

# SECTION 7

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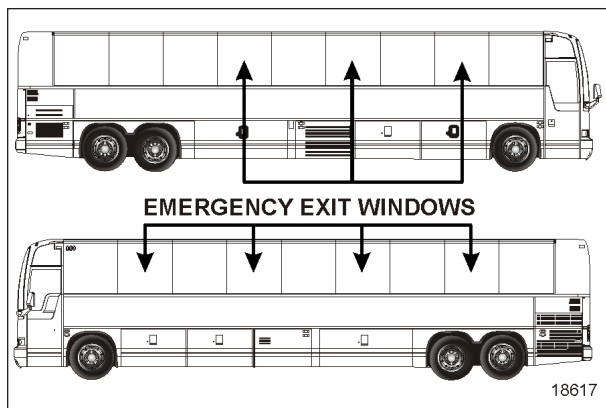
## Safety Features and Equipment 7-2

### EMERGENCY EXITS

Locate and learn how to use all possible emergency exits. It is good practice to inform passengers of the location of exits and how to use them in case of an emergency.

#### SIDE WINDOWS

Some side windows can be opened from the inside for emergency exit. A decal located on the bottom of each passenger window indicates the location of the nearest emergency exit. Also, blue lights close to the wall in the overhead storage compartments illuminate the emergency exit decals. These lights illuminate when the general lighting switch is on.



EMERGENCY EXIT WINDOWS (X3-45)

To open a side window emergency exit, tilt up the release bar and push the bottom of the window outwards, as illustrated below. The window is hinged from the top and will not fall out.

A pictogram on the dashboard illuminates when a window is opened. Refer to [PICTOGRAMS DISPLAYED ON THE DRIVER INFORMATION DISPLAY \(DID\)](#) for more information.

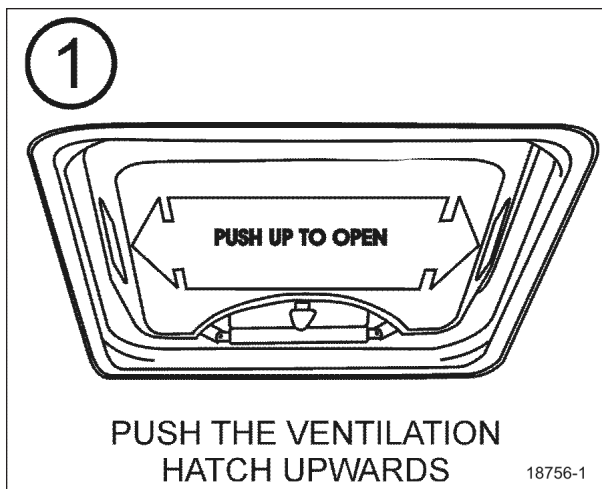
To close the window, tilt up the release bar and pull the window back. Push down the release bar to lock shut.

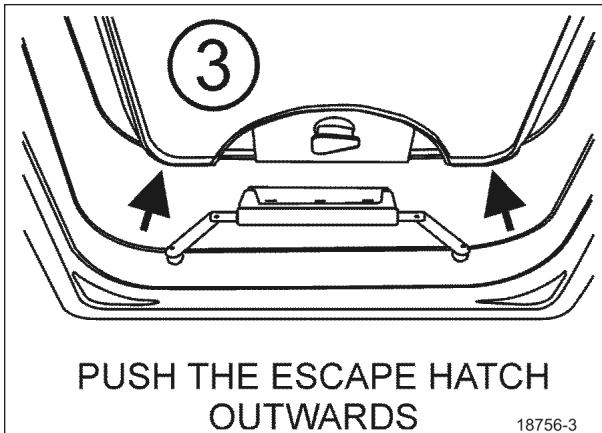
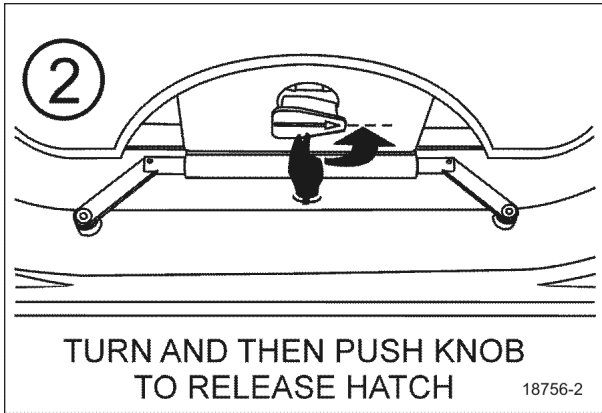


SIDE WINDOW EMERGENCY EXIT

#### ROOF HATCH

A roof ventilation hatch designed to be opened by occupants may be installed in the roof at the rear of the vehicle. Another optional roof hatch may be located in the front of the vehicle. The hatches can serve as emergency exits. In case of an emergency, push the ventilation hatch upward (1). Turn knob  $\frac{1}{4}$  turn (arrow pointing "TO EXIT") and then push knob to release the hatch (2). Push the escape hatch outwards (3). A decal with operating instructions is located on the hatch.





