

**2001**

**B7**  
**MEDIUM DUTY**  
**CHASSIS**



# The 2001 Chevrolet Medium Duty B7 Chassis Owner's Manual

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## **1-1 Features and Controls**

This section explains how to start and operate your vehicle.

## **2-1 Your Driving and the Road**

Here you'll find helpful information and tips about the road and how to drive under different conditions.

## **3-1 Problems on the Road**

This section tells you what to do if you have a problem while driving, such as a flat tire or overheated engine, etc.

## **4-1 Service**

Here the manual tells you how to keep your vehicle running properly.

## **5-1 Maintenance Schedule**

This section tells you when to perform vehicle maintenance and what fluids and lubricants to use.

## **6-1 Customer Assistance Information**

This section tells you how to contact Chevrolet for assistance and how to get service and owner publications. It also gives you information on "Reporting Safety Defects" on page 6-5.



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This manual includes the latest information at the time it was printed. We reserve the right to make changes after that time without further notice. For vehicles first sold in Canada, substitute the name “General Motors of Canada Limited” for GM Medium Duty Truck Division whenever it appears in this manual.

Please keep this manual in your vehicle, so it will be there if you ever need it when you’re on the road. If you sell the vehicle, please leave this manual in it so the new owner can use it.

Litho in U.S.A.  
C2101 A First Edition



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## How to Use this Manual

Many people read their owner's manual from beginning to end when they first receive their new vehicle. If you do this, it will help you learn about the features and controls for your vehicle. In this manual, you'll find that pictures and words work together to explain things quickly.

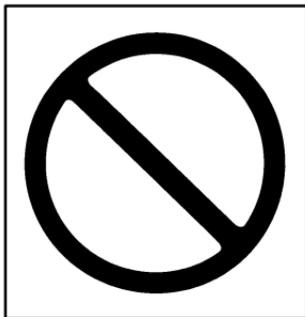
## Safety Warnings and Symbols

You will find a number of safety cautions in this book. We use a box and the word CAUTION to tell you about things that could hurt you if you were to ignore the warning.



**These mean there is something that could hurt you or other people.**

In the caution area, we tell you what the hazard is. Then we tell you what to do to help avoid or reduce the hazard. Please read these cautions. If you don't, you or others could be hurt.



You will also find a circle with a slash through it in this book. This safety symbol means “Don’t,” “Don’t do this” or “Don’t let this happen.”

In the notice area, we tell you about something that can damage your vehicle. Many times, this damage would not be covered by your warranty, and it could be costly. But the notice will tell you what to do to help avoid the damage.

When you read other manuals, you might see CAUTION and NOTICE warnings in different colors or in different words.

You’ll also see warning labels on your vehicle. They use the same words, CAUTION or NOTICE.

## Vehicle Damage Warnings

Also, in this book you will find these notices:

### **NOTICE:**

**These mean there is something that could damage your vehicle.**

## Vehicle Symbols

These are some of the symbols you may find on your vehicle. Also see “Warning Lights and Gages” in the Index.

For example, these symbols are used on an original battery:

CAUTION  
POSSIBLE  
INJURY



PROTECT  
EYES BY  
SHIELDING



CAUSTIC  
BATTERY  
ACID COULD  
CAUSE  
BURNS



AVOID  
SPARKS OR  
FLAMES



SPARK OR  
FLAME  
COULD  
EXPLODE  
BATTERY



These symbols are important for you and your passengers whenever your vehicle is driven:

CHILD  
RESTRAINT  
TOP STRAP  
ANCHOR



DOOR LOCK  
UNLOCK



FASTEN  
SEAT  
BELTS



POWER  
WINDOW



AIR BAG



These symbols have to do with your lamps:

MASTER  
LIGHTING  
SWITCH



TURN  
SIGNALS



PARKING  
LAMPS



HAZARD  
WARNING  
FLASHER



DAYTIME  
RUNNING  
LAMPS



FOG LAMPS



These symbols are on some of your controls:

WINDSHIELD  
WIPER



WINDSHIELD  
WASHER



WINDSHIELD  
DEFROSTER



REAR  
WINDOW  
DEFOGGER



VENTILATING  
FAN



These symbols are used on warning and indicator lights:

ENGINE  
COOLANT  
TEMP



BATTERY  
CHARGING  
SYSTEM



BRAKE



COOLANT



ENGINE OIL  
PRESSURE



ANTI-LOCK  
BRAKES



Here are some other symbols you may see:

FUSE



LIGHTER



HORN



FUEL



OWNER'S  
MANUAL

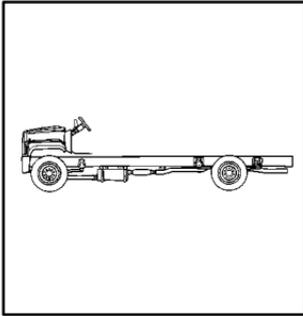


SERVICE  
MANUAL



## Model Reference

This manual contains information which covers the B7 Chassis models as shown. Most models are unfinished from the factory.



Medium Duty Chassis

Since B7 Chassis models delivered from the factory are finished in a variety of ways by a number of companies, you'll probably find other manuals in your finished vehicle. These manuals are put there by the companies that have added components or equipment to the B7 Chassis model. Read all these materials -- as well as this manual -- carefully, to get all of the information on your vehicle.

# Section 1 Features and Controls

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Here you can learn about the many standard and optional features on your vehicle, and information on starting, shifting and braking. Also explained are the instrument panel and the warning systems that tell you if everything is working properly -- and what to do if you have a problem.

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## Keys

### CAUTION:

**Leaving children in a vehicle with the ignition key is dangerous for many reasons. A child or others could be badly injured or even killed. They could operate controls or even make the vehicle move. Don't leave the keys in a vehicle with children.**



The square-head key is for the ignition only.

When a new vehicle is delivered, the dealership removes the plugs from the keys, and gives them to the first owner.

Each plug has a code on it that tells your dealer or a qualified locksmith how to make extra keys. Keep the plugs in a safe place. If you lose your keys, you'll be able to have new ones made easily using these plugs.

The body manufacturer may provide additional keys for locks to entry and access doors, and any other locking compartments on the vehicle. These additional keys may not have plugs with key codes.

## Theft

Vehicle theft is big business, especially in some cities, and even commercial vehicles are no exception. Although your vehicle has a number of theft-deterrent features, we know that nothing we put on it can make it impossible to steal. However, there are ways you can help.

### Key in the Ignition

If you leave your vehicle with the keys inside, it's an easy target for joy riders or professional thieves -- so don't do it.

Remember to remove your key and take it with you. Always do this. When you take your key with you, your ignition will be locked. Also remember to lock the doors.

## New Vehicle “Break-In”

### NOTICE:

Your vehicle doesn't need an elaborate “break-in.” But it will perform better in the long run if you follow these guidelines:

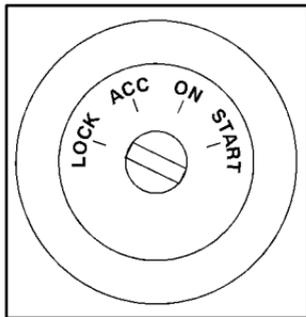
- Let your engine warm up before you operate your vehicle under load.
- Keep your speed at 55 mph (88 km/h) or less for the first 500 miles (805 km).
- Don't drive at any one speed -- fast or slow -- for the first 500 miles (805 km).  
Don't make full-throttle starts.

NOTICE: (Continued)

### NOTICE: (Continued)

- Avoid making hard stops for the first 200 miles (322 km) or so. During this time your new brake linings aren't yet broken in. Hard stops with new linings can mean premature wear and earlier replacement. Follow this breaking-in guideline every time you get new brake linings.
- Don't tow a trailer during break-in.
- Use the lowest gear you can when you start a loaded vehicle in motion and when going up hills to avoid overloading the engine.
- Check and adjust engine and transmission fluid levels often and be sure tires are properly inflated for the load you're carrying.
- If you have a Caterpillar<sup>®</sup> diesel engine, see the Caterpillar<sup>®</sup> Diesel Engine Operation & Maintenance Manual.

## Ignition Positions



Use your ignition key to start your vehicle. You can turn the ignition switch to four different positions.

**LOCK:** This position lets you insert and remove the ignition key.

**ACC (Accessory):** This position lets you use accessories when the engine is off.

**ON:** This is the position for driving.

**START:** This position starts your engine.

## Engine Starter Over-Crank Protection (If Equipped)

Some vehicles have an engine starter over-crank protection system. This system includes a built-in temperature limiting switch to prevent internal damage to the starter. If the starter motor overheats and shuts off due to over-cranking, the motor must cool down before the switch will reset and allow you to operate the starter. It can take up to six minutes before the starter will work again.

## Starting Your Gasoline Engine

Engines start differently. The 8th digit of your Vehicle Identification Number (VIN) shows the code letter for your engine. See “Vehicle Identification Number” in the Index. Follow the proper steps to start the engine.

To start a diesel engine, see “Starting Your Diesel Engine” in the Index.

## Automatic Transmission

Set the parking brake and move your shift lever to NEUTRAL (N) or PARK (P) if so equipped. Your engine won't start in any other position -- that's a safety feature.

## Manual Transmission

Set the parking brake, shift your gear selector to NEUTRAL and hold the clutch pedal to the floor while starting the engine.

## Starter Motor Operation

- The starter motor will disengage if you release the key or the engine reaches a predetermined engine speed.
- To prevent overheating, the starter motor will disengage after continuously operating for 15 seconds. You must release the key from the start position to re-engage the starter.
- The starter motor will not engage if the engine is already running.
- The starter motor will disengage if, after two seconds, the starter pinion gear does not engage the flywheel or there is no engine rpm signal from the engine speed sensor.

## Starting Your Engine

1. Without pushing the accelerator pedal, turn your ignition key to START. When the engine starts, let go of the key. The idle speed will go down as your engine gets warm.
2. If the engine doesn't start in 10 seconds, push the accelerator pedal all the way down and crank the engine for five more seconds, unless it starts sooner.
3. If your engine still won't start (or starts but then stops), it could be flooded with too much gasoline. Wait 15 seconds to let the starter motor cool down. Do Steps 1 through 3 again.  
  
When the engine starts, let go of the key and the accelerator pedal.

## NOTICE:

**Your engine is designed to work with the electronics in your vehicle. If you add electrical parts or accessories, you could change the way the engine operates. Before adding electrical equipment, check with your dealer. If you don't, your engine might not perform properly.**

**If you ever have to have your vehicle towed, see the part of this manual that tells how to do it without damaging your vehicle. See "Towing Your Vehicle" in the Index.**

## Gasoline Engine Warm-Up

When you've started your engine, let it run for 20 or 30 seconds to warm up before you put a load on the engine.

Drive at moderate speeds for the first few miles, especially in cold weather. Running a cold engine at high speed can damage it. See "Engine High Idle System" in the Index if your vehicle has this feature.

## Restarting the Gasoline Engine While Moving (Automatic Transmission)

If you have to restart the engine while the vehicle is moving, you'll first have to shift the automatic transmission to NEUTRAL (N). This safety feature prevents starting the engine when the transmission is in a drive gear.

## Stopping the Gasoline Engine

Let your engine idle for a few seconds before turning it off after you have finished driving your vehicle.

If you shift to NEUTRAL (N) or PARK (P), set the parking brake.

If your vehicle has a two-speed axle, put the range selector in LOW. To be sure the axle has shifted into LOW, engage the clutch and transmission; the vehicle may move slightly when you do this.

While your engine is idling before you turn it off, you can make a list of any operational or handling concerns to give to responsible maintenance personnel so they can handle them right away.

Moisture will condense in a fuel tank that is almost empty if the vehicle is not run for a while, even just overnight under some conditions. So, it's always best to refuel your vehicle at the end of each run.

## Starting Your Diesel Engine

If you have a Caterpillar diesel engine, also refer to your Caterpillar® Diesel Engine Operation & Maintenance Manual for starting procedure.

To make starting easier in cold weather (below 32°F or 0°C), the proper viscosity engine oil should be used. It's also best to heat the engine oil first. You can do this by using an engine coolant heater. A GM Automatic Ether Injection System aids cold weather starting.

### **NOTICE:**

**If you ever have to have your vehicle towed, see the part of this manual that tells how to do it without damaging your vehicle. See “Towing Your Vehicle” in the Index.**

## Restarting the Diesel Engine While Moving (Automatic Transmission)

If you have to restart the engine while the vehicle is moving, you'll first have to shift the automatic transmission to NEUTRAL (N). This safety feature prevents starting the engine when the transmission is in a drive gear.

## Stopping the Diesel Engine

If you have a Caterpillar diesel engine, see your Caterpillar® Diesel Engine Operation & Maintenance Manual.

1. Set the parking brake and shift to NEUTRAL (N) or PARK (P).
2. Turn the ignition key to OFF.

If your vehicle has a two-speed axle, see “Rear Axle, Two-Speed Electric Shift Control” or “Rear Axle, Two-Speed Airshift Control” in the Index.

## Cold Weather Starting (Caterpillar® Diesel)

Because the diesel engine uses compression ignition, it is harder to start in cold weather than a gasoline engine. The air intake heater and use of the proper engine oil, optional engine coolant heaters and optional ether injection systems help cold weather starting. See the Caterpillar® Diesel Engine Operation & Maintenance Manual for more information.

### **NOTICE:**

**Your diesel engine has an electric air intake heater system which reduces white smoke and helps start the engine in cold weather. Do not spray starting fluid into the air intake where it can contact the heater elements.**

**If you don't have the GM Automatic Ether Injection System, don't use starting fluid or you could damage your engine. If you have the GM system, use only GM approved starting fluid that has been tested to establish compatibility with the air inlet heater system.**

If It Won't Start In Cold Weather:

- Be sure the fuel filter is properly serviced. If water in the primary or secondary filter has frozen, the engine will not start.  
  
A good way to help prevent this is to add a pint (1/2 L) of isopropyl alcohol to each 50 gallons (190 L) of diesel fuel during freezing weather. This will also help prevent water from freezing in the fuel tank and lines.
- Be sure the fuel tank vent is open. A closed vent can create a partial vacuum in the tank that can make starting difficult or impossible.
- It helps to fill up the fuel tank at the end of every run. Moisture will condense in a nearly empty fuel tank.
- Is the fuel correct? See the Caterpillar® Operation & Maintenance Manual for more information.

## Diesel Engine Warm-Up

Several factors affect how quickly your diesel engine warms up. These can include outside temperature, engine load, idle time and your vehicle's option content. Your vehicle may be equipped with some features that can help the engine reach operating temperature sooner. Some of these features are discussed below.

Also, remember that an automatic transmission adds heat to the cooling system through the heat exchanger in the radiator. Because of this, vehicles equipped with automatic transmissions are often able to retain engine coolant heat better than manual transmission vehicles.

See your Caterpillar<sup>®</sup> Operation & Maintenance manual for additional diesel engine warm-up information.

## Engine Alarm and Automatic Shutdown (Option)

Your CHECK GAGES light will come on if the system senses high engine temperature or low engine oil pressure. If high engine temperature is detected, you will also hear a tone alarm at two beats per second. The alarm and light will remain on until the condition is fixed. If the engine temperature condition worsens, the tone alarm will go to five beats per second. When a low oil pressure condition is detected, the five beat per second alarm will come on immediately.

If the system senses low engine coolant, the five beat per second alarm and the LOW COOLANT warning light will come on.

The five beats per second tone alarm means that your engine will shut down in 25 seconds. Pull off the road and shut off the engine. Don't start it until the reason for the problem is known, and the problem is fixed. If the engine shuts down when you are still in traffic, you can restart the engine and get another 25 seconds of operation. Do this only if you have to, since there is a problem that can harm the engine if isn't fixed. Engine automatic shutdown, for gasoline engines, requires activation by your dealer.

## Fast Idle System (Electronically Controlled Caterpillar® Diesel and Gasoline Engines)

If your vehicle is equipped with an electronically controlled diesel engine, it has both automatic and manual fast idle capabilities.

### Automatic Fast Idle System (Caterpillar® Diesel Engine Only)

The automatic fast idle feature will engage whenever you start your vehicle and the engine is below the preset operating temperature. This will help decrease engine warm-up time.

Idle speed will then return to normal under any of the following conditions:

- The engine reaches the preset operating temperature.
- The brake pedal is pressed.
- The trailer brake hand lever (if equipped) is applied.
- The manual transmission clutch pedal is pressed or, the automatic transmission (if equipped) is shifted from NEUTRAL (N) or PARK (P).
- The vehicle speed exceeds approximately 10 mph (16 km/h).
- When the fast idle switch is pressed a second time.

## Manual Fast Idle System (Caterpillar® Diesel and Gasoline Engines)



The manual fast idle switch is located on the lower portion of the instrument panel just to the left of the steering wheel.

This system can be used to increase your engine idle speed whenever the following conditions are met:

- The brake pedal is not pressed.
- The trailer brake hand lever (if equipped) is not applied.
- The vehicle speed is below approximately 10 mph (16 km/h) for vehicles with diesel engines. The vehicle must not be moving and the accelerator must not be pressed for vehicles with gasoline engines.
- The manual transmission (if equipped) clutch pedal is not pressed or, the automatic transmission (if equipped) is in NEUTRAL (N).

The manual fast idle feature is activated by pressing the switch on the instrument panel. When the switch is pressed again, or any of the previous conditions are not met, manual fast idle will be deactivated.

For vehicles with gasoline engines, the manual fast idle has been preset at the factory. Your dealer may change the setting to fit your needs.

For vehicles with diesel engines, manual fast idle can be used to set any desired idle speed. To set a new temporary engine idle speed:

1. Make sure all of the previously described conditions are met.
2. Press the accelerator pedal to the desired engine speed.
3. Momentarily press the manual FAST IDLE switch.

For vehicles with diesel engines, the temporary idle speed will be set. This new rpm level will be remembered by the system until either the ignition is turned to OFF or a new idle speed is set.

## **Radiator Shutters (If Equipped)**

Radiator shutters aid engine warm-up by blocking the airflow through the radiator and charge air cooler to conserve heat in cold conditions.

The radiator shutters on your vehicle (if equipped) operate automatically. When the ignition switch is in START and the engine temperature is below 195°F (90°C) for Caterpillar® diesel, the shutters will close, blocking the flow of air through the radiator and charge air cooler. When the engine temperature reaches 195°F (90°C) for Caterpillar® diesel, the shutters will open to the normal operating position.

## Engine Checks Before Operating

When you've started your engine, let it run for 20 to 30 seconds before you put a load on the engine. But *don't* leave the vehicle while the engine is running.

During this warm-up period, check your warning lights and gages:

- If oil pressure doesn't begin to rise within 15 seconds of starting, stop the engine and find the cause.
- If the engine coolant temperature gage needle goes into the hot area on the gage, stop the engine and find the cause of the overheating.
- If you have air brakes, the dual-needle air pressure gage should read at least 105 psi (720 kPa) for both service systems before you try to move the vehicle. When air pressure is below 60 psi (420 kPa), the LOW AIR light will come on and you will hear a tone alarm. If the pressure doesn't build up or drops during warm-up, stop the engine and find the cause before you try to move the vehicle. Recommended air pressure before actually driving away is 120 psi (830 kPa).
- The charging system light should come on when the ignition key is turned to ON or START and should go out when the engine is running above idle. If the light doesn't go out or comes back on during normal engine operation, have the charging system checked right away. (This light tells you if the generator is not charging; it doesn't reflect the condition of the battery.)
- The voltmeter charge indicator gage tells you the condition of your battery's charge. The gage should be in the center area during engine operation. The red area on the left indicates an undercharge condition; the red area on the right indicates an overcharge. If the gage is in either red area, have the battery and charging system checked right away.

## NOTICE:

**Don't allow the engine to operate at low idle for more than five minutes. This can cause low engine operating temperatures which can affect engine operation and reduce engine life. Engine idle speed should be increased to 1200 rpm whenever extended idle is required. Once started, the engine should be placed under load to allow the engine coolant temperature to reach 150°F (66°C) before shutting off the engine.**

## Engine Coolant Heater (If Equipped)



If your vehicle is equipped with this feature, the plug-in receptacle is located behind the front bumper as shown, or in the component box on the driver's side of the vehicle.

In very cold weather, 0°F (-18°C) or colder, the engine coolant heater can help. You'll get easier starting and better fuel economy during engine warm-up. Usually, the coolant heater should be plugged in a minimum of four hours prior to starting your vehicle.

## To Use the Engine Coolant Heater

1. Turn off the engine.
2. Find the plug-in receptacle.
3. Plug a heavy-duty, three-prong extension cord (rated for at least 15 amps) into the vehicle's plug-in receptacle first. Then plug the extension cord into a normal, grounded 110-volt AC outlet.

### CAUTION:

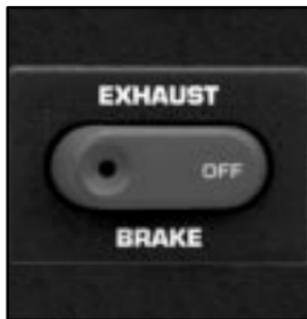
**Plugging the cord into an ungrounded outlet could cause an electrical shock. Also, the wrong kind of extension cord could overheat and cause a fire. You could be seriously injured. Plug the cord into a properly grounded three-prong 110-volt AC outlet. Use a heavy-duty three-prong extension cord rated for at least 15 amps.**

4. Before starting the engine, be sure to unplug the cord.

How long should you keep the coolant heater plugged in? The answer depends on the outside temperature. Above 32°F (0°C), the coolant heater is not required. From 32°F to -10°F (0°C to -23°C), keep the coolant heater plugged in at least two hours. Below -10°F (-23°C), keep the coolant heater plugged in for a minimum of eight hours or overnight. It will not harm either the coolant heater or the vehicle to leave the coolant heater plugged in longer than the times stated. Be sure to remove and store the cord before starting the engine. See “Diesel Fuel Requirements and Fuel System” in the Index for information on what fuel to use in cold weather.

## Diesel Engine Exhaust Brake

The exhaust brake is available on vehicles equipped with a diesel engine and air brakes (or an air compressor). It is located in the exhaust system.



The switch is located on the lower right side of the instrument panel and turns the exhaust brake on and off. The exhaust brake indicator light is on when the exhaust brake is in use.

The exhaust brake is used when the vehicle is moving to help slow the vehicle. The use of the exhaust brake will assist the braking of the vehicle and prolong the life of the foundation brake lining material.

When using the exhaust brake, the proper gear range selection is important. The exhaust brake will be most effective if the gear range selected is the lowest possible range that does not allow the engine rpm to go more than 200 rpm above rated (full load) rpm as shown on the Engine Information Plate. (Do not exceed 2900 rpm.)

The accelerator and clutch pedals must be released in order for the exhaust brake to engage. Whenever the EXHAUST BRAKE switch is in ON, the light in the switch will be on.

Do not use the exhaust brake when running the engine at idle during warm-up or other extended periods. Prolonged use of the exhaust brake during idling will cause the engine to overheat.

### CAUTION:

**Be careful when using the exhaust brake or you could lock the wheels and lose control of the vehicle. Operators not familiar with an exhaust brake should not use this brake on slippery surfaces before learning to use it on dry surfaces. If the vehicle's wheels begin to lock when using the exhaust brake on slippery surfaces, switch the exhaust brake off immediately. The exhaust brake will turn off if the anti-lock brake system is activated.**

## Two-Speed Rear Axle Electric Shift Control (If Equipped)

If your vehicle is equipped with this feature, you'll find a label (or labels) that show how to use it on the headliner above the windshield or in another place near the driver. Be sure to follow the directions carefully.

The switch for the rear axle shift control is located either on the shift lever (manual transmission vehicles) or on the shift tower just to the right of the shift lever (automatic transmission vehicles).



**Automatic  
Transmission**



**Manual Transmission**

When the switch is up, the rear axle is in the high range. Push it down to switch to the low range.

## Air Shift Control (If Equipped)

If your vehicle has a manual transmission and this feature, you'll find a label (or labels) that show how to use it on the headliner above the windshield or in another place near the driver. Make sure you follow the directions carefully.



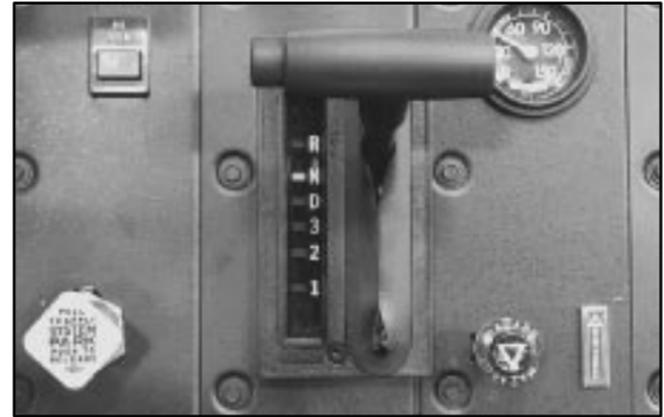
The lever for the rear axle shift control is located either at the lower right corner of the instrument panel cluster or on the shift lever.

When the lever is in HI, the rear axle is in the high range. Switch it to LOW to get the low range.

The two-speed axle should be in LOW when you park the vehicle. You'll need to engage the transmission, even moving the vehicle a little, to be sure the axle is in the low range. Then apply the parking brake, shift into NEUTRAL (N) and shut off the engine.

Also, always start the vehicle in motion with the two-speed axle in the LOW range. When you upshift the rear axle from LOW to HI, move the lever to the HI position, disengage the clutch, pause, engage the clutch and then press down on the accelerator. When you shift the axle down from HI to LOW, you don't have to clutch. Just move the lever to LOW, release the accelerator and then quickly press it down again.

## Automatic Transmission Operation



Your B7 model chassis may be equipped with an automatic transmission.

On the headliner in front of and above the driver, or in some other place near the driver, you will see a label that describes important operating facts about the automatic transmission in your vehicle. Make sure you follow the directions on this label. All vehicles with automatic transmissions can be started only in the NEUTRAL (N) position, unless equipped with the PARK (P) position. If your engine starts in any other position, the neutral start switch is malfunctioning. When you shift out of NEUTRAL (N), you may have to hold in a pushbutton on the shift lever, or lift up on a release handle as you shift. For further information on your transmission, see your Allison Transmission Operator's Manual.

 **CAUTION:**

**It can be dangerous to get out of your vehicle without the parking brake firmly set. Your vehicle can roll. If you've left the engine running, the vehicle can move suddenly. You or others could be injured. To be sure your vehicle won't move, even when you're on fairly level ground, always set your parking brake.**

 **CAUTION:**

**Shifting out of NEUTRAL (N) while your engine is "racing" (running at high speed) is dangerous. Unless your foot is firmly on the brake pedal, your vehicle could move very rapidly. You could lose control and hit people or objects. Don't shift out of NEUTRAL (N) while your engine is racing.**

## **Automatic Transmission Third Gear Hold (If Equipped)**

If your vehicle is equipped with this feature, your range selector has a “2-3” position. You can’t shift up to the next higher gear when the transmission is in this position unless your engine-governed speed is exceeded, such as when going downhill.

This feature is useful for certain load and traffic conditions. See the Allison Automatic Transmission Operator’s Manual in your vehicle for further information.

## **Manual Transmission**

### **Using the Clutch**

When you’re starting to move the vehicle, it’s important to begin with the engine speed at idle. Then start to engage the clutch and listen for an engine speed drop of about 100 rpm. At this point, the clutch is engaging, so you should increase the engine speed and fully engage the clutch. It’s important not to increase the engine speed sooner or before the clutch begins its engagement. If you do, you can cause damage to your vehicle.

## **Double-Clutching**

You must use the “double-clutching” method when you shift an unsynchronized gear set. Disengage the clutch, shift to NEUTRAL and engage the clutch. When upshifting, slow the engine until the engine rpm and road speed match. When downshifting, accelerate the engine until the engine rpm and road speed match. Then quickly disengage the clutch and move the shift lever to the next gear position and engage the clutch.

## **5- and 6-Speed Transmissions**

These transmissions have gears that automatically synchronize when you shift up or down (except FIRST (1) gear on the five-speed transmission which is unsynchronized). Choose the gear which will maintain the road speed you want while keeping the engine above two-thirds of the governed speed. When the engine speed drops below two-thirds of the governed speed, shift into the next lower gear before your engine begins to lug. When you shift down, be sure to double-clutch if required.

## Parking

### CAUTION:

**If you don't park your vehicle properly, it can roll. If you've left the engine running, it can move very quickly. You or others could be injured. To be sure your vehicle won't move, even when you're on level ground, follow the steps below.**

## Two-Speed Rear Axle

1. With the engine running, shift the two-speed rear axle into low. To be sure it's in low, you'll need to move the vehicle in gear just a little.
2. Hold the regular brake pedal down with your right foot.
3. Apply the parking brake.
4. Shift the transmission to NEUTRAL (N) or PARK (P).

## Hydraulic Brakes

If your vehicle has hydraulic brakes, it has a parking brake lever. The lever is located below the instrument panel cluster to the left of the steering column.

## Propshaft Brake Burnish Procedure

It is recommended that the propshaft-mounted parking brake be burnished as part of the new vehicle break-in. The parking brake will work best after it has been burnished following these instructions.

Make 10 stops, using the parking brake hand lever, from 20 mph (32 km/h) about 2 1/2 miles (4 km) apart. Between stops, drive the vehicle at 20 mph (32 km/h).

## Lever Operated Parking Brake (If Equipped)

### CAUTION:

**It will take a few seconds for the parking brake to fully apply, and even longer when it is cold outside. Do not leave your vehicle until the parking brake applies fully. Without the parking brake applied, your vehicle is free to move. It could hit someone or something.**

If your vehicle has hydraulic brakes, it has a parking brake lever. It's located below the instrument panel cluster and to the left of the steering column.



To apply the parking brake, place the transmission in NEUTRAL (N) and pull the lever all the way up. The PARK BRAKE light will illuminate when the parking brake is applied.

The vehicle must be stationary when applying the parking brake, except while burnishing the parking brake linings (see “Propshaft Brake Burnish Procedure” in the Index).

You can easily adjust the parking brake by turning the knob on the lever. Turning it clockwise makes the brake grip more tightly; it will also make the lever seem harder to pull up. Turning the knob counterclockwise makes the parking brake apply less firmly. Adjust the parking brake only when the lever is down (released).

If your parking brake doesn't hold the vehicle when applied, see your GM Medium Duty Truck dealer. The dealer can adjust your parking brake properly.



To release the parking brake, first push down the regular brake pedal. Then, push down the release catch and lower the parking brake lever all the way down.

The PARK BRAKE light will stay on if the parking brake is not fully released.

### **NOTICE:**

**Driving with the parking brake on can overheat the parts in the system. You may have to replace them, and you could also damage other parts of your vehicle.**

## **Air Brake (If Equipped)**

### **⚠ CAUTION:**

**When the yellow SYSTEM PARK knob is pushed in, your vehicle will be free to move. It could strike someone or something. When the knob is pushed in, hold the regular brake pedal down to keep your vehicle from moving.**

### **⚠ CAUTION:**

**If you apply any one of the air brake parking controls while the vehicle is moving, your rig will stop suddenly. If you are not ready for this, you or others could be injured. Don't apply any one of these controls while you're driving, unless you have to make an emergency stop.**

If your vehicle has air brakes, the parking brake control will be located on the instrument panel to the right of the steering column.



