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FOREWORD

The H3-41 and H3-45 are the current generation of highway coaches produced by Prevest Car Incorporated. Prevest Car Incorporated is committed to the continuous improvement of coach quality, reliability, durability and safety. With innovative features, the H3 series coach was designed with passenger and driver safety and comfort in mind.

This manual contains information available at the time of publication. Because optional equipment is covered in this manual, some of the optional equipment described may not apply to your coach. If in doubt, refer to the technical documentation package provided with the coach.

Driver's controls and instruments incorporate advanced technology for enhanced driving ease and security. This manual describes the main features, instruments and controls, and servicing requirements for both standard and optional equipment. Read this manual carefully to take advantage of the coach's advanced features and to insure optimum safety and passenger comfort.

Keep this manual with the coach at all times. Make sure this manual is kept with the coach when ownership is transferred. Please notify Prevest Car Incorporated soon after any change of address or transfer of ownership. This will ensure we provide prompt and reliable coach service to all coach operators. Use the appropriate card at the end of this manual.

Warnings, cautions and notes are used throughout this manual to emphasize important points when necessary.

WARNINGS call attention to instructions which must be precisely followed to avoid injury to persons.

CAUTIONS call attention to instructions which must be followed to avoid damage to equipment.

NOTES provide supplemental information and call attention to instructions which make the job easier.

The service life of the coach depends on the kind of attention it receives. Pay close attention to the warnings, cautions and notes. Read the various notices and instructions posted throughout the coach and attached to equipment.

Since continuous improvement is a primary focus at Prevest Car Incorporated, we reserve the right to make changes anytime, without notice, and without incurring any obligation.

Before reproducing or copying this manual, in whole or in part, written consent must be obtained from Prevest Car Incorporated.

SAFETY PRECAUTIONS

To ensure safe and reliable operation, take note of the safety precautions as follows:

- a) Operation and maintenance of the coach must be performed only by qualified personnel.
- b) Use caution when embarking and disembarking passengers.
- c) Always pay attention to pedestrians passing in front and behind the coach. Always yield to pedestrians at pedestrian walkways.
- d) Inspect the coach before operating.
- e) Make sure good visibility is maintained at all times. Keep windshields clean and free of obstructions.
- f) Make sure all doors are closed and secure before operating the coach. Before driving, conduct a walkaround inspection to check for security of all baggage compartment doors and equipment access doors.
- g) Adjust the driver's seat so that all controls can be reached easily.
- h) Always wear the safety belt when driving.
- i) Check the instrument panel frequently. Do not operate the coach when dials or indicators are not in the normal operating condition.
- j) Switch from high beams to low beams when meeting or following other vehicles within 500 feet (150 meters).
- k) Do not drive over obstacles on the road. Empty cartons, piles of leaves, and snowdrifts could conceal hidden dangers that could damage the coach suspension and underbody.
- l) When turning or changing lanes, signal your intention well in advance.
- m) When approaching to make a right turn, reduce the space between the coach and the curb to make sure another vehicle cannot pass on the right. Since the coach makes wide turns, allow enough space to make safe turns.
- n) Never leave the coach 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 coach.
- o) The service life of the coach depends on the kind of maintenance it receives. Always record any problems and report them immediately to maintenance personnel.
- p) Shut-off the engine before fueling, adding oil or performing maintenance or servicing tasks, unless stated otherwise.
- q) Do not run the engine or HVAC system with access doors left open. Close compartment doors before operating any equipment.
- r) 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.
- s) Fuel is highly flammable and explosive. Do not smoke when refueling. Keep away from open flames or sparks.
- t) Do not attempt to push- or pull-start a coach equipped with an automatic transmission. To avoid damaging gears or bearings in manual transmission-equipped coaches, do not push-, pull- or roll-start in first or reverse gears.
- u) For additional information about safe driving practices, contact the local department of motor vehicles authority.

Defensive driving

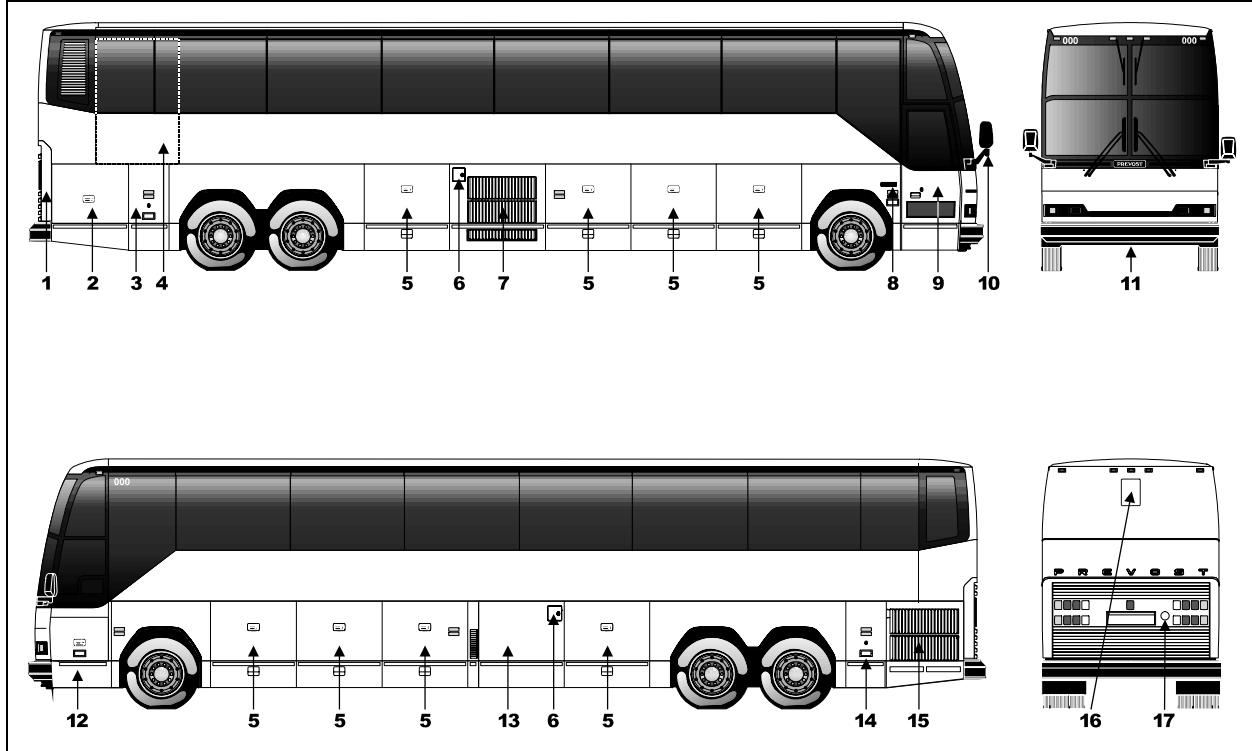
- a) To keep the coach from drifting across lanes during highway driving, always look over the horizon on the road ahead.
- b) Don't stare at the road ahead. Keep your eyes moving. Check all mirrors and dashboard instruments frequently.
- c) Establish eye-to-eye contact with other drivers and with pedestrians. Use headlights, high-beams and low-beams, turn signals and horn as needed.
- d) For city driving, allow a four to six second travel interval between the coach and the vehicle ahead. Increase this travel interval to six to eight seconds for highway driving. Use increased travel interval for night driving and in bad weather.
- e) Adjust your speed according to the road conditions, traffic and visibility. Never exceed the posted speed limits.

SAFETY PRECAUTIONS

- f) Reduce your speed if another vehicle is following too close behind to let the vehicle pass.
- g) Be prepared to stop when approaching an intersection. The stopping distance of the coach increases with the weight and speed of the coach.
- h) For additional information about defensive driving practices, contact the local department of motor vehicles authority.

CHAPTER 1 : COACH EXTERIOR

H3-45 COACH



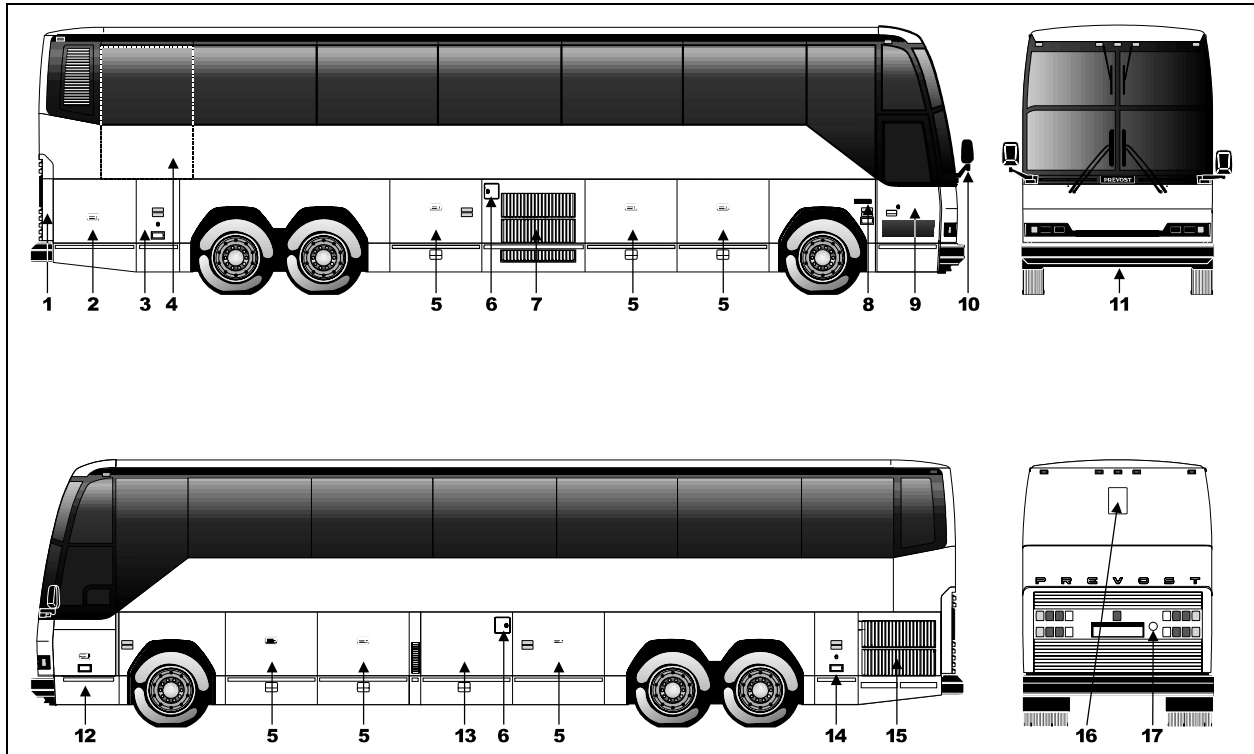
H3-45 EXTERIOR VUE

18302

- | | |
|--|---|
| 1- Engine Compartment Rear Door..... 1-3 | 10- Rear-View Mirrors..... 1-5 |
| 2- Engine Compartment R.H. Side Door 1-3 | 11- Reclining Bumper Compartment..... 1-7 |
| 3- Main Power Compartment..... 1-4 | 12- Front Electric & Service Compartment..... 1-7 |
| 4- Wheelchair Lift door 1-4 | 13- Heating, Ventilating and Air Conditioning
Compartment (HVAC) 1-7 |
| 5- Baggage Compartment..... 1-4 | 14- Rear Electric Compartment..... 1-7 |
| 6- Fuel Filler Door..... 1-4 | 15- Engine Radiator Door 1-8 |
| 7- A/C Condenser Door..... 1-4 | 16- Retractable Back-Up Camera 1-8 |
| 8- Entrance Door Operating Switch..... 1-5 | 17- 110 - 120 Volt Connector 1-8 |
| 9- Entrance Door 1-5 | |

COACH EXTERIOR

H3-41 COACH

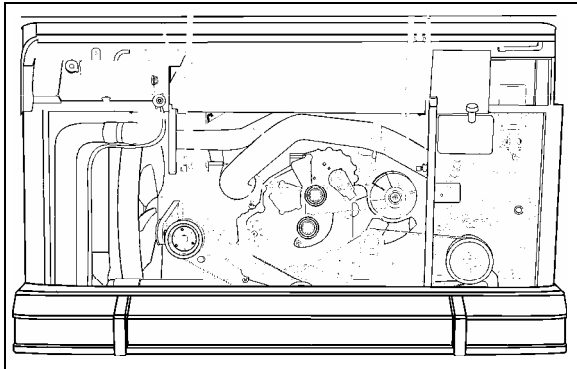


H3-41 EXTERIOR VUE

18303

- | | | | |
|--|-----|---|-----|
| 1- Engine Compartment Rear Door..... | 1-3 | 10- Rear-View Mirrors..... | 1-5 |
| 2- Engine Compartment R.H. Side Door | 1-3 | 11- Reclining Bumper Compartment..... | 1-7 |
| 3- Main Power Compartment..... | 1-4 | 12- Front Electric & Service Compartment..... | 1-7 |
| 4- Wheelchair Lift Door..... | 1-4 | 13- Heating, Ventilating and Air Conditioning | |
| 5- Baggage Compartment..... | 1-4 | Compartment (HVAC) | 1-7 |
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| 9- Entrance Door | 1-5 | 17- 110 -120 Volt Connector | 1-8 |

ENGINE COMPARTMENT REAR DOOR



ENGINE

Provides access to the following:

- Engine starting selector;
- Engine coolant surge tank;
- Air cleaner restriction indicator;
- Engine oil dipstick;
- Engine oil reserve tank;
- Automatic transmission oil dipstick;
- Cleaning cabinet connector;
- Fresh water reservoir connector.

The door latch release lever is located in the upper rear section of the engine compartment R.H. side door. Push up release lever, then place hand on the upper right of the rear door and pull rearward. The door will open automatically.

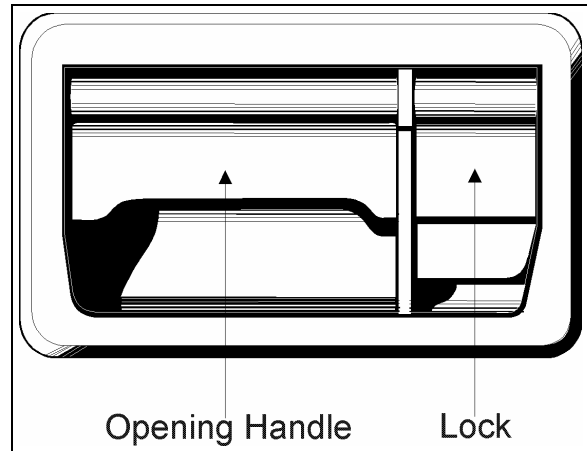
Always engage the safety catch when the compartment door is open. Release the catch before closing the door.

The lighting in the engine compartment turns on automatically when the door is opened. If the door is open, an indicator light will illuminate on the central dashboard.

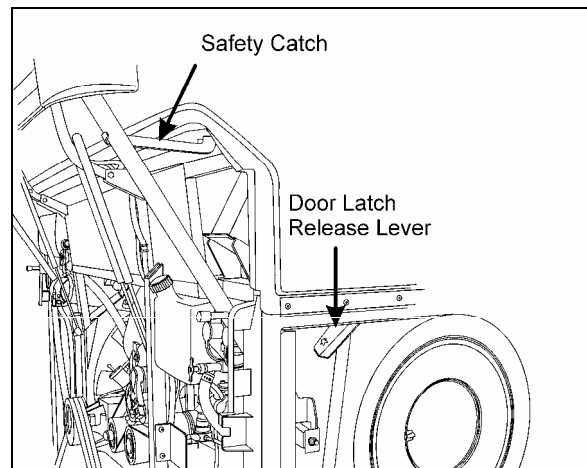
Warning : Pressurized cylinders assist the rear engine door opening. To avoid injury when opening it, do not stand at the rear of the coach. Stand clear when opening the rear door.

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

ENGINE COMPARTMENT R.H. SIDE DOOR



DOOR HANDLE



DOOR LATCH RELEASE LEVER

Provides access to the following:

- Engine compartment rear door release lever;
- Fuel filter/water separator (if applicable);
- Power steering fluid reservoir;
- Wet (main) air tank drain valve;
- External air supply fill valve;
- Cold weather starting fluid cup;
- Sump tank filler cap;
- A/C Compressor.

This door can be locked/unlocked using the exterior compartment key. Lift up the 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

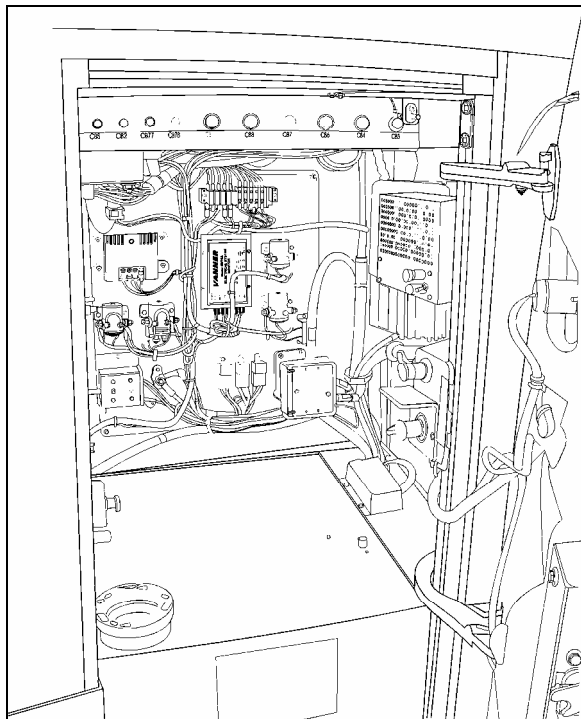
COACH EXTERIOR

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, an indicator light will illuminate on the central dashboard.

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

MAIN POWER COMPARTMENT



MAIN POWER COMPARTMENT

Provides access to the following:

- Battery voltage equalizer;
- Battery voltage equalizer monitor;
- volt batteries;
- Main breakers for the 12 volt and 24 volt electrical systems;
- Main power cut-off relay;
- Booster posts.

This 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

door is open, an indicator light will illuminate on the central dashboard.

WHEELCHAIR LIFT DOOR

For proper wheel chair lift operation, refer to the wheel chair lift manual provided in the technical publication box of the vehicle. The wheel chair lift is controlled by a toggle switch located on the dashboard. Refer to "Controls/Instruments" chapter (page 3-11).

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. Refer to the illustration under "Engine Compartment R.H. Side Door" in this chapter. Pressurized cylinders assist the opening and closing of the doors and hold the doors open.

The lighting in the compartment turns on automatically when the compartment door is opened. If the door is open, an indicator light will illuminate on the central dashboard.

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

Note : To prevent theft and vandalism, always lock the baggage compartment doors before leaving the 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 (page 3-10).

FUEL FILLER DOOR

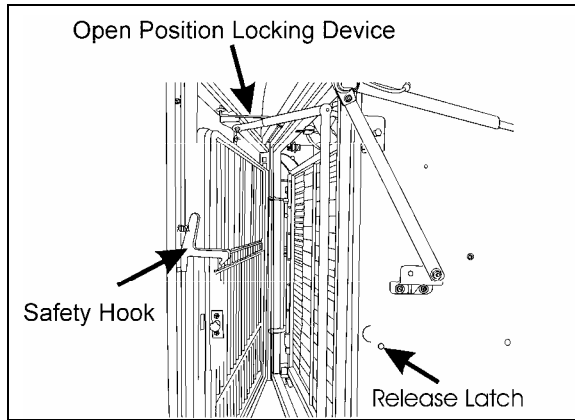
Both fuel filler doors can be locked/unlocked using the exterior compartment key. Turn the key in the lock to remove.

Note : The L.H. side door lock must be in the unlocked position before closing.

A/C CONDENSER DOOR

Pull the 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.

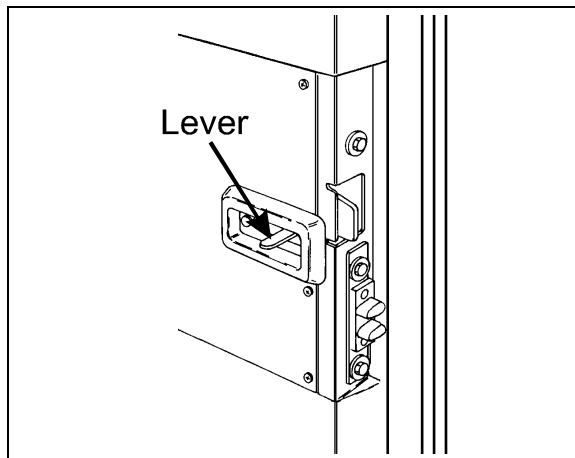
Caution : Close baggage compartment door in order to open condenser door completely.



CONDENSER DOOR

ENTRANCE DOOR

The entrance door can be locked/unlocked with the exterior compartment key. It can be locked/unlocked from the inside by a spring-return lever on the door.



SPRING-RETURN LEVER

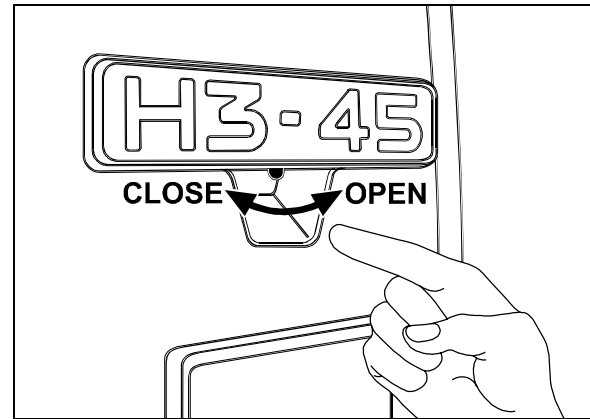
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Inside Operating Switch

Opening and closing the door is controlled by 2 push buttons located on the R.H. dashboard. Press and hold the red button to open the door and the green button to close the door.

Outside Operating Switch

The door must be unlocked before using the outside operating switch. Opening and closing the door is controlled by a 3-position toggle switch located at the left of the entrance door. Push and hold switch forward to open the door and rearward to close it.



OUTSIDE OPERATING SWITCH

Door Operation Logic

Operating The Door Using The Exterior Switch Or The Interior Push-Buttons

If the switch is held in position until the door is fully open or closed, the system holds pressure in the door cylinder, locking the door in that position.

The door can be opened in any position by releasing the switch or button when the desired door position is attained.

When the door is not fully open or fully closed, the system does not maintain pressure in the door cylinder therefore the door is not locked in position.

A proximity sensor has the door sealed shut when it senses the door is almost closed. This works even when the door is moved manually.

Emergency Door Opening

Refer to "Emergency safety features" chapter (page 6-2).

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 (page 3-4). Thermostats are used to

COACH EXTERIOR

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 and Spartan)

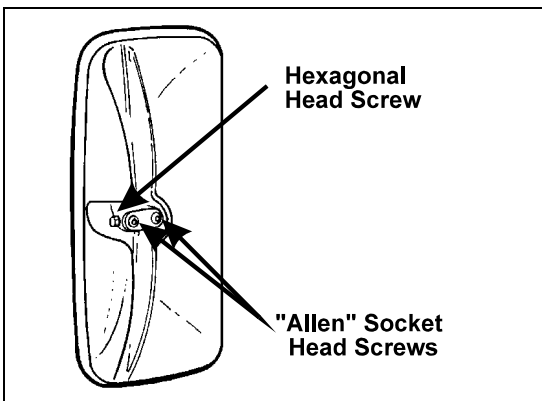
Electrically-adjusted mirrors are adjusted by the outside mirror controls located on the L.H. control panel. Refer to "Controls & Instruments" chapter (page 3-4).

Manual adjustment is also possible.

Manual Adjustment

Adjust the side-view mirrors until the side of the coach is visible. Adjust the flat-type mirror until the highway is in full view.

Manually Adjusted Mirror (Spartan)



MIRRORS ADJUSTMENT SCREWS

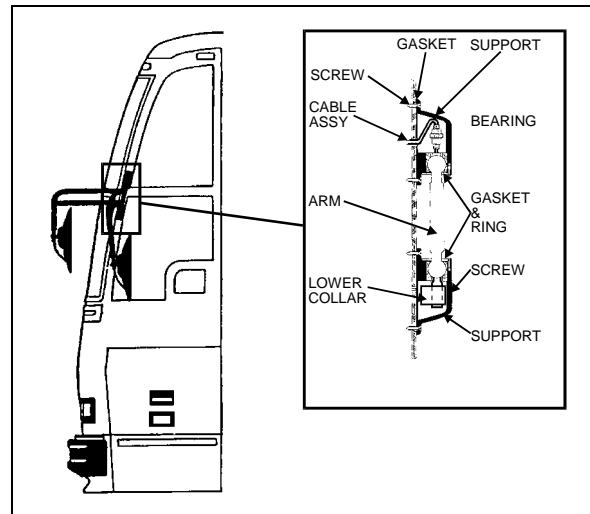
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Horizontal And Vertical Adjustment

Loosen the two Allen screws at the rear of the mirror body. Adjust the mirror to the desired angle, then tighten the screws.

Vertical Adjustment

Loosen the hexagonal head screw at the rear of the mirror body. Adjust the mirror to the desired angle, then tighten screw.

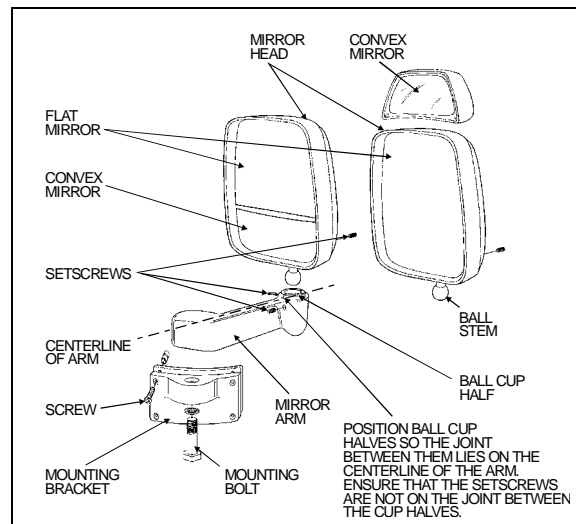


SPARTAN REAR-VIEW MIRRORS

18202

Caution : Do not over tighten the screws. Tighten until snug.

Manually Adjusted Mirror (Ramco)



RAMCO REAR-VIEW MIRRORS

18201

Adjustment

Loosen the bolt on the bracket of the mirror body. Adjust the mirror to the desired angle then tighten bolt.

Head Mirror Adjustment

Loosen the fixing screws. Adjust the head of the mirror then tighten fixing screws.

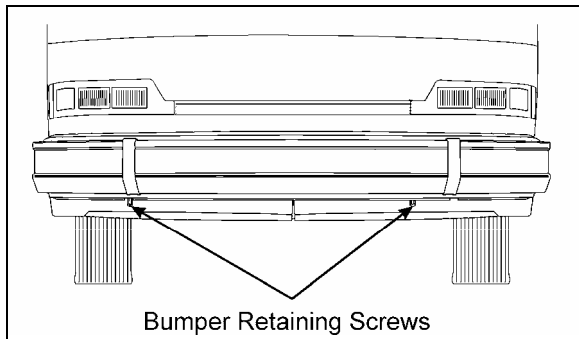
Caution : Do not over tighten the screws. Tighten until snug.

RECLINING BUMPER COMPARTMENT

The spare wheel and tire assembly is stored in the reclining bumper compartment.

Warning : *This compartment is not designed for storage. Never store loose objects in this compartment since they can interfere with the steering linkage mechanism.*

To access the reclining bumper compartment, loosen the two retaining nuts located under the front bumper about 10 turns using the wheel nut wrench. Push the nuts upward and tilt the front bumper forward.



FRONT BUMPER

Warning : *Since the bumper is heavy, two people are required to tilt the bumper forward.*

To fully lower the bumper, disconnect the safety hook on the retaining chain on the R.H. side of the bumper.

When closing the bumper compartment, make sure to connect the safety hook. Make sure that the bumper is securely installed and both nuts are tightened.

FRONT ELECTRIC & SERVICE COMPARTMENT

Provides access to the following:

- Alarm junction box;
- Front junction box;
- In-station lighting connector;
- Entrance door emergency opening valve;
- Windshield washer reservoir;
- Accessory air tank drain valve;
- External air supply fill valve;

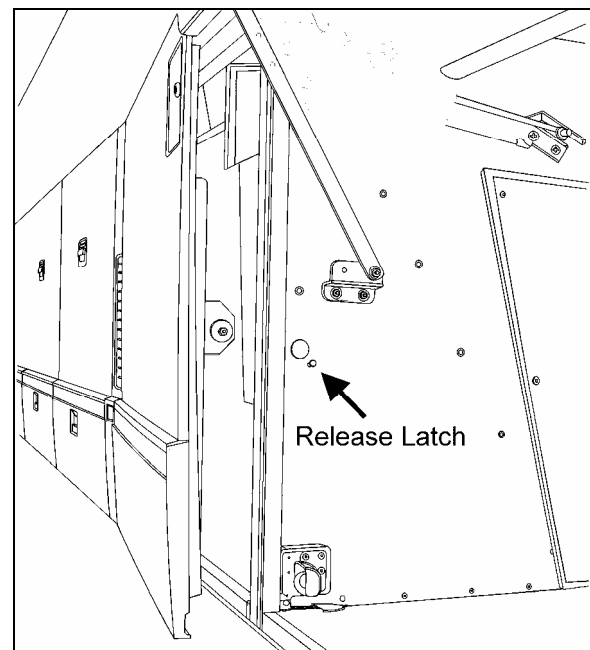
- Spare tire support and rail extension assembly.

The front 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. Refer to the illustration in "Engine Compartment R.H. Side door".

The lighting in the front service compartment turns on automatically when the door is opened.

HVAC COMPARTMENT

The HVAC (Heating, Ventilating and Air-Conditioning) humidistat control is found in this compartment.



HVAC COMPARTMENT ACCESS

The 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

REAR ELECTRIC COMPARTMENT

Provides access to the following:

- Rear junction box
- Electronic Control Unit (ECU)
- Vehicle Interface Module (VIM)
- Water heater system

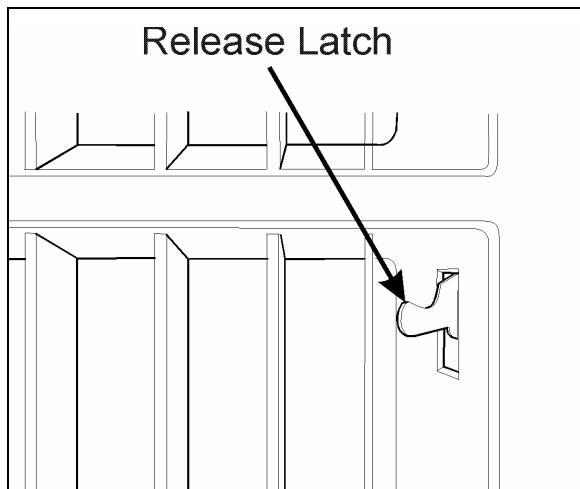
COACH EXTERIOR

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

The lighting in the compartment turns on automatically when the door is opened. If the door is open, an indicator light on the central dashboard will illuminate.

ENGINE RADIATOR DOOR

Open the radiator door by pushing down the release latch.



RADIATOR DOOR

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. The camera is automatically activated when the transmission is put in reverse gear and the ignition switch is "ON". The TV monitor is mounted on the top of the dashboard. Refer to "Controls & Instruments" chapter (page 3-6).

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

110-120 VOLT CONNECTOR

This connector is used with a 110-120 volt supply. It is connected to the engine block heater and the optional fresh water tank heater. Refer to "Care and Maintenance" chapter (page 7-8).

CHAPTER 2 : COACH INTERIOR

DRIVER'S AREA

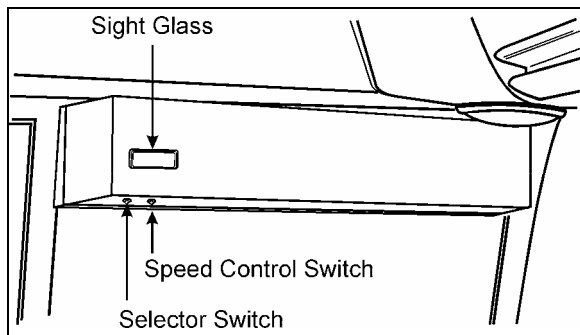
Entrance Door

Open and close the entrance door using the push-button switches located on the dashboard. Refer to "Controls & Instruments" chapter (page 3-17). In an emergency, an opening valve is also provided to open the door. Refer to "Emergency safety features" chapter (page 6-2).

Electrical Destination Sign

Turn the optional destination sign lighting on and off using the rocker switch located on the dashboard. Refer to "Controls & Instruments" chapter (page 3-9).

Depress the selector switch until the desired destination appears in the sight glass and is aligned with the arrow.



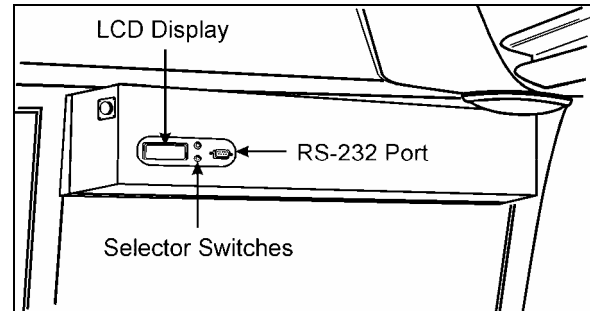
DESTINATION SIGN UNIT

OEH3B210

Note : Use the servo control switch to change the speed of the destination sign. Use high speed to search for the desired destination and slow speed to align the arrow in the sight glass.

Electronic Destination Sign

To change the destination, depress the selecting switches until the desired destination appears in the Liquid Crystal Display.