EMERGENCY ROOF ESCAPE OPENING

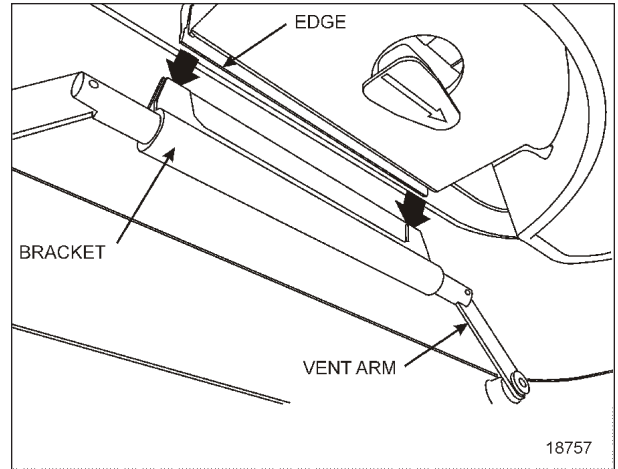
**NOTE**

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

**CAUTION**

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

To latch escape hatch after use, vent arms must be pushed upright in FULL OPEN VENT position. Insert edge firmly between the two sections of the bracket and then return knob to original position (arrow pointing "LATCHED") to lock the hatch. Finally, pull the hatch into closed position, one side at a time.



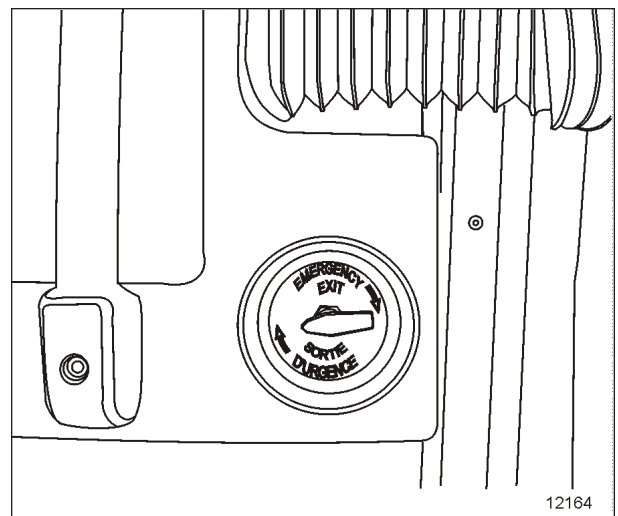
ROOF ESCAPE LATCHING

**EMERGENCY ENTRANCE DOOR OPENING**

An unlatch air valve located on the front wall, close to the entrance door allows emergency depletion of the door and locking cylinders. Another unlatch valve is located in the front service compartment and allows emergency opening from outside the vehicle. To open the door in an emergency, first turn the unlatch valve in the direction of the arrows and push (or pull) the door open. To close the door after emergency opening, return the valve to its initial position, open the door using the door operating switch and close the door normally.

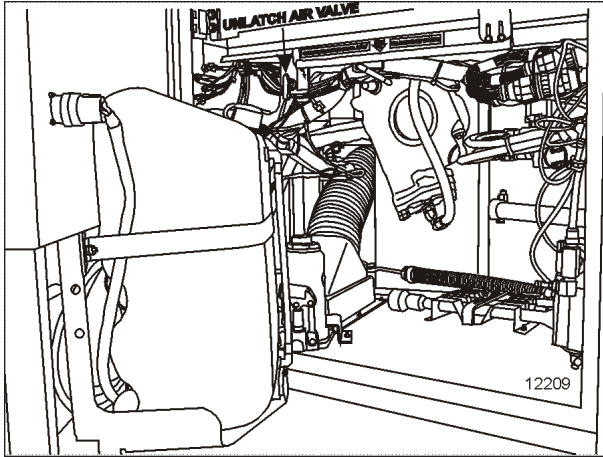
**NOTE**

*To be able to open the entrance door in an emergency, the entrance door must first be unlocked using the key or locking lever before unlatching the door from the outside or the inside.*

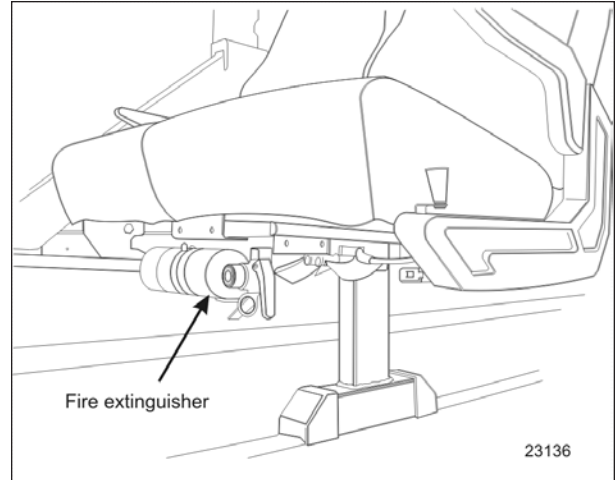


INTERIOR UNLATCH AIR VALVE

## Safety Features and Equipment 7-4



UNLATCH AIR VALVE LOCATION (X3 SERIES)



FIRE EXTINGUISHER UNDER FIRST ROW SEAT

### EMERGENCY EQUIPMENT

The coach is equipped with numerous safety features and equipment. Verify the equipment regularly and keep on hand and in good condition at all times. Following is the enumeration and description of safety equipment found on board.

#### FIRE EXTINGUISHERS

Fire extinguishers can be found at different locations in the coach according to the owner's choice.

