HOW TO USE THIS MANUAL

Chilton's Total Car Care manual for Ford Taurus and Mercury Sable is intended to help you learn more about the inner workings of your car and save you money on its upkeep and operation. The first two sections will be used the most, since they contain maintenance and tune-up information and procedures. Studies have shown that a properly tuned and maintained car can get better gas mileage than an out-of-tune car. The other sections deal with the more complex systems of your vehicle. Operating systems from engine through brakes are covered to the extent that we feel the average do-it-yourselfer becomes mechanically involved, as well as more complex procedures that will benefit both the advanced do-it-yourselfer mechanic as well as the professional.

A secondary purpose of this book is as a reference for owners who want to understand their car and/or their mechanics better. In this case, no tools at all are required.

Before attempting any repairs or service on your car, read through the entire procedure outlined in the appropriate section. This will give you the overall view of what tools and supplies will be required. There is nothing more frustrating than having to walk to the bus stop on Monday morning because you were short one gasket on Sunday afternoon. So read ahead and plan ahead. Each operation should be approached logically and all procedures thoroughly understood before attempting any work. Some special tools that may be required can often be rented from local automotive jobbers or places specializing in renting tools and equipment. Check the yellow pages of your phone book.

Sections contain adjustments, maintenance, removal and installation procedures, and repair or overhaul procedures. When repair is not considered practical, we tell you how to remove the failed part and then how to install the new or rebuilt replacement. In this way, you at least save the labor costs. Backyard overhaul of some components is just not practical, but the removal and installation procedure is often simple and well within the capabilities of the average car owner.

Two basic mechanic's rules should be mentioned here. First, whenever the left side of the car or engine is referred to, it is meant to specify the driver's side of the car. Conversely, the right side of the car means the passenger's side. Second, all screws and bolts are removed by turning counterclockwise, and tightened by turning clockwise, unless otherwise noted.

Safety is always the most important rule. Constantly be aware of the dangers involved in working on or around an automobile and take proper precautions to avoid the risk of personal injury or damage to the vehicle. See the procedure in this section, Servicing Your Vehicle Safely, and the SAFETY NOTICE on the acknowledgment page before attempting any service procedures.

Pay attention to the instructions provided. There are 3 common mistakes in mechanical work:

1. **Incorrect order of assembly, disassembly or adjustment. When taking something apart or putting it together, doing things in the wrong order usually just costs you**

extra time; however it CAN break something. Read the entire procedure before beginning disassembly. Do everything in the order in which the instructions say you should do it, even if you can't immediately see a reason for it. When you're taking apart something that is very intricate, you might want to draw a picture of how it looks when assembled at one point in order to make sure you get everything back in its proper position. We will supply exploded views whenever possible, but sometimes the job requires more attention to detail than an illustration provides. When making adjustments (especially tune-up adjustments), do them in order. One adjustment often affects another and you cannot expect satisfactory results unless each adjustment is made only when it cannot be changed by any other.

2. **Overtightening (or undertightening) nuts and bolts. While it is more common for overtorquing to cause damage, undertorquing can cause a fastener to vibrate loose and cause serious damage. Especially when dealing with aluminum parts, pay attention to torque specifications and utilize a torque wrench during assembly. If a torque figure is not available, remember that if you are using the right tool to do the job, you will probably not have to strain yourself to get a fastener tight enough. The pitch of most threads is so slight that the tension you put on the wrench will be multiplied many, many times in actual force on what you are tightening. A good example of how critical torque is can be seen in the case of spark plug installation, especially when you are putting the plug into an aluminum cylinder head. Too little torque can fail to crush the gasket, causing leakage of combustion gases and consequent overheating of the plug and engine parts. Too much torque can damage the threads or distort the plug, which changes the spark gap.**

There are many commercial chemical products available for ensuring that fasteners won't come loose, even if they are not torqued just right (a very common brand is Loctite®). If you're worried about getting something together tight enough to hold, but loose enough to avoid mechanical damage during assembly, one of these products might offer substantial insurance. Read the label on the package and make sure the product is compatible with the materials, fluids, etc. involved before choosing one.

3. **Crossthreading. This occurs when a part such as a bolt is screwed into a nut or casting at the wrong angle and forced, causing the threads to become damaged. Crossthreading is more likely to occur if access is difficult. It helps to clean and lubricate fasteners, and to start threading with the part to be installed going straight in, using your fingers. If you encounter resistance, unscrew the part and start over again at a different angle until it can be inserted and turned several times without much effort. Keep in mind that many parts, especially spark plugs, use tapered threads so that gentle turning will automatically bring the part you're threading to the proper angle if you don't force it or resist a change in angle. Don't put a wrench on the part until it's been turned in a couple of times by hand. If you suddenly encounter resistance and the part has not seated fully, don't force it. Pull it back out and make sure it's clean and threading properly.**

Always take your time and be patient; once you have some experience, working on your car will become an enjoyable hobby.

TOOLS AND EQUIPMENT

Naturally, without the proper tools and equipment it is impossible to properly service your vehicle. It would be impossible to catalog each tool that you would need to perform each or every operation in this book. It would also be unwise for the amateur to rush out and buy an expensive set of tools on the theory that he may need one or more of them at sometime.

The best approach is to proceed slowly, gathering a good quality set of those tools that are used most frequently. Don't be misled by the low cost of bargain tools. It is far better to spend a little more for better quality. Forged wrenches, 6 or 12-point sockets and fine tooth ratchets are by far preferable to their less expensive counterparts. As any good mechanic can tell you, there are few worse experiences than trying to work on a car with bad tools. Your monetary savings will be far outweighed by frustration and mangled knuckles.

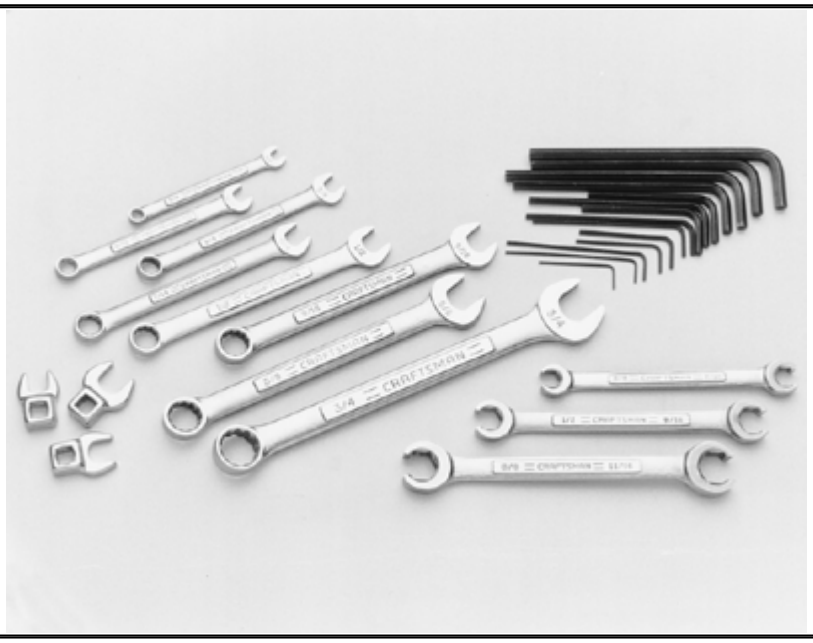
Certain tools, plus a basic ability to handle tools, are required to get started. A basic mechanics tool set, a torque wrench, and a Torx® bits set. Torx® bits are hexlobular drivers which fit both inside and outside on special Torx® head fasteners used in various places on your vehicle.

Begin accumulating those tools that are used most frequently; those associated with routine maintenance and tune-up.

In addition to the normal assortment of screwdrivers and pliers you should have the following tools for routine maintenance jobs (your vehicle, depending on the model year, uses both SAE and metric fasteners):

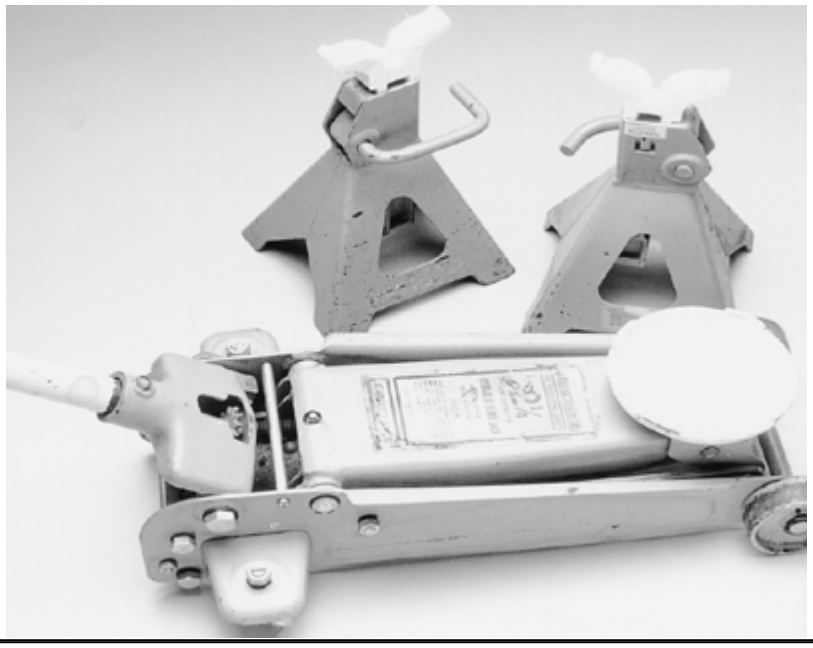
- **SAE/Metric wrenches, sockets and combination open end/box end wrenches in sizes from $^{1}/_{8}$ in. (3mm) to $^{3}/_{4}$ in. (19mm); and a spark plug socket $^{13}/_{16}$ in. (21mm). If possible, buy various length socket drive extensions. One break in this department is that the metric sockets available in the U.S. will all fit the ratchet handles and extensions you may already have ($^{1}/_{4}$ in., $^{3}/_{8}$ in., and $^{1}/_{2}$ in. drive).**

All but the most basic procedure will require an assortment of ratchets and sockets



In addition to ratchets, a good set of wrenches and hex keys will be necessary

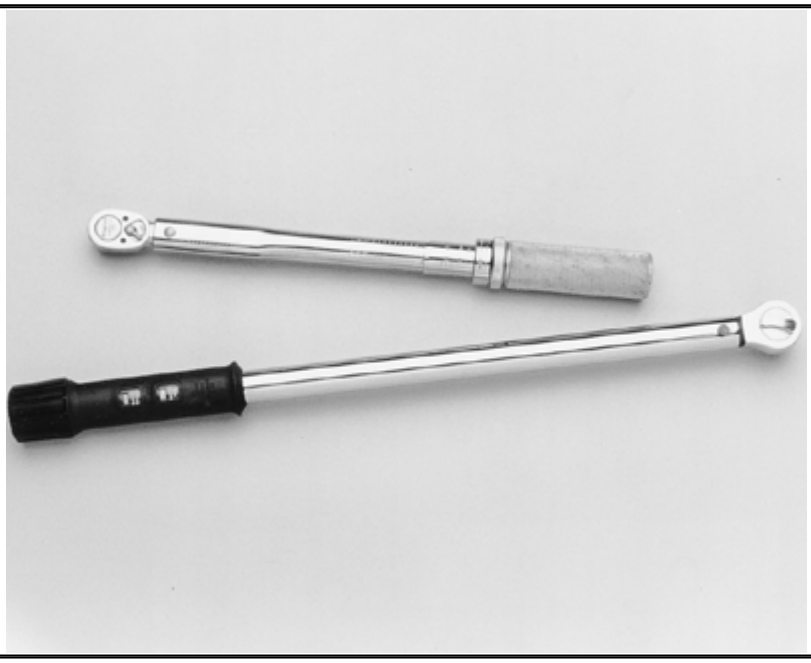
- **Jackstands for support.**



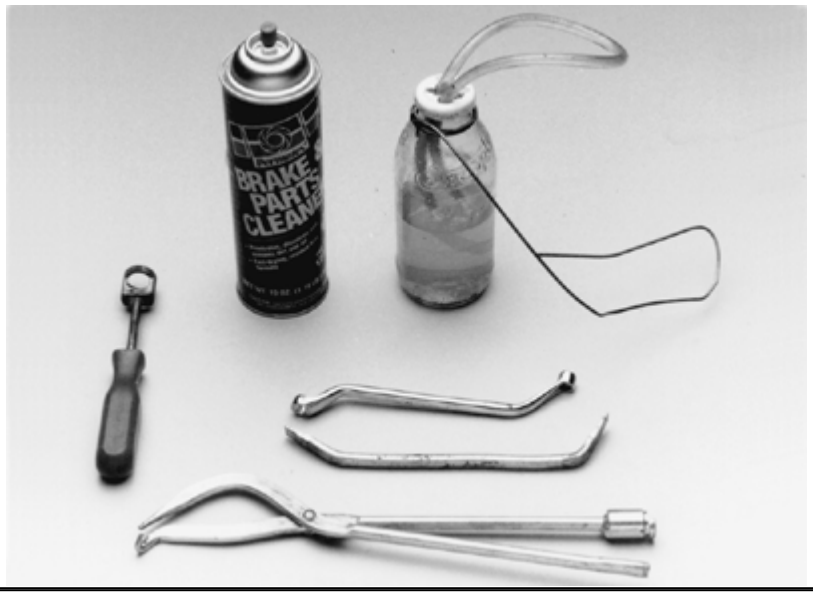
A hydraulic floor jack and a set of jackstands are essential for lifting and supporting the vehicle

An assortment of pliers will be handy, especially for old rusted parts and stripped bolt heads

You should have various screwdrivers, a hammer, chisels and prybars in your toolbox



Many repairs will require the use of torque wrench to assure the components are properly fastened



Although not always necessary, using specialized brake tools will save time

- **Oil filter wrench.**
- **Oil filter spout for pouring oil.**
- **Grease gun for chassis lubrication.**

A few inexpensive lubrication tools will make regular service easier

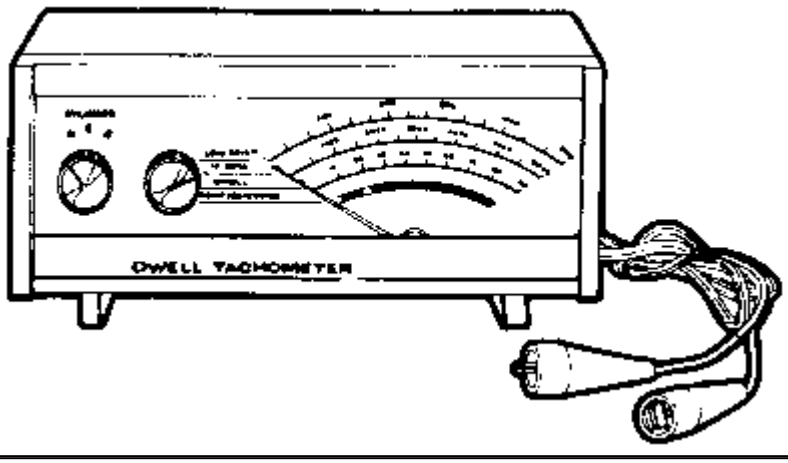
- **Hydrometer for checking the battery.**
- **A container for draining oil.**
- **Many rags for wiping up the inevitable mess.**

Various pullers, clamps and separator tools are needed for the repair of many components

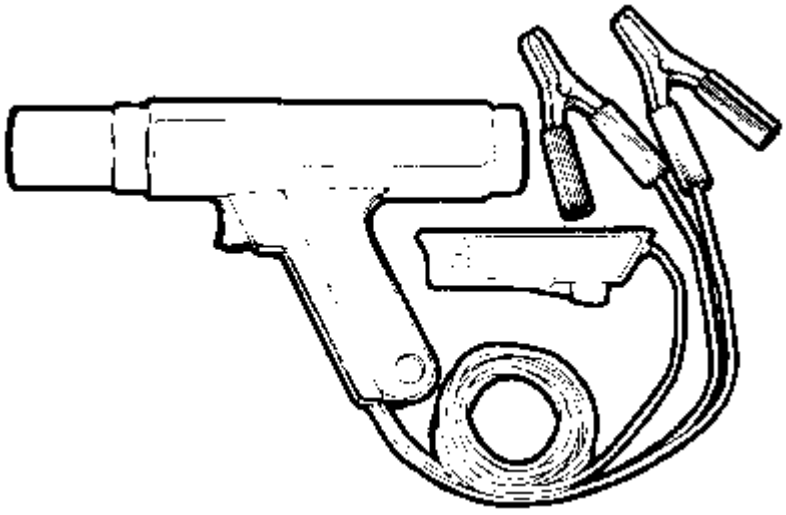
In addition to the above items, there are several others that are not absolutely necessary, but handy to have around. These include oil-dry (cat box litter works just as well and may be cheaper), a transmission funnel and the usual supply of lubricants, antifreeze and fluids, although these can be purchased as needed. This is a basic list for routine maintenance, but only your personal needs and desires can accurately determine your list of necessary tools.

The second list of tools is for tune-ups. While the tools involved here are slightly more sophisticated, they need not be outrageously expensive. There are several inexpensive tach/dwell meters on the market that are every bit as good for the average mechanic as a professional model. Just be sure that it goes to at least 1200-1500 rpm on the tach scale and that it works on 4 and 6 cylinder engines. A basic list of tune-up equipment could include:

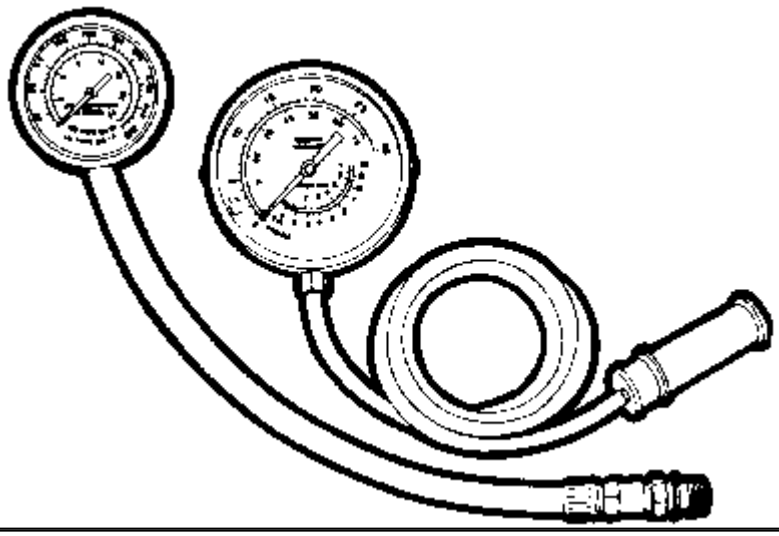
- **Tach-dwell meter.**
- **Spark plug wrench.**
- **Timing light (a DC light that works from the vehicle's battery is best, although an AC light that plugs into 110V house current will suffice with some sacrifice in brightness).**
- **Wire spark plug gauge/adjusting tools.**
- **Set of feeler gauges. In addition to these basic tools, there are several other tools and gauges you may find useful. In fact, some of these you may come to decide you can't live without. These include:**
- **Compression gauge. The screw-in type is slower to use, but eliminates the possibility of a faulty reading due to escaping pressure.**
- **Manifold vacuum gauge.**
- **A test light.**
- **Volt/ohmmeter (or multimeter).**
- **Induction meter. This is used for determining whether or not there is current in a wire, and may come in handy if a wire is broken somewhere in a wiring harness.**



Dwell/tachometer unit (typical)



Inductive type timing light



Compression gauge and a combination vacuum/fuel pressure gauge

Normally, the use of special factory tools is avoided for repair procedures, since these are not readily available for the do-it-yourself mechanic. When it is possible to perform the job with more commonly available tools, it will be pointed out, but occasionally, a special tool was designed to perform a specific function and should be used. Before substituting another tool, you should be convinced that neither

your safety nor the performance of the vehicle will be compromised.

When a special tool is indicated, it will be referred to by the manufacturer's part number. Some special tools are available commercially from major tool manufacturers. Others for your car can be purchased from your Ford/Mercury dealer or from the Owatonna Tool Co., Owatonna, Minnesota 55060.

As a final note, you will probably find a torque wrench necessary for all but the most basic work. The beam type models are perfectly adequate, although the newer click types are more precise.

Torque specification for each fastener will be given in the procedure in any case that a specific torque value is required. If no torque specifications are given, use the following values as a guide, based upon fastener size:

Bolts marked 6T

- **6mm bolt/nut-5-7 ft. lbs. (7-9 Nm)**
- **8mm bolt/nut-12-17 ft. lbs. (16-23 Nm)**
- **10mm bolt/nut-23-34 ft. lbs. (31-46 Nm)**
- **12mm bolt/nut-41-59 ft. lbs. (56-80 Nm)**
- **14mm bolt/nut-56-76 ft. lbs. (76-103 Nm)**

Bolts marked 8T

- **6mm bolt/nut-6-9 ft. lbs. (8-12 Nm)**
- **8mm bolt/nut-13-20 ft. lbs. (18-27 Nm)**
- **10mm bolt/nut-27-40 ft. lbs. (37-54 Nm)**
- **12mm bolt/nut-46-69 ft. lbs. (62-93 Nm)**
- **14mm bolt/nut-75-101 ft. lbs. (102-137 Nm)**

SERVICING YOUR VEHICLE SAFELY

Introduction

It is virtually impossible to anticipate all of the hazards involved with automotive maintenance and service but care and common sense will prevent most accidents.

The rules of safety for mechanics range from "don't smoke around gasoline,'' to "use the proper tool for the job.'' The trick to avoiding injuries is to develop safe work habits and take every possible precaution.

Do's

- **Do keep a fire extinguisher and first aid kit within easy reach.**
- **Do wear safety glasses or goggles when cutting, drilling, grinding or prying. If you wear glasses for the sake of vision, wear safety goggles over your regular glasses.**
- **Do shield your eyes whenever you work around the battery. Batteries contain sulfuric acid. In case of contact with the eyes or skin, flush the area with water or a mixture of water and baking soda, and get medical attention immediately.**
- **Do use safety stands for any under car service. Jacks are for raising vehicles; safety stands are for making sure the vehicle stays raised until you want it to come down. Whenever the vehicle is raised, block the wheels remaining on the ground and set the parking brake.**
- **Do use adequate ventilation when working with any chemicals or hazardous materials. Like carbon monoxide, the asbestos dust resulting from brake lining wear can be poisonous in sufficient quantities.**
- **Do disconnect the negative battery cable when working on the electrical system. The secondary ignition system can contain up to 40,000 volts.**
- **Do follow manufacturer's directions whenever working with potentially hazardous materials. Both brake fluid and antifreeze are poisonous if taken internally.**
- **Do properly maintain your tools. Loose hammerheads, mushroomed punches and chisels, frayed or poorly grounded electrical cords, excessively worn screwdrivers, spread wrenches (open end), and cracked sockets can cause accidents.**
- **Do use the proper size and type of tool for the job being done.**
- **Do, when possible, pull on a wrench handle rather than push on it, and adjust your stance to prevent a fall.**
- **Do be sure that adjustable wrenches are tightly adjusted on the nut or bolt and pulled so that the fastener's face is on the side of the fixed jaw.**
- **Do select a wrench or socket that fits the nut or bolt. The wrench or socket should sit straight, not cocked.**
- **Do strike squarely with a hammer to avoid glancing blows.**
- **Do set the parking brake and block the drive wheels if the work requires that the engine is running.**

Don'ts

- **Don't run an engine in a garage or anywhere else without proper ventilation-EVER! Carbon monoxide is poisonous. It is absorbed by the body 400 times faster than oxygen. It takes a long time to leave the human body and you can build up a deadly supply of it in your system by simply breathing in a little every day. You may not realize you are slowly poisoning yourself. Always use power vents, windows, fans or open the garage doors.**
- **Don't work around moving parts while wearing a necktie or other loose clothing. Short sleeves are much safer than long, loose sleeves. Hard-toed shoes with neoprene soles protect your toes and give a better grip on slippery surfaces. Jewelry such as watches, fancy belt buckles, beads or body adornment of any kind is not safe working around a car. Long hair should be hidden under a hat or cap.**
- **Don't use pockets for tool boxes. A fall or bump can drive a screwdriver deep into your body. Even a wiping cloth hanging from your back pocket can wrap around a spinning shaft or fan.**
- **Don't smoke when working around gasoline, cleaning solvent or other flammable material.**
- **Don't smoke when working around the battery. When the battery is being charged, it gives off explosive hydrogen gas.**
- **Don't use gasoline to wash your hands. There are excellent soaps available. Gasoline removes all the natural oils from the skin so that bone dry hands will suck up oil and grease.**
- **Don't service the air conditioning system unless you are equipped with the necessary tools and training. The refrigerant, R-12 or 134a, extremely cold when compressed, and when released into the air will instantly freeze any surface it contacts, including your eyes. Although the refrigerant is normally nontoxic, R-12 becomes a deadly poisonous gas in the presence of an open flame. One good whiff of the vapors from burning refrigerant can be fatal.**
- **Don't release refrigerant into the atmosphere. In most states it is now illegal to discharge refrigerant into the atmosphere due to harmful effects Freon® (R-12) has on the ozone layer. Check with local authorities about the laws in your state.**
- **Don't use screwdrivers for anything other than driving screws! A screwdriver used as a prying tool can snap when you least expect it, causing injuries. At the very least, you'll ruin a good screwdriver.**
- **Don't use a bumper jack (that little ratchet, scissors, or pantograph jack supplied with the car) for anything other than changing a flat! These jacks are only intended for emergency use out on the road; they are NOT designed as a maintenance tool. If you are serious about maintaining your car yourself, invest in a hydraulic floor jack of at least $1^{1}/_{2}$ ton capacity, and at least two sturdy jackstands.**

MODEL IDENTIFICATION

Two models of the Ford Taurus/Mercury Sable are offered-the 4-door sedan and the 4-door station wagon. The body style of the vehicle can be confirmed by locating the 6th and 7th positions of the VIN code. Vehicle model year identification can be verified by locating the 10th position of the VIN code and using the Vehicle Identification Chart.

SERIAL NUMBER IDENTIFICATION

Vehicle

The official vehicle identification (serial) number (used for title and registration purposes) is stamped on a metal tab fastened to the instrument panel and visible through the driver's side of the windshield from the outside. The vehicle identification (serial) number contains a 17-digit number. The number is used for warranty identification of the vehicle and indicates: manufacturer, type of restraint system, line, series, body type, engine, model year, and consecutive unit number.

Location of the Vehicle Identification Number (VIN) visible through the windshield

Certification Label

The Vehicle Certification Label is found on the left door lock face panel or door pillar. The upper half of the label contains the name of the manufacturer, month and year of manufacture, gross weight rating, gross axle weight, and the pertinent certification statements. The certification also repeats the VIN number, and gives the color code and accessories found on the car.

Location of the Vehicle Certification Label

Engine

The vehicle's engine identification is located in the 8th position of the VIN code.

Transaxle

The transaxle code is located on the bottom edge of the Vehicle Certification Label for vehicles equipped with the manual transaxle. The identification tag for vehicles equipped with the ATX automatic transaxle is located under one of the valve body cover retaining bolts. The identification tag for vehicles equipped with the AXOD, AXOD-E, AX4S and AX4N automatic transaxles is located on top of the torque converter housing.

ROUTINE MAINTENANCE

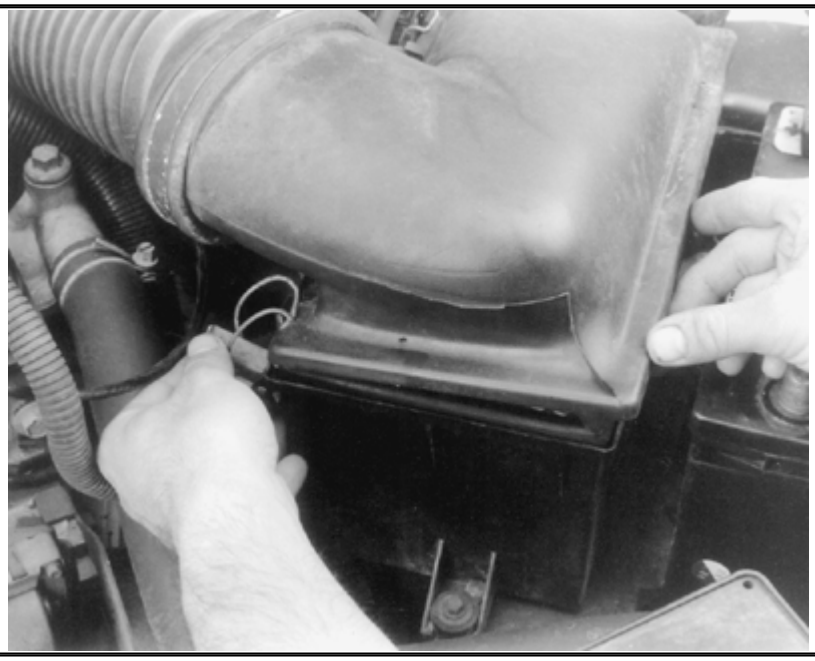
Air Cleaner

The air cleaner element should be replaced every 30 months or 30,000 miles (48,000 km). More frequent changes are necessary if the car is operated in dusty conditions.