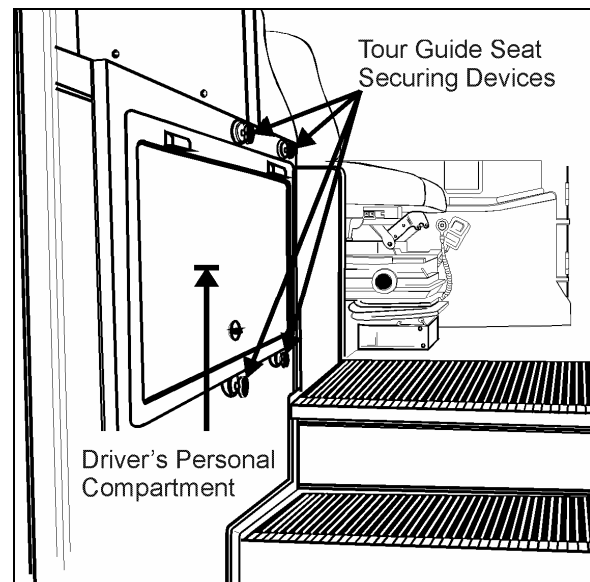
ELECTRONIC DESTINATION SIGN

2EH3B210

Note : The destination sign must be programmed with a computer connected to the RS-232 connector prior to first use. Follow the instructions on the computer disk to install and run the software.

Driver's Personal Compartment

The driver's personal compartment is located to the left of the stairway when entering the coach. The compartment can be locked/unlocked using the appropriate key. A tour optional guide seat may be installed in front of the driver's personal compartment. The seat is secured using securing devices.



PERSONAL COMPARTMENT

Ashtray

To open the ashtray, push slightly on lid's side. Remove ashtray by pulling out.

COACH INTERIOR

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

Cigarette Lighter

The cigarette lighter is located below the ashtray. 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 (e.g., flashlight, vacuum cleaner). The maximum power consumption 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 be used after the ignition key has been removed.

Adjustable HVAC Registers

The HVAC system has adjustable registers to control air flow. They are located on the dashboard, refer to "Controls & Instruments" chapter (page 3-19). The direction and volume of air flow are adjustable.

Driver's Power Window

The driver's area is equipped with a power window. The power window is controlled by using the rocker switch located on the L.H. side control panel. Refer to "Controls & Instruments" chapter (page 3-4).

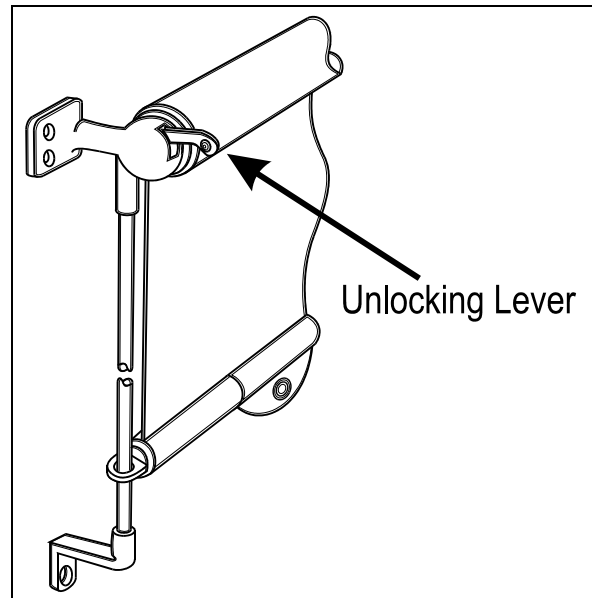
Sun Shades (Blinds)

Raising and lowering of the front blinds is controlled by two 3-position rocker switches located on the dashboard. Refer to "Controls & Instruments" chapter (page 3-9).

The driver is protected from side glare by a spring-release type blind on the left window.

The optional Plexiglas partition, located behind the

driver, may also be equipped with the same blind. Pull down and release the blind in the desired position. To raise the blind, depress the unlocking lever.



DRIVER'S LEFT WINDOW BLIND

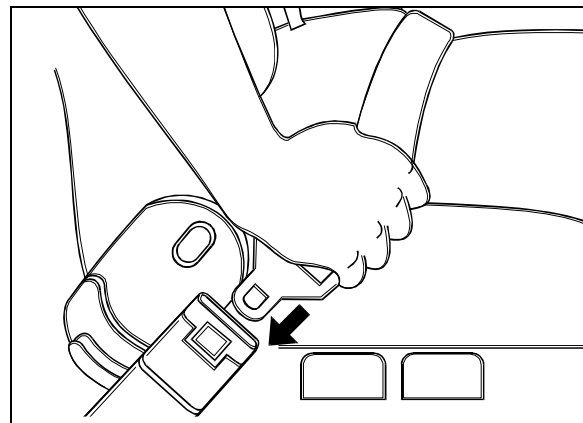
OEH3B214

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 coach. Adjust the left overhead mirror to see through the front passenger windows. The central mirror allows the driver to see passengers in the aisle.

Safety Belt

The driver's seat and the optional tour guide seat are equipped with retractable safety belts. To fasten safety belt, pull latch plate slowly and insert into the buckle until it locks (clicks). The inertia reel is self-adjusting. Manual adjustment is not required.



FASTENING SAFETY BELT

OEH3B222

Immediately report problems with safety belts to maintenance personnel.

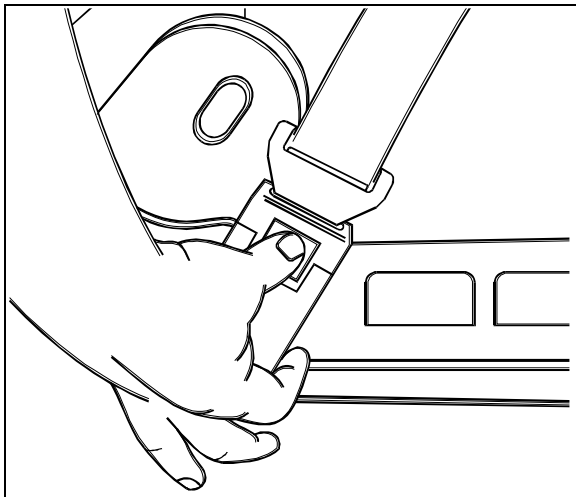
Note : The safety belt must be pulled out slowly and steadily, otherwise the inertia reel will lock before the latch plate reaches the buckle. If the inertia reel locks, let the belt retract completely before trying again.

Warning : To prevent serious injury during sudden braking or accidents, make sure the lap belt is snug and positioned low on the hips. Make sure the belt is not twisted. Check the belt and belt hardware. It should be free of damage. Report problems with safety belts to maintenance personnel.

Warning : To avoid pinching fingers between the retractor and control knobs, move safety belt retractor before adjusting seat angle.

Caution : Do not let the belt rub against edges. Do not bleach or dry clean.

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



UNFASTENING SAFETY BELT

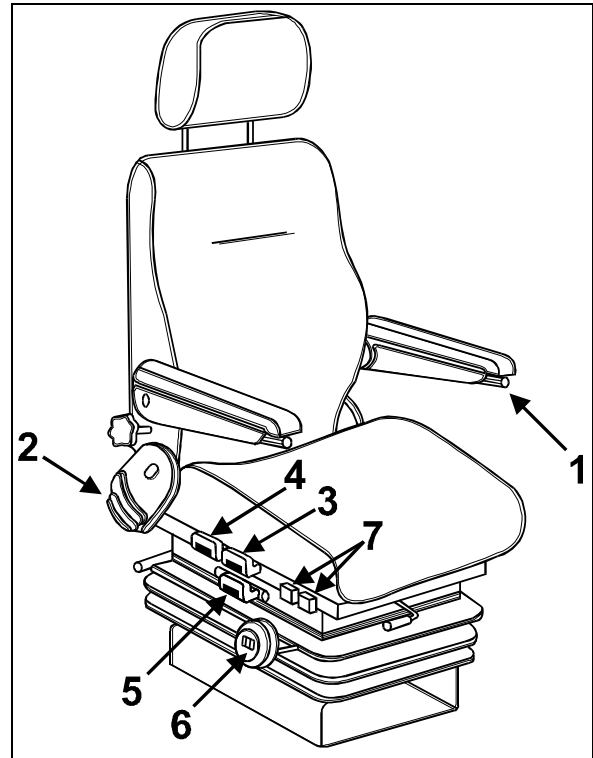
OEH3B218

Driver's Seat

The coach is equipped with a ISRI seat which is offered in three models. The standard model (model 6000) has mechanical suspension. The optional models (models 6500 and 6801) are equipped with air suspension. All seat models come equipped with safety belts. Adjustable armrests and lumbar supports are also available.

Warning: The driver's seat must be adjusted within easy reach of controls. Never adjust the seat while the coach is moving.

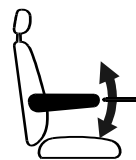
Warning : Always wear safety belt. Make sure the seat is adjusted and safety belt is fastened before driving.



DRIVER'S SEAT ADJUSTMENT (MECHANICAL)
OEH3B220

Driver's Seat Adjustment

ARMREST



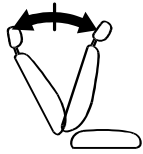
The driver's seat can be equipped with two folding armrests which can be raised or lowered for convenience.

To adjust the armrest to a different position, turn the control

knob (1) counterclockwise about 12 turns without applying pressure on the armrest, push the armrest to desired position. Lock in position by turning the control knob clockwise.

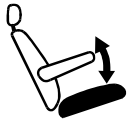
Note : Armrest may be raised at all times from its locked position simply by pulling up.

BACKREST



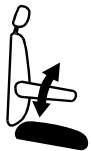
Lift lever (2) then adjust backrest to desired angle.

TILT (front)



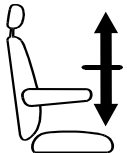
To lower or raise the seat's front section, pull handle (3) up and push or pull the seat cushion.

TILT (rear)



To lower or raise the seat's rear section, pull handle (4) up and push or pull the seat cushion.

UP AND DOWN



Pull both handles (3 and 4) up to adjust height of the seat.

FORE-AND-AFT



To adjust distance between driver and dashboard, pull handle (5) up and slide the seat forward or backward.

Note : Fore-and-aft seat adjustment control may also be located at the front of the seat.

SUSPENSION



For maximum mechanical suspension performance, rotate handwheel (6) until your body weight (in pounds) is shown on the indicator.

The seat suspension resistance can be changed to suit the driver. Turn handwheel clockwise to increase suspension resistance and counter-clockwise to decrease resistance.

Note : Air suspension seats self-adjust to the driver's weight. There is no handwheel suspension adjustment.

LUMBAR SUPPORT



To inflate the upper lumbar support bellows, depress the front rocker switch (7) upward. To deflate, depress the rocker switch downward.

Follow the same procedure to inflate and deflate the lower bellows using the rear rocker switch.

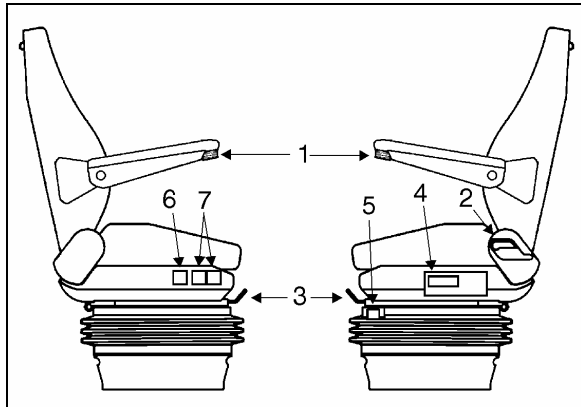
HEADREST



The headrest can be adjusted forward, rearward and vertically by 2 inches (50 mm). Directly move headrest to desired position.

Warning : For best protection, position headrest behind your head, not behind your neck.

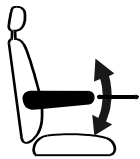
Driver's Pneumatic Seat



PNEUMATIC SUSPENSION SEAT

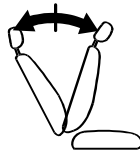
18126A

ARMREST



Rotate the control knob (1) to select desired arm resting angle. When not in use, raise armrest parallel with backrest.

BACKREST



Lift lever (2) to select proper adjustment angle of backrest.

FORE-AND-AFT



Pull handle (3) up and slide seat forwards or backwards to adjust distance between driver and dashboard.

Warning : The driver's seat must be adjusted within easy reach of controls. Never adjust the seat while the coach is moving.

TILT



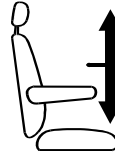
Pull handle (4) up, and push down or pull up on front of seat cushion to tilt the seat.

SUSPENSION



For maximum suspension performance, push down on knob (5) until required weight is reached.

UP AND DOWN



Press on "+" or "-" (6) to raise or lower driver's seat.

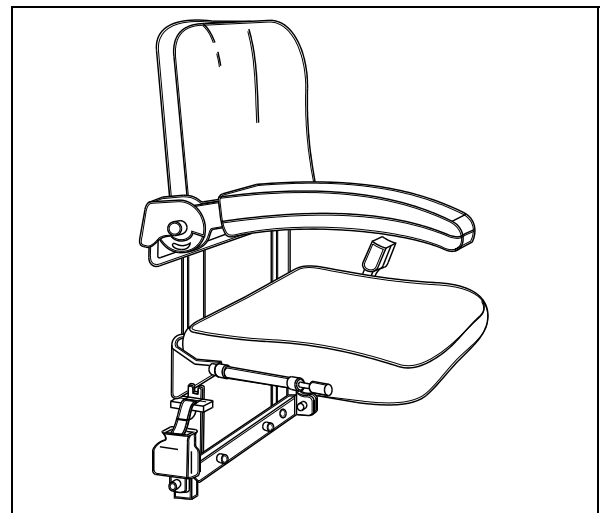
LUMBAR SUPPORT



Push on upper section of rocker switch (7) to inflate lumbar support bellows inside the seat backrest. Push on lower section of rocker switches to deflate bellows.

Note : Rear and front rocker switches are respectively for upper and lower lumbar support bellows.

Tour Guide Seat



TOUR GUIDE SEAT

OEH3B222

The optional folding tour guide seat is equipped with a retractable arm rest and safety belt. The seat can be folded up for convenience when embarking and disembarking passengers.

The tour guide seat can be removed and stored in the driver's personal compartment. To remove the seat from the stairwell wall, unscrew and

COACH INTERIOR

remove the two anchoring pins and washers at the bottom of the seat assembly. Raise and unhook the seat assembly.

Warning : Make sure tour guide's safety belt is buckled up prior to departure.

Microphone Jacks

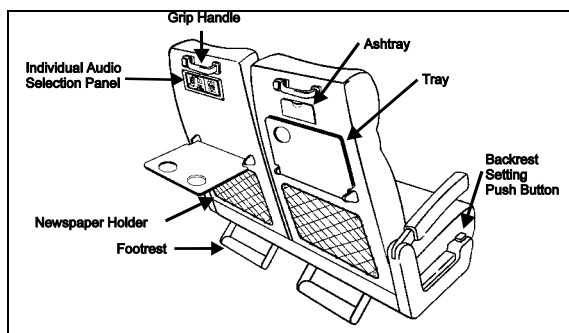
Six microphone jacks for the PA system are available in the following locations:

- On the side wall of the L.H. control panel;
- On the R.H. side of the dashboard;
- One optional outlet for the tour guide on each of the modesty panels;
- One optional outlet on the lavatory wall, behind the last row of seats;
- One optional outlet under the parcel rack, at the rear of the coach.

PASSENGERS' AREA

Passenger Seats

Passenger seats may be equipped with grip handles, ashtrays, newspaper holders, trays and footrests.



PASSENGER SEATS EQUIPMENT

OEH3B226

All seats are track-mounted so that the seating configuration can be changed. Each seat is mounted on oval aluminum pedestals to make it easier to clean between the pedestal and side wall.

Passenger seat backrests can be tilted by using the push-button located on the side of the seat cushion. Depress and hold push-button, then adjust backrest to the desired angle. Release push-button to lock backrest in position. The hydraulic seat back adjustment mechanism is equipped with a pull-off spring.

A folding armrest is installed on the aisle side of the passenger. Another folding armrest is located between the two seats and can be raised for passenger convenience. A fixed armrest is installed on the window side of the seat.

Swivel Seats

The coach is equipped with two sets of swivel seats to allow installation of card tables. The swivel seat can be rotated for passenger privacy.

To rotate seats, unscrew the wing nut from under each seat cushion then remove cushions. Remove the four wing screws, pull seats toward the aisle and rotate the seat counter-clockwise. Align mounting holes, secure with wing screws and install seat cushions.

Note : Instructions for making swivel seat adjustments are affixed on the rear frame under the seat cushion.

Exits

Three windows on each side of the coach, along with the ventilation hatch(es), can be opened from inside for emergency egress. There is a fourth emergency window on the L.H. side of H3-45 coaches. Refer to "Emergency Safety Features" chapter (page 6-1).

Ventilation Hatch

A ventilation hatch is installed in the ceiling at the rear of the coach. A second, optional hatch can be installed in the ceiling at the front of the coach.

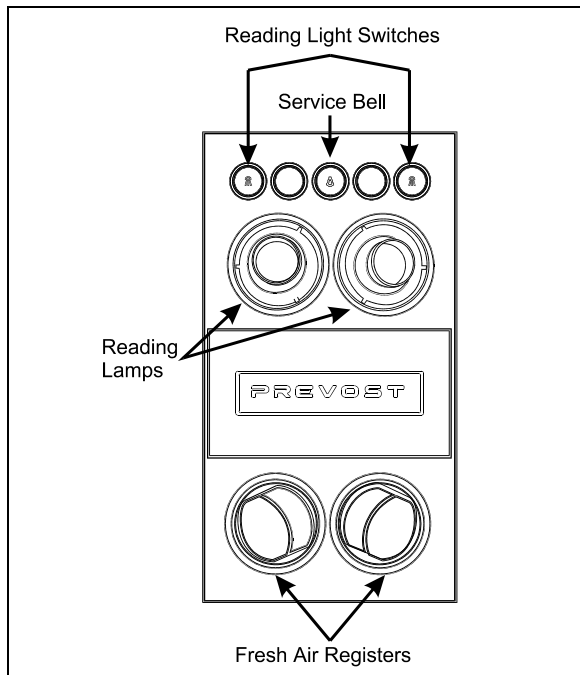
To open the hatch, push up with both hands and pull down to close. The ventilation hatch can be completely removed for emergency egress. Refer to "Emergency Safety Features" chapter (page 6-1).

Warning : Be aware of coach overhead clearance when traveling under overpasses with the ventilation hatch(es) open. Check for maximum clearance height.

Adjustable Air Registers

Adjustable registers located under the parcel racks provide air flow to the passengers. Air flow can be directed by rotating the nozzle. To adjust air flow volume, open or close the flaps.. Passengers can orient individual registers and regulate airflow. Activation of parcel rack fans is

done by depressing a rocker switch on the dashboard. Refer to "Controls & Instruments" chapter (page 3-12).



UNDER-RACK CONTROLS

Stop/Service Chime

The chime system is activated by a rocker switch located on the dashboard. Refer to "Controls & Instruments" chapter (page 3-12). The passenger stop (disembarkation) push-button and service push-buttons are located underneath the parcel racks. Pressing the stop button will inform the driver that a passenger wants to disembark. Pressing the service push-buttons will cause it to illuminate indicating the location of the passenger requesting service.

Reading Lamps

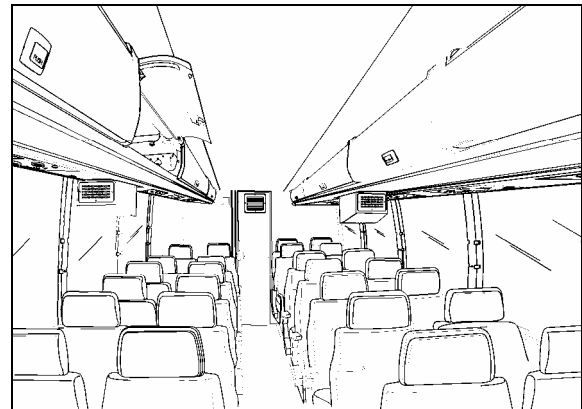
Reading lamps are mounted underneath the parcel racks. Depressing a rocker switch located on the dashboard (refer to "Controls & Instruments" chapter, page 3-11) will activate the reading lamp circuit and allow passenger control of reading lamps.

Parcel Rack

Passenger carry on baggage is stored in overhead compartments on each side of the coach. A first aid kit is located in the first front R.H. parcel rack. An optional video cassette

player and a C.D. player may be installed in the first front L.H. parcel rack.

To open the optional closed aircraft style parcel racks, push the handle in to release the latch, then let go. A pressurized cylinder opens the door.



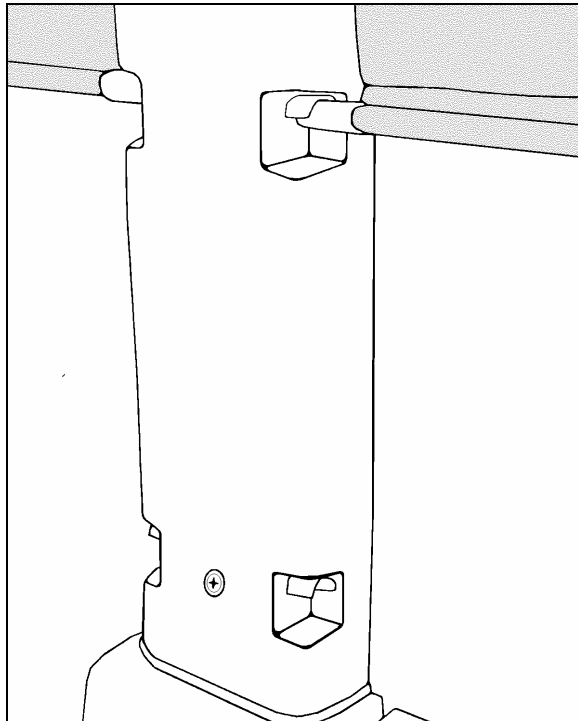
AIRCRAFT TYPE PARCEL RACKS

Note : The parcel racks have a minimum amount of separators installed so as to quicken inspection for forgotten objects.

Note : An optional lock can be installed on the first front L.H. parcel rack door.

Sun Shades (Blinds)

Passenger windows can be equipped with optional spring release-type blinds. Pull the sun visor down and hook onto the first or second catch.

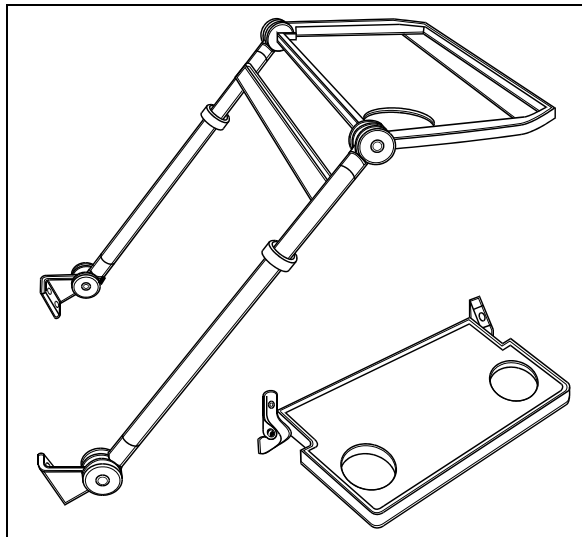


SUN VISOR MECHANISM

23130

Folding Trays

Two optional folding tray models can be installed in the coach.



FOLDING TRAY MODELS

OFH3B232

Note : Both tray models as well as the tray installed in each modesty panel, are equipped with tumbler holders.

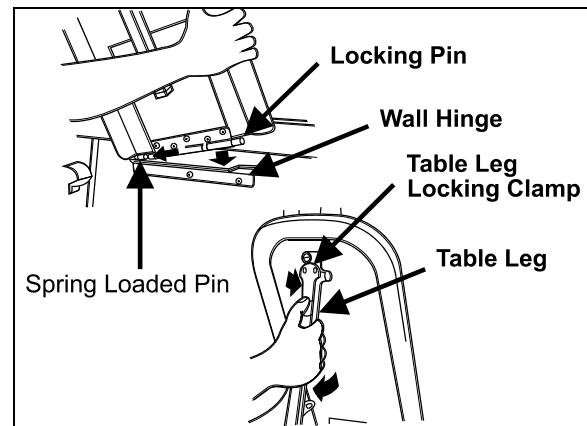
Waste Container

The waste container is located on the lavatory wall, and is accessible through an opening on each side of the wall. A small door, located on the aisle side, gives access to the waste container for cleaning.

Card Tables

Two card tables are provided as standard equipment and are used in the passenger swivel seat configuration. The card tables are stored in the parcel racks in separate stowage bags.

To install the card table, hold it at 45° (degrees) to the side wall. Insert the spring-loaded pin then the locking pin into the hinge. Push on the locking clamp to release the leg. Unfold the leg until the clamp locks it in position.



CARD TABLE INSTALLATION

OEH3B234

"Quick-Lounge" System

"Quick-Lounge" is a quick-fit modular system providing luxurious seating accommodations for passengers.

The optional 'quick-lounge' system occupies the same space as the paired seating configuration it replaces. The existing seat spacing remains unchanged. Galley

The optional galley may include features such as a microwave oven and refrigerator to accommodate hot/cold food and beverage service.

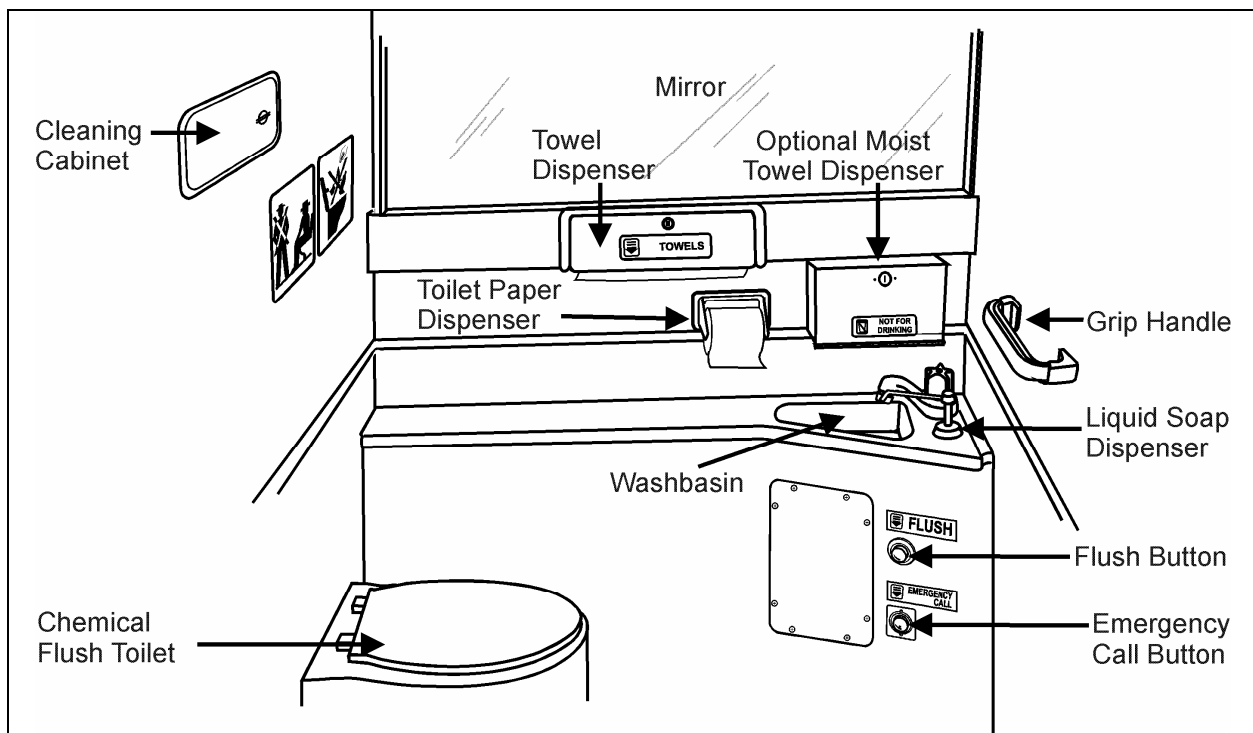
The galley's electrical power circuit is activated by a rocker switch located on the dashboard. Refer to "Controls & Instruments" chapter (page 3-12).

Galley

The optional galley may include features such as a microwave oven and refrigerator to accommodate hot or cold food and beverage service. The galley's electrical power circuit is activated by a rocker switch located on the dashboard. Refer to "Controls & Instruments" chapter (page 3-12).

Lavatory

The lavatory is located in the rear R.H. corner of the coach. It is equipped with a chemical flush toilet, bathroom tissue dispenser, wash-basin, towel dispenser, waste container, mirror, ashtray, and a cleaning cabinet. A liquid soap dispenser and moist towel dispenser are optional.



LAVATORY EQUIPMENT

OEH3B240

Locking the lavatory door from the inside will illuminate a fluorescent light in the lavatory and two outside signs to indicate occupation. One sign is located on the outer wall of the lavatory and another sign is located over the windshield. An indicator light on the dashboard will illuminate to inform the driver when the lavatory is occupied. A night-light is permanently lit in the lavatory when the ignition switch is in the ON position.

If emergency assistance is required, the person in the lavatory can sound a buzzer in the driver's area. The emergency call button, with operating instructions, is located on the inner wall of the lavatory.

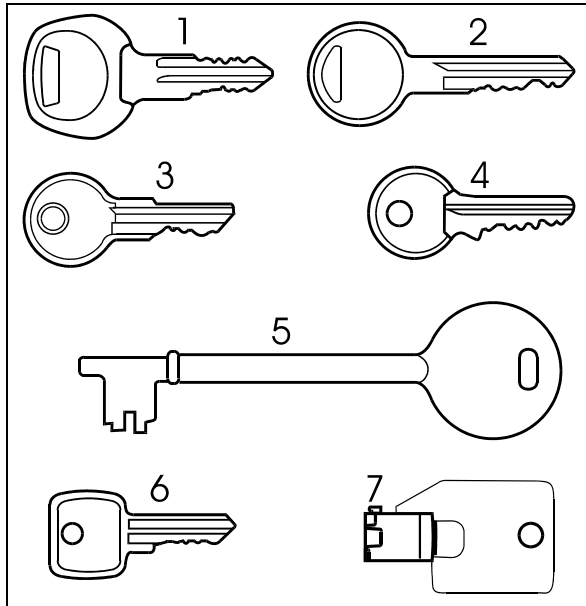
The lavatory has its own ventilation system that operates when the HVAC system is on.

The fresh water tank may be equipped with an immersion heater that operates from the in-station connector and is powered with a 110-120 volt supply. Refer to "Exterior of coach" chapter (page 1-8). For sump tank draining and filling procedures, refer to "Care and Maintenance" chapter (page 7-10).

CHAPTER 3 : CONTROLS & INSTRUMENTS

KEYS

Depending on the optional equipment installed, the following keys are available.



Keys

OE3B304

1 - Entrance Door/Exterior Compartment Key

Used to lock/unlock the entrance door, and any exterior compartment door.

Note : If the coach is equipped with the central locking system on the L.H. control panel, the baggage compartment doors can be remotely locked/unlocked from the control panel.

2 - Driver's Personal Compartment Key

Used to lock/unlock the driver's personal compartments.

3 - Ignition Key

Used to turn on the electrical power in the coach and to start the engine. Coach may be equipped with an optional ignition lever.

4 - Video System Compartment Key

Used to lock/unlock the video system compartment's optional lock located in the first left parcel rack.

5 - Lavatory Door Key

Used to lock/unlock the lavatory door or to prohibit access when necessary.

6 - Key for Towel Dispenser, Toilet Paper Dispenser and Cleaning Cabinet

Used to gain access to the towel dispenser for refilling or to access the hose plug inside the lavatory cleaning cabinet.

Note : A different key is used for the optional moist towel dispenser.

