

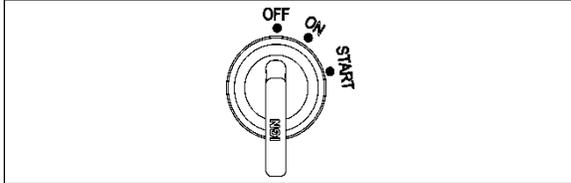
## SECTION 6      STARTING AND STOPPING PROCEDURES

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## 6-2 STARTING AND STOPPING PROCEDURES

### IGNITION SWITCH

Coaches are equipped with an ignition lever instead of an ignition key. Use the ignition lever to activate the electrical circuit by turning it to the ON position.



IGNITION SWITCH POSITIONS

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### CAUTION

When the vehicle is parked overnight or for an extended period of time, the ignition 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, Allison TCM power, entrance door and fire alarm.

#### NOTE

Depending on vehicle, communication radio system power is supplied either directly from battery OR only with engine running. Refer to wiring diagram for details.

The ignition switch doubles as the battery master switch. Any position other than OFF activates the electrical circuits. Electrical circuits are also activated when the hazard switch is depressed. Two auxiliary master switches in series with the ignition switch are installed on the vehicle; one is located on the rear electrical panel and one in the engine compartment on the rear start panel, for maintenance ease.

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

**Off** - In the OFF position, ignition cannot take place.

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.

**On** - Turn the lever clockwise to the first position to place the ignition switch to ON. Do not leave the lever in this position unless the engine is running.

**Start** - Use this position to crank the engine. The ignition switch is equipped with a starter protection which inhibits turning the lever to the START position if the lever has not previously been turned to the OFF position.

### STARTING THE ENGINE

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

#### STARTING FROM THE DRIVER'S SEAT

1. Make sure the rear start selector switch located in the engine compartment is set to the NORMAL position and that the battery master switch (master cut-out) located on the rear electrical panel is set to the ON position.



REAR ELECTRICAL PANEL IN R.H. ENGINE COMPARTMENT

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2. Make sure the parking brake is applied, if not, apply the parking brake by pulling the parking brake control button all the way up.

#### NOTE

An electronic protection will prevent the engine from starting if the parking brake is not applied.

3. Turn ignition switch to ON and wait a few second;

**NOTE**

When the ignition is turned to ON, the M32QR ABS Pressure Modulator Valve solenoids are briefly energized. This can be audibly detected by a rapid cycling of the PMVs. If the air system is fully charged and the service brake pedal is depressed when ignition is turned to ON, the modulator valves create a sharp audible "chuff" of air pressure.

4. The transmission pushbutton shift selector automatically selects neutral (N) when the ignition switch is turned to ON;
5. With your foot off the accelerator pedal, turn ignition switch to START position, release the ignition switch after the engine starts. If the engine did not start, return the ignition switch to the OFF position before trying to restart the engine;
6. Brake pedal must be applied when selecting Drive (D) otherwise the transmission will stay in neutral (N).



**CAUTION**

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



**CAUTION**

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



**CAUTION**

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

**NOTE**

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

**NOTE**

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

**Stopping the Engine**

1. Apply parking brake and place transmission in neutral (N);
2. 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);
3. Shut off all electrical loads;
4. Turn the ignition switch to the OFF position.



**CAUTION**

Do not shut OFF engine when running above normal idle.



**CAUTION**

Turn the battery master switch (master cut-out) to the OFF position after parking and when left unattended for an extended period of time.

**STARTING FROM THE ENGINE COMPARTMENT**

Switches to start and stop the engine from inside the engine compartment are mounted on a small panel above the air filter.



**DANGER**

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

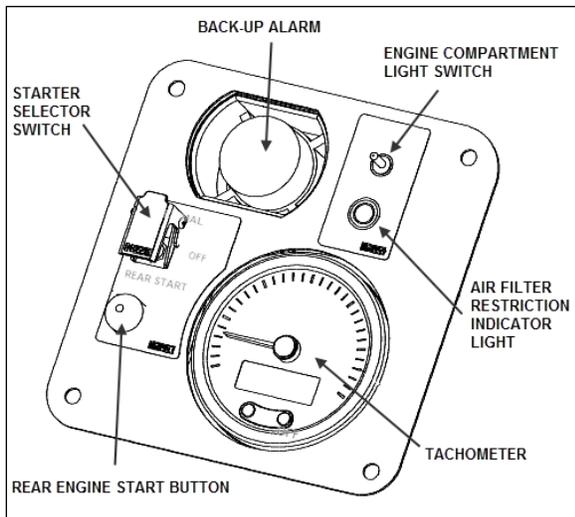
## 6-4 STARTING AND STOPPING PROCEDURES

1. Turn the battery master switches (ignition and master cut-out) to the *ON* position;



**BATTERY MASTER SWITCH**

2. Flip the starter selector switch to the *REAR START* position;



**REAR START PANEL**

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3. Press the *REAR START* push-button switch, release push-button after the engine starts.



