

# PREVOST

## COACH MANUFACTURER

### OWNER'S MANUAL VIP



# PA1541

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



## A Word of Congratulations from the President

*Thank you for choosing the Prevost H3-45 VIP,  
The "Ultimate" in luxury motorcoaching.*

You can be proud to be among the world's most discriminating motorcoach owners, those who choose the Prevost H3-45 VIP time and time again because of the confidence they have in our commitment to build the ultimate in factory-prepared, conversion-ready bus shells.

The Prevost commitment to excellence goes back 80 years, matched by a proven performance record more than a billion miles long. On every road and in every climate imaginable, from the frozen arctic through torrential rains and blazing hot desert sands, Prevost coaches have been there and back to tell the tale.

Your Prevost Owner's Manual provides you with a road map to years of carefree motorcoaching enjoyment. You can depend on our factory-owned Parts and Service Centers plus our many qualified service locations across North America, all staffed by professionals dedicated to meeting your needs with the utmost in efficiency and courtesy.

And though we are proud of our past, we're not about to forget the road ahead. That's why our R & D facility is the most innovative of its kind in North America.

All Prevost employees join me in thanking you for the trust you have placed in us. We'll do everything in our power to make sure you will always be delighted with your decision to go Prevost.

**Happy motorcoaching!**



# TABLE OF CONTENTS

|   |           |  |           |
|---|-----------|--|-----------|
| <b>FOREWORD</b> .....   | <b>1</b>  | DRIVER'S POWER WINDOW.....                             | 17        |
| <b>SAFETY PRECAUTIONS</b> .....                               | <b>3</b>  | FIXED WINDOWS .....                                    | 18        |
| SAFE OPERATING PRACTICES.....                                 | 3         | AWNING WINDOWS.....                                    | 18        |
| DEFENSIVE DRIVING PRACTICES.....                              | 3         | SLIDING WINDOWS .....                                  | 18        |
| <b>VEHICLE EXTERIOR</b> .....                                 | <b>5</b>  | <b>CONTROLS AND INSTRUMENTS</b> .....                  | <b>19</b> |
| ENGINE COMPARTMENT COMPONENTS.....                            | 6         | <b>KEYS</b> .....                                      | <b>19</b> |
| ENGINE COMPARTMENT.....                                       | 7         | FRONT ENTRANCE DOOR LOCK KEY.....                      | 19        |
| ENGINE R.H. SIDE ACCESS DOOR.....                             | 7         | EXTERIOR COMPARTMENTS KEY.....                         | 19        |
| ENGINE COMPARTMENT REAR DOOR .....                            | 7         | UTILITY COMPARTMENTS KEY.....                          | 19        |
| MAIN POWER COMPARTMENT (BATTERIES).....                       | 8         | IGNITION SWITCH KEY.....                               | 19        |
| ENGINE RADIATOR DOOR .....                                    | 8         | REMOTE ENTRY TRANSMITTER.....                          | 19        |
| CONDENSER COMPARTMENT<br>(Optional Central A/C System).....   | 8         | IGNITION SWITCH.....                                   | 20        |
| EVAPORATOR COMPARTMENT (Optional CENTRAL A/C<br>SYSTEM) ..... | 9         | <b>DRIVER'S AREA</b> .....                             | <b>22</b> |
| FRONT ELECTRICAL AND SERVICE COMPARTMENT .                    | 10        | <b>LATERAL CONTROL PANEL</b> .....                     | <b>23</b> |
| RECLINING BUMPER COMPARTMENT .....                            | 10        | TRANSMISSION PUSHBUTTON SHIFT SELECTOR.....            | 23        |
| BAGGAGE COMPARTMENTS.....                                     | 11        | CRUISE CONTROL SWITCHES.....                           | 23        |
| FUEL FILLER DOORS.....  | 11        | DRIVER'S POWER WINDOW SWITCH .....                     | 25        |
| ENTRANCE DOOR.....  | 11        | MIRROR CONTROLS (OPTION).....                          | 25        |
| INSIDE OPERATION .....  | 11        | LEVEL LOW SYSTEM.....                                  | 25        |
| OUTSIDE OPERATION .....                                       | 12        | PARKING BRAKES CONTROL VALVE.....                      | 26        |
| KEYLESS ENTRY SYSTEM.....                                     | 12        | TAG AXLE CONTROL VALVE.....                            | 26        |
| KEYLESS OPERATING INSTRUCTIONS.....                           | 13        | TRAILER AIR SUPPLY CONTROL VALVE .....                 | 26        |
| <b>EXTERIOR REAR VIEW MIRRORS</b> .....                       | <b>13</b> | UTILITY COMPARTMENT & 13-VOLT DC POWER<br>OUTLET ..... | 26        |
| ELECTRICALLY ADJUSTED MIRROR (RAMCO) .....                    | 13        | ASHTRAY .....  | 26        |
| <b>RETRACTABLE BACK-UP CAMERA</b> .....                       | <b>13</b> | CIGARETTE LIGHTER.....                                 | 27        |
| <b>110-120 VOLTS CONNECTOR</b> .....                          | <b>13</b> | DIAGNOSTIC DATA READER (DDR) RECEPTACLE .....          | 27        |
| <b>TRAILER HITCH</b> .....                                    | <b>14</b> | <b>DASHBOARD</b> .....                                 | <b>28</b> |
| <b>VEHICLE INTERIOR</b> .....                                 | <b>15</b> | CONTROL SWITCHES .....                                 | 29        |
| DRIVER'S SEAT – “DELIVERY” .....                              | 15        | L.H. DASHBOARD PANEL.....                              | 29        |
| DRIVER'S AND NAVIGATOR'S SEATS – ISRI (OPTIONAL)              | 15        | R.H. DASHBOARD PANEL.....                              | 32        |
| PNEUMATIC ISRI SEATS.....                                     | 15        | HVAC CONTROL UNITS.....                                | 33        |
| ELECTRIC ISRI SEATS .....                                     | 15        | HVAC AIR REGISTERS .....                               | 34        |
| <b>SAFETY BELTS</b> .....                                     | <b>16</b> | CLUSTER .....  | 36        |
| <b>STEERING WHEEL ADJUSTMENT</b> .....                        | <b>16</b> | MESSAGE CENTER DISPLAY (MCD) .....                     | 36        |
| <b>SUNSHADES (BLINDS)</b> .....                               | <b>17</b> | GAUGES .....   | 36        |
| <b>INSIDE MIRRORS</b> .....                                   | <b>17</b> | TELLTALE PANEL.....                                    | 39        |
| <b>ADJUSTABLE HVAC REGISTERS</b> .....                        | <b>17</b> | <b>STEERING COLUMN CONTROLS</b> .....                  | <b>42</b> |
| <b>WINDOWS</b> .....  | <b>17</b> | MULTI-FUNCTION LEVER.....                              | 43        |
|   |           | TRANSMISSION OUTPUT RETARDER.....                      | 43        |
|   |           | ELECTRIC HORN.....                                     | 44        |

## TABLE OF CONTENTS

---

|   |           |   |           |
|---|-----------|---|-----------|
| AIR HORN.....   | 44        | SLIDE-OUT MANUAL OVERRIDE PROCEDURES .....      | 65        |
| <b>FOOT-OPERATED CONTROLS .....</b>                   | <b>44</b> | POWER ASSIST OVERRIDE.....                      | 66        |
| BRAKE PEDAL .....                                     | 44        | MANUAL RATCHET RETRACTING PROCEDURE .....       | 69        |
| ACCELERATOR PEDAL .....                               | 45        | MANUAL RATCHET EXTENDING PROCEDURE.....         | 72        |
| STEERING WHEEL ADJUSTMENT                             |           | SLIDE-OUT TROUBLESHOOTING .....                 | 73        |
| UNLOCK AIR VALVE .....                                | 45        | <b>STARTING AND STOPPING</b>                    |           |
| <b>ALLISON TRANSMISSION.....</b>                      | <b>45</b> | <b>PROCEDURES.....</b>                          | <b>77</b> |
| OPERATION .....                                       | 45        | <b>STARTING THE ENGINE .....</b>                | <b>77</b> |
| PUSHBUTTON SHIFT SELECTOR.....                        | 46        | STARTING THE ENGINE FROM THE DRIVER'S AREA ..77 |           |
| FUNCTIONS OF THE "MODE" BUTTON .....                  | 46        | STOPPING THE ENGINE .....                       | 77        |
| DESCRIPTION OF THE AVAILABLE RANGES .....             | 46        | STARTING THE ENGINE FROM THE ENGINE             |           |
| <b>OTHER FEATURES.....</b>                            | <b>49</b> | COMPARTMENT.....                                | 78        |
| <b>DETROIT DIESEL ELECTRONIC CONTROL (DDEC)</b>       |           | STOPPING THE ENGINE .....                       | 78        |
| <b>SYSTEM .....</b>                                   | <b>49</b> | COLD WEATHER STARTING.....                      | 78        |
| <b>DDEC V ELECTRONIC CONTROL MODULE (ECM) .....</b>   | <b>50</b> | JUMP STARTING .....                             | 79        |
| <b>MESSAGE CENTER DISPLAY (MCD).....</b>              | <b>50</b> | <b>ENGINE BLOCK HEATER.....</b>                 | <b>80</b> |
| <b>DRIVING MODE MENU .....</b>                        | <b>51</b> | <b>ENGINE WARM-UP.....</b>                      | <b>80</b> |
| GAUGE MODE MENU .....                                 | 51        | <b>ALLISON TRANSMISSION WARM-UP .....</b>       | <b>80</b> |
| FUEL ECONOMY MENU .....                               | 51        | <b>SAFETY FEATURES AND</b>                      |           |
| TIME/DIST MENU .....                                  | 52        | <b>EQUIPMENT .....</b>                          | <b>81</b> |
| FAULT ? MENU.....                                     | 53        | <b>EMERGENCY EXITS.....</b>                     | <b>81</b> |
| <b>NON-DRIVING MODE MENU .....</b>                    | <b>53</b> | ELECTRIC AWNING WINDOWS .....                   | 81        |
| SET-UP MODE MENU .....                                | 53        | SLIDING WINDOWS .....                           | 81        |
| SYSTEM DIAGNOSTIC MENU.....                           | 55        | FIXED WINDOWS .....                             | 81        |
| STATUS TEST .....                                     | 56        | EMERGENCY ROOF ESCAPE HATCH .....               | 81        |
| DATA LOG MODE MENU .....                              | 57        | <b>EMERGENCY AIR-FILL VALVES.....</b>           | <b>82</b> |
| PASSWORDS .....                                       | 58        | <b>EMERGENCY AND PARKING BRAKES .....</b>       | <b>82</b> |
| <b>PRODRIVER™ .....</b>                               | <b>58</b> | <b>SAFETY EQUIPMENT .....</b>                   | <b>83</b> |
| <b>ALLISON TRANSMISSION ELECTRONIC CONTROLS .....</b> | <b>58</b> | FIRE EXTINGUISHERS .....                        | 83        |
| <b>TRANSMISSION RETARDER .....</b>                    | <b>59</b> | FIRST AID KIT .....                             | 83        |
| <b>JACOBS ENGINE BRAKE .....</b>                      | <b>59</b> | WARNING REFLECTORS .....                        | 83        |
| <b>ANTI-LOCK BRAKING SYSTEM .....</b>                 | <b>59</b> | JACK/TOOLS.....                                 | 83        |
| <b>RETRACTABLE TAG AXLE.....</b>                      | <b>60</b> | SPARE PARTS KIT .....                           | 83        |
| <b>KEYLESS ENTRY SYSTEM.....</b>                      | <b>60</b> | <b>CHANGING WHEELS .....</b>                    | <b>84</b> |
| KEYLESS OPERATING INSTRUCTIONS .....                  | 61        | JACKING POINTS .....                            | 84        |
| PROGRAMMING A PERSONAL CODE .....                     | 61        | HYDRAULIC JACK .....                            | 85        |
| <b>REMOTE ENTRY TRANSMITTER .....</b>                 | <b>61</b> | <b>TOWING.....</b>                              | <b>85</b> |
| PROGRAMMING TRANSMITTERS .....                        | 62        | <b>DAYTIME RUNNING LIGHTS.....</b>              | <b>85</b> |
| <b>SLIDE-OUT OPERATION .....</b>                      | <b>62</b> | <b>FOG LIGHTS .....</b>                         | <b>86</b> |
| SAFETY PRECAUTIONS.....                               | 62        | <b>CORNERING AND DOCKING LIGHTS.....</b>        | <b>86</b> |
| FRONT SLIDE-OUT OPERATION.....                        | 63        | <b>COMPARTMENT LIGHTING .....</b>               | <b>86</b> |
| REAR SLIDE-OUT OPERATION .....                        | 64        | <b>MUD FLAPS AND SPLASH GUARDS .....</b>        | <b>86</b> |
| SLIDE-OUT LOGIC CONTROLLER .....                      | 64        |   |           |

---

## TABLE OF CONTENTS

---

|   |           |  |            |
|---|-----------|--|------------|
| <b>BACK-UP CAMERA</b> .....   | <b>86</b> | <b>PRE-STARTING INSPECTION</b> .....                             | <b>101</b> |
| <b>BACK-UP ALARM</b> .....  | <b>86</b> | WITH ENGINE STOPPED .....  | 101        |
| BACK-UP ALARM CANCEL .....  | 86        | WITH ENGINE RUNNING .....  | 103        |
|   |           | EXTERIOR LIGHTING VERIFICATION .....                             | 104        |
| <b>ESSENTIAL FUNCTIONS TO OPERATE THE VEHICLE<br/>(BASIC LIMP-HOME FUNCTIONS)</b> ..... | <b>86</b> | <b>FIRST SERVICE ON NEW VEHICLE</b> .....                        | <b>106</b> |
| <b>ALARM SYSTEM</b> .....   | <b>88</b> | ENGINE OIL.....  | <b>106</b> |
|   |           | ALLISON TRANSMISSION OIL FILTER .....                            | <b>106</b> |
|   |           | COOLANT SYSTEM STRAINER .....                                    | <b>106</b> |
| <b>CARE AND MAINTENANCE</b> .....   | <b>91</b> | <b>GENERAL RECOMMENDATIONS</b> .....                             | <b>106</b> |
| <b>CLEANING</b> .....   | <b>91</b> | <b>WALK-AROUND INSPECTION (BEFORE EVERY TRIP)</b> .....          | <b>108</b> |
| SEAT UPHOLSTERY .....   | 91        | <b>LUBRICATION AND SERVICING SCHEDULE</b> .....                  | <b>109</b> |
| PLASTIC AND VINYL.....  | 92        | <b>LUBRICANT SPECIFICATIONS</b> .....                            | <b>112</b> |
| WINDOWS.....  | 92        |  |            |
| STAINLESS STEEL .....   | 92        | <b>TECHNICAL INFORMATION</b> .....                               | <b>115</b> |
| FORMICA .....   | 92        | <b>DIMENSIONS AND WEIGHTS</b> .....                              | <b>115</b> |
| CARPET .....  | 92        | <b>CAPACITIES</b> .....  | <b>115</b> |
| RUBBER COMPONENTS.....  | 92        | <b>FUEL TYPE</b> .....   | <b>115</b> |
| FLOOR CLEANING .....  | 92        | <b>WHEELS AND TIRES</b> .....                                    | <b>115</b> |
| EXTERIOR SURFACES.....  | 92        | RECOMMENDED TIRE INFLATION PRESSURE AT<br>MAXIMUM COLD LOAD..... | <b>115</b> |
| TAR OR OIL .....  | 93        | <b>BELTS</b> .....   | <b>116</b> |
| INSECTS .....   | 93        | <b>ENGINE</b> .....  | <b>116</b> |
| TREE SAP.....   | 93        | <b>ALLISON TRANSMISSION</b> .....                                | <b>116</b> |
| WINDOWS.....  | 93        | <b>BRAKES</b> .....  | <b>116</b> |
| WIPER BLADES.....   | 93        | BRAKE CHAMBER EFFECTIVE AREA.....                                | 116        |
| <b>FLUID LEVEL VERIFICATION</b> .....   | <b>93</b> | <b>AIR SYSTEM</b> .....  | <b>116</b> |
| ENGINE OIL LEVEL .....  | 93        | <b>ANTILOCK BRAKING SYSTEM (ABS)</b> .....                       | <b>116</b> |
| TRANSMISSION OIL LEVEL .....  | 94        | TROUBLESHOOTING AND TESTING .....                                | 116        |
| POWER STEERING FLUID LEVEL.....   | 96        | <b>STEERING</b> .....  | <b>117</b> |
| RADIATOR FAN GEARBOX OIL LEVEL.....   | 96        | <b>ELECTRICAL SYSTEM</b> .....                                   | <b>117</b> |
| WHEEL BEARING OIL LEVEL.....  | 97        | <b>SUSPENSION</b> .....  | <b>117</b> |
| COOLANT FLUID.....  | 97        | FRONT AXLE .....   | <b>117</b> |
| WINDSHIELD WASHER & HEADLIGHTS WASHER .....   | 97        | DRIVE AXLE.....  | <b>117</b> |
| <b>OTHER VERIFICATIONS</b> .....  | <b>98</b> | TAG AXLE.....  | <b>117</b> |
| AIR TANK PURGE .....  | 98        | <b>ALIGNMENT SPECIFICATIONS</b> .....                            | <b>118</b> |
| FIRE EXTINGUISHERS .....  | 98        | <b>HEATING AND AIR CONDITIONING</b> .....                        | <b>118</b> |
| FUEL FILTER/WATER SEPARATOR.....  | 99        | <b>OIL SPECIFICATIONS</b> .....                                  | <b>119</b> |
| BELT TENSION ADJUSTMENT .....   | 99        | ENGINE .....   | 119        |
| BACK-UP CAMERA .....  | 100       | ALLISON TRANSMISSION .....                                       | 119        |
| AIR FILTER RESTRICTION INDICATOR.....   | 100       | DIFFERENTIAL .....   | 119        |
| MAIN POWER COMPARTMENT FAN AIR FILTER.....  | 100       | FAN GEARBOX.....   | 119        |
| A/C AND HEATING SYSTEM AIR FILTERS .....  | 101       |  |            |
| HOSE INSPECTION .....   | 101       |  |            |
| LUBRICATION.....  | 101       |  |            |

## TABLE OF CONTENTS

---

|  |            |
|--|------------|
| POWER STEERING RESERVOIR .....   | 119        |
| WHEEL BEARINGS .....   | 119        |
| <b>ENGINE TROUBLESHOOTING FLOWCHART .....</b>  | <b>120</b> |
| <b>PLATES AND CERTIFICATION .....</b>  | <b>122</b> |
| SAFETY CERTIFICATION .....   | 122        |
| DOT CERTIFICATION PLATE .....  | 122        |
| EPA ENGINE LABEL .....   | 123        |
| VEHICLE IDENTIFICATION NUMBER (VIN) .....  | 123        |
| COACH FINAL RECORD .....   | 123        |
| <br>   |            |
| <b>APPENDIX A .....</b>  | <b>125</b> |
| <br>   |            |
| SERVICE LITERATURE .....   | 125        |
| NOTICE .....   | 126        |
| <br>   |            |
| <b>APPENDIX B .....</b>  | <b>127</b> |
| <br>   |            |
| ROADSIDE TROUBLESHOOTING GUIDE FOR MULTIPLEX<br>VEHICLES .....   | 127        |
| <br>   |            |
| <b>APPENDIX C .....</b>  | <b>133</b> |
| <b>TROUBLESHOOTING CODES (DTC) — ALLISON 4<sup>TH</sup><br/>GENERATION CONTROLS .....</b>                | <b>133</b> |
| DIAGNOSTIC TROUBLESHOOTING CODES (DTC)<br>OVERVIEW .....   | 133        |
| DIAGNOSTIC CODES – ALLISON 4 <sup>TH</sup> GENERATION<br>CONTROLS .....                                  | 133        |
| DIAGNOSTIC CODE DISPLAY AND CLEARING<br>PROCEDURE – ALLISON 4 <sup>TH</sup> GENERATION<br>CONTROLS ..... | 134        |
| DIAGNOSTIC CODE RESPONSE .....   | 135        |
| DIAGNOSTIC TROUBLESHOOTING CODES (DTC) LIST<br>- ALLISON 4 <sup>TH</sup> GENERATION CONTROLS .....       | 136        |
| <b>ALLISON TRANSMISSION OIL LEVEL CHECK USING<br/>THE PUSHBUTTON SHIFT SELECTOR .....</b>                | <b>139</b> |
| <br>   |            |
| <b>APPENDIX D .....</b>  | <b>141</b> |
| DDEC V DIAGNOSTIC CODES .....  | 141        |

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

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

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

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

The following words are used to emphasize particularly important information:



## WARNING

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



## CAUTION

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

## *NOTE*

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

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



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

### SAFE OPERATING PRACTICES

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

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

### DEFENSIVE DRIVING PRACTICES

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

## 4 SAFETY PRECAUTIONS

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contact the local department of motor vehicles authority.

### OTHER PRECAUTIONS



#### WARNING

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

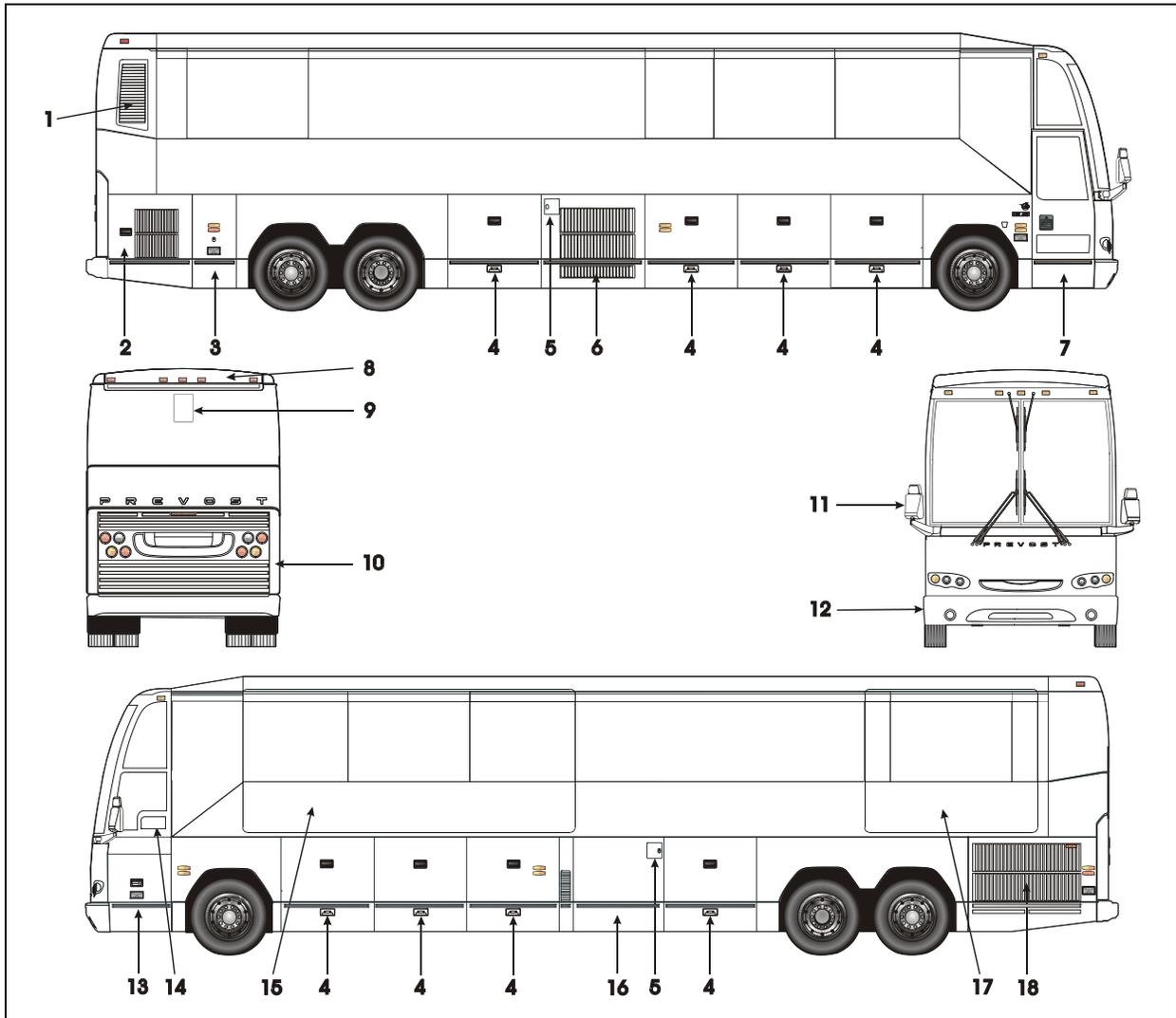
#### NOTE

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



#### CAUTION

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



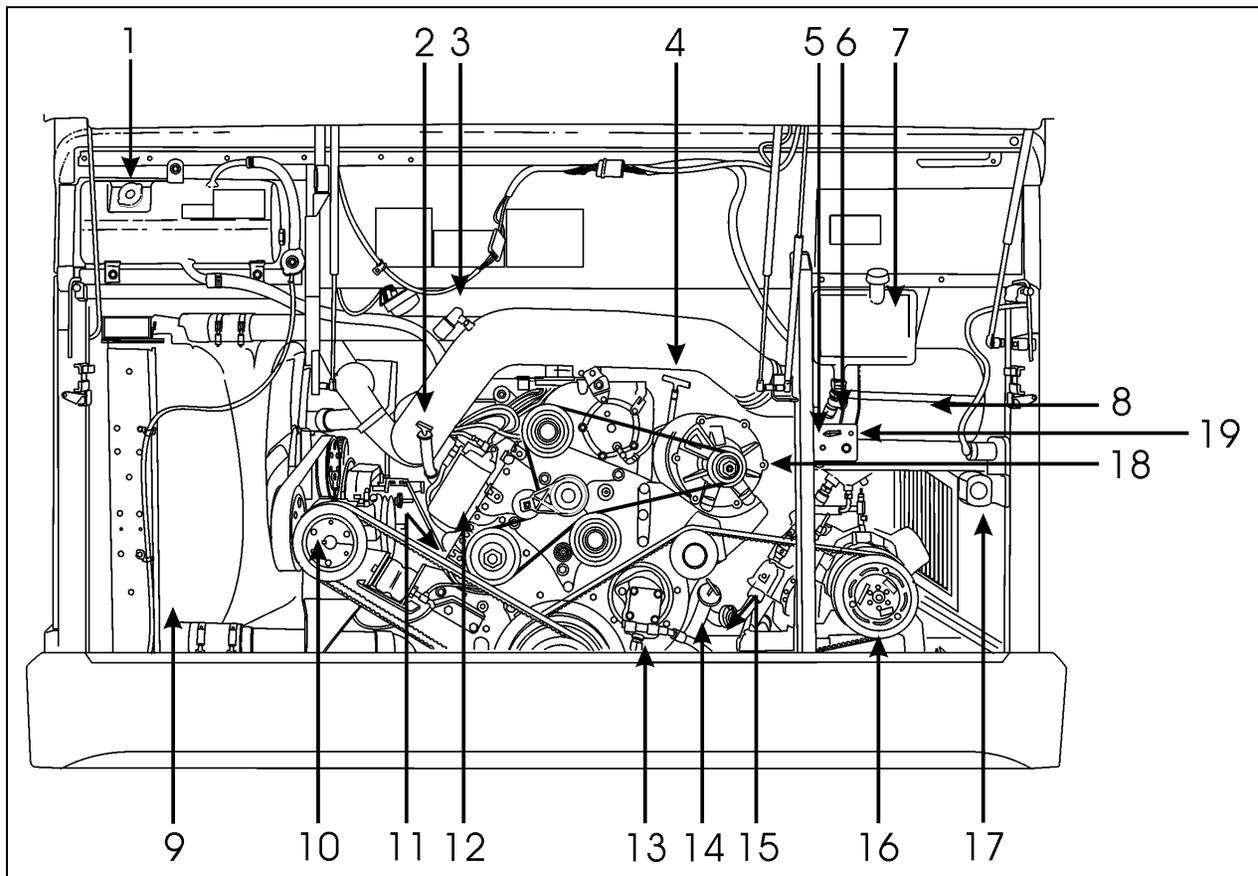
H3-45 VIP EXTERIOR VIEW

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- |   |  |
|---|--|
| <ol style="list-style-type: none"> <li>1. Engine air intake</li> <li>2. Engine R.H. side access door</li> <li>3. Main power compartment</li> <li>4. Baggage compartment</li> <li>5. Fuel filler door</li> <li>6. A/C condenser compartment or baggage compartment</li> <li>7. Entrance door</li> <li>8. Rear spoiler</li> <li>9. Retractable back up camera (optional)</li> </ol> | <ol style="list-style-type: none"> <li>10. Engine compartment rear door</li> <li>11. Rear-view mirrors</li> <li>12. Reclining bumper compartment</li> <li>13. Front electrical and service compartment</li> <li>14. Driver's power window</li> <li>15. Front Slide-out (Optional)</li> <li>16. Heating, ventilating and air conditioning compartment (HVAC) or baggage compartment</li> <li>17. Rear Slide-out (Optional)</li> <li>18. Engine radiator door</li> </ol> |
|---|--|

## 6 VEHICLE EXTERIOR

### ENGINE COMPARTMENT COMPONENTS



01123

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

## ENGINE COMPARTMENT

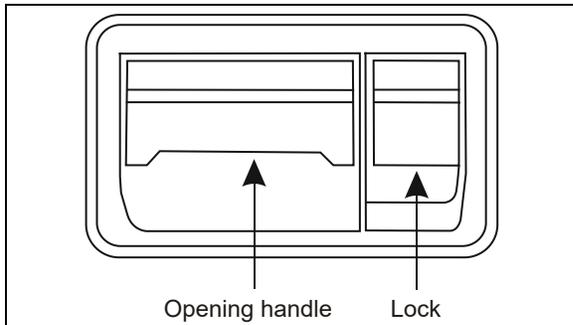
### ENGINE R.H. SIDE ACCESS DOOR

The engine R.H. side access door provides access to the following:

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

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

The lighting in the engine compartment turns on automatically when that door is open if the engine compartment light switch is set to ON.



DOOR HANDLE

18184B



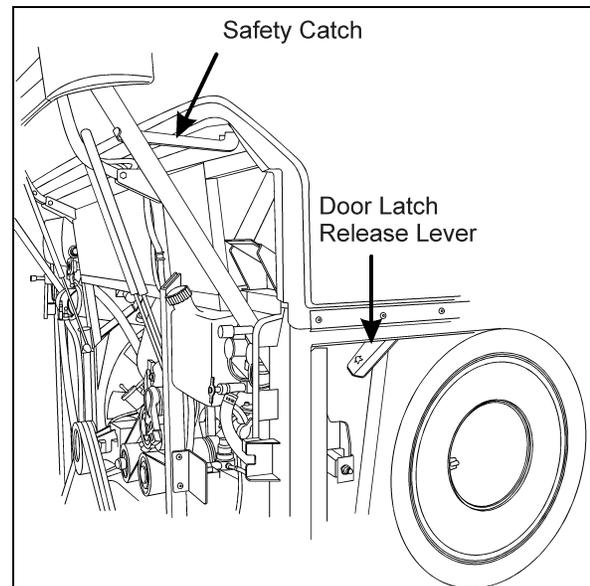
### WARNING

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

### ENGINE COMPARTMENT REAR DOOR

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

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



DOOR LATCH RELEASE LEVER

18331

The engine compartment rear door provides access to the following:

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

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

The lighting in the engine compartment turns on automatically when that door is open if the engine compartment light switch is set to ON.

## 8 VEHICLE EXTERIOR

Use this switch to turn off the light if not required when the door is open. When that door is open, a telltale light illuminates on the telltale panel.



### WARNING

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



### WARNING

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

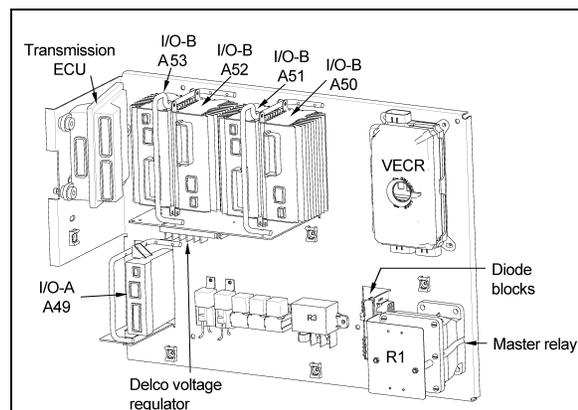
## MAIN POWER COMPARTMENT (BATTERIES)

The main power compartment provides access to the following :

- (4) 12 volts Batteries ;
- Main circuit breakers for 12-volt and 24-volt electrical systems ;
- Battery charger (optional) ;
- Vanner battery equalizer ;
- Battery master relay & battery master switch ;
- Voltage regulator (Delco alternator) ;
- Transmission Control Module (TCM) ;
- Electronic ground stud ;
- Multiplex modules: I/O-A, I/O-B ;
- Rear fuse box (VECR) & spare fuses ;
- Relays and diodes.

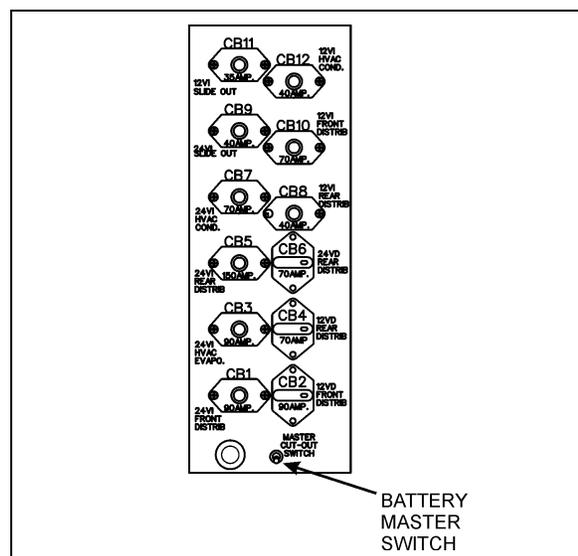
The compartment door can be locked/unlocked using the exterior compartment key. Turn the key in the lock to open the door.

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



VIEW OF UPPER MAIN POWER COMPARTMENT

06598

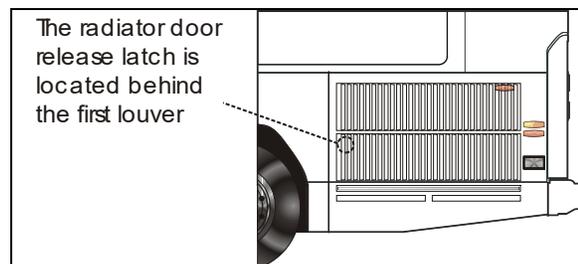


MAIN CIRCUIT BREAKERS 12-VOLT & 24-VOLT

06605

## ENGINE RADIATOR DOOR

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



RADIATOR DOOR RELEASE LATCH LOCATION

18529

## CONDENSER COMPARTMENT (Optional Central A/C System)

Pull the A/C condenser door release latch located inside the adjacent baggage compartment to partly open the condenser door. Push on the

safety hook, accessible through the opening, to open the door.

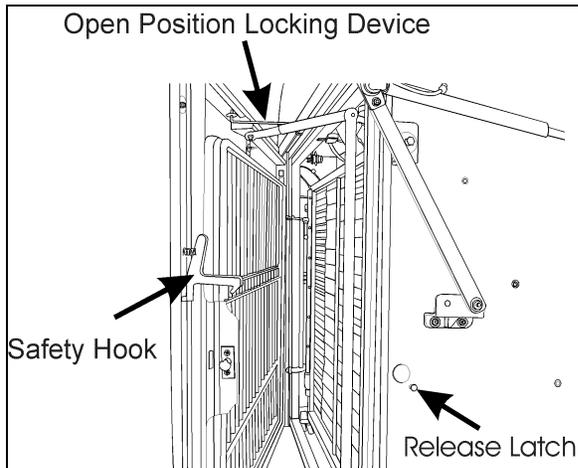
**NOTE**

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

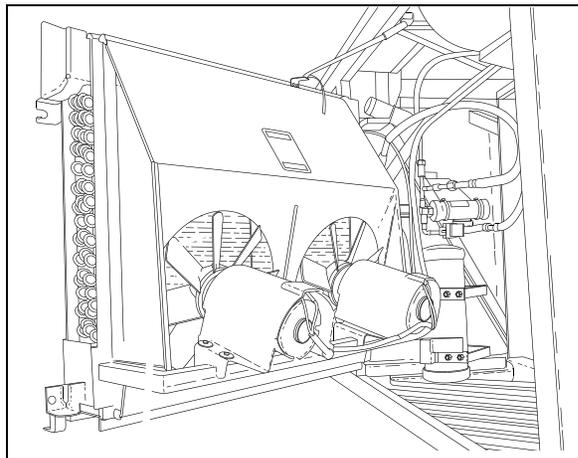


**CAUTION**

Close baggage compartment door before opening completely condenser compartment door.



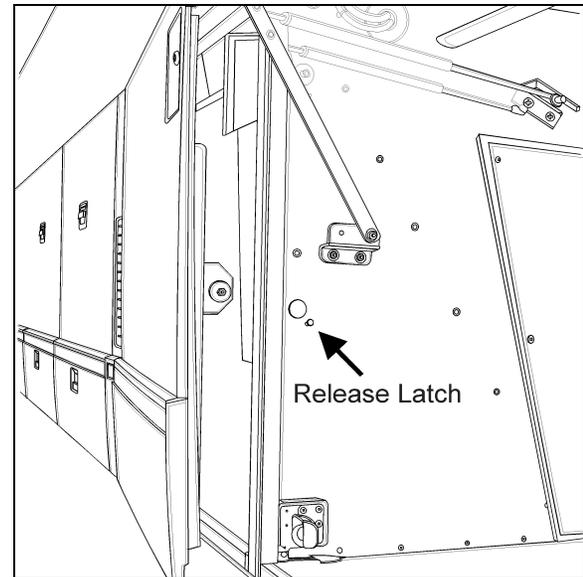
**ACCESS TO THE CONDENSER COMPARTMENT** 18311



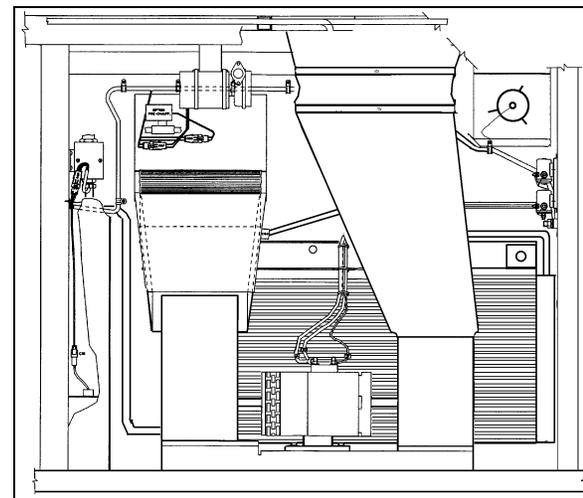
**CONDENSER COMPARTMENT (WITH CENTRAL A/C SYSTEM ONLY)** 22170

compartment door. Pull the release latch then pull the HVAC compartment door open.

The HVAC compartment contains relays, diodes and an I/O-B multiplex module mounted on a panel located on the R.H. side wall when facing the compartment.



**EVAPORATOR COMPARTMENT ACCESS** 18306

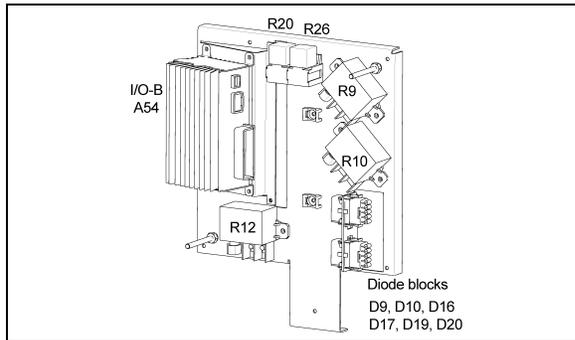


**EVAPORATOR COMPARTMENT (WITH CENTRAL A/C SYSTEM ONLY)** 22225

## EVAPORATOR COMPARTMENT (Optional Central A/C System only)

The evaporator compartment door release latch is located on the left side of the baggage compartment and to the right of the HVAC

# 10 VEHICLE EXTERIOR



## HVAC COMPONENTS PANEL

Each relay or resistor is identified to facilitate its location.

### NOTE

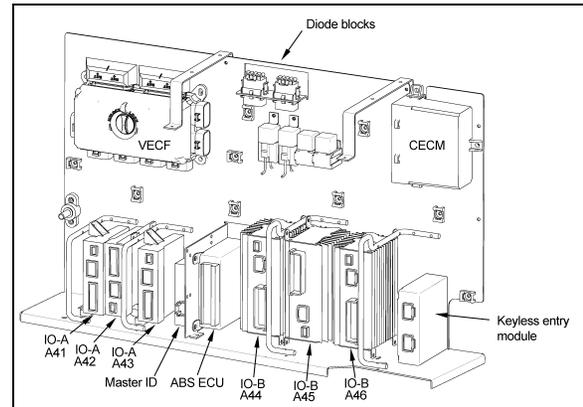
*It is important to keep the evaporator compartment door closed while checking the HVAC system to prevent faulty readings.*

## FRONT ELECTRICAL AND SERVICE COMPARTMENT

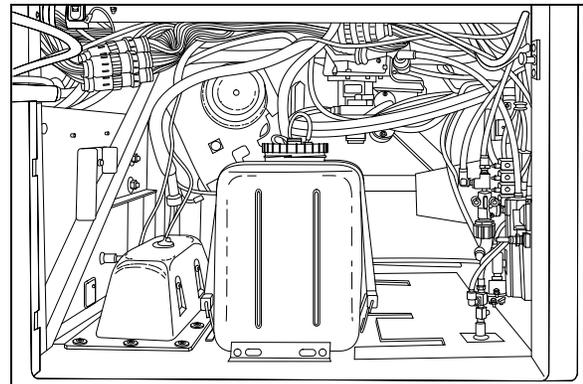
The front electrical and service compartment provides access to the following:

- ABS electronic control module ;
- Relays ;
- Windshield washer reservoir ;
- Headlights washer reservoir;
- Reclining bumper compartment opening lever ;
- Accessory air tank drain valve ;
- Electronic ground stud ;
- Multiplex modules: I/O-A, I/O-B ;
- CECM & Master ID
- Front fuse box (VECF) & spare fuses ;
- Keyless entry module ;
- Accessory air tank fill valve.

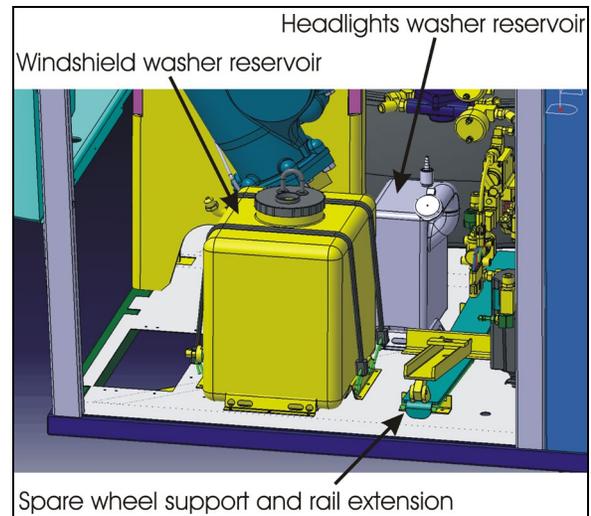
The front electrical & service compartment door can be locked/unlocked with the exterior compartment key. Lift protector cover to access the lock. Pull up door handle to release the latch then pull the door open.



## FRONT ELECTRICAL & SERVICE COMPARTMENT 06595



## FRONT ELECTRICAL & SERVICE COMPARTMENT 14050

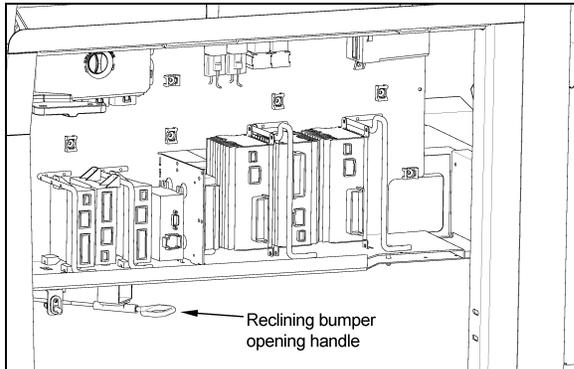


## FRONT ELECTRICAL & SERVICE COMPARTMENT

The lighting in the front electrical & service compartment turns on automatically when the door is open.

## RECLINING BUMPER COMPARTMENT

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



**RECLINING BUMPER OPENING HANDLE IN FRONT ELECTRICAL & SERVICE COMPARTMENT**

06602



### WARNING

The compartment behind the bumper is not designed for storage. Never store loose objects in this compartment since they can interfere with the steering linkage mechanism.

Use care when opening or closing the reclining bumper compartment to prevent personal injury

## BAGGAGE COMPARTMENTS

The baggage compartment doors can be locked/unlocked using the exterior compartment key. Lift up the cover to gain access to the lock. Pull up door handle to release the latch and then pull the door open. Pressurized cylinders assist the opening and closing of the baggage compartment doors and hold the doors open.

The lighting in the baggage compartment turns on automatically when the door is opened. When a baggage compartment door is open, a telltale light illuminates on the telltale panel.



