

# PREVOST

## COACH MANUFACTURER

### OWNER'S MANUAL VIP



# PA1526

(2<sup>nd</sup> edition rev 2023\_11\_06)

revised 2023/11/06: light bulb data table removed.

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# FOREWORD

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This PREVOST *Private Coach Owner's Manual* has been prepared to thoroughly acquaint you, the owner, with vehicle equipment and features in order to fully appreciate and safely enjoy your vehicle. Of course, you are anxious to drive your new private coach and test its features, but first please read this publication carefully to help ensure enjoyable and trouble free operation. This book should be kept inside the vehicle at all times for convenient reference. It is also suggested that it remains with the vehicle at the time of resale. Please notify PREVOST CAR INC. when the vehicle's ownership is transferred so that our records can be kept up to date. Do this by filling out the appropriate form at the end of this manual.

The specifications, descriptions and figures given are based on the latest information available at printing time. And because at PREVOST we are constantly striving to improve our products, we reserve the right to make changes at any time without notice and/or obligation on our part.

Please note that this publication applies to factory-prepared, conversion-ready luxury private coaches, manufactured by PREVOST CAR INC. It describes and explains the equipment and options available for installation in our factory. Therefore, there may be equipment described herein that is not installed on your vehicle. This publication also does not cover equipment installed by your interior designer or system manufacturer.

This manual, or portions thereof, cannot be reproduced in any form whatsoever, in whole or in part, without the written consent of PREVOST CAR INC.

The following words are used to emphasize particularly important information:

**Warning :** *Identifies instructions which, if not followed, could result in serious personal injury or loss of life.*

**Caution :** *Denotes instructions which, if not followed, could cause serious damage to vehicle components.*

**Note :** *Indicates supplementary information needed to fully understand and complete an instruction.*

For your own safety and to ensure prolonged service life of your private coach, heed our cautions, warnings and notes. Ignoring them could result in extensive damage and/or serious personal injury.

**Caution :** *Prior to working on a system inside vehicle, make sure to cut electrical power and air supply. A component could be supplied with electricity even if battery master switch is set to the OFF position and/or a component could be pressurized even if air tanks are emptied. Always refer to the appropriate wiring and pneumatic diagrams prior to working on electrical and/or pneumatic systems.*

*Prior to welding or soldering on the vehicle, disconnect all electronic modules. If these modules (ECM, ECU, ABS) are not disconnected, electronic components (EPROM, CHIPS) could be permanently damaged.*

*Refer to your maintenance manual for all related procedures.*

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## SAFETY PRECAUTIONS

To ensure safe and reliable operation, heed the following safety precautions.

### SAFE OPERATING PRACTICES

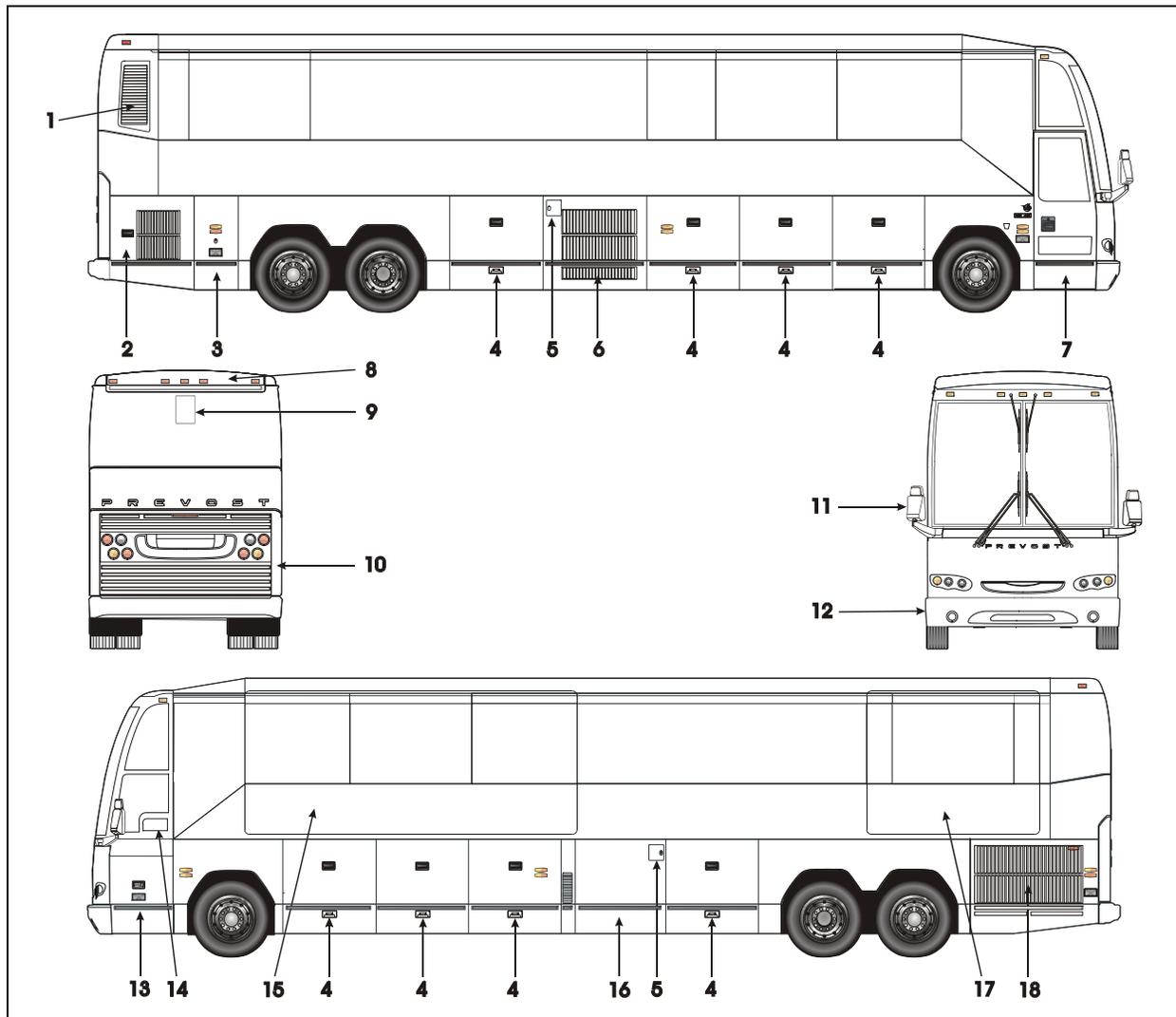
- Operation and maintenance of the vehicle must be performed only by qualified personnel.
- Before driving, conduct a walk around inspection and check that all baggage compartment doors and equipment access doors are securely shut.
- Make sure good visibility is maintained at all times. Keep windshields clean and free of obstructions.
- Adjust the driver's seat so that all controls can be reached easily.
- Always wear the safety belt when driving.
- Check the instrument panel frequently. Do not operate the vehicle when dials or indicators are not in their normal operating condition.
- Always pay attention to pedestrians passing in front and behind the vehicle. Always yield to pedestrians at pedestrian walkways.
- Do not drive over obstacles on the road. Empty boxes, piles of leaves, and snowdrifts could conceal hidden dangers that could damage the vehicle suspension and underbody.
- When turning or changing lanes, signal your intention well in advance.
- When approaching to make a right turn, reduce the space between the vehicle and the curb to make sure another vehicle cannot pass on the right. Since the vehicle makes wide turns, allow enough space to make safe turns.
- Switch from high beams to low beams when meeting or following other vehicles within 500 feet (150 meters).
- Never leave the vehicle unattended with the engine running, or with the key in the ignition. Turn off the engine, remove keys and apply the parking brake before leaving the vehicle.
- Shut-off the engine before refueling, adding oil, performing maintenance or servicing tasks, unless stated otherwise.

- Fuel is highly flammable and explosive. Do not smoke when refueling. Keep away from open flames or sparks.
- Do not run the engine or HVAC system with access doors left open. Close compartment doors before operating any equipment.
- Do not remove the surge tank filler cap or the cooling system pressure cap when the engine is hot. Let the engine cool down before removing filler caps.
- Do not attempt to push or pull-start a vehicle equipped with an automatic transmission.
- The service life of the vehicle depends on the kind of maintenance it receives. Always record any problems and report them immediately to maintenance personnel.
- Do not use the trailer hitch before reading the safety, technical and operational requirements on page 14 of this manual.

### DEFENSIVE DRIVING PRACTICES

- For city driving, allow a four to six second travel interval between your vehicle and the vehicle ahead. Increase this travel interval to six to eight seconds for highway driving. Increase time interval for driving at night or in foul weather.
- Be prepared to stop when approaching an intersection. The stopping distance of the vehicle increases with the weight and speed.
- Establish eye-to-eye contact with other drivers and with pedestrians. Use, high beam and low beam headlights, turn signals and horn as needed.
- On highway, don't stare at the road ahead. Keep your eyes moving. Check mirrors and dashboard instruments frequently.
- To keep the vehicle from drifting across lanes during highway driving, always look over the horizon on the road ahead.
- Adjust your speed to road conditions, traffic and visibility. Never exceed the posted speed limits.
- If another vehicle is following close behind, reduce your speed to let the vehicle pass.
- For additional information about safe operation and defensive driving practices, contact the local department of motor vehicles authority.

# VEHICLE EXTERIOR

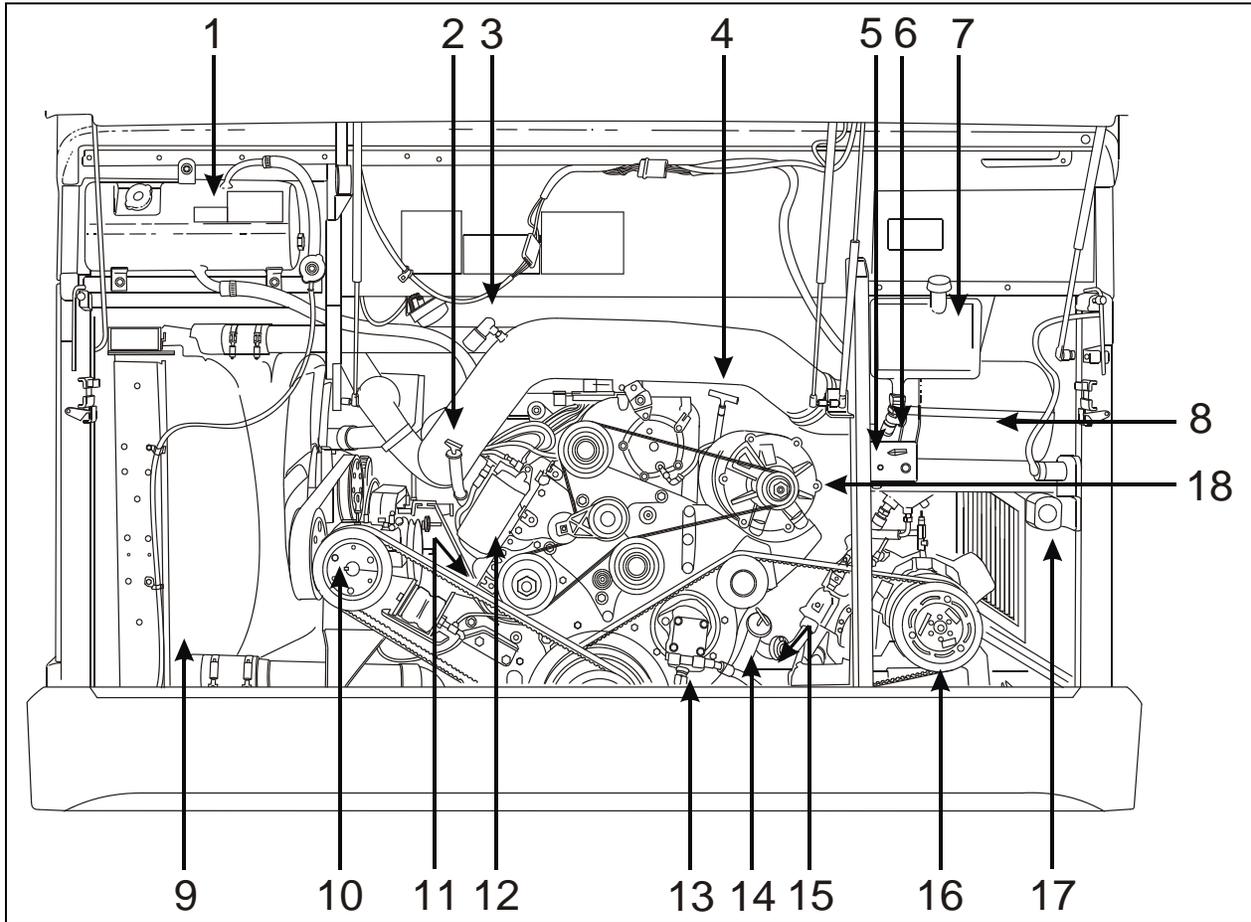


H3-45 VIP EXTERIOR VIEW

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- |   |  |
|---|--|
| 1. Engine air intake                                | 10. Engine rear door   |
| 2. Engine compartment R.H. side door                | 11. Rear-view mirrors  |
| 3. Main power compartment                           | 12. Reclining bumper compartment   |
| 4. Baggage compartment                              | 13. Front electrical and service compartment   |
| 5. Fuel filler door                                 | 14. Driver's power window  |
| 6. A/C condenser compartment or baggage compartment | 15. Front Slide-out (Optional)   |
| 7. Entrance door                                    | 16. Heating, ventilating and air conditioning compartment (HVAC) or baggage compartment and access to the slide-out electrical panel |
| 8. Rear spoiler                                     | 17. Rear Slide-out (Optional)  |
| 9. Retractable back up camera (optional)            | 18. Engine radiator door   |

ENGINE COMPARTMENT COMPONENTS



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- |   |  |
|---|--|
| 1. Coolant surge tank ;                                     | 10. Radiator fan gearbox ;               |
| 2. Transmission oil dipstick ;                              | 11. Engine oil filters ;                 |
| 3. Air cleaner restriction indicator ;                      | 12. Engine coolant filter/conditioner ;  |
| 4. Engine oil dipstick ;                                    | 13. Steering pump ;                      |
| 5. Starter selector switch & Rear start push-button switch; | 14. Engine oil filler cap ;              |
| 6. Belt tensioner control valve ;                           | 15. Primary and secondary fuel filters ; |
| 7. Engine oil reserve tank ;                                | 16. A/C compressor, central system ;     |
| 8. Air filter ;   | 17. Back-up alarm ;                      |
| 9. Radiator ;   | 18. Alternator ;                         |

## ENGINE COMPARTMENT

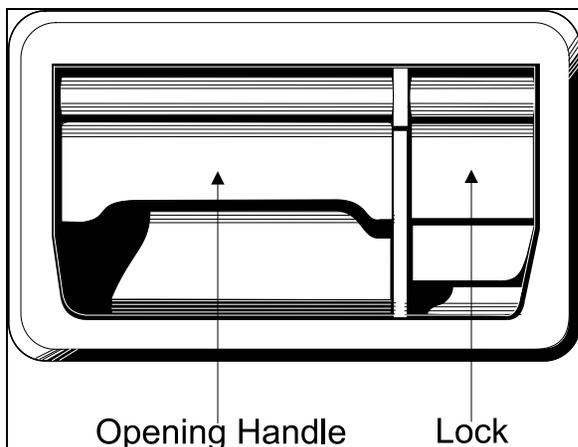
### ENGINE COMPARTMENT CURB-SIDE DOOR

The engine compartment curb-side door provides access to the following :

- Engine compartment rear door release lever ;
- Fuel Pro 382 filtration system (option) ;
- Power steering fluid reservoir ;
- Wet air tank drain valve ;
- Primary and secondary systems air supply fill valve ;
- Cold weather starting fluid bottle (ether).

This door can be locked/unlocked using the exterior compartment key. Lift up protector cover to gain access to the lock. Pull up the door handle to release the latch, then pull the door open. To keep the door open, engage the safety catch on top of the door. Release the safety catch before closing the door.

The lighting in the engine compartment turns *ON* automatically when the door is opened. If the compartment door is open, a telltale light will illuminate on the central dashboard.



DOOR HANDLE

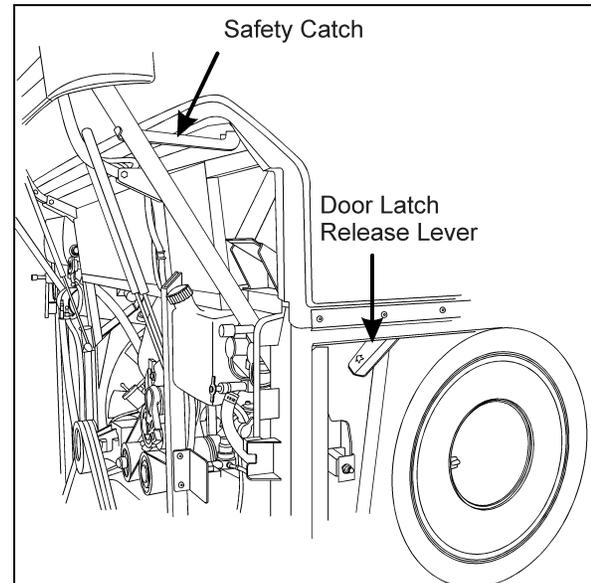
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**Warning:** Do not run the engine when the engine compartment curb-side door is open. Close engine compartment curb-side door before starting engine.

### ENGINE COMPARTMENT REAR DOOR

To open engine compartment rear door, you must first open engine compartment curb-side door then push up on the door latch release

lever, place hand on the upper right of the rear door and pull rearward.



DOOR LATCH RELEASE LEVER

18331

The engine compartment rear door provides access to the following:

- Engine;
- Alternator(s);
- Compressor(s);
- Belt tensioner control valve (see chapter 7, Care and Maintenance);
- Starter selector switch (see chapter 5, Starting and Stopping Procedures);
- Engine coolant surge tank;
- Air cleaner restriction indicator;
- Engine oil dipstick;
- Engine oil reserve tank;
- Automatic transmission oil dipstick;
- Engine coolant filler cap.

Always engage the safety catch when the engine compartment rear door is open. Release the catch before closing the door.

The lighting in the engine compartment rear door turns *ON* automatically when the door is opened. If the door is open, a telltale light will illuminate on the central dashboard.

## VEHICLE EXTERIOR

**Warning:** Pressurized cylinders assist the engine compartment rear door opening. To avoid injury when opening, do not stand at the rear of the coach. Stand clear when opening the engine compartment rear door.

**Warning:** Do not run engine when the engine compartment rear door is open. Close the engine compartment rear door before starting the engine.

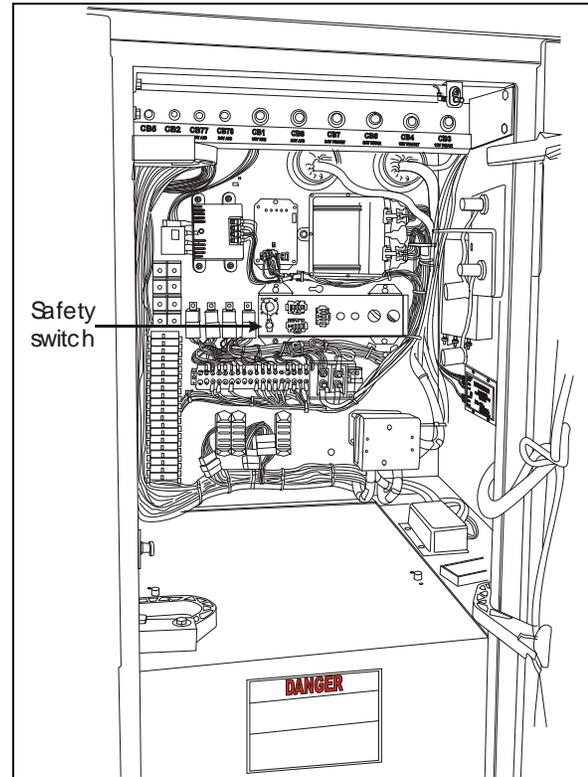
### MAIN POWER COMPARTMENT (BATTERIES)

The main power compartment provides access to the following :

- (4) 12 volts Batteries ;
- Main breakers for the 12 volt and 24 volt electrical systems ;
- Battery charger (optional) ;
- Battery equalizer ;
- Electrical system monitor ;
- Main battery relays (safety switch) ;
- Booster block terminals ;
- Alternator voltage regulator ;
- Alternator module ;
- Voltage regulator (Delco alternator) ;
- Transmission ECU (Electronic Control Unit) ;
- Secondary circuit breakers ;
- Rear junction box ;
- Relay, fuse box & spare fuses.

The compartment door can be locked/unlocked using the exterior compartment key. Turn the key in the lock to remove.

The lighting in the compartment turns *ON* automatically when the door is opened. If the main power compartment door is open, a telltale light will illuminate on the central dashboard.

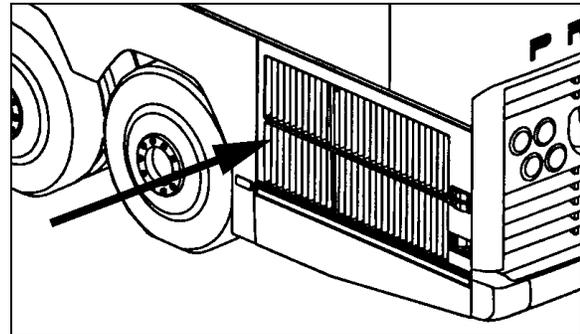


MAIN POWER COMPARTMENT

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### ENGINE RADIATOR DOOR

Open the engine radiator door by pushing on the release latch.



RADIATOR DOOR RELEASE LATCH LOCATION

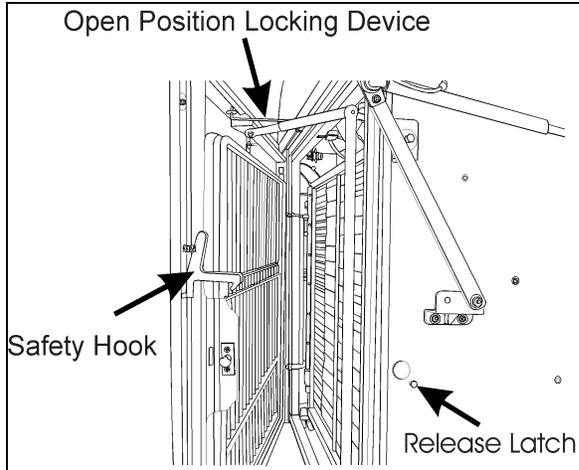
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### CONDENSER COMPARTMENT (A/C) (OPTIONAL)

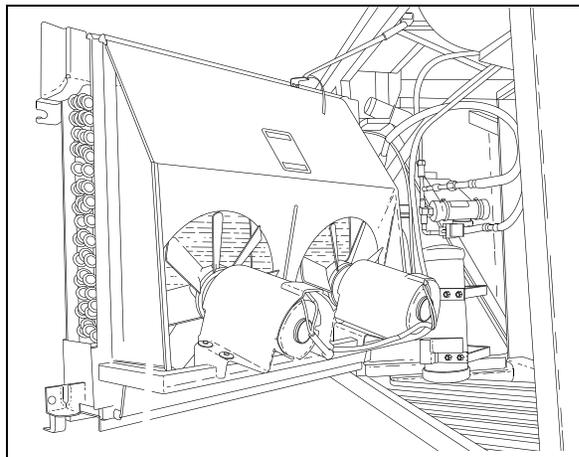
Pull the A/C condenser door release latch located inside the adjacent baggage compartment to partly open the condenser door. Push on the safety hook, accessible through the opening, to open the door.

**Note:** You must unfasten the open position locking device to completely open the condenser compartment door.

**Caution:** Close baggage compartment door before opening completely condenser compartment door.



ACCESS TO THE CONDENSER COMPARTMENT 18311



CONDENSER COMPARTMENT 22170

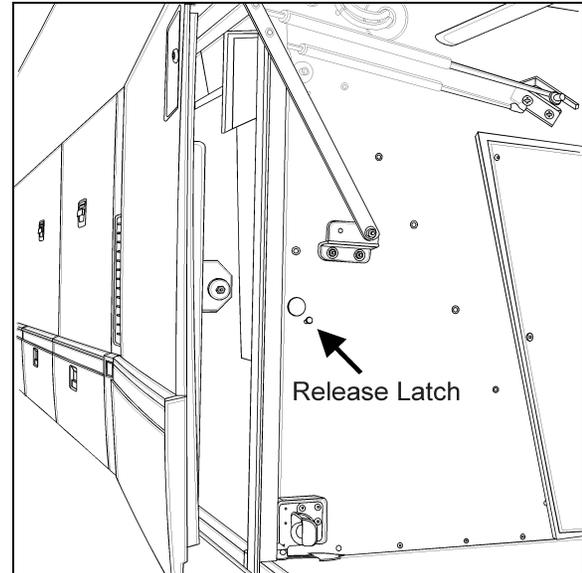
**HVAC COMPARTMENT (OPTIONAL)**

The HVAC compartment door release latch is located on the left side of the baggage compartment and to the right of the HVAC compartment door. Pull the release latch then pull the HVAC compartment door open.

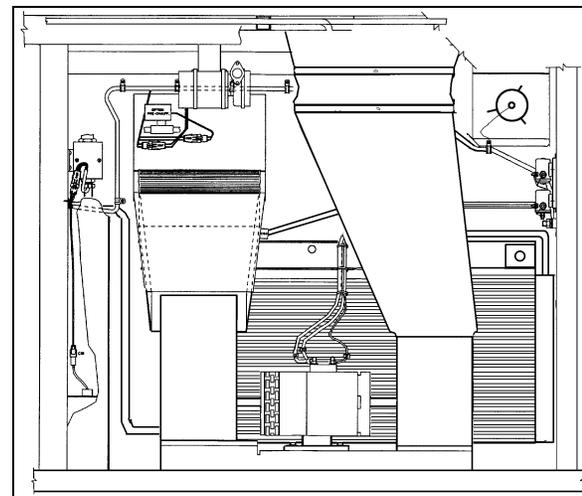
The HVAC compartment also contains relays and resistors. They are mounted on the control panel located on the R.H. side wall when facing the compartment.

- R39 – Condenser fan motor
- R40 – Condenser speed control HI
- R41 – Condenser speed control HI
- RS36 – Relay current limit
- RS37 – Relay current limit

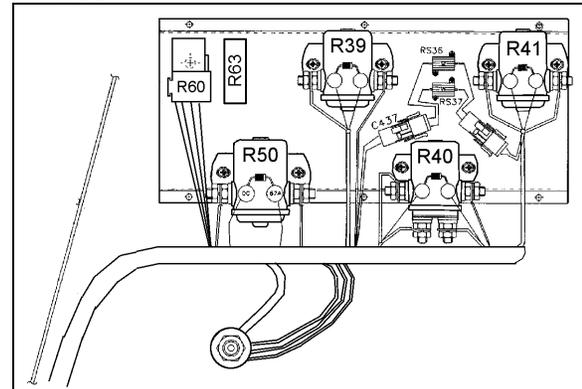
- R50 – Evaporator fan LOW & HI speed
- R60 – Evaporator fan HI speed
- R63 – Time Delay



HVAC COMPARTMENT ACCESS 18306



HVAC COMPARTMENT 22225



LOCATION OF RELAYS AND RESISTORS 06483

## VEHICLE EXTERIOR

Each relay or resistor is identified to facilitate its location.

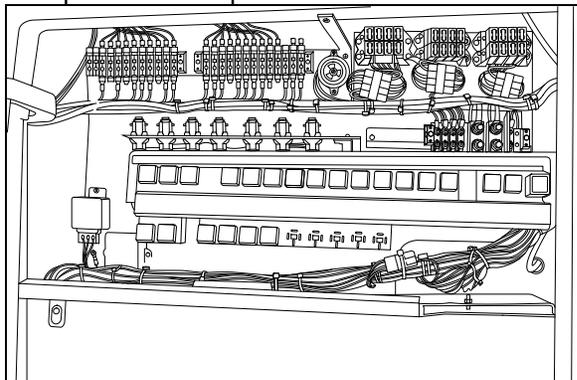
**Note:** It is important when checking the A/C and heating system to keep the condenser compartment door closed in order to avoid faulty readings.

### FRONT ELECTRICAL AND SERVICE COMPARTMENT

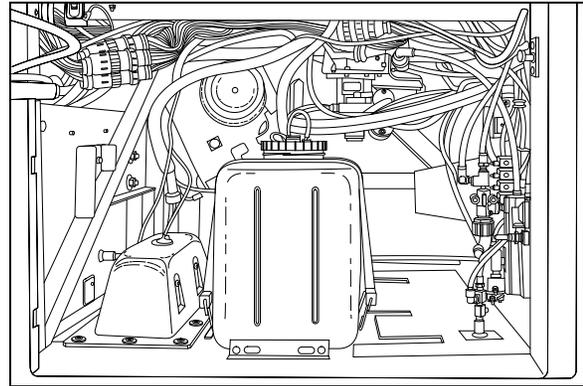
The front electrical and service compartment provides access to the following:

- Front junction box ;
- Circuit-breakers ;
- Pulse regulator (upper windshield wipers) ;
- Electric flasher unit ;
- ABS module ;
- Resistors ;
- Fuse box & spare fuses ;
- Relays ;
- Fire alarm ;
- Windshield washer reservoir ;
- Reclining bumper compartment opening lever ;
- Accessory air tank drain valve ;
- Accessory air tank fill valve.

The front electrical & service compartment door can be locked/unlocked with the exterior compartment key. Lift protector cover to access the lock. Pull up door handle to release the latch then pull the door open.



FRONT ELECTRICAL & SERVICE COMPARTMENT 06461B



FRONT ELECTRICAL & SERVICE COMPARTMENT 14050

The lighting in the front electrical & service compartment turns *ON* automatically when the door is opened.

### BAGGAGE COMPARTMENTS

The baggage compartment doors can be locked/unlocked using the exterior compartment key. Lift up the cover to gain access to the lock. Pull up door handle to release the latch, then pull the door open. Pressurized cylinders assist the opening and closing of the baggage compartment doors and hold the doors open. The lighting in the baggage compartment turns *ON* automatically when the door is opened. If the baggage compartment door is open, an indicator light will illuminate on the central dashboard.

**Warning:** To avoid injury, keep hands clear of baggage compartment door edge and door frame when closing.

**Note:** To prevent theft and vandalism, always lock the baggage compartment doors before leaving the private coach unattended.

**Note:** The baggage compartment doors can be locked/unlocked from the driver's position by an optional central locking system on the L.H. control panel. Refer to "Controls & Instruments" chapter.

### RECLINING BUMPER COMPARTMENT

**Warning:** The compartment behind the bumper is not designed for storage. Never store loose objects in this compartment since they can interfere with the steering linkage mechanism. Use care when opening or closing the reclining bumper compartment to prevent personal injury.

The front bumper can be tilted downward to give access to the compartment. Pull the opening handle located in the front electrical and service compartment to unlock. Tilt down the bumper to access the compartment. Push the bumper back up firmly in place to lock in position.

## FUEL FILLER DOORS

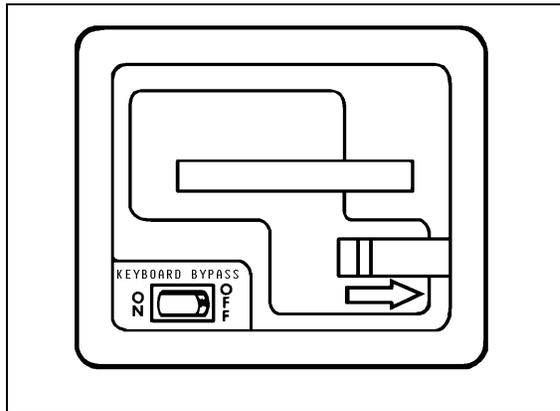
Both fuel filler doors can be locked/unlocked using the exterior compartment key. Turn the key in the lock to remove.

**Note:** It is always preferable to use the curb side door (condenser side) to avoid fuel fumes infiltration within the evaporator compartment.

## ENTRANCE DOOR

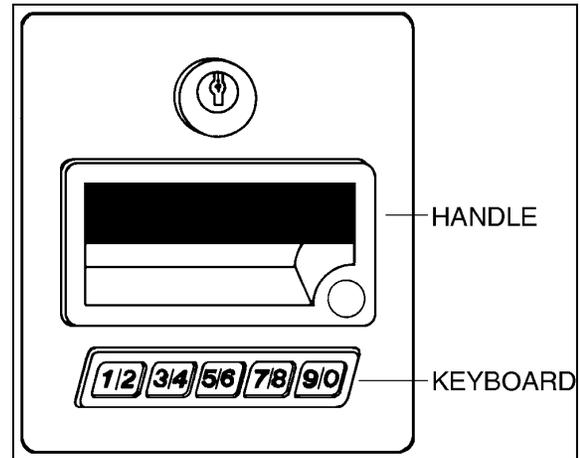
### INSIDE OPERATION

There are two ways of unlocking the entrance door from the inside. The first consists in actuating the rocker switch on the lower R.H. control panel. This operation will also unlock the baggage compartment. Also, you can unlock the entrance door by sliding its lock lever to the left. If the orange tab on the door lock lever is visible, the door is unlocked.



### OUTSIDE OPERATION

The first way of locking/unlocking the entrance door from the outside is the front entrance door lock key provided with the vehicle. Turn key to the left to lock or to the right to unlock the entrance door.



## KEYLESS ENTRY SYSTEM

By this system, you can lock or unlock the entrance door and the baggage and service compartment doors. The keyboard is located below the outside entrance door handle. The microprocessor/relay module is pre-programmed by the manufacturer and this code can not be deleted. Moreover, you can program your own entry code (e.g. a birthday or part of a social security number).

The manufacturer's code is:

- On your owner's wallet card;
- Taped to the microprocessor/relay module in driver's A/C compartment;
- Three stickers are joint to your owner's wallet card.

When you use the keyless entry system, the keyboard and stepwell lights illuminate. Do not push the buttons with a key, pencil or any other hard object as it could damage the buttons. Although each button is provided with two digits separated by a vertical line, there is only one contact per button. Press in center of button, i.e. between the two digits where there is the vertical line.

You must unlock the entrance door before you unlock any other baggage or service compartment door. If you let more than five seconds pass between the numbers you press, the system shuts down, and you have to enter your code again. If the keyless entry system does not work properly, use the key to lock or unlock entrance or compartment doors.

## VEHICLE EXTERIOR

### KEYLESS OPERATING INSTRUCTIONS

- 1) To unlock the entrance door, enter the five numbers of the code. After pressing the fifth number, the door will unlock. During the night, press any button to illuminate the keyboard, then enter the code.

When pressing any button, the keyboard lights up for five seconds and the stepwell lights for twenty-five seconds.

- 2) To unlock the baggage and service compartment doors, press button 3/4 within five seconds after the code that unlocks the entrance door.
- 3) To lock entrance door and compartments all at the same time, press the buttons 7/8 and 9/0 at the same time.

### PROGRAMMING YOUR PERSONAL CODE

**Note:** To avoid erasing code from the system memory, you should connect keyless entry system to house batteries, otherwise code will be erased each time battery main disconnect switches are set to the OFF position.

You can program a personal code to unlock entrance door and compartments. This code does not replace the permanent code that is programmed into the system. Use your personal code in the same manner that you would use the original code.

Do not choose a code that presents the numbers in sequential order, such as 1/2, 3/4, 5/6, 7/8, 9/0. Studies show that people who idly press the buttons usually press a sequential pattern. Also, do not select a code that uses the same button five times. Thieves can easily figure out these types of codes.

- 1) Choose and memorize your personal code.
- 2) Enter the original code, and within five seconds, press button 1/2.
- 3) Within five seconds of pressing button 1/2, enter your personal code, pressing each button within five seconds of the previous digit. The keyboard light will immediately turn OFF if code is correctly entered.

The keyless entry system registers your personal code. To unlock entrance door, you can use either code.

- 4) To erase your personal code, enter the original code, press button 1/2, then wait six seconds.

### EXTERIOR REAR VIEW MIRRORS

The coach is equipped with flat-type and convex-type rear-view mirrors. Convex mirrors give a wide angle view. Objects viewed in convex-type rear-view mirrors appear smaller and are actually closer than they appear.

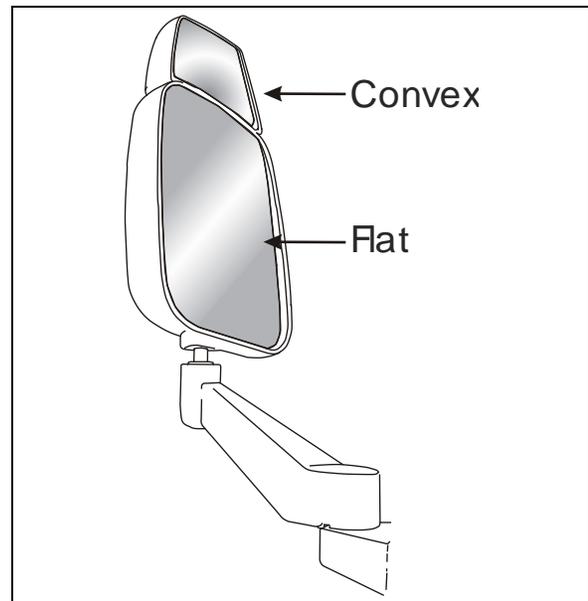
To provide good visibility in cold weather, the mirrors are equipped with heating elements that are activated by a rocker switch located on the dashboard. Refer to "Controls & Instruments" chapter. Thermostats are used to prevent continuous operation of the heating elements.

**Caution:** Do not attach stick-on type convex mirror accessories to the heated mirror glass. This could impede uniform heat distribution on the mirror surface which could break the mirror.

### ELECTRICALLY ADJUSTED MIRROR (RAMCO)

Electrically adjusted mirrors are adjusted by the outside mirror controls located on the L.H. control panel. Refer to "Controls & Instruments" chapter. Manual adjustment is also possible.

Adjust the side-view mirrors until the side of the vehicle is visible. Adjust the flat-type mirror until the road behind is in full view.



RAMCO REAR-VIEW MIRROR

18443

### RETRACTABLE BACK-UP CAMERA

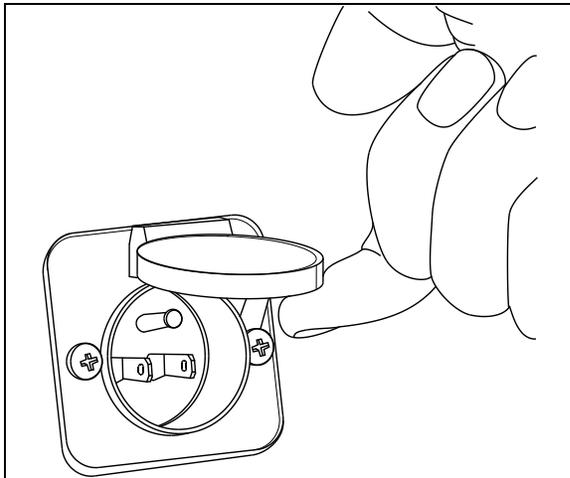
An optional back-up camera is available which provides the driver with visual assistance when

backing-up. The back-up camera is mounted in a retractable housing. For additional information, refer to "Controls & Instruments" and 'Care and maintenance' chapters.

**Note:** A switch located in the rear electric compartment is used to retract the back-up camera for cleaning or maintenance.

### 110-120 VOLTS CONNECTOR

This optional connector is used with a 110-120 volt supply and is connected to the engine block heater. Refer to "Other Features" chapter.



PRISE DE 110-120 VOLTS

06390

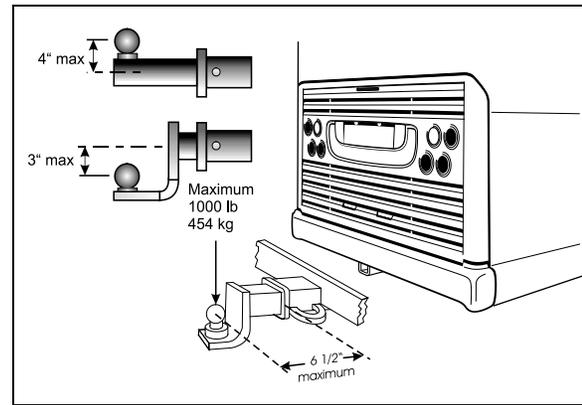
### TRAILER HITCH

Your vehicle may be equipped with a factory installed trailer hitch which has been designed to meet the following rating :

- **Maximum gross trailer weight: 20,000 lbs (9072 kg)**
- **Maximum tongue weight at 6 ½ inches (165 mm) or less from coupling receiver : 1,500 lbs (680 kg)**

**Warning:** The draw bar and the ball used for towing the trailer should be rated for 20,000 lbs capacity or more.

**Warning:** Pulling a trailer weighing more than the recommended maximum gross weight may cause engine and transmission overheating, and also possible hitch failure.



TRAILER HITCH

18487

**Note:** Pulling a trailer over long distances is considered as a "severe operating condition" for the vehicle and therefore, power plant requires more frequent servicing.

**Note:** The minimum requirement for a trailer weighing up to 20,000 lbs when coupled to a 20,000 lb Prévost Trailer Hitch is as per the following :

- A) Trailer must comply with **Federal Motor Carrier Safety Regulations 393.52** regarding trailer breaking capability.
- B) The trailer coupling attachments meet the following minimum static test load requirements :
  - Longitudinal tension and compression: (1.5 x GVWR of trailer)
  - Transverse thrust : (0.5 x GVWR of trailer)
  - Vertical tension and compression: (0.5 x GVWR of trailer)

Loads indicated must be applied without incurring loss of attachments or distortion or failure which could affect the safe towing of trailer.
- C) The ball and trailer coupling should meet the following minimum test load requirements without incurring failure :
  - Longitudinal tension and compression : (Gross Trailer Weight of trailer x 3)
  - Transverse thrust : (Gross Trailer Weight of trailer x 1)
  - Vertical tension and compression : (Gross Trailer Weight of trailer x 1.3)

## VEHICLE EXTERIOR

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*In this case, failure is identified as the point at which the coupling or ball will accept no additional test load without separation of the ball from the coupling ball socket, or the occurrence of a metal fracture of either coupling ball or coupling assembly, which results in separation of the ball from the coupling ball socket.*

*D) Two lengths of safety chain shall be used. The strength rating (minimum breaking force) of each individual chain and its connecting means shall be equal to, or exceed the trailer GVWR.*

*E) Towing vehicle must be equipped with engine or transmission retarder. The engine or the transmission retarder on the vehicle must be functional at all time (to be inspected frequently).*

This hitch must be used for recreational use only.

# VEHICLE INTERIOR

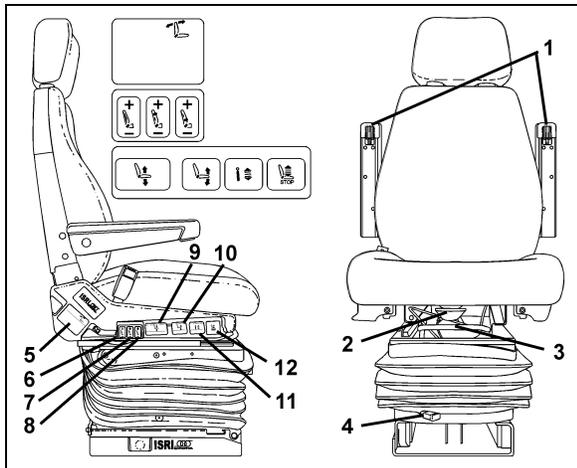
## DRIVER'S SEAT - "DELIVERY"

The driver's "delivery" seat is standard and legal only for driving the vehicle on its initial delivery. It is a conventional van seat equipped with tracks for fore and aft adjustments.

## DRIVER'S AND CO-PILOT'S SEATS - ISRI (OPTIONAL)

Two distinct ISRI model driver's and co-pilot's seats may be supplied with your vehicle: both with a sophisticated air suspension system, one being pneumatically operated, while the other is electrically operated. Both seats may be equipped with lumbar supports, heated cushions and adjustable armrests. Seats can be adjusted to the desired driving position by following the instructions listed below:

### PNEUMATIC ISRI SEATS



PNEUMATIC DRIVER'S SEAT

18385

**Warning:** Never try to adjust seat while driving vehicle as this could result in loss of vehicle control.

### Armrest (1)

Rotate control knob to select desired arm-resting angle. When not in use, raise armrest parallel with backrest.

### Seat Cushion (2)

Provides optimum comfort and support for any leg shape or size. Adjustable to 50mm length.

### Fore-and-aft (3)\*

Pull handle up and slide seat forwards or backwards to adjust distance between seat and dashboard.

### Isolator (4)

Reduces horizontal vibration, ensuring smooth ride.

### Backrest (5)

Lift lever to select proper adjustment angle of backrest.

### Air Side Bolster (6)

Offers desired side support to avoid body sideway.

### Air Lumbar (7) (8)

Provides back support with upper and lower settings, ensuring comfort during lengthy sitting.

### Air Height Adjustment (9)

Moves seat up or down independently of other seat settings. 100mm total travel.

### Adjustable Seat Recline (10)

Allows easy adjustment of four-setting inclination.

### Adjustable Shock Absorber (11)

Choose stiff or soft ride infinitely.

### Quick Air Release (12)

Exhausts all air from suspension, allowing for easy entry/exit. Returns seat to previous position.

## ELECTRIC ISRI SEATS

Adjust electric seats as follows:

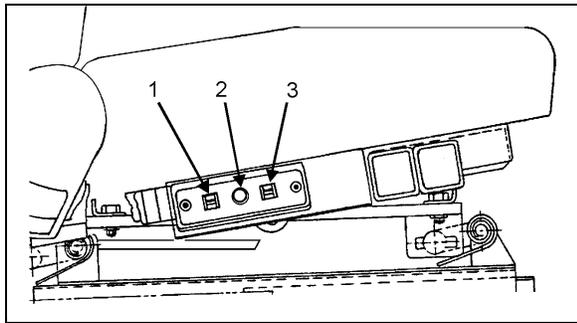
### Tilt (rear) (1)

Pull switch up to raise rear section of seat. Push switch down to lower rear section of seat.

### Fore-and-aft/Up-Down (2)

Push switch towards dashboard to move seat forwards or back to move seat backwards. Pull switch up to raise seat or push switch down to lower seat.

## VEHICLE INTERIOR



SEAT CONTROLS

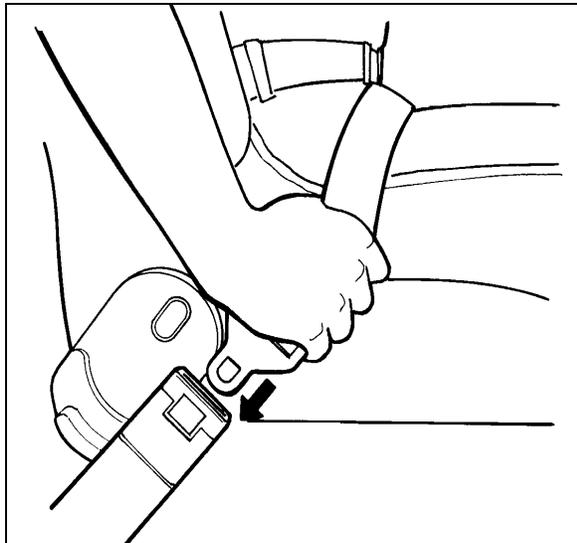
18040

### Tilt (front) (3)

Pull switch up to raise front section of seat. Push switch down to lower front section of seat.

## SAFETY BELTS

The driver's seat is equipped with a retractable safety belt as required by State, Provincial and Federal regulations. To fasten, pull seat belt out of the retractor and insert the latch plate into the buckle until it clicks. No special adjustment is required since the reel device is self-adjusting. If seat belt operation becomes defective, report to Manufacturer's Service Center.



SEATBELT

18028

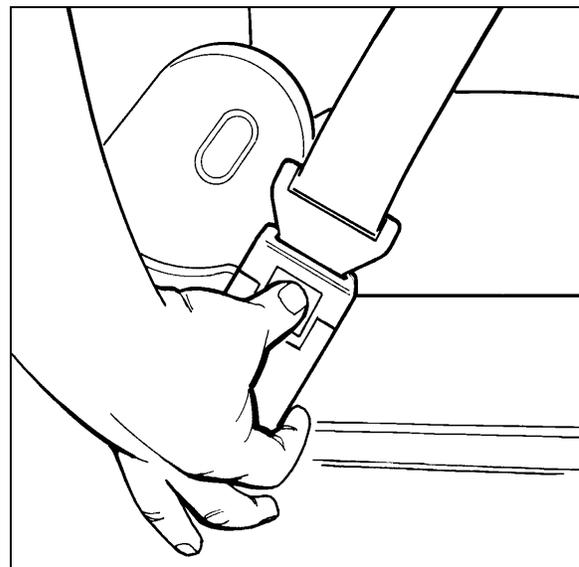
**Note:** The safety belt must be pulled out slowly and continuously, otherwise it will lock the reel before the latch plate reaches the buckle. If this happens, allow the belt to retract completely and repeat the procedure correctly.

**Warning:** A snug fit with the lap belt positioned low on the hips is necessary to ensure motorist's safety. The belt should not be worn twisted. Avoid pinching belt and/or belt hardware in seat mechanism. Do not wear belt over rigid or breakable objects, such as eyeglasses, pens or keys as these may cause injuries.

