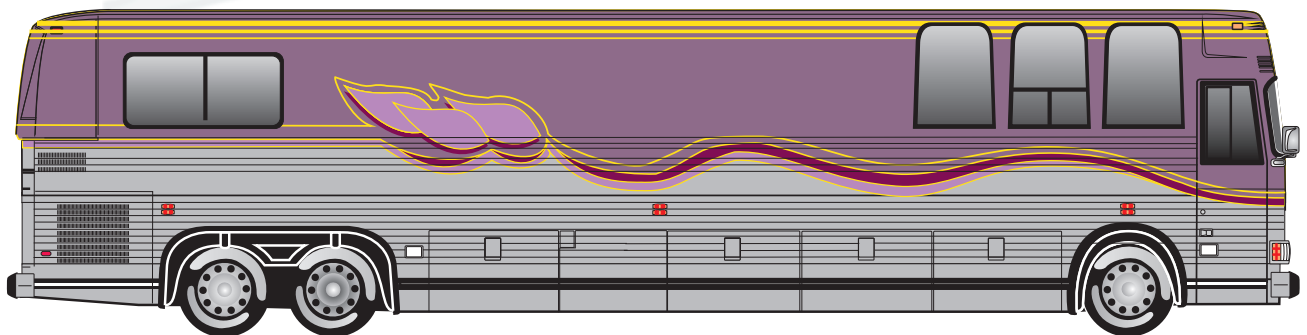


**PREVOST**  
PREVOST CAR INC.

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# Le Mirage XL

FACTORY-PREPARED  
CONVERSION-READY  
LUXURY MOTORCOACH



## OWNER'S MANUAL



# ***A Word From the President***

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## ***Thank You for Making the "Ultimate" Decision in Luxury Motorcoaching***

*We are proud to have you join the growing PRÉVOST family. The world's most discriminating motorcoach enthusiasts choose the PRÉVOST Le Mirage XL time and again because of the confidence they have in our commitment to building the ultimate in factory-prepared, conversion-ready luxury motorcoaches.*

*This PRÉVOST commitment to excellence goes back more than 70 years and is matched by a proven performance record that is literally hundreds of millions of miles long. On every road and in every climate imaginable, from frozen arctic through torrential rains and blazing hot desert sands, PRÉVOST coaches have been there and back in peak condition to tell the tale.*

*Your Owner's Manual will provide a road map to years and years of carefree motorcoaching enjoyment. Across North America you can depend on our factory owned Service and Parts Centers plus many qualified service locations. They are staffed by professionals dedicated to seeing that all your needs are met with the utmost in efficiency and courtesy.*

*Though we are proud of our past, we are not about to forget where the emphasis must lie... it must lie in the future. The PRÉVOST R&D department is the largest and most innovative of it's kind in North America.*

*All the employees join me in appreciation of the trust you have placed in us. We will make sure that you are totally satisfied with your coach.*

*Bon voyage and happy motorcoaching!*

*Georges Bourelle  
President & CEO*

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# Foreword

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

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

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

This manual encompasses all three (3) XL SHELL models, including: XL-40, XL-45 & XL-45E; Therefore, variations between them are identified as such.

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

The following words are used to emphasize particularly important information:

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

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

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

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

## Caution

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

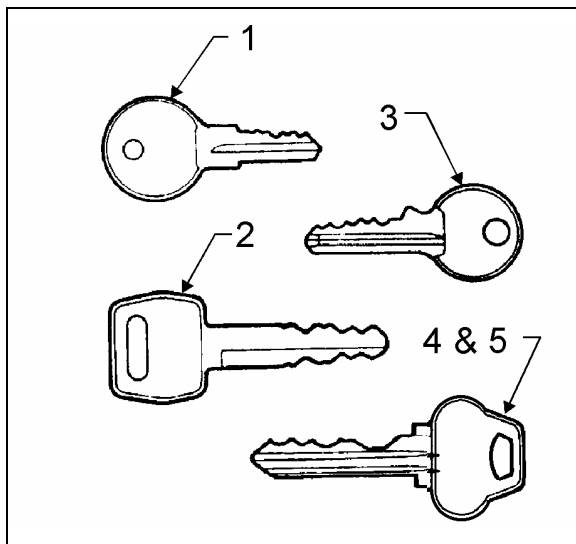
*Prior to welding or soldering procedures on the vehicle, disconnect all electronic modules. If these modules (ECM, ECU, ABS) are not disconnected, electronic components (EPROM, CHIPS) could be permanently damaged.*

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

# Controls/Instruments

## Keys

Depending on optional equipment, up to five (5) different key models may have been provided with the vehicle. They are used as described below;



23005

1. Ignition switch.
2. Baggage compartment door locks.  
Front electric compartment door lock.  
Steering compartment door lock.  
Side rear service compartment door lock (XL-45 only)
3. Engine compartment door lock.  
Engine R.H. side access door lock.  
Engine L.H. side access door lock.  
Engine oil reserve tank access door lock.  
Coolant surge tank access door lock.  
Fuel tank filling access door lock.
4. Front entrance door lock.
5. Central entrance door lock.

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

a) Record the key numbers and keep this information in a safe place. Do not keep these records inside vehicle.

b) 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.

## Main Battery Disconnect Switches

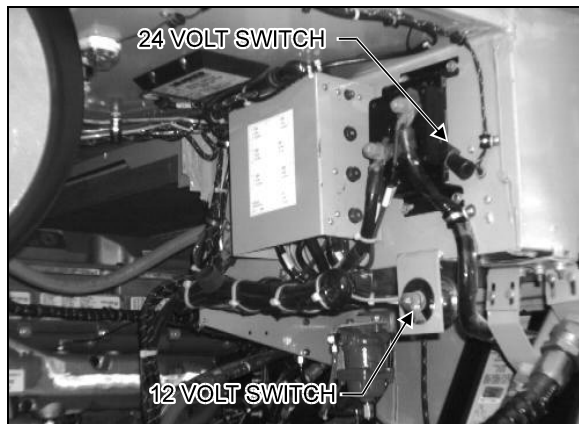
**Caution:** When vehicle is parked overnight or for an extended period of time, **both** battery main disconnect switches (24 V & 12 V) should be set to the "OFF" position in order to avoid battery voltage imbalance.

**Note:** When both main battery disconnect switches are set to the "OFF" position, the electrical supply from the batteries is cut off, with the exception of the Fire Detection System, the Engine & Transmission Electronic Controls, the Auxiliary Heating System and the Battery Equalizer(s).

### XL-40 & XL-45E

The 24 volt main battery disconnect switch is located above batteries and is accessible by the engine R.H. side access door.

The 12 volt main battery disconnect switch is located directly below the 24 volt disconnect switch.

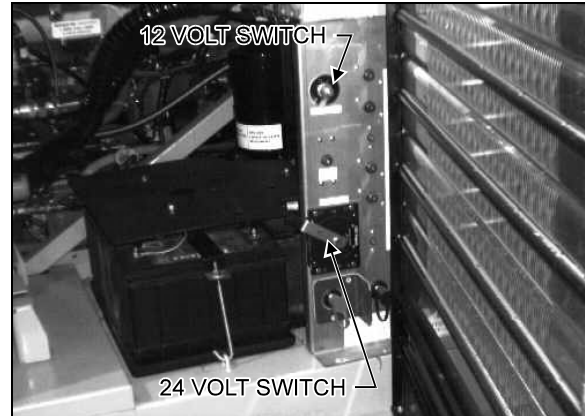


06032

### XL-45

The 24 volt main battery disconnect switch is located on R.H. side of batteries and is accessible by the engine R.H. side access door.

The 12 volt main battery disconnect switch is located directly above the 24 volt disconnect switch.



06033

## Fuel Tank Filling

On **XL-40 & 45E** vehicles, fuel filler neck is accessible by opening a small door located amidships, on R.H. side of vehicle. On **XL-45** vehicles, fuel filler necks are accessible by opening a small door located amidships, on either R.H. or L.H. side of vehicle.



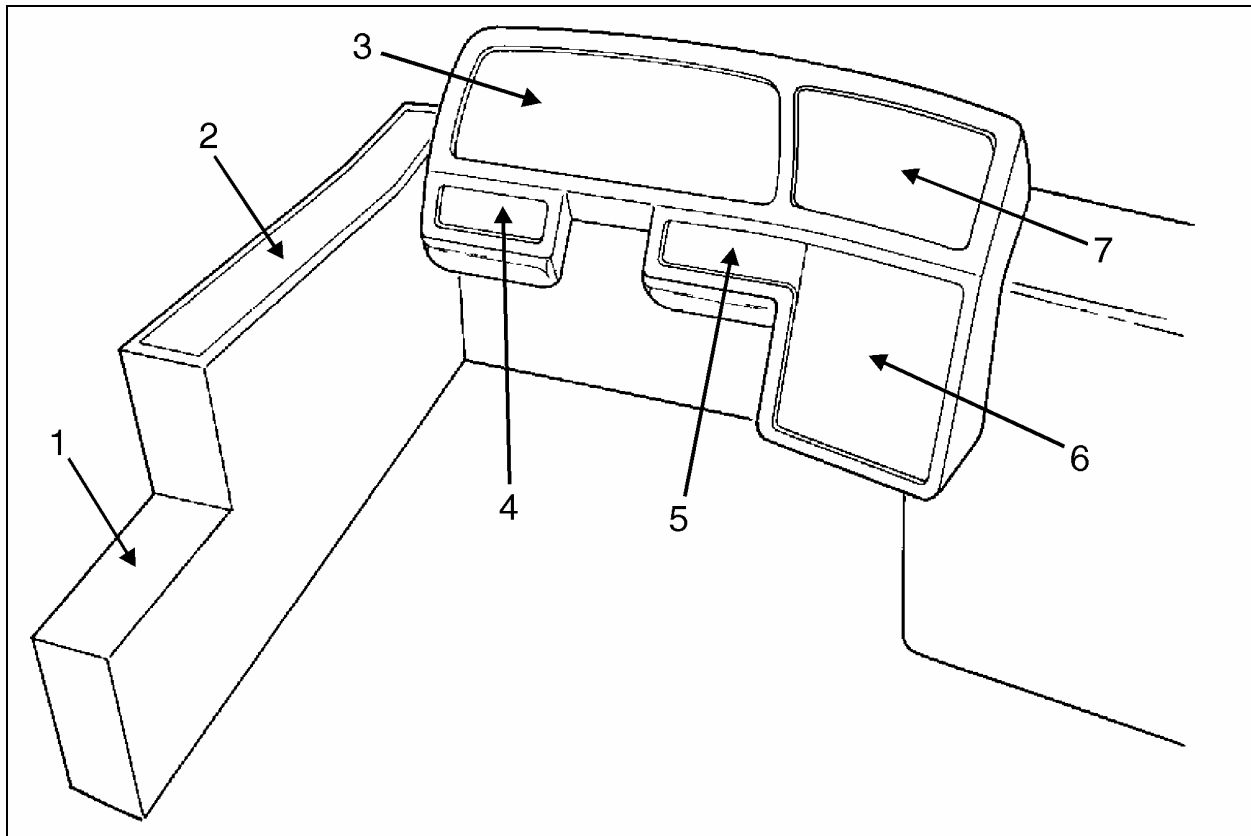
18013

**Note:** Provided vehicle is parked level, an automatic nozzle will shut off when tank is filled to approximately 95% capacity.

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



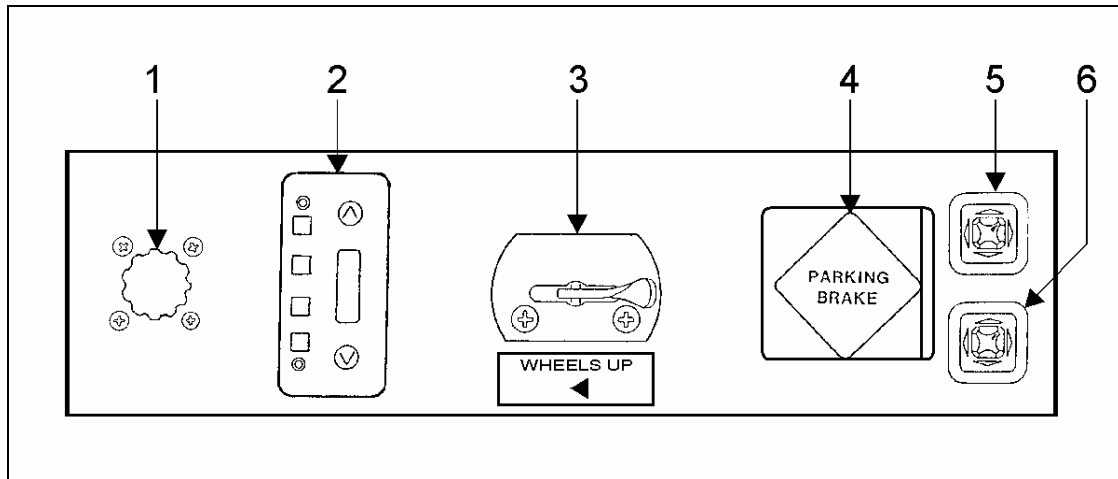
## Control and Instrument Panels



18010

| No. | Panel                   | Pg.  | No. | Panel                   | Pg.  |
|-----|-------------------------|------|-----|-------------------------|------|
| 1   | L.H. Lateral Console    | 2-4  | 4   | L.H. Lower Switch Panel | 2-13 |
| 2   | L.H. Side Control Panel | 2-5  | 5   | R.H. Lower Switch Panel | 2-14 |
| 3   | Dashboard               | 2-10 | 6   | R.H. Console            | 2-15 |
|     |                         |      | 7   | R.H. Upper Panel        | 2-16 |

## L.H. Lateral Console



18014

### 1. Diagnostic data reader connector

Datalink for DDEC 3, WT World Transmission and ABS Brakes.

### 2. Auxiliary preheating system timer (optional) (Webasto shown, or Espar)

See pages 2-35 & 36 for description of both heaters.

### 3. Tag axle valve

The tag axle is located directly behind the drive axle. Operation of the axle is controlled by a valve located on L.H. lateral console alongside parking brake control knob. The valve can be flipped to either one of the two positions, "wheels up" or "wheels down".

Axle will automatically be raised or lowered by air pressure according to valve position. Tag axle service brakes operate only when axle is in the "wheels down" position.

**Caution:** Tag axle should never be raised or lowered while vehicle is in motion, and should always remain in the "wheels down" position during normal operation.

When tag axle is raised, the corresponding indicator light will illuminate, and a beep will sound to remind you that axle is up.

There are two cases where it may be convenient to raise the tag axle; First, on slippery surfaces such as snow, where raising the tag axle will transfer extra weight and additional traction to

the drive wheels, and second, when maneuvering vehicle in tight areas such as a parking lot, where raising the tag axle shortens the wheel-base and allows tighter turning.

**Caution:** Do not raise tag axle on soft surfaces such as mud, since the drive axle will tend to sink deeper.

After either of the above uses, vehicle must be stopped, then tag axle must be lowered before resuming normal driving.

### 4. Parking brake control

See "Combination emergency and parking brakes" on page 2-19.

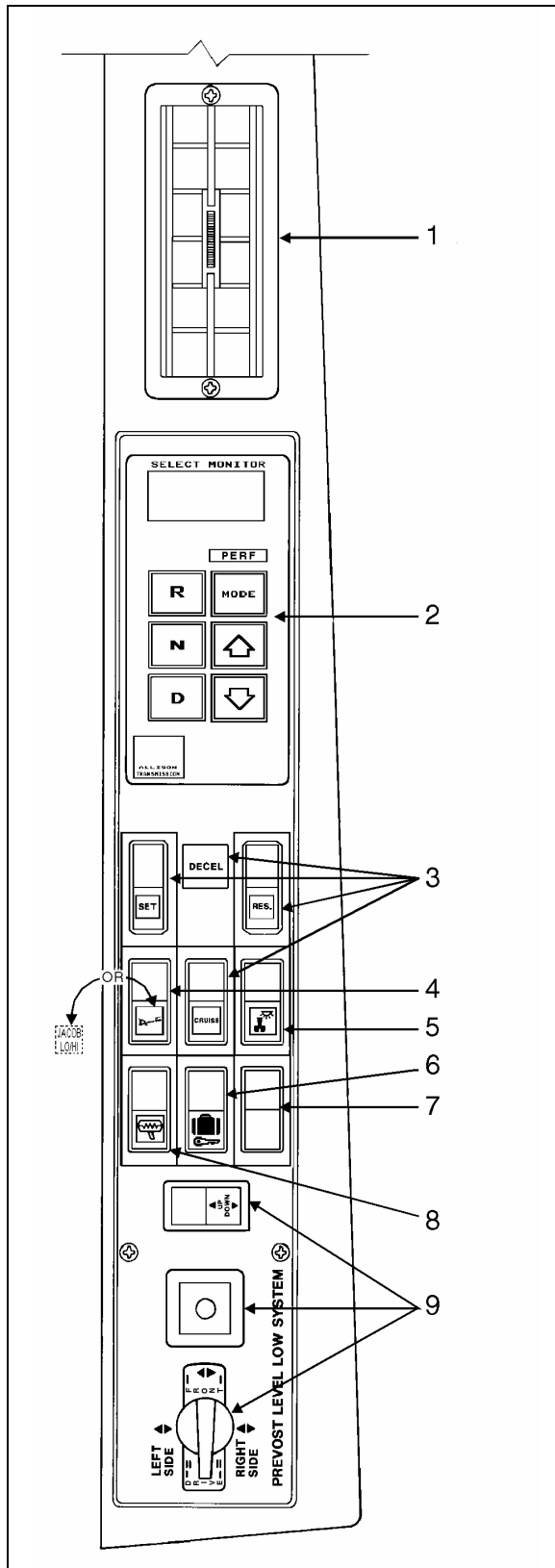
### 5. L.H. outside elect. mirror control (optional)

Turn pointer knob to the left for mirror head adjustments and to the right for convex mirror adjustments, then push down on either of the button's four (4) sides to adjust the selected mirror's viewing angle.

### 6. R.H. outside elect. mirror control (optional)

Turn pointer knob to the left for flat mirror head adjustments and to the right for convex mirror adjustments, then push down on either of the button's four (4) sides to adjust the selected mirror's viewing angle.

## L.H. Side Control Panel



18011

### 1. Adjustable louver

The louver is manually adjustable, so the heated or cooled air flow can be directed towards driver or side window.

### 2. Transmission push-button shifter

To select forward, neutral or reverse gears of transmission. For system operations see "AUTOMATIC TRANSMISSION" page 2-6).

### 3. Cruise control switches (see page 2-8)

### 4. Transmission retarder (optional) or Engine brake (optional) or Blank

**Transmission retarder:** Push down rocker switch to actuate transmission retarder. For system description, see page 4-5).

**Engine brake "Jacob's":** Push down rocker switch to the first position to actuate system to half engine brake and press to the second position for a full application of the engine brake. For system description, see page 4-3).

### 5. Driver's light switch (overhead lights)

Driver's light electric circuit is connected to 2 three-way switches; thus, it can be actuated with this switch or by means of the toggle switch located at extreme right of dashboard. Push rocker down or up depending on toggle switch position.

### 6. Baggage door lock (optional)

Push up rocker switch to unlock the baggage doors and push down to lock. For additional information see page 2-29 under heading "Baggage compartment".

### 7. Blank; for additional switch.

### 8. Exterior mirror defrost switch (optional)

Push down rocker switch to defrost both exterior mirrors.

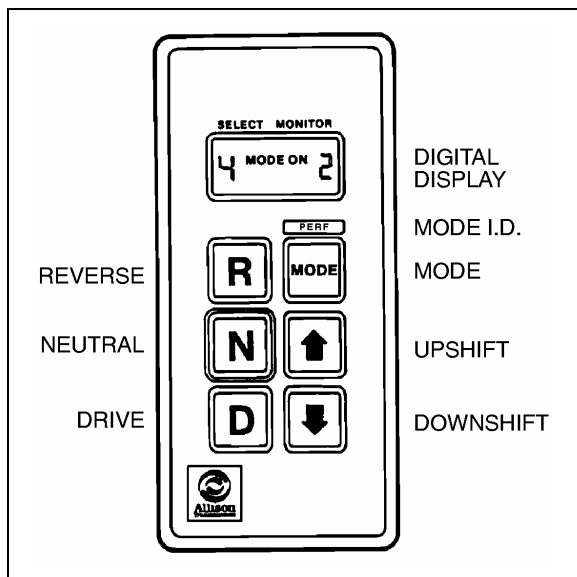
### 9. Level low system controls (see page 2-9)

## Automatic Transmission

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

### Range Selection - Push-button Shifter

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



PUSH-BUTTON SHIFTER

18015

The digital display indicates the readout of two (2) digits:

- Select** - Range of gears selected by the operator.
- Monitor** - Current gear of transmission operation.

Each time a button is pressed on the shifter a short "beep" will be heard to identify that the ECU has received instructions to change operation. The function of each button is as follows:

Select **Reverse** gear by pressing "R".

Select **Neutral** by pressing "N". Note the raised edge around the "N" button so the driver can orient his hand to the push-buttons by touch, without looking at the display. It is not necessary to press this button prior to starting the vehicle.

Select **Drive** range by pressing "D". The highest forward gear will appear on the *Select* display and the transmission will shift to the starting gear as indicated on the *Monitor* display.

The *Upshift* and *Downshift* (arrow) buttons are used to shift to a higher (if not in "D") or lower (if not in "1") range selected. One press changes the range selected by one range. If the button is pressed continuously, the range selected continues to change up or down until the button is released or until the highest or lowest possible range of gears is selected.

### Function of the Mode Button

This button is used to invoke a special function that has been programmed into the ECU. This button will shift between Primary (*Mode Off*) and Secondary (*Mode On*) shift schedule. The primary shift schedule is used each time the vehicle is started. To select the secondary shift schedule, depress mode button, the mode status will be indicated on the digital display by lighting *Mode On* when the function has been selected.

### Shift Schedule

**PRIMARY (Economy)** - Used each time the vehicle is started, this shift schedule is typically used for normal vehicle operation. This schedule allows for more efficient operation of the transmission and thereby helps contribute to improved fuel economy.

**SECONDARY (Performance)** -This shift schedule can be selected via the *MODE* button. This schedule allows for quicker response to transmission demands, shifts at higher ratios and in short uses the maximum engine power possible.

**HOLD UPSHIFT** - This shift schedule is automatically activated to prevent engine overspeed by upshifting the transmission into the next higher range.

In most cases the control system logic protects the transmission from abuse. Such actions as full throttle neutral-to-range shifts and high speed direction changes are inhibited.

## Operation

When a push-button pad is depressed, a beep sounds and the pad lights up indicating the transmission is ready to operate in the selected range. When the electronic control system detects a serious problem in the transmission, a buzzing tone sounds for 5 seconds, and the "DO NOT SHIFT" light on the dashboard (item #28 on page 2-12) illuminates to warn the driver that the transmission is held-in-gear. If another pad is depressed, the buzzing sound will continue until the original range is selected.

**Note:** As a light bulb and systems check, the "DO NOT SHIFT" light will illuminate when the ignition switch is turned "ON". After about two seconds the light will turn off. If the "DO NOT SHIFT" 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.

### A) Reverse (R)

Use this position to back up vehicle. Stop completely before shifting from forward to reverse or from reverse to forward. Touch the reverse (R) pad, the pad will light up and the reverse warning signal will be activated, provided the "back up alarm cancel" switch is "ON" (see item #5 on page 2-14).

### B) 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.

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

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

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

### C) 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 automati-

cally upshift to a higher range as output speed increases. As the vehicle slows down, output speed decreases, and the transmission automatically downshifts to the correct range. If a locked brake or a slick surface condition should occur, the ECU (Electronic Control Unit) will command converter operation (disconnect lockup) and inhibit downshifts for a period of time or until normal wheel speed has been restored.

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

### D) Fourth (4) and third (3) ranges

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

### E) Second (2) range

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

### F) First (1) range

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

**Caution:** Service brakes (foot pedal) 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(\*)). When descending in lower ranges, care must be taken that engine speed does not exceed 2450 rpm. This procedure keeps service brakes cool and ready for emergency stopping.

- (\*) -Refers to "JACOB'S engine brake" and "Transmission output retarder" options.

See pages 4-3 & 4-5 for details regarding both systems.

## Cruise Control Switches

### Introduction

The cruise control is an automatic speed control system that allows you to maintain a constant cruising speed above 20 m.p.h. (32 km/h) without depressing the accelerator pedal. The four (4) control switches are located on the L.H. side control panel (see page 2-5, item #3).

**Warning:** Do not use the cruise control system when driving conditions do not permit maintaining a constant speed, such as in heavy traffic or on roads that are winding, icy, snow covered, slippery, or with a loose driving surface.

### Setting Vehicle Speed

To turn on the system, push down "CRUISE" rocker switch, set the vehicle speed by accelerating to the desired speed, momentarily press and release the "SET" switch, and then remove your foot from accelerator pedal. This sets the cruising speed and stores it in memory, thus maintaining speed automatically.

**Note:** Cruise control system will not accept speed settings, nor will the "RESUME" switch operate, below approximately 20 m.p.h. (32 km/h).

### Increasing Set Speed

Vehicle speed setting may be increased by one of the following methods:

1. Press and hold the "RESUME" switch until the desired speed is obtained. Releasing the "RESUME" switch will set the new higher speed.
2. Depress accelerator pedal until the desired speed is obtained, then press and release the "SET" switch.

**Note:** When driving with cruise control in use, the speed may be increased for passing, etc., by depressing the accelerator in the usual manner. Once the foot is removed from the accelerator pedal, the cruise control will return to the set speed.

### Decreasing Set Speed

Vehicle speed setting may be decreased by one of the following methods:

1. Press and hold the "SET" switch until the desired lower speed is obtained. Releasing the "SET" switch will set the new speed.
2. The cruise control can be disengaged without losing the speed memory by either of two methods:
  - a) By lightly applying the brakes, or
  - b) By momentarily depressing the "DECEL" switch button.

After either of these disengagements, you may return to the previously set speed by pressing and releasing the "RESUME" switch, provided the speed is higher than 20 m.p.h. (32 km/h).

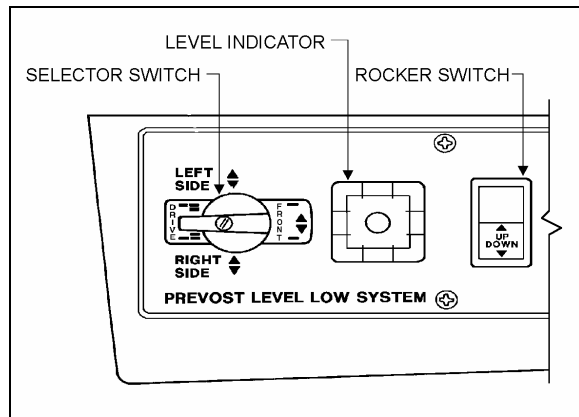
The cruise control is completely shut off and the speed memory is lost when turning off the "CRUISE" rocker switch.

**Note:** Cruise control is inoperative when speed drops below 20 m.p.h. (32 km/h), therefore the setting instructions must be repeated if vehicle speed drops below this mark.

When the cruise control system is canceled, objectionable vehicle motions are minimized by lightly depressing accelerator, before disengaging cruise control.

**Warning:** It is important to know that toggling the "SET" or the "RESUME" switch will result in a decrease or increase in speed (respectively) of 0.6 m.p.h. (1,0 km/h) for every touch.

## Level Low System Controls (optional)



18012

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

The three (3) leveling valves are located as follows: one at the front which controls the amount of air in both front air springs, one at the left rear which controls the left rear corner of the vehicle and one at the right rear which controls the right rear corner of the vehicle. During normal driving, these valves work automatically to maintain the chassis at the proper level above the axles, indifferent of road conditions or vehicle weight.

When parked, and **ONLY** when parked, the level of the vehicle can be manually adjusted within the range of travel of the air springs. Thus, if the vehicle is parked on uneven ground, the manual override leveling system can be used to level the chassis of the vehicle. With the ignition "ON" (engine running or not), turn the selector switch (located on L.H. side control panel, page 2-5) to the area of the vehicle requiring leveling, then press the rocker switch accordingly (up or down) to inflate or deflate the selected set of air springs. The front position raises or lowers the front only and does not tilt the vehicle to its sides. Each rear position raises or lowers its respective side, therefore, the rear positions can

be used to tilt the vehicle to one side or the other, or they can be used to raise or lower the rear of the vehicle. When leveling vehicle, it is often necessary to run the engine in order to get an adequate air supply.

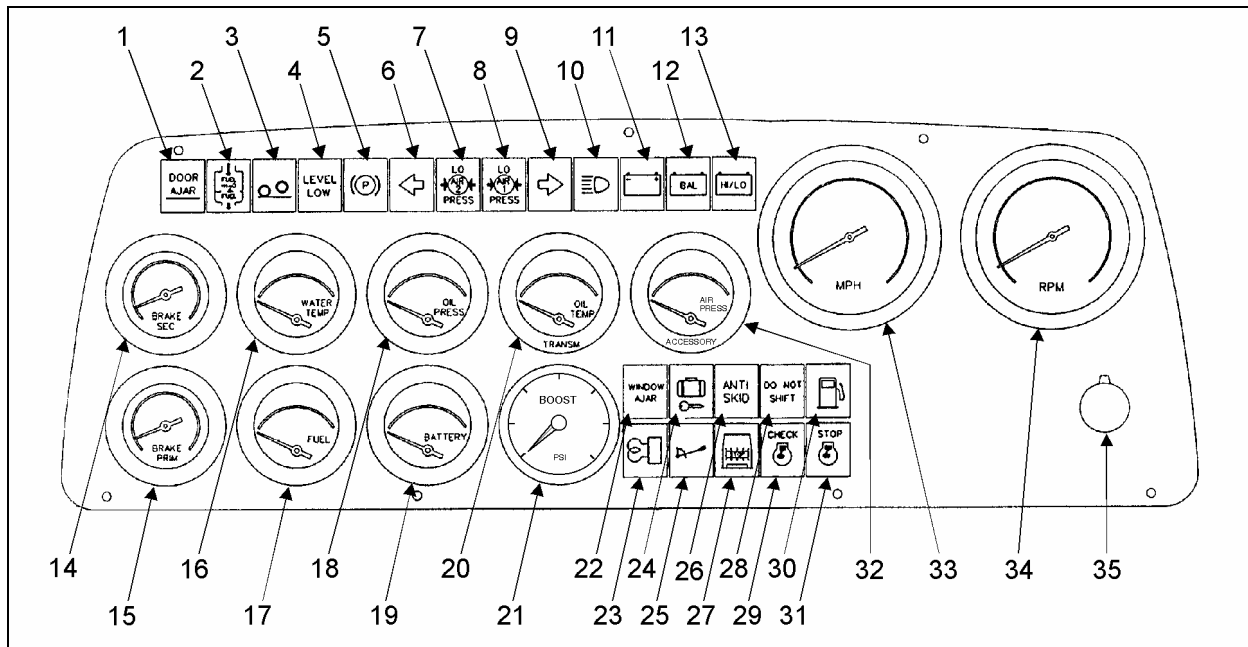
**Note:** It's always better to first, level the rear of the vehicle (right to left) before raising or lowering the front. After adjusting the rear, watch the level as you adjust the front. If the level shows that the vehicle is starting to tilt to either side, then stop adjusting the front as one of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

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

**Warning:** Do not drive the vehicle with the level low selector switch in any position other than "DRIVE", as this may render the vehicle unsafe and uncontrollable. If this is the case, the "LEVEL LOW" warning light in dashboard (item #4, page 2-11) will flash, reminding you that the selector is not in the "DRIVE" position.

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

## Dashboard



18019

- |          |                                                         |          |                                                        |
|----------|---------------------------------------------------------|----------|--------------------------------------------------------|
| 01 ..... | Door ajar (Optional), or Blank                          | 21 ..... | Turbo boost pressure gauge (Optional), or Blank        |
| 02 ..... | Water separator (Optional), or Blank                    | 22 ..... | Window ajar (Optional), or Blank                       |
| 03 ..... | Tag axle                                                | 23 ..... | Preheating system (Optional), or Blank                 |
| 04 ..... | Level low (Optional), or Blank                          | 24 ..... | Baggage compartment door lock (Optional), or Blank     |
| 05 ..... | Parking brake                                           | 25 ..... | Output retarder (Optional), or Blank                   |
| 06 ..... | L.H. turn signal - Hazard                               | 26 ..... | Antilock braking system (Optional), or Blank           |
| 07 ..... | Low secondary air pressure                              | 27 ..... | Brake light                                            |
| 08 ..... | Low primary air pressure                                | 28 ..... | Transmission "DO NOT SHIFT" light                      |
| 09 ..... | R.H. turn signal - Hazard                               | 29 ..... | Check engine                                           |
| 10 ..... | High beams                                              | 30 ..... | Low fuel level (Optional), or Blank                    |
| 11 ..... | Battery                                                 | 31 ..... | Stop engine                                            |
| 12 ..... | Battery balance                                         | 32 ..... | Accessory air tank pressure gauge (Optional), or Blank |
| 13 ..... | High or low battery voltage                             | 33 ..... | Speedometer-Odometer                                   |
| 14 ..... | Secondary air pressure gauge                            | 34 ..... | Tachometer                                             |
| 15 ..... | Primary air pressure gauge                              | 35 ..... | Instrument and switch brightness control               |
| 16 ..... | Engine coolant temperature gauge                        |          |                                                        |
| 17 ..... | Fuel gauge                                              |          |                                                        |
| 18 ..... | Oil pressure gauge                                      |          |                                                        |
| 19 ..... | Voltmeter                                               |          |                                                        |
| 20 ..... | Transmission oil temperature gauge (Optional), or Blank |          |                                                        |



## Dashboard Indicator/Warning Lights and Instruments

### 1. Door ajar (optional)

This indicator is provided on vehicles equipped with a central door, and will light only when this door is ajar.

### 2. Water separator (optional)

Lights when the accumulated water in the diesel fuel filter/water separator should be drained (see page 6-5).

### 3. Tag axle

Lights when tag axle wheels are raised. Furthermore, a beep will sound to advise the driver that the wheels are raised.

### 4. Level low (optional)

Flashes when vehicle manual leveling system is operating (see page 2-9).

### 5. Parking brake

Lights when parking brake is applied (see page 2-19).

### 6. L.H. turn signal - Hazard

Flashes when L.H. turn signal is selected with multifunction lever or when hazard switch is turned on. (When hazard switch is turned on both L.H. and R.H. turn signals will flash.)

### 7. Low secondary air pressure

Lights when air pressure in secondary system is too low. For System information, see "BRAKES" on page 3-1.

### 8. Low primary air pressure

Lights when air pressure in primary system is too low. For System information, see "BRAKES" on page 3-1.

### 9. R.H. turn signal - Hazard

Flashes when R.H. turn signal is selected with multifunction lever or when hazard switch is turned on. (When hazard switch is turned on both L.H. and R.H. turn signals will flash.)

### 10. High beams

Lights when headlight high beams are selected (see page 2-18).

### 11. Battery

Lights when alternator is not functioning properly.

### 12. Battery balance

Lights when batteries are out of balance.

**Note:** Before seeking assistance, check that the 12 volt main battery disconnect switch is set to the "ON" position, that the demand for the 12 volt power is not exceeding rated amperage output of battery equalizer(s) and finally, check circuit breaker on battery equalizer(s) (for location, refer to page 2-28). Allow at least 15 minutes to balance batteries after corrective measures have been taken.

### 13. High or low battery voltage

Lights when battery voltage exceeds 30.3 volts or drops below 23.7 volts.

### 14. Secondary air pressure gauge (Brakes)

Indicates air pressure in the secondary system. Normal reading varies from 95 to 125 psi (655 to 860 kPa).

### 15. Primary air pressure gauge (Brakes)

Indicates air pressure in the primary system. Normal reading varies from 95 to 125 psi (655 to 860 kPa).

### 16. Engine coolant temperature gauge

Indicates engine coolant temperature. Normal reading should vary from 190 to 215°F (88 to 102° C).

In extremely hot weather and high altitude, the coolant temperature can reach 215°F (102°C) and more when climbing a long grade at full throttle. If this situation occurs, the "check engine" light will come on (at 217°F - 103°C) and the engine overtemperature protection system (EOP) will be activated. If the cooling system is properly maintained, the temperature should stabilize below the shut back temperature of 222°F (106°C) so the vehicle can operate normally. See also item # 29 on page 2-12.

**Note:** Engine is not considered "overheating" when below 215°F (102°C).

### 17. Fuel gauge

Indicates the amount of fuel remaining in the fuel tank. If your vehicle has an optional auxiliary tank, the gauge will show the total fuel level, as the tanks are interconnected.

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

### 18. Oil pressure gauge

Indicates engine oil pressure. Normal reading at operating temperature should vary from 50 to 70 psi (345 to 483 kPa) at cruising speed.

### 19. Voltmeter

Indicates electrical system voltage. With engine operating, normal reading should be 27.5 volts.

### 20. Transmission oil temperature gauge (optional)

Indicates transmission oil temperature. Normal reading can vary from 160 to 250°F (70 to 120°C).

**Note:** For vehicles equipped with a transmission retarder, when retarder is operated for extended periods, it is possible and still acceptable that transmission oil temperature rises above 250°F (120°C) but must not exceed 330°F (165°C).

### 21. Turbo boost pressure gauge (optional)

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

### 22. Window ajar (optional)

Will light when any one or several of the vehicle's windows are opened.

### 23. Preheating system (optional)

Lights when preheating system is turned on. For systems description, see pages 2-35 & 2-36.

### 24. Baggage compartment door lock indicator (optional)

Will light if any one or several of the baggage compartment doors are unlocked.

### 25. Output retarder (optional)

Lights when transmission's output retarder is activated. For system description, see page 4-5.

### 26. Antilock braking system (optional)

Lights until vehicle speed reaches 4 mph (7 km/h), and when the antilock braking system is malfunctioning.

### 27. Brake light

Lights when brakes are activated.

### 28. Transmission "DO NOT SHIFT" light

See page 4-6 for description.

