement A (Figure 3).
2. From the same wall but near the forward end of the patient compartment, measure and mark a second point for Measurement A (Figure 3).
3. Starting at the rear compartment doors, draw a straight line between the marks made in Steps 1 and 2 (Figure 4). This is the cot Centerline.

SINGLE, CENTER-MOUNTED FASTENER

(FASTENER IN CENTER OF PATIENT COMPARTMENT)

1. Measure across the patient compartment from one side wall to the other (or to the bench seat, if present), and divide the total by two. This is the distance to the center of your patient compartment.
2. Starting at the patient compartment wall near the (rear) compartment doors, measure to the center of the patient compartment and mark a point at the distance you calculated in Step 1.
3. From the same wall but near the forward end of the compartment, measure and mark a second point at the distance you calculated in Step 1.
4. Draw a straight line between the marks made in Steps 3 and 4. This is the cot Centerline.

Important

If you will be using the Large Body Surface (LBS) accessory with a PROFlexx cot, you must install the fastener in the center of the ambulance patient compartment.

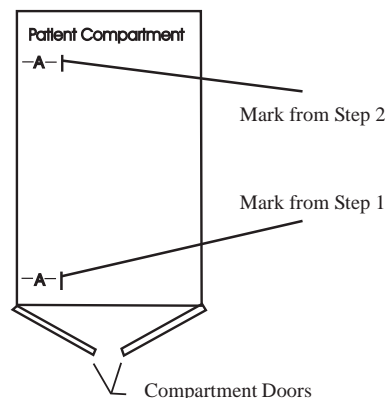


Figure 3 - Measuring from the Wall

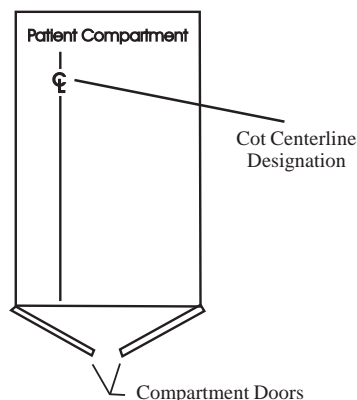


Figure 4 - Drawing the Cot Centerline



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Marking the Floor

STANDARD DUAL FASTENER MOUNTING FOR ALL FERNO COTS

If you want to have two fastener mounting options in the patient compartment, use one or both of the measuring methods explained on page 13 while following the guidelines below.

Note: *These guidelines are true whether you install two fastener mountings for the same cot (for example, side-mount and center-mount Model 35 setups); or, if you are installing fastener mountings for two different cots (for example, a Model 93 cot and Model 35 cot).*

When installing two fastener mounting positions in a single ambulance compartment, the two Centerlines:

MUST BE - A minimum of 14 1/2" (37 cm) from the patient compartment walls¹

MUST BE - At least 3 1/2" (9 cm) apart.²

MUST NOT BE - Between 15-20" (38-51 cm) apart.³

¹ **Note:** *Each Centerline must be a minimum of 14 1/2" (37 cm) from the side walls to allow room between the cot wheels and wall.*

² **Note:** *The Centerlines must be at least 3 1/2" (9 cm) apart to ensure the mounting blocks or backing plates do not overlap. If you installed a first fastener at the minimum 14 1/2" (37 cm) from the patient compartment wall, the second installation would need to be at least 18" (46 cm) from the same wall while also remaining at least 14 1/2" (37 cm) from the far wall.*

³ **Note:** *The Centerlines must be less than 15" (38 cm) apart or greater than 20" (51 cm) apart to ensure the cot wheels do not rest on top of the alternate mounting plates.*

If your ambulance compartment configuration will not allow these conditions to be met, do not install two fastener setups in your ambulance.

Model 175-3 and 175-4 Mounting Kits

ALTERNATE METHOD: DUAL, "IN-LINE" INSTALLATION OF MODEL 35 AND MODEL 30

Ferno has found that some installers wish to install a Model 35 series cot and a Model 30 cot "in-line" in the same ambulance compartment. This is possible due to the significantly shorter setup used to hold a Model 30 cot inside an ambulance.

In this alternate configuration, you may install one removable rail mount and use two different antler mounts along **the same cot Centerline**. This alternate method is possible **only** with the combination of a Model 35 and Model 30 setup, and not with any other cot configuration.

This type of installation requires the purchase and use of one special antler mounting block, available from Ferno Customer Relations (page 29). If you do not wish to purchase this block, or if you wish to install a dual fastener setup for any combination of cots other than the Model 30 and Model 35, use only the Standard Dual Fastener Mounting method described at left.

For complete instructions on preparing your ambulance floor for this alternate method, see the alternate method described in *Dual In-Line Installation*, page 21.



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Marking the Floor

4.4 Finding the Antler Points

Items Needed:

- 1 Pen, pencil, or etc. to mark the floor
 - 1 Measuring tape
1. Beginning from the **closed** rear compartment doors, measure and mark a point on the Centerline for Measurement **B** (Figure 5). Increase this distance as necessary to comply with federal KKK-A-1822 regulations (see *Cot Placement Considerations*, page 10).
 2. Starting from the mark made in Step 1, measure along the Centerline toward the front of the ambulance and mark a point for Measurement **C** (Figure 6). Label this point as Antler Point A1.
 3. Starting from Antler Point A1, measure along the Centerline toward the rear compartment doors and mark a point for Measurement **D** (Figure 7). Label this point as Antler Point A2.

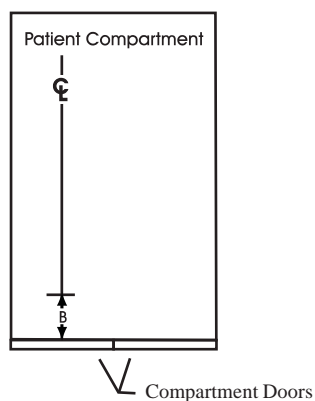


Figure 5 - Measuring from the Rear Doors

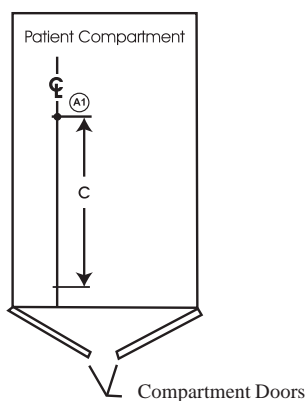


Figure 6 - Measurement C and Antler Point A1

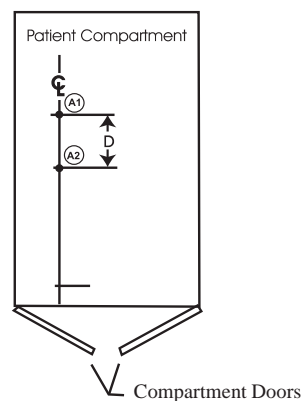


Figure 7 - Measurement D and Antler Point A2



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Marking the Floor

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4.5 Finding the Rail Points

Items Needed:

- 1 Pen, pencil, or etc. to mark the floor
 - 1 Measuring tape
 - 1 Framing square or carpenter's square
1. Starting from Antler Point A2, measure along the Centerline toward the rear compartment doors and mark a point for Measurement **E**. (Figure 8).
 2. Starting from the mark made for Measurement **E**, use a framing square or carpenter's square to measure perpendicular to the Centerline toward the wall and mark a point for Measurement **F**. Label this point as Rail Point R1 (Figure 9).

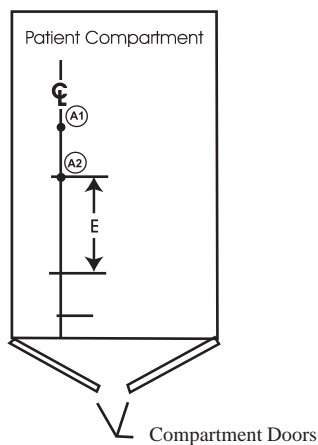


Figure 8 - Measurement E

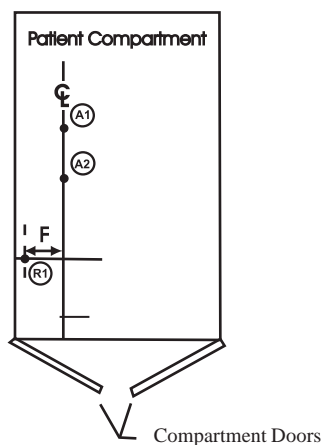


Figure 9 - Measurement F and Point 3

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Marking the Floor

- Starting from the mark made for Measurement **E**, measure along the Centerline toward the rear compartment doors and mark a point for Measurement **G** (Figure 10).
- Starting from the new mark on the Centerline made in Step 3, use a framing square or carpenter's square to measure perpendicular to the Centerline toward the wall and mark a new point for Measurement **F**. Label this point as Rail Point R2 (Figure 11).
- Verify your accuracy by measuring between Rail Point R1 and Rail Point R2. The distance should be the same as Measurement **G**.
- Before proceeding with the installation, verify each measurement made in Section 4. The measurements should match the measurements given in Table 4 on page 11 for your model cot. The markings on the patient compartment floor should match the completed markings shown in Figure 1 on page 12.

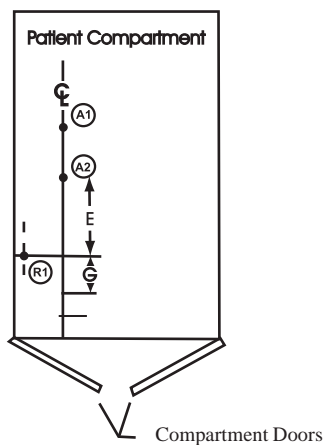


Figure 10 - Measurement G

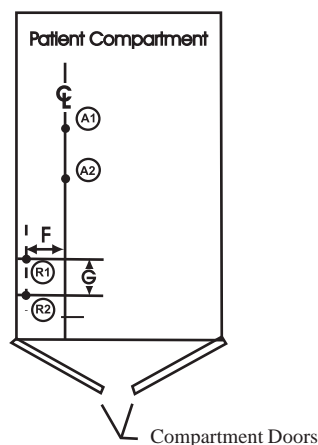


Figure 11 - Measurement F and Point 4

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Marking the Floor

Model 175-3 and 175-4 Mounting Kits

4.6 Marking for the Mounting Plates

Items Needed:

- 1 Pen, pencil, etc. to mark the floor
- 1 Antler Template (Template A, page 31)
- 1 Rail Template (Template B, page 31)
- 1 Hole punch
- 1 Framing square or carpenter's square

Important

Do **not** use the templates illustrated on these pages to mark your ambulance floor. Photocopy or cut out the templates on page 31.

USING TEMPLATE A TO OUTLINE THE ANTLER MOUNTING PLATES

1. Photocopy or cut out Template A from page 31.

Note: Do **not** use the templates illustrated on these pages to mark your ambulance floor. Use only the templates provided on page 31. After you cut out or photocopy the templates, measure them to verify they are the correct size.

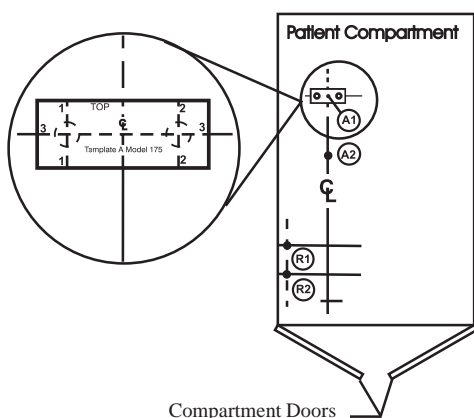


Figure 12 - Placing Template A at Antler Point A1

2. With a hole punch, carefully punch a small hole in Template A at the black dot at its center, where the Centerline indicator crosses the dashed line.
3. Position Template A on the patient compartment floor as follows:
 - Place the hole in the template on Antler Point A1 (Figure 12).
 - Align the template with its Centerline arrows on the Centerline on the floor (Figure 12).
4. Draw an outline of Template A. Mark the floor at each point indicated by the numbers 1, 2, and 3 (Figure 13).
5. Remove Template A and draw three straight lines that intersect the number 1 marks, number 2 marks, and number 3 marks (Figure 14). The intersections of these lines will be used to drill through the floor later.
6. Repeat Steps 3-5 using Antler Point A2 (Figure 15, page 19).

Make a mark at each numbered point

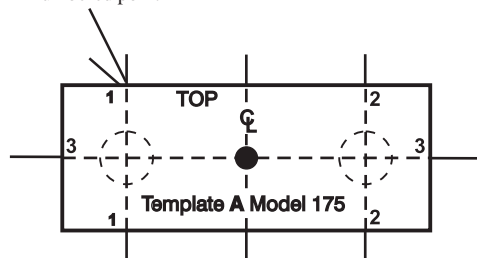


Figure 13 - Marking the Outline of Template A

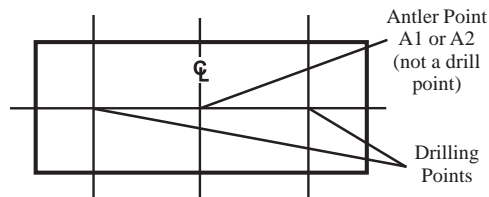


Figure 14 - Drawing the Intersecting Lines

• PART 14 : OEM LITERATURE

FERNO - MODEL 175-3 & 175-4 - COT FASTENING SYSTEM

Model 175-3 and 175-4 Mounting Kits

Marking the Floor

USING TEMPLATE B TO OUTLINE THE RAIL MOUNTING PLATE

1. Cut out Template **B** from page 31 along the indicated lines.

Note: Do **not** use the templates illustrated on these pages to mark your ambulance floor. Use only the templates provided on page 31. After you cut out or photocopy the templates, measure them to verify they are the correct size.

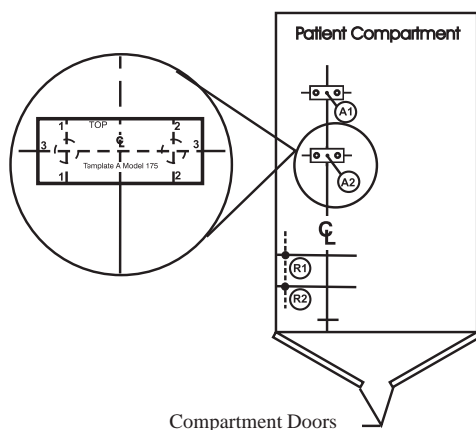


Figure 15 - Placing Template A at Antler Point A2

2. With a hole punch, carefully punch out the two black dots in Template **B**.
3. Position Template **B** on the patient compartment floor with the holes over Rail Point R1 and Rail Point R2 (Figure 16).
4. Draw an outline of Template **B**. Mark the floor at each point indicated by the numbers 1, 2, 3, and 4 (Figure 17).
5. Remove Template **B** and draw four lines that intersect the matching numbers (Figure 18). The intersections of these lines will be used to drill through the floor later.

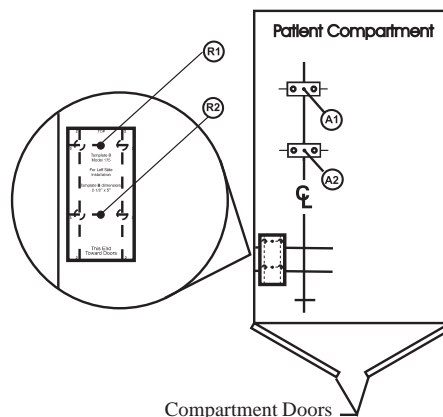


Figure 16 - Placing Template B

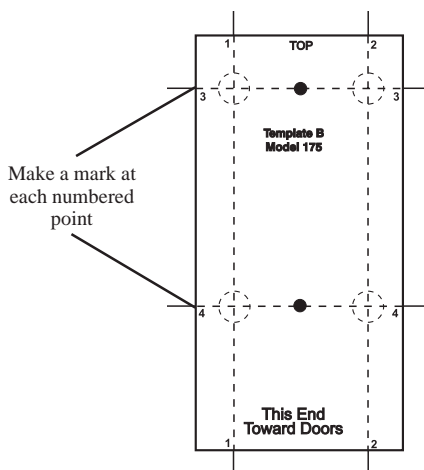


Figure 17 - Marking the Outline of Template B

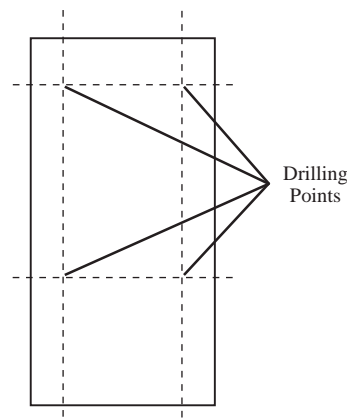


Figure 18 - Drawing the Intersecting Lines

• PART 14 : OEM LITERATURE

FERNO - MODEL 175-3 & 175-4 - COT FASTENING SYSTEM

Marking the Floor

Model 175-3 and 175-4 Mounting Kits

4.7 Standard Dual Fastener Mounting

If you purchased the 175-4 mounting kit or if you purchased the 175-3 kit and additional components, follow these instructions to prepare for the second set of floor plates.

1. Determine where you want the second cot fastener setup in the patient compartment. A list of rules for positioning the second Centerline is listed in *Standard Dual Fastener Mounting*, page 14.
2. Determine which model of Ferno cot you will use with this new installation. With the exception of Measurement A, use the appropriate measurements for your cot as found in Table 4, *Patient Compartment Measurements*, page 11.
3. Adjust Measurement A for the appropriate placement of a new (second) Centerline. To prevent any overlapping of the floor plates, adjust Measurement A a **minimum of 3 1/2" (9 cm)**.

Note: If you are installed your first fastener setup at the minimum Measurement A (14 1/2"/37 cm), your second fastener setup will be a minimum of 18" (46 cm) from the wall (Figure 19).

4. Following the guidelines for a second Centerline specified on page 14, measure from the side wall and mark a new Measurement A at both ends of the patient compartment. If the wall is contoured to the floor, see *Measuring from a Contoured Floor/Wall*, page 12 for instructions on how to adjust the floor measurements.
5. Draw a new (second) Centerline that intersects the marks made for this new (second) Measurement A.
6. Follow all the directions in Subsections 4.4 through Subsection 4.6 to mark the mounting points for the second set of floor plates.
7. Proceed with the installation once the placement for both sets of floor plates is marked and verified on the patient compartment floor.

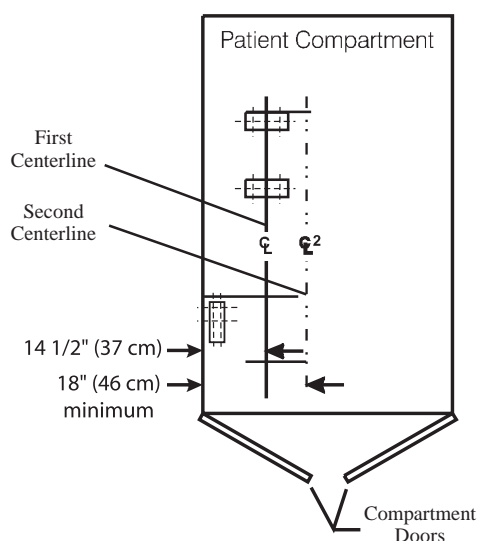


Figure 19 - Example of Two Centerlines Drawn at the Minimum Distance from Wall

• PART 14 : OEM LITERATURE

FERNO - MODEL 175-3 & 175-4 - COT FASTENING SYSTEM

Model 175-3 and 175-4 Mounting Kits

Marking the Floor

4.8 Dual In-Line Installation

For most multiple cot fastener setups, follow the instructions in Subsection 4.7, *Standard Dual Fastener Mounting*, page 20. However, if you have a Ferno Model 35 Series cot (35-A, 35-A+, 35-IT, etc.) and Ferno Model 30 Series cot (30-SC, 30-IT, etc.), you can install a setup that allows both cots to use the same Centerline. In this setup, only the antler is moved to accommodate the two cots, while the rail remains in place.

Note: This installation method requires you to purchase one modified antler mounting block (Ferno Accessory Kit #081-9912), that **must** be used with this installation, and may require the purchase of two additional antler floor plates. Contact EMSAR (page 28) and Ferno Customer Relations (page 29) to order these items.

To install a Model 35 and Model 30 setup in the same ambulance compartment using one Centerline:

- Follow the instructions in this section to mark the ambulance floor for the Model 35 cot.
- Measure to place the antler template in two additional locations along the Centerline for the Model 30 cot, using Figure 20 for reference:
 - From Antler Point A2, measure toward the patient compartment doors $3 \frac{1}{8}"$ (79 mm) and mark a point for Antler Point A3.
 - From Antler Point A3, measure toward the patient compartment doors $14 \frac{15}{16}"$ (379 mm) and mark a point for Antler Point A4.
- Verify that you have correctly measured and marked the floor for these new points. As an additional check, The distance from Point E on the Centerline to Antler Point A4 should be the same as the Measurement E for the Model 30 cot ($19 \frac{5}{16}"$ /49 cm), as shown in Figure 20.
- Repeat the instructions in Subsection 4.6, *Marking for the Mounting Plates*, to mark the outline and the intersecting lines for the two new antler mounting plates.
- Continue with the installation. For all four antler floor points, follow the installation instructions to drill the floor, recess the floor, and install antler floor plates as instructed in Section 5, *Installing the Fastener*.

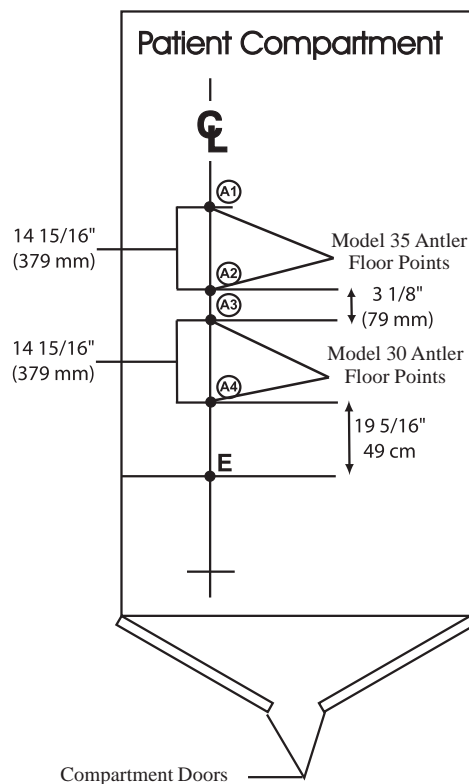


Figure 20 - Dual In-Line Installation



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• PART 14 : OEM LITERATURE

FERNO - MODEL 175-3 & 175-4 - COT FASTENING SYSTEM

Installing the Fastener

Model 175-3 and 175-4 Mounting Kits

5 - INSTALLING THE FASTENER

5.1 Drilling the Holes

Items Needed:

- 1 Drill
- 1 $\frac{1}{8}$ " bit
- 1 $\frac{5}{16}$ " bit
- 1 $\frac{3}{8}$ -16 tap

DRILLING THE HOLES

1. Before drilling through the floor, inspect the underside of the ambulance for obvious obstructions to the installation. Contact the ambulance manufacturer:
 - if the fuel tank, oxygen lines, or other elements are in the way of the installation.
 - for information about the ambulance warranty.
 - to make sure the backing plates can be installed without interference and welded safely.
2. Recognize proper drilling points. The drill points are at the intersections of the lines drawn between the template arrows. Do **not** drill at the labeled Antler and Rail points. Drill only at the intersections of the lines drawn between the arrows on the templates.
3. Cautiously drill a small guide hole (or pilot hole) through the floor at each mounting hole position, using a $\frac{1}{8}$ " drill bit.
4. Align backing plates with the holes.
5. Weld backing plates beneath the ambulance floor at all mounting points using a full penetration weld. For installation in the U.S.A., use a setup identical to one you have tested to meet or exceed all applicable guidelines.
6. Using the guide holes, drill completely through the ambulance floor and backing plates using a $\frac{5}{16}$ " diameter drill bit. These larger holes are for the mounting plate bolts. Repeat for each guide hole (Figure 21). There are two drilling points for each antler mounting plate, and four drilling points for each rail mounting plate.
7. Use a $\frac{3}{8}$ -16 tap to tap the backing plates for use with $\frac{3}{8}$ " bolts.

Important

The fastener is designed to be installed with backing plates at all mounting points.

If the vehicle in which you are installing the fastener does not have the required backing plates, have them installed. Consult the ambulance manufacturer for installation information.

WARNING

A fastener installed without backing plates can fail in a crash. Use properly installed backing plates to secure the fastener at all mounting points.

Important

Inspect the underside of the ambulance for anything (wiring, brake lines, fuel tank, oxygen lines or other elements) that might interfere with the installation.

Important

The Antler and Rail Points are only used to place the templates. Do not drill at these points. Drill the floor only at the intersections of the lines drawn between the arrows on the templates.

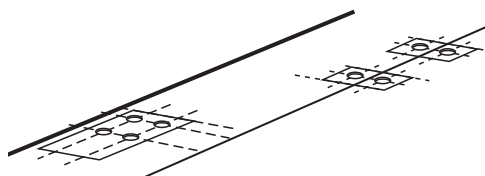


Figure 21 - Drilling the Bolt Holes



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• PART 14 : OEM LITERATURE

FERNO - MODEL 175-3 & 175-4 - COT FASTENING SYSTEM

Model 175-3 and 175-4 Mounting Kits

Installing the Fastener

5.2 Recessing the Floor for the Mounting Plates

Items Needed:

1 Router, saber saw or other device

1. Recess the floor $\frac{5}{8}$ " (16 mm) inside each template outline (Figures 22 and 23). You may want to use a router or saber saw to do this.

Note: Ambulance flooring styles vary widely. Consult the ambulance manufacturer for the proper method and tools to recess the floor for your style of ambulance. A typical ambulance floor cross-section is shown in Figure 22. Your ambulance floor may vary from this.

2. After you recess the floor, smooth the edges of the mounting plate cavity. Make sure the mounting plate will fit inside the mounting plate cavity.

Important

Ambulance flooring styles vary widely. Consult the ambulance manufacturer for the proper method and tools to recess the floor for your style of ambulance.

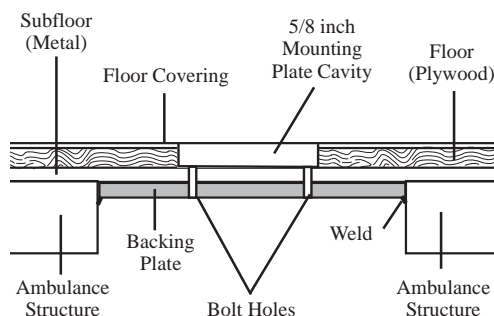


Figure 22 - Recessing the Floor for the Mounting Plates

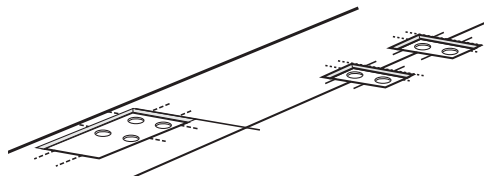


Figure 23 - Floor Recessed for Mounting Plates

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FERNO - MODEL 175-3 & 175-4 - COT FASTENING SYSTEM

Installing the Fastener

Model 175-3 and 175-4 Mounting Kits

5.3 Installing the Fastener

Before installing the fastener components, see page 8, *Items Required*, for a list of hardware needed.

INSTALLING THE ANTLER

1. Attach each antler mounting plate to the floor with two $\frac{3}{8}$ " socket head cap screws, lock washers, and jam nuts (hardware not supplied). The cap screws should extend beyond the backing plates a **minimum** of $\frac{3}{4}$ " (2 cm).
2. Place the antler on the cot Centerline with the antler hooks open toward the patient compartment doors (Figure 24).
3. Place the antler mounting blocks on the antler. The holes in the mounting blocks should face toward the inside of the antler (Figure 24).
4. Attach the antler and antler mounting blocks to the floor with two tie-down knobs. When the tie-down knobs are properly tightened into the antler mounting blocks, the knobs will be slightly recessed in the mounting blocks (Figure 25).

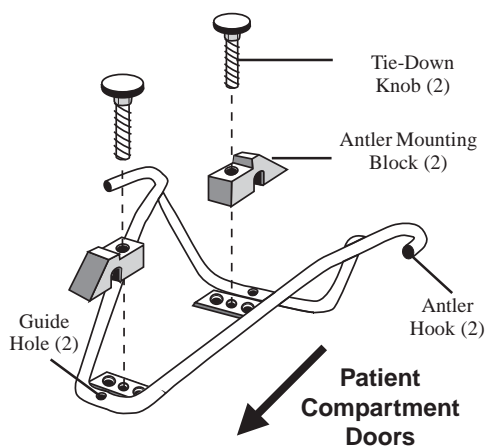


Figure 24 - Mounting the Antler

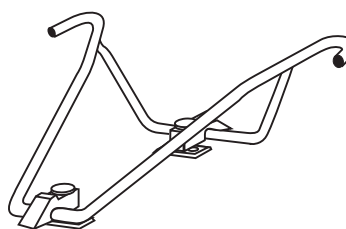


Figure 25 - Tie-Down Knobs Properly Seated in Mounting Blocks

• PART 14 : OEM LITERATURE

FERNO - MODEL 175-3 & 175-4 - COT FASTENING SYSTEM

Model 175-3 and 175-4 Mounting Kits

Installing the Fastener

INSTALLING THE RAIL ASSEMBLY

1. Attach the mounting bracket floor plate to the floor with four $\frac{3}{8}$ " socket head cap screws, lock washers, and jam nuts (hardware not supplied). The cap screws should extend beyond the backing plates a **minimum** of $\frac{3}{4}$ " (2 cm).
2. Slide the bolt on the bottom of the mounting bracket into the key hole in the bracket floor plate. Push the mounting bracket toward the forward end of the ambulance as far as it will go (Figure 26).
3. Secure the mounting bracket to the bracket floor plate with a tie-down knob.
4. Use Table 5 at right to position the rail clamp.
5. Attach the rail to the mounting bracket with the rail clamp, socket head cap screws, lock washers and jam nuts provided. Place the rail with the jaw end away from the patient compartment doors. Do **not** completely tighten the clamp yet.
6. Position the rail with the lock button and jaws perpendicular to the wall.

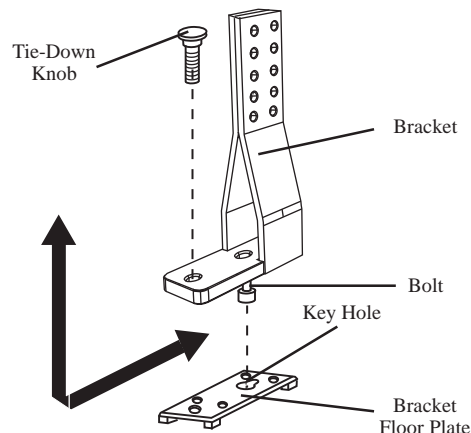
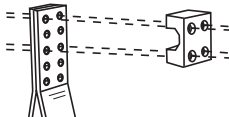
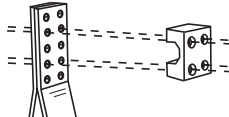
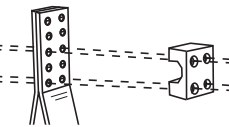


Figure 26 - Mounting the Rail Bracket

TABLE 5 - RAIL CLAMP POSITIONS

Top	
Center	
Bottom	

There are three rail clamp positions. Use the position that best allows the jaws on the rail to grasp the center of the fastener post on the cot.

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FERNO - MODEL 175-3 & 175-4 - COT FASTENING SYSTEM

Installing the Fastener

Model 175-3 and 175-4 Mounting Kits

5.4 Adjusting and Testing the Fastener

ADJUSTING THE FASTENER

1. Adjust the rail clamp so it does not touch the adjustment limit label (Figure 27).
2. Load a compatible Ferno cot into the fastener. (See the instructions in the cot users' manual and the Model 175 Users' Manual).
3. Verify that the antler hooks properly engage the loading-wheel forks on the cot (or the head-end transport wheels for the Model 30 cot).
4. Verify that the rail jaws grasp the center of the cot post. If not:
 - Adjust the clamp side-to-side within the adjustment range indicated by the adjustment limit label (Figure 27). Do not exceed the adjustment range between the jaw and label.
 - Adjust the height of the rail clamp if needed (see Table 5, page 25). Tighten the rail clamp to the mounting bracket.
5. Inspect the fastener for proper locking and unlocking of the cot, and secure mounting to the floor. When complete, the installed fastener should resemble Figure 28 on page 27.

U.S.A. - TESTING THE SETUP

The strength of any fastener mounting installation should be confirmed by the installer's own test procedure before placing the fastener in service.

The floor and backing plates to which the mounting components are attached must be crashworthy, having sufficient strength to hold the mounted fastener and cot with patient.

Test your fastener setup to meet or exceed the pull test specified in AMD .004. When the setup has passed this test, use the same setup when installing the fastener(s) in your ambulance(s).

IF YOU CANNOT LOAD THE COT

If the cot will not load into the fastener, remove the cot and verify your fastener settings and measurements.

If the fastener still does not function properly with the cot, contact Ferno Customer Relations (page 29).

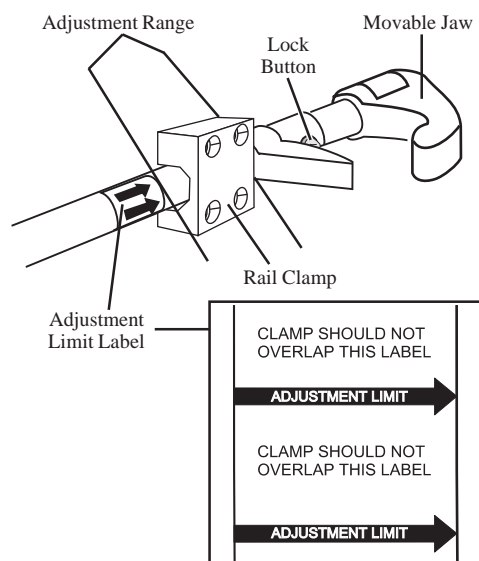


Figure 27 - Adjusting the Rail and Rail Clamp

⚠ WARNING

Improper adjustment can cause injury. Stay within the range between the jaw and the adjustment limit label.

Important

The adjustment limit label ensures the cot will be held near the reinforcements offered by the mounting bracket. Do not exceed the adjustment range between the jaw and the label.

⚠ WARNING

Improper testing can cause injury. U.S.A. installers must test the fastener setup to pass AMD Standard .004 before installing a fastener in an ambulance.



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- PART 14 : OEM LITERATURE

FERNO - MODEL 175-3 & 175-4 - COT FASTENING SYSTEM

Model 175-3 and 175-4 Mounting Kits

Installing the Fastener

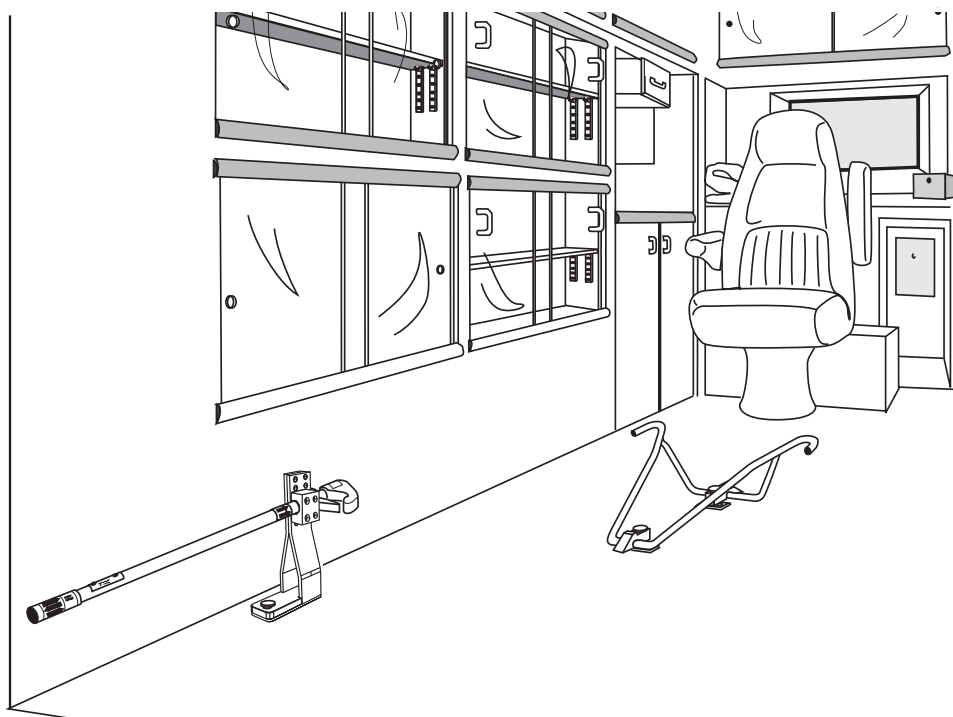


Figure 28 - Final Fastener Configuration



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• PART 14 : OEM LITERATURE

FERNO - MODEL 175-3 & 175-4 - COT FASTENING SYSTEM

Parts & Service, Accessories

Model 175-3 and 175-4 Mounting Kits

6 - PARTS AND SERVICE, ACCESSORIES

6.1 Parts and Service - U.S.A. and Canada

To order parts or for professional fastener repair, contact EMSAR®, the only agent authorized by Ferno to manage, service, and repair Ferno products. Phone, fax or visit EMSAR's web site for details.

1.800.73EMSAR (Phone)

1.937.383.1051 (Fax)

www.EMSAR.com (Internet)

6.2 Parts and Service - Worldwide

To order Ferno parts and for professional repair, contact your Ferno distributor. Your distributor is the only agent authorized by Ferno to manage, service, and repair Ferno products.

⚠ WARNING

Improper parts and service can cause injury. Use only Ferno-approved parts and service.

⚠ WARNING

Modifying the fastener can cause injury and damage. Use the fastener only as designed by Ferno.

*** 081 kits are available from Ferno. Contact Ferno Customer Relations, page 29, to order these kits.**

Model 175-					Description	Part Number	Qty.
1	2	3	4	5			
•	•	•	•	•	Antler	090-0271	1
		•	•	•	Antler Mounting Block (Removable)	090-0264	1
•	•				Antler Mounting Block (Permanent)	090-0272	2
		•	•	•	Removable Antler Floor Plates	090-0265	2
		•	•		Removable Floor Plate for Removable Mounting Bracket	090-0266	1
		•	•	•	Removable Tie-Down Knob, Short (for Bracket or Antler)	090-0268	1
		•	•	•	Removable Tie-Down Knob, Long (old-style)	090-0267	1
•	•	•	•	•	Replacement Split Fastener Post (non-PROFlexx models)	090-0277	1
•	•	•	•	•	Replacement Split Fastener Post (35-P PROFlexx)	190-1240	1
•	•	•	•	•	Replacement Split Fastener Post (93-P PROFlexx)	190-1154	1
•	•	•	•	•	Rail Push Handle	090-4226	1
•	•	•	•	•	Label Kit	090-4229	1
		•	•		Removable Floor Mounting Bracket (New 10-Hole)	190-1397	1
	•				Permanent Floor Mounting Bracket (New 10-Hole)	190-1400	1
•				•	Wall Mounting Bracket (New wide plate)	190-1398	1
	•	•	•		New (4-hole) Rail Clamp w/Hrdwr (use with floor bracket)	190-1399	1
•				•	New (4-hole) Rail Clamp w/Hrdwr (use with wall bracket)	190-1451	1
		•	•		Old 5-Hole Floor Mounting Bracket (Removable)	090-0263	1
	•				Old 5-Hole Floor Mounting Bracket (Permanent)	090-0261	1
•				•	Old Wall Mounting Brackets	090-0275	2
•	•	•	•	•	Rail, Aluminum	090-0278	1
•	•	•	•	•	Rail, Stainless Steel	090-5692	1
	•	•	•		Old 2-Hole Rail Clamp (single)	090-0262	1
•				•	Old 2-Hole Rail Clamps (pair)	090-0274	2
		•	•		Socket Screw w/Nut (1.5") for Mntg Bracket	090-5048	1
•	•	•	•	•	Spring and Bushing (for Rail)	090-4227	1
		•	•		Mounting Plate Plastic Cover Kit (2 antler, 1 rail)*	081-9734	3
		•	•	•	Modified Mounting Block for 35-30 in-line*	081-9912	1



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FERNO - MODEL 175-3 & 175-4 - COT FASTENING SYSTEM

Model 175-3 and 175-4 Mounting Kits Warranty, Ferno Customer Relations

7 - LIMITED WARRANTY

Limited Warranty Summary

Ferno-Washington, Inc. (Ferno), warrants the products we manufacture to be free from defects in material and workmanship for one year except as follows:

- (A) External finishes (gelcoat, decals, paint, etc.) are warranted for 90 days.
- (C) Repairs and services are warranted for 90 days or until the end of the time period(s) above, whichever comes last.

This limited warranty applies when you use and care for the product properly. If the product is not used and cared for properly, the warranty is void. The warranty period begins the day the product is shipped from Ferno or the day you receive it if you have proof of the delivery date. Shipping charges are not covered by the limited warranty. We are not liable for shipping damages or damages sustained through using the product.

Limited Warranty Obligation

If a product or part is proven to be defective, Ferno will repair or replace it. At our option, we will refund the product's purchase price. The purchaser accepts these terms in lieu of all damages.

This is a summary of the limited warranty. The actual terms and conditions of the limited warranty, and the limitations of liability and disclaimers, are available upon request by calling 800.733.3766 or 937.382.1451.

Cot Fastener Disclaimer

Ferno-Washington, Inc. (Ferno), cot fasteners are designed for use only with Ferno cots. **NO WARRANTY OR REPRESENTATION IS MADE WITH RESPECT TO THE ADAPTABILITY OR SUITABILITY OF COT FASTENERS FOR USE WITH COTS (OTHER THAN FERNO COTS), AND ALL SUCH WARRANTIES, INCLUDING WARRANTIES OF MERCHANTABILITY OF FITNESS FOR SUCH PURPOSES, ARE EXPRESSLY DISCLAIMED. FOR WARRANTY AND DISCLAIMER INFORMATION OF COT FASTENERS USED WITH FERNO COTS SEE FERNO'S WARRANTY AND DISCLAIMER STATEMENT.**

8 - FERNO CUSTOMER RELATIONS

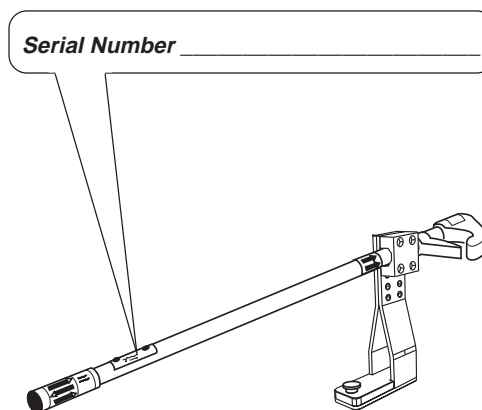
Customer service and product support are important aspects of each Ferno product. Please have the serial number of your Ferno fastener available when calling Ferno Customer Relations, and include it in all written communications.

For assistance in the U.S.A., please contact Ferno Customer Relations:

Telephone (Toll-free) 1.800.733.3766
Telephone 1.937.382.1451
Fax (Toll-free) 1.888.388.1349
Fax 1.937.382.1191

For assistance worldwide, please contact your Ferno distributor, or Ferno Customer Relations:

Telephone +1.937.382.1451
Fax +1.937.382.6569
Internet www.ferno.com





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NOTES



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Model 175-3 and 175-4 Mounting Kits

TEMPLATES

Important

The templates represent the portion of the mounting blocks that will be recessed in the patient compartment floor.

Each mounting block has an additional $\frac{1}{4}$ " (6 mm) lip that should overlap the floor when the block is correctly installed.

Important

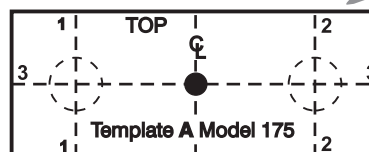
After you cut out or photocopy these templates, measure the size of the templates and verify that they are the correct size.

Important

The black spots on the templates indicate the marked Points A1, A2, R1 and R2 on the patient compartment floor. Remove the spots with a hole punch.

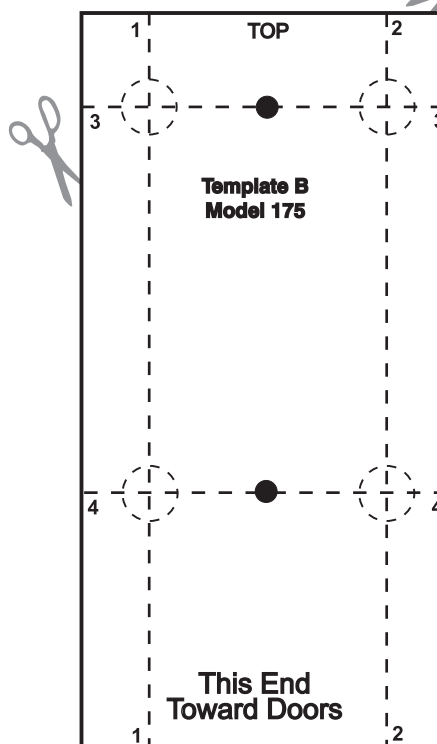
The black spots are **not** the drilling points. Drill only at the crosshairs indicated, following the instructions written in this manual.

TEMPLATE A
ANTLER TEMPLATE



Template A dimensions
2 1/2" x 1"

TEMPLATE B
RAIL TEMPLATE



Template B dimensions
2-1/2" x 5"




TECHNICAL MANUAL

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• PART 14 : OEM LITERATURE

INTERSTATE BATTERIES - SRM-27 - CONVERSION BATTERIES



Product Information

PRODUCT INFO

- Product Category
- Material Safety Data Sheets
- Battery Terms
- Warranty
- FAQs
- Recycling

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Interstate Deep Cycle/Cranking - 12 Volt

BCI Grp #	Interstate Type	RC (Min.) 25A	Warranty (Mo.)	Hrs. at Ampere Load			Dimensions (in.) L W H	Weight (lbs)	Terminal
				5	15	25			
24M	SRM-24	140	30	16.4	4.6	2.3	11 6-7/8 9-1/2	46	Auto/Stud posts
24M	HD24-DP	100	30	11.6	3.2	1.7	11 6-7/8 9-1/2	41	Auto/Stud posts
27M	SRM-27	160	30	17	5.2	2.6	12-3/4 6-3/4 9-1/2	53	Auto/Stud posts
27M	SRM-27B	180	30	20.4	5.7	3.0	12-3/4 6-3/4 9-1/2	55	Auto/Stud posts
29M	SRM-29	210	30	21	6.4	3.4	13 6-3/4 10	61	Auto/Stud posts
4DM	SRM-4D	390	30	38.0	11.5	6.5	21 8-1/4 10-3/8	119	Auto/Stud posts

Interstate Cranking/Starting - 12 Volt

BCI Grp #	Interstate Type	RC (Min.) 25A	Warranty (Mo.)	Dimensions (in.) L W H	Weight (lbs)	Terminal
24M	24M-XHD	135	24	11 6-7/8 9-1/2	48	Auto/Stud posts
24M	24M-HD	95	24	11 6-7/8 9-1/2	38	Auto/Stud posts
24M	24M-RD	75	24	11 6-7/8 9-1/2	35	Auto/Stud posts
27M	27M-XHD	180	24	12-3/4 6-3/4 9-1/2	54	Auto/Stud posts

Interstate Marine Batteries - 8 Volt

Interstate Type	Amp Hours	RC (Min.)		Warranty (Mo.)	Dimensions (in.) L W H	Weight (lbs)	Terminal
		25A	75A				
USRM8V19	142	305	92	30	19.25 7.50 10.75	93	L-shaped bracket w/ hole
USRM8V21	155	330	98	30	21.44 7.50 10.50	103	L-shaped bracket w/ hole
USRM8V24	190	430	134	30	24.38 7.44 10.50	118	L-shaped bracket w/ hole
USRM8V26	240	515	145	30	26.75 8.44 11.12	149	L-shaped bracket w/ hole
USRM8V27	215	445	122	30	27.44 7.44 10.50	132	L-shaped bracket w/ hole

Optima - Marine/RV

Part #	Group	CCA	MCA	RC (Min.) 25A	Warranty (Mo.) Free/Pro-rate	Amp Hrs @ 20 Hrs.	Dimensions (in.) L W H	Weight (lbs)	Terminal
SC31DM	31	900	1125	155	18/36	75	12-13/16 6-1/2 9-3/8	59.8	Stud and Auto
SC34DM	34	750	870	120	18/36	55	10 6-7/8 7-13/16	43.5	Stud and Auto
SC34M	34	800	1000	110	18/36	50	10 6-7/8 7-13/16	38.4	Stud and Auto

Interstate Deep Cycle/Cranking - 6 Volt

BCI Grp #	Interstate Type	Amp Hours @ 20 hrs.	RC (Min.)		Warranty (Mo.)	Hrs. at Ampere Load		Dimensions (in.) L W H	Weight (lbs)	Terminal
			@ 25A	@ 75A		5 amps	15 amps			
GC-2	U2200	232	474	122	6	54.5	14.0	10-1/4 7-1/8 11-1/4	62	2 options: threaded stud over auto post OR auto post w/ hole

Shop Online

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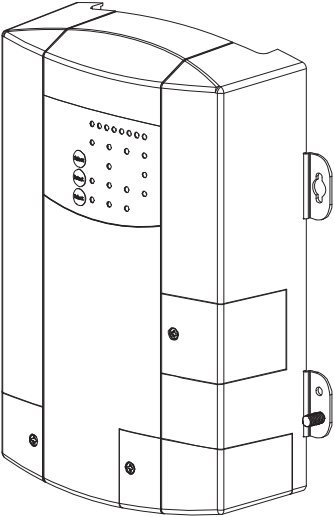
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XANTREX - TRUECHARGE 2 - BATTERIES' CHARGER

<p>Smart choice for power</p>	<p>xantrex</p>																						
	<table><tr><td>TC1012</td><td>10A-12V</td></tr><tr><td>TC1512</td><td>15A-12V</td></tr><tr><td>TC2012</td><td>20A-12V</td></tr><tr><td>TC3012</td><td>30A-12V</td></tr><tr><td>TC4012</td><td>40A-12V</td></tr><tr><td>TC5012</td><td>50A-12V</td></tr><tr><td>TC6012</td><td>60A-12V</td></tr><tr><td>TC1524</td><td>15A-24V</td></tr><tr><td>TC2024</td><td>20A-24V</td></tr><tr><td>TC3024</td><td>30A-24V</td></tr><tr><td>TC5024</td><td>50A-24V</td></tr></table> <p>Installation Guide</p>	TC1012	10A-12V	TC1512	15A-12V	TC2012	20A-12V	TC3012	30A-12V	TC4012	40A-12V	TC5012	50A-12V	TC6012	60A-12V	TC1524	15A-24V	TC2024	20A-24V	TC3024	30A-24V	TC5024	50A-24V
TC1012	10A-12V																						
TC1512	15A-12V																						
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TC4012	40A-12V																						
TC5012	50A-12V																						
TC6012	60A-12V																						
TC1524	15A-24V																						
TC2024	20A-24V																						
TC3024	30A-24V																						
TC5024	50A-24V																						
<p>TRUECHARGE™2</p> <p>Series Battery Charger</p> <p>This guide for use by qualified installers only</p>	<p>www.xantrex.com</p>																						



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Smart choice for power

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Truecharge™ 2 Series Battery Chargers

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About Xantrex

Xantrex Technology Inc. is a world-leading supplier of advanced power electronics and controls with products ranging from small mobile units to utility-scale systems for wind, solar, batteries, fuel cells, microturbines, and backup power applications in both grid-connected and stand-alone systems. Xantrex products include inverters, battery chargers, programmable power supplies, and variable speed drives that convert, supply, control, clean, and distribute electrical power.