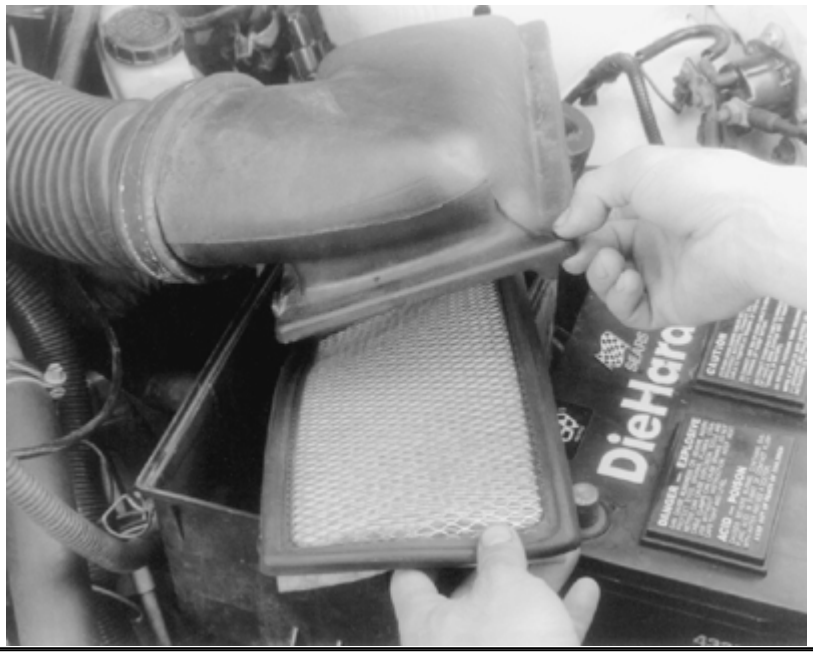
REMOVAL & INSTALLATION

Except 1994-95 Vehicles

1. **Loosen the air cleaner outlet tube clamps at both ends, then remove the tube. For the 2.5L and 3.0L engines, loosen the clamp at the throttle body only, and leave the tube connected to the cover.**
2. **On the 3.0L and the 3.0L SHO, disengage the airflow sensor electrical connector.**
3. **Release the air cleaner upper cover retaining clips or remove the retaining bolts.**
4. **Remove the air cleaner cover, then remove the air cleaner element.**



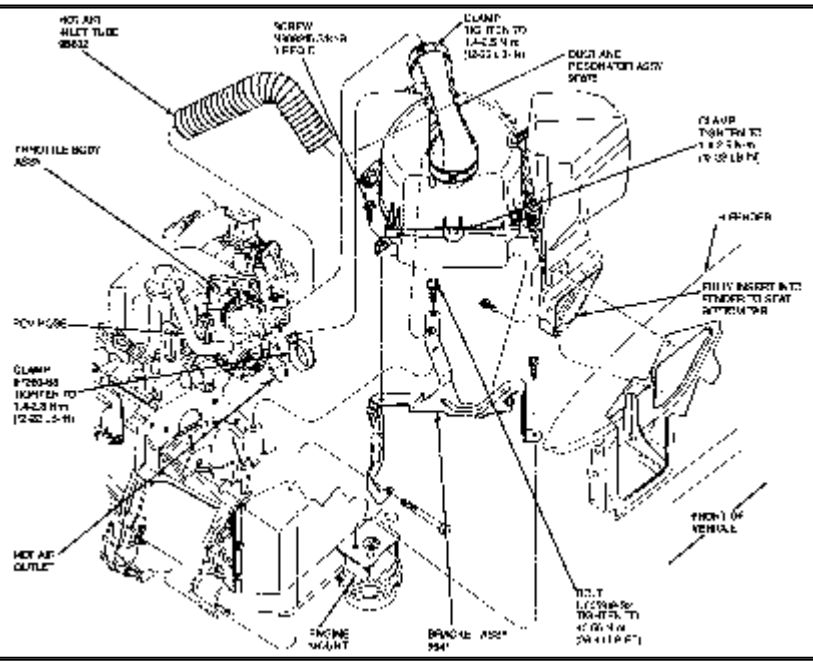
Unfastening the air cleaner cover retaining clips-early model 2.5L engine shown



Removing the air cleaner element-early model 2.5L engine shown

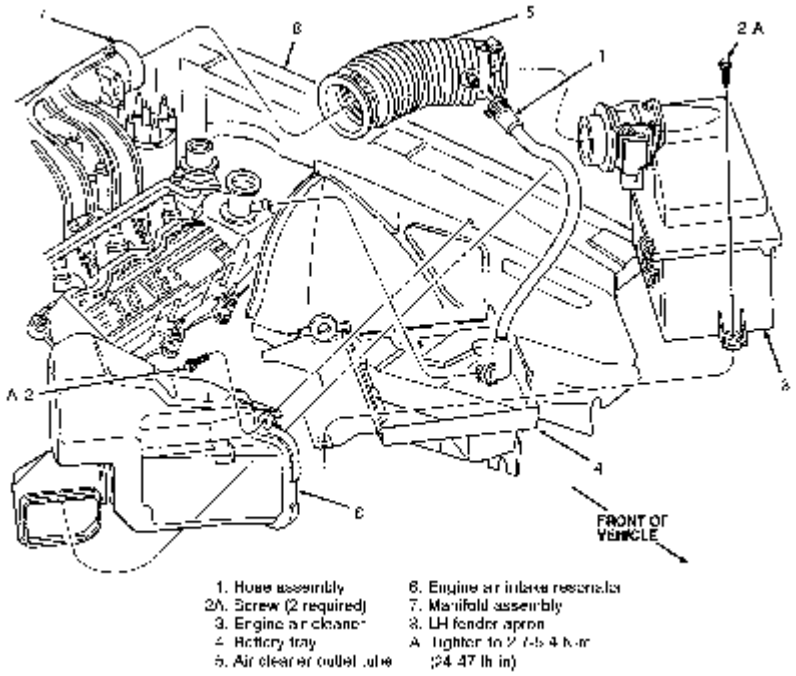
To install:

5. **Clean the inside surfaces of the air cleaner body, then install the new filter element.**
6. **Install the air cleaner upper cover, then install the bolts or fasten the retaining clips.**
7. **If removed, engage the airflow sensor electrical connector.**
8. **Install the air cleaner outlet tube.**



Exploded view of the air cleaner assembly and components-late model 2.5L shown

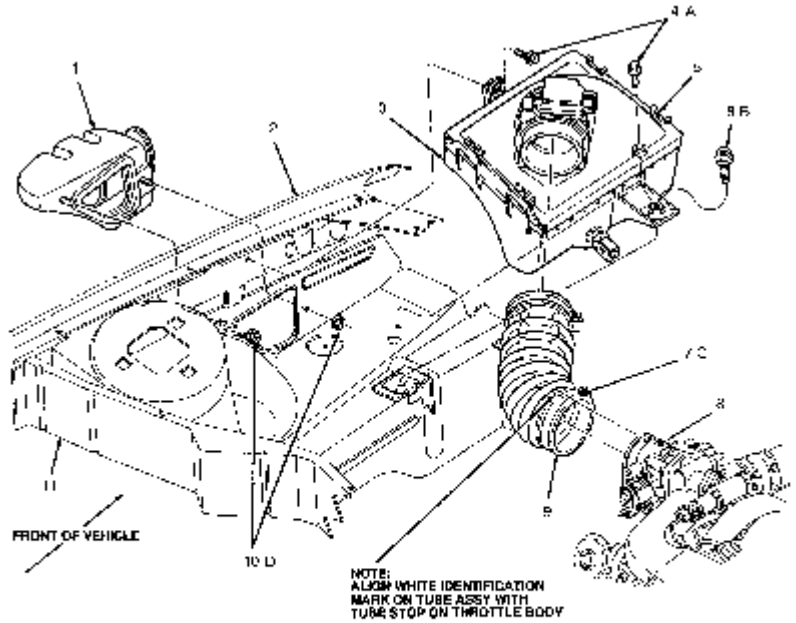
Click to enlarge



1. Hose assembly
2A. Screw (2 required)
3. Engine air cleaner
4. Battery tray
5. Air cleaner outlet tube
6. Engine air intake resonator
7. Manifold assembly
8. LH fender apron
A. Tighten to 2.7-5.4 N·m (24-47 lb-in)

Exploded view of the air cleaner assembly and components-3.0L engine shown

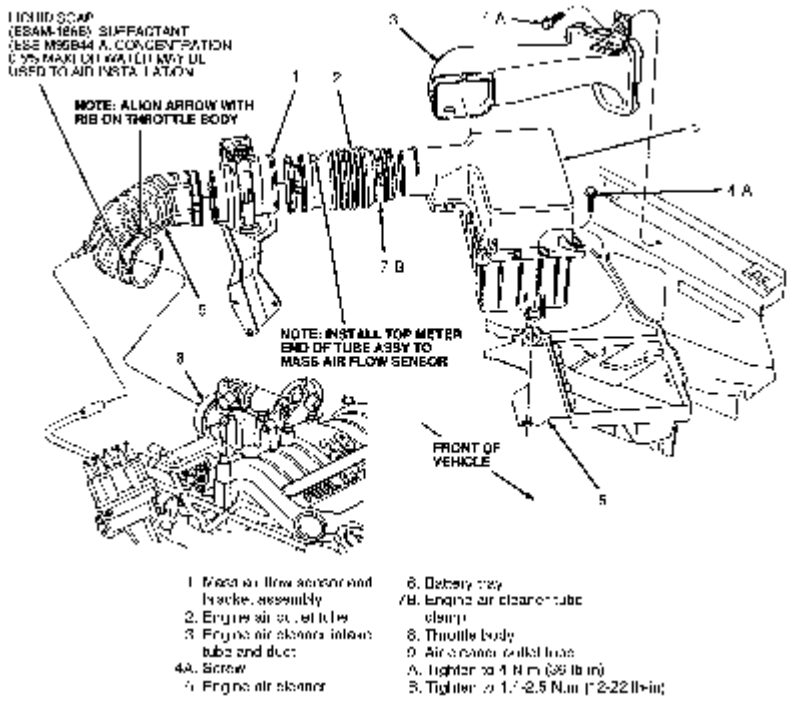
Click to enlarge



1. Engine air intake resonator
2. LH fender
3. Engine air cleaner
4A. Screw
5. Air cleaner cover retainer clip
6B. Bolt
7C. Clamp assembly (2 required)
8. Throttle body
9. Air cleaner outlet tube
10D. Nut and washer assembly
11. Gravel
A. Tighten to 12-18 N·m (9-13 lb-ft)
B. Tighten to 8-11 N·m (6-8 lb-ft)
C. Tighten to 1.4-2.3 N·m (12-20 lb-in)
D. Tighten to 5.5-7 N·m (49-62 lb-in)

Air cleaner assembly components-3.0L & 3.2L SHO engines shown

Click to enlarge



Air cleaner assembly components-3.8L engine shown

Click to enlarge

1994-95 Vehicles

1. Loosen the clamp securing the air cleaner outlet tube to the mass air flow sensor, then disconnect the air cleaner outlet tube.
2. If equipped, disconnect the engine control sensor wiring from the mass air flow sensor and the intake air temperature sensor.
3. On all engines except for the 3.8L engine, release the retaining clips to remove the air cleaner cover.
4. For the 3.8L engine, loosen the air cleaner cover retaining bolts until the cover is free from the air cleaner body, but DO NOT remove the screws.
5. Position the air cleaner cover aside, then remove the air cleaner element.

To install:

6. Clean all inside surfaces of the air cleaner and cover, then install the air cleaner element.
7. Position the air cleaner cover, then install the retaining clips or fasten the bolts, as applicable. If equipped, tighten the bolts to 20-30 inch lbs. (2.5-3.5 Nm).
8. If equipped, connect the engine control sensor wiring to the mass air flow sensor and the intake air temperature sensor.
9. Install the air cleaner outlet tube. On 3.0L engines, tighten the clamp to 24-48 inch lbs. (2.7-5.4 Nm). For all other engines, tighten the clamp to 12-22 inch lbs. (1.4-2.5 Nm).

Fuel Filter

RELIEVING FUEL SYSTEM PRESSURE

Except 2.5L CFI Engine

The pressure in the fuel system must be relieved before attempting to disconnect any fuel lines. A special valve is incorporated on the fuel rail assembly for the purpose of relieving the pressure in the fuel system.

1. **Remove the fuel tank cap.**
2. **Remove the cap from the pressure relief Schrader valve on the fuel rail.**
3. **Attach pressure gauge tool T80L-9974-A or equivalent, to the fuel pressure relief valve.**
4. **Release the pressure from the system into a suitable container.**
5. **Remove the pressure gauge tool, then install the cap on the pressure relief valve. Install the fuel tank cap.**

2.5L CFI Engine

1. **Disengage the electrical connector from the inertia switch, located on the left side of the luggage compartment.**
2. **Crank the engine for 15 seconds to relieve the fuel system pressure.**
3. **Connect the inertia switch.**

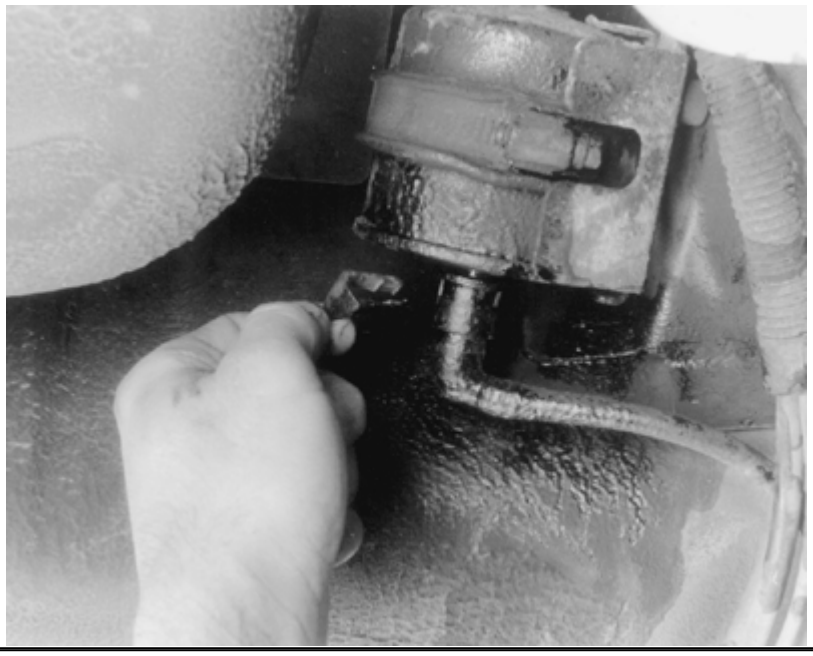
REMOVAL & INSTALLATION

The push connect fittings are designed with a retaining clip. Clips should be replaced whenever a connector is removed.

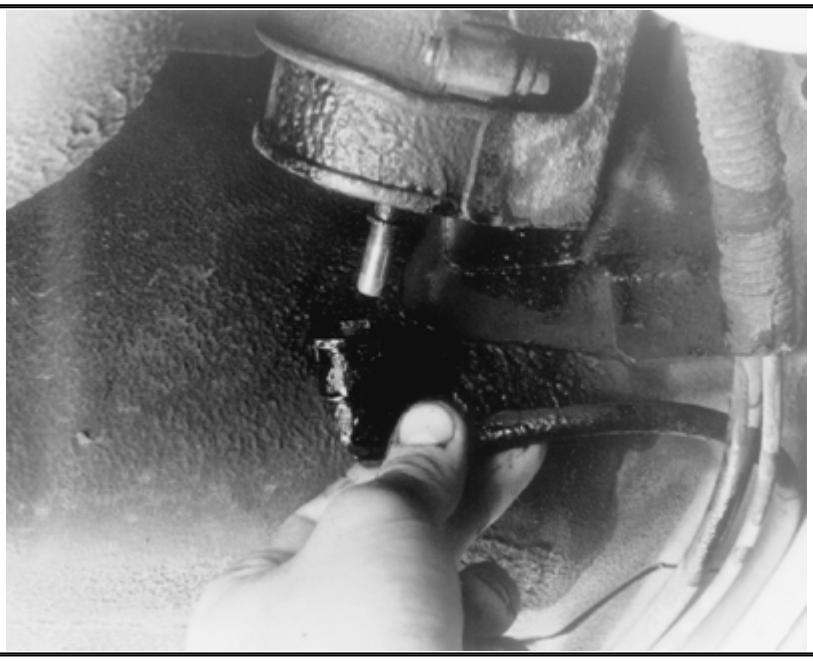
1. **Disconnect the negative battery cable.**
2. **Properly relieve the fuel system pressure. For details, refer to the procedure located earlier in this section.**
3. **Remove the push connect fittings at both ends of the fuel filter. This is accomplished by removing the hairpin clips from the fittings. Remove the hairpin clips by first bending, and then breaking the shipping tabs on the clips. Spread the 2 clip legs approximately $^{1}/_{8}$ in. (3mm) to disengage the body and push the legs into the fitting. Gently pull on the triangular end of the clip and work it clear of the fitting.**

When removing the clips, use your hands. Do NOT use tools, as damage may occur.

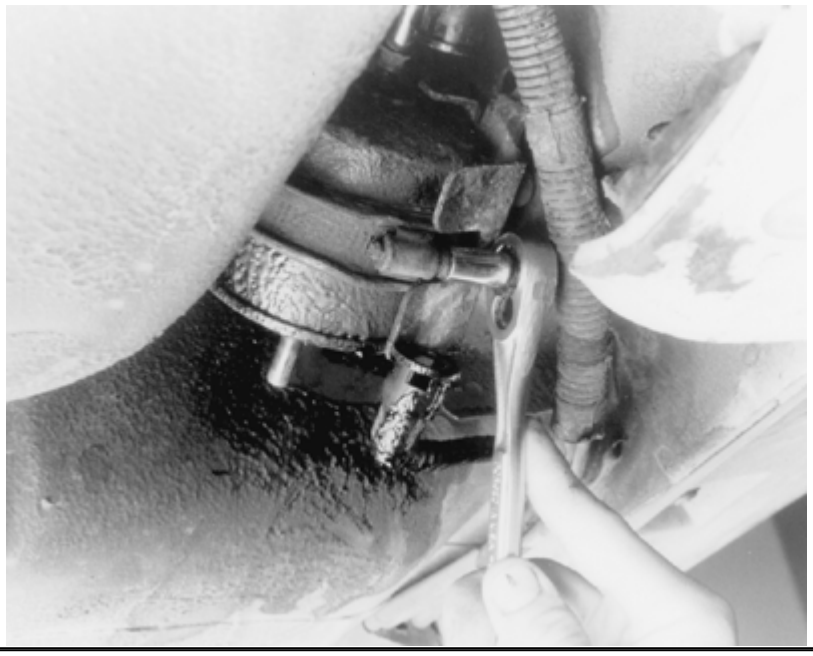
4. **Remove the filter from the mounting bracket by loosening the worm gear mounting clamp enough to allow the filter to pass through.**



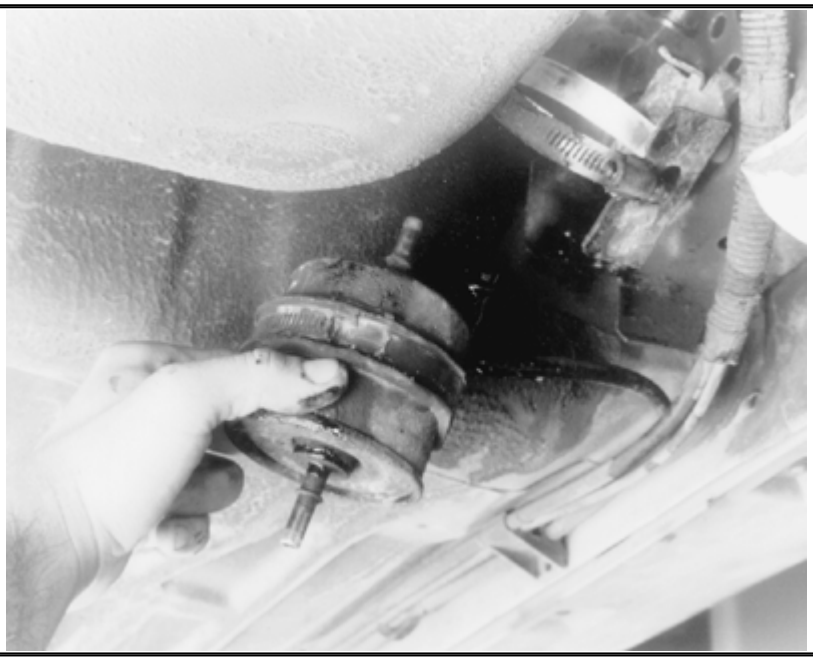
Removing the push connect fitting from the bottom of the fuel filter-Early model 2.5L shown



Removing the fuel line from the filter



Loosen the mounting clamp enough to allow the filter to pass through



Slide the fuel filter out of the mounting clamp

To install:

5. **Install the filter in the mounting bracket, ensuring that the flow direction arrow is pointing forward. Locate the fuel filter against the tab at the lower end of the bracket.**
6. **Insert a new hairpin clip into any 2 adjacent openings on each push connect fitting, with the triangular portion of the clip pointing away from the fitting opening. Install the clip to fully engage the body of the fitting. This is indicated by the legs of the hairpin clip being locked on the outside of the fitting body. Apply a light coat of engine oil to the ends of the fuel filter, then push the fittings onto the ends of the filter. When the fittings are engaged, a definite click will be heard. Pull on the fittings to ensure that they are fully engaged.**
7. **Tighten the worm gear mounting clamp to 15-25 inch lbs. (1.7-2.8 Nm).**

8. **Start the engine and check for leaks.**

PCV Valve

The Positive Crankcase Ventilation (PCV) system cycles crankcase gases back through the engine, where they are burned. The PCV valve regulates the amount of ventilating air and blow-by gas to the intake manifold and prevents backfire from traveling into the crankcase. For most vehicles, this system is comprised of a PCV valve connected to a tube or hose that goes from a grommet in the valve cover to the throttle body. On some engines, such as the 3.0L and 3.2L SHO, the system simply consists of a tube routed from the valve cover to the throttle body.

SERVICING

1. **Visually inspect the components of the PCV system. Check for rough idle, slow starting, high oil consumption and loose, leaking, clogged or damaged hoses.**
2. **Check the fresh air supply hose and the PCV hose for air leakage or flow restriction due to loose engagement, hose splitting, cracking or kinking, nipple damage, rubber grommet fit or any other damage.**
3. **If a component is suspected as the obvious cause of a malfunction, correct the cause before proceeding to the next step.**
4. **If all checks are okay, proceed to the pinpoint tests.**

PINPOINT TESTS

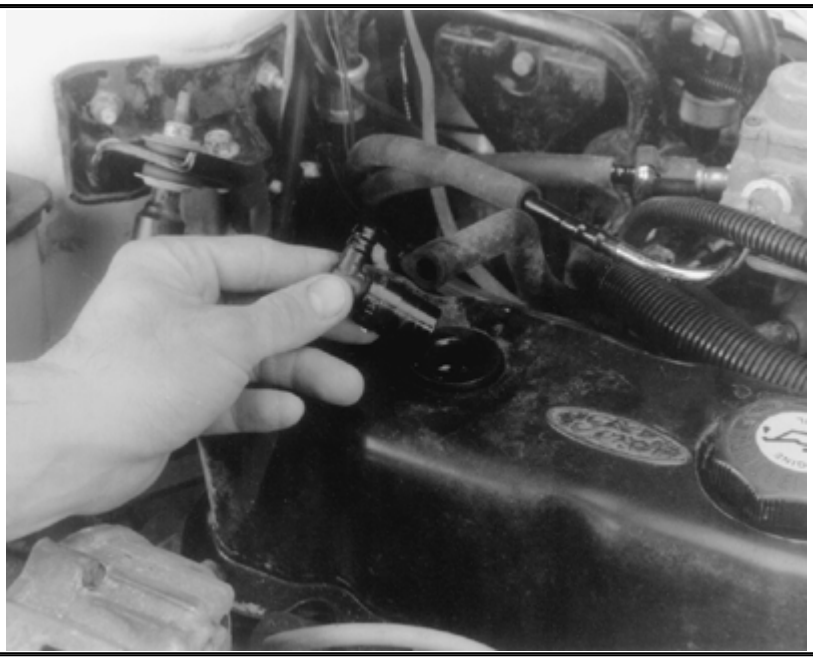
5. **If equipped, remove the PCV valve from the valve cover grommet and shake the valve. If the valve rattles when shaken, reinstall and proceed to Step 2. If the valve does not rattle, it is sticking and should be replaced.**
6. **Start the engine and bring it to normal operating temperature.**
7. **On the 2.5L engine, remove the corrugated hose from the oil separator nipple. On all other engines, disconnect the hose from the remote air cleaner or air outlet tube.**
8. **Place a stiff piece of paper over the nipple or hose end and wait 1 minute. If vacuum holds the paper in place, the system is okay; reconnect the hose. If the paper is not held in place, the system is plugged or the evaporative emission valve (if equipped) is leaking. If the evaporative emission valve is suspected of leaking, proceed to Step 5.**
9. **If equipped, disconnect the evaporative hose, and cap the connector.**
10. **Place a stiff piece of paper over the hose/nipple, as in Step 8, and wait 1 minute. If vacuum holds the paper in place, proceed to evaporative emission system testing. If the paper is not held in place, check for vacuum leaks/obstruction in the oil cap, PCV valve and hoses, or for split grommets. Also check the oil separator on the 2.5L engine and valve cover for a gasket lead or incorrect bolt torque.**

REMOVAL & INSTALLATION

2.5 and 3.0L Engines-Except SHO

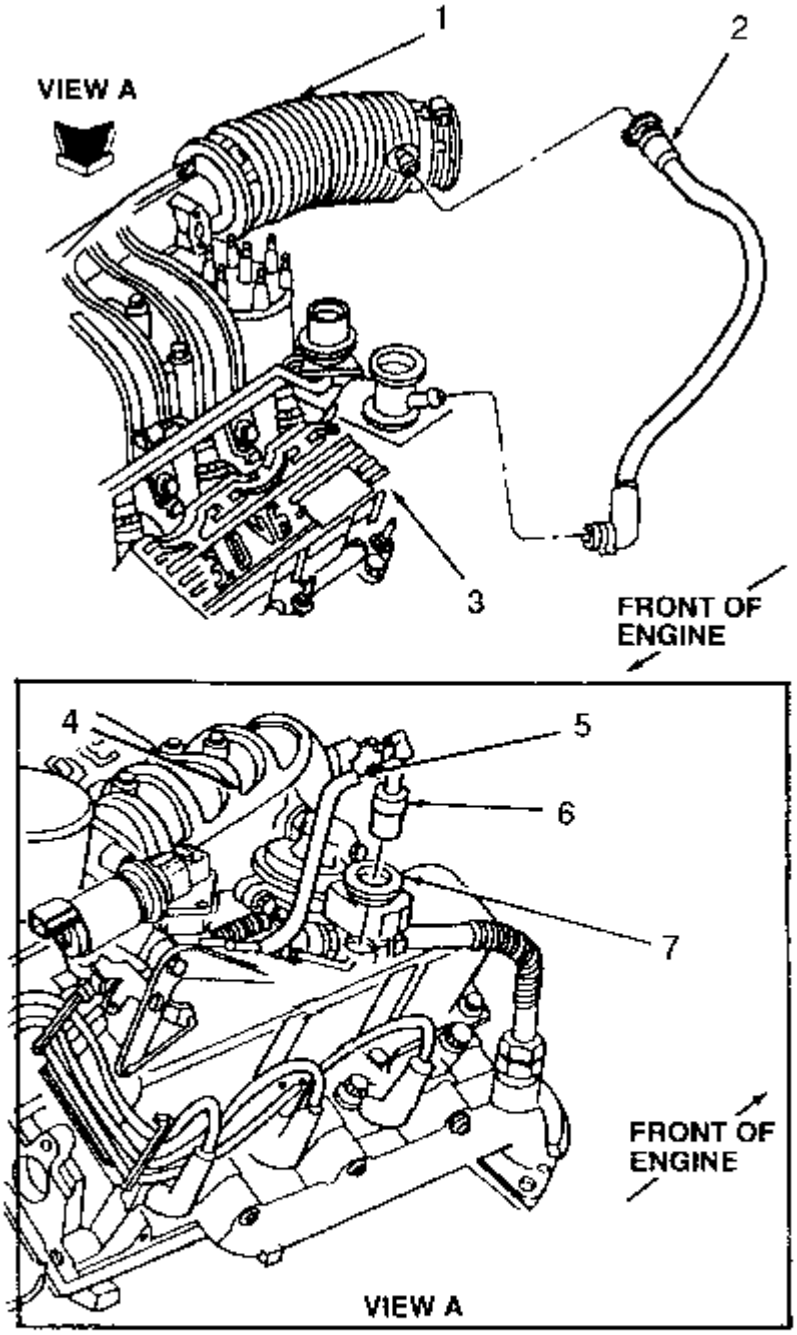
1. **Remove the fuel vapor hose and the crankcase ventilation hose from the PCV valve.**
2. **Remove the PCV valve from the PCV valve grommet.**

To install:



PCV system-early model 2.5L engine shown

3. **Inspect the valve and grommet for deterioration, and replace if necessary.**



1. Air cleaner outlet tube
2. Crankcase ventilation hose
3. Valve cover
4. Throttle body
5. Crankcase ventilation hose
6. Positive crankcase ventilation valve
7. Grommet

PCV system-late model 3.0L shown

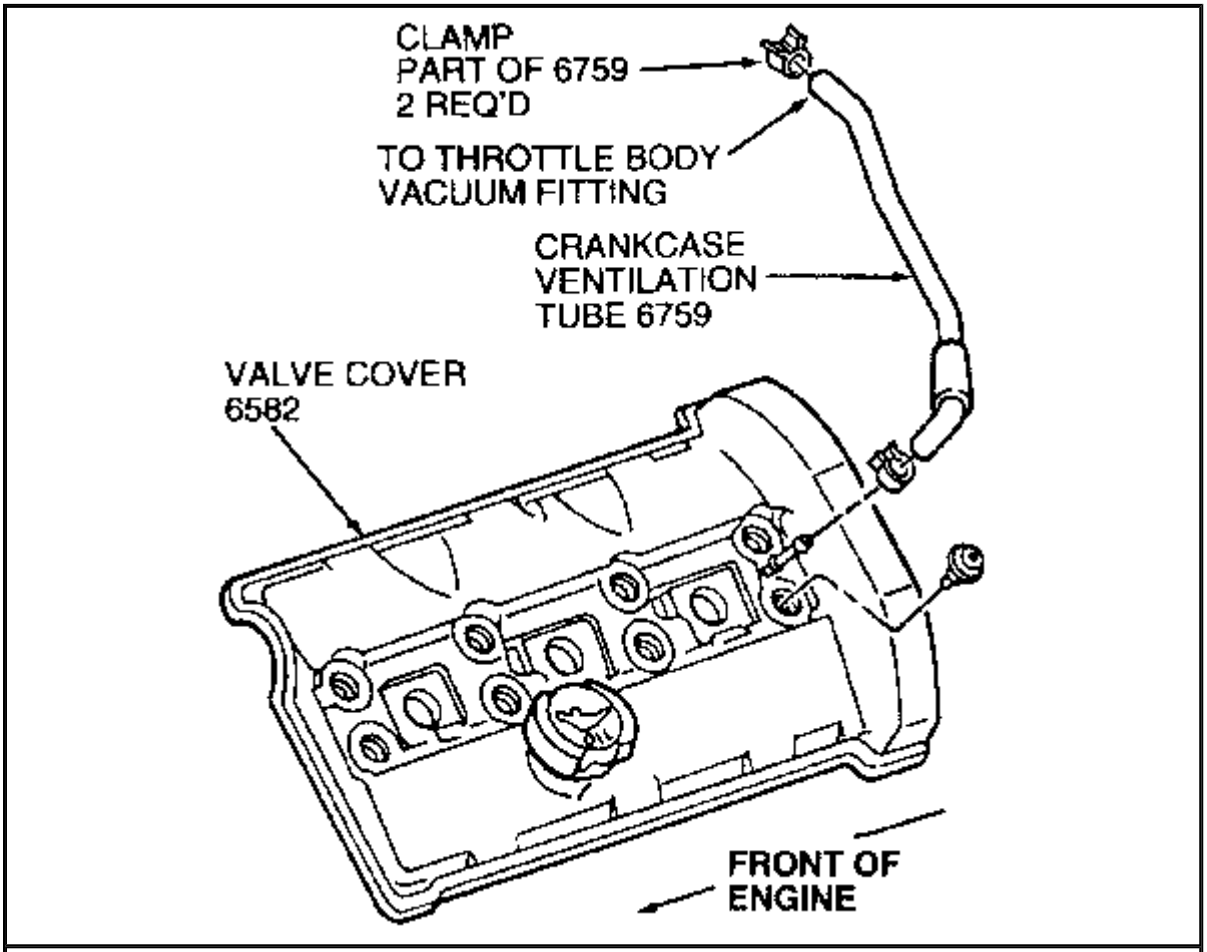
Click to enlarge

4. **Install the PCV valve into the valve grommet, then connect the fuel vapor and crankcase ventilation hoses.**