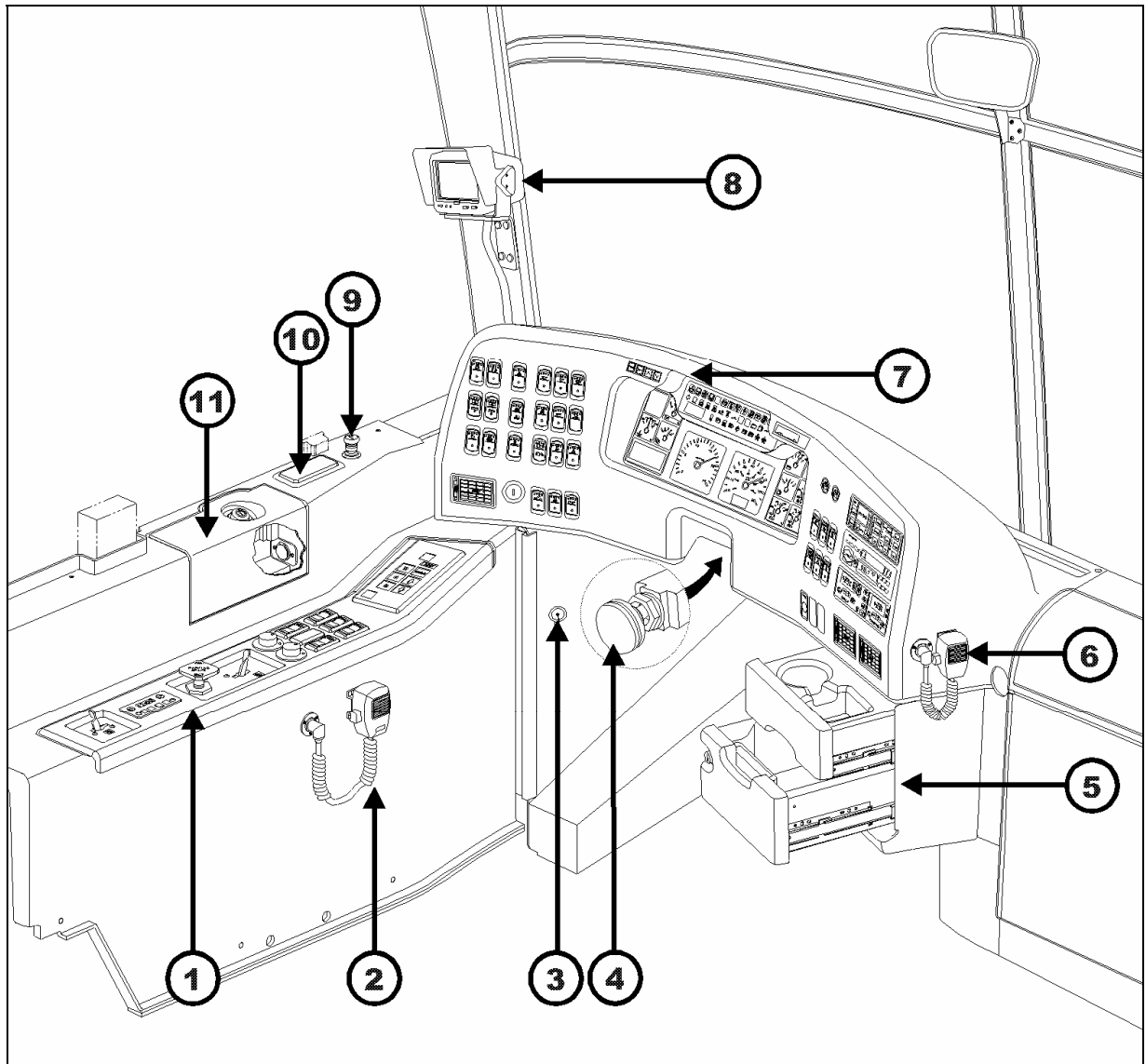
7 - Video Monitor

Used to lock/unlock the optional Video Monitors to remove or install them.

Note : For added security:

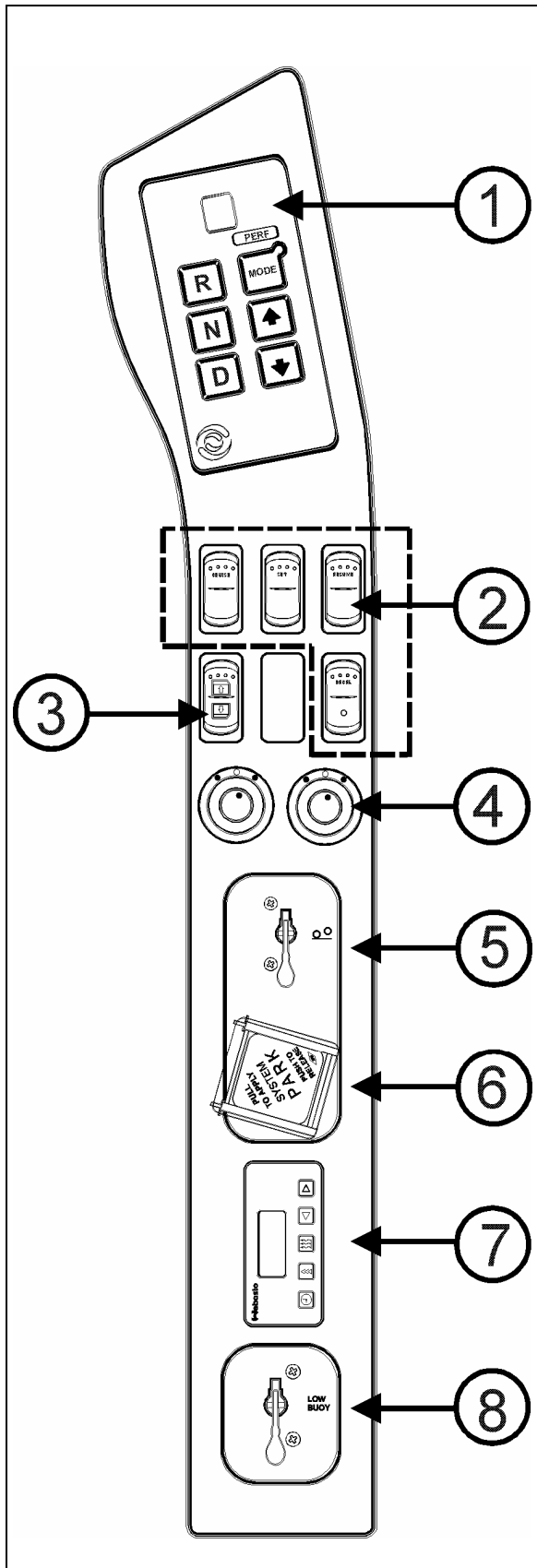
- a) Keep a record of the key numbers in a safe place. Do not keep the record in the coach. Keep on your person.
- b) Keep a duplicate of each key in a safe place in case of loss or theft.

CONTROLS & INSTRUMENTS



DRIVER'S AREA

1 - L.H. Control Panel	3-3
2 - P.A. System	3-17
3 - Diagnostic Data Reader (DDR) Receptacle.....	3-5
4 - Steering Wheel Adjustment Unlock Air Valve	3-22
5 - Utility Drawers.....	3-6
6 - Hostess's P.A. System (optional).....	3-17
7 - Dashboard	3-7
8 - Rear View TV Monitor.....	3-6
9 - Cigarette Lighter	3-6
10 - Ashtray.....	3-6
11 - Utility Compartment.....	3-6



L.H. CONTROL PANEL

L.H. CONTROL PANEL

- 1 - Transmission Display
- 2 - Cruise Control Switches
- 3 - Driver's Power Window Switch
- 4 - Mirror Controls
- 5 - Tag Axle Control Valve
- 6 - Parking Brakes Control Valve
- 7 - Water Heater Timer (refer to page 4-5)
- 8 - Low-Buoy Control Valve

Transmission Display

The control pad for the optional Allison automatic transmission is located as shown. Refer to Automatic Transmission in this chapter for operating instructions and more information. Coaches equipped with the optional Eaton semi-automatic transmission will have a range display at this location (not shown). Refer to Semi-Automatic Transmission in this chapter for more information.

Cruise Control

The cruise control is part of the DDEC IV 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 and accelerate the coach to the desired cruising speed. Depress and release the **SET** switch; then remove foot from the accelerator pedal. This will set the coach cruise speed and store it in memory.

CONTROLS & INSTRUMENTS

Note : The cruise control and RESUME switch do not operate at speeds below 20 mph (32 km/h).

Increasing Set Speed

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

a) With the accelerator pedal and the SET switch

Accelerate the coach using the accelerator pedal until the desired cruising speed is reached; then depress and release the SET switch.

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

b) With RESUME 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).

Decreasing Set Speed

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

a) With the SET switch

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.

b) With the DECEL switch

The cruise control can be disengaged without losing the preset cruise speed by either of the following methods:

- Slightly apply the service brake, or;
- Depress and release the DECEL switch.

Note : For coaches equipped with a manual transmission, the cruise control may be disengaged by depressing the clutch pedal, and re-engaged by releasing the clutch pedal.

After disengaging the cruise control, you can return to the preset cruising speed by pressing

and releasing the RESUME switch providing that the coach's speed is above 20 mph (32 km/h).

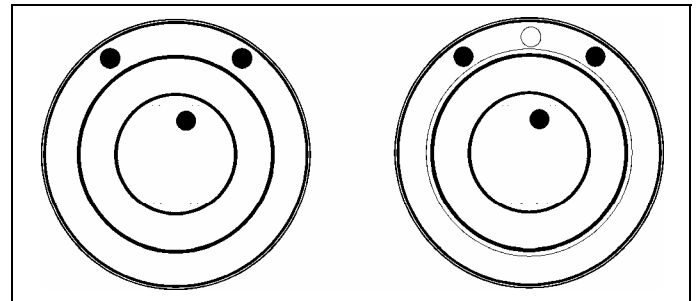
Note : To avoid sudden coach hesitation, depress the accelerator pedal lightly before disengaging the cruise control.

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

Driver's Power Window Switch

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

Mirror Controls



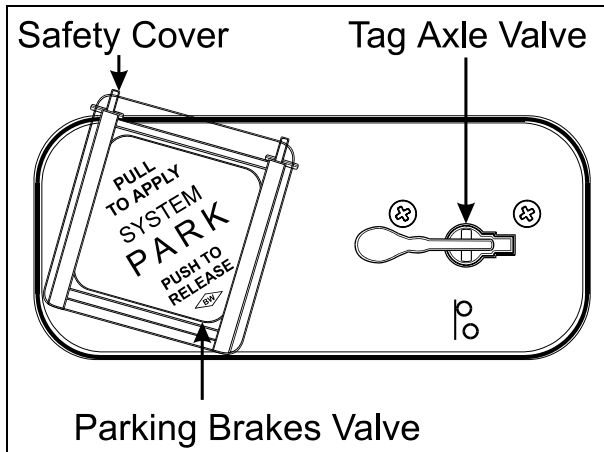
MIRROR CONTROLS

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.

Tag Axle Control Valve

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" chapter (page 4-12) for additional information.



CONTROL VALVES

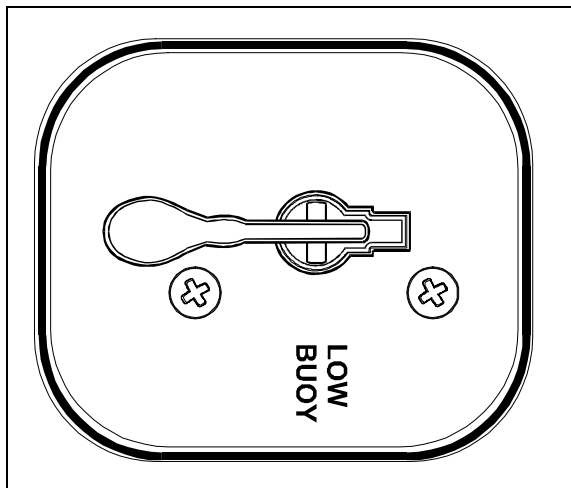
Parking Brakes Control Valve

Spring-loaded parking brakes are applied by pulling up the control valve knob and protector assembly. Lift safety cover and push down to release brakes. Refer to "Emergency and Parking Brakes" in "Emergency Safety Features" chapter.(page 6-4).

Water Heater Timer

Use to program the start time of the optional engine coolant heater. Refer to "Other Features" (page 4-5) for additional information.

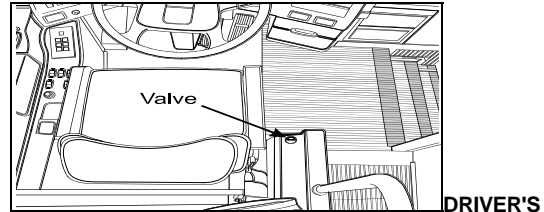
Low-Buoy Control Valve



LOW BUOY CONTROL VALVE

Rock back the control valve lever to lower the vehicle by about four inches. Returning lever to its normal (forward) position raises the vehicle back to its normal ride height.

Parking Brakes Override Valve



SEAT

If the primary system air pressure drops below 40 psi (276 kPa) during normal operation, the spring-loaded parking brakes will be immediately applied at full capacity on the drive axle to stop the vehicle.

If this occurs, determine the correct cause of pressure loss before proceeding.

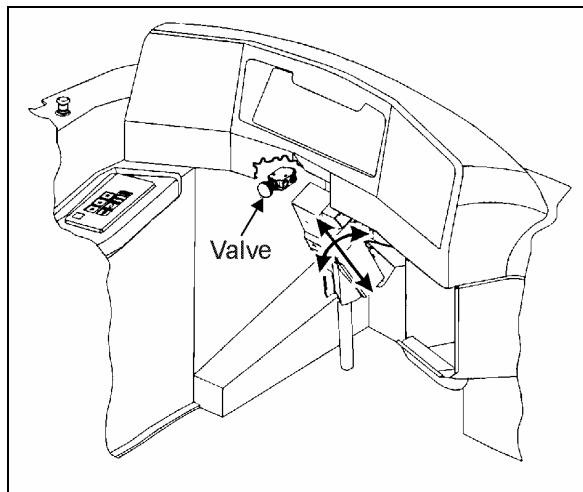
The vehicle may be equipped with an optional parking brake release system that can be used to override the parking brakes so that the vehicle can be driven for a short distance to a safe parking area. To operate the optional parking brake release, push and hold down the control knob while driving.

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.

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

STEERING WHEEL ADJUSTMENT UNLOCK AIR VALVE



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 coach is moving. Loss of control could result. Park the coach safely and apply parking brakes before adjusting the steering wheel.

DASHBOARD COMPARTMENTS

Two drawer type driver's compartments are standard issue and may be used to stow small items. The top compartment houses a cup/beverage holder. The lower, lockable compartment is larger and outfitted with a 12 Volt DC power outlet. Unclip the sliding rails to remove for cleaning.

REAR-VIEW TV MONITOR

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 A-pillar and switches on automatically when the transmission is in the reverse (R) range.

CIGARETTE LIGHTER

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.

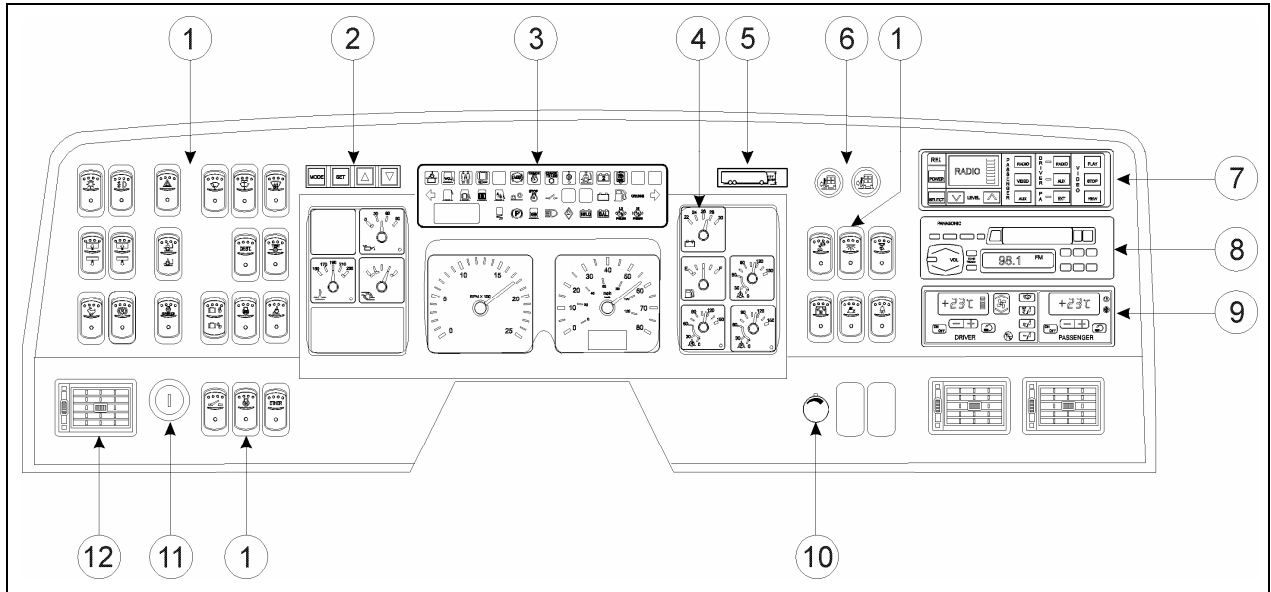
ASHTRAY

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.

UTILITY COMPARTMENT

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



DASHBOARD

DASHBOARD

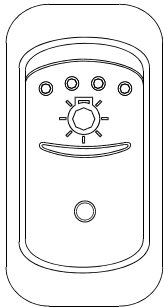
The dashboard comprises three digital displays (Trip Data Recorder (TDR), Exterior Temperature and Odometer Display). The digital displays have two intensities: day and night. A photocell inside the module will automatically shift the displays to night intensity at around 35 to 40 lux.

1. Control Switches.....	3-8
2. Trip Data Recorder (TDR).....	3-12
3. Telltale Panel	3-12
4. Gauges	3-16
5. Vehicle Height Information	3-17
6. Front Door Buttons.....	3-17
7. Control Head	3-17
8. Radio	3-18
9. HVAC Control Unit	3-18
10. Brightness Control	3-19
11. Ignition Switch	3-19
12. Air Registers.....	3-19

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.

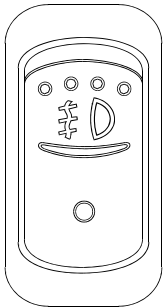
Headlights



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 canceled when the exterior lighting switch is fully depressed.

Fog Lights

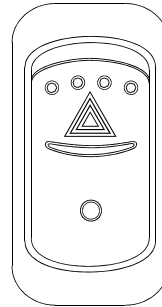


Optional halogen fog lights provide better visibility in fog and precipitation. They improve close range visibility and provide added safety. Remove protective covers from fog lights before use.

Warning : Turn off engine and apply parking brake before removing fog light covers.

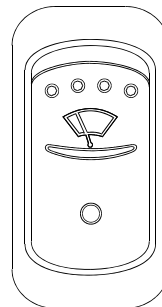
Note : Some states and provinces restrict the use of fog lights. Verify local state or provincial regulations before using

Hazard Warning Flashers



Depress the rocker switch to make all turn signal lights flash at once. The dashboard indicator lights will flash when the hazard warning flashers are on.

Upper Windshield Wipers

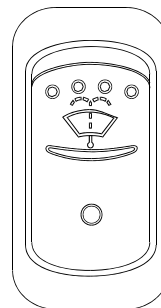


Depress the wiper rocker switch to the first position for intermittent wiping. For continuous wiping, depress switch fully.

Note : The lower windshield wipers are operated via the multi-function lever. Refer to "Steering Column Controls".

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

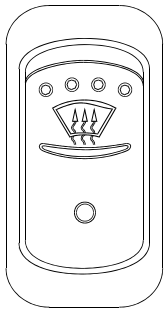
Upper Windshield Washers



Hold down rocker switch to spray windshield washer fluid.

Caution : Do not operate when windshield washer reservoir is empty. Doing so may damage the washer pump or motor.

Upper Windshield Defogger

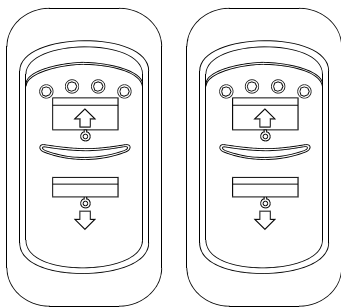


Depress this switch to the first position to operate the defogger blower at low speed, press down fully to operate the blower at high speed.

The coach may be equipped with an optional electric heating element.

If your coach is equipped as such, depress the rocker switch momentarily to turn on the heating element and clear fog, frost or thin ice from both sides of upper windshield. The heater elements automatically turn off after 10 minutes.

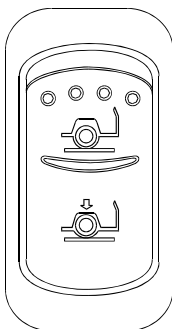
Left and Right Sun Shades



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.

Kneeling / Hi-Buoy (Optional)

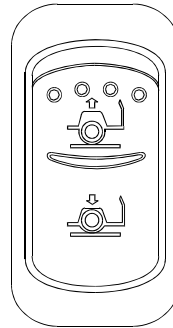


Momentarily press down the rocker switch rearward to lower the front end of the coach 4 inches (100 mm), and forward to return the coach to normal driving height. Refer to "Other Features" chapter (page 4-12).

Press and hold the rocker switch forward to raise the front end of the coach 4 inches (100 mm).

Release the rocker switch to return the coach to the normal driving height.

Kneeling / Full Hi-Buoy (Optional)

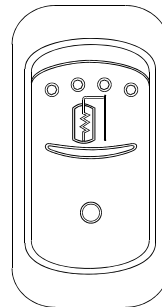


Momentarily press down the rocker switch rearward to lower the front end of the coach 4 inches (100mm), and forward to return the coach to normal driving height. Refer to "Other Features" chapter (page 4-12).

Press down and hold rocker switch forward to raise the complete suspension of the coach 4 inches (100 mm).

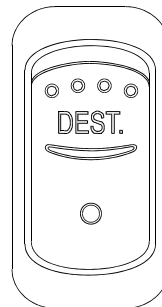
Release the rocker switch to return the coach to the normal driving height.

Outside Mirror Heat (Optional)



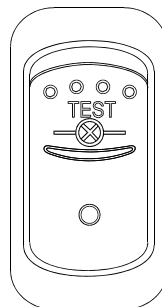
Turn on to clear fog, frost or thin ice from outside mirrors.

Destination Sign Light (Optional)



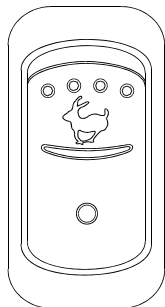
Turn destination sign light on or off using this switch.

Telltale Light Test



Press this switch while ignition is in the "ON" position to illuminate the telltale light cluster. Perform this test to verify indicator light functionality. Indicator lights will extinguish automatically after about ten seconds.

Fast Idle

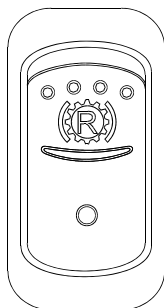


For extended idling periods, run the engine at fast idle. Press down the rocker switch to engage fast idle. This increases the engine speed to approximately 1,000 rpm.

Note: If the parking brake is released and/or the transmission is engaged with the engine running at fast idle, the engine will return to low idle and remain there as long as the parking brake is not applied and/or transmission is not placed in neutral (N).

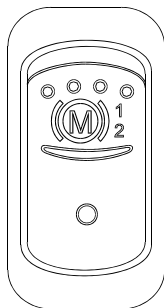
Caution: reduce the engine to low idle before shutting the engine off.

Transmission Retarder (Optional)



Press down rocker switch to actuate transmission retarder. Refer to "Steering Column Controls" in this chapter.

JACOBS Engine Retarder (Optional)



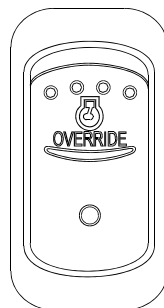
Press down rocker switch to the first position to actuate system 2/3 engine brake and press to the second position for a full application of engine brake. Refer to "Other Features" chapter (page 4-11).

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

Note : Engine brake is activated when accelerator pedal is released and the engine speed is higher than 750 rev/minutes. Stop lights are on when the engine brake is used.

Engine Stop Override or DDEC Diagnostic Request

Engine Stop Override



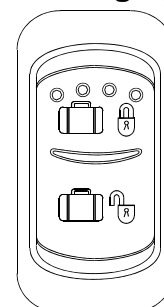
Press down this switch and release to override emergency engine shut down protection. Engine emergency shut down will be turned off for 30 seconds. This procedure can be repeated if done before the 30 seconds are up.

Caution : Use sparingly and in order to move coach 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 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 IV Diagnostic Codes"

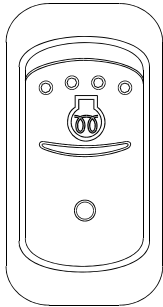
Baggage Compartment Central Locking System



This optional system enables locking all baggage compartment doors by pressing down on the upper portion of the switch. To unlock all compartments, press down on the lower portion of the switch.

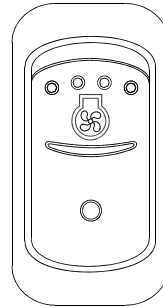
Note : Service panels are not linked to the central locking system.

Pre-heater (Optional)



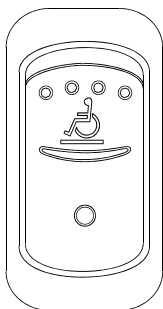
Push down rocker switch to turn the preheating system on, supplementing the central heating system when required. The pre-heater will turn on or off automatically depending on coolant temperature.

Engine Radiator Fan Override



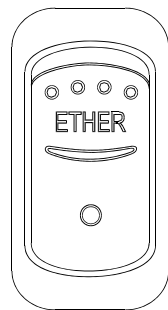
Depressing this rocker overrides the radiator fan's thermostatic switch. Use this feature when the radiator fan switches on and off often, such as when driving up a long grade or in very hot weather.

Wheelchair Lift



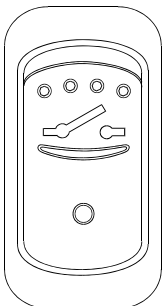
Activate the optional wheelchair lift by pressing down on the rocker switch. Refer to "Wheelchair Lift System Operator's Manual" for operating instructions.

ETHER Start Control (Optional)



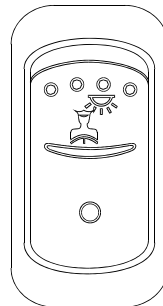
Activates the engine cold starting aid. Refer to "Starting and Stopping Procedures" chapter (page 5-2).

Battery Master Switch



Both the 12-volt and 24-volt systems are activated by the master switch located on the L.H. lower control panel. An indicator light on the L.H. dashboard will illuminate when the ignition key is in the OFF position.

Driver's Area Lighting

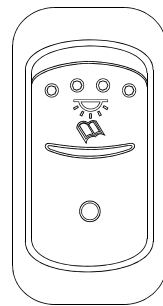


Press down the rocker switch to illuminate the two ceiling lights in the driver's area. These lights are frequently used at night when passengers are boarding or leaving the coach.

Caution: When parking the coach overnight, or for an extended period of time, place the battery master switch to the off position.

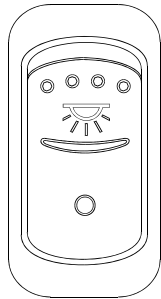
Note: When the battery master switch is placed in the OFF position, all electrical equipment connected to the batteries is cut off, with the exception of the battery equalizers and monitor, World Transmission (WT) Electronic Control Unit (ECU) memory, Vehicle Interface Module (VIM), preheating system, tachograph, and refrigerator power supply.

Reading Lamps



Pressing down the driver's rocker switch will power the reading lamp circuit to enable passengers to operate their personal reading lamps. Refer to "Coach Interior" chapter (page 2-7).

Interior Lighting

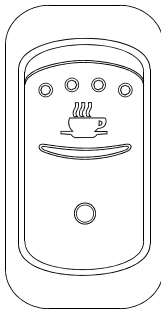


Press down the rocker switch to the first position to illuminate the aisle dome lights and to the second position to illuminate both the fluorescent lights and the aisle dome lights.

The aisle dome lights are located on the side of the parcel racks, and the fluorescent lights are located below the parcel racks.

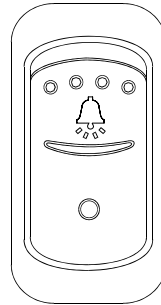
Caution : Turn off the aisle dome lights and fluorescent lights when the engine is stopped to avoid running-down the batteries.

Galley Power (Optional)



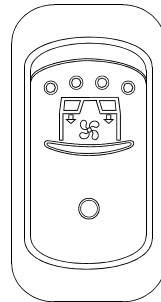
Press down the rocker switch to power the galley electrical circuit.

Stop/Service Chime (Optional)



Pressing down the driver's rocker switch will power the chime system to allow passenger operation of both the stop (disembarkation) button and the service button. Refer to "Coach Interior" chapter (page 2-7).

Passenger's Fresh Air Registers

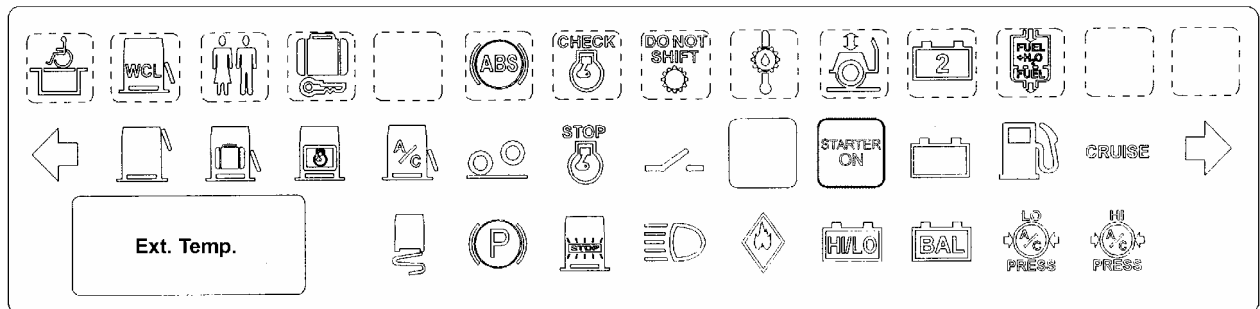


Press down on the rocker switch to allow passenger operation of overhead fresh air registers.

Trip Data Recorder (TDR)

This standard feature gathers, stores and displays important information about the vehicle's operation on a display screen on the lower middle portion of the dashboard. Refer to "Trip Data Recorder" heading in "Other Features" chapter (page 4-6) for a description of how to set-up and operate the display.

Telltale Panel



06217

Wheel Chair Lift



Illuminates when the wheel chair lift is supplied with electricity. The switch is located on the L.H. control panel.

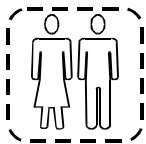
Refer to "L.H. Control Panel" heading, in this chapter.

Wheel Chair Lift Access Door Ajar



Illuminates when the wheel chair lift access door is open.

Lavatory Door Lock Indicator



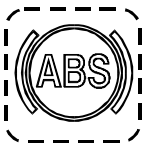
Illuminates when the lavatory door is locked.

Baggage Compartment Door Lock Indicator



Illuminates when one or more baggage compartment doors are unlocked.

Anti-Lock Braking System (ABS) Indicator



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 (page 4-11).

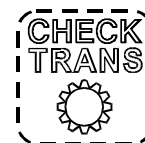
Check Engine Indicator



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

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 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 IV Diagnostic Codes" (page 8-6).

Check Transmission Indicator



Illuminates briefly when the ignition is switched ON as a light test. The indicator light should go out after two seconds.

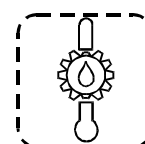
When the "CHECK TRANS" indicator is illuminated and the shift selector emits short beeps for 8 seconds, the ECU is restricting transmission shifting because special or abnormal conditions are detected. The SELECT digit on the display will be blank.

If this happens, drive the coach to the next available service station 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.

Any time the CHECK TRANS light illuminates, the ECU will register a diagnostic code. It may be identified on the display or using a diagnostic tool. Refer to "Technical Information" chapter under "World Transmission (WT) Diagnostic Codes" (page 8-9).

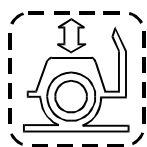
Note : The CHECK TRANS transmission indicator may also illuminate when starting the engine in extreme cold weather. Refer to "Starting and Stopping Procedures" chapter under "World Transmission (WT) Warm-up" (page 5-3).

Retarder Oil High Temperature Indicator



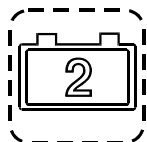
Illuminates when the transmission oil temperature is too high. Disengage the retarder to allow the oil temperature to cool down.

Kneeling/Hi-Buoy Indicator



Illuminates during Kneeling or Hi-Buoy operation. A buzzer informs the operator during the operation. The control switch is located on the dashboard.

Secondary Charge System Indicator



Illuminates when the secondary alternator is not functional.

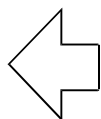
Fuel/Water Separator Indicator



Illuminates when accumulated water in the fuel filter/water separator needs to be drained.

Refer to "Care and Maintenance" chapter (page 7-7).

Left Turn Signal Indicator



Flashes when the left turn signals are turned on. Right and left turn signals are selected by operating the multi-function lever.

Refer to "Steering Column" heading, in this chapter.

Window Open Indicator



Illuminates when a window is open.

Baggage Compartment Door Ajar



Illuminates when one or more baggage compartment doors are open.

Engine Door Ajar Indicator



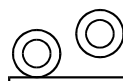
Illuminates when one or both engine compartment doors are open.

A/C - Heating Compartment Door Ajar Indicator



Illuminates when the A/C - heating compartment door is open.

Retracted Tag Axle Indicator



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

STOP Engine Indicator



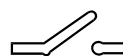
Illuminates when the ignition switch is "ON", as a light bulb and DDEC system check. The indicator should go off after five seconds.

If the indicator remains illuminated after five seconds, or comes on sometime after starting the engine, the DDEC system has detected a major problem. When a problem is detected, the engine power will automatically begin to decrease gradually, followed by full shut-down 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 IV Diagnostic Codes" (*

Electrical Systems Indicator



Illuminates when the ignition switch is OFF and the 12-volt and 24-volt electrical systems are activated by pressing down the battery master switch.

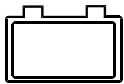
Starter ON Indicator



Illuminates when the engine starter is ON.

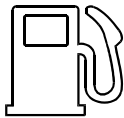
Warning: If the "STARTER ON" Indicator light remains illuminated even after releasing the ignition switch, Stop the engine immediately and set the battery master switch (ignition key) to the OFF position. Have the starter checked immediately.

Primary Charge System Indicator



Illuminates when the alternator is not charging the batteries.

Low Fuel Level Indicator



Illuminates when approximately 12 US gallons (45 liters) of fuel remain in the tank. After the light comes on, the remaining fuel will provide less than 60 miles (100 km) of travel. Do not exceed this distance.

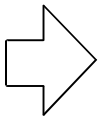
Note : Refuel as soon as possible.

Cruise Control Indicator



Illuminates when cruise control is activated.

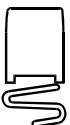
Right Turn Signal Indicator



Flashes when the right turn signals are activated. Right and left turn signals are selected by operating the multi-function lever. Refer to

"Steering Column" heading, in this chapter.

