PREVOST

COACH MANUFACTURER

OPERATOR'S MANUAL

H SERIES COACHES

PA1532

2nd edition revised 2023/06/09

revised 2023/06/09 : light bulb data table removed

This ***Operator's Manual*** for the PREVOST H3-41 and H3-45 coaches has been prepared to thoroughly acquaint you, the driver, with the equipment and features of the coach in order for you to fully appreciate and safely enjoy this vehicle. Prevost 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 standard and 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 ensure optimum safety and passenger comfort.

Keep this manual in the coach at all times. Make sure this manual is kept with the coach when ownership is transferred. Please use the appropriate card at the end of this manual to promptly notify Prevost Car of any change of address or transfer of ownership. This will ensure we provide fast and reliable coach service to all coach operators.

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

⚠ WARNING ⚠

Calls attention to instructions which must be precisely followed to avoid personal injury.

⚠ CAUTION ⚠

Calls attention to instructions which must be followed to avoid damage to the coach or to equipment.

NOTE

Provides 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.

SAFE OPERATING PRACTICES

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

- Operation and maintenance of the vehicle must be performed only by qualified personnel.
- Before driving, conduct a walk around inspection and check that all baggage compartment doors and equipment access doors are securely shut.
- Make sure good visibility is maintained at all times. Keep windshields clean and free of obstructions.
- Adjust the driver's seat so that all controls can be reached easily.
- Always wear your safety belt when driving.
- Check the instrument panel frequently. Do not operate the vehicle when dials or indicators do not indicate normal operating conditions.
- Always pay attention to pedestrians passing in front and behind the vehicle. Always yield to pedestrians at pedestrian walkways.
- Do not drive over obstacles on the road. Empty boxes, piles of leaves, and snowdrifts could conceal hidden dangers that could damage the vehicle suspension and underbody.
- When turning or changing lanes, signal your intention well in advance.
- When approaching to make a right turn, reduce the space between the vehicle and the curb to make sure another vehicle cannot pass on the right. Since the vehicle makes wide turns, allow enough space to make safe turns.
- Switch from high beams to low beams when meeting or following other vehicles within 500 feet (150 meters).
- Never leave the vehicle unattended with the engine running or with the key in the ignition. Turn off the engine, remove keys and apply the parking brake before leaving the vehicle.
- Shut-off the engine before refueling, adding oil, performing maintenance or servicing tasks, unless stated otherwise.
- Fuel is highly flammable and explosive. Do not smoke when refueling. Keep away from open flames or sparks.
- Do not run the engine or HVAC system with access doors left open. Close compartment doors before operating any equipment.
- Do not remove the surge tank filler cap or the cooling system pressure cap when the engine is hot. Let the engine cool down before removing filler caps.
- Do not attempt to push or pull-start the vehicle.
- The service life of the vehicle depends on the kind of maintenance it receives. Always record any problems and report them immediately to maintenance personnel. After each trip, perform a system diagnostic to check if error codes and anomalies were recorded in the vehicle electronic modules.

DEFENSIVE DRIVING PRACTICES

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

For additional information about safe operation and defensive driving practices, contact the local department of motor vehicles authority.

4 SAFETY PRECAUTIONS

OTHER PRECAUTIONS

⚠ WARNING ⚠

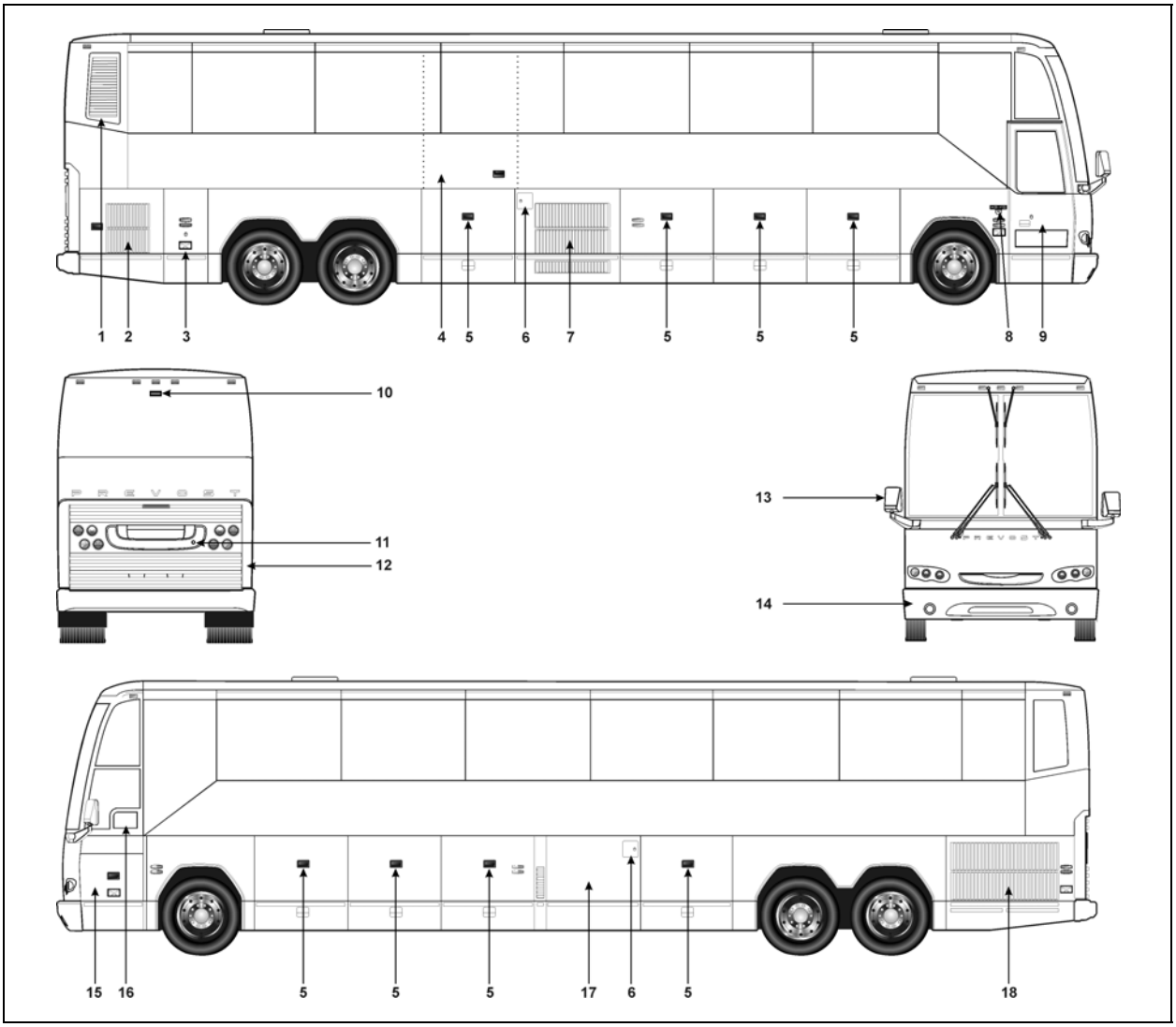
Prior to working on a system inside vehicle, make sure to cut electrical power and air supply. A component could be supplied with electricity even if the ignition switch is set to the OFF position and/or a component could be pressurized even if air tanks are emptied. Always refer to the appropriate wiring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

NOTE

When the ignition switch is set to the OFF position, the electrical components are not energized except for the CECM (Chasis Electronic Control Module), the battery equalizer, the preheater system and some electronic modules; which are energized during 15 minutes after the ignition has been set to the OFF position. Prior to working on one of these electrical components, set the battery master switch in the main power compartment to the OFF position. If the vehicle will not be operated for a long period (more than 2 weeks), it is recommended, in order to prevent the batteries from discharging, to trip the main circuit breakers located in the main power compartment to stop the small current drawn by the radio preset station memory, the CECM memory and the instrument cluster clock. Note that the radio station presets will be erased, same thing for the diagnostic codes history and the instrument cluster clock will have to be reset.

⚠ CAUTION ⚠

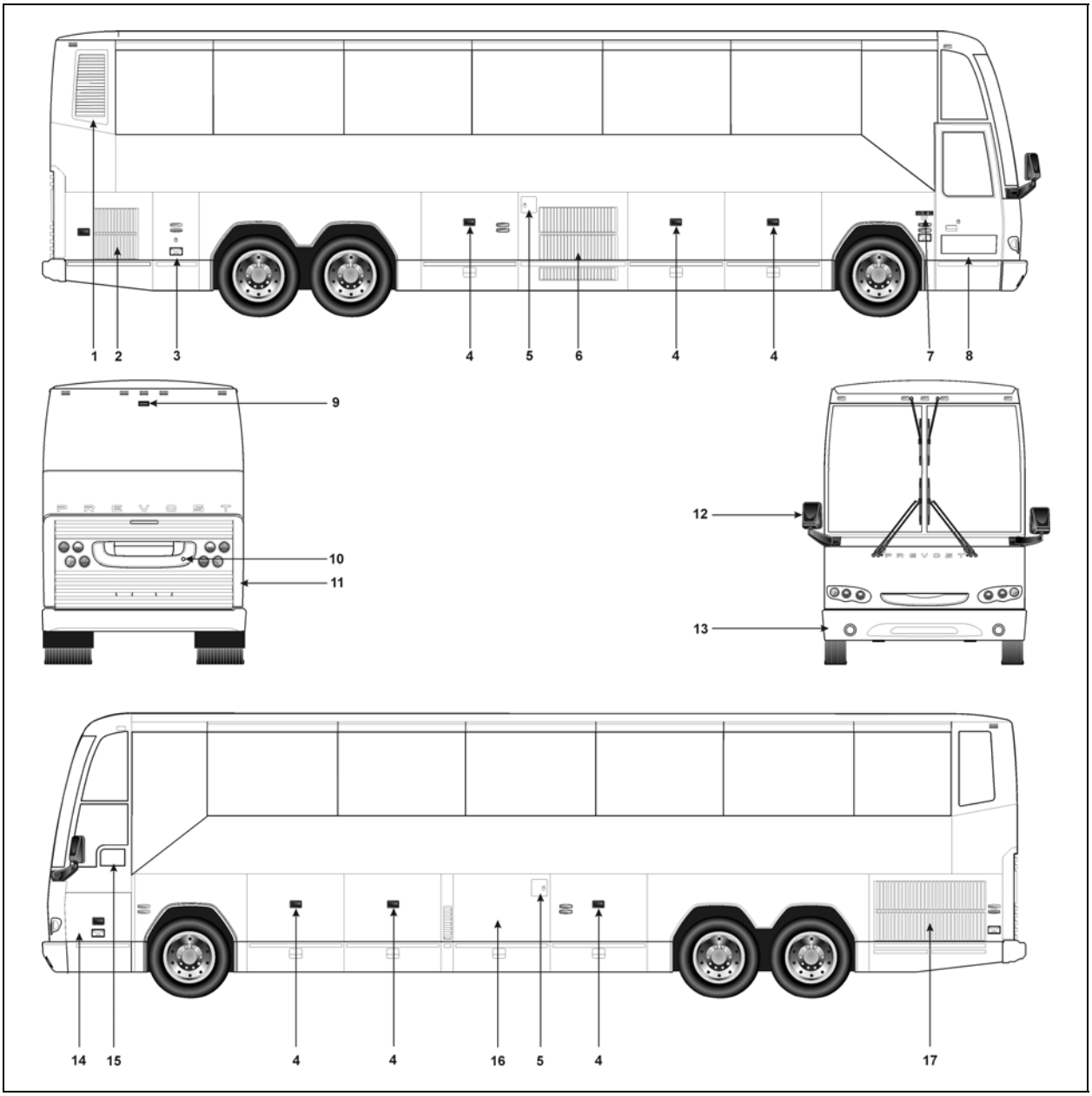
Prior to arc welding on the vehicle, refer to section 00-GENERAL of your maintenance manual. Precautions have to be taken to avoid costly damage to the electronic components.



H3-45 EXTERIOR VIEW (TYPICAL) 18590

1. Engine air intake
2. Engine compartment curb-side door
3. Main power compartment (battery compartment)
4. Wheelchair access door (optional Ricon lift)
5. Baggage compartment
6. Fuel filler door
7. Condenser compartment
8. Entrance door control switch
9. Entrance door
10. Back up camera (optional)
11. 110/120 volt connector, for block heater
12. Engine compartment rear door
13. Rear-view mirror
14. Spare wheel compartment
15. Front electrical and service compartment
16. Driver's power window
17. Evaporator compartment
18. Radiator door

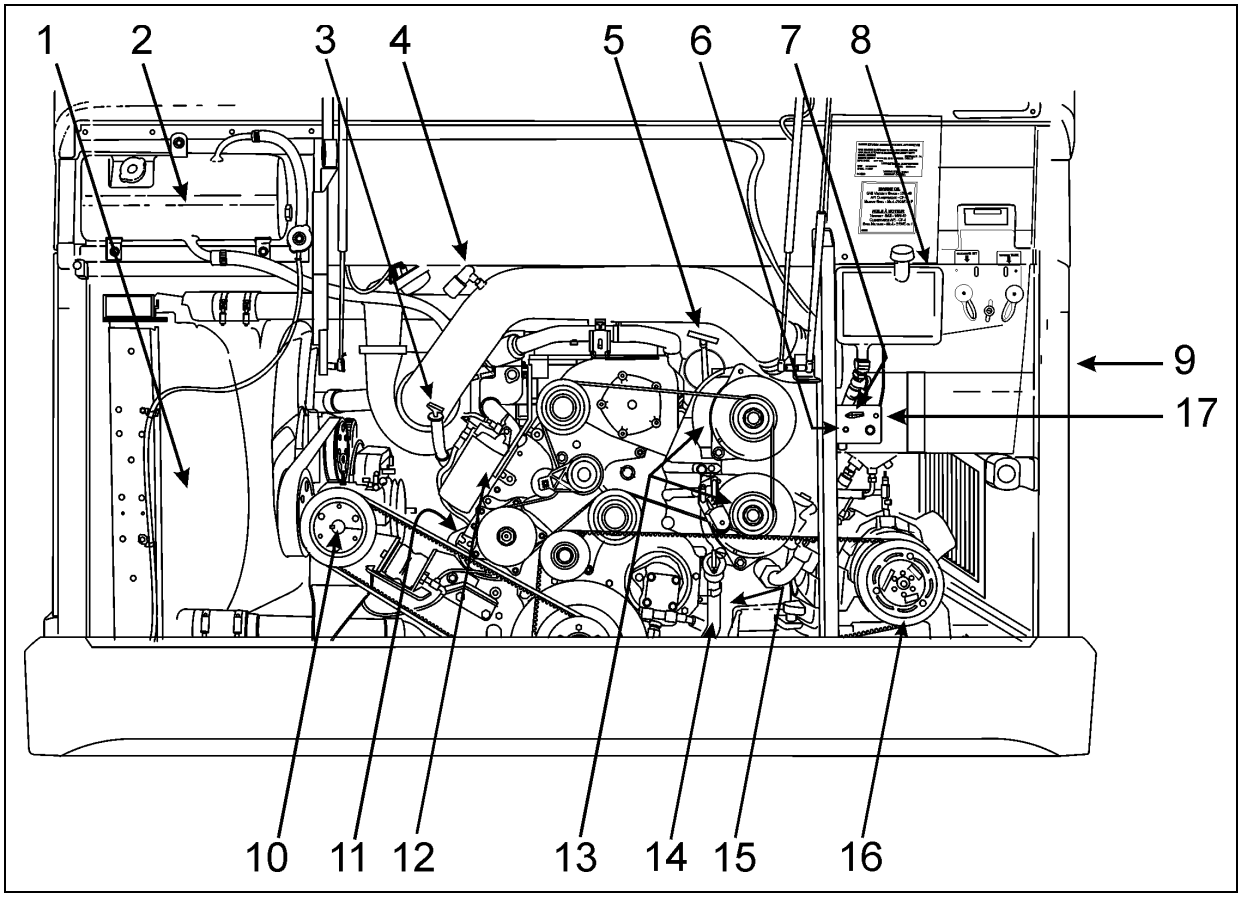
6 COACH EXTERIOR



H3-41 EXTERIOR VIEW (TYPICAL) 18591

1. Engine air intake
2. Engine compartment curb-side door
3. Main power compartment (battery compartment)
4. Baggage compartment
5. Fuel filler door
6. Condenser compartment
7. Entrance door control switch
8. Entrance door
9. Back up camera (optional)
10. 110/120 volt connector
11. Engine compartment rear door
12. Rear-view mirror
13. Spare wheel compartment
14. Front electrical and service compartment
15. Driver's power window
16. Evaporator compartment
17. Radiator door

ENGINE COMPARTMENT COMPONENTS



ENGINE COMPARTMENT 01116

1. Radiator and charge air cooler;
2. Coolant fluid surge tank;
3. Transmission fluid dipstick;
4. Air filter restriction indicator;
5. Engine oil dipstick;
6. Starter selector switch and engine rear start push-button switch;
7. Belt tensioner control valve;
8. Engine oil reserve tank;
9. Air filter;
10. Radiator fan gearbox;
11. Engine oil filters;
12. Engine coolant filter/conditioner;
13. Alternators;
14. Engine oil filling tube;
15. Primary and secondary fuel filters;
16. Main A/C compressor.
17. Engine compartment lighting switch.

ENGINE COMPARTMENT

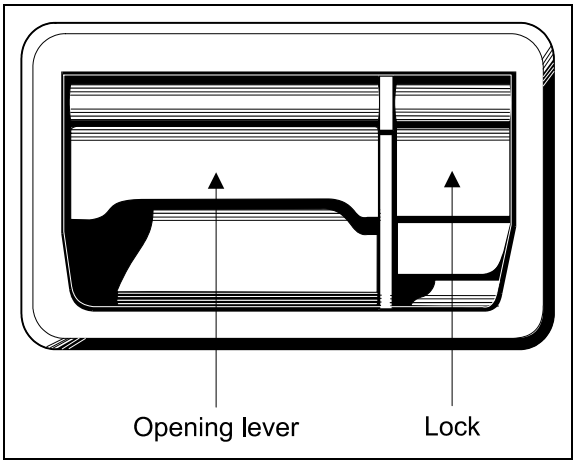
ENGINE COMPARTMENT CURB-SIDE DOOR

The engine compartment curb-side door provides access to the following (if equipped):

- Engine compartment rear door release lever;
- Detroit Diesel Fuel Pro 382 filtration system;
- Primary & secondary air system fill valve;
- Hydraulic fluid tank;
- Cold weather starting fluid bottle;
- Booster block terminals;
- Wet air tank drain cock;
- Sump tank access cap.

This door can be locked or unlocked using the exterior compartment key or, if so equipped, by the central door locking system. To open, pull up the door handle to release the latch and then pull the door open. The curb-side door also has a safety catch to prevent it from closing inadvertently. Release the catch before attempting to close.

When open, lights illuminate in the engine compartment and a telltale light illuminates in the dashboard.



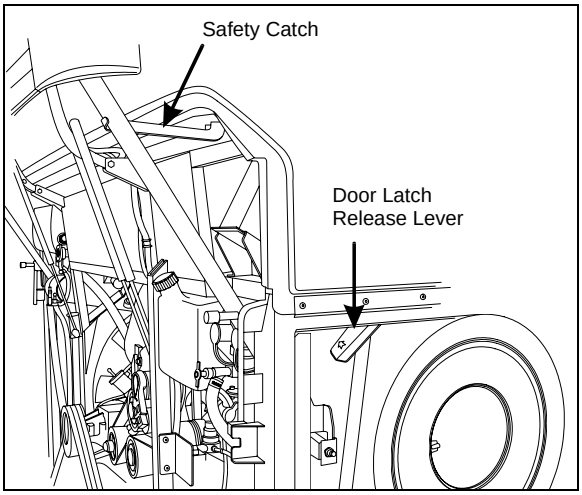
DOOR HANDLE 18184

⚠ WARNING ⚠

Unless otherwise stated, do not run the engine when the engine compartment curb-side door is open.

ENGINE COMPARTMENT REAR DOOR

To open the rear engine door, first open the curb side door then press the release lever. The rear door release lever is located in the upper rear section of the engine compartment, as seen when looking into the curb side engine compartment. Unlatch the door and pull it out and up. The door should stay open on it's own but it is recommended to always use the safety catch as shown.



OPENING OF THE ENGINE COMPARTMENT REAR DOOR 18331

This door provides access to the following equipment:

- Engine;
- Alternator(s);
- Compressor(s);
- Belt tensioning pressure control valve (see "Care and maintenance" chapter);
- Starter selector switch (see "Starting and stopping procedures" chapter);
- Plates and certification;
- Coolant fluid surge tank;
- Air filter restriction indicator;
- Couplings and valves for lavatory maintenance;
- Fresh water reservoir coupling;
- Engine oil dipstick;
- Engine oil reserve tank;
- Transmission oil dipstick;
- Coolant fluid surge tank access cap.

When open or not closed properly, lights illuminate in the engine compartment and a telltale light illuminates in the dashboard.

⚠ WARNING ⚠

Unless otherwise stated, do not run the engine when the engine compartment rear door is open.

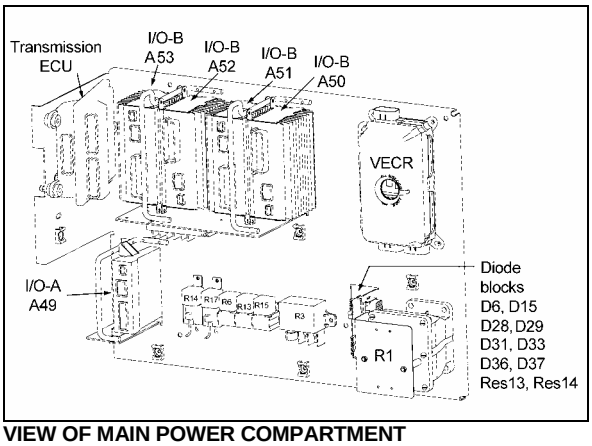
MAIN POWER COMPARTMENT (BATTERY)

This compartment is closed off from the engine compartment and is used to house batteries and electrical components. The following items are located in the main power compartment:

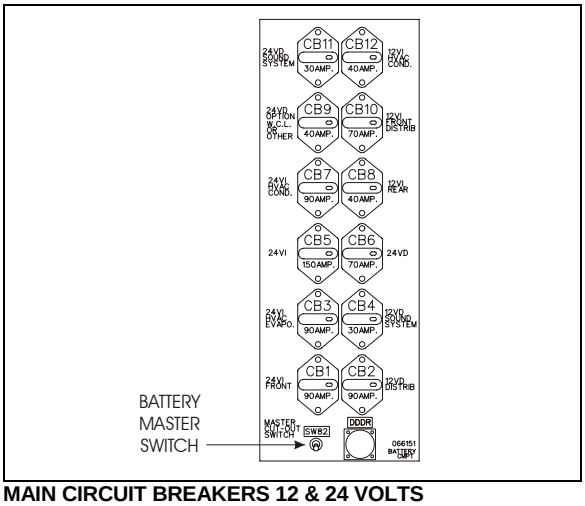
- o 12 volt batteries;
- o Main circuit breakers (12 & 24 volts);
- o Battery charger (optional);
- o Battery equalizer;
- o Battery master switch;
- o Rear junction box;
- o Rear multiplex modules;
- o ECU (Electronic Control Unit) for Allison World transmission or ZF-Astronic ;
- o Rear fuse box;
- o Relays;
- o Electronic ground stud.

To open the door, insert the key in the lock and turn. The door will pop open.

Lights in the compartment turn *ON* automatically when the door is opened. A telltale light indicating a compartment door is open will illuminate on the dashboard.



VIEW OF MAIN POWER COMPARTMENT



MAIN CIRCUIT BREAKERS 12 & 24 VOLTS

MULTIPLEX MODULES (main power compartment)			
VECR	Rear fuse box	A51	I/O-B
A1	Transmission ECU	A52	I/O-B
A49	I/O-A	A53	I/O-B
A50	I/O-B		

RELAYS (main power compartment)			
R1	Master relay	R14	Reading lamps
R3	12V IGN & A/C	R15	Option
R6	Fluorescent (direct lighting)	R17	12V Rr wake-up mode
R8	Service brakes	R21	Emergency cut-out
R13	Fluorescent (indirect lighting)	R25	Option

MAIN CIRCUIT BREAKERS (main power compartment)			
CB11	24 VD Sound system	CB12	12 VI HVAC condenser
CB9	24 VD Wheelchair lift or other option	CB10	12 VI Front distribution

CB7	24 VI HVAC condenser	CB8	12 VI Rear
CB5	24 VI	CB6	24 VD
CB3	24VI HVAC evaporator	CB4	12 VD Sound system
CB1	24VI Front	CB2	12 VD Distribution

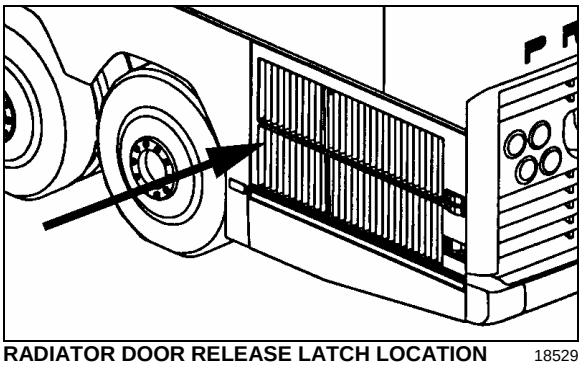
FUSES (main power compartment)			
F50	Pre-heating	F69	Overhead storage compartment lighting RH & LH
F51	Pre-heating	F70	Free/customer
F52	Spare fuse	F71	Spare fuse
F53	A54 multiplex module	F72	A50 multiplex module
F54	Free/customer	F73	Spare fuse
F55	Center aisle fluorescent & emergency lighting	F74	ECM engine IGN
F56	Fluorescent (indirect lighting)	F75	ECU trans IGN
F57	Fluorescent (indirect lighting)	F76	Free/customer
F58	Fluorescent (direct lighting)	F77	ECU transmission wake-up
F59	Fluorescent (direct lighting)	F78	ECM engine wake-up
F60	Reading lamps RH	F79	ECM engine wake-up
F61	Reading lamps RH	F80	A51 multiplex module
F62	Lavatory night light	F81	Alternators excitation resistor
F63	Pre-heating	F85	Spare fuse
F64	Wheelchair lift	F86	Spare fuse
F65	Multiplex modules main power compartment	F87	Spare fuse
F66	Radiator fan clutch	F88	Spare fuse
F67	A54 multiplex module	F89	Spare fuse
F68	A54 multiplex module		

RESISTORS (main power compartment)			
RES13	Excit. res. ALT-1	RES14	Excit. res. ALT-2

DIODES (main power compartment)			
D6	Master relay	D31	A/C compressor clutch
D8	Passenger liquid valve	D33	Toilet flush pump
D15	Wake-up mode	D36	Radiator fan clutch 2
D28	A/C compressor unloader RH	D37	Radiator fan clutch 1
D29	A/C compressor unloader LH	DXX	Nut used

RADIATOR DOOR

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

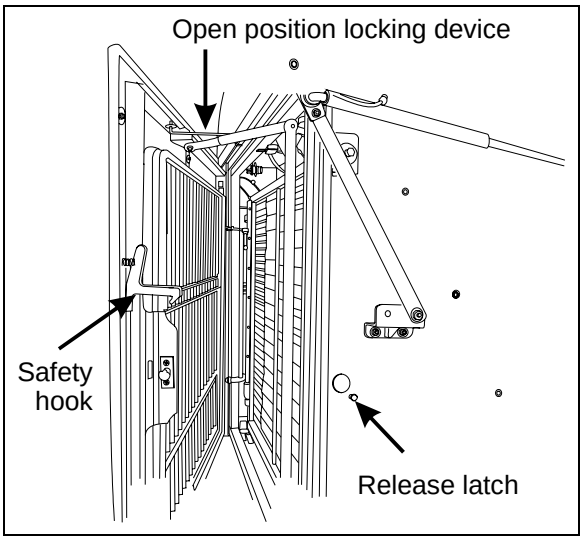


RADIATOR DOOR RELEASE LATCH LOCATION 18529

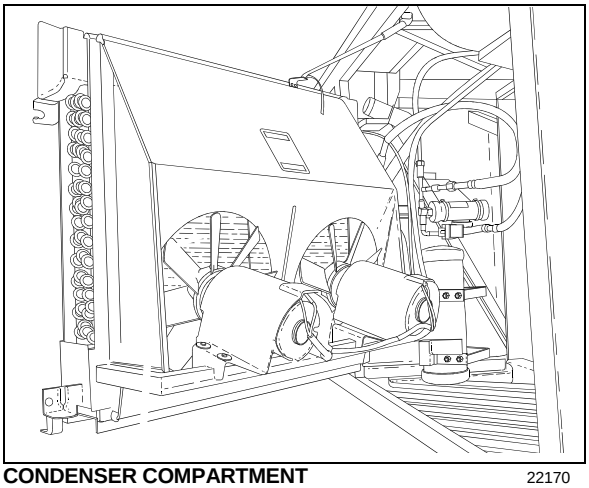
A/C CONDENSER COMPARTMENT

Pull the release latch located inside the adjacent baggage compartment to open the condenser door.

NOTE
The locking device must be unbolted to fully swing open condenser compartment door.



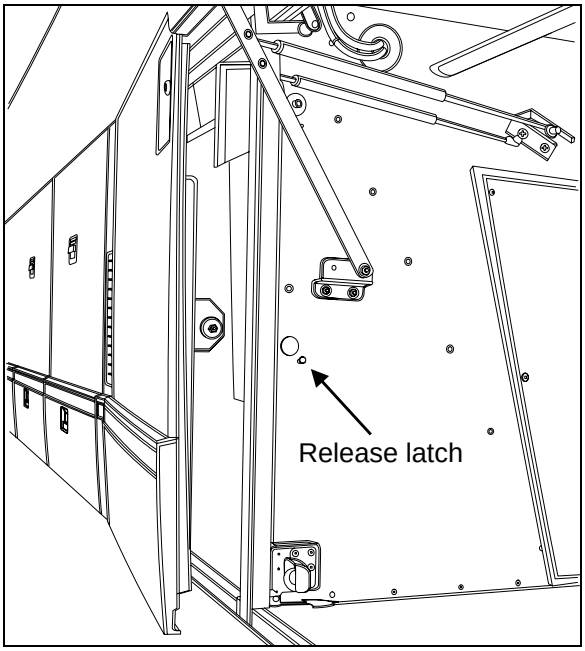
CONDENSER DOOR 18311



CONDENSER COMPARTMENT 22170

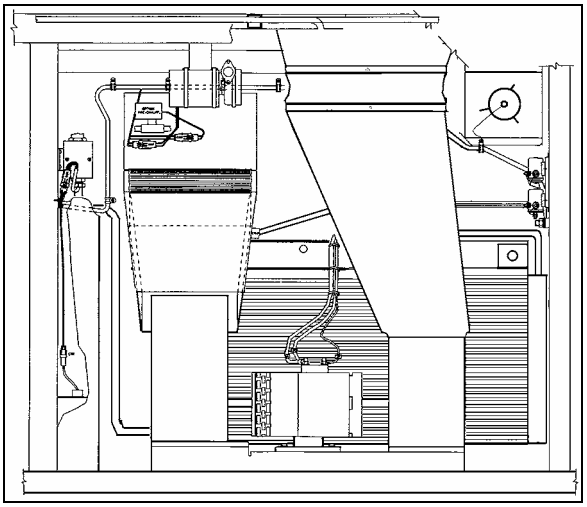
EVAPORATOR COMPARTMENT

To access the evaporator compartment, pull the release latch located on the left side wall of the rearmost baggage compartment.



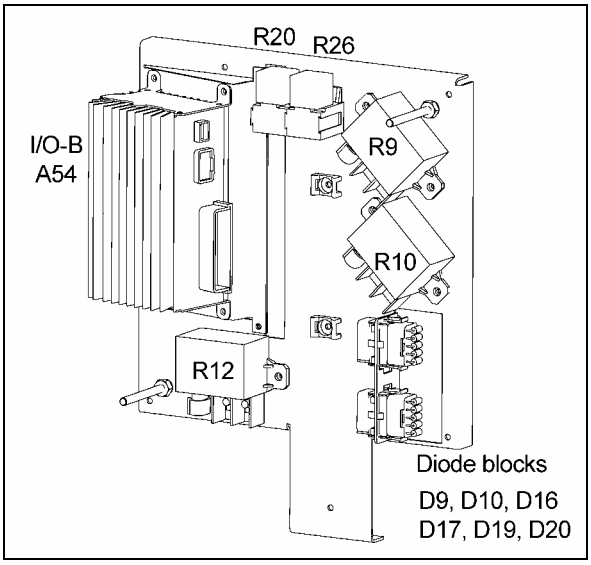
EVAPORATOR COMPARTMENT ACCESS 18306

The evaporator compartment contains relays, diodes and a multiplex electronic module mounted on a panel located on the R.H. side wall when facing the compartment:



EVAPORATOR COMPARTMENT 22225

NOTE
It is important to keep the evaporator compartment door closed while checking the HVAC system to prevent faulty readings.



HVAC COMPONENTS PANEL

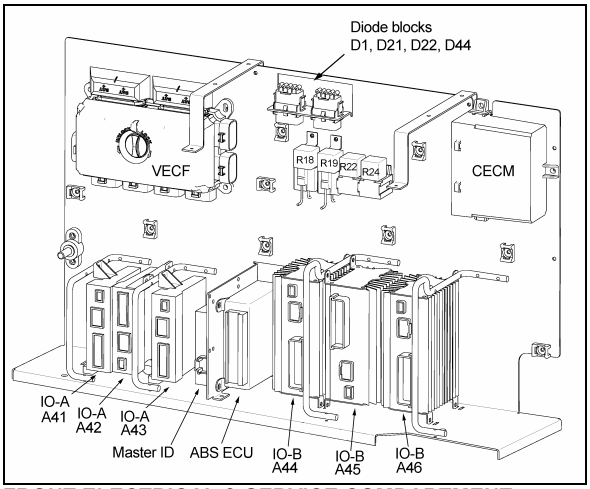
MULTIPLEX MODULES (evaporator compartment)			
A54	I/O-B		
RELAYS (evaporator compartment)			
R9	24V Condenser fan RH	R20	Water pump
R10	24V Condenser fan LH	R26	Pre-heating
R12	24V Evaporator fan		

DIODES (evaporator compartment)			
D9	Pre-heating	D19	Baggage compartment -2
D10	Pre-heating	D20	Baggage compartment -1
D16	Baggage compartment -3	DXX	Not used
D17	Baggage compartment -5		

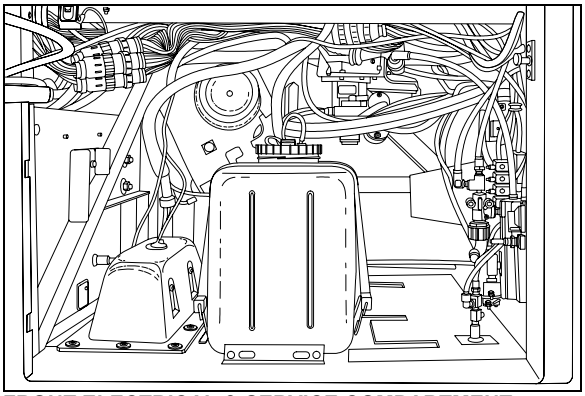
FRONT ELECTRICAL AND SERVICE COMPARTMENT

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

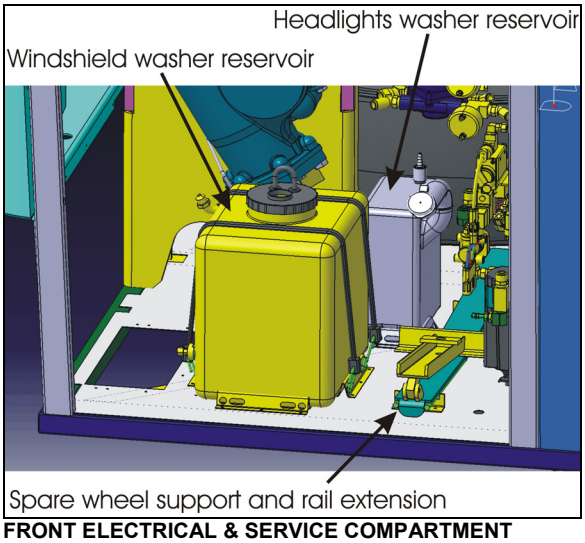
- Front junction box;
- ABS module;
- Front multiplex modules;
- Fuse box, spare fuses & resistors;
- Relays;
- Kneeling audible alarm;
- Emergency door opening unlock valve;
- Windshield washer reservoir;
- Headlights washer reservoir;
- Reclining bumper opening handle;
- Accessories air tank purge valve;
- Accessories system fill valve;
- Spare wheel support and rail;



FRONT ELECTRICAL & SERVICE COMPARTMENT



FRONT ELECTRICAL & SERVICE COMPARTMENT 14050



FRONT ELECTRICAL & SERVICE COMPARTMENT

This compartment door can be locked or unlocked using the exterior compartment key. The light in the front service compartment turns *ON* automatically when the door is opened.

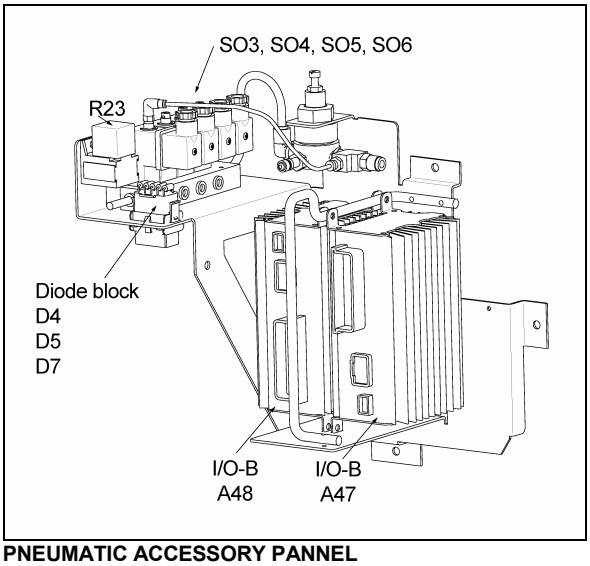
MODULES (front electrical & service compartment)			
VECF	Front fuse box	A42	I/O-A
MASTER ID	Interface	A43	I/O-A
ABS-ECU	ABS system 12 volts	A44	I/O-B
CECM	Multiplex chassis electronic control module	A45	I/O-B
A41	I/O-A	A46	I/O-B

RELAYS (front electrical & service compartment)			
R18	Wake-up mode	R22	Engine brake
R19	Wake-up mode	R24	Upper windshield wipers

FUSES (front electrical & service compartment)			
F1	Multiplex CECM module	F23	Intercom
F2	Front start main switch	F24	Mirror
F3	Pre-heating & driver liquid solenoid valve	F25	Back-up camera
F4	Wireless microphone	F26	Spare fuse
F5	Wake-up mode relay 24 volts	F27	Free/customer
F6	Free/customer	F28	Driver power window
F7	ABS & pre-heating control	F29	Instrument cluster & data reader
F8	Air horn	F30	Cigarette lighter & 12 volts accessory outlet
F9	Spare fuse	F31	Keyless entry module
F10	Spare fuse	F32	Spare fuse
F11	Sun visor	F33	Wake-up mode relay 12 volts
F12	Alimentation module multiplex A41	F34	Wake-up mode relay 12 volts
F13	Alimentation module multiplex A41	F35	12 volts accessory outlet
F14	Free/customer	F36	HVAC & telltale panel
F15	ABS brake system	F37	Spare fuse
F16	Defroster unit	F38	Spare fuse
F17	Destination sign	F39	Spare fuse
F18	Upper windshield defroster	F40	Spare fuse
F19	Pro Driver	F41	Spare fuse
F20	Dashboard rocker switch red LED	F82	Lower windshield wipers
F21	A44 multiplex module	F83	Sound system
F22	ABS brake system	F84	Free/customer

DIODES (front electrical & service compartment)			
D1	Accessories	D21	Service brake
D44	Ignition	D22	Service brake
DXX	Not used		

RIGHT CONSOLE



PNEUMATIC ACCESSORY PANNEL

MULTIPLEX MODULES (pneumatic accessory panel inside right console)			
A47	I/O-B	A48	I/O-B

RELAYS (pneumatic accessory panel inside right console)	
R23	Lower windshield wipers

SOLENOIDS (pneumatic accessory panel inside right console)			
SO3	Door unlock solenoid valve	SO5	Door opening solenoid valve
SO4	Door unlock solenoid valve	SO6	Door closing solenoid valve

DIODES (pneumatic accessory panel inside right console)			
D4	Lower windshield wipers speed 2	D7	Entrance door
D5	Lower windshield wipers speed 1	DXX	Not used

To access the pneumatic accessory panel of the right console, remove the panel under the larger utility compartment at the right of the dashboard.

BAGGAGE COMPARTMENTS

Baggage compartments can hold a maximum load of 2000 lb each, spread evenly over the floor. The total combined weight of cargo and passengers must not exceed 15660 lb. The baggage compartments can be locked or unlocked by using the exterior compartment key.

Pressurized cylinders assist the opening and closing of the baggage compartment doors.

To close, pull the door down by the notch in the lower part of the door. Once below a certain point, release the door and the cylinders will slam the door shut. Push-in the top part of the door past the safety catch on both sides to fully close.

Lights in the baggage compartments turn *ON* automatically when the door is opened. A telltale light illuminates in the telltale panel when a compartment door is open.

⚠ WARNING ⚠

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

NOTE

To prevent theft and vandalism, always lock all doors before leaving the vehicle unattended.

NOTE

The baggage compartment doors can be locked / unlocked by the optional central locking system. The switch is on the L.H. dashboard. Refer to "Controls & Instruments" chapter.

NOTE

To prevent the door from closing in case of defective cylinders, lock the door in open position by pushing it further towards the body of the coach, until it locks in place.

FUEL FILLER DOORS

There is one fuel filler door on each side of the coach, providing added convenience for refueling. Both fuel filler doors must be opened with the exterior compartment key. To open, turn the key ¼ turn and pull the door open.

It is recommended to refuel from the curb-side whenever possible, to avoid spilling fuel into the evaporator compartment. Any amount of fuel vapor in this compartment will be carried right up into the cabin by the HVAC system fresh air intake.

NOTE

Provided the vehicle is parked on level ground, an automatic nozzle will automatically shut off when tank is approximately 95% full.

⚠ CAUTION ⚠

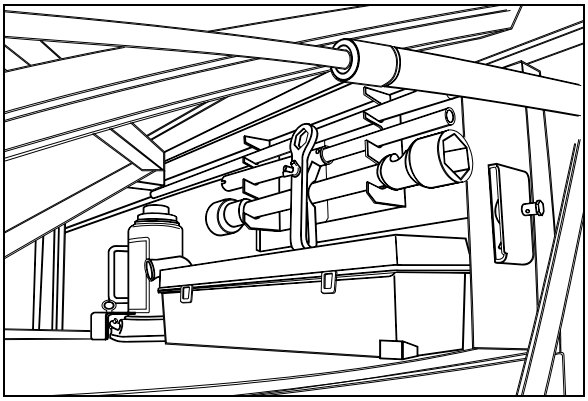
Do not fill to more than 95% of the tank capacity. Do not "top off" the tank, doing so may result in fuel spillage when the fuel expands.

SPARE WHEEL COMPARTMENT

The spare wheel is located in the compartment behind the front bumper.

⚠ WARNING ⚠

This compartment is not designed for miscellaneous storage. Never store loose objects in this compartment because they can interfere with the steering linkage mechanism.



TOOLS IN FIRST BAGGAGE COMPARTMENT 13015

To access the spare wheel compartment, pull on the release handle located in the front electrical and service compartment, near the lower door hinge.

NOTE

The jack and tools are located in the first baggage compartment.

The bumper will lower gradually.

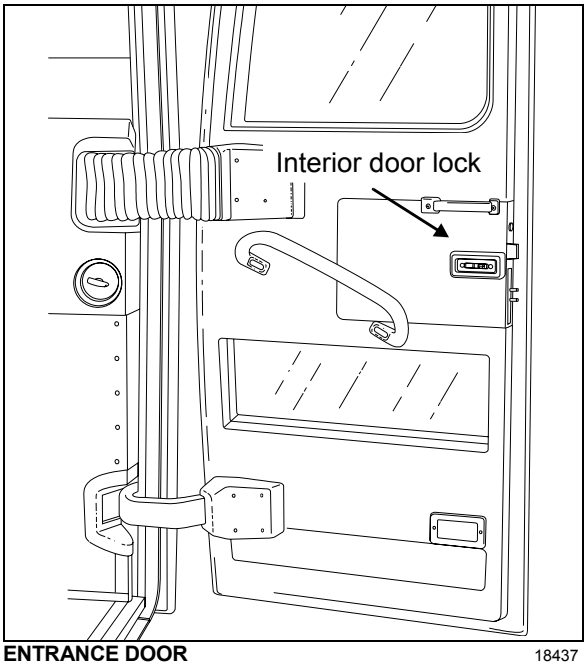
When closing the compartment, be sure the bumper is firmly in place.

ENTRANCE DOOR

Lock or unlock the entrance door from outside the vehicle by turning the key in the door lock (counterclockwise to lock, clockwise to unlock).

To unlock the entrance door from the inside, slide the lock lever on the inside of the door to the left. If the orange tab on the door-lock lever is visible, the door is unlocked.

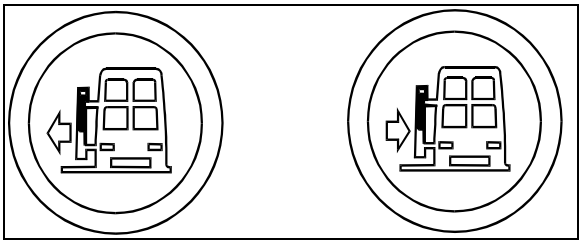
NOTE
If the interior lever is used to exit the coach and the key is not used to unlock the door, it will lock again upon closing. Remember to remove the keys upon exiting.



ENTRANCE DOOR 18437

ENTRANCE DOOR OPENING INTERIOR OPERATING SWITCHES

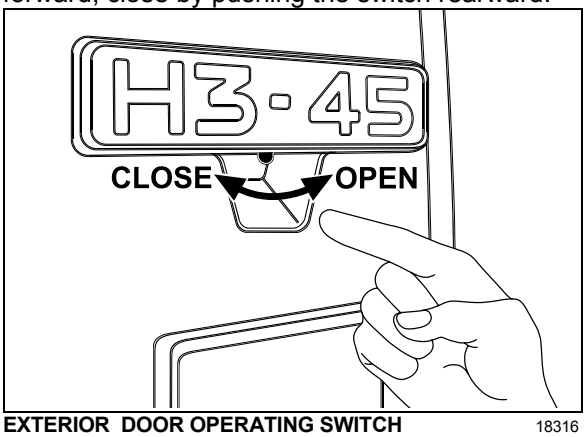
From the inside, open the door by pressing the door opening switch on the dashboard. Close by pressing the door closing switch on the dashboard. Refer to “Controls and Instruments” chapter for more information.



DASHBOARD SWITCHES 06464

ENTRANCE DOOR OPENING EXTERIOR OPERATING SWITCH

Opening and closing of the door may also be pneumatically controlled from the outside using the 3-position switch located on the door L.H. side. Open the door by pushing the switch forward, close by pushing the switch rearward.



EXTERIOR DOOR OPERATING SWITCH 18316

DOOR OPERATION LOGIC

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 to any position by releasing the switch (or button, if inside) when the desired position is attained. However, the door is not locked in any position other than fully open or fully closed. The door can then be opened or closed further by pushing or pulling on the door.

When the door is almost shut, a mechanism will finish the closing of the door. This works even when the door is shut manually.

EMERGENCY DOOR OPENING

Refer to “Safety Features and Equipment” chapter.

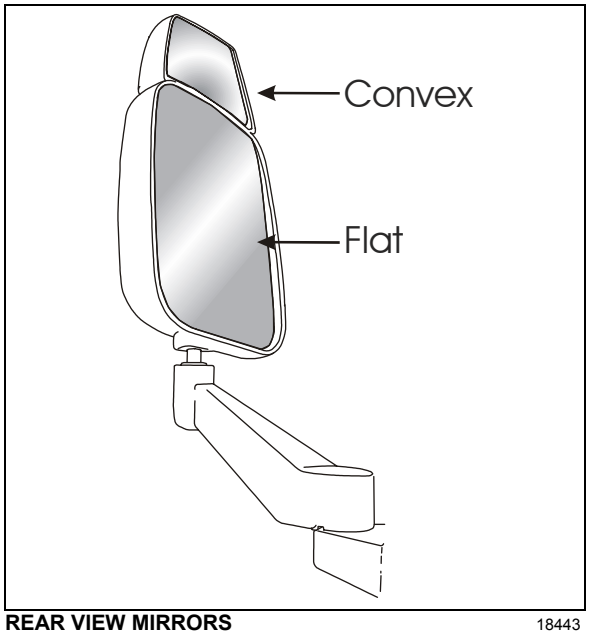
WHEELCHAIR LIFT DOOR

To open the optional wheelchair lift door, the coach must be parked on a flat and level surface with the parking brake on. The wheelchair access door swings to the side and is maintained open by a locking mechanism. Open the baggage compartment containing the lift mechanism (Ricon only). The baggage compartment door is located directly below the wheelchair lift door and it opens to the side. If the parking brake is not activated, a switch in the door will activate the parking brake when it detects the door is open.

Open the door completely until it locks in the open position. To close the door, lift on the locking mechanism arm and slam the door shut. Refer to “Other Features” for more information on operating the optional wheelchair lift.

REAR VIEW MIRRORS

The vehicle 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.



REAR VIEW MIRRORS 18443

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

⚠ CAUTION ⚠

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

ELECTRICALLY ADJUSTED REAR VIEW MIRRORS (RAMCO)

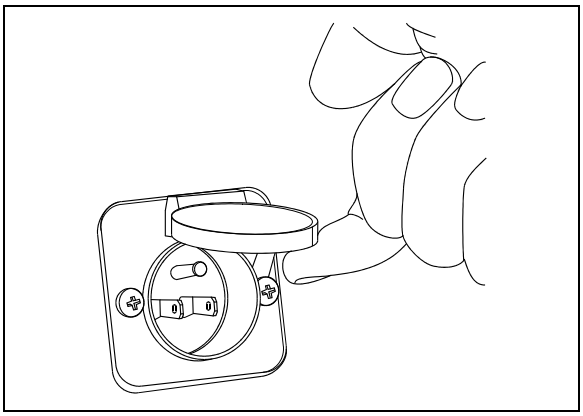
The mirrors are adjusted using the controls located on the L.H. control panel. Refer to "Controls & Instruments" chapter. Manual adjustment is also possible.

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

BACK UP CAMERA

An optional back up camera is available which provides the driver with visual assistance when backing up. Rear-view TV monitor is located at the dashboard L.H. side on the windshield post. For additional information, refer to "Controls & Instruments" and “Care and maintenance” chapters.

BLOCK HEATER CONNECTOR (110-120 VOLTS)



110-120 VOLT CONNECTOR 06390

All connectors must be used with a 110 - 120 volt grounded supply. A connector is located on the rear engine door and is connected to the engine block heater and to the fresh water tank

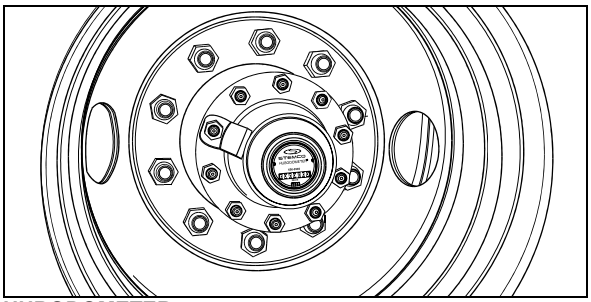
heater, if equipped. Another optional connector may be located on the main power compartment door. It connects to the battery charger and allows for in-station lighting. Refer to "Other Features" chapter.

HUBODOMETER

An odometer is installed on the curb-side drive axle wheel hub. The odometer calculates the total distance in miles (or kilometers, depending on model installed) traveled by the coach since manufacture, including factory road testing.

NOTE

It is normal for hubodometer, transmission ECU and DDEC ECM to disagree on mileage.

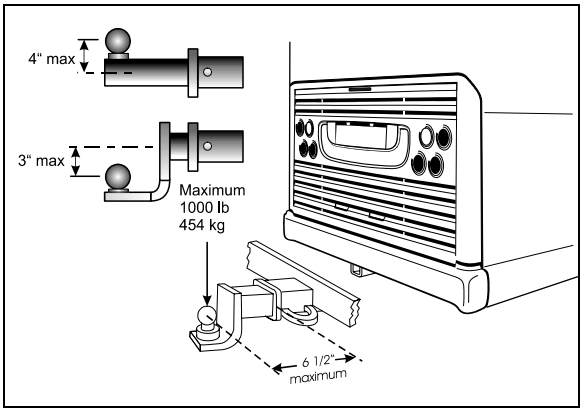


HUBODOMETER 13012

TRAILER HITCH

Your vehicle may be equipped as a special option with a factory installed trailer hitch which has been designed to meet SAE Class 4 specifications:

- **Maximum gross trailer weight: 10,000 lb (4,540 kg)**
- **Maximum tongue weight at 6 ½ inches (165 mm) or less from coupling receiver : 1,000 lb (454 kg)**



TRAILER HITCH 18487

⚠ WARNING ⚠

The draw bar and the ball used for towing the trailer should be rated for 10,000 lb capacity or more.

⚠ WARNING ⚠

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

NOTE

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

⚠ CAUTION ⚠

The minimum requirement for a trailer weighing up to 10,000 lb when coupled to a 10,000 lb Prévost Trailer Hitch is as per the following :

A) Trailer must comply with **Federal Motor Carrier Safety Regulations 393.52** regarding trailer breaking capability.

B) The trailer coupling attachments meet the following minimum static test load requirements :

- Longitudinal tension and compression: (1.5 x GVWR of trailer)
- Transverse thrust : (0.5 x GVWR of trailer)
- Vertical tension and compression: (0.5 x

GVWR of trailer)

Loads indicated must be applied without incurring loss of attachments or distortion or failure which could affect the safe towing of trailer.

C) The ball and trailer coupling should meet the following minimum test load requirements without incurring failure :

- Longitudinal tension and compression : (Gross Trailer Weight of trailer x 3)
- Transverse thrust : (Gross Trailer Weight of trailer x 1)
- Vertical tension and compression : (Gross Trailer Weight of trailer x 1.3)

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

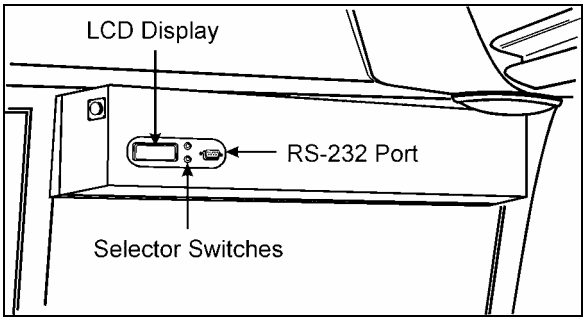
D) Two lengths of safety chain shall be used. The strength rating (minimum breaking force) of each individual chain and its connecting means shall be equal to, or exceed the trailer GVWR.

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

ELECTRONIC DESTINATION SIGN

Turn the optional destination sign lighting on and off using the rocker switch located on the dashboard. Refer to Controls & Instruments chapter.

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

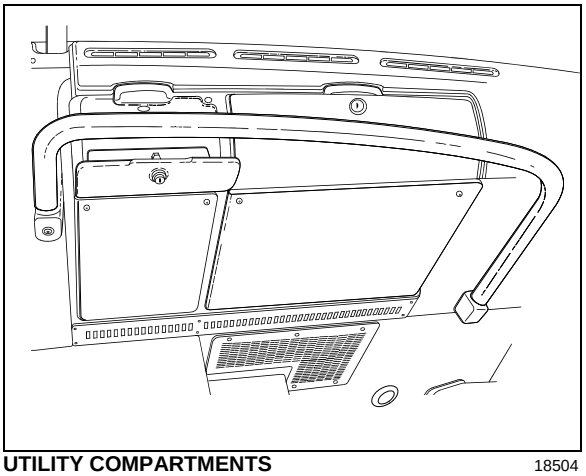


ELECTRONIC DESTINATION SIGN 2EH3B210

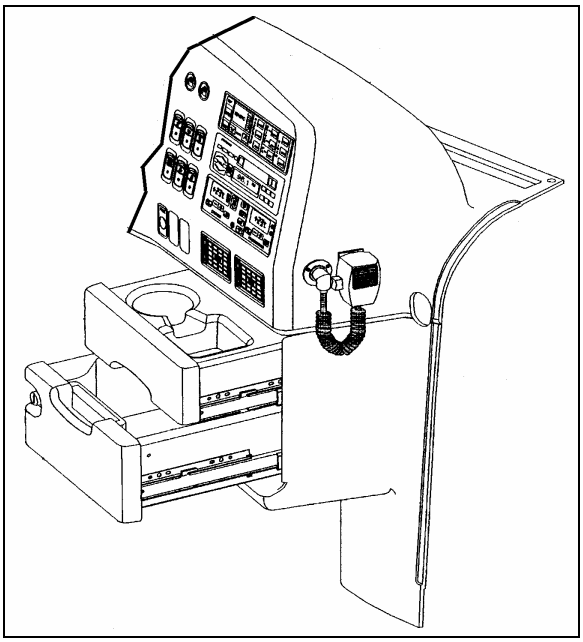
NOTE
The destination sign must be programmed with a computer connected to the RS-232 connector prior to first use. Follow the instructions on the computer disk to install and run the software.

UTILITY COMPARTMENTS

Two lockable utility compartments are located at the base of the windshield. Two stack drawers are located on the dashboard R.H. side. The top drawer includes a built-in cup holder and the lower one has a 12 volt appliance socket. To open this drawer, you must first depress the lock.

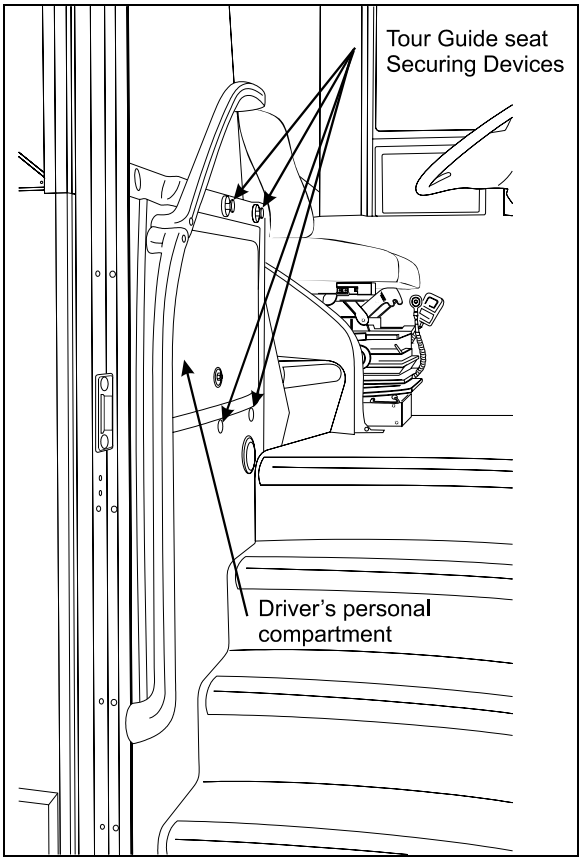


UTILITY COMPARTMENTS 18504



UTILITY COMPARTMENTS IN CONSOLE 18444

A lockable compartment for the driver is located on the L.H. side of the entrance stepwell. This compartment may be locked using the appropriate key. A tour guide seat is available as an option and is installed in front of the driver's compartment using the securing devices as shown hereafter.