3.0L and 3.2L SHO Engines

1. **Loosen the crankcase ventilation tube clamps.**
2. **Carefully disconnect the tube from the left-hand side valve cover fitting and the throttle body.**

To install:



PCV system-3.0L/3.2L SHO shown

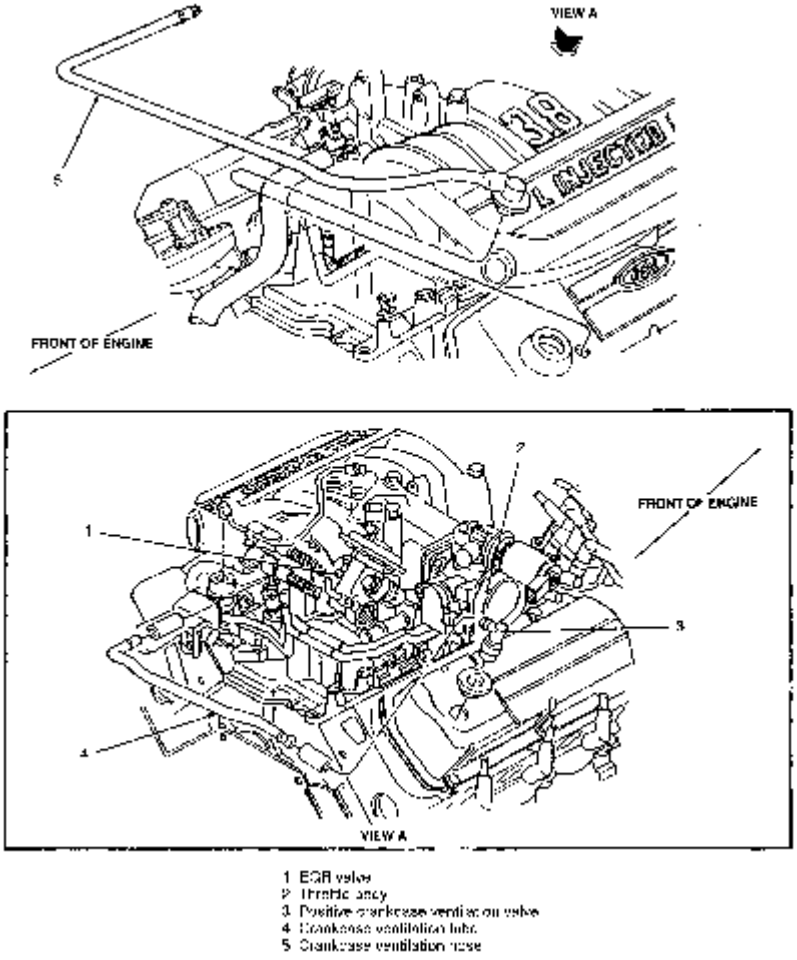
Click to enlarge

3. **Inspect the crankcase ventilation tube for deterioration and replace if necessary.**
4. **Connect the tube to the valve cover fitting and the throttle body, then secure with the retaining clamps.**

3.8L Engine

1. **Disconnect the crankcase ventilation tube from the PCV valve.**
2. **Remove the valve from the PCV valve grommet.**

To install:



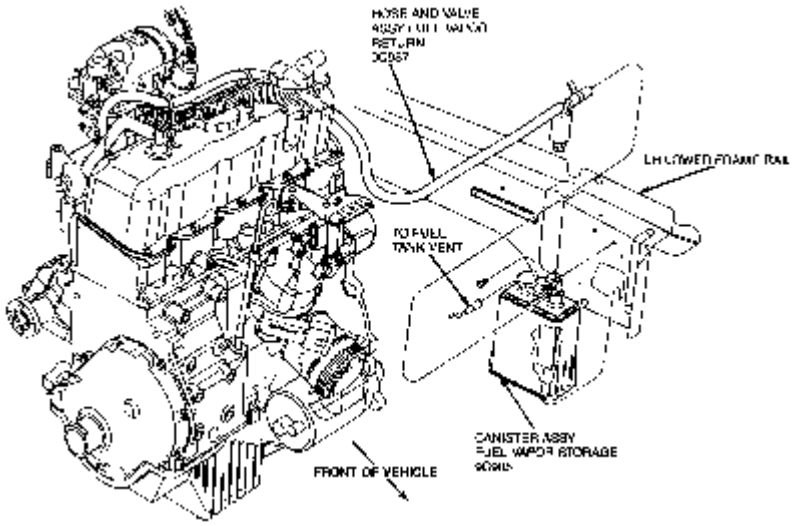
PCV system-late model 3.8L shown

Click to enlarge

3. **Inspect the PCV valve and grommet for deterioration, and replace if necessary.**
4. **Install the PCV valve into the valve grommet, then connect the crankcase ventilation tube.**

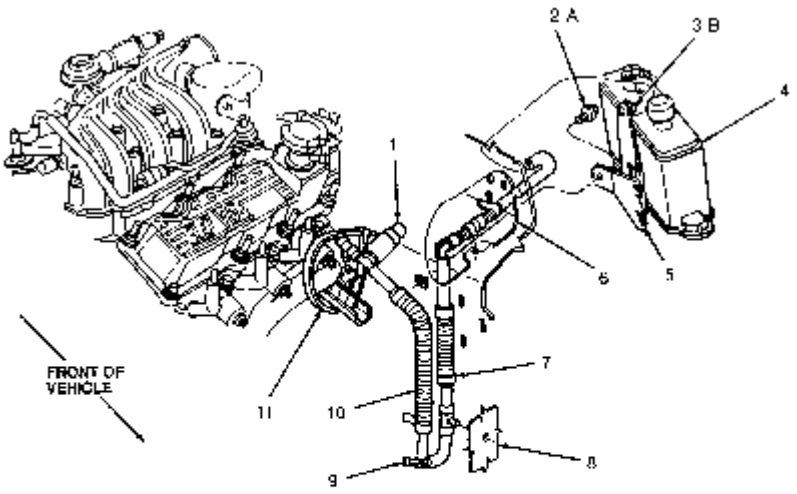
Evaporative Canister

To prevent gasoline vapors from being vented into the atmosphere, an evaporative emission system captures the vapors and stores them in a carbon-filled canister. The 3.0L Flexible Fuel (FF) vehicles utilize 4 separate canisters for this purpose.



Evaporative emission control system and related components-2.5L engine

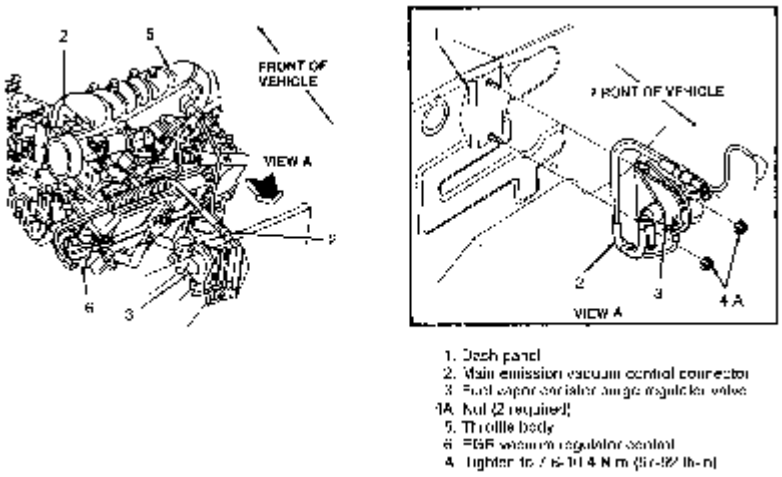
Click to enlarge



1. Evaporative emission canister purge solenoid
2. Bolt
3. Bolt
4. Evaporative emissions canister
5. evaporative emission canister bracket
6. LH headlamp opening (part of 16138)
7. Evaporative emission tube
8. Radiator support
9. Fuel tank vent tube (part of 9K313)
10. Evaporator emission hose
11. Tie strap
A. Tighten to 21.2-28.8 N.m (15.21 lb ft)
B. Tighten to 5.2-7.2 N.m (46-63 lb-in)

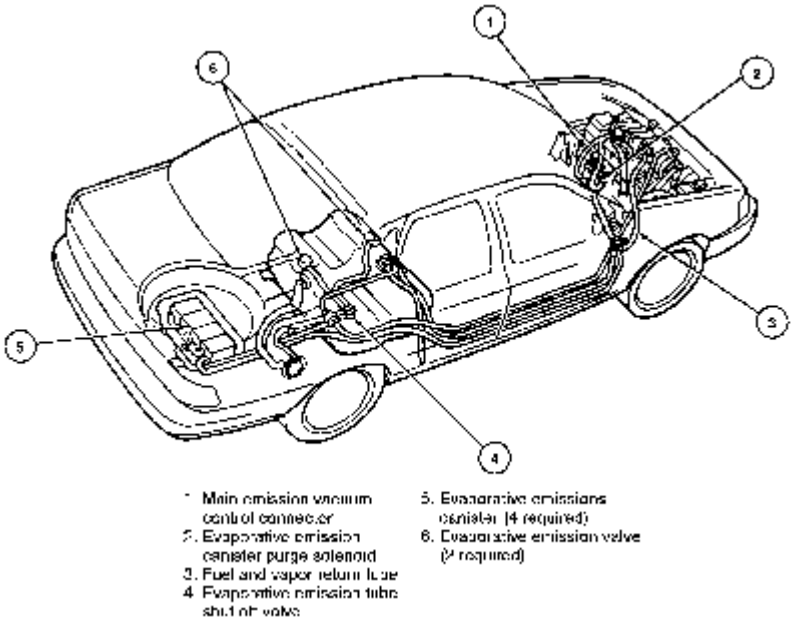
Evaporative emission control system and related components-3.0L engine (Except Flexible Fuel)

Click to enlarge



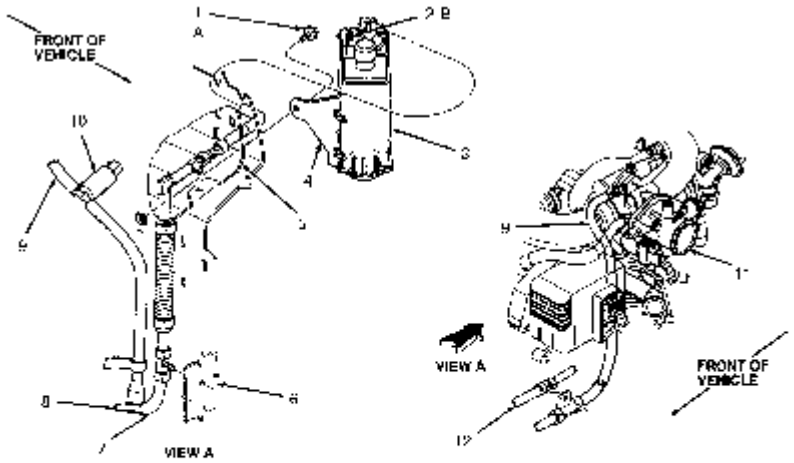
Evaporative emission control system and related components-3.0L Flexible Fuel (FF) engine

Click to enlarge



Location of system components-3.0L Flexible Fuel (FF) engine

Click to enlarge

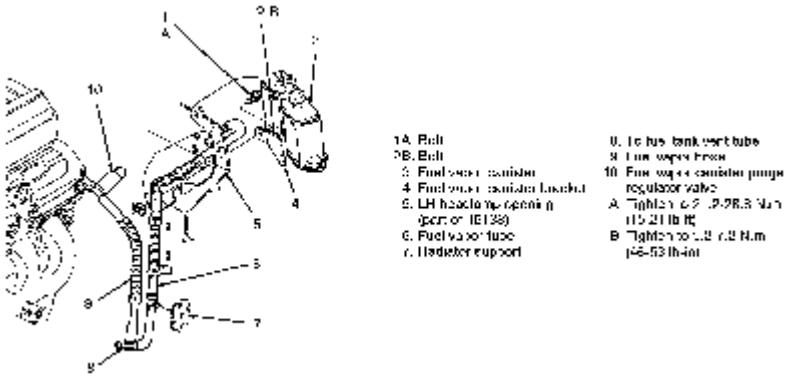


9. Evaporative emission hose
10. Evaporative emission canister purge solenoid
11. Throttle body
12. Battery ground cable
A. Tighten to 21.2 28.8 N.m (15.21 lb ft)
B. Tighten to 5.2 7.2 N.m (46 63 lb in)

1. Bolt
2. Bolt
3. Evaporative emissions canister
4. Evaporative emissions canister bracket
5. LH headlamp opening (part of 16138)
6. Radiator support
7. Evaporative emission tube
8. Fuel tank vent tube (part of SK313)

Evaporative emission control system and related components-3.0L SHO shown; 3.2L SHO similar

Click to enlarge



Evaporative emission control system and related components-3.8L engine

Click to enlarge

SERVICING

Since the canister is purged of fumes when the engine is operating, no real maintenance is required. However, the canister should be visually inspected for cracks, loose connections, etc. The emission canister is located on the driver's side fender near the battery, except for the 3.0 FF, which uses four evaporative emissions canisters mounted under the rear floor pan. The canister should have no liquid fuel in it; if it does, replace it. Replacement is simply a matter of disconnecting the hoses, loosening the mount and replacing the canister.

Removing the carbon canister-Early model 2.5L shown

Battery

GENERAL MAINTENANCE

Loose, dirty, or corroded battery terminals are a major cause of "no-start.'' Every 3 months or so, remove the battery terminals and clean them. This will help to retard corrosion.

Check the battery cables for signs of wear or chafing and replace any cable or terminal that looks marginal. Battery terminals can be easily cleaned and inexpensive terminal cleaning tools are an excellent investment that will pay for themselves many times over. They can usually be purchased from any well-equipped auto store or parts department. Side terminal batteries require a different tool to clean the threads in the battery case. The accumulated white powder and corrosion can be cleaned from the top of the battery with an old toothbrush and a solution of baking soda and water.

Unless you have a maintenance-free battery, check the electrolyte level and the specific gravity of each cell. Be sure that the vent holes in each cell cap are not blocked by grease or dirt. The vent holes allow hydrogen gas, formed by the chemical reaction in the battery, to escape safely.

Battery maintenance may be accomplished with household items (such as baking soda to neutralize spilled acid) or with special tools such as this post and terminal cleaner

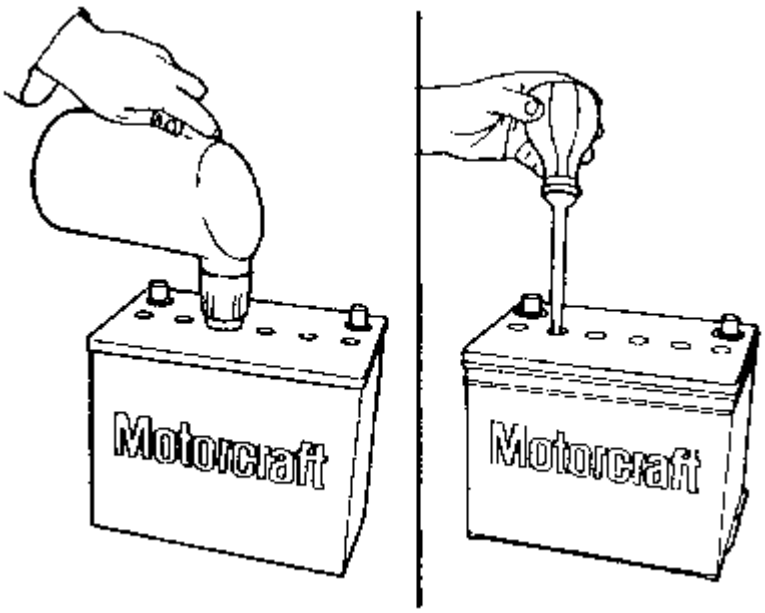
The underside of this special battery tool has a wire brush to clean post terminals

Place the tool over the terminals and twist to clean the post

FLUID LEVEL (EXCEPT MAINTENANCE-FREE BATTERIES)

Check the battery electrolyte level at least once a month, or more often in hot weather or during periods of extended car operation. The level can be checked through the case on translucent polypropylene batteries; the cell caps must be removed on other models. The electrolyte level in each cell should be kept filled to the split ring inside, or the line marked on the outside of the case.

If the level is low, add only distilled water, or colorless, odorless drinking water, through the opening until the level is correct. Each cell is completely separate from the others, so each must be checked and filled individually.



Two devices used to maintain electrolyte level: A self-leveling filler which fills to a predetermined level and a syringe-type filler

If water is added in freezing weather, the car should be driven several miles to allow the water to mix with the electrolyte. Otherwise, the battery could freeze.

SPECIFIC GRAVITY (EXCEPT MAINTENANCE-FREE BATTERIES)

At least once a year, check the specific gravity of the battery using a hydrometer.

A hydrometer, is an inexpensive instrument available from many sources, including auto parts stores. The hydrometer has a squeeze bulb at one end and a nozzle at the other. Battery electrolyte is sucked into the hydrometer until the float is lifted from its seat. The specific gravity is then read by noting the position of the float. Generally, if after charging, the specific gravity between any two cells varies more than 50 points (0.50), the battery is bad and should be replaced.

It is not possible to check the specific gravity in this manner on sealed (maintenance-free) batteries. Instead, the indicator built into the top of the case must be relied on to display any signs of battery deterioration. If the indicator is dark, the battery can be assumed to be OK. If the indicator is light, the specific gravity is low, and the battery should be charged or replaced.

CABLES

Once every 6 months, the battery terminals and the cable clamps should be cleaned. Loosen the clamps and remove the cables, negative cable first. On batteries with posts on top, the use of a puller specially made for this purpose is recommended. Damage may occur to the battery if proper terminal pullers are not used. These are inexpensive, and available in auto parts stores. Side terminal battery cables are secured with a bolt, and do not require a puller.

Clean the cable clamps and the battery terminal with a wire brush, until all corrosion, grease, etc. is removed and the metal is shiny. It is especially important to clean the inside of the clamp thoroughly, since a small deposit of foreign material or oxidation there can prevent a sound electrical connection and inhibit starting and/or charging. Special tools are available for cleaning these parts, one type for conventional batteries and another type for side terminal batteries.

Before installing the cable, loosen the battery hold-down clamp or strap, remove the battery and check the battery tray. Clear it of any debris, and check it for soundness. Rust should be wire brushed away, and the metal given a coat of anti-rust paint. Before replacing the battery, wash it with soap and water to remove any dirt. Replace the battery and tighten the hold-down clamp or strap securely, but be careful not to overtighten, which will crack the battery case.

After the clamps and terminals are clean, reinstall the cables, negative cable last; do not hammer on the clamps to install. Tighten the clamps securely, but do not distort them. Give the clamps and terminals a thin external coat of grease after installation, to retard corrosion.

Check the cables at the same time that the terminals are cleaned. If the cable insulation is cracked or broken, or if the ends are frayed, the cable should be replaced with a new cable of the same length and gauge.

Keep flames and sparks away from the battery; it gives off explosive hydrogen gas. Battery electrolyte contains sulfuric acid. If you should splash any on your skin or in your eyes, flush the affected areas with

plenty of clear water; if it lands in your eyes, get medical help immediately.

CHARGING

Before recharging a battery, see if any of the following problems exist:

- **Loose alternator belt**
- **Pinched or grounded alternator/voltage regulator wiring harness**
- **Loose wiring connection at the alternator and/or voltage regulator**
- **Loose or corroded connections at the battery and/or the engine ground**
- **Excessive battery drain due to any accessories or lighting left on.**

If any of these exist, remedy the problem, then check to see if the battery still needs to be charged. Cold batteries will not readily accept a charge. Therefore, batteries should be allowed to warm up to approximately 41°F (5°C) before charging. This may require allowing the battery to warm up at room temperature for four to eight hours, depending on the initial temperature and the size of the battery. A battery which has been completely discharged may be slow to accept a charge initially, and in some cases may not accept a charge at the normal charger setting. When batteries are in this condition, charging can be started by using a dead battery switch, on chargers equipped with one.

Completely discharged batteries, which have been discharged for a prolonged period of time (over one month) or which have an open circuit voltage of less than two volts, may not indicate accepting a charge even when the dead battery switch is used. The initial charge rate accepted by batteries in this condition is so low, that the ammeter on some charges will not show any indication of charge for up to 10 minutes. To determine whether a battery is accepting a charge, follow the charger manufacturer's instructions for the use of the dead battery switch. If the dead battery switch is the spring-loaded type, it should be held in the ON position for up to three minutes.

After releasing the dead battery switch and with the charger still on, measure the battery voltage. If it shows 12 volts or higher, the battery is accepting a charge and is capable of being recharged. But, it may require up to two hours of charging on batteries colder than 41°F (5°C) before the charge rate is high enough to register on the charger ammeter. If a battery cannot be charged by this procedure, it should be replaced.

Once the battery has begun to accept a charge, it can be charge to serviceable state or full charge by one of two methods:

- **Use the AUTOMATIC setting on chargers so equipped. This setting maintains the charging rate within safe limits by adjusting the voltage and the current to prevent excessive gassing and the spewing of electrolyte. About two to four hours is needed to charge a completely discharged battery to a serviceable state. If a full state of charge is desired, the charge can be completed by a low current rate of 3-5 amps for several hours.**
- **The second method is to use the MANUAL or constant current setting on the charger. Initially set the charging rate for 30-40 amps and maintain this setting for about 30 minutes or as long as there is not excessive gassing and electrolyte spewing. If gassing results, the charge rate must be reduced to a level where gassing will stop. This is especially true for maintenance-free batteries, in which**

excessive gassing will result in non-replaceable loss of electrolyte, shortening the battery life.

The total charge necessary will vary with battery size and its initial state of charge. In general, to bring a discharged battery to a serviceable state of charge, the amount of charging current multiplied by the charging time should equal the battery amp-hour capacity. For example, a 45 AH battery will need 15 amps of charge for three hours, or 9 amps of charge for five hours. If a full state of charge is desired, the charge can be completed by a low constant current of 3-5 amps for several hours.

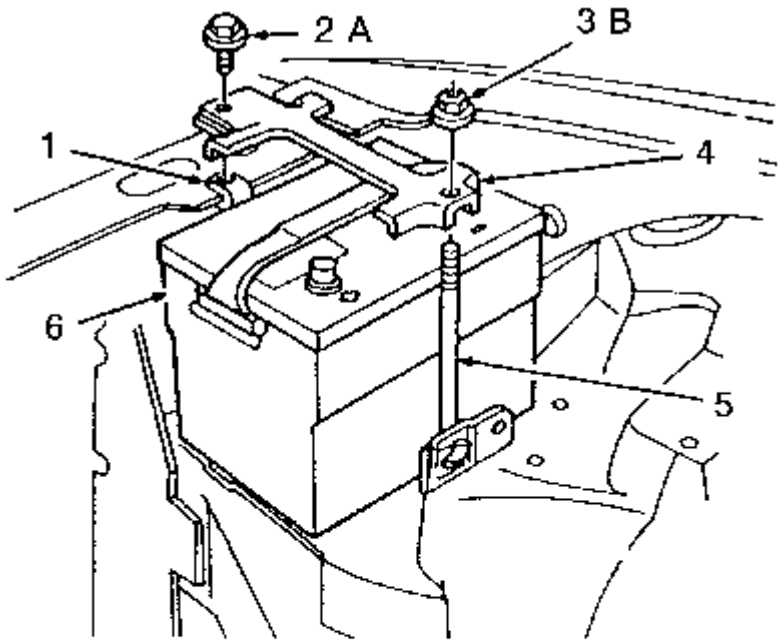
REPLACEMENT

The cold power rating of a battery measures battery starting performance and provides an approximate relationship between battery size and engine size. As a general rule, the cold power rating of a replacement battery should match or exceed your engine size in cubic inches.

CAUTION

Batteries normally produce explosive gases which can cause personal injury. DO NOT allow flames, sparks or lighted substances to come near the battery. When charging or working near a battery, always shield your face and protect your eyes. Also, always provide adequate ventilation.

1. **Carefully disconnect the negative battery cable from the battery terminal, and position it aside.**
2. **Carefully disconnect the positive cable from the battery terminal, and position it aside.**
3. **Clean the cable terminals using an acid neutralizing solution and a terminal cleaning brush.**
4. **Remove the battery hold-down clamp(s) by disconnecting the retaining nut(s) and bolt(s).**
5. **Remove the battery.**



1. U-nut
2A. Bolt (1 required)
3B. Nut (1 required)
4. Bracket
5. J-bolt
6. Battery assembly
A. Tighten to 7-10 N.m (62-88 lb-in)
B. Tighten to 3-5 N.m (27-44 lb-in)

Common battery hold-down assembly

Click to enlarge

To install:

6. **Clean the battery tray and hold-down clamp(s) with a wire brush and scraper. Replace any components that are worn.**
7. **Place the battery in the battery tray making sure that the positive and negative terminals are in the same position as they were previous to removal.**
8. **Assemble and tighten the hold-down hardware so that the battery is secure. Do not overtighten.**

For some vehicles, when the battery is disconnected and reconnected, abnormal driving symptoms may temporarily occur. The reason for this is that the Powertrain Control Module (PCM) has to relearn its adaptive strategy. Your vehicle may have to be driven 10 miles or more for the module to relearn the strategy.

9. **Secure the positive, then the negative battery cables to the proper terminals. Do not overtighten.**

Belts

All vehicles are equipped with V-ribbed drive belts. Replacement belts should be of the same type as originally installed. Loose belts will result in slippage and cause improper operation of the driven accessory, power steering, air conditioning, etc. Overtightened belts will put a severe load on accessory bearings and will almost certainly cause them to self-destruct. Some systems are equipped with an automatic belt tensioner, and will not require any tension adjustments. The drive belt condition should be inspected at 60,000 miles (96,000 km), then at every 15,000 miles (24,000 km) thereafter.

INSPECTION

Inspect all drive belts for excessive wear, cracks, glazed condition, and frayed or broken cords. Replace any drive belt showing one or more of the above conditions.

If a drive belt continually gets cut, the crankshaft pulley might have a sharp projection on it. Have the pulley replaced if this condition continues.

ADJUSTMENT

Alternator Belt

2.5L, 3.2L SHO, 3.8L AND SOME 3.0L ENGINES

The V-ribbed belts used on these engines, utilize an automatic belt tensioner which maintains proper belt tension for the life of the belt. The automatic belt tensioner has a belt wear indicator mark, as well as **MIN** and **MAX** marks. If the indicator mark is not between the **MIN** and **MAX** marks, the belt is worn or an incorrect belt is installed.

3.0L ENGINE WITHOUT AUTOMATIC TENSIONER-EXCEPT SHO

1. **Disconnect the negative battery cable.**
2. **Loosen the alternator adjustment and pivot bolts.**
3. **Apply tension to the belt using the adjusting screw.**
4. **Using a belt tension gauge, set the belt to the proper tension. The tension should be 140-160 lbs. (533-711 N) for a new belt or 110-130 lbs. (356-445 N) for a used belt on vehicles through 1991. On 1992 vehicles, tighten to 190-210 lbs. (845-935 N) for a new belt and 140-160 lbs. (622-712 N) for a used belt.**
5. **When the belt is properly tensioned, tighten the alternator adjustment bolt to 27 ft. lbs. (37 Nm).**
6. **Remove the tension gauge and run the engine for 5 minutes.**
7. **With the engine OFF and the belt tension gauge in place, check that the adjusting screw is in contact with the bracket before loosening the alternator adjustment bolt. Rotate the adjustment screw until the belt is tensioned to 110-130 lbs. (356-445 N) for vehicles through 1991 or 140-160 lbs. (622-712 N) for 1992 vehicles.**
8. **Tighten the alternator adjustment bolt to 27 ft. lbs. (37 Nm) and the pivot bolt to 43 ft. lbs. (58 Nm).**

3.0L SHO ENGINE

1. **Disconnect the negative battery cable.**

2. Loosen the idler/tensioner pulley nut.
3. Turn the adjusting bolt until the belt is adjusted properly.

Turning the wrench to the right tightens the belt adjustment; turning the wrench to the left loosens the belt tension.

4. Tighten the idler/tensioner pulley nut to 25-37 ft. lbs. (34-50 Nm) and check the belt tension.

REMOVAL & INSTALLATION

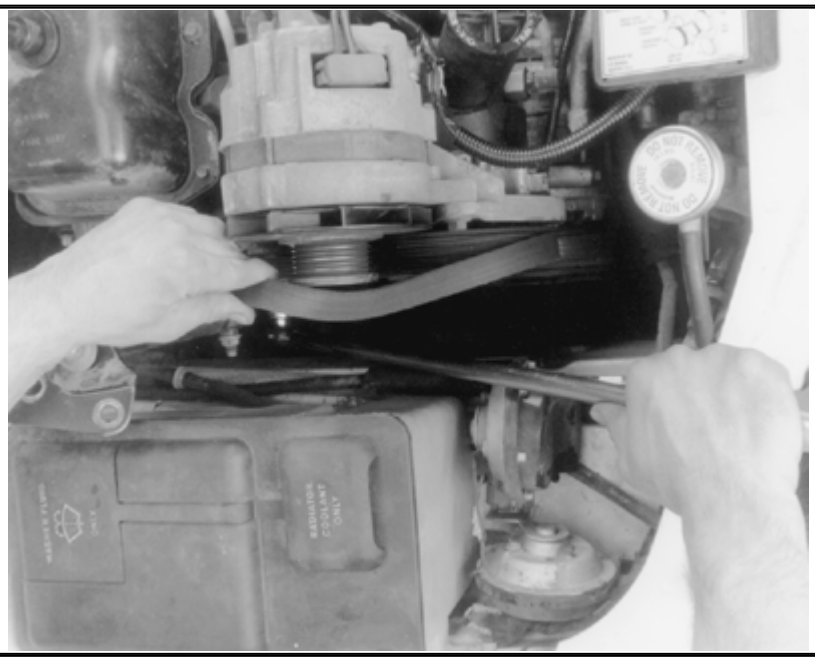
When installing belts on the pulley, ensure that all of the V-grooves are making contact with the pulleys.