### 29. Check engine

Will light if a minor engine malfunction is detected by the DDEC (Detroit Diesel Electronic Control) system. This includes any situation where the engine coolant reaches 217°F (103°C) because of cooling system problems or because of situations described on page 2-11 (item # 16). This light will remain illuminated until malfunction is corrected. Furthermore, this indicator flashes to indicate engine malfunction codes when the required procedure outlined on page 5-7 has been performed.

**Note:** As a light bulb and systems check, this indicator will illuminate when the ignition switch is turned "ON". After about five seconds the light will turn off.

### 30. Low fuel level (optional)

Lights when approximately 12 U.S. gallons (45 liters) of fuel remains in the tank(\*). It is recommended that you do not exceed a distance of 75 miles (120 km) after light has turned on. Light will illuminate "ON" & "OFF" just before running out of fuel. Fill tank as soon as possible.

(\*)-Applies to 160 U.S. gallon tank. For other optional tank volumes and distances see below:

- 250 U.S. gallons (160 + 90) = 15 U.S. gallons (57 liters), 90 miles (150 km).
- 208 U.S. gallons = 17 U.S. gallons (64 liters), 100 miles (165 km).
- 298 U.S. gallons (208 + 90) = 21 U.S. gallons (80 liters), 126 miles (210 km).

### 31. Stop engine

Will light when major engine problems occur. The engine power will automatically begin to decrease gradually and will be followed by an automatic shutdown after 30 seconds. This 30 second delay period may be repeated using the "Stop Engine Override Switch" outlined further on page 2-13 (item #5).

**Note:** Once engine is stopped, it cannot be restarted until malfunction is corrected.

As a light bulb and systems check, this indicator will illuminate when the ignition switch is turned "ON". After about five seconds the light will turn off.

### 32. Accessory air tank pressure gauge (optional)

Indicates air pressure in the Accessory air tank. Normal reading varies from 95 to 125 psi (655 to 860 kPa).

### 33. Speedometer-Odometer

The speedometer indicates the vehicle speed. The odometer indicates the distance driven;

U.S. vehicles: Miles/Kilometers  
(Miles predominant)

Canadian vehicles: Kilometers/Miles (Kilometers predominant)

### 34. Tachometer

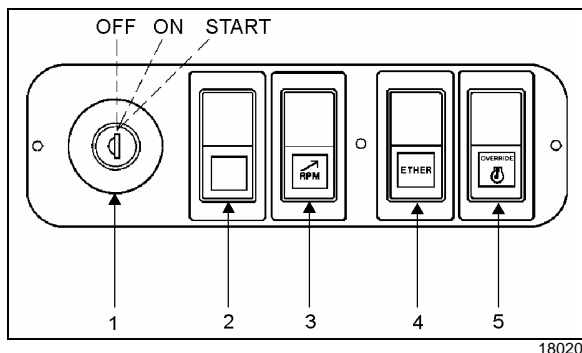
Indicates engine speed in hundreds of revolutions per minute (rpm) and serves as a guide for proper gear shifting. It also helps the driver in preventing excessive engine speeds when going down steep grades, with engine serving as a brake. Maximum allowable engine rpm is 2450.

### 35. Instrument & switch brightness control

Adjust as required. Brightness is progressively dimmed as control knob is rotated clockwise.

**Note:** Dashboard panel gauges show approximate readings and should not be relied upon for mechanical adjustments.

## L.H. Lower Switch Panel



## Switches

### 1. Ignition

Ignition switch has three positions:

"OFF": Ignition is "OFF" and key can be removed.

"ON": Ignition is "ON" and key cannot be removed.

"START": Starting position; spring-loaded ignition switch returns to "ON" position after starting. Ignition key must be returned to "OFF" position before trying to restart.

**Caution:** Do not engage starter for more than 15 seconds. Allow starter time to cool before engaging again. This will prevent starter from overheating and will allow the time delay relay to cool.

### 2. Blank; for additional switch.

### 3. Fast idle

Push down rocker switch to engage fast idle, thus increasing engine speed to approximately 1100 rpm. Use this switch for extended stops.

**Note:** If parking brake is released and/or transmission is shifted with the engine running at fast idle, engine will reduce its speed to idle and maintain this rpm as long as parking brake is not applied and/or transmission is in the neutral position. If engine is stopped with the fast idle switch in the "ON" position, this control will automatically be canceled when restarting the engine; the driver must then shut off, and reset rocker switch to reactuate fast idle. Generally, fast idle should be reduced to low idle before shutting off engine.

### 4. Ether cold starting aid (optional) or Blank

Activates ether cold starting device in engine compartment (see "Cold weather starting" page 4-7).

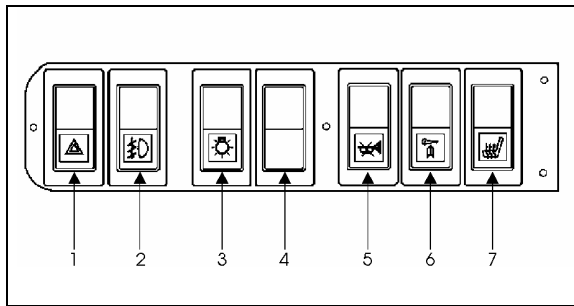
### 5. "Stop Engine" override

Push down rocker switch to reset the 30 second delay period and the shutdown procedure. This switch can be repeatedly depressed, **i.e. one (1) pulse is sufficient for each 30 second period**, for engine power in an emergency situation.

**Note:** The stop engine override switch will be operative only if it has been depressed before the end of the 30 second delay period.

**Caution:** The "Stop Engine" override must be used only in emergency situations to bring vehicle to a safe stop. Excessive use of this switch could cause serious damage to the engine.

## R.H. Lower Switch Panel



18021

### Switches

#### 1. Hazard flashers

Push down rocker switch and all turn signal lights will flash simultaneously. Turn signal indicator lights in dashboard will also flash.

#### 2. Fog lights (optional) or Blank

Push down rocker switch to activate fog lights as well as clearance, tail and marker lights. Before using fog lights, remove protective covers by pulling on their edges.

**Warning:** Before removing protective covers, stop engine and apply parking brake.

#### 3. Exterior lighting switch

Push down rocker switch to the first position to activate clearance, tail & marker lights and to the second position for headlights.

**Note:** Daytime running lights will be automatically canceled when this switch is pushed to second position. For system information, refer to section "Safety" under heading "Day time running lights" on page 3-4.

#### 4. Blank; for additional switch.

#### 5. Back up alarm cancel (optional) or Blank

Push down rocker switch to cancel alarm during back up maneuvers in special situations (e.g.: parking in campground after curfew).

**Warning:** Use this switch only in special situations as the alarm is designed primarily to warn bystanders of a vehicle backing up. Be sure to return rocker switch to normal position after use.

#### 6. Air-operated door lock (optional) or Blank

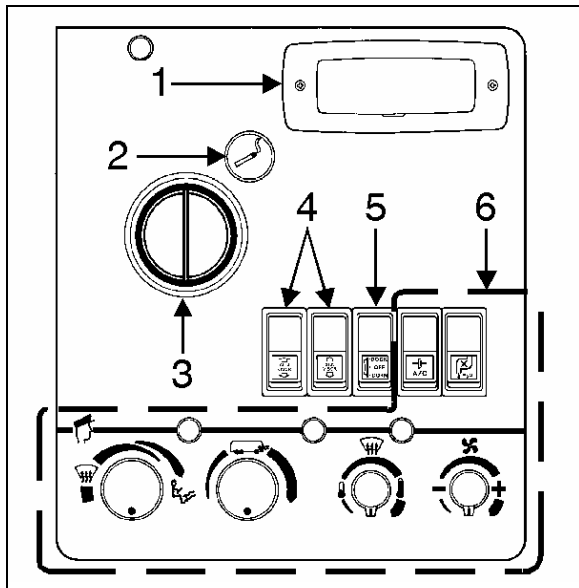
Push down rocker switch to lock the entrance door mechanism and push up to unlock.

**Caution:** Do not operate switch when door is open.

#### 7. Driver's seat heating (optional) or Blank

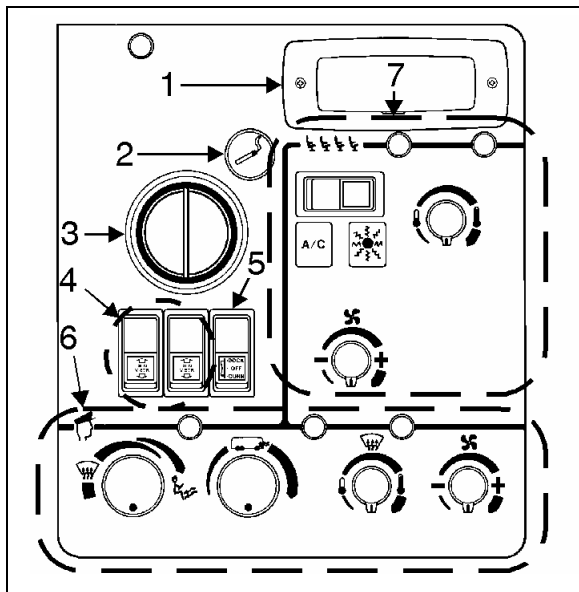
Push down rocker switch to activate heating element inside driver's seat cushions.

## R.H. Console



STANDARD CONSOLE

18022



CONSOLE WITH CENTRAL A/C SYSTEM

18023

### 1. Ashtray (optional)

To open, push in on left side. Remove ashtray by pressing on inner tab.

### 2. Cigarette lighter (12 volts) (optional)

Push in to activate; lighter will pop out when ready for use. Return lighter to initial (non-activated) position. The lighter socket can also be used for 12 volt appliances with a maximum

consumption of 130 watts (10 amps), such as a flashlight or small vacuum cleaner. Do not use appliances equipped with unsuitable plugs as they may damage socket and/or electrical circuit.

**Note:** Lighter and socket remain functional even when ignition is "OFF".

### 3. Adjustable louver

The louver is manually adjustable, so the heated or cooled air flow can be directed as desired.

**Note:** An additional adjustable louver is located on L.H. side control panel to defrost window. A third adjustable louver is located at extreme right of dashboard and can be used to concentrate warm air on windshield area used to view exterior R.H. side mirror.

### 4. Windshield blind control switches (Elect.) (optional) or blank

Push down rocker switch to lower blind or push up to raise blind. Left-hand switch controls left-hand blind and vice-versa.

### 5. Docking and cornering lamp switch (optional) or Blank

Push up rocker switch to activate simultaneously the four (4) docking lamps.

Push down rocker switch to actuate cornering lamp function. When selecting left or right turn signal, the corresponding cornering lamp will illuminate to increase lateral visibility (see page 3-4).

**Note:** When the rocker switch is set to the center position, the docking and cornering lamps will stay "OFF" at all times.

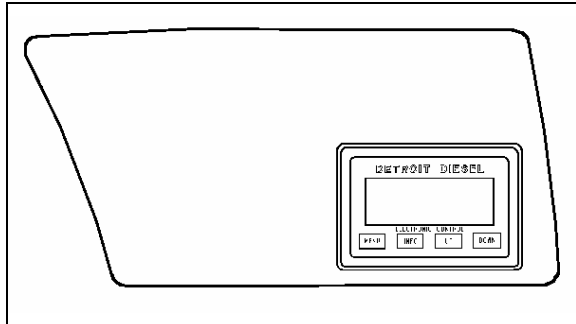
### 6. Driver's A/C - heating system controls

These controls are used to obtain desired temperature in driver's area. For system description see page 4-11.

### 7. Central A/C - heating system controls (optional)

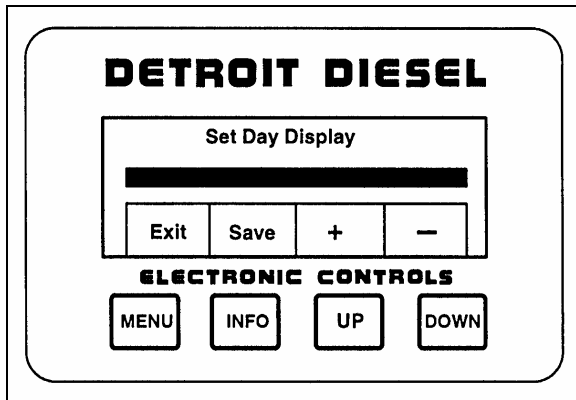
These controls are used to obtain desired temperature inside vehicle. For system description see page 4-12.

## R.H. Upper Panel



18033

### 1. Engine Data Display & Computer - ProDriver™ (optional)



18034

ProDriver™ is a graphic device that displays and records operational data transmitted by the Detroit Diesel Electronic Controls (DDEC) on the diagnostic data link. It utilizes a vacuum fluorescent (VF) display for wide viewing angles and excellent visibility in all ambient light conditions.

ProDriver™ has many driver friendly features designed to provide instantaneous feedback to the driver. This allows him to understand the effect of his actions on engine and vehicle performance. There are two (2) display screens automatically shown, which offer real time feedback based on the vehicle activity. Should an alert message be sent out by the ECM, the driver will be shown what is wrong and how the engine power will change.

Data available from ProDriver™ includes:

- Instantaneous and average fuel economy
- Trip time, miles, fuel used, fuel economy, average speed
- Driving time, percentage, miles, fuel used, fuel economy
- Idle time, fuel and percentage
- Cruise time, percentage, miles, fuel used, fuel economy
- Top gear time, percentage, miles, fuel used, fuel economy
- VSG (previously PTO) time, fuel used, and percentage
- Overspeed time and percentage for two (2) speed thresholds
- Over-rev time and percentage
- Maximum vehicle speed and RPM
- Coasting time and percentage
- Automated oil change interval tracking
- Hard braking incident records
- Driver initiated incident records, and
- Stop and check engine code logs.

**Note:** Refer to Detroit Diesel ProDriver™ Operating Manual (6SE701), for a full description of how to set up and operate your ProDriver™ display.

#### Button functions

- "MENU" - Displays main menu or previous menu level.
- "INFO" - Displays selected menu options; saves new data.
- "UP" / "DOWN" - Move selection arrow up or down, or move from screen to screen when multiple screens are available.

#### Button combinations

Press "UP" and "DOWN" at the same time to store an incident record.

## Special button functions

Alternate labels are displayed along the bottom of the screen directly over each button when the buttons are used to perform special functions.

## Display Screens

### Idle time

Automatically displayed when engine is idling. Shows idle time for current leg of the trip and as a percentage of engine running time. A bar graph shows the idle percentage compared to the fleet goal.

### Fuel economy

Automatically displayed when the vehicle is moving. Shows average fuel economy for current leg of the trip digitally and as a bar graph, with the fleet goal centered on the screen. Instantaneous economy is shown as a series of arrows. UP arrows show an improving leg average, while DOWN arrows show a decrease. The number of arrows shows the amount of change.

### Warning screens

Speeding, over revving, excessive idling and oil change screens will be displayed until acknowledged by pressing any button or the condition ceases. The display will return to the screen previously shown.

### Alert screens

Shown if a warning condition exists with the engine. Will be displayed until acknowledged by pressing any button.

**Note:** Menu displays are available only when the vehicle is stationary. The display may be viewed with the ignition OFF by pressing "MENU".

### To edit the main menu at idle:

IDLE SCREEN, "MENU" = MAIN MENU, "MENU" = IDLE SCREEN.

### To review leg summary information at idle:

IDLE SCREEN, "INFO" = SUMMARY 1, "INFO" = SUMMARY 2, "INFO" = IDLE SCREEN.

### To review trip summary information at idle:

IDLE SCREEN, "MENU", → TRIP SUMMARY, "INFO" = view trip summary page 1, "INFO" or "DOWN" = view trip summary page 2. Continue to press "INFO" or "DOWN" to view all the trip summary pages. "MENU" = Main menu, or "MENU", "MENU" = idle screen.

### To review leg summary info while in motion:

ECONOMY SCREEN, "INFO" = SUMMARY 1, "INFO" = SUMMARY 2, "INFO" = ECONOMY SCREEN.

### Display brightness

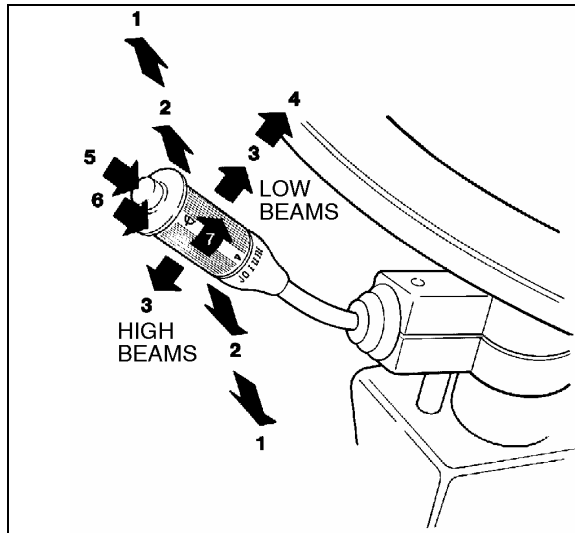
Temporary adjustments may be made while in the fuel economy, idle or leg summary screens by pressing "UP" or "DOWN". The normal setting returns the next time the engine is started.

### Entering driver ID

From the main menu screen, → Configuration "INFO", → Driver ID "INFO". Press "UP" to increment the selected digit. Press "DOWN" to select the next digit to the right. Press "INFO" to save the completed entry or press "MENU" to exit without saving changes.

## Steering Column Controls

### Multifunction lever



18024

Use the "Multifunction lever" to operate the following accessories:

#### 1. Turn signal

Move the lever up to upper position 1 to signal a right-hand turn, and down to lower position 1 to signal a left-hand turn. When the turn is completed, the signal will be canceled and lever will automatically return to its initial position.

#### 2. Lane change signal

Move the lever up or down, part way to either positions 1, and hold it there. The lever will return to its initial position when released.

#### 3. Headlight beam changer

High beams or low beams can be selected by respectively pushing the lever towards the dashboard or by pulling it towards the driver.

#### 4. Headlight flasher

High beams can be flashed momentarily by pulling the lever completely towards the driver and then releasing it.

#### 5. Courtesy-type blinkers

Clearance lights (blinkers) can be operated by pressing the button located at the tip of lever.

### 6. Washer controls

Push the external ring at the end of lever towards the steering column to activate windshield washers. When the ring is released, washers stop immediately but wipers will continue to run twice over to dry windshield.

**Warning:** In cold weather, windshield should first be warmed up with defroster before using washers, in order to prevent icing and serious visibility impairment.

**Caution:** To avoid damaging pump mechanism, never operate washers when windshield washer fluid level is insufficient.

### 7. Windshield wipers

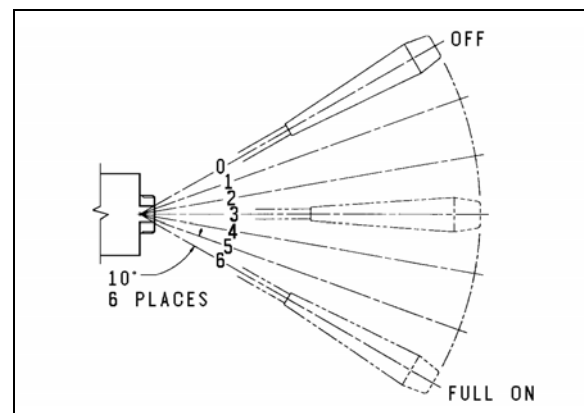
Turn lever forward to activate the two (2) elect/synchro arms; the first position corresponds to low speed and the second to high speed. Turn lever backwards to activate intermittent mode.

**Caution:** Do not run wiper blades on dry windshields as this may cause scratches. To avoid damaging wiper mechanism, always loosen frozen blades from windshield before operating wipers.

### Electric Horn

Can be activated by pressing button in center of steering wheel.

### Transmission Retarder Lever (optional)

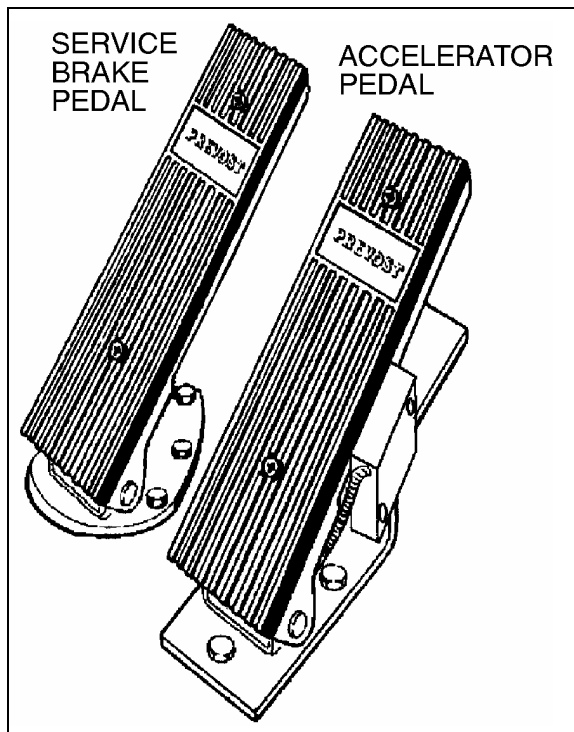


18018

Located on R.H. side of steering column. Use lever to select transmission's retardation level ("OFF" or 1 to 6). For system description, see page 4-5.



## Foot-Operated Controls



18025

## Combination Emergency and Parking Brakes

The spring-loaded, manually operated parking brake is activated by pulling up on the control valve knob located on L.H. lateral console (see item #4 on page 2-4).

This same brake system will automatically be applied in an emergency situation, whenever the control valve supply pressure drops below 40 psi (275 kPa).

For system information, see "BRAKES" on page 3-1.

### Service Brake Pedal

This vehicle is equipped with a dual braking system, the front brakes being independent of the rear brakes. Normally both systems are activated by the single brake pedal. This brake system becomes a modulated emergency system if a pressure drop occurs in the rear brake system.

Service brakes are applied by depressing the brake pedal, the rate of braking varying according to the gradual increase of pressure until the required rate of braking is obtained. When brake pedal is depressed, vehicle stoplights automatically light up.

For system information, see "BRAKES" on page 3-1.

### Accelerator Pedal

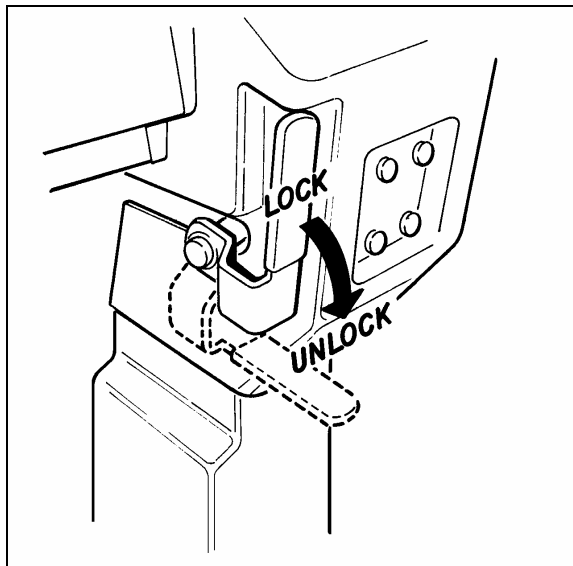
Controls engine rpm.

**Note:** Pedal will be inoperative when the "DDEC-TEST" switch in steering compartment is in the "ON" position.

## Tilt Steering Wheel and Telescopic Steering Column

To unlock, use the handle located on the steering column's left hand side. Pull handle down to permit a maximum variation of 11° in steering wheel angle, and a telescopic wheel movement of 2" (5 cm). Push handle up to lock both mechanisms.

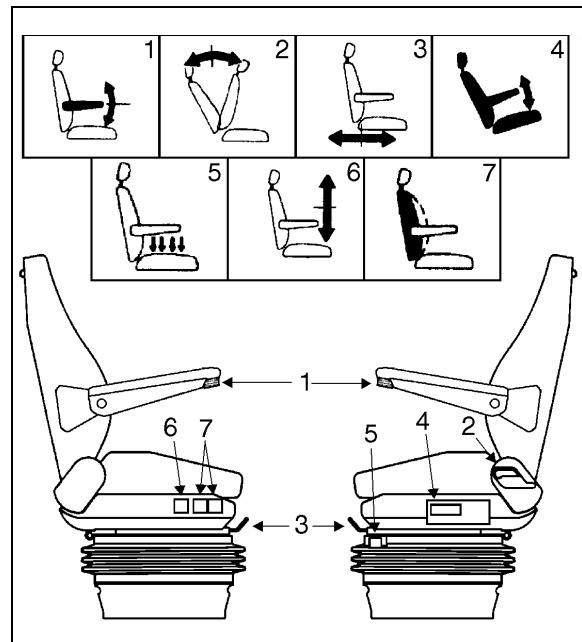
**Warning:** Never try to adjust the steering wheel while the vehicle is in motion; wheel could move unexpectedly, making you lose control of the vehicle.



18027

## Driver's and copilot's seats - "ISRI" (optional)

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



18026

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

## Seats

### Driver's Seat - "Delivery"

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

#### 1. Armrest

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

#### 2. Backrest

Lift lever to select proper adjustment angle of backrest.

#### 3\*. Fore-and-Aft

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

#### 4\*. Incline

Pull handle up, and adjust seat inclination.

**Warning:** Before proceeding with seat cushion adjustments, lower seat belt retractor to avoid pinching fingers between retractor and control knobs.

(\*)If your vehicle has electric seats, controls 3 & 4 change. For description of electric controls, see **Electric Seats "ISRI"** on this page.

#### 5. Suspension

For maximum suspension performance, push or pull knob until desired damping is reached.

#### 6. Raise/Lower

Press on + or - to respectively raise or lower driver's seat.

#### 7. Lumbar Support

Push on upper section of rocker switches to inflate lumbar support bellows inside the seat backrest, and push on lower section of rocker switches to deflate bellows.

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

#### Heated Cushions

The "ISRI" seat may also be equipped with back and seat heated cushions, operated by a switch mounted on R.H. lower switch panel (See item #7 on page 2-14).

#### Electric Seats "ISRI"

Adjust electric seats as follows:

##### 1. Tilt (rear)

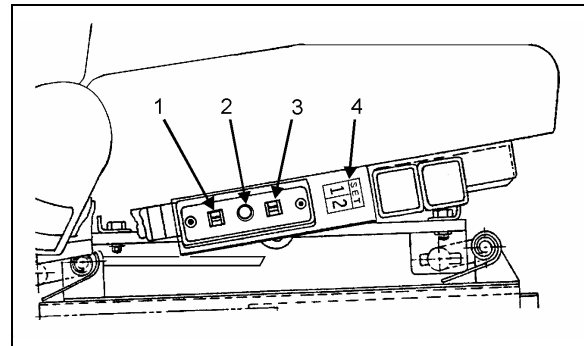
Pull switch up to raise rear section of seat. Push switch down to lower rear section of seat.

##### 2. Fore-and-Aft - Up/Down

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

##### 3. Tilt (front)

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



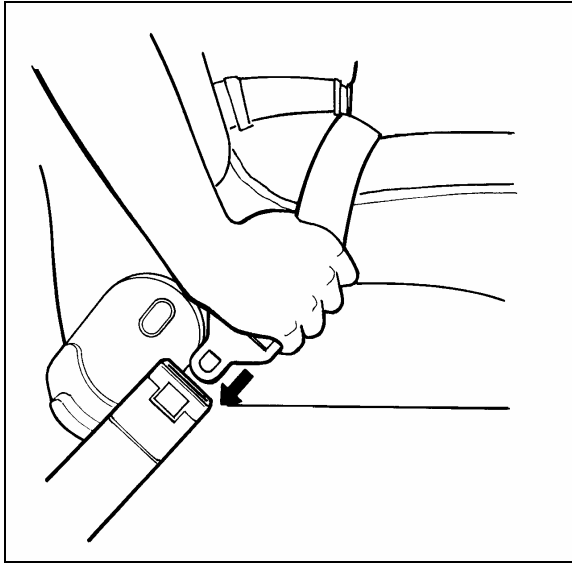
18040

##### 4. Memory

- Use switches (items 1,2 & 3) to adjust the seat to the position desired by driver "1".
- Press the "SET" button and then the number "1" button. Memory position "1" is now set.
- To set the seat position for driver "2", repeat steps 1 and 2 except press the number "2" button in step 2. Memory position "2" is now set.
- To move the seat to either memory position, press and hold the desired button ("1" or "2") for at least 2 seconds. If the seat does not move, the button was not held long enough or the seat is already in the desired position.
- To use the easy entry/exit feature, press and hold the number "1" and the number "2" buttons at the same time for at least 2 seconds. The seat will move to the full rear and full down position.
- To stop seat movement, push any control button (items 1 to 4).

**Note:** The seat can, at any time, be positioned using items 1,2 & 3 without affecting the two (2) memory positions.

## Seat Belts



18028

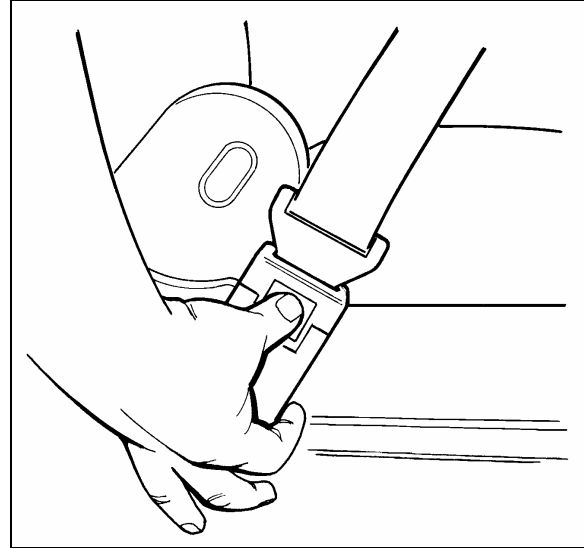
Each seat is equipped with a retractable seat belt as required by State, Provincial and Federal regulations. To fasten, pull seat belt out of the retractor and insert the latch plate into the buckle until it clicks. No special adjustment is required since the reel device is self-adjusting. If seat belt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

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

**Warning:** *A snug fit with the lap belt positioned low on the hips is necessary to ensure motorist's safety. 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 red button in center of buckle and allow belt to retract. If belt does not fully retract, pull it out and check for kinks or twists. Make sure that it remains untwisted as it retracts.



18029

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

## Exterior Mirrors



**OPTIONAL (RAMCO) MIRROR**

18036

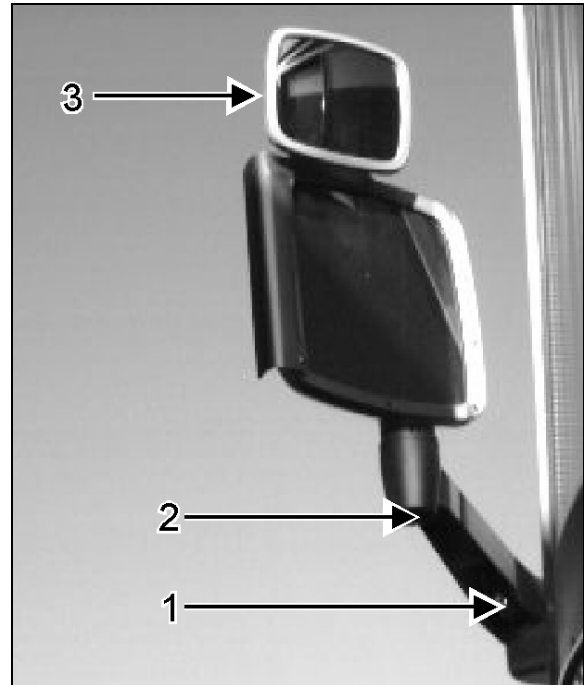
Your vehicle is equipped with two (2) exterior mirrors that may be supplied with an optional electric heating system which serves to minimize ice and condensation in extreme weather conditions. Integral thermostats are installed in both mirrors to avoid continual heating. Use the appropriate switch on the L.H. side control panel (item #8 on page 2-5) to activate the defroster system on both mirrors simultaneously.

The optional "RAMCO" mirrors can easily be adjusted by using the remote controls located on L.H. side control panel (items #5 & 6 on page 2-4).

The standard mirrors can be manually adjusted as per the following method:

To obtain desired vehicle width, adjust the mirror arm angle by loosening the adjusting "Allen" screw (item #1) located at body end of mirror arm. Adjust mirror arm to desired position, then tighten adjusting screw.

**Caution:** Do not overtighten.



**STANDARD MIRROR**

18035

Mirror head can be rotated and/or tilted by loosening the adjusting "Allen" screw (item #2) located at the base of mirror head. Adjust to desired position, then tighten adjusting screw.

**Caution:** Do not overtighten. Do not install a convex mirror on the heated mirror glass. This prevents even distribution of heat in the heated mirror and could cause the glass to break.

Convex mirror head can be rotated and/or tilted by loosening the adjusting nut (item #3) located at the rear of mirror. Adjust to desired position, then tighten adjusting nut.

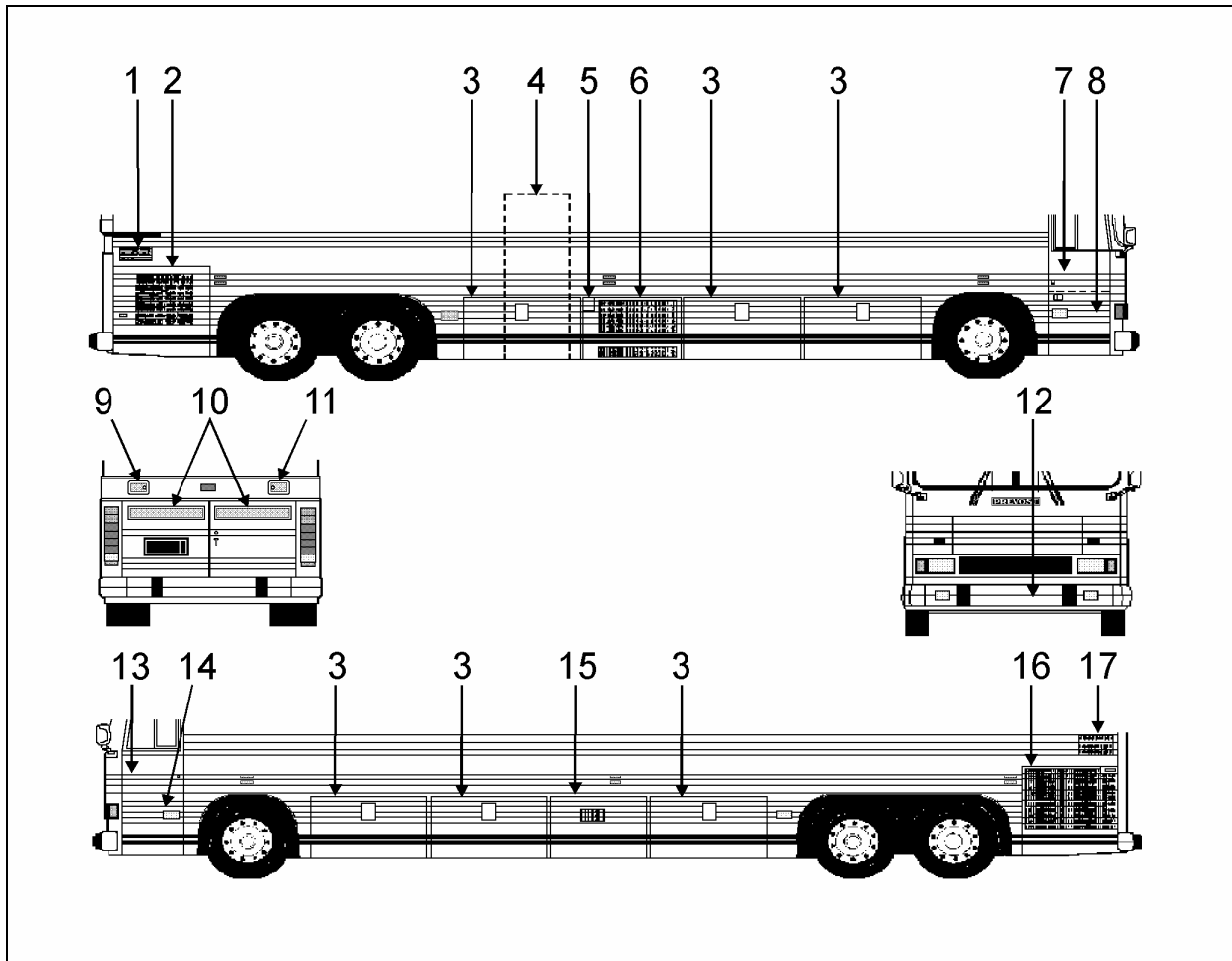
**Caution:** Do not overtighten.

**Warning:** Objects in convex mirror are closer than they appear.

Mirrors should not extend beyond body of coach any more than necessary.

**Note:** It is important for safe driving that you have good rear vision on each side of the vehicle; therefore, adjust mirrors **before** driving and immediately after adjusting your seat.