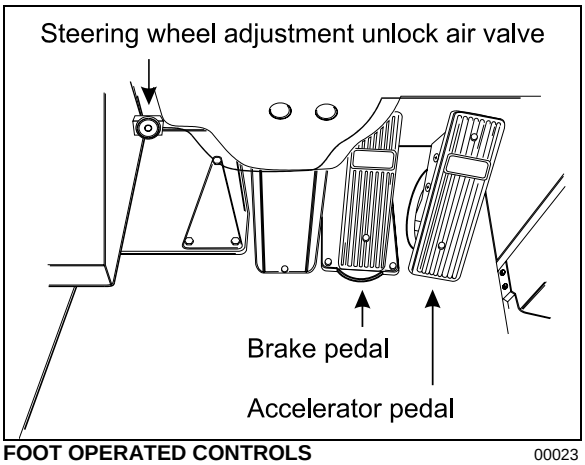


DRIVER'S PERSONAL COMPARTMENT 18507

The last compartment is located on the lateral control panel. It is lockable and equipped with a 12 volt appliance socket. To open this compartment, you must first depress the lock

STEERING WHEEL ADJUSTMENT

To unlock the steering wheel for tilt and telescopic adjustment, push with the left foot on the valve button located in the footwell. Refer to Controls & Instruments chapter, paragraph: Foot-Operated Controls.



FOOT OPERATED CONTROLS 00023

⚠ WARNING ⚠

Do not adjust the steering wheel while driving. Loss of control could result. Park the vehicle safely and apply parking brakes before adjusting the steering wheel.

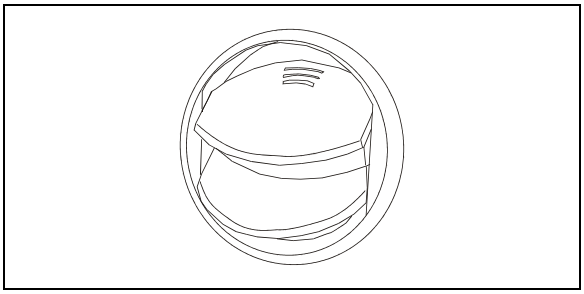
INTERIOR MIRRORS

Two manually adjustable mirrors are located in the driver's area. The one located in the upper left corner enables to eliminate the blind spot on the R.H. side of the coach. Adjust it to see through the R.H. side trapezoidal window. A central mirror allows the driver to see in the aisle. Adjust mirror manually.

DRIVER'S AREA ADJUSTABLE AIR REGISTERS

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

Use the HVAC control panel to set air temperature.



AIR REGISTER 22246

DRIVER'S SEAT - ISRI

The coach is equipped with one of two models of *ISRI* driver's seats. Standard is the mechanically adjusted seat. The pneumatic

model is available as an option. Both seats may be equipped with lumbar supports, heated cushions and adjustable armrests. Both seats are equipped with safety belts.

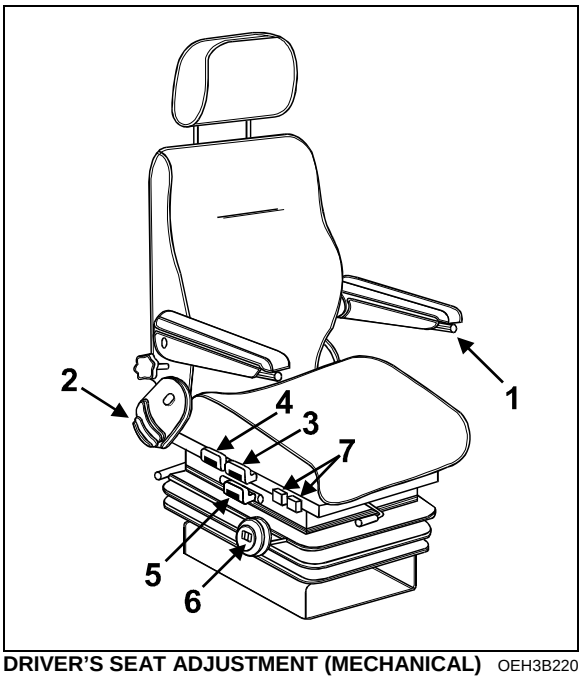
⚠ WARNING ⚠

The driver's seat must be adjusted to allow the driver to easily reach the controls of the coach. Never adjust seat while driving vehicle as this could result in loss of vehicle control.

MECHANICAL ISRI SEAT

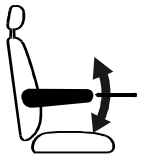
Driver's Seat Adjustment

ISRI seat can be adjusted to the desired driving position by following the instructions listed below:



DRIVER'S SEAT ADJUSTMENT (MECHANICAL) OEH3B220

Armrest

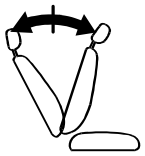


The driver's seat can be equipped with two folding armrests which can be raised or lowered for convenience.

To lower the armrest, turn the control knob (1) counterclockwise without applying pressure on the armrest, push the armrest to the desired position.

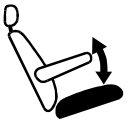
To raise the armrest, raise to the desired position then turn the control knob clockwise until it stops.

Backrest



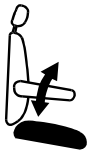
Lift lever (2) then adjust backrest to desired angle.

Tilt (front)



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

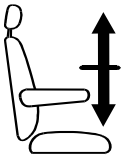
Tilt (rear)



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

Warning: *To avoid pinching the fingers between buckle and controls, lower safety belt buckle before adjusting seat height.*

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.

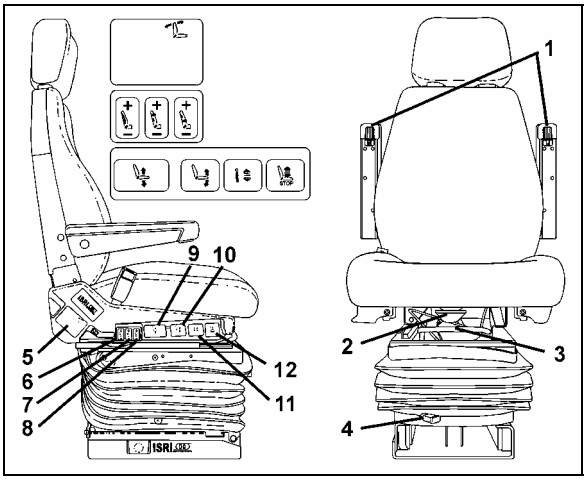
Follow the same procedure to inflate and deflate the lower bellows using the rear rocker switch.

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.

PNEUMATIC ISRI SEAT



PNEUMATIC DRIVER'S SEAT 18385

Armrest (1)

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

Seat Cushion (2)

Provides optimum comfort and support for any driver size. Adjustable to 50mm length.

Fore-and-aft (3)*

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

Isolator (4)

Reduces horizontal vibration, ensuring smooth ride.

Backrest (5)

Lift lever to select proper adjustment angle of backrest.

Air Side Bolster (6)

Offers desired side support to avoid body side-way.

Air Lumbar (7) (8)

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

Air Height Adjustment (9)

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

Adjustable Seat Recline (10)

Allows easy adjustment of four-setting inclination.

Adjustable Shock Absorber (11)

Choose stiff or soft ride infinitely.

Quick Air Release (12)

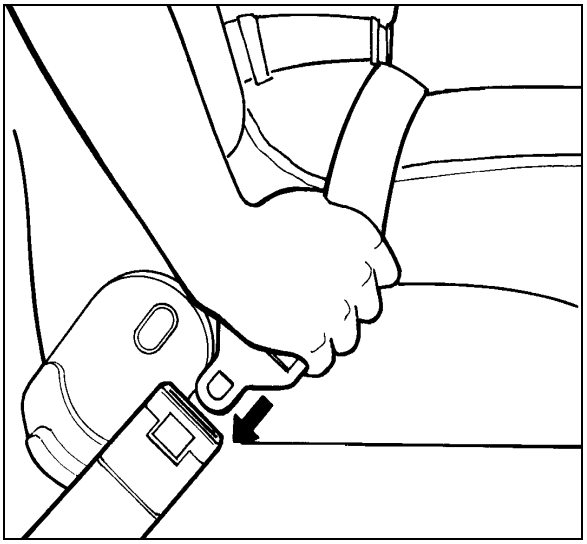
Exhausts all air from suspension, allowing for easy entry/exit. Returns seat to previous position.

SAFETY BELTS

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

NOTE

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



TO FASTEN SEATBELT 18028

⚠ WARNING ⚠

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

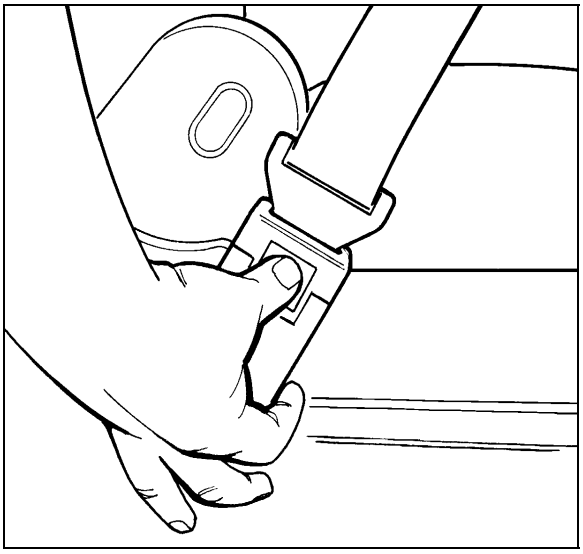
⚠ CAUTION ⚠

Never bleach or dry clean safety belt.

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

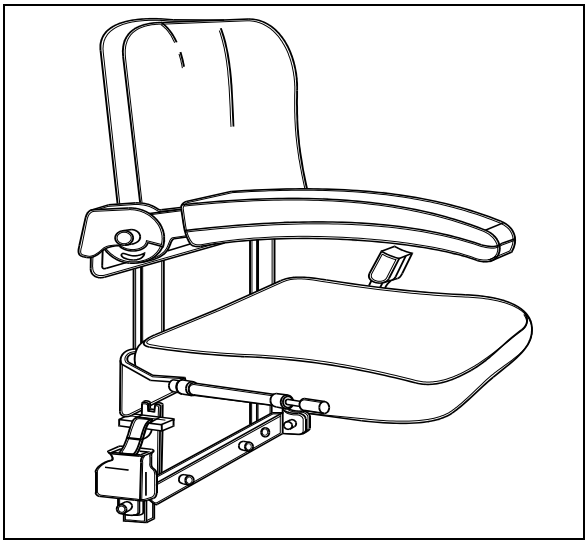
⚠ WARNING ⚠

Most State and Provincial laws require that safety belts be worn when they are supplied with the seat.



TO UNFASTEN SEATBELT 18029

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 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.

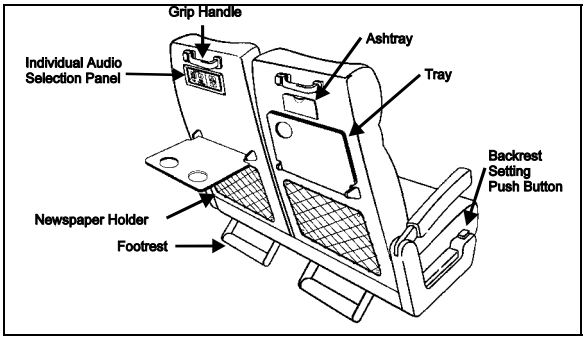
MICROPHONE JACKS

Up to six microphone jacks for the PA system can be located in the following locations:

- On the side wall of the driver's lateral control panel;
- On the right hand 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 overhead storage compartment, at the rear of the coach.

PASSENGER SEATS

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



PASSENGER SEAT EQUIPMENT OEH3B226

All seats are track-mounted so that the seating configuration can be changed. Each set is mounted on rectangular aluminum bases to make cleaning between the base and side wall easier.

Passenger seat backrests can be tilted by using the push-button located on the base of the seat. Depress and hold push-button, then adjust backrest to the desired angle. Release the push-button to lock backrest in position.

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

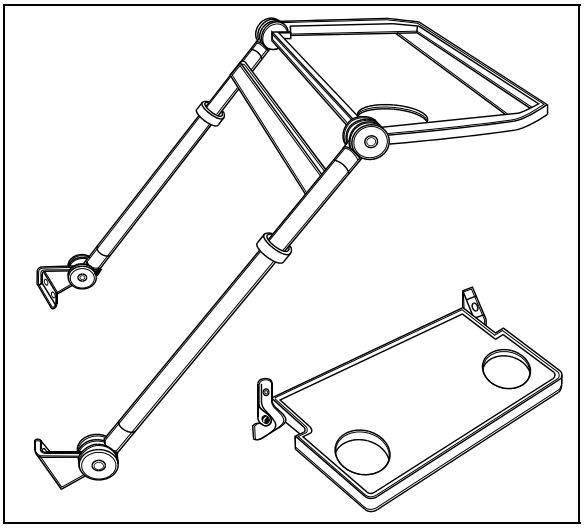
The coach may be equipped with two sets of swivel seats to allow installation of card tables. The swivel seat can be rotated for passenger privacy. To rotate seats, unscrew the wing nut from under each seat cushion then remove cushions. Remove the four wing screws, pull seats toward the aisle and rotate 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.

FOLDING TRAYS

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

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

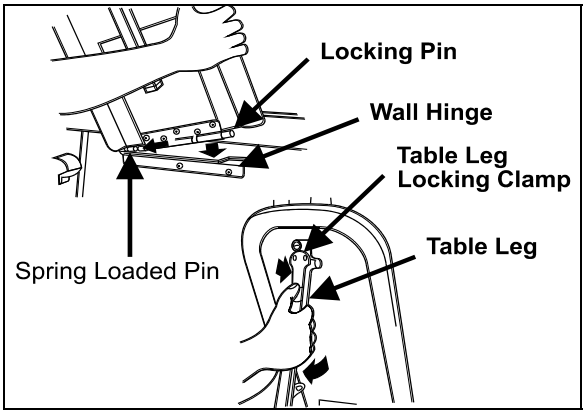


FOLDING TRAY MODELS OFH3B232

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 overhead storage compartments in separate stowage bags.

To install the card table, hold it at 45^{o} (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.

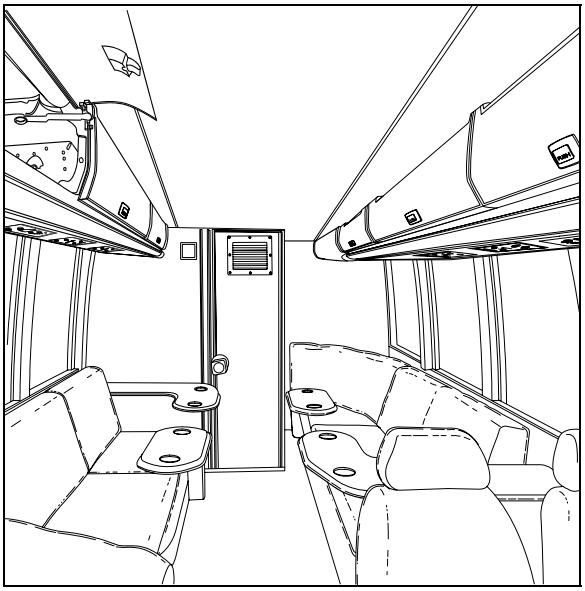


CARD TABLE INSTALLATION OEH3B234

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.



QUICK-LOUNGE 18445

OVERHEAD CONSOLE

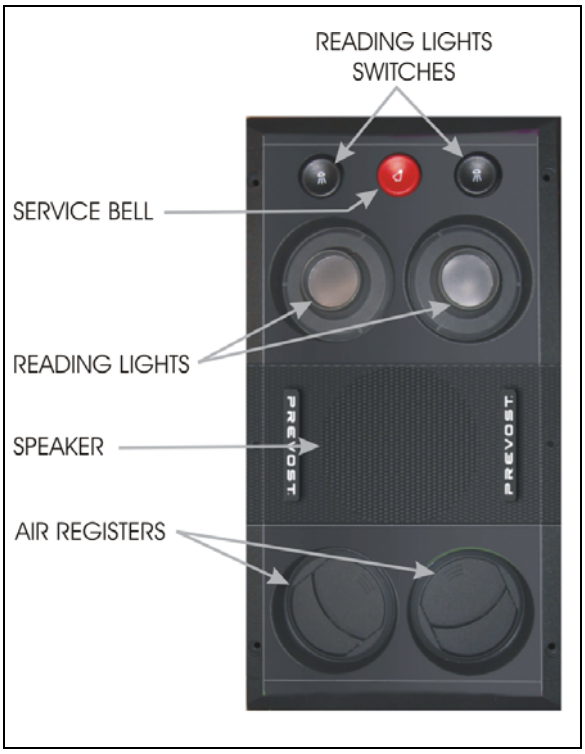
One airplane type overhead console is installed for each row of twin seats. Such amenities as reading lights, air vents and an optional service bell are controlled from this panel.

ADJUSTABLE AIR REGISTERS

Adjustable registers located on the overhead console provide air flow to the passengers. Air flow can be directed. Passengers can orient individual registers by rotating the nozzle. To adjust air flow, passengers must open or close the flaps. Activation of the fans is done by depressing a rocker switch on the dashboard. Refer to Controls & Instruments chapter.

SERVICE BELL

Pressing the service button on the overhead console will illuminate the button providing a visual cue for service personnel and, if activated, will sound a chime in the driver's area. The chime system is activated by a rocker switch located on the dashboard. Refer to Controls & Instruments chapter. Passengers may also use the chime system to request a stop for disembarking. Press the service button a second time to cancel the service request.



OVERHEAD CONSOLE 23137

READING LIGHTS

Reading lights are located on the overhead console and mounted underneath the overhead storage compartments. Depressing a rocker switch located on the dashboard (refer to Controls & Instruments chapter) will activate the reading light circuit and allow passenger control of reading lights.

WINDOWS

The coach is equipped with flush-mounted "Galaxsee" type windows all around and a split-window windshield for maximum visibility.

PANORAMIC WINDOWS

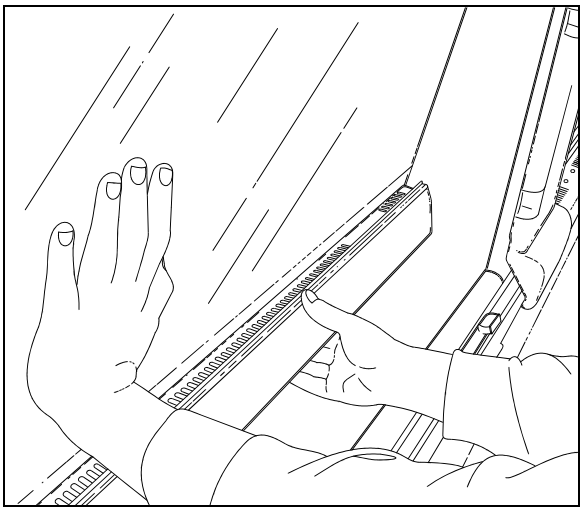
Panoramic side windows can come in either single pane or, as an option, double pane (thermopane) glass. Some of these windows are of the fixed type and cannot be opened. Others can be easily opened to serve as emergency exits.

Fixed Windows

These windows are mechanically attached to the structure and cannot be opened.

Emergency Windows

These windows can be opened from inside the vehicle as emergency exits. A decal on window sills indicates the location of the emergency windows. To open an emergency window, lift the window release bar (sill) and push the window open from the bottom.



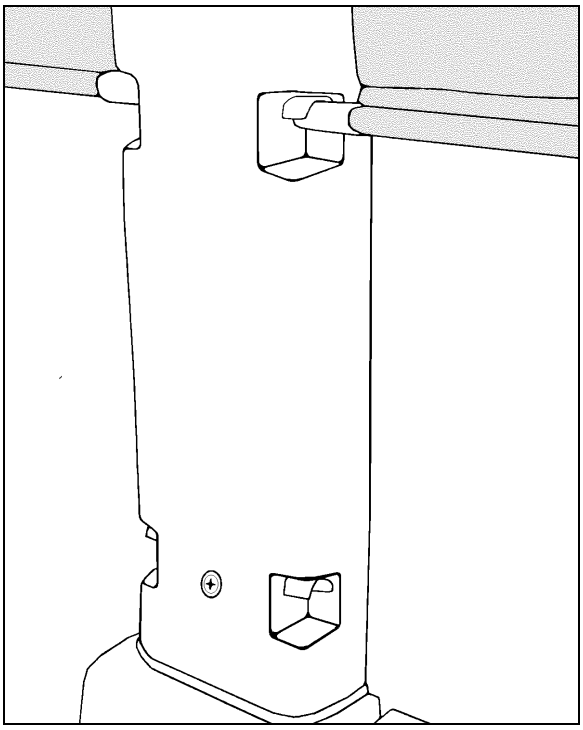
EMERGENCY WINDOW 18391

To close, lift the release bar and pull the window into position. Push down on release bar to lock the window shut.

For more information on emergency features, refer to Safety Features and Equipment chapter.

Window Sun Shades

Passenger windows may be equipped with pull-down sun shades. To operate, pull down the shade and insert the hem into the first or second catch. To retract pull out from the slots and guide the shade back up.



PASSENGER SUN SHADES 23130

DRIVER'S POWER WINDOW

The driver has a power window on the left side of the coach. The window is controlled by a rocker switch located on the lateral control panel. Refer to "Controls and Instruments" chapter.

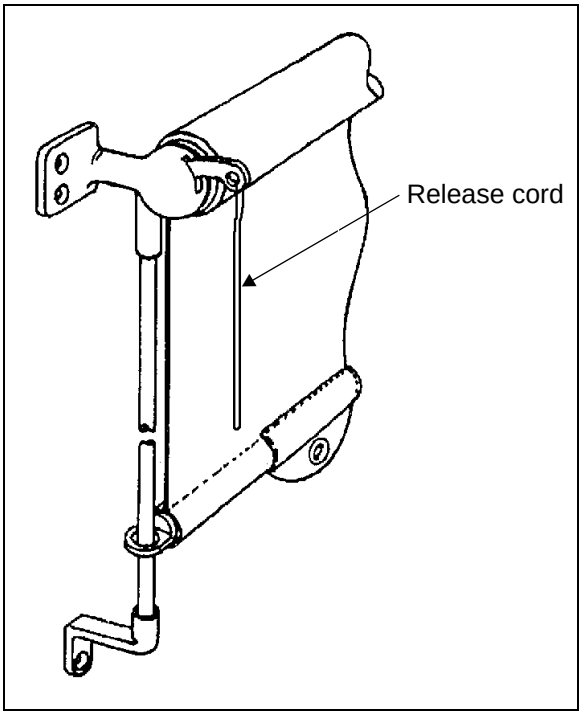
Driver's window shades

Two electrically-operated shades are installed behind the windshields. Two rocker switches on the dashboard operate each shade individually. Refer to "Controls and Instruments" chapter for more information.

⚠ CAUTION ⚠

The electric shades should only be operated electrically. Pulling down manually may damage the mechanism.

This vehicle is provided with a spring release type sun shade on the driver's left side window. Another spring release type shade is available on the optional driver's guard. To operate, pull down the shade by its hem to the appropriate position and release. It will remain in position. To raise, depress the unlocking lever and guide the shade back up using the other hand.



SPRING RELEASE SUNSHADE 23019

VENTILATION HATCH

A ventilation hatch is installed on the roof at the rear of the coach. A second, optional hatch can be installed on the roof 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 exit. Refer to "Safety Features and Equipment" chapter.

⚠ WARNING ⚠

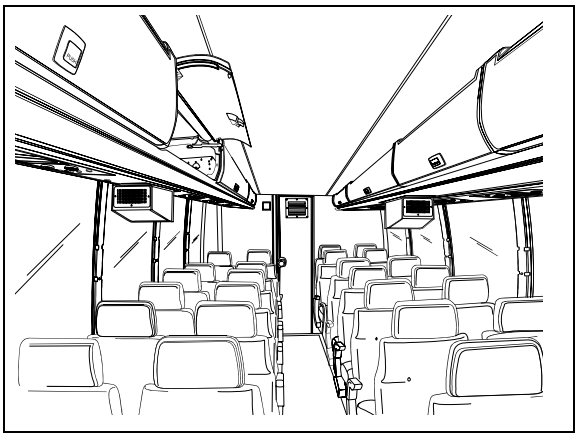
Be aware of coach overhead clearance when traveling under overpasses with the ventilation hatch(es) open. Check for maximum clearance height.

28 COACH INTERIOR

OVERHEAD COMPARTMENTS

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 curb side overhead storage compartment. An optional video cassette player and a CD player may be installed in the first front driver's side overhead storage compartment.

To open the optional closed overhead storage compartments, push the handle in to release the latch, then let go. A pressurized cylinder opens the door.



OVERHEAD STORAGE COMPARTMENTS 18390

NOTE
The overhead storage compartments 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 driver's side overhead storage compartment door to protect the optional audio/video equipment.

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.

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.

LAVATORY

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

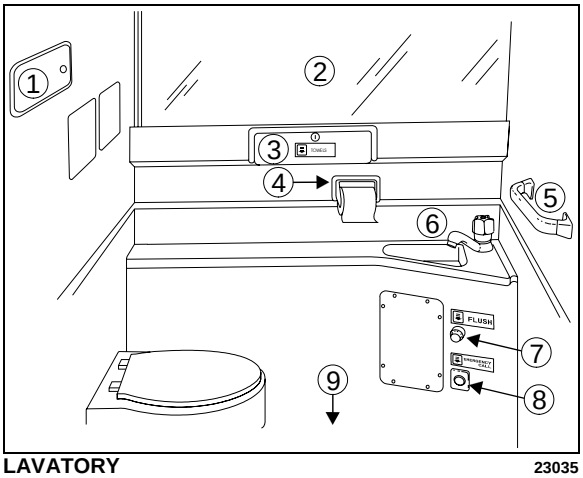
Locking the lavatory door from the inside will illuminate a fluorescent light in the lavatory and two outside signs to indicate occupation. One sign is located on the outer wall of the lavatory and another sign is located over the windshield.

A telltale 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 lavatory occupant can actuate a buzzer that will sound in driver's area. The buzzer push-button and instruction label are located on the wall of the lavatory.

The lavatory has its own ventilation system that operates continuously when the ignition switch is in the "ON" position.

The fresh water tank may be equipped with an immersion heater that is supplied by the 110/120 volt connector for the engine block heater.



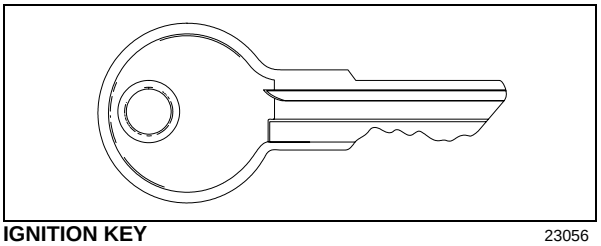
LAVATORY **23035**

1. Cleaning cabinet;
2. Mirror;
3. Paper towel dispenser;
4. Toilet paper roll;
5. Grip handle;
6. Faucet;
7. Flush button;
8. Emergency call button;
9. Waste basket.

KEYS

Depending on options, up to nine different keys are provided with the coach:

IGNITION KEY



IGNITION KEY 23056

Coaches may be equipped with an ignition lever instead of an ignition key. With the battery master switch activated, turn the ignition key counterclockwise to the ACC position to activate the electrical circuits.

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

⚠ CAUTION ⚠

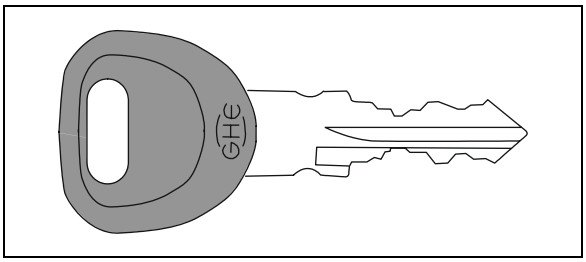
When the vehicle is parked overnight or for an extended period of time, the battery master switch should be set to the *OFF* position.

NOTE

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

ENTRANCE DOOR, EXTERIOR COMPARTMENTS AND LAVATORY DOOR LOCKS KEY

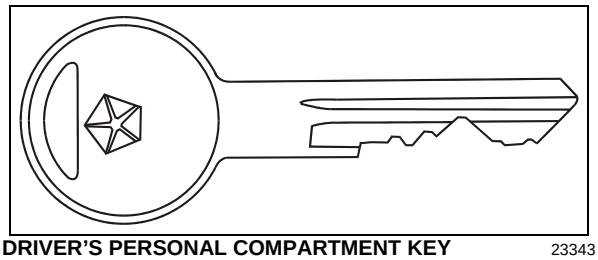
Use this key to lock or unlock the entrance door, the baggage bay doors, the electrical and service compartment doors, the lavatory door and the fuel filler doors.



ENTRANCE DOOR, EXTERIOR COMPARTMENT AND LAVATORY DOOR LOCKS KEY 23302

It is also possible to lock or 0nlock the baggage bays and service compartments from the inside by means of the optional central locking system.

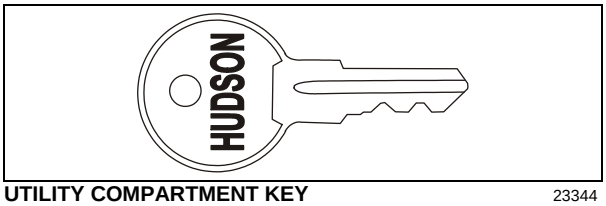
DRIVER'S PERSONAL COMPARTMENT KEY



DRIVER'S PERSONAL COMPARTMENT KEY 23343

Use this key to lock or unlock the driver's personal compartment, accessible through the stairway wall.

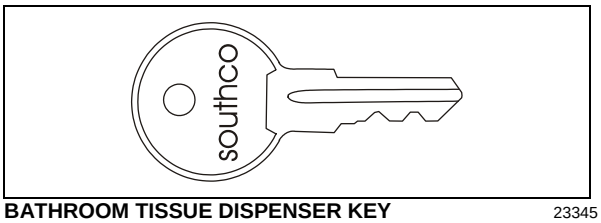
UTILITY COMPARTMENT KEY



UTILITY COMPARTMENT KEY 23344

This key locks or unlocks the utility compartments and the utility drawers on and around the dashboard.

HAND TOWEL DISPENSER KEY

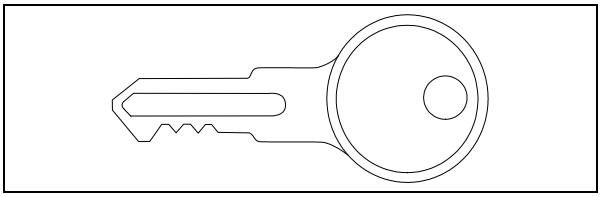


BATHROOM TISSUE DISPENSER KEY 23345

This key opens the hand towel dispenser in the lavatory.

NOTE
The optional moist towel dispenser uses a different key.

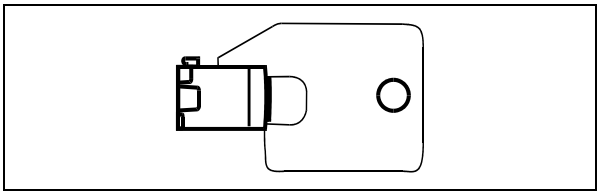
VCR COMPARTMENT KEY



VCR COMPARTMENT KEY 23246

Use this key to lock or unlock the overhead compartment containing the video cassette player.

TV MONITOR KEY

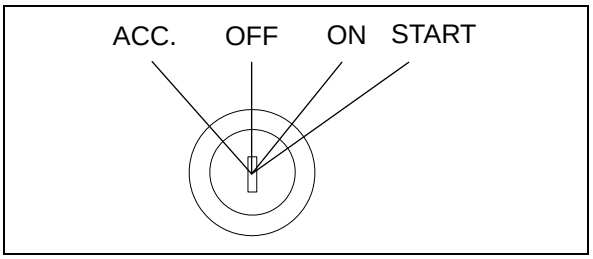


TV MONITOR KEY 23248

Use this key to remove the TV monitors for maintenance.

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

IGNITION SWITCH



IGNITION SWITCH POSITIONS 06354

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

OFF

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

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

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

ACCESSORIES

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

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

The features enabled when the key is in the ACC position are all those linked directly to the battery plus the exterior temperature display, the radio or entertainment system, exterior and interior lighting.

ON

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

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

NOTE
To prevent discharge of the batteries when the engine in not running, some functions are automatically switched off if the batteries voltage drops below 24.4 volts for more than

30 seconds. The "BAT" telltale light blinks while this protection mode is active. Set the ignition key to the OFF position and then turn the ignition key to the ON position to reactivate the functions for a period of 30 seconds before they switch off again. If a prolonged use of the functions with the engine not running is necessary, connect the battery to a charger.

START

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

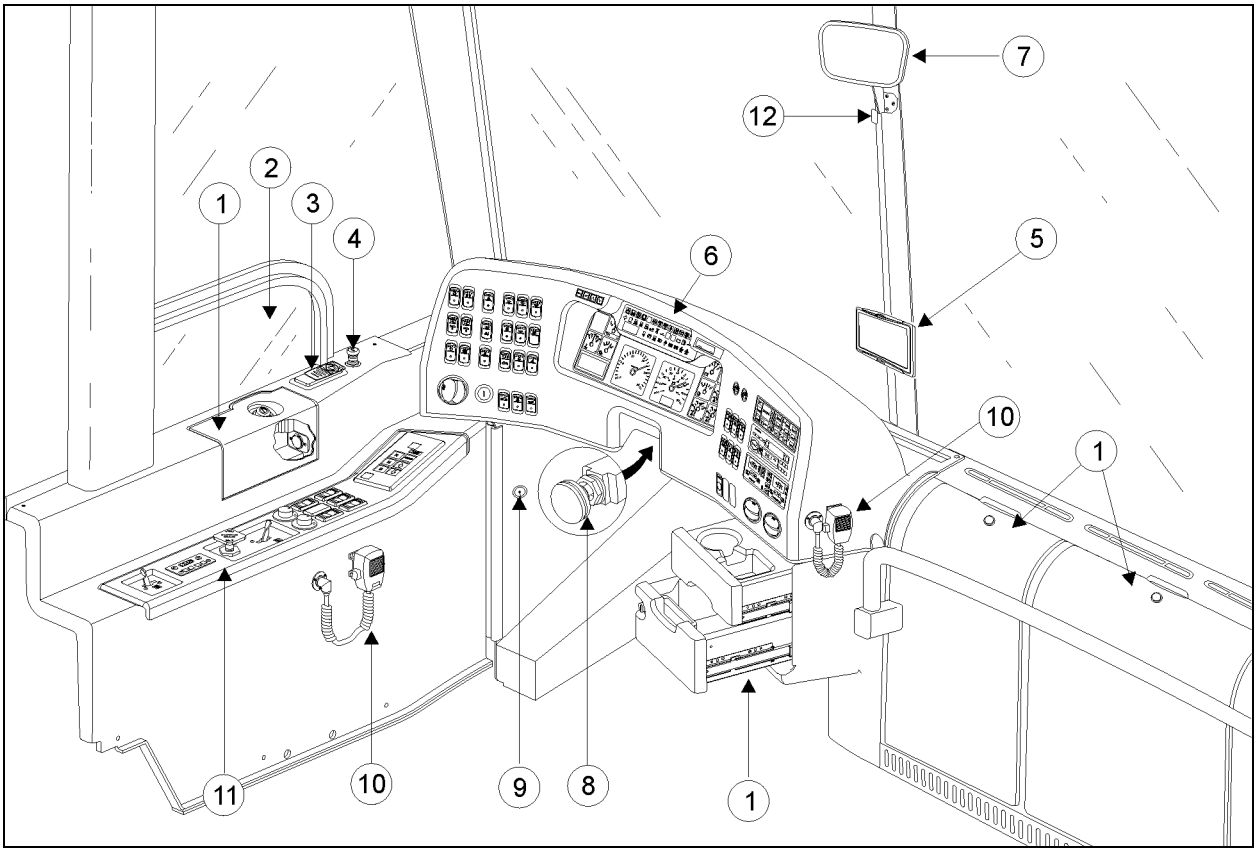
The ignition switch is equipped with a starter protection which inhibits turning the key to the START position if the key has not previously been turned to the OFF position.

⚠ CAUTION ⚠

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

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

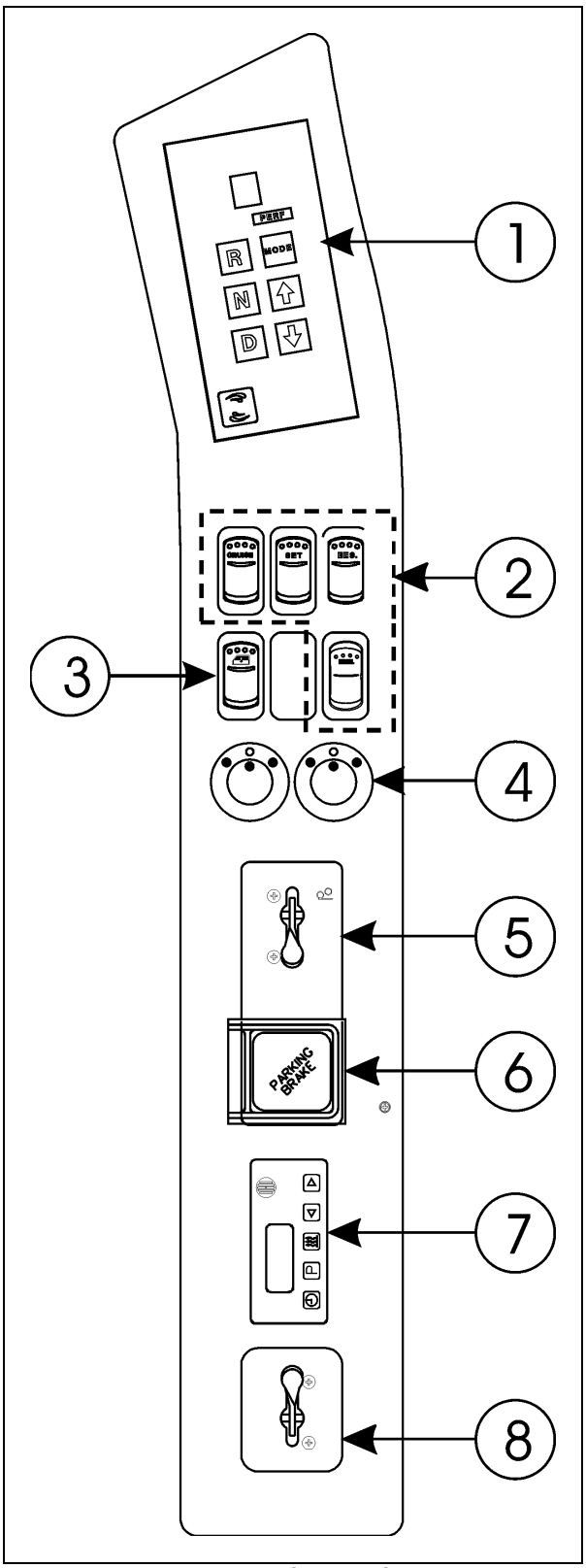
34 CONTROLS AND INSTRUMENTS



DRIVER'S AREA 18535

1. **Utility compartments**
2. **Driver's power window**
3. **GPS navigation system remote control**
4. **Cigarette lighter**
5. **GPS & Rear-view TV monitor**
6. **Dashboard**
7. **Mirror**
8. **Foot-operated steering wheel adjustment**
9. **Diagnostic Data Reader (DDR) receptacle**
10. **Microphone**
11. **Lateral control panel**
12. **DVD player remote control IR sensor**

LATERAL CONTROL PANEL



LATERAL CONTROL PANEL (TYPICAL) 06589

1. **Transmission Control Pad;**
2. **Cruise Control Switches (Optional);**
3. **Driver's Power Window Switch;**
4. **Mirror Controls;**
5. **Tag Axle Control Valve;**
6. **Parking Brakes Control Valve;**
7. **Coolant Heater Timer (Optional);**
8. **Low Buoy Control Valve (Optional);**

TRANSMISSION CONTROL PAD

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

CRUISE CONTROL SWITCHES

The cruise control is part of the DDEC V electronic engine control that will maintain a set speed when the vehicle is traveling above 20 mph (32 km/h) without having to use the accelerator pedal.

⚠ 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.

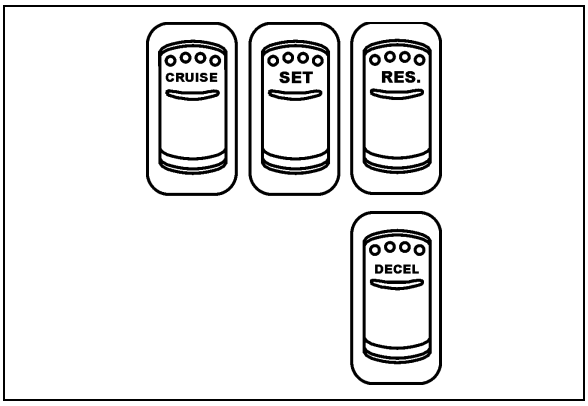
⚠ WARNING ⚠

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

Setting Coach Speed

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

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



CRUISE CONTROL SWITCHES 06590

Increasing Set Speed

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

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

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

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

Decreasing Set Speed

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

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

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

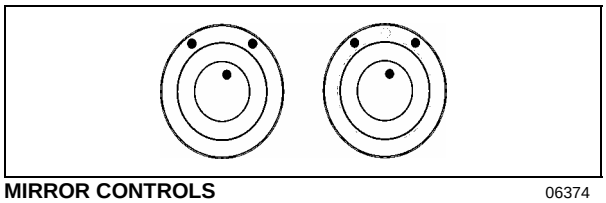
NOTE
To avoid sudden vehicle hesitation, slightly depress the accelerator pedal before disengaging the cruise control.

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

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

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

MIRROR CONTROLS



MIRROR CONTROLS 06374

Turn left pointer knob counterclockwise for flat mirror 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

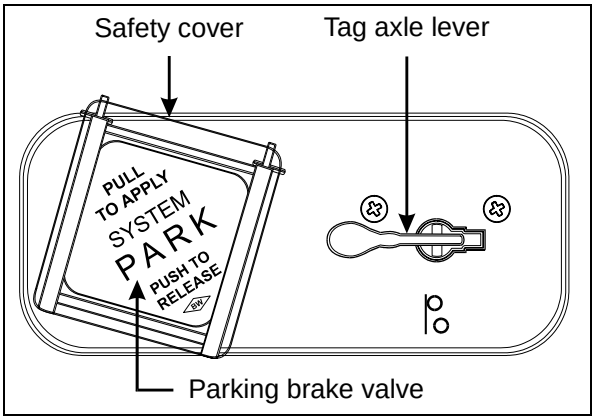
include convex mirrors, only one mirror control knob will be installed for both mirrors. To operate, turn knob to the left for L.H. mirror adjustments and to the right for R.H. mirror adjustments, then use the joystick control to adjust the selected mirror's viewing angle.

TAG AXLE CONTROL VALVE

Lift the tag axle by pushing the lever forward. Pulling the lever back will lower the tag axle. Refer to "Other Features" chapter for additional information.

PARKING BRAKES CONTROL VALVE

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

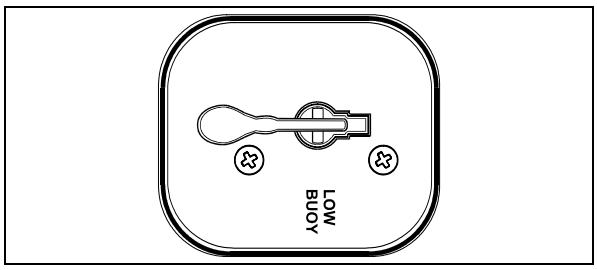


CONTROL VALVES 12129

COOLANT HEATER TIMER

Use the timer to program the start time of the optional engine coolant heater. Refer to "Other Features" chapter for additional information.

LOW BUOY CONTROL VALVE



LOW BUOY CONTROL VALVE 12165

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

⚠ WARNING ⚠

Use only below 5 mph (8 kph).

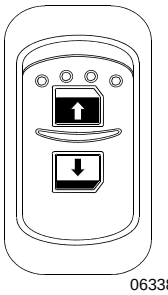
UTILITY COMPARTMENT

To open the compartment, push down on the lock button and swing the cover open towards the inside of the coach.

A 12 volts DC power outlet is located inside the pocket.

This socket can be used to power small 12 volt DC appliances such as a cellular phone or a vacuum cleaner. The maximum power consumption allowed for appliances plugged in this socket is 130 watts. Make sure appliances are equipped with suitable plugs that will not damage the socket.

POWER WINDOW SWITCH



06338

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

⚠ CAUTION ⚠

Close power window when parked or leaving the coach unattended.

ASHTRAY

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

⚠ WARNING ⚠

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

CIGARETTE LIGHTER

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 allowed for appliances plugged in this socket is 130 watts. Make sure the appliances are equipped with suitable plugs that will not damage the socket.

NOTE
The cigarette lighter can still be used after the ignition key has been removed.

DIAGNOSTIC DATA READER (DDR) RECEPTACLE

To ease 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.

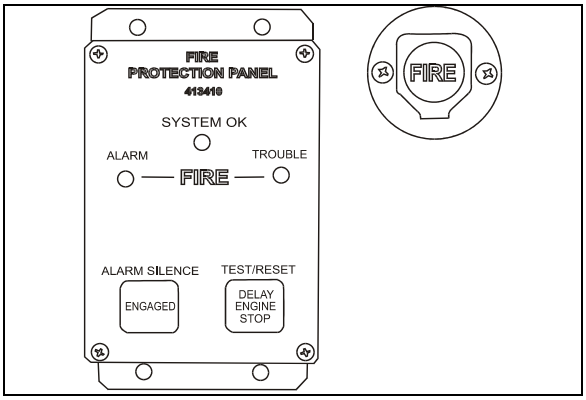
AUTOMATIC FIRE DETECTION AND SUPPRESSION SYSTEM (AFSS)

Protection Panel

The protection panel displays the current system status. The protection panel contains “SYSTEM OK”, fire “ALARM” and “TROUBLE” lamps, the audio alarm, the “TEST/RESET” switch, and the “ALARM SILENCE” switch.

The “SYSTEM OK” lamp indicates power is on the system and that there are no trouble conditions present. The “TROUBLE” lamp blinks if there is a fault in the detection circuitry and illuminates solid if there is a fault in the extinguishing circuitry. When the “TROUBLE” lamp is on, the “SYSTEM OK” lamp will be off and the audible alarm will sound intermittently. The “SYSTEM OK” lamp will flash when the system is low on battery power. Depressing the “TEST/RESET” switch tests the protection panel lamps and audio alarm. The “ALARM SILENCE” switch will disable the audio alarm.

When a fire detector automatically detects a fire, the fire “ALARM” lamp and audio alarm activate. When the Manual Activation Switch is activated, the fire “ALARM” lamp blinks and the audio alarm activates. The lamp will remain blinking until power is cycled to the system.



AFSS PROTECTION PANEL & MANUAL ACTIVATION SWITCH

Manual Activation Switch

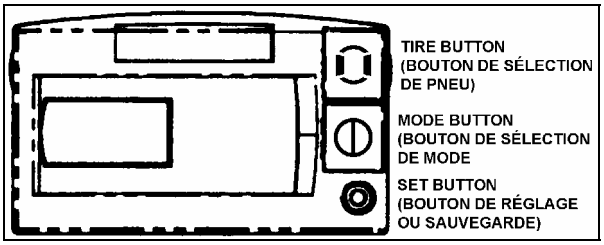
The manual activation switch allows immediate system activation (extinguisher discharge and engine shutdown) by the operator at any time. Activation of the switch is accomplished by twisting and pulling the tamper seal to remove, lifting the cover and pressing the red “FIRE” button for more than half a second. After the manual activation switch has been activated, the protection panel will blink the fire “ALARM” indicator until power has been cycled to the system.

Refer to chapter “Safety Features and Equipment” for more information on ***Kidde*** *Dual Spectrum* Automatic Fire detection and Suppression System (AFSS).

TIRE MONITORING SYSTEM (TMS)

This system is a sensing device designed to identify and display tire operating data and activate an alert or warning when pressure or temperature irregularities are detected.

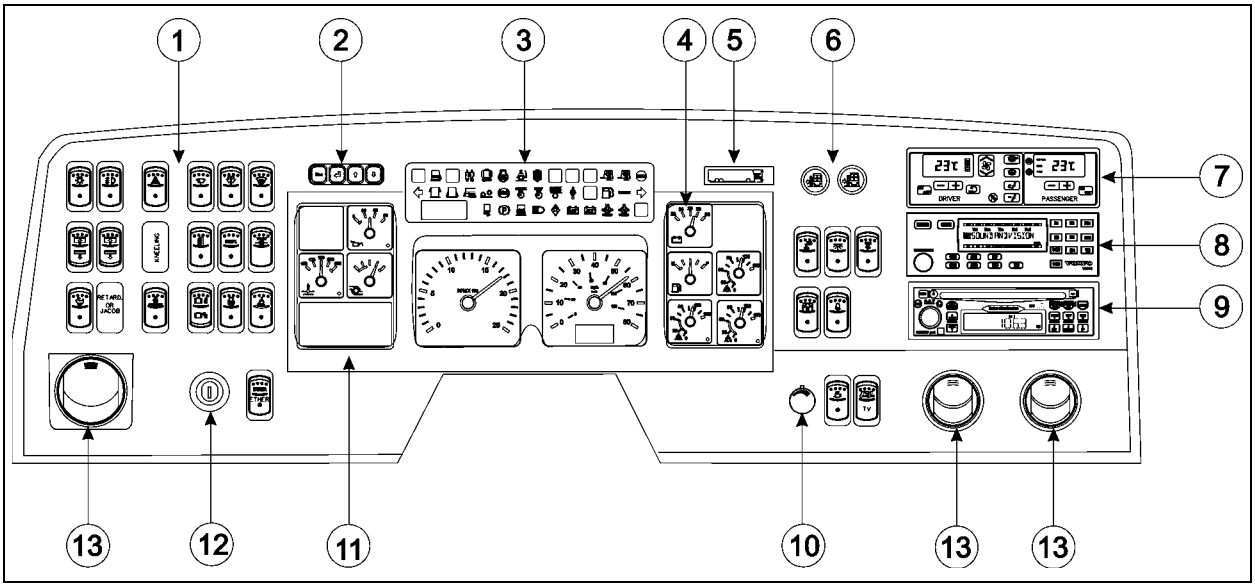
It is the responsibility of the driver to react promptly and with discretion to alerts and warnings. Abnormal tire inflation pressures should be corrected at the earliest opportunity.



DISPLAY

Refer to User’s Manual and to chapter “Safety Features and Equipment” for more information on Tire Monitoring System (TMS).

DASHBOARD



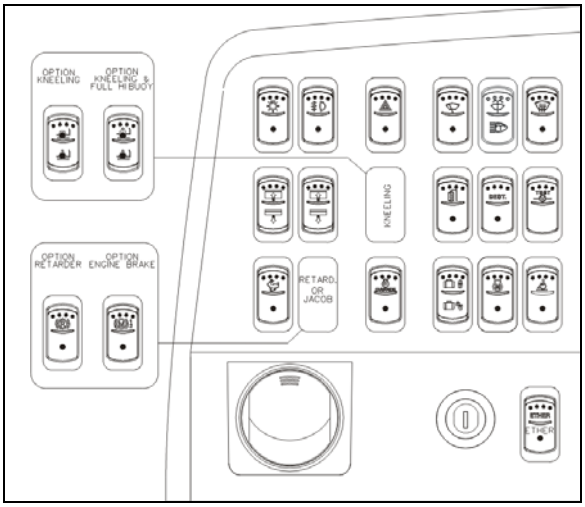
DASHBOARD 06607

1. L.H. Dashboard panel
2. Message Center Display keyboard (MCD)
3. Telltale Panel
4. Gauges
5. Vehicle Clearance Information
6. R.H. Dashboard panel
7. HVAC Control Unit
8. Sound Selector
9. AM/FM/CD Radio
10. Brightness Control
11. Message Center Display (MCD)
12. Ignition Switch
13. Air Registers

CONTROL SWITCHES

High quality laser-engraved switches are used to control many of the features of the vehicle. Many switches have an embedded indicator 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*. Switches are described in the order they appear, from left to right, top to bottom.

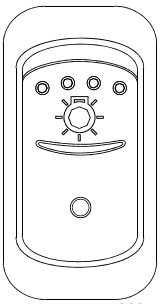
L.H. DASHBOARD PANEL



L.H. DASHBOARD PANEL 06576

The L.H. dashboard panel includes controls for the operation of the coach, it also includes the ether start control, the ignition switch and an adjustable air register.

Headlights and Exterior Lighting



06254

OFF position – Daytime running lights only.

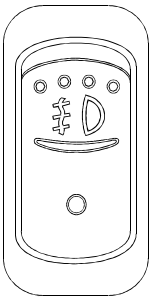
Press this rocker switch to turn on the following lights:

First position – front parking lights, taillights, clearance lights, marker lights, license plate light.

Second position (push down fully) - the headlights, the controls and instrument lights and all lights from the first position.

NOTE
Daytime running lights will be automatically cancelled when the exterior lighting switch is fully depressed (second position).

Fog Lights

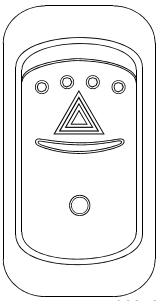


06255

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

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

Hazard Warning Flashers

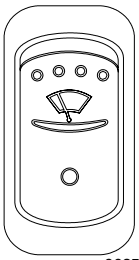


06256

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

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

Upper Windshield Wipers



06257

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

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

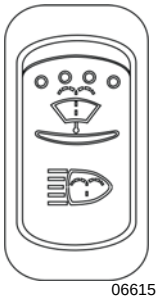
⚠ CAUTION ⚠

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

NOTE

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

Upper Windshield Washer & Headlights Washer (Optional)


06615

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

Momentarily press this rocker switch downwards to spray the headlights washer fluid. Each pressing of this switch produces 2 successive jets.

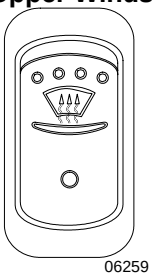
NOTE

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

⚠ CAUTION ⚠

Do not operate the washer mechanism while the washer fluid reservoirs are empty. This may damage the washer fluid pumps.

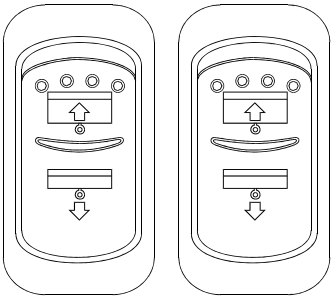
Upper Windshield Defrosting


06259

Optionally, the coach may be equipped with a defrosting system in the upper windshield section. Press the rocker switch to activate the recirculation pump and the blower in order to clear fog, frost or thin ice from either side of the upper windshield.

The upper windshield defrosting is automatically activated when the outside temperature is lower than 39°F (4°C), the engine temperature is higher than 86°F (30°C), the driver's side HVAC control unit is ON and the fan speed is higher than zero (refer to the HVAC control unit information in this chapter).

Left and Right Sunshades

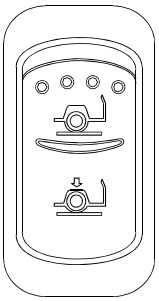

06353

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

⚠ CAUTION ⚠

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

Kneeling / Front Axle Hi-Buoy (Optional)


06250

Momentarily press the rocker switch downwards to lower the front end of the coach 4 inches (100 mm). Momentarily press the rocker switch upwards to raise the coach to the normal driving height. Refer to "Other Features" chapter for more information.

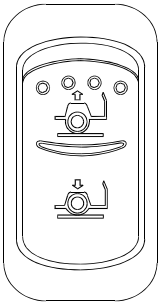
Press and hold the rocker switch upwards to raise the front end of the coach 4 inches (100 mm).

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

NOTE

The parking brakes must be applied to allow the use of the kneeling.

Kneeling / Full Hi-Buoy (Optional)



06251

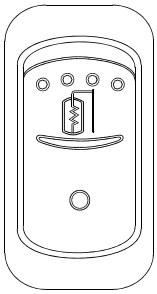
Momentarily press the rocker switch downwards to lower the front end of the coach 4 inches (100mm). Momentarily press the rocker switch upwards to return the coach to normal driving height. Refer to "Other Features" chapter.

Press and hold the rocker switch upwards 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.

NOTE
The parking brakes must be applied to allow the use of the kneeling.

Outside Mirror Heat (Optional)



06261

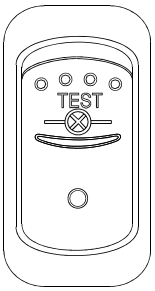
Press the rocker switch to clear fog, frost or thin ice from outside mirrors.

Destination Sign (Optional)

06261

Press the rocker switch to illuminate the destination sign.

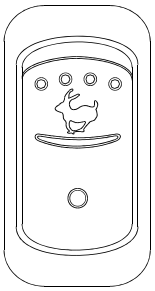
Telltale Light Test



06263

Press down and maintain this switch at least 2 seconds to illuminate the telltale light panel. The telltale panel audible alarm will sound. Perform this test to verify indicator light and telltale panel audible alarm functionality.

Fast Idle



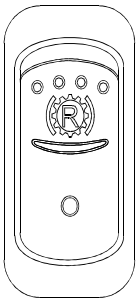
06264

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

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

⚠ CAUTION ⚠
Return the engine to normal idle before shutting the engine *OFF*.

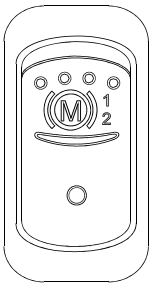
Transmission Output Retarder (Optional)



06252

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

JACOBS Engine Brake (Optional)



06253

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

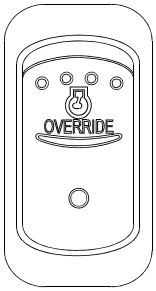
⚠ WARNING ⚠

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

NOTE

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

Engine Stop Override



06265

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

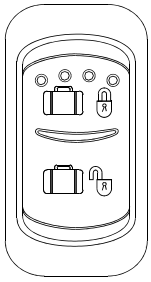
⚠ CAUTION ⚠

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

DDEC Diagnostic Request

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

Central Locking System

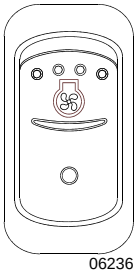

06266

This optional system enables locking baggage bays and engine curb side door by pressing the switch forward. To unlock, press the switch rearward.

NOTE

Doors must be locked using the key first, they can then be unlocked/locked using the central locking system.

Radiator Fan Override (Optional)

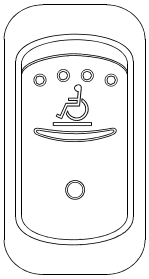

06236

Depressing the switch overrides the radiator fan's thermostatic switch, keeping the fan continuously on. This feature is useful when the fan switches on and off repeatedly, such as when driving up a long grade or when driving in very hot weather.