##### Under The First Row Seats

Depending on selected options, two fire extinguishers may be located under the first row seats. A decal at the bottom of each of the trapezoidal windows in the first row indicates the location of fire extinguishers. Instructions for use are found on the extinguishers.



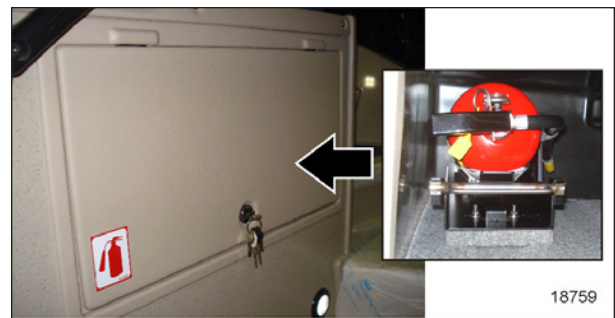
#### WARNING

Make sure you know how to operate the fire extinguishers in case of an emergency.



#### WARNING

If a fire extinguisher is located in the driver's personal compartment, the compartment should remain unlocked whenever the vehicle is in operation.



A DECAL INDICATES THAT A FIRE EXTINGUISHER (OPTION) IS LOCATED IN THE DRIVER'S PERSONAL COMPARTMENT

##### In An Overhead Compartment

An optional fire extinguisher can be located in an overhead compartment. A decal on the door of the compartment confirms the presence of a fire extinguisher.



A DECAL INDICATES THAT A FIRE HATCHET, A FIRE EXTINGUISHER AND A FIRST-AID KIT ARE LOCATED IN THIS OVERHEAD COMPARTMENT

### FIRST-AID KIT

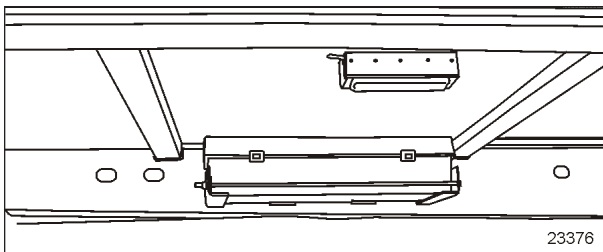
The optional first-aid kit is stored in the first curbside overhead storage compartment. A white cross over red background decal identifies the kit.

### FIRE HATCHET

An optional fire hatchet may be installed in the first curbside overhead storage compartment.

### WARNING REFLECTORS

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

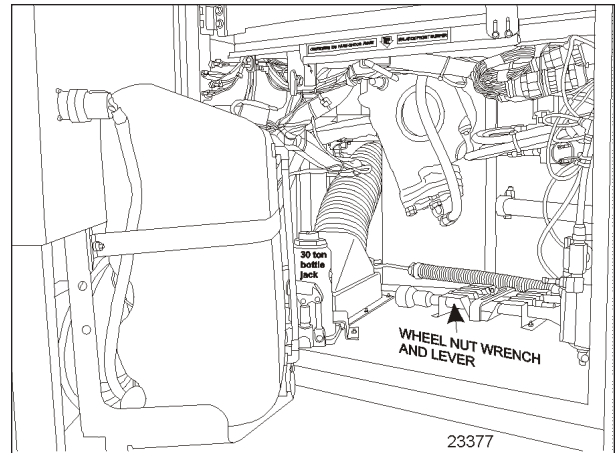


WARNING REFLECTORS LOCATION (X3 SERIES)

### JACK AND TOOLS

A kit for jacking up the vehicle and changing wheels is stored in the front service compartment. The kit includes a:

- 12-ton bottle jack;
- Wheel nut wrench and lever.



JACK/TOOLS LOCATION

### SPARE PARTS KIT

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

### AUTOMATIC FIRE SUPPRESSION SYSTEM (AFSS)

The coach may be equipped with the optional Automatic Fire Detection and Suppression System (AFSS).

#### System Operation

When a fire is detected inside the engine compartment, the system sends a fire alarm signal to the **Protection Panel** located in the driver's area near the lateral control panel. The **Protection Panel** immediately turns on the fire "ALARM" lamp and sounds the audio alarm. After a 15-second time delay the engine is automatically shut down. The fire extinguisher is discharged simultaneously with engine shutdown.

#### NOTE

*The Protection Panel continuously monitors system integrity and displays the information via the "SYSTEM OK" and fire "TROUBLE" indicators.*

## Safety Features and Equipment 7-6

### NOTE

The Manual Activation Switch is used when immediate discharge of the fire extinguisher and engine shutdown is desired.

### Operational Sequence (Fire)

1. A fire detector or linear thermal detector detects a fire in the engine compartment and sends a signal to the **Protection Panel** in the driver's area.
2. The fire "ALARM" lamp on the **Protection Panel** will illuminate solid red and an audible alarm will sound.
3. The operator shall bring the vehicle to a safe stop.
4. The system automatically shuts down the vehicle engine and discharges the extinguisher into the engine compartment 15 seconds after the fire alarm starts unless advanced or delayed by the operator.
  - If the operator presses the **Manual Activation Switch**, all delays will terminate and the engine shutdown and extinguisher discharge will occur immediately.
  - If the operator presses and releases the **Delay Engine Stop** switch once, the engine shutdown and extinguisher discharge will be delayed by an additional 15 seconds.



