INTRODUCTION
TO THE
OPERATOR'S MANUAL

Before we go any further, make sure of five things:

1). You've sent in your Spartan Motors Warranty Owners Registration. This will not only allow your vehicle to be serviced but you will receive a beautiful Spartan logo to be mounted on your coach.

2). That the dealer has provided you with a Spartan Service/Warranty manual and Bill of Material.

3). The base chassis warranty is 12 months or 24,000 miles to the first owner which ever come first, however some components have warranties which extend beyond that. Please see and read the service manual for an exact description.

4). Your vehicle is equipped with components which are the most readily available, per the application. However, remember this is a heavy-duty premium chassis, not an automotive car. Before any trips are made we recommend you either purchase the emergency spare parts kit (see description in the service manual) or you get those locally. Such items as filter elements, belts, in some cases may not be as readily available as you like.

5.) Before you drive, please obtain a copy of your commercial driver's license manual. While you do not need this license, the manual is excellent, in how it covers the operation air braked/larger diesel chassis. Reading it and following it's guidelines will be of tremendous benefit to you.

This manual has been prepared to acquaint you with the operations and maintenance of your Spartan chassis. This introduction gives you a brief summary as to how to operate the vehicle, general maintenance, Service/Warranty procedures, etc. For more detailed descriptions, please refer to the Service and Warranty manual. Be sure to read the manual and the Service/Warranty guidelines. Following these recommendations will help assure the most enjoyable, safe and trouble free operation of your chassis.

When it comes to service, remember that your authorized Spartan service center knows your chassis best. A complete list can be found at the back of this manual or by contacting Spartan Motors Service / Warranty Department.

In addition, there is an established Spartan Motors Chassis Owners International Club. This club is currently Spartan sponsored. It involves quarterly newsletters, gatherings, and activities all designed to keep you informed about chassis developments and how you interact with Spartan Motors. For membership information, please contact Ms. Courtney Grundstrom at (517) 543-6400 ext. 214.

We thank you for choosing a Spartan Motors product and want to assure you of our continuing interest in your motoring pleasure and satisfaction.

Note: Due to constant product improvement specifications are subject to change without notice.

Sincerely,

John Sztykiel
Executive Vice President
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In the event of a Service or Warranty related problem contact the following:

Service at Spartan Motors: (517) 543-6400 ext. 207
Bill Moore or Brett Miller

Service/Warranty in the Field: (800) 543-4334 or
(517) 543-6400

When contacting any of the above, please have your chassis Vehicle Identification Number (VIN) and mileage in hand.

To insure prompt payment on all Warranty claims, please follow this procedure:

1. Be sure that you have sent in the Warranty Registration to Spartan Motors.

2. Call the Warranty Department prior to doing repairs. (Notify Spartan Motors of repairs needed as they will be more than happy to assist you).

3. The Service Center must call Spartan to obtain a Warranty Authorization Number. (This is a reference number given to the invoice that is being sent to Spartan Motors.)

4. All bills should be itemized with parts and labor broken down.
COMPONENT CHECK LIST

The following check list is intended to familiarize the owner/user with the placement of components on the chassis. Please locate and check all items noted.

A. Engine
   1. Fluid levels
      a. Dipstick and filler tube placement (they are located at the end of the engine, the back of the motorhome.)
      b. See Engine Manual for filters, fluids and capacities.
   2. Filters and fuel water trap
   3. There is an indicator which indicates how clean the air cleaner is. A dirty air cleaner can reduce horse power and cause engine damage. Make sure the air intake is free of any clogging debris, and the filter element is clean.

B. Transmission
   1. Fluid levels
      a. Dipstick and filler tube placement

C. Cooling System
   1. Radiator placement - Note: Radiator location on chassis - make sure that there are no obstructions, leaves, snow, etc.
   2. Surge tank position - Note: Make sure the sight glass has a green tint. This indicates there is an adequate amount of coolant in the system. If the sight of glass is white, there is not enough coolant in the system, and it must be filled and deaerated. (see service manual)
   3. Coolant recovery tank
   4. Coolant level check - Note: Make sure coolant is between the add and fill markings on the coolant recovery tank.