### WARNING

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

### NOTE

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

### NOTE

The baggage compartment doors can also be locked / unlocked using:

- The central locking system switch on the L.H. dashboard (refer to "Controls & Instruments" chapter).
- The keyless entry system.
- The remote entry transmitter (refer to "Controls & Instruments" chapter).

## FUEL FILLER DOORS

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

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

### NOTE

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



### CAUTION

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

## ENTRANCE DOOR

### INSIDE OPERATION

Lock or unlock the entrance door from the inside by actuating the front entrance door rocker switch on the R.H. dashboard panel. Also, you can lock or unlock the entrance door by sliding its lock lever.

### NOTE

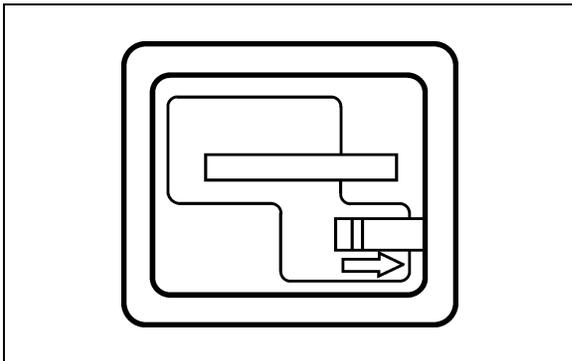
If the alarm system is armed, unlocking the

## 12 VEHICLE EXTERIOR

entrance door from the inside by sliding its lock lever will not disarm the alarm system. The alarm will sound.

### NOTE

For complete information concerning the Remote Keyless Entry & Anti-theft Alarm System, refer to the document included in your vehicle "publication box".



DOOR LOCK LEVER INSIDE THE VEHICLE

18187

### OUTSIDE OPERATION

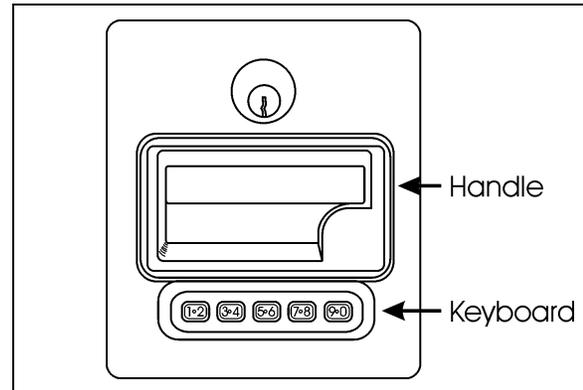
The first way of locking/unlocking the entrance door from the outside is the front entrance door lock key provided with the vehicle. Turn key counterclockwise to lock or clockwise to unlock the entrance door and disarm the intrusion protection and anti-theft system.

### NOTE

The stepwell lights and entrance overhead light turn on as the door opens.

### NOTE

For complete information concerning the Keyless Entry System & Anti-theft Alarm System, refer to the document included in your vehicle's "publication box".



DOOR HANDLE & KEYLESS ENTRY SYSTEM KEYBOARD

18597

### KEYLESS ENTRY SYSTEM

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

The manufacturer's code is:

- On your owner's wallet card;
- Taped to the keyless module in the front electrical & service compartment;
- Three stickers are joined to your owner's wallet card.

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

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

## KEYLESS OPERATING INSTRUCTIONS

- 1) To unlock the entrance door, enter the five numbers of the code. After pressing the fifth number, the stepwell lights and entrance overhead light turn on and the door unlocks. During the night, press any button to illuminate the keyboard and then enter the code.

When pressing any button, the keyboard lights up for five seconds.

- 2) To unlock the baggage and service compartment doors, press button 3·4 within five seconds after the code that unlocks the entrance door.
- 3) To lock the entrance door, the baggage compartment doors and arm the intrusion protection and anti-theft system all at the same time, press buttons 7·8 and 9·0 simultaneously.

**NOTE**

*The intrusion protection and anti-theft system will be set after a 30 seconds delay.*

For additional information, refer to "Other Features" chapter.

## EXTERIOR REAR VIEW MIRRORS

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

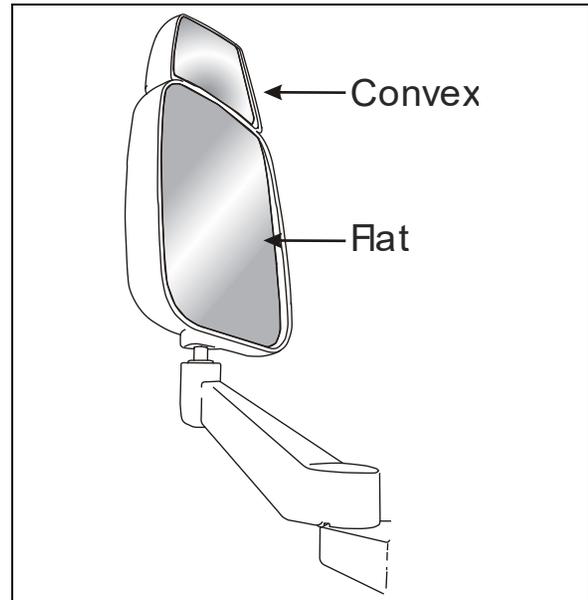
To provide good visibility in cold weather, the mirrors are equipped with heating elements that are activated by a rocker switch located on the dashboard. Refer to "Controls & Instruments" chapter. Thermostats are used to prevent continuous operation of the heating elements.



**CAUTION**

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

**ELECTRICALLY ADJUSTED MIRROR (RAMCO)**



**RAMCO REAR-VIEW MIRROR**

18443

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

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

## RETRACTABLE BACK-UP CAMERA

An optional back-up camera is available which provides the driver with visual assistance when backing-up. The back-up camera is mounted in a retractable housing. For additional information, refer to "Controls & Instruments" and 'Care and maintenance' chapters.

**NOTE**

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

## 110-120 VOLTS CONNECTOR

This connector is used with a 110-120 volt supply and is connected to the optional engine block heater. Refer to "Starting And Stopping Procedures" chapter.

## 14 VEHICLE EXTERIOR

### TRAILER HITCH

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

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



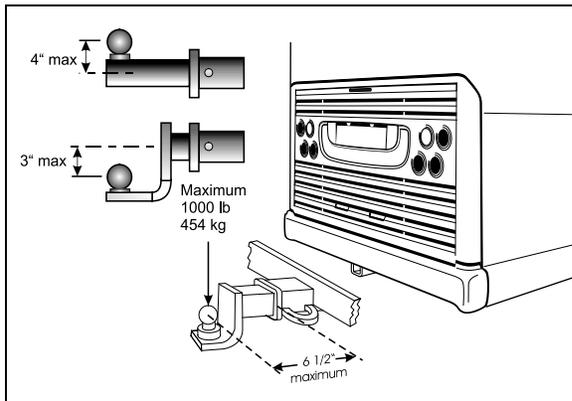
#### WARNING

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



#### WARNING

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



TRAILER HITCH

18487

#### NOTE

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



#### CAUTION

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

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

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

- C) The ball and trailer coupling should meet the following minimum test load requirements without incurring failure :
  - Longitudinal tension and compression : (Gross Trailer Weight of trailer x 3)
  - Transverse thrust : (Gross Trailer Weight of trailer x 1)
  - Vertical tension and compression : (Gross Trailer Weight of trailer x 1.3)

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

- D) Two lengths of safety chain shall be used. The strength rating (minimum breaking force) of each individual chain and its connecting means shall be equal to, or exceed the trailer GVWR.
- E) Towing vehicle must be equipped with engine or transmission retarder. The engine or the transmission retarder on the vehicle must be functional at all time (to be inspected frequently).

This hitch must be used for recreational use only.

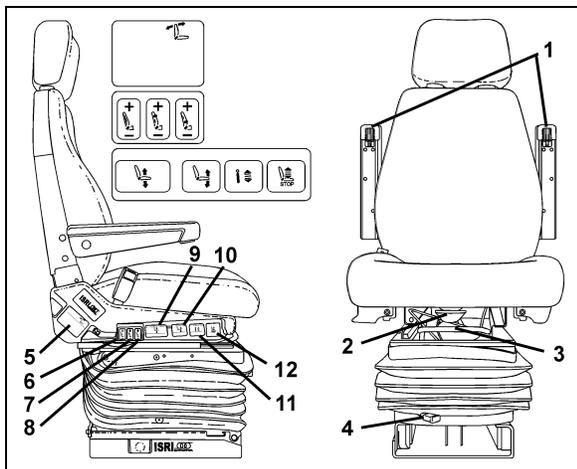
## DRIVER'S SEAT - "DELIVERY"

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

## DRIVER'S AND NAVIGATOR'S SEATS - ISRI (OPTIONAL)

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

### PNEUMATIC ISRI SEATS



PNEUMATIC DRIVER'S SEAT

18385



## WARNING

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

### Armrest (1)

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

### Seat Cushion (2)

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

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

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

### Isolator (4)

Reduces horizontal vibration, ensuring smooth ride.

### Backrest (5)

Lift lever to select proper adjustment angle of backrest.

### Air Side Bolster (6)

Offers desired side support to avoid body sideway.

### Air Lumbar (7) (8)

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

### Air Height Adjustment (9)

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

### Adjustable Seat Recline (10)

Allows easy adjustment of four-setting inclination.

### Adjustable Shock Absorber (11)

Choose stiff or soft ride infinitely.

### Quick Air Release (12)

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

## ELECTRIC ISRI SEATS

Adjust electric seats as follows:

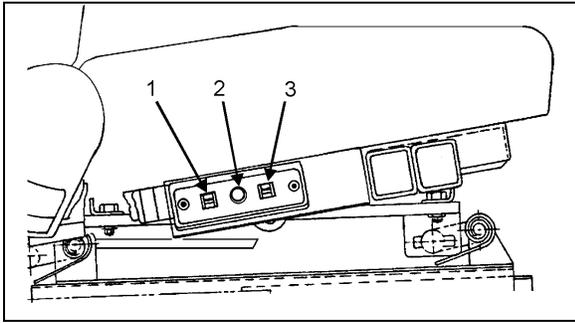
### Tilt (rear) (1)

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

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

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

## 16 VEHICLE INTERIOR



SEAT CONTROLS

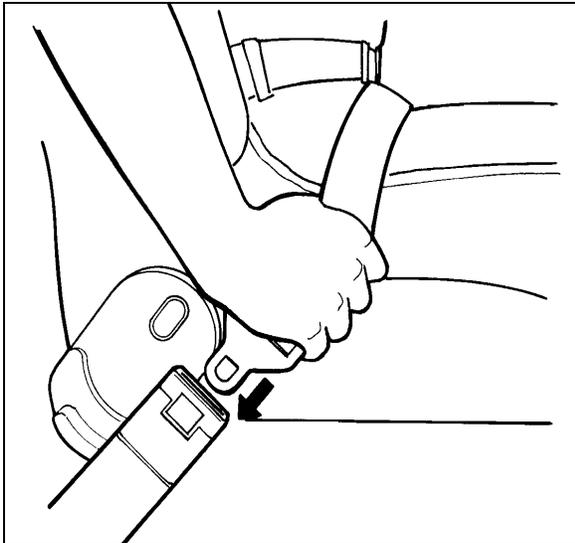
18040

### Tilt (front) (3)

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

## SAFETY BELTS

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



SEATBELT

18028

### NOTE

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



## WARNING

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



## CAUTION

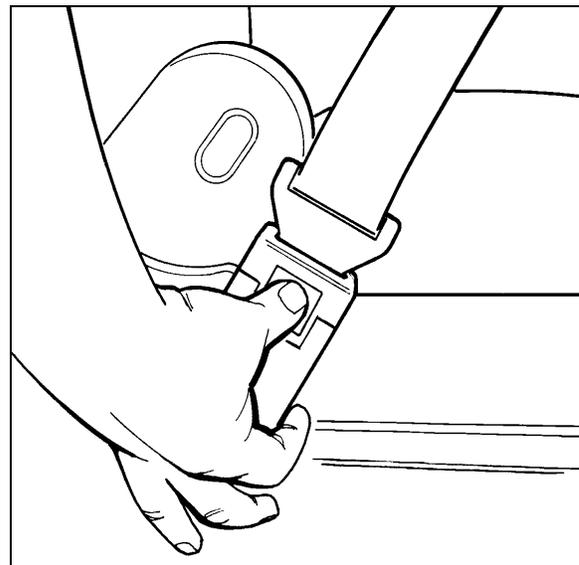
Never bleach or dry-clean safety belt.

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



## WARNING

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



SEATBELT

18029

## STEERING WHEEL ADJUSTMENT

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



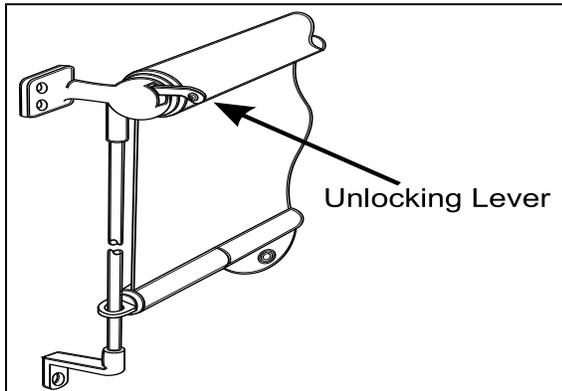
## WARNING

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

## SUNSHADES (BLINDS)

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

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



SPRING RELEASE SUNSHADE

23019

## INSIDE MIRRORS

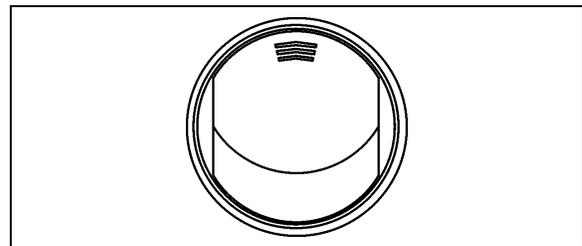
Two mirrors are located in the driver's area. The left overhead mirror provides visibility in the critical area on the R.H. side of the private coach. Adjust the left overhead mirror to see through the front cabin windows. The central mirror allows the driver to see in the central cabin aisle.

## ADJUSTABLE HVAC REGISTERS

The HVAC system has adjustable registers to control air flow around the driver's and navigator's area.

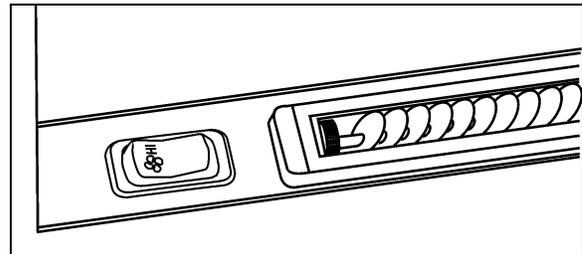
- Three are located on the dashboard, two on the R.H. side and one on the left (refer to Controls & Instruments chapter).
- Two more registers are located near the steering wheel column, under the dashboard. These registers are not adjustable but may be electrically open or closed by means of the HVAC control panel.
- Three auxiliary unit registers are located behind the driver (with small HVAC system only).
- For the navigator, two adjustable registers are located near the entrance door, at bottom of first lateral window (refer to Controls & Instruments chapter).

Use the HVAC control panel to set air temperature.



DASHBOARD AIR REGISTER

22287



NAVIGATOR'S AIR REGISTER & FAN SPEED CONTROL SWITCH

22286

## WINDOWS

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

### DRIVER'S POWER WINDOW

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

# 18 VEHICLE INTERIOR

## FIXED WINDOWS

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

## AWNING WINDOWS

To open or close an electrically-operated awning window, use the rocker switch button located on the wall, next to the window. After closing the window, maintain the rocker switch button depressed to latch the window.

### NOTE

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



### CAUTION

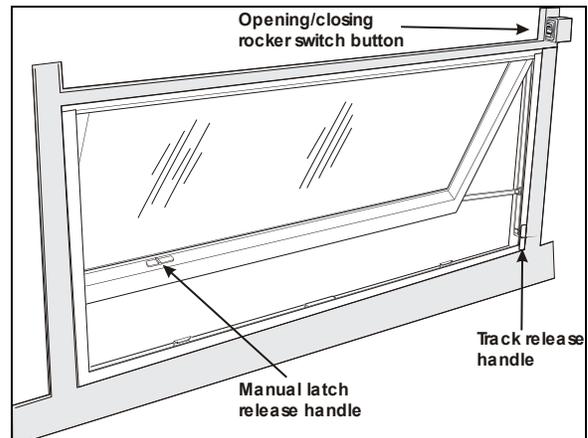
Avoid holding the rocker switch button depressed after the window has reached its full opened position or after the window has been latched.



### CAUTION

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

A telltale light on the dashboard illuminates when an awning window is opened. Refer to "Controls And Instruments" chapter for more information.

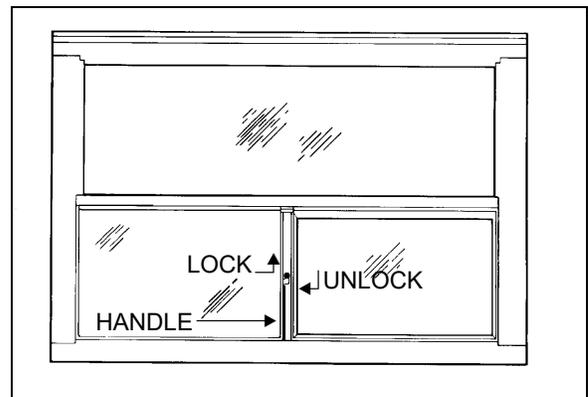


ELECTRIC AWNING WINDOW

18585

## SLIDING WINDOWS

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



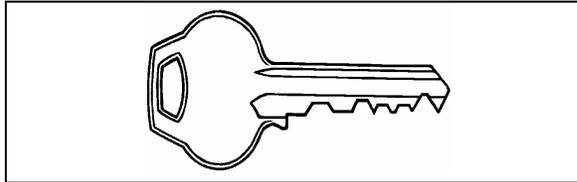
SLIDING WINDOW

18206

## KEYS

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

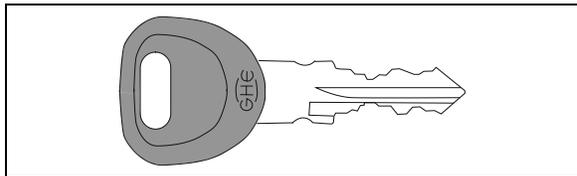
### FRONT ENTRANCE DOOR LOCK KEY



FRONT ENTRANCE DOOR LOCK KEY 23057

Use this key to lock or unlock the entrance door from outside. It is also possible to lock or unlock the entrance door using the entrance door locking switch, the keyless entry system or the remote entry transmitter.

### EXTERIOR COMPARTMENTS KEY



EXTERIOR COMPARTMENTS KEY 23302

Use this key to lock or unlock any exterior compartment door, including the fuel tank filling access doors, the baggage compartment doors and electrical/service compartment doors. It is also possible to lock or unlock the baggage compartment from the inside by means of the central locking system switch located on the L.H. dashboard panel.

#### **NOTE**

For your protection against theft:

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

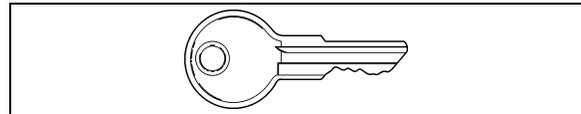
### UTILITY COMPARTMENT KEY



UTILITY COMPARTMENT KEY 23344

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

### IGNITION SWITCH KEY



IGNITION SWITCH KEY 23056

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

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



### CAUTION

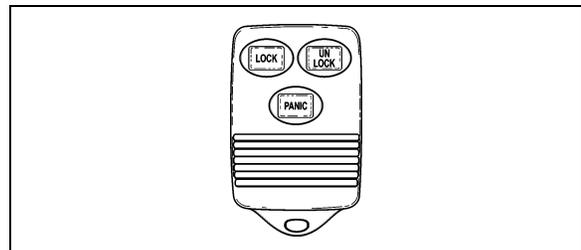
When the vehicle is parked overnight or for an extended period of time, the battery master switch should be set to the OFF position.

#### **NOTE**

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

### REMOTE ENTRY TRANSMITTER

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



REMOTE ENTRY TRANSMITTER 23208

## 20 CONTROLS AND INSTRUMENTS

To lock the entrance door and the baggage compartment doors simultaneously and arm the intrusion protection and anti-theft system:

- Press LOCK on the transmitter once.

### NOTE

The intrusion protection and anti-theft system will be set after a 30 seconds delay.

To confirm that the entrance door and baggage compartment doors have been locked and that the intrusion protection and anti-theft system is armed:

- Press LOCK again within five seconds of the first lock. The front and rear side markers will flash once if the doors have locked. If the entrance door or one of the baggage compartment doors is open, a door ajar signal prevents arming of the system.

To unlock the entrance door:

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

To unlock the baggage compartment doors:

- Press UNLOCK a second time within five seconds of the first unlock.

To set off the personal security alarm:

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

To deactivate the personal security alarm:

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

### NOTE

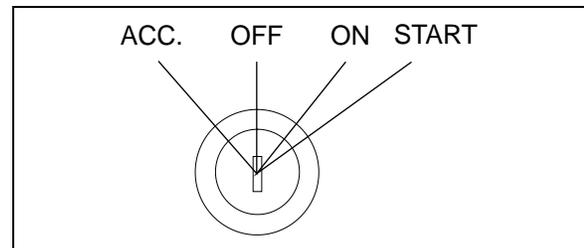
The remote entry features will not function when the ignition is in the ON or ACC. position.

For additional information, refer to "Other Features" chapter.

### NOTE

For complete information concerning the Remote Keyless Entry & Anti-theft Alarm System, refer to the document included in your vehicle "publication box".

## IGNITION SWITCH



IGNITION SWITCH POSITIONS

06354

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

### Off

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

The electrical circuits are not activated when the switch is in this position. Only the accessories connected directly to the batteries can be activated. Maintain the switch in this position when parked overnight or for an extended period.

### NOTE

The main battery relay is activated when the hazard flashers are activated, even if the key is in the OFF position.

### Accessories

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

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

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

### On

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

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

### **Start**

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

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



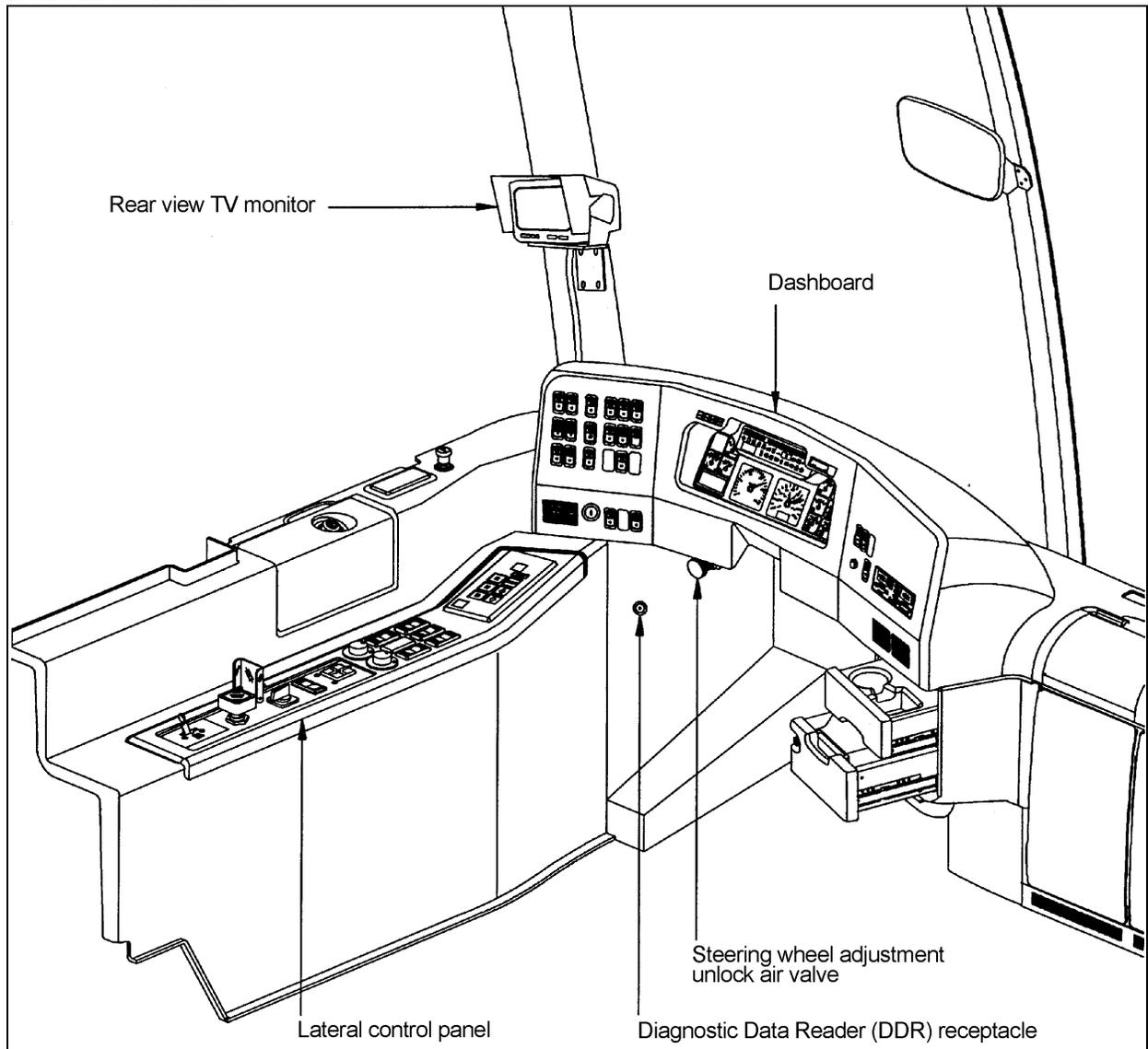
### **CAUTION**

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

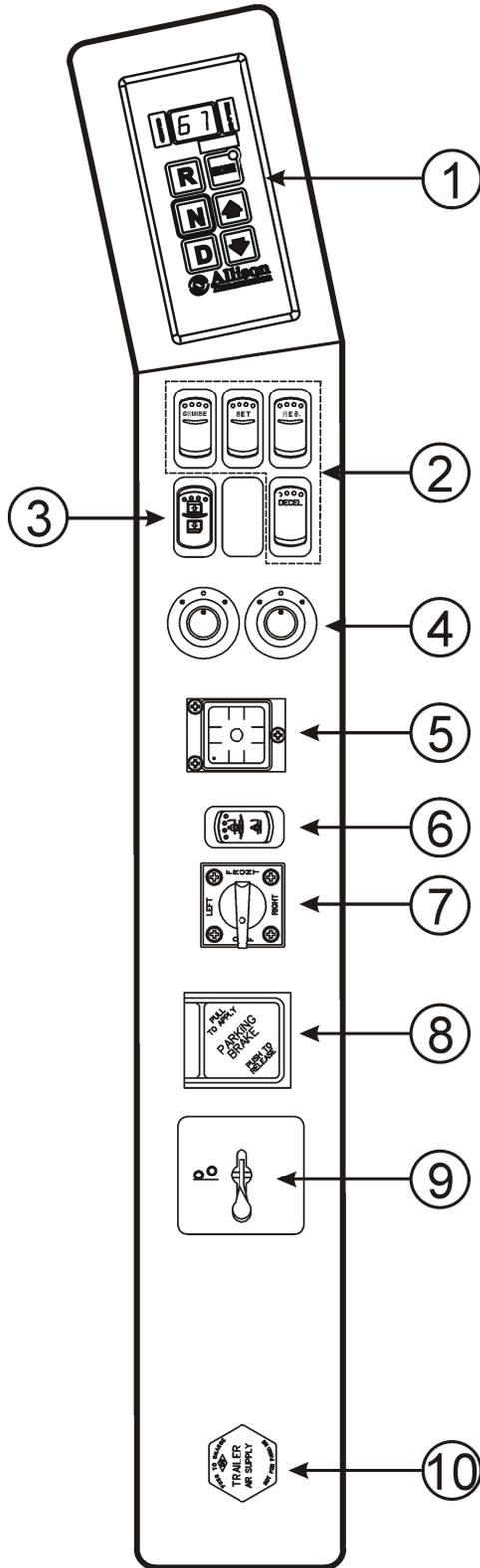
The features activated when the engine is running are all those described above plus the HVAC system and daytime running lights. The optional ether cold-start system is automatically deactivated once the engine runs.

## 22 CONTROLS AND INSTRUMENTS

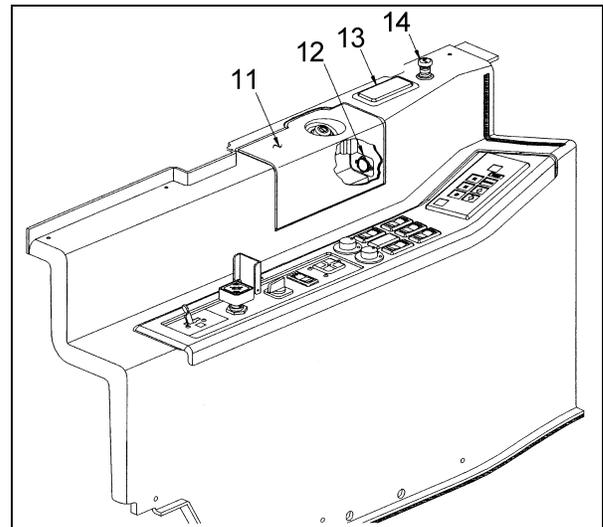
### DRIVER'S AREA



**LATERAL CONTROL PANEL**



1. Transmission Pushbutton Shift Selector
2. Cruise Control Switches
3. Driver's Power Window Switch
4. Outside Rear Mirror Controls
5. Level Indicator
6. Height Control Switch
7. Level Low Selector Switch
8. Parking Brakes Control Valve
9. Tag Axle Control Valve
10. Trailer Air Supply Control Valve (Optional)



06485

11. Utility Compartment
12. 12-volt DC Power Outlet
13. Ashtray
14. Cigarette Lighter

**PUSHBUTTON SHIFT SELECTOR (1)**

The Allison transmission pushbutton shift selector is located as shown. Refer to "Allison Transmission" heading in this chapter for operating instructions and more information.

**CRUISE CONTROL SWITCHES (2)**

The cruise control is part of the DDEC V electronic engine control that will maintain a set

## 24 CONTROLS AND INSTRUMENTS

speed when the vehicle is traveling above 20 mph (32 km/h).



### WARNING

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



### WARNING

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

### Setting coach speed

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

#### NOTE

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

### Increasing set speed

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

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

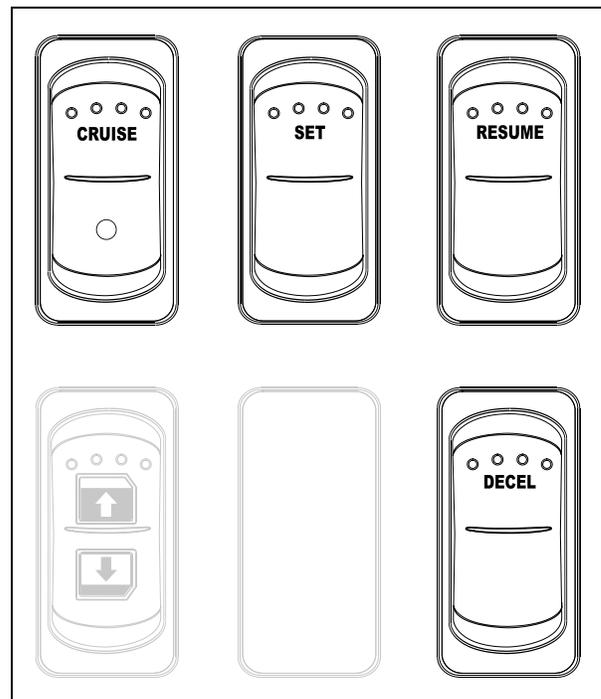
When driving with cruise control ON, each time the **RESUME** switch is momentarily depressed, the cruising set speed is raised by 0.6 mph (1.0 km/h).

#### NOTE

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

#### IMPORTANT NOTE

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



CRUISE CONTROL SWITCHES

06233

### Decreasing Set Speed

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

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

- Depress and release the **DECEL** switch.

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

**NOTE**

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

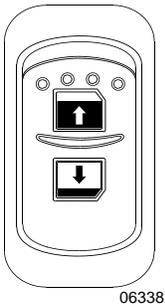
**NOTE**

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

**! WARNING**

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

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

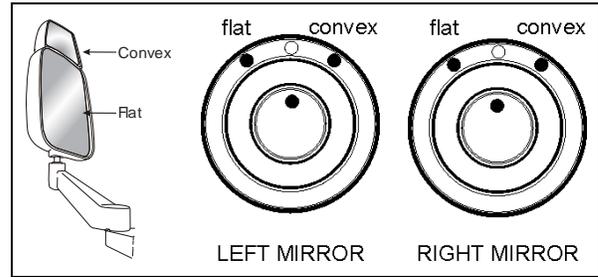


Use the rocker switch to open or close the driver's power window.

**! CAUTION**

Close power window when parked or leaving the coach unattended.

**MIRROR CONTROLS (Optional) (4)**



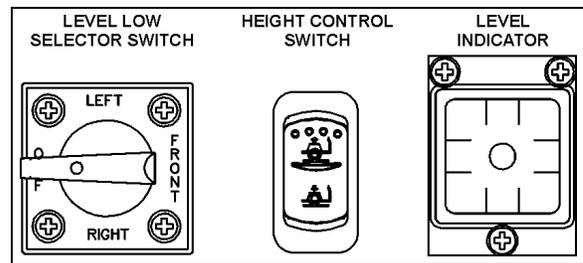
**MIRROR CONTROLS**  
06374

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

**NOTE**

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

**LEVEL LOW SYSTEM (5, 6, 7)**



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

The three leveling valves are located as follows: one at the front which controls the amount of air

## 26 CONTROLS AND INSTRUMENTS

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

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

### NOTE

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

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



### WARNING

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

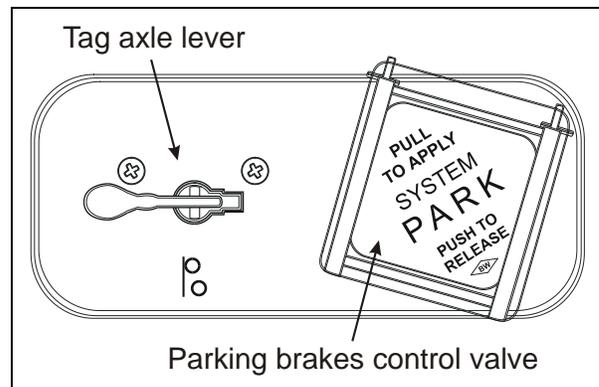
the **OFF** position.

### NOTE

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

### PARKING BRAKES CONTROL VALVE (8)

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



CONTROL VALVES

12129

### TAG AXLE CONTROL VALVE (9)

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

### TRAILER AIR SUPPLY CONTROL VALVE (Optional) (10)

The trailer air braking system is supplied by pushing this control valve.

### UTILITY COMPARTMENT & 12-VOLT DC POWER OUTLET (11) (12)

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

## ASHTRAY (13)

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



### **WARNING**

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

## CIGARETTE LIGHTER (14)

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

### ***NOTE***

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

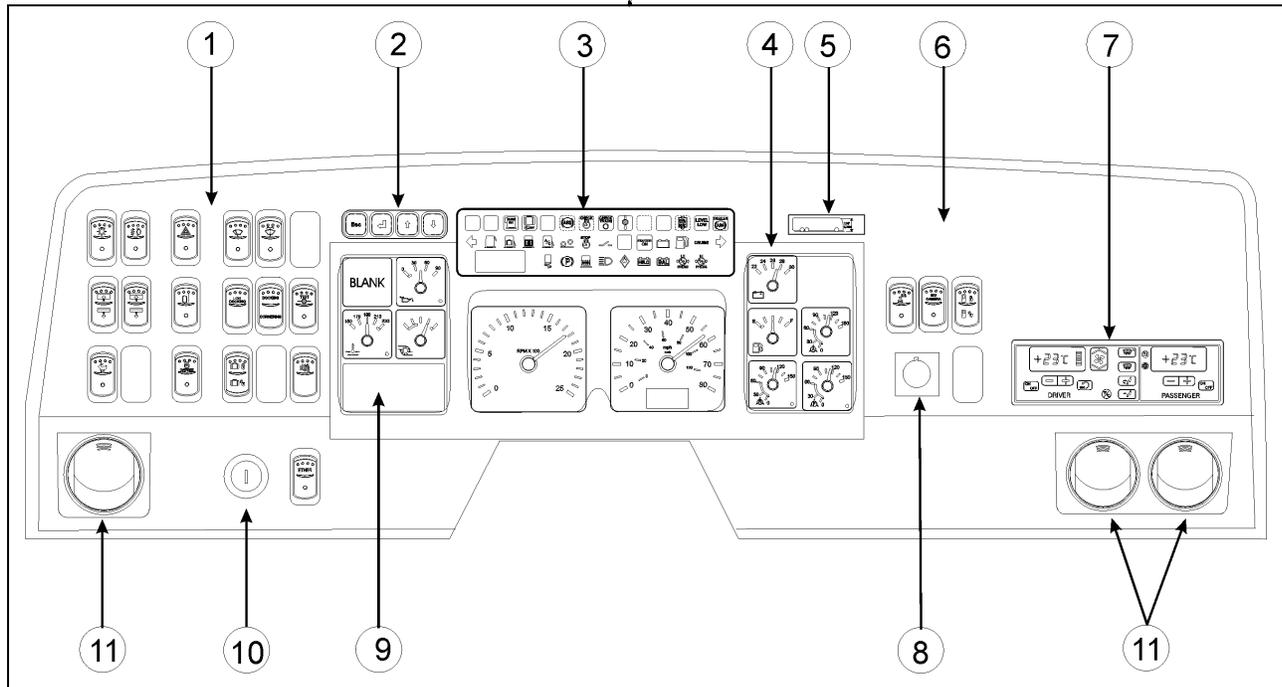
## DIAGNOSTIC DATA READER (DDR) RECEPTACLE

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

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

## 28 CONTROLS AND INSTRUMENTS

### DASHBOARD



DASHBOARD

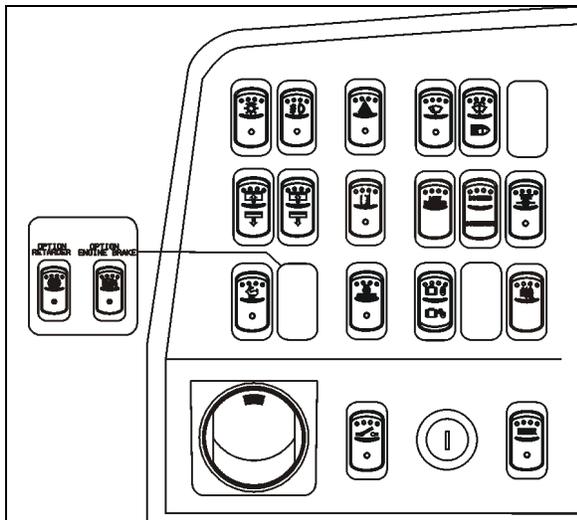
06560 VIP

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

## CONTROL SWITCHES

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

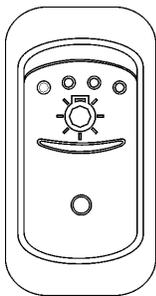
## L. H. DASHBOARD PANEL



L. H. DASHBOARD PANEL 06561

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

## Headlights and Exterior Lighting



06254

**OFF position** – Daytime running lights only.

Press this rocker switch to turn on the following lights:

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

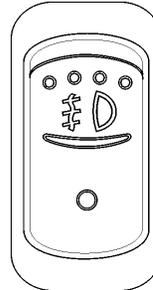
**Second position** (push down fully) - the headlights, the controls and instrument lights and all lights from the first position.

### NOTE

*Daytime running lights will be automatically*

*cancelled when the exterior lighting switch is fully depressed (second position).*

## Fog Lights (Optional)



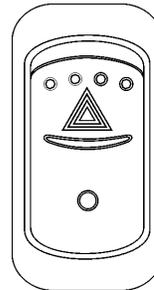
06255

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

### NOTE

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

## Hazard Warning Flashers



06256

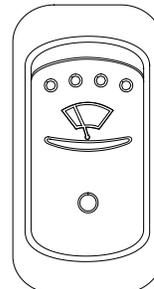
Press the rocker switch to make all turn signal lights flash at once. The dashboard telltale lights will flash when the hazard warning flashers are *ON*.



## CAUTION

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

## Upper Windshield Wipers (Optional)



06257

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

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

## 30 CONTROLS AND INSTRUMENTS



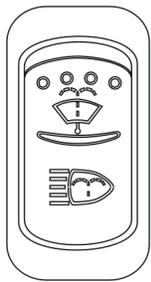
### CAUTION

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

### NOTE

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

### Upper Windshield Washer (optional) & Headlights Washer



06615

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

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



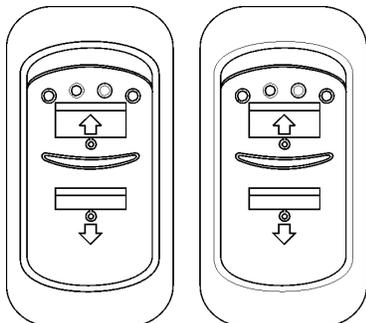
### CAUTION

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

### NOTE

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

### Left and Right Sunshades



06353

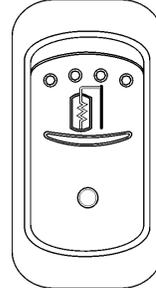
Press and hold to lower or raise left or right sun shade.



### CAUTION

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

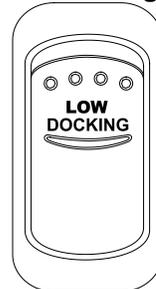
### Outside Rear View Mirror Heat (Optional)



06261

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

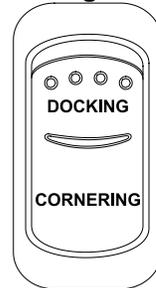
### Low Docking



06486

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

### Docking/Cornering

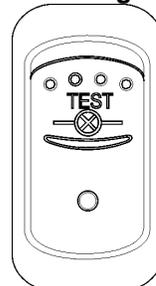


06337

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

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

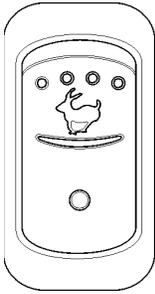
### Telltale Light Test



06263

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

## Fast Idle



06264

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

Never use the engine brake on slippery roads; loss of control could result.

### NOTE

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



## CAUTION

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



## CAUTION

Return the engine to normal idle before shutting the engine OFF.

## Engine Stop Override



06265

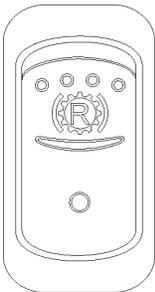
Press this switch then release to override the emergency engine shutdown protection. Engine emergency shutdown will be turned OFF for 30 seconds. This procedure can be repeated if done before the 30 seconds are up.



## CAUTION

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

## Transmission Output Retarder (Optional)



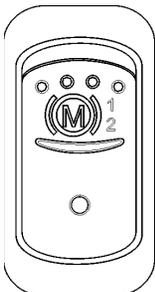
06252

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

## DDEC Diagnostic Request

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

## JACOBS Engine Brake (Optional)



06253

Press this switch to the first position to actuate the system to 66% engine brake and press to the second position for full application of engine brake. Refer to "Other Features" chapter.

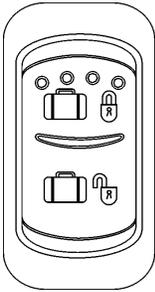


## WARNING

Engine brake must be used on dry road only.

## 32 CONTROLS AND INSTRUMENTS

### Central Locking System



06266

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

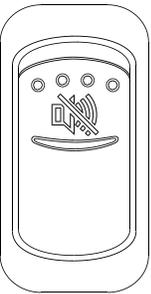
#### **NOTE**

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

#### **NOTE**

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

### Back-up Alarm Cancel



06311

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

### Ether Start Control (Optional)



06237

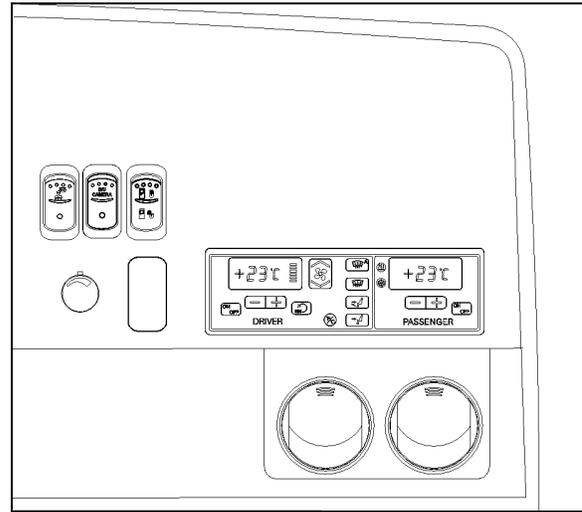
Activates the engine cold starting aid. Refer to "Starting and Stopping Procedures" chapter.