2.5L Engine

ALTERNATOR, POWER STEERING AND AIR CONDITIONING BELT

1. Insert a $^{1}/_{2}$ in. breaker bar into the square hole in the tensioner, then rotate the tensioner counterclockwise and remove the belt from the pulleys.

Be careful when removing or installing belts that the tool doesn't slip!



Removing the belt from the pulleys-early 2.5L engine shown

To install:

2. Install the belt over all pulleys except the alternator pulley.
3. Rotate the tensioner as described in Step 1 and install the belt over the alternator pulley. Check that all the V-grooves make proper contact with the pulleys.

3.0L Engine-Except SHO

ALTERNATOR BELT WITHOUT AUTOMATIC TENSIONER

1. Loosen the adjusting arm and pivot bolts.

2. Turn the alternator belt adjusting screw counterclockwise until the old belt can be removed.
3. Remove the belt.

To install:

4. Install the new belt over the pulleys. Check that all the V-grooves make proper contact with the pulleys.
5. Adjust the belt tension, then tighten the adjusting arm and pivot bolts.

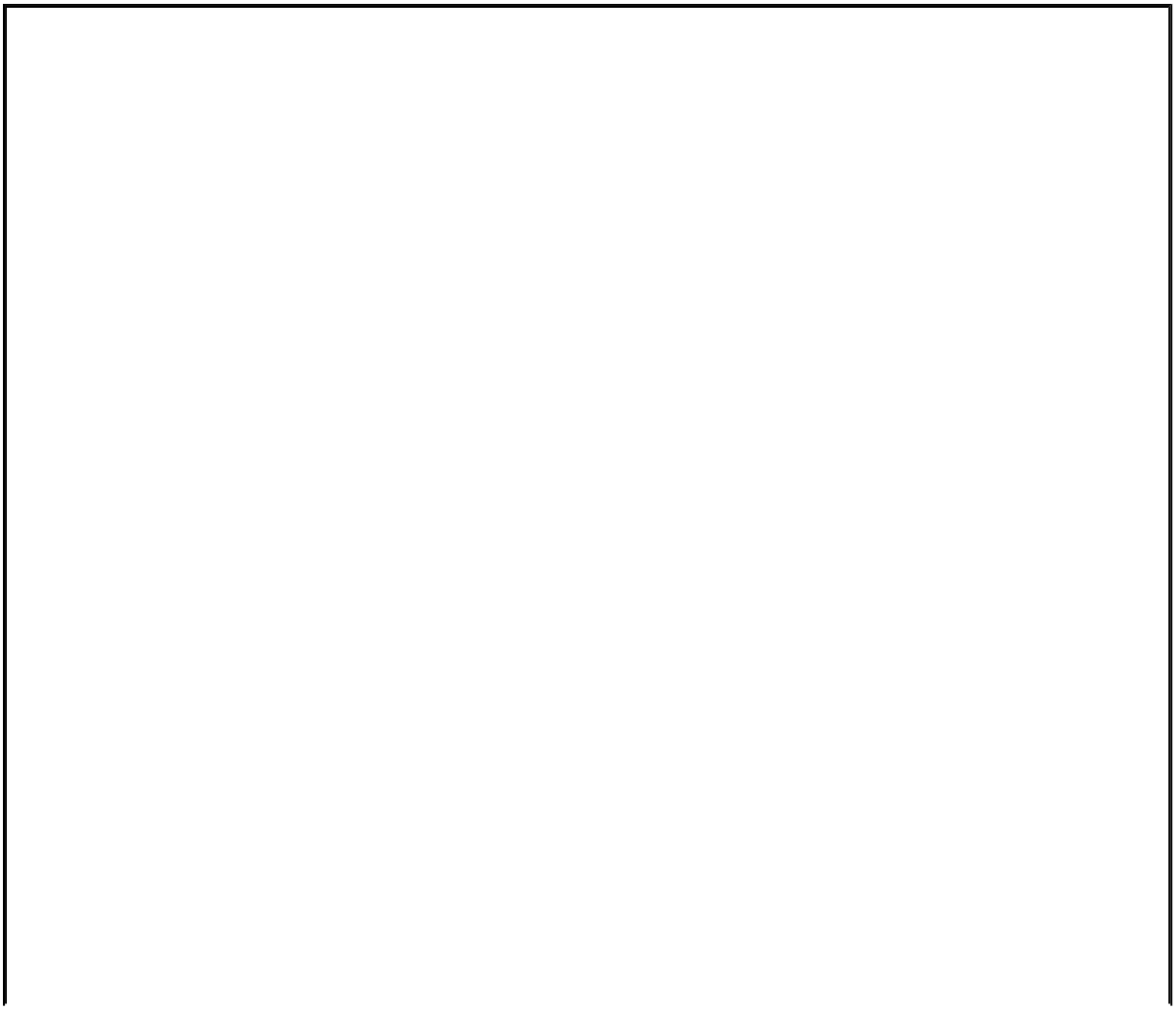
3.0L SHO Engine

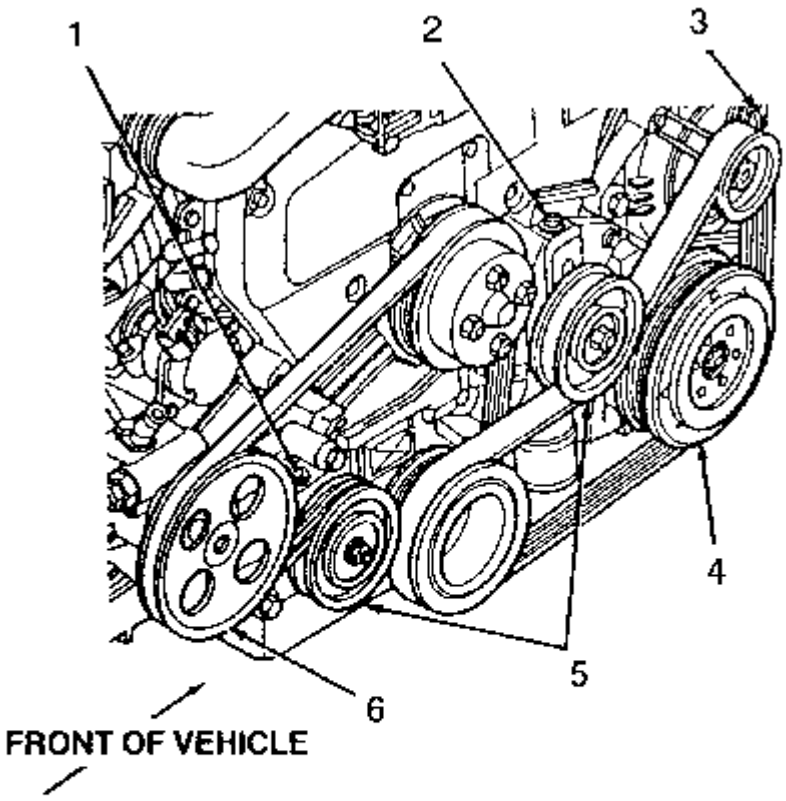
ALTERNATOR BELT

1. Loosen the nut in the center of the idler pulley.
2. Loosen the idler adjusting screw until the old belt can be removed, then remove the belt.

To install:

3. Install the new belt over the pulleys in proper contact with the pulleys.
4. Adjust the new belt to specifications as follows: Turn the idler pulley nut to the right to tighten the belt to a specification of 220-265 lbs. (980-1180 N). Torque the idler pulley nut to 25-37 ft. lbs. (34-50 Nm).





1. P/S water pump belt tension adjusting screw
2. A/C generator belt tension adjusting screw
3. Generator
4. A/C compressor
5. Drive belt tensioner pulley
6. Power steering pump

3.0L SHO accessory drive belts schematic

Click to enlarge

POWER STEERING AND AIR CONDITIONING BELT

1. **Remove the alternator belt.**
2. **Loosen the nut on the tensioner pulley.**
3. **Turn the belt adjusting screw on the tensioner counterclockwise until the belt can be removed, then remove the belt.**

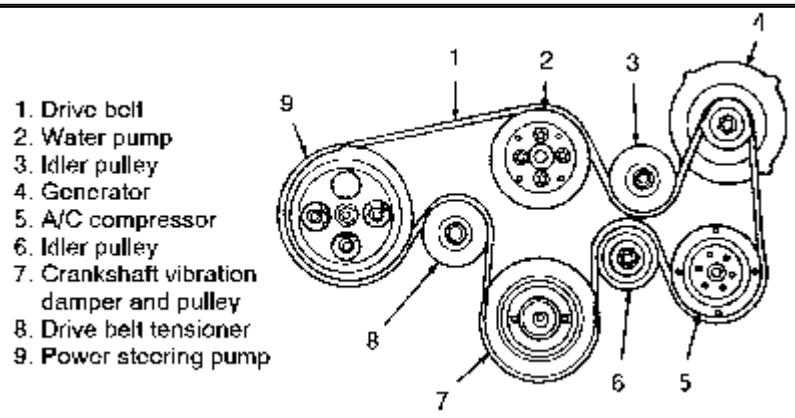
To install:

4. **Position the new belt over the proper pulleys, making sure the V-grooves are properly seated.**
5. **Install the alternator belt.**
6. **Adjust the power steering and air conditioning belt to a specification of 154-198 lbs. (690-980 N) with a belt tension gauge.**
7. **Adjust the alternator belt.**

3.2L SHO Engine

WITH AUTOMATIC TENSIONER

1. **Place a 14mm socket over the bolt on the drive belt tensioner and rotate it clockwise (downward) to release belt tension.**
2. **Remove the drive belt from the pulleys.**



3.2L SHO belt schematic

Click to enlarge

To install:

3. **Install the drive belt over all the pulleys except for the power steering pump pulley. Make sure that all the V-grooves make proper contact with the pulleys.**
4. **Place a 14mm socket over the bolt on the drive belt tensioner pulley and rotate it clockwise (downward), then install the drive belt over the power steering pump pulley.**

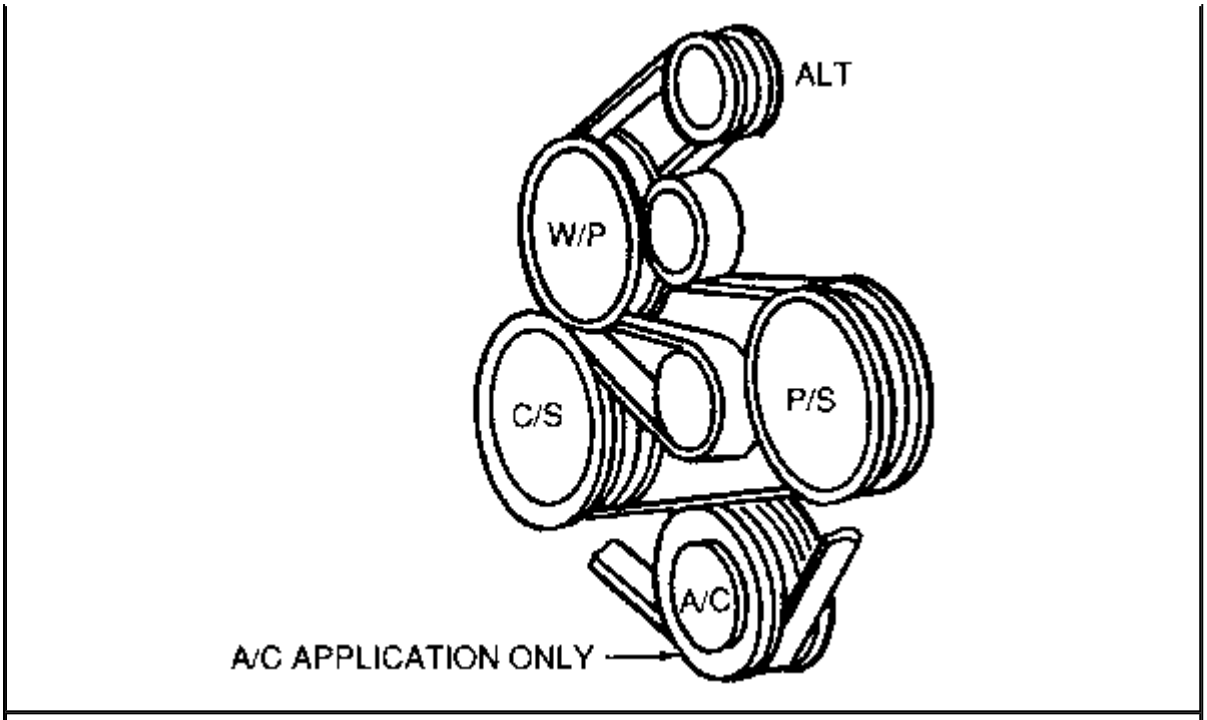
3.0L Engine (Except SHO) and 3.8L Engine

VEHICLES THROUGH 1993 WITH AUTOMATIC TENSIONER

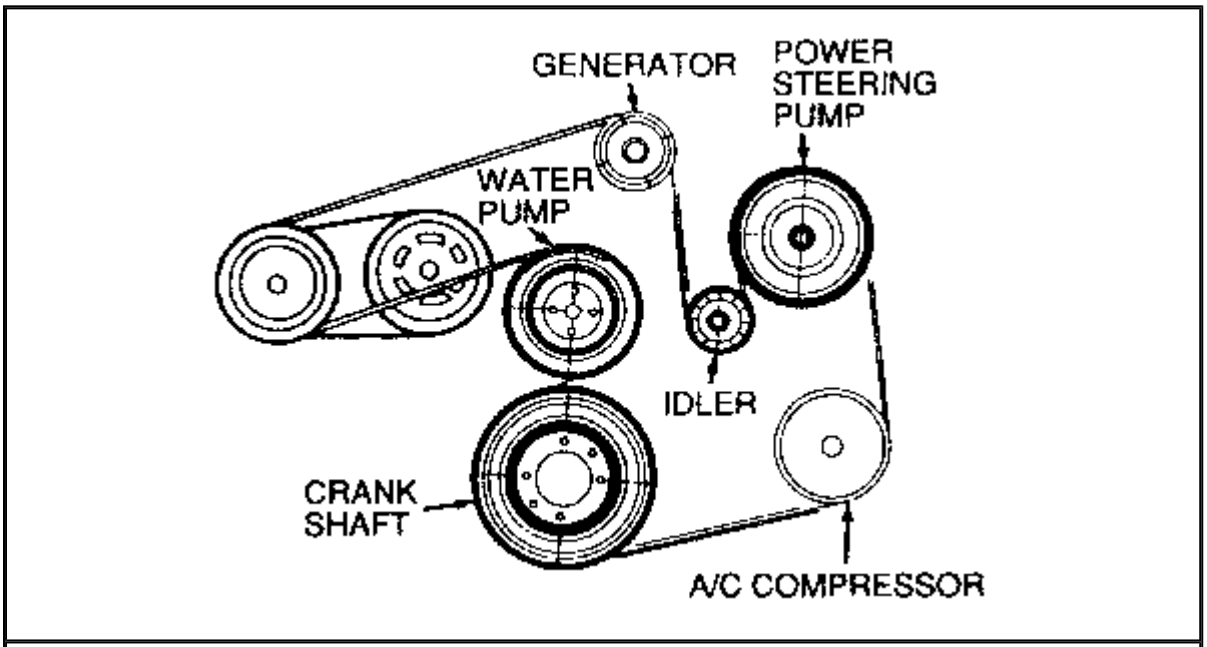
1. **Insert a $^{1}/_{2}$ in. breaker bar into the square hole in the tensioner.**

On the 3.8L engine, the tensioner has a $^{1}/_{2}$ in. square hole cast into the rear of the tension arm directly behind the pulley. On the 3.0L engine, the $^{1}/_{2}$ in. square hole is cast into the spring housing on the front of the tensioner.

2. **Rotate the tensioner clockwise and remove the belt.**



3.0L belt schematic-1993 shown



3.8L belt schematic-1993 shown

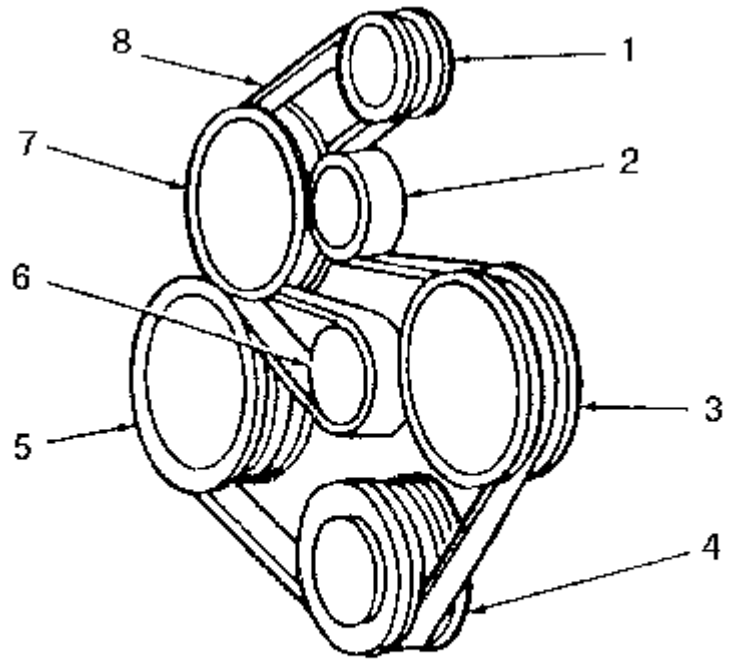
Click to enlarge

To install:

3. **Install the drive belt over all the pulleys, except for the alternator pulley on the 3.0L engine for vehicles through 1992, or the idler pulley for 1993 3.0L vehicles.**
4. **Rotate tensioner counterclockwise and install the belt over the alternator pulley. Make sure that all the V-grooves make proper contact with the pulleys.**
5. **On the 3.0L engine, install the alternator belt for vehicles through 1992.**
6. **For 1993 3.0L vehicles, install the drive belt over the idler pulley.**

1994-95 VEHICLES WITH AUTOMATIC TENSIONER

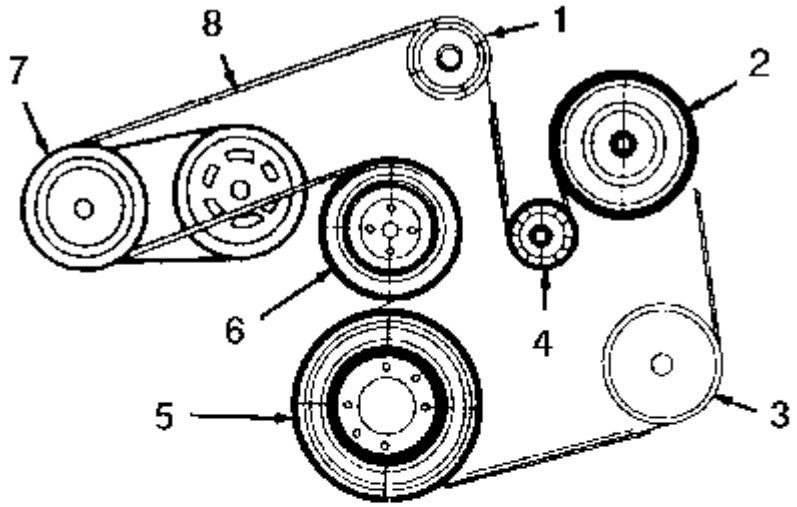
1. **Using a 15mm socket or wrench on the attaching bolt, rotate the drive belt tensioner pulley clockwise to relieve the tension.**
2. **Remove the drive belt.**



1. Generator
2. Drive belt tensioner
3. Power steering pump
4. A/C compressor
5. Crankshaft pulley
6. Idler pulley
7. Water pump
8. Drive belt

3.0L accessory drive belt schematic-1995 shown

Click to enlarge



1. Generator
2. Power steering pump
3. A/C compressor
4. Idler pulley
5. Crankshaft vibration damper and pulley
6. Water pump
7. Drive belt tensioner
8. Drive belt

3.8L accessory drive belt schematic-1995 shown

Click to enlarge

To install:

3. **Install the drive belt over all the pulleys, other than the drive belt tensioner.**
4. **Rotate the drive belt tensioner clockwise, using a 15mm socket or wrench, then install the belt over the drive belt tensioner pulley.**
5. **Make sure that all of the V-grooves make proper contact with the pulleys.**

Timing Belt

INSPECTION

Vehicles equipped with the 3.0L and 3.2L SHO engines are the only vehicles covered by this manual which utilize timing belts. The timing belt should be inspected for cracks, wear, or other damage, and should be replaced every 100,000 miles (160,000 km). For timing belt removal and installation procedures, please refer to ***Section 3*** of this manual.

Hoses

INSPECTION

Upper and lower radiator hoses, along with the heater hoses, should be inspected for deterioration, leaks and loose hose clamps at least every 15,000 miles (24,000 km). It is also wise to check the hoses periodically in early spring and at the beginning of the fall or winter when you are performing other maintenance. A quick visual inspection may discover a weakened hose which could have left you stranded had it remained unrepaired.

Whenever you are checking the hoses, make sure the engine and cooling system are cold. Visually inspect for cracking, rotting or collapsed hoses, and replace as necessary. Run your hand along the length of the hose. If a weak or swollen spot is noted when squeezing the hose wall, the hose should be replaced.

REMOVAL & INSTALLATION

1. **Disconnect the negative battery cable, then place protective covers over the fenders.**
2. **Place a suitable drain pan under the radiator.**

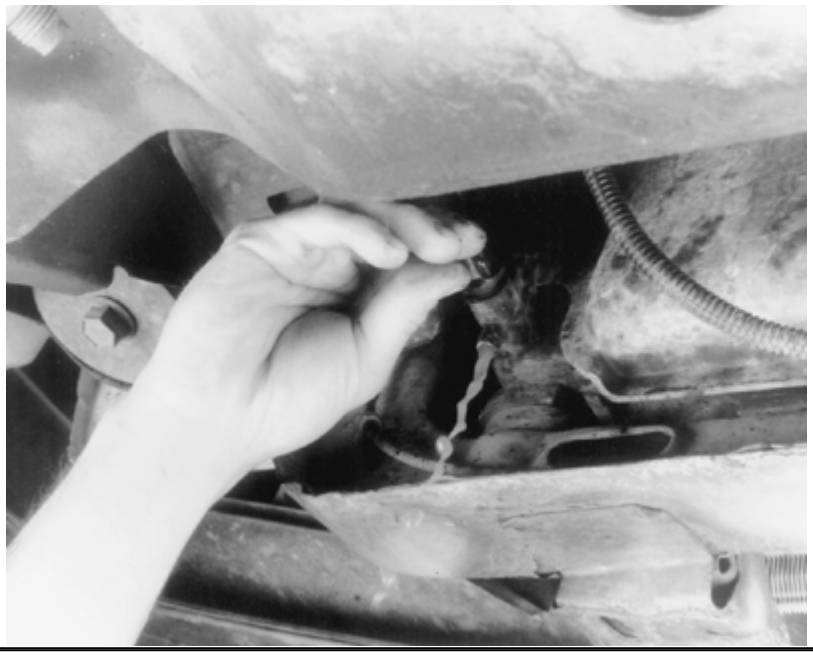
CAUTION

Never remove the pressure cap while the engine is running, or personal injury from scalding hot coolant or steam may result. If possible, wait until the engine has cooled to remove the pressure cap. If this is not possible, wrap a thick cloth around the pressure cap, then depress and turn it slowly to the stop. Step back while pressure is released from the cooling system. When you are sure all the pressure has been released, turn and remove the cap.

If only the upper hose is to be replaced, you need only drain off enough coolant so that the level is below the hose.

3. **Remove the radiator pressure cap. Attach a $^{3}/_{8}$ in. (9.5mm) diameter hose to the radiator draincock, then open the draincock and drain the radiator.**

Opening the radiator draincock located at the lower rear corner of the radiator

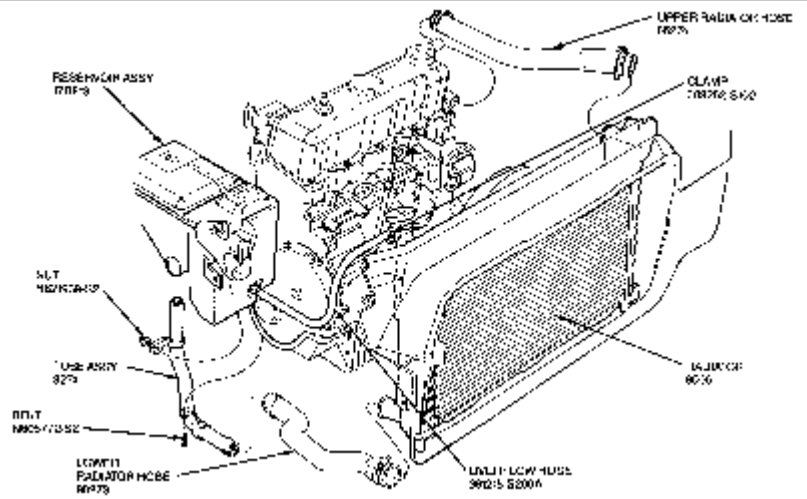


Attaching a small hose to the draincock will help direct the flow of coolant into the drainpan, thereby reducing the mess

CAUTION

The engine should be cool before any hoses are replaced. If engine is hot, let it cool down for at least an hour. When draining the coolant, keep in mind that cats and dogs are attracted by ethylene glycol antifreeze, and are quite likely to drink any that is left in an uncovered container or in puddles on the ground. This will prove fatal in sufficient quantity. Always drain the coolant into a sealable container. Coolant should be reused unless it is contaminated or several years old.

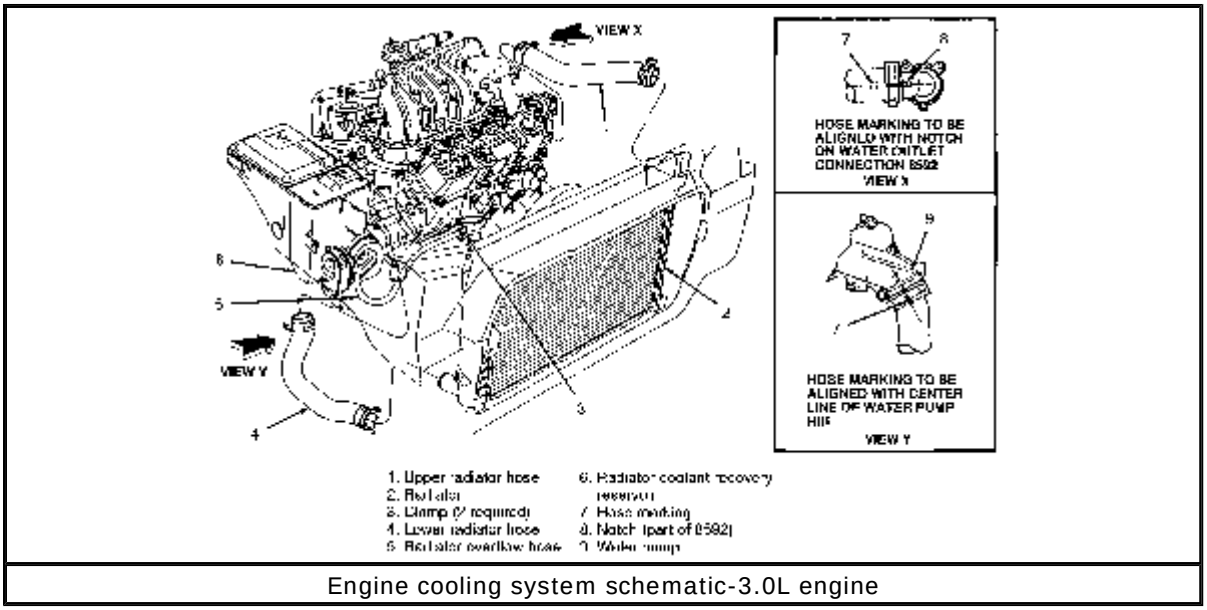
4. **After the radiator has drained, position the drain pan under the hose to be removed.**
5. **To remove the lower hose, loosen the lower hose clamps, then disconnect the hose from the water pump or radiator lower hose tube, and allow it to drain. Disconnect the other end of the hose from the radiator and remove the hose.**



Exploded view of the engine cooling system -2.5L engine

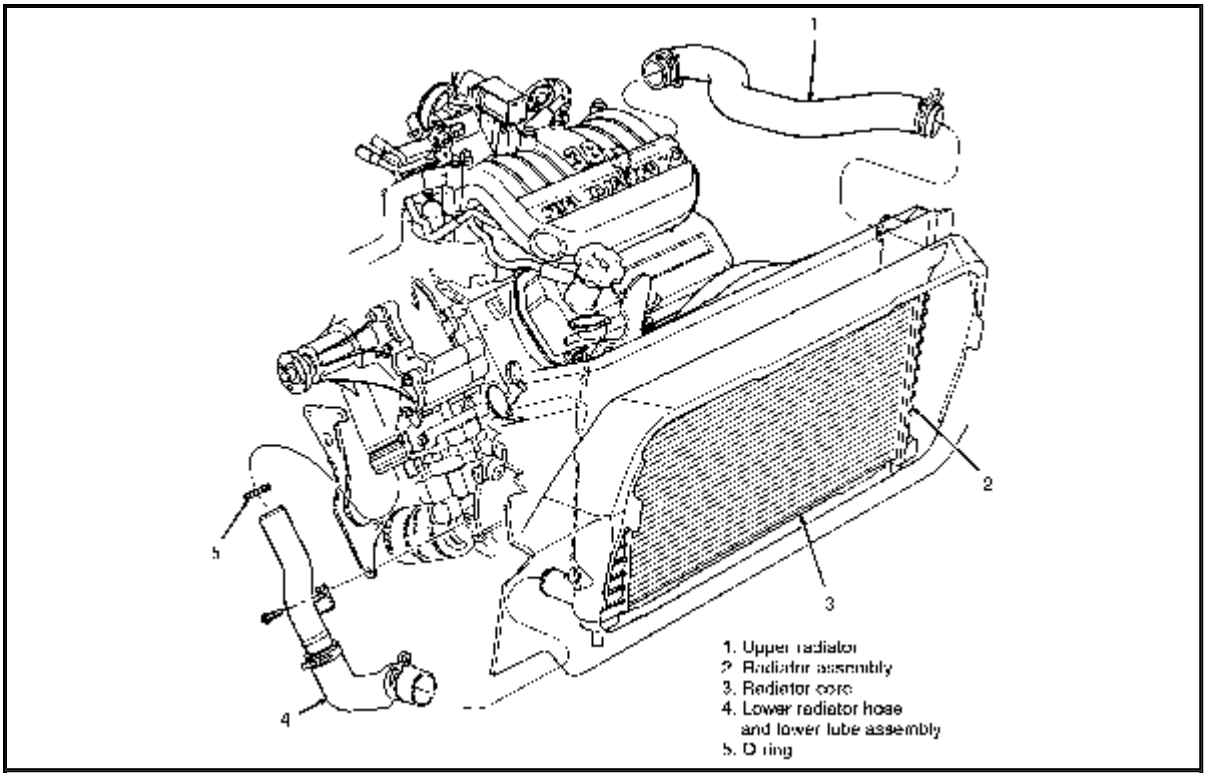
Click to enlarge

6. **To remove the upper hose, loosen the retaining clamps, then disconnect and remove the hose.**