D. Air System
   1. Tank placement (see manual)
   2. Air dryer placement and maintenance (see service manual)
   3. The air tanks should be manually drained before the start of each trip.

E. **IMPORTANT:**

   E. Power Steering System (see manual)
      1. Oil reservoir (located at the back of the coach)
         a. Fluid level check
         b. Type of fluid

F. Front Axle Oil Seals (see page 11)
   1. Placement
      a. Oil level
      b. Type of fluid

G. Prop Shaft (see manual)
   1. Placement
   2. Grease fitting positions

H. Air Cleaner
   1. Note air cleaner intake location and make sure it is clear of any debris
   2. Air cleaner restriction indicator (note location and how clean the filter element is)
OPERATING PROCEDURES

DRIVING IN GENERAL

**CAUTION** Spartan Motors recommends obeying posted speed limits. Further, driving too fast for conditions is dangerous, and creates the possibility of loss of vehicle control and resulting in personal injury. Under some circumstances, driving at very high speeds for extended periods of time may also result in damage to vehicle components, creating a risk of failure and potential loss of vehicle control. You may find it necessary to reduce your driving speed for road, traffic, or weather conditions.

**NEW VEHICLE BREAK-IN**

Your new vehicle does not need an extensive break-in. Try not to drive continuously at the same speed, as parts tend to adjust themselves better to other parts if various speeds are used during the first 1,000 miles. Approximately 100 miles of city driving is required to fully break in a new set of brake linings. Repeated heavy stops should be avoided during this period. New vehicles should be driven 500 miles before towing a trailer.

Don't add anti-friction compounds or special break-in oils during the first few thousand miles of operation, since these additives may prevent piston ring seating. See Engine Oil for information on oil usage.

**VEHICLE LOAD CAPACITY**

Your vehicle's load capacity is designed by weight not volume; thus, with large or heavy loads, you cannot necessarily load the vehicle until all available space is full. Maximum safe vehicle weights (front and rear total) as well as tire and rim sizes and inflation pressures are specified for your vehicle on the Vehicle Data Plate Label (located inside the coach). The manufacturer uses this information and supplies a Federal Certification Tag which is located inside the vehicle to the left of the driver.

Gross Axle Weight Rating (G.A.W.R.) The value specified as the load-carrying capacity of a single axle system, as measured at the tire-ground interface. The capacity is determined by the lowest rated capacity of the tires, brakes, wheels, suspension and axle assembly.

Gross Vehicle Weight Rating (G.V.W.R.) The maximum total vehicle weight, measured at tire-ground interfaces, for which the vehicle possesses components adequately rated to safely carry. This figure cannot exceed the sum of the G.A.W.R.s.

**WARNING** When fully loaded, the weight of the completed vehicle must not exceed the G.V.W.R., and the weight must be distributed so that the G.A.W.R. is not exceeded. Overloading can shorten vehicle life and create potentially serious safety hazards.

Spartan Motors recommends that you do not use selected higher capacity components because they do not necessarily increase your vehicle's load capacity, and they may adversely affect driver and passenger safety by reducing your vehicle's handling capability.

**FUEL ECONOMY**

Accurate fuel economy normally cannot be determined until a vehicle has been driven at least 1,000 miles because fuel consumption is higher during the new vehicle "break-in" period. To calculate fuel economy, divide the number of miles by the number of gallons of fuel used. In metric, multiply the number of liters used by 100 and divide the answer by the number of kilometers traveled. This will give you the number of liters used per 100 kilometers, which is the normal method used to compare fuel economy in metric units. Do this for several tankfuls to obtain an average.

**IMPROVING FUEL ECONOMY**

There are two important factors you can control to improve fuel economy; the mechanical condition of your vehicle and how you drive it.

A well tuned, properly maintained vehicle will deliver better fuel economy than a neglected vehicle. To be sure that your vehicle is in top operating condition for maximum fuel economy, follow the maintenance schedule provided in the Maintenance Schedule and Record Log.