#### **CAUTION**

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

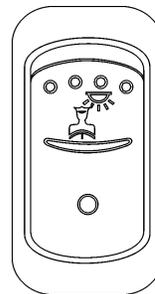
### R.H. DASHBOARD PANEL



R.H. DASHBOARD PANEL

06562

### Driver's Area Lighting



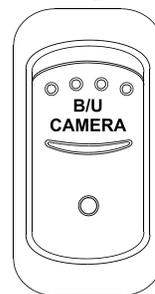
06244

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

#### **NOTE**

*The entrance overhead light and the stepwell lights turn on with the entrance door opening and turn off with door closing. If the entrance door is left opened, these lights will be turned off automatically if the batteries voltage drops below 24.4 volts.*

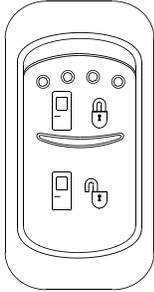
### Back-up Camera



06314

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

## Front Entrance Door



06313

Press this switch forward to lock the entrance door from the inside. To unlock the entrance door from the inside and disarm the intrusion protection and anti-theft system, press the switch rearward.

### NOTE

*When the alarm system is armed, unlocking the entrance door from the inside by sliding its lock lever will not disarm the alarm system. The alarm will sound.*

## Brightness Control

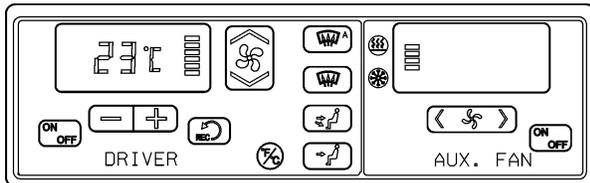


06565

Adjusts the brightness of the dashboard instruments and switches.

## HVAC CONTROL UNITS

### Vehicles equipped with small HVAC system



CONTROL UNIT FOR SMALL HVAC SYSTEM

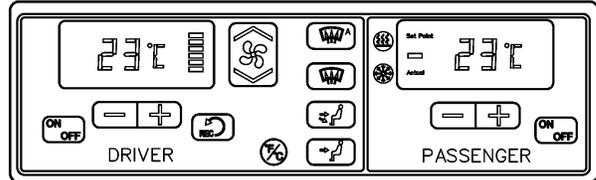
22286

The temperature control in the driver's area is provided directly by the driver section of the HVAC control unit.

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

In addition to the driver's unit, the small HVAC system also includes an auxiliary unit which uses the temperature control of the driver section of the control unit. The R.H. section of the control unit AUX. FAN enables to actuate the auxiliary unit and to regulate its fan speed. Using the < > type switch sets the fan speed and the speed chosen is illustrated on the window display.

### Vehicles equipped with central HVAC system



CONTROL UNIT FOR CENTRAL HVAC SYSTEM

22276

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

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

### NOTE

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

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

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

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

The driver section and the passenger section of the control unit may be turned ON by pressing the following button:



06372

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

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

1. The outside temperature is above 32°F (0°C).

## 34 CONTROLS AND INSTRUMENTS

- The passenger's area temperature has reached 7°F (4°C) under the set point.

### NOTE

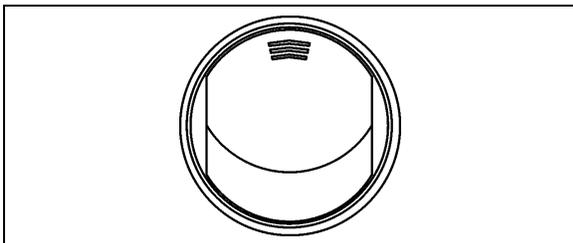
Upon starting, if the outside temperature is above 32°F (0°C) and then drops below 32°F (0°C), the compressor will keep running up to a temperature of 15°F (-9°C) to prevent condensation from forming on the windows.

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

### HVAC Air Registers

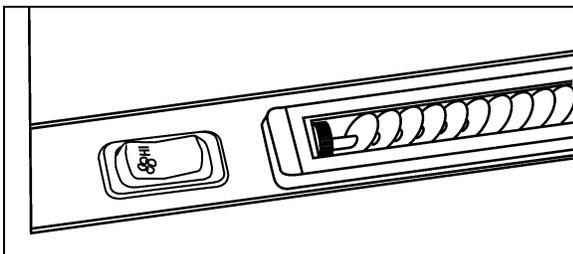
The HVAC system has registers to control air flow around the driver's and navigator's area.

- Three are located on the dashboard, two on the R.H. side and one on the left.
- Two more registers are located near the steering wheel column, under the dashboard. These registers are not adjustable but may be electrically open or closed by means of the HVAC control panel.
- Three auxiliary unit registers are located behind the driver (with small HVAC system only).
- For the navigator, two adjustable registers are located near the entrance door, at bottom of first lateral window.



DASHBOARD AIR REGISTER

22287



NAVIGATOR'S AIR REGISTER & FAN SPEED SELECTOR

### Navigator fan speed switch

Upon turning on of the HVAC control unit, both right and left windshield defogging/defrosting fans speed is set according to the driver section settings of the control unit. The navigator can afterwards, use this switch to increase or decrease the right windshield defogging/defrosting fan speed as needed.

### Navigator air registers

On small HVAC system, these registers are part of the auxiliary unit. Use the auxiliary unit fan speed switch on the R.H. portion of the control unit (AUX. FAN) to regulate the fan speed. Doing so will also reduce air from the three registers located behind the driver.

On vehicles equipped with the Central HVAC system, these registers are supplied in air by the passenger's (cabin) unit.

### Heating Mode Indicator



22135

This red LED illuminates when system is heating.

### Cooling Mode Indicator



22134

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

### NOTE

Both Heating Mode and Cooling Mode indicator LED can illuminate simultaneously. During winter, if the outside temperature is above 32°F (0°C), the A/C compressor may start for dehumidification purposes to prevent condensation from forming on the windows. During summer, the Heating Mode may activate to regulate inside temperature.

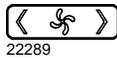
### Fan Speed



22135

This switch controls both right and left windshields defogging/defrosting fans speed. Increase speed by pressing on the upper portion of the button, decrease by pressing on the lower portion.

## Auxiliary Unit Fan Speed (With Small HVAC System Only)



22289

Use this switch to increase or decrease the auxiliary unit fan speed by pressing on the right or left portion of the button.

## Recirculate



22138

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

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

This feature is automatically cancelled when defogging is activated.

## Driver's section temperature setting



The temperature displayed on the driver section of the control unit is the temperature set point.

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



22132

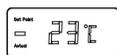
In case of interior temperature sender unit failure, the coolant valve will remain open and three lines "---" will be displayed.



## WARNING

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

## Passenger's (cabin) section temperature setting (with Central HVAC System)



The temperature displayed on the passenger section of the control unit is the actual temperature in the passenger's area.

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



22132

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

### NOTE

*Upon starting of the vehicle, when the ambient temperature is very cold and so is the inside of the vehicle, the HVAC control unit will permit a temperature overshoot up to 3° over the passenger's area set point to help warming up of the area.*

## Windshield Defogger/Defroster



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



22139

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

## Panel and Footwell



22137

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

## Panel



22136

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

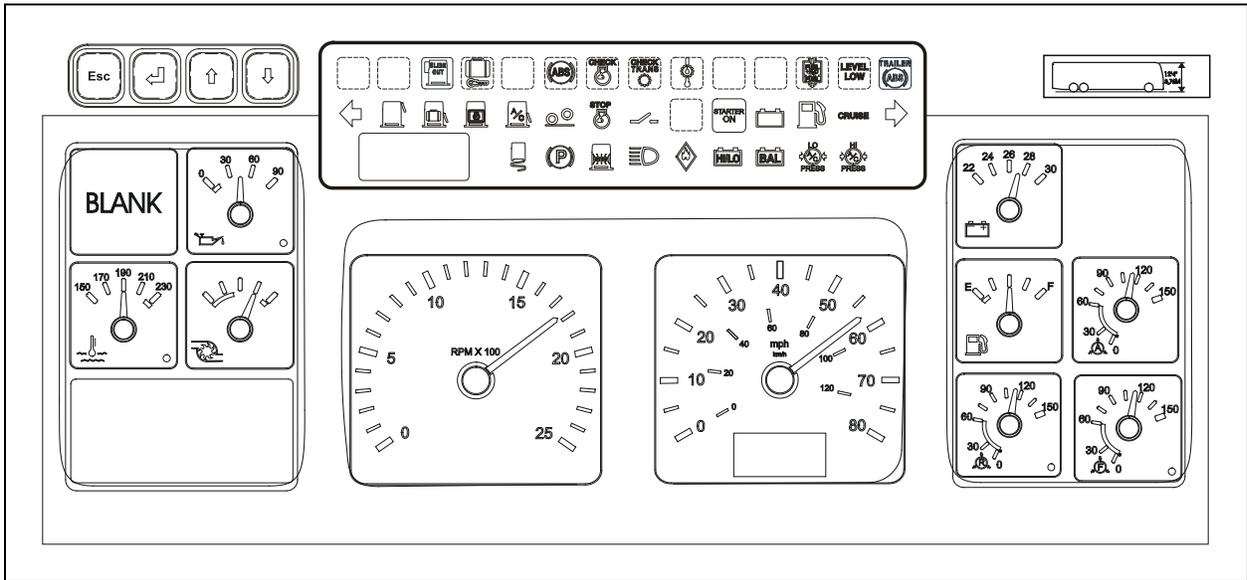
## Temperature Degree Selector



22133

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

# 36 CONTROLS AND INSTRUMENTS

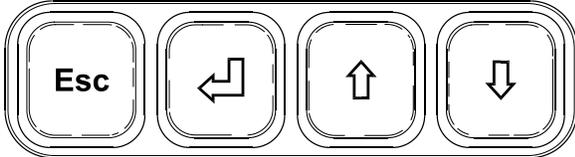


CLUSTER

06563

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

## MESSAGE CENTER DISPLAY (MCD)



06399

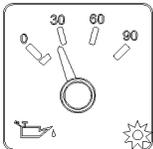
This standard feature gathers, stores and displays important information about the vehicle's operation on a display screen on the lower left portion of the cluster. Refer to Message Center Display in "Other Features" chapter for a description of how to set up and operate the Message Center Display.

## GAUGES

### NOTE

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

### Engine Oil Pressure



06229

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

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

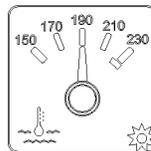
An audible alert signal also informs the driver of low oil pressure. Refer to "Safety Features and Equipment" chapter for table of audible alerts.



## CAUTION

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

### Engine Coolant Temperature



06231

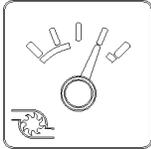
Indicates the operating temperature of the engine coolant. The normal reading should be between 190°F and 222°F (88°C to 106°C).

A high coolant temperature indicator LED

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

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

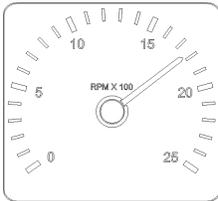
### Turbo Boost Pressure



06230

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

### Tachometer

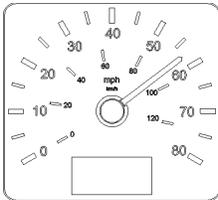


06221

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

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

### Speedometer

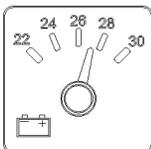


06222

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

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

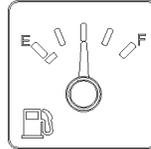
### Voltmeter (24-Volt System)



06224

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

### Fuel Level



06225

Indicates the amount of fuel remaining in the fuel tank.

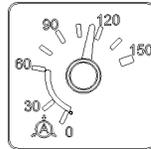
A telltale light illuminates when about 12 US gallons (45 liters) of fuel remain in the fuel tank.



### CAUTION

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

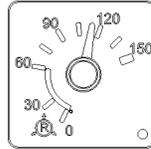
### Accessories Air Pressure



06226

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

### Primary System Air Pressure (Rear)



06228

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

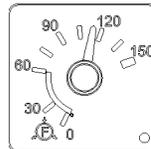
A low air pressure indicator LED (bottom right corner of gauge) illuminates when the primary air system pressure drops below 66 psi (455 kPa). An audible alert signal also informs the driver of low air pressure. Refer to “Safety Features and Equipment” chapter for table of audible alerts. If the air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



### WARNING

Do not drive the coach when air pressure is low.

### Secondary System Air Pressure (Front)



06227

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

## 38 CONTROLS AND INSTRUMENTS

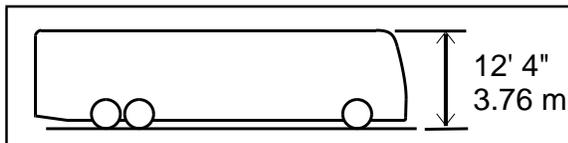
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A low air pressure indicator LED (bottom right corner of gauge) illuminates when the secondary air system pressure drops below 66 psi (455 kPa). An audible alert signal also informs the driver of low air pressure. Refer to "Safety Features and Equipment"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

### TELLTALE PANEL

|  |
|--|
|  <b>WARNING</b> |
| Do not drive the coach when air pressure is low.   |

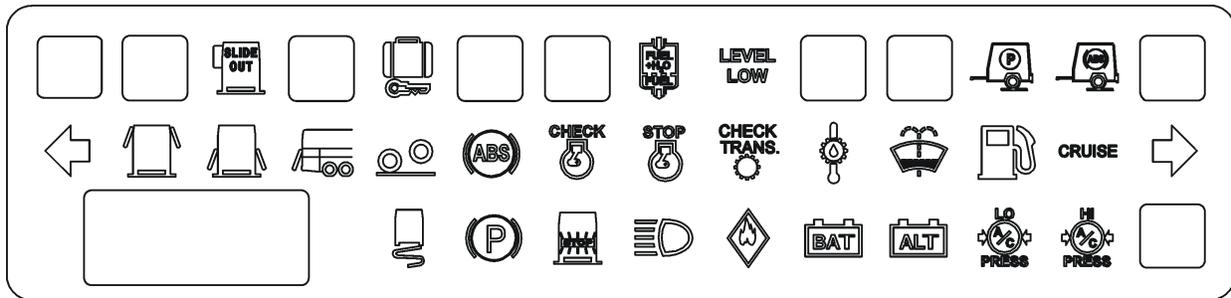
#### Vehicle Clearance Information



06447

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

|  |
|--|
|  <b>CAUTION</b>                                       |
| Vehicle clearance is higher when the ventilation hatch is open, Hi-Buoy is selected or if additional equipment is installed on the roof. |



**TELLTALE PANEL**

06593

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

### Slide-Out



06559

Illuminates when one or both slide-outs are partially or fully extended. Blinks to indicate that an error condition has been detected (refer to “Other Features” chapter).

### Baggage Compartment Door Unlocked



06387

Illuminates when one or more baggage compartment doors are unlocked.

### Fuel Filter/Water Separator



06291

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

### Level Low System Indicator



06297

Illuminates when the vehicle leveling system is activated.

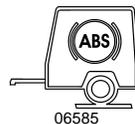
### Trailer Emergency / Parking brake



06591

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

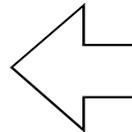
### Trailer Antilock Brake System (ABS)



06585

Illuminates when the trailer ABS is malfunctioning.

### Left Turn Signal



06290

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

### Emergency Window Open



06287

Illuminates when an emergency window is open or unlocked.

### Baggage Bay Door Ajar



Illuminates when one or more baggage bay doors are ajar.

### Engine Door Ajar



Illuminates when the engine compartment door is ajar.

### Retracted Tag Axle



06271

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

## 40 CONTROLS AND INSTRUMENTS

### Antilock Brake System



06272

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

### Check Engine



06281

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

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

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

A diagnostic code will be stored in the memory and the indicator can be used to identify the problem. Refer to Appendix D "DDEC V Diagnostic Codes".

### STOP Engine



06309

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

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

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

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

#### NOTE

Once the engine is stopped, it cannot be restarted until the problem has been corrected. A diagnostic code will be stored in memory. The STOP engine indicator can be

used to identify the problem. Refer to Appendix D "DDEC V Diagnostic Codes".

### Check Transmission



06282

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

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

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

Any time the CHECK TRANS telltale light illuminates, the TCM will register a diagnostic code. It may be identified on the display or by using a diagnostic tool. Refer to Appendix C.

#### NOTE

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

### Transmission fluid Temperature



06292

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

### Windshield Washer or Headlights Washer Fluid Low



066001

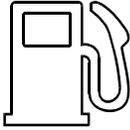
Illuminates when the windshield washer or the headlights washer fluid level is low. The washer fluid containers are located inside the front service compartment.



## WARNING

Do not drive without sufficient washer fluid.

### Fuel Level Low



06286

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

**NOTE**  
Refuel as soon as possible.

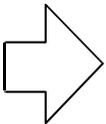
### Cruise Control Enabled



06284

Illuminates when cruise control is enabled.

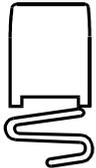
### Right Turn Signal



06289

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

### Freezing Conditions



06273

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

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

### Emergency/Parking Brake



06303

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

### Stoptlights ON



06305

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

### High Beam ON



06300

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

### Fire Detected



06288

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

**WARNING**

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

**NOTE**

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

**NOTE**

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

## 42 CONTROLS AND INSTRUMENTS

### NOTE

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

### Battery Voltage Incorrect



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

### NOTE

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

### NOTE

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

### NOTE

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

### NOTE

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

### Alternator



Illuminates when one of the alternators is not charging.

### NOTE

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

### A/C System Pressure Low



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

06298

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

### NOTE

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

### A/C System Pressure High



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

06296

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

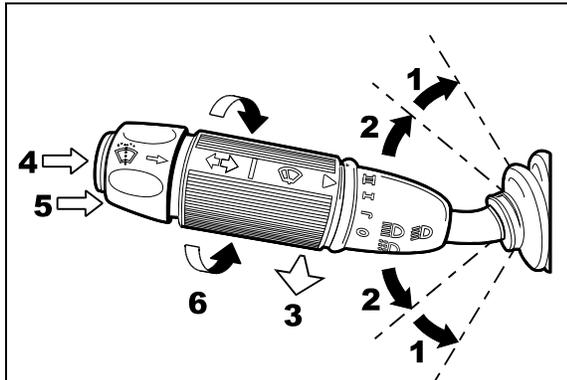
### NOTE

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

## STEERING COLUMN CONTROLS

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

**MULTI-FUNCTION LEVER**



**MULTI-FUNCTION LEVER** 23133  
 The multi-function lever is used to operate the following:

**Turn Signal (1)**

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

**Lane Change Signal (2)**

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

**Headlight Beam Toggle Switch (3)**

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

**Courtesy Blinkers (4)**

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

**Windshield Washer Control (5)**

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

**CAUTION**

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

**Windshield Wipers (6)**

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

**CAUTION**

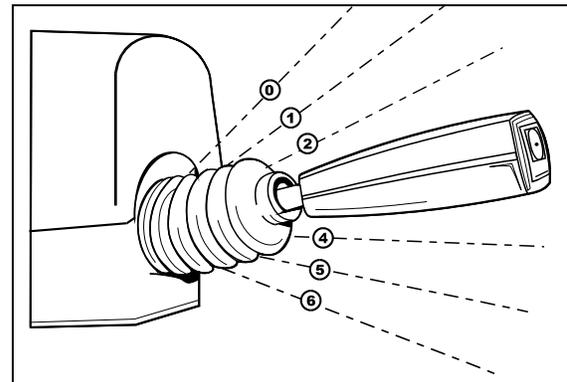
To avoid scratching the windshield, do not operate the wipers when the windshield is dry. To avoid damaging the wiper motor, free wiper blades that may be frozen to the windshield before operating the wipers.

**TRANSMISSION OUTPUT RETARDER (Optional)**

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

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

**Operating The Retarder Using The Hand Lever**



**RETARDER HAND LEVER** 07043

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

**WARNING**

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

## 44 CONTROLS AND INSTRUMENTS

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

### NOTE

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

### Operating The Retarder Using The Brake Pedal

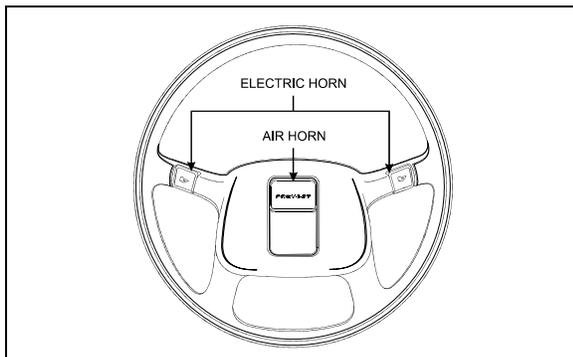
With the retarder activated (retarder switch depressed), the accelerator pedal released and the output retarder lever in the initial position (position 0), apply the brake pedal as if using the service brakes. The further the pedal is depressed, the more the output retarder is applied. Refer to "Other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

### NOTE

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

### ELECTRIC HORN

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



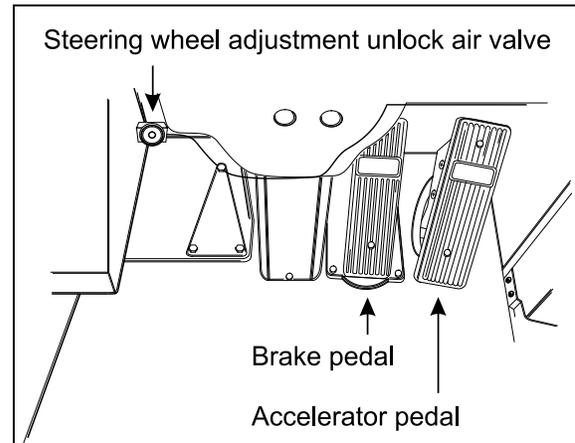
STEERING WHEEL

14029

### AIR HORN

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

### FOOT-OPERATED CONTROLS



FOOT OPERATED CONTROLS

00023A

### BRAKE PEDAL

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

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

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

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

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



### WARNING

Immediately report any brake system problem to the nearest Prevost or Prevost-approved

service center.



## WARNING

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



## CAUTION

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

### ACCELERATOR PEDAL

Controls engine RPM as needed.

#### *NOTE*

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



## CAUTION

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

### STEERING WHEEL ADJUSTMENT UNLOCK AIR VALVE

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



## WARNING

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

## ALLISON TRANSMISSION

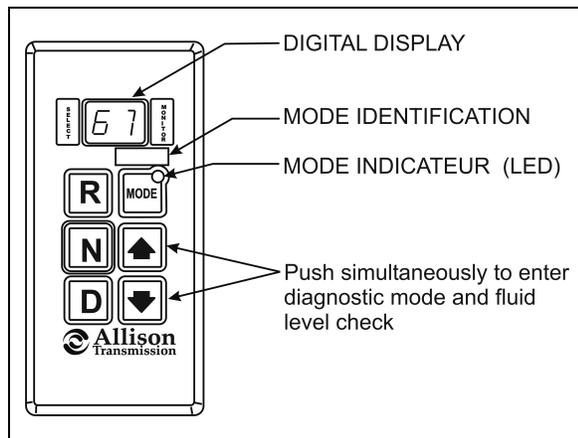
The transmission is fully automatic: Proper ranges should be automatically selected according to driving speeds to improve vehicle performance and control. The speed ratio of the power converter changes automatically as vehicle speed increases and direct-drive goes in and out as necessary. The speed ratio is modulated by vehicle speed and accelerator pedal position. You will find the complete transmission operation instructions and driving tips in the **Allison Bus Series Operator's Manual** included in your vehicle's publication box.

## OPERATION

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

#### *NOTE*

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



ALLISON PUSHBUTTON SHIFT SELECTOR 07134

## PUSHBUTTON SHIFT SELECTOR

The pushbutton shift selector has the following elements:

**R** (Reverse) — Press this button to select Reverse.

**N** (Neutral) — Press this button to select Neutral.

**D** (Drive) — Press this button to select Drive. The highest forward range available will appear in the digital display window under SELECT. The transmission will start out in the lowest available forward range, displayed under MONITOR, and advance automatically to the highest range.

▲ ▼ — Press respectively the ▲ (Upshift) or ▼ (Downshift) arrow button when in DRIVE to request the next higher or lower range. One press changes gears by one range. If the button is held down, the selection will scroll up or down until the button is released or until the highest or lowest possible range is selected. Protection mechanisms inhibit selecting ranges that are not appropriate for the current speed or which may damage driveline components.

**MODE** — The MODE button can allow the driver to enable a secondary shift mode that has been programmed into the TCM unit. The name of the secondary mode appears on the MODE IDENTIFICATION label adjacent to the MODE button. Pressing the MODE button activates the PERFORMANCE shift schedule and illuminates the mode indicator (LED).

### NOTE

When the diagnostic display mode has been entered, the MODE button is used to view and toggle through diagnostic code information. Refer to appendix C for more details about

*diagnostic code display procedure and fluid level check using the pushbutton shift selector.*

## FUNCTION OF THE «MODE» BUTTON

Both ECONOMY (default mode at starting of the engine) and PERFORMANCE (secondary shift mode) modes are equivalent from the first to the fourth gear as the transmission upshifts at around 2000 rpm.

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

The PERFORMANCE mode keeps upshifts at 2000 rpm in fifth and sixth gears. This makes for better performance than the economy mode but with higher fuel consumption. It is recommended this mode be selected while driving up or down grades. The mode indicator (LED) is illuminating when PERFORMANCE mode is selected.

## DESCRIPTION OF AVAILABLE RANGES

### R (Reverse)

Press the «R» button to select reverse. Completely stop the vehicle and let the engine return to idle before shifting from forward range «D» to reverse «R» or from reverse to forward range. The reverse warning signal will be activated when this range is selected.

### N (Neutral)

Use this position to start engine. Select «N» (Neutral) when checking vehicle accessories and for extended periods of engine idle operation; parking brake must then be applied. The pushbutton shift selector will automatically select «N» (Neutral) when the ignition switch is turned ON.

### NOTE

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

|  |
|--|
|  <b style="font-size: 1.2em;">WARNING</b> |
| Always apply parking brake before leaving driver's seat.   |

|  |
|--|
|  <b style="font-size: 1.2em;">CAUTION</b>             |
| Detroit Diesel engines should not be idled for extended periods at "slow" idle. For extended idling, engine should run at "fast" idle. |

|  |
|--|
|  <b style="font-size: 1.2em;">CAUTION</b>                             |
| Do not allow your vehicle to "coast" in neutral «N». This practice can result in transmission damage. Also, no engine braking is available in neutral. |

### D (Drive)

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

|  |
|--|
| <b><i>IMPORTANT NOTE</i></b>   |
| <i>Brake pedal must be applied when selecting «D» (Drive) otherwise the transmission will stay in «N» (Neutral).</i> |

|  |
|--|
| <b><i>NOTE</i></b>   |
| <i>The transmission should normally be allowed to shift by itself, but manual shifting can be done as described below.</i> |

### 1 (First range)

Select this range when pulling through mud and snow, when speed control is needed for driving up or down steep grades or when maneuvering in tight spaces. This range also provides maximum driving torque and engine braking power or retarder braking effect. In the lower ranges (1, 2,

3 and 4), the transmission will not upshift above the highest gear selected unless engine overspeed is detected.

### 2 (Second 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).

### 3, 4 (Third and fourth ranges)

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

|   |
|---|
|  <b style="font-size: 1.2em;">WARNING</b>  |
| Service brake should not be used to control the speed of vehicle on long, steep descents. Instead, lower transmission ranges should be used (in conjunction with output retarder. Refer to "JACOBS Engine Brake" and "Transmission Retarder" headings in "Other Features" chapter for details regarding both systems. This procedure keeps service brake cool and ready for emergency stopping. |

|  |
|--|
|  <b style="font-size: 1.2em;">CAUTION</b> |
| When descending in lower ranges, care must be taken that engine speed does not exceed 2,450 rpm.                             |



### DETROIT DIESEL ELECTRONIC CONTROL (DDEC) SYSTEM

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

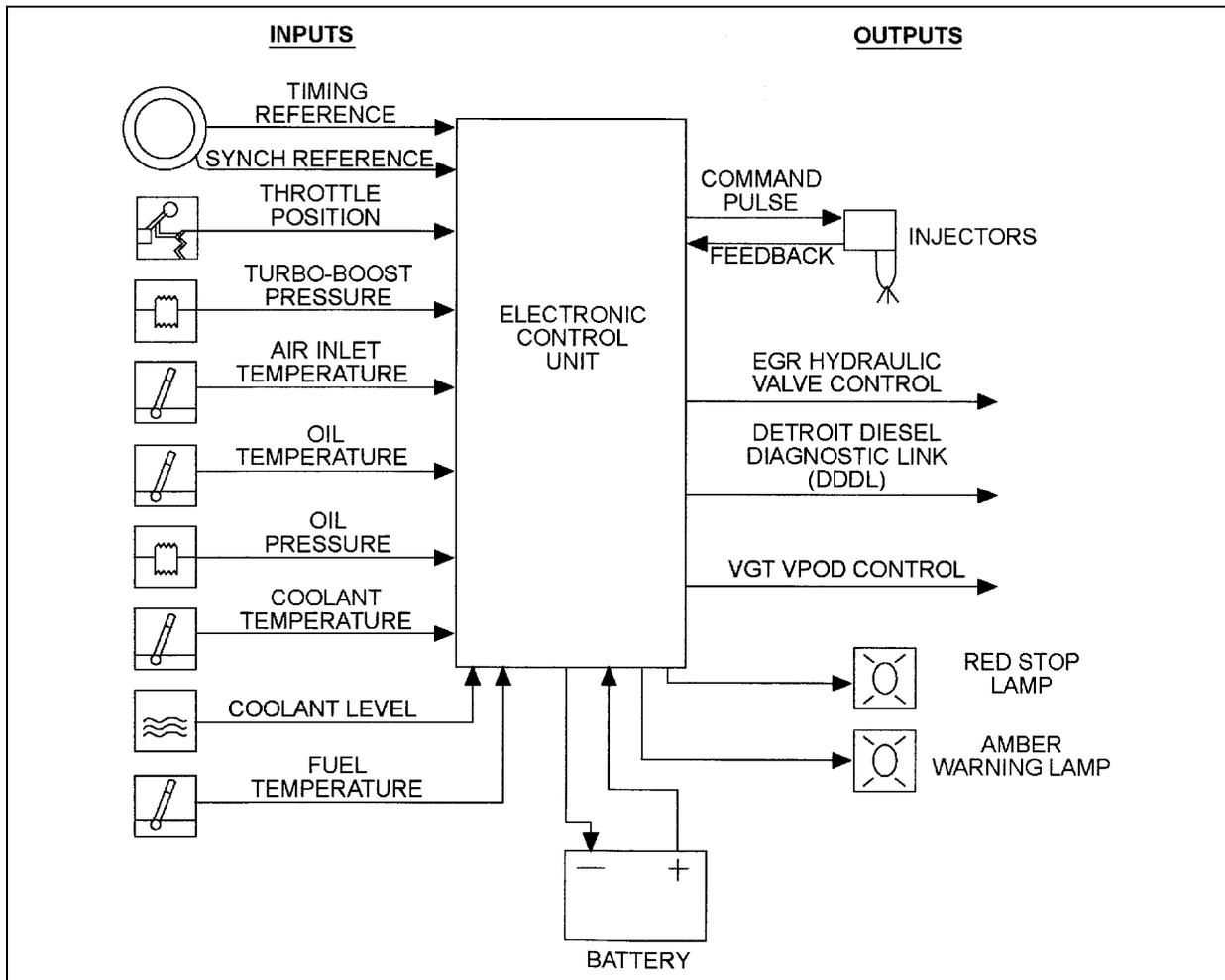
Its major components include an Electronic Control Module (ECM), Electronic Unit Injectors (EUI), electronic throttle pedal and sensors. The ECM, which provides central processing and control of the DDEC system, contains the following:

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

diagnostics and an engine protection system.

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

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



SCHEMATIC DIAGRAM OF DDEC V SYSTEM

01144

## DDEC V ELECTRONIC CONTROL MODULE (ECM)

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

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

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

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

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

## MESSAGE CENTER DISPLAY (MCD)

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

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

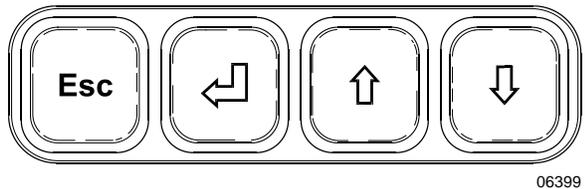
The MCD uses a dashboard integrated liquid crystal display. It provides automated intensity control of the display, based on the dashboard instrument panel lights for improved driver convenience.

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

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

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

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



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

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

To return to the previous level, press Esc key any time. In most cases, the MCD will return to

the previous level once a setting has been chosen.

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

### DRIVING MODE MENU

This menu includes the following modes;

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

### GAUGE MODE MENU

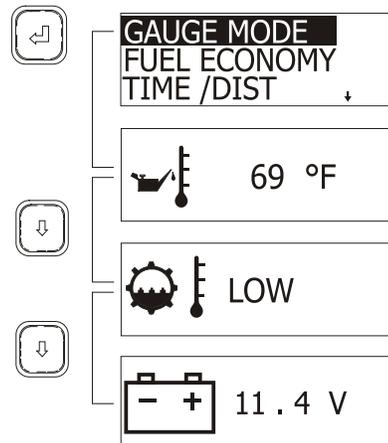
Transmission fluid temperature, engine oil temperature and battery voltage can be displayed in this mode.

To display:

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

To exit gauge mode, press Esc key.

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



### FUEL ECONOMY MENU

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

To display:

## 52 OTHER FEATURES

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

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

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

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

### TIME / DIST MENU

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

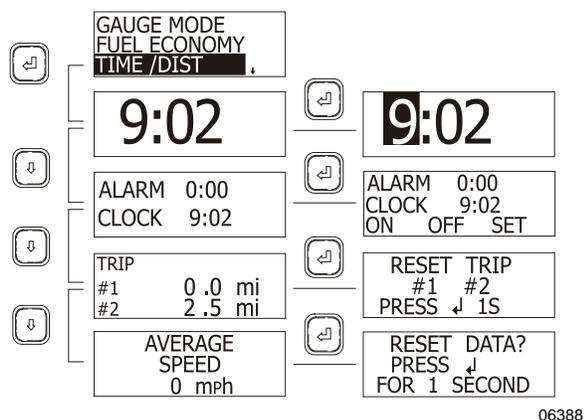
To display the digital clock:

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

The digital clock appears;

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

To exit TIME/DIST menu, press Esc key.



### Setting the Digital Clock

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

The first digit of the time is highlighted.

3. Set the correct value using the arrow keys;

4. Press enter key (↵);

The next digit of the time is highlighted.

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

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

### Reminder Alarm

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

To set the alarm:

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

4. Press the enter key (↵);

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

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

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

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

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

### Trip Odometers

Two trip odometers are available for driver convenience.

To reset a trip odometer:

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

To exit anytime, press Esc key.

## Average Speed

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

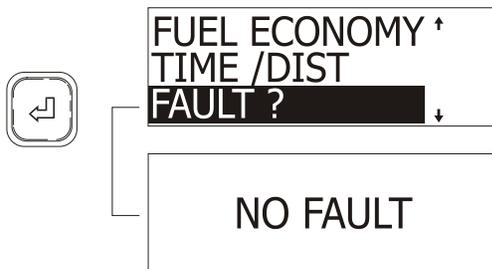
To reset:

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

## FAULT ? MENU (Fault messages)

To display logged fault messages:

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



06393

## NON-DRIVING MODE MENU

### SET UP MODE MENU

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

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

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

### Language Selection

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

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

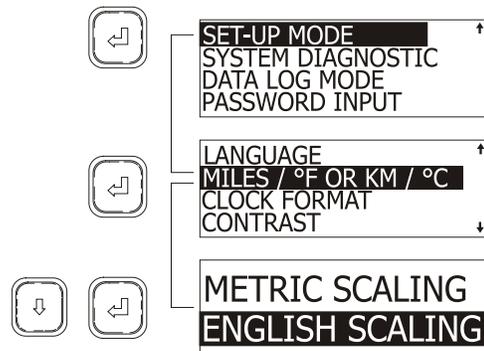
4. Press enter key (↵) to confirm the language choice.

The MCD returns to SET UP MODE menu.

### Metric or Standard Units

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

The MCD returns to SET UP MODE menu.

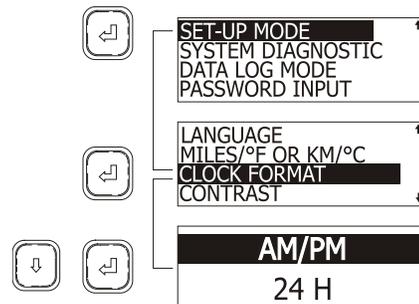


06384

### Clock Format

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

The MCD returns to SET UP MODE.



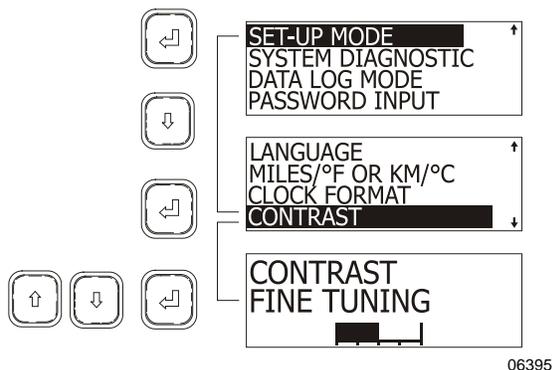
06389

## 54 OTHER FEATURES

### Setting Contrast

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

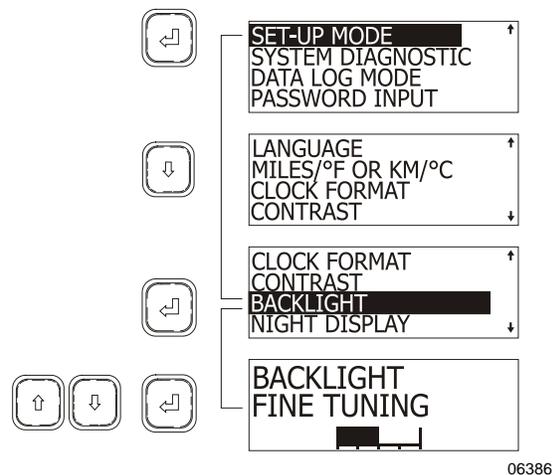
The MCD returns to SET UP MODE.



### Setting Backlight

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

The MCD returns to SET UP MODE.

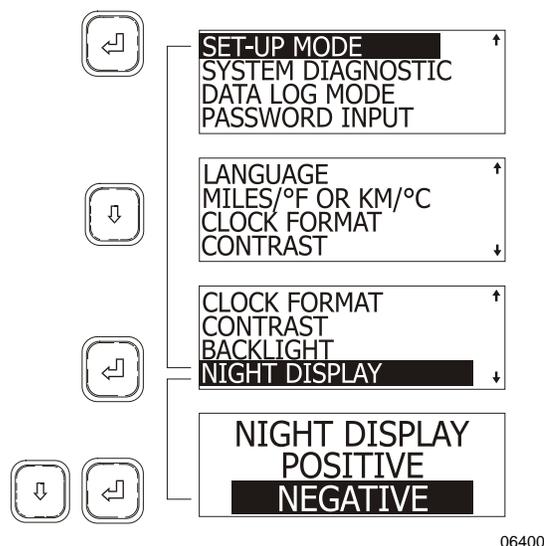


### Setting Night Display

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

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

The MCD returns to SET UP MODE.



### Setting Default Language

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

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

The MCD returns to SET UP MODE.

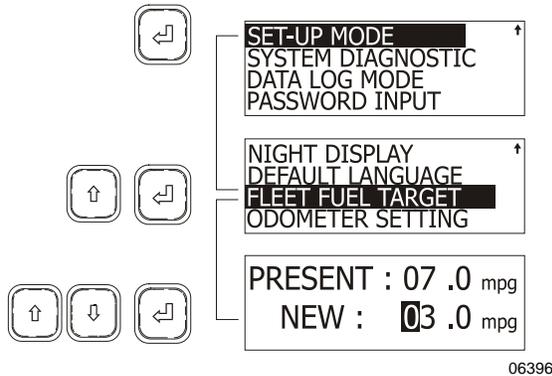
### Setting Fleet Fuel Target

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

1. In SET UP MODE, highlight FLEET FUEL TARGET using the arrow keys;
2. Press the enter key (↵);

3. Using the arrow keys set the highlighted digit;
4. Press enter key (↵) to confirm, the following digit is highlighted. Set as in step three;
5. When last digit is set, press the enter key (↵) to confirm new target.

The MCD returns to SET UP MODE.



### Setting the Odometer

This feature is disabled.

### SYSTEM DIAGNOSTIC MENU

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

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

### Fault Diagnostic

To request a diagnostic:

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

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

To request a general diagnostic:

1. Highlight GENERAL REQUEST using the arrow keys;

2. Press the enter key (↵).

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

To reset fault codes:

1. Highlight RESET ALL using the arrow keys;

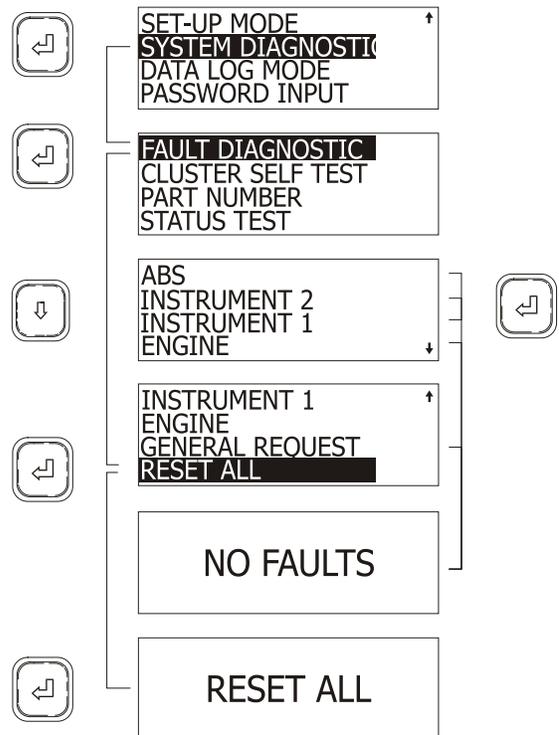
2. Press the enter key (↵);

The MCD displays RESET ALL.

3. Press enter key (↵) to confirm.

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

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



### Cluster Self Test

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

To perform a self test:

1. In diagnostic mode, highlight CLUSTER SELF TEST using the arrow keys;
2. Press enter key (↵) to confirm;

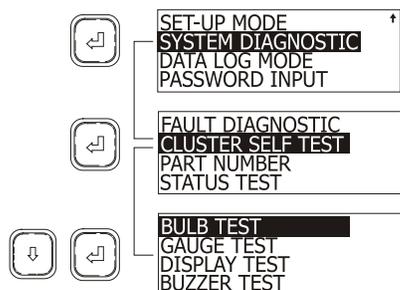
## 56 OTHER FEATURES

- Highlight the test to perform using the arrow keys;
- Press enter key (↵) to confirm;

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

### NOTE

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



06378

### BULB TEST

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

### GAUGE TEST

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

### DISPLAY TEST

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

### BUZZER TEST

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

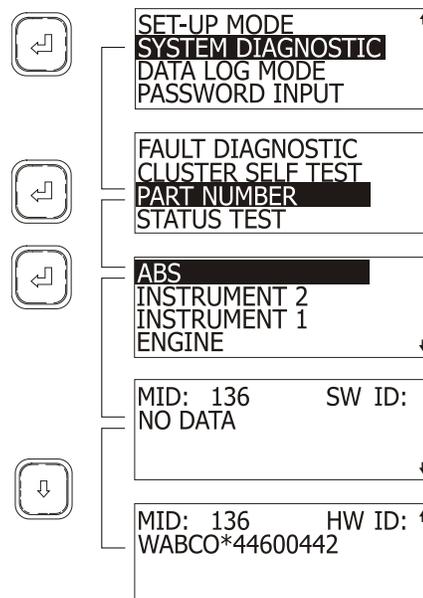
### PART NUMBER

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

To access PART NUMBER:

- When in SYSTEM DIAGNOSTIC menu, highlight PART NUMBER using the arrow keys;
- Press enter key (↵);
- Highlight the desired component;
- Press enter key (↵).

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



06391

### STATUS TEST

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

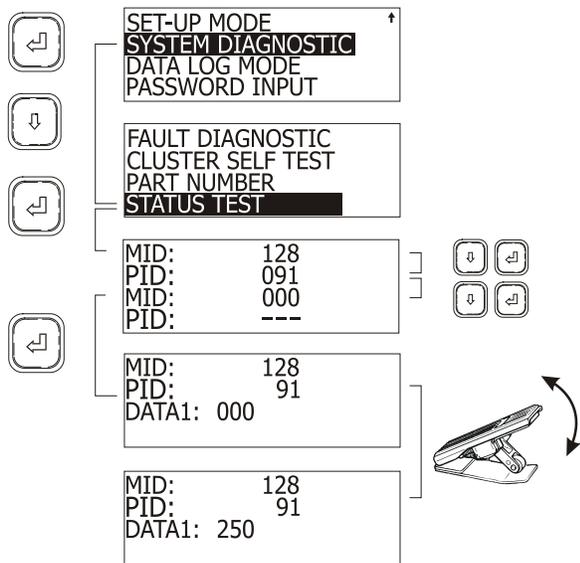
In Status Test mode, the MCD will monitor the system and display the data on the screen. Up to two components can be monitored at once.

To perform a status test:

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

The MCD now displays in real time the value of the component. The example below shows how changing the throttle position will be displayed on the MCD. That way one can verify if any identifiable sender unit is working properly or whether the link is OK.