Engine cooling system schematic-3.0L engine

Click to enlarge



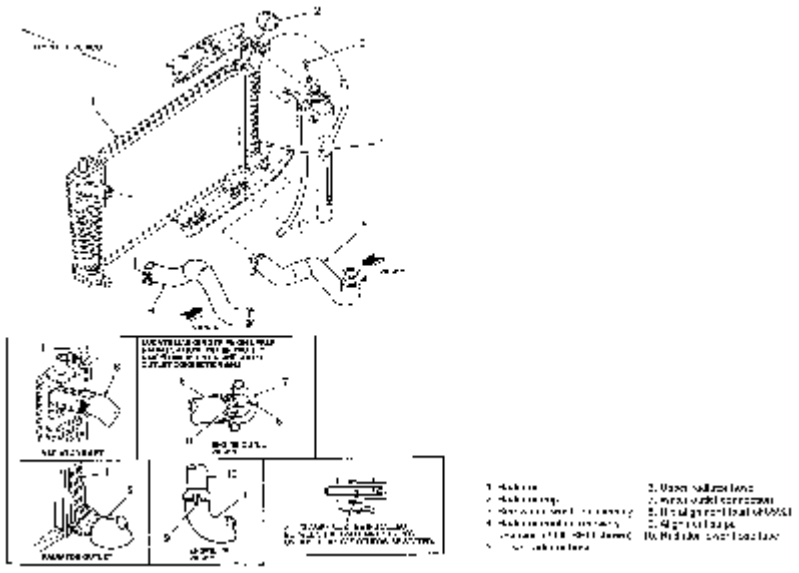
Exploded view of the engine cooling system-3.8L engine

Click to enlarge

7. **To remove the heater hose(s), loosen the clamps, then remove the hose(s).**

To install:

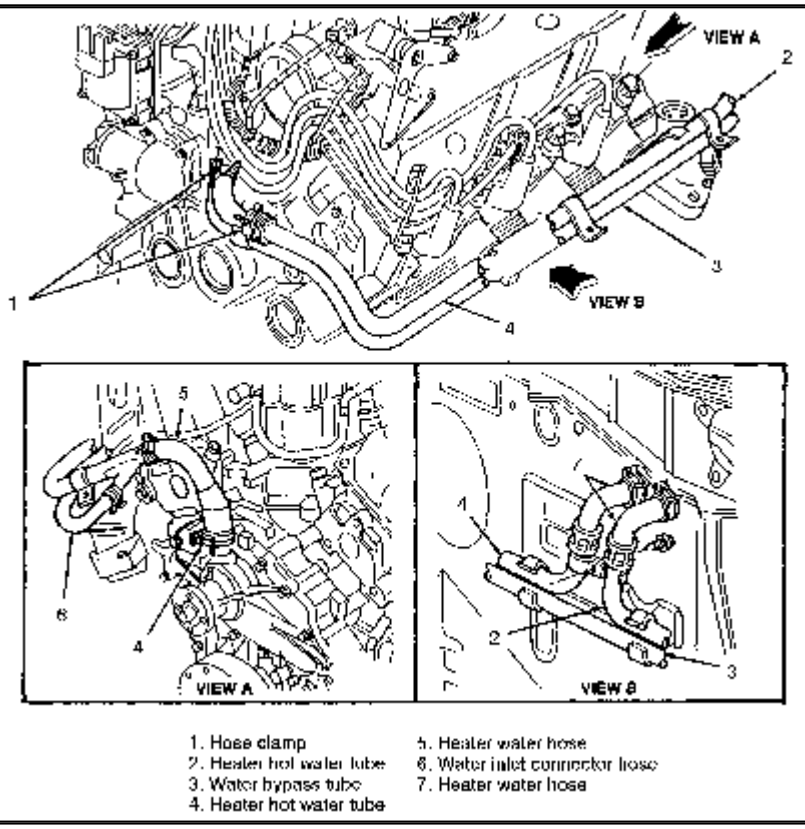
8. **Position the hose(s) to the appropriate connection(s).**
9. **If applicable, position the hose clamps between the alignment marks on both ends of the hose, then slide the hose onto the connections.**
10. **Tighten the hose clamps to 20-30 inch lbs. (2.2-3.4 Nm).**



Cooling system components-3.0L and 3.2L SHO engines

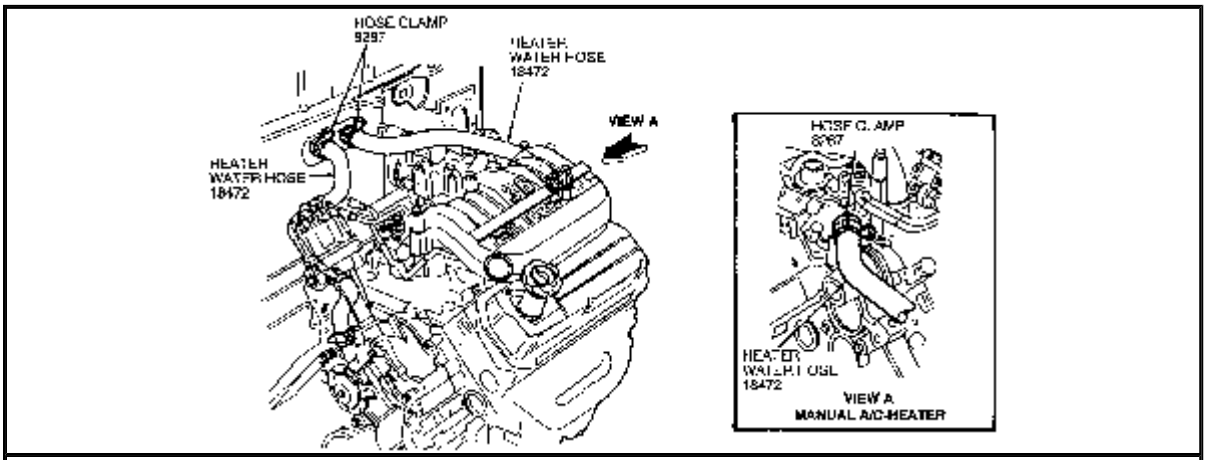
Click to enlarge

11. **Close the radiator draincock. Fill the cooling system with a 50/50 mixture of Ford Premium Cooling System Fluid E2FZ-19549-AA or B (CXC-8-B in Canada) or equivalent and water.**



Heater hose locations-3.0L engine

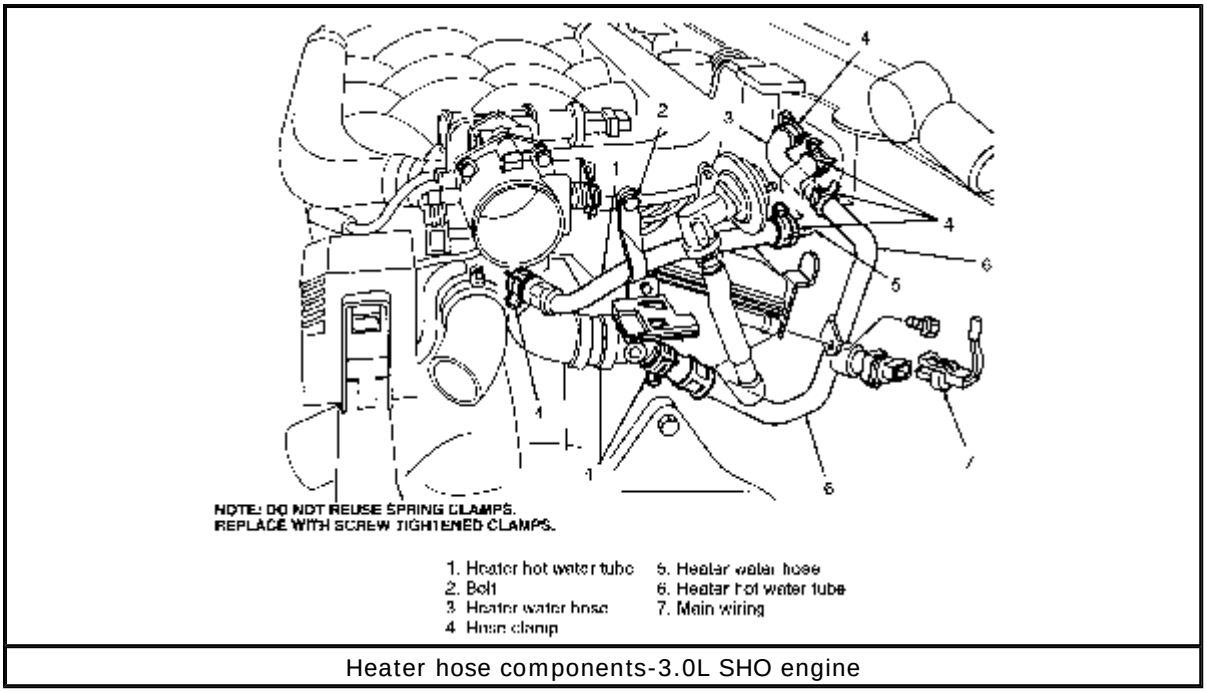
Click to enlarge



Heater hose assembly-3.8L engine

Click to enlarge

12. **Connect the negative battery cable, then start the engine and check for coolant leaks.**



Heater hose components-3.0L SHO engine

Click to enlarge

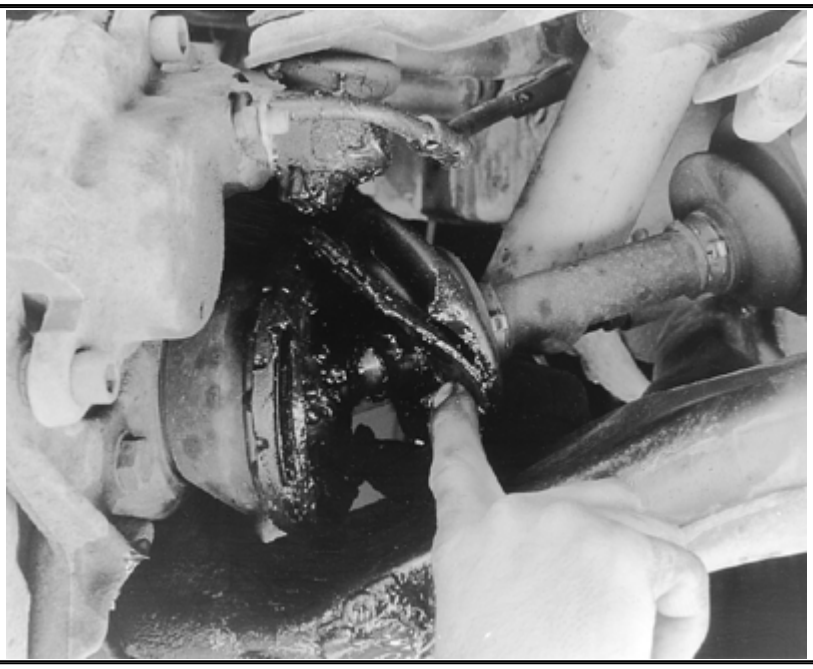
13. **When the engine cools, recheck the coolant level in the radiator, or reservoir container, then remove the fender covers.**

CV Boot

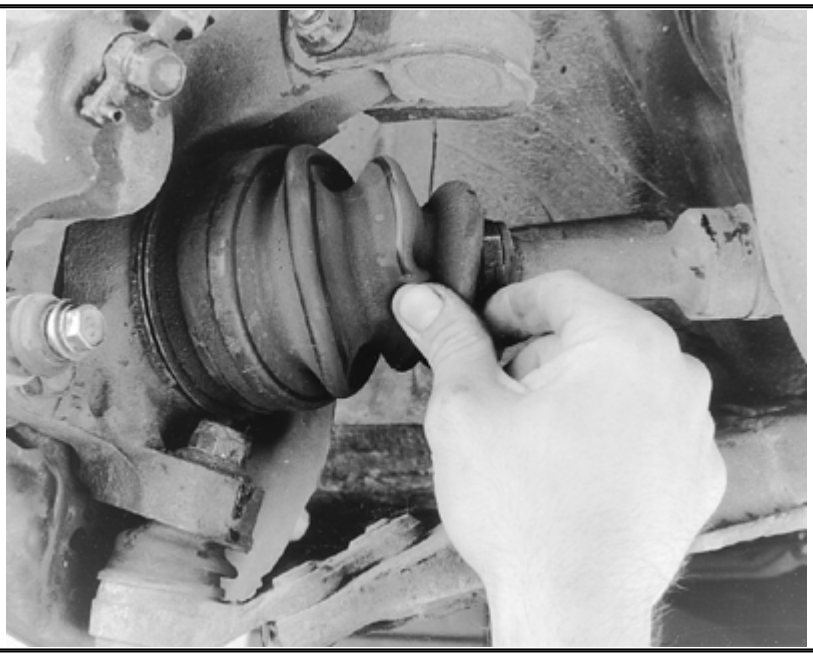
INSPECTION

CV joint boots should be periodically inspected. It would be a wise idea to examine the boot every time your vehicle is raised and supported. Check the boot for signs of cracks, tears or splits and repair/replace as necessary. For CV boot and joint repair, as well as overhaul procedures, please refer to ***Section 7*** of this

manual.



View of a torn CV boot



View of a CV boot in good condition

Air Conditioning

Some 1992-93 and all 1994-95 vehicles are equipped with a refrigerant (R-134a) that is incompatible with the older R-12 or Freon®. This newerrefrigerant is NOT available commercially in most areas, and it may be illegalto service a vehicle with this refrigerant. If you have a vehicle equipped withR-134a, it should be taken to a qualified technician for all A/C service.

Some 1992-93 vehicles equipped with the 3.0L engine, and all 1994-95 vehicles are using R-134a refrigerant, rather than the conventional R-12 refrigerant. The new R-134a refrigerant is not harmful to the ozone layer of the atmosphere. It

has many of the same properties as the old type of refrigerant and is similar in both form and function. These two refrigerants are not interchangeable with one another. Therefore, do not mix the two types of refrigerant, the tools used in servicing the air conditioning system, or component replacement parts from these two types of air conditioning systems. Failure to follow these guidelines will result in damage to the vehicle air conditioning system, and may also result in personal injury to the individual.

SYSTEM IDENTIFICATION

In order to determine which type of system your vehicle has, an identification data plate is located on the major system components. If the system components have YELLOW R-134a non-cfc tags, then the system requires R-134a refrigerant. These systems can also be identified by a gold-colored air conditioning compressor clutch and green-colored O-rings used throughout the system.

GENERAL SERVICING PROCEDURES

It is recommended, and possibly required by law, that a qualifiedtechnician perform the following services.

The most important aspect of air conditioning service is the maintenance of a pure and adequate charge of refrigerant in the system. A refrigeration system cannot function properly if a significant percentage of the charge is lost. Leaks are common because the severe vibration encountered underhood in an automobile can easily cause a sufficient cracking or loosening of the air conditioning fittings. As a result, the extreme operating pressures of the system force refrigerant out.

The problem can be understood by considering what happens to the system as it is operated with a continuous leak. Because the expansion valve regulates the flow of refrigerant to the evaporator, the level of refrigerant there is fairly constant. The receiver/drier stores any excess refrigerant, so a loss will first appear as a reduction in the level of liquid. As this level nears the bottom of the vessel, some refrigerant vapor bubbles will begin to appear in the stream of liquid supplied to the expansion valve. This vapor decreases the capacity of the expansion valve very little as the valve opens to compensate for its presence. As the quantity of liquid in the condenser decreases, the operating pressure will drop there and throughout the high side of the system. As the refrigerant continues to be expelled, the pressure available to force the liquid through the expansion valve will continue to decrease, and, eventually, the valve's orifice will prove to be too much of a restriction for adequate flow, even with the needle fully withdrawn.

At this point, low side pressure will start to drop, and severe reduction in cooling capacity, marked by freeze-up of the evaporator coil, will result. Eventually, the operating pressure of the evaporator will be lower than the pressure of the atmosphere surrounding it, and air will be drawn into the system wherever there are leaks in the low side.

Because all atmospheric air contains at least some moisture, water will enter the system and mix with the refrigerant and oil. Trace amounts of moisture will cause sludging of the oil, and corrosion of the system. Saturation and clogging of the filter/drier, and freezing of the expansion valve orifice will eventually result. As air fills the system to a greater and greater extent, it will interfere more and more with the normal flows of refrigerant and heat.

From this description, it should be obvious that much of the technician's time will

be spent detecting leaks, repairing them, and then restoring the purity and quantity of the refrigerant charge. A list of general rules should be followed in addition to all safety precautions:

- **Keep all tools as clean and dry as possible.**
- **Thoroughly purge the service gauges and hoses of air and moisture before connecting them to the system. Keep them capped when not in use.**
- **Thoroughly clean any refrigerant fitting before disconnecting it, in order to minimize the entrance of dirt into the system.**
- **Plan any operation that requires opening the system beforehand in order to minimize the length of time it will be exposed to open air. Cap or seal the open ends to minimize the entrance of foreign material.**
- **When adding oil, pour it through an extremely clean and dry tube or funnel. Keep the oil capped whenever possible. Do not use oil that has not been kept tightly sealed.**
- **Use only the appropriate refrigerant. Although you are unlikely to find it for sale, Do NOT use old containers of R-12 which were intended for cleaning or powering air horns.**
- **Completely evacuate any system that has been opened to replace a component, other than when isolating the compressor, or that has leaked sufficiently to draw in moisture and air. This requires evacuating air and moisture with a good vacuum pump for at least one hour. If a system has been open for a considerable length of time, it may be advisable to evacuate the system for up to 12 hours (overnight).**
- **Use a wrench on both halves of a fitting that is to be disconnected, so as to avoid placing torque on any of the refrigerant lines.**
- **When overhauling a compressor, pour some oil into a clean glass and inspect it. If there is evidence of dirt or metal particles, or both, flush all refrigerant components with clean refrigerant before evacuating and recharging the system. In addition, if metal particles are present, the compressor should be replaced.**
- **Schrader valves may leak only when under full operating pressure. Therefore, if leakage is suspected, but cannot be located, operate the system with a full charge of refrigerant and look for leaks from all Schrader valves. Replace any faulty valves.**

SAFETY WARNINGS

Because of the inherent dangers involved with working on air conditioning systems and R-12 refrigerant, the following safety precautions must be strictly adhered to in order to service the system safely:

Some vehicles covered by this manual are equipped with R-134a, NOT R-12refrigerant. These 2 refrigerants are NOT compatible. Using the incorrectrefrigerant in an R-134a system will lead to compressor failure, refrigerantoil sludge and/or poor air conditioning system performance.

- **Avoid contact with a charged refrigeration system, even when working on another part of the air conditioning system or vehicle. If a heavy tool comes into contact with a section of copper tubing or a heat exchanger, it can easily cause the relatively soft material to rupture.**
- **When it is necessary to apply force to a fitting which contains refrigerant, as when checking that all system couplings are securely tightened, use a wrench on both parts of the fitting involved, if possible. This will avoid putting torque on the refrigerant tubing. (It is advisable, when possible, to use tubing or line wrenches**

when tightening these flare nut fittings.

R-12 refrigerant is a chlorofluorocarbon which, when released into theatmosphere, can contribute to the depletion of the ozone layer in the upperatmosphere. Ozone filters out harmful radiation from the sun.

- **Do NOT attempt to discharge the system by merely loosening a fitting, or removing the service valve caps and cracking these valves. Precise control is possible only when using the service gauges. Wear protective gloves when connecting or disconnecting service gauge hoses.**

Be sure to consult the laws in your area before servicing the airconditioning system. In some cases, it is illegal to perform repairs involvingrefrigerant unless the work is done by a certified technician.

- **Discharge the system using the proper discharge equipment, as high concentrations of the gas can exclude oxygen and act as an anesthetic. When leak testing or soldering this is particularly important, as toxic gas is formed when the R-12 contacts any flame.**
- **NEVER start a system without first verifying that both service valves (if equipped) are backseated, and that all fittings throughout the system are snugly connected.**
- **Always wear goggles when working on a system to protect the eyes. If refrigerant contacts the eye, it is advisable in all cases to see a physician as soon as possible.**
- **Frostbite from liquid refrigerant should be treated by first gradually warming the area with cool water, and then gently applying petroleum jelly. A physician should be consulted.**
- **Always completely discharge the system into a suitable recovery system before painting the vehicle (if the paint is to be baked on), or before welding anywhere near the refrigerant lines.**
- **When servicing the system, minimize the time that any refrigerant line or fitting is open to the air in order to prevent moisture or dirt from entering the system. Contaminants such as moisture or dirt can damage internal system components. Always replace O-rings on lines or fittings which are disconnected. Prior to installation, coat, but do not soak, replacement O-rings with suitable compressor oil.**

Most repair work on an air conditioning system should be left to acertified professional. DO NOT, under any circumstances, attempt to loosen ortighten any fittings or perform any work other than that outlined here.

SYSTEM INSPECTION

It is possible to detect possible air conditioning system problems by a visual inspection. Check for a broken air conditioning belt, dirt blocking the condenser, disconnected wires, a loose compressor clutch, and oily residue around the air conditioning hose fittings. Missing service gauge port caps may also cause a leak to develop.

REFRIGERANT LEVEL CHECKS

The only way to accurately check the refrigerant level is to measure the system evaporator pressures with a manifold gauge set, although rapid on/off cycling of

the compressor clutch indicates that the air conditioning system is low on refrigerant. The normal refrigerant capacity is 39-41 oz. (1106-1162 grams).

GAUGE SETS

The following procedure is for the attachment of a manifold gauge set to the service gauge port valves. If charging station equipment is used, follow the equipment manufacturer's instructions.

CAUTION

The air conditioning system is under high pressure when the engine isrunning. When connecting and disconnecting the manifold gauge set, make surethe engine is not running.

1. **Turn both manifold gauge set valves fully clockwise to close the high and low pressure hoses at the gauge set refrigerant center outlet.**

Rotunda high side adapter set D81L-19703-A or Motorcraft Tool YT-354/355(or equivalent) is required to connect the manifold gauge set or a chargingstation to the high pressure service access gauge port valve.

2. **Remove the caps from the high and low pressure service gauge port valves.**
3. **If the manifold gauge set hoses do not have the valve depressing pins in them, install fitting adapters T71P-19703-S and R containing the pins on the manifold gauge hoses.**
4. **Connect the high and low pressure refrigerant hoses to their respective service ports, making sure they are hooked up correctly and fully seated. Tighten the fittings by hand, making sure they are not cross-threaded. Remember that an adapter is necessary to connect the manifold gauge hose to the high pressure fitting.**

DISCHARGING THE SYSTEM

Air conditioning system R-12 refrigerant is a chlorofluorocarbon which,when released into the atmosphere, can contribute to the depletion of the ozonelayer in the upper atmosphere. Ozone filters out harmful radiation from thesun. ALWAYS use an approved recovery/recycling machine that meets SAE standardswhen discharging the air conditioning system. Follow the operating instructionsprovided with the approved equipment exactly to properly discharge the air conditioningsystem.

WARNING

Some 1992 and later vehicles use R-134a refrigerant in place of theconventional R-12 refrigerant. Refer to the information on R-134a refrigerant systems in this Section. Also, any air conditioning equipment used to service the conventional R-12 refrigerant systems CANNOT be used to service the R-134a refrigerant systems.

The use of refrigerant recovery systems and recycling stations makes possible the recovery and reuse of refrigerant after contaminants and moisture have been

removed. If a recovery system or recycling station is used, the following general procedures should be followed, in addition to the operating instructions provided by the equipment manufacturer.

1. **Connect the refrigerant recycling station hose(s) to the vehicle air conditioning service ports and the recovery station inlet fitting.**

Hoses should have shut off devices or check valves within 12 in. (305mm)of the hose end to minimize the introduction of air into the recycling stationand to minimize the amount of refrigerant released when the hoses aredisconnected.

2. **Turn the power to the recycling station ON to start the recovery process. Allow the recycling station to pump the refrigerant from the system until the station pressure goes into a vacuum. On some stations, the pump will be shut off automatically by a low pressure switch in the electrical system. On other units it may be necessary to manually turn off the pump.**
3. **Once the recycling station has evacuated the vehicle air conditioning system, close the station inlet valve, if equipped. Then, switch OFF the electrical power.**
4. **Allow the vehicle air conditioning system to remain closed for about 2 minutes. Observe the system vacuum level as shown on the gauge. If the pressure does not rise, disconnect the recycling station hose(s).**
5. **If the system pressure rises, repeat Steps 2, 3 and 4 until the vacuum level remains stable for 2 minutes.**

EVACUATING THE SYSTEM

Some 1992 and later vehicles use R-134a refrigerant in place of theconventional R-12 refrigerant. Refer to the information on R-134a refrigerantsystems in this Section. Also, any air conditioning equipment used to serviceR-12 refrigerant systems CANNOT be used to service R-134a refrigerant systems.

1. **Connect a manifold gauge set as follows:**
    1. **Turn both manifold gauge set valves fully to the right, to close the high and low pressure hoses to the center manifold and hose.**
    2. **Remove the caps from the high and low pressure service gauge port valves.**
    3. **If the manifold gauge set hoses do not have valve depressing pins in them, install fitting adapters T71P19703S and R or equivalent, which have pins, on the low and high pressure hoses.**
    4. **Connect the high and low pressure hoses, or adapters, to the respective high and low pressure service gauge port valves. High side adapter set D81L-19703-A or tool YT-354/355 or equivalent is required to connect a manifold gauge set or charging station to the high pressure gauge port valve.**

Service tee fitting D87P-19703-A, which may bemounted on the clutch cycling pressure switch fitting, is available for use inthe low pressure side of fixed orifice tube systems, to be used in place of thelow pressure

gauge port valve.

2. **Leak test all connections and components with flame-type leak detector 023-00006 or equivalent, or electronic leak detector 055-00014, 055-00015 or equivalent.**

> **CAUTION**
>
> Fumes from flame-type leak detectors are noxious; avoid inhaling fumes orpersonal injury may result.

Good ventilation is necessary in the area where air conditioning leaktesting is to be done. If the surrounding air is contaminated with refrigerantgas, the leak detector will indicate this gas all the time. Odors from otherchemicals such as antifreeze, diesel fuel, disc brake cleaner or other cleaningsolvents can cause the same problem. A fan, even in a well ventilated area, isvery helpful in removing small traces of air contamination that might affectthe leak detector.

3. **Using an approved recovery/recycling station, properly discharge the refrigerant system.**
4. **Make sure both manifold gauge valves are turned fully clockwise. Make sure the center hose connection at the manifold gauge is tight.**
5. **Connect the manifold gauge set center hose to a vacuum pump.**
6. **Open the manifold gauge set valves and start the vacuum pump.**
7. **Evacuate the system with the vacuum pump until the low pressure gauge reads at least 25 in. Hg (84 kPa) or as close to 30 in. Hg (101 kPa) as possible. Continue to operate the vacuum pump for 15 minutes. If a part of the system has been replaced, continue to operate the vacuum pump for another 20-30 minutes.**
8. **When evacuation of the system is complete, close the manifold gauge set valves and turn the vacuum pump OFF.**
9. **Observe the low pressure gauge for 5 minutes to ensure that system vacuum is held. If vacuum is held, charge the system. If vacuum is not held for 5 minutes, leak test the system, service the leaks and evacuate the system again.**

CHARGING THE SYSTEM

Some 1992 and later vehicles use R-134a refrigerant in place of theconventional type R-12 refrigerant. Refer to the information on R-134arefrigerant systems in this section. Also any air conditioning equipment usedto service R-12 refrigerant systems CANNOT be used to service R-134arefrigerant systems.

1. **Connect a manifold gauge set according to the proper procedure. Properly discharge and evacuate the system.**
2. **With the manifold gauge set valves closed to the center hose, disconnect the vacuum pump from the manifold gauge set.**
3. **Connect the center hose of the manifold gauge set to a refrigerant drum.**

Use only a safety type dispensing valve.

4. **Loosen the center hose at the manifold gauge set and open the refrigerant drum valve. Purge air and moisture from the center hose, then tighten the center hose**

connection at the manifold gauge set.

5. **Detach the wire harness snap lock connector from the clutch cycling or low pressure switch and install a jumper wire across the 2 terminals of the connector.**
6. **Open the manifold gauge set low side valve to allow refrigerant to enter the system. Keep the refrigerant container in an upright position.**
7. **When no more refrigerant is being drawn into the system, start the engine and set the control assembly to the MAX cold and HI blower positions to draw the remaining refrigerant into the system. If equipped, press the air conditioning switch. Continue to add refrigerant to the system until the specified weight of the refrigerant is in the system. Then close the manifold gauge set low pressure valve and the refrigerant supply valve.**
8. **Remove the jumper wire from the clutch cycling or low pressure switch snap lock connector. Attach the connector to the pressure switch.**
9. **Operate the system until pressures stabilize to verify normal operation and system pressures.**
10. **In high ambient temperatures, it may be necessary to operate a high volume fan positioned to blow air through the radiator and condenser to aid in cooling the engine and prevent excessive refrigerant system pressures.**
11. **When charging is completed and system operating pressures are normal, disconnect the manifold gauge set from the vehicle. Install the protective caps on the service gauge port valves.**

LEAK TESTING THE SYSTEM

Connect the manifold gauge set. Be sure that both valves are closed. Both gauges should read about 122-163 in. Hg (413-551 kPa) with the engine not running. If very little or no pressure is indicated, leave the vacuum pump valve closed. Open the refrigerant tank valve and set the low pressure gauge valve to the counterclockwise position. This will open the system to tank pressure. Check all system connections, the compressor head gasket and shaft seal for leaks using a leak detector tool.