Your driving habits will have a significant influence on the amount of fuel you use. By consciously thinking about fuel economy and following these suggestions when you drive, you should be able to stretch your mileage:

- Avoid changes in speed as much as possible.
- Look ahead and anticipate changing traffic conditions. Sudden stops waste fuel.
• Avoid long period of idling.
• Avoid fast acceleration.
• Do not drive with your foot resting on the brake pedal.
• Keep loads light. Avoid carrying unneeded items.
• Keep tires inflated at the recommended pressure.

**CAUTION:** It is the driver's responsibility to monitor all gauges and warning devices while operating the vehicle.

**NORMAL STARTING PROCEDURES**

• Be sure head lamps are off.
• Put the transmission in neutral.
• Position the ignition switch to the ON position.
• Start the engine with the accelerator pedal at approximately half throttle.

**CAUTION:** To prevent damage to the starter, do not engage the starter more than 15 seconds. Wait two minutes between each attempt to start.

• Move the throttle to idle as soon as the engine starts.
• Engine oil pressure MUST be indicated on gauge within 15 seconds after starting.
• Step on the brake.
• Wait for air buzzer(s) to stop, push in the yellow park brake button to disengage parking brake.

**WARNING:** Let the engine idle 3 to 5 minutes at 1000 rpm before applying a load.
• Put the transmission in the drive or reverse position (accordingly).

**WARNING:** When going from drive to reverse or vice versa the chassis must come to a complete stop and engine speed must be at an idle.

Never idle engine in closed areas. Never sit in a parked or stopped vehicle for any extended amount of time with the engine running. Exhaust gases may build up. These gases are harmful and potentially lethal.

Carbon monoxide is colorless and odorless, but can be present with all other exhaust fumes. Therefore, if you ever smell exhaust fumes of any kind inside your vehicle, have it inspected immediately by your dealer and have the condition corrected. Do not drive with exhaust fumes present.

In order to guard against the possible entry of carbon monoxide into your vehicle, the exhaust system and body ventilation system should be properly inspected by a competent technician as follows:
• Each time the vehicle is raised for service;
• Whenever you detect a change in sounds from the exhaust system;
• Whenever the vehicle has been damaged by impact with another vehicle, object and/or road obstruction.

In order to afford proper ventilation, all air inlet vents should be kept clean of snow, leaves and other debris.

**AIR BRAKE OPERATION**

This section tells you about air brakes. You need this information for safe operation of air brakes used on trucks and buses.

Air brakes use compressed air to make the brakes work. You can apply all the braking force you need to each of the wheels of a heavy vehicle. Air brakes are a safe way of stopping large vehicles if the brakes are well maintained and used right. However, you must know more about air brakes than you need to know with the simpler brake systems used on light vehicles. Therefore, it is important for you to study this section.

Air brake systems are three braking systems combined: the service brake system, the parking brake system, and the emergency brake system.

The **service brake** system applies and releases the brakes when you use the brake pedal during normal driving. The **parking brake** system applies and releases the parking brakes when you use the parking brake control. The **emergency brake** system uses parts of the service and parking brake systems to stop the vehicle in the event of a brake system failure. The parts of these systems are discussed in greater detail below.

**THE PARTS OF AN AIR BRAKE SYSTEM**

There are many parts to an air brake system. You should know about the parts discussed here.

The air compressor pumps air into the air storage tanks (reservoirs). The air compressor is connected to the engine through gears. The compressor is cooled by the engine cooling system. It may have its own oil supply, or be lubricated by engine oil. If the compressor has its own oil supply, check the oil level before driving.

The governor controls when the air compressor will pump air into the air storage tanks. When air tank pressure rises to the "cut-out" level (around 125 pounds per square inch, or "psi"), the governor stops the compressor from pumping air. When the tank pressure falls to the "cut-in" pressure (around 100 psi) the governor allows the compressor to start pumping again.