To apply the parking brake, pull this knob toward you. To release the parking brake, push the knob in.

If the air pressure drops below 60 to 70 psi (413 to 482 kPa), the LOW AIR light will come on. If the air pressure drops to 40 to 45 psi (275 to 309 kPa), the yellow knob will automatically pop out and apply the spring brakes. If you ever have a complete loss of air, so that your air brakes automatically apply, there is a way that the tow operator can release the parking brakes to tow the vehicle. See “Towing Your Vehicle” in the Index.

### CAUTION:

**If your vehicle is left in gear, the engine can start if the vehicle starts to roll. This can easily happen if you have the diesel engine. Shift the transmission into NEUTRAL (N) before you leave the vehicle.**

## Parking Over Things That Burn

### CAUTION:

**Things that can burn could touch hot exhaust parts under your vehicle and ignite. Don't park over papers, leaves, dry grass or other things that can burn.**

## Engine Exhaust

### CAUTION:

Engine exhaust can kill. It contains the gas carbon monoxide (CO), which you can't see or smell. It can cause unconsciousness and death.

You might have exhaust coming in if:

- Your exhaust system sounds strange or different.
- Your vehicle gets rusty underneath.
- Your vehicle was damaged in a collision.
- Your vehicle was damaged when driving over high points on the road or over road debris.
- Repairs weren't done correctly.
- Your vehicle or exhaust system had been modified improperly.

If you ever suspect exhaust is coming into your vehicle:

- Drive it only with all the windows down to blow out any CO; and
- Have your vehicle fixed immediately.

## Running Your Engine While You're Parked (Automatic Transmission)

It's better not to park with the engine running. But if you ever have to, here are some things to know.

### CAUTION:

Idling the engine with the climate control system off could allow dangerous exhaust into your vehicle. See the earlier Caution under "Engine Exhaust."

Also, idling in a closed-in place can let deadly carbon monoxide (CO) into your vehicle even if the fan switch is at the highest setting. One place this can happen is a garage. Exhaust -- with CO -- can come in easily. NEVER park in a garage with the engine running.

Another closed-in place can be a blizzard.



## **CAUTION:**

**It can be dangerous to get out of your vehicle if the shift lever is not fully in PARK (P) with the parking brake firmly set. Your vehicle can roll. Don't leave your vehicle when the engine is running unless you have to. If you've left the engine running, the vehicle can move suddenly. You or others could be injured. To be sure your vehicle won't move, even when you're on fairly level ground, always set your parking brake and move the shift lever to PARK (P).**



## **CAUTION:**

**It can be dangerous to get out of your vehicle without the parking brake firmly set. Your vehicle can roll. If you've left the engine running, the vehicle can move suddenly. You or others could be injured. To be sure your vehicle won't move, even when you're on fairly level ground, always set your parking brake.**

Follow the proper steps to be sure your vehicle won't move.

## Horn

Sound the horn by firmly pressing the pad in the center of the steering wheel.

## Turn Signal Lever



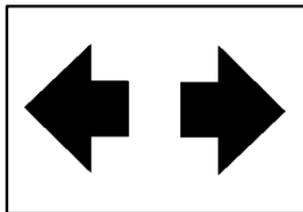
The lever located on the left side of the steering column includes your turn and lane change signals and headlamp high-low beam changer.

## Turn and Lane Change Signals

The turn signal has two upward (for right) and two downward (for left) positions. These positions allow you to signal a turn or a lane change.

To signal a turn, move the lever all the way up or down. When the turn is finished, the lever will return automatically.

To signal a lane change, just raise or lower the lever until the arrow starts to flash. Hold it there until you complete your lane change. The lever will return by itself when you release it.



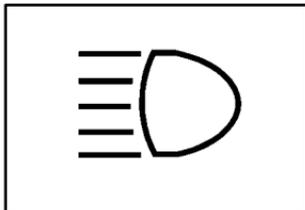
An arrow located on the instrument panel cluster will flash in the direction of the turn or lane change.

As you signal a turn or a lane change, if the arrows don't flash but just stay on, check the turn signal flasher and circuit breaker. See "Fuses and Circuit Breakers" in the Index.

If a bulb is burned out, replace it to help avoid an accident. If the arrows don't go on at all when you signal a turn, check the circuit breaker and for burned out bulbs. See "Fuses and Circuit Breakers" in the Index.

### Headlamp High/Low-Beam Changer

To change the headlamps from low to high beam or high to low beam, pull the multifunction lever all the way toward you, then release it.



When the high beams are on, this light located on the instrument panel cluster also will be on.

## Exterior Lamps

### Headlamps



The lamp switches are located on the left side of your instrument panel cluster.

Push the switch marked “P” to turn on the following:

- Parking Lamps
- Marker Lamps
- Taillamps
- Instrument Panel Lights
- License Plate Lamps

Press the switch marked with the master lamp symbol to turn on headlamps, as well as all of the lamps just listed. Press the switch marked OFF to turn off your lamps.

The thumbwheel is located to the right of the headlamp switch. Move the thumbwheel down to dim your instrument panel lights. Moving this wheel up makes these lamps brighter. Moving it all the way up will make the interior lamp come on. However, the company that finished your vehicle determines which lamps are operated by your lamp switches.

### **Daytime Running Lamps (If Equipped)**

Daytime Running Lamps (DRL) can make it easier for others to see the front of your vehicle during the day. DRL can be helpful in many different driving conditions, but they can be especially helpful in the short periods after dawn and before sunset. Fully functional daytime running lights are required on all vehicles first sold in Canada.

The DRL system will make your low-beam headlamps come on at reduced brightness in daylight when the following conditions are met:

- The ignition is on,
- the headlamp switch is off and
- the parking brake is released.

When the DRL are on, only your low-beam headlamps will be on. The other exterior lamps won't be on. Your instrument panel cluster won't be lit up either.

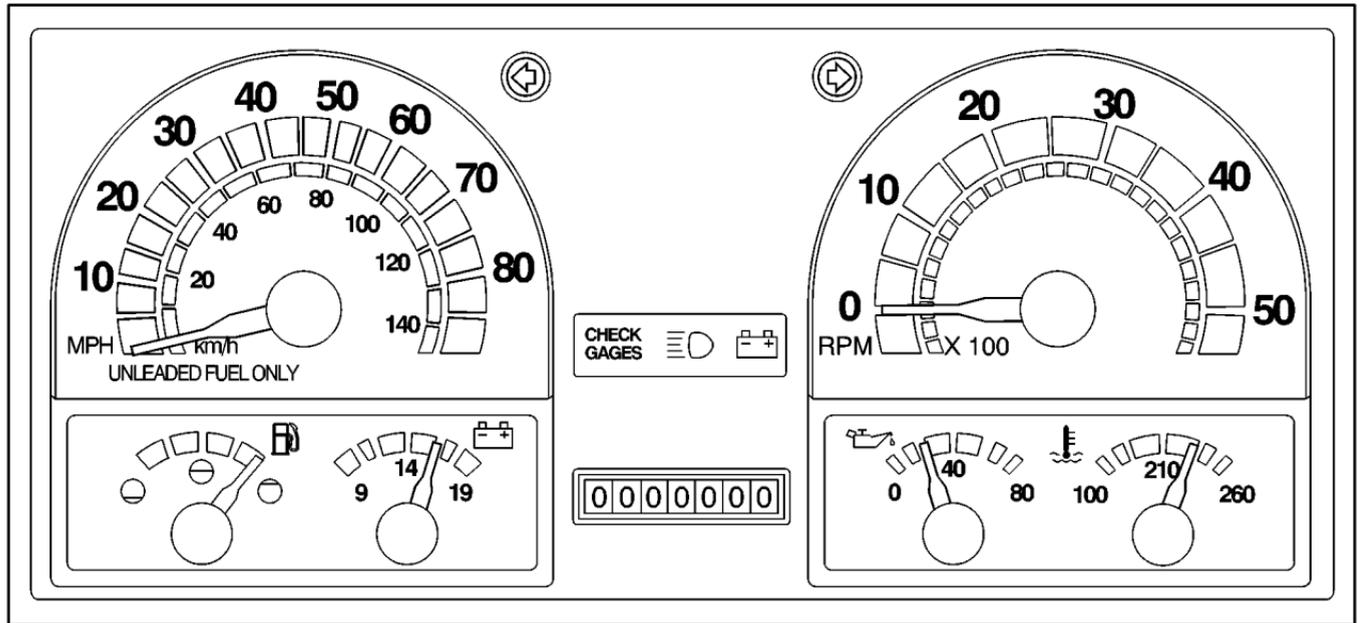
When it begins to get dark, your DRL indicator light is a reminder to turn your headlamp switch on. The other lamps that come on with your headlamps will also come on.

When you turn the headlamp switch off, the regular lamps will go off, and your low-beam headlamps will change to the reduced brightness of DRL.

To idle your vehicle with the DRL off, set the parking brake. The DRL will stay off until you release the parking brake.

As with any vehicle, you should turn on the regular headlamp system when you need it.

## Instrument Panel Cluster

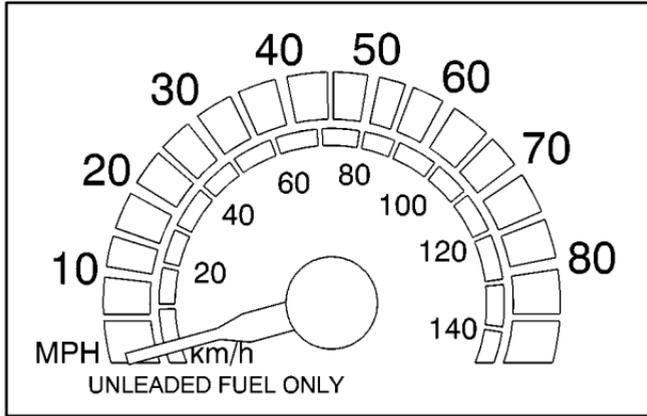


**Gasoline engine shown, diesel engine similar**

Your instrument panel cluster is designed to let you know at a glance how your vehicle is running. You'll know how fast you're going, about how much fuel is left, and many other things you'll need to know to drive safely and economically.

## Speedometer and Odometer

Your speedometer lets you see your speed in both miles per hour (mph) and kilometers per hour (km/h).

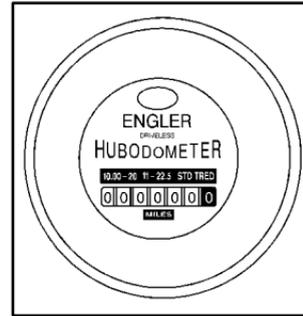


Your odometer shows how far your vehicle has been driven, in either miles (used in the United States) or kilometers (used in Canada).

Your odometer is tamper-resistant. The odometer will show silver lines between the numbers if someone tries to turn it back.

You may wonder what happens if your vehicle needs a new odometer installed. If the new odometer can be set to the mileage total of the old odometer, then it must be. But if it can't, then it's set at zero, and a label must be put on the driver's door to show the old mileage reading when the new odometer was installed.

## Hubodometer (If Equipped)



The hubodometer, mounted on the left rear wheel, may be used in addition to the instrument panel cluster odometer to record the total miles the vehicle is driven.

## Engine Speed Governor

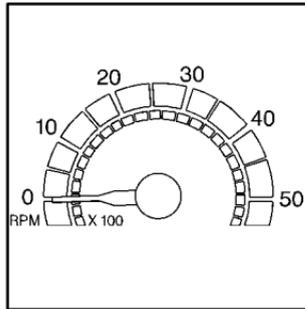
All gasoline engines have an electronic engine speed governor. The engine governed speeds range between 3600 and 4000 rpm depending on model, engine size and option content.

Caterpillar<sup>®</sup> diesel engines have a mechanical governor that is set at 2600 rpm.

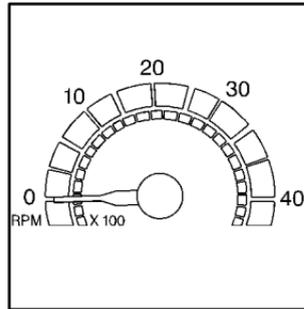
## Engine Road Speed Governor

This system controls maximum vehicle speed automatically and reduces engine power until vehicle speed gets down to a maximum governed speed (which depends on your vehicle's option content).

## Tachometer (If Equipped)



**Gasoline Engine**



**Diesel Engine**

This gage shows the engine speed in revolutions per minute (rpm).

## Warning Lights, Gages and Indicators

This part describes the warning lights and gages that may be on your vehicle. The pictures will help you locate them.

Warning lights and gages can signal that something is wrong before it becomes serious enough to cause an expensive repair or replacement. Paying attention to your warning lights and gages could also save you or others from injury.

Warning lights come on when there may be or is a problem with one of your vehicle's functions. As you will see in the details on the next few pages, some warning lights come on briefly when you start the engine just to let you know they're working. If you are familiar with this section, you should not be alarmed when this happens.

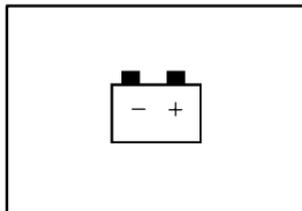
Gages can indicate when there may be or is a problem with one of your vehicle's functions. Often gages and warning lights work together to let you know when there's a problem with your vehicle.

When one of the warning lights comes on and stays on when you are driving, or when one of the gages shows there may be a problem, check the section that tells you what to do about it. Please follow this manual's advice. Waiting to do repairs can be costly -- and even dangerous. So please get to know your warning lights and gages. They're a big help.

## Charging System Indicator Light

### CAUTION:

**If your vehicle has an electric/hydraulic parking brake, do not drive if the charging system light is on. If the battery drains too much, the parking brake can suddenly come on and stop the vehicle. This can cause severe injury to you and others.**



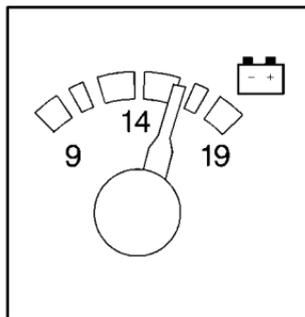
The charging system light is located in the center of the instrument panel cluster just above the odometer.

It should come on briefly when you turn on the ignition, before the engine is running, as a check to show that it is working.

If it stays on, or comes on while you are driving, have it checked right away. You may have a loose generator drive belt or some other problem.

Driving while this light is on could drain your battery. If you must drive a short distance with the light on, turn off your radio and other accessories. Sustained driving with a generator failure could result in a lack of back-up braking if the engine quits or the power steering pump should fail.

## Voltmeter



When your engine is not running, but the ignition is on (in START), this gage shows your battery's state of charge in DC volts.

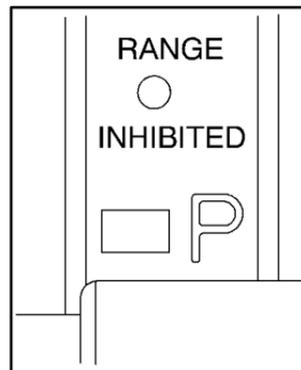
When the engine is running, the gage shows the condition of the charging system. Readings between the low and high warning zones indicate the normal operating range.

Readings in the low warning zone may occur when a large number of electrical accessories are operating in the vehicle and the engine is left at an idle for an extended period. This condition is normal since the charging system may not be able to provide full power at engine idle. As engine speeds are increased, this condition should correct itself because higher engine speeds allow the charging system to create maximum power.

You can only drive for a short time with the reading in either warning zone. If you must drive, turn off all unnecessary accessories.

Readings in either warning zone indicate a possible problem in the electrical system. Have the vehicle serviced as soon as possible.

## Range Inhibited Warning Light (If Equipped)



If your vehicle is equipped with an automatic transmission, this light could turn on indicating that transmission range shifts may not occur.

The warning light should come on briefly, as a check, when you turn on the ignition.

For detailed information on shift inhibit limitations, see the Allison Automatic Transmission Operator's Manual in your vehicle.

## Brake System Warning Light

Your vehicle has either hydraulic or air brakes. Each system has different warning lights.

### Hydraulic Brake System Warning Lights

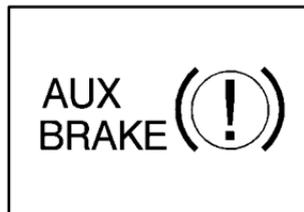
Vehicles with hydraulic systems have two brake system warning lights on the instrument panel.



If the PRIMARY BRAKE warning light comes on, it means that the fluid level in the master cylinder reservoir is low or there is another problem with your primary hydraulic brakes.

When it comes on, you will also hear a warning tone.

The PRIMARY BRAKE warning light may come on, and the warning tone may sound, when you're turning and braking at the same time. This is normal. See "Hydraulic Brake Systems" in the Index.



If the AUX BRAKE warning light comes on, it means that there is something wrong in the auxiliary brake system.

When this light comes on, you will also hear a warning tone.

Both of these lights should come on briefly every time you start the engine. If they don't come on then, have them fixed so they will be ready to warn you if there's a problem. If one or both of these warning lights stay on after you start the engine, there could be a brake problem. Have your brake system inspected right away.

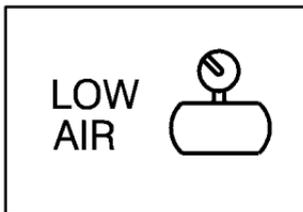
If one or both of these lights come on and stay on while you are driving, pull off the road and stop carefully. You may notice that the pedal is harder to push. Or, the pedal may go closer to the floor. It may take longer to stop. If either light is still on, have the vehicle towed for service. See "Towing Your Vehicle" in the Index. See "Hydraulic Brake Systems" in the Index for more information.

**⚠ CAUTION:**

**Your brake system may not be working properly if a brake system warning light is on. Driving with either of the brake system warning lights on can lead to an accident. If either light is still on after you've pulled off the road and stopped carefully, have the vehicle towed for service.**

### Air Brake System Warning Light

Vehicles with air brake systems have one brake system warning light on the instrument panel.



The LOW AIR warning light should come on, as a check, whenever you start the engine.

However, it is designed to come on, and stay on, when brake reservoir pressure has dropped below 60 to 70 psi (410 to 480 kPa).

When this warning light comes on, you will also hear a warning tone. If the warning light and tone come on while you are driving, you should drive only as far as the nearest point of safety and then stop the vehicle. Here's a very important thing for you to know:

**⚠ CAUTION:**

**If the LOW AIR warning light comes on and the warning tone sounds, the vehicle can stop suddenly and without further warning. This is because the parking brake will come on if the pressure falls below 40 to 45 psi (275 to 310 kPa). You or others could be injured. If the LOW AIR warning light comes on and the warning tone sounds, stop as soon as you can. You won't know how quickly the system is losing pressure, so be aware that the parking brake may come on suddenly.**

## Parking Brake Warning Light

**SERVICE  
PARK  
BRAKE**

This light turns on as a check when the engine is first started and any time the system needs adjustment.

When the SERVICE PARK BRAKE light comes on, you will also hear a warning tone. If this light comes on, have the system repaired immediately.

 **CAUTION:**

**If the SERVICE PARK BRAKE warning light comes on and the warning tone sounds, your vehicle can stop suddenly and without further warning. You or others could be injured. If the SERVICE PARK BRAKE warning light and the warning tone come on, pull over to the side of the road and apply the parking brake immediately.**

## Parking Brake Indicator Light

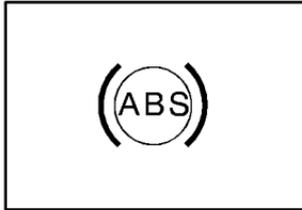
  
**PARK  
BRAKE**

Vehicles with hydraulic or air brakes have a parking brake indicator light. When the ignition is on, this light will come on when you set your parking brake.

The light will stay on if your parking brake doesn't release fully.

This light should also come on when you turn the ignition key to START. If it doesn't come on then, have it fixed so it will be ready to remind you if the parking brake is applied or hasn't released fully.

## Anti-Lock Brake System Warning Light

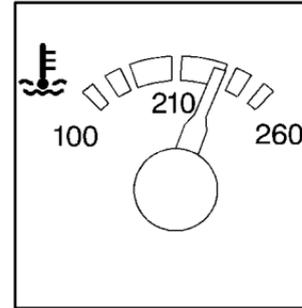


With the anti-lock brake system, this light will come on when you start your engine and it may stay on for several seconds. That's normal.

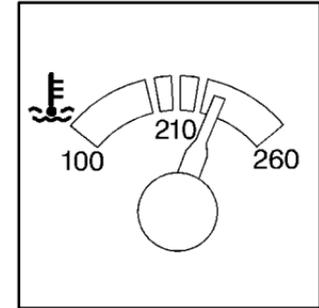
If the light stays on, or comes on when you're driving, your vehicle needs service. If the PRIMARY BRAKE or LOW AIR warning light isn't on, you still have brakes, but you don't have the anti-lock brake feature. If the PRIMARY BRAKE and/or LOW AIR warning light is on, you don't have anti-lock brakes and there's a problem with your regular brakes. See "Brake System Warning Light" earlier in this section.

The anti-lock brake system warning light should come on briefly when you turn the ignition key to ON. If the light doesn't come on then, have it fixed so it will be ready to warn you if there is a problem.

## Engine Coolant Temperature Gage



**Gasoline Engine**

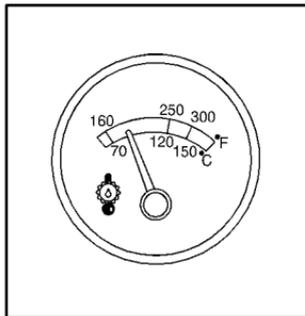


**Diesel Engine**

This gage shows the engine coolant temperature. If the gage pointer moves into the red area, your engine coolant might have overheated and your engine may be too hot. You should pull off the road, stop your vehicle and turn off the engine as soon as possible.

See "Engine Overheating" in the Index. If you have a Caterpillar® diesel engine, also see your Caterpillar® Operation & Maintenance Manual.

## Transmission Temperature Gage (If Equipped)



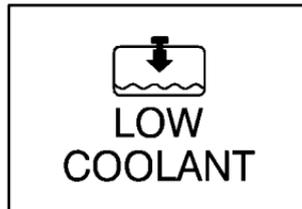
If you have an automatic transmission and this gage, it is located to the right of the dash mounted shift lever.

When your ignition is on, the gage shows the temperature of the transmission oil. A reading in the warning zone means you must stop driving and check into the cause. One possible cause is a low oil level in the transmission.

### **NOTICE:**

**If you drive when the transmission temperature gage is in the warning zone, you can badly damage the transmission.**

## Low Coolant Warning Light



You have a LOW COOLANT warning light. If this light comes on, your system is low on coolant and the engine may overheat.

The warning light should come on briefly, as a check, when you turn on the ignition.

When it comes on, you will also hear a warning tone at five beats per second for 10 seconds. See “Engine Coolant” in the Index and have your vehicle serviced as soon as you can.

This light may also come on if your vehicle is equipped with the optional automatic engine shutdown system and engine shutdown has begun. See “Engine Automatic Shutdown” in the Index.

## Manual Fast Idle Indicator Light (If Equipped)

F  
A  
S  
T  
  
I  
D  
L  
E

If your vehicle is equipped with an electronically controlled diesel engine or gasoline engine, you may have this indicator light. It is located next to the FAST IDLE switch on the lower, driver's side of the instrument panel cluster.

This light will illuminate whenever the manual FAST IDLE feature is engaged. For more details about this system, see “Fast Idle System” in the Index.

## Intake Heater Indicator Light (Diesel Engines)

INTAKE  
HEATER

This light on the instrument panel cluster will come on when the intake heater is on and the ignition key is in ON.

Since the light is illuminated whenever the intake heater is activated, it is normal for the light to cycle on and off as the heater cycles during engine warm-up. See “Engine Starting” in your Caterpillar® Operation & Maintenance Manual for more information.

## Malfunction Indicator Lamp (Service Engine Soon Light)

If your vehicle is equipped with either a gasoline engine or an electronically controlled diesel engine, you will have this light.

SERVICE  
ENGINE  
SOON

If this light comes on or flashes while you are driving, two things may happen.

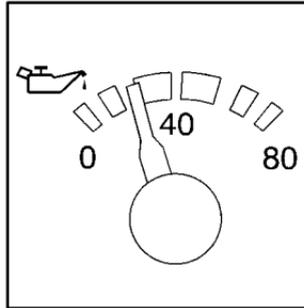
First, you won't notice any difference in engine performance, but your tail pipe emissions may increase. Second, your engine may not run properly or may stall without warning. If either of these things happen, drive or tow your vehicle to your dealer for service.

This light should come on when the ignition is on, but the engine is not running, as a check to show you it is working. If it does not come on at all, have it repaired.

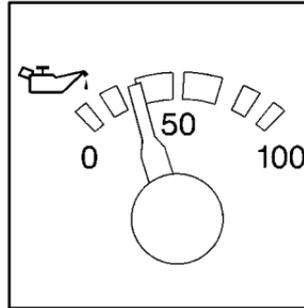
### **NOTICE:**

**If you keep driving your vehicle with this light on, after a while, your emission controls may not work as well, your fuel economy may not be as good and your engine may not run as smoothly. This could lead to costly repairs that may not be covered by your warranty.**

## Engine Oil Pressure Gage



**Gasoline Engine**



**Diesel Engine**

The engine oil pressure gage, located at the lower right portion of your instrument panel cluster, shows engine oil pressure in psi (pounds per square inch) or in kPa (kilopascals). Oil pressure may vary with outside temperature and oil viscosity, but readings of 30 to 40 psi (205 to 275 kPa) on gasoline engines at operating temperature and moderate road speeds are normal. If you have a diesel engine, the normal operating range should be between 35 to 70 psi (240 to 480 kPa).

A reading in the low pressure zone may be caused by a dangerously low oil level or another problem.

If you have a Caterpillar<sup>®</sup> diesel engine, also see your Caterpillar<sup>®</sup> Operation & Maintenance Manual.

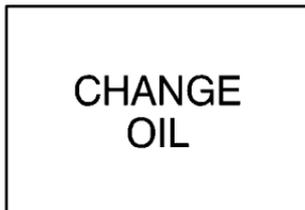
### **CAUTION:**

**Don't keep driving if the oil pressure is low. If you do, your engine can become so hot that it catches fire. You or others could be burned. Check your oil as soon as possible and have your vehicle serviced.**

### **NOTICE:**

**Damage to your engine from neglected oil problems can be costly and is not covered by your warranty.**

## Change Oil Light (If Equipped)



The CHANGE OIL light should come on briefly as a bulb check when you start the engine. If the light doesn't come on, have it serviced.

If the CHANGE OIL light comes on and stays on after you start the engine, have the oil changed.

For additional information, see “Engine Oil, When to Change” in the Index. To reset the Oil Life Monitor, see “Engine Oil Life Monitor” in the Index.

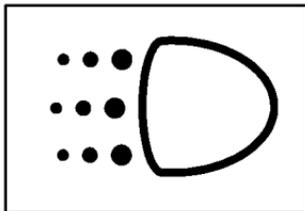
## Engine Overspeed Warning Light (Gasoline Engines)



If your vehicle has a gasoline engine, you'll have this light. As a check, this light will come on for a moment when you start your engine.

If it comes on when you're driving, it means that your engine speed is too great. Reduce your engine speed at once.

## Daytime Running Lamps (DRL) Indicator Light (If Equipped)



The DRL indicator light is located near the upper center of the instrument panel cluster. It goes on whenever the Daytime Running Lamps (DRL) are on.

When it begins to get dark, the DRL indicator light is a reminder to turn on your headlamps.

## Check Gages Indicator Light



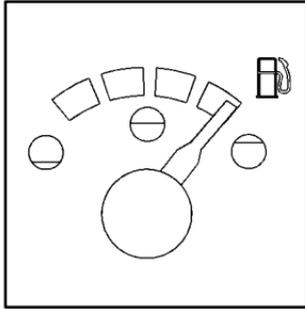
This light will come on as you're starting the engine, just as a check.

If it ever comes on and stays on while you are driving, however, it means that either your engine coolant temperature gage or your engine oil pressure gage may be showing a reading in the warning zone.

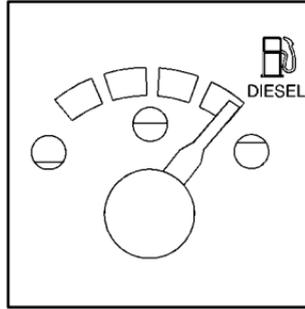
When the CHECK GAGES light comes on, you will also hear a warning tone. The tone and light will stay activated until the problem is corrected.

This light may also come on if your vehicle is equipped with the automatic engine shutdown system and engine shutdown has begun. See "Engine Automatic Shutdown" in the Index.

## Fuel Gage



**Gasoline Engine**



**Diesel Engine**

Your fuel gage is located in the lower left portion of your instrument panel cluster under the speedometer.

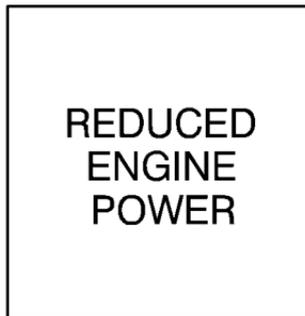
When the ignition is on, your fuel gage lets you know about how much fuel you have left. When the gage first shows empty, you'll still have a little fuel left, but you should get more fuel soon.

Here are four concerns of some operators. None of these show a problem with your fuel gage:

- The gage moves a little when you turn a corner or speed up.
- The gage doesn't go back to empty when you turn off the ignition.
- At the gas station, the pump shuts off before the gage reads full.
- It takes a little more or less fuel to fill up than the fuel gage indicated.

If you have a Caterpillar<sup>®</sup> diesel engine, also see your Caterpillar<sup>®</sup> Operation & Maintenance Manual.

## Reduced Engine Power Warning Light

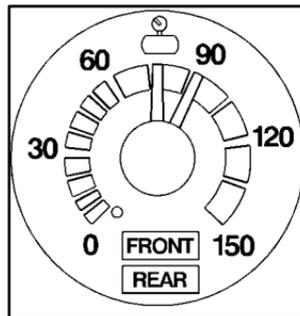


If the SERVICE ENGINE SOON and REDUCED ENGINE POWER lights are on, a noticeable reduction in the vehicle's performance may occur.

If the REDUCED ENGINE POWER light is on, but there is no reduction in performance, proceed to your destination. The performance may be reduced the next time the vehicle is driven. The vehicle may be driven at a reduced speed while the REDUCED ENGINE POWER light is on, but acceleration and speed may be reduced.

Anytime the SERVICE ENGINE SOON light stays on, the vehicle should be taken to an authorized GM dealer as soon as possible for service.

## Air Pressure Gage (If Equipped)

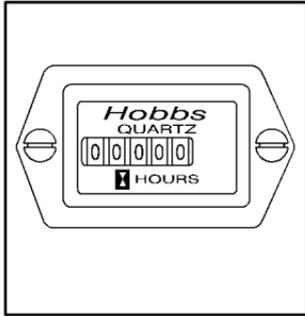


If your vehicle has air brakes, this gage located on the instrument panel cluster shows the air pressure for both your front and rear brake systems.