Windshield Wipers

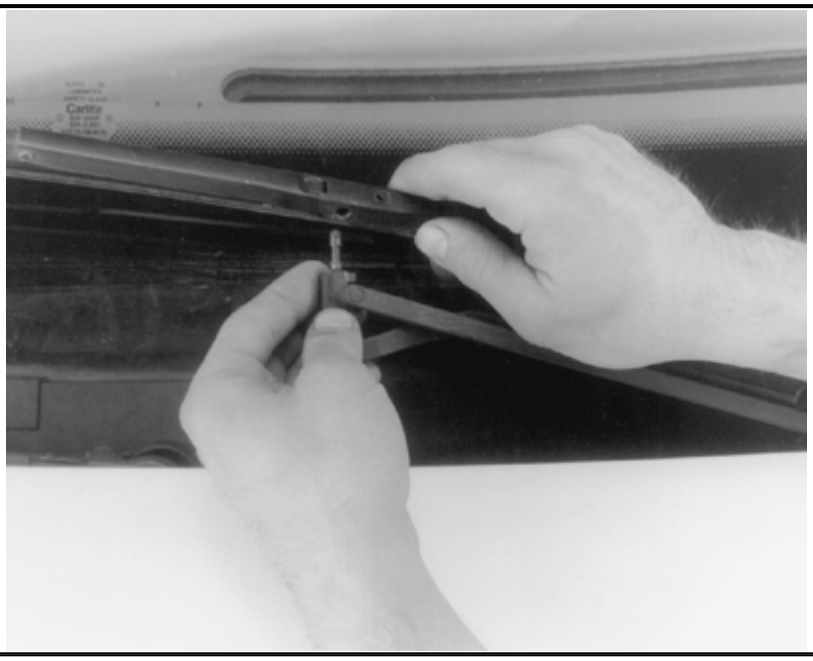
For maximum effectiveness and longest element (refill) life, the windshield and wiper blades should be kept clean. Dirt, tree sap, road tar and so on, will cause streaking, smearing and blade deterioration if left on the glass. It is advisable to wash the windshield carefully with a commercial glass cleaner at least once a month. Clean off the wiper blades with the wet rag afterwards. Do not attempt to move the wipers by hand; damage to the motor and drive mechanism could result.

To inspect and/or remove the wiper refills, place the wiper switch in the **LOW** speed position and the ignition switch in the **ACC** position. When the wiper blades are approximately vertical on the windshield, turn the ignition switch to **OFF**.

Examine the wiper refills. If they are cracked, broken or torn, they should be replaced immediately. Replacement intervals will vary with usage, although ozone deterioration usually limits refill life to about one year. If the wiper pattern is smeared or streaked, or if the blade chatters across the glass, the refills should be replaced. It is easiest and most sensible to replace the refills in pairs.

REMOVAL & INSTALLATION

Normally, if the wipers are not cleaning the windshield properly, only the refill has to be replaced. The blade and arm usually require replacement only in the event of damage. It is not necessary (except on new Tridon® refills) to remove the arm or the blade to replace the refill (rubber part), though you may have to position the arm higher on the glass. You can do this by turning the ignition switch **ON** and operating the wipers. When they are positioned where they are accessible, turn the ignition switch **OFF**.



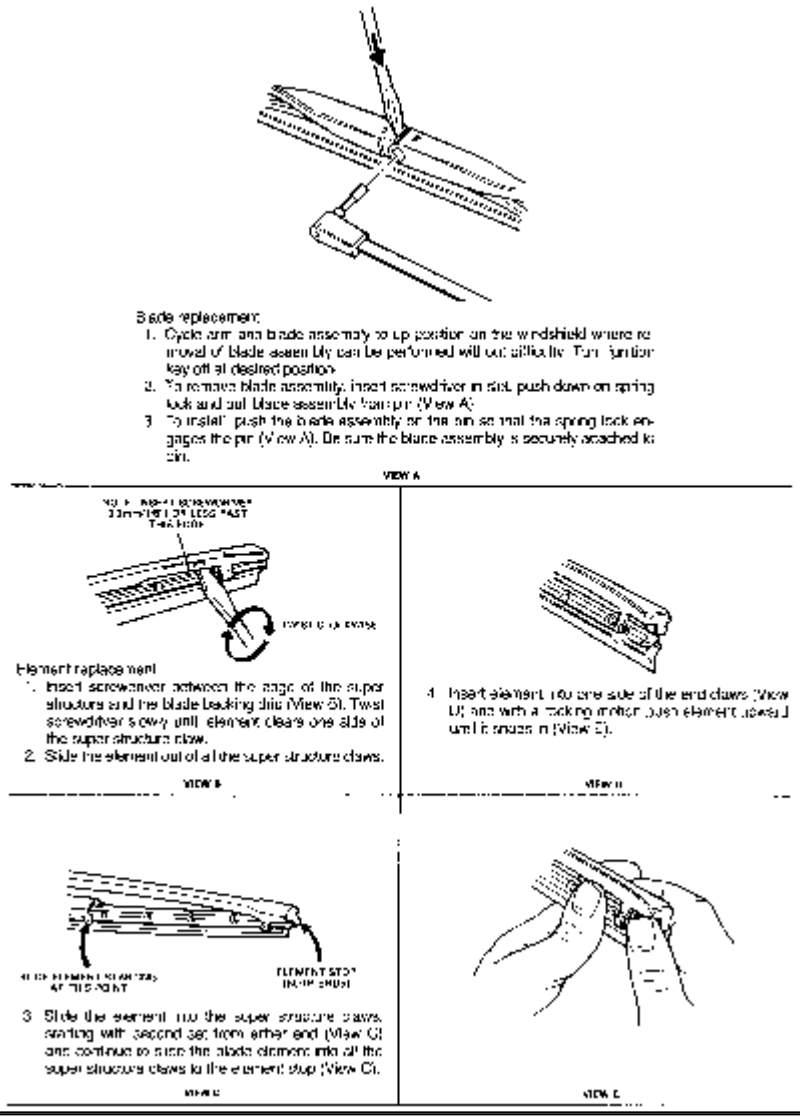
If necessary, the entire blade and insert may be removed from the end of the arm

If your vehicle is equipped with aftermarket blades, there are several different possible types of refills. Aftermarket wipers frequently use a different type blade or refill than the original. Here are some common aftermarket blades, though not all may be available for your car.

Most Anco® styles use a release button that is pushed down to allow the refill to slide out of the yoke jaws. The new refill slides back into the frame and locks in place.

Some Trico® refills are removed by locating where the metal backing strip or the refill is wider. Insert a small prybar between the frame and metal backing strip. Press down to release the refill from the retaining tab.

Other types of Trico® refills have two metal tabs which are unlocked by squeezing them together. The rubber filler can then be withdrawn from the frame jaws. A new refill is installed by inserting the refill into the front frame jaws and sliding it rearward to engage the remaining frame jaws. There are usually four jaws; be certain when installing, that the refill is engaged in all of them. At the end of its travel, the tabs will lock into place on the front jaws of the wiper blade frame.

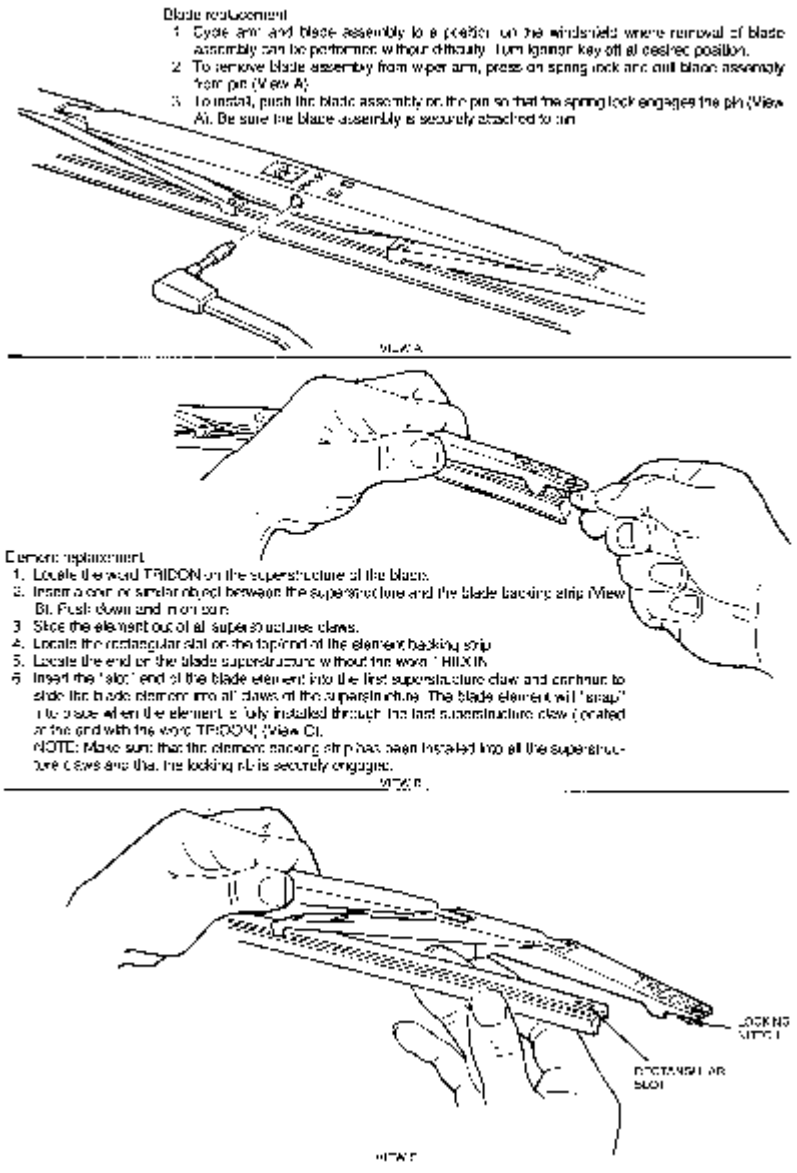


Wiper blade replacement-Trico®

Click to enlarge

Another type of refill is made from polycarbonate. The refill has a simple locking device at one end which flexes downward out of the groove into which the jaws of the holder fit, allowing easy release. By sliding the new refill through all the jaws and pushing through the slight resistance when it reaches the end of its travel, the refill will lock into position.

To replace the Tridon® refill, it is necessary to remove the wiper arm or blade. This refill has a plastic backing strip with a notch about 1 in. (25mm) from the end. Hold the blade (frame) on a hard surface so the frame is tightly bowed. Grip the tip of the backing strip and pull up while twisting counterclockwise. The backing strip will snap out of the retaining tab. Do this for the remaining tabs until the refill is free of the arm. The length of these refills is molded into the end and they should be replaced with identical types.



Wiper blade replacement-Tridon®

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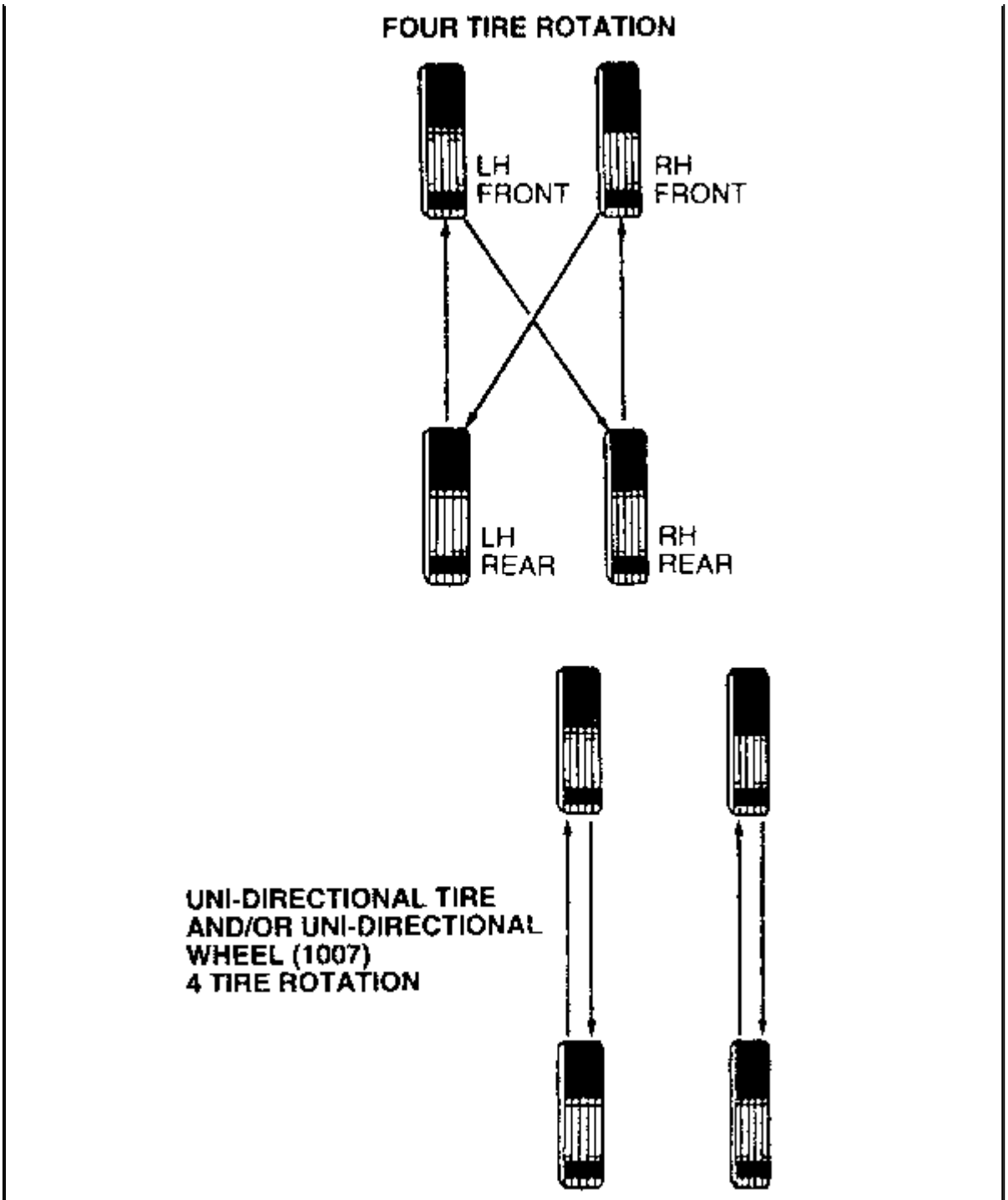
Regardless of the type of refill used, make sure that all of the frame jaws are engaged as the refill is pushed into place and locked. If the metal blade holder and frame are allowed to touch the glass during wiper operation, the glass will be scratched.

Tires and Wheels

TIRE ROTATION

Tire wear can be equalized by switching the position of the tires about every 7,500 miles (12,000 km). Including a conventional spare tire in the rotation pattern can give up to 20% more tread life. Do not include a SpaceSaver® or other temporary spare tire in the rotation pattern.

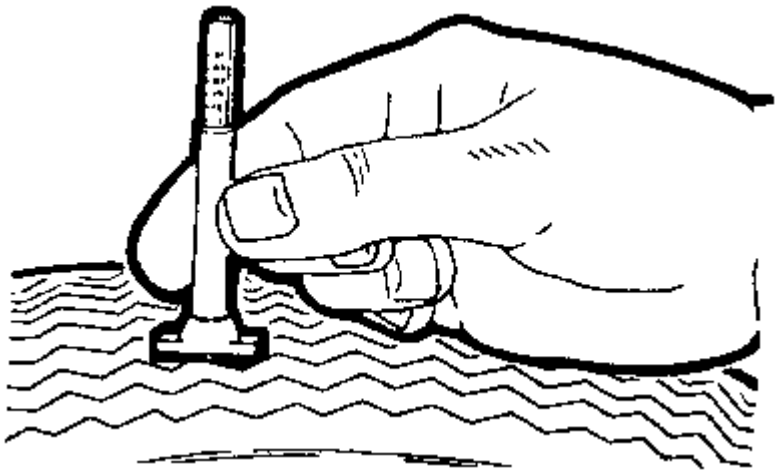


Tire rotation patterns-NEVER use the temporary spare for tire rotation or as a regular tire

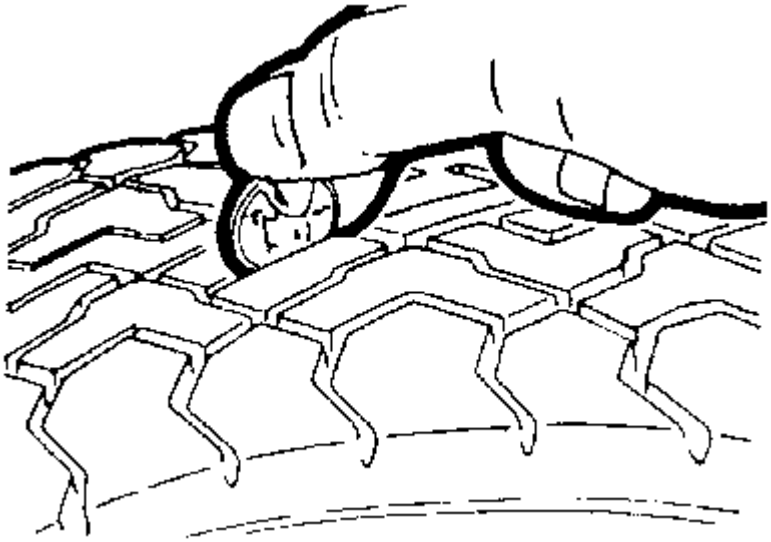
Click to enlarge

TIRE DESIGN

All tires made since 1968 have 8 built-in tread wear indicator bars that show up as $^{1}/_{2}$ in. (13mm) wide smooth bands across the tire when $^{1}/_{16}$ in. (1.6mm) of tread remains. The appearance of tread wear indicators means that the tires should be replaced. In fact, many states have laws prohibiting the use of tires with less than $^{1}/_{16}$ in. (1.6mm) of tread remaining. Tread thickness under $^{1}/_{16}$ in. (1.6mm) is very dangerous on wet roads due to hydroplaning.

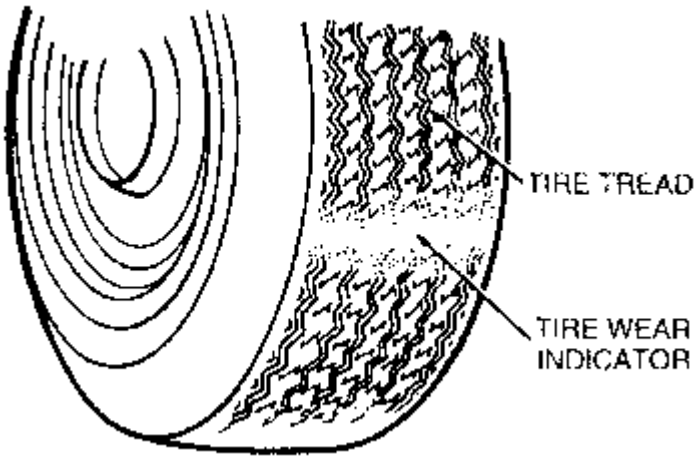


Tread depth can be checked using an inexpensive gauge



If a gauge is not available, a penny may be used to check for tire tread depth; when the top of Lincoln's head is visible, it is probably time for a new tire

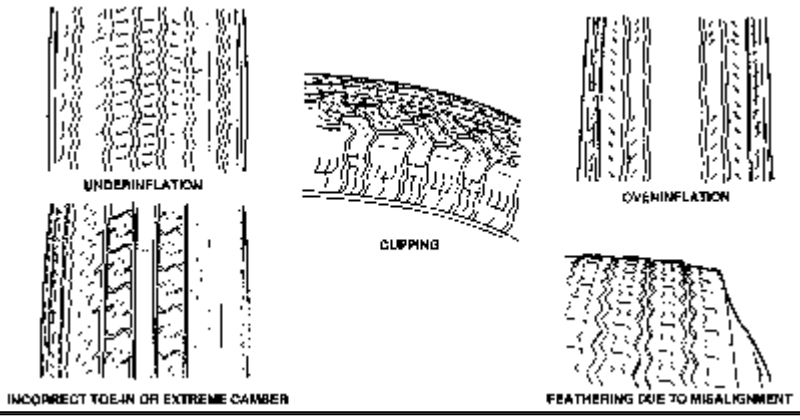
You can check your own tread depth with an inexpensive gauge or by using a Lincoln head penny. Slip the Lincoln penny into several tread grooves. If you can see the top of Lincoln's head in 2 adjacent grooves, the tires have less than $^{1}/_{16}$ in. (1.6mm) of tread left and should be replaced. You can measure snow tires in the same manner by using the tail side of the Lincoln penny. If you see the top of the Lincoln memorial, it's time to replace the snow tires.



If tires are used beyond the point of tread life, built-in wear indicators will begin to appear as lines perpendicular to the tread

Click to enlarge

Wear that occurs only on certain portions of the tire may indicate a particular problem which, when corrected or avoided, may significantly extend tire life. Wear that occurs only in the center of the tire indicates either overinflation or heavy acceleration on a drive wheel. Wear occurring at the outer edges of the tire, and not at the center may indicate underinflation, excessively hard cornering or a lack of rotation. Wear occurring at only the outer edge of the tire, may indicate a problem with wheel alignment or, perhaps, a non-uniformity defect in the tire.



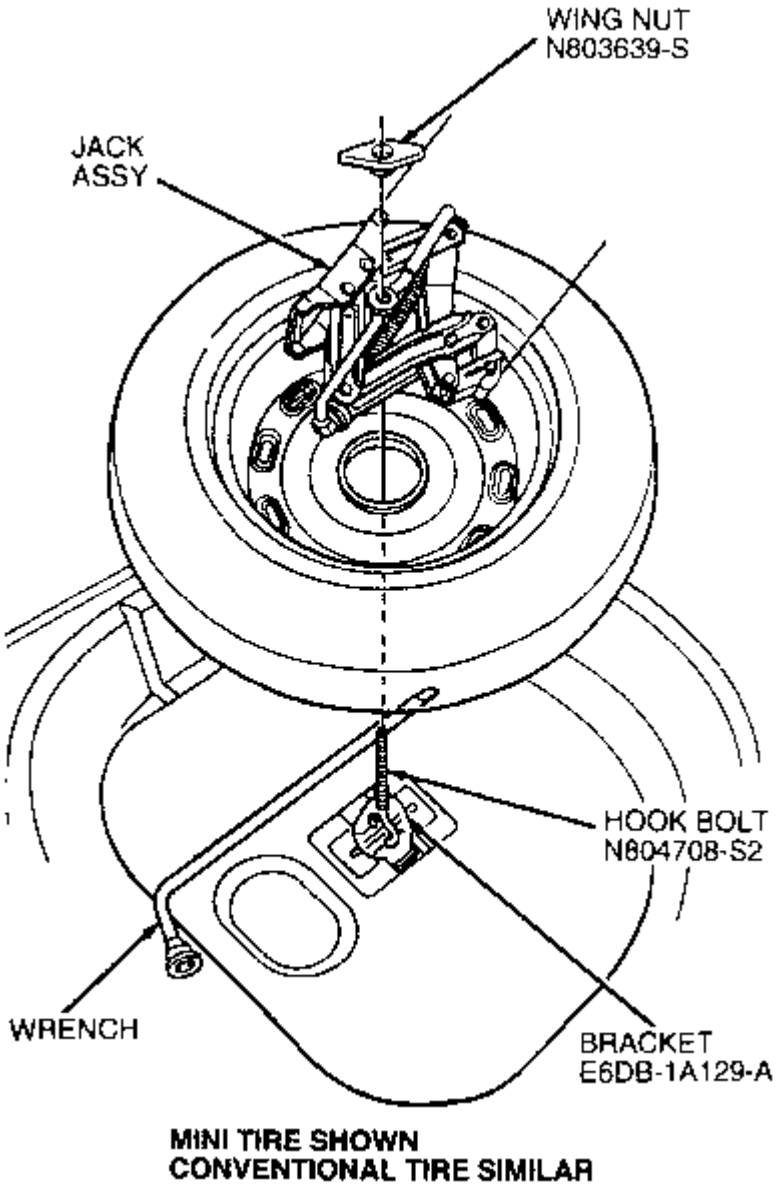
Uneven tire wear can be caused by variables from tire/vehicle condition to driving style

Click to enlarge

When you replace tires, never mix radial, bias-belted or bias type tires. Use only the tire sizes listed on the tire decal attached to your vehicle on the driver's side door post. Make sure that all tires are the same size, speed rating and load carrying capacity. Use only tire and wheel combinations as recommended on the tire decal or by your dealer. Failure to follow these precautions can adversely affect the safety and handling of your vehicle.

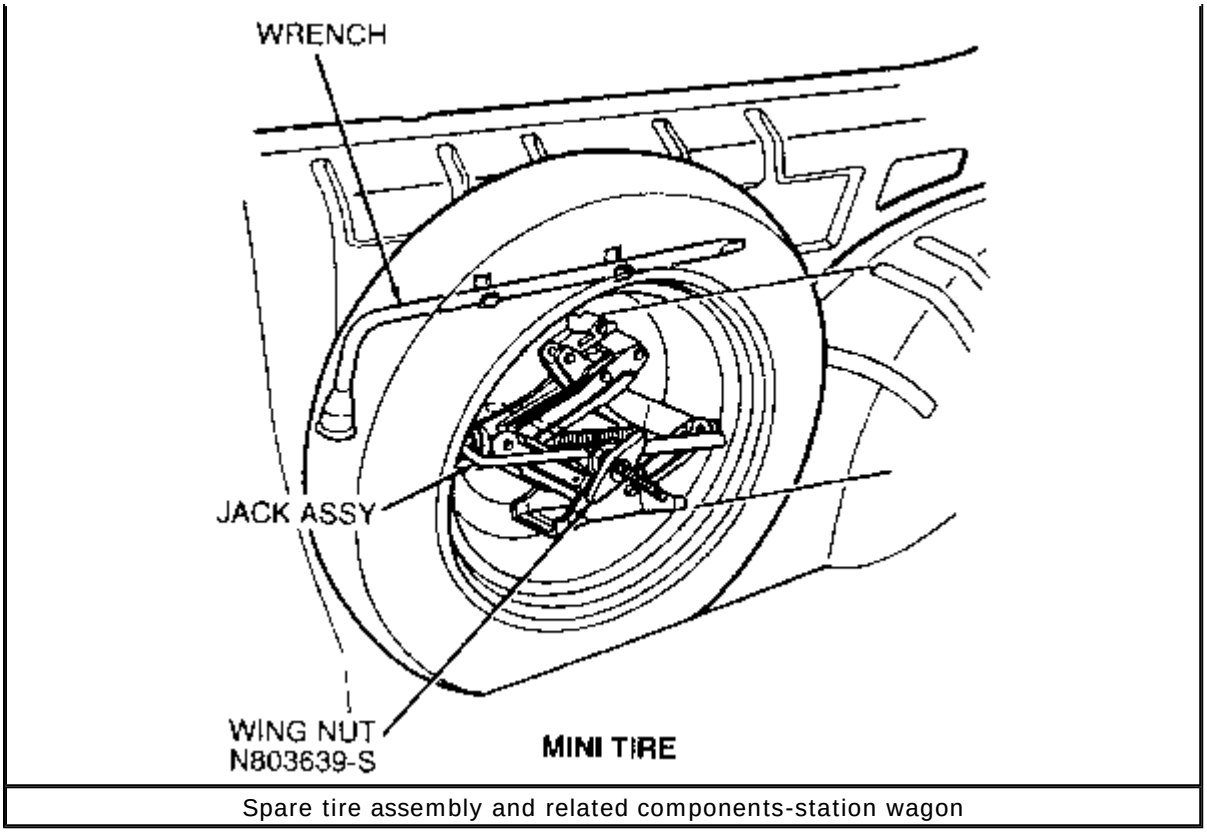
TIRE STORAGE

Store the tires at their recommended inflation pressures if they are mounted on wheels. All tires should be kept in a cool, dry place. If they are stored in the garage or basement, do not let them stand on a concrete floor; set them on strips of wood.



Spare tire assembly and related components-sedan

Click to enlarge



Spare tire assembly and related components-station wagon

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TIRE INFLATION

Tire inflation is the most ignored item of auto maintenance. Gasoline mileage can drop as much as 0.8% for every 1 pound per square inch (psi) of underinflation.

Two items should be a permanent fixture in every glove compartment: a tire pressure gauge and a tread depth gauge. Check the tire air pressure (including the spare) regularly with a pocket type gauge. Kicking the tires won't tell you a thing, and the gauge on the service station air hose is notoriously inaccurate. Also, just looking at the tire does not indicate if it is underinflated.

The tire pressures recommended for your car are usually found on a label attached to the door pillar, on the glove compartment's inner cover and in the owner's manual. Ideally, inflation pressure should be checked when the tires are cool. When the air becomes heated; it expands and the pressure increases. Every 10°F (-12°C) rise (or drop) in temperature means a difference of 1 psi (7 kPa), which also explains why the tire appears to lose air on a very cold night. When it is impossible to check the tires cold, allow for pressure build-up due to heat. If the hot pressure exceeds the cold pressure by more than 15 psi (103 kPa), reduce your speed. Otherwise internal heat is created in the tire. When the heat approaches the temperature at which the tire was cured during manufacture, the tread can separate from the body.

WARNING

Never counteract excessive pressure build-up by bleeding off air pressure (letting some air out). This will only further raise the tire operating temperature.

CARE OF WHEEL COVERS AND ALUMINUM WHEELS

To clean the wheels, wheel covers and wheel ornamentation, use a mild soap solution and thoroughly rinse with clean water. Do not use steel wool, abrasive type cleaner or strong detergents containing high alkaline or caustic agents, as damage to the protective coating and discoloration may result.

FLUIDS AND LUBRICANTS

Introduction

Used fluids such as engine oil, transmission fluid, antifreeze and brake fluid are hazardous wastes and must be disposed of properly. Before draining any fluid, consult your local authorities; in many areas, waste oil, etc. is being accepted as a part of recycling programs. A number of service stations and auto parts stores are also accepting waste fluids for recycling.

Be sure of the recycling center's policies before draining any fluids, as many will not accept different fluids that have been mixed together, such as oil and antifreeze.

Fuel and Engine Oil Recommendations

FUEL RECOMMENDATIONS

Some fuel additives contain chemicals that can damage the catalytic converter and/or oxygen sensor. Read all of the labels carefully before using any additive in the engine or fuel system.

All vehicles covered by this manual are designed to run on unleaded fuel. The used of a leaded fuel in a car requiring unleaded fuel will plug the catalytic converter and render it inoperative. It will also increase exhaust backpressure to the point where engine output will be severely reduced. The minimum octane rating of the unleaded fuel being used must be at least 87, which usually means regular unleaded, but some high performance engines may require higher ratings. Fuel should be selected for the brand and octane which performs best with your engine. Judge a gasoline by its ability to prevent pinging, its engine starting capabilities (cold and hot) and general all-weather performance.

For information regarding vehicles equipped with the Flexible Fuel (FF) system, refer to your owner's manual for fuel recommendations.

As far as the octane rating is concerned, refer to the General Engine Specifications Chart in ***Section 3*** of this manual to find your engine and its compression ratio. If the compression ration is 9.0:1 or lower, in most cases a regular unleaded grade of gasoline can be used. If the compression ratio is 9.0:1-9.3:1, use a premium grade of unleaded fuel.