**Caution:** Never bleach or dry-clean safety belt.

To unfasten belt, press the red button in center of buckle and allow belt to retract. If the belt does not fully retract, pull it out and check for kinks or twists. Make sure that it remains untwisted as it retracts.

**Warning:** Safety belts should always be worn by motorists using seats supplied with belts since this is required by most State and Provincial laws.



SEATBELT

18029

## STEERING WHEEL ADJUSTMENT

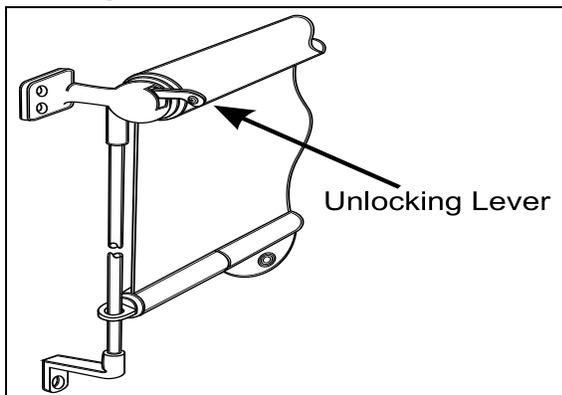
Push on the valve button with the left foot to unlock the steering wheel for tilt and telescopic adjustment.

**Warning:** Do not adjust the steering wheel while the vehicle is moving. Loss of control could result. Park the vehicle safely and apply parking brakes before adjusting the steering wheel.

## SUNSHADES (BLINDS)

This vehicle is provided with two electrically operated sunshades which are installed on both sides of the windshield. Push up or down the appropriate switch to raise or lower the shade to the desired position.

Moreover, an optional spring release type sunshade is provided for the driver's window to protect him from side glare. To operate, pull down the shade by its hem to the appropriate position and release it. It will remain automatically in position. To lift, depress the unlocking lever.



SPRING RELEASE SUNSHADE

23019

## INSIDE MIRRORS

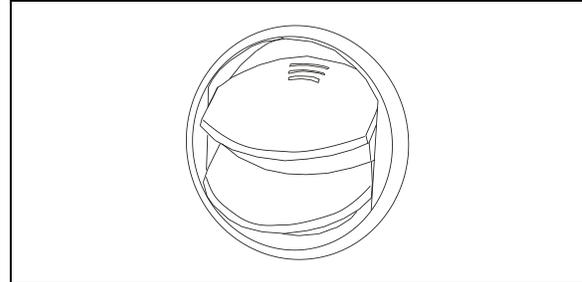
Two mirrors are located in the driver's area. The left overhead mirror provides visibility in the critical area on the R.H. side of the private coach. Adjust the left overhead mirror to see through the front cabin windows. The central mirror allows the driver to see in the central cabin aisle.

## ADJUSTABLE HVAC REGISTERS

The HVAC system has adjustable registers to control air flow around the driver's area. Three are located on the dashboard, two on the R.H. side and one on the left (refer to Controls & Instruments chapter). Two more registers are located near the steering wheel column, under the dashboard. These registers are not adjustable but may be electrically open or closed by means of the HVAC control panel. Two registers located in the driver's area are part of the passengers heating & ventilation system, one register is located behind the driver's seat and one is located close to the door, below the modesty panel wall for step de-icing. The

direction and volume of air flow for these two registers are adjustable manually.

Use the HVAC control panel to set air temperature.



AIR REGISTER

22246

## WINDOWS

The vehicle is equipped with single pane or double pane (thermos) windows. There are two automobile-like power windows and a possible combination of three types of side windows, all of them flush-mounted to the structure: fixed, awning and sliding windows. Following is a description and operating instructions for these types of windows:

### DRIVER'S POWER WINDOW

The driver's area is equipped with a power window. The window is controlled by a rocker switch located on the L.H. control panel. Refer to Chapter 3, Controls & Instruments.

### FIXED WINDOWS

These windows are either fastened or glued to the structure and form an integral part of the body of the vehicle, helping reduce vibration and noise. Fixed windows cannot be opened.

### AWNING WINDOWS

To open or close an electrically-operated awning window, use the rocker switch button located at the bottom of the window framing. After closing the window, maintain the rocker switch button depressed to latch the window.

**Note:** *The awning window electrical circuit is equipped with a thermistor protecting the components from overheating. If the awning window is opened and closed repeatedly, causing overheating of the components, the thermal protection will interrupt the operation of the window for a short while to permit cooling down of the components. This feature also prevents personal injuries and damages to the*

## VEHICLE INTERIOR

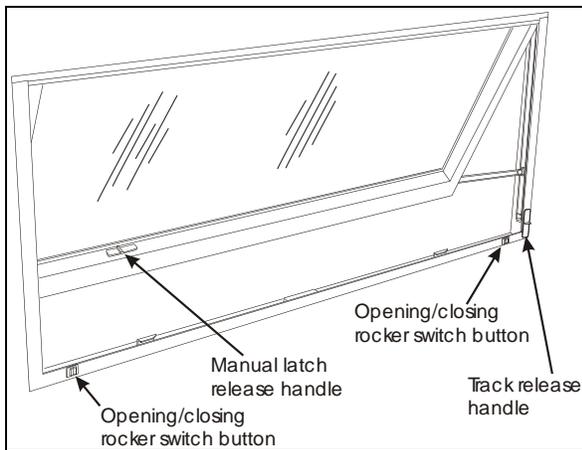
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components if something obstructs the window movement.

**Caution:** Avoid holding the rocker switch button depressed after the window has reached its full opened position or after the window has been latched.

**Caution:** Never try to open or close the awning window by pulling or pushing directly on the window, this could damage the opening mechanism gearbox.

A telltale light on the dashboard illuminates when an awning window is opened. Refer to CONTROLS AND INSTRUMENTS section for more formation.

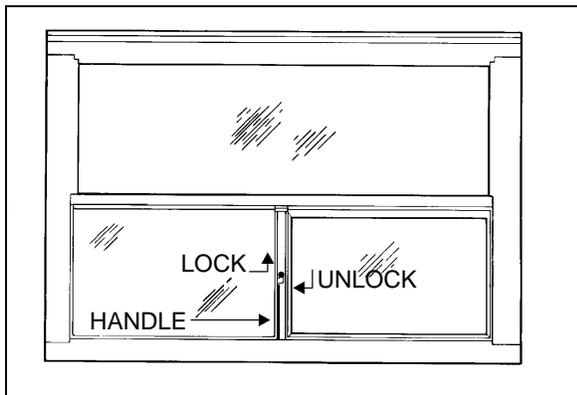


**ELECTRIC AWNING WINDOW**

18585

## SLIDING WINDOWS

Unlatch and pull the sliding window inwards, then slide open. Reverse operation to close.



**SLIDING WINDOW**

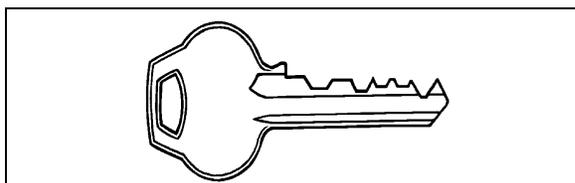
18206

# CONTROLS AND INSTRUMENTS

## KEYS

Three different key models are provided with the vehicle. They are used as described below.

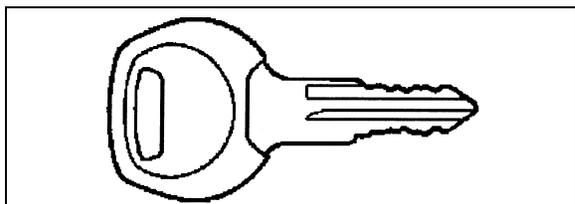
### FRONT ENTRANCE DOOR LOCK KEY



FRONT ENTRANCE DOOR LOCK KEY 23057

Use this key to lock or unlock the entrance door from outside. It is also possible to lock or unlock the entrance door using the Exterior compartment door lock, the Entrance door unlocking switch or using the Keyless entrance system.

### EXTERIOR COMPARTMENTS KEY



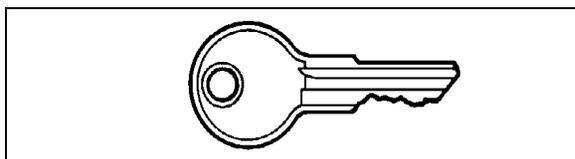
EXTERIOR COMPARTMENTS KEY 23276

Use this key to lock or unlock any exterior compartment door, including the fuel tank filling access door and electrical or service compartment doors. It is also possible to lock or unlock the baggage compartment and front service compartment doors from the inside by means of a switch located in the driver's area.

**Note:** For your protection against theft:

- Record the key numbers and keep this information in a safe place. Do not keep these records inside vehicle.
- It is also advisable to deposit a duplicate of each key in a safe place, so they can be obtained without difficulty in case of an emergency or loss.

### IGNITION SWITCH KEY



IGNITION SWITCH KEY 23056

Turn the ignition key counterclockwise to the ACC position to activate the electrical circuits.

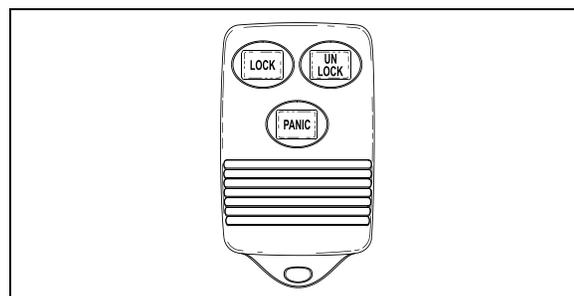
To start the engine, turn the key clockwise to the START position, and then release it. The key will set back to the ON position.

**Caution:** When the vehicle is parked overnight or for an extended period of time, the battery master switch should be set to the OFF position.

**Note:** When the battery master switch is set to the OFF position, all electrical supply from the batteries is cut off, with the exception of battery equalizer check module, ECM ignition and power supply, ECU power (Transmission), coolant heater electronic timer coolant heater and water re-circulating pump, pro-driver, power-verter, keyless entry system and fire alarm.

### REMOTE ENTRY TRANSMITTER

Up to four hand held (electronic key) transmitters can control electronic door lock system.



REMOTE ENTRY TRANSMITTER 23208

To unlock the entry door:

- Press the UNLOCK button on the transmitter. This will unlock the door and disarm the anti-theft system.

To unlock all compartments:

- Press UNLOCK a second time within five seconds of the first unlock. If more than five seconds pass pressing UNLOCK will only unlock the entry door.

To lock all doors and arm the anti-theft system:

- Press LOCK on the transmitter once.

To confirm that the door and compartments have been locked and that the anti-theft system is armed:

- Press LOCK again within five seconds of the first lock. The horn will chirp once if the door and compartments have locked. If the door

## CONTROLS AND INSTRUMENTS

or one of the compartments is open, a door ajar signal prevents arming of the system.

To set off the personal security alarm:

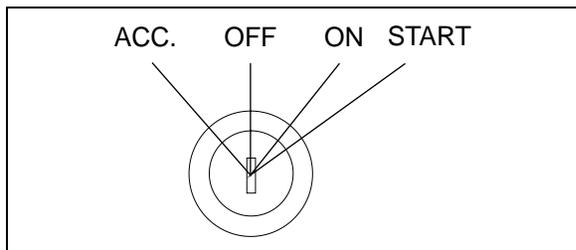
- Press the red PANIC button on any transmitter. The horn will sound and the headlamps will flash for a maximum of three minutes.

To deactivate the personal security alarm:

- Press the red PANIC button again on any transmitter or turn the ignition key *ON*.

**Note:** *the remote entry features will not function when the ignition is in the ON or ACC. position.*

### IGNITION SWITCH



IGNITION SWITCH POSITIONS

06354

The ignition switch is located on the lower left side of the dashboard. It has four positions:

#### Off

In the *OFF* position, ignition cannot take place. The key can be removed when in this position.

The electrical circuits are not activated when the switch is in this position. Only the accessories connected directly to the batteries can be activated. These are the coolant heater and water pump the battery master switch, the central locking system and Message Center Display (MCD). Maintain the switch in this position when parked overnight or for an extended period.

**Note:** *The battery master switch is ON when the hazard flashers are activated, even if the key is in the OFF position.*

#### Accessories

To operate the accessories only, turn the ignition key counterclockwise to the “ACC” position. The key cannot be removed in this position.

The electrical circuits are activated when the switch is in this position or when the hazard flashers are activated.

The features enabled when the key is in the ACC position are all those linked directly to the battery

plus the exterior temperature display, the radio or entertainment system, exterior and interior lighting.

#### On

To place ignition switch to *ON*, turn the key clockwise to the first position. The key cannot be removed in this position.

The electrical circuits activated when the switch is in the *ACC* position plus the transmission, engine and accessories, ABS system, wipers, dashboard cluster gauges and buzzers, air horn and air dryer heater are activated when the key is in this position. Do not leave the key in this position unless the engine is running.

#### Start

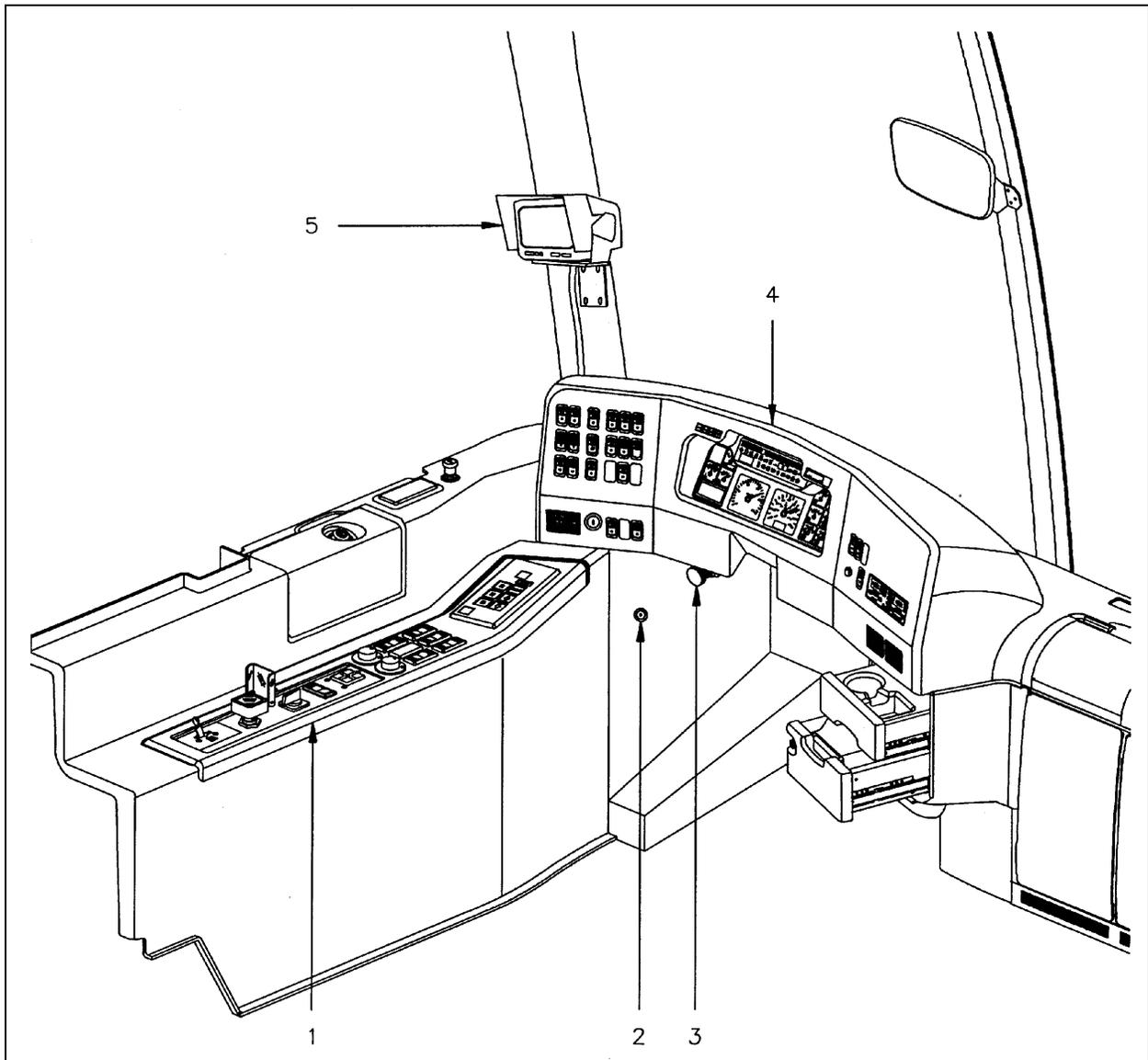
Turn the key clockwise to the second position and release as soon as the engine starts. The key will return to the *ON* position. If the engine did not start, return the ignition key to the *OFF* position before trying to restart the engine.

The ignition switch is equipped with a starter protection which inhibits turning the key to the *START* position if the key has not previously been turned to the *OFF* position.

**Warning:** *If the “STARTER ON” Indicator light on the dashboard cluster remains illuminated even after releasing the ignition switch, Stop the engine immediately and set the battery master switch (ignition key) to the OFF position. Have the starter checked immediately.*

**Caution:** *To avoid overheating the starter, do not engage the starter for more than 15 seconds at a time. Allow the starter to cool before trying to restart the engine.*

The features activated when the engine is running are all those described above plus the HVAC system and daytime running lights. The optional ether cold-start system is automatically deactivated once the engine runs.

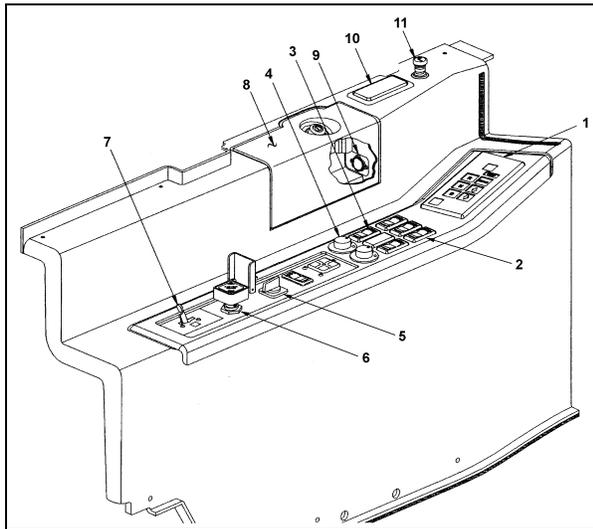


DRIVER'S AREA

18508

1. Lateral Control Panel
2. Diagnostic Data Reader (DDR) Receptacle
3. Steering Wheel Adjustment Unlock Air Valve
4. Dashboard
5. Rear View TV Monitor

### LATERAL CONTROL PANEL



LATERAL CONTROL PANEL

06485

1. Transmission Control pad
2. Cruise Control Switches
3. Driver's Power Window Switch
4. Mirror Controls
5. Level Low Control Valve
6. Parking Brakes Control Valve
7. Tag Axle Control Valve
8. Utility Compartment
9. 12 Volt DC Power Outlet
10. Ashtray
11. Cigarette Lighter

### TRANSMISSION CONTROL PAD (1)

The control pad for the Allison automatic transmission is located as shown. Refer to "Automatic Transmission" in this chapter for operating instructions and more information.

### CRUISE CONTROL SWITCHES (2)

The cruise control is part of the DDEC V electronic engine control that will maintain a set speed when the vehicle is traveling above 20 mph (32 km/h).

**Warning:** Do not use the cruise control when driving speed must be constantly adjusted, such as in heavy traffic or on winding, icy, snow-covered or slippery roads, or on gravel roads.

**Warning:** Do not put the transmission in the neutral (N) position while driving with cruise control. This will cause the engine to over-speed and may result in a loss of driving control.

### Setting coach speed

Depress the **CRUISE** rocker switch to activate the cruise control. A LED on the switch illuminates when the cruise control is activated. Accelerate the vehicle to the desired cruising speed using the accelerator pedal. Depress and release the **SET** switch then remove foot from the accelerator pedal. This will set the vehicle cruise speed and store it in memory.

**Note:** The **CRUISE** and **RESUME** switches do not operate at speeds below 20 mph (32 km/h).

### Increasing set speed

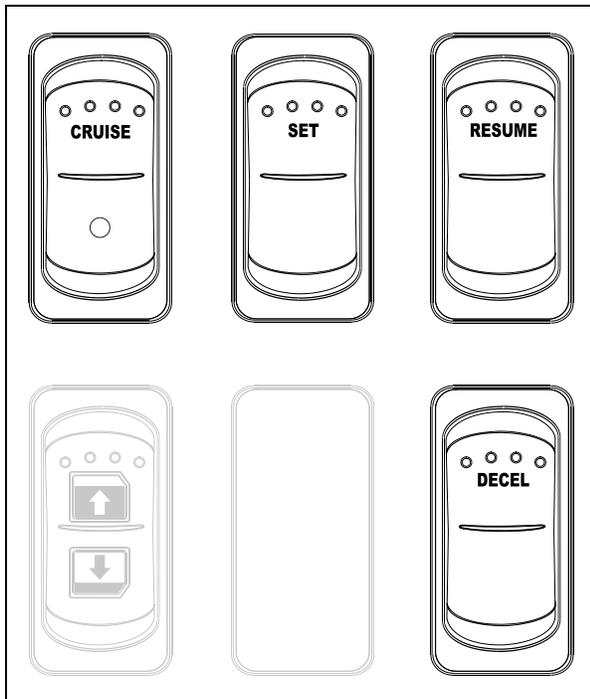
The vehicle cruise speed setting can be increased by one of the following methods:

- Accelerate using the accelerator pedal until the desired cruising speed is reached. Depress and release the **SET** switch.
- Depress and hold the **RESUME** switch until the desired cruising speed is reached. When the **RESUME** switch is released, the new cruising speed will be stored in the cruise control memory. The **RESUME** switch does not operate at speeds below 20 mph (32 km/h).

When driving with cruise control ON, each time the **RESUME** switch is momentarily depressed, the cruising set speed is raised by 0.6 mph (1.0 km/h).

**Note:** When driving with cruise control, the vehicle can still be accelerated by depressing the accelerator pedal in the usual manner. Once the accelerator pedal is released, the vehicle will return to the previously set cruising speed.

**IMPORTANT NOTE:** If the engine was stopped and the CRUISE rocker switch was in the ON position, the rocker switch must be reset by turning it OFF then ON again in order for the cruise control to be reactivated.



CRUISE CONTROL SWITCHES

06233

**Decreasing Set Speed**

The cruise speed setting can be decreased by one of the following methods:

- Depress and hold the **SET** switch until the desired cruising speed is reached. When the **SET** switch is released, the new cruising speed will be stored in the cruise control memory.
- Depressing momentarily the **SET** switch will decrease set cruising speed by 0.6 mph (1.0 km/h).
- Slightly apply the service brake.
- Depress and release the **DECEL** switch.

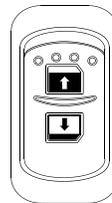
After disengaging the cruise control, you can return to the preset cruising speed by pressing and releasing the **RESUME** switch providing that your speed is above 20 mph (32 km/h).

**Note:** To avoid sudden vehicle hesitation, slightly depress the accelerator pedal before disengaging the cruise control.

**Note:** When the **CRUISE** rocker switch is turned off, the cruise control is completely shut off and the cruise speed setting is erased from the cruise control memory.

**Warning:** Every time the **SET** or the **RESUME** switch is depressed results in a decrease or increase (respectively) in cruising set speed of 0.6 mph (1.0 km/h).

**DRIVER'S POWER WINDOW SWITCH (3)**

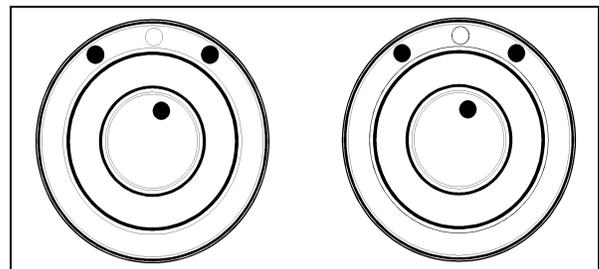


Use the rocker switch to open or close the driver's power window.

06338

**Caution:** Close power window when parked or leaving the coach unattended.

**MIRROR CONTROLS (OPTION) (4)**



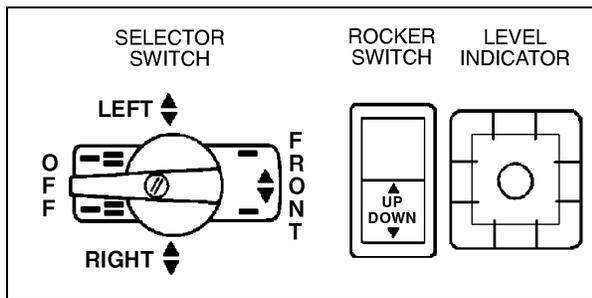
MIRROR CONTROLS

Turn left pointer knob counterclockwise for outside mirror head adjustments and to the right for convex mirror adjustments, then use the joystick control to adjust the selected mirror's viewing angle. Adjust the right outside mirror similarly but by using the right side control.

**Note:** If the mirror assemblies on your vehicle do not include convex mirrors, only one (1) Mirror Control will be installed for both mirrors. To operate, turn pointer knob to the left for L.H. mirror adjustments and to the right for R.H. mirror adjustments, then use the joystick control to adjust the selected mirror's viewing angle.

## CONTROLS AND INSTRUMENTS

### LEVEL LOW SYSTEM (5)



When driving, the conventional air leveling system of the vehicle controls the height at three points: the front, the left rear and the right rear. Your vehicle is equipped with a suspension system that consists of air springs (pressurized air bellows) located near each wheel. The amount of air in each air spring (and thus the vehicle height) is controlled by automatic leveling valves that operate between the chassis and the axles of the vehicle.

The three leveling valves are located as follows: one at the front which controls the amount of air in both front air springs, one at the left rear which controls the left rear corner of the vehicle and one at the right rear which controls the right rear corner of the vehicle. During normal driving, these valves work automatically to maintain the chassis at the proper level above the axles, indifferent of road conditions or vehicle weight.

When parked, and **ONLY** when parked, the level of the vehicle can be manually adjusted within the range of travel of the air springs. Thus, if the vehicle is parked on uneven ground, the manual override leveling system can be used to level the chassis of the vehicle. With the ignition ON (engine running or not), turn the selector switch located on L.H. side control panel to the area of the vehicle requiring leveling, then press the rocker switch accordingly (up or down) to inflate or deflate the selected set of air springs. The front position raises or lowers the front only and does not tilt the vehicle to its sides. Each rear position raises or lowers its respective side, therefore, the rear positions can be used to tilt the vehicle to one side or the other, or they can be used to raise or lower the rear of the vehicle. When leveling vehicle, it is often necessary to run the engine in order to get an adequate air supply.

**Note:** It is always better to first level the rear of the vehicle (right to left) before raising or lowering the front. After adjusting the rear, watch the level as you adjust the front. If the level shows that the vehicle is starting to tilt to either side, then stop adjusting the front as one of the air springs has come to the end of its travel range.

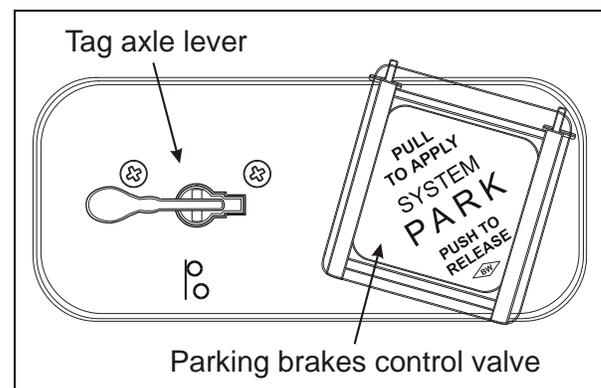
After manual leveling, turn OFF the engine. The vehicle will stay in the leveled position (the air is "locked" in the air springs) as long as there are no air leaks. The vehicle will hold this position for several days. When engine is restarted and air pressure is adequate, the vehicle will automatically level itself for driving conditions.

**Warning:** Do not drive the vehicle with the level low selector switch in any position other than OFF, as this may render the vehicle unsafe and uncontrollable. If this is the case, the Level Low warning telltale light in dashboard will flash, reminding you that the selector is not in the OFF position.

**Note:** If, for any reason, you wish to start the engine without moving vehicle (to warm up engine for instance) while keeping the vehicle in the manually leveled position, place selector switch in any position except OFF. When ignition switch is turned to the OFF position, reset the selector switch to the OFF position.

### PARKING BRAKES CONTROL VALVE (6)

Spring-loaded parking brakes are applied by pulling up the control valve knob and protector assembly. Lift the safety cover and push down to release brakes. Refer to "Emergency and Parking Brakes" in "Emergency Features And Safety Equipment" chapter 6.



**TAG AXLE CONTROL VALVE (7)**

Unload (or raise) the tag axle by pushing the lever forward. Pulling the lever back will load (or lower) the tag axle. Refer to "Other Features" in chapter 4 for additional information.

The DDR receptacle is located inside the footwell, on the upper left side wall.

**UTILITY COMPARTMENT (8) (9)**

The lockable free space utility compartment also includes a 12 volt appliance socket.

**ASHTRAY (10)**

To open the ashtray, push slightly on the cover's side. The ashtray can be removed for cleaning by pulling it out.

**Warning:** *To prevent a fire, never put paper or plastic wrappers in the ashtray. Empty ashtray often.*

**CIGARETTE LIGHTER (11)**

Push lighter in to activate. When ready to use, it will spring out automatically. Replace lighter in non-activated position. The cigarette lighter socket can be used to power 12-volt appliances (eg. flashlight, vacuum cleaner). The maximum power consumption allowed for appliances plugged in this socket is 130 watts. Make sure the appliances are equipped with suitable plugs that will not damage the socket.

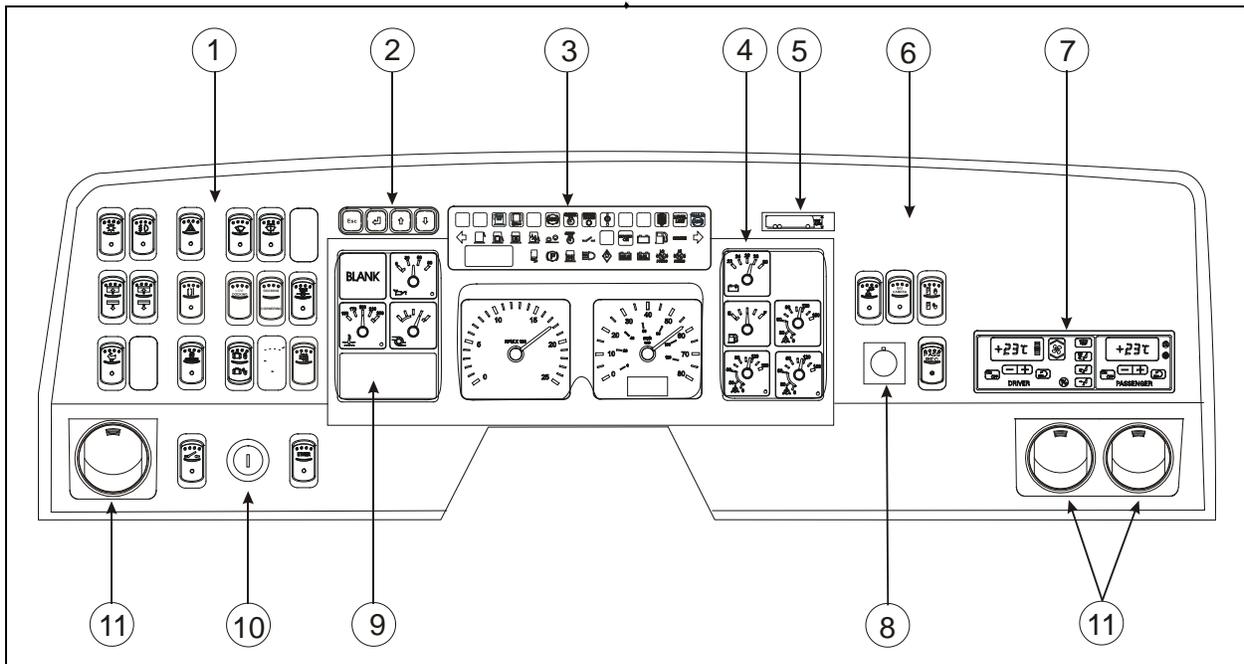
**Note:** *The cigarette lighter can still be used after the ignition key has been removed.*

**DIAGNOSTIC DATA READER (DDR) RECEPTACLE**

To facilitate troubleshooting of the DDEC, WT and ABS systems and to obtain data logged in the ECM (Electronic Control Module) memory, a Diagnostic Data Reader (DDR) (not supplied) can be connected through the DDR receptacle. A user's manual is supplied with the optional DDR.

## CONTROLS AND INSTRUMENTS

### DASHBOARD



DASHBOARD

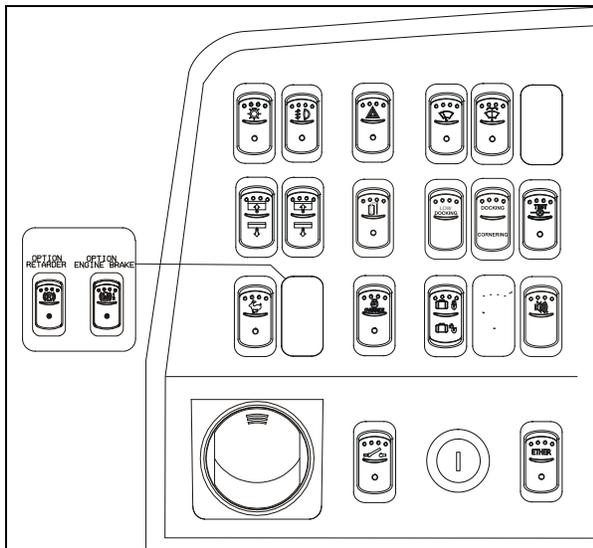
06560

1. L. H. DASHBOARD PANEL
2. MCD KEYPAD
3. TELLTALE PANEL
4. GAUGES
5. VEHICLE CLEARANCE INFORMATION
6. R. H. DASHBOARD PANEL
7. HVAC CONTROL UNIT
8. BRIGHTNESS CONTROL
9. MESSAGE CENTER DISPLAY (MCD)
10. IGNITION SWITCH
11. ADJUSTABLE AIR REGISTERS

**CONTROL SWITCHES**

High quality laser-engraved switches are used to control many of the features of the coach. Many switches have an embedded witness LED to inform the driver at a glance which features are active. Some switches' LED will turn *OFF* after a short while when the engine is running. This is normal and is designed to reduce glare when driving. The functions still operate even if the LED is *OFF*. If the switches are still *ON* when the engine is turned *OFF*, the LEDs will illuminate to warn the driver to turn them *OFF*.

**L. H. DASHBOARD PANEL**

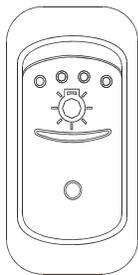


L. H. DASHBOARD PANEL

06561

The L.H. dashboard panel includes driver-exclusive controls, ether start control switch, ignition switch and an adjustable air register for the driver.

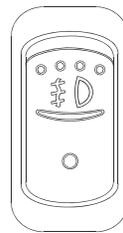
**Headlights**



Push down rocker switch to the first position to activate clearance, tail and marker lights. Push down fully to turn *ON* both the clearance and marker lights and the headlights. The controls and instrument lights will illuminate.

**Note:** Daytime running lights will be automatically cancelled when the exterior lighting switch is fully depressed.

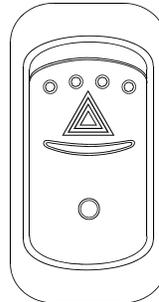
**Fog Lights (Option)**



Optional halogen fog lights provide better visibility in fog and precipitation. They improve close range visibility and provide added safety.

**Note:** Some states and provinces restrict the use of fog lights. Verify local state or provincial regulations before using.

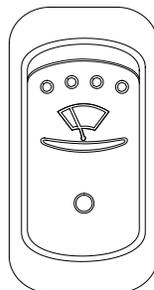
**Hazard Warning Flashers**



Press the rocker switch to make all turn signal lights flash at once. The dashboard telltale lights will flash when the hazard warning flashers are *ON*.

**Caution:** Do not use the hazard flashers for an extended period of time unless necessary because the electrical circuits are activated when the hazard switch is depressed.

**Upper Windshield Wipers**



Press the rocker switch to the first position to activate the upper wipers intermittently.

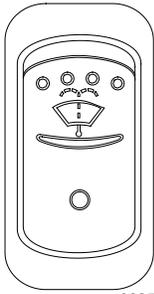
Press to the second position for continuous operation of the upper wipers.

**Caution:** To avoid damaging the wiper blades or scratching the windshield, do not operate the wipers when the windshield is dry. Also, loosen frozen wipers before operating.

**Note:** Lower windshield wipers are activated using the multi-function lever. Refer to paragraph: "Steering Column Controls" in this chapter.

## CONTROLS AND INSTRUMENTS

### Upper Windshield Washer



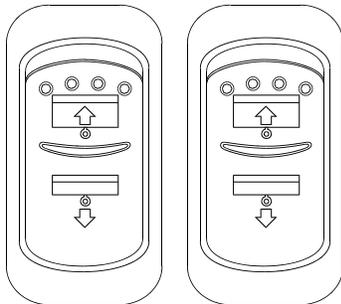
06258

Press the rocker switch to spray the upper windshields with washer fluid. Windshield wipers will automatically come on and stop a few seconds after releasing the switch.

**Note:** Lower windshield wipers are activated using the multi-function lever. Refer to paragraph: "Steering Column Controls" in this chapter.

**Caution:** Do not operate the washer mechanism while the washer fluid reservoir is empty. This may damage the washer fluid pump.

### Left and Right Sunshades

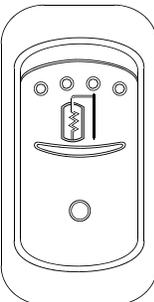


06353

Press and hold to lower or raise left or right sun shade.

**Caution:** Do not attempt to raise or lower these shades manually. Damage to electric motor or roller mechanism could result.

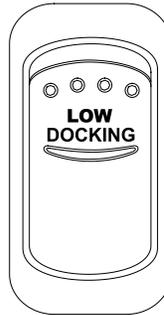
### Outside Mirror Heat (Optional)



06261

Press the rocker switch to clear fog, frost or thin ice from outside mirrors.

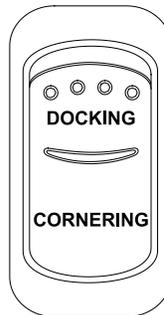
### Low Docking



06486

Press the rocker switch to reduce cornering and docking lights intensity.

### Docking/Cornering

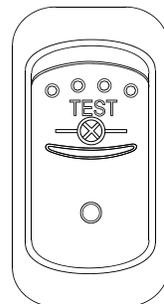


06337

Press the rocker switch forward to illuminate the cornering and docking lights.

Press the rocker switch rearward to illuminate the cornering lights when signaling a left or right turn.

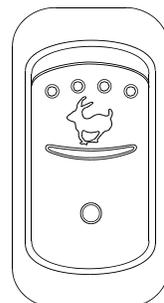
### Telltale Light Test



06263

Press this switch while ignition is in the ON position to illuminate the telltale light cluster. Perform this test to verify indicator light functionality. Telltale lights will turn off automatically after about three seconds.

### Fast Idle



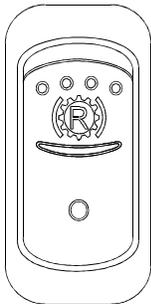
06264

For extended idling periods, run the engine at fast idle. Press down the rocker switch to engage fast idle. This increases the engine speed to approximately 1,000 rpm. Return to normal idle before driving or when stopping engine.

**Caution:** Even if normally the engine will return to normal idle and remain there if the parking brake is applied and/or transmission is placed in neutral (N), it is safer to first press down the rocker switch to run the engine at normal idle before engaging the transmission.

**Caution:** Return the engine to normal idle before shutting the engine OFF.

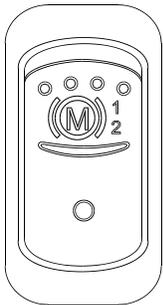
**Transmission Output Retarder (Optional)**



06252

Press rocker switch to activate the transmission retarder. Refer to "Transmission Output Retarder" in this chapter.

**JACOBS Engine Brake (Optional)**



06253

Press this switch to the first position to actuate the system to 2/3 engine brake and press to the second position for full application of engine brake. Refer to "Other Features" chapter.

**Warning:** Engine brake must be used on dry road only. Never use the engine brake on slippery roads; loss of control could result.

**Note:** Engine brake is only activated when accelerator pedal is released and the engine speed is higher than 750 rev/minutes. Stoplights turn ON when the engine brake is used.

**Engine Stop Override**



06265

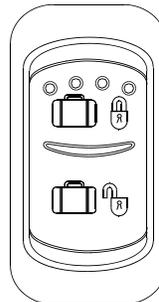
Press this switch then release to override the emergency engine shutdown protection. Engine emergency shutdown will be turned OFF for 30 seconds. This procedure can be repeated if done before the 30 seconds are up.

**Caution:** Use sparingly and in order to move the vehicle to a safe parking place only. Excessive use can cause severe engine damage.

**DDEC Diagnostic Request**

With the engine at idle or OFF and with the ignition switch in the ON position, press and release the Engine Stop Override rocker switch. Active codes will be flashed on the "Stop Engine" and inactive codes on the "Check Engine" telltale lights alternately. The first digit of the diagnostic code is determined by the number of flashes before a short pause. The second number of the diagnostic code is then flashed in the same manner. As an example, code "25" (everything O.K.) consists of two flashes, followed by a short pause, then five flashes. Refer to the "Technical Information" chapter under "DDEC V Diagnostic Codes".

**Central Locking System**



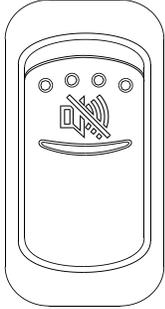
06266

This optional system enables locking all baggage compartment doors by pressing the switch forward. To unlock, press the switch rearward.

**Note:** Service compartment doors are not linked to the central locking system.

## CONTROLS AND INSTRUMENTS

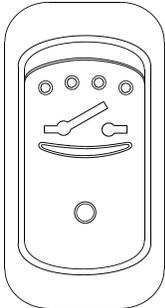
### Back-up Alarm Cancel



06311

Press down this switch to cancel the back-up alarm. Return to normal operation after use.

### Safety Switch



06269

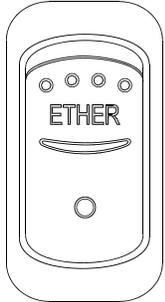
Both the 12 volt and 24 volt electrical systems are activated by this switch. A telltale light on the dashboard and a LED on the switch illuminate when the switch is depressed and the circuits are closed.

This switch is bypassed when the engine is running. When the engine is not running, the safety switch cuts off all electrical components from the batteries, except for the battery equalizers

and monitor, the transmission electronic control unit (ECU) memory, vehicle interface module (VIM), the coolant heater and optional refrigerator power supply.

**Caution:** When parking the coach overnight or for an extended period of time, open the electrical circuits using the safety switch.

### Ether Start Control (Optional)

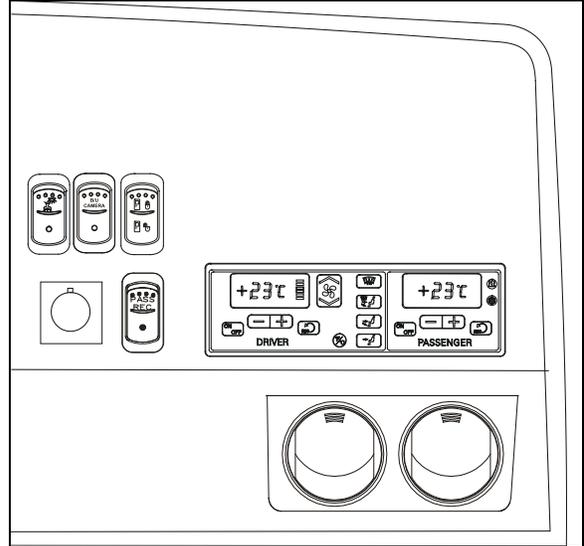


06237

Activates the engine cold starting aid. Refer to "Starting and Stopping Procedures" chapter.

**Caution:** Excessive use may result in severe engine damage.

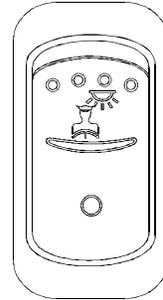
### R.H. DASHBOARD PANEL



R.H. DASHBOARD PANEL

06562

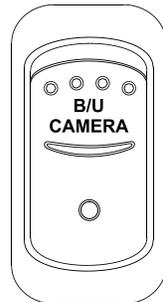
### Driver's Area Lighting



06244

Press the rocker switch to illuminate the ceiling lights in the driver's area as needed.

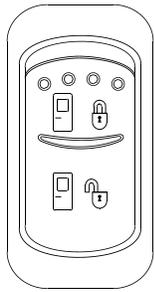
### Back-up Camera



06314

Press this switch to activate the back-up camera monitor when the transmission is not in the reverse gear.

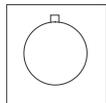
**Front Entrance Door**



06313

Press this switch to lock or unlock the entrance door from the inside.

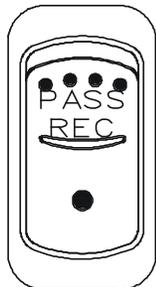
**Brightness Control**



06565

Adjusts the brightness of the dashboard instruments and switches.

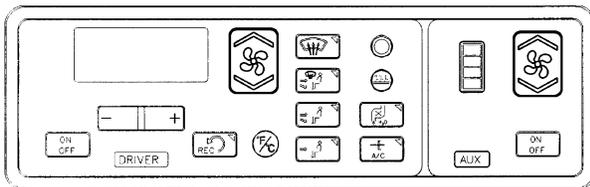
**Passenger air recirculate (with central A/C system)**



Press this switch to close the passenger's section fresh air damper.

**HVAC Control Unit**

Vehicles equipped with small system



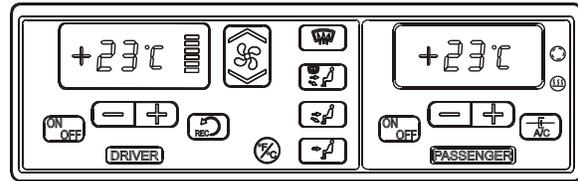
22184

The temperature control in the driver's area is provided directly by the HVAC control unit mounted on the dashboard R.H. side.

Using the Up/Down type switch sets the fan speed and the speed chosen is illustrated on the window display.

The auxiliary system temperature control is provided by the small system HVAC control unit. The R.H. portion of the HVAC control unit enables to actuate the Aux. System and to regulate the fan speed. Using the Up/Down type switch sets the fan speed and the speed chosen is illustrated on the window display.

Vehicles equipped with central system



22173

The vehicle is slightly pressurized by the central HVAC system to prevent dust and moisture from entering. Air flow and controls divide the vehicle into two areas: driver's area with defroster and cabin area.

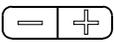
Fresh air is fed in each area and has a separate return air and discharge air duct.

**Note:** To operate the air conditioning system when stationary, run engine at fast idle. When the system is running, keep windows and door closed.

To prevent battery run-down, the central A/C and heating systems will not operate if the charging system is not working properly.

When the A/C system is running, park at least 4 feet (1,5 m) from other vehicles or buildings to allow sufficient air flow through the condenser core.

Separate driver and cabin heating, ventilation and air conditioning controls are located on this panel. To operate, the vehicle's engine must be running.

The driver's and the cabin units may be turned ON by pressing  or  or  buttons.

All parameters set before turning the system OFF will be kept in memory for the next power ON.

The HVAC module performs a self diagnosis every time it is turned ON. Codes are shown on displays or flashed on control buttons. Refer to "Maintenance Manual" for more information on the diagnostic codes.

**Heating Mode Indicator**



22135

This red LED illuminates when system is heating.

**Cooling Mode Indicator**

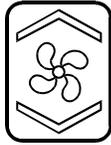


22134

This green LED illuminates when the system is cooling (when the compressor clutch is engaged).

## CONTROLS AND INSTRUMENTS

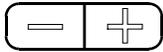
### Fan Speed



22135

The driver's fan has six speeds. Increase speed by pressing on the upper portion of the button, decrease by pressing on the lower portion.

### Temperature Set Button



22132

The driver's side and the cabin side have independent temperature controls.

These buttons determine the heating and cooling set points.

To increase the temperature, press on the "+" sign, to decrease the temperature, press on the "-" sign. Temperature range is between 55°F and 85°F (13°C to 29°C). On the driver's side only, asking for a temperature set point above 85°F (28°C) will keep the coolant valve open and "FUL" will be displayed. Cabin temperature range is limited to 85°F (29°C). Temperature increments are 1°F or 1°C depending on units displayed.

In case of interior temperature sender unit failure, the coolant valve will remain open and three lines "---" will be displayed.