The yellow pointer shows the pressure available for the front system, while the green pointer shows pressure for the rear. There should be no more than 4 psi (28 kPa) difference showing between the systems.

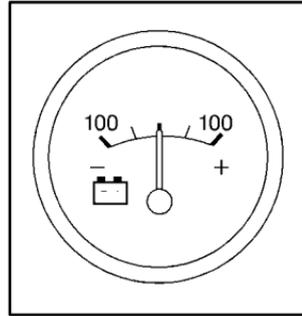
Don't drive until both pointers are showing at least 120 psi (830 kPa), so you'll have enough air if you need to apply your brakes.

## Hourmeter Gage (If Equipped)



This gage is located on your instrument panel cluster. It shows the total engine operating time.

## Ammeter Gage (If Equipped)



This gage, located on the lower right portion of the instrument panel cluster, shows how much charge the battery is getting when the engine is running. The gage works at all times.

When the indicator shows a reading left of center, it means that the battery is discharging. A reading to the right of center shows that the battery is being charged.

## Section 2 Your Driving and the Road

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Here you'll find information about driving on different kinds of roads and in varying weather conditions. We've also included many other useful tips on driving.

2-2	Defensive Driving	2-16	Driving in Rain and on Wet Roads
2-3	Drunken Driving	2-19	City Driving
2-6	Control of a Vehicle	2-19	Freeway Driving
2-6	Braking	2-21	Before Leaving on a Long Trip
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## Defensive Driving

The best advice anyone can give about driving is:  
Drive defensively.

Please start with a very important safety device in your vehicle: Buckle up.

Defensive driving really means “be ready for anything.” On city streets, rural roads or freeways, it means “always expect the unexpected.”

Assume that pedestrians or other drivers are going to be careless and make mistakes. Anticipate what they might do. Be ready for their mistakes.

Rear-end collisions are about the most preventable of accidents. Yet they are common. Allow enough following distance. It’s the best defensive driving maneuver, in both city and rural driving. You never know when the vehicle in front of you is going to brake or turn suddenly.

Defensive driving requires that a driver concentrate on the driving task. Anything that distracts from the driving task -- such as concentrating on a cellular telephone call, reading, or reaching for something on the floor -- makes proper defensive driving more difficult and can even cause a collision, with resulting injury. Ask a passenger to help do things like this, or pull off the road in a safe place to do them yourself. These simple defensive driving techniques could save your life.

## Drunken Driving

Death and injury associated with drinking and driving is a national tragedy. It's the number one contributor to the highway death toll, claiming thousands of victims every year.

Alcohol affects four things that anyone needs to drive a vehicle:

- Judgment
- Muscular Coordination
- Vision
- Attentiveness.

Police records show that almost half of all motor vehicle-related deaths involve alcohol. In most cases, these deaths are the result of someone who was drinking and driving. In recent years, about 16,000 annual motor vehicle-related deaths have been associated with the use of alcohol, with more than 300,000 people injured.

Many adults -- by some estimates, nearly half the adult population -- choose never to drink alcohol, so they never drive after drinking. For persons under 21, it's against the law in every U.S. state to drink alcohol. There are good medical, psychological and developmental reasons for these laws.

The obvious way to solve the leading highway safety problem is for people never to drink alcohol and then drive. But what if people do? How much is "too much" if the driver plans to drive? It's a lot less than many might think. Although it depends on each person and situation, here is some general information on the problem.

The Blood Alcohol Concentration (BAC) of someone who is drinking depends upon four things:

- The amount of alcohol consumed
- The drinker's body weight
- The amount of food that is consumed before and during drinking
- The length of time it has taken the drinker to consume the alcohol.

According to the American Medical Association, a 180-lb. (82 kg) person who drinks three 12-ounce (355 ml) bottles of beer in an hour will end up with a BAC of about 0.06 percent. The person would reach the same BAC by drinking three 4-ounce (120 ml) glasses of wine or three mixed drinks if each had 1-1/2 ounces (45 ml) of a liquor like whiskey, gin or vodka.



It's the amount of alcohol that counts. For example, if the same person drank three double martinis (3 ounces or 90 ml of liquor each) within an hour, the person's BAC would be close to 0.12 percent. A person who consumes food just before or during drinking will have a somewhat lower BAC level.

There is a gender difference, too. Women generally have a lower relative percentage of body water than men. Since alcohol is carried in body water, this means that a woman generally will reach a higher BAC level than a man of her same body weight when each has the same number of drinks.

The law in many U.S. states sets the legal limit at a BAC of 0.10 percent. In a growing number of U.S. states, and throughout Canada, the limit is 0.08 percent. In some other countries, it's even lower. The BAC limit for all commercial drivers in the United States is 0.04 percent.

The BAC will be over 0.10 percent after three to six drinks (in one hour). Of course, as we've seen, it depends on how much alcohol is in the drinks, and how quickly the person drinks them.

But the ability to drive is affected well below a BAC of 0.10 percent. Research shows that the driving skills of many people are impaired at a BAC approaching 0.05 percent, and that the effects are worse at night. All drivers are impaired at BAC levels above 0.05 percent. Statistics show that the chance of being in a collision increases sharply for drivers who have a BAC of 0.05 percent or above. A driver with a BAC level of 0.06 percent has doubled his or her chance of having a collision. At a BAC level of 0.10 percent, the chance of this driver having a collision is 12 times greater; at a level of 0.15 percent, the chance is 25 times greater!

The body takes about an hour to rid itself of the alcohol in one drink. No amount of coffee or number of cold showers will speed that up. "I'll be careful" isn't the right answer. What if there's an emergency, a need to take sudden action, as when a child darts into the street? A person with even a moderate BAC might not be able to react quickly enough to avoid the collision.

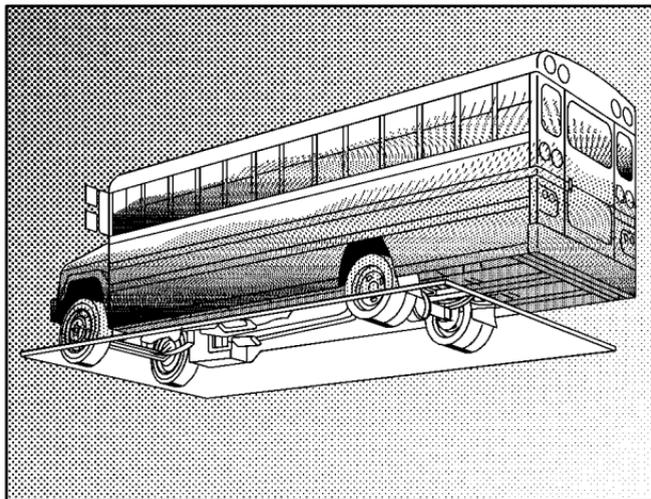
There's something else about drinking and driving that many people don't know. Medical research shows that alcohol in a person's system can make crash injuries worse, especially injuries to the brain, spinal cord or heart. This means that when anyone who has been drinking -- driver or passenger -- is in a crash, that person's chance of being killed or permanently disabled is higher than if the person had not been drinking.

 **CAUTION:**

**Drinking and then driving is very dangerous. Your reflexes, perceptions, attentiveness and judgment can be affected by even a small amount of alcohol. You can have a serious -- or even fatal -- collision if you drive after drinking. Please don't drink and drive or ride with a driver who has been drinking. Ride home in a cab; or if you're with a group, designate a driver who will not drink.**

## Control of a Vehicle

You have three systems that make your vehicle go where you want it to go. They are the brakes, the steering and the accelerator. All three systems have to do their work at the places where the tires meet the road.



Sometimes, as when you're driving on snow or ice, it's easy to ask more of those control systems than the tires and road can provide. That means you can lose control of your vehicle.

## Braking

Braking action involves *perception time* and *reaction time*.

First, you have to decide to push on the brake pedal. That's *perception time*. Then you have to bring up your foot and do it. That's *reaction time*.

Average *reaction time* is about 3/4 of a second. But that's only an average. It might be less with one driver and as long as two or three seconds or more with another. Age, physical condition, alertness, coordination and eyesight all play a part. So do alcohol, drugs and frustration. But even in 3/4 of a second, a vehicle moving at 60 mph (100 km/h) travels 66 feet (20 m). That could be a lot of distance in an emergency, so keeping enough space between your vehicle and others is important.

And, of course, actual stopping distances vary greatly with the surface of the road (whether it's pavement or gravel); the condition of the road (wet, dry, icy); tire tread; the condition of your brakes; the weight of the vehicle and the amount of brake force applied.

Avoid needless heavy braking. Some people drive in spurts -- heavy acceleration followed by heavy braking -- rather than keeping pace with traffic. This is a mistake. Your brakes may not have time to cool between hard stops. Your brakes will wear out much faster if you do a lot of heavy braking. If you keep pace with the traffic and allow realistic following distances, you will eliminate a lot of unnecessary braking. That means better braking and longer brake life.

If your engine ever stops while you're driving, brake normally but don't pump your brakes. If you do, the pedal may get harder to push down. If your engine stops, you will still have some power brake assist. But you will use it when you brake. Once the power assist is used up, it may take longer to stop and the brake pedal will be harder to push.

## Hydraulic Brake Systems

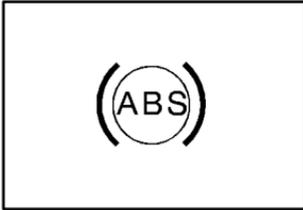
If your engine stops running, or if your primary brake system stops working, your vehicle has a reserve power assist system to help you slow down. Just slowly and steadily apply the brake pedal until you can safely get off the road. The pedal will seem harder to push down. Don't pump the pedal; the system won't work well or at all that way.

You may find that the steering wheel seems hard to turn when you're turning and braking at the same time. Also, the PRIMARY BRAKE warning light may come on and the warning tone may sound. This is normal because the main hydraulic brake system and power steering both use the power steering pump. If this ever happens, let up on the brake pedal a little. When you let up on the brake pedal in that situation, it lets the steering get a little more help from the pump.

## Anti-Lock Brakes (ABS)

Your vehicle has anti-lock brakes (ABS). ABS is an advanced electronic braking system that will help prevent a braking skid.

When you start your engine and begin to drive away, your anti-lock brake system will check itself. You may hear a momentary motor or clicking noise while this test is going on. This is normal.



If there's a problem with the anti-lock brake system, this warning light will stay on. See "Anti-Lock Brake System Warning Light" in the Index.



Here's how anti-lock works. Let's say the road is wet. You're driving safely. Suddenly an animal jumps out in front of you.

You slam on the brakes and continue braking. Here's what happens with ABS.

A computer senses that wheels are slowing down. If one of the wheels is about to stop rolling, the computer will separately work the brakes at each wheel.

The anti-lock system can change the brake pressure faster than any driver could. The computer is programmed to make the most of available tire and road conditions. This can help you steer around the obstacle while braking hard.



As you brake, your computer keeps receiving updates on wheel speed and controls braking pressure accordingly.

Remember: Anti-lock doesn't change the time you need to get your foot up to the brake pedal or always decrease stopping distance. If you get too close to the vehicle in front of you, you won't have time to apply your brakes if that vehicle suddenly slows or stops. Always leave enough room up ahead to stop, even though you have anti-lock brakes.

### **Using Anti-Lock**

Don't pump the brakes. Just hold the brake pedal down firmly and let anti-lock work for you. You may feel the brakes pulsate, or you may hear air exhausting, but this is normal.

### **Braking in Emergencies**

With anti-lock, you can steer and brake at the same time. In many emergencies, steering can help you more than even the very best braking.

## Steering

### Power Steering

If you lose power steering assist because the engine stops or the system is not functioning, you can steer but it will take much more effort.

On vehicles with hydraulic brakes, the power steering and main hydraulic brake system both use the power steering pump. See “Hydraulic Brake Systems” in the Index.

### Steering Tips

#### Driving on Curves

It’s important to take curves at a reasonable speed.

A lot of the “driver lost control” accidents mentioned on the news happen on curves. Here’s why:

Experienced driver or beginner, each of us is subject to the same laws of physics when driving on curves. The traction of the tires against the road surface makes it possible for the vehicle to change its path when you turn the front wheels.

If there’s no traction, inertia will keep the vehicle going in the same direction. If you’ve ever tried to steer a vehicle on wet ice, you’ll understand this.

The traction you can get in a curve depends on the condition of your tires and the road surface, the angle at which the curve is banked, and your speed. While you’re in a curve, speed is the one factor you can control.

What should you do if this ever happens? Ease up on the accelerator pedal, steer the vehicle the way you want it to go, and slow down.

Speed limit signs near curves warn that you should adjust your speed. Of course, the posted speeds are based on good weather and road conditions. Under less favorable conditions you’ll want to go slower.

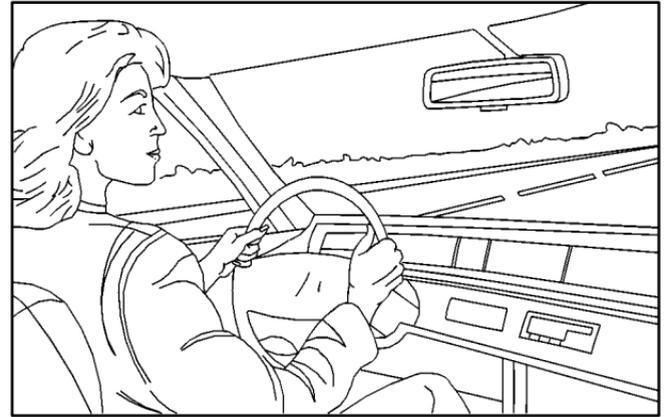
If you need to reduce your speed as you approach a curve, do it before you enter the curve, while your front wheels are straight ahead.

Try to adjust your speed so you can “drive” through the curve. Maintain a reasonable, steady speed. Wait to accelerate until you are out of the curve, and then accelerate gently into the straightaway.

## Steering in Emergencies

There are times when steering can be more effective than braking. For example, you come over a hill and find a truck stopped in your lane, or a car suddenly pulls out from nowhere, or a child darts out from between parked cars and stops right in front of you. You can avoid these problems by braking -- if you can stop in time. But sometimes you can't; there isn't room. That's the time for evasive action -- steering around the problem.

Your vehicle can perform very well in emergencies like these. First apply your brakes. See "Braking in Emergencies" earlier in this section. It is better to remove as much speed as you can from a possible collision. Then steer around the problem, to the left or right depending on the space available.

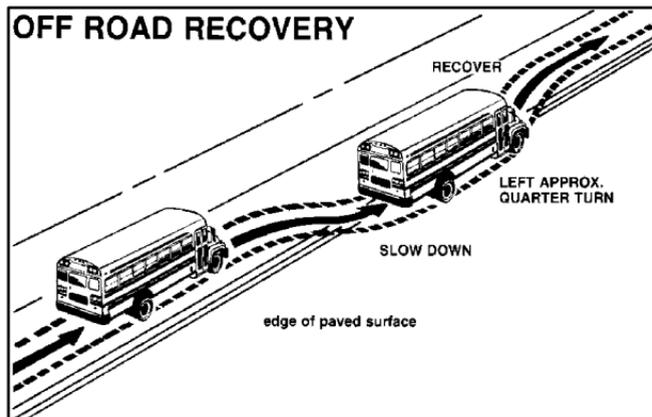


An emergency like this requires close attention and a quick decision. If you are holding the steering wheel at the recommended 9 and 3 o'clock positions, you can turn it a full 180 degrees very quickly without removing either hand. But you have to act fast, steer quickly, and just as quickly straighten the wheel once you have avoided the object.

The fact that such emergency situations are always possible is a good reason to practice defensive driving at all times and wear safety belts properly.

## Off-Road Recovery

You may find that your right wheels have dropped off the edge of a road onto the shoulder while you're driving.



If the level of the shoulder is only slightly below the pavement, recovery should be fairly easy. Ease off the accelerator and then, if there is nothing in the way, steer so that your vehicle straddles the edge of the pavement. You can turn the steering wheel up to one-quarter turn until the right front tire contacts the pavement edge. Then turn your steering wheel to go straight down the roadway.

## Passing

The driver of a vehicle about to pass another on a two-lane highway waits for just the right moment, accelerates, moves around the vehicle ahead, then goes back into the right lane again. A simple maneuver?

Not necessarily! Passing another vehicle on a two-lane highway is a potentially dangerous move, since the passing vehicle occupies the same lane as oncoming traffic for several seconds. A miscalculation, an error in judgment, or a brief surrender to frustration or anger can suddenly put the passing driver face to face with the worst of all traffic accidents -- the head-on collision.

So here are some tips for passing:

- A vehicle like yours takes a longer time to reach passing speed, so you'll need a longer stretch of clear road ahead than you would with a passenger car.
- "Drive ahead." Look down the road, to the sides and to crossroads for situations that might affect your passing patterns. If you have any doubt whatsoever about making a successful pass, wait for a better time.

- Watch for traffic signs, pavement markings and lines. If you can see a sign up ahead that might indicate a turn or an intersection, delay your pass. A broken center line usually indicates it's all right to pass (providing the road ahead is clear). Never cross a solid line on your side of the lane or a double solid line, even if the road seems empty of approaching traffic.
- Do not get too close to the vehicle you want to pass while you're awaiting an opportunity. For one thing, following too closely reduces your area of vision, especially if you're following a larger vehicle. Also, you won't have adequate space if the vehicle ahead suddenly slows or stops. Keep back a reasonable distance.
- When it looks like a chance to pass is coming up, start to accelerate but stay in the right lane and don't get too close. Time your move so you will be increasing speed as the time comes to move into the other lane. If the way is clear to pass, you will have a "running start" that more than makes up for the distance you would lose by dropping back. And if something happens to cause you to cancel your pass, you need only slow down and drop back again and wait for another opportunity.
- If other cars are lined up to pass a slow vehicle, wait your turn. But take care that someone isn't trying to pass you as you pull out to pass the slow vehicle.
- Check your mirrors and start your left lane change signal before moving out of the right lane to pass. When you are far enough ahead of the passed vehicle to see its front in your right outside mirror, activate your right lane change signal and move back into the right lane. (Remember that if your right outside mirror is convex, the vehicle you just passed may seem to be farther away from you than it really is.)
- Try not to pass more than one vehicle at a time on two-lane roads. Reconsider before passing the next vehicle.
- Don't overtake a slowly moving vehicle too rapidly. Even though the brake lamps are not flashing, it may be slowing down or starting to turn.
- If you're being passed, make it easy for the following driver to get ahead of you. Perhaps you can ease a little to the right.

## Loss of Control

Let's review what driving experts say about what happens when the three control systems (brakes, steering and acceleration) don't have enough friction where the tires meet the road to do what the driver has asked.

In any emergency, don't give up. Keep trying to steer and constantly seek an escape route or area of less danger.

### Skidding

In a skid, a driver can lose control of the vehicle. Defensive drivers avoid most skids by taking reasonable care suited to existing conditions, and by not "overdriving" those conditions. But skids are always possible.

The three types of skids correspond to your vehicle's three control systems. In the braking skid, your wheels aren't rolling. In the steering or cornering skid, too much speed or steering in a curve causes tires to slip and lose cornering force. And in the acceleration skid, too much throttle causes the driving wheels to spin.

A cornering skid and an acceleration skid are best handled by easing your foot off the accelerator pedal.

If your vehicle starts to slide, ease your foot off the accelerator pedal and quickly steer the way you want the vehicle to go. If you start steering quickly enough, your vehicle may straighten out. Always be ready for a second skid if it occurs.

Of course, traction is reduced when water, snow, ice, gravel or other material is on the road. For safety, you'll want to slow down and adjust your driving to these conditions. It is important to slow down on slippery surfaces because stopping distance will be longer and vehicle control more limited.

While driving on a surface with reduced traction, try your best to avoid sudden steering, acceleration or braking (including engine braking by shifting to a lower gear). Any sudden changes could cause the tires to slide. You may not realize the surface is slippery until your vehicle is skidding. Learn to recognize warning clues -- such as enough water, ice or packed snow on the road to make a "mirrored surface" -- and slow down when you have any doubt.

Remember: Any anti-lock brake system (ABS) helps avoid only the braking skid.

## Driving at Night

Night driving is more dangerous than day driving. One reason is that some drivers are likely to be impaired -- by alcohol or drugs, with night vision problems, or by fatigue.

Here are some tips on night driving.

- Drive defensively.
- Don't drink and drive.
- Adjust your inside rearview mirror to reduce the glare from headlamps behind you.
- Since you can't see as well, you may need to slow down and keep more space between you and other vehicles.
- Slow down, especially on higher speed roads. Your headlamps can light up only so much road ahead.
- In remote areas, watch for animals.
- If you're tired, pull off the road in a safe place and rest.

No one can see as well at night as in the daytime. But as we get older these differences increase. A 50-year-old driver may require at least twice as much light to see the same thing at night as a 20-year-old.

What you do in the daytime can also affect your night vision. For example, if you spend the day in bright sunshine you are wise to wear sunglasses. Your eyes will have less trouble adjusting to night. But if you're driving, don't wear sunglasses at night. They may cut down on glare from headlamps, but they also make a lot of things invisible.

You can be temporarily blinded by approaching headlamps. It can take a second or two, or even several seconds, for your eyes to readjust to the dark. When you are faced with severe glare (as from a driver who doesn't lower the high beams, or a vehicle with misaimed headlamps), slow down a little. Avoid staring directly into the approaching headlamps.

Keep your windshield and all the glass on your vehicle clean -- inside and out. Glare at night is made much worse by dirt on the glass. Even the inside of the glass can build up a film caused by dust. Dirty glass makes lights dazzle and flash more than clean glass would, making the pupils of your eyes contract repeatedly.

Remember that your headlamps light up far less of a roadway when you are in a turn or curve. Keep your eyes moving; that way, it's easier to pick out dimly lighted objects. Just as your headlamps should be checked regularly for proper aim, so should your eyes be examined regularly. Some drivers suffer from night blindness -- the inability to see in dim light -- and aren't even aware of it.

## Driving in Rain and on Wet Roads

Rain and wet roads can mean driving trouble. On a wet road, you can't stop, accelerate or turn as well because your tire-to-road traction isn't as good as on dry roads. And, if your tires don't have much tread left, you'll get even less traction. It's always wise to go slower and be cautious if rain starts to fall while you are driving. The surface may get wet suddenly when your reflexes are tuned for driving on dry pavement.

The heavier the rain, the harder it is to see. Even if your windshield wiper blades are in good shape, a heavy rain can make it harder to see road signs and traffic signals, pavement markings, the edge of the road and even people walking.

It's wise to keep your wiping equipment in good shape and keep your windshield washer tank filled with washer fluid. Replace your windshield wiper inserts when they show signs of streaking or missing areas on the windshield, or when strips of rubber start to separate from the inserts.

Driving too fast through large water puddles or even going through some vehicle washes can cause problems, too. The water may affect your brakes. Try to avoid puddles. But if you can't, try to slow down before you hit them.

### CAUTION:

**Wet brakes can cause accidents. They won't work as well in a quick stop and may cause pulling to one side. You could lose control of the vehicle.**

**After driving through a large puddle of water or a vehicle wash, apply your brake pedal lightly until your brakes work normally.**

## Hydroplaning

Hydroplaning is dangerous. So much water can build up under your tires that they can actually ride on the water. This can happen if the road is wet enough and you're going fast enough. When your vehicle is hydroplaning, it has little or no contact with the road.

Hydroplaning doesn't happen often. But it can if your tires do not have much tread or if the pressure in one or more is low. It can happen if a lot of water is standing on the road. If you can see reflections from trees, telephone poles or other vehicles, and raindrops "dimple" the water's surface, there could be hydroplaning.

Hydroplaning usually happens at higher speeds. There just isn't a hard and fast rule about hydroplaning. The best advice is to slow down when it is raining.

## Driving Through Deep Standing Water

### **NOTICE:**

**If you drive too quickly through deep puddles or standing water, water can come in through your engine's air intake and badly damage your engine. Never drive through water that is slightly lower than the underbody of your vehicle. If you can't avoid deep puddles or standing water, drive through them very slowly.**

## Driving Through Flowing Water

### CAUTION:

**Flowing or rushing water creates strong forces. If you try to drive through flowing water, as you might at a low water crossing, your vehicle can be carried away. As little as six inches of flowing water can carry away a smaller vehicle. If this happens, you and the other vehicle occupants could drown. Don't ignore police warning signs, and otherwise be very cautious about trying to drive through flowing water.**

## Some Other Rainy Weather Tips

- Turn on your low-beam headlamps and your marker and clearance lamps, if your vehicle has them -- not just your parking lamps -- to help make you more visible to others.
- Besides slowing down, allow some extra following distance. And be especially careful when you pass another vehicle. Allow yourself more clear room ahead, and be prepared to have your view restricted by road spray.
- Have good tires with proper tread depth. See “Tires” in the Index.

## City Driving

One of the biggest problems with city streets is the amount of traffic on them. You'll want to watch out for what the other drivers are doing and pay attention to traffic signals.

Here are ways to increase your safety in city driving:

- Know the best way to get to where you are going. Get a city map and plan your trip into an unknown part of the city just as you would for a cross-country trip.
- Larger vehicles can't be driven everywhere smaller ones can. There are low underpasses, truck routes and other special situations. Usually these are well marked, so be sure to watch for the signs.
- Try to use the freeways that rim and crisscross most large cities. You'll save time and energy. See the next part, "Freeway Driving."
- Treat a green light as a warning signal. A traffic light is there because the corner is busy enough to need it. When a light turns green, and just before you start to move, check both ways for vehicles that have not cleared the intersection or may be running the red light.

## Freeway Driving



Mile for mile, freeways (also called thruways, parkways, expressways, turnpikes or superhighways) are the safest of all roads. But they have their own special rules.

The most important advice on freeway driving is: Keep up with traffic and keep to the right. Drive at the same speed most of the other drivers are driving. Too-fast or too-slow driving breaks a smooth traffic flow. Treat the left lane on a freeway as a passing lane.

At the entrance, there is usually a ramp that leads to the freeway. If you have a clear view of the freeway as you drive along the entrance ramp, you should begin to check traffic. Try to determine where you expect to blend with the flow. Try to merge into the gap at close to the prevailing speed. Switch on your turn signal, check your mirrors and try to blend smoothly with the traffic flow.

Once you are on the freeway, adjust your speed to the posted limit or to the prevailing rate if it's slower. Stay in the right lane unless you want to pass. On some freeways, larger vehicles aren't allowed to use some lanes. These places usually are well-marked.

Before changing lanes, check your mirrors. Then use your turn signal.

Once you are moving on the freeway, make certain you allow a reasonable following distance. Expect to move slightly slower at night.

When you want to leave the freeway, move to the proper lane well in advance. If you miss your exit, do not, under any circumstances, stop and back up. Drive on to the next exit.

The exit ramp can be curved, sometimes quite sharply.

The exit speed for cars -- but not larger vehicles -- is usually posted. You should go more slowly.

Reduce your speed according to your speedometer, not to your sense of motion. After driving for any distance at higher speeds, you may tend to think you are going slower than you actually are.

## Before Leaving on a Long Trip

Make sure you're ready. Try to be well rested. If you must start when you're not fresh -- such as after a day's work -- don't plan to make too many miles that first part of the journey. Wear comfortable clothing and shoes you can easily drive in.

Is your vehicle ready for a long trip? If you keep it serviced and maintained, it's ready to go. If it needs service, have it done before starting out. Of course, you'll find experienced and able service experts in GM dealerships all across North America. They'll be ready and willing to help if you need it.

Here are some things you can check before a trip:

- *Windshield Washer Fluid*: Is the reservoir full? Are all windows clean inside and outside?
- *Wiper Blades*: Are they in good shape?
- *Fuel, Engine Oil, Other Fluids*: Have you checked all levels?
- *Lamps*: Are they all working? Are the lenses clean?
- *Tires*: They are vitally important to a safe, trouble-free trip. Is the tread good enough for long-distance driving? Are the tires all inflated to the recommended pressure?
- *Weather Forecasts*: What's the weather outlook along your route? Should you delay your trip a short time to avoid a major storm system?
- *Maps*: Do you have up-to-date maps?

## Highway Hypnosis

Is there actually such a condition as “highway hypnosis”? Or is it just plain falling asleep at the wheel? Call it highway hypnosis, lack of awareness, or whatever.

When you drive the vehicle for a long distance, there is something about an easy stretch of road with the same scenery, along with the hum of the tires on the road, the drone of the engine, and the rush of the wind against the vehicle that can make you sleepy. Don't let it happen to you! If it does, your vehicle can leave the road in *less than a second*, and you could crash and be injured.

What can you do about highway hypnosis?  
First, be aware that it can happen.

Then here are some tips:

- Make sure your vehicle is well ventilated, with a comfortably cool interior.
- Keep your eyes moving. Scan the road ahead and to the sides. Check your mirrors and your instruments frequently.
- If you get sleepy, pull off the road into a rest, service or parking area and take a nap, get some exercise, or both. For safety, treat drowsiness on the highway as an emergency.

## Hill and Mountain Roads



Driving on steep hills or mountains is different from driving in flat or rolling terrain.

Here are some tips that can make your drive through steep country safer:

- Keep the vehicle in good shape. Check all fluid levels and also the brakes, tires, cooling system and transmission. These parts can work hard on mountain roads.
- Know how to go down hills. The most important thing to know is this: let your engine do some of the slowing down. Shift to a lower gear when you go down a steep or long hill.

 **CAUTION:**

**If you don't shift down, your brakes could get so hot that they wouldn't work well. You would then have poor braking or even none going down a hill. You could crash. Shift down to let your engine assist your brakes on a steep downhill slope.**

 **CAUTION:**

**Coasting downhill in NEUTRAL (N) or with the ignition off is dangerous. Your brakes will have to do all the work of slowing down. They could get so hot that they wouldn't work well. You would then have poor braking or even none going down a hill. You could crash. Always have your engine running and your vehicle in gear when you go downhill.**

- Know how to go uphill. Use lower gears. They help cool your engine and transmission, and you can climb the hill better.
- Stay in your own lane when driving on two-lane roads in hills or mountains. Don't swing wide or cut across the center of the road. Drive at speeds that let you stay in your own lane.
- As you go over the top of a hill, be alert. There could be something in your lane, like a stalled car or an accident.
- You may see highway signs on mountains that warn of special problems. Examples are long grades, passing or no-passing zones, a falling rocks area, winding roads and special truck lanes. Be alert to these and take appropriate action.

## Winter Driving

Here are some tips for winter driving:

- Be sure the vehicle is in good shape for winter.
- You may want to put winter emergency supplies in your vehicle.

Include an ice scraper, a small brush or broom, a supply of windshield washer fluid, a rag, some winter outer clothing, a small shovel, a flashlight, a red cloth and reflective warning triangles. And, if you will be driving under severe conditions, include a small bag of sand, a piece of old carpet or a couple of burlap bags to help provide traction. Be sure you properly secure these items in your vehicle.

### Driving on Snow or Ice

Most of the time, those places where your tires meet the road probably have good traction.

However, if there is snow or ice between your tires and the road, you can have a very slippery situation. You'll have a lot less traction or "grip" and will need to be very careful.