5. Press Esc key to exit.



06420

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

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

### DATA LOG MODE MENU

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

1. To access data log:

2. Highlight DATA LOG MODE using the arrow keys;

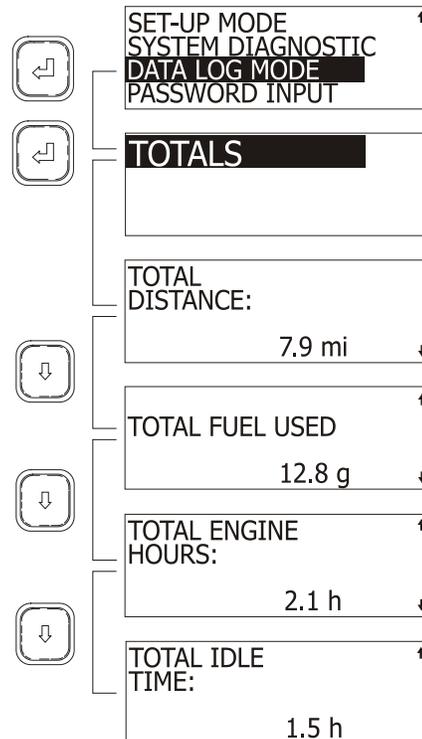
3. Press enter key (↵) to confirm;

The screen shows TOTALS highlighted.

4. Press enter key (↵);

5. View totals using the arrow keys.

Exit by pressing the Esc key.



06383

### PASSWORDS

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

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

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

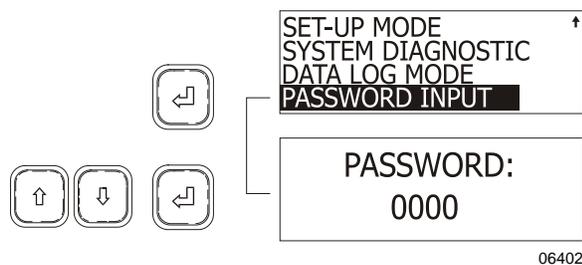
#### Password Input

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

## 58 OTHER FEATURES

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

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



### Changing passwords

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

To change passwords:

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

### PRODRIVER™

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

- Instantaneous and average fuel consumption rate;
- Trip time, miles driven, fuel used, , average speed;

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

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

### ALLISON TRANSMISSION ELECTRONIC CONTROLS

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

When one of these conditions is detected, the electronic control system is programmed to automatically respond in a manner which is safe for the driver, the vehicle and the transmission. The electronic control system turns *ON* the

CHECK TRANS light on the dashboard, which serves as a fault indicator.

To enhance troubleshooting and to allow interrogation of the TCM for valuable service information, the digital display on the transmission pushbutton shift selector or an optional diagnostic tool can be used. For information about reading and interpreting diagnostic codes, refer to Appendix C under "Diagnostic Troubleshooting Codes (DTC) – Allison 4<sup>th</sup> Generation Controls".

## TRANSMISSION RETARDER

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

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

### NOTE

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

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

### NOTE

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

### NOTE

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

## JACOBS ENGINE BRAKE

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

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

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



## WARNING

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

### NOTE

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

### NOTE

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

## ANTI-LOCK BRAKING SYSTEM

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

## 60 OTHER FEATURES

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

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

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



### CAUTION

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

### RETRACTABLE TAG AXLE

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

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

additional traction to the drive wheels providing improved control on slippery roads.



### CAUTION

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



### CAUTION

Never lower the tag axle while vehicle is moving.

### KEYLESS ENTRY SYSTEM

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

The manufacturer's code is:

- On your owner's wallet card;
- Taped to the keyless module in the front electrical & service compartment;
- Three stickers are joined to your owner's wallet card.

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

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

## KEYLESS OPERATING INSTRUCTIONS

- 1) To unlock the entrance door, enter the five numbers of the code. After pressing the fifth number, the stepwell lights and entrance overhead light turn on and the door unlocks. During the night, press any button to illuminate the keyboard and then enter the code.

When pressing any button, the keyboard lights up for five seconds.

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

### PROGRAMMING A PERSONAL CODE

**NOTE**

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

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

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

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

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

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

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

### REMOTE ENTRY TRANSMITTER

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

**To lock the entrance door and the baggage compartment doors simultaneously and arm the intrusion protection and anti-theft system:**

- Press LOCK on the transmitter once.

**NOTE**

*The intrusion protection and anti-theft system will be set after a 30 seconds delay.*

**To confirm that the entrance door and baggage compartment doors have been locked and that the intrusion protection and anti-theft system is armed:**

- Press LOCK again within five seconds of the first lock. The front and rear side markers will flash once if the doors have locked. If the entrance door or one of the baggage compartment doors is open, a door ajar signal prevents arming of the system.

**To unlock the entrance door:**

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

**To unlock the baggage compartment doors:**

- Press UNLOCK a second time within five seconds of the first unlock.

To set off the personal security alarm:

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

To deactivate the personal security alarm:

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

## 62 OTHER FEATURES

### NOTE

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

### Programming Transmitters

To program additional transmitters or replacing a lost or broken transmitter, all transmitters for a vehicle must be programmed at the same time. The receiver assembly module erases all previous transmitters from memory. When the transmitters are programmed or reprogrammed, the receiver assembly module can store up to four transmitters in memory.

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

1. Make sure that the anti-theft system is not armed or triggered.
2. Turn the ignition key from OFF to ON and wait for 15 seconds. If you do not respect this 15 seconds delay, the remote entry transmitters reprogram will not be possible.
3. Press the LOCK button 4 times within 6 seconds to enter programming mode.

If the system has successfully entered programming mode, the horn will beep one time.

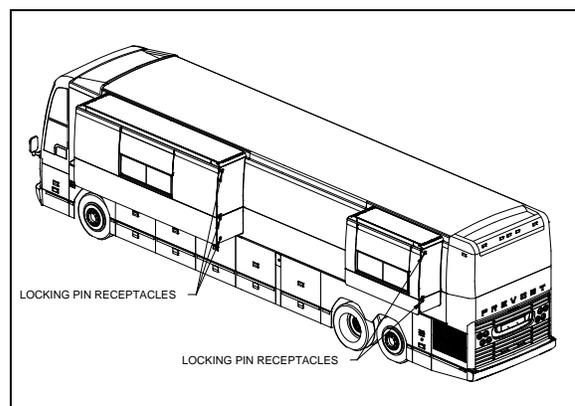
4. Press any button on a transmitter. The horn will beep to confirm that the transmitter has been programmed.
5. Repeat step 4 for each other transmitters (up to 3 other transmitters).
6. Turn ignition OFF or wait for 20 seconds after step 5 to exit programming mode. To confirm exiting of the programming mode, the horn will beep one time and the entrance overhead and stepwell lights will turn on.

## SLIDE-OUT OPERATION

### SAFETY PRECAUTIONS

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

- Make sure that the area outside of the slide-out is clear and that there are no persons or objects within 3 feet of the slide-out outside wall. **Serious personal injury or damage to the vehicle components may occur.**
- Make sure that the area inside the motor home where the room retracts (30" for the front and 24" for the rear slide-out) is free of people or obstacles. **Serious personal injury or damage to the vehicle components may occur.**
- In temperatures below freezing point, make sure that the entire sliding surface outside the slide-out is free of snow, ice or sleet. **Failure to clear all ice or snow may seriously damage the inflatable seal.**
- The parking brake must be applied.
- The transmission shifter must be in the "Neutral" position.
- Make sure that the locking pin receptacles are free of foreign objects.
- Open a window to avoid slide-out movement restriction.
- Level the vehicle.



SLIDE-OUT LOCKING PIN RECEPTACES

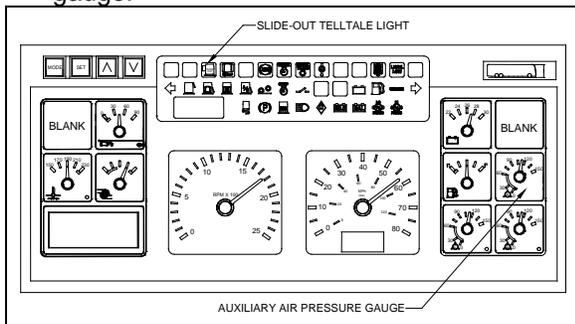
23342

## FRONT SLIDE-OUT OPERATION

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

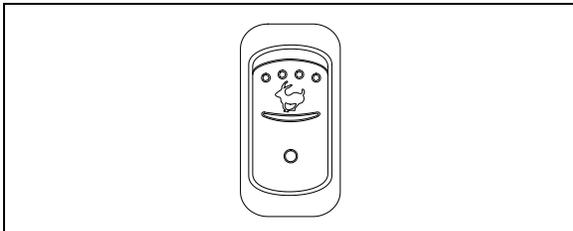
Before extending or retracting the front slide-out, please make sure all the following conditions are met:

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



**VEHICLE INSTRUMENT CLUSTER**

2. Make sure the parking brake is applied.
3. Turn the ignition key to the "ON" position, start the engine and set the RPM to fast idle.



**FAST IDLE BUTTON**

06264



### WARNING

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

### Front slide-out extending operation

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

- Deflation of the inflatable seal
- Unloading of the tag axle

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

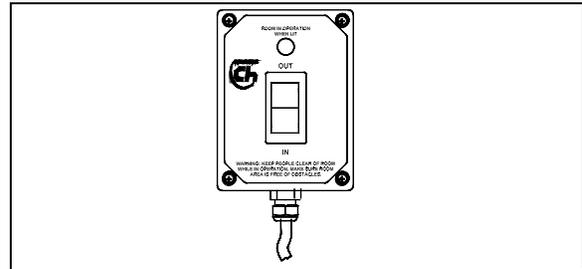
Then releasing the rocker switch will permit the following actions:

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

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

### NOTE

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



**SLIDE-OUT HANDHELD CONTROL**

### Front slide-out retracting operation

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

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

## 64 OTHER FEATURES

### REAR SLIDE-OUT OPERATION

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

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

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

#### Rear slide-out extending operation

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

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

Then releasing the rocker switch will permit the following actions:

- Re-inflation of the seal

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

#### NOTE

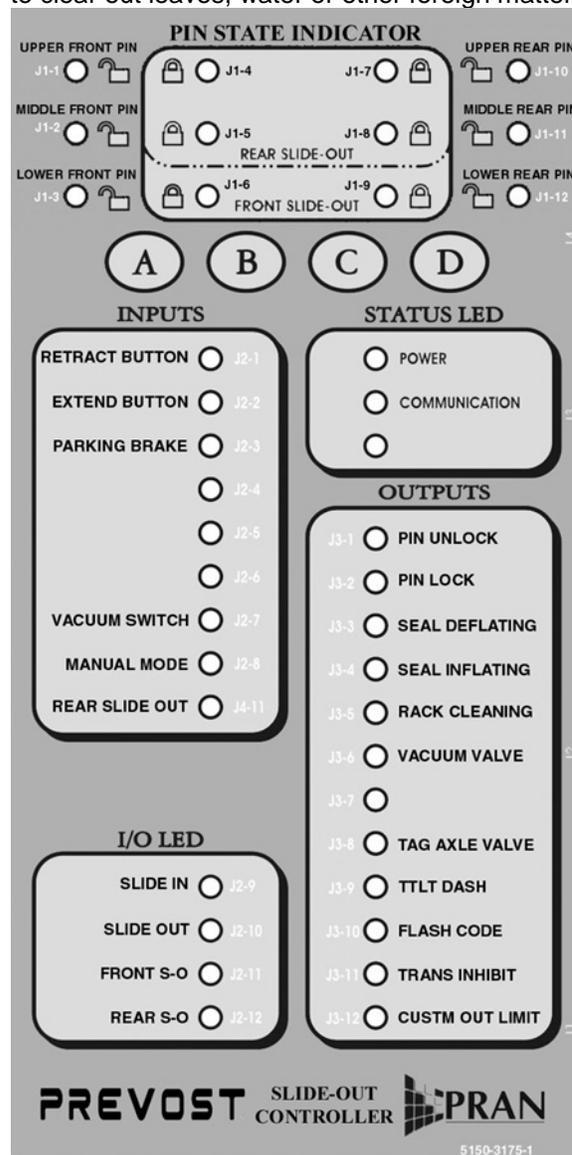
Control switch green indicator light flashing. A green light flashing indicates an error condition or missing operation condition. Refer to the troubleshooting list at the end of this section if that situation occurs.

#### Rear slide-out retracting operation

With the ignition switch to the "ON" position and the engine running, press and hold down the rocker switch to the "IN" position to retract the slide-out. Note that the green indicator light "ROOM IN OPERATION" will come on. When the movement of the slide-out to its full "IN"

position is completed, the rocker switch can be released to allow the re-inflation of the seal. The green indicator light goes out as the rocker switch is released. At any time during the slide-out movement, releasing the rocker switch will stop the operation instantly.

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



SLIDE-OUT LOGIC CONTROLLER INTERFACE DISPLAY

### SLIDE-OUT LOGIC CONTROLLER

#### Pin State Indicator

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

#### A/B/C/D Buttons

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

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

**Inputs**

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

**Status LED**

Power:

ON: the controller is powered

OFF: the controller is not powered

Communication:

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

**Outputs**

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

**I/O LED**

Slide in: ON if the slide-out is retracting

Slide out: ON if the slide-out is extending

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

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

**SLIDE-OUT MANUAL OVERRIDE PROCEDURES**

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

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

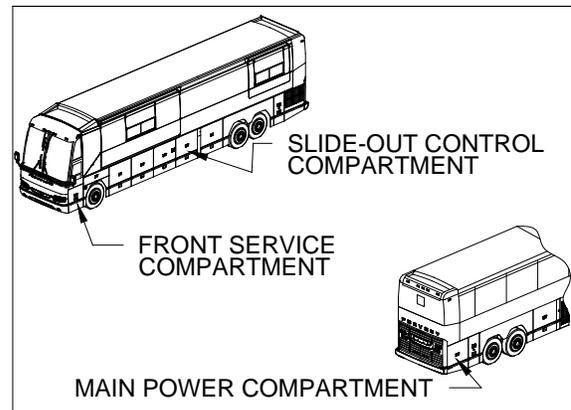
The second manual override procedure consist in rotating the slide-out motor shaft using a manual ratchet.

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

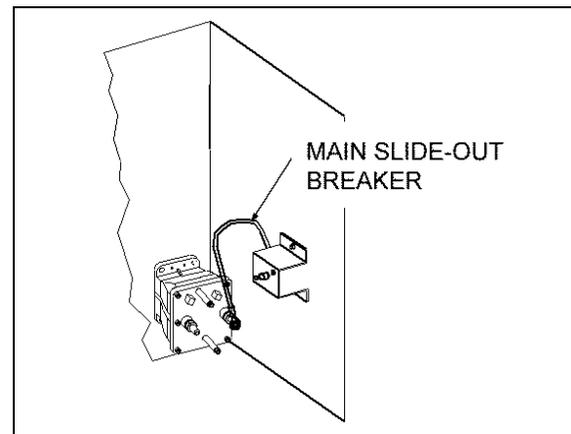
**Preliminary conditions for manual override procedures**

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

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

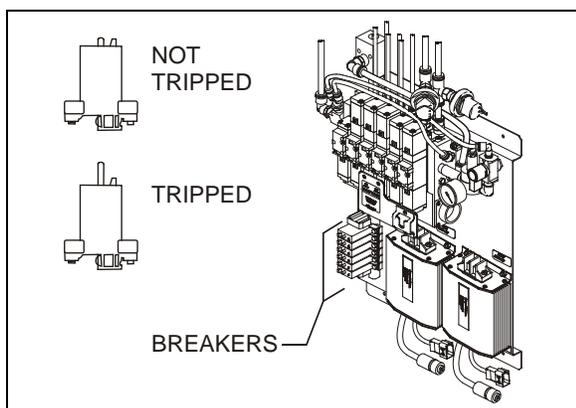


**COMPARTMENTS LOCATION**

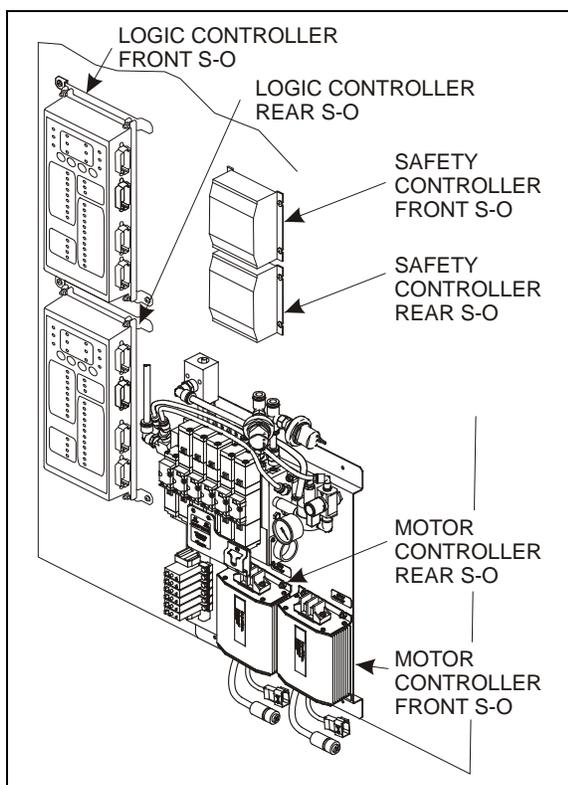


**MAIN SLIDE-OUT BREAKER IN MAIN POWER COMPARTMENT**

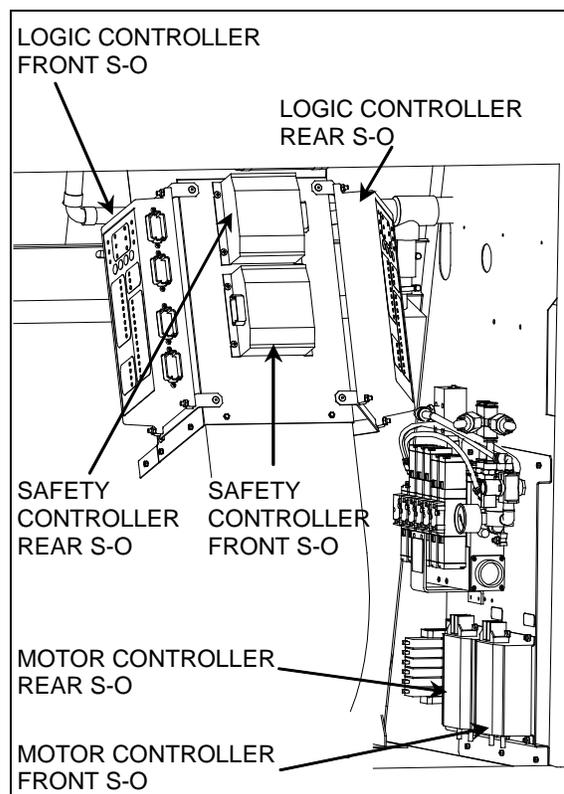
# 66 OTHER FEATURES



**BREAKERS IN SLIDE-OUT CONTROL COMPARTMENT**



**SLIDE-OUT ELECTRICAL PANEL(SMALL A/C)**

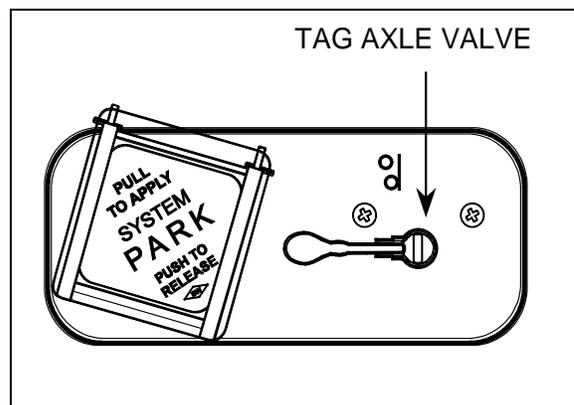


**SLIDE-OUT ELECTRICAL PANEL (CENTRAL A/C)**

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

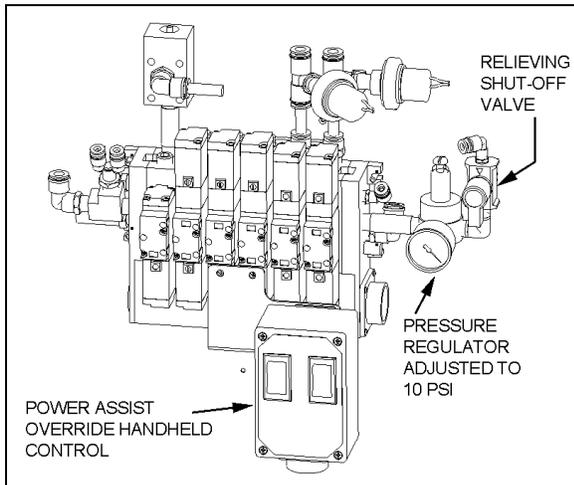
**NOTE**

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



**TAG AXLE VALVE ON LEFT LATERAL CONTROL PANEL**

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



**INFLATABLE SEAL PRESSURE REGULATOR**



## WARNING

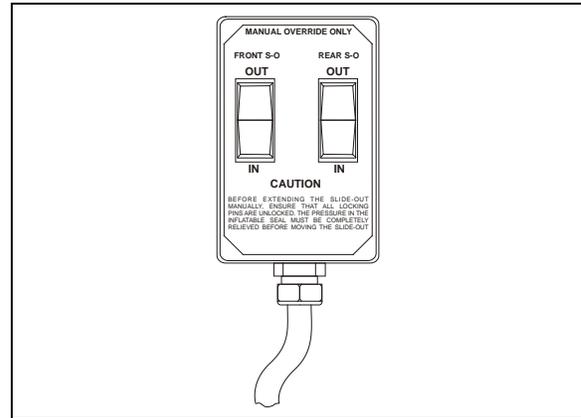
The pressure in the inflatable seal must be completely relieved to prevent any damage to the seal.



## CAUTION

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

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



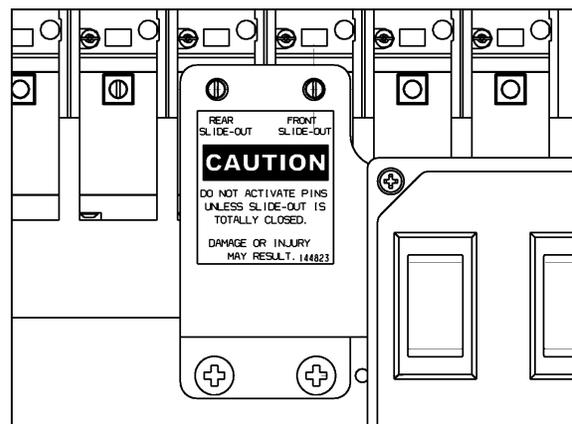
**POWER ASSIST OVERRIDE HANDHELD CONTROL**



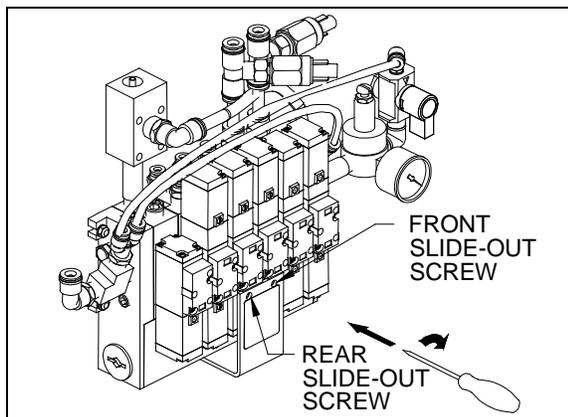
## CAUTION

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

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



**LOCKING PIN VALVE PROTECTION PLATE**



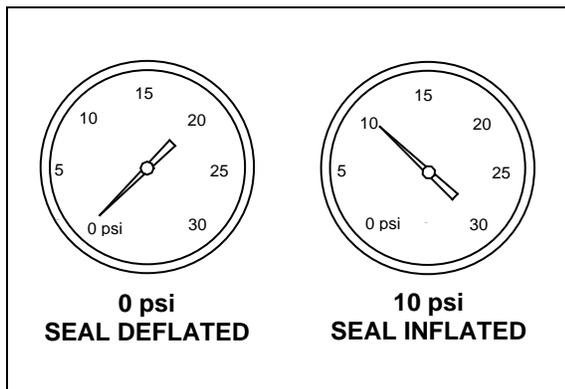
LOCKING PIN VALVE LOCATION



**WARNING**

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

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



INFLATABLE SEAL PRESSURE GAGE

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

**NOTE**

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

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

**NOTE**

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

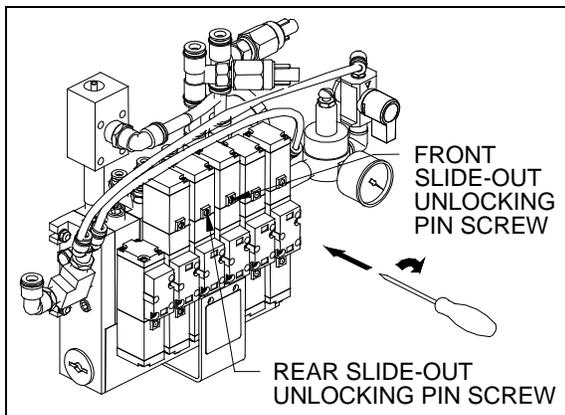
1. Turn the ignition switch to the "OFF" position.
2. Deflate the inflatable seal by using the relieving shut-off valve located in the slide-out control compartment. Turn the handle clockwise to deflate the seal. Make sure the pressure indicator reading is "0 psi".



**WARNING**

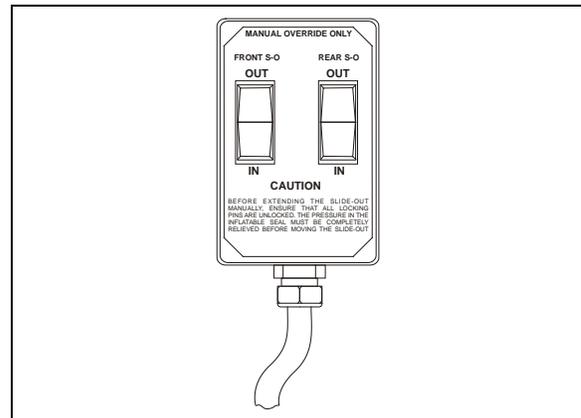
The pressure in the inflatable seal must be completely relieved to prevent any damage to the seal.

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



**UNLOCKING PIN VALVE LOCATION**

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



**POWER ASSIST OVERRIDE HANDHELD CONTROL**

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



## CAUTION

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

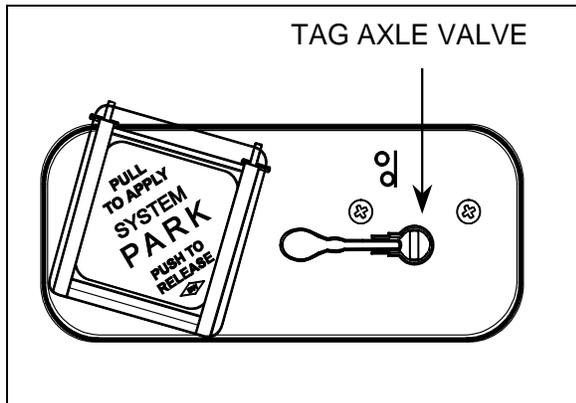
6. Once the slide-out room is lined up to its opened position (resting against the stoppers), release the rocker switch.
7. Finally, the inflatable seal can be re-inflated by turning the shut-off valve handle counterclockwise. Check the pressure gage on the inflatable seal regulator if the pressure is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

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

#### **NOTE**

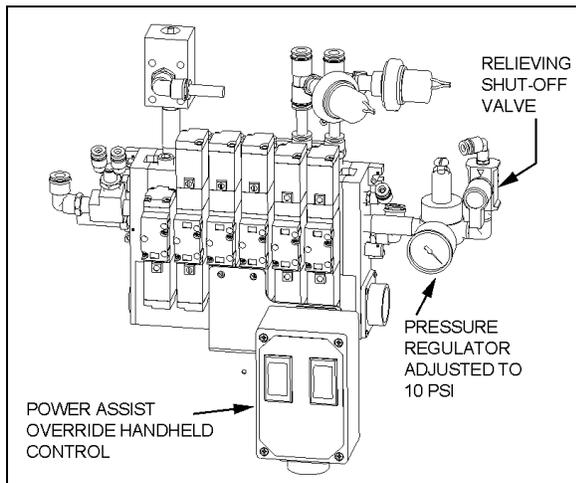
*For the front slide-out, the tag axle must be unloaded with the manual switch located on the left-hand control panel with the ignition switch to the "ON" position. This procedure is not necessary for the rear slide-out.*

## 70 OTHER FEATURES



TAG AXLE VALVE ON LEFT LATERAL CONTROL PANEL<sup>06390</sup>

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



INFLATABLE SEAL PRESSURE REGULATOR



### WARNING

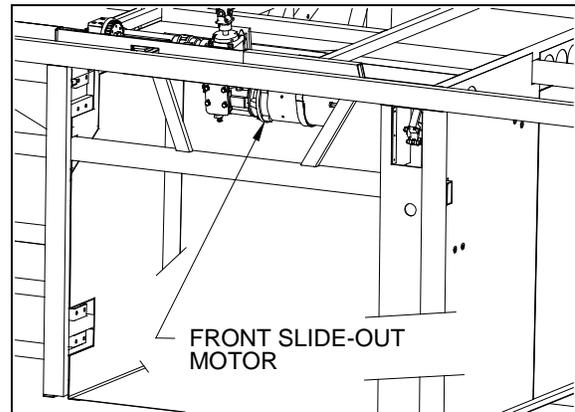
The pressure in the inflatable seal must be completely relieved to prevent any damage to the seal.



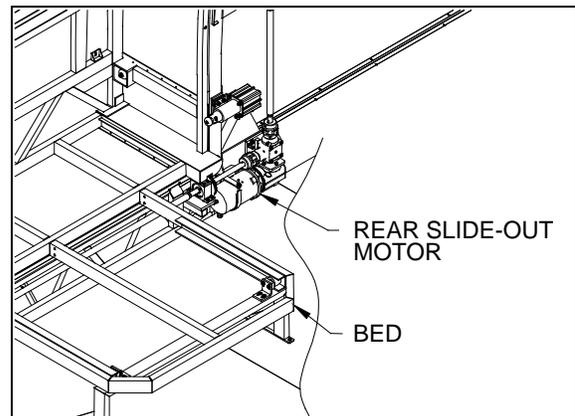
### CAUTION

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

3. To move the slide-out use a ½" hexagonal socket on the back of the slide-out motor.



FRONT SLIDE-OUT MOTOR



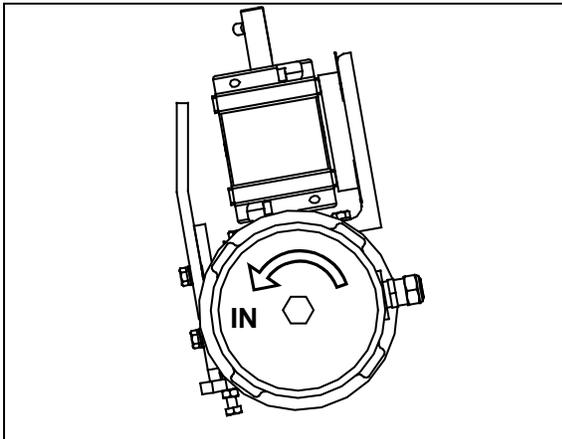
REAR SLIDE-OUT MOTOR INSIDE COACH

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

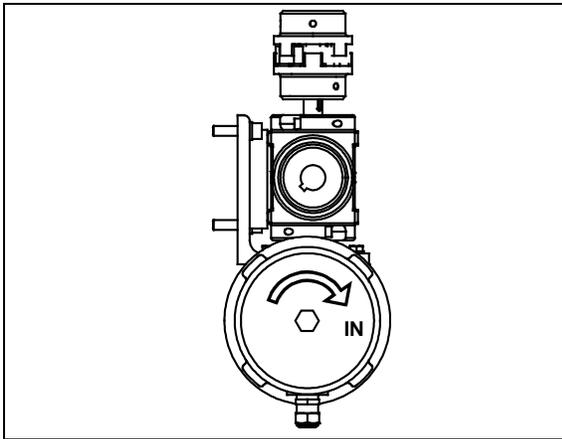


### CAUTION

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

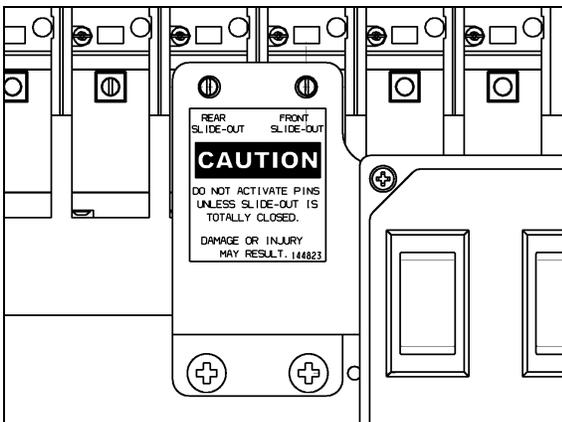


**DIRECTION OF ROTATION FOR RETRACTING (FRONT)**

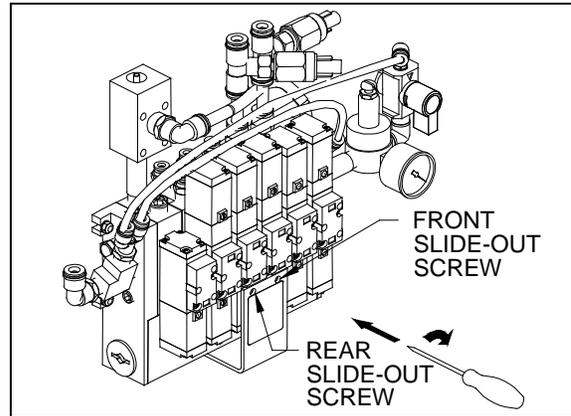


**DIRECTION OF ROTATION FOR RETRACTING (REAR)**

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



**LOCKING PIN VALVE PROTECTION PLATE**



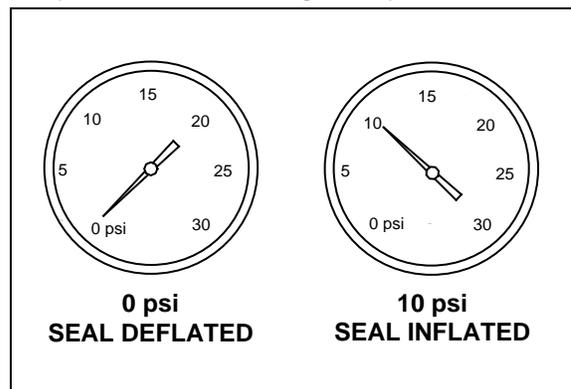
**LOCKING PIN VALVE LOCATION**



**WARNING**

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

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



**INFLATABLE SEAL PRESSURE GAGE**

## 72 OTHER FEATURES

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

### NOTE

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

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

### NOTE

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

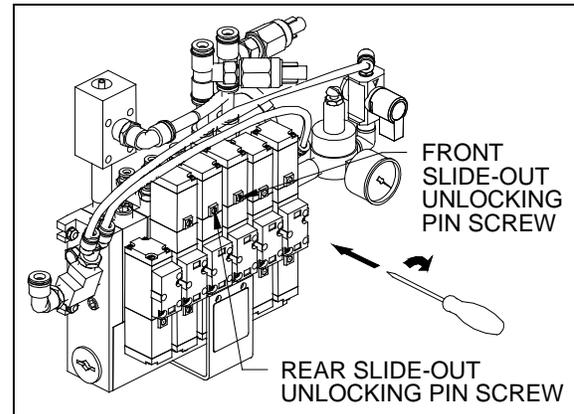
- Turn the ignition switch to the "OFF" position, and remove the ignition key for more safety.
- Deflate the inflatable seal by using the relieving shut-off valve located in the slide-out control compartment. Turn the handle clockwise to deflate the seal. Make sure the pressure indicator reading is "0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



### WARNING

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

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



UNLOCKING PIN VALVE LOCATION

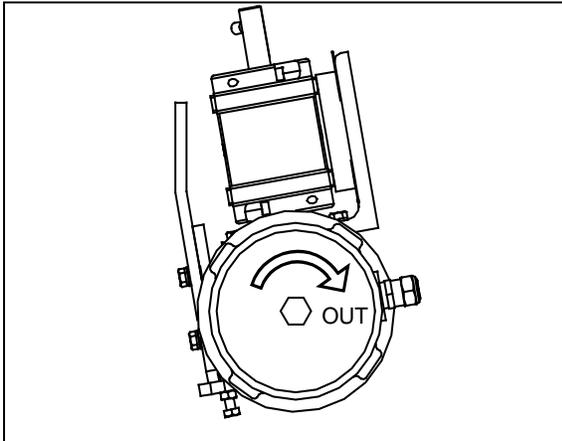
- Ensure the ignition key is in the "OFF" position. When the proper valve has been identified (right side for front slide-out and left side for rear slide-out), turn clockwise the "pin valve manual override screw" to actuate the locking pins. Keep the override screw in this position. During the process, you should hear a hissing sound, as the air flows to the pin cylinders.
  - Verify if all the pins are unlocked with the ignition to the "ON" position. To do so, check the lights on the "PIN STATE INDICATOR" zone of the logic controller interface display. A light next to all unlocked padlocks is used to identify the state unlocked of the pins. For the rear slide-out, take note that only 4 pins are used in the upper section of the pin state indicator zone. If at least one light is off, that means all the pins are not unlocked and it will not be possible to manually move the slide-out. In this case, restart the engine and make sure the air pressure is 110 psi minimum on the auxiliary air pressure gauge.
  - Switch the ignition to the "OFF" position, and remove the ignition key for more security.
  - When the locking pins have been unlocked, turn the pin valve manual override screw counterclockwise and keep it in this position to cancel the manual override actuation.
- To move the slide-out, use a 1/2" hexagonal socket on the back of the slide-out motor.

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

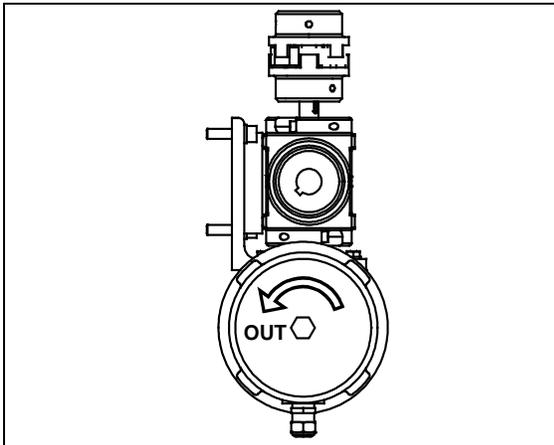


## CAUTION

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



**DIRECTION OF ROTATION FOR EXTENDING (FRONT)**



**DIRECTION OF ROTATION FOR EXTENDING (REAR)**

6. Once the slide-out is lined up to its opened position, remove the tool from the motor.
7. Finally, the inflatable seal can be re-inflated by turning the shut-off valve handle counterclockwise. Check the pressure gage on the inflatable seal regulator if the pressure is increasing to 10 psi.

## SLIDE-OUT TROUBLESHOOTING – THIRD GENERATION

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

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

### Flash code operation

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

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

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

Examples of codes:

**Code #12**  
flashes 1 time, pause of 1,5 seconds, then flashes 2 times, pause of 4 seconds

**Code #23**  
flashes 2 times, pause of 1,5 seconds, then flashes 3 times, pause of 4 seconds



## WARNING

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

## 74 OTHER FEATURES



### CAUTION

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

### Clearing the flash code blink

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

### Bringing back the last flash code

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

### Code description

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

## OTHER FEATURES 75

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

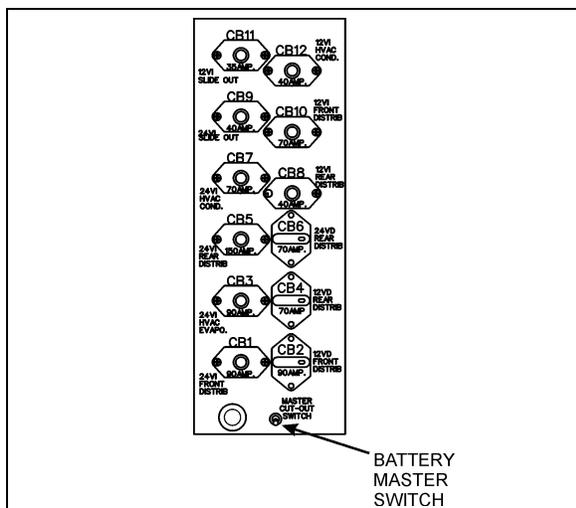


## STARTING THE ENGINE

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

## STARTING THE ENGINE FROM THE DRIVER'S AREA

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



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

**CAUTION**

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

**CAUTION**

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

**CAUTION**

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

**NOTE**

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

**NOTE**

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

**NOTE**

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

## STOPPING THE ENGINE

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

**CAUTION**

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

## 78 STARTING AND STOPPING PROCEDURES



### CAUTION

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

### STARTING THE ENGINE FROM THE ENGINE COMPARTMENT

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



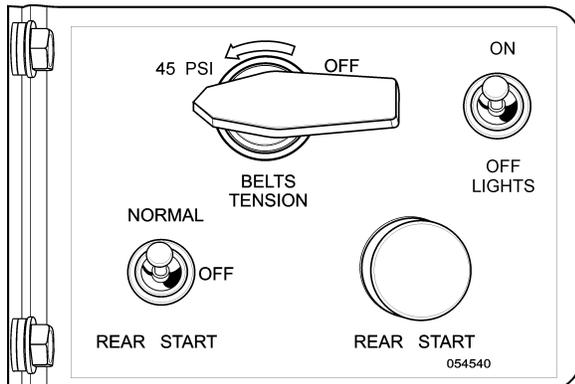
### WARNING

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

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

Set the starter selector switch to the *REAR START* position;

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



ENGINE REAR START PANEL

01044



### WARNING

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



### CAUTION

Refer to cautions in "Starting From The Driver's Seat" and "Stopping the Engine" in

this chapter.

### STOPPING THE ENGINE

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



### CAUTION

Do not stop engine by any other method.



### WARNING

Apply the parking brake before stopping engine. In the event the engine is stopped while the parking brake is not applied, a reminder alert will sound.

### COLD WEATHER STARTING

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

To activate the ether starting aid, proceed as follows:

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



### CAUTION

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



### CAUTION

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

## JUMP STARTING

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



### WARNING

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



### WARNING

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



### WARNING

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



### WARNING

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



### CAUTION

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



### CAUTION

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



### CAUTION

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



### CAUTION

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



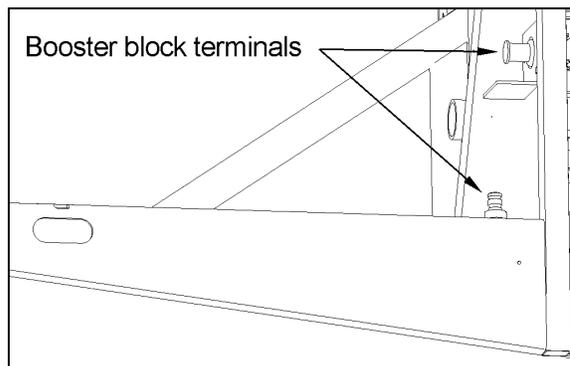
### CAUTION

Off-board battery charger with a start boost facility must not be used to jump start the vehicle. This could damage the electrical system.



### CAUTION

Choose a booster vehicle which produces comparable amperage as your vehicle.