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Date and Revision

June 2008 Rev A

Part Number

975-0402-01-01

Product Numbers

804-1210, 804-1215, 804-1220, 804-1230, 804-1240, 804-1250, 804-1260, 804-2415, 804-2420, 804-2430, 804-2450

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XANTREX - TRUECHARGE 2 - BATTERIES' CHARGER

About This Guide

Purpose

The purpose of this Installation Guide is to provide explanations and procedures for installing and configuring the Truecharge™ 2 Series Battery Charger.

Scope

The Guide provides safety guidelines, procedures for installing the battery charger, as well as information on configuring the battery charger. It does not provide details about particular brands of batteries. You need to consult individual battery manufacturers for this information.

Refer to Truecharge™ 2 Battery Charger Owner's Guide (doc. part number: 975-0401-01-01) for operational instructions.

Audience

The Guide is intended for qualified installers who need to install and configure any model unit of the Truecharge™ 2 Series Battery Charger. The installer should be a qualified technician or electrician.

Organization

This Guide is organized into two chapters and one appendix. Chapter 1 describes the standard features of a Truecharge™ 2 Battery Charger, as well as its protection features. It also provides information on the different parts of the Truecharge™ 2 Battery Charger including information on the optional remote panel.

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About This Guide

Chapter 2 provides procedures for installing, testing and configuring the Truecharge™ 2 Battery Charger.

Appendix A contains physical, electrical performance, and regulatory approval specifications for the Truecharge™ 2 Battery Charger.

Conventions Used

The following conventions are used in this guide.



WARNING

Warnings identify conditions or practices that could result in personal injury or loss of life.



CAUTION

Cautions identify conditions or practices that could result in damage to the unit or other equipment.

Important: These notes describe things which are important for you to know, but not as serious as a caution or warning.

This Guide contains information for 11 product models of the Truecharge™ 2 Series Battery Charger.

The 12V models are: TC1012, TC1512, TC2012, TC3012, TC4012, TC5012, and TC6012. When being referred to individually, the product will be referred to by its model name.

The 24V models are: TC1524, TC2024, TC3024, and TC5024. When being referred to individually, the product will be referred to by its model name.

When all models are being referred to, they will be referred to as Truecharge™ 2 Battery Chargers.

Related Information

You can find more information about Xantrex Technology Inc. as well as its products and services at www.xantrex.com



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XANTREX - TRUECHARGE 2 - BATTERIES' CHARGER

Important Safety Instructions

READ AND SAVE THIS INSTALLATION GUIDE FOR FUTURE REFERENCE.

This chapter contains important safety, installation, and operating instructions for the Truecharge™ 2 Series Battery Chargers.

1. Before installing and using a Truecharge™ 2 Battery Charger, read all instructions and cautionary markings on a Truecharge™ 2 Battery Charger unit, the batteries, and all appropriate sections of this guide.



CAUTION: Risk of injury

To reduce the risk of injury, charge only properly rated (such as 12 V and 24 V) lead-acid (GEL, AGM, Flooded, or lead-calcium) rechargeable batteries. Other battery types may burst, causing personal injury and damage.

2. Do not expose the Truecharge™ 2 Battery Charger to rain, snow, spray, or bilge water. To reduce risk of fire hazard, do not cover or obstruct the air intake vent openings. Do not install the Truecharge™ 2 Battery Charger in a zero-clearance compartment. Overheating may result.
3. This appliance is not intended for use by persons (including children) with reduced physical, sensory, or mental capabilities or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.

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XANTREX - TRUECHARGE 2 - BATTERIES' CHARGER

Safety

4. To avoid a risk of fire and electric shock, make sure that existing wiring is in good condition and that wire is not undersized. Do not operate the Truecharge™ 2 Battery Charger with damaged or substandard wiring.
5. The use of any attachments not recommended or sold by Xantrex, may result in risk of fire, electric shock, or injury to persons.
6. Do not operate the Truecharge™ 2 Battery Charger if it has received a sharp blow, been dropped, has cracks or openings in the enclosure (especially when the fuse cover has been damaged and will not close), or otherwise damaged in any other way. If the Truecharge™ 2 Battery Charger is damaged, see the Warranty section.
7. Do not disassemble the Truecharge™ 2 Battery Charger—there are hazardous voltages within. It contains no user-serviceable parts. See Warranty for instructions on obtaining service. Attempting to service the Truecharge™ 2 Battery Charger yourself may result in a risk of electrical shock or fire and will void your warranty. Internal capacitors remain charged after all power is disconnected.
8. To reduce the risk of electrical shock, disconnect both AC and DC power from the Truecharge™ 2 Battery Charger before attempting any maintenance or cleaning or working on any circuits connected to the Truecharge™ 2 Battery Charger. Turning off using the on/standby button on the remote panel will not reduce this risk.
9. The Truecharge™ 2 Battery Charger must be provided with equipment-grounding conductors connected to the AC and input ground, and from chassis to the DC ground.



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XANTREX - TRUECHARGE 2 - BATTERIES' CHARGER

Safety



WARNING: Explosion hazard

10. Working in the vicinity of lead-acid batteries is dangerous. Batteries generate explosive gases during normal operation. Therefore, it is of utmost importance that each time before servicing the charger in the vicinity of the battery, that you read this manual and follow the instructions exactly.
11. To reduce the risk of battery explosion, follow these instructions and those published by the battery manufacturer and the manufacturer of any unit you intend to use in the vicinity of the battery. Review cautionary markings on these products and on the engine

Personal Precautions When Working With Batteries



WARNING: BATTERIES PRESENT RISK OF ELECTRICAL SHOCK, BURN FROM HIGH SHORT-CIRCUIT CURRENT, FIRE OR EXPLOSION FROM VENTED GASES. OBSERVE PROPER PRECAUTIONS.

1. Have someone within range of your voice or close enough to come to your aid when you work near a lead-acid battery.
2. Have plenty of fresh water and soap nearby in case battery acid contacts skin, clothing, or eyes.
3. Wear proper, non-absorbent gloves, complete eye protection, and clothing protection. Avoid touching your eyes and wiping your forehead while working near batteries.

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Safety

4. If battery acid contacts skin or clothing, wash immediately with soap and water. If acid enters your eye, immediately flood it with running cold water for at least twenty minutes and get medical attention immediately.
5. Never smoke or allow a spark or flame near the engine or batteries.
6. Use extra caution to reduce the risk of dropping a metal tool on the battery. It could spark or short circuit the battery or other electrical parts and could cause an explosion.
7. Remove all personal metal items, like rings, bracelets, and watches when working with batteries. Batteries can produce a short circuit current high enough to weld metal to skin, causing a severe burn.
8. If you need to remove a battery, always remove the ground terminal from the battery first. Make sure all accessories are off so you don't cause an arc.
9. Never charge a frozen battery.

PREPARING TO CHARGE

10. Make sure the area around the battery is well ventilated.
11. Make sure the voltage of the batteries matches the output voltage of the battery charger.
12. Clean battery terminals. Be careful to keep corrosion from coming into contact with your eyes and skin.
13. Study and follow all of the battery manufacturer's specific precautions, such as removing or not removing cell caps while charging, whether equalization is acceptable for your battery, and recommended rates of charge.
14. Add distilled water in each cell until battery acid reaches the level specified by the battery manufacturer. This helps to purge excessive gas from cells. Do not overfill. For a battery without removable cell caps, carefully follow manufacturer's instructions.



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XANTREX - TRUECHARGE 2 - BATTERIES' CHARGER

Safety

BATTERY CHARGER LOCATION

15. Locate the Truecharge™ 2 Battery Charger unit away from batteries as practical in a well ventilated compartment.
16. Never place the Truecharge™ 2 Battery Charger unit directly above batteries; gases from a battery will corrode and damage the charger
17. Never allow battery acid to drip on the charger when reading gravity, or filling battery.
18. Do not operate the charger in a closed in area, or restrict the ventilation in any way.
19. Do not place a battery on top of the charger.
20. For North American marine installations, external connections to the charger shall comply with the United States Coast Guard Electrical Regulations (33CFR183, Sub Part I).



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Safety

FCC Information to the User

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced radio/TV technician for help.



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1 Introduction

Chapter 1 describes the standard features of a Truecharge™ 2 Battery Charger, as well as its protection features. It also provides information on the different parts of the Truecharge™ 2 Battery Charger including information on the optional remote panel.

Truecharge™ 2 Battery Charger

The Truecharge™ 2 Battery Charger ships with the following items.

- one Truecharge™ 2 Battery Charger unit
- installation and operation guides
- rubber boots for DC terminals
- ring terminals, nuts, and washers
- strain relief clamp for AC input cables

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Introduction

Standard and Protection Features

The Truecharge™ 2 Battery Charger provides the following standard features:

- three¹ full current rated outputs
- battery monitoring functions while in float mode or rest mode
- correct charging voltage for your batteries when connected to almost any single phase AC power outlet in the world
- low electromagnetic interference (EMI)
- automatic charge resumption after AC power interruption
- programmable custom charge sequence²
- fully discharged battery charging³
- an optional remote panel⁴ which can be mounted up to 15 m (50 ft) away for remote control and monitoring.
- an optional battery temperature sensor⁵ (BTS) provides battery temperature voltage compensation from -25 to 70 °C (-13 to 158 °F)

1. Model TC1012 has one output and model TC1512 has two outputs. All other models have three outputs. Each output (for models with 2 or 3 outputs) can charge different batteries that either have the same chemistry or can tolerate the same charge sequence.

2. The charger can be programmed with custom charge setpoints using PC interface. This programming can only be done using a special configuration tool operated by Xantrex or a designated OEM.

3. The charger can initiate charging a non-damaged but zero voltage battery.

4. Part number: 808-8040-00

5. Part number: 808-0232-01



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Standard and Protection Features

The Truecharge™ 2 Battery Charger provides the following protection features:

- reverse polarity protection via an output fuse to guard against reverse battery polarity
- AC input out-of-range protection shutdown
- ambient over temperature protection shutdown
- battery over-charging protection
- electronic current limiting provides protection against short circuit conditions on the charger's output
- ignition protected rating, enabling installation in engine spaces
- isolated design
- over temperature and short circuit protection for the BTS and communication connector ports
- drip-proof rubber boots for DC terminals for added moisture protection
- IP-32 drip protection rating¹
- fan lockout protection

The optional Battery Temperature Sensor (BTS) provides these protection features:

- battery under temperature charging protection preventing battery charging at -20 °C or below
- charging current compensation for different battery temperatures

1. In two specific installation orientations—see “Truecharge™ 2 Battery Charger Mounting Orientations” on page 2–7.

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Truecharge™ 2 Battery Charger

This section describes the different parts of the Truecharge™ 2 Battery Charger.

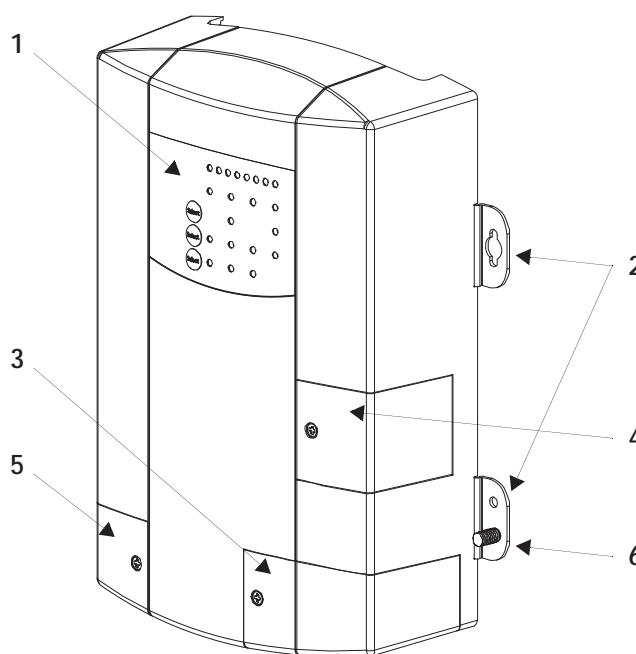


Figure 1-1 Truecharge™ 2 Battery Charger

Item	Description
1	Onboard control and status display panel or simply onboard display (see “Rear Panel” on page 1–6 for more information) for controlling the Truecharge™ 2 Battery Charger settings and for monitoring charger status and charging current.
2	Mounting flanges are used to permanently install the product.
3	DC wiring compartment cover protects the DC terminals, as well as the communication and BTS ports. Remove and replace when installing cables.



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Truecharge™ 2 Battery Charger

Item	Description
4	Fuse access panel cover provides access to the DC fuse in the event of an accidental reverse polarity installation.
5	AC wiring compartment cover provides the installer with easy access to the AC wiring compartment, to allow for a trouble free installation. Remove and replace when installing the product.
6	DC ground stud for connecting the charger's chassis to ground.

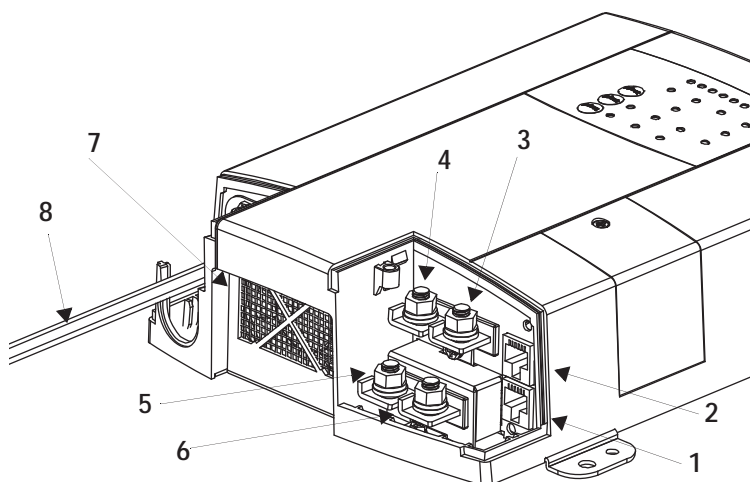
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Introduction

Rear Panel

This section describes the parts of the rear panel of the Truecharge™ 2 Battery Charger.



40 A model (TC4012) shown. Other models may vary.

Figure 1-2 Truecharge™ 2 Battery Charger Rear Panel

Item	Description
1	BTS port - battery temperature sensor port
2	Communication port - remote panel port
3	Battery positive (+) for bank 3 (6 mm stud)
4	Battery positive (+) for bank 2 (6 mm stud)
5	Battery positive (+) for bank 1 (6 mm stud) See Important note below.
6	Battery negative (-) , common for all three banks (6 mm stud) (common for both banks in model TC1512) (model TC1012 has a single bank only—one positive terminal and one negative terminal)



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Rear Panel

Item	Description
7	Air intake vent - located inside is the fan assembly
8	AC wiring - line, neutral, and ground input wires

Important: When installing only a single bank (or one battery) for Truecharge™ 2 Battery Chargers that have multiple outputs, positive bank 1 must be utilized. Bypassing bank 1 and using any of the other banks (bank 2 or bank 3) may render the charger to function improperly.

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Introduction

Onboard Control and Status Display Panel

This section describes the parts of the onboard control and status display panel of the Truecharge™ 2 Battery Charger.

Important: A “press and hold” action on any panel button means that the button must be held down for more than three seconds then released in order to send the instruction. A “press” action on any panel button means that the button must be pressed and released before two seconds have elapsed.

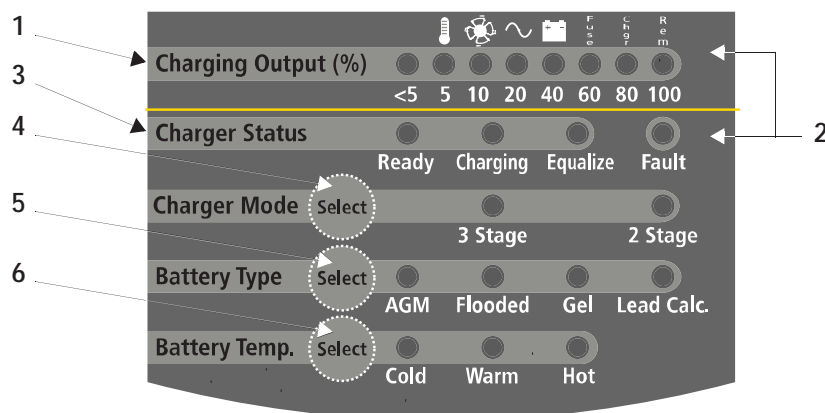


Figure 1-3 Onboard Control and Status Display Panel

To reduce current draw from the connected battery when AC power is not present, the panel's LED control and status lights are automatically turned off and the buttons are disabled.



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Onboard Control and Status Display Panel

Item	Description
1	Charging Output (%) LEDs <ul style="list-style-type: none">• The LEDs illuminate like a progress bar displaying the present total output charge current as a percentage of the set maximum charge current. The numbers below the LEDs represent the percentage values. See Figure 1-4 on page 1-11.• A single LED may flash intermittently in combination with a solid Fault LED (indicating a fault) or with a flashing Fault LED (indicating a warning). The icons above the LEDs represent the various types of fault and warning conditions. See Figure 1-4 on page 1-11.
2	Fault LED <p>The LED may illuminate a solid light (indicating a fault) or flash intermittently (indicating a warning) in combination with flashing Charging Output (%) LEDs. See Table 1-1, "Fault and Warning Indicators" on page 1-11 for details.</p>
3	Charger Status LEDs <p>Displays the current status of the charger.</p> <ul style="list-style-type: none">• Ready - a solid light indicates batteries are fully charged and in rest stage.• Ready and Charging - solid lights indicate batteries are fully charged and in float stage.• Charging - a solid light indicates charger is performing a normal charge cycle.• Equalize - a solid light indicates that the charger is performing an equalization cycle.<ul style="list-style-type: none">- a flashing light indicates that the equalization cycle will begin after the absorption stage is done.
4	Charger Mode Select button <ul style="list-style-type: none">• Press and hold the button for three seconds to select either of two settings. An indicator LED corresponds to each setting. Each setting optimizes the charging sequence differently in charging the batteries by stages.<ul style="list-style-type: none">• Three-stage - Bulk, Absorption, and Float; default setting• Two-stage - Bulk and Absorption only• When setting or cancelling an Equalization program: Press and hold both the Battery Temp. Select and Charger Mode Select buttons.

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Item	Description
5	<p>Battery Type Select button</p> <p>Press and hold the button for three seconds to select either of five settings. An indicator LED corresponds to each setting. Each setting maximizes charger performance for its corresponding battery type.</p> <ul style="list-style-type: none">• AGM - Absorbent Glass Mat lead-acid battery• Flooded - Lead-acid battery; default setting• GEL - Gel-type lead-acid battery• Lead Calc. - Lead-calcium battery• Custom - If a custom battery type has been programmed then all LEDs will illuminate
6	<p>Battery Temp. Select button</p> <ul style="list-style-type: none">• Press and hold the button for three seconds to select one of three settings. An indicator LED corresponds to each setting. Each setting will change the charger's internal threshold to compensate for variance in battery voltage due to a change in temperature.<ul style="list-style-type: none">• Cold - for battery temperature below 5 °C (41 °F)• Warm - for battery temperature between 5 and 30 °C (41 and 86 °F); default setting• Hot - for battery temperature above 30 °C (86 °F)• When setting or cancelling an Equalization program: Press and hold both the Battery Temp. Select and Charger Mode Select buttons.

The Fault LED works in conjunction with the Charging Current (%) LEDs. The icons at the top row above the Charging Current (%) LEDs represent the various types of fault and warning conditions. For example, a temperature warning is represented by a thermometer icon.

The Charging Current (%) LEDs will normally illuminate as a solid progress bar when they are indicating the amount of output charging current. If any of the LEDs start to flash intermittently at the same time that the Fault LED is either solid or flashing, a fault or warning condition is indicated.



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Onboard Control and Status Display Panel

Important: A warning condition notifies the user of an impending problem and will not stop the charger from charging, while a fault condition will stop the charger from charging the battery.

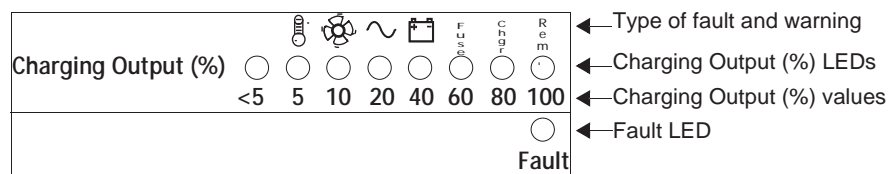


Figure 1-4 Charging Output (%) and Fault LEDs

Table 1-1 on page 1-11 summarizes the various fault conditions that might occur during the operation of the charger. For suggestions in what to do after a fault condition is detected, see Truecharge™ 2 Battery Charger Owner's Guide (doc. part number: 975-0401-01-01) on Table 3-1, "Interpreting Fault and Warning Indicators" on page 3-4 in Chapter 3, "Troubleshooting".

Table 1-1 Fault and Warning Indicators

Fault or Warning Condition	Temp 	Fan 	AC 	Battery 	Fuse 	Charger 	Remote 	Fault
High Battery Temp warning (>50°C) See Figure 1-6.								
High Battery Temp fault (>70°C) See Figure 1-6.								
Low Battery Temp warning (<0°C) See Figure 1-6.								



Flashing LED



Solid LED



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Table 1-1 Fault and Warning Indicators

Fault or Warning Condition	Temp 	Fan 	AC 	Battery 	Fuse F U S E	Charger C H G R	Remote R E M	Fault
Low Battery Temp fault (< -25°C) See Figure 1-6.								
AC input out of range Warning (<104V and >90V) or (<264V and >255V) See Figure 1-5.								
AC input out of range fault (<90V or >265V) See Figure 1-5.								
AC frequency out of range fault (<45 Hz or >65 Hz)								
High Battery voltage fault (>16.6V)								
High Charger Temp warning (>50°C)								
High Charger Temp fault (>70°C)								
Locked Fan fault								
Loss of Remote Connection warning								



Flashing LED



Solid LED



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Onboard Control and Status Display Panel

Table 1-1 Fault and Warning Indicators

Fault or Warning Condition	Temp 	Fan 	AC 	Battery 	Fuse F U S E	Charger C H G E R	Remote R E M	Fault
Reverse Polarity Fuse fault								
Internal fault								



Flashing LED



Solid LED

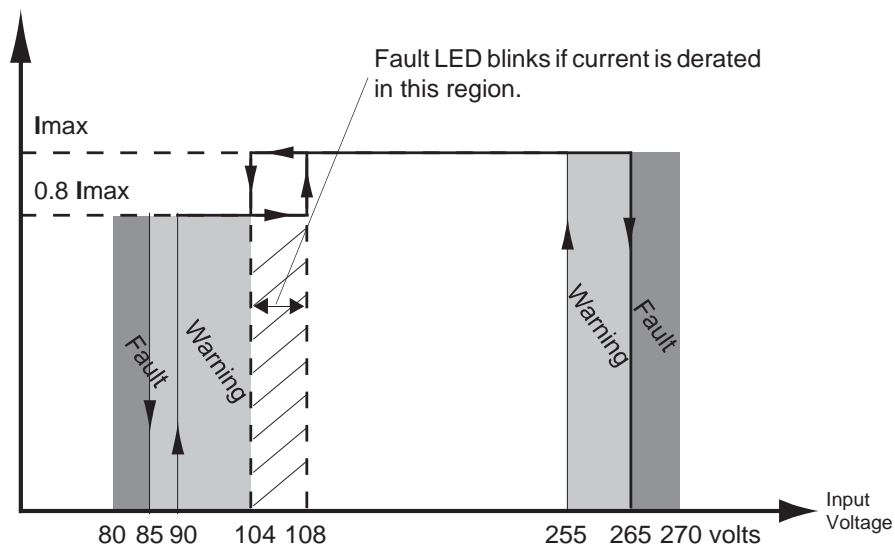


Figure 1-5 Input Voltage Operating and De-rating Curve



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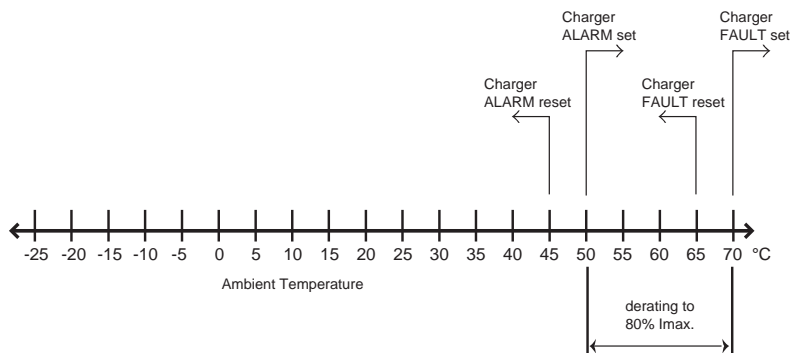


Figure 1-6 Battery and Charger Temperature Thresholds

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Remote Panel (Sold Separately)

Remote Panel (Sold Separately)

This section describes the parts of the optional remote panel (Part number: 808-8040-00) of the Truecharge™ 2 Battery Charger. The remote panel can be mounted using a communications cable up to 15 m (50 ft) from the Truecharge™ 2 Battery Charger connected via the communication port for convenience.

Important: A “press and hold” action on any panel button means that the button must be held down for more than three seconds then released in order to send the instruction. A “press” action on any panel button means that the button must be pressed and released before two seconds have elapsed.

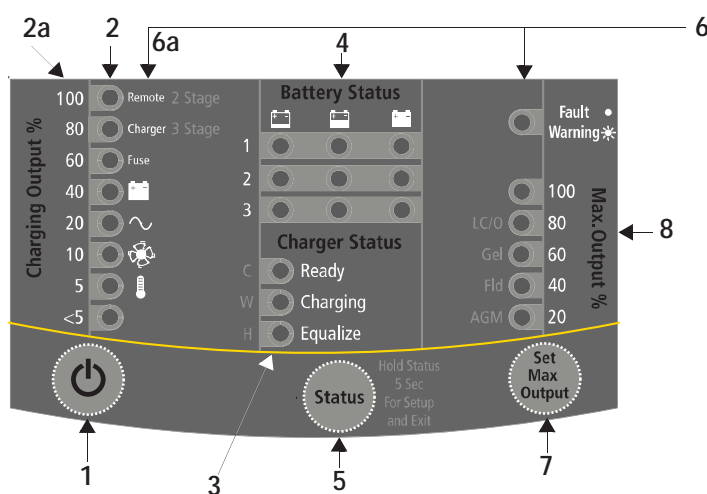


Figure 1-7 Truecharge™ 2 Battery Charger Remote Panel (optional)

The Remote Panel can be used to:

- Program the charger for battery type and temperature
- Set the charger mode (two or three-stage charging)
- Activate and terminate equalization (not allowed for GEL and AGM)



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- Limit the maximum charger output current (20, 40, 60, 80, and 100% of charger rating) to lower the current drawn from the generator or AC source
- Set the charger to ON or on STANDBY
- Set or cancel an equalization cycle
- Display faults and warnings
- Display basic battery level and settings

Item	Description
1	ON/STANDBY Button <ul style="list-style-type: none">• Press to enable or disable the charger while AC power is connected.• When in Setup Mode: Press to select the Charger Mode: two or three-stage.• To set or cancel an Equalization program: Press and hold both the Status and ON/STANDBY buttons.
2	Charging Output (%) LEDs <ul style="list-style-type: none">• The LEDs illuminate a progress bar displaying the present total output charge current as a percentage of the maximum charge current. The numbers below the LEDs represent the percentage values. See 2a on Figure 1-7 on page 1-15. NOTE: The charger maximum current can be set using the Remote Panel.• An LED may flash intermittently in combination with a solid Fault LED to indicate a fault or with a flashing Fault LED to indicate a warning condition. The icons on the right side of the LEDs represent different types of faults and warnings. See 6a on Figure 1-7 on page 1-15.



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Remote Panel (Sold Separately)

Item	Description
3	Charger Status LEDs Displays the present status of the charger. <ul style="list-style-type: none">• Ready - a solid light indicates that all batteries are fully charged and in rest stage.• Ready and Charging - solid lights indicate that batteries are fully charged and in float stage.• Charging - a solid light indicates that the charger is performing a normal charge cycle.• Equalize - a solid light indicates that the charger is performing an equalization cycle.<ul style="list-style-type: none">- a flashing light indicates that the equalization cycle will begin after the absorption stage is done.
4	Battery Status LEDs Displays the present status of each battery (or each battery bank). Each row represents the battery (or battery bank) number designation—1, 2, or 3. Each column represents Low, Medium, or Full battery capacity. NOTE: This feature is available only on the Remote Panel.
5	Status Button <ul style="list-style-type: none">• Press and hold to enter or exit Setup Mode.• When in Setup Mode: Press to select the Battery Temperature: <u>C</u>old, <u>W</u>arm, or <u>H</u>ot.• When setting or cancelling an Equalization program: Press and hold both the Status and ON/STANDBY buttons.
6	Fault/Warning LED The LED displays a solid light to indicate a fault condition or flashes intermittently in combination with a flashing Charging Output (%) LED to display a warning condition (6a). See Table 1-1, "Fault and Warning Indicators" on page 1-11 for details.
7	Set Max Output Button <ul style="list-style-type: none">• Press to select the desired maximum charging output current. NOTE: This feature is available only on the Remote Panel.• When in Setup Mode: Press to select the Battery Type: AGM, Flooded, GEL, Lead-Calcium/OEM
8	Max. Output (%) LED The LED illuminates a solid light corresponding to the Maximum Charger Output % setting.

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2 Installation

Chapter 2 provides procedures for installing, testing and configuring the Truecharge™ 2 Battery Charger.

It covers the following major topics:

- “Preparing for Installation” on page 2–2.
- “Installing the Truecharge™ 2 Battery Charger” on page 2–12
- “Installing Optional Accessories” on page 2–24
- “Configuring the Truecharge™ 2 Battery Charger” on page 2–26
- “Installing Batteries” on page 2–32

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Installation

Preparing for Installation



WARNING

The battery charger must be properly installed with in accordance with all local and application-specific codes and ordinances before it is used.

The Truecharge™ 2 Battery Charger is designed to be permanently mounted. Figure 2-1 shows a typical installation with three batteries, a battery temperature sensor (BTS) and a remote panel (both optional). It also shows the AC and DC wiring and protection devices required for a typical installation. Means of disconnection must be incorporated into the fixed wiring, in accordance with the electrical code that governs each installation.

NOTE: Not to scale. For illustration purposes only.

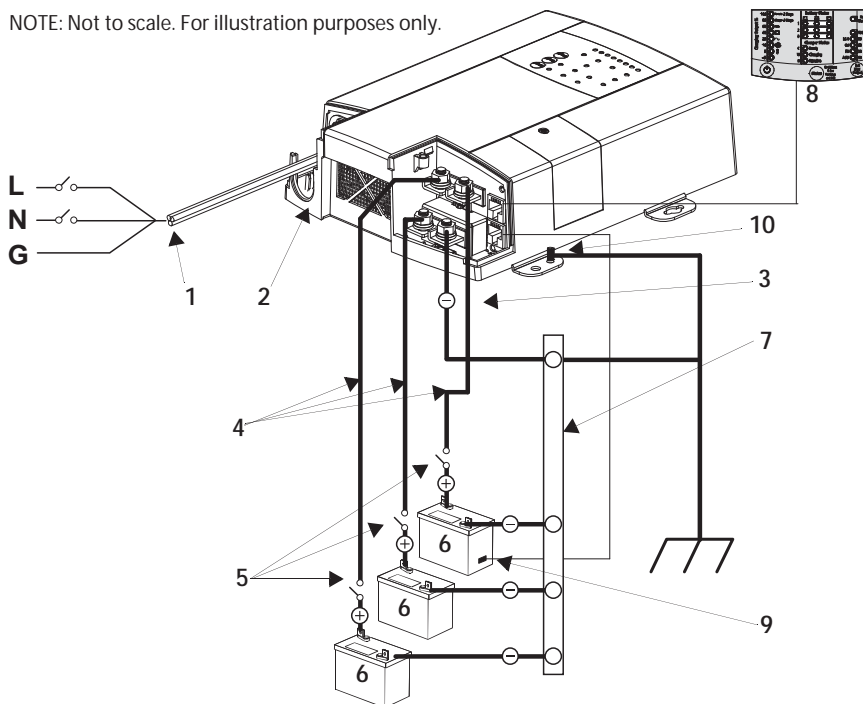


Figure 2-1 Typical Truecharge™ 2 Battery Charger System Installation



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Preparing for Installation

1	AC mains source protected by correct size and type of branch rated circuit breaker
2	AC input wiring compartment
3	DC negative cable
4	DC positive cables
5	DC circuit breakers or DC fused disconnects
6	Battery or battery bank
7	Engine ground bus or DC negative bus
8	Remote panel (optional accessory part number: 808-8040-00)
9	Battery temperature sensor (optional accessory part number: 808-0232-01)
10	DC chassis ground (earth)



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Tools and Materials

To mount and connect the Truecharge™ 2 Battery Charger you need the following tools:

- 10 mm socket wrench and extension for the DC terminals and ground stud
- Phillips screwdriver for removing and re-securing the AC and DC wiring compartment covers
- power drill/screwdriver
- drill bit for pilot holes for mounting screws (if using #6 mounting screws, use 1/16 drill)
- wire stripper
- manufacturer's recommended crimp tool for any crimp terminals that are being used

You need the following materials:

- 3 conductor AC input wiring
Use the information in “Planning AC Wiring” on page 2–15 and your local electrical codes to determine the correct wire and breaker or fuse.
- AC cable strain relief (if the one included is not compliant with your local electrical code requirements)
- appropriately sized DC cables for each battery, with suitable connectors at the battery end
- appropriately sized DC chassis ground (earth) with suitable connectors
- ring terminals to fit 6 mm (1/4 in.) studs at the charger end (Marine grade hardware is recommended).
- DC fused disconnect or properly rated circuit breaker for each battery bank
- mounting screws, M3 or #6 marine grade, corrosion resistant (4 pieces) (Length dependent on mounting surface).



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Preparing for Installation

Location

Install the Truecharge™ 2 Battery Charger in a location that meets the following requirements:

Condition	Requirement
Dry	The Truecharge™ 2 Battery Charger must be installed in a dry location not subject to moisture especially rain, spray, or splashing bilge water.
Clean	The Truecharge™ 2 Battery Charger should not be exposed to metal filings or any other form of contamination.
Cool	The ambient air temperature should be between 0 °C - 50 °C (32 °F - 122 °F) for best performance.
Ventilated	There must be at least 10 cm (4 in.) of clearance on the top and bottom ends of the Truecharge™ 2 Battery Charger for air flow and at least 6 cm (2.5 in.) of clearance on either side (see Figure 2-3). Ventilation openings on the charger must not be obstructed. If the charger is mounted in a tight fitting compartment, the compartment must be ventilated with cut-outs to prevent the charger overheating.
Safe	This battery charger is ignition protected, so it can be installed in areas containing gasoline tanks or fittings which require ignition protected equipment. Xantrex recommends, however, that it is safest not to install electrical equipment in these areas.
Close to batteries	The Truecharge™ 2 Battery Charger should be installed as close as possible to the batteries, but not in the same compartment to prevent corrosion. Avoid excessive cable lengths and use the recommended wire sizes. Xantrex recommends installing with cables sized to achieve less than 3% voltage drop on battery cables under full load. This will maximize the performance of the charger.

When planning to install the Truecharge™ 2 Battery Charger, be sure that you consider the location and orientation carefully. The Truecharge™ 2 Battery Charger is considered to have an IP rating of IP-32, if installed in either of two specific orientations [shown in Figure 2-2 a) and b)]. This



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rating means that it meets European and U.S. standards in preventing dripping water from entering the enclosure, and causing shock hazard and damage to equipment.

The other possible mounting orientations will not prevent the entry of dripping water, and are not suitable for marine, or a moist environment without the installation of additional drip protection. They are only acceptable for use in locations that are always dry [shown in Figure 2-2 c) and d)].

The environment, therefore, will determine the mounting orientations that are suitable for each installation. Is the installation environment one that will always be dry or will moisture or condensation sometimes enter the area?

Important: In marine environments, there is a likelihood that condensation will be present, and may drip on to the charger. Use the appropriate mounting orientations as shown in Figure 2-2.

For marine installations, the mounting orientations a) and b) in Figure 2-2 meet the North American and European marine requirements. Marine products are required to meet drip-proof tests to ensure safety in the presence of condensation.

If you are certain your installation is not subject to moisture, mounting orientations c) and d) in Figure 2-2 may be used.

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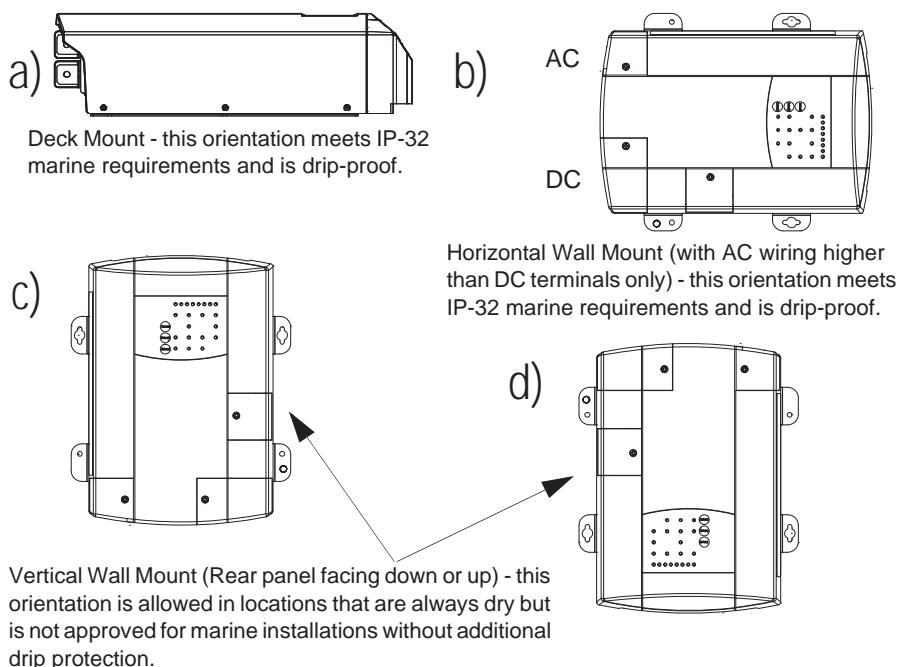


Figure 2-2 Truecharge™ 2 Battery Charger Mounting Orientations

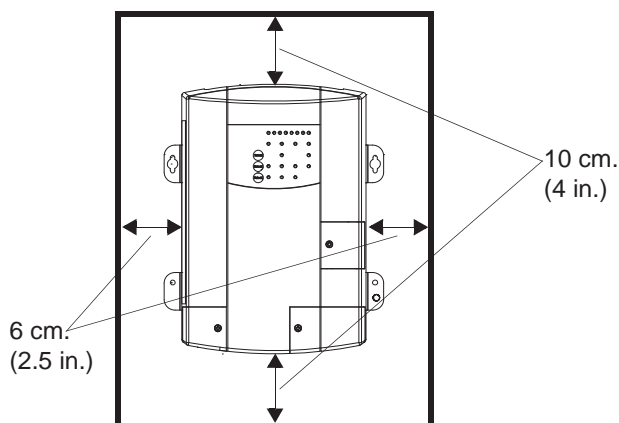


Figure 2-3 Ventilation Clearance



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Wiring Requirements



WARNING: Shock and fire hazard

Wiring and fuse sizes are governed by electrical codes and standards. Different requirements apply in different countries and to different types of installations, for example, boat, home or RV. It is the responsibility of the installer to ensure that each installation complies with all applicable codes and standards.



WARNING: Shock and fire hazard

Ensure that both wires and fuses are correctly sized. Maximum continuous current available from the charger may be an additional 6–10% above the nominal current rating of the charger. Output current may also vary depending on ambient temperature conditions.

DC Wiring

The following two tables show some typical wire sizes, based on 3% voltage drop on DC cables, 75 °C (167 °F) rated wire and wiring being inside the engine compartment – assumed ambient of 50 °C (122 °F).

Table 2-1 DC Wiring Requirements for 12 V chargers

Wire Length (max length one way)		Wire Size (AWG and mm ²)						
feet	meters	TC1012	TC1512	TC2012	TC3012	TC4012	TC5012	TC6012
5	1.5	No. 14 2 mm ²	No. 12 3.3 mm ²	No. 10 5.3 mm ²	No. 10 5.3 mm ²	No. 8 8.4 mm ²	No. 6 13.3 mm ²	No. 6 13.3 mm ²
7.5	2.25	No. 12 3.3 mm ²	No. 10 5.3 mm ²	No. 10 5.3 mm ²	No. 8 8.4 mm ²	No. 6 13.3 mm ²	No. 6 13.3 mm ²	No. 4 21.2 mm ²
20	6	No. 8 8.4 mm ²	No. 6 13.3 mm ²	No. 6 13.3 mm ²	No. 4 21.2 mm ²	No. 2 33.6 mm ²	No. 2 33.6 mm ²	No. 1 42.4 mm ²



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Table 2-2 DC Wiring Requirements for 24 V chargers

Wire Length (max length one way)		Wire Size (AWG and mm ²)			
feet	meters	TC1524	TC2024	TC3024	TC5024
5	1.5	No. 16 1.3 mm ²	No. 14 2 mm ²	No. 12 3.3 mm ²	No. 10 5.3 mm ²
7.5	2.25	No. 14 2 mm ²	No. 12 3.3 mm ²	No. 10 5.3 mm ²	No. 8 8.4 mm ²
20	6	No. 10 5.3 mm ²	No. 8 8.4 mm ²	No. 6 13.3 mm ²	No. 4 21.2 mm ²

Over-current protection disconnect

Electrical codes require the DC circuit from each battery to the charger to be equipped with a disconnect and an over-current protection device, usually within 7 inches (17.8 cm) of each battery¹. The devices are usually DC-rated circuit breakers, fused disconnects, or a separate fuse and disconnect for each circuit. These devices must be rated for DC voltage and current and be rated to withstand the short circuit rating of each battery. Do not substitute devices rated only for AC voltage; they may not operate properly.

The current rating of the DC fuses must be correctly matched to the size of the DC wiring used, in accordance with the applicable codes. This helps to protect the installation against fire in case of any overcurrent or short circuit fault.

The DC chassis ground (earth) should also be sized correctly to provide ground fault protection (see Table 2-1). Refer to the local electrical codes for your specific installation to determine the correct gauge and length.

1. Recommended by the American Boating and Yachting Council.



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AC Wiring



WARNING: Risk of fire

Use only on circuits provided with 20A maximum branch circuit protection in accordance with National Electrical Code, NFPA 70.

The AC wiring must meet be of sufficient size, and it must be protected by the appropriate size and type of input breaker, based on the jurisdiction and application. Some basic examples are given below.

The AC input wiring for the Truecharge™ 2 Battery Charger should be three-conductor cable, providing a line, neutral, and ground conductor (or L, N, GND) in an outer jacket, rated a minimum of 75C.

For example, in North America for 120 Vac application, you may use a 14 AWG wire with a 15 A breaker (or 12 AWG for a 20 A breaker) or for 230 Vac application, you may be able to use either a 2.5mm² wire with a 16 A, double pole breaker or fuses or use 1.5 mm² wire with a 10 A, double pole breaker or fuses. Note that every jurisdiction will have different requirements as will each application, so research the regulations for your local jurisdiction to determine which wire size and type is correct. Another example:

- for marine applications, the United States American Yachting and Boating Council (ABYC) requires stranded wire, which is more robust than solid wire when exposed to vibration
- for RV applications, the United States National Electrical Code (NEC) allows solid wire in multi-conductor cable, however, stranded wire is also acceptable which will withstand vibration better.

The circuit supplying the Truecharge™ 2 Battery Charger must be protected by the correct size and type of breaker to meet the code for your local jurisdiction and application. If a branch rated fuse is used, a correctly rated disconnect switch is required ahead of the fuse so that power can be turned off, allowing safe repair, or replacement of products on the mains circuit.



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Preparing for Installation

Battery Bank Size Requirements

The Truecharge™ 2 Battery Charger is designed to work with a minimum battery bank size. Each bank should meet the minimum Ah rating shown in Table 2-3.

Note: If the battery manufacturer has specified the maximum charge current, please follow their recommendation.

Table 2-3 Minimum Battery Bank Size

12 V Models	Minimum Battery Bank Size (Ah)
TC1012	30
TC1512	30
TC2012	80
TC3012	80
TC4012	80
TC5012	100
TC6012	100
24 V Models	Minimum Battery Bank Size (Ah)
TC1524	30
TC2024	50
TC3024	60
TC5024	100



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Installing the Truecharge™ 2 Battery Charger



WARNING: Shock and Energy Hazards

Be sure to read the safety guidelines and pay attention to all cautions and warnings throughout the installation procedure. The installer is responsible for ensuring compliance with the installation codes for your particular application.
Disconnect all sources of AC and DC power before proceeding.

Installation Sequence

To make charger installation quick and easy, Xantrex recommends that the installation tasks be performed in the following sequence:

1. Select charger mounting position and plan AC and DC cable routing.
2. Plan DC cable runs and install fuses or breakers (page 2–13).
3. Plan the AC connections at the charger (page 2–15).
4. Mount the charger in position (page 2–18).
5. Make the final DC (see page 2–19) and then AC cable connections (including earth grounds) (page 2–19).
6. Apply DC to the charge by closing the DC breakers or disconnects (page 2–23).
7. Apply mains AC to the charger by closing the AC input breaker.



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Installing the Truecharge™ 2 Battery Charger

Planning DC Wiring

The procedure for installing the DC wiring applies to a single battery, as well as multiple batteries or battery banks.



WARNING: Fire or burn hazard

To help prevent accidental shorts or sparks, leave the DC disconnects or breakers in the Off position or DC fuses removed from their fuse holders until installation is complete.



WARNING: Fire or burn hazard

The rubber boots must be installed over the Truecharge™ 2 Battery Charger DC terminals to provide drip protection, and protect against short circuits between output terminals. See “To install rubber boots:” on page 2–20.

1. Identify the battery or bank that most frequently becomes deeply discharged. This bank will often be a deep cycle battery referred to as the House Bank on a boat, as opposed to an engine Start Battery. This high priority bank should be connected to bank 1 on the Truecharge™ 2 Battery Charger, which is the default bank.
2. Plan the route that the DC wires will follow, keeping it as short as possible. Measure and cut the required wire length, after allowing some extra length for connections and to provide slack in the wires for strain relief.
3. Identify the positive wires, by using color-coded wire, or by marking both ends of the wire with colored tape, or similar kind of marking. Repeat with a different color for the negative. Most installation codes recommend coloring the positive red and the negative black.

Important: You may find it helpful to label each cable, associating it with the battery bank it is connected to. For example, bank 1 (–), bank 1 (+), bank 2 (–).



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4. Install a DC circuit breaker or fused disconnect in each positive cable within 7 inches (17.8 cm) of each battery. Consult your local electrical codes regarding the distance between the battery and the disconnect device. Be sure the breaker or fused disconnect is open.
5. Route the wiring to the batteries and to the Truecharge™ 2 Battery Charger. Avoid routing wiring through an electrical distribution panel, battery isolator, or other device that will add voltage drops.
6. Install crimp lugs on each end of the DC battery cables using the crimp manufacturer's instructions and tool.
7. Install the provided rubber boots over the charger end of the DC cables. Install rubber boots over the Truecharge™ 2 Battery Charger DC terminals to provide drip and added corrosion protection. Follow the procedure on page 2-24 to install rubber boots.
8. Route the optional battery temperature sensor (BTS) from the battery (one which is located in the warmest ambient temperature) to the charger location.
9. Proceed to "Planning AC Wiring".



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Installing the Truecharge™ 2 Battery Charger

Planning AC Wiring

Before connecting AC wiring, make sure the AC source circuit is protected by a breaker switch of the correct size and type, to comply with the electrical code for your location and application. The current rating of the input breaker should not be larger than 20A.

1. Disconnect the AC source by turning off the breaker feeding the circuit, unplugging from shorepower and disconnecting any other power sources (such as a generator).
2. Plan the route that the AC wiring will follow from the source (usually an AC distribution panel) to the Truecharge™ 2 Battery Charger. Measure and cut the required length of three-conductor cable allowing some extra length for connections and providing some slack. For example, in North America for 120 Vac application, you may use a 14 AWG wire with a 15 A breaker (or 12 AWG for a 20 A breaker) or for 230 Vac application, you may be able to use either a 2.5mm² wire with a 16 A, double pole breaker or fuses or use 1.5 mm² wire with a 10 A, double pole breaker or fuses. Note that every jurisdiction will have different requirements as will each application, so research the regulations for your local jurisdiction to determine which wire size and type is correct.
3. Make the AC connections to the charger when it is sitting on a table or other convenient work surface. Route the AC cables to the source after the charger is securely mounted in position, using all four mounting holes.
4. Unscrew the wiring compartment cover from the left rear of the Truecharge™ 2 Battery Charger to expose the AC wiring access hole.
5. Carefully remove 50 – 75 mm (2 – 3 in.) of the outer jacket from the source panel wiring, being careful not to cut or nick the insulation on the individual conductors.

