



Owner's Manual

forward control chassis

GVW A GVW Holdings Company

Workhorse Custom Chassis Forward Control Vehicle Owner's Manual

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W0004539A

Workhorse Custom Chassis Forward Control Vehicle Owner's Manual



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WCC Emblem are a registered trademark of
Workhorse Custom Chassis.

This Manual includes the latest information at the
time of its printing. WCC reserves the right to make
changes to this product after its printing, without
further notice.

Keep this manual in your vehicle so it will be
available for use if needed. If you sell the vehicle,
please leave the manual in the vehicle for the
new owner.



WCC is proud to be ISO 9001:9004 Certified.
NSF-ISR (a subsidiary of NSF International) has
found WCC to be in compliance to the
ISO Standards.

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INDEX

A good place to look for what you need is the Index in back of the manual. It's an alphabetical list of what's in the manual, and the page number where you'll find it.

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.



CAUTION

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."

Workhorse Custom Chassis Forward Control Vehicle Owner's Manual

VEHICLE DAMAGE WARNINGS

Also, in this book you will find these notices:

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

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.

Workhorse Custom Chassis Forward Control Vehicle Owner's Manual

VEHICLE SYMBOLS

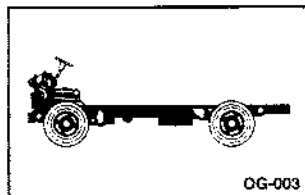
These are some of the symbols you may find on your vehicle.

<p>For example, these symbols are used on an original battery:</p> <p>CAUTION POSSIBLE INJURY </p> <p>PROTECT EYES BY SHIELDING </p> <p>CAUSTIC BATTERY ACID COULD CAUSE BURNS </p> <p>AVOID SPARKS OR FLAMES </p> <p>SPARK OR FLAME COULD EXPLODE BATTERY </p>	<p>These symbols are important for you and your passengers whenever your vehicle is driven:</p> <p>DOOR LOCK UNLOCK </p> <p>FASTEN SEAT BELTS </p> <p>POWER WINDOW </p> <p>AIR BAG </p>	<p>These symbols have to do with your lamps:</p> <p>MASTER LIGHTING SWITCH </p> <p>TURN SIGNALS </p> <p>PARKING LAMPS </p> <p>HAZARD WARNING FLASHER </p> <p>DAYTIME RUNNING LAMPS </p> <p>FOG LAMPS </p>	<p>These symbols are on some of your controls:</p> <p>WINDSHIELD WIPER </p> <p>WINDSHIELD WASHER </p> <p>WINDSHIELD DEFROSTER </p> <p>REAR WINDOW DEFOGGER </p> <p>VENTILATING FAN </p>	<p>These symbols are used on warning and indicator lights:</p> <p>ENGINE COOLANT TEMP </p> <p>BATTERY CHARGING SYSTEM </p> <p>BRAKE FAIL AND PARKING BRAKE </p> <p>COOLANT </p> <p>ENGINE OIL PRESSURE </p> <p>ANTI-LOCK BRAKES </p> <p>TRANSMISSION FAILURE </p> <p>TIRE PRESSURE MONITORING </p> <p>SERVICE ENGINE SOON </p>	<p>Here are some other symbols you may see:</p> <p>FUSE </p> <p>LIGHTER </p> <p>HORN </p> <p>SPEAKER </p> <p>FUEL GAUGE (GAS) </p> <p>FUEL GAUGE (DIESEL) </p> <p>81300001</p>
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Workhorse Custom Chassis Forward Control Vehicle Owner's Manual

MODEL REFERENCE

This manual covers this model:



Light and Medium
Duty Forward
Control Chassis
(WCC Commercial
and Motor Home)

Since WCC chassis models 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 and equipment to the WCC chassis model. Read all these materials (as well as this manual) carefully, to get all the information on your vehicle.

This table shows WCC model numbers and their corresponding chassis type as they are referenced in this manual.

Model Number

P300 42

P300 32

P300 22

P300 52

Chassis Type

P42 — Commercial

P32 — Motor Home

W22 — Motor Home

W52 — Commercial

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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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:

- 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.
- 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.

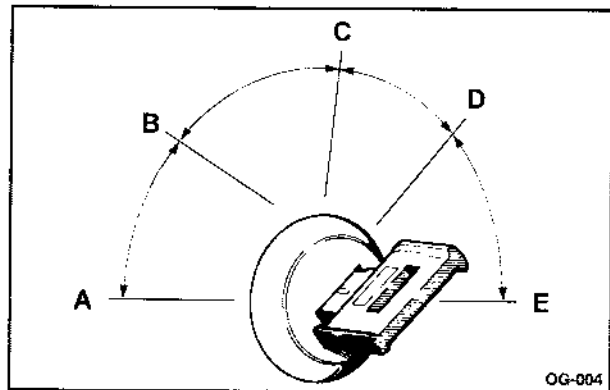
IGNITION POSITIONS



CAUTION

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

Use your ignition key to start your vehicle. The ignition key lets you turn the ignition switch to five different positions.



ACCESSORY (A): ACCESSORY lets you use accessories when the engine is off. To get into ACCESSORY, push in the key and turn it toward you. Your steering wheel will remain locked, just as it was before you inserted the key.

NOTICE

Extended use of accessories in the **ACCESSORY** position could drain your battery and prevent you from starting your vehicle.

LOCK (B): This position locks your ignition, steering wheel and transmission. You will only be able to remove your key when the ignition is turned to LOCK.

OFF (C): This position lets you turn off the engine but still turn the steering wheel. Use OFF if you must have your vehicle in motion while the engine is off (for example, if your vehicle is being pushed).

RUN (D): This is the position for driving.

START (E): This starts your engine.

**CAUTION**

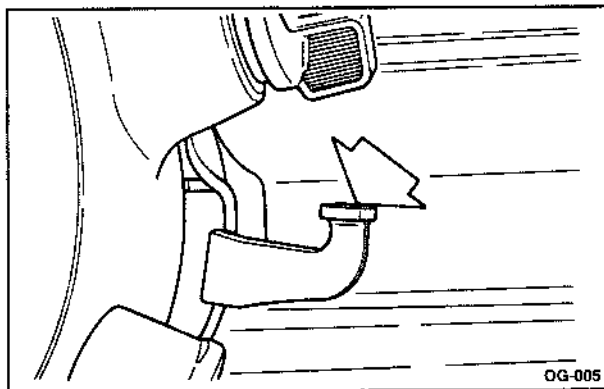
On manual transmission vehicles, turning the key to **LOCK** will lock the steering column and result in a loss of ability to steer the vehicle. This could cause a collision. If you need to turn the engine off while the vehicle is moving, turn the key only to **OFF**. Don't move the key release lever while the vehicle is moving.

NOTICE

If your key seems stuck in **LOCK** and you can't turn it, be sure you are using the correct key; if so, is it all the way in? If it is, then turn the steering wheel left and right while you turn the key hard. But turn the key only with your hand. Using a tool to force it could break the key or the ignition switch. If none of this works, then your vehicle needs service.

NOTICE

Trying to start your vehicle by pushing or pulling it could damage your vehicle, even if you have a manual transmission. And, if you have an automatic transmission, it won't start that way.

**KEY RELEASE LEVER
(MANUAL TRANSMISSION)**

OG-005

If you have a manual transmission, your ignition switch may have a key release lever.

You must press the lever before you can turn your key to the LOCK position. Then you can remove it from the ignition switch.

STARTING YOUR GASOLINE ENGINE

If you have a diesel engine, see "Starting Your Diesel Engine" in the Index.

Automatic Transmission

Move your shift lever to PARK (P) or NEUTRAL (N). Your engine won't start in any other position — that's a safety feature. To restart when you're already moving, use NEUTRAL (N) only.

NOTICE

Don't try to shift to PARK (P) if your vehicle is moving. If you do, you could damage the transmission. Shift to PARK (P) only when your vehicle is stopped.

Manual Transmission

The gear selector should be in NEUTRAL and the parking brake engaged. Hold the clutch pedal to the floor and start the engine. Your vehicle won't start if the clutch pedal is not all the way down — that's a safety feature.

How to Start 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.

NOTICE:

Holding your key in START for longer than 15 seconds at a time will cause your battery to be drained much sooner. And the excessive heat can damage your starter motor. Wait about 15 seconds between each try to help avoid draining your battery or damaging your starter.

2. If it doesn't start right away, hold your key in START. If it doesn't start in 10 seconds, push the accelerator pedal all the way down for five more seconds, unless it starts sooner.
3. If your engine still won't start (or starts but then stops), wait 15 seconds and start over.

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.

STARTING YOUR DIESEL ENGINE

Your diesel engine starts differently than a gasoline engine.

Automatic Transmission

Move your shift lever to PARK (P) or NEUTRAL (N). Your engine won't start in any other position — that's a safety feature. To restart when you're already moving, use NEUTRAL (N) only.

NOTICE

Don't try to shift to PARK (P) if your vehicle is moving. If you do, you could damage the transmission. Shift to PARK (P) only when your vehicle is stopped.

Manual Transmission

Move your shift lever to NEUTRAL and hold the clutch pedal to the floor while starting the engine. Your vehicle won't start if the clutch pedal is not all the way down — that's a safety feature.

Starting Your Engine

1. Turn your ignition key to RUN.
Observe the WAIT TO START light. (This light may not come on if the engine is hot.)
2. As soon as the WAIT TO START light goes off, IMMEDIATELY turn the ignition key to START. When the engine starts, let go of the key.

NOTICE

Holding your key in START for longer than 15 seconds at a time will cause your battery to be drained much sooner. And the excessive heat can damage your starter motor.

NOTICE

If the WAIT TO START light stays on, it means that your vehicle could have one of several problems, so you should have it serviced right away.

3. If the engine does not start after 15 seconds of cranking, turn the ignition key to OFF. Wait one minute for the starter to cool, then try the same steps again.

If you're trying to start your engine after you've run out of fuel, follow the steps in "Running Out of Fuel" (see "Diesel Fuel Requirements and Fuel System" in the Index).

When your engine is cold, let it run for a few minutes before you move your vehicle. This lets oil pressure build up. Your engine will sound louder when it's cold.

NOTICE

If you're not in an idling vehicle and the engine overheats, you wouldn't be there to see the coolant temperature gage. This could damage your vehicle. Don't let your engine run when you're not in your vehicle.

Cold Weather Starting (Diesel Engine)

The following tips will help you get good starting in cold weather.

Use the recommended engine oil when the outside temperature drops below freezing. See "Engine Oil" in the Index. When the outside temperature drops below 0°F (-18°C), use your engine coolant heater.

If you park your vehicle in a garage, you shouldn't need to use the coolant heater until the garage temperature goes below 0°F (-18°C), no matter how cold it is outside. If you experience longer cranking times, notice an unusual amount of exhaust smoke or are at higher altitudes (over 7,000 ft. or 2,135 m), you may use your engine coolant heater. See "Engine Coolant Heater" in the Index.

See "Diesel Fuel Requirements and Fuel System" in the Index for information on what fuel to use in cold weather.

If Your Diesel Engine Won't Start

If you've run out of fuel, look at "Running Out of Fuel" (see "Diesel Fuel Requirements and Fuel System" in the Index).

If you're not out of fuel, and your engine won't start, do this:

Turn your ignition key to RUN. IMMEDIATELY after the WAIT TO START light goes off, turn the ignition key to START while you push the accelerator pedal down.

If the light doesn't go off, wait a few seconds, then try starting your engine again. And, see your dealer as soon as you can for a starting system check.

If the light comes on and then goes off and you know your batteries are charged, but your engine still won't start, your vehicle needs service.

If the light does not come on when the engine is cold, your vehicle needs service.

If your batteries don't have enough charge to start your engine, see "Battery" in the Index.

Be sure you have the right oil for your engine, and that you've changed the oil at the proper times. If you use the wrong oil, your engine may be harder to start.

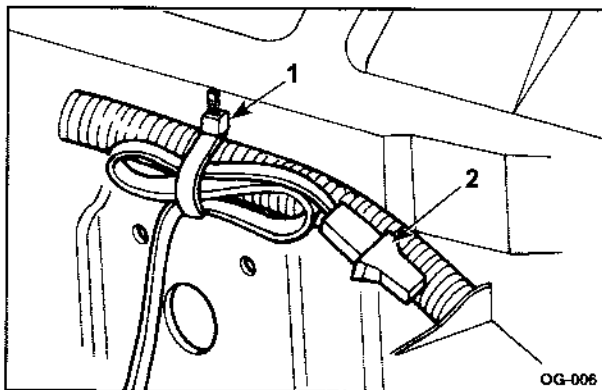
If the engine starts, runs a short time, then stops, your vehicle needs service.



CAUTION

Do not use gasoline or starting "aids," such as ether, in the air intake. They could damage your engine. There could also be a fire, which could cause serious personal injury.

ENGINE COOLANT HEATER (IF EQUIPPED)



1. Cord Strap
2. Cord Cap

The engine coolant heater is located either on the driver's side engine compartment frame rail or is clipped onto the driver's side radiator support.

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. Open the hood and unwrap the electrical cord.
3. Plug it 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. If the cord won't reach, use a heavy-duty three-prong extension cord rated for at least 15 amps.

4. Before starting the engine, be sure to unplug and store the cord as it was before to keep it away from moving engine parts. If you don't, it could be damaged.

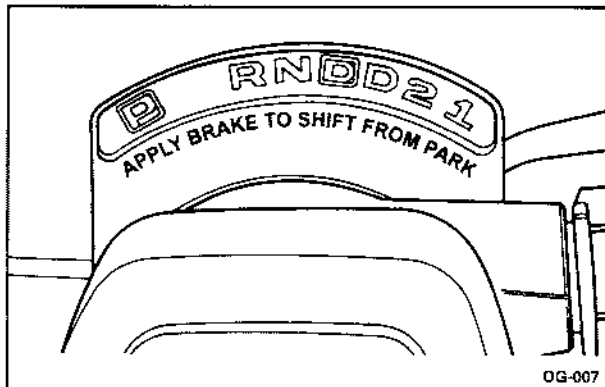
How long should you keep the coolant heater plugged in? The answer depends on the outside temperature, the kind of oil you have, and some other things. Instead of trying to list everything here, we ask that you contact your dealer in the area where you'll be parking your vehicle. The dealer can give you the best advice for that particular area.

DRIVING IN SNOW (DIESEL ENGINES)

When driving in a heavy snowstorm or in swirling snow with a diesel engine, snow can get into the air intake system. If you keep driving in these conditions, the air cleaner may get plugged causing black smoke and loss of power. In an emergency, if the air cleaner gets plugged with snow, you can remove the air cleaner. Then, drive to a place of safety as soon as possible and put the air cleaner back on.

AUTOMATIC TRANSMISSION OPERATION

There are several different positions for your shift lever.



**P32 Motor Home and
P42 and W52 Commercial (Except W22)**

PARK (P): This locks your rear wheels. It's the best position to use when you start your engine.

Ensure the shift lever is fully in PARK (P) before starting the engine. Your vehicle has a brake-transmission shift interlock. You have to fully apply your regular brakes before you can shift from PARK (P) when the ignition key is in RUN. If you cannot shift out of PARK (P), ease pressure on the shift lever and push the shift lever all the way into PARK (P) as you maintain brake application. Then move the shift lever into the gear you wish. See "Shifting Out of Park" in the Index.

In the event of a shift interlock solenoid malfunction, turn the key to OFF, pull the shift selector lever into NEUTRAL (N) and start the engine. Make sure to set the parking brake before starting the engine.

**CAUTION**

It is 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 have 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).

See "Shifting into PARK (P)" in the Index.

If you have a P32 motor home with a Gross Vehicle Weight Rating (GVWR) of 16,000 lbs. (7 258 kg) through 18,000 lbs. (8 165 kg), your transmission doesn't lock when in PARK (P). For these models an automatic parking brake will apply whenever your shift lever is moved to PARK (P). Wait five or six seconds for the parking brake to fully apply, then release the brake pedal. When your shift lever is moved from PARK (P), the automatic parking brake will release.

The W22 motor homes and W52 commercial vehicles do have a transmission parking position that locks when in PARK (P).

For models with manual transmissions, a foot apply or hand lever parking brake must be engaged to prevent the vehicle from rolling.

REVERSE (R): Use this gear to back up.

NOTICE

Shifting to **REVERSE (R)** while your vehicle is moving forward could damage your transmission. Shift to **REVERSE (R)** only after your vehicle is stopped.

To rock your vehicle back and forth to get out of snow, ice or sand without damaging your transmission, see "Stuck in Sand, Mud, Ice or Snow" in the Index.

NEUTRAL (N): In this position, your engine isn't connected with the wheels. To restart when you're already moving, use **NEUTRAL (N)** only. Also, use **NEUTRAL (N)** when your vehicle is being towed.




CAUTION

Shifting out of **PARK (P)** or **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 **PARK (P)** or **NEUTRAL (N)** while your engine is racing.


NOTICE

Damage to your transmission caused by shifting out of **PARK (P)** or **NEUTRAL (N)** with the engine racing isn't covered by your warranty.


AUTOMATIC OVERDRIVE : This position is for normal driving. If you need more power for passing, and you're:

- Going less than about 35 mph (55 km/h), push your accelerator pedal about halfway down.
- Going about 35 mph (55 km/h) or more, push the accelerator pedal all the way down.

You'll shift down to the next gear and have more power.

The W22 motor home and W52 Commercial vehicle have a five-speed Allison transmission, four gears of which can be selected with the shift lever. These are overdrive, third, second, and first. When overdrive is enabled, overdrive and drive (W52) or 3 (W22) correspond to fifth and third gears respectively. When overdrive is disabled with the "O/D OFF" switch, an indicator light on the cluster will light up to indicate that overdrive is disabled. The  on the indicator now corresponds to 4th gear. This switch thus enables you to manually select fourth gear. This feature should be used when driving on steep hills or heavy towing. For the four-speed automatic

transmission (P32 motor home) the driver should select third gear to provide this same functionality.

Fourth gear position on the five-speed can be used for normal driving offering more power but lower fuel economy than AUTOMATIC OVERDRIVE . You should use fourth gear position on the five-speed transmission when driving on steep hills. Selecting lower gear positions increases power but lowers fuel economy and can be useful to control speed as you go down steep mountain roads, but you would also want to use your brakes off and on.

First gear position provides the most tractive effort but lowest fuel economy. You can use it on very steep hills or in mud or snow. If the selector lever is put in first, the transmission will not shift until the vehicle is going slow enough.

Forward Gears

GEAR	5-SPEED	NOT TO EXCEED	4-SPEED	NOT TO EXCEED
Fifth	Ⓓ	—	—	—
Fourth	Ⓓ Switch "OFF"	—	Ⓓ	—
Third	3	Does not apply	D	—
Second	2	Does not apply	2	40 mph (64 km/h)
First	1	Does not apply	1	30 mph (48 km/h)

RANGE INHIBIT WARNING LIGHT (ALLISON TRANSMISSION ONLY)

This light comes on when the gear selected by the driver cannot be engaged (see the Allison transmission manual for more information).

NOTICE

If your rear wheels can't rotate, don't try to drive. This might happen if you were stuck in very deep sand or mud or were up against a solid object. You could damage your transmission.

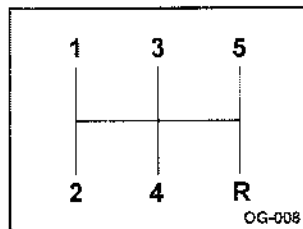
Also, if you stop when going uphill, don't hold your vehicle there with only the accelerator pedal. This could overheat and damage the transmission. Use your brakes to hold your vehicle in position on a hill.

MANUAL TRANSMISSION OPERATION (5.7L AND 6.5L ENGINES ONLY)



CAUTION

If you skip more than one gear when you downshift, you could lose control of your vehicle. You could injure yourself or others. Don't shift down more than one gear at a time when you downshift.



If you have a five-speed manual transmission with low gear, this is your shift pattern.

Here's how to operate your transmission:

LOW (1): Press the clutch pedal and shift into LOW (1). Then, slowly let up on the clutch pedal as you press the accelerator pedal. Shift into LOW (1) only when the vehicle speed is below 5 mph (8 km/h). If you try to shift into LOW (1) at excessive vehicle speeds, the shift lever will not move into the LOW (1) position until vehicle speed is reduced. LOW (1) is intended only for heavy loads and is not recommended for normal driving conditions.

FIRST (2): Use this gear to start your vehicle moving under normal driving conditions. Press the clutch pedal and shift into FIRST (2). Then, slowly let up on the clutch pedal as you press the accelerator pedal.

You can shift into FIRST (2) when you're going less than 20 mph (32 km/h). If you've come to a complete stop and it's hard to shift into FIRST (2), put the shift lever in NEUTRAL, let up on the clutch then press the clutch pedal back down. Then shift

into FIRST (2). If you try to shift into FIRST (2) at excessive vehicle speeds, the shift lever will not move into the FIRST (2) position until vehicle speed is reduced.

SECOND (3): Press the clutch pedal as you let up on the accelerator pedal and shift into SECOND (3). Then, slowly let up on the clutch pedal as you press the accelerator pedal.

THIRD (4) and FOURTH (5): Shift into the higher forward gears the same way you do for SECOND (3). Slowly let up on the clutch pedal as you press the accelerator pedal.

To stop your vehicle, let up on the accelerator pedal and press the brake pedal. Just before the vehicle stops, press the clutch pedal and the brake pedal, and shift to NEUTRAL.

NEUTRAL: Use this position when you start or idle your engine.

REVERSE (R): To back up, first press down the clutch pedal. Wait about five seconds for the internal parts to stop spinning and then shift into REVERSE (R). Let up on the clutch pedal slowly while pressing the accelerator pedal.

NOTICE

Shift to REVERSE (R) only after your vehicle is stopped. Shifting to REVERSE (R) while your vehicle is moving could damage your transmission.

Also, use REVERSE (R), along with the parking brake, when turning off your engine and parking your vehicle.

Manual Transmission Shift Speeds

If your speed drops below 20 mph (32 km/h), or if the engine is not running smoothly, you should downshift to the next lower gear. You may have to downshift two or more gears to keep the engine running smoothly or for good performance.

NOTICE

If you skip more than one gear when you downshift, or if you race the engine when you downshift, you can damage the clutch or transmission.

Operating Precautions

- When you are stopped uphill, do not hold the vehicle in place using the accelerator and clutch pedals. Use the regular brakes or the parking brake.
- Shift to the next lower gear for very hard pulls at low road speeds.
- Shift the gears smoothly to let the gears engage.
- Do not ride the clutch pedal; this will damage the clutch.
- Downshift one or two gears from the high gear when you are driving at slow speeds (less than 30 mph or 50 km/h), in stop-and-go traffic, and when going down steep hills.
- Do not coast with the transmission in NEUTRAL.
- Set the parking brake firmly before you leave the vehicle.

PARKING BRAKES

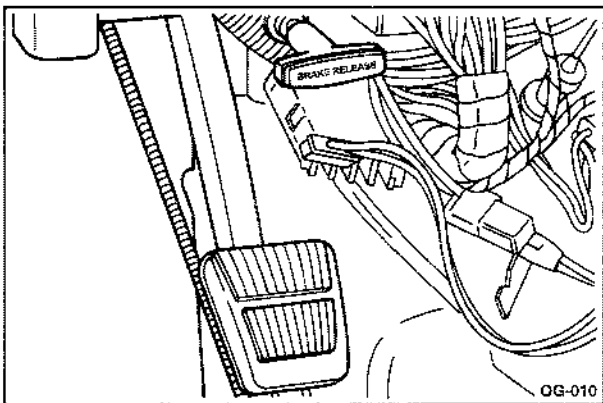
The parking brake should always be set when parking your vehicle. Always release the parking brake before driving off.

NOTICE

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

Pedal and Lever Parking Brake

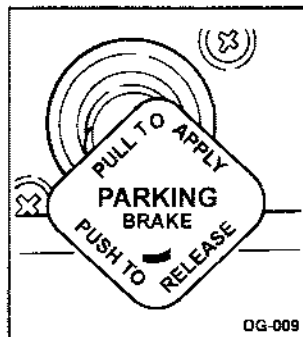
The parking brake is applied by either a pedal or lever assembly. Some motor home models use a pedal assembly and commercial models use a lever assembly. The pedal assembly is foot-actuated and the lever assembly is hand-actuated.



Foot Pedal Park Brake

Pull-Button Apply Parking Brake

If you have a P32 motor home with a Gross Vehicle Weight Rating (GVWR) of 16,000 lbs. (7 258 kg) through 18,000 lbs. (8 165 kg) you have a pull-button parking brake switch on the instrument panel to the right of the steering column.



The pull button is used to apply the parking brake in any gear other than PARK (P). Pull the button to apply the parking brake and the AUTO PARK warning light and the BRAKE light will both come on. Push the button back in to release the parking brake.

Auto-Apply Parking Brake

The auto-apply parking brake will also be activated by placing the automatic transmission in the PARK (P) position. This activates the auto-apply parking brake through the park/neutral position switch circuit.

To activate the auto-apply parking brake, press the regular brake pedal and shift the transmission into PARK (P). Hold the regular brake pedal down for about five or six seconds after shifting into PARK (P) to allow the auto-apply parking brake to fully apply. Then release the regular brake pedal. This will cause the AUTO PARK warning light to come on, but the BRAKE light will not come on unless the pull-button parking brake switch is applied as well.

The auto-apply function is released when the transmission is shifted out of PARK (P).

NOTICE

If your vehicle is moving, never turn your ignition key to OFF. If you do so, the AUTO PARK light will come on and the parking brake will be set. Damage can occur to your vehicle.

If your vehicle is moving and the engine stalls, shift into NEUTRAL (N) and use your regular brakes to stop the vehicle. Then turn the ignition key to OFF.

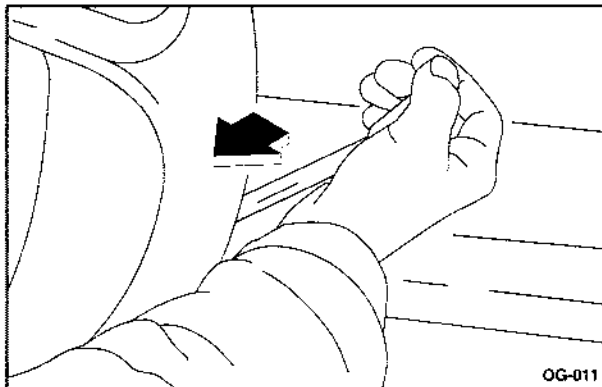
SHIFTING INTO PARK (P) (AUTOMATIC TRANSMISSION ONLY)

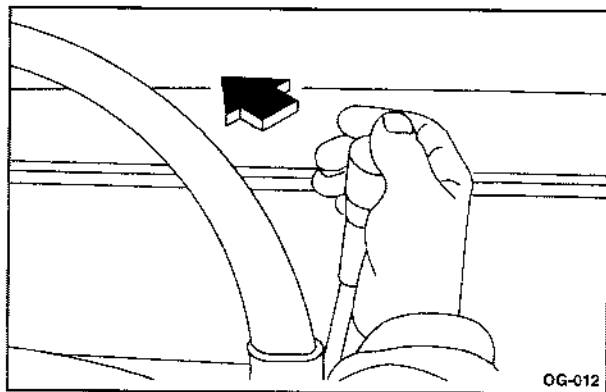


CAUTION

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. If you have 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, use the steps that follow.

1. Shift into PARK (P) by holding the brake pedal down and setting the parking brake. Then, move the shift lever into PARK (P) like this:
 - Pull the lever toward you.





- Move the lever up as far as it will go.
2. Move the ignition key to LOCK, remove the key and take it with you. If you can leave your vehicle with the ignition key in your hand, your vehicle is in PARK (P).

Leaving Your Vehicle With the Engine Running (Automatic Transmission Only)



CAUTION

It can be dangerous to leave your vehicle with the engine running. Your vehicle could move suddenly if the shift lever is not fully in PARK (P) with the parking brake firmly set. And, if you leave the vehicle with the engine running, it could overheat and even catch fire. You or others could be injured. Don't leave your vehicle with the engine running unless you have to.

If you have to leave your vehicle with the engine running, be sure your vehicle is in PARK (P) and your parking brake is firmly set before you leave it. After you've moved the shift lever into PARK (P), hold the regular brake pedal down. Then, see if you can move the shift lever away from PARK (P) without first pulling it toward you. If you can, it means that the shift lever wasn't fully locked into PARK (P).

Torque Lock (Vehicles with Automatic Transmission and Park Pawl)

If you are parking on a hill and you don't shift your transmission into PARK (P) properly, the weight of the vehicle may put too much force on the parking pawl in the transmission. You may find it difficult to pull the shift lever out of PARK (P). This is called "torque lock." To prevent torque lock, set the parking brake and then shift into PARK (P) properly before you leave the driver's seat. To find out how, see "Shifting into PARK (P)" in the Index.

When you are ready to drive, move the shift lever out of PARK (P) *before* you release the parking brake.

If torque lock does occur, you may need to have another vehicle push yours a little uphill to take some of the pressure from the parking pawl in the transmission, so you can pull the shift lever out of PARK (P).

**SHIFTING OUT OF PARK (P)
(AUTOMATIC TRANSMISSION ONLY)**

Your vehicle has a brake-transmission shift interlock. You have to fully apply your regular brake before you can shift from PARK (P) when the ignition is in the RUN position.

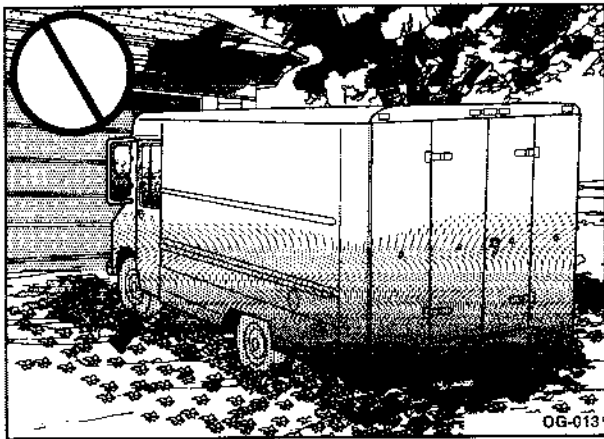
If you cannot shift out of PARK (P), ease pressure on the shift lever and push the shift lever all the way into PARK (P) as you maintain brake application. Then move the shift lever into the gear you want.

If you ever hold the brake pedal down but still can't shift out of PARK (P), try this:

1. Turn the ignition key to OFF.
2. Apply and hold the brake until the end of Step 4.
3. Shift to NEUTRAL (N).
4. Start the vehicle and then shift to the drive gear you want.
5. Have the vehicle fixed as soon as you can.

**PARKING YOUR VEHICLE (MANUAL
TRANSMISSION MODELS ONLY)**

Before you get out of your vehicle, put your manual transmission in REVERSE (R) and firmly apply the parking brake.

PARKING OVER THINGS THAT CAN 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 ever you 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)**.

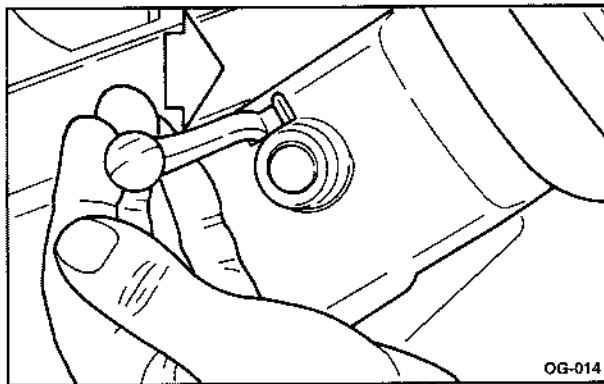
Follow the proper steps to be sure your vehicle won't move. See "Shifting into **PARK (P)**" in the Index.

HORN

Press the pad in the center of the steering wheel to sound the horn.

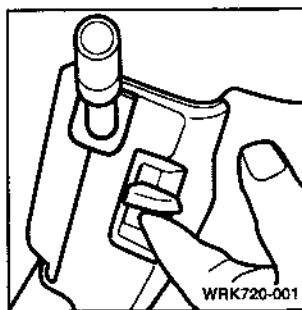
TILT WHEEL

A tilt steering wheel allows you to adjust the steering wheel before you drive.



All Vehicles (Except W22)

You can also raise it to the highest level to give your legs more room when you exit and enter the vehicle.

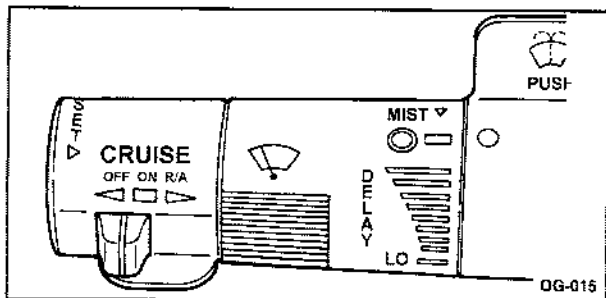


Motor Home (W22)

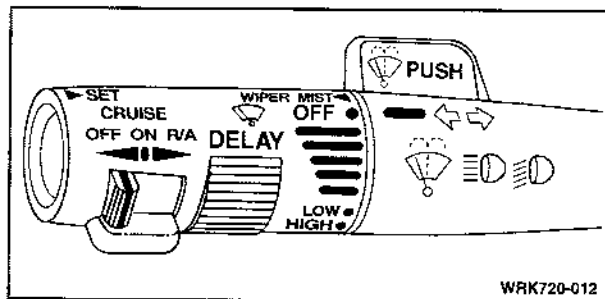
To tilt the wheel, hold the steering wheel and pull the lever.

Move the steering wheel to a comfortable level, then release the lever to lock the wheel in place.

TURN SIGNAL/MULTIFUNCTION LEVER



All Vehicles (Except W22)



Motor Home (W22)

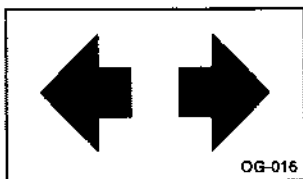
The lever on the left side of the steering column includes your:

- Turn Signal and Lane Changer
- Headlamp High/Low Beam Changer
- Windshield Wipers
- Windshield Washer
- Cruise Control (if equipped)

Turn Signal and Lane Change Indicator

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.



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

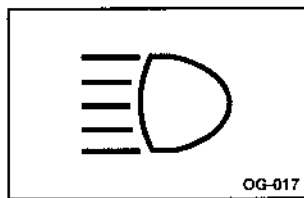
To signal a lane change, just raise or lower the lever until the arrow starts to flash. Hold it there until you complete your lane change. The lever will return by itself when you release it.

As you signal a turn or a lane change, if the arrows don't flash but just stay on, a signal bulb may be burned out and other drivers won't see your turn signal.

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 fuse (see "Fuses and Circuit Breakers" in the Index) and for burned-out bulbs.

Headlamp High/Low Beam Changer

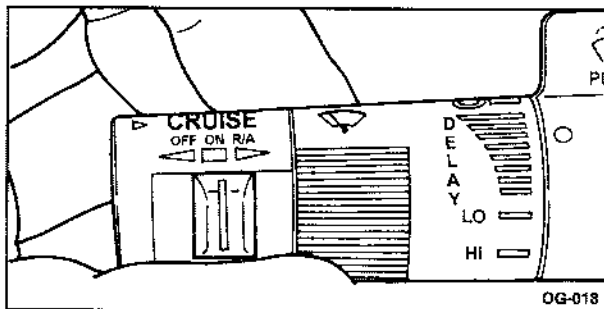
To change the headlamps from low beam to high beam, or high to low, pull the turn signal lever all the way toward you, then release it.



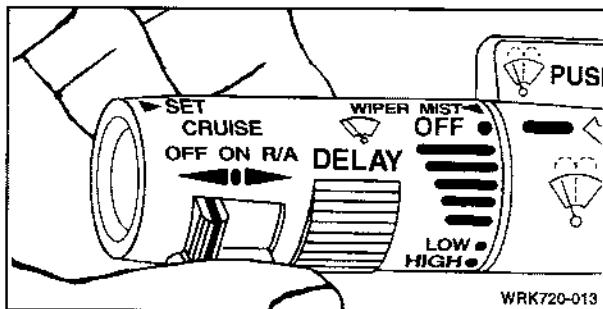
When the high beams are on, this light on the instrument panel will also be on.

Windshield Wipers

The windshield wipers are controlled by turning the band with the wiper symbol on it.



All Vehicles (Except W22)



Motor Home (W22)

For a single wiping cycle, turn the band to MIST. Hold it there until the wipers start, then let go. The wipers will stop after one cycle. If you want more cycles, hold the band on MIST longer.

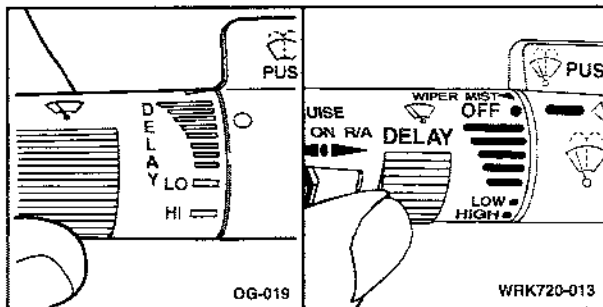
For steady wiping at low speed, turn the band away from you to LO. For high-speed wiping, turn the band further, to HI. To stop the wipers, move the band to OFF.

Remember that damaged wiper blades may prevent you from seeing well enough to drive safely. To avoid damage, be sure to clear ice and snow from the wiper blades before using them. If they're frozen to the windshield, carefully loosen or thaw them. If your blades do become damaged, get new blades or blade inserts.

Heavy snow or ice can overload your wiper system. Clear away snow or ice to prevent an overload.

Low-Speed Delay Wipers (Motor Home Option)

You can set the wiper speed for a long or short delay between wipes. This can be very useful in light rain or snow. Turn the band to choose the delay time. The closer to LO, the shorter the delay.



All Vehicles
(Except W22)

Motor Home
(W22)

Windshield Washer

At the top of the multifunction lever there's a paddle with the word PUSH on it. To spray washer fluid on the windshield, push the paddle.



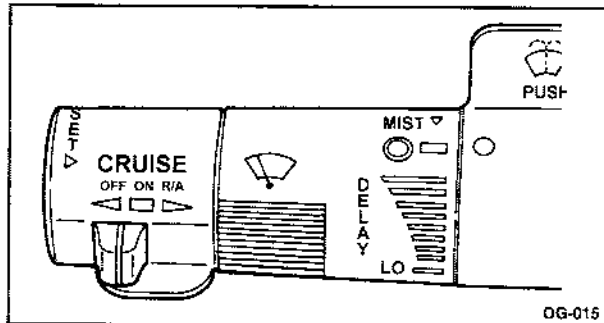
CAUTION

In freezing weather, don't use your washer until the windshield is warmed. Otherwise the washer fluid can form ice on the windshield, blocking your vision.

If you have the standard wipers, the wipers will keep going in LO until you turn the wiper control to OFF.

If you have the low-speed delay option, the wipers will clear the window and then either stop or return to your preset speed.

Cruise Control (Motor Home Option)



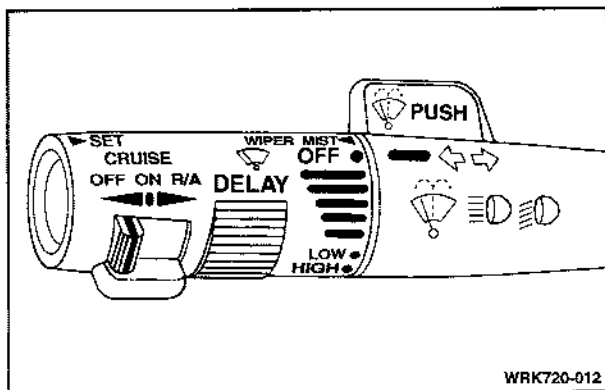
All Vehicles (Except W22)

Cruise Control

With cruise control, you can maintain a speed of about 25 mph (40 km/h) or more without keeping your foot on the accelerator. Cruise control does not work at speeds below about 25 mph (40 km/h), or above the set vehicle speed limit.

For the 3.9L diesel, 4.8L, 6.0L and 8.1L gasoline engines a warning light on the cluster will light up

when the cruise control is set and the maximum limited speed of the vehicle has been reached or exceeded.



Motor Home (W22)

When you apply your brakes, the cruise control shuts off.

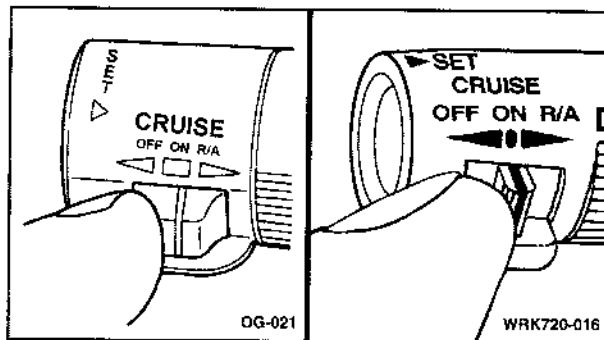


CAUTION

- Cruise control can be dangerous where you can't drive safely at a steady speed. So, don't use your cruise control on winding roads or in heavy traffic.
- Cruise control can be dangerous on slippery roads. On such roads, fast changes in tire traction can cause needless wheel spinning, and you could lose control. Don't use cruise control on slippery roads.

Setting Cruise Control**CAUTION**

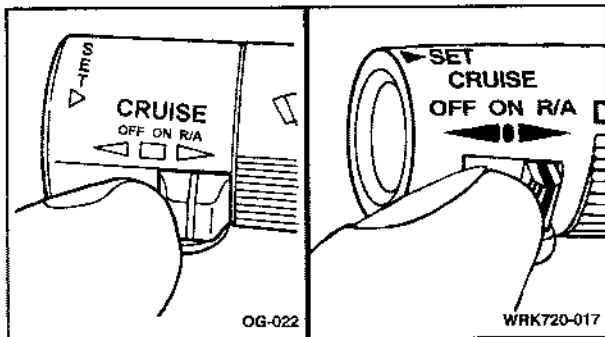
If you leave your cruise control switch on when you're not using cruise, you might hit a button and go into cruise when you don't want to. You could be startled and even lose control. Keep the cruise control switch off until you want to use it.

**All Vehicles
(Except W22)****Motor Home
(W22)**

1. Move the cruise control switch to ON.
2. Get up to the speed you want.
3. Push in the SET button at the end of the lever and release it.
4. Take your foot off the accelerator pedal.

Resuming a Set Speed

Suppose you set your cruise control at a desired speed and then you apply the brake. This shuts off the cruise control, but you don't need to reset it.



All Vehicles
(Except W22)

Motor Home
(W22)

Once you're going about 25 mph (40 km/h) or more, you can move the cruise control switch from ON to R/A for less than half a second.

Your vehicle will return to your chosen speed and stay there.

If you hold the switch at R/A longer than a second the vehicle will keep going faster until you release the switch or apply the brake. So unless you want to go faster, don't hold the switch at R/A.

Increasing Speed While Using Cruise Control

There are two ways to go to a higher speed:

- Use the accelerator pedal to get to the higher speed. Push the "SET" button at the end of the lever, then release the button and the accelerator pedal. You'll now cruise at the higher speed.
- Move the switch from ON to R/A. Hold it there until you get up to the speed you want, and then release the switch. To increase your speed in very small amounts, move the switch to R/A for less than a second and then release it. Each time you do this, your vehicle will go about 1 mph (1.6 km/h) faster.

Reducing Speed While Using Cruise Control

Push in the button at the end of the lever until you reach the lower speed you want, then release it.

To slow down in very small amounts, push the button for less than half a second. Each time you do this, you'll go 1 mph (1.6 km/h) slower.