**Warning:** Warm temperatures may cause drowsiness and affect alertness while driving. Keep temperature comfortable but not too high.

### Recirculate



22138

Closes or opens the fresh air damper.

A red LED in the top right corner of the button illuminates when cabin section air is recirculated. Use for faster cabin section heating.

This feature is automatically cancelled when defogging is activated.

### Windshield Defogger



22139

The dashboard damper sends air only to the lower windshield when activated. The footwell damper is closed also. A red LED in the top right corner of the button illuminates when activated.

Upon pressing this button, the fan is turned on at maximum speed, the fresh air damper opens completely (REC off) and the temperature is set to maximum if the temperature set point has not

yet been attained once.

### A/C compressor



06385

Engages the A/C compressor.

### Water Pump



Engages the water recirculating pump to increase the coolant flow when more heat is necessary.

### All Vents Open



22140

The dashboard damper opens halfway, sending air to the windshield and panel vents.

The footwell damper is also fully open.

A red LED in the top right corner of the button illuminates when activated.

### Panel and Footwell



22137

The dashboard damper sends air to the panel vents and footwell.

A red LED in the top right corner of the button illuminates when activated.

### Panel



22136

Air is sent to panel registers. The foot damper is closed.

A red LED in the top right corner of the button illuminates when activated.

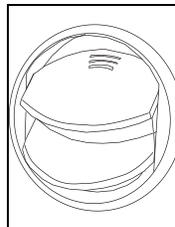
### Temperature Degree Selector



22133

Toggles between Fahrenheit and Celsius units. To operate, the driver's section must be on.

### AIR REGISTERS

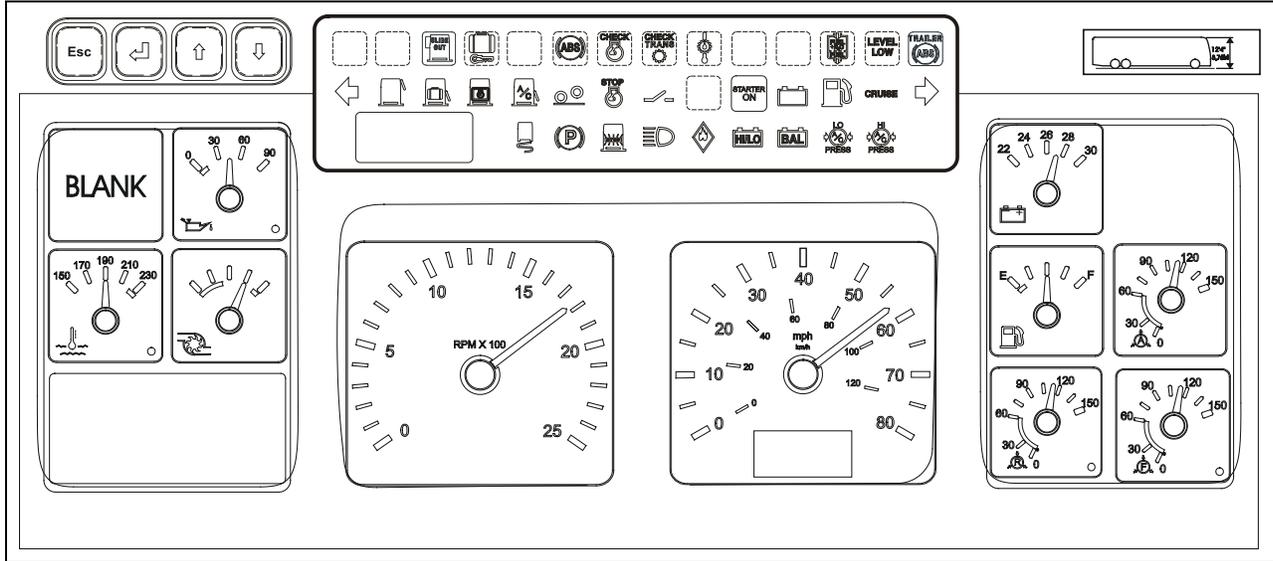


22246

Three adjustable driver air registers in the dashboard feed air to the driver's compartment. Use the HVAC control panel to set air temperature and fan speed.

VIP vehicles equipped with a central system have two additional registers located near the entrance door, at bottom of first lateral window.

CLUSTER



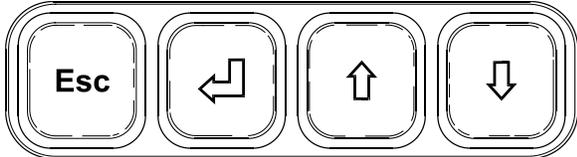
CLUSTER

06563

The cluster incorporates the Message Center Display, the Telltale Panel, the Gauges and Vehicle Clearance Information.

corner of gauge) illuminates when the ECM decides oil pressure is too low. In such a case, the ECM will start to power down the engine until finally shutting it off as explained under “STOP Engine” telltale light, in this chapter.

MESSAGE CENTER DISPLAY (MCD)



06399

This standard feature gathers, stores and displays important information about the vehicle’s operation on a display screen on the lower left portion of the cluster. Refer to Message Center Display in Other Features chapter for a description of how to set up and operate the Message Center Display.

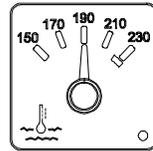
An audible alert signal also informs the driver of low oil pressure. Refer to Safety Features and Equipment chapter for table of audible alerts.

**Caution:** Loss of oil pressure may cause severe engine damage. If low oil pressure LED illuminates, park the vehicle safely and stop the engine immediately. Request service assistance.

GAUGES

**Note:** Do not refer to dashboard instruments during adjustment procedures. Use only calibrated gauges.

Engine Coolant Temperature

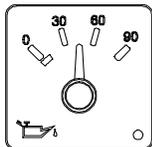


06231

Indicates the operating temperature of the engine coolant. The normal reading should be between 190°F and 222°F (88°C to 106°C).

A high coolant temperature indicator LED (bottom right corner of gauge) illuminates when the coolant temperature rises above 223°F (106°C). An audible alert signal also informs the driver of this condition.

Engine Oil Pressure



Indicates engine oil pressure. The normal reading should be between 50 and 70 psi (345 - 480 kPa) at 55 mph (90 km/h).

The engine protection system will start power down. Refer to Safety Features and Equipment chapter for table of audible alerts.

06229

A low oil pressure indicator LED (bottom right

## CONTROLS AND INSTRUMENTS

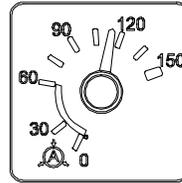
### Turbo Boost Pressure



06230

Indicates turbo boost pressure in psi. Reading depends on engine rpm and load conditions.

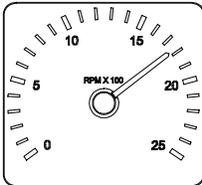
### Accessories Air Pressure



06226

Indicates the accessories air system pressure. The normal operating pressure is from 95 to 125 psi (655 to 860 kPa).

### Tachometer

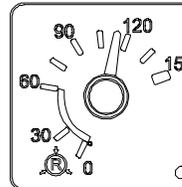


06221

Indicates the operating speed of the engine in hundreds of revolutions per minute (rpm x 100). The tachometer serves as a guide for gear shifting and

helps to prevent engine over-speeding when driving downhill with the JACOBS engine brake operating. The maximum allowed engine speed is 2,450 rpm.

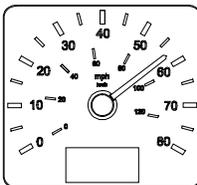
### Primary System Air Pressure (Rear)



06228

Indicates the primary air system pressure. The normal operating pressure is from 95 to 125 psi (655 to 860 kPa).

### Speedometer



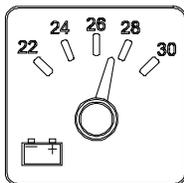
06222

Indicates the vehicle speed in miles per hour (mph) and kilometers per hour (km/h).

The digital odometer records the distance traveled in miles or in kilometers (units are driver selectable).

**Warning:** Do not drive the coach when air pressure is low.

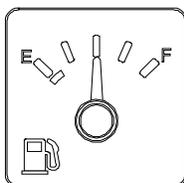
### Voltmeter (24-Volt System)



06224

Indicates the condition of the 24-volt electrical system. With the engine running, the normal reading should be between 26.5 and 28.0 volts.

### Fuel Level

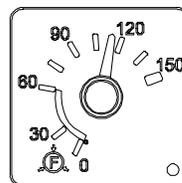


06225

Indicates the amount of fuel remaining in the fuel tank.

A telltale light illuminates when about 12 US gallons (45 liters) of fuel remain in the fuel tank.

### Secondary System Air Pressure (Front)



06227

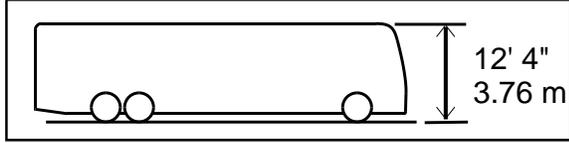
Indicates the secondary air system pressure. The normal operating pressure is from 95 to 125 psi (655 to 860 kPa).

A low air pressure indicator LED (bottom right corner of gauge) illuminates when the secondary air system pressure drops below 66 psi (455 kPa). An audible alert signal also informs the driver of low air pressure. Refer to Safety Features and Equipment chapter for table of audible alerts. If the air pressure drops below 40 psi (276 kPa), the emergency brake applies at full capacity.

**Warning:** Do not drive the coach when air pressure is low.

**Caution:** Operating the vehicle when the reading is below 1/8 full is not recommended.

Vehicle Clearance Information

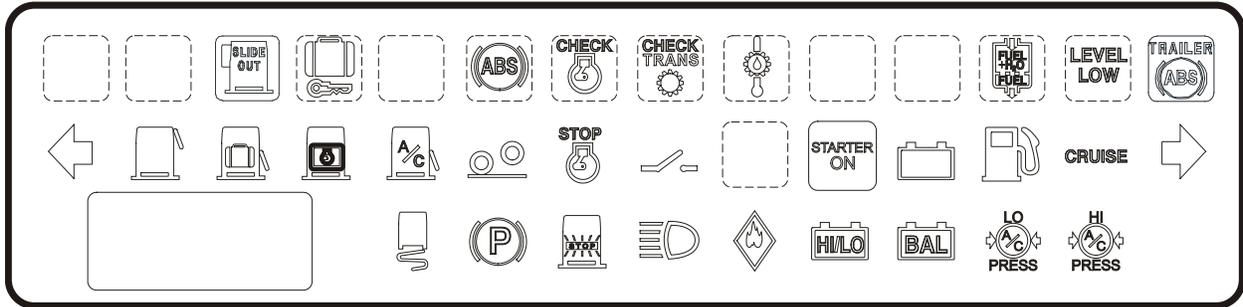


06447

Safe vehicle clearance height is 12'4" (3.76 m).

**Caution:** vehicle clearance is higher when the ventilation hatch is open, Hi-Buoy is selected or if additional equipment is installed on the roof.

TELLTALE PANEL



TELLTALE PANEL

06564

Some telltale lights described below appear on the telltale panel only if the corresponding optional equipment is installed on the vehicle.

Slide-Out



06559

Illuminates when the slide-out(s) is in operation. Blinks to indicate that an error code has been detected.

ON after five seconds or comes ON sometime after starting the engine, the Detroit Diesel Electronic Control (DDEC) system has detected a minor problem.

The indicator light will remain ON until the malfunction has been corrected.

A diagnostic code will be stored in the memory and the indicator can be used to identify the problem. Refer to the "Technical Information" chapter under "DDEC V Diagnostic Codes".

Baggage Compartment Door Unlocked



06387

Illuminates when one or more baggage compartment doors are unlocked.

Check Transmission



06282

Illuminates when the ignition is switched ON. The indicator light should go out once the engine starts.

Antilock Brake System



06272

Illuminates when the ABS is not available or when the ABS is malfunctioning. Since the ABS system does not operate under 4 mph (7 km/h), the indicator will remain illuminated until the coach reaches that speed. Refer to "Other Features" chapter.

When the "CHECK TRANS" indicator is illuminated and the shift selector emits short beeps for 8 seconds, the electronic control unit (ECU) is restricting transmission shifting because special or abnormal conditions are detected. The control pad display will be blank.

If this happens, drive the coach to the next available service center to receive assistance. The ECU will not respond to shift selector requests since operating limitations are being placed on the transmission (i.e. upshifts and downshifts may be restricted). Direction changes and shifts to and from neutral (N) will not occur.

Check Engine



06281

Illuminates when the ignition switch is ON as a light bulb check. The light should turn OFF after five seconds. If the indicator remains

Any time the CHECK TRANS telltale light illuminates, the ECU will register a diagnostic code. It may be identified on the display or by

## CONTROLS AND INSTRUMENTS

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using a diagnostic tool. Refer to "Technical Information" chapter.

**Note:** The *CHECK TRANS* indicator may also illuminate when starting the engine in extremely cold weather. Refer to "Starting and Stopping Procedures".

### Transmission fluid Temperature



06292

Illuminates when the transmission fluid temperature is too high. An audible alert signal also informs the driver of this condition. Disengage the retarder to allow the oil temperature to cool down.

### Fuel Filter/Water Separator



06291

Illuminates when accumulated water in the optional fuel filter/water separator needs to be drained. Refer to Care and Maintenance chapter.

### Level Low System Indicator



06297

Illuminates when the vehicle leveling system is activated.

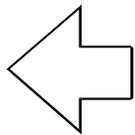
### Trailer Antilock Brake System (ABS)



06554

Illuminates when the trailer ABS is malfunctioning.

### Left Turn Signal



06290

Flashes when the left turn signals are activated. Signal right and left turns by operating the multi-function lever. See Steering Column Controls in this chapter.

### Emergency Window Open



06287

Illuminates when an awning window is open or unlocked.

### Baggage Compartment Door Ajar



06306

Illuminates when one or more baggage compartment doors are ajar.

### Engine Door Ajar



06308

Illuminates when either the side or rear engine door is ajar.

### HVAC Compartment Door Ajar



06304

Illuminates when either the condenser door or the evaporator door is ajar.

### Retracted Tag Axle



06271

Illuminates when the tag axle is retracted. When the tag axle is retracted, an alarm will sound to warn the driver. The control valve is located on the L.H. lateral console.

### STOP Engine



06309

Illuminates when the ignition switch is *ON* as a light bulb and DDEC system check. The indicator should go *OFF* after five seconds.

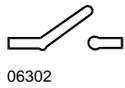
If the indicator remains illuminated after five seconds or comes *ON* sometime after starting the engine, the DDEC system has detected a major problem. Immediately park the coach in a safe place and stop the engine. An audible alert signal also informs the driver of this condition.

When a problem is detected, the engine power will automatically begin to decrease gradually, followed by full shutdown after 30 seconds.

The engine emergency shutdown may be bypassed by using the "Engine Stop Override" switch on the L.H. lower control panel.

**Note:** Once the engine is stopped, it cannot be restarted until the problem has been corrected. A diagnostic code will be stored in memory. The STOP engine indicator can be used to identify the problem. Refer to Technical Information chapter under "DDEC V Diagnostic Codes".

**Safety Switch**



06302

Illuminates when the 12 volt and 24 volt electrical systems are activated. Use the safety switch to activate or deactivate the circuits.

**Starter ON**

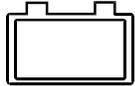


06380

Illuminates when the engine starter is ON.

**Warning:** If the "STARTER ON" Indicator light remains illuminated even after releasing the ignition switch, Stop the engine immediately and set the battery master switch (ignition key) to the OFF position. Have the starter checked immediately.

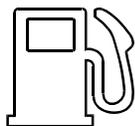
**Alternator**



06371

Illuminates when the alternator is not charging.

**Fuel Level Low**



06286

Illuminates when approximately 12 US gallons (45 liters) of fuel remains in the tank. After the light comes ON, the remaining fuel will provide no more than 60 miles (100 km) of travel. Do not exceed this distance.

**Note:** Refuel as soon as possible.

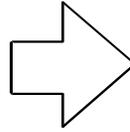
**Cruise Control Enabled**



06284

Illuminates when cruise control is enabled.

**Right Turn Signal**



06289

Flashes when the right turn signals are activated. Signal right and left turns by operating the multi-function lever. See Steering Column Controls in this chapter.

**Freezing Conditions**



06273

Flashes for about 10 seconds every 15 minutes when the outside temperature is in the range between 2°C and 1°C (35°F to 34°F), when the road is most slippery.

An audible alert will sound when these conditions arise. Refer to Safety Features and Equipment chapter.

**Emergency/Parking Brake**



06303

Illuminates when the emergency /parking brake is applied. The control valve is located on the L.H. control panel. An audible alert will sound if ignition is turned to OFF and the parking brake is not engaged.

**Stoptlights ON**



06305

Illuminates when rear stoplights illuminate. This occurs when either cruise control DECEL switch, service brake, parking brake, engine retarder or transmission retarder is applied.

**High Beam ON**



06300

Illuminates when high beams are selected. High and low beams are selected by operating the multi-function lever. Refer to Steering Column Controls heading in this chapter.

**Fire Detected**



06288

Illuminates if a fire is detected in the engine compartment. An audible alert also informs the driver when a fire is detected. Refer to Safety Features and Equipment

## CONTROLS AND INSTRUMENTS

chapter.

**Warning:** In case of a fire, stop the vehicle immediately, stop the engine and evacuate the vehicle.

**Note:** For extinguisher's location, refer to Safety Features and Equipment chapter.

### Battery Voltage Incorrect



Illuminates when the battery voltage exceeds 30 volts or drops below 24 volts.

06275

**Note:** The high/low battery voltage indicator will illuminate for a few seconds after the engine is started because of the voltage drop when the starter is engaged.

### Battery Voltage Not Equal



Illuminates when the battery voltage is not equalized.

06274

**Note:** If the battery equalizer indicator illuminates, make sure that the battery equalizer circuit breakers are reset before requesting breakdown assistance. Wait 15 minutes after setting breakers to allow batteries to equalize. The breakers are located in the main power compartment.

### A/C System Pressure Low



Illuminates when the A/C system pressure is too low. If the A/C pressure is too low, the compressor clutch disengages and the fan stops.

06298

**Note:** When outside temperature is low, it is possible and normal for that telltale light to come ON.

Refer to the Maintenance Manual for information on control panel troubleshooting mode.

### A/C System Pressure High



Illuminates when the A/C system pressure is too high. If the A/C pressure is too high, the compressor clutch is disengaged, but the fan remains activated.

06296

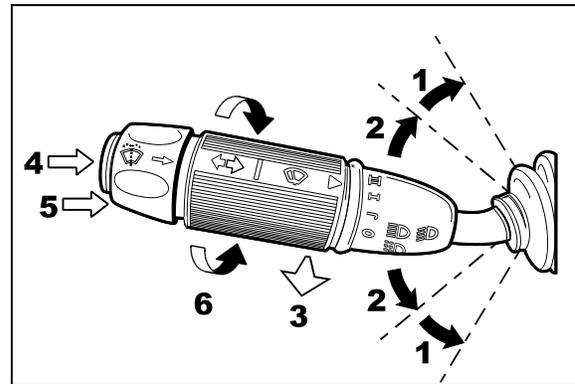
**Note:** When outside temperature is high, it is possible and normal for that telltale light to come ON.

Refer to the Maintenance Manual for information on control panel troubleshooting mode.

## STEERING COLUMN CONTROLS

Many of the most frequently used controls are conveniently placed on the steering column or the steering wheel, just like a passenger car. The Multi-function lever is located on the left side of the steering wheel while the optional transmission retarder lever is located on the right side of the steering wheel. Switches for the electric horn and the air horn are located directly on the steering wheel.

### MULTI-FUNCTION LEVER



#### MULTI-FUNCTION LEVER

23133

The multi-function lever is used to operate the following:

#### Turn Signal (1)

Move the lever all the way up until it locks in position to signal a right turn. Move the lever all the way down until it locks in position to signal a left turn. The lever automatically returns to the horizontal OFF position once the turn is completed.

#### Lane Change Signal (2)

Move the lever part way to the catch position and hold until the lane change maneuver is completed. The lever will spring back into the OFF position once released.

#### Headlight Beam Toggle Switch (3)

Toggle between high and low beams by pulling the lever up towards you. To flash the

headlights, pull the lever up halfway. The lever will spring back into normal position once released.

**Courtesy Blinkers (4)**

Clearance and parking lights can be flashed by pressing the button located on the lever tip.

**Windshield Washer Control (5)**

Push the external ring at the end of the lever toward the steering column to activate the lower windshield washers. The wipers come ON and continue wiping for a few seconds after the ring is released.

**Warning:** Before using the windshield washers in cold weather, heat the windshield with the defroster to prevent icing and reduced visibility.

**Caution:** To avoid damaging the pump mechanism, do not use the windshield washer when the fluid level is very low or empty.

**Windshield Wipers (6)**

Turn the lever counterclockwise to activate the lower windshield wipers. The first position activates the wipers intermittently. The second position is the slow speed and the third position is for high speed wiping.

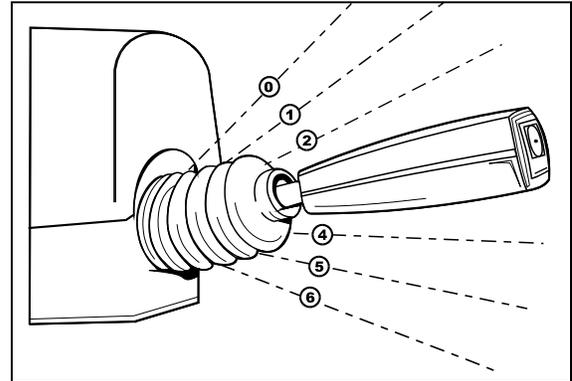
**Caution:** To avoid scratching the windshield, do not operate the wipers when the windshield is dry. To avoid damaging the wiper motor, free wiper blades that may be frozen to the windshield before operating the wipers.

**TRANSMISSION OUTPUT RETARDER**

The retarder can be operated using a hand lever mounted on the steering wheel column or using the service brake pedal.

To use the transmission output retarder, it must be activated by pressing the appropriate rocker switch on the dashboard.

**Operating The Retarder Using The Hand Lever**



RETARDER HAND LEVER 07043

With the retarder activated (retarder switch depressed) and the accelerator pedal released, move the output retarder lever clockwise from the first to the sixth position. The efficiency for each position is as follows:

Position	Efficiency
Initial	0%
1st	16%
2nd	33%
3rd	49%
4th	71%
5th	89%
6th	100%

**Note:** The output retarder lever is located on the right side of the steering column.

**Operating The Retarder Using The Brake Pedal**

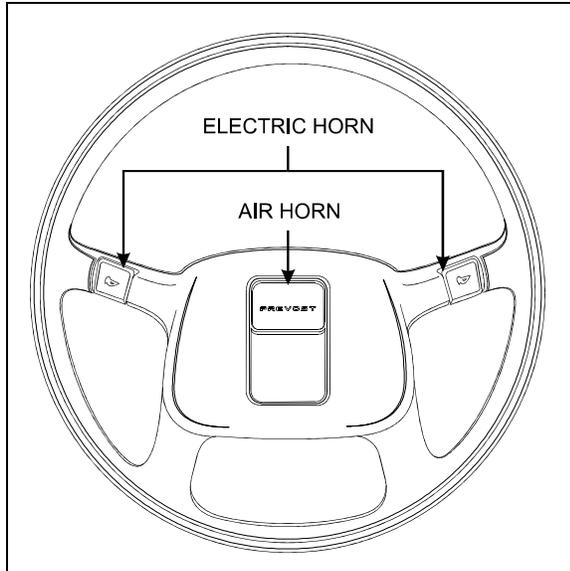
With the retarder activated (retarder switch depressed), the accelerator pedal released and the output retarder lever in the initial position (position 0), apply the brake pedal as if using the service brakes. The further the pedal is depressed, the more the output retarder is applied. Refer to "Other Features" chapter for more information about the transmission retarder.

**Note:** If the wheels start to lock up on slippery roads, the output retarder will automatically deactivate until the wheels start to turn.

## CONTROLS AND INSTRUMENTS

### ELECTRIC HORN

The electric horn buttons are on the steering wheel spokes. Use only the electric horn in urban areas.



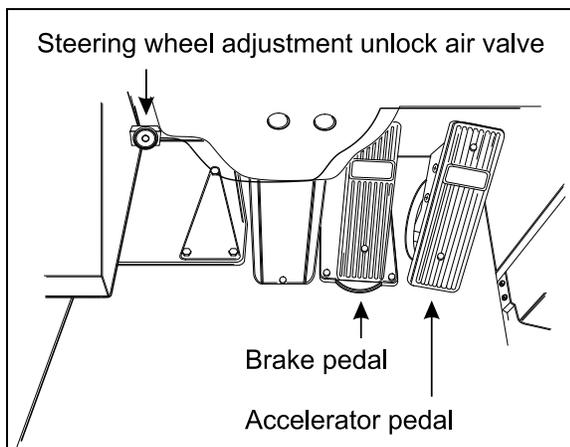
STEERING WHEEL

14029

### AIR HORN

The air horn button is located on the center of the steering wheel. Use this horn only on the highway.

### FOOT-OPERATED CONTROLS



FOOT OPERATED CONTROLS

00023A

### BRAKE PEDAL

The private coach is equipped with a dual braking system. The front brakes operate from a different air source than the drive and tag axle brakes.

The dual braking system becomes a modulated emergency system if a pressure drop occurs in the primary brake system.

Service brakes are applied by depressing the brake pedal. Braking increases with the amount of pressure applied to the foot pedal. Refer to Other Features chapter under Antilock Braking System. When the brake pedal is depressed, the brake lights turn ON automatically.

For safe and effective braking, the air system pressure should reach at least 95 psi (655 kPa) in both the primary and secondary circuits.

A warning light and an audible alert will sound when the air pressure in either the primary or secondary circuits drops below 66 psi (455 kPa). If this occurs, stop the coach, determine the cause of the pressure loss before proceeding. The brake pedal can be used in conjunction with the transmission retarder. Refer to Transmission Output Retarder in this chapter.

**Warning:** Immediately report any brake system problem to the nearest Prevost or Prevost-approved service center, or to your company.

**Warning:** Do not "fan" or "pump" the brake pedal. This practice does not increase brake system effectiveness but rather reduces system air pressure thereby causing reduced braking effectiveness.

**Caution:** "Riding" the brake by resting one's foot on the brake pedal when not braking can cause abnormally high brake temperature, can damage and cause premature wear of brake components and reduce brake effectiveness.

### ACCELERATOR PEDAL

Controls engine RPM as needed.

**Note:** The accelerator pedal will not operate when the entrance door is open.

**Caution:** Do not let the engine operate above 2,450 RPM.

### STEERING WHEEL ADJUSTMENT UNLOCK AIR VALVE

Push on the valve button with the left foot to unlock the steering wheel for tilt and telescopic adjustment.

**Warning:** Do not adjust the steering wheel while the vehicle is moving. Loss of control could result. Park the vehicle safely and apply parking brake before adjusting the steering wheel.

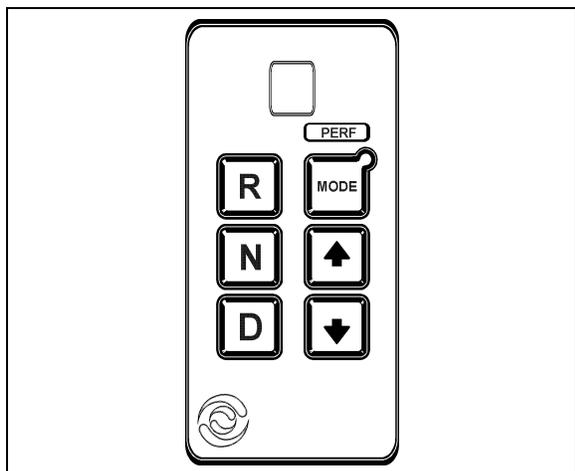
### ALLISON TRANSMISSION

The transmission is fully automatic: Proper ranges should be automatically selected according to driving speeds to improve vehicle performance and control. The speed ratio of the power converter changes automatically as vehicle speed increases and direct-drive goes in and out as necessary, The speed ratio is modulated by vehicle speed and accelerator pedal position.

### OPERATION

When a button is depressed on the transmission control pad, the corresponding letter or number is displayed indicating the transmission is ready to operate in the selected range. If the electronic control system detects a serious problem in the transmission, a buzzing tone sounds for 5 seconds and the "CHECK TRANS" light on the dashboard illuminates to warn the driver that the transmission is held in gear. If another is depressed, the buzzing sound will continue until the original range is selected.

**Note:** As a light bulb and systems check, the "CHECK TRANS" light will illuminate when the ignition switch is turned to ON. After about two seconds the light will turn off. If the "CHECK TRANS" light remains on, the self-diagnostic system has detected a problem. If the problem disappears, the light will go out, but a trouble code will remain stored in the ECU.



WORLD TRANSMISSION CONTROL PAD

07025

### RANGE SELECTION – PUSH BUTTON SHIFTER

The push button shifter is used by the operator to select Neutral (N), Reverse (R) or a range of forward gears (D). When the forward range has been selected, the transmission starts in the lowest gear and, as conditions permit, automatically upshifts until the highest gear is selected.

The digital display indicates the selected gear of transmission operation.

The function of each button is as follows:

- Select REVERSE gear by pressing "R".
- Select NEUTRAL by pressing "N". Note the raised edge around the "N" button so the driver can orient his hand to the push buttons by touch, without looking at the display. It is not necessary to press this button prior to starting the vehicle.
- Select DRIVE range by pressing "D". The highest forward gear will appear on the display and the transmission will shift to the starting gear (not shown on the display).

The "▲" and "▼" buttons are used to shift to a higher or lower range. One press changes gears by one range. If the button is held down, the selection will scroll up or down until the button is released or until the highest or lowest possible range is selected. Protection mechanisms inhibit selecting ranges that are not appropriate for the current speed or which may damage driveline components.

### FUNCTIONS OF THE "MODE" BUTTON

This button is used to invoke a special function (mode) that has been programmed into the ECU. Both modes are equivalent from the first to the fourth gear as the transmission upshifts at around 2000 rpm.

The default "ECONOMY" mode allows for upshifts in fifth and sixth gear at around 1700 rpm. This is a more efficient operation of the transmission and thereby helps improve fuel economy.

The "PERF" (performance) mode keeps upshifts at 2000 rpm in fifth and sixth gears. This makes for better performance than the economy mode but with higher fuel consumption. It is

## CONTROLS AND INSTRUMENTS

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recommended this mode be selected while driving up or down grades. The mode status will be indicated on the digital display by a red LED illuminating in the upper right corner of the MODE button when selected.

### Oil Level Display Mode (optional)

Select oil level display mode by pressing simultaneously on the "▲" and "▼" keys. A first press will indicate the transmission fluid level after a two-minute wait if the following conditions are met:

- The vehicle is not moving;
- The engine is in normal idle;
- The transmission has reached its normal operating temperature;
- Transmission is in NEUTRAL;
- The sender unit is functional.

A code will be displayed one digit at a time. Refer to Technical Information chapter under Oil Level Sensor Codes.

### Diagnostic Display Mode

Pressing a second time on the "▲" and "▼" keys simultaneously will select the diagnostic display mode. Refer to the Technical Information chapter for more information about the WT diagnostic codes. To exit diagnostic display mode, press N button, or up and down arrow keys at the same time.

### Reverse (R)

Press the R button to select reverse. Stop completely before shifting from forward to reverse or from reverse to forward. The reverse warning signal will be activated when this range is selected.

### Neutral (N)

Use this position to start engine. Select neutral (N) when checking vehicle accessories and for extended periods of engine idle operation; parking brake must then be applied. The push-button shifter will automatically select neutral when the master switch is turned ON.

**Note:** The automatic transmission does not have a park (P) position. Select neutral (N) and apply parking brake when the vehicle is left unattended. An audible alert will sound if the engine is stopped and the parking brake is not applied.

**Warning:** Always apply parking brake before leaving driver's seat.

**Caution:** Detroit Diesel engines should not be idled for extended periods at "slow" idle. For extended idling, engine should run at "fast" idle.

**Caution:** Do not allow your vehicle to "coast" in neutral. This practice can result in transmission damage. Also, no engine braking is available in neutral.

### Drive (D)

Use this position for all normal driving conditions. After touching this pad, the vehicle will start in first or second range and will automatically upshift to a higher range as output speed increases. As the vehicle slows down, output speed decreases, the transmission automatically downshifts to the correct range. If a locked brake or a slick surface condition should occur, the ECU (Electronic Control Unit) will command converter operation (disconnect lockup) and inhibit downshifts for a period of time or until normal wheel speed has been restored.

**Important note:** Brake pedal must be applied when selecting Drive (D) otherwise the transmission will stay in neutral (N).

- First range (1):

Select this range when pulling through mud and snow or when speed control is needed for driving up steep grades. This range also provides maximum engine braking power or retarder braking effect. In the lower ranges (1, 2, 3 and 4), the transmission will not upshift above the highest gear selected unless engine overspeed is detected.

**Note:** The transmission should normally be allowed to shift by itself, but manual shifting can be done as described below.

- Second range (2)

Select this range when operating in heavy and congested traffic. The transmission will start in first and automatically upshift to second. When slowing, the transmission will automatically downshift to first range. Low ranges provide progressively greater engine and retarder braking power (the lower the range, the greater the engine and retarder braking effect).

- Third and fourth ranges (3 and 4)

Select these ranges when driving on moderate grades or when load and traffic conditions limit speed.

**Warning:** *Service brake should not be used to control the speed of vehicle on long, steep descents. Instead, lower transmission ranges should be used (in conjunction with output retarder. Refer to "JACOBS Engine Brake" and "Transmission Retarder" headings in "Technical Information" chapter for details regarding both systems. This procedure keeps service brake cool and ready for emergency stopping.*

**Caution:** *When descending in lower ranges, care must be taken that engine speed does not exceed 2,450 rpm.*

### **DETROIT DIESEL ELECTRONIC CONTROL (DDEC) SYSTEM**

DDEC is an advanced-technology electronic fuel injection and control system for Detroit Diesel engines. As an integral part of the engine, the DDEC system provides a number of performance features and driver benefits including improved fuel economy and performance, reduced cold smoke and reduced maintenance and repair costs. These advantages are obtained by optimizing control of the critical engine functions which affect fuel economy, engine reliability and the performance of the injectors.

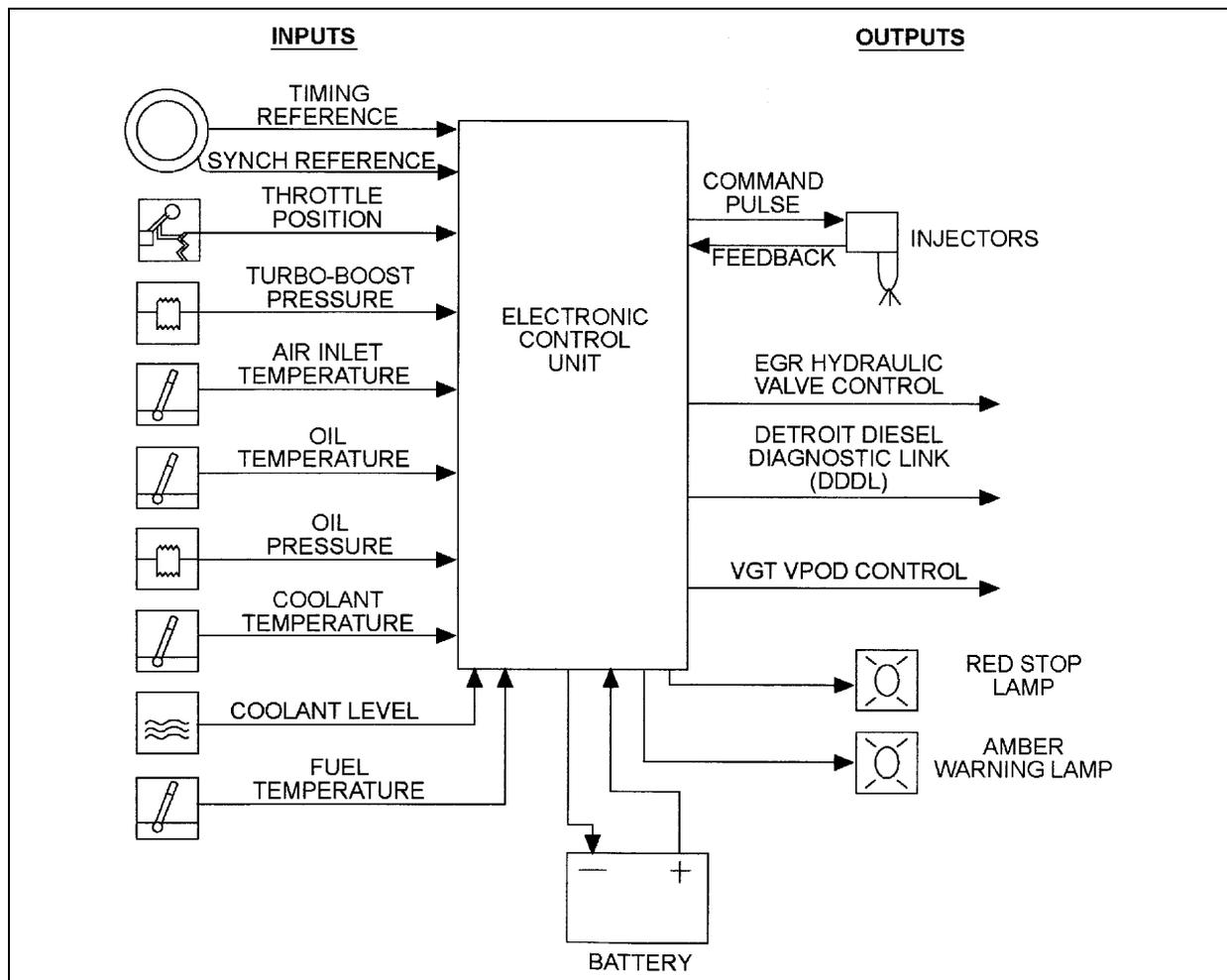
Its major components include an Electronic Control Module (ECM), Electronic Unit Injectors (EUI), electronic throttle pedal and sensors. The ECM, which provides central processing and control of the DDEC system, contains the following:

- A microprocessor that continuously monitors and analyzes the engine's performance using sensors during engine operation;
- Flash Random Access Memory (FRAM) that stores ECM runtime software, which contains engine control instructions;
- Electrically Erasable, Programmable, Read-Only Memory (EEPROM) that provides instructions for basic engine control functions such as rated speed and power, engine governing, cold start logic and diagnostics and an engine protection system.

The Electronic Unit Injectors (EUI) operates on a principle similar to the mechanical unit injector system. However, a solenoid operated control valve performs the injection timing and metering functions which make injector timing much simpler and more precise.

DDEC provides the capability of quickly diagnosing system malfunctions with a self-diagnostic system. The self-diagnostic system monitors all engine sensors and electronic components and recognizes system faults and other engine-related problems by providing the technician with a diagnostic code. The DDEC system will illuminate the dashboard CHECK ENGINE and STOP ENGINE indicators which are integral parts of the electronic diagnostic system. These lights are designed to indicate a problem and transmit a coded signal to the technician to locate the defective component. To facilitate troubleshooting and obtain pertinent data logged in the ECM (Electronic Control Module) memory, a Diagnostic Data Reader (DDR) can be used (not supplied by manufacturer). Plug the DDR into the receptacle on the upper left wall in the driver's footwell. You can also momentarily depress the STOP ENGINE OVERRIDE switch on the L.H. lower control panel (refer to "Controls & Instruments" chapter 3). Active and inactive codes will flash respectively the STOP ENGINE and the CHECK ENGINE indicators. Refer to "Technical Information" chapter 8 under "DDEC V Diagnostic Codes".

## OTHER FEATURES



SCHEMATIC DIAGRAM OF DDEC V SYSTEM

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### DDEC V ELECTRONIC CONTROL MODULE (ECM)

The simplest implementation of Data Hub does not require the addition of any hardware to the vehicle. Instead, basic Data Hub features built into the DDEC V ECM are used. The ECM stores data such as miles, fuel used, idle time, PTO time, idle fuel, cruise time and cruise fuel on life-to-date, trip and daily basis. Daily recording is limited to a maximum of two days.

Selected parameters, such as oil pressure, are measured periodically under specified conditions. The measurements are analyzed over long time periods, which allows the system to detect degradation in performance and warn the user prior to component failure.

The average life span of up to ten components may be specified in terms of miles, fuel used, time, engine RPM and engine hours. The ECM

tracks the specified factors and automatically alerts the user when the average life span of the component has been attained. An event log is also stored which indicates the vehicle status (e.g., off, idle, in motion) at 15 minute intervals.

Data stored in the DDEC V ECM is extracted by connecting a cable from a PC to the vehicle's diagnostic connector via an RP1202 adapter module. Data extraction takes about 20 seconds.

### MESSAGE CENTER DISPLAY (MCD)

MCD is a standard dashboard mounted graphic device that displays and records operational data transmitted by the Detroit Diesel Electronic Controls (DDEC) and other electronically controlled components on the SAE J1708/1587 diagnostic data link.

The many functions of the MCD include vehicle operating status for the driver and diagnostics for the technician.

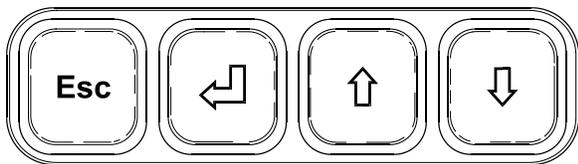
The MCD uses a dashboard integrated liquid crystal display. It provides automated intensity control of the display, based on the dashboard instrument panel lights for improved driver convenience.

Should an alert message be sent out by the ECM, the driver will be shown what is wrong via an error code. Symbols may be displayed on the screen when a condition occurs or as a reminder that a feature is enabled. These symbols include a bell when the reminder alarm is on, "PTO" when fast idle is activated or "CC" when cruise control is activated.

**Note:** When a condition requiring attention occurs, the screen relating to that condition will automatically replace the current display.

The MCD works with interactive menus in a series of cascading layers. The MCD allows access only to GAUGE MODE, FUEL ECONOMY and TIME/DIST menus when the vehicle is moving. Access to the remaining menus is granted when the vehicle is stopped.

The driver inputs commands and settings by using the keys on the MCD keypad.



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Use the up (↑) and down(↓) arrows to highlight a function or a setting. At any given level, small arrows may appear in the upper and lower right corner of the display. This means that more information is available by scrolling up or down with the arrow keys.

To change the setting of a feature, press enter key (↵). The first value to set is highlighted. Set the correct value with the arrow keys. Press the enter key when the correct value is displayed. The next value to set is highlighted. In some cases, the enter key will reset compiled data. In that situation, the MCD will prompt you to press the enter key for 1 second to prevent accidental resetting.

To return to the previous level, press Esc key any time. In most cases, the MCD will return to the previous level once a setting has been chosen.

To return to the main menu from any submenu, press Esc key a few times.

### DRIVING MODE MENU

This menu includes the following modes; Gauge Mode; Fuel Economy, Time/Dist; Faults?.

### GAUGE MODE MENU

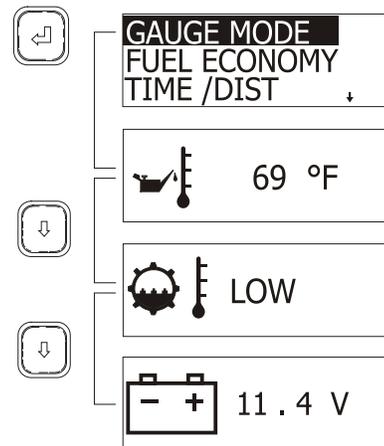
Transmission fluid temperature, engine oil temperature and battery voltage can be displayed in this mode.

To display:

1. Highlight GAUGE MODE;
2. Press enter key (↵);
3. Choose a gauge using the up (↑) or down (↓) arrow keys.

To exit gauge mode, press Esc key.

**Note:** When a condition requiring attention occurs, the screen relating to that condition will automatically replace the current display.



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### FUEL ECONOMY MENU

Check average and instantaneous fuel consumption, as well as distance until empty.

To display:

1. Highlight FUEL ECONOMY
2. Press enter key (↵);
3. Toggle between average/instantaneous fuel consumption or leg fuel consumption using the up and down arrows;

To exit FUEL ECONOMY menu, press Esc key any time.

## OTHER FEATURES

- To reset average and instantaneous fuel consumption, press enter key. The MCD will prompt you to press enter key for one second to reset;

If you do not wish to reset the fuel data, press Esc to return to previous menu.

### TIME / DIST MENU

This menu gives access to the digital clock, the reminder alarm, two trip odometers and the average speed counter.

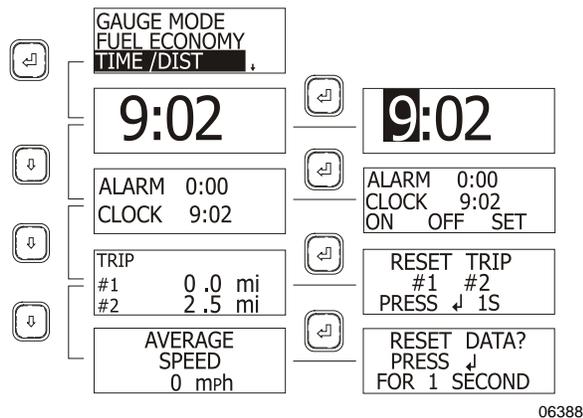
To display the digital clock:

- Highlight TIME/DIST;
- Press enter key (↵);

The digital clock appears;

- Use up down arrows to display the alarm and clock display, the trip odometer display or the average speed counter display.

To exit TIME/DIST menu, press Esc key.



### Setting the Digital Clock

- Display the clock;
- Press the enter key (↵);

The first digit of the time is highlighted.

- Set the correct value using the arrow keys;
- Press enter key (↵);

The next digit of the time is highlighted.

- Set the correct time using the up (↑) and down(↓) arrow keys and the enter key (↵);

After pressing the enter key when the last digit is highlighted, the display reverts to clock mode.

### Reminder Alarm

The alarm can be useful to remind the driver of a task to do at a given time.

To set the alarm:

- Display the alarm and clock menu;
- Press the enter key (↵);
- Using the arrow keys, highlight ON, to arm the alarm, OFF to disarm the alarm or SET to set the alarm time;
- Press the enter key (↵);

If you have chosen SET, set the time using the arrow keys and enter key.

To exit any menu and return to the previous menu, press Esc key.

A bell appears in the upper right corner on all MCD screens if the alarm is armed.

When armed, the alarm will sound at the set time even when the battery master switch is off.

To stop the alarm from sounding, press any key on the MCD keypad.

### Trip Odometers

Two trip odometers are available for driver convenience.

To reset a trip odometer:

- Display the trip odometers;
- Press the enter key (↵);
- Using the arrow keys, highlight the trip odometer you wish to reset;
- Press the enter key (↵) for 1 second.

To exit anytime, press Esc key.

### Average Speed

The average speed display shows the average speed has been driven since the last reset.

To reset:

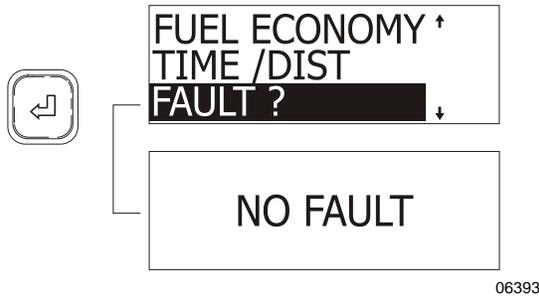
- Display the average speed;
- Press the enter key (↵);

- When prompted, press the enter key for 1 second to reset data.

### FAULT ? MENU (Fault messages)

To display logged fault messages:

- Highlight FAULT ?
- Press the enter key (↵);
- Fault messages are displayed (if any).



### NON-DRIVING MODE MENU

#### SET UP MODE MENU

Set up mode allows the driver to customize the MCD. Set up mode allows setting the language, units used (Metric or Standard), clock format, display contrast, backlight and night display.

If the correct password is entered, default language, fleet fuel target and passwords can also be set.

To configure the MCD, highlight SET UP MODE using the arrow keys, then press the enter key.

#### Language Selection

If available, language may be selected. To select a language:

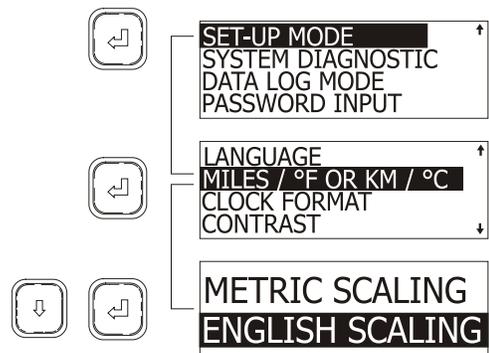
- In SET UP MODE, highlight LANGUAGE using the arrow keys;
- Press the enter key (↵);
- Highlight the desired language using the arrow keys;
- Press enter key (↵) to confirm the language choice.

The MCD returns to SET UP MODE menu.

#### Metric or Standard Units

- In SET UP MODE menu, highlight MILES/°F OR KM/°C using the arrow keys;
- Press the enter key (↵);
- Highlight the desired units using the arrow keys;
- Press enter key (↵) to confirm.