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6. Remove the AC (L, N, GND) wires from the AC wiring compartment of the charger.
7. Feed the source AC wire through the included strain relief. Position approximately 1" from end of jacketed portion of the AC wiring.
8. Connect the AC wiring to the Truecharge™ 2 Battery Charger pigtail wires, being sure to connect the line conductor to the line, the neutral to the neutral, and the ground to the ground. The pigtail wires are color coded as follows:

Conductor	Color code
Line	Black or brown
Neutral	White or blue
Ground	Green with yellow stripe

Make the connections using crimp-on connectors or with other approved connectors required by your code, and suitable for your installation. For example, the ABYC Standards and Recommended Practices for Small Craft prohibit twist-on connectors for AC connections on a boat. For other types of installation, refer to your applicable code.

For marine installations, follow the connector manufacturer's procedure for installing butt splice connectors.



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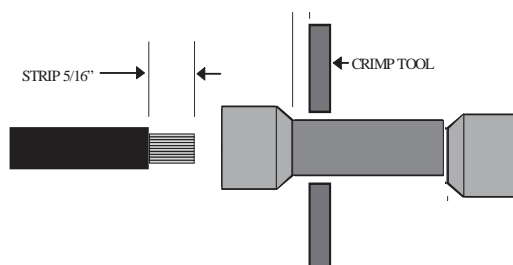
XANTREX - TRUECHARGE 2 - BATTERIES' CHARGER

Installing the Truecharge™ 2 Battery Charger

To connect AC wires with the crimp-on butt-splice connector:

Important: You must exercise care when crimping butt-splice connectors. Use the crimp tool recommended by the manufacturer for the connector used.

- a) Using a wire stripper, carefully strip 8 mm (5/16 in.) from the ends of the two wires being connected.
- b) Insert one wire into one end of the butt-splice, until the insulation hits the internal metal crimp section, insert the butt-splice into the crimping tool, and crimp firmly. The proper location for the crimp is approximately 1.6 mm (1/16 in.) past where the butt-splice insulation tapers down as shown.



- c) Repeat Step b for the other end of the butt-splice.
9. Slide the strain relief into the bottom half of the strain relief retention hole in the charger.
10. When all connections are completed, push the wiring and connectors inside the AC wiring compartment. Install the wiring compartment cover and tighten the screw on top to secure the cover. Do not over-tighten.
11. Proceed to “Mounting the Optional Remote Panel” on page 2–24, if you have the optional remote panel otherwise, proceed to “Mounting the Truecharge™ 2 Battery Charger” on page 2–18.



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Mounting the Truecharge™ 2 Battery Charger

Mount the Truecharge™ 2 Battery Charger using all four mounting slots and holes which are provided. For marine only installations, the mounting orientations a) and b) in Figure 2-2 meet the North American and European marine requirements. Marine products are required to meet drip-proof tests to ensure safety in the presence of condensation. The other possible mounting orientations c) and d) also shown in Figure 2-2 will not prevent the entry of dripping water, and are not suitable for marine, or a moist environment without the installation of additional drip protection. They are only acceptable for use in locations that are always dry.

Important: Be sure to measure your AC and DC cables and plan the routing of the cables before drilling the pilot holes for mounting the Truecharge™ 2 Battery Charger.

To mount the Truecharge™ 2 Battery Charger:

1. Keep the carton and packing material in case you need to return the Truecharge™ 2 Battery Charger for servicing.
2. Ensure that you have selected a mounting surface that is clear, flat and allows for a minimum of 10 cm (4 in.) of clearance on the top and bottom ends for air flow and at least 6 cm (2.5 in.) of clearance on either sides (see Figure 2-3, "Ventilation Clearance" on page 2-7)
3. Drill the four pilot holes for the mounting screws, taking care that there is nothing behind the surface that can be damaged by the drill.
4. Mount the Truecharge™ 2 Battery Charger using corrosion resistant, #6 (3 mm) round, pan head (or similar) screws.

The top two keyhole-style mounting holes can be used to hold the Truecharge™ 2 Battery Charger in place while fastening the bottom two screws. For secure, permanent mounting, use the holes in all four mounting flanges and fasten all four screws. The keyhole slots should not be used solely for the installation of the charger.

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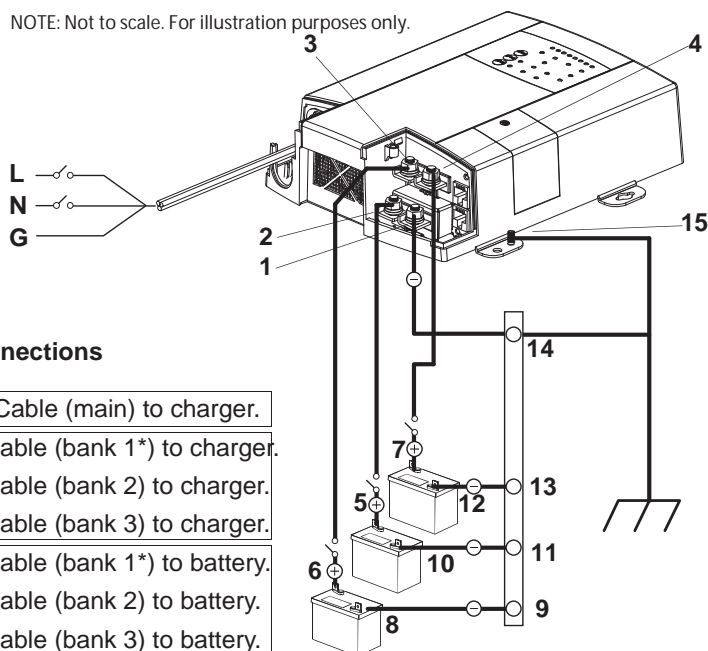
XANTREX - TRUECHARGE 2 - BATTERIES' CHARGER

Installing the Truecharge™ 2 Battery Charger

Make the Final Connections

After planning the DC and AC connections and mounting the charger, the last procedures, including installing the DC terminal rubber boots for drip protection, will finalize the wiring connections.

NOTE: Not to scale. For illustration purposes only.



DC connections

1. Negative Cable (main) to charger.
2. Positive Cable (bank 1*) to charger.
3. Positive Cable (bank 2) to charger.
4. Positive Cable (bank 3) to charger.
5. Positive Cable (bank 1*) to battery.
6. Positive Cable (bank 2) to battery.
7. Positive Cable (bank 3) to battery.
8. Negative Cable (A) to battery terminal (bank 1*).
9. Negative Cable (A) to DC negative bus (bank 1*).
10. Negative Cable (B) to battery terminal (bank 2).
11. Negative Cable (B) to DC negative bus (bank 2).
12. Negative Cable (C) to battery terminal (bank 3).
13. Negative Cable (C) to DC negative bus (bank 3).
14. Negative Cable (main) to negative bus bar.
15. Ground Cable to DC ground stud.

* see Important note below.

Important: When installing only a single bank (or one battery) for Truecharge™ 2 Battery Chargers that have multiple outputs, positive bank 1 must be utilized. Bypassing bank 1 and using any of the other banks (bank 2 or bank 3) may render the charger to function improperly.

Figure 2-4 Final DC Wiring Connection Order

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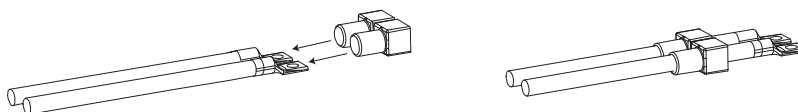
Installation

Installing the Drip Protection Rubber Boots

Xantrex recommends that you install the supplied rubber boots over the Truecharge™ 2 Battery Charger DC terminals to provide drip and short circuit protection.

To install rubber boots:

1. Before making the DC connections to the charger, feed the rubber boot over the charger end of the DC cables.



2. Perform all other DC connections as described in “Planning DC Wiring” on page 2–13.
3. After the DC cables are connected to the charger, slide the boot up the cables and over the DC terminals. If you are only using one battery, slide the spare boots over the unused DC terminals.

The Truecharge™ 2 Battery Charger is provided with drip protection rubber boots for the DC terminals.

Final DC Connections



WARNING: Fire and burn hazard

Make sure that the DC fuse and circuit breaker are open.

To make the final DC connections (see Figure 2-4 on page 2–19):

1. Connect the negative cable from the negative terminal on the battery (if you are using only one battery or bank), or the negative ground bar or bus (if you are using more than one battery or bank), to the negative DC terminal on



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Installing the Truecharge™ 2 Battery Charger

the Truecharge™ 2 Battery Charger (Figure 2-4, item 1). Use a flat washer, a lock washer and a nut (5 included in the installation kit) to secure the connection.

Tighten the nuts to 2.3 N-m (20 lb-in.) torque and test that the wire is secure. Do not over-tighten as this may result in damage to the charger.

2. Connect each positive cable to the correct positive DC terminal on the Truecharge™ 2 Battery Charger (Figure 2-4, items 2 to 4). Use a flat washer, a lock washer and a nut (5 included in the installation kit) to secure the connection.

Tighten the nuts to 2.3 N-m (20 lb-in.) torque and test that the wire is secure.

3. Connect the free end of each positive cable to the correct positive terminal of the battery (Figure 2-4, items 5 to 7), using sufficient torque as recommended by your battery manufacturer.
4. Connect the free end of the negative cable to the negative terminal on the battery (Figure 2-4, items 8, 10, and 12), using sufficient torque as recommended by your battery manufacturer.

NOTE: If you are using more than one battery, you will need to connect the negative cable from each of the batteries to the negative ground bar or bus (Figure 2-4, items 9, 11, and 13). The negative ground bar or bus will then have a single negative cable connecting to the negative charger terminal (Figure 2-4, item 14).



CAUTION: Reverse polarity damage

Before proceeding, carefully check the wiring polarity – make sure the positive terminals of the Truecharge™ 2 Battery Charger are connected to the correct terminals of the battery (fuses or breakers) and from there to the positive terminals of the battery. Make sure the negative terminal of the Truecharge™ 2 Battery Charger is connected to the battery negative terminal (or DC negative bus). Do not reverse the connections.



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5. Install the DC chassis ground (earth) from the ground stud on the Truecharge™ 2 Battery Charger to the engine bus or DC ground bus (Figure 2-4, item 15). Use a flat washer, a lock washer and a nut (included in the installation kit) to secure the connection.

Tighten the nuts to 2.3 N-m (20 lb-in.) torque and test that the wire is secure. Do not over-tighten as this may result in damage to the charger.

6. Connect any optional accessories. See “Installing Optional Accessories” on page 2–24.
7. Secure cables in place using tie-wraps, P-clamps or cable straps according to electrical codes. Coil and tie any BTS or remote panel extension cable.
8. The DC breakers may be closed at this time.

Final AC Connections

To make the final AC connections:

1. Complete the installation by routing the AC cable to the AC source.
2. Connect the AC cable to the AC disconnect breaker and ground in accordance with the color codes on page 2–16.
3. Secure cables in place using tie-wraps, P-clamps or cable straps according to electrical codes.
4. The AC mains may be applied at this time by closing the breaker.



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Installing the Truecharge™ 2 Battery Charger

Grounding Instructions



WARNING: Electric shock hazard

Have an electrician install a properly grounded circuit if one is not available. Improper connection can result in risk of an electric shock.

The Truecharge™ 2 Battery Charger Battery Charger must be connected to a grounded, metal permanent wiring system, or an equipment-grounding conductor should be run with the circuit conductors and connected to equipment-grounding lead on the charger. Connections to the battery charger should comply with all local and application-specific codes and ordinances.

Xantrex recommends that you install a DC chassis ground (earth) from the ground stud on the Truecharge™ 2 Battery Charger to the engine bus or DC ground bus. The DC chassis ground (earth) should be sized correctly with the power conductors, and both must be sized for the battery fuses that are used to protect the DC wiring. Refer to your local electrical codes to verify the requirements in your jurisdiction for your application.

Powering Up

Make one last check that all connections and connectors are secure.

The Truecharge™ 2 Battery Charger charger may now be powered up. Switch the AC power on at the source breaker. It is normal to see a 7-10 second delay while the charger powers up. During this time, the indicator LEDs on the onboard display and the remote panel will illuminate for a second (power on test) before reporting charging and battery status information.

Note: The indicator LEDs will also illuminate when DC power is applied and battery bank 1 voltage is above 9V.



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Installation

Installing Optional Accessories

Optional accessories are available for purchase at Xantrex.
Call Customer Service to order the accessories below:

- Remote Panel (Part number: 808-8040-00)
- Battery Temperature Sensor (Part number: 808-0232-01)

Mounting the Optional Remote Panel

To mount the remote panel:

1. Choose a location for the remote panel that is within 15 m (50 ft.) from the charger. Use only the four-conductor communications cable (RJ-11) that came with the remote panel.
2. Use the enclosed mounting template to predrill mounting holes.
Take care that there is nothing behind the surface for you to damage such as other cables or pipes.
3. Connect the RJ-11 connector to the remote panel and route it to the charger. Be careful not to damage the connector locking tab when routing the cable. You can use some tape to protect the locking tab from catching on something and breaking off when routing the cable.
4. Once the Truecharge™ 2 Battery Charger is mounted, plug the other RJ-11 connector into the Remote port on the rear panel of the Truecharge™ 2 Battery Charger.



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Installing Optional Accessories

Installing the Optional Battery Temperature Sensor (BTS)

Xantrex strongly recommends that you install the optional Battery Temperature Sensor (BTS) to protect your battery and improve charging accuracy. If no BTS is connected, the charger defaults to the charging temperature settings (Cold, Warm, or Hot). It is important to set this before the BTS is installed to ensure that even when the BTS connection is subsequently lost due to a BTS malfunction or a severed or loose wire connection, an approximate representation of the battery temperature is passed on to the charger.

To install a BTS:

1. Switch off all devices operating from the battery.
2. Connect the ring terminal on the sensor directly on to the negative battery stud, or affix the double-sided adhesive backing to the sensor back and attach the sensor to the side of the battery to be monitored.

NOTE: If there are multiple batteries, attach the BTS to the battery that is located in the warmest ambient temperature.

3. Route the sensor cable to the charger and plug it to the BTS port on the rear panel.

Important: To minimize noise interference, the remote and BTS cables should be routed away from the AC mains line and DC battery cables.

Also, if the BTS is unplugged after a battery overtemperature fault, the charger will stop charging. Use the onboard display to set the appropriate temperature setting to restart charging.



CAUTION: Battery damage

In the absence of a BTS, setting a battery temperature that is lower than the actual temperature will cause the battery to be overcharged and may damage or reduce the life of the battery or cause a hazard. Setting the temperature higher than the actual temperature will result in under-charging the battery.



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Configuring the Truecharge™ 2 Battery Charger

Once the charger is connected to a battery on bank 1 or to AC, it is live and it may be configured. The indicator LEDs on the onboard display will illuminate for a second (power on test) before reporting charging and battery status information.

When the remote panel is connected, there will be a short delay of about 1three seconds before reporting charging and battery status information. The remote panel will use this time to query the charger for the current operating conditions.

If AC was already applied, ensure that the charger is ON by pressing ON/STANDBY if necessary.



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Configuring the Truecharge™ 2 Battery Charger

Configuring the Charger Mode

Using the Onboard Display Panel

To configure the charger mode:

Note: By default, the Charger Mode is set to three-stage.

1. Press and hold the Charger Mode Select button for three seconds.
2. Select the proper charger mode.
The LEDs will indicate which of the two modes is being selected: three-stage (default) or two-stage.

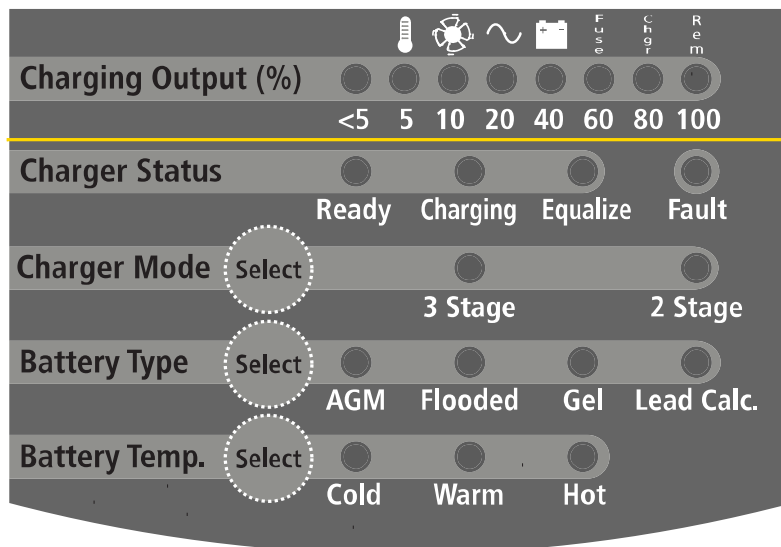


Figure 2-5 Onboard Display Panel

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Installation

Using the Remote Panel

To configure the charger mode:

Note: By default, the Charger Mode is set to three-stage.

1. Press and hold the Status button for three seconds to enter the Setup mode.
Entering the Setup mode will enable you to select the charger mode.
2. Press ON/STANDBY button to select the desired charger mode.
The LEDs will indicate which of the two types is being selected: three-stage (default) or two-stage.
3. Press and hold the Status button for three seconds to exit the Setup mode.

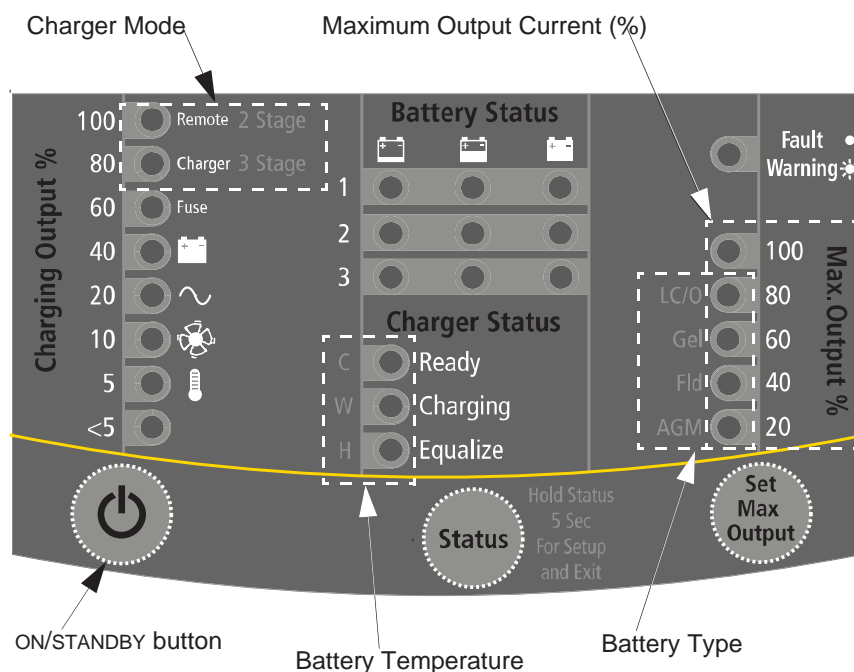


Figure 2-6 Remote Panel



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Configuring the Truecharge™ 2 Battery Charger

Configuring the Battery Bank Type

Using the Onboard Display Panel

To configure the battery bank type:

Note: By default, the battery type is set to Flooded.

1. Press and hold the Battery Type Select button for three seconds.
2. Select the proper battery type.
The LEDs will indicate which of the four types is being selected: Flooded (default), GEL, Lead Calc., AGM.
However, if a custom battery type has been programmed by the OEM, all four LEDs will light up to indicate a fifth type.

Using the Remote Panel

To configure the battery bank type:

Note: By default, the battery type is set to Flooded.

1. Press and hold the Status button for three seconds to enter the Setup mode.
Entering the Setup mode will enable you to select the battery type.
2. Press Set Max Output button to select the proper battery type.
The LEDs will indicate which of the four types is being selected: Flooded (default), GEL, Lead Calc., or AGM.
However, if a custom battery type has been programmed by the OEM, all four LEDs will light up to indicate a fifth type.
3. Press and hold the Status button for three seconds to exit the Setup mode.



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Configuring the Battery Temperature without the BTS

Using the Onboard Display Panel

To configure the battery temperature:

Note: By default, the Battery Temp. is set to Warm.

1. Press and hold the Battery Temperature Select button for three seconds.
2. Select the appropriate battery temperature setting.
The LEDs will indicate which of the three types is being selected: Warm, Hot, or Cold.

Note: Cold is for battery temperature below 5 °C (41 °F). Warm is for battery temperature between 5 and 30 °C (41 and 86 °F); default setting. Hot is for battery temperature above 30 °C (86 °F). See “Battery Temperature Compensation Levels” on page 2–31 to see how output voltage is offset by varying the temperature selection.

Using the Remote Panel

To configure the battery temperature:

Note: By default, the Battery Temp. is set to Warm.

1. Press and hold the Status button for three seconds to enter the Setup mode.
Entering the Setup mode will enable you to select the battery temperature setting.
2. Press Status button to select the appropriate battery temperature setting.
The LEDs will indicate which of the three types is being selected: W(arm), H(ot), or C(old).
3. Press and hold the Status button for three seconds to exit the Setup mode.



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Configuring the Truecharge™ 2 Battery Charger

Table 2-4 Battery Temperature Compensation Levels

Temperature Selection	Recommended for battery temperature of:	Voltage added for temperature compensation offset from 25 °C	
Cold	below 5 °C (41 °F)	Flooded/PbCa/Gel	0.675
		AGM	0.525
Warm	between 5 and 30 °C (41 and 86 °F)	Flooded/PbCa/Gel	0
		AGM	0
Hot	above 30 °C (86 °F)	Flooded/PbCa/Gel	-0.27
		AGM	-0.21

Configuring the Maximum Output Current Percentage

Using only the Remote Panel

To configure the maximum output current:

Note: By default, the Max. Output % is set to 100.

Press the Set Max Output button to select the appropriate maximum output setting.

The LEDs will indicate which of the five values is being selected: 100, 80, 60, 40, or 20.



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Installing Batteries

Replacing old or defective batteries (even installing new batteries) require that you disconnect all AC and DC sources prior to installation.



WARNING

Battery installation should always be treated like a brand new installation. This means, that all safety and precautionary guidelines that were followed prior and during the installation of the charger, must again be followed in order to avoid risks of electrical shock, injury, or death.

To replace an old battery:

1. Turn off the AC source by disconnecting the AC line.
2. Switch off all devices operating from currently installed batteries.
3. Disconnect the battery cables from the old battery.
NOTE: Disconnect the negative cable first, then the positive cable. Inspect all AC and DC cables for damage and repair, if necessary.
4. Replace the old battery with the new battery.
5. Reconnect the battery cables to the new battery.
NOTE: Reconnect the positive cable first, then the negative cable.

Important: If the new battery is different from the old one in chemistry, temperature, or size, remember to re-configure the battery settings accordingly.



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A Specifications

Appendix A contains physical, electrical performance, and regulatory approval specifications for the Truecharge™ 2 Battery Charger.

Note: Specifications are subject to change without notice.

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Specifications

Physical Specifications

Base Unit Dimensions: L × W × H	TC1012, TC1512: 200 × 170 × 70mm (7.87 × 6.70 × 2.76 in.) TC2012, TC3012, TC4012: 250 × 170 × 70mm (9.84 × 6.70 × 2.76 in.) TC5012, TC6012: 350 × 170 × 70mm (13.78 × 6.70 × 2.76 in.) TC1524, TC2024: 250 × 170 × 70mm (9.84 × 6.70 × 2.76 in.) TC3024, TC5024: 300 × 210 × 125mm (11.81 × 8.27 × 4.92 in.)
Weight	TC1012, TC1512: 2.0 kg (4.4 lbs) TC2012, TC3012, TC4012: 2.2 kg (4.8 lbs) TC5012, TC6012: 4.5 kg (9.9 lbs) TC1524, TC2024: 2.2 kg (4.8 lbs) TC3024, TC5024: 5.0 kg (11.0 lbs)
AC input connections	Two color-coded No. 14 AWG wires (L, N) and one No. 14 AWG (G) minimum 152 mm (6 in.) long in a separate AC wiring enclosure with 21.3 mm (0.84 in.) hole provision for connection of a ½ inch North American "trade size" cable clamp (included).
DC output connections	TC1012: Two M6 studs (1 positive and 1 common negative) for battery cable ring terminals and one M6 mm DC equipment ground TC1512: Three M6 studs (2 positives and 1 common negative) for battery cable ring terminals and one M6 mm DC equipment ground TC2012, TC3012, TC4012, TC5012, TC6012, TC1524, TC2024, TC3024, TC5024: Four M6 studs (3 positives and 1 common negative) for battery cable ring terminals and one M6 mm DC equipment ground



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Electrical Specifications

Electrical Specifications

Number of isolated battery bank outputs	TC1012: 1 output TC1512: 2 separated outputs TC2012, TC3012, TC4012, TC5012, TC6012, TC1524, TC2024, TC3024, TC5024: 3 separated outputs	
Nominal battery voltage	12 V units: 12 Vdc 24 V units: 24 Vdc	
Normal operating output range	12 V units: 0 – 16 Vdc 24 V units: 0 – 32 Vdc	
Nominal operating AC input voltage	110 – 250 Vac	
Maximum DC output current (total)	TC1012: 10 ±10% A TC1512: 15 ±10% A TC2012: 20 ±10% A TC3012: 30 ±10% A TC4012: 40 ±10% A TC5012: 50 ±10% A TC6012: 60 ±10% A TC1524: 15 ±10% A TC2024: 20 ±10% A TC3024: 30 ±10% A TC5024: 50 ±10% A	
Absorption voltage: ±0.1 V for 12 V units ±0.2 V for 24 V units	12 V units 25 °C (77 °F)	24 V units 25 °C (77 °F)
	Flooded	28.8
	GEL	28.4
	AGM	28.6
	Lead-calcium	31.0



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Float voltage: ±0.1 V for 12 V units ±0.2 V for 24 V units	12 V units 25 °C (77 °F)	24 V units 25 °C (77 °F)
	Flooded 13.5	27.0
	GEL 13.8	27.6
	AGM 13.4	26.8
	Lead-calcium 13.5	27.0
Equalize mode current	50% rated output ±6%	
Equalize mode— maximum output voltage	12 V units: 16 ±0.1 Vdc 24 V units: 32 ±0.2 Vdc	
Off-state current draw (without remote installed)	12 V units: <30 mA 24 V units: <20 mA	



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AC Input Specifications

AC Input Specifications

AC input voltage range	Nominal: 120 Vac, 230 Vac, 240 Vac Full Performance: 105 – 265 Vac \pm 4 Vac Automatic derating to 80%: 90 – 104 \pm 4 Vac	
Maximum AC input current	at 104 Vac	at 208 Vac
	TC1012: 2.5 A	TC1012: 1.5 A
	TC1512: 3.5 A	TC1512: 2.0 A
	TC2012: 4.5 A	TC2012: 2.5 A
	TC3012: 7.0 A	TC3012: 3.5 A
	TC4012: 9.0 A	TC4012: 4.5 A
	TC5012: 11.5 A	TC5012: 5.5 A
	TC6012: 13.5 A	TC6012: 6.5 A
	TC1524: 7.0 A	TC1524: 3.5 A
	TC2024: 9.0 A	TC2024: 4.5 A
	TC3024: 13.5 A	TC3024: 7.0 A
	TC5024: 22.5 A	TC5024: 11.5 A
Power factor at rated load	≥ 0.95	
Frequency	47 – 63 Hz	
Efficiency – peak	12 V units: 77% @ 120 Vac, 80% @ 230 Vac 24 V units: 85% @ 120 Vac, 87% @ 230 Vac	
Surge protection	Line-to-neutral surge protector rated at 275 Vac	



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Specifications

DC Output Specifications

DC output voltage range including dead battery charging voltage	12 V units: 0 – 15.5 Vdc 24 V units: 0 – 31 Vdc
Maximum equalization voltage (no BTS installed)	12 V units: 16 Vdc 24 V units: 32 Vdc
Voltage accuracy (no load)	12 V units: ± 0.1 Vdc at 14.4 Vdc @ 25 °C (77 °F) 24 V units: ± 0.2 Vdc at 28.8 Vdc @ 25 °C (77 °F)
Voltage regulation	Uncompensated load voltage regulation < 0.1Vdc drop from 0 Amps to rated current output at charger output terminals (adds in series with recommended 3% limit for user's battery cable voltage drop).

Temperature Specifications

Nominal ambient	25 °C (77 °F)
Operating range (full performance)	-20 – 50 °C (-4 – 122 °F)
Current de-rating (above 50 °C ambient temperature)	upto 80% derating I _{max} (50 – 65 °C) (122 – 149 °F)
Storage	-40 to 80 °C (-40 to 176 °F)
Humidity	5 – 95%, RH non-condensing



TECHNICAL MANUAL

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• PART 14 : OEM LITERATURE

XANTREX - TRUECHARGE 2 - BATTERIES' CHARGER

Protection Features

Protection Features

Battery reverse polarity	Protected by a replaceable DC output fuse
Over-voltage limits	The Truecharge™ 2 Battery Charger will stop charging any bank if the output voltage is above 16.6 ± 0.5 Vdc.
Output current limit	TC1012: 10 $\pm 10\%$ A (up to 15.5 V) TC1512: 15 $\pm 10\%$ A (up to 15.5 V) TC2012: 20 $\pm 10\%$ A (up to 15.5 V) TC3012: 30 $\pm 10\%$ A (up to 15.5 V) TC4012: 40 $\pm 10\%$ A (up to 15.5 V) TC5012: 50 $\pm 10\%$ A (up to 15.5 V) TC6012: 60 $\pm 10\%$ A (up to 15.5 V) TC1524: 15 $\pm 10\%$ A (up to 31 V) TC2024: 20 $\pm 10\%$ A (up to 31 V) TC3024: 30 $\pm 10\%$ A (up to 31 V) TC5024: 50 $\pm 10\%$ A (up to 31 V)
Over-temperature	Internal charger temperature is measured. Charger shuts down and restarts as follows: <ul style="list-style-type: none">• Shutdown at 70 °C (158 °F)• Restart at 65 °C (149 °F)
Current derating in ambient temperatures	Rated current to 50 °C (122 °F) derating to 80% I _{max} above 50 °C (122 °F)
Battery over-temperature protection	Battery temperature, as sensed by the battery temperature sensor (if installed), results in the charger no longer charging the individual battery or bank at a battery temperature of 70 °C (158 °F).



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XANTREX - TRUECHARGE 2 - BATTERIES' CHARGER

Specifications

Approvals

Safety	NRTL approved to CSA E60335-2-29 and UL1236, including the marine supplement, ignition protection, and UL1564 CE marked, complying with Low Voltage Directive 2006-95-EC, complying with EN60335-2-29 Battery Chargers, including Australian deviations ISO 8846: Ignition Protection for Small Craft ABYC E11 - Alternating Current and Direct Current Electrical Systems on Boats ABYC A31 - Battery Chargers and Inverters NFPA70/2008 US NEC for home and RV installation requirements
EMC	FCC Class B CE marked, meeting EMC Directive 2004-108-EC
Other	KKK-A-1822 Rev F - Federal Specification for the Star-of-Life Ambulance



TECHNICAL MANUAL MX151D - GM



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XANTREX - TRUECHARGE 2 - BATTERIES' CHARGER



TECHNICAL MANUAL MX151D - GM



- PART 14 : OEM LITERATURE

XANTREX - TRUECHARGE 2 - BATTERIES' CHARGER

<p>Xantrex Technology Inc.</p> <p>1 800 670 0707 Tel toll free NA 1 408 987 6030 Tel direct</p> <p>1 800 994 7828 Fax toll free NA</p> <p>customerservice@xantrex.com www.xantrex.com</p>	
975-0402-01-01	Printed in China

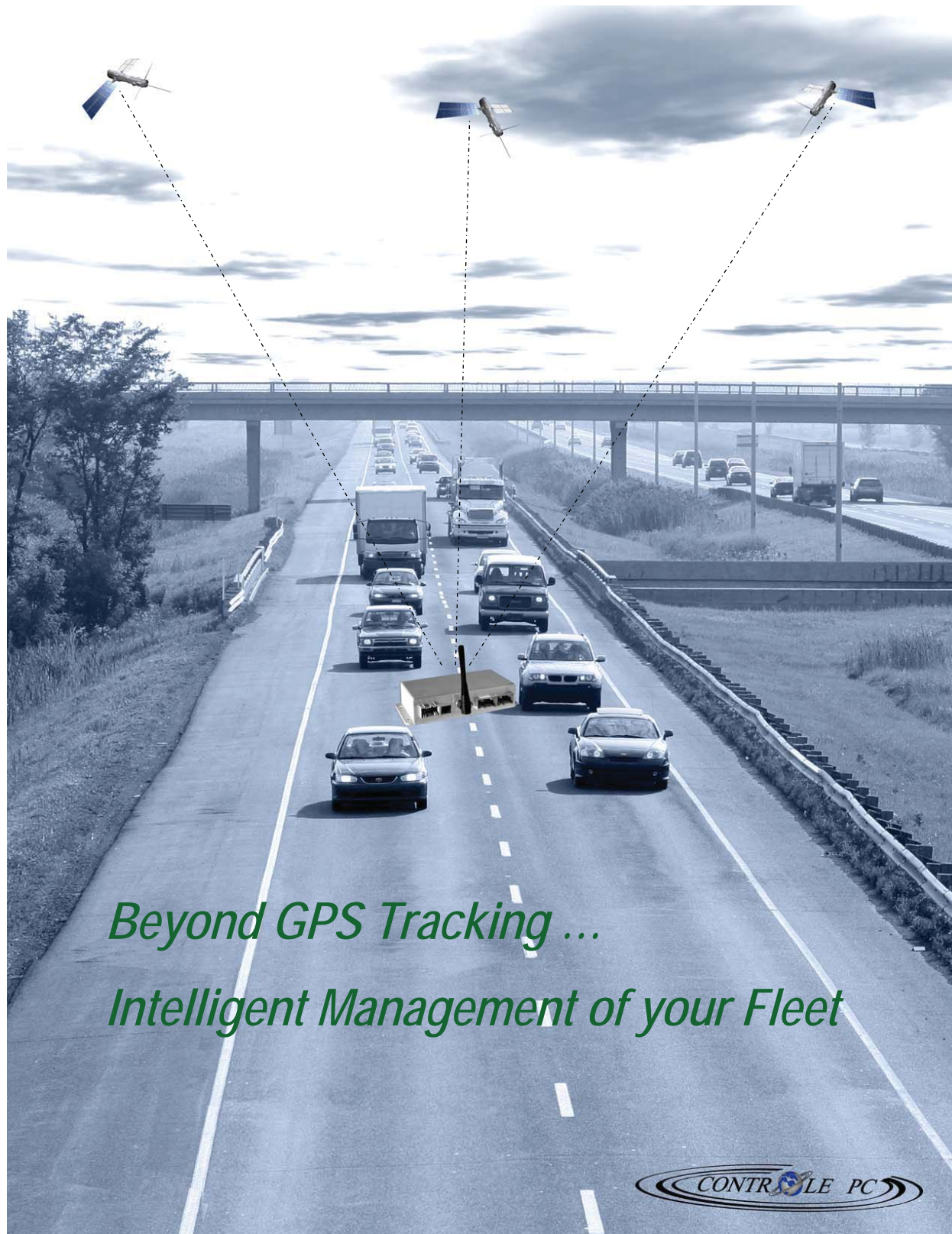


TECHNICAL MANUAL MX151D - GM



- PART 14 : OEM LITERATURE

CONTROLE PC - CPC IV - ONBOARD COMPUTER



• PART 14 : OEM LITERATURE

CONTROLE PC - CPC IV - ONBOARD COMPUTER

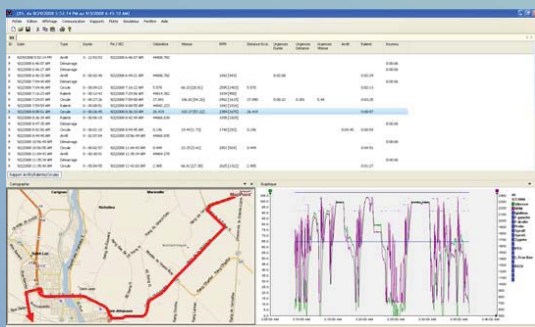
Imagine an advanced intelligent device that records, second-by-second, all data related to the complete operation of your vehicles, including GPS positioning, and makes it available in a real-time or deferred mode.

Designed to monitor and optimize the management of your fleet, the data accumulator CPC-IV™, better known as a "black box", integrates the accuracy of the GPS tracking system to the power of its data acquisition and logging capabilities.

To optimize the control and management of your fleet of vehicles and thereby significantly improve your return on investment, you need more than just GPS location data. You should also be able to capture all data related to the operation of a vehicle, such as speed and over-speeding, engine revolution (RPM), sudden accelerations and brutal decelerations, fuel consumption, engine alert codes, idle-time, mileage and engine hours, and all other data related the operation of any r type of vehicle in your fleet. **This is the role of the CPC-IV™.**



The CPC-IV™ Data Accumulator represents the ultimate design for a compact black box. It is an advanced intelligent data acquisition system that collects and stores data for any type of vehicle and automotive equipment: cars, trucks, buses, motorcycles, heavy machinery and even boats. It records immediate, detailed time stamped, data generated by the vehicle, including the GPS tracking, in a real time mode via sensors and via an interface to the Electronic Control Module (ECM) of the vehicle. The CPC-IV accepts up to **24 digital or analog inputs, plus 8 pulse inputs** to capture all data in accordance to customer pre-defined parameters such as door and hood opening, flashers, brakes, oil pressure, coolant temperature, speed and RPM. Additionally, the unit has **8 programmable outputs** for functions such as activating or controlling door unlocking, horn, emergency flashers.



The CPC-IV™ enables interface connection to other peripheral equipment such as radio communications UHF/VHF, cellular or satellite modems, on-board computers and alpha-numeric displays.



TECHNICAL MANUAL

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• PART 14 : OEM LITERATURE

CONTROLE PC - CPC IV - ONBOARD COMPUTER

The application and implementation of preventive maintenance standards as well as the analysis of the performance of your fleet require the acquisition and logging of operational data, fuel consumption data and performance data of each vehicle to establish an optimized reliable diagnostic and to implement the appropriate, cost effective, corrective measures.

CPC+ DIAGNOSTIC SOFTWARE

The CPC-IV stores and provides an impressive array of detailed operational data (to the second) which is available at all time. The detailed reports provided by the system are based on sound principles of management by exception, thus facilitating the analysis and implementation processes. The CPC+ Diagnostic Software allows for quick visualization of captured data under multiple formats such as tables, graphics, charts and maps. The automated generation of customizable reports includes Daily Summary Report, Second by Second Graphical Report, Dashboard Simulator, Vehicle Location and Tracking, Diagnostics on the operational performance of each vehicle.

GPS TRACKING AND AVL

The Automatic Vehicle Location (AVL) system is a powerful tool for managing multiple fleets of vehicles, from service vehicles, public works vehicles and emergency vehicles, to public transport vehicles. The system enables the tracking, utilizing mapping software, of vehicle location, speed and direction of travel. The advanced mapping system is optimized for rapid panning and zooming. The system offers two modes of operation: real-time mode and deferred mode. In the deferred mode of operation, GPS data already stored in the black box can be played back directly on the computer screen without having to incur costly communications costs. Downloaded data is stored in a database for further monitoring and analysis of the operations of the vehicle with the help of the CPC+ Diagnostic Software for GPS tracking.

In the real-time mode, offered as an option, AVL and wireless communications technology work together to provide vehicle positioning at all time or on-demand. Location information is transmitted via wireless communication system (either satellite or cellular) to the operations terminal and is made available to fleet managers and dispatchers. GPS data may be displayed in a real-time mode or in a playback mode

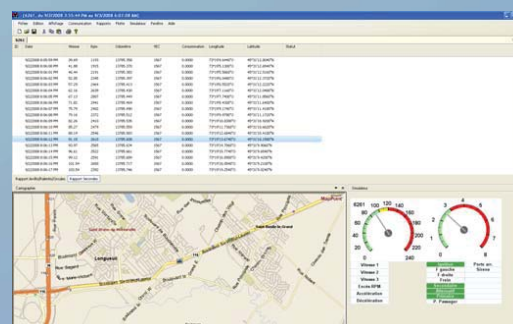
IMPROVED PREVENTIVE MAINTENANCE

Proper engine tuning and maintenance will reduce fuel consumption by 10%, but poor or limited maintenance will increase fuel consumption by as much as 50%.

The CPC-IV automatically provides all data to insure a proper maintenance plan and schedule for every vehicle, such as mileage (miles or kilometers), engine operating hours, idle time and warnings that the vehicle will be due for maintenance in a user-defined number of miles/kilometers, engine operating hours or calendar days. Furthermore, the unit logs and reports data available from the Electronic Control Module of the vehicle (OBDII, CAN, J1939) such as "MIL status, Misfire Monitor, Fuel System Monitor, Oxygen Sensor Monitor, MAF air flow rate, EGR Monitor, Engine coolant temperature".

The data logged by the CPC-IV can be directly interfaced to the users actual Preventive Maintenance system or optimized with the Preventive Maintenance software provided as an option with the CPC-IV

Dashboard Simulator Display





TECHNICAL MANUAL

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CONTROLE PC - CPC IV - ONBOARD COMPUTER

CPC-IV™ TECHNICAL SPECIFICATIONS

MAIN FEATURES :

- Embedded flash memory for data storage: up to 64 MB
- Automatic data download via RF-900 secured communications
- Software stored in embedded flash memory
- Software updates done via RF-900 communications or USB port
- Four economy modes to save vehicle battery
- Long range SPI port (up to 25') for peripheral connection: memory card, video camera, keyboard, display)
- Up to 24 digital or analogue inputs
- Up to 8 pulse inputs
- 8 programmable outputs
- Programmable alarms for the driver (sound and/or visual)
- Driver identification
- Connectivity for RFID
- Monitoring of on-board backup battery for sleep modes
- Data logging done second-by-second
- Anti-theft protection
- Accurate internal real time clock: set with atomic time from GPS
- OS awareness
- Capability of logging over 80,000km second by second on embedded flash memory
- Keyboard connectivity
- LCD display connectivity
- Cell phone and radio connectivity
- Printer connectivity
- GPS connectivity
- Programmable vehicle maintenance alarm

COMMUNICATIONS INTERFACES :

- RS 232
- SPI
- USB 2.0 Full Speed
- RF
- Can 2.0
- C2Sib ((SAE J1850: VPW, PWM, ISO9141)
- J1708 J1939

PHYSICAL SPECIFICATIONS :

- Temperature operating range: -40 to +85 °C
- Rugged extruded aluminum casing
- Size: Width: 6", Length: 3", Height: 1" approx.

SOFTWARE :

- CPC+ Diagnostic software based on principle of management by exception
- Customizable reports
- GPS Tracking and Automatic Vehicle Location
- Advanced mapping
- Intuitive and modern interface

Our mission is to provide you the most efficient and cost effective solutions to solve the problems of managing your fleet of vehicles by developing state-of-the-art hardware and software products adapted to your needs. Our challenge is to continually bring you the most innovative solutions in managing your fleet.

CANADA AND UNITED STATES

Contrôle PC

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TECHNICAL MANUAL MX151D - GM



• PART 14 : OEM LITERATURE

ESPAR - AIRTRONIC - HEATING SYSTEM

AIRTRONIC^{*} / AIRTRONIC^{*} M

Technical Description
Installation Instructions
Operating Instructions
Maintenance Instructions
Troubleshooting and Repair Instructions
Parts List



Espar Heater Systems

Espar Products, Inc.
6099A Vipond Drive
Mississauga, Ontario
Canada L5T 2B2

(905) 670-0960
(800) 387-4800 Canada & U.S.A.
(905) 670-0728 Fax

www.espar.com

AIRTRONIC^{*} D2

25 2069 05 - 12 Volt
25 2070 05 - 24 Volt

AIRTRONIC^{*} D2 Camper

25 2326 05 - 12 Volt

AIRTRONIC^{*} D3 Camper

25 2317 05 - 12 Volt

AIRTRONIC^{*} D4

25 2113 05 - 12 Volt
25 2114 05 - 24 Volt

AIRTRONIC^{*} D4S

25 2144 05 - 12 Volt
25 2145 05 - 24 Volt

AIRTRONIC^{*} D4 Camper

25 2318 05 - 12 Volt

AIRTRONIC^{*} D4 Camper Plus

25 2327 05 - 12 Volt

AIRTRONIC^{*} B4

20 1812 05 - 12 Volt



20 2900 81 01 03

02.2009 Subject to Change

Web Edition



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ESPAR - AIRTRONIC - HEATING SYSTEM

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Special Notes

Note: Highlight areas requiring special attention or clarification.

Caution: Indicates that personal injury or damage to equipment may occur unless specific guidelines are followed.

Warning: Indicates that serious or fatal injury may result if specific guidelines are not followed.

This publication was correct at the time of going to print. However, Espar Inc. has a policy of continuous improvement and reserves the right to amend any specifications without prior notice.



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ESPAR - AIRTRONIC - HEATING SYSTEM



Introduction

Heater Warnings

Warning To Installer:

Correct installation of this heater is necessary to ensure safe and proper operation.
Read and understand this manual before attempting to install a heater.



Warning - Explosion Hazard

1. Heater must be turned off while re-fueling.
2. Do not install heater in enclosed areas where combustible fumes may be present.
3. Do not install heaters in engine compartments of gasoline powered boats.



Warning - Fire Hazard

1. Install heater so it will maintain a minimum distance of 2" from any flammable or heat sensitive material.
2. Install the exhaust system so it will maintain a minimum distance of 2" from any flammable or heat sensitive material.
3. Ensure that the fuel system is intact and there are no leaks.

Failure to follow these instructions could cause fire resulting in serious or fatal injury.



Warning - Asphyxiation Hazard

1. Route the heater exhaust so that exhaust fumes can not enter any passenger compartments.
2. Ensure an air tight seal will be maintained between the heater and mounting surface and at any exhaust connection points.
3. Ensure that heating air supply is taken from an area where poisonous gases will not be present.
4. If running exhaust components through an enclosed compartment, ensure that it is vented to the outside.

Failure to follow these instructions could cause oxygen depletion resulting in serious or fatal injury.

Direct questions to Espar Heater Systems

Canada & U.S.A. 1-800-387-4800

ATTENTION

Operation with bio-diesel

AIRTRONIC D2 / D4

AIRTRONIC D2 is not certified for use with bio-diesel. Admixtures of bio-diesel up to a magnitude of approx. 5%, as in some countries, are allowed.

ATTENTION

Heating at high altitudes

Up to 1500 meters - unrestricted heating operation is possible

Above 1500 meters - heating operation is in principle possible for short periods, e.g. when crossing a mountain pass or during a brief stop. In cases of extended stays, the fuel supply at the fuel metering pump has to be adapted to high altitude conditions.

The following high altitude kits are available:

P/N: 24 0222 00 00 00 (Contains high altitude fuel pump)

or

P/N: 20 2900 70 00 07 (Contains high altitude sensor, no extra fuel pump needed)

or

P/N: 22 1000 33 22 00 (Only works with Airtronic Heaters that are showing „H-Kit“ on their factory label)

Note: Only one kit from the listed above is needed.

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ESPAR - AIRTRONIC - HEATING SYSTEM

Introduction

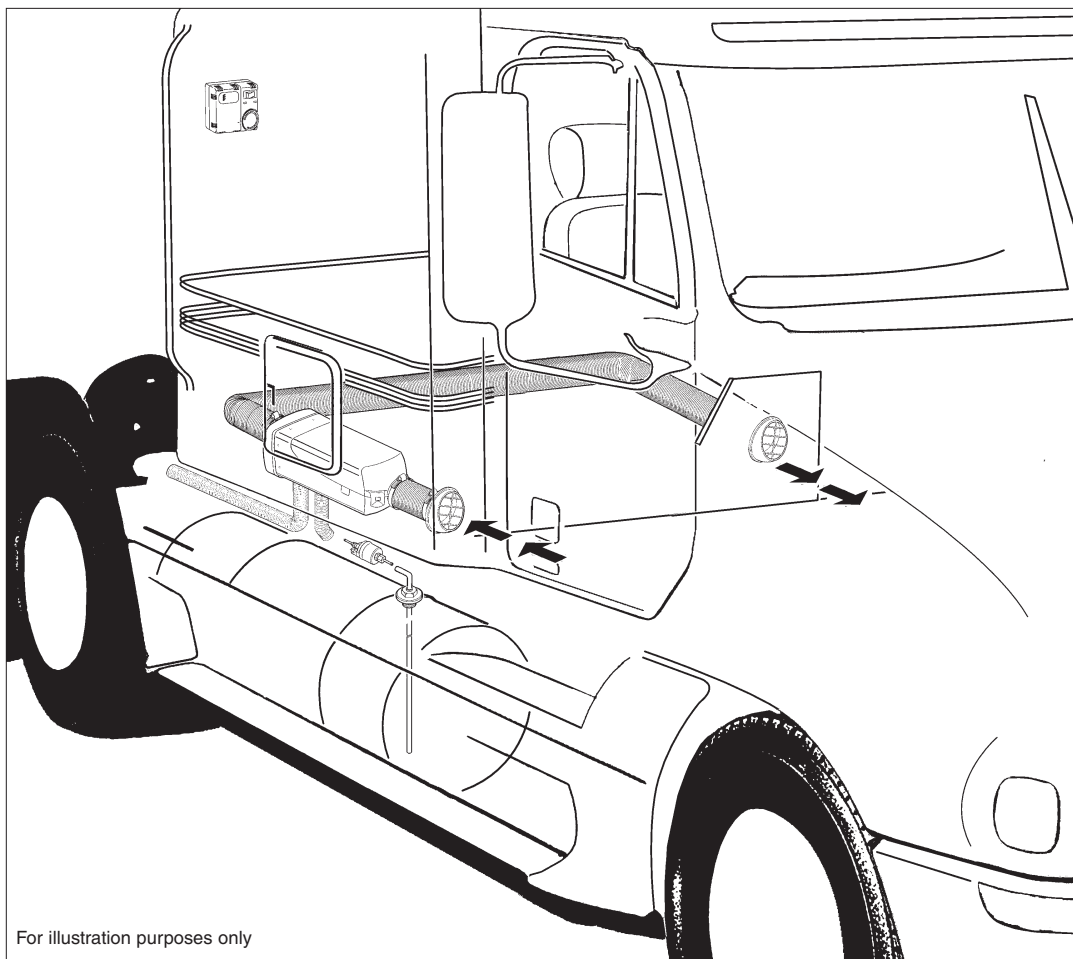
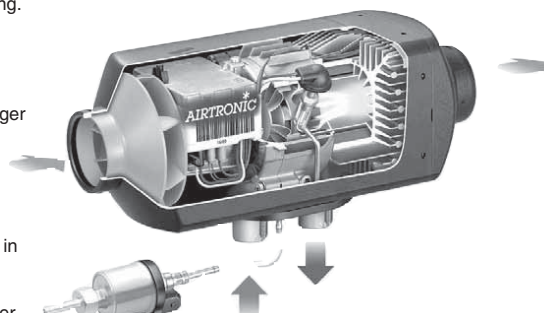
Espar's *AIRTRONIC* bunk heaters

The *AIRTRONIC* D2 is a compact diesel-fired 7,500 BTU/hr air heater, quality engineered to provide a dependable means of space heating. This heater is uniquely designed for inside mounting and ease of installation. The *AIRTRONIC* D4 is a 13,650 BTU/hr air heater for larger bunks.