Passing Another Vehicle While Using Cruise Control

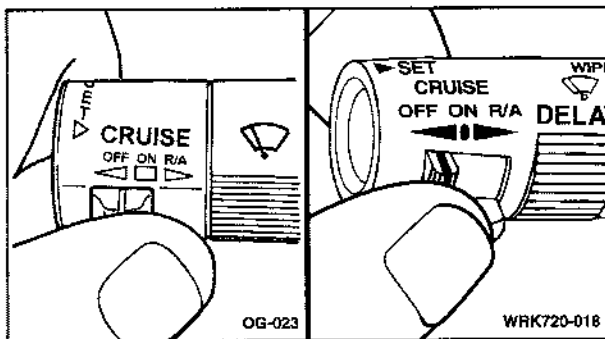
Use the accelerator pedal to increase your speed. When you take your foot off the pedal, your vehicle will slow down to the speed you set earlier.

Using Cruise Control on Hills

How well your cruise control will work on hills depends upon your speed, load and the steepness of the hills. When going up steep hills, you may have to step on the accelerator pedal to maintain your speed. When going downhill, you may have to brake or shift to a lower gear to keep your speed down. Of course, applying the brake takes you out of cruise control. Many drivers find this to be too much trouble and don't use cruise control on steep hills.

Ending Cruise Control

There are two ways to turn off the cruise control:



**All Vehicles
(Except W22)**

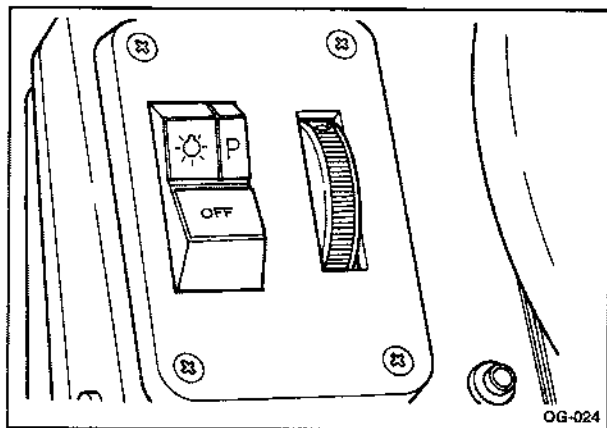
**Motor Home
(W22)**

- Step lightly on the brake pedal; or push the clutch pedal, if you have a manual transmission.
- Move the cruise switch to OFF.

Erasing Speed Memory

When you turn off the cruise control or the ignition, your cruise control set speed memory is erased.

Exterior Lamps



Your lamp switches are usually on the left side of the instrument panel.

Press the switch marked P to turn on:

- Parking Lamps
- Sidemarkers Lamps
- Tail lamps
- Instrument Panel Lights

Press the switch with the master lamp symbol to turn on all the lamps listed as well as the headlamps. The lamp switch may also control any other lamps or lights provided by the body manufacturer.

Press the bottom switch marked OFF to turn off all your lamps.

I/P Backlighting Adjustments

Backlighting can not be adjusted if the lamp switch is in the OFF position. Move the thumbwheel, located next to the main lamp switch, up to brighten your instrument panel lights. If you move the switch all the way up until it clicks, your interior lamps will come on if the body manufacturer wired your switch to these lamps. Move the thumbwheel down to dim your instrument panel lights.

If the thumbwheel is on the brightest setting but the instrument panel still appears dim, adjust the thumbwheel to the dimmest position and slowly readjust to the desired brightness.

Note: The thumbwheel may be speed sensitive.

A circuit breaker protects your headlamps. If you have an electrical overload, your headlamps will flicker on and off. Have your headlamp wiring checked right away if this happens.

Daytime Running Lamps

Daytime Running Lamps (DRL) can make it easier for others to see the front of your vehicle during the day (taillamps and marker lamps remain off). DRL can be helpful in many different driving conditions, but they can be especially helpful in the short periods after dawn and before sunset.

NOTE: Daytime running lamps are optional on some models.

Your headlamps will come on at reduced brightness in daylight when:

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

When you turn on your headlamps, the DRL will switch off and the exterior lamps will come on. (This feature may differ on Workhorse Custom Chassis RV models per Coach Motor homes.) When you turn off the headlamps, the exterior lamps will go out and the headlamps will switch to the reduced brightness of DRL again.

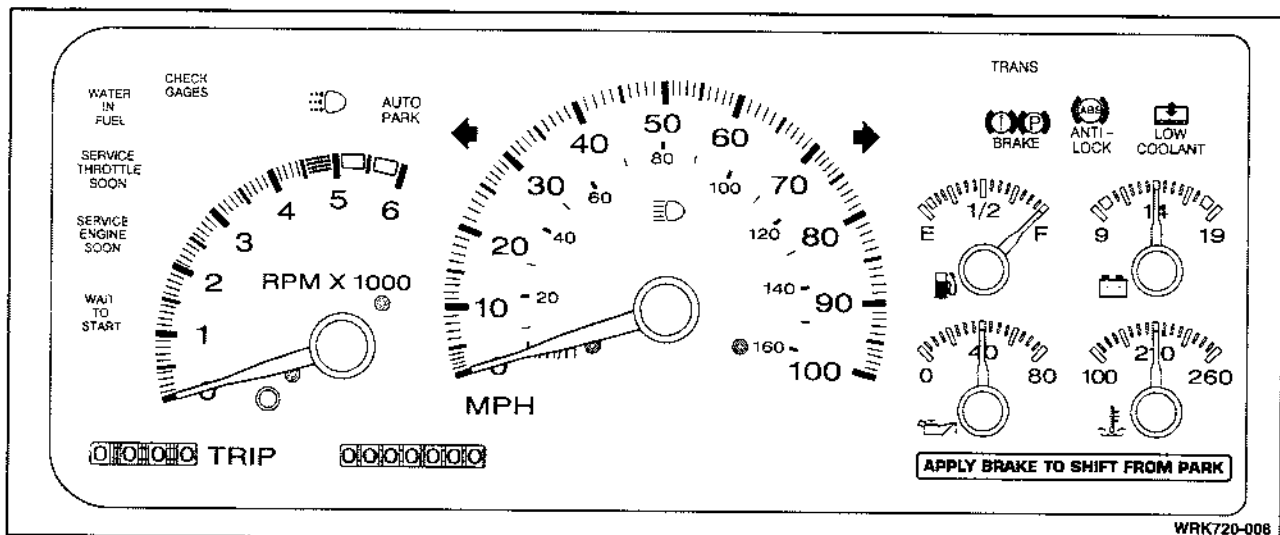
To idle your vehicle with the DRL off, set the parking brake. The DRL will stay off until you release the parking brake.

On motor home chassis vehicles with a 16,000 lb. (7 258 kg) through 18,000 lb. (8 165 kg) GVWR, the DRL will also turn off when you shift the transmission into PARK (P), which applies the parking brake. The DRL will remain off until the transmission is shifted out of PARK (P), the manual parking brake is fully released, and the parking brake warning light goes out.

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

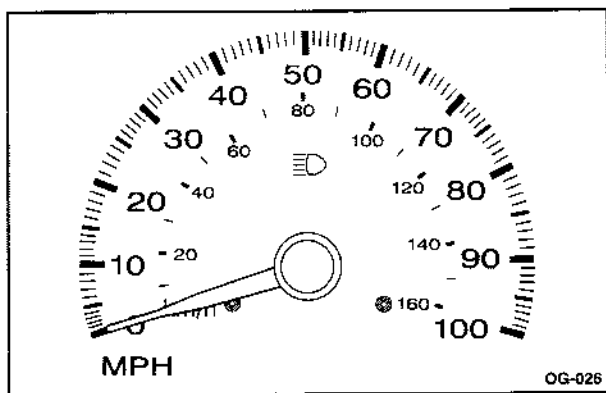
NOTE: Rear tail lamps and marker lamps are not lit when DRL are on.

INSTRUMENT PANEL CLUSTER TYPICAL — (4.3L, 5.7L GAS AND 6.5L DIESEL ENGINES ONLY)



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

Speedometer



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

Tamper Resistant Odometer 4.3L, 5.7L Gas and 6.5L Diesel Engines Only

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

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

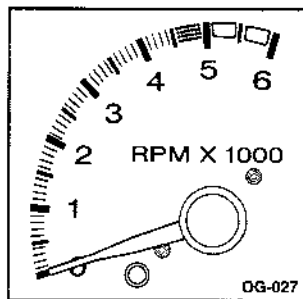
You may wonder what happens if your vehicle needs a new odometer installed. If the new one can be set to the mileage total of the old odometer, then it must be. But if it can't, then it's set at zero, and a label must be put on the driver's door to show the old mileage reading when the new odometer was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

The trip odometer can be used to record mileage on a short term basis and can be reset to zero by pushing the trip odometer reset button.

Road-Speed Limiter

On the 6.0L and 8.1L gas engine and the diesel 6.5L engine, the top speed is limited by the electronic throttle control (ETC). The ETC controls the throttle valve or diesel fuel rate to maintain the vehicle at the top speed limit. The fuel will be cut off at a slightly higher speed if the vehicle manages to exceed the ETC controlled limiter on a steep downhill. The road speed limiter sets the top speed limit on the turbocharged and normally aspirated diesel 6.5L engine at 75 mph (120 km/h). The 6.0L and 8.1L engines display a warning in the message center on the I/P cluster when the preset road speed limit has been reached or exceeded.

NOTE: Exceeding the posted speed limit is not condoned.

Tachometer — 4.3L and 5.7L Gas and 6.5L Diesel Engines Only

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

WARNING LIGHTS, GAGES AND INDICATORS — 4.3L AND 5.7L GAS AND 6.5L DIESEL ENGINES ONLY

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

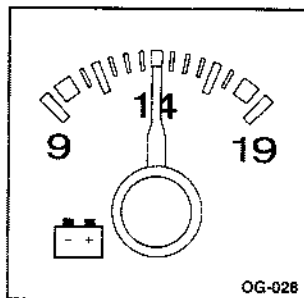
Warning lights and gages can signal that something is wrong before it becomes serious enough to cause an expensive repair or replacement. Paying attention to your warning lights and gages could also save you or others from injury.

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.

Voltmeter — 4.3L and 5.7L Gas and 6.5L Diesel Engines Only



When your engine is not running, but the ignition is on (in RUN), the 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 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 is not able to provide full power at engine idle. As engine speeds are increased, this condition should correct itself as higher engine speeds allow the charging system to create maximum power.

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

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

Battery Charging System Warning Lamp

This light is used by the charging system to warn that the system is not charging the battery. It will be on when the ignition is on and the engine is not running. If this light comes on when driving, turn off as many electrical loads as possible, specifically the air conditioning system. If the battery was fully charged when the light came on and the air conditioning system, radio, fan motors and etc., are turned off immediately, the vehicle might be capable of being driven for up to another hour, at highway speeds, before the engine will cut out due to a lack of electrical power. **Drive to the nearest service center to have the charging system serviced.**



CAUTION

If you continue to drive after the light comes on, keep a close eye on the engine coolant temperature gauge. The belt which drives the alternator also drives the engine water pump. If the temperature starts to rise after the light comes on, pull off of the road immediately. Continued driving with the light on and the temperature rising, will cause the engine to overheat. This can cause serious damage to the engine. The high temperature in the engine compartment might cause a fire.

On some vehicles an optional warning buzzer may also sound to indicate that the charging system voltage is too high, too low or that the charging system has failed. The buzzer will sound for 3 seconds or until the trip reset button is pressed, depending on the severity of the fault.

Auto Park Brake Light



If you have a motor home with a GVWR of 16,000 lbs. (7 258 kg) through 18,000 lbs. (8 165 kg), you will have this light on your instrument cluster.

It should come on as you start the vehicle and stay on when your transmission is in PARK (P). The light will also stay on while the system is building pressure to release the parking brake. If it doesn't come on then, have it fixed so it will be ready to warn you if there's a problem. If the light comes on frequently (less than 15 minute intervals) while driving, see your dealer for service on your auto park brake apply system.

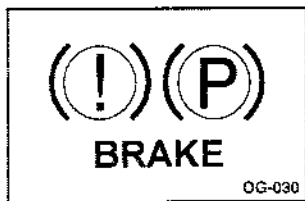
NOTICE

If your vehicle is moving, never turn your ignition key to OFF. If you do so, the AUTO PARK light will come on and the parking brake will be set. Damage can occur to your vehicle.

If your vehicle is moving and the engine stalls, shift into NEUTRAL (N) and use your regular brake to stop the vehicle. Turn the ignition key to OFF.

Brake System Warning Light

Your vehicle's hydraulic brake system is divided into two parts. If one part isn't working, the other part can still work and stop you. For good braking, though, you need both parts working well.



This light should come on briefly when you turn the ignition key to RUN.

If it doesn't come on then, have it fixed so it will be ready to warn you if there's a problem. If this warning light stays on after you start the engine there could be a brake problem. Have your brake system inspected right away.

If the light comes 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.

On the P32 motor home / P42 commercial this light will come on if there is a difference in pressure between the front and rear systems. On the W22 and W52 the light will also come on when the brake fluid level in the master cylinder is low and if there is no flow of hydraulic fluid in the brake boost system.

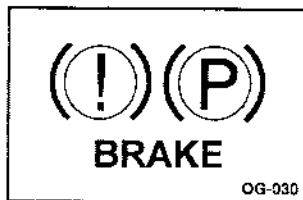
If the light is still on after you stop, have the vehicle towed for service. (See "Towing Your Vehicle" in the Index.)

Some school bus models also have a tone alarm that sounds if the pressure in the brake boost system gets too low.



CAUTION

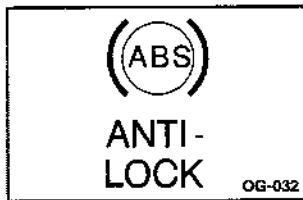
Your brake system may not be working properly if the brake warning light is on. Driving with the brake warning light on can lead to an accident. If the light is still on after you've pulled off the road and stopped carefully, have the vehicle towed for service.

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.

On the P32 motor home with a 16,000 lb. (7 258 kg) through 18,000 lb. (8 165 kg) GVWR, this light will come on and stay on when you set the parking brake with the pull button pulled out in any gear other than PARK (P). This light will come on when you set the parking brake by placing the transmission into PARK (P) and pull out the pull button. The light should go off when the transmission is in any gear other than PARK (P) and the pull button is pushed in. This light will come on and a tone alarm will sound if the parking brake system requires service.

Anti-Lock Brake System Warning Light

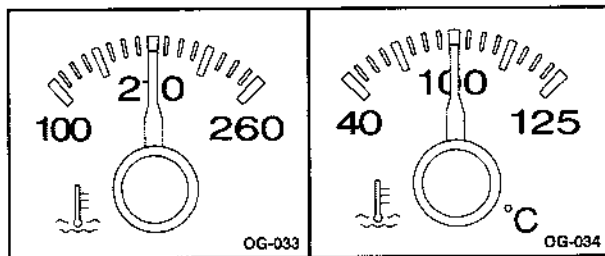
With the anti-lock brake system, this light will come on when you start your engine and may stay on for several seconds. That's normal.

If the light stays on, or comes on when you're driving, your vehicle needs service. If the regular brake system warning light isn't on, you still have brakes, but you don't have anti-lock brakes. If the regular brake system warning light is also 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 RUN. If the light doesn't come on then, have it fixed so it will be ready to warn you if there is a problem.

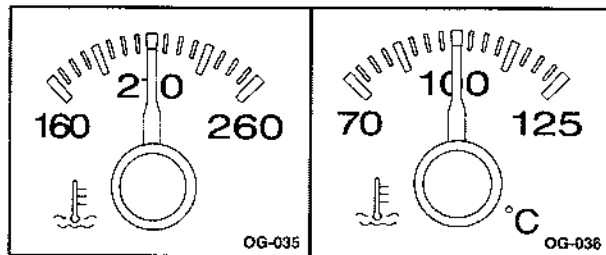
Engine Coolant Temperature Gage —**Except 8.1L Engines**

These gages show the engine coolant temperature. If the gage pointer moves into the red area, it means that your engine coolant has overheated.



**Gasoline Engine
(United States)**

**Gasoline Engine
(Export)**



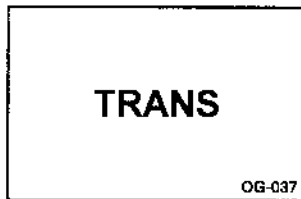
**Diesel Engine
(United States)**

**Diesel Engine
(Export)**

If you have been operating your vehicle under normal driving conditions, you should pull off the road, stop your vehicle and turn off the engine as soon as possible.

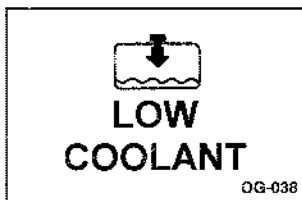
The "Problems on the Road," section of this manual shows what to do. See "Engine Overheating" in the index.

Trans Light — 5.7L Gas and 6.5L Diesel Engines Only



Indicates problem with Allison Transmission. Vehicle should be taken to dealer promptly.

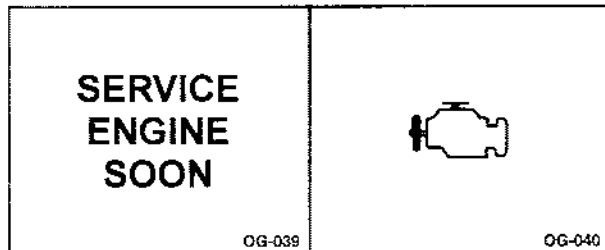
Low Coolant Warning Light (Diesel Engines Only)



If you have a diesel engine, you have a LOW COOLANT warning light. You will see this light for a few seconds when you start your engine.

If this light ever comes on when the engine is running, even briefly, your system is low on coolant and the engine may overheat. See "Engine Coolant" in the Index and have your vehicle serviced as soon as you can.

Service Engine Soon Light — 5.7L Gas and 6.5L Diesel Engines Only



United States

Export

Your vehicle is equipped with a computer which monitors operation of the fuel, ignition and emission control systems.

This system is called On-Board Diagnostics-First Generation, (OBD I for Federal) and On Board Diagnostics Second Generation (OBD II for California less than 14,000 lb. GVWR), and is intended to assure that emissions are at acceptable levels for the life of the vehicle, helping to produce a

cleaner environment. The SERVICE ENGINE SOON light comes on to indicate that there is a problem and service is required. Malfunctions often will be indicated by the system before any problem is apparent. This may prevent more serious damage to your vehicle. This system is also designed to assist your service technician in correctly diagnosing any malfunction.

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

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.

NOTICE

Modifications made to the engine, transmission, exhaust or fuel system of your vehicle or the replacement of the original tires with other than those of the same Tire Performance Criteria (TPC) can affect your vehicle's emission controls and may cause the SERVICE ENGINE SOON light to come on. Modifications to these systems could lead to costly repairs not covered by your warranty. This may also result in a failure to pass a required Emission Inspection/Maintenance test.

This light should come on, as a check to show you it is working, when the ignition is on and the engine is not running. If the light doesn't come on, have it repaired. This light will also come on during a malfunction in one of two ways:

- **Light Flashing** — A misfire condition has been detected. A misfire increases vehicle emissions and may damage the emission control system on your vehicle. Dealer or qualified service center diagnosis and service may be required.
- **Light On Steady** — An emission control system malfunction has been detected on your vehicle. Dealer or qualified service center diagnosis and service may be required.

If the Light Is Flashing

The following may prevent more serious damage to your vehicle:

- Reducing vehicle speed.
- Avoiding hard accelerations.
- Avoiding steep uphill grades.
- If you are towing a trailer, reduce the amount of cargo being hauled as soon as it is possible.

If the light stops flashing and remains on steady, see "If the Light Is On Steady" following.

If the light continues to flash, when it is safe to do so, *stop the vehicle*. Find a safe place to park your vehicle. Turn the key off, wait at least 10 seconds and restart the engine. If the light remains on steady, see "If the Light Is On Steady" following. If the light is still flashing, follow the previous steps, and drive the vehicle to your dealer or qualified service center for service.

If the Light Is On Steady

You may be able to correct the emission system malfunction by considering the following:

Did you recently put fuel into your vehicle?

If so, reinstall the fuel cap, making sure to fully install the cap. See "Filling Your Tank" in the Index. The diagnostic system can determine if the fuel cap has been left off or improperly installed. A loose or missing fuel cap will allow fuel to evaporate into the atmosphere. A few driving trips with the cap properly installed should turn the light off.

Did you just drive through a deep puddle of water?

If so, your electrical system may be wet. The condition will usually be corrected when the electrical system dries out. A few driving trips should turn the light off.

Are you low on fuel?

As your engine starts to run out of fuel, your engine may not run as efficiently as designed since small amounts of air are sucked into the fuel line causing

a misfire. The system can detect this. Adding fuel should correct this condition. Make sure to install the fuel cap properly. See "Filling Your Tank" in the Index. It will take a few driving trips to turn the light off.

Have you recently changed brands of fuel?

If so, be sure to fuel your vehicle with quality fuel (see "Fuel" in the Index). Poor fuel quality will cause your engine not to run as efficiently as designed. You may notice this as stalling after start-up, stalling when you put the vehicle into gear, misfiring, hesitation on acceleration or stumbling on acceleration. (These conditions may go away once the engine is warmed up.) This will be detected by the system and cause the light to turn on.

If you experience one or more of these conditions, change the fuel brand you use. It will require at least one full tank of the proper fuel to turn the light off.

If none of the above steps have made the light turn off, have your dealer or qualified service center check the vehicle. Your dealer has the proper test equipment and diagnostic tools to fix any

mechanical or electrical problems that may have developed.

Malfunction Indicator Lamp (Service Engine Soon Light) (Diesel Engine)

For 6.5L diesel engines your vehicle comes equipped with a computer which monitors operation of the fuel, timing and emission control systems.

This system is called On-Board Diagnostics-Second Generation (OBD II for California less than 14,000 lb GVWR), and is intended to assure that emissions are at acceptable levels for the life of the vehicle, helping to produce a cleaner environment. The SERVICE ENGINE SOON light comes on to indicate when service is required. Malfunctions often will be indicated by the system before any problem is apparent. This may prevent more serious damage to your vehicle. This system is also designed to assist your service technician in correctly diagnosing any malfunction.

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.

NOTICE

Modifications made to the engine, transmission, exhaust or fuel system of your vehicle or the replacement of the original tires with other than those of the same Tire Performance Criteria (TPC) can affect your vehicle's emission controls and may cause the light to come on. Modifications to these systems could lead to costly repairs not covered by your warranty. This may also result in a failure to pass a required Emission Inspection/Maintenance test.

If the Light Comes On

This light should come on, as a check to show you it is working, when the ignition is on and the engine is not running. If it doesn't, have it repaired. This light will also come on if an emission control system malfunction has been detected on your vehicle. Dealer or qualified service center diagnosis and service may be required.

You also may be able to correct the emission system malfunction by considering the following:

Did you just drive through a deep puddle of water?

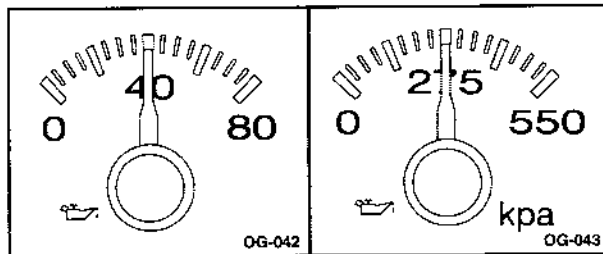
If so, your electrical system may be wet. The condition will usually be corrected when the electrical system dries out. A few driving trips should turn the light off.

Are you low on fuel?

As your engine starts to run out of fuel, your engine may not run as efficiently as designed since small amounts of air are sucked into the fuel line. The system can detect this. Adding fuel should correct this condition. It will take a few driving trips to turn the light off.

If none of the above steps have made the light turn off, have your dealer or qualified service center check the vehicle. Your dealer has the proper test equipment and diagnostic tools to fix any mechanical or electrical problems that may have developed.

Engine Oil Pressure Gage — 5.7L Gas and 6.5L Diesel Engines Only



United States

Export

The oil pressure gage shows the engine oil pressure in psi (pounds per square inch) or with export vehicles in kPa (kilopascals) when the engine is running.

Oil pressure may vary with engine speed, outside temperature and oil viscosity, but readings above the low pressure zone indicate the normal operating range. The gage is in the lower right corner of the instrument cluster.

A reading in the low pressure zone may be caused by a dangerously low oil level or other problems causing low oil pressure. If your engine is idling, though, a lower pressure is normal.



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.

Service Throttle Soon Light

**SERVICE
THROTTLE
SOON**

OG-044

On the 6.5L diesel engines a computer monitors the operation of the electronic accelerator.

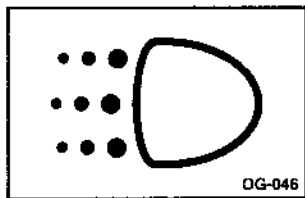
This light should come on when the ignition is on but the engine is not running, as a check to show you it's working. If it does not come on at all, have it fixed right away. If the light stays on after the engine starts or comes on while you are driving, the computer is indicating that you have a problem. You should take your vehicle in for service soon.

Wait to Start Light (Diesel Engines Only)



Your diesel engine has a special starting system. When the WAIT TO START light goes off, your engine is ready to be started.

Daytime Running Lamp (DRL) Indicator Light



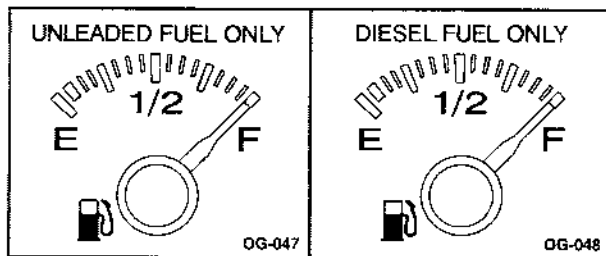
The DRL indicator is on whenever the ignition is on and the headlamp switch and parking brake are off. This light tells you that your DRL are on.

For more details, see "Starting Your Diesel Engine" in the Index.

Fuel Gage

The fuel gage tells you about how much fuel you have left, when the ignition is on. When the gage first indicates empty, you still have a little fuel left, but you should get more fuel soon. (Export vehicles will not have the unleaded fuel label.)

If your fuel gage indicates full at all times (gasoline engines only), the fuel gage reading may be suspect. Have your vehicle serviced immediately.



3.5 L and 5.7L Gasoline

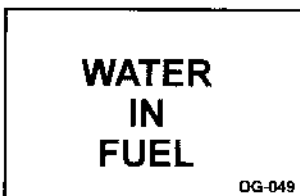
6.5L Diesel

Here are four things some owners ask about. None of these show a problem with your fuel gage.

- At the gas station, the gas pump shuts off before the gage reads full.
- The fuel tank will take either a little more or less fuel to fill up than the fuel gage shows.
- 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.

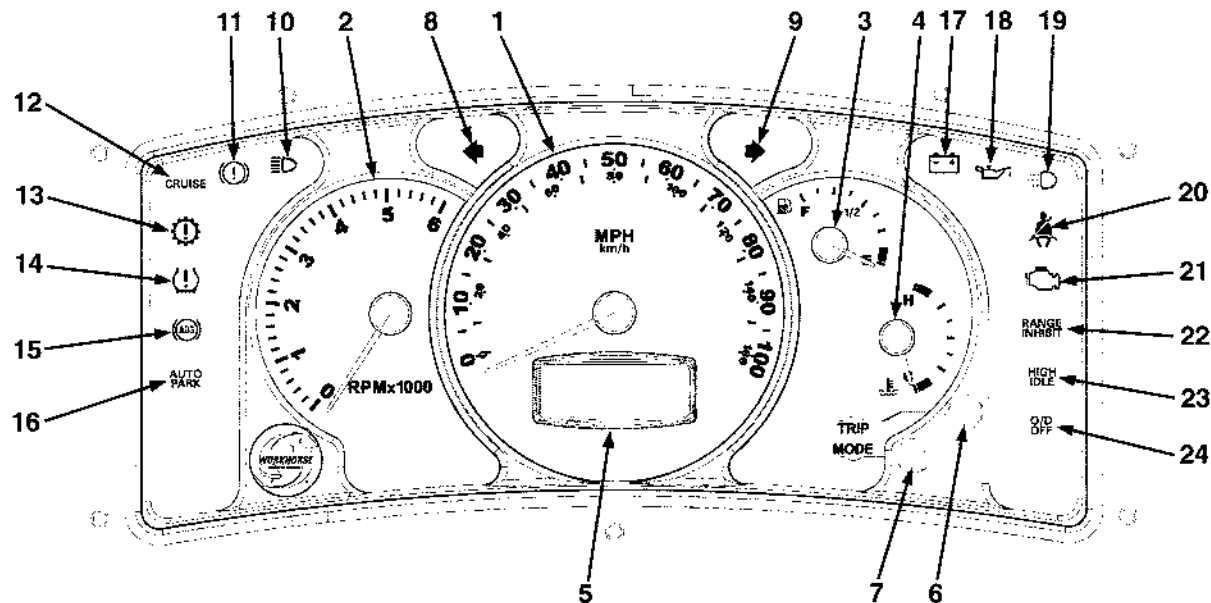
For your fuel tank capacity, see "Fuel Capacity" in the Index.

Water In Fuel Light (Diesel Engines Only)



This light will come on to warn you if there is water in the diesel fuel system. For more information on how this light works, see "Diesel Fuel Requirements and Fuel System" in the Index.

INSTRUMENT PANEL CLUSTER - 4.8L, 6.0L AND 8.1L GASOLINE ENGINES



1	Speedometer	13	Transmission Fail Warning Light
2	Tachometer	14	Tire pressure monitoring telltale
3	Fuel Gauge	15	Anti-lock Brake System Warning Light
4	Engine Coolant Temperature Gauge	16	Auto Park Brake Engaged Warning Light
5	LCD Screen	17	Battery Charging System Warning Light
6	Trip Button	18	Engine Oil Pressure Warning Light
7	Mode Button	19	Daytime Running Lamps On Warning Light
8	Turn signal LH turn active	20	Seat Belt Reminder Warning Light
9	Turn signal RH turn active	21	Service Engine Warning Light
10	Headlight High Beam On Warning Light	22	Transmission Range Inhibit On Warning Light
11	Brake fail and Park Brake Warning Light	23	High Idle Enabled On Warning Light
12	Cruise Control Active Warning Light	24	Overdrive Off Warning Light

**INSTRUMENT PANEL CLUSTER
MODEL OPTIONS — 4.8L, 6.0L AND 8.1L**

The instrument cluster is available in two models:

- **Base Instrument Cluster**
- **Base Instrument Cluster with Trip Computer (CTC)**

The hardware features of both the instrument cluster options are the same, and for this reason the Base Instrument Cluster function is described in detail. Additional features and functions of the Trip Computer option are described in that section.

Base Instrument Cluster Features

The instrument cluster is equipped with the following listed features (Refer to the illustration).

Trip Button:

- Selects and resets the trip 1 and 2 odometers.
- Scrolls upwards in the menu display.
- Is used with the Mode button to select menu choices and toggle between Metric and US units.
- Displays the odometer reading when ignition is "OFF".
- Acknowledges the sounding of the buzzer and chimes.

Mode Button:

- Selects inquiry mode (only available if equipped with PRND321 display).
- Scrolls downward in the menu display.
- Is used with the Trip Button to select menu choices and toggle between Metric and US units.
- Displays the odometer reading when ignition is "OFF".

- Is used to enter the cluster diagnostic mode.

Liquid Crystal Display (LCD) Screen:

- Indicates transmission gear selection on vehicles equipped with an automatic transmission (if the steering column is not equipped with a gear selection indicator).
- Odometer with maximum mileage accumulated to 999999.9 miles / km.
- Trip odometer 1 and 2 (independent functions).
- Battery voltage.
- Oil Pressure or PRND321 (depends on the user selection).
- Warning messages to provide more detail if the vehicle condition monitoring system detects a fault (this will interrupt monitoring data displayed).

Odometer display with the ignition "OFF":

- Switch vehicle headlights to "ON". The odometer can be read until the lights are switched "OFF".

or

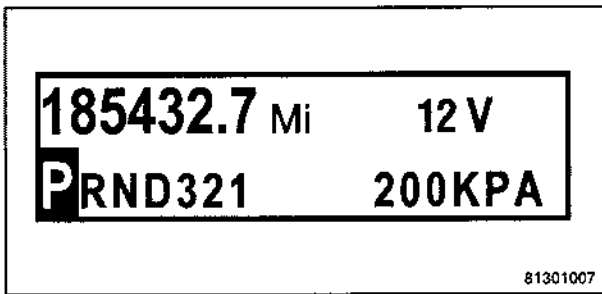
- Press the Trip or Mode button to view the odometer.

Self-testing Feature:

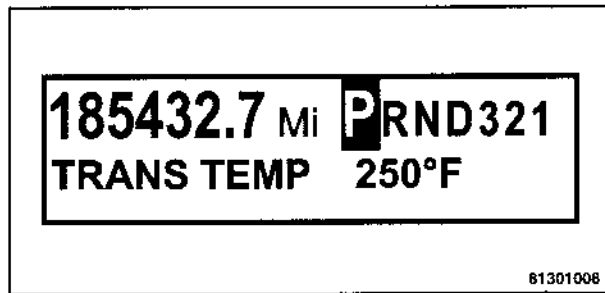
- Insert key into the ignition and switch to "ON". The instrument cluster will automatically perform a self-test and display any errors found on the LCD screen.

Default LCD Screen layout:

The default settings of the LCD Screen layouts for the Base Instrument Cluster are described below. (The tables are a representation of the LCD Screen divided into quarters or four separate sections).



Factory Default LCD Screen Layout



Factory Default LCD Screen layout
(warning message active)

Base Cluster with transmission gear selection displayed on steering column

Left half of screen	Right half of the screen
ODOMETER / TRIP ODOMETER	Battery Voltage
OIL PRESSURE	

Base Cluster with transmission gear selection displayed on instrument cluster LCD Screen

Left half of the screen	Right half of the screen
ODOMETER / TRIP ODOMETER	PRND321 / Battery Voltage
OIL PRESSURE / PRND321	

Accessing Menu's and changing the default LCD screen display:

- The default screen display can be changed as follows:
 - **Step 1** — Press the Mode button to enter the Inquiry Menu
 - **Step 2** — Highlight choice by scrolling up or down with the Trip or Mode button.
 - **Step 3** — Make selections automatically by waiting 3 seconds or press and release both the Trip and Mode buttons simultaneously.
- The selection is highlighted.
- The Trip button scrolls up and the Mode button scrolls down.
- Pressing the Trip and Mode button and releasing them at the same time selects the item, or selection can be made automatically by waiting 3 seconds.

Changing Units:

- Press and release both the Trip and Mode buttons simultaneously to toggle between Metric and US units while in the default LCD screen.

Trip Odometer resets:

- Select the Trip Odometer you want to reset by pressing the Trip button.
- Press and hold the Trip button for at least 2 seconds to reset it.

Warning message feature:

- If the vehicle condition monitoring system detects a fault, a message will be displayed on the LCD screen, a warning light will come on accompanied by a buzzer or chime.
- The fault message will take priority and interrupt the bottom line of the LCD display screen, accompanied by a buzzer or chime. The transmission gear selection indicator (PRND321) will move to the upper RH corner of the LCD display screen.

- If more than one fault is detected, each message will be displayed for three seconds, one after the other.
- A message is displayed until the fault is corrected or the user acknowledges the fault by pressing the Trip button. NOTE: If the ignition is switched "OFF" with an active fault, the message will be displayed again once the ignition is switched "ON".

Message meanings:

- **Door Ajar** — This message will be displayed when a door is not in the fully closed position.
- **Vehicle Speed Control Active** — This message will be displayed if the pre-set maximum speed of the vehicle is exceeded.
- **Low Fuel** — This message is displayed when the fuel level in the tank reaches 15% remaining.
- **Oil Pressure Low** — This message will be displayed if the engine oil pressure drops too low.
- **Check Engine Oil level** — This message will be displayed if the engine oil level drops below the

minimum level (only available on the 6.0L gas engine).

- **Check Engine Temperature** — This message will be displayed if the engine temperature is too high.
- **Check Transmission Temperature** — This message will be displayed if the transmission temperature is too high (only with automatic transmission).
- **Check Coolant Temperature** — This message will be displayed if the engine coolant temperature is too high.
- **Reduced Engine Power** — This message will be displayed if the engine controller detects a condition that may cause damage to the engine. If this happens, stop the vehicle, turn off the ignition, wait approximately 10 seconds, and restart the engine. If the message and warning light stay on after the restart, have the vehicle serviced (only available on 8.1L gas engine).
- **Check Battery** — This message will be displayed if the battery voltage drops below or exceeds the safe margin set.

The instrument cluster is equipped with a tone generator to draw the users attention to specific warning conditions. These conditions will be displayed on the LCD screen as messages, or on the warning lamps. The tone generator will either sound the buzzer for serious conditions or the chime as a reminder.

Buzzer warning conditions:

- **High engine coolant temperature** — The buzzer sounds for 3 seconds or until the user acknowledges the warning by pressing the trip-reset button accompanied with either a "Check Coolant Temperature" or "Check Engine Temperature" message.
- **Low oil pressure** — The buzzer sounds until the user acknowledges the warning by pressing the trip-reset button accompanied with a "Low Oil Pressure" message.
- **Low fuel** — The buzzer sounds for 3 seconds or until the user acknowledges the warning by pressing the trip-reset button when the fuel tank is at or below 15% of tank capacity.

- **Low Engine Coolant** — The buzzer sounds until the user acknowledges the warning by pressing the trip-reset button with engine running accompanied with a "Low Coolant" message (Not available on gas engines).
- **High Transmission Fluid Temperature** — The buzzer sounds for 3 seconds or until the user acknowledges the warning by pressing the trip-reset button (Automatic Transmissions only).
- **Low voltage** — The buzzer sounds until the user acknowledges the warning by pressing the trip-reset button with engine running and the battery voltage dropping below 10.5 V for a continuous period of 30 seconds.
- **High voltage** — The buzzer sounds until the user acknowledges the warning by pressing the trip-reset button with engine running and the battery voltage exceeding 16 V for a continuous period of 5 seconds.
- **Charging problem** — The buzzer sounds for 3 seconds or until the user acknowledges the warning by pressing the trip-reset button with the "Battery Charge" warning light on.

- **Brake System Failure** — The buzzer sounds until the user acknowledges the warning by pressing the trip-reset button with the "Brake System Failure" warning light on.

Chime warning conditions:

- **Park Brake Reminder** — The chime will sound when the park brake is applied and vehicle speed is above 3 mph (4.8km/h). In the case of an automatic transmission, with the engine running, the park brake applied for longer than 3 seconds and the transmission out of Park, the chime sounds until it is acknowledged by pressing the trip-reset button or the park brake is released or the transmission range selector is moved to Park or the engine stop running.

- **Seat Belt Reminder** — When the driver's seat belt is not fastened, the chime will sound. If the seat belt is buckled during this 8-second period, the audible warning turns off.
 - **Turn Signal Reminder** — The chime will sound at the turn signal flasher rate, if the vehicle is in motion with the hazard switch off, and the left or right turn signal switch is activated and remains activated for more than a 3/4 mile.
 - **Headlights On Reminder** — If the ignition is switched "OFF" and the headlights are left on, the chime will sound until the headlight switch is turned off, or the dimmer control is turned to the dome lamp position, or the trip reset button is pressed.
 - **Key-In Ignition Reminder** — The chime will sound when the key is left in the ignition with the ignition "OFF" and the driver's door is opened. The chime will continue to sound until either the driver's door is closed or the key is removed from the ignition. The availability of this feature is dependent on body-builder wiring.
- Engine Oil change reminder message reset:
- **Method 1**
 - Perform oil change as normal.
 - Turn ignition switch to "ON" position, but do not start engine.
 - Fully press and release the accelerator pedal three times within 5 seconds, and turn ignition "OFF" for at least 10 seconds.
 - The oil life counter on the engine controller will be reset to start a new cycle.
 - **Method 2**
 - Perform oil change as normal at a certified Workhorse Service Center (Service Center will reset the message).

Base Instrument Cluster with Trip Computer (CTC)

In addition to all the features as described for the Base Instrument Cluster, this option of the instrument cluster has additional functionality added in the form of a Trip Computer (CTC).

The user can select one of the following to be displayed on the LCD Screen (lower line) from the list below:

- **Instantaneous Fuel Consumption (liters per hour)** — Selecting this menu option will display the instantaneous fuel consumption, but will read "---" when the vehicle is stationary.
- **Average Fuel Consumption** — Selecting this menu option will display the average fuel consumption, based on the instantaneous fuel consumption over the last 50 miles (80 km).

- **Fuel range** — Selecting this menu option will display the available fuel range, based on the remaining fuel capacity and the average fuel consumption over the last 50 miles (80 km). The display will read "---" below 15% of tank capacity.
- **Average Vehicle Speed** — Selecting this menu option will display the average vehicle speed based on the time and distance traveled since the last reset.
- **Outside Temperature** — Selecting this menu option will display the outside temperature.
(Subject to body manufacturer installation specifications.)

Selection of the LCD lower line display:

- The Trip Computer allows the user to select the function to be displayed from the menu by the following method:
 - **Step 1** — Press the Mode button to enter Inquiry Menu
 - **Step 2** — Highlight Trip Computer by scrolling up or down with the Trip or Mode buttons.
 - **Step 3** — Make selection automatically by waiting 3 seconds or pressing and releasing both Trip and Mode buttons simultaneously.

The LCD Screen layouts are described with the different options of the Base Instrument Cluster with Trip Computer (CTC) as follows. (The tables are a representation of the LCD Screen divided into quarters or four separate sections).

Base Cluster with CTC and transmission gear selection displayed on steering column

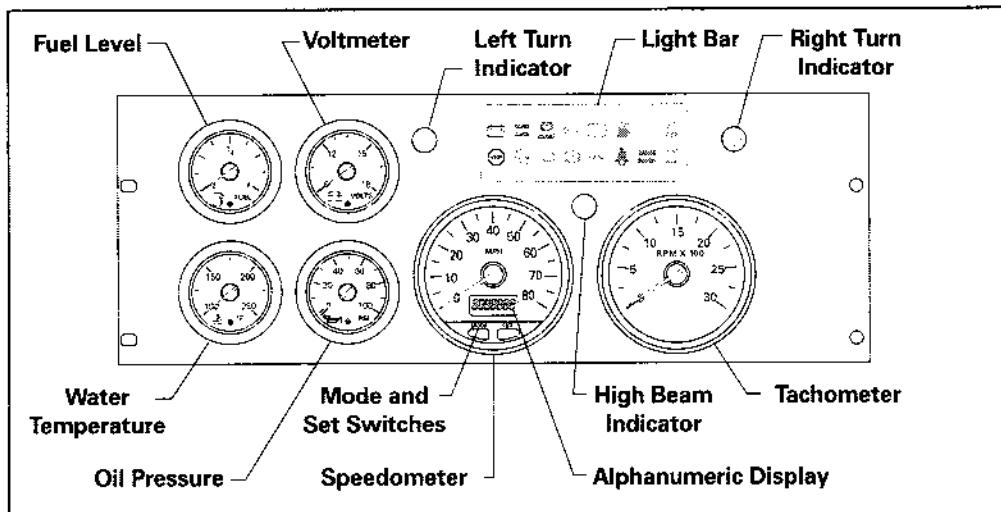
Left half of the screen	Right half of the screen
ODOMETER / TRIP ODOMETER	Battery Voltage
OIL PRESSURE / Trip Computer option selected	

Base Cluster with CTC and transmission gear selection displayed in instrument cluster LCD Screen

Left half of the screen	Right half of the screen
ODOMETER / TRIP	PRND321 / Battery Voltage
OIL PRESSURE / Trip Computer option selected / PRND321	

Instrument Cluster Panel with Cummins 3.9T Diesel Engine

The purpose of the instrumentation is to display the operational status of the vehicle. In addition to the gauges and light bars, the instrumentation contains an alphanumeric display that lets the driver know when a condition or event occurs that requires attention.