⚠ CAUTION ⚠

Do not use this feature unnecessarily as it will shorten fan life, reduce available horsepower and increase noise and fuel consumption.

Wheelchair Lift (Optional)


06268

Activate the optional wheelchair lift electrical circuit by pressing down on the rocker switch. Refer to "Other Features" for instructions on operating the wheelchair lift.

Ether Start Control (Optional)

06237

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

⚠ CAUTION ⚠

Excessive use may result in severe engine damage.

Driver Controlled Differential Lock (DCDL) (Optional)

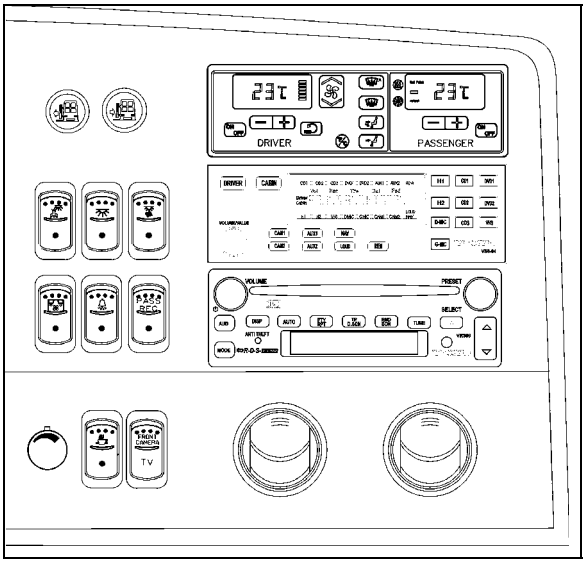
06571

Press the rocker switch to lock or unlock differential action. Refer to "Other Features" chapter for the complete operating instructions.

⚠ CAUTION ⚠

- **Engage DCDL only under poor road surface conditions.**
- **DCDL will not engage and will disengage in speed higher than 5 MPH.**
- **Do not lock DCDL when one or more wheels are slipping, spinning or loosing traction. You can damage the drive axle.**
- **Using the rocker switch, unlock DCDL when the need for improved traction has passed otherwise it will reengage automatically as speed gets below 5 MPH. Over a prolonged period, this situation will increase tire wear and stress to the vehicle.**
- **Do not engage during downhill operation.**

R.H. DASHBOARD PANEL



R.H. DASHBOARD PANEL 06608

Controls for passenger comfort and entertainment are grouped on this panel. The HVAC control module as well as the cluster dimmer switch, miscellaneous control switches and air vents are therefore located on the R.H. dashboard panel.

Door Operating Buttons

06313

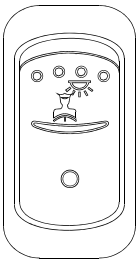
Press and hold button to open or close the door.

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.

Driver's Area Lighting



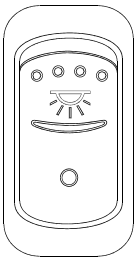
06244

Press the rocker switch to turn on the driver's overhead light as needed.

NOTE

The entrance overhead light and the stairwell light turn on with the entrance door opening. If the entrance door is left opened, these lights will be turned off automatically after 15 minutes to prevent discharge of the batteries.

Interior Lighting



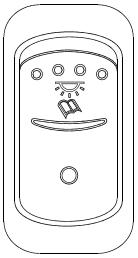
06239

Press this rocker switch to the first position to illuminate the aisle fluorescent lighting. Press down the second position to illuminate the in-station fluorescent lights.

⚠ CAUTION ⚠

To avoid running down the batteries when the engine is off, turn off the lights or connect the optional battery charger to a 110 - 120 volt AC power supply.

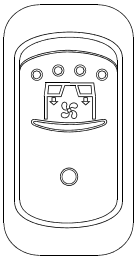
Reading Lights



06240

This switch powers the reading light circuit enabling passengers to operate their personal reading lights.

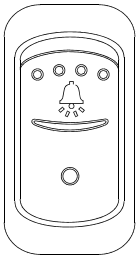
Passenger Overhead Air Registers



06245

Press the switch to activate the passenger overhead air registers fans.

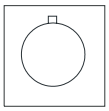
Stop / Service Chime (Optional)



06243

Press this switch to enable the stop / service chime. Even when the chime circuit is not enabled, the buttons in the overhead panels will illuminate if depressed by the passengers.

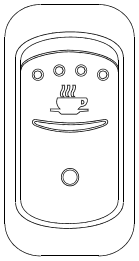
Brightness Control



06565

Adjusts the brightness of the dashboard instruments and switches.

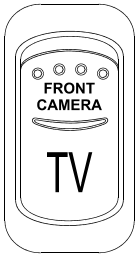
Galley



06241

This switch activates the optional galley's electrical circuit.

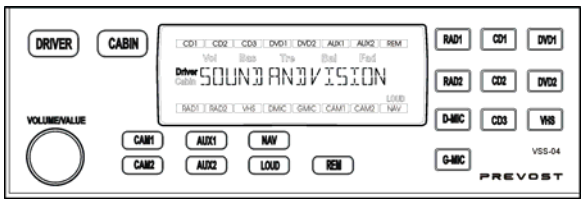
Front Camera (Optional)



06446

Press this switch to turn ON the forward looking camera and display the road ahead on the passenger TV monitors. When the front camera is not enabled, the TV circuit reverts to the VCR output.

VSS-04 SOUND SELECTOR



The VSS-04 Multichannel Sound Selector enables the driver to select audio and video entertainment with independent settings of volume level, bass, treble, etc. in the passenger and driver's areas. The dashboard radio, DVD player, video cassette player, the P.A. system, auxiliary systems and other components are controlled by this unit.

Controls and features

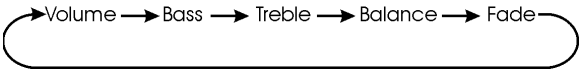
Power switch: there is no power button. The unit turns on automatically when the ignition switch is set to ACC or ON position and turns off when the ignition switch is set to OFF position. Start image shows "SOUND AND VISION".

DRIVER: press to adjust sound settings and select audio/video source for the driver's area. Driver's and passenger's systems are independent systems. RAD1 is default source.

CABIN: press to adjust sound settings and select audio/video source for the passenger's area.

VOLUME/VALUE: turn to adjust volume level or sound settings value for the selected audio/video source (RAD1 is default source). Each source has independent settings of volume, bass, treble, etc.

Press repeatedly to select sound settings. Settings will change as follow:



NOTE
Some components like the standard radio, the satellite radio and the DVD Player have their own audio controls (volume, bass, treble, balance, fade, etc.). These audio controls should be adjusted once at the beginning and should not be changed after. *If volume level or sound quality adjustments are required, they should be made using the VSS-04 Sound Selector only.*

Presets of the audio controls:

- *Adjust each radio and DVD Player own volume level between 50% and 75% of their output range.*
- *Adjust radio's own bass, treble, balance and fade settings to mid-range.*

CAM1: press to turn on the optional panoramic view camera. The video monitors turn on automatically. Press a second time to turn off. This function can be selected simultaneously with an audio function like the radio, the driver or guide microphone or a CD player.

NOTE
The back-up camera turns on automatically when the transmission selector is set to reverse "R".

CAM2: press to select an optional second panoramic view camera if equipped as current video source. Press a second time to cancel. This function can be selected simultaneously with an audio function like the radio, the driver or guide microphone or a CD.

AUX1, AUX2: press to select an auxiliary audio/video source like a second VHS. Press a second time to cancel the selection.

NAV: press to select the navigation system display as current video source. Press a second time to cancel.

LOUD: press to increase the low frequencies level of the selected audio/video source. Press a second time to cancel.

REM: press to enable use of the remote control to operate selection of sources, settings of volume, bass, treble, etc. Press a second time to cancel use of the remote control.

NOTE
Point the remote control in direction of the Sound Selector.

RAD1: press to select the dashboard radio as current source audio for the chosen area.

RAD2: press to select an optional radio (satellite radio for example) as current audio source for the chosen area.

D-MIC: press to turn on driver microphone (function not available on certain microphone type). A gong can be heard and the current audio source volume in the passenger's area is reduced. Press a second time to turn off. When the microphone is activated, turn VOLUME/VALUE button to adjust volume. Also, you can turn on the microphone simply by pressing its on/off switch.

NOTE

Adjustment for background music

When microphone is activated, the current audio source will reduce to a certain level which as been set at the factory. To adjust it, proceed as follow:

1- *Press AUX1 and VOLUME/VALUE at the same time.*

2- *Turn VOLUME/VALUE knob to adjust the background music volume.*

3- *Press AUX1 and VOLUME/VALUE once again to save the setting.*

Adjustment for gong sound

When microphone is activated, a gong can be heard. Gong sound level as been set at the factory. To adjust it, proceed as follow:

4- *Press AUX2 and VOLUME/VALUE at the same time.*

5- *Turn VOLUME/VALUE knob to adjust gong volume.*

6- *Press AUX2 and VOLUME/VALUE once again to save the setting.*

G-MIC: press to turn on the guide microphone (function not available on certain microphone type). Press a second time to turn off. When the microphone is activated, turn VOLUME/VALUE button to adjust volume. Also, you can turn on the microphone simply by pressing its on/off switch.

CD1, CD2, CD3: press to select up to 3 different remote CD players as current source.

DVD1: press to select DVD Player #1 as current source.

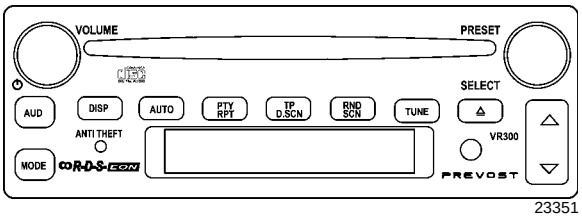
DVD2: press to select DVD Player #2 as current source.

VHS: press to select VHS as current source.

NOTE

Remote control battery replacement. Use CR2025 lithium battery.

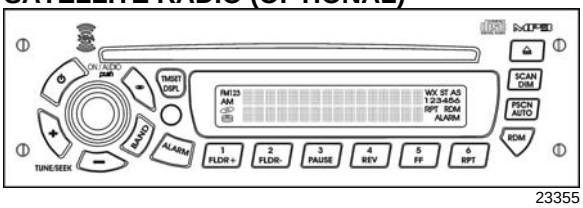
VR300 CD/AM/FM STEREO RECEIVER



23351

You can select from several bands of entertainment (AM/FM) and information (WX weather band) radio services. You can play a CD inserted in the radio's CD slot or control a remote CD Changer with this unit. The complete radio operating instructions manual is included in *section 23: Accessories* of your vehicle's maintenance manual.

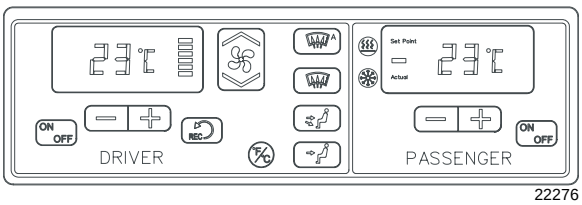
SATELLITE RADIO (OPTIONAL)



23355

This satellite radio may be located on the dashboard or inside the first driver's side overhead compartment. The complete operating instruction manual is included in your vehicle's *technical publications box*.

HVAC CONTROL UNIT



22276

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

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

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

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

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

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

The driver's and the passengers' units may be turned ON by pressing the following button:

Also, the driver's HVAC section turns on automatically at starting of the engine and uses the settings that were kept in memory before turning off of the system.

The A/C compressor starts automatically when the two following conditions are satisfied:

1. The outside temperature is above 32°F (0°C).
2. The passenger's area temperature has reached 7°F (4°C) under the set point.

NOTE
Upon starting, if the outside temperature is above 32°*F (0°C) and then drops below* 32°*F (0°C), the compressor will keep running up to a temperature of 15°F (-9°C) to prevent condensation from forming on the windows.*

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

Heating Mode Indicator


22135

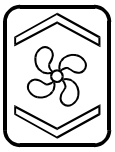
This red LED illuminates when system is heating.

Cooling Mode Indicator


22134

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

Fan Speed


22135

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

Recirculate

22138

Closes or opens the driver's and passenger's section fresh air damper.

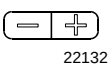
A red LED in the top right corner of the button illuminates when air is recirculated. Use for faster driver's section heating.

This feature is automatically cancelled when defogging is activated.

Driver's section temperature setting

The temperature displayed on the driver's side HVAC control unit is the temperature set point.

To increase the temperature set point, press on the "+" sign, to decrease the temperature set point, press on the " - " sign. Temperature range is between 60°F and 82°F (16°C to 28°C). On the driver's side only, asking for a temperature set point above 82°F (28°C) will keep the coolant valve open and "FUL" will be displayed.

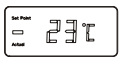

22132

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

⚠ WARNING ⚠

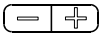
Warm temperatures may cause drowsiness and affect alertness while driving. Keep the temperature comfortable but not to high.

Passenger's section temperature setting



The temperature displayed on the passenger's side HVAC control unit is the actual temperature in the passenger's area.

To increase or decrease the temperature set point in the passenger's area, press on the "+" or the " - " sign. Pressing these buttons will flash the displayed set point and the word "SET" will highlight. Temperature range is between 60°F and 82°F (16°C to 28°C).



22132

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

NOTE

Upon starting of the vehicle, when the ambient temperature is very cold and so is the inside of the vehicle, the HVAC control unit will permit a temperature overshoot up to 3° over the passenger’s area set point to help warming up of the area because some parts of the vehicle like the seats and the overhead compartments accumulate cold.

Windshield Defogger

Upon pressing this button, the dashboard damper sends air only to the lower windshield. The fan is turned on to maximum speed, the fresh air damper opens completely (REC off) and the driver set point is increased to 4°F (2°C) over the passenger's section set point.

The dashboard damper sends air only to the lower windshield when activated. The footwell damper is closed also but the fan speed can be reduced or increased.

Panel and Footwell

22137

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

Panel

22136

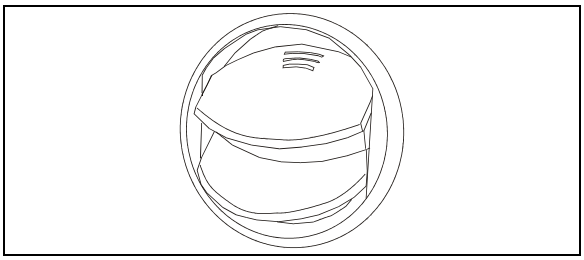
Air is sent to panel registers. The foot damper is closed.

Temperature Degree Selector

22133

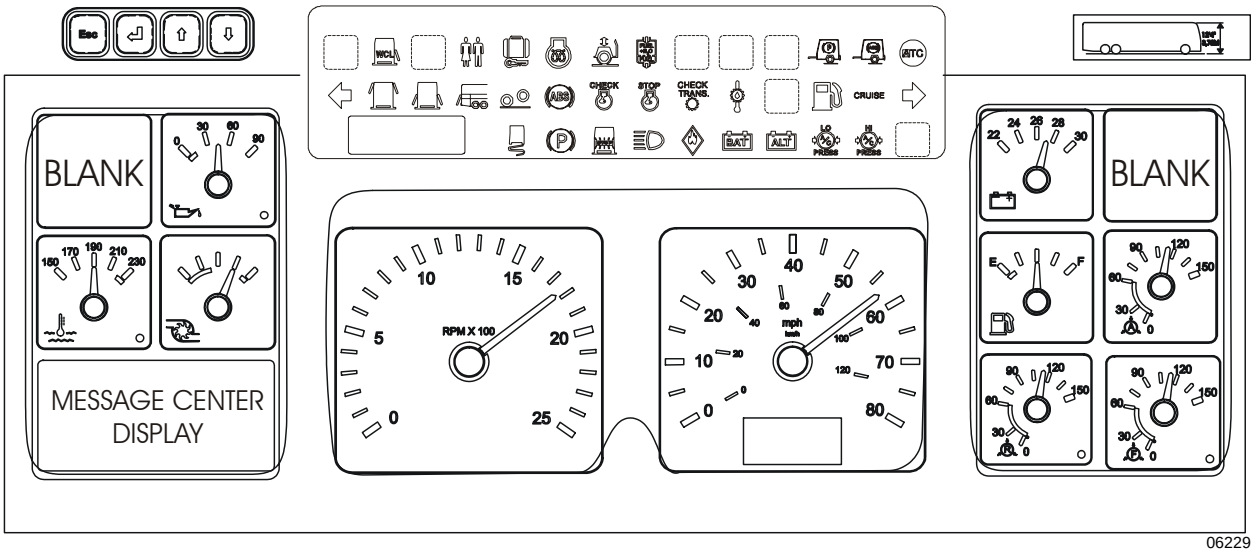
Toggles the HVAV control unit temperature units between Fahrenheit and Celsius. The driver’s section must be on. Also toggles the outside temperature units displayed on the telltale panel.

AIR REGISTERS



AIR REGISTER

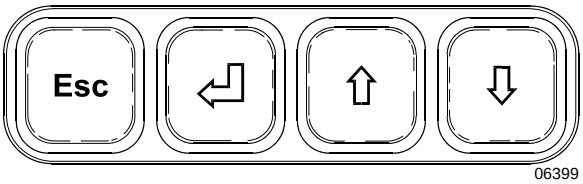
Three adjustable driver air registers in the dashboard and one near the door feed air to the driver's compartment. Use the HVAC control panel to set air temperature and fan speed.



CLUSTER

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

MESSAGE CENTER DISPLAY (MCD)

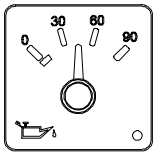


This standard feature gathers, stores and displays important information about the vehicle's operation on a display screen on the lower left portion of the cluster. Refer to Message Center Display in Other Features chapter for a description of how to set up and operate the Message Center Display.

GAUGES

NOTE
Do not refer to dashboard instruments during adjustment procedures. Use only calibrated gauges.

Engine Oil Pressure



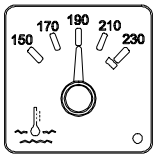
Indicates engine oil pressure. The normal reading should be between 50 and 70 psi (345 - 480 kPa) at 55 mph (90 km/h).

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

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

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

Engine Coolant Temperature



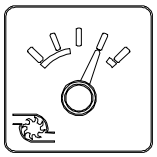
06231

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

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

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

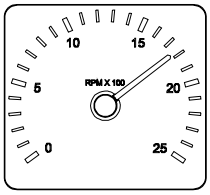
Turbo Boost Pressure



06230

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

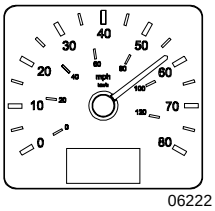
Tachometer



06221

Indicates the operating speed of the engine in hundreds of revolutions per minute (rpm x 100). The tachometer serves as a guide for gear shifting and helps to prevent engine over-speeding when driving downhill with the JACOBS engine brake operating. The maximum allowed engine speed is 2,450 rpm.

Speedometer

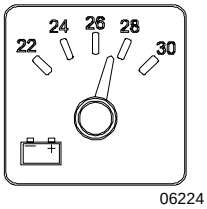


06222

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

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

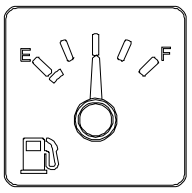
Voltmeter (24-Volt System)



06224

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

Fuel Level



06225

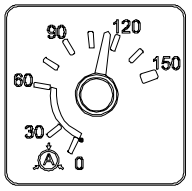
Indicates the amount of fuel remaining in the fuel tank.

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

⚠ CAUTION ⚠

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

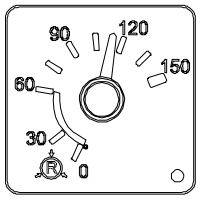
Accessories Air Pressure



06226

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

Primary System Air Pressure (Rear)



06228

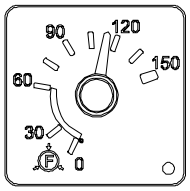
Indicates the primary air system pressure. The normal operating pressure is from 95 to 125 psi (655 to 860 kPa).

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

⚠ WARNING ⚠

Do not drive the coach when air pressure is low.

Secondary System Air Pressure (Front)



06227

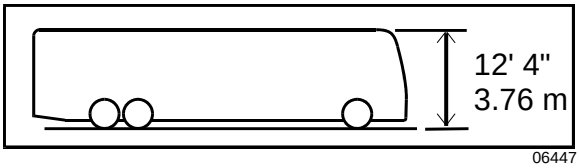
Indicates the secondary air system pressure. The normal operating pressure is from 95 to 125 psi (655 to 860 kPa).

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

⚠ WARNING ⚠

Do not drive the coach when air pressure is low.

VEHICLE CLEARANCE INFORMATION



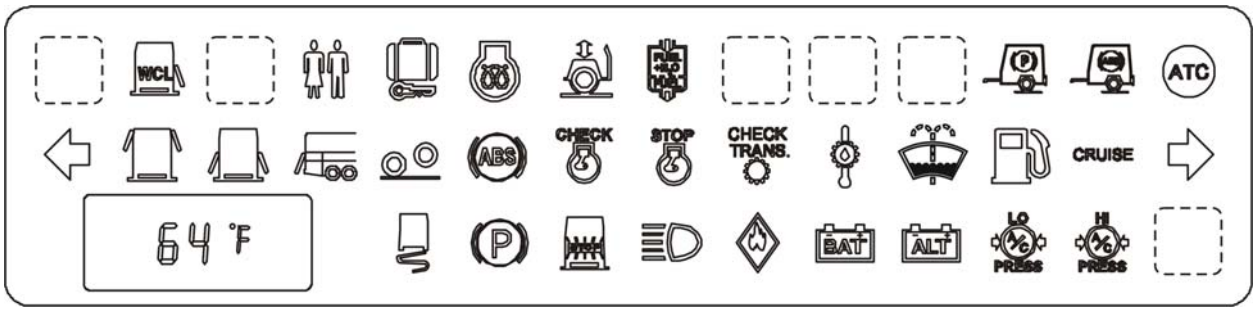
06447

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

⚠ CAUTION ⚠

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

TELLTALE PANEL



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

Wheelchair Lift

06299

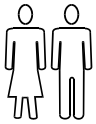
Illuminates when the wheelchair lift is enabled and when the wheelchair lift compartment door and/or the wheelchair access door are open.

The parking brake is activated when this door is open. Refer to Other Features chapter.

⚠ WARNING ⚠

Opening the door at a speed under 5 mph (8 km/h) will activate the parking brake and sound an audible alert.

Lavatory Door Locked


06375

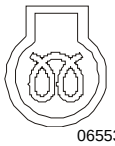
Illuminates when the lavatory door is locked

Baggage Bay Unlocked


06387

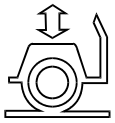
Illuminates when one or more bays are unlocked.

Preheater (option)


06553

Illuminates when the preheating system is in operation.

Kneeling / Hi-Buoy Active


06448

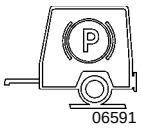
Illuminates when Kneeling or Hi-Buoy is active. An audible alert also informs the driver during operation. Refer to Safety Features and Equipment chapter.

Fuel Filter/Water Separator

06291

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

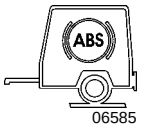
Trailer Emergency / Parking brake



06591

Illuminates when the trailer emergency/parking brake is unexpectedly applied as when the vehicle is moving and a parking brake air line rupture happens.

Trailer Antilock Brake System (ABS)



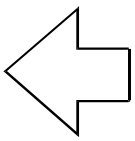
06585

Illuminates when the trailer ABS is malfunctioning.

Automatic Traction Control (ATC)

Illuminates when the automatic traction control system intervenes to prevent excess wheel spin during acceleration.

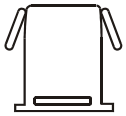
Left Turn Signal


06290

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

NOTE
The directional signals are automatically activated when the vehicle is backing up.

Emergency Window Open

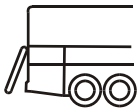

06287

Illuminates when an emergency window is open or unlocked.

Baggage Bay Door Ajar

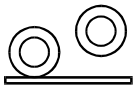
Illuminates when one or more baggage bay doors are ajar.

Engine Door Ajar



Illuminates when the engine compartment door is ajar.

Retracted Tag Axle


06271

Illuminates when the tag axle is retracted. The telltale panel audible alarm will sound to warn the driver. The control valve is located on the L.H. lateral console.

Antilock Brake System (ABS)

06272

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

Check Engine

06281

Illuminates when the ignition switch is *ON* as a light bulb check. The light should turn *OFF* after five seconds. If the indicator remains *ON* after five seconds or comes *ON* sometime after starting the engine, the Detroit Diesel Electronic Control (DDEC) system has detected a minor problem.

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

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

STOP Engine

06309

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

If the indicator remains illuminated after five seconds or comes *ON* sometime after starting the engine, the DDEC system has detected a major problem. Immediately park the coach in a safe place and stop the engine.

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

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

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

Check Transmission

06282

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

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

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

Any time the CHECK TRANS telltale light illuminates, the ECU will register a diagnostic code. It may be identified on the display (Allison & ZF-Astronic transmission) or by using a diagnostic tool. Refer to "Technical Information" chapter.

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

Transmission fluid Temperature


06292

Illuminates when the transmission fluid temperature is too high (Allison transmission only). Disengage the retarder to allow the oil temperature to cool down.

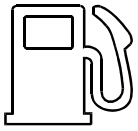
Windshield Washer or Headlights Washer Fluid Low


066001

Illuminates when the windshield washer or the headlight washer fluid level is low. The washer fluid containers are located inside the front service compartment.

⚠ WARNING ⚠
Do not drive without sufficient washer fluid.

Fuel Level Low


06286

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

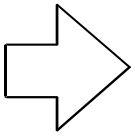
NOTE
Refuel as soon as possible.

Cruise Control Enabled

06284

Illuminates when cruise control is enabled.

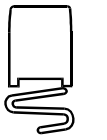
Right Turn Signal


06289

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

NOTE
The directional signals are automatically activated when the vehicle is backing up.

Freezing Conditions


06273

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

Emergency/Parking Brake

06303

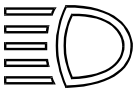
Illuminates when the emergency/parking brake is applied. The control valve is located on the L.H. control panel. An audible alert will sound if ignition is turned to *OFF* and the parking brake is not engaged.

Stoplights ON

06305

Illuminates when rear stoplights illuminate. This occurs when service brake, engine retarder or transmission retarder is applied and when the parking brakes are applied with engine running.

High Beam ON


06300

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

Fire Detected


06288

Illuminates if a fire is detected in the engine compartment while the vehicle is on the road. An audible alert informs the driver when a fire is detected. In case of fire detection when parked (parking brake applied, engine running or not), the electric horn is activated to alert the driver. Refer to Safety Features and Equipment chapter.

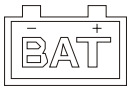
⚠ **WARNING** ⚠
In case of a fire, stop the vehicle immediately, stop the engine and evacuate the vehicle.

NOTE
It is possible to cancel an alarm while on the road. To do so, stop the vehicle. Cycle the ignition between the ON and OFF position and then start the vehicle normally. This can be done on a temporary basis when a false alarm is activated by a defective fire detector. The driver can go on without being annoyed by the alarm.

NOTE
To stop the electric horn alarm when parked, cycle the ignition between the ON and OFF position twice within 3 seconds.

NOTE
For extinguisher's location, refer to Safety Features and Equipment chapter.

Battery Voltage Incorrect



Illuminates when the battery voltage is too high, too low or not equalized.

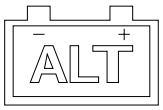
NOTE
To identify the battery problem (too high, too low or not equalized voltage), using the message center display (MCD), perform a system diagnostic by selecting SYSTEM DIAGNOSTIC, FAULT DIAGNOSTIC & ELECTRICAL SYSTEM and see the fault messages.

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.

NOTE
To prevent discharge of the batteries when the engine in not running, some functions are automatically switched off if the batteries voltage drops below 24.4 volts for more than 30 seconds. The "BAT" telltale light blinks while this protection mode is active. Set the ignition key to the OFF position and then turn the ignition key to the ON position to reactivate the functions for a period of 30 seconds before they switch off again.

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

Alternator



Illuminates when one of the alternators is not charging.

NOTE
To identify which alternator is defective (1=lower, 2=upper), using the message center display (MCD), perform a system diagnostic by selecting SYSTEM DIAGNOSTIC, FAULT DIAGNOSTIC & ELECTRICAL SYSTEM and see the fault messages.

A/C System Pressure Low

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

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

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

A/C System Pressure High

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

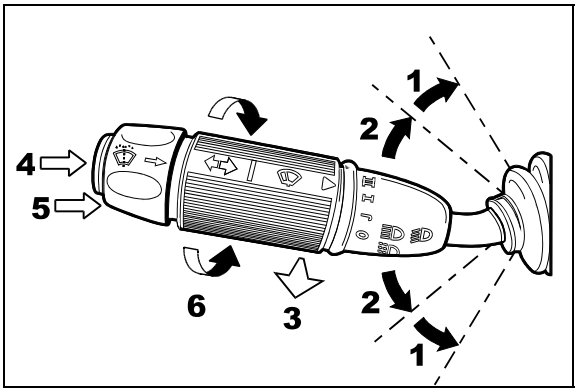
Refer to the Maintenance Manual for information on control panel troubleshooting mode.

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

STEERING COLUMN CONTROLS

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

MULTI-FUNCTION LEVER



MULTI-FUNCTION LEVER **23133**

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

Turn Signal (1)

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

Lane Change Signal (2)

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

Headlight Beam Toggle Switch (3)

Toggle between high and low beams by pulling the lever up towards you. To flash the headlights, pull the lever up halfway. The lever will spring back into normal position once released.

Courtesy Blinkers (4)

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

Windshield Washer Control (5)

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

⚠ WARNING ⚠

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

⚠ CAUTION ⚠

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

Windshield Wipers (6)

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

⚠ CAUTION ⚠

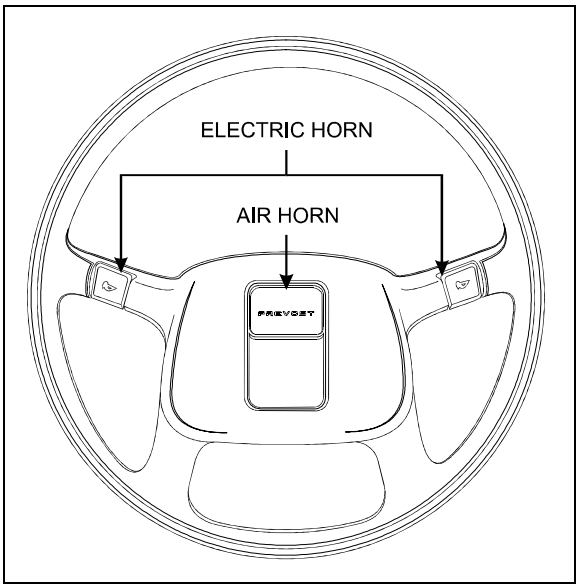
To avoid scratching the windshield, do not operate the wipers when the windshield is dry. To avoid damaging the wiper motor, free wiper blades that may be frozen to the windshield before operating the wipers.

ELECTRIC HORN

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

NOTE

When the vehicle is stationary, the electric horn will sound to inform the driver that a fire is detected in the engine compartment.

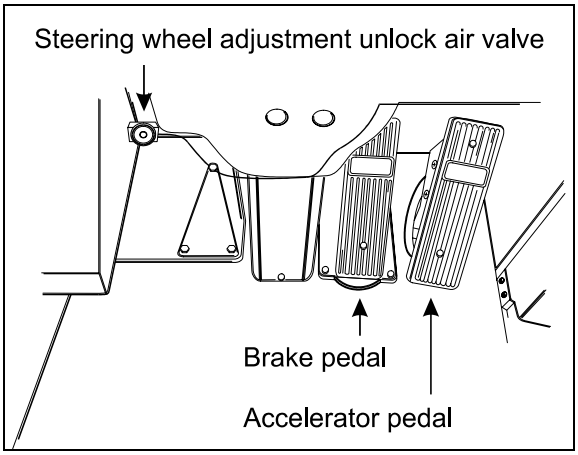


STEERING WHEEL 14029

AIR HORN

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

FOOT-OPERATED CONTROLS



FOOT OPERATED CONTROLS 00023A

BRAKE PEDAL

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

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

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

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

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

⚠ WARNING ⚠

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

⚠ WARNING ⚠

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

⚠ CAUTION ⚠

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

ACCELERATOR PEDAL

Controls engine RPM as needed.

NOTE

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

⚠ CAUTION ⚠

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

STEERING WHEEL ADJUSTMENT UNLOCK AIR VALVE

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

⚠ WARNING ⚠

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

ALLISON TRANSMISSION

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

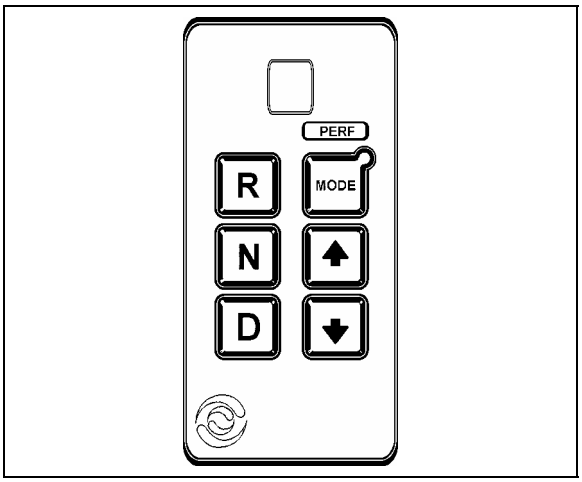
OPERATION

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

NOTE

As a light bulb and systems check, the "CHECK TRANS" light will illuminate when the ignition switch is turned to ON. After about two seconds the light will turn off. If the "CHECK

TRANS" light remains on, the self-diagnostic system has detected a problem. If the problem disappears, the light will go out, but a trouble code will remain stored in the ECU.



WORLD TRANSMISSION CONTROL PAD 07025

RANGE SELECTION – PUSH BUTTON SHIFTER

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

The digital display indicates the selected gear of transmission operation.

The function of each button is as follows:

- o Select REVERSE gear by pressing "R".
- o 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.
- o Select DRIVE range by pressing "D". The highest forward gear will appear on the display and the transmission will shift to the starting gear (not shown on the display).

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

FUNCTIONS OF THE "MODE" BUTTON

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

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

The *"PERF"* (performance) mode keeps upshifts at 2000 rpm in fifth and sixth gears. This makes for better performance than the economy mode but with higher fuel consumption. It is recommended this mode be selected while driving up or down grades. The mode status will be indicated on the digital display by a red LED illuminating in the upper right corner of the MODE button when selected.

Oil Level Display Mode (optional)

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

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

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

Diagnostic Display Mode

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

Reverse (R)

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

Neutral (N)

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

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

⚠ WARNING ⚠
Always apply parking brake before leaving driver's seat.

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

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

Drive (D)

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

IMPORTANT NOTE
Brake pedal must be applied when selecting Drive (D) otherwise the transmission will stay in neutral (N).

o First range (1):

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

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

o Second range (2)

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

o Third and fourth ranges (3 and 4)

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

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

⚠ CAUTION ⚠

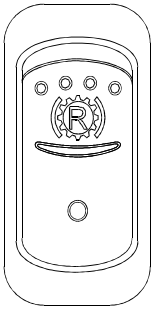
When descending in lower ranges, care must be taken that engine speed does not exceed 2,450 rpm.

TRANSMISSION OUTPUT RETARDER

The transmission output retarder is available only with the Allison transmission.

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

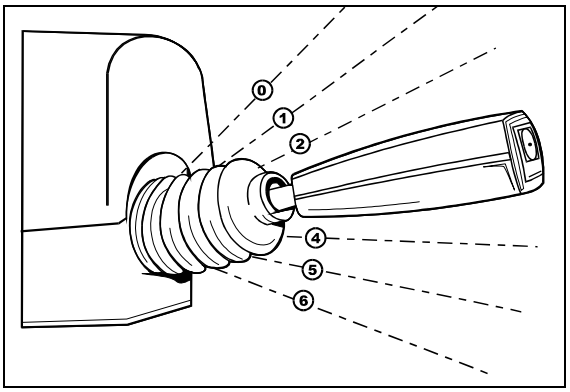
To use the transmission output retarder, it must be activated by pressing the appropriate rocker switch on the dashboard.



06252

Press down rocker switch to activate the optional transmission output retarder.

OPERATING THE RETARDER USING THE HAND LEVER



RETARDER HAND LEVER 07043

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

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

NOTE

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

OPERATING THE RETARDER USING THE BRAKE PEDAL

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

NOTE

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

ZF-ASTRONIC AUTOMATIC TRANSMISSION

RANGE SELECTOR KEYPAD

The range selector keypad contains 6 keys and a display.

"**R** " Reverse travel

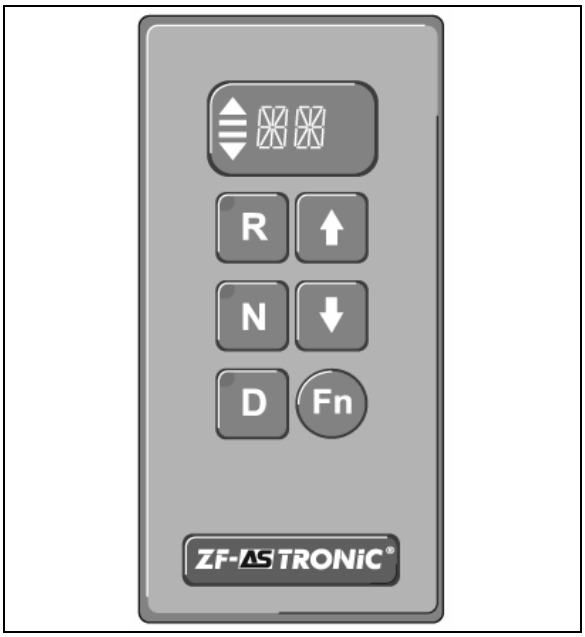
"**N** " Neutral (no gears selected in transmission)

"**D**" Forward travel

" ⇧ " Upshift

" ⇩ " Downshift

"**Fn**" Switches between manual and automatic mode.



RANGE SELECTOR KEYPAD 07081

INDICATOR LIGHT

Flashing: Transmission function change requested. Function change is completed when indicator light is permanently illuminated.

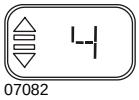
Permanently illuminated: Function in use.

NOTE
*The "**R**", "**N**" and "**D**" ranges are only selected once the keys are released. If the keys are held down for more than 5 seconds, the shifting request is ignored. The " ⇧ ", " ⇩ " and "**Fn**" selection keys are activated when pressed*

DISPLAY

The display indicates the number of the selected gear, the neutral position as well as faults.

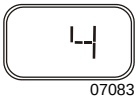
Display: Automatic mode


07082

Transmission in automatic mode (2 bars and 2 arrows)

4th gear selected in transmission

Display: Manual mode


07083

4th gear selected in transmission (No bars or arrows are displayed)

ACCELERATOR PEDAL

The position of the accelerator pedal does not need to be changed during the shifting process. The clutch actuation and engine speed are controlled by the electronic transmission control unit (ECU) depending on accelerator pedal position.

AUTOMATIC MODE

If the "**D**" key is pressed, the gear shifting system selects the most appropriate gear for starting. The 2nd gear is the default starting gear; however, the system will select the 1st gear if necessary like when starting the vehicle on a slope. Once the accelerator is depressed, the clutch engages automatically and then the vehicle starts to move. The gear shifting system automatically performs upshifts and downshifts during travel. When in automatic mode, the gear shifting system avoids shifts which result in the engine overspeeding or stalling. The driver can always intervene manually (upshift and downshift) with no need to change the accelerator pedal position – for example, in difficult driving situations. The driving mode then changes from automatic to manual for approximately 20 seconds.

MANUAL MODE

If the "**Fn**" key is pressed, the transmission system changes into manual mode. The driver can also press the upshift or downshift key to select a moving off gear other than the one proposed by the system. Once the accelerator is depressed, the clutch engages automatically and the vehicle starts to move. The driver uses the key " ⇧ " or " ⇩ " to select the gears required.

NOTE
The driver must avoid overspeeding the engine. The engine may stall if the accelerator is depressed in a gear too high.

EASY START SYSTEM

This system intervene during passage from neutral "**N"** to forward travel "**D"** or reverse travel "**R"** in maintaining drive axle service brakes application for 2 seconds after brake pedal has been released. This system eases the starting of the vehicle on a slope, preventing it from rolling while the clutch is not fully engaged.

DRIVING TIPS

⚠ CAUTION ⚠

The engine 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. The driver must not leave the vehicle when the engine is running and a gear is selected.

⚠ CAUTION ⚠

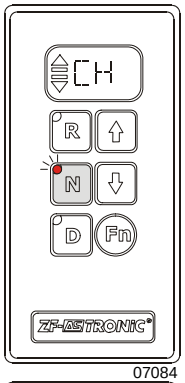
Do not allow the vehicle to coast in neutral (N). This practice can result in transmission damage. Also, no engine breaking is available in neutral (N).

Indicator light in the "R", "N" and "D" keys

Flashing: Transmission function change requested. Function change is completed when indicator light is permanently illuminated.

Permanently illuminated: Function in use.

STARTING THE ENGINE



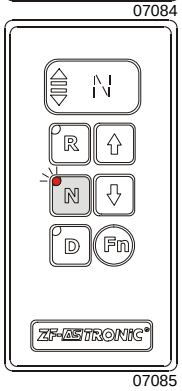
07084

o Apply parking brake

o Switch on "ignition"

o Transmission system self-check. "**CH"** appears on the display.

The indicator light of the "**N"** key lights up as soon as the neutral transmission shift has been completed.



07085

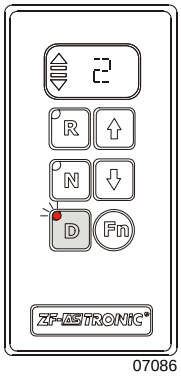
o Start the engine

o Self-check is completed when "**N**" (neutral) appears on the display, transmission is in neutral setting. On start-up, automatic mode is default selection.

NOTE

Gear shifts are not possible when the engine is not running.

SETTING OFF, FORWARD TRAVEL



07086

o Start the engine

o Apply service brakes (activation of Easy Start) and depress "**D**" key. Automatic mode is activated.

o The display shows the starting gear selected.

o Indicator light of "**D**" key lights up. (The system selects the 2nd starting gear, the clutch remains disengaged.

o Release the service brakes and depress accelerator pedal.

⚠ CAUTION ⚠

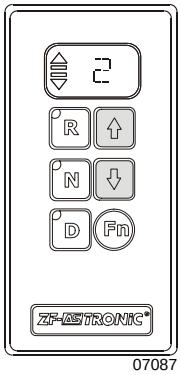
The vehicle may roll away even if the accelerator is not depressed after the service brakes have been released by Easy Start System.

IMPORTANT NOTE

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

o Vehicle sets off (clutch engages automatically)

CORRECTING THE STARTING GEAR



07087

The system selects 2nd starting gear as default. The driver may select 1st starting gear.

To undertake a correction:

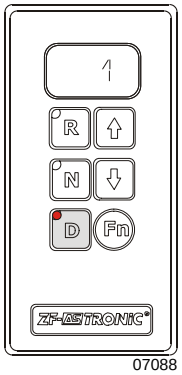
o Depress " ⇩ " key to select 1st gear.

o The display shows the starting gear selected.

NOTE
It is recommended to select the 1st starting gear for starting on a slope

MANEUVERING MODE

Maneuvering mode is provided for extremely slow travel. The 1st gear and the reverse gear are provided as maneuvering gears. Maneuvering mode is not available in the other gears. To engage maneuvering mode, select 1st gear or reverse gear "**R**" using " ⇧ " or " ⇩ " key. When in maneuvering mode, the clutch control differs from the normal driving mode. The accelerator pedal controls the clutch action just like a clutch pedal would. This control is available from 0 to 70% of the accelerator pedal stroke. Over 70% of the stroke, the clutch is fully engaged, and a change will be made from maneuvering mode into setting off mode. The vehicle may accelerate suddenly.



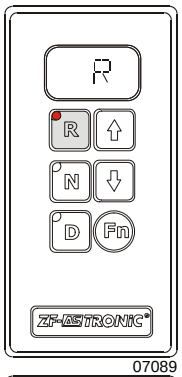
07088

Unlimited maneuvering time.

The "**CL**" (clutch) display appears when the clutch is overloaded.

⚠ CAUTION ⚠

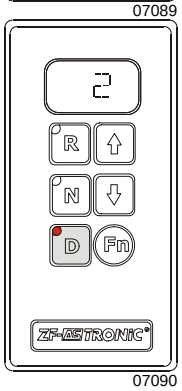
If the driver does not respond to the "C" display, the clutch may be damaged as a result of overload.



07089

Unlimited maneuvering time.

The "**CL"** (clutch) display appears when the clutch is overloaded.



07090

⚠ WARNING ⚠

If the driver does not respond to the "CL", a change is made from maneuvering mode into setting off mode. The vehicle may accelerate rapidly.

STARTING TO ROLL ON SLOPES

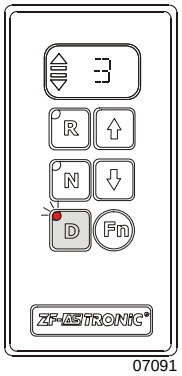
Precondition: the engine must be running.

⚠ WARNING ⚠

If the vehicle starts to roll and no gears are selected (the indicator light of the "N" key lights up), the engine brake is ineffective.

⚠ CAUTION ⚠

Do not allow the vehicle to roll in the opposite direction of travel than the gear selected.

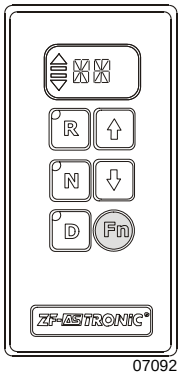


07091

If the vehicle rolls forward with transmission in neutral "**N**" after that the brake is released and the driver shifts from "**N**" to "**D**", the system selects a gear suitable for the running speed.

CHANGING BETWEEN MANUAL MODE AND AUTOMATIC MODE

Always possible, even if the vehicle is in motion.



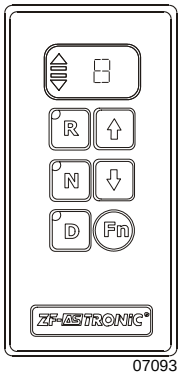
07092

Changing from manual to automatic mode.
o Depress the "**Fn**" key

Changing from automatic to manual mode.
o Depress the "**Fn**" key

CHANGING GEAR

Changing gear in automatic mode



07093

o All upshifts and downshifts are performed automatically.

o They depend on:
o The drive situation.
o The load.
o The accelerator pedal position.
o The running speed.
o The engine speed.

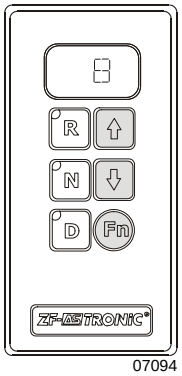
Arrows and 2 bars = automatic mode.

8th gear is selected.

NOTE

If a manual gear shifting is selected, the gear shifting system temporarily exits automatic mode and returns to automatic mode after approx. 10 - 20 seconds if no other manual gear shifting is selected.

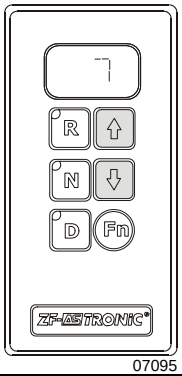
Changing gear in manual mode



07094

o Depress " ⇧ " or " ⇩ " key to select the required gear.

Jumping gears



07095

Jumping one gear:

Depress " ⇧ " or " ⇩ " key twice in rapid succession in the direction required.

Jumping two gears:

Depress " ⇧ " or " ⇩ " key three times in rapid succession in the direction required.

NOTE

*The driver can shift into neutral "**N**" from any gear at any time. This shift process always takes priority.*

o *There is no need to change the position of the accelerator pedal during the gear shifting process because the engine speed is automatically controlled.*

o *A gear shifting command is not carried out if this shift would result in the maximum engine speed (governing speed) being exceeded.*

⚠ WARNING ⚠

If the driver shifts to neutral "N" during travel, the engine brake is then no longer effective.

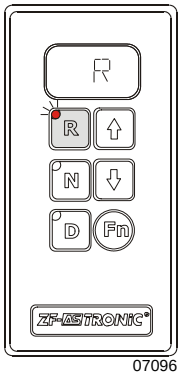
Engine braking effect when changing gear

The engine brake is deactivated by the system during gear shifting. Once the gearshift is completed, the engine brake is then automatically reactivated. If the engine brake is actuated, the system switches back into automatic mode so that the maximum engine braking effect is achieved.

⚠ WARNING ⚠

The effect of the engine brake is interrupted during gear shifting. The vehicle may accelerate when traveling downhill.

REVERSING



07096

Selecting reverse gear:

- o The vehicle **must** be at a standstill.
- o Apply service brakes (activation of Easy Start System) and depress" **R**" key.
- o "**R**" appears in the display (clutch remains disengaged). Indicator light of "**R**" key lights up.
- o Release service brakes and depress accelerator pedal (clutch engages automatically).
- o Vehicle moves backwards.

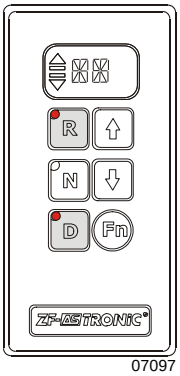
⚠ CAUTION ⚠

If the vehicle is rolling, shifts cannot be made into reverse. Stop the vehicle immediately.

⚠ CAUTION ⚠

The vehicle may roll away even if the accelerator is not depressed after the service brakes have been released by Easy Start System.

CHANGING DIRECTION OF TRAVEL (FORWARD/ REVERSE)



07097

Changing from "**R**" to "**D**" direction of travel

- o The vehicle **must** be at a standstill
- o Depress "**D**" key

Changing from "**D**" to "**R**" direction of travel

- o The vehicle **must** be at a standstill
- o Depress "**R**" key

⚠ CAUTION ⚠

A change in the direction of travel may only be undertaken when the vehicle is at a standstill otherwise the transmission will shift into neutral. While the indicator light is flashing, this indicates that the gear change is not yet complete.

STOPPING VEHICLE

- o Do not actuate the accelerator and use the service brake to bring the vehicle to a standstill.
- o The clutch disengages automatically before the vehicle reaches a standstill so that engine "stalling" is prevented.
- o Always actuate service brake or parking brake if vehicle is not moved.

⚠ CAUTION ⚠

To preserve the mechanical components of the clutch releasing mechanism, the transmission should be shifted to neutral "N" if the vehicle stops for a long periods of time (more than approx. 1 to 2 min., for example, in traffic jams, at railway crossings etc.). This disengages the clutch and relieves the clutch releasing mechanism.

⚠ WARNING ⚠

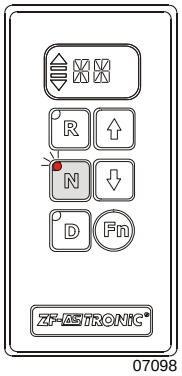
If the vehicle is at a standstill with the engine running and a gear selected, the vehicle can be moved by simple depressing the accelerator!

Before leaving a vehicle with the engine running, the transmission must be shifted into neutral and the parking brakes must be applied.

Actuating the parking brake during travel on a slippery road surface may result in the engine coming to a standstill.

Power-assisted steering is then no longer available.

SWITCHING OFF ENGINE/PARKING VEHICLE



07098

- Bring vehicle to a standstill
- Engage parking brakes
- Depress "**N**" neutral key
- "**N**" appears on the display. Indicator light of "**N**" lights up.
- Switch off engine via ignition key

NOTE

*If the transmission is **not** shifted into neutral "**N**" before the engine is switched off, transmission shifts automatically into neutral once the ignition is "Off".*

⚠ WARNING ⚠

When engine is switched off, transmission goes into neutral "N", NO gear is selected. The vehicle may roll away if brakes are not applied.

TOWING

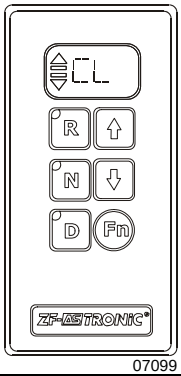
⚠ CAUTION ⚠

To prevent damage to the drive train components, disconnect axle shafts or driveshaft before towing. Do not attempt to push or pull-start the vehicle.

⚠ CAUTION ⚠

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.

CLUTCH PROTECTION



07099

"**CL**" is displayed if there is a risk of clutch overload resulting from several starting processes occurring in a rapid succession or when running very slow in a starting gear too high.

NOTE

Select an operating mode in which the clutch will not be overloaded, for example:

- *Accelerate vehicle (to engage the clutch).*
- *Stop the vehicle.*
- *Set off quickly in a lower gear.*
- *To preserve the mechanical components of the clutch releasing mechanism, the transmission should be shifted to neutral "**N**" if the vehicle stops for a long periods of time (more than approx. 1 to 2 min., for example, in traffic jams, at railway crossings etc.). This disengages the clutch and relieves the clutch releasing mechanism.*

Even though the clutch is automated, the driver still has considerable influence on clutch service life. To minimize the level of wear on the clutch, it is recommended to select the lowest gear as possible when setting off.

ENGINE OVERSPEED PROTECTION

The electronics system only allows shifts to be undertaken if they lie within the speeds specified by the vehicle manufacturer. This is done to the benefit of both engine and transmission.

Manual mode

- If the vehicle accelerates on downhill gradients, an automatic shift is not made into a higher gear.
- Ensure that the engine does not exceed the permitted speed range.

⚠ CAUTION ⚠

The engine may be damaged if the vehicle is accelerated on downhill gradients and the engine thereby enters the overspeed range.

Automatic mode

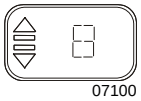
⚠ CAUTION ⚠

The vehicle may accelerate on downhill slopes. The system will then undertake an upshift to protect the engine from damage in the overspeed range (red range).

ZF-ASTRONIC DISPLAY

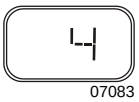
The display provides information on the status of the transmission. It usually shows the gear selected (e.g.: 1 - 10 or "**N**", "**R**").

Automatic mode

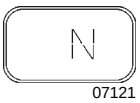

07100

Automatic mode is shown in the display by means of 2 bars and 2 arrows (8th gear is selected in transmission).

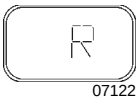
Manual mode


07083

4th gear selected in transmission (No bars or arrows).

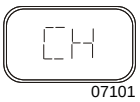

07121

Transmission in neutral position

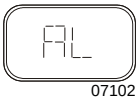

07122

Reverse gear is engaged

Additional display information:


07101

"**CH**" = system self-check appears on display when ignition is ON.


07102

"**AL**" = airless

Alternates with the normal display. The transmission compressed air system has insufficient pressure.

NOTE

Only leave once there is sufficient pressure in the pneumatic system. If pressure is too low when the vehicle stops, do not engage the clutch otherwise the engine will "stall".

⚠ WARNING ⚠

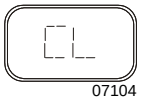
If shifts are undertaken when pneumatic pressure is too low, the transmission may remain in neutral to ensure that there is no direct drive and that the engine brake is effective.


07103

"**FP**" = accelerator pedal

Move accelerator to idling position.

If the display does not go out, there is a system error. Vehicle cannot be driven any further.


07104

"**CL**" = clutch

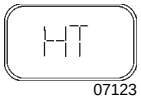
Alternates with the normal display. Clutch is overloaded.

See "CLUTCH PROTECTION"

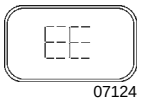

07105

"**CW**" = clutch wear

Visit nearest specialist workshop to replace the clutch.

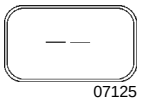

07123

"**HT**" = High temperature


07124

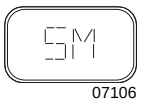
"**EE**" = Electronic Error

Is displayed when communication between the display and the transmission electronics is disturbed


07125

"**--**" = Display Error

Is displayed when communication between the display and the transmission electronics is disturbed

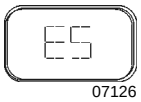

07106

"**SM**" = system malfunction

- **Stop the vehicle**
- **Vehicle may no longer be driven**

⚠ WARNING ⚠

Whenever possible, do not stop the vehicle in danger zones.

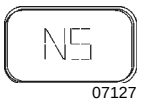


07126

"**ES**" = Easy Start

- **Temporarily, no electronic starting traction control is available**

⚠ WARNING ⚠
The vehicle can start moving.

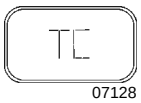


07127

"**NS**" = Neutral Shift

- **Shift transmission to "N" Neutral**

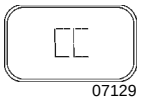
NOTE
Depending on the vehicle type, the transmission can automatically shift to neutral in order to protect the mechanical components of the clutch releasing system after running a certain amount of time.



07128

"**TC**" = Transmission Check

- **Transmission position cannot be learned**



07129

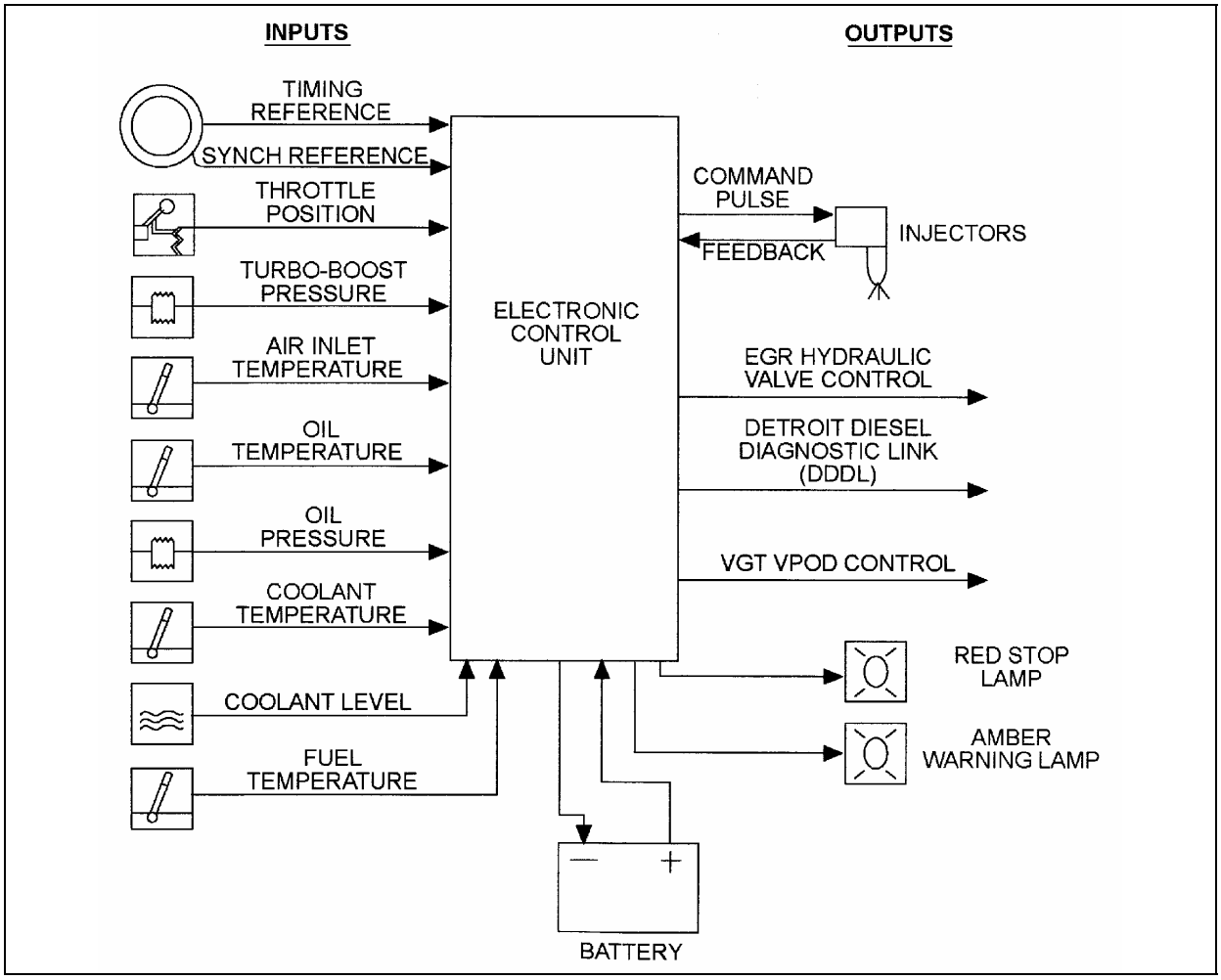
"**CC**" = Clutch Check

- **Clutch position cannot be learned**

Error messages and the reactions resulting from these errors can be deleted with the vehicle at a standstill and the "Ignition OFF".