## Exterior Compartments (XL-40)



18030

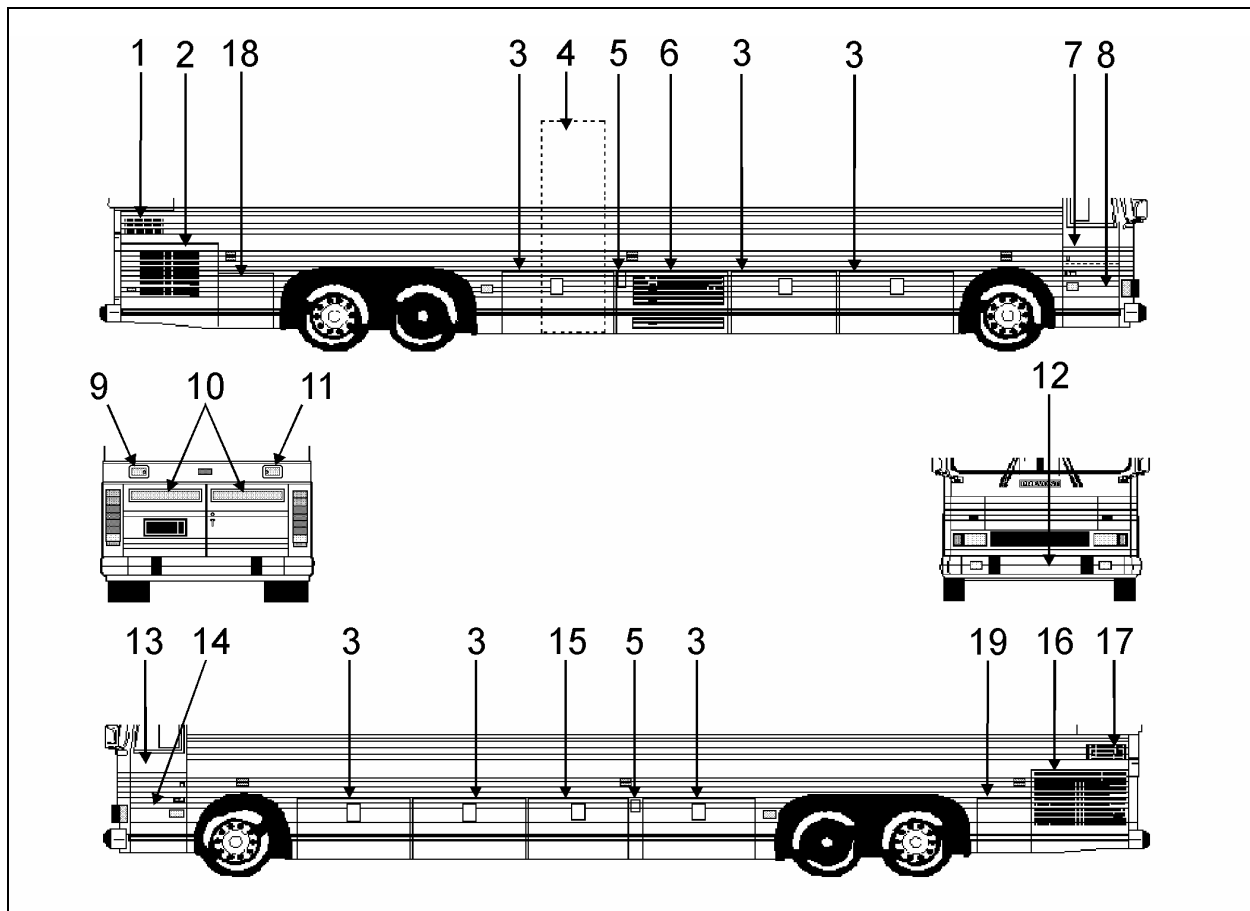
- |                                          |                                                                |
|------------------------------------------|----------------------------------------------------------------|
| 01..... Engine air intake duct           | 10..... Engine rear doors                                      |
| 02..... Engine R.H. side door            | 11..... Engine oil reserve tank filling<br>(block heater plug) |
| 03..... Baggage compartment              | 12..... Reclining bumper compartment                           |
| 04..... Central door (optional)          | 13..... Front electrical compartment                           |
| 05..... Fuel tank filling door           | 14..... Steering compartment                                   |
| 06..... Condenser or Baggage compartment | 15..... A/C & heating or baggage compartment                   |
| 07..... Front entrance door              | 16..... Engine L.H. side door                                  |
| 08..... Right front storage compartment* | 17..... Engine air intake duct                                 |
| 09..... Coolant surge tank filling door  |                                                                |

\* - (optional) - Only on vehicles equipped with a central door and no entrance door.

The above figure identifies all exterior compartments and access doors. See page 2-27 for securing and accessing procedures.

**Note:** If doors are supplied with locks, refer to page 2-1 to select the appropriate key.

## Exterior Compartments (XL-45)



18031

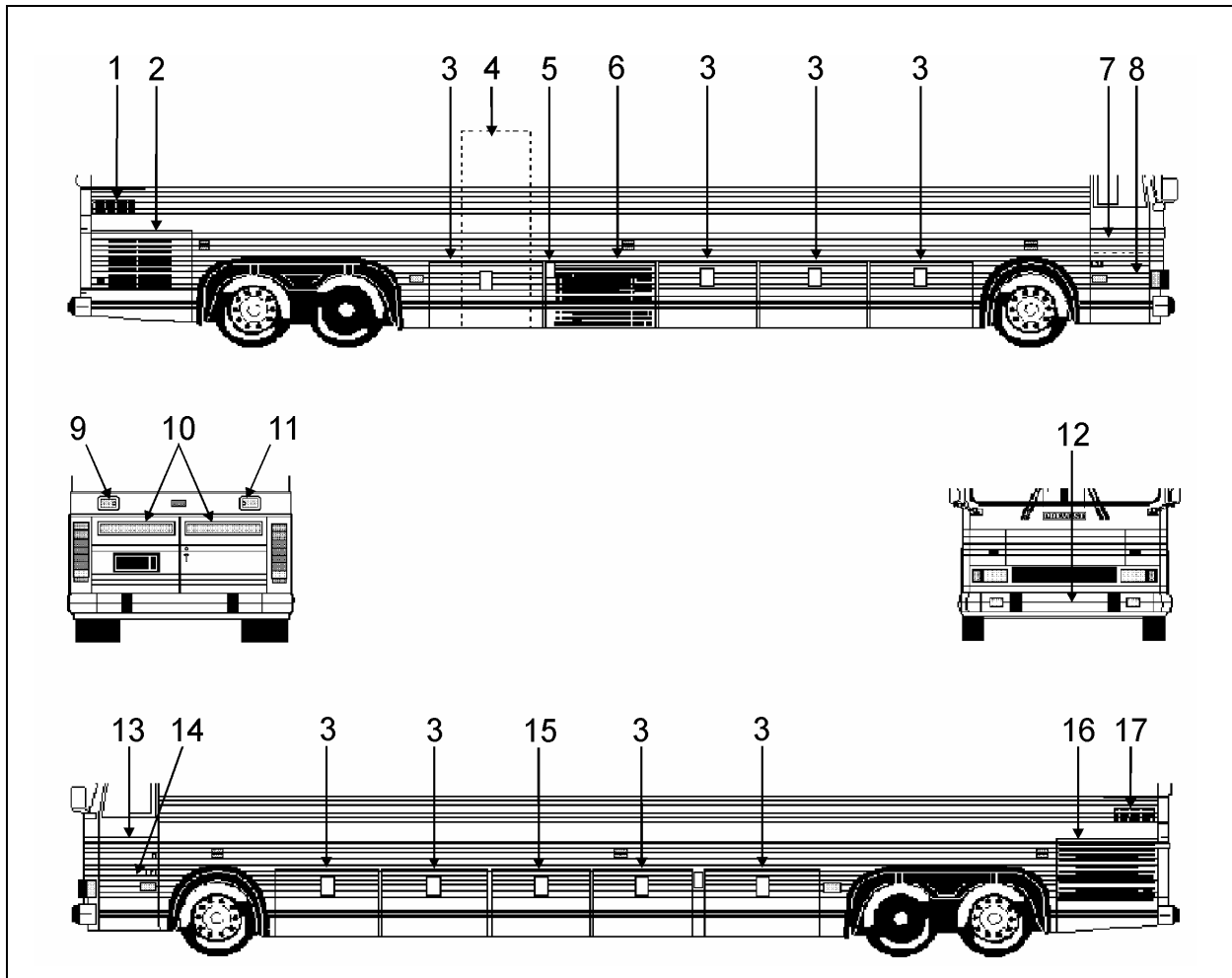
|          |                                  |         |                                                        |
|----------|----------------------------------|---------|--------------------------------------------------------|
| 01 ..... | Engine air intake duct           | 11..... | Engine oil reserve tank filling<br>(block heater plug) |
| 02 ..... | Engine R.H. side door            | 12..... | Reclining bumper compartment                           |
| 03 ..... | Baggage compartment              | 13..... | Front electrical compartment                           |
| 04 ..... | Central door (optional)          | 14..... | Steering compartment                                   |
| 05 ..... | Fuel tank filling door           | 15..... | A/C & heating or baggage compartment                   |
| 06 ..... | Condenser or Baggage compartment | 16..... | Engine L.H. side door                                  |
| 07 ..... | Front entrance door              | 17..... | Engine air intake duct                                 |
| 08 ..... | Right front storage compartment* | 18..... | R.H. side rear service compartment                     |
| 09 ..... | Coolant surge tank filling door  | 19..... | L.H. side rear service compartment                     |
| 10 ..... | Engine rear doors                |         |                                                        |

\* - (optional) - Only on vehicles equipped with a central door and no entrance door.

The above figure identifies all exterior compartments and access doors. See page 2-27 for securing and accessing procedures.

**Note:** If doors are supplied with locks, refer to page 2-1 to select the appropriate key.

## Exterior Compartments (XL-45E)



18032

- |         |                                  |         |                                                        |
|---------|----------------------------------|---------|--------------------------------------------------------|
| 01..... | Engine air intake duct           | 10..... | Engine rear doors                                      |
| 02..... | Engine R.H. side door            | 11..... | Engine oil reserve tank filling<br>(block heater plug) |
| 03..... | Baggage compartment              | 12..... | Reclining bumper compartment                           |
| 04..... | Central door (optional)          | 13..... | Front electrical compartment                           |
| 05..... | Fuel tank filling door           | 14..... | Steering compartment                                   |
| 06..... | Condenser or Baggage compartment | 15..... | A/C & heating or baggage compartment                   |
| 07..... | Front entrance door              | 16..... | Engine L.H. side door                                  |
| 08..... | Right front storage compartment* | 17..... | Engine air intake duct                                 |
| 09..... | Coolant surge tank filling door  |         |                                                        |

\* - (optional) - Only on vehicles equipped with a central door and no entrance door.

The above figure identifies all exterior compartments and access doors. See page 2-27 for securing and accessing procedures.

**Note:** If doors are supplied with locks, refer to page 2-1 to select the appropriate key.



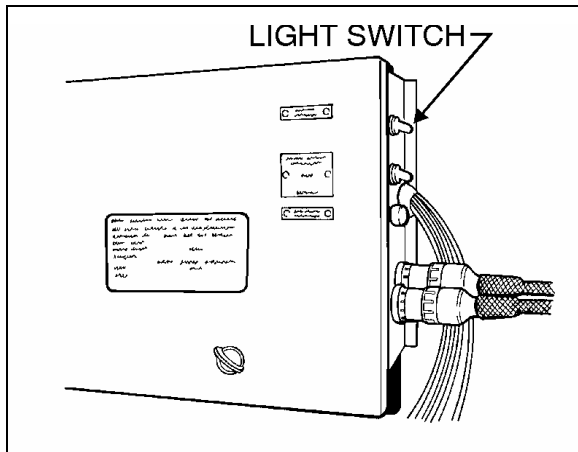
## Engine Compartment Doors (doors #2 & 10)

For access to the engine compartment, two rear doors and one R.H. side door are provided (*all doors are secured with keylocks - see "KEYS" on page 2-1*). To open rear doors, turn lock release handle counterclockwise and pull open doors. Doors are held in open position by a mechanical locking device located at top of each door.



01009

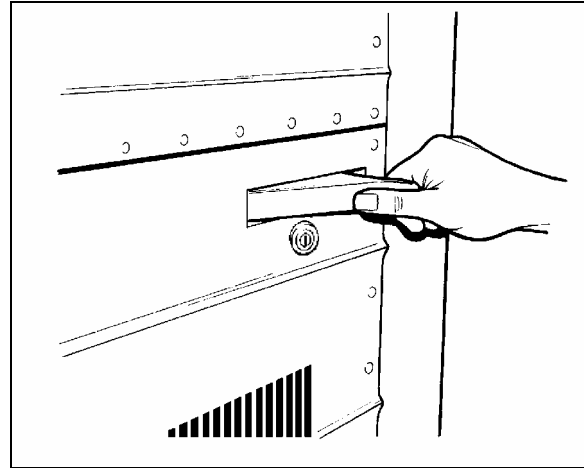
A switch located on R.H. side of rear junction box can be used to actuate the engine compartment lights.



01011M

To close doors, first release mechanical locking device by pushing in with fingers, then return doors to closed position; always starting with left (driver's side) door.

The side door can be opened by pulling the release handle and then pulling on the door.



18037

The engine L.H. side compartment door, which opens similarly to the R.H. side compartment door, is designed to provide access to the radiator.

## Engine Air Intake Ducts (items #1 & 17)

Engine air intake ducts are not accessible; they are designed only to supply engine air cleaner.

## Fuel Tank Filling Door (door #5)

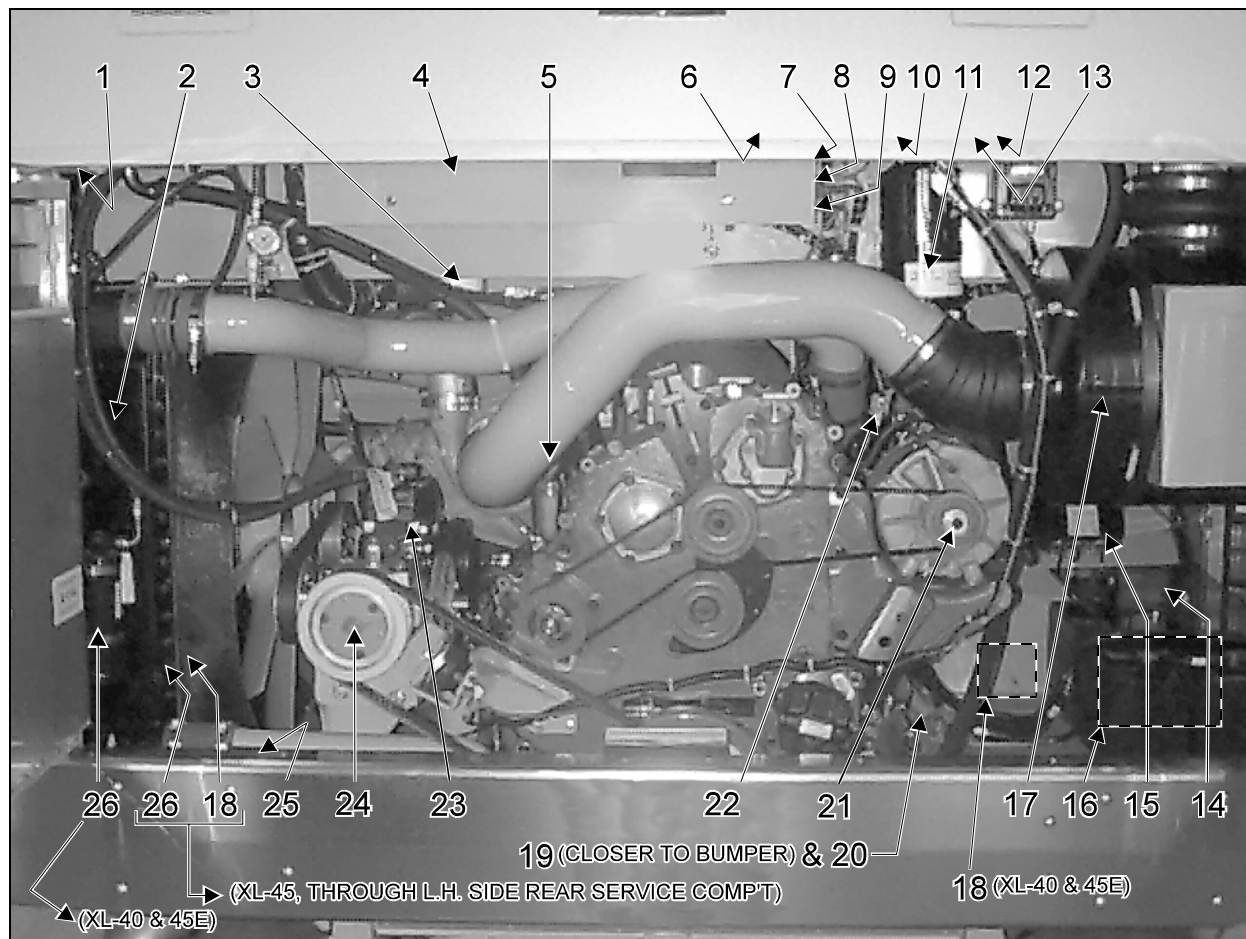
Fuel filler neck is accessible by simply pulling out door's R.H. side finger notch.

**Note:** *XL-45's have filler necks on both sides of vehicle.*

## Central & Front Entrance Doors (doors #4 & 7)

To open doors from the outside, simply pull out door handle. To open from the inside, simply pull up door handle. To secure doors, push in from the outside or pull in from the inside.

## Engine Compartment Components



01014

### Component Identification:

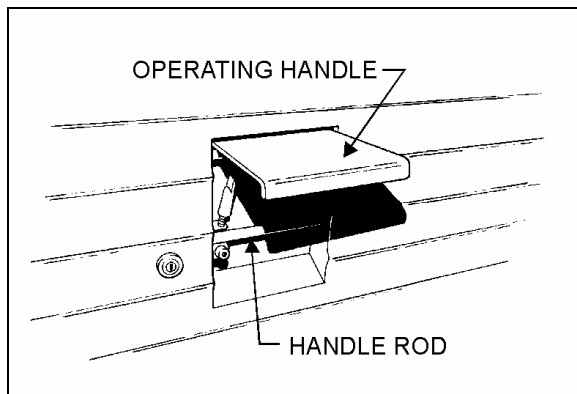
|         |                                        |         |                                                                                         |
|---------|----------------------------------------|---------|-----------------------------------------------------------------------------------------|
| 01..... | Coolant surge tank                     | 16..... | A/C compressor (Central system) or Alternator 24V 75A or Alternators 12V 145A & 24V 75A |
| 02..... | Radiator                               | 17..... | Engine air cleaner                                                                      |
| 03..... | Fire detector                          | 18..... | Preheater (Webasto or Espar)                                                            |
| 04..... | Rear junction box                      | 19..... | Engine primary fuel filter                                                              |
| 05..... | Transmission oil dipstick              | 20..... | Engine secondary fuel filter                                                            |
| 06..... | Belt tensioning pressure control valve | 21..... | Alternator 24V 270A or Alternator 12V 300A                                              |
| 07..... | Engine compartment light switch        | 22..... | Engine oil dipstick                                                                     |
| 08..... | Starter selector switch                | 23..... | A/C compressor (driver's system) or Alternator 12V 145A                                 |
| 09..... | Rear start push-button switch          | 24..... | Radiator fan gearbox                                                                    |
| 10..... | Engine oil pressure gauge              | 25..... | Muffler                                                                                 |
| 11..... | Power steering oil tank                | 26..... | Driver A/C unit receiver/dryer                                                          |
| 12..... | Engine oil temperature gauge           |         |                                                                                         |
| 13..... | Engine oil reserve tank                |         |                                                                                         |
| 14..... | Battery assembly                       |         |                                                                                         |
| 15..... | Battery equalizer(s) "VANNER"          |         |                                                                                         |

## Baggage Compartment (doors #3 - Also #6 & 15 if applicable)

An optional elect. door locking system may be installed on all baggage compartment doors. The switch is located on the L.H. side control panel (see item #6 on page 2-5). Push up rocker switch to unlock the doors and push down to lock. An indicator light will illuminate on dashboard if one (1) or several baggage compartment doors are unlocked.

The baggage compartment doors may also be locked or unlocked from outside using the key provided (see "KEYS" on page 2-1).

To open a baggage compartment door, insert fingers under lower edge of operating handle, pull out and up to unlatch door, grab handle rod and pull up compartment door. The opening action is assisted by gas cylinders which also hold the door in the open position.



18043

Opening of baggage door will actuate a microswitch that will turn on the compartment lights.

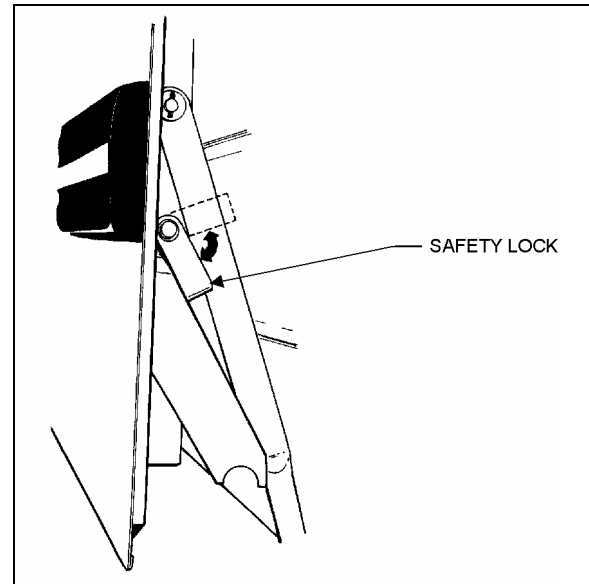
**Note:** In case of malfunction or special conditions, use the safety lock to keep the door securely opened.

To close a baggage compartment door, first release safety lock, then pull handle rod out and down as far as door will allow, then push down handle to complete procedure and latch door.

**Warning:** Always open and close baggage compartment doors using the handle rod ONLY. Keep hands off all door edges.

**Caution:** Do not slam baggage compartment doors. This can only damage door weather stripping and/or locking mechanism.

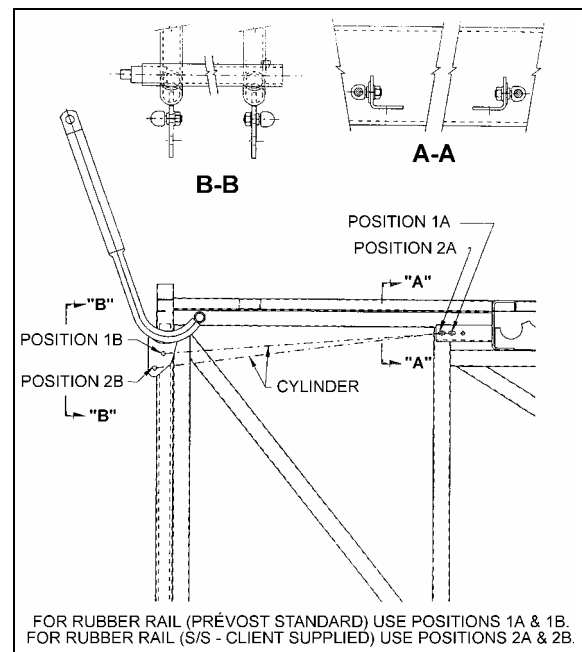
**Note:** To prevent theft and/or vandalism, always lock baggage doors before leaving vehicle.



18038

## Cylinder positioning

In order to increase strength of door cylinders when stainless steel rub rails have been added to vehicle body, change their position as per illustration below:



18205

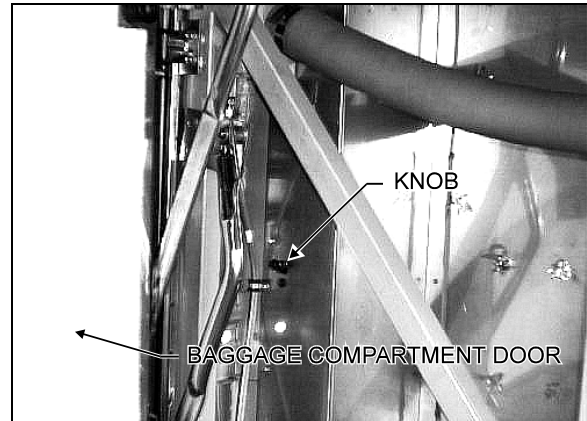
## Reclining Bumper Compartment (door #12)

The front bumper is of the "reclining-type". To open, carefully remove the large bolt at each end using the wheel nut wrench, then slowly lower the bumper.

**Warning:** This compartment has not been designed for storage. Never leave any loose objects in this area since they may interfere with steering linkage mechanism.

Additional care should be taken when opening this compartment since bumper weighs 100 lbs (45 kg).

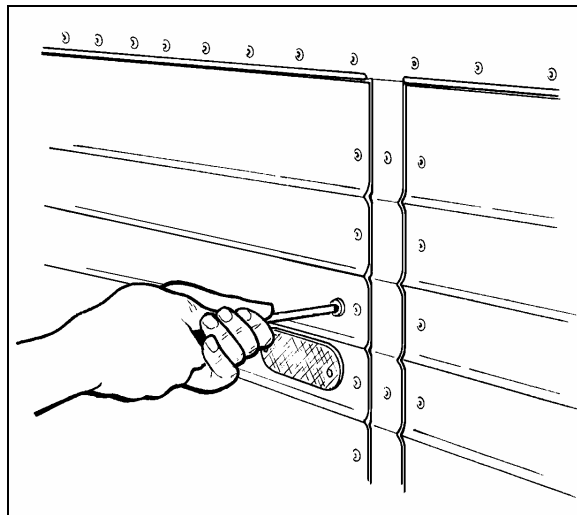
**Caution:** After compartment panel has been secured, the two (2) bumper retaining bolts should be checked to make sure they are tightly fastened.



18056

## A/C & Heating and Condenser Compartment Doors (doors #6 & 15)

The A/C & heating and Condenser compartment doors can be opened manually or mechanically, depending on options. Open the door manually by first, removing the "Phillips" retaining screws (qty = 2) and then pulling on side of door where screws are located.

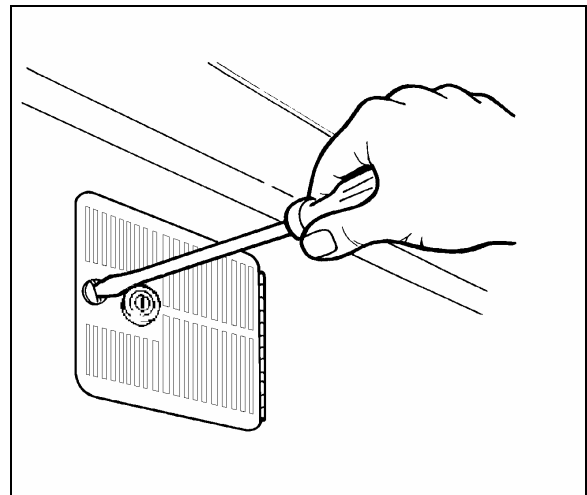


18039

Open the door mechanically by first opening the Baggage Compartment aft of A/C or Condenser Compartment, then pull on door knob (see next figure).

## Service Doors (doors #8,9,11,13 & 14)

Service doors can be opened by turning the slotted head "Dzus" fasteners 1/4 turn counterclockwise and then pulling on the door.



18044

Service doors may also be locked or unlocked using key provided (see "KEYS" on page 2-1).

Doors #8,13 & 14 are each provided with a microswitch which when actuated, will turn on compartment light.

**Caution:** Special care must be taken not to damage the paint around the "Dzus" fasteners when using a screwdriver or a coin.

### L.H. Side Rear Service Compartment (XL-45) (door #19)

To access this compartment, use key provided (see "KEYS" on page 2-1). To secure, simply push in door.

**Warning:** *This compartment is designed to give access to engine compartment components and cannot be used for storage.*

### R.H. Side Rear Service Compartment (XL-45) (door #18)

To access this compartment, open engine R.H. side door (see page #27, Engine Comp't Doors), and pull on service compartment switch handle located on R.H. side of 24V battery disconnect switch, next to door hinge. To secure, simply push in door.



18047

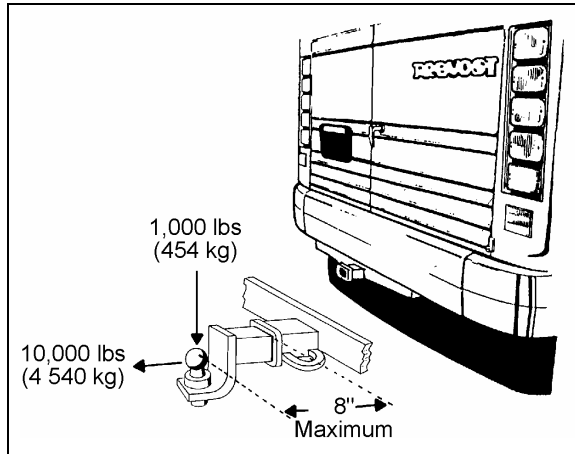
**Warning:** *This compartment is designed to give access to engine compartment components and cannot be used for storage.*

## Accessories

### Trailer Hitch

(optional XL-40 & 45E, standard XL-45)

Your vehicle may be equipped with a factory installed trailer hitch which has been designed to meet SAE, class 4 specifications.



23007

- Maximum gross trailer weight: 10,000 lbs (4 540 kg)
- Maximum tongue weight at 8 inches (200 mm) or less from coupling receiver: 1,000 lbs (454 kg)

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

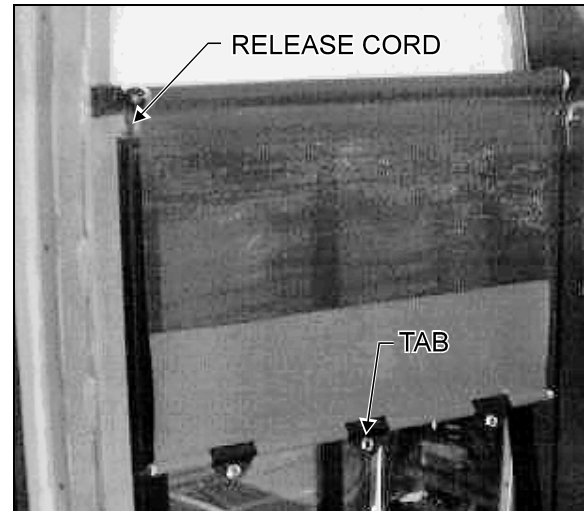
**Note:** Pulling a trailer over long distances is considered as a "severe operating condition" for the vehicle and therefore, power plant requires more frequent servicing.

### Mud Flaps (standard) & Splash Guards (optional)

Mud flaps are installed behind each wheel of front and tag axles in order to minimize dirt on the lower panels of vehicle and to reduce stone projections on vehicles behind you. Splash guards may also have been installed behind each dual wheel of the drive axle in order to reduce stone projections on tag axle wheels.

### Blinds (optional)

Your vehicle may be supplied with three blinds: one (1) on driver's side window and two (2) on windshield. To operate blind, pull down tab to the required position and then release; the blind will remain in position. To raise blind, pull on release cord on it's L.H. side.



18048

### Windshield blinds (Electric)

To operate electric blinds, use the two (2) rocker switches located on R.H. console (item #4, page 2-15).

**Spare Parts Kit (optional)**

A Spare Parts Kit may be supplied with your vehicle. Parts are stored in a cardboard box located inside the forward baggage compartment.

Kit contents depend on certain vehicle options as shown below:

- 1** = Series 60 Engine + Driver's A/C System + 24V-75A Alternator.
- 2** = Series 60 Engine + Driver's A/C System + 24V-75A Alternator + 12V-145A Alternator.
- 3** = Series 60 Engine + Driver's A/C System + 24V-270A Alternator.
- 4** = Series 60 Engine + Driver's A/C System + 12V-145A Alternator + 24V-270A Alternator.
- 5** = Series 60 Engine + Full A/C System + 24V-270A Alternator.
- 6** = Series 60 Engine + Full A/C System + 12V-145A Alternator + 24V-270A Alternator.
- 7** = Series 60 Engine + Driver's A/C System + 12V-300A Alternator + 24V-75A Alternator.

| Part No. | Description              | QTY | Option No. |   |   |   |   |   |   |
|----------|--------------------------|-----|------------|---|---|---|---|---|---|
|          |                          |     | 1          | 2 | 3 | 4 | 5 | 6 | 7 |
| 561122   | Light Bulb, 24V          | 2   | X          | X | X | X | X | X | X |
| 561166   | Light Bulb #464, 24V, 3W | 2   | X          | X | X | X | X | X | X |
| 562278   | Light Bulb, 24V, 10W     | 4   | X          | X | X | X | X | X | X |
| 561707   | Relay, 24V               | 1   | X          | X | X | X | X | X | X |
| 561797   | Circuit Breaker, 3 Amp   | 1   | X          | X | X | X | X | X | X |
| 561790   | Circuit Breaker, 6 Amp   | 1   | X          | X | X | X | X | X | X |
| 561791   | Circuit Breaker, 8 Amp   | 1   | X          | X | X | X | X | X | X |
| 561792   | Circuit Breaker, 10 Amp  | 1   | X          | X | X | X | X | X | X |
| 561793   | Circuit Breaker, 15 Amp  | 1   | X          | X | X | X | X | X | X |
| 561794   | Circuit Breaker, 20 Amp  | 1   | X          | X | X | X | X | X | X |
| 561795   | Circuit Breaker, 25 Amp  | 1   | X          | X | X | X | X | X | X |
| 561880   | Light Bulb, 12V, 21W     | 3   | X          | X | X | X | X | X | X |
| 561881   | Light Bulb, 12V, 10W     | 2   | X          | X | X | X | X | X | X |
| 561882   | Light Bulb, 12V          | 1   | X          | X | X | X | X | X | X |
| 451144   | Gauge, Oil               | 1   | X          | X | X | X |   |   | X |
| 506680   | V-Belt, BX-80            | 1   | X          | X |   |   |   |   |   |
| 506685   | V-Belt, A35              | 1   | X          | X | X | X |   |   | X |
| 506690   | V-Belt, AX-74            | 3   | X          | X | X | X | X | X | X |
| 506688   | Belt, Multi-V            | 1   | X          | X | X | X | X | X | X |
| 506681   | V-Belt, BX-100           | 1   |            | X |   | X |   |   |   |

CONTROLS/INSTRUMENTS

| Part No. | Description                              | QTY | Option No. |   |   |   |   |   |   |
|----------|------------------------------------------|-----|------------|---|---|---|---|---|---|
|          |                                          |     | 1          | 2 | 3 | 4 | 5 | 6 | 7 |
| 506669   | Belt, Poly V12                           | 1   |            |   | X | X | X | X | X |
| 506664   | Belt, BX-97                              | 2   |            |   |   |   | X | X |   |
| 506683   | V-Belt, BX-31                            | 2   |            |   |   |   |   | X |   |
| 506708   | V-Belt, BX-77                            | 1   |            |   |   |   |   |   | X |
| 500445   | Washer, flat, zinc plated (Copilot Seat) | 6   | X          | X | X | X | X | X | X |
| 500480   | Washer, lock, split (Copilot Seat)       | 6   | X          | X | X | X | X | X | X |
| 500709   | Nut, Hex, zinc plated (Copilot Seat)     | 6   | X          | X | X | X | X | X | X |
| 362056   | Plate, Anchoring (Copilot Seat)          | 2   | X          | X | X | X | X | X | X |
| 362521   | Plate, Anchoring (Copilot Seat)          | 2   | X          | X | X | X | X | X | X |
| 363109   | Plate, Anchoring (Copilot Seat)          | 2   | X          | X | X | X | X | X | X |



## Preheating System Timers (auxiliary) (optional)

The timer, located on L.H. lateral console (see page 2-4), is used to program the starting and stopping time of the preheating system. One of two optional Timers may be installed in your vehicle, Espar (40 000 BTU) or Webasto (80 000 BTU). The system indicator light, located on dashboard (see item #23 on page 2-10) illuminates when system is functional. The following offers system descriptions for both Timers.

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

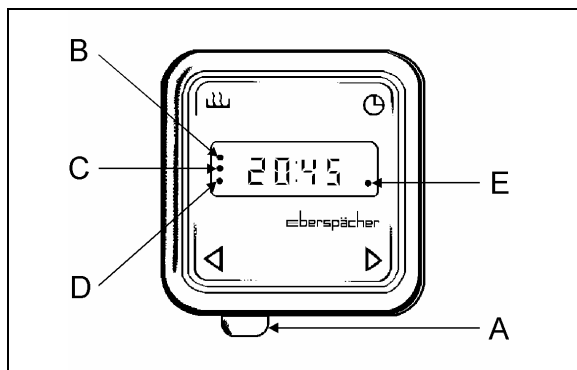
**Warning:** Preheating system must not operate when vehicle is parked inside or during fuel fill stops.

**Note:** Preheating system uses the same fuel as the engine.

In case of failure:

1. Shut off and turn on again.
2. Check main circuit breaker and overheating switch (Espar) or overheat fuse (Webasto).
3. Have system repaired in a specialized shop.

### Espar (40 000 Btu)



18045

#### Time Display

Pull lever **A** forward\*.

#### Time Setting

Pull lever **A** forward and press on < or on >.

#### Heating Startup (Possible Regardless of Preselection)

Press on 1.

Display of heating time in minutes, operation indicator light **E** is flashing.

#### Heating Startup, Continuous Operation

Pull lever **A** forward and press simultaneously on .

#### Heating Shutoff

Press on 2. Fan has automatic delay to allow cooling.

#### Preselection of Heating Startup Time

Memorization of three startup times.

#### Display of Memorized Times

**Note:** Heating will turn on automatically at preselected time.

Press once on 3: Heating is set for the 1<sup>st</sup> startup time\*\*, indicator light **B** is on.

Press twice on 4: Heating is set for the 2<sup>nd</sup> startup time\*\*, indicator light **C** is on.

Press three times on 5: Heating is set for the 3<sup>rd</sup> startup time\*\*, indicator light **D** is on.

Neutral position: Press four times on : No display or display of time\*. No preselected startup time.

#### Setting of Startup Times\*\*:

1<sup>st</sup> memory: Press momentarily on , **B** is on.

2<sup>nd</sup> memory: Press momentarily on 6, **C** is on.

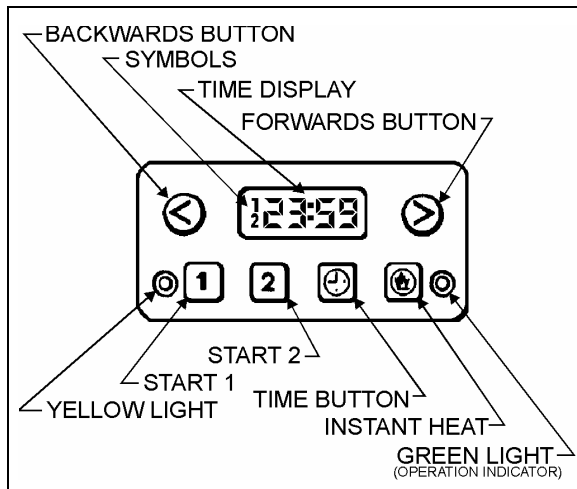
3<sup>rd</sup> memory: Press momentarily on 7, **D** is on.