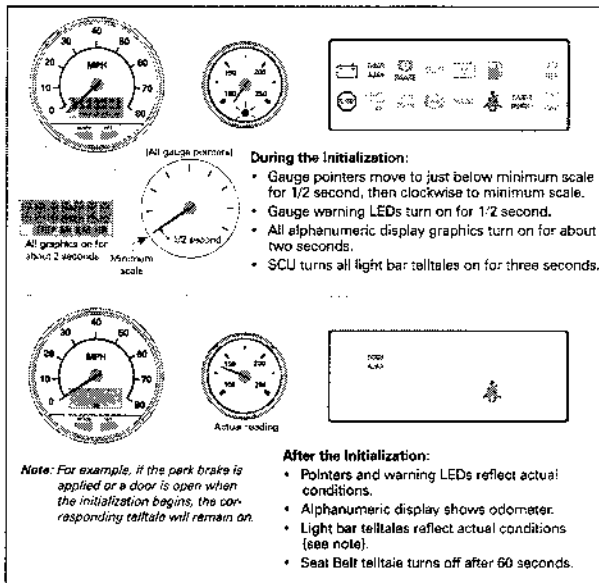
Panel Layout

Ignition Key On Position

Turning the ignition to the ON position, activates the instrumentation and starts an initialization sequence. This sequence gives the operator a chance to verify correct operation of the gauges and indicators.

Your vehicle will require service if any of the following conditions occur after the initialization sequence.

- A telltale does not light, or is always on
- A 2-inch gauge's pointer stays at minimum scale and its warning LED flashes slowly, indicating the gauge is not receiving data from the vehicle data bus.
- A 2-inch gauge's pointer goes to full or minimum scale and its warning LED flashes rapidly, indicating the gauge has received invalid or out-of-range data.



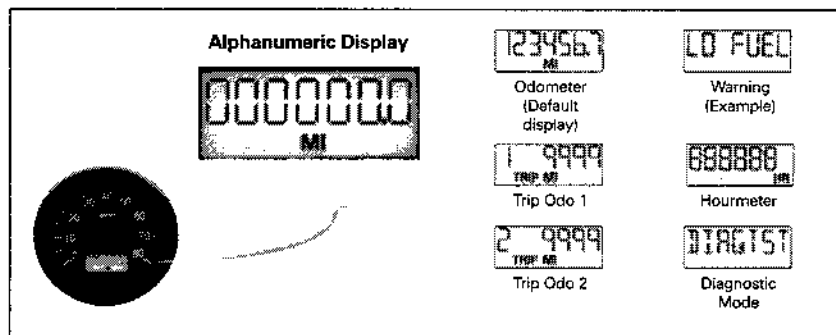
"Ignition Key On" System Initialization

Mode and Set Switches

The mode and set switches are buttons in the speedometer that allow you to select, set, and reset displays in the Alphanumeric Display. They also allow you to scroll through active system warning messages.

Alphanumeric Display

Turning the ignition to the on position activates the Alphanumeric Display in the speedometer. When the ignition is off, turning on the backlighting or pressing the mode or set switch activates the display for 10 seconds, allowing one to use the display without an ignition key.



Normal Operation Displays

Normal Operating Mode

After the initialization sequence, the Alphanumeric Display goes into its normal operating mode. First it displays all unacknowledged messages (if they exist), then it displays the odometer. The non-resettable odometer displays up to 999999.9 miles or kilometers. After that, it displays 1000000 to 9999999 without a decimal point.

The following displays are also available by pressing the mode switch.

- **Trip Odometers** - Two independently resettable trip odometers are available, each with a maximum display of 9999.9 miles or kilometers.
- **Hourmeter** - The non-resettable hourmeter displays up to 999999 hours.

In addition to these displays, the Alphanumeric Display can be used to view fault codes and up to

the last six warning messages.

System Diagnostic Test Mode

The System Diagnostic Test mode offers three functions:

- **Auto** - a fully automatic test of all modules, displays and telltales
- **Manual** - manual selection of individual modules and telltales to test
- **Faults and Warnings** - recalls up to 128 device faults and the six most recently acknowledged warning messages.

To access the System Diagnostic Test mode, turn the ignition to the ON position and press the mode switch until *DIAGTST* appears in the display. Then press the set switch to enter the System Diagnostic Test mode. *AUTO* will be displayed.

Auto Test Mode

During the Auto Test mode, the I/P generates its own pointer positioning and warning LED data. If the instrumentation passes the Auto test, everything in the instrumentation display (except the input circuits) is functioning properly. Thus if the instrumentation fails during normal operation and passes the Auto Test, the failure is due to either the I/P itself or the vehicle's inputs to the I/P.

Manual Test Mode

The Manual Test mode is the same as the Auto Test mode except that individual modules, displays, and telltales can be isolated and tested.

Faults and Warning Messages

Fault Codes

When the engine Electronic Control Module (ECM) detects a fault, it can set an active fault code. The active fault code describes a specific type of failure (for

example, low oil pressure). Each fault code is accompanied by a **device fault code** identifying the device that detected the fault. If the user presses the set switch when *FAULTS* is displayed, the I/P displays *POLLING*. After all the active fault codes have been received, the ECM displays the device fault codes one-at-a-time in 3-second intervals. Pressing the mode or set switch during this time exits the Fault mode.

Warning Messages

When a problem exists with the vehicle, an active fault code will set. Examples of potential problems are low oil pressure, high coolant temperature and high transmission temperature. When an active fault code exists, a warning message will display, the buzzer will sound and a warning LED will display in the appropriate gauge.

Acknowledged Warning Messages

Unless otherwise stated, the user can acknowledge an unacknowledged message by pressing the set switch when the message is visible. The I/P will turn the buzzer off and display either the odometer or the next unacknowledged message if one exists.

The I/P stores the six most recent messages for later viewing. If more than six messages have been acknowledged, the oldest one will be deleted.

Messages can be viewed and acknowledged using the mode and set switches. The last message to be acknowledged will be the first message to be displayed. If the mode switch is not pressed for 15 seconds, the I/P will display the odometer (or the next unacknowledged message, if one exists).

Gauge Warning LEDs

When a I/P detects that the data received for a particular gauge is out of range the gauge LED will rapidly flash and the pointer will indicate zero (input is too low) or full scale (input is too high). This indicates that although the I/P is receiving data for the gauge, the input is out of range.

Slow Flashing LED

If the I/P does not receive any input at all for a particular gauge, it will flash that gauge's warning LED slowly (about once per second) and position its pointer to zero.

Engine Oil Pressure Gauge LED

if the I/P receives an active fault code, it turns on the LED in the Oil Pressure gauge, displays *OILP LO* in the Alphanumeric Display, and sounds the buzzer.

Coolant Temperature Gauge LED

When a high Coolant Temperature condition exists, the LED in the Coolant Temperature gauge, displays *H2OT HI* in the Alphanumeric Display, and sounds the buzzer.

Voltmeter Gauge LED

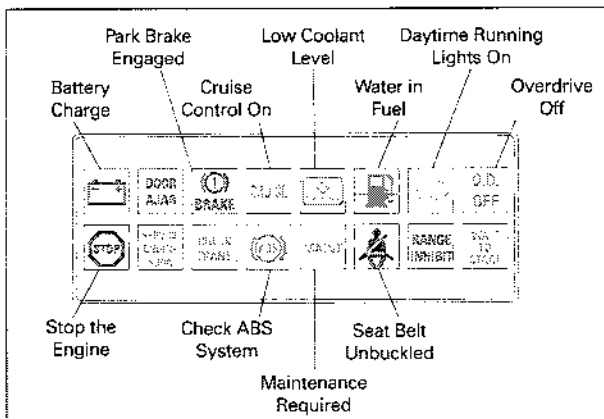
When the battery voltage is less than 10 volts or more than 17 volts, the I/P turns on the warning LED in the Voltmeter gauge and the Battery telltale in the light bar. It does not turn the buzzer on, nor does it display a message in the Alphanumeric Display.

Fuel Level Gauge LED

When the I/P detects the fuel level is less than 1/8 tank, it turns on the warning LED in the Fuel Level Gauge. It does not turn the buzzer on, nor does it display a message in the Alphanumeric Display.

Light Bar Telltales

The light bar contains the telltales shown below. Some of the telltales are controlled by direct inputs from switches while others are controlled by the ECM.



Light Bar Telltales

Battery Charge - When the battery voltage is below or above safe margin setting.

Door Ajar - When a door is not in a fully closed position.

Brake - Park Brake is applied.

Cruise - Vehicle cruise is engaged.

Low Coolant Level - Engine Coolant is low.

Water in Fuel - The system has detected water in the fuel. **The engine power and speed will be reduced.**

Daytime Running Lights On - The headlights are illuminated for safety.

Overdrive off - Operator has selected to operate the vehicle in all ranges except Overdrive.

Stop Engine - The Engine ECM has detected that a Critical Engine Operation Condition exists. The Engine ECM will shut down the engine if the condition is not repaired immediately.

Service Engine Soon - The Engine ECM has detected that a Engine Operation Condition is out of range. **The engine power and speed will be reduced.**

Check Trans - The Transmission ECM has detected that a transmission operation/condition is out of range. Therefore transmission operation may be restricted.

ABS - The Anti Lock Brake System has detected a fault.

Maintenance - The Engine ECM indicates that certain Routine Maintenance procedures need to be performed.

Seat Belt - A seat belt is not latched. Light will remain on for 60 seconds.

Range Inhibit - The Transmission ECM has prevented a range selected by the operator.

Wait to Start - The engine Pre-heat system has been activated. Wait until the light goes off before engaging the starter.

*** Note: This vehicle's standard Electronic Engine Calibration is for an automatic engine idle shut down after 5 minutes without driver input.**

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.

Control of a Vehicle84	Hill and Mountain Roads87
Braking85	Recreational Vehicle Towing89
Steering87	Loading Your Vehicle90

**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.

**CAUTION**

For high GVWR vehicles, operating above 12,000 lbs. (5 400 kg), your vehicle may handle differently than a typical passenger car or light truck. That is because of the increased forces created by high weight and a higher center of gravity. This requires driver sensitivity while using the brakes for stopping distances, slowing of the vehicle on down grades and cornering.

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.

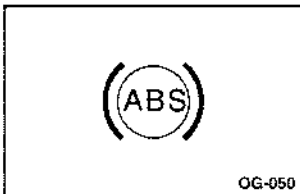
1. And, of course, actual stopping distances vary greatly with the surface of the road (whether it's pavement or gravel); the condition of the road (wet, dry, icy); tire tread; the condition of your brakes; the weight of the vehicle and the amount of brake force applied.

2. Avoid needless heavy braking. Some people drive in spurts of 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.
3. If your engine stops while driving a P32 motor home / P42 commercial, 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.
4. If your engine stops while driving a W22 motor home or a W52 commercial vehicle, the brake system will continue to perform normally.

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. Here's what happens with ABS.

A computer senses that wheels are slowing down. If one of the wheels is about to stop rolling, for the P32 motor home / P42 commercial models, the computer will separately work the brakes at each front wheel and at both rear wheels. For W22 motor home or a W52 commercial vehicle, 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.

You can 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 vibrate, or you may notice some noise, 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.

It is more difficult to steer the vehicle when it is stopped. To make it easier to steer, release the brakes slightly and allow the vehicle to move in slow motion.



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.

HILL AND 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. Shifting out of overdrive to lower gear(s) when you go down a steep or long hill, allows the engine to be part of the braking process.
- When in mountain/high altitude conditions, Workhorse Custom Chassis recommend downshifting to utilize engine braking. This will enhance brake pad life and will minimize wear and rotor warpage.

**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**

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.

RECREATIONAL VEHICLE TOWING

Gross Vehicle Weight Rating (GVWR) is the maximum permissible weight of this fully loaded Motorhome. Gross Combination Weight Rating (GCWR) means the maximum allowable loaded weight of this Motorhome and any towed trailer or towed vehicle. Gross Combination Weight Rating (GCWR) is usually greater than the Gross Vehicle Weight Rating (GVWR). Towing capability will be determined by considering the five factors below:

1. The weight imposed on the towing vehicle's rear axle (combination weight on rear axle from towing vehicle and tongue load from towed load) shall not exceed the Gross Rear Axle Weight Rating as specified by the final stage manufacturer.
2. When the towed weight exceeds 1,000 pounds, the towing system must be equipped with a separate brake system for the towed load and be activated by the braking application of the towing vehicle.

- Do not exceed the capacity limits of any towing equipment and follow the final stage manufacturer's equipped hitch limits, recommendations and guidelines. Also, ensure that individual components installed separately be rated equal to or higher than any towed load.
- The total towed weight when added to the operating weight of the towing vehicle cannot exceed the Gross Combination Weight Rating of the towing vehicle as identified by the final stage manufacturer.
- All state and federal requirements are adhered to.

IMPORTANT: All five of the above criteria must be met if the vehicle is used for towing. Failure to adhere to these criteria will affect safe vehicle operation and could void manufacturer validations and warranties.

LOADING YOUR VEHICLE

The diagram shows a rectangular label with a circular logo in the top left corner. The label contains the following fields and text:

- GVWR
- GAWR FRT
- GAWR RR
- LTRG
- PAYLOAD =
- TIRE
- RIM
- PSI/KPA (COLD)
- SEE OWNER'S MANUAL FOR ADDITIONAL INFORMATION
- OG-051

A large, diagonal watermark reading "EXAMPLE" is overlaid on the center of the label.

The Certification/Tire label in your vehicle will look similar to this example. Because the label is furnished by the final body manufacturer, there may be some differences between the example and the actual label on your vehicle.

The Certification/Tire label location is also determined by the body manufacturer. See that company's manual to find out where it is on your vehicle 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. This information is also on the Incomplete Vehicle Document.

The Certification/Tire label also tells you the maximum weight for the front and rear axles, called the 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. Also, do not load your vehicle unevenly from side to side. 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.

Suspension Air Cylinders

All P32 motor home and some commercial models have front suspension air cylinders. You can increase and decrease the air pressure to level the vehicle. The cylinders are inside the coil springs of your front suspension. There is an air valve on the bottom of each cylinder. The W22 motor homes and W52 commercial vehicles do not use air cylinders but leaf springs.

Before loading the vehicle, inflate both suspension air cylinders to the maximum pressure listed for your vehicle. After loading, decrease the air cylinder pressure as needed to level the vehicle. Reduce air pressure to no less than the minimum pressure listed for your vehicle.

Check the air pressure in the cylinders monthly. Specifications should be as follows if loaded to the maximum Gross Axle Weight Rating (GAWR).

- 50 psi (345 kPa) for 4,300 to 5,000 lb. (1 950 to 2 270 kg) front suspension/axle.
- 70 psi (483 kPa) for 5,300 lb. (2 404 kg) front suspension/axle.

- 90 psi (620 kPa) for 5,500 lb. (2 500 kg) front suspension/axle.
- 110 psi (758 kPa) for 6,000 lb. (2 722 kg) front suspension/axle.



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.**

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

Hazard Warning Flashers	94	Cooling System (Gasoline Engines)	107
Other Warning Devices	95	Cooling System (Diesel Engines)	112
Jump Starting	95	Engine Fan Noise	117
Emergency Release of Parking Brake —		If a Tire Goes Flat	117
P32 Motor Home Chassis	101	Changing a Flat Tire	118
Towing Your Vehicle	103	If You're Stuck: In Sand, Mud,	
Engine Overheating	104	Ice or Snow	120

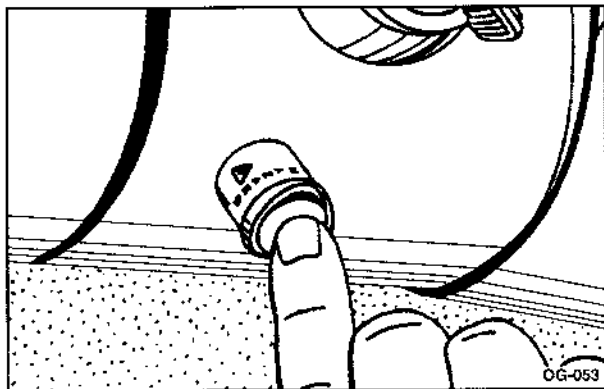
HAZARD WARNING FLASHERS

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.

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

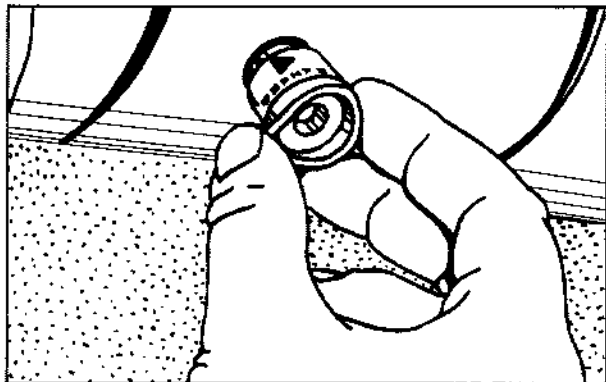
The hazard warning flashers won't flash if you're braking. Also, when the hazard warning flashers are on, your turn signals won't work.

On all models except W22, your hazard warning flashers button is on the steering column below the ignition switch.



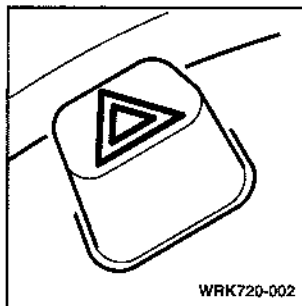
Motor Home Shown (Except W22)

Press the button in to make your front and rear turn signals flash on and off.



Motor Home Shown (Except W22)

To turn off the flashers, pull out on the collar.



Motor Home (W22)

On W22 motor homes, your hazard warning flashers button is located on top of the steering column.

Press the button in to turn on your flashers.

To turn them off press the button again.

OTHER WARNING DEVICES

If you carry reflective triangles, you can set one up at the side of the road about 300 feet (100 m) behind your vehicle.

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. But use the following steps listed to do it safely.

**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 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.

NOTICE

With a diesel engine, do not apply more than the nominal 12 volts to the electrical system during charging or jump starting. Glow plug system failure may result.

If you have a diesel engine with two or more batteries, 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 so the jumper cables can reach, but be sure the vehicles aren't touching each other. If they are, it could cause a ground connection you don't want. You wouldn't be able to start your vehicle, and the bad grounding could damage the electrical systems.

**CAUTION**

If your vehicle has air conditioning, the auxiliary electric fan under the hood can start up even when the engine is not running and can injure you. Keep hands, clothing and tools away from any underhood electric fan.

3. Set the parking brake firmly on each vehicle. Put an automatic transmission in PARK (P) or a manual transmission in NEUTRAL (N).
4. Turn off the ignition on both vehicles. Turn off all lamps that aren't needed and both radios. This will avoid sparks and help save both batteries. It could also save your radio.

5. Open the hoods and locate the batteries. 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 battery (or batteries) installed in every new 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.

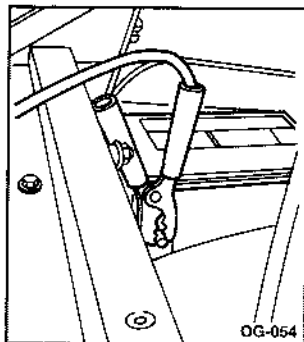
Battery fluid contains acid that can burn you. Don't get it on you. If you accidentally get it in your eyes or on your skin, flush the place with water and get medical help immediately.

6. 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.

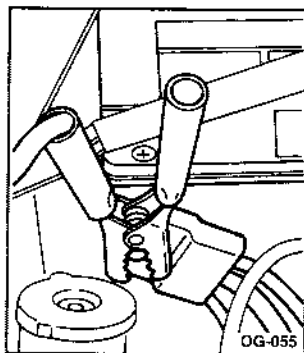
Before you connect the cables, here are some basic things you should know. Positive (+) will go to positive (+) and negative (-) will go to a metal engine part or some other well-grounded part. Don't connect positive (+) to negative (-) or you'll get a short that would damage the battery and maybe other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

**CAUTION**

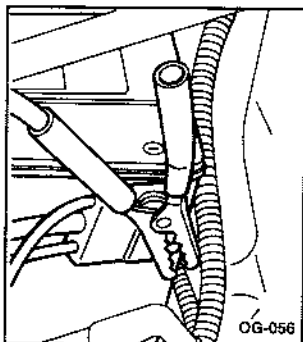
Fans or other moving engine parts can injure you badly. Keep your hands away from moving parts once the engine is running.



7. Connect the red positive (+) cable to the positive (+) terminal of the vehicle with the dead battery. Use a remote positive (+) terminal if the vehicle has one.

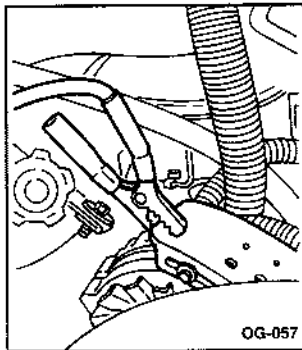


8. Don't let the other end touch metal. Connect it to the positive (+) terminal of the good battery. Use a remote positive (+) terminal if the vehicle has one.



9. 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.

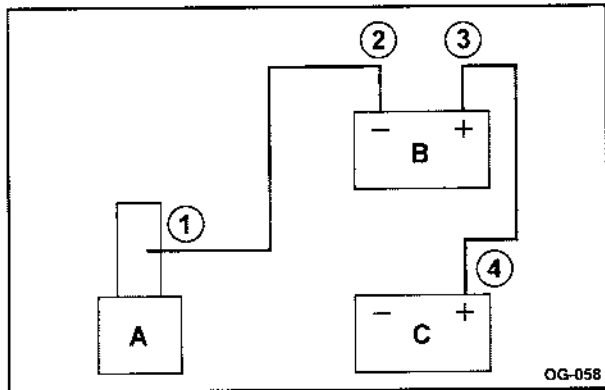
It goes to a heavy, unpainted metal part of the vehicle with the dead battery.



10. Attach the cable at least 18 inches (45 cm) away from the dead battery. This will allow for a good electrical connection and lessen the chance of sparks.

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

13. Remove the cables in reverse order to prevent electrical shorting, reference illustration OG-058. Take care that they don't touch each other or any other metal.



Removal Order

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

EMERGENCY RELEASE OF PARKING BRAKE — P32 MOTOR HOME CHASSIS

If your transmission is in PARK (P) and the vehicle won't start, and you need to release the automatic parking brake, do the following:

1. Apply the manual parking brake and turn the ignition to RUN.
2. Push and hold the regular brake pedal down and shift the transmission to NEUTRAL (N).



CAUTION

If you are not holding the regular brake pedal down and the parking brake releases, the vehicle could roll. You or others could be injured.

When the AUTO PARK brake warning light goes out, the electric AUTO PARK brake is released. The key must be left in RUN to keep the AUTO PARK brake released. If the battery is dead, you will need to jump start your vehicle (see "Jump Starting" earlier in this section).

3. Release the manual parking brake. The AUTO PARK warning light will go out at this time.

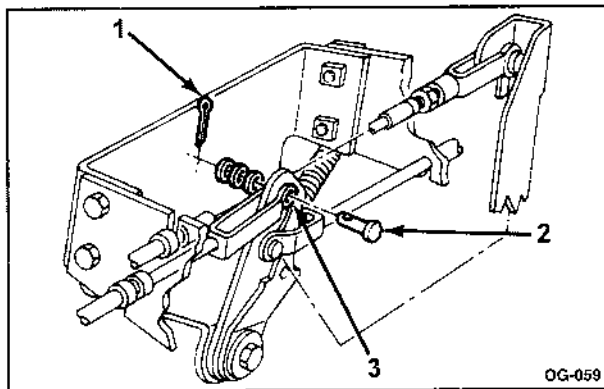
The automatic parking brake must be released before your vehicle can be towed. If the parking brake won't release, there is a way to release it manually. The next part shows you how to do it, but please follow these steps carefully.

**CAUTION**

You or others can be badly injured in trying to put the automatic parking brake system back together. To do it takes special tools and procedures. Have the system put back together only by an authorized dealer.

**CAUTION**

You can be badly injured while you are trying to release the automatic parking brake manually. Unless you have the proper experience and tools, you should let your dealer, a towing service or another professional release the parking brake.



1. Cotter Pin
2. Clevis Pin
3. Clevis Pin Eye

Use the following procedure to manually release the automatic parking brake:

1. Block the wheels and release the manual parking brake.
2. Go to the slotted bracket inside the parking brake assembly. Remove the cotter pin (1) from the actuator cable clevis pin.
3. Pry the parking brake clevis pin (2) from the clevis pin eye (3). Now be sure to apply the manual parking brake.

Remove only these parts. Don't remove other parts, such as the cotter pin or clevis pin in the manual foot brake cable, or the cable in the parking brake assembly at the rear of the transmission.

The automatic parking brake system should now be released and the vehicle should be ready for towing.

Keep the parts you have removed (cotter pin, clevis pin, washers and any other parts) in a safe place, so you'll be able to find them later.

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.**
- **Use only the correct hooks.**

NOTICE

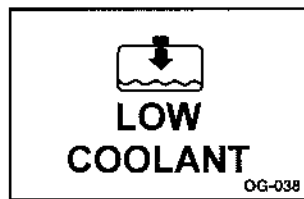
Two wheel drive vehicles should not be towed on the drive wheels, if possible. If this is unavoidable, the vehicle can be towed forward for a maximum of 50 miles (80.47 km) at a maximum speed of 35 mph (56.33 km/h)

NOTICE

Use the proper towing equipment to avoid damage to the bumper, fascia or fog lamp areas of the vehicle.

With current trends in automotive styles and design, it is essential that the correct towing equipment is used to tow a vehicle. Your vehicle can be towed with wheel-lift or car carrier equipment.

Consult your dealer or a professional towing service if you need to have your vehicle towed. See "Roadside Assistance" in the Index.

ENGINE OVERHEATING

You will find a coolant temperature gage on your vehicle's instrument panel. If you have a diesel engine, you will also have a LOW COOLANT warning light.

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.

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 - AUTOMATIC OVERDRIVE (O) or DRIVE (D) for automatic transmissions.

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.

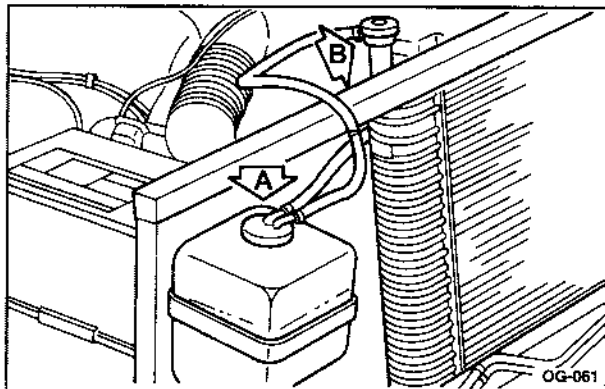
If there's still no sign of steam, push down the accelerator until the engine speed is about twice as fast as normal idle speed for at least three minutes while you're parked. If you still have the warning, *turn off the engine and get everyone out of the vehicle* until it cools down.

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

COOLING SYSTEM (GASOLINE ENGINES)

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

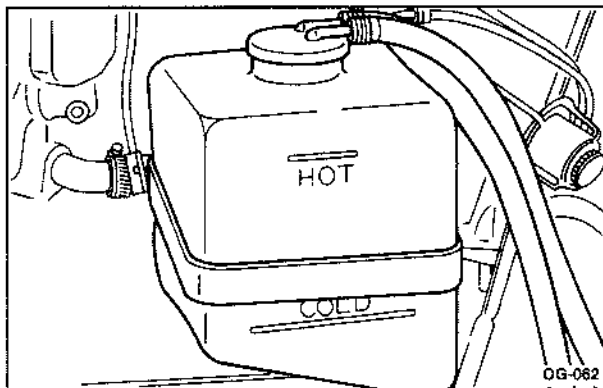
- A. Coolant Recovery Tank (mounted by the body manufacturer)
- B. Radiator Pressure Cap



CAUTION

If your vehicle has air conditioning, the auxiliary electric engine cooling fan under the hood can start up even when the engine is not running and can injure you. Keep hands, clothing and tools away from any underhood electric fan.

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



The coolant level should be at or above the HOT 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® (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® 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 (Gasoline Engines)

If you haven't found a problem yet, but the coolant level isn't at HOT, add a 50/50 mixture of *clean, drinkable water* and DEX-COOL® 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 approved coolant.

NOTICE

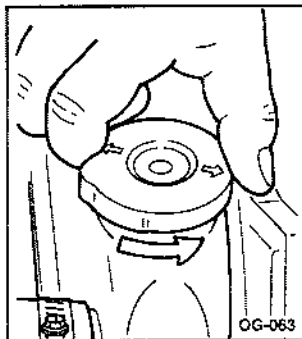
In cold weather, water can freeze and crack the engine, radiator, heater core and other parts. Use the recommended coolant and the proper coolant mixture.

**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 HOT mark, start your vehicle.

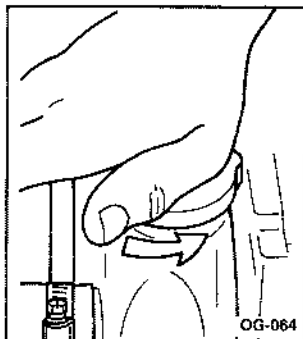
If the overheat warning continues, there's one more thing you can try. You can add the proper coolant mixture directly to the radiator, but be sure the cooling system is cool before you do it.

**How to Add Coolant to the Radiator
(Gasoline Engines)**

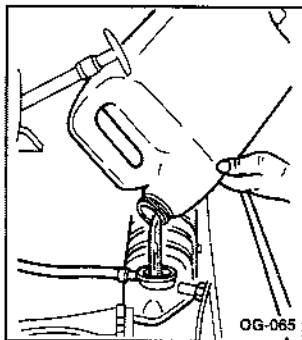
1. You can remove the radiator pressure cap when the cooling system, including the radiator pressure cap and upper radiator hose, is no longer hot.

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.

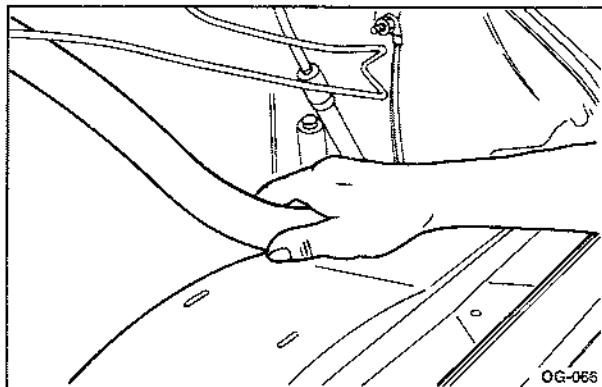


2. Then keep turning the pressure cap, but now push down as you turn it. Remove the pressure cap.



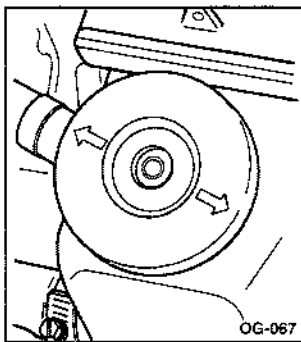
3. Fill the radiator with the proper coolant mixture, up to the base of the filler neck. (See "Engine Coolant" in the Index for more information about the proper coolant mixture.) Avoid fluid spills into engine air intakes.

4. Then fill the coolant recovery tank to the COLD mark.
5. Put the cap back on the coolant recovery tank, but leave the pressure cap off.



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

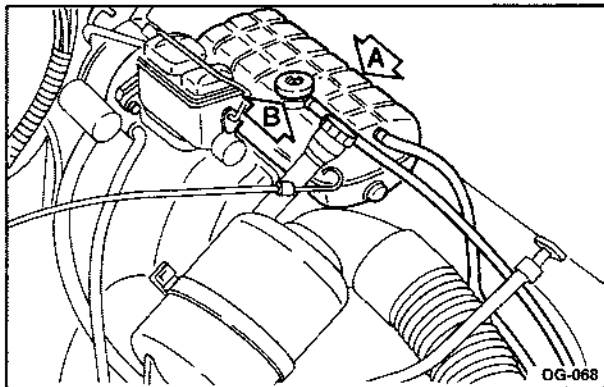
7. By this time, the coolant level inside the radiator filler neck may be lower. If the level is lower, add more of the proper coolant mixture through the filler neck until the level reaches the base of the filler neck.



8. 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 ENGINES)

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



- A. Coolant Surge Tank
B. Coolant Surge Tank Pressure Cap

You will also find engine cooling fans at the front of the engine, behind the radiator.

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 or above the FULL COLD 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.

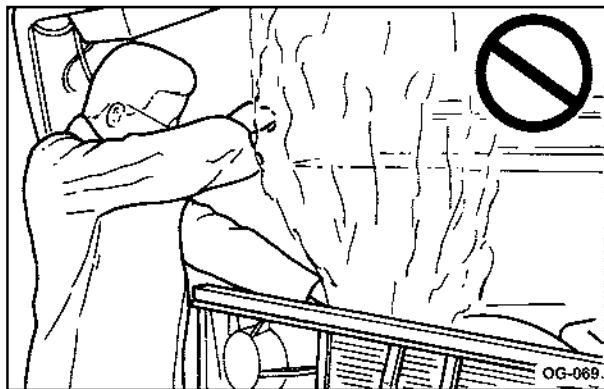
If there seems to be no leak, start the engine again. See if the fan speed increases when idle speed is doubled by pushing the accelerator pedal down. If it doesn't, your vehicle needs service. Turn off the engine.

How to Add Coolant to the Coolant Surge Tank (Diesel Engines)

If you haven't found a problem yet, but the coolant level isn't at FULL COLD, 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 "Engine Coolant" in the Index for more information.)

**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**

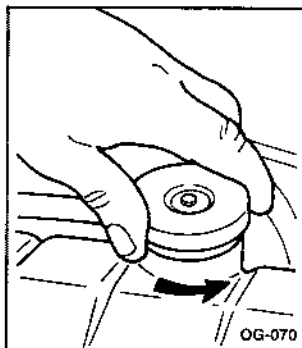
Adding only plain water to your cooling system can be dangerous. Plain water, or some other liquid like alcohol, can boil before the proper coolant mixture will. Your vehicle's coolant warning system is set for the proper coolant mixture. With plain water or the wrong mixture, your engine could get too 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**

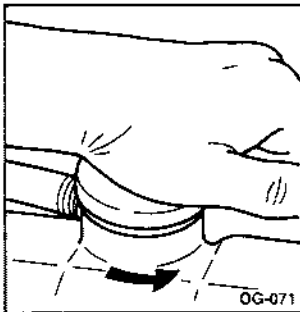
You can be burned if you spill coolant on hot engine parts. Coolant contains ethylene glycol and it will burn if the engine parts are hot enough. Don't spill coolant on a hot engine.



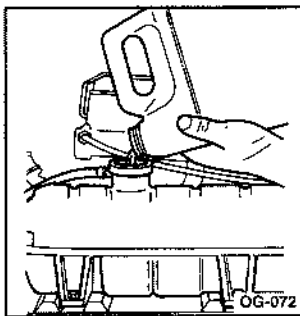
1. You can remove the coolant surge tank pressure cap when the cooling system, including the coolant surge tank pressure cap and upper radiator hose, is no longer hot.

Turn the pressure cap slowly counterclockwise (left) until it first stops. (Don't press down while turning the pressure cap.)

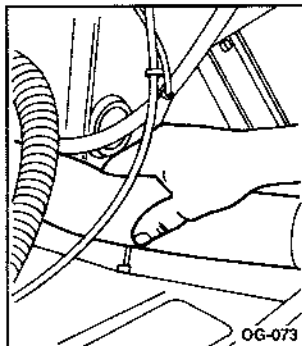
If you hear a hiss, wait for that to stop. A hiss means there is still some pressure left.



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

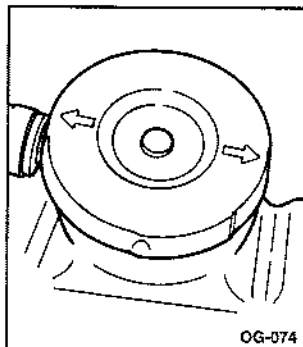


3. Then fill the coolant surge tank with the proper mixture, to the FULL COLD mark.



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 cooling fan(s).

5. 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 FULL COLD mark.



6. 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 every day 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 as the clutch more fully 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, the next part tells you what to do.

If a jack and jacking tools were supplied with your vehicle, see the body manufacturer's information for jacking instructions.

CHANGING A FLAT TIRE

A flat or damaged tire can be a major roadside problem. You're very likely to have to go for help. 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.

So if you're stopped somewhere by a flat or damaged tire or wheel, you should get expert help right then.

If the correct equipment is available, though, here is the procedure to follow.

- Does the tire still seem to have air under pressure in it? If so, stand to the side. Look at the wheel to see if it looks like another wheel on the vehicle. If so, go on to the next step. If it doesn't, or even if you can't be sure, stop and get expert help.



CAUTION

Tire-rim assemblies can explode. If you work on a pressurized tire mounted on a damaged wheel, the assembly can expand with explosive force without warning. You and others nearby can be badly injured. Don't work around a tire that has air under pressure in it when its wheel is or might be damaged.

- Does the wheel look normal? If you can't be sure, stop and get expert help.
- Let the air out of the tire. You can do this by taking out the valve core.
- If you have the correct equipment, put on the spare wheel and tire assembly.



CAUTION

Rust or dirt on the 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 a 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.



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.



CAUTION

- There are many ways to be hurt badly, or be killed, while you are trying to change a truck tire and rim. Follow all of the safety precautions on the truck jack and other equipment.
- If you try to put air back into a tire that has run flat, or even a tire that was quite low on air, without first finding out why it was low or flat, 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.

- Use a clip-on chuck and hose extension when you add air to your tires. You'll need an accurate truck tire pressure gage. Stand to one side and add the air. Use inflation pressure as shown on the Certification/Tire Label.
- All wheel nuts and other tire and wheel fasteners must be properly tightened. See "Tightening the Wheel Nuts" in the Index.

**CAUTION**

Incorrect wheel nuts or improperly tightened wheel nuts can cause the wheel to become loose and even come off. This could lead to an accident. Be sure to use the correct wheel nuts. If you have to replace them, be sure to get new original equipment wheel nuts.

Stop somewhere as soon as you can and have the nuts tightened with a torque wrench. See "Tightening the Wheel Nuts" in the Index for the proper torque for your particular wheel.

NOTICE

Improperly tightened wheel nuts can lead to brake pulsation and rotor damage. To avoid expensive brake repairs, evenly tighten the wheel nuts in the proper sequence and to the proper torque specification.

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.

For information about using tire chains on your vehicle, see "Tire Chains" in the Index.

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.

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.

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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.

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.**
- **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.**

FUEL (GASOLINE ENGINE)

If your vehicle has a diesel engine, see "Diesel Fuel Requirements and Fuel System" in this Section. For vehicles with gasoline engines, please read this.

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.

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.

If your vehicle is certified to meet California Emission Standards (indicated on the underhood emission control label), it is designed to operate on fuels that meet California specifications. If such fuels are not available in states adopting California emissions standards, your vehicle will operate

satisfactorily on fuels meeting federal specifications, but emission control system performance may be affected. The malfunction indicator lamp on your instrument panel may turn on and/or your vehicle may fail a smog-check test. (See "Malfunction Indicator Lamp" in the Index.) If this occurs, return to your authorized dealer for diagnosis to determine the cause of failure. In the event it is determined that the cause of the condition is the type of fuels used, repairs may not be covered by your warranty.

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. WCC 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 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.

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.

NOTICE

The presence of dirt and/or debris in the fuel will restrict the flow of fuel through the filter and may eventually affect the performance of the fuel system. Only clean fuel should be used and avoid contamination of the fuel tank by any reasonable means.

DIESEL FUEL REQUIREMENTS AND FUEL SYSTEM

Some states and provinces have restrictions on the purchase of diesel fuel for light-duty vehicles and require you to buy permits or pay special taxes. Some of these restrictions apply only to residents, and others apply to both residents and visitors. These restrictions can change. To learn the current restrictions in any state or province, contact your auto club, the police or other officials.

Diesel Engine Fuel**NOTICE**

Diesel fuel or fuel additives not recommended in this manual could damage your fuel system and engine. Your warranty wouldn't cover this damage. And:

- **Diesel fuel that has been mixed with engine oil could damage your engine and emission controls. Check with the service station operator to make sure the diesel fuel has not been mixed with engine oil.**
- **If you ever run out of diesel fuel, it can be difficult to restart your engine. "Running Out of Fuel," later in this section, tells you how to get it started again. To avoid all this, never let your tank get empty.**

What Fuel to Use

In the United States, for best results use Number 2-D diesel fuel year-round (above and below freezing conditions) as oil companies blend Number 2-D fuel to address climate differences. Number 1-D diesel fuel may be used in very cold temperatures (when it stays below 0°F or -18°C); however, it will produce a power and fuel economy loss. The use of Number 1-D diesel fuel in warm or hot climates may result in stalling, poor starting when the engine is hot and may damage the fuel injection system.

At a minimum, the diesel fuel you use should meet specifications ASTM D975-94 (Grade Low Sulfur) in the United States. In addition, the Engine Manufacturers Association (EMA) has identified properties of an improved diesel fuel for better engine performance and durability. Diesel fuels corresponding to the EMA description could provide better starting, less noise and better vehicle performance. If there are questions about the fuel you are using, please contact your fuel supplier.

Diesel fuel may foam when you fill your tank. This can cause the automatic pump nozzle to shut off, even though your tank isn't full. If this happens, just wait for the foaming to stop and then continue to fill your tank.

**CAUTION**

Heat coming from the engine may cause the fuel to expand and force the fuel out of your tank. If something ignites the fuel, a fire could start and people could be burned. To help avoid this, fill your fuel tank only until the automatic nozzle shuts off. Don't try to "top it off."

What Fuel to Use in Canada

Canadian fuels are blended for seasonal changes. Diesel Type "A" fuel is blended for better cold weather starting (below 0°F or -18°C); however, you may notice some power and fuel economy loss. If Type "A" fuel is used in warmer temperatures,

stalling and hard starting may occur. Diesel Type "B" fuel is blended for temperatures above 8°F (-18°C). The emission control system requires the use of diesel fuel with low-sulfur (.05% by weight) content. Both low- and higher-sulfur fuels will be available in Canada. Only low-sulfur diesel fuels are available in the United States. It is important that diesel-powered trucks are refueled only with low-sulfur fuel. Use of fuels with higher-sulfur content will affect the function of the emission components and may cause reduced performance, excessive smoke and unpleasant odor.

At a minimum, the diesel fuel you use should meet specifications CAN/CGSB-3.517-93 (Low Sulfur Diesel) in Canada. In addition, the Engine Manufacturers Association (EMA) has identified properties of an improved diesel fuel for better engine performance and durability. Diesel fuels corresponding to the EMA description could provide better starting, less noise and better vehicle performance. If there are questions about the fuel you are using, please contact your fuel supplier.

Very Cold Weather Operation

Follow the instructions listed previously under the heading "What Fuel to Use."

NOTICE

Never use home heating oil or gasoline in your diesel engine. They can cause engine damage.