- o Wait until the display goes out.
- o If the display does not go out once the ignition has been turned "OFF", set the battery master switch to the **OFF** position.
- o Switch the ignition back on.

If the error message is still in place, the transmission has to be repaired. The transmission is inoperative. The vehicle will have to be taken to a service point. The error number(s) must be specified when the service point is contacted. See appendix B for System faults and error messages.



SCHEMATIC DIAGRAM OF DDEC V SYSTEM 01144

DETROIT DIESEL ELECTRONIC CONTROL (DDEC) SYSTEM

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

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

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

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

DDEC provides the capability of quickly diagnosing system malfunctions with a self-diagnostic system. The self-diagnostic system

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

DDEC V ELECTRONIC CONTROL MODULE (ECM)

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

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

The average life span of up to ten components may be specified in terms of miles, fuel used, time, engine rpm and engine hours. The ECM tracks the specified factors and automatically alerts the user when the average component life span has been attained. An event log is also stored which indicates the vehicle status (e.g., off, idle, in motion) at 15 minute intervals.

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

MESSAGE CENTER DISPLAY (MCD)

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

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

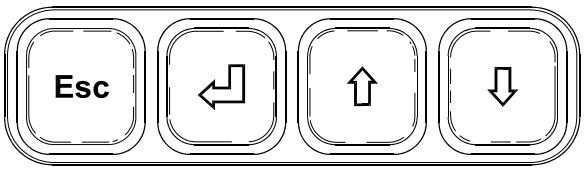
The MCD uses a dashboard integrated liquid crystal display. It provides automated intensity control of the display, based on the dashboard instrument panel lights for improved driver convenience.

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

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

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

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



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

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

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

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

DRIVING MODE MENU

This menu includes the following modes;

Gauge Mode; Fuel Economy, Time/Dist; Faults?.

GAUGE MODE MENU

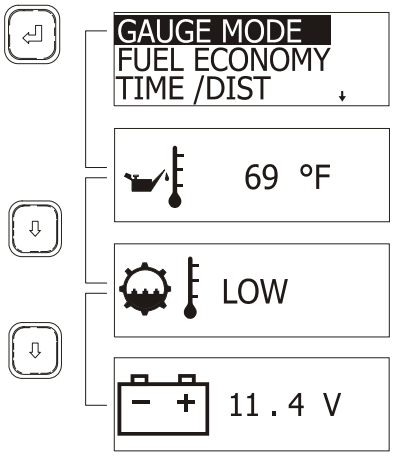
Transmission fluid temperature, engine oil temperature and battery voltage can be displayed in this mode.

To display:

1. Highlight GAUGE MODE;
2. Press enter key (⏎);
3. Choose a gauge using the up (⇧) or down (⇩) arrow keys.

To exit gauge mode, press Esc key.

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



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FUEL ECONOMY MENU

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

To display:

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

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

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

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

TIME / DIST MENU

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

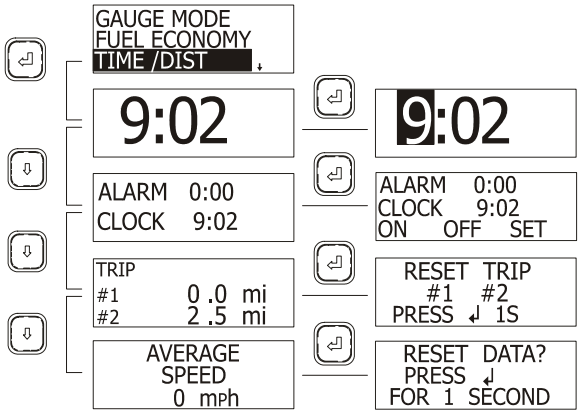
To display the digital clock:

1. Highlight TIME/DIST;
2. Press enter key (⏎);

The digital clock appears;

3. Use up (⇧) or down (⇩) arrow to display the alarm and clock display, the trip odometer display or the average speed counter display.

To exit TIME/DIST menu, press Esc key.



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Setting the Digital Clock

1. Display the clock;
2. Press the enter key (⏎);

The first digit of the time is highlighted.

3. Set the correct value using the arrow keys;
4. Press enter key (⏎);

The next digit of the time is highlighted.

5. Set the correct time using the arrow keys and the enter key;

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

Reminder Alarm

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

To set the alarm:

1. Display the alarm and clock menu;
2. Press the enter key (⏎);
3. Using the arrow keys, highlight ON, to arm the alarm, OFF to disarm the alarm or SET to set the alarm time;
4. Press the enter key (⏎);

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

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

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

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

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

Trip Odometers

Two trip odometers are available for driver convenience.

To reset a trip odometer:

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

To exit anytime, press Esc key.

Average Speed

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

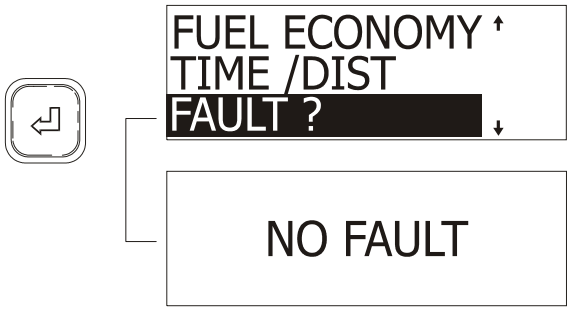
To reset:

1. Display the average speed;
2. Press the enter key (⏎);
3. When prompted, press the enter key for 1 second to reset data.

FAULT ? MENU (Fault messages)

To display logged fault messages:

1. Highlight FAULT ?
2. Press the enter key (⏎);
3. Fault messages are displayed (if any).



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NON-DRIVING MODE MENU

SET UP MODE MENU

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

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

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

Language Selection

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

1. In SET UP MODE, highlight LANGUAGE using the arrow keys;
2. Press the enter key (⏎);

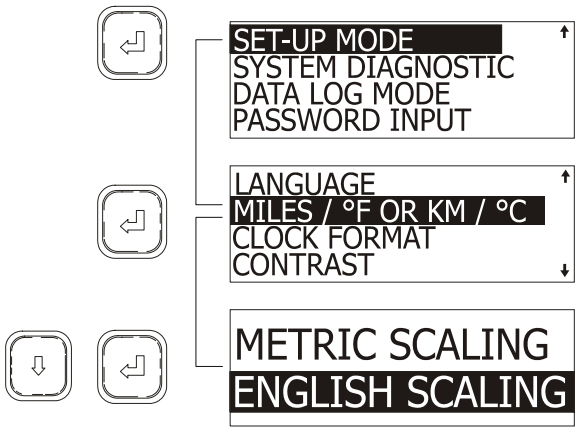
3. Highlight the desired language using the arrow keys;
4. Press enter key (⏎) to confirm the language choice.

The MCD returns to SET UP MODE menu.

Metric or Standard Units

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

The MCD returns to SET UP MODE menu.



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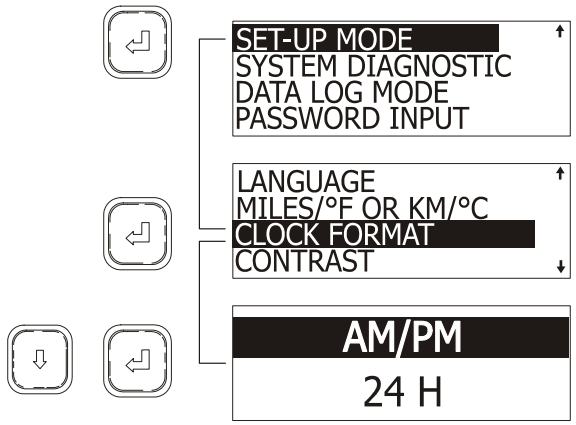
Clock Format

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

The MCD returns to SET UP MODE.

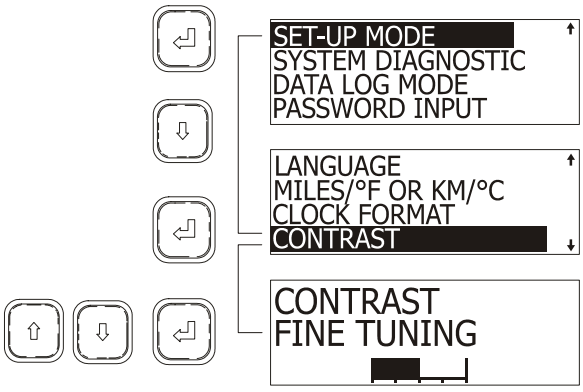


06389

Setting Contrast

1. In SET UP MODE, highlight CONTRAST using the arrow keys;
2. Press the enter key (⏎);
3. Using the arrow keys, set the desired contrast. A horizontal graphic shows state of contrast;
4. Press enter key (⏎) to confirm.

The MCD returns to SET UP MODE.

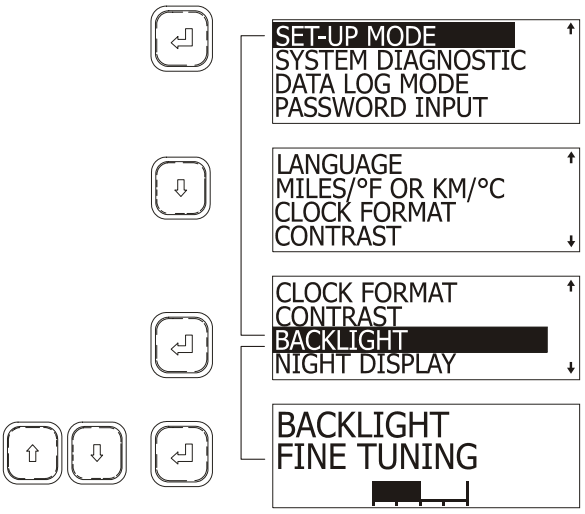


06395

Setting Backlight

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

The MCD returns to SET UP MODE.

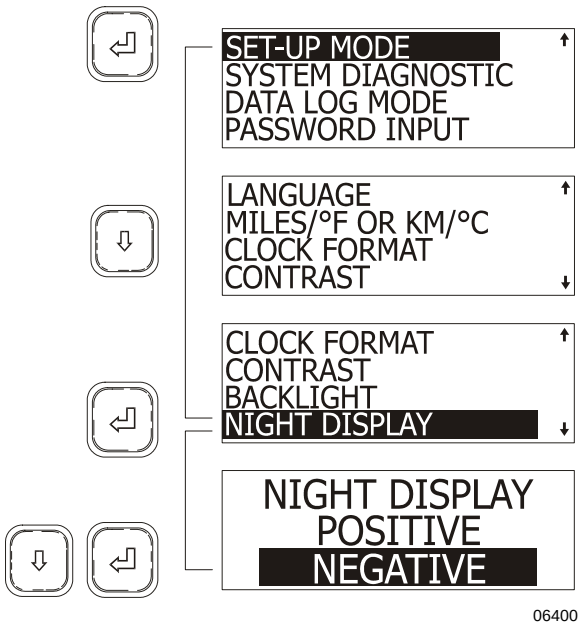


Setting Night Display

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

1. In SET-UP MODE, highlight NIGHT DISPLAY using the arrow keys;
2. Press the enter key (⏎);
3. Highlight the desired display using the arrow keys;
4. Press enter key (⏎) to confirm.

The MCD returns to SET UP MODE.



Setting Default Language

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

1. In SET UP MODE, highlight DEFAULT LANGUAGE using the arrow keys;
2. Press the enter key (⏎);
3. Highlight the desired language using the arrow keys;
4. Press enter key (⏎) to confirm.

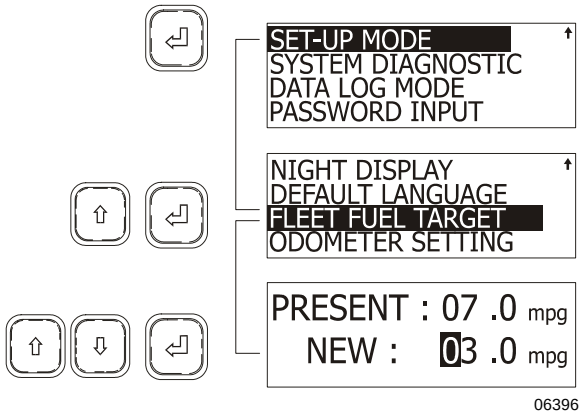
The MCD returns to SET UP MODE.

Setting Fleet Fuel Target

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

1. In SET UP MODE, highlight FLEET FUEL TARGET using the arrow keys;
2. Press the enter key (⏎);
3. Using the arrow keys set the highlighted digit;
4. Press enter key (⏎) to confirm, the following digit is highlighted. Set as in step three;
5. When last digit is set, press the enter key (⏎) to confirm new target.

The MCD returns to SET UP MODE.



Setting the Odometer

This feature is disabled.

SYSTEM DIAGNOSTIC MENU

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

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

Fault Diagnostic

To request a diagnostic:

1. Highlight FAULT DIAGNOSTIC with the arrow keys;
2. Press the enter key (⏎) to confirm.
3. Highlight the component to request a diagnostic using the arrow keys;
4. Press the enter key (⏎).

After showing a fault message or fault code (if any) the MCD returns to FAULT DIAGNOSTIC screen (for the fault code description, see the appendixes at the end of the manual).

To request a general diagnostic:

1. Highlight GENERAL REQUEST using the arrow keys;
2. Press the enter key (⏎).

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

To reset fault codes:

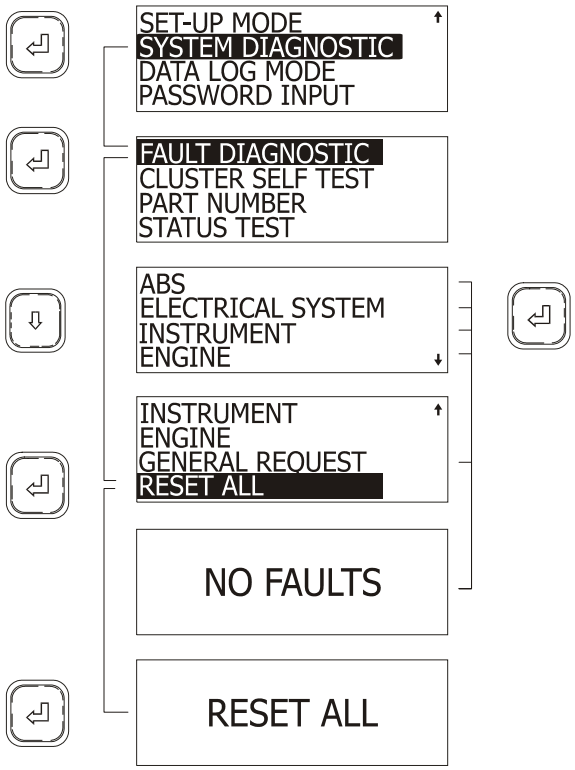
1. Highlight RESET ALL using the arrow keys;
2. Press the enter key (⏎);

The MCD displays RESET ALL.

3. Press enter key (⏎) to confirm.

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

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



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Cluster Self Test

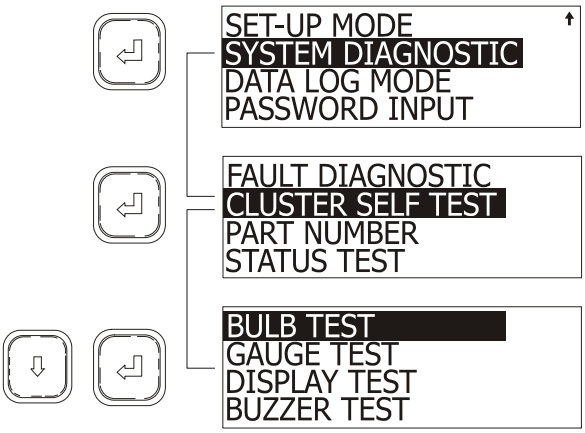
Tests cluster light bulbs, gauges, MCD display and buzzers.

To perform a self test:

1. In diagnostic mode, highlight CLUSTER SELF TEST using the arrow keys;
2. Press enter key (⏎) to confirm;
3. Highlight the test to perform using the arrow keys;
4. Press enter key (⏎) to confirm;

The test may normally take several seconds to perform. The MCD may explain the progression of the test as it runs. The display returns to cluster self test mode once finished.

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



BULB TEST

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

GAUGE TEST

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

DISPLAY TEST

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

BUZZER TEST

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

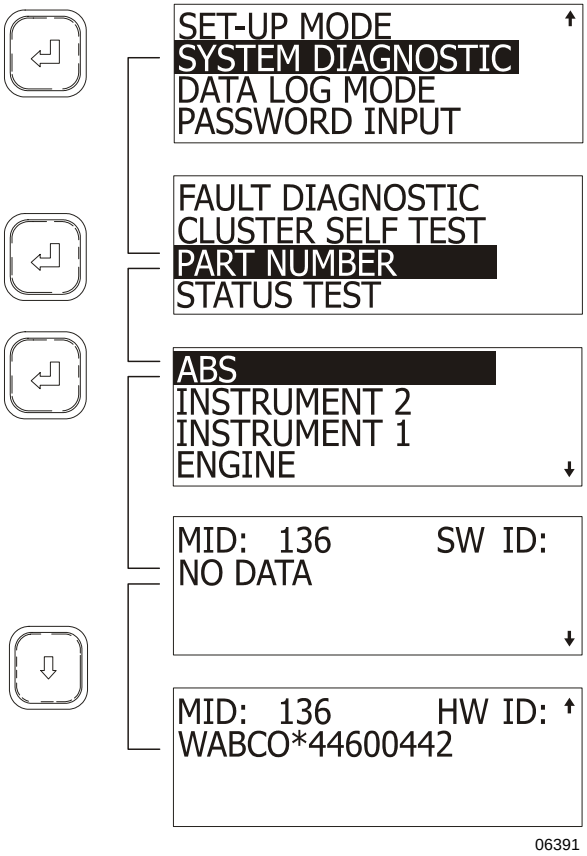
PART NUMBER

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

To access PART NUMBER:

1. When in SYSTEM DIAGNOSTIC menu, highlight PART NUMBER using the arrow keys;
2. Press enter key (⏎);
3. Highlight the desired component;
4. Press enter key (⏎).

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



STATUS TEST

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

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

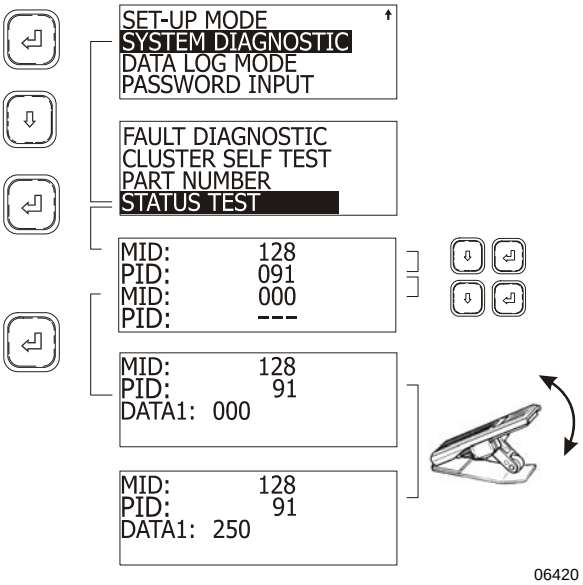
To perform a status test:

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

The MCD now displays in real time the value of the component. The example below shows how changing the throttle position will be displayed

on the MCD. That way one can verify if any identifiable sender unit is working properly or whether the link is OK.

5. Press Esc key to exit.



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

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

DATA LOG MODE MENU

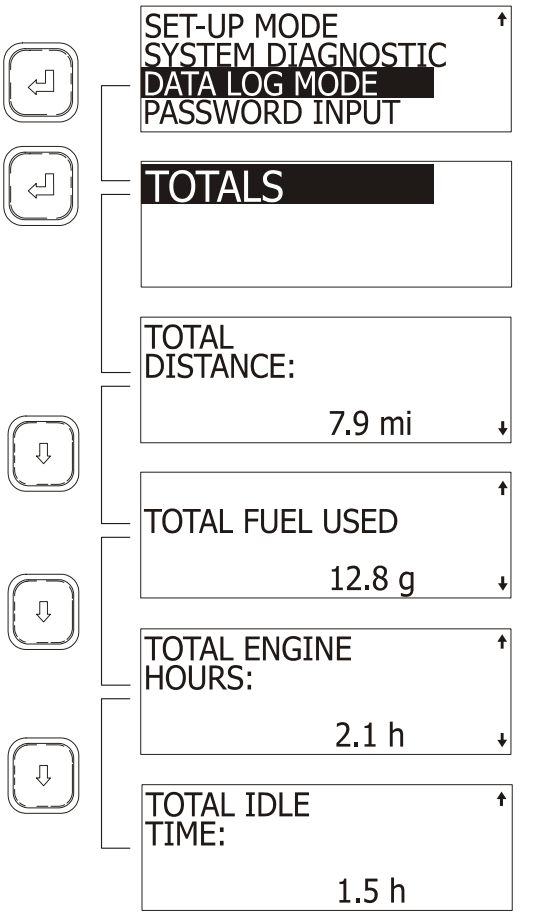
This feature shows total accumulated distance, fuel used engine hours and idle time.

1. To access data log:
2. Highlight DATA LOG MODE using the arrow keys;
3. Press enter key (⏎) to confirm;

The screen shows TOTALS highlighted.

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

Exit by pressing the Esc key.



PASSWORDS

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

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

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

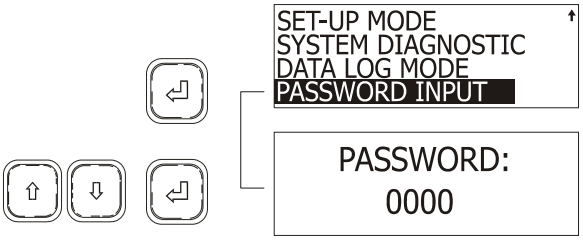
Password Input

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

1. Use the arrow keys to highlight PASSWORD INPUT;
2. Press enter key (⏎) to confirm;
3. Use the arrow keys to set the first digit of the password;

4. Press enter to highlight the next digit;
5. Pressing enter key (⏎) on last digit will confirm the password.

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



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Changing passwords

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

To change passwords:

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

PRODRIVER™

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

- Instantaneous and average fuel consumption rate;
- Trip time, miles driven, fuel used, , average speed;
- Driving time, percentage, miles, fuel used, fuel consumption rate;
- Idle time, percentage and fuel used;
- Cruise time, percentage, miles cruised, fuel used, fuel consumption rate;
- Top gear time, percentage, miles driven, fuel used, fuel consumption rate;
- Overspeed time and percentage for two speed thresholds;
- Over-rev time and percentage;
- Maximum vehicle speed and RPM;
- Coasting time and percentage;
- Automated oil change interval tracking;
- Hard braking incident record;
- Driver initiated incident record;
- Stop Engine and Check Engine code log.

ALLISON TRANSMISSION ELECTRONIC CONTROL UNIT (ECU)

The ECU works with the Allison transmission and with the push-button shift selector.

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

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

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

TRANSMISSION RETARDER

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

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

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

NOTE
Extended use will raise the temperature of the transmission fluid.

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

NOTE
Each time the transmission retarder system is in operation, the stoplights automatically illuminate.

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

JACOBS ENGINE BRAKE

The JACOBS engine brake is an optional diesel engine retarder which uses engine compression to aid in slowing and controlling the vehicle. When activated, (refer to "Controls & Instruments" chapter) 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-slowing device, not a vehicle-stopping device. It is not a substitute for the service braking system. The service brake must be used to bring the vehicle to a complete stop.

Effectiveness of the engine brake system will vary according to the transmission range in use. The engine brake system is more effective in lower ranges and at higher engine speeds.

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

NOTE
Each time the engine brake system is in operation, the stoplights automatically illuminate.

ANTILOCK BRAKING SYSTEM

The purpose of the Antilock 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. Locked wheels also impede directional control and cause severe tire abrasion. An antilock braking system provides maximum braking performance while maintaining adequate control on slippery roads.

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

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

⚠ WARNING ⚠

Vehicles following ABS-equipped vehicles may not be able to brake as fast on slippery roads.

DRIVER CONTROLLED DIFFERENTIAL LOCK (DCDL)

By actuating the electric switch, the driver can lock or unlock differential action.

The purpose of the DCDL is to provide maximum vehicle traction and control on unfavorable road or highway surfaces. When the DCDL is actuated, a clutch collar completely locks the differential case, gearing, and axle shafts together. This feature maximizes traction to both wheels. The lock position will also protect against spinout damage to the differential. The DCDL should not be actuated when favorable road conditions exist.

OPERATION TIPS

1. The DCDL can be locked or unlocked if the vehicle is standing still or moving at a constant low speed when the wheels are not spinning, slipping, or losing traction.
2. When the DCDL is locked, operate the vehicle at low speeds. DCDL will not engage and will disengage in speed higher than 5 MPH (8 km/h).
3. When the DCDL is locked, the vehicle's turning radius will increase. This condition is called "understeer." The driver must use caution, good judgment and drive at low speeds when operating the vehicle with the DCDL locked.
4. Always unlock the DCDL as soon as the need for maximum traction has passed and the vehicle is traveling on a good road or highway.
5. Do not lock the DCDL when the wheels are slipping or losing traction, or damage to the axle can result.
6. Do not lock the DCDL when the vehicle is traveling down steep grades, or potential loss of vehicle stability could occur.

LOCKING THE DCDL

When encountering poor road or highway conditions where maximum traction is needed, follow the recommended procedures:

1. Without the wheels spinning, slipping or losing traction, flip the DCDL control switch to the "LOCK" position while maintaining a constant vehicle speed.
2. Let up momentarily on the accelerator to relieve torque on the gearing, allowing the DCDL to lock.
3. When the DCDL is fully locked, the vehicle will have an "understeer" condition when making turns. Proceed cautiously over poor road or highway conditions.

UNLOCKING THE DCDL

When the vehicle can safely operate and driving conditions have improved, disengage the DCDL following the recommended procedures:

1. Flip the control switch to the "UNLOCK" position, when the vehicle is stopped or when traveling at low speed while the wheels are not spinning, slipping or losing traction.
2. Let up momentarily on the accelerator to relieve torque on the gearing, allowing the DCDL to unlock.
3. Resume driving at normal speed using good driving judgment.

KNEELING SYSTEM

This system lowers the front end, enabling passengers to get on and off the coach without any difficulty.

To operate :

- Stop the coach ;
- Set the transmission to neutral(N) ;
- Apply the parking brakes ;
- Momentarily press the rocker switch downwards to lower the front end of the coach 4 inches (100 mm). (Refer to "Controls & Instruments" chapter).

A warning flasher will indicate that the front of the coach is being lowered.

NOTE

The parking brakes must be applied to allow the use of the kneeling.

NOTE
Kneeling is disabled when the entrance door is open.

To raise the front of the coach to its normal height ;

- o Momentarily press the rocker switch upwards. The front end will rapidly rise up ;
- o Release the parking brakes ;
- o Shift the transmission to the desired range.

⚠ CAUTION ⚠
Avoid parking the coach too close to the sidewalk or to other obstacles which could damage the coach during kneeling.

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 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

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 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.

IN-STATION LIGHTING

The in-station lighting system circuit is linked with the optional battery charger: When the charger is connected to an external power source, the in-station lighting circuit can be energized without depleting the batteries.

The receptacle used for the battery charger is located on the main power compartment door

COOLANT HEATER

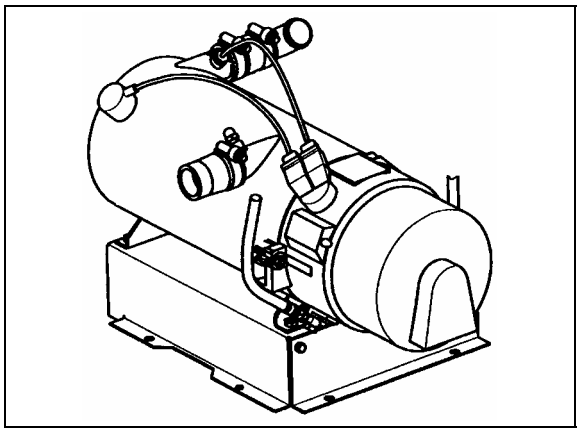
This optional auxiliary heating system is used for preheating and retaining the heat of water-cooled engines. It can be used before startup to ease starting and to provide rapid operation of the interior heating system. It can also be used with the engine running to maintain coolant heat and interior temperature.

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

⚠ WARNING ⚠

The coolant heating 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.

The coolant heater is located in a compartment in the lower part of the rear electrical compartment. To access the coolant heater, remove the panel in the rear electrical compartment.



COOLANT HEATER (104,000 BTU) 22224

SWITCHING THE HEATER ON

The timer light illuminates when the heater is switched *ON*. Air is forced in to flush out the combustion chamber of residual gases 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 ignition unit.

Once the flame sensor has signaled to the control unit that combustion has taken place, the ignition unit is switched *OFF.* The dashboard telltale light will illuminate to indicate when the burner is *ON.*

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 on 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 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 heater failure. Refer to Technical Information chapter for additional information.

COOLANT HEATER TIMER

The timer, located on L.H. lateral console is used to program the starting and stopping time of the preheating system and to give Fault Codes. The system indicator light, located on the timer, illuminates when the system is functional.

⚠ CAUTION ⚠

The preheating system should not operate for more than one hour before starting engine as this could discharge batteries.

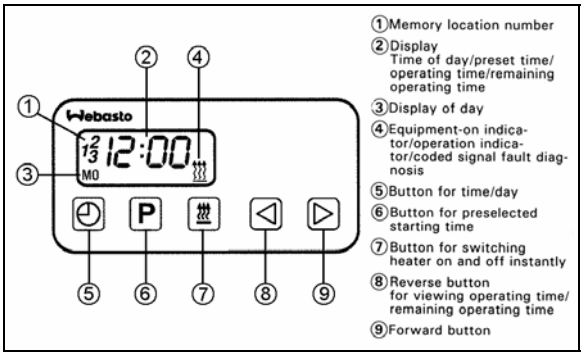
⚠ WARNING ⚠

Preheating system must not operate when vehicle is parked inside or during fuel fill stops.

NOTE

Preheating system uses the same fuel as the engine.

Timer operating instructions (Webasto)



WEBASTO 22223

These instructions refer to the Webasto timer illustrated above.

Remaining Operating Time

The remaining operating time refers to the period of time the heater still continues to remain in operation. It may be changed while the heater is in operation.

Setting the Digital Timer

After the power has been connected, all symbols on the digital display are flashing. The time of the day and the day of the week must be set.

All flashing symbols of the timer can be set by means of the Forward (9) or Reverse (8) buttons.

When buttons (8) and (9) are pressed for more than 2 seconds, the quick digit advance mode is activated.

Setting the Time and Day of the Week

1. Press button (5) for more than 2 seconds (time display flashes).
2. Press (8) or (9) button to set the time of day.
3. Wait 5 seconds. The time of day is stored (day of week flashes).
4. Press (8) or (9) button to set the correct day of week.
5. Wait 5 seconds. The day of week is stored.

Viewing the Time (Ignition ON)

Continuous display of current time and day of the week.

Viewing the Time (Ignition OFF)

Briefly press button (5) to display current time and day for 5 seconds.

Switching Heater ON (Instant Heating) With Ignition ON:

Press button (7). Heater is switched on (continuous operation) and continues to operate until button (7) is pressed again or ignition is switched off.

NOTE

If the ignition is switched off while heater is in operation, the remaining operating time of 15 minutes flashes on the display and the heater will continue to operate for this period of time.

Switching Heater ON (Instant Heating) With Ignition OFF:

Press button (7). Heater is switched on for preset operating time (the factory-set heater operating duration is 60 minutes)

Switching Heater OFF

Press button (7). The heater starts its after-run cycle and switches off thereafter.

Presetting Starting Time

1. Press button (6). Memory location number flashes.

NOTE
By repeatedly pressing button (6), starting time 2 or 3 can be preset.

2. Press button (8) or (9) until correct startup time is set.
3. Wait 5 seconds. Preset starting time is stored and day of week flashes.
4. Press button (8) or (9) to select the correct startup day of week.
5. Wait 5 seconds. The startup day of week is stored.

The number of memory location remains on the display. The timer is now in the programmed mode and will switch the heater on at the preset time.

NOTE
We recommend that memory locations 1 and 2 be used for presetting times within 24 hours of setting the timer. Memory location 3 can be used for a starting time within the next 7 days of setting the timer.

Recalling Preset Times

Press (6) repeatedly until the desired memory location number and preset time are displayed.

Canceling Preset Time

Press button (6) repeatedly until no more memory location number is visible on the display.

Setting Operating Time

1. With heater off, press button (8). Operating time flashes.
2. Press button (8) or (9) to set the operating time (between 1 and 120 minutes)
3. Wait 5 seconds. Operating time is stored.

The heater remains in operation for the preset time (except for continuous operation).

Setting the Remaining Operating Time

1. With heater in operation, press button (8). Remaining operating time flashes.
2. Set remaining time with button (8) or (9).
3. Wait 5 seconds. Remaining operating time is stored.

Fault Diagnosis by Coded Light Signals

On heaters equipped with a fault diagnosis system using coded light signals, the equipment-on indicator/operation indicator flashes. Please consult appendix E for the Fault Diagnosis and Code list.

TROUBLESHOOTING AND MAINTENANCE

The diagnostic code system in Webasto timers is standard. Refer to Appendix E at the end of this manual, to the Maintenance Manual or to Webasto manual for more information.

NOTE
If there are no heater faults, the heater will go through a normal start cycle and regulate based on thermostat setting.

NOTE
Switch on the preheating system briefly about once a month, even during the warm season.

⚠ CAUTION ⚠
When welding on the vehicle, disconnect the preheater module connector in order to protect this system from voltage surges.

⚠ 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.

GPS NAVIGATION SYSTEM (OPTIONAL)

This optional system provides benefits to ease navigation and traveling like:

- Always knowing your precise position;
- Having detailed maps of entire USA & Canada;

- Finding hotels, restaurants and other Point Of Interest (POI);
- Knowing estimated time of arrival and distance to destination.

It features:

- Map display, adaptive pictogram and voice guidance;
- Map zoom in and out.
- Remote control with active holder.

The complete Navigation System instruction manual is included in your vehicle's technical publication box.

⚠ CAUTION ⚠

Never insert a CD/DVD other than the map CD/DVD. Doing so will block the computer and it will have to be sent to the manufacturer for extraction.

GPS NAVIGATION SYSTEM

WHEELCHAIR LIFT

Read and understand the RICON Owner's Manual before attempting to use the wheelchair lift. The instructions below are a quick reference and serve to complement the information provided by the lift manufacturer.

⚠ WARNING ⚠

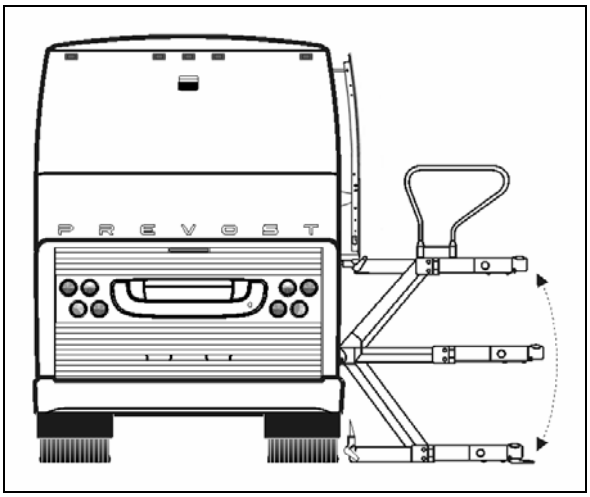
To operate the optional wheelchair lift, the coach must be parked on a flat and level surface, with the parking brake applied.

Activate the lift mechanism circuit by pressing down on the wheelchair rocker switch on the dashboard.

WHEELCHAIR LIFT AND ACCESS DOORS

Open the access door until fully opened, then open the lift mechanism baggage door and swing open until locked open.

A light inside the vehicle illuminates the doorway when the wheelchair access door is open.



RICON WHEELCHAIR LIFT 23XXX

A telltale light on the dashboard illuminates when the lift mechanism door or the wheelchair access door is open. Refer to Controls and Instruments chapter.

NOTE

When wheelchair lift system is activated or when the lift mechanism door or the wheelchair access door is open, the ECM will inhibit the accelerator pedal to prevent any coach movement. Furthermore, the parking brake cannot be released.

If in motion and the access door opens, a telltale light will illuminate and an audible alert will sound. When the coach speed decreases below 2 mph (3 Km/h), the parking brake automatically applies.

To close the door, pull the door handle to unlock from the open position, and then slam the door shut.

OPERATING THE RICON WHEELCHAIR LIFT

⚠ WARNING ⚠

Inspect the lift before each use as described in the RICON Owner's manual. If any unsafe condition exists, or if unusual noises or movements are noticed, DO NOT use and contact an authorized RICON dealer for repair.

⚠ WARNING ⚠

Read and comply with all warning labels and symbols affixed to the wheelchair lift.

⚠ WARNING ⚠

Do not operate with a load in excess of 660 lbs (300 Kg).

The coach must be parked at least 10 feet (3 meters) away from other vehicles or large objects. Control the movement of the lift platform with the handheld control device stowed in the wheelchair lift baggage compartment. When operating the lift, be careful the control wire doesn't bind with the lift mechanism.

Using the handheld control device, deploy the lift by pressing on the OUT switch.

When the lift begins to deploy, it is normal to hear a clutch action of one or two clicks should be heard. Once deployed, lift the handrails until locked in vertical position. Buckle the restraint belt.

Use the UP/DOWN switch to raise or lower the platform. Upon reaching the top or the bottom of its stroke, the appropriate rollstop will lower.

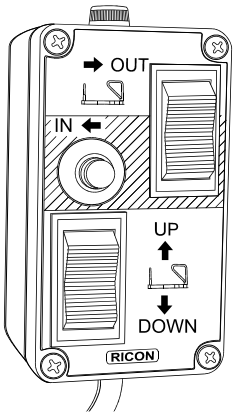
NOTE

The restraint belt acts as a safety device and it prevents raising or lowering the lift when not buckled.

Roll the wheelchair onto the platform with the wheelchair facing outwards because the front rollstop is not designed to keep the large rear wheels of a wheelchair from rolling off the platform.

⚠ WARNING ⚠

Use extreme care when rolling on or off the platform and lock the wheelchair brakes while stationary on the platform. Make sure the wheelchair fits safely on the platform. Keep arms and legs away from moving parts.



HANDHELD CONTROL DEVICE 23258

NOTE

The indicator light on the control device illuminates when power is supplied (when the lift electrical circuit is activated by the switch on the dashboard).

To stow the platform, detach the restraint belt and fold the left handrail, then fold the right handrail (lift the slam lock handles to fold handrails). Re-fasten restraint belt. Press down and hold the IN-LOCKOUT button and the IN switch until the lift is fully stowed.

THRESHOLD WARNING SYSTEM (TWS) ADJUSTMENT

There are three verifications to perform; 1) Adjust Aiming of Acoustic Sensor Beam, 2) Test Aim of Acoustic Sensor Beam, and 3) Adjust Acoustic Sensor Timing.

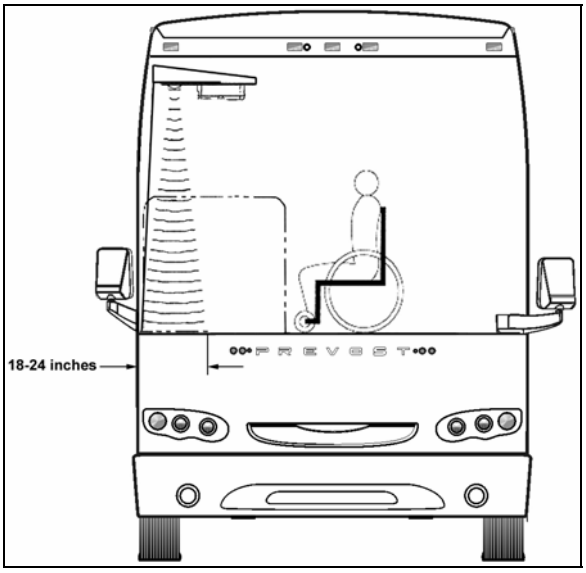
Adjustment of the sensor timing is done at the factory and should not need to be repeated in the field. Readjustment should only be considered if the sensor aiming could not be adjusted to ignore both the wheelchair in the aisle and the platform during its normal movement.

Adjust Aiming of Acoustic Sensor Beam

1. Place wheelchair with passenger in center aisle of coach, pointed at doorway where Threshold Warning System (TWS) is installed. The TWS should not detect a wheelchair and passenger when they are located this far from doorway.
2. Turn power to lift on (LED on TWS module will light steady) and indicator light on the control device illuminates. If wheelchair and passenger are detected by acoustic sensors the LED will flash, the buzzer will sound and the module red light will flash. If this occurs it is necessary to adjust aiming of sensors.

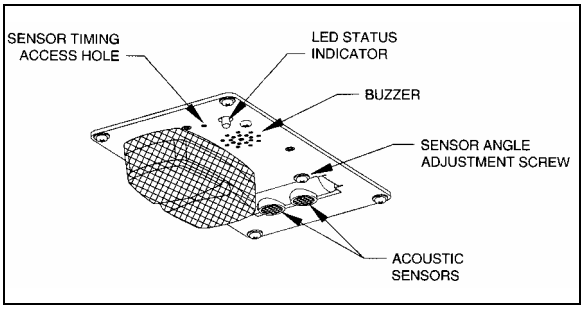
3. Turn sensor angle adjustment screw clockwise to move direction of beam away from center aisle and towards doorway. Stop adjustment when LED ceases to flash.

NOTE
Only in rare instances will adjustment be needed in the counterclockwise direction.



TWS AREA

4. Move centerline of small wheels of wheelchair (with passenger) to within 24 inches of doorway and repeat aiming procedure in previous step.



TWS MODULE DETAIL

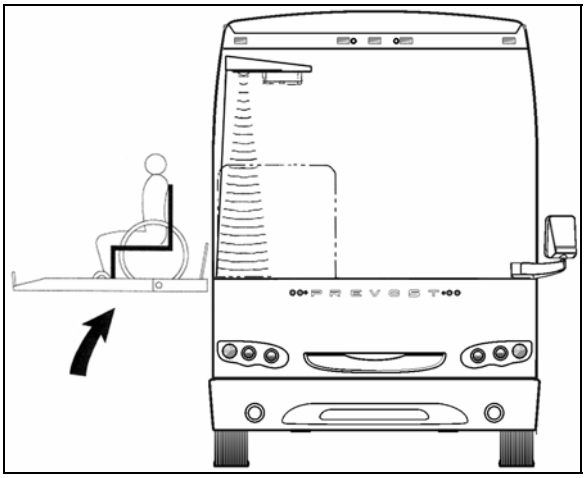
Test Aim of Acoustic Sensor Beam

1. Move wheelchair and passenger slowly towards doorway. TWS should detect wheelchair and passenger (LED will flash, buzzer will sound and the module red light will flash) when centerline of front wheels is between 18 and 24 inches from doorway.

2. Open vehicle access door above lift. Lower platform to ground and place wheelchair and passenger at rear of platform. Rollstop (rear barrier) should be up. Raise platform to floor level.

   This normal platform motion with wheelchair and passenger aboard should not actuate TWS. If LED does flash (buzzer will also sound and module red light will flash), turn sensor adjustment screw slightly counterclockwise.

NOTE
If an adjustment is made, repeat the previous step where wheelchair is between 18 and 24 inches from doorway.



CHECKING NORMAL PLATFORM POSITION

Adjust Acoustic Sensor Timing

1. Support a flat sheet of cardboard, or similar material, directly beneath TWS module at a distance of 4½ feet below module. Sheet must be facing sensors.

NOTE
Before proceeding, visually inspect sensors to verify that they are pointing directly at floor, or nearly, and are not pointing off at an extreme angle.

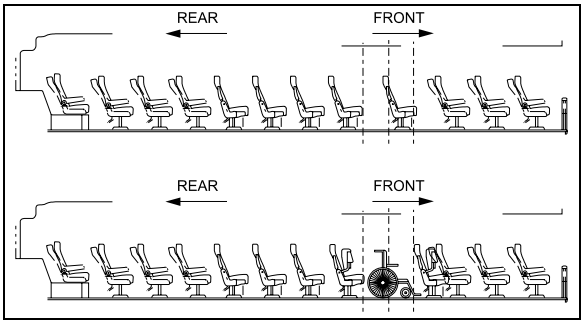
2. Note the sensor timing access hole. This hole provides access to a plunger-actuated switch that sets the sensor timing. Insert a 1/16-inch diameter wire-like object into the access hole and press the plunger inward. The LED will flash momentarily while the module establishes the distance and then

remain on steady. Release the plunger when the LED ceases to flash.

NOTE
It is important that objects, such as your body, tools, seats, etc, do not interfere with the beam while the adjustment is being made.

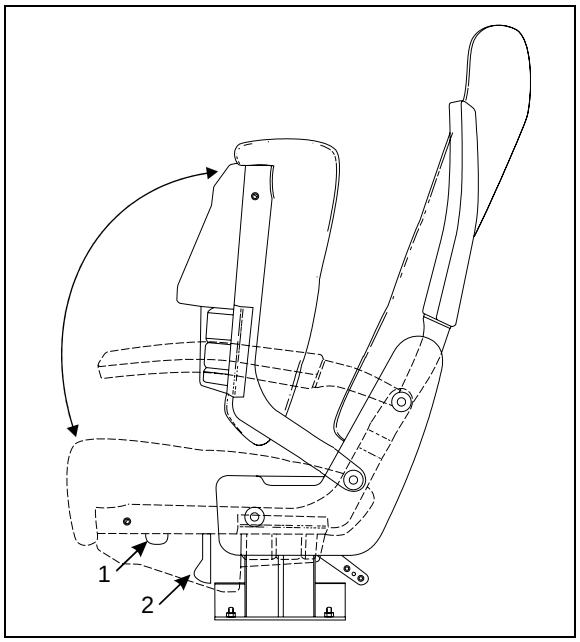
INTERIOR APPOINTMENTS

To accommodate a wheelchair, two rows of regular seats on one side of the coach must be folded and slid away. Seats may be folded on both sides of the coach to make room for a second wheelchair.



POSSIBLE SEATING ARRANGEMENTS 23259

An electrical wheelchair or tri-wheeler may require sliding back seats from both sides of the coach to allow enough turnaround space.



FOLDING SEATS 18430

To fold a set of seats, raise the seat back then lift up the seat cushion (pull on lever 1). To slide a row of seats, remove the black covers from the floor tracks. Pull the lever 2 while sliding the seat along the track.

The wheelchair occupants have a hostess/stop chime and a reading light switch at their disposal on the window sill of the coach, within easy reach.

Wheelchair Restraint System

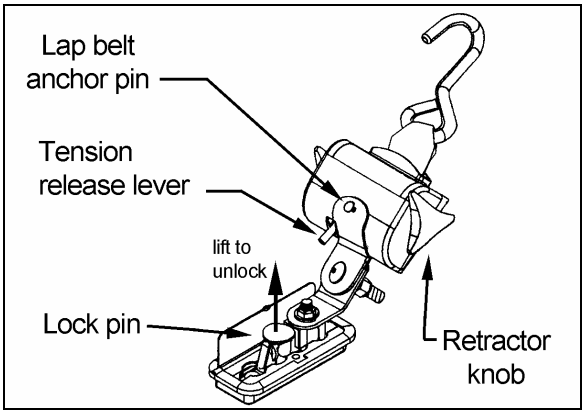
Two sets of wheelchair restraint belts are kept in plastic pouches and stowed in an overhead compartment.

To secure each wheelchair, four tiedown straps must be used (at all four corners).

Two of the four retaining belts have attaching pins on the retractors to secure the occupant's lap belt. They must be placed at the rear of the wheelchair.

Each tiedown retractor slots into a floor anchorage track.

To anchor the retaining belts, lift the track cover, push in the retractor anchor then slide it until it locks in place. Hook one strap to each corner of the wheelchair frame (not the wheels) and allow the retractors to tension the belts.



BELT ANCHORING AND RETRACTION SYSTEMS

To remove the restraint belts, release tension in the locking mechanism by tightening the belt slightly more with the retractor knob before pushing down on the red release lever on the retractor. Unhook the wheelchair and allow the belts to retract. Guide the belts in, making sure they remain untwisted as they retract.

Release the anchor by lifting the lock pin then sliding out and up the anchor from the floor track. Close the lid on the tracks to prevent dirt from entering the track cavity.

⚠ WARNING ⚠

Do not let restraint or safety belts rub against sharp edges. Do not bleach or dry clean.

Wheelchair Occupant Restraint

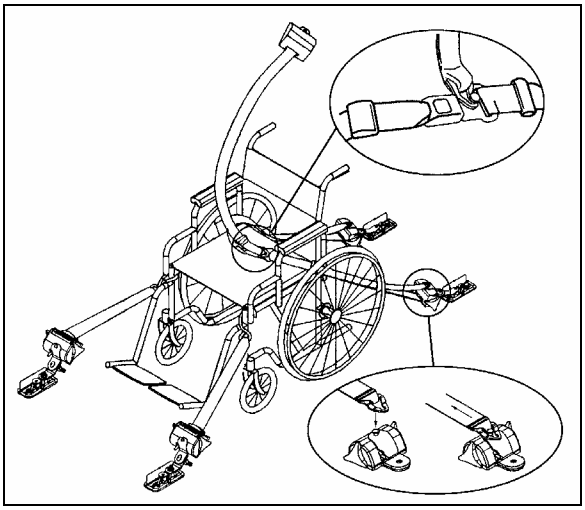
Secure the wheelchair occupant in the following manner:

Snap the lap belts to the pins on the retractors of the rear restraint belts. Adjust the lap belt so it sits snug across the hips. Snap the shoulder belt to the pin on the lap belt. A retractor adjusts shoulder belt length automatically.

To release the belt, unsnap the shoulder belt then press the red button in the center of the buckle.

⚠ WARNING ⚠

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



WHEELCHAIR RESTRAINTS AND ACCESSORIES

EMERGENCY OPERATION

In the event of electrical power loss, manual operation of the lift is possible as explained below.

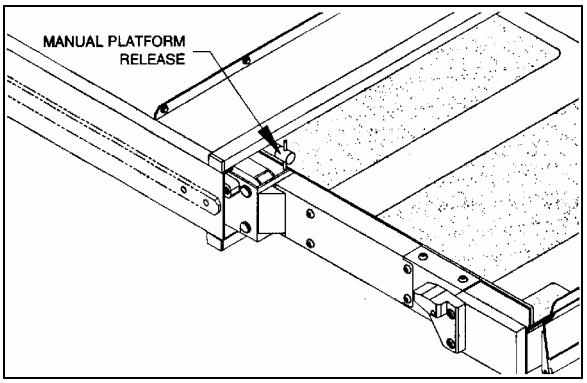
To manually deploy the platform

Allow enough space for lift operation and passenger boarding. If a break down situation exists and the vehicle cannot be moved so that the lift system can be operated safely, the operator must summon emergency assistance to move the vehicle before operating the lift.

Fully open wheelchair access and lift doors. Ensure that there are no obstacles in the path of the lift.

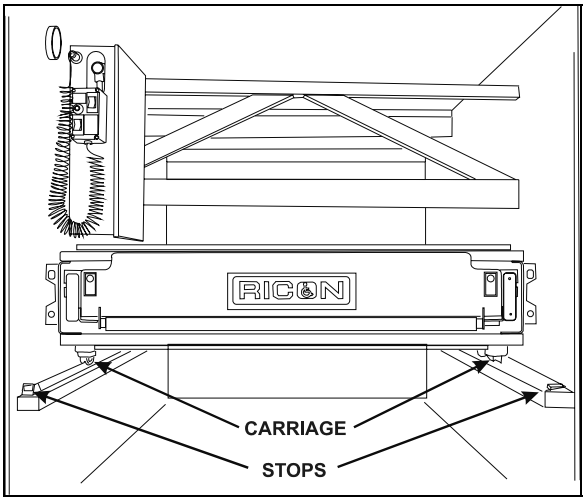
Remove the pump handle from inside the cover of the lift mechanism box.

Turn one of the manual platform release shafts using pump handle extension.



MANUAL PLATFORM RELEASE SHAFT

Grasp the platform and pull firmly until the lift is all the way out against the carriage stops.



WHEELCHAIR LIFT MANUAL OPERATION 23265

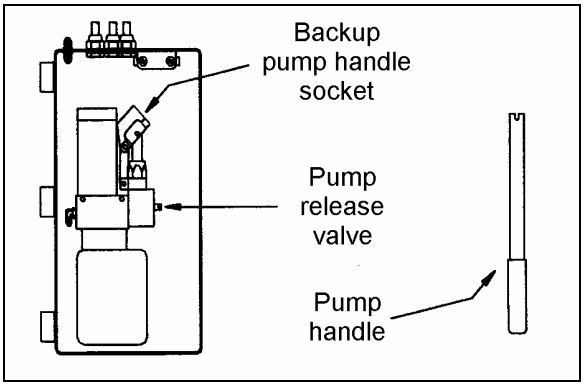
To manually raise the platform

Remove the pump handle from inside the cover of the lift mechanism box.

Insert the handle onto manual backup pump release valve. Make sure the notches at the end of the handle are fully engaged by the release valve pin. Twist the handle CLOCKWISE until lightly-snug and remove.

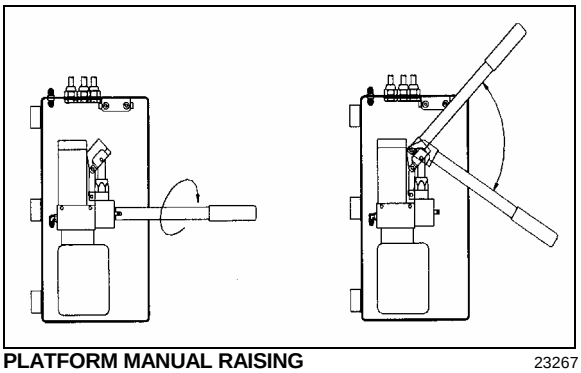
⚠ CAUTION ⚠

During manual rising of the lift, do not raise the platform more than 1-1/2 inches above the vehicle floor level. Any excessive travel will make it difficult to enter the platform and/or damage the lift bridge plate actuator. The outer edge of the bridge plate must rest squarely on the vehicle floor.



WHEELCHAIR LIFT MANUAL HYDRAULIC PUMP 23268

Insert handle extension into manual backup pump handle socket and pump to raise the platform to the vehicle floor level.



PLATFORM MANUAL RAISING 23267

The lift passenger and attendant must follow the instructions to ENTER or EXIT the vehicle, as previously described.

To manually lower the platform

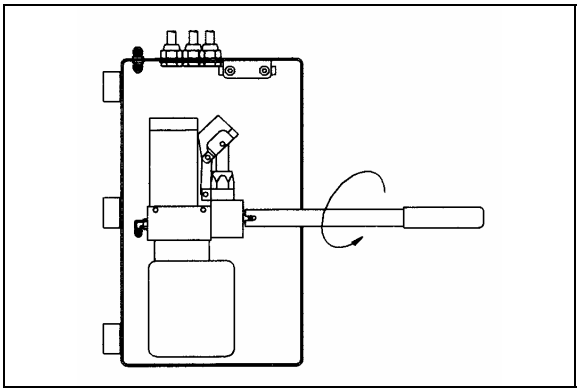
⚠ CAUTION ⚠

Do not turn pump release valve more than ¼-turn COUNTER-CLOCKWISE. The valve is totally removable which will disable all automatic and manual UP/DOWN functions.

Insert the pump handle extension onto manual backup pump release valve. Make sure the notches at the end of the handle are fully engaged by the release valve pin. Slowly twist the handle ¼-turn COUTER-CLOCKWISE until the platform begins to lower.

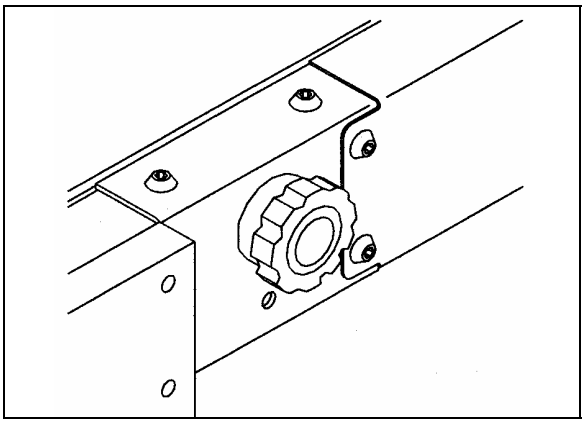
Allow the platform to reach ground level.

Twist the handle CLOCKWISE until lightly-snug and remove.



PLATFORM MANUAL LOWERING

Using the rollstop manual control knob and one hand on the rollstop, OPEN the rollstop.



ROLLSTOP MANUAL CONTROL KNOB 23275

The attendant and lift passenger should follow the instructions to ENTER or EXIT the vehicle, as described previously.

To manually stow the platform

Raise or lower the platform to the deploy/stow position; the platform frame must be parallel to the side of the lift enclosure. If the exact position cannot be obtained, slightly low is preferred to slightly high.

Using the rollstop manual control knob and one hand one the rollstop, close the rollstop until it latches.

Use one person on each side of the lift to prevent mechanical binding.

With fingers up and palms forward, push the platform forcefully to start the lift moving inward. As the lift begins to move inward, maintain a constant pushing motion until the lift comes to rest completely inside the lift enclosure.

Push firmly at the end and make sure that the platform manual release shafts have turned to lock the platform.

To manually stow the lift from ground level

In the unlikely event of a hydraulic system failure and the manual backup pump is inoperative, the lift may be stowed as follows by **two or more able-bodied people**:

Raise or lower the platform to the deploy/stow position; the platform frame must be parallel to the side of the lift enclosure. If the exact position cannot be obtained. Slightly low is preferred to slightly high.