Freezing Indicator



Flashes for about 10 seconds when the outside temperature drops from 2°C to 1°C (35°F to 34°F).

Emergency/Parking Brake Indicator



Illuminates when the emergency/parking brake is applied. The control valve is located on the R.H. lateral console.

A buzzer will sound if ignition is turned to off and the parking brake is not engaged.

Stoplight Indicator



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

High Beam Indicator



Illuminates when high beams are selected. High and low beams are selected by operating the multi-function lever.

Refer to "Steering Column" heading, in this chapter.

Fire Indicator (Engine Compartment)



Illuminates if a fire is detected in the engine compartment.

Note : For extinguisher's location refer to "Emergency Safety Features" chapter (page 6-2).

High/Low Battery Voltage Indicators



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

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 Equalizer Indicator



Illuminates when the battery voltage is not equalized.

Note : If the battery equalizer indicator

CONTROLS & INSTRUMENTS

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

Low Air Conditioning (A/C) Pressure Indicator



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

Note : In cold weather, the low A/C pressure indicator may light up. This is not an abnormal condition.

High A/C Pressure Indicator



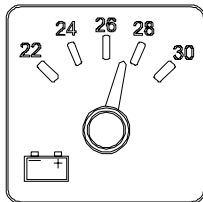
Illuminates when the A/C system pressure is too high. If the A/C pressure is too high, the compressor clutch is disengaged, but the fan remains activated.

Note : In hot weather, the high A/C pressure indicator may light up. This is not an abnormal condition.

Gauges

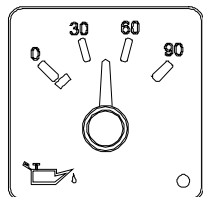
Note : Do not refer to dashboard instruments during adjustment procedures. Use calibrated gauges.

Voltmeter (24-Volt System)



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

Engine Oil Pressure Gauge



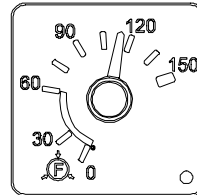
Indicates engine oil pressure. The normal reading should be between 50 and 70 psi (345 - 480 kPa) at 55 mph (90 km/h).

A low oil pressure indicator LED (bottom right corner) illuminates when the oil pressure drops

below 50 psi (345 kPa).

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

Air Pressure Gauge (Primary System)

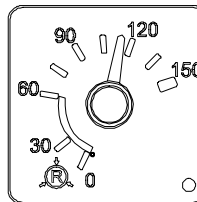


Indicates the primary air system pressure. The normal operating pressure is from 95 to 125 psi (655 to 860 kPa).

A low air pressure indicator LED (bottom right corner) illuminates when the primary air system pressure drops below 66 psi (455 kPa).

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

Air Pressure Gauge (Secondary System)

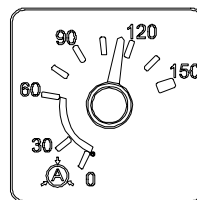


Indicates the secondary air system pressure. The normal operating pressure is from 95 to 125 psi (655 to 860 kPa).

A low air pressure indicator LED (bottom right corner) illuminates when the secondary air system pressure drops below 66 psi (455 kPa).

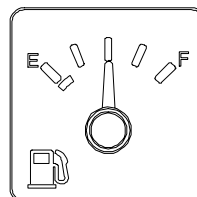
Warning : Do not drive the coach when air pressure is low.

Air Pressure Gauge (Accessories)



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

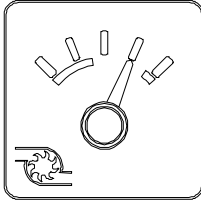
Fuel Gauge



Indicates the amount of fuel remaining in the fuel tank.

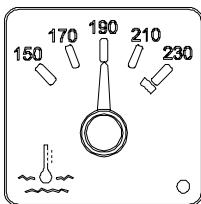
Caution : Operating the coach when the reading is below 1/8 full is not recommended.

Turbo Boost pressure Gauge



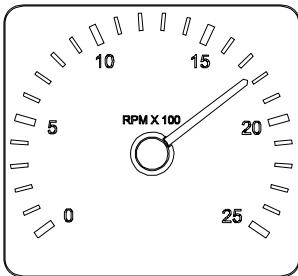
Indicates turbo boost pressure in psi. Reading depends on engine rpm and load conditions.

Engine Coolant Temperature Gauge



Indicates the operating temperature of the engine coolant. The normal reading should be between 190°F to 215 °F (88°C to 102 °C).

Tachometer

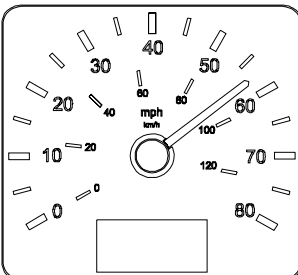


Indicates the operating speed of the engine in hundreds of revolutions per minute (rpm x 100).

The tachometer serves as a guide for

gear shifting, and helps to prevent engine overspeeding when driving downhill with the JACOBS engine brake operating. The maximum allowable engine speed is 2,450 rpm.

Speedometer

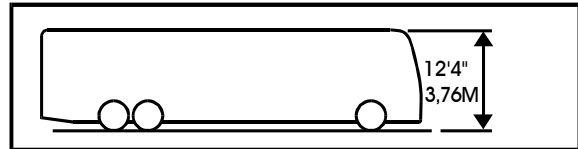


Indicates the coach speed in miles per hour (mph) and kilometers per hour (km/h).

The digital odometer registers the distance traveled in miles or in

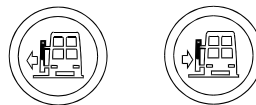
kilometers (units are driver selectable).

Vehicle Height Information



Normal vehicle height is 12'-4" (3.76 m).

Front Door Buttons

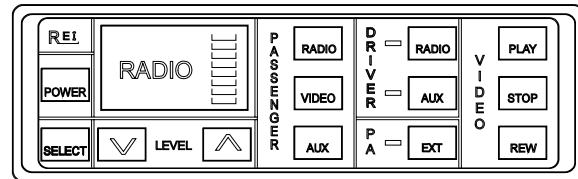


Press and hold the red button to open the door and the green button to close the door.

Releasing the button at any time will immediately stop door movement.

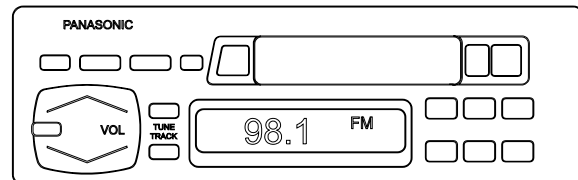
Warning : The door mechanism has no automatic safety protection to avoid injury to bystanders. The driver is responsible for the safe operation of the door.

Control Head



The control head enables the driver to independently control audio entertainment and volume level in the passenger and driver's areas. The video cassette player, the P.A. system and auxiliary systems (e.g. DVD player) are also controlled by the control head panel.

Radio



Due to the availability of several radio brands, refer to the manufacturers operating instructions.

HVAC Control Unit

The cabin is pressurized by the A/C - heating system. Air flow and controls divide the coach into two areas:

- driver area with defroster;
- passenger area.

Pressurization of the cabin helps prevent dust and moisture from entering.

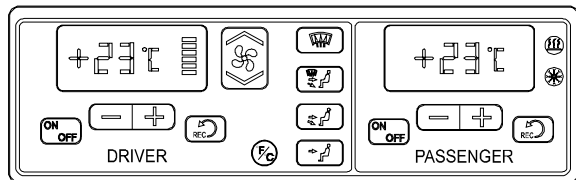
Fresh air is fed in each area and has a separate return air and discharge air duct. The passenger's area also has a fan in the lavatory to circulate fresh air and for heating and cooling. The lavatory fan serves as the main air exhaust for the coach.

Warning : Do not let temperature in the driver's area rise above 72 °F (22 °C). Warm temperatures may cause drowsiness and affect alertness while driving. Keep temperature between 68 °F to 72 °F (20 °C to 22 °C).




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

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

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



Separate driver and passenger heating, ventilation and air conditioning controls are located on this panel.

To operate, the coach's engine must be running. The driver's or the passenger's units may be turned on by pressing  or  or  buttons.

All parameters set before turn off will be kept in memory for the next power on.

The HVAC module performs a self diagnostic every time it is turned on. Codes are shown on displays or flashed on control buttons.

Heating Mode Indicator



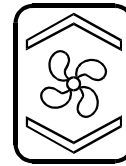
Illuminates when system is heating.

Cooling Mode Indicator



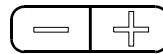
Illuminates when system is cooling.

Fan Speed



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



The driver's side and the passenger's side have independent temperature

controls. 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 (12°C to 28°C).

Recirculate Button



Permits air recirculation in the driver's or passenger's side of the cabin.

A LED lights up when in operation.

Windshield defogger



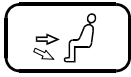
Air is sent towards windshield when activated.

All Vents Open



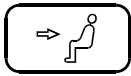
Air is sent to defogger vents as well as panel and footwell registers.

Panel and Footwell



Air is sent to panel and footwell registers only.

Panel



Air is sent to panel registers only.

Temperature degree selector



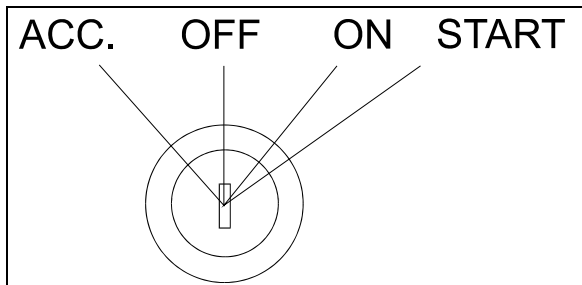
Toggles between Fahrenheit and Celsius units.

Brightness Control



Adjusts the brightness of the dashboard instruments and switches.

Ignition Switch



Note: The coach may be equipped with a keyless ignition.

The ignition switch has four positions:

ACCESSORIES

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

OFF

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

ON

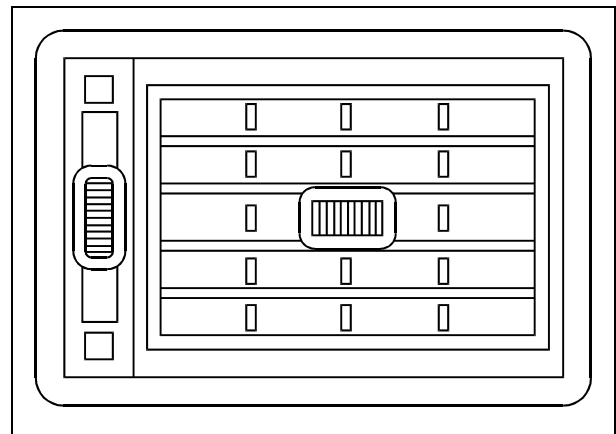
To place ignition switch to ON, turn the key clockwise to the first position. The key cannot be removed in this position.

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.

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.

Air Registers



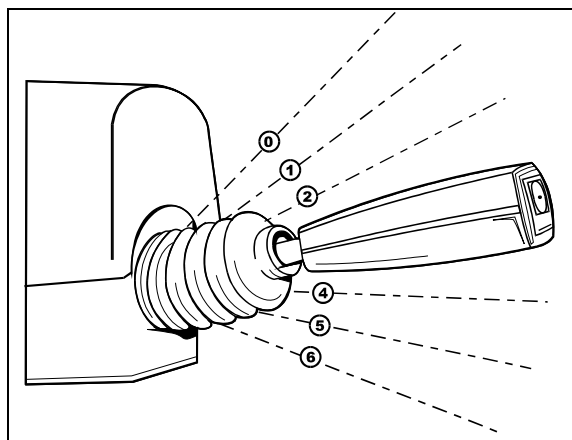
AIR REGISTER

Three adjustable driver's air registers feed air to the driver's compartment. Use HVAC control panel to set air temperature.

STEERING COLUMN CONTROLS

Transmission Output Retarder

Press down the rocker switch on the dashboard to actuate transmission retarder. Refer to "Other Features" chapter (page 4-11).



RETARDER HAND LEVER

23132

Operating the Retarder Using the Hand Lever:

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%

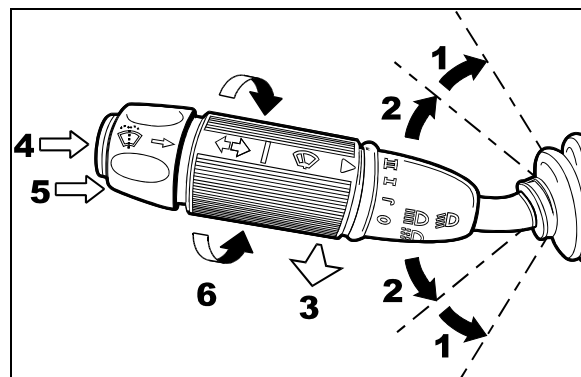
Note : The output retarder lever is located on the right side of the steering column.

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, apply the brake pedal as if using the service brakes. The further the break pedal is depressed, the more the output retarder is applied. Refer to "Other Features" chapter (page 4-11).

Note : For coaches equipped with the Anti-lock Braking System (ABS), if the wheels start to lock-up on slippery roads, the output retarder will automatically deactivate until the wheels turn freely.

Multi-function Lever



MULTI-FUNCTION LEVER

23133

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

- Turn Signal

Move the lever up to the second detent position to signal a right turn, down to the second detent position to signal a left turn. The lever automatically returns to the horizontal OFF position once the turn is completed.

- Lane Change Signal

Move the lever part way to the first detent 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

Toggle between high and low beams by pulling the lever rearward. Pulling the lever rearward while the lights are off will flash the headlights.

- Courtesy Blinkers

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

- Windshield Washer Control

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

Warning : Before using the windshield washer 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 low.

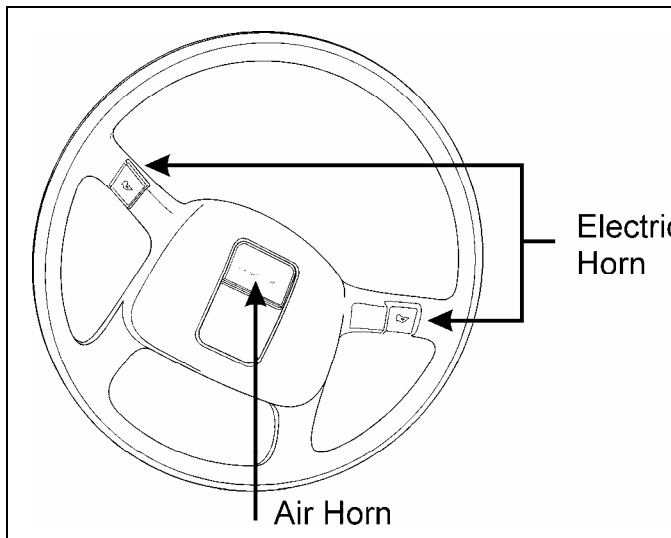
Lower Windshield Wipers

Turn the lever counterclockwise to activate the lower windshield washers. 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, loosen wiper blades that may be frozen to the windshield before operating the wipers.

Electric Horn

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

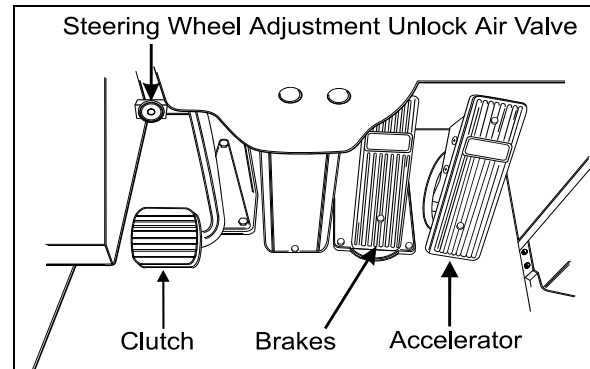


STEERING WHEEL

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

8118A

Service Brakes

The coach is equipped with a dual braking system. The front brakes operate differently from the drive and tag brakes.

The dual braking system becomes a modulated emergency system if a pressure drop occurs in the rear 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 "ABS Brake (Anti-lock Braking System)" (page 4-11). 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 a buzzer will sound when the air pressure in either the primary or secondary circuits drops below 70 psi (483 kPa). If this occurs, stop the coach, determine the cause of the pressure loss before proceeding.

Warning : Immediately report any brake system problem to the maintenance service personnel.

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

Steering Wheel Adjustment Unlock Air Valve

Refer to page 3-6 of this chapter for operating instructions .

Accelerator Pedal

Controls engine RPM.

Note : the accelerator pedal will not operate when the front door is open.

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

Clutch Pedal

Installed on manual or semi-automatic transmission equipped vehicles only. Used to engage and disengage the transmission.

MANUAL TRANSMISSION

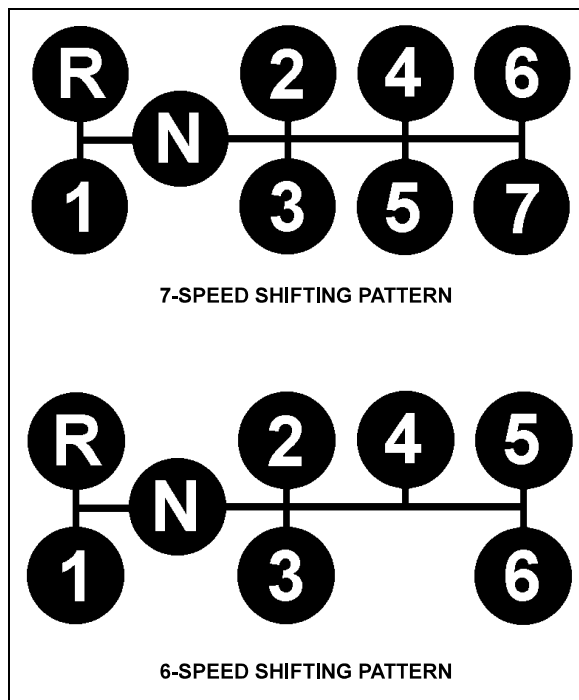
The optional manual transmission has 6 or 7 forward gears (including creeper) and one reverse gear.

Note : A Spicer PS145-7A, 7-speed transmission is specified with the 12.7 liter, series-60, 400 horsepower engine and a PS130-6B, 6-speed, is specified with the optional 11.1 liter, 325 horsepower engine.

The transmission shift lever located to the right of the driver's seat is used to select gears. The coach is equipped with a safety switch to prevent accidental starter engagement if the shift lever is not in the neutral position.

When shifting from neutral to first or reverse gear, depress the clutch pedal fully to activate the clutch brake. This makes it easier to shift from neutral to forward or reverse.

Caution : To avoid damaging the clutch brake mechanism, do not fully depress the clutch pedal when the coach is in motion.



OEH3B350

Upshifting

Always start moving the coach forward with the transmission in first gear, then shift to second, third, fourth, fifth, sixth and seventh gears (if applicable). Do not skip gears. Do not shift to the next higher gear until the engine speed has reached 1,900 rpm. Double clutching is recommended for shifting gears.

Downshifting

Double-clutching is also recommended for downshifting. Always change to a lower gear to avoid engine lugging. Use lower gears when driving uphill or downhill, and when driving on ice, snow or mud (minimum 1,400 rpm).

Use lower gears when driving downhill to make full use of engine compression. Never let the engine operate above 2,450 rpm.

Under normal driving conditions, it is not always necessary to downshift through all gears. Downshift from seventh to first gear after bringing the coach to a complete stop.

Caution : Never let the engine operate above 2,450 rpm.

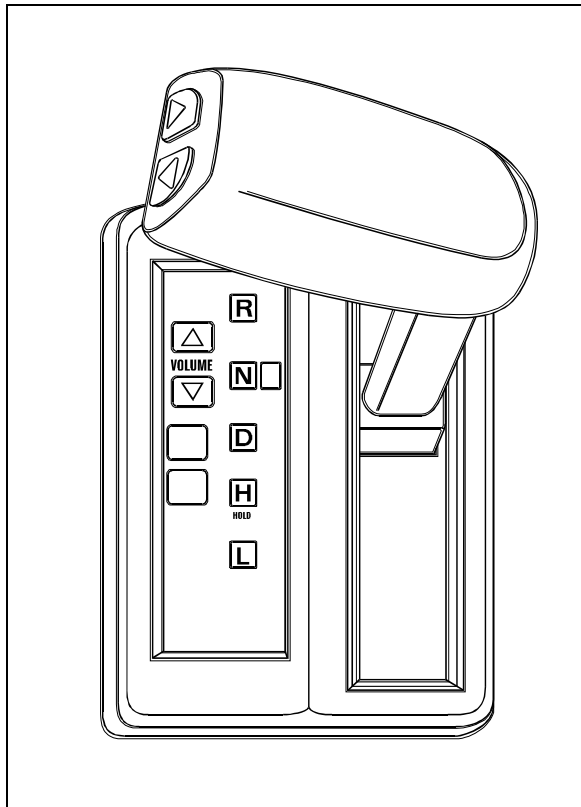
Caution : Always leave the shift selector in neutral when the coach is parked.

Caution : To prevent premature clutch wear, always start driving the coach with the transmission in first gear.

Caution : Before ascending or descending a long or steep grade, reduce speed and shift into a lower gear. Use lower gears to control speed and avoid prolonged or frequent braking which will result in brake overheating and reduce braking effectiveness. To reduce brake wear, use the JACOBS engine brake when descending a steep grade.

Warning : Shifting into lower gears on slippery surfaces should be done with caution. Sudden engine compression braking could cause drive wheels to lock-up, and may result in loss of control.

SEMI-AUTOMATIC TRANSMISSION



SHIFT CONSOLE

The optional Eaton Fuller Autoshift is a ten speed semi-automatic transmission and works similarly to any automatic transmission except that the driver must depress the clutch pedal for startups and stops.

A car-like shift console contains the gear select lever and position indicators along with indicator lamps. Gear select buttons located on the side of the handle allow manual control of the transmission. Optional volume control buttons at the base of the console allow control of tone volume.

A display screen on the L.H. control panel informs the driver of which gear is presently engaged. A flashing number indicates the next gear to be engaged. The screen also displays fault codes by flashing the first digit, then the second digit of the code. Refer to technical Information chapter under "Eaton Transmission Fault Codes" (page 8-25) for more information.

AUTOMATIC TRANSMISSION

The operation and driving of this vehicle with an automatic transmission is similar to that of an automobile equipped with an automatic transmission. Proper ranges should be selected according to driving speeds to improve vehicle performance and control. The transmission is fully automatic. Speed ratio of power converter changes automatically as vehicle speed increases and direct-drive goes in and out as necessary, modulated by vehicle speed, and accelerator position.

Range Selection - Push-Button Shifter

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

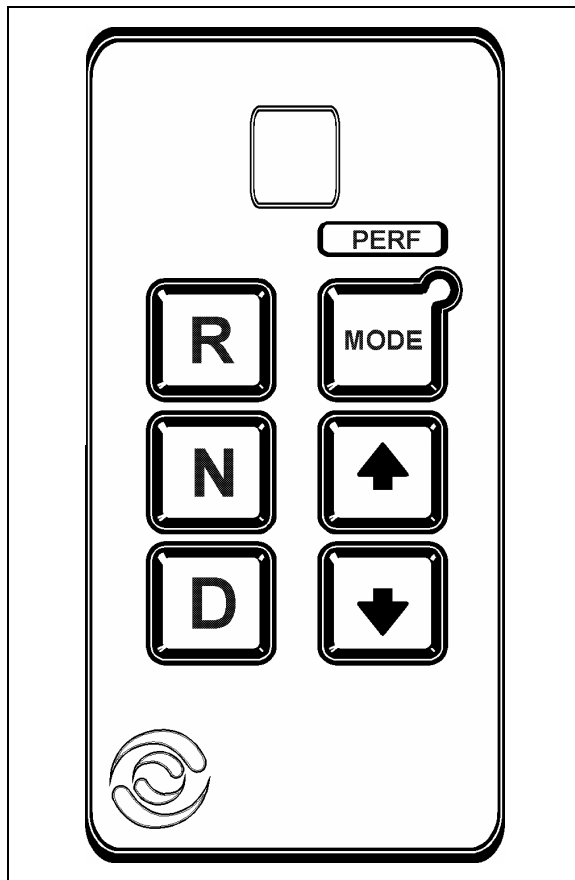
The digital display indicates the current gear of transmission operation.

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 digital display and the transmission will shift to the starting gear (not indicated on the digital display).



CONTROL PAD

The "▲" and "▼" buttons are used to shift to a higher or lower (if not in "1") range selected. 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 gear is selected. Protection mechanisms should inhibit selecting ranges that are not appropriate or which may damage driveline components.

Function 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 contribute to 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 a higher fuel consumption. It is 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 oil level after a two minute wait if the following conditions are met:

- the vehicle is parked;
- the engine is in slow idle;
- normal operating temperature is attained;
- transmission is in NEUTRAL;
- the sender unit is present and working.

A code will be displayed one digit at a time:

- O L - O K (oil level is correct)
- L O - 0 1 (one quart low)
- L O - 0 2 (two quarts low)
- H I - 0 1 (one quart high)
- H I - 0 2 (two quart high)

Note : If one or more conditions are not met, an error code will be displayed:

- O L - 5 0 (engine RPM too low)
- O L - 5 9 (engine RPM too high)
- O L - 6 5 (transmission not at NEUTRAL)
- O L - 7 0 (sump oil temperature too low)
- O L - 7 9 (sump oil temperature too high)
- O L - 8 9 (output shaft rotation)
- O L - 9 5 (sender unit defective)

To exit, press either D, R, or N button.

Diagnostic Display Mode

Pressing a second time (or a first time if oil level option not present) on the "▲" and "▼" keys will select diagnostic display mode. Refer to Allison WT troubleshooting guide for further information. To exit diagnostic display mode, press either D, R, N button, or up and down arrow keys at the same time.

Operation

When a button is depressed, the corresponding letter or number is displayed indicating the transmission is ready to operate in the selected range. When 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 (see page 3-13) 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.*

Reverse (R)

Use this position to back up vehicle. Stop completely before shifting from forward to reverse or from reverse to forward. Touch the reverse (R) button, "R" will be displayed and the reverse warning signal will be activated.

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 coach is left unattended. 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.*

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

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

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, and 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.

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

Fourth (4) and Third (3) ranges

Select these ranges when driving on moderate grades, or when load and traffic conditions require the use of limited speed.

Second (2) range

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).

First (1) range

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), transmission will not upshift above the highest gear selected unless recommended engine governed speed for that gear is exceeded.

Warning : *Service brakes 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 output retarder" options. See pages 4-11 for details regarding both systems)). This procedure keeps service brakes cool and ready for emergency stopping.*

Caution : *When descending in lower ranges, care must be taken that engine speed does not exceed 2450 rpm.*

CHAPTER 4 : OTHER FEATURES

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 cost. These advantages are obtained by optimizing control of the critical engine functions which affect fuel economy, engine reliability and the performance of the injectors.

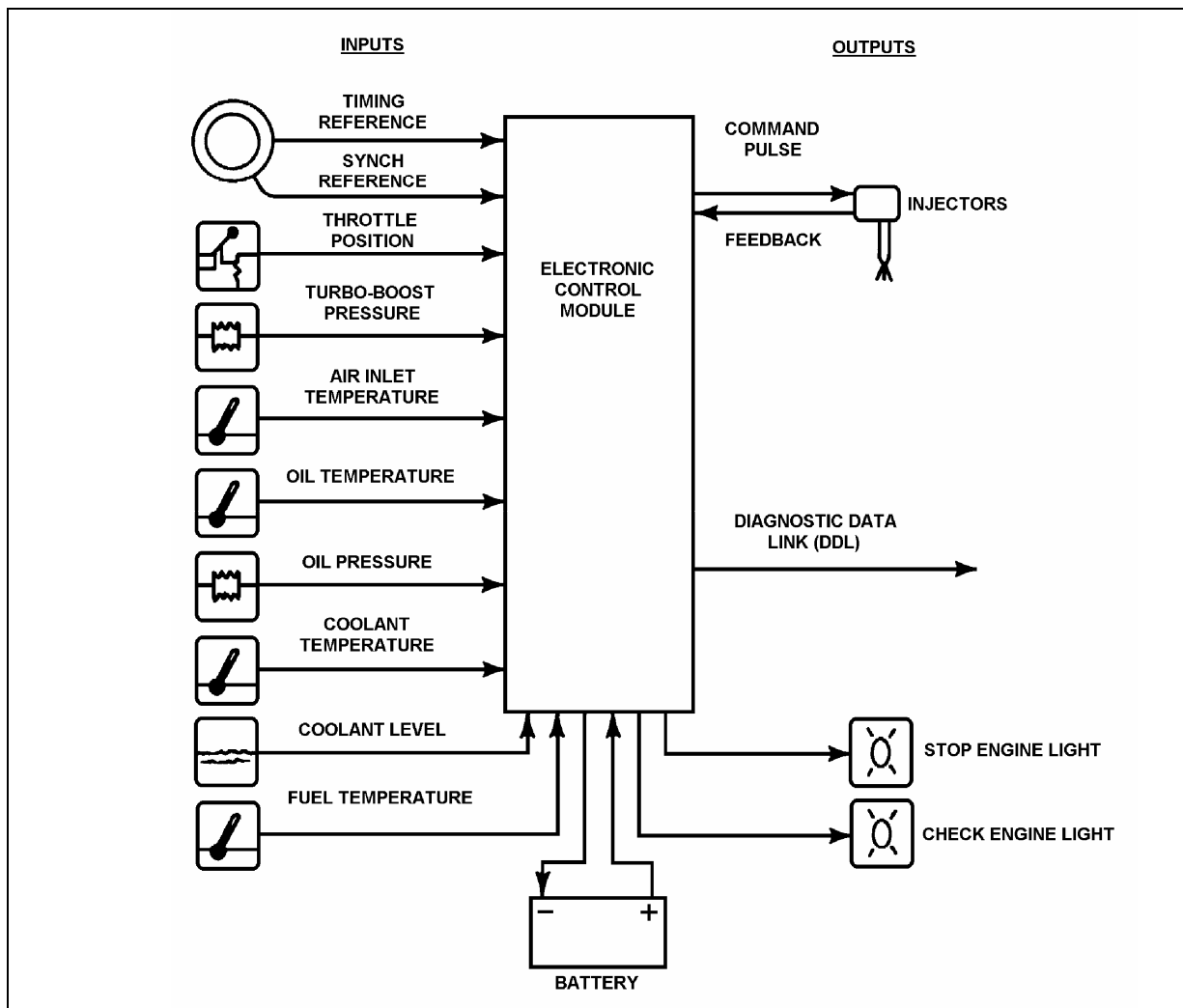
Its major components include an Electronic Control Module (ECM), Electronic Unit Injectors (EUI), electronic throttle pedal and sensors. The ECM, which provides central processing and control of the DDEC system, contains the following:

- A microprocessor that continuously monitors and analyzes the engine's performance using sensors during engine operations.
- 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) operate 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 the "Controls & Instruments" chapter). Active and inactive codes will flash respectively the STOP ENGINE and the CHECK ENGINE indicators. Refer to "Technical Information" chapter under "DDEC IV Diagnostic Codes".

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SCHEMATIC DIAGRAM OF DDEC IV SYSTEM

OEH3B402

DETROIT DIESEL DATA HUB

Detroit Diesel Corporation has introduced DDEC IV, the fourth generation of its electronic engine control system. The advanced electronic hardware and control software that has been used in DDEC IV has significant capabilities beyond what is required to efficiently manage the engine. This capability has been used to create a family of products called Data Hub. Refer to "Controls & Instruments" chapter. Data Hub is a data acquisition and analysis system that is designed to provide the users of DDEC equipped engines with a tool for achieving improved performance and reduced operating costs. There are several levels of capability available with Data Hub. This is accomplished by combining sophisticated software with the DDEC ECM or additional on-board hardware.

Data Hub Software

There are two versions of Data Hub software which provide different levels of capability. Both versions are designed with user-friendly screens and menus. Operation is intuitive and may be accomplished with minimum training. On-line help is available to assist in the operation of each command.

Trip Record ACcess (TRAC)

Data Extraction System Software

TRAC is a PC-based software package that extracts operational data stored in the Engine Electronic Control Module (ECM). The extracted data can be used to automate fleet record keeping or evaluate fleet performance in key areas; such as miles driven, fuel consumed, engine hours, idle/PTO time, etc. Fault codes

and ECM set-up parameters can also be reviewed to aid in troubleshooting, when necessary.

TRAC is designed for use with all Detroit Diesel engines that are equipped with the DDEC II and new DDEC IV ECM. In addition, it may be used to extract stored data from other ECMs that are SAE.TCM J1708 compatible. Once the data has been extracted from the ECM, PC-based tools such as spreadsheets or databases can be used to organize the data for effective management reporting and decision-making.

The TRAC system consists of: PC software and manual, TRAC translator PC interface, data extraction cable and diagnostic connector adapter.

Advanced Data Hub Analysis Software

The "Advanced Data Hub analysis software" is a full-featured "smart system" that handles the collection, analysis and reporting of operational data generated by all versions of the Data Hub system. The software is designed to reduce the user's time spent on data analysis. The powerful analysis and reporting capabilities of the software provide the user with an overview of the fleet status which either demonstrates that performance is within guidelines or suggests necessary corrective action. This results in a minimum time expenditure for the fleet manager.

The "Executive Summary" reduces future performance to a number of trends or benchmarks chosen by the user. Trends are based on both comparisons to like periods from previous years and recent performance periods. This approach isolates seasonal variation while providing the informational basis for tactical decisions. Examples of trend data include items; such as, miles, engine hours, fuel used, idle time, cruise time, diagnostic message frequency, etc. Both absolute and percentage values are presented. The "Executive Summary" approach eliminates the need to review a large number of detailed reports on a daily basis to determine the level of performance. Data from the "Executive Summary" may also be exported to other applications for combination with data from other areas of the business.