In cold weather, your fuel filter may become clogged (waxed). To unclog it, move the vehicle to a warm garage area and warm the filter to between 32°F and 50°F (0°C to 10°C). You won't need to replace it. Additional information on the fuel filter follows.

NOTICE

The presence of dirt and/or debris in the fuel will restrict the flow of fuel through the filter and may eventually affect the performance of the fuel system. Only clean fuel should be used and avoid contamination of the fuel tank by any reasonable means.



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.

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, a WATER IN FUEL light will come on. If it does, the water must be drained. Your dealer can show you how to do this.

**WATER
IN
FUEL**

OG-049

This light also should come on briefly when you start your engine, as a check. If it doesn't, have it fixed so it will be there to let you know if you ever do get water in your fuel.

NOTICE

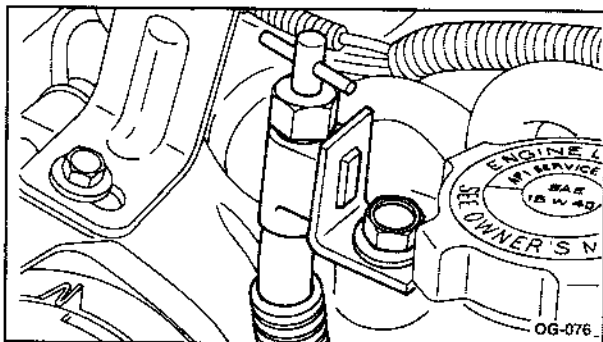
If you drive when this warning light is on, you can damage your fuel injection system and your engine. If the light comes on right after you refuel, it means water was pumped into your fuel tank. Turn off your engine immediately. Then, have the water drained at once.

If the light comes on at any other time, use this chart.

Problem	Recommended Action
1. Light comes on intermittently.	Drain water from fuel filter.
2. Light stays on: — At temperatures above freezing.	Drain fuel filter immediately. If no water can be drained and light stays on, see your dealer for assistance.
— At temperatures below freezing.	Drain fuel filter immediately. If no water can be drained, water may be frozen in the water drain system. Open the air bleed valve to check for fuel pressure. If no fuel pressure is present, water may be frozen in the fuel lines. Move the vehicle to a warm location to thaw out.
— Immediately after refueling.	A large amount of water may have been pumped into fuel tank. Fuel tank purging is required; see your dealer for assistance.

To drain water 6.5L Diesel Engines:

1. Stop and park the vehicle in a safe place. Turn off the engine and apply the parking brake.
2. Remove the fuel cap.
3. Place a fuel-resistant container under the filter drain hose. The filter drain hose is located on the front of the engine and is connected to the water drain valve.



4. With the engine off, open the water drain valve two to three turns. The valve is located to the left of the engine oil fill cap, when standing in front of the vehicle.

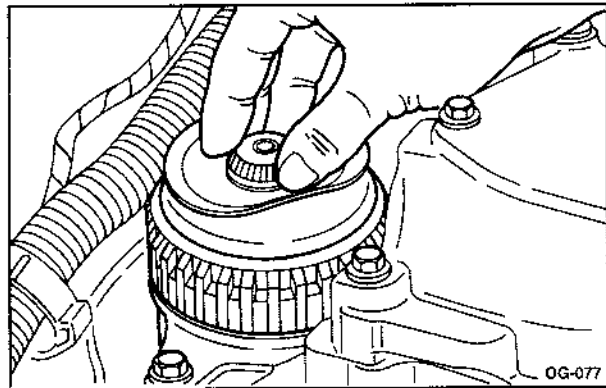
5. Start the engine and allow it to idle until clear fuel is observed. If no liquid comes out, your vehicle needs service.
6. Stop the engine and close the water drain valve.
7. Remove the fuel-resistant container and properly dispose of the contaminated fuel. To find out how to properly dispose of contaminated diesel fuel, see "Engine Oil, Used" in the Index.
8. Install the fuel cap.

If the WATER IN FUEL light comes on again after driving a short distance or the engine runs rough or stalls — a large amount of water has probably been pumped into the fuel tank. The fuel tank should be purged.

Hard starting, hesitation or "flat" performance at high speed or hard acceleration may be an indication of premature fuel filter plugging due to dirty or contaminated fuel. The filter element may need to be changed if this happens. See "Fuel Filter Replacement" in the Index.

Running Out of Fuel (Diesel Engines)

If the engine stalls and you think that you've run out of fuel, do this:



First, open the fuel filter air bleed valve. Briefly crank the engine and have someone watch the bleed valve. If air comes out of the bleed valve, then you are probably out of fuel.

**CAUTION**

Diesel fuel is flammable. It could start a fire if it gets on hot engine parts. You could be burned. Don't let too much fuel flow from the air bleed valve, and wipe up any spilled fuel with a cloth.

To restart your engine:

1. If you're parked on a level surface, add at least two gallons of fuel. However, if you're parked on a slope, you may need to add up to five gallons of fuel.
2. With the air bleed valve open, turn your ignition key to START for 10 to 15 seconds to crank (but not start) your engine. Wait one minute between intervals of cranking to allow the starter motor to cool. Overheating the starter motor could damage it. Keep doing this until you can just see some clear fuel at the air bleed valve. (If, during this step, the engine starts, turn the ignition off and close the valve before restarting.)
3. Close the air bleed valve.
4. Turn the ignition key to START for 10 to 15 seconds at a time until your engine starts.

3.9L Cummins Diesel Only

Problem	Recommended Action
— At temperatures below freezing.	Drain fuel-water separator immediately. If no water can be drained, water may be frozen in the water drain system. Water may also be frozen in the fuel lines. Move the vehicle to a warm location to thaw out.
— Immediately after refueling.	A large amount of water may have been pumped into fuel tank. Fuel tank purging is required; see your dealer for assistance

Fuel-Water Separator

Your 3.9L Cummins diesel engine comes equipped with a fuel-water separator. The fuel-water separator is located along the left frame rail, near the back of the transmission.

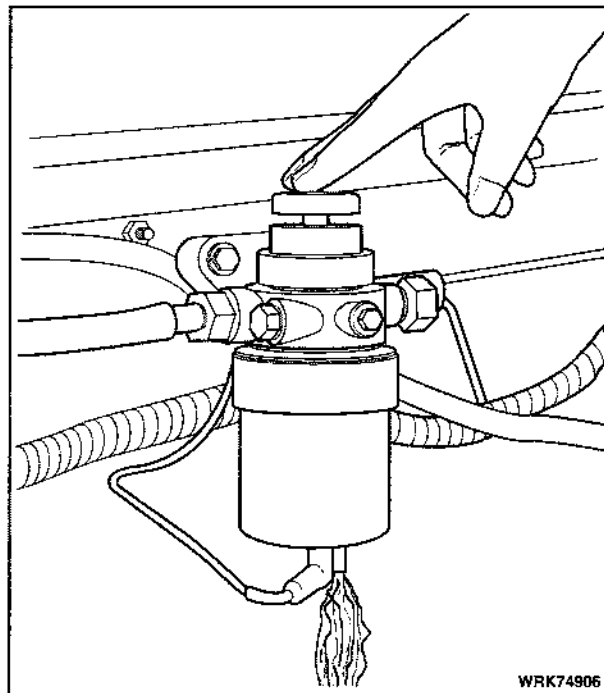
**CAUTION**

The water and sediment drained from the separator can contain hazardous petroleum products. Please consult your local environmental agency for recommended disposal guidelines.

Drain the water and sediment from the separator daily. Drain the water-contaminated fuel into an appropriate container, and dispose of it in accordance with local environmental regulations.

To Drain Water (3.9L Cummins Diesel):

1. Stop and park the vehicle in a safe place. Turn off the engine and apply the parking brake.
2. Remove the fuel cap.
3. Place a fuel-resistant container under the fuel-water separator. With the engine off, open the valve at the bottom of the fuel-water separator, and drain the water and sediment. If no liquid comes out, your vehicle needs service.
4. Remove the fuel-resistant container and properly dispose of the contaminated fuel. To find out how to properly dispose of contaminated diesel fuel, see "Engine Oil, Used" in the Index of your Workhorse owner's manual.
5. Install the fuel cap.
6. Close the valve at the bottom of the fuel-water separator.
7. Push the button on top of the fuel-water separator several times until you feel a high resistance pressure, and the fuel system is primed.



WRK74906

If the WATER IN FUEL light comes on again after driving a short distance or the engine runs rough or stalls — a large amount of water has probably been pumped into the fuel tank. The fuel tank should be purged.

Hard starting, hesitation, or “flat” performance at high speed or hard acceleration may be an indication of premature fuel filter plugging due to dirty or contaminated fuel. The filter element may need to be changed if this happens. See “Fuel Filter Replacement (Diesel Engines)” in this supplement.

Running Out of Fuel (3.9L Cummins Diesel Engines)

The fuel system on the 3.9L Cummins diesel engine is self-priming. If the engine stalls, and you think that you've run out of fuel, add fuel, and restart the engine. If you're parked on a level surface, add at least two gallons of fuel. However, if you're parked on a slope, you may need to add up to five gallons of fuel.

Fuel Filter Replacement (3.9L Cummins Diesel Engines)

The 3.9L Cummins diesel engine uses a spin-on type fuel filter. Refer to the Cummins Operation and Maintenance Manual, ISB (4 cylinder) and ISB^e (4 and 6 cylinder) Series Engines.

Fuel Filter Replacement (Diesel Engines)

If you want to change the fuel filter yourself, here's how to do it:



CAUTION

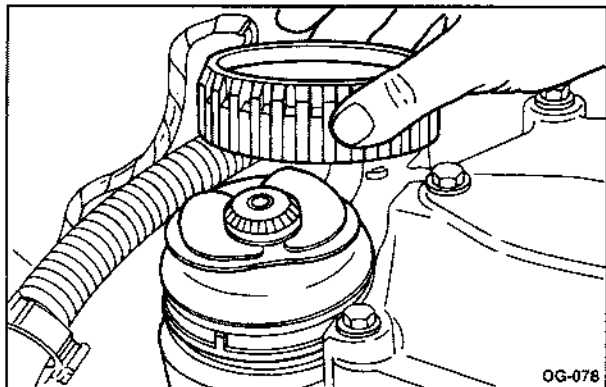
Diesel fuel is flammable. It could start a fire if something ignites it, and you could be burned. Don't let it get on hot engine parts, and keep matches or other ignition sources away.

First, drain any water from the filter following the procedure for draining water listed previously.

Your vehicle's engine should be off until the end of the following procedure.

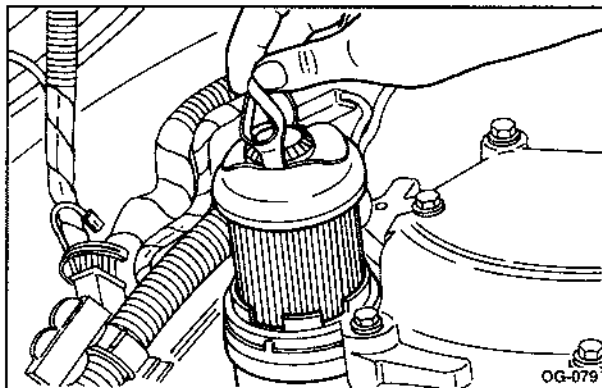
The fuel filter is located at the rear of the engine

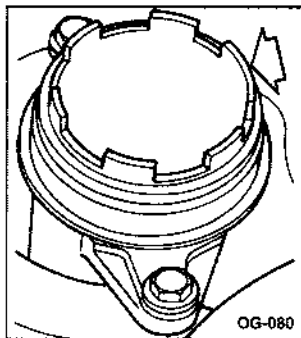
1. Apply the parking brake.
2. Take off the fuel cap. This releases vacuum or pressure in the tank.



3. Unscrew and remove the ring nut from the top of the filter head.

4. Lift the element out of the filter head using the pull tab attached to the top of the filter. If there is any dirt on the element sealing surface of the filter head, clean it off.





5. Line up the widest slot in the top of the new element with the widest key on the top of the filter head.

The word FRONT on the filter should face the front of the vehicle. Push the element in until the mating surfaces touch. Be sure that the seal has not been dislodged from the new element during installation.

6. Connect a 5/16 inch inside diameter hose or tube to the top of the air vent valve and lead hose into a fuel-resistant container.

7. Replace and tighten the ring nut to the top of the filter head.
8. With the air bleed valve open, turn your ignition key to START for 10 to 15 seconds. Wait one minute for your starter to cool. Do this until you can see clear fuel coming from the air bleed valve. If no liquid comes out, your vehicle needs service.
9. Close the air bleed valve and replace the fuel cap.
10. Start your engine and let it idle for five minutes. Check your fuel filter and air bleed valve for leaks.

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

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

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



CAUTION

If you get gasoline on yourself 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 you hear a clicking sound. Make sure you fully install the cap. The diagnostic system can determine if the fuel cap has been left off or improperly installed. This would allow fuel to evaporate into the atmosphere. See "Malfunction Indicator Lamp" in the Index.

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 properly. This may cause your malfunction indicator lamp to light and your fuel tank and emissions system may be damaged. See "Malfunction Indicator Lamp" in the Index.

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 ENGINE COMPARTMENT COVER

To open the hood, see the body manufacturer's information.



CAUTION

If your vehicle has air conditioning, the auxiliary engine fan under the hood can start up and injure you even when the engine is not running. Keep hands, clothing and tools away from any underhood electric fan.



CAUTION

Things that burn can get on hot engine parts and start a fire. These include liquids like gasoline or diesel 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.

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

Cleaning Your Diesel Engine

NOTICE

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

NOISE CONTROL SYSTEM

The following information relates to compliance with Federal noise emission standards for vehicles with a Gross Vehicle Weight Rating (GVWR) of more than 10,000 lbs. (4 536 kg). The Maintenance Schedule provides information on maintaining the noise control system to minimize degradation of the noise emission control system during the life of your vehicle. The noise control system warranty is given in your Warranty booklet.

These standards apply only to vehicles sold in the United States.

Tampering With Noise Control System Prohibited

Federal law prohibits the following acts or the causing thereof:

1. The removal or rendering inoperative by any person, other than for purposes of maintenance, repair or replacement, of any device or element of design incorporated into any new vehicle for the purpose of noise control, prior to its sale or delivery to the ultimate purchaser or while it is in use; or
2. The use of the vehicle after such device or element of design has been removed or rendered inoperative by any person.

Among those acts presumed to constitute tampering are the acts listed on the next page.

Insulation:

- Removal of the noise shields or any underhood insulation.

Engine:

- Removal or rendering engine speed limiter (if equipped) inoperative so as to allow engine speed to exceed manufacturer specifications.

Fan and Drive:

- Removal of fan clutch (if equipped) or rendering clutch inoperative.
- Removal of the fan shroud (if equipped).

Air Intake:

- Removal of the air cleaner silencer.
- Reversing the air cleaner cover.

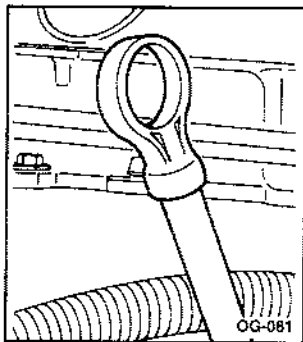
Exhaust:

- Removal of the muffler and/or resonator.
- Removal of the exhaust pipes and exhaust pipe clamps.

ENGINE OIL (GASOLINE ENGINE)

If your vehicle has a diesel engine, see "Engine Oil (Diesel Engine)" in this section.

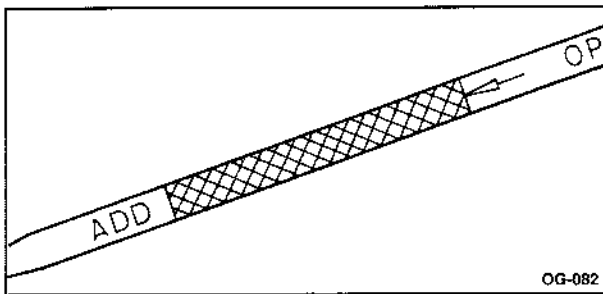
It's a good idea to check your engine oil every time you get fuel. In order to get an accurate reading, the oil must be warm and the vehicle must be on level ground.



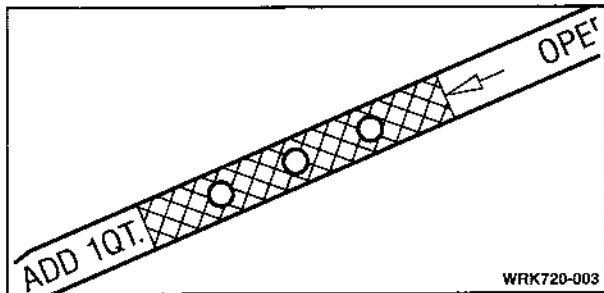
Turn off the engine and give the oil several minutes to drain back into the oil pan. If you don't, the oil dipstick might not show the actual level.

Checking Engine Oil

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.



All Models (Except 8.1L Engines)



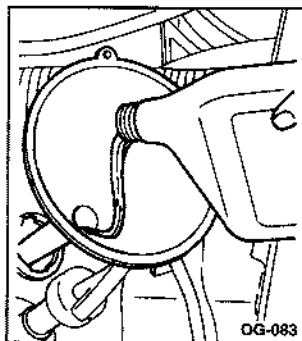
8.1L Engines

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 are through. Avoid fluids spills into engine air intakes.

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.

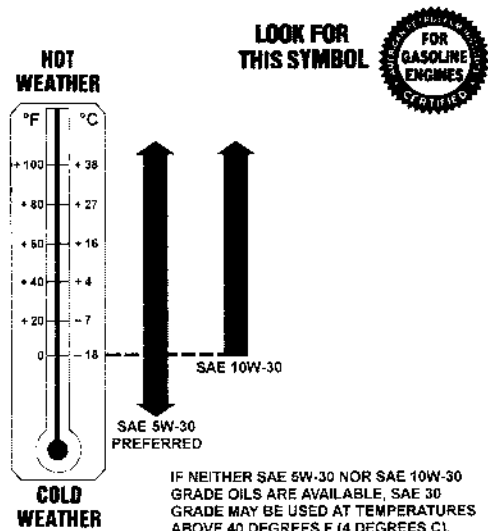


If you change your own oil, be sure you use oil that has the Starburst symbol on the front of the oil container. If you have your oil changed for you, be sure the oil put into your engine is American Petroleum Institute certified for gasoline engines.

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

RECOMMENDED SAE VISCOSITY GRADE ENGINE OILS

FOR BEST FUEL ECONOMY AND COLD STARTING, SELECT THE LOWEST SAE VISCOSITY GRADE OIL FOR THE EXPECTED TEMPERATURE RANGE.



DO NOT USE SAE 10W-40, SAE 20W-50 OR ANY OTHER GRADE OIL NOT RECOMMENDED

OG-085

As shown in the chart, 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.

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 5W-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. Your dealer is ready to advise if you think something should be added.

When to Change Engine Oil

If any one of these is true for you, use the short trip/city maintenance schedule:

- 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 include extensive idling (such as frequent driving in stop-and-go traffic).
- Most trips are through dusty areas.
- The vehicle is used for delivery service, police, taxi or other commercial application.

Driving under these conditions causes engine oil to break down sooner. If any one of these is true for your vehicle, then you need to change your oil and filter every 3,000 miles (5 000 km) or 3 months — whichever occurs first.

If none of them is true, use the long trip/highway maintenance schedule. Change the oil and filter every 7,500 miles (12 500 km) or 12 months — whichever occurs first. Driving a vehicle with a fully

warmed engine under highway conditions causes engine oil to break down slower.

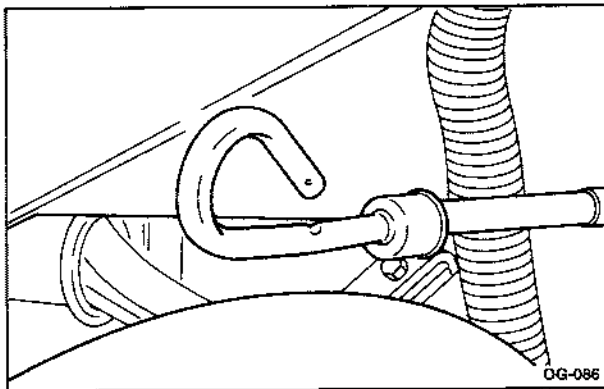
What to do with Used Oil

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 (DIESEL ENGINES)

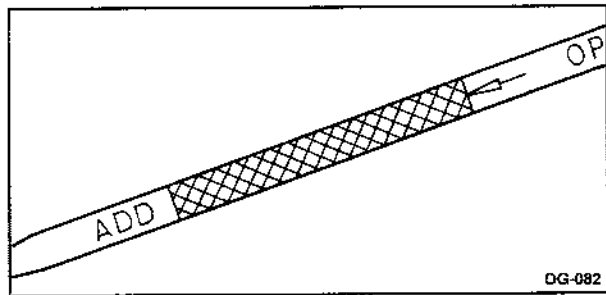
It's a good idea to check your engine oil level every time you get fuel. In order to get an accurate reading, the oil must be warm and the vehicle must be on level ground.



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

Checking Engine Oil

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



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 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

Look for these two things:

- CG-4
Oils designated as API CG-4 are best for your vehicle. The CG-4 designation may appear either alone, or in combination with other API designations, such as API CG-4/SH, CG-4/SJ, SH/CG-4 or SJ/CG-4.

These letters show American Petroleum Institute (API) levels of quality.

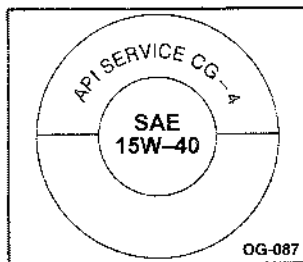
NOTICE

If you use oils that don't have one of these designations, you can cause engine damage which is not covered by your warranty.

- SAE 15W-40

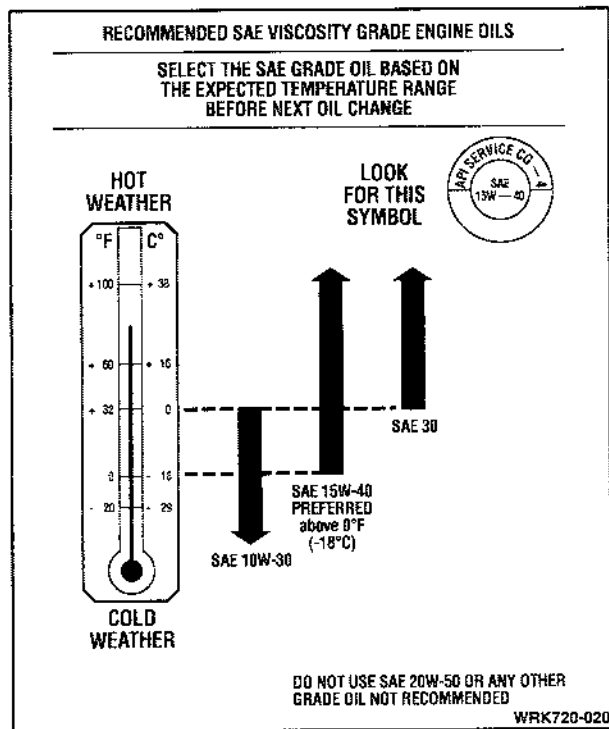
As shown in the viscosity chart, SAE 15W-40 is best for your vehicle. However, you can use SAE 10W-30 if it's going to be colder than 32°F (0°C) before your next oil change. When it's very cold, below 0°F (-18°C), you should use SAE 10W-30 to improve cold starting. Also, SAE 30 may be used at temperatures above freezing, 32°F (0°C).

These numbers on the oil container show its viscosity, or thickness. Do not use other viscosity oils such as SAE 10W-40 or SAE 20W-50.



This doughnut-shaped logo (symbol) is used on most oil containers to help you select the correct oil. It means that the oil has been certified by the American Petroleum Institute.

You should look for this on the oil container, and use *only* those oils that display the logo.



Engine Oil Additives

Don't add anything to your oil. Your dealer is ready to advise if you think something should be added.

When to Change Engine Oil

If any one of these is true for you, use the short trip/city maintenance schedule:

- 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 include extensive idling (such as frequent driving in stop-and-go traffic).
- Most trips are through dusty areas.
- You frequently tow a trailer or use a carrier on top of your vehicle.

Driving under these conditions causes engine oil to break down sooner. If any of these is true for your vehicle, then you need to change your oil and filter every 2,500 miles (4 000 km) or 3 months — whichever occurs first.

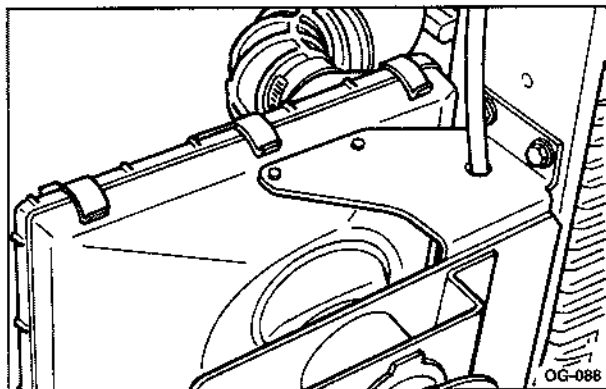
If none of them is true, use the long trip/highway maintenance schedule. Change the oil and filter

every 5,000 miles (8 000 km) or 12 months — whichever occurs first. Driving a vehicle with a fully warmed engine under highway conditions causes engine oil to break down slower.

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 AIR CLEANER/FILTER**All Engines (Except 3.9L Cummins Diesel)**

To remove the air cleaner cover, remove the metal clips that hold the cover on. Remove the cover and lift out the air filter.

Insert a new air filter, then replace the air cleaner cover. Move the metal clips to hold the cover in place.

To avoid the possibility of unfiltered air being drawn into the engine, make sure the air cleaner cover is on straight and the metal clips are properly in place. Ensure that the evacuator valve is checked frequently for debris blockage on all Vehicles with the 8.1L Engine.

To remove the air cleaner cover on the 3.9L Cummins Diesel Engine, remove the wing nuts that hold the cover on. Remove the cover and lift out the air filter. Insert new air filter, then replace the air cleaner cover. Refasten the cover with the wing nuts.

If the vehicle is fitted with an optional air restriction indicator, change the air filter only when indicated.

**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.

AUTOMATIC TRANSMISSION FLUID — ALLISON

See your Allison Automatic Transmission Operator's Manual to find out when to change your transmission fluid and filters.

AUTOMATIC TRANSMISSION FLUID — HYDRA-MATIC**When to Check and Change**

A good time to check your automatic transmission fluid level is when the engine oil is changed.

Change both the fluid and filter every 50,000 miles (83 000 km).

See "Scheduled Maintenance Services" in the Index.

How to Check

Because this operation can be a little difficult, you may choose to have this done at the dealership service department.

If you do it yourself, be sure to follow all the instructions here, or you could get a false reading on the dipstick.

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.

Wait at least 30 minutes before checking the transmission fluid level if you have been driving:

- When outside temperatures are above 90°F (32°C).
- At high speed for quite a while.
- In heavy traffic — especially in hot weather.
- While pulling a trailer.

To get the right reading, the fluid should be at normal operating temperature, which is 180°F to 200°F (82°C to 93°C).

Get the vehicle warmed up by driving about 15 miles (24 km) when outside temperatures are above 50°F (10°C). If it's colder than 50°F (10°C), drive the vehicle in DRIVE (D) until the engine temperature gage moves and then remains steady for 10 minutes. Then follow the hot check procedures.

Checking Transmission Fluid Cold

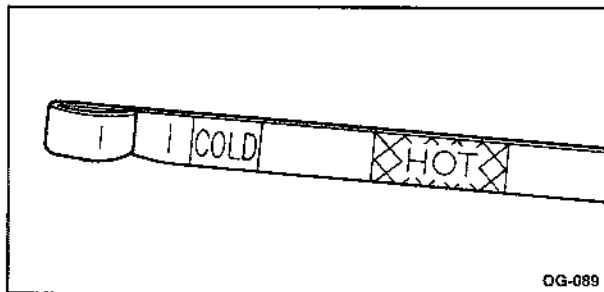
A cold check is made after the vehicle has been sitting for eight hours or more with the engine off and is used only as a reference. Let the engine run at idle for five minutes if outside temperatures are 50°F (10°C) or more. If it's colder than 50°F (10°C), you may have to idle the engine longer. Should the fluid level be low during a cold check, you *must* perform a hot check before adding fluid. This will give you a more accurate reading of the fluid level.

Checking the Fluid Level

- Park your vehicle on a level place. Keep the engine running.
- With the parking brake applied, place the shift lever in PARK (P).
- With your foot on the brake pedal, move the shift lever through each gear range, pausing for about three seconds in each range. Then, position the shift lever in PARK (P).
- Let the engine run at idle for three minutes or more.

Then, without shutting off the engine, follow these steps:

1. Pull out the dipstick and wipe it with a clean rag or paper towel.
2. Push it back in all the way, wait three seconds and then pull it back out again.



3. Check both sides of the dipstick, and read the lower level. The fluid level must be in the COLD area for a cold check or in the HOT area or cross-hatched area for a hot check.
4. If the fluid level is in the acceptable range, push the dipstick back in all the way.

How to Add Fluid

Refer to the Maintenance Schedule to determine what kind of transmission fluid to use. See "Recommended Fluids and Lubricants" in the Index.

Add fluid only after checking the transmission fluid while it is hot. (A cold check is used only as a reference.) If the fluid level is low, add only enough of the proper fluid to bring the level up to the HOT area for a hot check. It doesn't take much fluid, generally less than one pint (0.5 L). *Don't overfill.* Avoid fluid spills into engine air intakes.

NOTICE

We recommend you use only fluid labeled DEXRON®-III, because fluid with that label is made especially for your automatic transmission. Damage caused by fluid other than DEXRON®-III is not covered by your new vehicle warranty.

- After adding fluid, recheck the fluid level as described under "How to Check."
- When the correct fluid level is obtained, push the dipstick back in all the way.

MANUAL TRANSMISSION FLUID

When to Check

A good time to have it checked is when the engine oil is changed. However, the fluid in your manual transmission doesn't require changing.

How to Check

Because this operation can be a little difficult, you may choose to have this done at your dealer Service Department.

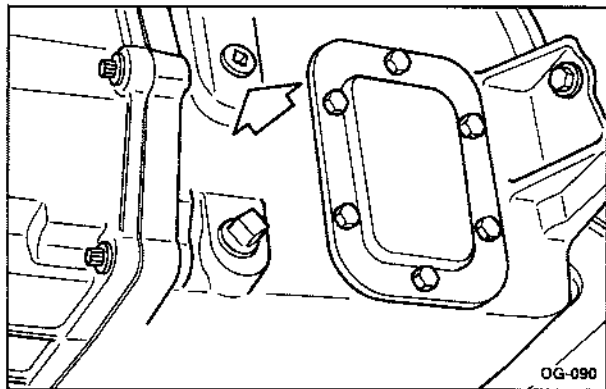
If you do it yourself, be sure to follow all the instructions here, or you could get a false reading.

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.

Check the fluid level only when your engine is off, the vehicle is parked on a level place and the transmission is cool enough for you to rest your fingers on the transmission case.

Then, follow these steps:



1. Remove the filler plug.
2. Check that the lubricant level is up to the bottom of the filler plug hole.

3. If the fluid level is good, install the plug and be sure it is fully seated. If the fluid level is low, add more fluid as described in the next steps.

How to add Fluid

Here's how to add fluid. Refer to the Maintenance Schedule to determine what kind of fluid to use. See "Recommended Fluids and Lubricants" in the Index.

1. Remove the filler plug.
2. Add fluid at the filler plug hole. Add only enough fluid to bring the fluid level up to the bottom of the filler plug hole.
3. Install the filler plug. Be sure the plug is fully seated.

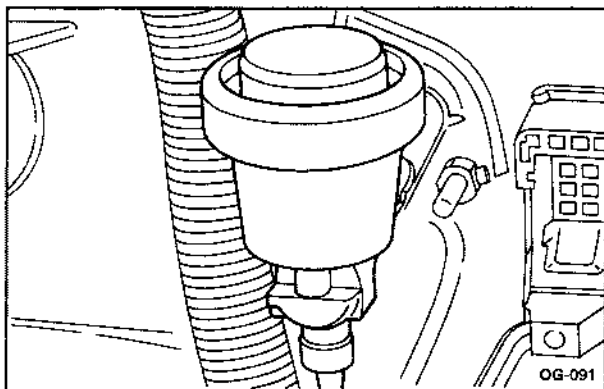
HYDRAULIC CLUTCH

The hydraulic clutch system in your vehicle is self-adjusting. A slight amount of play (1/4 inch to 1/2 inch or 6 mm to 12 mm) in the pedal is normal.

It isn't a good idea to "top off" your clutch fluid. Adding fluid won't correct a leak. A fluid loss in this system could indicate a problem. Have the system inspected and repaired.

When to Check and What to Use

Refer to the Maintenance Schedule, Owner Checks and Services, to determine how often you should check the fluid level in your clutch master cylinder reservoir and for the proper fluid. See "Owner Checks and Services" and "Recommended Fluids and Lubricants" in the Index.



How to Check

The proper fluid should be added if the level does not reach the bottom of the diaphragm when it's in place in the reservoir. See the instructions on the reservoir cap.

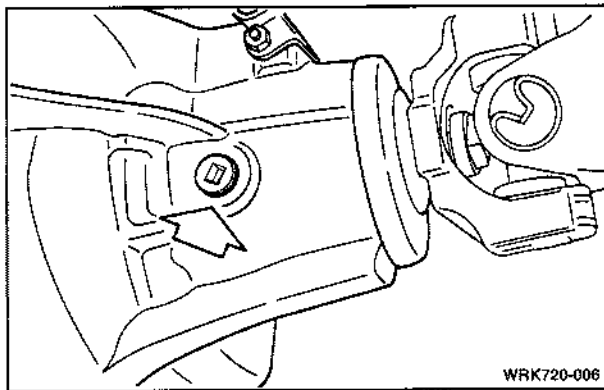
REAR AXLE

When to Check and Change Lubricant

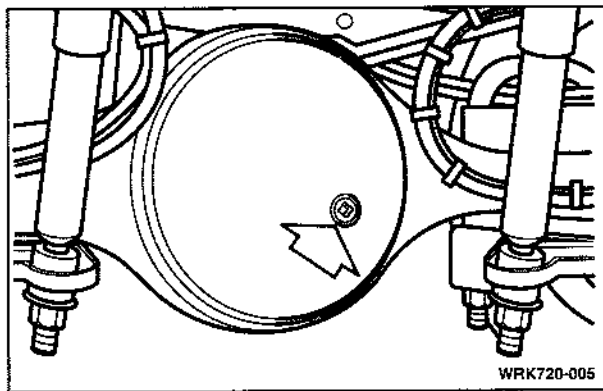
Refer to the Maintenance Schedule to determine how often to check the lubricant and when to change it. See "Scheduled Maintenance Services" in the Index.

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.



All Models (Except W22 and W52)

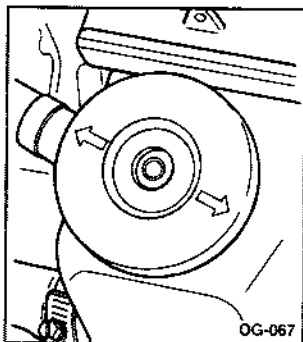


W22 and W52

What to Use

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

RADIATOR PRESSURE CAP (GASOLINE ENGINES)



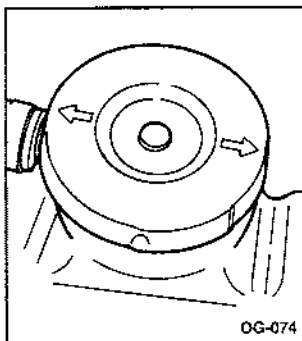
The radiator pressure cap must be tightly installed with the arrows on the cap lined up with the overflow tube on the radiator filler neck.

NOTICE

Your radiator pressure cap is a 15 psi (105 kPa) pressure-type cap and 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 overflow tube on the radiator filler neck.

When you replace your radiator pressure cap, an AC® cap is recommended.

SURGE TANK PRESSURE CAP (DIESEL ENGINES)



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 unique 15 psi (105 kPa) pressure-type cap for use with surge tank 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.

THERMOSTAT

Engine coolant temperature is controlled by a thermostat in the engine coolant system. The thermostat stops the flow of coolant through the radiator until the coolant reaches a preset temperature.

When you replace your thermostat, an AC® thermostat is recommended.

ENGINE COOLANT

The cooling system in your vehicle is filled with DEX-COOL® 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® 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® coolant will:

- Give freezing protection down to -34°F (-37°C).
- Give boiling protection up to 265°F (129°C).
- Protect against rust and corrosion.
- Help keep the proper engine temperature.
- Let the warning lights and gauges work as they should.

NOTICE

When adding coolant, it is important that you use only DEX-COOL® (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® 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® 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® coolant.

NOTICE

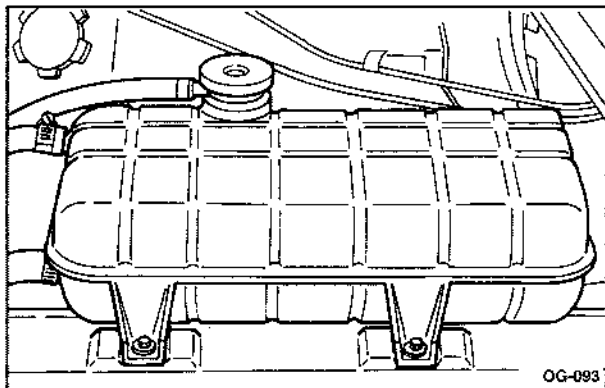
If you use an improper coolant mixture, your engine could overheat and be badly damaged. The repair cost wouldn't be covered by your warranty. Too much water in the mixture can freeze and crack the engine, radiator, heater core and other parts.

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 — Diesel Engines



If your vehicle has a diesel engine, it has a see-through surge tank mounted on top of the radiator.

**CAUTION**

Turning the surge tank pressure cap when the engine and radiator are hot can allow steam and scalding liquids to blow out and burn you badly. Never turn the surge tank pressure cap — even a little — when the engine and radiator are hot.

The vehicle must be on a level surface. When your engine is cold, the coolant level should be at the FULL COLD mark.



**LOW
COOLANT**

OG-038

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

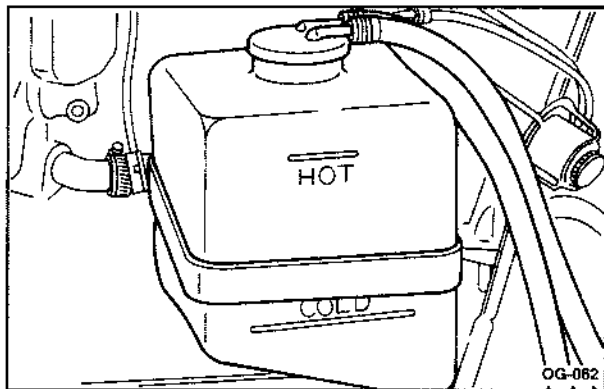
Adding Coolant

If you need more coolant, add the proper DEX-COOL® coolant mixture *at the surge tank*, but only when the engine is cool.

**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 replacing the pressure cap, make sure it is hand-tight.

Checking Coolant — Gasoline Engines

If your vehicle has a gasoline engine, it has a see-through coolant recovery tank, mounted by the body manufacturer.

The vehicle must be on a level surface. When your engine is cold, the coolant level should be at FULL COLD, or a little higher. When your engine is warm, the level should be up to FULL HOT, or a little higher.

Adding Coolant

If you need more coolant, add the proper DEX-COOL® coolant mixture *at the coolant recovery tank*.



CAUTION

Turning the radiator pressure cap when the engine and radiator are hot can allow steam and scalding liquids to blow out and burn you badly. With the coolant recovery tank, you will almost never have to add coolant at the radiator. Never turn the radiator pressure cap — even a little — when the engine and radiator are hot.

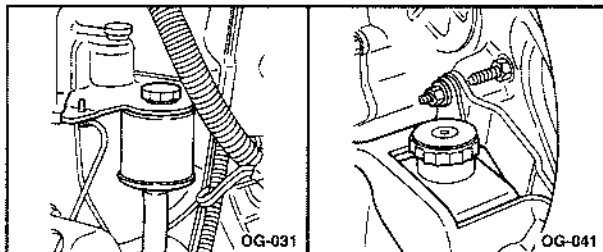
Add coolant mixture at the recovery tank, but be careful not to spill it.



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.

POWER STEERING FLUID



Remote Reservoir

Integral Reservoir

NOTICE

Always turn the engine off before checking or adding power steering fluid. The power steering cap is close to the fan and other moving parts.

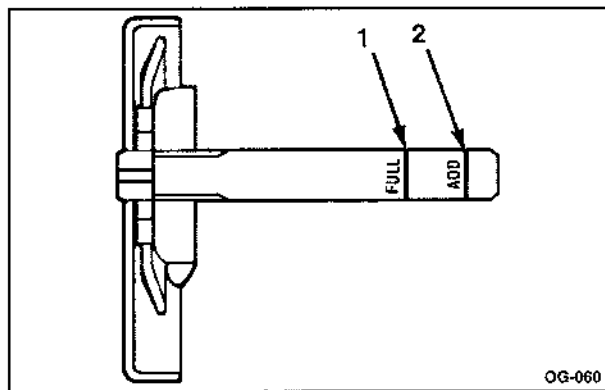
When to Check Power Steering Fluid

It is not necessary to regularly check power steering fluid unless you suspect there is a leak in the system or you hear an unusual noise. A fluid loss in this system could indicate a problem. Have the system inspected and repaired.

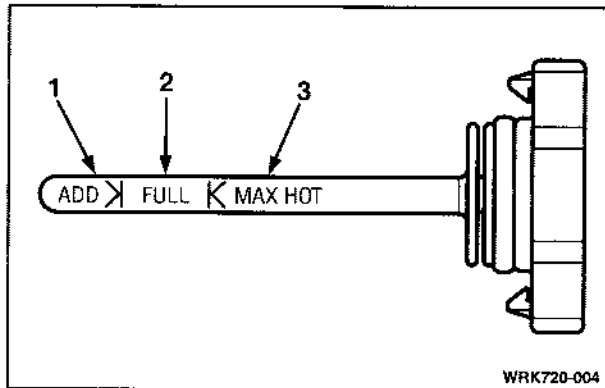
How to Check Power Steering Fluid

When the engine compartment is cool, wipe the cap and the top of the reservoir clean, then unscrew the cap and wipe the dipstick with a clean rag. Replace the cap and completely tighten it. Then remove the cap again and look at the fluid level on the dipstick.

The level should be at the FULL COLD mark. If necessary, add only enough fluid to bring the level up to the mark.

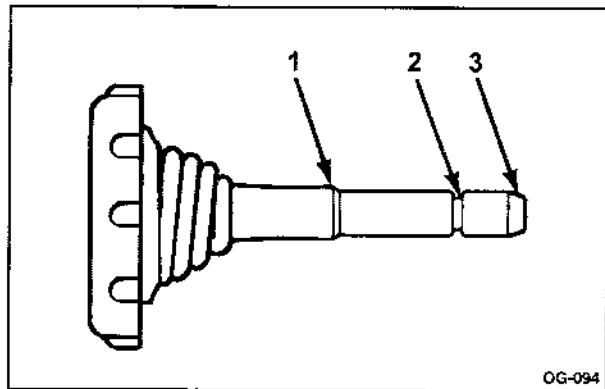
**Remote Reservoir (Except W22 and W52)**

1. FULL
2. ADD



Remote Reservoir (W22 and W52)

1. ADD
2. FULL
3. MAX HOT



Integral Reservoir

1. HOT
2. COLD
3. ADD

What to Use

To determine what kind of fluid to use, see "Recommended Fluids and Lubricants" in the Index. Always use the proper fluid. Failure to use the proper fluid can cause leaks and damage hoses and seals.