What's the worst time for this? "Wet ice." Very cold snow or ice can be slick and hard to drive on. But wet ice can be even more trouble because it may offer the least traction of all. You can get wet ice when it's about

freezing (32°F; 0°C) and freezing rain begins to fall. Try to avoid driving on wet ice until salt and sand crews can get there.

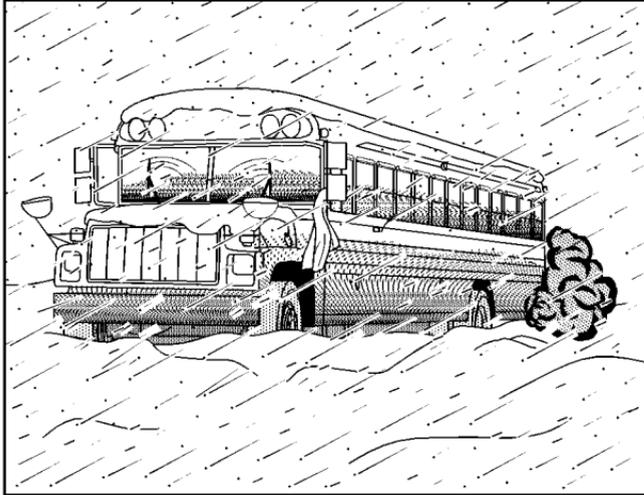
Whatever the condition -- smooth ice, packed, blowing or loose snow -- drive with caution.

Accelerate gently. Try not to break the fragile traction. If you accelerate too fast, the drive wheels will spin and polish the surface under the tires even more.

Your anti-lock brakes improve your vehicle's stability when you make a hard stop on a slippery road. Even though you have an anti-lock braking system, you'll want to begin stopping sooner than you would on dry pavement. See "Anti-Lock" in the Index.

- Allow greater following distance on any slippery road.
- Watch for slippery spots. The road might be fine until you hit a spot that's covered with ice. On an otherwise clear road, ice patches may appear in shaded areas where the sun can't reach: around clumps of trees, behind buildings or under bridges. Sometimes the surface of a curve or an overpass may remain icy when the surrounding roads are clear. If you see a patch of ice ahead of you, brake before you are on it. Try not to brake while you're actually on the ice, and avoid sudden steering maneuvers.

## If You're Caught in a Blizzard



If you are stopped by heavy snow, you could be in a serious situation. You should probably stay with your vehicle unless you know for sure that you are near help and you can hike through the snow. Here are some things to do to summon help and keep yourself and your passengers safe:

- Turn on your hazard flashers.

- Tie a red cloth to your mirror arm to alert police that you've been stopped by the snow.
- Put on extra clothing or wrap a blanket around you. If you have no blankets or extra clothing, make body insulators from newspapers, burlap bags, rags, floor mats -- anything you can wrap around yourself or tuck under your clothing to keep warm.

You can run the engine to keep warm, but be careful.

### CAUTION:

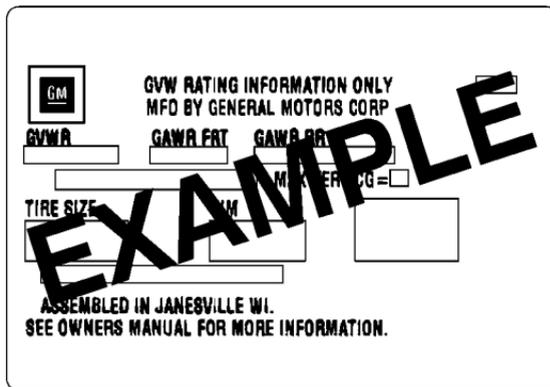
**Snow can trap exhaust gases under your vehicle. This can cause deadly CO (carbon monoxide) gas to get inside. CO could overcome you and kill you. You can't see it or smell it, so you might not know it is in your vehicle. Clear away snow from around the base of your vehicle, especially any that is blocking your exhaust pipe. And check around again from time to time to be sure snow doesn't collect there.**

**Open a window just a little on the side of the vehicle that's away from the wind. This will help keep CO out.**

Run your engine only as long as you must. This saves fuel. When you run the engine, make it go a little faster than just idle. That is, push the accelerator slightly. This uses less fuel for the heat that you get and it keeps the battery (or batteries) charged. You will need a well-charged battery (or batteries) to restart the vehicle, and possibly for signaling later on with your headlamps. Let the heater run for a while.

If you have a diesel engine, you may have to run it at a higher speed to get enough heat. Then, shut the engine off and close the window almost all the way to preserve the heat. Start the engine again and repeat this only when you feel really uncomfortable from the cold. But do it as little as possible. Preserve the fuel as long as you can. To help keep warm, you can get out of the vehicle and do some fairly vigorous exercises every half hour or so until help comes.

## Loading Your Vehicle



The Certification/Tire label will be provided and installed by the final body manufacturer. To locate the Certification/Tire label, see that company's manual or contact them directly. The label shows the size of your original tires and the inflation pressures needed to obtain the gross weight capacity of your vehicle. This is called the Gross Vehicle Weight Rating (GVWR). The GVWR includes the weight of the vehicle, all occupants, fuel and cargo.

The Certification/Tire label also tells you the maximum weights for the front and rear axles, called Gross Axle Weight Rating (GAWR). To find out the actual loads on your front and rear axles, you need to go to a weigh station and weigh your vehicle. Your dealer can help you with this. Be sure to spread out your load equally on both sides of the centerline.

Never exceed the GVWR for your vehicle, or the GAWR for either the front or rear axle.

And if you do have a heavy load, you should spread it out.

### CAUTION:

**Do not load your vehicle any heavier than the GVWR, or either the maximum front or rear GAWR. If you do, parts on your vehicle can break, and it can change the way your vehicle handles. These could cause you to lose control and crash. Also, overloading can shorten the life of your vehicle.**

Using heavier suspension components to get added durability might not change your weight ratings.

Ask your dealer to help you load your vehicle the right way.

### **NOTICE:**

**Your warranty does not cover parts or components that fail because of overloading.**

### CAUTION:

**Things you put inside your vehicle can strike and injure people in a sudden stop or turn, or in a crash.**

- **Put things in the cargo area of your vehicle. Try to spread the weight evenly.**
- **Never stack heavier things, like suitcases, inside the vehicle so that some of them are above the tops of the seats.**
- **Don't leave an unsecured child restraint in your vehicle.**
- **When you carry something inside the vehicle, secure it whenever you can.**

## Section 3 Problems on the Road

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Here you'll find what to do about some problems that can occur on the road.

3-2 Hazard Warning Flashers  
3-2 Other Warning Devices  
3-3 Jump Starting  
3-8 Towing Your Vehicle  
3-15 Engine Overheating  
3-17 Cooling System (Gasoline Engine)

3-23 Cooling System (Diesel Engine)  
3-29 Engine Fan Noise  
3-29 If a Tire Goes Flat  
3-30 Changing a Flat Tire  
3-30 If You're Stuck: In Sand, Mud, Ice or Snow

## Hazard Warning Flashers

Your hazard warning flashers let you warn others. They also let police know you have a problem. Your front and rear turn signal lamps will flash on and off.



The knob for your flashers is on the lower right side of the instrument panel. Pull the knob out to make your front and rear turn signal lamps flash on and off.

Your hazard warning flashers work no matter what position your key is in, and even if the key isn't in.

To turn off the flashers, push in the knob. When the hazard warning flashers are on, your turn signals won't work.

## Other Warning Devices

If you carry reflective triangles, you can set one up at the side of the road behind your vehicle in the recommended manner per Federal Motor Carrier Safety Regulation (FMCSR) Section 392.22, to warn others.

## Jump Starting

If your battery (or batteries) has run down, you may want to use another vehicle and some jumper cables to start your vehicle. Please use the following steps to do it safely.

The batteries are mounted in a battery box provided by the body builder. It can be located on either the right or left side of the vehicle.

### CAUTION:

**Batteries can hurt you. They can be dangerous because:**

- They contain acid that can burn you.
- They contain gas that can explode or ignite.
- They contain enough electricity to burn you.

**If you don't follow these steps exactly, some or all of these things can hurt you.**

### NOTICE:

**Ignoring these steps could result in costly damage to your vehicle that wouldn't be covered by your warranty.**

**The ACDelco<sup>®</sup> battery in your vehicle has a built-in hydrometer. Do not charge, test or jump start the battery if the hydrometer looks clear or light yellow. Replace the battery when there is a clear or light yellow hydrometer and a cranking complaint.**

**Trying to start your vehicle by pushing or pulling it won't work, and it could damage your vehicle.**

1. Check the other vehicle. It must have a 12-volt battery with a negative ground system.

## **NOTICE:**

**If the other system isn't a 12-volt system with a negative ground, both vehicles can be damaged.**

If you have a diesel engine vehicle with two batteries (or more), you should know before you begin that, especially in cold weather, you may not be able to get enough power from a single battery in another vehicle to start your diesel engine.

If your vehicle has more than one battery, use the battery that's closest to the starter -- this will reduce electrical resistance.

2. Get the vehicles close enough for the jumper cables to reach, but be sure the vehicles aren't touching each other. You wouldn't be able to start your vehicle, and the bad grounding could damage the electrical systems.
3. Turn off the ignition on both vehicles. Turn off all lamps that aren't needed, as well as radios. This will avoid sparks and help save both batteries.

4. Locate the batteries on each vehicle. Find the positive (+) and negative (-) terminals on each battery.

## **CAUTION:**

**Using a match near a battery can cause battery gas to explode. People have been hurt doing this, and some have been blinded. Use a flashlight if you need more light.**

**Be sure the batteries have enough water. You don't need to add water to the ACDelco® battery (or batteries) installed in every new GM vehicle. But if a battery has filler caps, be sure the right amount of fluid is there. If it is low, add water to take care of that first. If you don't, explosive gas could be present.**

**Battery fluid contains acid that can burn you. Don't get it on you. If you accidentally get it in your eyes or on your skin, flush the place with water and get medical help immediately.**

5. Check that the jumper cables don't have loose or missing insulation. If they do, you could get a shock. The vehicles could be damaged, too.

Before you connect the cables, here are some basic things you should know. Positive (+) will go to positive (+) and negative (-) will go to a heavy, unpainted metal engine part or some other well-grounded part. Don't connect positive (+) to negative (-) or you'll get a short that would damage the battery and maybe other parts, too.

**⚠ CAUTION:**

**Fans or other moving engine parts can injure you badly. Keep your hands away from moving parts once the engine is running.**



6. Connect the red positive (+) cable to the positive (+) terminal of the vehicle with the dead battery.



7. Don't let the other end touch metal. Connect it to the positive (+) terminal of the good battery.



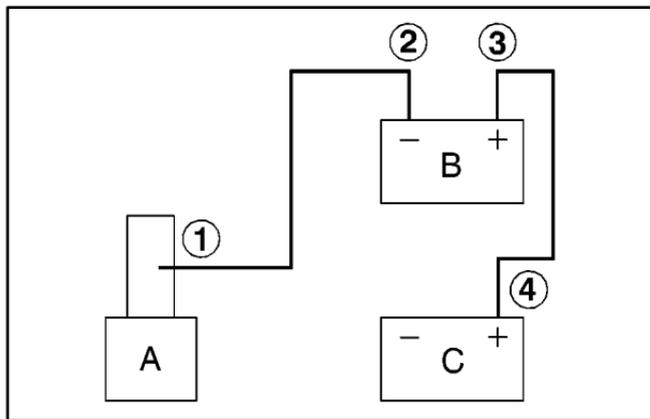
8. Now connect the black negative (-) cable to the good battery's negative (-) terminal.

Don't let the other end touch anything until the next step. The other end of the negative (-) cable doesn't go to the dead battery. It goes to a heavy, unpainted metal part on the engine, or some other well-grounded part of the vehicle with the dead battery.



9. Attach the cable at least 8 inches (45 cm) away from the dead battery, but not near engine parts that move. The electrical connection is just as good there, but the chance of sparks getting back to the battery is much less.

10. Now start the vehicle with the good battery and run the engine for one to two minutes. If your vehicle has the high idle option, use it.
11. Try to start the vehicle with the dead battery. If it won't start after a few tries, it probably needs service.



### Jumper Cable Removal

- A. Heavy, Unpainted Metal Engine Part
- B. Good Battery
- C. Dead Battery

To disconnect the jumper cables from both vehicles, do the following:

1. Disconnect the black negative (-) cable from the heavy, unpainted metal engine part on the vehicle that had the dead battery.
2. Disconnect the black negative (-) cable from the negative (-) terminal on the vehicle with the good battery.
3. Disconnect the red positive (+) cable from the vehicle with the good battery.
4. Disconnect the red positive (+) cable from the other vehicle.

## Towing Your Vehicle

### CAUTION:

**To help avoid serious personal injury to you or others:**

- **Never let passengers ride in a vehicle that is being towed.**
- **Never tow faster than safe or posted speeds.**
- **Never tow with damaged parts not fully secured.**
- **Never get under your vehicle after it has been lifted by the tow truck.**
- **Always secure the vehicle on each side with separate safety chains when towing it.**
- **Working on air brakes without first using the release studs to compress the springs can lead to injury. Never work on the air brake chambers without first using the release studs to compress the brake springs.**
- **When the brake springs are manually compressed, you will have no brakes. Release your air-operated parking brakes manually only to tow the vehicle. Never drive the vehicle with the brakes released.**

Consult your dealer or a professional towing service if you need to have your vehicle towed. They can provide the right equipment and know-how to tow it without damage. See “Roadside Assistance” in the Index.

Before you do anything, turn on the hazard warning flashers (if they have not been damaged).

When you call, tell the towing service:

- That your vehicle has rear-wheel drive.
- The make, model and year of your vehicle.
- Whether you can still move the shift lever.
- If there was an accident, what was damaged.

When the towing service arrives, let the tow operator know that this manual contains towing instructions. The operator may want to see them.

Here are specific towing instructions:

## Towing Your Vehicle From the Front (Front Wheels Off the Ground)

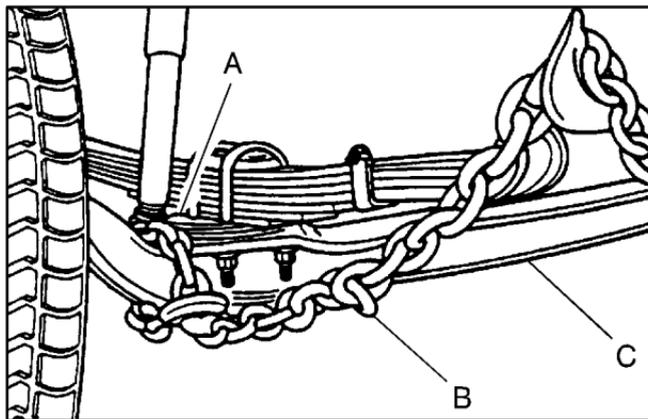
### Before Towing

Block the rear wheels of the disabled vehicle. On vehicles with air brakes, release the emergency brake system by compressing the brake chamber springs as outlined in this section. (This is to prevent the possibility of the emergency brake being applied during towing.)

On vehicles with hydraulic brakes without an electric/hydraulic parking brake, release the parking brake fully by moving the lever to the fully-released position.

### Towing the Vehicle with the Front Bumper Removed

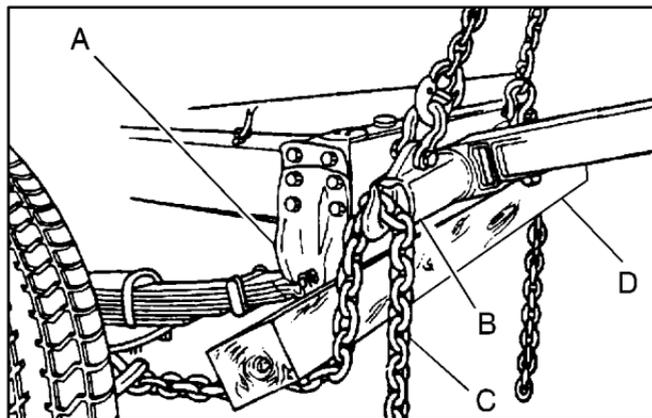
1. Remove the front bumper.
2. Connect and lock the lift chains to the front axle, outside of the spring anchor plates as shown.



- A. Spring Anchor Plate                      B. Lift Chain  
C. Front Axle

3. Place a 6" x 6" x 5' hardwood beam underneath and slightly behind the front spring shackle brackets.

4. Connect lift chains to the tow bar and raise the tow bar until lift chain slack has been taken up and the hardwood beam is fully seated against the spring shackle brackets as shown.

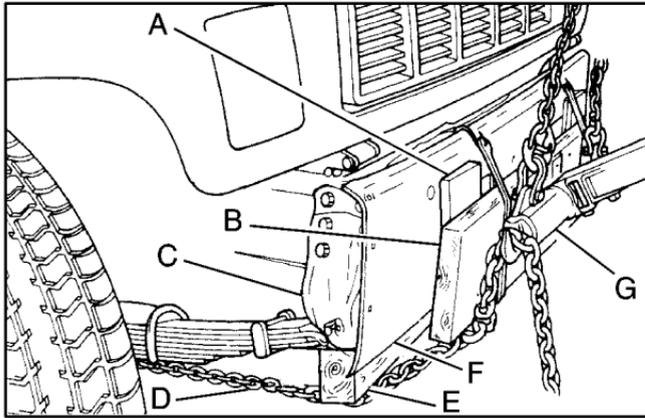


- |                    |                  |
|--------------------|------------------|
| A. Shackle Bracket | C. Lift Chain    |
| B. Tow Bar         | D. Hardwood Beam |

5. Raise the vehicle to the required height.

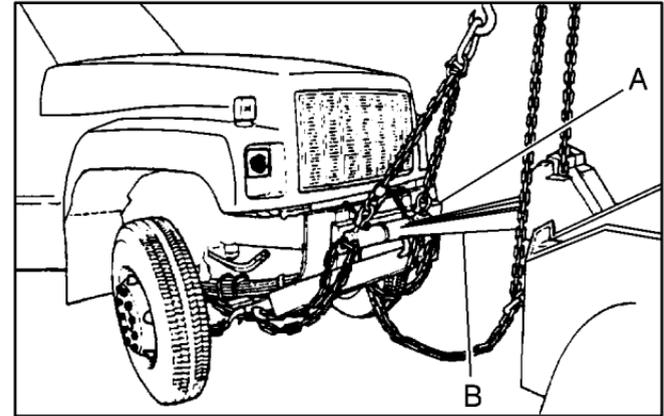
### Towing the Vehicle with the Front Bumper Installed

1. Connect and lock the lift chains to the front axle, outside of the spring anchor plates as previously shown.
2. Place a 6" x 6" x 5' hardwood beam underneath and slightly behind the front spring shackle brackets as previously shown.
3. Connect the lift chains to the tow bar and take up the slack in the chains until the tow bar is within 4" of the front bumper facing. Place a 2" x 2" x 40" hardwood board with rubber pads against the front bumper and secure as shown.



- |                    |                  |
|--------------------|------------------|
| A. Rubber Pad      | E. Hardwood Beam |
| B. Hardwood Board  | F. Bumper        |
| C. Shackle Bracket | G. Tow Bar       |
| D. Lift Chain      |                  |

- Remove the remaining slack in the lift chains. The tow bar swing arm should rest against the 2" x 2" x 40" hardwood board as shown.



- |                   |              |
|-------------------|--------------|
| A. Hardwood Board | B. Swing Arm |
|-------------------|--------------|
- Raise the vehicle to the required height.

## **Single Drive Rear Axle**

Disconnect the propshaft at the rear axle. Secure the propshaft to the frame or crossmember.

### **After Towing**

Block the rear wheels and install axle and propeller shafts. Check for proper phasing of universal joints. Apply the emergency brake system before disconnecting from the towing vehicle. Check and fill the rear axle with oil as required.

## **Towing Your Vehicle From the Front (All Wheels On the Ground)**

Your vehicle may be towed on all wheels provided the steering is working. Remember that the power brakes and power steering will not have power assist. Vehicles with air brakes will not have brakes. There must be a tow bar installed between the towing vehicle and the disabled vehicle.

## **Before Towing**

Block the wheels of the disabled vehicle. On vehicles with air brakes, release the emergency brake system by compressing the brake chamber springs as outlined in this section. (This is to prevent the possibility of the emergency brake being applied during towing.)

On vehicles with hydraulic brakes, release the parking brake fully by moving the lever to the fully-released position.

If there is damage or suspected damage to the axle(s), remove the axle shafts. Cover the hub openings to prevent the loss of lubricant or entry of dirt or foreign objects.

### **After Towing**

Block the rear wheels and install axle and propshafts. Check for proper phasing of universal joints. Apply the parking brake system before disconnecting from the towing vehicle. Check and fill rear axle with oil as required.

## **Towing Your Vehicle From the Rear (Rear Wheels Off the Ground)**

### **Before Towing**

Secure the steering wheel to maintain a straight-ahead position. Make certain that the front axle is not loaded above the front axle Gross Axle Weight Rating (GAWR) as indicated on the vehicle's Certification/Tire label.

### **After Towing**

Block the rear wheels and release the steering. Apply the parking brake system before disconnecting from the towing vehicle. Check and fill the rear axle with oil as required.

### **Releasing Air-Operated Parking Brakes (If Equipped)**

If your vehicle has air brakes, you could have a special towing problem. If your vehicle has to be towed because of a complete loss of air pressure from both systems, the parking brakes will have automatically engaged.

The tow operator can release the brakes manually by using the following steps. Then your vehicle can be towed with all wheels or just the rear wheels on the ground.

1. Block the wheels of the vehicle.



2. Remove the release stud and nut from the side of the brake chamber. Some chambers have studs which are visible at all times.



3. Remove the rubber cap from the rear of the chamber.

4. Put the release stud, nut and flat washer into the chamber.
5. Turn the stud clockwise a quarter of a turn.



6. Using a wrench, turn the stud nut clockwise several turns to release the brakes. Follow the same procedure to release the other brake.

7. At the repair facility, apply air pressure of at least 70 psi (480 kPa) to the brake chambers, either from an external air supply or the vehicle's air system.
8. Turn the stud nut counterclockwise several turns. Remove the stud from the chamber.
9. Put the stud into the side of the chamber, and replace the rubber cap.

## Engine Overheating

You will find a coolant temperature warning gage located on your vehicle's instrument panel cluster, as well as a LOW COOLANT warning light, if you have a diesel engine. Your vehicle also has a CHECK GAGES warning light on the instrument panel cluster.

### If Steam Is Coming From Your Engine

#### CAUTION:

Steam from an overheated engine can burn you badly, even if you just open the hood. Stay away from the engine if you see or hear steam coming from it. Just turn it off and get everyone away from the vehicle until it cools down. Wait until there is no sign of steam or coolant before you open the hood.

CAUTION: (Continued)

#### CAUTION: (Continued)

**If you keep driving when your engine is overheated, the liquids in it can catch fire. You or others could be badly burned. Stop your engine if it overheats, and get out of the vehicle until the engine is cool.**

#### NOTICE:

**If your engine catches fire because you keep driving with no coolant, your vehicle can be badly damaged. The costly repairs would not be covered by your warranty.**

## If No Steam Is Coming From Your Engine

If you get an engine overheat warning but see or hear no steam, the problem may not be too serious. Sometimes the engine can get a little too hot when you:

- Climb a long hill on a hot day.
- Stop after high-speed driving.
- Idle for long periods in traffic.

If you get the overheat warning with no sign of steam, try this for a minute or so:

1. If you have an air conditioner and it's on, turn it off.
2. Turn on your heater to full hot at the highest fan speed and open the window as necessary.
3. If you're in a traffic jam, shift to NEUTRAL (N); otherwise, shift to the highest gear while driving DRIVE (D) for automatic transmissions.
4. If climbing a hill, downshift to raise engine and fan speeds.

If you no longer have the overheat warning, you can drive. Just to be safe, drive slower for about 10 minutes. If the warning doesn't come back on, you can drive normally.

If the warning continues, pull over, stop, and park your vehicle right away.

If there's still no sign of steam, push down the accelerator until the engine speed is about twice as fast as normal idle speed for at least three minutes while you're parked. If you still have the warning, *turn off the engine and get everyone out of the vehicle* until it cools down.

You may decide not to lift the hood but to get service help right away.

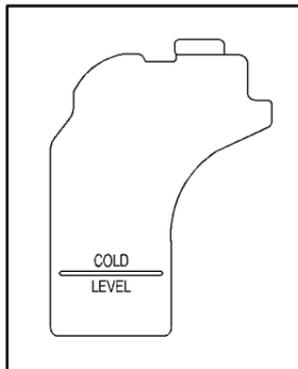
## Cooling System (Gasoline Engine)

When you decide it's safe to lift the hood, here's what you'll see:



- A. Coolant Recovery Tank
- B. Engine Fan
- C. Radiator Pressure Cap

If the coolant inside the coolant recovery tank is boiling, don't do anything else until it cools down.



When the engine is cold, the coolant level should be at the COLD LEVEL mark. If it isn't, you may have a leak in the radiator hoses, heater hoses, radiator, water pump or somewhere else in the cooling system.

### CAUTION:

**Heater and radiator hoses, and other engine parts, can be very hot. Don't touch them. If you do, you can be burned.**

**Don't run the engine if there is a leak. If you run the engine, it could lose all coolant. That could cause an engine fire, and you could be burned. Get any leak fixed before you drive the vehicle.**

## NOTICE:

**Engine damage from running your engine without coolant isn't covered by your warranty.**

## NOTICE:

**When adding coolant, it is important that you use only DEX-COOL<sup>®</sup> (silicate-free) coolant.**

**If coolant other than DEX-COOL is added to the system, premature engine, heater core or radiator corrosion may result. In addition, the engine coolant will require change sooner -- at 30,000 miles (50 000 km) or 24 months, whichever occurs first. Damage caused by the use of coolant other than DEX-COOL<sup>®</sup> is not covered by your new vehicle warranty.**

If there seems to be no leak, start the engine again. See if the engine cooling fan speed increases when idle speed is doubled by pushing the accelerator pedal down. If it doesn't, your vehicle needs service. Turn off the engine.

## How to Add Coolant to the Coolant Recovery Tank

If you haven't found a problem yet, but the coolant level isn't at or above the COLD LEVEL mark, add a 50/50 mixture of *clean, drinkable water* and DEX-COOL<sup>®</sup> engine coolant at the coolant recovery tank. See "Engine Coolant" in the Index for more information.



## CAUTION:

**Adding only plain water to your cooling system can be dangerous. Plain water, or some other liquid like alcohol, can boil before the proper coolant mixture will. Your vehicle's coolant warning system is set for the proper coolant mixture. With plain water or the wrong mixture, your engine could get too hot but you wouldn't get the overheat warning. Your engine could catch fire and you or others could be burned. Use a 50/50 mixture of clean, drinkable water and DEX-COOL<sup>®</sup> coolant.**

## NOTICE:

**In cold weather, water can freeze and crack the engine, radiator, heater core and other parts. Use the recommended coolant and the proper coolant mixture.**



## CAUTION:

**You can be burned if you spill coolant on hot engine parts. Coolant contains ethylene glycol and it will burn if the engine parts are hot enough. Don't spill coolant on a hot engine.**

When the coolant in the coolant recovery tank is at the COLD LEVEL mark, start your vehicle.

If the overheat warning continues, there's one more thing you can try. You can add the proper coolant mixture directly to the radiator, but be sure the cooling system is cool before you do it.

**⚠ CAUTION:**

Steam and scalding liquids from a hot cooling system can blow out and burn you badly. They are under pressure, and if you turn the radiator pressure cap -- even a little -- they can come out at high speed. Never turn the cap when the cooling system, including the radiator pressure cap, is hot. Wait for the cooling system and radiator pressure cap to cool if you ever have to turn the pressure cap.



## How to Add Coolant to the Radiator



1. You can remove the radiator pressure cap when the cooling system, including the radiator pressure cap and upper radiator hose, is no longer hot. Turn the pressure cap slowly counterclockwise until it first stops. (Don't press down while turning the pressure cap.)

If you hear a hiss, wait for that to stop. A hiss means there is still some pressure left.



2. Then keep turning the pressure cap, but now push down as you turn it. Remove the pressure cap.



3. Fill the radiator with the proper DEX-COOL<sup>®</sup> coolant mixture, up to the base of the filler neck. See "Engine Coolant" in the Index for more information about the proper coolant mixture.

4. Then fill the coolant recovery tank to one-half full.

- Put the cap back on the coolant recovery tank, but leave the radiator pressure cap off.



- Start the engine and let it run until you can feel the upper radiator hose getting hot. Watch out for the engine cooling fan.

- By this time, the coolant level inside the radiator filler neck may be lower. If the level is lower, add more of the proper DEX-COOL<sup>®</sup> coolant mixture through the filler neck until the level reaches the base of the filler neck.



- Then replace the pressure cap. At any time during this procedure if coolant begins to flow out of the filler neck, reinstall the pressure cap. Be sure the arrows on the pressure cap line up like this.

## Cooling System (Diesel Engine)

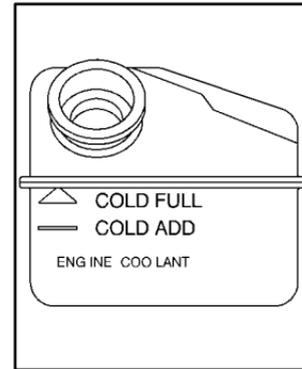
When you decide it's safe to lift the hood, here's what you'll see:



**Caterpillar<sup>®</sup> Diesel Engine**

- A. Engine Fan
- B. Coolant Surge Tank

If the coolant inside the coolant surge tank is boiling, don't do anything else until it cools down.



The coolant level should be at COLD ADD or higher. If it isn't, you may have a leak in the radiator hoses, heater hoses, radiator, water pump or somewhere else in the cooling system.

**Caterpillar<sup>®</sup>  
Diesel Engine**

 **CAUTION:**

**Heater and radiator hoses, and other engine parts, can be very hot. Don't touch them.**

**If you do, you can be burned.**

**Don't run the engine if there is a leak. If you run the engine, it could lose all coolant. That could cause an engine fire, and you could be burned. Get any leak fixed before you drive the vehicle.**

**NOTICE:**

**Engine damage from running your engine without coolant isn't covered by your warranty.**

If there seems to be no leak, start the engine again. See if the fan speed increases when idle speed is doubled by pushing the accelerator pedal down. If it doesn't, your vehicle needs service. Turn off the engine.

## How to Add Coolant to the Coolant Surge Tank

If you haven't found a problem yet, but the coolant level isn't at the COLD FULL mark, add a 50/50 mixture of *clean, drinkable water* and coolant at the coolant surge tank, but be sure the cooling system, including the coolant surge tank pressure cap, is cool before you do it. See the Caterpillar® Diesel Engine Operation & Maintenance Manual for the proper engine coolant to use.