**BOOSTER BLOCK TERMINALS IN ENGINE R.H. SIDE ACCESS COMPARTMENT**

18595

To jump start, proceed as follows:

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

## 80 STARTING AND STOPPING PROCEDURES

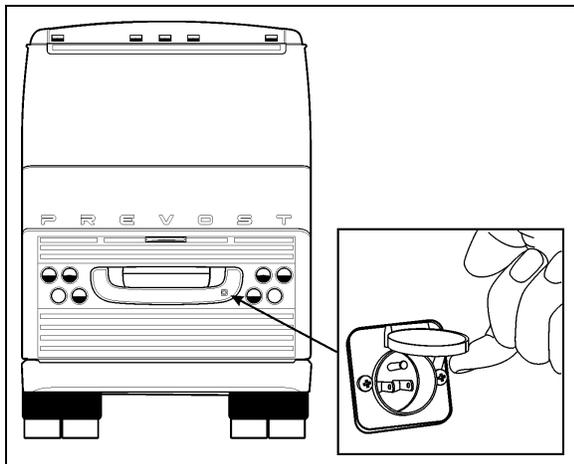
3. Connect the other end of the same red jumper cable to the positive (+) terminal on the booster block;
4. Connect one end of the black jumper cable to the negative (-) post on the booster power source;
5. Connect the other end of the same black jumper cable to the negative (-) terminal on the booster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

### NOTE

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

### ENGINE BLOCK HEATER

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



110-120 VOLTS CONNECTOR

06390



### CAUTION

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

### ENGINE WARM-UP

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



### WARNING

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

### NOTE

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

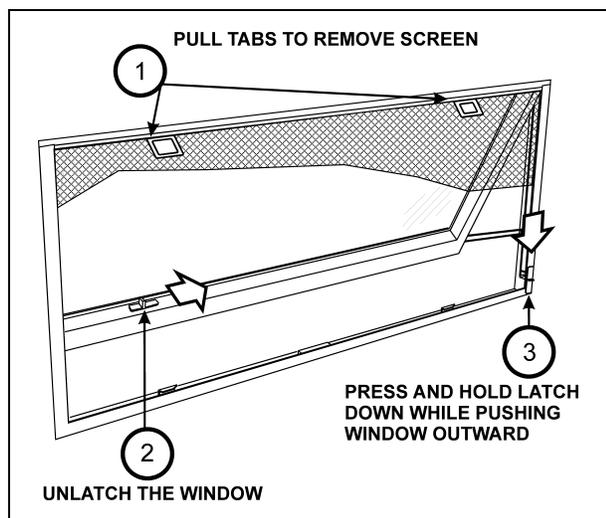
### ALLISON TRANSMISSION WARM-UP

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

## EMERGENCY EXITS

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

### ELECTRIC AWNING WINDOWS

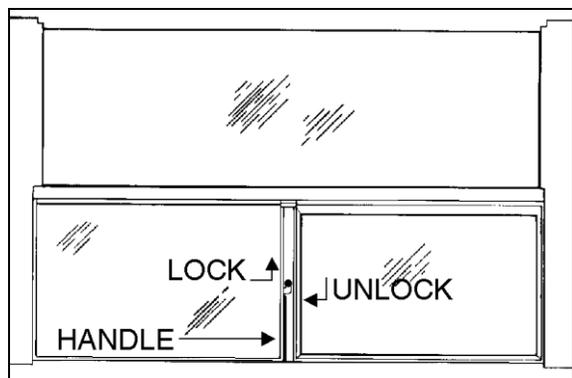


**ELECTRIC AWNING WINDOW**

18584

### SLIDING WINDOWS

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



**SLIDING WINDOW**

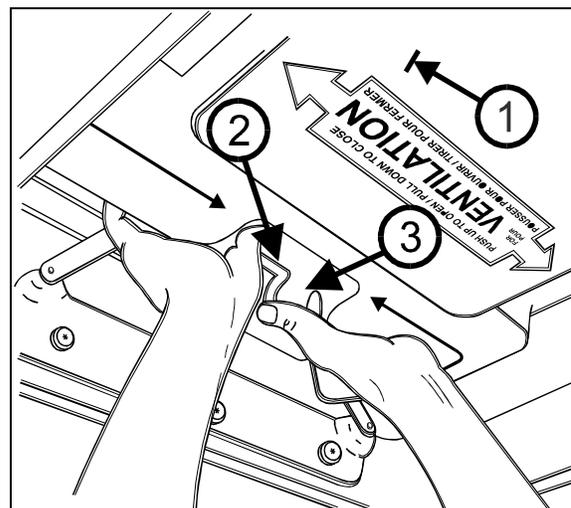
18206

### FIXED WINDOWS

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

### EMERGENCY ROOF ESCAPE HATCH

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



**EMERGENCY ROOF ESCAPE OPENING**

OEH3B604

#### NOTE

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

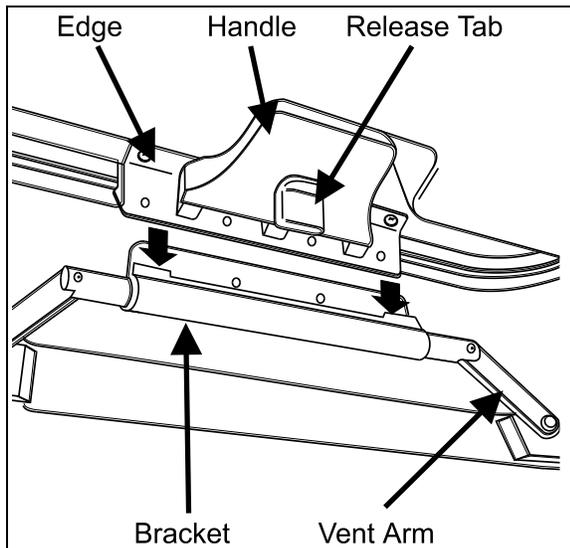


#### CAUTION

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

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

## 82 SAFETY FEATURES AND EQUIPMENT

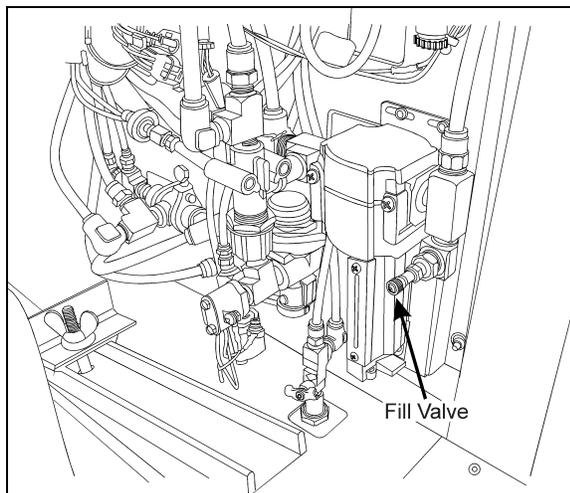


ROOF ESCAPE HANDLE

23150

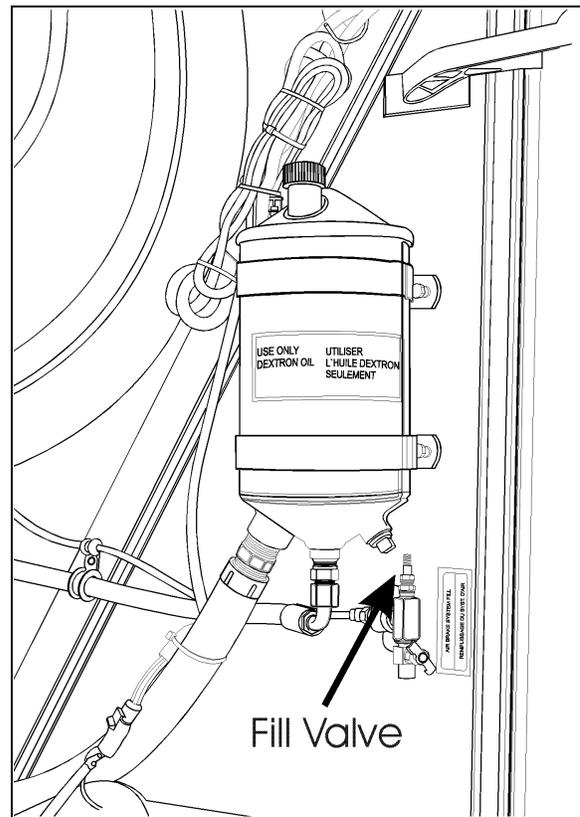
### EMERGENCY AIR-FILL VALVES

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



FILL VALVE IN FRONT SERVICE COMPARTMENT

12130



FILL VALVE IN ENGINE COMPARTMENT

12162

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



### CAUTION

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

### EMERGENCY AND PARKING BRAKES

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

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

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

### NOTE

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

### NOTE

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



### WARNING

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

### NOTE

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

### NOTE

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

## SAFETY EQUIPMENT

### FIRE EXTINGUISHERS

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

### FIRST AID KIT

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

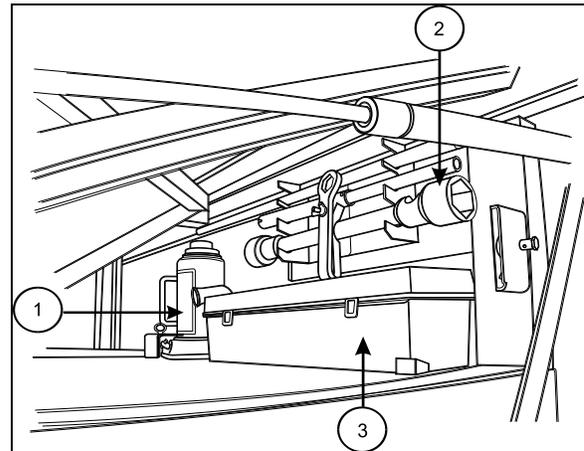
### WARNING REFLECTORS

A kit containing three triangular reflectors is provided to warn other drivers on the road in case of a breakdown. The kit is located on the right side of the first R.H. side baggage compartment with the jack and tools. The reflectors provide visible warning of an emergency situation. The three reflectors should be placed as indicated on the box cover. These reflectors comply with FMVSS 125 (Federal Motor Vehicle Safety Standards).

### JACK/TOOLS

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

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



FRONT BAGGAGE COMPARTMENT

13015

### SPARE PARTS KIT

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

# 84 SAFETY FEATURES AND EQUIPMENT

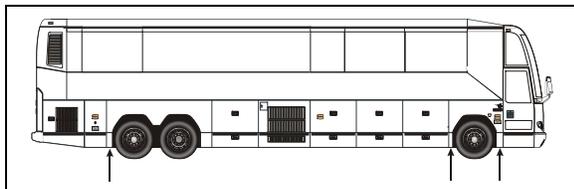
## CHANGING WHEELS

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

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

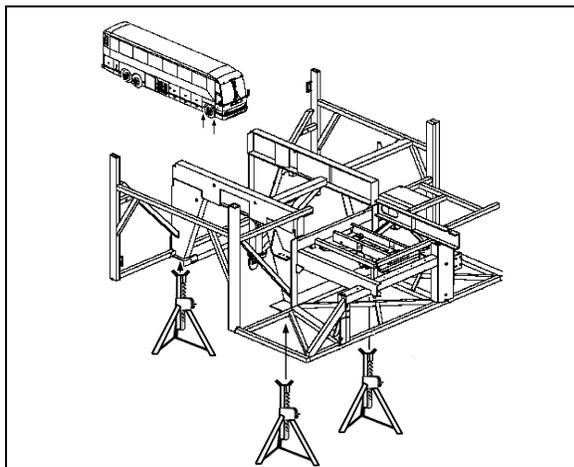
## JACKING POINTS

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

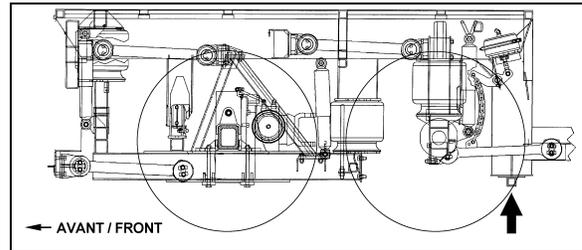


JACKING POINTS ON FRAME

18530



JACKING POINTS ON FRONT FRAME

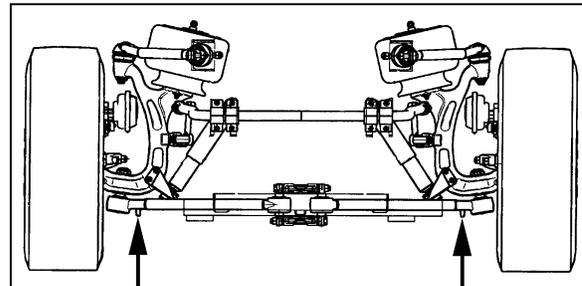


JACKING POINTS ON REAR FRAME



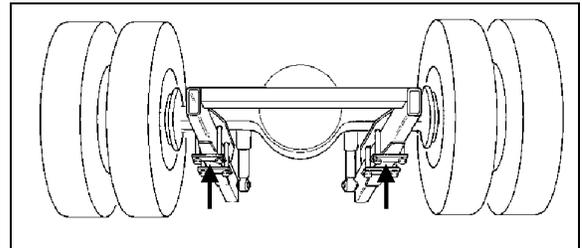
## WARNING

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



JACKING POINTS ON FRONT AXLE

16095



JACKING POINTS ON DRIVE AXLE

OEH3B762



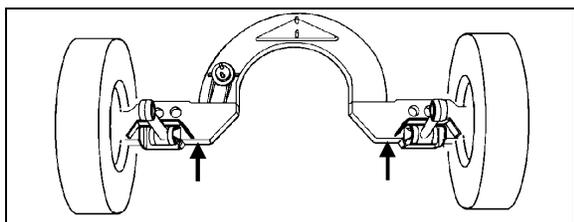
## WARNING

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



## WARNING

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



**JACKING POINTS ON TAG AXLE** OE3B764

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

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

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

### HYDRAULIC JACK

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

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

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

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

**! WARNING**

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

**! WARNING**

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

### TOWING

To prevent damage to the vehicle, use the two tow eyes fixed to the vehicle's frame between the front axle and the front bumper. Use only a solid link tow bar and a safety chain to tow the vehicle. If required, connect an auxiliary air

supply to the vehicle so brakes can be operated while towing.

**! WARNING**

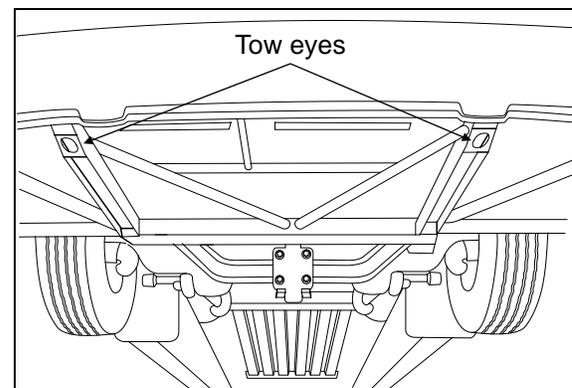
During a towing operation, the driver should be alone inside the vehicle.

**! CAUTION**

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

**NOTE**

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



**TOW EYES UNDER VEHICLE** 18401

### DAYTIME RUNNING LIGHTS

The daytime running lights system provide added safety by making the front of the vehicle more visible to other drivers during the day.

The daytime running lights system turns the headlights on when:

- Engine is running;
- Parking brake is released;
- The exterior lighting switch is set to the OFF position or depressed to the first position.



## WARNING

Do not drive only with the daytime running lights at night because the taillights and the side marker lights are not turned on in that situation and the high beam can blind other drivers. For night driving, turn *ON* the headlights by depressing the headlights and exterior lighting rocker switch to the second position.

## FOG LIGHTS

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

### NOTE

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

## CORNERING AND DOCKING LIGHTS

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

## COMPARTMENT LIGHTING

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

## MUD FLAPS AND SPLASH GUARDS

Mud flaps are installed behind each front wheel and the tag axles. Mud flaps minimize dirt on the

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

## BACK-UP CAMERA

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

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

## BACK-UP ALARM

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

## BACK-UP ALARM CANCEL

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

### NOTE

*After use, return to normal operation.*

## ESSENTIAL FUNCTIONS TO OPERATE THE VEHICLE (BASIC LIMP-HOME FUNCTIONS)

Even with a defective CECM (Chassis Electronic Control Module) or a CAN network problem, essential base functions are maintained to rear start the vehicle from the engine compartment and drive in a secure manner.

## AVAILABLE FUNCTIONS

- Startup: Turn on the ignition in the driver's area and rear start the vehicle from the engine compartment,

- Windshield wipers: Wipers functions at 1st speed only,
- Headlights: Low beams only,
- Directional signals: Rear and front only,
- Stoplights: 2 upper stoplights + high-mounted stoplight are functional,
- HVAC: Functional with set point fixed at 70°F (22°C), evaporator and condenser fixed at speed 1, defroster fixed at speed 4.
- Entrance door lock/unlock switch.



### CAUTION

The following directives must be followed.

- Never connect a battery charger when the ignition is at the ON position on a vehicle with a CAN defective or certain functions will start up by themselves,
- Disconnect the charger before starting the vehicle, if not the default functions will not activate,
- If the default mode does not activate, try to turn the ignition OFF while ensuring that no charger is connected and then restart the vehicle.

## 88 SAFETY FEATURES AND EQUIPMENT

### ALARM SYSTEM

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

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

## SAFETY FEATURES AND EQUIPMENT 89

| Indicator Light  | Audible Alarm | Condition   |
|--|---------------|---|
| <br>06273 | Yes           | Outside temperature close to water freezing point |
| <br>06292 | Yes           | Transmission fluid too hot                        |



## CLEANING

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

### NOTE

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



### CAUTION

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

## SEAT UPHOLSTERY

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

### NOTE

*The abrasive nature of dirt and grit will reduce upholstery life expectancy. Vacuum regularly.*

## Removal of stains and marks

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

### Method One:

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



### WARNING

Use solvents in a well ventilated area. Open all windows and doors.

### Method Two:

- Wet the stain with a solution of household detergent and lukewarm water. Do not soak the stain;
- Rub the stain with a damp cloth;
- Rinse cloth after each application.



### CAUTION

Do not use soap, soap powder, ammonia, soda, bleach or cleaning products containing any of these compounds.

## Beverage stains

Remove beverage stains by following method one. If stain persists, repeat method one using methyl alcohol instead of solvent.

## Alcoholic beverage stains

Remove alcoholic beverage stains by wetting the stain with water, then cleaning following method two.

## Burns

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

## Cosmetic stains

Remove stains left by cosmetics by following method one then method two.

## Ink stains

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

## Blood, urine or vomit stains

Remove such stains by following method two.

## 92 CARE AND MAINTENANCE

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### Copying ink - ball-point pen ink

Treat with methyl alcohol, blotting frequently to avoid spreading stain, followed by method two.

### Marking ink (Felt-tip pens)

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

### Oil, grease and paint

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

### Rust stains

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

### Tar

Soften tar with benzene, then treat using method one followed by method two.

### Chewing gum

Soften gum with cyclohexane. Carefully scrape off stains using a sharp knife or razor blade.

### PLASTIC AND VINYL

Clean plastic and vinyl trim using a clean damp cloth or sponge. For vinyl trim marks, use a lukewarm all purpose cleaner or a mild saddle soap. Remove water spots and soap traces using a clean damp cloth or sponge. Dry with a clean soft cloth.

Remove grease, tar or oil stains with a clean cloth or sponge and an all purpose or solvent-type vinyl cleaner.

Apply a colorless vinyl or leather protective product to maintain the luster and pliability of the plastic or vinyl surface.

### WINDOWS

Clean the inside of the windows with a solution of one part vinegar to ten parts water.

### STAINLESS STEEL

Use a stainless steel cleaner and follow the manufacturer's instructions. Stainless steel

cleaning solution may be ordered from Prevost Car Inc. quoting part number 68-0356.

### FORMICA

Remove stains on formica surfaces with a household detergent, methyl alcohol or mineral turps. Clean with a mild abrasive and water solution if stain persists.

### CARPET

Vacuum carpets regularly to prolong carpet life.

### RUBBER COMPONENTS

Use only pure water or glycerin to clean stains on rubber components.



### CAUTION

Never use solvents on rubber components.

### FLOOR CLEANING

Clean vinyl floors with a quality nonionic detergent cleaner. Follow the manufacturer's recommendations for cleaning.

Remove any excess detergent solution using a wet/dry vacuum or mop. Rinse floor with a solution of one part Clorox to ten parts warm water.

Polish dry floor using a high-speed buffer and a smooth red 3-M polishing pad.

Mop floor periodically with a solution of 5 per cent Clorox in warm water.

### NOTE

*For custom or special floor covering materials, consult the manufacturer or your converter for information on how to clean and maintain these types of floors.*

### EXTERIOR SURFACES

Frequent washing and waxing of the vehicle exterior will help protect the finish and luster. The paint finish is attacked by the abrasive effects of airborne particles and corrosive pollutants.

Before washing the exterior of the vehicle, close the fresh air dampers using the "REC" button located on HVAC control panel and on the air intake duct in the evaporator compartment.

Install keyhole protectors to prevent water from penetrating. Rinse vehicle with water to remove all loose dirt. Wash vehicle using a quality brand car wash soap. Follow manufacturer's recommendations for cleaning. Rinse well with water.

The vehicle exterior should be cleaned, waxed and buffed when water droplets no longer form on the painted surfaces.

|  |
|--|
|  <b>CAUTION</b> |
| Hot water can damage paint. Keep water cool or lukewarm.   |

|  |
|--|
|  <b>CAUTION</b>                     |
| Make sure cleaning solutions are not harmful to painted surfaces. Read the manufacturer's instructions before using. |

|   |
|---|
|  <b>CAUTION</b> |
| Do not spray water jet directly into fresh air inlet dampers.                                     |

|  |
|--|
|  <b>CAUTION</b> |
| Do not aim high pressure water jet at radiator or condenser doors. This could damage the fins.     |

To prevent corrosion, remove caked-on dirt and road salt from the vehicle underbody using a high pressure water jet. Clean wheel housings, bumpers, muffler, tailpipe and brackets.

Carry out corrosion prevention cleaning at least twice a year. Spray underneath of the vehicle and let soak before cleaning. Let engine and exhaust system cool down before cleaning.

## TAR OR OIL

Remove tar or oil as soon as possible with an approved automotive tar and oil remover or turpentine. Thoroughly clean area with car wash soap and water. Let dry, then wax.

## INSECTS

Remove insect stains as soon as possible with lukewarm soap and water or insect remover.

## TREE SAP

Remove tree sap or bird droppings with lukewarm soap and water. Do not allow to harden.

## WINDOWS

To prevent windshield wiper streaking, keep silicone sprays away from windshield. Remove road film and wax build-up from windows with lukewarm soap and water or with an alcohol-based cleaning agent. If a chamois is used to dry and polish glass, use it exclusively for that purpose.

## WIPER BLADES

To avoid tearing frozen wiper blades, loosen them before removing. Remove and clean wiper blades periodically with an alcohol-based cleaning solution. Clean wiper blades using a sponge or soft cloth.

## FLUID LEVEL VERIFICATION

Periodic inspection of fluid level is the most economical and easiest way to help your vehicle perform at its best. Rigorous fluid level inspection and replacement will greatly help minimize expensive and unscheduled repairs.

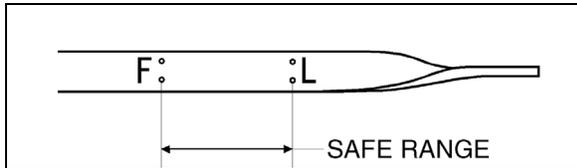
## ENGINE OIL LEVEL

Check engine oil level when engine is still warm and with vehicle parked on a level surface. Shut *OFF* engine and wait at least 10 minutes for oil to drain into oil pan before checking. Check engine oil level daily or before each trip. Add oil as required. Do not overfill. Remove dipstick, wipe clean and fully reinsert to ensure an accurate reading. Remove dipstick and check engine oil level.

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

# 94 CARE AND MAINTENANCE

let the oil level go above the F mark on the dipstick.



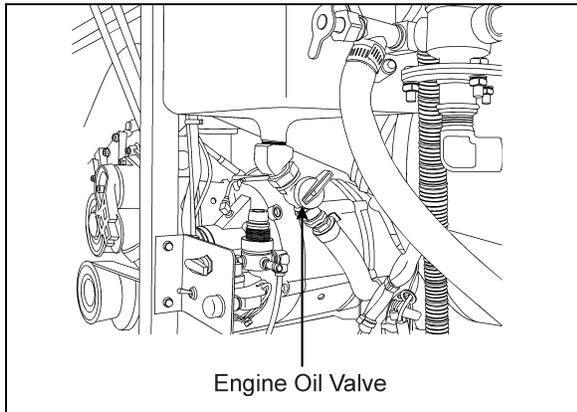
ENGINE OIL LEVEL DIPSTICK

01027



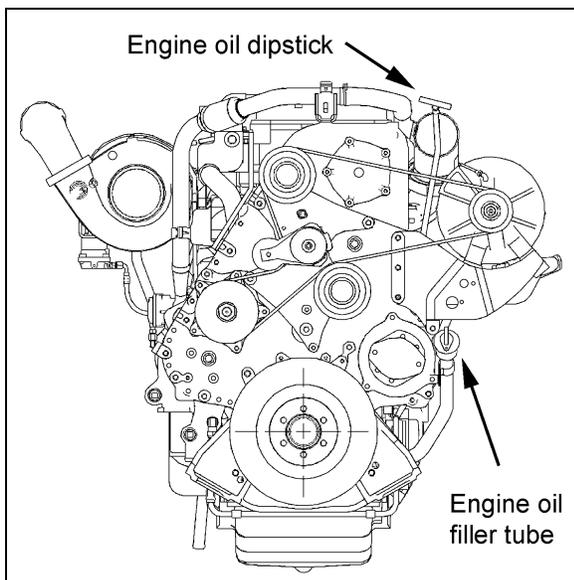
## CAUTION

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



ENGINE OIL RESERVE TANK

01063



ENGINE COMPARTMENT

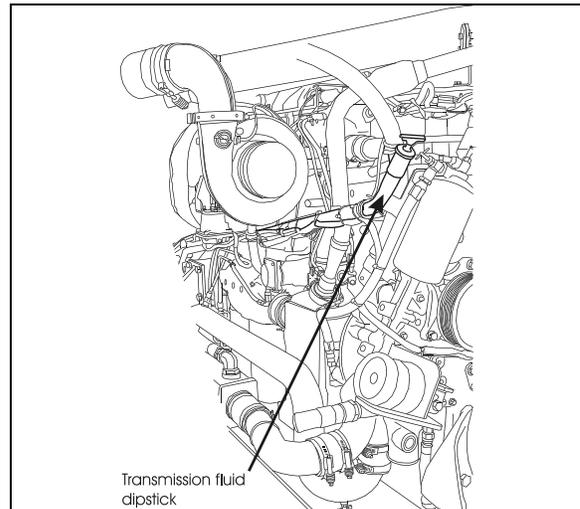
01117

## TRANSMISSION OIL LEVEL

The transmission fluid level can be checked with the dipstick or with the use of the shift selector display. For more information on how to use the shift selector display to check the transmission oil level, refer to Appendix C under "Allison transmission oil level check using the pushbutton shift selector" in this manual.

The automatic transmission oil level dipstick is accessible through the engine compartment rear door and is located on the left side of the engine.

Clean all dirt from around the end of the oil filler tube before removing the dipstick. Dirt or foreign matter must not be permitted to enter the oil system since it will cause valves to stick, undue wear of transmission parts, and clogged passages. To remove dipstick, unscrew filler cap approximately three turns and pull out dipstick. Check the oil level using the procedures in Cold Check and Hot Check. Record any abnormal level on your "Maintenance Records".



LEFT SIDE OF ENGINE

01121



## WARNING

When checking the oil level, be sure that the parking brake and/or emergency brakes are set and 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, since this could cause severe burns.

Do not wear loose clothing and, stay away from rotating parts during procedure; personal injury could occur.

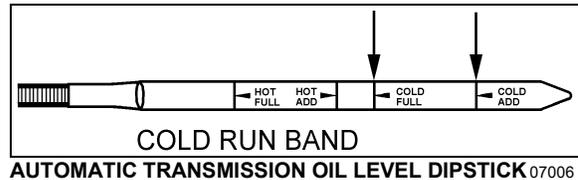
**NOTE**

*The Cold Check is more appropriate for verifying the oil level after the first fill-up. In case of conflict, the Hot Check has priority over the Cold Check; the fluid level check using the pushbutton shift selector has priority over the Hot Check.*

**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.

1. 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.
2. Run the engine at idle in «N» (Neutral) for about one minute.
3. Shift to «D» (Drive) and operate the engine for 30 seconds at 1000-1500 rpm; then shift to «R» (Reverse) to clear the hydraulic system of air.
4. Move the vehicle to a level surface, put transmission in «N» (Neutral), and set the parking brake.
5. Finally shift to Neutral (N) and allow the engine to idle (500 - 800 rpm).
6. While the engine is running, remove the dipstick from the tube and wipe it clean (Fig. 4). Insert the dipstick into the fill tube, pushing down until it stops.
7. Remove the dipstick and observe the fluid level. Repeat the check procedure to verify the reading. If the fluid on the dipstick is within the COLD CHECK band, the level is satisfactory for operating the transmission until the oil is hot enough to perform a **Hot Check**. If the fluid level is not within this band, add or drain fluid as necessary to bring the level within the COLD CHECK band.
8. Perform a **Hot Check** at the first opportunity after the normal operating temperature of 160°F to 200°F (71°C to 93°C) is attained.



**CAUTION**

**DO NOT** operate the transmission for extended periods of time until a **Hot Check** has verified proper fluid level. Transmission damage can result from extended operation at improper fluid level conditions.



**CAUTION**

Obtain an accurate fluid level by imposing the following conditions:

- Engine is idling (500-800 rpm) in «N» (Neutral).
- Transmission fluid is at normal operating temperature.
- The vehicle is on a level surface.



**CAUTION**

The oil level rises as sump temperature increases. **DO NOT** fill above the Cold Run band if the transmission oil is below normal operating temperature. During operation, an overfull transmission can become overheated, leading to transmission damage.

**Hot Check**



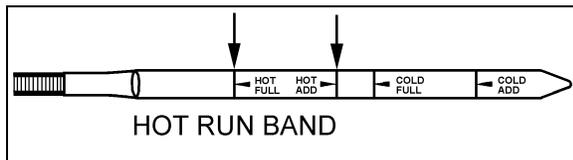
**CAUTION**

The oil **must be hot** to obtain an accurate check because the fluid level rises as temperature increases.

1. The **Hot Check** can be performed when the transmission oil reaches the normal operating temperature (160°F to 200°F / 71°C to 93°C). The transmission oil temperature can be checked with the dashboard message center display (MCD) when selecting the Gauge Mode.

## 96 CARE AND MAINTENANCE

2. Park the vehicle on a level surface and shift to «N» (Neutral). Apply the parking brake and allow the engine to idle (500 - 800 rpm).
3. Remove the dipstick from the tube and wipe it clean. Insert the dipstick into the fill tube, pushing down until it stops.
4. Remove the dipstick and observe the fluid level. The safe operating level is anywhere within the HOT RUN band on the dipstick. Repeat the check procedure to verify the reading.
5. If the level is **not** within this band, add or drain fluid as necessary to bring the level within the HOT RUN band.
6. Be sure fluid level checks are consistent. Check level more than once and if readings are not consistent, check to be sure the transmission breather is clean and not clogged. If readings are still not consistent, contact your nearest Allison dealer or distributor.



AUTOMATIC TRANSMISSION OIL LEVEL DIPSTICK 07006

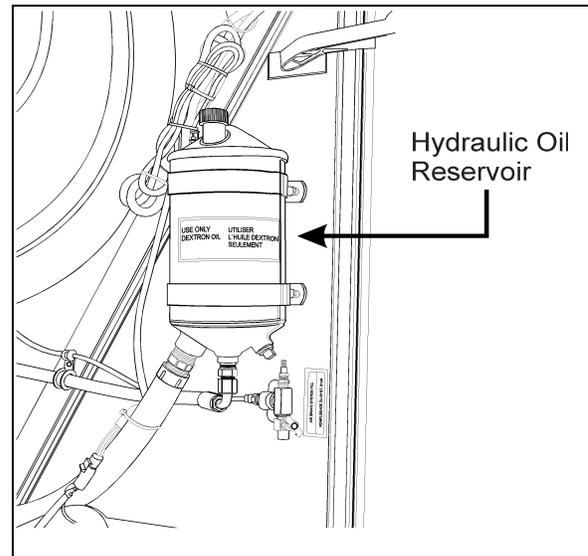
### NOTE

Approximately 1 quart (0.95 liters) of oil will raise the oil level from the lower line of the HOT RUN band to the middle of the HOT RUN band.

Replace dipstick and tighten the filler tube cap until the rubber seal is correctly seated.

### POWER STEERING FLUID LEVEL

The vehicle is equipped with a power steering system. The hydraulic fluid tank is accessible by the engine compartment R.H. side door.



POWER STEERING HYDRAULIC FLUID TANK

14043

Check fluid level as follows:

1. Stop engine, open engine compartment R.H. side door and engine compartment door, place rear start switch to OFF position;
2. Unscrew and remove the dipstick located on top of the fluid tank and wipe with a clean rag;
3. Replace dipstick in tank, then remove to check fluid level;
4. Add hydraulic fluid until it reaches the FULL mark on the dipstick (use Dexron II, Dexron IIE, Dexron III or Mercon fluid type);
5. Place engine rear start switch to NORMAL position. Close engine compartment door;
6. Replace and tighten dipstick and close engine compartment R.H. side door.

### RADIATOR FAN GEARBOX OIL LEVEL

The radiator fan is belt-driven by the engine crankshaft pulley through a gearbox and drive shaft. A dipstick located on top of the gearbox is used to check the radiator fan gearbox oil level.

Check radiator fan gear box oil level as follows:

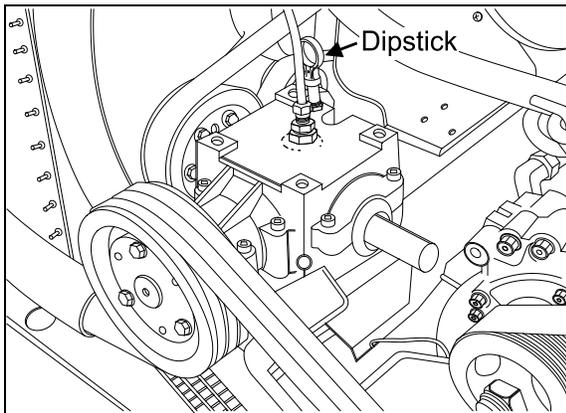
1. Stop engine, open main power compartment and place battery master switch to the OFF position;
2. Open engine compartment door and place engine rear start switch to OFF position;
3. Remove the dipstick located on top of the gearbox and wipe with a clean rag;

4. Insert dipstick in gearbox case, then remove again to check mark;
5. Add, if necessary, MOBIL SHC 630 synthetic lubricant (PREVOST #180217) until it reaches "FULL" mark;

**NOTE**

*Mobil SHC 630 is a new lubricant and is not compatible with SHC 634 lubricant that was previously used.*

6. Reinsert the dipstick;
7. Place engine rear start switch to *NORMAL* position. Close engine compartment door;
8. Set battery master switch to *ON* position.



**RADIATOR FAN GEARBOX OIL LEVEL DIPSTICK** 05062

**WHEEL BEARING OIL LEVEL**

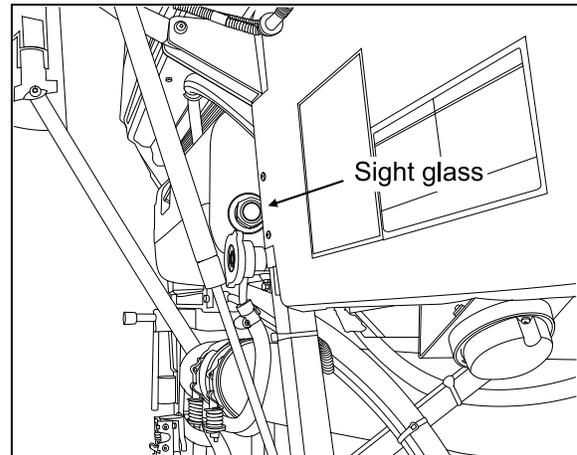
Drive axle wheel bearings are lubricated by the differential oil. Maintain differential oil at correct level to ensure adequate lubrication of drive axle wheel bearings at all times.

**FRONT AND TAG AXLE WHEEL HUBS**

The unitized hub bearings used on the NDS range of axles, are non-serviceable items. Bearings are pre-adjusted, lubricated and have seals fitted as part of the manufacturing process. The bearings are greased for life and there is no need or facility for re-lubrication.

**COOLANT FLUID**

Coolant level is correct when coolant is visible through the surge tank sight glass when cold. If coolant level is low, fill system with the same 50-50 mixture normally used.



**SURGE TANK SIGHT GLASS**

05069



**WARNING**

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

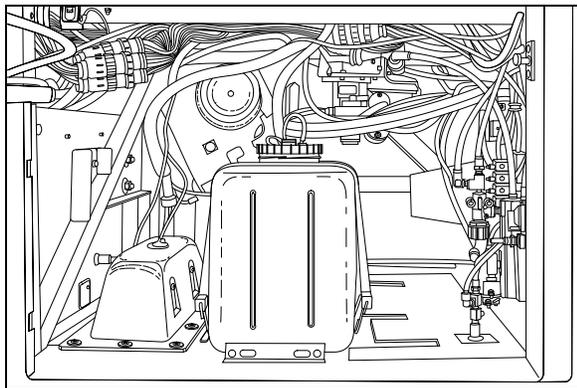


**CAUTION**

Use only coolant that meets DDC specs for use in DDC engines. The cooling system must be maintained according to DDC maintenance specs for coolant, ratio of 50/50 and supplemental coolant additives (SCAs). Failure to do so could damage the cooling system. Refer to Maintenance Manual or DDC for instructions.

**WINDSHIELD WASHER & HEADLIGHTS WASHER RESERVOIRS**

The windshield washer reservoir and headlights washer reservoir are located in the front service compartment door. The windshield washer reservoir has a capacity of 5.3 US gallons (20 liters) while the headlights washer reservoir has a capacity of 2.6 US gallons (10 liters). Check fluid level regularly.



**WINDSHIELD WASHER FLUID RESERVOIR** 14050

The spray jets are located on the windshield wipers and are angled to spray towards the center of the windshield.

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

Adjust the headlights washer nozzles according to the instructions found in section 23 of the maintenance manual. You may use water or windshield washer fluid as well.

|  |                  |
|--|------------------|
|  | <h2>CAUTION</h2> |
| <p>During cold weather days, use windshield washer fluid suitable for freezing temperature only.</p> |                  |

### OTHER VERIFICATIONS

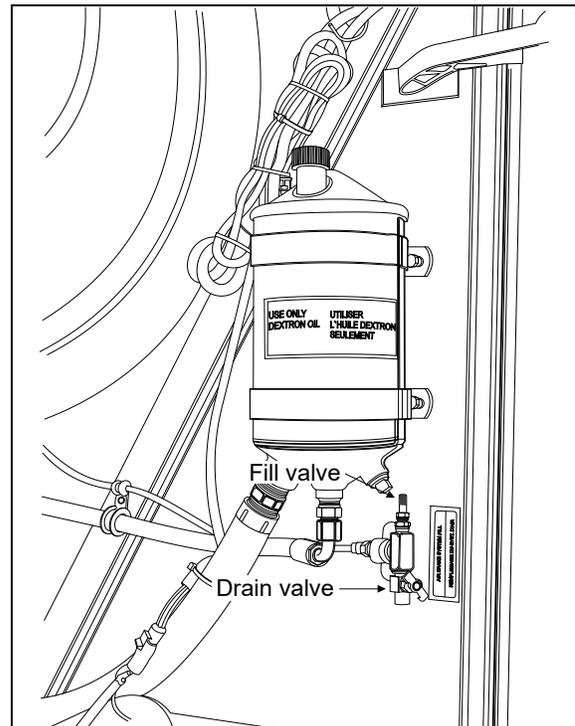
It is good practice to regularly inspect the vehicle for signs of component wear and to perform safety and maintenance routines.

### AIR TANK PURGE

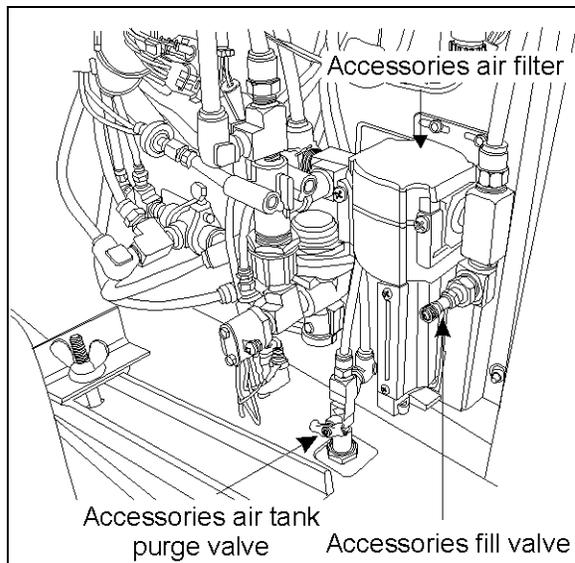
The vehicle may be equipped with up to twelve air tanks. Purge accessory and wet air tanks before each trip. The primary and secondary air tanks must be purged at every oil change. Oil changes should be scheduled at least every 12,500 miles (20 000 km).

The accessory air tank drain cock is accessible from the front service and electrical compartment. The wet air tank drain cock is accessible from the engine compartment R.H. side door. All air tanks are equipped with a drain cock underneath the tank. Refer to figure "Lubrication and Servicing Points" at the end of this chapter for tanks location.

Drain tanks by turning cocks counterclockwise.



**ENGINE COMPARTMENT R.H. SIDE** 12148



**FRONT SERVICE COMPARTMENT** 12130

### FIRE EXTINGUISHERS

Inspect fire extinguishers monthly to insure operation in emergency situations.

In the case of extinguishers equipped with a pressure gauge, the needle should be in the green or *NORMAL* range. Refill or replace extinguisher if pressure is below normal;

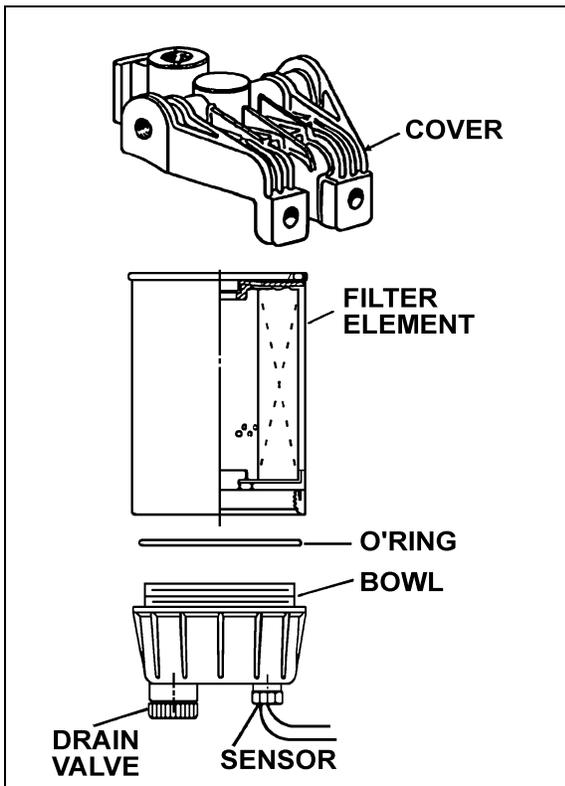
Check that seal on handle is intact;

Check that nozzle hose is in good condition and that nozzle is free of obstruction;

Keep fire extinguishers clean.

## FUEL FILTER/WATER SEPARATOR

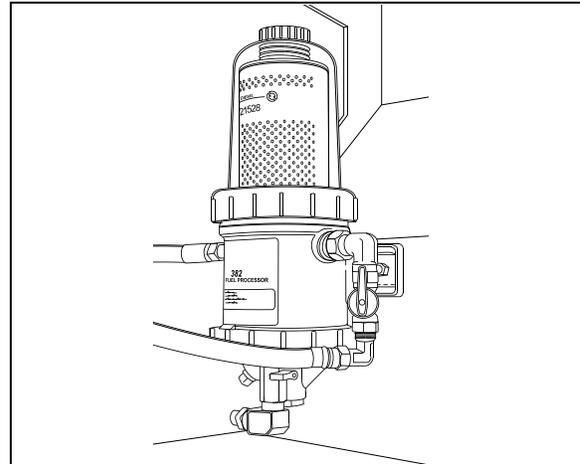
The fuel system is equipped with primary and secondary fuel filters for additional protection of the injectors. A fuel filter/water-separator may be installed in primary fuel-filter location, to prevent water infiltration in engine fuel system. It should be drained periodically, or when the water separator telltale light on the dashboard illuminates. To drain, loosen positive seal drain valve below separator, and tighten after water has been flushed out.



FUEL FILTER/WATER SEPARATOR

03025

The optional Fuel Pro 382 diesel fuel filter system consists of a permanently mounted fuel processor, a replaceable filter element, a filter element cover and collar and a fluid filter base assembly. This system is installed between the fuel tank and the fuel pump and is designed to be the only fuel filter in the fuel system. The filter serves as a water separator as well as a fuel filter. To drain, turn  $\frac{1}{4}$  turn the drain valve below filter, close when water has been flushed out.



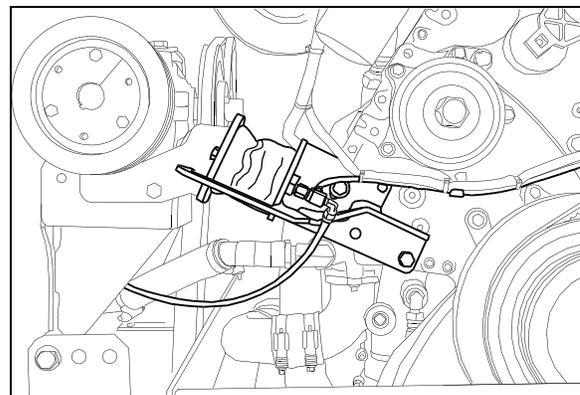
DAVCO FUEL PRO 382

03032

## BELT TENSION ADJUSTMENT

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

Belt tensioning is applied through air bellows which are adjusted by an air pressure regulating valve mounted in the engine compartment, right behind the belt tensioning pressure control valve. The correct pressure of 45 psi (310 kPa) is set at the factory. The distance between the stop and the plate at the top of the bellow should be approximately  $\frac{1}{4}$ " (7mm). Periodically verify the pressure at the regulating valve using a pressure gauge and correct if necessary.

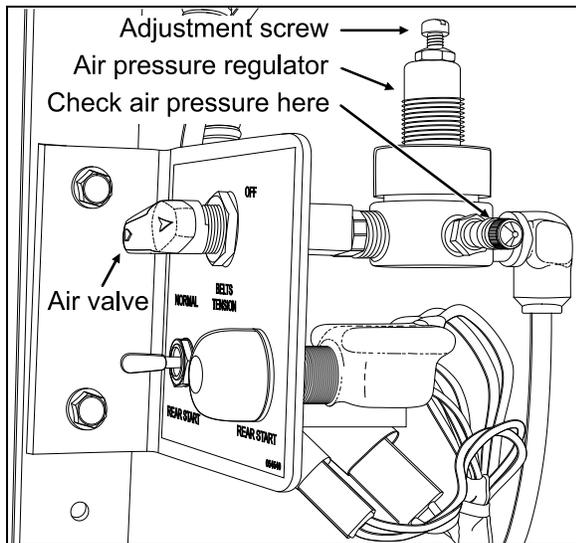


AIR BELLOWS

01122

For belt replacement, air pressure must be released from bellows by means of the belt tensioning pressure control valve. This valve, mounted close to the pressure regulating valve, is manually operated. Before handling, be sure that all engine stopping safety precautions have been observed.