The use of a fuel too low in octane (a measurement of antiknock quality) will result in spark knock. Since many factors such as altitude, terrain, air temperature and humidity affect operating efficiency, knocking may result even though the recommended fuel is being used. If persistent knocking occurs, it may be necessary to switch to a higher grade of fuel. Continuous or heavy knocking may result in engine damage.

Your engine's fuel requirement can change with time, mainly due to carbon buildup, which will in turn change the compression ratio. If your

engine pings, knocks, or diesels (runs with the ignition off) switch to a higher grade of fuel. Sometimes just changing brands will cure the problem. If it becomes necessary to retard the timing from the specifications, don't change it more than a few degrees.

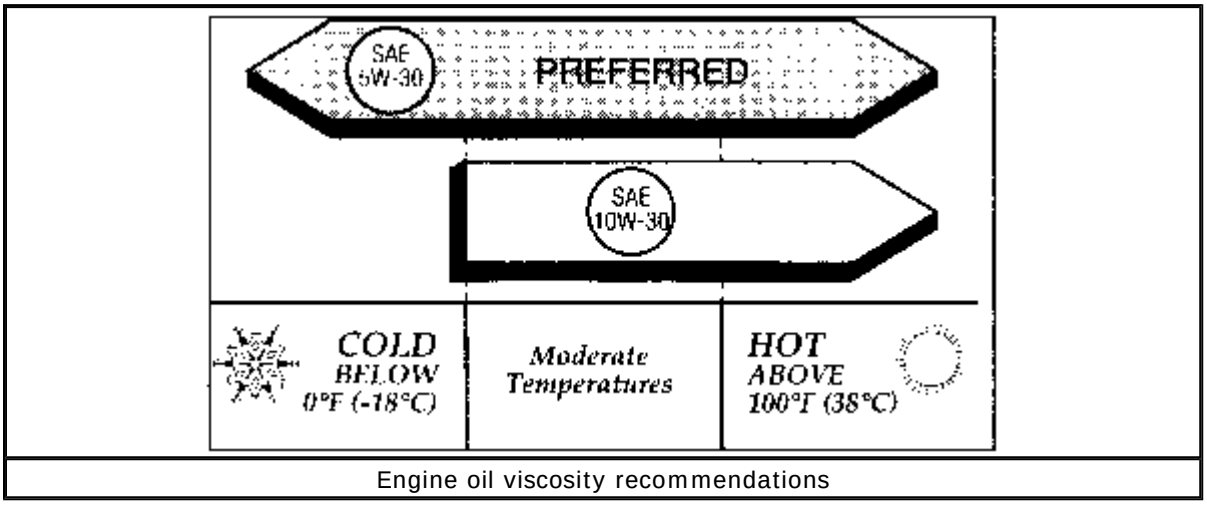
Retarded timing will reduce power output and fuel mileage, in addition to making the engine run hotter.

OIL RECOMMENDATIONS

The SAE (Society of Automotive Engineers) grade number indicates the viscosity of the engine oil and, thus, its ability to lubricate at a given temperature. The lower the SAE grade number, the lighter the oil; the lower the viscosity, the easier it is to crank the engine in cold weather. Oil viscosities should be chosen from those oils recommended for the lowest anticipated temperatures during the oil change interval. With the proper viscosity you will be assured of easy cold starting and sufficient engine protection.

Multi-viscosity oils (5W-30, 10W-30, etc.) offer the important advantage of being adaptable to temperature extremes. They allow easy starting at low temperatures, yet they give good protection at high speeds and engine temperatures. This is a decided advantage in changeable climates or in long distance driving.

The API (American Petroleum Institute) designation indicates the classification of engine oil used under certain given operating conditions. Only oils designated for use Service SG, or the latest superceding oil grade, should be used. Oils of the SG type perform a variety of functions inside the engine in addition to their basic function as a lubricant. Through a balanced system of metallic detergents and polymeric dispersants, the oil prevents the formation of high and low temperature deposits and also keeps sludge and dirt particles in suspension. Acids, particularly sulfuric acid, as well as other byproducts of combustion, are neutralized. Both the SAE grade number and the API designation can be found of the side of the oil bottle. Oil meeting API classification SG, SG/CC or SG/CD is recommended for use in your vehicle. Ford has filled your crankcase with SAE 5W-30 and recommends that you continue to use this as long as the outside temperatures don't exceed 100°F (38°C). There are other options, however, such as SAE 10W-30; refer to the accompanying oil viscosity/ambient temperature chart.



Engine oil viscosity recommendations

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Synthetic Oil

There are excellent synthetic and fuel-efficient oils available that, under the right circumstances, can help provide better fuel mileage and better engine protection. However, these advantages come at a price, which can be three or four times the price per quart of conventional motor oils.

Before pouring any synthetic oils into your car's engine, you should consider the condition of the engine and the type of driving you do. It is also wise to check the vehicle manufacturer's position on synthetic oils.

Generally, it is best to avoid the use of synthetic oil in both brand new and older, high mileage engines. New engines require a proper break-in, and the synthetics are so slippery that they can impede this; most manufacturers recommend that you wait at least 5,000 miles (8,000 km) before switching to a synthetic oil. Conversely, older engines are looser and tend to use more oil; synthetics will slip past worn parts more readily than regular oil, and will be used up faster. If your car already leaks and/or uses oil (due to worn parts or bad seals/gaskets), it may leak and use more with a synthetic inside.

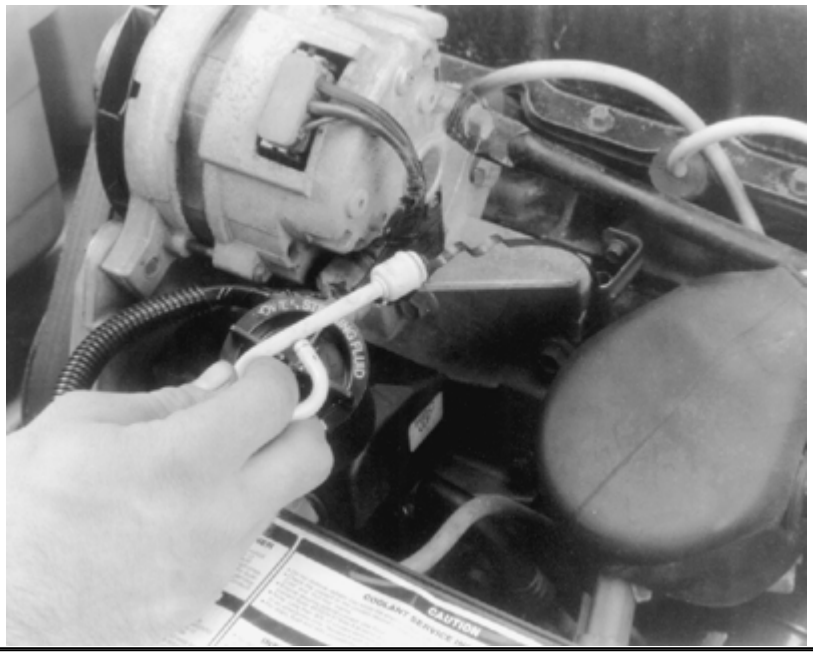
Consider your type of driving. If most of your accumulated mileage is on the highway at higher, steadier speed, a synthetic oil will reduce friction and probably help deliver better fuel mileage. If you choose to use synthetic oil in this case, synthetic oils which are certified and have the preferred viscosity may be used in your engine; however, the oil and filter must still be changed according to the maintenance schedule. Cars used under harder, stop-and-go, short hop circumstances should always be serviced more frequently, and for these cars, synthetic oil may not be a wise investment.

Engine

OIL LEVEL CHECK

Every time you stop for fuel, check the engine oil, making sure the engine has fully warmed and the vehicle is parked on a level surface. Because it takes a few minutes for all the oil to drain back to the oil pan, you should wait a few minutes before checking your oil. If you are doing this at a fuel stop, first fill the fuel tank, then open the hood and check the oil, (but don't get so carried away as to forget to pay for the fuel. Most station attendants won't believe that you forgot.)

1. **Be sure your car is parked on level ground.**
2. **Shut off the engine. When checking the oil level, it is best for the engine to be at normal operating temperature, although checking the oil immediately after stopping will lead to a false reading. Wait a few minutes after turning off the engine to allow the oil to drain back into the crankcase.**
3. **Open the hood and locate the dipstick in a guide tube at the left-center, front of the engine. Pull the dipstick from its tube, wipe it clean with a lint-free rag, then reinsert it. Push it down firmly to assure that it is firmly seated in the tube.**



Remove the dipstick from the engine

Wipe the dipstick with a clean, lint-free rag

4. **Pull the dipstick out again and, holding it horizontally, read the oil level. The oil should be between the MAX and ADD marks on the dipstick. If the oil is below the ADD mark, add oil of the proper viscosity through the capped opening in the top of the cylinder head cover or filler tube, as applicable.**
5. **Reinsert the dipstick and check the oil level again after adding any oil. Approximately one quart of oil will raise the level from the ADD mark to the MAX mark. Be sure not to overfill the crankcase and waste the oil. Excess oil will generally be consumed at an accelerated rate.**

OIL AND FILTER CHANGE

Change the engine oil and oil filter every 6 months or 5,000 miles (8,000 km). If the car is used in severe service or dusty conditions, change the engine oil and oil filter every 3 months or 3,000 miles (4,800 km). Following these recommended

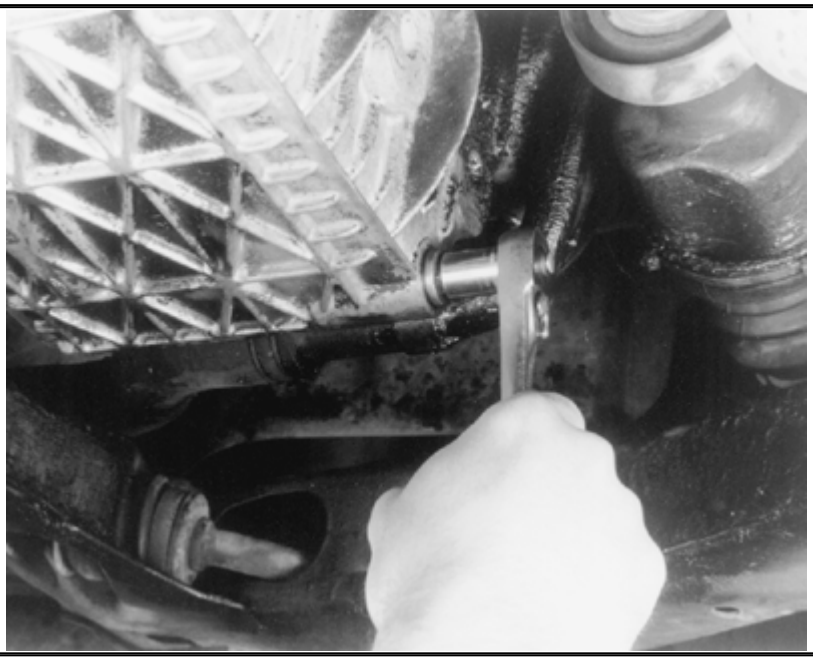
intervals will help keep you car engine in good condition. Dirty oil loses its lubricating qualities and can cause premature wear in your engine.

1. **Make sure the engine is at normal operating temperature (this promotes complete draining of the old oil).**
2. **Apply the parking brake and block the wheels, or raise and safely support the car evenly on jackstands.**
3. **Place a drain pan of about 6 quart capacity under the engine oil pan drain plug. Wipe the drain plug and surrounding area clean using an old rag.**

CAUTION

The EPA warns that prolonged contact with used engine oil may cause a number of skin disorders, including cancer! You should make every effort to minimize your exposure to used engine oil. Protective gloves should be worn when changing the oil. Wash your hands and any other exposed skin areas as soon as possible after exposure to used engine oil. Soap and water, or waterless hand cleaner should be used.

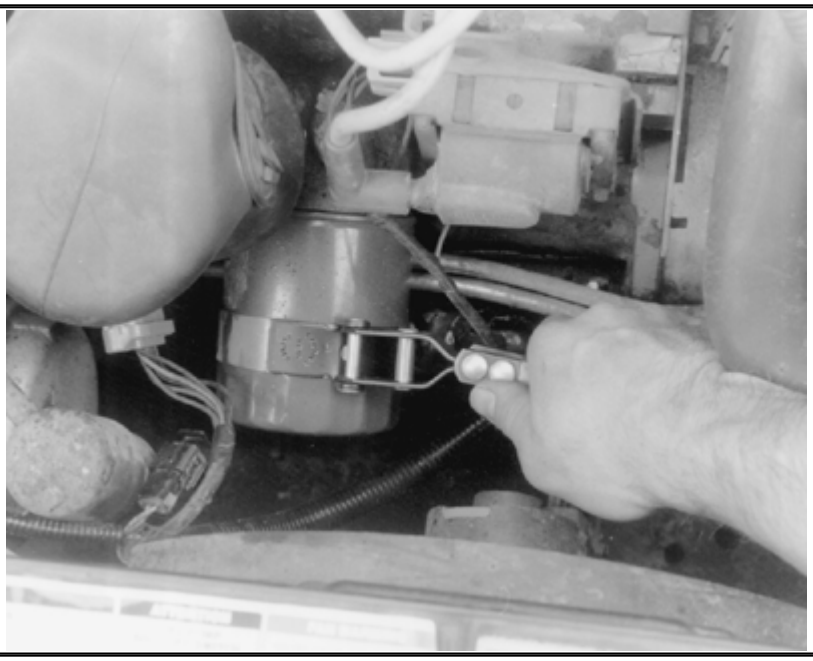
4. **Loosen the drain plug using the proper size box or socket wrench. Turn the plug out by hand, using a rag to shield your fingers from the hot oil. By keeping an inward pressure on the plug as you unscrew it, oil won't escape past the threads and you can remove it without being burned by the hot oil.**
5. **Quickly withdraw the plug and move your hands out of the way, but be careful not to drop the plug into the drain pan, as fishing it out can be an unpleasant mess. Allow all the old oil to drain completely into the pan, then inspect the drain plug gasket and replace it if necessary.**
6. **Install and carefully tighten the drain plug. Be careful not to overtighten the drain plug, otherwise you'll be buying a new pan or a trick replacement plug for stripped threads.**



Loosen and remove the oil drain plug

Having the engine at normal operating temperature will promote complete draining of the engine oil

7. **Move the drain pan under the engine oil filter. Use a strap-type or cap-type filter wrench to loosen the oil filter. Cover your hand with a rag and spin the filter off by hand; turn it slowly. Keep in mind that it's holding about one quart of dirty, hot oil.**



Remove the oil filter using a strap-type filter wrench

8. **Empty the oil filter into the drain pan and properly dispose of the filter.**
9. **Wipe the engine filter mount clean with a lint-free rag. Coat the rubber gasket on the new oil filter with clean engine oil, applying it with a finger. Carefully start the filter onto the threaded engine mount, by hand. When the filter touches the adapter surface, give it another $^{1}/_{2}$-1 turn (no more, or you'll squash the gasket and it will leak).**
10. **Lower the vehicle to the ground. Refill the crankcase to specification with the proper grade and type motor oil. Install the filler cap and start the engine. Allow the engine to idle and check for oil leaks. Shut off the engine, wait several minutes,**

then check the oil level with the dipstick. The oil level will drop as the filter fills up with oil. Add oil to the proper dipstick level.

Remove the oil filler cap located on the valve cover

Refill the crankcase with the proper grade and capacity of engine oil

When you have finished this job, you will notice that you now possess four or five quarts of dirty oil. Pour it into plastic jugs, such as clean milk or antifreeze containers. Then, locate a service station or automotive parts store where you can pour it into their used oil tank for recycling.

WARNING

Pouring used motor oil into a storm drain not only pollutes the environment, it violates Federal law. Dispose of waste oil properly.

Manual Transaxle

FLUID RECOMMENDATIONS AND LEVEL CHECK

Each time the engine oil is changed, the fluid level of the transaxle should be checked. The car must be resting on level ground or supported on jackstands (front and back) evenly. To check the fluid, remove the filler plug, located on the upper front (driver's side) of the transaxle with a $^{3}/_{8}$ in. (10mm) extension and ratchet.

Checking the manual transaxle fluid-early model 2.5L shown

The filler plug has a hex head; do not mistake any other bolts for the filler plug. Do not overfill the transaxle. The oil level should be even with the edge of the filler hole or within $^{1}/_{4}$ in. (6mm) of the hole. If the oil is low, add Motorcraft Type F or Dexron®II automatic transmission fluid.

Automatic Transaxle

FLUID RECOMMENDATIONS AND LEVEL CHECK

A dipstick is provided in the engine compartment to check the level of the automatic transaxle. Check the Maintenance Component Location charts at the end of this section for the dipstick location on your vehicle. Be sure the car is on level ground and that the car's engine and transaxle have reached normal operating temperatures.

1. **Start the engine, set the parking brake, and put the transaxle selector lever in the PARK position.**
2. **Move the selector lever through all the positions and return to the PARK position. DO NOT TURN OFF THE ENGINE DURING THE FLUID LEVEL CHECK.**
3. **Clean all dirt from the dipstick cap before removing the dipstick. Remove the dipstick and wipe clean.**
4. **Reinsert the dipstick making sure it is fully seated. Pull the dipstick out of the tube**

and check the fluid level. The fluid level should be between the FULL and ADD marks.

5. **If necessary, add enough fluid through the dipstick tube/filler to bring the level to the FULL mark on the dipstick. Use Dexron®II or Mercon® fluid in the ATX 3-speed transaxle, AXOD and AXOD-E overdrive transaxles.**

Do NOT overfill the transaxle. Doing so can cause damage to the transaxle. Make sure the dipstick is fully seated. If by chance you overfill the transaxle, thread a small piece of rubber vacuum hose into the dipstick tube until it hits the bottom, then withdraw the excess fluid using a large, clean turkey baster or equivalent.

DRAIN AND REFILL

In normal service it should not be necessary or required to drain and refill the automatic transaxle. However, under severe operation or dusty conditions, the fluid should be changed every 20 months or 20,000 miles (32,000 km).

1. **Raise the car and safely support it on jackstands. If the pan is equipped with a drain plug, drain the fluid into a suitable container.**
2. **If the pan does not have a drain plug, place a suitable drain pan underneath the transaxle oil pan. Loosen the oil pan mounting bolts and allow the fluid to drain until it reaches the level of the pan flange. Remove the attaching bolts, leaving one end attached so that the pan will tip and the rest of the fluid will drain.**
3. **Remove the oil pan and thoroughly clean it. Remove the old gasket. Make sure that the gasket mounting surfaces are clean.**
4. **Unfasten the transaxle filter screen retaining bolt and remove the screen.**
5. **Install a new filter screen and O-ring. Place a new gasket on the pan and install the pan to the transaxle. Torque the transaxle pan to 15-19 ft. lbs. (20-26 Nm).**
6. **Fill the transaxle to the correct level. Remove the jackstands and lower the car to the ground.**

Cooling System

CAUTION

NEVER remove the radiator cap under any conditions while the engine is hot! Failure to follow these instructions could result in damage to the coolingsystem and engine, as well as personal injury. To avoid having scalding hotcoolant or steam blow out of the radiator, use extreme care whenever you areremoving the radiator cap. Wait until the engine has cooled, then wrap a thickcloth around the radiator cap and turn it slowly to the first stop. Step backwhile the pressure is released from the cooling system. When you are sure thepressure has been released, press down on the radiator cap (still holding the cloth in position), then turn and remove the radiator cap.

On vehicles equipped with a coolant recovery reservoir, removal of theradiator cap is normally not required, except for when draining the system orinspecting the radiator and cap.

Servicing the cooling system can be a dangerous matter unless the proper precautions are observed. It is best to check the coolant level in the radiator

when the engine is cold. All vehicles covered by this manual should be equipped with a coolant recovery reservoir. If the coolant level is at or near the FULL COLD line (engine cold) or the FULL HOT line (engine hot), the level is satisfactory. Always be certain that the filler caps on both the radiator and the recovery reservoir are closed tightly.

If the coolant level is found to be low, add a 50/50 mixture of coolant that meets Ford specifications, such as Ford Cooling System Fluid, Prestone® II or other approved coolant and clean water. Coolant may be added either through the filler neck on the radiator or directly into the recovery reservoir.

CAUTION

NEVER add coolant to a hot engine unless it is running. If the engine is notrunning, you run the risk of cracking the engine block.

It is wise to pressure check the cooling system at least once a year. If the coolant level is chronically low or rusty, the system should be thoroughly checked for leaks.

At least once every two years or 30,000 miles (48,000 km), the engine and radiator should be inspected, flushed and refilled with fresh coolant. If the coolant is left in the system too long, it loses its ability to prevent rust corrosion. If the coolant has too much water, it won't protect against freezing.

The pressure cap should be examined for signs of age or deterioration. The fan belt and other drive belts should be inspected and adjusted to the proper tension.

Hose clamps should be tightened, and soft or cracked hoses replaced. Damp spots, or accumulations of rust or dye near the hoses, water pump or other areas indicate possible leakage, which must be corrected before filling the system with fresh coolant.

FLUID RECOMMENDATIONS

This engine has an aluminum cylinder head and requires a corrosion inhibiting coolant formulation to avoid radiator damage. Use only a permanent type coolant that meets Ford Specifications such as Ford Cooling System Fluid, Prestone® II, or other approved coolants. Mix the coolant with clean water until a 50/50 solution is attained.

LEVEL CHECK

The cooling system of your car contains, among other items, a radiator and an expansion tank/recovery reservoir. When the engine is running heat is generated. The rise in temperature causes the coolant, in the radiator, to expand and builds up internal pressure. When a certain pressure is reached, a pressure relief valve in the radiator filler cap (pressure cap) is lifted from its seat and allows coolant to flow through the radiator filler neck, down a hose, and into the expansion reservoir.

When the system temperature and pressure are reduced in the radiator, the water in the expansion reservoir is siphoned back into the radiator.

On systems with a coolant recovery tank, maintain the coolant level between the

marks on the recovery reservoir.

If, for some reason, the vehicle does not have a coolant recovery tank,maintain the coolant level 1-2 in. (25-51mm) below the bottom of the radiatorfiller neck when the engine is cold and 1 in. (25mm) below the bottom of thefiller neck when the engine is hot.

DRAIN AND REFILL

For best protection against freezing and overheating, maintain an approximate 50% water and 50% ethylene glycol (or other suitable) antifreeze mixture in the cooling system. Do not mix different brands of antifreeze to avoid possible chemical damage to the cooling system.

Avoid using water that is known to have a high alkaline content or is very hard, except in emergency situations. Drain and flush the cooling system as soon as possible after using such water.

CAUTION

Cover the radiator cap with a thick cloth before removing it from a radiatorin a vehicle that is hot. Turn the cap counterclockwise slowly until pressurecan be heard escaping. Allow all pressure to escape from the radiator beforecompletely removing the radiator cap. It is best to allow the engine to cool,if possible, before removing the radiator cap.

NEVER add cold water to an overheated engine while the engine is notrunning.

After filling the radiator, run the engine until it reaches normal operating temperature, to make sure that the thermostat has opened and all the air is bled from the system.

CAUTION

The cooling fan motor is controlled by a temperature switch. The fan maycome on and run even when the engine is off and will continue to run until theengine has cooled to a predetermined level. Take care not to get your fingers,etc. close to the fan blades.

Draining Coolant

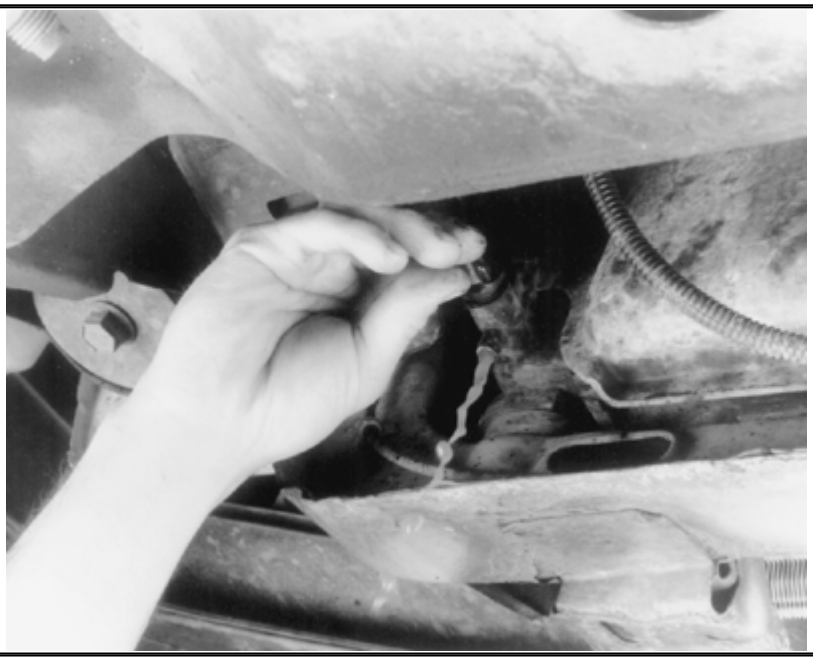
CAUTION

When draining the coolant, keep in mind that cats and dogs are attracted byethylene glycol antifreeze, and are quite likely to drink any that is left inan uncovered container or in puddles on the ground. This will prove fatal insufficient quantity. Always drain the coolant into a sealable container.Coolant should be reused unless it is contaminated or several years old.

To drain the coolant, connect a hose approximately 18 in. (46cm) long, with an inside diameter of $^{3}/_{8}$ in. (9.5mm), to the nipple on the drain valve located on the

bottom of the radiator. With the engine cool, set the heater control to the maximum heat position. Remove the radiator cap and open the drain valve or loosen the Allen® head plug $^{3}/_{16}$ in. (5mm), allowing the coolant to drain into a suitable container. When all of the coolant is drained, remove the hose and close the drain valve or Allen® head plug.

Open the drain valve located on the bottom of the radiator



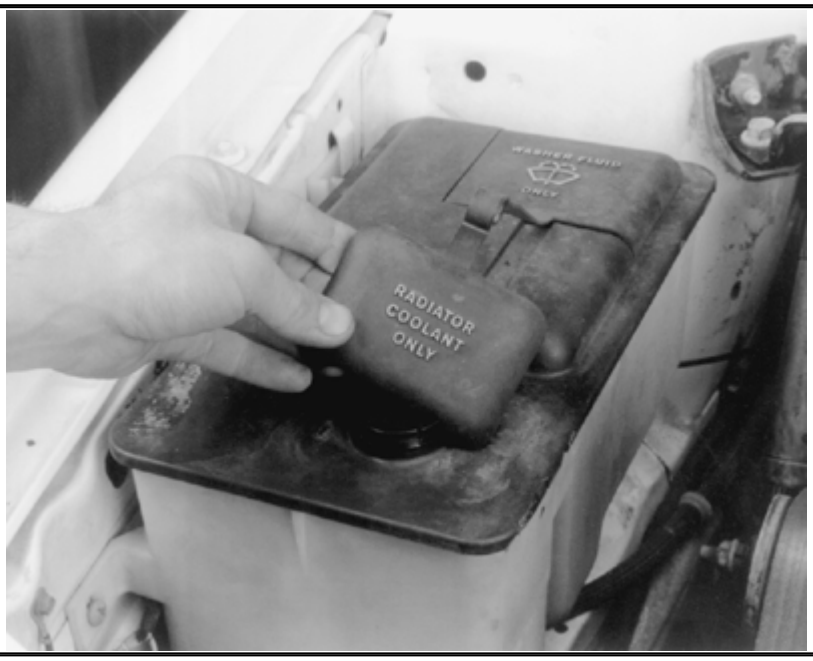
Attaching a small hose to the draincock will help direct the flow of coolant into the drain pan, thereby reducing the mess

Replacing Coolant

If there is any evidence of rust or scaling in the cooling system, the system should be flushed thoroughly before refilling. Refer to the flushing/cleaning procedure, later in this section. With the engine OFF and COOL:

1. **Using a funnel, add the designated quantity of a 50% coolant and 50% water solution to the radiator.**

2. **Reinstall the radiator cap to the fully installed position, then back it off to the first stop.**
3. **Start and idle the engine until the upper radiator hose is warm.**
4. **Immediately shut off the engine. Cautiously remove the radiator cap and add water until the radiator is full. Reinstall the radiator cap securely.**



All vehicles covered by this manual should be equipped with a coolant reservoir

Add coolant to the correct marks on the reservoir

5. **Add coolant to the ADD mark on the reservoir, then fill to the FULL HOT mark with water.**

Check the coolant level to make sure it is sufficient

6. **Check the system for leaks and return the heater temperature control to its normal position.**

RADIATOR CAP INSPECTION

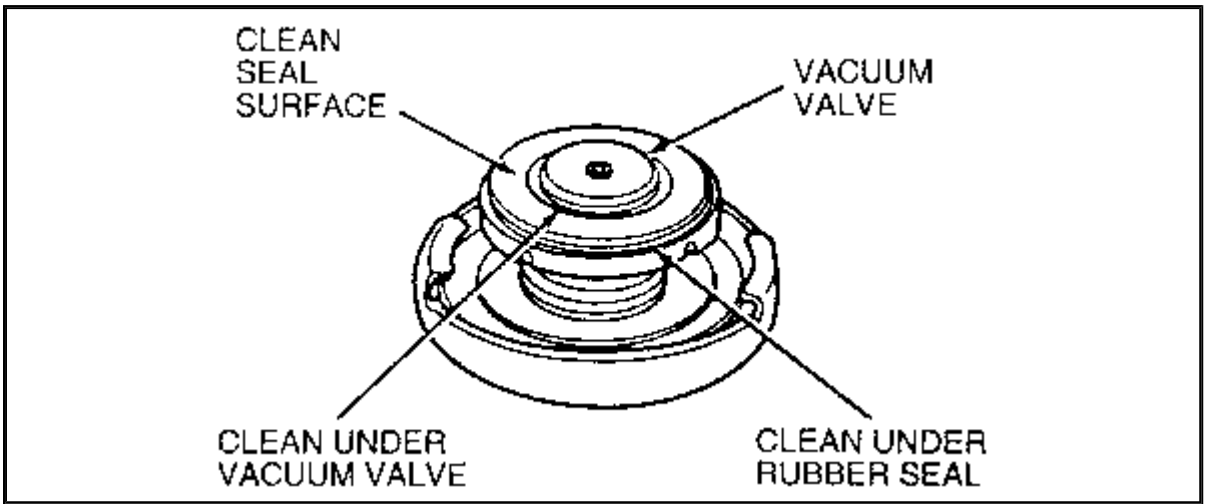
Allow the engine to cool sufficiently before attempting to remove the radiator cap. Use a rag to cover the cap, then remove by pressing down and turning counterclockwise to the first stop. If any hissing is noted (indicating the release of pressure), wait until the hissing stops completely, then press down again and turn counterclockwise until the cap can be removed.