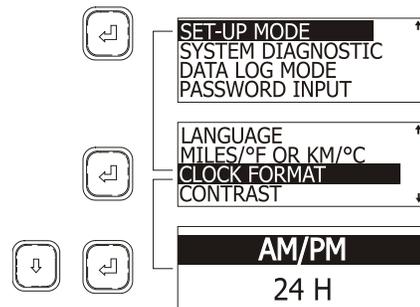
The MCD returns to SET UP MODE menu.



#### Clock Format

- In SET UP MODE, highlight CLOCK FORMAT using the arrow keys;
- Press the enter key (↵);
- Highlight the desired format (AM/PM or 24 H) using the arrow keys;
- Press enter key (↵) to confirm.

The MCD returns to SET UP MODE.



#### Setting Contrast

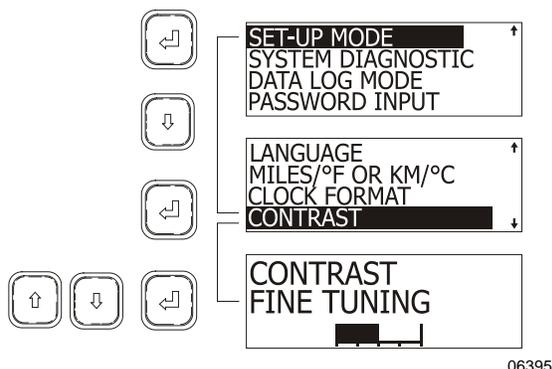
- In SET UP MODE, highlight CONTRAST using the arrow keys;
- Press the enter key (↵);

## OTHER FEATURES

- Using the arrow keys, set the desired contrast. A horizontal graphic shows state of contrast;

- Press enter key (↵) to confirm.

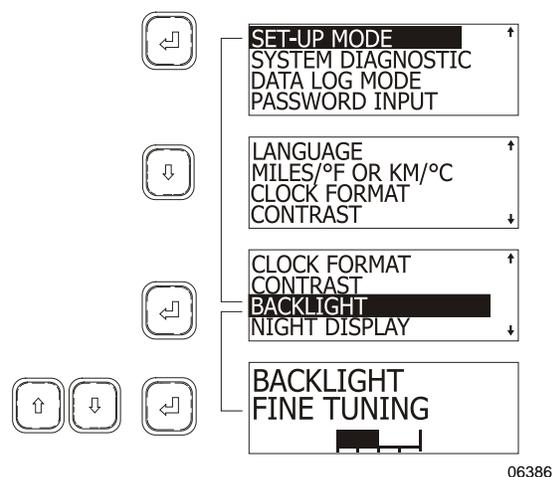
The MCD returns to SET UP MODE.



### Setting Backlight

- In SET UP MODE, highlight BACKLIGHT using the arrow keys;
- Press the enter key (↵);
- Using the arrow keys, set the desired back lighting. A horizontal graphic shows state of lighting;
- Press enter key (↵) to confirm.

The MCD returns to SET UP MODE.



### Setting Night Display

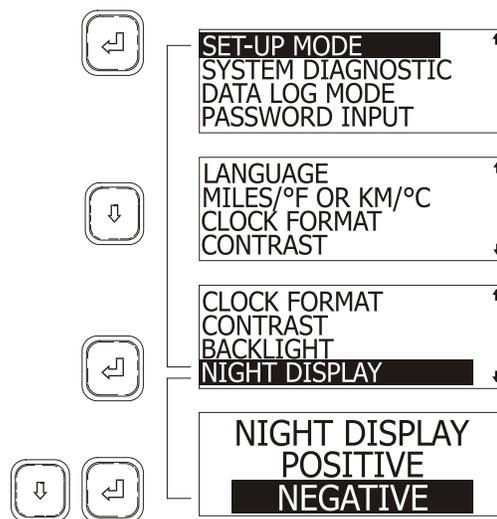
Night display, when activated, shows all displays in negative when the headlights are ON.

- In SET-UP MODE, highlight NIGHT DISPLAY using the arrow keys;

- Press the enter key (↵);
- Highlight the desired display using the arrow keys;

- Press enter key (↵) to confirm.

The MCD returns to SET UP MODE.



### Setting Default Language

This feature is enabled when the correct password is entered (see PASSWORD INPUT).

- In SET UP MODE, highlight DEFAULT LANGUAGE using the arrow keys;
- Press the enter key (↵);
- Highlight the desired language using the arrow keys;
- Press enter key (↵) to confirm.

The MCD returns to SET UP MODE.

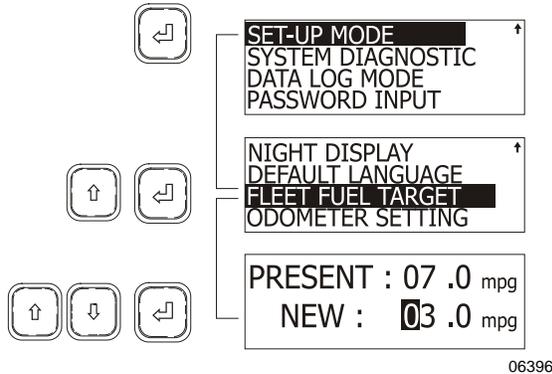
### Setting Fleet Fuel Target

This feature is enabled when the correct password is entered (see PASSWORD INPUT).

- In SET UP MODE, highlight FLEET FUEL TARGET using the arrow keys;
- Press the enter key (↵);
- Using the arrow keys set the highlighted digit;
- Press enter key (↵) to confirm, the following digit is highlighted. Set as in step three;

- When last digit is set, press the enter key (↵) to confirm new target.

The MCD returns to SET UP MODE.



### Setting the Odometer

This feature is disabled.

### SYSTEM DIAGNOSTIC MENU

System Diagnostic menu allows the driver to request diagnostics from the ECU's of components such as the engine, ABS brakes and other instruments. The driver can also perform a cluster self test and read data about the ECU's

Enter diagnostic mode by using the arrow keys to highlight SYSTEM DIAGNOSTIC, then pressing the enter key to confirm.

### Fault Diagnostic

To request a diagnostic:

- Highlight FAULT DIAGNOSTIC with the arrow keys;
- Press the enter key (↵) to confirm.
- Highlight the component to request a diagnostic using the arrow keys;
- Press the enter key (↵).

After showing a fault message (if any) the MCD returns to FAULT DIAGNOSTIC screen.

To request a general diagnostic:

- Highlight GENERAL REQUEST using the arrow keys;
- Press the enter key (↵).

After showing a fault message (if any) the MCD returns to FAULT DIAGNOSTIC screen.

To reset fault codes:

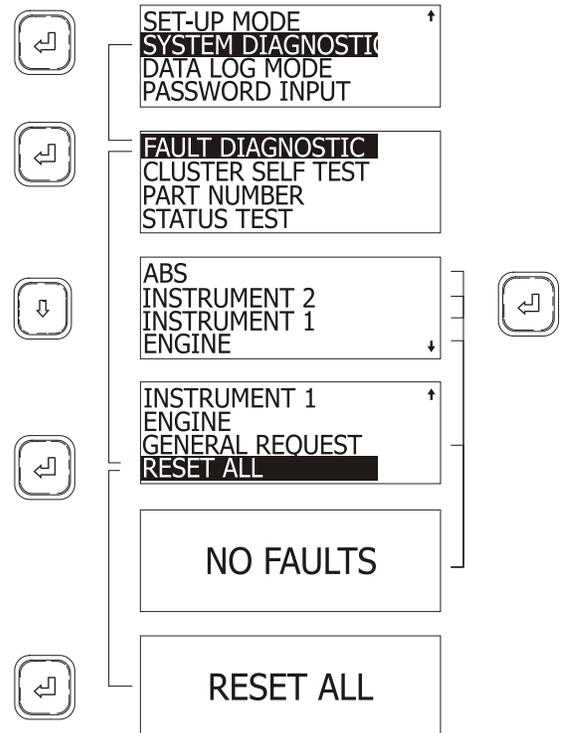
- Highlight RESET ALL using the arrow keys;
- Press the enter key (↵);

The MCD displays RESET ALL.

- Press enter key (↵) to confirm.

After resetting the fault codes, the MCD returns to FAULT DIAGNOSTIC screen.

Exit FAULT DIAGNOSTIC and return to SYSTEM DIAGNOSTIC using Esc key.



### Cluster Self Test

Tests cluster light bulbs, gauges, MCD display and buzzers.

To perform a self test:

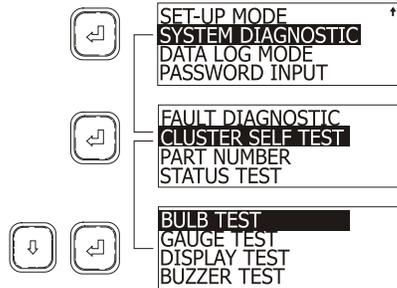
- In diagnostic mode, highlight CLUSTER SELF TEST using the arrow keys;
- Press enter key (↵) to confirm;
- Highlight the test to perform using the arrow keys;
- Press enter key (↵) to confirm;

The test may normally take several seconds to perform. The MCD may explain the progression

## OTHER FEATURES

of the test as it runs. The display returns to cluster self test mode once finished.

**Note:** While in the cluster self test mode, the engine ECU data link is disconnected. Therefore, the gauges will not function until the cluster is out of the self test mode. To interrupt any test, cycle the ignition key off and on.



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### BULB TEST

Turns ON all telltale lights and red warning LED's in the gauges which have them, for ten seconds.

### GAUGE TEST

This test causes the pointers in the tachometer, speedometer, oil pressure, coolant temperature, fuel and turbo boost gauges to move from minimum scale to full scale and back, briefly stopping at mid-scale each way. This occurs three times. The air pressure and voltmeter gauges are excluded from the test.

### DISPLAY TEST

To help identify defects in the graphic display, the display goes from dark to bright in about ten seconds.

### BUZZER TEST

Sounds each of the buzzer signals for ten seconds each. The name of the buzzer is written on the display as the test runs.

### PART NUMBER

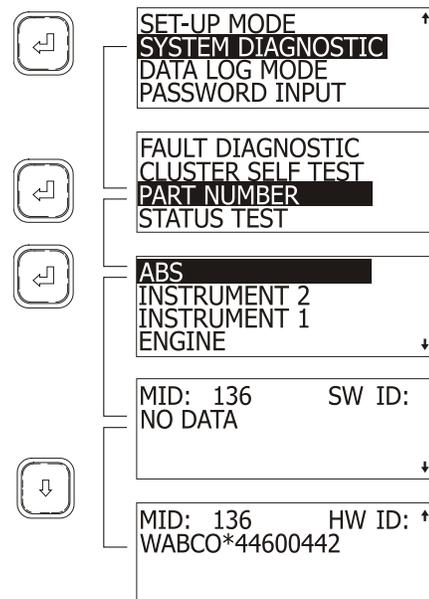
This feature requests information from the available components. This information includes the component's SAE message identifier (MID), its software ID (SW ID) and hardware ID (HW ID) if available.

To access PART NUMBER:

1. When in SYSTEM DIAGNOSTIC menu, highlight PART NUMBER using the arrow keys;

2. Press enter key (↵);
3. Highlight the desired component;
4. Press enter key (↵).

The MCD displays the information on two screens. Toggle between screens using the arrow keys.



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### STATUS TEST

This feature allows testing the response of vehicle systems. This can be useful when troubleshooting or checking the proper working order of senders and other components. This feature is enabled when correct password is entered (see password input)

In Status Test mode, the MCD will monitor the system and display the data on the screen. Up to two components can be monitored at once.

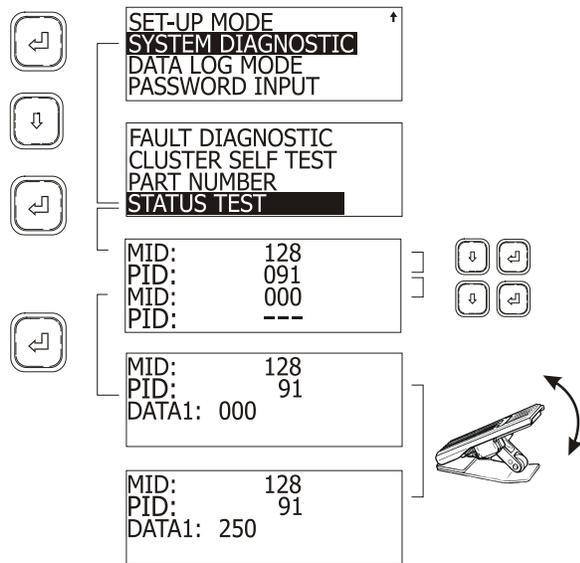
To perform a status test:

1. When in SYSTEM DIAGNOSTIC, highlight STATUS TEST using the arrow keys;
2. Press enter key (↵);
3. Using the arrow and enter keys, enter a MID and PID (or PPID);
4. Press enter key (↵).

The MCD now displays in real time the value of the component. The example below shows how changing the throttle position will be displayed on the MCD. That way one can verify if any

identifiable sender unit is working properly or whether the link is OK.

5. Press Esc key to exit.



In this example, a throttle pedal in good working order will send a linear and continuous (no jumps) signal to the ECU, appearing as DATA value on the MCD screen. Full pedal movement will display values from 000 (no throttle) to 250 (maximum throttle).

**Note:** The MCD can perform a status test on as many as two components simultaneously. To do so, when setting MID and PID codes, set a second (non zero) MID and PID code.

### DATA LOG MODE MENU

This feature shows total accumulated distance, fuel used engine hours and idle time.

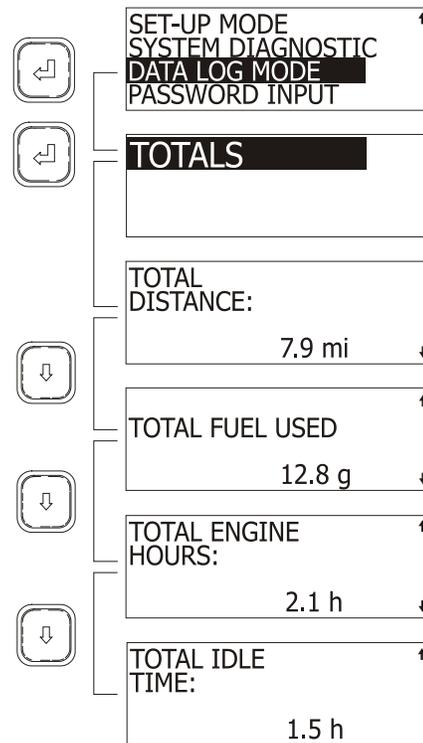
1. To access data log:
2. Highlight DATA LOG MODE using the arrow keys;

3. Press enter key (↵) to confirm;

The screen shows TOTALS highlighted.

4. Press enter key (↵);
5. View totals using the arrow keys.

Exit by pressing the Esc key.



### PASSWORDS

The MCD recognizes two passwords: a mechanic's password and an owner's password. The mechanic's password allows setting DEFAULT LANGUAGE, FLEET FUEL TARGET, performing a STATUS TEST and using the RESET ALL function. The owners password gives access to all the above and allows changing both passwords.

The mechanic's password is initially set to "0000".

The owner's password is initially set to "1234".

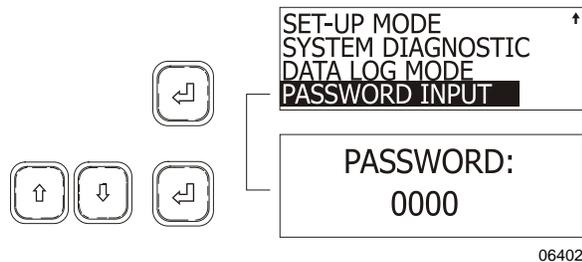
### Password Input

To enter either password and have access to restricted functions of the MCD:

1. Use the arrow keys to highlight PASSWORD INPUT;
2. Press enter key (↵) to confirm;
3. Use the arrow keys to set the first digit of the password;
4. Press enter to highlight the next digit;
5. Pressing enter key on last digit will confirm the password.

## OTHER FEATURES

If the entered password is correct, the MCD will revert to the previous screen. Access to restricted screens is allowed.



### Changing passwords

To change any password, owner's password must be entered first.

To change passwords:

1. Using the arrow keys, highlight SET UP MODE;
2. Press enter key (↵) to confirm;
3. Using the arrow keys, highlight PASSWORD CONFIG;
4. Press enter key (↵) to confirm;
5. Using the arrow keys, select MECHANIC or OWNER;
6. Press enter key (↵) to confirm;
7. Set new password.

### PRODRIVER™

PRODRIVER™ is an optional graphic device similar to MCD but with added features. A summary of data displays available from PRODRIVER™ include:

- Instantaneous and average fuel consumption rate;
- Trip time, miles driven, fuel used, , average speed;
- Driving time, percentage, miles, fuel used, fuel consumption rate;
- Idle time, percentage and fuel used;
- Cruise time, percentage, miles cruised, fuel used, fuel consumption rate;
- Top gear time, percentage, miles driven, fuel used, fuel consumption rate;
- Overspeed time and percentage for two speed thresholds;

- Over-rev time and percentage;
- Maximum vehicle speed and RPM;
- Coasting time and percentage;
- Automated oil change interval tracking;
- Hard braking incident record;
- Driver initiated incident record;
- Stop Engine and Check Engine code log.

PRODRIVER™ has many additional features and benefits and can be combined with other members of Data Hub line of products from Detroit Diesel. This combination presents a powerful vehicle information management system.

### WORLD TRANSMISSION ELECTRONIC CONTROL UNIT (ECU)

Works with the automatic transmission with the push-button shift selector.

The World Transmission electronic controls has four major elements: The Electronic Control Unit (ECU), the Throttle Position Sensor (TPS), speed sensors and the transmission shift selector control pad. Refer to "Controls & Instruments" chapter 3. These components work together to electronically control the functions of the transmission. The throttle sensor, speed sensors and shift selector transmit information to the ECU. The ECU processes this information and then sends signals to actuate specific solenoids located on the control valve body in the transmission. The action of the solenoids affects hydraulic circuits, which in turn control the upshifts, downshifts, and lock-up functions. In addition to controlling the operation of the transmission, the WT electronic controls monitor the system for abnormal conditions.

When one of these conditions is detected, the WT electronic control system is programmed to automatically respond in a manner which is safe for the driver, the vehicle and the transmission. The WT electronic control system turns ON the CHECK TRANS light on the dashboard, which serves as a fault indicator.

To enhance troubleshooting and to allow interrogation of the ECU for valuable service information, the shift selector display on the transmission control pad or an optional diagnostic tool can be used. For information about reading and interpreting diagnostic codes,

refer to chapter 8, "Technical Information" under "World Transmission Diagnostic Codes".

## TRANSMISSION RETARDER

The transmission retarder is an optional device that helps to reduce the speed of a vehicle. It improves vehicle control, increases driving safety and permits more economical operation. The retarder provides slowing power when it is most needed, such as when descending mountain roads, in stop-and-go traffic and on crowded freeways.

The retarder is provided with a switch on the dashboard and a lever on the steering column (refer to "Controls & Instruments" chapter 3).

**Note:** *Extended use will raise the temperature of the transmission oil.*

The retarder helps to reduce speed on grades without using the vehicle's conventional service braking system. This virtually eliminates brake overheating and reduces the risk of a runaway vehicle. A retarder greatly increases the service life of brake pads and discs, resulting in reduced brake maintenance costs.

**Note:** *Each time the transmission retarder system is in operation, the stoplights automatically illuminate.*

**Note:** *For vehicles equipped with the Antilock Braking System (ABS), as the wheels start to lock-up on slippery roads, the output retarder automatically deactivates until the wheels roll freely.*

## JACOBS ENGINE BRAKE

The JACOBS engine brake is an optional diesel engine retarder which uses engine compression to aid in slowing and controlling the vehicle. When activated, (refer to "Controls & Instruments" chapter 3) the JACOBS brake alters the operation of the engine's exhaust valves so that the engine works as a power-absorbing air compressor. This provides a retarding action to the wheels.

The engine brake is a vehicle-slowng device, not a vehicle-stopping device. It is not a substitute for the service braking system. The service brakes must be used to bring the vehicle to a complete stop.

Effectiveness of the engine brake system will vary according to the transmission range in use.

The engine brake system is more effective in lower ranges and at higher engine speeds.

**Warning:** *When descending significant grades, use the service brakes as little as possible. If the engine does not slow the vehicle to a safe speed, apply service brakes and shift to a lower range. Let the engine (and engine brake) slow the vehicle. Keep brakes cool and ready for emergency stopping.*

**Note:** *For vehicles equipped with the Antilock Braking System (ABS), as the wheels start to lock-up on slippery roads, the engine brake automatically deactivates until the wheels roll freely.*

**Note:** *Each time the engine brake system is in operation, the stoplights automatically illuminate.*

## ANTI-LOCK BRAKING SYSTEM

The purpose of the Anti-lock Braking System (ABS) is to maintain vehicle stability and control during braking and to minimize the stopping distance in any road condition.

On slippery roads and more generally in emergency situations, over-braking frequently induces wheel locking. Wheel locking greatly increases braking distance on any road surface. Locked wheels also impede directional control and cause severe tire abrasion. An anti-lock braking system provides maximum braking performance while maintaining adequate control on slippery roads.

The basis of ABS is constant monitoring of wheel parameters during braking. Sensors on each wheel of the front and drive axles constantly measure wheel speed during braking. This information is transmitted to a four-channel electronic processor which senses when any wheel is about to lock. Modulating valves quickly adjust brake pressure (up to 5 times every second) to prevent wheel lock. Each wheel is therefore controlled according to the available grip.

In this way, the vehicle is brought to a stop in the shortest possible time while remaining stable and under the driver's control.

## OTHER FEATURES

**Caution:** Vehicles following ABS-equipped vehicles may not be able to brake as fast on slippery roads. Whenever possible, warn other drivers by depressing the brake pedal lightly several times before braking.

### RETRACTABLE TAG AXLE

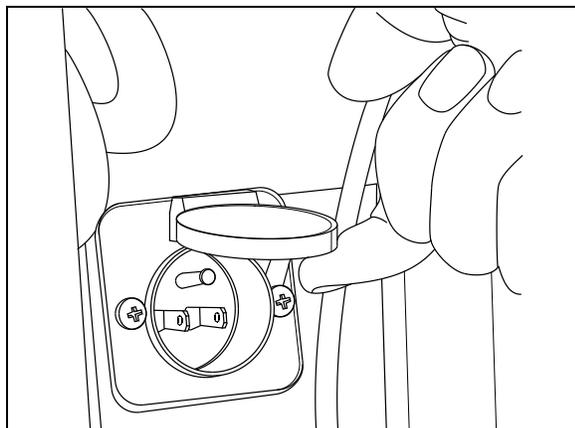
The optional lifting of the tag axle is controlled by a valve located on the left lateral console. The valve can be switched to either the WHEELS UP or WHEELS DOWN position. The axle will be automatically raised or lowered by air pressure according to the position of the valve switch. Refer to "Controls & Instruments" chapter 3.

The tag axle service brakes and parking brakes operate only when the tag axle is in the WHEELS DOWN position. Never lower the tag axle while the coach is moving. When the tag axle is in the WHEELS UP position, the corresponding indicator light will illuminate and a beep will sound to alert the driver of the tag axle's position. Lifting the tag axle shortens the wheelbase and allows tighter turning. This is very useful in tight maneuvering areas like in a parking lot or when negotiating a tight corner. Raising the tag axle transfers extra weight and additional traction to the drive wheels providing improved control on slippery roads.

**Caution:** In order to prevent damage to the suspension, always raise the tag axle before lifting the vehicle.

**Caution:** Never lower the tag axle while vehicle is moving.

### 110-120 VOLT CONNECTOR



110-120 VOLT POWER CONNECTOR

06390

The optional 110-120 volt power connector is located on the engine compartment R.H. side access door. Refer to "Vehicle Exterior" chapter 1. Connect the female end of an extension cord to the male connector. Connect the plug at the other end of the cord to a 110-120 VAC outlet only.

The engine may be equipped with an engine immersion-type electric block heater to assist cold weather starting.

The engine block heater should be used whenever the vehicle is parked for extended periods in cold weather and whenever a suitable power source is available.

**Caution:** Only use a 110-120 VAC power source. Use only a grounded type (three pronged) extension cord with a minimum rated current capacity of 15 amps. Disconnect the extension cord before starting or moving the vehicle.

### KEYLESS ENTRY SYSTEM

By using this system, you can lock or unlock the entrance door and the baggage and service compartment doors. The keyboard is located below the entrance door handle. The master code in the microprocessor/relay module is pre-programmed by the manufacturer and cannot be deleted. Moreover, you can program your own entry code (e.g. a birthday or part of a social security number).

The master code is:

- Printed on the owner's wallet card;
- Printed on three decals, joined to the owner's wallet card.
- Printed on decal affixed to the keyless system microprocessor/relay module in the front console;

When you use the keyless entry system, the keyboard and step lights illuminate.

Do not push the buttons with a key, pencil or any other hard or sharp object as the buttons could be damaged. Although each button is provided with two digits separated by a vertical line, there is only one contact per button. Press in the center of the button (between the two digits, on the vertical line).

You must unlock the entrance door before you unlock any other baggage or service compartment door. If you let more than five

seconds pass between the numbers you press, the system shuts down, and you have to enter your code again. If the keyless entry system does not work properly, use the key to lock or unlock entrance or compartment doors.

### **KEYLESS OPERATING INSTRUCTIONS**

1. To unlock the entrance door and disarm the anti-theft alarm, enter the permanent factory code or the personal code. After pressing the fifth digit, the door will unlock. During the night, press any button to illuminate the keyboard, then enter the code.
2. When pressing any button, the keyboard lights up for five seconds and the step lights illuminate for twenty-five seconds.
3. To unlock the baggage and service compartment doors, press button 3|4 within five seconds of entering the code.
4. To lock entrance door, compartments and arm the anti-theft alarm system all at the same time, press buttons 7|8 and 9|0 simultaneously.

### **PROGRAMMING A PERSONAL CODE**

**Note:** To avoid erasing the code from the system memory, you should connect the keyless entry system to house batteries, otherwise the code will be erased each time battery main disconnect switches are set to the OFF position.

You can program one personal code to unlock the entrance door and compartments. This code does not replace the permanent code that is factory programmed into the system. Use your personal code in the same manner that you would use the original code.

Do not choose a code that presents the numbers in sequential order, such as 1|2, 3|4, 5|6, 7|8, 9|0. Studies show that people who idly press the buttons usually press a sequential pattern. Also, do not select a code that uses the same button five times. Thieves can easily figure out these types of codes.

1. Choose and memorize your personal code.
2. Enter the original code, and within five seconds, press button 1|2.
3. Within five seconds of pressing button 1|2, enter your personal code, pressing each button within five seconds of the previous

digit. The keyboard light will immediately turn OFF if the code is correctly entered.

The keyless entry system registers your personal code. To unlock the entrance door, you can use either code.

To erase your personal code, enter the original code, press button 1|2, then wait six seconds.

### **REMOTE ENTRY TRANSMITTER**

Up to four hand held (key fob) transmitters can control electronic door lock system.

To unlock the entry door:

- Press the UNLOCK button on the transmitter. This will unlock the door and disarm the anti-theft system.

To unlock all compartments:

- Press UNLOCK a second time within five seconds of the first unlock. If more than five seconds pass pressing UNLOCK will only unlock the entry door.

To lock all doors and arm the anti-theft system:

- Press LOCK on the transmitter once.

To confirm that the door and compartments have been locked and that the anti-theft system is armed:

- Press LOCK again within five seconds of the first lock. The horn will chirp once if the door and compartments have locked. If the door or one of the compartments are open, a door ajar signal prevents arming of the system.

To set off the personal security alarm:

- Press the red PANIC button on any transmitter. The horn will sound and the headlamps will flash for a maximum of three minutes.

To deactivate the personal security alarm:

- Press the red PANIC button again on any transmitter or turn the ignition key ON.

**Note:** the remote entry features will not function when the ignition is in the ON or ACC. position.

### **Programming Transmitters**

To program additional transmitters or replacing a lost or broken transmitter, all transmitters for a vehicle must be programmed at the same time. The receiver assembly module erases all

## OTHER FEATURES

previous transmitters from memory. When the transmitters are programmed or reprogrammed, the receiver assembly module can store up to four transmitters in memory.

To program or reprogram transmitters into the remote/keyless entry system, perform the following steps:

1. Make sure that the anti-theft system is not armed or triggered.
2. Turn the ignition key from *OFF* to *ON* five times within ten seconds, ending in *ON*. Refer to chapter 3, "Controls and Instruments" for information on positions of the ignition switch.

If the system has successfully entered program mode, it will lock then unlock all doors.

3. Press any button on a transmitter. The doors will lock and unlock to confirm that the transmitter has been programmed. Repeat for each other transmitter.

If the door locks do not respond for any transmitter, wait a few seconds and press the button again. If the doors still fail to respond, call your service representative.

4. Turn ignition *OFF* (or wait up to five minutes after step two). To exit program mode. If a new set of transmitters have been programmed or reprogrammed, the remote control system will lock and unlock all doors one last time to confirm.

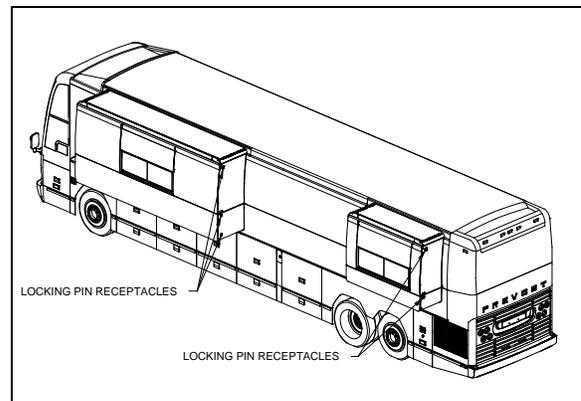
## SLIDE-OUT OPERATION

### SAFETY PRECAUTIONS

Before operating both slide-out units, proceed to the following verifications :

- Make sure that the area outside of the slide-out is clear and that there are no persons or objects within 3 feet of the slide-out outside wall. ***Serious personal injury or damage to the vehicle components may occur.***
- Make sure that the area inside the motor home where the room retracts (30" for the front and 24" for the rear slide-out) is free of people or obstacles. ***Serious personal injury or damage to the vehicle components may occur.***

- In temperatures below freezing point, make sure that the entire sliding surface outside the slide-out is free of snow, ice or sleet. ***Failure to clear all ice or snow may seriously damage the inflatable seal.***
- The parking brake must be applied.
- The transmission shifter must be in the "Neutral" position.
- Make sure that the locking pin receptacles are free of foreign objects.
- Open a window to avoid slide-out movement restriction.
- Level the vehicle.



SLIDE-OUT LOCKING PIN RECEPTACLES

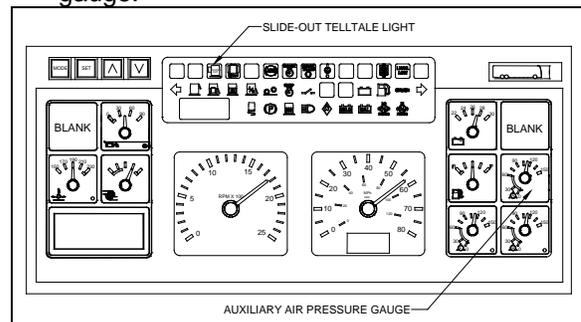
23342

## FRONT SLIDE-OUT OPERATION

### Preliminary condition for the front slide-out operation

Before extending or retracting the front slide-out, please make sure all the following conditions are met:

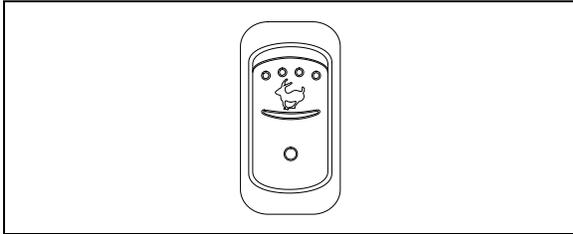
1. Make sure the air pressure is 110 psi minimum on the auxiliary air pressure gauge.



VEHICLE INSTRUMENT CLUSTER

2. Make sure the parking brake is applied.

- Turn the ignition key to the "ON" position, start the engine and set the RPM to fast idle.



FAST IDLE BUTTON

06264

**Warning:** The inflatable seals can be re-inflated only when the slide-out is in its full "OUT" or full "IN" position. Do not leave the slide-out in any position other than the full extended or closed position as water infiltration may occur.

#### Front slide-out extending operation

With the ignition switch to the "ON" position and the engine running, press and hold down the handheld control rocker switch to the "OUT" position. The green indicator light "ROOM IN OPERATION" will come on to indicate that the slide-out operation cycle is activated. The following actions will be done in sequence:

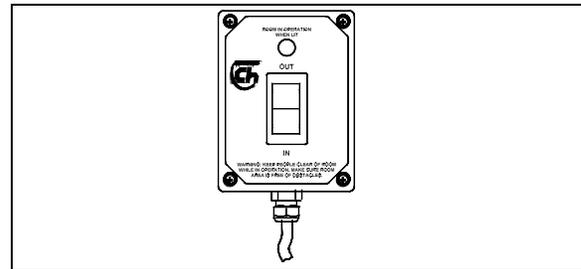
- Deflation of the inflatable seal
- Unloading of the tag axle
- Retraction of the locking pins
- Movement of the slide-out to its full "OUT" position

Then releasing the rocker switch will permit the following actions:

- Re-inflation of the seal
- Reloading of the tag axle

When the rocker switch is released, the green indicator light goes out. Note that for safety reasons, releasing the rocker switch will stop the slide-out movement instantly. At any time, releasing the rocker switch from the "OUT" position and pressing it to the "IN" position will reverse the operation.

**Note:** Handheld control green indicator light flashing. A green light flashing indicates an error condition or missing operation condition. Refer to the troubleshooting list at the end of this section if that situation occurs.



SLIDE-OUT HANDHELD CONTROL

#### Front slide-out retracting operation

With the ignition switch to the "ON" position and the engine running, press and hold down the rocker switch to the "IN" position to retract the slide-out. Note that the green indicator light "ROOM IN OPERATION" will come on. When the movement of the slide-out to its full "IN" position is completed, the rocker switch can be released to allow the re-inflation of the seal and reloading of the tag axle. The green indicator light goes out as the rocker switch is released. At any time during the slide-out movement, releasing the rocker switch will stop the operation instantly.

Please note that while the room retracts, there is a hissing sound. This is normal, as air is being blown in the gear racks on top of the slide-out to clear out leaves, water or other foreign matter.

#### REAR SLIDE-OUT OPERATION

##### Preliminary condition for the rear slide-out operation

Before extending or retracting the rear slide-out, please respect all the following conditions:

- Make sure the air pressure is 110 psi minimum on the auxiliary air pressure gauge.
- Make sure the parking brake is applied
- Turn the ignition key to the "ON" position, start the engine and set the RPM to fast idle.

##### Rear slide-out extending operation

With the ignition switch to the "ON" position and the engine running, press and hold down the handheld control rocker switch to the "OUT" position. The green indicator light "ROOM IN OPERATION" will come on to indicate that the slide-out operation cycle is activated. The following actions will be done in sequence:

## OTHER FEATURES

- Deflation of the inflatable seal
- Retraction of the locking pins
- Movement of the slide-out to its full "OUT" position

Then releasing the rocker switch will permit the following actions:

- Re-inflation of the seal

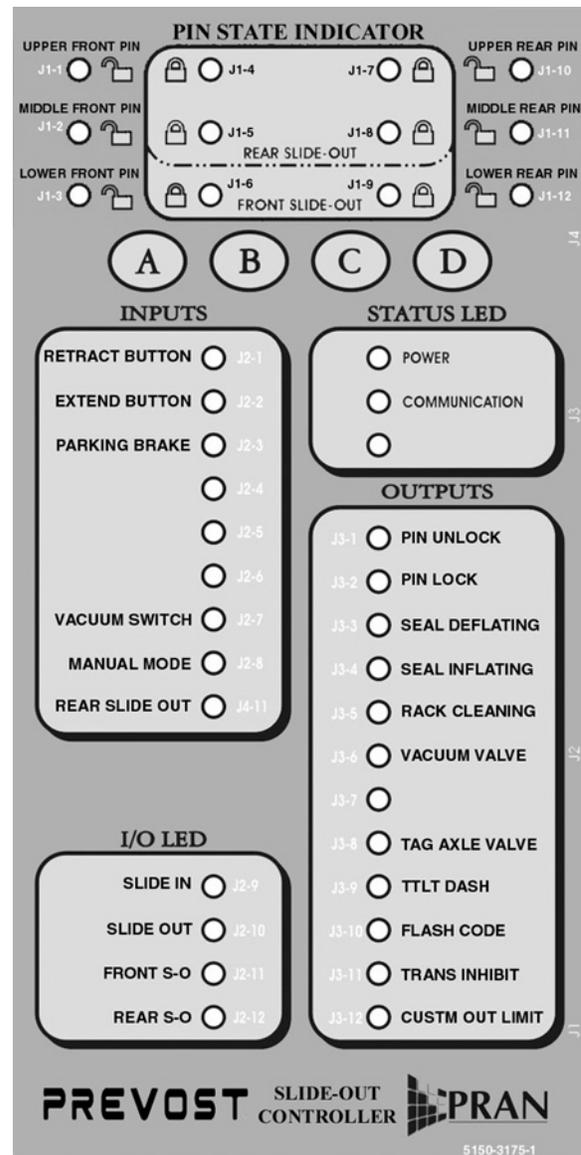
When the rocker switch is released, the green indicator light goes out. Note that for safety reasons, releasing the rocker switch will stop the slide-out movement instantly. At any time, releasing the rocker switch from the "OUT" position and pressing it to the "IN" position will reverse the operation.

**Note:** Control switch green indicator light flashing. A green light flashing indicates an error condition or missing operation condition. Refer to the troubleshooting list at the end of this section if that situation occurs.

### Rear slide-out retracting operation

With the ignition switch to the "ON" position and the engine running, press and hold down the rocker switch to the "IN" position to retract the slide-out. Note that the green indicator light "ROOM IN OPERATION" will come on. When the movement of the slide-out to its full "IN" position is completed, the rocker switch can be released to allow the re-inflation of the seal. The green indicator light goes out as the rocker switch is released. At any time during the slide-out movement, releasing the rocker switch will stop the operation instantly.

Please note that while the slide-out retracts, there is a hissing sound. This is normal, as air is being blown in the gear racks on top of the room to clear out leaves, water or other foreign matter.



SLIDE-OUT LOGIC CONTROLLER INTERFACE DISPLAY

## SLIDE-OUT LOGIC CONTROLLER

### Pin State Indicator

Determine the state of each pins of the slide-out.

### A/B/C/D Buttons

A+D (at the same time) set the current position as the outer limit.

B+C (at the same time) reset to the manufacturer settings

### Inputs

Each LEDs determine the state of each of the inputs connected to the controller

**Status LED**

Power:

ON: the controller is powered

OFF: the controller is not powered

Communication:

Indicates the activity on the serial communication port. Blinking in normal operation at 1Hz

**Outputs**

Each LED determine the state of the outputs controlled by the controller. The flash code description can be found in the troubleshooting list at the end of this section.

**I/O LED**

Slide in: ON if the slide-out is retracting

Slide out: ON if the slide-out is extending

Front S-O Set: ON if the controller is configured as the front slide-out

Rear S-O Set: ON if the controller is configured as the rear slide-out

**SLIDE-OUT MANUAL OVERRIDE PROCEDURES**

In case of power retracting system failure to function, it is possible to use two different manual override procedures to retract or extend the slide-out.

The first one, which is the power assist override will permit you to control the slide-out motor directly connected to the battery power, without the use of the logic controllers or motor controllers.

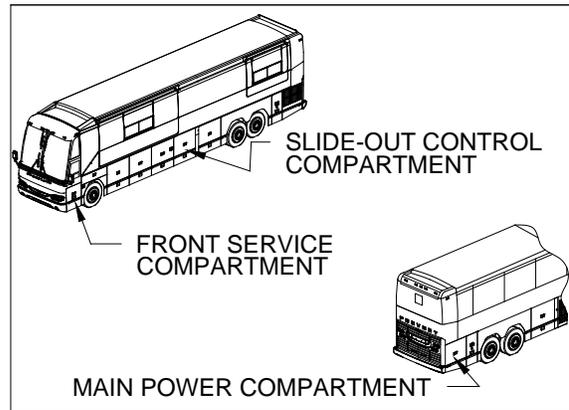
The second manual override procedure consist in rotating the slide-out motor shaft using a manual ratchet.

However, it is very important to follow all the instructions very carefully to insure that the inflatable seal or the retraction mechanisms are not damaged.

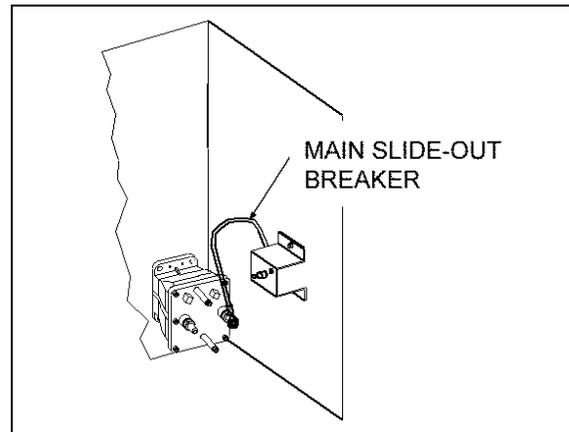
**Preliminary conditions for manual override procedures**

Before using one of the slide-out manual override procedures, make sure that the problem cannot be solved by one of the following simple checks:

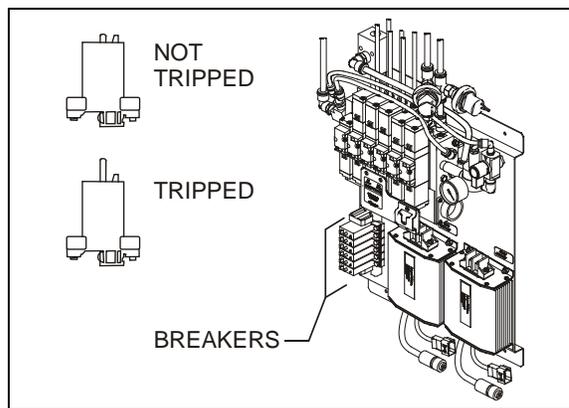
- Make sure that none of the breakers are tripped (the breakers are located in the slide-out control compartment and in the main power compartment).
- Make sure the barking brake is applied.
- Make sure the voltage is high enough by running the engine at fast idle or having the battery charger connected.



**COMPARTMENTS LOCATION**

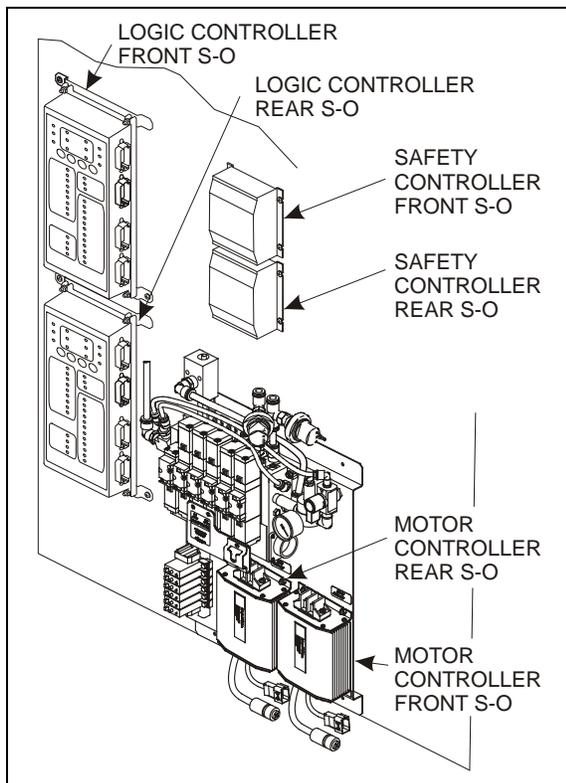


**MAIN SLIDE-OUT BREAKER IN MAIN POWER COMPARTMENT**

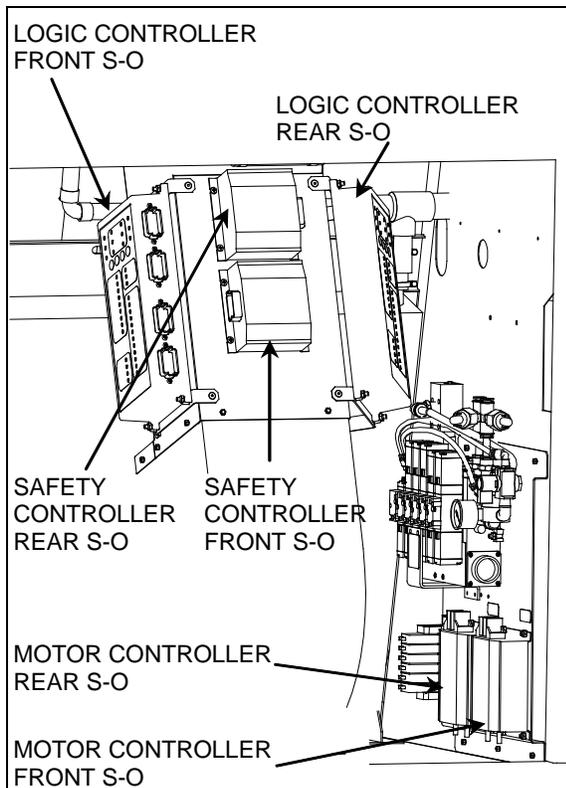


**BREAKERS IN SLIDE-OUT CONTROL COMPARTMENT**

## OTHER FEATURES



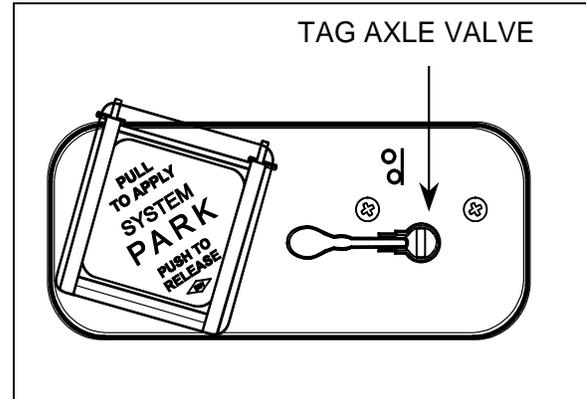
SLIDE-OUT ELECTRICAL PANEL (SMALL A/C)



SLIDE-OUT ELECTRICAL PANEL (CENTRAL A/C)

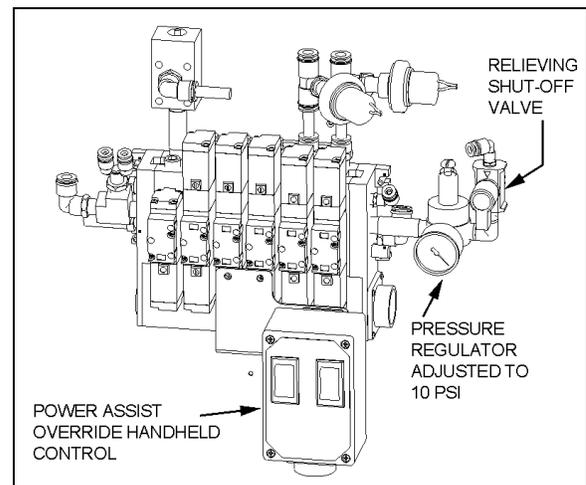
### POWER ASSIST OVERRIDE – Retracting procedure – Front and rear slide-out

**Note:** For the front slide-out, the tag axle must be unloaded with the manual switch located on the left-hand control panel with the ignition switch to the "ON" position. This procedure is not necessary for the rear slide-out.



TAG AXLE VALVE ON LEFT LATERAL CONTROL PANEL  
06390

1. Turn the ignition switch to the "OFF" position.
2. Deflate the inflatable seal by using the relieving shut-off valve located in the slide-out control compartment. Turn the handle clockwise to deflate the seal. Make sure the pressure indicator reading is "0 psi".

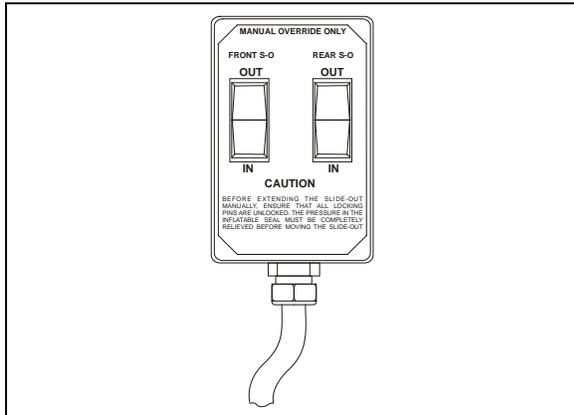


INFLATABLE SEAL PRESSURE REGULATOR

**Warning:** The pressure in the inflatable seal must be completely relieved to prevent any damage to the seal.

**Caution:** Before moving the slide-out manually, ensure that all locking pins are unlocked. Refer to the slide-out manual extending procedure.