### WARNING

The engine will stop 15 seconds after the fire alarm starts. The operator must be prepared to bring the vehicle to a safe stop as soon as the alarm sounds. Steering may become difficult after engine shutdown. If more time is required, the "DELAY ENGINE STOP" switch may be pressed and released for an additional 15 second delay.



### WARNING

The extinguisher discharge may cause an obscuring cloud behind and near the vehicle.

5. The red fire "ALARM" lamp and audible alarm will stay on. The yellow fire "TROUBLE" lamp will also be on indicating a discharged extinguisher.

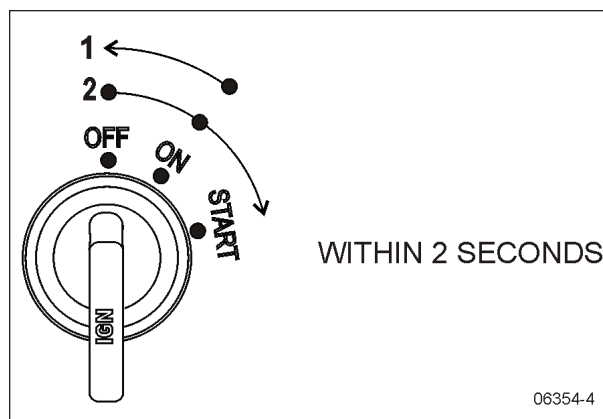
6. The system must be reset and the fire extinguisher removed and replaced in accordance with the System Reset portion of the Kidde Dual Spectrum Operation & Maintenance Manual.

### Starting The Vehicle After A Fire Alarm

The vehicle may be started after a fire alarm without resetting the system. Refer to ignition switch sequence below. This will not reset the system; rather it will instruct the vehicle's multiplex system to ignore vehicle interface outputs from the Protection Panel. This feature is intended to be used only in emergencies that require the vehicle to be restarted and moved a short distance prior to system reset. It should not be performed if the cause of the fire has not been clearly identified and corrected.

To start the vehicle, perform this ignition switch (key) sequence.

- From the **ON** position,
- Turn to **OFF**, return to **ON** and **START** vehicle within 2 seconds.



### TIRE PRESSURE MONITORING SYSTEM (TPMS)

The coach may be equipped with the optional Tire Pressure Monitoring System (TPMS).

## Description

System includes the following elements:

- Special tire valves;
- RF sensor inside each tire, fixed to the valve;
- 3 antennas to receive the sensors RF signal (one in the front spare tire compartment, one above the L.H. side rear wheels and one above the R.H. side rear wheels);
- A TPMS receiver connected to the antennas and located in the front electrical compartment, above the CECM;
- A TPMS display built in the L.H. dashboard panel;
- A "FLAT TIRE" telltale panel indicator.

The section of the special tire valves located inside the tire is dome-shaped to allow fixing the sensor.

Sensors provide continuous tire pressure and temperature reading.

The normal sensor battery lifespan is 5 years. The remaining lifespan is displayed as a percentage in the TPMS display.

### NOTE

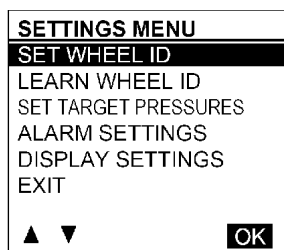
*It is recommended to check the remaining battery lifespan when changing the tires in order to replace the sensors at the same time if they are due for replacement before the next change.*

The screw fixing the sensor to the valve can only be used once because the threads are coated to lock the sensor in place and prevent unfastening.

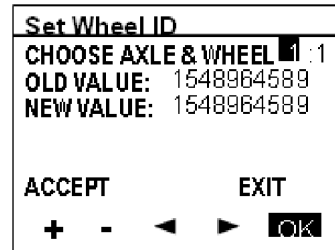
The telltale panel indicator illuminates for 3 seconds when the ignition switch is turned ON to check the display operation and the communication between the display and the vehicle multiplex system. This confirms the communication between the TPMS display and CECM.

## Settings Menu

- Set Wheel ID



23411-2



- ◀ ▶ Navigate
- +/- Increase decrease digits
- OK Navigate forward
- ACCEPT & OK Execute Change Old Value = New. Stay in Menu
- EXIT & OK Ignore changes in progress (new value) and EXIT menu

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- Learn Wheel ID

This menu allows learning new wheel sensors ID. The user can learn only one wheel, several wheels or all wheels of the vehicle. The sequence automatically jumps to the next wheel such that a user can initiate all wheels without having to come back to the display between each wheel.

The display uses a pressure change as the criteria to recognize which wheel sensor the operator wants to get assigned to a given location. The amount of pressure change required is established at 2 PSI.

A pressure change of about 3 PSI is needed to wake up a sensor and then an extra amount of pressure change of 2 PSI is needed to trigger the display. The operator has to create a pressure change by at least 6 PSI and then wait for the display to recognize the pressure change. The wait time corresponds to the sensor sampling rate.

When entering the menu, the axle 1, wheel 1 is selected by default as a starting point for the learning. The user can select another axle with +/- , move the cursor to the wheel number with the right arrow and select another wheel with the +/- or move the cursor down to the start learning button.