#### Setting of time by pressing on < or on >

Neutral position: Press once again on 8: No display or display of time\*, the preset times are still in memory.

\* Eventually permanent display of time with the vehicle ignition switch on.

\*\* Display of heating startup time turns out after approximately 20 seconds, or time delay\*.

**Webasto (80 000 Btu)****1. To set the clock**

If the time display e.g. 18:33 is wrong, or if it flashes 8:88, press button 9 and at the same time press either 10 (backwards) or 11 (forwards). The longer you hold the button down, the quicker the display changes. The last few minutes are set accurately by quick pushes. Adjust to get exact time, e.g. 23:59. The display fades after 20 sec.

**2. Do you want to know the time?**

Just press 12 at any time. The display appears again.

**3. You can get instant heat...**

with the button 13, which switches your heater on (or off) immediately. The green light is on while the heater is switched on.

**4. ... or you can program the heater to come on up to 24 hours ahead.**

Press button 14 - and the display shows the time at which the heater will start. You can alter starting time by pressing button (backwards) or 15 (forwards). The longer you press the button, the faster the display changes. The last few minutes are set accurately by quick pushes. The display fades after 20 sec. The symbol 1 remains in the display, and the yellow light stays on. Your starting time is now activated.

**5. Button allows you to program a second starting time**

Press button 16, which de-activates starting time 1. Then proceed as in (4).

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

**6. Do you want to check (or activate) your starting time?**

Press button 17 or 18 briefly. The display shows, for 20 sec., the programmed starting time. This activates the timer to start the heater at the time shown.

**7. Do you want to cancel a programmed start?**

Press button 21 or 22 briefly. The appropriate number in the display goes out, together with the yellow light.

## Brakes

There are two (2) brake systems on your vehicle, the service brakes and the combination emergency & parking brakes, both of which are described below.

Your vehicle may also be supplied with ABS brakes (antilock braking system) and an additional retardation system. ABS brakes system information is available in this section on page 3-2; for information regarding both optional retardation systems, see "ENGINE RETARDER SYSTEM (JACOBS)" on page 4-3 and "AUTOMATIC TRANSMISSION OUTPUT RETARDER" on page 4-5.

## Service Brakes

The service brakes use air pressure from a footpedal-operated brake valve to actuate chambers which apply the brakes at each wheel. The air system is divided into two (2) independent circuits to isolate front brakes from rear brakes, thus providing safe braking if one (1) circuit fails. Front axle brakes operate from the secondary air system, while brakes on both the drive axle and tag axle operate from the primary air system.

**Note:** *The tag axle service brakes operate only when the axle is in normal ride position (loaded & down).*

Furthermore, the brake application sequence, which starts with rear brakes and then front brakes, provides uniform braking on slippery surfaces.

For safe brake effectiveness, vehicle air system pressure should reach at least 95 psi (655 kPa) in both primary and secondary air circuits. (see items #14 & 15 on page 2-10)

A warning light turns on (see Dashboard items #7 & 8, page 2-10) and a buzzer sounds when air pressure in one of the primary or secondary circuits drops below 60 psi (413 kPa). Vehicle must then be stopped and cause of pressure loss must be corrected before further operation.

**Warning:** *"FANNING" or "PUMPING" brake pedal is not recommended. This practice will not increase brake system effectiveness, but will instead waste air and thereby reduce brake effectiveness.*

*"RIDING" the brake by resting foot on brake pedal when not braking can cause abnormally high brake temperatures, excessive lining wear, possible damage to the brake drums, and loss of brake efficiency.*

## Combination Emergency and Parking Brakes

### Emergency brakes

In normal operation, if air pressure in both brake circuits drops below approximately 40 psi (276 kPa), spring-loaded emergency parking brakes will immediately be applied at full capacity on drive and tag axle wheels to stop vehicle. In an extreme condition, the emergency brakes might be applied quite rapidly. Vehicle must then be stopped and cause of pressure loss must be corrected before resuming operation.

### Parking brakes

Spring-loaded parking brakes are manually applied by pulling up the control valve knob, located on L.H. lateral console (see page 2-4).

They are not designed to be used as service brakes. In normal driving conditions, control valve knob must be pushed all the way down.

**Note:** *Parking brakes can supplement service brakes to stop the vehicle in an emergency condition only. The stopping distance will be considerably longer than with a normal brake application.*

*Before releasing parking brakes by pushing down control valve knob, pressure gauges should be checked to ensure that brake system air pressure has built up to a minimum of 95 psi (655 kPa).*

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

**Note:** Each time the parking brake is applied and ignition key is turned or left to the "ON" position, the stoplights automatically light up.

## Back up Alarm

The back up alarm system serves to warn bystanders of vehicle moving in reverse range. Driver should take extra precautions when backing up. If in doubt, have someone guide you.

**Note:** Alarm should automatically operate when the reverse range is selected; if not, then "Back up alarm cancel" switch is on (see item #5 on page 2-14).

## ABS Brakes (antilock braking system)

Standard (XL-45),  
Optional (XL-40 & 45E)

The purpose of the antilock braking system is to preserve the stability and steerability of a vehicle during braking, and to minimize its stopping distance whatever the road conditions.

On slippery roads and in emergency situations, overbraking frequently induces wheel locking.

Antilock braking system provides maximum braking performance while maintaining adequate steerability on slippery roads.

Also, on smooth or slippery surfaces, the stopping distance with locked wheels is greatly extended; on rough surfaces the problem is tire abrasion.

The basis of ABS is constant monitoring of the wheel behavior during braking. Sensors on each wheel of front and drive axles continually monitor the wheel speed during braking, transmitting this information to a four-channel electronic processor which senses when a wheel is about to lock. Modulating valves quickly adjust the brake pressure (up to 5 times per second) to prevent wheel from locking. Each wheel is thereby controlled according to the grip available between its tire and the road.

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

**Caution:** On slippery roads, motorists behind you may not be able to brake as fast as you; so where possible, give a prior warning by lightly depressing brake pedal several times before braking.

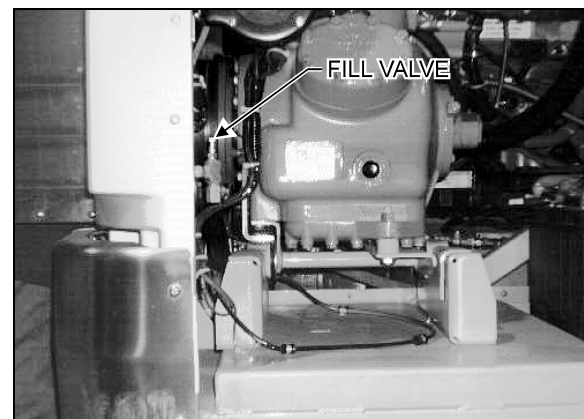
## Air System Emergency Fill Valve

The vehicle is equipped with two air system emergency fill valves to supplement the air system when air pressure is low and engine cannot be operated. The rear valve is located in engine compartment and accessible from engine R.H. side door: On XL-40 & 45E vehicles, the valve is positioned over battery assembly, close to door hinge; on XL-45 vehicles, the valve is positioned directly under back up alarm, close to L.H. side of door opening.



XL-40 & 45E REAR VALVE LOCATION

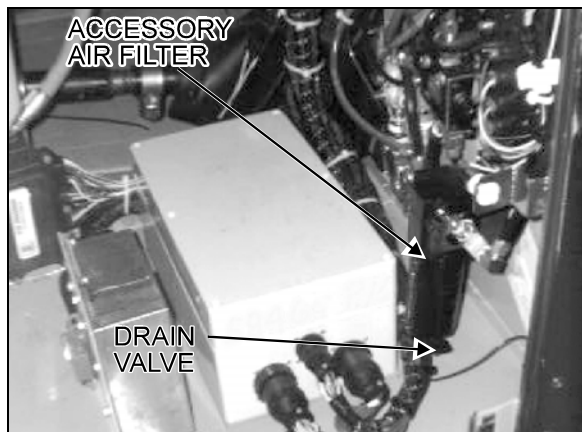
12010



XL-45 REAR VALVE LOCATION

12011

The front valve is located in the steering compartment at bottom of accessory air filter.



FRONT VALVE LOCATION

12089M

These two air system emergency fill valves are fitted with the same valve stems as standard tires, and can be filled by any standard external air supply line.

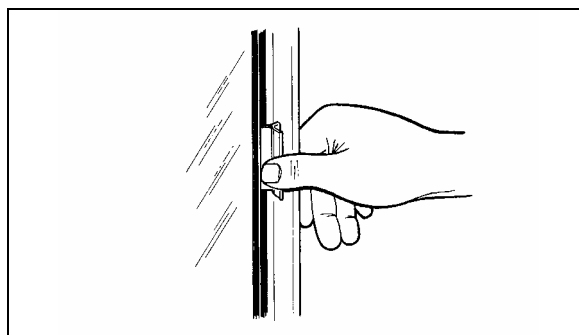
The rear air system emergency fill valve will supply air for all systems (brakes, suspension and accessories) while the front fill valve will supply air for accessories only.

**Caution:** Air filled through these two points will pass through the standard air filtering system provided by Prévost. Do not fill air through any other points.

## Emergency Exits

### Sliding Type Emergency Escape Window

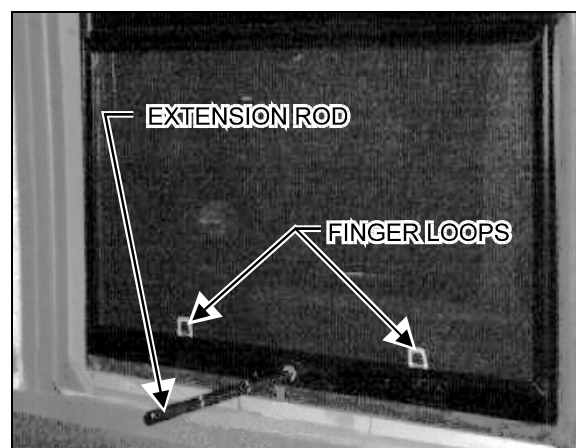
Unlatch sliding window and open completely, then slide the screen fully open and exit vehicle through window frame.



18049

### Awning Type Emergency Escape Window

To exit vehicle through awning type windows, remove screen by pulling upwards on both finger loops; take extension rod out of its seat, straighten out and push all the way through window frame, then exit through window frame. Escape window extension rods are identified by a red end section.



18050

### Emergency Roof Escape (optional)

To exit vehicle through a Prévost installed roof escape hatch, fully push out ventilation hatch, then while depressing black tab towards rear of vehicle, push handle out in the same direction; this will release emergency hatch catch.



18051

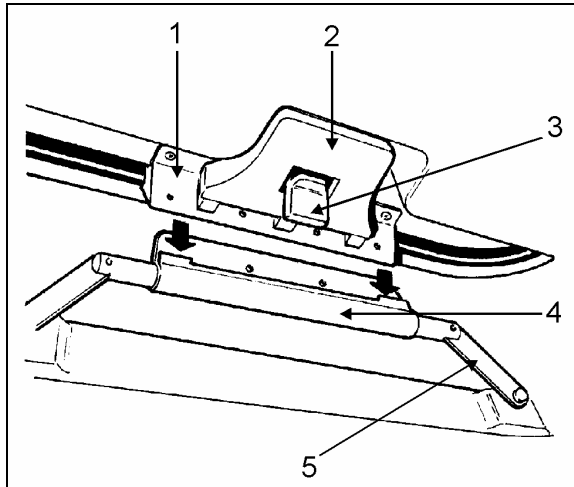
- 1 ..... Emergency escape hatch
- 2 ..... Instructions decal
- 3 ..... Hatch handle
- 4 ..... Black tab

**Note:** These instructions are also affixed to escape hatch.

In the event of ventilation systems failure, hatch can be used to provide air circulation, by simply pushing hatch upwards.

**Caution:** If running with roof hatch(es) open, beware of low overhead clearances.

To relatch handle after use, push vent arms upright in "full open vent" position, then insert edge into bracket and pull handle in. Finally, pull hatch inward, one side at a time.



18052

- 1 ..... Edge
- 2 ..... Handle
- 3 ..... Black tab
- 4 ..... Bracket
- 5 ..... Vent arm

## Day Time Running Lights

This system turns on automatically the low beams at a lower intensity as soon as engine is started and parking brake is released.

This system will be canceled;

- when engine is stopped
- when parking brake is applied
- when the marker light switch is turned on.

**Warning:** Never run vehicle at night with these lights only as they have a lesser intensity, and the system does not turn on the marker and clearance lights.

## Fog Lights (optional)

The halogen fog lights recessed in front bumper allow the driver a better visibility in foggy weather, and improve the range of vision just ahead of vehicle. They are also a useful "active safety" factor. For location of ON/OFF switch, see page 2-14.

**Note:** Some States or Provinces may restrict the use of these lamps. Verify regulations governing each State and/or Province before using fog lights.

## Docking and Cornering Lights (optional)

Two (2) halogen lights are installed on each side of vehicle: one near the front and one near the rear.

When the switch (see page 2-15) is set to the "Docking" position, the four (4) lamps light simultaneously in order to facilitate "docking" procedure.

When the switch is set to the "Cornering" position and the left or right turn signal is selected, the corresponding cornering light will illuminate to increase lateral visibility.

## Alarm System

As an added protection to indicator lights, Prévost vehicles are equipped with audible alarms to inform the driver of the following operating conditions:

| Indicator lights | Audible alarm | Condition                                                                                    |
|------------------|---------------|----------------------------------------------------------------------------------------------|
| Air primary      | Buzzer        | Low air pressure                                                                             |
| Air secondary    | Buzzer        | Low air pressure                                                                             |
| "Do not shift"   | Buzzer        | Inhibits shifting of transmission                                                            |
| Tag axle         | Beep          | Tag axle wheels up                                                                           |
| N/A              | Beep          | Ignition "OFF", parking brake not applied and/or pressure is applied on service brake pedal. |
| N/A              | Bell ringing  | Fire in engine compartment                                                                   |

**Note:** The alarms for both primary and secondary low air pressure are produced by the same buzzer.

## Safety Equipment

### Extinguishers

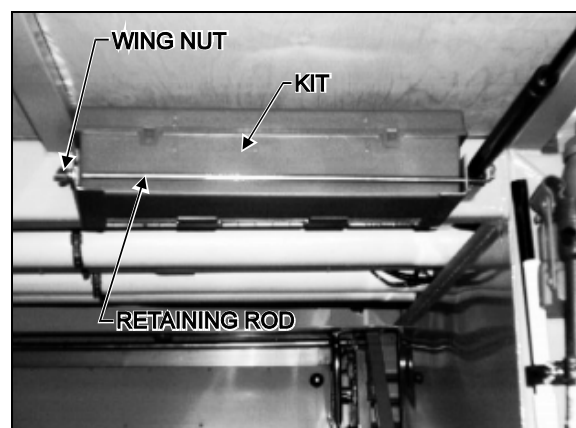
Two fire extinguishers are provided with the vehicle and are installed behind the driver's seat along the wall. Use Fire Extinguishers as required, while carefully following instructions on Extinguishers' Labels.

**Note:** Fire extinguishers may have been relocated following interior design and/or State or Provincial regulations.

### Emergency warning reflectors

A kit of triangular reflectors (Qty=3) is provided to warn approaching motorists of an immobilized vehicle in a Breakdown Situation. This device indicates an Emergency Situation by reflecting the light emanating from a light source. The three reflectors should be placed as illustrated on inside face of box cover. This kit complies with FMVSS 125 (Federal Motor Vehicle Safety Standards).

The Kit is located inside Forward Baggage Compartment and can be removed by simply unscrewing Wing Nut and removing Retaining Rod. (May be relocated by Converter).



23010

## Safety Precautions

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

- a) Operation and maintenance of the vehicle must only be performed by qualified personnel.
- b) Always pay attention to pedestrians passing in front and behind the vehicle. Always yield to pedestrians at pedestrian walkways.
- c) Inspect the vehicle before operating (see "WALK-AROUND INSPECTION" on page 6-10).
- d) Make sure good visibility is maintained at all times. Keep windshields clean and free of obstructions.
- e) Make sure all doors are closed and secure before operating the vehicle. Before driving, conduct a "walkaround" inspection to check for security of all baggage compartment doors and equipment access doors.
- f) Adjust the driver's seat so that all controls can be easily reached.
- g) Always wear safety belt when driving.
- h) Check the instrument panel frequently. Do not operate the vehicle when dials or indicators are not in the normal operating condition.
- i) Switch from high beams to low beams when meeting or following other vehicles within 500 feet (150 meters).
- j) Do not drive over obstacles on the road. Empty cartons, piles of leaves, and snowdrifts could conceal hidden dangers that could damage the vehicle suspension and/or underbody.
- k) When turning or changing lanes, signal your intention well in advance.
- l) When approaching to make a right turn, reduce spacing between vehicle and curb to make sure other vehicles cannot pass on the right. Since the coach makes wide turns, allow enough space to make safe turns.
- m) 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 coach.

- n) The service life of the vehicle depends on the kind of maintenance it receives. Always record any problems and report them to your mechanic immediately.
- o) Unless stated otherwise, shut-off engine before fueling, adding oil or performing maintenance or servicing tasks.
- p) Do not run the engine or HVAC system with access doors left open. Close compartment doors before operating any equipment.
- q) 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.
- r) Fuel is highly flammable and explosive. Do not smoke when refueling. Keep away from open flames or sparks.
- s) Do not attempt to push or pull-start a vehicle equipped with an automatic transmission.
- t) For additional information about safe driving practices, contact the local department of motor vehicles authority.

## Defensive Driving

- a) To keep the vehicle from drifting across lanes during highway driving, always look over the horizon on the road ahead.
- b) Don't stare at the road ahead. Keep your eyes moving. Check all mirrors and dashboard instruments frequently.
- c) Establish eye-to-eye contact with other drivers and with pedestrians. Use headlights, high-beams and low-beams, turn signals and horn(s) as needed.
- d) 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. Use increased travel intervals for night driving and in bad weather.
- e) Adjust your speed according to the road conditions, traffic and visibility. Never exceed the posted speed limits.
- f) Reduce your speed if other vehicles are following too closely behind and let them pass.
- g) Be prepared to stop when approaching an intersection. The stopping distance of the vehicle increases with its weight and speed.
- h) For additional information about defensive driving practices, contact your local department of motor vehicles authority.



# Starting and Stopping Procedures

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## General Information

**Caution:** Read this section of manual before driving vehicle.

## Starting Engine From Driver's Compartment

The following procedure is used to start and stop the engine from the driver's compartment.

### Starting Engine

1. Make sure the starter selector switch in engine compartment is set to the "NORMAL" position and that main battery disconnect switch (see page 2-2) is set to the "ON" position.
2. Make sure the parking brake control valve knob, located on R.H. lateral console, is pulled all the way up, so that the spring-loaded parking brakes are applied.
3. Make sure transmission is in neutral.
4. Turn ignition key to "START" position, then release it as soon as engine starts.

**Note:** If engine does not start, ignition key must be returned to the "OFF" position prior to restarting.

**Caution:** Special precautions are necessary with turbocharged engines to avoid possible turbine damage. After starting, run the engine at low idle for two minutes to allow flowing of lubricant to the turbocharger. Afterwards, run at fast idle and check oil pressure before attempting to drive the vehicle.

Do not engage starter for more than 15 seconds at a time. If engine does not start within 15 seconds, release ignition key and allow starter to cool for one (1) minute before engaging starter again. Continuous use of the starter without allowing a cooling period may damage the starter motor.

With DDEC engines, pressure must not be applied on accelerator pedal before starting. An application on pedal will induce a fault information to the Electronic Control Unit, thus affecting the fuel system control.

If accelerator pedal is depressed inadvertently, release it and wait approximately 30 seconds before resuming starting procedure.

## Stopping Engine

1. Apply parking brake then set transmission to the neutral position.
2. Allow engine to run at slow idle for at least two minutes, then shut off engine. This will ensure that the turbine speed has dropped, and the engine exhaust gas temperature is down to approximately 300°F.

**Caution:** Do not shut the engine down directly from high rpm.

If vehicle is parked and left unattended for an extended period of time, main battery disconnect switch (see page 2-2) should be set to the "OFF" position.

## Starting Engine From Engine Compartment

The following procedure is used to start and stop the engine from the engine compartment.

### Starting Engine

Switches for starting and stopping the engine from the engine compartment are mounted on the R.H. side of rear junction box.

**Warning:** Before attempting to start engine from engine compartment, make sure parking brake is applied and transmission is in neutral.

1. Make sure the starter selector switch in engine compartment is set to the "REAR START" position and the main battery disconnect switch (see page 2-2) is set to the "ON" position.
2. Press starter push-button switch and release as soon as engine starts.

**Warning:** Stay away from moving parts, and do not wear loose clothes (no neckties, open jackets, shirttails, etc.).

**Caution:** Steps previously explained with respect to starter use also apply in this situation.

### Stopping Engine

Stop only by turning the starter selector switch to the "OFF" position.

## Starting Engine When out of Fuel

The problem with restarting a diesel engine that has run out of fuel, is that after the fuel is exhausted from the tank, it is pumped from the primary fuel filter or the fuel filter/water separator, if vehicle is so equipped, and sometimes partially removed from the secondary filter resulting in an insufficient fuel supply to sustain engine firing. The primary fuel filter or fuel filter/water separator and secondary filter must be free of air in order for the systems to provide adequate fuel for the injectors. When the engine runs out of fuel, the following operations must be performed before restarting.

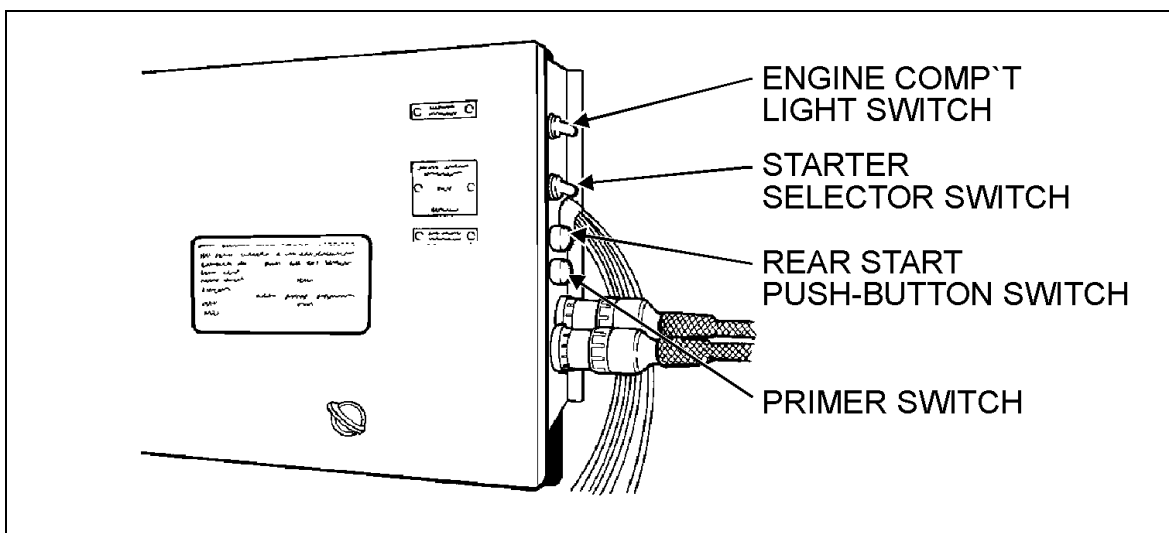
Fill fuel tank with the recommended fuel oil. If only partial filling is possible, add a minimum of 10 gallons (38 liters) of fuel.

### If the vehicle is equipped with an optional priming pump:

Start the priming pump. The switch is located in the engine compartment on rear junction box just below "Rear Start" push-button switch. Start the engine and check for leaks.

### If the vehicle is not equipped with a priming pump.

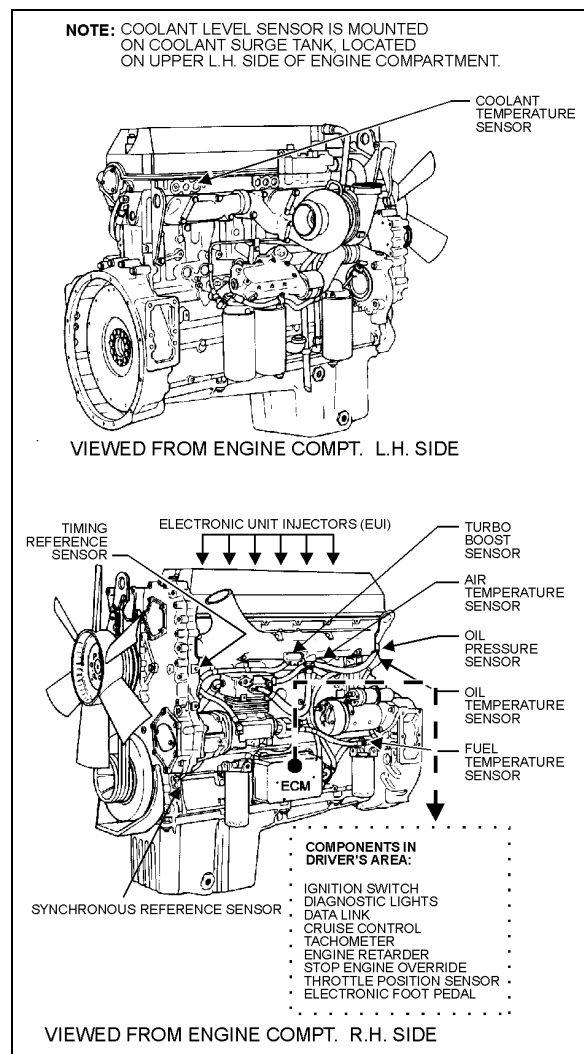
1. Unscrew the cap on the priming valve located on the secondary filter.
2. Direct fuel under pressure 25 psi (172 kPa) to the priming valve using a quick coupling.
3. Start the engine and check for leaks.



01037M

## Detroit Diesel Electronic Control (DDEC)

The major components of DDEC are as follows:



01015M

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

Its major components include an Electronic Control Module (ECM), Electronic Unit Injectors

(EUI) and sensors. The ECM is the brain of the DDEC system and is located between primary and secondary fuel filters. Within the ECM is the 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, plus an engine protection system.

The ECM continuously monitors and analyses the DDEC system during engine operation with electronic sensors. The Electronic Unit Injectors (EUI) operate on a principle similar to the mechanical unit injector system. However, a solenoid-operated control valve performs the injection timing and metering functions which make injector timing much simpler and more precise.

DDEC provides the capability to quickly diagnose system malfunctions by 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. Diagnostic codes are logged into the ECM memory and can be read by performing procedure outlined on page 5-7.

### Engine Brake System (Jacobs)

The "Jake brake" is a diesel engine retarder that uses the engine itself to aid in slowing and controlling the vehicle. When activated, the "Jake brake" alters the operation of the engine's exhaust valves so that the engine works as a power-absorbing air compressor. This provides a retarding action to the wheels.

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

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

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

**Note:** Engine brake is operative only when accelerator pedal is released, and when engine speed is over 900 rpm.

Each time the engine brake system is in operation, the stoplights will automatically light up.

## World Transmission WT Electronic Control System

The WT Electronic Control System consists of five (5) major components connected by wiring harnesses - Electronic Control Unit (ECU), direct electronic communication, three (3) speed sensors, push-button shifter, and control module (which contains solenoid valves and a pressure switch). The throttle position sensor, speed sensors pressure switch, and push-button shifter transmit information to the ECU. The ECU processes this information and sends signals to actuate specific solenoids located on the control module in the transmission. These solenoids control both the oncoming and offgoing clutch pressure during a shift.

Another feature of the World Transmission is its ability to adapt or "learn" as it operates. Each shift is electronically measured, stored and used by the ECU to adapt and "learn" the optimum conditions for future clutch apply and release. It is important to note that if the shift quality of low mileage vehicles or vehicles with new or recalibrated ECU's is unacceptable, simply drive the vehicle through its shift ranges for awhile. After this "learning" period any rough shifting will be corrected and shift quality will be restored.

In addition to controlling the operation of the transmission, the ECU monitors the system for conditions that could result in damage to the transmission or improper vehicle operation. When one of these conditions is detected, the ECU is programmed to respond automatically in a manner which will ensure safe operation of the vehicle and the transmission.

## Torque Converter

The torque converter consists of three (3) elements - pump, turbine, and stator. The pump is the input element and is driven directly by the engine. The turbine is the output element and is hydraulically driven by the pump. The stator is the reaction (torque multiplying) element. When the pump turns faster than the turbine, the

torque converter is multiplying torque. When the turbine approaches the speed of the pump, the stator starts to rotate with the pump and turbine. When this occurs, torque multiplication stops and the torque converter functions as a fluid coupling.

The lockup clutch is located inside the torque converter and consists of three (3) elements - piston, clutch plate/damper, and backplate. The piston and backplate are driven by the engine. The clutch plate/damper, located between the piston and backplate, is splined to the converter turbine. The lockup clutch is engaged and released in response to electronic signals from the ECU. Engagement of the lockup clutch provides a direct drive from the engine to the transmission gearing. This eliminates converter slippage to provide maximum fuel economy. The torsional damper absorbs engine torsional vibration.

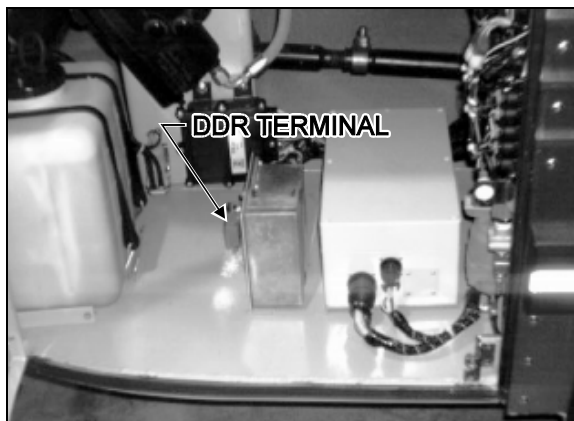
The lockup clutch releases at lower speeds and when ECU detects conditions requiring it to be released.

## Planetary Gears and Clutches

A series of three (3) helical planetary gear sets and shafts provides the gear ratios and direction of travel for the vehicle. The planetary gear sets are controlled by five (5) multiplate clutches that work in pairs to produce six (6) speeds. The clutches are applied and released hydraulically in response to electronic signals from the ECU to the appropriate combination of solenoids.

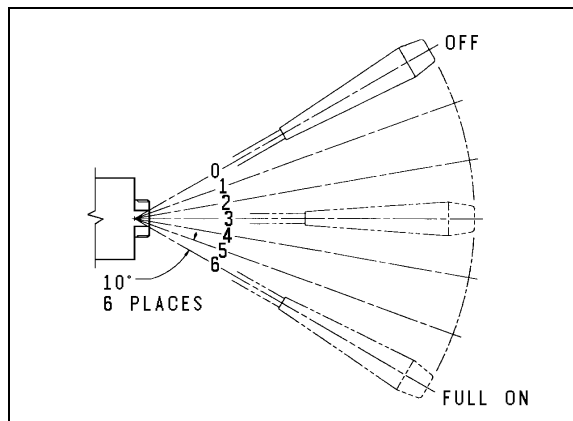
## Cooler Circuit

The transmission oil is cooled by a remote-mounted oil cooler. Connections to the cooling circuit are located at the rear of the transmission to facilitate installation of remote cooler lines. Oil ports are internal requiring only coolant to be routed to and from the cooler.



STEERING COMPARTMENT

07005



18018

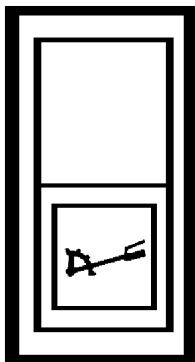
To enhance troubleshooting and to allow interrogation of the ECU for valuable service information, a DDR (diagnostic data reader) can be used. To use it, plug the appropriate connector (not furnished by the manufacturer) in the terminal located in the steering compartment or the DDR connector located on L.H. side control panel. You can also use your push-button shifter to perform certain maintenance operations (see page 4-6 under "Diagnostic codes").

**Output Retarder (optional)**

The purpose of the retarder is to assist in stopping the vehicle during stop and go driving and to control the downhill speed of the vehicle on a grade. For both of these uses, the retarder serves to extend the life of the service brakes and to enhance vehicle control. The retarder system is activated by turning "ON" the retarder enable switch (L.H. side control panel-item #4 on page 2-4).

The retarder controls are broken down into two (2) types:

**BRAKE APPLY** - actuated by brake pressure; applies the retarder at three (3) distinct retardation levels (low = 1/3 - 2 psi, medium = 2/3 - 4 psi, and "full on" - 7 psi) when increasing pressures are detected in the brake system.



18017

**Warning:** Always manually disable the retarder controls (turn off enable switch) during inclement weather or slippery road conditions.

**AUTOMATIC APPLY** - actuated by hand lever located on R.H. side of steering column; retarder capacity is determined by hand lever which permits the operator to select "OFF", or one of six (6) levels of automatically-commanded retardation, the highest of which is maximum retarder capacity "full on".

The controls may be used in combinations such that the retarder can be activated when either of the two (2) controls are actuated. (If both are actuated simultaneously, the level of retardation will correspond to higher input signal).

The optimum retarder control will depend on the vehicle type and retarder use. In general maximum brake savings occur with increased retarder use. In stop and go driving, retarder use can be maximized by using the "BRAKE APPLY". For downhill speed control, the "AUTOMATIC APPLY" may provide the best operator control.

When the vehicle is equipped with the anti-lock braking system (ABS) and the system is activated, the transmission controls "ABS input" is used to disengage the retarder and the transmission lockup clutch, thus enhancing performance of the ABS system.

**Diagnostic Telltales**

Two (2) diagnostic features are available with the transmission control system to assist in troubleshooting of malfunctions and/or the monitoring of specific operating parameters. These features include a "DO NOT SHIFT" light on the dashboard, and the Diagnostic Data Reader (DDR). When a malfunction is detected in the control system, a series of "diagnostic codes" are used to identify and clarify the nature of the malfunction.

### Do Not Shift - Light

The "DO NOT SHIFT" light is located on dashboard.

Illumination of this light, accompanied by eight (8) seconds of short beeps from the shifter, indicates that shifts are being restricted. The *SELECT* digit on the display will be blank. Operation may continue in order to reach service assistance. The ECU may not respond to shifter requests, since operating limitations are being placed on the transmission, i.e. upshifts and downshifts may be restricted. Direction changes will not occur.



18016

The ECU will not respond to operator requests while *DO NOT SHIFT* is indicated.

Any time this light has been illuminated, the ECU will register a diagnostic code. It may be identified on the digital display and/or the Diagnostic Data Reader (DDR).

### Diagnostic Data Reader (DDR) (optional)

The purpose of the DDR is to assist in the installation checkout and the troubleshooting of malfunctions as detected by the ECU. The DDR is a portable microcomputerbased receiver/transmitter/display unit. The DDR transmits and receives data to/from the ECU, processes the data and displays appropriate information to the servicer. Operating instructions are supplied with each DDR.

### Diagnostic Codes

Illumination of the *DO NOT SHIFT* light during vehicle operation (start-up), indicates that the ECU has registered a diagnostic code. A summary of diagnostic codes with each associated transmission response is shown on pages 5-10 through 5-20.

Diagnostic codes can be displayed either by the DDR or on the digital display of the shifter. The following information describes use of the diagnostic capabilities of the system without the DDR.

Up to five (5) diagnostic codes can be registered in the ECU at one time. In addition to the code itself, additional information for each code is available: whether or not any inhibits resulting from the code are active; ignition cycle counts to indicate the frequency of the code occurrence. After a fixed number of ignition cycles, any code

will automatically disappear from memory if it has not reoccurred.

The general procedure to display the codes is to first enter the diagnostic mode. This is accomplished by pressing the upshift and downshift arrow buttons simultaneously on the push-button shifter. The Diagnostic Display Mode may be entered for viewing of codes at any speed. Codes can only be cleared when the output speed = 0 and no output speed sensor failure is active. For each code stored in memory, beginning with any code that is presently inhibiting the transmission, the four (4) digits of the code and the pertinent parameters are continuously flashed on the display. Pressing the mode button once will cause the next code with pertinent information to be displayed. Dashes indicate all stored codes have been displayed.

To clear any active inhibits, the mode button must be depressed and held for an extended length of time. To clear the code from memory, The mode button must be pressed and held for a longer period of time. All active inhibits will also be cleared during a normal powerdown (ignition switched off followed by zero output and zero engine speeds).

### Importance of Proper Oil Level

1. Maintaining the proper oil level is very important. The transmission oil is used to apply clutches and to lubricate and cool the components. If the oil level is too low, the result can be poor performance because clutches will not receive adequate oil supply. If the oil level is too high, overheating results from the oil being churned and aerated.
2. Always check the oil level at least twice to ensure that an accurate check is obtained.
3. Transmission input speed and oil temperature significantly affect the oil level. An increase in input speed lowers the oil level; an increase in oil temperature raises the oil level. Thus, the oil level must always be checked with the engine running at idle (approximately 500 rpm), the parking brake applied, and the transmission in neutral. A final check of the oil level must be made when the transmission reaches normal operating temperature (160 - 250°F; 70 - 120°C).

**Fill Pipe Protection**

When adding oil or checking oil level, dirt or foreign material must not be allowed to enter the filler tube. Before removing the dipstick, clean around the end of the filler tube. Refer to "Care & maintenance" section for manual oil level check procedure.

**Readout of the Oil Level Sensor**

The oil level sensor (OLS) is designed to measure transmission oil level only when a specific combination of operating conditions exist:

- engine must be at idle
- **NEUTRAL** must be selected
- zero output speed
- transmission oil must be within a "normal" temperature band
- once the first four (4) conditions are met, a "waiting" period must pass (approx. 2 min., to facilitate consistent oil drainback) before oil level measurement may begin.