Using the rollstop manual control knob and one hand on the rollstop, close the rollstop until it latches.

⚠ WARNING ⚠

The platform is heavy and should be lifted using caution and proper lifting technique: Always lift with legs and not the back when attempting to lift heavy objects.

Use one person on each side of the lift to prevent mechanical binding.

With fingers up and palms forward, push the platform forcefully to start the lift moving inward. As the lift begins to move inward, maintain a constant pushing motion until the lift comes to rest completely inside the lift enclosure.

Push firmly and make sure that the platform manual release shafts have turned to lock the platform.

WHEELCHAIR LIFT REMOVAL FOR STORING OR MAINTENANCE PURPOSES

Disconnect connector located at compartment ceiling.

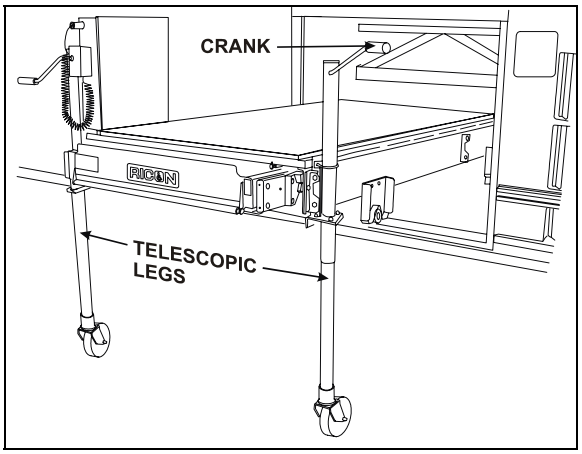
Remove 4 fixing bolts located inside compartment, on each side of platform.

Grasp the platform and pull firmly, sustaining a constant pull so that the platform slides onto the rails until the carriage come in contact with the stops.

Secure the first two telescopic legs onto the platform.

NOTE

There are two telescopic legs for each platform side. The proper side is indicated onto the telescopic leg.



INSTALLATION OF TELESCOPIC LEGS

Turn telescopic leg crank to raise the carriage to be able to clear the stops.

Pull the platform until the rear carriage hit against the stops.

Secure the two rear telescopic legs onto the platform then turn telescopic leg crank to be able to clear the stops.

Remove platform completely.

Lower the platform to minimum height using the telescopic leg cranks before moving it.

⚠ WARNING ⚠

For better stability, keep the platform at minimum height when moving.

⚠ WARNING ⚠

Never deploy the platform from enclosure while standing on the telescopic legs.

⚠ WARNING ⚠

Telescopic legs were designed to support and move the platform only, do not use as a work table.

⚠ WARNING ⚠

Before moving platform, make sure that floor is level and free of obstacles.

WHEELCHAIR LIFT INSTALLATION

Raise the platform to proper level.

Insert the platform so that the rear carriage clears the stops.

Turn telescopic leg crank until the carriage clears the stops.

Remove the two rear telescopic legs from the platform.

Insert the platform until the front carriage clears the stops.

Lower the front of the platform.

Remove the two front telescopic legs from the platform.

Push firmly and make sure that the platform manual release shafts have turned to lock the platform.

Secure the 4 fixing bolts located inside compartment, on each side of platform. **Apply a torque of 60 Ft-lbs.**

Reconnect connector located at compartment ceiling.

⚠ WARNING ⚠
When re-inserting platform into compartment, make sure that carriage wheels are properly aligned over the L. H. side triangular rail before removing telescopic legs.

STARTING THE ENGINE

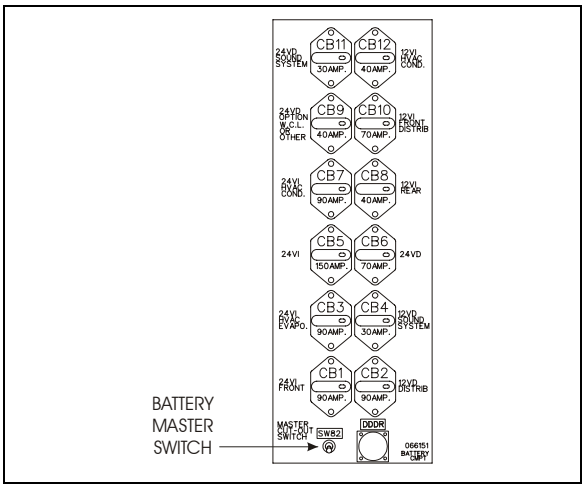
In normal circumstances, the engine should be started from the driver's seat. However, a rear-start panel in the engine compartment permits starting the engine from that location, mainly for maintenance purposes.

STARTING FROM THE DRIVER'S SEAT

1. Apply the spring-loaded parking brake by pulling the parking brake control button all the way up;

2. Make sure the starter selector switch located in the engine compartment is set to the *NORMAL* position;

3. Check that the battery master switch in the main power compartment is set to the *ON* position;



INSIDE MAIN POWER COMPARTMENT

4. Place transmission in neutral;

5. Turn ignition key to *START* position (refer to Controls and Instruments chapter), release the key after the engine starts.

NOTE

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

⚠ WARNING ⚠

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

⚠ CAUTION ⚠

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

⚠ CAUTION ⚠

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

⚠ CAUTION ⚠

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

NOTE

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

NOTE

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

Stopping the Engine

1. Apply parking brake and place transmission in neutral (N);

2. Shut off all electrical loads;

3. Allow engine to idle for at least two minutes before shutting engine *OFF*. This insures that the turbine speed drops and allows time for the engine exhaust gas temperature to drop to about 300°F (150°C);

4. Turn the ignition key to the *OFF* position.

⚠ CAUTION ⚠

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

⚠ CAUTION ⚠

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

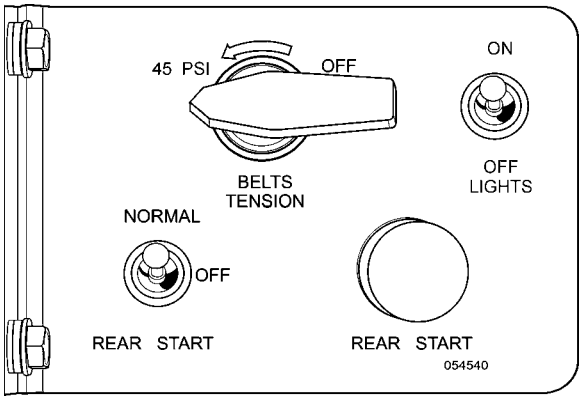
STARTING FROM THE ENGINE COMPARTMENT

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

⚠ WARNING ⚠

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

2. Set the Safety switches to the ON position;
3. Set the starter selector switch to the *REAR START* position;
4. Press the starter push-button switch. Release the push-button after the engine starts.



REAR START PANEL 01044

⚠ WARNING ⚠

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

⚠ CAUTION ⚠

Refer to cautions in "Starting From The Driver's Seat" and "Stopping the Engine" in this chapter.

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

⚠ CAUTION ⚠

Do not stop engine by any other method.

⚠ WARNING ⚠

Apply the parking brake before stopping engine. In the event the engine is stopped while the parking brake is not applied, a reminder alert will sound.

COLD WEATHER STARTING

The vehicle may be equipped with the optional ether cold starting aid to facilitate cold-weather starts. A toggle switch located near the ignition switch on the dashboard activates the starting aid. A dashboard logic circuit prevents inadvertent activation while the engine is running.

To activate the ether starting aid, proceed as follows:

1. While cranking engine, press the "Ether" rocker switch on the dashboard for 3 seconds to fill the solenoid valve;
2. Release rocker switch to discharge a shot of ether;
3. Allow 3 seconds for the shot to discharge;
4. Start the engine, use a second shot if necessary to keep the engine running.

⚠ CAUTION ⚠

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

⚠ CAUTION ⚠

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

JUMP STARTING

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

⚠ WARNING ⚠

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

⚠ WARNING ⚠

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

⚠ WARNING ⚠

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

⚠ WARNING ⚠

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

⚠ CAUTION ⚠

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

⚠ CAUTION ⚠

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

⚠ CAUTION ⚠

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

⚠ CAUTION ⚠

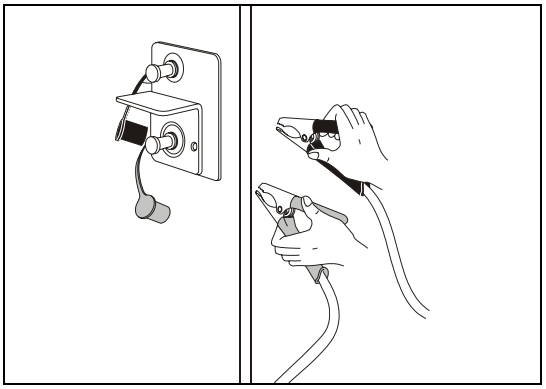
Before attempting to jump start, make sure the parking brake is applied and the transmission is in neutral (N). Turn off all lights, heaters and other electrical accessories.

⚠ CAUTION ⚠

Choose a booster vehicle which produces comparable amperage as your vehicle.

⚠ CAUTION ⚠

Off-board battery charger with a start boost facility must not be used to jump start the vehicle. This could damage the electrical system.



BOOSTER BLOCK TERMINALS 18521

To jump start, proceed as follows:

1. Remove the protective caps from the booster block terminals located in compartment at the right of the engine;
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 vehicle with the run-down battery;
7. Disconnect the jumper cables in reverse order given in steps 2 through 5;
8. Install protective caps on the booster block terminals.

NOTE

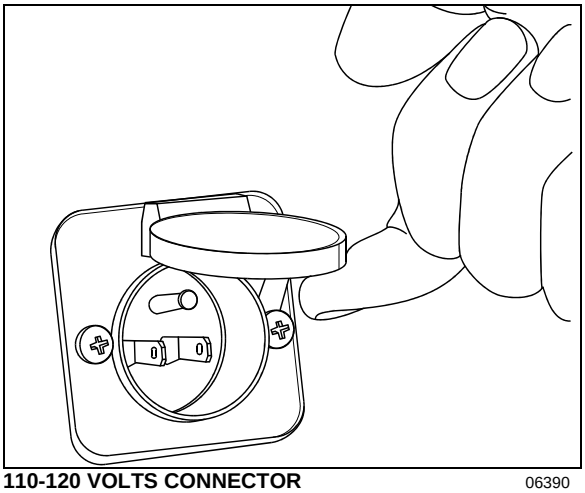
Jumper cables must be rated at 500 cranking amperes. If jumper cable length is 20 feet (6 m) or less, use 2/0 (AWG) gauge wires. If cable length is between 20 to 30 feet (6 to 9 m), use 3/0 (AWG) gauge wires.

ENGINE BLOCK HEATER

The vehicle is equipped with an engine immersion-type electric block heater to assist cold weather starting. A connector is on the rear engine compartment door. Using an extension cord, connect to a 110 - 120 VAC outlet.

⚠ CAUTION ⚠

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



110-120 VOLTS CONNECTOR 06390

ENGINE WARM-UP

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

⚠ WARNING ⚠

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

NOTE

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

ALLISON TRANSMISSION WARM-UP

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

ZF-ASTRONIC TRANSMISSION – STARTING THE VEHICLE AT LOW TEMPERATURES

For outside temperatures between -4°F (–20°C) and -22°F (–30°C), the transmission will require a warming up phase once the engine is started. The engine must be operated for at least 10 minutes with the vehicle at a standstill until the transmission oil has warmed up.

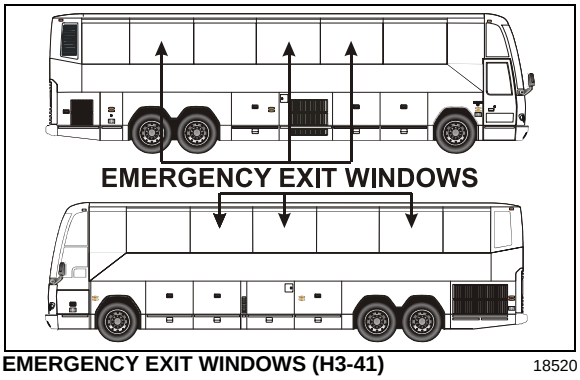
For outside temperatures below -22°F (–30°C), warm air must be used to heat the transmission up to a temperature above -22°F (–30°C) before the engine is started.

EMERGENCY EXITS

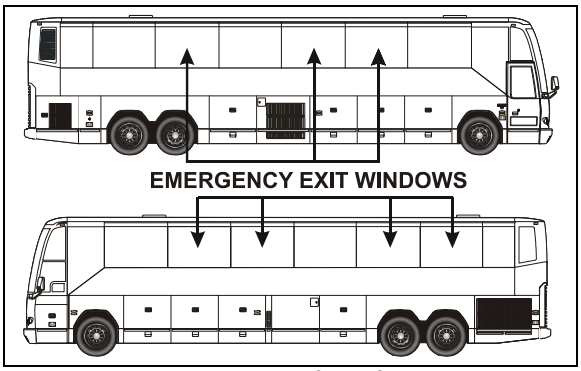
Locate and learn how to use all possible emergency exits. It is good practice to inform passengers of the location of exits and how to use them in case of an emergency.

SIDE WINDOWS

Some side windows can be opened from the inside for emergency exit. A decal located on the bottom of each passenger window indicates the location of the nearest emergency exit. Also, blue lights close to the wall in the overhead storage compartments illuminate the emergency exit decals. These lights illuminate when the general lighting switch is on.



EMERGENCY EXIT WINDOWS (H3-41) 18520

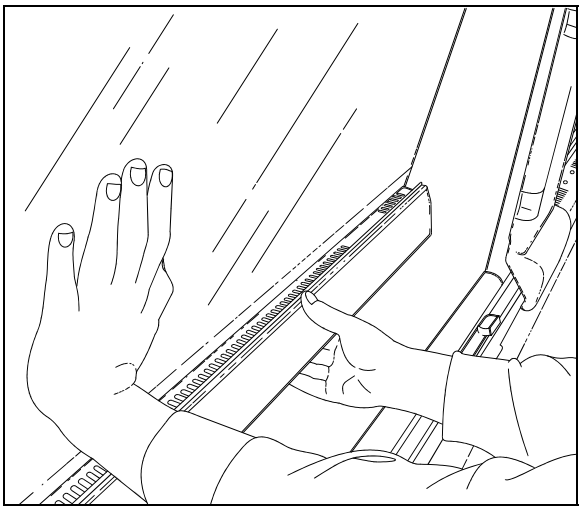


EMERGENCY EXIT WINDOWS (H3-45) 18519

To open a side window emergency exit, tilt up the release bar and push the bottom of the window outwards, as illustrated below. The window is hinged from the top and will not fall out.

A telltale light on the dashboard illuminates when a window is opened. Refer to Controls and Instruments chapter for more information.

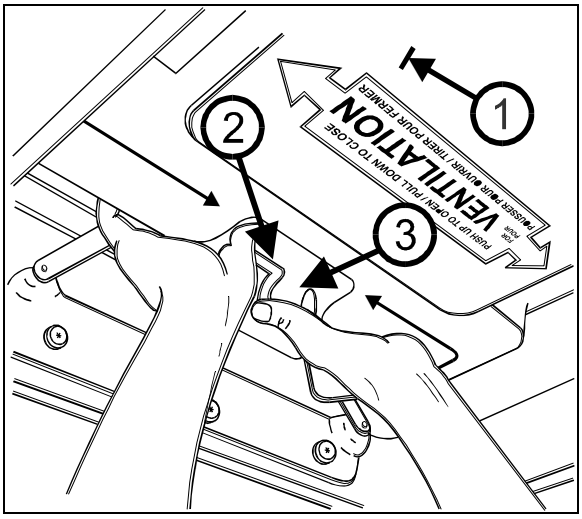
To close the window, tilt up the release bar and pull the window back. Push down the release bar to lock shut.



SIDE WINDOW EMERGENCY EXIT 18391

ROOF HATCH

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



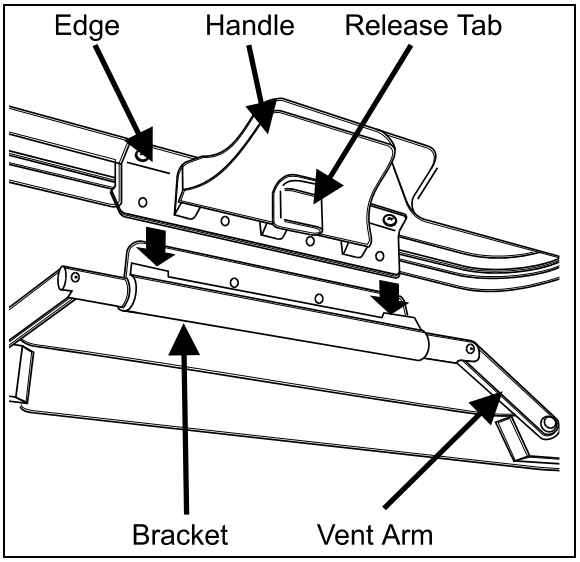
EMERGENCY ROOF ESCAPE OPENING OEH3B604

NOTE
In the event of ventilation blower motor failure, the roof hatch may be used to aid ventilation by pushing the hatch upward.

⚠ CAUTION ⚠

Be aware of reduced vehicle overhead clearance when driving under overpasses with the roof hatch open.

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



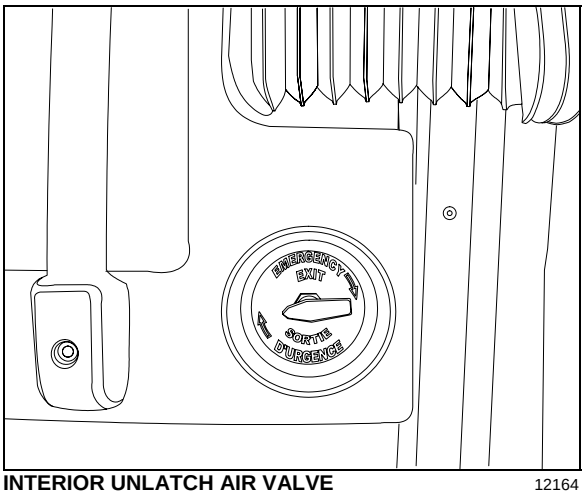
ROOF ESCAPE HANDLE OEH3B606

EMERGENCY ENTRANCE DOOR OPENING

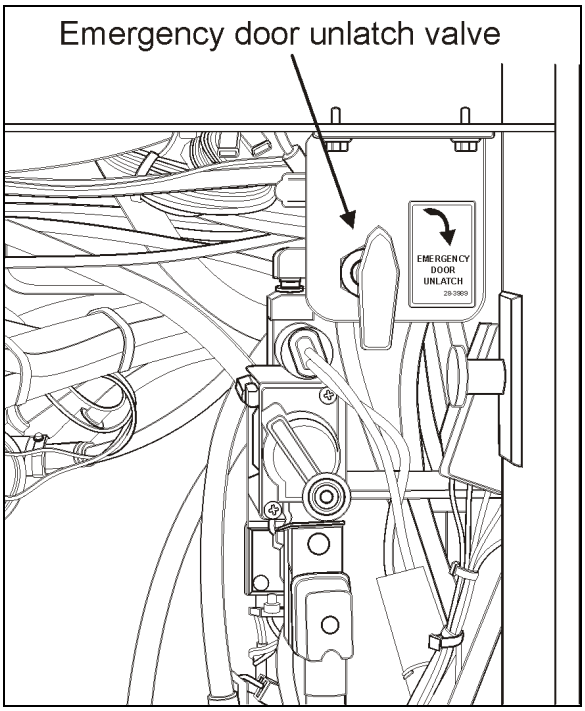
An unlatch air valve located on the front wall, close to the entrance door allows emergency depletion of the door and locking cylinders. Another unlatch valve is located in the front service compartment and allows emergency opening from outside the cabin. To open the door in an emergency situation, first turn the unlatch valve in the direction of the arrows and push (or pull) the door open. To close the door after emergency opening, return the valve to its initial position, open the door using the door operating switch, then close the door normally.

NOTE

To be able to open the entrance door in an emergency situation, the entrance door must first be unlock using the key or lock lever before unlatching the door from the outside or the inside.



INTERIOR UNLATCH AIR VALVE 12164



FRONT SERVICE COMPARTMENT 12189

EMERGENCY EQUIPMENT

The coach is equipped with numerous safety features and equipment. Verify the equipment regularly and keep on-hand and in good condition at all times. Following is the enumeration and description of safety equipment found on board.

AUTOMATIC FIRE DETECTION AND SUPPRESSION SYSTEM (AFSS) (OPTIONAL)

The coach may be equipped with the optional Automatic Fire Detection and Suppression System (AFSS).

System operation

When a fire is detected inside the engine compartment, the system sends a fire alarm signal to the ***Protection Panel*** located in the Driver's area near the lateral control panel. The ***Protection Panel*** immediately turns on the fire "ALARM" lamp and sounds the audio alarm. After a 15-second time delay the engine is automatically shut down. The fire extinguisher is discharged simultaneously with engine shutdown.

NOTE
*The **Manual Activation Switch** is used when immediate discharge of the fire extinguisher and engine shutdown is desired.*

NOTE
*The **Protection Panel** continuously monitors system integrity and displays the information via the "SYSTEM OK" and fire "TROUBLE" indicators.*

Operational sequence (fire)

1. A fire detector or liner thermal detector detects a fire in the engine compartment and sends a signal to the ***Protection Panel*** in the driver's area.
2. The fire "ALARM" lamp on the ***Protection Panel*** will illuminate solid red and an audible alarm will sound.
3. The operator shall bring the vehicle to a safe stop.
4. The system automatically shuts down the vehicle engine and discharges the extinguisher into the engine compartment 15 seconds after the fire alarm starts unless advanced or delayed by the operator.
   - o If the operator presses the ***Manual Activation Switch***, all delays will terminate and the engine shutdown and extinguisher discharge will occur immediately.
   - o If the operator presses and releases the ***Delay Engine Stop*** switch once, the engine shutdown and extinguisher discharge will be delayed by an additional 15 seconds.

⚠ WARNING ⚠
The engine will stop 15 seconds after the fire alarm starts. The operator must be prepared to bring the vehicle to a safe stop as soon as the alarm sounds. Steering may become difficult after engine shutdown. If more time is required, the "DELAY ENGINE STOP" switch may be pressed and released for an additional 15 second delay.

⚠ WARNING ⚠
The extinguisher discharge may cause an obscuring cloud behind and near the vehicle.

5. The red fire "ALARM" lamp and audible alarm will stay on. The yellow fire "TROUBLE" lamp will also be on indicating a discharged extinguisher.
6. The system must be reset and the fire extinguisher removed and replaced in accordance with the System Reset portion of the Kidde Dual Spectrum Operation & Maintenance Manual.

TIRE MONITORING SYSTEM (TMS) (OPTIONAL)

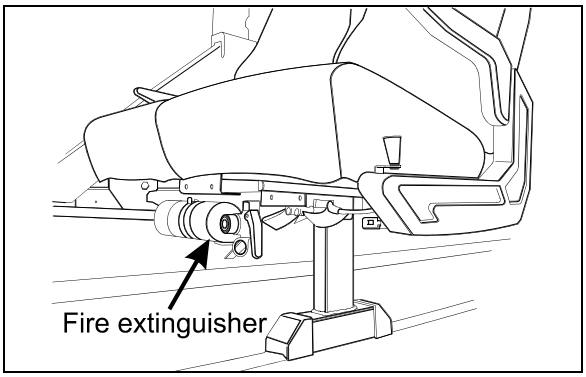
The coach may be equipped with the optional Tire Monitoring System (TMS).

Warnings

1. When an alert or warning condition is detected, reduce vehicle speed to an appropriate safe level and proceed to a safe stopping location or facility where the tire can be inspected and serviced.
2. The pressure deviation alert indicates that the pressure has dropped a selected amount below the required pressure for that level of tire temperature.
3. The low pressure warning indicates that the air pressure has dropped to a selected minimum.
4. The high temperature warning indicates that the contained air temperature has exceeded the selected maximum. A tire temperature build-up can be caused by a number of factors including severe under-inflation, hard sustained braking, vehicle overload and sustained high speeds.

FIRE EXTINGUISHERS

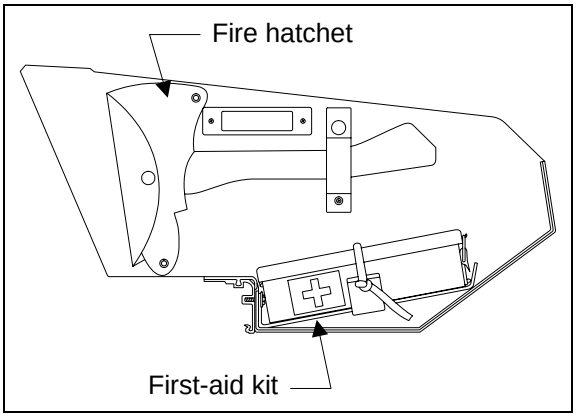
Two fire extinguishers are located under the seats in the first row behind the driver. Instructions for use are found on the extinguishers. Make sure you know how to operate fire extinguishers in case of an emergency.



FIRST ROW SEATS 23136

FIRST-AID KIT

The optional first-aid kit is stored in the first curb-side overhead storage compartment. A white cross over red background decal identifies the kit.



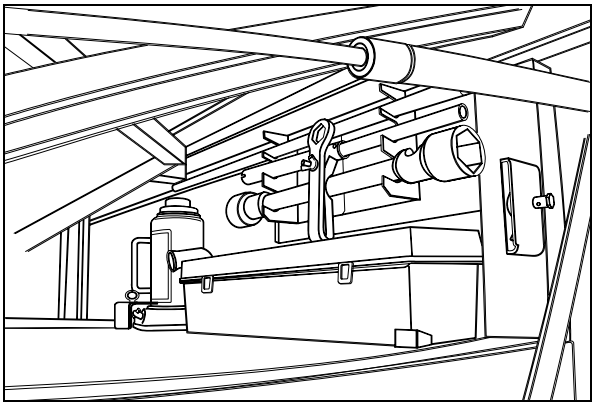
FIRST CURB-SIDE OVERHEAD COMPARTMENT 23141

FIRE HATCHET

A optional fire hatchet may be installed in the first curb-side overhead storage compartment.

WARNING REFLECTORS

A box containing three triangular reflectors is provided to warn other drivers on the road in case of a breakdown. The box is located with the jack and tools kit in the first curb-side baggage bay. 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).



REFLECTOR BOX, JACK AND TOOLS 13015

JACK AND TOOLS

A kit for jacking up the vehicle and changing wheels is stored in the first curb-side baggage bay.

The kit includes:

One 30 ton bottle jack;

A wheel nut wrench and lever;

SPARE PARTS KIT

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

LIMP-HOME BELT

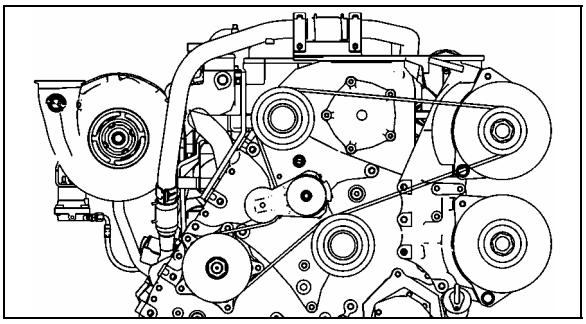
In case of malfunction of the lower alternator, install the limp-home belt on the upper alternator. The installation of the belt allows the coach to be driven to a repair facility after only minor manipulations.

Lower alternator failure:

1. Raise the belt tensioner. Use a breaker bar with a ¾ inch drive to rotate the tensioner pulley upward and relieve alternator belt tension. Remove belt;
2. Install the limp-home drive belt (#5060056) on the drive and top alternator pulleys first;
3. Install the limp-home belt on the top idler pulley;

4. Slide the belt on the lower idler pulley. Use a screwdriver or even a quarter to ease clearing the pulley lip (the lower pulley is devoid of grooves, making it easier to slide the belt in place);
5. Gently release the belt tensioner.

NOTE
To prevent the batteries from discharging the HVAC system is turned OFF when running on a single alternator.



LIMP-HOME BELT ON TOP ALTERNATOR 01154

SPARE WHEEL AND TIRE

The spare wheel and tire is located in a compartment behind the reclining front bumper.

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.

CHANGING A WHEEL

To access the spare wheel compartment, pull on the release handle located in the front electrical and service compartment, near the lower door hinge.

NOTE
The jack and tools are located in the first baggage compartment.

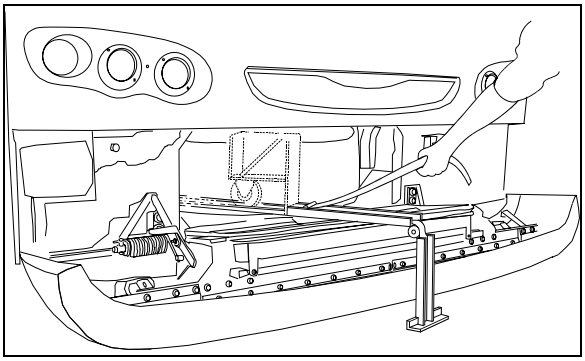
The bumper will lower gradually.

When closing the compartment, be sure the bumper is firmly in place.

Removing the spare wheel from the 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. In the front electrical and service compartment, unscrew 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.

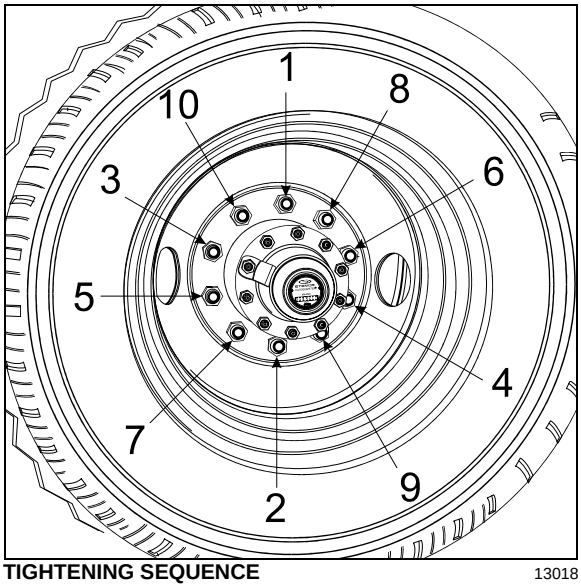
⚠ CAUTION ⚠
Before driving, make sure that the support and rail extension assembly is reinstalled and the wheel has been secured with the holding chain.



REMOVING SPARE WHEEL AND TIRE 13024

1. Loosen the wheel nuts about one turn;
2. Raise the vehicle by the closest jacking point (See Jacking Points in this chapter);
3. Remove the wheel nuts and remove the wheel;
4. Mount the spare wheel over the studs, being careful not to damage the stud threads;
5. Screw in the wheel nuts according to the sequence shown in the following figure and tighten slightly more and repeat the sequence a few times to position the wheel correctly. Once tightening induces wheel spin, lower the coach for final tightening;
6. Tighten the nuts progressively in the sequence shown. Final tightening should be done using a torque wrench. Dry tightening

torque is 450 – 500 lbf-ft (610 – 680 Nm) for steel as well as for aluminum wheels.



TIGHTENING SEQUENCE 13018

NOTE
The jack and tools are located in the first baggage compartment.

NOTE
Periodically check the spare tire inflation pressure. Tire pressure should be the maximum pressure specified in the chart.

NOTE
Periodically check that the spare is securely fastened in its compartment.

⚠ CAUTION ⚠
Before driving, be sure the flat tire, track, jack and tools are securely reinstalled in their respective compartments.

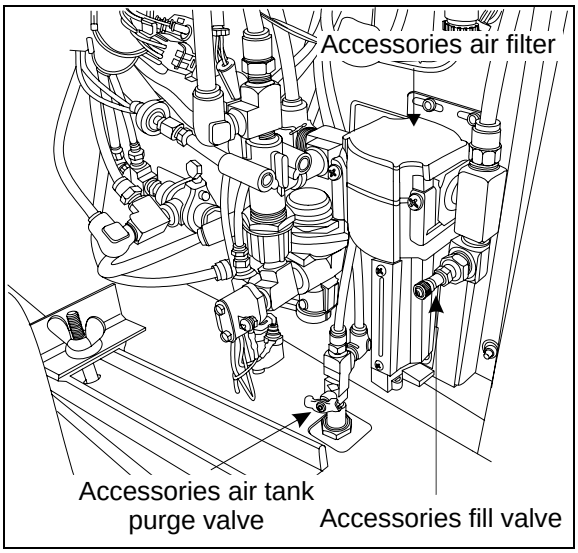
⚠ CAUTION ⚠
Check that the bumper is securely closed shut before driving.

EMERGENCY AIR-FILL VALVES

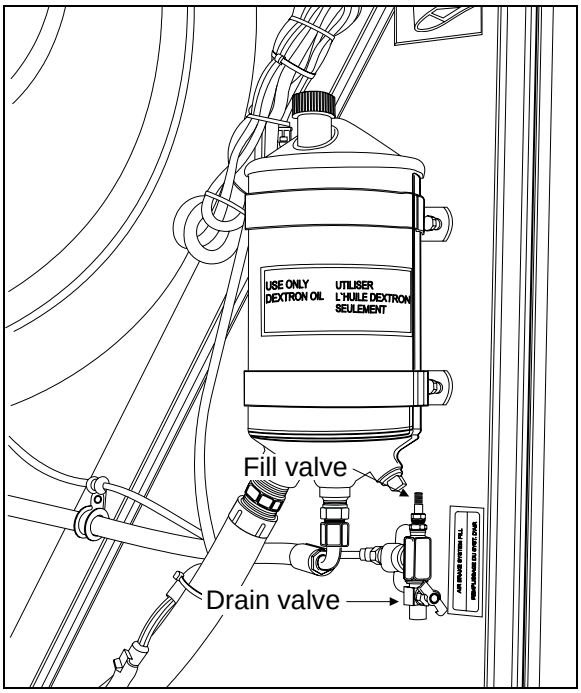
The vehicle is equipped with two air system emergency fill valves to supplement the air system when air pressure is low and the engine cannot be operated. One valve is located inside the front service compartment. The other valve is located inside the engine compartment.

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 (brakes, suspension and accessories). The fill valve located in the front service compartment supplies air for accessories only.

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



FRONT SERVICE COMPARTMENT 12130



FILL VALVE IN ENGINE COMPARTMENT 12162

EMERGENCY AND PARKING BRAKES

During normal operation, if air pressure in any brake circuit drops below 40 psi (276 kPa), spring-loaded emergency brake will be immediately applied at full capacity to the drive axle wheels to stop the vehicle.

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

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

⚠ WARNING ⚠

Always apply the parking brake before leaving the driver's seat.

NOTE

Only use the parking brake to supplement the service brake to stop the vehicle in emergency conditions. The stopping distance will be considerably longer than when using normal service brake.

NOTE

Before releasing the parking brake 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).

NOTE

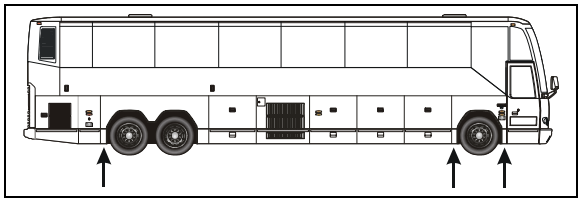
The telltale panel audible alarm will sound if the ignition switch has been turned to OFF without applying the parking brake. The same beep will sound if pressure is still applied to the service brake pedal.

NOTE

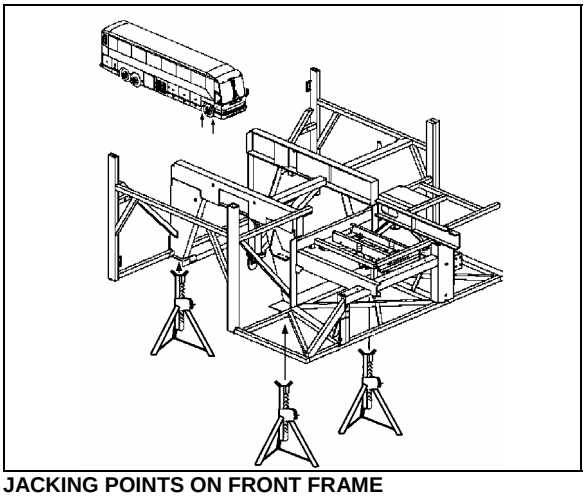
The stoplights automatically turn on when the parking brake is applied and the engine is running.

JACKING POINTS

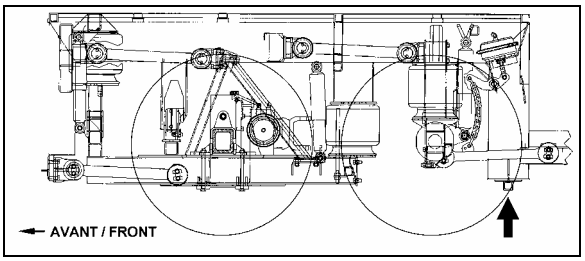
Twelve jacking points are located on the vehicle: three are located on each side of the frame and two are located under each axle. Refer to the following illustrations for the location of jacking points.



JACKING POINTS ON FRAME 18524



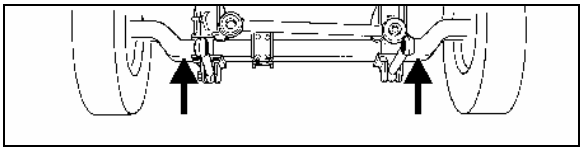
JACKING POINTS ON FRONT FRAME



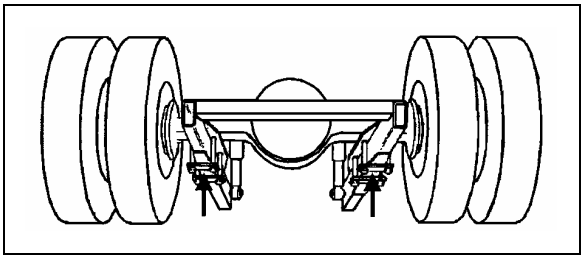
JACKING POINTS ON REAR FRAME

⚠ WARNING ⚠

The suspension of the vehicle must be in the normal ride position before jacking.



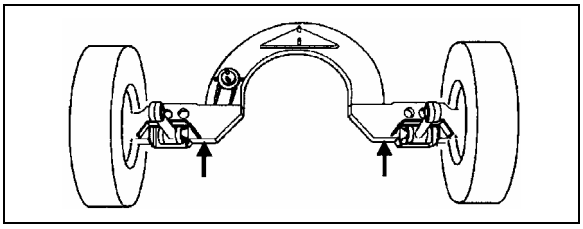
JACKING POINTS ON FRONT AXLE 10005



JACKING POINTS ON DRIVE AXLE 11005

⚠ WARNING ⚠

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



JACKING POINTS ON TAG AXLE 11023

⚠ WARNING ⚠

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

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

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

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

⚠ WARNING ⚠

Do not jack vehicle with passengers inside. Coach weight depends on equipment and cargo within. Check before jacking.

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

TOWING THE VEHICLE

The vehicle can be transported on a low bed semi-trailer of adequate gross axle weight capacity. When transporting a vehicle in this manner, apply parking brake and shut down the engine. Block all wheels and secure vehicle with tie-downs. Check that overall height will clear obstacles on the route to follow, and obtain required permits.

The vehicle can also be towed by lifting the front axle or by towing from the front with all wheels on the ground. These two methods are described below under their respective headings. Whatever the method used, the

vehicle should be towed by truck operators authorized and experienced in towing highway coaches.

Observe normal precautions including, but not limited to, the ones listed below when towing the vehicle:

- Make sure the parking brake is released before towing.
- Do not allow passengers to ride onboard the towed vehicle.
- Tow the vehicle at a safe speed as dictated by road and weather conditions.
- Accelerate and decelerate slowly and cautiously.

⚠ WARNING ⚠

Do not carry passengers while the coach is being towed.

⚠ CAUTION ⚠

Never tow the vehicle from the rear, as this will cause serious damage to the chassis and engine cradle. In case of damage to the drive train components, use a low bed semi-trailer to support the rear end.

LIFTING AND TOWING

The towed vehicle must be lifted from under the front axle only. The tow truck must be equipped with the proper lifting equipment to reach under the front axle since no other lifting points are recommended. Lifting and towing from any other point are unauthorized as it may cause serious damage to the structure. Do not unload or raise the tag axle when lifting and towing to prevent overloading the drive axle.

1. Remove both drive axle shafts to prevent damage to the transmission. Plug axle tube to prevent oil loss. Refer to Rockwell's *"Maintenance manual no.5"* annexed at the end of Section 11: Rear Axle of the maintenance manual.

⚠ CAUTION ⚠

Transmission lubrication is inadequate when towing. With automatic, semi-automatic or manual transmission, the axle shafts or driveshaft must be disconnected to avoid serious damage to the transmission. Do not attempt to push or pull-start the coach.

2. Operate the engine when towing to maintain brake system air pressure. If the engine cannot be operated, connect an external air pressure line from the tow truck to the emergency fill valve in the engine R.H. side compartment. The emergency fill valve in the front service compartment does not supply air pressure to the brake system. The air pressure must be a minimum of 75 psi (520 kPa), and the line should be attached to the air line with a clip-on chuck.

⚠ CAUTION ⚠

Do not tow the vehicle without external air pressure applied to the emergency fill valve if the engine does not operate. Without brake system air pressure, the brakes may apply automatically if system air drops below 40 psi (275 kPa). If failure prevents releasing the parking brakes with air pressure, disengage the parking brakes mechanically.

3. Lift the vehicle from under the front axle, and adequately secure the underside to the tow truck lifting attachment with chains.
4. Observe safety precautions when towing.

⚠ CAUTION ⚠

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.

TOWING WITHOUT LIFTING

⚠ CAUTION ⚠

When towing vehicle without lifting, use only a tow truck with a solid link tow bar and related equipment. All other means of towing are unauthorized. Tow only from the front of the vehicle.

1. Remove both drive axle shafts to prevent damage to the transmission. Plug axle tube to prevent oil loss. Refer to Rockwell's *"Maintenance manual no.5"* annexed at the end of Section 11: Rear Axle of the maintenance manual.

⚠ CAUTION ⚠

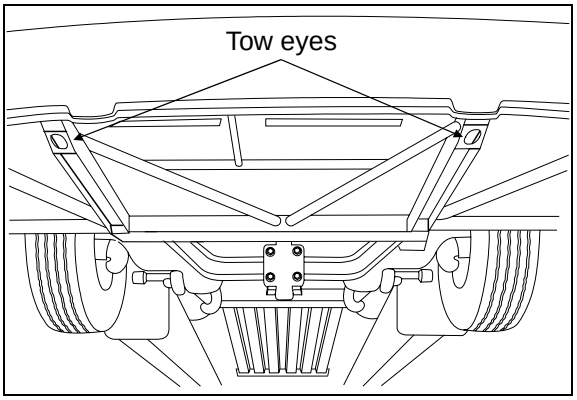
Transmission lubrication is inadequate when towing. With automatic, semi-automatic or manual transmission, the axle shafts or driveshaft must be disconnected to avoid serious damage to the transmission. Do not attempt to push or pull-start the coach.

2. Operate the engine when towing to maintain brake system air pressure. If the engine cannot be operated, connect an external air pressure line from the tow truck to the emergency fill valve in the engine R.H. side compartment. The emergency fill valve in the front service compartment does not supply air pressure to the brake system. The air pressure must be a minimum of 75 psi (520 kPa), and the line should be attached to the air line with a clip-on chuck.

⚠ CAUTION ⚠

Do not tow the vehicle without external air pressure applied to the emergency fill valve if the engine does not operate. Without brake system air pressure, the brakes may apply automatically if system air drops below 40 psi (275 kPa). If failure prevents releasing the parking brakes with air pressure, disengage the parking brakes mechanically.

3. Position the tow truck so that the tow bar contacts the front bumper of the vehicle.
4. Attach the tow truck chains only in the tow eyes of the vehicle under the bumper and take up all the slack.
5. Use a safety chain as applicable.
6. Observe safety precautions when towing.



TOW EYES UNDER VEHICLE 18401

⚠ CAUTION ⚠

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

DAYTIME RUNNING LIGHTS

The daytime running lights system provide added safety by making the front of the vehicle more visible to other drivers during the day.

The daytime running lights system turns the headlights on when:

Engine is running;

Parking brake is released;

The exterior lighting switch is set to the OFF position or depressed to the first position.

⚠ WARNING ⚠

Do not drive with only the daytime running lights at night because the taillights and the side marker lights are not turned on in that situation and the high beam can blind other drivers. For night driving, turn *ON* the headlights by depressing the headlights and exterior lighting rocker switch to the second position.

FOG LIGHTS

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

NOTE

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

COMPARTMENT LIGHTING

Baggage bays, front and rear service compartments and main power compartment lights are automatically turned *ON* when the corresponding compartment door is opened. A telltale light on the dashboard illuminates when a baggage bay door is open.

MUD FLAPS AND SPLASH GUARDS

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

BACK UP CAMERA

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

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

BACK UP ALARM

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

ESSENTIAL FUNCTIONS TO OPERATE THE VEHICLE (BASIC LIMP-HOME FUNCTIONS)

Even with a defective CECM (Chassis Electronic Control Module) or a CAN network problem, essential base functions are maintained to rear start the vehicle from the engine compartment and drive in a secure manner.

AVAILABLE FUNCTIONS

- Startup: Turn on the ignition in the driver's area and rear start the vehicle from the engine compartment,
- Opening the door: Functions normally,
- Closing the door: Manually pull on the door and it will lock automatically,
- Windshield wipers: Wipers functions at 1st speed only,
- Windshield washer fluid: Lower windshield washer only,
- Headlights: Low beams only,
- Directional signals: Rear and front only,
- Stoplights: 2 upper stoplights + high-mounted stoplight are functional,
- HVAC: Functional with set point fixed at 70°F (22°C), evaporator and condenser fixed at speed 1, defroster fixed at speed 4.

⚠ CAUTION ⚠

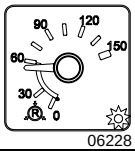
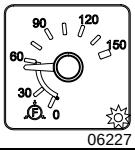
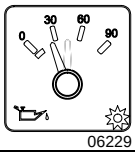
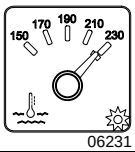
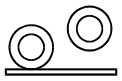
The following directives must be followed.

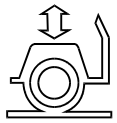
- **Never connect a battery charger when the ignition is at the ON position on a vehicle with a CAN defective or certain functions will start up by themselves,**
- **Disconnect the charger before starting the vehicle, if not the default functions will not activate,**
- **If the default mode does not activate, try to turn the ignition OFF while ensuring that no charger is connected and then restart the vehicle.**

AUDIBLE ALERTS

In addition to the dashboard telltale lights, the vehicle is equipped with an alert system to provide audible indications to the driver of the conditions given in the following table.

NOTE
To verify the telltale panel audible alarm functionality, with the engine running, press down and maintain the L.H. dashboard panel "TEST" switch at least 2 seconds. The telltale panel audible alarm will sound.

Visual Indication	Audible Alert	Condition
 06228	Yes	Air pressure in primary system below 66 psi (860 kPa).
 06227	Yes	Air pressure in secondary system below 66 psi (860 kPa).
 06229	Yes	Engine oil pressure below 50 psi (345 kPa).
 06231	Yes	Coolant temperature above 223 °F (106 °C).
 06282	Yes	Gear changing inhibited.
None	Yes	Reverse gear engaged.
 06288	Yes	Fire in engine compartment.
 06271	Yes	Tag axle retracted.

Visual Indication	Audible Alert	Condition
 06448	Yes	Kneeling down.
None	Yes	Engine OFF but parking brake not applied.
None	Yes	Lavatory emergency call button
 06309	Yes	Major problem detected by engine.
 06273	Yes	Outside temperature close to water freezing point.
 06292	Yes	Transmission fluid too hot.
 06299	Yes	Wheelchair lift access door is open

CLEANING

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

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

⚠ CAUTION ⚠
Custom fabrics and materials may require different cleaning and maintenance practices. Consult your converter.

SEAT UPHOLSTERY

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

NOTE
The abrasive nature of dirt and grit will reduce upholstery life expectancy. Vacuum regularly.

Removal Of Stains And Marks

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

Method One:

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

⚠ WARNING ⚠
Use solvents in a well ventilated area. Open all windows and doors.

Method Two

1. Wet the stain with a solution of household detergent and lukewarm water. Do not soak the stain;
2. Rub the stain with a damp cloth;
3. Rinse cloth after each application.

⚠ CAUTION ⚠
Do not use soap, soap powder, ammonia, soda, bleach or cleaning products containing any of these compounds.

Beverage Stains

Remove beverage stains by following method one. If stain persists, repeat method one using methylated spirits instead of solvent.

Alcoholic Beverage Stains

Remove alcoholic beverage stains by wetting the stain with water, then cleaning following method two.

Burns

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

Cosmetic Stains

Remove stains left by cosmetics by following method one then method two.

Ink Stains

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

Blood, Urine Or Vomit Stains

Remove such stains by following method two.

Copying Ink - Ball-Point Pen Ink

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

Marking Ink (Felt-tip Pens)

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

Oil, Grease And Paint

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

Rust Stains

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

Tar

Soften tar with benzene, then treat using method one followed by method two.

Chewing Gum

Soften gum with cyclohexane. Carefully scrape off stains using a sharp knife or razor blade.

PLASTIC AND VINYL

Clean plastic and vinyl trim using a clean damp cloth or sponge. For vinyl trim marks, use a lukewarm all purpose cleaner or a mild saddle soap. Remove water spots and soap traces using a clean damp cloth or sponge. Dry with a clean soft cloth.

Remove grease, tar or oil stains with a clean cloth or sponge and an all purpose or solvent-type vinyl cleaner.

Apply a colorless vinyl or leather protective product to maintain the luster and pliability of the plastic or vinyl surface.

WINDOWS

Clean the inside of the windows with a solution of one part vinegar to ten parts water.

WINDSHIELD

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.

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

To keep its original appearance, wash the floor regularly. Clean vinyl floors with a quality nonionic detergent cleaner or an household all purpose cleaner. Follow the manufacturer's recommendations for cleaning. Remove incrusted rubber or oil stains with thinner.

Remove any excess detergent solution using a wet/dry vacuum or mop. Rinse floor with a solution of one part Clorox to ten parts warm water.

Polish dry floor using a high-speed buffer and a smooth red 3-M polishing pad.

Mop floor periodically with a solution of 5 per cent Clorox in warm water.

NOTE
For custom or special floor covering materials, consult the manufacturer or your converter for information on how to clean and maintain these types of floors.

EXTERIOR SURFACES

Frequent washing and waxing of the vehicle exterior will help protect the finish and luster. The paint finish is attacked by the abrasive effects of airborne particles and corrosive pollutants.

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

The vehicle exterior should be cleaned, waxed and buffed when water droplets no longer form on the painted surfaces.

⚠ CAUTION ⚠
Hot water can damage paint. Keep water cool or lukewarm.

⚠ CAUTION ⚠
Make sure cleaning solutions are not harmful to painted surfaces. Read the manufacturer's instructions before using.

⚠ CAUTION ⚠
Do not spray water jet directly into fresh air inlet dampers.

⚠ CAUTION ⚠
Do not aim high pressure water jet at radiator or condenser doors. This could damage the fins.

To prevent corrosion, remove caked-on dirt and road salt from the vehicle underbody using a high pressure water jet. Clean wheel housings, bumpers, muffler, tailpipe and brackets.

Carry out corrosion prevention cleaning at least twice a year. Spray underneath of the vehicle and let soak before cleaning. Let engine and exhaust system cool down before cleaning.

Tar Or Oil

Remove tar or oil as soon as possible with an approved automotive tar and oil remover or turpentine. Thoroughly clean area with car wash soap and water. Let dry, then wax.

Insects

Remove insect stains as soon as possible with lukewarm soap and water or insect remover.

Tree Sap

Remove tree sap or bird droppings with lukewarm soap and water. Do not allow to harden.

LAVATORY MAINTENANCE

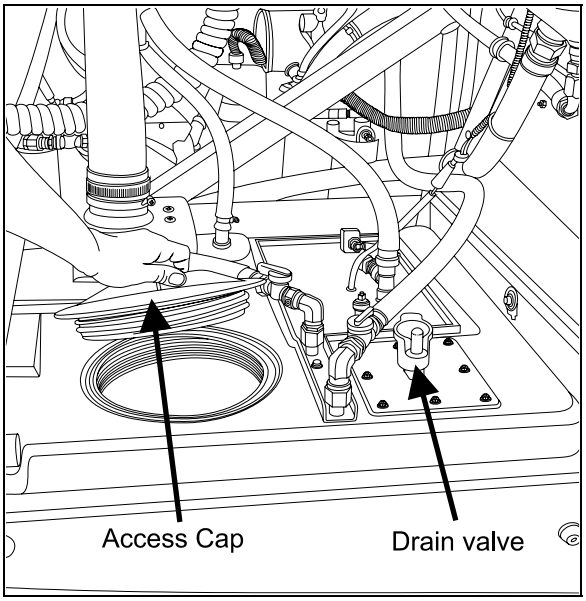
Flush water in the lavatory is recirculated from the sump tank (if two sump tanks are installed, the top tank is the main tank and the bottom one becomes the auxiliary sump tank). When the main sump tank water is too soiled to be recirculated, the driver can dump it into the optional auxiliary sump tank until a suitable dump location can be reached. The main sump tank is then filled with clean water and the process continues.

The optional top tank contains about 13 gallons (50 liters) and the lower tank contains about 26 gallons (100 liters).

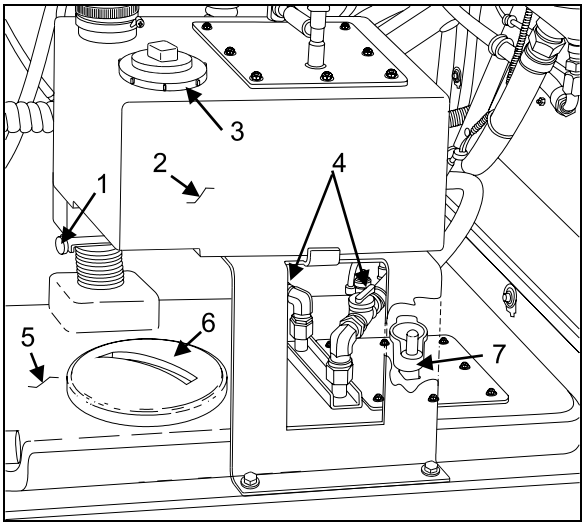
NOTE
The fresh water tank also drains into the sump tank. One must take into account this fact to avoid an overflow.

Routine draining and filling of lavatory tanks should be performed by maintenance personnel only, and should be done before parking the coach overnight in freezing temperatures.

The sump tank may be equipped with a heating element which permits circulating coolant fluid through the tank in cold weather. When not needed, close the valves to bypass the system.



SINGLE SUMP TANK OPTION 23294A



DUAL SUMP TANK OPTION 23295

1. Main sump tank drain valve;
2. Main sump tank
3. Main sump tank access cap;
4. Auxiliary sump tank heating element valves;
5. Auxiliary sump tank
6. Auxiliary sump tank access cap;
7. Auxiliary sump tank drain valve.

FILLING THE SUMP TANK

Fill the sump tank through the access hole and throw in a packet of commercial toilet deodorant (Prevost part #900329).

DRAINING THE SUMP TANK

When recirculating water in the toilet is soiled, drain the sump tank. If equipped with the optional auxiliary sump tank, drain the main sump tank contents into the auxiliary tank by opening the knife gate valve under the tank. Perform the filling procedure of the main tank.

DRAINING THE AUXILIARY SUMP TANK

To drain the auxiliary sump tank contents, remove the cap located underneath the tank then turn the drain valve lever counterclockwise about eight or nine turns and pull the lever up. Remove the access cap and flush tank with clean water. To close, push the valve down on its seat then turn the drain valve lever several turns clockwise until the rubber bladder seals the drain hole. Reinstall both caps.

⚠ CAUTION ⚠

Lavatory tanks should be serviced only at suitably equipped stations.

NOTE

It is unlawful to dump sump tank contents in any location other than those designated as such.

When a complete tank draining is required, clean main tank by repeating the draining and filling operations while leaving the auxiliary sump tank drain valve opened. Close valves and drop in a packet of commercial toilet deodorant (Prevost part #900329) in toilet before starting final filling of the main tank.

⚠ WARNING ⚠

The toilet deodorant contains compounds which can be very irritating to skin. Use rubber gloves when handling and then clean toilet seat.

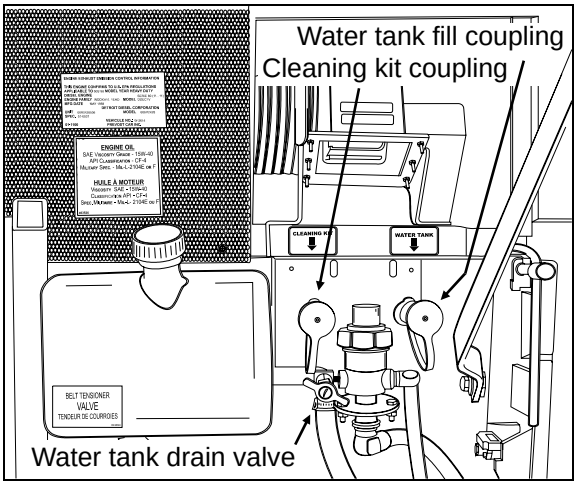
⚠ CAUTION ⚠

When cold weather is expected, both sump tanks must be drained if the coach is parked overnight or for an extended period of time.

NOTE
Due to the heat it produces, there is less risk of freezing in the tanks when the engine is operating.

NOTE
New coaches are delivered with the sump and fresh water tanks empty. Fill with water before putting the coach in service.

FRESH WATER RESERVOIR



ENGINE COMPARTMENT 23209

Water from the fresh water reservoir supplies the washbasin in the lavatory.

⚠ WARNING ⚠
Do not drink water from the fresh water reservoir.

Filling The Fresh Water Reservoir

Connect the fresh water supply hose to the fresh water reservoir fill connection located in the curb-side engine compartment. The fresh water tank contains about 17 gallons (66 liters). Fill the reservoir until the overflow tube leaks, signaling that the reservoir is full.

⚠ WARNING ⚠
Never put antifreeze in fresh water reservoir; antifreeze is toxic.

⚠ WARNING ⚠
If reservoir has not been drained for an extended period of time, draining and filling operations must be repeated three (3) times in order to clean reservoir and eliminate contaminated water.

Draining The Fresh Water Reservoir

The fresh water reservoir can be drained by simply opening the drain cock. Don't forget to close the cock when draining is complete.

NOTE
The fresh water reservoir may be equipped with an optional thermal valve which is set to open at about 35°F, thereby automatically draining the reservoir in near-freezing temperatures.

CLEANING CABINET

A hose connection and valve is located behind a small door in the top curbside corner of the rear lavatory wall. It can be used to attach a garden hose for lavatory cleaning. To use, connect a fresh water supply to the connection in the engine compartment, identified as "Cleaning Kit", located next to the fresh water reservoir fill coupling.

To prevent freezing during cold weather, drain the hose after every use.