WINDSHIELD WASHER FLUID

What to Use

When you need windshield washer fluid, be sure to read the manufacturer's instructions before use. If you will be operating your vehicle in an area where the temperature may fall below freezing, use a fluid that has sufficient protection against freezing.

Adding Washer Fluid

The windshield washer fluid bottle is mounted by the body manufacturer. Avoid fluid spills into engine air intakes.

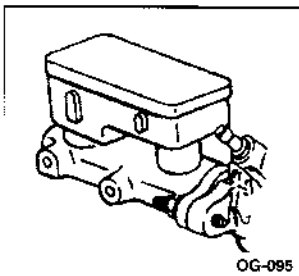
Open the cap labeled WASHER FLUID ONLY. Add washer fluid until the tank is full.

NOTICE

- **When using concentrated washer fluid, follow the manufacturer's instructions for adding water.**
- **Don't mix water with ready-to-use washer fluid. Water can cause the solution to freeze and damage your washer fluid tank and other parts of the washer system. Also, water doesn't clean as well as washer fluid.**
- **Fill your washer fluid tank only three-quarters full when it's very cold. This allows for expansion if freezing occurs, which could damage the tank if it is completely full.**
- **Don't use engine coolant (antifreeze) in your windshield washer. It can damage your washer system and paint.**

BRAKES

Brake Fluid



Your brake master cylinder reservoir is here. It is filled with DOT-3 brake fluid.

There are only two reasons why the brake fluid level in the reservoir might go down. The first is that the brake fluid goes down to an acceptable level during normal brake lining wear. When new linings are put in, the fluid level goes back up. The other reason is that fluid is leaking out of the brake system. If it is, you should have your brake system fixed, since a leak means that sooner or later your brakes won't work well, or won't work at all.

So, it isn't a good idea to "top off" your brake fluid. Adding brake fluid won't correct a leak. If you add fluid when your linings are worn, then you'll have too much fluid when you get new brake linings. You should add (or remove) brake fluid, as necessary, only when work is done on the brake hydraulic system. Avoid fluid spills into engine air intakes.

**CAUTION**

If you have too much brake fluid, it can spill on the engine. The fluid will burn if the engine is hot enough. You or others could be burned, and your vehicle could be damaged. Add brake fluid only when work is done on the brake hydraulic system.

Refer to the Maintenance Schedule to determine when to check your brake fluid. See "Periodic Maintenance Inspections" in the Index. On W22 motor homes, the brake system warning light will come on when the fluid level becomes too low.

Checking Brake Fluid

If you have the see-through reservoir with outside markings, you can check the brake fluid without taking off the cap.

Just look at the brake fluid reservoir. The fluid level should be above MIN. If it isn't, have your brake system checked to see if there is a leak.

After work is done on the brake hydraulic system, make sure the level is above the MIN but not over the MAX mark.

With the metallic reservoir, you have to take the cap off to check the brake fluid. Always clean the cap and the area around the cap before removing it. The fluid levels should not be more than 3/4 inch (18 mm) below the top of the reservoir. If they are, have your brake system checked to see if there is a leak.

After work is done on the brake hydraulic system, make sure the levels are at the minimum fill marks.

What to Add

When you do need brake fluid, **use only DOT-3 brake fluid**. Refer to "Recommended Fluids and Lubricants" in the Index. 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 an accident. 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.**
- **If you spill brake fluid on your vehicle's painted surfaces, the paint finish can be damaged. Be careful not to spill brake fluid on your vehicle. If you do, wash it off immediately.**

Brake Wear

Unless you have the four-wheel disc brake option, your vehicle has front disc brakes and rear drum brakes.

Disc brake pads have built-in wear indicators that make a high-pitched warning sound when the brake pads are worn and new pads are needed. The sound may come and go or be heard all the time your vehicle is moving (except when you are pushing on the brake pedal firmly).

**CAUTION**

The brake wear warning sound means that soon your brakes won't work well. That could lead to an accident. When you hear the brake wear warning sound, have your vehicle serviced.

NOTICE

Continuing to drive with worn-out brake pads could result in costly brake repair.

Some driving conditions or climates may cause a brake squeal when the brakes are first applied or lightly applied. This does not mean something is wrong with your brakes.

Properly torqued wheel nuts are necessary to help prevent brake pulsation. When tires are rotated, inspect brake pads for wear and evenly torque wheel nuts in the proper sequence to WCC specifications.

If you have rear drum brakes, they don't have wear indicators, but if you ever hear a rear brake rubbing noise, have the rear brake linings inspected immediately. Also, the rear brake drums should be removed and inspected each time the tires are removed for rotation or changing. When you have the front brake pads replaced, have the rear brakes inspected, too.

Brake linings should always be replaced as complete axle sets.

See "Brake System Inspection" in Section 5 of this manual under Part C "Periodic Maintenance Inspections."

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.

Brake Adjustment

Every time you make a brake stop, your disc brakes adjust for wear.

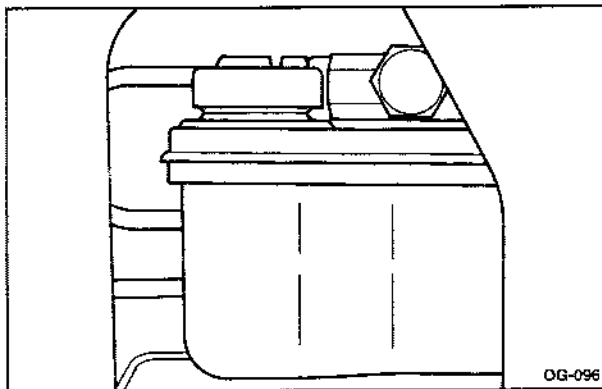
If your brake pedal goes down farther than normal, your rear drum brakes may need adjustment. Adjust them by backing up and firmly applying the brakes a few times.

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 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 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.

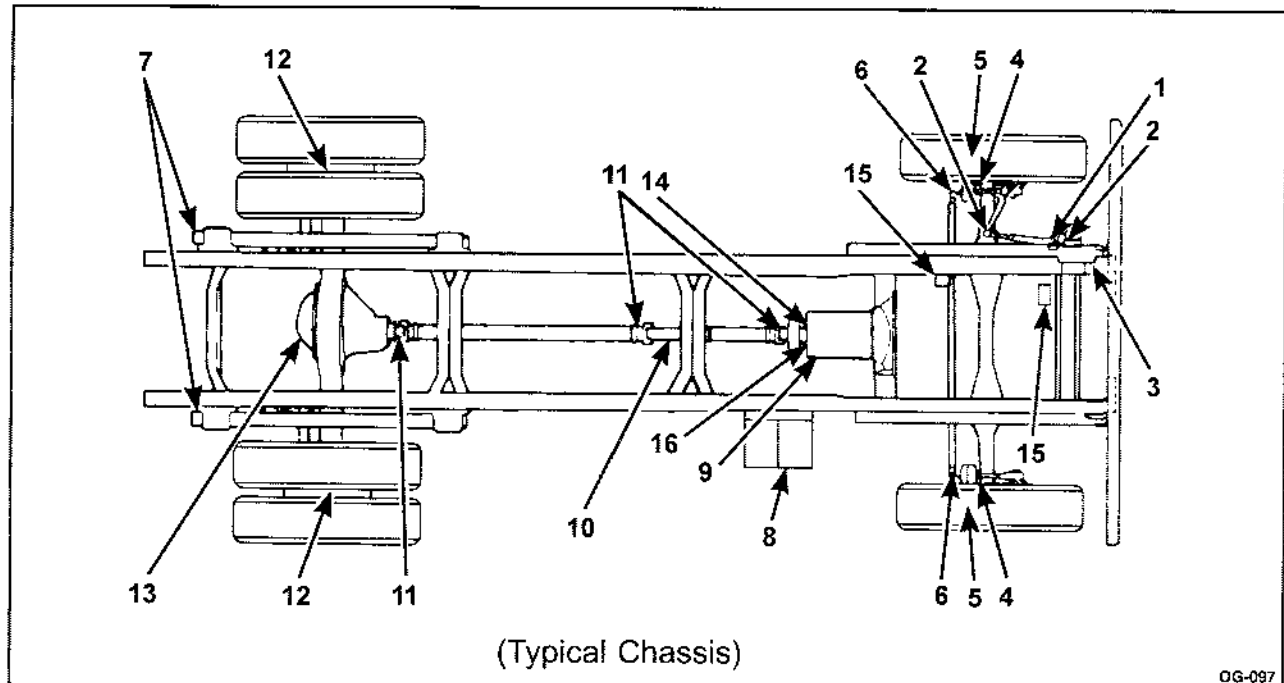
AUTO PARK BRAKE SYSTEM (ELECTRIC PUMP)



The P32 motor homes with a GVWR of 16,000 lbs. (7 258 kg) through 18,000 lbs.(8 165 kg) and with a 6.5L diesel engine, equipped with an electric automatically applied parking brake, the fluid reservoir is located under the vehicle behind the transmission on the passenger's side. The P32 motor homes with a GVWR of 16,000 lbs. (7 258 kg) through 18,000 lbs.(8 165 kg) with the 8.1L engine, equipped with an electric automatically applied parking brake, the fluid reservoir is located in front and to the right of the radiator.

This system uses Automatic Transmission Fluid (DEXRON®-III). Use the same specification fluid as used for the automatic transmission. Fluid should be checked with the vehicle in PARK (P) and should have a reading between the minimum and maximum markings. Clean the cap prior to adding fluid. Do not overfill.

CHASSIS LUBRICATION



ITEM NO.	ITEM	REMARKS
1	Steering Column Slip Joint**	One fitting. (Except W22 and W52.)
2	Steering Drag Link Ends	One fitting each end.
3	Steering Column U-Joints	One fitting each joint. (Except W22 and W52.)
4	Front Steering Knuckles	One fitting each side, lower bushing. (Hand-operated grease gun only.) Hand-pack upper bearing. (Except W22 and W52.)
4B	Upper and Lower Ball Joints	One fitting each side (Hand-operated grease gun only)
5	Front Wheel Bearings*	Hand-pack or lubricate. (W22 and W52 oil lubricated.)
6	Steering Tie Rod Ends	One fitting each end.
7	Spring Slip Pads** (Multi-Leaf Only)	Apply chassis lubricant.
8	Battery Terminal (except "ST" type)	Keep coated with petroleum jelly.
9	Parking Brake Bell Crank**, †	One fitting.

ITEM NO.	ITEM	REMARKS
10	Propshaft Slip Joints	One fitting each joint; lubricate with Grade 1 Wheel Bearing Lubricant.
11	Propshaft U-Joints	One fitting each joint (1350, 1410, 1480 and 1550 Series); lubricate with Grade 1 Wheel Bearing Lubricant.
12	Rear Wheel Bearings*	Hand-pack or lubricate. (W22 and W52 oil lubricated.)
13	Rear Axle*	Fill to level of filler plug.
14	Parking Brake Clevis Pin†	Apply chassis lubricant.
15	Master Cylinder†	Fill 1/4" (6 mm) below opening. (Except W22 and W52.)
16	Master Cylinder†	Fill to bottom of notched rings, visible through the openings (W22 and W52).
17	Parking Brake Lever Pivot**†	Apply chassis lubricant. (Parking brake lever in cab)

* Refer to your Maintenance Schedule.
** Applies to some vehicles.
† Applies to hydraulic brakes only.

BATTERY

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.



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.

If the vehicle is to be stored for extended periods of 60 days or more, it is recommended to keep the battery charged by connecting it to a trickle charger, in a safe place — because of emitted hydrogen during battery charging. This will extend the life of the battery.

The idle control learned variables might need to be re-learned by the engine controller after the battery is reconnected. Consult your local dealer or service manual for the "Idle Learn" procedure. It is a procedure, which does not require any tools and can be easily done by yourself. This procedure is not absolutely necessary, since the engine controller will teach new values every time your engine returns to idle speed. The engine may not idle smoothly until the idle control variables are relearned.

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

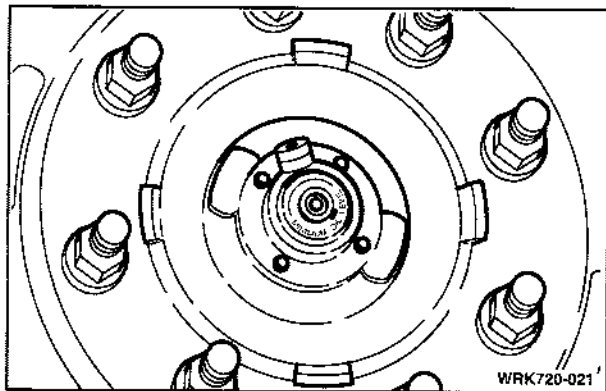
Gasoline Vehicle Storage

Extended periods of vehicle storage (over 60 days) can result in deterioration of gasoline fuel due to oxidation. A commercially available fuel stabilizer ("STA-BIL" or equivalent) should be added prior to gasoline fill whenever the anticipated storage period is over 60 days. The manufacturer's instructions included with the product should be followed. Operate the vehicle for 10 minutes at idle speed to distribute the stabilizer throughout the fuel system.

Moisture condensation will be minimized by filling the fuel tank.

FRONT WHEEL BEARINGS WITH OIL-FILLED HUBS (IF EQUIPPED)

Some vehicles have oil-lubricated front hubs.



If your vehicle has these, check to see if they have enough oil. You can tell by simply looking into the

sight glass on the front wheel hubs to see if there is oil there.

If oil is low, remove the fill cap, and 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 on the sight glass.

Your Maintenance Schedule will tell you what oil to use. See "Recommended Fluids and Lubricants" in the Index.

When you fill the hub, check the glass again after driving a short distance. It may take a while for the oil to flow through the system, and you may need 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 WCC 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.**
- **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 located somewhere on your vehicle (check with your body manufacturer or on the incomplete vehicle document), 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**

NOTICE (Continued)

NOTICE (Continued)

- **Bad handling**
- **Bad fuel economy.**

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.

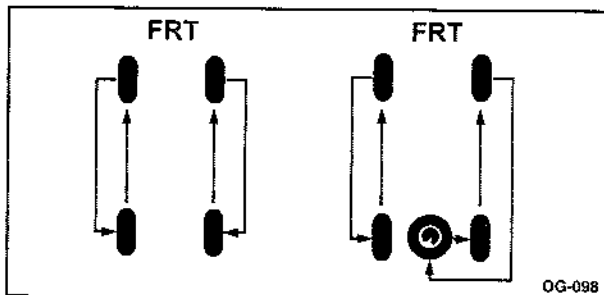
How to Check

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.

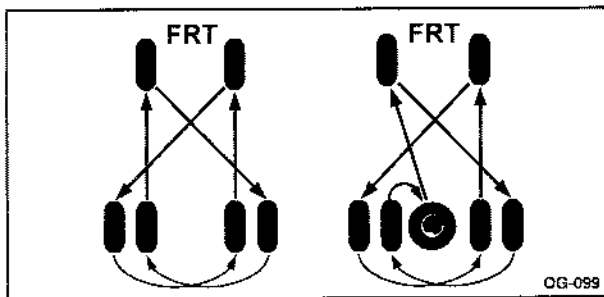
Tire Inspection and Rotation

Tires should be rotated every 6,000 to 8,000 miles (10 000 to 13 000 km). Any time you notice unusual wear, rotate your tires as soon as possible and check wheel alignment. Also check for damaged tires or wheels. See "When It's Time for New Tires" and "Wheel Replacement" later in this section for more information. If your vehicle has dual rear wheels, also see "Dual Tire Operation" later in this section.



The purpose of regular rotation is to achieve more uniform wear for all tires on the vehicle. The first rotation is the most important. See "Scheduled Maintenance Services" in the Index for scheduled rotation intervals.

If your vehicle has single rear wheels, always use one of the correct rotation patterns shown on previous page when rotating your tires.



**Same Load Range and Tread Pattern
Front and Rear**

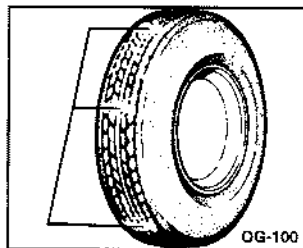
If your vehicle has dual rear wheels, always use one of the correct rotation patterns shown here when rotating your tires.

When you install dual wheels, be sure the vent holes in the inner and outer wheels on each side are lined up.

After the tires have been rotated, adjust the front and rear inflation pressures as shown on the Certification/Tire label. Make certain that all wheel nuts are properly tightened. See "Wheel Nut Torque" in the Index.

**CAUTION**

Rust or dirt on a wheel, or on the parts to which it is fastened, can make 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 places where the wheel attaches to the vehicle. In an emergency, you can use a cloth or a 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. (See "Changing a Flat Tire" in the Index.)

When It's Time for New Tires

One way to tell when it's time for new tires is to check the treadwear indicators, which will appear when your tires have only 1/16 inch (1.6 mm) or less of tread remaining.

Some commercial truck tires may not have treadwear indicators. Some larger tires, such as 19 1/2 inch (49.5 cm) tires, do not have treadwear indicators.

You need a new tire if any of the following statements are true:

- You can see the indicators at three or more places around the tire.
- 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.

Dual Tire Operation

When the vehicle is new, or whenever a wheel, wheel bolt or wheel nut is replaced, check the wheel nut torque after 100, 1,000 and 6,000 miles (160, 1600 and 10 000 km) of driving. For proper torque, see "Wheel Nut Torque" in the Index.

The outer and inner tire on a dual wheel set up will wear differently. 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.

Buying New Tires

To find out what kind and size of tires you need, look at the Certification/Tire label.

The tires installed on your vehicle when it was new may have had a Tire Performance Criteria Specification (TPC Spec) number on each tire's sidewall. When you get new tires, get ones with that same TPC Spec number. That way your vehicle will continue to have tires that are designed to give proper endurance, handling, speed rating, traction, ride and other things during normal service on your vehicle. If your tires have an all-season tread design, the TPC number will be followed by an "MS" (for mud and snow).

If you ever replace your tires with those not having a TPC Spec number, make sure they are the same size, load range, speed rating and construction type (bias, bias-belted or radial) as your original tires.



CAUTION

Mixing tires could cause you to lose control while driving. If you mix tires of different sizes or types (radial and bias-belted tires), the vehicle may not handle properly, and you could have a crash. Using tires of different sizes may also cause damage to your vehicle. Be sure to use the same size and type tires on all wheels.



CAUTION

If you use bias-ply tires on your vehicle, the wheel rim flanges could develop cracks after many miles of driving. A tire and/or wheel could fail suddenly, causing a crash. Use only radial-ply tires with the wheels on your vehicle.

Wheel Alignment and Tire Balance

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

Scheduled wheel alignment and wheel balancing are not needed. However, if you notice unusual tire wear or your vehicle 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 rebalanced.

Wheel Replacement

Replace any wheel that is bent, cracked, or badly rusted or corroded. If wheel nuts keep coming loose, the wheel, wheel bolts and wheel nuts should be replaced. If the wheel leaks air, replace it (except some aluminum wheels, which can sometimes be repaired). See your dealer if any of these conditions exist.

Your dealer will know the kind of wheel you need.

Each new wheel should have the same load-carrying capacity, diameter, width, offset and be mounted the same way as the one it replaces.

If you need to replace any of your wheels, wheel bolts or wheel nuts, replace them only with new original equipment parts. This way, you will be sure to have the right wheel, wheel bolts and wheel nuts for your vehicle.



CAUTION

Using the wrong replacement wheels, wheel bolts or wheel nuts on your vehicle can be dangerous. It could affect the braking and handling of your vehicle, make your tires lose air and make you lose control. You could have a collision in which you or others could be injured. Always use the correct wheel, wheel bolts and wheel nuts for replacement.

NOTICE

The wrong wheel can also cause problems with bearing life, brake cooling, speedometer or odometer calibration, headlamp aim, bumper height, vehicle ground clearance and tire or tire chain clearance to the body and chassis.

Whenever a wheel, wheel bolt or wheel nut is replaced on a dual wheel setup, check the wheel nut torque after 100, 1,000 and 6,000 miles (160, 1600 and 10 000 km) of driving. For proper torque, see "Wheel Nut Torque" in the Index.

See "Changing a Flat Tire" in the Index for more information.

Used Replacement Wheels**CAUTION**

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

Tire Chains

NOTICE

Use tire chains only where legal and only when you must. Use chains that are the proper size for your tires. Install them on the tires of the rear axle. Tighten them as tightly as possible with the ends securely fastened. Drive slowly and follow the chain manufacturer's instructions. If you can hear the chains contacting your vehicle, stop and retighten them. If the contact continues, slow down until it stops. Driving too fast or spinning the wheels with chains on will damage your vehicle.

Before using any tire chains, check with your body manufacturer to be sure there is enough clearance between the tires and the wheel well.

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.

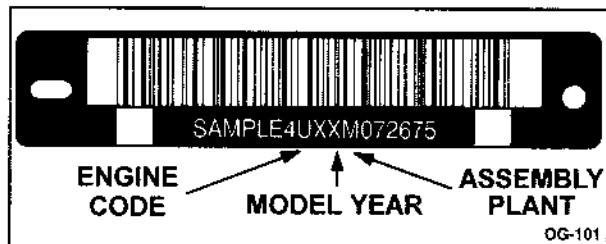
UNDERBODY MAINTENANCE

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 the radiator support panel. 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 PARTS IDENTIFICATION LABEL

You'll find this label somewhere on your vehicle — final label location is determined by the body manufacturer. However, a good place to look for the label is on the right front inside hood or engine access panel. 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

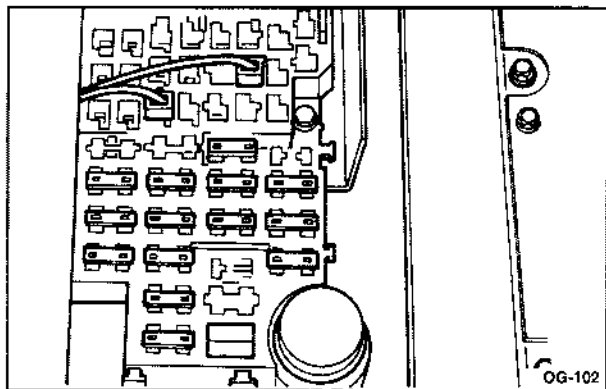
Don't add anything electrical to your vehicle unless you check with your dealer first. Some electrical equipment can damage your vehicle and the damage wouldn't be covered by your warranty. Some add-on electrical equipment can keep other components from working as they should.

Fuses and Circuit Breakers

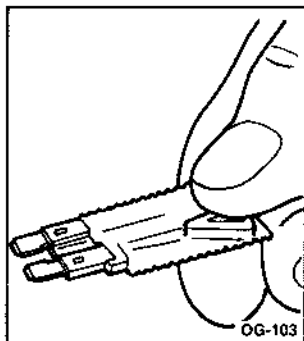
The wiring circuits in your vehicle are protected from short circuits by a combination of fuses, circuit breakers and fusible thermal links in the wiring itself. This greatly reduces the chance of fires caused by electrical problems.

Fuse Block

The fuse block is mounted by the body manufacturer.



Only 5.7L Gas and 6.5L Diesel Engines



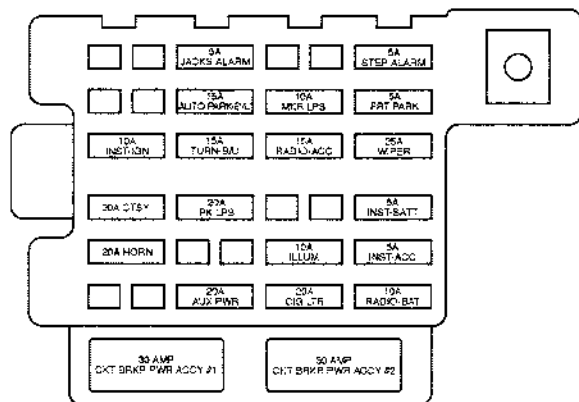
You can remove fuses with a fuse extractor.

Be sure to use the correct fuse. If you ever have a problem on the road and don't have a spare fuse, you can borrow one of the correct value. Just pick some feature of your vehicle that you can get along without and use its fuse. Replace it as soon as you can. See "Fuses and Circuit Breakers" in this section.

Fuses and Circuit Breakers — P32 Motor Home

Name	Circuits Protected
HORN	Horn Relay
CTSY	Dome & Courtesy Lamps (Body Builder)
INST — IGN	DRL Relay, DRL Control Module Cluster, Audio Alarm, Check Tire
AUX PWR	Body Builder

Name	Circuits Protected
PK LPS	Headlamp Switch (Park, Marker and Tail Lamps)
TURN — B/U	Turn Signal Switch, & B/U Lamps
JACKS ALARM	Jacks Alarm
CIG LTR	Cigarette Lighter (Body Builder)
ILLUM	Instrument Panel Cluster, Audio Alarm, Body Builder Feed
RADIO — ACC	Body Builder Radio
MKR LPS	License Lamps, Body Builder Marker Lamps
RADIO — BAT	Body Builder Radio
WIPER	Body Builder Wipers
FRT PARK	Front Park Lamps
STEP ALARM	Step Alarm
PWR ACCY #1	Body Builder
PWR ACCY #2	Body Builder
INST — BAT	Cluster, Check Tire
INST — ACC	Cluster
AUTO PARK — B/U	Auto Park Brake, Park/Neutral Positions, B/U Lamps



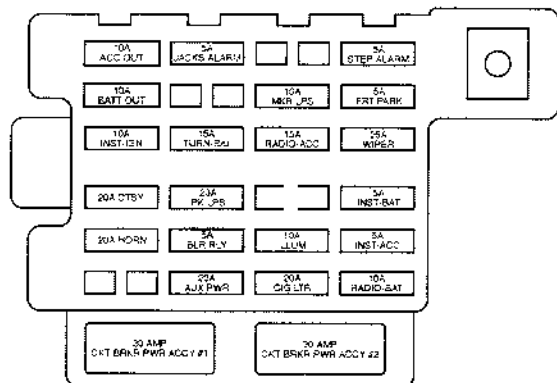
Internal Fuse Block

WRK720-009

Name	Circuits Protected	Name	Circuits Protected
BRAKE	ABS Module, ABS Brake Switch	LIGHTING	I/P External Fuseblock, Headlamp Switch, Data Link Fuse (Eng)
CRUISE	Cruise Control Switch		
FUEL PMP	Fuel Pump Relay	BATTERY	I/P External Fuse Block, Stop/Hazard Fuse (Eng)
ETM	Electronic Throttle Module	IGN A	Ignition Switch Starter Relay
CRANK	Crank Request to PCM	IGN B	Ignition Switch
LH TAIL	LH Tail Lamps		
RH TAIL	RH Tail Lamps		
DATA	Data Link	ABS	ABS Module
"B" STUD	Body Builder	BLOWER	HVAC Blower
"A" STUD	Body Builder (30A without Auto Apply; 60A with Auto Apply.)	PWR BRK	Auxiliary Fan
		HORN — PCM	Engine Fuse Block, Horn Fuse (I/P External)

Fuses and Circuit Breakers — P42 Commercial 4.8L and 6.0L

Name	Circuits Protected
HORN	Horn Relay
CTS Y	Dome & Courtesy Lamps (Body Builder)
INST — IGN	DRL Relay, DRL Control Module, Cluster, Audio Alarm, Check Tire
AUX PWR	Body Builder



Internal Fuse Block

WRK720-010

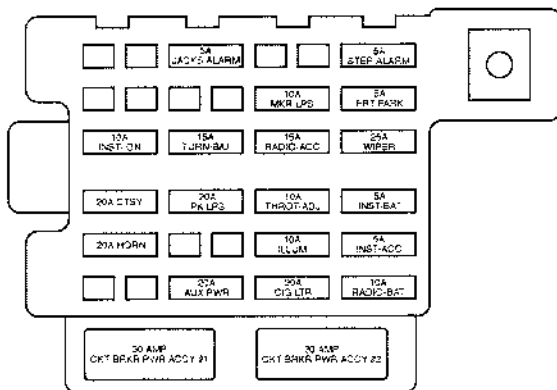
Name	Circuits Protected
PK LPS	Headlamp Switch (Park, Marker and Tail Lamps)
TURN — B/U	Turn Signal Switch, Park/Neutral Position & B/U Lamps
JACKS ALARM	Jacks Alarm
CIG LTR	Cigarette Lighter (Body Builder)
ILLUM	Instrument Panel Cluster, Audio Alarm, Body Builder Feed
RADIO — ACC	Body Builder Radio
MKR LPS	License Lamps, Body Builder Marker Lamps
RADIO — BAT	Body Builder Radio
WIPER	Body Builder Wipers
FRT PARK	Front Park Lamps
STEP ALARM	Step Alarm
PWR ACCY #1	Body Builder
PWR ACCY #2	Body Builder
INST — BAT	Cluster, Check Tire
INST — ACC	Cluster
ACC OUT	Accessory Out in Convenience Center
BATT OUT	Battery out in Convenience Center
BLR RLY	Blower Relay

Name	Circuits Protected	Name	Circuits Protected
BRAKE	ABS Module ABS Brake Switch	LIGHTING	I/P External Fuseblock, Headlamp Switch, Data Link Fuse (Eng)
CRUISE	Cruise Control Switch	BATTERY	I/P External Fuse Block, Stop/Hazard Fuse (Eng)
FUEL PMP	Fuel Pump Relay	IGN A	Ignition Switch Starter Relay
ETM	Electronic Throttle Module	IGN B	Ignition Switch
CRANK	Crank Request to PCM	ABS	ABS Module
LH TAIL	LH Tail Lamps	BLOWER	HVAC Blower
RH TAIL	RH Tail Lamps	PWR BRK	Power Brake
DATA	Data Link	HORN — PCM	Eng. Fuse Block Horn Fuse (I/P External)
B STUD	Body Builder		
A STUD	Body Builder		

Fuses and Circuit Breakers — W22 Motor Home

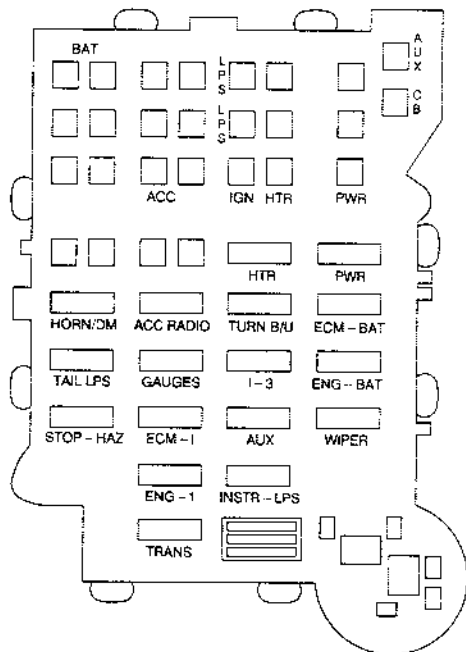
Name	Circuits Protected
HORN	Horn Relay
CTS Y	Dome & Courtesy Lamps (Body Builder)
INST — IGN	DRL Relay, DRL Control Module, Cluster, Audio Alarm, Check Tire
AUX PWR	Body Builder

Name	Circuits Protected
PK LPS	Headlamp Switch (Park, Marker and Tail Lamps)
TURN — B/U	Turn Signal Switch, Park/Neutral Position & B/U Lamps
JACKS ALARM	Jacks Alarm
CIG LTR	Cigarette Lighter (Body Builder)
ILLUM	Instrument Panel Cluster, Audio Alarm, Body Builder Feed
RADIO — ACC	Body Builder Radio
MKR LPS	License Lamps, Body Builder Marker Lamps
RADIO — BAT	Body Builder Radio
WIPER	Body Builder Wipers
FRT PARK	Front Park Lamps
STEP ALARM	Step Alarm
PWR ACCY #1	Body Builder
PWR ACCY #2	Body Builder
INST — BAT	Cluster, Check Tire
INST — ACC	Cluster
THROT — ADJ	Throttle Adjust

**Internal Fuse Block**

WRK720-010

Name	Circuits Protected	Name	Circuits Protected
BRAKE	ABS Module, ABS Brake Switch	LIGHTING	I/P External Fuseblock, Headlamp Switch, Data Link Fuse (Eng)
CRUISE	Cruise Control Switch	BATTERY	I/P External Fuse Block, Stop/Hazard Fuse (Eng)
FUEL PMP	Fuel Pump Relay	IGN A	Ignition Switch Starter Relay
ETM	Electronic Throttle Module	IGN B	Ignition Switch
CRANK	Crank Request to PCM	ABS	ABS Module
LH TAIL	LH Tail Lamps	Blower	HVAC Blower
RH TAIL	RH Tail Lamps	PWR BRK	Power Brake
DATA	Data Link	Horn — PCM	Eng Fuse Block, Horn Fuse (I/P External)
"B" STUD	Body Builder		
"A" STUD	Body Builder		



Internal Fuse Block

OG-105

Fuses and Circuit Breakers — P42 Commercial (Except 3.9L Cummins Diesel Engines)

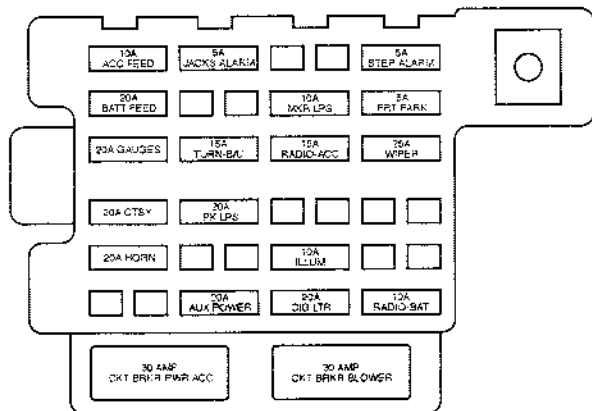
Name	Circuits Protected
HTR	To Be Determined By Body Builder
PWR	To Be Determined By Body Builder
HORN/DM	Horn Relay, Dome Lamp, Audio Alarm
ACC RADIO	To Be Determined By Body Builder
TURN-B/U	Turn Signal Flasher, B/U Lamps
PARK/ NEUTRAL	(Automatic and Manual)
ECM-BAT	Fuel Pump Relay, Engine Oil Pressure Indicator Sensor, Vehicle Control Module
TAIL LPS	Headlamp Switch, Park Brake Switch/Alarm/Indicator Lamp
GAUGES	Daytime Running Lamps Relay, Daytime Running Lamps Control Module, Air Conditioner Compressor Relay, Instrument Panel Cluster, Audio Alarm, Alternator, Body Builder Ignition

Continued

Name	Circuits Protected	Name	Circuits Protected
I-3	Vehicle Control Module, Stop Lamp/TCC Switch, ABS Module, Engine Alarm	AUX	To Be Determined By Body Builder
ENG-BAT	Air Conditioner Compressor Relay, Data Link	WIPER	Body Builder Windshield Wiper System
STOP-HAZ	Hazard Lamp Flasher, Stop Lamp Switch	ENG-1	Heated Oxygen Sensors, Secondary Oxygen Sensors, Mass Air Flow Sensor, Camshaft Position Sensor, Evaporative Emissions Canister, Purge Valve Solenoid, Canister Vent Sensor, Fuel Heater, Water in Fuel Sensor, Glowplug Control, Fan Control Relay
ECM-1	Fuel Injectors, Ignition Coil, Electronic Ignition Control Module, Vehicle Control Module, Crankshaft Position Sensor, Instrument Panel Cluster, Powertrain Control Module, Vehicle Speed Sensor Calibrator, Engine Control Harness, Fuel Injector Pump Shutoff Solenoid, Transmission Control Module, Fuel Pump Relay	INSTR-LPS	Audio Alarm, PRNDL Lamp, Instrument Panel Cluster, Body Builder Instrument Lamps
		TRANS	Transmission

Fuses and Circuit Breakers — P42 Commercial (with 3.9L Cummins Diesel Engine)

Name	Circuits Protected
HORN	Horn Relay
CTSY	Dome & Courtesy Lamps (Body Builder)
GAGES	DRL Relay, DRL Control Module, Cluster, Audio Alarm



Internal Fuse Block

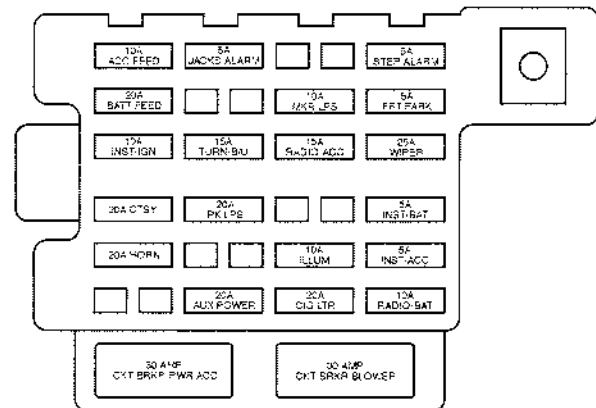
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Name	Circuits Protected
BATT FEED	Body Builder Battery Feed
ACC FEED	Body Builder Accessory Feed
AUX PWR	Body Builder, Cluster Power
PK LPS	Headlamp Switch (Park, Marker and Tail Lamps)
TURN — B/U	Turn Signal Switch, Park/Neutral Position & B/U Lamp Switch
JACKS ALARM	Jacks Alarm
CIG LTR	Cigarette Lighter (Body Builder)
ILLUM	Instrument Panel Cluster, Audio Alarm, Body Builder Feed
RADIO — ACC MKR LPS	Body Builder Radio License Lamps, Body Builder Marker Lamps
RADIO — BAT	Body Builder Radio
WIPER	Body Builder Wipers
FRT PARK	Front Park Lamps
STEP ALARM	Step Alarm
BLOWER	Body Builder Blower
PWR ACC	Body Builder

Name	Circuits Protected	Name	Circuits Protected
"A" STUD	Body Builder	IGN B	Ignition Switch
LIGHTING	I/P External Fuseblock, Headlamp Switch, Data Link Fuse (Eng)	ABS	ABS Module
BATTERY	I/P External Fuse Block, Stop/Hazard Fuse (Eng)	CLEAN POWER	Clean Power
IGN A	Ignition Switch Starter Relay	HORN/CONV/BAT	Eng Fuse Block, Horn Fuse (I/P External)
		FUEL HEATER 1	Fuel Heater Number 1
		FUEL HEATER 2	Fuel Heater Number 2

Fuses and Circuit Breakers — W52 Commercial

Name	Circuits Protected
HORN	Horn Relay
CTS Y	Dome & Courtesy Lamps (Body Builder)
INST — IGN	DRL Relay, DRL Control Module, Cluster, Audio Alarm, Check Tire
BATT FEED	Body Builder Battery Feed

**Internal Fuse Block**

81304002

Name	Circuits Protected
ACC FEED	Body Builder Accessory Feed
AUX PWR	Body Builder
PK LPS	Headlamp Switch (Park, Marker and Tail Lamps)
TURN — B/U	Turn Signal Switch, Park/Neutral Position & B/U Lamps
JACKS ALARM	Jacks Alarm
CIG LTR	Cigarette Lighter (Body Builder)
ILLUM	Instrument Panel Cluster, Audio Alarm, Body Builder Feed
RADIO — ACC	Body Builder Radio
MKR LPS	License Lamps, Body Builder Marker Lamps
RADIO — BAT	Body Builder Radio
WIPER	Body Builder Wipers
FRT PARK	Front Park Lamps
STEP ALARM	Step Alarm
BLOWER	Body Builder Blower
PWR ACC	Body Builder
INST — BAT	Cluster, Check Tire
INST — ACC	Cluster

Name	Circuits Protected	Name	Circuits Protected
BRAKE	ABS Module, ABS Brake Switch	LIGHTING	I/P External Fuseblock, Headlamp Switch, Data Link Fuse (Eng)
CRUISE	Cruise Control Switch	BATTERY	I/P External Fuse Block, Stop/Hazard Fuse (Eng)
FUEL PMP	Fuel Pump Relay	IGN A	Ignition Switch Starter Relay
ETM	Electronic Throttle Module	IGN B	Ignition Switch
CRANK	Crank Request to PCM	ABS	ABS Module
LH TAIL	LH Tail Lamps	CLEAN POWER	Clean Power
RH TAIL	RH Tail Lamps	PWR BRK	Power Brake
DATA	Data Link	HORN — PCM	Eng Fuse Block, Horn Fuse (I/P External)
"B" STUD	Body Builder		
"A" STUD	Body Builder		

CAPACITIES AND SPECIFICATIONS

These specifications are for information only. If you have any questions, see the service manual for the chassis or refer to the body manufacturer's publications.

Engine Identification — Gasoline Engines

Engine Type	4.8L	5.7L V8	6.0L	8.1L V8
VIN Code	V	R	U	G
Fuel System	SPFI**	SCPI*	SPFI**	SPFI**

* Sequential Central Port Fuel Injection

** Sequential Port Fuel Injection

Engine Identification — Diesel Engines

Engine Type	3.9L L4	6.5L V8	6.5L V8
VIN Code	P	Y	F
Fuel System	EFI**	IEFI*	IEFI* Turbo

* Indirect Electronic Fuel Injection

** Electronic Fuel Injection

Crankcase Capacity

Engine	Quarts (Liters)
3.9L Cummins Diesel*	13.7 (13.0)
4.8L	5.0 (4.7)
5.7L	5.0 (4.7)
6.0L	5.0 (4.7)
6.5L	8.0 (7.6)
8.1L	6.4 (6.0)

All quantities are approximate. After refill, the level **MUST** be checked. See "Engine Oil and Filter Recommendations" in the Index.

*Refer to the Cummins Operation and Maintenance Manual, ISB (4 cylinder) and ISB^e (4 and 6 cylinder) Series Engines.

Fuel Tank Capacity

Model	Gallons(Liters)
Commercial	
— Standard, P42, W52	40 (151)
— School Bus, Standard	30 (113)
— Optional, P42 3.9L Cummins Diesel	30 (113)

P32 Motor Home

— Standard	40 (151)
— Optional	60 (227)
— Optional (178, 190, 208 or 228 inch wheel base)	75 (284)

W22 Motor Home

— Standard	75 (284)
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All above quantities are approximate.

Cooling System Capacity

Engine	Quarts (Liters)
3.9L Cummins Diesel*	19.0 (18.0)
4.8L	24.7 (23.4)
5.7L	15.5 (14.6)
6.0L	24.7 (23.4)
6.5L	
— P32/W22/W52	24.7 (23.4)
— P42 Commercial	25.0 (23.5)
8.1L	23.5 (22.2)

All quantities are approximate. After refill, the level MUST be checked. See "Engine Cooling System" in the Index.

* Refer to the Cummins Operation and Maintenance Manual, ISB (4 cylinder) and ISB^e (4 and 6 cylinder) Series Engines.