To enter OLS readout mode (after meeting the conditions noted above), simultaneously press the *UPSHIFT* and *DOWNSHIFT* arrows on the shifter. If the five (5) conditions noted above are present, the display will immediately enter the reading mode. If the "waiting" period has not elapsed, the left digit of the display will become a "chasing" digit and the right digit will count down from (8) to (1) until the waiting period is complete.

After attaining the reading mode, the display will flash "OL-OK", "LO-01", "HI-02", etc., where the suffix "01" or "02" indicate the volume of oil (in quarts) low or high.

At any time in this sequence, simultaneously pressing the **UPSHIFT** and **DOWNSHIFT** arrows directs the ECU to enter the transmission diagnostic mode as described under "Diagnostic Codes" on page 4-6. D, N, or R may also be selected on the shifter at any time - the OLS mode will abort and normal transmission will commence. Shifts are not inhibited.

**Oil Level Sensor (OLS) Codes**

| <u>CODE</u> | <u>CAUSE OF CODE</u> |
|-------------|----------------------|
| OL-OK       | oil level is correct |
| LO-01       | one quart low        |

|       |                               |
|-------|-------------------------------|
| LO-02 | two quarts low                |
| HI-01 | one quart high                |
| HI-02 | two quarts high               |
| 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                |

**Cold Weather Starting**

**Cold Starting Aid (Ether)(optional)**

The vehicle may be equipped with an electrically-operated ether cold starting aid designed to ease engine starting when temperature is below 35°F (2°C). The control rocker switch, located on the L.H. lower switch panel (see page 2-13), is provided with a locking mechanism to avoid accidental use when engine is running. To activate the ether starting aid, proceed as follows:

**Caution:** Do not use additional ether discharge shots during engine starting.

Do not discharge several shots during ether starting aid procedure. The valve is gauged in function of engine cylinders; Too much ether may be detrimental to engine cylinders, moreover it may render the warranty null & void.

1. Prior to cranking engine, slide down lock tab while pressing rocker switch for three (3) seconds to fill solenoid valve.
2. Release switch to discharge shot.
3. Allow three (3) seconds for shot to discharge.
4. Start engine, use additional shots if necessary to keep engine running.

**Caution:** This practice should be performed only when absolutely necessary. Excessive use of fluid could result in serious engine damage.

## Engine Block Heater (optional)

The vehicle is equipped with an engine immersion-type electric block heater to assist cold weather starting. The heater male electric plug is easily accessible through the engine oil reserve tank access door. To use it, connect the female plug of an electrical extension cord to the heater plug. Some converted vehicles may have the heater connected to the coach AC power system. The extension cord must be plugged into a 110-120 V AC power source only. The engine block heater should be used whenever the vehicle is parked for an extended period of time in cold weather and a suitable power source is available.

**Caution:** Use only a 110-120 V AC power source. Extension cord must be of the grounded type (three prongs) and have a minimum rated capacity of 15 amps. Be sure to disconnect cord before starting and/or moving the vehicle.

## Engine Warm-Up

After starting the engine, run it at low idle for two (2) minutes to allow flowing of lubricant to the turbocharger, then increase speed to fast idle for warm-up period by using "FAST IDLE" switch located on L.H. lower switch panel (see page 2-13). Run the engine at fast idle and no load for about five (5) minutes to allow it to warm-up before applying a load. Parking brakes should be kept applied throughout warm-up. Gauges and indicator lights should be monitored to check that all conditions are normal. If an abnormal condition should develop, stop engine immediately and have condition corrected.

**Warning:** Never let the engine run in an enclosed, non-ventilated area. Exhaust fumes from the engine contain dangerous gases which can be fatal if inhaled.

**Note:** The engine will come up to normal operating temperature shortly after you start driving; if possible, avoid going to full throttle until engine coolant temperature reaches 140°F (60°C).

## Transmission Warm-Up

When temperature is below -20°F (-29°C), the "DO NOT SHIFT" and "CHECK TRANS" will stay "ON" after the engine is started. The transmission will stay in neutral, regardless of the gear range selected until it warms past -20°F (-29°C).

At that point, the "DO NOT SHIFT" light will turn off and the transmission will operate only in first gear or reverse. When the "CHECK TRANS" light goes out at 20°F (-7°C), the transmission is warm enough to safely operate in all gear ranges.

## Routine Inspection Before a Trip and on the Road

### With Engine Stopped

#### General

Check general vehicle condition and verify all exterior lighting. Also check for loose nuts and bolts.

#### Extinguishers

Ensure that fire extinguishers are in working order and easily accessible.

#### Emergency exits

Check that emergency exits can be easily opened.

#### Driver's area

Adjust mirrors and seat.

#### Doors

Make sure that all exterior doors are closed.

#### Tools and spares

Check for wheel nut wrench and jack, door keys, spare belts and emergency reflectors.

#### Washer reservoir

Check that it is full. To prevent the windshield washer fluid from freezing during the winter, use antifreeze windshield washer.

#### Tires

All tires, including the spare, should be inspected for cuts and correct inflation. On both aluminum alloy and steel wheels, nuts should be checked using a torque wrench to specifications given in the Maintenance Manual.



**Wheel bearings**

Check oil level in sight glass (see page 6-4).

**Caution:** *During a fuel stop, especially if a brake job has been performed recently, apply hand on wheel bearing cover and check for overheating.*

**Leaks**

Check thoroughly under vehicle and in compartments. Report all leaks to your nearest Service Center.

**Coolant level**

The cooling system is completely filled when the coolant (cold) is visible in the sight glass on the right side of the surge tank (see page 6-5). If topping-up is necessary, fill the system with the same mixture ratio already used (50-50), as instructed in the "Maintenance Manual".

**Warning:** *Hot engine coolant is under pressure. Never remove cap until coolant has cooled.*

**Engine oil**

Check oil level; refill directly into engine or from reserve tank (see page 6-2).

**Air system**

Purge accessories and wet tanks by opening drain valve (see page 6-4).

**Power steering oil tank**

Check oil level (see page 6-3).

**Belts**

Check for worn belts.

**Belt tensioners**

Visually check belt tension and the space between tensioning bellows' brackets (see page 6-5).

**With Engine Running**

**Note:** *Vehicle must be on level ground.*

**Gauges and buzzers**

Gauges should be in normal position, warning lights and buzzers off.

**Fuel level**

Be sure level is sufficient.

**Transmission**

Check oil level (see page 6-2).

**Leaks**

Inspect around vehicle and listen for any air leak.

**Water separator**

Purge drain valve (see page 6-5).

**Turbocharger**

Look for any leaks or unusual sounds coming from the turbo compressor.

**Service brakes**

Check for pressure build-up. With engine stopped and no brake applied, loss should not exceed 3 psi/min. (21 kPa/min). Make a full brake application; loss should not exceed 7 psi (48 kPa).

**Parking and emergency brakes**

With air pressure above 65 psi (448 kPa), lower pressure with brake pedal applications, check that buzzer works and that control button lifts up. Wait until air pressure exceeds 95 psi (655 kPa) before releasing parking brakes.

## General Instructions

- Make sure the basic principles of operation of the vehicle are understood.
- Maintain the vehicle in good running condition.
- Do not drive your vehicle with an extremely low fuel level. This advice is very important, especially if your vehicle is equipped with an auxiliary fuel tank. Unlike a gasoline engine, if a diesel engine runs out of fuel it will not simply restart after fuel is added to the tank. The engine must be "primed" (see "Starting Engine When out of Fuel" on page 4-2).
- Allow engine to run at slow idle for at least 2 minutes before turning it off.
- Engine should always be at idle speed when shifting from neutral to reverse or forward range.
- Automatic transmission shift pattern does not include a park position. Parking brake must therefore be applied to hold vehicle when it is unattended. Gearshift should then be in neutral position. If engine is stopped without applying the parking brake, a warning buzzer will sound until the parking brake is applied and your foot is removed from the brake pedal.
- Perform procedures as detailed in this manual.
- Unless otherwise specified, engine should be turned off for all lubrication and maintenance procedures.
- Do not attempt to push-start or pull-start the vehicle.
- Do not tow vehicle without first removing the drive axle shafts or disconnecting the drive shaft. Internal lubrication of the transmission is inadequate when the vehicle is towed.
- Fire extinguishers should be accessible at all times. In case of fire, get everyone out of the vehicle, then think of your own safety before attempting to fight the fire.
- When driving on ice or snow, acceleration or deceleration should be done gradually.

**Note:** Normal operation as well as some emergencies or abnormal conditions are covered in this booklet. Any malfunction interfering with satisfactory operation should be corrected immediately, particularly when safety may be involved.

- The Gross Vehicle Weight Rating (G.V.W.R.) and the Gross Axle Weight Ratings (G.A.W.R.), for front, drive and tag axles of your vehicle are listed on a metal certification label affixed below L.H. side control panel in

driver's area. The G.A.W.R. is the maximum load that can be applied on each axle of the vehicle and is more than what is legally permitted on some highways.

To exceed the G.V.W.R. and/or the G.A.W.R., voids the Prévost warranty.

- Do not conceal the serial numbers and certification plates (for locations, refer to "Technical Information" section). Reinstall in same location after installing any trim.
- Installation of odd type and size windows may require cutting the vertical window post of vehicle structure. However, no more than three (3) of these posts should be cut on same side of vehicle and two (2) adjacent posts should never be cut.

**Important:** Violation of these instructions is not safe and constitutes sufficient reason for Prévost to void its warranty on any affected area.

## Heating and Air Conditioning

### Ventilation

Driver should always try to introduce as much circulation of outside fresh air as possible without hampering heating and air conditioning systems. Under extreme temperature conditions however, when maximum capacity is required, the adjustable intake dampers (see following pages) should be closed.

It should be remembered that the inside of vehicle should always be slightly pressurized to minimize the entrance of dust and moisture.

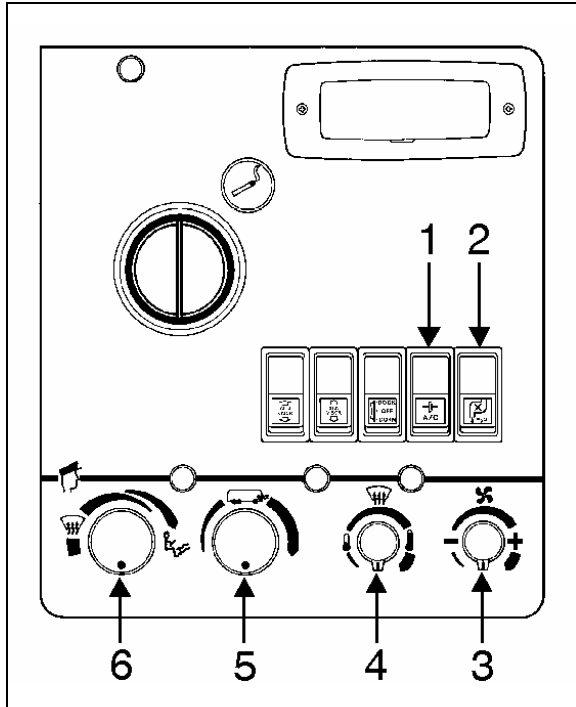
Vehicle heating and air conditioning systems have been designed to allow circulation of some outside fresh air, so windows should be kept closed at all times.

In case of air conditioning system failure, substitute ventilation may be provided by opening roof-mounted emergency vent(s).

**Note:** The driver's area A/C & heating and defrost systems are independent from the central system.

## Driver's Compartment A/C & Heating System

### Vehicles Equipped with Driver's System Only



R.H. CONSOLE

18022M

#### 1. "A/C clutch" switch

Push down rocker switch to operate the air conditioning system, and push up to turn it off.

**Caution:** The air conditioning system should not be used when outside temperature is below 40° F (5° C).

**Note:** During operation of air conditioning system, windows should be kept closed and door not left open longer than necessary.

#### 2. "Hot water pump" switch (optional)

Push down rocker switch to activate the hot water pump, then push up to turn it off.

The use of the hot water pump increases the hot water flow circulating through the heater core, thus delivering more heat.

#### 3. "Fan" speed control

Turn knob clockwise to the first position to obtain minimum air flow to circulate warm, cool or outside air, according to settings of temperature control knob and A/C clutch switch. Turn clockwise again to obtain the desired ventilation speed.

#### 4. "Temperature" control

Once the A/C clutch switch is set to the proper position and fans are on, select the desired temperature by turning the temperature control knob clockwise to raise or counterclockwise to lower temperature. Only a slight movement of knob is generally sufficient to change temperature setting.

Temperature control knob is used to select interior temperature within the range of 65 to 78°F (18 to 26° C). Once temperature is selected, system will automatically maintain it within close limits.

At extreme clockwise position, full heat will be maintained.

**Warning:** Excessive high temperature in driver's area could induce drowsiness, affecting driver's ability to operate the coach safely.

#### 5. "Recirc.-fresh air" control

This knob should normally be rotated clockwise to allow maximum fresh air admission. When outside temperature is extremely high and maximum cooling is required or when outside temperature is extremely low and maximum heating is required, the knob should be rotated counterclockwise to shut off the fresh air admission, thus recirculating the air inside vehicle. This position should also be selected when driving vehicle on dusty roads and in air polluted areas to avoid admission of contaminated air inside vehicle.

**Warning:** Keep in mind that the "Recirc.-fresh air" control must be reset to the "fresh air" position following these special road conditions in order to prevent contamination of air in driver's area.

**Note:** In order to improve air circulation when A/C system is inoperative, open the roof escape(s) and position the "Recirc.-fresh air" control to the extreme right position (fresh-air).

## 6. "Feet air outlet" control

This control is used to control the air flow delivered under the dash on the driver's side. Turn control knob clockwise to increase air flow and counterclockwise to decrease.

## How to Use the Controls

### To ventilate without heat or air conditioning

Turn the "temperature" control knobs to the maximum counterclockwise position (cool), turn the "recirc.-fresh air" control knob to the maximum clockwise position (fresh air), then set the "A/C heat" switch to the "heat" position and turn the fan speed control knob to the desired position.

### To heat

To ensure maximum efficiency of heating system, activate the "Hot water pump" switch, turn the fan speed control to the highest speed position, then adjust the temperature control knob to a comfortable setting.

### To defrost

To obtain the maximum defrosting efficiency, switch the "fan" speed control to the highest position, set the "hot water pump" switch to the "ON" position, turn the "recirc.-fresh air" control knob to the maximum clockwise position (fresh air), turn the "feet air outlet" control knob to the maximum counterclockwise position (defrost position), then turn the "temperature" control to the maximum clockwise position (warm).

### To dehumidify

Because an air conditioner dehumidifies as it cools, you can use it in cool weather to help in drying air. Turn on the "Fan" speed control and set the "A/C clutch" switch to the "ON" position, turn the "feet air outlet" control knob to the maximum counterclockwise position (defrost position), then adjust the "temperature" control to a comfortable setting.

**Caution:** The air conditioning system should not be used when outside temperature is below 40° F (5°C).

## To turn everything OFF

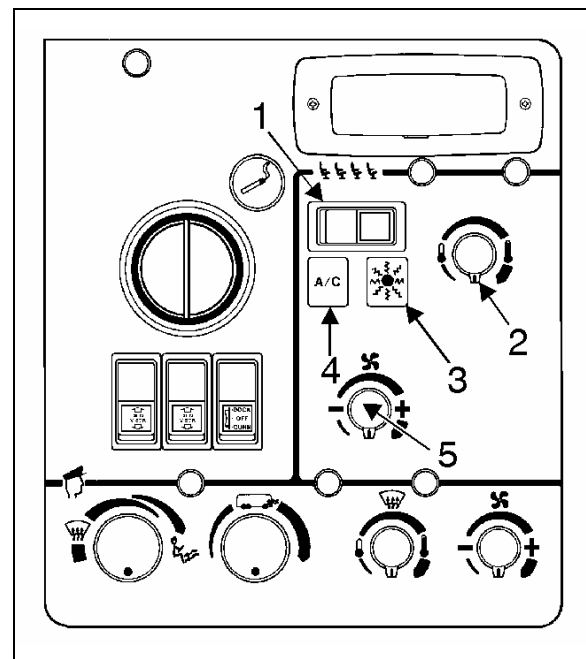
Set the "A/C clutch" switch, "hot water pump" and "fan" speed control knob to the "OFF" position and turn the "temperature" control knob to the maximum counterclockwise position (cool).

## Vehicles Equipped with Driver's and Central System

The controls used are the same as for vehicles equipped with a driver's system only, with the exception that there is no independent "hot water pump" and "A/C clutch" switches. Instead, there is one two-way switch as described on the next page.

**Note:** The driver's heating and defrost systems are independent from the central system.

## Central A/C & Heating System



R.H. CONSOLE

18023M

### 1. "A/C heat" switch

This switch has three positions: "A/C - OFF - HEAT". Set the switch to:

- "A/C" position (L.H. side) when vehicle's interior needs to be cooled or dehumidified.
- "HEAT" position (R.H. side) when vehicle's interior needs to be warmed or ventilated.

- "OFF" position (center) before stopping the vehicle.

**Note:** Fuel economy is slightly reduced when "A/C" position is used.

To operate air conditioning system when vehicle is stationary, run engine at fast idle. During operation of air conditioning system, windows should be kept closed and door not left open longer than necessary.

In order to prevent battery discharge, A/C & heating system will not operate if battery charging system is not working properly.

**Caution:** "A/C" position should not be used when outside temperature is below 40°F (5°C).

While the A/C system is running, make sure the vehicle is parked at least four (4) feet (1,2m) from other vehicles and/or buildings to allow a sufficient air flow through the condenser core.

## 2. "Temperature" control

Once the A/C clutch switch is set to the proper position and fans are on, select the desired temperature by turning the temperature control knob clockwise to raise or counterclockwise to lower temperature. Only a slight movement of knob is generally sufficient to change temperature setting.

Temperature control knob is used to select interior temperature within the range of 65 to 78°F (18 to 26° C). Once temperature is selected, system will automatically maintain it within close limits.

At extreme clockwise position, full heat will be maintained.

## 3. "Heat" indicator light

This indicator will be illuminated when hot water is circulating through the water valve, no matter which mode has been selected (A/C or heating).

## 4. "A/C" warning light

This light is designed to light up when the "A/C" system is not working properly. If this happens, first stop "A/C" system, then perform the following checks:

- Check the condenser for obstruction. Clean if necessary. (Refer to "Maintenance Manual").

- Check that the evaporator and condenser motors are operating.
- Check evaporator filter for cleanliness. Clean or replace as required. (Refer to "Care and Maintenance" section, page 6-9).
- Check the air return duct(s) for obstruction. Ducts are located on the left side or on both sides of the vehicle floor, approximately in the center. Clean if necessary.

After these checks, test the system. If the "A/C" warning light does not turn off, set the "A/C - heat" switch to "OFF" position, and seek qualified service assistance.

## 5. "Fan" speed control

Turn knob clockwise at the first position to obtain minimum air flow and to start "Driver's system" to circulate warm, cool, or outside air, according to settings of temperature control knob (driver's), "A/C-heat" switch and "Recirc.-fresh air" control. Turn clockwise again to obtain the desired ventilation speed.

## How to Use the Controls

### To ventilate

Turn the "temperature" control knobs to the maximum counterclockwise position (cool), then set the "A/C - heat" switch to the "Heat" position.

### To heat

To ensure maximum efficiency of heating system, set the "A/C - heat" switch to the "heat" position, switch the fan speed control to the highest speed position, then adjust the temperature control knobs to a comfortable setting.

### To defrost

To obtain the maximum defrosting efficiency, switch the "fan" speed control to the highest position, set the "hot water pump" switch to the "ON" position, turn the "recirc.-fresh air" control knob to the maximum clockwise position (fresh air), turn the "feet air outlet" control knob to the maximum counterclockwise position (defrost position), then turn the "temperature" control to the maximum clockwise position (warm).

### To dehumidify

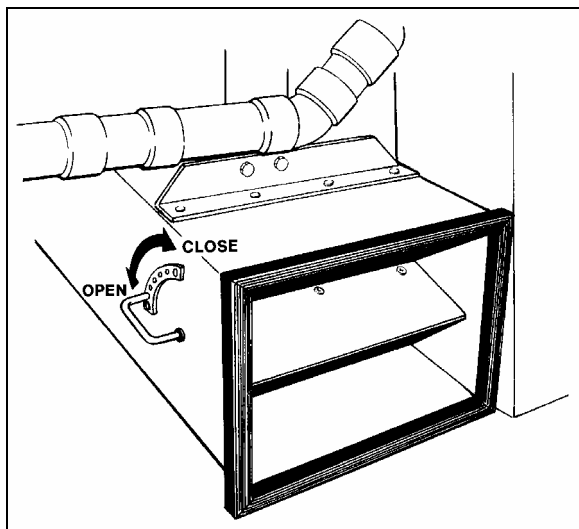
Because an air conditioner dehumidifies as it cools, you can use it in cool weather to help in drying air. Set the "A/C - heat" switch to the "A/C" position, then adjust the "temperature" control to a comfortable setting. With this set-up, the A/C and heating will run simultaneously, thus drying air as it flows through the evaporator and then heating it as it flows through the heater radiator.

**Caution:** *The air conditioning system should not be used when outside temperature is below 40° F (5°C).*

### To turn everything OFF

Set the "A/C heat" switch and "fan speed" control knob to the "OFF" position and turn the "temperature" control knobs to the maximum counterclockwise position (cool).

An adjustable air intake damper is located in the evaporator compartment (third compartment on the L.H. side of vehicle). The damper should normally be left open. However, under extreme temperature conditions, it can be closed or partially closed to block the addition of ambient air and heat or cool air inside of coach as desired. As soon as extreme heating or cooling is no longer required, the damper should be reopened.



22004

## Preheating Systems (optional)

### Espar (Eberspächer):

#### Description of operations

This Auxiliary Preheating System is used for preheating and retaining the heat of water-cooled engines. It can be used before starting the engine to ease its starting and to provide immediate inside heat upon operation of the heating system. It can also be used with engine running to maintain coolant heat and maintain the set temperature inside vehicle.

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

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

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

The hot combustion gases are diverted at the end of the flame pipe, then pass through the indirect heating surfaces of the heat exchanger and transmit their heat to the water passing through the heat exchanger.

The heat is thermostatically controlled, and operates intermittently, i.e. the switched-on times of the burner vary depending on the heat requirement. The water temperature depends on the setting of the built-in water thermostat.

The water circulation pump remains in operation as long as the heater is operating - even in the regulation intervals and during the delayed cutout of the switched-off heater. The pump can also be operated independently of the heater by means of an appropriate circuit. The heater can be switched on at any time, i.e. during the delayed cutout period too. Ignition takes place once this delay time is over.

When the heater is switched off, the fuel supply is interrupted. The flame goes out, and at the same time a delayed cutout of some 2.5 minutes begins. The combustion air still flowing flushes

the remaining combustion gases out of the chamber and cools off the hot parts on the exhaust side of the heat exchanger, while the water circulation pump still running transmits the heat present in the heat exchanger, thus preventing local overheats. Once the delayed cutout time is over, both the combustion air blower and the water circulation pump switch off automatically. A cutout will take place in case of any failure of the preheater.

### Webasto:

#### Description of operations

Switch on the heater, the operation indicator lamp comes on and the heater motor & circulating pump begin to run. After about 10-25 seconds the solenoid valve opens and fuel is sprayed into the combustion chamber. At the same time the electronic ignition unit produces high voltage (8000V) and the mixture of fuel and air in the combustion chamber is ignited by the spark on the ignition electrodes. The flame is indicated by the flame detector, then the electronic ignition unit stops producing high voltage and combustion continues by itself (spark on electrodes is required only to ignite the flame). At this moment the heater is working and produces heat.

If the heater is switched off by the on/off switch, the solenoid valve interrupts fuel supply, combustion stops and indicator lamp turns off. Combustion air fan still blows air, cleaning the combustion chamber of any fumes and cooling down the combustion chamber. Coolant circulation pump pumps coolant, making a purge cycle for approximately 2-3 minutes, thus protecting the heater against overheating.

If the heater is not switched off by the on/off switch, the control thermostat will switch off the heater when coolant temperature reaches  $165^{\circ} \pm 6^{\circ}\text{F}$  ( $75^{\circ} \pm 3^{\circ}\text{C}$ ) and turns it on at  $154^{\circ} \pm 9^{\circ}\text{F}$  ( $68^{\circ} \pm 5^{\circ}\text{C}$ ). During this time the heater (combustion) is off, the indication lamp and coolant pump are on. Combustion air fan blows air for 2-3 minutes and then turns off.

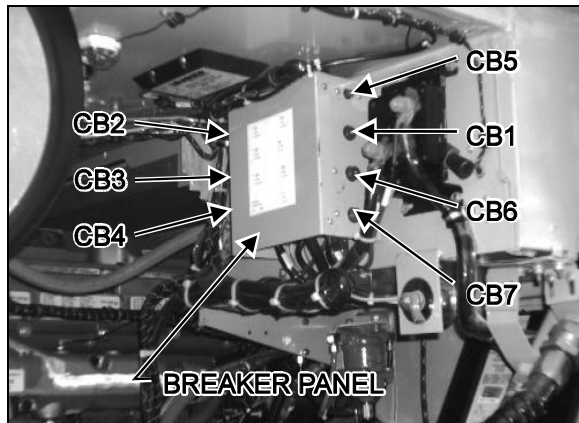
## Main Breakers

Nine (9) main breakers may be installed on your vehicle; six (6) of which are standard and three (3) supplied only on vehicles with central A/C system. Breakers CB2 to CB7 are standard and

## STARTING AND STOPPING PROCEDURES

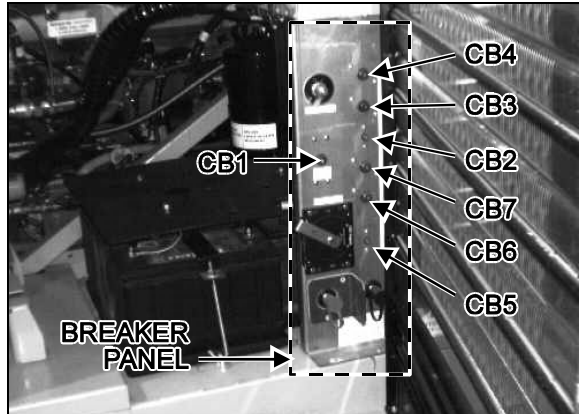
breakers CB1, CB8 & CB9 are optional. Breakers are located as follows:

On **XL-40 & 45E**, breakers CB1 to CB7 are installed on breaker panel located in Engine Compartment. They are accessible through engine R.H. side door.



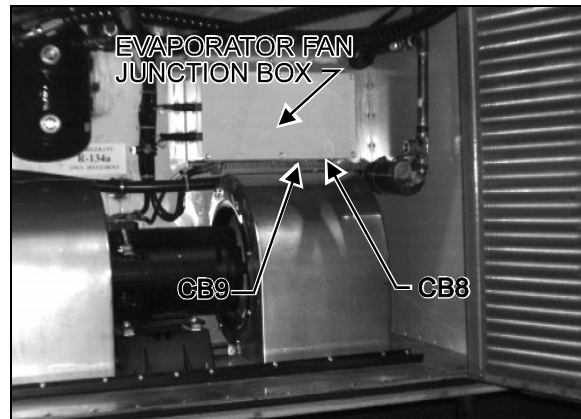
06042

On **XL-45**, breakers CB1 to CB7 are installed on breaker panel located in Engine Compartment. They are accessible through engine R.H. side door.



06033M

On all vehicles, optional breakers CB8 & CB9 are installed on Evaporator Fan Junction Box located in Condenser Compartment.



06044

## Windshield Washer Reservoir

Windshield washer reservoir is located in front left compartment (steering compartment) below driver's floor. This reservoir has a capacity of approximately 5 U.S. gallons (18.9 liters). Its spin-on type cover is provided with a removable cap to ease windshield washer reservoir filling. Reservoir supply should be checked regularly.

Spray jets are mounted under windshield wiper arms. The reservoir's fluid is forced by air pressure through rubber tubes into spray jets and onto windshield.



23011



## Jump Starting

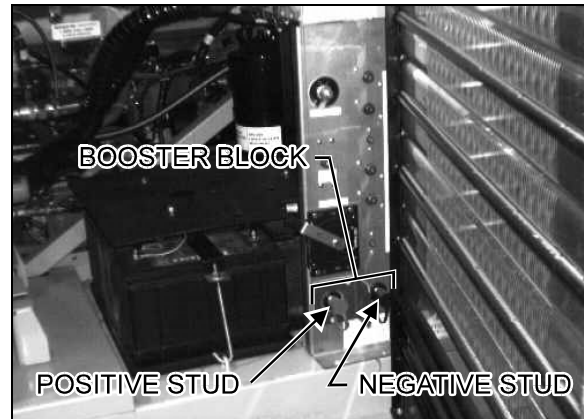
Whenever it becomes necessary to start the engine while batteries are discharged, use another power source of the same voltage (24 volt DC), negative grounded and proper jumper cables.

**Warning:** Procedures other than the one outlined could cause injury or damage from battery acid spray, explosion, or charging system overload.

- Never connect to the negative post of the discharged battery.
- Never allow the two vehicles or the jumper cable clamps to touch each other.
- Never attempt to jump start a vehicle if the discharged battery fluid is frozen or if the battery fluid level is low, as the battery may rupture or explode.
- Do not jump start vehicles equipped with maintenance-free batteries if the test indicator is light yellow.
- Turn off all lights, heaters and other electrical accessories. Make sure the parking brake is applied and the transmission is set to "NEUTRAL" before attempting to jump start the engine.
- Wear eye protection and remove rings, watches with metal bands and other metal jewelry.

1. Connect one end of the red jumper cable to the positive (+) post of the booster power source.
2. On **XL-40 & 45E** vehicles, remove the gray protective sealant from the 24 volt battery disconnect switch post, then connect the other end of the red jumper cable to this post according to the illustration on page 4-18 (it may be necessary to also remove the insulating varnish on the battery switch disconnect post).
2. On **XL-45** vehicles, remove the red protective cap from Booster Block's Positive Stud, then connect the other end of the red jumper cable to this stud (see illustration on this page).
3. Connect one end of the black jumper cable to the negative (-) post of the booster power source.

4. On **XL-40 & 45E** vehicles, remove the gray protective sealant from the engine ground stud fixed on frame, then connect the other end of the black jumper cable to this stud as shown on illustration (page 4-18).
4. On **XL-45** vehicles, remove the black protective cap from Booster Block's Negative Stud, then connect the other end of the black jumper cable to this stud (see illustration below).



06033M

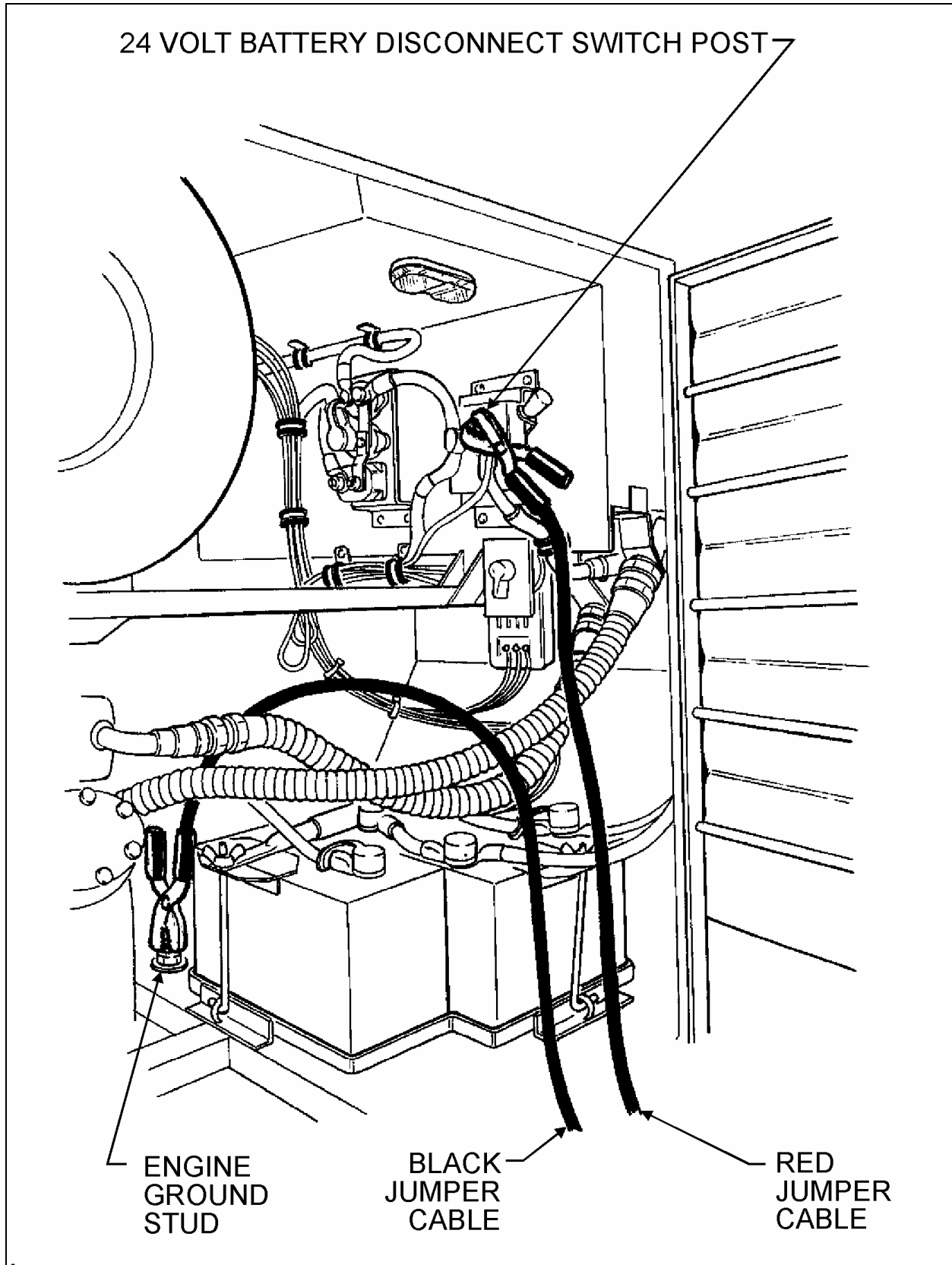
5. Start the engine in the vehicle that is providing the jump start. Let the engine run for a few minutes, then start the engine in the vehicle that has the discharged batteries.

**Warning:** Do not engage starter for more than 15 seconds. Allow starter time to cool before engaging again. This will prevent starter from overheating and will allow time delay relay to cool.

6. To remove the cables, perform the above procedure in reverse order, then replace the protective sealant, if possible.

**Note:** Jumper cables must withstand 500 cranking amperes. If cable length is 20 feet (6 m) or less, use 2/0 (AWG) gage wires. If cable length is between 20-30 feet (6-9 m), use 3/0 (AWG) gage wires.

**Note:** If, after doing this procedure, Starter turns but Engine still doesn't run; (with Jumper Cables in place) wait approximately 15 minutes (to give battery equalizers time to balance 12V and 24V charges), then try again. If engine still doesn't run, repeat procedure once again.



## Tires

### Tire Pressure

The condition and pressure of the tires can greatly affect both useful tire life and road safety.

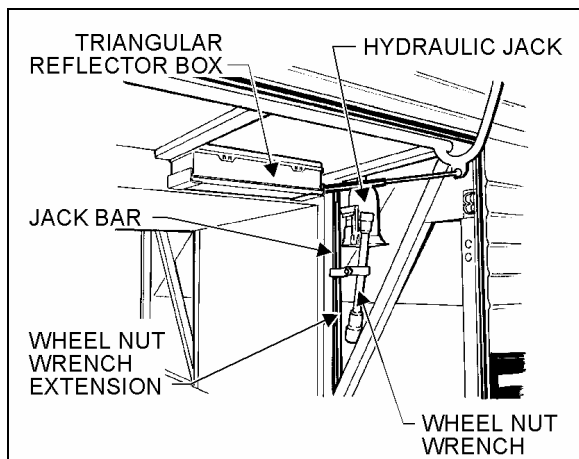
**Note:** The recommended tire inflation pressures are given in the "Technical Information" section, page 5-2. Also, cold tire inflation pressures are listed on the Department of Transport's certification plate, affixed below L.H. side control panel in driver's compartment.

At regular intervals, verify the tire pressures. Use an accurate tire pressure gauge when checking inflation pressures. Never exceed the maximum tire inflation pressure specified on each tire.

Cold tire inflation pressure means: When a vehicle has not been driven for at least 3 hours or less than 1 mile (1.6 km).

**Warning:** Incorrect tire pressures cause increased tire wear and adversely affect road holding of the vehicle, leading to loss of vehicle control.

### Changing Wheels



23012

Tire failure is a rare event these days, if tires are properly cared for. In case of a flat tire, move vehicle a safe distance away from traffic and apply the parking brake. Remember to switch "ON" the hazard flashers and according to the

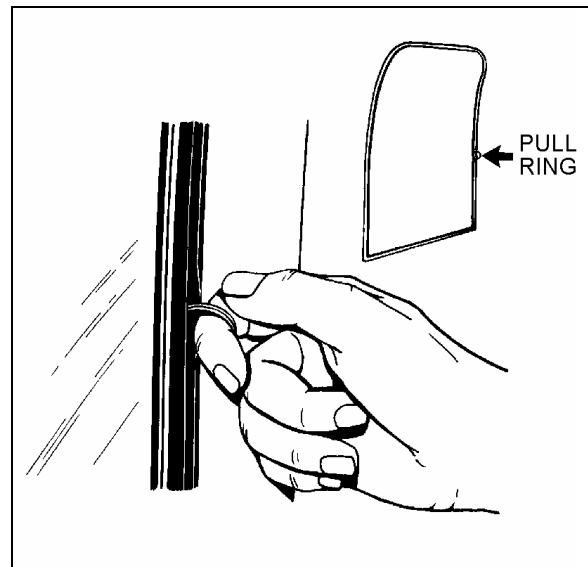
highway code regulations, set up the triangular reflectors (see "Emergency warning reflectors" on page 3-5) at an adequate distance to warn incoming motorists.