For a more detailed review of future performance, the "Exception Reporting" capability of the software may be used. The

user identifies types of data and performance exception limits for each. The software then screens data gathered over a selected time period and highlights "exceptions". Typically, the exceptions result in corrective action or a more detailed analysis to determine the reason for the exception.

Data may also be presented in a greater level of detail by using the "Summary Reporting" capability of the software. This allows the user to review specific types of data, which are selected from a list of available types, organized by vehicle or driver (requires Data Hub hardware). The time period covered by the summary is also user-selectable. This feature is commonly used to provide periodic informational reports to fleet managers. The user-selectable nature of the data contain only the data of interest for a specific manager.

Finally, the software provides a "User Interactive" capability which allows the user to rapidly sort through increasing levels of detail from the computer keyboard. This feature is very useful in investigating the occurrence of specific events.

Data generated by the Data Hub system may also be easily exported to other applications for additional processing, which allows users to integrate the data into mainframe-based programs.

Data Hub Hardware

The Data Hub hardware consists of a range of products that the user can select to configure a system that will meet his or her needs without requiring investment in unwanted features. Conversely, this modular approach allows the user to easily add capabilities at a later date if requirements change. All Data Hub hardware has a wide input voltage range, which allows it to be powered directly by sources of up to 24 volts.

Wireless Data Collection Systems

The basic method of extracting data from the Data Hub System is by connecting a cable to the J1708 or RS232 high speed data connections provided with the system.

Significant automation and convenience can be achieved by using one of the several wireless data collection techniques that are supported by Data Hub. A broad range of approaches are

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available to provide a package that will meet the user's specific needs.

Smart Card technology is available for partial data extraction from the Data Logger by adding a Smart Card Interface module to the Data Hub system. Current limitations in card memory capacity will restrict the user to gathering only selected data with the card. The credit card-sized device has been recently introduced for fuel purchase authorization and driver communication on a nationwide basis with a network of 1,500 truck stops equipped with Smart Card interfaces.

Several long range communication systems are currently available that are routinely used by trucking companies for driver communication and vehicle location. These systems rely on various technologies (e.g., cellular, radio, satellite). The Data Logger may be interfaced with these existing systems for partial data extraction. Complete extraction is not recommended due to the cost of the communication time.

The use of Data Hub is described in the instruction manual furnished with each tool.

DDEC IV 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 IV ECM are used. The ECM stores data such as miles, fuel used, idle time, PTO time, idle fuel, cruise time and cruise fuel on a 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 IV 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.

Data Logger

A Data Logger may be added to the system to expand the recording capability available from the ECM. A range of memory capacities is planned with up to a maximum of 640K possible. This will allow expansion of daily recording to several months. Additional features are also available when a Data Logger is included in the system.

The Data Logger adds an Event Log, which details the date and time of various trip events (e.g., trip legs and stops, speeding and idling events, diagnostic messages). Detailed alert recording documents 13 engine parameter values for 1 minute prior to the occurrence of selected diagnostic messages to aid in troubleshooting. This is especially useful for diagnosing intermittent conditions. Detailed incident recording stores speed, RPM, brake, cruise and throttle status at 1 second intervals for a continuous 3 minute period for use in incident reconstruction.

The Data Logger receives its data via the SAE J1708 data link. This provides the ability to monitor and record data provided by any J1708 compatible device, such as a non-DDEC ECM, an electronic transmission, anti-lock brakes (ABS) or smart sensors. A battery-backed clock/calendar is also included to provide accurate reference points for recorded data. The current date and time may also be requested via J1708 for use by other devices.

The Data Logger has enhanced interface capability, which allows it to operate the Driver Data Display and provides compatibility with a variety of data extraction options. There is also a digital output channel that may be used to drive an audible or visual signaling device. It is designed for installation in a moisture-protected environment.

WATER HEATER

A choice of optional water heaters include the Webasto DBW 2010 rated at 45 000 Btu/h (13 kW), the DBW 2020 rated at 80 000 Btu/h (23.3 kW) and the Espar D12W, rated at 41 000 Btu/h (12 kW).

The auxiliary preheating system is used for preheating and retaining the heat of water-

cooled engines. It can be used before startup to facilitate starting and to provide rapid operation of the interior heating system. It can also be used with the engine running to maintain coolant heat and interior temperature.

The heater operates independently of the engine. It is connected to the cooling system, heating circuits, and to the coach fuel and electrical system.

Warning : *The preheating system uses the same fuel as the engine. Do not operate in a closed building or while refueling. Operate only in a well-ventilated area.*

Switching the Heater On

The pilot lamp turns on when the heater is switched on. Combustion air flows in to flush out the combustion chamber, and the water circulation pump begins operating. The fuel metering pump delivers fuel in precise amounts to the combustion chamber, where fuel and combustion air form a combustible mixture which is ignited by the glow plug.

Once the flame sensor has signaled to the control unit that combustion has taken place, the glow plug and ignition coil are switched off.

Hot combustion gases are diverted at the end of the flame pipe and are then forced through the indirect heating surfaces of the heat exchanger. The heat exchanger transfers the heat to the coolant water passing through the heat exchanger.

The heater is thermostatically controlled and operates intermittently (i.e., the switched-on time of the burner varies depending of the heat requirement). The water temperature is controlled by the built-in water thermostat.

The water circulation pump remains in operation as long as the heater is operating; even during the regulated intervals and during the delayed cut-out of the switched-off heater. The pump can also be operated independently of the heater by means of an appropriate circuit. The heater can be switched on at any time (i.e., during the delayed cut-out period). Ignition takes place after the delayed cut-out time expires.

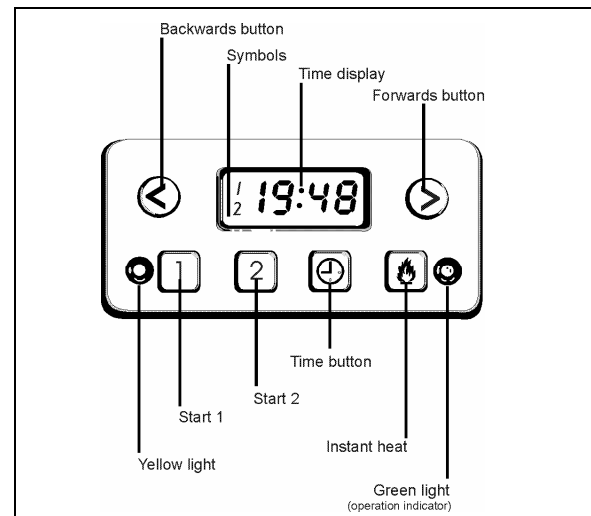
Switching the Heater Off

The fuel supply is interrupted when the heater is switched off. This causes the flame to go out and a delayed cut-out of 2.5 minutes begins.

The circulating combustion air flushes the remaining combustion gases out of the chamber and cools off the heated parts on the exhaust side of the heat exchanger. The water circulation pump continues to transfer the latent heat present in the heat exchanger, thus preventing hot spots. Once the delayed cut-out time expires, both the combustion air blower and the water circulation pump switch-off automatically. A cut-out will automatically take place in case of preheater failure. Refer to Technical Information chapter for more information.

Water Heater Timer

Note : *Heater timer control pad may differ from the one described. Refer to your manufacturer's instruction booklet for detailed operating instructions.*



To set the clock

If the time display e.g. 18:33 is wrong, or if it flashes 8:88, hold and press either (backwards) or (forwards). The longer you hold the button down, the quicker the display changes. The last few minutes are set accurately by quick pushes. Adjust to get exact time, e.g. 23:59. The display fades after 20 seconds.

Present Time Display

Press at any time. Present time appears on the screen.

Manual Heating Start-Up

Press to switch the heater on or off immediately. The green light illuminates when the heater is on.

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Programming Heating Start Time

Press **1** and the display shows the time at which the heater will start. You can alter the starting time by pressing either **6** (backwards) or **7** (forwards) button. The longer you hold the button down, the faster the display changes. The last few minutes are set accurately by quick pushes. The display fades after 20 seconds. Start time 1 remains on the display, and the yellow light stays on. Starting time #1 is now activated.

Button **8** allows you to program a second starting time:

Press button **9** which de-activates starting time 1, then proceed as with **1**.10

The activation of the second starting time is indicated by the symbol 2.

To Check (or activate) Start Time

Press button **1** or **11** briefly. The display shows the programmed starting time for 20 seconds. This also programs the timer to start the heater at the time shown.

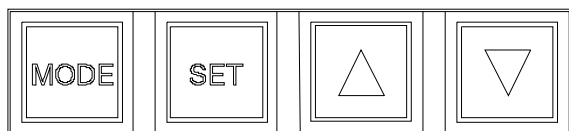
To Cancel Heating Start Time

Press button **1** or **12** briefly. The appropriate number in the display goes out, together with the yellow light.

Caution : To avoid running down the batteries, do not turn on the preheating system for more than one hour before starting the engine.

Warning : The preheating system uses the same fuel as the engine. Do not operate in a building or while refueling. Operate only in a well-ventilated area.

TRIP DATA RECORDER (TDR)



TDR 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 engines on the SAE J1708/1587 diagnostic data link. TDR 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.

Many driver friendly features are designed into TDR to provide instantaneous feedback to the driver. This enables the driver to understand the effect of actions on engine and vehicle performance. Two display screens (automatically shown) offer real-time feedback based on the vehicle's activity. When in motion, the "Fuel Economy" screen displays fuel consumption versus the fleet's target. When stopped, "Idle Percentage" time versus fleet's target is indicated. Should an alert message be sent out by the ECM, the driver will be shown what is wrong and how engine power will change.

Five different modes are available for viewing on the screen:

- Multi-Function;
- Diagnostic;
- Set-Up;
- Gauge Display;
- Fuel Economy.

To change from one mode to another, press the MODE button. Each mode contains sub-displays with information related to the selected mode. These can be accessed using the UP/Down arrow buttons. If a display contains a value that can be changed, pressing the SET button enables the change and selects the digit to be changed. At this point, choosing a value is done with the UP/DOWN arrow buttons. To accept a change, press SET again.

Note : Diagnostic and set up modes are not available when the vehicle is in motion. If such a mode is in use and the vehicle reaches a speed of 5 mph (8 km/h), the screen will automatically revert to clock display.

Warning : If the vehicle is in motion, reach around the steering wheel with the left hand to access the control buttons. Accessing the buttons through the steering wheel can result in injury or death due to loss of vehicle control.

Multi-Function Mode

The multi-function mode contains a clock, an alarm clock, two independent trip odometers and an engine hourmeter.

Clock Display

The clock displays the current time in either a 12-hour format (12:00:00 a.m. to 11:59:59 p.m.)

or a 24-hour format (00:00:00 to 23:59:59). The choice is made in the Set-Up Menu.

To display the clock:

- Use the MODE button to select the Multi-Function Mode;
- Use the UP/DOWN arrow buttons to display the time.

To change the time display:

- When the clock time is displayed, press the SET button to select the hours digits. The hours digits will flash when selected. Use the UP/DOWN arrow buttons to select the desired hour;
- Press SET a second time to select the minutes digits. The minutes will flash when selected. Use the UP/DOWN arrow buttons to set the desired minute;
- To accept the displayed time and exit the time set function, press SET a third time.

Note : *The seconds digits cannot be selected.*

Alarm Clock Display

The alarm clock function permits the sounding of a reminder tone at any desired time.

To display the alarm clock:

- Use the MODE button to select the Multi-Function mode;
- Use the UP/DOWN arrow buttons to display ALARM.

To change the alarm time:

- When the alarm time is displayed, press the SET button to select the hours digits. The hours digits will flash when selected. Use the UP/DOWN arrow buttons to select the desired hour;
- Press SET a second time to select the minutes digits. The minutes will flash when selected. Use the UP/DOWN arrow buttons to set the desired minute;
- To accept the displayed time and exit the alarm time function, press SET a third time.

Note : *The seconds digits cannot be selected.*

To enable the reminder tone:

- Set the alarm time, or

- Press and hold the MODE button. The next mode display will appear once the reminder tone is enabled. The clock display with a bell will appear on screen.

To disable the reminder tone:

- When the bell symbol is displayed, press and hold the MODE button until the next mode display appears. The clock display will appear without the bell symbol.

To silence the reminder:

- Press any of the four buttons while the reminder is sounding.

Trip Odometer Display

Two independent trip odometers are available (Trip Odometer 1 and Trip Odometer 2). Each one displays the distance traveled since it was last reset.

To display a trip odometer:

- Use the MODE button to select the Multi-Function Mode;
- Use the UP/DOWN buttons to display either TRIP ODOMETER 1 or TRIP ODOMETER 2.

To reset a trip odometer:

- Display the trip odometer to reset (1 or 2);
- Press and hold the set button for 1 second.

Hourmeter Display

The hourmeter display accumulates and displays the total time the engine has run. This display is not resettable by the driver. To display the hourmeter:

- Use the MODE button to select the Multi-Function mode;
- Use the UP/DOWN buttons to display the hourmeter.

Diagnostics Mode

The diagnostics mode provides two functions:

- Cluster self test mode - Contains several tests to check the instrument cluster.
- Diagnostics messages - Reports the status of various vehicle sub-systems.

Cluster Self Test Mode

As an aid in troubleshooting the instrument cluster, the following tests are provided:

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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.*

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 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 alternates between all dark and all light for about ten seconds.

Buzzer Test - Sounds each of the three buzzer signals for ten seconds each.

To access the Cluster Self Test mode:

- Use the MODE button to access the DIAGNOSTICS mode;
- Scroll to the Cluster Self Test menu;
- Press the SET button to activate the Cluster Self Test;
- Use the UP/DOWN buttons to display the desired test (Bulb, Gauge, Display or Buzzer test);
- Activate the test by pressing the SET button. The test will end automatically.

Set-Up Mode

The set-up mode allows the driver to choose between US Standard or Metric units, between 12- or 24-hour time display, to set the screen and odometer brightness as well as the screen contrast. The fuel economy target value is also set in this mode.

Note : *Settings are retained when the ignition is off and also when the battery is disconnected. If battery power is lost when in the set-up mode, the instrument cluster will revert to it's default values.*

Units

The units function configures the cluster to display data using US or Metric units.

US Standard - Distances are displayed in miles temperatures are displayed in Fahrenheit degrees and fuel consumption is displayed in miles per gallon.

Metric - Distances are displayed in kilometers, temperatures are displayed in Celsius degrees and fuel consumption is displayed in liters per hundred kilometers.

To configure the cluster for Metric or US units:

- Use the MODE button to display the Set-Up menu;
- Scroll to Units with the UP/DOWN buttons;
- Press the SET button to toggle between English and Metric.

Clock Mode

The clock mode configures the clock to display 12-hour (a.m./p.m.) or 24-hour time. To change the clock format:

- Use the MODE button to display the Set-Up menu;
- Scroll to Clock using the UP/DOWN buttons;
- Use the SET button to toggle between the 12- and 24-hour time formats.

Contrast Adjust Function

This function adjusts the contrast of the screen. To adjust the screen contrast level:

- Use the MODE button to display the Set-Up menu;
- Scroll to Contrast Adjust using the UP/DOWN buttons;
- Press the SET button;
- Increase or decrease the contrast using the UP/DOWN buttons.
- Press SET when the contrast is at desired level.

Note : *Contrast will revert to original level once the ignition is turned off.*

Backlighting Adjust Function

This function allows the odometer and graphic display backlighting (brightness) to be adjusted independently of the gauge backlighting:

- Use the MODE button to display the Set-Up menu;

- Scroll to Backlighting Adjust using the UP/DOWN buttons;
- Press the SET button;
- Increase or decrease the backlighting using the UP/DOWN buttons.
- Press SET when backlighting is at the desired level.

Note : Backlighting will revert to original level once the ignition is turned off.

Fuel Economy Target Adjust Function

This function allows for setting a fuel economy target:

- Use the MODE button to display the Set-Up menu;
- Scroll to Fuel Economy Target using the UP/DOWN buttons;
- Press the SET button;
- Increase or decrease the value using the UP/DOWN buttons.
- Press SET when the contrast is at the desired level.

Note : Target will revert to original level once the ignition is turned off.

Gauge Mode

The gauge mode provides additional gauge displays. A voltage display is standard. Engine and transmission oil temperature displays are optional. Gauge displays contain a symbol, a value (such as volts or degrees) and text messages when appropriate.

Voltmeter:

This standard gauge display monitors the battery voltage. If the voltage exceeds 16 volts, "TOO HIGH" will be displayed.

Engine Oil Temperature:

The range of this optional gauge display is 90° to 310 °F. If the temperature exceeds the trip point, "TOO HIGH" will be displayed and the yellow caution telltale light will illuminate.

Transmission Oil Temperature:

The range of this optional gauge display is 90° to 310 °F. If the temperature exceeds the trip point, "TOO HIGH" will be displayed

and the yellow caution telltale light will illuminate.

Preset Trip Points for Graphic Display Gauges:

Each of the gauges in the graphic display has a preset trip point according to the engine manufacturer's specifications. A trip point represents a critical condition when reached. The engine oil temperature gauge display may have a trip point of 270 °F, for example. Should a trip point be reached, the screen will automatically show a symbol or message identifying the critical condition.

In some cases, the yellow Caution telltale or red Stop telltale light may illuminate and a buzzer may sound when a trip point is reached. These warnings will continue until the ignition is turned off or until the condition causing this warning no longer exists. The visual and audible warnings will return if the condition still exists when the ignition is turned back on.

Note : When a condition requiring attention occurs, the symbol identifying that condition will automatically replace the current display.

To choose a gauge display:

- Press the Mode button until a gauge display appears;
- Use the UP/DOWN buttons to display the desired gauge .

Fuel Economy Mode

The fuel economy mode allows the driver to see fuel consumption during a trip. Information is updated continually and presented in the form of a bargraph. Average fuel consumption rate during the trip (AVG) and the instantaneous fuel consumption rate can be seen at a glance, along with the target fuel consumption rate.

To select the Trip Fuel Meter or bargraph display:

- Use the MODE button to select the Fuel Economy mode;
- Use the UP/DOWN buttons to display the bargraph or Trip Fuel Meter.

Bargraph (AVG INST TARGET Display)

The bargraph display shows the vehicle's average, instantaneous and target fuel consumption. The range is 0 to 99.9 miles per gallon, or 0 to 999 liters per 100 kilometers. The

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average consumption value can be reset by pressing the SET button while in this display (the Trip Fuel Meter value will also be reset).

Trip Fuel Meter

The Trip Fuel Meter displays the amount of fuel used since the last time it was reset. Its range is from 0 to 9999 gallons or liters (driver selectable). The Trip Fuel Meter value can be reset by pressing the SET button while in this display (the AVG fuel consumption value will also be reset).

PRODRIVER™

PRODRIVER™ is an optional graphic device similar to TDR 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, fuel consumption rate, 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 records;
- Driver initiated incident records;
- Stop and check engine code logs.

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 and provides advanced communication business solutions for fleet operators.

WORLD TRANSMISSION (WT) ELECTRONIC CONTROL

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

The World Transmission (WT) electronic controls comprises four major elements: Electronic Control Unit (ECU), Throttle Position Sensor (TPS), speed sensors and shift selector. Refer to "Controls & Instruments" chapter.

These components work together to electronically control the transmission functions. 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 affect 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, 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 "DO NOT SHIFT" light on the dashboard, which serves as a fault indicator.

To enhance troubleshooting and to allow interrogation of the ECU (Electronic Control Unit) for valuable service information, the shift selector display or a diagnostic tool (not supplied) can be used. For information about reading and interpreting diagnostic codes, refer to "Technical Information" chapter under "World Transmission (WT) Diagnostic Codes".

JACOBS ENGINE BRAKE

The JACOBS engine brake is an optional diesel engine retarder which uses engine compression to aid in slowing and controlling the coach.

When activated, (refer to "Controls & Instruments" chapter) 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 coach's service brakes must be used to bring the coach 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 service brakes as little as possible. If engine does not slow coach to a safe speed, apply service brakes and shift to a lower range. Let the engine (and engine brake) slow the coach. Keep brakes cool and ready for emergency stopping.*

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

TRANSMISSION RETARDER

A retarder is a 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).

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

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 will automatically illuminate.*

Note : *For coaches 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.*

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 breaking distance on any road surface, impedes directional control and causes 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 axles 1 and 2 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 per second) to prevent wheel lock. Each wheel is therefore controlled according to the available grip.

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

Caution : *Vehicles following ABS-equipped coaches 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.*

KNEELING SYSTEM

This system lowers the front end, enabling passengers to get on and off the coach without any difficulty. The system operates rapidly; taking only 5 seconds to lower and 9 seconds to rise.

Note : *This coach is equipped with an interlock system which automatically applies the parking brake when the kneeling system is activated.*

To operate, stop the coach, set the transmission to neutral(N), then push down the rocker switch located on the dashboard. (Refer to "Controls & Instruments" chapter). The parking brake will be applied automatically and a warning flasher will indicate that the front of the coach is being lowered.

To raise the front of the coach to its normal height, push up the rocker switch. The front end will rapidly rise up. The system will release the parking brake and shift the transmission to the previously selected range.

Caution : *Avoid parking the coach too close to the sidewalk or to other obstacles which could damage the coach during kneeling.*

OTHER FEATURES

Note : *The kneeling system does not operate when the coach is traveling over 5 mph (8 km/h). Consequently, the driver cannot inadvertently operate the kneeling system at higher speeds.*

HI-BUOY

The coach may be equipped with the optional front Hi-Buoy or full Hi-Buoy. The front Hi-Buoy system has the same functions as front kneeling. In addition it enables passengers to get on or off the coach easily by raising the front end about 4 inches (100 mm), which may prove useful when the dock is higher than usual. The front Hi-Buoy is combined with front kneeling to increase flexibility of the system. Refer to "Controls & Instruments" chapter.

The full Hi-Buoy system raises the whole coach about 4 inches (100 mm). It can be used to enable passengers to get on or off the coach easily, and to safely travel roads with high obstacles. Refer to "Controls & Instruments" chapter.

Note : *The Hi-Buoy system does not operate when the coach is traveling over 5 mph (8 km/h). Consequently, the driver cannot inadvertently operate the Hi-Buoy system at higher speeds.*

LOW-BUOY

This system lowers the coach about 4 inches (100 mm). It enables the coach to drive through underpasses where the height is less than 12 feet (3.7 m).

Low-Buoy operation is controlled by a valve located on the right lateral console. The valve can be switched to either LOW-BUOY or NORMAL positions. A warning light on the dashboard will indicate that the coach is being lowered. Refer to "Controls & Instruments" chapter.

Caution : *Avoid parking too close to the curb or other obstacles that could damage the coach during low-buoy operation.*

Note : *The Low-Buoy system does not operate when the coach is traveling over 5 mph (8 km/h). Consequently, the driver cannot inadvertently operate the Low-Buoy system at higher speeds.*

RETRACTABLE TAG AXLE

Optional tag axle retraction is controlled by a valve located on the right 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 valve position. Refer to "Controls & Instruments" chapter.

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. The tag axle can be raised in tight maneuvering areas like in a parking lot or to make it easier to turn a short corner. The tag axle shortens the wheelbase and allows tighter turning. 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 coach.*

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

TAG LOAD RELEASE SYSTEM (TLR)

This standard system allows automatic unloading of the tag axle air springs, without raising the axle, whenever coach speed drops to less than 8 mph (13 km/h) and steer angle exceeds 22.5° (1 1/4 turns of the steering wheel). The system automatically transfers the tag axle load to the drive axle. It reduces tag wheel shearing to convey shorter turning radii for tighter cornering and remarkable agility in close-quarter maneuvering, whether backing up or moving forward.

SAFETY LIGHTS

Daytime Running Lights (DRL)

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 coach more visible to other drivers.

The lights are not used when:

- engine is stopped;
- parking brake is applied;
- the exterior lighting switch is turned 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

Optional halogen fog lights may be installed (refer to "Controls & Instruments" chapter). Fog lights provide better visibility in fog and precipitation. They improve visibility immediately in front of the coach. 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.*

Docking and Cornering Lights

The coach may be equipped with up to four halogen docking and cornering lights. Two lights are installed at the front of the coach, on each side as standard equipment. Two optional lights may be installed on each side at the rear of the 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 or docking the coach.

Compartment Lighting

Baggage, engine, front left service, main power compartment, front and rear electric compartment lights are automatically turned on when the compartment door is opened. An indicator light on the central dashboard will illuminate when a compartment door is open.

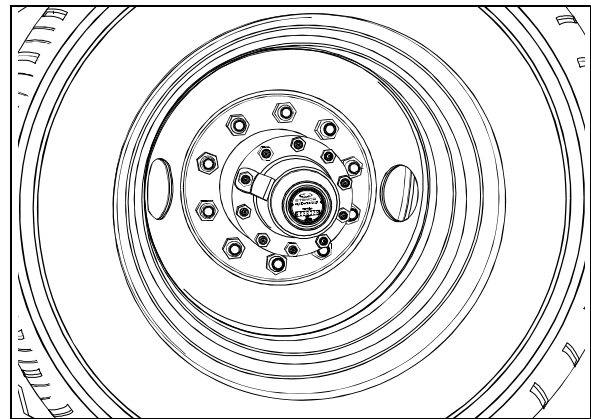
BACK-UP ALARM

The back-up alarm alerts pedestrians and other drivers when the 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.

HUBDOMETER

A wheel hubodometer is installed on the R.H. drive axle. It indicates the total distance in miles or kilometers traveled by the coach since manufacture, including road testing.



HUBDOMETER

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 coach and prevent stones and debris from being thrown at vehicles traveling behind the 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.

SPARE PARTS KIT

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

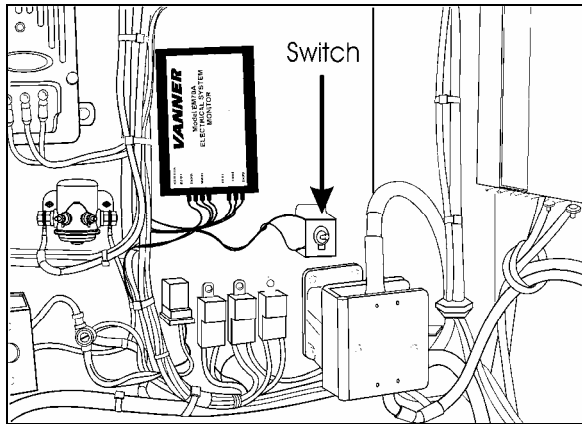
CHAPTER 5 : STARTING AND STOPPING PROCEDURES

STARTING ENGINE FROM DRIVER'S COMPARTMENT

Start or stop the engine as follows:

Starting Engine

- Set the master switch located in the main power compartment to the ON position;



MASTER SWITCH IN MAIN POWER COMPARTMENT

- Make sure the starter selector switch located in the engine compartment is set to the NORMAL position. When starting the engine from the front of the coach, set the battery master switch located on the dashboard to the ON position. Refer to the "Controls & Instruments" chapter;
- Apply the spring-loaded parking brakes by pulling the parking brake control button all the way up;
- Place transmission in neutral;
- Turn key in ignition to START position, release after starting.

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 slow 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.

Stopping Engine

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

Caution : Do not shut-off engine when running above slow idle.

Caution : Set the battery master switch to the OFF position after parking and when left unattended for an extended period of time. Refer to "Controls & Instruments" chapter.

STARTING FROM THE ENGINE COMPARTMENT

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

Starting Engine

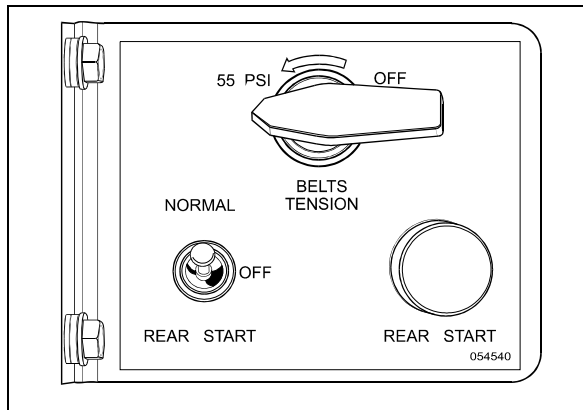
Warning : Apply parking brake and place transmission in neutral (N) before starting engine from inside engine compartment.

- Set the master switch located in the main power compartment to the ON position;
- Set the starter selector switch to the REAR START position. Set the battery master

STARTING & STOPPING PROCEDURES

switch located on the dashboard to the ON position. Refer to "Control & Instruments" chapter;

- Press starter push-button switch. Release push-button after starting.



REAR START PANEL

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

Caution : Refer to cautions in "Starting Engine From Drivers Compartment" in this chapter.

Stopping Engine

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

Caution : Do not stop engine by any other method.

COLD WEATHER STARTING

Cold Starting Aid (Ether)

The coach may be equipped with the optional ether cold starting aid to facilitate cold-weather starts when the temperature is below 35°F (2°C). A control rocker switch is located on the dashboard. To activate the ether starting aid, proceed as follows:

- Before cranking engine, press the rocker switch for 3 seconds to fill solenoid valve;
- Release rocker switch to discharge shot of ether;
- Allow 3 seconds for shot to discharge;
- Start engine.

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

ENGINE BLOCK HEATER

The coach may be equipped with an engine immersion-type electric block heater to assist cold weather starting. The 110-120 VAC power connector is located on the engine compartment rear door. Connect the female plug of an extension cord to the 110-120 VAC male outlet. Plug the extension cord into a 110-120 VAC power source only. Use the engine block heater whenever the coach is parked for an extended period of time in cold weather and when a 110-120 VAC power source is available.

Caution : Use only 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.

ENGINE WARM-UP

After starting the engine, keep the parking brake applied and let the engine run at slow 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. To warm-up the engine, open station doors or move the coach outside.

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

WORLD TRANSMISSION (WT) WARM-UP

When the transmission temperature falls below -20 °F (-29 °C), the CHECK TRANS indicator illuminates after the engine is started. In this

STARTING AND STOPPING PROCEDURES

case, the transmission will be locked in neutral (N) until the transmission temperature rises above -20 °F (-29 °C) and the CHECK TRANS indicator light goes out. The transmission will only operate in first or reverse gears until it reaches the normal operating temperature.

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.

Note : To charge batteries using the booster block terminals, the main power switches must be turned on.

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.

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

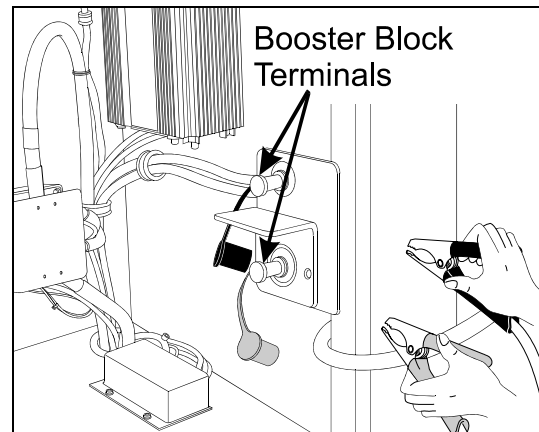
Caution : Do not jump start if a maintenance-free battery has a yellow test indicator. Have the battery replaced.

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.

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 shut-off 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 coach 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.



MAIN POWER COMPARTMENT

CHAPTER 6 : EMERGENCY SAFETY FEATURES

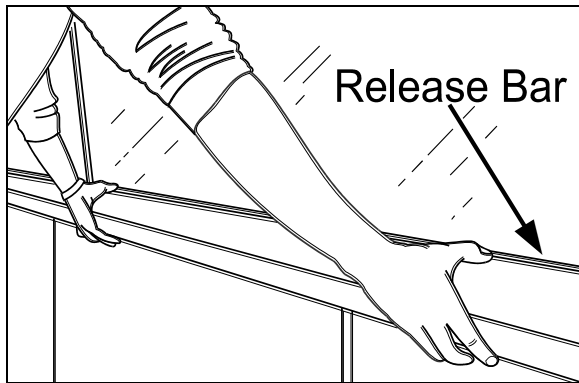
EMERGENCY EXITS

Side Windows

Some side passenger windows can be opened from the inside for emergency escape. A decal located on the bottom of each passenger window indicates the emergency exit location. Two blue lights installed in the upper section of the side windows illuminate the emergency exit decals. Emergency exit decal lighting is operated by the general lighting switch located on the dashboard.

To open a side window emergency exit, slide fingers under the notches on the window release bar. Lift the window release bar and push the window out from the bottom. Opening instruction decals are located on the release bar of each emergency exit window.

To close an emergency exit side window, lift the release bar and pull the window in as illustrated on the decal at the bottom of the window.



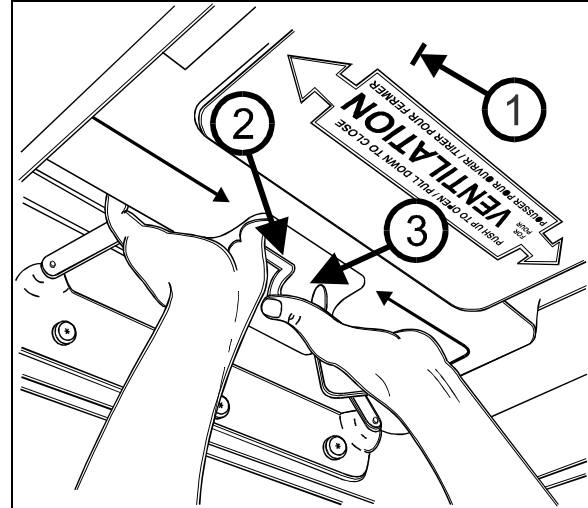
EMERGENCY EXIT WINDOW OPENING

Caution : To prevent damage, keep the emergency exit windows closed during normal operation. To avoid damaging the emergency exit system, do not slam windows shut.

Emergency Roof Escape

An emergency escape hatch (1) is located in the roof at the rear of the coach. It is designed to be opened by passengers. An optional emergency roof hatch is located at the front of the coach. 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 escape hatch.