Two air storage tanks are used to hold compressed air. The tanks will hold enough air to allow the brakes to be used several times even if the compressor stops working.
• **Air Tank Drains** Compressed air usually has some water and some compressor oil in it which is bad for the air brake system. For example, the water can freeze in cold weather and cause brake failure. The water and oil tend to collect in the bottom of the air tank. Therefore each air tank is equipped with a drain valve in the bottom. There are two types, manually operated by turning a quarter turn, shown in Figure 5-1. You must drain the tanks yourself at the end of each day of driving.

All Spartan chassis are equipped with an automatic air/moisture ejector. This device is located between the air compressor and first tank back near the engine. It automatically collects moisture and ejects it from the system. From time to time you will hear it spitting (ejecting moisture).

![Figure 5-1](image)

• **Safety Valve** A safety relief valve is installed in the first tank the air compressor pumps air to. The safety valve protects the tank and the rest of the system from too much pressure. The valve is usually set to open at 150 psi. If the safety valve releases air, something is wrong. Have the fault fixed by a mechanic.

• **The Brake Pedal** You put on the brakes by pushing down the brake pedal. (It is also called the foot valve, or treadle valve.) Pushing the pedal down harder applies more air pressure. Letting up on the brake pedal reduces the air pressure and releases the brakes. Releasing the brakes lets some compressed air go out of the system, so the air pressure in the tanks is reduced. It must be made up by the air compressor. Pressing and releasing the pedal unnecessarily can let air out faster than the compressor can replace it. If the pressure gets too low the brakes won't work.

When you push the brake pedal down, two forces push back against your foot. One force comes from a spring. The second force comes from the air pressure going to the brakes. This lets you feel how much air pressure is being applied to the brakes.

• **Supply Pressure Gauges** All air-braked vehicles have a pressure gauge connected to the air tank. All Spartan chassis have a dual air brake system, and there will be a gauge for each half of the system. (Or a single gauge with two needles). Dual systems will be discussed later. These gauges tell you how much pressure is in the air tanks.

• **Low Air Pressure Warning** A low air pressure warning signal is required on vehicles with air brakes. A warning signal you can see must come on before the air pressure in the tanks falls below 60 psi. (Or one half the compressor governor cutout pressure on older vehicles). A buzzer may also come on.

• **Stop Light Switch** Drivers behind you must be warned when you put your brakes on. The air brake system does this with an electric switch that works by air pressure. The switch turns on the brake lights when you put on the air brakes.

• **Emergency Brake** All trucks, truck tractors, and buses must be equipped with emergency brakes and parking brakes. They must be held on by mechanical force (because air pressure can eventually leak away). Spring brakes are used to meet these needs. When driving, powerful springs are held back by air pressure. If the air pressure is removed, the springs put on the brakes. A parking brake control in the cab allows the driver to let the air out of the spring brakes. This lets the spring put the brakes on. A leak in the air brake system which causes all the air to be lost will also cause the springs to put on the brakes.

Spring brakes will come fully on when air pressure drops to a range of 20 to 45 psi (typically 20 to 30 psi). Do not wait for the brakes to come on automatically. When the low air pressure warning light and buzzer first come on bring the vehicle to a safe stop right away while you can still control the brakes.

• **Parking Brake Controls** The braking power of spring brakes depends on the brakes being in adjustment. If the brakes are not adjusted right, neither the regular brakes nor the emergency/ parking brakes will work right.

In Spartan chassis with air brakes, you put on the parking brakes using a diamond shaped, yellow, push-pull control knob. You pull the knob out to
put the parking brakes (spring brakes) on, and push it in to release them. Use the parking brakes whenever you park.

**CAUTION:** Never push the brake pedal down when the spring brakes are on. If you do, the brakes could be damaged by the combined forces of the springs and the air pressure. Many brake systems are designed so this will not happen. But not all systems are set up that way, and those that are may not always work. It is much better to develop the habit of not pushing the brake pedal down when the spring brakes are on.