FLUID LEVEL VERIFICATION

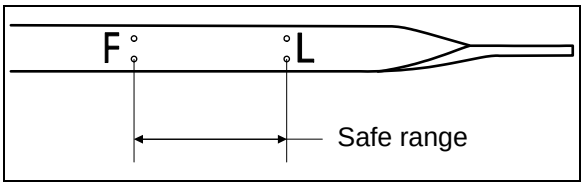
Periodic inspection of oil and fluid levels is the most economical and easiest way to help your vehicle perform at its best. Rigorous oil level inspection and replacement will greatly help minimize expensive and unscheduled repairs.

ENGINE OIL LEVEL

Check engine oil level when engine is still warm and with vehicle parked on a level surface. Shut *OFF* engine and wait at least 10 minutes for oil to drain into oil pan before checking. Check engine oil level daily or before each trip. Add oil as required. Do not overfill. Remove dipstick, wipe clean and fully reinsert to ensure an accurate reading. Remove dipstick and check engine oil level.

The oil level must be maintained between the two marks indicated on the dipstick. Do not let the oil level drop below the L mark. Add oil by opening the oil reserve tank drain cock 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 cock or oil filler cap after adding oil. Recheck the oil level. Do

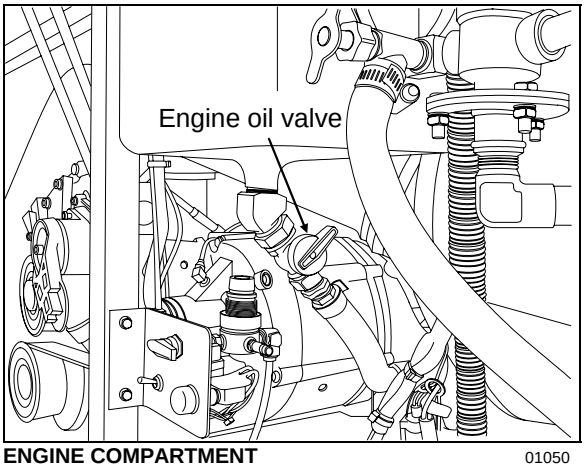
not let the oil level go above the F mark on the dipstick.



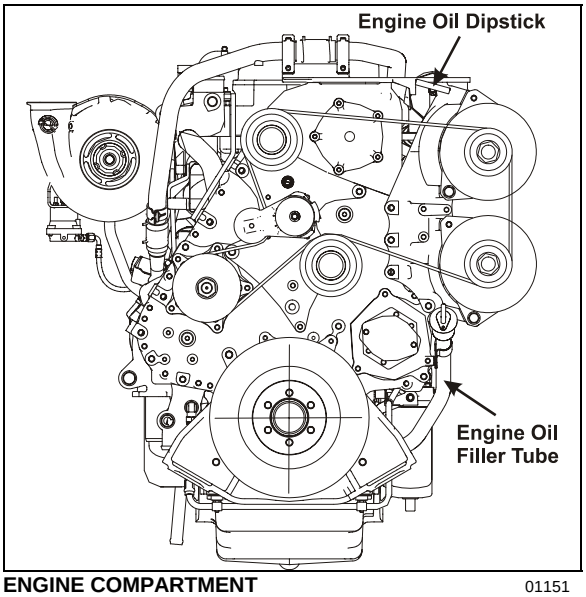
ENGINE OIL LEVEL DIPSTICK 01027

⚠ CAUTION ⚠

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



ENGINE COMPARTMENT 01050



ENGINE COMPARTMENT 01151

TRANSMISSION FLUID LEVEL

⚠ 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.

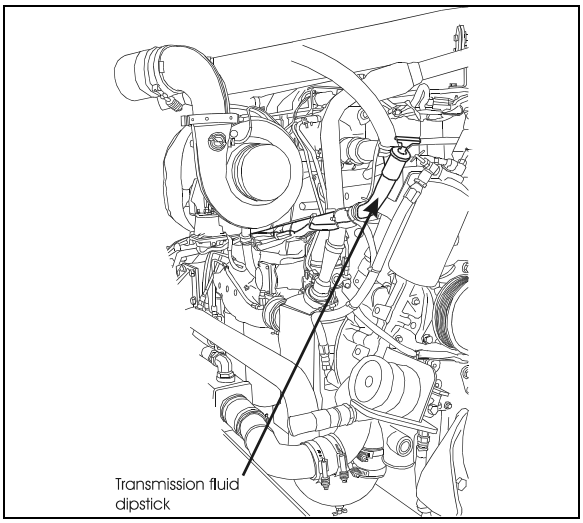
⚠ CAUTION ⚠

Do not mix fluid types or brands because of possible incompatibility.

⚠ CAUTION ⚠

Use clean fluid and containers when filling transmission. Never use containers that have contained water or anti-freeze (Glycol).

ALLISON TRANSMISSION FLUID LEVEL



LEFT SIDE OF ENGINE 01121

The transmission fluid level can be checked with the dipstick or with the use of the shift selector display. For more information on how to use the shift selector display to check the transmission oil level, refer to TECHNICAL INFORMATION in this manual.

The transmission fluid level dipstick is accessible through the engine compartment rear door and is located on the left side of the engine.

To check the transmission fluid level, a "cold check" and a "hot check" must be performed. A cold check must be made when the transmission fluid is between 60°F and 120°F (16°C and 50°C).

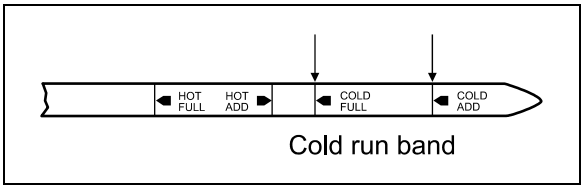
NOTE

Perform the cold check first to verify the transmission fluid level before performing the hot check.

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 fluid temperature is between 60°F and 120°F (16°C and 50°C). With the engine idling, make sure the parking brake is applied and the transmission is in neutral (N). Remove and wipe the dipstick with a clean cloth. Check oil level. If the oil level is within the COLD RUN band, the oil level is correct and a hot check can be performed. If the oil level is on or below the lower line of the COLD RUN band, add oil until the level lies within the COLD RUN band. If the oil level is above the COLD RUN band, drain oil until the level is within the band.



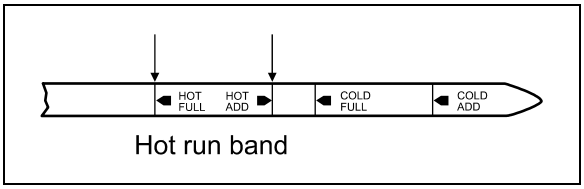
TRANSMISSION FLUID LEVEL DIPSTICK 07006

⚠ CAUTION ⚠

The oil level rises as oil temperature rises. Do not add oil above the "cold run" band before the transmission reaches 180°F to 220°F (82°C to 104°C).

Hot Check

Make sure the transmission fluid temperature is between 180°F and 220°F (82°C and 104°C) before performing the hot check. Run the engine between 1,000 and 1,200 RPM for approximately one minute to purge air from the system. With the engine idling and the parking brake applied, shift transmission from forward (D) to reverse (R) and back into neutral (N) to fill clutch cavities with oil. Remove and clean dipstick, then check oil level. If the oil level is on or under the lower HOT RUN line, add just enough oil to bring up the level to the middle of the HOT RUN band.



TRANSMISSION FLUID LEVEL DIPSTICK 07006

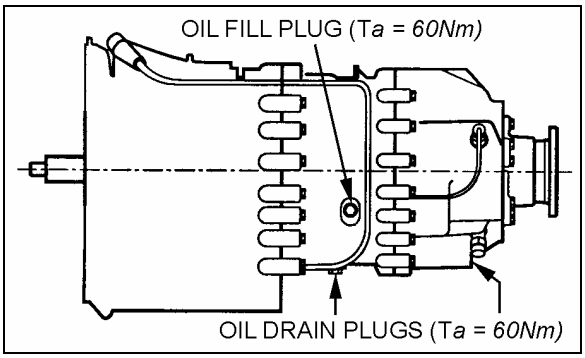
Replace dipstick and tighten the filler tube cap until the rubber seal is correctly seated.

⚠ CAUTION ⚠

Do not overfill transmission fluid reservoir. Severe damage may result.

ZF-ASTRONIC TRANSMISSION FLUID LEVEL

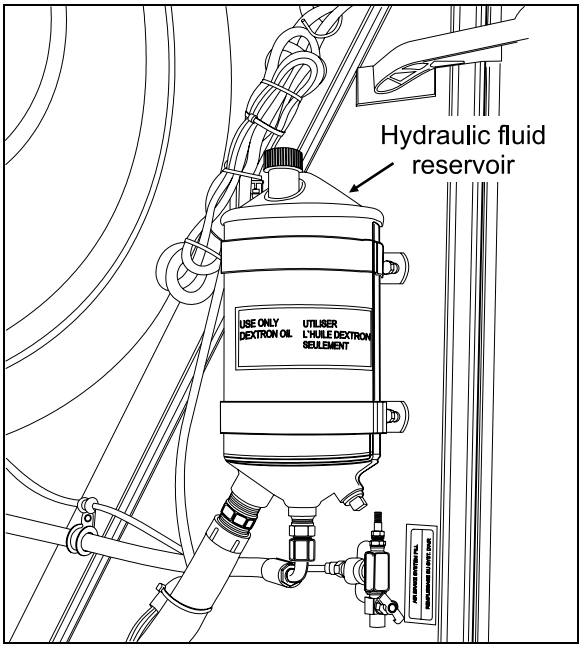
- Vehicle should be on horizontal ground when oil is changed;
- Do not check oil level straight after a journey (incorrect measurement). Undertake the check once the transmission oil has cooled down (lower than 104°F or 40 °C);
- Remove oil fill screw;
- Add oil if the oil level has fallen below the oil filling point;
- Add oil through the oil filling point;
- The oil level is correct once the top of the oil has reached the bottom of the filling point or once oil has already started to escape from the filling point.



ZF TRANSMISSION FILLING POINT 07111

POWER STEERING FLUID LEVEL

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



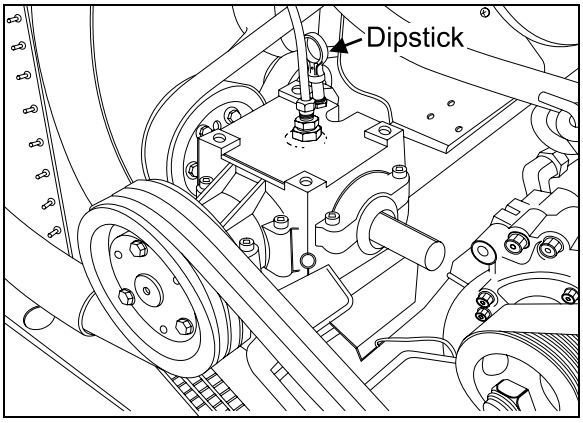
ENGINE COMPARTMENT 14043

Check fluid level as follows:

1. Stop engine, open engine compartment and place rear start switch to *OFF* position;
2. Unscrew and remove the dipstick located on top of the fluid tank and wipe with a clean rag;
3. Replace dipstick in tank, then remove to check fluid level;
4. Add hydraulic fluid until it reaches the FULL mark on the dipstick;
5. Replace and tighten dipstick;
6. Place engine rear start switch to *NORMAL* position. Close engine compartment door.

RADIATOR FAN GEARBOX OIL LEVEL

The radiator fan is belt-driven by the engine crankshaft pulley through a gearbox and drive shaft. A dipstick located on top of the gearbox is used to check the radiator fan gearbox oil level.



ENGINE COMPARTMENT 05062

Check radiator fan gearbox oil level as follows:

1. Stop engine, open engine compartment and place battery master switch to the *OFF* position;
2. Open engine compartment door and place engine starter switch to *OFF* position;
3. Remove the dipstick located on the top of the gearbox and wipe with a clean rag;
4. Insert dipstick in gearbox case, then remove again to check mark;
5. If necessary, add lubricant, through the oil dipstick tube or vent plug, until the level reaches the "FULL" mark;
6. Reinsert the dipstick;
7. Place engine rear start switch to *NORMAL* position. Close engine compartment door;
8. Set battery master switch to *ON* position.

DRIVE AXLE WHEEL BEARING OIL LEVEL

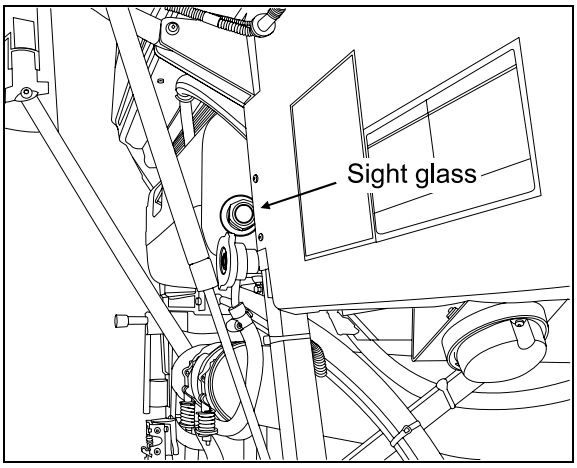
Drive axle wheel bearings are lubricated by the differential oil. Maintain differential oil at correct level to ensure adequate lubrication of drive axle wheel bearings at all times.

FRONT AND TAG AXLE WHEEL HUBS

The unitized hub bearings used on the NDS range of axles, are non-serviceable items. Bearings are pre-adjusted, lubricated and have seals fitted as part of the manufacturing process. The bearings are greased for life and there is no need or facility for re-lubrication.

COOLANT FLUID LEVEL

Coolant level is correct when coolant is visible through the surge tank sight glass when cold. If coolant level is low, fill system with the same 50-50 mixture normally used.



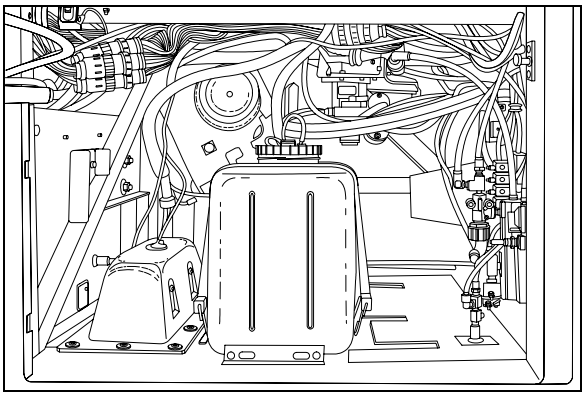
SURGE TANK IN ENGINE COMPARTMENT 05066

⚠ WARNING ⚠

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

WINDSHIELD WASHER & HEADLIGHTS WASHER RESERVOIRS

The windshield washer reservoir and headlights washer reservoir are located in the front service compartment door. The windshield washer reservoir has a capacity of 5.3 US gallons (20 liters) while the headlights washer reservoir has a capacity of 2.6 US gallons (10 liters). Check fluid level regularly.



WINDSHIELD WASHER FLUID RESERVOIR 14050

The spray jets are located on the windshield wipers and are angled to spray towards the center of the windshield.

Adjust the headlights washer nozzles according to the instructions found in section 23 of the maintenance manual. You may use water or windshield washer fluid as well.

⚠ CAUTION ⚠

During cold weather days, use windshield washer fluid suitable for freezing temperature only.

OTHER VERIFICATIONS

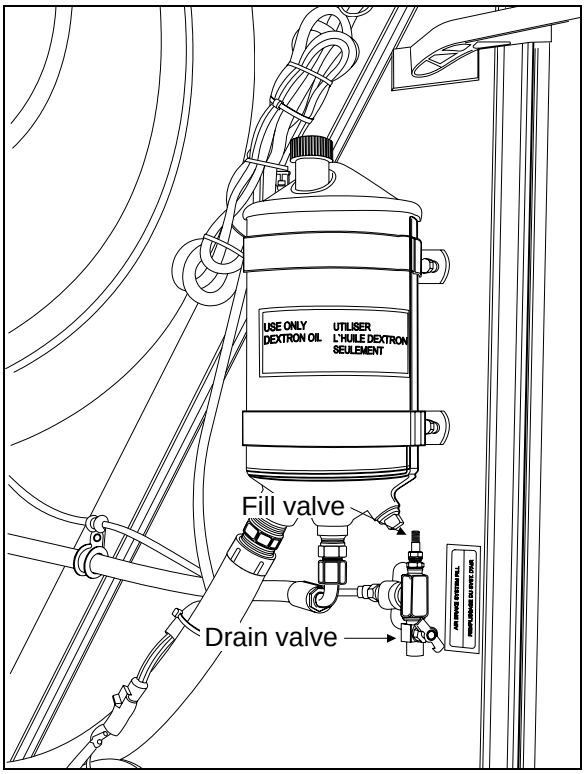
It is good practice to regularly inspect the vehicle for signs of component wear and to perform safety and maintenance routines.

AIR TANK PURGE

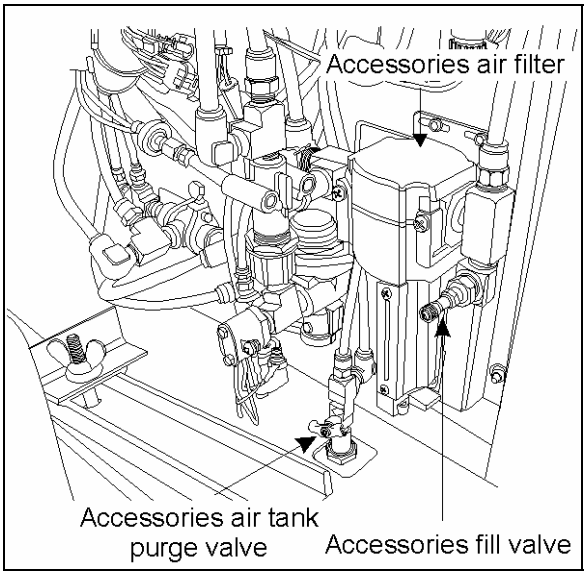
The vehicle may be equipped with up to six air tanks. Purge accessory and wet air tanks before each trip. The primary and secondary air tanks must be purged at every oil change. Oil changes should be scheduled at least every 12,500 miles (20 000 km).

The accessory air tank drain cock is accessible from the front service compartment. The wet air tank drain cock is accessible from the engine compartment. All air tanks are equipped with a drain cock underneath the tank. Refer to the "Lubrication and Service Check Point Chart" in this chapter for tank locations.

Drain tanks by turning cocks counterclockwise.



ENGINE COMPARTMENT 12148



FRONT SERVICE COMPARTMENT 12130

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;

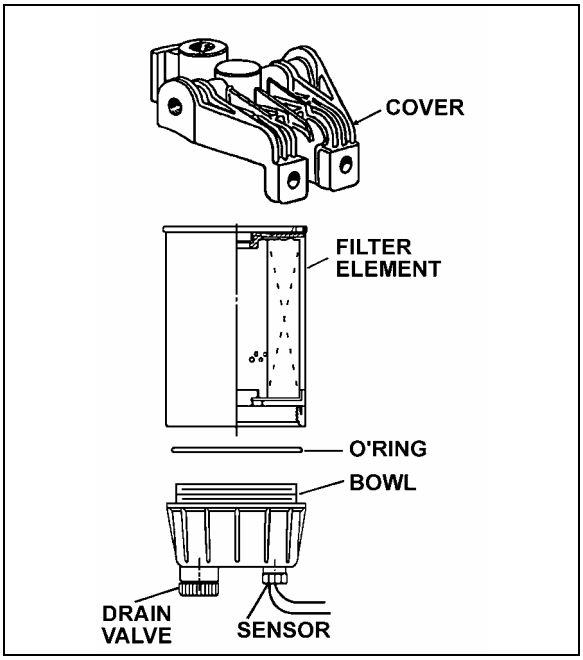
Check that seal on handle is intact;

Check that hose nozzle is in good condition and the nozzle is free of obstructions;

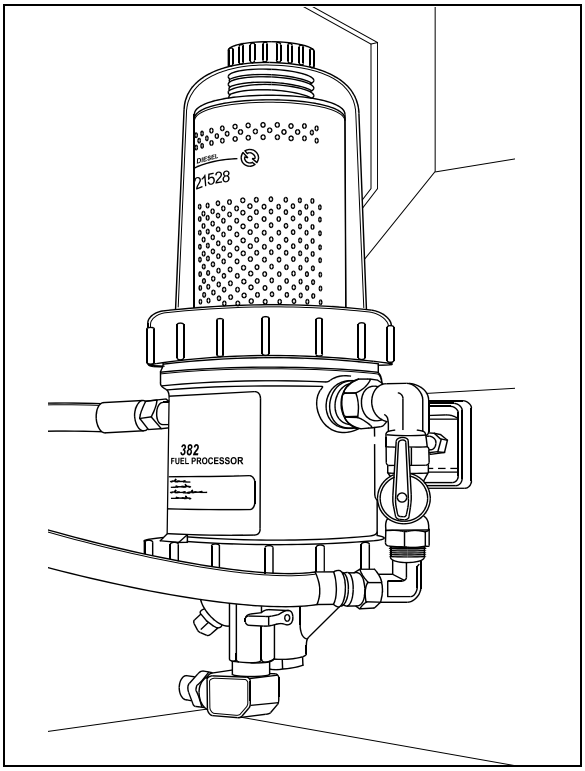
Keep fire extinguishers clean.

FUEL FILTER/WATER SEPARATOR

An optional fuel filter/water separator may be installed in the engine compartment in place of the primary fuel filter. It is used to prevent water from entering the fuel system. The water separator should be drained periodically or when the telltale light on the dashboard illuminates. To drain water, loosen the drain valve below the separator. Close the drain valve when finished.



FUEL FILTER/WATER SEPARATOR 03025



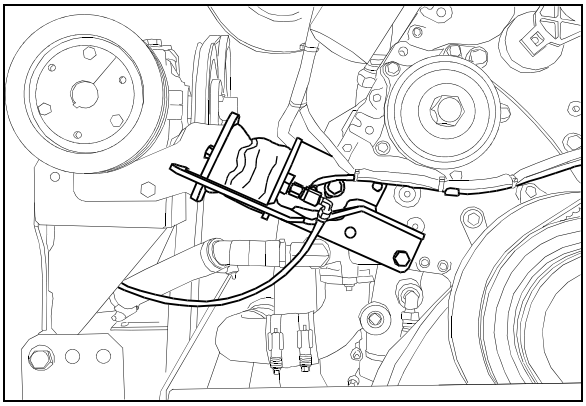
DAVCO FUEL PRO 382 INSTALLATION 03032

The optional Fuel Pro 382 diesel fuel filter system consists of a permanently mounted fuel processor, a replaceable filter element, a filter element cover and collar and a fluid filter base assembly. This system is installed between the fuel tank and the fuel pump and is designed to be the only fuel filter in the fuel system. The filter serves as a water separator as well as a fuel filter. To drain water, loosen the drain valve below the separator one quarter turn. Close the drain valve when finished.

BELT TENSION ADJUSTMENT

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

Belt tensioning is applied through air bellows which are adjusted by an air pressure regulating valve mounted in the engine compartment, right behind the belt tensioning pressure control valve. The correct pressure of 45 psi (310 kPa) is set at the factory. The distance between the stop and the plate at the top of the bellow should be approximately ¼ " (7mm). Periodically verify the pressure at the regulating valve using a pressure gauge and correct if necessary.

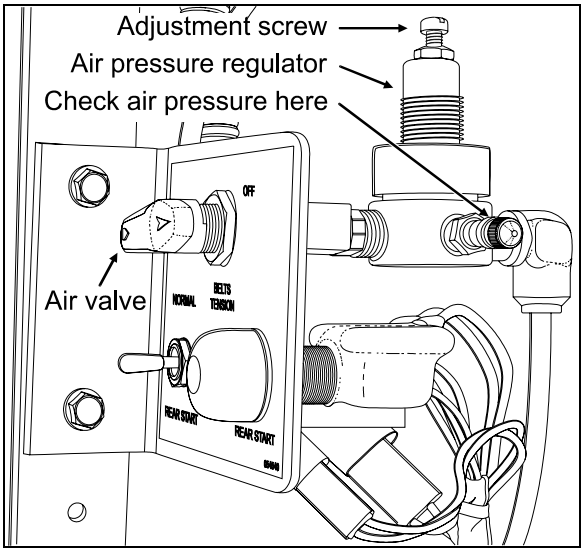


AIR BELLOWS 01122

For belt replacement, air pressure must be released from bellows by means of the belt tensioning pressure control valve. Turn control valve handle clockwise to release pressure from the air bellows. Before handling, set the rear start switch to OFF and observe all applicable safety precautions.

Turn control valve handle counterclockwise to its initial position to reapply pressure to the air bellows.

- Refer to the Parts Manual, Maintenance Manual or "Service Bulletins" for recommended belt sizes and tension settings;
- Periodically inspect belt and pulleys for wear or damage;
- Do not treat belts with any compounds. Keep belts dry.



BELT TENSION AIR REGULATOR AND VALVE 01058

BACK UP CAMERA

The optional back up camera is located on the rear cap. As soon as the transmission is put in reverse (R), back up camera and monitor are turned on automatically. To clean the camera's protective glass, spray with soapy water. Wipe with a clean damp rag or wiper blade.

⚠ WARNING ⚠

To avoid injury, do not clean camera with transmission in reverse (R). Shut off engine and apply parking brake before cleaning.

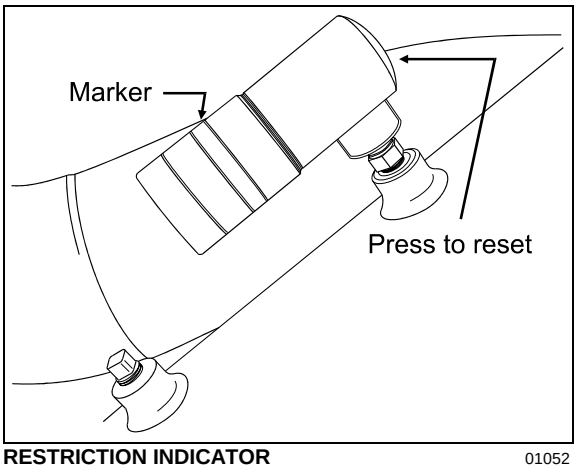
⚠ CAUTION ⚠

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

AIR FILTER RESTRICTION INDICATOR

An optional filter restriction indicator is used to monitor the vacuum level between the air filter and engine. A red marker is displayed when the air filter is clogged. When a red marker is displayed, the air filter must be replaced. Reset by pressing on the indicator's extremity.

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



RESTRICTION INDICATOR 01052

A/C AND HEATING SYSTEM AIR FILTERS

For maximum air conditioning and heating system efficiency, air filters should be inspected and cleaned as required in the maintenance schedule to ensure proper ventilation of the evaporator and heating radiator cores. To clean filters, remove lint using a nylon brush, back flush with water then dry with air.

⚠ CAUTION ⚠

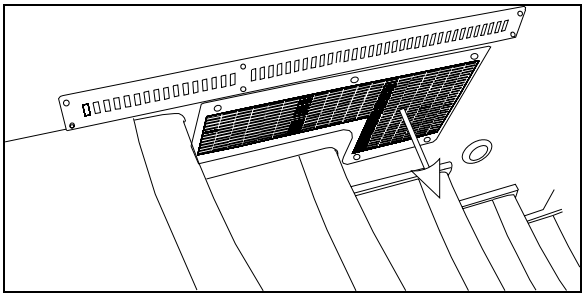
Do not use a high pressure water jet to avoid damaging the filter.

⚠ CAUTION ⚠

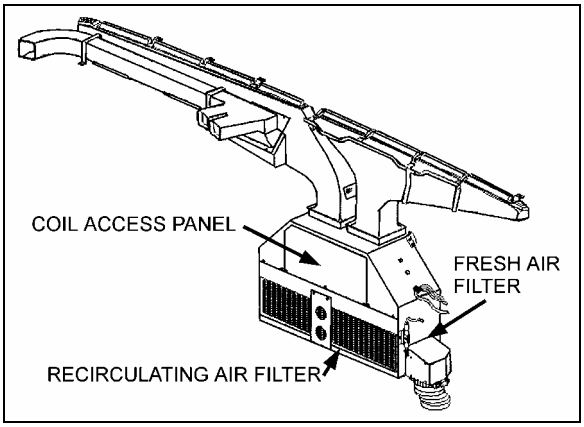
Be sure not to reverse the filters upon installation.

DRIVER'S AREA AIR FILTERS

The driver HVAC system's air filters are located behind the front console. To gain access to the A/C filters, remove the grille located at the top step of the entrance door stairs. Remove the filters for cleaning or replacement.



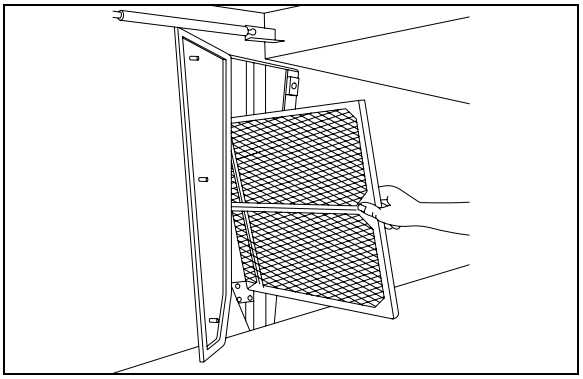
DRIVER'S AREA AIR FILTER REMOVAL 18505



DRIVER'S AREA AIR FILTERS 22171

CABIN AIR FILTER

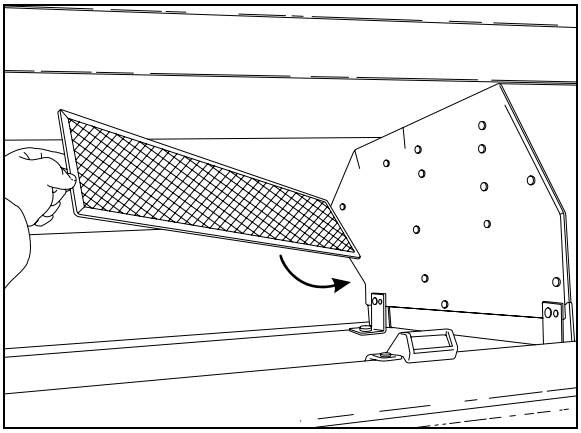
To access central HVAC system filter, open one of the two baggage compartment adjacent to the evaporator compartment. The filter is located behind an access door held shut by three retaining screws Slide out the filter, clean or replace.



CABIN AIR FILTER 22100

Filters in the Overhead Compartments

Remove, clean or replace the air filter located behind each overhead baggage compartment fan.



OVERHEAD COMPARTMENT FAN AIR FILTER 22201

HOSE INSPECTION

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

LUBRICATION

Grease all lubrication points during scheduled maintenance. For heavy loads or extended use, lubricate more often. Refer to the Maintenance Manual, section 24 for information on lubrication.

ROUTINE INSPECTION

This inspection should be performed every working day.

WITH ENGINE STOPPED

Inspect hoses for leaks. Carefully inspect all fittings, clamps and ties. To prevent chafing, make sure hoses are not touching shafts, couplings, heated surfaces, sharp edges or other parts. Since hose clamps and ties can vibrate loose or fail over time, inspect frequently and tighten or replace as necessary.

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

Leaks

Check for leaks under vehicle and in compartments.

Correct leaking hoses immediately. Failure to correct leaks can cause severe damage to the equipment, as well as increase operating costs due to lost fluids. Treat fuel and oil leaks as an immediate fire hazard.

⚠ WARNING ⚠

Personal injury and property damage may result from fire caused by leaking flammable fluids.

Hose Service Life

Hoses have a limited service life. Thoroughly inspect hoses annually. Look for surface damage or indications of twisted, worn, crimped, cracked or leaking lines. Replace damaged hoses immediately.

Hoses should be replaced during major overhaul or after a maximum of seven years service. Be certain replacement hoses match the original equipment manufacturer's specifications.

Wheels And Tires

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

Keep the tires inflated to the recommended inflation pressure to prolong tire life and for safety.

NOTE

Recommended tire inflation pressures are given in the "Coach Final Record", placed in the technical publications package supplied with the vehicle. The cold tire inflation pressures are on the Department of Transport certification plate located on the L.H. console

besides the driver's seat. When special tires are installed by Prevost on a new vehicle, a special tire inflation chart is added next to the certification plate.

⚠ 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.

⚠ WARNING ⚠

If replacement tires are different from those described on the certification plate, pressure must be adjusted as requested in the Tire and Rim Association Manual.

Doors

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

Tools And Spares

Make sure the vehicle is equipped with a wheel nut wrench, door keys, spare belts, reflectors and jack.

Air System

To drain water from air and accessory tanks, open drain cocks. Close drains when completed. Refer to heading "Air Tank Purge" in this chapter.

Water Separator

To drain water separator, open drain valve. Close drain valve after draining.

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-water mixture. Refer to the vehicle "Maintenance Manual", section 05 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

Wheel Bearings

Check wheel bearing cover for overheating (especially after using the service brakes) during fuel stops by touching the wheel bearing cover.

Windshield Washer Reservoir

Make sure windshield washer reservoir is full. For cold weather, use antifreeze windshield washer fluid.

Engine Oil

Check engine oil level during fuel stops. It is normal for diesel engines to burn some oil. If the oil level is low, refer to heading "Engine Oil Level" in this chapter.

⚠ WARNING ⚠

Check the engine oil level with vehicle parked on a level surface and with the parking brake engaged.

Power Steering Oil Tank

Check steering oil level. Refer to heading "Power Steering Fluid Level" in this chapter.

Belts

Check for loose, worn or broken belts.

Belt Tension Adjustment

Check belt tension using a pressure gauge. Refer to heading "Belt Tension Adjustment" in "Other Verifications" section in this chapter.

Fire Extinguishers

Check fire extinguishers to make sure they are ready for operation. Refer to heading "Fire Extinguishers" in "Other Verifications" section in this chapter.

Emergency Exits

Verify emergency exits for correct operation.

Driver's Section

Adjust driver's mirrors and seat.

WITH ENGINE RUNNING

Fault diagnostic and error codes

Using the message center display, perform a system diagnostic to check if error codes and anomalies were recorded in the vehicle electronic modules. Refer to OTHER FEATURES section under SYSTEM DIAGNOSTIC MENU.

Leaks

Walk around vehicle and listen for air leaks.

Turbocharger

Check for leaks and listen for unusual sounds coming from the turbocharger.

Automatic Transmission

Check automatic transmission oil level. Refer to heading "Automatic Transmission Fluid Level" in this chapter.

Gauges And Buzzers

Perform a telltale light test (see "Controls and Instruments" chapter). Make sure gauges are in normal operating condition. Indicator lights and buzzers should all be *OFF* before driving.

Fuel Level

Make sure there is enough fuel in the tanks.

Service Brake Test

Check for correct pressure build-up. Stop engine and check pressure gauge Pressure loss should be imperceptible with engine stopped and without brake pedal applied. Air loss should not exceed 3 psi/minute (21 kPa/minute) with engine stopped and brake pedal fully applied.

Parking Brake Test

Release parking/emergency brake. Pump service brake pedal until air pressure drops to 65 psi (448 kPa). Make sure the warning buzzer operates and that the emergency brakes apply (the control valve knob lifts up). Allow air pressure to reach 95 psi (655 kPa) before releasing parking brake.

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

EXTERIOR LIGHTING VERIFICATION

Exterior Lighting Test Mode

This useful function allows quick verification of the vehicle exterior lights.

Activating the test mode:

When the vehicle is stationary (parking brake applied), pull up the multi-function lever 3 times within 3 seconds to activate the test mode. This test can be done when the engine is not running providing that the battery charge is sufficient (above 24.4 volts).

The telltale panel alarm emits a sound each second to remind that the test mode is in progress.

Stopping the test mode:

To stop the test mode, pull up the multi-function lever once or turn the ignition OFF or remove the parking brake.

IMPORTANT NOTE
The test mode is useful to check the functioning of the multiplex outputs and the exterior lights. It doesn't test the functionality of the commands related to the exterior lighting. For a complete testing, the directional signal commands, the headlights commands and the brake pedal have to be checked before. Once these commands tested, activate the test mode to check the exterior lighting.

Using the test mode:

First, test the functionality of the commands related to the exterior lighting:

- Activate the right directional signal and check that the corresponding telltale light illuminates.
- Activate the left directional signal and check that the corresponding telltale light illuminates.
- Press on the brake pedal and check that the STOP telltale light illuminates.

Once these commands tested, activate the test mode to check the exterior lighting by pulling up the multi-function lever 3 times within 3 seconds.

Go to the front of the vehicle and check the lights:

- o First the left and right directional signals.
- o Identification lights and clearance lights.
- o Low beams.
- o High beams.

Go to the left side of the vehicle:

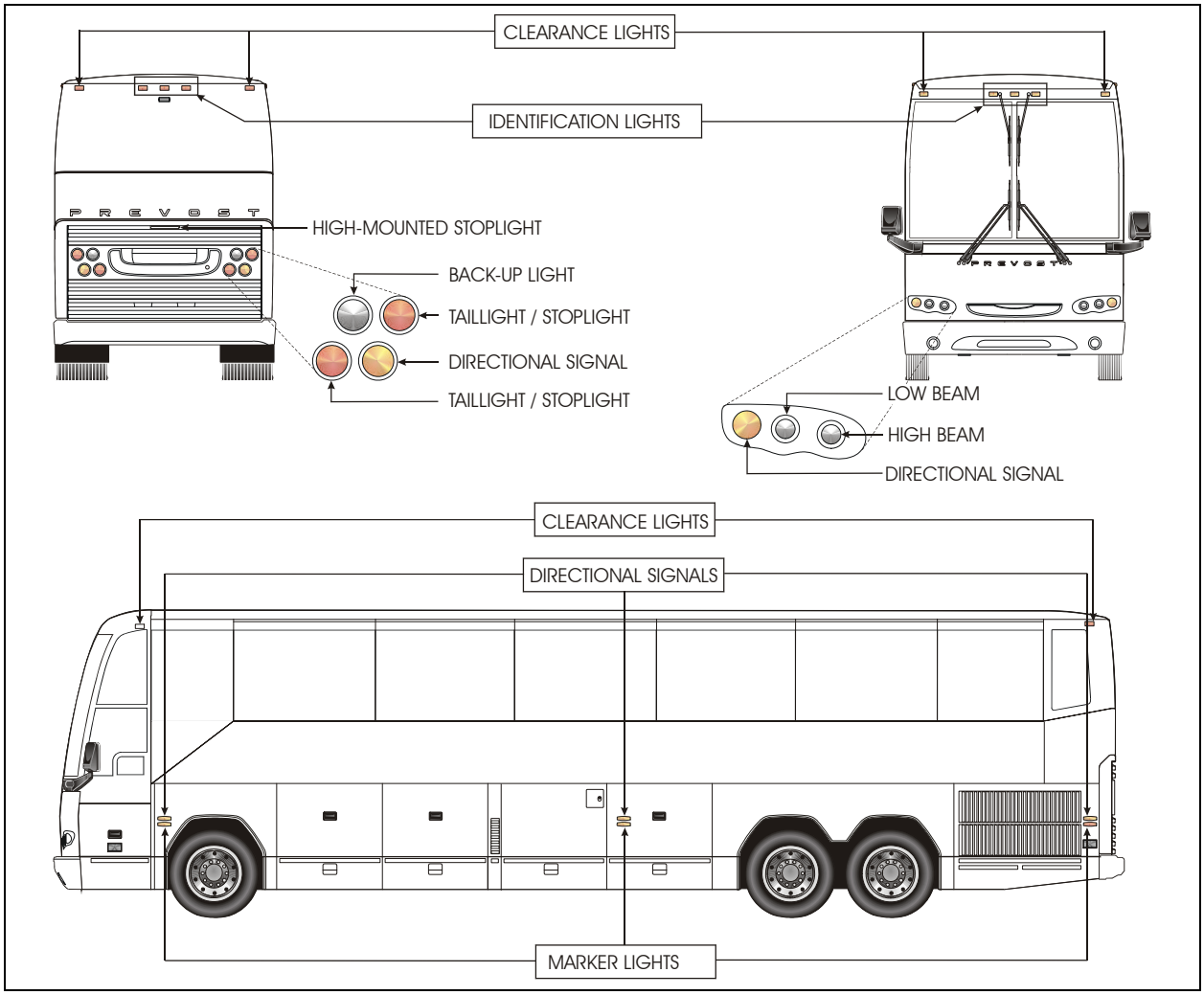
- o Directional signals.
- o Marker lights.
- o Directional signals.
- o Marker lights.

Go to the rear of the vehicle:

- o Directional signals.
- o Identification lights and clearance lights.
- o Stoplights and taillights.
- o Back-up lights and back-up alarm (option).

NOTE
To check the back-up lights and back-up alarm, you must flip the starter selector switch to REAR START position. (If the vehicle is running, do this quick enough so that the engine does not stop).

Go to the right side of the vehicle (same sequence as left side).



EXTERIOR LIGHTING IDENTIFICATION

FIRST SERVICE ON NEW VEHICLE

NOTE
Refer to Maintenance Manual for precise service schedule.

ENGINE OIL

Preliminary oil change is not required since the engine has been test-run at the factory. Change oil and filter every 12,500 miles (20 000 km) or once a year, whichever comes first.

ALLISON TRANSMISSION FLUID FILTER

Replace World transmission main filter cartridge after the first 5,000 miles (8 000 km) and then according to the lubrication and servicing schedule, depending if the vehicle is equipped or not with a retarder and depending on the type of oil used (Dexron III/VI or TrandSynd fluid).

COOLANT SYSTEM STRAINER

The coolant system strainer is designed to recover the soldering residues trapped inside the coolant lines during their initial assembly. Clean strainer after first 3,000 miles (5 000 km) and then every 50,000 miles (80 000 km). Refer to the Maintenance Manual under section 05: Cooling System.

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

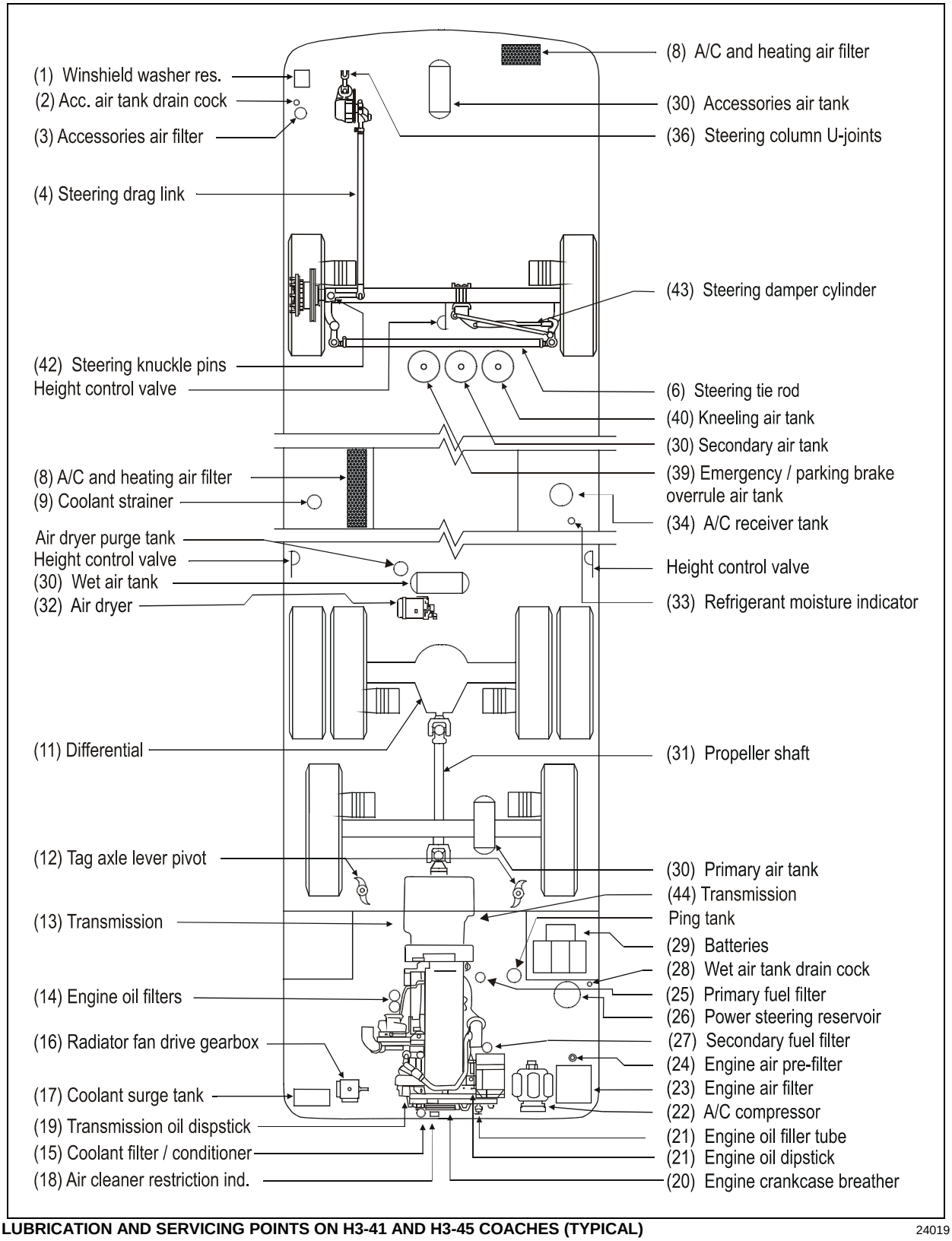
GENERAL RECOMMENDATIONS

- Understand basic principles of vehicle operation;
- Always maintain the vehicle in good running condition;
- Do not drive with low fuel. If the fuel tank runs dry, the engine will not start until the air is bled from the fuel system. Refer to "Maintenance Manual" for more information;
- Allow engine to run for at least two minutes at slow idle before shutting *OFF*;
- Engine should be at idle when shifting from neutral (N) to forward (D) or from neutral (N) to reverse (R);

⚠ CAUTION ⚠
Fast idle should always be turned off before releasing the parking brake and putting the coach in gear. Driveline damage can result if the fast idle switch is always left on.

- The automatic transmission does not have a park (P) position. Place transmission in neutral (N) position and apply parking brake when the vehicle is stopped. A warning buzzer will sound if the engine is stopped and the parking brake has not been applied when foot pressure is removed from the brake pedal;
- Always follow the procedures described in this manual;
- Unless stated otherwise, shut off the engine before performing all servicing, lubrication and maintenance tasks;
- Do not attempt to push or pull-start the coach;
- Damage may result if towed with the axle shafts or driveshaft connected;
- Two chemical fire extinguishers are under the first row of passenger seats. In case of fire, immediately evacuate all occupants. Occupant safety is the first priority. Do not attempt to extinguish the fire if there is immediate danger or risk for personal injury;
- When driving on ice and snow, accelerate and decelerate gradually;

⚠ WARNING ⚠
Report all problems affecting passenger or driver safety to a Prevost service center or an authorized service center. Have problems corrected immediately.



LUBRICATION AND SERVICING POINTS ON H3-41 AND H3-45 COACHES (TYPICAL) 24019

WALK-AROUND INSPECTION

It is compulsory to perform a basic visual inspection of key areas on the vehicle before every trip and to report any problem areas to your Prevost service center or a Prevost authorized service center. The following list is a reminder only and does not substitute items and procedures specified by local authorities.

Outside the Vehicle

ITEM*	REF.	DESCRIPTION
---	---	Check for leaks under vehicle and in engine compartment.
---	---	Check that baggage and service compartment doors are properly closed.
---	p.125	Inspect tires and wheels for correct tire pressure, wear or damage and for missing wheel studs and nuts.
1	p.121	Check windshield washer fluid level and add if necessary.
---	---	Check condition of windshield wiper blades.
---	p.127	Verify proper operation of all road lights, signal lights, brake lights, marker lights and back up lights; Replace light bulbs as required.
2, 28	p.121	Drain accumulated water in accessory and wet air tanks.

Engine Compartment

ITEM*	REF.	DESCRIPTION
21	p.117	Check engine crankcase oil level; Add if necessary.
13,19	p.118	Check Allison transmission fluid level (can be checked from push-button shift selector); Add if necessary.
26	p.119	Check power steering reservoir fluid level; Add if necessary.
17	p.121	Check coolant surge tank fluid level; Add if necessary.
25	p.122	Drain accumulated water in primary fuel filter/water separator (if equipped).
18,23	p.123	Check air cleaner restriction indicator; Replace air filter when red signal locks in full view.

Inside the Vehicle

ITEM*	REF.	DESCRIPTION
---	---	Check for proper operation of the entrance door.
---	---	Check that emergency exit windows and roof escape hatches can be opened, then close all windows and hatches securely.
---	---	Verify proper operation of windshield wiper/washer.
---	---	Adjust mirrors for adequate rear view vision.
---	---	Start engine and check for proper operation of all gauges and indicator lights.
---	---	Check for proper operation of electric and air horns and back up alarm.
---	p.131	Perform a brake test. Check both primary and secondary pressure gauges.

* Item numbers refer to “LUBRICATION AND SERVICING POINTS” figure

LUBRICATION AND SERVICING SCHEDULE

⚠ CAUTION ⚠
On new vehicles, preliminary servicing is required. Refer to the heading "First Service on New Vehicle" in this chapter.

SERVICE EVERY 6,250 MILES (10 000 KM) OR TWICE A YEAR, WHICHEVER COMES FIRST			
ITEM [1]	DESCRIPTION	REMARKS [2]	REF.
23	Engine air filter	Inspect and clean, replace element if required.	p.123
24	Engine air pre-filter	Check discharge tube.	---
22	A/C compressor	Check oil level, add if necessary.	Maintenan-ce Manual section 22
34	A/C receiver tank	Check refrigerant level, add if necessary (HFC 134a refrigerant)	---
33	Refrigerant moisture indicator	Replace filter dryer unit according to moisture indicator (as needed).	---
16	Radiator fan drive gearbox	Check oil level, add if necessary.	p.120
31	Propeller shaft	Grease one fitting on each universal joint and slip joint (use Multipurpose grease)	---
12	Tag axle lever pivot	Grease one fitting on each pivot (use Multipurpose grease)	---
4	Drag link ends	Grease one fitting at each end(use Multipurpose grease)	---
6	Steering tie rod ends	Grease one fitting at each end (use Multipurpose grease)	---
42	Steering Knuckle Pins	Grease three fittings per knuckle (use Multipurpose grease)	---
43	Steering Damper Cylinder	Grease one fitting at rod end (use Multipurpose grease)	---
44	ZF-Astronic Transmission	Check oil level, add if necessary.	p.119
---	Alternator Drive Belt	Check for wear and cracks.	---

SERVICE EVERY 12,500 MILES (20 000 KM) OR EVERY 6 MONTHS, WHICHEVER COMES FIRST			
ITEM [1]	DESCRIPTION	REMARKS	REF.
13	Allison World transmission **equipped with retarder**	Change fluid and filters (if containing non-TranSynd fluid).	p.118

[1] Item numbers refer to "LUBRICATION AND SERVICING POINTS" figure.
[2] See end of this section for lubricant and part number specifications.

SERVICE EVERY 12,500 MILES (20 000 KM) OR ONCE A YEAR, WHICHEVER COMES FIRST			
ITEM [1]	DESCRIPTION	REMARKS [2]	REF.
14, 21	Engine oil & filters	Change oil and filters.	p.117
25, 27	Fuel filters	Change primary and secondary fuel filters (Fill with clean fuel before installation).	p.122
15	Coolant filter/conditioner	Replace element.	---
17	Coolant surge tank	Test coolant solution.	p.121
30, 39, 40,2,28	Air Tanks	Drain accumulated water from all tanks.	p.121
8	A/C and heating air filters	Clean or replace two elements (twice a year).	p.124
---	Overhead compartment fan air filters	Clean or replace	p.124

SERVICE EVERY 25,000 MILES (40 000 KM) OR ACCORDING TO THE FLEET MAINTENANCE, WHICHEVER COMES FIRST			
ITEM [1]	DESCRIPTION	REMARKS [2]	REF.
11	Differential	Check oil level, add if necessary (use same type of gear oil)	p.120

SERVICE EVERY 25,000 MILES (40 000 KM) OR ONCE A YEAR, WHICHEVER COMES FIRST			
ITEM [1]	DESCRIPTION	REMARKS [2]	REF.
13	Allison World transmission **without retarder**	Change fluid and filters (if containing non-TranSynd fluid).	p.118

SERVICE EVERY 50,000 MILES (80 000 KM) OR ONCE A YEAR, WHICHEVER COMES FIRST			
ITEM [1]	DESCRIPTION	REMARKS [2]	REF.
16	Radiator fan drive gearbox	Change oil.	p.120
26	Power steering reservoir	Replace oil and filter cartridge element.	p.119
9	Coolant strainer	Check and clean, change cartridge if required.[3]	p.129
20	Engine crankcase breather	Clean breather steel mesh.	---
---	Hoses	Thoroughly inspect all hoses.	---
---	Evaporator motor brushes	Inspect brushes and replace if necessary	---

[3] If soldering has been performed on the system, clean strainer after 3,000 miles (5 000 Km).

SERVICE EVERY 50,000 MILES (80 000 KM) OR ONCE EVERY TWO YEARS, WHICHEVER COMES FIRST			
ITEM [1]	DESCRIPTION	REMARKS [2]	REF.
13	Allison World transmission **with or without retarder**	Change filters (if containing TranSynd fluid only, no mixture).[4]	p.118
13	Allison World transmission **with retarder**	Change fluid (if containing TranSynd fluid only, no mixture). [4]	p.118

SERVICE EVERY 100,000 MILES (160 000 KM) OR ONCE A YEAR, WHICHEVER COMES FIRST			
ITEM [1]	DESCRIPTION	REMARKS [2]	REF.
11	Differential	Change oil & clean breathers (if using Multi-grade gear oil).	p.120

SERVICE EVERY 100,000 MILES (160 000 KM) OR ONCE EVERY TWO YEARS, WHICHEVER COMES FIRST			
ITEM [1]	DESCRIPTION	REMARKS [2]	REF.
3	Accessories air filter	Change filter element.	p.121
32	Air dryer	Change cartridge.	---
---	Bosch T1 alternators	Change the brushes and the voltage regulator as per “Repair and Testing Instructions for T1 Alternator 0120 69 552” annexed to section 06 of the Maintenance Manual.	---

SERVICE EVERY 150,000 MILES (240 000 KM) OR ONCE EVERY FOUR YEARS, WHICHEVER COMES FIRST			
ITEM [1]	DESCRIPTION	REMARKS [2]	REF.
13	Allison World transmission **without retarder**	Change fluid (if containing TranSynd fluid only, no mixture). [4]	p.118

SERVICE EVERY 185,000 MILES (300 000 KM) OR ONCE EVERY TWO YEARS, WHICHEVER COMES FIRST			
ITEM [1]	DESCRIPTION	REMARKS [2]	REF.
44	ZF-Astronic Transmission	Change oil, clean breather	p.119

[4] When the transmission contains a mixture of fluids (defined as the quantity of non-TranSynd fluid remaining in the transmission after a fluid change combined with the quantity of TranSynd required to fill the transmission to the proper level), perform the fluid and filter change at 25,000 miles (40 200 Km) or 1 year, whichever comes first.

SERVICE EVERY 200,000 MILES (320 000 KM) OR ONCE EVERY FOUR YEARS, WHICHEVER COMES FIRST			
ITEM [1]	DESCRIPTION	REMARKS [2]	REF.
---	Bosch T1 alternators	Replace bearings as per “Repair and Testing Instructions for T1 Alternator 0120 69 552” annexed to section 06.	---

SERVICE EVERY 250,000 MILES (400 000 KM) OR ONCE EVERY FOUR YEARS, WHICHEVER COMES FIRST			
ITEM [1]	DESCRIPTION	REMARKS [2]	REF.
11	Differential	Change oil & clean breathers if using synthetic oil	p.120

MISCELLANEOUS SERVICE			
ITEM [1]	DESCRIPTION	REMARKS [2]	REF.
15, 17	Cooling System	Drain, flush and refill every two years or 200,000 miles (320 000 km) whichever comes first.	p.121
29	Battery Terminals	Clean and coat terminals yearly (use battery terminal coating)	---
---	Discharge Tubes [5]	Every three months: Check condenser's discharge tubes (2) Check evaporator's discharge tubes (6) Check front discharge tubes (2).	---

LUBRICANT SPECIFICATIONS

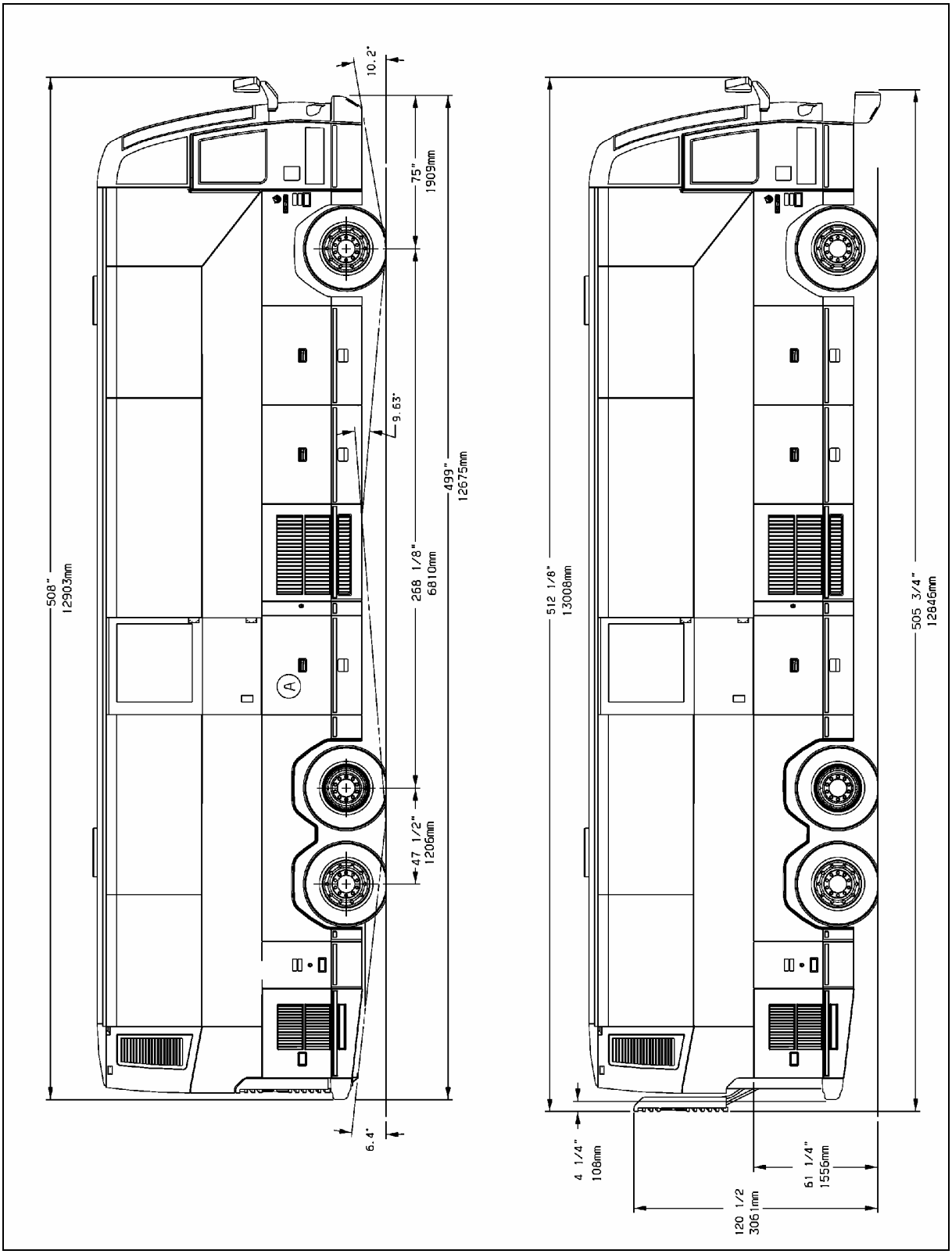
ITEM [1]	DESCRIPTION	SPECIFICATIONS
21	Engine oil	SAE Viscosity Grade: 15W40 API Classification: CI4
26	Power steering oil	Automatic Transmission fluid (Dexron-IIE or Dexron-III)
17	Engine coolant	Phosphorous and nitrates free coolant in order to meet specification 7SE298 or TMC RP-329 TYPE A. 50% antifreeze/water solution is normally used. Detroit Diesel Power Cool or Prestone Heavy Duty.
22	A/C compressor oil	Polyolester Oil, HFC 134a compatible: Castrol SW-68 (POE) or equivalent
11	Differential oil	Multigrade gear oil meeting MIL-L-2105-D: 85W140 If temperature drops below 10°F (-12°C), 80W90 should be used, and below -15°F (-26°C), 75W90 should be used. (In extreme conditions or for better performance, full synthetic gear oil can be used.)