 **CAUTION:**

**Steam and scalding liquids from a hot cooling system can blow out and burn you badly. They are under pressure, and if you turn the coolant surge tank pressure cap -- even a little -- they can come out at high speed. Never turn the cap when the cooling system, including the coolant surge tank pressure cap, is hot. Wait for the cooling system and coolant surge tank pressure cap to cool if you ever have to turn the pressure cap.**



**⚠ CAUTION:**

Adding only plain water to your cooling system can be dangerous. Plain water, or some other liquid like alcohol, can boil before the proper coolant mixture will. Your vehicle's coolant warning system is set for the proper coolant mixture. With plain water or the wrong mixture, your engine could get too hot but you wouldn't get the overheat warning. Your engine could catch fire and you or others could be burned. Use a 50/50 mixture of clean, drinkable water and coolant.

## NOTICE:

In cold weather, water can freeze and crack the engine, radiator, heater core and other parts. So use the recommended coolant.

## ⚠ CAUTION:

You can be burned if you spill coolant on hot engine parts. Coolant contains ethylene glycol and it will burn if the engine parts are hot enough. Don't spill coolant on a hot engine.



1. You can remove the coolant surge tank pressure cap when the cooling system, including the coolant surge tank pressure cap and upper radiator hose, is no longer hot. Turn the pressure cap slowly counterclockwise until it first stops. (Don't press down while turning the pressure cap.)  
If you hear a hiss, wait for that to stop.  
A hiss means there is still some pressure left.



2. Then keep turning the cap, but now push down as you turn it. Remove the pressure cap.



3. Then fill the coolant surge tank with the proper coolant mixture, up to the COLD FULL mark.



4. With the coolant surge tank pressure cap off, start the engine and let it run until you can feel the upper radiator hose getting hot. Watch out for the engine fan.

By this time, the coolant level inside the coolant surge tank may be lower. If the level is lower, add more of the proper mixture to the coolant surge tank until the level reaches the COLD FULL mark.



5. Then replace the pressure cap. Be sure the arrows on the pressure cap line up like this.

## Engine Fan Noise

Your vehicle has a clutched engine cooling fan. When the clutch is engaged, the fan spins faster to provide more air to cool the engine. In most everyday driving conditions, the clutch is not fully engaged. This improves fuel economy and reduces fan noise. Under heavy vehicle loading, trailer towing and/or high outside temperatures, the fan speed increases when the clutch engages. So you may hear an increase in fan noise. This is normal and should not be mistaken as the transmission slipping or making extra shifts. It is merely the cooling system functioning properly. The fan will slow down when additional cooling is not required and the clutch disengages.

You may also hear this fan noise when you start the engine. It will go away as the fan clutch disengages.

## If a Tire Goes Flat

It's unusual for a tire to "blow out" while you're driving, especially if you maintain your tires properly. If air goes out of a tire, it's much more likely to leak out slowly. But if you should ever have a "blowout," here are a few tips about what to expect and what to do:

If a front tire fails, the flat tire will create a drag that pulls the vehicle toward that side. Take your foot off the accelerator pedal and grip the steering wheel firmly. Steer to maintain lane position, and then gently brake to a stop well out of the traffic lane.

A rear blowout, particularly on a curve, acts much like a skid and may require the same correction you'd use in a skid. In any rear blowout, remove your foot from the accelerator pedal. Get the vehicle under control by steering the way you want the vehicle to go. It may be very bumpy and noisy, but you can still steer. Gently brake to a stop -- well off the road if possible.

If a tire goes flat, avoid further tire and wheel damage by driving slowly to a level place and turn on your hazard warning flashers. The next part tells you what to do.

## Changing a Flat Tire

Your truck, when new, included no tire changing equipment and no place to store a tire in the vehicle. Few drivers of these vehicles have the necessary equipment aboard to be able to change a flat tire safely. For example, you have to have a truck jack that can lift several thousand pounds and a torque wrench that can generate several hundred foot-pounds (newton-meters) of twisting force.

### CAUTION:

**If you try to put air back into a tire that has run flat, or even a tire that was quite low on air, the tire can have a sudden air-out. This could cause you to lose control of the vehicle and have a serious crash. Don't refill a flat or very low tire with air without first having the tire taken off the wheel and checked for damage.**

So if you're stopped somewhere by a flat or damaged tire or wheel, you should get expert help. See "Roadside Assistance" in the Index.

### CAUTION:

**Your vehicle, when new, included no tire changing equipment and no place to store a tire in the vehicle. Special tools and procedures are required if a tire needs to be serviced. If these tools and procedures aren't used, you or others could be injured or killed while trying to change or service a truck tire.**

## If You're Stuck: In Sand, Mud, Ice or Snow

In order to free your vehicle when it is stuck, you will need to spin the wheels, but you don't want to spin your wheels too fast. The method known as "rocking" can help you get out when you're stuck, but you must use caution.



## **CAUTION:**

**If you let your tires spin at high speed, they can explode, and you or others could be injured. And, the transmission or other parts of the vehicle can overheat. That could cause an engine compartment fire or other damage. When you're stuck, spin the wheels as little as possible. Don't spin the wheels above 35 mph (55 km/h) as shown on the speedometer.**

## **NOTICE:**

**Spinning your wheels can destroy parts of your vehicle as well as the tires. If you spin the wheels too fast while shifting your transmission back and forth, you can destroy your transmission.**

## **Rocking Your Vehicle To Get It Out**

First, turn your steering wheel left and right. That will clear the area around your front wheels. Then shift back and forth between REVERSE (R) and a forward gear (or with a manual transmission, between FIRST (1) or SECOND (2) and REVERSE (R)), spinning the wheels as little as possible. Release the accelerator pedal while you shift, and press lightly on the accelerator pedal when the transmission is in gear. By slowly spinning your wheels in the forward and reverse directions, you will cause a rocking motion that may free your vehicle. If that doesn't get you out after a few tries, you may need to be towed out. If you do need to be towed out, see "Towing Your Vehicle" in the Index.

## Section 4 Service

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Here you will find information about the care of your vehicle. This section begins with service and fuel information, and then it shows how to check important fluid and lubricant levels. There is also technical information about your vehicle.

4-2	Service	4-19	Rear Axle
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4-6	Diesel Fuel Requirements and Fuel System	4-23	Engine Coolant (Caterpillar <sup>®</sup> Diesel Engine)
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## Service

Your dealer knows your vehicle best and wants you to be happy with it. We hope you'll go to your dealer for all your service needs. You'll get genuine GM parts and GM-trained and supported service people.

We hope you'll want to keep your GM vehicle all GM. Genuine GM parts have one of these marks:



## Doing Your Own Service Work

If you want to do some of your own service work, you'll want to use the proper service manual. It tells you much more about how to service your vehicle than this manual can. To order the proper service manual, see "Service and Owner Publications" in the Index.

You should keep a record with all parts receipts and list the mileage and the date of any service work you perform. See "Maintenance Record" in the Index.

### CAUTION:

**You can be injured and your vehicle could be damaged if you try to do service work on a vehicle without knowing enough about it.**

- **Be sure you have sufficient knowledge, experience, the proper replacement parts and tools before you attempt any vehicle maintenance task.**

**CAUTION: (Continued)**

**CAUTION: (Continued)**

- Be sure to use the proper nuts, bolts and other fasteners. “English” and “metric” fasteners can be easily confused. If you use the wrong fasteners, parts can later break or fall off. You could be hurt.

## Two Safety Cautions about Engine Fan Breakage

 **CAUTION:**

### Changing the Fan Drive Ratio or Engine Governed Speed

If you change the fan drive ratio or increase the governed speed of the engine, you may increase stress on the engine fan and the fan could eventually fail. If the fan breaks apart while it is

**CAUTION: (Continued)**

**CAUTION: (Continued)**

rotating, the flying pieces can cause severe injury to anyone -- such as a service technician -- who is nearby. And, of course, the pieces can severely damage the vehicle. Don't change the fan drive ratio or increase the governed speed of the vehicle without getting the necessary information from your dealer.

**Winter Fronts, Grille Covers or Obstructions**  
Winter fronts, grille covers or other add-on equipment causing obstructions in front or behind the fan should not be used on this vehicle. They may increase the stress on the fan as the blades pass over the covered areas. If this causes the fan to eventually break apart while it is rotating, the pieces can cause severe injury to anyone nearby, such as a service technician working on the engine, and of course the pieces can severely damage the vehicle.

If your vehicle is equipped with the optional radiator shutters, see “Radiator Shutters” in the Index.

## Fuel (Gasoline Engine)

If your vehicle has a diesel engine, see “Diesel Engine Fuel” in this section. For vehicles with gasoline engines, please read this.

Use regular unleaded gasoline rated at 87 octane or higher. It is recommended that the gasoline meet specifications which were developed by the American Automobile Manufacturers Association (AAMA) and endorsed by the Canadian Motor Vehicle Manufacturers Association for better vehicle performance and engine protection. Gasolines meeting the AAMA specification could provide improved driveability and emission control system performance compared to other gasolines.



### Canada Only

Be sure the posted octane is at least 87. If the octane is less than 87, you may get a heavy knocking noise when you drive. If it's bad enough, it can damage your engine.

In Canada, look for the “Auto Makers’ Choice” label on the fuel pump.

If you're using fuel rated at 87 octane or higher and you hear heavy knocking, your engine needs service. But don't worry if you hear a little pinging noise when you're accelerating or driving up a hill. That's normal, and you don't have to buy a higher octane fuel to get rid of pinging. It's the heavy, constant knock that means you have a problem.

Some gasolines that are not reformulated for low emissions may contain an octane-enhancing additive called methylcyclopentadienyl manganese tricarbonyl (MMT); ask your service station operator whether or not the fuel contains MMT. General Motors does not recommend the use of such gasolines. If fuels containing MMT are used, spark plug life may be reduced and your emission control system performance may be affected. The malfunction indicator lamp on your instrument panel may turn on. If this occurs, return to your authorized GM dealer for service.

To provide cleaner air, all gasolines in the United States are now required to contain additives that will help prevent deposits from forming in your engine and fuel system, allowing your emission control system to function properly. Therefore, you should not have to add anything to the fuel. In addition, gasolines containing oxygenates, such as ethers and ethanol, and reformulated gasolines may be available in your area to contribute to clean air. General Motors recommends that you use these gasolines, particularly if they comply with the specifications described earlier.

## **NOTICE:**

**Your vehicle was not designed for fuel that contains methanol. Don't use it. It can corrode metal parts in your fuel system and also damage plastic and rubber parts. That damage wouldn't be covered under your warranty.**

## Diesel Fuel Requirements and Fuel System

### Diesel Engine Fuel

See your Caterpillar® Diesel Engine Operation & Maintenance Manual for information concerning fuel usage.

### Water in Fuel

Sometimes, water can be pumped into your fuel tank along with your diesel fuel. This can happen if a service station doesn't regularly inspect and clean its fuel tanks, or if it gets contaminated fuel from its suppliers.

If this happens, water must be drained. Your dealer can show you how to do this.

### CAUTION:

**Diesel fuel containing water is still flammable. You could be burned. If you ever try to drain water from your fuel, keep sparks, flames and smoking materials away from the mixture.**

### NOTICE:

**If there is water in your diesel fuel and the weather is warm or humid, fungus and bacteria can grow in the fuel. They can damage your fuel system. You'll need a diesel fuel biocide to sterilize your fuel system. Your dealer can advise you if you ever need this.**

**If your fuel tank needs to be purged to remove water, see your dealer or a qualified technician. Improper purging can damage your fuel system.**

Diesel engine vehicles that stand unused for several days or weeks can develop water in the fuel from condensation. It helps to fill the fuel tank if the diesel engine vehicle will not be used for a time.

## Fuels in Foreign Countries (Gasoline Engines)

If you plan on driving in another country outside the United States or Canada, the proper fuel may be hard to find. Never use leaded gasoline or any other fuel not recommended in the previous text on fuel. Costly repairs caused by use of improper fuel wouldn't be covered by your warranty.

To check on fuel availability, ask an auto club, or contact a major oil company that does business in the country where you'll be driving.

## Filling Your Tank

### CAUTION:

**Fuel vapor is highly flammable. It burns violently, and that can cause very bad injuries. Don't smoke if you're near gasoline or diesel fuel, or if you're refueling your vehicle. Keep sparks, flames and smoking materials away from gasoline or diesel fuel.**

The fuel cap can be on either or both sides of your vehicle depending on option content.

To take off the cap, turn it slowly to the left (counterclockwise).

## CAUTION:

**Gasoline Engine Vehicles:** If you get gasoline on you and then something ignites it, you could be badly burned. Gasoline can spray out on you if you open the fuel filler cap too quickly. This spray can happen if your tank is nearly full, and is more likely in hot weather. Open the fuel filler cap slowly and wait for any “hiss” noise to stop. Then unscrew the cap all the way.

When you put the cap back on, turn it to the right (clockwise) until it is tight.

## NOTICE:

If you need a new cap, be sure to get the right type. Your dealer can get one for you. If you get the wrong type, it may not fit or have proper venting, and your fuel tank and emissions system might be damaged.

## Filling a Portable Fuel Container

### CAUTION:

Never fill a portable fuel container while it is in your vehicle. Static electricity discharge from the container can ignite the gasoline vapor. You can be badly burned and your vehicle damaged if this occurs. To help avoid injury to you and others:

- Dispense gasoline only into approved containers.
- Do not fill a container while it is inside a vehicle, in a vehicle’s trunk, pickup bed or on any surface other than the ground.
- Bring the fill nozzle in contact with the inside of the fill opening before operating the nozzle. Contact should be maintained until the filling is complete.
- Don’t smoke while pumping gasoline.

## Checking Things Under the Hood



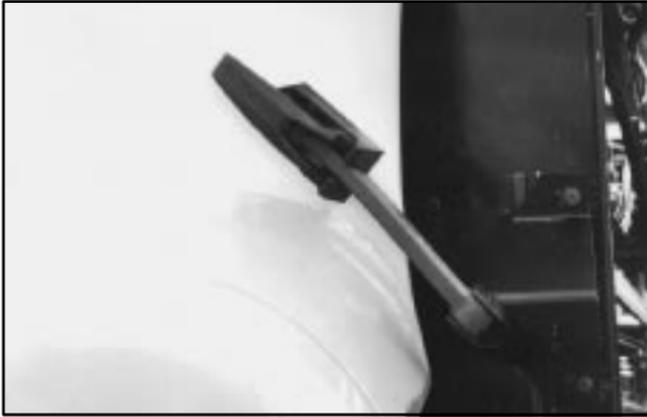
To tilt the complete hood forward, pull out on each of the hood latch handles to release the locks.



Then take the hand holds and pull the hood forward.

When you tilt the hood forward far enough, spring-cushioned cables will support it.

Before closing the hood, be sure all the filler caps are on properly.



Once the hood is back down and seated, make sure the latches are firmly locked in position.

## **⚠ CAUTION:**

**Things that burn can get on hot engine parts and start a fire. These include liquids like fuel, oil, coolant, brake fluid, windshield washer and other fluids, and plastic or rubber. You or others could be burned. Be careful not to drop or spill things that will burn onto a hot engine.**

## **Cleaning Your Diesel Engine**

If you have a diesel engine, you may need to have the engine cleaned from time to time. See the Caterpillar® Operation & Maintenance Manual for more information.

## **NOTICE:**

**If you spray or pour water on your engine when it is warm or hot, or when it is running, you could cause serious damage to it. If you clean the engine, clean it only when it is cold.**

## Engine Oil (Gasoline Engine)

### Checking Engine Oil

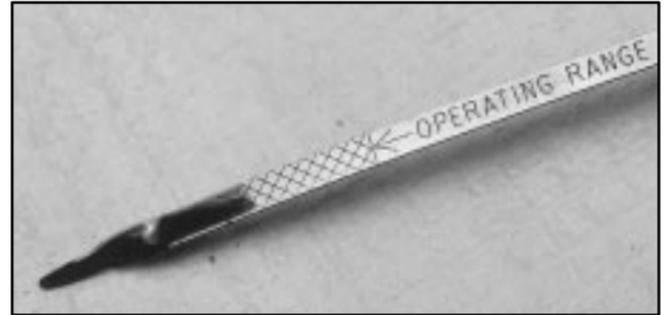
It's a good idea to check your engine oil every time you get fuel. In order to get an accurate reading, the oil must be warm and the vehicle must be on level ground.



The engine oil dipstick is located on the driver's side of the engine compartment.

Turn off the engine and give the oil several minutes to drain back into the oil pan. If you don't, the oil dipstick might not show the actual level.

Pull out the dipstick and clean it with a paper towel or cloth, then push it back in all the way. Remove it again, keeping the tip down, and check the level.



## When to Add Engine Oil

If the oil is at or below the ADD line, then you'll need to add at least one quart of oil. But you must use the right kind. This part explains what kind of oil to use. For crankcase capacity, see "Capacities and Specifications" in the Index.

### NOTICE:

**Don't add too much oil. If your engine has so much oil that the oil level gets above the cross-hatched area that shows the proper operating range, your engine could be damaged.**

Be sure to fill it enough to put the level somewhere in the proper operating range. Push the dipstick all the way back in when you're through.

## What Kind of Engine Oil to Use

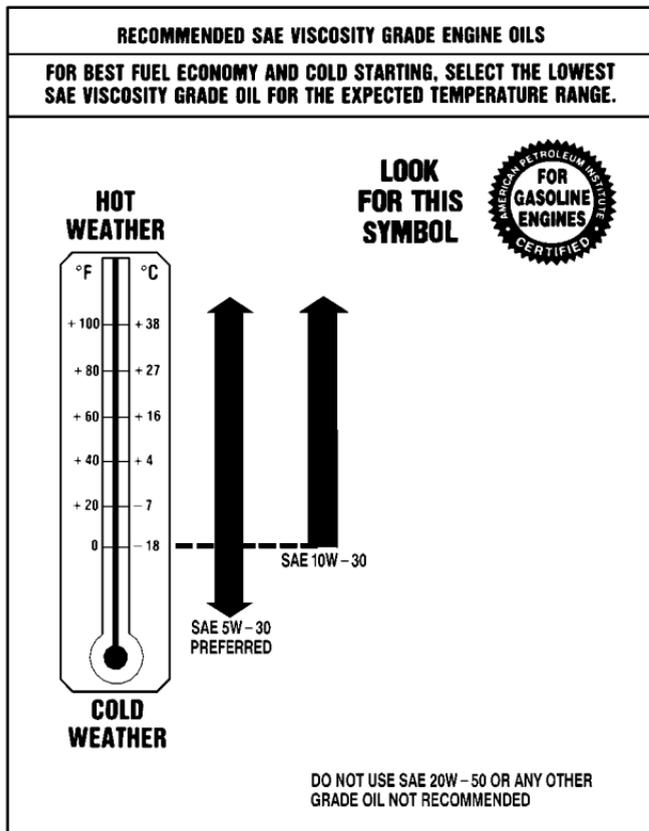
Oils recommended for your vehicle can be identified by looking for the starburst symbol.

This symbol indicates that the oil has been certified by the American Petroleum Institute (API). Do not use any oil which does not carry this starburst symbol.



If you change your own oil, be sure you use oil that has the starburst symbol on the front of the oil container. If you have your oil changed for you, be sure the oil put into your engine is American Petroleum Institute certified for gasoline engines.

You should also use the proper viscosity oil for your vehicle, as shown in the following chart:



As in the chart shown previously, SAE 5W-30 is best for your vehicle. However, you can use SAE 10W-30 if it's going to be 0°F (-18°C) or above. These numbers on an oil container show its viscosity, or thickness. Do not use other viscosity oils, such as SAE 20W-50.

## NOTICE:

**Use only engine oil with the American Petroleum Institute Certified For Gasoline Engines starburst symbol. Failure to use the recommended oil can result in engine damage not covered by your warranty.**

GM Goodwrench<sup>®</sup> oil meets all the requirements for your vehicle.

If you are in an area where the temperature falls below -20°F (-29°C), consider using either an SAE 5W-30 synthetic oil or an SAE 0W-30 oil. Both will provide easier cold starting and better protection for your engine at extremely low temperatures.

## Engine Oil Additives

Don't add anything to your oil. The recommended oils with the starburst symbol are all you will need for good performance and engine protection.

## When to Change Engine Oil

Your vehicle has a computer that lets you know when to change your engine oil. This is not based on mileage, but on engine revolutions and engine operating temperature. When the computer has calculated that the oil needs changing, the GM Oil Life System™ will indicate that a change is necessary. The mileage between oil and filter changes will vary depending on how you drive your vehicle -- usually between 3,000 miles (5 000 km) and 7,500 miles (12 500 km) since your last oil and filter change. Under severe conditions, the system may come on before 3,000 miles (5 000 km). Never drive your vehicle more than 7,500 miles (12 500 km) or 12 months (whichever occurs first) without an oil change.

The system won't detect dust in the oil. So, if you drive in a dusty area, be sure to change your oil and filter every 3,000 miles (5 000 km) or sooner. Remember to reset the CHANGE OIL light whenever the oil is changed.

## How to Reset the GM Oil Life System™

To reset the CHANGE OIL message, do the following:

1. Turn the ignition key to START with the engine off.
2. Fully press and release the accelerator pedal three times within 10 seconds.

If the CHANGE OIL message flashes for five seconds, the system is reset. If the message does not display for five seconds, you will need to reset the system again.

## What to Do with Used Oil

Did you know that used engine oil contains certain elements that may be unhealthy for your skin and could even cause cancer? Don't let used oil stay on your skin for very long. Clean your skin and nails with soap and water, or a good hand cleaner. Wash or properly throw away clothing or rags containing used engine oil. See the manufacturer's warnings about the use and disposal of oil products.

Used oil can be a real threat to the environment. If you change your own oil, be sure to drain all free-flowing oil from the filter before disposal. Don't ever dispose of oil by putting it in the trash, pouring it on the ground, into sewers, or into streams or bodies of water. Instead, recycle it by taking it to a place that collects used oil. If you have a problem properly disposing of your used oil, ask your dealer, a service station or a local recycling center for help.

## Engine Oil (Caterpillar® Diesel Engines)

See your Caterpillar® Operation & Maintenance Manual for information on oil quality and viscosities as well as the temperature range chart.

## Engine Air Cleaner Filter Restriction Indicator (Gasoline Engine)

Your engine has an indicator that lets you know when the air filter is dirty and needs to be serviced. The air filter restriction indicator is located below the air cleaner on the driver's side of the engine.



**Gasoline Engine shown**

When the CHANGE FILTER indicator appears in the sight glass, it's time to service the air filter.

After the air filter is properly serviced, the indicator can be reset by pushing the button on top of the indicator to reset it.

## Engine Air Filter Restriction Indicator (Diesel Engines)

Your engine has an indicator that lets you know when the air cleaner filter is dirty and needs to be serviced. The air filter restriction indicator is located below the air cleaner on the driver's side of the engine.



**Caterpillar®  
Diesel shown**

When the yellow indicator reaches the red ring in the sight glass, it's time to service the air filter.

After the air filter is properly serviced, the indicator can be reset by pushing the button on top of the indicator to reset it.

## Engine Air Cleaner/Filter

Your GM Maintenance Schedule says when to replace the air filter.



**Gasoline Engine**



**Caterpillar®  
Diesel Engine**



## **CAUTION:**

**Gasoline Engines Only: Operating the engine with the air cleaner/filter off can cause you or others to be burned. The air cleaner not only cleans the air, it stops flame if the engine backfires. If it isn't there, and the engine backfires, you could be burned. Don't drive with it off, and be careful working on the engine with the air cleaner/filter off.**

## **NOTICE:**

**Gasoline Engines Only: If the air cleaner/filter is off, a backfire can cause a damaging engine fire. And, dirt can easily get into your engine, which will damage it. Always have the air cleaner/filter in place when you're driving.**

To replace the engine air cleaner/filter element:

1. Remove the finger screws holding the housing cover.
2. Remove the cover and replace the filter element.
3. Be sure that the finger screws are securely tightened when reinstalling the element and housing cover.

## Automatic Transmission Fluid

### When to Check

A good time to have it checked is when the engine oil is checked. See your Allison Automatic Transmission Operator's Manual to find out when to change your transmission fluid and filters.

### How to Check and What to Use

The Allison Automatic Transmission Operator's Manual that came with the vehicle shows how to check the automatic transmission fluid and what fluid to use.

#### **NOTICE:**

**Too much or too little fluid can damage your transmission. Too much can mean that some of the fluid could come out and fall on hot engine parts or exhaust system parts, starting a fire. Be sure to get an accurate reading if you check your transmission fluid.**

## Automatic Transmission External Filter

Your automatic transmission spin-on type filter requires periodic replacement. It is mounted just behind the radiator on the outside of the passenger's side frame rail.

Consult the Allison Automatic Transmission "Driver's Handbook" that came with the vehicle for proper change intervals.

## Manual Transmission Fluid

### When to Check

A good time to have it checked is when the engine oil is checked. See your Maintenance Schedule to find out when to change your transmission fluid and filters.

## How to Check and What to Use

Your Eaton Fuller Manual Transmission Operator's Manual also shows how to check the manual transmission fluid and what fluid to use.

### **NOTICE:**

**Too much or too little fluid can damage your transmission. Too much can mean that some of the fluid could come out and fall on hot engine parts or exhaust system parts, starting a fire. Be sure to get an accurate reading if you check your transmission fluid.**

Refer to your Eaton Fuller Manual Transmission Operator's Manual for information about adding manual transmission fluid.

## Rear Axle

### When to Check and Change Lubricant

Refer to the Maintenance Schedule to determine how often to check the lubricant and when to change it. See "Scheduled Maintenance Services" in the Maintenance Schedule.

### How to Check Lubricant



If the level is below the bottom of the filler plug hole, you'll need to add some lubricant. Add enough lubricant to raise the level to the bottom of the filler plug hole.

## What to Use

Refer to the Maintenance Schedule to determine what kind of lubricant to use. See “Recommended Fluids and Lubricants” in the Maintenance Schedule.

## Engine Coolant (Gasoline Engine)

The cooling system in your vehicle is filled with DEX-COOL<sup>®</sup> engine coolant. This coolant is designed to remain in your vehicle for 5 years or 150,000 miles (240 000 km), whichever occurs first, if you add only DEX-COOL<sup>®</sup> extended life coolant.

The following explains your cooling system and how to add coolant when it is low. If you have a problem with engine overheating, see “Engine Overheating” in the Index.

A 50/50 mixture of clean, drinkable water and DEX-COOL<sup>®</sup> coolant will:

- Give freezing protection down to -34°F (-37°C).
- Give boiling protection up to 252°F (122°C).
- Protect against rust and corrosion.
- Help keep the proper engine temperature.
- Let the warning lights and gages work as they should.

### NOTICE:

**When adding coolant, it is important that you use only DEX-COOL<sup>®</sup> (silicate-free) coolant.**

**If coolant other than DEX-COOL is added to the system, premature engine, heater core or radiator corrosion may result. In addition, the engine coolant will require change sooner -- at 30,000 miles (50 000 km) or 24 months, whichever occurs first. Damage caused by the use of coolant other than DEX-COOL<sup>®</sup> is not covered by your new vehicle warranty.**

## What to Use

Use a mixture of one-half *clean, drinkable water* and one-half DEX-COOL<sup>®</sup> coolant which won't damage aluminum parts. If you use this coolant mixture, you don't need to add anything else.



### CAUTION:

**Adding only plain water to your cooling system can be dangerous. Plain water, or some other liquid like alcohol, can boil before the proper coolant mixture will. Your vehicle's coolant warning system is set for the proper coolant mixture. With plain water or the wrong mixture, your engine could get too hot but you wouldn't get the overheat warning. Your engine could catch fire and you or others could be burned. Use a 50/50 mixture of clean, drinkable water and DEX-COOL<sup>®</sup> coolant.**

### NOTICE:

**If you use an improper coolant mixture, your engine could overheat and be badly damaged. The repair cost wouldn't be covered by your warranty. Too much water in the mixture can freeze and crack the engine, radiator, heater core and other parts.**

If you have to add coolant more than four times a year, have your dealer check your cooling system.

### NOTICE:

**If you use the proper coolant, you don't have to add extra inhibitors or additives which claim to improve the system. These can be harmful.**

## Checking Coolant

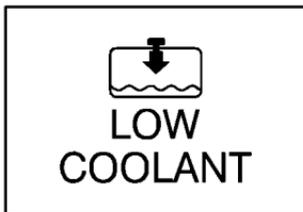


**Coolant Recovery Tank (Gasoline Engines)**



**Surge Tank (Caterpillar® Diesel Engines)**

When your engine is cold, the coolant level should be at the COLD level, or a little higher, on the coolant recovery tank with the gasoline engine, or at the COLD FULL mark, visible through the surge tank, with the diesel engine.



If this light comes on and stays on, it means you're low on engine coolant.

### Adding Coolant

If you need more coolant, add the proper DEX-COOL<sup>®</sup> coolant mixture *at the coolant recovery tank or the surge tank.*

### CAUTION:

**Turning the radiator pressure cap (on a gasoline engine) or the surge tank cap (on a diesel engine) when the engine and radiator are hot can allow steam and scalding liquids to blow out and burn you badly. With the coolant recovery system, you will almost never have to add coolant at the radiator. Never turn the radiator pressure cap or the surge tank pressure cap -- even a little -- when the engine and radiator are hot.**

Add coolant mixture at the recovery tank or the surge tank, but be careful not to spill it.

### CAUTION:

**You can be burned if you spill coolant on hot engine parts. Coolant contains ethylene glycol, and it will burn if the engine parts are hot enough. Don't spill coolant on a hot engine.**

Some conditions, such as trapped air in the cooling system, can affect the coolant level in the radiator. If you need to add coolant to the radiator, follow the steps listed under "How to Add Coolant to the Radiator." See "Engine Overheating" in the Index.

### **Engine Coolant (Caterpillar<sup>®</sup> Diesel Engine)**

If your vehicle has a Caterpillar diesel engine, see the Caterpillar<sup>®</sup> Diesel Engine Operation & Maintenance Manual provided with your vehicle to find out what to add, also when and how to service your cooling system.

## Radiator Pressure Cap (Gasoline Engine)



Be sure the arrows on the cap line up with the overflow tube on the filler neck. This will prevent coolant loss and possible engine damage from overheating.

### NOTICE:

**Your radiator pressure cap is a 9 psi (62 kPa) pressure-type cap for use with medium duty cooling systems only. It must be tightly installed to prevent coolant loss and possible engine damage from overheating. Be sure the arrows on the cap line up with the top of the overflow tube.**

## Surge Tank Pressure Cap (Diesel Engine)



The surge tank pressure cap must be tightly installed with the arrows on the cap lined up with the top tube of the coolant surge tank.

### NOTICE:

**Your surge tank pressure cap is a 9 psi (62 kPa) pressure-type cap for use with medium duty cooling systems only. It must be tightly installed to prevent coolant loss and possible engine damage from overheating. Be sure the arrows on the cap line up with the top tube of the coolant surge tank.**

## Heater Hose Shut-Off Valve



If you have a gasoline engine, your vehicle is equipped with two shut-off valves. One is located on the radiator and one on the engine. These can be easily accessed with the hood tilted.

If you have a Caterpillar<sup>®</sup> diesel engine, your vehicle is also equipped with two shut-off valves. One is located on the radiator and one at the rear of the engine next to the cylinder head.

These valves control the flow of coolant through the heating system.

## Power Steering Fluid

See your Maintenance Schedule for when to check your power steering fluid.