**DUAL AIR BRAKE**

A dual air brake system has two separate air brake systems which use a single set of brake controls. Each system has its own air tanks, noses, lines, etc. One system typically operates the regular brakes on the rear axle or axles. The other system operates the regular brakes on the front axle (and possibly one rear axle). Both systems supply air to the trailer (if there is one). The first system is called the “primary” system. The other is called the “secondary” system.

Before driving a vehicle with a dual air system, allow time for the air compressor to build up a minimum of 100 psi pressure in both the primary and secondary systems. Watch the primary and secondary air pressure gauges (or needles, if the system has two needles in one gauge). Pay attention to the low-air pressure warning light and buzzer. The warning light and buzzer should shut off when air pressure in both systems rises to a value set by the manufacturer. This value must be greater than 60 psi.

The buzzer should come on before the air pressure drops below 60 psi in either system. If this happens while driving you should stop right away and safely park the vehicle. If one air system is very low on pressure, either the front or the rear brakes will not be operating fully. This means it will take you longer to stop. Bring the vehicle to a safe stop, and have the air brake system fixed.

If the air governor does not work as described above, it may need to be fixed. A governor that does not work right may not keep enough air pressure for safe driving.

- **Test Parking Brake.** Stop the vehicle, put the parking brake on, and gently pull against it in a low gear to test that the parking brake will hold.

- **Test Service Brakes.** Wait for normal air pressure, release the parking brake, move the vehicle forward slowly (about 5 mph), and apply the brakes firmly using the brake pedal. Note any vehicle “pulling” to one side, unusual feel, or delayed stopping action.

This test may show you problems which you otherwise wouldn’t know about until you needed the brakes on the road.

**USING AIR BRAKES**

This vehicle has a newer heavy-duty dual air brake system.

- **Normal Stops** Push the brake pedal down. Control the pressure so the vehicle comes to a smooth, safe stop.

- **Emergency Stops** You should brake so you can steer and so your vehicle stays in a straight line. Use one of the following two methods.

  **Controlled braking.** This method is also called “squeeze” braking. Put on the brakes as hard as you can without locking the wheels. Do not turn the steering wheel while doing this. If you need to make large steering adjustments or if you feel the wheels sliding, release the brakes. Brake again as soon as the tires get traction.

  **Stab braking.** a) Press on the brake pedal as hard as you can. b) Release the brakes when the wheels lock up. c) As soon as the wheels start rolling, put on the brakes fully again. It can take up to one second for the wheels to start rolling after you release the brakes. Make sure you stay off the brakes long enough to get the wheels rolling again. Otherwise the vehicle may not stay in a straight line.

- **Stopping Distance** With air brakes there is an added delay: the time required for the brakes to work after the brake pedal is pushed. With hydraulic brakes (used on cars and light/medium trucks), the brakes work instantly. However, with air brakes, it takes a little time (one half second or more) for the air to flow through the lines to the brakes. Thus, the total stopping distance for vehicles with air brake systems is made up of four different factors.

  
  | Perception Distance |
  | Reaction Distance   |
  | Brake Lag Distance  |
  | Effective Braking Distance |
  | = Total Stopping Distance |

  The air brake lag distance at 55 mph on dry pavement adds about 32 feet. So at 55 mph for an average driver under good traction and brake condition, the total stopping distance is over 300 feet. This is longer than a football field.

- **Braking on Downgrades** When you use the brakes, they get hot. Brakes can take a lot of heat. However, brakes will stop working if there is
too much heat. Excessive heat is caused by trying to slow down from too high a speed too many times or too quickly. Brakes will fade when they get too hot. (You will have to push harder on the pedal to get the same stopping force). They can fade so badly they will not slow you down.

The right way to go down long grades is to use a low gear and go slow enough that a fairly light, steady use of the brakes will keep you from speeding up. If you go slow enough, the brakes will be able to get rid of the heat so they will work as they should.