### **DANGER**

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" in this section



### **DANGER**

Rotating shafts can be dangerous. You can snag cloths, skin, hair, hands, etc. This can cause a serious injury or death. Do not work on a shaft (with or without a guard) when the engine is running.

### **Stopping the Engine**

To stop the engine from the engine compartment, flip the starter selector switch to the - position.



### **DANGER**

Make sure parking brake is applied and entrance door interlock is not canceled before stopping the engine.



### **CAUTION**

Do not stop engine by any other method.

### **COLD WEATHER STARTING**

When starting a cold engine, the intake air should be warmed up by using the intake air preheater. Turn the ignition switch to the *ON* position. The preheater will not engage at coolant temperature above 54°F (12°C). If the coolant temperature is below 54°F (12°C), the preheater will engage and will light the preheater telltale between 0 and 50 seconds, depending on the engine coolant temperature. Wait before the preheater telltale has turned off before starting the engine.

If necessary, once the engine has started, the preheater will reengage (post heating) for the same length of time as the preheat time.



### **DANGER**

**Do not** use ether or other combustable starting aid fluid on any engine equipped with an intake air preheater. If the engine is equipped with a preheater, introduction of ether or similar starting aids could cause a fire or explosion resulting in severe property damage, serious personal injury or death.

**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.

 **DANGER**  
 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.

 **DANGER**  
 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.

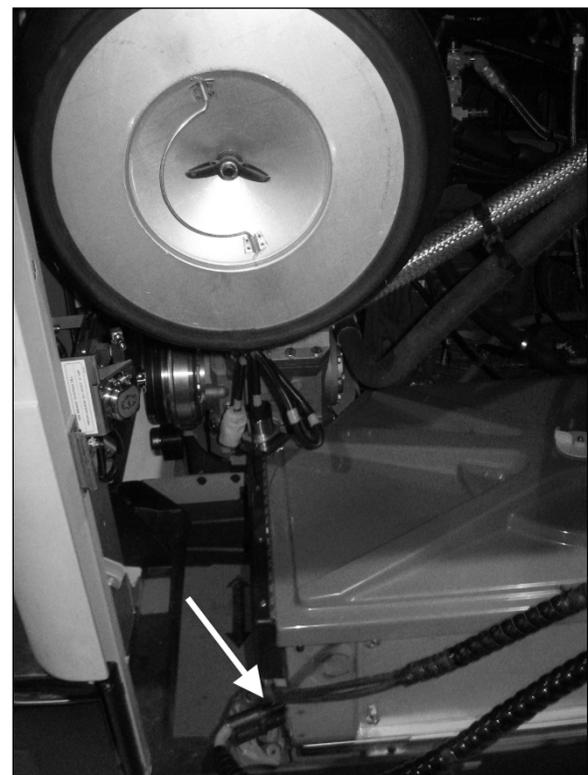
 **WARNING**  
 Before attempting to jump start, make sure the parking brake is applied and the transmission is in neutral (N). Turn off all lights, heaters and other electrical accessories.

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

To jump start, proceed as follows:

1. Remove the protective plug from the booster block bulkhead connector located in the engine curbside compartment;
2. Connect to the bulkhead connector. If the boosting battery is in another vehicle, that vehicle's engine must be shut OFF before connecting;
3. Disconnect the jumper cable.
4. Install protective plug on the booster block terminal.

**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.*



**BOOSTER BLOCK LOCATION**

**ENGINE PROTECTION SYSTEM**

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

## 6-6 STARTING AND STOPPING PROCEDURES

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.

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 during 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.

### IDLE SHUTDOWN TIMER

The idle shutdown timer is programmed to shut down the engine after 15 minutes of engine idling time.

The engine will shut down at the set time under the following conditions:

- Vehicle speed is 0;
- Engine is running at normal or fast idle speed;
- The engine coolant temperature is above 120°F (49°C);
- The temperature inside the vehicle is between 59°F (15°C) and 81°F (27°C);
- The parking brake is applied;
- The transmission is in neutral (N);
- The wheelchair lift system is not in use;

Pressing the fuel pedal will prevent engine shutdown and restart countdown.

### 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.

 <b>DANGER</b>
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

When the transmission temperature falls below -20°F (-29°C), the CHECK 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 telltale light goes out. The transmission will only operate in first or reverse gears until it reaches normal operating temperature.