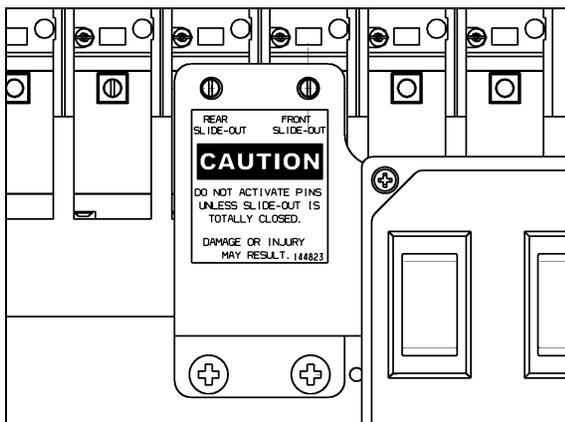
3. Turn the ignition switch to the "ON" position, start the engine and set the RPM to fast idle.
4. With the power assist override handheld control, press and hold down the Front S-O or Rear S-O rocker switch to the "IN" position, depending on which slide-out you want to retract.



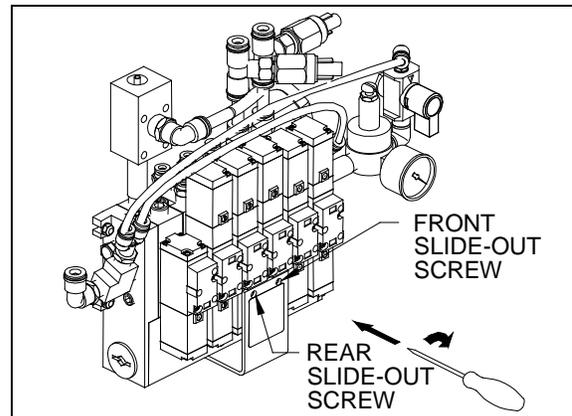
POWER ASSIST OVERRIDE HANDHELD CONTROL

**Caution:** Remember that in override mode, the logic controller doesn't keep track of the slide-out position neither command the motor controller. Be careful as the slide-out approaches its closed position, in order not to overshoot it, which may damage the mechanism.

5. Once the slide-out room is lined up to its closed position (flush with the vehicle body), release the rocker switch.
6. To close the locking pins, use the following method:



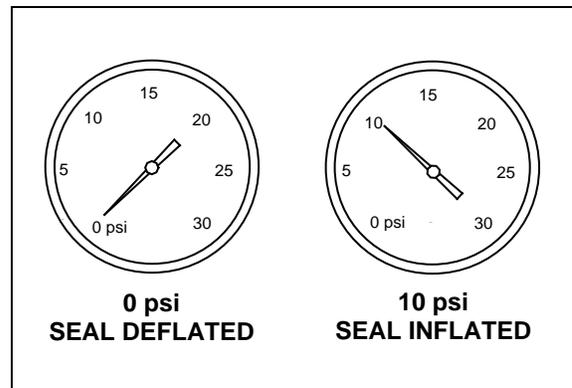
LOCKING PIN VALVE PROTECTION PLATE



LOCKING PIN VALVE LOCATION

**Warning:** Actuating the locking pins on the slide-out not completely closed or with locking pins misaligned with their receptacle may result in glass breakage and cause serious injury.

- a) Insert a small screwdriver in the protection plate hole to access the "pin valve manual override screw" corresponding to the slide-out to be locked. Turn the override screw clockwise to actuate the locking pins. During the process, you should hear a hissing sound, as the air flows to the pin cylinders.
  - b) When the locking pins have been locked, re-insert a screwdriver in the protection plate hole. Turn the override screw counterclockwise and keep it in this position to cancel the manual override actuation.
7. Finally, the inflatable seal can be re-inflated by turning the shut-off valve handle counterclockwise. Check the pressure gage on the inflatable seal regulator if the pressure is increasing to 10 psi.



INFLATABLE SEAL PRESSURE GAGE

8. When the retraction procedure is completed, if the transmission DRIVE range or REVERSE cannot be selected to move the

## OTHER FEATURES

vehicle, verify that at least one pin is locked on each slide-out. To do so, check the lights (12) on the "PIN STATE INDICATOR" zone of the logic controller interface display. A light next to all padlocks is used to identify the state locked or unlocked of the pins. For the rear slide-out, take note that only 4 pins are used in the upper section of the pin state indicator zone. With the ignition key to the "ON" position, verify if at least one pin locked light is "ON". Otherwise, go back to step 7 of this section to manually lock all the pins until all pin locked lights go "ON".

**Note:** The slide-out safety controllers use a relay to inhibit transmission range selection to prevent the vehicle from moving if each slide-out has not at least one pin locked.

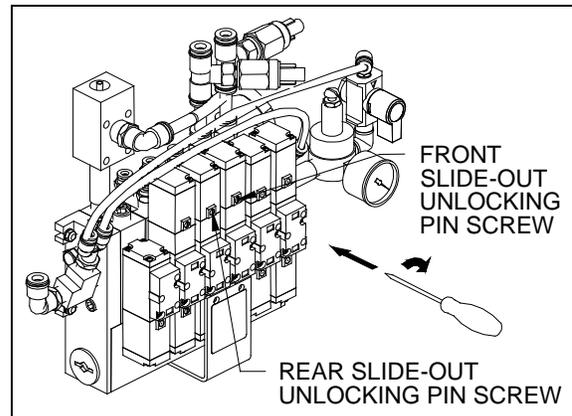
### POWER ASSIST OVERRIDE – Extending procedure – Front and rear slide-out

**Note:** For the front slide-out, the tag axle must be unloaded with the manual switch located on the left-hand control panel with the ignition switch to the "ON" position. This procedure is not necessary for the rear slide-out.

1. Turn the ignition switch to the "OFF" position.
2. Deflate the inflatable seal by using the relieving shut-off valve located in the slide-out control compartment. Turn the handle clockwise to deflate the seal. Make sure the pressure indicator reading is "0 psi".

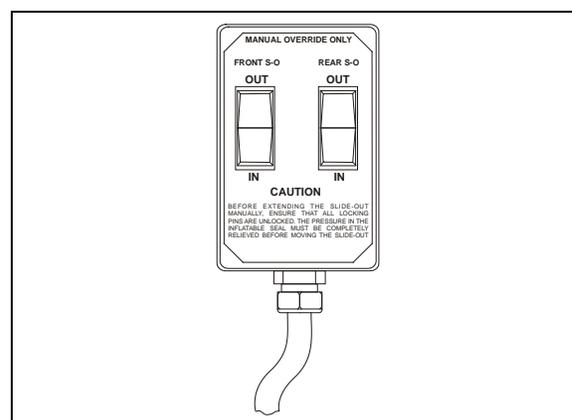
**Warning:** The pressure in the inflatable seal must be completely relieved to prevent any damage to the seal.

3. To unlock the pins, use the following method:
  - a) Identify the proper pneumatic valve controlling the unlocking of the pins of the slide-out to be extend.
  - b) Ensure the ignition key is in the "OFF" position. When the proper valve has been identified (right side for front slide-out and left side for rear slide-out), turn clockwise the "pin valve manual override screw" to actuate the locking pins. Keep the override screw in this position. During the process, you should hear a hissing sound, as the air flows to the pin cylinders.



UNLOCKING PIN VALVE LOCATION

- c) Verify if all the pins are unlocked with the ignition to the "ON" position. To do so, check the lights on the "PIN STATE INDICATOR" zone of the logic controller interface display. A light next to all unlocked padlocks is used to identify the state unlocked of the pins. For the rear slide-out, take note that only 4 pins are used in the upper section of the pin state indicator zone. If at least one light is off, that means all the pins are not unlocked and it will not be possible to manually move the slide-out. In this case, restart the engine and make sure the air pressure is 110 psi minimum on the auxiliary air pressure gauge.
  - d) Switch the ignition to the "OFF" position, and remove the ignition key for more security.
  - e) When the locking pins have been unlocked, turn the pin valve manual override screw counterclockwise and keep it in this position to cancel the manual override actuation.
4. Turn the ignition switch to the "ON" position, start the engine and set the RPM to fast idle.



POWER ASSIST OVERRIDE HANDHELD CONTROL

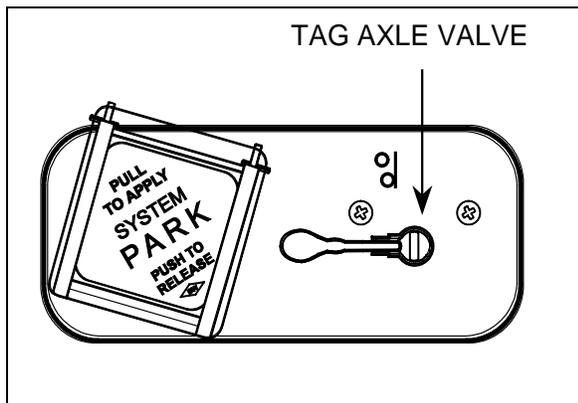
5. With the power assist override handheld control, press and hold down the Front S-O or Rear S-O rocker switch to the "OUT" position depending on which slide-out you want to retract.

**Caution:** Remember that in override mode, the logic controller doesn't keep track of the slide-out position neither command the motor controller. Be careful as the slide-out approaches its opened position, in order not to overshoot it, which may damage the mechanism.

6. Once the slide-out room is lined up to its opened position (resting against the stoppers), release the rocker switch.
7. Finally, the inflatable seal can be re-inflated by turning the shut-off valve handle counterclockwise. Check the pressure gage on the inflatable seal regulator if the pressure is increasing to 10 psi.

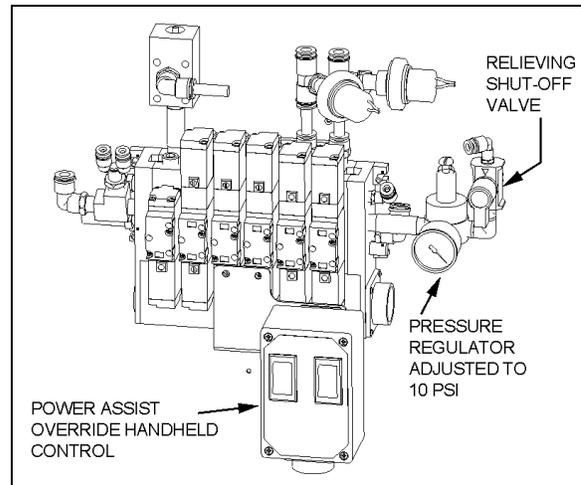
**Manual ratchet retracting procedure – Front and rear slide-out**

**Note:** For the front slide-out, the tag axle must be unloaded with the manual switch located on the left-hand control panel with the ignition switch to the "ON" position. This procedure is not necessary for the rear slide-out.



TAG AXLE VALVE ON LEFT LATERAL CONTROL PANEL 06390

1. Turn the ignition switch to the "OFF" position, and remove the ignition key for more safety.
2. Deflate the inflatable seal by using the relieving shut-off valve located in the slide-out control compartment. Turn the handle clockwise to deflate the seal. Make sure the pressure indicator reading is "0 psi".

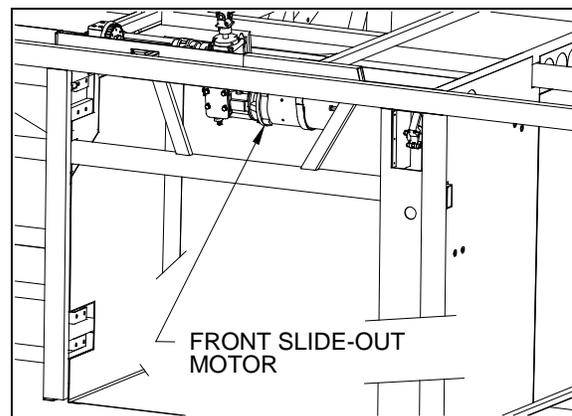


INFLATABLE SEAL PRESSURE REGULATOR

**Warning:** The pressure in the inflatable seal must be completely relieved to prevent any damage to the seal.

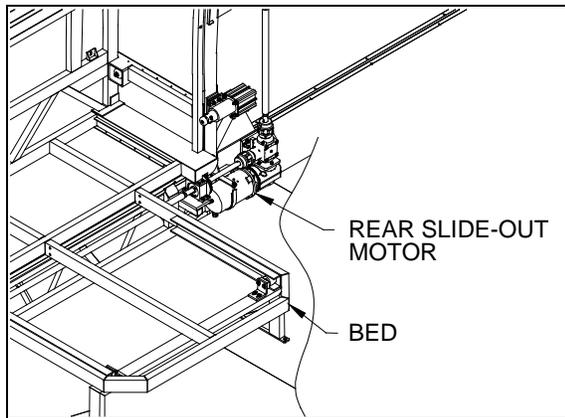
**Caution:** Before moving the slide-out manually, ensure that all locking pins are unlocked. Refer to the slide-out manual ratchet extending procedure.

3. To move the slide-out use a 1/2" hexagonal socket on the back of the slide-out motor.



FRONT SLIDE-OUT MOTOR

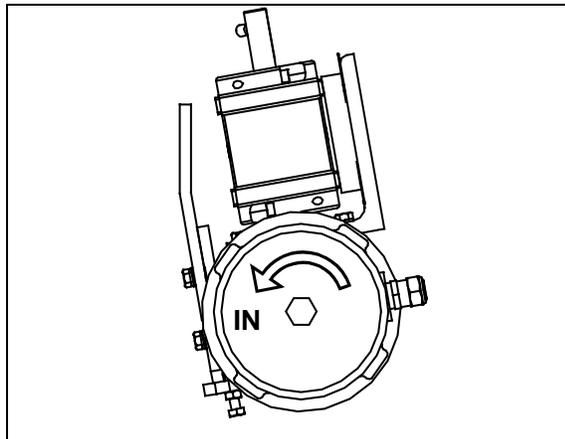
## OTHER FEATURES



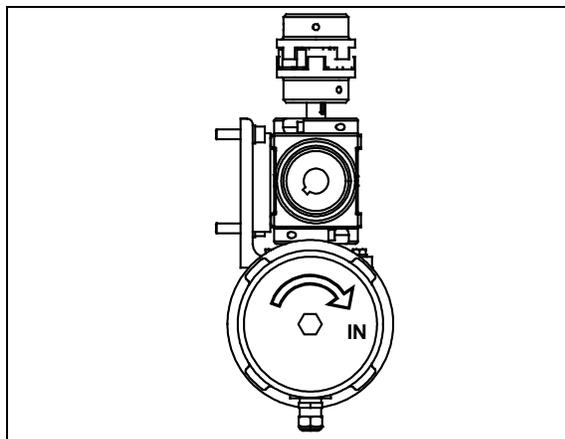
REAR SLIDE-OUT MOTOR INSIDE COACH

4. Rotate the slide-out motor with a manual ratchet or any power drill until the slide-out comes to its closed position.

**Caution:** Slow down on the closing speed as the slide-out approaches its closed position, in order not to overshoot it, which may damage the mechanism.

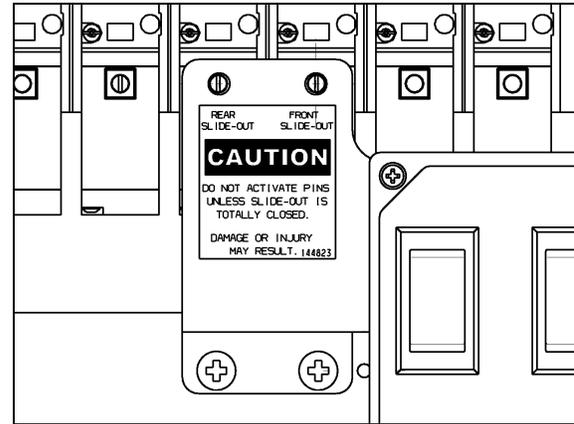


DIRECTION OF ROTATION FOR RETRACTING (FRONT)

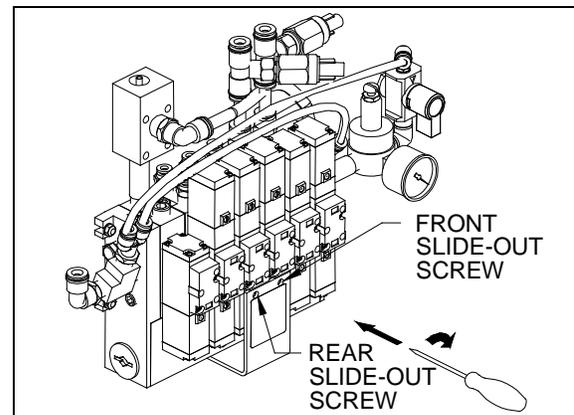


DIRECTION OF ROTATION FOR RETRACTING (REAR)

5. Once the slide-out room is lined up to its closed position, remove the tool from the motor.
6. To close the locking pins, use the following method:



LOCKING PIN VALVE PROTECTION PLATE

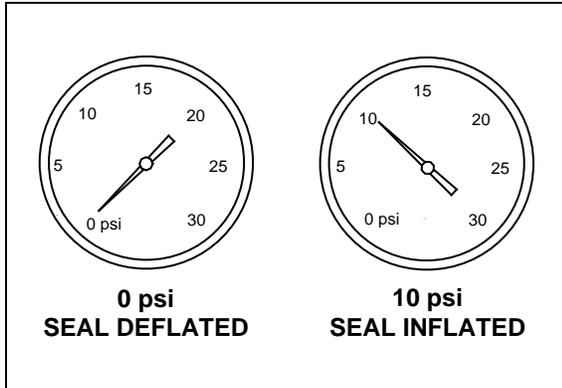


LOCKING PIN VALVE LOCATION

**Warning:** Actuating the locking pins on the slide-out not completely closed or with locking pins misaligned with their receptacle may result in glass breakage and cause serious injury.

- a) Insert a small screwdriver in the protection plate hole to access the "pin valve manual override screw" corresponding to the slide-out to be locked. Turn the override screw clockwise to actuate the locking pins. During the process, you should hear a hissing sound, as the air flows to the pin cylinders.
- b) When the locking pins have been locked, re-insert a screwdriver in the protection plate hole. Turn the override screw counterclockwise and keep it in this position to cancel the manual override actuation.

- Finally, the inflatable seal can be re-inflated by turning the shut-off valve handle counterclockwise. Check the pressure gage on the inflatable seal regulator if the pressure is increasing to 10 psi.



INFLATABLE SEAL PRESSURE GAGE

- When the retraction procedure is completed, if the transmission DRIVE range or REVERSE cannot be selected to move the vehicle, verify that at least one pin is locked on each slide-out. To do so, check the lights (12) on the "PIN STATE INDICATOR" zone of the logic controller interface display. A light next to all padlocks is used to identify the state locked or unlocked of the pins. For the rear slide-out, take note that only 4 pins are used in the upper section of the pin state indicator zone. With the ignition key to the "ON" position, verify if at least one pin locked light is "ON". Otherwise, go back to step 7 of this section to manually lock all the pins until all pin locked lights go "ON".

**Note:** The slide-out safety controllers use a relay to inhibit transmission range selection to prevent the vehicle from moving if each slide-out has not at least one pin locked.

#### Manual ratchet extending procedure – Front and rear slide-out

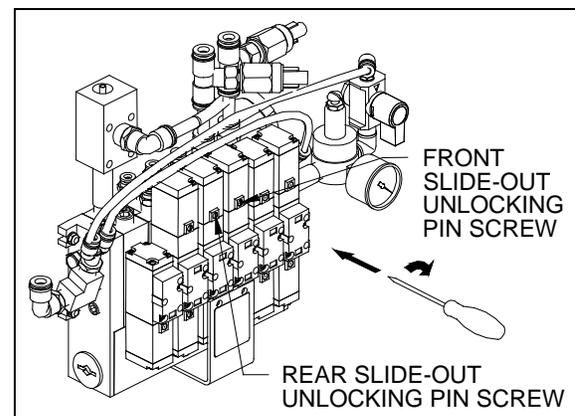
**Note:** For the front slide-out, the tag axle must be unloaded with the manual switch located on the left-hand control panel with the ignition switch to the "ON" position. This procedure is not necessary for the rear slide-out.

- Turn the ignition switch to the "OFF" position, and remove the ignition key for more safety.

- Deflate the inflatable seal by using the relieving shut-off valve located in the slide-out control compartment. Turn the handle clockwise to deflate the seal. Make sure the pressure indicator reading is "0 psi".

**Warning:** The pressure in the inflatable seal must be completely relieved to prevent any damage to the seal.

- To unlock the pins, use the following method:
  - Identify the proper pneumatic valve controlling the unlocking of the pins of the slide-out to be extent.



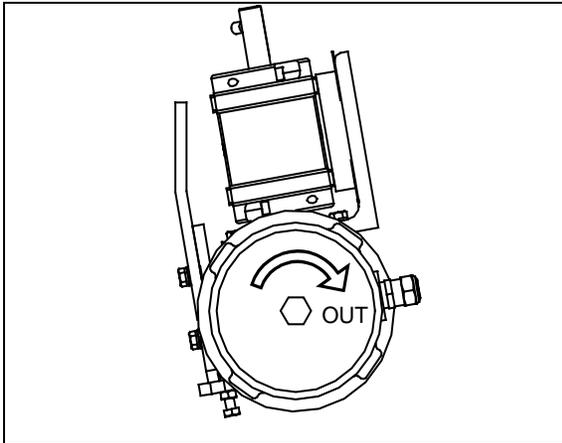
UNLOCKING PIN VALVE LOCATION

- Ensure the ignition key is in the "OFF" position. When the proper valve has been identified (right side for front slide-out and left side for rear slide-out), turn clockwise the "pin valve manual override screw" to actuate the locking pins. Keep the override screw in this position. During the process, you should hear a hissing sound, as the air flows to the pin cylinders.
- Verify if all the pins are unlocked with the ignition to the "ON" position. To do so, check the lights on the "PIN STATE INDICATOR" zone of the logic controller interface display. A light next to all unlocked padlocks is used to identify the state unlocked of the pins. For the rear slide-out, take note that only 4 pins are used in the upper section of the pin state indicator zone. If at least one light is off, that means all the pins are not unlocked and it will not be possible to manually move the slide-out. In this case, restart the engine and make sure the air pressure is 110 psi minimum on the auxiliary air pressure gauge.

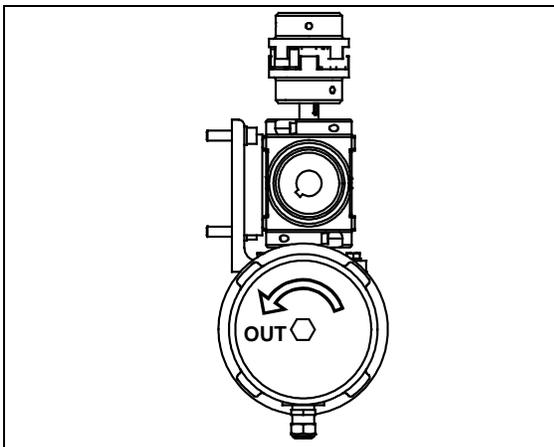
## OTHER FEATURES

- d) Switch the ignition to the "OFF" position, and remove the ignition key for more security.
- e) When the locking pins have been unlocked, turn the pin valve manual override screw counterclockwise and keep it in this position to cancel the manual override actuation.
4. To move the slide-out, use a ½" hexagonal socket on the back of the slide-out motor.
5. Rotate the motor with a manual ratchet or any power drill until the slide-out comes to its full opened position.

**Caution:** Slow down on the opening speed as the slide-out approaches its opened position, in order not to overshoot it, which may damage the mechanism.



DIRECTION OF ROTATION FOR EXTENDING (FRONT)



DIRECTION OF ROTATION FOR EXTENDING (REAR)

6. Once the slide-out is lined up to its opened position, remove the tool from the motor.
7. Finally, the inflatable seal can be re-inflated by turning the shut-off valve handle counterclockwise. Check the pressure gauge

on the inflatable seal regulator if the pressure is increasing to 10 psi.

## SLIDE-OUT TROUBLESHOOTING – THIRD GENERATION

### How to recognize 3<sup>rd</sup> generation controller

When there is no error conditions, press and hold the handheld control rocker switch in the IN or OUT position for 3 seconds and release it. If the controller is a generation 3, the LED on the control will blink three times. Generation 3 controller can also be recognized by their different colors: gray instead of blue/yellow.

### Flash code operation

The flash codes are either displayed on the dashboard (telltale panel), on the handheld control or on the logic controller with the output LED identified "Flash Code".

In a case where both the front and rear slide-out are in error and flashing error codes on their respective remotes, the dash tell tale will flash the front slide-out error code.

A flash code consist of two consecutive series of blinks separated by a one-and-one-half second pause. The first series of blinks identifies the first digit of the error number and the second series of blinks identifies the second digit of the error number. The flash code repeats itself after a pause of 4 seconds. All flash codes except 12, 31, 32 and 33 are repeating themselves for ever until cleared with the Ignition turned OFF and ON. The codes 12, 31, 32 and 33 will repeat three times and then stopped

Examples of codes:

Code #12

flashes 1 time, pause of 1,5 seconds, then flashes 2 times, pause of 4 seconds

Code #23

flashes 2 times, pause of 1,5 seconds, then flashes 3 times, pause of 4 seconds

**Warning:** If the dash slide-out telltale light starts blinking while on the road for 30 minutes, it means that one of the structural pins (4 bottom pins for the front slide or 2 bottom pins for the rear slide) is not properly inserted. Driving for a long period in this condition can damage the vehicle structure.

**Caution:** If the dash slide-out telltale light comes ON and stays ON (no blink) after 30 minutes on the road, it means that one of the 2 upper pins (not structural) are not properly inserted. Driving with the upper pins not inserted will not cause damage to the vehicle structure.

Turning the ignition OFF and ON again, will stop the flash code blinking.

**Bringing back the last flash code**

Press and hold the handheld control rocker switch to the IN or OUT position for 2 seconds to see again an active flash code error that was cleared by turning the Ignition OFF and ON.

**Clearing the flash code blink**

**Code description**

SIGNAL	PROBLEM	CAUSE	CORRECTIVE ACTION
Code #12	The slide-out does not extend or retract	The parking brake is not seen as being active by the controller	Make sure the parking brake is applied  Confirm parking brake application with the parking brake light on the telltale panel  Check wiring
Code #13	The seal deflates but the slide-out does not extend or retract	Problem with the vacuum switch sensor or the seal deflating valve	Visually inspect the seal to confirm that it is deflated  If seal deflates, check/replace the vacuum switch  If seal does not deflate, check the seal deflating valve
Code #14	The seal deflates but the slide-out does not extend	The controller does not see all pins unlocked	Safety module not present or disconnected  One of the unlock sensor wrongly positioned or broken  Pin unlock valve defective
Code #21	When extending, the slide-out stops after having extended by 1 inch	The limit IN sensor is seen as active by the controller	Check the limit IN sensor
Code #22	When retracting, the slide-out went too far	The limit IN sensor is always seen as inactive by the controller	Check the limit IN sensor
Code #23	When extending, the slide-out stops after having extended by 8 inches	The controller does not see the teeth sensor	Check the teeth sensor
Code #24	The slide-out does not move out	Problem with the slide-out motor or motor drive controller module	Ensure the motor breaker is not tripped  Check/replace the motor drive
Code #25	When retracting, the slide-out does not move at all or moves by 8 inches and stops	Teeth sensor not seen by the controller or a problem with the motor drive module or the motor itself	Check that the motor breaker is not tripped  Check/replace the teeth sensor

## OTHER FEATURES

			Check/replace the motor drive module
Code #26	The slide-out retracts but refuses to pin	The slide-out position has been moved manually, mixing-up the teeth counter	Use the manual procedure to re-pin, it will reset the counter. If this problem comes back, check the teeth sensor adjustment
Code #31	One of the unlock sensor is defective and needs repair. No immediate impact on the slide-out operation	One of the unlock sensor is always seen active even when the pins are locked	Check the unlock sensors
Code #32	One of the lock sensor is defective and needs repair. No immediate impact on the slide-out operation	One of the lock sensor is always seen as active	Check the lock sensors
Code #33	The slide-out stopped in overcurrent	There is abnormal friction in the slide-out movement or the slide-out mechanical stopper before reaching full extension	Check the mechanical slides
Code #41	The slide-out is not working properly	The front and the rear logic controllers have the same ECU number	Check the wiring of the rear module, to make sure the input J4-11 is ON.
Code #42	The slide-out does not extend or retract	The battery voltage is too low	Start the engine and set the RPM to fast idle Connect to a battery charger capable to supply 40 Amps

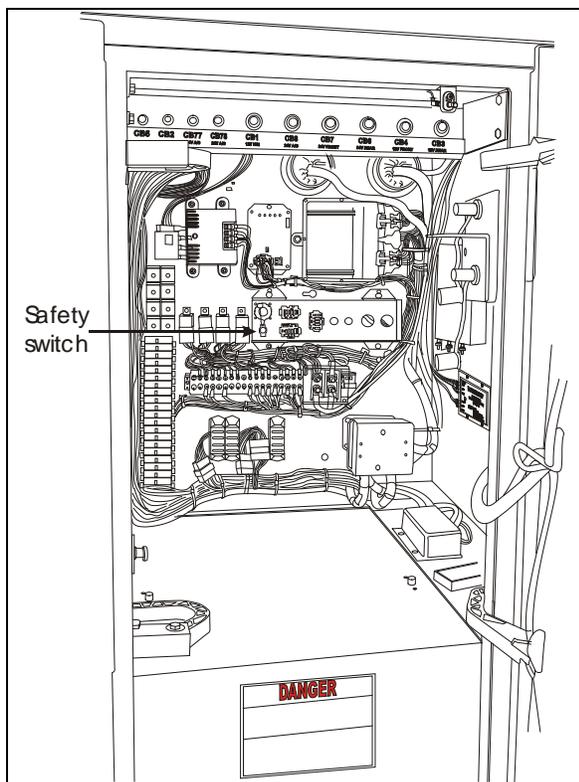
# STARTING AND STOPPING PROCEDURES

## STARTING THE ENGINE

In normal circumstances, the engine should be started from the driver's area. However, a rear start panel located in the engine compartment permits starting the engine from that location, mainly for maintenance purposes.

## STARTING THE ENGINE FROM THE DRIVER'S AREA

- Apply the spring-loaded parking brake by pulling the parking brake control button all the way up;
- Make sure the starter selector switch located in the engine compartment is set to the *NORMAL* position;
- Check that the safety switch in the main power compartment and on the dashboard are set to the *ON* position;



MAIN POWER COMPARTMENT

18520

- Place transmission in neutral;
- Turn ignition key to *START* position (refer to Controls and Instruments chapter), release the key after the engine starts.

**Warning:** If the “STARTER ON” telltale light remains illuminated after releasing the ignition switch, stop the engine immediately and set the safety switch to the off position. Have the starter checked immediately.

**Caution:** Do not engage starter for more than 15 seconds at a time. If engine does not start within 15 seconds, release ignition key and let starter cool for one minute before attempting to restart.

**Caution:** Do not press accelerator pedal before starting. This could result in an electronic control unit fault and degrade the fuel system control.

**Caution:** Special precautions are necessary with turbocharged engines to avoid possible turbine damage. After starting, run the engine at normal idle for two minutes to allow lubricating oil to reach the turbocharger. Then run the engine at fast idle. Let oil pressure reach normal operating range before driving.

**Note:** If engine does not start, return key to OFF position before attempting to restart.

**Note:** If the accelerator pedal is depressed before starting, release and wait 30 seconds before attempting to restart.

**Important note:** Brake pedal must be applied when selecting Drive (D) otherwise the transmission will stay in neutral (N).

## STOPPING THE ENGINE

- Apply parking brake and place transmission in neutral (N);
- Remove all electrical loads;
- Allow engine to idle for at least two minutes before shutting engine OFF. This insures that the turbine speed drops and allows time for the engine exhaust gas temperature to drop to about 300°F (150°C);
- Turn the ignition key to the OFF position.

**Caution:** Do not shut OFF engine when running above normal idle.

**Caution:** Set the Safety switch to the OFF position after parking and when left unattended for an extended period of time.

## STARTING AND STOPPING PROCEDURES

### STARTING THE ENGINE FROM THE ENGINE COMPARTMENT

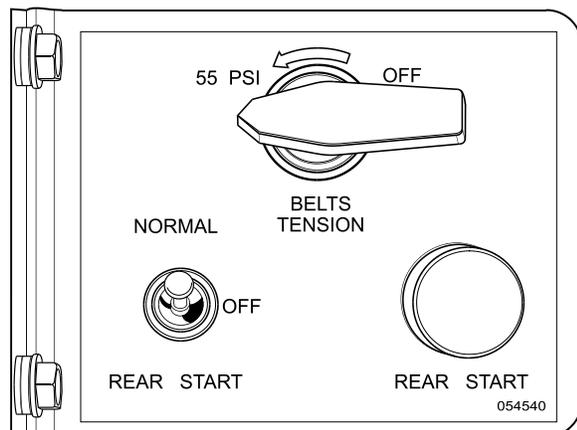
Switches to start and stop the engine from inside the engine compartment are mounted on a small panel on the R.H. side of engine compartment.

**Warning:** Apply parking brake and place transmission in neutral (N) before starting engine from inside the engine compartment.

Set the safety switches in the main power compartment and on the dashboard to the ON position;

Set the starter selector switch to the REAR START position;

Press the starter push-button switch. Release push-button after the engine starts.



ENGINE REAR START PANEL

01044

**Warning:** Do not wear loose clothing when working near engine. Stand clear of rotating components.

**Caution:** Refer to cautions in “Starting The Engine From The Driver’s Area” in this chapter.

### STOPPING THE ENGINE

To stop the engine, set the starter selector switch to the OFF position.

**Caution:** Do not stop engine by any other method.

### COLD WEATHER STARTING

The vehicle may be equipped with the optional ether cold starting aid to facilitate cold-weather starts. A rocker switch located on the dashboard near the ignition switch activates the device. A dashboard logic circuit prevents accidental operation when the engine is running.

To activate the ether starting aid, proceed as follows:

1. Before starting the engine, press the “Ether” rocker switch on the dashboard for 3 seconds to fill the solenoid;
2. Release rocker switch to discharge a shot of ether;
3. Allow 3 seconds for the shot to discharge;
4. Start the engine and use if necessary another shot to keep the engine running.

**Caution:** Use the cold starting aid only when absolutely necessary. Excessive use of starter fluid could result in serious engine damage.

**Caution:** Do not engage starter for more than 15 seconds at a time. If engine does not start within 15 seconds, release ignition key and let starter cool for one minute before attempting to restart.

### JUMP STARTING

In order to avoid damage to solid-state electrical components, it is important that jumper (booster) cables be used correctly and only in emergencies. To jump start, use another 24 volt DC, negative grounded, power source. Use only jumper cables rated at 500 cranking amperes.

**Warning:** Injury, explosion, battery acid damage or charging system overload may result if these jump starting procedures are not precisely followed.

**Warning:** Wear eye protection and remove rings, metal jewelry and watches with metal bands.

**Warning:** The battery could rupture or explode if jump started when the run-down battery fluid is frozen or if the battery fluid level is low. Check condition of run-down battery before attempting to jump start.

**Warning:** The gases given off by batteries while jump starting are explosive. Do not smoke near batteries.

**Caution:** Do not let the two vehicles touch. Keep a walk-through distance between the two vehicles. Make sure positive (red) and negative (black) jumper cable clamps do not touch.

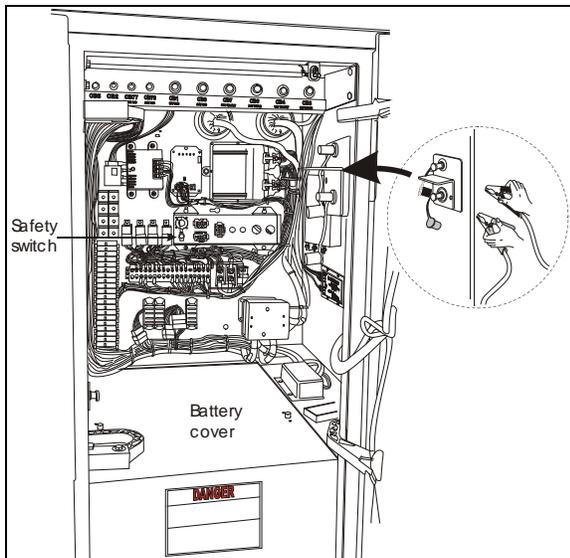
## STARTING AND STOPPING PROCEDURES

**Caution:** Never connect the jumper cable to the negative terminal post of the run-down battery.

**Caution:** Do not jump start if a maintenance-free battery has a yellow test indicator. Have the battery replaced.

**Caution:** Before attempting to jump start, make sure the parking brake is applied and the transmission is in neutral (N). Turn off all lights, heaters and other electrical accessories.

**Caution:** Choose a booster vehicle which produces comparable amperage as your vehicle.



BOOSTER BLOCK TERMINALS

18521

To jump start, proceed as follows:

1. Remove the protective caps from the booster block terminals located in the main power compartment.
2. Connect one end of the red jumper cable to the positive (+) post of the booster power source. If the good battery is in another vehicle, that vehicle's engine must be stop before connecting;
3. Connect the other end of the same red jumper cable to the positive (+) terminal on the booster block;
4. Connect one end of the black jumper cable to the negative (-) post on the booster power source;

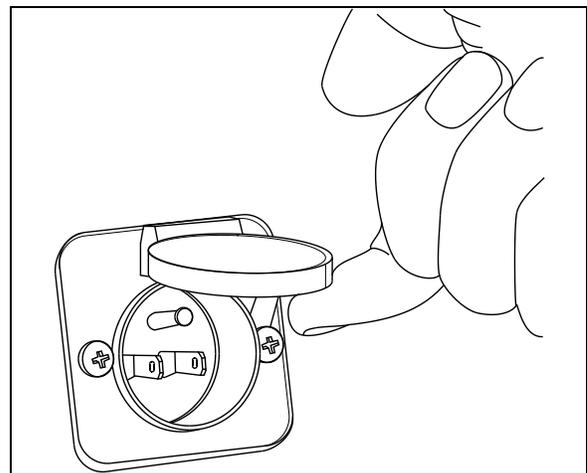
5. Connect the other end of the same black jumper cable to the negative (-) terminal on the booster block; If the good battery is in another vehicle, start that vehicle's engine;
6. Let the engine run for a few minutes, then start the vehicle with the run-down battery;
7. Disconnect the jumper cables in reverse order given in steps 2 through 5;
8. Install protective caps on the booster block terminals.

**Note:** Jumper cables must be rated at 500 cranking amperes. If jumper cable length is 20 feet (6 m) or less, use 2/0 (AWG) gauge wires. If cable length is between 20 to 30 feet (6 to 9 m), use 3/0 (AWG) gauge wires.

## ENGINE BLOCK HEATER

The vehicle may be equipped with an engine immersion-type electric block heater to assist cold weather starting. If so, a connector is located on the engine compartment R.H. side access door. Using an extension cord, connect to a 110 - 120 VAC outlet. Use the engine block heater when the vehicle is parked in cold weather for a long period and the proper power source is available.

**Caution:** Connect only to a 110-120 VAC power source. Use only grounded (three prongs) extension cords with a minimum rated capacity of 15 amps. Disconnect the extension cord before starting. Before driving, make sure the extension cord is disconnected and the engine compartment door is closed.



110-120 VOLTS CONNECTOR

06390

## STARTING AND STOPPING PROCEDURES

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### ENGINE WARM-UP

After starting the engine, keep the parking brake applied and let the engine run at normal idle for two minutes to allow lubricating oil to reach the turbocharger. Increase engine speed to fast idle, using the fast idle switch located on the dashboard for five minutes, without loading the engine. Monitor the gauges and indicator lights to make sure all conditions are normal. If an abnormal condition is observed, stop the engine immediately and have the condition corrected.

**Warning:** *Never let the engine run in an enclosed, non-ventilated area. Engine exhaust fumes contain dangerous gases which can be fatal if inhaled. Before warming up the engine, open the door(s) or move the vehicle outside.*

**Note:** *The engine will reach normal operating temperature shortly after starting. Avoid running engine at full throttle until engine coolant temperature reaches 140°F (60°C).*

### WORLD TRANSMISSION (WT) WARM-UP

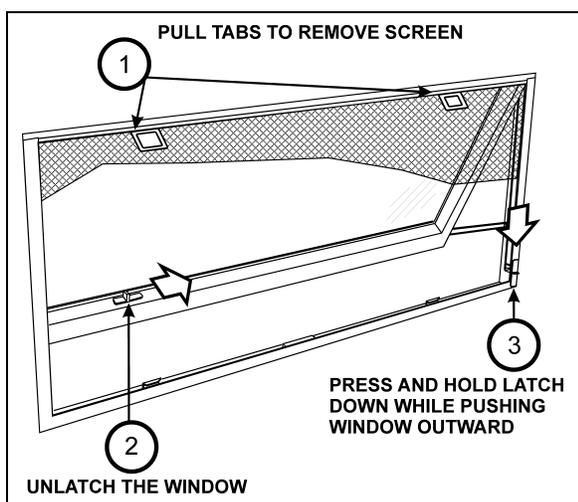
With an automatic transmission, when the temperature falls below -20°F (-29°C), the CHECK TRANS telltale light illuminates after the engine is started, and a reminder tone will sound. In this case, the transmission will be locked in neutral (N) until the transmission temperature rises above -20°F (-29°C) and the CHECK TRANS telltale light goes out. The transmission will only operate in first or reverse gears until it reaches normal operating temperature.

# SAFETY FEATURES AND EQUIPMENT

## EMERGENCY EXITS

Locate and learn how to use all possible emergency exits. Inform all guests or passengers of the location of exits and how to use them in case of an emergency.

## ELECTRIC AWNING WINDOWS

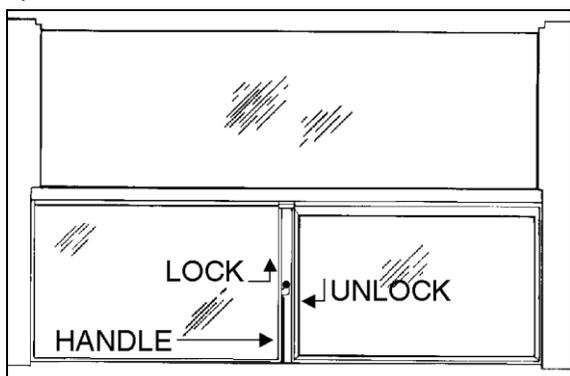


ELECTRIC AWNING WINDOW

18584

## SLIDING WINDOWS

Sliding windows can be used as emergency exits. To open, unlock, pull in window then slide open.



SLIDING WINDOW

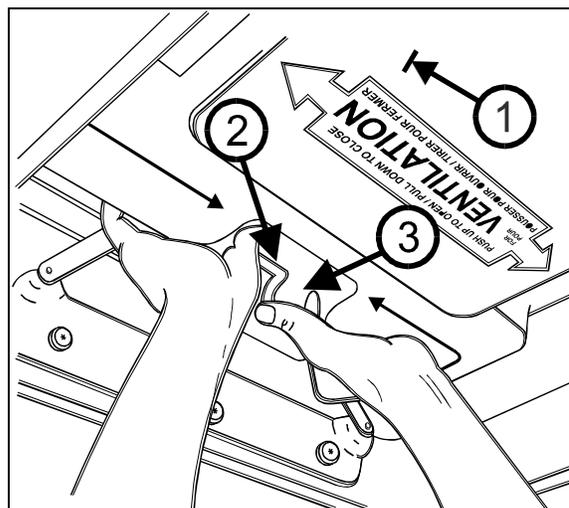
18206

## FIXED WINDOWS

Fixed windows are fastened or glued to the structure of the vehicle, they do not open and are very hard to break. Do not attempt to open, instead find and use the entrance door, the nearest awning or sliding window or a roof escape hatch.

## EMERGENCY ROOF ESCAPE HATCH

A roof ventilation hatch, designed to be opened by occupants may be installed in the roof at the rear of the vehicle. It can serve as an emergency escape (1). Another optional roof hatch may be located at the front of the vehicle. In case of an emergency, push out the ventilation hatch completely. To release the emergency hatch, pull tab (2) rearward while pushing handle (3) out. An instruction decal with complete operating instructions is located on the hatch.



EMERGENCY ROOF ESCAPE OPENING

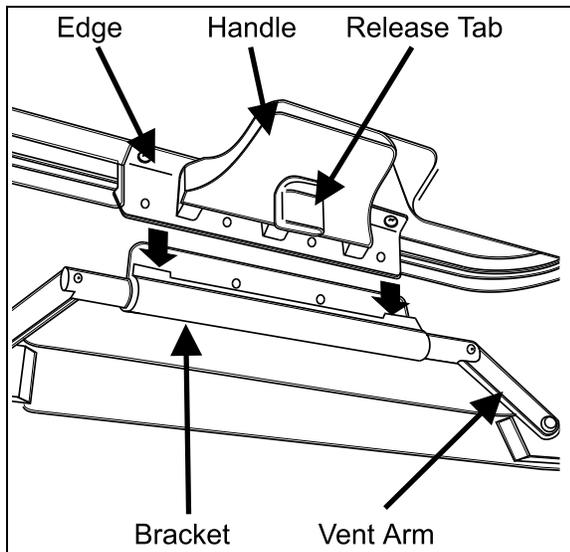
OEH3B604

**Note:** In the event of ventilation blower motor failure, the emergency roof escape may be used to aid ventilation by pushing the hatch upward.

**Caution:** Be aware of reduced vehicle overhead clearance when driving under overpasses when the emergency roof escape hatch is open.

To latch handle after use, vent arms must be pushed upright in FULL OPEN VENT position. Insert edge between the two sections of the bracket and pull handle in to lock the hatch. Finally, pull the hatch in to closed position, one side at a time.

## SAFETY FEATURES AND EQUIPMENT

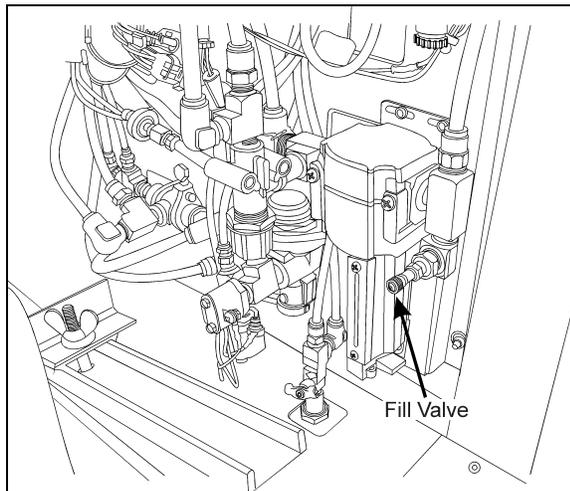


ROOF ESCAPE HANDLE

23150

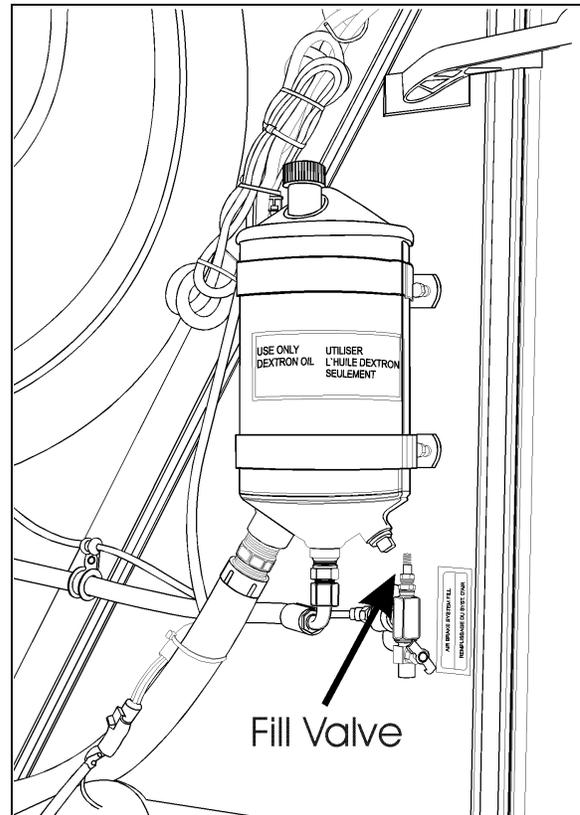
### EMERGENCY AIR-FILL VALVES

The private coach is equipped with two air system emergency fill valves to supplement the air system when air pressure is low and the engine cannot be operated. One valve is located inside the front service and electrical compartment. The other valve is located inside the engine compartment near the R.H. access door hinge.



FILL VALVE IN FRONT SERVICE COMPARTMENT

12130



FILL VALVE IN ENGINE COMPARTMENT

12162

Both air system emergency fill valves are fitted with standard tire valve stems. The air systems can be filled using any standard external air supply line. The fill valve located in the engine compartment supplies air for all systems (brakes, suspension and accessories). The fill valve located in the service compartment supplies air for accessories only.

**Caution :** Air filled through the two emergency fill valves will pass through the standard air filtering system. Do not fill air at any other location. Do not exceed 120 psi (827 kPa).