### How To Check Power Steering Fluid

Check your power steering fluid only when the engine is warm. If the engine isn't warm, you probably won't get an accurate reading.



If you can see fluid in the sight glass, you have enough. If you need fluid, add only enough of the proper fluid to bring it into view in the sight glass.

## What to Use

To determine what kind of fluid to use, see “Recommended Fluids and Lubricants” in the Index.

### **NOTICE:**

**When adding power steering fluid or making a complete fluid change, always use the proper fluid. Failure to use the proper fluid can cause leaks and damage hoses and seals.**

**If your power steering fluid level is low, this can cause the PRIMARY BRAKE or AUX BRAKE warning lights to come on. If either light remains on after you have added power steering fluid to the proper level, then shut off the engine for 10 seconds. This should reset the brake warning lights. If one or both lights stay on though, see “Hydraulic Brake Warning Lights” in the Index.**

## Brakes

### Brake Fluid



If your vehicle has hydraulic brakes, there's a brake master cylinder. Refer to the Maintenance Schedule to determine when to check your brake fluid.

### **CAUTION:**

**Don't add brake fluid before you check the level. If you do, you could get too much brake fluid. Brake fluid could spill on the hot engine and it can catch fire. You could be burned and your vehicle could be damaged. See “Checking Brake Fluid” in this section.**

## Checking Brake Fluid

Apply the brake pedal several times with the ignition off. Then clean one of the reservoir caps and the area around the cap, and remove it. The fluid level should be even with the bottom ring of the filler opening.



If it's low, add enough fluid to fill the reservoir to the proper level.

## What to Add

Use the proper fluid listed in your Maintenance Schedule. Use new brake fluid from a sealed container only.

Always clean the brake fluid reservoir cap and the area around the cap before removing it. This will help keep dirt from entering the reservoir.

## CAUTION:

**With the wrong kind of fluid in your brake system, your brakes may not work well, or they may not even work at all. This could cause a crash. Always use the proper brake fluid.**

## NOTICE:

**Using the wrong fluid can badly damage brake system parts. For example, just a few drops of mineral-based oil, such as engine oil, in your brake system can damage brake system parts so badly that they'll have to be replaced. Don't let someone put in the wrong kind of fluid, and don't use DOT-5 silicone brake fluid.**

## Brake Pedal Travel

See your dealer if the brake pedal does not return to normal height, or if there is a rapid increase in pedal travel. This could be a sign of brake trouble.

## Replacing Brake System Parts

The braking system on a vehicle is complex. Its many parts have to be of top quality and work well together if the vehicle is to have really good braking. Your vehicle was designed and tested with top-quality GM brake parts. When you replace parts of your braking system -- for example, when your brake linings wear down and you have to have new ones put in -- be sure you get new approved GM replacement parts. If you don't, your brakes may no longer work properly. For example, if someone puts in brake linings that are wrong for your vehicle, the balance between your front and rear brakes can change -- for the worse. The braking performance you've come to expect can change in many other ways if someone puts in the wrong replacement brake parts.

## Air Brake Systems (If Equipped)

If you have air brakes, it is important to get rid of moisture in the system. Moisture will damage your system if it isn't removed daily.



There are two ways to do this. One is automatic if your air-brake is equipped with the moisture ejector. If your vehicle doesn't have that option, however, you must drain the air reservoirs every day.

Drain them at full system pressure. To be sure you're at full pressure, check your air pressure gage. It should read at least 100 psi (692 kPa).

## Moisture Ejector (If Equipped)

If you have air brakes with a moisture ejector, the valve automatically ejects moisture from the reserve tank when the air compressor cycles.

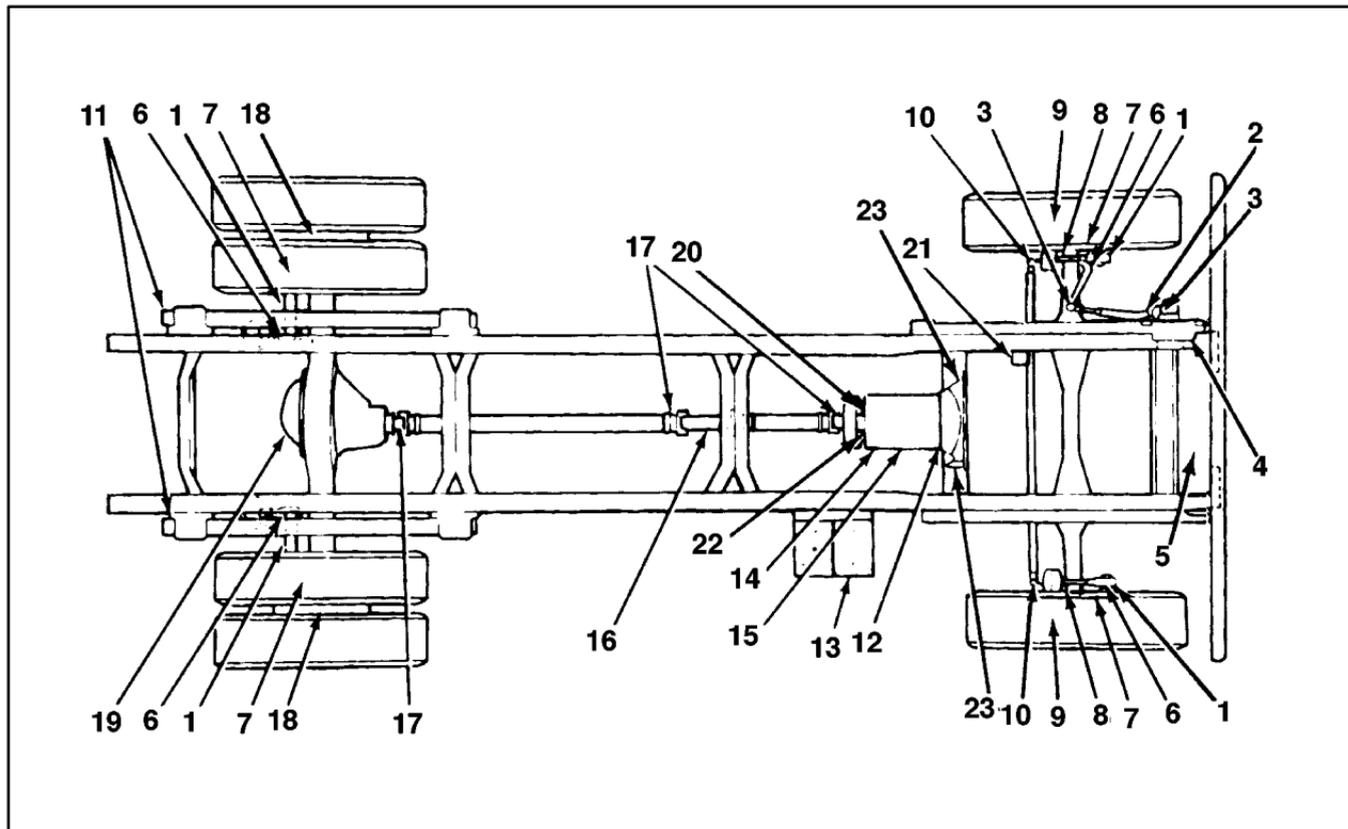
## Air Dryer (If Equipped)



If your vehicle has air brakes, it may have an air dryer. This collects and removes dirt, moisture or other foreign matter from the air prior to entering the brake system. It is mounted on the left frame rail.

If your dryer is a Bendix-Westinghouse, it has a filter that you need to change at intervals. See your Maintenance Schedule for more about servicing this filter.

## Chassis Lubrication



ITEM NO.	ITEM	REMARKS
1.	Brake Camshaft✓, Brake Caliper Rails\$	One fitting each (apply sparingly). For caliper rails, apply Aero Shell #5 Lubricant.
2.	Steering Column Slip Joint**	One fitting.
3.	Steering Drag Link Ends	One fitting each end.
4.	Steering Column U-joints	One fitting each joint.
5.	Pivot Points and Hinges	Apply chassis lubricant.
6.	Slack Adjuster✓	One fitting.
7.	Brake Cam Roller Pins✓	Apply engine oil.
8.	Front Steering Knuckles	One fitting each side, lower bushing. (Hand-operated grease gun only.) Hand-pack upper bearing.
9.	Front Wheel Bearings*	Hand-pack or lubricate.
10.	Steering Tie Rod Ends	One fitting each end.
11.	Spring Slip Pads** (Multi-leaf Only)	Apply chassis lubricant.
12.	Clutch Release Bearing**	Cup or fitting.
13.	Battery Terminal (except "ST" type)	Keep coated with petroleum jelly.
14.	Parking Brake Bell Crank**, \$	One fitting.

ITEM NO.	ITEM	REMARKS
15.	Transmission*	Fill to level of filler plug.
15.	Transmission-Automatic*,**,†	Check fluid level.
16.	Propshaft Slip Joints	One fitting each joint; lubricate with GM Part No. 1051344 Wheel Bearing Lubricant.
17.	Propshaft U-joints	One fitting each joint (1480 and 1550 Series); lubricate with GM Part No. 1051344 Wheel Bearing Lubricant. Two fittings each joint (1610 Series and larger); lubricate with GM Part No. 1051344 Wheel Bearing Lubricant.
18.	Rear Wheel Bearings*	Hand-pack or lubricate.
19.	Rear Axle*	Fill to level of filler plug.
20.	Parking Brake Clevis Pin\$	Apply chassis lubricant.
21.	Master Cylinder\$	Fill 1/4 inch (6 mm) below opening.
22.	Parking Brake Lever Pivot**, \$	Apply chassis lubricant.
23.	Clutch Release Cross Shaft**	One fitting each.

\*Refer to Maintenance Schedule.

\*\*Applies to some vehicles.

✓Applies to air brakes only.

†Refer to Allison Transmission Operator's Manual.

\$Applies to hydraulic brakes only.

## Battery

Your new vehicle comes with one or more maintenance free ACDelco® batteries. When it's time for a new battery, be sure it has the replacement number shown on the original battery's label. We recommend an ACDelco battery.

**WARNING:** Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm. Wash hands after handling.

## Vehicle Storage

If you're not going to drive your vehicle for 25 days or more, remove the black, negative (-) cable from the battery. This will help keep your battery from running down. (If your vehicle has more than one battery, be sure to remove the negative (-) battery cable from each battery.)

### CAUTION:

**Batteries have acid that can burn you and gas that can explode. You can be badly hurt if you aren't careful. See "Jump Starting" in the Index for tips on working around a battery without getting hurt.**

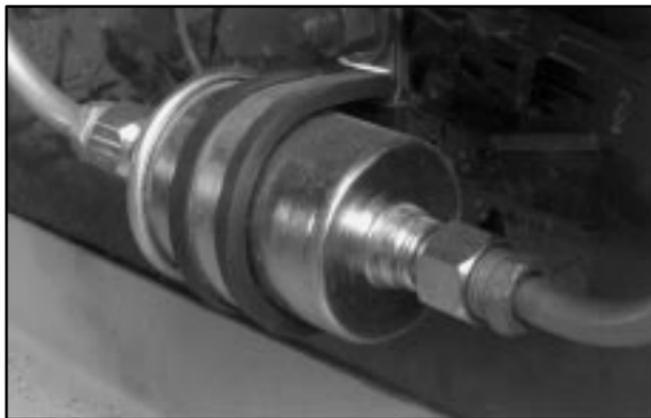
When you are ready to use the vehicle again, refer to the engine starting procedure in the Index.

Contact your dealer to learn how to prepare your vehicle for longer storage periods.

## Other Service Items

### Fuel Filter (Gasoline Engines)

The steel fuel filter is located in the fuel line along the inside of the driver's side frame rail. It is strapped and bolted to the frame.



Refer to your Maintenance Schedule for recommended service intervals.

### Primary Fuel Filter and Water Separator (Option)



Your Caterpillar<sup>®</sup> diesel engine vehicle may have this spin-on filter. It is inside the passenger's side frame rail at the rear of the transmission.

It has a drain bowl at the bottom. Check this every so often to see if any water or particles are in the bowl and drain the fuel into a fuel resistant container. Dispose of contaminated fuel properly.

To drain the bowl, shut off the engine. Then partially open the drain valve at the bottom of the filter.

## Secondary Fuel Filter and Water Separator/Heater (Option)



If you have a Caterpillar<sup>®</sup> diesel engine, you may have this spin-on filter and fuel separator/heater. It is mounted on the driver's side of the engine.

It has a metal drain bowl at the bottom. Occasionally, check the bowl for any water or particles. To check or drain the bowl, shut off the engine. Then push up on the spring loaded drain valve until clear fuel is flowing from the valve. The particles or water will drain out first. Dispose of the contaminated fuel properly.

## Automatic Ether Injection System (If Equipped)



If your Caterpillar<sup>®</sup> diesel engine vehicle has this feature, it is at the rear of the engine compartment on the driver's side.

To change an empty ether cylinder, follow these steps:

1. Loosen the 5/16 inch screw head on the cylinder-to-bracket clamp.
2. Spread the clamp apart.

3. Clean any dirt from the neck of the cylinder and the top of the valve before you take out the cylinder.
4. Check the inside of the valve for any foreign matter and clean as necessary.
5. Cover the valve to protect it from dirt and take out the cylinder.
6. Whenever you take out the cylinder, install a new gasket and spread a light film of clean oil on it. Use only one gasket.
7. Put in the new cylinder. Turn it clockwise until it just starts to contact the gasket.
8. Tighten the cylinder another one-half turn (180 degrees). Don't make it too tight.
9. Re-tighten the cylinder clamp.

## Front Wheel Bearings with Oil-Filled Hubs (If Equipped)

Some vehicles have oil-filled hubs.



If your vehicle has these, check now and then to see if they have enough oil. You can tell by simply looking into the sight glass to see if there is oil there.

If there isn't, clean the rubber fill plug in the center of the glass, and remove it. Be careful not to allow any dirt or water to get into the oil. Add enough oil to bring it up to the level mark that you'll see on the glass.

Your Maintenance Schedule will tell you what to use.

When you fill the hub, check the glass again after driving a short distance. It takes a while for the oil to flow through the system, and you may find that you have to add a little more to fill it to the proper level.

## Tires

Your new vehicle comes with high-quality tires made by a leading tire manufacturer. If you ever have questions about your tire warranty and where to obtain service, see your GM Warranty booklet for details.



### CAUTION:

Poorly maintained and improperly used tires are dangerous.

- **Overloading your tires can cause overheating as a result of too much friction. You could have an air-out and a serious accident. See “Loading Your Vehicle” in the Index.**

**CAUTION: (Continued)**

### CAUTION: (Continued)

- **Underinflated tires pose the same danger as overloaded tires. The resulting accident could cause serious injury. Check all tires frequently to maintain the recommended pressure. Tire pressure should be checked when your tires are cold.**
- **Overinflated tires are more likely to be cut, punctured or broken by a sudden impact -- such as when you hit a pothole. Keep tires at the recommended pressure.**
- **Worn, old tires can cause accidents. If your tread is badly worn, or if your tires have been damaged, replace them.**

## Inflation -- Tire Pressure

The Certification/Tire label, which is provided by the final body manufacturer, shows the correct inflation pressures for your tires when they're cold. "Cold" means your vehicle has been sitting for at least three hours or driven no more than 1 mile (1.6 km).

### NOTICE:

**Don't let anyone tell you that underinflation or overinflation is all right. It's not. If your tires don't have enough air (underinflation), you can get the following:**

- Too much flexing
- Too much heat
- Tire overloading
- Bad wear
- Bad handling
- Bad fuel economy.

**NOTICE: (Continued)**

### NOTICE: (Continued)

**If your tires have too much air (overinflation), you can get the following:**

- Unusual wear
- Bad handling
- Rough ride
- Needless damage from road hazards.

### When to Check

Check your tires once a month or more. Also, check the tire pressure of the spare tire.

### How to Check

Use a good quality pocket-type gage to check tire pressure. You can't tell if your tires are properly inflated simply by looking at them. Radial tires may look properly inflated even when they're underinflated.

Be sure to put the valve caps back on the valve stems. They help prevent leaks by keeping out dirt and moisture.

## Rims and Wheels

Rims and wheels are stamped with a maximum load and cold inflation rating. Be sure you don't exceed these. If you ever think you need to, first contact the rim and wheel maker to get their advice.

## Dual Tire Operation

When the vehicle is new, or whenever a wheel, wheel bolt or wheel nut is replaced, check the wheel nut torque and tighten the wheel stud nuts to the specified torque values at 1,000 miles (1 600 km). Thereafter, tighten them 1,000 miles (1 600 km) after each time the wheel is removed.

For proper torque, see "Wheel Nut Torque" in the Index.

The outer tire on a dual wheel setup generally wears faster than the inner tire. Your tires will wear more evenly and last longer if you rotate the tires periodically. If you're going to be doing a lot of driving on high-crown roads, you can reduce tire wear by adding 5 psi (35 kPa) to the tire pressure in the outer tires. Be sure to return to the recommended pressures when no longer driving under those conditions. See "Changing a Flat Tire" in the Index for more information.

### CAUTION:

**If you operate your vehicle with a tire that is badly underinflated, the tire can overheat. An overheated tire can lose air suddenly or catch fire. You or others could be injured. Be sure all tires (including the spare, if any) are properly inflated.**

## When It's Time for New Tires

Replace your tires when the tread depth is down to 1/8 of an inch (3.2 mm) for the front tires, or 1/16 of an inch (1.6 mm) for a rear tire. Also, you need a new tire if:

- You can see cord or fabric showing through the tire's rubber.
- The tread or sidewall is cracked, cut or snagged deep enough to show cord or fabric.
- The tire has a bump, bulge or split.
- The tire has a puncture, cut or other damage that can't be repaired well because of the size or location of the damage.

When you replace tires, make sure they are the same size, load range, speed rating and construction type (bias, bias-belted or radial) as your original tires.

## Wheel Alignment and Tire Balance

The wheels on your vehicle were aligned at the factory to give you the longest tire life and best overall performance.

Proper front wheel alignment must be maintained in order to ensure efficient steering, good directional stability, and prevent abnormal tire wear. If you notice unusual tire wear or your vehicle is pulling one way or the other, the alignment may need to be reset. If you notice your vehicle vibrating when driving on a smooth road, your wheels may need to be balanced.

### CAUTION:

**Mixing tires could cause you to lose control while driving. If you mix tires of different types -- like radial and bias-belted tires -- the vehicle may not handle properly, and you could have a crash. Be sure to use the same type of tires all around.**

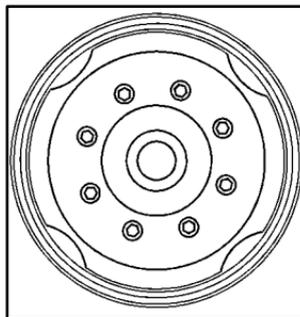
## Tightening the Wheel Nuts

### CAUTION:

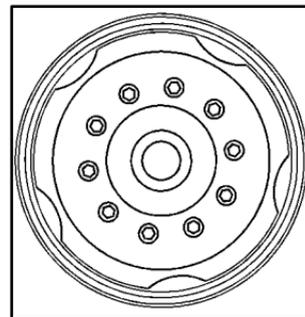
Wheel nuts that are not tight can work loose. If all the nuts on a wheel come off, the wheel can come off the vehicle, causing a serious crash. All wheel nuts must be properly tightened. Follow the rules in this section to be sure they are.

This section lets you know how often to check the tightness of the wheel nuts on your vehicle and how tight they must be.

First, use these pictures to decide what kind of wheels you have.



**Hub-Piloted Type,  
8-Hole**



**Hub-Piloted Type,  
10-Hole**

Then, follow the steps below for the wheels you have.

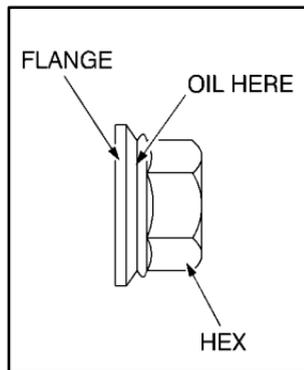
## CAUTION:

**Never use oil or grease on studs or nuts. If you do, the nuts might come loose. Your wheel could fall off, causing a serious accident.**

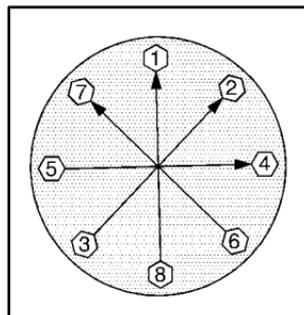
### Hub-Piloted Wheels, 8-Hole or 10-Hole

The studs and nuts used with these wheels have right-hand threads.

1. With intermittent pilot pads, position a pad at 12 o'clock to center the wheel and reduce run-out.
2. Put the tire and rim assembly on the axle hub. Install the outer rear tire and rim assembly so that its valve stem is exactly opposite the valve stem on the inner tire and rim assembly.
3. Put on the wheel nuts.
4. Finger-tighten the nuts.

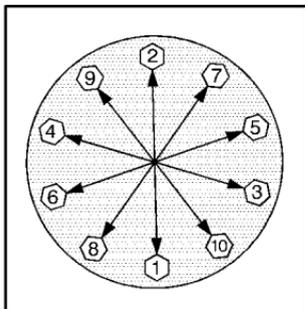


5. Oil the surfaces between the nuts and washers as shown. Do not oil the studs or the threads of the nut.

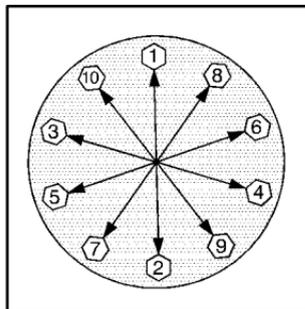


**8-Hole**

6. Tighten the nuts to 400 lb-ft (542 N·m) if an eight-hole stud or 480 lb-ft (650 N·m) if a 10-hole stud using the following diagrams.



**10-Hole (Front or Inner Dual Wheel)**



**10-Hole (Outer Dual Wheel)**

**⚠ CAUTION:**

If wheel studs are damaged, they can break. If all the studs on a wheel broke, the wheel could come off and cause a serious crash. If any stud is damaged because of a loose-running wheel, it could be that all of the studs are damaged. To be sure, replace all studs on the wheel. If the stud holes in a wheel have become larger, the wheel

**CAUTION: (Continued)**

**CAUTION: (Continued)**

could collapse in operation. Replace any wheel if its stud holes have become larger or distorted in any way. Inspect hubs and hub piloted wheels for damage. Because of loose running wheels, piloting pad damage may occur and require replacement of the entire hub, for proper centering of the wheels.

**⚠ CAUTION:**

Rust or dirt on a wheel, or on the parts to which it is fastened, can make the wheel nuts become loose after a time. The wheel could come off and cause an accident. When you change a wheel, remove any rust or dirt from the places where the wheel attaches to the vehicle. In an emergency, you can use a cloth or paper towel to do this; but be sure to use a scraper or wire brush later, if you need to, to get all the rust or dirt off.

## How Often to Check

Wheel tightness is so important you should have a technician check nut tightness on all wheels, with a torque wrench, every 1,000 miles (1 600 km).

## Wheel Replacement

Replace any wheel that is bent, cracked or badly rusted. If wheel nuts keep coming loose, replace the wheel. If the wheel leaks air, replace it.

Your dealer will know the kind of wheel you need.

### CAUTION:

**A leaking wheel could fail without warning. A wheel designed for tubeless tires could be leaking because it is damaged. Don't use an inner tube or some other thing to try to stop the leaking. Get a new wheel of the proper type.**

### CAUTION:

**Without the correct wheel, you may not be able to stop properly, and you could have other problems like a tire air-out. You could have a collision. If you don't go to your dealer to get a new wheel, be sure you get the correct one. Each new wheel should match the original wheel in load-carrying capacity, inflation pressure capacity, diameter, width, offset and mounting configuration.**

Using wheels and tires with higher load-carrying limits than the original wheels and tires doesn't change the GAWR or the GVWR of your vehicle.

## NOTICE:

**The wrong wheel can cause trouble in bearing life, brake cooling, speedometer/odometer calibration, headlamp aim, bumper height, vehicle ground clearance, stopping distance and tire clearance to the body and chassis. You could also have other problems like a tire air-out.**

### Used Replacement Wheels

## CAUTION:

**Putting a used wheel on your vehicle is dangerous. You can't know how it's been used or how many miles it's been driven. It could fail suddenly and cause an accident. If you have to replace a wheel, use a new GM original equipment wheel.**

## Appearance Care

Remember, cleaning products can be hazardous. Some are toxic. Others can burst into flame if you strike a match or get them on a hot part of the vehicle. Some are dangerous if you breathe their fumes in a closed space. When you use anything from a container to clean your vehicle, be sure to follow the manufacturer's warnings and instructions. And always open your doors or windows when you're cleaning the inside.

*Never* use these to clean your vehicle:

- Gasoline
- Benzene
- Naphtha
- Carbon Tetrachloride
- Acetone
- Paint Thinner
- Turpentine
- Lacquer Thinner
- Nail Polish Remover

They can all be hazardous -- some more than others -- and they can all damage your vehicle, too.

Don't use any of these unless this manual says you can. In many uses, these will damage your vehicle:

- Alcohol
- Laundry Soap
- Bleach
- Reducing Agents

## Care of Safety Belts

Keep belts clean and dry.

### CAUTION:

**Do not bleach or dye safety belts. If you do, it may severely weaken them. In a crash, they might not be able to provide adequate protection. Clean safety belts only with mild soap and lukewarm water.**

## Cleaning Tires

To clean your tires, use a stiff brush with a tire cleaner.

### NOTICE:

**When applying a tire dressing always take care to wipe off any overspray or splash from all painted surfaces on the body or wheels of the vehicle. Petroleum-based products may damage the paint finish and tires.**

## Sheet Metal Damage

If your vehicle is damaged and requires sheet metal repair or replacement, make sure the body repair shop applies anti-corrosion material to the parts repaired or replaced to restore corrosion protection.

Original manufacturer replacement parts will provide the corrosion protection while maintaining the warranty.

## Finish Damage

Any stone chips, fractures or deep scratches in the finish should be repaired right away. Bare metal will corrode quickly and may develop into a major repair expense.

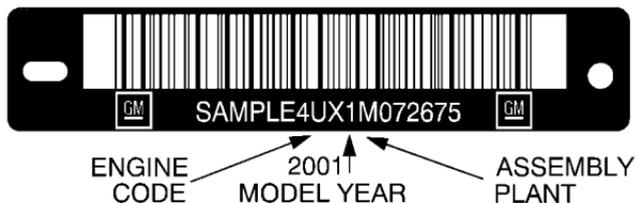
Minor chips and scratches can be repaired with touch-up materials available from your dealer or other service outlets. Larger areas of finish damage can be corrected in your dealer's body and paint shop.

## Underbody Maintenance

Chemicals used for ice and snow removal and dust control can collect on the underbody. If these are not removed, accelerated corrosion (rust) can occur on the underbody parts such as fuel lines, frame, floor pan and exhaust system even though they have corrosion protection.

At least every spring, flush these materials from the underbody with plain water. Clean any areas where mud and other debris can collect. Dirt packed in closed areas of the frame should be loosened before being flushed. Your dealer or an underbody vehicle washing system can do this for you.

## Vehicle Identification Number (VIN)



This is the legal identifier for your vehicle. It appears on a plate at the rear of the engine compartment on the driver's side. The VIN also appears on the Vehicle Certification and Service Parts labels and the certificates of title and registration.

### Engine Identification

The 8th character in your VIN is the engine code. This code will help you identify your engine, specifications and replacement parts.

## Service Statement

One of these statements is on your Certification/Tire label. Here is what each one means.

**MAX. VERT. CG** -- The highest allowable vertical center of gravity, at the highest allowable GVWR. It's measured from level ground in inches.

**SCHOOL BUS** -- A bus for purposes that include carrying students to and from school or related events, but does not include a bus designed and sold for operation as a common carrier in urban transportation.

**SCHOOL BUS - CANADA** -- A Canadian school bus.

**BUS** -- A vehicle designed for carrying more than 10 people.

### Service Parts Identification Label

You'll find this label in a location determined by the body manufacturer. It's very helpful if you ever need to order parts. On this label is:

- your VIN,
- the model designation,
- a list of all production options and special equipment.

Be sure that this label is not removed from the vehicle.

## Electrical System

### Add-On Electrical Equipment

#### **NOTICE:**

**Don't add anything electrical to your vehicle unless you check with your dealer first. Some electrical equipment can damage your vehicle and the damage wouldn't be covered by your warranty. Some add-on electrical equipment can keep other components from working as they should.**

### Headlamp Wiring

The headlamp wiring is protected by a circuit breaker in the lamp switch. An electrical overload will cause the lamps to go on and off, or in some cases to remain off. If this happens, have your headlamp wiring checked right away.

### In-Line Fuses

A sealed in-line fuse is in the main engine harness near the generator to provide protection for the generator R terminal output lead. To remove the fuse, release the connector in half. Remove the failed fuse and install a new fuse. Press the fuse holder back together until the halves and the lock have seated.

On gasoline engine vehicles, this protected circuit provides a control signal for the engine alarm system and hydraulic brake control system.

On vehicles with diesel engines, this protected circuit controls the tachometer, engine alarm system and hydraulic brake control system.

## Fusible Links

A fusible link is a short piece of wire several gage sizes smaller than the circuit it protects. It will melt in an overload situation, opening the circuit.

Your ammeter and battery to hydraulic brake control circuits have these fusible links. Fusible links for the ammeter are located at the starter and the generator. The size is printed on the insulation. If the size of the insulation cannot be seen, consult your GM dealer for the proper size. Replace a fusible link with one of the same size and insulation type. Fusible link insulation is a special purpose high temperature material.

Vehicles with a diesel engine also have a fusible link for the intake heater feed circuit. Should an electrical short occur, the fusible link will open and prevent damage to the major harness.

## 1-Way Power Feed

This terminal feed, located just below the instrument panel attached to the left cowl support, lets the body manufacturer connect up to 100 amps of power for body electrical systems.



If you need to get to this terminal, release the clip on the side and open the hinged door. This provision is protected by two paired maxi-fuses in the maxi-fuse center.

## Fuses and Circuit Breakers

The wiring circuits in your vehicle are protected from short circuits by a combination of circuit breakers, maxi-fuses and fusible links in the wiring itself. This greatly reduces the chance of a fire caused by an electrical problem.

### Instrument Panel Circuit Breaker Block

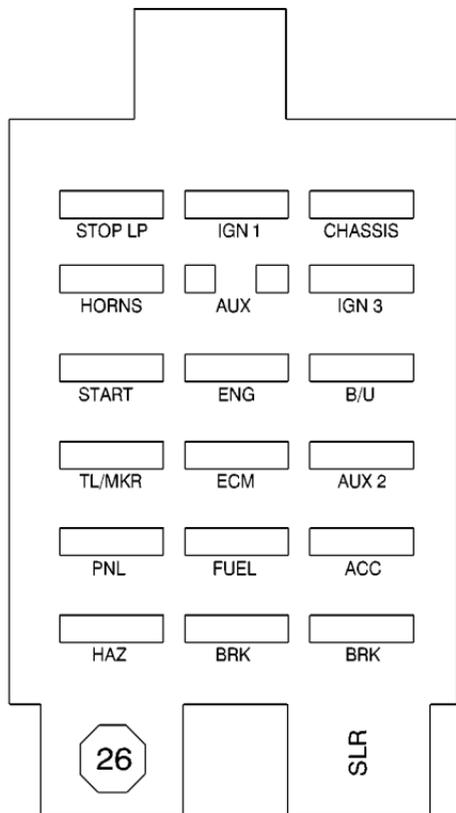


This circuit breaker block is located in the upper right corner of the instrument panel. To gain access to the circuit breaker block, remove the two screws in the protective cover.