Allison Transmission Fluid Capacity

	Quarts (Liters)
Standard Oil Pan	19.0 (18.0)

Hydra-Matic 4L80-E Fluid Capacity

	Quarts (Liters)
Standard Oil Pan	5.0 (4.7)

Service Replacement Part and Filter Recommendations

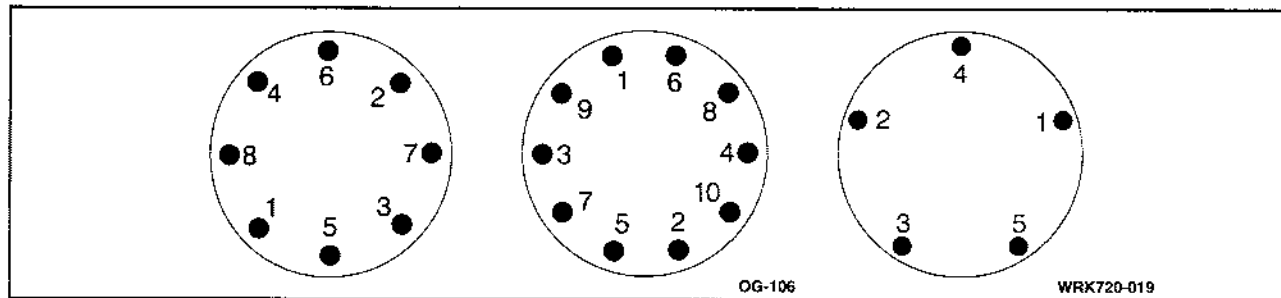
Replacement part numbers listed in this section are based on the latest information available at the time of printing, and are subject to change. If a part listed in this manual is not the same as the part used in your vehicle when it was built, or if you have any questions, please contact your WCC dealer.

Engine — Gasoline	4.8L	5.7L	6.0L	8.1L
Spark Plug	PTJ16R15	41-932	PTJ16R15	42-99321
— Gap	0.060" (1.52 mm)	0.060" (1.52 mm)	0.060" (1.52 mm)	0.060" (1.52 mm)
Oil Filter	PF59	PF1218	PF59	PF454
PCV Valve	CV948C	CV769C	CV948C	—
Air Cleaner Filter	A1519C	A1236C	A1518C	A1236C
Fuel Filter	GF481	GF481	GF481	GF481
Radiator Cap	RC33	RC33	RC33	RC33
Automatic Transmission — Allison				
Spin-On Fluid Filter	—	—	—	29537268

Service Replacement Part and Filter Recommendations (Continued)

Engine — Diesel	3.9L	6.5L
Oil Filter	Cummins Part Number 4893280, or Fleetguard® Part Number LF3886	PF1218
Air Cleaner Filter	AC/Delco Part Number A1236C, or Workhorse Part Number 25099849	*
Fuel Filter	Cummins Part Number 4894548, or Fleetguard® Part Number FF5420	TP1256
Radiator Cap	RC33, or Workhorse Part Number 15977333	RC33

* VIN code Y engines use part number A917C. VIN code F engines use part number A1236C.



Wheel Nut Torque

Model	GVW Range lbs.	(kg)	Number of Wheel Bolts	Torque lb-ft (N•m)
P42 Commercial	8,600 - 9,400	(3 901 - 4 264)	8	120 lb-ft (163 N•m)
P42 Commercial	10,000 - 11,000	(4 536 - 4 990)	8	140 lb-ft (190 N•m)
P42 Commercial	12,000 - 16,000	(5 443 - 7 258)	5 Front, 10 Rear	175 lb-ft (237 N•m)
P32 Motor Home	12,300	(5 579)	8	140 lb-ft (190 N•m)
P32 Motor Home	14,800 - 18,000	(6 713 - 8 165)	5 Front, 10 Rear	175 lb-ft (237 N•m)
W22 Motor Home	20,700 - 22,000	(9 390 - 9 979)	8	475 lb-ft (644 N•m)
W52 Commercial	19,500	(8845)	8	475 lb-ft (644 N•m)

Review the certification for the Gross Vehicle Weight Rating label, which is located somewhere on your vehicle. Check with your body manufacturer.

Lamp and Bulb Data

Before replacing any bulbs, be sure that all lamps are off and the engine isn't running.

We recommend that you use an AC-type bulb whenever you need to replace one.

Some exterior lamps are supplied by the body manufacturer. Consult the body manufacturer's information for light bulb use.

AIR CONDITIONING REFRIGERANTS

If the air conditioning system in your vehicle needs refrigerant, be sure the proper refrigerant is used. The proper refrigerant for your vehicle is R134A.

This section covers the maintenance required for your vehicle. Your vehicle needs these services to retain its safety, dependability and emission control performance.

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IMPORTANT:
KEEP ENGINE OIL
AT THE PROPER
LEVEL AND CHANGE AS
RECOMMENDED

OG-107

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.

HOW THIS SECTION IS ORGANIZED

This maintenance schedule is divided into five 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 are skilled enough to do some work on your vehicle, you will probably 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: Periodic Maintenance Inspections” explains important inspections that your dealer’s service department or another qualified service center should perform.

“Part D: Recommended Fluids and Lubricants” lists some recommended products 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 E: Maintenance Record” provides a place for you to record the maintenance performed on your vehicle. Whenever any maintenance is performed, be sure to write it down in this part. This will help you determine when your next maintenance should be done. In addition, it is a good idea to 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 WCC want to help you keep your vehicle in good working condition. But, we don't exactly know 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 you may drive it to work, to do errands or in many other ways.

Because of all the different ways people use their vehicles, maintenance requirements 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 trained service people will perform the work using genuine WCC replacement parts.

The proper fluids and lubricants to use are listed in Part D. 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.

These schedules are for vehicles which:

- 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.

If your vehicle has an Allison transmission, see your Allison Automatic Transmission Operator's Manual for scheduled maintenance.

Selecting the Right Schedule

First you'll need to decide which of the two schedules is right for your vehicle. Here's how to decide which schedule to follow:

Gasoline engine vehicles and diesel engine vehicles have different maintenance requirements. If you have a diesel engine, follow a schedule designated for diesel engine vehicles only.

Short Trip/City Definition — Gasoline Engines

Follow the Short Trip/City Scheduled Maintenance if any one of these conditions is true for your vehicle:

- 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 include extensive idling (such as frequent driving in stop-and-go traffic).
- Most trips are through dusty areas.
- If the vehicle is used for delivery service, police, taxi or other commercial application.

One of the reasons you should follow this schedule if you operate your vehicle under any of these conditions is these conditions cause engine oil to break down sooner.

Every 3,000 Miles (5 000 km): Engine Oil and Filter Change (or 3 months, whichever occurs first). Chassis Lubrication (or 3 months, whichever occurs first). Drive Axle Service (or 3 months, whichever occurs first).

Short Trip/City Intervals — Gasoline Engines

At 3,000 Miles (5 000 km) and 30,000 Miles (48 000km) – Then Every 30,000 Miles (48 000 km): Inspect/adjust auto apply parking brake system. (if equipped.)

Every 6,000 Miles (10 000 km): Tire Rotation.

Every 15,000 Miles (25 000 km): Air Cleaner Filter Inspection, if driving in dusty conditions. Shields and Underhood Insulation Inspection. Front Wheel Bearing Repack (or at each brake relining, whichever occurs first).

Every 30,000 Miles (50 000 km): Air Cleaner Filter Replacement. Fuel Filter Replacement.

Every 50,000 Miles (83 000 km): Automatic Transmission Service.

Every 60,000 Miles (100 000 km): Engine Accessory Drive Belt Inspection. Fuel Tank, Cap and Lines Inspection. Exhaust Gas Recirculation System Inspection. Evaporative Control System Inspection.

Short Trip/City Intervals — Gasoline Engines

Every 100,000 Miles (166 000 km): Spark Plug Wire Inspection. Spark Plug Replacement. Positive Crankcase Ventilation (PCV) Valve Inspection.

Every 150,000 Miles (240 000 km): Cooling System Service (or every 60 months, whichever occurs first).

These intervals only summarize maintenance services. Be sure to follow the complete scheduled maintenance on the following pages.

Long Trip/Highway Definition — Gasoline Engines

Follow this scheduled maintenance *only* if none of the conditions from the Short Trip/City Scheduled Maintenance is true. Do not use this schedule if the vehicle is used for trailer towing, driven in a dusty area or used off paved roads. Use the Short Trip/City schedule for these conditions.

Driving a vehicle with a fully warmed engine under highway conditions causes engine oil to break down slower.

Long Trip/Highway Intervals — Gasoline Engines

At 5,000 Miles (8 000 km) and 30,000 Miles (48 000km) – Then Every 30,000 Miles (48 000 km): Inspect/adjust Auto Apply parking brake system. (if equipped.)

Every 7,500 Miles (12 500 km): Engine Oil and Filter Change (or every 12 months, whichever occurs first). Chassis Lubrication (or every 12 months, whichever occurs first). Drive Axle Service. Tire Rotation.

Every 15,000 Miles (25 000 km): Shields and Underhood Insulation Inspection.

Every 30,000 Miles (50 000 km): Fuel Filter Replacement. Air Cleaner Filter Replacement. Front Wheel Bearing Repack (or at each brake relining, whichever occurs first).

Long Trip/Highway Intervals — Gasoline Engines

Every 50,000 Miles (83 000 km): Automatic Transmission Service.

Every 60,000 Miles (100 000 km): Engine Accessory Drive Belt Inspection. Fuel Tank, Cap and Lines Inspection. Exhaust Gas Recirculation System Inspection. Evaporative Control System Inspection.

Every 100,000 Miles (166 000 km): Spark Plug Wire Inspection. Spark Plug Replacement. Positive Crankcase Ventilation (PCV) Valve Inspection.

Every 150,000 Miles (240 000 km): Cooling System Service (or every 60 months, whichever occurs first).

These intervals only summarize maintenance services. Be sure to follow the complete scheduled maintenance on the following pages.

Short Trip/City Definition — Diesel Engines

NOTE: For vehicles equipped with the 3.9L (Cummins ISB) engine refer to Maintenance Schedule — Cummins ISB Diesel Engines.

Follow the Short Trip/City Scheduled Maintenance if any one of these conditions is true for your vehicle:

- 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 include extensive idling (such as frequent driving in stop-and-go traffic).
- You operate your vehicle in dusty areas or off-road frequently.
- You frequently tow a trailer with your vehicle.
- If the vehicle is used for delivery service, shuttle service or other commercial application.

One of the reasons you should follow this schedule if you operate your vehicle under any of these conditions is these conditions cause engine oil to break down sooner.

Short Trip/City Intervals — Diesel Engines

Every 2,500 Miles (4 000 km): Engine Oil and Filter Change (or every 3 months, whichever occurs first). Chassis Lubrication (or every 3 months, whichever occurs first). Drive Axle Service.

At 5,000 Miles (8 000 km) and 30,000 Miles (48 000 km) — Then Every 30,000 Miles (48 000 km): Engine Idle Speed Adjustment (Engine Code Y only). Inspect and adjust Auto Apply parking brake system. (if equipped.)

Every 7,500 Miles (12 000 km): Tire Rotation. Inspect and adjust Auto Apply parking brake system (if equipped.)

Every 10,000 Miles (16 000 km): Shields and Underhood Insulation Inspection. Thermostatically Controlled Engine Cooling Fan Check (or every 12 months, whichever occurs first). Air Intake System Inspection.

Every 15,000 Miles (24 000 km): Air Cleaner Filter Inspection, if driving in dusty conditions. Front Wheel

Short Trip/City Intervals — Diesel Engines

Bearing Repack (or at each brake relining).

Every 25,000 Miles (40 000 km): Fuel Cap Replacement, if driving in dusty conditions.

Every 30,000 Miles (48 000 km): Air Cleaner Filter Replacement. Fuel Filter Replacement.

Every 50,000 Miles (80 000 km): Automatic Transmission Service.

Every 60,000 Miles (96 000 km): Crankcase Depression Regulator Valve (CDRV) System Check (VIN Code Y engine only). Engine Accessory Drive Belt Inspection.

Every 150,000 Miles (240 000 km): Cooling System Service (or every 60 months, whichever occurs first).

These intervals only summarize maintenance services. Be sure to follow the complete scheduled maintenance on the following pages.

Long Trip/Highway Definition — Diesel Engines

NOTE: For vehicles equipped with the 3.9L (Cummins ISB) engine refer to Maintenance Schedule — Cummins ISB Diesel Engines.

Follow this scheduled maintenance only if none of the conditions from the Short Trip/City Scheduled Maintenance is true. Do not use this schedule if the vehicle is used for trailer towing, driven in a dusty area or used off paved roads. Use the Short Trip/City schedule for these conditions.

Driving a vehicle with a fully warmed engine under highway conditions causes engine oil to break down slower.

Long Trip/Highway Intervals — Diesel Engines

Every 5,000 Miles (8 000 km): Engine Oil and Filter Change (or every 12 months, whichever occurs first). Chassis Lubrication (or every 12 months, whichever occurs first). Drive Axle Service.

Long Trip/Highway Intervals — Diesel Engines

At 5,000 Miles (8 000 km) and 30,000 Miles (48 000 km) — Then Every 30,000 Miles (48 000 km): Engine Idle Speed Adjustment (Engine Code Y only). Inspect and adjust Auto Apply parking brake system. (if equipped.)

At 5,000 Miles (8 000 km) — Then Every 10,000 Miles (16 000 km): Tire Rotation.

Every 10,000 Miles (16 000 km): Shields and Underhood Insulation Inspection. Air Intake System Inspection. Thermostatically Controlled Engine Cooling Fan Check (or every 12 months, whichever occurs first).

Every 30,000 Miles (48 000 km): Front Wheel Bearing Repack (or at each brake relining). Fuel Filter Replacement. Air Cleaner Filter Replacement.

Every 50,000 Miles (80 000 km): Automatic Transmission Service.

Every 60,000 Miles (96 000 km): Crankcase Depression Regulator Valve (CDRV) System

Inspection (VIN Code Y engine only). Engine Accessory Drive Belt Inspection.

Every 150,000 Miles (240 000 km): Cooling System Service (or every 60 months, whichever occurs first).

These intervals only summarize maintenance services. Be sure to follow the complete scheduled maintenance on the following pages.

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 at 150,000 miles (240 000 km) should be performed at the same interval after 150,000 miles (240 000 km).

See "Owner Checks and Services" and "Periodic Maintenance Inspections" following.

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 to have all recommended maintenance services

be performed at the indicated intervals and the maintenance be recorded.

Lubricate the front suspension, kingpin bushings, steering linkage, automatic transmission shift linkage, parking brake cable guides, propshaft splines, universal joints, brake pedal springs, front wheel bearings and auto-apply park brake cam and linkage.

+ A good time to check your brakes is during tire rotation. See "Brake System Inspection" under "Periodic Maintenance Inspections" in Part C of this schedule.

** Drive axle service (see "Recommended Fluids and Lubricants" in the Index for proper lubricant to use):

- Standard Differential — Check fluid level and add fluid as needed at every oil change. If driving in dusty areas or towing a trailer, drain fluid and refill every 15,000 miles (25 000 km).
- More frequent lubrication may be required for heavy duty use.
- Dana 70/80/S135 Series — Check fluid level and add fluid as needed at every oil change. If driving in dusty, sandy or wet conditions or towing a trailer, change lubricant every 25,000 miles (42 000 km) or 6 months (whichever occurs first).

Short Trip / City Scheduled Maintenance — Gasoline Engines

3,000 Miles (5 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)
- Check axle fluid level and add fluid as needed. (See footnote **)
- Inspect/adjust auto apply parking brake system. (if equipped)

DATE	
ACTUAL MILEAGE	SERVICED BY:

6,000 Miles (10 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)
- Check axle fluid level and add fluid as needed. (See footnote **.)
- Rotate tires. See "Tire Inspection and Rotation" in the Index for proper rotation pattern and additional information. (See footnote +.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

9,000 Miles (15 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.

DATE	
ACTUAL MILEAGE	SERVICED BY:

Short Trip / City Scheduled Maintenance — Gasoline Engines

9,000 Miles (15 000 km) Continued

- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)
- Check axle fluid level and add fluid as needed, (See footnote **.)

12,000 Miles (20 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)
- Check axle fluid level and add fluid as needed. (See footnote **.)
- Rotate tires. See "Tire Inspection and Rotation" in the Index for proper rotation pattern and additional information. (See footnote +.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

15,000 Miles (25 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

Short Trip / City Scheduled Maintenance — Gasoline Engines

15,000 Miles (25 000 km) Continued

- Inspect air cleaner filter if you are driving in dusty conditions. Replace filter if necessary.
An Emission Control Service.
- Check axle fluid level and add fluid as needed. (See footnote **.)
- Clean and repack the front wheel bearings (or at each brake relining, whichever occurs first).
- Inspect shields and underhood insulation for damage or looseness. Adjust or replace as required.
This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.

18,000 Miles (30 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)
- Check axle fluid level and add fluid as needed. (See footnote **.)
- Rotate tires. See "Tire Inspection and Rotation" in the Index for proper rotation pattern and additional information. (See footnote +.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

Short Trip / City Scheduled Maintenance — Gasoline Engines

21,000 Miles (35 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)
- Check axle fluid level and add fluid as needed. (See footnote **.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

24,000 Miles (40 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)
- Check axle fluid level and add fluid as needed. (See footnote **.)
- Rotate tires. See "Tire Inspection and Rotation" in the Index for proper rotation pattern and additional information. (See footnote +.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

27,000 Miles (45 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.

DATE	
ACTUAL MILEAGE	SERVICED BY:

Short Trip / City Scheduled Maintenance — Gasoline Engines

27,000 Miles (45 000 km) Continued

- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)
- Check axle fluid level and add fluid as needed. (See footnote **.)

30,000 Miles (50 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)
- Check axle fluid level and add fluid as needed. (See footnote **.)
- Clean and repack the front wheel bearings (or at each brake relining, whichever occurs first).
- Replace fuel filter.
An Emission Control Service.
- Replace air cleaner filter.
An Emission Control Service.
- Inspect shields and underhood insulation for damage or looseness. Adjust or replace as required.
This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.
- Inspect/adjust auto apply parking brake system. (if equipped)

DATE	
ACTUAL MILEAGE	SERVICED BY:

Short Trip / City Scheduled Maintenance — Gasoline Engines

30,000 Miles (50 000 km) Continued

- Rotate tires. See "Tire Inspection and Rotation" in the Index for proper rotation pattern and additional information. (See footnote +.)

33,000 Miles (55 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)
- Check axle fluid level and add fluid as needed. (See footnote **.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

36,000 Miles (60 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)
- Rotate tires. See "Tire Inspection and Rotation" in the Index for proper rotation pattern and additional information. (See footnote +.)
- Check axle fluid level and add fluid as needed. (See footnote **.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

Short Trip / City Scheduled Maintenance — Gasoline Engines

39,000 Miles (65 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)
- Check axle fluid level and add fluid as needed. (See footnote **.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

42,000 Miles (70 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)
- Check axle fluid level and add fluid as needed. (See footnote **.)
- Rotate tires. See "Tire Inspection and Rotation" in the Index for proper rotation pattern and additional information. (See footnote +.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

45,000 Miles (75 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.

DATE	
ACTUAL MILEAGE	SERVICED BY:

Short Trip / City Scheduled Maintenance — Gasoline Engines

45,000 Miles (75 000 km) Continued

- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)
- Check axle fluid level and add fluid as needed. (See footnote **.)
- Clean and repack the front wheel bearings (or at each brake relining, whichever occurs first).
- Inspect air cleaner filter if you are driving in dusty conditions. Replace filter if necessary.
An Emission Control Service.
- Inspect shields and underhood insulation for damage or looseness. Adjust or replace as required.
This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.

48,000 Miles (80 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)
- Check axle fluid level and add fluid as needed. (See footnote **.)
- Rotate tires. See "Tire Inspection and Rotation" in the Index for proper rotation pattern and additional information. (See footnote +.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

Short Trip / City Scheduled Maintenance — Gasoline Engines

50,000 Miles (83 000 km)

- Change automatic transmission fluid and filter. Manual transmission fluid doesn't require change.

DATE	
ACTUAL MILEAGE	SERVICED BY:

51,000 Miles (85 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)
- Check axle fluid level and add fluid as needed. (See footnote **.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

54,000 Miles (90 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)
- Check axle fluid level and add fluid as needed. (See footnote **.)
- Rotate tires. See "Tire Inspection and Rotation" in the Index for proper rotation pattern and additional information. (See footnote +.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

Short Trip / City Scheduled Maintenance — Gasoline Engines

57,000 Miles (95 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)
- Check axle fluid level and add fluid as needed. (See footnote **.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

60,000 Miles (100 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)
- Check axle fluid level and add fluid as needed. (See footnote **.)
- Clean and repack the front wheel bearings (or at each brake relining, whichever occurs first).
- Inspect shields and underhood insulation for damage or looseness. Adjust or replace as required.
This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.
- Inspect engine accessory drive belt.
An Emission Control Service.
- Inspect/adjust auto apply parking brake system. (if equipped)

DATE	
ACTUAL MILEAGE	SERVICED BY:

Short Trip / City Scheduled Maintenance — Gasoline Engines

60,000 Miles (100 000 km) (Continued)

- Replace fuel filter.
An Emission Control Service.
- Conduct Exhaust Gas Recirculation (EGR) system inspection as described in the service manual.
An Emission Control Service.
- Conduct evaporative control system inspection. Check all fuel and vapor lines and hoses for proper hook-up, routing and condition. Check that the purge valve works properly (if equipped). Replace as needed.
An Emission Control Service. (See footnote †.)
- Replace air cleaner filter.
An Emission Control Service.
- Inspect fuel tank, cap and lines for damage or leaks. Inspect fuel cap gasket for any damage. Replace parts as needed.
An Emission Control Service. (See footnote †.)
- Rotate tires. See "Tire Inspection and Rotation" in the Index for proper rotation pattern and additional information. (See footnote +.)

63,000 Miles (105 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.

DATE	
ACTUAL MILEAGE	SERVICED BY:

Short Trip / City Scheduled Maintenance — Gasoline Engines

63,000 Miles (105 000 km) Continued

- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)
- Check axle fluid level and add fluid as needed. (See footnote **.)

66,000 Miles (110 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)
- Check axle fluid level and add fluid as needed. (See footnote **.)
- Rotate tires. See "Tire Inspection and Rotation" in the Index for proper rotation pattern and additional information. (See footnote +.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

69,000 Miles (115 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

Short Trip / City Scheduled Maintenance — Gasoline Engines

69,000 Miles (115 000 km) Continued

- Check axle fluid level and add fluid as needed. (See footnote **.)

72,000 Miles (120 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)
- Check axle fluid level and add fluid as needed. (See footnote **.)
- Rotate tires. See "Tire Inspection and Rotation" in the Index for proper rotation pattern and additional information. (See footnote +.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

75,000 Miles (125 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)
- Clean and repack the front wheel bearings (or at each brake relining, whichever occurs first).
- Inspect air cleaner filter if you are driving in dusty conditions. Replace filter if necessary.
An Emission Control Service.

DATE	
ACTUAL MILEAGE	SERVICED BY:

Short Trip / City Scheduled Maintenance — Gasoline Engines

75,000 Miles (125 000 km) Continued

- Check axle fluid level and add fluid as needed. (See footnote **.)
- Inspect shields and underhood insulation for damage or looseness. Adjust or replace as required.
This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.

78,000 Miles (130 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)
- Check axle fluid level and add fluid as needed. (See footnote **.)
- Rotate tires. See "Tire Inspection and Rotation" in the Index for proper rotation pattern and additional information. (See footnote +.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

81,000 Miles (135 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)
- Check axle fluid level and add fluid as needed. (See footnote **.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

Short Trip / City Scheduled Maintenance — Gasoline Engines

84,000 Miles (140 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)
- Check axle fluid level and add fluid as needed. (See footnote **.)
- Rotate tires. See "Tire Inspection and Rotation" in the Index for proper rotation pattern and additional information. (See footnote +.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

87,000 Miles (145 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)
- Check axle fluid level and add fluid as needed. (See footnote **.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

90,000 Miles (150 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Inspect/adjust auto apply parking brake system. (if equipped)

DATE	
ACTUAL MILEAGE	SERVICED BY:

Short Trip / City Scheduled Maintenance — Gasoline Engines

90,000 Miles (150 000 km) Continued

- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)
- Check axle fluid level and add fluid as needed. (See footnote **.)
- Clean and repack the front wheel bearings (or at each brake relining, whichever occurs first).
- Replace fuel filter.
An Emission Control Service.
- Replace air cleaner filter.
An Emission Control Service.
- Rotate tires. See "Tire Inspection and Rotation" in the Index for proper rotation pattern and additional information. (See footnote +.)
- Inspect shields and underhood insulation for damage or looseness. Adjust or replace as required.
This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.

93,000 Miles (155 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

Short Trip / City Scheduled Maintenance — Gasoline Engines

93,000 Miles (155 000 km) Continued

- Check axle fluid level and add fluid as needed. (See footnote **.)

96,000 Miles (160 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)
- Check axle fluid level and add fluid as needed. (See footnote **.)
- Rotate tires. See "Tire Inspection and Rotation" in the Index for proper rotation pattern and additional information. (See footnote +.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

99,000 Miles (165 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)
- Check axle fluid level and add fluid as needed. (See footnote **.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

Short Trip / City Scheduled Maintenance — Gasoline Engines

100,000 Miles (166 000 km)

- Inspect spark plug wires.
An Emission Control Service.
- Replace spark plugs.
An Emission Control Service.
- Change automatic transmission fluid and filter. Manual transmission fluid doesn't require change.
- Inspect Positive Crankcase Ventilation (PCV) valve.
An Emission Control Service.

DATE	
ACTUAL MILEAGE	SERVICED BY:

150, 000 Miles (240 000 km)

- Drain, flush and refill cooling system (or every 60 months since last service, whichever occurs first). See "Engine Coolant" in the Index for what to use. Inspect hoses. Clean radiator, condenser, pressure cap and neck. Pressure test cooling system and pressure cap.
An Emission Control Service.
- Inspect/adjust auto apply parking brake system. (if equipped)

DATE	
ACTUAL MILEAGE	SERVICED BY:

Long Trip / Highway Scheduled Maintenance — Gasoline Engines

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 at 150,000 miles (240 000 km) should be performed at the same interval after 150,000 miles (240 000 km).

See "Owner Checks and Services" and "Periodic Maintenance Inspections" following.

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.

Lubricate the front suspension, kingpin bushings, steering linkage, automatic transmission shift linkage, parking brake cable guides, propshaft splines, universal joints, brake pedal springs, front wheel bearings and auto park brake cam and linkage.

+ A good time to check your brakes is during tire rotation. See "Brake System Inspection" under "Periodic Maintenance Inspections" in Part C of this schedule.

** Drive axle service (see "Recommended Fluids and Lubricants" in the Index for proper lubricant to use):

- Standard Differential — Check fluid level and add fluid as needed at every engine oil change.
- Dana 70/80/S110/S135/S150 Series — Check fluid level and add fluid as needed at every oil change.

Long Trip / Highway Scheduled Maintenance — Gasoline Engines

7,500 Miles (12 500 km)

- Change engine oil and filter (or every 12 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 12 months, whichever occurs first).
(See footnote #.)
- Check axle fluid level and add fluid as needed. (See footnote **.)
- Rotate tires. See "Tire Inspection and Rotation" in the Index for proper rotation pattern and additional information. (See footnote +.)
- Inspect/adjust auto apply parking brake system. (if equipped)

DATE	
ACTUAL MILEAGE	SERVICED BY:

15,000 Miles (25 000 km)

- Change engine oil and filter (or every 12 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 12 months, whichever occurs first).
(See footnote #.)
- Check axle fluid level and add fluid as needed. (See footnote **.)
- Inspect shields and underhood insulation for damage or looseness. Adjust or replace as required.
This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.
- Rotate tires. See "Tire Inspection and Rotation" in the Index for proper rotation pattern and additional information. (See footnote +.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

Long Trip / Highway Scheduled Maintenance — Gasoline Engines

22,500 Miles (37 500 km)

- Change engine oil and filter (or every 12 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 12 months, whichever occurs first).
(See footnote #.)
- Check axle fluid level and add fluid as needed. (See footnote **.)
- Rotate tires. See "Tire Inspection and Rotation" in the Index for proper rotation pattern and additional information. (See footnote +.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

30,000 Miles (50 000 km)

- Change engine oil and filter (or every 12 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 12 months, whichever occurs first).
(See footnote #.)
- Check axle fluid level and add fluid as needed. (See footnote **.)
- Clean and repack the front wheel bearings (or at each brake relining, whichever occurs first).
- Rotate tires. See "Tire Inspection and Rotation" in the Index for proper rotation pattern and additional information. (See footnote +.)
- Inspect/adjust auto apply parking brake system. (if equipped)

DATE	
ACTUAL MILEAGE	SERVICED BY:

Long Trip / Highway Scheduled Maintenance — Gasoline Engines

30,000 Miles (50 000 km) Continued

- Replace fuel filter.
An Emission Control Service
- Replace air cleaner filter.
An Emission Control Service.
- Inspect shields and underhood insulation for damage or looseness. Adjust or replace as required.
This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.

37,500 Miles (62 500 km)

- Change engine oil and filter (or every 12 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 12 months, whichever occurs first).
(See footnote #.)
- Check axle fluid level and add fluid as needed. (See footnote **.)
- Rotate tires. See "Tire Inspection and Rotation" in the Index for proper rotation pattern and additional information. (See footnote +.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

45,000 Miles (75 000 km)

- Change engine oil and filter (or every 12 months, whichever occurs first).
An Emission Control Service.

DATE	
ACTUAL MILEAGE	SERVICED BY:

Long Trip / Highway Scheduled Maintenance — Gasoline Engines

45,000 Miles (75 000 km) Continued

- Lubricate chassis components (or every 12 months, whichever occurs first).
(See footnote #.)
- Check axle fluid level and add fluid as needed. (See footnote **.)
- Inspect shields and underhood insulation for damage or looseness. Adjust or replace as required.
This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.
- Rotate tires. See "Tire Inspection and Rotation" in the Index for proper rotation pattern and additional information. (See footnote +.)

50,000 Miles (83 000 km)

- Change automatic transmission fluid and filter. Manual transmission fluid doesn't require change.

DATE	
ACTUAL MILEAGE	SERVICED BY:

52,500 Miles (87 500 km)

- Change engine oil and filter (or every 12 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 12 months, whichever occurs first).
(See footnote #.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

Long Trip / Highway Scheduled Maintenance — Gasoline Engines

52,500 Miles (87 500 km) Continued

- Check axle fluid level and add fluid as needed. (See footnote **.)
- Rotate tires. See "Tire Inspection and Rotation" in the Index for proper rotation pattern and additional information. (See footnote +.)

60,000 Miles (100 000 km)

- Change engine oil and filter (or every 12 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 12 months, whichever occurs first).
(See footnote #.)
- Check axle fluid level and add fluid as needed. (See footnote **.)
- Clean and repack the front wheel bearings (or at each brake relining, whichever occurs first).
- Rotate tires. See "Tire Inspection and Rotation" in the Index for proper rotation pattern and additional information. (See footnote +.)
- Inspect engine accessory drive belt.
An Emission Control Service.
- Replace fuel filter.
An Emission Control Service.
- Inspect/adjust auto apply parking brake system. (if equipped)

DATE	
ACTUAL MILEAGE	SERVICED BY:

Long Trip / Highway Scheduled Maintenance — Gasoline Engines

60,000 Miles (100 000 km) Continued

- Replace air cleaner filter.
An Emission Control Service.
- Inspect fuel tank, cap and lines for damage or leaks. Inspect fuel cap gasket for any damage.
Replace parts as needed.
An Emission Control Service. (See footnote †.)
- Inspect shields and underhood insulation for damage or looseness. Adjust or replace as required.
This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.
- Inspect Exhaust Gas Recirculation (EGR) system as described in the service manual.
An Emission Control Service.
- Inspect Evaporative Control System. Check all fuel and vapor lines and hoses for proper hook-up, routing and condition. Check that the purge valve works properly, if equipped. Replace as needed.
An Emission Control Service. (See footnote †.)

67,500 Miles (112 500 km)

- Change engine oil and filter (or every 12 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 12 months, whichever occurs first).
(See footnote #.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

Long Trip / Highway Scheduled Maintenance — Gasoline Engines

67,500 Miles (112 500 km) Continued

- Check axle fluid level and add fluid as needed. (See footnote **.)
- Rotate tires. See "Tire Inspection and Rotation" in the Index for proper rotation pattern and additional information. (See footnote +.)

75,000 Miles (125 000 km)

- Change engine oil and filter (or every 12 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 12 months, whichever occurs first).
(See footnote #.)
- Check axle fluid level and add fluid as needed. (See footnote **.)
- Inspect shields and underhood insulation for damage or looseness. Adjust or replace as required.
This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.
- Rotate tires. See "Tire Inspection and Rotation" in the Index for proper rotation pattern and additional information. (See footnote +.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

82,500 Miles (137 500 km)

- Change engine oil and filter (or every 12 months, whichever occurs first).
An Emission Control Service.

DATE	
ACTUAL MILEAGE	SERVICED BY:

Long Trip / Highway Scheduled Maintenance — Gasoline Engines

82,500 Miles (137 500 km) Continued

- Lubricate chassis components (or every 12 months, whichever occurs first).
(See footnote #.)
- Check axle fluid level and add fluid as needed. (See footnote **.)
- Rotate tires. See "Tire Inspection and Rotation" in the Index for proper rotation pattern and additional information. (See footnote +.)

90,000 Miles (150 000 km)

- Change engine oil and filter (or every 12 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 12 months, whichever occurs first).
(See footnote #.)
- Check axle fluid level and add fluid as needed. (See footnote **.)
- Clean and repack the front wheel bearings (or at each brake relining, whichever occurs first).
- Replace fuel filter.
An Emission Control Service.
- Replace air cleaner filter.
An Emission Control Service.
- Inspect/adjust auto apply parking brake system. (if equipped)

DATE	
ACTUAL MILEAGE	SERVICED BY:

Long Trip / Highway Scheduled Maintenance — Gasoline Engines

90,000 Miles (150 000 km) Continued

- Inspect shields and underhood insulation for damage or looseness. Adjust or replace as required.
This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.
- Rotate tires. See "Tire Inspection and Rotation" in the Index for proper rotation pattern and additional information. (See footnote +.)

97,500 Miles (162 500 km)

- Change engine oil and filter (or every 12 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 12 months, whichever occurs first).
(See footnote #.)
- Check axle fluid level and add fluid as needed. (See footnote **.)
- Rotate tires. See "Tire Inspection and Rotation" in the Index for proper rotation pattern and additional information. (See footnote +.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

Long Trip / Highway Scheduled Maintenance — Gasoline Engines

100,000 Miles (166 000 km)

- Inspect spark plug wires.
An Emission Control Service.
- Replace spark plugs.
An Emission Control Service.
- Change automatic transmission fluid and filter. Manual transmission fluid doesn't require change.
- Inspect Positive Crankcase Ventilation (PCV) valve.
An Emission Control Service.

DATE	
ACTUAL MILEAGE	SERVICED BY:

150,000 Miles (240 000 km)

- Drain, flush and refill cooling system (or every 60 months since last service, whichever occurs first). See "Engine Coolant" in the Index for what to use. Inspect hoses. Clean radiator, condenser, pressure cap and neck. Pressure test the cooling system and pressure cap.
An Emission Control Service.
- Inspect/adjust auto apply parking brake system. (if equipped)

DATE	
ACTUAL MILEAGE	SERVICED BY:

Short Trip/City Scheduled Maintenance — Diesel Engines

The services shown in this schedule up to 100,000 miles (160 000 km) should be performed after 100,000 miles (160 000 km) at the same intervals. The services shown at 150,000 miles (240 000 km) should be performed at the same interval after 150,000 miles (240 000 km).

See "Owner Checks and Services" and "Periodic Maintenance Inspections" following.

Footnotes

Lubricate the front suspension, kingpin bushings, steering linkage, automatic transmission shift linkage, parking brake cable guides, propshaft splines, universal joints, brake pedal springs, front wheel bearings and auto apply park brake cam and linkage.

* When the vehicle is operated in extreme dust and dirt conditions (off-road), the air cleaner filter may need to be checked as often as every 300 miles (500 km) and replaced as necessary.

+ A good time to check your brakes is during tire rotation. See "Brake System Inspection" under "Periodic Maintenance Inspections" in Part C of this schedule.

** Drive axle service (see "Recommended Fluids and Lubricants" in the Index for proper lubricant to use):

- Standard Differential — Check fluid as needed at every engine oil change. If driving in dusty areas or towing a trailer, drain fluid and refill every 15,000 miles (24 000 km).
- More frequent lubrication may be required for heavy-duty use.
- Dana 70/80/S135 Series — Check fluid level and add fluid as needed at every oil change. If driving in dusty, sandy or wet conditions or towing a trailer, change lubricant every 25,000 miles (40 000 km) or 6 months, (whichever occurs first).

Short Trip/City Scheduled Maintenance — Diesel Engines

2,500 Miles (4 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)
- Inspect/adjust auto apply parking brake system. (if equipped)

DATE	
ACTUAL MILEAGE	SERVICED BY:

5,000 Miles (8 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)
- Engine Code Y only: Adjust engine idle speed to specifications shown on the underhood label using calibrated test equipment. Check that the idle stop solenoid or dashpot works properly (if equipped).
- Check axle fluid level and add fluid as needed. (See footnote **.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

7,500 Miles (12 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

Short Trip/City Scheduled Maintenance — Diesel Engines

7,500 Miles (12 000 km) Continued

- Rotate tires. See "Tire Inspection and Rotation" in the Index for proper rotation pattern and additional information. (See footnote +.)

10,000 Miles (16 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)
- Inspect shields and underhood insulation for damage or looseness. Adjust or replace as required.
This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.
- Check the air intake system installation to assure gaskets are properly sealed and all hose connections, fasteners and other components are tight. Also check to be sure the air cleaner housing is properly seated and the cover fits tightly. Tighten connections and fasteners or replace damaged parts as necessary.
This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.
- If your engine has a thermostatically controlled cooling fan, inspect all hoses and ducts for proper hook-up (or every 12 months, whichever occurs first). Be sure the valve works properly. *This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.*
- Check axle fluid level and add fluid as needed. (See footnote **.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

Short Trip/City Scheduled Maintenance — Diesel Engines

12,500 Miles (20 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

15,000 Miles (24 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)
- Inspect air cleaner filter if you are driving in dusty conditions. Replace filter if necessary.
*An Emission Control Service. (See footnote *.)*
- Rotate tires. See "Tire Inspection and Rotation" in the Index for proper rotation pattern and additional information. (See footnote +.)
- Clean and repack the front wheel bearings (or at each brake relining, whichever occurs first).
- Check axle fluid level and add fluid as needed. (See footnote **.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

Short Trip/City Scheduled Maintenance — Diesel Engines

17,500 Miles (28 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

20,000 Miles (32 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)
- Inspect shields and underhood insulation for damage or looseness. Adjust or replace as required.
This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.
- Check the air intake system installation to assure gaskets are properly sealed and all hose connections, fasteners and other components are tight. Also check to be sure the air cleaner housing is properly seated and the cover fits tightly. Tighten connections and fasteners or replace damaged parts as necessary.
This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.
- If your engine has a thermostatically controlled cooling fan, inspect all hoses and ducts for proper hook-up (or every 12 months, whichever occurs first), Be sure the valve works properly. *This is a Noise Emission Control Service, Applicable only to vehicles sold in the United States.*

DATE	
ACTUAL MILEAGE	SERVICED BY:

Short Trip/City Scheduled Maintenance — Diesel Engines

20,000 Miles (32 000 km) Continued

- Check axle fluid level and add fluid as needed. (See footnote **.)

22,500 Miles (36 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)
- Rotate tires. See "Tire Inspection and Rotation" in the Index for proper rotation pattern and additional information. (See footnote +.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

25,000 Miles (40 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)
- Check axle fluid level and add fluid as needed. (See footnote **.)
- Replace fuel filler cap if driving in dusty conditions.
An Emission Control Service.

DATE	
ACTUAL MILEAGE	SERVICED BY:

Short Trip/City Scheduled Maintenance — Diesel Engines

27,500 Miles (44 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

30,000 Miles (48 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)
- Replace air cleaner filter.
*An Emission Control Service. (See footnote *.)*
- Rotate tires. See "Tire Inspection and Rotation" in the index for proper rotation pattern and additional information. (See footnote +.)
- Clean and repack the front wheel bearings (or at each brake relining, whichever occurs first).
- Replace fuel filter.
- Inspect shields and underhood insulation for damage or looseness. Adjust or replace as required.
This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.

DATE	
ACTUAL MILEAGE	SERVICED BY:

Short Trip/City Scheduled Maintenance — Diesel Engines

30,000 Miles (48 000 km) Continued

- Check the air intake system installation to assure gaskets are properly sealed and all hose connections, fasteners and other components are tight. Also check to be sure the air cleaner housing is properly seated and the cover fits tightly. Tighten connections and fasteners or replace damaged parts as necessary.
This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.
- If your engine has a thermostatically controlled cooling fan, inspect all hoses and ducts for proper hook-up (or every 12 months, whichever occurs first). Be sure the valve works properly. *This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.*
- Engine Code Y only: Adjust engine idle speed to specifications shown on the underhood label using calibrated test equipment. Check that the idle stop solenoid or dashpot works properly (if equipped).
- Check axle fluid level and add fluid as needed. (See footnote **.)
- Inspect/adjust auto apply parking brake system. (if equipped)

32,500 Miles (52 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

Short Trip/City Scheduled Maintenance — Diesel Engines

35,000 Miles (56 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)
- Check axle fluid level and add fluid as needed. (See footnote **.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

37,500 Miles (60 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)
- Rotate tires. See "Tire Inspection and Rotation" in the Index for proper rotation pattern and additional information. (See footnote +.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

40,000 Miles (64 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.

DATE	
ACTUAL MILEAGE	SERVICED BY:

Short Trip/City Scheduled Maintenance — Diesel Engines

40,000 Miles (64 000 km) Continued

- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)
- Inspect shields and underhood insulation for damage or looseness. Adjust or replace as required.
This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.
- Check the air intake system installation to assure gaskets are properly sealed and all hose connections, fasteners and other components are tight. Also check to be sure the air cleaner housing is properly seated and the cover fits tightly. Tighten connections and fasteners or replace damaged parts as necessary.
This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.
- If your engine has a thermostatically controlled cooling fan, inspect all hoses and ducts for proper hook-up (or every 12 months, whichever occurs first). Be sure the valve works properly. *This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.*
- Check axle fluid level and add fluid as needed. (See footnote **.)

42,500 Miles (68 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

Short Trip/City Scheduled Maintenance — Diesel Engines

45,000 Miles (72 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)
- Inspect air cleaner filter if you are driving in dusty conditions. Replace filter if necessary.
An Emission Control Service. (See footnote *.)
- Rotate tires. See "Tire Inspection and Rotation" in the index for proper rotation pattern and additional information. (See footnote +.)
- Clean and repack the front wheel bearings (or at each brake relining, whichever occurs first).
- Check axle fluid level and add fluid as needed. (See footnote **.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

47,500 Miles (76 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

Short Trip/City Scheduled Maintenance — Diesel Engines

50,000 Miles (80 000 km)

- | DATE | |
|----------------|--------------|
| ACTUAL MILEAGE | SERVICED BY: |
| | |
- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
 - Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)
 - Change automatic transmission fluid and filter. Manual transmission fluid doesn't require change.
 - Inspect shields and underhood insulation for damage or looseness. Adjust or replace as required.
This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.
 - Check the air intake system installation to assure gaskets are properly sealed and all hose connections, fasteners and other components are tight. Also check to be sure the air cleaner housing is properly seated and the cover fits tightly. Tighten connections and fasteners or replace damaged parts as necessary.
This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.
 - If your engine has a thermostatically controlled cooling fan, inspect all hoses and ducts for proper hook-up (or every 12 months, whichever occurs first). Be sure the valve works properly. *This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.*
 - Check axle fluid level and add fluid as needed. (See footnote **.)
 - Replace fuel filler cap if driving in dusty conditions.
An Emission Control Service.