### EMERGENCY AND PARKING BRAKES

During normal operation, if air pressure in both brake circuits drops below 40 psi (276 kPa), spring-loaded emergency parking brakes will be immediately applied at full capacity to the drive axle wheels to stop the private coach.

## SAFETY FEATURES AND EQUIPMENT

Spring-loaded parking brakes are applied by pulling up the control valve knob located on the L.H. lateral console.

Parking brakes are not designed to be used as service brakes. For normal driving conditions, the control valve knob must remain in the down position.

**Note :** Only use the parking brakes to supplement the service brakes to stop the private coach in emergency conditions. The stopping distance will be considerably longer than when using normal service brakes.

**Note :** Before releasing the parking brakes by pushing down the control valve knob, check the pressure gauges to make sure that the brake system air pressure is greater than or equal to 95 psi (655 kPa).

**Warning :** Always apply the parking brakes before leaving the driver's seat.

**Note :** A beep will sound if the ignition switch is turned to the OFF position without applying the parking brakes. The same beep will sound if pressure is still applied to the service brake pedal.

**Note :** The stoplights will automatically turn on when the parking brake is applied and the ignition key is turned to the ON position.

## SAFETY EQUIPMENT

### FIRE EXTINGUISHERS

Two fire extinguishers are located on the private coach L.H. side just behind the driver's seat. Instructions for use are found on the extinguishers. Make sure you know how to operate fire extinguishers in case of an emergency.

### FIRST AID KIT

The First Aid Kit is optional. A sticker (white cross over red background) identifies the First Aid Kit. It is usually stored near the driver's seat.

### WARNING REFLECTORS

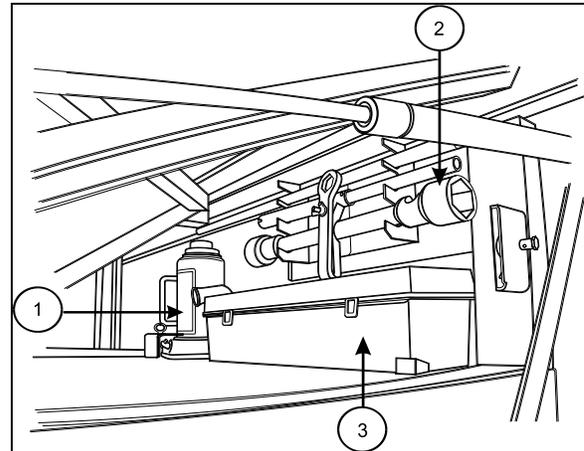
A kit containing three triangular reflectors is provided to warn other drivers on the road in case of a breakdown. The kit is located on the right side of the first R.H. side baggage

compartment with the jack and tools. The reflectors provide visible warning of an emergency situation. The three reflectors should be placed as indicated on the box cover. These reflectors comply with FMVSS 125 (Federal Motor Vehicle Safety Standards).

### JACK/TOOLS

A kit for jacking up the private coach is stored in the first R.H. side baggage compartment. The kit includes a:

1. 30 ton bottle jack;
2. Wheel nut wrench and lever;
3. Triangular reflectors.



FRONT BAGGAGE COMPARTMENT

13015

### SPARE PARTS KIT

The private coach may be equipped with a spare parts kit (optional). The kit contains parts such as bulbs, circuit breakers, belts, etc. The spare parts kit is stored in the first baggage compartment.

### CHANGING WHEELS

In case of a flat tire, turn ON the hazard flashers and bring the vehicle to a stop on the side of the road. Apply the parking brake. Make sure the vehicle is parked safely away from traffic. Set up the triangular reflectors in accordance with applicable highway regulations.

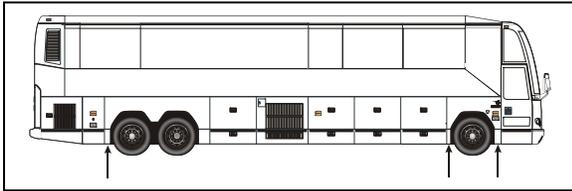
We suggest that you **do not** attempt to change a wheel. First, the wheel and tire are very heavy and usually there is no space available to put the removed flat. Second, the wheel nuts, especially those on inner dual, can become very tight after being on for only a short time. Often a

## SAFETY FEATURES AND EQUIPMENT

heavy air wrench is required to get these nuts loose. We suggest you get help via CB radio or cellular phone. There are tire service trucks all over the country that can bring a wheel and make the change safely.

### JACKING POINTS

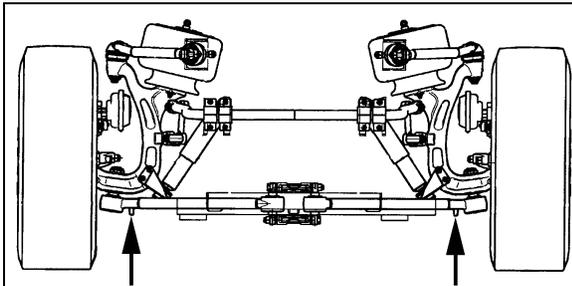
Twelve jacking points are located on the vehicle: three are located on each side of the frame and two are located under each axle. Refer to the following illustrations for the location of jacking points.



JACKING POINTS ON FRAME

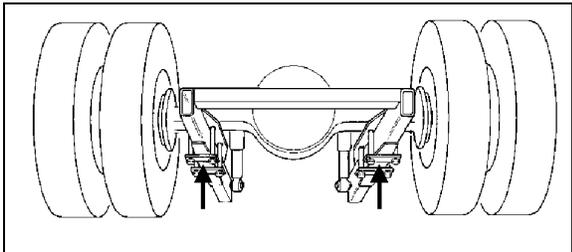
18530

**Warning:** The suspension of the vehicle must be in the normal ride position before jacking. The level low system must be in the OFF position prior to turning OFF the ignition key.



JACKING POINTS ON FRONT AXLE

16095

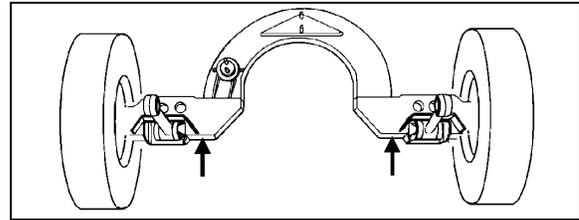


JACKING POINTS ON DRIVE AXLE

OEH3B762

**Warning:** Always unload or retract the tag axle before jacking the vehicle from the front and drive axle jacking points to prevent damage to suspension components.

**Warning:** The jacking points on the tag axle must be used for raising the tag axle only.



JACKING POINTS ON TAG AXLE

OEH3B764

Several kinds of hydraulic jacks can be used. Only jack at the specified jacking points. Jack must support the following capacities:

Front axle: 20,000 lbs. (9 100 kg);

Drive axle: 40,000 lbs. (18 200 kg).

### HYDRAULIC JACK

**To raise:** turn release valve clockwise. Insert handle in socket and raise by pumping.

**To lower:** remove handle and turn the release valve slowly counterclockwise.

Always keep ram and extension screw retracted when jack is not in use.

**Service:** Check oil level when jack fails to raise to full height. Lower ram completely with release valve open and jack in upright position, remove filler plug and refill to level of filler hole with hydraulic jack oil. Never use brake fluid.

**Warning:** Jack is intended for lifting only. Do not get under the vehicle or load for any reason unless it is properly supported with safety stands and securely blocked.

**Warning:** Do not overload jack above rated capacity. Prevent "side loading", make sure load is centered on ram. Do not push or tilt load off jack.

### TOWING

To prevent damage to the vehicle, use the two tow eyes located under the rear bumper and/or fixed to the vehicle's frame between the front axle and the front bumper. Use only a solid link tow bar and a safety chain to tow the vehicle. If required, connect an auxiliary air supply to the vehicle so brakes can be operated while towing.

**Warning:** During a towing operation, the driver should be alone inside the vehicle.

**Caution:** To prevent damage to the drive train components, disconnect axle shafts or driveshaft before towing. Do not attempt to push or pull-start a vehicle equipped with an automatic transmission.

**Note:** Make sure axle shafts or driveshaft are installed correctly after towing. Tighten axle shaft and driveshaft nuts to the correct torque settings. Do not invert shafts.

## DAYTIME RUNNING LIGHTS

The low beams come ON automatically at reduced intensity when the engine is started and the parking brake is released. The daytime running lights provide added safety by making the traveling private coach more visible to other drivers.

The lights are not used when:

- Engine is stopped;
- Parking brake is applied;
- The exterior lighting switch is depressed to the second position.

**Warning :** Do not drive with the daytime running lights at night. For night driving, turn ON the headlights by depressing the exterior lighting rocker switch to the second position. The daytime running lights do not provide sufficient illumination for safe driving at night.

## FOG LIGHTS

Fog lights provide better visibility in fog and precipitation. They improve visibility immediately in front of the vehicle. They also provide added safety.

**Note:** Some states or provinces may restrict the use of fog lights. Verify local state or provincial regulations before using

## CORNERING AND DOCKING LIGHTS

The private coach may be equipped with up to four halogen lights. Two cornering lights are installed at the front of the vehicle, on each side as standard equipment. Two optional docking lights may be installed on each side at the rear of the private coach. The front lights illuminate at the same time as the turn signal flashers to increase lateral visibility while turning. The rear lights illuminate automatically when the reverse (R) range is selected to increase visibility while backing-up the vehicle.

## COMPARTMENT LIGHTING

Baggage, engine, front service, main power compartment and rear electric compartment lights are automatically turned ON when their respective compartment door is opened provided that the engine is running or both safety switches are in the ON position. A telltale light on the central dashboard will illuminate when a compartment door is open.

## MUD FLAPS AND SPLASH GUARDS

Mud flaps are installed behind each front wheel and the tag axles. Mud flaps minimize dirt on the lower panels of the private coach and prevent stones and debris from being thrown at vehicles travelling behind the private coach. Splash guards may be installed behind each dual wheel of the drive axle to prevent stone projectiles from being thrown at the tag axle wheels.

## BACK-UP CAMERA

An optional back-up camera is available which provides the driver with visual assistance when backing-up.

The TV monitor is mounted on the left side pillar and switches ON automatically when the transmission is in the reverse (R) range.

## BACK-UP ALARM

The back-up alarm alerts pedestrians and other drivers when the private coach is being backed-up. Take extra precautions whenever backing-up. If necessary, use a guide to provide directions when backing-up. Both the alarm and optional camera are automatically activated when the transmission is put in the reverse (R) range.

## BACK-UP ALARM CANCEL

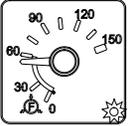
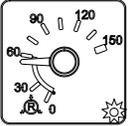
A rocker switch located on the L.H. side dashboard panel allows the driver to cancel the back-up alarm system (as for example: at night on a camping site).

**Note:** After use, return to normal operation.

## SAFETY FEATURES AND EQUIPMENT

### ALARM SYSTEM

In addition to the dashboard indicator lights, the private coach is equipped with an audible alarm system to provide audible indications to the driver of the conditions given in the following table:

Indicator Light	Audible Alarm	Condition
 06227	Yes	Air pressure in primary system below 66 psi (860 kPa)
 06228	Yes	Air pressure in secondary system below 66 psi (860 kPa)
 06229	Yes	Engine oil pressure Below 50 psi (345 kPa)
 06231	Yes	Coolant temperature above 223°F (106°C)
<b>CHECK TRANS</b>  06282	Yes	Gear changing inhibited
None	Yes	Reverse gear engaged
 06288	Yes	Fire in engine compartment
 06271	Yes	Tag axle retracted
None	Yes	Engine OFF but parking brake not applied
<b>STOP</b>  06309	Yes	Major problem detected by engine ECU

## SAFETY FEATURES AND EQUIPMENT

Indicator Light	Audible Alarm	Condition
 06273	Yes	Outside temperature close to water freezing point
 06292	Yes	Transmission fluid too hot

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# CARE AND MAINTENANCE

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## CLEANING

The cleaning information provided in this section is regarded as recommended cleaning practices. Cleaning results may vary depending on the condition of the stain. Always clean stains promptly for best results.

**Note:** Use only approved cleaning products such as Prevost A.P.C., all purpose cleaner (Prevost # 683664). Never use stain protection products on new fabrics. To prevent permanent staining of fabrics, clean stains soon after they occur. Incorrect treatment of stains can worsen them. Get help from a cleaning specialist to remove stubborn stains.

**Caution:** Custom fabrics and materials may require different cleaning and maintenance practices. Consult your converter.

## SEAT UPHOLSTERY

Firmly beat the fabric with a blunt object, such as a wooden paddle, to release dust and dirt. Vacuum the seat fabric in the direction of the stitching using an upholstery nozzle.

**Note:** The abrasive nature of dirt and dust will reduce upholstery life expectancy. Vacuum regularly.

## Removal of stains and marks

Depending on the nature of the stain, apply one of the two methods explained below to remove stains and marks on wool plush.

### Method One:

- Apply a nonflammable solvent (Trichloroethylene) to stained area with a clean, white absorbent rag;
- Clean stain by starting at the outer edges of the stain and working in toward the center;
- Blot affected area frequently with a clean, dry absorbent cloth to prevent stain rings caused by excess solvent.

**Warning:** Use solvents in a well ventilated area. Open all windows and doors.

### Method Two:

- Wet the stain with a solution of household detergent and lukewarm water. Do not soak the stain;

- Rub the stain with a damp cloth;
- Rinse cloth after each application.

**Caution:** Do not use soap, soap powder, ammonia, soda, bleach or cleaning products containing any of these compounds.

## Beverage stains

Remove beverage stains by following method one. If stain persists, repeat method one using methyl alcohol instead of solvent.

## Alcoholic beverage stains

Remove alcoholic beverage stains by wetting the stain with water, then cleaning following method two.

## Burns

Scrape burnt area using a knife or razor blade then clean following method two. Consult an upholstery specialist when dealing with extensive burns.

## Cosmetic stains

Remove stains left by cosmetics by following method one then method two.

## Ink stains

Remove ink stains following method two. If stain persists, apply a warm oxalic acid solution. Rinse with water.

## Blood, urine or vomit stains

Remove such stains by following method two.

## Copying ink - ball-point pen ink

Treat with methyl alcohol, blotting frequently to avoid spreading stain, followed by method two.

## Marking ink (Felt-tip pens)

Treat with Methyl-Ethyl-Ketone (MEK) followed by method two.

## Oil, grease and paint

Remove excess using a knife. Treat with method one followed by method two. If stain persists, repeat procedure.

## CARE AND MAINTENANCE

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### Rust stains

Remove rust stains by following method two. Apply a warm oxalic acid solution to stained area. Rinse with water.

### Tar

Soften tar with benzene, then treat using method one followed by method two.

### Chewing gum

Soften gum with cyclohexane. Carefully scrape off stains using a sharp knife or razor blade.

### PLASTIC AND VINYL

Clean plastic and vinyl trim using a clean damp cloth or sponge. For vinyl trim marks, use a lukewarm all purpose cleaner or a mild saddle soap. Remove water spots and soap traces using a clean damp cloth or sponge. Dry with a clean soft cloth.

Remove grease, tar or oil stains with a clean cloth or sponge and an all purpose or solvent-type vinyl cleaner.

Apply a colorless vinyl or leather protective product to maintain the luster and pliability of the plastic or vinyl surface.

### WINDOWS

Clean the inside of the windows with a solution of one part vinegar to ten parts water.

### STAINLESS STEEL

Use a stainless steel cleaner and follow the manufacturer's instructions. Stainless steel cleaning solution may be ordered from Prevost Car Inc. quoting part number 68-0356.

### FORMICA

Remove stains on formica surfaces with a household detergent, methyl alcohol or mineral turps. Clean with a mild abrasive and water solution if stain persists.

### CARPET

Vacuum carpets regularly to prolong carpet life.

### RUBBER COMPONENTS

Use only pure water or glycerin to clean stains on rubber components.

**Caution:** *Never use solvents on rubber components.*

### FLOOR CLEANING

Clean vinyl floors with a quality nonionic detergent cleaner. Follow the manufacturer's recommendations for cleaning.

Remove any excess detergent solution using a wet/dry vacuum or mop. Rinse floor with a solution of one part Clorox to ten parts warm water.

Polish dry floor using a high-speed buffer and a smooth red 3-M polishing pad.

Mop floor periodically with a solution of 5 per cent Clorox in warm water.

**Note:** *For custom or special floor covering materials, consult the manufacturer or your converter for information on how to clean and maintain these types of floors.*

### EXTERIOR SURFACES

Frequent washing and waxing of the vehicle exterior will help protect the finish and luster. The paint finish is attacked by the abrasive effects of airborne particles and corrosive pollutants.

Before washing the exterior of the vehicle, close the fresh air dampers using the "REC" button located on HVAC control panel and on the air intake duct in the evaporator compartment. Install keyhole protectors to prevent water from penetrating. Rinse vehicle with water to remove all loose dirt. Wash vehicle using a quality brand car wash soap. Follow manufacturer's recommendations for cleaning. Rinse well with water.

The vehicle exterior should be cleaned, waxed and buffed when water droplets no longer form on the painted surfaces.

**Caution:** *Hot water can damage paint. Keep water cool or lukewarm.*

**Caution:** *Make sure cleaning solutions are not harmful to painted surfaces. Read the manufacturer's instructions before using.*

**Caution:** *Do not spray water jet directly into fresh air inlet dampers.*

**Caution:** Do not aim high pressure water jet at radiator doors. This could damage the radiator fins.

To prevent corrosion, remove caked-on dirt and road salt from the vehicle underbody using a high pressure water jet. Clean wheel housings, bumpers, muffler, tailpipe and brackets.

Carry out corrosion prevention cleaning at least twice a year. Spray underneath of the vehicle and let soak before cleaning. Let engine and exhaust system cool down before cleaning.

**TAR OR OIL**

Remove tar or oil as soon as possible with an approved automotive tar and oil remover or turpentine. Thoroughly clean area with car wash soap and water. Let dry, then wax.

**INSECTS**

Remove insect stains as soon as possible with lukewarm soap and water or insect remover.

**TREE SAP**

Remove tree sap or bird droppings with lukewarm soap and water. Do not allow to harden.

**WINDOWS**

To prevent windshield wiper streaking, keep silicone sprays away from windshield. Remove road film and wax build-up from windows with lukewarm soap and water or with an alcohol-based cleaning agent. If a chamois is used to dry and polish glass, use it exclusively for that purpose.

**WIPER BLADES**

To avoid tearing frozen wiper blades, loosen them before removing. Remove and clean wiper blades periodically with an alcohol-based cleaning solution. Clean wiper blades using a sponge or soft cloth.

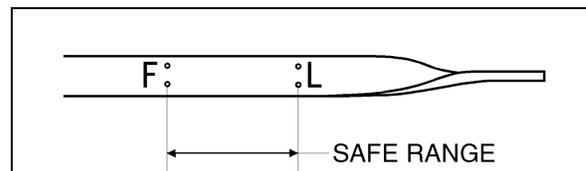
**FLUID LEVEL VERIFICATION**

Periodic inspection of fluid level is the most economical and easiest way to help your vehicle perform at its best. Rigorous fluid level inspection and replacement will greatly help minimize expensive and unscheduled repairs.

**ENGINE OIL LEVEL**

Check engine oil level when engine is still warm and with vehicle parked on a level surface. Shut OFF engine and wait at least 10 minutes for oil to drain into oil pan before checking. Check engine oil level daily or before each trip. Add oil as required. Do not overfill. Remove dipstick, wipe clean and fully reinsert to ensure an accurate reading. Remove dipstick and check engine oil level.

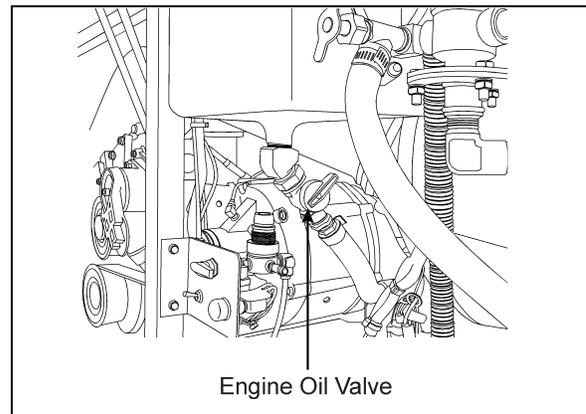
The oil level must be maintained between the two marks indicated on the dipstick. Do not let the oil level drop below the L mark. Add oil by opening the oil reserve tank drain valve or through the oil filler pipe. Use the markings on the tank to check the quantity of oil added. Close the oil reserve tank drain valve or oil filler cap after adding oil. Recheck the oil level. Do not let the oil level go above the F mark on the dipstick.



ENGINE OIL LEVEL DIPSTICK

01027

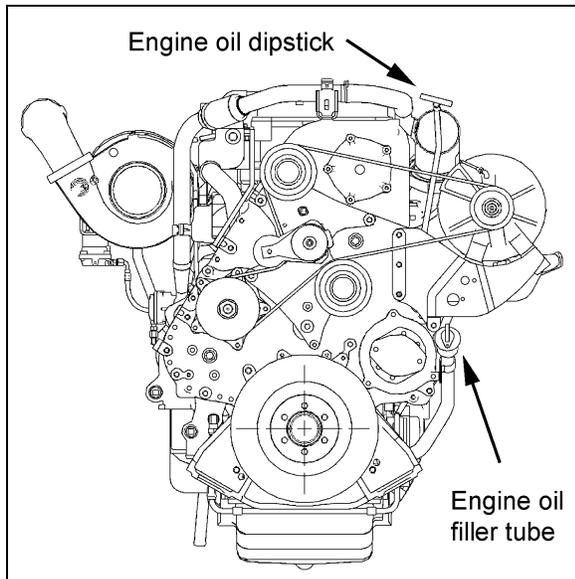
**Caution:** Keep engine oil level between "L" and "F" on dipstick. Do not overfill. Check when refueling.



ENGINE OIL RESERVE TANK

01063

## CARE AND MAINTENANCE



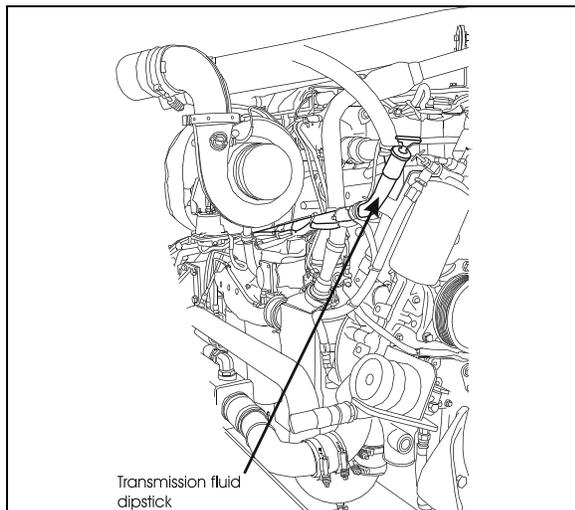
ENGINE COMPARTMENT

01117

### TRANSMISSION OIL LEVEL

The automatic transmission oil level dipstick is accessible through the engine compartment rear door and is located on the left side of the engine.

To check the transmission oil level, a "cold check" and a "hot check" must be performed. A cold check must be made when the transmission oil is between 60°F and 120°F (16°C and 50°C).



LEFT SIDE OF ENGINE

01121

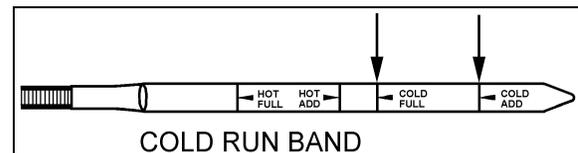
**Note:** Perform the cold check first to verify the transmission oil level before performing the hot check.

**Warning:** To prevent personal injury, do not service transmission wearing loose clothing. Stand clear of the engine and rotating components while checking the oil level.

To prevent dirt and foreign matter from entering the transmission, clean the end of the oil fill tube before removing dipstick. To remove dipstick, unscrew filler cap approximately three turns and pull out dipstick.

### Cold Check

Run the engine until the transmission oil temperature is between 60°F and 120°F (16°C and 50°C). With the engine idling, make sure the parking brake is applied and the transmission is in neutral (N). Remove and wipe the dipstick with a clean cloth. Check oil level. If the oil level is within the COLD RUN band, the oil level is correct and a hot check can be performed. If the oil level is on or below the lower line of the COLD RUN band, add oil until the level lies within the COLD RUN band. If the oil level is above the COLD RUN band, drain oil until the level is within the band.

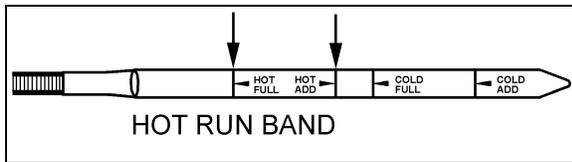


AUTOMATIC TRANSMISSION OIL LEVEL DIPSTICK 07006

**Caution:** The oil level rises as oil temperature rises. Do not add oil above the "cold run" band before the transmission reaches 180°F to 220°F (82°C to 104°C).

### Hot Check

Make sure the transmission oil temperature is between 180°F and 220°F (82°C and 104°C) before performing the hot check. Run the engine between 1,000 and 1,200 RPM for approximately one minute to purge air from the system. With the engine idling and the parking brake applied, shift transmission from forward (D) to reverse (R) and back into neutral (N) to fill clutch cavities with oil. Remove and clean dipstick, then check oil level. If the oil level is on or under the lower HOT RUN line, add just enough oil to bring up the level to the middle of the HOT RUN band.



AUTOMATIC TRANSMISSION OIL LEVEL DIPSTICK 07006

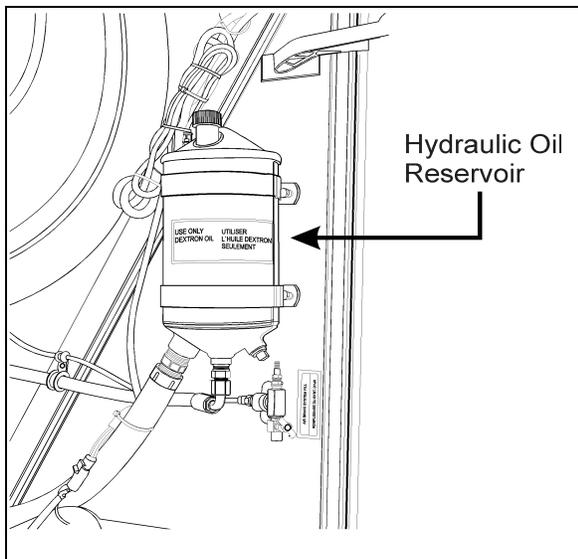
**Note:** Approximately 1 quart (0.95 liters) of oil will raise the oil level from the lower line of the HOT RUN band to the middle of the HOT RUN band.

Replace dipstick and tighten the filler tube cap until the rubber seal is correctly seated.

**Caution:** Do not overfill transmission oil reservoir. Severe damage may result.

### POWER STEERING FLUID LEVEL

The vehicle is equipped with a power steering system. The hydraulic fluid tank is accessible by the engine compartment R.H. side door.



POWER STEERING HYDRAULIC FLUID TANK 14043

Check fluid level as follows:

1. Stop engine, open engine compartment R.H. side door and engine compartment door, place rear start switch to OFF position;
2. Unscrew and remove the dipstick located on top of the fluid tank and wipe with a clean rag;
3. Replace dipstick in tank, then remove to check fluid level;
4. Add hydraulic fluid until it reaches the FULL mark on the dipstick (use Dexron II, Dexron IIE, Dexron III or Mercon fluid type);

5. Place engine rear start switch to NORMAL position. Close engine compartment door;
6. Replace and tighten dipstick and close engine compartment R.H. side door.

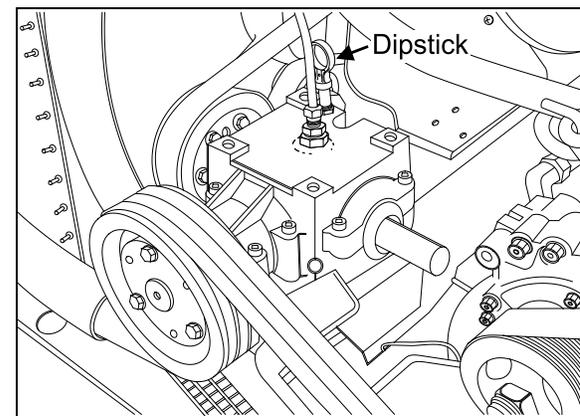
### RADIATOR FAN GEARBOX OIL LEVEL

The radiator fan is belt-driven by the engine crankshaft pulley through a gearbox and drive shaft. A dipstick located on top of the gearbox is used to check the radiator fan gearbox oil level.

Check radiator fan gear box oil level as follows:

1. Stop engine, open main power compartment and place battery master switch to the OFF position;
2. Open engine compartment door and place engine rear start switch to OFF position;
3. Remove the dipstick located on top of the gearbox and wipe with a clean rag;
4. Insert dipstick in gearbox case, then remove again to check mark;
5. Add, if necessary, MOBIL SHC 630 synthetic lubricant (PREVOST #180217) until it reaches "FULL" mark;
6. Reinsert the dipstick;
7. Place engine rear start switch to NORMAL position. Close engine compartment door;
8. Set battery master switch to ON position.

**Note:** Mobil SHC 630 is a new lubricant and is not compatible with SHC 634 lubricant that was previously used.



RADIATOR FAN GEARBOX OIL LEVEL DIPSTICK 05062

## CARE AND MAINTENANCE

### WHEEL BEARING OIL LEVEL

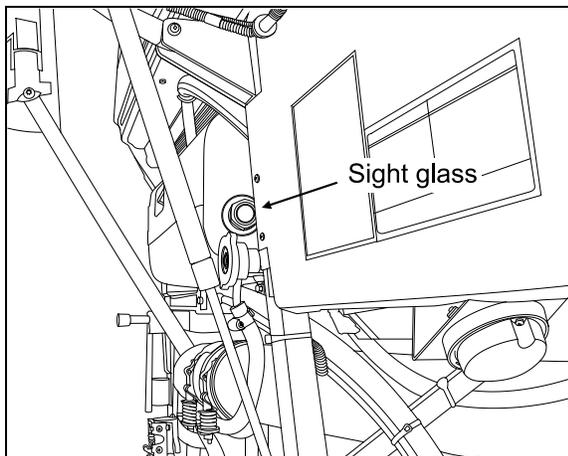
Drive axle wheel bearings are lubricated by the differential oil. Maintain differential oil at correct level to ensure adequate lubrication of drive axle wheel bearings at all times.

### FRONT AND TAG AXLE WHEEL HUBS

The unitized hub bearings used on the NDS range of axles, are non-serviceable items. Bearings are pre-adjusted, lubricated and have seals fitted as part of the manufacturing process. The bearings are greased for life and there is no need or facility for re-lubrication.

### COOLANT FLUID

Coolant level is correct when coolant is visible through the surge tank sight glass when cold. If coolant level is low, fill system with the same 50-50 mixture normally used.



**SURGE TANK SIGHR GLASS**

05069

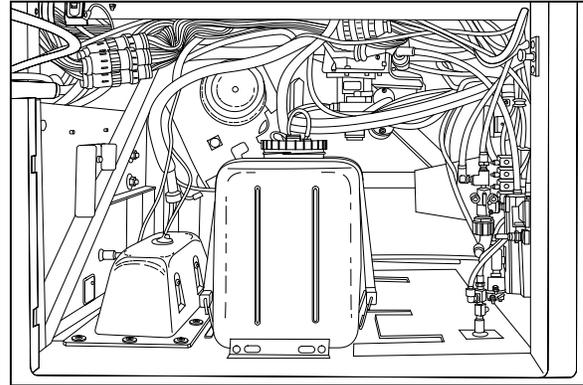
**Caution:** Use only coolant that meets DDC specs for use in DDC engines.

The cooling system must be maintained according to DDC maintenance specs for coolant, ratio of 50/50 and supplemental coolant additives (SCAs). Failure to do so could damage the cooling system. Refer to Maintenance Manual or DDC for instructions.

**Warning:** Hot engine coolant is under high pressure. Allow engine to cool down before adding coolant.

### WINDSHIELD WASHER TANK

The windshield washer reservoir is located in the front service and electrical compartment. The reservoir has a capacity of 5 US gallons (19 liters). Check fluid level regularly.



**WINDSHIELD WASHER FLUID RESERVOIR**

14050

The spray jets are located on the windshield wipers and are angled to spray towards the center of the windshield.

Upper and lower windshield wipers have separate controls and separate washer pumps which are connected to the same reservoir.

### OTHER VERIFICATIONS

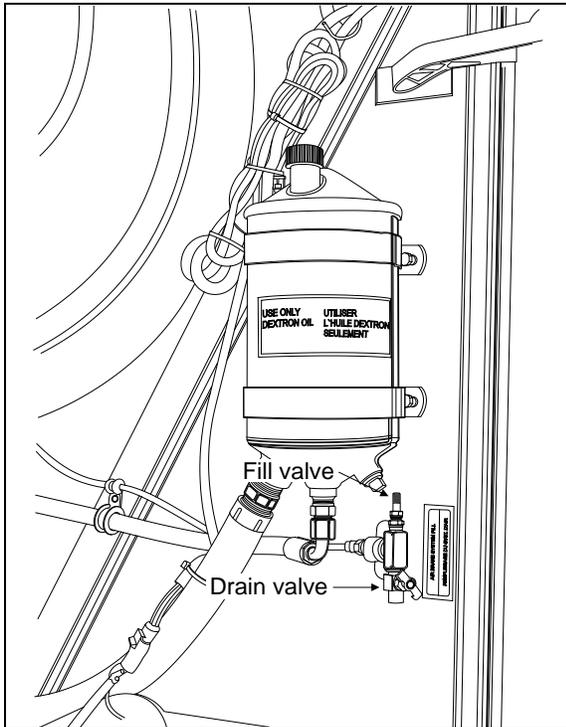
It is good practice to regularly inspect the vehicle for signs of component wear and to perform safety and maintenance routines.

### AIR TANK PURGE

The vehicle may be equipped with up to twelve air tanks. Purge accessory and wet air tanks before each trip. The primary and secondary air tanks must be purged at every oil change. Oil changes should be scheduled at least every 12,500 miles (20 000 km).

The accessory air tank drain cock is accessible from the front service and electrical compartment. The wet air tank drain cock is accessible from the engine compartment R.H. side door. All air tanks are equipped with a drain cock underneath the tank. Refer to figure "Lubrication and Servicing Points" at the end of this chapter for tanks location.

Drain tanks by turning cocks counterclockwise.



ENGINE COMPARTMENT R.H. SIDE

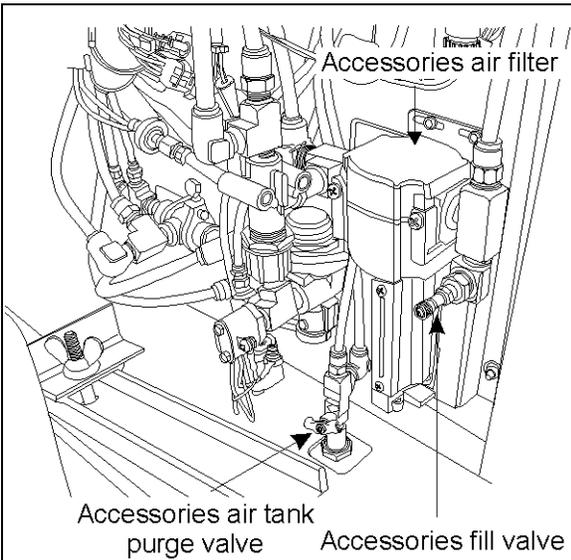
12148

Check that nozzle hose is in good condition and that nozzle is free of obstruction;

Keep fire extinguishers clean.

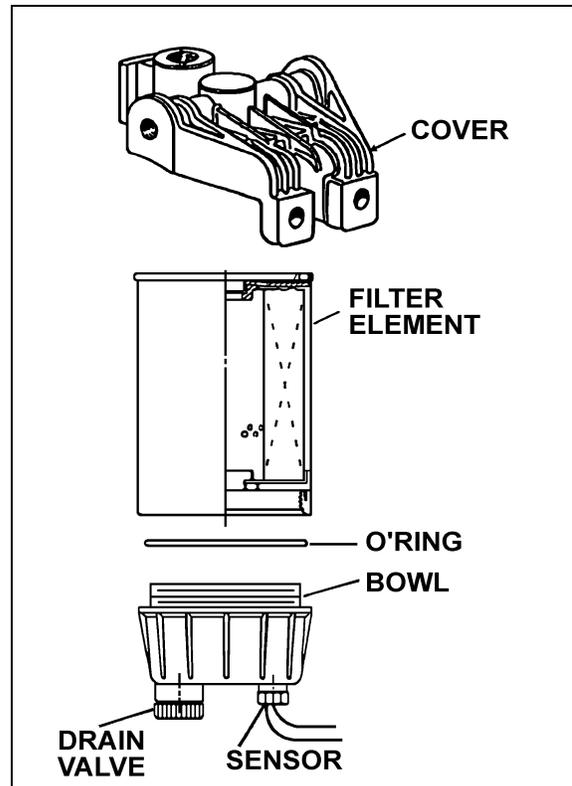
### FUEL FILTER/WATER SEPARATOR

The fuel system is equipped with primary and secondary fuel filters for additional protection of the injectors. A fuel filter/water-separator may be installed in primary fuel-filter location, to prevent water infiltration in engine fuel system. It should be drained periodically, or when the water separator telltale light on the dashboard illuminates. To drain, loosen positive seal drain valve below separator, and tighten after water has been flushed out.



FRONT SERVICE COMPARTMENT

12130



FUEL FILTER/WATER SEPARATOR

03025

### FIRE EXTINGUISHERS

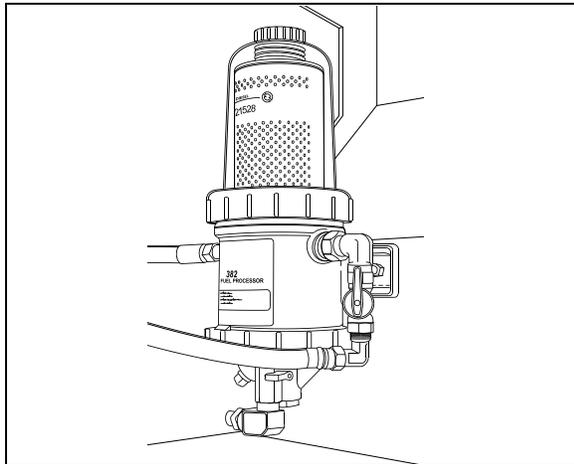
Inspect fire extinguishers monthly to insure operation in emergency situations.

In the case of extinguishers equipped with a pressure gauge, the needle should be in the green or *NORMAL* range. Refill or replace extinguisher if pressure is below normal;

Check that seal on handle is intact;

The optional Fuel Pro 382 diesel fuel filter system consists of a permanently mounted fuel processor, a replaceable filter element, a filter element cover and collar and a fluid filter base assembly. This system is installed between the fuel tank and the fuel pump and is designed to be the only fuel filter in the fuel system. The filter serves as a water separator as well as a fuel filter. To drain, turn ¼ turn the drain valve below filter, close when water has been flushed out.

## CARE AND MAINTENANCE



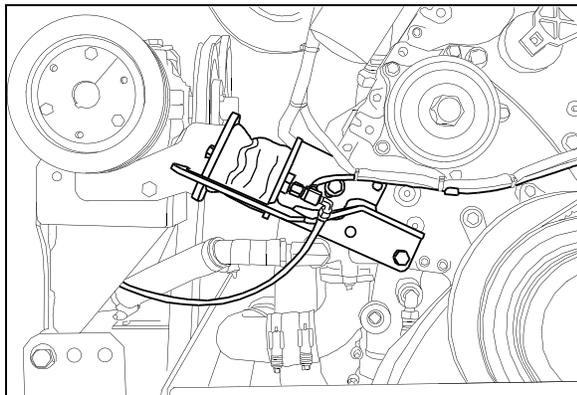
DAVCO FUEL PRO 382

03032

### BELT TENSION ADJUSTMENT

The radiator transfer fan and air conditioning compressor are driven by V-belts.

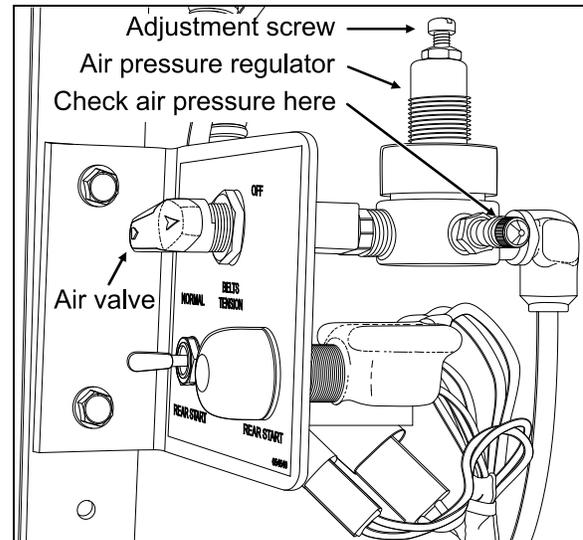
Belt tensioning is applied through air bellows which are adjusted by an air pressure regulating valve mounted in the engine compartment, right behind the belt tensioning pressure control valve. The correct pressure of 45 psi (310 kPa) is set at the factory. The distance between the stop and the plate at the top of the bellow should be approximately  $\frac{1}{4}$ " (7mm). Periodically verify the pressure at the regulating valve using a pressure gauge and correct if necessary.



AIR BELLOWS

01122

For belt replacement, air pressure must be released from bellows by means of the belt tensioning pressure control valve. This valve, mounted close to the pressure regulating valve, is manually operated. Before handling, be sure that all engine stopping safety precautions have been observed.



PRESSURE REGULATING VALVE

01058

- Refer to the Parts Manual, Maintenance Manual or "Service Bulletins" for recommended belt sizes and tension settings;
- Periodically inspect belt and pulleys for wear or damage;
- Do not treat belts with any compounds. Keep belts dry;

### BACK UP CAMERA

The retractable back-up camera is visible only when turned *ON*. A switch located in the rear electrical compartment is used to extract the camera for cleaning.

To clean the camera's protective glass, turn the switch *ON* and spray with soapy water. Wipe with a clean damp rag or wiper blade.

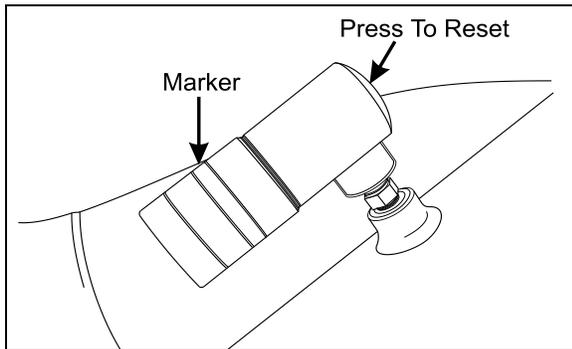
**Warning:** To avoid injury, do not clean camera with transmission in reverse (R). Shut off engine and apply parking brake before cleaning.

**Caution:** To prevent scratches to the camera protective glass, do not wipe with dry rag. Use a clean damp rag.

### AIR FILTER RESTRICTION INDICATOR

A filter restriction indicator is used to monitor the vacuum level between the air filter and engine. A red marker is displayed when the air filter is clogged. When a red marker is displayed, the air filter must be replaced. Reset by pressing on the indicator's extremity.

The filter restriction indicator is located on the engine air intake duct.



RESTRICTION INDICATOR

01052

### A/C AND HEATING SYSTEM AIR FILTERS

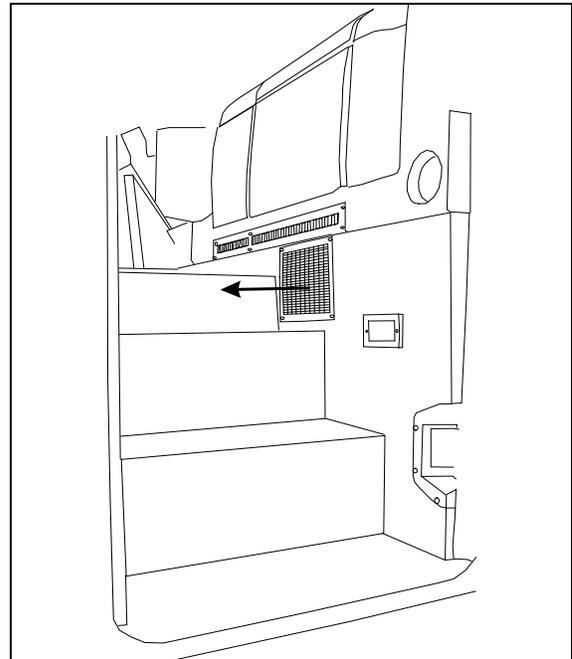
For maximum air conditioning and heating system efficiency, air filters should be inspected and cleaned as required in maintenance schedule to ensure proper ventilation of the evaporator and heating radiator cores. To clean filters, back flush with water, then dry with air.

**Caution:** Do not use high pressure water jet to avoid damaging filter.

**Caution:** Be sure not to reverse filter upon installation.

#### Driver's Area Filters

The driver HVAC system's air filters are located behind the R.H. console. To gain access to the A/C filters, unscrew the grill located at the top step of the entrance door steps. Remove the filters for cleaning or replacement.



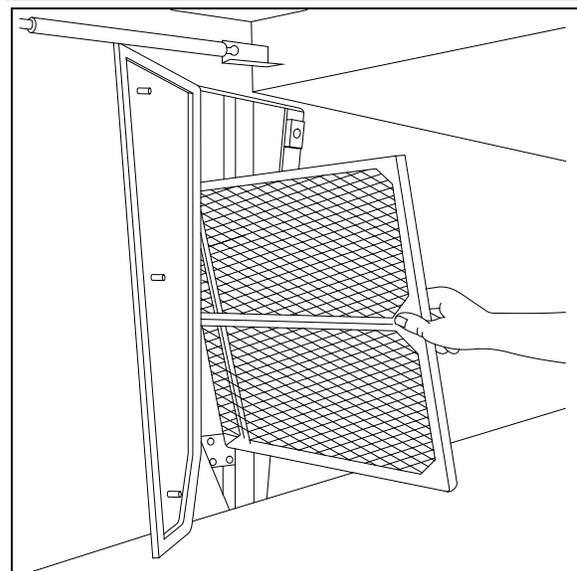
DRIVER'S AREA AIR FILTER REMOVAL

22231

#### Cabin System Air Filter

The central HVAC system's air filter is located in the A/C and heating compartment on L.H. side of the vehicle. To gain access, locate access panel in one of the baggage compartment adjacent to the A/C and heating compartment. Open panel by unscrewing ( $\frac{1}{4}$  turn) the three screws of either panel, unsnap both fasteners on top of filter and slide out the filter for cleaning.

**Caution:** Be sure not to install filter in inverted position.



CABIN SYSTEM AIR FILTER REMOVAL

22178

## CARE AND MAINTENANCE

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### HOSE INSPECTION

Inspect hoses regularly to ensure efficient, economical and safe operation of the engine and related equipment.

### LUBRICATION

Grease all lubrication points during scheduled maintenance. For heavy loads or extended use, lubricate more often. Refer to the end of this chapter or to Maintenance Manual, section 24 for information on lubrication.

### PRE-STARTING INSPECTION

#### WITH ENGINE STOPPED:

Inspect hoses for leaks. Carefully inspect all fittings, clamps and ties. To prevent chafing, make sure hoses are not touching shafts, couplings, heated surfaces, sharp edges or other parts. Since hose clamps and ties can vibrate loose or fail over time, inspect frequently and tighten or replace as necessary.

Check for loose nuts and bolts. Visually inspect safety of compartment door latches. Test operation of all exterior lights.

**Caution:** All hose clamps of 1 3/8" ID and over, used on the heating and cooling systems, are of the "Constant-torque" type. This type of clamp is designed to automatically adjust its diameter to compensate for the normal expansion/contraction of a hose and metal connection that occurs during vehicle operation and shutdown. A torque wrench should be used for proper installation. The recommended torque is 90 to 100 lbf-in. (10 to 11 N·m). The hose clamps will break if over-torqued and cause loss of coolant. Do not over-tighten, especially during cold weather when hose has contracted.

#### Leaks

Check for leaks under vehicle and in compartments.

Correct leaking hoses immediately. Failure to correct leaks can cause severe damage to the equipment, as well as increase operating costs due to lost fluids. Treat fuel and oil leaks as an immediate fire hazard.

**Warning:** Fire hazard - personal injury and property damage may result from fire caused by leaking flammable fluids.

### Hose Service Life

Hoses have a limited service life. Thoroughly inspect hoses annually. Look for surface damage or indications of twisted, worn, crimped, cracked or leaking lines. Replace damaged hoses immediately.

Hoses should be replaced during major overhaul or after a maximum of five years service. Make sure replacement hoses match the original equipment manufacturer's specifications.

### Wheels And Tires

Check for loose wheel nuts. Both aluminum alloy and steel wheel nuts should be tightened to 450 to 500 foot-pounds (610 to 680 Nm.) torque.

Keep the tires inflated to the recommended inflation pressure to prolong tire life and for safety.