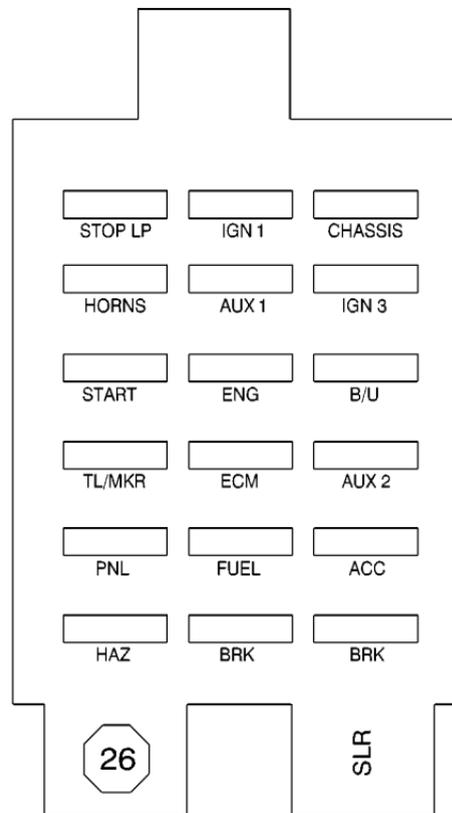
You can remove circuit breakers with a fuse extractor. If you have one, you will find it attached to the inside of the cover.

Be sure to use the correct circuit breaker. If you ever have a problem on the road and don't have a spare circuit breaker, you can borrow one of the correct value. Just pick some feature of your vehicle that you can get along without and use its circuit breaker if it is of the value you need. Replace it as soon as you can.

These circuit breakers are non-cycling; do not replace them with cycling circuit breakers. Also, don't use circuit breakers of higher amperage than those indicated on the circuit breaker block.



**Gasoline Engines**

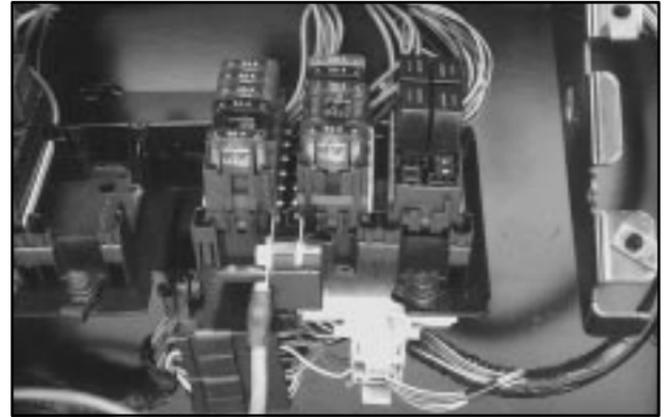


**Diesel Engines**

<b>Circuit Breaker</b>	<b>Circuits Protected</b>
STOP LP	Stoplamps
IGN 1	Ignition Switch
CHASSIS	Air Dryer (Gasoline Engines) PCM
HORNS	Horn
AUX or AUX 1	Fuel Heater (Caterpillar® Diesel Engines)
IGN 3	Ignition 3
START	Starter
ENG	Engine
B/U	Back-up Lamps
TL/MKR	Taillamps/Marker Lamps
ECM	ECM Battery Circuit (Gasoline Engines)
AUX 2	Two-speed rear axle
PNL	Instrument Panel Lights
FUEL	Fuel
ACC	Accessories
HAZ	Directional Signal/Hazard Flasher
BRK	Hydraulic Brake Monitor Circuit

### Maxi-Fuse Block

This block uses blade-type fuses. The block is under the instrument panel on the passenger's side. Just to the left and right of it are the relay centers.



When a circuit goes out, first check the instrument panel circuit breaker block. If no circuit breakers are out there, the problem could be here, in the maxi-fuse block.

To access the maxi-fuse block, remove the screws that secure the long dash panel to the right of the automatic transmission shifter. Remove the panel to expose the maxi-fuse block and relay center.

Locate the label attached to the cowl directly under the maxi-fuse center. It identifies the maxi-fuse rates, the circuits they power and the relay schematic.

Power is fed through these fuses to devices such as the headlamp switch, and the ignition switch feed circuits. Remaining power feeds supply the main circuit breaker block.

Be sure to replace maxi-fuses with maxi-fuses of the same rating.

## Replacement Bulbs

Before you replace any bulbs, be sure that all lamps are off and the engine isn't running.

We recommend that you use an AC<sup>®</sup> type bulb whenever you need to replace one.

**All exterior lamps are supplied by the body manufacturer. Consult the body manufacturer's information for light bulb use.**

## Capacities and Specifications

### Engine Identification and Data

Engine RPO	LG5	L18
Engine Type	7.2L L6	8.1L V8
Fuel System	HEUI	SPFI
Firing Order	1-5-3-6-2-4	1-8-7-2-6-5-4-3

### Wheel Nut Torque

Refer to "Tightening the Wheel Nuts" in this section for wheel nut torque information.

### Cooling System Capacity

Model	Quarts (Liters)
7.2L manual transmission . . . . .	30.5 (28.9)
7.2L automatic transmission . . . . .	28.5 (27.0)
8.1L manual transmission . . . . .	25.5 (24.0)
8.1L automatic transmission . . . . .	23.5 (22.0)

Above capacities (volumes) are approximate and do not include heaters or lines added by school bus body builders.

## Crankcase Capacity

Capacities (volumes) shown are normal refill. Add oil as indicated when the oil filter element is changed.

Capacities given are approximate -- keep level within the operating range. Do not operate with fluid level below the ADD line.

Engine	Capacity -- Quarts (Liters)
7.2L	21 (19.8)*
8.1L	6.5 (6.2)**

\*Additional oil is required with auxiliary oil filter systems. Make sure to add enough extra oil to fill the auxiliary oil filter system. For LUBERFINER 750-C systems, add 14 quarts (13.25 L).

\*\*Verify oil level indicator after initial fill. There may be some variation in the fill level depending on the vehicle option content.

Extending the recommended oil change interval requires the use of an infrared oil analysis program which shows the condition of the oil and its additives. For more information, consult your GM Truck dealer, who is an authorized Caterpillar<sup>®</sup> engine dealer.

## Fuel Tank Capacity

Model	U.S. Gallons (Liters)
R.H. Mount (Standard)	60.0 (227.1)
L.H. Mount (Optional)	60.0 (227.1)
R.H. Mount (Optional)	35.0 (132.5)

Above capacities (volumes) are approximate.

## Transmission Capacity

Capacities (volumes) shown are approximate. For automatic transmissions, see the Allison Automatic Transmission "Operator's Manual" for oil check and maintenance information.

Automatic Transmission	Pints (Liters)
2000 Series	35.0 (13.5)
2400 Series	35.0 (13.5)
AT545 (Shallow Oil Pan)	27.0 (12.6)*
AT545 (Deep Oil Pan)	40.0 (19.0)
Manual Transmission	Pints (Liters)
FS4205B	11.1 (5.3)
FS5205A	11.6 (5.5)

\*Add two pints (one liter) when changing spin-on type filter.

## Rear Axle Lubricant Capacity

<b>Axle Type</b>	<b>Lubricant, Pints (Liters)</b>
19060S .....	28.0 (13.0)
21060S .....	28.0 (13.0)

Above capacities (volumes) are approximate.

Add 2 pints (1.0 L) when hubs are replaced.

## Normal Maintenance Replacement Parts

### Allison Transmission External Filters

<b>Engine</b>	<b>AC Part Number</b>
7.2L .....	PF897
8.1L .....	PF897

### Air Compressor Filter

<b>Air Compressor</b>	<b>GM Part Number</b>
Bendix TU-FLO 550 (13.2 CFM) .....	6485496

## Service Replacement Part and Filter Recommendations

Replacement part numbers listed in this section are based on the latest information available at the time of printing, and are subject to change. If a part listed in this manual is not the same as the part used in your vehicle when it was built, or if you have any questions, please contact your GM Truck dealer.

Engine	7.2L L6	8.1L V8
RPO	LG5	L18
Spark Plug		Denso Type TJ 14R-P15
Gap		0.060" (1.52mm)
Torque		14.75 lb. ft. (20.0Nm)
Oil Filter	CAT <sup>®</sup> 1R-0739	AC Type PF-454
Air Cleaner*	Donaldson P522606	ACDelco <sup>®</sup> A1518C
Fuel Filter	AC-TP-915D Primary*	ACDelco <sup>®</sup> GF626
Secondary Fuel Filter	CAT <sup>®</sup> 1R0751	
Pressure Caps	RC-54	GM Part No. 15997145

\*Optional Racor (KUK) B6484GM-01 cold weather spin-on type located in the component box.

## Section 5 Scheduled Maintenance Services

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This section covers the maintenance required for your vehicle. Your vehicle needs these services to retain its safety, dependability and emission control performance.

5-2	Introduction	5-27	Part C: Recommended Fluids and Lubricants
5-4	Part A: Scheduled Maintenance Services	5-29	Part D: Maintenance Record
5-24	Part B: Owner Checks and Services		

**IMPORTANT:**  
KEEP ENGINE OIL  
AT THE PROPER  
LEVEL AND CHANGE AS  
RECOMMENDED



***Protection  
Plan***

*Have you purchased the GM Protection Plan? The Plan supplements your new vehicle warranties. See your Warranty and Owner Assistance booklet or your dealer for details.*

## **Introduction**

### **Your Vehicle and the Environment**

Proper vehicle maintenance not only helps to keep your vehicle in good working condition, but also helps the environment. All recommended maintenance procedures are important. Improper vehicle maintenance can even affect the quality of the air we breathe. Improper fluid levels or the wrong tire inflation can increase the level of emissions from your vehicle. To help protect our environment, and to keep your vehicle in good condition, please maintain your vehicle properly.

### **Maintenance Requirements**

Maintenance intervals, checks, inspections and recommended fluids and lubricants as prescribed in this manual are necessary to keep your vehicle in good working condition. Any damage caused by failure to follow recommended maintenance may not be covered by warranty.

## How This Section is Organized

This maintenance schedule is divided into four parts:

**“Part A: Scheduled Maintenance Services”** shows what to have done and how often. Some of these services can be complex, so unless you are technically qualified and have the necessary equipment, you should let your dealer’s service department or another qualified service center do these jobs.

### CAUTION:

**Performing maintenance work on a vehicle can be dangerous. In trying to do some jobs, you can be seriously injured. Do your own maintenance work only if you have the required know-how and the proper tools and equipment for the job. If you have any doubt, have a qualified technician do the work.**

If you want to get the service information, see “Service and Owner Publications” in the Index.

**“Part B: Owner Checks and Services”** tells you what should be checked and when. It also explains what you can easily do to help keep your vehicle in good condition.

**“Part C: Recommended Fluids and Lubricants”** lists some recommended products necessary to help keep your vehicle properly maintained. These products, or their equivalents, should be used whether you do the work yourself or have it done.

**“Part D: Maintenance Record”** is a place for you to record and keep track of the maintenance performed on your vehicle. Keep your maintenance receipts. They may be needed to qualify your vehicle for warranty repairs.

## Part A: Scheduled Maintenance Services

### Using Your Maintenance Schedule

We at General Motors want to help you keep your vehicle in good working condition. But we don't know exactly how you'll drive it. You may drive very short distances only a few times a week. Or you may drive long distances all the time in very hot, dusty weather. You may use your vehicle in making deliveries or in many other ways.

Because of all the different ways people use their vehicles, maintenance needs vary. You may need more frequent checks and replacements. So please read the following and note how you drive. If you have any questions on how to keep your vehicle in good condition, see your dealer.

This part tells you the maintenance services you should have done and when you should schedule them. If you go to your dealer for your service needs, you'll know that GM-trained and supported service people will perform the work using genuine GM parts.

The proper fluids and lubricants to use are listed in Part C. Make sure whoever services your vehicle uses these. All parts should be replaced and all necessary repairs done before you or anyone else drives the vehicle.

This schedule is for vehicles that:

- carry passengers and cargo within recommended limits. You will find these limits on your vehicle's Certification/Tire label. See "Loading Your Vehicle" in the Index.
- are driven on reasonable road surfaces within legal driving limits.
- use the recommended fuel. See "Fuel" in the Index.

### Scheduled Maintenance Supplements

If your vehicle has a Caterpillar<sup>®</sup> diesel engine, your GM owner's manual is supplemented by the Caterpillar<sup>®</sup> Diesel Engine Operation & Maintenance Manual. If your vehicle has an Allison transmission, your GM owner's manual is supplemented by an Allison Transmission Operator's Manual. Always refer to these manuals for related maintenance services.

## Scheduled Maintenance

The services shown in this schedule up to 100,000 miles (166 000 km) should be performed after 100,000 miles (166 000 km) at the same intervals. The services shown after 100,000 miles (166 000 km) should be performed at those same intervals.

This vehicle has a computer that lets you know when to change your engine oil. This is not based on mileage, but on engine revolutions and engine operating temperature. When the computer has calculated that the oil needs changing, the Oil Life Monitor will indicate that a change is necessary.

The “Footnotes” at the end of this Maintenance Schedule further explain maintenance services.

See “Scheduled Maintenance Supplements” earlier in this section.

### 1,000 Miles (1 600 km)

- Wheel stud nut service. (46)

### 3,000 Miles (5 000 km)

- Check Oil Life Monitor. If engine oil and filter are changed, reset monitor. See “Engine Oil” in the Index. (3)(9)
- Check fluid levels (or every 3 months, whichever occurs first). (1)(2)(6)
- Clutch pedal free travel service. (10)
- Rear axle air shift motor service. (11)

### 6,000 Miles (10 000 km)

- Check Oil Life Monitor. If engine oil and filter are changed, reset monitor. See “Engine Oil” in the Index. (3)(9)
- Check fluid levels (or every 3 months, whichever occurs first). (1)(2)(6)
- Chassis lubrication service (or every 6 months, whichever occurs first). (12)
- Wheels and tires service. (15)(46)
- Hydraulic brake service (or every 6 months, whichever occurs first). (7)
- Hydraulic parking brake service (or every 6 months, whichever occurs first). (8)
- Clutch pedal free travel service. (10)

## 9,000 Miles (15 000 km)

- Check Oil Life Monitor. If engine oil and filter are changed, reset monitor. See “Engine Oil” in the Index. (3)(9)
- Check fluid levels (or every 3 months, whichever occurs first). (1)(2)(6)

## 12,000 Miles (20 000 km)

- Check Oil Life Monitor. If engine oil and filter are changed, reset monitor. See “Engine Oil” in the Index. (3)(9)
- Check fluid levels (or every 3 months, whichever occurs first). (1)(2)(6)
- Chassis lubrication service (or every 6 months, whichever occurs first). (12)
- Wheels and tires service. (15)(46)
- Hydraulic brake service (or every 6 months, whichever occurs first). (7)
- Hydraulic parking brake service (or every 6 months, whichever occurs first). (8)
- Engine drive belts service (or every 12 months, whichever occurs first). (18)

- Clutch pedal free travel service. (10)
- Thermostatically controlled engine cooling fan service. (4)(20)
- Shields and underhood insulation service. (4)(5)(21)
- Check air brake relay valve operation and check for leaks (or every month, or every 300 hours, whichever occurs first).

## 15,000 Miles (25 000 km)

- Check Oil Life Monitor. If engine oil and filter are changed, reset monitor. See “Engine Oil” in the Index. (3)(9)
- Check fluid levels (or every 3 months, whichever occurs first). (1)(2)(6)
- Steering system service. (13)
- Front and rear suspension service. (14)
- Spring-to-axle U-bolts and shackle bolts service. (16)
- Exhaust system service (or every 6 months, whichever occurs first). (3)(4)(17)
- Air brake service (or every 6 months, whichever occurs first). (39)

## **18,000 Miles (30 000 km)**

- Check Oil Life Monitor. If engine oil and filter are changed, reset monitor. See “Engine Oil” in the Index. (3)(9)
- Check fluid levels (or every 3 months, whichever occurs first). (1)(2)(6)
- Chassis lubrication service (or every 6 months, whichever occurs first). (12)
- Wheels and tires service. (15)(46)
- Hydraulic brake service (or every 6 months, whichever occurs first). (7)
- Hydraulic brake caliper service (or every 6 months, whichever occurs first). (22)
- Hydraulic parking brake service (or every 6 months, whichever occurs first). (8)
- Clutch pedal free travel service. (10)
- Clean air brake application valve (or every 3 months, or every 300 hours, whichever occurs first); lubricate linkage.

## **21,000 Miles (35 000 km)**

- Check Oil Life Monitor. If engine oil and filter are changed, reset monitor. See “Engine Oil” in the Index. (3)(9)
- Check fluid levels (or every 3 months, whichever occurs first). (1)(2)(6)

## **24,000 Miles (40 000 km)**

- Check Oil Life Monitor. If engine oil and filter are changed, reset monitor. See “Engine Oil” in the Index. (3)(9)
- Check fluid levels (or every 3 months, whichever occurs first). (1)(2)(6)
- Chassis lubrication service (or every 6 months, whichever occurs first). (12)
- Wheel bearing (grease type) service (or every 24 months, whichever occurs first, and whenever hubs are removed). (23)
- Wheels and tires service. (15)(46)
- Hydraulic brake service (or every 6 months, whichever occurs first). (7)
- Hydraulic parking brake service (or every 6 months, whichever occurs first). (8)

*(Continued)*

## 24,000 Miles (40 000 km) (Continued)

- Engine drive belts service (or every 12 months, whichever occurs first). (18)
- Clutch pedal free travel service. (10)
- Thermostatically controlled engine cooling fan service. (4)(20)
- Shields and underhood insulation service. (4)(5)(21)
- Air intake system service (or every 24 months, whichever occurs first). (4)(5)(24)
- Evaporative Control System service (if equipped) (or every 24 months, whichever occurs first). (3)(26) †
- Rear axle air shift motor service. (11)
- Check air brake relay valve operation and check for leaks (or every month, or every 300 hours, whichever occurs first).
- Air brake chamber service (or every 2 months, whichever occurs first). (41)

## 27,000 Miles (45 000 km)

- Check Oil Life Monitor. If engine oil and filter are changed, reset monitor. See “Engine Oil” in the Index. (3)(9)
- Check fluid levels (or every 3 months, whichever occurs first). (1)(2)(6)

## 30,000 Miles (50 000 km)

- Check Oil Life Monitor. If engine oil and filter are changed, reset monitor. See “Engine Oil” in the Index. (3)(9)
- Check fluid levels (or every 3 months, whichever occurs first). (1)(2)(6)
- Chassis lubrication service (or every 6 months, whichever occurs first). (12)
- Replace fuel filter(s) (or every 12 months, whichever occurs first). (3)
- Air cleaner filter replacement service (or every 24 months, whichever occurs first). (3)(4)(27)
- Steering system service. (13)
- Front and rear suspension service. (14)
- Spring-to-axle U-bolts and shackle bolts service. (16)
- Exhaust system service (or every 6 months, whichever occurs first). (3)(4)(17)
- Air brake service (or every 6 months, whichever occurs first). (39)
- Wheels and tires service. (15)(46)
- Hydraulic brake service (or every 6 months, whichever occurs first). (7)

- Hydraulic parking brake service (or every 6 months, whichever occurs first). (8)
- Clutch pedal free travel service. (10)
- Air brake automatic slack adjuster service (or every 500 hours, whichever occurs first). (40)

### **33,000 Miles (55 000 km)**

- Check Oil Life Monitor. If engine oil and filter are changed, reset monitor. See “Engine Oil” in the Index. (3)(9)
- Check fluid levels (or every 3 months, whichever occurs first). (1)(2)(6)

### **36,000 Miles (60 000 km)**

- Check Oil Life Monitor. If engine oil and filter are changed, reset monitor. See “Engine Oil” in the Index. (3)(9)
- Check fluid levels (or every 3 months, whichever occurs first). (1)(2)(6)
- Chassis lubrication service (or every 6 months, whichever occurs first). (12)
- Wheels and tires service. (15)(46)
- Hydraulic brake service (or every 6 months, whichever occurs first). (7)

- Hydraulic brake caliper service (or every 6 months, whichever occurs first). (22)
- Hydraulic parking brake service (or every 6 months, whichever occurs first). (8)
- Engine drive belts service (or every 12 months, whichever occurs first). (18)
- Clutch pedal free travel service. (10)
- Thermostatically controlled engine cooling fan service. (4)(20)
- Shields and underhood insulation service. (4)(5)(21)
- Check air brake relay valve operation and check for leaks (or every month, or every 300 hours, whichever occurs first).
- Clean air brake application valve (or every 3 months, or every 300 hours, whichever occurs first); lubricate linkage.

### **39,000 Miles (65 000 km)**

- Check Oil Life Monitor. If engine oil and filter are changed, reset monitor. See “Engine Oil” in the Index. (3)(9)
- Check fluid levels (or every 3 months, whichever occurs first). (1)(2)(6)

## **42,000 Miles (70 000 km)**

- Check Oil Life Monitor. If engine oil and filter are changed, reset monitor. See “Engine Oil” in the Index. (3)(9)
- Check fluid levels (or every 3 months, whichever occurs first). (1)(2)(6)
- Chassis lubrication service (or every 6 months, whichever occurs first). (12)
- Wheels and tires service. (15)(46)
- Hydraulic brake service (or every 6 months, whichever occurs first). (7)
- Hydraulic parking brake service (or every 6 months, whichever occurs first). (8)
- Clutch pedal free travel service. (10)

## **45,000 Miles (75 000 km)**

- Check Oil Life Monitor. If engine oil and filter are changed, reset monitor. See “Engine Oil” in the Index. (3)(9)
- Check fluid levels (or every 3 months, whichever occurs first). (1)(2)(6)
- Steering system service. (13)
- Front and rear suspension service. (14)

- Spring-to-axle U-bolts and shackle bolts service. (16)
- Exhaust system service (or every 6 months, whichever occurs first). (3)(4)(17)
- Air brake service (or every 6 months, whichever occurs first). (39)

## **48,000 Miles (80 000 km)**

- Check Oil Life Monitor. If engine oil and filter are changed, reset monitor. See “Engine Oil” in the Index. (3)(9)
- Check fluid levels (or every 3 months, whichever occurs first). (1)(2)(6)
- Chassis lubrication service (or every 6 months, whichever occurs first). (12)
- Wheel bearing (grease type) service (or every 24 months, whichever occurs first, and whenever hubs are removed). (23)
- Wheels and tires service. (15)(46)
- Hydraulic brake service (or every 6 months, whichever occurs first). (7)
- Hydraulic parking brake service (or every 6 months, whichever occurs first). (8)

- Engine drive belts service (or every 12 months, whichever occurs first). (18)
- Clutch pedal free travel service. (10)
- Thermostatically controlled engine cooling fan service. (4)(20)
- Shields and underhood insulation service. (4)(5)(21)
- Air intake system service (or every 24 months, whichever occurs first). (4)(5)(24)
- Evaporative Control System service (if equipped) (or every 24 months, whichever occurs first). (3)(26) †
- Rear axle air shift motor service. (11)
- Check air brake relay valve operation and check for leaks (or every month, or every 300 hours, whichever occurs first).
- Air brake chamber service (or every 2 months, whichever occurs first). (41)

### **51,000 Miles (85 000 km)**

- Check Oil Life Monitor. If engine oil and filter are changed, reset monitor. See “Engine Oil” in the Index. (3)(9)
- Check fluid levels (or every 3 months, whichever occurs first). (1)(2)(6)

### **54,000 Miles (90 000 km)**

- Check Oil Life Monitor. If engine oil and filter are changed, reset monitor. See “Engine Oil” in the Index. (3)(9)
- Check fluid levels (or every 3 months, whichever occurs first). (1)(2)(6)
- Chassis lubrication service (or every 6 months, whichever occurs first). (12)
- Wheels and tires service. (15)(46)
- Hydraulic brake service (or every 6 months, whichever occurs first). (7)
- Hydraulic brake caliper service (or every 6 months, whichever occurs first). (22)
- Hydraulic parking brake service (or every 6 months, whichever occurs first). (8)
- Clutch pedal free travel service. (10)
- Spark plug service. (3)(28)
- Clean air brake application valve (or every 3 months, or every 300 hours, whichever occurs first); lubricate linkage.

## **57,000 Miles (95 000 km)**

- Check Oil Life Monitor. If engine oil and filter are changed, reset monitor. See “Engine Oil” in the Index. (3)(9)
- Check fluid levels (or every 3 months, whichever occurs first). (1)(2)(6)

## **60,000 Miles (100 000 km)**

- Check Oil Life Monitor. If engine oil and filter are changed, reset monitor. See “Engine Oil” in the Index. (3)(9)
- Check fluid levels (or every 3 months, whichever occurs first). (1)(2)(6)
- Chassis lubrication service (or every 6 months, whichever occurs first). (12)
- Replace fuel filter(s) (or every 12 months, whichever occurs first). (3)
- Air cleaner filter replacement service (or every 24 months, whichever occurs first). (3)(4)(27)
- Steering system service. (13)
- Front and rear suspension service. (14)
- Spring-to-axle U-bolts and shackle bolts service. (16)

- Exhaust system service (or every 6 months, whichever occurs first). (3)(4)(17)
- Air brake service (or every 6 months, whichever occurs first). (39)
- Wheels and tires service. (15)(46)
- Hydraulic brake service (or every 6 months, whichever occurs first). (7)
- Hydraulic parking brake service (or every 6 months, whichever occurs first). (8)
- Engine drive belts service (or every 12 months, whichever occurs first). (18)
- Clutch pedal free travel service. (10)
- Thermostatically controlled engine cooling fan service. (4)(20)
- Shields and underhood insulation service. (4)(5)(21)
- Check air brake relay valve operation and check for leaks (or every month, or every 300 hours, whichever occurs first).
- Air brake automatic slack adjuster service (or every 500 hours, whichever occurs first). (40)

### **63,000 Miles (105 000 km)**

- Check Oil Life Monitor. If engine oil and filter are changed, reset monitor. See “Engine Oil” in the Index. (3)(9)
- Check fluid levels (or every 3 months, whichever occurs first). (1)(2)(6)

### **66,000 Miles (110 000 km)**

- Check Oil Life Monitor. If engine oil and filter are changed, reset monitor. See “Engine Oil” in the Index. (3)(9)
- Check fluid levels (or every 3 months, whichever occurs first). (1)(2)(6)
- Chassis lubrication service (or every 6 months, whichever occurs first). (12)
- Wheels and tires service. (15)(46)
- Hydraulic brake service (or every 6 months, whichever occurs first). (7)
- Hydraulic parking brake service (or every 6 months, whichever occurs first). (8)
- Clutch pedal free travel service. (10)

### **69,000 Miles (115 000 km)**

- Check Oil Life Monitor. If engine oil and filter are changed, reset monitor. See “Engine Oil” in the Index. (3)(9)
- Check fluid levels (or every 3 months, whichever occurs first). (1)(2)(6)

### **72,000 Miles (120 000 km)**

- Check Oil Life Monitor. If engine oil and filter are changed, reset monitor. See “Engine Oil” in the Index. (3)(9)
- Check fluid levels (or every 3 months, whichever occurs first). (1)(2)(6)
- Chassis lubrication service (or every 6 months, whichever occurs first). (12)
- Wheel bearing (grease type) service (or every 24 months, whichever occurs first, and whenever hubs are removed). (23)
- Wheels and tires service. (15)(46)
- Hydraulic brake service (or every 6 months, whichever occurs first). (7)
- Hydraulic brake caliper service (or every 6 months, whichever occurs first). (22)

*(Continued)*

## 72,000 Miles (120 000 km) (Continued)

- Hydraulic parking brake service (or every 6 months, whichever occurs first). (8)
- Engine drive belts service (or every 12 months, whichever occurs first). (18)
- Clutch pedal free travel service. (10)
- Thermostatically controlled engine cooling fan service. (4)(20)
- Shields and underhood insulation service. (4)(5)(21)
- Air intake system service (or every 24 months, whichever occurs first). (4)(5)(24)
- Fuel tank, fuel cap and fuel lines service (or every 72 months, whichever occurs first). (3)(30) †
- EGR system inspection (or every 72 months, whichever occurs first). (3)(31)
- Evaporative Control System Service (if equipped) (or every 24 months, whichever occurs first). (3)(26) †
- Rear axle air shift motor service. (11)
- Check air brake relay valve operation and check for leaks (or every month, or every 300 hours, whichever occurs first).

- Clean air brake application valve (or every 3 months, or every 300 hours, whichever occurs first); lubricate linkage.
- Air brake chamber service (or every 2 months, whichever occurs first). (41)

## 75,000 Miles (125 000 km)

- Check Oil Life Monitor. If engine oil and filter are changed, reset monitor. See “Engine Oil” in the Index. (3)(9)
- Check fluid levels (or every 3 months, whichever occurs first). (1)(2)(6)
- Steering system service. (13)
- Front and rear suspension service. (14)
- Spring-to-axle U-bolts and shackle bolts service. (16)
- Exhaust system service (or every 6 months, whichever occurs first). (3)(4)(17)
- Air brake service (or every 6 months, whichever occurs first). (39)

### **78,000 Miles (130 000 km)**

- Check Oil Life Monitor. If engine oil and filter are changed, reset monitor. See “Engine Oil” in the Index. (3)(9)
- Check fluid levels (or every 3 months, whichever occurs first). (1)(2)(6)
- Chassis lubrication service (or every 6 months, whichever occurs first). (12)
- Wheels and tires service. (15)(46)
- Hydraulic brake service (or every 6 months, whichever occurs first). (7)
- Hydraulic parking brake service (or every 6 months, whichever occurs first). (8)
- Clutch pedal free travel service. (10)

### **81,000 Miles (135 000 km)**

- Check Oil Life Monitor. If engine oil and filter are changed, reset monitor. See “Engine Oil” in the Index. (3)(9)
- Check fluid levels (or every 3 months, whichever occurs first). (1)(2)(6)
- Wheel bearings service -- Eaton Axle (oil-filled) (or every 24 months, whichever occurs first). (23)(47)

### **84,000 Miles (140 000 km)**

- Check Oil Life Monitor. If engine oil and filter are changed, reset monitor. See “Engine Oil” in the Index. (3)(9)
- Check fluid levels (or every 3 months, whichever occurs first). (1)(2)(6)
- Chassis lubrication service (or every 6 months, whichever occurs first). (12)
- Wheels and tires service. (15)(46)
- Hydraulic brake service (or every 6 months, whichever occurs first). (7)
- Hydraulic parking brake service (or every 6 months, whichever occurs first). (8)
- Engine drive belts service (or every 12 months, whichever occurs first). (18)
- Clutch pedal free travel service. (10)
- Thermostatically controlled engine cooling fan service. (4)(20)
- Shields and underhood insulation service. (4)(5)(21)
- Check air brake relay valve operation and check for leaks (or every month, or every 300 hours, whichever occurs first).