Some people believe that using the brakes hard going downhill but letting up on them from time to time will allow them to cool. Tests have shown this is not true. Brakes cool very slowly, so the cooling between hard braking is not enough to prevent overheating. Also, the vehicle picks up speed when the brakes are let up, which means more hard braking to slow it back down. Braking in this way, on-and-off, builds up more heat than the light, steady method does. Therefore, go slow enough use the right gear, and maintain light, steady pressure on the brakes.

It is always important for the brakes to be adjusted right. However, it is especially important when going down steep grades. In addition to proper slack adjustment, the air brake system should be balanced, to give about the same braking at each of the wheels. Otherwise, some brakes will do more work than others. They will heat up and lose some of their stopping power. Brake balance can be tested and fixed by good air brake mechanics.

- **Low Air Pressure** If the low air pressure warning comes on, stop and safely park your vehicle as soon as possible. There might be an air leak in the system. Controlled braking is possible only while enough air remains in the air tanks. The spring brakes will come on when the air pressure drops into the range 20 to 45 psi. A heavily loaded vehicle will take a long distance to stop, because the spring brakes do not work on all axles. Lightly loaded vehicles or vehicles on slippery roads may skid out of control when the spring brakes come on. It is much safer to stop while there is enough air in the tanks to use the foot brake.

- **Parking Brakes.** Any time you park, use the parking brakes, except as noted below. Pull the parking brake control knob out to apply the parking brakes, push it in to release them. The control will be a yellow, diamond-shaped knob labeled "parking brakes" on newer vehicles. On older vehicles, it may be a round blue knob or some other shape (including a lever that swings from side to side or up and down).

Don't use the parking brakes if the brakes are very hot (from just having come down a steep grade), or if the brakes are very wet in freezing temperatures. If they are used while they are very hot, they can be damaged by the heat. If they are used in freezing temperatures when the brakes are very wet, they can freeze so the vehicle can not move. Use wheel chocks to hold the vehicle. Let hot brakes cool before using the parking brakes. If the brakes are wet, use the brakes lightly while driving in a low gear to heat and dry them.

Your vehicle does not have individual automatic air tank drains, drain your air tanks at the end of each working day to remove moisture and oil. Otherwise, the brakes could fail.

Never leave your vehicle unattended without applying the parking brakes or chocking the wheels. Your vehicle might roll away and cause injury and damage.

### UP HILL DRIVING

- Manually downshift the transmission into third or second gear depending on the severity of hill.
- The increased torque given by downshifting will improve the hill climbing ability, but will decrease road speed.

**NOTE:** On extremely steep hills the transmission temperatures may tend to increase. Normal transmission operating temperatures range is 180-220 degrees. The maximum temperature for non-retarder models is 300 F degrees. It is advisable, however, that at a suitable place to stop the chassis, apply the park brake, place the transmission in neutral and accelerate engine to 1200 to 1500 RPM. This should reduce the sump temperature to operating level within a short time. If high levels persist consult the transmission and/or engine operator's manual.

**IMPORTANT:** When traveling, typically a diesel runs best (cooling system operates most effectively, lubrication, etc.) when the engine is run at 80 to 90% of governed RPM. This is extremely important when going up hill. Even though you have an automatic, there may be times in both going uphill or downhill when the transmission will not shift because the speed or power (torque) which it is seeing will not allow it. Thus you will have to manually shift the transmission yourself. When you are doing this take your foot off the accelerator until the shift is complete.
DRIVING DOWN HILLS OR AROUND TURNS

Using your brakes generates heat. Brakes can take a lot of heat, however they can stop working if there is too much heat. Excessive heat is caused by trying to slow down from too high a speed too many times, or too quickly.

The right way to go down long grades is to use a low gear and go slow enough that a fairly light, steady use of the brakes will keep you from speeding up.

IMPORTANT: It is always best to shift into low gear just before you start downhill, or before you enter the turn. This will help to prevent the vehicle from picking up unnecessary road speed.

If you go slow enough, the brakes will be able to get rid of the heat so they will work as they should.