# 100 CARE AND MAINTENANCE



**PRESSURE REGULATING VALVE** 01058

- Refer to the Parts Manual, Maintenance Manual or "Service Bulletins" for recommended belt sizes and tension settings;
- Periodically inspect belt and pulleys for wear or damage;
- Do not treat belts with any compounds. Keep belts dry;

## BACK UP CAMERA

The retractable back-up camera is visible only when turned *ON*. A switch located in the rear electrical compartment is used to extract the camera for cleaning.

To clean the camera's protective glass, turn the switch *ON* and spray with soapy water. Wipe with a clean damp rag or wiper blade.

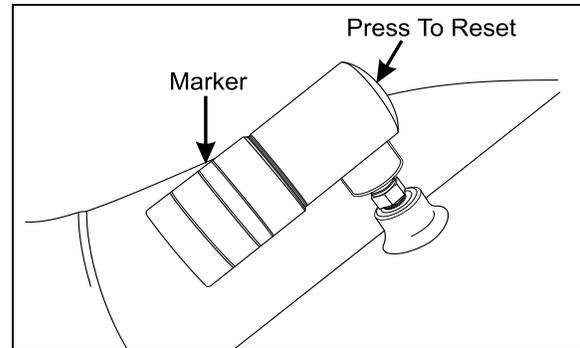
|   |                |
|---|----------------|
|   | <b>WARNING</b> |
| To avoid injury, do not clean camera with transmission in reverse (R). Shut off engine and apply parking brake before cleaning. |                |

|  |                |
|--|----------------|
|  | <b>CAUTION</b> |
| To prevent scratches to the camera protective glass, do not wipe with dry rag. Use a clean damp rag. |                |

## AIR FILTER RESTRICTION INDICATOR

A filter restriction indicator is used to monitor the vacuum level between the air filter and engine. A red marker is displayed when the air filter is clogged. When a red marker is displayed, the air filter must be replaced. Reset by pressing on the indicator's extremity.

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

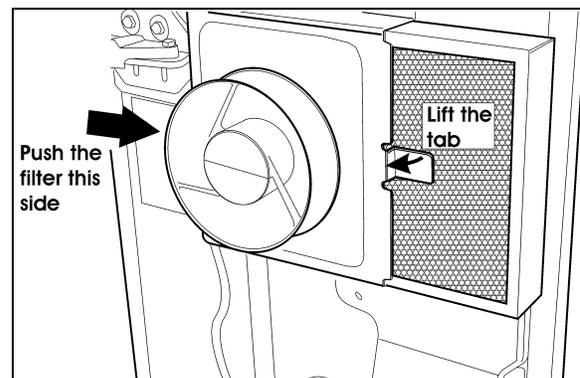


**RESTRICTION INDICATOR** 01052

## MAIN POWER COMPARTMENT FAN AIR FILTER

For maximum service life of the electrical components, air filter should be inspected and cleaned as required in maintenance schedule to ensure proper ventilation and cooling of the main power compartment. Clean filter with an air jet in the opposite direction of normal air flow. Replace filter when necessary.

|  |                |
|--|----------------|
|  | <b>CAUTION</b> |
| Be sure not to reverse filter upon installation. |                |



**MAIN POWER COMPARTMENT FAN AIR FILTER REMOVAL** 06603

## A/C AND HEATING SYSTEM AIR FILTERS

For maximum air conditioning and heating system efficiency, air filters should be inspected and cleaned as required in maintenance schedule to ensure proper ventilation of the evaporator and heating radiator cores. To clean filters, back flush with water, then dry with air.



### CAUTION

Do not use high pressure water jet to avoid damaging filter.

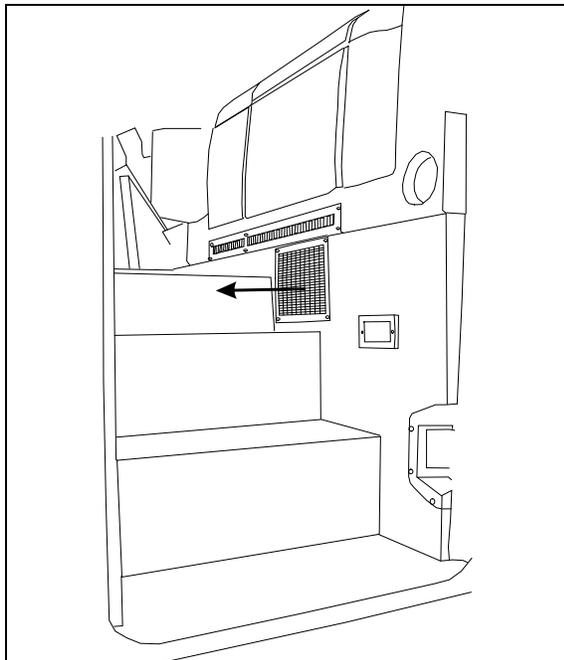


### CAUTION

Be sure not to reverse filter upon installation.

## Driver's Area Filters

The driver HVAC system's air filters are located behind the R.H. console. To gain access to the A/C filters, unscrew the grill located at the top step of the entrance door steps. Remove the filters for cleaning or replacement.



DRIVER'S AREA AIR FILTER REMOVAL

## Cabin System Air Filter

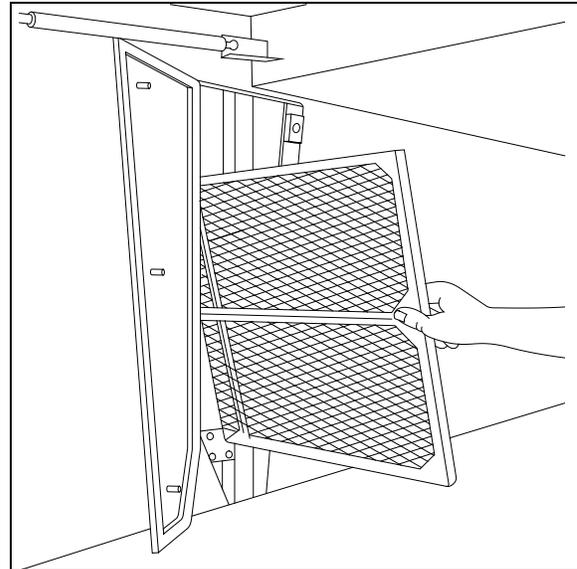
The central HVAC system's air filter is located in the A/C and heating compartment on L.H. side of the vehicle. To gain access, locate access panel in one of the baggage compartment

adjacent to the A/C and heating compartment. Open panel by unscrewing ( $\frac{1}{4}$  turn) the three screws of either panel, unsnap both fasteners on top of filter and slide out the filter for cleaning.



### CAUTION

Be sure not to install filter in inverted position.



CABIN SYSTEM AIR FILTER REMOVAL

22178

## HOSE INSPECTION

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

## LUBRICATION

Grease all lubrication points during scheduled maintenance. For heavy loads or extended use, lubricate more often. Refer to the end of this chapter or to Maintenance Manual, section 24 for information on lubrication.

## PRE-STARTING INSPECTION

### WITH ENGINE STOPPED:

Inspect hoses for leaks. Carefully inspect all fittings, clamps and ties. To prevent chafing, make sure hoses are not touching shafts, couplings, heated surfaces, sharp edges or other parts. Since hose clamps and ties can vibrate loose or fail over time, inspect frequently and tighten or replace as necessary.

## 102 CARE AND MAINTENANCE

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



### CAUTION

All hose clamps of 1 3/8" ID and over, used on the heating and cooling systems, are of the "Constant-torque" type. This type of clamp is designed to automatically adjust its diameter to compensate for the normal expansion /contraction of a hose and metal connection that occurs during vehicle operation and shutdown. A torque wrench should be used for proper installation. The recommended torque is 90 to 100 lbf-in. (10 to 11 N·m). The hose clamps will break if over-torqued and cause loss of coolant. Do not over-tighten, especially during cold weather when hose has contracted.

### Leaks

Check for leaks under vehicle and in compartments.

Correct leaking hoses immediately. Failure to correct leaks can cause severe damage to the equipment, as well as increase operating costs due to lost fluids. Treat fuel and oil leaks as an immediate fire hazard.



### WARNING

Fire hazard - personal injury and property damage may result from fire caused by leaking flammable fluids.

### Hose Service Life

Hoses have a limited service life. Thoroughly inspect hoses annually. Look for surface damage or indications of twisted, worn, crimped, cracked or leaking lines. Replace damaged hoses immediately.

Hoses should be replaced during major overhaul or after a maximum of five years service. Make sure replacement hoses match the original equipment manufacturer's specifications.

### Wheels And Tires

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

Keep the tires inflated to the recommended inflation pressure to prolong tire life and for safety.

### NOTE

*Recommended tire inflation pressures are given in the "Coach Final Record", placed in the technical publications package supplied with the vehicle. The cold tire inflation pressures are on the Department of Transport certification plate located on the L.H. console besides the driver's seat.*



### WARNING

Do not exceed maximum inflation pressure. Incorrect tire pressure increases tire wear and could lead to loss of driving control because of reduced road handling. Check tire pressure regularly.

### Doors

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

### Tools And Spares

Make sure the vehicle is equipped with a wheel nut wrench, door keys, spare belts, reflectors and jack.

### Air System

To purge water from air and accessory tanks, open drain cocks. Close drains when completed. Refer to heading "Air Tank Purge" in this chapter.

### Water Separator

To purge water separator, loosen bleed screw. Tighten bleed screw after purging.

### Coolant Level

Check coolant level. Coolant level is correct when visible in the filler neck of the surge tank. If coolant level is low, fill system with 50-50 coolant mixture. Refer to the vehicle "Maintenance Manual" for more information.



## WARNING

Hot engine coolant is under pressure. Do not attempt to open the coolant filler cap when the engine is hot. Allow engine to cool before adding coolant.

### Wheel Bearings

Check wheel bearing cover for overheating (especially after brake work) during fuel stops by touching the wheel bearing cover.

### Windshield Washer Reservoir

Make sure windshield washer reservoir is full. For cold weather, use antifreeze windshield washer fluid.

### Engine Oil

Check engine oil level during fuel stops. It is normal for diesel engines to burn some oil. If the oil level is low, refer to heading "Engine Oil Level" in this chapter.



## WARNING

Check the engine oil level with vehicle parked on a level surface and with the parking brake engaged.

### Power Steering Oil Tank

Check steering oil level. Refer to heading "Power Steering Fluid Level" in this chapter.

### Belts

Check for loose, worn or broken belts.

### Belt Tension Adjustment

Check belt tension using a pressure gauge. Refer to heading "Belt Tension Adjustment" in "Other Verifications" section in this chapter.

### Fire Extinguishers

Check fire extinguishers to make sure they are ready for operation. Refer to heading "Fire Extinguishers" in "Other Verifications" section in this chapter.

### Emergency Exits

Verify emergency exits for correct operation.

### Driver's Section

Adjust driver's mirrors and seat.

### WITH ENGINE RUNNING:

#### Leaks

Walk around vehicle and listen for air leaks.

#### Turbocharger

Check for leaks and listen for unusual sounds coming from the turbocharger.

#### Automatic Transmission

Check automatic transmission oil level. Refer to heading "Automatic Transmission Oil Level" in this chapter.

#### Gauges And Buzzers

Perform a telltale light test (see "Controls and Instruments" chapter). Make sure gauges are in normal operating condition. Indicator lights and buzzers should all be *OFF* before driving.

#### Fuel Level

Make sure fuel level is sufficient.

#### Service Brakes

Check for correct pressure build-up. Pressure loss should not exceed 3 psi/minute (21 kPa/minute) with engine stopped and without brake applied. Perform a full brake application. Air loss should not exceed 7 psi/minute (48 kPa/minute).

#### Brake Test

Release parking and emergency brakes. Pump service brake pedal until air pressure drops to 65 psi (448 kPa). Make sure the warning buzzer operates and that the emergency brakes apply (the control valve knob lifts up). Allow air pressure to reach 95 psi (655 kPa) before releasing parking brake.

## Parking And Emergency Brake Test

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

## EXTERIOR LIGHTING VERIFICATION

### Exterior Lighting Test Mode

This useful function allows quick verification of the vehicle exterior lights.

#### Activating the test mode:

When the vehicle is stationary (parking brake applied), pull up the multi-function lever 3 times within 3 seconds to activate the test mode. This test can be done when the engine is not running providing that the battery charge is sufficient (above 24.4 volts).

The telltale panel alarm emits a sound each second to remind that the test mode is in progress.

#### Stopping the test mode:

To stop the test mode, pull up the multi-function lever once or turn the ignition OFF or remove the parking brake.

#### **IMPORTANT NOTE**

*The test mode is useful to check the functioning of the multiplex outputs and the exterior lights. It doesn't test the functionality of the commands related to the exterior lighting. For a complete testing, the directional signal commands, the headlights commands and the brake pedal have to be checked before. Once these commands tested, activate the test mode to check the exterior lighting.*

#### Using the test mode:

First, test the functionality of the commands related to the exterior lighting:

- Activate the right directional signal and check that the corresponding telltale light illuminates.
- Activate the left directional signal and check that the corresponding telltale light illuminates.
- Press on the brake pedal and check that the STOP telltale light illuminates.

Once these commands tested, activate the test mode to check the exterior lighting by pulling up the multi-function lever 3 times within 3 seconds.

Go to the front of the vehicle and check the lights:

- First the left and right directional signals.
- Identification lights and clearance lights.
- Low beams.
- High beams.

Go to the left side of the vehicle:

- Directional signals.
- Marker lights.
- Cornering signals.

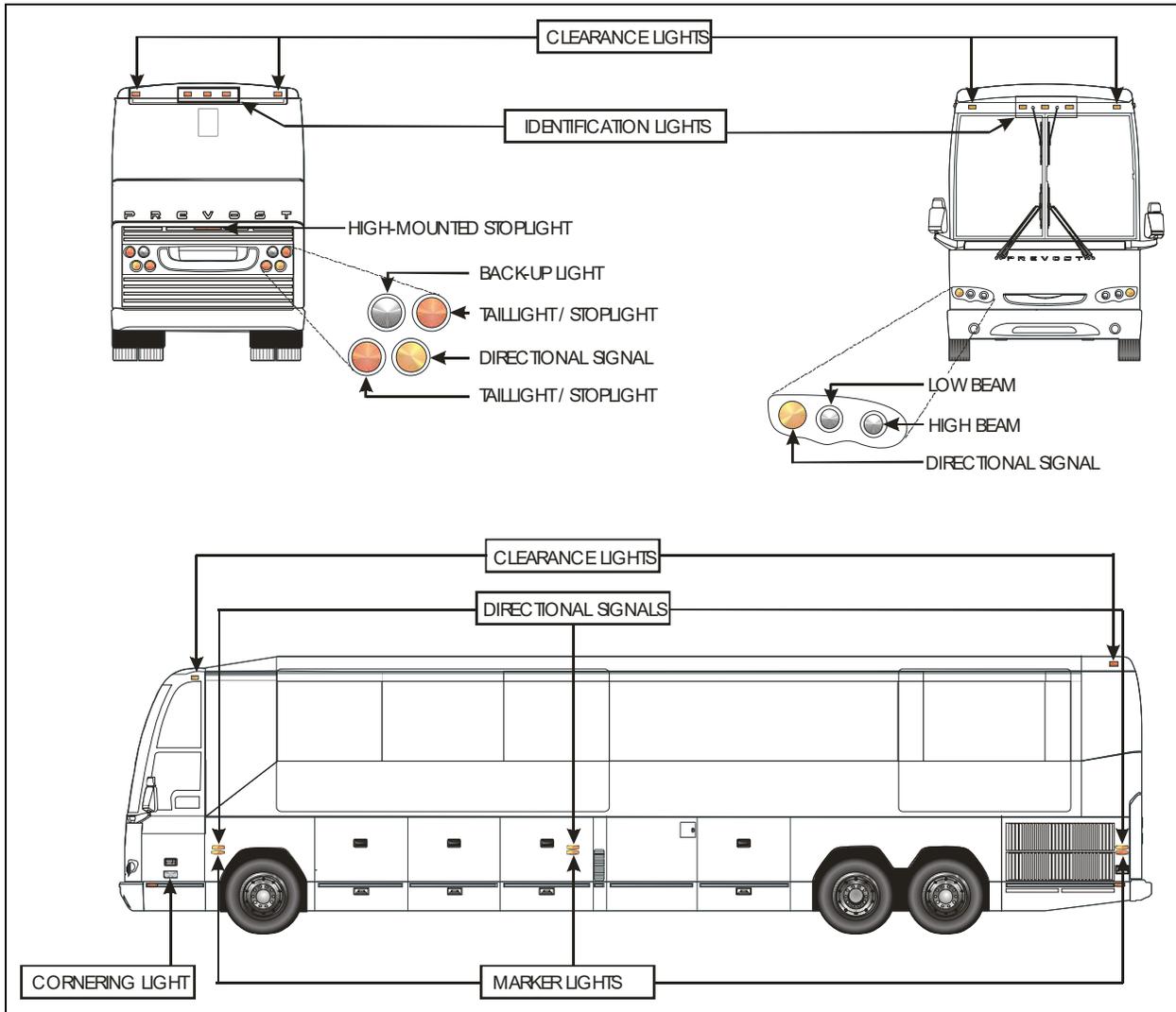
Go to the rear of the vehicle:

- Directional signals.
- Identification lights and clearance lights.
- Stoplights and taillights.
- Back-up lights and back-up alarm (option).

#### **NOTE**

*To check the back-up lights and back-up alarm, you must flip the starter selector switch to REAR START position. (If the vehicle is running, do this quick enough so that the engine does not stop).*

Go to the right side of the vehicle (same sequence as left side).



EXTERIOR LIGHTING IDENTIFICATION

## FIRST SERVICE ON NEW VEHICLE

**NOTE**

*Refer to Maintenance Manual for precise service schedule.*

### ENGINE OIL

Preliminary oil change is not required since the engine has been test-run at the factory. Change oil and filter every 12,500 miles (20 000 km) or once a year, whichever comes first.

### ALLISON TRANSMISSION OIL FILTER

Replace transmission main filter cartridge after the first 5,000 miles (8 000 km) and then according to the lubrication and servicing schedule, depending if the vehicle is equipped or not with a retarder and depending on the type of oil used (Dexron III/VI or Castrol TransSynd fluid).

### COOLANT SYSTEM STRAINER

The coolant system strainer is designed to recover the soldering residues trapped inside the coolant lines during their initial assembly. Clean strainer after first 3,000 miles (5 000 km) and then every 50,000 miles (80 000 km). Refer to the Maintenance Manual under section 05: Cooling System.

**NOTE**

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

### GENERAL RECOMMENDATIONS

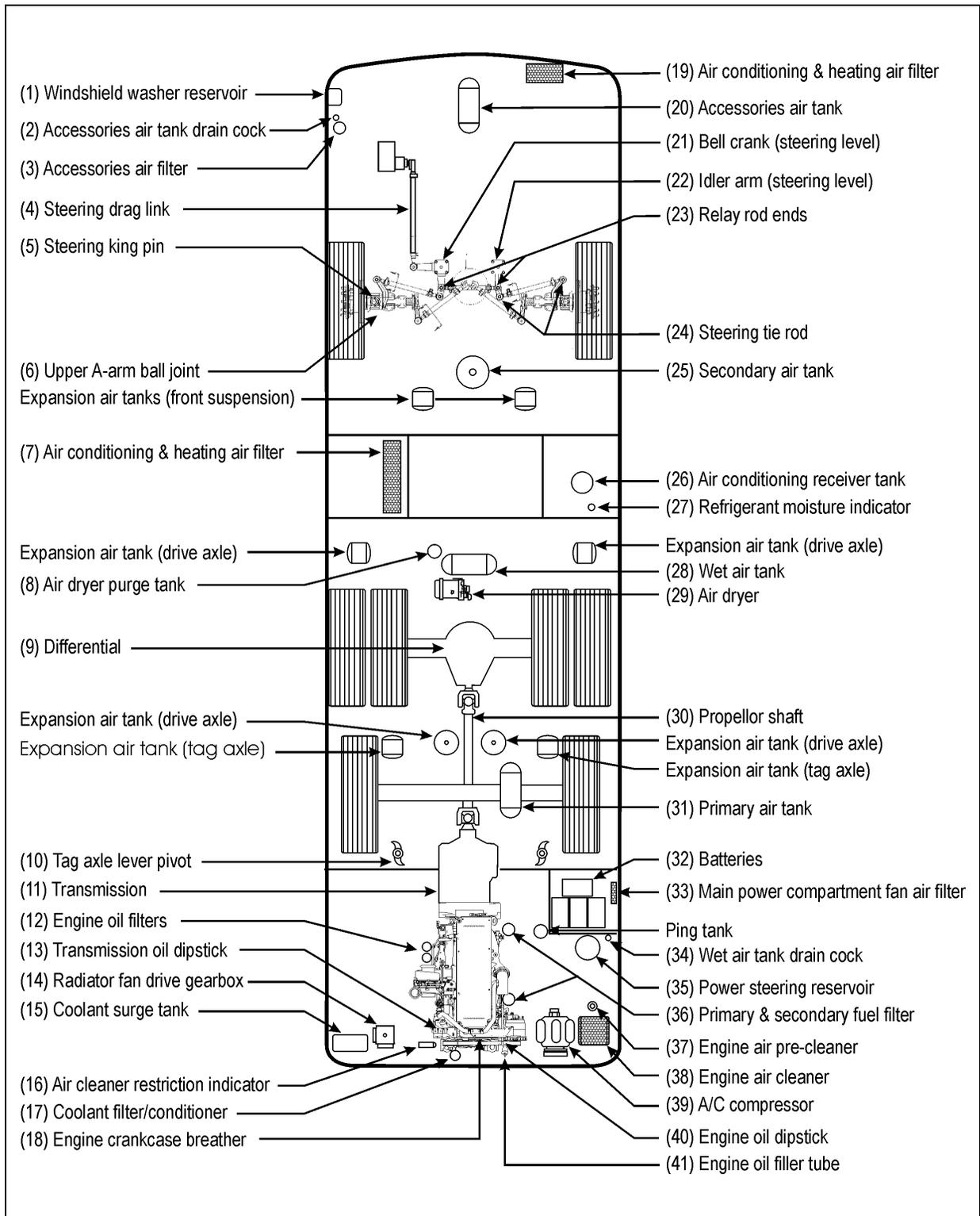
- Understand basic principles of vehicle operation;
- Always maintain the vehicle in good running condition;

- Do not drive with low fuel. If the fuel tank runs dry, the engine will not start until the air is bled from the fuel system. Refer to "Maintenance Manual" for more information;
- Allow engine to run for at least two minutes at slow idle before shutting OFF;
- Engine should be at idle when shifting from neutral (N) to forward (D) or from neutral (N) to reverse (R);
- The automatic transmission does not have a park (P) position. Place transmission in neutral (N) position and apply parking brake when the vehicle is stopped. A warning buzzer will sound if the engine is stopped and the parking brake has not been applied when foot pressure is removed from the brake pedal;
- Always follow the procedures described in this manual;
- Unless stated otherwise, shut OFF the engine before performing all servicing, lubrication and maintenance tasks;
- Do not attempt to push or pull-start a vehicle equipped with an automatic transmission;
- The vehicle may be damaged if towed with the axle shafts or driveshaft connected. Do not push or pull-start the vehicle in first or reverse gears;
- Two chemical fire extinguishers are stored near the back of the driver's seat. In case of fire, immediately evacuate all occupants. Human life safety is the first priority. Do not attempt to extinguish the fire if there is immediate danger or risk for personal injury;
- When driving on ice and snow, accelerate and decelerate gradually;



### WARNING

Report all problems affecting passenger or driver safety to your service center or an authorized service center. Have problems corrected immediately.



LUBRICATION AND SERVICING POINTS ON INDEPENDENT FRONT SUSPENSION VEHICLES (TYPICAL)

## 108 CARE AND MAINTENANCE

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### WALK-AROUND INSPECTION (BEFORE EVERY TRIP)

It is a good practice to make a basic visual inspection of key areas on the vehicle before every trip and to report any problem areas to your PREVOST service center or a PREVOST-authorized authorized service center.

#### Outside The Vehicle

| ITEM <sup>1</sup> | DESCRIPTION  |
|-------------------|--|
| ---               | Check for leaks under vehicle and in engine compartment  |
| ---               | Check that baggage and service compartment doors are properly closed   |
| ---               | Inspect tires and wheels for correct tire pressure, wear or damage and for missing wheel studs and nuts                                    |
| 1                 | Check windshield washer fluid level and add if necessary   |
| ---               | Check condition of windshield wiper blades   |
| ---               | Verify proper operation of all road lights, signal lights, brake lights, marker lights and back up lights; Replace light bulbs as required |
| 2, 28             | Drain accumulated water in accessory and wet air tanks   |

#### Engine Compartment

| ITEM <sup>1</sup> | DESCRIPTION  |
|-------------------|--|
| 40, 41            | Check engine crankcase oil level; Add if necessary   |
| 11, 13            | Check transmission oil level (can be checked from pushbutton shift selector); Add if necessary   |
| 35                | Check power steering reservoir fluid level; Add if necessary                                     |
| 17                | Check coolant surge tank fluid level; Add if necessary   |
| 36                | Drain accumulated water in primary fuel filter/water separator (if equipped)                     |
| 16, 38            | Check air cleaner restriction indicator; Replace air cleaner when red signals locks in full view |

#### Inside The Vehicle

| ITEM <sup>1</sup> | DESCRIPTION  |
|-------------------|--|
| ---               | Check for proper operation of the entrance door  |
| ---               | Check that emergency exit windows and roof escape hatches can be opened, then close all windows and hatches securely |
| ---               | Verify proper operation of windshield wiper/washer   |
| ---               | Adjust mirrors for adequate rear view vision   |
| ---               | Start engine and check for proper operation of all gauges and indicator lights                                       |
| ---               | Check for proper operation of electric and air horns and back up alarm   |
| ---               | Perform brake test. Check both primary and secondary pressure gauges   |

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<sup>1</sup> Item numbers refer to figure on lubrication and servicing points in this chapter.

**LUBRICATION AND SERVICING SCHEDULE**

| <b>SERVICE EVERY 6,250 MILES (10 000 KM) OR TWICE A YEAR, WHICHEVER COMES FIRST</b> |                                       |  |                             |
|---|---------------------------------------|--|-----------------------------|
| ITEM <sup>1</sup>   | DESCRIPTION                           | REMARKS  | LUBRICANT/PART <sup>2</sup> |
| 38  | Engine Air Cleaner                    | Inspect and replace element if required                                  | Filter: #530197             |
| 37  | Engine Air Pre-Cleaner                | Check discharge tube   | -----                       |
| 39  | A/C Compressor                        | Check oil level, add if necessary  | Polyolester Oil             |
| 26  | A/C Receiver Tank                     | Check refrigerant level, add if necessary                                | HFC 134a                    |
| 27  | Refrigerant Moisture Indicator        | Replace filter dryer unit according to moisture indicator (as needed)    | Filter: #950332             |
| 14  | Radiator Fan Drive Gearbox            | Check oil level, add if necessary  | Mobil SHC 630               |
| 33  | Main power compartment fan air filter | Clean or replace   | Filter: #454400             |
| 30  | Propeller Shaft                       | Grease one fitting on each universal joint and one fitting on slip joint | Multi purpose grease        |
| 10  | Tag Axle Lever Pivot                  | Grease one fitting on each pivot   | Multi purpose grease        |
| 4   | Drag Link Ends                        | Grease one fitting at each end   | Multi purpose grease        |
| 5   | Steering King Pins                    | Grease fitting   | Multi purpose grease        |
| 23  | Relay Rod Ends                        | Grease one fitting at each end   | Multi purpose grease        |
| 6   | Upper A-Arm Ball Joint                | Grease one fitting at each end   | Multi purpose grease        |
| 24  | Steering Tie Rod Ends                 | Grease one fitting at each end   | Multi purpose grease        |
| 22  | Idler Arm                             | Grease fitting   | Multi purpose grease        |
| 21  | Bell Crank                            | Grease fitting   | Multi purpose grease        |
| ---   | Drive belts                           | Check for wear and cracks  | -----                       |

| <b>SERVICE EVERY 12,500 MILES (20 000 KM) OR EVERY 6 MONTHS, WHICHEVER COMES FIRST</b> |  |  |                             |
|--|--|--|-----------------------------|
| ITEM <sup>1</sup>  | DESCRIPTION  | REMARKS  | LUBRICANT/PART <sup>2</sup> |
| 11   | Allison transmission <b>equipped with retarder</b> | Change fluid and filters (if containing non-TranSynd fluid). | Dexron-III/VI               |

<sup>2</sup> See end of this section for lubricant and part number specifications.

## 110 CARE AND MAINTENANCE

| SERVICE EVERY 12,500 MILES (20 000 KM) OR ONCE A YEAR, WHICHEVER COMES FIRST |                             |  |  |
|--|-----------------------------|--|--|
| ITEM <sup>1</sup>  | DESCRIPTION                 | REMARKS  | LUBRICANT/PART <sup>2</sup>  |
| 12   | Engine Oil Filters          | Change oil and filters   | Engine oil:<br>SAE 15W40, API C14<br>Filters: #510458              |
| 36   | Fuel Filters                | Change primary and secondary fuel filters (Fill with clean fuel before installation) | Primary: #510137<br>Prim. w/sep.:<br>#531390<br>Secondary: #510128 |
| 17   | Coolant Filter/Conditioner  | Replace element  | Filter: #550630  |
| 15   | Coolant Surge Tank          | Test coolant solution  | -----  |
| 20, 25,<br>28, 31  | Air Tanks                   | Drain accumulated water from all tanks   | -----  |
| 7  | A/C and Heating Air Filters | Clean or replace two elements (twice a year)   | Driver's: #871049<br>Passenger's: #871051                          |

| SERVICE EVERY 25,000 MILES (40 000 KM) OR ACCORDING TO THE FLEET MAINTENANCE INTERVAL, WHICHEVER COMES FIRST |              |                                   |                             |
|--|--------------|-----------------------------------|-----------------------------|
| ITEM <sup>1</sup>  | DESCRIPTION  | REMARKS                           | LUBRICANT/PART <sup>2</sup> |
| 9  | Differential | Check oil level, add if necessary | Same type of gear oil       |

| SERVICE EVERY 25,000 MILES (40 000 KM) OR ONCE A YEAR, WHICHEVER COMES FIRST |  |  |                             |
|--|--|--|-----------------------------|
| ITEM <sup>1</sup>  | DESCRIPTION                                  | REMARKS  | LUBRICANT/PART <sup>2</sup> |
| 11   | Allison transmission <b>without retarder</b> | Change fluid and filters (if containing non-TranSynd fluid). | Dexron-III/VI               |

| SERVICE EVERY 50,000 MILES (80 000 KM) OR ONCE A YEAR, WHICHEVER COMES FIRST |  |                                      |                             |
|--|--|--------------------------------------|-----------------------------|
| ITEM <sup>1</sup>  | DESCRIPTION  | REMARKS                              | LUBRICANT/PART <sup>2</sup> |
| 14   | Radiator Fan Drive Gearbox                               | Change oil                           | Mobil SHC 630               |
| 35   | Power Steering Reservoir                                 | Replace oil filter cartridge element | Cartridge: #660987          |
| 18   | Engine Crankcase Breather                                | Clean breather steel mesh            | -----                       |
| ---  | Hoses  | Thoroughly inspect all hoses         | -----                       |
| ---  | Evaporator, condenser and recirculating pump drive motor | Inspect brush, replace if necessary  | -----                       |

| SERVICE EVERY 50,000 MILES (80 000 KM) OR ONCE EVERY TWO YEARS, WHICHEVER COMES FIRST |  |  |  |
|---|--|--|--|
|---|--|--|--|

## CARE AND MAINTENANCE 111

| ITEM <sup>1</sup> | DESCRIPTION  | REMARKS   | LUBRICANT/PART <sup>2</sup> |
|-------------------|--|---|-----------------------------|
| 11                | Allison transmission <b>with or without retarder</b> | Change filters (if containin Castrol TranSynd fluid only, no mixture). <sup>3</sup> | Filters: #571709            |
| 11                | Allison transmission <b>with retarder</b>            | Change fluid (if containing Castrol TranSynd fluid only, no mixture). <sup>4</sup>  | Fluid: TranSynd             |

### SERVICE EVERY 100,000 MILES (160 000 KM) OR ONCE A YEAR, WHICHEVER COMES FIRST.

| ITEM <sup>1</sup> | DESCRIPTION  | REMARKS                     | LUBRICANT/PART <sup>2</sup> |
|-------------------|--------------|-----------------------------|-----------------------------|
| 9                 | Differential | Change oil; Clean breathers | Multi-grade gear oil        |

### SERVICE EVERY 100,000 MILES (160 000 KM) OR ONCE EVERY TWO YEARS, WHICHEVER COMES FIRST

| ITEM <sup>1</sup> | DESCRIPTION            | REMARKS               | LUBRICANT/PART <sup>2</sup> |
|-------------------|------------------------|-----------------------|-----------------------------|
| 3                 | Accessories Air Filter | Change filter element | Filter: #641252             |
| 29                | Air Dryer              | Change cartridge      | Cartridge: #3097369         |

### SERVICE EVERY 150,000 MILES (240 000 KM) OR ONCE EVERY FOUR YEARS, WHICHEVER COMES FIRST

| ITEM <sup>1</sup> | DESCRIPTION                                  | REMARKS  | LUBRICANT/PART <sup>2</sup> |
|-------------------|--|--|-----------------------------|
| 11                | Allison transmission <b>without retarder</b> | Change fluid (if containing TranSynd fluid only, no mixture). <sup>4</sup> | Fluid: TranSynd             |

### SERVICE EVERY 250,000 MILES (400 000 KM) OR ONCE EVERY 4 YEARS, WHICHEVER COMES FIRST

| ITEM <sup>1</sup> | DESCRIPTION  | REMARKS                     | LUBRICANT/PART <sup>2</sup> |
|-------------------|--------------|-----------------------------|-----------------------------|
| 9                 | Differential | Change oil; Clean breathers | Synthetic oil               |

<sup>3</sup> When the transmission contains a mixture of fluids (defined as the quantity of non-TranSynd fluid remaining in the transmission after a fluid change combined with the quantity of TranSynd required to fill the transmission to the proper level), perform the fluid and filter change at 25,000 miles (40 200 Km) or 1 year, whichever comes first.

## 112 CARE AND MAINTENANCE

| MISCELLANEOUS SERVICE |                              |   |                             |
|-----------------------|------------------------------|---|-----------------------------|
| ITEM <sup>1</sup>     | DESCRIPTION                  | REMARKS   | LUBRICANT/PART <sup>2</sup> |
| 17, 15                | Cooling System               | Drain, flush and refill every two years or 200,000 miles (320 000 km) whichever comes first   | Engine coolant              |
| 32                    | Battery Terminals            | Clean and coat terminals yearly   | Battery terminal coating    |
| ---                   | Discharge Tubes <sup>4</sup> | Every three months:<br>Check 2 condenser's discharge tubes<br>Check 6 evaporator's discharge tubes<br>Check 2 front discharge tubes | -----                       |

### LUBRICANT SPECIFICATIONS

| ITEM <sup>1</sup> | DESCRIPTION              | SPECIFICATIONS   |
|-------------------|--------------------------|--|
| 41                | Engine Oil               | SAE Viscosity Grade: 15W40<br>API Classification: CI4  |
| 35                | Power Steering Oil       | Automatic Transmission Oil<br>(Dexron-II/E or Dexron-III)  |
| 15                | Engine Coolant           | Phosphorous and nitrates free coolant in order to meet specification 7SE298 or TMC RP-329 TYPE A. 50% antifreeze/water solution is normally used.<br>Detroit Diesel Power Cool or Prestone Heavy Duty.   |
| 39                | A/C Compressor Oil       | Polyolester Oil, HFC 134a compatible:<br>Large capacity A/C: Castrol SW-68 (POE) or equivalent<br>Small capacity A/C: ZXL100PG (PAG)   |
| 9                 | Differential Oil         | Multigrade gear oil meeting MIL-L-2105-D: 85W140<br>If temperature drops below 10°F (-12°C), 80W90 should be used, and below -15°F (-26°C), 75W90 should be used.<br>(In extreme conditions or for better performance, full synthetic gear oil can be used.) |
| 14                | Fan Gearbox Oil          | Mobil SHC 630  |
| 11                | Allison Transmission Oil | Dexron-III/VI or Castrol TranSynd  |
| ---               | 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   |

<sup>4</sup> Discharge tubes are rubber tubes located under vehicle.

| <b>DIMENSIONS AND WEIGHTS</b>                            |                        |
|--|------------------------|
| Overall length (over bumpers)                            | 45' 8" (13.9 m)        |
| Overall width  | 102" (2.59 m)          |
| Overall height (normal ride height)                      | 146 ¼" (3.715 m)       |
| Wheelbase (center of front axle to center of drive axle) | 316 ¼" (8.033 m)       |
| Floor height from ground                                 | 63" (1.6 m)            |
| Ground clearance   | 11" (280 mm)           |
| Step height from ground                                  | 14" (356 mm)           |
| Headroom   | 77" (1.956 m)          |
| Entrance door opening width                              | 27" (686 mm)           |
| Front overhang   | 76" (1,93 m)           |
| Rear overhang  | 108 ¼" (2.749 m)       |
| Front track  | 84.4" (2.145 m)        |
| Drive track  | 76.7" (1.949 m)        |
| Rear track (tag axle)                                    | 83.6" (2.124 m)        |
| Turning circle radius                                    | 42' (12.8 m)           |
| Curb weight (before conversion)                          | 31,990 lbs (14 540 Kg) |
| Gross Vehicle Weight Rating (G.V.W.R.)                   | 54,500 lbs (23 665 kg) |
| Front axle Gross Axle Weight Rating (G.A.W.R.)           | 18,000 lbs (7 500 kg)  |
| Drive axle G.A.W.R.                                      | 22,500 lbs (10 230 kg) |
| Tag axle G.A.W.R.  | 14,000 lbs (6 365 kg)  |

**NOTE**  
*Curb weight is given as an indication only and is subject to vary from coach to coach, mostly due to optional equipment.*

The Gross Vehicle Weight Rating (G.V.W.R.) and the Gross Axle Weight Rating (G.A.W.R.) for front, drive and tag axles are listed on a certification plate located on the L.H. control panel in driver's section.

| <b>CAPACITIES</b>                                 |                     |
|---|---------------------|
| Engine oil (in crankcase)                         | 41 US qts (39 l)    |
| Engine oil (in reserve tank)                      | 8.4 US qts (8.0 l)  |
| Fuel tank (legal capacity equal to 95% of volume) | 235 US gal. (890 l) |

| <b>CAPACITIES</b>  |   |
|--|---|
| Cooling system   | 24 US gal. (91 l)                             |
| Allison transmission (does not include external circuit) | 6 US gal. (23 l)                              |
| Differential oil   | 5 US gal. (19 l)                              |
| Power steering reservoir                                 | 4 US qts (3.7 l)                              |
| A/C compressor oil                                       | 4.5 US qts (4.3 l)                            |
| Windshield washer reservoir                              | 5 US gal. (19 l)                              |
| Refrigerant  | 24.1 lbs (11 kg)<br>6 lbs (2.75 kg) small A/C |

**FUEL TYPE**

ASTM specification ..... D-975  
 Recommended grade ..... 1-D  
 Acceptable grade ..... 2-D

**WHEELS AND TIRES**

Drive Axle Steel wheels ..... 9" X 22½"  
 Drive Axle Aluminum forged wheels ... 9" X 22½"  
 Drive Axle Super Single Aluminum forged wheels ..... 14" X 22½"  
 Drive Axle Tires ..... 315/80 R 22½"  
 Drive Axle Super Single Tires ..... 455/55 R 22½"  
 Tag & Front Axle Wheels ..... 10½" X 22½"  
 Tag & Front Axle Tires ..... 365/70 R 22½"

**RECOMMENDED TIRE INFLATION PRESSURE AT MAXIMUM COLD LOAD**

The maximum recommended tire inflation pressures are given in the applicable documents supplied with the vehicle. In addition, cold tire inflation pressures are listed on the Department of Transport (DOT) certification plate, affixed on the wall behind the driver's seat.

|  |                |
|--|----------------|
|   | <b>CAUTION</b> |
| 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 |                |

# 116 TECHNICAL INFORMATION

manufacturer's recommendations. For non standard tire and wheel specifications, see Prevost tire pressure tabulation in "Coach Final Record" or special specification chart affixed next to the DOT certification plate.



## WARNING

Special tire selection may lower maximum allowable speed limit, even below posted speed limit. For maximum safety, check with tire manufacturer.

## BELTS

| Use                                | Model               | Qty |
|------------------------------------|---------------------|-----|
| Radiator fan gearbox drive         | V-Belt<br>3/BX-74   | 1   |
| Radiator fan drive (fan)           | Poly-V<br>12PK-2100 | 1   |
| A/C system 05G compressor          | BX-100              | 2   |
| A/C small system Seltec compressor | V-Belt<br>A35       | 1   |
| Alternator, Delco                  | Poly-V<br>10/2232   | 1   |

## ENGINE

Power is provided by a Detroit Diesel DDEC V Series 60 engine, displacing 14 liters. The engine is an inline six cylinder, four stroke, turbocharged, air to air charge cooled, diesel engine with an overhead camshaft and four valves per cylinder.

Rated horsepower.....515 HP @ 1,800 rpm  
Peak torque..... 1,650 lbf•ft @ 1,200 rpm  
Operating range ..... 1,200 – 2,100 rpm

## ALLISON TRANSMISSION

Allison WT B500 (B500R with the optional output retarder) electronically controlled six speed automatic transmission.

### Gear Ratios

1<sup>st</sup>.....3.510  
2<sup>nd</sup>.....1.906  
3<sup>rd</sup>.....1.429  
4<sup>th</sup>.....1.000  
5<sup>th</sup>.....0.737  
6<sup>th</sup>.....0.639  
Reverse.....4.801  
Converter.....1.578

Drive axle ratio .....4.30  
Drive axle ratio (optional).....4.56  
Drive axle ratio (optional).....4.88

## BRAKES

The features of the braking system include a dual system where the front and rear circuits are completely independent from each other. The brakes are air operated disc type brakes with automatic slack adjusters on front, drive and tag axles. The emergency/parking brakes are located on the drive and tag axles only.

### BRAKE CHAMBER EFFECTIVE AREA

Front axle (IFS) .....24 in<sup>2</sup>  
Front axle (I-Beam) .....24 in<sup>2</sup>  
Drive axle .....24/24 in<sup>2</sup> (service / emergency)  
Tag axle .....14/16 in<sup>2</sup> (service / emergency)

## AIR SYSTEM

Compressed air is provided by a 15.8 cfm Bendix-Westinghouse BA921, one cylinder, gear-driven, water-cooled and engine oil lubricated air compressor.

Other features and components of the air system include an air dryer and nylon color-coded air lines.

## ANTILOCK BRAKING SYSTEM (ABS)

The antilock braking system has one Electronic Control Unit (ECU) controlling a four channel system. A wheel slip sensor is mounted at each front axle and drive axle wheel. The Tag axle wheels are slave to the drive axle wheels.

The Electronic Control Module (ECM) is maintenance free. Its operating voltage is 24 ± 6 volts DC. The thermal operating range for the ECM is from -40 to 167°F (-40 to 75°C).

The solenoid control valves are maintenance free. Their operating voltage is 24 (+4.8, -2.4) volts DC. The rated current draw is 1.65 amps. The thermal operating range of the solenoid control valves is from -40 to 176°F (-40 to 80°C).

## TROUBLESHOOTING AND TESTING

For troubleshooting and testing of the vehicle's anti-lock braking system, refer to Meritor-WABCO Maintenance Manual MM-0112 "Anti-Lock Braking System For Trucks, Tractors and Buses" or use dashboard Message Center

Display (MCD) Diagnostic Mode under ECU  
Diagnostic: "Brakes".

## STEERING

- Tilt steering wheel and telescopic steering column;
- Integral hydraulic assisted steering gear;
- System pressure: 2175 psi (150 bars);

## ELECTRICAL SYSTEM

- 24 volt, negative ground;
- 12 volt exterior lighting;
- Twin 28 volt, 140 amp, self-regulated, belt-driven, air-cooled Bosch alternators;
- Four 12 volt, group 31 format maintenance-free batteries connected in series/parallel. Cold cranking capacity is 1900 amps with a reserve capacity of 195 minutes;
- 100 amp battery equalizer;

## SUSPENSION

Goodyear rolling lobe type air springs (bellows) are used throughout.

### FRONT AXLE

2 Bellows (14.5");  
2 Shock absorbers;  
4 Radius rods;  
1 Transverse radius rod;  
1 Height control valve;  
1 Anti-roll bar, 2" diameter.