These heaters provide hot air to the interior of vehicles for passenger comfort. Since the heater runs on diesel fuel and 12 or 24 volt power, it is able to provide space heat completely independently of the vehicle engine.

The heater is operated by a rheostat switch or room thermostat. It cycles through four temperature settings (boost-high-medium-low) in order to maintain the desired temperature.

If, in special cases, less heating capacity is required than the heater supplies in the "Low" setting, the heater switches to a "stand-by" setting. Temperature and overheat sensors, and a specially designed heat exchanger are among the safety features which make this heater a safe and dependable unit.





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ESPAR - AIRTRONIC - HEATING SYSTEM



Product Information

Technical Data

Heater	<i>AIRTRONIC</i>			<i>AIRTRONIC M</i>			
Version	D2			D4			
Heat Output (±10%)	7,500 BTU/hr Boost (2.2 kW) 6,150 BTU/hr High (1.8 kW) 4,100 BTU/hr Medium (1.2 kW) 2,900 BTU/hr Low (0.85 kW)			13,650 BTU/hr Boost (4.0 kW) 10,200 BTU/hr High (3.0 kW) 6,800 BTU/hr Medium (2.0 kW) 3,400 BTU/hr Low (1.0 kW)			
Current at 12v (±10%)	8.3 amps - Start 2.8 amps - Boost 1.9 amps - High 1.0 amps - Medium 0.7 amps - Low			8.3 amps - Start 3.3 amps - Boost 2.0 amps - High 1.1 amps - Medium 0.6 amps - Low			
Current at 24v (±10%)	4.2 amps/hr - Start 1.4 amps/hr - Boost 1.0 amps/hr - High 0.5 amps/hr - Medium 0.3 amps/hr - Low			4.2 amps/hr - Start 1.7 amps/hr - Boost 1.0 amps/hr - High 0.5 amps/hr - Medium 0.3 amps/hr - Low			
Fuel Consumption (±10%)		U.S. Gal/hr	Litre/hr		U.S. Gal/hr	Litre/hr	
	Boost	0.07	0.28	Boost	0.13	0.51	
	High	0.06	0.23	High	0.10	0.38	
	Medium	0.04	0.14	Medium	0.07	0.25	
	Low	0.03	0.10	Low	0.03	0.13	
Air Flow (±10%)	48 cfm Boost 40 cfm High 27 cfm Medium 19 cfm Low			85 cfm Boost 69 cfm High 50 cfm Medium 30 cfm Low			
Operating Voltage Range	10.5 - 16 vdc at 12 vdc 21 - 32 vdc at 24 vdc			10.5 - 16 vdc at 12 vdc 21 - 32 vdc at 24 vdc			
Overheat Temperature Shutdown (±10%)	240°F (115°C)			240°F (116°C)			
Ambient Operating Temperature	-40°F to 158°F (-40°C to 70°C)			-40°F to 158°F (-40°C to 70°C)			
Weight	6.0 lbs. (2.7 kg)			9.9 lbs. (4.5 kg)			

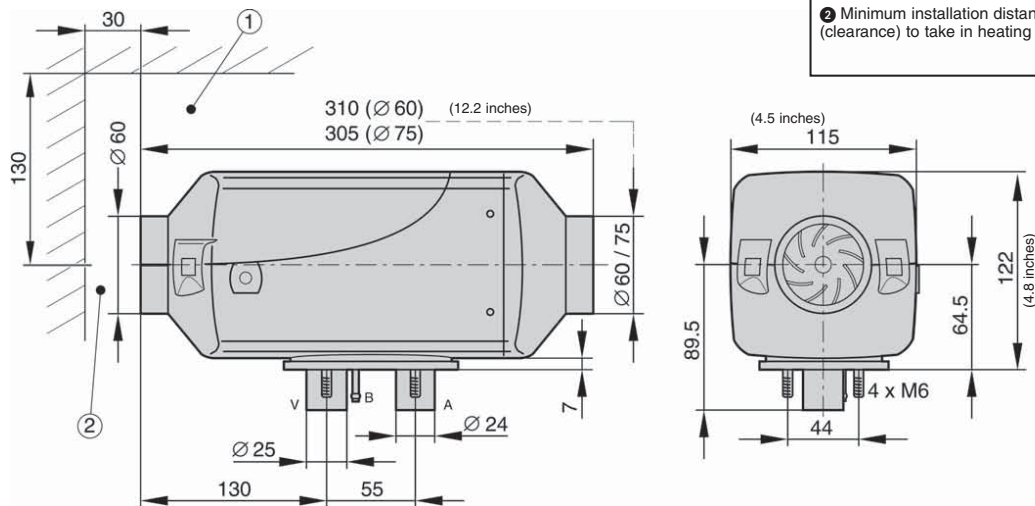
Note: The heater control unit is equipped with a low voltage cutout to prevent vehicle battery drain and a high voltage cutout to protect heater electrical parts.

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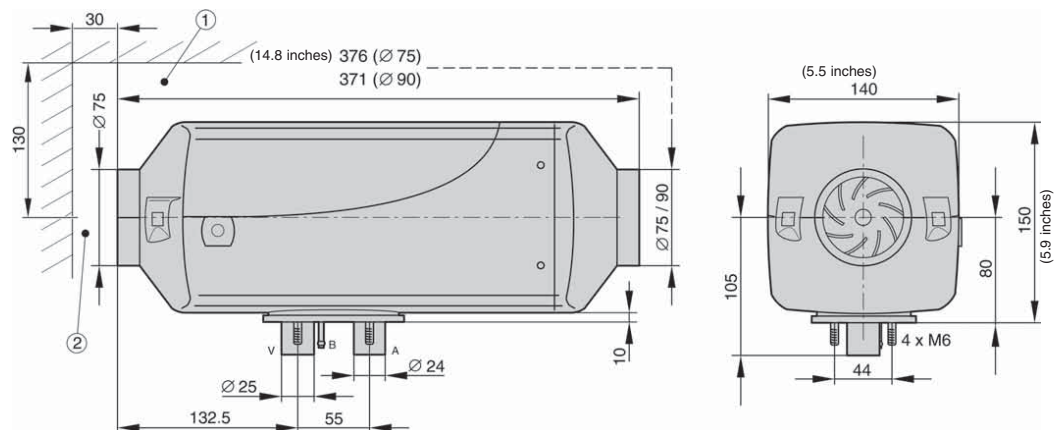
ESPAR - AIRTRONIC - HEATING SYSTEM

Product Information

Principal Dimensions *AIRTRONIC D2*



Principal Dimensions *AIRTRONIC B / D4*

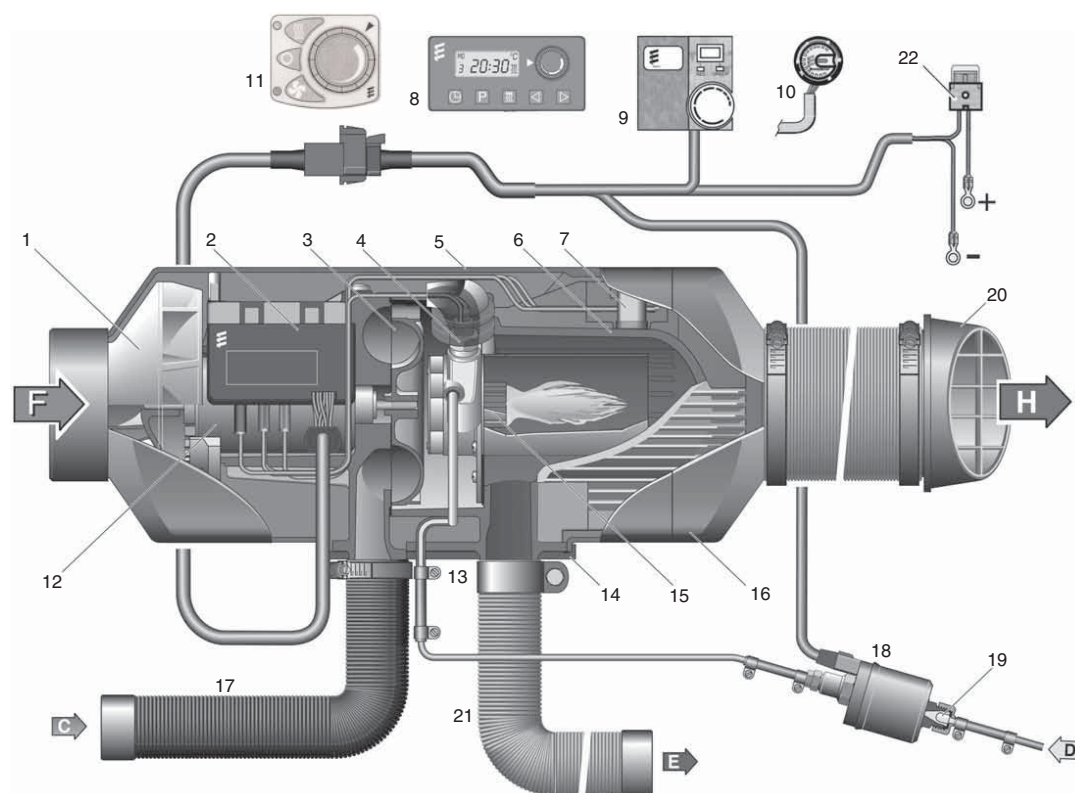


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ESPAR - AIRTRONIC - HEATING SYSTEM

Product Information

Heater Components



- 1 Hot Air Blower Wheel
- 2 Control Unit
- 3 Combustion Air Blower Wheel
- 4 Glow Pin
- 5 Cover
- 6 Heat Exchanger
- 7 Overheat/Flame sensor
- 8 7 Day Timer with Thermostat (optional)
- 9 Operating Unit (Thermostat)
- 10 Operating Unit (Rheostat)
- 11 Mini Controller
- 12 Blower Motor
- 13 Fuel Connection

- 14 Flange Seal
- 15 Combustion Chamber (Burner)
- 16 Hot Air Outlet Hood
- 17 Combustion Air Intake Hose
- 18 Fuel Metering Pump
- 19 Fuel Filter built into FMP
- 20 Hot Air Output Deflector
- 21 Flexible Exhaust Pipe
- 22 Main Fuse: -
AIRTRONIC D2 - 20 A - 12V
AIRTRONIC D4 - 20 A - 12V

C = Combustion Air
D = Fuel Intake from Tank
E = Exhaust
F = Fresh Air Intake
H = Hot Air Output

• PART 14 : OEM LITERATURE

ESPAR - AIRTRONIC - HEATING SYSTEM

Installation

Heater Location

Depending on the type of vehicle, the best location for mounting the heater will vary. Typically, air heaters are mounted inside tool or luggage compartments. However, the heater may be mounted anywhere inside the vehicle provided you adhere to the following conditions:

- Combustion air intake, exhaust and fuel inlet must be located outside of the vehicle.
- Heater must be mounted on flat horizontal surface providing an air tight seal between heater and vehicle.
- Do not mount the heater outside the vehicle, unless care is taken to protect the heater from the weather. When selecting the location, consider the following:
 - Combustion air and exhaust connections.
 - Ducting.
 - Fuel line connections.
 - Electrical connections.

Heater Mounting

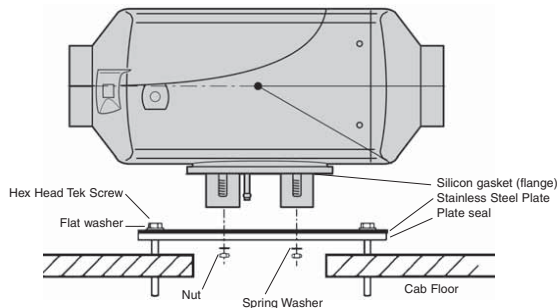
A mounting plate and hardware are provided with the truck heater kit.

- Choose heater location.
- Using template, drill and cut center hole. Cut (1) four and one half inch (4 1/2") diameter hole or one rectangular hole four (4") by five (5") inches to accommodate mounting plate and seal. Secure mounting plate to vehicle floor with "Tek" screws provided.
- Use heater flange as a template if not using mounting plate and seal.
- Mount heater on mounting plate with nuts and spring washers provided.
- For ease of installation make the exhaust, combustion air intake and fuel connections at base of heater before mounting the heater into the vehicle. See following pages for instructions and restrictions on exhaust, combustion and fuel hook-ups.

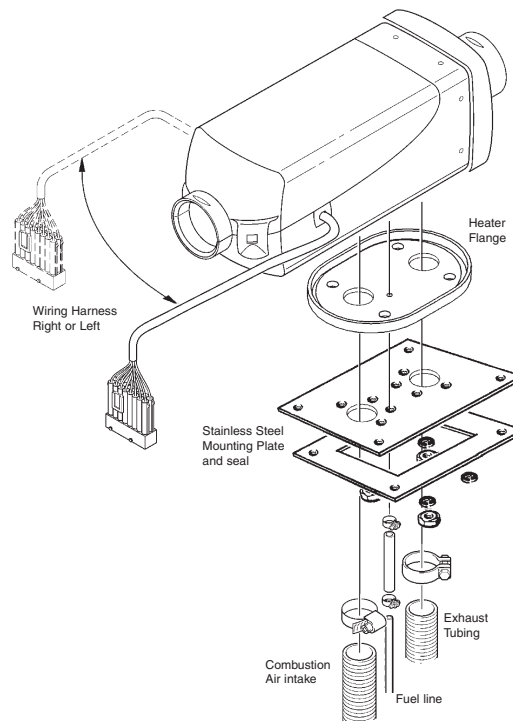
Wiring harness connection, right or left

Wiring harness can be converted to the opposite side of the heater if it makes the installation more practical. To do this you must remove the *AIRTRONIC* cover and then the control unit. On the control unit (underneath) is a semicircular clip protecting the harness. This must be removed. The harness can be moved to the other side of the control unit then reassembled. The grommet on the heater casing (side) must also be taken out and secured into the opposite lower side of heater casing.

Heater Mounting Plate Installation



Note: Tighten screws sufficiently to ensure positive seal between mounting plate and mounting surface. Do not over tighten.

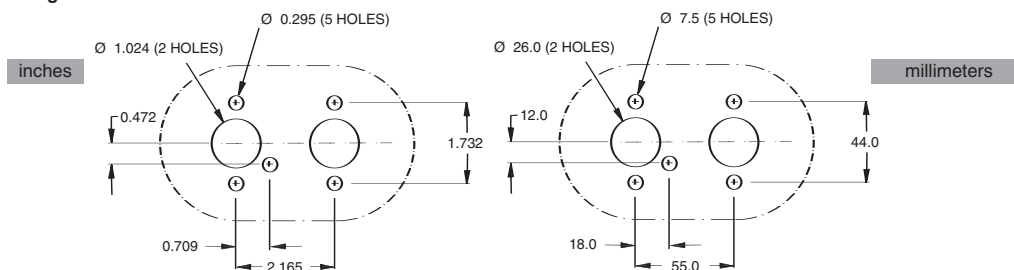


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ESPAR - AIRTRONIC - HEATING SYSTEM

Installation

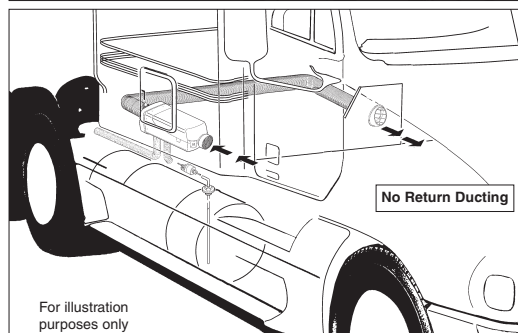
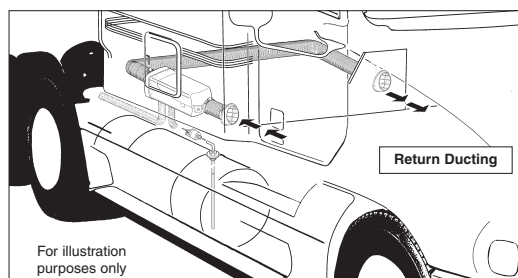
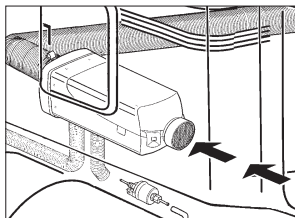
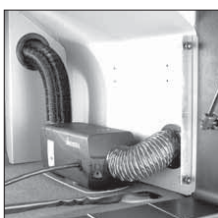
Mounting Pattern



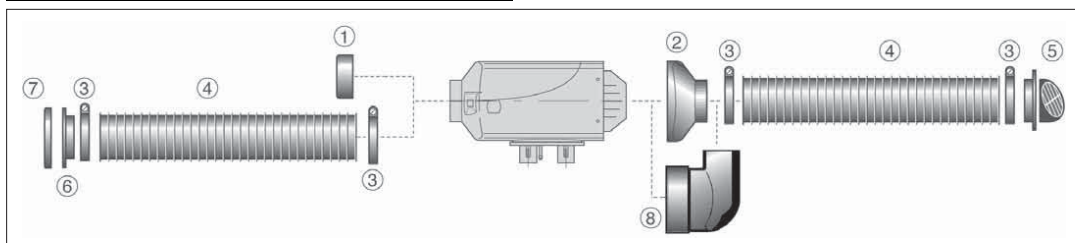
Heater Air Ducting Installation

A 60mm flexible duct 40 inches long, hot air outlet and clamps are provided with the heater kit. In routing and installing the ducting the following criteria must be observed:

- Route ducting with smooth bends. Avoid crushing duct.
- Position hot air outlet so that it cannot be obstructed.
- When not using return ducting. Use a protective air intake grille on air inlet side of heater to prevent objects from being sucked in.
- Ensure provisions are made for proper air return ventilation.
- Use return air ducting for best heating efficiency.



Ducting Components



1. Protective Grill
2. Air Outlet Hood *AIRTRONIC* D2 - ø60 or 75mm
AIRTRONIC D4 - ø75 or 90mm
3. Hose Clamp 2-2 3/4"
4. Flex Duct 2 3/8" (ø60 or 75mm) (ø90mm on D4)

5. Air Outlet - Rotatable
6. Connection Piece
7. Protective Grill
8. 90° Bend Ducting 2 3/8"

Warning: Do not use existing vehicle ducting or outlets. Ducts and outlets must be capable of withstanding a minimum of 300°F operating temperatures.

Caution: Do not over tighten duct clamps. Do not position outlet so that it will blow hot air directly at operator or at room thermostat.

• PART 14 : OEM LITERATURE

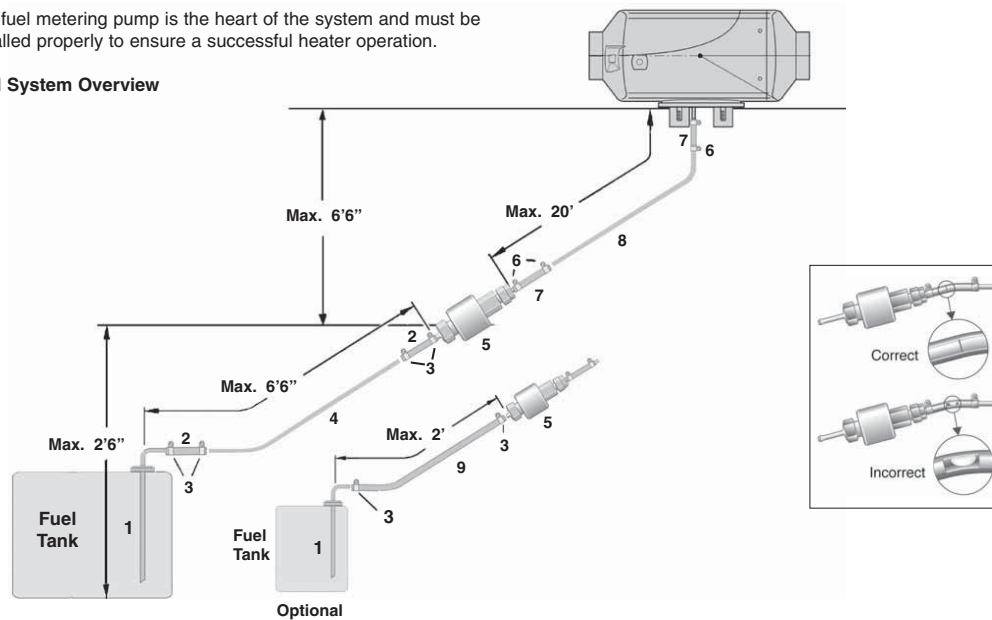
ESPAR - AIRTRONIC - HEATING SYSTEM

Installation

Fuel System

The fuel metering pump is the heart of the system and must be installed properly to ensure a successful heater operation.

Fuel System Overview



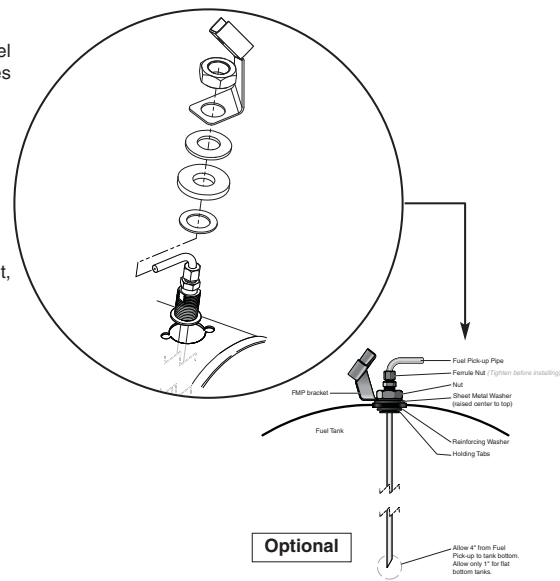
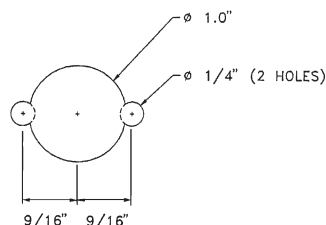
Note: Butt joints and clamps on all connections.

- | | | |
|-------------------------|----------------------------------|----------------------------------|
| 1. Fuel Pick-Up Pipe | 4. 2.0mm Black Plastic Fuel Line | 7. 3.5mm Rubber Connector |
| 2. 5.0 Rubber Connector | 5. Fuel Metering Pump | 8. 1.5mm White Plastic Fuel Line |
| 3. 11mm Clamp | 6. 9mm Clamp | 9. 5mm Rubber Fuel Line |

Fuel Pick-Up Pipe Installation (Drill Option)

- Choose a protected mounting location close to the fuel pump and heater. A spare fuel sender gauge plate provides an ideal mounting location.
- Drill the mounting holes as shown.
- Tighten Ferrule nut to pick-up pipe at desired height.
- Cut the fuel pick-up pipe to length.
- Mount the fuel pick-up pipe as shown.
- Lower the fuel pick-up pipe (with reinforcing washer) into the tank using the slot created by the two 1/4" holes.
- Lift the assembly into position through the 1" hole.
- Assemble the rubber washer, fuel metering pump bracket, metal cup washer and nut.

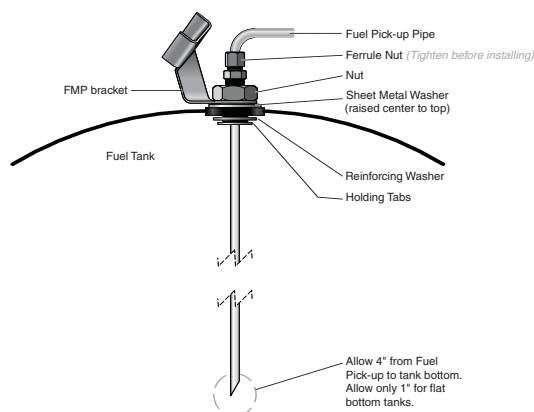
Note: Drill the two 1/4" holes first.



• PART 14 : OEM LITERATURE

ESPAR - AIRTRONIC - HEATING SYSTEM

Installation



Custom Pick-Up Pipe with 1/4" NPT fitting - option

- Remove an existing plug from the top of the fuel tank.
- Cut the fuel pick-up pipe to length.
- Secure the fuel pick-up pipe into position using the combined NPT compression fitting.

Note: Will not be able to use FMP bracket.

Note: Other NPT fittings are available in various sizes (Refer to parts section).

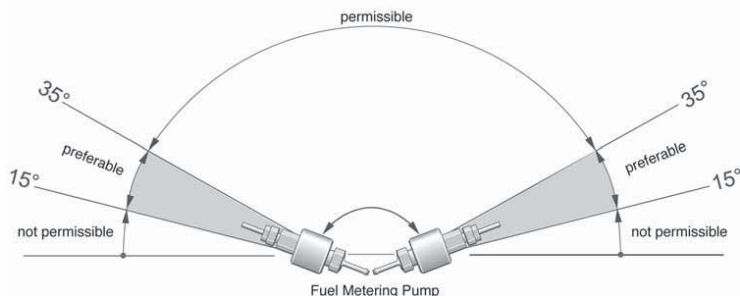
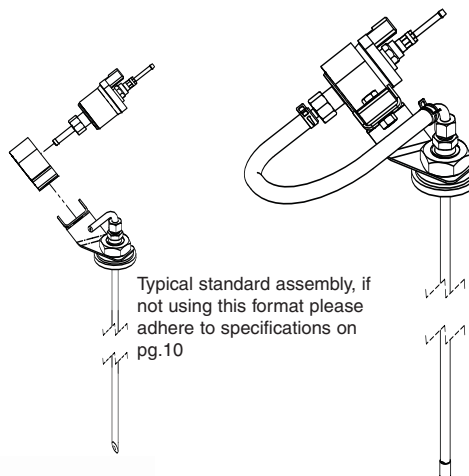
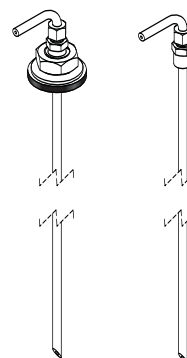
Fuel Metering Pump

- Choose a protected mounting location close to the fuel pick-up pipe and heater if not using standard assembly as shown on right.
- Using the bracket and rubber mount provided, install fuel pump as shown.

Note: Proper mounting angle of the fuel pump is necessary to allow any air or vapor in the fuel lines to pass through the pump rather than cause a blockage.

Fuel Line

- Route fuel lines from the fuel pick-up pipe to the fuel metering pump then to the heater.
- Use fuel lines provided.
- Other sizes or types of fuel lines may inhibit proper fuel flow.
- Make proper butt joints using clamps and connector pieces as shown on previous page.
- Use a sharp utility knife to cut plastic fuel lines to avoid burrs and pinching fuel line shut.





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• PART 14 : OEM LITERATURE

ESPAR - AIRTRONIC - HEATING SYSTEM

Installation

Electrical Connections

Main Harness.....

16 pin connector with 10 terminated wires at 8 terminals. (green/red, blue/white (2), red, grey/red, grey, brown, brown/white and yellow (2)). Connect to the heater's 16 pin connector. Connect other harnesses as described below.

*includes

Power Harness.....

2 core harness (red and brown). Route power harness to batteries, cut to length and terminate as described below. Install 20 amp fuse last (10 amp on 24V). Connect red wire to fuse holder near battery. Connect fuse link wire directly to battery positive post using ring terminal. Connect brown wire directly to battery negative post using ring terminal.

Switch Harness.....

7 core harness (red, brown/white, yellow, grey, brown, grey/red and blue/white). Route this harness the length required to reach thermostat installed in bunk compartment. Do not cut this harness, wires have been soldered at ends for convenience of terminating to terminals on thermostat. Coil up excess harness and secure in safe location.

Fuel Metering Pump Harness.....

Connect to thermostat or rheostat switch (refer to switch connection section).

2 core harness (green/red and brown).

Route this harness from heater to fuel metering pump. Cut to length and connect to fuel metering pump using single terminals and connector provided with kit.

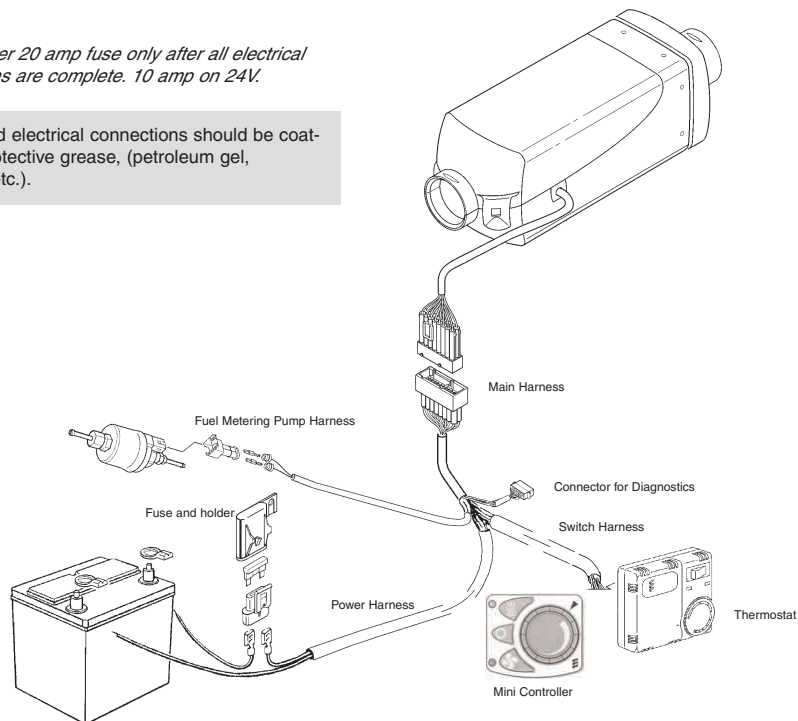
Diagnostic Harness.....

Note: No polarity required.

8 pin connector (red, brown, yellow, blue/white). For diagnostic purposes only.

Caution: Install power 20 amp fuse only after all electrical connections are complete. 10 amp on 24V.

Note: All exposed electrical connections should be coated with protective grease, (petroleum gel, Vaseline, etc.).



• PART 14 : OEM LITERATURE

ESPAR - AIRTRONIC - HEATING SYSTEM

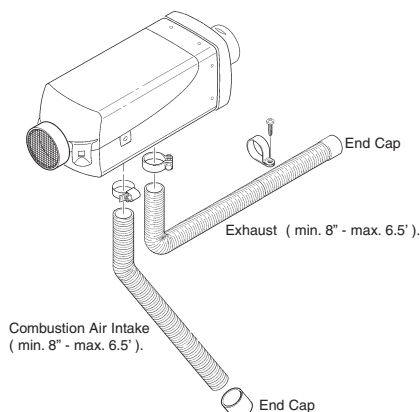
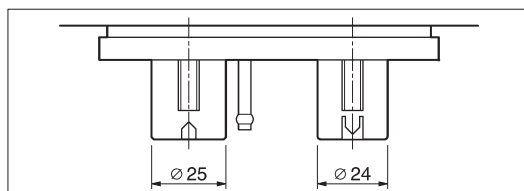
Installation / Operation and Function

Exhaust and Combustion Air Intake Connections

A 24mm flexible stainless steel exhaust pipe (51" long) and a 25mm flexible plastic tube (39" long) for combustion air intake are included with the heater kit. Exhaust clamps and holders are also provided.

Caution: Route exhaust and combustion air intakes so they cannot be plugged by dirt, water or snow. Ensure the outlets do not face into the vehicle slip stream. Keep exhaust and combustion air intake a minimum of 12" apart. Drill 1/8" holes in exhaust pipe if necessary to allow water drainage. Combustion air intake and exhaust lengths can be shortened to a minimum of 8".

- Attach the exhaust pipe to the exhaust outlet of the heat exchanger.
- Route exhaust pipe to an open area to the rear or side of the vehicle so that fumes cannot build up and enter the cab or the combustion air inlet to the heater.
- Install protective cap.
- Attach the combustion air intake tube to the combustion air inlet of the heater.
- Once secure to the heater inlet, the intake pipe must be routed to the underside of the vehicle where it will pick up clean, fresh, moisture free air.



Warning: The exhaust is hot, keep a minimum of 2" clearance from any heat sensitive material

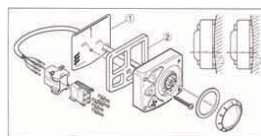
Warning: Route exhaust so that the exhaust fumes cannot enter the passenger compartment.

Operating Switches

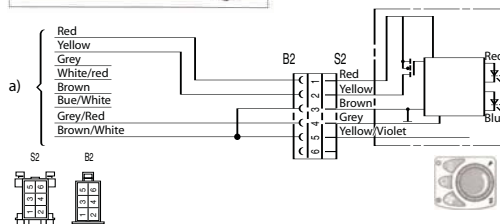
The heater can be controlled using a Mini Controller, Thermostat or Rheostat type switch. It can also be controlled by a 7 day timer with thermostat. See schematic pg. 19.

Mini Controller

- Stick the drilling template to the required place of installation. **Note:** The drilling template (removable and self-adhesive) is attached to the front. Do not press the control field during installation.
- Drill 2.5 and 7.5 mm holes.
- Remove the control knob from the mini controller.
- Fit the mini controller with the elastic base.
- Screw in fixing screw up to the end stop.
- Put the control knob on the mini controller. The arresting device in the control knob must be inserted in the keyway in the mini controller.
- Connect the mini controller in accordance with the circuit diagram.



- 1 Drilling template
- 2 Elastic base for uneven installation area



a) Connection of control elements on the heater:

- red battery plus
- yellow switch on signal S+
- grey optional external sensor
- brown battery minus
- blue / white diagnostics
- grey / red set temperature value
- brown / white sensor reference ground

Insulate any cable ends not used.

The connectors and socket housing are shown from the cable entry side.

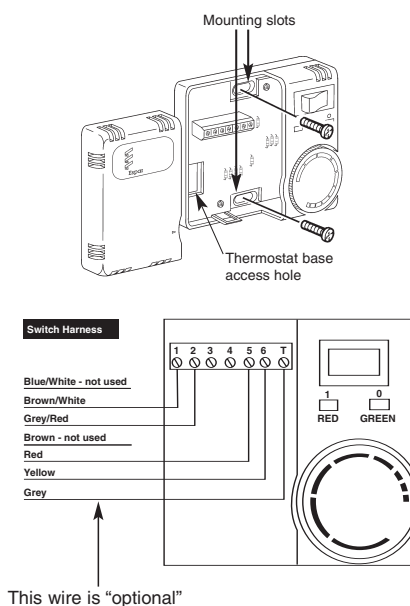
Thermostat

- Select a mounting location which will be representative of the average temperature of the area being heated. Avoid mounting near heater outlets, windows, doors, electrical appliances or in areas receiving direct sunlight.
- Route the switch harness from the heater to the thermostat mounting location.
- Mount the thermostat as shown using proper mounting hardware and the slots provided on the thermostat base. Pull the switch harness through the thermostat base access hole.
- Connect the six core switch harness to the thermostat as shown.

• PART 14 : OEM LITERATURE

ESPAR - AIRTRONIC - HEATING SYSTEM

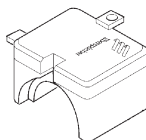
Operation and Function



Grey wire notes:

- It is recommended that when using return ducting, not to use this wire. See illustration on pg. 9 for ducting.
- Not using the grey wire defaults the heater to use the temperature sensor on the control unit of the heater.
- Use of the grey wire defaults the heater to use the sensor on the thermostat.
- The sensor on the control unit provides a more accurate reading of the overall air temperature, whereas the sensor in the thermostat gives more of a spot reading of the air surrounding the thermostat.

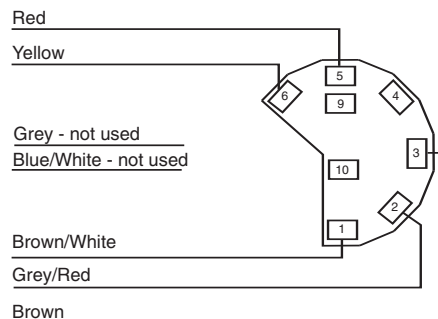
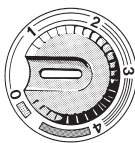
Temperature sensor on
AIRTRONIC control unit.



Rheostat Switch

Note: When using Rheostat switch, the **Return Ducting** method must be used as shown on page 9. This allows the **AIRTRONIC** heater's internal sensor to properly monitor cab temperature.

- Mount the rheostat switch in a location where it is easily accessible.
- Route the switch harness from the heater to the Rheostat mounting location.
- Connect the six core switch harness as shown.



Heater Operation



Warning - Fire Hazard

To prevent fire, the heater must be switched off while filling fuel tanks. To prevent asphyxiation, the heater must not be operated in enclosed areas unless heat exhaust is routed to the outside.

1 Switch On

- Switch the heater on using the mini controller's heat button or the room thermostat's, On/Off switch (1=On, 0=Off) or the rheostat switch.

2 Start Up

On start up the indicator light illuminates and the following sequences take place:

- Control unit does a systems check of the glow pin, flame sensor/temperature sensor, fuel metering pump and control unit.
- Glow pin is energized and starts preheating the combustion chamber.
- Blower starts slowly and begins to accelerate.
- After a delay (approx. 60 seconds) the fuel pump delivers fuel.
- Ignition will take place as the fuel/air mixture begins to burn.
- Blower speed and fuel delivery are slowly increased.
- Once flame sensor has detected a flame the glow pin will switch off, after approx. 60 secs.
- After another 120 secs., heater will have reached maximum power.

• PART 14 : OEM LITERATURE

ESPAR - AIRTRONIC - HEATING SYSTEM

Operation and Function

3 Temperature Setting for Mini Controller

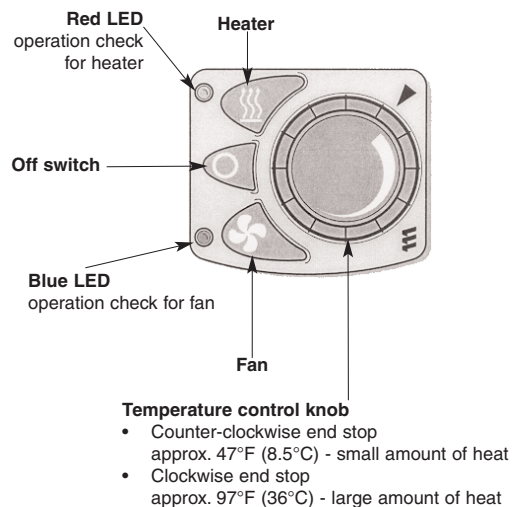
The mini controller enables you to set the heater installed in the vehicle to the temperature you require.

You can control the desired temperature range by turning the dial clockwise to increase temperature.

- Lowest Setting - approx. 47°F (8.5°C)
- Highest Setting - approx. 97°F (36°C)

Use the "Heater" button to start the heater in heating mode (continuous operation). You can adjust the required temperature with the temperature control knob. If the heater is in heating mode, the red LED lights up as a check.

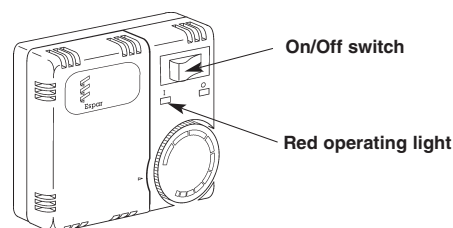
Use the "Fan" button to start the heater in fan mode (continuous operation). This feature circulates the air through out the cabin area. The temperature control knob has no function in fan mode. If the heater is in fan mode, the blue LED lights up as a check.



3 Temperature Setting for Thermostat and Rheostat

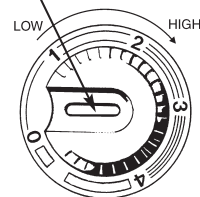
Using the adjusting dial, set the desired temperature range.

- Lowest Setting - approx. 10°C (50°F)
- Mid - Setting - approx. 20°C (68°F)
- Highest Setting - approx. 30°C (86°F)



On OEM installs the "red" & "green" indicator lights illuminate. On aftermarket installs only the "red" light illuminates.

Operation indicating light





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• PART 14 : OEM LITERATURE

ESPAR - AIRTRONIC - HEATING SYSTEM

Operation and Function

3 Temperature Control

- The temperature is monitored constantly at the heater's process air inlet or external sensor.
- This temperature is compared to the set temperature on the adjusting dial (Mini controller/Thermostat).
- The heater cycles through Boost, High, Medium and Low heat modes to maintain the desired temperature.
- If the desired temperature is exceeded while the heater is operating in low heat mode the heater will switch into "standby" mode. This is a comfort feature.
- The heater will re-start once heat is required again.

3 Temperature Setting for Mini Controller

Once switched off manually, the heater begins a controlled cool down cycle.





- Indicating light(s) on switch will go off.
- Fuel pump stops delivering fuel.
- The glow pin is re-energized for a 40 second after-glow to burn off any combustion residue.
- The blower continues to run for 4 minutes and automatically switches off.

3 Controls and Safety Equipment

- If the heater fails to ignite within two 90 second start attempts, a "no start" shut down occurs.
- If a flame out occurs after the heater has started, the heater will attempt one restart.
- If repeated flame outs occur within 10 minutes the heater will not restart.
- Overheat shut down will occur if there is a restriction of the heating air flow (i.e. blocked inlet or outlet). The overheat sensor will automatically reset once the heater has cooled down.
- Once the air flow restriction is removed, the heater can be re-started by switching the heater off then back on.
- If the voltage drops below 10.5 volts or rises above 16 volts the heater will shut down (21 volts and 28 volts for 24 volt systems).
- If the glow pin circuit or fuel metering pump circuit are interrupted the heater will not start.
- The blower motor is checked continuously during operation. Shut down will occur if the blower does not start or maintain proper speed.



Operational Flow Chart

Operating Mode	STARTING PHASE					RUNNING PHASE		SHUT DOWN PHASE		
	System Check	Pre-heat	Ignition Attempt	Pre-heat 2nd. attempt	Ignition Attempt 2nd. attempt	Boost	Controlled Heating	After Glow	Cool Down	Stand by
 Blower	Off	On	On	On	On	On	On	On	On	On
 Glow Pin	Off	On	On	On	On	Off	Off	On	Off	Off
 Fuel Pump	Off	Off	On	Off	On	On	On	Off	Off	Off
	1- 3 sec.	60 sec.	Up to 90 sec.	60 sec.	Up to 90 sec.	Time dependent on heat exchanger temperature		40 sec.	4 min.	
				If Required						
						Continual Operation until switched off by operator or temperature control				

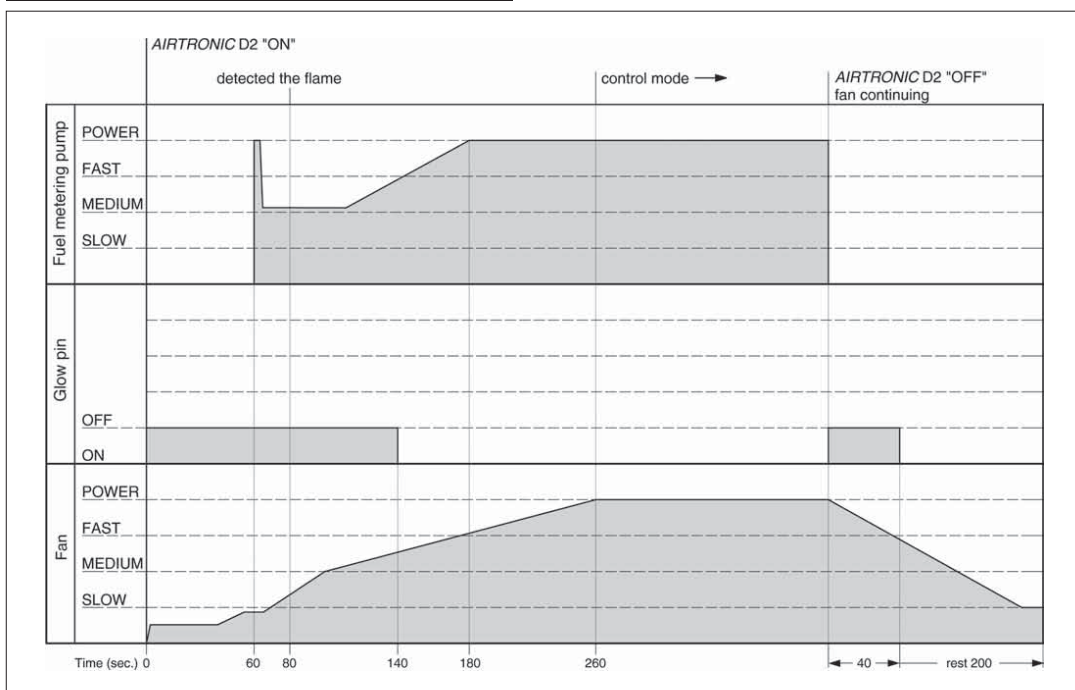
Note: During controlled heating cycle, if desired heat level is exceeded the heater will switch into standby mode.
Heater will automatically restart once heat is again required

• PART 14 : OEM LITERATURE

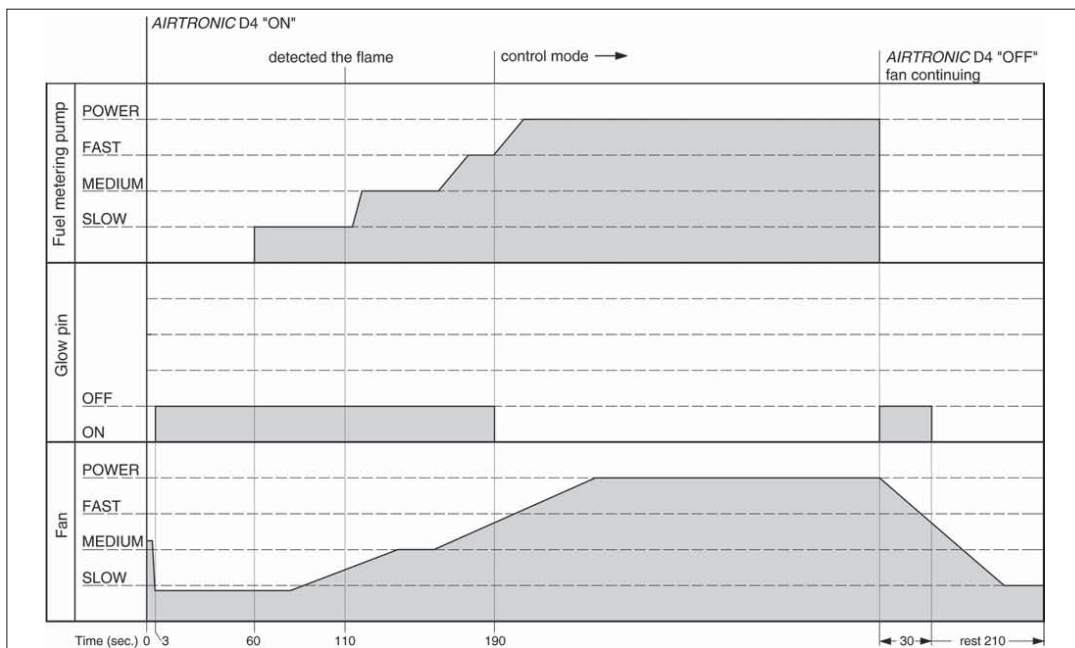
ESPAR - AIRTRONIC - HEATING SYSTEM

Operation and Function

Function diagram *AIRTRONIC D2*



Function diagram *AIRTRONIC D4*

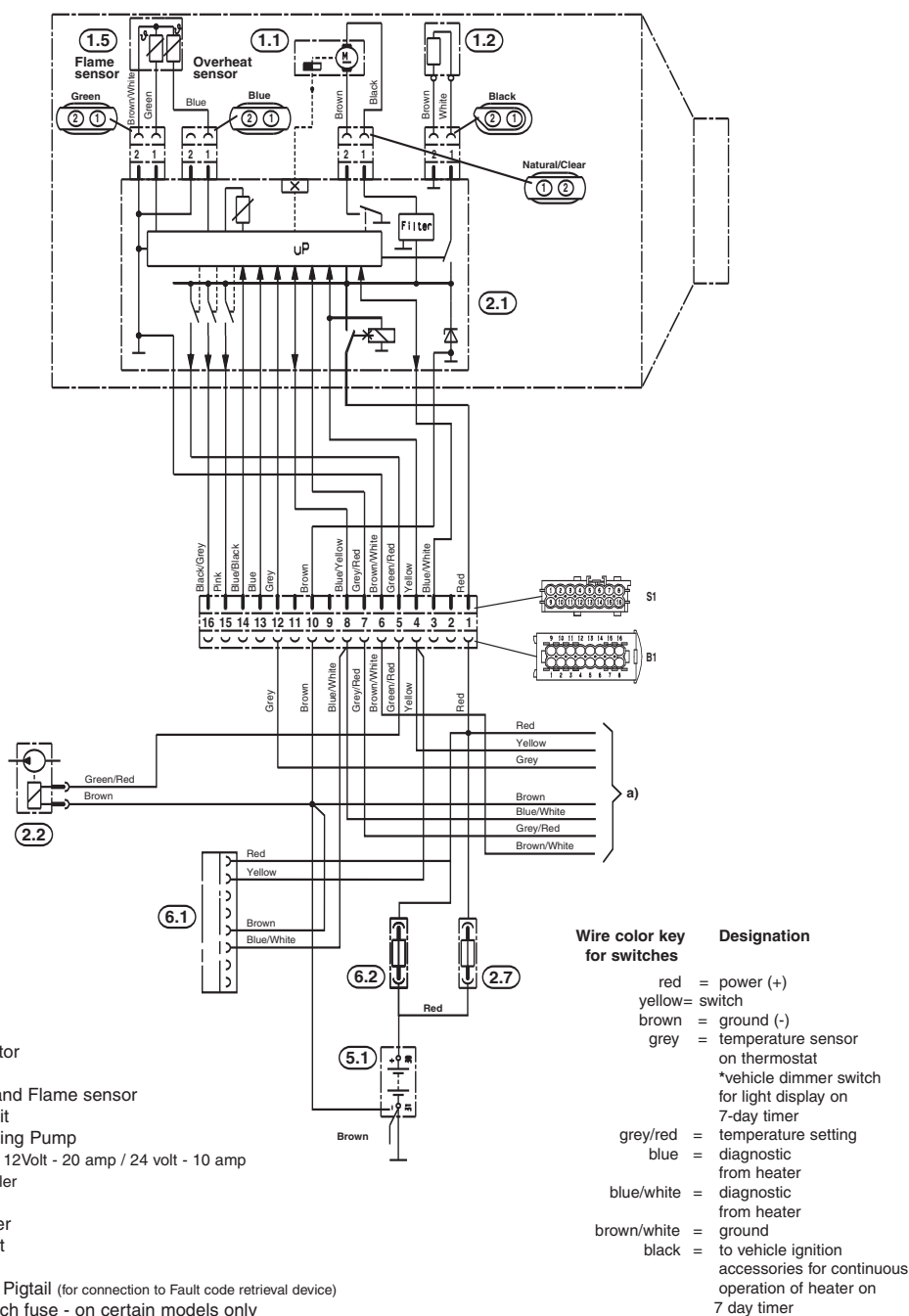


• PART 14 : OEM LITERATURE

ESPAR - AIRTRONIC - HEATING SYSTEM

Operation and Function

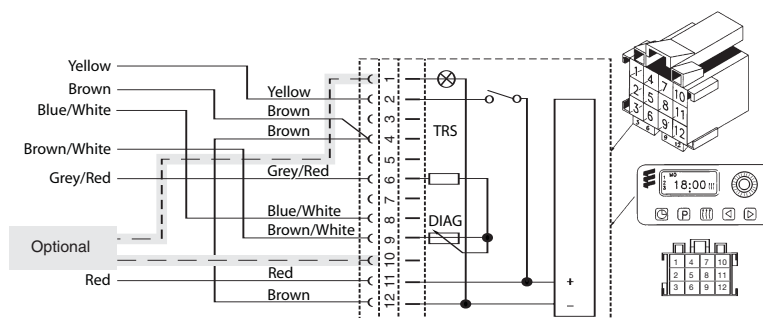
Schematic *AIRTRONIC D2 / AIRTRONIC D4*



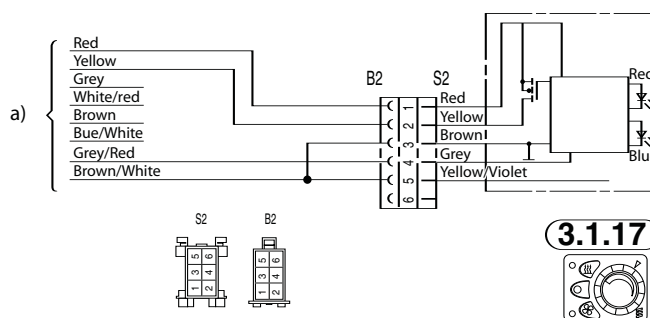
• PART 14 : OEM LITERATURE

ESPAR - AIRTRONIC - HEATING SYSTEM

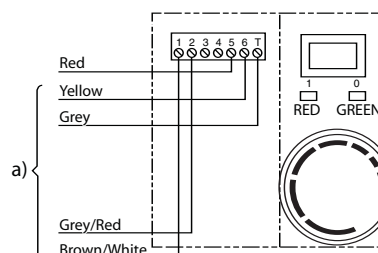
Operation and Function



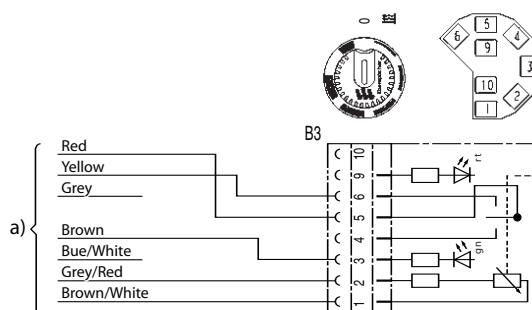
3.2.8



3.1.17



3.5



3.1.11

• PART 14 : OEM LITERATURE

ESPAR - AIRTRONIC - HEATING SYSTEM

Maintenance / Troubleshooting / Repair

Maintenance

Recommended Periodic Maintenance

- Remove the **glow pin** and inspect for carbon build up. Clean or replace.
- Remove the **glow pin screen** and inspect for carbon build up. Replace.
- Make sure **vent hole** is open. Espar recommends the use of non-detergent 100% volatile carburetor cleaner, an air gun will also help. Remove loose carbon from the glow pin chamber.
- Inspect the **ducting**, the air intake screen and air outlet for restriction or blockage.
- Inspect **combustion air intake and exhaust** for blockage.
- Operate your heater for a minimum of 20 minutes each month.
- **Maintain your batteries** and all electrical connections in good condition. With insufficient power the heater will not start. Low and high voltage cutouts will shut the heater down automatically.
- Use **fuel suitable for the climate** (see engine manufacturers recommendations). Blending used engine oil with diesel fuel is not permitted.