Short Trip/City Scheduled Maintenance — Diesel Engines

52,500 Miles (84 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)
- Rotate tires. See "Tire Inspection and Rotation" in the Index for proper rotation pattern and additional information. (See footnote +.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

55,000 Miles (88 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)
- Check axle fluid level and add fluid as needed. (See footnote **.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

57,500 Miles (92 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

Short Trip/City Scheduled Maintenance — Diesel Engines

60,000 Miles (96 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)
- Replace air cleaner filter. *An Emission Control Service.* (See footnote *.)
- Rotate tires. See "Tire Inspection and Rotation" in the Index for proper rotation pattern and additional information. (See footnote +.)
- Clean and repack the front wheel bearings (or at each brake relining, whichever occurs first).
- Check the crankcase depression regulator valve system for any worn, plugged or collapsed hoses.
See service manual. *An Emission Control Service.*
- Replace fuel filter.
- Check the EGR System (if equipped) (except Code F engine) as described in the service manual.
An Emission Control Service.
- Inspect accessory drive (serpentine) belt for cracks, fraying and wear and check belt for proper tension.
Replace belt as needed. *An Emission Control Service.*
- Inspect shields and underhood insulation for damage or looseness. Adjust or replace as required.
This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.

DATE	
ACTUAL MILEAGE	SERVICED BY:

Short Trip/City Scheduled Maintenance — Diesel Engines

60,000 Miles (96 000 km) Continued

- Check the air intake system installation to assure gaskets are properly sealed and all hose connections, fasteners and other components are tight. Also check to be sure the air cleaner housing is properly seated and the cover fits tightly. Tighten connections and fasteners or replace damaged parts as necessary. *This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.*
- If your engine has a thermostatically controlled cooling fan, inspect all hoses and ducts for proper hook-up (or every 12 months, whichever occurs first). Be sure the valve works properly. *This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.*
- Engine Code Y only: Adjust engine idle speed to specifications shown on the underhood label using calibrated test equipment. Check that the idle stop solenoid or dashpot works properly (if so equipped).
- Check axle fluid level and add fluid as needed. (See footnote **.)
- Inspect/adjust auto apply parking brake system. (if equipped)

62,500 Miles (100 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first). *An Emission Control Service.*
- Lubricate chassis components (or every 3 months, whichever occurs first). (See footnote #.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

Short Trip/City Scheduled Maintenance — Diesel Engines

65,000 Miles (104 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)
- Check axle fluid level and add fluid as needed. (See footnote **.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

67,500 Miles (108 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)
- Rotate tires. See "Tire Inspection and Rotation" in the Index for proper rotation pattern and additional information. (See footnote +.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

70,000 Miles (112 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.

DATE	
ACTUAL MILEAGE	SERVICED BY:

Short Trip/City Scheduled Maintenance — Diesel Engines

70,000 Miles (112 000 km) Continued

- Lubricate chassis components (or every 3 months, whichever occurs first). (See footnote #.)
- Inspect shields and underhood insulation for damage or looseness. Adjust or replace as required.
This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.
- Check the air intake system installation to assure gaskets are properly sealed and all hose connections, fasteners and other components are tight. Also check to be sure the air cleaner housing is properly seated and the cover fits tightly. Tighten connections and fasteners or replace damaged parts as necessary.
This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.
- If your engine has a thermostatically controlled cooling fan, inspect all hoses and ducts for proper hook-up (or every 12 months, whichever occurs first). Be sure the valve works properly. *This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.*
- Check axle fluid level and add fluid as needed. (See footnote **.)

72,500 Miles (116 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

Short Trip/City Scheduled Maintenance — Diesel Engines

75,000 Miles (120 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)
- Inspect air cleaner filter if you are driving in dusty conditions. Replace filter if necessary.
An Emission Control Service. (See footnote *.)
- Rotate tires. See "Tire Inspection and Rotation" in the Index for proper rotation pattern and additional information. (See footnote +.)
- Clean and repack the front wheel bearings (or at each brake relining, whichever occurs first).
- Check axle fluid level and add fluid as needed. (See footnote **.)
- Replace fuel filler cap if driving in dusty conditions.
An Emission Control Service.

DATE	
ACTUAL MILEAGE	SERVICED BY:

77,500 Miles (124 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

Short Trip/City Scheduled Maintenance — Diesel Engines

80,000 Miles (128 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first). *An Emission Control Service.*
- Lubricate chassis components (or every 3 months, whichever occurs first). (See footnote #.)
- Inspect shields and underhood insulation for damage or looseness. Adjust or replace as required. *This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.*
- Check the air intake system installation to assure gaskets are properly sealed and all hose connections, fasteners and other components are tight. Also check to be sure the air cleaner housing is properly seated and the cover fits tightly. Tighten connections and fasteners or replace damaged parts as necessary. *This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.*
- If your engine has a thermostatically controlled cooling fan, inspect all hoses and ducts for proper hook-up (or every 12 months, whichever occurs first). Be sure the valve works properly. *This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.*
- Check axle fluid level and add fluid as needed. (See footnote **.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

82,500 Miles (132 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first). *An Emission Control Service.*

DATE	
ACTUAL MILEAGE	SERVICED BY:

Short Trip/City Scheduled Maintenance — Diesel Engines

82,500 Miles (132 000 km) Continued

- Lubricate chassis components (or every 3 months, whichever occurs first). (See footnote #.)
- Rotate tires. See "Tire Inspection and Rotation" in the Index for proper rotation pattern and additional information. (See footnote +.)

85,000 Miles (136 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)
- Check axle fluid level and add fluid as needed. (See footnote **.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

87,500 Miles (140 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

Short Trip/City Scheduled Maintenance — Diesel Engines

90,000 Miles (144 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)
- Inspect shields and underhood insulation for damage or looseness. Adjust or replace as required.
This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.
- Check the air intake system installation to assure gaskets are properly sealed and all hose connections, fasteners and other components are tight. Also check to be sure the air cleaner housing is properly seated and the cover fits tightly. Tighten connections and fasteners or replace damaged parts as necessary.
This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.
- If your engine has a thermostatically controlled cooling fan, inspect all hoses and ducts for proper hook-up (or every 12 months, whichever occurs first). Be sure the valve works properly.
This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.
- Check axle fluid level and add fluid as needed. (See footnote **.)
- Replace air cleaner filter.
*An Emission Control Service. (See footnote **.)*
- Rotate tires. See "Tire Inspection and Rotation" in the Index for proper rotation pattern and additional information. (See footnote +.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

Short Trip/City Scheduled Maintenance — Diesel Engines

90,000 Miles (144 000 km) Continued

- Clean and repack the front wheel bearings (or at each brake relining, whichever occurs first).
- Replace fuel filter.
- Engine Code Y only: Adjust engine idle speed to specifications shown on the underhood label using calibrated test equipment. Check that the idle stop solenoid or dashpot works properly (if equipped).
- Inspect/adjust auto apply parking brake system. (if equipped)

92,500 Miles (148 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

95,000 Miles (152 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)
- Check axle fluid level and add fluid as needed. (See footnote **.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

Short Trip/City Scheduled Maintenance — Diesel Engines

97,500 Miles (156 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)
- Rotate tires. See "Tire Inspection and Rotation" in the Index for proper rotation pattern and additional information. (See footnote +.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

100,000 Miles (160 000 km)

- Change engine oil and filter (or every 3 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 3 months, whichever occurs first).
(See footnote #.)
- Inspect shields and underhood insulation for damage or looseness. Adjust or replace as required.
This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.
- Check the air intake system installation to assure gaskets are properly sealed and all hose connections, fasteners and other components are tight. Also check to be sure the air cleaner housing is properly seated and the cover fits tightly. Tighten connections and fasteners or replace damaged parts as necessary.
This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.

DATE	
ACTUAL MILEAGE	SERVICED BY:

Short Trip/City Scheduled Maintenance — Diesel Engines

100,000 Miles (160 000 km) Continued

- If your engine has a thermostatically controlled cooling fan, inspect all hoses and ducts for proper hook-up (or every 12 months, whichever occurs first). Be sure the valve works properly. *This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.*
- Check axle fluid level and add fluid as needed. (See footnote **.)
- Change automatic transmission fluid and filter. Manual transmission fluid doesn't require change.
- Replace fuel filler cap if driving in dusty conditions.
An Emission Control Service.

150,000 Miles (240 000)

- Drain, flush and refill the cooling system with new coolant (or every 60 months, whichever occurs first). See "Engine Coolant" in the Index for what to use. *An Emission Control Service.*

Also inspect the hoses and replace them if they are cracked, swollen or deteriorated. Tighten all hose clamps (except constant tension clamps). Remove debris and clean the outside of the radiator and air conditioning condenser. Wash the radiator neck. To ensure proper operation, pressure test the radiator and cap.

- Inspect/adjust auto apply parking brake system. (if equipped)

DATE	
ACTUAL MILEAGE	SERVICED BY:

Long Trip / Highway Scheduled Maintenance — Diesel Engines

The services shown in this schedule up to 100,000 miles (160 000 km) should be performed after 100,000 miles (160 000 km) at the same intervals. The services shown at 150,000 miles (240 000 km) should be performed at the same interval after 150,000 miles (240 000 km).

See "Owner Checks and Services" and "Periodic Maintenance Inspections" following.

Footnotes

Lubricate the front suspension, kingpin bushings, steering linkage, automatic transmission shift linkage, parking brake cable guides, propshaft splines, universal joints, brake pedal springs, front wheel bearings and auto apply park brake cam and linkage.

+ A good time to check your brakes is during tire rotation. See "Brake System Inspection" under "Periodic Maintenance Inspections" in Part C of this schedule.

** Drive axle service (see "Recommended Fluids and Lubricants" in the Index for proper lubricant to use):

- Standard Differential — Check fluid level and add fluid as needed at every engine oil change.
- Dana 70/80/S135 Series — Check fluid level and add fluid as needed at every oil change.

Long Trip / Highway Scheduled Maintenance — Diesel Engines

5,000 Miles (8 000 km)

- Change engine oil and filter (or every 12 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 12 months, whichever occurs first).
(See footnote #.)
- Rotate tires. See "Tire Inspection and Rotation" in the Index for proper rotation pattern and additional information. (See footnote +.)
- Engine Code Y only: Adjust engine idle speed to specifications shown on the underhood label using calibrated test equipment. Check that the idle stop solenoid or dashpot works properly (if equipped).
- Check axle fluid level and add fluid as needed. (See footnote **.)
- Inspect/adjust auto apply parking brake system. (if equipped)

DATE	
ACTUAL MILEAGE	SERVICED BY:

10,000 Miles (16 000 km)

- Change engine oil and filter (or every 12 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 12 months, whichever occurs first).
(See footnote #.)
- Inspect shields and underhood insulation for damage or looseness. Adjust or replace as required.
This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.

DATE	
ACTUAL MILEAGE	SERVICED BY:

Long Trip / Highway Scheduled Maintenance — Diesel Engines

10,000 Miles (16 000 km) (Continued)

- Check the air intake system installation to assure gaskets are properly sealed and all hose connections, fasteners and other components are tight. Also check to be sure the air cleaner housing is properly seated and the cover fits tightly. Tighten connections and fasteners or replace damaged parts as necessary. *This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.*
- If your engine has a thermostatically controlled cooling fan, inspect all hoses and ducts for proper hook-up (or every 12 months, whichever occurs first). Be sure the valve works properly. *This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.*
- Check axle fluid level and add fluid as needed. (See footnote **.)

15,000 Miles (24 000 km)

- Change engine oil and filter (or every 12 months, whichever occurs first). *An Emission Control Service.*
- Lubricate chassis components (or every 12 months, whichever occurs first). (See footnote #.)
- Rotate tires. See "Tire Inspection and Rotation" in the Index for proper rotation pattern and additional information. (See footnote +.)
- Check axle fluid level and add fluid as needed. (See footnote **.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

Long Trip / Highway Scheduled Maintenance — Diesel Engines

20,000 Miles (32 000 km)

- Change engine oil and filter (or every 12 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 12 months, whichever occurs first).
(See footnote #.)
- Inspect shields and underhood insulation for damage or looseness. Adjust or replace as required.
This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.
- Check the air intake system installation to assure gaskets are properly sealed and all hose connections, fasteners and other components are tight. Also check to be sure the air cleaner housing is properly seated and the cover fits tightly. Tighten connections and fasteners or replace damaged parts as necessary.
This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.
- If your engine has a thermostatically controlled cooling fan, inspect all hoses and ducts for proper hook-up (or every 12 months, whichever occurs first). Be sure the valve works properly. *This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.*
- Check axle fluid level and add fluid as needed. (See footnote **.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

25,000 Miles (40 000 km)

- Change engine oil and filter (or every 12 months, whichever occurs first).
An Emission Control Service.

DATE	
ACTUAL MILEAGE	SERVICED BY:

Long Trip / Highway Scheduled Maintenance — Diesel Engines

25,000 Miles (40 000 km) Continued

- Lubricate chassis components (or every 12 months, whichever occurs first). (See footnote #.)
- Rotate tires. See "Tire Inspection and Rotation" in the Index for proper rotation pattern and additional information. (See footnote +.)
- Check axle fluid level and add fluid as needed. (See footnote **.)

30,000 Miles (48 000 km)

- Change engine oil and filter (or every 12 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 12 months, whichever occurs first).
(See footnote #.)
- Replace air cleaner filter.
An Emission Control Service.
- Clean and repack the front wheel bearings (or at each brake relining, whichever occurs first).
- Replace fuel filter.
- Inspect shields and underhood insulation for damage or looseness. Adjust or replace as required.
This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.
- Inspect/adjust auto apply parking brake system. (if equipped)

DATE	
ACTUAL MILEAGE	SERVICED BY:

Long Trip / Highway Scheduled Maintenance — Diesel Engines

30,000 Miles (48 000 km) Continued

- Check the air intake system installation to assure gaskets are properly sealed and all hose connections, fasteners and other components are tight. Also check to be sure the air cleaner housing is properly seated and the cover fits tightly. Tighten connections and fasteners or replace damaged parts as necessary. *This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.*
- If your engine has a thermostatically controlled cooling fan, inspect all hoses and ducts for proper hook-up (or every 12 months, whichever occurs first). Be sure the valve works properly. *This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.*
- Check axle fluid level and add fluid as needed. (See footnote **.)
- Engine Code Y only: Adjust engine idle speed to specifications shown on the underhood label using calibrated test equipment. Check the idle stop solenoid or dashpot works properly (if equipped).

35,000 Miles (56 000 km)

- Change engine oil and filter (or every 12 months, whichever occurs first). *An Emission Control Service.*
- Lubricate chassis components (or every 12 months, whichever occurs first). (See footnote #.)
- Rotate tires. See "Tire Inspection and Rotation" in the Index for proper rotation pattern and additional information. (See footnote +.)
- Check axle fluid level and add fluid as needed. (See footnote **.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

Long Trip / Highway Scheduled Maintenance --- Diesel Engines

40,000 Miles (64 000 km)

- Change engine oil and filter (or every 12 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 12 months, whichever occurs first).
(See footnote #.)
- Inspect shields and underhood insulation for damage or looseness. Adjust or replace as required.
This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.
- Check the air intake system installation to assure that gaskets are properly sealed and that all hose connections, fasteners and other components are tight. Also check to be sure that the air cleaner housing is properly seated and the cover fits tightly. Tighten connections and fasteners or replace damaged parts as necessary. *This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.*
- If your engine has a thermostatically controlled cooling fan, inspect all hoses and ducts for proper hook-up (or every 12 months, whichever occurs first). Be sure the valve works properly.
This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.
- Check axle fluid level and add fluid as needed. (See footnote **.)

45,000 Miles (72 000 km)

- Change engine oil and filter (or every 12 months, whichever occurs first).
An Emission Control Service.

DATE	
ACTUAL MILEAGE	SERVICED BY:

Long Trip / Highway Scheduled Maintenance — Diesel Engines

45,000 Miles (72 000 km) Continued

- Lubricate chassis components (or every 12 months, whichever occurs first).
(See footnote #.)
- Rotate tires. See "Tire Inspection and Rotation" in the Index for proper rotation pattern and additional information. (See footnote +.)
- Check axle fluid level and add fluid as needed. (See footnote **.)

50,000 Miles (80 000 km)

- Change engine oil and filter (or every 12 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 12 months, whichever occurs first).
(See footnote #.)
- Change automatic transmission fluid and filter. Manual transmission fluid doesn't require change.
- Inspect shields and underhood insulation for damage or looseness. Adjust or replace as required.
This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.
- Check the air intake system installation to assure gaskets are properly sealed and all hose connections, fasteners and other components are tight. Also check to be sure the air cleaner housing is properly seated and the cover fits tightly. Tighten connections and fasteners or replace damaged parts as necessary.
This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.

DATE	
ACTUAL MILEAGE	SERVICED BY:

Long Trip / Highway Scheduled Maintenance — Diesel Engines

50,000 Miles (80 000 km) Continued

- If your engine has a thermostatically controlled cooling fan, inspect all hoses and ducts for proper hook-up (or every 12 months, whichever occurs first). Be sure the valve works properly.
This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.
- Check axle fluid level and add fluid as needed. (See footnote **).

55,000 Miles (88 000 km)

- Change engine oil and filter (or every 12 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 12 months, whichever occurs first).
(See footnote #.)
- Rotate tires. See "Tire Inspection and Rotation" in the Index for proper rotation pattern and additional information. (See footnote +.)
- Check axle fluid level and add fluid as needed. (See footnote **.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

Long Trip / Highway Scheduled Maintenance — Diesel Engines

60,000 Miles (96 000 km)

- | DATE | |
|----------------|--------------|
| ACTUAL MILEAGE | SERVICED BY: |
| | |
- Change engine oil and filter (or every 12 months, whichever occurs first).
An Emission Control Service.
 - Lubricate chassis components (or every 12 months, whichever occurs first).
(See footnote #.)
 - Replace air cleaner filter.
An Emission Control Service.
 - Clean and repack the front wheel bearings (or at each brake relining, whichever occurs first).
 - Check the crankcase depression regulator valve system for any worn, plugged or collapsed hoses. See service manual. *An Emission Control Service.*
 - Replace fuel filter.
 - Inspect accessory drive (serpentine) belt for cracks, fraying and wear and check belt for proper tension. Replace belt as needed. *An Emission Control Service.*
 - Inspect shields and underhood insulation for damage or looseness. Adjust or replace as required.
This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.
 - Check the air intake system installation to assure gaskets are properly sealed and all hose connections, fasteners and other components are tight. Also check to be sure the air cleaner housing is properly seated and the cover fits tightly. Tighten connections and fasteners or replace damaged parts as necessary.
This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.

Long Trip / Highway Scheduled Maintenance — Diesel Engines

60,000 Miles (96 000 km) Continued

- If your engine has a thermostatically controlled cooling fan, inspect all hoses and ducts for proper hook-up (or every 12 months, whichever occurs first). Be sure the valve works properly.
This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.
- Engine Code Y only: Adjust engine idle speed to specifications shown on the underhood label using calibrated test equipment. Check the idle stop solenoid or dashpot works properly (if equipped).
- Check axle fluid level and add fluid as needed. (See footnote **.)
- Inspect/adjust auto apply parking brake system. (if equipped)

65,000 Miles (104 000 km)

- Change engine oil and filter (or every 12 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 12 months, whichever occurs first).
(See footnote #.)
- Rotate tires. See "Tire Inspection and Rotation" in the Index for proper rotation pattern and additional information. (See footnote +.)
- Check axle fluid level and add fluid as needed. (See footnote **.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

Long Trip / Highway Scheduled Maintenance — Diesel Engines

70,000 Miles (112 000 km)

- Change engine oil and filter (or every 12 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 12 months, whichever occurs first).
(See footnote #.)
- Inspect shields and underhood insulation for damage or looseness. Adjust or replace as required.
This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.
- Check the air intake system installation to assure gaskets are properly sealed and all hose connections, fasteners and other components are tight. Also check to be sure the air cleaner housing is properly seated and the cover fits tightly. Tighten connections and fasteners or replace damaged parts as necessary.
This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.
- If your engine has a thermostatically controlled cooling fan, inspect all hoses and ducts for proper hook-up (or every 12 months, whichever occurs first). Be sure the valve works properly.
This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.
- Check axle fluid level and add fluid as needed. (See footnote **.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

Long Trip / Highway Scheduled Maintenance — Diesel Engines

75,000 Miles (120 000 km)

- Change engine oil and filter (or every 12 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 12 months, whichever occurs first).
(See footnote #.)
- Rotate tires. See "Tire Inspection and Rotation" in the Index for proper rotation pattern and additional information. (See footnote +.)
- Check axle fluid level and add fluid as needed. (See footnote **.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

80,000 Miles (128 000 km)

- Change engine oil and filter (or every 12 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 12 months, whichever occurs first).
(See footnote #.)
- Inspect shields and underhood insulation for damage or looseness. Adjust or replace as required.
This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.

DATE	
ACTUAL MILEAGE	SERVICED BY:

Long Trip / Highway Scheduled Maintenance — Diesel Engines

80,000 Miles (128 000 km) Continued

- Check the air intake system installation to assure gaskets are properly sealed and all hose connections, fasteners and other components are tight. Also check to be sure the air cleaner housing is properly seated and the cover fits tightly. Tighten connections and fasteners or replace damaged parts as necessary.
This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.
- If your engine has a thermostatically controlled cooling fan, inspect all hoses and ducts for proper hook-up (or every 12 months, whichever occurs first). Be sure the valve works properly.
This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.
- Check axle fluid level and add fluid as needed. (See footnote **.)

85,000 Miles (136 000 km)

- Change engine oil and filter (or every 12 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 12 months, whichever occurs first).
(See footnote #.)
- Rotate tires. See "Tire Inspection and Rotation" in the Index for proper rotation pattern and additional information. (See footnote +.)
- Check axle fluid level and add fluid as needed. (See footnote **.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

Long Trip / Highway Scheduled Maintenance — Diesel Engines

90,000 Miles (144 000 km)

- Change engine oil and filter (or every 12 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 12 months, whichever occurs first).
(See footnote #.)
- Replace air cleaner filter.
An Emission Control Service.
- Clean and repack the front wheel bearings (or at each brake relining, whichever occurs first).
- Replace fuel filter.
- Inspect shields and underhood insulation for damage or looseness. Adjust or replace as required.
This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.
- Check the air intake system installation to assure gaskets are properly sealed and all hose connections, fasteners and other components are tight. Also check to be sure the air cleaner housing is properly seated and the cover fits tightly. Tighten connections and fasteners or replace damaged parts as necessary.
This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.
- If your engine has a thermostatically controlled cooling fan, inspect all hoses and ducts for proper hook-up (or every 12 months, whichever occurs first). Be sure the valve works properly.
This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.
- Inspect/adjust auto apply parking brake system. (if equipped)

DATE	
ACTUAL MILEAGE	SERVICED BY:

Long Trip / Highway Scheduled Maintenance — Diesel Engines

90,000 Miles (144 000 km) Continued

- Engine Code Y only: Adjust engine idle speed to specifications shown on the underhood label using calibrated test equipment. Check that the idle stop solenoid or dashpot works properly (if equipped).
- Check axle fluid level and add fluid as needed. (See footnote **.)

95,000 Miles (152 000 km)

- Change engine oil and filter (or every 12 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 12 months, whichever occurs first).
(See footnote #.)
- Rotate tires. See "Tire Inspection and Rotation" in the Index for proper rotation pattern and additional information. (See footnote +.)
- Check axle fluid level and add fluid as needed. (See footnote **.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

100,000 Miles (160 000 km)

- Change engine oil and filter (or every 12 months, whichever occurs first).
An Emission Control Service.
- Lubricate chassis components (or every 12 months, whichever occurs first).
(See footnote #.)

DATE	
ACTUAL MILEAGE	SERVICED BY:

Long Trip / Highway Scheduled Maintenance — Diesel Engines**100,000 Miles (160 000 km) Continued**

- Change automatic transmission fluid and filter. Manual transmission fluid doesn't require change.
- Inspect shields and underhood insulation for damage or looseness. Adjust or replace as required.
This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.
- Check the air intake system installation to assure gaskets are properly sealed and all hose connections, fasteners and other components are tight. Also check to be sure the air cleaner housing is properly seated and the cover fits tightly. Tighten connections and fasteners or replace damaged parts as necessary.
This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.
- If your engine has a thermostatically controlled cooling fan, inspect all hoses and ducts for proper hook-up (or every 12 months, whichever occurs first). Be sure the valve works properly.
This is a Noise Emission Control Service. Applicable only to vehicles sold in the United States.
- Check axle fluid level and add fluid as needed. (See footnote **.)

Long Trip / Highway Scheduled Maintenance — Diesel Engines

150,000 Miles (240 000 km)

- Drain, flush and refill the cooling system with new coolant (or every 60 months, whichever occurs first). See "Engine Coolant" in the Index for what to use. *An Emission Control Service.*
- Also inspect the hoses and replace them if they are cracked, swollen or deteriorated. Tighten all hose clamps (except constant tension clamps). Remove debris and clean the outside of the radiator and air conditioning condenser. Wash the radiator neck. To ensure proper operation, pressure test the radiator and cap.
- Inspect/adjust auto apply parking brake system. (if equipped)

DATE	
ACTUAL MILEAGE	SERVICED BY

Maintenance Schedule — Cummins ISB (4 Cylinder) and ISB (4 and 6 Cylinder) Diesel Engines

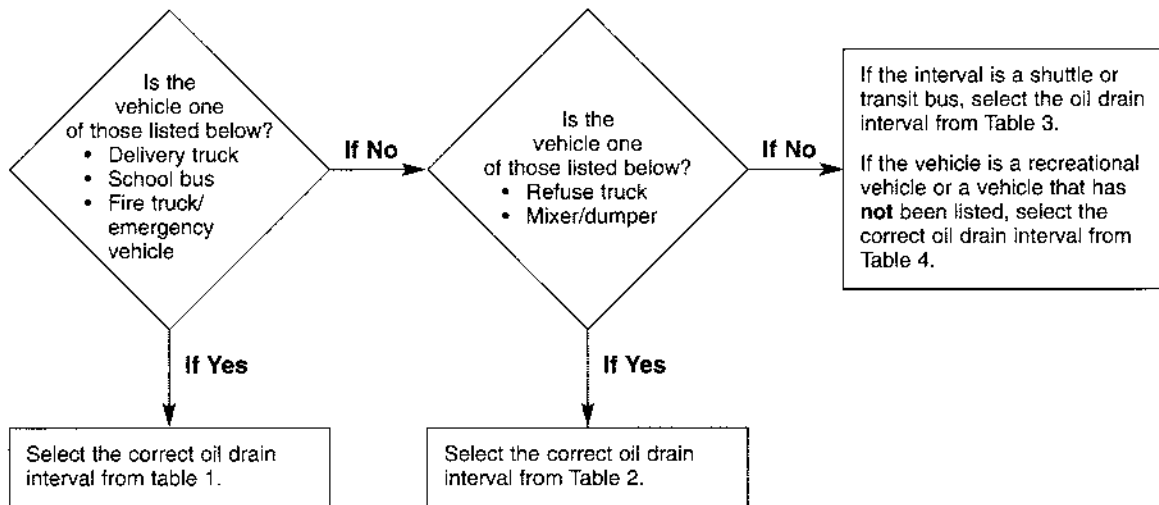
Daily or Refueling	Every 12,000 km (7500 mi), 250 Hours, or 3 Months (3)	Every 24,000 km (15,000 mi), 500 Hours, or 6 Months (3)
Maintenance Check	Check/Inspect	Change/Replace/Inspect
<ul style="list-style-type: none"> • Check and correct <ul style="list-style-type: none"> — Engine oil level — Coolant level • Check air intake piping • Drain fuel-water separator • Inspect cooling fan • Inspect engine • Check crankcase breather tube • Drain air tanks and reservoirs 	<ul style="list-style-type: none"> • Mounting hardware <ul style="list-style-type: none"> — Injection pump — Air compressor • Check air intake piping • Check charge air cooler • Check air cleaner restriction 	<ul style="list-style-type: none"> • Check antifreeze (2) • Change fuel filter • Change lubricating oil (1) • Change lubricating oil filter (1)
<ol style="list-style-type: none"> 1. The lubricating oil and lubricating oil filter interval can be adjusted based on application, fuel consumption, gross vehicle weight, and idle time. Refer to Oil Drain Intervals on page 288. 2. Antifreeze check interval is every oil change or 24,000 km (15,000 mi), 500 hours, or 6 months, whichever occurs first. Must use a heavy-duty year round antifreeze that meets the chemical composition of GM6038M. The antifreeze change interval is 2 years or 320,000 km (200,000 mi), whichever comes first. Antifreeze is essential for freeze, overheat, and corrosion protection. 3. Follow the manufacturer's recommended maintenance procedures for the starter, alternator, generator, batteries, electrical components, exhaust brake, charge air cooler, radiator, air compressor, air cleaner, freon compressor, and fan clutch. Refer to the 2002 Workhorse Service Manual Supplement. 		

Maintenance Schedule — Cummins ISB (4 Cylinder) and ISB (4 and 6 Cylinder) Diesel Engines

Every 48,000 km (30,000 mi), 1000 Hours, or 1 Year (2)	Every 96,000 km (60,000 mi), 2000 Hours, or 2 Years (2)	Every 241,500 km (150,000 mi), 5000 Hours, or 4 Years (2)
Maintenance Check	Check/Inspect/Replace	Change/Inspect
<ul style="list-style-type: none"> • Fan Hub • Belt Tensioner • Drive belts 	<ul style="list-style-type: none"> • Vibration Damper • Replace antifreeze (1) • Radiator hoses 	<ul style="list-style-type: none"> • Overhead valve lash (3)
<ol style="list-style-type: none"> 1. Antifreeze check interval is every oil change or 24,000 km (15,000 mi), 500 hours, or 6 months, whichever occurs first. Must use a heavy-duty year round antifreeze that meets the chemical composition of GM6038M. The antifreeze change interval is 2 years or 320,000 km (200,000 mi), whichever comes first. Antifreeze is essential for freeze, overheat, and corrosion protection. 2. Follow the manufacturer's recommended maintenance procedures for the starter, alternator, generator, batteries, electrical components, exhaust brake, charge air cooler, radiator, air compressor, air cleaner, freon compressor, and fan clutch. Refer to the 2002 Workhorse Service Manual Supplement. 3. Reset valves to nominal values if outside specification. Lash specification is 0.152 to 0.381 mm (0.006 to 0.015 in) for intake valve lash and 0.381 to 0.762 mm (0.015 to 0.030 in) for exhaust valve lash. Measure valve lash every 81,000 km (50,000 mi) after the first valve lash check. 		

Maintenance Schedule – Cummins ISB (4 Cylinder) and ISB (4 and 6 Cylinder) Diesel Engines**Oil Drain Intervals**

Refer to the following flowchart to determine the maximum recommended oil change and filter change intervals in kilometers, miles, hours, or months, whichever comes first.



Maintenance Schedule — Cummins ISB (4 Cylinder) and ISB (4 and 6 Cylinder) Diesel Engines
Table 1, Maximum Oil Drain Intervals

(A) Severe-Duty (If the vehicle meets any of these conditions)	(B) Normal Duty (If the vehicle meets both of these conditions)
Average fuel economy is less than 2.998 km/liter [7.0 mpg], or idle time is 40 percent or greater, or vehicle operates in dusty areas, or gross vehicle weight is greater than 20,865 kg [46,000 lb].	Average fuel economy is less than 2.998 km/liter [7.0 mpg], or idle time is 40 percent or greater, or vehicle operates in dusty areas, or gross vehicle weight is greater than 20,865 kg [46,000 lb].
Vehicle uses the severe-duty oil drain interval (A).	Vehicle uses the normal-duty oil drain interval (B).
(A) Severe-Duty 14,500 km [9000 mi], 500 hours, 6 months, or 7571 liters [2000 gal] of fuel, whichever comes first	(B) Normal-Duty (C) 24,000 km, 500 hours, 6 months, or 7571 liters [2000 gal] of fuel, whichever comes first.

Table 2, Oil Drain Intervals

Refuse Truck, Mixer, or Dump Truck	Kilometers	Miles	Hours	Months
Below 10-mph average	4850	3000	500	6
10- to 15-mph average	9650	6000	500	6
15- to 20-mph average	13,770	8500	500	6
20- to 25-mph average	14,500	9000	500	6
Higher than 25-mph average	19,000	12,000	500	6

Maintenance Schedule — Cummins ISB (4 Cylinder) and ISB (4 and 6 Cylinder) Diesel Engines**Table 3, Oil Drain Intervals**

Shuttle or Transit Bus	Kilometers	Miles	Hours	Months
2- to 4-mph average	2400	1500	500	6
4- to 6-mph average	4850	3000	500	6
6- to 8-mph average	6450	4000	500	6
8- to 10-mph average	8050	5000	500	6
10- to 15-mph average	9650	6000	500	6

Table 4, Oil Drain Intervals

Vehicle/Equipment	Kilometers	Miles	Hours	Months
Recreational vehicle	24,000	15,000	500	12
Truck crane	14,500	9000	500	6
Yard spotter	14,500	9000	500	6
All others	14,500	9000	500	6

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.

Be sure any necessary repairs are completed at once. Whenever any fluids or lubricants are added to your vehicle, make sure they are the proper ones, as shown in Part D.

At the First 100, 1,000 and 6,000 Miles (160, 1 600 and 10 000 km)

For vehicles with dual wheels, check dual wheel nut torque. For proper torque, see "Wheel Nut Torque" in the Index.

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® 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***Manual Transmission Check***

Check the transmission fluid level; add if needed. See "Manual Transmission Fluid" in the Index. Check for leaks. A fluid loss may indicate a problem. Have the system inspected and repaired if needed.

Automatic Transmission Check

Check the transmission fluid level; add if needed. See "Automatic Transmission Fluid" in the Index. A fluid loss may indicate a problem. Check the system and repair if needed.

Hydraulic Clutch System Check

Check the fluid level in the clutch reservoir. See "Hydraulic Clutch Fluid" in the Index. A fluid loss in this system could indicate a problem. Have the system inspected and repaired at once.

At Least Once a Year

Starter Switch Check



CAUTION

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 (see "Parking Brake" in the Index if necessary) and the regular brake.

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) or NEUTRAL (N). If the starter works in any other position, your vehicle needs service.

On manual transmission vehicles, put the shift lever in NEUTRAL (N), push the clutch down halfway and try to start the engine. The starter should work only when the clutch is pushed down all the way to the floor. If the starter works when the clutch isn't pushed all the way down, your vehicle needs service.

**Brake-Transmission Shift Interlock (BTSI)
Check (Automatic Transmission)****CAUTION**

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. It should be parked on a level surface.
2. Firmly apply the parking brake (see "Parking Brake" in the Index if necessary).
NOTE: Be ready to apply the regular brake immediately if the vehicle begins to move.
3. With the engine off, turn the key to the RUN position, but don't start the engine. Without applying the regular brake, try to move the shift lever out of PARK (P) with normal effort. If the shift lever moves out of PARK (P), your vehicle's BTSI needs service.

Ignition Transmission Lock Check

While parked, and with the parking brake set, try to turn the ignition key to LOCK in each shift lever position.

- With an automatic transmission, the key should turn to LOCK only when the shift lever is in PARK (P).
- With a manual transmission, the key should turn to LOCK when the shift lever is in any gear position.

On vehicles with a key release lever, try to turn the key to LOCK without pressing the lever. The key should turn to LOCK only when you press the key lever.

On all vehicles, the key should come out only in LOCK.

**Parking Brake and Automatic Transmission
PARK (P) Mechanism Check****CAUTION**

When you are doing this check, your vehicle could begin to move. You or others could be injured and property could be damaged. Make sure there is room in front of your vehicle in case it begins to roll. Be ready to apply the regular brake at once should the vehicle begin to move.

Park on a fairly steep hill, with the vehicle facing downhill. Keeping your foot on the regular brake, set the parking brake.

- To check the parking brake's holding ability: With the engine running and transmission in NEUTRAL (N), slowly remove foot pressure from the regular brake pedal. Do this until the vehicle is held by the parking brake only.
- To check the PARK (P) mechanism's holding ability: With the engine running, shift to PARK (P). Then release all brakes.

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: PERIODIC MAINTENANCE INSPECTIONS

Listed in this part are inspections and services which should be performed at least twice a year (for instance each spring and fall). *You should let your dealer's service department or other qualified service center do these jobs. Make sure any necessary repairs are completed at once.*

Proper procedures to perform these services may be found in a service manual. See "Service and Owner Publications" in the Index.

Steering and Suspension Inspection

Inspect the front and rear suspension and steering system for damaged, loose or missing parts, signs of wear or lack of lubrication. Inspect the power steering lines and hoses for proper hook-up, binding, leaks, cracks, chafing, etc.

Exhaust System Inspection

Inspect the complete exhaust system. Inspect the body near the exhaust system. Look for broken, damaged, missing or out-of-position parts as well as open seams, holes, loose connections or other conditions which could cause a heat build-up in the floor pan or could let exhaust fumes into the vehicle. See "Engine Exhaust" in the Index.

Engine Cooling System Inspection

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.

Throttle System Inspection

Inspect the throttle system for interference or binding, and for damaged or missing parts. Replace parts as needed. Replace any components which have high effort or excessive wear. Do not lubricate accelerator and cruise control cables.

Rear Axle Service

Check the gear lubricant level in the rear axle and add if needed. See "Rear Axle" in the Index. A fluid loss may indicate a problem. Check the axle and repair it if needed.

Brake System Inspection

Inspect the complete system. 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. For vehicles with rear drum brakes, also inspect drum brake linings for wear and cracks. Inspect other brake parts, including drums, wheel cylinders, calipers, parking brake, etc. Check parking brake adjustment. You may need to have your brakes inspected more often if your driving habits or conditions result in frequent braking.

PART D: 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.

USAGE	FLUID/LUBRICANT
Engine Oil (Diesel Engine)	Engine Oil with the letters CG-4 is best for your vehicle. The CG-4 designation may appear either alone, or in combination with other API designations, such as API CG-4/SH, CG-4/SJ, SH/CG-4 or SJ/CG-4. These letters show American Petroleum Institute (API) levels of quality. To determine the preferred viscosity for your vehicle's diesel engine, see "Engine Oil" in the Index.
Engine Coolant	50/50 mixture of clean, drinkable water and use DEX-COOL®. See "Engine Coolant" in the Index.

USAGE	FLUID/LUBRICANT
Hydraulic Brake System	Delco Supreme 11® Brake Fluid or equivalent DOT-3 Brake Fluid.
Hydraulic Clutch System	Delco Supreme 11® Brake Fluid or equivalent DOT-3 Brake Fluid.
Electric Hydraulic Auto Parking Brake	DEXRON®-III Automatic Transmission Fluid.
Parking Brake Cable Guides	Chassis Lubricant meeting requirements of NLGI # 2, Category LB or GC-LB.
Park Brake Cam Switch and Linkage	Chassis Lubricant meeting requirements of NLGI # 2, Category LB or GC-LB.
Power Steering System	Power Steering Fluid

USAGE	FLUID/LUBRICANT
Manual Transmission (5-Speed with Low Gear)	Synthetic Manual Transmission Fluid SAE 75W-90 GL-4 Gear Oil.
Automatic Transmission	DEXRON®-III Automatic Transmission Fluid.
Chassis Lubrication	Chassis Lubricant meeting requirements of NLGI # 2, Category LB or GC-LB.
Front Wheel Bearings Grease	Wheel Bearing Lubricant meeting requirements of NLGI # 2, Category GC or GC-LB.
Front Wheel Bearings with Oil Filled Hubs	SAE 90W GL-5 Gear Oil.
Differential, Rear Axle	Synthetic Rear Axle Fluid SAE 75W-90 GL-5 Gear Oil.
Propshaft Splines and Universal Joints	Chassis Lubricant meeting requirements of NLGI # 2, Category LB or GC-LB.

PART E: MAINTENANCE RECORD

After the scheduled services are performed, record the date, odometer reading and who performed the service in the boxes provided after the maintenance

interval. Any additional information from "Owner Checks and Services" or "Periodic Maintenance" 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

MAINTENANCE RECORD			
DATE	ODOMETER READING	SERVICED BY	MAINTENANCE PERFORMED

Here you will find out how to contact WCC if you need assistance. This section also tells you how to obtain service publications and how to report any safety defects. Additionally, if needing Service Manuals, Technical Publications or any other service literature contact the Workhorse Custom Chassis Customer Assistance Office.

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CUSTOMER ASSISTANCE OFFICES

WCC encourages customers to call the toll-free number (1-877-946-7731) for assistance. If a U.S. customer wishes to write, the letter should be addressed to WCC's Customer Assistance Center.

United States

Customer Assistance Center
Workhorse Custom Chassis, LCC
850 Stephenson Highway, Suite #510
Troy, MI 48083-1174
1-877-946-7731

ROADSIDE ASSISTANCE PROGRAM

To enhance Workhorse's commitment to customer satisfaction, a free membership is provided in the Workhorse Roadside Assistance Program for 3 years or 36,000 miles.

Roadside assistance is available 24 hours a day, 365 days a year, by calling 1-877-946-7731. This toll-free number will provide you over-the-phone roadside assistance with minor problems. If your problem cannot be resolved over the phone, our advisors have access to a nationwide network of dealer recommended service providers.

The following services are available:

- Toll-free number 1-877-946-7731
- Free towing for warranty repairs
- Basic over-the-phone technical advice
- Available dealer services at reasonable costs (i.e., wrecker services, locksmith/key service, glass repair, etc.)

The Roadside Assistance Center uses companies that will provide you with quality and priority service. When roadside services are required, our advisors will explain any payment obligations that may be incurred for utilizing outside services.

For prompt assistance when calling, please have the following available to give to the advisor:

- Vehicle Identification Number (VIN)
- License plate number
- Vehicle type (motor home, step van, etc.)
- Vehicle location
- Telephone number where you can be reached
- Vehicle mileage
- Description of problem

WARRANTY INFORMATION

For warranty information, please see Section 7 of this manual.

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 WCC.

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 WCC.

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 WCC. You may write to:

Transport Canada
330 Sparks Street
Tower C
Ottawa, Ontario K1A 0N5

**REPORTING SAFETY DEFECTS TO
WORKHORSE CUSTOM CHASSIS**

In addition to notifying NHTSA (or Transport Canada) in a situation like this, we certainly hope you'll notify us. Please call us at 1-877-946-7731 or write:

Customer Assistance Center
Workhorse Custom Chassis, LCC
850 Stephenson Highway, Suite #510
Troy, MI 48083-1174
1-877-946-7731

**WORKHORSE CUSTOM CHASSIS
SERVICE PUBLICATIONS****Current Service Publications***Service Manuals*

Service manuals have the diagnosis and repair information on engines, transmission, axle, suspension, brakes, electrical, steering, body, etc.

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.

Ordering Information

All service publications ordering information including pricing, shipping and payment options can be obtained by calling TOLL FREE: 1-800-686-6980 (Monday-Friday, 9 AM - 5 PM EST)

Section 7

The following pages makeup the

Warranty and Owner Assistance Information

for your vehicle.

Owner's Name _____

Street Address _____

City & State _____

Vehicle Identification Number (VIN)(see page 189): _____

Warranty Start Date and Mileage: _____

Month _____ Day _____ Year _____

_____ .X

NOTE: If delayed warranty start date applies, see delayed warranty start approval form.

Warranty and Owner Assistance Information

Better Business Bureau Information

Workhorse Custom Chassis participates in BBB AUTO LINE, and informal dispute resolution program administered by the Council of Better Business Bureaus. You must resort to BBB AUTO LINE before exercising rights or seeking remedies created by Title I of the Magnuson-Moss Warranty Act, 15 U.S.C. §2301 *et seq.* ("the Act"). If you choose to pursue rights and remedies not created by Title I of the Act, resort to BBB AUTO LINE is not required by any provision of the Act.