Some people believe that using the brakes hard going down hill but letting up on them from time to time will allow them to cool. Tests have shown this is not true. Brakes cool very slowly, so the cooling between hard brakings is not enough to prevent overheating. Also the vehicle picks up speed when the brakes are let up, meaning more hard braking to slow it back down. Braking in this way, on and off, builds up more heat than applying light, steady pressure. Therefore, go slow enough, use the right gear, and maintain light, steady pressure.

It is always important for the brakes to be adjusted right, however it is especially important when going down steep grades. If the brakes are not adjusted right, neither the regular brakes nor the emergency/parking brakes will work right.

DRIVING IN COLD CONDITIONS

- Follow the normal starting procedures.
- Use the following chart as a reference for a required cold weather starting aid.

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Starting Aids</th>
<th>Oil Pan and Block Heaters</th>
</tr>
</thead>
<tbody>
<tr>
<td>0°C</td>
<td>Unaided</td>
<td>Unaided</td>
</tr>
<tr>
<td>-12°C</td>
<td>Suggested</td>
<td>Suggested</td>
</tr>
<tr>
<td>-18°C</td>
<td>Required</td>
<td>Required</td>
</tr>
<tr>
<td>-24°C</td>
<td>Required</td>
<td>Required</td>
</tr>
</tbody>
</table>

FOR STARTING ETHER EQUIPPED ENGINE (Optional Equipment)
- Depress the accelerator pedal all the way to the start position and release the pedal.
- Put transmission in neutral.
- Position the main electrical switch to the ON position.
- While cranking the engine, inject a metered amount of starting fluid.
- Continue operation as normal.

FOR OIL PAN OR ENGINE BLOCK HEATER EQUIPPED MODELS
- Plug in at least three hours prior to operation. The amount of time is relative to ambient temperature.
- Once engine is heated, follow normal operation procedure.

NOTE: All Spartan Diesel chassis are equipped with an engine block heater. Oil pan heaters are an optional item.

DRIVING IN HIGH TEMPERATURES

- Observe engine and transmission temperature indicated by gauges on the dash panel to be within operating range.
- If transmission temperature increases excessively, stop at a suitable place, apply the park brake, place the transmission in neutral and accelerate engine to 1200 to 1500 RPM's. This should reduce the pump temperature to operating level within a short time.
- If overheating persists, consult the transmission and/or engine operators manual.

NOTE: Due to varying climates and load conditions, there may be times when the vehicle must be driven at a slower speed than desired to keep the operating temperatures of the engine and transmission in their desired levels. This will be typically noticed on extremely hot days and going up hill.

SPECIAL DRIVING INSTRUCTIONS

SLIPPERY SURFACES
On slippery surfaces, avoid quick movements of the steering wheel. Decrease your speed and allow for extra stopping distance required by these conditions. Apply the brakes by pumping the pedal steadily and evenly to avoid wheel lockup and loss of vehicle control.

WARNING: Do not use cruise control on slippery roads.

- To stop on ice, shift to N (NEUTRAL) below 10 mph and gently pump the brakes to bring the vehicle to a stop.

If the wheels spin during vehicle start up, shift to 2 (SECOND) gear. Move forward slowly and evenly, if this does not work, try rocking the vehicle.
conditions, there may be times when the vehicle must be driven at a slower speed than desired to keep the operating temperatures of the engine and transmission in their desired levels. This will be typically noticed on extremely hot days and going up hill.

**SPECIAL DRIVING INSTRUCTIONS**

**SLIPPERY SURFACES**
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If the wheels spin during vehicle start up, shift to 2 (SECOND) gear. Move forward slowly and evenly, if this does not work, try rocking the vehicle.

**ROCKING THE VEHICLE**
"Rocking" the vehicle is moving it forward and backward in a steady rhythm to gain enough momentum to move it off a particularly slippery spot. Shift, in a steady rhythm, between forward and reverse gears while pressing gently on the accelerator.

If you are still stuck after a minute or two of rocking, have the vehicle pulled out.

**CAUTION:** Prolonged rocking, even at low speeds, may cause engine overheating, transmission and axia damage of failure, or tire damage.