Basic Troubleshooting

Check List:

What happens when the heater is switched on and

Heater does not ignite

1 Blower motor does not run

- Check:**
- Fuse in power harness.
 - Power to control unit.
 - Power to and from switch.
 - Electrical connections.

2 Blower motor runs approximately 20 seconds and then shuts off

- Check:**
- Ensure voltage at control unit remains above 10 volts during start up with glow pin circuit on.

3 Blower motor runs/fuel metering pump starts and then shuts down after two start up attempts

- Check:**
- Fuel lines and fuel filter.
 - Fuel quantity. Pg. 27
 - Combustion air or exhaust tube blockage.

4 Blower motor runs/no fuel metering pump

- Check:**
- For electrical pulses at fuel metering pump.
 - If pump is frozen.
 - Blocked fuel line.

Heater ignites

1 Shuts down at random

- Check:**
- Fuel metering pump quantity. Pg. 27
 - Possible overheat.
 - Control unit input voltage.

2 Heater smokes and carbons up

- Check:**
- Exhaust pipe blocked.
 - Combustion air intake blocked.
 - Exhaust entering combustion air intake pipe.
 - Short cycling, rapid on/off operation.
 - Fuel system.
 - Fuel metering pump position and quantity.
 - Motor rpm.



• PART 14 : OEM LITERATURE

ESPAR - AIRTRONIC - HEATING SYSTEM

Maintenance / Troubleshooting / Repair

Self Diagnostics


The heater is equipped with self diagnostic capability. To retrieve information on the heater's last 5 faults, a retrieval device is required (P/N: 20 2900 70 50 20). There is a pig tail to accommodate the connector on the main harness from heater. If wire pigtail is not present, a wiring adapter (P/N: 22 1000 31 86 00) must be used.

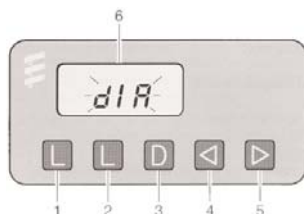
Connect the fault code retrieval device as shown. This device enables these five functions to be performed.

1. Access the current fault which is affecting the heater.
2. Access the five previous faults which affected the heater.
3. Clear the fault memory to erase previous fault history.
4. Unlock "lockout features" which exist for some control units.
5. Start heater.

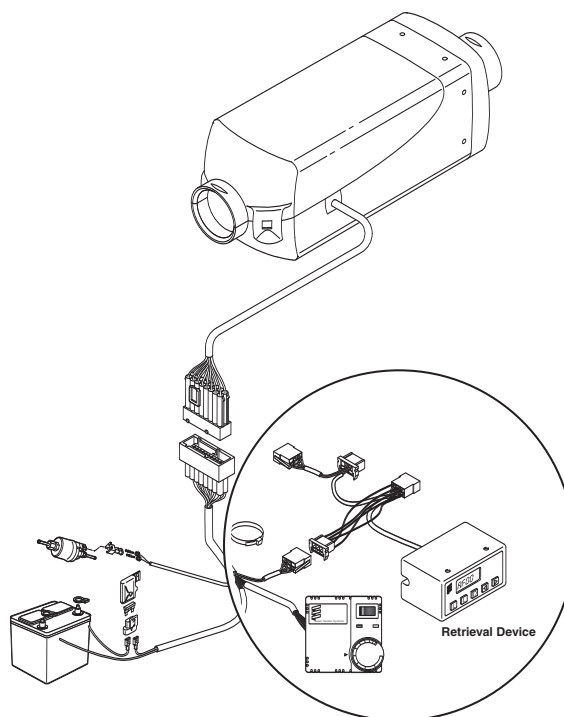
Equipment Face and Controls

Symbols that are seen on the display face are as follows:

AF	Actual fault.
F1-F5	Up to five stored faults can be accessed. The AF and F1 are the same number.
	This sign is displayed when the heater is in operation.
DIAG	The word (DIA) 'gnostic will come on when the unit is connected.
000	Three digit diagnostic fault code number.

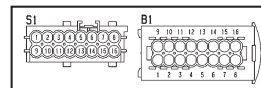


1. delete fault memory
 2. delete fault memory
 3. switch heater on / off, request diagnostic fault codes
 4. backwards, fault F5 - F1, AF
 5. forward AF, F1 - F5
 6. display
- Switch the fault code retrieval device on and wait 10 seconds.
 - Press the "D" button.
 - Wait 3-5 seconds for the current fault code to appear (AF).
 - To review the previous faults use the arrow buttons (F1= Most Recent, F5= Oldest).
 - Consult the fault code chart for code number descriptions.
 - To erase the faults that are in memory press both "L" keys at the same time for 5 seconds. This will also unlock the control unit in the case of an operational lockout.



Note: If there are no heater faults, the heater will go through a normal start cycle and regulate based on thermostat setting.

See schematic
pg. 19





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• PART 14 : OEM LITERATURE

ESPAR - AIRTRONIC - HEATING SYSTEM

Maintenance / Troubleshooting / Repair

Fault Code	Fault Description Causes / Repair
000 Normal Operation	
004 Warning - short circuit in control unit, fresh air-outlet	Disconnect connection S1/B1 at <i>AIRTRONIC</i> . At connector B1, pin 16 check for short between pin and blower relay. If no short exists replace control unit.
005 Warning - short circuit at control unit - anti-theft alarm output	Disconnect connection S1/B1 at <i>AIRTRONIC</i> . At connector B1, pin 15 check the line through to the relay isolating switch or theft warning in line for short circuit to chassis. If no short exists replace control unit.
009 TRS - shut down	Switch off due to signal change. Check for change of signal from (+) to (-) at pin 13 (S1) or a (+) signal at pin 14 (S1).
010 Overvoltage	Start vehicle motor. Check voltage at (B1) between terminals 1 and 10. This must be less than 16 volts (15.2 volts with glow pin on). Check vehicle charging system. <i>AIRTRONIC 24 volt - voltage must be less than 32 volts</i>
011 Undervoltage shut down	Check voltage at connector (B1) between terminals 1 and 10 when heater starts. This must be more than 10 volts. Check vehicle charging system. Check batteries and connections. <i>AIRTRONIC 24 volt - voltage must be more than 21 volts.</i>
012 Overheat at overheating sensor	Sensor has detected excessive temperatures. Check for clogged hot air ducting. Check that the the total number of ducting pieces in unison is not too large. Re-route if necessary. Check overheat sensor resistance values. (see component value chart pg 27). If O.K. Measure fuel quantity. See page 27.
013 Overheat at flame sensor	Flame sensor detects excessive temperature at heat exchanger. Check for clogged hot air ducting. Check that the the total number of ducting pieces in unison is not too large. Re-route if necessary. Measure fuel quantity. See page 27. Check flame sensor resistance. (see component value chart pg 27)
014 Temperature difference between flame sensor and overheat sensor too large	Check for clogged hot air ducting. Check that the the total number of ducting pieces in unison is not too large. Check flame sensor, if O.K., check overheat sensor. If over-heat sensor is O.K. measure fuel quantity. See page 27. If fuel quantity is O.K. replace control unit.
015 Overheat with excessive temperatures	Fault code 015 is shown when the <i>AIRTRONIC</i> is switched on again after fault code 017. The hardware limit value for the overheat sensor, has been exceeded - control unit is locked. Unlock control unit, follow procedure for code 014.
017 Overheat with excessive temperature	The hardware limit value for the overheat sensor, has been exceeded, because the control unit has not detected fault code 012, 013. The control unit is locked. If <i>AIRTRONIC</i> is switched on again, fault code 015 is displayed. Unlock control unit, follow procedure for code 014.
019* Glow Pin Resistance	Power consumed by glow pin is too low (glow pin resistance is too high). Replace the glow pin.
020 Open circuit - glow pin	Check continuity of glow pin. <i>AIRTRONIC 12 volt - approx. 0.42 Ω - 0.70 Ω</i> <i>AIRTRONIC 24 volt - approx. 1.2 Ω - 2.5 Ω</i>
021 Short circuit - glow pin	Check functions of glow pin in installed condition, to do so disconnect connector from controller. <i>AIRTRONIC 12 Volt and 24 Volt</i> . Apply voltage of 8 / 18 volts to glow pin respectively, and measure current intensity after 40 seconds. Glow pin is O.K. for the following values: glow pin 8 volt - current = 9 amps \pm 1.5 / - 1.2 amps glow pin 18 volt - current = 4 amps \pm 0.5 amps If the values differ, replace glow pin. If the values of the continuity test and function test are O.K., check glow pin cable harness for damage and continuity. If O.K., replace control unit.

Caution!
For *AIRTRONIC 12 volt*, check functions with max. 8 volt
For *AIRTRONIC 24 volt*, check functions with max. 18 volt.
If voltage values are exceeded the component is destroyed.
Check short-circuit resistance of mains unit: min. 20 Amp.

* This fault code is only displayed for a new generation control box. This differs from the control box to date by its cable loom wrapped in cable taped and by a temperature sensor mounted on the side, which becomes visible when the cover is removed.



TECHNICAL MANUAL

MX151D - GM



• PART 14 : OEM LITERATURE

ESPAR - AIRTRONIC - HEATING SYSTEM



Maintenance / Troubleshooting / Repair

Fault Code	Fault Description Causes / Repair
022* Gow pin, output (+) - short circuit	Check glow plug lead harness for correct laying and damage and continuity, if ok -> replace control box.
025* Diagnostics cable blue/white - short circuit	This fault code cannot be displayed as the diagnostics cable is probably defective. Check diagnostics cable for correct laying and possible damage.
031 Blower motor interrupted	Check blower motor cable harness for correct routing and damage. If O.K., disconnect cable harness from control unit and check for continuity, if O.K., replace control unit.
032 Blower motor, short circuit Caution! For AIRTRONIC 12 volt, check functions with 8 volt For AIRTRONIC 24 volt, check functions with 18 volt. If voltage values are exceeded the component may be destroyed. Check short-circuit resistance of mains unit: min. 20 Amp.	Check wires for short circuit. Check functions of blower motor, to do so, disconnect connector from control unit. Apply voltage of 8 volts or 18 volts \pm 0.1 to blower motor and measure current intensity after 40 seconds. Current < 6.5 amp - blower motor O.K., replace controller Current > 6.5 amp, replace blower.
033 Blower motor does not turn	Motor speed varies from specification by more than 10% for longer than 30 seconds. If too slow, check for restriction, and check for short in motor circuit or control unit. If none found, replace blower. If too fast, check for damage or missing magnetic sensor on control unit. Replace blower motor if damaged. Replace control unit otherwise.
034* Blower motor, outlet (+) short circuit after U_B (battery voltage)	•Check that the lead harness of the blower motor has been correctly laid and check for damage, if ok —> remove lead harness at control box and check for continuity, if ok —> replace control box.
047 Short circuit or overload - fuel metering pump	Disconnect connector from fuel metering pump, if fault code 048 (interruption) is displayed then the fuel metering pump is defective, replace FMP. If fault code 047 is still displayed, then disconnect connection S1/B1. At connector B1, Pin 5, check line1(green/red) through to FMP for short circuit to pin 10, if O.K. replace control unit.
048 Open circuit - fuel metering pump	Disconnect connector from fuel pump and measure resistance value of fuel pump (see values, pg 28). If resistance values O.K., then reconnect cable harness to the fuel pump. Disconnect connection S1/B1, and measure the resistance value between pin 5 and pin 10. If O.K., replace control unit.
049* Metering pump outlet (+) Short circuit - after U_B (battery voltage)	Check that the lead harness of the metering pump has been correctly laid and check for damage, if ok -> remove lead harness and check for continuity, if ok -> replace control box.
050 Too many no start attempts	Control unit is locked after too many unsuccessful start attempts. (Maximum 255 start attempts). Check fuel, glow pin, combustion air and exhaust flow. Unlock the control box by deleting the fault memory with the timer, diagnostic unit, or Edith service program.
051 Faulty flame recognition	If the resistance value of flame sensor is 1274 Ω after switching on (> 70°C), then the blower of the AIRTRONIC runs for approx. 15 minutes to cool down. If resistance does not fall below the above value within 15 mins., this is followed by fault shut down. Check flame sensor, diagrams and values, pg 27. If O.K., replace control unit.
052 No start safety time exceeded	No flame detected on start attempt. Check exhaust and combustion air lines. Check fuel supply/measure fuel quantity, see following pages. Check glow pin (see fault code 020 and 021). Check flame sensor, diagram and values table on following pages, if O.K., replace control unit.
053 Flame cutout in boost mode	Heater has started successfully the flame has extinguished.
054 Flame cutout in high mode	Check exhaust and combustion air lines. Check fuel
055 Flame cutout in medium mode	supply/measure fuel quantity, see values, pg 27. Check flame
056 Flame cutout in low mode	sensor, diagram and values table on following pages, if O.K., replace control unit.

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ESPAR - AIRTRONIC - HEATING SYSTEM

Maintenance / Troubleshooting / Repair

Fault Code	Fault Description Causes / Repair
060 Open circuit - external temperature	Temperature sensor detects a value beyond it's range sensor Disconnect connection S1/B1 (main harness), measure resistance value at connector B1, pins 6 & 12. Refer to the values table on pg 25. If there is an open circuit, the ohmic value between the pins is > 7175. If the resistance value is O.K., then the control unit is defective. Replace control unit.
061 Short circuit - external temperature	Disconnect connection S1/B1 (main harness), measure resistance value at connector B1, between pins 6 & 12., see values on pg 25. If there is a short circuit, the ohmic value between the pins is < 486 Ω. If fault 061 continues to be displayed, then the control unit is defective. Replace control unit.
062 Thermostat/Rheostat/Timer, open circuit Fault recognition only works in heating mode. However, if a short circuit already exists and the <i>AIRTRONIC</i> is subsequently switched on, ventilating mode will be active (no fault code).	Potentiometer values outside of range on Thermostat (switch) Check resistance between pins 6 and 7 at B1. Resistance value for interruption between pins > 7175 Ω Normal value: 1740 Ω - 2180 Ω (± 80 Ω) If resistance value is O.K., replace control unit. If not replace thermostat switch.
063 Switch control - short circuit	If a ventilating switch has been built in, disconnect and check function. If faulty, replace switch. Disconnect wires from thermostat or switch. If fault code 062 is displayed, replace switch. If switch is O.K., check connection lines grey/red and brown/white for short-circuit. If O.K., reconnect wires to thermostat/switch. Disconnect connection B1. If fault 063 is still displayed, replace control unit. Resistance value for short circuit between pins 6 and 7 < 486 Ω. Normal value: 1740 Ω - 2180 Ω (± 80 Ω).
064 Open circuit - flame sensor	Sensor is sensing value outside of range. Open <i>Airtronic</i> shell and remove control unit from casing. Disconnect green connector from control unit. At green connector measure resistance value at green wire and brown/white wire. Check flame sensor, diagram and values on pg. 25. If flame sensor is O.K., replace control unit. Resistance value for interruption > 7175 Ω
065 Short circuit - flame sensor	Open <i>Airtronic</i> shell and remove control unit from casing. Disconnect green connector from control unit. If fault 064 is displayed, replace combination sensor (flame/temperature). If fault 065 is still displayed, replace control unit. Resistance value for short circuit < 486 Ω, see values on following pages.
071 Open circuit - overheat sensor	Open <i>Airtronic</i> shell and remove control unit from casing. Disconnect blue and green connectors from control unit. Measure the resistance value at blue connector (pin 1- blue wire) and at green connector pin 2 (brown/white wire). See values on following pages. If O.K., replace control unit. Resistance value for interruption > 223 Ω.
072 Short circuit - overheat sensor	Open <i>Airtronic</i> shell and remove control unit from casing. Disconnect blue connector from control unit. If fault 071 displayed, replace combination sensor (flame/temperature). If fault 072 is still displayed, replace control unit. Resistance value for short circuit < 183 Ω, see following pages for values.
074* Control box defect	Overheating threshold value is not detected by control box —> replace control unit.
090 Control unit defect	Internal failure. Replace control unit.
091 External voltage disturbance	Check vehicle charging system. Poor battery, battery charger, eliminate fault.
092 Control unit defective (ROM fault)	Disconnect heater from power for 10 seconds by disconnecting it from harness or pull out the fuses. Reconnect and test again. If the problem persists, replace ECU.
093* Control unit defective	
094 Control unit defective (EEPROM fault)	
095* Control unit defective	
096 Internal temperature sensor defect	Replace control unit or use external temperature sensor if possible.
097 Control unit defective (power failure)	Internal failure. Replace control unit.

* This fault code is only displayed for a new generation control box. This differs from the control box to date by its cable loom wrapped in cable taped and by a temperature sensor mounted on the side, which becomes visible when the cover is removed.



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ESPAR - AIRTRONIC - HEATING SYSTEM

Maintenance / Troubleshooting / Repair



Fault Code

098* Control unit defective
099* Too many resets in sequence

Transistor error in control box.

Fault Description Causes / Repair

Replace control unit.

Voltage short-term < 5 - 6 volt (for 12 volt) or < 7 - 8 volt (for 24 volt).
In case of a voltage drop, check the fuses, the supply cables, the negative connections and the positive support point on the battery for corrosion and correct contact.

Test control box with testing device, if ok -> check lead harness of the external components has been correctly laid and check for damage, if ok -> check lead harness for continuity, if ok -> replace control box.

* This fault code is only displayed for a new generation control box. This differs from the control box to date by its cable loom wrapped in cable taped and by a temperature sensor mounted on the side, which becomes visible when the cover is removed.



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ESPAR - AIRTRONIC - HEATING SYSTEM

Notes:

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ESPAR - AIRTRONIC - HEATING SYSTEM

Maintenance / Troubleshooting / Repair

Fuel Quantity Test

The fuel quantity should be tested if the heater has difficulty starting or maintaining a flame.

Preparation

- Detach the fuel line from the *AIRTRONIC*.
- Insert the fuel line into a measuring glass (10 cm³) graduated cylinder 10ml.
- Switch the *AIRTRONIC* on and allow fuel system to bleed out air for approx. 60 seconds.
- Switch the *AIRTRONIC* off and drain the measuring glass.

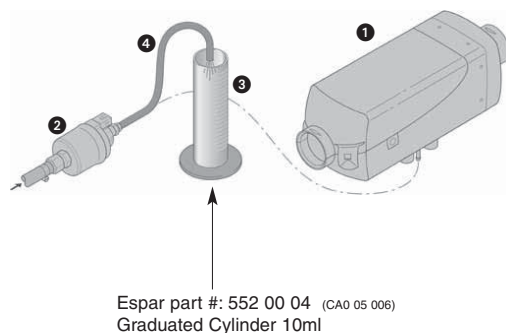
Measurement

- Switch the *AIRTRONIC* on.
- The fuel is pumped approx. 30 seconds after switching on.
- Hold the fuel line in the measuring glass level with the glow pin while fuel is being delivered.
- The pump will stop automatically after delivering fuel for 90 seconds (110 seconds for *AIRTRONIC* 4).
- Once fuel pump stops, switch off the heater.

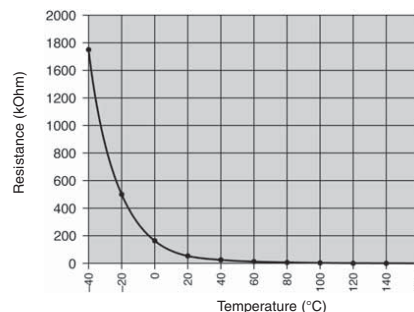
Evaluation

- Read out the quantity of fuel in measuring glass.
- Fuel quantity should be between:
3.5 ml and 4.3 ml. on *AIRTRONIC* 2
5.0 ml and 6.3 ml. on *AIRTRONIC* 4
- Replace the fuel metering pump if the fuel quantity is above specified value.
If measured fuel quantity is insufficient:
 - Check the filter in the fuel pump.
 - Check that the fuel lines are correctly routed.
 - Check that the fuel lines don't leak.
 - Check and tighten hose connections.
 - Does fuel withdrawal comply with the data in the technical description.

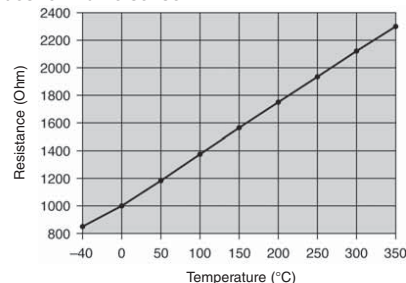
Note: The fuel quantity is not affected by voltage variances.



Values for Overheat sensor



Values for Flame sensor



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ESPAR - AIRTRONIC - HEATING SYSTEM

Maintenance / Troubleshooting / Repair

Repair Instructions

Removing the cover

Removing and checking the control unit

Removing the glow pin

Removing the lining

Removing and checking the overheat and flame sensor

Installing the overheat and flame sensor

Dismantling the heat exchanger

Removing the combustion air blower

Removing the combustion chamber

Caution: Remove power from the heater prior to any disassembly by unplugging main connection or removing main fuse.
If gasket was removed during disassembly, replace it when reassembling.
Clean all parts before reassembly and check for any signs of damage, replace where necessary.

Removing the cover from the AIRTRONIC

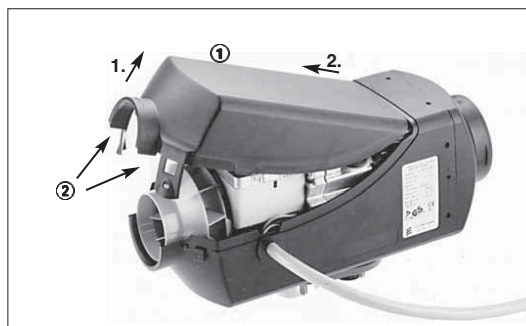
Unlock both seal plates, lift cover and pull to the front.

Note:

The cover must always be removed from the AIRTRONIC for all repair stages. You may have to wait for the device to cool down.

The cable harness can exit from the left or right of heater shell.

Cover ①
Seal Plates ②



Removing the control unit

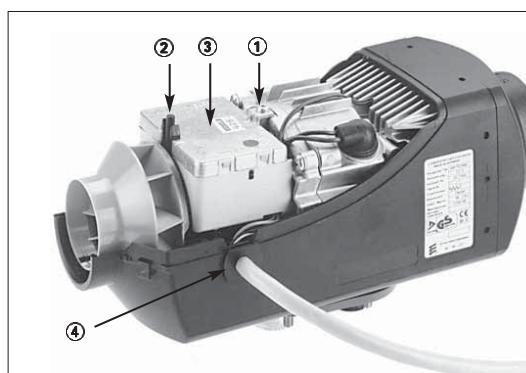
Remove the AIRTRONIC cover.

Unscrew fastening screw, press retaining brackets together, lift out control unit. Unclip the lines from the holder of the control unit (observe the positions of the lines). Remove the bushing (lower part) from the outer case. Disconnect the control unit from the controller. The control unit can now be removed.

Note:

When reassembling the control unit, ensure that the lines are correctly clipped in the holder of the control unit, and that the connectors are plugged into the control unit (non-interchangeable).

Fastening screw ①
Retaining brackets ②
Control unit ③
Bushing ④



Note: Control unit can only be checked while on heater.

Checking the control unit.

A test instrument is necessary to check the control unit in a dismantled state. The test instrument is connected up to the PC and with special software can display run times on certain parts and give a visual of heater in operation.

Part number: 22 1524 89 00 00

Adapter P/N: 22 1000 31 86 00

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Maintenance / Troubleshooting / Repair

Repair Instructions

Removing the cover

Removing and checking the control unit

Removing the glow pin

Removing the lining

Removing and checking the overheat and flame sensor

Installing the overheat and flame sensor

Dismantling the heat exchanger

Removing the combustion air blower

Removing the combustion chamber

Caution: Remove power from the heater prior to any disassembly by unplugging main connection or removing main fuse.
If gasket was removed during disassembly, replace it when reassembling.
Clean all parts before reassembly and check for any signs of damage, replace where necessary.

Removing the cover from the AIRTRONIC

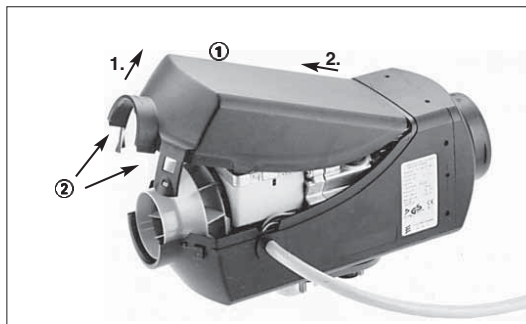
Unlock both seal plates, lift cover and pull to the front.

Note:

The cover must always be removed from the AIRTRONIC for all repair stages. You may have to wait for the device to cool down.

The cable harness can exit from the left or right of heater shell.

Cover ①
Seal Plates ②



Removing the control unit

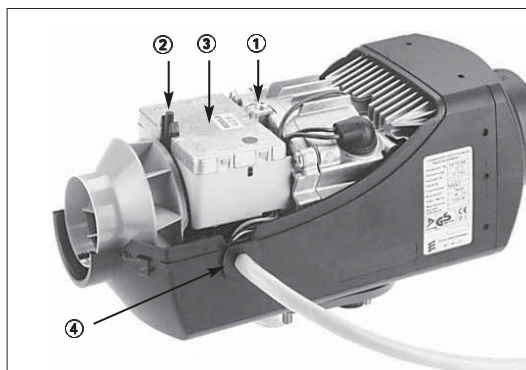
Remove the AIRTRONIC cover.

Unscrew fastening screw, press retaining brackets together, lift out control unit. Unclip the lines from the holder of the control unit (observe the positions of the lines). Remove the bushing (lower part) from the outer case. Disconnect the control unit from the controller. The control unit can now be removed.

Note:

When reassembling the control unit, ensure that the lines are correctly clipped in the holder of the control unit, and that the connectors are plugged into the control unit (non-interchangeable).

Fastening screw ①
Retaining brackets ②
Control unit ③
Bushing ④



Note: Control unit can only be checked while on heater.

Checking the control unit.

A test instrument is necessary to check the control unit in a dismantled state. The test instrument is connected up to the PC and with special software can display run times on certain parts and give a visual of heater in operation.

Part number: 22 1524 89 00 00

Adapter P/N: 22 1000 31 86 00

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ESPAR - AIRTRONIC - HEATING SYSTEM

Maintenance / Troubleshooting / Repair

Heater Casing Disassembly

- Remove the *AIRTRONIC* cover.
- Remove the control unit.

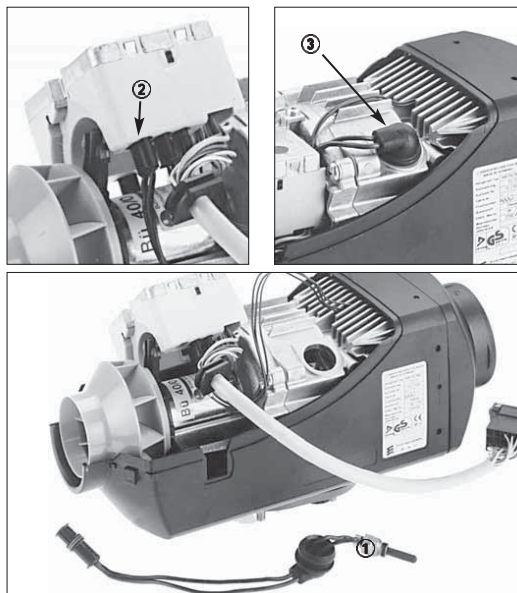
Disconnect the connector of the glow pin cable harness from the control unit.
Remove the rubber grommet and use the special tool (SW 12) to unscrew the glow pin.
The special tool is included with the glow pin.
Tighten torque of the glow pin : 6 ^{+0.5} Nm



Note:

When the glow pin has been removed, check the screen of the support in installed state for any contamination. The screen must be replaced if the surface is covered with carbon.

- Glow Pin ①
Connector of glow pin cable harness ②
Rubber bushing ③



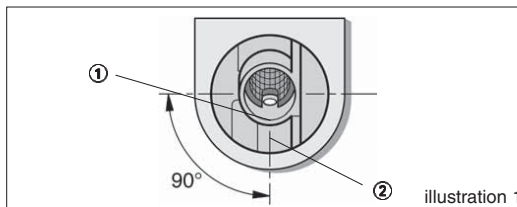
Removing the screen

Pull the screen out of the support with pointed pliers. Blow out the support with compressed air.
If necessary, carefully pierce with a wire.

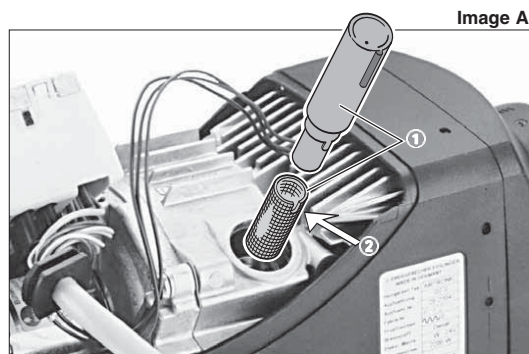
The special tool has to be used to install the new screen. The special tool is included with the screen. Push the screen onto the special tool, watching the position of the recess. The recess must be positioned at right angles (90°) to the axis of the heater.

Push the tool with the screen carefully as far as it will go, ensuring that the bore (ø 2.7 mm) for the glow plug ventilation is free. See illustration 1.

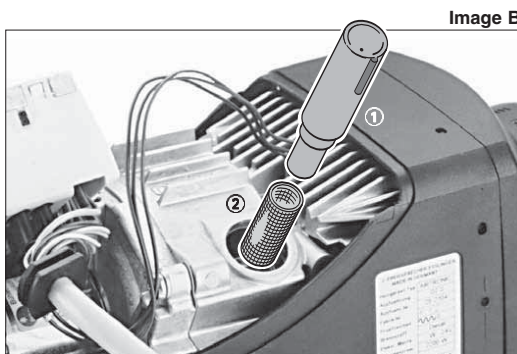
In case of the shorter, new style screen (see image B) the position of the screen to the vent hole has no reference. Ensure installation tool is completely seated when installing screen.



- ① Screen
② Bore (Ø 2.7 mm) for glow pin ventilation



- ① Special tool with lining
② Position of recess



- ① New Special tool
② New Screen

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ESPAR - AIRTRONIC - HEATING SYSTEM

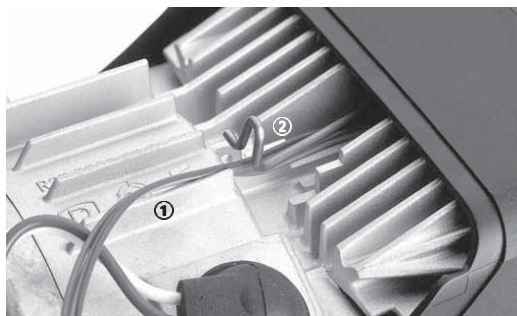
Maintenance / Troubleshooting / Repair

Removing the overheat sensor / flame sensor

- Remove the *AIRTRONIC* cover.
- Remove the control unit.

Disconnect both connectors of the overheating / flame sensor cable harness from the control unit.
Unlock clip from sensor.
Remove overheat/flame sensor.

Cable harness for overheat/flame sensor ①
clip ②



Checking the overheat / flame sensor

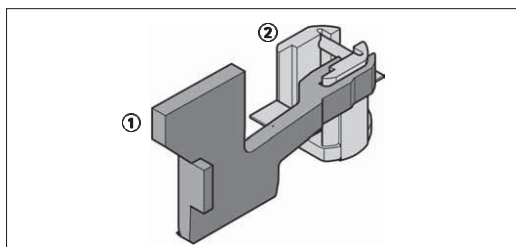
Observe a maximum temperature of 320° C for checking the sensor.

Overheat sensor

Check the overheat sensor with a digital multimeter. If the resistance value is outside the set point indicated in the values, on pg.26 then the sensor must be replaced.

Flame Sensor

Check the flame sensor with a digital multimeter. If the resistance value is outside the set point indicated by the values table on pg 26, then the sensor must be replaced.



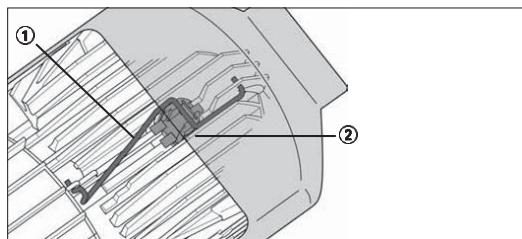
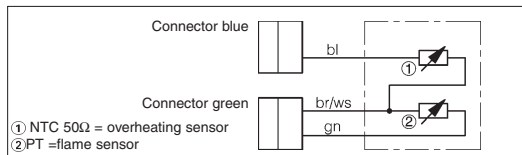
- ① Special tool - only for *AIRTRONIC* D2
- ② Overheat sensor / flame sensor

Installing the overheat / flame sensor

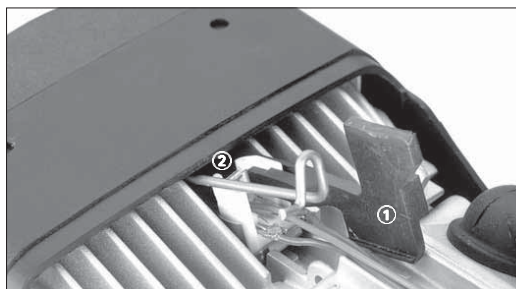
For *AIRTRONIC* D2 (Assembly using purpose made tool) mount the special tool on the sensor.
Place the sensor on the heat exchanger using the special tool. The special tool slides on the heat exchanger until the sensor meets the collar (installation site of the sensor).

Lock the sensor in place and remove the purpose made tool. It is then vital to check that the sensor sits flat on the heat exchanger. If necessary use a mirror and lamp to aid correct assembly.

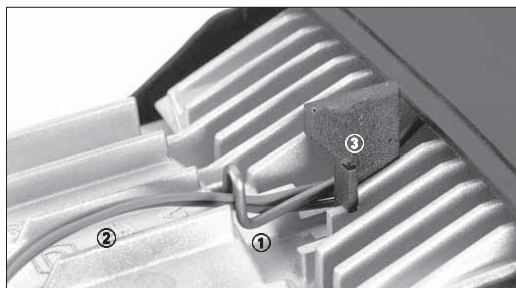
Route the cable harness sensor along the clip eyelet to the control unit and connect.



- ① Clip
- ② Overheat sensor / flame sensor



- ① Special tool - only for *AIRTRONIC* D2
- ② Overheat sensor / flame sensor



- ① Clip
- ② Cable harness - overheat/ flame sensor
- ③ Special tool - only necessary for the *AIRTRONIC* D2

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ESPAR - AIRTRONIC - HEATING SYSTEM

Maintenance / Troubleshooting / Repair

Dismantling the heat exchanger Removing the combustion air blower

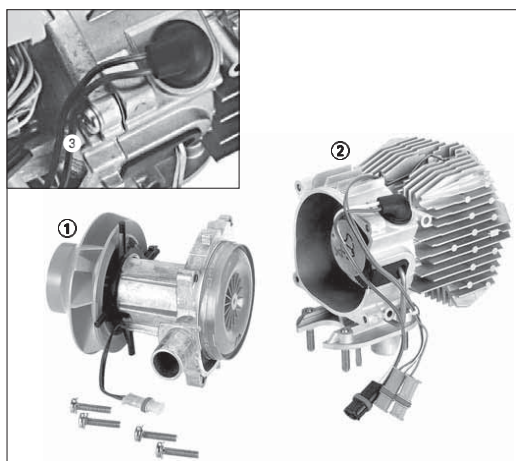
- Remove the *AIRTRONIC* cover.
- Remove the control unit.

Remove the flange seal.
Take the *AIRTRONIC* out of the outer case (lower part).
Unscrew the 4 fastening screws from the combustion air blower.
Remove the combustion air blower and the seal from the heat exchanger.

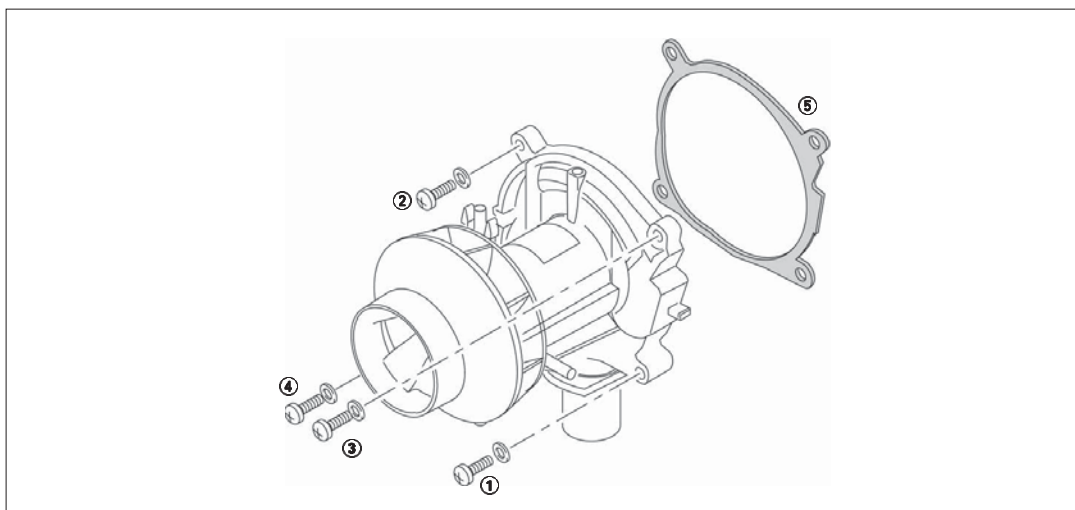
Important!

When reassembling the combustion air blower, a new seal is always required.

Tighten the 4 fastening screws of the combustion air blower in the series shown in the drawing, with a tightening torque of 4 ± 0.5 Nm.



- ① Combustion Air blower
- ② Heat Exchanger
- ③ Fastening screws



- ① - ④ Tighten the fastening screws in this sequence with a tightening torque of 4 ± 0.5 Nm
- ⑤ Always replace the seal between combustion air blower and heat exchanger

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ESPAR - AIRTRONIC - HEATING SYSTEM

Maintenance / Troubleshooting / Repair

Removing the combustion chamber

- Remove the *AIRTRONIC* cover.

Remove the flange seal.

Take the *AIRTRONIC* out of the outer case (lower part).

- Remove control unit (see previous pages).
- Remove glow pin (see previous pages).
- Remove combustion air blower (see previous pages).

Unscrew the fastening screws.

For *AIRTRONIC* D2 = 3 fastening screws

For *AIRTRONIC* D4 = 4 fastening screws

Pull the combustion burner out to the front and remove the burner's thermal insulator from the heat exchanger.

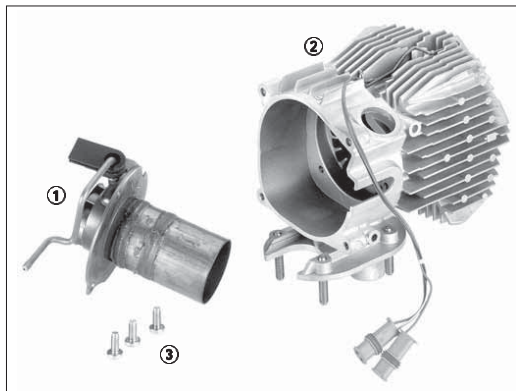
Note!

When reassembling the combustion burner, the thermal insulator, must always be replaced.

Tighten the fastening screws of the combustion chamber with a torque of 5 ^{+0.5} Nm.

Note:

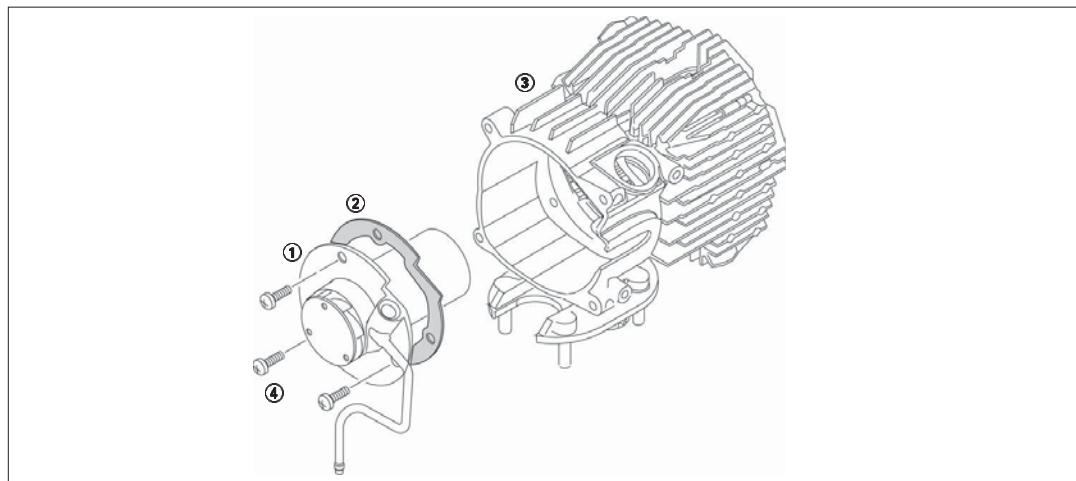
If the heat exchanger is being replaced, the overheat / flame sensor must be dismantled and mounted to the new heat exchanger (see previous pages).