You may call BBB AUTO LINE toll free at 1-800-955-5100. Further information about BBB AUTO LINE can be found on page 358 of this booklet.

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An Important Message to Chassis Owners

WCC's Commitment to You

We are committed to assuring satisfaction with your new WCC Chassis.

Your WCC dealer also wants you to be completely satisfied and invites you to return for all your service needs both during and after the warranty period. You should be aware that not all WCC dealers are equipped to service all chassis. If you are traveling or unable to return to your WCC chassis dealer for any reason, call 1-877-946-7731 for the name and location of the nearest WCC chassis service location.

Chassis Operation and Care

Considering your chassis, we know you will want to operate and maintain it properly. We urge you to follow the maintenance instructions contained in your WCC Owner's Manual.

Should you have any questions on how to keep your chassis in good working condition, ask your WCC dealer, the place you can rely on to use the proper parts and repair practices.

Maintenance Records

Retain receipts covering performance of regular maintenance. Receipts can be very important if a question arises as to whether a malfunction is caused by lack of maintenance or a defect in material or workmanship.

Receipts should be retained in the glove box literature portfolio. Also, a "Maintenance Record" form is provided in the Maintenance Schedule section of the Owner's Manual for your convenience in recording services performed.


Owner Assistance

Your WCC chassis dealer is best equipped to provide all your service needs. In the event you have any questions or concerns, talk to a member of dealer management. If you still need assistance follow the additional procedure outlined in "Owner Assistance" on page 357 of this booklet.

Warranty Coverage at a Glance

The warranty coverages are summarized below. Please read pages 327 through 359 for complete details.

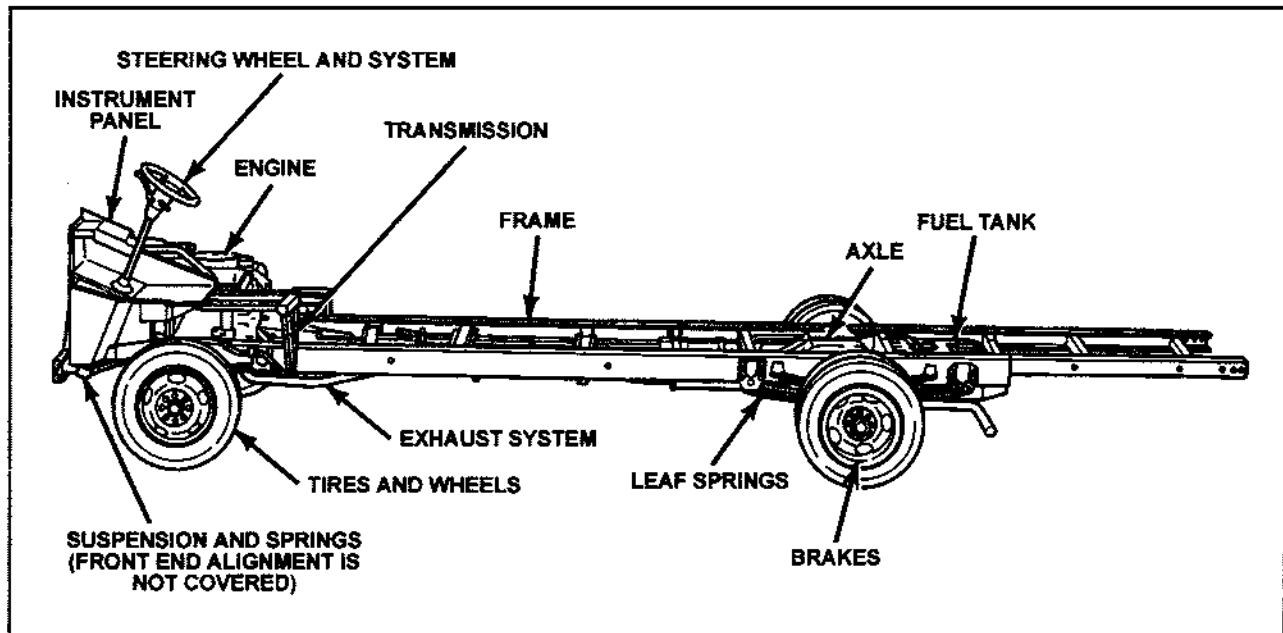
New Chassis Limited Warranty			
Coverage	3 YRS/ 36,000 MI		5 YRS/ 100,000 MI
	Basic Chassis Coverage (includes tires) The chassis generally consists of the frame, axle, engine, transmission, brakes, steering, suspension and certain electrical components, as supplied by WCC. 6.5L Diesel Engine		

 No Charge

 \$100 Deductible Charge.

WCC Chassis

What Is Covered



The WCC-Series Chassis is an engine and frame unit, which includes the driving controls as shown above.

WCC New Chassis Limited Warranty

WCC will provide for repairs to the chassis during the warranty period in accordance with the following terms, conditions, and limitations.

What Is Covered



Warranty Applies

This warranty is for WCC chassis which are registered in the United States and normally operated in the United States or Canada, and is provided to the original and any subsequent owners of the chassis during the Warranty Period.



Repairs Covered

The warranty covers repairs to correct any chassis defect related to materials or workmanship occurring during the Warranty Period. Needed repairs will be performed using new or remanufactured parts.



Warranty Period

The Warranty Period for all coverage begins on the date the chassis is first delivered or put in use and ends at the expiration of the coverage period.

For details regarding eligibility for a delay in the start of the warranty, see "Delayed Warranty Start" in the "Things You Should Know About The New Chassis Warranty" starting on page 334.



Basic Chassis Coverage

Chassis coverage includes the chassis frame, axle, engine, transmission, brakes, steering, suspension, and certain electrical components, as supplied by WCC. These components are covered for 3 years or 46,000 miles, whichever comes first, except for other coverage listed here under "What Is Not Covered" and those items listed under "What Is Not Covered" on pages 330, 331, 332, and 333.

WCC New Chassis Limited Warranty

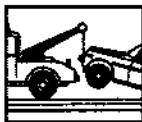
Body company, tire manufacturer or component suppliers may provide warranty coverage in addition to the WCC chassis warranty coverage. Review the supplier company's warranty information for coverage details.



Tire Coverage

The tires originally supplied with your chassis are covered against defects in material or workmanship under the Basic Chassis Coverage. Any tire replaced under the Basic Chassis Coverage will continue to be covered for the remaining portion of the New Chassis Limited Warranty.

Following the expiration of the Basic Chassis Coverage, tires may continue to be covered under the tire manufacturer's warranty. Review the tire manufacturer's warranty booklet or consult the tire manufacturer distributor for specific details.



Towing

Towing is covered to the nearest WCC dealer facility if your vehicle cannot be driven because of a warranted chassis defect.



6.5L Diesel Engine Coverage

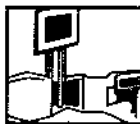
The diesel engines (except those items listed under "What Is Not Covered" on pages 330, 331, 332, and 333) are covered for 5 years or 100,000 miles, whichever comes first. A \$100 deductible per repair visit may apply after the chassis has been in use for 3 years or 36,000 miles, whichever comes first. For additional information, refer to "Things You Should Know About the New Chassis Limited Warranty" starting on page 334.



No Charge

Chassis warranty repairs, including towing, parts and labor, will be made at No Charge, less any applicable deductible.

WCC New Chassis Limited Warranty



Obtaining Repairs

To obtain chassis warranty repairs, take the vehicle to a participating WCC dealer facility within the

Warranty Period and request the needed repairs. A reasonable time must be allowed for the dealer to perform necessary repairs.

What Is Not Covered



Tire Damage or Wear

Normal tire wear or wear out is not covered. Road hazard damage such as punctures, cuts, snags, and breaks resulting from pothole impact, curb

impact, or from other objects is not covered. Damage from improper front suspension alignment, improper inflation, spinning (as when stuck in mud or snow), tire chains, racing, improper mounting or dismounting, misuse, negligence, alteration, vandalism, or misapplication is not covered.



Damage Due to Accident, Misuse, or Alteration

Damage or poor performance caused as the result of any of the following is not covered:

- Cutting, welding, stretching, or shrinking of chassis frame rails or driveline;
- Addition of aftermarket suspension equipment such as tag axles, springs or spring helpers, spacer blocks, or air springs;
- Addition of aftermarket engine and transmission modifications such as superchargers, turbochargers, exhaust brakes, exhaust systems, air induction systems, computers (software or hardware modifications), governors, gear splitters or electric braking devices;
- Chassis overloading or uneven weight distribution;
- Collision, fire, theft, freezing, vandalism, riot, explosion, or objects striking the chassis;

WCC New Chassis Limited Warranty

- Misuse of the chassis such as driving over curbs, overloading, racing, or other competition. Proper chassis use is discussed in the Owner's Manual;
- Alteration or modification to the chassis or components after final assembly by WCC. In addition, coverage does not apply if the odometer has been disconnected, its reading has been altered, or mileage cannot be determined.

NOTE: This warranty is void on chassis currently or previously titled as salvaged, scrapped, junked, or totaled.



Front Suspension Alignment

The front suspension alignment should be checked and adjusted as necessary by the body company after final vehicle assembly has been completed. In some instances, it may be necessary for the owner to check and adjust the alignment due to chassis loading after purchase. The need for a front suspension alignment is maintenance and is not covered under the terms of the New Chassis Limited Warranty.



Damage or Corrosion Due to Environment, Chemical Treatments or Aftermarket Products

Damage caused by airborne fallout (chemicals, tree sap, salt spray, etc.), stones, hail, earthquake, water or flood, windstorm, lightning, the application of chemicals or sealants subsequent to manufacture, etc., is not covered.



Damage Due to Insufficient or Improper Maintenance

Damage caused by failure to follow the recommended Maintenance Schedule intervals and/or failure to use or maintain fluids, fuel, lubricants, or refrigerant recommended in the Owner's Manual is not covered.

WCC New Chassis Limited Warranty



Maintenance

All vehicles require periodic maintenance. Maintenance services, such as those detailed in the Owner's

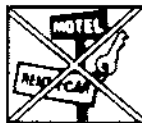
Manual or Maintenance Publications are the owner's expense. Vehicle lubrication, cleaning, or polishing, as well as items requiring replacement or repair as a result of vehicle use, wear, or exposure are not covered.

Items such as:

- Filters
- Brake Pads / Linings
- Clutch Linings
- Coolants and Fluids
- Limited Slip Rear Axle Service
- Tire Rotation
- Wheel Balance**

are covered only when replacement or repair is the result of a defect in material or workmanship. Failure or damage of components due to vehicle use, wear, exposure, or lack of maintenance is not covered.

** Maintenance items after 7,500 miles.



Extra Expenses

Economic loss or extra expense is not covered.

Examples include:

- Loss of vehicle use
- Inconvenience
- Storage
- Payment for loss of time or pay
- Vehicle rental expense
- Lodging, meals, or other travel costs
- State or local taxes required on warranty repairs

WCC New Chassis Limited Warranty

Other Terms: This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

WCC does not authorize any person to create for it any other obligation or liability connection with these chassis. **Any, implied warranty of merchantability or fitness for a particular purpose applicable to this chassis is limited in duration to the duration of this written warranty. Performance of repairs and needed adjustments is the exclusive remedy under this written warranty or any implied warranty. WCC shall not be liable for incidental or consequential damages (such as, but not limited to, lost wages or vehicle rental expenses) resulting from breach of this written warranty or any implied warranty.***

* Some states do not allow limitations on how long an implied warranty will last or the exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you.



Contaminated Fuel - Damage and failures caused by contaminated fuel, including towing, injector plugging, fuel filters clogging, fuel pump damage, and tank cleaning is not covered by warranty.

Warranty Repairs – Component Exchanges

In the interest of customer satisfaction, WCC may offer exchange service on some chassis components. This service is intended to reduce the amount of time your vehicle is not available for use due to repairs. Components used in exchange are Service Replacement Parts which may be new, remanufactured, reconditioned, or repaired, depending on the component involved.

All exchange components used meet WCC standards and are warranted the same as new components. Examples of the types of components that might be serviced in this fashion include: engine and transmission assemblies, instrument cluster assemblies, and powertrain control modules.

Warranty Repairs – Recycled Materials

Environmental Protection Agency (EPA) guidelines and WCC support the capture, purification, and reuse of automotive air conditioning refrigerant gases and engine coolant. As a result, any repairs WCC may make to your chassis may involve the installation of purified reclaimed refrigerant and coolant.

Chassis Air-Conditioning Systems

If your chassis was ordered with air-conditioning provisions from WCC, the components that were installed by WCC will be covered under the Basic Chassis Coverage. The components that may have been installed by WCC are as follows: compressor, condenser, condenser fan, receiver-drier, line between compressor and condenser, and the high and low pressure cut-off switches. All other air-conditioning components (such as the evaporator, expansion valve, duct work, controls, associated hoses, refrigerant charge, etc.) are installed by the body company. See the body company's warranty for the coverage on the air-conditioning components they installed.

Delayed Warranty Start

Chassis originally sold to a body company for later sale to a retail owner may be eligible for delayed warranty start. Warranty on chassis which have been approved for a delayed warranty start will commence at the date and mileage the chassis was sold to the first retail owner.

Things You Should Know About the New Chassis Limited Warranty

The maximum extension beyond the original date of delivery to the body company up to:

- Chassis originally sold as commercial use:
maximum extension of 12 months, 4,000 miles, whichever comes first.
- Chassis originally sold as recreational use:
maximum extension of 24 months, 6,000 miles, whichever comes first.

Contact your selling commercial or recreational vehicle dealer to process a Delayed Warranty Start Application.

NOTE: Chassis put in demonstrator use are not eligible for a Delayed Warranty Start. The delayed warranty start is not valid unless approved by WCC.

Tire Service

Any participating WCC Dealer or the tire dealer for your brand of tires can assist you with tire service. If, after contacting one of these dealers, you need further assistance or you have questions, please contact WCC's Customer Assistance Center. The toll-free telephone numbers are listed on page 358.

6.5L Diesel Engine Components

The complete engine assembly, including turbocharger components, is covered for defects in material or workmanship for 3 years or 36,000 miles, whichever comes first. No deductible applies during this coverage period. The engine parts listed below continue to be covered (may be subject to a \$100 deductible) for 5 years or 100,000 miles, whichever comes first.

- Cylinder block and heads and all internal parts, intake and exhaust manifolds, timing gears, timing gear chain or belt and cover, flywheel, harmonic balancer, valve covers, oil pan, oil pump, water pump, fuel pump, engine mounts, seals and gaskets.
- Diesel Fuel Metering System: injection pump, nozzles, high pressure lines and high pressure sealing devices.
- Glow Plug Control System: control/glow plug assembly, glow plugs, cold advance relay, and ECM.

Things You Should Know About the New Chassis Limited Warranty

NOTE: Some of the components from the previous page may also be covered by the Emission Warranty with no deductible (see pages 343 through 347 for details).

Warranty Coverage – Extensions

Time Extensions: The New Chassis Limited Warranty will be extended one day for each day beyond the first 24 hour period in which your vehicle is at an authorized dealer facility for warranty service. You may be asked to show the repair orders to verify the period of time the warranty is to be extended. Your extension rights may vary depending on state law.

Mileage Extensions: Prior to delivery, some mileage is put on your chassis during testing at the assembly plant, during shipping and while at the dealer facility. The dealer records this mileage on the first page of this warranty booklet at delivery. For eligible chassis, this mileage will be added to the mileage limits of the warranty ensuring that you receive full benefit of the coverage. Mileage extension eligibility:

- Applies only to new chassis held exclusively in new vehicle inventory.
- Does not apply to used chassis, WCC owned chassis, dealer owned used chassis, or dealer demonstrator chassis.
- Does not apply to vehicles with more than 1,000 miles on the odometer even though the chassis may not have been registered for license plates.

Warranty Service – United States and Canada

For your records, the servicing dealer should provide a copy of the Warranty Repair Order listing all warranty repairs performed. While any participating WCC chassis dealer will perform warranty service, we recommend that you return to the WCC chassis dealer that sold you your chassis because of their continued and personal interest in you. If you are traveling or have changed your residence, visit any WCC chassis dealer in the United States or Canada for warranty service.

Things You Should Know About the New Chassis Limited Warranty

Original Equipment Alterations

This warranty does not cover any damage or failure resulting from modification or alteration to chassis original equipment as manufactured or assembled by WCC. Examples of the types of alterations that would not be covered include, installation or use of any non-WCC part, accessory, materials, or the cutting, welding, or disconnecting of the chassis original equipment parts and components.

Recreation Vehicle and Special Body or Equipment Alterations

Installations, or alterations to the original equipment chassis as manufactured and assembled by WCC, are not covered by this warranty. The special body company (assembler) or equipment installer is solely responsible for warranties on the body or equipment and any alterations to any of the parts, components, systems or assemblies installed by WCC. Examples include, but are not limited to, special body installation (such as recreational vehicles), the installation of a non-WCC part, cutting, welding or the disconnecting of original equipment chassis

parts and components, extension of wheelbase, suspension and driveline modifications and axle additions.

Pre-Delivery Service

Defects in the mechanical, electrical and other components of your chassis may occur at the factory or while it is being transported to the body company or dealer facility. Normally, any defects occurring during assembly are detected and corrected at the factory during the inspection process. In addition, body companies or dealers are obligated to inspect each chassis before delivery. They repair any uncorrected factory defects and any transit damage detected before the chassis is delivered to the body builder or customer.

Any defects still present at the time the chassis is delivered to you are covered by the WCC chassis warranty. If you find any such defects when you take delivery, please advise your dealer without delay. For further details concerning any repairs which the dealer may have made prior to your taking delivery of your vehicle, please ask your dealer.

Things You Should Know About the New Chassis Limited Warranty

Production Changes

WCC and WCC dealers reserve the right to make changes in chassis built and/or sold by them at any time without incurring any obligation to make the same or similar changes on chassis previously built and/or sold by them.

Normal Noise

Some of the components within your WCC chassis will emit sound which can vary depending on final vehicle construction, layout, installation, etc... Typical sounds may include, but are not limited to, air induction, exhaust system, brake system, and axle and other driveline components. Sounds which do not affect the durability of your chassis are not covered under this warranty.

Noise Emissions Warranty Vehicles Over 10,000 lbs. GVWR Only.

WCC warrants to the first person who purchases this chassis for purposes other than resale, and to each subsequent purchaser of this chassis which, as manufactured by WCC, was designed, built and equipped to conform at the time it left WCC's control with all applicable United States EPA Noise Control Regulations.

This warranty covers the chassis as designed, built and equipped by WCC, and is not limited to any particular part, component or system of the chassis manufactured by WCC. Defects in design, assembly, or in any part component or chassis system as manufactured by WCC, which, at the time it left WCC's control, caused noise emissions to exceed Federal standards, are covered by this warranty for the life of the chassis

Emission Control Systems Warranties

This section outlines the emission warranties that WCC provides for your chassis in accordance with the U.S. Federal Clean Air Act. Defects in material or workmanship in WCC emission parts may also be covered under the New Chassis Limited Warranty coverage. There may be additional coverage on WCC diesel engine chassis. In any case, the warranty with the broadest coverage applies.

What is Covered

The parts covered under the emission warranty are listed under the Emission Warranty Parts List on pages 344 through 347.

How to Determine the Applicable Emission Control System Warranty

State and Federal agencies may require different emission control systems warranties for chassis depending on whether the chassis has a light or a heavy duty emission control system. Do the following to determine your chassis system: Locate the label attached to the engine air cleaner housing on the engine.

Heavy Duty Federal Emission Control System

The Emission Defect Warranty described below begins on the date the chassis is first delivered or put into use and continues for a period of either (i) 5 years or 50,000 miles (whichever occurs first) on all Heavy Duty Gasoline chassis greater than 8,500 lbs. GVWR and on Diesel chassis up to 19,500 lbs. GVWR; or (ii) 5 years or 100,000 miles (whichever occurs first) on Diesel chassis over 19,500 lbs. GVWR.

Emission Control Systems Warranties

WCC warrants to the owner that the chassis:

- Was designed, equipped, and built so as to conform at the time of sale with applicable regulations of the Federal Environmental Protection Agency (EPA), and
- Is free from defects in materials and workmanship which cause the chassis to fail to conform with those regulations during the emission warranty period.

Emission related defects in the genuine WCC parts listed under Emission Parts Covered, including related diagnostic costs, parts and labor are covered by this warranty.

* WCC warrants that your dealer will replace, repair or adjust to WCC specifications, at no charge to you, any of the parts listed on pages 344 through 347 which may be necessary to cause your chassis to conform to the applicable emission standards.

*** The warranty for some Diesel engines is the responsibility of the engine manufacturer. See your Workhorse dealer for details.**

Emission Control Systems Warranties

California Emission Control Warranty

This section outlines the emission warranties that WCC provides for your chassis in accordance with the California Air Resources Board. Defects in material or workmanship in WCC emission parts may also be covered under the New Chassis Limited Warranty coverage. There may be additional coverage on WCC diesel engine chassis. In any case, the warranty with the broadest coverage applies.

This warranty applies if your chassis meets both of the following requirements:

- Your chassis is registered in California **or other states adopting California emission and warranty regulations***
- Is certified for sale in California as indicated on the chassis emission control information label.

* Currently Connecticut, Massachusetts, New Jersey, New York, Rhode Island, Maine and New Hampshire.

Your Rights and Obligations (For Chassis Subject to California Exhaust Emission Standards)

The California Air Resources Board and WCC are pleased to explain the emission control system warranty on your chassis. In California, new chassis must be designed, equipped and built to meet the state's stringent anti-smog standards. WCC must warrant your chassis emission control system for the periods of time and mileage listed on page 342 provided there has been no abuse, neglect, or improper maintenance of your chassis. Your chassis emission control system may include parts such as the fuel injection system, ignition system, catalytic converter, and engine computer. Also included are hoses, belts, connectors, and other emission related assemblies.

Emission Control Systems Warranties

Where a warrantable condition exists, WCC will repair your chassis at no cost to you, including diagnosis, parts, and labor.

WCC Emission Warranty Coverage for California Medium Duty Vehicle, 8,500 lbs. - 14,000 lbs. GVWR:

- For 3 years or 50,000 miles, whichever comes first:

If your chassis fails a Smog Check inspection, WCC will make all necessary repairs and adjustments to ensure that your chassis passes the inspection. This is your chassis emission control system Performance Warranty.

If any emission related part on your chassis is defective, WCC will repair or replace it. This is your short-term Emission Defects Warranty.

- For 7 years or 70,000 miles, whichever comes first:

If an emission related part listed in your chassis warranty booklet specially noted with coverage for 7 years or 70,000 miles is defective, WCC will repair or replace it. This is your long-term Emission Defects Warranty.

WCC Emission Warranty Coverage for California Heavy Duty Vehicle, Over 14,000 lbs. GVWR:

- For Heavy Duty Gasoline engine chassis, over 14,000 lbs. GVWR, the emission warranty period is 5 years or 50,000 miles, whichever comes first.
- For Heavy Duty Diesel engine chassis, the emission warranty period is 5 years or 100,000 miles, or 3,000 hours of operation, whichever comes first.

Any authorized WCC dealer will, as necessary under these warranties, replace, repair, or adjust to WCC specifications any genuine WCC parts that affect emissions.

The applicable warranty period shall begin on the date the vehicle is delivered to the first retail purchaser.

Owner's Warranty Responsibilities:

As the chassis owner, you are responsible for the performance of the scheduled maintenance listed in your Owner's Manual/Maintenance Schedule. WCC recommends that you retain all maintenance receipts for your chassis, but WCC cannot deny warranty solely

Emission Control Systems Warranties

for the lack of receipts or for your failure to ensure the performance of all scheduled maintenance.

You are responsible for presenting your vehicle to a WCC dealer as soon as a problem exists. The warranted repairs should be completed in a reasonable amount of time, not to exceed 30 days.

As the chassis owner, you should also be aware that WCC may deny you warranty coverage if your chassis or a part has failed due to abuse, neglect, improper or insufficient maintenance, or modifications not approved by WCC.

If you have any questions regarding your rights and responsibilities under these warranties, You should contact the Customer Assistance Center at 1-877-946-7731 or, in California, the State of California Air Resources Board, Mobile Source Operations Division, P.O. Box 8001, El Monte, California 91731-2990

What is Covered

The parts covered under the Emission Control System Warranties are listed under Emission Warranty Parts List beginning on page 344.

What is Not Covered

The Emission Control Systems Warranties obligations do not apply to conditions resulting from tampering, abuse, neglect or improper maintenance or any other item listed under "What is Not Covered" in the Chassis Limited Warranty on pages 330, 331, 332 and 333. The "Other Terms" presented in the Chassis Limited Warranty also apply to the emission related warranties.

Emission Warranty Parts List

The parts that may affect your chassis emissions are on the following pages. These emission parts are covered under emission warranty as follows:

Emission Control Systems Warranties

NOTE: Certain parts may be covered beyond these warranties if shown with asterisk as follows:

* 7 years/70,000 miles, whichever comes first, California emission coverage.

Powertrain Control System

Barometric Pressure Sensor
Brake Switch
Camshaft Position Sensor
Coolant Fan Control Relay
Coolant Level Sensor
Crankshaft Position Sensor
Data Link Connector
Electric Throttle Control (ETC) Motor
Engine Control Module (ECM)
Engine Coolant Temperature Sensor
Fast Idle Solenoid
Intake Air Temperature Sensor
Malfunction Indicator Lamp
Manifold Absolute Pressure Sensor
Mass Air Flow Sensor*
Oxygen Sensors
Park/Neutral Position Switch
Powertrain Control Module (PCM)
Programmable Read Only Memory (PROM)

Throttle Position Sensor
Throttle Position Switch
Torque Converter Clutch Solenoid Valve
Transmission Speed Sensors
Vehicle Control Module (VCM)
Vehicle Speed Sensor

Fuel Management System

Altitude Fuel Limiter (Diesels)
Diesel Fuel Injection Pump
Diesel Fuel Injection Pump Timing Adjuster
Fuel Injectors
Fuel Pressure Regulator
Fuel Rail Assembly
Diesel Glow Plugs

Emission Control Systems Warranties

Air Management System

Air Cleaner (except for filter element)
Air Cleaner Diaphragm Motor
Air Cleaner Resonator
Air Cleaner Temperature Compensator Valve
Air Flow Meter
Air Intake Ducts
Charge Air Control Actuator
Charge Air Control Solenoid Valve
Charge Air Control Valve
Charge Air Cooler
Charge Air Cooler Fan
Charge Air System
Idle Air Control Valve
Idle Speed Control Motor
Intake Manifold*
Throttle Body Assembly*
Throttle Body Heater
Throttle Closing Dashpot
Turbocharger*
Turbocharger Oil Separator
Turbocharger Thermo Purge Switch

Ignition System

Ignition Coil
Ignition Control Module*
Ignition Timing Adjustment
Knock Sensor System
Spark Plug Wires
Spark Plugs

Catalytic Converter System

Catalytic Converter*
Exhaust Manifold*
Exhaust pipes and/or Mufflers (when located
between converter and exhaust manifold)

Positive Crankcase Ventilation System

- Diesel Crankcase Depression Regulator Valve
- Oil Filler Cap
- PCV Filter
- PCV Oil Separator
- PCV Valve

Exhaust Gas Recirculation System

- EGR Control Valves
- EGR Passages
- EGR Temperature Sensor
- EGR Thermal Vacuum Valve
- EGR Vacuum Pump (Diesel Only)
- EGR Valve
- EGR Valve and Exhaust Pressure Regulator
 - Solenoid Valve (diesels only)
- EGR Valve Relay
- Exhaust Backpressure Transducer
- Exhaust Pressure Regulator Valve and Actuator
 - (diesels only)

Secondary Air Injection System

- AIR Pump
- Bypass Valve
- Check Valves
- Deceleration Valve
- Injection Check Valve
- Pump Belt
- Switching Valves
- Vacuum Delay Valve

Evaporative Emission Control System (Gasoline Engines)

- Canister
- Canister Control Valve
- Canister Vent Solenoid
- Canister Purge Solenoid Valve
- Canister Purge Thermal Vacuum Valve
- Fuel Feed and Return Pipes and Hoses
- Fuel Filler Cap
- Fuel Tank Filler Pipe (with restrictor)
- Fuel Tank Pressure Control Valve
- Fuel Tanks*
- Fuel Tank Vacuum Sensor
- Purge Line Vacuum Switch

Emission Control Systems Warranties

Miscellaneous Items Used in Above Systems

Actuators	Hoses	Sealing Devices
Belts	Housings	Sensors
Clamps	Mounting	Springs
Connectors	Hardware	Switches
Ducts	Pipes	Tubes
Fittings	Pulleys	Valves
Gaskets	Relays	Wiring
Grommets		

* 7 years/70,000 miles, whichever comes first.
California emission coverage.

Parts specified in your maintenance schedule as requiring scheduled replacement are covered up to their first replacement interval or the applicable emission warranty coverage period, whichever comes first. If failure of one of these parts results in failure of another part, both will be covered under the Emission Control System Warranties.

For detailed information concerning specific parts covered by these Emission Control Systems Warranties, ask your WCC dealer.

Things You Should Know About the Emission Control Systems Warranties

Replacement Parts

The emission control systems of your chassis were designed, built, and tested** and the chassis is certified as being in conformity with applicable Federal and California emission requirements.

Accordingly, it is recommended that any replacement parts used for maintenance or for the repair of emission control systems be new, genuine WCC parts.

The warranty obligations are not dependent upon the use of any particular brand of replacement parts. The owner may elect to use non WCC parts for replacement purposes, however, use of replacement parts of non-equivalent quality may impair the effectiveness of emission control systems.

Emission Control Systems Warranties

If other than new, WCC approved parts are used for maintenance replacements or for the repair of parts affecting emission control, the owner should assure himself/herself that such parts are warranted by their manufacturer to be equivalent to genuine WCC parts in performance and durability.

** "genuine WCC parts", when used in connection with WCC chassis means parts manufactured by or for WCC, designed for use on WCC chassis and distributed by any division or subsidiary of WCC.

Maintenance and Repairs

Maintenance and repairs can be performed by any qualified service outlet, however, warranty repairs must be performed by an authorized dealer except in an emergency situation when a warranted part or a warranty station is not reasonably available to the vehicle owner.

In an emergency, where an authorized dealer is not reasonably available, repairs may be performed at any available service establishment or by the owner, using any replacement part. WCC will consider reimbursement for the expense incurred (including

diagnosis), not to exceed the manufacturer's suggested retail price for all warranted parts replaced and labor charges based on WCC's recommended time allowance for the warranty repair and the geographically appropriate labor rate. A part not being available within 10 days or a repair not being completed within 30 days constitutes an emergency. Retain receipts and failed parts in order to receive compensation for warranty repairs reimbursable due to an emergency.

If, in an emergency situation, it is necessary to have repairs performed by other than a WCC dealer and you believe the repairs are covered by emission warranties, take the replaced parts and your receipt to a WCC dealer for reimbursement consideration. This applies to both the Emission Defect Warranty and Emission Performance Warranty.

Receipts and records covering the performance of regular maintenance or emergency repairs should be retained in the event questions arise concerning maintenance. These receipts and records should be transferred to each subsequent owner. WCC will not

Emission Control Systems Warranties

deny warranty coverage solely on the absence of maintenance records. However, WCC may deny a warranty claim if a failure to perform scheduled maintenance resulted in the failure of a warranty part.

Claims Procedure

As with the other warranties covered in this booklet, take your vehicle to any authorized WCC dealer facility to obtain service under the emission warranties. This should be done as soon as possible after failing an EPA-approved Inspection-Maintenance test for a California Smog Check test, or at any time you suspect a defect in a part.

Those repairs qualifying under the warranty will be performed by any WCC dealer at no charge. Repairs which do not qualify will be charged to you. You will be notified as to whether or not the repair qualifies under the warranty within a reasonable time (not to exceed 30 days after receipt of the vehicle by the dealer, or within the time period required by local or state law).

The only exceptions would be if you request or agree to an extension, or if a delay results from events beyond the control of your dealer or WCC. If you are not so notified, WCC will provide any required repairs at no charge.

In the event a warranty matter is not handled to your satisfaction, refer to the Customer Satisfaction Procedure in this booklet under "Owner Assistance" on page 357.

For further information or to report violations of the emission control systems warranties, you may contact the Director, Field Operations and Support Division Environmental Protection Agency, 401 "M" Street S.W., Washington, DC 20460.

For a chassis subject to the California Exhaust Emission standards, you may contact the State of California Air Resources Board, Mobile Source Operations Division, P.O. Box 8001, El Monte, California 91731-2990.

Limited Warranty on CUMMINS Engines

Base Engine Warranty

This warranty covers any failures of the Engine, which result, under normal use and service, from a defect in material of factory workmanship (Warrantable Failure). This coverage begins with the date of in service to the first retail owner and ends two years (2 years or 50,000 miles/80,468 kilometers, whichever occurs first).

These warranties are made to all Owners in the chain of distribution, and Coverage continues to all subsequent Owners until the end of the periods of Coverage.

Cummins Responsibilities

Cummins will pay for all parts and labor needed to repair the damage to the Engine resulting from a Warrantable Failure.

Cummins will pay for the lubricating oil, antifreeze, filter elements, belts, hoses and other maintenance items that are not reusable due to the Warrantable Failure.

Cummins will pay for reasonable labor costs for Engine removal and reinstallation when necessary to repair a Warrantable Failure.

Cummins will pay reasonable costs for towing a vehicle disabled by a Warrantable Failure to the nearest authorized repair station for the first year from the date of in service to the first retail owner or the duration of the warranty, whichever occurs first. In lieu of the towing expense, Cummins will pay reasonable costs for mechanics to travel to and from the location of the vehicle, including meals, mileage, and lodging when the repair is performed at the site of the failure.

Owner Responsibilities

Owner is responsible for the operation and maintenance of the Engine as specified in the applicable Cummins Operation and Maintenance Manual. Owner is also responsible for providing proof that all recommended maintenance have been performed.

Before the expiration of the applicable warranty, Owner must notify a Cummins distributor, authorized dealer or other repair location approved by Cummins of any Warrantable Failure and make the Engine available for repair by such facility. Except for Engines disabled by a Warrantable Failure during the first year from the date of in service by the first retail/owner or the duration of the warranty, whichever occurs first, owner must also deliver the Engine to the repair facility. Locations in the United States and Canada are listed in the Cummins United States and Canada Sales and Service Directory.

Owner is responsible for the cost of lubricating oil, antifreeze, filter elements and other maintenance items provided during warranty repairs unless such items are not reusable due to the Warrantable Failure.

Owner is responsible for communication expenses, meals, lodging and similar costs incurred as a result of a Warrantable Failure.

Owner is responsible for non-Engine repairs and for "downtime" expenses, cargo damage, fines, all applicable taxes; all business costs and other losses resulting from a Warrantable Failure.

Limitations

Cummins is not responsible for failures or damage resulting from what Cummins determines to be abuse or neglect, including but not limited to: operation without adequate coolants or lubricants; over fueling; over speeding; lack of maintenance of lubricating, cooling or intake systems; improper storage, starting, warm-up, run-in or shutdown practices; unauthorized modifications of the Engine. Cummins is also not responsible for failures caused by incorrect oil or fuel or by water, dirt or other contaminants in the fuel or oil.

This warranty does not apply to accessories supplied by Cummins, which bear the name of another company. This category includes, but is not limited to: alternators, starters, fans, air conditioning compressors, clutches, filters, transmissions, torque converters, vacuum pumps, engine exhaust brakes, power steering pumps, non-Cummins fan drives, and air compressors.

Failures resulting in excessive oil consumption are covered for the duration of the coverage or 100,000 miles (160,935 kilometers) or 7000 hours from the date of delivery to the first retail owner, whichever of the three occurs first. Before a claim for excessive oil consumption will be considered, Owner must submit adequate documentation to show that consumption exceeds Cummins published standards.

Failures of belts and hoses supplied by Cummins are covered during the first year from the date of in service to the first retail/owner, delivery of the Engine or the duration of the warranty, whichever occurs first.

Parts used to repair a Warrantable Failure may be new Cummins parts; Cummins approved rebuilt parts, or repaired parts. Cummins is not responsible for failures resulting from the use of parts not approved by Cummins.

A new Cummins or Cummins approved rebuilt part used to repair a Warrantable Failure assumes the identity of the part it replaced and is entitled to the remaining coverage hereunder.

NOTICE:

CUMMINS DOES NOT COVER THE WEAR OF NORMAL WEAR ITEMS AND IS NOT RESPONSIBLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.

LIMITED WARRANTY ON NEW ALLISON AUTOMATIC TRANSMISSIONS INSTALLED IN WORKHORSE CUSTOMS CHASSIS

Allison Transmission Division, General Motors Corporation will provide for repairs or replacement, at its option, during the warranty period of each new Allison Transmission that is installed in a Workhorse Custom Chassis in accordance with the following terms, conditions and limitations.

WHAT IS COVERED

WARRANTY APPLIES – This warranty is for new Allison Transmissions installed in a Workhorse Custom Chassis and is provided to the original and any subsequent owner(s) of the vehicle during the warranty period.

REPAIRS COVERED – The warranty covers repairs or replacement, at Allison Transmission's option, to correct any transmission malfunction resulting from defects in material or workmanship occurring during the warranty period. Needed repairs or replacements will be performed using the method Allison Transmission determines most appropriate under the circumstances.

TOWING – Towing is covered to the nearest Allison Transmission Distributor and authorized Dealer only when necessary to prevent further damage to your transmission.

PAYMENT TERMS – Warranty repairs include parts and labor.

NOTE:

OBTAINING REPAIRS – TO OBTAIN WARRANTY REPAIRS, TAKE THE VEHICLE TO ANY ALLISON TRANSMISSION DISTRIBUTOR OR AUTHORIZED DEALER WITHIN A REASONABLE AMOUNT OF TIME AND REQUEST THE NEEDED REPAIRS.

A reasonable amount of time must be allowed for the Distributor or Dealer to perform necessary repairs.

TRANSMISSION REMOVAL AND REINSTALLATION – Labor costs for the removal and reinstallations of the transmission, when necessary to make a warranty repair, are covered by this warranty.

Warranty period – The warranty period for all coverage shall begin on the date of in-service by the retail purchaser. The warranty period for all coverage shall end at the expiration of the coverage set forth below.

MY 2000 –2003 Commercial, and Motorhome Chassis

<u>Model</u>	<u>Warranty</u>
<u>Limitations</u>	<u>Parts and Labor</u>
Allison 1000 Series	36 months / Unlimited mileage No Charge

WHAT IS NOT COVERED

DAMAGE DUE TO ACCIDENT, MISUSE, or ALTERATION – Defects and damage caused as the result of any of the following are not covered: Flood, collision, fire, theft, freezing, vandalism, riot, explosion or objects striking the vehicle; Misuse of the vehicle; Installation into unapproved application and installations; Alterations or modification of the transmissions or the vehicle and; Anything other than defects in Allison Transmission material or workmanship.

NOTE: This warranty is void on transmissions used in vehicles currently or previously titled as salvaged, scrapped, junked or totaled.

CHASSIS, BODY and COMPONENTS – The chassis and body company (assemblers) and other component and equipment manufactures are solely responsible for warranties on the chassis, body, component(s) and equipment they

provide. Any transmission repair caused by an alteration(s) made to the Allison transmission or the vehicle is solely the responsibility of the entity making the alteration(s)

NOTE:

DAMAGE CAUSED BY LACK OF MAINTENANCE OR BY THE USE OF TRANSMISSION FLUIDS NOT RECOMMENDED IN THE OPERATOR'S MANUAL – Defects and damage caused by any of the following are not covered:

Failure to follow the recommendations of the maintenance schedule intervals applicable to the transmission;

Failure to use transmission fluids or maintain transmission fluid levels recommended in the Operator's Manual.

MAINTENANCE – Normal maintenance (such as replacement of filters, screens, and transmission fluid) is not covered and is the owner's responsibility.

REPAIRS by UNAUTHORIZED DEALERS – Defects and damage caused by a service outlet that is not an authorized Allison Transmission Distributor or Dealer and not covered.

USE of OTHER-THAN GENUINE ALLISON TRANSMISSION PARTS – Defects and damage caused by the use of parts that are not genuine Allison Transmission parts are not covered.

EXTRA EXPENSES – Economic loss and extra expenses are not covered. Examples include but are not limited to: loss of vehicle use; inconvenience; storage; payment for loss of time or pay; vehicle rental expense; lodging; meals or other travel costs.

If you have any questions regarding this warranty or the performance of warranty obligations, you may contact any Allison Transmission Distributor or Dealer, or write to:

Allison Transmission Division,
General Motors Corporation
P.O. Box 894
Indianapolis, IN 46206-0894
Attention: Warranty Administration

Customer Satisfaction Procedures

Customer Satisfaction Procedure

Your Satisfaction and goodwill are important to your dealer and to WCC. Normally, any concerns with the sales transaction or the operation of your chassis 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 dealer 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 dealer facility.**

STEP TWO – If after contacting a member of dealer management, it appears your concern cannot be resolved by the dealer without further help contact **Workhorse Custom Chassis by calling on our toll-free number shown on page 358 so we can give your inquiry prompt attention.**

Please have the following information available to give the Customer Assistance Representative.

- Vehicle Identification Number - This is a 17 digit number starting with a 5. (This is available from the vehicle registration or title, or the plate above the left top of the instrument panel.)
- Dealer name and location.
- Vehicle's delivery date and present mileage.

When contacting WCC, please remember, 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.

STEP THREE – Both WCC and your WCC dealer are committed to making sure you are completely satisfied with your new chassis. However, if you continue to be dissatisfied after following the procedure outlined in Steps One and Two, you may file with the WCC/BBB Auto Line Program to enforce any additional rights you may have.

Customer Satisfaction Procedures

The BBB Auto Line program is an out of court program administered by the Council of Better Business Bureaus to settle automotive disputes regarding vehicle repairs or the interpretation of the New Chassis Limited Warranty. Although you may be required to resort to this informal dispute resolution program prior to filing any court action, use of the program is free of charge and your case will generally be heard within 40 days. If you do not agree with the decision given in your case, you may reject it and proceed with any other venue for relief available to you.

You may contact the BBB using the toll-free telephone number or write them at the following address:

BBB Auto Line
Council of Better Business Bureaus, Inc.
4200 Wilson Boulevard
Suite 800
Arlington, VA 22203-1804
Telephone: 1-800-955-5100

This program is available in all 50 states and the District of Columbia. Eligibility is limited by vehicle age, mileage and other factors. WCC reserves the

right to change eligibility limitations and/or to discontinue its participation in this program.

State Warranty Enforcement Laws.

Laws in many states permit owners to obtain a replacement chassis or a refund of the purchase price under certain circumstances. The provisions of these laws vary from state to state. Some state laws also require that you use BBB AUTO LINE prior to filing a claim in a state court. To the extent allowed by state law, WCC requires that you first provide us with written notification of any service difficulty you have experienced so that we have an opportunity make any needed repairs before you are eligible for the remedies provided by these laws.

Your written notification should be sent to:

Customer Assistance Center
Workhorse Custom Chassis LLC
850 Stephenson Highway, Suite #510
Troy, MI 48083-1174
1-877-946-7731

Customer Satisfaction Procedures

Special Policy Adjustment Programs Beyond the Warranty Period

WCC is proud of the protection afforded by its warranty coverages. In order to achieve maximum customer satisfaction, there may be times when WCC will establish a special policy adjustment program to pay all or part of the cost of certain repairs not covered by the Warranty or to reimburse certain repair expenses you may have incurred. Check with your WCC dealer or call WCC Customer Assistance to determine whether any special policy adjustment program is applicable to your chassis.

When you make an inquiry, you will need to give the year, model and mileage of your chassis and your Vehicle Identification Number (VIN).

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