A 12 ton hydraulic jack, a wheel nut wrench and the triangular reflector kit are installed inside the first R.H. side baggage compartment, near the entrance door.

We suggest that you **do not** attempt to change a wheel. First, the wheel and tire are very heavy and usually there is no space available to put the removed flat. Second the wheel nuts, especially those on an inner dual, can become very tight after being installed for only a short time. Often a heavy air wrench is required to get these nuts loose. We suggest you get help via CB radio or cellular phone. There are tire service trucks all over the country who can bring a wheel and make the change safely. If you have no choice and must do it yourself, see instructions in the "Maintenance Manual".

## Windows

Some panoramic-type windows (with or without a lower sliding section) may have been provided with a metal ring for removal purposes. To remove window, pull on the metal ring located in the rubber strip in order to remove strip, then push firmly on window to expel it from its frame.



23013

## Jacking Points

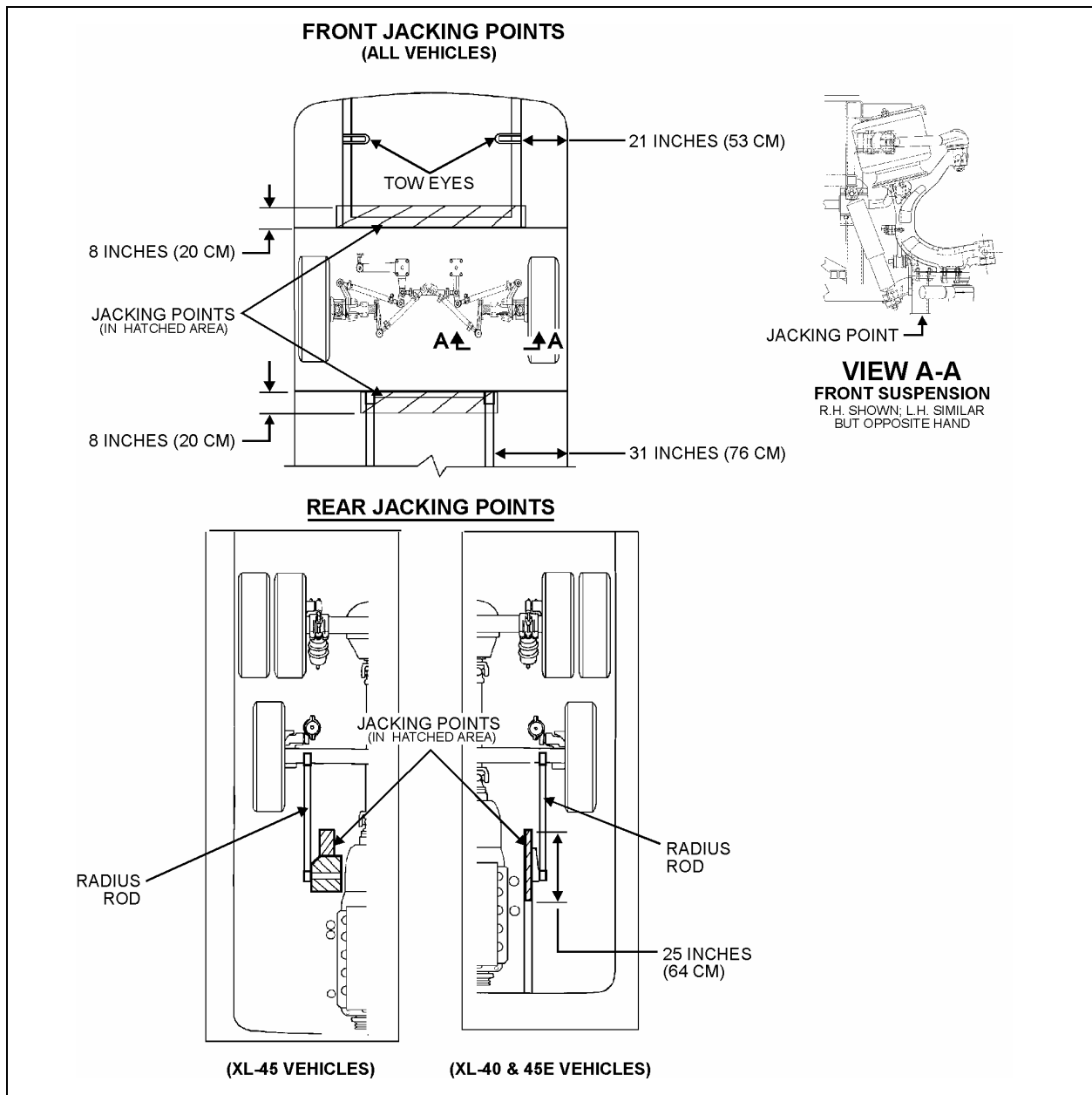
The vehicle can be jacked by exerting pressure under body jacking points or axle jacking points (see jacking point illustrations). Equipment for lifting front of vehicle must have a combined lifting capacity of 13,000 lbs (5 900 kg). Equipment for lifting rear of vehicle must have a combined lifting capacity of 25,000 lbs (11 400 kg).

**Warning:** When it is necessary to raise the vehicle, care should be taken to ensure that pressure is applied only at the points indicated in jacking points illustrations.

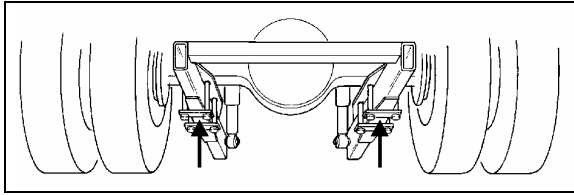
**Warning:** Extra lift capacity may be required if luggage or any other type of load (e.g. conversion equipment) are onboard vehicle.

## Body Jacking Points

Body jacking points are recommended to be used for axle removal; Otherwise use axle jacking points.



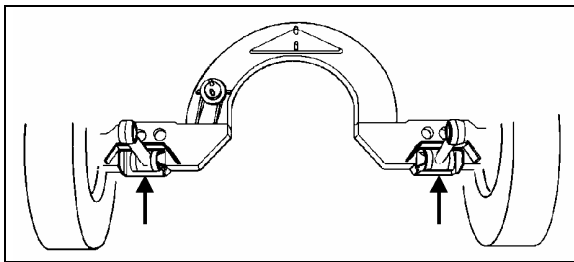
## Axle Jacking Points



DRIVE AXLE

11005

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



TAG AXLE

18086

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

For front suspension jacking points, see "View A-A" on figure at page 4-20.

## Towing The Vehicle

The vehicle can be transported on a low bed semi-trailer of adequate gross axle weight capacity. When transporting a vehicle, 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 as required.

**Note:** The engine cannot be started by pushing or towing.

The vehicle can also be towed by lifting under the front axle or by towing from the front with all wheels on the ground. These 2 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 intercity coaches.

Observe normal precautions including, but not limited to, the ones listed below when towing the vehicle:

1. Make sure the parking brake is released before towing.
2. Do not allow passengers to ride inside the towed vehicle.
3. Tow the vehicle at a safe speed as dictated by road and weather conditions.
4. Accelerate and decelerate slowly with caution.

## 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. For correct procedure, refer to Rockwell's "Maintenance Manual 5" annexed at the end of Section 11 "Rear Axle", in your Maintenance Manual.

**Caution:** Transmission lubrication is inadequate when towing. With either automatic or manual transmission, the drive axle shafts must be removed to avoid serious damage to the transmission.

2. Operate the engine of the vehicle 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 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 vehicle lifting attachment with chains.
4. Observe safety precautions when towing.

**Note:** When the propeller or axle shafts are reinstalled, ensure the nuts are tightened to the appropriate torques and the axle shafts are properly installed (R.H. & L.H.) and/or the propeller shaft is properly phased. Refer to the "Maintenance Manual" for torque values.

### Towing Without Lifting

**Caution:** When towing without lifting vehicle, 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. For correct procedure, refer to Rockwell's "Maintenance Manual 5" annexed at the end of Section 11 "Rear Axle", in your Maintenance Manual.

**Caution:** Transmission lubrication is inadequate when towing. With either automatic or manual transmission, the drive axle shafts must be removed to avoid serious damage to the transmission.

2. Operate the engine of the vehicle 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 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 in the tow eyes of the vehicle under the bumper and take up all the slack (see "Body Jacking Points" illustration on page 4-20).
5. Attach safety chains as applicable.
6. Observe safety precautions when towing.

**Note:** When the propeller or axle shafts are reinstalled, ensure the nuts are tightened to the appropriate torques and the axle shafts are properly installed (R.H. & L.H.) and/or the propeller shaft is properly phased. Refer to the "Maintenance Manual" for torque values.

### Retractable Tag Axle

Operation of the tag axle is controlled by a valve located on the L.H. Lateral Console. The valve can be flipped to either one of two positions, "Wheels up" or "Wheels down". Axle will automatically be raised or lowered by air pressure according to valve position (see page 2-4).

Tag axle service brakes operate only when axle is down. Never lower tag axle while vehicle is moving. When tag axle is up, the corresponding indicator light will illuminate, and a beep will sound to remind you that axle is up. Tag axle can be raised in tight maneuvering areas as in parking lots or to help in turning a short corner, thus shortening the wheelbase and allowing tighter turning. Raising tag axle transfers extra weight and additional traction to the drive wheels on a slippery surface.

**Caution:** Always raise tag axle before lifting vehicle to prevent damage to suspension components.

After either of the above uses, vehicle must be stopped, then tag axle must be lowered before resuming normal driving.

# Technical Information

## Dimensions

| SPECIFICATION                                                       | XL-40              | XL-45              | XL-45E             |
|---------------------------------------------------------------------|--------------------|--------------------|--------------------|
| <b>Overall length</b>                                               | 40.0' (12 192 mm)  | 45.0' (13 716 mm)  | 45.0' (13 716 mm)  |
| <b>Overall width</b>                                                | 102" (2 591 mm)    | 102" (2 591 mm)    | 102" (2 591 mm)    |
| <b>Overall height</b><br>(over closed roof hatch)                   |                    |                    |                    |
| - Standard                                                          | 133.75" (3 397 mm) | 133.75" (3 397 mm) | 136.75" (3 473 mm) |
| - Optional                                                          | 136.75" (3 473 mm) | 136.75" (3 473 mm) |                    |
| <b>Entrance door width</b>                                          |                    |                    |                    |
| - Front (Standard)                                                  | 26" (660 mm)       | 26" (660 mm)       | 26" (660 mm)       |
| - Central (Optional)                                                | 31" (787 mm)       | 31" (787 mm)       | 31" (787 mm)       |
| <b>Headroom</b>                                                     |                    |                    |                    |
| - Standard                                                          | 83" (2 108 mm)     | 83" (2 108 mm)     | 86" (2 184 mm)     |
| - Optional                                                          | 86" (2 184 mm)     | 86" (2 184 mm)     |                    |
| <b>Cabin floor height</b>                                           | 48.5" (1 232 mm)   | 48.5" (1 232 mm)   | 48.5" (1 232 mm)   |
| <b>Ground clearance</b>                                             | 11" (279 mm)       | 11" (279 mm)       | 11" (279 mm)       |
| <b>Wheel base</b> (Front suspension<br>center to drive axle center) | 280" (7 112 mm)    | 315" (8 001 mm)    | 340" (8 636 mm)    |
| <b>Front overhang</b>                                               | 68.8" (1 748 mm)   | 68.8" (1 748 mm)   | 68.8" (1 748 mm)   |
| <b>Rear overhang</b>                                                | 82.7" (2 101 mm)   | 107.7" (2 736 mm)  | 82.7" (2 101 mm)   |
| <b>Front track</b>                                                  |                    |                    |                    |
| - Steel                                                             | 85" (2 160 mm)     | 85" (2 160 mm)     | 85" (2 160 mm)     |
| - Alum.                                                             | 85.9" (2 182 mm)   | 85.9" (2 182 mm)   | 85.9" (2 182 mm)   |
| <b>Drive track</b>                                                  | 76.5" (1 943 mm)   | 76.5" (1 943 mm)   | 76.5" (1 943 mm)   |
| <b>Rear track</b> (Tag axle)                                        | 82" (2 083 mm)     | 82" (2 083 mm)     | 82" (2 083 mm)     |
| <b>Turning circle radius</b> (Exterior front corner)                | 38' (11,58 m)      | 42' (12,8 m)       | 44.5' (13,6 m)     |

## Weights

### Curb weight (before conversion)

|              |                        |
|--------------|------------------------|
| XL-40 .....  | 27,115 lbs (12 202 kg) |
| XL-45 .....  | 30,200 lbs (13 590 kg) |
| XL-45E ..... | 26,860 lbs (12 184 kg) |

### Gross vehicle

**weight rating**.....48,900 lbs (22 005 kg)

### Gross axle weight rating

|                       |                       |
|-----------------------|-----------------------|
| Front suspension..... | 16,500 lbs (7 425 kg) |
| Drive axle.....       | 20,400 lbs (9 180 kg) |
| Tag axle.....         | 12,000 lbs (5 400 kg) |

The Gross Vehicle Weight Rating (G.V.W.R.) and the Gross Axle Weight Ratings (G.A.W.R.) for front, drive and rear axles are listed on a certification plate located on the panel at the L.H. side of driver's seat, under the side control panel.

## Capacities

### Engine oil

|                    |                          |
|--------------------|--------------------------|
| Crankcase .....    | 37 U.S. qts (35 liters)  |
| Reserve tank ..... | 10 U.S. qts (9,5 liters) |

(Standard on XL-45, Optional on XL-40 & 45E)

### Fuel tank

|                      |                            |
|----------------------|----------------------------|
| XL-40 & XL-45E ..... | 160 U.S. gal. (606 liters) |
| XL-45 .....          | 208 U.S. gal. (787 liters) |

### Auxiliary fuel tank

(Optional).....90 U.S. gal. (341 liters)

### Cooling system (Approx.)

Includes heating system.....24 U.S. gal. (91 liters)

### Transmission oil

(does not include external circuits).....10 U.S. gal. (38 liters)

**Differential oil** ..43/41 U.S. pts (20,7/19,5 liters)

### Power steering

**reservoir** .....

### Windshield washer

**reservoir** .....5 U.S. gal. (18,9 liters)

### Refrigerant

|                                     |                |
|-------------------------------------|----------------|
| Driver's system (XL-40 & 45E) ..... | 6 lbs (2,7 kg) |
| Driver's system (XL-45) .....       | 6.5 lbs (3 kg) |
| Driver's and central system .....   | 24 lbs (11 kg) |

## Air Circuit Reservoir

Including suspension and accessories.....6,775 in<sup>3</sup> (111 042 cm<sup>3</sup>)

## Fuel Type

**ASTM specification**.....D-975

**Recommended grade**.....1-D

**Acceptable grade**.....2-D

## Wheels And Tires

**Steel wheels** (stud mounted).....9 X 22.5  
Except inner drive axle .....8.25 X 22.5

**Alum. polished wheels** (stud mounted)9 X 22.5  
Except inner drive axle (steel) .....8.25 X 22.5

**Tires** .....315/80 R 22.5

### Recommended tire inflation pressure (cold)

|                   |                   |
|-------------------|-------------------|
| Front wheels..... | 100 psi (689 kPa) |
| Drive axle .....  | 90 psi (620 kPa)  |
| Tag axle.....     | 80 psi (551 kPa)  |

**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 other tire and wheel specifications, see Prévost tire pressure tabulation in "Coach Final Record".*

## Belts

### Radiator fan drive (transfer)

Make:.....Gates



Model: .....AX 74

Qty: .....3

**Radiator fan drive (fan)**

Make: .....Dayco

Model: ..... Multi-V, Poly rib, 51"

Qty: .....1

**Tecumseh compressor (driver's A/C only)**

Make: .....Gates

Model: ..... A35

Qty: .....1

**Carrier compressor (central A/C system)**

Make: .....Gates

Model: .....BX 97

Qty: .....2

**Alternator 24 V 75 amps**

Make: .....Gates

Model: .....BX 80

Qty: .....1

**Alternator 12 V 145 amps (Driver's A/C)**

Make: .....Gates

Model: ..... BX 100

Qty: .....1

**Alternator 12 V 145 amps (Central A/C)**

Make: .....Gates

Model: .....BX 31

Qty: .....1

**Alternator 24 V 75 amps to 12 V 300 amps**

Make: .....Dayco

Model: .....BX 77

Qty: .....1

**Alternator 12 V 300 amps**

Make: ..... Detroit Diesel

Model: .....Poly-V, 12K 72"

Qty: .....1

**Alternator 24 V 270 amps**

Make:..... Detroit Diesel

Model:..... Poly-V, 12K 72"

Qty:..... 1

**Engine**

Detroit Diesel DDEC III Series 60, 12.7 liters inline 6 cylinders, 470 BHP @ 2100 rpm with optional engine retarder "Jake Brake" Model 760.

**Transmission**

Allison six speed automatic World Transmission B500 or B500R with Electronic Control.

| <b>Gear</b>                  | <b>Ratio</b> |
|------------------------------|--------------|
| 1 <sup>st</sup> .....        | 3.51         |
| 2 <sup>nd</sup> .....        | 1.91         |
| 3 <sup>rd</sup> .....        | 1.43         |
| 4 <sup>th</sup> .....        | 1.00         |
| 5 <sup>th</sup> .....        | 0.74         |
| 6 <sup>th</sup> .....        | 0.64         |
| Rev .....                    | 4.80         |
| Converter.....               | 1.79         |
| <b>Output retarder</b> ..... | (Optional)   |

**Note:** Gear ratios do not include torque converter multiplications.

**Drive Axle Ratio**

4.56 : 1 or 4.89 : 1

## Brakes

- Air operated, disc type on front axle (Knorr-Bremse) and tag axle (Rockwell); drum type on drive axle (Rockwell).

- Brake chamber effective area:

Front wheels = 24 in<sup>2</sup>

Drive axle = 30 in<sup>2</sup> (service) - 36 in<sup>2</sup> (emer/park)

Tag axle = 16 in<sup>2</sup> (service) - 24 in<sup>2</sup> (emer/park)

- Automatic slack adjuster.
- Two cylinder air compressor, engine gear driven, water-cooled and lubricated.
- Air dryer.
- Nylon color-coded air lines.

## Steering

- Tilt steering wheel and telescopic steering column.
- TRW Pump PS25, gear driven from engine.
- System pressure 2200 psi (15 158 kPa).

## Electrical System

### 24 & 12 volt negative grounded

#### Available alternators:

- 145 amps/12 volts
- 75 amps/24 volts
- 270 amps/24 volts
- 300 amps/12 volts

Four (4) model 1150, 12 volt, maintenance-free batteries, each with a 625 AMP cold cranking capacity each at 0°C.

Battery equalizer(s): 50 AMP equalizer system with relay and breaker or 100 AMP equalizer system with relay and breaker.

electrical system monitor and voltage regulator.

Wiring protection: fuses, manual and automatic resettable circuit breakers

12 volt and 24 volt manual disconnect switches

## Suspension

### Front suspension (independent)

- 2 air springs
- 2 shock absorbers
- 1 height control valve
- 1 sway bar

### Drive axle

- 4 air springs
- 4 shock absorbers
- 3 longitudinal radius rods
- 1 transversal radius rod
- 2 height control valves
- 1 sway bar

### Tag axle

- 2 air springs
- 2 shock absorbers
- 3 longitudinal radius rods
- 1 transversal radius rod

## Alignment

### Front wheels

Toe-in: .....3/32" ±1/32" (2,4 mm ± 0,8 mm)

King pin inclination: ..... 6 1/2° (not adjustable)

Caster: ..... + 2°(not adjustable)

Camber:.....-1/8° ± 1/4°

### Drive axle

XL-40 ..... 5/8" (16 mm) max.

XL-45E ..... 5/8" (16 mm) max.

XL-45 ..... 9/16" (14 mm) max.

### Tag axle

Toe: ..... 0" ± 3/64" (0 mm ± 1,2 mm)



## TECHNICAL INFORMATION

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Sensors  
Clamping bushes  
Wiring harnesses

### Electronic control module technical data

Voltage:.....24 ± 6 volts  
Thermal operating range:..... -40 to 167 °F  
(-40 to 75 °C)

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

Electrical connection is made through a 35 pin plug

Maintenance:..... none

### Solenoid control valve technical data

Voltage:.....24 (+4.8, -2.4) volts  
Current:..... DC  
Rated current:..... 1.65 amps  
Protection system according to DIN 40050  
Maximum service pressure:..... 10 bars (145 psi)  
Thermal operating range:..... -40 to 176 °F  
(-40 to 80 °C)

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

Maintenance:..... none

### Sensor technical data

Two cored screened cable:.....AWG 18 (1 mm<sup>2</sup>)  
Force needed to tear out lead:..... 11.2 lbs (50 N)  
Force needed to pull off shrink-fitted tube: .....  
..... 11.2 lbs (50 N)  
Thermal operating range:..... -40 to 176 °F  
(-40 to 80 °C)

Protection system according to DIN 40050

## Preheating Systems (Optional)

### Espar (Eberspächer)

Heater: ..... Model D12W

Heating capacity: .....12 kW  
Heating output:..... 41,000 Btu/hr  
Fuel type:..... Same as engine  
Fuel consumption:.....0.44 U.S. gal.  
(1,65 liters) / hour  
Rated voltage: ..... 24 ± 4 volts  
Electric power consumption:..... 55 watts

### Webasto

Heater:.....Model DBW 2020  
Heating capacity: ..... 23.3 kW  
Heating output:..... 80,000 Btu/hr  
Fuel type:..... Same as engine  
Fuel consumption:.....0.8 U.S. gal.  
(3 liters) / hour  
Rated voltage: ..... 24 ± 4 volts  
Electric power consumption:..... 120 watts

## DDEC III Diagnostic Codes

### To read codes:

Use a diagnostic data reader plugged in receptacle on the bottom of side panel of L.H. control panel or momentarily depress the Stop engine "OVERRIDE" switch (located on the L.H. lower control panel) with the ignition on, engine at idle or not running. Active codes will be flashed on the stop engine telltale (located on central dashboard), followed by the inactive codes being flashed on the check engine telltale (located on central dashboard). The cycle repeats until the operator depresses again the Stop engine "OVERRIDE" switch. A code "43" consists of four flashes, followed by a short pause, then three flashes in quick succession.

| DDC Code Number (Flashed) | Description                                | DDC Code Number (Flashed) | Description                                 |
|---------------------------|--------------------------------------------|---------------------------|---------------------------------------------|
| 11                        | Variable speed governor sensor voltage low | 12                        | Variable speed governor sensor voltage high |
| 13                        | Coolant level circuit failed low           | 14                        | Intercooler temperature circuit failed high |
| 14                        | Coolant temperature circuit failed high    | 14                        | Oil temperature circuit failed high         |
| 15                        | Intercooler temperature failed low         | 15                        | Coolant temperature circuit failed low      |
| 15                        | Oil temperature circuit failed low         | 16                        | Coolant level circuit failed high           |
| 17                        | Bypass position circuit failed high        | 18                        | Bypass position circuit failed low          |
| 21                        | EFPA circuit failed low                    | 22                        | EFPA circuit failed low                     |
| 23                        | Fuel temperature circuit failed high       | 24                        | Fuel temperature circuit failed low         |
| 25                        | Reserved for "no codes"                    | 26                        | Aux. shutdown #1 active                     |
| 26                        | Aux. shutdown #2 active                    | 27                        | Air temperature circuit failed high         |
| 28                        | Air temperature circuit failed low         | 31                        | Aux. output #3 open circuit (high side)     |
| 31                        | Aux. output #3 short to ground (high side) | 31                        | Aux. output #4 open circuit (high side)     |
| 31                        | Aux. output #4 short to ground (high side) | 32                        | SEL open circuit                            |
| 32                        | SEL short to battery                       | 33                        | Turbo boost pressure circuit failed high    |
| 34                        | Turbo boost pressure circuit failed low    | 35                        | Oil pressure circuit failed high            |
| 36                        | Oil pressure circuit failed high           | 37                        | Fuel pressure circuit failed high           |

TECHNICAL INFORMATION

| DDC Code Number (Flashed) | Description                                                      | DDC Code Number (Flashed) | Description                                                       |
|---------------------------|------------------------------------------------------------------|---------------------------|-------------------------------------------------------------------|
| 38                        | Fuel pressure circuit failed low                                 | 41                        | Too many SRS (missing TRS)                                        |
| 42                        | Too few SRS (missing SRS)                                        | 43                        | Coolant level low                                                 |
| 44                        | Intercooler temperature high                                     | 44                        | Coolant temperature high                                          |
| 44                        | Oil temperature high                                             | 45                        | Oil pressure low                                                  |
| 46                        | Battery voltage low                                              | 47                        | Fuel pressure high                                                |
| 48                        | Fuel pressure low                                                | 52                        | A/D conversion fail                                               |
| 53                        | Nonvolatile checksum incorrect                                   | 53                        | EEPROM write error                                                |
| 54                        | Vehicle speed sensor fault                                       | 55                        | J1939 data link fault                                             |
| 55                        | Proprietary link fault (master)                                  | 55                        | Proprietary link fault (receiver)                                 |
| 56                        | J1587 data link fault                                            | 57                        | J1922 data link fault                                             |
| 58                        | Torque overload                                                  | 61                        | Response time long                                                |
| 62                        | Aux. output #1 short to battery                                  | 62                        | Aux. output #1 open circuit                                       |
| 62                        | Aux. output #2 short to battery                                  | 62                        | Aux. output #2 open circuit                                       |
| 62                        | Aux. output #5 short to battery                                  | 62                        | Aux. output #5 open circuit                                       |
| 62                        | Aux. output #6 short to battery                                  | 62                        | Aux. output #6 open circuit                                       |
| 62                        | Aux. output #7 short to battery                                  | 62                        | Aux. output #7 open circuit                                       |
| 62                        | Aux. output #8 short to battery                                  | 62                        | Aux. output #8 open circuit                                       |
| 63                        | PWM #1 short to battery                                          | 63                        | PWM #1 open circuit                                               |
| 63                        | PWM #2 short to battery                                          | 63                        | PWM #2 open circuit                                               |
| 63                        | PWM #3 short to battery                                          | 63                        | PWM #3 open circuit                                               |
| 63                        | PWM #4 short to battery                                          | 63                        | PWM #4 open circuit                                               |
| 64                        | Turbo speed circuit failed                                       | 65                        | Reserved for air filter differential pressure circuit failed high |
| 65                        | Reserved for air filter differential pressure circuit failed low | 66                        | Reserved for oil filter differential pressure circuit failed high |
| 66                        | Reserved for oil filter differential pressure circuit failed low | 67                        | Coolant pressure circuit failed high                              |
| 67                        | Coolant pressure circuit failed low                              | 68                        | Idle validation circuit fault (grounded circuit)                  |

| DDC Code Number (Flashed) | Description                                  | DDC Code Number (Flashed) | Description                               |
|---------------------------|----------------------------------------------|---------------------------|-------------------------------------------|
| 68                        | Idle validation circuit fault (open circuit) | 71                        | Injector response time short              |
| 72                        | Vehicle overspeed                            | 72                        | Reserved for vehicle overspeed (absolute) |
| 73                        | Reserved for air differential pressure high  | 74                        | Oil differential pressure high            |
| 75                        | Battery voltage high                         | 76                        | Engine overspeed with engine brake        |
| 77                        | All other faults not listed                  | 81                        | Timing actuator (dual fuel) failed high   |
| 81                        | Oil level circuit failed high                | 81                        | Crankcase pressure circuit failed high    |
| 82                        | Timing actuator (dual fuel) failed low       | 82                        | Oil level circuit failed low              |
| 82                        | Crankcase pressure circuit failed low        | 83                        | Oil level high                            |
| 83                        | Crankcase pressure high                      | 84                        | Oil level low                             |
| 84                        | Crankcase pressure low                       | 85                        | Engine overspeed                          |
| 86                        | Pump pressure circuit failed high            | 86                        | Barometric pressure circuit failed high   |
| 87                        | Pump pressure circuit failed low             | 87                        | Barometric pressure circuit failed high   |
| 88                        | Coolant pressure low                         | --                        | CEL short to battery                      |
| --                        | CEL open circuit                             | --                        | Clock Module failure                      |
| --                        | Clock module abnormal rate                   |                           |                                           |

## World Transmission (WT) Diagnostic Codes

### Diagnostic Code Memory

Diagnostic codes are logged in a list in memory (sometimes referred to as the queue), positioning the most recently occurring code first and containing up to five codes. The codes continued in the list have the information recorded as shown in the chart below. Access to the code list position, main code, sub code and active indicator is through either the shifter display or the Pro-Link Diagnostic Datareader (DDR). Access to the ignition cycle counter and event counter is through the DDR only.

| 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 Shifter Display and DDR |           |          | YES=<br>ACTIVE=<br>"MODE ON" | Ignition cycle counter and event counter are not available on shifter display |               |

**Note:** All information is available with a DDR.

The following paragraphs define the different parts of the code list.

#### Code list position

The position 1 through 5 which a code occupies in the code list in memory. Positions are shown as "d1" (Diagnostic Code #1) through "d5."

#### Main code

The general condition or area of fault detected by ECU.

#### Sub Code

The specific area or condition under the main code in which the condition was detected.

#### Active Indicator

Will be turned "on" when a fault condition is active (shifter will display "MODE ON" or the DDR will display "YES"). Will be set to "off" when conditions exist to indicate fault condition is gone.

#### Ignition cycle counter

Used to clear diagnostic codes that are inactive from the code list in memory. Counter is incremented each time a normal ECU powerdown occurs following clearing of the Active Indicator. Code will be cleared from the list when the counter exceeds 25.

#### Event counter

Used to count the number of occurrences of a diagnostic code that occur prior to the incident being cleared from the code list. The most recent code will be in position "d1". If the most recent code is one which is already in the code list, that code will be moved to position "d1", the Active Indicator will be turned "on" (shifter will display "MODE ON" or the DDR will display "YES"), the Ignition Cycle Counter is cleared and "1" is added to the Event counter.



### Clearing the Active Indicator and code records from the Code list in memory

If the conditions causing a diagnostic code to be set are cleared, the Active Indicator can be manually cleared by holding the "MODE" button down continuously for 3 seconds until a tone is heard from the shifter. 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.

### Code reading and code clearing procedures

Diagnostic codes can be read and cleared by two methods: by using the Pro-Link 9000 DDR plugged in receptacle located on L.H. lateral console or by using the shifter display. The use of the Pro-Link 9000 DDR is described in the instruction manual furnished with each tool. The method of reading and clearing codes described in this section refers to only entering the Diagnostic Display Mode by the proper button.

The Diagnostic Display Mode may be entered for viewing of codes at any speed. Codes can only be cleared when the output speed = 0 and no output speed sensor failure is active.

The following descriptions explain how to use the shifter to read and clear codes:

#### Reading Codes:

1. Enter the diagnostic display mode by pressing the "↑" and "↓" (upshift and downshift arrows) buttons at the same time on the push-button shifter.

**Note:** If a "DO NOT SHIFT" condition is present at this time, the lever should be in the same position as it was at time of code detection. If not, this shifter tone will sound continuously.

**Note:** If an oil level sensor is present, then oil level will be displayed first. Diagnostic code display is achieved by depressing the upshift and downshift arrows or display mode button a second time.

2. Read the first code in the first of five code positions on the digital display of the shifter. For example, we will read code 25 11 in the first position. The display will change every two seconds as follows:

- a. Code list position --"d1"

- b. Main code --"25"

- c. Sub code --"11"

- d. Display will repeat cycle of a., b. and c. above

3. Press the "MODE" button momentarily to view the second position (d2) in the same way as 2. above.
4. To view the third, fourth and fifth positions (d3, d4 and d5), momentarily press the "MODE" button as explained above.
5. Pressing the "MODE" button momentarily after the fifth position is displayed will cause the sequence of code positions to start over with the first position.
6. Any code which is active will be indicated by the "MODE ON" indicator (active indicator) being turned on while in that code position (while in the normal operating mode, the "MODE ON" indicator is turned on to indicate "PERFORMANCE" mode operation, (refer to "Function of the mode button", on page 2-6)).
7. Any code position in the list which does not have a diagnostic code logged will display "- -" for both the main and sub code displays. All positions after a code position without any code will also not contain any codes.

#### Clearing Codes:

1. Clearing of the active indicator is automatically done at ECU powerdown on all but code 69 34 (see code list, page 5-13).
2. Some codes will clear the active indicator automatically when the condition causing the code is no longer detected by the ECU.
3. Manual clearing is possible while in the diagnostic display mode and after the condition causing to code is corrected (output speed must be zero).
  - a. To clear all active indicators, hold the "MODE" button down continuously for 3 seconds until the shifter tone sounds for 0.5 seconds.
  - b. 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 turn off.

**Caution:** *If clearing a code while locked in a Forward or Reverse position (fail-to-range), the transmission will still be in Drive or Reverse when the clearing procedure is completed. Neutral must be manually selected.*

#### Exiting the diagnostic display mode:

The diagnostic display mode can be exited by any of the following procedures:

1. Press the "↑" and "↓" (upshift and downshift) buttons at the same time on the push-button shifter.
2. Press any range button, "D", "N" or "R", on the push-button shifter (the shift will be commanded if it is not inhibited by an active code).
3. Do nothing and wait until the calibrated time (approximately 10 minutes) has passed and the system automatically returns to the normal operating mode.
4. Turn off power to the ECU (turn off the vehicle at the ignition switch).
5. After the clearing the active indicator procedure described above has been performed.

#### Clearing records from the code list in memory

If the requirements for Manual Clearing the Active Indicator have been satisfied, and the "MODE" button is held down continuously for ten seconds while in the display mode until a tone sounds, all diagnostic records in the code list that are not active will be cleared and the remaining records will be moved up in the code list.

#### Abbreviation Found in the Code Chart

The following responses are used throughout the following chart to command safe operation when diagnostic codes are set.

##### • DNS (Do Not Shift) Response

- Turn off lockup clutch and inhibit lockup operation.
- Inhibit all shifts.
- Turn on *DO NOT SHIFT* light.
- Pulse the tone generator for 8 seconds when the condition is first detected.
- Blank the select digit in the display.
- Ignore any range selection inputs and disable the button feedback tone for the push-button shifter.

##### • SOL OFF (Solenoid Off) Response

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

##### • RPR (Return to Previous Range) Response

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

##### • NNC (Neutral No Clutches) Response

- When certain ratio or C3 pressure switch tests are not passed, the ECU commands a neutral condition with no clutches applied.