**Note:** Recommended tire inflation pressures are given in the "Coach Final Record", placed in the technical publications package supplied with the vehicle. The cold tire inflation pressures are on the Department of Transport certification plate located on the L.H. console besides the driver's seat.

**Warning:** Do not exceed maximum inflation pressure. Incorrect tire pressure increases tire wear and could lead to loss of driving control because of reduced road handling. Check tire pressure regularly.

### Doors

Close all exterior doors and windows. Check for good tightness and fit.

### Tools And Spares

Make sure the vehicle is equipped with a wheel nut wrench, door keys, spare belts, reflectors and jack.

### Air System

To purge water from air and accessory tanks, open drain cocks. Close drains when completed. Refer to heading "Air Tank Purge" in this chapter.

### Water Separator

To purge water separator, loosen bleed screw. Tighten bleed screw after purging.

**Coolant Level**

Check coolant level. Coolant level is correct when visible in the filler neck of the surge tank. If coolant level is low, fill system with 50-50 coolant mixture. Refer to the vehicle "Maintenance Manual" for more information.

**Warning:** Hot engine coolant is under pressure. Do not attempt to open the coolant filler cap when the engine is hot. Allow engine to cool before adding coolant.

**Wheel Bearings**

Check wheel bearing cover for overheating (especially after brake work) during fuel stops by touching the wheel bearing cover.

**Windshield Washer Reservoir**

Make sure windshield washer reservoir is full. For cold weather, use antifreeze windshield washer fluid.

**Engine Oil**

Check engine oil level during fuel stops. It is normal for diesel engines to burn some oil. If the oil level is low, refer to heading "Engine Oil Level" in this chapter.

**Warning:** Check the engine oil level with vehicle parked on a level surface and with the parking brake engaged.

**Power Steering Oil Tank**

Check steering oil level. Refer to heading "Power Steering Fluid Level" in this chapter.

**Belts**

Check for loose, worn or broken belts.

**Belt Tension Adjustment**

Check belt tension using a pressure gauge. Refer to heading "Belt Tension Adjustment" in "Other Verifications" section in this chapter.

**Fire Extinguishers**

Check fire extinguishers to make sure they are ready for operation. Refer to heading "Fire Extinguishers" in "Other Verifications" section in this chapter.

**Emergency Exits**

Verify emergency exits for correct operation.

**Driver's Section**

Adjust driver's mirrors and seat.

**WITH ENGINE RUNNING:****Leaks**

Walk around vehicle and listen for air leaks.

**Turbocharger**

Check for leaks and listen for unusual sounds coming from the turbocharger.

**Automatic Transmission**

Check automatic transmission oil level. Refer to heading "Automatic Transmission Oil Level" in this chapter.

**Gauges And Buzzers**

Perform a telltale light test (see "Controls and Instruments" chapter). Make sure gauges are in normal operating condition. Indicator lights and buzzers should all be *OFF* before driving.

**Fuel Level**

Make sure fuel level is sufficient.

**Service Brakes**

Check for correct pressure build-up. Pressure loss should not exceed 3 psi/minute (21 kPa/minute) with engine stopped and without brake applied. Perform a full brake application. Air loss should not exceed 7 psi/minute (48 kPa/minute).

**Brake Test**

Release parking and emergency brakes. Pump service brake pedal until air pressure drops to 65 psi (448 kPa). Make sure the warning buzzer operates and that the emergency brakes apply (the control valve knob lifts up). Allow air pressure to reach 95 psi (655 kPa) before releasing parking brake.

## CARE AND MAINTENANCE

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### Parking And Emergency Brake Test

Driving the vehicle while the parking brake is applied should not be possible.

### FIRST SERVICE ON NEW VEHICLE

**Note:** Refer to Maintenance Manual for precise service schedule.

### ENGINE OIL

Preliminary oil change is not required since the engine has been test-run at the factory. Change oil and filter every 12,500 miles (20 000 km) or once a year, whichever comes first.

### ALLISON TRANSMISSION OIL FILTER

Replace automatic transmission fluid and oil filter cartridge after first 5,000 miles (8 000 km) and then every 12,500 miles (40 000 km).

### COOLANT SYSTEM STRAINER

The coolant system strainer is designed to recover the soldering residues trapped inside the coolant lines during their initial assembly. Clean strainer after first 3,000 miles (5 000 km) and then every 50,000 miles (80 000 km). Refer to the Maintenance Manual under section 05: Cooling System.

**Note:** If soldering has been performed on cooling system, clean strainer after 3,000 miles (5 000 km).

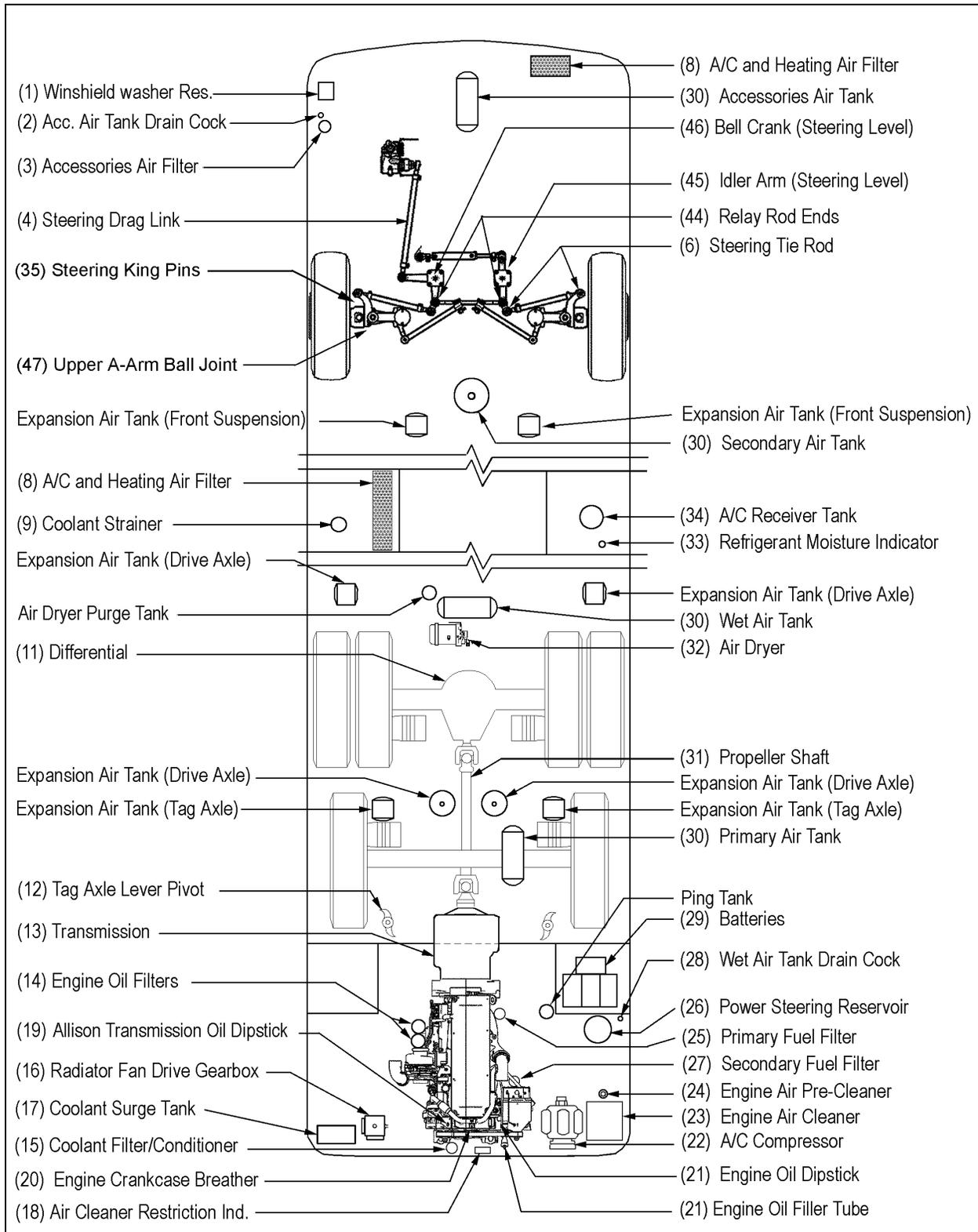
### GENERAL RECOMMENDATIONS

- Understand basic principles of vehicle operation;
- Always maintain the vehicle in good running condition;
- Do not drive with low fuel. If the fuel tank runs dry, the engine will not start until the air

is bled from the fuel system. Refer to "Maintenance Manual" for more information;

- Allow engine to run for at least two minutes at slow idle before shutting *OFF*;
- Engine should be at idle when shifting from neutral (N) to forward (D) or from neutral (N) to reverse (R);
- The automatic transmission does not have a park (P) position. Place transmission in neutral (N) position and apply parking brake when the vehicle is stopped. A warning buzzer will sound if the engine is stopped and the parking brake has not been applied when foot pressure is removed from the brake pedal;
- Always follow the procedures described in this manual;
- Unless stated otherwise, shut *OFF* the engine before performing all servicing, lubrication and maintenance tasks;
- Do not attempt to push or pull-start a vehicle equipped with an automatic transmission;
- The vehicle may be damaged if towed with the axle shafts or driveshaft connected. Do not push or pull-start the vehicle in first or reverse gears;
- Two chemical fire extinguishers are stored near the back of the driver's seat. In case of fire, immediately evacuate all occupants. Human life safety is the first priority. Do not attempt to extinguish the fire if there is immediate danger or risk for personal injury;
- When driving on ice and snow, accelerate and decelerate gradually;

**Warning:** Report all problems affecting passenger or driver safety to your service center or an authorized service center. Have problems corrected immediately.



LUBRICATION AND SERVICING POINTS ON INDEPENDENT FRONT SUSPENSION VEHICLES (TYPICAL)

24025

## CARE AND MAINTENANCE

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### WALK-AROUND INSPECTION (BEFORE EVERY TRIP)

It is a good practice to make a basic visual inspection of key areas on the vehicle before every trip and to report any problem areas to your PREVOST service center or a PREVOST-authorized authorized service center.

#### Outside The Vehicle

ITEM*	DESCRIPTION
---	Check for leaks under vehicle and in engine compartment
---	Check that baggage and service compartment doors are properly closed
---	Inspect tires and wheels for correct tire pressure, wear or damage and for missing wheel studs and nuts
1	Check windshield washer fluid level and add if necessary
---	Check condition of windshield wiper blades
---	Verify proper operation of all road lights, signal lights, brake lights, marker lights and back up lights; Replace light bulbs as required
2, 28	Drain accumulated water in accessory and wet air tanks

#### Engine Compartment

ITEM*	DESCRIPTION
21	Check engine crankcase oil level; Add if necessary
13, 19	Check transmission oil level (can be checked from push-button shift selector); Add if necessary
26	Check power steering reservoir fluid level; Add if necessary
17	Check coolant surge tank fluid level; Add if necessary
25	Drain accumulated water in primary fuel filter/water separator (if equipped)
18, 23	Check air cleaner restriction indicator; Replace air cleaner when red signals locks in full view

#### Inside The Vehicle

ITEM*	DESCRIPTION
---	Check for proper operation of the entrance door
---	Check that emergency exit windows and roof escape hatches can be opened, then close all windows and hatches securely
---	Verify proper operation of windshield wiper/washer
---	Adjust mirrors for adequate rear view vision
---	Start engine and check for proper operation of all gauges and indicator lights
---	Check for proper operation of electric and air horns and back up alarm
---	Perform brake test. Check both primary and secondary pressure gauges

\* Item numbers refer to figure on lubrication and servicing points in this chapter.

**LUBRICATION AND SERVICING SCHEDULE**

Service every 6,250 miles (10 000 km) or twice a year, whichever comes first.

ITEM*	DESCRIPTION	REMARKS	LUBRICANT &/OR PART**
23	Engine Air Cleaner	Inspect and replace element if required	Filter: #530197
24	Engine Air Pre-Cleaner	Check discharge tube	-----
22	A/C Compressor	Check oil level, add if necessary	Polyolester Oil
34	A/C Receiver Tank	Check refrigerant level, add if necessary	HFC 134a
33	Refrigerant Moisture Indicator	Replace filter dryer unit according to moisture indicator (as needed)	Filter: #950332
11	Differential	Check oil level, add if necessary	Multigrade gear oil
16	Radiator Fan Drive Gearbox	Check oil level, add if necessary	Mobil SHC 630
31	Propeller Shaft	Grease one fitting on each universal joint and one fitting on slip joint	Multi purpose grease
12	Tag Axle Lever Pivot	Grease one fitting on each pivot	Multi purpose grease
4	Drag Link Ends	Grease one fitting at each end	Multi purpose grease
35	Steering King Pins	Grease fitting	Multi purpose grease
44	Relay Rod Ends	Grease one fitting at each end	Multi purpose grease
47	Upper A-Arm Ball Joint	Grease one fitting at each end	Multi purpose grease
6	Steering Tie Rod Ends	Grease one fitting at each end	Multi purpose grease
45	Idler Arm	Grease fitting	Multi purpose grease
46	Bell Crank	Grease fitting	Multi purpose grease
---	Drive belts	Check for wear and cracks	-----

\* Item numbers refer to figure on lubrication and servicing points in this chapter.

\*\* See end of this section for lubricant and part number specifications.

## CARE AND MAINTENANCE

Service every 12,500 miles (20 000 km) or once a year, whichever comes first.

ITEM*	DESCRIPTION	REMARKS	LUBRICANT &/OR PART**
13	Allison transmission	Change fluid and filters (if containing non-TranSynd fluid).	Dexron-IIe or Dexron-III
14	Engine Oil Filters	Change oil and filters	Engine oil: SAE 15W40, API C14 Filters: #510458
25, 27	Fuel Filters	Change primary and secondary fuel filters (Fill with clean fuel before installation)	Primary: #510137 Prim. w/sep.: #531390 Secondary: #510128
15	Coolant Filter/Conditioner	Replace element	Filter: #550630
17	Coolant Surge Tank	Test coolant solution	-----
30	Air Tanks	Drain accumulated water from all tanks	-----
8	A/C and Heating Air Filters	Clean or replace two elements (twice a year)	Driver's: #871049 Passenger's: #871051

Service Every 50,000 Miles (80 000 Km) Or Once A Year, Whichever Comes First.

ITEM*	DESCRIPTION	REMARKS	LUBRICANT &/OR PART**
16	Radiator Fan Drive Gearbox	Change oil	Mobil SHC 630
26	Power Steering Reservoir	Replace oil filter cartridge element	Cartridge: #660987
13	Allison Transmission	Change fluid and filters (if containing 100% TranSynd fluid only). †	Fluid: Castrol TranSynd™ Filters: #571709
9	Coolant Strainer	Check and clean, change cartridge if required. ††	Cartridge: #871029
20	Engine Crankcase Breather	Clean breather steel mesh	-----
---	Hoses	Thoroughly inspect all hoses	-----

\* Item numbers refer to figure on lubrication and servicing points in this chapter.

\*\* See end of this section for lubricant and part number specifications.

† When the transmission contains a mixture of fluids (defined as the quantity of non-TranSynd fluid remaining in the transmission after a fluid change combined with the quantity of TranSynd required to fill the transmission to the proper level), perform the fluid and filter change at 25,000 miles (40 200 Km) or 1 year, whichever comes first.

†† If soldering has been performed on the system, clean strainer after 3,000 miles (5 000 Km).

## CARE AND MAINTENANCE

Service every 100,000 miles (160 000 km) or once every two years, whichever comes first.

ITEM*	DESCRIPTION	REMARKS	LUBRICANT &/OR PART**
11	Differential	Change oil; Clean breathers	Multigrade gear oil
3	Accessories Air Filter	Change filter element	Filter: #641252
32	Air Dryer	Change cartridge	Cartridge: #3097369

### Miscellaneous service

ITEM*	DESCRIPTION	REMARKS	LUBRICANT &/OR PART**
15, 17	Cooling System	Drain, flush and refill every two years or 200,000 miles (320 000 km) whichever comes first	Engine coolant
29	Battery Terminals	Clean and coat terminals yearly	Battery terminal coating
---	Discharge Tubes***	Every three months: Check 2 condenser's discharge tubes Check 6 evaporator's discharge tubes Check 2 front discharge tubes	-----

\* Item numbers refer to figure on lubrication and servicing points in this chapter.

\*\* See end of this section for lubricant and part number specifications.

\*\*\* Discharge tubes are rubber tubes located under vehicle.

## CARE AND MAINTENANCE

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### LUBRICANT SPECIFICATIONS

ITEM*	DESCRIPTION	SPECIFICATIONS
21	Engine Oil	SAE Viscosity Grade: 15W40 API Classification: CI4
26	Power Steering Oil	Automatic Transmission Oil (Dexron-IIE or Dexron-III)
17	Engine Coolant	Phosphorous and nitrates free coolant in order to meet specification 7SE298 or TMC RP-329 TYPE A. 50% antifreeze/water solution is normally used. Detroit Diesel Power Cool or Prestone Heavy Duty.
22	A/C Compressor Oil	Polyolester Oil, HFC 134a compatible: Large capacity A/C: Castrol SW-68 (POE) or equivalent Small capacity A/C: ZXL100PG (PAG)
11	Differential Oil	Multigrade gear oil meeting MIL-L-2105-D: 85W140 If temperature drops below 10°F (-12°C), 80W90 should be used, and below -15°F (-26°C), 75W90 should be used. (In extreme conditions or for better performance, full synthetic gear oil can be used.)
16	Fan Gearbox Oil	Mobil SHC 630
13	Allison Transmission Oil	Dexron-IIE, Dexron-III or Castrol TranSynd
---	Multi Purpose Grease	Good quality lithium-base grease: NLGI No.2 Grade is suitable for most temperatures NLGI No.1 Grade is suitable for extremely low temperatures

\* Item numbers refer to figure on lubrication and servicing points in this chapter.



## TECHNICAL INFORMATION

DIMENSIONS AND WEIGHTS	
Overall length (over bumpers)	45' 8" (13.9 m)
Overall width	102" (2.59 m)
Overall height (normal ride height)	146 ¼" (3.715 m)
Wheelbase (center of front axle to center of drive axle)	316 ¼" (8.033 m)
Floor height from ground	63" (1.6 m)
Ground clearance	11" (280 mm)
Step height from ground	14" (356 mm)
Headroom	77" (1.956 m)
Entrance door opening width	27" (686 mm)
Front overhang	76" (1.93 m)
Rear overhang	108 ¼" (2.749 m)
Front track	84.4" (2.145 m)
Drive track	76.7" (1.949 m)
Rear track (tag axle)	83.6" (2.124 m)
Turning circle radius	42' (12.8 m)
Curb weight (before conversion)	31,990 lbs (14 540 Kg)
Gross Vehicle Weight Rating (G.V.W.R.)	54,500 lbs (23 665 kg)
Front axle Gross Axle Weight Rating (G.A.W.R.)	18,000 lbs (7 500 kg)
Drive axle G.A.W.R.	22,500 lbs (10 230 kg)
Tag axle G.A.W.R.	14,000 lbs (6 365 kg)

**Note:** Curb weight is given as an indication only and is subject to vary from coach to coach, mostly due to optional equipment.

The Gross Vehicle Weight Rating (G.V.W.R.) and the Gross Axle Weight Rating (G.A.W.R.) for front, drive and tag axles are listed on a certification plate located on the L.H. control panel in driver's section.

CAPACITIES	
Engine oil (in crankcase)	41 US qts (39 l)
Engine oil (in reserve tank)	8.4 US qts (8.0 l)
Fuel tank (legal capacity equal to 95% of volume)	235 US gal. (890 l)
Cooling system	24 US gal. (91 l)

CAPACITIES	
Allison transmission (does not include external circuit)	6 US gal. (23 l)
Differential oil	5 US gal. (19 l)
Power steering reservoir	4 US qts (3.7 l)
A/C compressor oil	4.5 US qts (4.3 l)
Windshield washer reservoir	5 US gal. (19 l)
Refrigerant	24.1 lbs (11 kg) 6 lbs (2.75 kg) small A/C

### FUEL TYPE

ASTM specification ..... D-975  
 Recommended grade ..... 1-D  
 Acceptable grade ..... 2-D

### WHEELS AND TIRES

Drive Axle Steel wheels ..... 9" X 22½"  
 Drive Axle Aluminum forged wheels ... 9" X 22½"  
 Drive Axle Super Single Aluminum forged wheels ..... 14" X 22½"  
 Drive Axle Tires..... 315/80 R 22½"  
 Drive Axle Super Single Tires ..... 455/55 R 22½"  
 Tag & Front Axle Wheels ..... 10½" X 22½"  
 Tag & Front Axle Tires ..... 365/70 R 22½"

### RECOMMENDED TIRE INFLATION PRESSURE AT MAXIMUM COLD LOAD

The maximum recommended tire inflation pressures are given in the applicable documents supplied with the vehicle. In addition, cold tire inflation pressures are listed on the Department of Transport (DOT) certification plate, affixed on the wall behind the driver's seat.

**Caution:** These tire pressures are established in accordance with the maximum allowable load on each axle. A lower pressure is recommended if the axle load is less than the above specifications. Weigh vehicle fully loaded and pressurize according to tire manufacturer's recommendations. For non standard tire and wheel specifications, see Prevost tire pressure tabulation in "Coach Final Record" or special specification chart affixed next to the DOT certification plate.

## TECHNICAL INFORMATION

**Warning:** Special tire selection may lower maximum allowable speed limit, even below posted speed limit. For maximum safety, check with tire manufacturer.

### BELTS

Use	Model	Qty
Radiator fan gearbox drive	V-Belt 3/BX-74	1
Radiator fan drive (fan)	Poly-V 12PK-2100	1
A/C system 05G compressor	BX-100	2
A/C small system Seltec compressor	V-Belt A35	1
Alternator, Delco	Poly-V 10/2232	1

### ENGINE

Power is provided by a Detroit Diesel DDEC V Series 60 engine, displacing 14 liters. The engine is an inline six cylinder, four stroke, turbocharged, air to air charge cooled, diesel engine with an overhead camshaft and four valves per cylinder.

Rated horsepower.....515 HP @ 1,800 rpm  
 Peak torque..... 1,650 lbf•ft @ 1,200 rpm  
 Operating range ..... 1,200 – 2,100 rpm

### ALLISON WORLD TRANSMISSION

Allison WT B500 (B500R with the optional output retarder) electronically controlled six speed automatic transmission.

#### Gear Ratios

1<sup>st</sup> .....3.510  
 2<sup>nd</sup> .....1.906  
 3<sup>rd</sup> .....1.429  
 4<sup>th</sup> .....1.000  
 5<sup>th</sup> .....0.737  
 6<sup>th</sup> .....0.639  
 Reverse.....4.801  
 Converter.....1.578  
 Drive axle ratio .....4.30  
 Drive axle ratio (optional) .....4.56  
 Drive axle ratio (optional) .....4.88

### BRAKES

The features of the braking system include a dual system where the front and rear circuits are completely independent from each other. The brakes are air operated disc type brakes with

automatic slack adjusters on front, drive and tag axles. The emergency/parking brakes are located on the drive and tag axles only.

### BRAKE CHAMBER EFFECTIVE AREA

Front axle (IFS) .....24 in<sup>2</sup>  
 Front axle (I-Beam) .....24 in<sup>2</sup>  
 Drive axle .....24/24 in<sup>2</sup> (service / emergency)  
 Tag axle ..... 14/16 in<sup>2</sup> (service / emergency)

### AIR SYSTEM

Compressed air is provided by a 15.8 cfm Bendix-Westinghouse BA921, one cylinder, gear-driven, water-cooled and engine oil lubricated air compressor.

Other features and components of the air system include an air dryer and nylon color-coded air lines.

### ANTILOCK BRAKING SYSTEM (ABS)

The antilock braking system has one Electronic Control Unit (ECU) controlling a four channel system. A wheel slip sensor is mounted at each front axle and drive axle wheel. The Tag axle wheels are slave to the drive axle wheels.

The Electronic Control Module (ECM) is maintenance free. Its operating voltage is 24 ± 6 volts DC. The thermal operating range for the ECM is from -40 to 167°F (-40 to 75°C).

The solenoid control valves are maintenance free. Their operating voltage is 24 (+4.8, -2.4) volts DC. The rated current draw is 1.65 amps. The thermal operating range of the solenoid control valves is from -40 to 176°F (-40 to 80°C).

### TROUBLESHOOTING AND TESTING

For troubleshooting and testing of the vehicle's anti-lock braking system, refer to Meritor-WABCO Maintenance Manual MM-0112 "Anti-Lock Braking System For Trucks, Tractors and Buses" or use dashboard Message Center Display (MCD) Diagnostic Mode under ECU Diagnostic: "Brakes".

### STEERING

- Tilt steering wheel and telescopic steering column;
- Integral hydraulic assisted steering gear;
- System pressure: 2175 psi (150 bars);

**ELECTRICAL SYSTEM**

- 24 volt, negative ground;
- 12 volt exterior lighting;
- Twin 28 volt, 140 amp, self-regulated, belt-driven, air-cooled Bosch alternators;
- Four 12 volt, group 31 format maintenance-free batteries connected in series/parallel. Cold cranking capacity is 1900 amps with a reserve capacity of 195 minutes;
- 100 amp battery equalizer;

**SUSPENSION**

Goodyear rolling lobe type air springs (bellows) are used throughout.

**FRONT AXLE**

- 2 Bellows (14.5");
- 2 Shock absorbers;
- 4 Radius rods;
- 1 Transverse radius rod;
- 1 Height control valve;
- 1 Anti-roll bar, 2" diameter.

**DRIVE AXLE**

- 4 Bellows (11");
- 4 Shock absorbers;
- 3 Radius rods;
- 2 Height control valves;
- 1 Panhard rod
- 1 Anti-roll bar, 1½" diameter

**TAG AXLE**

- 2 Bellows (11");
- 2 Shock absorbers;
- 3 Radius rods;
- 1 Panhard rod.

**ALIGNMENT**

FRONT AXLE (INDEPENDENT FRONT SUSPENSION)						
Load	Minimum value		Nominal value		Maximum value	
	Non-converted	Converted	Non-converted	Converted	Non-converted	Converted
Right camber (degrees)	0.2	-0.150	0.35	0.0	0.55	0.200
Left camber (degrees)	0.2	-0.150	0.35	0.0	0.55	0.200
Right caster (degrees)	2.55		2.8		3.05	
Left caster (degrees)	2.55		2.8		3.05	
Total toe-in (degrees)	0.08		0.13		0.17	

**ALIGNMENT SPECIFICATIONS**

Use wheel alignment systems which work with angle measurements only, such as Josam or Hunter systems. Alignment specifications are listed in the following tables:

DRIVE AXLE			
	Minimum value	Nominal value	Maximum value
Thrust angle (degrees)	-0.04	0	0.04

TAG AXLE			
	Minimum value	Nominal value	Maximum value
Parallelism (degrees)*	-0.02	0	0.02
(*) Use the drive axle as reference			

**HEATING AND AIR CONDITIONING**

Two air conditioning systems are available: the large capacity (central A/C) or the small capacity A/C (also known as driver's air). Vehicles equipped with the large capacity A/C benefit

## TECHNICAL INFORMATION

from a combination heating and cooling system that provides adequate capacity of conditioned and filtered air for all climatic conditions. Fresh air is drawn into the system from the left (driver's) side of the vehicle. Return air is taken from the middle of the vehicle. The driver's heater and defogger are controlled separately from the central unit. An air mixture selector enables air to be drawn into the system from outside the vehicle or recirculated. Driver's air provides cooling for the driver's area only, maximizing available baggage space for other uses. The small capacity A/C enables cooling the driver's area only.

SMALL CAPACITY A/C	
Air conditioning capacity	2 tons
Refrigerant type	134a
Air flow	450 cfm (12,7 m <sup>3</sup> /min)

COMPRESSOR (For small capacity A/C)	
Number of cylinders	6
Operating speed	700 to 6 000 rpm
Oil capacity	6.0 U.S. oz (0,18 l)
Approved oil	ZXL100PG (PAG)

LARGE CAPACITY A/C	
Air conditioning capacity	7.5 tons
Refrigerant type	134a
Heating capacity	152 000 Btu/h
Air flow	2 600 cfm (73,6 m <sup>3</sup> /min)

COMPRESSOR (For large capacity A/C)	
Number of cylinders	6
Operating speed	400 to 2 200 rpm (1,750 rpm, nominal)
Minimum speed for lubrication	400 rpm
Oil capacity	4.5 U.S. qts (4,3 l)
Approved oil	Castrol SW-68 (POE)

**Note:** The above oils are suitable for use with reciprocating compressors using refrigerant R-134a and with evaporator temperatures above -40°F (-40°C).

## OIL SPECIFICATIONS

### ENGINE

Heavy-duty engine oil SAE 15W-40 meeting API classification CI-4.

### ALLISON TRANSMISSION

The Allison transmission must be filled with *Dexron IIE*, *Dexron II*, *Castrol TranSyndI* or automatic transmission fluid or any equivalent Class C4 hydraulic fluid.

### DIFFERENTIAL

Multigrade gear oil meeting MIL-L-2105-D: 85W140 is recommended for use in drive axle. This lubricant performs well over a broad temperature range, providing good gear and bearing protection in a variety of climates. If temperature drops below 10°F (-12°C), 80W90 should be used, and below -15°F (-26°C), 75W90 should be used. In extreme conditions or for better performance, full synthetic gear oil should be used.

### FAN GEARBOX

Only Mobil SHC 630 synthetic oil (Prevost #180217) is recommended for the fan gearbox.

### POWER STEERING RESERVOIR

Use Dexron IIE or Dexron III automatic transmission fluid for this system.

## DDEC V DIAGNOSTIC CODES

To read the diagnostic codes, a Diagnostic Data Reader should be plugged into the receptacle located on the lower side panel of the L.H. control panel. To read diagnostic codes as blink codes, momentarily depress the STOP ENGINE OVERRIDE switch while the ignition is ON, the engine is idling or shut off. Active codes will be flashed on the STOP ENGINE indicator light followed by the inactive codes being flashed on the CHECK ENGINE indicator light. The cycle is repeated until the operator depresses the STOP ENGINE OVERRIDE switch again. For example: code "43" consists of four flashes, followed by a short pause, then another three flashes in quick succession. The following table is a list of the DDEC diagnostic codes.

**TECHNICAL INFORMATION**

<b>DDEC V Code</b>	<b>PID</b>	<b>SID</b>	<b>FMI</b>	<b>DESCRIPTION</b>
11	187	--	4	Variable Speed Governor Sensor Voltage Low
11	187	--	7	Variable Speed Governor Switch System Not Responding
12	187	--	3	Variable Speed Governor Sensor Voltage High
13	111	--	4	Coolant Level Sensor Input Voltage Low
13	111	--	6	Add Coolant Level Sensor Input Voltage Low
13		146	6	EGR Valve Current too High
14	52	--	3	Intercooler Coolant Temperature Sensor Input Voltage High
14	110	--	3	Coolant Temperature Sensor Input Voltage High
14	175	--	3	Oil Temperature Sensor Input Voltage High
15	52	--	4	Intercooler Coolant Temperature Sensor Input Voltage Low
15	110	--	4	Coolant Temperature Sensor Input Voltage Low
15	175	--	4	Oil Temperature Sensor Input Voltage Low
16	111	--	3	Coolant Level Sensor Input Voltage High
16	111	--	5	Add Coolant Level Sensor Input Voltage High
16		146	5	EGR Valve Current too Low
17	51	--	3	Throttle Plate Position Sensor Input Voltage High
17	72	--	3	Blower Bypass Position Input Voltage High
17	354	--	3	Relative Humidity Sensor Circuit Failed High
18	51	--	4	Throttle Plate Position Sensor Input Voltage Low
18	72	--	4	Blower Bypass Position Input Voltage Low
18	354	--	4	Relative Humidity Sensor Circuit Failed Low
21	91	--	3	Throttle Position Sensor Input Voltage High
22	91	--	4	Throttle Position Sensor Input Voltage Low
23	174	--	3	Fuel Temperature Sensor Input Voltage High
23	--	65	3	Oxygen Content Circuit Input Voltage High
24	174	--	4	Fuel Temperature Sensor Input Voltage Low
24	--	65	4	Oxygen Content Circuit Input Voltage Low
25	--	--	--	Reserved for "No Codes"
26	--	25	11	Aux. Shutdown #1 Active
26	--	61	11	Aux. Shutdown #2 Active
27	105	--	3	Intake Manifold Temperature Sensor Input Voltage High
27	171	--	3	Ambient Air Temperature Sensor Input Voltage High
27	172	--	3	Air Temperature Sensor Input Voltage High
28	105	--	4	Intake Manifold Temperature Sensor Input Voltage Low

## TECHNICAL INFORMATION

DDEC V Code	PID	SID	FMI	DESCRIPTION
28	171	--	4	Ambient Air Temperature Sensor Input Voltage Low
28	172	--	4	Air Temperature Sensor Input Voltage Low
29	351	—	4	TCI Temperature Circuit Failed Low
29	404	—	4	Turbo Compressor Temperature Out Sensor Input Voltage Low
31	--	51	3	Aux. Output #3 Open Circuit (High Side) – Pin E-49
31	--	51	4	Aux. Output #3 Short To Ground (High Side) – Pin E-49
31	--	51	7	Aux. Output #3 Mechanical System Fail - Pin E-49
31	--	52	3	Aux. Output #4 Open Circuit (High Side) - Pin E-48
31	--	52	4	Aux. Output #4 Short to Ground (High Side) - Pin E-48
31	--	52	7	Aux. Output #4 Mechanical System Failure - Pin E-48
31	--	260	3	Aux. Output #12 Open Circuit (High Side) - Pin E-46
31	--	260	4	Aux. Output #12 Short to Ground (High Side) - Pin E-46
31	--	260	7	Aux. Output #12 Mechanical System Failure - Pin E-46
31	--	261	3	Aux. Output #13 Open Circuit (High Side) - Pin E-47
31	--	261	4	Aux. Output #13 Short to Ground (High Side) - Pin E-47
31	--	261	7	Aux. Output #13 Mechanical System Failure - Pin E-47
31	--	262	3	Aux. Output #14 Open Circuit (High Side) - Pin E-50
31	--	262	4	Aux. Output #14 Short to Ground (High Side) - Pin E-50
31	--	262	7	Aux. Output #14 Mechanical System Failure - Pin E-50
31	--	263	3	Aux. Output #15 Open Circuit (High Side) - Pin E-51
31	--	263	4	Aux. Output #15 Short to Ground (High Side) - Pin E-51
31	--	263	7	Aux. Output #15 Mechanical System Failure - Pin E-51
31	--	264	3	Aux. Output #16 Open Circuit (High Side) - Pin E-52
31	--	264	4	Aux. Output #16 Short to Ground (High Side) - Pin E-52
31	--	264	7	Aux. Output #16 Mechanical System Failure - Pin E-52
31	--	265	3	Aux. Output #17 Open Circuit (High Side) - Pin E-53
31	--	265	4	Aux. Output #17 Short to Ground (High Side) - Pin E-53
31	--	265	7	Aux. Output #17 Mechanical System Failure - Pin E-53
32	--	238	3	RSL Short to Battery (+)
32	--	238	4	RSL Open Circuit
32	--	239	3	AWL Short to Battery (+)
32	--	239	4	AWL Open Circuit
33	102	--	3	Turbo Boost Pressure Sensor Input Voltage High
34	102	--	4	Turbo Boost Pressure Sensor Input Voltage Low
35	19	--	3	High Range Oil Pressure Sensor Input Voltage High
35	100	--	3	Oil Pressure Sensor Input Voltage High
36	19	--	4	High Range Oil Pressure Sensor Input Voltage Low

**TECHNICAL INFORMATION**

<b>DDEC V Code</b>	<b>PID</b>	<b>SID</b>	<b>FMI</b>	<b>DESCRIPTION</b>
36	100	--	4	Oil Pressure Sensor Input Voltage Low
37	18	--	3	High Range Fuel Pressure Sensor Input Voltage High
37	94	--	3	Fuel Pressure Sensor Input Voltage High
37	95	--	3	Fuel Restriction Sensor Input Voltage High
38	18	--	4	High Range Fuel Pressure Sensor Input Voltage Low
38	94	--	4	Fuel Pressure Sensor Input Voltage Low
38	95		4	Fuel Restriction Sensor Input Voltage Low
39	—	146	2	EGR Leak- Boost Power
39	—	146	12	EGR Leak- Boost Jake
39	—	146	7	EGR Valve Not Responding
39	—	147	2	VNT Vanes Not Responding – Boost Power
39	—	147	11	VNT Vanes at Max – Jake
39	—	147	12	VNT Vanes Not Responding – Boost Jake
39	—	147	14	EGR Flow too low
39	—	147	7	VNT Vanes Not Responding – EGR
41	--	21	0	Too Many CKP Sensor (missing CMP Sensor)
42	--	21	1	Too few CKP Sensor (missing CKP Sensor)
43	111	--	1	Coolant Level Low
44	52	--	0	Intercooler Coolant Temperature High
44	105	--	0	Intake Manifold Temperature High
44	105	--	14	Engine Power Derate Due to Intake Manifold Temperature
44	110	--	0	Coolant Temperature High
44	110	--	14	Engine Power Derate Due to Coolant Temperature
44	172	--	0	Air Inlet Temperature High
44	175	--	0	Oil Temperature High
45	19	--	1	High Range Oil Pressure Low
45	100	--	1	Oil Pressure Low
46	168	--	1	ECM Battery Voltage Low
46	--	155		Injector V (reg) Voltage Failed Low
46	--	211	1	Sensor Supply Pins V-11/V-12 Low
46	--	212	4	Injector V (slope) Voltage Failed Low
46	--	214	1	RTC Backup Battery Voltage Low, Pin E-59
46	--	221	4	Injector I (pull-in) Voltage Failed Low
46	--	232	1	Sensor Supply Voltage Low, Pin E-12/E-26
47	18	--	0	High Range Fuel Pressure High
47	94	--	0	Fuel Pressure High
47	102	--	0	Turbo Boost Pressure High

## TECHNICAL INFORMATION

DDEC V Code	PID	SID	FMI	DESCRIPTION
47	102	--	14	Engine Power Derate Due to Turbo Boost Pressure
47	106	--	0	Air Inlet Pressure High
47	164	--	0	Injection Control Pressure High
48	18	--	1	High Range Fuel Pressure Low
48	94	--	1	Fuel Pressure Low
48	106	--	1	Air Inlet Pressure Low
48	164	--	1	Injection Control Pressure Low
48	351	--	1	TCI Temperature Low
48	404	—	1	Turbo Compressor Temperature Out Low
48	404	--	14	Engine Power Derate Due to Turbo Compressor Out Temperature
48	411	--	1	EGR Differential Pressure Low
48	412	--	1	EGR Temperature Low
49	351	--	0	TCI Temperature High
49	404	--	0	Turbo Compressor Out Temperature High
51	351	--	3	TCI Temperature Circuit Failed High
51	404	--	3	Turbo Compressor Out Temperature Sensor Input Voltage High
52	--	254	12	A/D Conversion Fail
53	--	253	2	Nonvolatile Checksum Incorrect
53	--	253	12	EEPROM Write Error
53	--	253	13	Out of Calibration
54	84	--	12	Vehicle Speed Sensor Fault
55	--	216	14	Other ECU Fault (This fault is logged in conjunction with another fault to indicate missing information from another ECU.)
55	--	231	12	J1939 Data Link Fault
55	--	248	8	Proprietary Data Link Fault (Master)
55	--	248	9	Proprietary Data Link Fault (Receiver)
56	--	250	12	J1587 Data Link Fault
57	--	249	12	J1922 Data Link Fault
58	92	--	0	Torque Overload
61	--	xxx	0	Injector xxx Response Time Long
62	--	26	3	Aux. Output #1 Short to Battery (+) – Pin V-4
62	--	26	4	Aux. Output #1 Open Circuit - Pin V-4
62	—	26	7	Aux. Output #1 Mechanical System Not Responding Properly - Pin V-4
62	--	40	3	Aux. Output #2 Short to Battery (+) - Pin V-5
62	--	40	4	Aux. Output #2 Open Circuit - Pin V-5

**TECHNICAL INFORMATION**

<b>DDEC V Code</b>	<b>PID</b>	<b>SID</b>	<b>FMI</b>	<b>DESCRIPTION</b>
62	—	40	7	Aux. Output #2 Mechanical System Not Responding Properly – Pin V-5
62	--	53	3	Aux. Output #5 Short to Battery (+) - Pin V-6
62	--	53	4	Aux. Output #5 Open Circuit - Pin V-6
62	—	53	7	Aux. Output #5 Mechanical System Not Responding Properly - Pin V-6
62	--	54	3	Aux. Output #6 Short to Battery (+) - Pin V-7
62	--	54	4	Aux. Output #6 Open Circuit - Pin V-7
62	--	54	7	Aux. Output #6 Mechanical System Not Responding Properly - Pin V-7
62	--	55	3	Aux. Output #7 Short to Battery (+) - Pin V-40
62	--	55	4	Aux. Output #7 Open Circuit - Pin V-40
62	—	55	7	Aux. Output #7 Mechanical System Not Responding Properly - Pin V-40
62	--	56	3	Aux. Output #8 Short to Battery (+) – Pin V-53
62	--	56	4	Aux. Output #8 Open Circuit - Pin V-53
62	--	56	7	Aux. Output #8 Mechanical System Not Responding Properly - Pin V-53
62	--	257	3	Aux. Output #9 Open Circuit – Pin V-54
62	--	257	4	Aux. Output #9 Short to Gnd – Pin V-54
62	--	257	7	Aux. Output #9 Mechanical System Failure – Pin V-54
62	--	258	3	Aux. Output #10 Open Circuit – Pin V-55
62	--	258	4	Aux. Output #10 Short to Gnd – Pin V-55
62	--	258	7	Aux. Output #10 Mechanical System Failure – Pin V-55
62	--	259	3	Aux. Output #11 Open Circuit – Pin E-13
62	--	259	4	Aux. Output #11 Short to Gnd – Pin E-13
62	--	259	7	Aux. Output #11 Mechanical System Failure – Pin E-13
63	--	57	0	PWM #1 Above Normal Range, Pin V-53
63	--	57	1	PWM #1 Below Normal Range, Pin V-53
63	--	57	3	PWM #1 Short to Battery (+), Pin V-53
63	--	57	4	PWM #1 Open Circuit, Pin V-53
63	--	58	0	PWM #2 Above Normal Range, Pin V-46
63	--	58	1	PWM #2 Below Normal Range, Pin V-46
63	--	58	3	PWM #2 Short to Battery (+), Pin V-46
63	--	58	4	PWM #2 Open Circuit, Pin V-46
63	--	59	0	PWM #3 Above Normal Range, Pin E-3
63	--	59	1	PWM #3 Below Normal Range, Pin E-3
63	--	59	3	PWM #3 Short to Battery (+), Pin E-3
63	--	59	4	PWM #3 Open Circuit, Pin E-3

## TECHNICAL INFORMATION

DDEC V Code	PID	SID	FMI	DESCRIPTION
63	--	60	0	PWM #4 Above Normal Range, Pin E-4
63	--	60	1	PWM #4 Below Normal Range, Pin E-4
63	--	60	3	PWM #4 Short to Battery (+), Pin E-4
63	--	60	4	PWM #4 Open Circuit, Pin E-4
63	--	267	0	PWM #5 Above Normal Range - Pin E-8
63	--	267	1	PWM #5 Below Normal Range - Pin E-8
63	--	267	3	PWM #5 Short to Battery (+) - Pin E-8
63	--	267	4	PWM #5 Open Circuit - Pin E-8
63	--	267	7	PWM #5 Mechanical System Failed - Pin E-8
63	--	268	0	PWM #6 Above Normal Range - Pin E-11
63	--	268	1	PWM #6 Below Normal Range - Pin E-11
63	--	268	3	PWM #6 Short to Battery (+) - Pin E-11
63	--	268	4	PWM #6 Open Circuit - Pin E-11
63	--	268	7	PWM #6 Mechanical System Failed - Pin E-11
64	103	--	0	Turbo Overspeed
64	103	--	8	Turbo Speed Sensor Input Failure – Abnormal Period
65	51	--	0	Throttle Plate Position Above Normal Range
65	51	--	1	Throttle Plate Position Below Normal Range
65	51	--	2	Throttle Plate Position Erratic
65	51	--	7	Throttle Plate Not Responding
65	107	--	3	Air Filter Restriction Sensor Voltage High
65	107	--	4	Air Filter Restriction Sensor Voltage Low
66	99	--	3	Oil Filter Restriction Sensor Voltage High
66	99	--	4	Oil Filter Restriction Sensor Voltage Low
66	--	76	0	Engine Knock Level Above Normal Range
66	--	76	3	Engine Knock Level Sensor Input Voltage High
66	--	76	4	Engine Knock Level Sensor Input Voltage Low
66	--	76	7	Engine Knock Level Sensor Not Responding
67	20	--	3	High Range Coolant Pressure Sensor Input Voltage High
67	20	--	4	High Range Coolant Pressure Sensor Input Voltage Low
67	106	--	3	Air Inlet Pressure Sensor Input Voltage High
67	106	--	4	Air Inlet Pressure Sensor Input Voltage Low
67	109	--	3	Coolant Pressure Sensor Input Voltage High
67	109	--	4	Coolant Pressure Sensor Input Voltage Low
68	--	230	5	TPS Idle Validation Circuit Fault (open circuit)
68	--	230	6	TPS Idle Validation Circuit Fault (short to ground)
71	--	xxx	1	Injector xxx Response Time Short

**TECHNICAL INFORMATION**

<b>DDEC V Code</b>	<b>PID</b>	<b>SID</b>	<b>FMI</b>	<b>DESCRIPTION</b>
72	84	--	0	Vehicle Overspeed
72	84	--	11	Vehicle Overspeed (Absolute)
72	--	65	0	Oxygen Content Too High
72	--	65	1	Oxygen Content Too Low
73	107	--	0	Air Filter Restriction High
73	--	77	0	Gas Valve Position Above Normal Range
73	--	77	1	Gas Valve Position Below Normal Range
73	--	77	3	Gas Valve Position Input Voltage High
73	--	77	4	Gas Valve Position Input Voltage Low
73	--	77	7	Gas Metering Valve Not Responding
74	70	--	4	Optimized Idle Safety Loop Short to Ground
74	99	--	0	Oil Filter Restriction High
75	168	--	0	ECM Battery Voltage High
75	--	155	3	Injector V (reg) Voltage Failed High
75	--	211	0	Sensor Supply Pins V-11/V-12 Voltage High
75	--	212	3	Injector V (slope) Voltage Failed High
75	--	221	3	Injector V (pull-in) Voltage Failed High
75	--	214	0	RTC Backup Battery Voltage High
75	--	232	0	Sensor Supply Voltage High, Pin E-26
76	121	--	0	Engine Overspeed With Engine Brake
77	19	—	0	High Range Oil Pressure High
77	20	—	0	High Range Coolant Pressure High
77	21	—	0	ECU Temperature Above Range
77	21	—	1	ECU Temperature Below Range
77	21	—	3	ECU Temperature Above Failed High
77	21	—	4	ECU Temperature Above Failed Low
77	72	—	0	Blower Bypass Door Position High
77	72	—	1	Blower Bypass Door Position Low
77	73	—	1	Fire Pump Pressure Low
77	81	—	0	Exhaust Back Pressure High
77	81	—	1	Exhaust Back Pressure Low
77	81	—	3	Exhaust Back Pressure Sensor Voltage High
77	81	—	4	Exhaust Back Pressure Sensor Voltage Low
77	81	—	12	Exhaust Back Pressure at Rampdown Threshold
77	95	—	1	Fuel Filter Differential Pressure Low
77	99	—	1	Oil Filter Differential Pressure Low
77	100	—	0	Engine Oil Pressure High

## TECHNICAL INFORMATION

DDEC V Code	PID	SID	FMI	DESCRIPTION
77	102	—	1	Turbo Boost Pressure Low
77	105	—	1	Inlet Manifold Temperature Low
77	107	—	1	Air filter Restriction Pressure Low
77	108	—	0	Barometric Pressure High
77	108	—	1	Barometric Pressure Low
77	109	—	0	Coolant Pressure High
77	110	—	1	Coolant Temperature Low
77	111	—	0	Coolant Level High
77	171	—	0	Ambient Air Temperature High
77	171	—	1	Ambient Air Temperature Low
77	172	—	1	Air Inlet Temperature Low
77	174	—	0	Fuel Temperature High
77	174	—	1	Fuel Temperature Low
77	175	—	1	Engine Oil Temperature Low
77	222	—	14	Anti-Theft Fault Present
77	251	—	10	Clock Module Abnormal Rate of Change
77	251	—	13	Clock Module Failure
77	252	—	10	Clock Module Abnormal Rate of Change
77	252	—	13	Clock Module Failure
77	354	—	0	Relative Humidity Above Range
77	354	—	1	Relative Humidity Below Range
77	446	—	0	Cylinder Head Temperature Above Range
77	—	151	11	Service Now Lamp Fault Expiration
78	86	--	14	Cruise Control/Adaptive Cruise Control Fault
81	98	--	3	Oil Level Sensor Input Voltage High
81	101	--	3	Crankcase Pressure Sensor Input Voltage High
81	153	--	3	Extended Crankcase Pressure Input Voltage High
81	164	--	3	Injection Control Pressure Sensor Input Voltage High
81	173	--	3	Exhaust Temperature Sensor Input Voltage High
81	411	—	3	EGR Delta Pressure Sensor Circuit Failed High
81	412	—	3	EGR Temperature Circuit Failed High
81	412	—	9	EGR Temperature Network Sensor Not Responding
81		20	3	Timing Actuator Failed High
81		20	4	Timing Actuator Failed Low
81	--	129	3	Exhaust Port Temperature #1 Sensor Voltage High
81	--	130	3	Exhaust Port Temperature #2 Sensor Voltage High
81	--	131	3	Exhaust Port Temperature #3 Sensor Voltage High