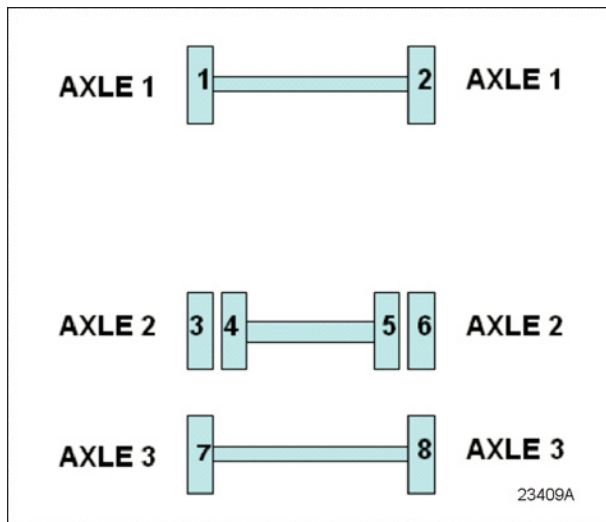
After the start learning button is selected, the display stores the first transmission it gets from each sensor ID into the "initial pressure" for that sensor ID. Then it compares each subsequent pressure received for that sensor ID with the initial one and when the comparison shows a delta pressure exceeding the defined level required, this sensor ID is assigned to the selected tire location.

Once a wheel ID has been assigned, the display increments the number of wheels done and it moves to the next axle/wheel in the sequence, waiting for another sensor to come up with a pressure change. Within one learning session, the display remembers which sensor has been assigned and it will not assign it twice.

The sequence increments the display of the next wheel on the same axle, counting wheels from left to

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right, and then moves to the next axle, counting axles from front to rear.

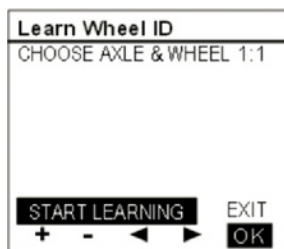
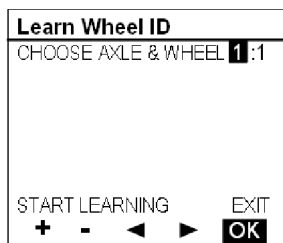


It activates the next wheel parameter each time a wheel is done. This setting is integrated with the vehicle electronic, activating an audible signal on the vehicle, thus providing feedback to the user that he can move on to the next wheel.

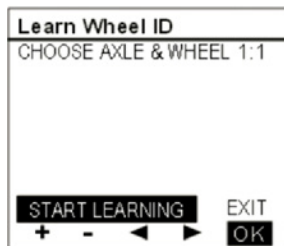
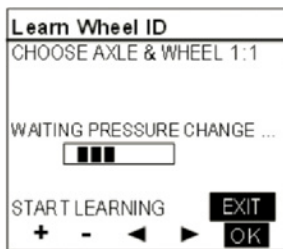
The spare tire can be done by selecting the axle/wheel “spare” which is internally encoded to 15:1.



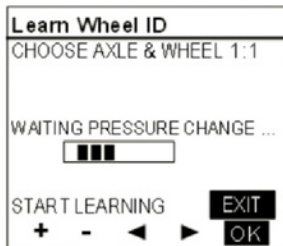
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23461-2



23461-2

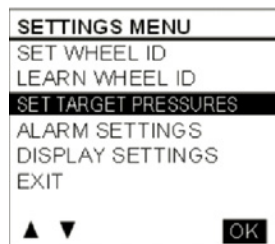


- Set Target Pressures

This menu allows the end user to fine-tune the target pressure setting, taking account for the specific operating conditions (cold weather operation or unloaded operation). The end user can readjust the target pressure within +30% and -20% of the factory set target pressure but not outside this range.

The factory set target pressure is always kept in permanent memory into the TPMS display and cannot be edited by the end user.

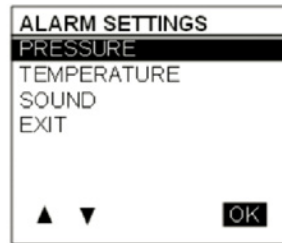
When the user sets a new target value, the selection can't be made outside the valid range.



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- Alarm Settings

When selecting the Alarm Settings Menu, a submenu containing Pressure Alarm and Temperature Alarm appears.



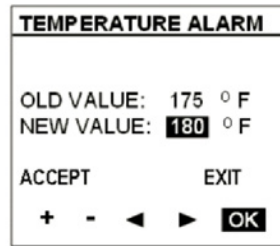
23461-5

When selecting Pressure, the following pressure alarm screen appears. A similar screen is displayed for temperature settings. The cursor can be moved to highlight the data beside “new value” and the “accept / exit” option. +/- allows increasing or decreasing the “new value” data. Pressure alarm changes are made by steps of 1 PSI, in the range from 5 to 20 PSI. Temperature alarm is done by steps of 5°F (2°C) in the range from 150 °F to 180 °F (64 °C to 82 °C). Pressing OK with “accept” highlighted applies changes and exits to the previous menu, while pressing OK while the “exit” option is highlighted exits without changes.