## Diagnostic Code List and Description

| MAIN CODE | SUB CODE | DESCRIPTION                                                  | DO NOT SHIFT LIGHT | INHIBITED OPERATION DESCRIPTION                 |
|-----------|----------|--------------------------------------------------------------|--------------------|-------------------------------------------------|
| 12        | 12       | Oil level, low                                               | No                 | No upshift above a calibration range            |
| 12        | 23       | Oil level, high                                              | No                 | No upshift above a calibration range            |
| 13        | 12       | ECU input voltage, low                                       | Yes                | DNS, SOL OFF (Hydraulic default)                |
| 13        | 13       | ECU input voltage, medium low                                | No                 | None: Shift adaptive feature will not function. |
| 13        | 23       | ECU input voltage, high                                      | Yes                | DNS, SOL OFF (Hydraulic default)                |
| 14        | 12       | Oil level sensor, low                                        | No                 | None                                            |
| 14        | 23       | Oil level sensor, high                                       | No                 | None                                            |
| 21        | 12       | Throttle position sensor, low                                | No                 | Use Throttle default value                      |
| 21        | 23       | Throttle position sensor, high                               | No                 | Use Throttle default value                      |
| 22        | 14       | Engine speed sensor reasonableness test                      | No                 | Use default engine speed                        |
| 22        | 15       | Turbine speed sensor reasonableness test                     | Yes                | DNS, Lock in current range                      |
| 22        | 16       | Output speed sensor reasonableness or rapid decel test       | Yes                | DNS, Lock in current range                      |
| 23        | 12       | Primary Shifter or RSI Link Fault                            | No                 | Hold in last valid direction                    |
| 23        | 13       | Primary Shifter Mode Function Fault                          | No                 | Mode change not permitted                       |
| 23        | 14       | Secondary Shifter or RSI Link Fault                          | No                 | Hold in last valid direction                    |
| 23        | 15       | Secondary Shifter Mode Function Fault                        | No                 | Mode change not permitted                       |
| 24        | 12       | Sump oil temperature, cold                                   | Yes                | DNS                                             |
| 24        | 23       | Sump oil temperature, hot                                    | No                 | No upshifts above a calibration range           |
| 25        | 00       | Output speed reasonableness test, detected at 0 speed, (L)   | Yes                | DNS, Lock in current range (L)                  |
| 25        | 11       | Output speed reasonableness test, detected at 0 speed, (1st) | Yes                | DNS, Lock in current range (1st)                |
| 25        | 22       | Output speed reasonableness test, detected at 0 speed 2nd    | Yes                | DNS, Lock in current range (2nd)                |
| 25        | 33       | Output speed reasonableness test, detected at 0 speed, 3rd   | Yes                | DNS, Lock in current range (3rd)                |
| 25        | 44       | Output speed reasonableness test, de-                        | Yes                | DNS, Lock in current range                      |

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| MAIN CODE | SUB CODE | DESCRIPTION                                                | DO NOT SHIFT LIGHT | INHIBITED OPERATION DESCRIPTION                                  |
|-----------|----------|------------------------------------------------------------|--------------------|------------------------------------------------------------------|
|           |          | ected at 0 speed, 4th                                      |                    | (4th)                                                            |
| 25        | 55       | Output speed reasonableness test, detected at 0 speed, 5th | Yes                | DNS, Lock in current range (5th)                                 |
| 25        | 66       | Output speed reasonableness test, detected at 0 speed, 6th | Yes                | DNS, Lock in current range (6th)                                 |
| 25        | 77       | Output speed reasonableness test, detected at 0 speed, R   | Yes                | DNS, Lock in current range (R)                                   |
| 32        | 00       | C3 pressure switch open, L range                           | Yes                | DNS, Lock in current range (L)                                   |
| 32        | 33       | C3 pressure switch open, 3rd range                         | Yes                | DNS, Lock in current range (3rd)                                 |
| 32        | 55       | C3 pressure switch open, 5th range                         | Yes                | DNS, Lock in current range (5th)                                 |
| 32        | 77       | C3 pressure switch open, R range                           | Yes                | DNS, Lock in current range (R)                                   |
| 33        | 12       | Sump oil temperature sensor, low                           | No                 | Use default value of 200° F (93° C)                              |
| 33        | 23       | Sump oil temperature sensor, high                          | No                 | Use default value of 200° F (93° C)                              |
| 34        | 12       | EEPROM, factory cal. compatibility number wrong            | Yes                | DNS, SOL OFF (Hydraulic default)                                 |
| 34        | 13       | EEPROM, factory calibration block checksum                 | Yes                | DNS, SOL OFF (Hydraulic default)                                 |
| 34        | 14       | EEPROM, Power Off Block checksum                           | Yes                | Use previous location, or factory calibration and reset adaptive |
| 34        | 15       | EEPROM, Diagnostic Queue Block Checksum                    | Yes                | Use previous location, or clear diagnostic queue                 |
| 34        | 16       | EEPROM, Real Time Block Checksum                           | Yes                | DNS, SOL OFF (Hydraulic default)                                 |
| 35        | 00       | Power interruption (Code set after power restored)         | No                 | NONE (Hydraulic default during interruption)                     |
| 35        | 16       | Real Time EEPROM Write Interruption                        | Yes                | DNS, SOL OFF (Hydraulic default)                                 |
| 36        | 00       | Hardware/Software not compatible                           | Yes                | DNS, SOL OFF (Hydraulic default)                                 |
| 41        | 12       | Open or short to ground, A solenoid circuit                | Yes                | DNS, SOL OFF (Hydraulic default)                                 |
| 41        | 13       | Open or short to ground, B solenoid circuit                | Yes                | DNS, SOL OFF (Hydraulic default)                                 |

| MAIN CODE | SUB CODE | DESCRIPTION                                   | DO NOT SHIFT LIGHT | INHIBITED OPERATION DESCRIPTION               |
|-----------|----------|-----------------------------------------------|--------------------|-----------------------------------------------|
| 41        | 14       | Open or short to ground, C solenoid circuit   | Yes                | DNS, SOL OFF (Hydraulic default)              |
| 41        | 15       | Open or short to ground, D solenoid circuit   | Yes                | DNS, SOL OFF (Hydraulic default)              |
| 41        | 16       | Open or short to ground, E solenoid circuit   | Yes                | DNS, SOL OFF (Hydraulic default)              |
| 41        | 21       | Open or short to ground, F solenoid circuit   | No                 | Lock-up inhibited                             |
| 41        | 22       | Open or short to ground, G solenoid circuit   | Yes                | DNS, SOL OFF (Hydraulic default)              |
| 41        | 23       | Open or short to ground, H solenoid circuit   | No                 | Retarder allowed, differential lock inhibited |
| 41        | 24       | Open or short to ground, J solenoid circuit   | No                 | Low and 1st inhibited                         |
| 41        | 25       | Open or short to ground, K solenoid circuit   | No                 | K solenoid operation inhibited                |
| 41        | 26       | Open or short to ground, N solenoid circuit   | No                 | Low and 1st inhibited                         |
| 42        | 12       | Short to battery, A solenoid circuit          | Yes                | DNS, Lock in a range                          |
| 42        | 13       | Short to battery, B solenoid circuit          | Yes                | DNS, Lock in a range                          |
| 42        | 14       | Short to battery, C solenoid circuit          | Yes                | DNS, Lock in a range                          |
| 42        | 15       | Short to battery, D solenoid circuit          | Yes                | DNS, Lock in a range                          |
| 42        | 16       | Short to battery, E solenoid circuit          | Yes                | DNS, Lock in a range                          |
| 42        | 21       | Short to battery, F solenoid circuit          | No                 | Lock-up inhibited                             |
| 42        | 22       | Short to battery, G solenoid circuit          | Yes                | DNS, Lock in a range                          |
| 42        | 23       | Short to battery, H solenoid circuit          | No                 | Retarder allowed, differential lock inhibited |
| 42        | 24       | Short to battery, J solenoid circuit          | No                 | Low and 1st inhibited                         |
| 42        | 25       | Short to battery, K solenoid circuit          | No                 | K solenoid operation inhibited                |
| 42        | 26       | Short to battery, N solenoid circuit          | No                 | Low and 1st inhibited                         |
| 43        | 21       | Low side driver, F solenoid circuit           | No                 | Lock-up inhibited                             |
| 43        | 25       | Low side driver, K solenoid circuit inhibited | No                 | K solenoid operation                          |
| 43        | 26       | Low side driver, N solenoid circuit           | No                 | Low and 1st inhibited                         |
| 44        | 12       | Short to ground, A solenoid circuit           | Yes                | DNS, SOL OFF (Hydraulic default)              |
| 44        | 13       | Short to ground, B solenoid circuit           | Yes                | DNS, SOL OFF (Hy-                             |

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| MAIN CODE | SUB CODE | DESCRIPTION                                | DO NOT SHIFT LIGHT | INHIBITED OPERATION DESCRIPTION               |
|-----------|----------|--------------------------------------------|--------------------|-----------------------------------------------|
|           |          |                                            |                    | draulic default)                              |
| 44        | 14       | Short to ground, C solenoid circuit        | Yes                | DNS, SOL OFF (Hydraulic default)              |
| 44        | 15       | Short to ground, D solenoid circuit        | Yes                | DNS, SOL OFF (Hydraulic default)              |
| 44        | 16       | Short to ground, E solenoid circuit        | Yes                | DNS, SOL OFF (Hydraulic default)              |
| 44        | 21       | Short to ground, F solenoid circuit        | No                 | Lock-up inhibited                             |
| 44        | 22       | Short to ground, G solenoid circuit        | Yes                | DNS, SOL OFF (Hydraulic default)              |
| 44        | 23       | Short to ground, H solenoid circuit        | No                 | Retarder allowed, differential lock inhibited |
| 44        | 24       | Short to ground, J solenoid circuit        | No                 | Low and 1st inhibited                         |
| 44        | 25       | Short to ground, K solenoid circuit        | No                 | K solenoid operation inhibited                |
| 44        | 26       | Short to ground, N solenoid circuit        | No                 | Low and 1st inhibited                         |
| 45        | 12       | Open circuit, A solenoid circuit           | Yes                | DNS, SOL OFF (Hydraulic default)              |
| 45        | 13       | Open circuit, B solenoid circuit           | Yes                | DNS, SOL OFF (Hydraulic default)              |
| 45        | 14       | Open circuit, C solenoid circuit           | Yes                | DNS, SOL OFF (Hydraulic default)              |
| 45        | 15       | Open circuit, D solenoid circuit           | Yes                | DNS, SOL OFF (Hydraulic default)              |
| 45        | 16       | Open circuit, E solenoid circuit           | Yes                | DNS, SOL OFF (Hydraulic default)              |
| 45        | 21       | Open circuit, F solenoid circuit           | No                 | Lock-up inhibited                             |
| 45        | 22       | Open circuit, G solenoid circuit           | Yes                | DNS, SOL OFF (Hydraulic default)              |
| 45        | 23       | Open circuit, H solenoid circuit           | No                 | Retarder allowed, differential lock inhibited |
| 45        | 24       | Open circuit, J solenoid circuit           | No                 | Low and 1st inhibited                         |
| 45        | 25       | Open circuit, K solenoid circuit           | No                 | K solenoid operation inhibited                |
| 45        | 26       | Open circuit, N solenoid circuit           | No                 | Low and 1st inhibited                         |
| 51        | 10       | Offgoing ratio test (during shift), 1 to L | Yes                | Low and 1st inhibited                         |
| 51        | 12       | Offgoing ratio test (during shift), 1 to 2 | Yes                | DNS, RPR                                      |
| 51        | 21       | Offgoing ratio test (during shift), 2 to 1 | Yes                | DNS, RPR                                      |
| 51        | 23       | Offgoing ratio test (during shift), 2 to 3 | Yes                | DNS, RPR                                      |

| MAIN CODE | SUB CODE | DESCRIPTION                                               | DO NOT SHIFT LIGHT | INHIBITED OPERATION DESCRIPTION |
|-----------|----------|-----------------------------------------------------------|--------------------|---------------------------------|
| 51        | 43       | Offgoing ratio test (during shift), 4 to 3                | Yes                | DNS, RPR                        |
| 51        | 45       | Offgoing ratio test (during shift), 4 to 5                | Yes                | DNS, RPR                        |
| 51        | 65       | Offgoing ratio test (during shift), 6 to 5                | Yes                | DNS, RPR                        |
| 52        | 01       | Offgoing C3PS test (during shift), L to 1                 | Yes                | DNS, RPR                        |
| 52        | 08       | Offgoing C3PS test (during shift), L to N1                | Yes                | DNS, NNC                        |
| 52        | 32       | Offgoing C3PS test (during shift), 3 to 2                 | Yes                | DNS, RPR                        |
| 52        | 34       | Offgoing C3PS test (during shift), 3 to 4                 | Yes                | DNS, RPR                        |
| 52        | 54       | Offgoing C3PS test (during shift), 5 to 4                 | Yes                | DNS, RPR                        |
| 52        | 56       | Offgoing C3PS test (during shift), 5 to 6                 | Yes                | DNS, RPR                        |
| 52        | 71       | Offgoing C3PS test (during shift), R to 1                 | Yes                | DNS, NNC                        |
| 52        | 72       | Offgoing C3PS test (during shift), R to 2                 | Yes                | DNS, NNC                        |
| 52        | 78       | Offgoing C3PS test (during shift), R to N1                | Yes                | DNS, NNC                        |
| 52        | 79       | Offgoing C3PS test (during shift), R to 2 (R to NNC to 2) | Yes                | DNS, NNC                        |
| 52        | 99       | Offgoing C3PS test (during shift), N3 to N2               | Yes                | DNS, RPR                        |
| 53        | 08       | Offgoing speed test (during shift), L to N1               | Yes                | DNS, NNC                        |
| 53        | 18       | Offgoing speed test (during shift), 1 to N1               | Yes                | DNS, NNC                        |
| 53        | 28       | Offgoing speed test (during shift), 2 to N1               | Yes                | DNS, NNC                        |
| 53        | 29       | Offgoing speed test (during shift), 2 to N2               | Yes                | DNS, RPR                        |
| 53        | 38       | Offgoing speed test (during shift), 3 to N1               | Yes                | DNS, NNC                        |
| 53        | 39       | Offgoing speed test (during shift), 3 to N3               | Yes                | DNS, RPR                        |
| 53        | 48       | Offgoing speed test (during shift), 4 to N1               | Yes                | DNS, NNC                        |
| 53        | 49       | Offgoing speed test (during shift), 4 to N3               | Yes                | DNS, RPR                        |
| 53        | 58       | Offgoing speed test (during shift), 5 to N1               | Yes                | DNS, NNC                        |
| 53        | 59       | Offgoing speed test (during shift), 5 to N3               | Yes                | DNS, RPR                        |

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| MAIN CODE | SUB CODE | DESCRIPTION                                               | DO NOT SHIFT LIGHT | INHIBITED OPERATION DESCRIPTION         |
|-----------|----------|-----------------------------------------------------------|--------------------|-----------------------------------------|
| 53        | 68       | Offgoing speed test (during shift), 6 to N1               | Yes                | DNS, NNC                                |
| 53        | 69       | Offgoing speed test (during shift), 6 to N4               | Yes                | DNS, RPR                                |
| 53        | 78       | Offgoing speed test (during shift), R to N1               | Yes                | DNS, NNC                                |
| 53        | 99       | Offgoing speed test (during shift), N2 to N3 or N3 to N2  | Yes                | DNS, RPR                                |
| 54        | 01       | Oncoming ratio test (after shift), L to 1                 | Yes                | DNS, RPR                                |
| 54        | 07       | Oncoming ratio test (after shift), L to R                 | Yes                | DNS, NNC                                |
| 54        | 10       | Oncoming ratio test (after shift), 1 to L                 | Yes                | DNS, RPR                                |
| 54        | 12       | Oncoming ratio test (after shift), 1 to 2                 | Yes                | DNS, RPR                                |
| 54        | 17       | Oncoming ratio test (after shift), 1 to R                 | Yes                | DNS, NNC                                |
| 54        | 21       | Oncoming ratio test (after shift), 2 to 1                 | Yes                | DNS, RPR                                |
| 54        | 23       | Oncoming ratio test (after shift), 2 to 3                 | Yes                | DNS, RPR                                |
| 54        | 27       | Oncoming ratio test (after shift), 2 to R                 | Yes                | DNS, NNC                                |
| 54        | 32       | Oncoming ratio test (after shift), 3 to 2                 | Yes                | DNS, RPR                                |
| 54        | 34       | Oncoming ratio test (after shift), 3 to 4                 | Yes                | DNS, RPR                                |
| 54        | 43       | Oncoming ratio test (after shift), 4 to 3                 | Yes                | DNS, RPR                                |
| 54        | 45       | Oncoming ratio test (after shift), 4 to 5                 | Yes                | DNS, RPR or SOL OFF (Hydraulic default) |
| 54        | 54       | Oncoming ratio test (after shift), 5 to 4                 | Yes                | DNS,RPR                                 |
| 54        | 56       | Oncoming ratio test (after shift), 5 to 6                 | Yes                | DNS,RPR                                 |
| 54        | 65       | Oncoming ratio test (after shift), 6 to 5                 | Yes                | DNS,RPR                                 |
| 54        | 70       | Oncoming ratio test (after shift), R to L                 | Yes                | DNS,NNC                                 |
| 54        | 71       | Oncoming ratio test (after shift), R to 1                 | Yes                | DNS,NNC                                 |
| 54        | 72       | Oncoming ratio test (after shift), R to 2                 | Yes                | DNS,NNC                                 |
| 54        | 80       | Oncoming ratio test (after shift), N1 to L                | Yes                | DNS,RPR                                 |
| 54        | 81       | Oncoming ratio test (after shift), N1 to 1                | Yes                | DNS,RPR                                 |
| 54        | 82       | Oncoming ratio test (after shift), N1 to 2                | Yes                | DNS,RPR                                 |
| 54        | 83       | Oncoming ratio test (after shift), N1 to 3                | Yes                | DNS,RPR                                 |
| 54        | 85       | Oncoming ratio test (after shift), N1 to 5                | Yes                | DNS,RPR                                 |
| 54        | 86       | Oncoming ratio test (after shift), N1 to 6                | Yes                | DNS, RPR                                |
| 54        | 92       | Oncoming ratio test (after shift), R to 2 (R to NNC to 2) | Yes                | DNS, NNC                                |



| MAIN CODE | SUB CODE | DESCRIPTION                                                          | DO NOT SHIFT LIGHT | INHIBITED OPERATION DESCRIPTION |
|-----------|----------|----------------------------------------------------------------------|--------------------|---------------------------------|
| 54        | 92       | Oncoming ratio test (after shift), N1 to 2 (N1 to NNC to 2)          | Yes                | DNS, RPR                        |
| 54        | 92       | Oncoming ratio test (after shift), N2 to 2                           | Yes                | DNS, RPR                        |
| 54        | 93       | Oncoming ratio test (after shift), N3 to 3                           | Yes                | DNS, RPR                        |
| 54        | 95       | Oncoming ratio test (after shift), N3 to 5                           | Yes                | DNS, RPR                        |
| 54        | 96       | Oncoming ratio test (after shift), N4 to 6                           | Yes                | DNS, RPR                        |
| 54        | 97       | Oncoming ratio test (after shift), 2 to R (2 to NNC to R)            | Yes                | DNS, NNC                        |
| 55        | 17       | Oncoming C3PS test (after shift), 1 to R                             | Yes                | DNS, NNC                        |
| 55        | 27       | Oncoming C3PS test (after shift), 2 to R                             | Yes                | DNS, NNC                        |
| 55        | 80       | Oncoming C3PS test (after shift), N1 to L                            | Yes                | DNS, RPR                        |
| 55        | 87       | Oncoming C3PS test (after shift), N1 to R                            | Yes                | DNS, RPR                        |
| 55        | 97       | Oncoming C3PS test (after shift), 2 to R or NVL to R (2 to NNC to R) | Yes                | DNS, NNC                        |
| 56        | 00       | Range verification test, L                                           | Yes                | DNS, 1st, Low, or SOL OFF (Low) |
| 56        | 11       | Range verification test, 1st                                         | Yes                | DNS, 6th                        |
| 56        | 22       | Range verification test, 2nd                                         | Yes                | DNS, 6th or 5th                 |
| 56        | 33       | Range verification test, 3rd                                         | Yes                | DNS, 5th or SOL                 |
| 56        | 44       | Range verification test, 4th                                         | Yes                | DNS, 3rd or 5th                 |
| 56        | 55       | Range verification test, 5th                                         | Yes                | DNS, SOL OFF (5th) or 3rd       |
| 56        | 66       | Range verification test, 6th                                         | Yes                | DNS, 5th, 3rd, or SOL OFF (3rd) |
| 56        | 77       | Range verification test, R                                           | Yes                | DNS, N2 or N3                   |
| 57        | 11       | Range verification C3PS test, 1st                                    | Yes                | DNS, SOL OFF (3rd)              |
| 57        | 22       | Range verification C3PS test, 2nd                                    | Yes                | DNS, 3rd                        |
| 57        | 44       | Range verification C3PS test, 4th                                    | Yes                | DNS, 5th or SOL OFF (3rd)       |
| 57        | 66       | Range verification C3PS test, 6th                                    | Yes                | SOL OFF (5th), DNS              |
| 57        | 88       | Range verification C3PS test, N1                                     | Yes                | DNS, N3                         |
| 57        | 99       | Range verification C3PS test, N2 or N4                               | Yes                | DNS, N3                         |
| 61        | 00       | Retarder oil temperature, hot                                        | No                 | None                            |
| 62        | 12       | Retarder oil temperature sensor, low                                 | No                 | None                            |
| 62        | 23       | Retarder oil temperature sensor, high                                | No                 | None                            |
| 63        | 00       | Special function input                                               | No                 | Depends on special function     |
| 64        | 12       | Retarder modulation request sensor, low                              | No                 | Retarder operation inhibited    |

TECHNICAL INFORMATION

| MAIN CODE | SUB CODE | DESCRIPTION                                    | DO NOT SHIFT LIGHT | INHIBITED OPERATION DESCRIPTION                                            |
|-----------|----------|------------------------------------------------|--------------------|----------------------------------------------------------------------------|
| 64        | 23       | Retarder modulation request sensor, high       | No                 | Retarder operation inhibited                                               |
| 65        | 00       | Engine rating too high                         | Yes                | DNS                                                                        |
| 66        | 00       | Serial communications interface fault          | No                 | Use default throttle values                                                |
| 69        | 12       | ECU, A solenoid driver open                    | Yes                | DNS, SOL OFF (hydraulic default)                                           |
| 69        | 13       | ECU, B solenoid driver open                    | Yes                | DNS, SOL OFF (hydraulic default)                                           |
| 69        | 14       | ECU, C solenoid driver open                    | Yes                | DNS, SOL OFF (hydraulic default)                                           |
| 69        | 15       | ECU, D solenoid driver open                    | Yes                | DNS, SOL OFF (hydraulic default)                                           |
| 69        | 16       | ECU, E solenoid driver open                    | Yes                | DNS, SOL OFF (hydraulic default)                                           |
| 69        | 21       | ECU, F solenoid driver open                    | No                 | Lock-up inhibited                                                          |
| 69        | 22       | ECU, G solenoid driver open                    | Yes                | DNS, SOL OFF (Hydraulic default)                                           |
| 69        | 23       | ECU, H solenoid driver open                    | No                 | Retarder allowed, differential lock inhibited                              |
| 69        | 24       | ECU, J solenoid driver open                    | No                 | Low and 1 st inhibited                                                     |
| 69        | 25       | ECU, K solenoid driver open                    | No                 | K solenoid operation inhibited                                             |
| 69        | 26       | ECU, N solenoid driver open                    | No                 | Low and 1st inhibited                                                      |
| 69        | 32       | ECU, SPI communications link fault             | No                 | Hold in last valid direction                                               |
| 69        | 33       | ECU, Central Operating Processor (COP) timeout | Yes                | Reset ECU, Shutdown ECU on 2nd occurrence (power loss: hydraulic defaults) |
| 69        | 34       | ECU, EEPROM write timeout                      | Yes                | DNS, SOL OFF (Hydraulic default)                                           |
| 69        | 35       | ECU, EEPROM checksum                           | Yes                | Induce COP timeout (reset ECU)                                             |
| 69        | 36       | ECU, RAM self test                             | Yes                | Induce COP timeout (reset ECU)                                             |
| 69        | 41       | ECU, I/O ASIC addressing test                  | Yes                | Induce COP timeout (reset ECU)                                             |
| 70        | 12       | Software, minor loop overrun                   | Yes                | Induce COP timeout (reset ECU)                                             |
| 70        | 13       | Software, illegal write to address \$0000      | Yes                | Induce COP timeout (reset ECU)                                             |
| 70        | 14       | Software, major loop overrun                   | Yes                | Induce COP timeout (re-                                                    |

| MAIN CODE | SUB CODE | DESCRIPTION | DO NOT SHIFT LIGHT | INHIBITED OPERATION DESCRIPTION |
|-----------|----------|-------------|--------------------|---------------------------------|
|           |          |             |                    | set ECU)                        |

### Light Bulb Data

| APPLICATION                          | PREVOST PART NO. | TRADE OR SAE NUMBER | WATTS OR CANDLE POWER | VOLTS | QTY |
|--------------------------------------|------------------|---------------------|-----------------------|-------|-----|
| <b>EXTERIOR LIGHTING</b>             |                  |                     |                       |       |     |
| Hi-beam, Headlight                   | 930291           | 9004                | 65 W                  | 12    | 2   |
| Lo-beam, Headlight                   | 930291           | 9004                | 45 W                  | 12    | 2   |
| Docking & cornering                  | 561882           | H3(Osram)           | 55 W                  | 12    | 4   |
| Fog (Optional)                       | 561882           | H3(Osram)           | 55 W                  | 12    | 2   |
| License plate (sealed)               | 930266           | ---                 | 12 W                  | 12    | 2   |
| Side directional                     | 561917           | 1893                | 2 cp                  | 12    | 20  |
| Side marker                          | 561917           | 1893                | 2 cp                  | 12    | 20  |
| Identification                       | 562059           | 194                 | 2 cp                  | 12    | 6   |
| Clearance                            | 562059           | 194                 | 2 cp                  | 12    | 8   |
| Front directional (hazard & marker)  | 562135           | 3057                | 32/3 cp               | 12    | 2   |
| Rear directional                     | 560589           | 1156                | 32 cp                 | 12    | 8   |
| Stop                                 | 560589           | 1156                | 32 cp                 | 12    | 8   |
| Back-up                              | 560589           | 1156                | 32 cp                 | 12    | 4   |
| Center stop                          | 560589           | 1156                | 32 cp                 | 12    | 2   |
| Tail                                 | 560123           | 67                  | 4 cp                  | 12    | 8   |
| Exterior compartment (except engine) | 562278           | 6429 (78207)        | 10 W                  | 24    | 12  |
| Engine compartment                   | 560601           | 456                 | 2 cp                  | 24    | 6   |
|                                      |                  |                     |                       |       |     |
|                                      |                  |                     |                       |       |     |
|                                      |                  |                     |                       |       |     |

TECHNICAL INFORMATION

| APPLICATION               | PREVOST<br>PART NO. | TRADE OR<br>SAE NUMBER | WATTS OR<br>CANDLE<br>POWER | VOLTS | QTY |
|---------------------------|---------------------|------------------------|-----------------------------|-------|-----|
|                           |                     |                        |                             |       |     |
|                           |                     |                        |                             |       |     |
| <b>INTERIOR LIGHTING</b>  |                     |                        |                             |       |     |
| Check engine              | 562048              | E-9 (Norma)            | 2 W                         | 12    | 1   |
| Stop engine               | 562048              | E-9 (Norma)            | 2 W                         | 12    | 1   |
| Flasher indicator         | 562048              | E-9 (Norma)            | 2 W                         | 12    | 2   |
| Other indicator - 1/unit  | 562049              | (Osram)                | 2 W                         | 24    | AR  |
| Speedometer               | 560145              | 1829                   | 1 cp                        | 24    | 2   |
| Tachometer                | 560145              | 1829                   | 1 cp                        | 24    | 2   |
| Turbo boost (optional)    | 561167              | 3899 (Osram)           | 3 W                         | 24    | 1   |
| Other instrument - 1/unit | 560144              | 1820                   | 1.6 cp                      | 24    | AR  |
| Step                      | 562278              | 6429 (78207)           | 10 W                        | 24    | 3   |
| Driver's area             | 561553              | 78236                  | 10 W                        | 24    | 4   |

## Data Plate & Certification

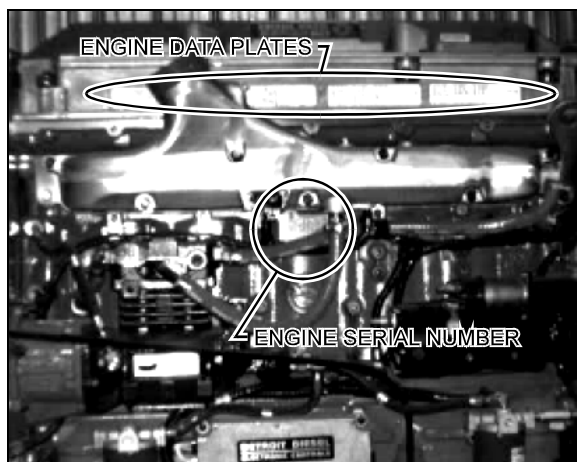
### Data Plate

The main components of the vehicle such as engine, transmission, axles and chassis are identified by different serial numbers. It may be necessary to locate these numbers for warranty purposes.

#### Engine

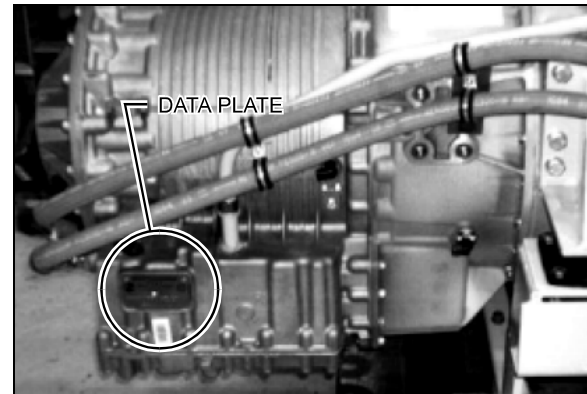
The engine serial number is stamped on the cylinder block under the intake manifold (oil filter side) close to the water pump.

In addition, four plates are located on the rocker cover (oil filter side). Contents of the plates include the engine serial and model numbers and a list of the optional equipment on the engine. The information is primarily used when ordering replacement parts.



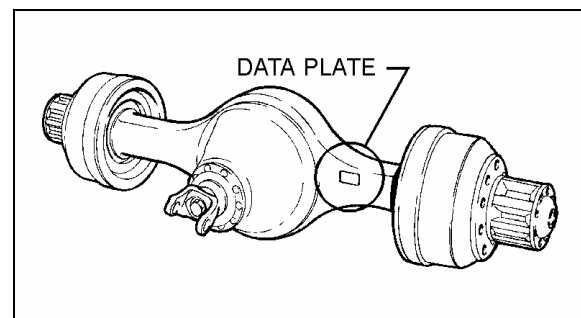
01012

#### Transmission



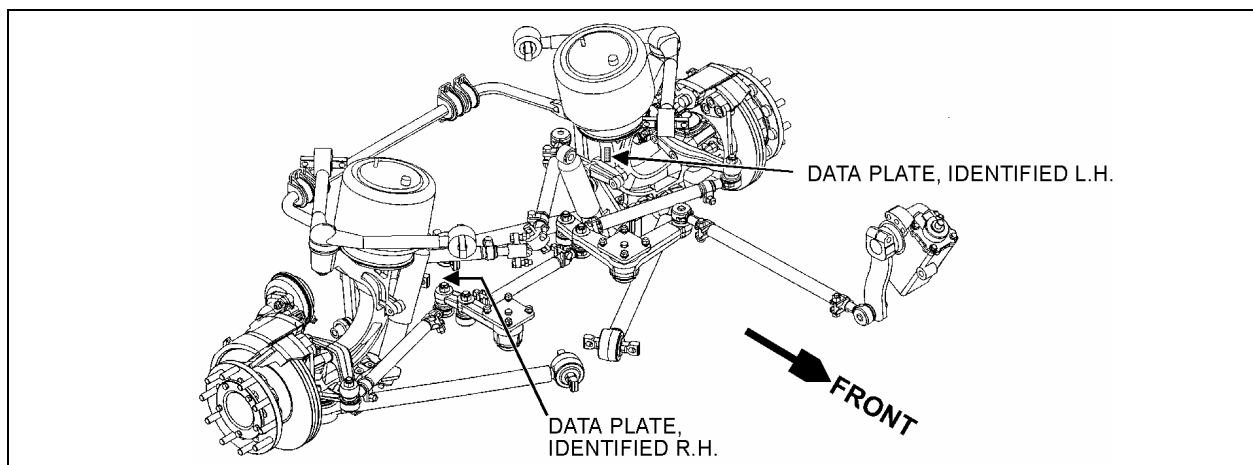
07003

#### Drive Axle



11004

#### Front Suspension

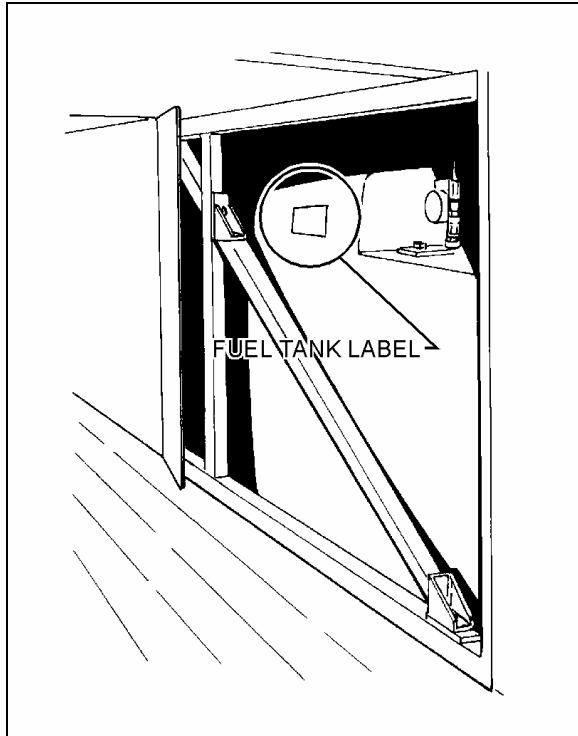


16036M



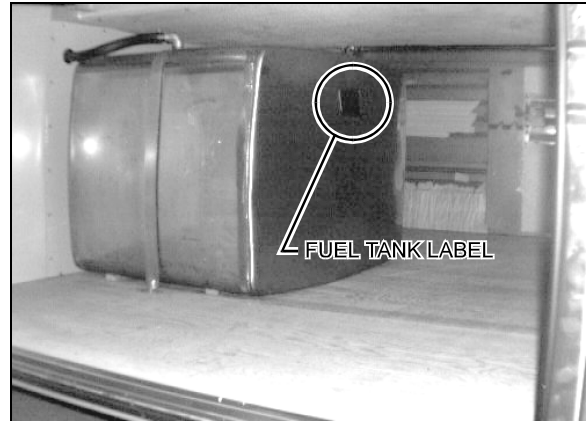
### Fuel Tank Label - XL-40 & 45E

The fuel tank label is affixed on side of fuel tank. To read this label, open the last baggage compartment door, locate the fuel tank access panel then remove it by unscrewing the Phillips head retaining screws.



03003

**Note:** *Optional auxiliary fuel tank has a label affixed to the side of the tank and can be easily read through the second (third on XL-45E) baggage compartment door.*

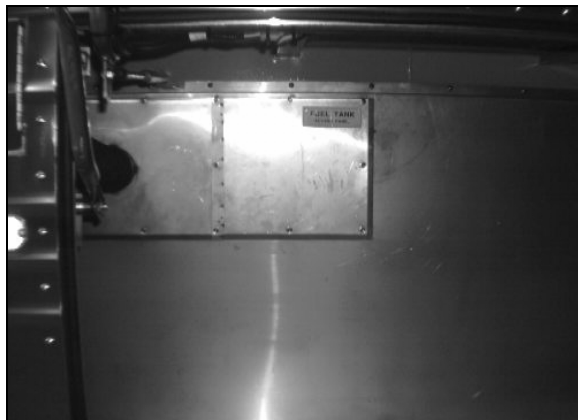


03002

**Note:** *It is strongly recommended that you take note of all the serial numbers on the vehicle and supply them to your insurance company; They may be useful.*

### Fuel Tank Label - XL-45

The fuel tank label is affixed on side of fuel tank. To read this label, unscrew the fuel tank access panel nuts located on upper L.H. side of rear bulkhead inside condenser compartment (or baggage compt) as illustrated below.



# Care and Maintenance

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## Interior Cleaning

Most of the interior of your vehicle was installed by the Interior Designer and Systems Manufacturer who converted your vehicle. Refer to them for correct maintenance and cleaning of the components they've installed.

For the maintenance and cleaning of the materials installed by PRÉVOST inside your vehicle, refer to the following instructions.

### Plastic and Vinyl

Use a clean, damp cloth or sponge to keep trim free from dust. For other soilage, use a lukewarm all purpose cleaning solution or a mild saddle soap for vinyl trim. Remove water spots and soap traces with a clean, damp cloth or sponge. Use a clean, soft cloth to rub dry.

Grease, tar or oil stains can be removed with a clean cloth or sponge soaked with an all purpose cleaner or with a solvent-type vinyl cleaning agent.

Occasionally, apply a colorless vinyl or leather preservative to retain the material's luster and pliability.

### Windows

To clean inside surface of the windows, use a commercial glass cleaner or a 10 to 1 mix of water and white vinegar. For maximum visibility, keep your windows clean at all times.

### Rubber Components

Should be treated only with pure water or glycerin.

### Pressure Laminates

Normal maintenance consists in wiping surfaces with a damp cloth and detergent. Remove spillage at once to avoid permanent stains.

To remove stains, first try cleaning the affected area with a household detergent, methylated spirits or mineral turpentine. If stain is still present, try a mild abrasive and water solution.

## Stainless Steel

Use a stainless steel cleaner available at any automotive washing and cleaning specialist and follow manufacturer's instructions.

## Exterior Cleaning

The paint on your vehicle is very durable, but must be protected from harsh weather conditions that can make it lose its luster. Therefore, wash and wax your vehicle often. The longer the dirt is left on the paint, the greater the risk of damaging the glossy finish; either by scratching (if the dirt is rubbed into the paint), or simply by the chemical effect dirt particles have on painted surfaces.

Begin by spraying water over the entire vehicle to remove all loose dirt, then wash with a car washing-soap in the concentration recommended by the manufacturer. Rinse afterwards with a generous stream of water.

**Note:** *The vehicle paintwork needs polishing or preserving when water no longer forms droplets on the surface.*

**Caution:** *Do not use hot water. Lukewarm to cool water is less harmful to the paint. Do not use solutions that can damage the body paint.*

*Do not aim the water jet directly into openings such as the A/C & heating compartment door grille to avoid water penetration in the fresh air intake duct. If the water jet is under high pressure, avoid aiming the jet directly on condenser and radiator doors as the fins of cores may be damaged.*

*Do not wash or wax your vehicle in direct sunlight.*

The underside of the vehicle picks up dirt and road salt used to keep streets and highways free of snow and ice. To protect against corrosion, it is important to remove mud, debris and road salt from the underside with a powerful water jet. Be sure to include the wheel housings, bumpers, muffler, tailpipe and brackets. This should be done twice a year and is best accomplished after the vehicle has been driven through a heavy rain.



The exterior of the vehicle, engine, engine compartment, aluminum wheels and mirrors should always be washed as soon as possible after accumulating road salt.

**Note:** *Let engine and exhaust cool down before washing.*

### Tar or Oil

Do not allow tar or oil to remain on the paint. Remove as soon as possible with tar remover or turpentine. After applying cleaning fluids, always wash with a lukewarm water and soap solution, then apply a new coat of wax.

### Insects

Remove as soon as possible with a lukewarm water and soap solution or insect remover.

### Tree Sap

Do not allow tree sap or bird droppings to harden on the paint. Remove with a lukewarm water and soap solution.

### Windows

Keep silicone sprays off the windshield to avoid wiper smear in rain. Clean all windows regularly to remove road film and bus-wash wax buildup. Use a lukewarm soap and water solution or an alcohol-based cleaning agent. If a chamois is used for polishing the glass, it should be used exclusively for that purpose.

### Wiper Blades

If wiper blades are frozen, remove ice gently by hand to avoid blade damage. Remove all wiper blades periodically and clean them thoroughly with an alcohol-based solution. Use a sponge or soft cloth and wipe lengthwise. Replace wiper blades if they are damaged or do not clean well.

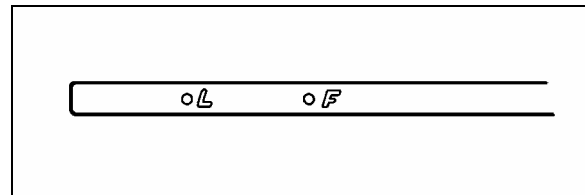
## Oil Verification

### Engine Oil Level

Ideally, check engine oil level when oil is warm with vehicle on a level surface; for instance, dur-

ing every fuel filling. First, stop engine and wait at least 10 minutes for the oil to drain back into the oil pan. Then, pull out the dipstick, wipe clean, reinsert the dipstick and note the oil level.

Maintain the oil level between the two marks on the dipstick, and never allow it to drop below the "L" mark. If required, add oil from the oil reserve tank by opening the tank valve and observing the oil level change in the sight glass, then check oil level again. No advantage is gained by having oil level above the "F" mark. Do not forget to shut off oil reserve tank valve as too much oil can be harmful to the engine.