[5] Discharge tubes are rubber tubes located under vehicle.

16	Fan gearbox oil	Mobil SHC 630 (Prevost #180217)
44	ZF-Astronic transmission	Castrol Syntrans grade SAE 75W-85 (synthetic)
13, 19	Allison Transmission Fluid	Dexron III/VI or Castrol TranSynd (see Lubrication And Servicing Schedule for proper oil)
---	Multipurpose Grease	Good quality lithium-base grease: NLGI No.2 Grade is suitable for most temperatures NLGI No.1 Grade is suitable for extremely low temperatures

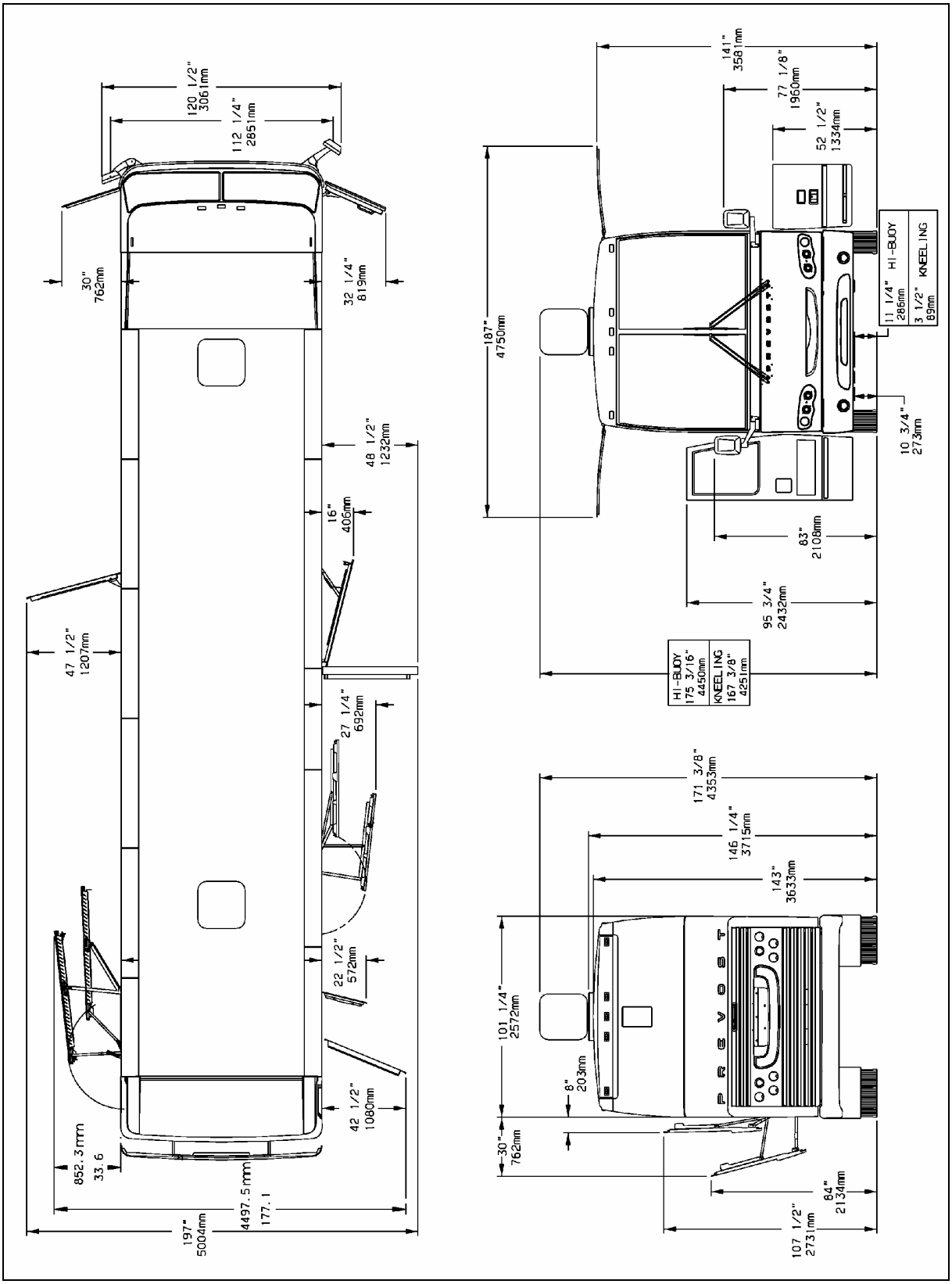
PART NUMBER SPECIFICATIONS

Please, refer to your vehicle Parts Manual

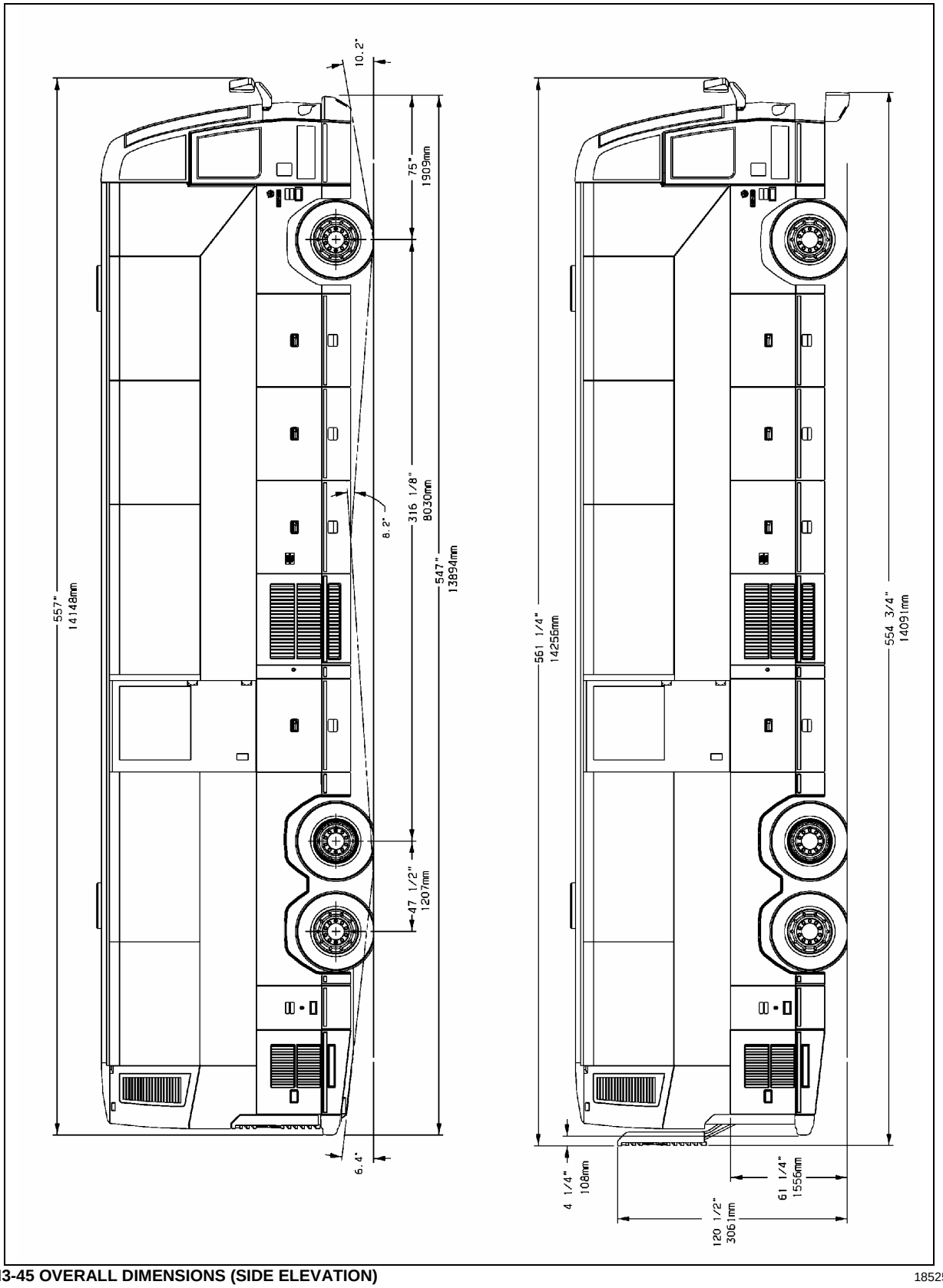


H3-41 OVERALL DIMENSIONS (SIDE ELEVATION)

18527

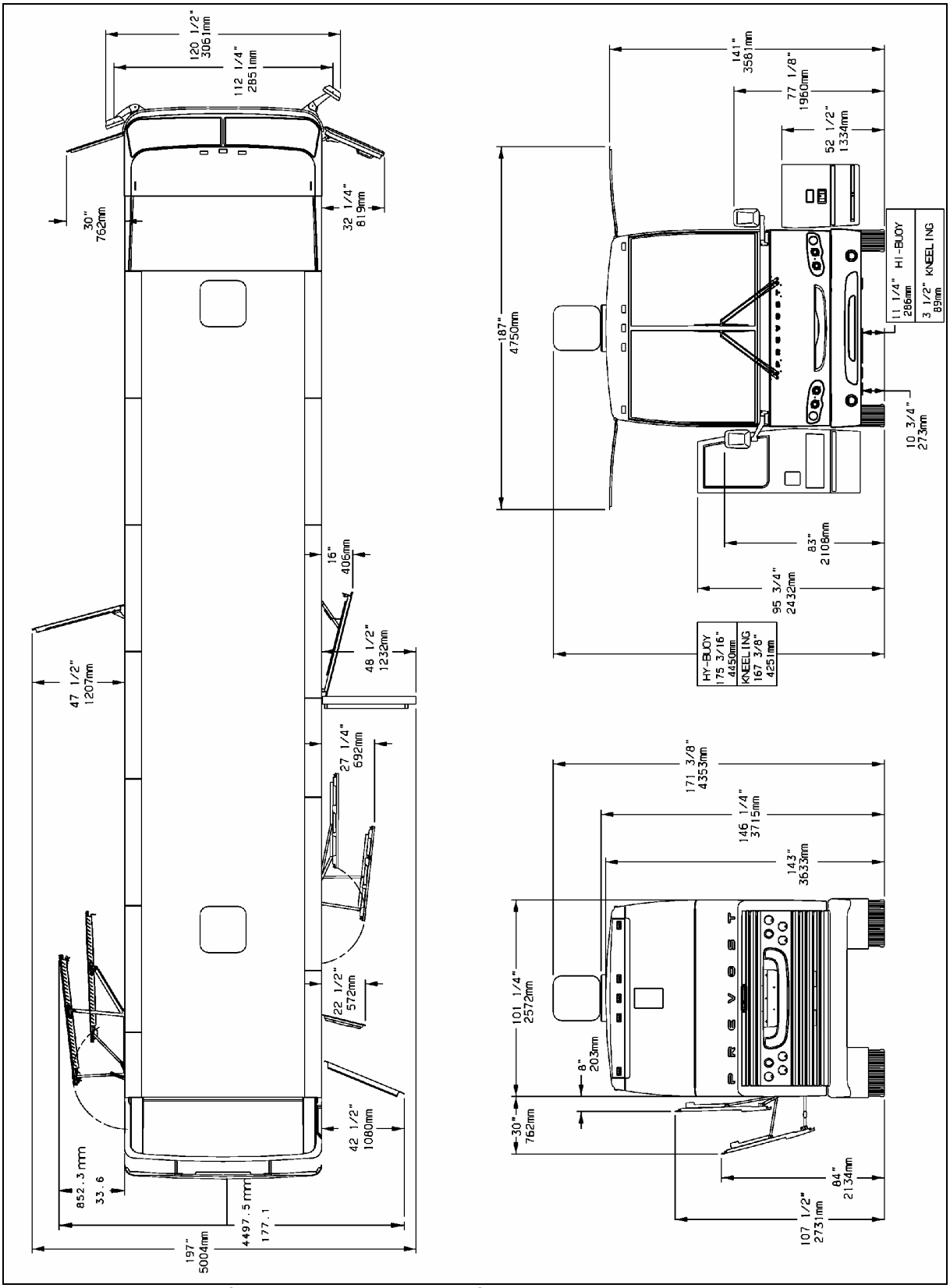


H3-41 OVERALL DIMENSIONS (TOP, FRONT AND REAR VIEWS) 18528



H3-45 OVERALL DIMENSIONS (SIDE ELEVATION)

18525



H3-45 OVERALL DIMENSIONS (TOP, FRONT AND REAR VIEWS) 18526

DIMENSIONS AND WEIGHTS	H3-41	H3-45
Overall length (over bumpers)	41’ 7” (12.7 m)	45' 8” (13.9 m)
Overall width	102" (2.59 m)	
Overall height (normal ride height)	146 ¼" (3.715 m)	
Wheelbase (center of front axle to center of drive axle)	267” (6.782 m)	316 ¼" (8.033 m)
Floor height from ground	63" (1.6 m)	
Ground clearance	11" (280 mm)	
Step height from ground	14" (356 mm)	
Step height (other steps)	7” (178 mm)	
Seats	48	56 - 58
Headroom	77" (1.956 m)	
Entrance door opening width	27" (686 mm)	
Front overhang	76" (1,93 m)	
Rear overhang	108 ½” (2.757 m)	108 ¼" (2.749 m)
Front track	84.4" (2.145 m)	
Drive track	76.7" (1.949 m)	
Rear track (tag axle)	83.6" (2.124 m)	
Turning circle radius (I-beam axle)	40' 4” (12.3 m)	45’ 7” (13.9 m)
Curb weight [1]	35,535 lbs (16 118 Kg)	36,585 lbs (16 600 Kg)
Gross Vehicle Weight Rating (G.V.W.R.) [2]	52,060 lbs (23 665 kg)	
Front axle Gross Axle Weight Rating (G.A.W.R.)	16,500 lbs (7 500 kg)	
Drive axle G.A.W.R.	22,500 lbs (10 230 kg)	
Tag axle G.A.W.R.	14,000 lbs (6 365 kg)	

NOTE

Curb weight is given as an indication only and is subject to vary from coach to coach, mostly due to optional equipment.

The Gross Vehicle Weight Rating (G.V.W.R.) and the Gross Axle Weight Rating (G.A.W.R.) for front, drive and tag axles are listed on a certification plate located on the L.H. control panel in driver's section.

CAPACITIES	H3-41	H3-45
Engine oil (in crankcase)	41 US qts (39 l)	
Engine oil (in reserve tank)	8.4 US qts (8.0 l)	
Fuel tank (legal capacity equal to 95% of volume)	235 US gal. (890 l)	
Cooling system	24 US gal. (91 l)	
Allison transmission (does not include external circuit)	6 US gal. (23 l) 6.9 US gal. (26 l) with retarder	
ZF-Astronic automatic transmission	3 US gal. (11 l)	
Differential oil	5 US gal. (19 l)	
Power steering reservoir	4 US qts (3.7 l)	
A/C compressor oil	4.5 US qts (4.3 l)	
Windshield washer reservoir	5 US gal. (19 l)	
Refrigerant	26 lbs (11.8 kg)	

BAGGAGE COMPARTMENTS

Total volume (H3-45) ..... 470 ft^3
Total volume (H3-41) ..... 355 ft^3
Loading capacity ..... 2500 lbs/comp.

FUEL TYPE

ASTM specification D-975
Recommended grade 1-D
Acceptable grade 2-D

WHEELS AND TIRES

Steel wheels ..... 9” X 22½”
Aluminum forged wheels ..... 9” X 22½”
Tires ..... 315/80 R 22.5 load range “L”

RECOMMENDED TIRE INFLATION PRESSURE AT MAXIMUM COLD LOAD

The recommended tire inflation pressures are given in the applicable documents supplied with the vehicle. In addition, cold tire inflation pressures are listed on the Department of Transport (DOT) certification plate, affixed on the wall behind the driver’s seat. For special tire selection, a “*PREVOST COACH SPECIAL SPECIFICATION*” chart is supplied with the vehicle and is affixed next to the DOT

[1] Weight of a motor vehicle complete with body excluding the payload. Includes standard equipment, a full load of engine fuel, oil, and coolant and, if so equipped, air conditioning and the additional weight of any optional engine.

[2] Maximum weight specified by the manufacturer for a single vehicle. The gross vehicle weight rating is equivalent to the sum of the gross axle weights specified by the manufacturer under each wheels of the axles (front, drive & tag) of the vehicle.

certification plate, located on the left wall close to the driver's seat.

⚠ CAUTION ⚠

These tire pressures are established in accordance with the maximum allowable load on each axle. A lower pressure is recommended if the axle load is less than the above specifications. Weigh vehicle fully loaded and pressurize according to tire manufacturer's recommendations. For non standard tire and wheel specifications, see Prevost tire pressure tabulation in "Coach Final Record" or special specification chart affixed next to the DOT certification plate.

⚠ WARNING ⚠

Special tire selection may lower maximum allowable speed limit, even below posted speed limit. For maximum safety, check with tire manufacturer.

BELTS

Use	Model	Qty
Radiator fan gearbox drive	V-Belt 3/BX-74	1
Radiator fan drive (fan)	Poly-V 12PK-2100	1
A/C system compressor	BX-100	2
Alternator 2 x 28V, 140 Amps.	Poly-V 10/2232	1
Alternator, 1x "limp-home"	Poly-V 10/2000	1

ENGINE

Power is provided by a Detroit Diesel DDEC V Series 60 engine, displacing 12.7 liters. The engine is an inline six cylinder, four stroke, turbocharged, air to air charge cooled, diesel engine with an overhead camshaft and four valves per cylinder.

Rated horsepower... 425 - 445 HP @ 1,800 rpm
Peak torque..... 1,450 lbf•ft @ 1,200 rpm
Operating range ..... 1,200 – 2,100 rpm

ALLISON WORLD TRANSMISSION

Allison WT B500 (B500R with the optional output retarder) electronically controlled six speed automatic transmission.

See appendix C for the fluid level sensor code description.

Gear Ratios

1st.....3.510
2nd.....1.906
3rd.....1.429
4th.....1.000
5th.....0.737
6th.....0.639
Reverse.....4.801
Converter 1.578
Drive axle ratio 4.30
Drive axle ratio (optional).....4.56
Drive axle ratio (optional).....4.88

ZF-ASTRONIC TRANSMISSION

Electronically controlled ten speed automatic transmission.

Gear Ratios

1st.....7.44
2nd.....5.78
3rd.....4.57
4th.....3.55
5th.....2.70
6th.....2.10
7th.....1.63
8th.....1.27
9th.....1.00
10th.....0.78
Reverse.....11.41

BRAKES

The features of the braking system include a dual system where the front and rear circuits are completely independent from each other. The brakes are air operated disc type brakes with automatic slack adjusters on front, drive and tag axles. The emergency/parking brakes are located on the drive and tag axles only.

BRAKE CHAMBER EFFECTIVE AREA

Front axle (Rigid front axle).....24 in^2
Drive axle .....24/24 in^2 (service / emergency)
Tag axle .....14/16 in^2 (service / emergency)

AIR SYSTEM

Compressed air is provided by a 15.8 cfm Bendix-Westinghouse BA-921 one cylinder, gear-driven, water-cooled and engine oil lubricated air compressor.

Other features and components of the air system include an air dryer and nylon color-coded air lines.

ANTILOCK BRAKING SYSTEM (ABS)

The antilock braking system has one Electronic Control Unit (ECU) controlling a four channel system. A wheel slip sensor is mounted at each front axle and drive axle wheel. The Tag axle wheels are slave to the drive axle wheels.

The Electronic Control Module (ECM) is maintenance free. Its operating voltage is 24 ± 6 volts DC. The thermal operating range for the ECM is from -40 to 167°F (-40 to 75°C).

The solenoid control valves are maintenance free. Their operating voltage is 24 (+4.8, -2.4) volts DC. The rated current draw is 1.65 amps. The thermal operating range of the solenoid control valves is from -40 to 176°F (-40 to 80°C).

TROUBLESHOOTING AND TESTING

For troubleshooting and testing of the vehicle's anti-lock braking system, refer to Meritor WABCO Maintenance Manual: *"Anti-Lock Brake Systems For Trucks, Tractors and Buses"* or use dashboard Message Center Display (MCD) Diagnostic Mode under ECU Diagnostic: "Brakes".

STEERING

Tilt steering wheel and telescopic steering column;

- o Integral hydraulic assisted steering gear;
- o System pressure: 2175 psi (150 bars);

ELECTRICAL SYSTEM

- o 24 volt, negative ground;
- o 12 volt exterior lighting;
- o Twin 28 volt, 140 amp, self-regulated, belt-driven, air-cooled Bosch alternators;
- o Four 12 volt, group 31 format maintenance-free batteries connected in series/parallel. Cold cranking capacity is 1900 amps with a reserve capacity of 195 minutes;
- o 100 amp battery equalizer;

SUSPENSION

Goodyear rolling lobe type air springs (bellows) are used throughout.

FRONT AXLE

2 Bellows (12");
2 Shock absorbers;
4 Radius rods;
1 Transverse radius rod;
1 Height control valve;
1 Anti-roll bar, 2" diameter.

DRIVE AXLE

4 Bellows (11");
4 Shock absorbers;
3 Radius rods;
2 Height control valves;
1 Panhard rod
1 Anti-roll bar, 1½" diameter

TAG AXLE

2 Bellows (11");
2 Shock absorbers;
3 Radius rods;
1 Panhard rod.

ALIGNMENT SPECIFICATIONS

Use wheel alignment systems which work with angle measurements only, such as Josam or Hunter systems. Alignment specifications are listed in the following tables:

I-BEAM FRONT AXLE			
	Minimum value	Nominal value	Maximum value
Right camber (degrees)	-0.25	0.125	0.375
Left camber (degrees)	-0.25	0.125	0.375
Right caster (degrees)	2.0	2.75	3.5
Left caster (degrees)	2.0	2.75	3.5
Total toe-in (inches)	0.08	0.13	0.17

DRIVE AXLE			
	Minimum value	Nominal value	Maximum value
Thrust angle (degrees)	-0.04	0	0.04

TAG AXLE			
	Minimum value	Nominal value	Maximum value

Thrust angle (degrees)*	-0.02	0	0.02
(*) Use the drive axle as reference			

HEATING AND AIR CONDITIONING

A large capacity, central A/C provides enough conditioned and filtered air for all climatic conditions. Fresh air is drawn into the system from the evaporator compartment on driver's side of the vehicle. Return air is taken from the middle of the vehicle. The driver's heater and defogger are controlled separately from the central unit. An air mixture selector enables air to be drawn into the system from outside the vehicle or recirculated. Optionally, condensers installed in the overhead storage compartments provide cool air to the seated passengers from the overhead registers.

A/C SYSTEM	
Cooling capacity	9 tons
Refrigerant type	134a
Heating capacity	152 000 Btu/h
Airflow	2 600 cfm (73.6 m^3/min)

COMPRESSOR	
Number of cylinders	6
Operating speed	400 to 2 200 rpm (2,600 rpm, intermittent)
Minimum speed for lubrication	400 rpm
Oil capacity	4.5 US qts (4,3 l)
Approved oil	Castrol SW-68 (POE)

NOTE
The above oils are suitable for use with reciprocating compressors using refrigerant R-134a and with evaporator temperatures above -40°F (-40°C).

OIL SPECIFICATIONS

ENGINE

Heavy-duty engine oil SAE 15W-40 meeting API classification CI-4.

ALLISON TRANSMISSION

The Allison transmission must be filled with *Dexron III/VI* automatic transmission fluid, *Castrol TranSynd* or any equivalent Class C4 hydraulic fluid.

ZF-ASTRONIC TRANSMISSION

The ZF-Astronic transmission must be filled with Castrol Syntrans grade 75W-85 oil.

DIFFERENTIAL

Multigrade gear oil meeting MIL-L-2105-D: 85W140 is recommended for use in drive axle. This lubricant performs well over a broad temperature range, providing good gear and

bearing protection in a variety of climates. If temperature drops below 10°F (-12°C), 80W90 should be used, and below -15°F (-26°C), 75W90 should be used. In extreme conditions or for better performance, full synthetic gear oil should be used.

FAN GEARBOX

Only Mobil SHC 630 synthetic oil (Prevost #180217) is recommended for the fan gearbox.

POWER STEERING RESERVOIR

Use Dexron IIE or Dexron III automatic transmission fluid for this system.

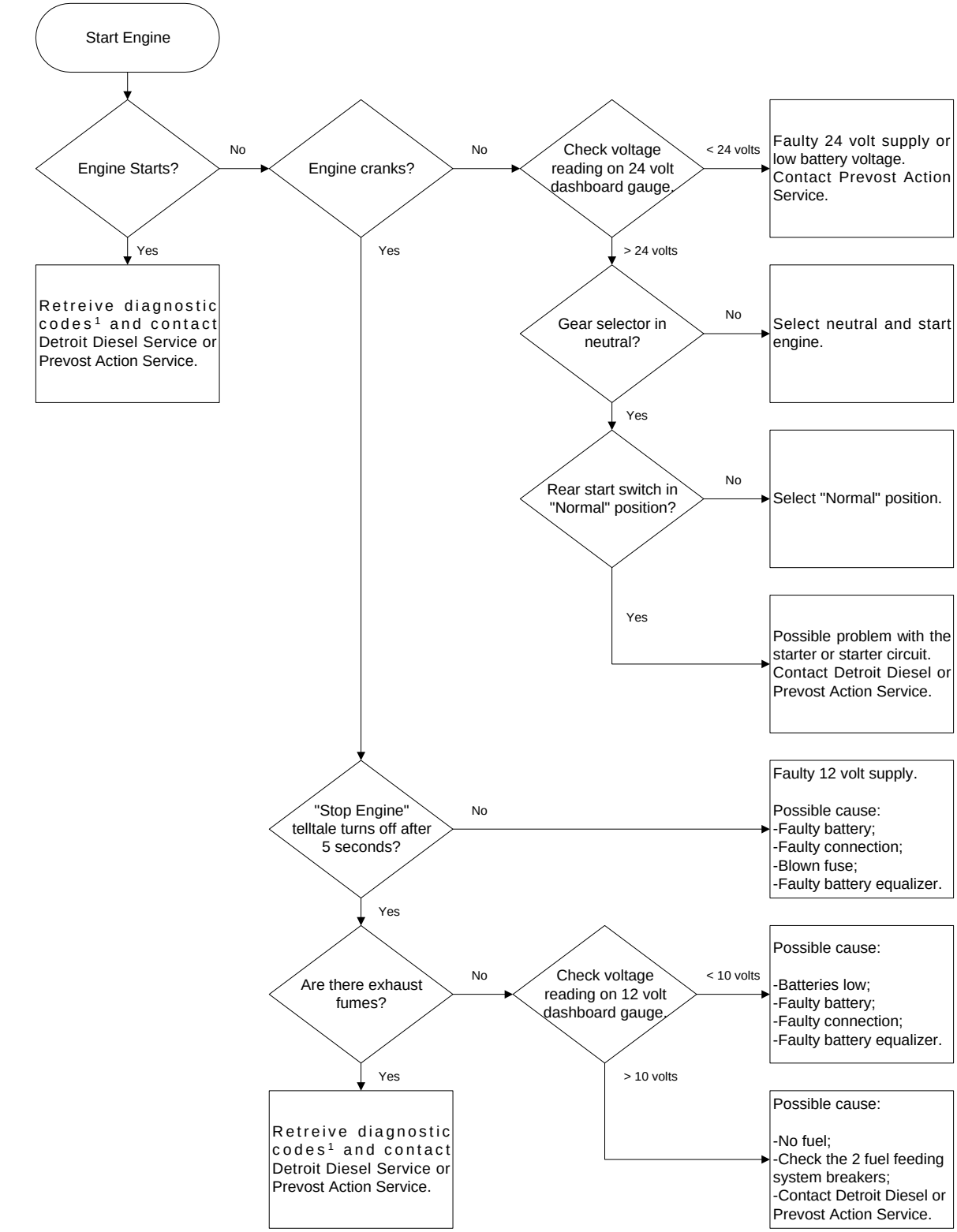
PRE-HEATING SYSTEM

Depending on options chosen, a coolant heater may be installed on the coolant circuit. The heater can be used as a pre-heater or as an auxiliary heat source.

Only the Webasto 104,000 Btu preheater is available. The heater is controlled by a programmable timer. See Other Features chapter for information on how to use the timer.

Webasto		
Model		Thermo 300
Heating output		104,000 Btu/hr (30 kW)
Fuel type		Same as engine
Fuel consumption		4.8 US qts/hr (4.5 l/hr)
Rated voltage		24 V DC
Operating voltage		20-28 V DC
Electric power consumption without water pump		110 watts
Dimensions Inch (mm)	(L) (W) (H)	24.01 (610 mm) 9.69 (246 mm) 8.66 (220 mm)
Weight	lb (kg)	41.88 (19)

ENGINE TROUBLESHOOTING FLOWCHART



(1) Refer to DDEC V Diagnostic Codes in appendix D.

01093

LIGHT BULB DATA

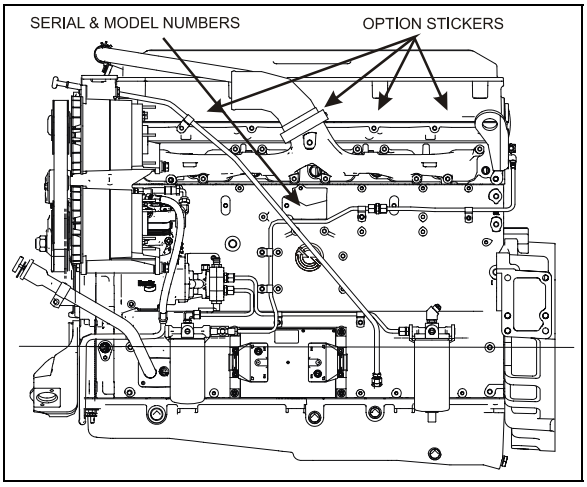
Please, refer to your vehicle Parts Manual for selection of replacement light bulbs.

PLATES AND CERTIFICATION

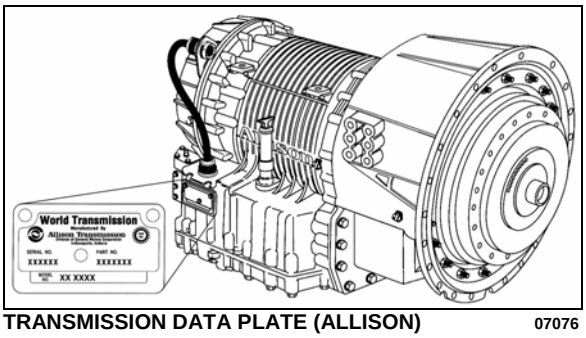
The main components of the vehicle, such as engine, transmission, axles and the chassis are identified by different serial numbers. It may be necessary to locate these numbers for warranty purposes.

The engine serial and model number are stamped on the cylinder block (as viewed from the flywheel end) on the left side just below the fire deck and above the cast-in Detroit Diesel logo.

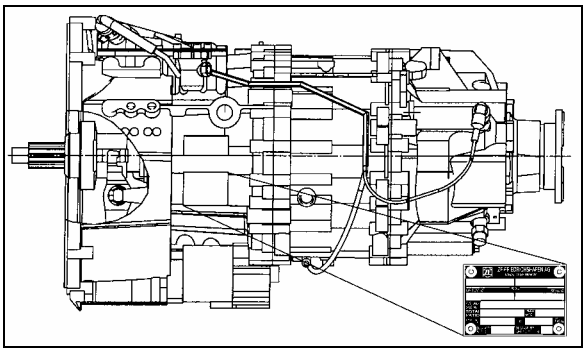
In addition, option decals are located on the rocker cover (starter side). The engine serial and model number and a list of the optional engine equipment are written on these decals. Refer to this information when ordering replacement parts.



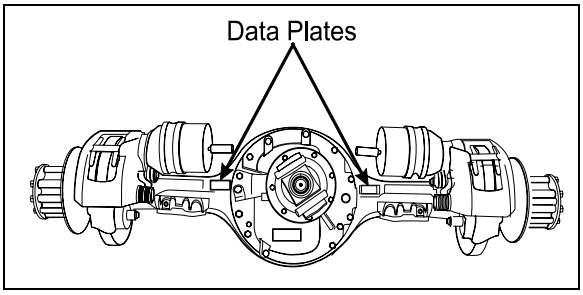
SERIES 60 ENGINE 00043



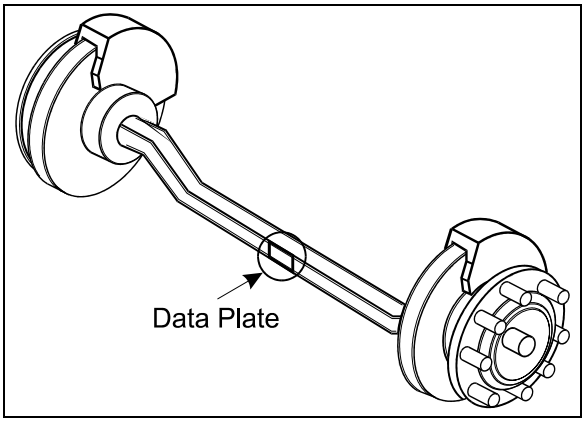
TRANSMISSION DATA PLATE (ALLISON) 07076



ZF-ASTRONIC TRANSMISSION 00040



DRIVE AXLE 11019



I-BEAM FRONT AXLE 00008

SAFETY CERTIFICATION

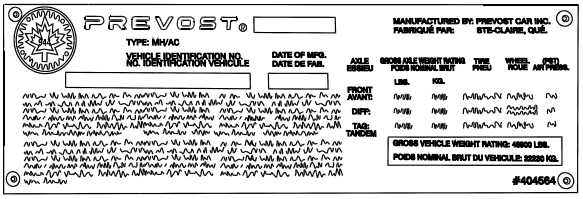
Vehicle components meet specifications and standards as follows:

- Material and parts conform to ASTM and/or SAE standards in effect at the time of manufacture.
- All factory-installed interior materials meet FMVSS 302 for fire resistance.
- Certified according to Provincial, State and Federal Safety standards (Canadian and US) BMCSS, FMVSS and CMVSS.

Other applicable certification labels are affixed to the applicable components.

DOT CERTIFICATION PLATE

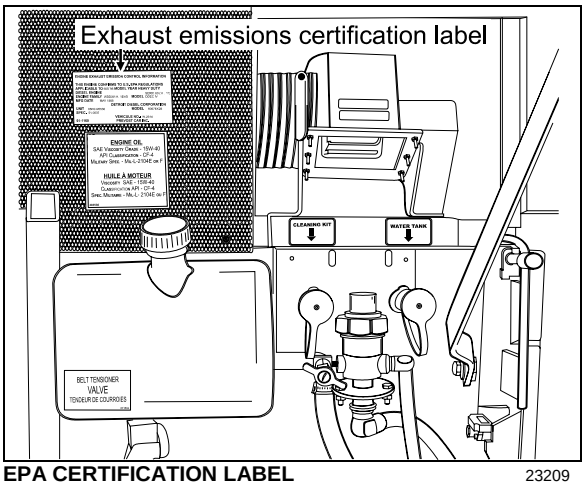
This certifies that vehicles manufactured by Prevost Car Inc. comply with all Federal Motor Vehicle Safety Standards at the time of manufacture. Information such as date of manufacture, model year, gross vehicle weight rating, tire types and inflation pressure is also etched on this plate. The DOT Certification plate is affixed to L.H. control panel.



DOT CERTIFICATION PLATE 00016

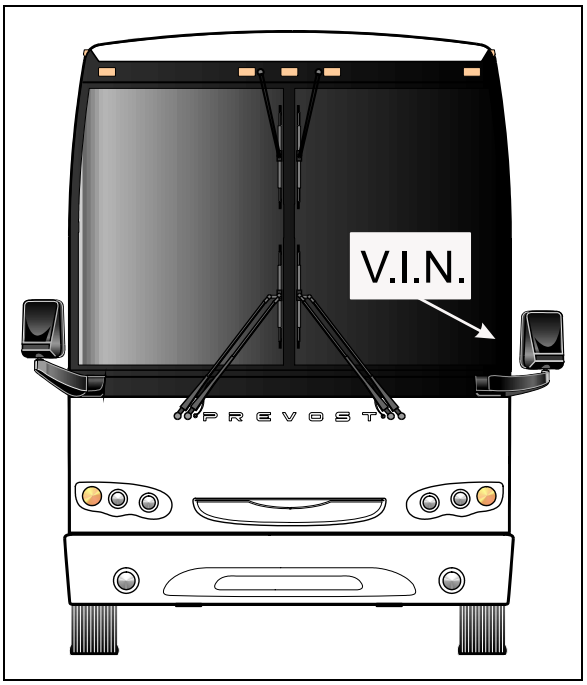
EPA ENGINE LABEL

The emissions certification label affixed to the panel over the engine oil reserve tank certifies that the engine conforms to federal and any state exhaust emissions regulations.



EPA CERTIFICATION LABEL 23209

VEHICLE IDENTIFICATION NUMBER (VIN)



VEHICLE IDENTIFICATION NUMBER 18479

The Vehicle Identification Number is stamped on a plate located on the windshield frame pillar (driver's side). The VIN is visible from the outside of the vehicle. Make sure the correct vehicle identification number is given when ordering replacement parts. Using the VIN when ordering parts will facilitate processing.

NOTE
Record the VIN in the vehicle documentation and keep with company records. The VIN will normally be used for vehicle registration, service reference needs and for obtaining vehicle insurance coverage.

COACH FINAL RECORD

The Coach Final Record is a record of all data pertaining to the assembly of the vehicle. This record is included in the technical publications package supplied with the vehicle. Retain this record in the company records office for reference and safe-keeping.

SERVICE LITERATURE

Visit our web sit at **www.prevostcar.com** for on-line product information and technical publications!

Additional copies of the following service literature are available on request and at low cost. These can be helpful to mechanics and drivers alike.

- **Maintenance Manual**
- **Operator's Manual**
- **Parts Manual**
- **Service Center Directory**

To order, call Prevost Parts toll free 1-800-463-8876 or write to:

PREVOST PARTS INC.

2955-A Watt Street
Sainte-Foy, (Quebec)
Canada G1X 3W1

Specify the complete vehicle serial number. Allow 30 days for delivery

150 APPENDIX A

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 Prevost 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 Prevost 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 Prevost Car Inc. You may write to:

Transport Canada
Box 8880
Ottawa, Ontario, K1G 3J2

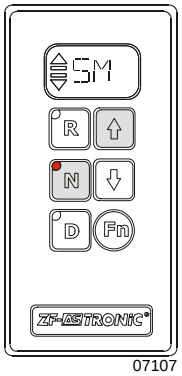
DECLARATION OF THE MANUFACTURING DEFECTS TO PREVOST CAR INC.

In addition to notify the NHTSA (or Transport Canada), please contact Prevost Car at **1-418-831-2046**. Or you may write to :

Prevost Car Inc.
After-sales service department
850 ch. Olivier,
Saint-Nicolas (Quebec)
Canada, G7A 2N1

ZF-ASTRONIC TRANSMISSION SYSTEM FAULTS AND ERROR MESSAGES

SYSTEM FAULTS (ERROR MESSAGES)

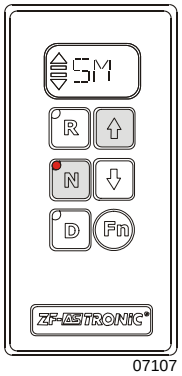


If the «**SM**» symbol appears in the display, a system error has occurred.

- **Stop the vehicle**
- **Vehicle may no longer be driven**

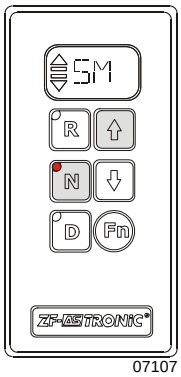
Error messages and the reactions resulting from these errors can be deleted with the vehicle at a standstill and the «Ignition OFF». (Wait until the display goes out). If the display does not go out once the ignition has been turned «OFF», set the battery master switch to the **off** position. Switch the ignition back on. If the error message is still in place, the transmission has to be repaired. The transmission is inoperative. The vehicle will have to be taken to a service point. The error number(s) must be specified when the service point is contacted.

Calling up error numbers



- Switch on ignition
- Depress « **N** » key
- Hold down « ⇧ » key
- One or more error numbers appear on the display. These correspond to the errors presently active in the system.

Calling up error numbers from the error memory:



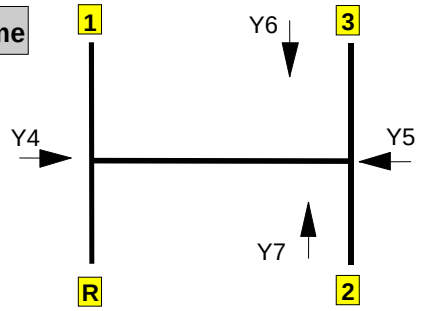
- Switch on ignition
- Press «**N**» key and at the same time depress the foot-operated brake
- Hold down the foot-operated brake and depress and hold down « ⇧ » key
- The errors stored in the transmission ECU are shown on the display one after another.

ERROR CODES

Shift schemes of transmissions:

Y2 Splitter K2
Y3 Splitter K1
Y8 Range (GP) low
Y9 Range (GP)

10/12-Gear Scheme



ON MESSAGES CENTER DISPLAY (MCD) SAE-J1587 Codes	ON SHIFT SELECTOR DISPLAY	ISO CODES WITH TESTMAN TOOL	DESCRIPTION
8, 7	8	161	Easy Start, Brake doesn't open completely
8, 14	8	162	Easy Start, Not Available
20,6	14	22	Short circuit to ground at output ACC (wakeup control signal for ZMTEC, keep alive signal for voltage doubler, and power signal for speed sensor #2)
20,5	14	54	Interruption at output ACC (wakeup control signal for ZMTEC, keep alive signal for voltage doubler, and power signal for speed sensor #2)
20,3	14	86	Short circuit to positive at output ACC (wakeup control signal for ZMTEC, keep alive signal for voltage doubler, and power signal for speed sensor #2)
21,2	15	127	Error on ECU temperature sensor signal
21,0	15	193	ECU temperature too high
31,3	1F	137	No range change group (GP) sensor signal (Short circuit to positive)
31,6	1F	138	No range change group (GP) sensor signal (Short circuit to ground)
31,5	1F	139	No range change group (GP) sensor signal (Interruption)
31,13	1F	140	Self adjustment error of range change group sensor in position fast
31,7	1F	159	Range-change group sensor signal leaves engaged position during driving
32,3	20	141	No splitter group (GV) sensor signal (Short circuit to positive)
32,6	20	142	No splitter group (GV) sensor signal (Short circuit to ground)
32,5	20	143	No splitter group (GV) sensor signal (Interruption)
32,13	20	144	Splitter group (GV) sensor self adjustment error
32,7	20	160	Splitter sensor signal leaves engaged position during driving
33,14	21	107	Stabilised voltage supply at output AU (clutch sensor supply) too high or too low
33,13	21	117	Error in clutch self-adjustment process
33,2	21	124	Error on clutch travel signal
34,7	22	120	Mechanical failure of small clutch disengagement valve
34,7	22	121	Mechanical failure of large clutch disengagement valve
34,7	22	122	Mechanical failure of small clutch engagement valve
34,7	22	123	Mechanical failure of large clutch engagement valve
34,6	22	18	Short circuit to ground at output stage to small disengagement clutch valve
34,6	22	19	Short circuit to ground at output stage to small engagement clutch valve
34,6	22	20	Short circuit to ground at output stage to large disengagement clutch valve
34,6	22	21	Short circuit to ground at output stage to large engagement clutch valve
34,5	22	50	Interruption at output stage to small disengagement clutch valve

ON MESSAGES CENTER DISPLAY (MCD) SAE-J1587 Codes	ON SHIFT SELECTOR DISPLAY	ISO CODES WITH TESTMAN TOOL	DESCRIPTION
34,5	22	51	Interruption at output stage to small engagement clutch valve
34,5	22	52	Interruption at output stage to large disengagement clutch valve
34,5	22	53	Interruption at output stage to large engagement clutch valve
34,3	22	82	Short circuit to positive at output stage to small disengagement clutch valve
34,3	22	83	Short circuit to positive at output stage to small engagement clutch valve
34,3	22	84	Short circuit to positive at output stage to large disengagement clutch valve
34,3	22	85	Short circuit to positive at output stage to large engagement clutch valve
35,5	23	41	Interruption at output stage to Y9 (Valve Range)
35,3	23	73	Short circuit to positive at output stage to Y9 (Valve range)
35,6	23	9	Short circuit to ground at output stage to Y9 (Valve Range)
36,5	24	40	Interruption at output stage to Y8 (Valve Range)
36,3	24	72	Short circuit to positive at output stage to Y8 (Valve range)
36,6	24	8	Short circuit to ground at output stage to Y8 (Valve Range)
37,6	25	2	Short circuit to ground at output stage to Y2 (Valve Splitter)
37,5	25	34	Interruption at output stage to Y2 (Valve Splitter)
37,3	25	66	Short circuit to positive at output stage to Y2 (Valve Splitter)
38,6	26	3	Short circuit to ground at output stage to Y3 (Valve Splitter)
38,5	26	35	Interruption at output stage to Y3 (Valve Splitter)
38,3	26	67	Short circuit to positive at output stage to Y3 (Valve Splitter)
39,5	27	36	Interruption at output stage to Y4 (Valve Select)
39,6	27	4	Short circuit to ground at output stage to Y4 (Valve Select)
39,3	27	68	Short circuit to positive at output stage to Y4 (Valve Select)
40,5	28	38	Interruption at output stage to Y6 (Valve Shift)
40,6	28	6	Short circuit to ground at output stage to Y6 (Valve Shift)
40,3	28	70	Short circuit to positive at output stage to Y6 (Valve Shift)
43,2	2B	175	Error on ”Ignition lock” signal (terminal 15)
48,3	30	129	No shift sensor signal (Short circuit to positive)
48,6	30	130	No shift sensor signal (Short circuit to ground)
48,5	30	131	No shift sensor signal (Interruption)
48,13	30	132	Self adjustment error of shift sensor
48,7	30	157	Selector sensor signal leaves position during driving
48,7	30	158	Engage sensor signal leaves engaged position during driving
50,5	32	37	Interruption at output stage to Y5 (Valve Select)
50,6	32	5	Short circuit to ground at output stage to Y5 (Valve Select)
50,3	32	69	Short circuit to positive at output stage to Y5 (Valve Select)
51,5	33	39	Interruption at output stage to Y7 (Valve Shift)
51,6	33	7	Short circuit to ground at output stage to Y7 (Valve Shift)
51,3	33	71	Short circuit to positive at output stage to Y7 (Valve Shift)
54,6	36	17	Short circuit to ground at output stage to Y1 (inertia brake valve)
54,5	36	49	Interruption at output stage to Y1 (inertia brake valve)
54,3	36	81	Short circuit to positive at output stage to Y1 (inertia brake valve)
55,7	37	114	Clutch engaged unintentionally at standstill, gear engaged
55,7	37	118	Clutch does not disengage
55,7	37	119	Clutch does not engage / does not transmit engine torque
56,7	38	145	Range change group (GP) disengagement error
56,7	38	146	Changeover error during range change group (GP) shifting

ON MESSAGES CENTER DISPLAY (MCD) SAE-J1587 Codes	ON SHIFT SELECTOR DISPLAY	ISO CODES WITH TESTMAN TOOL	DESCRIPTION
56,7	38	147	Range change group (GP) does not engage
57,2	39	108	Error in shift lever
57,14	39	110	ZF CAN timeout (can also means shift lever error through ZMP06400.hex)
58,7	3A	154	Main transmission gear does not disengage
58,7	3A	155	Main transmission gear does not engage
58,7	3A	156	Wrong gear shifting
59,7	3B	151	Selector cylinder does not disengage
59,7	3B	152	Change over error during gate selection procedure
59,7	3B	153	Selector cylinder does not engage
60,3	3C	133	No gate select sensor signal (Short circuit to positive)
60,6	3C	134	No gate select sensor signal (Short circuit to ground)
60,5	3C	135	No gate select sensor signal (Interruption)
60,13	3C	136	Gate select sensor self adjustment error
61,7	3D	148	Splitter (GV) does not disengage
61,7	3D	149	Change over error during splitter shifting
61,7	3D	150	Splitter (GV) does not engage
63,14	3F	100	Error on output speed signal 2
106,0	6A	125	Error on pressure reduction valve
106,14	6A	126	Error on pressure sensor signal
150,14	96	59	Acknowledge fault of PTO 1
150,14	96	60	Acknowledge fault of PTO 2
150,7	96	61	Disengagement fault of PTO 1
150,7	96	62	Disengagement fault of PTO 2
150,7	96	63	Engagement fault of PTO1
150,7	96	64	Engagement fault of PTO2
151,14	97	102	Plausibility error between transmission input speed and output speed
152,6	98	10	Short circuit to ground at output stage to Y10 (Main valve)
152,5	98	42	Interruption at output stage to Y10 (Main valve)
152,3	98	74	Short circuit to positive at output stage to Y10 (Main valve)
153,14	99	-	Error on ISO 14320 communications line
154,14	9A	101	Error on both output speed signals
161,14	A1	98	Error on transmission input speed signal
177,2	B1	128	Error on oil temperature sensor signal
191,14	BF	194	Both sources of vehicle speed are faulty
191,14	BF	99	Error on output speed signal 1
230,14	E6	166	Permanent idle signal
230,14	E6	168	No idle signal or error on ”idle signal switch” signal (EEC2)
230,14	E7	103	Error on ”Wheel-based vehicle speed” signal (CCV
231,7	E7	163	Engine does not react on torque intervention
231,14	E7	164	Error on ”Drivers demand engine percent torque” (EEC1)
231,14	E7	165	Error on ”Accelerator pedal position” (EEC2)
231,14	E7	167	Error on ”Percent load at current speed” signal (EEC2)
231,14	E7	171	Error on ”Actual engine percent torque” signal (EEC1)
231,14	E7	172	Permanent engine brake request signal
231,14	E7	173	Error on ”Brake switch” signal (CCVS)
231,14	E7	177	System-CAN Busoff error

ON MESSAGES CENTER DISPLAY (MCD) SAE-J1587 Codes	ON SHIFT SELECTOR DISPLAY	ISO CODES WITH TESTMAN TOOL	DESCRIPTION
231,11	E7	178	CAN error frames
231,11	E7	179	CAN queue overrun
231,14	E7	180	CAN EEC1 timeout
231,14	E7	181	CAN EEC2 timeout
231,14	E7	182	CAN CCVS timeout
231,14	E7	183	CAN ERC1_ER timeout
231,14	E7	197	Error on "Front axle speed" (WSI)
231,14	E7	198	Error on "Relative wheel speeds" (WSI)
231,14	E7	199	CAN WSI timeout
231,14	E7	26	CAN engine configuration timeout
231,14	E7	27	Error on ”engine configuration message” (engine configuration)
231,14	E7	31	Error on ”Actual engine retarder - percent torque” signal (ERC1_ER)
231,14	E7	32	Error on ”Engine retarder configuration message” (Engine retarder configuration)
231,14	E7	33	CAN ”Engine retarder configuration” timeout
231,14	E7	91	CAN EBC1 timeout
231,14	E7	92	Error on ”ABS active” signal (EBC1)
231,14	E7	93	Error on ”ASR engine control active” signal (EBC1)
231,14	E7	94	Error on ”ASR brake control active” signal (EBC1)
231,14	E7	95	Error on ”Cruise control active” signal (CCVS)
231,14	E7	96	Error on ”Cruise control set speed” (CCVS)
231,14	E7	97	Error on ”Engine speed” signal (EEC1)
-	EE	-	Communication error between GS3 and ZMTEC on display line
248,6	F8	25	Short circuit to ground at output SD to display
248,3	F8	89	Short circuit to positive at output SD to display
251,0	FB	104	High voltage (Vehicle electrical system voltage too high)
251,1	FD	105	Low voltage (Vehicle electrical system voltage too low)
253,14	FD	190	EOL EEPROM parameter out of valid range
253,14	FD	191	EOL EEPROM parameter checksum error
254,12	FE	169	Cut-off relay in ECU does not switch off
254,13	FE	170	No voltage supply at pin 30 or cut-off relay in ECU does not switch on
254,14	FE	188	ECU fault - wrong interrupt
254,14	FE	189	ECU fault - stack watch
254,14	FE	192	ECU fault - EEPROM access failure (or first power-up after programming without managed power down cycle)
254,14	FE	90	Communication error between controller 1 and controller 2 (ECU failure)
-	FF	-	ZMTEC does not recognise the ISO fault code

WORLD TRANSMISSION (WT) DIAGNOSTIC CODES

The WT Diagnostic Code Memory List contains the following headings: Code List Position, Main Code, Sub Code, Active indicator, Ignition Cycle Counter and Event counter. Up to five (5) codes can be stored at the same time in this memory.

The last occurring codes are listed first. Accessing the code list position, main code, sub code and active indicator is done through the Shift Selector Display or by using the Pro-Link Diagnostic Tool. Access to the ignition cycle counter and event counter can be done only through the Pro-Link diagnostic tool. The following table is an example of the information stored in memory.

Diagnostic Code Memory List

Code List Position	Main Code	Sub Code	Active Indicator	Ignition Cycle Counter	Event Counter
d1	21	12	YES	00	10
d2	41	12	YES	00	04
d3	23	12	NO	08	02
d4	34	12	NO	13	01
d5	56	11	NO	22	02
Displayed on Shift Selector Display and Diagnostic Tool			"YES" = ACTIVE = "MODE ON"	Ignition cycle counter and event counter are not available on Shift Selector Display	

NOTE
All information stored in memory can be accessed using the Pro-Link Diagnostic Tool.

NOTE
The diagnostic codes are stored in the memory queue in positions 1 through 5. The location of a diagnostic code in the memory queue is identified by "d1" (diagnostic code #1) through "d5".

The following paragraphs define the different WT Diagnostic Code Memory List headings:

MAIN CODE

The general condition or area of fault detected by the ECU.

SUB CODE

The specific area or condition under the Main Code in which the condition was detected.

ACTIVE INDICATOR

Illuminates when a fault condition is active (Shift Selector will display *MODE ON* or the Pro-Link Diagnostic Tool will display *YES*). The indicator will extinguish when the fault condition is gone.

IGNITION CYCLE COUNTER

Used to clear inactive diagnostic codes from the code list in memory. The counter is incremented each time a normal ECU power-down occurs following the clearing of the active indicator. A diagnostic code will be cleared from the list when the counter exceeds 25.

EVENT COUNTER

Used to record the number of times a diagnostic code occurs prior to the incident being cleared from the code list. The last occurring code will be stored in position "d1". If the most recent code is already in the code list, that code will be moved to position "d1". The Active Indicator will illuminate (Shift Selector will display *MODE ON* or the Diagnostic Tool will display *YES*), the Ignition Cycle Counter will be cleared and "1" will be added to the Event Counter.

CODE READING AND CLEARING

Diagnostic codes can be read and cleared by two methods: by using the Pro-Link 9000 Diagnostic Tool plugged into the receptacle located in the driver's footwell or by using the Shift Selector Display. The operation of the Pro-Link 9000 Diagnostic Tool is described in the user's manual provided with the Tool. This section describes how to read and clear codes using the Shift Selector Display.

The Diagnostic Display Mode can be entered for viewing codes at any speed. Codes can only be cleared when the output speed = 0 and no output speed sensor failure is active.

Reading Codes

Read codes as follows:
Enter the Diagnostic Display Mode by pressing both the "▲" (up arrow) and "▼" (down arrow) push buttons at the same time, twice on the push-button Shift Selector.

NOTE
To obtain the oil level, press the "▲" (up arrow) and "▼" (down arrow) push-buttons once, at the same time. Refer to "Oil Level Sensor (OLS) Codes" in this chapter.

Read the first code in the first of the five code positions on the digital display of the Shift Selector. For example, code "25 11" is stored in the first position. The display will change every two seconds as follows:

- o Code list position = "d1"
- o Main code = "25"
- o Sub code = "11"

Display will repeat steps a, b and c.

Press the MODE button momentarily to view the second position (d2) as described in step 2.

To view the third, fourth and fifth positions (d3, d4 and d5), momentarily press the MODE button as explained above.

Pressing the MODE button momentarily after the fifth position (d5) is displayed will return the code display to the first position (d1).

Any code which is active will be indicated by the MODE ON indicator (Active Indicator) being illuminated while in that code position. While in the normal operating mode, the MODE ON indicator is illuminated to indicate the ECONOMY mode operation. Refer to "Controls & Instruments" chapter under MODE.

Any code position in the list which does not have a diagnostic code logged will display "- -" for both the Main and Sub Code displays. All positions after a code position without any code stored will also display "- -".

Clearing Codes

Clearing of the Active Indicator is automatically done at ECU power-down for all codes except code "69 34".

Some codes will clear the Active Indicator automatically when the condition causing the code is no longer detected by the ECU. Refer to the "Diagnostic Code List and Description" table in this chapter.

Manual code clearing is only possible while in the Diagnostic Display Mode (output speed must be zero) and after the condition causing the code is corrected.

To clear all Active Indicators, hold down the MODE button continuously for 3 seconds until the Shift Selector tone sounds for 0.5 second.

To clear code records from the list, hold the *MODE* button down continuously for ten seconds until a second tone sounds. All diagnostic records in the list that are not active will then be cleared and the remaining records will then be moved up the list.

Release the MODE button to return to normal operating mode.

If the condition causing the code was not active at the time, the active indicator will go out.

NOTE
If clearing a code while locked in a drive (D) or reverse (R) position (fail-to-range), the transmission will still be in drive (D) or reverse (R) when the clearing procedure is completed. Neutral (N) must be manually selected.

Exiting the Diagnostic Display Mode

The Diagnostic Display Mode can be exited by any of the following methods:

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

DIAGNOSTIC CODE RESPONSE

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

DNS - Do Not Shift Response

- o Release lock up clutch and inhibit lock up operation.
- o Inhibit all shifts.
- o Turn *ON* the CHECK TRANS light.
- o Display the range attained.
- o Ignore any range selection inputs from the shift selector.

DNA - Do Not Adapt Response

The ECU stops adaptive shift control while the code is active.

SOL OFF - SOLenoid OFF Response

All solenoids are commanded *OFF* (turning solenoids “A” and “B” off electrically cause them to be on hydraulically).