### DRIVE AXLE

4 Bellows (11");  
4 Shock absorbers;  
3 Radius rods;  
2 Height control valves;  
1 Panhard rod  
1 Anti-roll bar, 1½" diameter

### TAG AXLE

2 Bellows (11");  
2 Shock absorbers;  
3 Radius rods;  
1 Panhard rod.

# 118 TECHNICAL INFORMATION

## ALIGNMENT

| FRONT AXLE<br>(INDEPENDENT FRONT SUSPENSION) |               |           |               |           |               |           |
|--|---------------|-----------|---------------|-----------|---------------|-----------|
| Load   | Minimum value |           | Nominal value |           | Maximum value |           |
|  | Non-converted | Converted | Non-converted | Converted | Non-converted | Converted |
| Right camber (degrees)                       | 0.2           | -0.150    | 0.35          | 0.0       | 0.55          | 0.200     |
| Left camber (degrees)                        | 0.2           | -0.150    | 0.35          | 0.0       | 0.55          | 0.200     |
| Right caster (degrees)                       | 2.55          |           | 2.8           |           | 3.05          |           |
| Left caster (degrees)                        | 2.55          |           | 2.8           |           | 3.05          |           |
| Total toe-in (degrees)                       | 0.08          |           | 0.13          |           | 0.17          |           |

## ALIGNMENT SPECIFICATIONS

Use wheel alignment systems which work with angle measurements only, such as Josam or Hunter systems. Alignment specifications are listed in the following tables:

| DRIVE AXLE             |               |               |               |
|------------------------|---------------|---------------|---------------|
|                        | Minimum value | Nominal value | Maximum value |
| Thrust angle (degrees) | -0.04         | 0             | 0.04          |

| TAG AXLE                            |               |               |               |
|-------------------------------------|---------------|---------------|---------------|
|                                     | Minimum value | Nominal value | Maximum value |
| Parallelism (degrees)*              | -0.02         | 0             | 0.02          |
| (*) Use the drive axle as reference |               |               |               |

## HEATING AND AIR CONDITIONING

Two air conditioning systems are available: the large capacity (central A/C) or the small capacity A/C (also known as driver's air). Vehicles equipped with the large capacity A/C benefit from a combination heating and cooling system that provides adequate capacity of conditioned and filtered air for all climatic conditions. Fresh air is drawn into the system from the left (driver's) side of the vehicle. Return air is taken from the middle of the vehicle. The driver's heater and defogger are controlled separately from the central unit. An air mixture selector enables air to be drawn into the system from outside the vehicle or recirculated. Driver's air provides cooling for the driver's area only, maximizing available baggage space for other

uses. The small capacity A/C enables cooling the driver's area only.

| SMALL CAPACITY A/C        |                                    |
|---------------------------|------------------------------------|
| Air conditioning capacity | 2 tons                             |
| Refrigerant type          | 134a                               |
| Air flow                  | 450 cfm (12,7 m <sup>3</sup> /min) |

| COMPRESSOR (For small capacity A/C) |                      |
|-------------------------------------|----------------------|
| Number of cylinders                 | 6                    |
| Operating speed                     | 700 to 6 000 rpm     |
| Oil capacity                        | 6.0 U.S. oz (0,18 l) |
| Approved oil                        | ZXL100PG (PAG)       |

| LARGE CAPACITY A/C        |                                      |
|---------------------------|--------------------------------------|
| Air conditioning capacity | 7.5 tons                             |
| Refrigerant type          | 134a                                 |
| Heating capacity          | 152 000 Btu/h                        |
| Air flow                  | 2 600 cfm (73,6 m <sup>3</sup> /min) |

| COMPRESSOR (For large capacity A/C) |  |
|-------------------------------------|--|
| Number of cylinders                 | 6  |
| Operating speed                     | 400 to 2 200 rpm<br>(1,750 rpm, nominal) |
| Minimum speed for lubrication       | 400 rpm                                  |
| Oil capacity                        | 4.5 U.S. qts (4,3 l)                     |

|              |                     |
|--------------|---------------------|
| Approved oil | Castrol SW-68 (POE) |
|--------------|---------------------|

**NOTE**

*The above oils are suitable for use with reciprocating compressors using refrigerant R-134a and with evaporator temperatures above -40°F (-40°C).*

**OIL SPECIFICATIONS****ENGINE**

Heavy-duty engine oil SAE 15W-40 meeting API classification CI-4.

**ALLISON TRANSMISSION**

The Allison transmission must be filled with *Dexron III/VI* automatic transmission fluid, *Castrol TranSynd* or any equivalent Class C4 hydraulic fluid.

**DIFFERENTIAL**

Multigrade gear oil meeting MIL-L-2105-D: 85W140 is recommended for use in drive axle. This lubricant performs well over a broad temperature range, providing good gear and bearing protection in a variety of climates. If temperature drops below 10°F (-12°C), 80W90 should be used, and below -15°F (-26°C), 75W90 should be used. In extreme conditions or for better performance, full synthetic gear oil should be used.

**FAN GEARBOX**

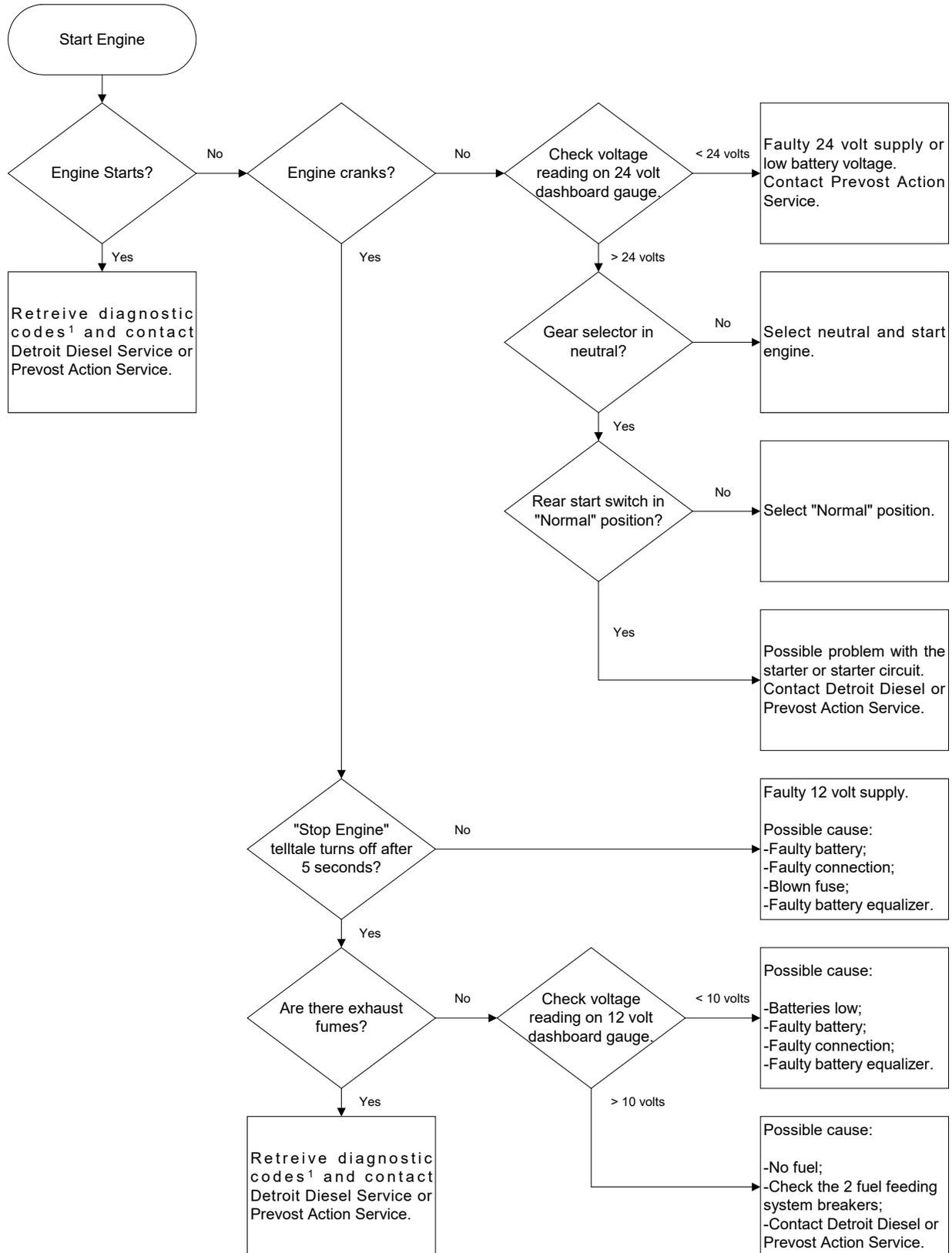
Only Mobil SHC 630 synthetic oil (Prevost #180217) is recommended for the fan gearbox.

**POWER STEERING RESERVOIR**

Use Dexron IIE or Dexron III automatic transmission fluid for this system.

# 120 TECHNICAL INFORMATION

## ENGINE TROUBLESHOOTING FLOWCHART



(1) Refer to DDEC V Diagnostic Codes in this chapter.

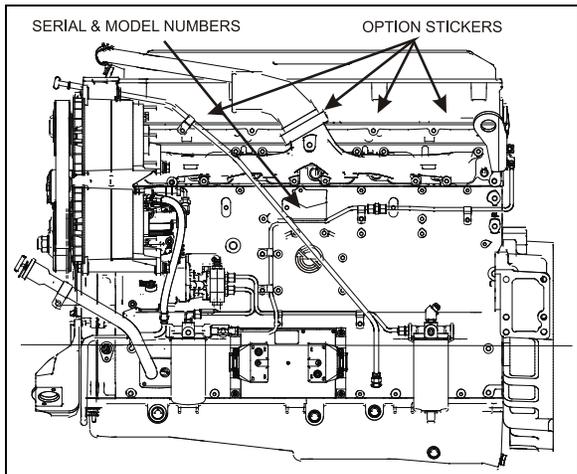


## PLATES AND CERTIFICATION

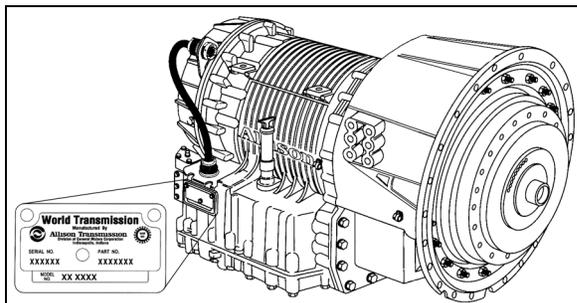
The main components of the vehicle, such as engine, transmission, axles and the chassis are identified by different serial numbers. It may be necessary to locate these numbers for warranty purposes.

The engine serial and model number are stamped on the cylinder block (as viewed from the flywheel end) on the left side just below the fire deck and above the cast-in Detroit Diesel logo.

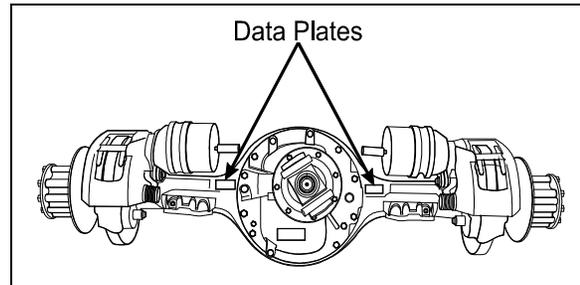
In addition, option decals are located on the rocker cover (starter side). The engine serial and model number and a list of the optional engine equipment are written on these decals. Refer to this information when ordering replacement parts.



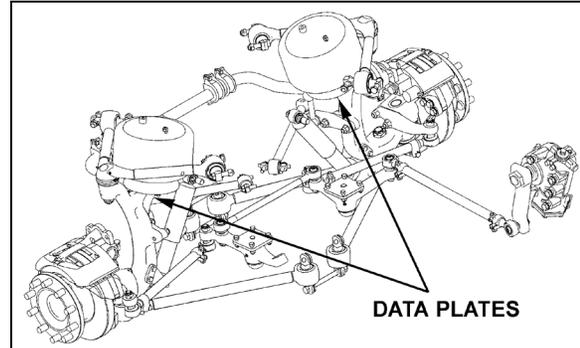
**SERIES 60 ENGINE** 00043



**TRANSMISSION DATA PLATE (ALLISON)** 07076



**DRIVE AXLE** 11019



**IFS TYPICAL SERIAL & MODEL NUMBERS** 00025C

## SAFETY CERTIFICATION

Vehicle components meet specifications and standards as follows:

- Material and parts conform to ASTM and/or SAE standards in effect at the time of manufacture.
- All factory-installed interior materials meet FMVSS 302 for fire resistance.
- Certified according to Provincial, State and Federal Safety standards (Canadian and US) BMCSS, FMVSS and CMVSS.

Other applicable certification labels are affixed to the applicable components.

## DOT CERTIFICATION PLATE

This certifies that vehicles manufactured by Prevest Car Inc. comply with all Federal Motor Vehicle Safety Standards at the time of manufacture. Information such as date of manufacture, model year, gross vehicle weight rating, tire types and inflation pressure is also etched on this plate. The DOT Certification plate is affixed to L.H. control panel.

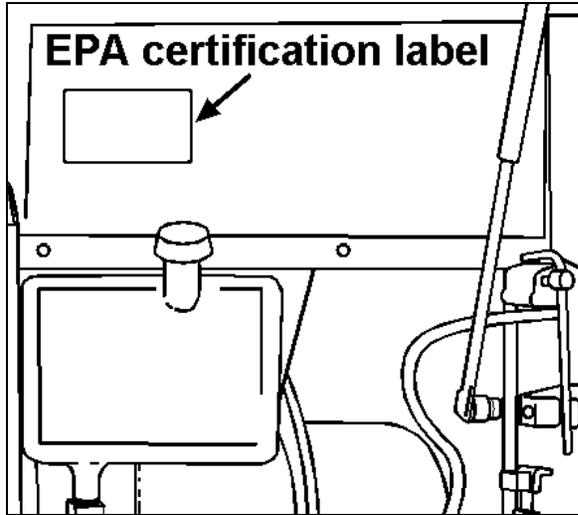
|   |             |                             |                                   |   |
|---|-------------|-----------------------------|-----------------------------------|---|
|   | PREVOST     |                             | MANUFACTURED BY: PREVOST CAR INC. |   |
|   | TYPE: M/VAG |                             | FABRIQUE PAR: STE-CLAUDE, QUE.    |   |
| VEHICLE IDENTIFICATION NO. / NO. IDENTIFICATION VEHICULE                            |             | DATE OF MFG. / DATE DE FAB. | AXLE / ESSELU                     | GRAND AXLE WEIGHT RATING / POIDS MAXIMUM BRAS |
| FRONT / AVANT   |             | FRONT / AVANT               | FRONT / AVANT                     | FRONT / AVANT                                 |
| DRIVE / MOTEUR  |             | DRIVE / MOTEUR              | DRIVE / MOTEUR                    | DRIVE / MOTEUR                                |
| TANDEM  |             | TANDEM                      | TANDEM                            | TANDEM  |
| GROSS VEHICLE WEIGHT RATING: 46000 LBS. / POIDS MAXIMUM BRUT DU VEHICULE: 20880 KG. |             |                             |                                   |   |
| #404564   |             |                             |                                   |   |

## DOT CERTIFICATION PLATE

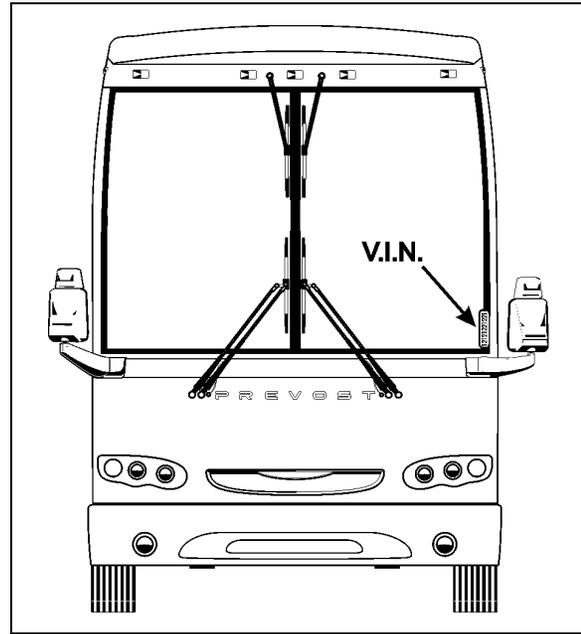
00016

### EPA ENGINE LABEL

The emissions certification label affixed to the panel over the engine oil reserve tank certifies that the engine conforms to federal and any state exhaust emissions regulations.



## VEHICLE IDENTIFICATION NUMBER (VIN)



VEHICLE IDENTIFICATION NUMBER

18491

The Vehicle Identification Number is stamped on a plate located on the windshield frame pillar (driver's side). The VIN is visible from the outside of the vehicle. Make sure the correct vehicle identification number is given when ordering replacement parts. Using the VIN when ordering parts will facilitate processing.

### COACH FINAL RECORD

The Coach Final Record is a record of all data pertaining to the assembly of the vehicle. This record is included in the technical publications package supplied with the vehicle. Retain this record in the company records office for reference and safe-keeping.

#### **NOTE**

*Record the VIN in the vehicle documentation and keep with company records. The VIN will normally be used for vehicle registration, service reference needs and for obtaining vehicle insurance coverage.*



**SERVICE LITERATURE**

Visit our web sit at [www.prevostcar.com](http://www.prevostcar.com) for on-line product information and technical publications!

Additional copies of the following service literature are available on request and at low cost.

- **Maintenance Manual**
- **Parts Manual**
- **Service Center Directory**

To order, call Prevost Parts toll free 1-800-463-8876 or write to:

**PREVOST PARTS INC.**

2955-A Watt Street  
Sainte-Foy, (Quebec)  
Canada G1X 3W1

**Specify the complete vehicle serial number. Allow 30 days for delivery**

**NOTICE**

**DECLARATION OF THE MANUFACTURING DEFECTS TO THE GOVERNMENT OF THE UNITED STATES**

If you believe that your vehicle has defect which could cause a crash or could cause injury or death, you should immediately inform the National Highway Traffic Safety Administration (NHTSA) in addition to notifying PrevoSt Car Inc..

If NHTSA receives similar complaints, it may open an investigation, and if it finds that a safety defect exists in a group of vehicles, it may order a recall and remedy campaign.

However, NHTSA cannot become involved in individual problems between you, your dealer, or PrevoSt Car Inc..

To contact NHTSA you may either call the Auto Safety Hotline toll-free at **1-800-424-9393** (or **366-0123** in Washington, D.C. area) or write to:

**NHTSA  
U.S. Department of transportation  
Washington, D.C. 20590.**

You can also obtain other information about motor vehicle safety from the Hotline.

**DECLARATION OF THE MANUFACTURING DEFECTS TO THE CANADIAN GOVERNMENT**

If you stay in Canada, and if you believe that your vehicle has a safety defect, you should immediately inform Transport Canada and PrevoSt Car Inc. You may write to:

**Transport Canada  
Box 8880  
Ottawa, Ontario, K1G 3J2**

**DECLARATION OF THE MANUFACTURING DEFECTS TO PREVOST CAR INC.**

In addition to notify the NHTSA (or Transport Canada), please contact PrevoSt Car at **1-418-831-2046**. Or you may write to :

**PrevoSt Car Inc.  
After-sales service department  
850 ch. Olivier,  
Saint-Nicolas (Quebec)  
Canada, G7A 2N1**

**ROADSIDE TROUBLESHOOTING GUIDE FOR MULTIPLEX VEHICLES**

| Problem/Symptom  | Probable Causes   | Actions   |
|--|---|---|
| Vehicle does not Start   | Rear Start selector switch is not at the NORMAL position<br><br>Battery master switch in the battery compartment is at the OFF position (down)                        | <ol style="list-style-type: none"> <li>1. Check that the rear start selector switch is flipped up to NORMAL start position and battery master switch is flipped up to ON and retry cranking</li> <li>2. Flip the rear start selector switch to "Rear Start" and start the vehicle from the rear</li> </ol>  |
|  | CAN network problem (Multiplex)<br><br>Module A53 not powered or is defective<br><br>Engine ECM does not receive the ignition signal<br><br>Engine ECM is not powered | If the vehicle does not start from the rear: <ol style="list-style-type: none"> <li>1. Verify that module A53 is powered:               <ol style="list-style-type: none"> <li>a) Check the SYSTEM DIAGNOSTIC menu of the message center display (MCD). Select FAULT DIAGNOSTIC and ELECTRICAL SYSTEM. The message "No Response ModA53, Active" indicates a power problem on the module or a CAN network problem.</li> <li>b) Check / reset circuit breaker CB5</li> <li>c) Check / replace fuse F65</li> <li>d) Probe gray connector on module to see if it is powered.</li> </ol> </li> <li>2. Verify that the engine ECM is powered and get the ignition signal               <ol style="list-style-type: none"> <li>a) Check / reset circuit breaker CB8<br/>Check / replace fuse F74</li> <li>b) Check / reset circuit breaker CB2<br/>Check / replace fuse F78</li> </ol> </li> </ol> |
| None of the Multiplexed functions are operating, including the basic limp-home functions (door opening, flashers, wipers in speed 1)<br><br>Three dashes "---" appear in the telltale panel instead of the outside temperature<br><br><i>Note: The sunshades are still functioning since these are not multiplexed</i> | The program version in the CECM is different than the program in the I/O modules and the CECM is forcing all I/O modules to stay inactive                             | <ol style="list-style-type: none"> <li>1. Engage the auto-programming of the I/O modules: Turn the ignition key to the OFF position, flip the battery master switch in the battery compartment to OFF and ON and then turn the ignition key ON. The letters CAN will appear in the telltale LCD panel for about 3 minutes Everything shall get back to normal once the letters CAN are replaced with outside temperature display</li> <li>2. Try disconnecting the green connector on the CECM and reconnect</li> <li>3. If step 1 and 2 are ineffective, try disconnecting the Master ID module completely and repeat step 1</li> <li>4. Try disconnecting the CECM</li> </ol>   |

## 128 APPENDIX B

| Problem/Symptom   | Probable Causes  | Actions  |
|---|--|--|
|   |  | completely, leave it disconnected and see if the limp-home functions (start of the vehicle from the engine compartment, wipers speed 1, flashers, etc ) are functioning  |
| <p>Many secondary functions (not essential for driving) not functioning (interior lighting, driver's area lighting, wiper speed 2 and intermittent)</p> <p>Outside temperature display in the telltale LCD panel displays three dashes "---"</p> <p>Marker lights and clearance lights are turned ON when setting ignition to the ON position</p> | <p>The CECM module does not receive 24 V power</p> <p>The CAN network is not working. It could be caused by a short on the network, an open circuit, a problem with the CECM or the CECM being disconnected from the network</p> | <ol style="list-style-type: none"> <li>1. Check / reset circuit breaker CB6 (4<sup>th</sup> from the top on the right side column) Check / replace fuse F1</li> <li>2. Operate in limp-home mode by starting the vehicle from the engine compartment (REAR START). All functions essential to drive are available</li> </ol> <p>To close and lock the door, pull the door manually up to its closed position and it will lock by itself. The door opening button is still functioning</p>  |
| <p>No temperature control in the passenger area</p> <p>Passenger temperature display indicates two dashes "--"</p>  | <p>Problem with the temperature sensor located in the evaporator compartment air intake or the sensor wiring</p>   | <ol style="list-style-type: none"> <li>1. Instruct the driver to manually control the temperature by playing with the passenger set point. Set above 22°C (72°F) to heat and below 22° C (72°F) to cool</li> </ol>   |
| <p>Entrance door does not open nor close using the control buttons</p> <p>Defroster fan not functioning</p> <p>Lower windshield wipers not functioning in speed 1 or intermittent</p>   | <p>Module A47 is not powered or is faulty</p>  | <ol style="list-style-type: none"> <li>1. Check the SYSTEM DIAGNOSTIC menu of the message center display (MCD). Select FAULT DIAGNOSTIC and ELECTRICAL SYSTEM. The message "No Response ModA47, Active" indicates a power problem on the module. (A CAN network problem would show the same message but doesn't produce these symptoms).</li> <li>2. Check / reset circuit breaker CB6</li> <li>3. Check / replace fuse F5</li> <li>4. Probe gray connector on module to see if it is powered.</li> <li>5. Use the air release valves near the entrance door and in the front service compartment to lock / unlock the door</li> </ol> |
| <p>Lower windshield wipers not functioning in speed 1 or intermittent</p>   | <p>No power on R23</p>   | <ol style="list-style-type: none"> <li>1. Check / replace fuse F82</li> </ol>  |
| <p>HVAC condenser fans not functioning in speed 1</p>   | <p>Circuit breaker CB12 was manually tripped and not reset</p>   | <ol style="list-style-type: none"> <li>1. Check / reset circuit breaker CB12</li> </ol>  |
| <p>HVAC condenser fans not functioning in speed 2</p>   | <p>Circuit breaker CB7 was manually tripped and not</p>  | <ol style="list-style-type: none"> <li>1. Check / reset circuit breaker CB7</li> </ol>   |

| Problem/Symptom  | Probable Causes  | Actions  |
|--|--|--|
| <p>Lower and upper windshield washer not functioning</p> <p>Upper windshield wiper not functioning</p> <p>Defroster fan is functioning but no heat or cooling available in the driver area</p> | <p>reset</p> <p>Module A46 is not powered or is faulty</p> | <ol style="list-style-type: none"> <li>1. Check the SYSTEM DIAGNOSTIC menu of the message center display (MCD). Select FAULT DIAGNOSTIC and ELECTRICAL SYSTEM. The message “No Response ModA46, Active” indicates a power problem on the module. (A CAN network problem would show the same message but doesn't produce these symptoms).</li> <li>2. Check / reset circuit breaker CB1</li> <li>3. Check / replace fuse F12</li> <li>4. Probe gray connector on module to see if it is powered.</li> </ol>         |
| <p>Low beam headlights and front flasher on left side not functioning</p> <p>Electric horn not functioning</p>   | <p>Module A45 is not powered or is faulty</p>              | <ol style="list-style-type: none"> <li>1. Check the SYSTEM DIAGNOSTIC menu of the message center display (MCD). Select FAULT DIAGNOSTIC and ELECTRICAL SYSTEM. The message “No Response ModA45, Active” indicates a power problem on the module. (A CAN network problem would show the same message but doesn't produce these symptoms).</li> <li>2. Check / reset circuit breaker CB2</li> <li>3. Check / replace fuse F33 and F34</li> <li>4. Probe gray connector on module to see if it is powered.</li> </ol> |
| <p>Low beam headlights and flasher on right side not functioning</p>   | <p>Module A48 is not powered or is faulty</p>              | <ol style="list-style-type: none"> <li>1. Check the SYSTEM DIAGNOSTIC menu of the message center display (MCD). Select FAULT DIAGNOSTIC and ELECTRICAL SYSTEM. The message “No Response ModA48, Active” indicates a power problem on the module. (A CAN network problem would show the same message but doesn't produce this symptom).</li> <li>2. Check / reset circuit breaker CB2</li> <li>3. Check / replace fuse F33 and F34</li> <li>4. Probe gray connector on module to see if it is powered.</li> </ol>   |
| <p>Rear flashers not functioning</p> <p>Stoplights and high-mounted stoplight not functioning</p>  | <p>Module A51 is not powered or is faulty</p>              | <ol style="list-style-type: none"> <li>1. Check the SYSTEM DIAGNOSTIC menu of the message center display (MCD). Select FAULT DIAGNOSTIC and ELECTRICAL SYSTEM. The message “No Response ModA51, Active” indicates a power problem on the module. (A CAN network problem</li> </ol>   |

## 130 APPENDIX B

| Problem/Symptom   | Probable Causes  | Actions  |
|---|--|--|
|   |  | <p>would show the same message but doesn't produce this symptom).</p> <ol style="list-style-type: none"> <li>2. Check / reset circuit breaker CB2</li> <li>3. Check / replace fuse F80</li> <li>4. Probe gray connector on module to see if it is powered.</li> </ol>  |
| <p>Engine is overheating and radiator fan clutch does not engage</p> <p>The A/C compressor clutch does not engage</p> | <p>Module A52 is not powered or is faulty</p>                                    | <ol style="list-style-type: none"> <li>1. Check the SYSTEM DIAGNOSTIC menu of the message center display (MCD). Select FAULT DIAGNOSTIC and ELECTRICAL SYSTEM. The message "No Response ModA52, Active" indicates a power problem on the module. (A CAN network problem would show the same message but doesn't produce this symptom).</li> <li>2. Check / reset circuit breaker CB5</li> <li>3. Check / replace fuse F65</li> <li>4. Probe gray connector on module to see if it is powered.</li> </ol>   |
| <p>Evaporator fan not functioning</p>   | <p>Circuit breaker CB3 tripped</p> <p>Module A54 is not powered or is faulty</p> | <ol style="list-style-type: none"> <li>1. Check / reset circuit breaker CB3</li> <li>2. Check the SYSTEM DIAGNOSTIC menu of the message center display (MCD). Select FAULT DIAGNOSTIC and ELECTRICAL SYSTEM. The message "No Response ModA54, Active" indicates a power problem on the module. (A CAN network problem would show the same message but doesn't produce this symptom).</li> <li>3. Check / reset circuit breaker CB5</li> <li>4. Check / replace fuse F67 , F68</li> <li>5. Probe gray connector on module to see if it is powered.</li> </ol> |
| <p>HVAC condenser fans not functioning in speed 1</p>   | <p>Module A54 is not powered or is faulty</p>                                    | <ol style="list-style-type: none"> <li>1. Check the SYSTEM DIAGNOSTIC menu of the message center display (MCD). Select FAULT DIAGNOSTIC and ELECTRICAL SYSTEM. The message "No Response ModA54, Active" indicates a power problem on the module. (A CAN network problem would show the same message but doesn't produce this symptom).</li> <li>2. Check / reset circuit breaker CB5</li> <li>3. Check / replace fuse F67 , F68</li> <li>4. Probe gray connector on module to see if it is powered.</li> </ol>   |

| Problem/Symptom  | Probable Causes   | Actions  |
|--|---|--|
| Sound system not functioning   | Circuit breaker CB4 or CB11 was manually tripped and not reset  | 1. Check / reset circuit breaker CB4 or CB11   |
| Fire alarm telltale light and audible alarm always ON and there is no fire or high temperature in the engine compartment     | Short-circuited fire sensor or defective sensor   | 1. Prior to start the vehicle, cycle the ignition key to the ON position, OFF position and then ON position again and then start the vehicle. This will deactivate the fire alarm function. This has to be repeated each time the vehicle is re-started  |
| The vehicle is parked and the electrical horn is activated to indicate a fire in the engine compartment but there is no fire | Short-circuited fire sensor or defective sensor   | 1. Cycle the ignition key between the ON and OFF position twice within 3 seconds. This will deactivate the fire alarm function. This has to be repeated each time the vehicle is parked  |
| A single light, a group of LED lights or another function of the vehicle is not functioning                                  | The multiplex outputs are protected in current by an internal "soft-fuse". When an output is shorted, it turns OFF and stays OFF until the "soft-fuse" is reset | 1. Turn the ignition key to the OFF position and turn to the ON position again. This resets all "soft-fuses"   |
| No backlighting in the instrument cluster  | Circuit breaker CB10 is tripped or fuse F20 blown   | Check / reset circuit breaker CB10<br>Check / replace fuse F20   |
| The radiator fan clutch does not function and the engine is overheating  |   | <ol style="list-style-type: none"> <li>1. Set the ignition key to the ON position.</li> <li>2. Activate the dashboard Telltale Light Test switch 3 times within 4 seconds.</li> <li>3. In the engine compartment, set the starter selector switch to REAR START and then start the engine from the rear. While in this mode, the rear start push-button can be used to manually engage the fan clutch. The Multiplex system knows when the engine is already running, and it will not activate the starter.</li> <li>4. Press the push-button one time to engage the clutch to 1<sup>st</sup> speed, press a second time to engage to 2<sup>nd</sup> speed, press a third time to stop the fan, press once again to return to 1<sup>st</sup> speed.</li> </ol> <p>If the fan clutch does not engage using this procedure then the clutch is faulty or the wiring between the multiplex module and the clutch is faulty. Mechanically lock the fan clutch as described in section 05: COOLING SYSTEM of the maintenance manual.</p> |



## DIAGNOSTIC TROUBLESHOOTING CODES (DTC) — ALLISON 4<sup>TH</sup> GENERATION CONTROLS

### DIAGNOSTIC TROUBLESHOOTING CODES (DTC) OVERVIEW

Diagnostic codes (DTC) are numerical indications relating to a malfunction in transmission operation. These codes are logged in a list in the TCM memory with the most severe or most recent code listed first. A maximum of five codes (numbered d1 to d5) may be listed in memory at one time. As codes are added, the oldest inactive code is dropped from the list. If all codes are active, the code with the lowest priority that is not included on the severity list is dropped from the list.

Diagnostic codes (DTC) and code information may be accessed through the pushbutton shift selector or using an Allison DOC™ diagnostic tool.

The TCM separately stores the active and inactive codes. An active code is any code that is current in the TCM decision-making process. Inactive codes are codes that are retained in the TCM memory and will not necessary affect the TCM decision-making process. Inactive codes are useful in determining if a problem is:

- Isolated ;
- Intermittent ;
- Result from a previous malfunction.

The TCM may automatically delete a code from memory if it has not recurred. If the MODE INDICATOR (LED) is not illuminated, the displayed code is not active. An illuminated MODE INDICATOR (LED) during normal operation signifies secondary shift mode operation.



### DIAGNOSTIC CODES – ALLISON 4<sup>TH</sup> GENERATION CONTROLS

When the diagnostic mode is entered, the first code (position d1) is displayed as follows:

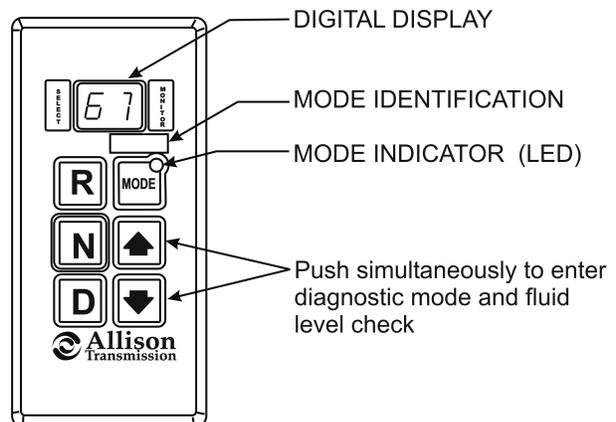
Exemple : Code P0722

Displayed as: **d1...P...07...22**

The code list position is the first item displayed, followed by the DTC. Each item is displayed for about one second. The display cycles continuously until the next code list position is accessed by pressing the **MODE** button. The following example shows how DTC P0722 is displayed on the pushbutton shift selector.

|        |   |   |         |
|--------|---|---|---------|
| SELECT | d | 1 | MONITOR |
|        |   | P |         |
|        | 0 | 7 |         |
|        | 2 | 2 |         |

- d1 (code list position) – The position which a code occupies in the list. Positions are displayed as « d1 » through « d5 » (code list position 1 through code list position 5).
- P0722 (DTC) – The diagnostic troubleshooting code number referring to the general condition or area of fault detected by the TCM.



## 134 APPENDIX C

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### DIAGNOSTIC CODE DISPLAY AND CLEARING PROCEDURE – ALLISON 4<sup>TH</sup> GENERATION CONTROLS

Diagnostic codes can be read and cleared by two methods:

- Using an Allison DOC™ diagnostic tool. For specific instructions on how to use an Allison DOC™ diagnostic tool, refer to the User Guide.
- Using the pushbutton shift selector.

*To begin the diagnostic process:*

1. Bring the vehicle to a stop at a safe location.
2. Apply the parking brake.

*To display stored codes:*

1. Simultaneously press the ▲ (Up) and ▼ (Down) arrow buttons twice to access the Diagnostic Display Mode.

|                    |
|--------------------|
| <b><i>NOTE</i></b> |
|--------------------|

|   |
|---|
| <i>To access the Oil Level Display Mode, simultaneously press the ▲ (Up) and ▼ (Down) arrow buttons once. Consult paragraph: « ALLISON TRANSMISSION OIL LEVEL CHECK USING THE PUSHBUTTON SHIFT SELECTOR » at the end of this section.</i> |
|---|

2. Observe the digital display for code (d1).
3. Press the MODE button to see the next code (d2) – repeat for subsequent codes (d3, d4 & d5).

|                    |
|--------------------|
| <b><i>NOTE</i></b> |
|--------------------|

|  |
|--|
| <i>Be sure to record all codes displayed before they are cleared. This is essential for troubleshooting.</i> |
|--|

|                    |
|--------------------|
| <b><i>NOTE</i></b> |
|--------------------|

|  |
|--|
| <i>The Diagnostic Display Mode can be entered for viewing codes at any speed. Codes can only be cleared when the output speed = 0 and no output speed sensor failure is active</i> |
|--|

Active indicators (MODE INDICATOR LED) and inactive codes can be cleared manually, while in the diagnostic display mode, after the condition causing the code is identified.

*To clear active indicators and inactive codes:*

1. While in Diagnostic Display Mode, press and hold the MODE button for 10 seconds to clear both active indicators and inactive codes.
2. Begin operating as normal. Have the transmission checked at the earliest opportunity by an Allison Transmission distributor or dealer.

|   |
|---|
| <b><i>NOTE</i></b>  |
| <i>All active indicators are cleared at TCM power down.</i>   |
| <i>Some codes will clear their active indicator when the condition causing the code is no longer detected by the TCM.</i> |

The Diagnostic Display Mode can be exited by any of the following methods:

- Press simultaneously the ▲ (Up) and ▼ (Down) arrow buttons at the same time on the pushbutton shift selector.
- Press any range button «D», «N» or «R» on the pushbutton shift selector (the shift will be commanded if it is not inhibited by an active code).
- Wait until the calibrated time (approximately 10 minutes) has passed. The system will automatically return to the normal operating mode.
- Turn off power to the TCM (shut off the engine using the ignition key).

|  |
|--|
| <b><i>NOTE</i></b>   |
| <i>If clearing a code while locked in a «D» (Drive) or «R» (Reverse) position (fail-to-range), the transmission will still be in «D» (Drive) or «R» (Reverse) when the clearing procedure is completed. «N» (Neutral) must be manually selected.</i> |

**DIAGNOSTIC CODE RESPONSE**

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

**DNS - Do Not Shift Response**

- Release lock up clutch and inhibit lock up operation.
- Inhibit all shifts.
- Turn *ON* the CHECK TRANS light.
- Display the range attained.
- Ignore any range selection inputs from the shift selector.

**DNA - Do Not Adapt Response**

The TCM stops adaptive shift control while the code is active.

**SOL OFF - SOLenoid OFF Response**

All solenoids are commanded *OFF* (turning solenoids "A" and "B" off electrically cause them to be on hydraulically).

**RPR - Return to Previous Range Response**

When the speed sensor ratio or C3 pressure switch test associated with a shift not successful, the TCM commands the same range as commanded before the shift.

**NNC - Neutral No Clutches Response**

When certain speed sensor ratio or C3 pressure switch tests are not successful, the TCM commands a neutral condition with no clutches applied.