01016

**Note:** *For location of engine oil dipstick and engine oil reserve tank see figure on page 2-28.*

### Automatic Transmission Oil Level

#### Manual oil level check procedure

**Note:** *For "Electronic Readout of Oil level sensor" and other transmission related information, see pages 4-4 through 4-7.*

**Warning:** *When checking the oil level, be sure that the transmission is in Neutral, parking brake is properly engaged, and the wheels are chocked. Unexpected and possible sudden vehicle movement may occur if these precautions are not taken.*

*Special care must be taken not to touch the engine coolant tubing and/or exhaust pipe, as this could cause severe burns.*

*Do not wear loose clothing and stay away from rotating parts during procedure. Personal injury could occur.*

**Note:** *Clean around the end of fill tube before removing dipstick. This will aid in preventing dirt and/or foreign matter from entering the fluid system, which can cause valves to stick, undue wear of transmission parts, or clog passages.*

### Cold check

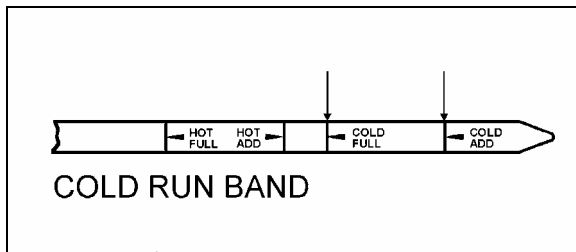
The purpose of the Cold Check is to determine if the transmission has enough fluid to be operated safely until a Hot Check can be made.

If the engine has been shut down for an extended period of time, park the vehicle on a level surface and apply the parking brake.

Run the engine for at least 1 minute. Shift to Drive and operate the engine for 30 seconds at 1000-1500 rpm; then shift to Reverse to clear the hydraulic system of air. Then shift to Neutral and allow the engine to idle (500-800 rpm).

After wiping the dipstick clean (see page 2-28 for dipstick location), check the fluid level. If the fluid on the dipstick is within the COLD RUN band, the level is satisfactory. If the fluid level is not within this band, add or drain fluid as necessary to bring the level to the COLD RUN band.

Perform a HOT CHECK at the first opportunity after normal operating temperature (71°C-93°C; 160°F-200°F) is reached.



07006A

**Caution:** An accurate fluid level check cannot be made unless the engine is idling (500-800 rpm) in Neutral, the transmission fluid is at the proper temperature, and the vehicle is on a level surface.

### Hot check

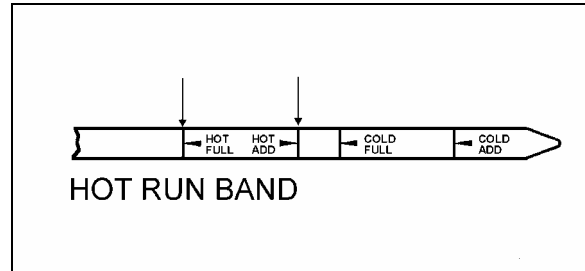
Because the fluid level rises as temperature increases, the fluid must be hot to ensure an accurate check.

Be sure fluid has reached normal operating temperature (71°C-93°C; 160°F-200°F).

Park the vehicle on a level surface and shift to Neutral. Apply parking brake and allow the engine to idle (500-800 rpm).

After wiping the dipstick clean, check the fluid level. The safe operating level is anywhere within the HOT RUN band on the dipstick.

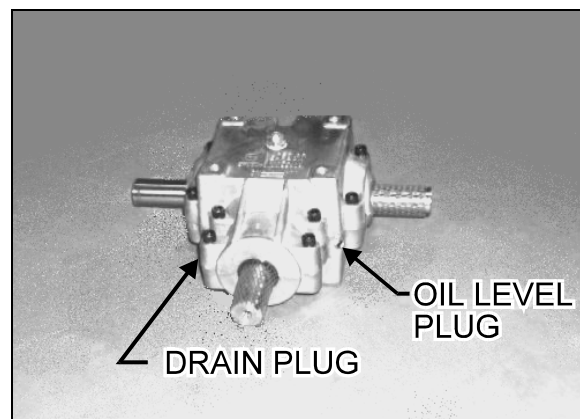
If the level is not within this band, add or drain fluid as necessary to bring the level within the HOT RUN band.



07006B

### Fan Gearbox Oil Level

The radiator fan is belt driven from the engine crankshaft pulley through a drive shaft and a gearbox (for location of gearbox, see page 2-28). The gearbox is equipped with an Oil Level Plug and a Drain Plug. Check oil level with the engine stopped and make sure that all engine stopping safety precautions have been observed. Oil level is correct when oil seeps out of loosened Oil Level Plug; if adding is necessary, use Mobil SHC 634 Synthetic lubricant.



05012M

### Power Steering Oil Level

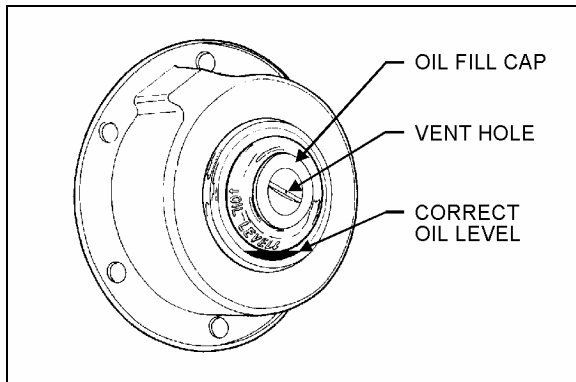
Your vehicle is equipped with an integrated power steering system. The power steering fluid reservoir is located on the upper R.H. side of engine in the engine compartment (see page 2-28). To check fluid level, proceed as follows:

1. Stop engine, and open both engine rear doors.

2. Remove dipstick and wipe with a clean rag.
3. Insert dipstick in reservoir, then remove it again to check mark.
4. Adjust level to "FULL" mark, using only "DEXRON IIE or III" automatic transmission fluid.

### Wheel Bearing Oil Level

The oil level for the front and tag axle wheel bearings must be maintained to the level mark in the cap. The level is determined by a line, indicated by arrows, that is incorporated to the plastic lens and passes underneath the words "OIL LEVEL". To check oil level after vehicle has been driven, wait at least 15 minutes to ensure that oil has settled. Drive axle wheel bearings are lubricated by the differential oil. Maintain differential oil level to ensure adequate lubrication of drive axle wheel bearings at all times.



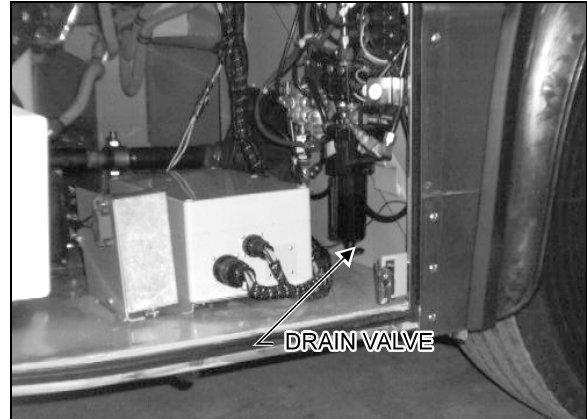
13003

**Caution:** Wheel bearing oil fill cap is supplied with a very small vent hole in its center. Occasionally insert a small tip (toothpick size) to be sure that hole is not plugged; a plugged hole may cause leakage when heat expands the oil and air.

### Air Tanks

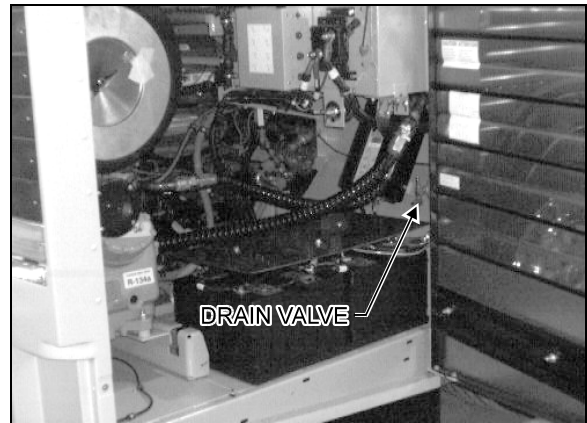
Your vehicle is equipped with four (4) air tanks; the accessory tank and wet tank must be purged before every trip or once a month, while the primary and secondary air tanks must be purged each time the oil and filters are changed (maximum 10,000 miles (16 000 km)).

The accessory air tank is installed above front axle and its remote drain valve is located in Steering Compartment.



12012

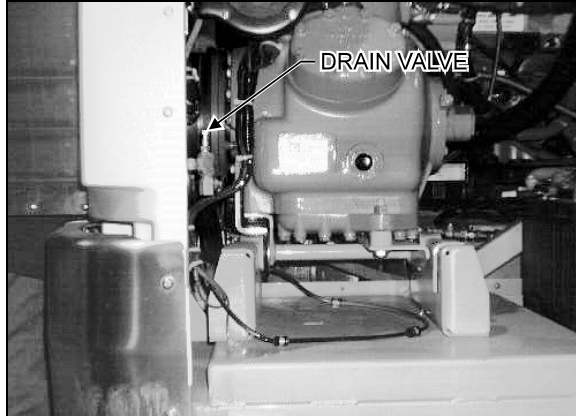
The wet air tank is installed above L.H. wheel of drive axle and its remote drain valve is located in engine compartment and is accessible through engine R.H. side door. On **XL-40 & 45E** valve is located below air filter and on **XL-45** valve is located below emergency fill valve.



XL-40 & 45E

12010

All four (4) tanks installed under the vehicle, are supplied with a drain valve underneath the tank. For locations, refer to figure in "Lubrication and servicing schedule" later in this section.



XL-45

12011M

## Coolant Level Verification

The cooling system is completely filled when the coolant (cold) is visible in the sight glass of the surge tank (see page 2-28 for location). If topping-up is necessary, fill the system with the same mixture ratio already used in the system.

**Warning:** Hot engine coolant is under pressure. Never remove cap when coolant is hot as severe burns can result. Allow engine to cool before checking coolant level.

## Water Separator (Optional)

A fuel filter/water separator may be installed in engine's primary fuel filter location, in engine compartment, to prevent water infiltration in engine fuel system. It should be drained periodically, or when the water separator indicator lamp lights on dashboard. To drain, loosen self venting drain below separator, and tighten after water has been flushed out.

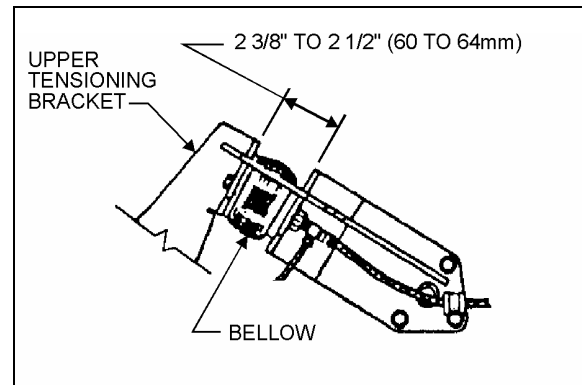


03004

## Belt Tensioners

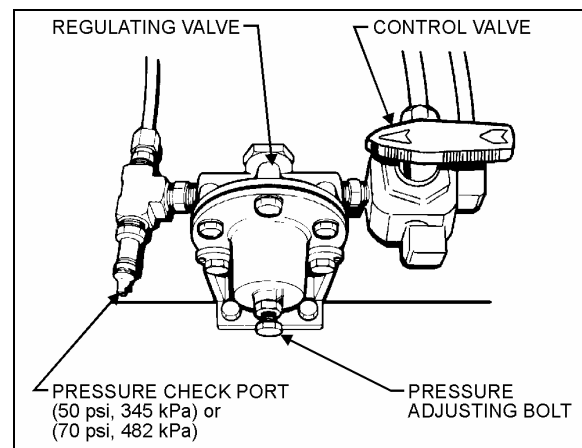
### Air-operated Type

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



12017

For belt replacement, air pressure must be released from bellows by means of the belt tensioning pressure control valve. This valve (see page 2-28) mounted above the engine doors close to the pressure regulating valve, is manually operated. Before handling, be sure that all engine stopping safety precautions have been observed.



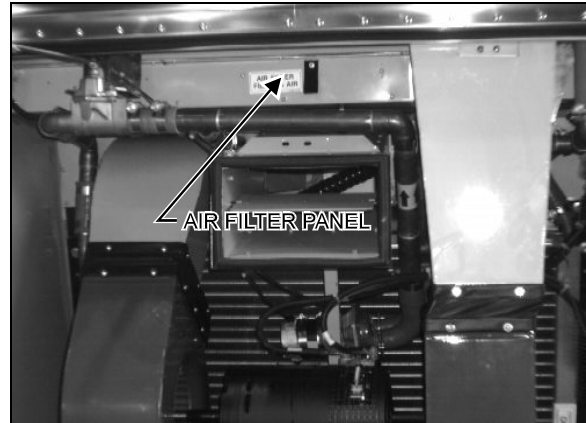
12018

## Manually Adjustable Type

There are two (2) different types of manually adjustable belt tensioning systems. Tension belts according to the instructions in "Maintenance Manual".

## A/C And Heating Air Filters

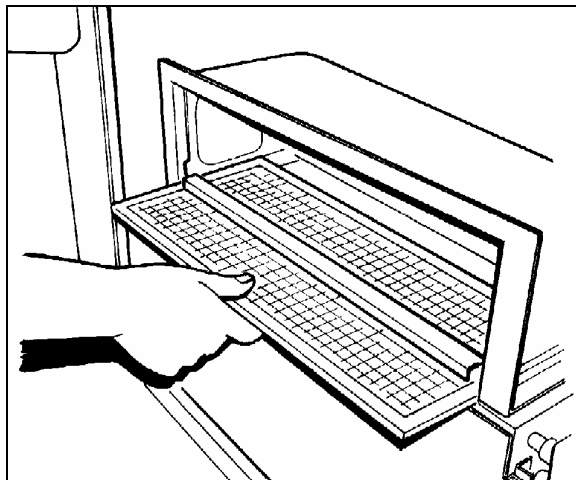
For maximum air conditioning and heating system efficiency, air filters should be inspected and cleaned as required in maintenance schedule to ensure proper ventilation of the evaporator and heating radiator cores.



22013

## Driver's System

Air filter for driver's system is located under dashboard. To gain access, turn counterclockwise both 3/4 turn knurled fasteners of A/C and heating unit access panel, then lift and remove panel.



22011

## Central System

The central system uses three (3) air filters, they are located in A/C and heating compartment. To gain access, open A/C and heating compartment door (see page 2-30) then remove the six (6) outer screws ("Phillips") retaining the air filter panel. Slide out panel c/w one (1) filter, then slide out other two (2) filters.

## Flexible Hose Maintenance

The performance of engine and related equipment is greatly affected by the flexible hoses' ability to carry fluids or gases. Maintenance of hoses is an important function in ensuring efficient, economical, and safe operation of your vehicle.

## Pre-starting Inspection

Inspect hoses for leaks, and check all fittings, clamps, and ties carefully. Ensure that hoses are not resting on or touching shafts, couplings, heated surfaces including exhaust manifolds, any sharp edges, or other obviously damaging areas. Since all machinery vibrates and moves to a certain extent, clamps and ties can fatigue with time. To ensure proper support, inspect fasteners frequently and tighten or replace them as necessary.

## Leaks

Investigate leaks immediately to determine if fittings have loosened or cracked, and also if hoses have ruptured or worn through. Take corrective action immediately. Leaks are not only potentially detrimental to machine operation, but can also result in added expenses caused by the need to replace lost fluids.

**Warning:** Personal injury and/or property damage may result from fire due to the leakage of flammable fluids, such as fuel or lubricating oil.

## Service Life

A hose has a limited service life which is controlled by many factors. With this in mind, it is recommended that all hoses be thoroughly inspected annually. Look for surface damage or indications of twisted, worn, crimped, brittle, cracked, or leaking lines. Hoses having the outer surface worn through or a damaged metal reinforcement should be considered unfit for further service.

It is also recommended that all hoses in this vehicle be replaced during major overhaul and/or after a maximum of five service years. Replacement hoses and hardware should always be at least equal in quality to that of the O.E.M..

## Lubrication

A lubrication chart is provided in this section to give locations of key service points on the vehicle. Cleaning, removal or disassembly procedures (required for lubrication purposes) are covered in the applicable sections of this manual.

Lubrication intervals are based on recommendations for normal operating conditions. Where more severe service is encountered, more frequent attention will be required.

## Fire Extinguishers

In order for fire extinguishers to operate adequately in emergency situations, we strongly recommend that all units be inspected on a monthly basis.

- Check that pressure is adequate and recharge if required.
- Check that seal on handle is intact.
- Check that hose or nozzle is not restricted.
- Keep fire extinguishers clean.
- Note inspection date.

## First Service On New Vehicle

### Differential Oil

Factory-filled oil in differential on new vehicle should be drained and refilled between 1,000 miles (1 600 km) and 3,000 miles (4 800 km) of initial operation, then according to the lubrication and servicing schedule.

### Coolant Strainer

The coolant strainer is designed to recover the soldering residues trapped inside coolant lines during their initial assembly; perform initial cleaning once vehicle has run approximately 3,000 miles (4 800 km), then according to the lubrication and servicing schedule.

**Note:** *If additional soldering has been performed on any points of coolant piping, clean coolant system strainer as outlined on new vehicle (3,000 miles (4 800 km)).*

On vehicles equipped with driver's A/C system, strainer is located in Reclining Bumper Compartment.



RECLINING BUMPER COMPARTMENT

05022

On vehicles equipped with central A/C system, strainer is located in A/C & Heating Compartment.



A/C & HEATING COMPARTMENT

05021

### Automatic Transmission Oil Filter

Change cartridge after first 3,000 miles (4 800 km), then after each 25,000 miles (40 000 km) as specified in the lubrication and servicing schedule. Check the oil frequently (with engine running - see page 6-2); if necessary, add sufficient oil to raise level to the proper mark on dipstick.

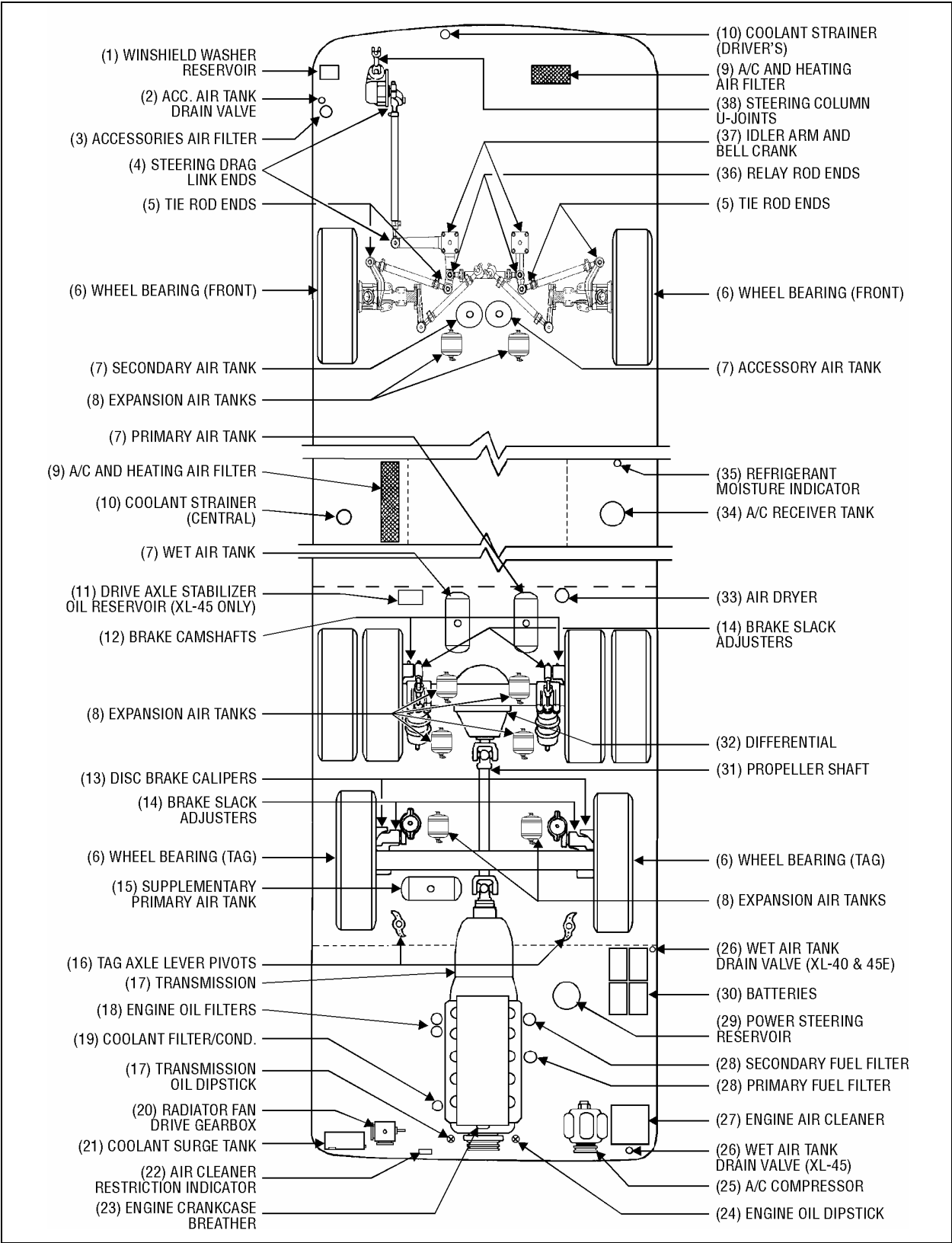
### Engine Oil

There is no special break-in period since engine break-in has been done in factory; Therefore oil should be changed according to the lubrication and servicing schedule intervals. Check the oil at every fuel filling. If necessary, add sufficient oil to raise the level to the proper mark on dipstick.

### Radiator Fan Drive Gearbox Oil

Factory-filled oil in radiator fan drive gearbox on new vehicle should be drained and refilled after 3,000 miles (4 800 km) of initial operation, then according to the lubrication and servicing schedule.

# Lubrication And Servicing Schedule



LUBRICATION AND SERVICING POINTS

24001A



**Caution:** Before operating vehicle, perform "Routine inspection before a trip and on the road" as outlined on page 4-8.

**Note:** Perform the "FIRST SERVICE ON NEW VEHICLE" as outlined on page 6-9.

## Walk-Around Inspection (Before Every Trip)

It is a good practice to make a basic visual inspection of key areas on the vehicle before every trip and to report any problem areas to qualified technicians for immediate correction.

### A) Outside The Vehicle

| ITEM*  | DESCRIPTION                                                                                                                                 |
|--------|---------------------------------------------------------------------------------------------------------------------------------------------|
| ---    | Check for leaks under vehicle and engine compartment                                                                                        |
| ---    | Check that baggage and service compartment doors close properly                                                                             |
| ---    | Inspect tires and wheels for correct tire pressure, wear or damage, and for missing wheel stud and nuts                                     |
| 1      | Check windshield washer fluid level and add if necessary                                                                                    |
| ---    | Check condition of windshield wiper blades                                                                                                  |
| ---    | Verify proper operation of all road lights, signal lights, brake lights, marker lights, and back-up lights; Replace light bulbs as required |
| 3 & 26 | Drain accumulated water in accessory and wet air tanks                                                                                      |

### B) Engine Compartment

| ITEM* | DESCRIPTION                                                                                          |
|-------|------------------------------------------------------------------------------------------------------|
| 24    | Check engine crankcase oil level; Add if necessary                                                   |
| 17    | Check transmission oil level (level can be checked from pushbutton shift selector); Add if necessary |
| 29    | Check power steering reservoir fluid level; Add if necessary                                         |
| 21    | Check coolant surge tank fluid level, Add if necessary                                               |
| 28    | Drain accumulated water in primary fuel filter/water separator (if equipped)                         |

### C) Inside the Vehicle

| ITEM | DESCRIPTION                                                                                                          |
|------|----------------------------------------------------------------------------------------------------------------------|
| ---  | Check for proper operation of the entrance door                                                                      |
| ---  | Inspect cleanliness in the driver's area                                                                             |
| ---  | 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                                                                   |
| ---  | Check rear view mirrors for broken glass; 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 horn(s), and back-up alarm                                                             |

\* Item numbers refer to figure on page 6-9.

## Periodic Lubrication And Servicing Schedule

Service every 6,250 miles (10 000 km) or twice a year, whichever comes first.

| ITEM* | DESCRIPTION                    | REMARKS                                                                  | LUBRICANT &/OR PART**                     |
|-------|--------------------------------|--------------------------------------------------------------------------|-------------------------------------------|
| 27    | Engine Air Cleaner             | Inspect and clean, replace element if required                           | Filter: #530197                           |
| 25    | A/C Compressor                 | Check oil level, add if necessary                                        | Polyolester oil                           |
| 34    | A/C Receiver Tank              | Check refrigerant level, add if necessary                                | HFC 134a                                  |
| 35    | Refrigerant Moisture Indicator | Replace filter dryer unit according to moisture indicator                | Filter: #452542<br>C/W Moisture indicator |
| 32    | Differential                   | Check oil level, add if necessary                                        | Multigrade gear oil                       |
| 20    | Radiator Fan Drive Gearbox     | Check oil level, add if necessary                                        | Synthetic oil, ISO VG 460                 |
| 31    | Propeller shaft                | Grease one fitting on each universal joint and one fitting on slip joint | Multi purpose grease                      |
| 16    | Tag Axle Lever Pivot           | Grease one fitting on each pivot                                         | Multi purpose grease                      |
| 14    | Brake Slack Adjuster           | Grease one fitting on each slack adjuster (all axles)                    | Multi purpose grease                      |
| 4     | Steering Drag Link End         | Grease one fitting at each end                                           | Multi purpose grease                      |
| 5     | Tie Rod Ends                   | Grease one fitting at each end (4 places)                                | Multi purpose grease                      |
| 36    | Relay Rod Ends                 | Grease one fitting at each end                                           | Multi purpose grease                      |
| 37    | Idler Arm and Bell Crank       | Grease one fitting on each (2 places)                                    | Multi purpose grease                      |
| 13    | Disc Brake Calipers            | Grease two fittings on each of front and tag axles.                      | Multi purpose grease                      |

\* Item numbers refer to figure on page 6-9.

\*\* See end of this section for lubricant and part number specifications.

**Caution:** Rockwell suggests that for items #13 & 14 the following lubricants be used:

Operating Temperatures at or above -40°F (-40°C)

- Special brake grease, Rockwell Specification 0-616-A, part number A-1779-W-283 or equivalent
- Texaco Thermotex EP No. 1 or equivalent
- Shell Darina No. 1 or equivalent
- Aral Aralub 3837 or equivalent.

Operating Temperature below -40°F (-40°C)

- Special Low Temperature Brake Grease, Rockwell Specification 0-645, part number 2297-X-4574 or equivalent
- Mobilgrease 28 or equivalent
- Mobilgrease 32 or equivalent

CARE AND MAINTENANCE

**Service every 12,500 miles (20 000 km) or once a year, whichever comes first.**

| ITEM* | DESCRIPTION                 | REMARKS                                                                                 | LUBRICANT &/OR PART**                                           |
|-------|-----------------------------|-----------------------------------------------------------------------------------------|-----------------------------------------------------------------|
| 18    | Engine                      | Change oil and filters                                                                  | Motor oil:<br>SAE 15W40, API CG-4<br>Filters: #510458           |
| 28    | Fuel Filters                | Change primary and secondary fuel filters<br>(Fill with clean fuel before installation) | Primary: #510137<br>Prim. w/sep.: #531390<br>Secondary: #510128 |
| 19    | Coolant Filter/Conditioner  | Replace element                                                                         | Filter: #550630                                                 |
| 7     | Air Tanks                   | Drain accumulated water in all tanks                                                    | -----                                                           |
| 8     | Expansion Air Tanks         | Drain accumulated water in all tanks                                                    | -----                                                           |
| 9     | A/C and Heating Air Filters | Clean or replace elements                                                               | Driver's: #871049 (Qty = 1)<br>Central: #871034 (Qty = 3)       |
| 21    | Coolant Surge Tank          | Test coolant solution                                                                   | -----                                                           |

**Service every 25,000 miles (40 000 km) or once a year, whichever comes first.**

| ITEM* | DESCRIPTION            | REMARKS                | LUBRICANT &/OR PART**     |
|-------|------------------------|------------------------|---------------------------|
| 17    | Automatic Transmission | Change oil and filters | Dexron-II-E or Dexron-III |

**Service every 50,000 miles (80 000 km) or once a year, whichever comes first.**

| ITEM* | DESCRIPTION                 | REMARKS                                                                                 | LUBRICANT &/OR PART**                       |
|-------|-----------------------------|-----------------------------------------------------------------------------------------|---------------------------------------------|
| 29    | Power Steering Reservoir    | Replace oil filter cartridge element                                                    | Cartridge: #660987                          |
| 6     | Front and Tag Axle Bearings | Refill to level with differential oil or<br>re-pack with wheel bearing grease           | Differential oil or<br>Multi Purpose Grease |
| 10    | Coolant Strainers           | Check and clean, change cartridge if<br>required                                        | Driver's: #870807<br>Central: #871029       |
| 20    | Radiator Fan Drive Gearbox  | Change oil                                                                              | Synthetic oil ISO VG 460                    |
| 23    | Engine Crankcase Breather   | Clean breather steel mesh                                                               | -----                                       |
| ---   | Flexible Hoses              | Thoroughly inspect all hoses (see " <i>Flexible<br/>Hose Maintenance</i> " on page 6-6) | -----                                       |
| ---   | Preheater (Webasto only)    | Test coolant solution                                                                   | -----                                       |

\* Item numbers refer to figure on page 6-9.

\*\* See end of this section for lubricant and part number specifications.

**Service every 100,000 miles (160 000 km) or once every two years, whichever comes first.**

| ITEM* | DESCRIPTION            | REMARKS                                          | LUBRICANT &/OR PART** |
|-------|------------------------|--------------------------------------------------|-----------------------|
| 3     | Accessories Air Filter | Change filter element                            | Element: #641340      |
| 33    | Air Dryer              | Change cartridge                                 | Cartridge: #641278    |
| 32    | Differential           | Change oil, clean breathers                      | Multigrade gear oil   |
| 12    | Brake Camshafts        | Grease one fitting on each drive axle drum brake | Multi purpose grease  |

### Miscellaneous Service

| ITEM* | DESCRIPTION              | REMARKS                                                                                                                                           | LUBRICANT &/OR PART      |
|-------|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| 30    | Battery Terminals        | Clean and coat terminals yearly                                                                                                                   | Battery terminal coating |
| 21    | Cooling System           | Drain, flush and refill every two years or 200,000 miles (320 000 km)                                                                             | Engine coolant           |
| 38    | Steering Column U-joints | Lubricate three fittings as required<br>(See <i>Maintenance Manual, Section 14</i> )                                                              | -----                    |
| ---   | Discharge Tubes***       | Every three months:<br>Check condenser discharge tubes (Qty=2)<br>Check evaporator discharge tubes (Qty=6)<br>Check front discharge tubes (Qty=2) | -----                    |

\* Item numbers refer to figure on page 6-9.

\*\* See end of this section for lubricant and part number specifications.

\*\*\* Discharge tubes are rubber tubes located underneath vehicle.

## Lubricant Specifications

| ITEM*          | DESCRIPTION                                  | SPECIFICATIONS                                                                                                                                                                                                                           |      |
|----------------|----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| 18             | Engine Oil                                   | SAE Viscosity Grade: 15W40<br>API Classification: CG4                                                                                                                                                                                    |      |
| 29             | Power Steering Oil                           | Automatic Transmission Oil<br>(Dexron-IIE or Dexron-III)                                                                                                                                                                                 |      |
| 21             | Engine Coolant                               | Low silicate, ethylene glycol coolant<br>50% antifreeze/water solution is normally used<br>Antifreeze concentration should be between 30% and 67%                                                                                        |      |
| 25             | A/C Compressor Oil                           | Polyolester Oil, HFC 134A compatible<br>trol SW-68 (POE) or equivalent                                                                                                                                                                   | Cas- |
| 32<br>and<br>6 | Differential Oil<br>and<br>Wheel Bearing Oil | Gear oil meeting MIL-L-2105-D: 85W140<br>- If temperature is below 10°F (-12°C) 80W90 can be used, and below -15°F (-26°C) 75W90 can be used.<br>- In extreme conditions or for better performance, full synthetic gear oil can be used. |      |
| 20             | Fan Gearbox Oil                              | Synthetic oil: ISO VG (viscosity grade) 460<br>bil SHC 634 or equivalent                                                                                                                                                                 | Mo-  |
| 17             | Automatic Transmission Oil                   | Dexron-IIE or Dexron-III                                                                                                                                                                                                                 |      |
| ---            | Multi Purpose Grease                         | Good quality lithium-base grease:<br>NLGI No.2 Grade is suitable for most temperatures<br>NLGI No.1 Grade is suitable for extremely low temperatures                                                                                     |      |

\* Item numbers refer to figure on page 6-9.

## Part Number Specifications

| ITEM* | DESCRIPTION                                                | PREVOST NO                            | SUPPLIER NO                                                                 |
|-------|------------------------------------------------------------|---------------------------------------|-----------------------------------------------------------------------------|
| 18    | Engine Oil Filters                                         | #510458                               | Detroit Diesel: 25014505<br>AC Rochester Div. GM: PF2100                    |
| 29    | Power Steering Reservoir Oil Filter                        | #660528                               | Garrison Hydraulic: 32516                                                   |
| 27    | Engine Air Cleaner Filter                                  | #530197                               | Nelson: 70337-N<br>Baldwin: PA-2839<br>Donaldson: P52-2874<br>Fram: CA-7113 |
| 35    | Refrigerant Filter Dryer Unit                              | #452542                               | Alco controls: EKH 307S (modified)                                          |
| 28    | Engine Primary Fuel Filter                                 | #510137                               | Detroit Diesel: 25014274<br>AC Rochester Div. GM: TP-915D                   |
| 28    | Engine Primary Fuel Filter with Water Separator (optional) | #531390                               | Detroit Diesel: 25011910<br>AC Rochester Div. GM: TP-1057                   |
| 28    | Engine Secondary Fuel Filter                               | #510128                               | Detroit Diesel: 25014342<br>AC Rochester Div. GM: TP-916D                   |
| 19    | Engine Coolant Filter/Conditioner                          | #550630                               | Detroit Diesel: 23507545<br>Nalco Chemical Company: DDF3000                 |
| 9     | A/C and Heating, Driver's Air Filter                       | #871049                               | Permatron Corp.: Model "R"                                                  |
| 9     | A/C and Heating, Central Air Filter                        | #871034                               | Permatron Corp.: Model 13X21X1 IN                                           |
| 17    | Automatic Transmission Oil Filter Kit                      | #571687                               | Allison: 29503829                                                           |
| 10    | Coolant Strainer                                           | Driver's: #870807<br>Central: #871029 | Braukmann: #13-13-00740<br>Parker: #925566                                  |
| 3     | Accessories Air Filter                                     | #640080                               | Bendix: #222588                                                             |
| 33    | Air Dryer Cartridge                                        | #641278                               | Rockwell Wabco: #S 432 923 2                                                |

\* Item numbers refer to figure on page 6-9.

# ***Service Literature***

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Additional copies of the following Service Literature are available upon request and at low cost.

**- Maintenance Manual**

**- Owner's Manual**

**- Parts Manual**

To order the desired Manual(s), please contact your local distributor or write to:

**PRÉVOST CAR INC.**

ATTN.: TECHNICAL PUBLICATIONS DEPARTMENT

35 Gagnon Boulevard

Sainte-Claire, Québec

Canada, G0R 2V0

Fax no.: (418) 883-4157

**Specify your vehicle's complete serial number. Allow 30 days for delivery.**

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# Notice

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United States Operators please notice:

The National Highway Traffic Safety Administration has requested that the following statement be provided for your information:

*If you believe that your vehicle has a defect which could cause a crash or could cause injury or death, you should immediately inform the National Highway Traffic Safety Administration (NHTSA) in addition to notifying Prévost Car Inc..*

*If NHTSA receives similar complaints, it may open an investigation, and if it finds that a safety defect exists in a group of vehicles, it may order a recall and remedy campaign. However, NHTSA cannot become involved in individual problems between you, your dealer, or Prévost Car Inc..*

*To contact NHTSA you may either call the Auto Safety Hotline toll-free at 1-800-424-9393 (or 366-0123 in Washington, DC area) or write to: NHTSA, U.S. Department of Transportation, Washington, DC 20590. You can also obtain other information about motor vehicle safety from the Hotline*

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# Change of Address or Ownership

Any change of address or ownership should be brought to the attention of the manufacturer by completing and mailing the attached card.

## CHANGE OF ADDRESS

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OLD ADDRESS→

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CITY: \_\_\_\_\_  
STATE/PROVINCE: \_\_\_\_\_  
ZIP/POSTAL CODE: \_\_\_\_\_  
TEL/FAX NO.: \_\_\_\_\_

NEW ADDRESS→

STREET NO./APT.: \_\_\_\_\_  
CITY: \_\_\_\_\_  
STATE/PROVINCE: \_\_\_\_\_  
ZIP/POSTAL CODE: \_\_\_\_\_  
TEL/FAX NO.: \_\_\_\_\_

CUT ON DOTTED LINES

## CHANGE OF OWNERSHIP

VEHICLE SERIAL NUMBER: 2PC \_ 334 \_ \_ \_ 102 \_ \_ \_ \_

The ownership of this vehicle is transferred

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CITY: \_\_\_\_\_  
STATE/PROVINCE: \_\_\_\_\_  
ZIP/POSTAL CODE: \_\_\_\_\_  
TEL/FAX NO.: \_\_\_\_\_

TO→

NAME: \_\_\_\_\_  
STREET NO./APT.: \_\_\_\_\_  
CITY: \_\_\_\_\_  
STATE/PROVINCE: \_\_\_\_\_  
ZIP/POSTAL CODE: \_\_\_\_\_  
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