**TECHNICAL INFORMATION**

<b>DDEC V Code</b>	<b>PID</b>	<b>SID</b>	<b>FMI</b>	<b>DESCRIPTION</b>
81	--	132	3	Exhaust Port Temperature #4 Sensor Voltage High
81	--	133	3	Exhaust Port Temperature #5 Sensor Voltage High
81	--	134	3	Exhaust Port Temperature #6 Sensor Voltage High
81	--	135	3	Exhaust Port Temperature #7 Sensor Voltage High
81	--	136	3	Exhaust Port Temperature #8 Sensor Voltage High
81	--	137	3	Exhaust Port Temperature #9 Sensor Voltage High
81	--	138	3	Exhaust Port Temperature #10 Sensor Voltage High
81	--	139	3	Exhaust Port Temperature #11 Sensor Voltage High
81	--	140	3	Exhaust Port Temperature #12 Sensor Voltage High
81	--	141	3	Exhaust Port Temperature #13 Sensor Voltage High
81	--	142	3	Exhaust Port Temperature #14 Sensor Voltage High
81	--	143	3	Exhaust Port Temperature #15 Sensor Voltage High
81	--	144	3	Exhaust Port Temperature #16 Sensor Voltage High
81	—	277	9	EGR Rate Sensor not Responding
81	—	277	12	EGR Rate Sensor Failed
82	98	--	4	Oil Level Sensor Input Voltage Low
82	101	--	4	Crankcase Pressure Sensor Input Voltage Low
82	153	--	4	Extended Crankcase Pressure Input Voltage Low
82	164	--	4	Injection Control Pressure Sensor Input Voltage Low
82	173	--	4	Exhaust Temperature Sensor Input Voltage Low
82	411	—	4	EGR Delta Pressure Sensor Circuit Failed Low
82	412	—	4	EGR Temperature Circuit Failed Low
82	412	—	12	EGR Temperature Network Sensor Failed
82	--	129	4	Exhaust Port Temperature #1 Sensor Voltage Low
82	--	130	4	Exhaust Port Temperature #2 Sensor Voltage Low
82	--	131	4	Exhaust Port Temperature #3 Sensor Voltage Low
82	--	132	4	Exhaust Port Temperature #4 Sensor Voltage Low
82	--	133	4	Exhaust Port Temperature #5 Sensor Voltage Low
82	--	134	4	Exhaust Port Temperature #6 Sensor Voltage Low
82	--	135	4	Exhaust Port Temperature #7 Sensor Voltage Low
82	--	136	4	Exhaust Port Temperature #8 Sensor Voltage Low
82	--	137	4	Exhaust Port Temperature #9 Sensor Voltage Low
82	--	138	4	Exhaust Port Temperature #10 Sensor Voltage Low
82	--	139	4	Exhaust Port Temperature #11 Sensor Voltage Low
82	--	140	4	Exhaust Port Temperature #12 Sensor Voltage Low
82	--	141	4	Exhaust Port Temperature #13 Sensor Voltage Low
82	--	142	4	Exhaust Port Temperature #14 Sensor Voltage Low

## TECHNICAL INFORMATION

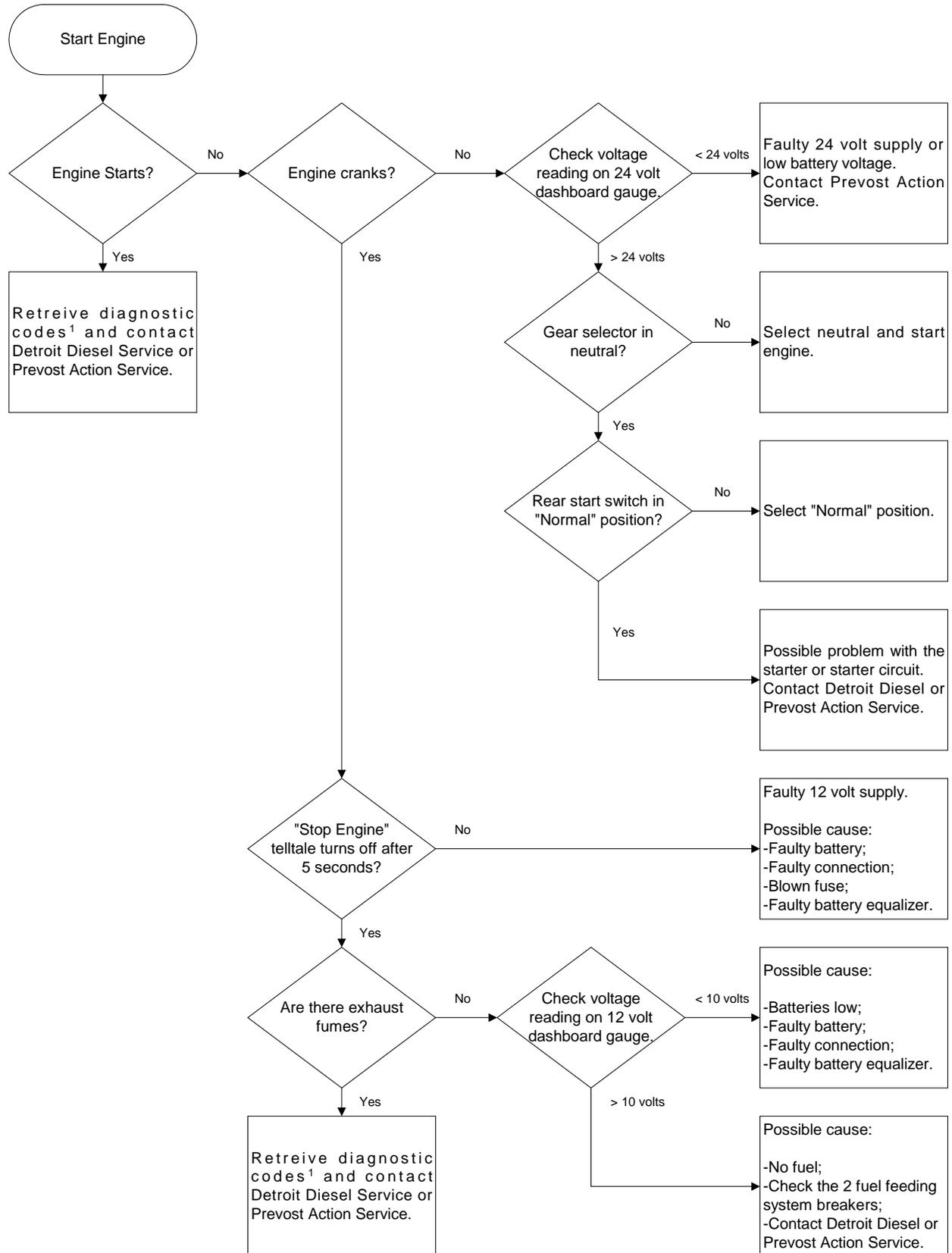
DDEC V Code	PID	SID	FMI	DESCRIPTION
82	--	143	4	Exhaust Port Temperature #15 Sensor Voltage Low
82	--	144	4	Exhaust Port Temperature #16 Sensor Voltage Low
82	—	277	12	EGR Rate Sensor Failed
82	412	—	9	EGR Temperature Smart Sensor not Responding
82	412	—	12	EGR Temperature Smart Sensor failed
83	73	—	0	Pump Pressure High
83	98	--	0	Oil Level High
83	101	--	0	Crankcase Pressure High
83	153	--	0	Extended Crankcase Pressure High
83	173	--	0	Exhaust Temperature High
83	411	—	0	EGR Delta Pressure High
83	412	—	0	EGR Temperature High
83	--	129	0	Exhaust Port Temperature #1 High
83	--	130	0	Exhaust Port Temperature #2 High
83	--	131	0	Exhaust Port Temperature #3 High
83	--	132	0	Exhaust Port Temperature #4 High
83	--	133	0	Exhaust Port Temperature #5 High
83	--	134	0	Exhaust Port Temperature #6 High
83	--	135	0	Exhaust Port Temperature #7 High
83	--	136	0	Exhaust Port Temperature #8 High
83	--	137	0	Exhaust Port Temperature #9 High
83	--	138	0	Exhaust Port Temperature #10 High
83	--	139	0	Exhaust Port Temperature #11 High
83	--	140	0	Exhaust Port Temperature #12 High
83	--	141	0	Exhaust Port Temperature #13 High
83	--	142	0	Exhaust Port Temperature #14 High
83	--	143	0	Exhaust Port Temperature #15 High
83	--	144	0	Exhaust Port Temperature #16 High
84	98	--	1	Oil Level Low
84	101	--	1	Crankcase Pressure Low
84	153	--	1	Extended Crankcase Pressure Low
85	190	--	0	Engine Overspeed
85	190	--	14	Engine Overspeed Signal
86	73	--	3	Pump Pressure Sensor Input Voltage High
86	108	--	3	Barometric Pressure Sensor Input Voltage High
87	73	--	4	Pump Pressure Sensor Input Voltage Low
87	108	--	4	Barometric Pressure Sensor Input Voltage Low

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**TECHNICAL INFORMATION**

<b>DDEC V Code</b>	<b>PID</b>	<b>SID</b>	<b>FMI</b>	<b>DESCRIPTION</b>
88	20	--	1	High Range Coolant Pressure Low
88	109	--	1	Coolant Pressure Low
89	95	--	0	Fuel Restriction High
89	111	--	12	Maintenance Alert Coolant Level Fault

ENGINE TROUBLESHOOTING FLOWCHART



(1) Refer to DDEC V Diagnostic Codes in this chapter.

## WORLD TRANSMISSION (WT) DIAGNOSTIC CODES

The WT Diagnostic Code Memory List contains the following headings: Code List Position, Main Code, Sub Code, Active indicator, Ignition Cycle Counter and Event counter. Up to five (5) codes can be stored at the same time in this memory.

The last occurring codes are listed first. Accessing the code list position, main code, sub code and active indicator is done through the Shift Selector Display or by using the Pro-Link Diagnostic Tool. Access to the ignition cycle counter and event counter can be done only through the Pro-Link diagnostic tool. The following table is an example of the information stored in memory.

### DIAGNOSTIC CODE MEMORY LIST

Code List Position	Main Code	Sub Code	Active Indicator	Ignition Cycle Counter	Event Counter
d1	21	12	YES	00	10
d2	41	12	YES	00	04
d3	23	12	NO	08	02
d4	34	12	NO	13	01
d5	56	11	NO	22	02
Displayed on Shift Selector Display and Diagnostic Tool			"YES" = ACTIVE = "MODE ON"	Ignition cycle counter and event counter are not available on Shift Selector Display	

**Note:** All information stored in memory can be accessed using the Pro-Link Diagnostic Tool.

**Note:** The diagnostic codes are stored in the memory queue in positions 1 through 5. The location of a diagnostic code in the memory queue is identified by "d1" (diagnostic code #1) through "d5".

The following paragraphs define the different WT Diagnostic Code Memory List headings:

#### MAIN CODE

The general condition or area of fault detected by the ECU.

#### SUB CODE

The specific area or condition under the Main Code in which the condition was detected.

#### ACTIVE INDICATOR

Illuminates when a fault condition is active (Shift Selector will display *MODE ON* or the Pro-Link Diagnostic Tool will display *YES*). The indicator will extinguish when the fault condition is gone.

#### IGNITION CYCLE COUNTER

Used to clear inactive diagnostic codes from the code list in memory. The counter is incremented each time a normal ECU power-down occurs following the clearing of the active indicator. A

diagnostic code will be cleared from the list when the counter exceeds 25.

#### EVENT COUNTER

Used to record the number of times a diagnostic code occurs prior to the incident being cleared from the code list. The last occurring code will be stored in position "d1". If the most recent code is already in the code list, that code will be moved to position "d1". The Active Indicator will illuminate (Shift Selector will display *MODE ON* or the Diagnostic Tool will display *YES*), the Ignition Cycle Counter will be cleared and "1" will be added to the Event Counter.

#### CODE READING AND CLEARING

Diagnostic codes can be read and cleared by two methods: by using the Pro-Link 9000 Diagnostic Tool plugged into the receptacle located in the driver's footwell or by using the Shift Selector Display. The operation of the Pro-Link 9000 Diagnostic Tool is described in the user's manual provided with the Tool. This section describes how to read and clear codes using the Shift Selector Display.

The Diagnostic Display Mode can be entered for viewing codes at any speed. Codes can only be cleared when the output speed = 0 and no output speed sensor failure is active.

## TECHNICAL INFORMATION

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### Reading Codes

Read codes as follows:

Enter the Diagnostic Display Mode by pressing both the "▲" (up arrow) and "▼" (down arrow) push buttons at the same time, twice on the push-button Shift Selector.

**Note:** To obtain the oil level, press the "▲" (up arrow) and "▼" (down arrow) push-buttons once, at the same time. Refer to "Oil Level Sensor (OLS) Codes" in this chapter.

Read the first code in the first of the five code positions on the digital display of the Shift Selector. For example, code "25 11" is stored in the first position. The display will change every two seconds as follows:

- Code list position = "d1"
- Main code = "25"
- Sub code = "11"

Display will repeat steps a, b and c.

Press the MODE button momentarily to view the second position (d2) as described in step 2.

To view the third, fourth and fifth positions (d3, d4 and d5), momentarily press the MODE button as explained above.

Pressing the MODE button momentarily after the fifth position (d5) is displayed will return the code display to the first position (d1).

Any code which is active will be indicated by the MODE ON indicator (Active Indicator) being illuminated while in that code position. While in the normal operating mode, the MODE ON indicator is illuminated to indicate the ECONOMY mode operation. Refer to "Controls & Instruments" chapter under MODE.

Any code position in the list which does not have a diagnostic code logged will display "- -" for both the Main and Sub Code displays. All positions after a code position without any code stored will also display "- -".

### Clearing Codes

Clearing of the Active Indicator is automatically done at ECU power-down for all codes except code "69 34".

Some codes will clear the Active Indicator automatically when the condition causing the code is no longer detected by the ECU. Refer to the "Diagnostic Code List and Description" table in this chapter.

Manual code clearing is only possible while in the Diagnostic Display Mode (output speed must be zero) and after the condition causing the code is corrected.

To clear all Active Indicators, hold down the MODE button continuously for 3 seconds until the Shift Selector tone sounds for 0.5 second.

To clear code records from the list, hold the MODE button down continuously for ten seconds until a second tone sounds. All diagnostic records in the list that are not active will then be cleared and the remaining records will then be moved up the list.

Release the MODE button to return to normal operating mode.

If the condition causing the code was not active at the time, the active indicator will go out.

**Note:** If clearing a code while locked in a drive (D) or reverse (R) position (fail-to-range), the transmission will still be in drive (D) or reverse (R) when the clearing procedure is completed. Neutral (N) must be manually selected.

### Exiting The Diagnostic Display Mode

The Diagnostic Display Mode can be exited by any of the following methods:

- Press the "▲" (up arrow) and "▼" (down arrow) push buttons at the same time on the push-button Shift Selector.
- Press any range button, "D", "N" or "R" on the push-button Shift Selector (the shift will be commanded if it is not inhibited by an active code).
- Do nothing and wait until the calibrated time (approximately 10 minutes) has passed. The system will automatically return to the normal operating mode.
- Turn off power to the ECU (shut off the engine with the ignition key).
- After clearing the active indicator as described in "Clearing Codes" section.

### DIAGNOSTIC CODE RESPONSE

The following responses are used in the "Diagnostic Code List and Description" table to command safe operation when diagnostic codes are sent.

**DNS - Do Not Shift Response**

- Release lock up clutch and inhibit lock up operation.
- Inhibit all shifts.
- Turn *ON* the CHECK TRANS light.
- Display the range attained.
- Ignore any range selection inputs from the shift selector.

**DNA - Do Not Adapt Response**

The ECU stops adaptive shift control while the code is active.

**SOL OFF - SOLenoid OFF Response**

All solenoids are commanded *OFF* (turning solenoids “A” and “B” off electrically cause them to be on hydraulically).

**RPR - Return to Previous Range Response**

When the speed sensor ratio or C3 pressure switch test associated with a shift not successful, the ECU commands the same range as commanded before the shift.

**NNC - Neutral No Clutches Response**

When certain speed sensor ratio or C3 pressure switch tests are not successful, the ECU commands a neutral condition with no clutches applied.

**DIAGNOSTIC CODE LIST AND DESCRIPTION**

MAIN CODE	SUB CODE	DESCRIPTION	CHECK TRANS LIGHT	INHIBITED OPERATION DESCRIPTION
13	12	ECU input voltage, low	Yes	DNS, DNA, SOL OFF, (Hydraulic default)
13	13	ECU input voltage, medium low	No	DNA
13	23	ECU input voltage, high	Yes	DNS, SOL OFF (Hydraulic default)
14	12	Oil level sensor, failed low	No	None
14	23	Oil level sensor, failed high	No	None
22	14	Engine speed sensor reasonableness test	No	Use default engine speed, DNA
22	15	Turbine speed sensor reasonableness test	Yes	DNS, lock in current range, DNA
22	16	Output speed sensor reasonableness test	Yes <sup>(1)</sup>	DNS, LOCK IN CURRENT RANGE, DNA
23	12	Primary Shift Selector or RSI Link Fault	Yes	Hold in last valid direction. May cause "cateye" display
23	14	Secondary Shift Selector or RSI Link Fault	Yes	Hold in last valid direction
23	16	Shift Selector display line fault	No	None, may cause "cateye" display
24	12	Sump fluid temperature, cold	Yes	DNS, lock in neutral
24	23	Sump fluid temperature, hot	No	No upshifts above a calibration range
25	0	Output speed sensor detected at 0 speed (Low)	Yes <sup>(1)</sup>	DNS, lock in current range (Low), DNA
25	11	Output speed sensor detected at 0 speed (1st)	Yes <sup>(1)</sup>	DNS, lock in current range (1st), DNA
25	22	Output speed sensor detected at 0 speed (2nd)	Yes <sup>(1)</sup>	DNS, lock in current range (2nd), DNA
25	33	Output speed sensor detected at 0 speed (3rd)	Yes <sup>(1)</sup>	DNS, lock in current range (3rd), DNA
25	44	Output speed sensor detected at 0 speed (4th)	Yes <sup>(1)</sup>	DNS, lock in current range (4th), DNA

## TECHNICAL INFORMATION

MAIN CODE	SUB CODE	DESCRIPTION	CHECK TRANS LIGHT	INHIBITED OPERATION DESCRIPTION
25	55	Output speed sensor detected at 0 speed (5th)	Yes <sup>(1)</sup>	DNS, lock in current range (5th), DNA
25	66	Output speed sensor detected at 0 speed (6th)	Yes <sup>(1)</sup>	DNS, lock in current range (6th), DNA
25	77	Output speed sensor detected at 0 speed (R)	Yes <sup>(1)</sup>	DNS, lock in current range (R), DNA
26	00	Throttle source not detected	No	Use throttle default values, DNA
26	11	Engine coolant source not detected	No	Use default value of 0°F
32	0	C3 pressure switch open, Low range	Yes	DNS, lock in current range (Low), DNA
32	33	C3 pressure switch open, 3rd range	Yes	DNS, lock in current range (3rd), DNA
32	55	C3 pressure switch open, 5th range	Yes	DNS, lock in current range (5th), DNA
32	77	C3 pressure switch open, Reverse range	Yes	DNS, lock in current range (R), DNA
33	12	Sump oil temperature sensor failed low	No	Use default value of 200°F (93°C)
33	23	Sump oil temperature sensor, failed high	No	Use default value of 200°F (93°C)
34	12	Factory calibration compatibility number wrong	Yes	DNS, SOL OFF (Hydraulic default), DNA
34	13	Factory calibration block checksum	Yes	DNS, SOL OFF (Hydraulic default), DNA
34	14	Power off block checksum	No	Use previous location or factory calibration and reset adaptive, DNA
34	15	Diagnostic queue block checksum	No	Use previous location or clear diagnostic queue, DNA
34	16	Real time block checksum	Yes	DNS, SOL OFF (Hydraulic default), DNA
34	17	Customer modifiable constants checksum	Yes	DNS, SOL OFF (Hydraulic default), DNA
35	0	Power interruption (code set after power restored)	No	None (Hydraulic default during interruption)
35	16	Real time write interruption	Yes	DNS, SOL OFF (Hydraulic default), DNA
36	0	Hardware/Software not compatible	Yes <sup>(2)</sup>	DNS, SOL OFF (Hydraulic default), DNA
42	12	Short to battery, A solenoid circuit	Yes	DNS, SOL OFF, DNA
42	13	Short to battery, B solenoid circuit	Yes	DNS, SOL OFF, DNA
42	14	Short to battery, C solenoid circuit	Yes	DNS, SOL OFF, DNA
42	15	Short to battery, D solenoid circuit	Yes	DNS, SOL OFF, DNA
42	16	Short to battery, E solenoid circuit	Yes	DNS, SOL OFF, DNA
42	21	Short to battery, F solenoid circuit	No	Lock up inhibited, DNA
42	22	Short to battery, G solenoid circuit	Yes	DNS, lock in a range
42	23	Short to battery, H solenoid circuit	No	Differential lock inhibited (3070 only), retarder inhibited
42	24	Short to battery, J solenoid circuit	No	Low and 1st inhibited
42	26	Short to battery, N solenoid circuit	No	Low and 1st inhibited, allow retarder

**TECHNICAL INFORMATION**

MAIN CODE	SUB CODE	DESCRIPTION	CHECK TRANS LIGHT	INHIBITED OPERATION DESCRIPTION
44	12	Short to ground, A solenoid circuit	Yes	DNS, SOL OFF (Hydraulic default), DNA
44	13	Short to ground, B solenoid circuit	Yes	DNS, SOL OFF (Hydraulic default), DNA
44	14	Short to ground, C solenoid circuit	Yes	DNS, SOL OFF (Hydraulic default), DNA
44	15	Short to ground, D solenoid circuit	Yes	DNS, SOL OFF (Hydraulic default), DNA
44	16	Short to ground, E solenoid circuit	Yes	DNS, SOL OFF (Hydraulic default), DNA
44	21	Short to ground, F solenoid circuit	No	Lockup inhibited, DNA
44	22	Short to ground, G solenoid circuit	Yes	DNS, SOL OFF (Hydraulic default), DNA
44	23	Short to ground, H solenoid circuit	No	Differential lock inhibited (3070 only), retarder operation inhibited
44	24	Short to ground, J solenoid circuit	No	Low and 1st inhibited
44	26	Short to ground, N solenoid circuit	No	Low and 1st inhibited, retarder allowed
45	12	Open circuit, A solenoid circuit	Yes	DNS, SOL OFF (Hydraulic default), DNA
45	13	Open circuit, B solenoid circuit	Yes	DNS, SOL OFF (Hydraulic default), DNA
45	14	Open circuit, C solenoid circuit	Yes	DNS, SOL OFF (Hydraulic default), DNA
45	15	Open circuit, D solenoid circuit	Yes	DNS, SOL OFF (Hydraulic default), DNA
45	16	Open circuit, E solenoid circuit	Yes	DNS, SOL OFF (Hydraulic default), DNA
45	21	Open circuit, F solenoid circuit	No	Lock up inhibited, DNA
45	22	Open circuit, G solenoid circuit	Yes	DNS, SOL OFF (Hydraulic default), DNA
45	23	Open circuit, H solenoid circuit	No	Differential lock inhibited (3070 only), retarder inhibited
45	24	Open circuit, J solenoid circuit	No	Low and 1st inhibited
45	26	Open circuit, N solenoid circuit	No	Low and 1st inhibited, retarder allowed
46	21	Overcurrent, F solenoid circuit	No	Lock up inhibited, DNA
46	26	Overcurrent, N and H solenoid circuits	No	Low and first inhibited or retarder inhibited, DNA
46	27	Overcurrent, A-Hi solenoid circuit	Yes	DNS, SOL OFF (Hydraulic default), DNA
51	01	Offgoing ratio test (during shift), Low to 1	Yes	DNS, RPR, DNA
51	10	Offgoing ratio test (during shift), 1 to Low	Yes	DNS, RPR, DNA
51	12	Offgoing ratio test (during shift), 1 to 2	Yes	DNS, RPR, DNA
51	21	Offgoing ratio test (during shift), 2 to 1	Yes	DNS, RPR, DNA
51	23	Offgoing ratio test (during shift), 2 to 3	Yes	DNS, RPR, DNA
51	24	Offgoing ratio test (during shift), 2 to 4	Yes	DNS, RPR, DNA
51	35	Offgoing ratio test (during shift), 3 to 5	Yes	DNS, RPR, DNA
51	42	Offgoing ratio test (during shift), 4 to 2	Yes	DNS, RPR, DNA

## TECHNICAL INFORMATION

MAIN CODE	SUB CODE	DESCRIPTION	CHECK TRANS LIGHT	INHIBITED OPERATION DESCRIPTION
51	43	Offgoing ratio test (during shift), 4 to 3	Yes <sup>(1)</sup>	DNS, RPR, DNA
51	45	Offgoing ratio test (during shift), 4 to 5	Yes <sup>(1)</sup>	DNS, RPR, DNA
51	46	Offgoing ratio test (during shift), 4 to 6	Yes	DNS, RPR, DNA
51	53	Offgoing ratio test (during shift), 5 to 3	Yes	DNS, RPR, DNA
51	64	Offgoing ratio test (during shift), 6 to 4	Yes	DNS, RPR, DNA
51	65	Offgoing ratio test (during shift), 6 to 5	Yes	DNS, RPR, DNA
	XY	Offgoing ratio test, X to Y <sup>(3)</sup>		
52	1	Offgoing C3PS test (during shift), Low to 1	Yes	DNS, RPR, DNA
52	8	Offgoing C3PS test (during shift), L to N1	Yes	DNS, NNC, DNA
52	32	Offgoing C3PS test (during shift), 3 to 2	Yes	DNS, RPR, DNA
52	34	Offgoing C3PS test (during shift), 3 to 4	Yes	DNS, RPR, DNA
52	54	Offgoing C3PS test (during shift), 5 to 4	Yes	DNS, RPR, DNA
52	56	Offgoing C3PS test (during shift), 5 to 6	Yes	DNS, RPR, DNA
52	71	Offgoing C3PS test (during shift), R to 1	Yes	DNS, NNC, DNA
52	72	Offgoing C3PS test (during shift), R to 2	Yes	DNS, NNC, DNA
52	78	Offgoing C3PS test (during shift), R to N1	Yes	DNS, NNC, DNA
52	99	Offgoing C3PS test (during shift), N3 to N2	Yes	DNS, RPR, DNA
52	XY	Offgoing C3PS test (during shift) X to Y <sup>(3)</sup>		
53	8	Offgoing speed test (during shift), L to N1	Yes <sup>(1)</sup>	DNS, NNC, DNA
53	18	Offgoing speed test (during shift), 1 to N1	Yes <sup>(1)</sup>	DNS, NNC, DNA
53	28	Offgoing speed test (during shift), 2 to N1	Yes <sup>(1)</sup>	DNS, NNC, DNA
53	29	Offgoing speed test (during shift), 2 to N2	Yes <sup>(1)</sup>	DNS, RPR, DNA
53	38	Offgoing speed test (during shift), 3 to N1	Yes <sup>(1)</sup>	DNS, NNC, DNA
53	39	Offgoing speed test (during shift), 3 to N3	Yes <sup>(1)</sup>	DNS, RPR, DNA
53	48	Offgoing speed test (during shift), 4 to N1	Yes <sup>(1)</sup>	DNS, NNC, DNA
53	49	Offgoing speed test (during shift), 4 to N3	Yes <sup>(1)</sup>	DNS, RPR, DNA
53	58	Offgoing speed test (during shift), 5 to N1	Yes <sup>(1)</sup>	DNS, NNC, DNA
53	59	Offgoing speed test (during shift), 5 to N3	Yes <sup>(1)</sup>	DNS, RPR, DNA
53	68	Offgoing speed test (during shift), 6 to N1	Yes <sup>(1)</sup>	DNS, NNC, DNA

TECHNICAL INFORMATION

MAIN CODE	SUB CODE	DESCRIPTION	CHECK TRANS LIGHT	INHIBITED OPERATION DESCRIPTION
53	69	Offgoing speed test (during shift), 6 to N4	Yes <sup>(1)</sup>	DNS, RPR, DNA
53	78	Offgoing speed test (during shift), R to N1	Yes	DNS, NNC, DNA
53	99	Offgoing speed test (during shift), N2 to N3 or N3 to N2	Yes	DNS, RPR, DNA
53	XY	Offgoing speed test (during shift), X to Y <sup>(3)</sup>		
54	1	Oncoming ratio test (after shift), L to 1	Yes	DNS, RPR, DNA
54	7	Oncoming ratio test (after shift), L to R	Yes	DNS, NNC, DNA
54	10	Oncoming ratio test (after shift), 1 to L	Yes	DNS, RPR, DNA
54	12	Oncoming ratio test (after shift), 1 to 2	Yes	DNS, RPR, DNA
54	17	Oncoming ratio test (after shift), 1 to R	Yes	DNS, NNC, DNA
54	21	Oncoming ratio test (after shift), 2 to 1	Yes	DNS, RPR, DNA
54	23	Oncoming ratio test (after shift), 2 to 3	Yes	DNS, RPR, DNA
54	24	Oncoming ratio test (during shift), 2 to 4	Yes	DNS, RPR, DNA
54	27	Oncoming ratio test (after shift), 2 to R	Yes	DNS, RPR, DNA
54	32	Oncoming ratio test (after shift), 3 to 2	Yes	DNS, RPR, DNA
54	34	Oncoming ratio test (after shift), 3 to 4	Yes	DNS, RPR, DNA
54	35	Oncoming ratio test (during shift), 3 to 5	Yes	DNS, RPR, DNA
54	42	Oncoming ratio test (during shift), 4 to 2	Yes	DNS, RPR, DNA
54	43	Oncoming ratio test (after shift), 4 to 3	Yes	DNS, RPR, DNA
54	45	Oncoming ratio test (after shift), 4 to 5	Yes	DNS, RPR or SOL OFF (Hydraulic default), DNA
54	46	Oncoming ratio test (during shift), 4 to 6	Yes	DNS, RPR, DNA
54	53	Oncoming ratio test (during shift), 5 to 3	Yes	DNS, RPR, DNA
54	54	Oncoming ratio test (after shift), 5 to 4	Yes	DNS, RPR, DNA
54	56	Oncoming ratio test (after shift), 5 to 6	Yes	DNS, RPR, DNA
54	64	Oncoming ratio test (after shift), 6 to 4	Yes	DNS, RPR, DNA
54	65	Oncoming ratio test (after shift), 6 to 5	Yes	DNS, RPR, DNA
54	70	Oncoming ratio test (after shift), R to L	Yes	DNS, NNC, DNA
54	71	Oncoming ratio test (after shift), R to 1	Yes	DNS, NNC, DNA
54	72	Oncoming ratio test (after shift), R to 2	Yes	DNS, NNC, DNA
54	80	Oncoming ratio test (after shift), N1 to L	Yes	DNS, RPR, DNA
54	81	Oncoming ratio test (after shift), N1 to 1	Yes	DNS, RPR, DNA
54	82	Oncoming ratio test (after shift), N1 to 2	Yes	DNS, RPR, DNA
54	83	Oncoming ratio test (after shift), N1 to 3	Yes	DNS, RPR, DNA
54	85	Oncoming ratio test (after shift), N1 to 5	Yes	DNS, RPR, DNA
54	86	Oncoming ratio test (after shift), N1 to 6	Yes	DNS, RPR, DNA

## TECHNICAL INFORMATION

MAIN CODE	SUB CODE	DESCRIPTION	CHECK TRANS LIGHT	INHIBITED OPERATION DESCRIPTION
54	92	Oncoming ratio test (after shift), N2 to 2	Yes	DNS, RPR, DNA
54	93	Oncoming ratio test (after shift), N3 to 3	Yes	DNS, RPR, DNA
54	95	Oncoming ratio test (after shift), N3 to 5	Yes	DNS, RPR, DNA
54	96	Oncoming ratio test (after shift), N4 to 6	Yes	DNS, RPR, DNA
54	XY	Oncoming ratio test (after shift), X to Y <sup>(3)</sup>		
55	07	Oncoming C3PS test (after shift), Low to R	Yes <sup>(1)</sup>	DNS, NNC, DNA
55	17	Oncoming C3PS test (after shift), 1 to R	Yes <sup>(1)</sup>	DNS, NNC, DNA
55	27	Oncoming C3PS test (after shift), 2 to R	Yes <sup>(1)</sup>	DNS, NNC, DNA
55	87	Oncoming C3PS test (after shift), N1 to R	Yes	DNS, RPR, DNA
55	97	Oncoming C3PS test (after shift), NVL to R	Yes <sup>(1)</sup>	DNS, NNC, DNA
55	XY	Oncoming C3PS test (after shift), X to Y <sup>(3)</sup>		
56	0	Range verification test, L	Yes <sup>(1)</sup>	DNS, 1st, Low or SOL OFF (Low),DNA
56	11	Range verification ratio test, 1 <sup>st</sup>	Yes	DNS, 6th, DNA
56	22	Range verification ratio test, 2 <sup>nd</sup>	Yes <sup>(1)</sup>	DNS, 6th or 5th, DNA
56	33	Range verification ratio test, 3 <sup>rd</sup>	Yes <sup>(1)</sup>	DNS, 5th or SOL OFF (4th), DNA
56	44	Range verification ratio test, 4 <sup>th</sup>	Yes	DNS, 3rd or 5th, DNA
56	55	Range verification ratio test, 5 <sup>th</sup>	Yes <sup>(1)</sup>	DNS, SOL OFF (5th) or 3rd, DNA
56	66	Range verification ratio test, 6 <sup>th</sup>	Yes	DNS, 5th, 3rd or SOL OFF (3rd), DNA
56	77	Range verification ratio test, R	Yes	DNS, N2 or N3, DNA
57	11	Range verification C3PS test, 1 <sup>st</sup>	Yes	DNS, SOL OFF (3rd), DNA
57	22	Range verification C3PS test, 2 <sup>nd</sup>	Yes	DNS, 3rd, DNA
57	44	Range verification C3PS test, 4 <sup>th</sup>	Yes	DNS, 5th or SOL OFF (3rd), DNA
57	66	Range verification C3PS test, 6 <sup>th</sup>	Yes	DSN, SOL OFF (5th), DNA
57	88	Range verification C3PS test, N1	Yes	DNS, N3, DNA
57	99	Range verification C3PS test, N2 or N4	Yes	DNS, N3, DNA
61	0	Retarder oil temperature, hot	No	None
62	12	Retarder oil temperature sensor, low	No	None
62	23	Retarder oil temperature sensor, high	No	None
62	32	Engine coolant sensor, failed low	No	Use default value of 0°F
62	33	Engine coolant sensor, failed high	No	Use default value of 0°F
63	0	Input function fault	Yes	Depends on input function, DNA
63	26	Kickdown input, failed on	No	Kickdown operation inhibited

**TECHNICAL INFORMATION**

MAIN CODE	SUB CODE	DESCRIPTION	CHECK TRANS LIGHT	INHIBITED OPERATION DESCRIPTION
63	40	Service brake status input, failed on	No	No auto Neutral to Drive shifts for refuse packer (I/O package # 41).
64	12	Retarder modulation request sensor, failed low	No	Retarder operation inhibited
64	23	Retarder modulation request sensor, failed high	No	Retarder operation inhibited
66	0	Serial communications interface fault	No	Use default throttle values, DNA
66	11	SCI engine coolant source fault	No	Use default value of 0°F
69	27	ECU, inoperative A-Hi switch	Yes	DNS, NNC, DNA
69	28	ECU, inoperative F-Hi switch	Yes	Lock up inhibited, DNA
69	29	ECU, inoperative N and H-Hi switch	No	Low and 1st inhibited, retarder inhibited, DNA
69	33	ECU, Computer Operating Properly (COP) timeout	No	RESET ECU, SHUTDOWN ECU ON 2ND OCCURRENCE (POWER LOSS: HYDRAULIC DEFAULTS), MAY CAUSE "CATEYE" DISPLAY, DNA <sup>(4)</sup>
69	34	ECU, write timeout	Yes	DNS, SOL OFF (Hydraulic default), DNA
69	35	ECU, checksum test	No	Induce COP timeout (reset ECU), DNA <sup>(4)</sup>
69	36	ECU, RAM self test	No	INDUCE COP TIMEOUT (reset ECU), DNA <sup>(4)</sup>
69	39	Communication chip addressing error	No	Use default for J1939 data, DNA
69	41	ECU, I/O ASIC addressing test	No	Induce COP timeout (reset ECU), DNA <sup>(4)</sup>
69	42	SPI output failure	Yes	GPO 1-8 and reverse warning inoperable
69	43	SPI input failure	Yes	DNS, lock in range, DNA

(1) This code is logged in real time to protect the transmission in case a loss of power to the ECU. Power Interruption code 35 00 occurs.

(2) The ECU hardware or software must be changed so that they are compatible.

(3) Additional codes could be logged for other shifts where X indicates range shifted from and Y indicates range shifted to.

(4) The COP reset will clear the active inhibit.

## TECHNICAL INFORMATION

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### FLUID LEVEL SENSOR (OLS) CODES

Oil level codes are obtained as follows:

Press both the "▲" (up arrow) and "▼" (down arrow) push-buttons simultaneously. Oil level codes are displayed in 2 minutes (e.g. display will flash and 8, 7, ...; countdown will occur during the 2 minutes) once the following parameters are met:

- Waiting time, vehicle must be stationary for at least 2 minutes to allow the oil to settle;
- Engine at idle;
- Oil at normal operating temperature, between 140°F (60°C) and 220°F (104°C):
- Transmission in neutral (N);
- Transmission output shaft stopped;
- Oil level sensor present and working.
- After 2 minutes, the display will flash one of the codes shown below:

CODE	CAUSE OF CODE
O, L...O, K	Oil level is correct
O, L...L, O...01	One quart low
O, L...L, O...02	Two quarts low
O, L...H, I...01	One quart high
O, L...H, I...02	Two quarts high

**Note:** Failure to meet one of the above parameters will stop the two minute countdown. One of the codes shown hereafter will indicate the cause of the countdown interruption. Once all parameters are met, the countdown will continue from where it left off.

CODE	CAUSE OF CODE
O, L...-...0,X	Waiting time too short
OL-50	Engine speed (rpm) too low
OL-59	Engine speed (rpm) too high
OL-65	Neutral must be selected
OL-70	Sump oil temperature too low
OL-79	Sump oil temperature too high
OL-89	Output shaft rotation
OL-95	Sensor failure

### Exiting The Fluid Level Display Mode

To exit the Oil Level Display Mode, press any range button ("R", "N" or "D").

### CLEARING CODES

If the CHECK TRANS light is illuminated, first clear all diagnostic codes by pressing both the "▲" (up arrow) and "▼" (down arrow) pushbuttons at the same time, twice.

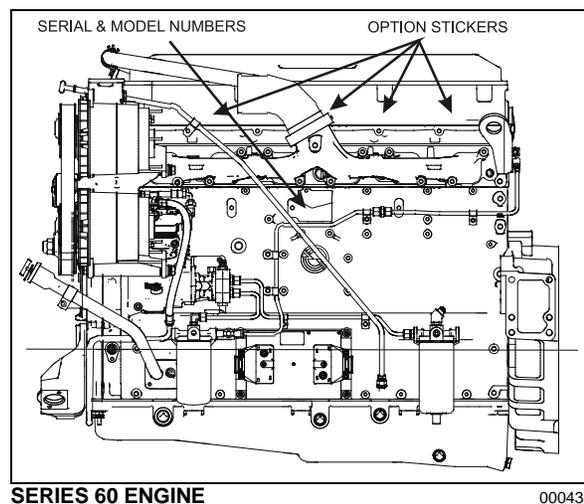
Take the vehicle for a test drive. If the CHECK TRANS light illuminates again, record the diagnostic codes. Refer to "World Transmission (WT) Diagnostic Codes" in this chapter.

## PLATES AND CERTIFICATION

The main components of the vehicle, such as engine, transmission, axles and the chassis are identified by different serial numbers. It may be necessary to locate these numbers for warranty purposes.

The engine serial and model number are stamped on the cylinder block (as viewed from the flywheel end) on the left side just below the fire deck and above the cast-in Detroit Diesel logo.

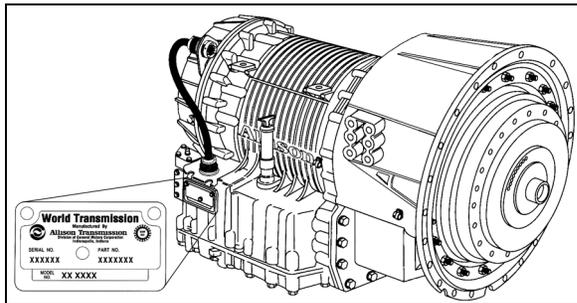
In addition, option decals are located on the rocker cover (starter side). The engine serial and model number and a list of the optional engine equipment are written on these decals. Refer to this information when ordering replacement parts.



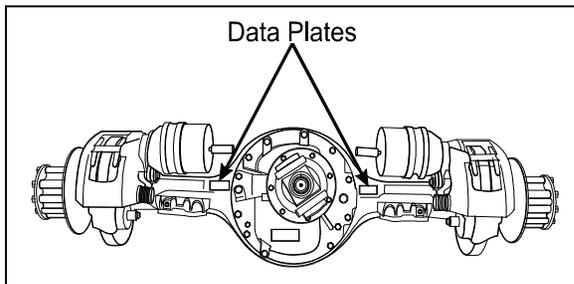
SERIES 60 ENGINE

00043

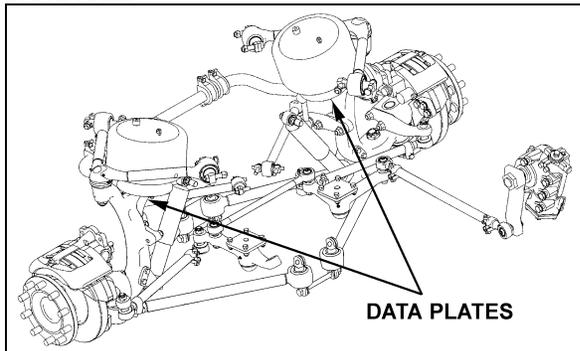
## TECHNICAL INFORMATION



TRANSMISSION DATA PLATE (ALLISON) 07076



DRIVE AXLE 11019



IFS TYPICAL SERIAL & MODEL NUMBERS 00025C

## SAFETY CERTIFICATION

Vehicle components meet specifications and standards as follows:

- Material and parts conform to ASTM and/or SAE standards in effect at the time of manufacture.
- All factory-installed interior materials meet FMVSS 302 for fire resistance.
- Certified according to Provincial, State and Federal Safety standards (Canadian and US) BMCSS, FMVSS and CMVSS.

Other applicable certification labels are affixed to the applicable components.

## DOT CERTIFICATION PLATE

This certifies that vehicles manufactured by PrevoSt Car Inc. comply with all Federal Motor Vehicle Safety Standards at the time of

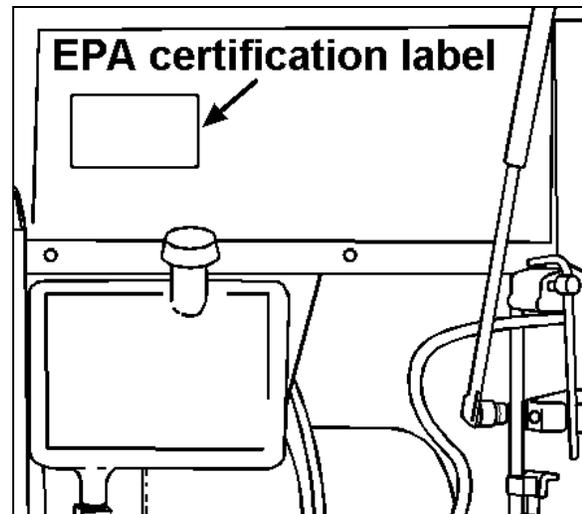
manufacture. Information such as date of manufacture, model year, gross vehicle weight rating, tire types and inflation pressure is also etched on this plate. The DOT Certification plate is affixed to L.H. control panel.



DOT CERTIFICATION PLATE 00016

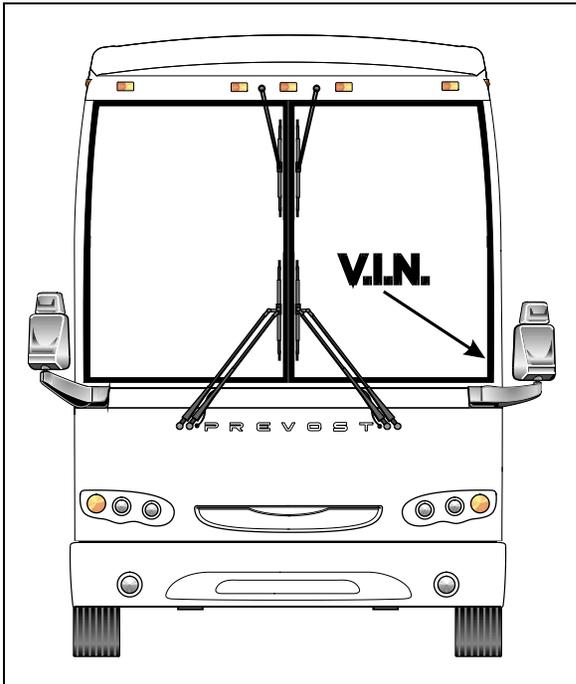
## EPA ENGINE LABEL

The emissions certification label affixed to the panel over the engine oil reserve tank certifies that the engine conforms to federal and any state exhaust emissions regulations.



EPA CERTIFICATION LABEL 23303

**VEHICLE IDENTIFICATION NUMBER (VIN)**



**VEHICLE IDENTIFICATION NUMBER** 18491

The Vehicle Identification Number is stamped on a plate located on the windshield frame pillar (driver's side). The VIN is visible from the outside of the vehicle. Make sure the correct vehicle identification number is given when ordering replacement parts. Using the VIN when ordering parts will facilitate processing.

**Note:** Record the VIN in the vehicle documentation and keep with company records. The VIN will normally be used for vehicle registration, service reference needs and for obtaining vehicle insurance coverage.

**COACH FINAL RECORD**

The Coach Final Record is a record of all data pertaining to the assembly of the vehicle. This record is included in the technical publications package supplied with the vehicle. Retain this record in the company records office for reference and safe-keeping.

### SERVICE LITERATURE

Visit our web sit at [www.prevostcar.com](http://www.prevostcar.com) for on-line product information and technical publications!

Additional copies of the following service literature are available on request and at low cost.

- **Maintenance Manual**
- **Parts Manual**
- **Service Center Directory**

To order, call Prevost Parts toll free 1-800-463-8876 or write to:

**PREVOST PARTS INC.**

2955-A Watt Street  
Sainte-Foy, (Quebec)  
Canada G1X 3W1

**Specify the complete vehicle serial number. Allow 30 days for delivery**

## APPENDIX

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### NOTICE

#### DECLARATION OF THE MANUFACTURING DEFECTS TO THE GOVERNMENT OF THE UNITED STATES

If you believe that your vehicle has defect which could cause a crash or could cause injury or death, you should immediately inform the National Highway Traffic Safety Administration (NHTSA) in addition to notifying Prevest Car Inc..

If NHTSA receives similar complaints, it may open an investigation, and if it finds that a safety defect exists in a group of vehicles, it may order a recall and remedy campaign.

However, NHTSA cannot become involved in individual problems between you, your dealer, or Prevest Car Inc..

To contact NHTSA you may either call the Auto Safety Hotline toll-free at **1-800-424-9393** (or **366-0123** in Washington, D.C. area) or write to:

**NHTSA  
U.S. Department of transportation  
Washington, D.C. 20590.**

You can also obtain other information about motor vehicle safety from the Hotline.

#### DECLARATION OF THE MANUFACTURING DEFECTS TO THE CANADIAN GOVERNMENT

If you stay in Canada, and if you believe that your vehicle has a safety defect, you should immediately inform Transport Canada and Prevest Car Inc. You may write to:

**Transport Canada  
Box 8880  
Ottawa, Ontario, K1G 3J2**

#### DECLARATION OF THE MANUFACTURING DEFECTS TO PREVOST CAR INC.

In addition to notify the NHTSA (or Transport Canada), please contact Prevest Car at **1-418-831-2046**. Or you may write to :

**Prevest Car Inc.  
After-sales service department  
850 ch. Olivier,  
Saint-Nicolas (Quebec)  
Canada, G7A 2N1**

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