- ① Combustion burner
- ② Heat Exchanger
- ③ Fastening screws

AIRTRONIC D2 = 3 fastening screws

AIRTRONIC D4 = 4 fastening screws



- ① Combustion burner
- ② Thermal insulator between combustion burner and heat exchanger, must always be replaced if burner is removed from the heat exchanger.
- ③ Heat exchanger
- ④ Fastening screws

AIRTRONIC D2 = 3 fastening screws

AIRTRONIC D4 = 4 fastening screws

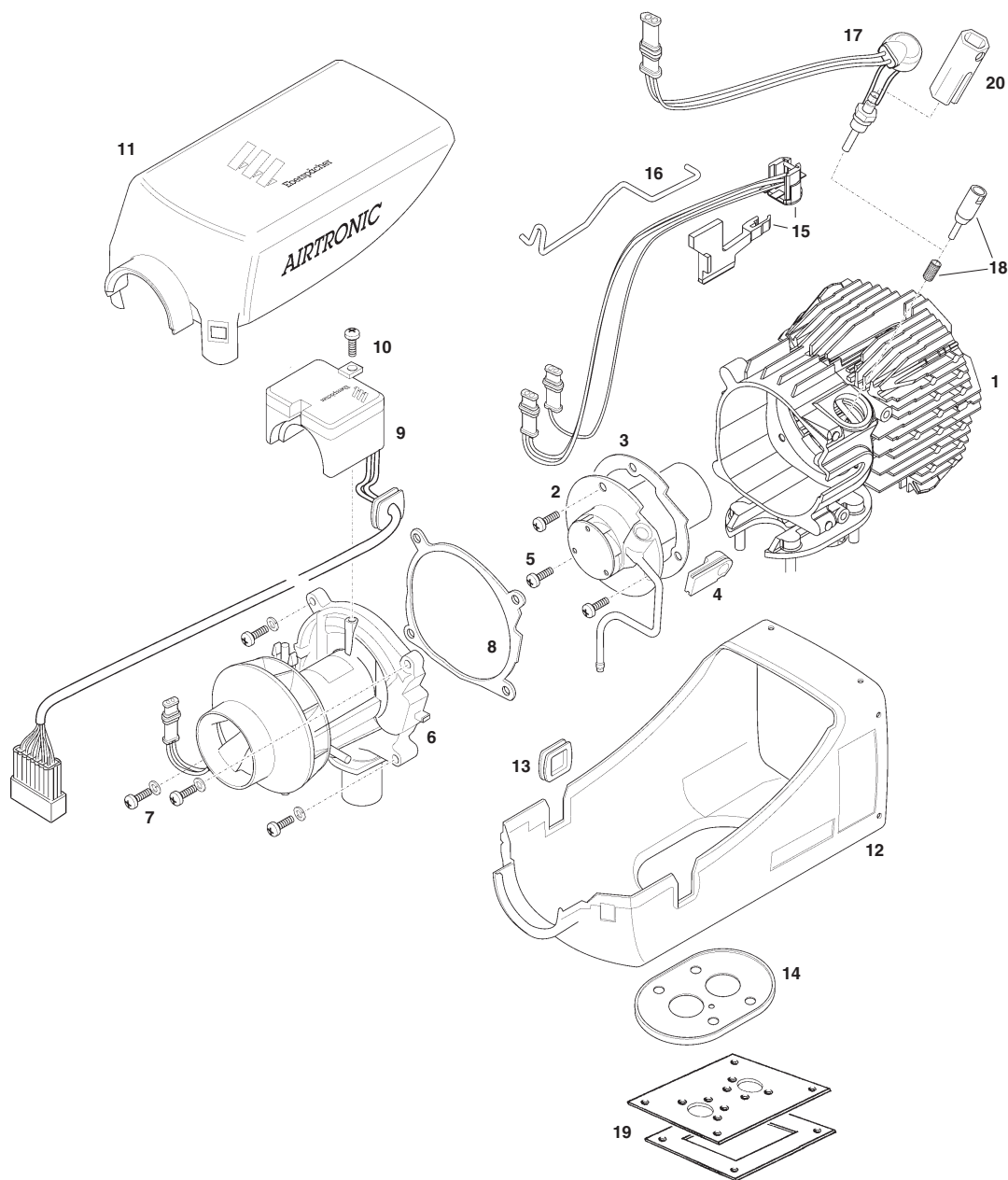
- PART 14 : OEM LITERATURE

ESPAR - AIRTRONIC - HEATING SYSTEM

Heater Parts

AIRTRONIC D2 / D3 / B / D4

Service Parts Diagram





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ESPAR - AIRTRONIC - HEATING SYSTEM

Heater Parts

AIRTRONIC D2 / D3 / B / D4

Ref. No.	Description	Part Number	Model #	20 1812 05 12V	25 2069 05 12V	25 2070 05 24V	25 2326 05 12V	25 2113 05 12V	25 2114 05 24V	25 2144 05 12V	25 2145 05 24V	25 2317 05 12V	25 2318 05 12V	25 2327 05 12V
1	Heat exchanger	25 2069 06 01 00 25 2113 06 01 00		•	•	•	•	•	•	•	•	•	•	•
2	Burner	25 2069 10 01 00 25 2113 10 01 00 20 1812 10 01 00		•	•	•	•	•	•	•	•	•	•	•
3	Thermal insulator for burner	25 2069 06 00 01 25 2113 06 00 01		•	•	•	•	•	•	•	•	•	•	•
4	Grommet	25 2069 06 00 02		•	•	•	•	•	•	•	•	•	•	•
5	Fillister head bolt, M 5 x 12 (3 required)	103 10 348		•	•	•	•	•	•	•	•	•	•	•
	Fillister head bolt, M 5 x 12 (4 required)	103 10 348		•	•	•	•	•	•	•	•	•	•	•
6	Blower motor	12V 25 2069 99 20 00 24V 25 2070 99 20 00 12V 25 2113 99 20 00 24V 25 2114 99 20 00 12V 25 2144 99 20 00 24V 25 2145 99 20 00		•	•	•	•	•	•	•	•	•	•	•
7	Fillister head bolt, M 5 x 25	Locally available hardware		•	•	•	•	•	•	•	•	•	•	•
8	Gasket, blower	25 2069 01 00 03 25 2113 01 00 03		•	•	•	•	•	•	•	•	•	•	•
9	Control unit	24V 22 5102 00 10 01 12V 22 5101 00 10 05 24V 22 5102 00 10 03 12V 22 5101 00 10 06 24V 22 5102 00 10 06 12V 22 5101 00 10 12 12V 22 5101 00 10 11 12V 22 5101 00 10 13 12V 22 5101 00 10 14 Hella 12V 22 5101 00 30 01 Hella 12V 22 5101 00 30 05 22 5101 00 30 15		•	•	•	•	•	•	•	•	•	•	•
10	Fillister head bolt, M 4 x 10	103 10 349		•	•	•	•	•	•	•	•	•	•	•
11	Upper casing	25 2069 01 06 00 25 2113 01 00 01		•	•	•	•	•	•	•	•	•	•	•
12	Lower casing	25 2069 01 01 00 25 2113 01 01 00		•	•	•	•	•	•	•	•	•	•	•
13	Grommet	25 2069 01 00 01		•	•	•	•	•	•	•	•	•	•	•
14	Flange seal	25 2069 01 00 02		•	•	•	•	•	•	•	•	•	•	•
15	Overheat sensor / Flame sensor with tool	25 2069 01 02 00		•	•	•	•	•	•	•	•	•	•	•
16	Clip	25 2069 01 02 02 25 2113 01 02 02		•	•	•	•	•	•	•	•	•	•	•
17	Glow pin with socket wrench	12V 25 2069 01 13 00 24V 25 2070 01 11 00		•	•	•	•	•	•	•	•	•	•	•
18	Glow pin screen with tool	25 2069 10 01 02		•	•	•	•	•	•	•	•	•	•	•
19	Mounting plate with hardware and seal	5540001 (CA0 00 019)		•	•	•	•	•	•	•	•	•	•	•
20	Socket wrench	25 2069 01 03 03		•	•	•	•	•	•	•	•	•	•	•

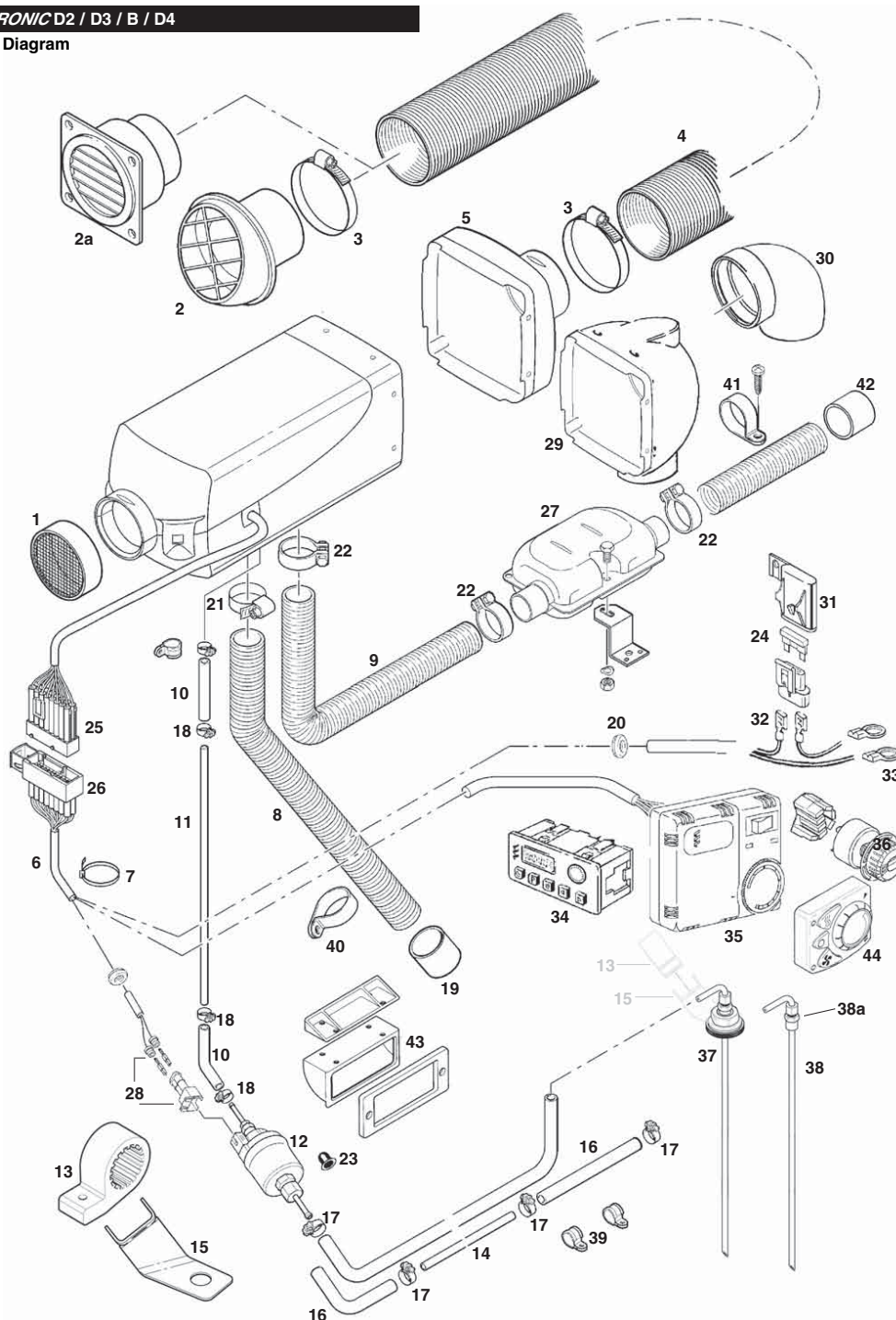
• PART 14 : OEM LITERATURE

ESPAR - AIRTRONIC - HEATING SYSTEM

Heater Parts

AIRTRONIC D2 / D3 / B / D4

Parts Diagram





TECHNICAL MANUAL

MX151D - GM



• PART 14 : OEM LITERATURE

ESPAR - AIRTRONIC - HEATING SYSTEM

Heater Parts

AIRTRONIC D2 / D3 / B / D4

Ref. No.	Description	Part Number	Model #	20 1812 05 12V	25 2069 05 12V	25 2070 05 24V	25 2326 05 12V	25 2113 05 12V	25 2114 05 24V	25 2144 05 12V	25 2145 05 24V	25 2317 05 12V	25 2318 05 12V	25 2327 05 12V
1	Safety screen	ø 60 25 1688 80 06 00 ø 75 25 1552 05 01 00		•	•	•	•	•	•	•	•	•	•	•
2	Warm air deflector	ø 60 20 1577 89 06 00 ø 90 20 1609 80 09 00 ø 75 22 1050 89 21 00		•	•	•	•	•	•	•	•	•	•	•
2a		ø 50-70 5550004 (CA1 10 047) ø 70-90 5550003 (CA1 10 042)		•	•	•	•	•	•	•	•	•	•	•
3	Clamp	ø 60 10 2114 31 00 00 ø 90 10 2114 37 00 00 ø 75 10 2114 34 00 00		•	•	•	•	•	•	•	•	•	•	•
4	Flexible air hose	ø 60 22 1000 01 00 16 ø 90 22 1000 01 00 19 ø 75 22 1000 01 00 18		•	•	•	•	•	•	•	•	•	•	•
5	Straight outlet hood	20 2900 70 03 91 (CA1 60 201) • short harness 20 2900 70 02 05 (CA1 60 205)		•	•	•	•	•	•	•	•	•	•	•
6	Main harness	5590003 (CA1 00 005)		•	•	•	•	•	•	•	•	•	•	•
7	Cable ties	ø25 mm 360 00 006		•	•	•	•	•	•	•	•	•	•	•
8	Air intake	ø24 mm 25 1774 80 02 00		•	•	•	•	•	•	•	•	•	•	•
9	Flexible exhaust	3.5 mm 360 75 300		•	•	•	•	•	•	•	•	•	•	•
10	Fuel hose - rubber	1.5 mm 890 31 118		•	•	•	•	•	•	•	•	•	•	•
11	Plastic fuel line	12V 22 4519 01 00 00 24V 22 4518 01 00 00		•	•	•	•	•	•	•	•	•	•	•
12	Fuel metering pump	22 1000 50 03 00		•	•	•	•	•	•	•	•	•	•	•
13	Clamp for fuel metering pump	2 mm 890 31 125		•	•	•	•	•	•	•	•	•	•	•
14	Plastic fuel line - black	20 2900 40 0104		•	•	•	•	•	•	•	•	•	•	•
15	Angle bracket	5 mm 360 75 350		•	•	•	•	•	•	•	•	•	•	•
16	Fuel hose - rubber	11 mm 10 2068 01 10 98		•	•	•	•	•	•	•	•	•	•	•
17	Clamp	9 mm 10 2068 00 90 98		•	•	•	•	•	•	•	•	•	•	•
18	Clamp	25 1729 89 00 02		•	•	•	•	•	•	•	•	•	•	•
19	End sleeve with cross bar - 25mm plastic	20 1280 09 01 03		•	•	•	•	•	•	•	•	•	•	•
20	Grommet	ø 20-32 10 2065 02 00 32		•	•	•	•	•	•	•	•	•	•	•
21	Intake hose clamp	26 mm 152 61 102		•	•	•	•	•	•	•	•	•	•	•
22	Clamp	20 1312 00 00 06		•	•	•	•	•	•	•	•	•	•	•
23	Fuel screen	20 amp 5670055 (CA1 07 005) 10 amp 5670056 (CA1 07 006)		•	•	•	•	•	•	•	•	•	•	•
24	Blade fuse	22 1000 31 80 00		•	•	•	•	•	•	•	•	•	•	•
25	Plug connector - Kit	22 1000 31 81 00		•	•	•	•	•	•	•	•	•	•	•
26	Housing - Kit female	25 1864 81 01 00		•	•	•	•	•	•	•	•	•	•	•
*27	Muffler	22 1000 31 87 00		•	•	•	•	•	•	•	•	•	•	•
28	Connectors for fuel metering pump - Kit	ø 60 22 1000 01 00 20 ø 75 22 1000 01 00 22 ø 90 22 1000 01 00 23		•	•	•	•	•	•	•	•	•	•	•
*29	90° Air outlet hood	ø 60 25 1688 89 00 01 ø 75 25 1482 89 00 05		•	•	•	•	•	•	•	•	•	•	•
*30	90° Bend	5670051 (CA1 07 001) 5670199 (CA1 90 043) 5670178 (CA1 90 014)		•	•	•	•	•	•	•	•	•	•	•
31	Fuse holder with terminals	22 1000 30 40 00		•	•	•	•	•	•	•	•	•	•	•
32	Terminals			•	•	•	•	•	•	•	•	•	•	•
33	3/8" Ring terminals 10-12 G			•	•	•	•	•	•	•	•	•	•	•
*34	7 day timer with thermostat			•	•	•	•	•	•	•	•	•	•	•



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ESPAR - AIRTRONIC - HEATING SYSTEM

Heater Parts

AIRTRONIC D2 / D3 / B / D4

Ref. No.	Description	Part Number	Model #	20 1812 05 12V	25 2069 05 12V	25 2070 05 24V	25 2326 05 12V	25 2113 05 12V	25 2114 05 24V	25 2144 05 12V	25 2145 05 24V	25 2317 05 12V	25 2318 05 12V	25 2327 05 12V
35	Thermostat	12V 5670097 (301 00 154)		•	•									
		24V 5670096 (301 00 153)				•		•						
* 36	Operating switch (rotary)	12V 25 1895 71 00 00		•	•	•								
		24V 25 1896 71 00 00				•		•						
37	Standard fuel pick up pipe	2 mm 20 2900 20 20 10		•	•	•	•	•	•	•	•	•	•	•
* 38	Fuel pick up pipe (Compression fitting type)	20 2900 20 20 42 (CA0 12 042)		•	•	•	•	•	•	•	•	•	•	•
* 38a	Compression fittings	1/4" NPT 20 2900 20 20 44 (CA0 12 044)		•	•	•	•	•	•	•	•	•	•	•
		3/8" NPT 5520002 (CA0 00 031)		•	•	•	•	•	•	•	•	•	•	•
		1/2" NPT 5520006 (CA0 12 005)		•	•	•	•	•	•	•	•	•	•	•
39	P-clamp w/Lining	10 mm 152 00 139		•	•	•	•	•	•	•	•	•	•	•
40	P-clamp	25 mm 152 10 048		•	•	•	•	•	•	•	•	•	•	•
41	P-clamp	28 mm 152 10 051		•	•	•	•	•	•	•	•	•	•	•
42	End-sleeve	24 mm 25 1482 80 00 01		•	•	•	•	•	•	•	•	•	•	•
	Fault code retrieval device	20 2900 70 50 20 (CA1 05 020)		•	•	•	•	•	•	•	•	•	•	•
43	Bezel kit for 7 day timer	25 1482 70 01 00		•	•	•	•	•	•	•	•	•	•	•
44	Mini Controller	22 1000 32 07 00		•	•	•	•	•	•	•	•	•	•	•

*indicates optional features



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Notes





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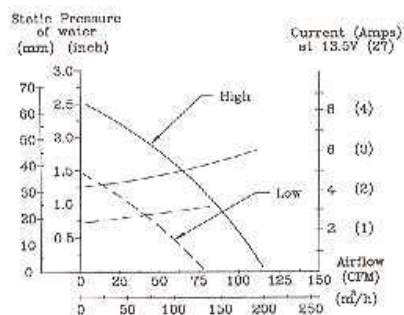
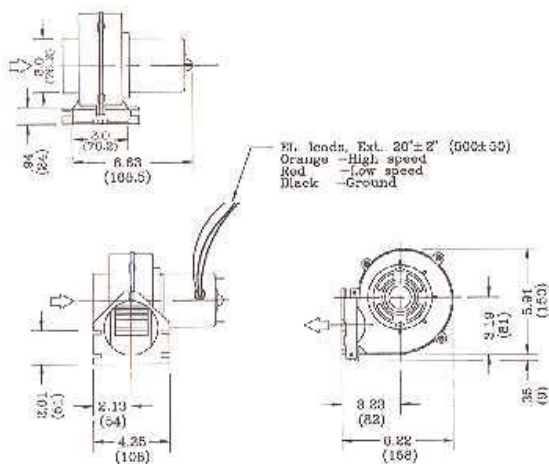
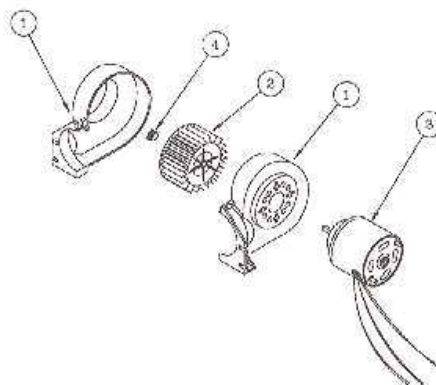
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MCC - 15-0311 - EXHAUST FAN

MCC Blower Model 503

Mobile Climate Control



Part Descriptions: Specifications

Part No.	No.	Part No.	Description
15-0311 Blower 12V	1	25-0033	Blower Housing
15-0312 Blower 24V	2	25-0291	Blower Wheel (C.C.W.)
	3	25-0344	Motor 12V
		25-0107	Motor 24V
	4	25-0022	Clip

Blower Housing and Blower Wheel made of ABS plastic.

2-Speed wire wound motor.

Weight -2.4 lbs. (1.1 kg)

FEATURES

The 503 is an excellent defrost booster blower. It can also be used to bring outside air into the cab.



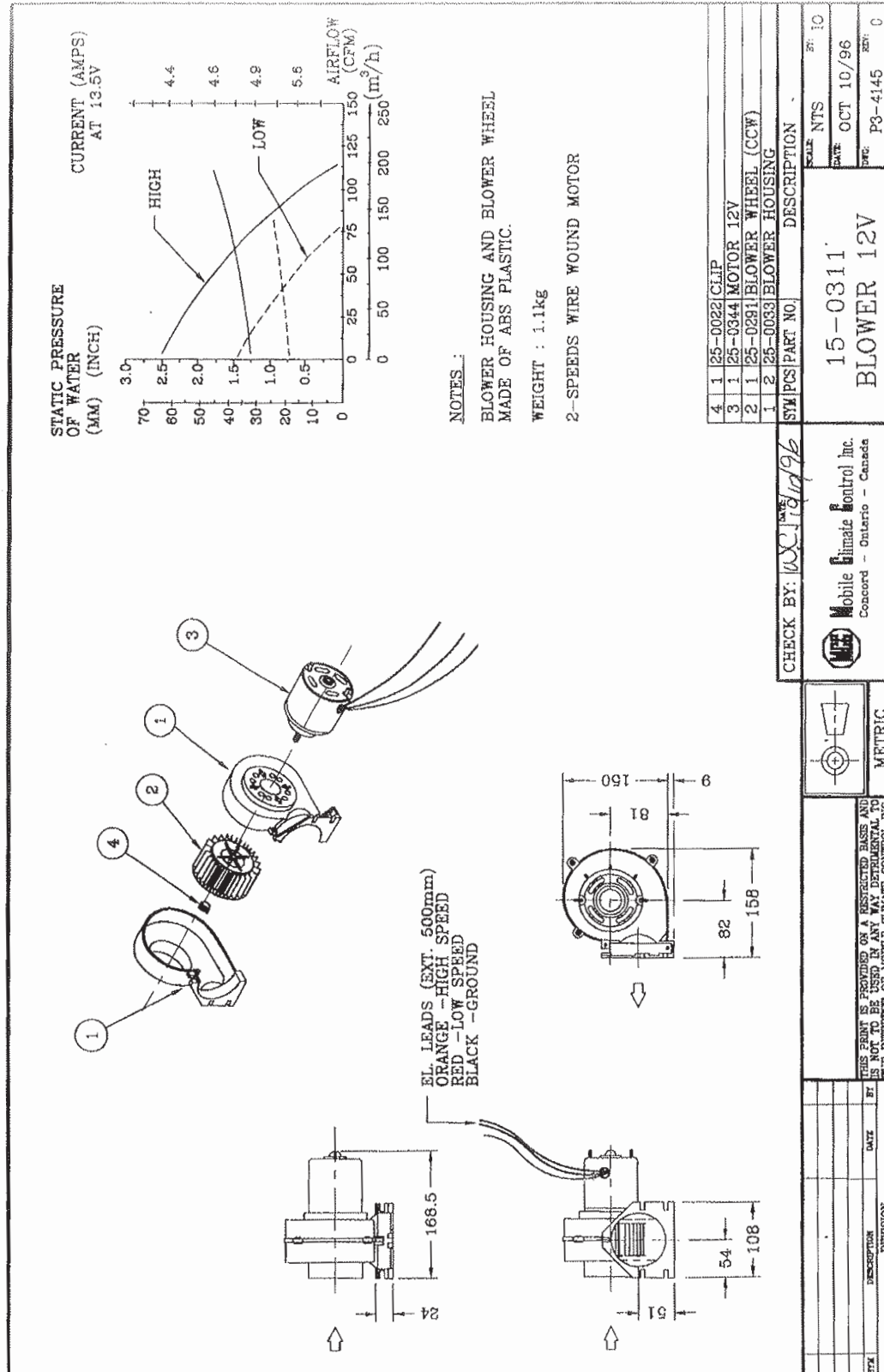
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• PART 14 : OEM LITERATURE

INPOWER - ETM52 - ELECTRONIC THROTTLE MODULE

OWNERS MANUAL

Model ETM52 Electronic Throttle Module 2009 Ford and GM Vehicles



A. Introduction

The InPower ETM52 electronic throttle provides two modes of fast idle engine speed control for the following Ford and GM chassis with automatic transmissions:

GM	2008-2009 Suburban/Tahoe, Engines: 4.8L(C), 5.3L(O), 6.0L(K), 6.0L(Y)
GM	2008-2009 Express/Savana, Engines: 4.8L(C), 5.3L(4), 6.0L(K), 6.6L(6)
GM	2008-2009 Silverado/Serra 1500-3500, Engines: 4.8L(C), 5.3L(O), 5.3L(3), 6.0L(K), 6.6L(6)
GM	2008-2009 Topkick/Kodiak C4500/C5500, Engines: 6.6L(9)
Ford	2009 E250-E450, Engines: 5.4L(L), 6.0L(P), 6.8L(S)
Ford	2008-2009 F250-F550, Engines: 6.4L(R)

Two speed control modes are available: Automatic and Fixed Speed. The modes are activated from a customer supplied mode switch.

Fixed Speed Mode:

Ford Diesel	1200 rpm
Ford Gas	1200 or 1500 rpm, selectable at installation
GM Diesel	1200 or 1460 rpm, selectable at installation
GM Gas	1200 or 1460 rpm, selectable at installation

Automatic Mode:

This mode will cause the engine speed to increase to the fixed speed value of the Fixed Speed Mode when the battery voltage indicates a low charging condition. Normal idle speed is resumed when the battery voltage indicates a charged condition.

A wiring harness is supplied with the ETM52 system that connects to the ETM52 control module via a 12-pin Amp Mate-N-Lok connector. This harness includes a cable with plug for connecting to the vehicle's OBD-II diagnostic connector, as well as a set of blunt-cut wires for the other interface connections. On Ford installations some of these blunt-cut wires connect to the Ford SEIC circuit's blunt-cut wires. Installing equipment such as wheel chair platform lift interlocks require a vehicle gear lever Park position signal. This signal is available from the Ford SEIC but is not available on GM chassis. The ETM52 electronic throttle provides this signal for the GM vehicles. GM chassis installations utilize the cable to the OBD-II connector as well as blunt-cut wires for interface to the GM ECM PTO Enable Input, parking brake switch (C4500/C5500 diesel-only chassis), and a Park position for interlock functions.

Note that this manual contains separate sections for Ford installations and GM installations.

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INPOWER - ETM52 - ELECTRONIC THROTTLE MODULE

B. Operation

When the vehicle is parked and **Chassis Ready Conditions** are satisfied the engine speed may be controlled by one of the two available modes (Fixed Speed or Automatic).

Chassis Ready Conditions are:

1. Parking brake is set
2. Gear shift in "Park" (automatic transmission only)
3. Foot is off service brake
4. Foot is off the accelerator pedal
5. Vehicle is stationary (no speed)
6. Engine is started and idling below 900 rpm
7. Coolant temperature above 140° F (Ford Gas engine only)

Modes Of Operation:

1. Fixed Speed Mode:

When activated, the engine speed is increased to a fixed rpm value. This is established at installation as follows:

Ford Gas:	1200 rpm or 1500 rpm
Ford Diesel:	1200 rpm
GM Gas:	1200 rpm or 1460 rpm
GM Diesel:	1200 rpm or 1460 rpm

2. Automatic Mode:

When activated, the engine speed is increased to a fixed rpm value when the battery voltage indicates a low charging condition. Normal idle speed is resumed when the battery voltage indicates a charged condition. The fixed high rpm value is determined by the Fixed Speed mode installation configuration.

Status Indicators

Eight LED indicators provides status and problem detection information. Refer to the following table for coding of these functions.

LED	Status	Indication
RPM	On Solid	Fixed speed mode selected, engine at fast idle
RPM	Flashing	Fixed speed mode selected, engine <u>not</u> at fast idle*
CHRG	On Solid	Automatic mode selected, engine at fast idle
CHRG	Flashing	Automatic mode selected, engine <u>not</u> at fast idle*
PARK	On Solid	Transmission in PARK position
PARK	Flashing	Transmission <u>not</u> in PARK position
PK BRK	On Solid	Park Brake set
PK BRK	Flashing	Park Brake <u>not</u> set
SBRK	On Solid	Service Brake at rest (not activated)
SBRK	Flashing	Service Brake activated
VSPEED	On Solid	Vehicle stationary
VSPEED	Flashing	Vehicle moving
ACL	On Solid	Accelerator at rest (<u>not</u> depressed)
ACL	Flashing	Accelerator depressed
VIN	On Solid	Vehicle is supported
VIN	Flashing	Vehicle is not supported, has invalid VIN, or loss of communications.

* The chassis engine control module (ECM) is not responding to the fast idle speed request. This could be caused by a chassis sensor interlock (See *Chassis Ready Conditions* on page 1 for required conditions to satisfy interlocks), or some other PCM system problem.

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INPOWER - ETM52 - ELECTRONIC THROTTLE MODULE

C. Installation - Ford Chassis

1. Getting Started

The recommended location for the ETM52 system is under the dash due to the proximity of the wiring connections and cable length. **The unit should not be located in the engine compartment, or any location that is not protected. Do not lengthen the DLC Cable.**

2. Mount the ETM52 Module

Disconnect the battery before making any connections. Mount the ETM52 module under the dash using the two mounting holes. Ensure that you have sufficient distance to install the 18 inch long DLC cable.

3. Install the Wire Harness

Plug the 12-pin connector of the wiring harness into the ETM52 module. Route the DLC cable to the OBDII Data Link Connector and plug it in. The OBDII connector is usually located on the lower part of the dash on the driver's side. Using a cable tie, secure the plug to the OBDII connector so that it will not vibrate out. We recommend that you route the DLC cable back across the bottom of the plug/connector, and loop the cable tie around the plug, socket and cable, thereby keeping the cable out of the way. Also ensure that the entire cable is routed and secured to keep it out of the way. In addition to the Data Link Cable, this wiring harness contains one group of 18 inch long blunt-cut wires and one group of 60 inch long blunt-cut wires. Connect these wires as described in the following paragraphs and as shown in the Ford wiring diagrams on pages 6 and 7.

4. Install the Fast Idle Switch

The ETM52 system provides two modes of fast idle control: Automatic and Fixed Speed. The typical installation approach is to use a three-position driver's switch with an *Auto*, *Off* and *On* position. However, these two control modes can be configured differently. For example, you might desire just an Automatic function activated by an On-Off switch. Or a fixed speed fast idle function activated by another vehicle circuit.

Prior to installing the three-position Fast Idle Switch review the Ford gas and Ford diesel wiring diagrams on pages 6 and 7. Mount the switch in a convenient location. Locate the ETM52 wiring harness 18 inch long group of blunt-cut wires (Violet, Tan, Blue and Gray). Wire the Violet blunt-cut wire to the Auto position and the Tan wire to the On position of the Fast Idle Switch. The Blue and Gray wires will not be used. Fold them back and tape them to the loom. Wire the Fast Idle Switch common position to a +12 volt ignition circuit (+12 volts when the ignition switch is on).

5. Ford SEIC Wiring

The Ford SEIC circuit contains a set of color coded blunt-cut wires located in the engine compartment on the top, driver's side of the firewall. Refer to Ford SEIC documentation for more details. Some of these SEIC wires will be connected to the ETM52 wiring harness 60 inch long blunt-cut wires (Pink, Orange and Brown). Note that different connections are required for diesel and gas engine vehicles.

Ford Diesel - Locate the SEIC Yellow/Green wire and connect it to the Orange wire in the ETM52 harness. The Pink and Brown ETM52 harness wires will not be used.

Ford Gas - Locate the SEIC Green, Yellow/Green and Blue/Green blunt-cut wires. Connect them to the ETM52 harness blunt-cut wires as follows:

SEIC Green to ETM52 Brown
SEIC Yellow/Green to ETM52 Orange
SEIC Blue/Green to ETM52 Pink

Refer to Ford gas and diesel wiring diagrams on page 6 and 7.

Note on Ford Gas Installations - The Fixed Speed mode for Ford gas installations is 1200 rpm. This speed can be changed to 1500 rpm by the following procedure. Locate the Brown wire in the ETM52 wiring harness. At the ETM52 end of the harness the Brown wire is in pin position 11 (See Wiring diagram on page 6). Using an Amp Mate-N-Lok connector pin extractor remove the wire from pin 11 and install it in pin position 12.

This completes the Ford Installation portion of the manual.

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INPOWER - ETM52 - ELECTRONIC THROTTLE MODULE

D. Installation - Chevy & GMC Chassis

1. Getting Started

The recommended location for the ETM52 system is under the dash due to the proximity of the wiring connections and cable length. **The unit should not be located in the engine compartment, or any location that is not protected. Do not lengthen the DLC Cable.**

2. Mount the ETM52 Module

Mount the ETM52 module under the dash using the two mounting holes. Ensure that you have sufficient distance to install the 18 inch long DLC cable.

3. Install the Wire Harness

Plug the 12-pin connector of the wiring harness into the ETM52 module. Route the DLC cable to the OBDII Data Link Connector and plug it in. The OBDII connector is usually located on the lower part of the dash on the driver's side. Using a cable tie, secure the plug to the OBDII connector so that it will not vibrate out. We recommend that you route the DLC cable back across the bottom of the plug/connector, and loop the cable tie around the plug, socket and cable, thereby keeping the cable out of the way. Also ensure that the entire cable is routed and secured to keep it out of the way. Connect the wiring harness blunt-cut wires to the mode switch (not supplied with ETM52) and to the required chassis connection as shown in the wiring diagrams.

4. Install the Fast Idle Switch

The ETM52 system provides two modes of fast idle control: Automatic and Fixed Speed. The typical installation approach is to use a three-position driver's switch with an *Auto*, *Off* and *On* position. However, these two control modes can be configured differently. For example, you might desire just an Automatic function activated by an On-Off switch. Or a fixed speed fast idle function activated by another vehicle circuit.

Prior to installing the three-position Fast Idle Switch review the GM wiring diagrams on pages 8 and 9. Mount the switch in a convenient location. Locate the ETM52 wiring harness 18 inch long group of blunt-cut wires (Violet, Tan, Blue and Gray). Wire the Violet blunt-cut wire to the Auto position and the Tan wire to the On position of the Fast Idle Switch. Wire the Fast Idle Switch common position to a +12 volt ignition circuit (+12 volts when the ignition switch is on).

The Fixed Speed mode for GM GVan and C4500/C5500 installations is 1200 rpm. This speed can be changed to 1460 rpm by the following procedure. Locate the Blue wire in the ETM52 wiring harness and connect it to the +12 volt ignition wire that is connected to the Fast Idle Switch common position.

5. GM Chassis Park Output Wiring

The ETM52 provides a transmission Park position output for use with InPower model ITM122 and ITM123 interlock systems on Chevy and GMC chassis. This Park wire is the pink blunt-cut wire in the ETM52 wire harness. Connect it to the Park input in the interlock system.

6. GM Park Brake Switch Sense Wiring

On Chevy and GMC C4500 and C5500 chassis it is necessary to connect the gray wire in the ETM52 wiring harness to the parking brake switch. Depending on the chassis, this may be a foot operated brake or a hand brake on the center console. Wire into the Light Blue wire as shown in the wiring diagram on page 9.

7. GM PTO Input Wiring

Note - This procedure is required on vehicles that will operate in temperatures under 15° F. On Chevy and GMC C4500 and C5500 chassis it is necessary to wire into the GM PTO wire behind the dash. First locate the dash-mounted PTO Switch (or High Idle Switch). Remove the switch panel to expose the harness/connector on the rear and splice into the Green wire. If there is no switch installed on the dash locate the harness/connector that would plug into the switch (located behind the switch panel). On the switch harness/connector locate the wire that goes to the EMC PTO Input. This will be a Green Wire. Now splice the orange (PTO) blunt-cut wire in the ETM52 wiring harness into this wire.

This completes the GM Installation portion of the manual.

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INPOWER - ETM52 - ELECTRONIC THROTTLE MODULE

E. Specifications

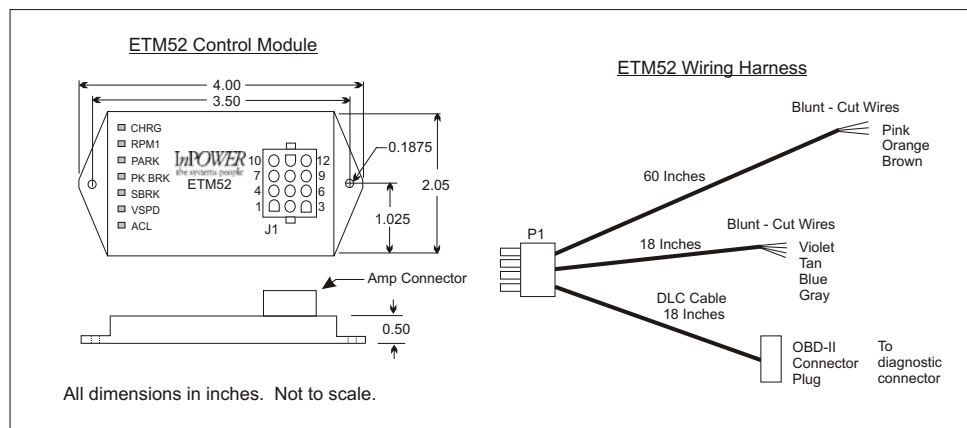
Electrical

Input Voltage (+12V Terminal): 8 to 16 volts
Input Current (+12V Terminal): 30 mA

Mechanical

Weight: 0.17 lbs
Connections: 12 Pin Amp Mate-N-Lok Connector
Case Material: Cyolac thermoplastic (UL 94VO)

F. Mechanical Drawing



G. Customer Support

Technical Support

For product support, contact InPower at 740-548-0965 or 866-548-0965. Product bulletins and owner's manuals are available on our web site:

www.InPowerDirect.com.

Warranty

InPOWER LLC warrants its products to be free from defects in material and workmanship under normal use, care and maintenance for a period of two (2) years from the date of shipment. Please see www.inpowerdirect.com/warranty.htm for specifics or call 866-548-0965 for a copy of our warranty policy.

Customer Evaluation

InPower wants to ensure total customer satisfaction. Please download a product evaluation form at www.InPowerDirect.com/Customer_evaluation.htm or call us toll free at 866-548-0965 to be sent a form by mail.

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Owners Manual

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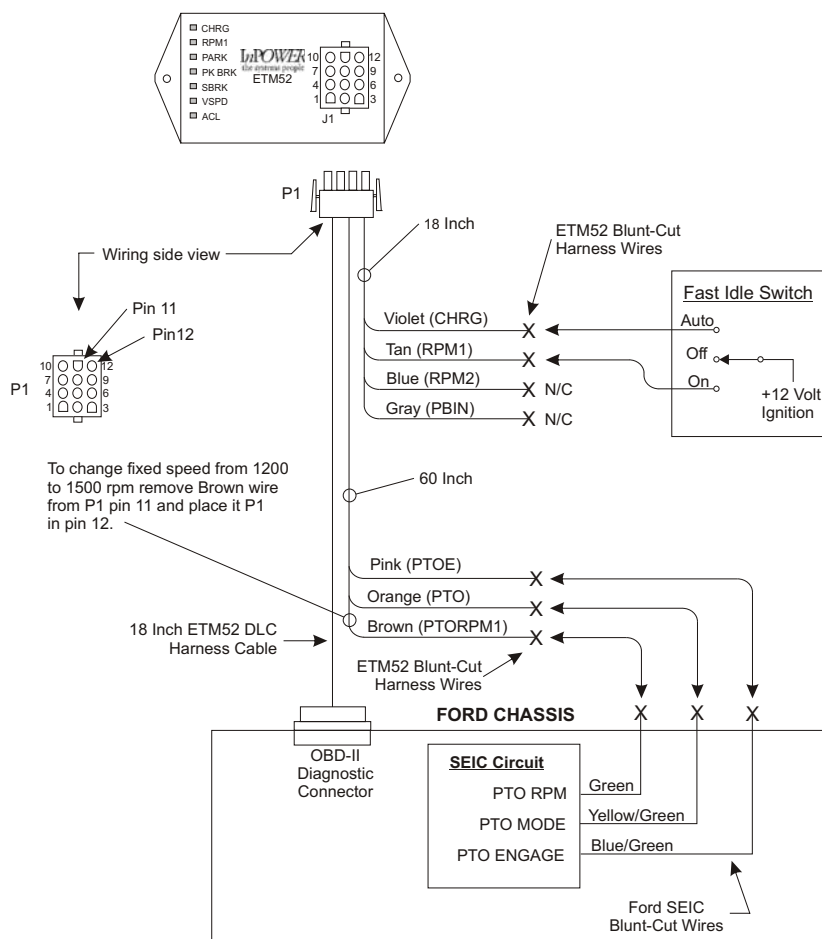
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INPOWER - ETM52 - ELECTRONIC THROTTLE MODULE

FORD E-SERIES GAS WIRING DIAGRAM



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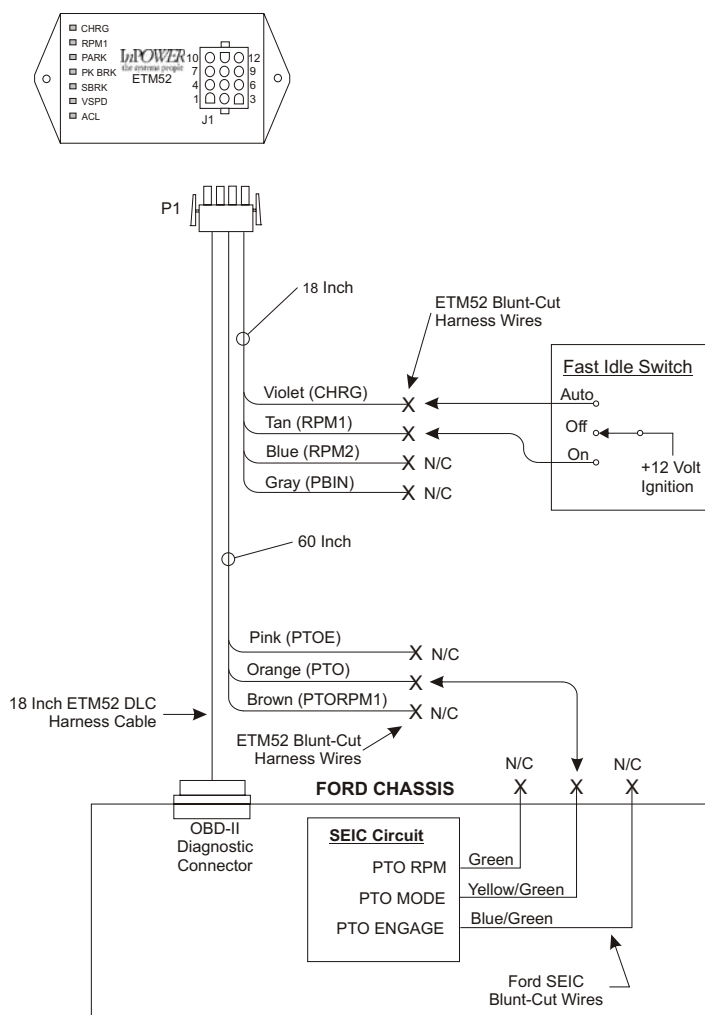
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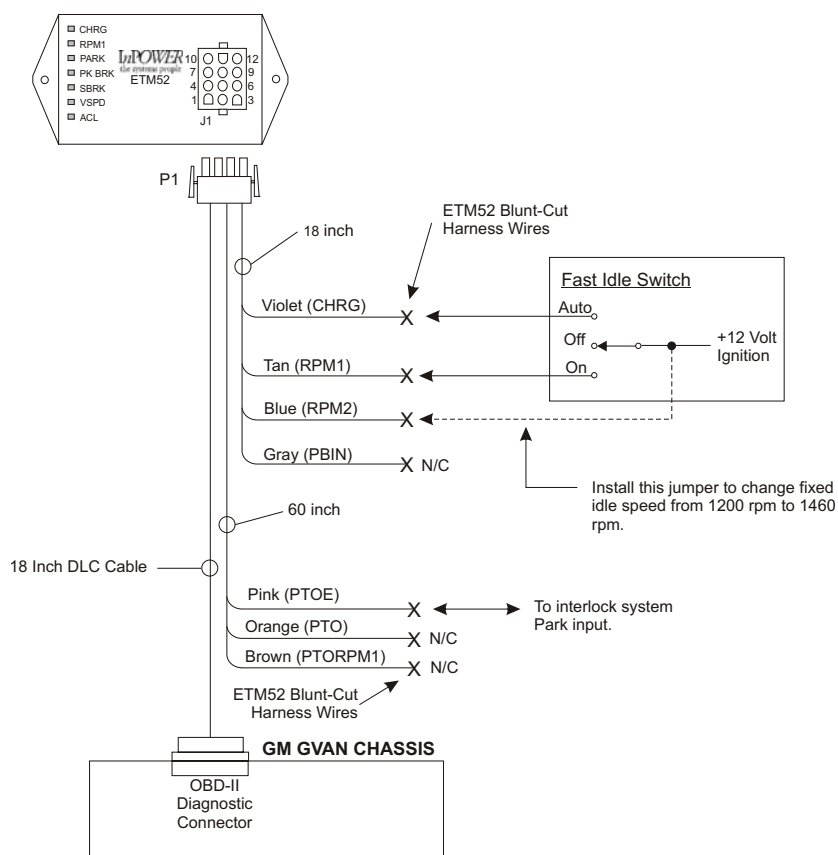
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GM GVAN WIRING DIAGRAM





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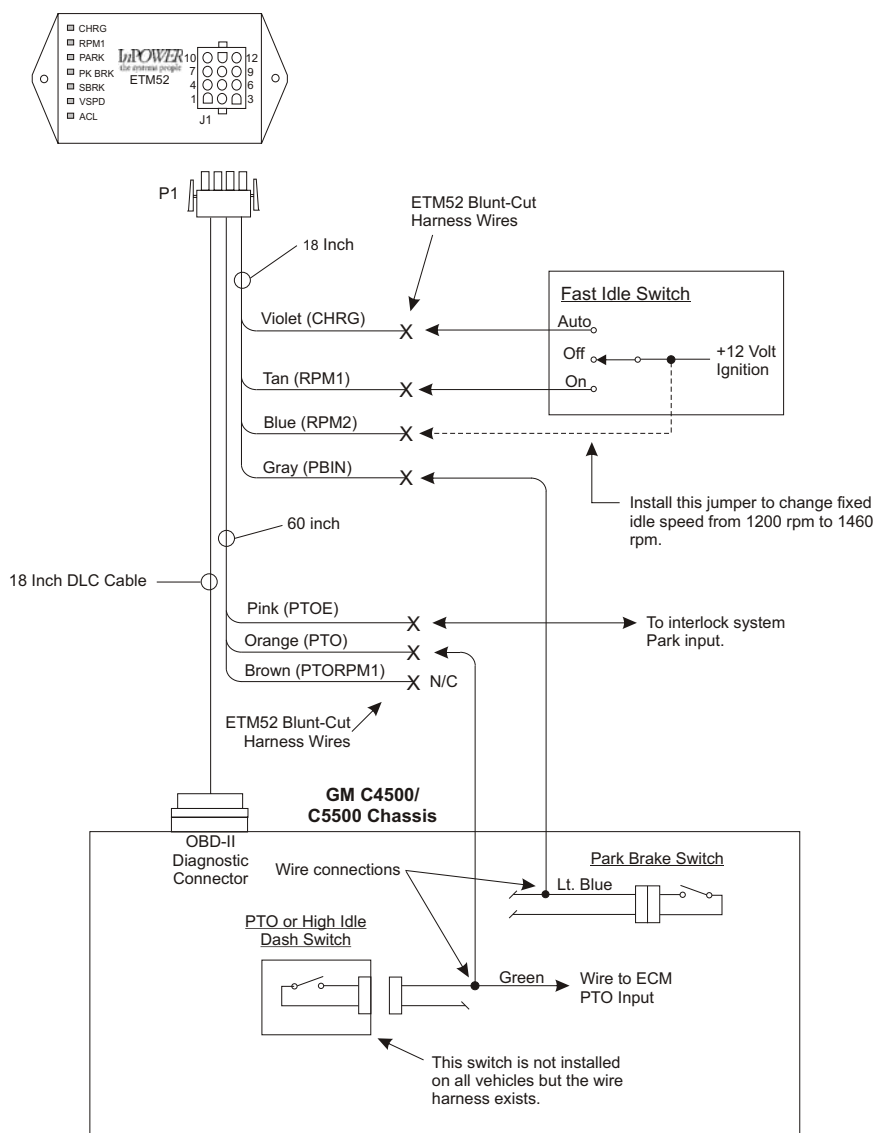
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GM C4500 & C5500 CHASSIS WIRING DIAGRAM



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TECHNICAL MANUAL

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• PART 14 : OEM LITERATURE

VANNER - 3250GCP FLASHER - FLASHING MODULE



3250GCP FLASHER Owner's Manual

GENERAL

The heavy duty 3250GCP electronic flasher has been designed to operate in the most severe environments. This unit also has output short circuit protection for reverse input voltage protection.

WARNING LIGHTS

The 3250GCP flasher can be used with most incandescent, halogen, and LED warning lights.

CHARACTERISTICS & TIPS

- 1) For extended service reliability, it is important that the flasher is not overloaded. In some cases, the unit's short circuit protection may consider the overload a short circuit, and shut the unit down.
- 2) The A output of the flasher receives its operating voltage from the B output. If the B output does not flash, then as a result the A output will not flash.

SPECIFICATIONS

Maximum output current:	50 Amps per terminal
-with 50w lamps	9 Typical per terminal
-with 35w lamps	12 Typical per terminal
Input Voltage:	10-16 Vdc, 13.6 Vdc nominal
Flashes per min. over full voltage range:	60 \pm 8%
Duty cycle:	50/50 \pm 10%
Ambient temperature:	-40°F to +150°F (-40°C to +65°C)
Fuse or Circuit Breaker:	70 Amp max.

TROUBLESHOOTING

PROBLEM	ITEMS TO CHECK
All outputs do not flash:	<ol style="list-style-type: none">1) Is the battery voltage less than 10Vdc?2) Are the wire and light connections proper?3) Do you have more than the rated number of lights on the outputs?4) Is the remote ground switch wired correctly?
One output does not flash:	<ol style="list-style-type: none">1) Is the battery voltage less than 10 Vdc?2) Is the affected output shorted or overloaded?