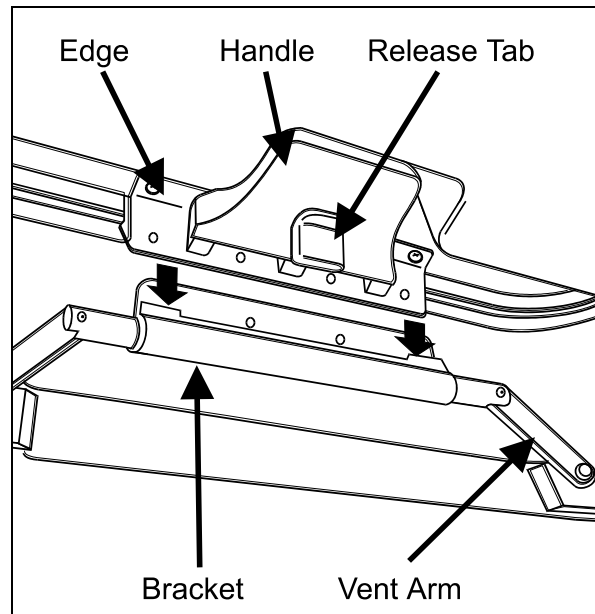


EMERGENCY ROOF ESCAPE OPENING

OEH3B604

Note : In the event of ventilation blower motor failure, the emergency roof escape can be opened by pushing the hatch upward.

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



ROOF ESCAPE HANDLE

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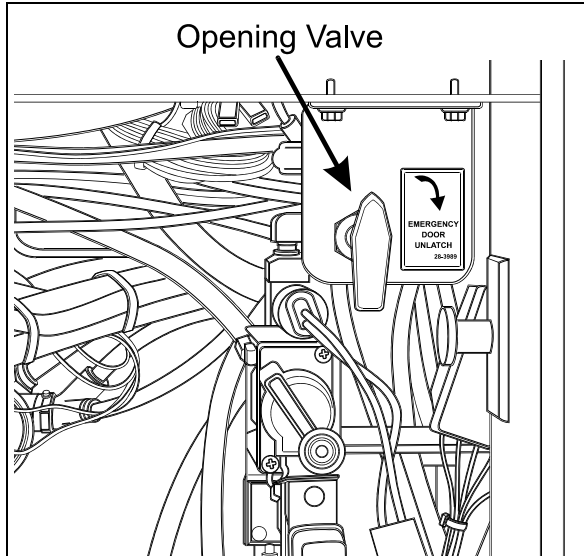
To re-latch handle after use, vent arms must be pushed upright in FULL OPEN VENT position. Insert edge between the two sections of the bracket and pull handle in to lock the hatch.

EMERGENCY SAFETY FEATURES

Finally, pull the hatch in to close, one side at a time.

Front door emergency opening

Outside Emergency Opening Valve

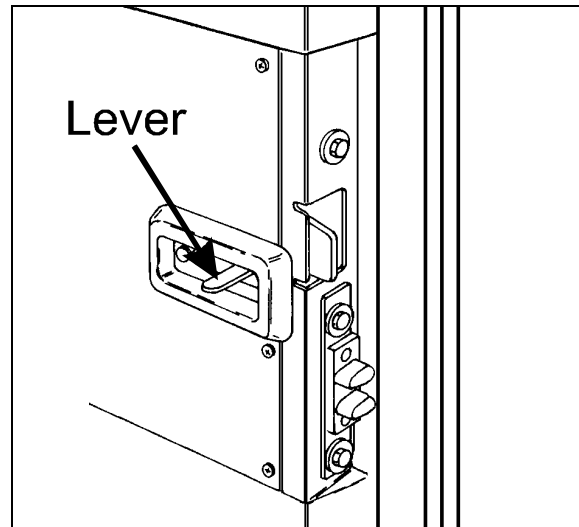


FRONT SERVICE COMPARTMENT

Before operating the system, the front door must be unlocked. To operate the system, set the valve located in the front service compartment to the UNLATCH position before pulling the door open. Reset the valve to its initial position before closing the door.

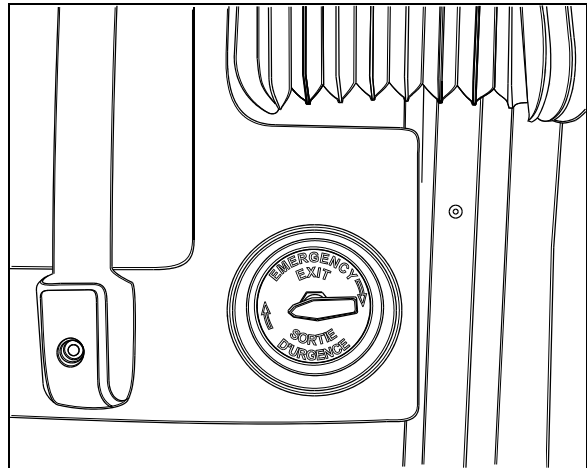
Inside Emergency Opening Valve

If the door is locked, push and hold the unlocking lever forward. Release the latch by turning the emergency opening valve located beside the stairwell, clockwise, then push the door open. Reset the valve to its initial position before closing the door.



FRONT DOOR UNLOCKING LEVER

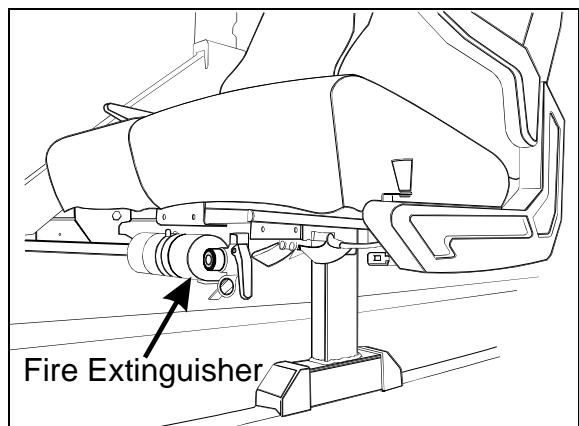
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EMERGENCY OPENING VALVE

SAFETY EQUIPMENT

Fire Extinguishers

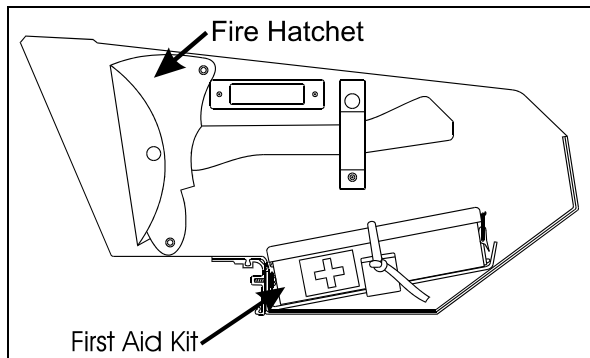


FRONT ROW SEATS

A fire extinguisher is located under the first R.H. seat. A second fire extinguisher is located under the first L.H. seat. Instructions for use are found on the extinguishers. Know how to operate fire extinguishers in case of an emergency. Decals indicating the location of the fire extinguishers are found on each window adjacent to the first L.H. and R.H. seat.

Fire Hatchet

The first R.H. side parcel rack may be equipped with an optional fire hatchet.



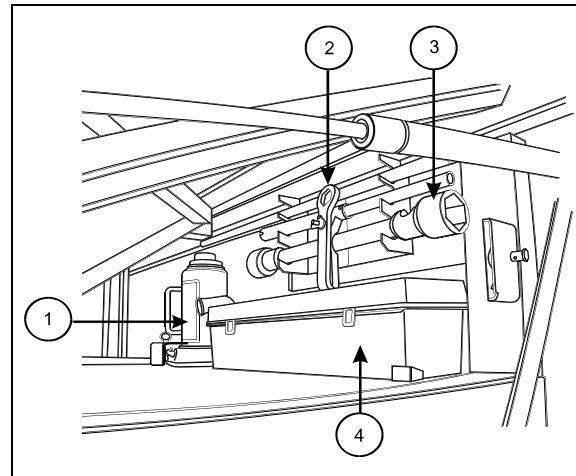
FRONT R.H. PARCEL RACK

First Aid Kit

A sticker (white cross over red background) indicates in which parcel rack the first aid kit is stored. It is usually stored in the first R.H. parcel rack.

Emergency 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).



FRONT BAGGAGE COMPARTMENT

Jack/Tools

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

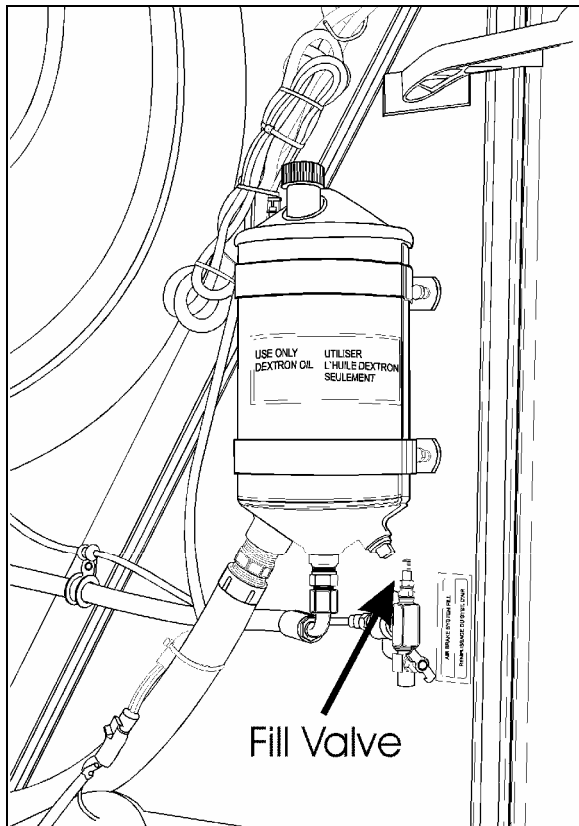
1. 30 ton bottle jack;
2. Bumper wrench;
3. Wheel nut wrench and lever;
4. Triangular reflectors.

AIR SYSTEM

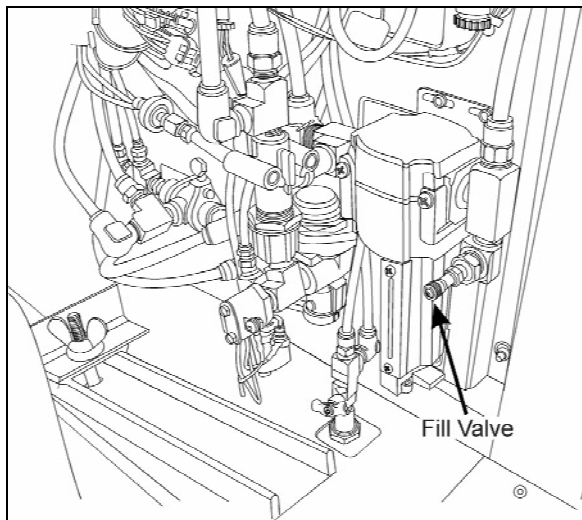
Emergency Fill Valves

The 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 engine compartment near the R.H. access door hinge. The other valve is located inside the front service compartment.

EMERGENCY SAFETY FEATURES



FILL VALVE IN ENGINE COMPARTMENT



FILL VALVE IN FRONT SERVICE COMPARTMENT

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

ALARM SYSTEM

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

(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 coach.

Spring-loaded parking brakes are applied by pulling up the control valve knob located on the R.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 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 has been turned off 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.

EMERGENCY SAFETY FEATURES

Indicator Light	Audible Alarm	Condition
Air primary	Buzzer	Low air pressure
Air secondary	Buzzer	Low air pressure
Check Trans	Buzzer	Inhibits shifting of transmission
N/A	Buzzer	Lavatory emergency button is activated
N/A	Chime	Button activated by passenger
Fire	Bell	Fire in engine compartment
Kneeling / Hi-Buoy	Beep	Front kneeling position is selected
Tag-Axle	Beep	Tag axle raised or unloaded
Freezing Indicator	Beep	Outdoor temperature is 49° F (4° C) "Be careful the road can be slippery"

NOTE : All alarm units are located in the front service compartment. The low pressure alarms for both primary and secondary air pressure systems are produced by the same alarm unit.

CHAPTER 7 : CARE AND MAINTENANCE

INTERIOR CLEANING

To provide consistent and quality passenger service, the coach interior must be kept clean at all times. Scheduled servicing of the coach shall include cleaning of all passenger areas.

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.

Note : 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.

SEAT UPHOLSTERY

Normal Cleaning

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

Note : Upholstery life will be reduced due to the abrasive nature of dirt and grit. Vacuum the seat upholstery regularly.

Removal of Stains and Marks

Remove stains and marks from the wool plush as follows:

Method 1

- 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 2

- 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 1. If stain persists, repeat method 1 using methylated spirits instead of solvent.

Alcoholic Beverage Stains

Remove alcoholic beverage stains by wetting the stain with water, then clean following method 2.

Burns

Scrape burnt area using a knife or razor blade then clean following method 2. Consult an upholstering specialist when dealing with extensive burns.

Cosmetic Stains

Remove stains left by cosmetics by following method 1 then method 2.

Ink Stains

Remove ink stains following method 2. If stain persists, apply a warm oxalic acid solution. Rinse with water.

Blood, Urine or Vomit Stains

Remove such stains by following method 2.

Copying Ink - Ball-point Pen Ink

Treat with methylated spirits, blotting frequently to avoid spreading stain, followed by method 2.

CARE AND MAINTENANCE

Marking Ink (Felt-tip Pens)

Treat with Methyl-Ethyl-Ketone (MEK) followed by method 2.

Oil, Grease and Paint

Remove excess using a knife. Treat with method 1 followed by method 2. If stain persists, repeat procedure.

Rust Stains

Remove rust stains by following method 2. Apply a warm oxalic acid solution to stained areas. Rinse with water.

Tar

Soften Tar with benzene and then treat using method 1 followed by method 2.

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, methylated spirits 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 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.

EXTERIOR CLEANING

Frequent washing and waxing of the coach exterior will help to protect the paint finish. The paint finish is attacked by the abrasive effects of airborne particles and damage from corrosive pollutants.

Before washing the exterior of the coach, close the fresh air dampers using the switch located on the lower R.H. control panel. Install keyhole protectors to prevent water from penetrating. Rinse coach with water to remove all loose dirt. Wash coach using a quality brand car wash soap. Follow manufacturer's recommendations for cleaning. Rinse well with water.

The coach 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 coach 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 coach 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

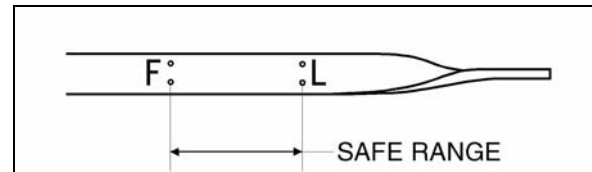
cleaning solution. Clean wiper blades using a sponge or soft cloth.

OIL LEVEL VERIFICATION

ENGINE OIL LEVEL

Check engine oil level when engine is still warm and with coach 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.

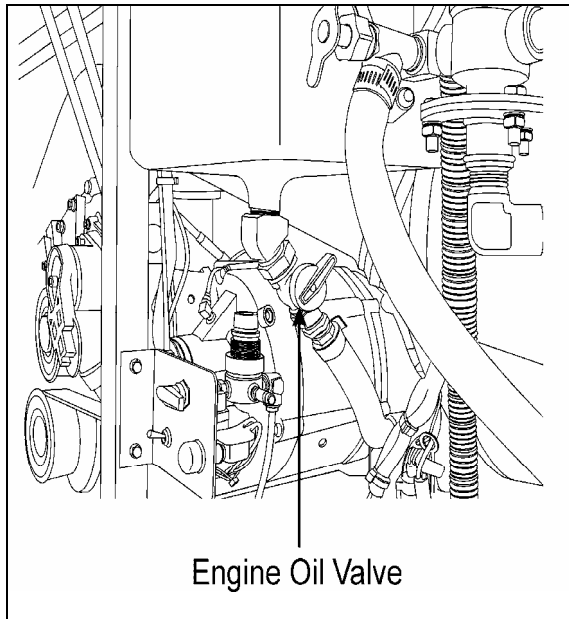
The oil level must be maintained between the two marks indicated on the dipstick. Do not let the oil level drop below the L mark. Add oil by opening the oil reserve tank drain valve or through the oil filler pipe. Use the markings on the tank to check the quantity of oil added. Close the oil reserve 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.



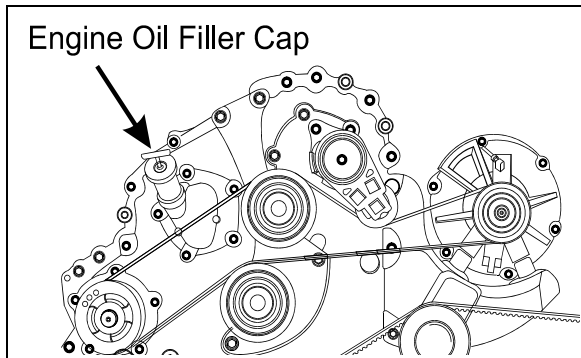
ENGINE OIL LEVEL DIPSTICK

01027

Caution : Keep engine oil level between "L" and "F" on dipstick. Do not overfill. Check when refueling.



ENGINE OIL VALVE



ENGINE COMPARTMENT

AUTOMATIC 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 140 °F (16 °C and 60 °C).

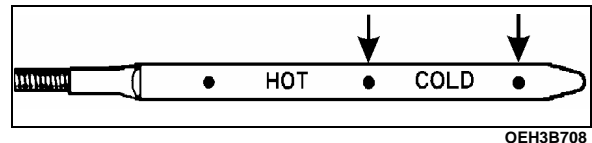
Note : Perform the cold check first to verify the transmission oil level before performing the hot check.

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

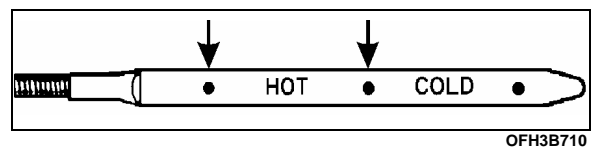
Run the engine until the transmission oil temperature is between 60 °F and 140 °F (16 °C and 60 °C). With the engine idling, make sure the parking brake is applied and the transmission is in Neutral (N). Remove and wipe the dipstick with a clean cloth. Check oil level. If the oil level is within the COLD RUN band, a cold 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. A hot check can be performed when the transmission reaches normal operating temperature of 160 °F to 250 °F (70 °C to 120 °C).



Caution : The oil level rises as oil temperature rises. Do not add oil above the "cold run" band before the transmission reaches 160 °F to 250 °F (70 °C to 120 °C).

Hot Check

Make sure the transmission oil temperature is between 160°F and 250°F (70°C and 120°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.



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.

-SPEED AND 7-SPEED MANUAL TRANSMISSION OIL LEVEL

Oil Check

Manual transmission oil should be checked with engine stopped and cold.

Warning : Before servicing the coach, park safely over a repair pit, apply parking brake, stop engine and set battery master switch to the off position.

Unscrew the fill plug and verify if the oil level is at the plug thread level.

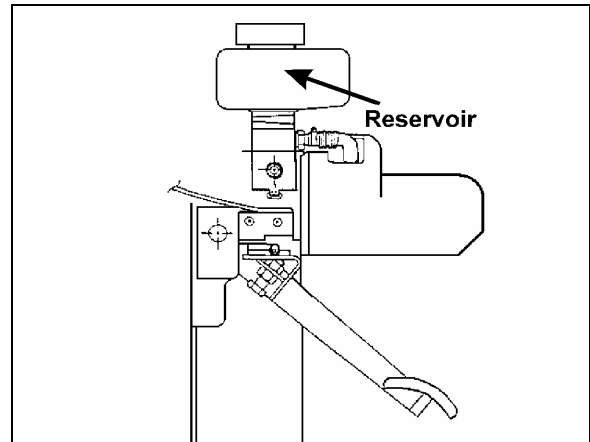
Refill

Refill manual transmission as follows:

1. Remove fill plug.
2. Add oil until it overflows.
3. Clean oil from the transmission case and the fill plug.
4. Replace fill plug.

Clutch Pedal Master Cylinder Fluid Level

Maintain the clutch pedal master cylinder fluid level at the reservoir seam. The fluid reservoir is located under the dashboard near the clutch pedal.

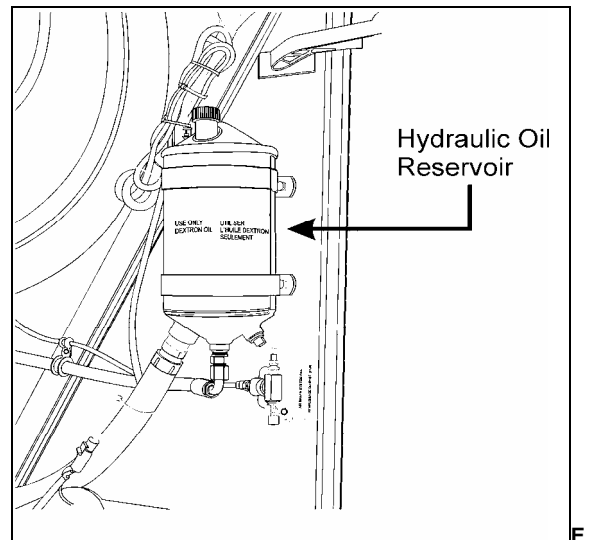


FLUID RESERVOIR

OEH3B716

POWER STEERING FLUID LEVEL

The coach is equipped with a power steering system. The hydraulic fluid tank is located in the engine compartment R.H. side door.



ENGINE COMPARTMENT R.H. SIDE DOOR

HYDRAULIC FLUID LEVEL CHECK

Check fluid level as follows:

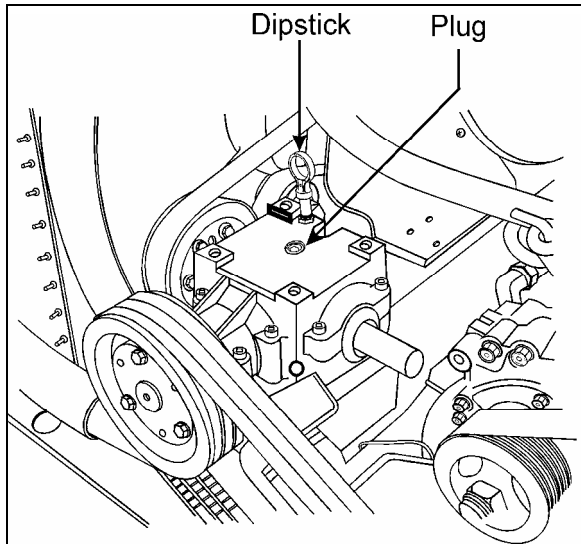
1. Stop engine and open engine compartment R.H. side door.
2. Unscrew and remove the dipstick located on top of the fluid tank and wipe with a clean rag.
3. Replace dipstick in tank, and then remove to check fluid level.

CARE AND MAINTENANCE

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. Replace and tighten dipstick.

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 the top of the gearbox is used to check the radiator fan gearbox oil level.



ENGINE COMPARTMENT

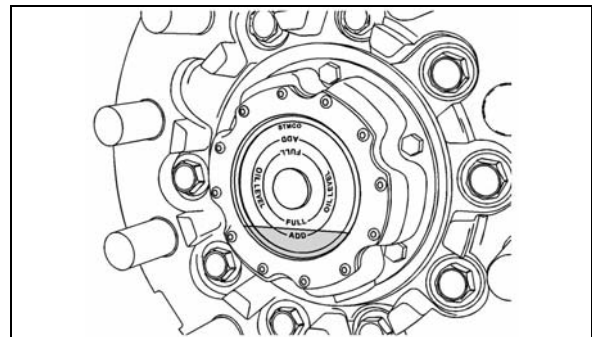
OIL LEVEL CHECK

Check oil level as follows:

1. Stop Engine;
2. Set battery master switch to OFF position;
3. Open engine compartment door and place engine starter switch to OFF position;
4. Remove the dipstick located on the top of the gearbox and wipe with a clean rag;
5. Insert dipstick in gearbox case then remove again to check mark;
6. Add, if necessary, MOBIL SHC 634 synthetic lubricant (or Prevost P/N 18-0185) until it reaches "FULL" mark;
7. Reinsert the dipstick;
8. Place engine control box to NORMAL position. Close engine compartment door;
9. Set battery master switch to ON position.

WHEEL BEARING OIL LEVEL

The oil level for the front and tag axle wheel bearings must be maintained to the level marked in the cap. A sight glass is provided for convenient verification of oil level. Oil level should be checked daily and must be maintained between the "ADD" and "FULL" level mark in the sight glass.. Wait at least 15 minutes before checking the oil level after the coach has been driven to make sure the bearing oil has settled. Differential oil is used to lubricate the drive axle wheel bearings. Maintain the drive axle wheel bearing oil at the level indicated to ensure adequate lubrication.



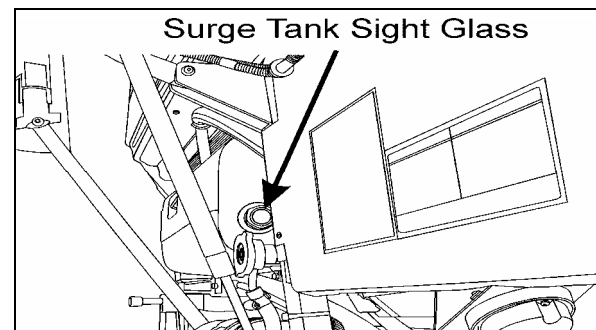
WHEEL BEARING LUBRICATION

13017

Caution : The wheel bearing oil fill cap has a small vent hole in the center to prevent overpressure in the bearing housing. Clean occasionally by inserting a needle.

COOLANT LEVEL CHECK

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.



ENGINE COMPARTMENT

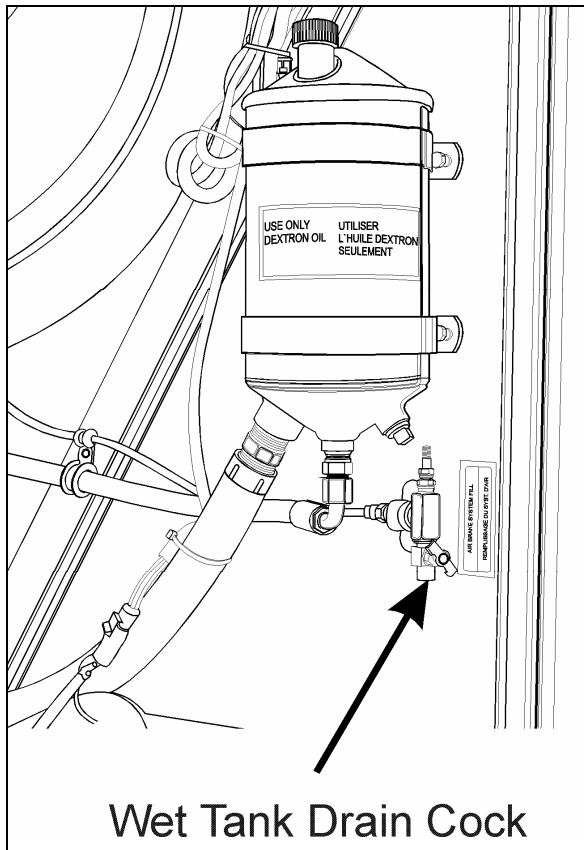
Warning : Hot engine coolant is under high pressure. Allow engine to cool down before adding coolant.

AIR TANKS

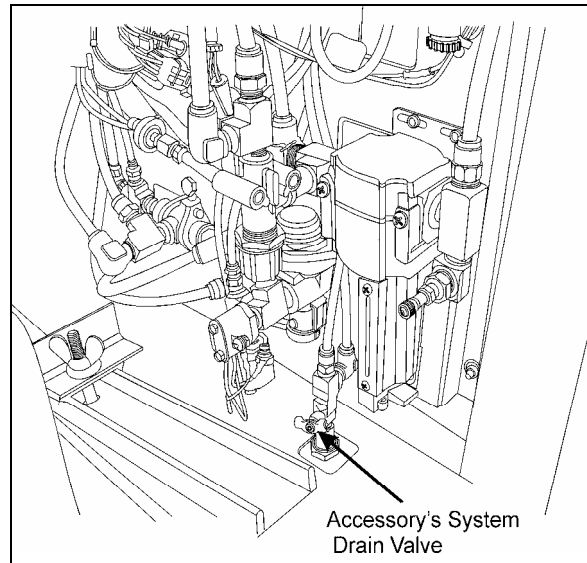
The coach may be equipped with six air tanks. Purge accessory and wet air tanks daily or before each trip. The primary, secondary, kneeling system (optional) and parking brake override (optional) air tanks, must be purged at every oil change. Oil changes should be scheduled at least every 12,500 miles (20 000 km).

The accessory air tank drain cock is accessible from the front service 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 the "Lubrication and Service Check Point Chart" in the "Maintenance Manual" for tank locations.

Drain tanks by turning cocks counterclockwise.



ENGINE COMPARTMENT



FRONT SERVICE COMPARTMENT

FIRE EXTINGUISHERS

Inspect fire extinguishers monthly to insure operation in emergency situations.

- On extinguishers 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;
- Check that hose nozzle is in good condition and the nozzle is free of obstruction;
- Keep fire extinguishers clean;
- Check signature and date of last inspection. Replace signature and date if not inspected within last month.

WATER SEPARATOR

The optional water separator installed in the engine compartment is used to prevent water from entering the fuel system. The water separator should be drained periodically, or when the water separator indicator light on the dashboard goes on. To drain water, loosen bleed screw below separator one quarter turn. Tighten bleed screw when finished.

110-120 VOLT IN-STATION LIGHTING CIRCUIT

The optional 110-120 volt lighting system can be used when the coach is being cleaned or serviced by using an interior power receptacle. The optional receptacle used for the in-station lighting circuit is located on the engine compartment rear door.

110-120 VOLT CONNECTOR

(ENGINE BLOCK HEATER & OPTIONAL FRESH WATER TANK HEATER)

The 110-120 volt power connector is located on the engine compartment rear door. Refer to "Coach Exterior" chapter. Connect the female extension cord plug to the male connector on the engine compartment rear door. Connect the plug at the other end of the cord to a 110-120 VAC outlet only.

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

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

The coach may be equipped with a fresh water tank heater.

When the coach is plugged to an external power source, the engine block heater and the optional fresh water tank heater turn on.

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 coach.

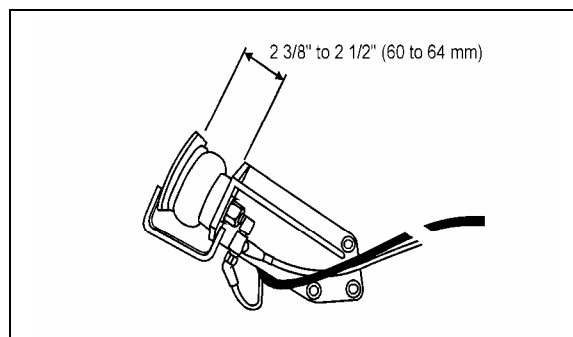
BELT TENSION ADJUSTMENT

The radiator transfer fan and air conditioning compressor are driven by V-belts.

Belt Tension Gauge #68-2404 is used to measure the belt tension of series-60 engine belts. Refer to Prevost Maintenance Manuals or Service Bulletins for recommended belt sizes and tension settings.

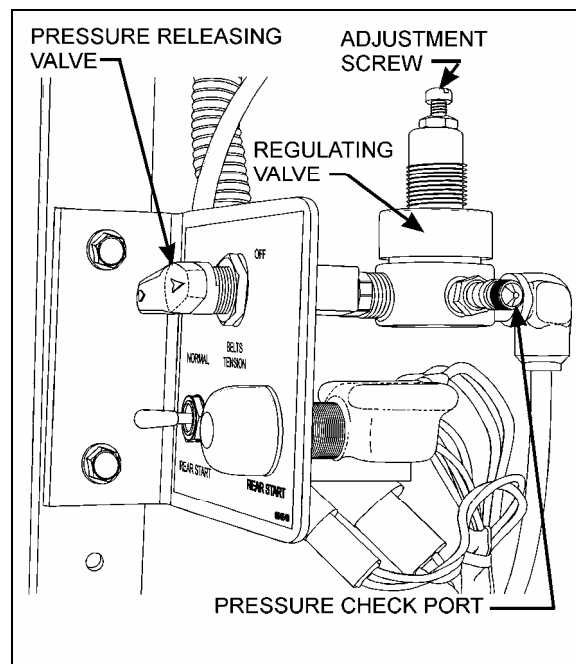
BELT TENSIONERS

Belt tensioning is applied through air bellows which are adjusted by an air pressure regulating valve mounted in the engine compartment, right behind the engine start panel. For proper operation of the air bellows, adjust the upper tensioning bracket to provide a 2 3/8"-2 1/2" (60-64mm) extension with the pneumatic system under normal pressure and the pressure regulating valve set at 50 psi (345 kPa).



AIR BELLOW

For belt replacement, air pressure must be released from bellows by means of the belt tensioning pressure control valve. This valve mounted above the engine doors 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

12143

GENERAL RULES FOR BELT TENSION

- Refer to Prevost Maintenance Manuals or Service Bulletins for recommended belt sizes and tension settings;
- With belt tension set, run engine for 10 minutes. Check tension and reset if necessary;
- Periodically inspect belt and pulleys for wear or damage;
- Do not treat belts with any compounds. Keep belts dry;
- Do not use belts wider than the bottom surface of the tension gauge.

BACK-UP CAMERA

A back-up camera with a TV monitor can be installed as an option. When the transmission is placed in reverse (R), the camera and TV monitor will automatically switch on. The monitor will switch off when the coach is taken out of reverse (R). The back-up camera is retractable and is visible only when turned on. A switch located in the rear electric 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.