## 136 APPENDIX C

### DIAGNOSTIC TROUBLESHOOTING CODES (DTC) LIST - ALLISON 4<sup>TH</sup> GENERATION CONTROLS

| DTC   | Description   | CHECK TRANS Light | Inhibited Operation Description   |
|-------|---|-------------------|---|
| C1312 | Retarder Request Sensor Failed Low                        | No                | May inhibit retarder operation if not using J1939 datalink  |
| C1313 | Retarder Request Sensor Failed High                       | No                | May inhibit retarder operation if not using J1939 datalink  |
| P0122 | Pedal Position Sensor Low Voltage                         | No                | Use default throttle values. Freezes shift adapts.  |
| P0123 | Pedal Position Sensor High Voltage                        | No                | Use default throttle values. Freezes shift adapts.  |
| P0218 | Transmission Fluid Over Temperature                       | No                | Use hot mode shift schedule. Holds fourth range. TCC is inhibited. Freezes shift adapts.                    |
| P0602 | TCM Not Programmed  | Yes               | Lock in Neutral   |
| P0610 | TCM Vehicle Options (Trans ID) Error                      | Yes               | Use TID A calibration   |
| P0613 | TCM Processor   | No                | All solenoids off   |
| P0614 | Torque Control Data Mismatch - ECM/TCM                    | Yes               | Allows operation only in reverse and second range.  |
| P0634 | TCM Internal Temperature Too High                         | Yes               | SOL OFF (hydraulic default)   |
| P063E | Auto Configuration Throttle Input Not Present             | Yes               | Use default throttle values   |
| P063F | Auto Configuration Engine Coolant Temp Input Not Present  | No                | None  |
| P0658 | Actuator Supply Voltage 1 (HSD1) Low                      | Yes               | DNS, SOL OFF (hydraulic default)  |
| P0659 | Actuator Supply Voltage 1 (HSD1) High                     | Yes               | DNS, SOL OFF (hydraulic default)  |
| P0702 | Transmission Control System Electrical (TransID)          | Yes               | Use TID A calibration   |
| P0703 | Brake Switch Circuit Malfunction                          | No                | No Neutral to Drive shifts for refuse packer. TCM inhibits retarder operation if a TPS code is also active. |
| P0708 | Transmission Range Sensor Circuit High Input              | Yes               | Ignore defective strip selector inputs  |
| P070C | Transmission Fluid Level Sensor Circuit – Low Input       | No                | None  |
| P070D | Transmission Fluid Level Sensor Circuit – High Input      | No                | None  |
| P0711 | Transmission Fluid Temperature Sensor Circuit Performance | Yes               | Use default sump temp   |
| P0712 | Transmission Fluid Temperature Sensor Circuit Low Input   | Yes               | Use default sump temp   |
| P0713 | Transmission Fluid Temperature Sensor Circuit High Input  | Yes               | Use default sump temp   |
| P0716 | Turbine Speed Sensor Circuit Performance                  | Yes               | DNS, Lock in current range  |
| P0717 | Turbine Speed Sensor Circuit No Signal                    | Yes               | DNS, Lock in current range  |
| P0719 | Brake Switch ABS Input Low                                | No                | TCM assumes ABS is OFF  |
| P071A | RELS Input Failed On                                      | Yes               | Inhibit RELS operation  |
| P071D | General Purpose Input Fault                               | Yes               | None  |
| P0721 | Output Speed Sensor Circuit Performance                   | Yes               | DNS, Lock in current range  |
| P0722 | Output Speed Sensor Circuit No Signal                     | Yes               | DNS, Lock in current range  |
| P0726 | Engine Speed Sensor Circuit Performance                   | No                | Default to turbine speed  |
| P0727 | Engine Speed Sensor Circuit No Signal                     | No                | Default to turbine speed  |
| P0729 | Incorrect 6 <sup>th</sup> Gear Ratio                      | Yes               | DNS, Attempt 5 <sup>th</sup> , then 3 <sup>rd</sup>   |
| P0731 | Incorrect 1 <sup>st</sup> Gear ratio                      | Yes               | DNS, Attempt 2 <sup>nd</sup> , then 5 <sup>th</sup>   |
| P0732 | Incorrect 2 <sup>nd</sup> Gear ratio                      | Yes               | DNS, Attempt 3 <sup>rd</sup> , then 5 <sup>th</sup>   |

| <b>DTC</b> | <b>Description</b>                                      | <b>CHECK TRANS Light</b> | <b>Inhibited Operation Description</b>                                     |
|------------|---|--------------------------|--|
| P0733      | Incorrect 3 <sup>rd</sup> Gear ratio                    | Yes                      | DNS, Attempt 4 <sup>th</sup> , then 6 <sup>th</sup>                        |
| P0734      | Incorrect 4 <sup>th</sup> Gear ratio                    | Yes                      | DNS, Attempt 5 <sup>th</sup> , then 3 <sup>rd</sup>                        |
| P0735      | Incorrect 5 <sup>th</sup> Gear ratio                    | Yes                      | DNS, Attempt 6 <sup>th</sup> , then 3 <sup>rd</sup> , then 2 <sup>nd</sup> |
| P0736      | Incorrect Reverse Gear ratio                            | Yes                      | DNS, Lock in Neutral   |
| P0741      | Torque Converter Clutch System Stuck Off                | Yes                      | None   |
| P0776      | Pressure Control Solenoid 2 Stuck Off                   | Yes                      | DNS, RPR   |
| P0777      | Pressure Control Solenoid 2 Stuck On                    | Yes                      | DNS, RPR   |
| P0796      | Pressure Control Solenoid 3 Stuck Off                   | Yes                      | DNS, RPR   |
| P0797      | Pressure Control Solenoid 3 Stuck On                    | Yes                      | DNS, RPR   |
| P0842      | Transmission Pressure Switch 1 Circuit Low              | Yes                      | DNS, Lock in current range   |
| P0843      | Transmission Pressure Switch 1 Circuit High             | Yes                      | DNS, Lock in current range   |
| P0880      | TCM Power Input Signal                                  | No                       | None   |
| P0881      | TCM Power Input Signal Performance                      | No                       | None   |
| P0882      | TCM Power Input Signal Low                              | Yes                      | DNS, SOL OFF (hydraulic default)   |
| P0883      | TCM Power Input Signal High                             | No                       | None   |
| P0894      | Transmission Component Slipping                         | Yes                      | DNS, Lock in first   |
| P0960      | Pressure Control Solenoid Main Mod Control Circuit Open | Yes                      | None   |
| P0962      | Pressure Control Solenoid Main Mod Control Circuit Low  | Yes                      | DNS, SOL OFF (hydraulic default)   |
| P0963      | Pressure Control Solenoid Main Mod Control Circuit High | Yes                      | None   |
| P0964      | Pressure Control Solenoid 2 (PCS2) Control Circuit Open | Yes                      | DNS, SOL OFF (hydraulic default)   |
| P0966      | Pressure Control Solenoid 2 (PCS2) Control Circuit Low  | Yes                      | DNS, SOL OFF (hydraulic default)   |
| P0967      | Pressure Control Solenoid 2 (PCS2) Control Circuit High | Yes                      | DNS, SOL OFF (hydraulic default)   |
| P0968      | Pressure Control Solenoid 3 (PCS3) Control Circuit Open | Yes                      | DNS, SOL OFF (hydraulic default)   |
| P0970      | Pressure Control Solenoid 3 (PCS3) Control Circuit Low  | Yes                      | DNS, SOL OFF (hydraulic default)   |
| P0971      | Pressure Control Solenoid 3 (PCS3) Control Circuit High | Yes                      | DNS, SOL OFF (hydraulic default)   |
| P0973      | Shift Solenoid 1 (SS1) Control Circuit Low              | Yes                      | DNS, SOL OFF (hydraulic default)   |
| P0974      | Shift Solenoid 1 (SS1) Control Circuit High             | Yes                      | DNS, SOL OFF (hydraulic default)   |
| P0975      | Shift Solenoid 2 (SS2) Control Circuit Open             | Yes                      | 7-speed: Allow 2 through 6, N, R   |
| P0976      | Shift Solenoid 2 (SS2) Control Circuit Low              | Yes                      | 7-speed: Allow 2 through 6, N, R<br>Inhibit TCC operation                  |
| P0977      | Shift Solenoid 2 (SS2) Control Circuit High             | Yes                      | 7-speed: Allow 2 through 6, N, R   |
| P0989      | Retarder Pressure Sensor Failed Low                     | No                       | None   |
| P0990      | Retarder Pressure Sensor Failed High                    | No                       | None   |
| P1739      | Incorrect Low Gear Ratio                                | Yes                      | Command 2 <sup>nd</sup> and allow shifts 2 through 6, N, R                 |
| P1891      | Throttle Position Sensor PWM Signal Low Input           | No                       | Use default throttle values  |
| P1892      | Throttle Position Sensor PWM Signal High Input          | No                       | Use default throttle values  |
| P2184      | Engine Coolant Temperature Sensor Circuit Low Input     | No                       | Use default engine coolant values  |
| P2185      | Engine Coolant Temperature Sensor Circuit High Input    | No                       | Use default engine coolant values  |
| P2637      | Torque Management Feedback Signal (SEM)                 | Yes                      | Inhibit SEM  |
| P2641      | Torque Management Feedback Signal (LRTP)                | Yes                      | Inhibit LRTP   |
| P2670      | Actuator Supply Voltage 2 (HSD2) Low                    | Yes                      | DNS, SOL OFF (hydraulic default)   |
| P2671      | Actuator Supply Voltage 2 (HSD2) High                   | Yes                      | DNS, SOL OFF (hydraulic default)   |
| P2685      | Actuator Supply Voltage 3 (HSD3) Low                    | Yes                      | DNS, SOL OFF (hydraulic default)   |

## 138 APPENDIX C

| DTC   | Description   | CHECK TRANS Light | Inhibited Operation Description                               |
|-------|---|-------------------|---|
| P2686 | Actuator Supply Voltage 3 (HSD3) High                           | Yes               | DNS, SOL OFF (hydraulic default)                              |
| P2714 | Pressure Control Solenoid 4 (PCS4) Stuck Off                    | Yes               | DNS, RPR  |
| P2715 | Pressure Control Solenoid 4 (PCS4) Stuck On                     | Yes               | DNS, SOL OFF (hydraulic default)                              |
| P2718 | Pressure Control Solenoid 4 (PCS4) Control Circuit Open         | Yes               | DNS, SOL OFF (hydraulic default)                              |
| P2720 | Pressure Control Solenoid 4 (PCS4) Control Circuit Low          | Yes               | DNS, SOL OFF (hydraulic default)                              |
| P2721 | Pressure Control Solenoid 4 (PCS4) Control Circuit High         | Yes               | DNS, SOL OFF (hydraulic default)                              |
| P2723 | Pressure Control Solenoid 1 (PCS1) Stuck Off                    | Yes               | DNS, RPR  |
| P2724 | Pressure Control Solenoid 1 (PCS1) Stuck On                     | Yes               | DNS, RPR  |
| P2727 | Pressure Control Solenoid 1 (PCS1) Control Circuit Open         | Yes               | DNS, SOL OFF (hydraulic default)                              |
| P2729 | Pressure Control Solenoid 1 (PCS1) Control Circuit Low          | Yes               | DNS, SOL OFF (hydraulic default)                              |
| P2730 | Pressure Control Solenoid 1 (PCS1) Control Circuit High         | Yes               | DNS, SOL OFF (hydraulic default)                              |
| P2736 | Pressure Control Solenoid 5 (PCS5) Control Circuit Open         | Yes               | Inhibit retarder operation                                    |
| P2738 | Pressure Control Solenoid 5 (PCS5) Control Circuit Low          | Yes               | Allow 2 through 6, N, R. Inhibit retarder and TCC operation   |
| P2739 | Pressure Control Solenoid 5 (PCS5) Control Circuit High         | Yes               | Inhibit retarder operation                                    |
| P2740 | Retarder Oil Temperature Hot                                    | No                | None  |
| P2742 | Retarder Oil Temperature Sensor Circuit – Low Input             | No                | Use default retarder temp values                              |
| P2743 | Retarder Oil Temperature Sensor Circuit – High Input            | No                | Use default retarder temp values                              |
| P2761 | TCC PCS Control Circuit Open                                    | Yes               | Inhibit TCC operation   |
| P2763 | TCC PCS Control Circuit High                                    | Yes               | Inhibit TCC operation   |
| P2764 | TCC PCS Control Circuit Low                                     | Yes               | 7-speed: Allow 2 through 6, N, R. Inhibit TCC operation       |
| P278A | Kickdown Input Failed ON  | No                | Inhibit kickdown operation                                    |
| P2793 | Gear Shift Direction Circuit                                    | Yes               | Ignores PWM input from shift selector                         |
| P2808 | Pressure Control Solenoid 6 (PCS6) Stuck Off                    | Yes               | DNS, RPR  |
| P2809 | Pressure Control Solenoid 6 (PCS6) Stuck On                     | Yes               | DNS, RPR  |
| P2812 | Pressure Control Solenoid 6 (PCS6) Control Circuit Open         | Yes               | DNS, SOL OFF (hydraulic default)                              |
| P2814 | Pressure Control Solenoid 6 (PCS6) Control Circuit Low          | Yes               | DNS, SOL OFF (hydraulic default)                              |
| P2815 | Pressure Control Solenoid 6 (PCS6) Control Circuit High         | Yes               | DNS, SOL OFF (hydraulic default)                              |
| U0001 | Hi Speed CAN Bus Reset Counter Overrun (IESCAN)                 | No                | Use default values, inhibit SEM                               |
| U0010 | CAN BUS Reset Counter Overrun                                   | No                | Use default values, inhibit SEM                               |
| U0100 | Lost Communications with ECM/PCM (J1587)                        | Yes               | Use default values  |
| U0103 | Lost Communication with Gear Shift Module (Shift Selector) 1    | Yes               | Maintain range selected, observe gear shift direction circuit |
| U0115 | Lost Communication with ECM                                     | Yes               | Use default values  |
| U0291 | Lost Communication with Gear Shift Module (Shift Selector) 2    | Yes               | Maintain range selected, observe gear shift direction circuit |
| U0304 | Incompatible Gear Shift Module 1 (Shift Selector) ID            | Yes               | Ignore shift selector inputs                                  |
| U0333 | Incompatible Gear Shift Module 2 (Shift Selector) ID            | Yes               | Ignore shift selector inputs                                  |
| U0404 | Invalid Data Received From Gear Shift Module (Shift Selector) 1 | Yes               | Maintain range selected, observe gear shift direction circuit |
| U0592 | Invalid Data Received From Gear Shift Module (Shift Selector) 2 | Yes               | Maintain range selected, observe gear shift direction circuit |

### ALLISON TRANSMISSION OIL LEVEL CHECK USING THE PUSHBUTTON SHIFT SELECTOR

Oil level codes are obtained as follows:

1. Park vehicle on a level surface, select «N» (neutral) on the pushbutton shift selector and apply parking brake.
2. Press simultaneously the ▲ (Up) and ▼ (Down) arrow buttons once.
3. Oil level codes are displayed in 2 minutes (e.g. display will flash and 8, 7, 6, 5, ...; countdown will occur during the 2 minutes) once the following parameters are met:
  - **Waiting time, vehicle must be stationary for at least 2 minutes to allow the oil to settle;**
  - **Engine at idle;**
  - **Oil at normal operating temperature, between 140°F (60°C) and 220°F (104°C);**
  - **Transmission in «N» (Neutral);**
  - **Transmission output shaft stopped;**
  - **Oil level sensor present and working.**

After 2 minutes, the display will flash one of the codes shown below:

| CODE           | CAUSE OF CODE        |
|----------------|----------------------|
| O L...O K      | Oil level is correct |
| O L...L O...01 | One quart low        |
| O L...L O...02 | Two quarts low       |
| O L...H I...01 | One quart high       |
| O L...H I...02 | Two quarts high      |

| CODE        | CAUSE OF CODE                 |
|-------------|-------------------------------|
| OL...-...0X | Waiting time too short        |
| OL...50     | Engine speed (rpm) too low    |
| OL...59     | Engine speed (rpm) too high   |
| OL...65     | Neutral must be selected      |
| OL...70     | Sump oil temperature too low  |
| OL...79     | Sump oil temperature too high |
| OL...89     | Output shaft rotation         |
| OL...95     | Sensor failure                |

#### Exiting the Fluid Level Display Mode

To exit the Oil Level Display Mode, press any range button: «R», «N» or «D».

**NOTE**

*Failure to meet one of the above parameters will stop the two minute countdown. One of the codes shown hereafter will indicate the cause of the countdown interruption. Once all parameters are met, the countdown will continue from where it left off.*



## DDEC V DIAGNOSTIC CODES

To read the diagnostic codes, a Diagnostic Data Reader should be plugged into the receptacle located on the lower side panel of the L.H. control panel. To read diagnostic codes as blink codes, momentarily depress the STOP ENGINE OVERRIDE switch while the ignition is ON, the engine is idling or shut off. Active codes will be flashed on the STOP ENGINE indicator light followed by the inactive codes being flashed on the CHECK ENGINE indicator light. The cycle is repeated until the operator depresses the STOP ENGINE OVERRIDE switch again. For example: code "43" consists of four flashes, followed by a short pause, then another three flashes in quick succession. The following table is a list of the DDEC diagnostic codes.

| DDEC V Code | PID | SID | FMI | DESCRIPTION   |
|-------------|-----|-----|-----|---|
| 11          | 187 | --  | 4   | Variable Speed Governor Sensor Voltage Low                |
| 11          | 187 | --  | 7   | Variable Speed Governor Switch System Not Responding      |
| 12          | 187 | --  | 3   | Variable Speed Governor Sensor Voltage High               |
| 13          | 111 | --  | 4   | Coolant Level Sensor Input Voltage Low                    |
| 13          | 111 | --  | 6   | Add Coolant Level Sensor Input Voltage Low                |
| 13          |     | 146 | 6   | EGR Valve Current too High                                |
| 14          | 52  | --  | 3   | Intercooler Coolant Temperature Sensor Input Voltage High |
| 14          | 110 | --  | 3   | Coolant Temperature Sensor Input Voltage High             |
| 14          | 175 | --  | 3   | Oil Temperature Sensor Input Voltage High                 |
| 15          | 52  | --  | 4   | Intercooler Coolant Temperature Sensor Input Voltage Low  |
| 15          | 110 | --  | 4   | Coolant Temperature Sensor Input Voltage Low              |
| 15          | 175 | --  | 4   | Oil Temperature Sensor Input Voltage Low                  |
| 16          | 111 | --  | 3   | Coolant Level Sensor Input Voltage High                   |
| 16          | 111 | --  | 5   | Add Coolant Level Sensor Input Voltage High               |
| 16          |     | 146 | 5   | EGR Valve Current too Low                                 |
| 17          | 51  | --  | 3   | Throttle Plate Position Sensor Input Voltage High         |
| 17          | 72  | --  | 3   | Blower Bypass Position Input Voltage High                 |
| 17          | 354 | --  | 3   | Relative Humidity Sensor Circuit Failed High              |
| 18          | 51  | --  | 4   | Throttle Plate Position Sensor Input Voltage Low          |
| 18          | 72  | --  | 4   | Blower Bypass Position Input Voltage Low                  |
| 18          | 354 | --  | 4   | Relative Humidity Sensor Circuit Failed Low               |
| 21          | 91  | --  | 3   | Throttle Position Sensor Input Voltage High               |
| 22          | 91  | --  | 4   | Throttle Position Sensor Input Voltage Low                |
| 23          | 174 | --  | 3   | Fuel Temperature Sensor Input Voltage High                |
| 23          | --  | 65  | 3   | Oxygen Content Circuit Input Voltage High                 |
| 24          | 174 | --  | 4   | Fuel Temperature Sensor Input Voltage Low                 |

## 142 APPENDIX D

| DDEC V Code | PID | SID | FMI | DESCRIPTION   |
|-------------|-----|-----|-----|---|
| 24          | --  | 65  | 4   | Oxygen Content Circuit Input Voltage Low                  |
| 25          | --  | --  | --  | Reserved for "No Codes"                                   |
| 26          | --  | 25  | 11  | Aux. Shutdown #1 Active                                   |
| 26          | --  | 61  | 11  | Aux. Shutdown #2 Active                                   |
| 27          | 105 | --  | 3   | Intake Manifold Temperature Sensor Input Voltage High     |
| 27          | 171 | --  | 3   | Ambient Air Temperature Sensor Input Voltage High         |
| 27          | 172 | --  | 3   | Air Temperature Sensor Input Voltage High                 |
| 28          | 105 | --  | 4   | Intake Manifold Temperature Sensor Input Voltage Low      |
| 28          | 171 | --  | 4   | Ambient Air Temperature Sensor Input Voltage Low          |
| 28          | 172 | --  | 4   | Air Temperature Sensor Input Voltage Low                  |
| 29          | 351 | —   | 4   | TCI Temperature Circuit Failed Low                        |
| 29          | 404 | —   | 4   | Turbo Compressor Temperature Out Sensor Input Voltage Low |
| 31          | --  | 51  | 3   | Aux. Output #3 Open Circuit (High Side) – Pin E-49        |
| 31          | --  | 51  | 4   | Aux. Output #3 Short To Ground (High Side) – Pin E-49     |
| 31          | --  | 51  | 7   | Aux. Output #3 Mechanical System Fail - Pin E-49          |
| 31          | --  | 52  | 3   | Aux. Output #4 Open Circuit (High Side) - Pin E-48        |
| 31          | --  | 52  | 4   | Aux. Output #4 Short to Ground (High Side) - Pin E-48     |
| 31          | --  | 52  | 7   | Aux. Output #4 Mechanical System Failure - Pin E-48       |
| 31          | --  | 260 | 3   | Aux. Output #12 Open Circuit (High Side) - Pin E-46       |
| 31          | --  | 260 | 4   | Aux. Output #12 Short to Ground (High Side) - Pin E-46    |
| 31          | --  | 260 | 7   | Aux. Output #12 Mechanical System Failure - Pin E-46      |
| 31          | --  | 261 | 3   | Aux. Output #13 Open Circuit (High Side) - Pin E-47       |
| 31          | --  | 261 | 4   | Aux. Output #13 Short to Ground (High Side) - Pin E-47    |
| 31          | --  | 261 | 7   | Aux. Output #13 Mechanical System Failure - Pin E-47      |
| 31          | --  | 262 | 3   | Aux. Output #14 Open Circuit (High Side) - Pin E-50       |
| 31          | --  | 262 | 4   | Aux. Output #14 Short to Ground (High Side) - Pin E-50    |
| 31          | --  | 262 | 7   | Aux. Output #14 Mechanical System Failure - Pin E-50      |
| 31          | --  | 263 | 3   | Aux. Output #15 Open Circuit (High Side) - Pin E-51       |
| 31          | --  | 263 | 4   | Aux. Output #15 Short to Ground (High Side) - Pin E-51    |
| 31          | --  | 263 | 7   | Aux. Output #15 Mechanical System Failure - Pin E-51      |
| 31          | --  | 264 | 3   | Aux. Output #16 Open Circuit (High Side) - Pin E-52       |
| 31          | --  | 264 | 4   | Aux. Output #16 Short to Ground (High Side) - Pin E-52    |
| 31          | --  | 264 | 7   | Aux. Output #16 Mechanical System Failure - Pin E-52      |
| 31          | --  | 265 | 3   | Aux. Output #17 Open Circuit (High Side) - Pin E-53       |
| 31          | --  | 265 | 4   | Aux. Output #17 Short to Ground (High Side) - Pin E-53    |
| 31          | --  | 265 | 7   | Aux. Output #17 Mechanical System Failure - Pin E-53      |

| <b>DDEC V Code</b> | <b>PID</b> | <b>SID</b> | <b>FMI</b> | <b>DESCRIPTION</b>                                     |
|--------------------|------------|------------|------------|--|
| 32                 | --         | 238        | 3          | RSL Short to Battery (+)                               |
| 32                 | --         | 238        | 4          | RSL Open Circuit                                       |
| 32                 | --         | 239        | 3          | AWL Short to Battery (+)                               |
| 32                 | --         | 239        | 4          | AWL Open Circuit                                       |
| 33                 | 102        | --         | 3          | Turbo Boost Pressure Sensor Input Voltage High         |
| 34                 | 102        | --         | 4          | Turbo Boost Pressure Sensor Input Voltage Low          |
| 35                 | 19         | --         | 3          | High Range Oil Pressure Sensor Input Voltage High      |
| 35                 | 100        | --         | 3          | Oil Pressure Sensor Input Voltage High                 |
| 36                 | 19         | --         | 4          | High Range Oil Pressure Sensor Input Voltage Low       |
| 36                 | 100        | --         | 4          | Oil Pressure Sensor Input Voltage Low                  |
| 37                 | 18         | --         | 3          | High Range Fuel Pressure Sensor Input Voltage High     |
| 37                 | 94         | --         | 3          | Fuel Pressure Sensor Input Voltage High                |
| 37                 | 95         | --         | 3          | Fuel Restriction Sensor Input Voltage High             |
| 38                 | 18         | --         | 4          | High Range Fuel Pressure Sensor Input Voltage Low      |
| 38                 | 94         | --         | 4          | Fuel Pressure Sensor Input Voltage Low                 |
| 38                 | 95         | --         | 4          | Fuel Restriction Sensor Input Voltage Low              |
| 39                 | —          | 146        | 2          | EGR Leak- Boost Power                                  |
| 39                 | —          | 146        | 12         | EGR Leak- Boost Jake                                   |
| 39                 | —          | 146        | 7          | EGR Valve Not Responding                               |
| 39                 | —          | 147        | 2          | VNT Vanes Not Responding – Boost Power                 |
| 39                 | —          | 147        | 11         | VNT Vanes at Max – Jake                                |
| 39                 | —          | 147        | 12         | VNT Vanes Not Responding – Boost Jake                  |
| 39                 | —          | 147        | 14         | EGR Flow too low                                       |
| 39                 | —          | 147        | 7          | VNT Vanes Not Responding – EGR                         |
| 41                 | --         | 21         | 0          | Too Many CKP Sensor (missing CMP Sensor)               |
| 42                 | --         | 21         | 1          | Too few CKP Sensor (missing CKP Sensor)                |
| 43                 | 111        | --         | 1          | Coolant Level Low                                      |
| 44                 | 52         | --         | 0          | Intercooler Coolant Temperature High                   |
| 44                 | 105        | --         | 0          | Intake Manifold Temperature High                       |
| 44                 | 105        | --         | 14         | Engine Power Derate Due to Intake Manifold Temperature |
| 44                 | 110        | --         | 0          | Coolant Temperature High                               |
| 44                 | 110        | --         | 14         | Engine Power Derate Due to Coolant Temperature         |
| 44                 | 172        | --         | 0          | Air Inlet Temperature High                             |
| 44                 | 175        | --         | 0          | Oil Temperature High                                   |
| 45                 | 19         | --         | 1          | High Range Oil Pressure Low                            |
| 45                 | 100        | --         | 1          | Oil Pressure Low                                       |
| 46                 | 168        | --         | 1          | ECM Battery Voltage Low                                |

## 144 APPENDIX D

| DDEC V Code | PID | SID | FMI | DESCRIPTION  |
|-------------|-----|-----|-----|--|
| 46          | --  | 155 |     | Injector V (reg) Voltage Failed Low  |
| 46          | --  | 211 | 1   | Sensor Supply Pins V-11/V-12 Low   |
| 46          | --  | 212 | 4   | Injector V (slope) Voltage Failed Low  |
| 46          | --  | 214 | 1   | RTC Backup Battery Voltage Low, Pin E-59   |
| 46          | --  | 221 | 4   | Injector I (pull-in) Voltage Failed Low  |
| 46          | --  | 232 | 1   | Sensor Supply Voltage Low, Pin E-12/E-26   |
| 47          | 18  | --  | 0   | High Range Fuel Pressure High  |
| 47          | 94  | --  | 0   | Fuel Pressure High   |
| 47          | 102 | --  | 0   | Turbo Boost Pressure High  |
| 47          | 102 | --  | 14  | Engine Power Derate Due to Turbo Boost Pressure  |
| 47          | 106 | --  | 0   | Air Inlet Pressure High  |
| 47          | 164 | --  | 0   | Injection Control Pressure High  |
| 48          | 18  | --  | 1   | High Range Fuel Pressure Low   |
| 48          | 94  | --  | 1   | Fuel Pressure Low  |
| 48          | 106 | --  | 1   | Air Inlet Pressure Low   |
| 48          | 164 | --  | 1   | Injection Control Pressure Low   |
| 48          | 351 | --  | 1   | TCI Temperature Low  |
| 48          | 404 | --- | 1   | Turbo Compressor Temperature Out Low   |
| 48          | 404 | --  | 14  | Engine Power Derate Due to Turbo Compressor Out Temperature  |
| 48          | 411 | --  | 1   | EGR Differential Pressure Low  |
| 48          | 412 | --  | 1   | EGR Temperature Low  |
| 49          | 351 | --  | 0   | TCI Temperature High   |
| 49          | 404 | --  | 0   | Turbo Compressor Out Temperature High  |
| 51          | 351 | --  | 3   | TCI Temperature Circuit Failed High  |
| 51          | 404 | --  | 3   | Turbo Compressor Out Temperature Sensor Input Voltage High   |
| 52          | --  | 254 | 12  | A/D Conversion Fail  |
| 53          | --  | 253 | 2   | Nonvolatile Checksum Incorrect   |
| 53          | --  | 253 | 12  | EEPROM Write Error   |
| 53          | --  | 253 | 13  | Out of Calibration   |
| 54          | 84  | --  | 12  | Vehicle Speed Sensor Fault   |
| 55          | --  | 216 | 14  | Other ECU Fault (This fault is logged in conjunction with another fault to indicate missing information from another ECU.) |
| 55          | --  | 231 | 12  | J1939 Data Link Fault  |
| 55          | --  | 248 | 8   | Proprietary Data Link Fault (Master)   |
| 55          | --  | 248 | 9   | Proprietary Data Link Fault (Receiver)   |
| 56          | --  | 250 | 12  | J1587 Data Link Fault  |

| <b>DDEC V Code</b> | <b>PID</b> | <b>SID</b> | <b>FMI</b> | <b>DESCRIPTION</b>  |
|--------------------|------------|------------|------------|---|
| 57                 | --         | 249        | 12         | J1922 Data Link Fault   |
| 58                 | 92         | --         | 0          | Torque Overload   |
| 61                 | --         | xxx        | 0          | Injector xxx Response Time Long                                     |
| 62                 | --         | 26         | 3          | Aux. Output #1 Short to Battery (+) – Pin V-4                       |
| 62                 | --         | 26         | 4          | Aux. Output #1 Open Circuit - Pin V-4                               |
| 62                 | —          | 26         | 7          | Aux. Output #1 Mechanical System Not Responding Properly - Pin V-4  |
| 62                 | --         | 40         | 3          | Aux. Output #2 Short to Battery (+) - Pin V-5                       |
| 62                 | --         | 40         | 4          | Aux. Output #2 Open Circuit - Pin V-5                               |
| 62                 | —          | 40         | 7          | Aux. Output #2 Mechanical System Not Responding Properly – Pin V-5  |
| 62                 | --         | 53         | 3          | Aux. Output #5 Short to Battery (+) - Pin V-6                       |
| 62                 | --         | 53         | 4          | Aux. Output #5 Open Circuit - Pin V-6                               |
| 62                 | —          | 53         | 7          | Aux. Output #5 Mechanical System Not Responding Properly - Pin V-6  |
| 62                 | --         | 54         | 3          | Aux. Output #6 Short to Battery (+) - Pin V-7                       |
| 62                 | --         | 54         | 4          | Aux. Output #6 Open Circuit - Pin V-7                               |
| 62                 | --         | 54         | 7          | Aux. Output #6 Mechanical System Not Responding Properly - Pin V-7  |
| 62                 | --         | 55         | 3          | Aux. Output #7 Short to Battery (+) - Pin V-40                      |
| 62                 | --         | 55         | 4          | Aux. Output #7 Open Circuit - Pin V-40                              |
| 62                 | —          | 55         | 7          | Aux. Output #7 Mechanical System Not Responding Properly - Pin V-40 |
| 62                 | --         | 56         | 3          | Aux. Output #8 Short to Battery (+) – Pin V-53                      |
| 62                 | --         | 56         | 4          | Aux. Output #8 Open Circuit - Pin V-53                              |
| 62                 | --         | 56         | 7          | Aux. Output #8 Mechanical System Not Responding Properly - Pin V-53 |
| 62                 | --         | 257        | 3          | Aux. Output #9 Open Circuit – Pin V-54                              |
| 62                 | --         | 257        | 4          | Aux. Output #9 Short to Gnd – Pin V-54                              |
| 62                 | --         | 257        | 7          | Aux. Output #9 Mechanical System Failure – Pin V-54                 |
| 62                 | --         | 258        | 3          | Aux. Output #10 Open Circuit – Pin V-55                             |
| 62                 | --         | 258        | 4          | Aux. Output #10 Short to Gnd – Pin V-55                             |
| 62                 | --         | 258        | 7          | Aux. Output #10 Mechanical System Failure – Pin V-55                |
| 62                 | --         | 259        | 3          | Aux. Output #11 Open Circuit – Pin E-13                             |
| 62                 | --         | 259        | 4          | Aux. Output #11 Short to Gnd – Pin E-13                             |
| 62                 | --         | 259        | 7          | Aux. Output #11 Mechanical System Failure – Pin E-13                |
| 63                 | --         | 57         | 0          | PWM #1 Above Normal Range, Pin V-53                                 |
| 63                 | --         | 57         | 1          | PWM #1 Below Normal Range, Pin V-53                                 |
| 63                 | --         | 57         | 3          | PWM #1 Short to Battery (+), Pin V-53                               |
| 63                 | --         | 57         | 4          | PWM #1 Open Circuit, Pin V-53                                       |

## 146 APPENDIX D

| DDEC V Code | PID | SID | FMI | DESCRIPTION   |
|-------------|-----|-----|-----|---|
| 63          | --  | 58  | 0   | PWM #2 Above Normal Range, Pin V-46                   |
| 63          | --  | 58  | 1   | PWM #2 Below Normal Range, Pin V-46                   |
| 63          | --  | 58  | 3   | PWM #2 Short to Battery (+), Pin V-46                 |
| 63          | --  | 58  | 4   | PWM #2 Open Circuit, Pin V-46                         |
| 63          | --  | 59  | 0   | PWM #3 Above Normal Range, Pin E-3                    |
| 63          | --  | 59  | 1   | PWM #3 Below Normal Range, Pin E-3                    |
| 63          | --  | 59  | 3   | PWM #3 Short to Battery (+), Pin E-3                  |
| 63          | --  | 59  | 4   | PWM #3 Open Circuit, Pin E-3                          |
| 63          | --  | 60  | 0   | PWM #4 Above Normal Range, Pin E-4                    |
| 63          | --  | 60  | 1   | PWM #4 Below Normal Range, Pin E-4                    |
| 63          | --  | 60  | 3   | PWM #4 Short to Battery (+), Pin E-4                  |
| 63          | --  | 60  | 4   | PWM #4 Open Circuit, Pin E-4                          |
| 63          | --  | 267 | 0   | PWM #5 Above Normal Range - Pin E-8                   |
| 63          | --  | 267 | 1   | PWM #5 Below Normal Range - Pin E-8                   |
| 63          | --  | 267 | 3   | PWM #5 Short to Battery (+) - Pin E-8                 |
| 63          | --  | 267 | 4   | PWM #5 Open Circuit - Pin E-8                         |
| 63          | --  | 267 | 7   | PWM #5 Mechanical System Failed - Pin E-8             |
| 63          | --  | 268 | 0   | PWM #6 Above Normal Range - Pin E-11                  |
| 63          | --  | 268 | 1   | PWM #6 Below Normal Range - Pin E-11                  |
| 63          | --  | 268 | 3   | PWM #6 Short to Battery (+) - Pin E-11                |
| 63          | --  | 268 | 4   | PWM #6 Open Circuit - Pin E-11                        |
| 63          | --  | 268 | 7   | PWM #6 Mechanical System Failed - Pin E-11            |
| 64          | 103 | --  | 0   | Turbo Overspeed                                       |
| 64          | 103 | --  | 8   | Turbo Speed Sensor Input Failure – Abnormal Period    |
| 65          | 51  | --  | 0   | Throttle Plate Position Above Normal Range            |
| 65          | 51  | --  | 1   | Throttle Plate Position Below Normal Range            |
| 65          | 51  | --  | 2   | Throttle Plate Position Erratic                       |
| 65          | 51  | --  | 7   | Throttle Plate Not Responding                         |
| 65          | 107 | --  | 3   | Air Filter Restriction Sensor Voltage High            |
| 65          | 107 | --  | 4   | Air Filter Restriction Sensor Voltage Low             |
| 66          | 99  | --  | 3   | Oil Filter Restriction Sensor Voltage High            |
| 66          | 99  | --  | 4   | Oil Filter Restriction Sensor Voltage Low             |
| 66          | --  | 76  | 0   | Engine Knock Level Above Normal Range                 |
| 66          | --  | 76  | 3   | Engine Knock Level Sensor Input Voltage High          |
| 66          | --  | 76  | 4   | Engine Knock Level Sensor Input Voltage Low           |
| 66          | --  | 76  | 7   | Engine Knock Level Sensor Not Responding              |
| 67          | 20  | --  | 3   | High Range Coolant Pressure Sensor Input Voltage High |
| 67          | 20  | --  | 4   | High Range Coolant Pressure Sensor Input Voltage Low  |

| <b>DDEC V Code</b> | <b>PID</b> | <b>SID</b> | <b>FMI</b> | <b>DESCRIPTION</b>                                  |
|--------------------|------------|------------|------------|---|
| 67                 | 106        | --         | 3          | Air Inlet Pressure Sensor Input Voltage High        |
| 67                 | 106        | --         | 4          | Air Inlet Pressure Sensor Input Voltage Low         |
| 67                 | 109        | --         | 3          | Coolant Pressure Sensor Input Voltage High          |
| 67                 | 109        | --         | 4          | Coolant Pressure Sensor Input Voltage Low           |
| 68                 | --         | 230        | 5          | TPS Idle Validation Circuit Fault (open circuit)    |
| 68                 | --         | 230        | 6          | TPS Idle Validation Circuit Fault (short to ground) |
| 71                 | --         | xxx        | 1          | Injector xxx Response Time Short                    |
| 72                 | 84         | --         | 0          | Vehicle Overspeed                                   |
| 72                 | 84         | --         | 11         | Vehicle Overspeed (Absolute)                        |
| 72                 | --         | 65         | 0          | Oxygen Content Too High                             |
| 72                 | --         | 65         | 1          | Oxygen Content Too Low                              |
| 73                 | 107        | --         | 0          | Air Filter Restriction High                         |
| 73                 | --         | 77         | 0          | Gas Valve Position Above Normal Range               |
| 73                 | --         | 77         | 1          | Gas Valve Position Below Normal Range               |
| 73                 | --         | 77         | 3          | Gas Valve Position Input Voltage High               |
| 73                 | --         | 77         | 4          | Gas Valve Position Input Voltage Low                |
| 73                 | --         | 77         | 7          | Gas Metering Valve Not Responding                   |
| 74                 | 70         | --         | 4          | Optimized Idle Safety Loop Short to Ground          |
| 74                 | 99         | --         | 0          | Oil Filter Restriction High                         |
| 75                 | 168        | --         | 0          | ECM Battery Voltage High                            |
| 75                 | --         | 155        | 3          | Injector V (reg) Voltage Failed High                |
| 75                 | --         | 211        | 0          | Sensor Supply Pins V-11/V-12 Voltage High           |
| 75                 | --         | 212        | 3          | Injector V (slope) Voltage Failed High              |
| 75                 | --         | 221        | 3          | Injector V (pull-in) Voltage Failed High            |
| 75                 | --         | 214        | 0          | RTC Backup Battery Voltage High                     |
| 75                 | --         | 232        | 0          | Sensor Supply Voltage High, Pin E-26                |
| 76                 | 121        | --         | 0          | Engine Overspeed With Engine Brake                  |
| 77                 | 19         | —          | 0          | High Range Oil Pressure High                        |
| 77                 | 20         | —          | 0          | High Range Coolant Pressure High                    |
| 77                 | 21         | —          | 0          | ECU Temperature Above Range                         |
| 77                 | 21         | —          | 1          | ECU Temperature Below Range                         |
| 77                 | 21         | —          | 3          | ECU Temperature Above Failed High                   |
| 77                 | 21         | —          | 4          | ECU Temperature Above Failed Low                    |
| 77                 | 72         | —          | 0          | Blower Bypass Door Position High                    |
| 77                 | 72         | —          | 1          | Blower Bypass Door Position Low                     |
| 77                 | 73         | —          | 1          | Fire Pump Pressure Low                              |
| 77                 | 81         | —          | 0          | Exhaust Back Pressure High                          |
| 77                 | 81         | —          | 1          | Exhaust Back Pressure Low                           |

# 148 APPENDIX D

| DDEC V Code | PID | SID | FMI | DESCRIPTION  |
|-------------|-----|-----|-----|--|
| 77          | 81  | —   | 3   | Exhaust Back Pressure Sensor Voltage High            |
| 77          | 81  | —   | 4   | Exhaust Back Pressure Sensor Voltage Low             |
| 77          | 81  | —   | 12  | Exhaust Back Pressure at Rampdown Threshold          |
| 77          | 95  | —   | 1   | Fuel Filter Differential Pressure Low                |
| 77          | 99  | —   | 1   | Oil Filter Differential Pressure Low                 |
| 77          | 100 | —   | 0   | Engine Oil Pressure High                             |
| 77          | 102 | —   | 1   | Turbo Boost Pressure Low                             |
| 77          | 105 | —   | 1   | Inlet Manifold Temperature Low                       |
| 77          | 107 | —   | 1   | Air filter Restriction Pressure Low                  |
| 77          | 108 | —   | 0   | Barometric Pressure High                             |
| 77          | 108 | —   | 1   | Barometric Pressure Low                              |
| 77          | 109 | —   | 0   | Coolant Pressure High                                |
| 77          | 110 | —   | 1   | Coolant Temperature Low                              |
| 77          | 111 | —   | 0   | Coolant Level High                                   |
| 77          | 171 | —   | 0   | Ambient Air Temperature High                         |
| 77          | 171 | —   | 1   | Ambient Air Temperature Low                          |
| 77          | 172 | —   | 1   | Air Inlet Temperature Low                            |
| 77          | 174 | —   | 0   | Fuel Temperature High                                |
| 77          | 174 | —   | 1   | Fuel Temperature Low                                 |
| 77          | 175 | —   | 1   | Engine Oil Temperature Low                           |
| 77          | 222 | —   | 14  | Anti-Theft Fault Present                             |
| 77          | 251 | —   | 10  | Clock Module Abnormal Rate of Change                 |
| 77          | 251 | —   | 13  | Clock Module Failure                                 |
| 77          | 252 | —   | 10  | Clock Module Abnormal Rate of Change                 |
| 77          | 252 | —   | 13  | Clock Module Failure                                 |
| 77          | 354 | —   | 0   | Relative Humidity Above Range                        |
| 77          | 354 | —   | 1   | Relative Humidity Below Range                        |
| 77          | 446 | —   | 0   | Cylinder Head Temperature Above Range                |
| 77          | —   | 151 | 11  | Service Now Lamp Fault Expiration                    |
| 78          | 86  | --  | 14  | Cruise Control/Adaptive Cruise Control Fault         |
| 81          | 98  | --  | 3   | Oil Level Sensor Input Voltage High                  |
| 81          | 101 | --  | 3   | Crankcase Pressure Sensor Input Voltage High         |
| 81          | 153 | --  | 3   | Extended Crankcase Pressure Input Voltage High       |
| 81          | 164 | --  | 3   | Injection Control Pressure Sensor Input Voltage High |
| 81          | 173 | --  | 3   | Exhaust Temperature Sensor Input Voltage High        |
| 81          | 411 | —   | 3   | EGR Delta Pressure Sensor Circuit Failed High        |
| 81          | 412 | —   | 3   | EGR Temperature Circuit Failed High                  |
| 81          | 412 | —   | 9   | EGR Temperature Network Sensor Not Responding        |

| <b>DDEC V Code</b> | <b>PID</b> | <b>SID</b> | <b>FMI</b> | <b>DESCRIPTION</b>                                  |
|--------------------|------------|------------|------------|---|
| 81                 |            | 20         | 3          | Timing Actuator Failed High                         |
| 81                 |            | 20         | 4          | Timing Actuator Failed Low                          |
| 81                 | --         | 129        | 3          | Exhaust Port Temperature #1 Sensor Voltage High     |
| 81                 | --         | 130        | 3          | Exhaust Port Temperature #2 Sensor Voltage High     |
| 81                 | --         | 131        | 3          | Exhaust Port Temperature #3 Sensor Voltage High     |
| 81                 | --         | 132        | 3          | Exhaust Port Temperature #4 Sensor Voltage High     |
| 81                 | --         | 133        | 3          | Exhaust Port Temperature #5 Sensor Voltage High     |
| 81                 | --         | 134        | 3          | Exhaust Port Temperature #6 Sensor Voltage High     |
| 81                 | --         | 135        | 3          | Exhaust Port Temperature #7 Sensor Voltage High     |
| 81                 | --         | 136        | 3          | Exhaust Port Temperature #8 Sensor Voltage High     |
| 81                 | --         | 137        | 3          | Exhaust Port Temperature #9 Sensor Voltage High     |
| 81                 | --         | 138        | 3          | Exhaust Port Temperature #10 Sensor Voltage High    |
| 81                 | --         | 139        | 3          | Exhaust Port Temperature #11 Sensor Voltage High    |
| 81                 | --         | 140        | 3          | Exhaust Port Temperature #12 Sensor Voltage High    |
| 81                 | --         | 141        | 3          | Exhaust Port Temperature #13 Sensor Voltage High    |
| 81                 | --         | 142        | 3          | Exhaust Port Temperature #14 Sensor Voltage High    |
| 81                 | --         | 143        | 3          | Exhaust Port Temperature #15 Sensor Voltage High    |
| 81                 | --         | 144        | 3          | Exhaust Port Temperature #16 Sensor Voltage High    |
| 81                 | —          | 277        | 9          | EGR Rate Sensor not Responding                      |
| 81                 | —          | 277        | 12         | EGR Rate Sensor Failed                              |
| 82                 | 98         | --         | 4          | Oil Level Sensor Input Voltage Low                  |
| 82                 | 101        | --         | 4          | Crankcase Pressure Sensor Input Voltage Low         |
| 82                 | 153        | --         | 4          | Extended Crankcase Pressure Input Voltage Low       |
| 82                 | 164        | --         | 4          | Injection Control Pressure Sensor Input Voltage Low |
| 82                 | 173        | --         | 4          | Exhaust Temperature Sensor Input Voltage Low        |
| 82                 | 411        | —          | 4          | EGR Delta Pressure Sensor Circuit Failed Low        |
| 82                 | 412        | —          | 4          | EGR Temperature Circuit Failed Low                  |
| 82                 | 412        | —          | 12         | EGR Temperature Network Sensor Failed               |
| 82                 | --         | 129        | 4          | Exhaust Port Temperature #1 Sensor Voltage Low      |
| 82                 | --         | 130        | 4          | Exhaust Port Temperature #2 Sensor Voltage Low      |
| 82                 | --         | 131        | 4          | Exhaust Port Temperature #3 Sensor Voltage Low      |
| 82                 | --         | 132        | 4          | Exhaust Port Temperature #4 Sensor Voltage Low      |
| 82                 | --         | 133        | 4          | Exhaust Port Temperature #5 Sensor Voltage Low      |
| 82                 | --         | 134        | 4          | Exhaust Port Temperature #6 Sensor Voltage Low      |
| 82                 | --         | 135        | 4          | Exhaust Port Temperature #7 Sensor Voltage Low      |
| 82                 | --         | 136        | 4          | Exhaust Port Temperature #8 Sensor Voltage Low      |
| 82                 | --         | 137        | 4          | Exhaust Port Temperature #9 Sensor Voltage Low      |
| 82                 | --         | 138        | 4          | Exhaust Port Temperature #10 Sensor Voltage Low     |

# 150 APPENDIX D

| DDEC V Code | PID | SID | FMI | DESCRIPTION                                     |
|-------------|-----|-----|-----|---|
| 82          | --  | 139 | 4   | Exhaust Port Temperature #11 Sensor Voltage Low |
| 82          | --  | 140 | 4   | Exhaust Port Temperature #12 Sensor Voltage Low |
| 82          | --  | 141 | 4   | Exhaust Port Temperature #13 Sensor Voltage Low |
| 82          | --  | 142 | 4   | Exhaust Port Temperature #14 Sensor Voltage Low |
| 82          | --  | 143 | 4   | Exhaust Port Temperature #15 Sensor Voltage Low |
| 82          | --  | 144 | 4   | Exhaust Port Temperature #16 Sensor Voltage Low |
| 82          | —   | 277 | 12  | EGR Rate Sensor Failed                          |
| 82          | 412 | —   | 9   | EGR Temperature Smart Sensor not Responding     |
| 82          | 412 | —   | 12  | EGR Temperature Smart Sensor failed             |
| 83          | 73  | —   | 0   | Pump Pressure High                              |
| 83          | 98  | --  | 0   | Oil Level High                                  |
| 83          | 101 | --  | 0   | Crankcase Pressure High                         |
| 83          | 153 | --  | 0   | Extended Crankcase Pressure High                |
| 83          | 173 | --  | 0   | Exhaust Temperature High                        |
| 83          | 411 | —   | 0   | EGR Delta Pressure High                         |
| 83          | 412 | —   | 0   | EGR Temperature High                            |
| 83          | --  | 129 | 0   | Exhaust Port Temperature #1 High                |
| 83          | --  | 130 | 0   | Exhaust Port Temperature #2 High                |
| 83          | --  | 131 | 0   | Exhaust Port Temperature #3 High                |
| 83          | --  | 132 | 0   | Exhaust Port Temperature #4 High                |
| 83          | --  | 133 | 0   | Exhaust Port Temperature #5 High                |
| 83          | --  | 134 | 0   | Exhaust Port Temperature #6 High                |
| 83          | --  | 135 | 0   | Exhaust Port Temperature #7 High                |
| 83          | --  | 136 | 0   | Exhaust Port Temperature #8 High                |
| 83          | --  | 137 | 0   | Exhaust Port Temperature #9 High                |
| 83          | --  | 138 | 0   | Exhaust Port Temperature #10 High               |
| 83          | --  | 139 | 0   | Exhaust Port Temperature #11 High               |
| 83          | --  | 140 | 0   | Exhaust Port Temperature #12 High               |
| 83          | --  | 141 | 0   | Exhaust Port Temperature #13 High               |
| 83          | --  | 142 | 0   | Exhaust Port Temperature #14 High               |
| 83          | --  | 143 | 0   | Exhaust Port Temperature #15 High               |
| 83          | --  | 144 | 0   | Exhaust Port Temperature #16 High               |
| 84          | 98  | --  | 1   | Oil Level Low                                   |
| 84          | 101 | --  | 1   | Crankcase Pressure Low                          |
| 84          | 153 | --  | 1   | Extended Crankcase Pressure Low                 |
| 85          | 190 | --  | 0   | Engine Overspeed                                |
| 85          | 190 | --  | 14  | Engine Overspeed Signal                         |
| 86          | 73  | --  | 3   | Pump Pressure Sensor Input Voltage High         |

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| <b>DDEC V Code</b> | <b>PID</b> | <b>SID</b> | <b>FMI</b> | <b>DESCRIPTION</b>                            |
|--------------------|------------|------------|------------|---|
| 86                 | 108        | --         | 3          | Barometric Pressure Sensor Input Voltage High |
| 87                 | 73         | --         | 4          | Pump Pressure Sensor Input Voltage Low        |
| 87                 | 108        | --         | 4          | Barometric Pressure Sensor Input Voltage Low  |
| 88                 | 20         | --         | 1          | High Range Coolant Pressure Low               |
| 88                 | 109        | --         | 1          | Coolant Pressure Low                          |
| 89                 | 95         | --         | 0          | Fuel Restriction High                         |
| 89                 | 111        | --         | 12         | Maintenance Alert Coolant Level Fault         |