## **87,000 Miles (145 000 km)**

- Check Oil Life Monitor. If engine oil and filter are changed, reset monitor. See “Engine Oil” in the Index. (3)(9)
- Check fluid levels (or every 3 months, whichever occurs first). (1)(2)(6)

## **90,000 Miles (150 000 km)**

- Check Oil Life Monitor. If engine oil and filter are changed, reset monitor. See “Engine Oil” in the Index. (3)(9)
- Check fluid levels (or every 3 months, whichever occurs first). (1)(2)(6)
- Chassis lubrication service (or every 6 months, whichever occurs first). (12)
- Replace fuel filter(s) (or every 12 months, whichever occurs first). (3)
- Air cleaner filter replacement service (or every 24 months, whichever occurs first). (3)(4)(27)
- Steering system service. (13)
- Front and rear suspension service. (14)
- Spring-to-axle U-bolts and shackle bolts service. (16)

- Exhaust system service (or every 6 months, whichever occurs first). (3)(4)(17)
- Air brake service (or every 6 months, whichever occurs first). (39)
- Wheels and tires service. (15)(46)
- Hydraulic brake service (or every 6 months, whichever occurs first). (7)
- Hydraulic brake caliper service (or every 6 months, whichever occurs first). (22)
- Hydraulic parking brake service (or every 6 months, whichever occurs first). (8)
- Clutch pedal free travel service. (10)
- Air brake automatic slack adjuster service (or every 500 hours, whichever occurs first). (40)
- Clean air brake application valve (or every 3 months, or every 300 hours, whichever occurs first); lubricate linkage.

## **93,000 Miles (155 000 km)**

- Check Oil Life Monitor. If engine oil and filter are changed, reset monitor. See “Engine Oil” in the Index. (3)(9)
- Check fluid levels (or every 3 months, whichever occurs first). (1)(2)(6)

## 96,000 Miles (160 000 km)

- Check Oil Life Monitor. If engine oil and filter are changed, reset monitor. See “Engine Oil” in the Index. (3)(9)
- Check fluid levels (or every 3 months, whichever occurs first). (1)(2)(6)
- Chassis lubrication service (or every 6 months, whichever occurs first). (12)
- Lubricate door hinge pins and rollers with engine oil.
- Wheel bearing (grease type) service (or every 24 months, whichever occurs first, and whenever hubs are removed). (23)
- Wheels and tires service. (15)(46)
- Hydraulic brake service (or every 6 months, whichever occurs first). (7)
- Hydraulic parking brake service (or every 6 months, whichever occurs first). (8)
- Engine drive belts service (or every 12 months, whichever occurs first). (18)
- Clutch pedal free travel service. (10)

- Thermostatically controlled engine cooling fan service. (4)(20)
- Shields and underhood insulation service. (4)(5)(21)
- Air intake system service (or every 24 months, whichever occurs first). (4)(5)(24)
- Evaporative Control System Service (if equipped) (or every 24 months, whichever occurs first). (3)(26) †
- Rear axle air shift motor service. (11)
- Check air brake relay valve operation and check for leaks (or every month, or every 300 hours, whichever occurs first).
- Air brake chamber service (or every 2 months, whichever occurs first). (41)

## 99,000 Miles (165 000 km)

- Check Oil Life Monitor. If engine oil and filter are changed, reset monitor. See “Engine Oil” in the Index. (3)(9)
- Check fluid levels (or every 3 months, whichever occurs first). (1)(2)(6)

### **100,000 Miles (166 000 km)**

- Change power steering fluid (or every 24 months, whichever occurs first). (13)
- Replace power steering reservoir filter element (or every 24 months, whichever occurs first).
- Front axle service (or every 36 months, whichever occurs first). (38)
- Rear axle service -- Eaton, Rockwell, Spicer Axles (or every 12 months, whichever occurs first). (37)(47)
- Exhaust brake service (if equipped). Check for excessive spindle free play and smooth operation. Lubricate ball joint cap.
- Air brake service (or every 12 months, or 3,600 hours, whichever occurs first). (44)

### **150,000 Miles (240 000 km)**

- Cooling system service (or every 60 months since last service, whichever occurs first). (3)(35)

### **200,000 Miles (320 000 km)**

- Remove, disassemble, clean and inspect the air brake trailer supply valve (or every 2 years, or 7,200 hours, whichever occurs first).

### **250,000 Miles (400 000 km)**

- Wheel bearings service -- Eaton Axle (oil-filled) (or every 36 months, whichever occurs first). (23)(48)
- Rear axle service -- Eaton, Rockwell, Spicer Axles (or every 36 months, whichever occurs first). (37)(48)
- Manual transmission fluid replacement (or every 60 months, whichever occurs first).

### **300,000 Miles (480 000 km)**

- Remove, disassemble, clean and inspect the air brake air dryer (or every 3 years, or 10,800 hours, whichever occurs first). Replace desiccant on Bendix-Westinghouse units.

## Footnotes

† = The U.S. Environmental Protection Agency or the California Air Resources Board has determined that the failure to perform this maintenance item will not nullify the emission warranty or limit recall liability prior to the completion of the vehicle's useful life. We, however, urge that all recommended maintenance services be performed at the indicated intervals and the maintenance be recorded.

(1) = If your vehicle has an Allison automatic transmission, your GM owner's manual is supplemented by an Allison Transmission Operator's Manual. Always refer to these manuals for related maintenance services.

(2) = Check the fluid level in the manual transmission.

(3) = An Emission Control Service.

(4) = A Noise Emission Control Device.

(5) = Applies only to vehicles sold in the United States.

(6) = Check fluid level in brake master cylinder, clutch master cylinder (if equipped), power steering pump, axle, transmission and hydraulic spring parking brake pump (if equipped). A low fluid level in the brake master cylinder can indicate worn brake linings and should be checked accordingly.

(7) = Inspect brake lines and hoses for proper hook-up, binding, leaks, cracks, chafing, etc. Inspect disc brake pads for wear and rotors for surface condition. Check brake pedal for excessive free play or travel (or every 6 months, whichever occurs first) and have serviced if needed. Check brakes more often if driving habits and conditions result in frequent braking.

(8) = Inspect hydraulic parking brake drum and linings for wear or cracks and check linkage and adjustment. Check spring brake actuator and pump for leaks. Note: The spring brake section of the actuator is non-serviceable.

(9) = This vehicle has an Engine Oil Life Monitor. This monitor will show you when to change the engine oil and filter -- usually between 3,000 miles (5 000 km) and 7,500 miles (12 500 km) since your last oil change. Under severe conditions, the indicator may come on before 3,000 miles (5 000 km). Never drive your vehicle more than 7,500 miles (12 500 km) or 12 months without an oil and filter change.

The system won't detect dust in the oil. So if you drive in a dusty area, be sure to change your oil and filter every 3,000 miles (5 000 km) or sooner if the Change Oil Light comes on. Remember to reset the Oil Life Monitor whenever the oil is changed. For more information, see "Change Oil Light" in the Index.

(10) = Check clutch pedal for free travel. Press pedal by hand until resistance is felt. Free travel should be maintained at 1.5 to 2 inches (38 to 51 mm) measured at the clutch pedal pad. Make checks at 3,000 miles (5 000 km) and 6,000 miles (10 000 km) and then every 6,000 miles (10 000 km) thereafter.

(11) = Inspect rear axle air shift motor for fluid leaks. Remove plug to check fluid level. Inspect air lines and hoses for proper hook-up, binding, leaks, etc. Inspect at 3,000 miles (5 000 km) and 24,000 miles (40 000 km) and then every 24,000 miles (40 000 km) thereafter.

(12) = Chassis Lubrication Service: Lubricate all grease fittings in front suspension, front axle, steering linkage and steering gear at output shaft sleeve bearing. DO NOT lubricate kingpin bushings or steering gear output shaft sleeve bearing with air pressure equipment; instead, use a hand grease gun to ensure complete purge and eliminate sealer cap distortion. Lubricate transmission and shift linkage, hood latches and hood hinges, parking brake lever pivot, clevis pins and linkage, disc brake caliper rails, clutch linkage and release bearing (if equipped), propeller shaft slip joint, universal joint, brake camshaft bracket, slack adjusters, pedal shaft, clutch cross shaft and clutch pedal springs. Lubricate suspension, axle and steering linkage more often when operating under dusty or muddy conditions and in excessive off-road use.

(13) = Check steering system:

- Look for damaged, loose or missing parts. Also look for parts showing signs of wear or lack of lubrication. Replace parts as needed. Also check steering gear mounting bolts, pitman arm nut, gear housing upper cover and side cover attaching bolts, steering column mounting bolts and cardan joint clamp bolts; tighten if necessary. (See service manual.)
- Inspect power steering hoses, tubes and fittings for leaks. Hoses and lines must not be twisted, kinked or tightly bent. Make sure clips, clamps, supporting tubes and hoses are in place and properly secured.
- Check steering gear for leakage around pitman shaft and housing. If leakage is evident (lubricant oozing out, not just oily film), leak should be corrected immediately.

(14) = Check front and rear suspension. Look for damaged, loose or missing parts or parts showing signs of wear or lack of lubrication. Replace parts as needed.

(15) = Adjust tire pressures as indicated on the Certification/Tire label for optimum tire life. See “Tires” in the Index for further details. Check tires for excessive or abnormal wear or damage. Also check for damaged wheels. Replace wheels and/or tires as needed.

(16) = Check spring-to-axle U-bolts and shackle bolts for proper torque. See the service manual for torque sequence and specifications. When parts are replaced, the torque must be checked and adjusted more often during the first 6,000 miles (10 000 km). Check torque at 500 miles (800 km) and 2,000 miles (3 000 km) after first use of parts.

(17) = Check complete exhaust system and cab areas near the exhaust system for broken, damaged, missing or out-of-position parts. Also inspect for open seams, holes, loose connections or other conditions which could let exhaust fumes seep into the driver compartment. Needed repairs should be made at once. To help maintain system integrity, replace exhaust pipes whenever a new muffler is put on.

(18) = Check all engine drive belts for cracks, fraying and wear. Replace as needed.

(20) = With the engine off and below normal operating temperature, check to see that the thermostatically controlled engine cooling fan can be rotated by hand on viscous-operated drives. Replace as needed.

(21) = Check shields and underhood insulation for damage or looseness. Adjust or replace as needed.

(22) = Lubricate caliper housing, caliper support spring and caliper support key.

(23) = Wheel bearing service:

- Grease type -- Clean, inspect and lubricate with the proper wheel bearing grease at designated intervals or when hubs are removed. See “Recommended Fluids and Lubricants” in the Index.
- Oil-filled type -- Some wheel bearings are lubricated by rear axle lubricant. When you have oil-filled hubs, use lubricant identical to that used in your rear axle. Lubricant change intervals are the same for front and rear axles. However, you must maintain oil level at the OIL LEVEL mark between change intervals. See “Recommended Fluids and Lubricants” in the Index.

(24) = Check the air intake system installation to see that gaskets are seated properly and all hose connections, fasteners and other components are tight. For gasoline engines, also check to be sure the air cleaner housing is properly seated, that the cover fits tightly and that the wing nut is tight. Tighten connections and fasteners or replace parts as required.

(26) = Evaporative Control System Service (if equipped): Check all fuel and vapor lines and hoses for proper connections and any damage (or every 24 months, whichever occurs first). Replace parts as needed.

(27) = Replace air cleaner filter (or every 24 months, whichever occurs first). Replace filter more often if driving in dusty conditions. Ask your dealer for the proper replacement intervals for your driving conditions.

(28) = Replace spark plugs. Inspect wires for damage. Check the wire boot and boot heat shield fit at spark plugs and coil. Replace parts as needed.

(30) = Check the fuel tank, fuel cap and fuel lines for damage which could cause leakage. Inspect fuel cap and gasket for any damage. Check fuel cap gasket for even filler neck imprint. Replace parts as needed.

(31) = Check EGR system as described in the service manual. See “Service and Owner Publications” in the Index.

(32) = Inspect Electronic Vacuum Regulator Valve (EVRV) filter for excessive contamination or plugging. If needed, clean filter with solution of soap and water, let dry and install.

(35) = Drain, flush and refill cooling system. See “Recommended Fluids and Lubricants” in the Index for what to use. Inspect hoses. Clean radiator, condenser, pressure cap and neck. Pressure test cooling system and

pressure cap. For Caterpillar<sup>®</sup> diesel engines, always refer to the Caterpillar Diesel Engine Operation & Maintenance Manual for coolant recommendations and change intervals.

(37) = Rear axle service: Change the lubricant. See “Recommended Fluids and Lubricants” in the Index.

(38) = Front axle service: Re-pack upper kingpin roller bearing.

(39) = Air brake service:

- Inspect brake lines and hoses for proper hook-up, binding, leaks, cracks, chafing, etc. Inspect drum brake linings for wear or cracks. Inspect other brake parts at each wheel, including drums, wheel cylinders and piston heat shields and boots. Check brake pedal for excessive free play or travel (or every 6 months, whichever occurs first) and have serviced if needed. Check brakes more often if driving habits and conditions result in frequent braking.
- Test air lines for leaks; tighten as needed. Replace compressor filter.

- Inspect air parking brake chamber for leaks and damage. Inspect lines and hoses for leaks, cracks, chafing, etc. Also check all attachments for tightness, wear or damage. Note: The spring brake section of the rear brake diaphragms are non-serviceable.
- Replace the air compressor filter element, mounted on the air compressor. For remote air compressor intake service, refer to air cleaner filter replacement.

(40) = Clean and lubricate air brake automatic slack adjuster. Check pushrod travel and auto adjustment operation. Have serviced if needed.

(41) = Air brake chamber service: Check operation, mounting, clamps and air lines and check for leaks.

(44) = Air brake service: Remove, disassemble, clean and inspect the safety valve, standard brake chamber, quick release valve, quick release/double check valve combination, parking brake control valve, double check valve, pressure protection valve and alcohol injector. Remove, disassemble and clean the application valve; replace parts showing wear. Remove, disassemble, clean and inspect the spring brake control valve; replace rubber parts.

(46) = Tighten the wheel stud nuts to the specified torque values at 1,000 miles (1 600 km). Thereafter, tighten them 1,000 miles (1 600 km) after each time the wheel is removed. See “Tightening the Wheel Nuts” in the Index.

(47) = Service is required now if you operate under any of these Short Trip/City conditions:

- Most trips are less than 5 to 10 miles (8 to 16 km). This is particularly important when outside temperatures are below freezing.
- Most trips are through dusty areas.
- You frequently tow a trailer.
- The vehicle is operated at or near maximum GVW ratings.
- The vehicle is operated in hilly or mountainous terrain.

(48) = Service is required now for all vehicles that have not previously required service under the Short Trip/City conditions.

## Part B: Owner Checks and Services

Listed in this part are owner checks and services which should be performed at the intervals specified to help ensure the safety, dependability and emission control performance of your vehicle.

For your safety and that of others, any of the safety-related components that may have been damaged in an accident should be checked and any needed repairs made before operating the vehicle.

At the minimum, these routine checks should be made every 6 months or 6,000 miles (10 000 km), whichever occurs first. Whenever repairs are needed, have them completed before operating the vehicle.

### At Each Fuel Fill

*It is important for you or a service station attendant to perform these underhood checks at each fuel fill.*

#### Engine Oil Level Check

Check the engine oil level and add the proper oil if necessary. See “Engine Oil” in the Index for further details.

#### Engine Coolant Level Check

Check the engine coolant level and add DEX-COOL<sup>®</sup> coolant mixture if necessary. See “Engine Coolant” in the Index for further details.

#### Tire Inflation Check

Check tire inflation cold. Make sure tires are inflated to the pressures specified on the Certification/Tire label. See “Tires” in the Index for further details.

## At Least Twice a Year

### Parking Brake Check

Park on a fairly steep hill and hold the vehicle with the parking brake only. This checks holding ability.

### Starter Switch Check



**When you are doing this check, the vehicle could move suddenly. If it does, you or others could be injured. Follow the steps below.**

1. Before you start, be sure you have enough room around the vehicle.
2. Firmly apply both the parking brake and the regular brakes. See “Parking Brake” in the Index if necessary.

NOTE: Do not use the accelerator pedal, and be ready to turn off the engine immediately if it starts.

3. On automatic transmission vehicles, try to start the engine in each gear. The starter should work only in PARK (P), if equipped, or NEUTRAL (N). If the starter works in any other position, your vehicle needs service.

### Automatic Transmission Shift Indicator Check

Check that the indicator points to the gear chosen.

### Steering Check

Be alert for any changes in steering action, abnormal front tire wear or steering wheel position. An inspection or service is needed when the steering wheel is harder to turn or has too much free play, or if there are strange sounds when turning or parking.

### Brake System Check

Be alert to illumination of the low air warning lamp or for the tone alarm, or changes in braking action, such as repeated pulling to one side, unusual sounds when braking or increased brake pedal travel. Make sure air brake system reservoirs are drained daily with full system air pressure, and check system for leaks. Any of these conditions could indicate the need for brake system inspection and/or service.

## **Engine Cooling System Service**

Inspect the hoses and have them replaced if they are cracked, swollen or deteriorated. Inspect all pipes, fittings and clamps; replace as needed. Clean the outside of the radiator and air conditioning condenser. To help ensure proper operation, a pressure test of the cooling system and pressure cap is recommended at least once a year.

## **Exhaust System Check**

Be alert for any changes in the sound of the exhaust system or any smell of fumes. These are signs the system may be leaking. Have it checked and/or repaired at once. Refer to “Engine Exhaust” and “Running Your Engine While You’re Parked” in the Index.

## **Hood Latches Check**

Check that the hood closes firmly. Check for broken, damaged, loose or missing parts that might prevent tight latching. Make sure the secondary latch (if equipped) keeps the hood from opening all the way when the primary latch is released.

## **Fluid Leaks Check**

Check for fuel, coolant, oil or other fluid leaks by looking at the surface beneath the vehicle after it has been parked for awhile.

## **Underbody Inspection**

Corrosive materials used for ice, snow removal and dust control can collect on the underbody. If these materials are not removed, accelerated corrosion (rust) can occur on underbody parts such as fuel lines, frame, floor pan and exhaust system. At least every spring, flush these materials from the underbody with plain water. Take care to clean well any areas where mud and other debris can collect. Sediment packed in closed areas of the frame should be loosened before being flushed.

## **Engine Cover Check**

Check that the cab’s engine cover and seal (if equipped) are not torn or damaged. Be sure that the cover is bolted down firmly to the floor.

## **At Least Once a Year**

### **Underbody Flushing Service**

At least every spring, use plain water to flush any corrosive materials from the underbody. Take care to clean thoroughly any areas where mud and other debris can collect.

## Part C: Recommended Fluids and Lubricants

NOTE: Fluids and lubricants identified below by name, part number or specification may be obtained from your dealer.

USAGE	FLUID/LUBRICANT
Engine Oil (Gasoline Engine)	Engine oil with the American Petroleum Institute Certified for Gasoline Engines starburst symbol of the proper viscosity. To determine the preferred viscosity for your vehicle's engine, see "Engine Oil" in the Index.
Engine Oil (Caterpillar Diesel Engine)	See the Caterpillar® Operation & Maintenance Manual for engine oil recommendations.

USAGE	FLUID/LUBRICANT
Engine Coolant (GM Gasoline Engine)	50/50 mixture of clean, drinkable water and use only GM Goodwrench® DEX-COOL® or Havoline® DEX-COOL® Coolant. See "Engine Coolant" in the Index.
Engine Coolant (Caterpillar Diesel Engine)	See the Caterpillar® Operation & Maintenance Manual for engine coolant recommendations.
Hydraulic Brake System	Delco Supreme 11® Brake Fluid (GM Part No. 12377967 or equivalent DOT-3 brake fluid).
Windshield Washer Solvent	GM Optikleen® Washer Solvent (GM Part No. 1051515) or equivalent.
Clutch Bearing Lubricant	Clutch Bearing Lubricant (GM Part No. 12378484 or equivalent NLGI #3 consistency).

<b>USAGE</b>	<b>FLUID/LUBRICANT</b>
Exhaust Brake Ball Joint Cap Lubricant	High-Temperature Grease (GM Part No. 1051344 or equivalent) or NLGI #3 consistency.
Spring Parking Brake Hydraulic Pump	DEXRON®-III Automatic Transmission Fluid.
Brake Caliper Housing, Caliper Support Spring and Caliper Support Key	Aeroshell #5 Grease (GM Part No. 12377969 or equivalent).
Power Steering System	GM Power Steering Fluid (GM Part No. 1052884 - 1 pint, 1050017 - 1 quart, or equivalent).
Manual Transmission	Synthetic Manual Transmission Fluid (GM Part No. 12345724) is the recommended lubricant to use.
Automatic Transmission	See the Allison Transmission Operator's Manual for correct transmission fluid.

<b>USAGE</b>	<b>FLUID/LUBRICANT</b>
Chassis Lubrication	Chassis Lubricant (GM Part No. 12377985 or equivalent) or lubricant meeting requirements of NLGI # 2, Category LB or GC-LB.
Wheel Bearing Grease	Wheel bearing lubricant meeting requirements of NLGI # 2, Category GC or GC-LB (GM Part No. 1051344 or equivalent).
Front Wheel Bearings with Oil Filled Hubs	SAE 75W-90 Synthetic Axle Lubricant for Medium Duty Trucks (GM Part No. 12345841 or equivalent).
Rear Axle	SAE 75W-90 Synthetic Axle Lubricant for Medium Duty Trucks (GM Part No. 12345841 or equivalent).
Rear Axle Shift Motor Lubricant	Refrigerant Oil (GM Part No. 5416939).
Propshafts and Splines	Wheel bearing lubricant meeting requirements of NLGI # 2, Category GC or GC-LB (GM Part No. 1051344 or equivalent).

## Part D: Maintenance Record

After the scheduled services are performed, enter the date, odometer reading and services performed on the maintenance record charts provided here. Any additional information from “Owner Checks and Services” can be added on the following record pages. Also, you should retain all maintenance receipts. Your owner information portfolio is a convenient place to store them.

<b>Maintenance Record</b>			
<b>DATE</b>	<b>ODOMETER READING</b>	<b>SERVICED BY</b>	<b>MAINTENANCE PERFORMED</b>



## Section 6 Customer Assistance Information

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Here you will find out how to contact Chevrolet if you need assistance. This section also tells you how to obtain service publications and how to report any safety defects.

6-2 Customer Satisfaction Procedure  
6-3 Customer Assistance for Text Telephone  
(TTY) Users  
6-3 Customer Assistance Offices  
6-4 Warranty Information

6-5 Reporting Safety Defects to the United  
States Government  
6-5 Reporting Safety Defects to the  
Canadian Government  
6-6 Reporting Safety Defects to General Motors

## Customer Satisfaction Procedure



Your satisfaction and goodwill are important to your dealer and to Chevrolet. Normally, any concerns with the sales transaction or the operation of your vehicle will be resolved by your dealer's sales or service departments. Sometimes, however, despite the best intentions of all concerned, misunderstandings can occur. If your concern has not been resolved to your satisfaction, the following steps should be taken:

**STEP ONE** -- Discuss your concern with a member of dealership management. Normally, concerns can be quickly resolved at that level. If the matter has already been reviewed with the sales, service or parts manager, contact the owner of the dealership or the general manager.

**STEP TWO** -- If after contacting a member of dealership management, it appears your concern cannot be resolved by the dealership without further help, contact the Chevrolet Medium Duty Truck Customer Assistance Center by calling 1-800-TO-CHEVY (1-800-862-4389). In Canada, contact GM of Canada Customer Communication Centre in Oshawa by calling 1-800-263-3777 (English) or 1-800-263-7854 (French).

We encourage you to call the toll-free number in order to give your inquiry prompt attention. Please have the following information available to give the Customer Assistance Representative:

- Vehicle Identification Number (This is available from the vehicle registration or title. See “Vehicle Identification Number” in the Index.)
- Dealership name and location
- Vehicle delivery date and present mileage

When contacting Chevrolet, please remember that your concern will likely be resolved at a dealer’s facility. That is why we suggest you follow Step One first if you have a concern.

## Customer Assistance for Text Telephone (TTY) Users

To assist customers who are deaf, hard of hearing, or speech-impaired and who use Text Telephones (TTYs), Chevrolet has TTY equipment available at its Customer Assistance Center. Any TTY user can communicate with Chevrolet by dialing: 1-800-833-CHEV (1-800-833-2438). (TTY users in Canada can dial 1-800-263-3830.)

## Customer Assistance Offices

Chevrolet encourages customers to call the toll-free number for assistance. If a U.S. customer wishes to write to Chevrolet, the letter should be addressed to Chevrolet Medium Duty Truck’s Customer Assistance Center.

### United States

Chevrolet Medium Duty Truck  
Customer Assistance Center  
P.O. Box 33172  
Detroit, MI 48232-5172

1-800-TO-CHEVY (1-800-862-4389)  
1-800-833-2438 (For Text Telephone devices (TTYs))

**From:**

Puerto Rico: 1-800-496-9992 (English)  
1-800-496-9993 (Spanish)

U.S. Virgin Islands: 1-800-496-9994

Fax Number: 313-381-0022

## Canada

General Motors of Canada Limited  
Customer Communication Centre, 163-005  
1908 Colonel Sam Drive  
Oshawa, Ontario L1H 8P7  
1-800-263-3777 (English)  
1-800-263-7854 (French)  
1-800-263-3830 (For Text Telephone devices (TTYs))  
Roadside Assistance: 1-800-268-6800

## Mexico, Central America and Caribbean Islands/Countries (Except Puerto Rico and U.S. Virgin Islands)

General Motors de Mexico, S. de R.L. de C.V.  
Customer Assistance Center  
Paseo de la Reforma # 2740  
Col. Lomas de Bezares  
C.P. 11910, Mexico, D.F.  
01-800-508-0000  
Long Distance: 011-52 - 53 29 0 800

## Warranty Information

Your vehicle comes with a separate warranty booklet that contains detailed warranty information.

## **REPORTING SAFETY DEFECTS TO THE UNITED STATES GOVERNMENT**

If you believe that your vehicle has a defect which could cause a crash or could cause injury or death, you should immediately inform the National Highway Traffic Safety Administration (NHTSA), in addition to notifying General Motors.

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 General Motors.

To contact NHTSA, you may either call the Auto Safety Hotline toll-free at 1-800-424-9393 (or 366-0123 in the 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.

## **REPORTING SAFETY DEFECTS TO THE CANADIAN GOVERNMENT**

If you live in Canada, and you believe that your vehicle has a safety defect, you should immediately notify Transport Canada, in addition to notifying General Motors of Canada Limited. You may write to:

Transport Canada  
330 Sparks Street  
Tower C  
Ottawa, Ontario K1A 0N5

## **REPORTING SAFETY DEFECTS TO GENERAL MOTORS**

In addition to notifying NHTSA (or Transport Canada) in a situation like this, we certainly hope you'll notify us. Please call us at 1-800-462-8782, or write:

Chevrolet Medium Duty Truck  
Customer Assistance Center  
P.O. Box 33172  
Detroit, MI 48232-5172

In Canada, please call us at 1-800-263-3777 (English) or 1-800-263-7854 (French). Or, write:

General Motors of Canada Limited  
Customer Communication Centre, 163-005  
1908 Colonel Sam Drive  
Oshawa, Ontario L1H 8P7

# 2001 CHEVROLET SERVICE PUBLICATIONS ORDERING INFORMATION

*The following publications covering the operation and servicing of your vehicle can be purchased by filling out the Service Publication Order Form in this book and mailing it in with your check, money order, or credit card information to Helm, Incorporated (address below.)*

## CURRENT PUBLICATIONS FOR 2001 CHEVROLET

### SERVICE MANUALS

Service Manuals have the diagnosis and repair information on engines, transmission, axle, suspension, brakes, electrical, steering, body, etc.

RETAIL SELL PRICE: \$120.00

### TRANSMISSION, TRANSAXLE, TRANSFER CASE UNIT REPAIR MANUAL

This manual provides information on unit repair service procedures, adjustments and specifications for the 2001 GM transmissions, transaxles and transfer cases.

RETAIL SELL PRICE: \$50.00

### SERVICE BULLETINS

Service Bulletins give technical service information needed to knowledgeable service General Motors cars and trucks. Each bulletin contains instructions to assist in the diagnosis and service of your vehicle.

### OWNER'S INFORMATION

Owner publications are written directly for Owners and intended to provide basic operational information about the vehicle. The owner's manual will include the Maintenance Schedule for all models.

In-Portfolio: Includes a Portfolio, Owner's Manual and Warranty Booklet.

RETAIL SELL PRICE: \$20.00

Without Portfolio: Owner's Manual only.

RETAIL SELL PRICE: \$15.00

### CURRENT & PAST MODEL ORDER FORMS

Service Publications are available for current and past model GM vehicles. To request an order form, please specify year and model name of the vehicle.

**PLEASE COMPLETE THE ORDER FORM SHOWN ON  
THE FOLLOWING PAGE AND MAIL TO:**

Helm, Incorporated • P.O. Box 07130 • Detroit, MI 48207

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(Monday-Friday 8:00 AM – 6:00 PM EST)

FAX Orders Only 1-313-865-5927

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2 0 0 1 G M	PUBLICATION FORM NUMBER	ITEM DESCRIPTION	VEHICLE MODEL		QTY.	PRICE EACH*	TOTAL PRICE
			NAME	YEAR			
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		Car & Light Truck Transmission Unit Repair		2001		\$50.00	
		Owner's Manual In Portfolio		2001		\$20.00	
		Owner's Manual Without Portfolio		2001		\$15.00	

<b>S H I P T O</b>	<b>NOTE:</b> Dealers and Companies please provide dealer or company name, and also the name of the person to whose attention the shipment should be sent. Mail completed order form to: HELM, INCORPORATED • P.O. Box 07130 • Detroit, MI 48207 For purchases outside U.S.A. please write to the above address for quotation.		<b>P A Y M E N T</b>	<input type="checkbox"/> Check or Money Order payable to <b>Helm, Inc. (USA funds          only — do not send cash.)</b>		<b>TOTAL MATERIAL</b>		
	_____			<input type="checkbox"/> MasterCard	Michigan Purchasers add 6% sales tax			
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	_____			<input type="checkbox"/> Discover	Canadian Postage			
	_____			Account Number: <input type="text"/>	Expiration Date mo/yr: <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>		Check here if your billing address is different from your shipping address shown. <input type="checkbox"/>	
(CUSTOMER'S NAME) (ATTENTION)		CUSTOMER SIGNATURE _____						
(STREET ADDRESS—NO P.O. BOX NUMBERS)								
(CITY) (STATE) (ZIP CODE)								
DAYTIME TELEPHONE NO. ( ) AREA CODE								

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\*(Prices are subject to change without notice and without incurring obligation. Allow ample time for delivery.)

Note to Canadian Customers: All listed prices are quoted in U.S. funds. Canadian residents are to make checks payable in U.S. funds.