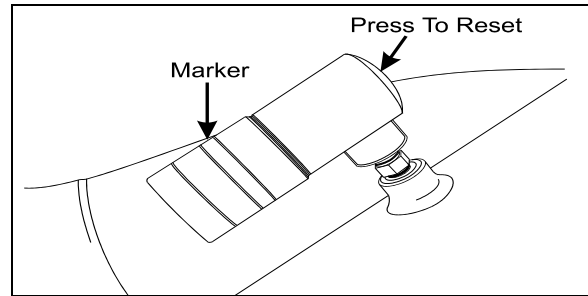
Caution : To prevent scratches to the camera protective glass, do not wipe with dry rag. Use a clean damp rag.

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.

The filter restriction indicator is located on the engine air intake duct.

When a red marker is displayed, the air filter must be replaced. Reset by pressing on the indicator's extremity.



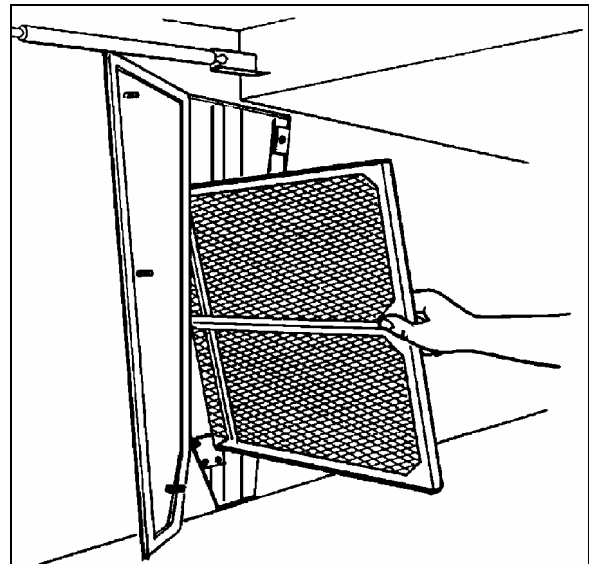
RESTRICTION INDICATOR

A/C AND HEATING SYSTEM AIR FILTERS

For maximum system efficiency, air filters should be inspected and cleaned

Cabin Air Filters

The cabin air filters are located in the first and second baggage compartments. To access, unscrew the three panel fasteners 1/4 turn. Remove, clean and replace filters.



PASSENGER'S AREA AIR FILTER

OEH3B748

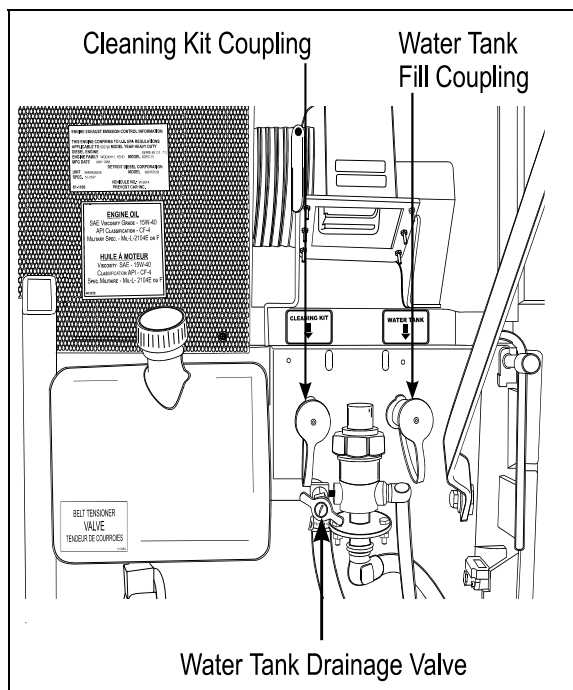
Caution : Be sure not to install filter in inverted position.

LAVATORY MAINTENANCE

Draining and filling lavatory tanks should be performed by maintenance personnel. Unless an appropriate power source (110-120 VAC) is available to connect the tank heating element (optional), emergency draining of water tanks must be performed in case of engine or heating failure in freezing weather. The driver should supervise the servicing when on the road. Refer to "Coach Exterior" chapter under "110-120 Volt Connector"

FRESH WATER RESERVOIR FILLING

Plug the fresh water reservoir supply connector in the quick-release male connector located over the engine oil reserve tank. Fill the reservoir until the overflow tube spills, indicating the reservoir is full.



SERVICES VALVES

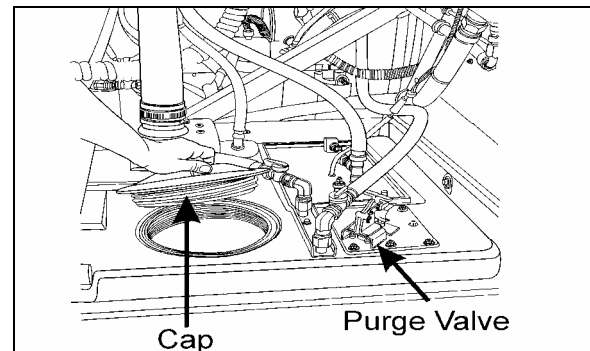
Warning : Never put antifreeze in fresh water reservoir. Anti-freeze is toxic.

Caution : Never leave water in fresh water tank during freezing weather, unless heating element is plugged to an external power source.

FRESH WATER RESERVOIR DRAINING

To drain fresh water reservoir, open drain valve located near the quick-release couplings in the engine compartment. Close valve when finished.

SUMP TANK DRAINING



SUMP TANK

To drain sump tank, unscrew cap a few turns and pull on the drain hose slide valve T-handle located under the sump tank. Flush tank and pump cage with clean water.

Caution : The lavatory should be serviced by maintenance personnel after emergency draining. Lavatory tanks should be serviced only at suitably equipped stations.

SUMP TANK FILLING

Remove cap on sump tank. Fill tank with 2 gallons (9 liters) of antifreeze and two gallons of water.

Caution : Do not overfill sump tank.

Note : The antifreeze solution in the sump tank will be diluted by fresh water from the lavatory sink. Regular maintenance of the sump tank is required to prevent freezing.

CLEANING CABINET

A coiled hose located in the cleaning cabinet above the toilet can be used during lavatory cleaning. To use, connect a fresh water supply to the "Hansen" quick-release coupling, identified as "Cleaning Kit", located above the engine oil reserve tank. Refer to the figure under "Fresh Water Reservoir Draining" in this chapter.

To prevent freezing during cold weather, drain the hose after every use. To drain the hose, uncoil and open the nozzle near the lavatory floor drain.

Have an assistant push on the spring ball of the quick-release coupling to allow air into the system.

FLEXIBLE HOSE INSPECTION

Inspect flexible hoses regularly to ensure efficient, economical, and safe operation of the engine and related equipment.

PRE-STARTING INSPECTION

Inspect hoses daily 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.

LEAKS

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.

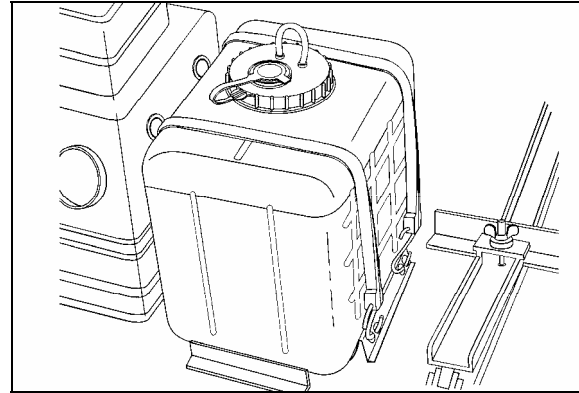
SERVICE LIFE

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.

WINDSHIELD WASHER TANK

The windshield washer reservoir is located in the front left service compartment. The reservoir has a capacity of 5 US gallons (19 liters) and is equipped with a spin-on type cover. Check the windshield washer fluid level regularly.



FRONT SERVICE COMPARTMENT

The spray jets are located under the windshield wiper arms.

Upper and lower windshield wipers have separate controls and separate washer pumps which are connected to the same reservoir.

TIRES

TIRE PRESSURE

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" located in the technical publication package supplied with the coach. The cold tire inflation pressures are on the Department of Transport certification plate located on the back of 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.

Note : Always check the spare tire pressure when checking tire pressures.

CHANGING WHEELS

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

RECLINING FRONT BUMPER

The spare tire is stored in the compartment directly behind the front bumper. To gain access to the spare tire, unscrew the nut located below each end of the bumper and then push up. With the help of an assistant, carefully lower the bumper to the ground.

Warning : *The bumper is heavy. Get assistance before attempting to recline the bumper.*

Warning : *The spare tire compartment is not designed for storage. Do not store loose objects in the spare tire compartment. Loose objects may interfere with the steering linkage. Remove any loose objects found in compartment.*

REMOVING SPARE WHEEL AND TIRE FROM COMPARTMENT

To remove the spare wheel and tire from the compartment, loosen the turn-buckle on the holding chain to release the wheel and dolly. Open the front service compartment. Remove the wing nut holding the support and rail extension assembly. Remove the support and rail extension assembly. Attach the assembly to the matching holes located in the front center of the spare tire compartment. Remove the spare wheel using the strap. Remove the tire covering. Remove the two nuts and separate the spare wheel from the dolly.

Caution : *Before driving, make sure that the support and rail extension assembly is reinstalled and the wheel has been secured with the holding chain.*

Caution : *Make sure that the bumper is safely hooked in place, and that the retaining nuts are tight.*

Note : *The jack and wheel nut wrench are stored in the right side of the R.H. side first baggage compartment.*

Note : *Check the spare tire inflation pressure periodically. Inflate the spare tire to the maximum tire pressure specified in the chart.*

Note : *Periodically check that spare tire is securely fastened in compartment.*

PROCEDURE

Step 1

Apply parking brake and stop engine. Remove spare wheel and tire from compartment.

Step 2

Remove wheel cover or hub cap

Stud mounted wheel :

Loosen wheel nuts about one turn. Turn nuts counterclockwise for R.H. side and clockwise for the L.H. side. Do not remove the nuts.

Hub mounted wheel :

Loosen wheel nuts about one turn. Turn nuts counterclockwise. Do not remove the nuts.

Step 3

Use the hydraulic jack to raise coach. Raise it to the required height to change the wheel.

Note : *Six jacking points are located on each side of the coach: three are located under the frame, and three are located under the axles. Refer to "Jacking Points" in this chapter.*

Warning : *Place the jack on stable and level ground. If necessary, place a board under the jack.*

Warning : *To prevent personal injury or equipment damage, only use the recommended jacking points.*

Warning : *Do not raise the coach until you are sure the jack is securely engaged.*

Warning : *Passengers must not remain in the coach when it is jacked up.*

Step 4

Remove the wheel nuts. Replace wheel with spare tire. Replace nuts and loosely tighten in a criss-cross pattern before lowering the coach.

Step 5

Lower coach until the tire just touches the ground by slowly unscrewing the hydraulic valve on the jack.

Step 6

Torque the nuts in a criss-cross pattern to 450 to 500 foot-pounds (610 to 680 N.m).

Step 7

Lower the coach completely and remove jack. Inflate tire pressure to the cold tire inflation pressure.

Step 8

Store damaged wheel in spare tire compartment. Repair and balance the flat tire as soon as possible.

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.

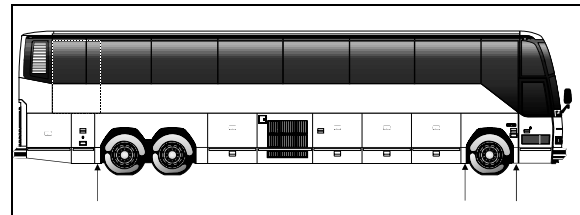
Service : Check oil level when jack fails to raise to full height. Lower ram completely with release valve open and jack in upright position, remove filler plug and refill to level of filler hole with hydraulic jack oil. Never use brake fluid.

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.

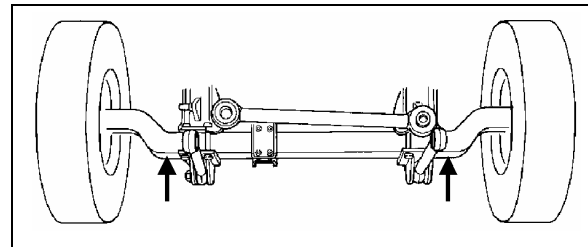
Jacking Points

Five jacking points are located on each side of the coach: three are located under the frame and two are located under the axles. Refer to the following illustration for the location of jacking points.



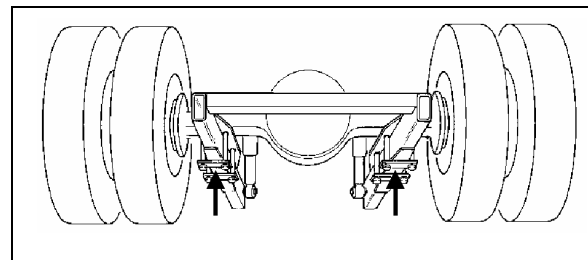
JACKING POINTS ON FRAME

EH3B758



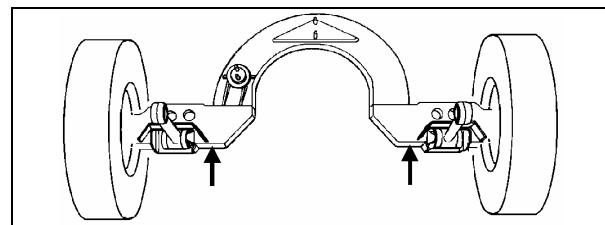
JACKING POINTS ON FRONT AXLE

OEH3B760



JACKING POINTS ON DRIVE AXLE

OEH3B762



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: 13,000 lbs (5 900 kg)
- Drive axle: 25,000 lbs (11 365 kg)

TOWING

To prevent damage to the coach, use the two tow eyes located under each bumper. Use only a solid link tow bar and a safety chain to tow the coach. If required, connect an auxiliary air supply to the coach so brakes can be operated while towing.

Warning : *Unload passengers before towing. Do not carry passengers in the coach while towing.*

Caution : *To prevent damage to the drivetrain components, disconnect axle shafts or driveshaft before towing. Do not attempt to push- or pull-start the coach with a manual transmission in first or second gear. Do not attempt to push- or pull-start a coach 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.*

LUBRICATION

Lubricate at all lubrication points during scheduled maintenance. For heavy loads or extended use, lubricate more often.

FIRST SERVICE ON NEW COACH

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).

AUTOMATIC TRANSMISSION OIL FILTER

Replace automatic transmission oil filter cartridge after first 5,000 miles (8 000 km), and then every 25,000 miles (40 000).

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).

Note : *If soldering has been performed on cooling system, clean strainer after 3,000 miles (5 000 km).*

DAILY INSPECTION

WITH ENGINE STOPPED

General

Check for loose nuts and bolts. Visually inspect security of compartment door latches. Test operation of all exterior lights.

Tires and Wheels

Check tire pressures. Check for loose wheel nuts. Both aluminum alloy and steel wheel nuts should be tightened to 450 to 500 foot-pounds (610 to 680 N.m) torque.

Leaks

Check for leaks under coach and in compartments. Record and report leaks to maintenance personnel.

Doors

Close all exterior doors and windows. Check for good tightness and fit.

Tools and Spares

Make sure coach 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 System" 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 coach "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 oil level in sight glass. Refer to heading "Wheel Bearing Oil Level" in this chapter.

CAUTION: 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 to prevent freezing.

Engine Oil

Check engine oil level during fuel stops. If the oil level is low, refer to heading "Oil Level Verification" in this chapter.

Warning : Check the engine oil level with coach parked on a level surface and with the parking brake engaged.

Power Steering Oil Tank

Check steering oil level. Refer to heading "Oil Level Verification" in this chapter.

Belts

Check for loose, worn or broken belts.

Belt Tension Adjustment

Check belt tension manually. Refer to heading "Belt Tension Adjustment" in this chapter.

Extinguishers and First Aid Kit

Make sure that the first aid kit is complete and stowed in place. Check fire extinguishers to make sure they are ready for operation. Refer to "Fire Extinguishers" in chapter.6

Seats

Ensure all seats and seat cushions are securely attached.

Emergency Exits

Test emergency exits for correct operation.

Lavatory

Make sure the lavatory is clean and equipped with an adequate supply of toilet paper, towels and water.

Driver's Section

Adjust driver's mirrors and seat.

WITH ENGINE RUNNING

Leaks

Walk around coach 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 "Oil Level Verification" 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.

CARE AND MAINTENANCE

Air loss should not exceed 7 psi/minute (48 kPa/minute).

Brake Test

Release parking and emergency brakes. Pump 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) Allow air pressure to reach 95 psi (655 kPa) before releasing parking brake.

Parking and Emergency Brake Test

Driving the vehicle while the parking brake is applied should not be possible.

GENERAL RECOMMENDATIONS

- Understand basic principles of coach operation;
- Always maintain the coach in good running condition;
- Do not drive coach 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 2 minutes at slow idle before shutting off;
- Engine should be at idle when shifting from neutral (N) to forward (D) or 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 coach 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 coach equipped with an automatic transmission;
- Coaches may be damaged if towed with the axle shafts or drive shaft connected. Do not push- or pull-start the coach in first or reverse gears;
- Chemical fire extinguishers are stored under the first L.H. and R.H. seats. In case of fire, immediately evacuate all passengers. Passenger and personal safety is the first priority. Do not attempt to extinguish the fire if there is immediate danger of passenger or personal injury;
- When driving on ice and snow, accelerate and decelerate gradually.

Warning : Report all problems affecting passenger or driver safety to maintenance personnel. Have problems corrected immediately.

CHAPTER 8 : TECHNICAL INFORMATION

DIMENSIONS

Length Overall (over bumpers)

H3-45 45' (13 716 mm)
H3-41 41' (12 497 mm)

Width, Overall 102" (2 591 mm)

Height, Overall 12' (3 658 mm)
(over closed roof hatches)

Wheelbase

H3-45 317" (8 052 mm)
H3-41 268" (6 807 mm)

Cabin Floor Height 63" (1601 mm)

Ground Clearance 11" (280 mm)

Floor-to Ceiling Height 77" (1 956 mm)

Center Aisle Width 14" (356 mm)

Step Height from Ground 14" (356 mm)

Height of other Steps 7" (178 mm)

Entrance Door Opening Width 27" (685 mm)

Front Overhang 71.5" (1 816 mm)

Rear Overhang 103.5" (2 628 mm)

Front Track 84.4" (2 145 mm)

Drive Track 76.7" (1 949 mm)

Rear Track 83.6" (2 124 mm)

Turning Radius (exterior front corner)

H3-45 45.7' (13 930 mm)
H3-41 39' (11 885 mm)

WEIGHTS

GVW 49 000 lbs (22 270 kg)

Dry Weight (w/6-Cyl. & World. Trans.)

H3-45 33 800 lbs (15 330 kg)
H3-41 32 400 lbs (14 695 kg)

Gross Axle Weight Rating (G.A.W.R.)

Refer to the Coach Final Record located in the technical publication package supplied with the coach.

STORAGE VOLUME

Exterior baggage compartments:

H3-45 470 ft³ / 13,3 m³
H3-41 360 ft³ / 10,2 m³

Parcel racks:

H3-45 92 ft³ / 2,6 m³
H3-41 84 ft³ / 2,4 m³

SEATS

Seating capacity: (Normal configuration)

Including 1 or 2 card table(s)

H3-45 56
H3-41 48

NOTE : Several seating layouts may be obtained through a combination of available equipment with the addition or removal of some items such as passengers' seats, card table, galley and lavatory.

CAPACITIES

Engine Oil

- Without oil filters:
 - To the LOW mark..... 26 quarts / 24.5 liters
 - To the FULL mark..... 32 quarts / 30.25 liters
- With oil filters installed:
 - To the LOW mark..... 41 quarts / 38.75 liters
- Reserve tank 8.4 quarts / 8 liters

Fuel Reservoir

235 US gal / 890 liters (legal capacity equal to 95% of volume)

Differential Oil

20.4 quarts / 19.3 liters

Cooling System

24 US gal / 91 liters

Transmission

- **Automatic Transmission**
(does not include external circuits)
40 US qts / 37,8 liters
- **Semi-Automatic Transmission**
13 US qts / 12 liters
- **Manual Transmission**
 - 7 speed**..... 24 US qts / 22,7 liters
 - 6 speed**..... 20,5 US qts / 19.4 liters

Power Steering Reservoir

4 US qts / 3,7 liters

Windshield Washer Reservoir

5 US gal / 19 liters

FUEL TYPE

Specification:.....ASTM D-975

Recommended grade:..... 1-D

Acceptable grade:..... 2-D

WHEELS AND TIRES

Keep the tires inflated to the recommended inflation pressure to prolong tire life and for safety. See the tire inflation pressures and loadings in the Coach Final Record located in the technical publication package supplied with the coach.

Warning : *All tires on the same axle should always be inflated to the same pressure. A 5 psi (35 kPa) under inflation in one front tire not only can destroy ease of steering, but creates steering hazard which could lead to a potential accident.*

Note : *For a specific vehicle, inflation pressures and loadings change with the type of tires.*

Note : *It is recommended that coach be equipped with the same type of tires.*

Note : *Always check the spare tire pressure when checking tire pressure. The spare tire should be inflated to the maximum tire pressure specified in the chart.*

BELTS

Radiator Fan Drive (Transfer)

Make:.....Dayco

Model:

Prevost number..... 50-6663

Supplier number.....5100495

Qty:..... 1

Radiator Fan Drive with Thermostatic Option

Make:.....Dayco

Model:..... 50-6691

Qty: 3

A/C System Compressor

Make:Gates
 Model: CX 97
 Qty:2

TRANSMISSION

• Automatic

Allison B-500 World Trans., 6-speed

Available in 4, 5, or 6 speed shift calibrations.

Gear	Ratio
1 st	3.510
2 nd
3 rd	1.429
4 th	1.000
5 th	0.737
6 th	0.639
Rev.	4.801
Converter	1.578
Output retarder	optional

Note : Gear ratios do not include torque converter multiplication.

• Semi-Automatic

Eaton Fuller Autoshift RTAO-14710B-AS

Gear	Ratio
Overall	14.78
Lo Reverse	11.23
1 st	10.99
2 nd	8.18
3 rd	6.07
4 th	4.46
5 th	3.32
6 th	2.46
7 th	1.83
8 th	1.36
9 th	1.00
10 th	0.74

• Manual

Spicer PS145-7A, 7-speed

Gear	Ratio
1 st	10.13
2 nd	5.99
3 rd	3.56
4 th	2.57
5 th	1.84
6 th	1.33
7 th	1.00
Rev.	10.13

Spicer PS130-6B, 6-speed

Gear	Ratio
1 st	8.53
2 nd	4.87
3 rd	3.00
4 th	1.90
5 th	1.33
6 th	1.00
Rev.	8.53

DRIVE AXLE RATIO

- World Transmission 4.88 : 1 standard
4.56 : 1 optional
- Eaton Fuller RTAO-14710B-AS 3.73 : 1 standard
- w/12.7L & PS145-7A & w/11.1L & PS130-6B 3.21 : 1 standard
3.07 : 1 optional

ALIGNMENT

Front Axle

- Toe in 3/32" ± 1/32" (2,4 ± 0,8 mm)
- Caster +3° (+1 1/4° to -1/2° accepted)
- Camber (R.H.) - 1/8 ± 7/16°

TECHNICAL INFORMATION

- Camber (L.H.)+3/8 ± 7/16°

Tag Axle

- Toe in..... 0 ± 3/32" (0 ± 2,4 mm)

BRAKES

Dual system plus parking brake

Disc brakes on front and tag axles

24 disc-type spring brakes on front axle

30-36 disc-type spring brakes on drive axle

16-16 disc-type spring brakes on tag axle

Two-cylinder, engine gear-driven, water-cooled and engine oil-lubricated air compressor

Air dryer

Nylon color-coded air lines

ABS system on all axles with dashboard warning light

STEERING

Tilt steering wheel and telescopic steering column

Hydraulic-assisted steering gear

SUSPENSION

Hi-Buoy (optional)

Low-Buoy (optional)

Kneeling system (optional)

"1200" air springs (front and tag axles)

"1100" air springs (drive axle)

Dual action shock absorbers

Leveling valves

Sway bar on front axle

Sway bar on tag axle upon special request

ELECTRICAL SYSTEM

24 volt system

12 volt exterior lighting

270 amp, self-rectified, gear-driven, oil-cooled "Delco" alternator lubricated by engine circuit

Four 12 volt, maintenance-free batteries with a 1250 cold cranking amp capacity

12 volt system provided with two battery equalizers

Two weatherproof junction boxes

Manual reset circuit breakers

12 volt and 24 volt battery relax

SOUND SYSTEM

Sixteen (H3-45) or twelve (H3-41) Hi-Fi speakers in passengers' section (standard)

Two Hi-Fi speakers in driver's area (optional)

Deluxe sound system AM/FM cassette (optional)

CD player (10 stacks) (optional)

PA system with volume control (standard)

Microphone outlets (one standard)

Cellular phone antenna (optional)

VIDEO SYSTEM (OPTIONAL)

TV converter ("Starcom 7V") with remote control "Panasonic" videocassette player

- Model: VHS ag-1000B with remote control

TV monitors mounted under parcel racks

- Model: ST-1001

OIL SPECIFICATIONS

Engine

Heavy-duty engine oil SAE: 15-W40 with classification API: CF4 and meeting military specification: MIL-L-2104E.

Transmission

Automatic

Use, "Dexron IIE" "Dexron III" or "Mercon" fluid.

Semi-Automatic

CD50 synthetic lubricant

Manual

Same as engine oil

Differential

Multigrade lubricants are recommended for use in the drive axle. These lubricants perform well over broad temperature ranges, providing good gear and bearing protection in a variety of climates.

Two categories of lubricants may be used according to the climate in which coach is operated.

- SAE 85W-140 (above 10 °F (-12 °C))
- SAE 75W-90 (below 10 °F (-12 °C))

Speed: 1750 rpm
 Power: 2 hp
 Voltage: 27.5 V
 Maximum amperage: 69 A

Fan Gearbox

Bearing and gear MOBIL SHC 634 synthetic lubricant (PREVOST # 180185) is recommended for the fan gearbox.

Power Steering Reservoir

Fill reservoir with "Dexron II", "Dexron IIE", "Dexron III" or "Mercon" fluid.

Wheel Bearings

SAE-90 oil is recommended for the front and tag axle wheel bearings. Drive axle wheel bearings are lubricated by the differential oil.

Clutch Master Cylinder

Use DOT 3 heavy-duty brake fluid.

HEATING AND AIR CONDITIONING SYSTEM

Driver's System

Air conditioning capacity:2 tons
 Refrigerant: 134a
 Heating capacity: 37,000 Btu/hr

Central System

Air conditioning capacity: 7.5 tons
 Refrigerant: 134a
 Heating capacity: 152,000 Btu/hr
 Modulated A/C and ventilation speed

Two blowers

Make: Leroy Somer
 Model: TAP 12
 Voltage: 27.5 V
 Amperage: 23 A
 Speed: 1900 rpm
 Power: 0.57 hp

One blower motor

Model: Prevost
 Type: T 19 Compound winding

Temperature Control

Six output stage "Honeywell Energy Management" microprocessor

Digital remote thermometers for inside and outside temperatures, mounted on central console in driver's area

Rheostatic thermostat setting and telltale

Manual fresh air control

Humidistat set to 30%

Compressor

Belt-driven magnetic clutch

Number of cylinders: 6

Operating speed: 400 to 2,200 rpm
 (rated speed: 1,750 rpm)

Minimum speed for lubrication: 400 rpm

Oil capacity: 1.13 US gal (4,3 liters)

Approved oil:Castrol S-W 68 (POE)

ANTILOCK BRAKING SYSTEM (ABS)

Components:

- Electronic Control Unit (ECU);
- Solenoid control valves;
- Sensors;
- Clamping bushes;
- Wiring harnesses.

Electronic Control Unit Technical Data

Voltage: 24 ± 6 volts

Thermal operating range:

..... -40 to 167 °F(-40 to 75 °C)

Protection system for sealed multi-pin plug according to DIN 40050

TECHNICAL INFORMATION

Electrical connection is made through a 35 pin plug

Maintenance:..... none

Solenoid Control Valve Technical Data

Voltage:.....24 (+4.8, -2.4) volts

Current:..... DC

Rated current:..... 1.65 amps

Protection system according to DIN 40050

Maximum service pressure:..... 10 bars (145 psi)

Thermal operating range:

..... -40 to 176 °F(-40 to 80 °C)

Electrical connector:..... 894 601 010 2

Installation: Maximum pipe length between solenoid control valve and brake cylinder is 5' (1,5

m); pipe diameter is 3/8" (10 mm) venting downward at an angle of 15° on the vertical plane.

Maintenance:..... none

Sensor Technical Data

Two-core screened cable:AWG 18 (1 mm²)

Force needed to tear out lead: 11.2 lbs (50 N)

Force needed to pull off shrink-fitted tube:

..... 11.2 lbs (50 N)

Protection system according to DIN 40050

Thermal operating range:

..... -40 to 176 °F (-40 to 80 °C)

WATER HEATER TECHNICAL DATA

	Espar D12W	Webasto DBW 2010	Webasto DBW 2020
Heating capacity	12 kW	13 kW	23,3 kw
Heating output	41,000 Btu/hr	45 000 Btu/hr	80 000 Btu/hr
Fuel type	Same as engine	Same as engine	Same as engine
Fuel consumption	1,75 U.S. qts (1,65 L/hr)	1,58 U.S. qts (1,50 L/hr)	3,17 U.S. qts (3,00 L/hr)
Rated voltage	24 volts	24 volts	24 volts
Electricity consumption	55 watts	60 watts	120 watts

DDEC IV DIAGNOSTIC CODES

To Read Codes:

Plug a diagnostic data reader into the receptacle located on the side panel of the L.H. control panel or momentarily depress the STOP ENGINE OVERRIDE switch, located on the L.H. lower control panel, with the ignition ON, the engine idling or engine shut-off. Active codes will be flashed on the STOP ENGINE indicator light, located on the central dashboard, followed by the inactive codes being flashed on the CHECK ENGINE indicator light located on the central dashboard. The cycle is repeated until the operator depresses the STOP ENGINE OVERRIDE switch. For example; a 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 diagnostic codes.

DDEC Code Number (Flashed)	DESCRIPTION	DDEC Code Number (Flashed)	DESCRIPTION
11	Variable speed governor sensor	12	Variable speed governor sensor

TECHNICAL INFORMATION

DDEC Code Number (Flashed)	DESCRIPTION	DDEC Code Number (Flashed)	DESCRIPTION
	voltage low		voltage high
13	Coolant level circuit failed low	14	Intercooler temperature circuit failed high
14	Coolant temperature circuit failed high	14	Oil temperature circuit failed high
15	Intercooler temperature circuit failed low	15	Coolant temperature circuit failed low
15	Oil temperature circuit failed low	16	Coolant level circuit failed high
17	Bypass position circuit failed high	18	Bypass position circuit failed low
21	EFPA circuit failed high	22	EFPA circuit failed low
23	Fuel temperature circuit failed high	24	Fuel temperature circuit failed low
25	Reserved for "no codes"	26	Aux. shutdown #1 active
26	Aux. shutdown #2 active	27	Air temperature circuit failed high
28	Air temperature circuit failed low	31	Aux. output #3 open circuit (high side)
31	Aux. output #3 short to ground (high side)	31	Aux. output #4 open circuit (high side)
31	Aux. output #4 short to ground (high side)	32	SEL open circuit
32	SEL short to battery	33	Turbo boost pressure circuit failed high
34	Turbo boost pressure circuit failed low	35	Oil pressure circuit failed high
36	Oil pressure circuit failed low	37	Fuel pressure circuit failed high
38	Fuel pressure circuit failed low	41	Too many SRS (missing TRS)
42	Too few SRS (missing SRS)	43	Coolant level low
44	Intercooler temperature high	44	Coolant temperature high
44	Oil temperature high	45	Oil pressure low
46	Battery voltage low	47	Fuel pressure high
48	Fuel pressure low	52	A/D conversion fail
53	Nonvolatile checksum incorrect	53	EEPROM write error

TECHNICAL INFORMATION

DDEC Code Number (Flashed)	DESCRIPTION	DDEC Code Number (Flashed)	DESCRIPTION
54	Vehicle speed sensor fault	55	J1939 data link fault
55	Proprietary link fault (master)	55	Proprietary link fault (receiver)
56	J1587 data link fault	57	J1922 data link fault
58	Torque overload	61	Response time long
62	Aux. output #1 short to battery	62	Aux. output #1 open circuit
62	Aux. output #2 short to battery	62	Aux. output #2 open circuit
62	Aux. output #5 short to battery	62	Aux. output #5 open circuit
62	Aux. output #6 short to battery	62	Aux. output #6 open circuit
62	Aux. output #7 short to battery	62	Aux. output #7 open circuit
62	Aux. output #8 short to battery	62	Aux. output #8 open circuit
63	PWM #1 short to battery	63	PWM #1 open circuit
63	PWM #2 short to battery	63	PWM #2 open circuit
63	PWM #3 short to battery	63	PWM #3 open circuit
63	PWM #4 short to battery	63	PWM #4 open circuit
64	Turbo speed circuit failed	65	Reserved for air filter differential pressure circuit failed high
65	Reserved for air filter differential pressure circuit failed low	66	Reserved for oil filter differential pressure circuit failed high
66	Reserved for oil filter differential pressure circuit failed low	67	Coolant pressure circuit failed high
67	Coolant pressure circuit failed low	68	Idle validation circuit fault (grounded circuit)
68	Idle validation circuit fault (open circuit)	71	Injector response time short
72	Vehicle overspeed	72	Reserved for vehicle overspeed (absolute)
73	Reserved for air differential pressure high	74	Oil differential pressure high
75	Battery voltage high	76	Engine overspeed with engine brake
77	All other faults not listed	81	Timing actuator (dual fuel) failed high

DDEC Code Number (Flashed)	DESCRIPTION	DDEC Code Number (Flashed)	DESCRIPTION
81	Oil level circuit failed high	81	Crankcase pressure circuit failed high
82	Timing actuator (dual fuel) failed low	82	Oil level circuit failed low
82	Crankcase pressure circuit failed low	83	Oil level high
83	Crankcase pressure high	84	Oil level low
84	Crankcase pressure low	85	Engine overspeed
86	Pump pressure circuit failed high	86	Barometric pressure circuit failed high
87	Pump pressure circuit failed low	87	Barometric pressure circuit failed high
88	Coolant pressure low	--	CEL short to battery
--	CEL open circuit	--	Clock Module failure
--	Clock module abnormal rate		

WORLD TRANSMISSION (WT) DIAGNOSTIC CODES

Diagnostic Code Memory

Diagnostic codes are stored in a list in memory (sometimes referred to as a queue). The last occurring codes are listed first. Up to five codes can be stored in memory. Accessing the code list position, main code, sub code and active indicator is done through the shift selector display or through the Pro-Link diagnostic tool. Access to the ignition cycle counter and event counter is through the Pro-Link diagnostic tool only. The following table is an example of the information stored in memory.