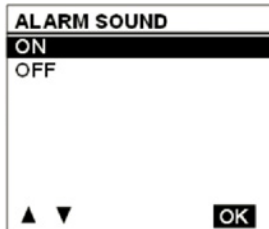
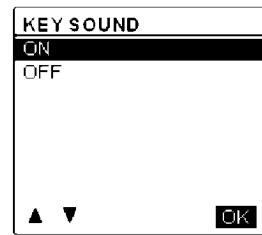




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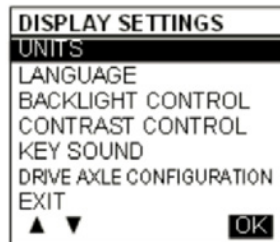


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- Display Settings



23461-8



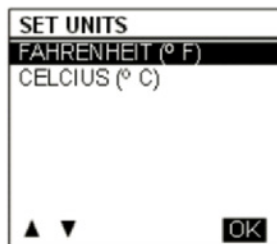
23461-12

- Tire / Axle Configuration

Pressing the up / down arrows allows to select the option of 2 or 4 tires, which are the choices for the drive axle on the vehicle.

Refer to “Appendix G” for Troubleshooting Guide on Tire Pressure Monitoring System (TPMS).

- Units & Language



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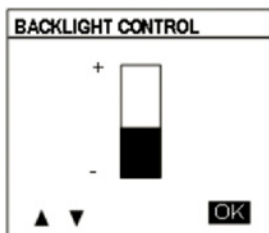
### LIMP-HOME BELT

In case of mechanical failure of the lower alternator, install the limp-home belt on the upper alternator. The installation of the belt allows the coach to be driven to a repair facility after only minor manipulations.

#### NOTE

*Because of the arrangement of the alternators and the belt tensioner, a limp-home belt on the lower alternator is not possible.*

- Backlight Intensity



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- Key Sound

Turns ON/OFF the sound of keys each time they are pressed.

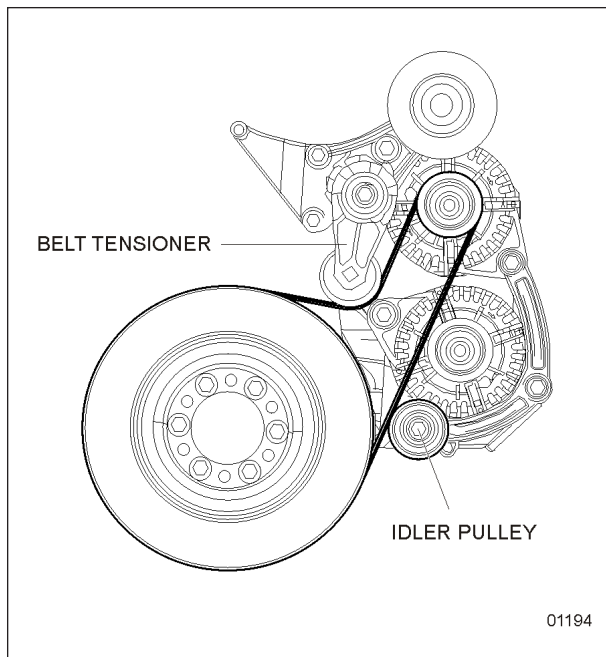
### LOWER ALTERNATOR FAILURE

1. Raise the belt tensioner. Use a breaker bar with a  $\frac{3}{4}$  inch drive to rotate the tensioner pulley upward and relieve alternator belt tension. Remove belt;
2. Install the limp-home drive belt on the drive and top alternator pulleys first;
3. Complete installation of the limp-home belt as shown;
4. Slide the belt on the idler pulley;
5. Gently release the belt tensioner;

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### NOTE

To prevent the batteries from being discharged, the HVAC system will turn OFF automatically if the battery state of charge falls below 50%.



LIMP-HOME BELT ON TOP ALTERNATOR

## SPARE WHEEL

The spare wheel and tire are located in a compartment behind the reclining front bumper.

In case of a flat tire:

1. Turn ON the hazard flashers;
2. Bring the coach to a stop on the side of the road;
3. Apply the parking brake;
4. Make sure the coach is parked safely away from traffic;
5. Set up the triangular reflectors in accordance with applicable highway regulations.

## CHANGING A WHEEL

To access the spare wheel compartment, lower the front reclining bumper.

To do so, pull on the release handle located in the front electrical and service compartment.

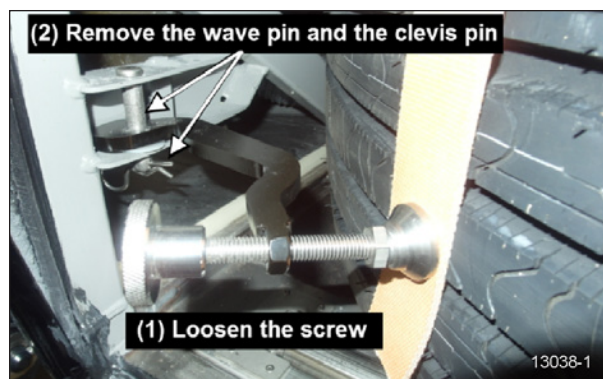
The bumper will lower gradually. When closing the compartment, be sure the bumper is firmly in place.

### NOTE

The bumper is equipped with spring hinges to allow handling by one person.

### To Remove The Spare Wheel From The Compartment:

1. Loosen the screw holding the tire in place (see image).
2. Remove the wave pin and the clevis pin.
3. Pull the spare wheel out of the compartment using the strap.