*If after reviewing this chart you still can't locate the problem, contact Vanner for technical assistance--800-AC POWER



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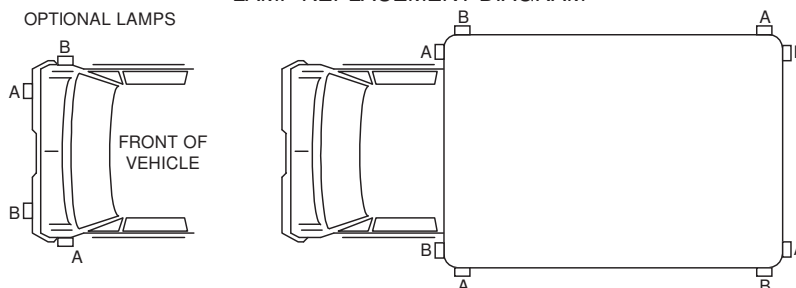
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VANNER - 3250GCP FLASHER - FLASHING MODULE

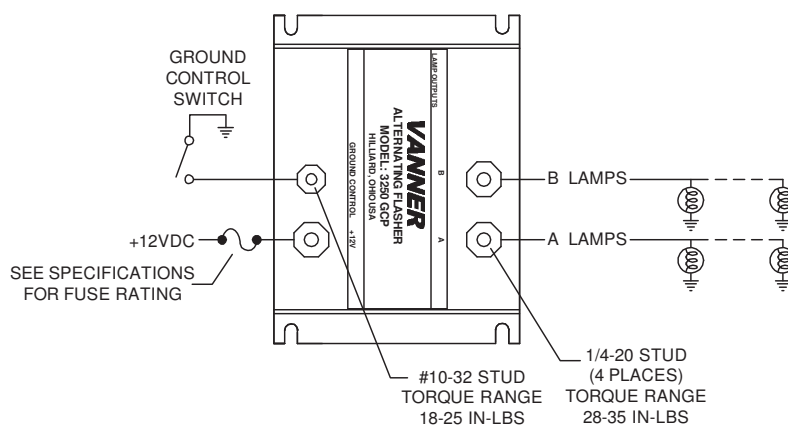
FLASHERS

3250GCP Owner's Manual

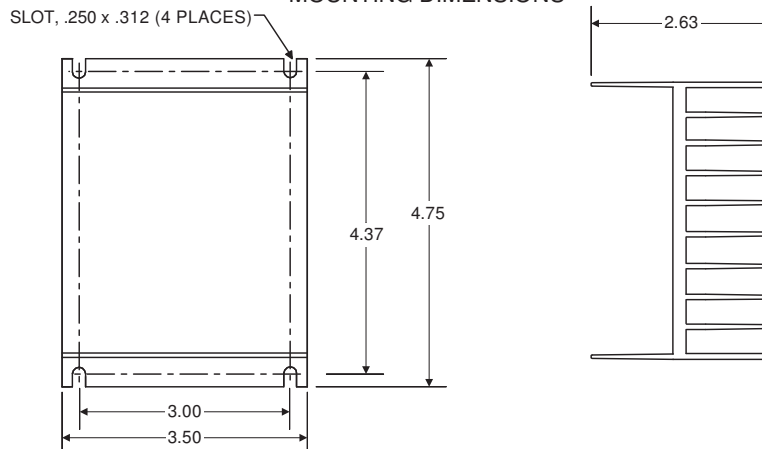
LAMP REPLACEMENT DIAGRAM



CONNECTION DIAGRAM



MOUNTING DIMENSIONS



VANNER INC.

800-AC-POWER

Corporate Office: 4282 Reynolds Drive • Hilliard, Ohio 43026 • Tel (614) 771-2718 • Fax (614) 771-4904 • www.vanner.com
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• PART 14 : OEM LITERATURE

BUSSMANN - 15303-3 - FUSE BLOCK

Bussmann® MINI-TERMINAL POWER DISTRIBUTION MODULE

SERIES 15300 RTMR

Rear Terminal Mini Fuse & Relay Power Distribution Module



The Rear Terminal Mini Fuse and Relay panel (RTMR) provides efficient power distribution in a rugged compact form for applications in marine, construction, agriculture, heavy trucking, specialty vehicles, etc. This innovative product offers a weather tight enclosure (**IP66/67**) for various MINI (2.8mm) blade components when cover, cable seals, and cavity plugs are installed. It is available with various degrees of internal electrical bussing. Additionally, custom labels and multiple hardware configurations are available to solve any application need.

SPECIFICATIONS

Input Terminal Rating: M6 input studs on bussed/partially bussed inputs: 80A max input on bussed fuse side, 80A max input on bussed relay side.

Output Terminal Rating: 2.8mm blade terminals (30A max per terminal)

Temperature Rating: -40°F (-40°C) to 260°F (125°C).

Materials: Black thermoplastic housing; Tin-plated copper internal bussing; Bright nickel-plated brass studs (on bussed versions).

Termination: Delphi Packard Metri-Pack® 280 Series terminals (sealed/tangless) or AMP® terminals.* Delphi Packard 280 Series cavity plugs are installed where wires are not used.* Accepts #12-22 AWG wire sizes.

Torque Rating: 75in-lb (8.5Nm) max.

Mounting Torque Rating: #10-32 or M5 threaded inserts; 24in-lb (2.7Nm) max torque.

Ingress Protection Rating: IP66-IEC 60529 (Valid when properly installed with cover, sealed terminals, and cavity plugs.) IP67 (Same requirements as IP66, but also needs a periodic - 3-9 months - coating of silicone lubricant applied to green base seal.)

OPTIONS

End Caps: Protective silicone end caps available for stud-ded versions.

Mounting: Mounting brackets available for surface-mounting RTMR. (See page 7.)

Labels: Consult factory for custom label options.

Replacement Accessories: Consult factory for available service parts.

*Electrical terminals, cable seals & cavity plugs are NOT supplied by Cooper Bussmann.





TECHNICAL MANUAL

MX151D - GM

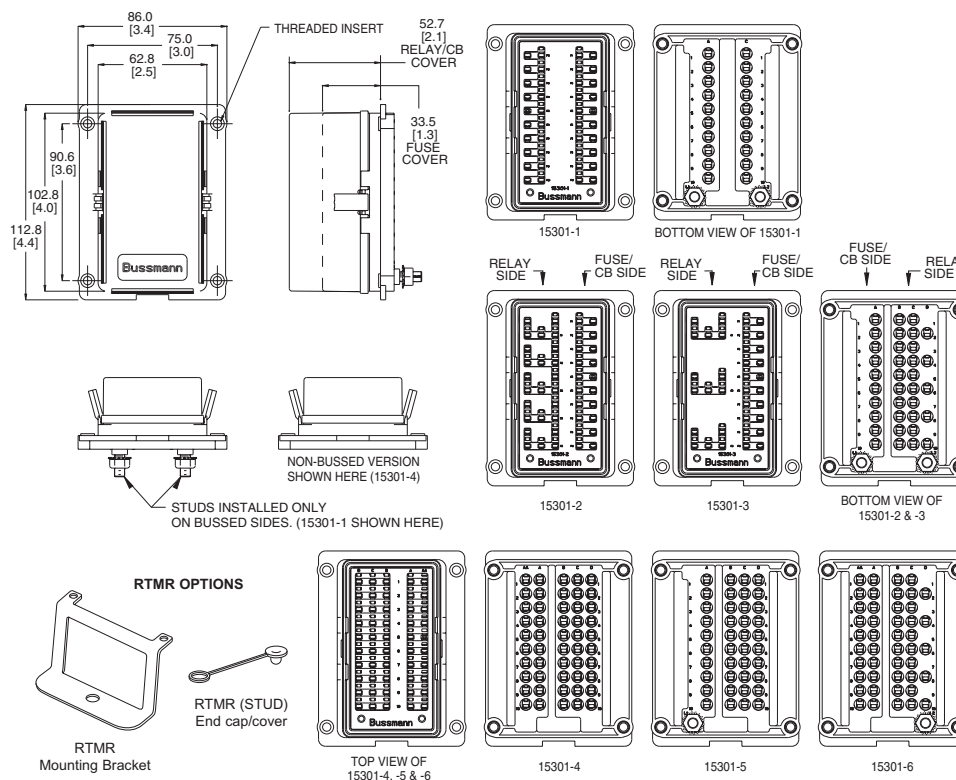


• PART 14 : OEM LITERATURE

BUSSMANN - 15303-3 - FUSE BLOCK

SERIES 15300 RTMR

DIMENSIONS (Dims. shown are for reference only. Consult factory for latest prints)



PART NUMBERING SYSTEM

Series	Mounting	Base	Terminal Cavity	Hardware	Cover	Marking Options
1530	1 - #10-32 threaded insert 2 - M5x0.8 threaded insert	1 - Fuse / C.B. Base 20 Fuse Positions (10 on each side) 2 - Micro Relay Base 5 Micro Relays with 10 Fuses / C.B. 3 - Mini Relay Base 3 Mini (or Micro) Relays with 10 Fuses / C.B. 4 - Non Bussed Version 3 Mini or 5 Micro Relays and 10 Fuses/C.B. 5 - Partially Bussed Version 3 Unbussed Mini or 5 Unbussed Micro Relays and 10 Bussed Fuses/C.B. 6 - Partially Bussed Version 3 Bussed Mini or 5 Bussed Micro Relays and 10 Unbussed Fuses/C.B.	Blank - Standard Delphi 280® A - AMP® series	0 - No nuts 1 - Nuts (bulk) 2 - Nuts (assembled) 3 - No nuts, end caps (bulk) 4 - No nuts, end caps (assembled) 5 - Nuts and end caps (in bulk) 6 - Nuts and end caps (assembled)	0 - No cover 1 - Fuse cover 2 - Relay / circuit breaker (C.B.) cover	Blank - Std. marking (Consult factory for special options.)

Mounting Brackets

B028 - 7012 -

Material

O - Plated steel
P - Stainless steel

RTMR Stud End Cap

B066 - 7008

Bussmann® MINI-TERMINAL POWER DISTRIBUTION MODULE



TECHNICAL MANUAL

MX151D - GM



• PART 14 : OEM LITERATURE

WHELEN - SA315P - SPEAKERS

Projector™ Series SA315P Speaker

SUPER COMPACT, MULTI-PORT 100 WATT RMS SPEAKER



SA315P with nylon composite housing

Smaller size speaker with full size performance will mount in more locations than ever before.

The SA315P installs easily and delivers traffic clearing warning where it's needed: down and in front of your vehicle.

Complies with OSHA 1910.95 guidelines regarding "Permissible Noise Exposure".



SA315P with vehicle specific mounting in grille of Crown Victoria.

Form# S3150209

FEATURES

- All weather nylon composite black housing with front loaded, powder coated speaker driver.
- Superior performance in a very small profile package. Only 2-7/8" in depth.
- Exceeds California Title XIII, Class A and S.A.E. J1849 requirements with most 100 watt sirens (120-123dB @ 10').
- Optimum performance assured when used with all Whelen high-power electronic sirens.
- Easily installs to the radiator cross member in just a few minutes (without dismantling the front grille of the vehicle).
- Truer tone quality and wider/higher frequency response than speakers of comparable size.
- Universal mounting bracket, plus vehicle specific brackets available.

- Compact size is ideal for concealed installations in any type vehicle.
- Two year standard Whelen warranty.



Photo shows mounting placement of SA315P between grille and radiator.



**Whelen Products
are Proudly
Designed & Manufactured
in the U.S.A.**

WHELEN®
Engineers for the Emergency Warning Industry

PROJECTOR™ SERIES SA315P SPEAKER



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WHELEN - SA315P - SPEAKERS

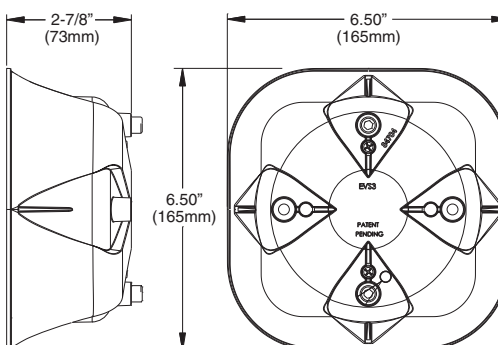
MODEL SA315P

SA315P 123dB speaker, nylon composite



Dodge Charger with vehicle specific mounting of SA315P in grille.

SPECIFICATIONS



Weight: 4 lbs. 11 oz. (2.12kg)

AVAILABLE MOUNTINGS

UNIVERSAL MOUNTINGS

SAK9 Universal/swivel ball type mount bracket

VEHICLE SPECIFIC MOUNTING BRACKETS

SAK1 Ford Explorer, 2002-2009,
Chevy Suburban/Tahoe, 2004-2006,
Dodge Charger, 2006-2009

SAK5 Chevy Suburban/Tahoe, 2000-2003,
Chevrolet Avalanche, 2002-2009,
GMC Envoy, 2004-2009

SAK10 Ford Excursion, 2002-2006

SAK11 Chevy Trail Blazer, 2002-2009

SAK13 Ford Expedition, 2003-2006

SAK17 Quick Installation for Ford Crown Victoria,
2003-2009

SAK18 Dodge Magnum, 2005-2008

SAK20 Ford Escape, 2004-2009

SAK21 Chevy Impala (police package) 2006-2009

SAK22 Ford 500, 2005-2009

SAK23 Ford Expedition, 2009

SAK24 Chevy Suburban/Tahoe, 2007-2009

SAK25 Chevy Express Van, 2006-2009

SAK28* Ford "F" Series Super-Duty, 2008-2009,
Driver Side

SAK29* Ford 2008 "F" Series Super-Duty, 2008-2009,
Passenger Side

SAK30 Ford Taurus, 2008-2009

SAK31 Ford Fusion, 2007-2009

SAK32 Ford E350/E450, 2008-2009, Driver
or Passenger Side

* Requires removal of factory fog lights, if equipped.



SA315P with mounting bracket.

WHELEN[®]
ENGINEERING COMPANY, INC.

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Chester, Connecticut 06412-0684
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*Some back-up alarms are made in Canada for Whelen.
Code No. 12049D-0209



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- PART 14 : OEM LITERATURE

GO POWER! - SINEWAVE 600W - INVERTER



Go Power! Manual

GP-SW2000 Inverter

GP-SW1000 Inverter

GP-SW600 Inverter



Go Power! Electric Inc.
PO Box 6033
Victoria, BC V8P 5L4
Tel: 866-247-6527
Fax: 866-607-6527
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GO POWER! - SINEWAVE 600W - INVERTER



*Go Power! GP-SW2000, GP-SW1000 and GP-SW600
Inverter Owner's Manual*

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GP Electric 04.07 Rev 1.0
GP-GP-SW2000-600 InstallGuide.doc



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GO POWER! - SINEWAVE 600W - INVERTER



Go Power! GP-SW2000, GP-SW1000 and GP-SW600 Inverter Owner's Manual

1. Introduction

The Go Power! Sine Wave series models are used in a wide range of applications including remote homes, RVs, sailboats and powerboats. It will operate most televisions and VCRs, personal computers, small appliances and tools such as drills, sanders, grinders, mixers and blenders. **The inverter must have a greater power rating than the load it is providing power to.**

To get the most out of the power inverter, it must be installed and used properly. Please read the instructions in this manual before installing and using this model.

2. Specifications

2.1 GP-SW2000 W Inverter

Model No.	GP-SW-2000-12	GP-SW-2000-24
Continuous Output Power	2000 W	
Surge Rating	3000 W	
Input Voltage	12V	24 V
Output Frequency Adjustable	50/60Hz +/- 0.05%	
Efficiency (full load)	89%	
No Load Current Draw	1.20 A	0.6A
No Load Current Draw-Power Save	0.25A	0.125A
Output Waveform	Sine Wave <3% THD	
Output Voltage Regulation	115 V RMS -10%/+4%	
Input Voltage Regulation	10.5-15 VDC	21.0-30.0 VDC
Protection	Overload, Short Circuit, Reverse Polarity (Fuse), Over/Under Input Voltage, Over Temp.	
Operating Temperature Range	0-40°C	
Storage Temperature Range	-30°C to 70°C	
Overall Dimensions	422 x 208 x 160 mm 16.6 x 8.2 x 6.3 "	
Weight	8.5 kg 18.9 lbs	
Inverter Install Kit	GP-DC-Kit 4	GP-DC-Kit 3

GP-SW1000 W Inverter

Model No.	GP-SW-1000-12	GP-SW-1000-24
Continuous Output Power	1000 W	
Surge Rating	1500 W	
Input Voltage	12V	24 V
Output Frequency Adjustable	50/60Hz +/- 0.05%	
Efficiency (full load)	89%	
No Load Current Draw	1.20 A	0.6A
No Load Current Draw-Power Save	0.25A	0.125A
Output Waveform	Sine Wave <3% THD	
Output Voltage Regulation	115 V RMS -10%/+4%	
Input Voltage Regulation	10.5-15 VDC	21.0-30.0 VDC
Protection	Overload, Short Circuit, Reverse Polarity (Fuse), Over/Under Input Voltage, Over Temp.	
Operating Temperature Range	0-40°C	
Storage Temperature Range	-30°C to 70°C	
Overall Dimensions	383 x 182 x 89 mm 15.1" x 7.2" x 3.5 "	
Weight	4.0 kg 8.8 lbs	
Inverter Install Kit	GP-DC-Kit 2	



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MX151D - GM



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GO POWER! - SINEWAVE 600W - INVERTER



*Go Power! GP-SW2000, GP-SW1000 and GP-SW600
Inverter Owner's Manual*

GP-SW600 W inverter

Model No.	GP-SW-600-12	GP-SW-600-24
Continuous Output Power	600 W	
Surge Rating	860 W	
Input Voltage	12 V	24V
Output Frequency Adjustable	50/60Hz +/- 0.05%	
Efficiency (full load)	85%	89%
No Load Current Draw	0.20 A	0.10A
Output Waveform	Sine Wave <3% THD	
Output Voltage Regulation	115V RMS -10%/+4%	
Input Voltage Relation	10.5-15 VDC	21.0-30.0 VDC
Protection	Overload, Short Circuit, Reverse Polarity (Fuse), Over/Under Input Voltage, Over Temp.	
Operating Temperature Range	0-40°C	
Storage Temperature Range	-30°C to 70°C	
Overall Dimensions	295 X 180 X 72 mm 11.6" x 7.1" x 2.8"	
Weight	2.7 kg 5.9 lbs	
Inverter Install Kit	GP-DC-Kit 2	

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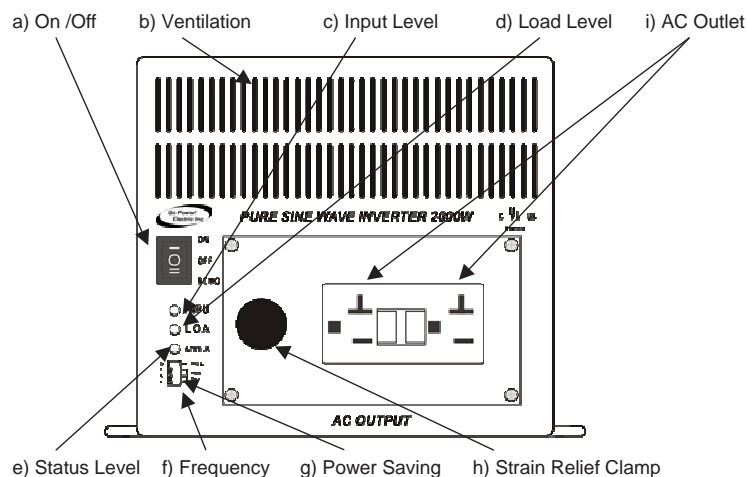
GO POWER! - SINEWAVE 600W - INVERTER



*Go Power! GP-SW2000, GP-SW1000 and GP-SW600
Inverter Owner's Manual*

3. Name and main function

3.1 Front view GP GP-SW2000:



- a) ON / OFF switch: Power ON/OFF switch, leave in the OFF position during installation. Leave in REMOTE position when using optional remote.
- b) Ventilation Ports:
Do not obstruct, allow at least one inch for airflow.
- c) Input Level:
Displays input voltage. Green indicates normal battery level, yellow indicates mid to low battery level and red indicates under voltage.
- d) Load Level:
Displays AC load watts. Green indicates normal operation, yellow indicates mid to high operation and red indicates overload levels.
- e) Status Level:
Displays operating condition. Green indicates normal, flashing green every second indicates Power Saving mode, and red indicates a Fault. See Section 5 for Power Saving and LED variations in Fault mode.
- f) Frequency:
Typical North American setting is 60 Hz. Set dip switch S4 to "0" for 50 Hz and "1" for 60 Hz.
- g) Power Saving:
Puts inverter to sleep until a load is present.
- h) Strain Relief Clamp:
Provides strain relief for Hard Wire AC Output option
- i) AC Outlet: Ground Fault Protected (GFCI)
Outlet sockets available: North America

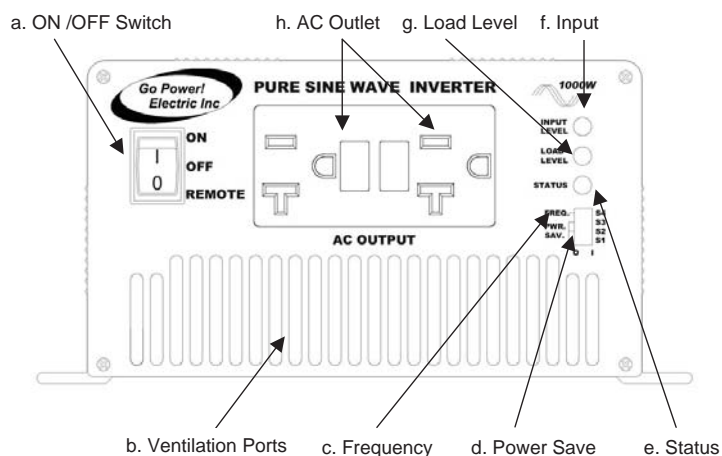
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GO POWER! - SINEWAVE 600W - INVERTER



*Go Power! GP-SW2000, GP-SW1000 and GP-SW600
Inverter Owner's Manual*

3.2 Front view GP SW1000:



- a) ON / OFF switch:
Power ON/OFF switch, leave in the OFF position during installation. Leave in REMOTE position when using optional remote.
- b) Ventilation Ports:
Do not obstruct, allow at least one inch for airflow.
- c) Frequency:
Typical North American setting is 60 Hz. Set dip switch S4 to "0" for 50Hz and "1" for 60 Hz
- d) Power Saving:
Puts inverter to sleep until a load is present.
- e) Status Level:
Displays operating condition. Green indicates normal, flashing green indicates Power Saving mode, and red indicates a Fault. See Section 5 for Power Saving and LED variations in Fault mode.
- f) Input Level:
Displays input voltage. Green indicates normal battery level, yellow indicates mid to low battery level and red indicates under voltage.
- g) Load Level:
Displays AC load watts. Green indicates normal operation, yellow indicates mid to high operation and red indicates overload levels.
- h) AC Outlet: Ground Fault Protected (GFCI)
- i) Outlet sockets available: North America



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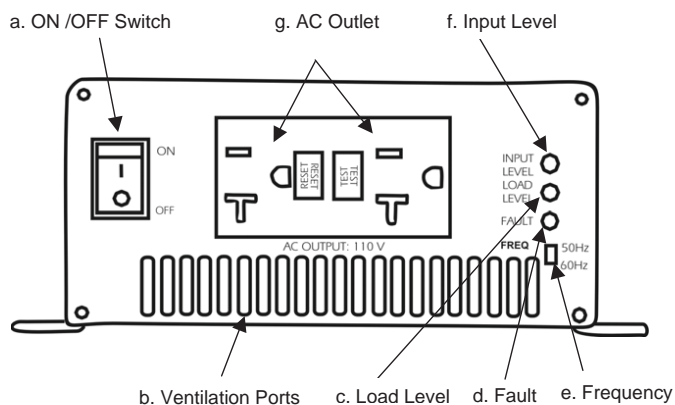
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GO POWER! - SINEWAVE 600W - INVERTER



*Go Power! GP-SW2000, GP-SW1000 and GP-SW600
Inverter Owner's Manual*

3.3 Front view GP SW600:



- a) ON / OFF switch:
Power ON/OFF switch, leave in the OFF position during installation.
- b) Ventilation Ports:
Do not obstruct, allow at least one inch for airflow.
- c) Load Level:
Display AC load watts. Green indicates normal operation, yellow indicates mid or high operation and red indicates overload levels.
- d) Fault:
See Section 5 for LED variations in Fault mode.
- e) Frequency:
Typical North American setting is 60 Hz.
- f) Input Level:
Displays input voltage. Green indicates normal battery level, yellow indicates mid to low battery level and red indicates under voltage.
- g) AC Outlet: Ground Fault Protected (GFCI)
Outlet sockets available: North America



TECHNICAL MANUAL

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• PART 14 : OEM LITERATURE

CARSON - SA-500-20 - SIREN AMPLIFIER

Page 6 of 8

SA-500-20 Installation and Operating Instructions

OPERATION

WARNING  **Sound Hazard** - Sound level from siren speaker (>120dBA @ 10 feet) may cause hearing damage. Do not operate siren without adequate hearing protection for you and anyone in immediate vicinity. (Ref. OSHA 1910.95 for occupational noise exposure guidelines)

GENERAL

This unit is designed for easy operation under the stress associated with high-speed pursuit. Most siren functions are accessible with one simple motion without repetitive activation of switches or automatic timed switching that can interfere with desired operation.

SELECTOR SWITCH

The rotary selector switch controls the primary operating mode of the siren.

Yelp - A rapidly changing tone used in congested areas.

Wail - A slower changing tone used on highways.

Stby - A silent mode that allows Manual, Horn and Public Address operation.

Radio - Also known as Radio Repeat, this mode amplifies a radio speaker input for re-broadcast outside the vehicle. No siren tones or PA operation are available in this mode.



MAN/PHSR

This momentary push-button switch provides a very rapid changing tone (Phaser) when the selector switch is in the Yelp or Wail positions. This tone is used at intersections and very highly congested areas. Pressing the button once changes to the Phaser tone and pressing again changes the tone back to Yelp or Wail.

With the selector switch in the Stby position this switch provides Manual siren tone control, rising when pressed and falling when released. This is used to momentarily alert motorists or in low noise areas.

Phaser may be replaced by **Two-Tone** or disabled. See OPTION SWITCHES section.



HORN

This momentary push-button switch provides a simulated air-horn tone while pressed. This can be used to supplement the normal vehicle horn and is useful at intersections or in low noise areas. This tone overrides other siren tones. Horn may be disabled. See OPTION SWITCHES section.

MICROPHONE

The attached noise-canceling microphone is used for public address operation and overrides any siren tone when the button on the side (PTT) is pressed.

VOLUME CONTROLS

Controls are provided for radio repeat volume and public address volume. These should be set when the vehicle is parked. Set the RAD volume with the selector switch in the Radio position and the radio volume set to desired level. Set the PA volume to the maximum level with no feedback (squeal).



AUXILIARY INPUT

During installation an auxiliary input may be connected to the horn ring or other switching device. It provides the same operation as pressing the Horn button or optionally the Man/Phsr button.

CUTOUT

During installation, a cutout input may be connected to a door switch. It turns off any siren tone when the door is opened. The siren tone will continue to be cut off even when the door is closed. Changing any switch or input will restore normal function.

HORN RING CYCLER 2 (Optional)

Available while selector switch is in standby, repeatedly tapping the horn ring or other switch will cycle through Wail, Yelp, and Phaser tones. Tapping the horn ring twice quickly will stop siren tones. Holding the horn ring produces horn. See OPTION SWITCHES section for further details.

05/07/05

CP4874B



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CARSON - SA-500-20 - SIREN AMPLIFIER

SA-500-20 Installation and Operating Instructions

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SERVICE

This unit is designed to provide years of reliable service under even the worst conditions. Many times there may appear to be a problem with the unit when the true problem is in the speaker(s) or improper installation. The following chart shows typical symptoms and possible causes.

A blown internal fuse doesn't necessarily mean that the unit is bad. If a speaker or speaker lead is shorted the internal fuse will blow before the unit is damaged. Disconnect the SPKR leads and replace the fuse. If the **OUTPUT** light comes on (dim lighting to see) with power on and Yelp selected it is OK. Check the speaker(s) or leads for possible shorting.

PROBLEMS

Symptom	Possible Cause	Check
No power or siren output	Power switch not turned on Bad speaker(s) Connector loose Internal fuse blown Loose connection at power source	Does backlighting come on? Do you hear a "pop" when turned on? Is the OUTPUT light on front panel coming on in Yelp? Is an external fuse or circuit breaker used? Are the negative leads connected to a good ground?
No siren tone - PA works	High Voltage Protection Mic button stuck Cutout activated Cutout Polarity Option set wrong	Input voltage must be less than highest rated voltage. Does mic button release properly? Does the siren work when Cutout input is disconnected? Is the CUT_P option properly configured?
No PA	PA volume not set properly Selector in Radio position	Have you tried turning the PA volume control? PA is not available in the Radio position
Distorted siren sound	Speaker assembly loose Intermittent Aux Input connection Low vehicle voltage	Is the speaker bell or tip loose? Is the Auxiliary Input used and wired properly? Input voltage must be greater than lowest rated voltage.
Intermittent siren tone	High Voltage Protection Connector loose Bad power connection Mic button activation Circuit breaker in supply connection	Is the vehicle voltage regulator working properly? Is the connector tight on the back of the unit? Is there a loose connection on a power lead? Is something lying on the microphone? Is a circuit breaker used with at least a 50A rating?
Horn function or Manual or Phaser stuck on	Horn switch stuck Man/Phsr switch stuck Aux Input improperly connected Aux Input Polarity Option set wrong	Does the horn switch return fully when released? Does the Man/Phsr switch return fully when released? Is the Aux Input used and wired properly? Is the AUX_P option properly configured?
No Radio	Unit not connected to radio Radio volume too low	Is the radio connected properly to the unit? Can you here the radio in the vehicle? Have you tried turning the RAD volume control?
Wrong siren tone	Two-Tone option installed Aux Input set to wrong function Yelp Override option installed	Is the T-T option selected? Is the AUX_I option configured properly? Is the YLP_O option selected?
Phaser not working	Phaser disabled	Is the P_I option selected?
Horn not working	Horn disabled	Is the H_I option selected?

PARTS

The following parts are available from Carson Manufacturing Company, Inc.:

Part	Description
CP3966	Bolt, mounting, 1/4-20 X 3/8" (2 required)
CP3571	Bracket, mounting
CP4688-10	Connector, 10-pin Terminal Block Plug
CP4680-1	Cover (not including chassis)
ATO/ATC 20A	Fuse, 20 Amp Automotive
CP4852	Knob, selector switch
CP4750	Microphone, Noise Canceling w/Connector
CP3633	Microphone Bracket with mounting Screws
SR-15-1	Microphone Strain Relief
CP4119	Transistor, output (2 required) (Industry standard TIP36C, Not Texas Instruments)
ED1558	Hardware Kit (Connector, bolts, microphone bracket with screws)
CP4874	Instruction Manual

CP4874B

05/07/05



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• PART 14 : OEM LITERATURE

CARSON - SA-500-20 - SIREN AMPLIFIER

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SA-500-20 Installation and Operating Instructions

RETURN

If you have any questions concerning this or any other Carson product, please contact our **Technical Service Department** at (888) 577-6877. Many issues can be handled over the phone. We can also be reached via e-mail at service@carsonsirens.com

If a product must be returned for any reason, please contact our Technical Service Department to obtain a Returned Merchandise Authorization number (RMA#) before you ship the product to Carson. Please write the RMA# clearly on the package near the mailing label. Be sure to provide a return address, contact and phone number, along with a brief description of the problem.

LIMITED WARRANTY

Carson Manufacturing Company, Inc. warrants this new product to be free from defects in material and workmanship, under normal use and service, for a period of five (5) years from the date of delivery to the first user-purchaser.

During this warranty period the obligation of Carson Manufacturing is limited to repairing or replacing, as Carson Manufacturing may elect, any part or parts of such product which after examination by Carson Manufacturing is determined to be defective in material and/or workmanship.

This warranty does not cover labor charges for removal or re-installation of the product. Fuses and lamps are not covered under this warranty.

This warranty does not extend to any unit that has been subjected to abuse, misuse, improper installation or which has not been adequately maintained, nor to units which have problems related to service or modification at any facility other than the manufacturer.

THERE ARE NO OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL CARSON MANUFACTURING COMPANY, INC. BE LIABLE FOR ANY LOSS OF PROFITS OR ANY INDIRECT OR CONSEQUENTIAL DAMAGES ARISING OUT OF ANY SUCH DEFECT IN MATERIALS OR WORKMANSHIP.

05/07/05

CP4874B



TECHNICAL MANUAL

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• PART 14 : OEM LITERATURE

WHELEN - CSP660 - STROBE POWER SUPPLY

WHELEN[®]

ENGINEERING COMPANY INC.

Route 145, Winthrop Road,
Chester, Connecticut 06412
Phone: (860) 526-9504
Fax: (860) 526-4078
Internet: www.whelen.com
Sales e-mail: autosale@whelen.com
Canadian Sales e-mail: autocan@whelen.com
Customer Service e-mail: custserv@whelen.com

Installation Guide: CSP660 Strobe Power Supply

Automotive: Power Supplies

Safety First

This document provides all the necessary information to allow your Whelen product to be properly and safely installed. Before beginning the installation and/or operation of your new product, the installation technician and operator must read this manual completely. Important information is contained herein that could prevent serious injury or damage.

- **Proper installation of this product requires the installer to have a good understanding of automotive electronics, systems and procedures.**
- **If mounting this product requires drilling holes, the installer MUST be sure that no vehicle components or other vital parts could be damaged by the drilling process. Check both sides of the mounting surface before drilling begins. Also de-burr any holes and remove any metal shards or remnants. Install grommets into all wire passage holes.**
- **If this manual states that this product may be mounted with suction cups, magnets, tape or Velcro™, clean the mounting surface with a 50/50 mix of isopropyl alcohol and water and dry thoroughly.**
- **Do not install this product or route any wires in the deployment area of your air bag. Equipment mounted or located in the air bag deployment area will damage or reduce the effectiveness of the air bag, or become a projectile that could cause serious personal injury or death. Refer to your vehicle owners manual for the air bag deployment area. The User/Installer assumes full responsibility to determine proper mounting location, based on providing ultimate safety to all passengers inside the vehicle.**
- **For this product to operate at optimum efficiency, a good electrical connection to chassis ground must be made. The recommended procedure requires the product ground wire to be connected directly to the NEGATIVE (-) battery post.**
- **If this product uses a remote device to activate or control this product, make sure that this control is located in an area that allows both the vehicle and the control to be operated safely in any driving condition.**
- **Do not attempt to activate or control this device in a hazardous driving situation.**
- **It is recommended that these instructions be stored in a safe place and referred to when performing maintenance and/or reinstallation of this product.**
- **FAILURE TO FOLLOW THESE SAFETY PRECAUTIONS AND INSTRUCTIONS COULD RESULT IN DAMAGE TO THE PRODUCT OR VEHICLE AND/OR SERIOUS INJURY TO YOU AND YOUR PASSENGERS!**

For warranty information regarding this product, visit www.whelen.com/warranty

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Form No.13196N (042209)



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• PART 14 : OEM LITERATURE

WHELEN - CSP660 - STROBE POWER SUPPLY

The CSP660 Strobe Power Supply, like all Whelen components, can be installed in many different types of vehicles. The guidelines for the installation of this product are written so that no matter what vehicle is being used, the installation and operation will be simple.

Selecting a Mounting Location:

The most common choice for a mounting area would be a trunk or similar compartment. However, due to the wide variety of vehicles onto which the CSP660 could be installed, this is not always possible. The following guidelines will help the installer select an alternative:

- **The CSP660 should be mounted on a metal surface to aid heat dissipation. Be sure that this surface is not one that either generates or is exposed to excessive heat during operation of the vehicle.**
- **Do not select a location where the power supply will be exposed to potential damage from any unsecured or loose equipment in the vehicle.**
- **Be sure the area selected will not allow the unit to be exposed to water.**
- **When routing the wires, it is important to choose a path that will keep these wires away from excessive heat and from any vehicle equipment that could compromise the integrity of the wires (ex. trunk lids, door jams, etc.).**
- **When the best mounting location has been determined, securely fasten the CSP660 to its mounting surface using the supplied hardware.**

WARNING! The Strobe Light Power Supply is a high voltage device. Do not touch or remove tube assembly in strobe light head assemblies while in operation. Wait 10 minutes after disconnecting the unit from its power source before starting work or troubleshooting on power supply or system.

CAUTION: As it will be necessary to drill holes into the mounting surface, the installer **MUST** be sure that no vehicle components or other vital parts could be damaged by the drilling process. Check both sides of the mounting surface before drilling begins.

1. Position the unit in its proposed mounting location to ensure that it fits properly. With the CSP660 in place, insert an awl or other suitable tool into the mounting screw area of the power supply and scribe the areas that are to be drilled.
2. Remove the unit from its mounting area and, using a drill bit sized for a #8 phillips pan head sheet metal screws, drill a hole in each of the areas scribed in the previous step.
3. Return the CSP660 to its mounting location and using the supplied #8 phillips pan head sheet metal screws, mount the unit onto its mounting surface.

NOTE: The shorter screws go to the back of the unit.

Wiring your CSP660:

1. Locate the 3 position Power Connector included with your CSP660 and plug it into the port indicated in Fig. 1. Extend the BLACK and RED wires from the Power Connector towards the battery.

WARNING! All customer supplied wires that connect to the positive terminal of the battery must be sized to supply at least 125% of the maximum operating current and FUSED at the battery to carry that load. DO NOT USE CIRCUIT BREAKERS WITH THIS PRODUCT!

2. Connect the RED wire to a fuse block (customer supplied) and then to the POSITIVE terminal on the battery.

NOTE: Although a 10 amp fuse (customer supplied) is required to be used in the fuse block, do not install the fuse until all of the wire connections are completed.

3. Connect the BLACK wire to the factory chassis ground adjacent to the battery.
4. Refer to page 3 for wiring information for the Control Connector and for the Pattern Selection Connector.
5. As indicated in page 3, there is a provision in the Power Connector for a wire (VIOLET) to activate Hi Power/Low Power strobe operation. If this feature is desired, locate the VIOLET wire included with your power supply and, with the Power Connector disconnected from the power supply, insert the pinned end of the VIOLET wire into position 3 of the Power Connector.



TECHNICAL MANUAL

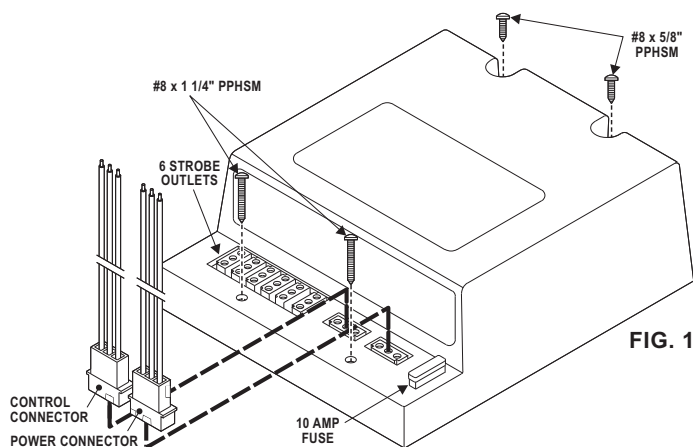
MX151D - GM



• PART 14 : OEM LITERATURE

WHELEN - CSP660 - STROBE POWER SUPPLY

CSP660 SPECIFICATIONS	
V-INPUT (DUAL VOLTAGE)	12.8VDC +/-20% 25.6VDC +/-20%
I-IN 12.8V	6 AMPS 3 AMPS
FLASHRATE	150 F/M TYP
FLASH PATTERNS	1 - COMET FLASH 2 - TRIPLE FLASH 3 - DOUBLE FLASH 4 - SINGLE FLASH 5 - ACTION FLASH 6 - MODU-FLASH 7 - MICRO BURST 2 8 - MICRO BURST 3 9 - LONG BURST 10 - ACTIONSCAN
JOULES HI	9.8/4.8/4.8/4.8 TYP
JOULES LO	4.7/2.4/2.4/2.4 TYP
OUTPUT POWER	60 WATTS



Control Connector

Position # 1 - Yellow Wire
Position # 2 - Green Wire
Position # 3 - Blue Wire

Power Connector

Position # 1 - Red Wire
Position # 2 - Black Wire
Position # 3 - Violet Wire / Optional

Pattern Control

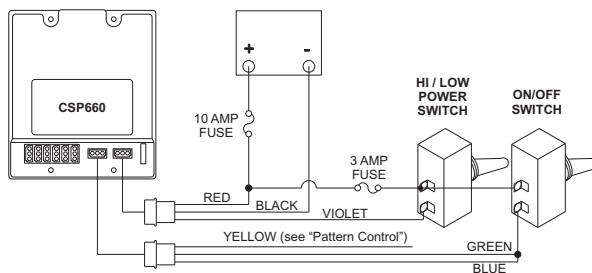
To cycle forward to the next pattern: Apply +voltage to Yellow wire for less than 1 second.
To cycle back to the previous pattern: Apply +voltage to Yellow wire for more than 1 second.
To establish the active pattern: Allow pattern to flash for more than 5 seconds.

NOTE - The type of switch used depends on how the operator wishes the Hi/Lo feature to function:

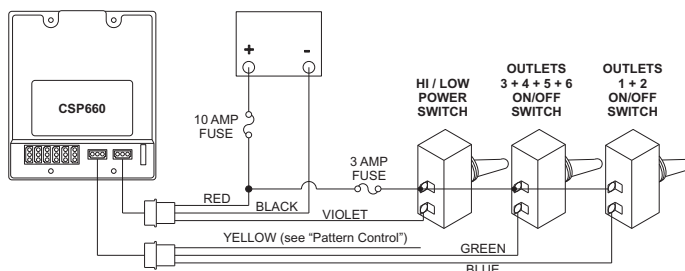
Latching Mode: By applying +voltage to the Violet wire for less than 1 sec., the power supply is "latched" into low power operation. The unit must be turned off and then back on to restore normal, Hi power operation. A momentary switch is desired for this style.

Level Mode: Applying +voltage to the Violet wire for more than 1 sec. holds the power supply in low power mode until that voltage is removed. Use a toggle switch for this style.

Wiring Option 1: All Outlets On/Off



Wiring Option 2: Group Outlet Control





TECHNICAL MANUAL

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• PART 14 : OEM LITERATURE

RICO SUCTION LABS - RS-4 - SUCTION DEVICE



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products

Aspirators—Rico Model RS-4

For Operation from Ambulance Vacuum System or Electric Vacuum Pump

Adapters

Aspirators

Canisters & Brackets

Heads & Fittings

Hoses

Pumps

Rico Kits

Miscellaneous



The Rico RS-4 can be installed as a floor, cabinet or wall-mounted system.

It is designed to operate efficiently from the vacuum system of any ambulance engine. It may also be used with an efficient **vacuum pump**. All metal parts are made of plated brass, steel or aluminum. As an additional safety factor, the head and vacuum container are made of machined acrylic plastic.

The disposable **Sani-Liner** (Item 1019) fits inside the container to receive the aspirated contents. A new Sani-Liner can be quickly and easily fitted into the container.

The Rico RS-4 comes complete with the necessary fittings, installation instructions and one (1) package (containing 24/each) Sani-Liners.

Rico RS-4—Fixed Unit

Item	1001
Weight	4 lbs
Size	6" W x 6" D x 12" H
	15.24 cm W x 15.22 cm D x 29.21 cm H



TECHNICAL MANUAL MX151D - GM



- PART 14 : OEM LITERATURE

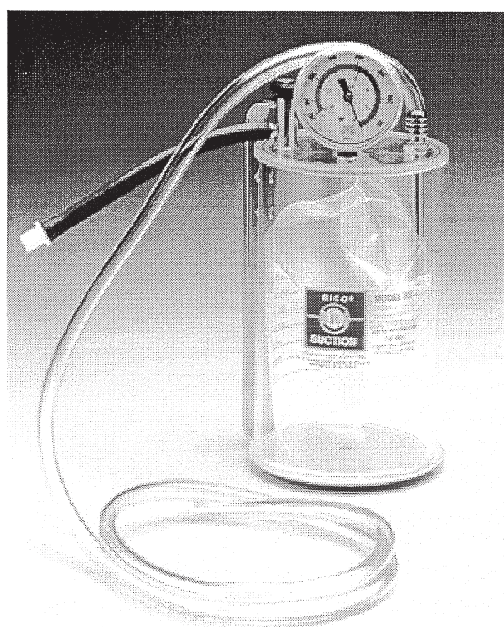
RICO SUCTION LABS - RS-4 - SUCTION DEVICE



OPERATIONS MANUAL

RICO MODEL RS-4

Catalog #1001



RICO SUCTION LABS, INC.

326 MACARTHUR LANE
BURLINGTON, NC 27217-8739

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TECHNICAL MANUAL

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• PART 14 : OEM LITERATURE

RICO SUCTION LABS - RS-4 - SUCTION DEVICE

FOREWARD

Rico Suction Labs, Inc. is the original pioneer in the field of Emergency Medical Aspirators for ambulance use. Rico Aspirators have been in commercial use on ambulances in the United States since 1952, and are currently used throughout the world.

The Rico Aspirator is a precision, custom-made instrument, machined to exacting standards. Extensive research and practical field experience, coupled with its simplicity in design creates the most reliable aspirator available.

The Rico Aspirator is known for its quality and dependable performance.

OPERATING INSTRUCTIONS

RICO MODEL RS-4

Engine or Electric Vacuum Pump

Upon receiving your Rico Aspirator, you should thoroughly familiarize yourself with its "ready to operate" appearance.

VACUUM PUMP OPERATION

Off Mode: - Switch to vacuum pump in "off" position.

Maximum vacuum Mode:

- Switch located on vacuum pump in "on" position.
- Completely close (clockwise rotation) regulator valve.

Regulated Mode:

- Open (counter-clockwise rotation) regulator valve until bleeder valve is activated.
- Adjust to desired setting.



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- PART 14 : OEM LITERATURE

RICO SUCTION LABS - RS-4 - SUCTION DEVICE

INSTALLATION

Directions for installing to Ambulance Engine

- Step 1. Cut vacuum hose running into base of carburetor or manifold. Do not use power brake or spark advance hose.
- Step 2. Insert furnished tee which fits $\frac{1}{4}$ " ID hose into each end of severed hose.
- Step 3. Connect black vacuum line to $\frac{1}{4}$ " fitting in tee. Run line along chassis into patient compartment through $\frac{5}{8}$ " drilled hole in floor and connect to vacuum container or through driver compartment to patient compartment.

Installation – 12V Electric Diaphragm Vacuum Pump

Sufficient vacuum may be attained by running vacuum power from 12V diaphragm vacuum pump (See Rico Suction Labs Parts List)

Installation may vary based on the ambulance configuration and vacuum power design.



TECHNICAL MANUAL

MX151D - GM



• PART 14 : OEM LITERATURE

RICO SUCTION LABS - RS-4 - SUCTION DEVICE

CERTIFICATE

Rico Suction Labs, Inc. hereby certifies that the Rico Suction Units , Model RS-4 and Model RS-6, with the Rico Ready-To-Use Kit and the Rico Suction Rinsing Water Bottle, meet the applicable Requirements of Federal Specification KKK-A-1822E, paragraph 3.12.3, FOR ENGINE VACUUM.

The Rico Throat Catheter Handle, which we furnish with our Throat Catheter Kit and Ready-To-Use Kit, incorporates the Y connector for Tracheal Suctioning.

We do not furnish the following items which are required by Federal Specifications for Engine Vacuum: vacuum tank with check valve (reservoir chamber). Vacuum plug in, self-sealing valve connection (plug in outlet) can be furnished at additional cost.

Our Electric Vacuum Pumps comply with Federal Specifications for Vacuum and Air Flow.

PERFORMANCE

RICO SUCTION Model RS-4 and Model RS-6, when used with Vacuum of Ambulance Engine:

• Time to reach 380 mm Hg	2.5 – 3 seconds
• Vacuum Gauge Error	+/- 2.4%
• Maximum Free Air Flow	30 – 35 LPM
• Maximum Vacuum	13" – 18" Hg
Metric	330.2 – 457.20 mm Hg

RICO SUCTION Model RS-6 and Model RS-5X, when used manually:

• Time to reach 380 mm Hg	2.4 seconds
• Vacuum Gauge Error	+/- 2.4%
• Maximum Free Air Flow	38 LPM
• Maximum Vacuum	27.8" Hg
Metric	706.12 mm Hg
• Cubic Inch Displacement Per Stroke	12.75 Cubic Inch
Metric	208.93 Cubic Cm

The above exceeds all published requirements for Vacuum and Air Flow.



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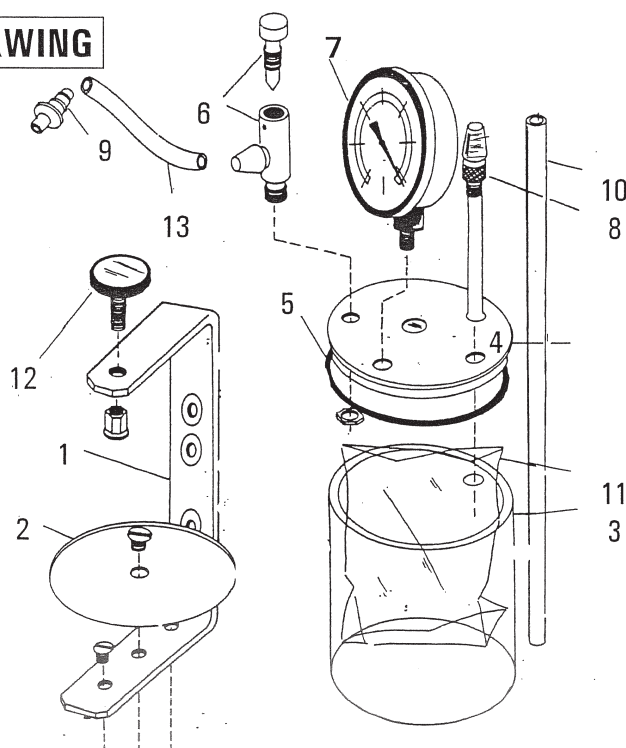
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• PART 14 : OEM LITERATURE

RICO SUCTION LABS - RS-4 - SUCTION DEVICE

PARTS DRAWING



PARTS LIST

	<i>DESCRIPTION</i>	<i>CATALOG #</i>
1.	FRAME	2025P
2.	BRACKET PAN	2024P
3.	VACUUM CONTAINER BOTTLE	2026P
4.	VACUUM CONTAINER HEAD	2028P
5.	O-RING GASKET	2032P
6.	REGULATOR VALVE	2029P
7.	VACUUM GAUGE	2035P
8.	STEM, PATIENT HOSE	2031P
9.	QUICK DISCONNECT-MALE	2034P
10.	PATIENT HOSE	2041P
11.	RICO SANI-LINER	1019
12.	HOLD DOWN SWIVEL	2023P
13.	BLACK VACUUM HOSE	2036P



TECHNICAL MANUAL MX151D - GM



- PART 14 : OEM LITERATURE

RICO SUCTION LABS - RS-4 - SUCTION DEVICE



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Catalog Online @ www.ricosuction.com

• PART 14 : OEM LITERATURE

OHIO MEDICAL CORPORATION - SUCTION OUTLET

Ambulance/OEM Outlets

Product Specifications

FEATURES AND BENEFITS

- DISS connection on inlet pipe for any hose connection
- Accepts Chemetron/Allied®, Ohio Diamond, HillRom® Beacon Medaes, Puritan Bennett and DISS specific adapters
- Pin indexed to prevent interchangeability of gas services
- Less than 3 psi (21 kPa) pressure drop through the outlet at 120 L/min and 50 psig (345 kPa) inlet pressure
- Inlet pipe can be swiveled 360 degrees for ease of installation
- Gas specific back bodies can accept either Quick Connect or DISS front identification bodies
- Outlets can be adjusted up to 3/4" (19mm) in mounting plate thickness.
- Adapters are available from Ohio Medical Corporation

SPECIFICATIONS

The medical gas console outlet shall be Ohio Medical Healthcair® Series. The outlets shall be UL Listed, NFPA compliant, cleaned for medical gas service and be pressure tested. Each outlet shall have less than 3 psi (21kPa) pressure drop through the outlet @ 120 l/min. and 50 psig (345 kPa) inlet pressure. For outlets providing positive pressure gas, the outlet shall be equipped with a primary and secondary check valve, the secondary check valve shall be rated for 200 psi (1,379 kPa) allowing the primary check valve to be removed for service without isolating the entire zone.