**WARNING:** Do not overspeed the engine or spin the wheels. You could, disintegrate a tire with an explosive force which could result in injury to a bystander or occupant.

**FLOODED AREAS**
Avoid driving through flooded areas unless you are sure the water is no higher than the bottom of the hubs. Drive through slowly. Allow adequate stopping distance since wet brakes do not grip well. After driving through water, gently apply the brakes several times while the vehicle is moving slowly to dry the brakes.

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**SHUT DOWN PROCEDURES**

- Bring chassis to a complete stop.
- Put transmission in neutral, and keep your foot on the brakes.
- Apply park brake. (Pull out the yellow park brake button)
- Take your foot off the brake.

**NOTE:** Allow engine to idle for three to five minutes - otherwise turbo charger may be damaged.

**NOTE:** Failure to let engine cool down after operating under load for one hour or more may cause reduced engine block and turbo life.

- Turn the ignition switch to the OFF position.

**RUNNING OUT OF FUEL:**
If your vehicle runs out of fuel, stop the vehicle on a level location away from traffic. The engine may be restarted by adding at least 10 gallons of fuel to the fuel tank. If the vehicle is not level, up to 15 gallons of fuel may be required. Then refer to engine operator's manual for starting the engine.

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**TOWING PROCEDURES**

**USING THIS VEHICLE TO TOW**

**CAUTION:** Use Gross Combination Weight (GCW) and Gross Vehicle Weight (GVW) to determine amount of weight that can be towed by this vehicle. Refer to coach manufacturer's identification plates for GCW and GVW. Subtract GVW, which is total weight of this vehicle alone, from GCW, which is total weight that this vehicle can safely motor. This is the total amount of weight that this vehicle can tow. If this amount is exceeded, serious damage to this vehicle can result from the extra weight. Over-loading the vehicle can also lead to unsafe operating conditions.

In all situations use special precautionary procedures, safety equipment, and proper emergency warning lighting when towing. Refer to coach manufacturer's manual for further instruction to prevent damage to this vehicle while towing.

**WARNING:** In all cases when towing something contact the local/state authorities for the braking and other requirements concerning towed vehicles. What is represented on the data plate is the capacity only and has nothing to do with actual vehicle towing requirements.
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SHUT DOWN PROCEDURES

- Bring chassis to a complete stop.
- Put transmission in neutral, and keep your foot on the brakes.
- Apply park brake. (Pull out the yellow park brake button)
- Take your foot off the brake.

NOTE: Allow engine to idle for three to five minutes - otherwise turbo charger may be damaged.

NOTE: Failure to let engine cool down after operating under load for one half hour or more may cause reduced engine block and turbo life.

- Turn the ignition switch to the OFF position.

RUNNING OUT OF FUEL:
If your vehicle runs out of fuel, stop the vehicle on a level location away from traffic. The engine may be restarted by adding at least 10 gallons of fuel to the fuel tank. If the vehicle is not level, up to 15 gallons of fuel may be required. Then refer to engine operator’s manual for starting the engine.

TOWING PROCEDURES

USING THIS VEHICLE TO TOW

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TOWING THIS VEHICLE
When it is necessary to tow a disabled vehicle, certain precautions and procedures must be taken to prevent damage to the vehicle and/or components. Failure to use standard towing industry precautionary measures when lifting or towing a disabled vehicle could result in an unsafe operating condition.

CAUTION: If vehicle is to be towed for extended distance, remove the prop shaft to the rear axle. Failure to do so could cause transmission damage due to lack of proper lubrication.

Only in extreme emergency may the vehicle be towed up to 1/2 mile (.80 km) at no more than 4 MPH (8.04 KPH) without first disconnecting propeller shaft from main transmission.

An engine-driven pump mounted on the automatic transmission supplies all lubricating and clutch apply oil to the transmission. Because the pump location is ahead of the transmission gearing and clutches, the pump cannot be driven when towing the vehicle. Therefore, anytime that the vehicle must be towed, the driveline must be disconnected, or severe damage to the transmission could result from lack of lubrication.