REMOVING THE SPARE WHEEL

### Installation Of The Spare Wheel

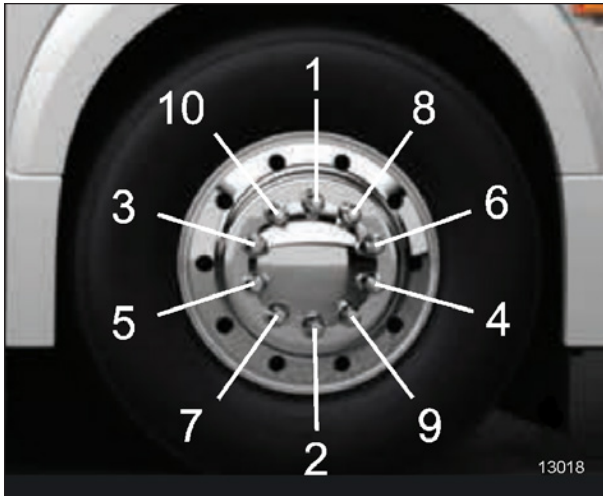
### NOTE

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

1. Loosen the wheel nuts about one turn;
2. Raise the vehicle by the closest jacking point (refer to Maintenance information [MI18-18](#) for jacking points);
3. Remove the wheel nuts and remove the wheel;
4. Mount the spare wheel over the studs, being careful not to damage the stud threads;
5. Screw in the wheel nuts according to the sequence shown in the following figure and tighten slightly more and repeat the sequence a few times to position the wheel correctly.

Once tightening induces wheel spin, lower the coach for final tightening;

- Tighten the nuts progressively in the sequence shown. Final tightening should be done using a torque wrench. Dry tightening torque is 450 – 500 lbf-ft (610 – 680 Nm) for steel as well as for aluminum wheels.



TIGHTENING SEQUENCE

### NOTE

Periodically check the spare tire inflation pressure. Tire pressure should be the maximum pressure specified in the chart.

### NOTE

Periodically check that the spare is securely fastened in its compartment.



### CAUTION

Before driving, be sure the flat tire, track, jack and tools are securely reinstalled in their respective compartments.



### CAUTION

Check that the bumper is securely closed shut before driving.

## SUPER SINGLE TIRE REPLACEMENT

Increase tire pressure to 125 PSI (862 kPa) if you are using the supplied 365/70 R 22.5 spare tire to replace

a super single tire on the drive axle.

In this particular configuration, spare wheel is to be used for emergencies only and for temporary use.



### WARNING

- Spare tire pressure should be increased to 125 PSI.
- Do not exceed 80km/h (50 MPH)
- Repair and re-install original super-single wheel and tire **as soon as possible**.
- While the spare tire is installed, avoid sharp turns, sudden acceleration and braking.



### WARNING

Before driving, be sure the flat tire, track, jack and tools are securely reinstalled in their respective compartments. Check that the bumper is securely closed shut before driving.

## EMERGENCY AIR-FILL VALVES

The vehicle is equipped with two air system emergency fill valves to supplement the air system when air pressure is low and the engine cannot be operated. One valve is located inside the front service compartment. The other valve is located inside the engine compartment.

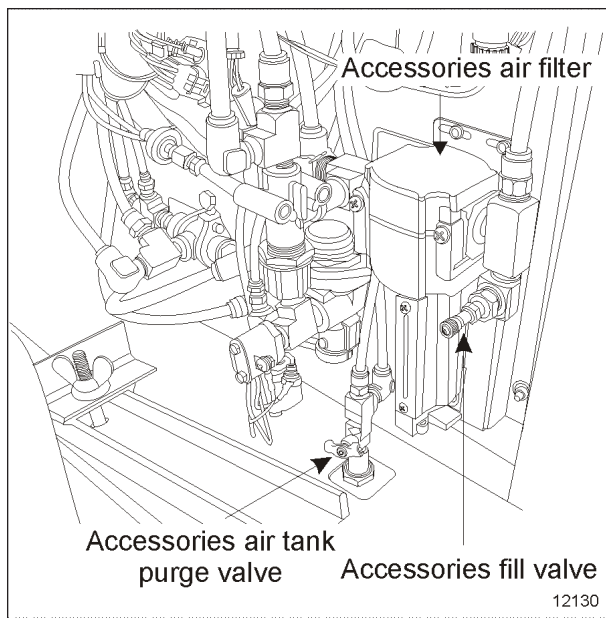
Both air system emergency fill valves are fitted with standard tire valve stems. The air systems can be filled using any standard external air supply line. The fill valve located in the engine compartment supplies air for all systems (brakes, suspension and accessories). The fill valve located in the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



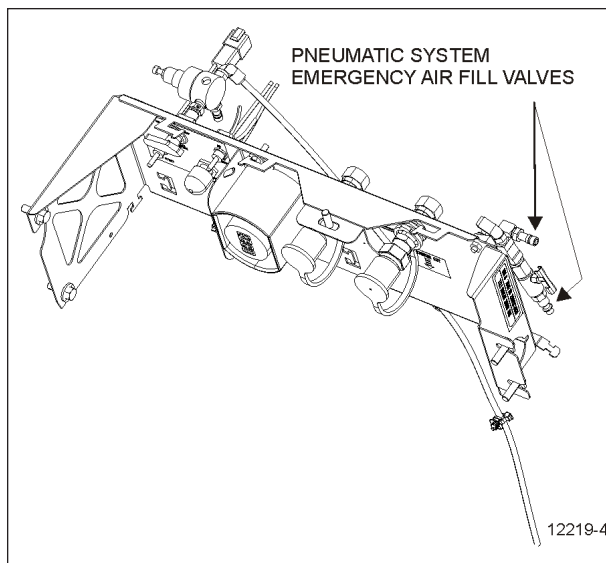
### CAUTION

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

## Safety Features and Equipment 7-12



FRONT SERVICE COMPARTMENT



FILL FITTING IN ENGINE COMPARTMENT

### EMERGENCY AND PARKING BRAKES

During normal operation, if air pressure in any brake circuit drops below 40 psi (276 kPa), spring-loaded emergency brake will be immediately applied at full capacity to the drive axle wheels to stop the vehicle.