RPR - Return to Previous Range Response

When the speed sensor ratio or C3 pressure switch test associated with a shift not successful, the ECU commands the same range as commanded before the shift.

NNC - Neutral No Clutches Response

When certain speed sensor ratio or C3 pressure switch tests are not successful, the ECU commands a neutral condition with no clutches applied.

ALLISON TRANSMISSION Diagnostic Code List And Description

MAIN CODE	SUB CODE	DESCRIPTION	CHECK TRANS LIGHT	INHIBITED OPERATION DESCRIPTION
13	12	ECU input voltage, low	Yes	DNS, DNA, SOL OFF, (Hydraulic default)
13	13	ECU input voltage, medium low	No	DNA
13	23	ECU input voltage, high	Yes	DNS, SOL OFF (Hydraulic default)
14	12	Oil level sensor, failed low	No	None
14	23	Oil level sensor, failed high	No	None
22	14	Engine speed sensor reasonableness test	No	Use default engine speed, DNA
22	15	Turbine speed sensor reasonableness test	Yes	DNS, lock in current range, DNA
22	16	Output speed sensor reasonableness test	Yes(1)	DNS, LOCK IN CURRENT RANGE, DNA
23	12	Primary Shift Selector or RSI Link Fault	Yes	Hold in last valid direction. May cause "cateye" display
23	14	Secondary Shift Selector or RSI Link Fault	Yes	Hold in last valid direction
23	16	Shift Selector display line fault	No	None, may cause "cateye" display
24	12	Sump fluid temperature, cold	Yes	DNS, lock in neutral
24	23	Sump fluid temperature, hot	No	No upshifts above a calibration range
25	0	Output speed sensor detected at 0 speed (Low)	Yes(1)	DNS, lock in current range (Low), DNA
25	11	Output speed sensor detected at 0 speed (1st)	Yes(1)	DNS, lock in current range (1st), DNA
25	22	Output speed sensor detected at 0 speed (2nd)	Yes(1)	DNS, lock in current range (2nd), DNA
25	33	Output speed sensor detected at 0 speed (3rd)	Yes(1)	DNS, lock in current range (3rd), DNA
25	44	Output speed sensor detected at 0 speed (4th)	Yes(1)	DNS, lock in current range (4th), DNA
25	55	Output speed sensor detected at 0 speed (5th)	Yes(1)	DNS, lock in current range (5th), DNA
25	66	Output speed sensor detected at 0 speed (6th)	Yes(1)	DNS, lock in current range (6th), DNA
25	77	Output speed sensor detected at 0 speed (R)	Yes(1)	DNS, lock in current range (R), DNA
26	00	Throttle source not detected	No	Use throttle default values, DNA
26	11	Engine coolant source not detected	No	Use default value of 0°F
32	0	C3 pressure switch open, Low range	Yes	DNS, lock in current range (Low), DNA
32	33	C3 pressure switch open, 3rd range	Yes	DNS, lock in current range (3rd), DNA
32	55	C3 pressure switch open, 5th range	Yes	DNS, lock in current range (5th), DNA
32	77	C3 pressure switch open, Reverse range	Yes	DNS, lock in current range (R), DNA

MAIN CODE	SUB CODE	DESCRIPTION	CHECK TRANS LIGHT	INHIBITED OPERATION DESCRIPTION
33	12	Sump oil temperature sensor failed low	No	Use default value of 200°F (93°C)
33	23	Sump oil temperature sensor, failed high	No	Use default value of 200°F (93°C)
34	12	Factory calibration compatibility number wrong	Yes	DNS, SOL OFF (Hydraulic default), DNA
34	13	Factory calibration block checksum	Yes	DNS, SOL OFF (Hydraulic default), DNA
34	14	Power off block checksum	No	Use previous location or factory calibration and reset adaptive, DNA
34	15	Diagnostic queue block checksum	No	Use previous location or clear diagnostic queue, DNA
34	16	Real time block checksum	Yes	DNS, SOL OFF (Hydraulic default), DNA
34	17	Customer modifiable constants checksum	Yes	DNS, SOL OFF (Hydraulic default), DNA
35	0	Power interruption (code set after power restored)	No	None (Hydraulic default during interruption)
35	16	Real time write interruption	Yes	DNS, SOL OFF (Hydraulic default), DNA
36	0	Hardware/Software not compatible	Yes(2)	DNS, SOL OFF (Hydraulic default), DNA
42	12	Short to battery, A solenoid circuit	Yes	DNS, SOL OFF, DNA
42	13	Short to battery, B solenoid circuit	Yes	DNS, SOL OFF, DNA
42	14	Short to battery, C solenoid circuit	Yes	DNS, SOL OFF, DNA
42	15	Short to battery, D solenoid circuit	Yes	DNS, SOL OFF, DNA
42	16	Short to battery, E solenoid circuit	Yes	DNS, SOL OFF, DNA
42	21	Short to battery, F solenoid circuit	No	Lock up inhibited, DNA
42	22	Short to battery, G solenoid circuit	Yes	DNS, lock in a range
42	23	Short to battery, H solenoid circuit	No	Differential lock inhibited (3070 only), retarder inhibited
42	24	Short to battery, J solenoid circuit	No	Low and 1st inhibited
42	26	Short to battery, N solenoid circuit	No	Low and 1st inhibited, allow retarder
44	12	Short to ground, A solenoid circuit	Yes	DNS, SOL OFF (Hydraulic default), DNA
44	13	Short to ground, B solenoid circuit	Yes	DNS, SOL OFF (Hydraulic default), DNA
44	14	Short to ground, C solenoid circuit	Yes	DNS, SOL OFF (Hydraulic default), DNA
44	15	Short to ground, D solenoid circuit	Yes	DNS, SOL OFF (Hydraulic default), DNA
44	16	Short to ground, E solenoid circuit	Yes	DNS, SOL OFF (Hydraulic default), DNA
44	21	Short to ground, F solenoid circuit	No	Lockup inhibited, DNA
44	22	Short to ground, G solenoid circuit	Yes	DNS, SOL OFF (Hydraulic default), DNA
44	23	Short to ground, H solenoid circuit	No	Differential lock inhibited (3070 only), retarder operation inhibited
44	24	Short to ground, J solenoid circuit	No	Low and 1st inhibited

MAIN CODE	SUB CODE	DESCRIPTION	CHECK TRANS LIGHT	INHIBITED OPERATION DESCRIPTION
44	26	Short to ground, N solenoid circuit	No	Low and 1st inhibited, retarder allowed
45	12	Open circuit, A solenoid circuit	Yes	DNS, SOL OFF (Hydraulic default), DNA
45	13	Open circuit, B solenoid circuit	Yes	DNS, SOL OFF (Hydraulic default), DNA
45	14	Open circuit, C solenoid circuit	Yes	DNS, SOL OFF (Hydraulic default), DNA
45	15	Open circuit, D solenoid circuit	Yes	DNS, SOL OFF (Hydraulic default), DNA
45	16	Open circuit, E solenoid circuit	Yes	DNS, SOL OFF (Hydraulic default), DNA
45	21	Open circuit, F solenoid circuit	No	Lock up inhibited, DNA
45	22	Open circuit, G solenoid circuit	Yes	DNS, SOL OFF (Hydraulic default), DNA
45	23	Open circuit, H solenoid circuit	No	Differential lock inhibited (3070 only), retarder inhibited
45	24	Open circuit, J solenoid circuit	No	Low and 1st inhibited
45	26	Open circuit, N solenoid circuit	No	Low and 1st inhibited, retarder allowed
46	21	Overcurrent, F solenoid circuit	No	Lock up inhibited, DNA
46	26	Overcurrent, N and H solenoid circuits	No	Low and first inhibited or retarder inhibited, DNA
46	27	Overcurrent, A-Hi solenoid circuit	Yes	DNS, SOL OFF (Hydraulic default), DNA
51	01	Offgoing ratio test (during shift), Low to 1	Yes	DNS, RPR, DNA
51	10	Offgoing ratio test (during shift), 1 to Low	Yes	DNS, RPR, DNA
51	12	Offgoing ratio test (during shift), 1 to 2	Yes	DNS, RPR, DNA
51	21	Offgoing ratio test (during shift), 2 to 1	Yes	DNS, RPR, DNA
51	23	Offgoing ratio test (during shift), 2 to 3	Yes	DNS, RPR, DNA
51	24	Offgoing ratio test (during shift), 2 to 4	Yes	DNS, RPR, DNA
51	35	Offgoing ratio test (during shift), 3 to 5	Yes	DNS, RPR, DNA
51	42	Offgoing ratio test (during shift), 4 to 2	Yes	DNS, RPR, DNA
51	43	Offgoing ratio test (during shift), 4 to 3	Yes(1)	DNS, RPR, DNA
51	45	Offgoing ratio test (during shift), 4 to 5	Yes(1)	DNS, RPR, DNA
51	46	Offgoing ratio test (during shift), 4 to 6	Yes	DNS, RPR, DNA
51	53	Offgoing ratio test (during shift), 5 to 3	Yes	DNS, RPR, DNA
51	64	Offgoing ratio test (during shift), 6 to 4	Yes	DNS, RPR, DNA
51	65	Offgoing ratio test (during shift), 6 to 5	Yes	DNS, RPR, DNA
	XY	Offgoing ratio test, X to Y(3)		
52	1	Offgoing C3PS test (during shift), Low to 1	Yes	DNS, RPR, DNA
52	8	Offgoing C3PS test (during shift), L to N1	Yes	DNS, NNC, DNA
52	32	Offgoing C3PS test (during shift), 3 to 2	Yes	DNS, RPR, DNA
52	34	Offgoing C3PS test (during shift), 3 to 4	Yes	DNS, RPR, DNA

MAIN CODE	SUB CODE	DESCRIPTION	CHECK TRANS LIGHT	INHIBITED OPERATION DESCRIPTION
52	54	Offgoing C3PS test (during shift), 5 to 4	Yes	DNS, RPR, DNA
52	56	Offgoing C3PS test (during shift), 5 to 6	Yes	DNS, RPR, DNA
52	71	Offgoing C3PS test (during shift), R to 1	Yes	DNS, NNC, DNA
52	72	Offgoing C3PS test (during shift), R to 2	Yes	DNS, NNC, DNA
52	78	Offgoing C3PS test (during shift), R to N1	Yes	DNS, NNC, DNA
52	99	Offgoing C3PS test (during shift), N3 to N2	Yes	DNS, RPR, DNA
52	XY	Offgoing C3PS test (during shift) X to Y(3)		
53	8	Offgoing speed test (during shift), L to N1	Yes(1)	DNS, NNC, DNA
53	18	Offgoing speed test (during shift), 1 to N1	Yes(1)	DNS, NNC, DNA
53	28	Offgoing speed test (during shift), 2 to N1	Yes(1)	DNS, NNC, DNA
53	29	Offgoing speed test (during shift), 2 to N2	Yes(1)	DNS, RPR, DNA
53	38	Offgoing speed test (during shift), 3 to N1	Yes(1)	DNS, NNC, DNA
53	39	Offgoing speed test (during shift), 3 to N3	Yes(1)	DNS, RPR, DNA
53	48	Offgoing speed test (during shift), 4 to N1	Yes(1)	DNS, NNC, DNA
53	49	Offgoing speed test (during shift), 4 to N3	Yes(1)	DNS, RPR, DNA
53	58	Offgoing speed test (during shift), 5 to N1	Yes(1)	DNS, NNC, DNA
53	59	Offgoing speed test (during shift), 5 to N3	Yes(1)	DNS, RPR, DNA
53	68	Offgoing speed test (during shift), 6 to N1	Yes(1)	DNS, NNC, DNA
53	69	Offgoing speed test (during shift), 6 to N4	Yes(1)	DNS, RPR, DNA
53	78	Offgoing speed test (during shift), R to N1	Yes	DNS, NNC, DNA
53	99	Offgoing speed test (during shift), N2 to N3 or N3 to N2	Yes	DNS, RPR, DNA
53	XY	Offgoing speed test (during shift), X to Y(3)		
54	1	Oncoming ratio test (after shift), L to 1	Yes	DNS, RPR, DNA
54	7	Oncoming ratio test (after shift), L to R	Yes	DNS, NNC, DNA
54	10	Oncoming ratio test (after shift), 1 to L	Yes	DNS, RPR, DNA
54	12	Oncoming ratio test (after shift), 1 to 2	Yes	DNS, RPR, DNA
54	17	Oncoming ratio test (after shift), 1 to R	Yes	DNS, NNC, DNA
54	21	Oncoming ratio test (after shift), 2 to 1	Yes	DNS, RPR, DNA

MAIN CODE	SUB CODE	DESCRIPTION	CHECK TRANS LIGHT	INHIBITED OPERATION DESCRIPTION
54	23	Oncoming ratio test (after shift), 2 to 3	Yes	DNS, RPR, DNA
54	24	Oncoming ratio test (during shift), 2 to 4	Yes	DNS, RPR, DNA
54	27	Oncoming ratio test (after shift), 2 to R	Yes	DNS, RPR, DNA
54	32	Oncoming ratio test (after shift), 3 to 2	Yes	DNS, RPR, DNA
54	34	Oncoming ratio test (after shift), 3 to 4	Yes	DNS, RPR, DNA
54	35	Oncoming ratio test (during shift), 3 to 5	Yes	DNS, RPR, DNA
54	42	Oncoming ratio test (during shift), 4 to 2	Yes	DNS, RPR, DNA
54	43	Oncoming ratio test (after shift), 4 to 3	Yes	DNS, RPR, DNA
54	45	Oncoming ratio test (after shift), 4 to 5	Yes	DNS, RPR or SOL OFF (Hydraulic default), DNA
54	46	Oncoming ratio test (during shift), 4 to 6	Yes	DNS, RPR, DNA
54	53	Oncoming ratio test (during shift), 5 to 3	Yes	DNS, RPR, DNA
54	54	Oncoming ratio test (after shift), 5 to 4	Yes	DNS, RPR, DNA
54	56	Oncoming ratio test (after shift), 5 to 6	Yes	DNS, RPR, DNA
54	64	Oncoming ratio test (after shift), 6 to 4	Yes	DNS, RPR, DNA
54	65	Oncoming ratio test (after shift), 6 to 5	Yes	DNS, RPR, DNA
54	70	Oncoming ratio test (after shift), R to L	Yes	DNS, NNC, DNA
54	71	Oncoming ratio test (after shift), R to 1	Yes	DNS, NNC, DNA
54	72	Oncoming ratio test (after shift), R to 2	Yes	DNS, NNC, DNA
54	80	Oncoming ratio test (after shift), N1 to L	Yes	DNS, RPR, DNA
54	81	Oncoming ratio test (after shift), N1 to 1	Yes	DNS, RPR, DNA
54	82	Oncoming ratio test (after shift), N1 to 2	Yes	DNS, RPR, DNA
54	83	Oncoming ratio test (after shift), N1 to 3	Yes	DNS, RPR, DNA
54	85	Oncoming ratio test (after shift), N1 to 5	Yes	DNS, RPR, DNA
54	86	Oncoming ratio test (after shift), N1 to 6	Yes	DNS, RPR, DNA
54	92	Oncoming ratio test (after shift), N2 to 2	Yes	DNS, RPR, DNA
54	93	Oncoming ratio test (after shift), N3 to 3	Yes	DNS, RPR, DNA
54	95	Oncoming ratio test (after shift), N3 to 5	Yes	DNS, RPR, DNA
54	96	Oncoming ratio test (after shift), N4 to 6	Yes	DNS, RPR, DNA
54	XY	Oncoming ratio test (after shift), X to Y(3)		

MAIN CODE	SUB CODE	DESCRIPTION	CHECK TRANS LIGHT	INHIBITED OPERATION DESCRIPTION
55	07	Oncoming C3PS test (after shift), Low to R	Yes(1)	DNS, NNC, DNA
55	17	Oncoming C3PS test (after shift), 1 to R	Yes(1)	DNS, NNC, DNA
55	27	Oncoming C3PS test (after shift), 2 to R	Yes(1)	DNS, NNC, DNA
55	87	Oncoming C3PS test (after shift), N1 to R	Yes	DNS, RPR, DNA
55	97	Oncoming C3PS test (after shift), NVL to R	Yes(1)	DNS, NNC, DNA
55	XY	Oncoming C3PS test (after shift), X to Y(3)		
56	0	Range verification test, L	Yes(1)	DNS, 1st, Low or SOL OFF (Low),DNA
56	11	Range verification ratio test, 1st	Yes	DNS, 6th, DNA
56	22	Range verification ratio test, 2nd	Yes(1)	DNS, 6th or 5th, DNA
56	33	Range verification ratio test, 3rd	Yes(1)	DNS, 5th or SOL OFF (4th), DNA
56	44	Range verification ratio test, 4th	Yes	DNS, 3rd or 5th, DNA
56	55	Range verification ratio test, 5th	Yes(1)	DNS, SOL OFF (5th) or 3rd, DNA
56	66	Range verification ratio test, 6th	Yes	DNS, 5th, 3rd or SOL OFF (3rd), DNA
56	77	Range verification ratio test, R	Yes	DNS, N2 or N3, DNA
57	11	Range verification C3PS test, 1st	Yes	DNS, SOL OFF (3rd), DNA
57	22	Range verification C3PS test, 2nd	Yes	DNS, 3rd, DNA
57	44	Range verification C3PS test, 4th	Yes	DNS, 5th or SOL OFF (3rd), DNA
57	66	Range verification C3PS test, 6th	Yes	DSN, SOL OFF (5th), DNA
57	88	Range verification C3PS test, N1	Yes	DNS, N3, DNA
57	99	Range verification C3PS test, N2 or N4	Yes	DNS, N3, DNA
61	0	Retarder oil temperature, hot	No	None
62	12	Retarder oil temperature sensor, low	No	None
62	23	Retarder oil temperature sensor, high	No	None
62	32	Engine coolant sensor, failed low	No	Use default value of 0°F
62	33	Engine coolant sensor, failed high	No	Use default value of 0°F
63	0	Input function fault	Yes	Depends on input function, DNA
63	26	Kickdown input, failed on	No	Kickdown operation inhibited
63	40	Service brake status input, failed on	No	No auto Neutral to Drive shifts for refuse packer (I/O package # 41).
64	12	Retarder modulation request sensor, failed low	No	Retarder operation inhibited
64	23	Retarder modulation request sensor, failed high	No	Retarder operation inhibited
66	0	Serial communications interface fault	No	Use default throttle values, DNA
66	11	SCI engine coolant source fault	No	Use default value of 0°F
69	27	ECU, inoperative A-Hi switch	Yes	DNS, NNC, DNA

MAIN CODE	SUB CODE	DESCRIPTION	CHECK TRANS LIGHT	INHIBITED OPERATION DESCRIPTION
69	28	ECU, inoperative F-Hi switch	Yes	Lock up inhibited, DNA
69	29	ECU, inoperative N and H-Hi switch	No	Low and 1st inhibited, retarder inhibited, DNA
69	33	ECU, Computer Operating Properly (COP) timeout	No	RESET ECU, SHUTDOWN ECU ON 2ND OCCURRENCE (POWER LOSS: HYDRAULIC DEFAULTS), MAY CAUSE "CATEYE" DISPLAY, DNA(4)
69	34	ECU, write timeout	Yes	DNS, SOL OFF (Hydraulic default), DNA
69	35	ECU, checksum test	No	Induce COP timeout (reset ECU), DNA(4)
69	36	ECU, RAM self test	No	INDUCE COP TIMEOUT (reset ECU), DNA(4)
69	39	Communication chip addressing error	No	Use default for J1939 data, DNA
69	41	ECU, I/O ASIC addressing test	No	Induce COP timeout (reset ECU), DNA(4)
69	42	SPI output failure	Yes	GPO 1-8 and reverse warning inoperable
69	43	SPI input failure	Yes	DNS, lock in range, DNA

(1) This code is logged in real time to protect the transmission in case a loss of power to the ECU. Power Interruption code 35 00 occurs.

(2) The ECU hardware or software must be changed so that they are compatible.

(3) Additional codes could be logged for other shifts where X indicates range shifted from and Y indicates range shifted to.

(4) The COP reset will clear the active inhibit.

FLUID LEVEL SENSOR (OLS) CODES

Oil level codes are obtained as follows:

Press both the "▲" (up arrow) and "▼" (down arrow) push-buttons simultaneously. Oil level codes are displayed in 2 minutes (e.g. display will flash and 8, 7, ...; countdown will occur during the 2 minutes) once the following parameters are met:

- o Waiting time, vehicle must be stationary for at least 2 minutes to allow the oil to settle;
- o Engine at idle;
- o Oil at normal operating temperature, between 140°F (60°C) and 220°F (104°C):
- o Transmission in neutral (N);
- o Transmission output shaft stopped;
- o Oil level sensor present and working.
- o After 2 minutes, the display will flash one of the codes shown below:

CODE	CAUSE OF CODE
O, L…O, K	Oil level is correct
O, L…L, O…01	One quart low
O, L…L, O…02	Two quarts low
O, L…H, I…01	One quart high
O, L…H, I…02	Two quarts high

NOTE
Failure to meet one of the above parameters will stop the two minute countdown. One of the codes shown hereafter will indicate the cause of the countdown interruption. Once all parameters are met, the countdown will continue from where it left off.

CODE	CAUSE OF CODE
O, L…-…0,X	Waiting time too short
OL-50	Engine speed (rpm) too low
OL-59	Engine speed (rpm) too high
OL-65	Neutral must be selected
OL-70	Sump oil temperature too low
OL-79	Sump oil temperature too high
OL-89	Output shaft rotation
OL-95	Sensor failure

Exiting The Fluid Level Display Mode

To exit the Oil Level Display Mode, press any range button ("R", "N" or "D").

CLEARING CODES

If the CHECK TRANS light is illuminated, first clear all diagnostic codes by pressing both the "▲" (up arrow) and "▼" (down arrow) pushbuttons at the same time, twice.

Take the vehicle for a test drive. If the CHECK TRANS light illuminates again, record the diagnostic codes. Refer to "World Transmission (WT) Diagnostic Codes" in this appendix.

DDEC V DIAGNOSTIC CODES

To read the diagnostic codes, a Diagnostic Data Reader should be plugged into the receptacle located on the lower side panel of the L.H. control panel. To read diagnostic codes as blink codes, momentarily depress the STOP ENGINE OVERRIDE switch while the ignition is *ON*, the engine is idling or shut off. Active codes will be flashed on the STOP ENGINE indicator light followed by the inactive codes being flashed on the CHECK ENGINE indicator light. The cycle is repeated until the operator depresses the STOP ENGINE OVERRIDE switch again. For example: code "43" consists of four flashes, followed by a short pause, then another three flashes in quick succession. The following table is a list of the DDEC diagnostic codes.

DDEC V Code	PID	SID	FMI	DESCRIPTION
11	187	--	4	Variable Speed Governor Sensor Voltage Low
11	187	--	7	Variable Speed Governor Switch System Not Responding
12	187	--	3	Variable Speed Governor Sensor Voltage High
13	111	--	4	Coolant Level Sensor Input Voltage Low
13	111	--	6	Add Coolant Level Sensor Input Voltage Low
13		146	6	EGR Valve Current too High
14	52	--	3	Intercooler Coolant Temperature Sensor Input Voltage High
14	110	--	3	Coolant Temperature Sensor Input Voltage High
14	175	--	3	Oil Temperature Sensor Input Voltage High
15	52	--	4	Intercooler Coolant Temperature Sensor Input Voltage Low
15	110	--	4	Coolant Temperature Sensor Input Voltage Low
15	175	--	4	Oil Temperature Sensor Input Voltage Low
16	111	--	3	Coolant Level Sensor Input Voltage High
16	111	--	5	Add Coolant Level Sensor Input Voltage High
16		146	5	EGR Valve Current too Low
17	51	--	3	Throttle Plate Position Sensor Input Voltage High
17	72	--	3	Blower Bypass Position Input Voltage High
17	354	--	3	Relative Humidity Sensor Circuit Failed High
18	51	--	4	Throttle Plate Position Sensor Input Voltage Low
18	72	--	4	Blower Bypass Position Input Voltage Low
18	354	--	4	Relative Humidity Sensor Circuit Failed Low
21	91	--	3	Throttle Position Sensor Input Voltage High
22	91	--	4	Throttle Position Sensor Input Voltage Low
23	174	--	3	Fuel Temperature Sensor Input Voltage High
23	--	65	3	Oxygen Content Circuit Input Voltage High
24	174	--	4	Fuel Temperature Sensor Input Voltage Low

DDEC V Code	PID	SID	FMI	DESCRIPTION
24	--	65	4	Oxygen Content Circuit Input Voltage Low
25	--	--	--	Reserved for ‘‘No Codes"
26	--	25	11	Aux. Shutdown #1 Active
26	--	61	11	Aux. Shutdown #2 Active
27	105	--	3	Intake Manifold Temperature Sensor Input Voltage High
27	171	--	3	Ambient Air Temperature Sensor Input Voltage High
27	172	--	3	Air Temperature Sensor Input Voltage High
28	105	--	4	Intake Manifold Temperature Sensor Input Voltage Low
28	171	--	4	Ambient Air Temperature Sensor Input Voltage Low
28	172	--	4	Air Temperature Sensor Input Voltage Low
29	351	—	4	TCI Temperature Circuit Failed Low
29	404	—	4	Turbo Compressor Temperature Out Sensor Input Voltage Low
31	--	51	3	Aux. Output #3 Open Circuit (High Side) – Pin E-49
31	--	51	4	Aux. Output #3 Short To Ground (High Side) – Pin E-49
31	--	51	7	Aux. Output #3 Mechanical System Fail - Pin E-49
31	--	52	3	Aux. Output #4 Open Circuit (High Side) - Pin E-48
31	--	52	4	Aux. Output #4 Short to Ground (High Side) - Pin E-48
31	--	52	7	Aux. Output #4 Mechanical System Failure - Pin E-48
31	--	260	3	Aux. Output #12 Open Circuit (High Side) - Pin E-46
31	--	260	4	Aux. Output #12 Short to Ground (High Side) - Pin E-46
31	--	260	7	Aux. Output #12 Mechanical System Failure - Pin E-46
31	--	261	3	Aux. Output #13 Open Circuit (High Side) - Pin E-47
31	--	261	4	Aux. Output #13 Short to Ground (High Side) - Pin E-47
31	--	261	7	Aux. Output #13 Mechanical System Failure - Pin E-47
31	--	262	3	Aux. Output #14 Open Circuit (High Side) - Pin E-50
31	--	262	4	Aux. Output #14 Short to Ground (High Side) - Pin E-50
31	--	262	7	Aux. Output #14 Mechanical System Failure - Pin E-50
31	--	263	3	Aux. Output #15 Open Circuit (High Side) - Pin E-51
31	--	263	4	Aux. Output #15 Short to Ground (High Side) - Pin E-51
31	--	263	7	Aux. Output #15 Mechanical System Failure - Pin E-51
31	--	264	3	Aux. Output #16 Open Circuit (High Side) - Pin E-52
31	--	264	4	Aux. Output #16 Short to Ground (High Side) - Pin E-52
31	--	264	7	Aux. Output #16 Mechanical System Failure - Pin E-52
31	--	265	3	Aux. Output #17 Open Circuit (High Side) - Pin E-53
31	--	265	4	Aux. Output #17 Short to Ground (High Side) - Pin E-53

DDEC V Code	PID	SID	FMI	DESCRIPTION
31	--	265	7	Aux. Output #17 Mechanical System Failure - Pin E-53
32	--	238	3	RSL Short to Battery (+)
32	--	238	4	RSL Open Circuit
32	--	239	3	AWL Short to Battery (+)
32	--	239	4	AWL Open Circuit
33	102	--	3	Turbo Boost Pressure Sensor Input Voltage High
34	102	--	4	Turbo Boost Pressure Sensor Input Voltage Low
35	19	--	3	High Range Oil Pressure Sensor Input Voltage High
35	100	--	3	Oil Pressure Sensor Input Voltage High
36	19	--	4	High Range Oil Pressure Sensor Input Voltage Low
36	100	--	4	Oil Pressure Sensor Input Voltage Low
37	18	--	3	High Range Fuel Pressure Sensor Input Voltage High
37	94	--	3	Fuel Pressure Sensor Input Voltage High
37	95	--	3	Fuel Restriction Sensor Input Voltage High
38	18	--	4	High Range Fuel Pressure Sensor Input Voltage Low
38	94	--	4	Fuel Pressure Sensor Input Voltage Low
38	95		4	Fuel Restriction Sensor Input Voltage Low
39	—	146	2	EGR Leak- Boost Power
39	—	146	12	EGR Leak- Boost Jake
39	—	146	7	EGR Valve Not Responding
39	—	147	2	VNT Vanes Not Responding – Boost Power
39	—	147	11	VNT Vanes at Max – Jake
39	—	147	12	VNT Vanes Not Responding – Boost Jake
39	—	147	14	EGR Flow too low
39	—	147	7	VNT Vanes Not Responding – EGR
41	--	21	0	Too Many CKP Sensor (missing CMP Sensor)
42	--	21	1	Too few CKP Sensor (missing CKP Sensor)
43	111	--	1	Coolant Level Low
44	52	--	0	Intercooler Coolant Temperature High
44	105	--	0	Intake Manifold Temperature High
44	105	--	14	Engine Power Derate Due to Intake Manifold Temperature
44	110	--	0	Coolant Temperature High
44	110	--	14	Engine Power Derate Due to Coolant Temperature
44	172	--	0	Air Inlet Temperature High
44	175	--	0	Oil Temperature High
45	19	--	1	High Range Oil Pressure Low
45	100	--	1	Oil Pressure Low

DDEC V Code	PID	SID	FMI	DESCRIPTION
46	168	--	1	ECM Battery Voltage Low
46	--	155		Injector V (reg) Voltage Failed Low
46	--	211	1	Sensor Supply Pins V-11/V-12 Low
46	--	212	4	Injector V (slope) Voltage Failed Low
46	--	214	1	RTC Backup Battery Voltage Low, Pin E-59
46	--	221	4	Injector I (pull-in) Voltage Failed Low
46	--	232	1	Sensor Supply Voltage Low, Pin E-12/E-26
47	18	--	0	High Range Fuel Pressure High
47	94	--	0	Fuel Pressure High
47	102	--	0	Turbo Boost Pressure High
47	102	--	14	Engine Power Derate Due to Turbo Boost Pressure
47	106	--	0	Air Inlet Pressure High
47	164	--	0	Injection Control Pressure High
48	18	--	1	High Range Fuel Pressure Low
48	94	--	1	Fuel Pressure Low
48	106	--	1	Air Inlet Pressure Low
48	164	--	1	Injection Control Pressure Low
48	351	--	1	TCI Temperature Low
48	404	—	1	Turbo Compressor Temperature Out Low
48	404	--	14	Engine Power Derate Due to Turbo Compressor Out Temperature
48	411	--	1	EGR Differential Pressure Low
48	412	--	1	EGR Temperature Low
49	351	--	0	TCI Temperature High
49	404	--	0	Turbo Compressor Out Temperature High
51	351	--	3	TCI Temperature Circuit Failed High
51	404	--	3	Turbo Compressor Out Temperature Sensor Input Voltage High
52	--	254	12	A/D Conversion Fail
53	--	253	2	Nonvolatile Checksum Incorrect
53	--	253	12	EEPROM Write Error
53	--	253	13	Out of Calibration
54	84	--	12	Vehicle Speed Sensor Fault
55	--	216	14	Other ECU Fault (This fault is logged in conjunction with another fault to indicate missing information from another ECU.)
55	--	231	12	J1939 Data Link Fault
55	--	248	8	Proprietary Data Link Fault (Master)
55	--	248	9	Proprietary Data Link Fault (Receiver)

DDEC V Code	PID	SID	FMI	DESCRIPTION
56	--	250	12	J1587 Data Link Fault
57	--	249	12	J1922 Data Link Fault
58	92	--	0	Torque Overload
61	--	xxx	0	Injector xxx Response Time Long
62	--	26	3	Aux. Output #1 Short to Battery (+) – Pin V-4
62	--	26	4	Aux. Output #1 Open Circuit - Pin V-4
62	—	26	7	Aux. Output #1 Mechanical System Not Responding Properly - Pin V-4
62	--	40	3	Aux. Output #2 Short to Battery (+) - Pin V-5
62	--	40	4	Aux. Output #2 Open Circuit - Pin V-5
62	—	40	7	Aux. Output #2 Mechanical System Not Responding Properly – Pin V-5
62	--	53	3	Aux. Output #5 Short to Battery (+) - Pin V-6
62	--	53	4	Aux. Output #5 Open Circuit - Pin V-6
62	—	53	7	Aux. Output #5 Mechanical System Not Responding Properly - Pin V-6
62	--	54	3	Aux. Output #6 Short to Battery (+) - Pin V-7
62	--	54	4	Aux. Output #6 Open Circuit - Pin V-7
62	--	54	7	Aux. Output #6 Mechanical System Not Responding Properly - Pin V-7
62	--	55	3	Aux. Output #7 Short to Battery (+) - Pin V-40
62	--	55	4	Aux. Output #7 Open Circuit - Pin V-40
62	—	55	7	Aux. Output #7 Mechanical System Not Responding Properly - Pin V-40
62	--	56	3	Aux. Output #8 Short to Battery (+) – Pin V-53
62	--	56	4	Aux. Output #8 Open Circuit - Pin V-53
62	--	56	7	Aux. Output #8 Mechanical System Not Responding Properly - Pin V-53
62	--	257	3	Aux. Output #9 Open Circuit – Pin V-54
62	--	257	4	Aux. Output #9 Short to Gnd – Pin V-54
62	--	257	7	Aux. Output #9 Mechanical System Failure – Pin V-54
62	--	258	3	Aux. Output #10 Open Circuit – Pin V-55
62	--	258	4	Aux. Output #10 Short to Gnd – Pin V-55
62	--	258	7	Aux. Output #10 Mechanical System Failure – Pin V-55
62	--	259	3	Aux. Output #11 Open Circuit – Pin E-13
62	--	259	4	Aux. Output #11 Short to Gnd – Pin E-13
62	--	259	7	Aux. Output #11 Mechanical System Failure – Pin E-13
63	--	57	0	PWM #1 Above Normal Range, Pin V-53
63	--	57	1	PWM #1 Below Normal Range, Pin V-53
63	--	57	3	PWM #1 Short to Battery (+), Pin V-53

DDEC V Code	PID	SID	FMI	DESCRIPTION
63	--	57	4	PWM #1 Open Circuit, Pin V-53
63	--	58	0	PWM #2 Above Normal Range, Pin V-46
63	--	58	1	PWM #2 Below Normal Range, Pin V-46
63	--	58	3	PWM #2 Short to Battery (+), Pin V-46
63	--	58	4	PWM #2 Open Circuit, Pin V-46
63	--	59	0	PWM #3 Above Normal Range, Pin E-3
63	--	59	1	PWM #3 Below Normal Range, Pin E-3
63	--	59	3	PWM #3 Short to Battery (+), Pin E-3
63	--	59	4	PWM #3 Open Circuit, Pin E-3
63	--	60	0	PWM #4 Above Normal Range, Pin E-4
63	--	60	1	PWM #4 Below Normal Range, Pin E-4
63	--	60	3	PWM #4 Short to Battery (+), Pin E-4
63	--	60	4	PWM #4 Open Circuit, Pin E-4
63	--	267	0	PWM #5 Above Normal Range - Pin E-8
63	--	267	1	PWM #5 Below Normal Range - Pin E-8
63	--	267	3	PWM #5 Short to Battery (+) - Pin E-8
63	--	267	4	PWM #5 Open Circuit - Pin E-8
63	--	267	7	PWM #5 Mechanical System Failed - Pin E-8
63	--	268	0	PWM #6 Above Normal Range - Pin E-11
63	--	268	1	PWM #6 Below Normal Range - Pin E-11
63	--	268	3	PWM #6 Short to Battery (+) - Pin E-11
63	--	268	4	PWM #6 Open Circuit - Pin E-11
63	--	268	7	PWM #6 Mechanical System Failed - Pin E-11
64	103	--	0	Turbo Overspeed
64	103	--	8	Turbo Speed Sensor Input Failure – Abnormal Period
65	51	--	0	Throttle Plate Position Above Normal Range
65	51	--	1	Throttle Plate Position Below Normal Range
65	51	--	2	Throttle Plate Position Erratic
65	51	--	7	Throttle Plate Not Responding
65	107	--	3	Air Filter Restriction Sensor Voltage High
65	107	--	4	Air Filter Restriction Sensor Voltage Low
66	99	--	3	Oil Filter Restriction Sensor Voltage High
66	99	--	4	Oil Filter Restriction Sensor Voltage Low
66	--	76	0	Engine Knock Level Above Normal Range
66	--	76	3	Engine Knock Level Sensor Input Voltage High
66	--	76	4	Engine Knock Level Sensor Input Voltage Low
66	--	76	7	Engine Knock Level Sensor Not Responding

DDEC V Code	PID	SID	FMI	DESCRIPTION
67	20	--	3	High Range Coolant Pressure Sensor Input Voltage High
67	20	--	4	High Range Coolant Pressure Sensor Input Voltage Low
67	106	--	3	Air Inlet Pressure Sensor Input Voltage High
67	106	--	4	Air Inlet Pressure Sensor Input Voltage Low
67	109	--	3	Coolant Pressure Sensor Input Voltage High
67	109	--	4	Coolant Pressure Sensor Input Voltage Low
68	--	230	5	TPS Idle Validation Circuit Fault (open circuit)
68	--	230	6	TPS Idle Validation Circuit Fault (short to ground)
71	--	xxx	1	Injector xxx Response Time Short
72	84	--	0	Vehicle Overspeed
72	84	--	11	Vehicle Overspeed (Absolute)
72	--	65	0	Oxygen Content Too High
72	--	65	1	Oxygen Content Too Low
73	107	--	0	Air Filter Restriction High
73	--	77	0	Gas Valve Position Above Normal Range
73	--	77	1	Gas Valve Position Below Normal Range
73	--	77	3	Gas Valve Position Input Voltage High
73	--	77	4	Gas Valve Position Input Voltage Low
73	--	77	7	Gas Metering Valve Not Responding
74	70	--	4	Optimized Idle Safety Loop Short to Ground
74	99	--	0	Oil Filter Restriction High
75	168	--	0	ECM Battery Voltage High
75	--	155	3	Injector V (reg) Voltage Failed High
75	--	211	0	Sensor Supply Pins V-11/V-12 Voltage High
75	--	212	3	Injector V (slope) Voltage Failed High
75	--	221	3	Injector V (pull-in) Voltage Failed High
75	--	214	0	RTC Backup Battery Voltage High
75	--	232	0	Sensor Supply Voltage High, Pin E-26
76	121	--	0	Engine Overspeed With Engine Brake
77	19	—	0	High Range Oil Pressure High
77	20	—	0	High Range Coolant Pressure High
77	21	—	0	ECU Temperature Above Range
77	21	—	1	ECU Temperature Below Range
77	21	—	3	ECU Temperature Above Failed High
77	21	—	4	ECU Temperature Above Failed Low
77	72	—	0	Blower Bypass Door Position High
77	72	—	1	Blower Bypass Door Position Low

DDEC V Code	PID	SID	FMI	DESCRIPTION
77	73	—	1	Fire Pump Pressure Low
77	81	—	0	Exhaust Back Pressure High
77	81	—	1	Exhaust Back Pressure Low
77	81	—	3	Exhaust Back Pressure Sensor Voltage High
77	81	—	4	Exhaust Back Pressure Sensor Voltage Low
77	81	—	12	Exhaust Back Pressure at Rampdown Threshold
77	95	—	1	Fuel Filter Differential Pressure Low
77	99	—	1	Oil Filter Differential Pressure Low
77	100	—	0	Engine Oil Pressure High
77	102	—	1	Turbo Boost Pressure Low
77	105	—	1	Inlet Manifold Temperature Low
77	107	—	1	Air filter Restriction Pressure Low
77	108	—	0	Barometric Pressure High
77	108	—	1	Barometric Pressure Low
77	109	—	0	Coolant Pressure High
77	110	—	1	Coolant Temperature Low
77	111	—	0	Coolant Level High
77	171	—	0	Ambient Air Temperature High
77	171	—	1	Ambient Air Temperature Low
77	172	—	1	Air Inlet Temperature Low
77	174	—	0	Fuel Temperature High
77	174	—	1	Fuel Temperature Low
77	175	—	1	Engine Oil Temperature Low
77	222	—	14	Anti-Theft Fault Present
77	251	—	10	Clock Module Abnormal Rate of Change
77	251	—	13	Clock Module Failure
77	252	—	10	Clock Module Abnormal Rate of Change
77	252	—	13	Clock Module Failure
77	354	—	0	Relative Humidity Above Range
77	354	—	1	Relative Humidity Below Range
77	446	—	0	Cylinder Head Temperature Above Range
77	—	151	11	Service Now Lamp Fault Expiration
78	86	--	14	Cruise Control/Adaptive Cruise Control Fault
81	98	--	3	Oil Level Sensor Input Voltage High
81	101	--	3	Crankcase Pressure Sensor Input Voltage High
81	153	--	3	Extended Crankcase Pressure Input Voltage High
81	164	--	3	Injection Control Pressure Sensor Input Voltage High

DDEC V Code	PID	SID	FMI	DESCRIPTION
81	173	--	3	Exhaust Temperature Sensor Input Voltage High
81	411	—	3	EGR Delta Pressure Sensor Circuit Failed High
81	412	—	3	EGR Temperature Circuit Failed High
81	412	—	9	EGR Temperature Network Sensor Not Responding
81		20	3	Timing Actuator Failed High
81		20	4	Timing Actuator Failed Low
81	--	129	3	Exhaust Port Temperature #1 Sensor Voltage High
81	--	130	3	Exhaust Port Temperature #2 Sensor Voltage High
81	--	131	3	Exhaust Port Temperature #3 Sensor Voltage High
81	--	132	3	Exhaust Port Temperature #4 Sensor Voltage High
81	--	133	3	Exhaust Port Temperature #5 Sensor Voltage High
81	--	134	3	Exhaust Port Temperature #6 Sensor Voltage High
81	--	135	3	Exhaust Port Temperature #7 Sensor Voltage High
81	--	136	3	Exhaust Port Temperature #8 Sensor Voltage High
81	--	137	3	Exhaust Port Temperature #9 Sensor Voltage High
81	--	138	3	Exhaust Port Temperature #10 Sensor Voltage High
81	--	139	3	Exhaust Port Temperature #11 Sensor Voltage High
81	--	140	3	Exhaust Port Temperature #12 Sensor Voltage High
81	--	141	3	Exhaust Port Temperature #13 Sensor Voltage High
81	--	142	3	Exhaust Port Temperature #14 Sensor Voltage High
81	--	143	3	Exhaust Port Temperature #15 Sensor Voltage High
81	--	144	3	Exhaust Port Temperature #16 Sensor Voltage High
81	—	277	9	EGR Rate Sensor not Responding
81	—	277	12	EGR Rate Sensor Failed
82	98	--	4	Oil Level Sensor Input Voltage Low
82	101	--	4	Crankcase Pressure Sensor Input Voltage Low
82	153	--	4	Extended Crankcase Pressure Input Voltage Low
82	164	--	4	Injection Control Pressure Sensor Input Voltage Low
82	173	--	4	Exhaust Temperature Sensor Input Voltage Low
82	411	—	4	EGR Delta Pressure Sensor Circuit Failed Low
82	412	—	4	EGR Temperature Circuit Failed Low
82	412	—	12	EGR Temperature Network Sensor Failed
82	--	129	4	Exhaust Port Temperature #1 Sensor Voltage Low
82	--	130	4	Exhaust Port Temperature #2 Sensor Voltage Low
82	--	131	4	Exhaust Port Temperature #3 Sensor Voltage Low
82	--	132	4	Exhaust Port Temperature #4 Sensor Voltage Low
82	--	133	4	Exhaust Port Temperature #5 Sensor Voltage Low

DDEC V Code	PID	SID	FMI	DESCRIPTION
82	--	134	4	Exhaust Port Temperature #6 Sensor Voltage Low
82	--	135	4	Exhaust Port Temperature #7 Sensor Voltage Low
82	--	136	4	Exhaust Port Temperature #8 Sensor Voltage Low
82	--	137	4	Exhaust Port Temperature #9 Sensor Voltage Low
82	--	138	4	Exhaust Port Temperature #10 Sensor Voltage Low
82	--	139	4	Exhaust Port Temperature #11 Sensor Voltage Low
82	--	140	4	Exhaust Port Temperature #12 Sensor Voltage Low
82	--	141	4	Exhaust Port Temperature #13 Sensor Voltage Low
82	--	142	4	Exhaust Port Temperature #14 Sensor Voltage Low
82	--	143	4	Exhaust Port Temperature #15 Sensor Voltage Low
82	--	144	4	Exhaust Port Temperature #16 Sensor Voltage Low
82	—	277	12	EGR Rate Sensor Failed
82	412	—	9	EGR Temperature Smart Sensor not Responding
82	412	—	12	EGR Temperature Smart Sensor failed
83	73	—	0	Pump Pressure High
83	98	--	0	Oil Level High
83	101	--	0	Crankcase Pressure High
83	153	--	0	Extended Crankcase Pressure High
83	173	--	0	Exhaust Temperature High
83	411	—	0	EGR Delta Pressure High
83	412	—	0	EGR Temperature High
83	--	129	0	Exhaust Port Temperature #1 High
83	--	130	0	Exhaust Port Temperature #2 High
83	--	131	0	Exhaust Port Temperature #3 High
83	--	132	0	Exhaust Port Temperature #4 High
83	--	133	0	Exhaust Port Temperature #5 High
83	--	134	0	Exhaust Port Temperature #6 High
83	--	135	0	Exhaust Port Temperature #7 High
83	--	136	0	Exhaust Port Temperature #8 High
83	--	137	0	Exhaust Port Temperature #9 High
83	--	138	0	Exhaust Port Temperature #10 High
83	--	139	0	Exhaust Port Temperature #11 High
83	--	140	0	Exhaust Port Temperature #12 High
83	--	141	0	Exhaust Port Temperature #13 High
83	--	142	0	Exhaust Port Temperature #14 High
83	--	143	0	Exhaust Port Temperature #15 High
83	--	144	0	Exhaust Port Temperature #16 High

DDEC V Code	PID	SID	FMI	DESCRIPTION
84	98	--	1	Oil Level Low
84	101	--	1	Crankcase Pressure Low
84	153	--	1	Extended Crankcase Pressure Low
85	190	--	0	Engine Overspeed
85	190	--	14	Engine Overspeed Signal
86	73	--	3	Pump Pressure Sensor Input Voltage High
86	108	--	3	Barometric Pressure Sensor Input Voltage High
87	73	--	4	Pump Pressure Sensor Input Voltage Low
87	108	--	4	Barometric Pressure Sensor Input Voltage Low
88	20	--	1	High Range Coolant Pressure Low
88	109	--	1	Coolant Pressure Low
89	95	--	0	Fuel Restriction High
89	111	--	12	Maintenance Alert Coolant Level Fault

Webasto Preheater Operational Failure Symptoms via Fault/Flash code

The following table lists the possible faults which can be read by flashing code off of an appropriate timer, the equipment-on indicator /operation indicator flashes.

Failure Symptom	Probable Cause	Check and Correct
1X Flash (F 01) No combustion after completion of start up sequence.	- Fuel system - Combustion air - Electronic ignition	- Fuel level - Type of fuel being used - Fuel filter - Fuel line connections (air bubbles in fuel lines) - Fuel nozzle plugged - Air intake or exhaust, restricted or plugged - Incorrect electrode gap
2X Flashes (F 02) Flame out during burner operation no restart possible	- Fuel supply (shortage of fuel)	- Restriction in the fuel system - Fuel filter - Fuel line connections (air bubbles in fuel lines) - Type of fuel being used
3X Flashes (F 03) Low voltage for more than 20 seconds	- Electrical system	- Load test batteries - Corrosion at connections - Loose connections
4X Flashes (F 04) Flame detector recognizes false flame signal during pre-start or shut-down cycle	- Defective flame detector	- Replace flame detector
5X Flashes (F 05) Flame detector	- Wiring - Defective flame detector	- Damaged wiring, open or short circuit - Replace flame detector
6X Flashes (F 06) Temperature sensor	- Wiring - Defective temperature sensor	- Damaged wiring, open or short circuit - Replace temperature sensor
7X Flashes (F 07) Fuel solenoid valve	- Wiring - Defective solenoid valve	- Damaged or corroded wiring, open or short circuit - Replace solenoid valve
8X Flashes (F 08) Combustion air fan motor	- Wiring - Wrong RPM - Defective combustion air fan motor	- Damaged wiring, open or short circuit - Replace combustion air fan - Replace combustion air fan
9X Flashes (F 09) Circulation pump motor	- Wiring - Defective circulation pump motor	- Damaged wiring, open or short circuit - Replace circulation pump motor
10X Flashes (F 10) Temperature limiter	- Overheat condition - Coolant flow - Wiring - Defective temperature limiter	- Reset temperature limiter - Coolant level or flow restriction - Air trapped in coolant circuit - Damaged or corroded wiring, open or short circuit - Replace temperature limiter
11X Flashes (F 11) Electronic ignition coil	- Wiring - Defective electronic ignition coil	- Damaged wiring, open or short circuit - Replace electronic ignition coil
12X Flashes (F 12) Heater lock out	- 3 repeated faults/flame-outs or 5 repeated start attempts	- Reinitialize control unit by switching heater on and disconnecting power.

ROADSIDE TROUBLESHOOTING GUIDE FOR MULTIPLEX VEHICLES

Problem/Symptom	Probable Causes	Actions
Vehicle does not Start	Rear Start selector switch is not at the NORMAL position Battery master switch in the battery compartment is at the OFF position (down)	1. Check that the rear start selector switch is flipped up to NORMAL start position and battery master switch is flipped up to ON and retry cranking 2. Flip the rear start selector switch to "Rear Start" and start the vehicle from the rear
	CAN network problem (Multiplex) Module A53 not powered or is defective Engine ECM does not receive the ignition signal Engine ECM is not powered	If the vehicle does not start from the rear: 1. Verify that module A53 is powered: a) Check the SYSTEM DIAGNOSTIC menu of the message center display (MCD). Select FAULT DIAGNOSTIC and ELECTRICAL SYSTEM. The message "No Response ModA53, Active" indicates a power problem on the module or a CAN network problem. b) Check / reset circuit breaker CB5 c) Check / replace fuse F65 d) Probe gray connector on module to see if it is powered. 2. Verify that the engine ECM is powered and get the ignition signal a) Check / reset circuit breaker CB8 Check / replace fuse F74 b) Check / reset circuit breaker CB2 Check / replace fuse F78
None of the Multiplexed functions are operating, including the basic limp-home functions (door opening, flashers, wipers in speed 1) Three dashes "---" appear in the telltale panel instead of the outside temperature *Note: The sunshades are still functioning since these are not multiplexed*	The program version in the CECM is different than the program in the I/O modules and the CECM is forcing all I/O modules to stay inactive	1. Engage the auto-programming of the I/O modules: Turn the ignition key to the OFF position, flip the battery master switch in the battery compartment to OFF and ON and then turn the ignition key ON. The letters CAN will appear in the telltale LCD panel for about 3 minutes Everything shall get back to normal once the letters CAN are replaced with outside temperature display 2. Try disconnecting the green connector on the CECM and reconnect 3. If step 1 and 2 are ineffective, try disconnecting the Master ID module completely and repeat step 1

Problem/Symptom	Probable Causes	Actions
		4. Try disconnecting the CECM completely, leave it disconnected and see if the limp-home functions (start of the vehicle from the engine compartment, wipers speed 1, flashers, etc) are functioning
Many secondary functions (not essential for driving) not functioning (interior lighting, driver's area lighting, wiper speed 2 and intermittent) Outside temperature display in the telltale LCD panel displays three dashes "---" Marker lights and clearance lights are turned ON when setting ignition to the ON position	The CECM module does not receive 24 V power The CAN network is not working. It could be caused by a short on the network, an open circuit, a problem with the CECM or the CECM being disconnected from the network	1. Check / reset circuit breaker CB6 (4th from the top on the right side column) Check / replace fuse F1 2. Operate in limp-home mode by starting the vehicle from the engine compartment (REAR START). All functions essential to drive are available To close and lock the door, pull the door manually up to its closed position and it will lock by itself. The door opening button is still functioning
No temperature control in the passenger area Passenger temperature display indicates two dashes "--"	Problem with the temperature sensor located in the evaporator compartment air intake or the sensor wiring	1. Instruct the driver to manually control the temperature by playing with the passenger set point. Set above 22°C (72°F) to heat and below 22° C (72°F) to cool
Entrance door does not open nor close using the control buttons Defroster fan not functioning Lower windshield wipers not functioning in speed 1 or intermittent	Module A47 is not powered or is faulty	1. Check the SYSTEM DIAGNOSTIC menu of the message center display (MCD). Select FAULT DIAGNOSTIC and ELECTRICAL SYSTEM. The message “No Response ModA47, Active” indicates a power problem on the module. (A CAN network problem would show the same message but doesn't produce these symptoms). 2. Check / reset circuit breaker CB6 3. Check / replace fuse F5 4. Probe gray connector on module to see if it is powered. 5. Use the air release valves near the entrance door and in the front service compartment to lock / unlock the door
Lower windshield wipers not functioning in speed 1 or intermittent	No power on R23	1. Check / replace fuse F82
HVAC condenser fans not functioning in speed 1	Circuit breaker CB12 was manually tripped and not reset	1. Check / reset circuit breaker CB12
HVAC condenser fans not functioning in speed 2	Circuit breaker CB7 was manually tripped and not	1. Check / reset circuit breaker CB7

Problem/Symptom	Probable Causes	Actions
	reset	
Lower and upper windshield washer not functioning Upper windshield wiper not functioning Defroster fan is functioning but no heat or cooling available in the driver area	Module A46 is not powered or is faulty	1. Check the SYSTEM DIAGNOSTIC menu of the message center display (MCD). Select FAULT DIAGNOSTIC and ELECTRICAL SYSTEM. The message “No Response ModA46, Active” indicates a power problem on the module. (A CAN network problem would show the same message but doesn't produce these symptoms). 2. Check / reset circuit breaker CB1 3. Check / replace fuse F12 4. Probe gray connector on module to see if it is powered.
Low beam headlights and front flasher on left side not functioning Electric horn not functioning	Module A45 is not powered or is faulty	1. Check the SYSTEM DIAGNOSTIC menu of the message center display (MCD). Select FAULT DIAGNOSTIC and ELECTRICAL SYSTEM. The message “No Response ModA45, Active” indicates a power problem on the module. (A CAN network problem would show the same message but doesn't produce these symptoms). 2. Check / reset circuit breaker CB2 3. Check / replace fuse F33 and F34 4. Probe gray connector on module to see if it is powered.
Low beam headlights and flasher on right side not functioning	Module A48 is not powered or is faulty	1. Check the SYSTEM DIAGNOSTIC menu of the message center display (MCD). Select FAULT DIAGNOSTIC and ELECTRICAL SYSTEM. The message “No Response ModA48, Active” indicates a power problem on the module. (A CAN network problem would show the same message but doesn't produce this symptom). 2. Check / reset circuit breaker CB2 3. Check / replace fuse F33 and F34 4. Probe gray connector on module to see if it is powered.
Rear flashers not functioning Stoplights and high-mounted stoplight not functioning	Module A51 is not powered or is faulty	1. Check the SYSTEM DIAGNOSTIC menu of the message center display (MCD). Select FAULT DIAGNOSTIC and ELECTRICAL SYSTEM. The message “No Response ModA51, Active” indicates a power problem on the module. (A CAN network problem would show the same message but

Problem/Symptom	Probable Causes	Actions
		doesn't produce this symptom). 2. Check / reset circuit breaker CB2 3. Check / replace fuse F80 4. Probe gray connector on module to see if it is powered.
Engine is overheating and radiator fan clutch does not engage The A/C compressor clutch does not engage	Module A52 is not powered or is faulty	1. Check the SYSTEM DIAGNOSTIC menu of the message center display (MCD). Select FAULT DIAGNOSTIC and ELECTRICAL SYSTEM. The message “No Response ModA52, Active” indicates a power problem on the module. (A CAN network problem would show the same message but doesn't produce this symptom). 2. Check / reset circuit breaker CB5 3. Check / replace fuse F65 4. Probe gray connector on module to see if it is powered.
Evaporator fan not functioning	Circuit breaker CB3 tripped Module A54 is not powered or is faulty	1. Check / reset circuit breaker CB3 2. Check the SYSTEM DIAGNOSTIC menu of the message center display (MCD). Select FAULT DIAGNOSTIC and ELECTRICAL SYSTEM. The message “No Response ModA54, Active” indicates a power problem on the module. (A CAN network problem would show the same message but doesn't produce this symptom). 3. Check / reset circuit breaker CB5 4. Check / replace fuse F67 , F68 5. Probe gray connector on module to see if it is powered.
HVAC condenser fans not functioning in speed 1	Module A54 is not powered or is faulty	1. Check the SYSTEM DIAGNOSTIC menu of the message center display (MCD). Select FAULT DIAGNOSTIC and ELECTRICAL SYSTEM. The message “No Response ModA54, Active” indicates a power problem on the module. (A CAN network problem would show the same message but doesn't produce this symptom). 2. Check / reset circuit breaker CB5 3. Check / replace fuse F67 , F68 4. Probe gray connector on module to see if it is powered.
Sound system not functioning	Circuit breaker CB4 or CB11 was manually tripped and not	1. Check / reset circuit breaker CB4 or CB11

Problem/Symptom	Probable Causes	Actions
	reset	
Fire alarm telltale light and audible alarm always ON and there is no fire or high temperature in the engine compartment	Short-circuited fire sensor or defective sensor	1. Prior to start the vehicle, cycle the ignition key to the ON position, OFF position and then ON position again and then start the vehicle. This will deactivate the fire alarm function. This has to be repeated each time the vehicle is re-started
The vehicle is parked and the electrical horn is activated to indicate a fire in the engine compartment but there is no fire	Short-circuited fire sensor or defective sensor	1. Cycle the ignition key between the ON and OFF position twice within 3 seconds. This will deactivate the fire alarm function. This has to be repeated each time the vehicle is parked
A single light, a group of LED lights or another function of the vehicle is not functioning	The multiplex outputs are protected in current by an internal “soft-fuse”. When an output is shorted, it turns OFF and stays OFF until the "soft-fuse" is reset	1. Turn the ignition key to the OFF position and turn to the ON position again. This resets all "soft –fuses"
No backlighting in the instrument cluster	Circuit breaker CB10 is tripped or fuse F20 blown	Check / reset circuit breaker CB10 Check / replace fuse F20
The radiator fan clutch does not function and the engine is overheating		1. Set the ignition key to the ON position. 2. Activate the dashboard Telltale Light Test switch 3 times within 4 seconds. 3. In the engine compartment, set the starter selector switch to REAR START and then start the engine from the rear. While in this mode, the rear start push-button can be used to manually engage the fan clutch. The Multiplex system knows when the engine is already running, and it will not activate the starter. 4. Press the push-button one time to engage the clutch to 1st speed, press a second time to engage to 2nd speed, press a third time to stop the fan, press once again to return to 1st speed. If the fan clutch does not engage using this procedure then the clutch is faulty or the wiring between the multiplex module and the clutch is faulty. Mechanically lock the fan clutch as described in section 05: COOLING SYSTEM of the maintenance manual.