The console outlets shall have a gas specific back body which can accommodate up to a 3/4 "(19 mm) plate. Each back body shall be equipped with a copper gas specific DISS fitting which is brazed to the outlet body. The inlet pipe can be swiveled 360 degrees for ease of installation.

Outlet bodies shall be gas specific by means of a gas specific indexing pin arrangement. The indexing pins shall be arranged in such a way as to connect the latch-valve assembly only with the specific matching gas back body, preventing interchangeability of gas services.

The latch-valve assembly which, by means of color coding and wording shall identify the specific medical gas service provided by the outlet and shall accept gas specific adapters.

Ohio Medical Corporation is an ISO 13485 registered facility.



Ohio Diamond Compatible Console Outlet



Puritan-Bennett Compatible Console Outlet



Chemetron Compatible Console Outlet



DISS Console Outlet



*Rebuild Kits Available

Chemetron® is a registered trademark of Allied Healthcare Products, Inc.
Hill-Rom® is a registered trademark of Hillenbrand Industries





TECHNICAL MANUAL

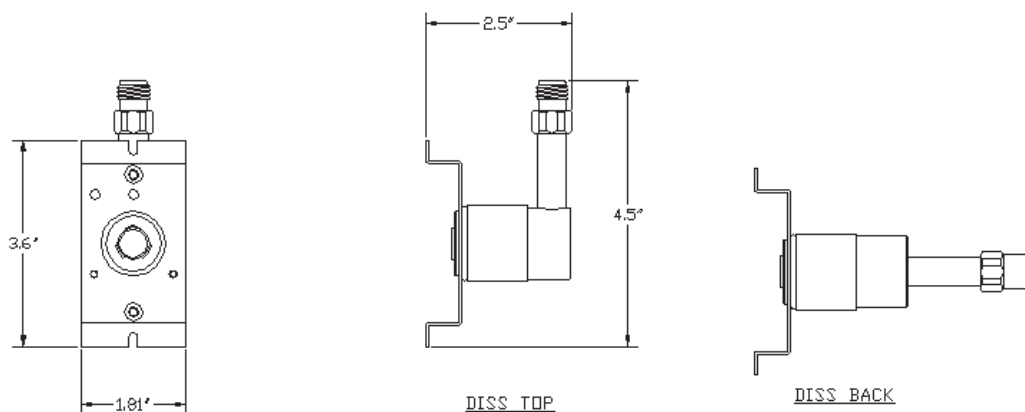
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• PART 14 : OEM LITERATURE

OHIO MEDICAL CORPORATION - SUCTION OUTLET

DISS Shown



Latch Valve (Front Body)

DESCRIPTION	DISS Console	Diamond Compatible Console	Chemetron Compatible Console	Puritan-Bennett Compatible Console
Oxygen	261100-1	261110-1	261120-1	261140-1
Vacuum	261100-2	261110-2	261120-2	261140-2
Nitrous Oxide	261100-3	261110-3	261120-3	261140-3
Air	261100-4	261110-4	261120-4	261140-4
Nitrogen	261100-5			
Evac/WAGD	261100-6	261110-6	261120-6	261140-6
Carbon Dioxide	261000-7			

Rough In (Back Body)

DESCRIPTION	90° DISS Top	DISS Back
Oxygen	261230-2	261230-1
Vacuum	261230-4	261230-3
Nitrous Oxide	261230-6	261230-5
Air	261230-8	261230-7
Nitrogen	261230-10	261230-9
Evac/WAGD	261230-12	261230-11
Carbon Dioxide	261230-14	261230-13

TRUSTED BRANDS OF OHIO MEDICAL™



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Form No.255457 (Rev.3) 05/2009

• PART 14 : OEM LITERATURE

THOMAS - 907 SERIES - SUCTION PUMP

<p>Diaphragm</p> 	<h2>907 SERIES</h2>
<p>MODELS</p> <p>Standard models 907CDC18</p> <p>Other models based on availability and minimum purchase.</p> <p>907BDC22</p> <p>ISO 9001 CERTIFIED</p>	 <p>FEATURES</p> <ul style="list-style-type: none"> • Oil-less operation • Permanently lubricated bearings • Field service capability • Stainless steel valves and aluminum valve plate • Lightweight die-cast aluminum head and diaphragm hold down plate • Long-life diaphragm • Inlet filter • Balanced for smooth, low vibration operation • Service Kit SK927 <p>Consult factory for custom applications</p> <p>THOMAS A Gardner Denver Product</p>



TECHNICAL MANUAL

MX151D - GM



• PART 14 : OEM LITERATURE

THOMAS - 907 SERIES - SUCTION PUMP

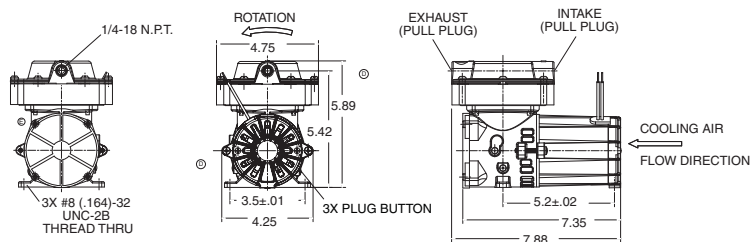
907 Series Performance Data

Standard					
MODEL NUMBER		907CDC18		907BDC22	
HEAD CONFIGURATION		Pressure/Vacuum		Vacuum	
STROKE		.180 Inches		.220 Inches	
PRESSURE		Flow @ 12v		Flow @ 12v	
CFM @ PSI	LPM @ bar				
PSI	bar	CFM	LPM	CFM	LPM
0	0	2.05	58.0		
5	.5	1.67	42.5		
10	1.0	1.30	27.3		
15	1.5	.93	18.4		
20	2.0	.72	10.9		
25	3.0	.53			
30	5.0	.35			
35	7.0				
40	10.0				
MAX. CONTINUOUS PRESSURE		30 PSI	2.1 bar		
VACUUM		Flow @ 12 v		Flow @ 12 v	
CFM @ IN. hg	LPM @ mbar (gauge)				
IN. hg	mbar (gauge)	CFM	LPM	CFM	LPM
0	0	2.05	58.0	1.80	60.0
5	-100	1.25	44.6	1.34	43.3
10	-200	.82	33.1	.88	35.6
15	-400	.48	19.7	.56	21.6
20	-600		8.3		10.9
MAX. VACUUM		22.2"hg	-751 mbar	24.8"hg	-841 mbar
MAX. AMBIENT AIR TEMP.		104° F	40°C	104° F	40°C
MIN. AMBIENT START TEMP.		50° F	10°C	50° F	10°C
MAX. RESTART PRESSURE		5 PSI	.3 bar		
MAX. RESTART VACUUM		21.9"hg	-741 mbar	24.1"hg	-817 mbar
MOTOR VOLTAGE/FREQUENCY		12v DC		12v DC	
MOTOR TYPE		Permanent Magnet		Permanent Magnet	
CURRENT AT RATED LOAD (AMPS)		10.8		7.7	
POWER AT RATED LOAD (WATTS)					
STARTING CURRENT (LOCKED ROTOR, AMPS)		40.0		20.0	
MIN. FULL LOAD SPEED (RPM)		2680		2504	
THERMAL PROTECTOR		No		No	
NET WEIGHT		6.5 lbs.	2.9 kg	6.5 lbs.	2.9 kg

The information presented in this material is based on technical data and test results of nominal units. It is believed to be accurate and reliable and is offered as an aid to help in the selection of Thomas products. It is the responsibility of the user to determine the suitability of the product for his intended use and the user assumes all risk and liability whatsoever in connection therewith. Thomas Industries does not warrant, guarantee or assume any obligation or liability in connection with this information.

NOTE: Models pictured are representative of the series and do not represent a specific model number. Consult factory for detailed physical description.

907CDC18



THOMAS
A Gardner Denver Product

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www.thomaspumps.com

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• PART 14 : OEM LITERATURE

WHITE-RODGERS - 1A10-651 - THERMOSTAT

THERMOSTATS

LINE VOLTAGE THERMOSTATS

White, _____
Rodgers



1A10-651
with S29-21 subbase

1A10-651 LIGHT DUTY AND 1A16-51 HEAVY DUTY LINE VOLTAGE THERMOSTATS

For Direct Control of Fan Coils, Fans, Motor Starters, Circulator Motors, Contactors, Valves for Heating, Cooling & SPDT Applications

FEATURES

- Two dial stops for setting a maximum or minimum temperature. Minimum between 66 to 87°F. Maximum between 60 to 81°F.
- Thermostat mounts on 2" x 4" electrical box.
- Includes set point locking feature at 66°, 69°, 72°, 75°, 78° or 81°F
- Vertical or horizontal mounting.
- Optional heating and cooling subbase S29-21 available.
- Beige color.
- Does not contain mercury.

SPECIFICATIONS

Dimensions without subbase, knob & case . . . 4 1/2" H x 2 7/8" W x 1 3/4" D (Vertical)
Dimensions with subbase, knob & case 5 1/8" H x 2 7/8" W x 2 1/8" D (Vertical)
Agency U.L. listed and C.S.A. certified

PARTS AND ACCESSORIES See end of this section for additional parts and accessories

- F61-2152 – Wallplate (4 5/8" x 6 5/8") only
- F20-1852 – Vertical and horizontal thermostat dials without thermometer
- F20-2386 – Thermostat and subbase dials for horizontal mounting
- Thermostat guards – see pages 28-29

Model Number	Range	Differential	Switch Action	A.C. Electrical Ratings						Pilot Duty
				Voltage	Heat			Cool		
					Full Load	Locked Rotor	Resistive (Non-inductive)	Full Load	Locked Rotor	
1A10-651	36 to 90°F ¹ (2 to 32°C)	1.5°F	SPDT	120	8.0A	48.0A	8.0A	8.0A	48.0A	125 VA
				240/277	4.0A	24.0A	8.0A	4.0A	24.0A	125 VA
				120	16.0A	96.0A	16.0A	8.0A	48.0A	125 VA
1A16-51	36 to 90°F ¹ (2 to 32°C)	1.5°F	SPDT	120	16.0A	96.0A	16.0A	8.0A	48.0A	125 VA
				240/277	8.0A	48.0A	16.0A	4.0A	24.0A	125 VA
				120	16.0A	96.0A	16.0A	8.0A	48.0A	125 VA

SUBBASES FOR 1A10-651 AND 1A16-51

Model Number	System Switching	Thermostat Used	Thermostat Style
S29-21	Cool – OFF – Heat	1A10-651, 1A16-51	Vertical
S29-22	OFF – Heat	1A10-651, 1A16-51	Vertical



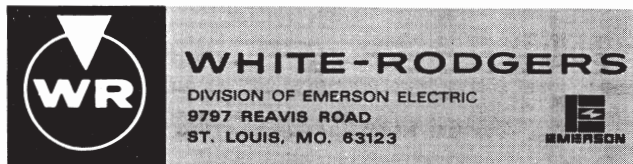
TECHNICAL MANUAL

MX151D - GM



• PART 14 : OEM LITERATURE

WHITE-RODGERS - 1A10-651 - THERMOSTAT



— INSTRUCTIONS — TYPE 1A10-SERIES LIGHT DUTY LINE VOLTAGE HEATING-COOLING THERMOSTAT

**READ ALL INSTRUCTIONS CAREFULLY, BEFORE INSTALLING OR OPERATING THIS THERMOSTAT
KEEP INSTRUCTION SHEET FOR FUTURE USE**

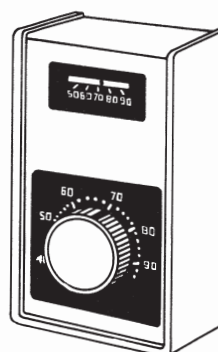
This Light Duty Line Voltage Heating-Cooling Thermostat is designed for controlling fan motors, circulator motors, contactors, motor starters, valves, etc. To provide greater room comfort, the thermostat is equipped with fixed anticipators.

Two dial stops are supplied, which may be used for making a maximum or minimum setting, a limited temperature range or a locked dial setting. (See parts package).

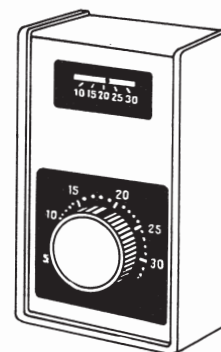
The thermostat may be converted to horizontal mounting by applying the adhesive backed horizontal dial over the vertical dial. (See dial package).

The temperature may be set anywhere between 36° and 90° F or 2° and 32° C by turning knob to the desired temperature on the dial.

Positive off or system selection can be obtained by using a switching sub-base.



DEGREES FAHRENHEIT
TYPE



DEGREES CENTIGRADE
TYPE

SPECIFICATIONS

Switch Action: S.P.D.T.

(Heating, open on rise)
(Cooling, close on rise)

Range: 36 to 90° F. or 2° to 32° C.

CAUTION When thermostat is set below 40° F or 5° C, damage to the building and/or contents may result due to freezing. This is possible due to factory calibration tolerances, thermostat location and operating characteristics of the heating equipment.

Contact Structure: Snap Switch

Electrical Rating:

Voltage (A.C.)	120v.	240v.	277v.
Full Load Amps.	8	4	4
Locked Rotor Amps.	48	24	24
Resistive Amps.	8	8	8
Pilot Duty	125 VA		

SELECTING LOCATION

The proper location of the room thermostat is most important to insure that it will provide a comfortable home temperature. Observe the following general rules when selecting a location:

1. Locate it about 5 ft. above the floor.
2. Install it on a partitioning wall, not on an outside wall.
3. Never expose it to direct light from lamps, sun, fireplaces or any temperature radiating equipment.
4. Avoid locations close to doors that lead outside, windows, or adjoining outside walls.

5. Avoid locations close to air registers, or in the direct path of air from them.
6. Make sure there are no pipes or duct work in that part of the wall chosen for the thermostat location.
7. Never locate it in a room that is warmer or cooler than the rest of the home, such as the kitchen.
8. Avoid location with lack of air circulation, such as behind doors or alcoves.
9. The living or dining room is normally a good location, provided there is no cooking range or refrigerator on opposite side of wall.

INSTALLATION

CAUTION To prevent electrical shock and/or equipment damage, disconnect electric power to system, at main fuse or circuit breaker box, until installation is complete.

The thermostat may be mounted in any standard 3" x 2" or 4" x 2" electrical outlet box. For ease of installation, use a deep type box. **USE COPPER CONDUCTORS ONLY.**

Installation should be made as follows:

1. Cut field just long enough to reach wiring terminals with thermostat held in palm of hand. (Appx. 6")

2. Strip field wires 1/2" and make connections to wiring terminals. Connect load (or loads) as shown on the diagram for your application. (See wiring)
3. Remove thermostat cover by grasping top and bottom of cover and pull straight out. Dress wiring into switch box and secure thermostat to outlet box with mounting screws.
- NOTE: DO NOT PUSH OR DAMAGE THE KNOB SENSING ELEMENT DURING INSTALLATION.**
4. Install thermostat cover and turn knob to desired setting.

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PART No. 37-3911
Replaces 37-3655-1, 37-3657, 37-3842, 37-3867



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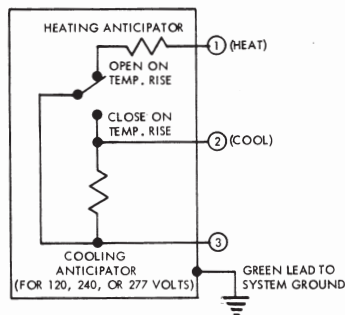
• PART 14 : OEM LITERATURE

WHITE-RODGERS - 1A10-651 - THERMOSTAT

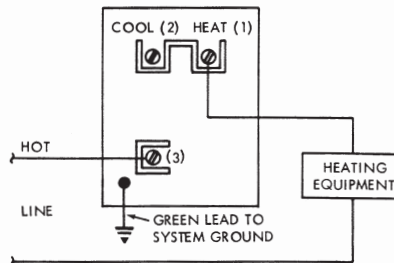
WIRING

NOTE: All wiring should be installed according to local and national electrical codes and ordinances.

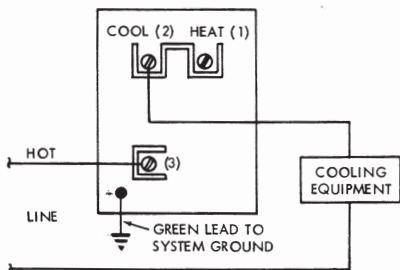
INTERNAL SCHEMATIC OF 1A10



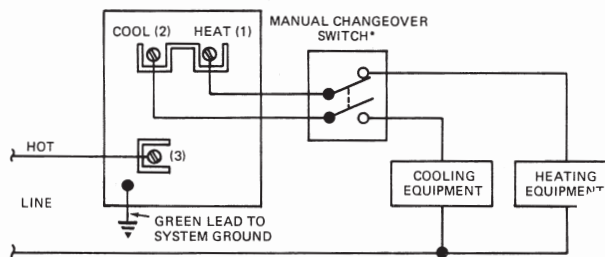
TYPICAL HOOK-UP FOR HEATING ONLY SYSTEM



TYPICAL HOOK-UP FOR COOLING ONLY SYSTEM

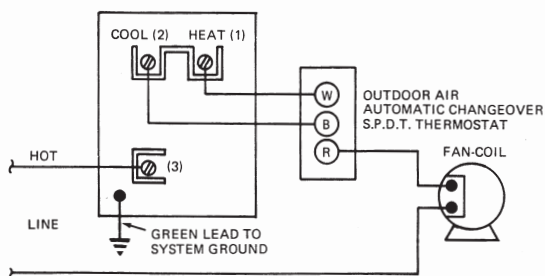


HEATING-COOLING SYSTEM USING A MANUAL CHANGEOVER SWITCH

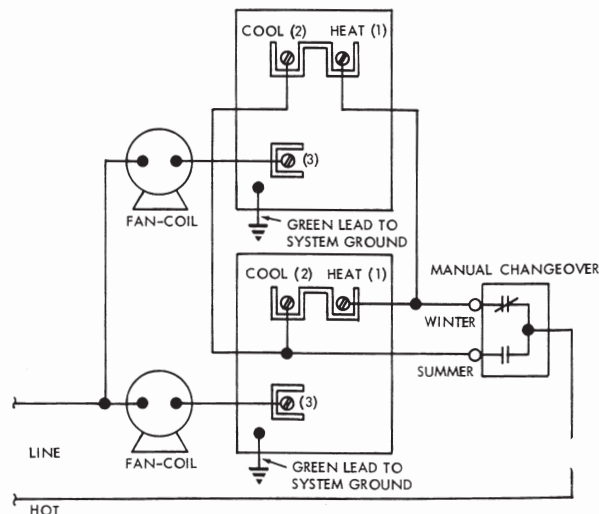


* POSITIVE OFF OR SYSTEM SELECTION CAN BE OBTAINED BY USING A SWITCHING SUB-BASE.

FAN COIL SYSTEM



HEATING-COOLING FAN-COIL SYSTEM USING TWO OR MORE THERMOSTATS



• PART 14 : OEM LITERATURE

WHITE-RODGERS - 1A10-651 - THERMOSTAT

LOCKED DIAL SETTING OR LIMITED SETTING STOPS

The enclosed stops may be used to provide "LOCKED DIAL SETTING" or "LIMITED SETTING". Instructions for installing the stops to perform either of these functions are given below.

NOTE: Once stops are installed, they cannot be removed.

CAUTION To prevent electrical shock and/or equipment damage, disconnect electric power to system, at main fuse or circuit breaker box, until installation is complete.

PACKAGE CONTAINS:

- 2 — stops
- 2 — pins



INSTALLATION

MAXIMUM LIMIT DIAL SETTING — By installing one Stop, the maximum limit temperature may be set. (Example: Fig. A, Max. Limit Setting 78° F or 26° C)

1. From Figure "A" select the hole at the outer edge of the knob which corresponds to the maximum dial setting you desire.
2. Rotate knob counter-clockwise to lowest setting. Remove thermostat cover by grasping top and bottom and pull straight out.
3. Position stop under knob so the hole in the stop and selected hole in thermostat base are aligned. Insert pin into aligned holes, but do not push pin completely down. (Fig. "D")
4. Rotate knob clockwise to its newly selected maximum setting. With the thermostat cover in place, this should now be the maximum temperature setting you selected in step #1. If setting is incorrect, the stop is still removable and may be moved to another hole.
5. With stop installed in the correct hole, the pin can now be seated down on the stop by pushing with the blade of a screwdriver or gently tapping with a light object. **Use care not to hit the knob.** The stop is now installed and cannot be removed.

4. Rotate knob counter-clockwise to its newly selected minimum setting. With the thermostat cover in place, this should now be the minimum temperature setting you selected in step #1. If setting is incorrect, the stop is still removable and may be moved to another hole.

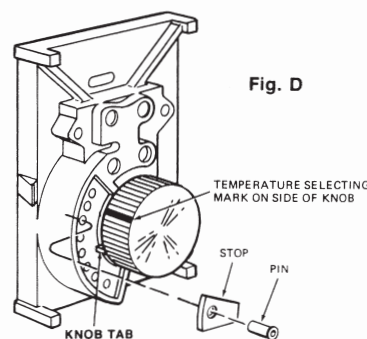
5. With stop installed in the correct hole, the pin can now be seated down on the stop by pushing with the blade of a screwdriver or gently tapping with a light object. **Use care not to hit the knob.**

LOCKED DIAL SETTING — By installing two Stops, the Knob may be locked at a selected temperature (Fig. C).

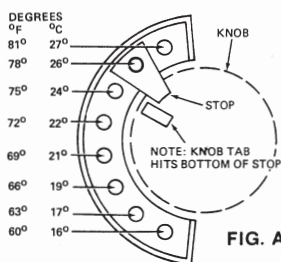
1. Select the temperature setting at which the knob is to be locked and locate the corresponding hole in fig. "A" (Minimum 66° F or 19° C, Maximum 81° F or 27° C). Install the first stop as described in maximum limit dial setting section.
2. Rotate the knob clockwise until it hits the first stop. Install the second stop in the same manner in the second hole down from first stop. (Example: Fig. C Knob setting is locked at 72° F or 22° C and cannot be changed.)

MINIMUM LIMIT DIAL SETTING — By installing one Stop, the minimum temperature may be set. (Example: Fig. B, Min. Limit Setting 69° F or 21° C)

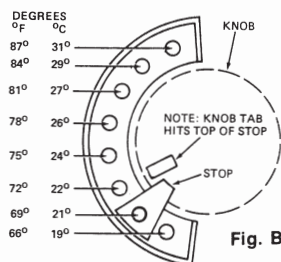
1. From Figure "B" select the hole at the outer edge of the knob which corresponds to the minimum dial setting you desire.
2. Rotate knob clockwise to highest setting. Remove thermostat cover by grasping top and bottom and pull straight out.
3. Position stop under knob so the hole in the stop and selected hole in thermostat base are aligned. Insert pin into aligned holes but do not push pin completely down. (Fig. D)



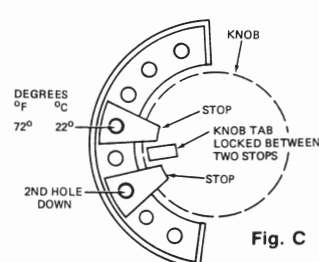
MAX. DIAL SETTING STOP



MIN. DIAL SETTING STOP



LOCKED DIAL SETTING



• PART 14 : OEM LITERATURE

TST- 180-0344 - ANALOG VOLTMETER



Component Products

360-0206



Compartment Light Control Module
Controls compartment light, ground. Rated for 15 amps of current.

Similar Items:

VM-100 – Digital Voltmeter
VM-200 – Digital Ammeter

180-1911



Digital Hourmeter

TST digital hourmeters are inexpensive and reliable. These weather resistant, panel mounted, DC input meters are designed for use in specialty vehicles and feature a compact and convenient mounting configuration. Operating temperature ranges from minus 40 degrees F to plus 170 degrees F.

Meters – Analog and Digital

180-0343



Analog Ammeter

Black face / bezel, 200 amp rating, analog ammeters requiring 4 milliamps to drive the full meter scale while providing 2% full-scale, 1% linear scale accuracy. 250-degree needle swing with 10 amp gradient markings on the face provide accuracy. 300 amp version shown.

Similar Items:

180-0342 – 300 Amp Black Face, Black Bezel
180-0345 – 300 Amp Black Face, Chrome Bezel
180-0347 – 200 Amp Black Face, Chrome Bezel

180-0344



Analog Voltmeters

Only 4 milliamps needed to drive full scale meter, providing a 2% full-scale and 1% linear scale accuracy. 250 degree needle swing provides reading for 7-18 volts with 4 gradients between each indicated volt. Black face / bezel.

Similar Items:

180-0346 – Volt Meter Black Face Chrome Bezel

180-0355



Analog Hourmeter

Provides quartz accuracy to +3 seconds / month. Black face / bezel. Immediate on / off capability eliminates run-on. Provides up to 99,999.9 hours. Meter has black face, a yellow sweep second hand, and a white minute hand.

ViewMaster™ Series Digital Meters



Voltmeter (left) and Ammeter (right)

360-3024



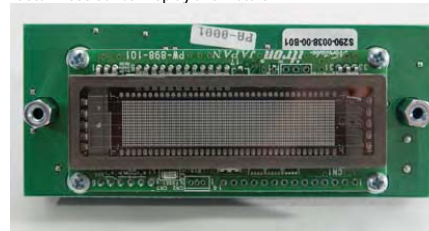
Digital Clock

24 hour digital wall clock assembly, stand-alone package or custom fit into panel. Clock has a 0.375 inch, red LED display. Changes to stopwatch and back to clock by pushing the MODE switch. One button control makes switchover or reset easy.

Similar Items:

360-3012 – 12 or 24 hour Clock

ViewMaster™ 500 series Display and Meters



Digital Displays and Meters

Display for digital ammeter and / or voltmeter.

VM-500 – Viewmaster display only (see photo above)

VMH-500 – Viewmaster Hall Effect Current Sensor only

VM-501 – For single alternator vehicles, includes 1 Hall Effect Current Sensor (HECS)

VM-502 – For vehicles with 2 alternators, includes 2 HECS



TECHNICAL MANUAL

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• PART 14 : OEM LITERATURE

SOUND OFF SIGNAL - ETHFSS-SP - WIG WAG MODULE

SoundOff Signal

3900 Central Parkway

Hudsonville, MI 49426

toll free 800.338.7337

office 616.896.7100

techsupport@soundoffsignal.com

www.soundoffsignal.com

Solid State Headlight Flasher with Select-A-Pattern Technology

(ETHFSS-SP)

(ETHFSS-SPA) with AMP Connector

(ETHFSS-SPFL) with AMP Connector, Mating Harness, and Loop Plug

Congratulations! You are now the proud owner of the most technically advanced true 100% Solid State Selectable Pattern Headlight Flasher System in the market today. Add to it our never ending commitment to quality, when properly installed this new Flasher System will provide you with years of dependable trouble free service.

The Flasher System will operate a 2 or 4 headlight system on any vehicle with a +8-30 Vdc negative ground system.

Specifications:

Input Voltage	8-30Vdc
Output Current:	9.5 Amps / output
Standby Current:	< 10mA
Number of Flash Patterns:	7

NOTE:

When used in dark conditions, the low beam headlights need to be ON for proper illumination, while the highbeam headlights will flash to gain attention and increase the vehicle's visibility.

When the high beam switch is activated, the Flasher system's High Beam Over-Ride (HBOR) is activated and will interrupt the flashing sequence to allow normal high beam function. The HBOR function is automatically disabled with the high beam switch is de-activated allowing the headlight flasher to resume operation.

NOTE:

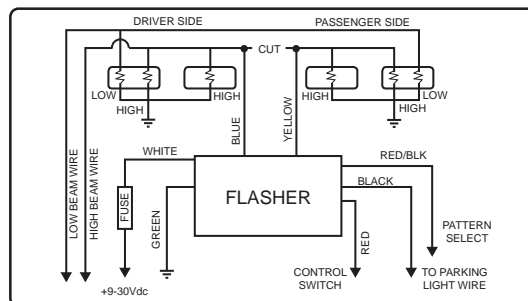
Flashing Headlights and Taillight Systems are intended for approved vehicles only. The user of this system is responsible to ensure compliance to any Federal, State, or Municipal regulations, which may apply.

WARNING:

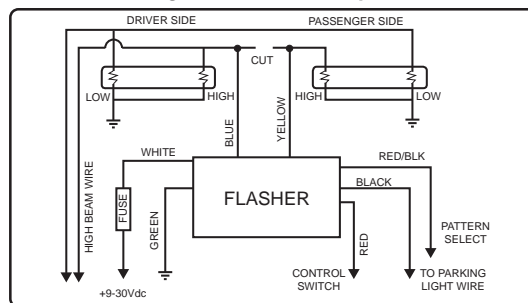
This Flasher will not work on any "ground side switched" system. If you have any questions regarding what type of system your vehicle has, contact SoundOff Signal's Technical Service Department at 1-800-338-7337.

MOUNTING:

The enclosed headlight flasher has been designed to be water resistant. However, to ensure years of trouble free operation of the flasher system, it should be mounted in a location that is protected from direct water spray and high temperatures.



Wiring Schematic - 4 Lamp Install



Wiring Schematic - 2 Lamp Install

Green Wire:

Connect to reliable ground, preferably close to ground post of battery

Blue and Yellow wires:

Locate the wire that supplies power to either the passenger side or driver side high beam headlight. Cut this wire approximately 10-12" from the headlight. Connect the yellow wire to the lead that returns to the headlight. Connect the blue wire to the other piece of the cut wire which will provide power to the opposite highbeam headlight.



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SOUND OFF SIGNAL - ETHFSS-SP - WIG WAG MODULE

White Wire:

Connect to a +8-30 Vdc power source capable of providing 15 Amps.

WARNING:

DO NOT USE A CIRCUIT BREAKER, FUSIBLE LINK, OR SLOW BLOW TYPE FUSE

Red Wire:

Connect to a powered switch through a user supplied 1 amp fuse.

Black Wire (OPTIONAL Connection):

If an "Automatic Nighttime Flasher disable" is required (check with state and municipal regulations) simply 'T' or tap this wire into the parking / marker light wire. This feature will disable the flasher whenever the parking / marker lights are turned ON.

Flash Pattern Selection:

To change the pattern, momentarily touch Red/Blk wire to ground. The pattern will change each time Red/Blk wire is touched to ground.

Flash Pattern Sequence:

- | | |
|------------------|---------------------|
| 1 - Road Runner™ | 115 cycles / minute |
| 2 - PowerPulse™ | 180 cycles / minute |
| 3 - ETM | 215 cycles / minute |
| 4 - Double Flash | 50 cycles / minute |
| 5 - Q-Switch™ | Multi-Pattern |
| 6 - Cycle Flash | Multi-Pattern |
| 7 - Single Flash | 56 cycles / minute |

Once the pattern is selected, the flasher will retain the selected flash pattern.

Final System Check:

1. Verify Headlight Flasher properly flashes headlights when Flash Enable switch is turned ON.
2. With Flash Enable Switch ON, turn High beam switch ON and verify both high beam headlights turn ON steady.
3. If NTCO is required: With Flash Enable Switch ON, turn parking / marker lights ON and verify Flasher does not function.

Troubleshooting:

Symptom:

No Operation

Solution:

Verify fuse is not open.
Verify voltage of 8-30Vdc is present on Red wire and Flash enable wire.

Interference with Radio equipment

Verify power and ground wires are not connected to same circuit as radio equipment. Connect ground wire as close to ground terminal of battery as practical

Flasher stops functioning when marker lights are turned ON

NTCO (Night Time cut-off) wire is connected to parking / marker lights. If flashing of headlights is allowed at night, remove NTCO wire from marker light wiring.

Headlights turn ON for short time then OFF for a couple of seconds and repeats

Over-current shutdown of the flasher has detected too much load on the flasher. Verify a maximum of 2-55 Watt lamps are connected to each output

WARRANTY

SoundOff Signal warrants the Solid State Headlight Flasher (ETHFSS-SP) for Five (5) years from the date of purchase to the original purchaser against any manufacturer defects or workmanship. This warranty applies only to units installed according to manufacturer's installation instructions and operated within the units specifications.

SoundOff Signal's obligation under this warranty is limited to repairing or exchanging the unit. Exchanging units under this warranty is as follows: 100% of purchase price for the first two years, 75% of purchase price the 3rd year, 50% of purchase price the 4th year, and 25% of purchase price the 5th year.

Warranty is void if the unit was installed incorrectly or maliciously damaged.

All warranty claims must be accompanied by a dated proof of purchase.

SoundOff Signal retains the right to be the sole mediator of what constitutes defects in performance or manufacturing.

ETHFSS-SP 11/07



TECHNICAL MANUAL MX151D - GM



- PART 14 : OEM LITERATURE

VIPER - MODEL 211HV - KEYLESS ENTRY SYSTEM

Viper®

Model 211HV

► *Owner's Guide*



TECHNICAL MANUAL

MX151D - GM



• PART 14 : OEM LITERATURE

VIPER - MODEL 211HV - KEYLESS ENTRY SYSTEM

limited lifetime consumer warranty

Directed Electronics, Inc. ("Directed") promises to the original purchaser to repair or replace with a comparable reconditioned model any Directed unit (hereafter the "unit"), excluding without limitation the siren, the remote transmitters, the associated sensors and accessories, which proves to be defective in workmanship or material under reasonable use during the lifetime of the vehicle provided the following conditions are met: the unit was professionally installed and serviced by an authorized Directed dealer; the unit will be professionally reinstalled in the vehicle in which it was originally installed by an authorized Directed dealer; and the unit is returned to Directed, shipping prepaid with a legible copy of the bill of sale or other dated proof of purchase bearing the following information: consumer's name, telephone number and address; the authorized dealers name, telephone number and address; complete product description, including accessories; the year, make and model of the vehicle; vehicle license number and vehicle identification number. All components other than the unit, including without limitation the siren, the remote transmitters and the associated sensors and accessories, carry a one-year warranty from the date of purchase of the same. This warranty is non-transferable and is automatically void if: the original purchaser has not completed the warranty card and mailed it within ten (10) days of the date of purchase to the address listed on the card; the unit's date code or serial number is defaced, missing or altered; the unit has been modified or used in a manner contrary to its intended purpose; the unit has been damaged by accident, unreasonable use, neglect, improper service, installation or other causes not arising out of defects in materials or construction. The warranty does not cover damage to the unit caused by installation or removal of the unit. Directed, in its sole discretion, will determine what constitutes excessive damage and may refuse the return of any unit with excessive damage. TO THE MAXIMUM EXTENT ALLOWED BY LAW, ALL WARRANTIES, INCLUDING BUT NOT LIMITED TO EXPRESS WARRANTY, IMPLIED WARRANTY, WARRANTY OF MERCHANTABILITY, FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF NON-INFRINGEMENT OF INTELLECTUAL PROPERTY, ARE EXPRESSLY EXCLUDED; AND DIRECTED NEITHER ASSUMES NOR AUTHORIZES ANY PERSON OR ENTITY TO ASSUME FOR IT ANY DUTY, OBLIGATION OR LIABILITY IN CONNECTION WITH ITS PRODUCTS. DIRECTED DISCLAIMS AND HAS ABSOLUTELY NO LIABILITY FOR ANY AND ALL ACTS OF THIRD PARTIES INCLUDING ITS AUTHORIZED DEALERS OR INSTALLERS. DIRECTED SECURITY SYSTEMS, INCLUDING THIS UNIT, ARE DETERRENTS AGAINST POSSIBLE THEFT. DIRECTED IS NOT OFFERING A GUARANTEE OR INSURANCE AGAINST VANDALISM, DAMAGE OR THEFT OF THE AUTOMOBILE, ITS PARTS OR CONTENTS; AND HEREBY EXPRESSLY DISCLAIMS ANY LIABILITY WHATSOEVER, INCLUDING WITHOUT LIMITATION, LIABILITY FOR THEFT, DAMAGE AND/OR VANDALISM. THIS WARRANTY DOES NOT COVER LABOR COSTS FOR MAINTENANCE, REMOVAL OR REINSTALLATION OF THE UNIT OR ANY

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TECHNICAL MANUAL

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• PART 14 : OEM LITERATURE

VIPER - MODEL 211HV - KEYLESS ENTRY SYSTEM

CONSEQUENTIAL DAMAGES OF ANY KIND. IN THE EVENT OF A CLAIM OR A DISPUTE INVOLVING DIRECTED OR ITS SUBSIDIARY, THE PROPER VENUE SHALL BE SAN DIEGO COUNTY IN THE STATE OF CALIFORNIA. CALIFORNIA STATE LAWS AND APPLICABLE FEDERAL LAWS SHALL APPLY AND GOVERN THE DISPUTE. THE MAXIMUM RECOVERY UNDER ANY CLAIM AGAINST DIRECTED SHALL BE STRICTLY LIMITED TO THE AUTHORIZED DIRECTED DEALER'S PURCHASE PRICE OF THE UNIT. DIRECTED SHALL NOT BE RESPONSIBLE FOR ANY DAMAGES WHATSOEVER, INCLUDING BUT NOT LIMITED TO, ANY CONSEQUENTIAL DAMAGES, INCIDENTAL DAMAGES, DAMAGES FOR THE LOSS OF TIME, LOSS OF EARNINGS, COMMERCIAL LOSS, LOSS OF ECONOMIC OPPORTUNITY AND THE LIKE. NOTWITHSTANDING THE ABOVE, THE MANUFACTURER DOES OFFER A LIMITED WARRANTY TO REPLACE OR REPAIR THE CONTROL MODULE AS DESCRIBED ABOVE. Some states do not allow limitations on how long an implied warranty will last or the exclusion or limitation of incidental or consequential damages. This warranty gives you specific legal rights and you may also have other rights that vary from State to State.

This product may be covered by a Guaranteed Protection Plan ("GPP"). See your authorized Directed dealer for details of the plan or call Directed Customer Service at 1-800-876-0800. Directed security systems, including this unit, are deterrents against possible theft. Directed is not offering a guarantee or insurance against vandalism, damage or theft of the automobile, its parts or contents; and hereby expressly disclaims any liability whatsoever, including without limitation, liability for theft, damage and/or vandalism. Directed does not and has not authorized any person or entity to create for it any other obligation, promise, duty or obligation in connection with this security system.

Make sure you have all of the following information from your dealer:

A clear copy of the sales receipt, showing the following:

- Date of purchase
- Your full name and address
- Authorized dealer's company name and address
- Type of alarm installed
- Year, make, model and color of the automobile
- Automobile license number
- Vehicle identification number
- All security options installed on automobile
- Installation receipts



TECHNICAL MANUAL MX151D - GM



• PART 14 : OEM LITERATURE

VIPER - MODEL 211HV - KEYLESS ENTRY SYSTEM

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• PART 14 : OEM LITERATURE

VIPER - MODEL 211HV - KEYLESS ENTRY SYSTEM

standard transmitter configuration



controls the **Arm** function.



controls the **Disarm** function.




controls **Audible Mode** and an **Auxiliary Output**.



controls the **Panic** function.



and  pressed together control an **Auxiliary Output**.

what is included

- The control module
- Super het receiver
- A pair of four-button transmitters
- A status LED indicator light
- A push-button Valet® switch
- Your warranty registration



TECHNICAL MANUAL

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VIPER - MODEL 211HV - KEYLESS ENTRY SYSTEM

important information

Congratulations on the purchase of your keyless entry system. Due to the complexity of this system, it must be installed by an authorized dealer only. Installation of this product by anyone other than an authorized dealer voids the warranty. All dealers are provided with a preprinted dealer certificate to verify that they are authorized.

By carefully reading this Owner's Guide prior to using your system, you will maximize the use of this system and its features.

You can print additional or replacement copies of this manual by accessing the Directed web site at www.directed.com.

→ **system maintenance**

The system requires no specific maintenance. Your remote is powered by a small, lightweight 3-volt lithium battery that will last approximately one year under normal use. When the battery begins to weaken, operating range will be reduced and the LED on the remote will dim.

→ **your warranty**

Your warranty registration must be completely filled out and returned within 10 days of purchase. Your product warranty will not be validated if your warranty registration is not returned. Make sure you receive the warranty registration from your dealer. It is also necessary to keep your proof of purchase, which reflects that the product was installed by an authorized dealer.

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→ **fcc/id notice**

This device complies with Part 15 of FCC rules. Operation is subject to the following conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesirable operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this device.

Directed Electronics, Inc.

412 Series



**Tested to Comply
with FCC Standards**

transmitter functions

The receiver uses a computer-based learn routine to learn the transmitter buttons. This makes it possible to assign any specific transmitter button, or combination of buttons, to any receiver function. The transmitter initially comes programmed with the Standard Configuration, but may also be customized by an authorized dealer. The transmitter buttons indicated in all of the instructions in this manual correspond to a Standard Configuration transmitter.



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→ **standard configuration**




Button

The locking/arming function is controlled by pressing this button for one second. Pressing  a 2nd time (within 5 seconds) after arming will honk the horn.



Button

The unlocking/disarming function is controlled by pressing this button for one second. Pressing  a 2nd time (within 5 seconds) after disarming will honk the horn.



Button

An optional auxiliary function are controlled by this button. (An optional auxiliary function, such as trunk release, can be controlled by pressing this button for 1.5 seconds.)

The auxiliary output controls _____.



Button

The panic feature is controlled by pressing this button for one second.



and **Buttons**

An optional auxiliary convenience or expansion function that you have added to your system can be activated by pressing these buttons simultaneously.

The auxiliary output controls _____.



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using your system

→ **locking/arming**

Pressing  for one second arms the system by activating the starter kill (optional) and locking the doors (if connected). The horn will honk (if connected and in audible mode) and the parking lights will flash once to confirm arming of the system. While the system is armed, the status LED will flash once per second. The Failsafe® Starter Kill (if installed) will also prevent the vehicle's starter from cranking.

note: Manually locking the vehicle does not arm the system; it will only lock the doors.

The system can also be programmed to arm the optional Failsafe® Starter Kill automatically (called Passive Mode). If the system has been programmed for Passive Mode, the Failsafe® Starter Kill will automatically activate 30 seconds after the ignition has been turned off. After the ignition has been turned off, the status LED will flash rapidly to indicate that the system is in Passive Mode.

If Passive Mode has been programmed on, then it is also possible to program the system for Passive Locking. With Passive Locking, the vehicle doors lock automatically at the same time that the Failsafe® Starter Kill is activated. If Passive Locking is programmed on, care must be taken to prevent the keys from being locked in the vehicle.

note: For Passive Mode to be effective, the Failsafe® Starter Kill relay must be installed.



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→ **unlocking/disarming**

Pressing  for one second disarms the system and unlocks the doors (if connected). The horn will honk twice (if connected and in audible mode) and the parking lights will flash twice to confirm disarming of the system. The optional Failsafe® Starter Kill will be deactivated. The status LED will turn off, unless the system is programmed for Passive Mode. In Passive Mode, the status LED will flash rapidly when the system is disarmed. This indicates that the system will re-engage the starter kill and re-lock the doors (if Passive Locking has been programmed) in 30 seconds unless the ignition is turned on.

note: If the system has been armed with the remote transmitter, you must use the transmitter or the Valet switch to disarm the system and deactivate the starter kill. Manually unlocking the vehicle does not disarm the system; it will only unlock the doors.

→ **disabling the system without a transmitter**

If your remote transmitter is lost or damaged, you can manually override the system. To do this, you must have the vehicle's ignition key and know where the Valet® switch is located. Be sure to check with the installer for the location of the Valet® switch.



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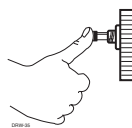


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To disarm the security system, turn the ignition to the ON position. Press and release the Valet switch within 10 seconds. The status LED will stop flashing and the vehicle should start. If the vehicle does not start, you may have waited too long; turn the ignition off and repeat the process.



Location of Valet Button _____

→ **audible mode**

To temporarily turn on the arm or disarm horn honk(s), simply press  for less than one second before arming or disarming, and the confirmation honk(s) will be present for that one operation only.

→ **valet mode**

You can prevent your system from automatically activating the Failsafe® Starter Kill (optional, not included) and locking the doors by using Valet® Mode. This is very useful when washing the vehicle or having it serviced. In Valet® Mode, the starter kill cannot be activated, even with the transmitter, but all convenience functions (door locks, trunk release, etc.) will continue to work normally.



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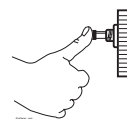
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To enter or exit Valet® Mode:





1. Turn the ignition on.
2. Turn the ignition off.
3. Press and release the Valet® switch within 10 seconds.



The status LED will light steadily if you are entering Valet® Mode and will turn off if you are exiting Valet® Mode.

→ **panic mode**

If you are threatened in or near your vehicle, you can attract attention by triggering the system with your transmitter. Just press  for two seconds to enter Panic Mode. In Panic Mode, the horn will honk and the parking lights will flash for 30 seconds. To stop Panic Mode at any time, press  on the transmitter again.

note: In order for Panic Mode to be effective, the vehicle's horn (or optional siren) as well as the vehicle's parking lights must be connected.

rapid resume logic

This Directed system will store its current state to non-volatile memory. If power is lost and then reconnected, the system will recall the stored state from memory. This means if the unit is in



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Valet Mode and the battery is disconnected for any reason, such as servicing the car, when the battery is reconnected the unit will still be in Valet Mode. This applies to all states of the system including arm, disarm, and panic mode.

programming options

Programming options control your system's normal, operational set-up. Most options do not require additional parts, but some may require additional installation labor. This system's programming options are listed below, with the factory default settings in **bold**:

- Ignition switch-controlled door-locking **on** or off. With this feature on, the doors will lock 3 seconds after the ignition key is turned on, and unlock when the ignition key is turned off.
- Comfort Closure **off** or on. This option is not available for all vehicles. When programmed on, and pressing  on the remote, the vehicle will lock and close the windows/sunroof. See your dealer to see if this is available for your vehicle.



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glossary of terms

Control Unit: The “brain” of your system. Usually hidden under the dash area of the vehicle. It houses the microprocessor that monitors your vehicle and controls all system functions.

LED: A light mounted at a discretionary location inside the vehicle. It is used to indicate the status of your system.

Starter Interrupt: An automatic switch controlled by your system which prevents the vehicle’s starter from cranking whenever the system is armed. The vehicle is never prevented from cranking when the system is disarmed, in Valet Mode, or if the starter interrupt switch itself fails. Your system has feature-ready circuitry for the starter interrupt, however installation may require additional labor.

Transmitter: A hand-held, remote control which operates the various functions of your system.

Valet Switch: A small button mounted at a discretionary location inside the vehicle. It is used to override the system when a transmitter is lost or damaged, or to enter or exit Valet Mode.



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security & convenience expansions

Listed below are some of the many expansion options available for use with your system. Some options may require additional parts and/or labor. Please consult with your dealer for a complete list of options available for use with this system.

Domelight Supervision: The domelight will illuminate for 30 seconds each time the system is disarmed using the remote. This is useful for seeing inside the vehicle at night prior to entering it.

Power Door Lock Control: Your system is capable of controlling many types of power door lock systems; however, some door lock systems may require extra parts. Consult with your dealer to determine which type of locks your vehicle uses. If power locks are connected, the system can be programmed to lock the doors automatically 30 seconds after the ignition has been turned off. The system can also be programmed to lock the doors when the ignition is turned on and to unlock them when the ignition is turned off.

Power Trunk Release: The system's auxiliary output can be programmed to operate a factory power release for the vehicle's trunk or hatch. If the factory release is not power-activated, Directed®'s 522T trunk-release solenoid can often be added.



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Power Window Control: Power window control is provided with Directed®'s 529T or 530T systems. The 529T system will roll up two windows automatically when the system is armed, or roll two windows down by using the transmitter. The 530T will roll two windows both up and down. The 530T also provides one touch switch operation.

Progressive Door Unlocking: For added security, your system can be configured to unlock the driver's door only, leaving the passenger doors locked. Pressing the unlock button an additional time will unlock the passenger doors. This option requires additional parts and labor.



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QUICK REFERENCE GUIDE

To lock/arm using your remote

- To arm the system press  for one second. The doors will lock (if connected). The LED will begin to flash. The Failsafe® Starter Kill will prevent the vehicle's starter from cranking if it has been installed. The vehicle's horn (if connected) will honk and the parking lights will flash once to confirm arming of the system.

To unlock/disarm using your remote

- To disarm the system press  for one second. The doors will unlock (if connected). The Failsafe® Starter Kill will be deactivated and the vehicle's horn (if connected) will honk twice and the parking lights will flash twice.


To enter or exit Valet® Mode

- Turn the ignition to the ON position. Turn the ignition back off. Press and release the Valet® switch within 10 seconds. The status LED will light steadily if you have entered Valet® Mode. To exit Valet® Mode, repeat the steps above. The LED will turn off when exiting Valet® Mode.

To activate Panic Mode

- Press and hold  for 2 seconds.

To exit Panic Mode

- Press  on the transmitter.

Location of Valet Switch _____

Cut along dotted line and fold for a quick and easy reference to keep in your purse or wallet.



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The company behind this system is Directed Electronics, Inc.

Since its inception, Directed Electronics has had one purpose, to provide consumers with the finest vehicle security and car stereo products and accessories available. The recipient of nearly 100 patents and Innovations Awards in the field of advanced electronic technology, DIRECTED is ISO 9001 registered.

Quality Directed Electronics products are sold and serviced throughout North America and around the world.

Call (800) 274-0200 for more information about our products and services.



Directed Electronics is committed to delivering world class quality products and services that excite and delight our customers.



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