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

Parking brake is not designed to be used as a service brake. For normal driving conditions, the control valve knob must remain depressed.



### WARNING

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

### NOTE

Only use the parking brake to supplement the service brake to stop the vehicle in emergency conditions. The stopping distance will be considerably longer than when using normal service brake.

### NOTE

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

### NOTE

The telltale panel audible alarm will sound if the ignition switch has been turned to OFF without applying the parking brake. The same beep will sound if pressure is still applied to the service brake pedal.

### NOTE

The stop lights automatically turn on when the parking brake is applied and the engine is running.

### VEHICLE JACKING POINTS

For detailed instructions, refer to Maintenance information [MI18-18](#), available on the technical publications USB key and website.

### HYDRAULIC JACK

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



### DANGER

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.



### DANGER

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 THE VEHICLE

For detailed instructions, refer to Maintenance information [MI18-18](#), available on the technical publications USB key and website.

## DAYTIME RUNNING LIGHTS

The daytime running lights system provides 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 pressed to the first position.



### WARNING

Do not drive with only the daytime running lights at night because the tail and marker lights are not turned on in that situation and the high beams can blind other drivers. For night driving, turn ON the headlights by depressing the exterior lighting rocker switch to the second position.

## FOG LIGHTS

Optional halogen fog lights are available. They provide better visibility in fog and precipitation. They improve visibility immediately in front of the vehicle. They also provide added safety.

### NOTE

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

## COMPARTMENT LIGHTING

Baggage compartments and the service compartments lights are automatically turned on when the corresponding compartment door is opened. A pictogram will appear on the status bar of the Driver Information Display (DID) when the baggage 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 vehicle and prevent stones and debris from being thrown at vehicles traveling behind the vehicle. Splash guards may be installed behind each dual wheel of the drive axle to prevent stone projectiles from being thrown at the tag axle wheels.

## BACK-UP CAMERA

An optional back-up camera is available which provides the driver with visual assistance when backing-up. The monitor is mounted on the left side pillar. It switches on automatically when the transmission is in the reverse (R) range.

## BACK-UP ALARM

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

### ESSENTIAL FUNCTIONS TO OPERATE THE VEHICLE (BASIC LIMP-HOME FUNCTIONS)

Even with a defective CECM (Chassis Electronic Control Module) or a CAN network problem, essential base functions are maintained to rear start the vehicle from the engine compartment and drive in a secure manner.

#### AVAILABLE FUNCTIONS

- Startup: Turn on the ignition in the driver's area and rear start the vehicle from the engine compartment,
- Opening the door: Functions normally,
- Closing the door: Manually pull on the door and it will lock automatically,
- Windshield wipers: Wipers functions at 1st speed only
- Windshields washer fluid: Lower windshield washer
- Headlights: Low beams only,
- Directional signals: Rear and front only,
- Stoplights: 2 upper stoplights + high-mounted stoplight are functional,
- HVAC: Functional with set point fixed at 70°F (22°C), evaporator and condenser fixed at speed 1, defroster fixed at speed 4.



#### CAUTION

The following directives must be followed.

- Never connect a battery charger when the ignition is at the ON position on a vehicle with a CAN defective or certain functions will start up by themselves,
- Disconnect the charger before starting the vehicle, if not the default functions will not activate,
- If the default mode does not activate, try to turn the ignition OFF while ensuring that no charger is connected and then restart the vehicle.

### ENGINE PROTECTION SYSTEM

The engine protection will automatically derate or stop the engine when certain engine conditions reach a critical stage.

In the event of a serious fault, the red STOP telltale light comes on and an audible alarm will sound if the engine is running.



An illuminated STOP telltale light indicates a serious problem has been detected, and the driver must respond immediately to the problem. The vehicle must be safely pulled off the road and stopped. In some instances, the engine must be switched off immediately.

#### AUTOMATIC ENGINE SHUTDOWN

Prior to an actual automatic shutdown, the engine will automatically derate, go to idle, and then stop as the vehicle speed gets below 2 mph (3 km/h).

The engine shutdown protection will automatically derate and stop the engine when one or more of the conditions listed below reaches a critical point:

- High engine coolant temperature
- High engine oil temperature
- Low engine oil pressure
- High crankcase pressure (rate of change)

After the automatic engine shutdown sequence, the engine may be restarted. To do so, turn the ignition switch to the OFF position for 7 seconds and then turn it back to ON. However, it will only operate for 30 seconds unless the problem is resolved.

Use this function sparingly and in order to move the vehicle to a safe parking place only. Excessive use may result in severe engine damage.



#### WARNING

Failure to take necessary action when the STOP telltale light is on can ultimately result in automatic engine derate and shutdown.