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.

Definitions of Diagnostic Codes

Diagnostic codes are defined as follows:

Code list position:

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".

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 be extinguished when conditions exist that indicate 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.

Clearing Codes

Clearing the Active Indicator and Code Records from the Code List in Memory:

If the conditions causing a diagnostic code are cleared, the active indicator can be manually cleared by holding the MODE push-button down continuously for 3 seconds until a tone is heard

from the shift selector. To clear code records from the list, hold the MODE push-button down continuously for ten seconds until a second tone sounds. All diagnostic records in the list that are inactive will then be cleared and the remaining records will then move up the list.

Code Reading and Code Clearing Procedures:

Diagnostic codes can be read and cleared by two methods: by using the Pro-Link 9000 diagnostic tool plugged into the receptacle located on the L.H. control panel; 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.

The following describes how to read and clear codes using the shift selector display:

Reading Codes:

Read codes as follows:

1. 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.

2. 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:
 - a. Code list position = "d1"
 - b. Main code = "25"
 - c. Sub code = "11"
 - d. Display will repeat steps a., b. and c.
3. Press the MODE push-button momentarily to view the second position (d2) as described in step 2.

4. To view the third, fourth and fifth positions (d3, d4 and d5), momentarily press the MODE push-button as explained above.
5. Pressing the MODE push-button momentarily after the fifth position is displayed will return the code display to the first position (d1).
6. 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.
7. 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:

Clear codes as follows:

1. Clearing of the active indicator is automatically done at ECU power-down for all codes except code "69 34".
2. 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.
3. Manual clearing is possible while in the diagnostic display mode and after the condition causing the code is corrected (output speed must be zero).
 - To clear all active indicators, hold down the MODE push-button continuously for 3 seconds until the shift selector tone sounds for 0.5 seconds.
 - Release the MODE push-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:

1. Press the "▲" (up arrow) and "▼" (down arrow) push-buttons at the same time on the push-button shift selector.
2. 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).
3. Do nothing and wait until the calibrated time (approximately 10 minutes) has passed. The system will automatically return to the normal operating mode.
4. Turn off power to the ECU (shut-off the engine with the ignition key).
5. After clearing the active indicator as described in "Clearing Codes" section.

Clearing Records from the Code List in Memory

If the active indicator has been successfully cleared manually, and the MODE push-button is held down continuously for ten seconds while in the display mode until a tone sounds, all diagnostic records in the code list that are not active will be cleared and the remaining records will be moved up the code list.

Code Chart Abbreviations

The following responses are used in the "Diagnostic Code List and Description" table to command safe operation when diagnostic codes are set.

TECHNICAL INFORMATION

CT (CHECK TRANS) Response

- Turn off lock-up clutch and inhibit lock-up operation.
- Inhibit all shifts.
- Turn on CHECK TRANS light.
- Pulse the tone generator for 8 seconds when the condition is first detected.
- Blank the select digit in the display.
- Ignore any range selection inputs and disable the push-button feedback tone for the push-button shift selector.

SOL OFF (Solenoid Off) Response

- All solenoids are commanded off (turning solenoids "A" and "B" off electrically causes them to operate hydraulically).

RPR (Return to Previous Range) Response

- When the ratio or C3 pressure switch tests associated with a shift are not passed, the ECU commands the same range as commanded at the beginning of the shift.

NNC (Neutral No Clutches) Response

- When certain ratio or C3 pressure switch tests are not passed, 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
12	12	Oil level, low	No	No upshift above a calibration range
12	23	Oil level,high	No	No upshift above a calibration range
13	12	ECU input voltage, low	Yes	CT, SOL OFF (Hydraulic default)
13	13	ECU input voltage, medium low	No	None: Shift adaptive feature will not function.
13	23	ECU input voltage, high	Yes	CT, SOL OFF (Hydraulic default)
14	12	Oil level sensor, low	No	None
14	23	Oil level sensor, high	No	None
21	12	Throttle position sensor, low	No	Use Throttle default value
21	23	Throttle position sensor, high	No	Use Throttle default value
22	14	Engine speed sensor reasonableness test	No	Use default engine speed
22	15	Turbine speed sensor reasonableness test	Yes	CT, Lock in current range
22	16	Output speed sensor reasonableness or rapid decel test	Yes	CT, Lock in current range
23	12	Primary Shift Selector or RSI Link Fault	No	Hold in last valid direction
23	13	Primary Shift Selector Mode Function Fault	No	Mode change not permitted

TECHNICAL INFORMATION

MAIN CODE	SUB CODE	DESCRIPTION	CHECK TRANS LIGHT	INHIBITED OPERATION DESCRIPTION
23	14	Secondary Shift Selector or RSI Link Fault	No	Hold in last valid direction
23	15	Secondary Shift Selector Mode Function Fault	No	Mode change not permitted
24	12	Sump oil temperature, cold	Yes	CT
24	23	Sump oil temperature, hot	No	No upshifts above a calibration range
25	0	Output speed reasonableness test, detected at 0 speed, (L)	Yes	CT, Lock in current range (L)
25	11	Output speed reasonableness test, detected at 0 speed, (1st)	Yes	CT, Lock in current range (1 st)
25	22	Output speed reasonableness test, detected at 0 speed 2nd	Yes	CT, Lock in current range (2nd)
25	33	Output speed reasonableness test, detected at 0 speed, 3rd	Yes	CT, Lock in current range (3rd)
25	44	Output speed reasonableness test, detected at 0 speed, 4th	Yes	CT, Lock in current range (4th)
25	55	Output speed reasonableness test, detected at 0 speed, 5th	Yes	CT, Lock in current range (5th)
25	66	Output speed reasonableness test, detected at 0 speed, 6th	Yes	CT, Lock in current range (6th)
25	77	Output speed reasonableness test, detected at 0 speed, R	Yes	CT, Lock in current range (R)
32	0	C3 pressure switch open, L range	Yes	CT, Lock in current range (L)
32	33	C3 pressure switch open, 3rd range	Yes	CT, Lock in current range (3rd)
32	55	C3 pressure switch open, 5th range	Yes	CT, Lock in current range (5th)
32	77	C3 pressure switch open, R range	Yes	CT, Lock in current range (R)
33	12	Sump oil temperature sensor, low	No	Use default value of 200ø F (93ø C)
33	23	Sump oil temperature sensor, high	No	Use default value of 200ø F (93ø C)
34	12	EEPROM, factory cal. compatibility number wrong	Yes	CT, SOL OFF (Hydraulic default)
34	13	EEPROM, factory calibration block checksum	Yes	CT, SOL OFF (Hydraulic default)

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MAIN CODE	SUB CODE	DESCRIPTION	CHECK TRANS LIGHT	INHIBITED OPERATION DESCRIPTION
34	14	EEPROM, Power Off Block checksum	Yes	Use previous location, or factory calibration and reset adaptive
34	15	EEPROM, Diagnostic Queue Block Checksum	Yes	Use previous location, or clear diagnostic queue
34	16	EEPROM, Real Time Block Checksum	Yes	CT, SOL OFF (Hydraulic default)
35	0	Power interruption (Code set after power restored)	No	NONE (Hydraulic default during interruption)
35	16	Real Time EEPROM Write Interruption	Yes	CT, SOL OFF (Hydraulic default)
36	0	Hardware/Software not compatible	Yes	CT, SOL OFF (Hydraulic default)
41	12	Open or short to ground, A solenoid circuit	Yes	CT, SOL OFF (Hydraulic default)
41	13	Open or short to ground, B solenoid circuit	Yes	CT, SOL OFF (Hydraulic default)
41	14	Open or short to ground, C solenoid circuit	Yes	CT, SOL OFF (Hydraulic default)
41	15	Open or short to ground, D solenoid circuit	Yes	CT, SOL OFF (Hydraulic default)
41	16	Open or short to ground, E solenoid circuit	Yes	CT, SOL OFF (Hydraulic default)
41	21	Open or short to ground, F solenoid circuit	No	Lock-up inhibited
41	22	Open or short to ground, G solenoid circuit	Yes	CT, SOL OFF (Hydraulic default)
41	23	Open or short to ground, H solenoid circuit	No	Retarder allowed, differential lock inhibited
41	24	Open or short to ground, J solenoid circuit	No	Low and 1st inhibited
41	25	Open or short to ground, K solenoid circuit	No	K solenoid operation inhibited
41	26	Open or short to ground, N solenoid circuit	No	Low and 1st inhibited
42	12	Short to battery, A solenoid circuit	Yes	CT, Lock in a range
42	13	Short to battery, B solenoid circuit	Yes	CT, Lock in a range

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MAIN CODE	SUB CODE	DESCRIPTION	CHECK TRANS LIGHT	INHIBITED OPERATION DESCRIPTION
42	14	Short to battery, C solenoid circuit	Yes	CT, Lock in a range
42	15	Short to battery, D solenoid circuit	Yes	CT, Lock in a range
42	16	Short to battery, E solenoid circuit	Yes	CT, Lock in a range
42	21	Short to battery, F solenoid circuit	No	Lock-up inhibited
42	22	Short to battery, G solenoid circuit	Yes	CT, Lock in a range
42	23	Short to battery, H solenoid circuit	No	Retarder allowed, differential lock inhibited
42	24	Short to battery, J solenoid circuit	No	Low and 1st inhibited
42	25	Short to battery, K solenoid circuit	No	K solenoid operation inhibited
42	26	Short to battery, N solenoid circuit	No	Low and 1st inhibited
43	21	Low side driver, F solenoid circuit	No	Lock-up inhibited
43	25	Low side driver, K solenoid circuit	No	K solenoid operation inhibited
43	26	Low side driver, N solenoid circuit	No	Low and 1st inhibited
44	12	Short to ground,A solenoid circuit	Yes	CT, SOL OFF (Hydraulic default)
44	13	Short to ground,B solenoid circuit	Yes	CT, SOL OFF (Hydraulic default)
44	14	Short to ground,C solenoid circuit	Yes	CT, SOL OFF (Hydraulic default)
44	15	Short to ground,D solenoid circuit	Yes	CT, SOL OFF (Hydraulic default)
44	16	Short to ground,E solenoid circuit	Yes	CT, SOL OFF (Hydraulic default)
44	21	Short to ground,F solenoid circuit	No	Lock-up inhibited
44	22	Short to ground,G solenoid circuit	Yes	CT, SOL OFF (Hydraulic default)
44	23	Short to ground,H solenoid circuit	No	Retarder allowed. differential lock inhibited

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MAIN CODE	SUB CODE	DESCRIPTION	CHECK TRANS LIGHT	INHIBITED OPERATION DESCRIPTION
44	24	Short to ground,J solenoid circuit	No	Low and 1st inhibited
44	25	Short to ground,K solenoid circuit	No	K solenoid operation inhibited
44	26	Short to ground,N solenoid circuit	No	Low and 1st inhibited
45	12	Open circuit,A solenoid circuit	Yes	CT, SOL OFF (Hydraulic default)
45	13	Open circuit,B solenoid circuit	Yes	CT, SOL OFF (Hydraulic default)
45	14	Open circuit,C solenoid circuit	Yes	CT, SOL OFF (Hydraulic default)
45	15	Open circuit,D solenoid circuit	Yes	CT, SOL OFF (Hydraulic default)
45	16	Open circuit,E solenoid circuit	Yes	CT, SOL OFF (Hydraulic default)
45	21	Open circuit,F solenoid circuit	No	Lock-up inhibited
45	22	Open circuit,G solenoid circuit	Yes	CT, SOL OFF (Hydraulic default)
45	23	Open circuit,H solenoid circuit	No	Retarder allowed differential lock inhibited
45	24	Open circuit,J solenoid circuit	No	Low and 1st inhibited
45	25	Open circuit,K solenoid circuit	No	K solenoid operation inhibited
45	26	Open circuit,N solenoid circuit	No	Low and 1st inhibited
51	10	Offgoing ratio test (during shift), 1 to L	Yes	Low and 1st inhibited
51	12	Offgoing ratio test (during shift), 1 to 2	Yes	CT, RPR
51	21	Offgoing ratio test (during shift), 2 to 1	Yes	CT, RPR
51	23	Offgoing ratio test (during shift). 2 to 3	Yes	CT, RPR

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MAIN CODE	SUB CODE	DESCRIPTION	CHECK TRANS LIGHT	INHIBITED OPERATION DESCRIPTION
51	43	Offgoing ratio test (during shift), 4 to 3	Yes	CT, RPR
51	45	Offgoing ratio test (during shift), 4 to 5	Yes	CT, RPR
51	65	Offgoing ratio test (during shift), 6 to 5	Yes	CT, RPR
52	1	Offgoing C3PS test (during shift), L to 1	Yes	CT, RPR
52	8	Offgoing C3PS test (during shift), L to N1	Yes	CT, NNC
52	32	Offgoing C3PS test (during shift), 3 to 2	Yes	CT, RPR
52	34	Offgoing C3PS test (during shift), 3 to 4	Yes	CT, RPR
52	54	Offgoing C3PS test (during shift), 5 to 4	Yes	CT, RPR
52	56	Offgoing C3PS test (during shift), 5 to 6	Yes	CT, RPR
52	71	Offgoing C3PS test (during shift), R to 1	Yes	CT, NNC
52	72	Offgoing C3PS test (during shift), R to 2	Yes	CT, NNC
52	78	Offgoing C3PS test (during shift), R to N1	Yes	CT, NNC
52	79	Offgoing C3PS test (during shift), R to 2 (R to NNC to 2)	Yes	CT, NNC

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MAIN CODE	SUB CODE	DESCRIPTION	CHECK TRANS LIGHT	INHIBITED OPERATION DESCRIPTION
52	99	Offgoing C3PS test (during shift), N3 to N2	Yes	CT, RPR
53	8	Offgoing speed test (during shift), L to N1	Yes	CT, NNC
53	18	Offgoing speed test (during shift), 1 to N1	Yes	CT, NNC
53	28	Offgoing speed test (during shift), 2 to N1	Yes	CT, NNC
53	29	Offgoing speed test (during shift), 2 to N2	Yes	CT, RPR
53	38	Offgoing speed test (during shift), 3 to N1	Yes	CT, NNC
53	39	Offgoing speed test (during shift), 3 to N3	Yes	CT, RPR
53	48	Offgoing speed test (during shift), 4 to N1	Yes	CT, NNC
53	49	Offgoing speed test (during shift), 4 to N3	Yes	CT, RPR
53	58	Offgoing speed test (during shift), 5 to N1	Yes	CT, NNC
53	59	Offgoing speed test (during shift), 5 to N3	Yes	CT, RPR
53	68	Offgoing speed test (during shift), 6 to N1	Yes	CT, NNC
53	69	Offgoing speed test (during shift), 6 to N4	Yes	CT, RPR

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MAIN CODE	SUB CODE	DESCRIPTION	CHECK TRANS LIGHT	INHIBITED OPERATION DESCRIPTION
53	78	Offgoing speed test (during shift), R to N1	Yes	CT, NNC
53	99	Offgoing speed test (during shift), N2 to N3 or N3 to N2	Yes	CT, RPR
54	1	Oncoming ratio test (after shift), L to 1	Yes	CT, RPR
54	7	Oncoming ratio test (after shift), L to R	Yes	CT, NNC
54	10	Oncoming ratio test (after shift), 1 to L	Yes	CT, RPR
54	12	Oncoming ratio test (after shift), 1 to 2	Yes	CT, RPR
54	17	Oncoming ratio test (after shift), 1 to R	Yes	CT, NNC
54	21	Oncoming ratio test (after shift), 2 to 1	Yes	CT, RPR
54	23	Oncoming ratio test (after shift), 2 to 3	Yes	CT, RPR
54	27	Oncoming ratio test (after shift), 2 to R	Yes	CT, NNC
54	32	Oncoming ratio test (after shift), 3 to 2	Yes	CT, RPR
54	34	Oncoming ratio test (after shift), 3 to 4	Yes	CT, RPR
54	43	Oncoming ratio test (after shift), 4 to 3	Yes	CT, RPR

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MAIN CODE	SUB CODE	DESCRIPTION	CHECK TRANS LIGHT	INHIBITED OPERATION DESCRIPTION
54	45	Oncoming ratio test (after shift), 4 to 5	Yes	CT, RPR or SOL OFF (Hydraulic default)
54	54	Oncoming ratio test (after shift), 5 to 4	Yes	CT,RPR
54	56	Oncoming ratio test (after shift), 5 to 6	Yes	CT,RPR
54	65	Oncoming ratio test (after shift), 6 to 5	Yes	CT,RPR
54	70	Oncoming ratio test (after shift), R to L	Yes	CT,NNC
54	71	Oncoming ratio test (after shift), R to 1	Yes	CT,NNC
54	72	Oncoming ratio test (after shift), R to 2	Yes	CT,NNC
54	80	Oncoming ratio test (after shift), N1 to L	Yes	CT,RPR
54	81	Oncoming ratio test (after shift), N1 to 1	Yes	CT,RPR
54	82	Oncoming ratio test (after shift), N1 to 2	Yes	CT,RPR
54	83	Oncoming ratio test (after shift), N1 to 3	Yes	CT,RPR
54	85	Oncoming ratio test (after shift), N1 to 5	Yes	CT,RPR
54	86	Oncoming ratio test (after shift), NI to 6	Yes	CT, RPR

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MAIN CODE	SUB CODE	DESCRIPTION	CHECK TRANS LIGHT	INHIBITED OPERATION DESCRIPTION
54	92	Oncoming ratio test (after shift), R to 2 (R to NNC to 2)	Yes	CT, NNC
54	92	Oncoming ratio test (after shift), N1 to 2 (N1 to NNC to 2)	Yes	CT, RPR
54	92	Oncoming ratio test (after shift), N2 to 2	Yes	CT, RPR
54	93	Oncoming ratio test (after shift), N3 to 3	Yes	CT, RPR
54	95	Oncoming ratio test (after shift), N3 to 5	Yes	CT, RPR
54	96	Oncoming ratio test (after shift), N4 to 6	Yes	CT, RPR
54	97	Oncoming ratio test (after shift), 2 to R (2 to NNC to R)	Yes	CT, NNC
55	17	Oncoming C3PS test (after shift), 1 to R	Yes	CT, NNC
55	27	Oncoming C3PS test (after shift), 2 to R	Yes	CT, NNC
55	80	Oncoming C3PS test (after shift), N1 to L	Yes	CT, RPR
55	87	Oncoming C3PS test (after shift), N1 to R	Yes	CT, RPR
55	97	Oncoming C3PS test (after shift), 2 to R or NVL to R (2 to NNC to R)	Yes	CT, NNC
56	0	Range verification test, L	Yes	CT, 1st, Low, or SOL OFF (Low)
56	11	Range verification test, 1st	Yes	CT, 6th
56	22	Range verification test, 2nd	Yes	CT, 6th or 5th

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MAIN CODE	SUB CODE	DESCRIPTION	CHECK TRANS LIGHT	INHIBITED OPERATION DESCRIPTION
56	33	Range verification test, 3rd	Yes	CT, 5th or SOL
56	44	Range verification test, 4th	Yes	CT, 3rd or 5th
56	55	Range verification test, 5th	Yes	CT, SOL OFF (5th) or 3rd
56	66	Range verification test, 6th	Yes	CT, 5th, 3rd, or SOL OFF (3rd)
56	77	Range verification test, R	Yes	CT, N2 or N3
57	11	Range verification C3PS test, 1st	Yes	CT, SOL OFF (3rd)
57	22	Range verification C3PS test, 2nd	Yes	CT, 3rd
57	44	Range verification C3PS test, 4th	Yes	CT, 5th or SOL OFF (3rd)
57	66	Range verification C3PS test, 6th	Yes	SOL OFF (5th), CT
57	88	Range verification C3PS test, N1	Yes	CT, N3
57	99	Range verification C3PS test, N2 or N4	Yes	CT, N3
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
63	0	Special function input	No	Depends on special function
64	12	Retarder modulation request sensor, low	No	Retarder operation inhibited
64	23	Retarder modulation request sensor, high	No	Retarder operation inhibited
65	0	Engine rating too high	Yes	CT
66	0	Serial communications interface fault	No	Use default throttle values
69	12	ECU, A solenoid driver open	Yes	CT, SOL OFF (hydraulic default)
69	13	ECU, B solenoid driver open	Yes	CT, SOL OFF (hydraulic default)

MAIN CODE	SUB CODE	DESCRIPTION	CHECK TRANS LIGHT	INHIBITED OPERATION DESCRIPTION
69	14	ECU, C solenoid driver open	Yes	CT, SOL OFF (hydraulic default)
69	15	ECU, D solenoid driver open	Yes	CT, SOL OFF (hydraulic default)
69	16	ECU, E solenoid driver open	Yes	CT, SOL OFF (hydraulic default)
69	21	ECU, F solenoid driver open	No	Lock-up inhibited
69	22	ECU, G solenoid driver open	Yes	CT, SOL OFF (Hydraulic default)
69	23	ECU, H solenoid driver open	No	Retarder allowed, differential lock inhibited
69	24	ECU, J solenoid driver open	No	Low and 1 st inhibited
69	25	ECU, K solenoid driver open	No	K solenoid operation inhibited
69	26	ECU, N solenoid driver open	No	Low and 1st inhibited
69	32	ECU, SPI communications link fault	No	Hold in last valid direction
69	33	ECU, Central Operating Processor (COP) timeout	Yes	Reset ECU, Shutdown ECU on 2nd occurrence (power loss: hydraulic defaults)
69	34	ECU, EEPROM write timeout	Yes	CT, SOL OFF (Hydraulic default)
69	35	ECU, EEPROM checksum	Yes	Induce COP timeout (reset ECU)
69	36	ECU, RAM self test	Yes	Induce COP timeout (reset ECU)
69	41	ECU, I/O ASIC addressing test	Yes	Induce COP timeout (reset ECU)

Oil 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 two minutes (e.g., display will flash and 8, 7,...;

countdown will occur during the two minutes) once the following parameters are met:

- Engine at idle;
- Oil at operating temperature;
- Transmission in neutral (N);

TECHNICAL INFORMATION

- Transmission output shaft stopped;
- Oil level sensor present and working.

After two minutes, the display will flash one of the codes shown below.

CODE	CAUSE OF CODE
OL-OK	oil level is correct
LO-01	one quart low
LO-02	two quarts low
HI-01	one quart high
HI-02	two quarts high

NOTE: Failure to meet one of the above parameters will stop the two minute countdown. One of the codes shown below 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
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 Oil 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) push-buttons at the same time, twice.

Take the coach for a test drive. If the CHECK TRANS light illuminates again, record the diagnostic codes. Refer to "World Transmission (WT) Diagnostic Codes" under "Reading Codes".

EATON FULLER RTAO-14710B-AS SEMI-AUTOMATIC TRANSMISSION

Fault code retrieval and clearing

Retrieve fault codes by enabling the system's self-diagnostic mode:

- Place the shift lever in neutral;
- Apply the parking brakes;
- Turn the ignition key/lever to ON but do *not* start the engine;
- Retrieve codes :



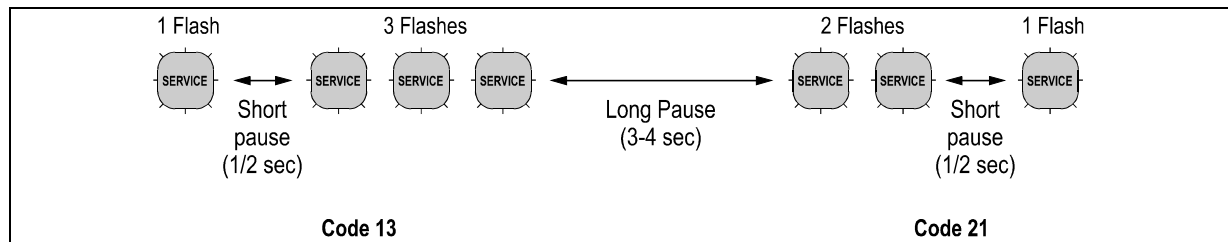
To retrieve active codes, start with the key/lever in the ON position. Turn the key/lever OFF and ON two times within five seconds ending with the key/lever in the ON position.



To retrieve inactive (intermittent) codes, start with the key/lever in the ON position. Turn the key/lever OFF and ON four times within five seconds ending with the key/lever in the ON position.

After a brief pause, the service transmission indicator light begins flashing two digit codes.

- Observe the sequence of flashes on the indicator lights and record the codes. A one or two second pause separates each stored code and the sequence automatically repeats after all codes have been flashed.



Refer to Eaton Fuller Troubleshooting Guide (TRTS-0050).

Eaton Fuller Semi-Automatic Transmission Fault Codes					
Code	Description	Code	Description	Code	Description
11	System controller	35	Engine control failure	58	Output shaft speed sensor
12	Transmission ECU	41	Range failed to engage	61	Rail select motor
13	Power connect relay coil	43	Range solenoid valve	63	Gear select motor
14	Shift lever	44	Inertia brake solenoid coil	65	Low motor voltage coil
15	Shift lever data link	51	Rail select sensor	71	Stuck engaged
16	Eaton proprietary link (EPL)	52	Gear select sensor	72	Failed to select rail
17	Start enable realy Coil	53	Reverse ball switch	73	Failed to engage gear
31	Engine brake relay coil	56	Input shaft speed sensor	74	Failed to synchronize initial engagement
33	Battery voltage supply	57	Main shaft speed sensor	83	Shift lever missing

LIGHT BULB DATA

Please, refer to your vehicle Parts Manual for selection of replacement light bulbs.

DATA PLATES AND CERTIFICATIONS

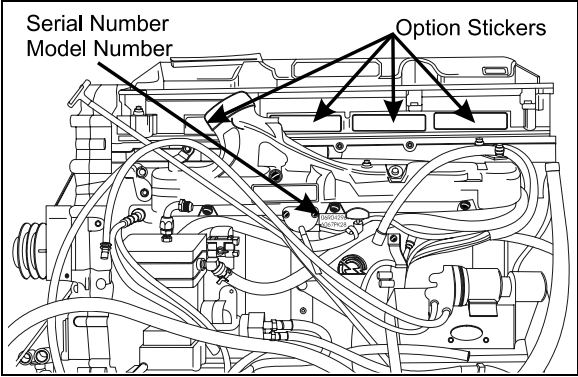
Data Plates

The engine, transmission, axles, chassis and other major components are identified by serial numbers. Refer to the component serial numbers when requesting warranty service.

Engine

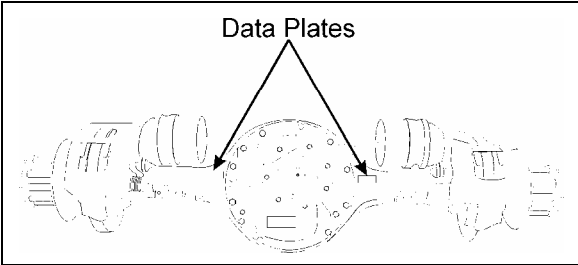
The engine serial and model number are stamped on the cylinder block (as viewed from the flywheel end) on the left side just below the fire deck and above the cast-in Detroit Diesel logo.

In addition, option stickers are located on the rocker cover (starter side). The engine serial and model number and a list of the optional engine equipment is written on these stickers. Refer to this information when ordering replacement parts.



SERIES 60 ENGINE

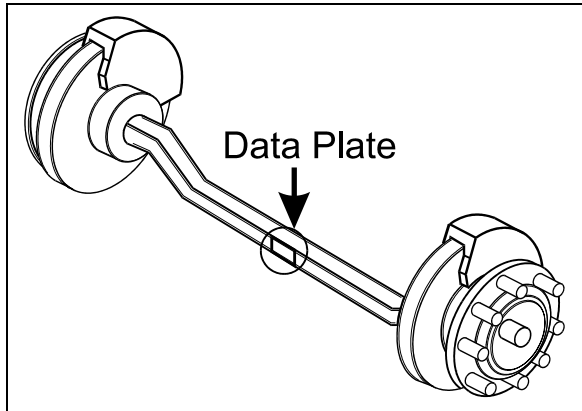
Drive Axle



TYPICAL SERIAL AND MODEL NUMBERS

TECHNICAL INFORMATION

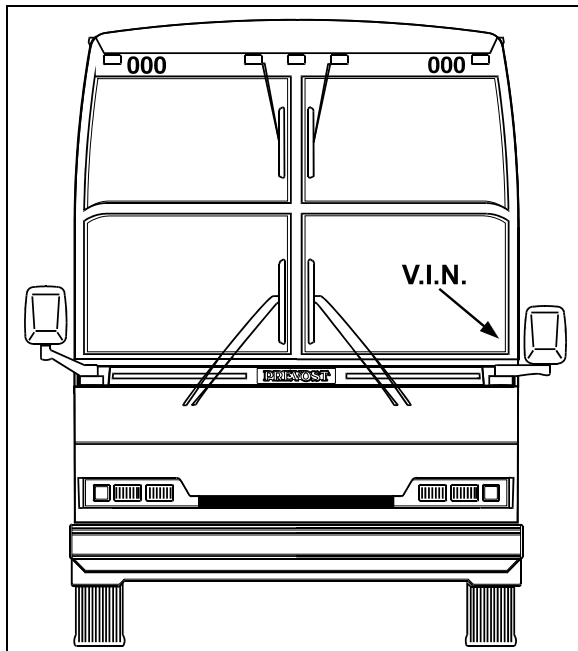
Front Axle



TYPICAL SERIAL AND MODEL NUMBERS

Vehicle Identification Number (VIN)

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 coach. Make sure the correct vehicle identification number is given when ordering replacement parts. Using the VIN when ordering parts will facilitate processing.



VEHICLE I.D.

NOTE: Record the VIN in the coach documentation and keep with company records. The VIN will normally be used for vehicle registration and for obtaining vehicle insurance coverage.

Safety Certification

Coach 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.

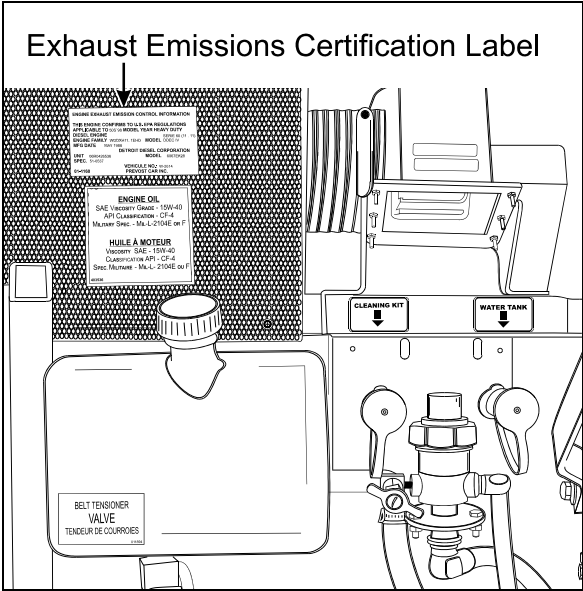
Other applicable certification labels are affixed to the component.

DOT Certification Label

This certifies that coaches manufactured by Prevost Car Inc., comply with all Federal Motor Vehicle Safety Standards at the time of manufacture. The DOT Certification label is affixed on the modesty panel, behind the driver's seat.

EPA Engine Label

The exhaust emission certification label affixed to the oil reserve tank certifies that the engine conforms to federal and any state exhaust emission regulations. It gives the operating conditions under which certification was made.



COACH FINAL RECORD

The Coach Final Record is a record of all data pertaining to the assembly of the coach. This record is included in the technical publication package supplied with the coach. Retain this record in the company records office for reference and safe-keeping.

SERVICE LITERATURE

Additional copies of the following service literature are available on request and at low cost. These will be helpful to your mechanic and driver.

- **Maintenance Manual**
- **Operator's Manual**
- **Parts Manual**
- **Service Center Directory**

To order the desired manual(s), please contact your local distributor or write to:

PRÉVOST CAR INC.

ATT.: TECHNICAL PUBLICATIONS DEPARTMENT
35, boulevard Gagnon,
Sainte-Claire, Québec,
Canada, G0R 2V0

Specify the complete vehicle serial number. Allow 30 days for delivery.

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 Prévost 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 Prévost 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 Prévost Car Inc. You may write to:

**Transport Canada
Box 8880
Ottawa, Ontario, K1G 3J2**

Declaration Of The Manufacturing Defects To Prévost Car Inc.

In addition to notify the NHTSA (or Transport Canada), please contact Prévost Car at **1-418-883-3391**. Or you may write to :

**Prévost Car Inc.
After-sales service department
35, boulevard Gagnon
Ste-Claire, (Québec)
Canada G0R 2V0**