Allow the engine to cool before attempting to remove the radiator cap. DO NOT remove the cap while the engine is hot!

CAUTION

DO NOT attempt to remove the radiator cap while the engine is hot. Severepersonal injury from steam burns can result.

Check the condition of the radiator cap gasket and seal inside the cap. The radiator cap is designed to seal the cooling system under normal operating conditions which allow the buildup of a certain amount of pressure (this pressure rating is stamped or printed on the cap). The pressure in the system raises the boiling point of the coolant to help prevent overheating. If the radiator cap does not seal properly, the boiling point of the coolant is lowered and overheating will likely occur. If the cap must be replaced, purchase a new cap according to the pressure rating which is specified for your vehicle.



Check the condition of the radiator cap gasket, and the seal inside of the cap

Prior to installing the radiator cap, inspect and clean the filler neck. If you are reusing the old cap, clean it thoroughly with clear water. After installing the cap, make sure the arrows align with the overflow hose.

FLUSHING AND CLEANING THE SYSTEM

1. **Drain the cooling system, including the radiator and engine block. Close the drain valve/plugs, then refill the system with water at the radiator fill neck.**
2. **Allow the engine to idle for about 5 minutes. Turn the engine off. Drain the cooling system again.**
3. **Repeat the above steps until nearly clear water is drained from the radiator. Allow the remaining water to drain and then close the draincock.**
4. **Disconnect the overflow hose from the radiator filler neck. Remove the coolant recovery reservoir from the fender apron and empty the fluid.**
5. **Flush the reservoir with clean water. Reinstall the reservoir.**
6. **Fill the radiator and cooling system with the proper concentration of coolant and water. Don't forget to also fill the reservoir to its proper level.**

Brake Master Cylinder

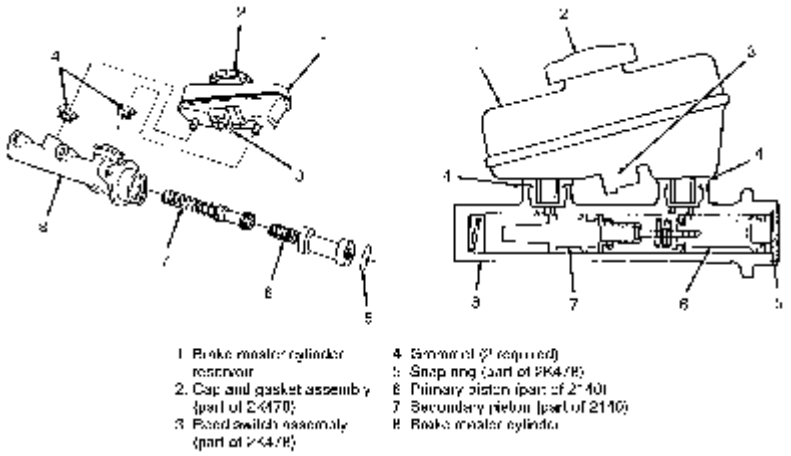
FLUID RECOMMENDATIONS

When adding to or refilling the master cylinder, be sure to use Heavy Duty (H. D.)

brake fluid that meets or exceeds Ford Motor Company specification ESA-M6C25-A, such as Motorcraft C6AZ-19542-AA or BA or equivalent.

CAUTION

Brake fluid damages paint. It also absorbs moisture from the air; never leave a container or the master cylinder uncovered any longer than necessary. All parts in contact with the brake fluid (master cylinder, hoses, plunger assemblies, etc.) must be kept clean, since any contamination of the brake fluid can adversely affect braking performance.



Brake master cylinder components-sedan

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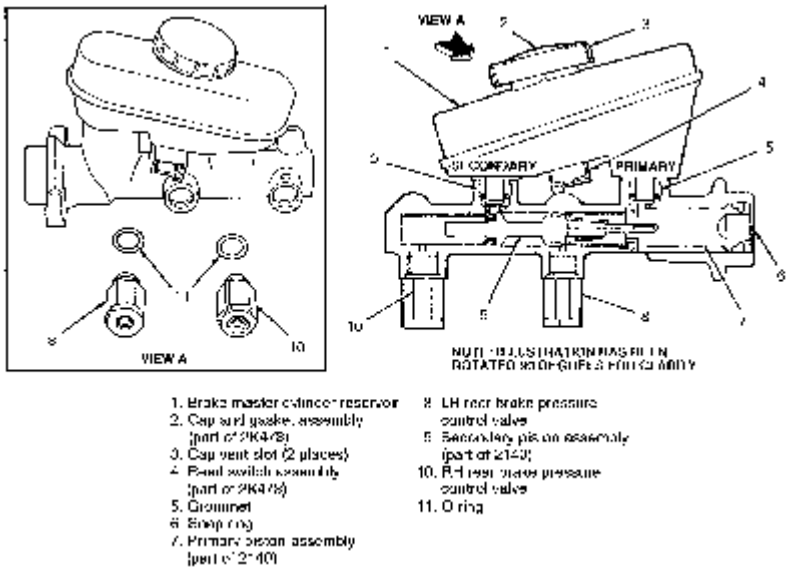

Brake master cylinder components-station wagon

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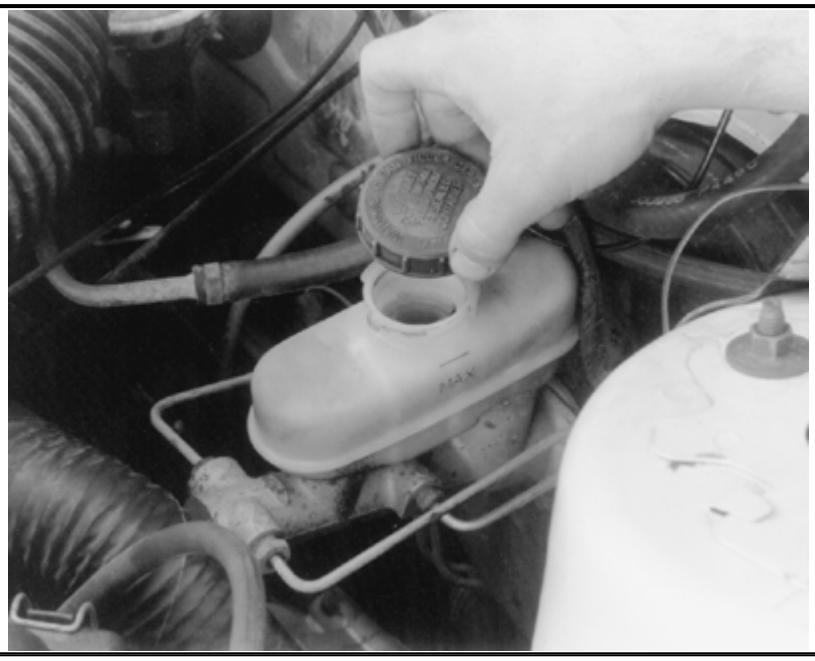
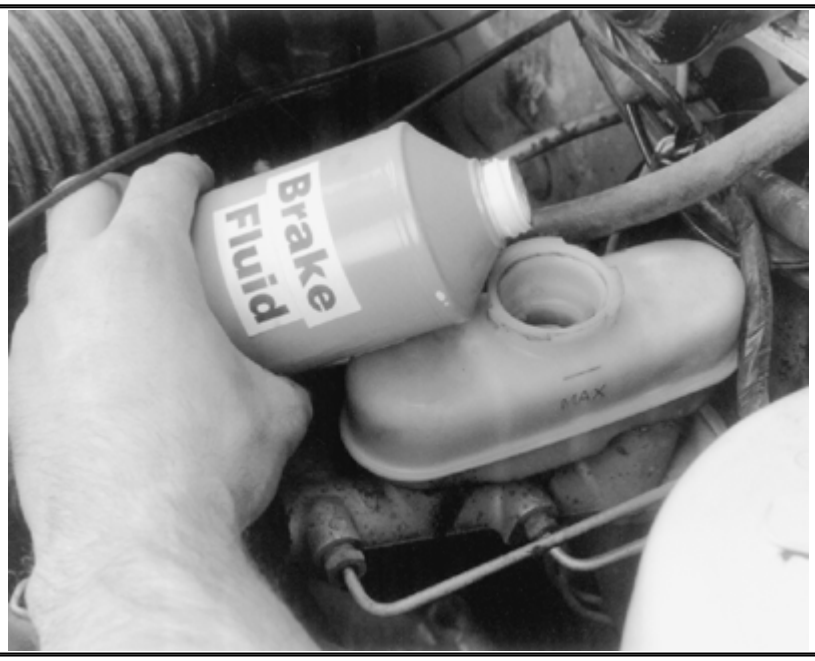
LEVEL CHECK

It should be obvious how important the brake system is to the safe operation of your vehicle. Maintaining the correct level of clean brake fluid is critical for the

proper operation of your vehicle. A low fluid level indicates a need for service (there may be a leak in the system or the brake pads may just be worn and in need of replacement). In any case, the brake fluid level should be inspected at least during every oil change, but more often is desirable. Every time you open the hood is a good time to glance at the master cylinder reservoir.



Before taking the cap off of the master cylinder, make sure all dirt and/or debris is cleaned off



When adding brake fluid to the master cylinder, use only clean, fresh fluid from a sealed container

The brake master cylinder is located under the hood, on the left side (driver's side) of the firewall. Check the Maintenance Component Location charts, at the end of this section, for the exact location on your vehicle. Before removing the master cylinder reservoir cap, make sure the vehicle is resting on level ground and clean all the dirt away from the top of the master cylinder. Remove the master cylinder cap.

Some vehicles covered by this manual are equipped with and Anti-lock Brake System (ABS). To check the fluid level in the master cylinder reservoir of a vehicle equipped with ABS:

1. **Turn the ignition OFF.**
2. **Pump the brake pedal at least 20 times or until the pedal feel becomes hard, then turn the ignition key to the ON position.**
3. **Wait at least 60 seconds to be sure that the fluid level is stabilized.**
4. **The fluid level should be at the MAX line as indicated on the side of the reservoir.**

The fluid level will lower somewhat due to normal brake lining wear. However, if the level is less than half the volume of the reservoir, check the brake system for leaks. Leaks in the brake hydraulic system most commonly occur at the rear wheel cylinders or at the front calipers. Leaks at the brake lines or the master cylinder can also be the cause of lost brake fluid. If a leak is detected, repair it and bleed the system, as described in *Section 9* .

5. **If the level is low, remove the cap and add Heavy Duty Brake Fluid (Dot 3) until the MAX line is reached. The level of the brake fluid should be at the MAX line embossed on the translucent plastic reservoir of the master cylinder.**

If the master cylinder reservoir has a cap with an expanding rubber diaphragm, be sure to push the diaphragm up into the cap before installing the cap.

Power Steering Pump

FLUID RECOMMENDATIONS

Use Ford Motor Company's premium power steering fluid E6AZ-19582-AA (ESW-M2C33-F) or equivalent.

LEVEL CHECK

You should check the level of the power steering fluid at least twice a year. You may check the fluid when the engine is either hot or cold.

To check the fluid when the engine is hot:

1. **Start the engine and let it run until it reaches normal operating temperature.**
2. **While the engine is idling, turn the steering wheel all the way to the right and then to the left several times. Turn the engine OFF.**
3. **Open the hood and remove the power steering pump dipstick located on the right side (passenger side) near the front of the engine.**
4. **Wipe the dipstick clean and reinsert it into the pump reservoir. Withdraw the dipstick and note the fluid level. The level must show in the FULL HOT range on the dipstick.**
5. **If the power steering fluid is low, add the proper fluid in small amounts, continuously checking the level, until you reach the FULL HOT range, but do not overfill. Remove any excess fluid with a clean suction bulb or equivalent.**

Make sure the cap is clean before removing it; this will prevent dirt from contaminating the system

If checking the fluid when the engine is hot, it should be within the proper marks of the FULL HOT side of the dipstick

Power steering dipstick fluid level marks for checking the fluid when the engine is cold

Add power steering fluid in small amounts, but do not overfill

If you check the power steering fluid when the engine is cold, make sure that the fluid level reaches the FULL COLD range on the dipstick. However, the reading will only be accurate if the fluid temperature is approximately 50-85°F (10-30°C).

Steering Rack

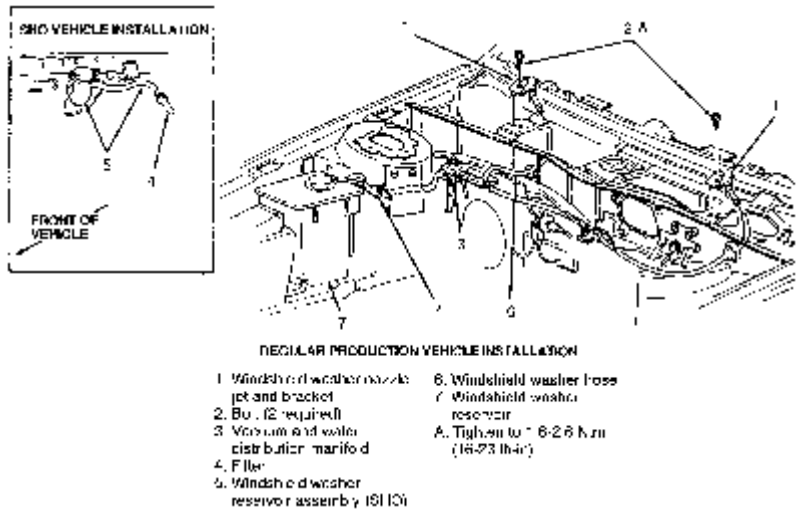
FLUID RECOMMENDATIONS

Use Ford Motor Company's premium power steering fluid E6AZ-19582-AA (ESW-M2C33-F) or equivalent.

Windshield Washer Pump

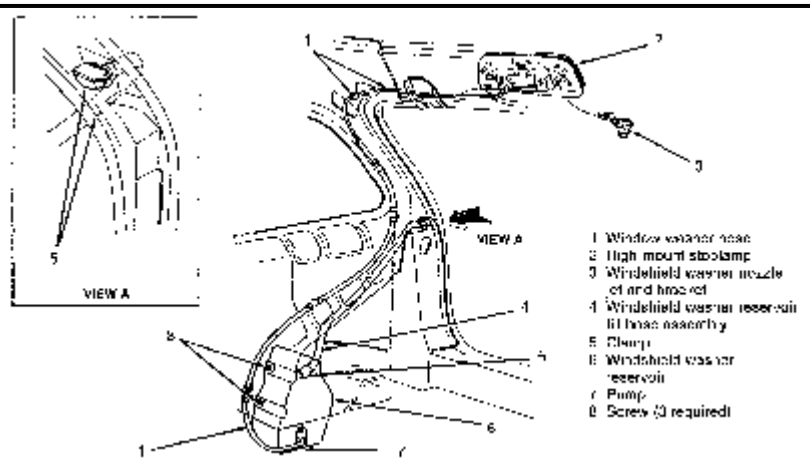
FLUID RECOMMENDATIONS AND LEVEL CHECK

The windshield washer pump fluid reservoir is a plastic container usually found on the right (passenger) side of the engine compartment. If equipped, the rear window washer pump fluid reservoir is located under the rear right-hand quarter panel and the fill cap is found outside, near the liftgate opening. The reservoir should be filled to the top of the container using a washer fluid solution that can be found at most auto parts stores. Do NOT further dilute the solution (unless it is sold as a concentrate; if so, follow the manufacturer's instructions), as this will adversely affect its ability to keep from freezing at low temperatures. Also, never place another fluid, such as ethylene glycol antifreeze in the reservoir, as other fluids could damage pump seals.



Windshield washer reservoir location and components-late model sedan shown; early model similar

Click to enlarge



Windshield washer reservoir location and components-station wagon shown

Click to enlarge

Body Maintenance

Regular body maintenance preserves the vehicle's appearance during the life of the vehicle. When washing or waxing the exterior of the vehicle, be sure to use

products that meet or exceed Ford Motor Company's specifications. Replace all damaged weatherstrips as needed. Replace all chipped or cracked glass as needed. Drain holes are located under each rocker panel, quarter panel and door; these holes should be kept open to allow water to drain.

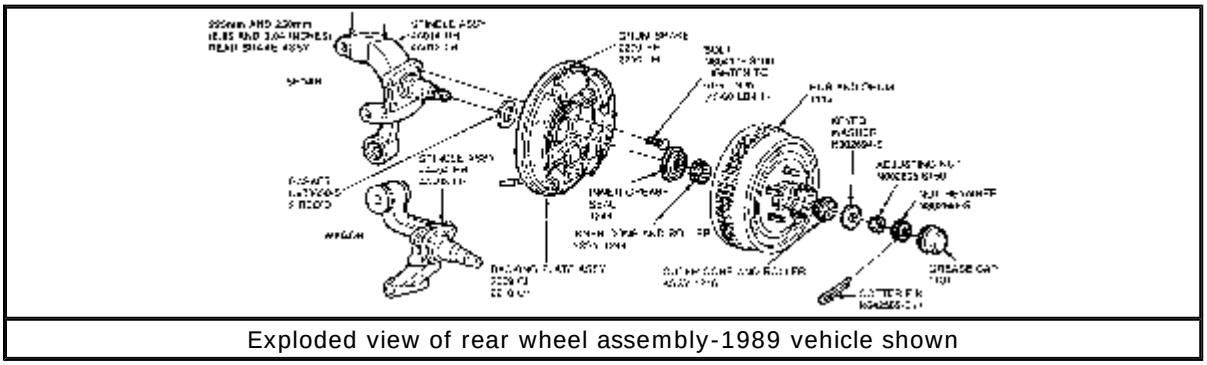
Rear Wheel Bearings

These procedures are for rear wheel bearings only. For informationregarding front wheel bearings, please refer to *Section7* of this manual.

CAUTION

When servicing the rear wheel bearings, use caution because brake shoes maycontain asbestos, which has been determined to be a cancer causing agent. NEVERclean the brake surfaces with compressed air! Avoid inhaling any dust from anybrake surface! When cleaning brake surfaces, use a commercially available brakecleaning fluid.

Once every 30,000 miles (48,000 km), clean and repack the rear wheel bearings using Long-Life Lubricant, Ford part no. C1AZ-19590-B, or equivalent.



Exploded view of rear wheel assembly-1989 vehicle shown

Click to enlarge

Sodium-based grease is not compatible with lithium-based grease. Read thepackage labels and be careful not to mix the two types. If there is any doubt asto the type of grease used, completely clean the old grease from the bearingand hub before repacking.

Before handling the bearings, there are a few things that you should remember to do and not to do.

Remember to DO the following:

- **Remove all outside dirt from the housing before exposing the bearing.**
- **Treat a used bearing as gently as you would a new one.**
- **Work with clean tools in clean surroundings.**
- **Use clean, dry canvas gloves, or at least clean, dry hands.**
- **Use clean solvents and flushing fluids.**
- **Use clean paper when laying out the bearings to dry.**

- **Protect disassembled bearings from rust and dirt by covering them up.**
- **Use clean rags to wipe bearings.**
- **Keep the bearings in oil-proof paper when they are to be stored or are not in use.**
- **Clean the inside of the housing before replacing the bearing.**

Also observe the following:

- **Do NOT work in dirty surroundings.**
- **Do NOT use dirty, chipped or damaged tools.**
- **Do NOT work on wooden work benches or use wooden mallets.**
- **Do NOT handle bearings with dirty or moist hands.**
- **Do NOT use gasoline for cleaning; use a safe solvent.**
- **Do NOT spin-dry bearings with compressed air as they will be damaged.**
- **Do NOT spin dirty bearings.**
- **Do NOT use cotton waste or dirty cloths to wipe bearings.**
- **Do NOT scratch or nick bearing surfaces.**
- **Do NOT allow the bearing to come in contact with dirt or rust at any time.**

ADJUSTMENT

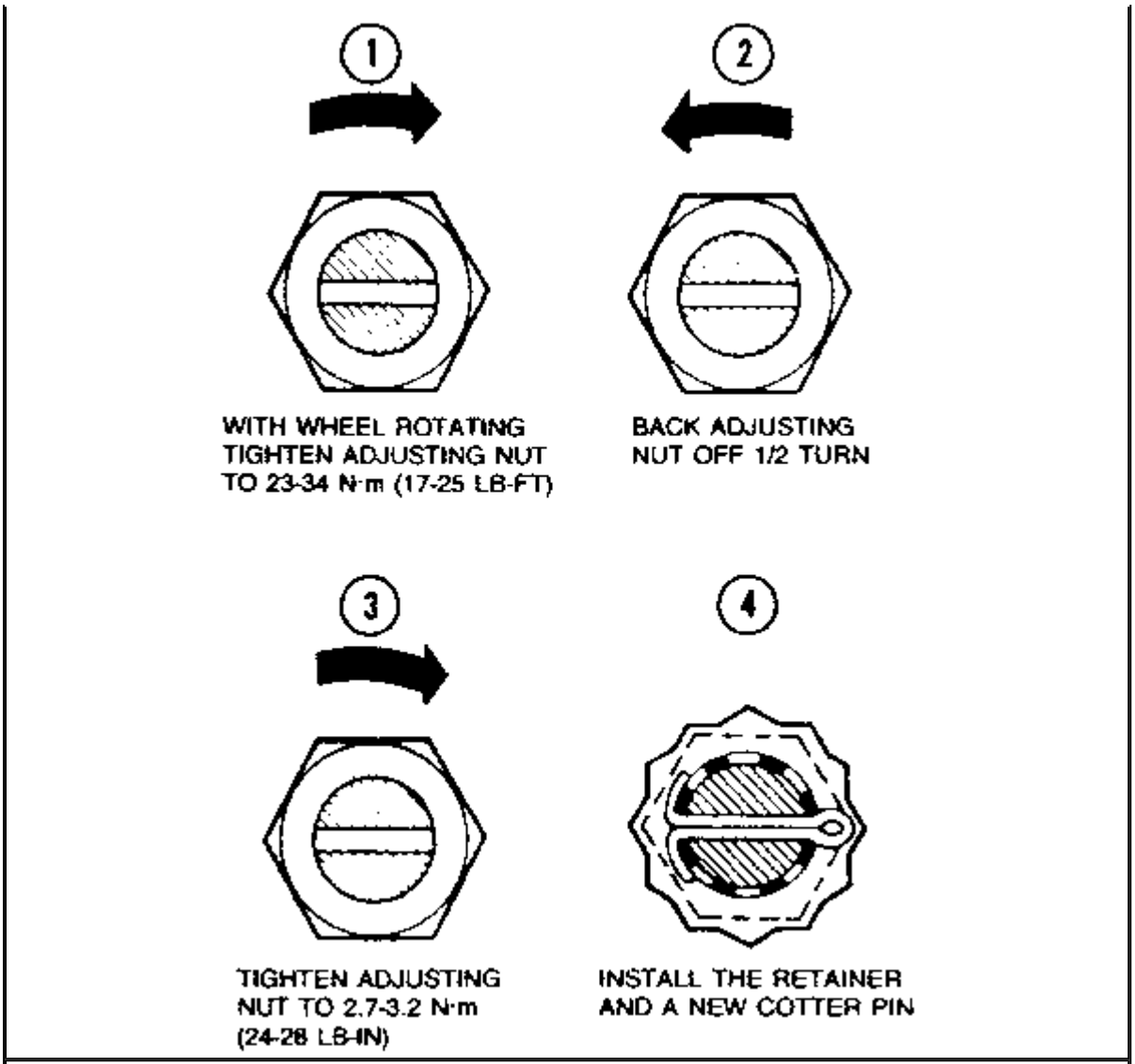
The following procedure applies only to 1986-89 vehicles. Adjustment is not possible on 1990-95 vehicles. This procedure should be performed whenever the wheel is excessively loose on the spindle or it does not rotate freely.

The rear wheel uses a tapered roller bearing which may feel loose whenproperly adjusted; this condition should be considered normal.

1. **Remove the wheel cover or ornament/nut cover. Loosen the lug nuts if the wheel must be removed.**

If the vehicle is equipped with styled steel or aluminumwheels, the wheel/tire assembly must be removed to access the dust cover forremoval.

2. **Raise and safely support the rear of the vehicle until the tires clear the floor.**
3. **If necessary, remove the wheel.**
4. **Remove the hub grease cap, taking care not to damage it.**
5. **Remove the cotter pin and the nut retainer. Discard the cotter pin.**
6. **Back off the hub nut one full turn.**



Wheel bearing adjustment-1986-89 vehicles ONLY

Click to enlarge

7. Tighten the adjusting nut to 17-25 ft. lbs. (23-24 Nm) while rotating the hub and drum assembly to seat the bearings. Back off the adjusting nut $^{1}/_{2}$ turn, then retighten it to 24-28 inch lbs. (2.7-3.2 Nm).
8. Position the nut retainer over the adjusting nut so the slots are in line with the cotter pin hole, without rotating the adjusting nut.
9. Install a new cotter pin and bend the ends around the retainer flange.
10. Check the hub rotation. If the hub rotates freely, install the grease cap. If not, check the bearings for damage and replace, as necessary.
11. If applicable, install the wheel and tire assembly, as well as the wheel cover/ornament, then lower the vehicle.

REMOVAL, PACKING & INSTALLATION

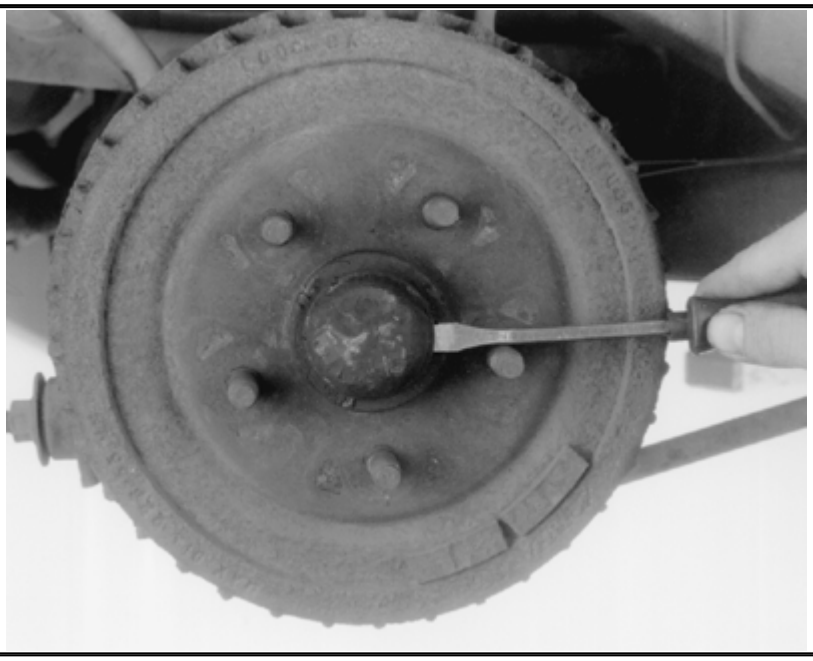
With Drum Brakes

1986-89 VEHICLES

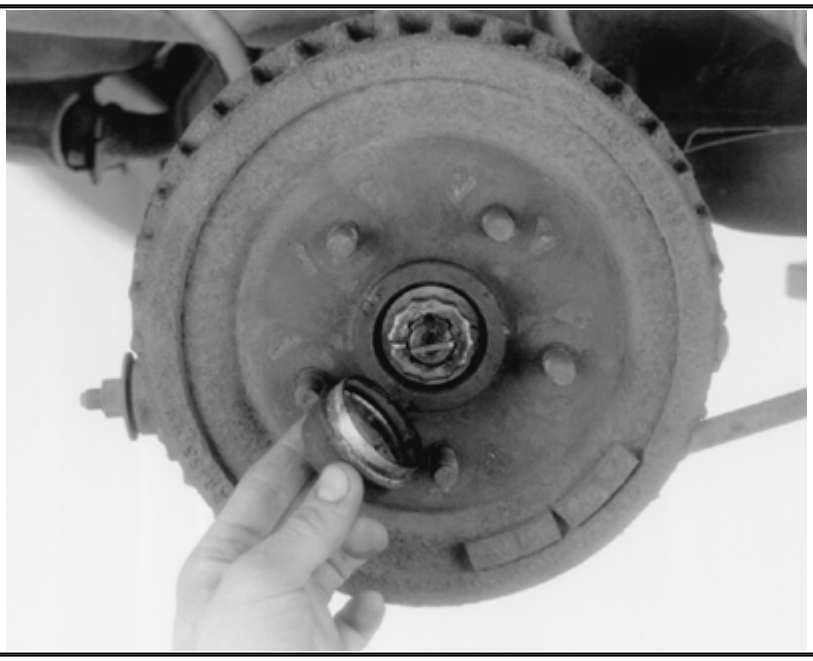
1. Raise the vehicle and support it safely on jackstands. Remove the wheel from the

hub and drum.

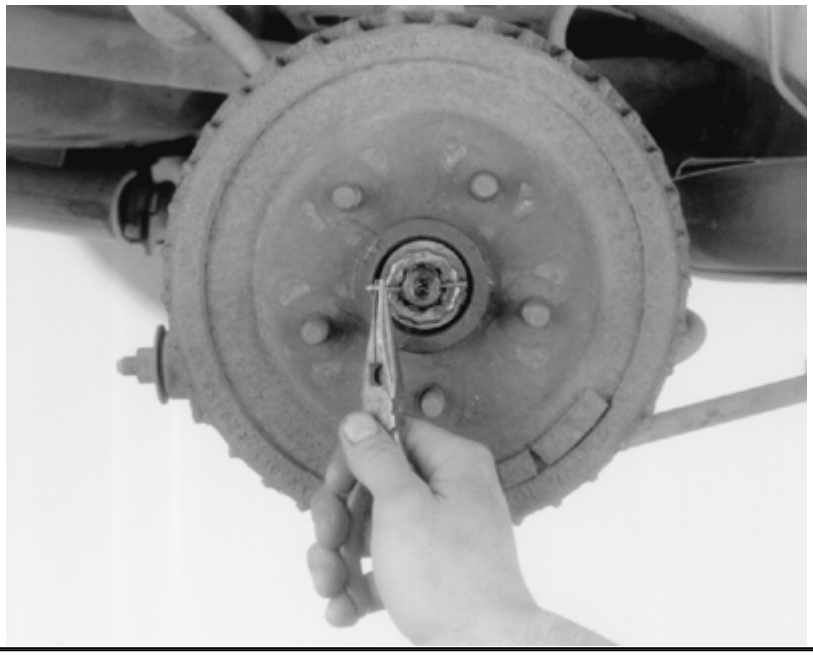
2. **Remove the grease cap from the hub. Remove the cotter pin, nut retainer, adjusting nut and keyed flat washer from the spindle. Discard the cotter pin.**



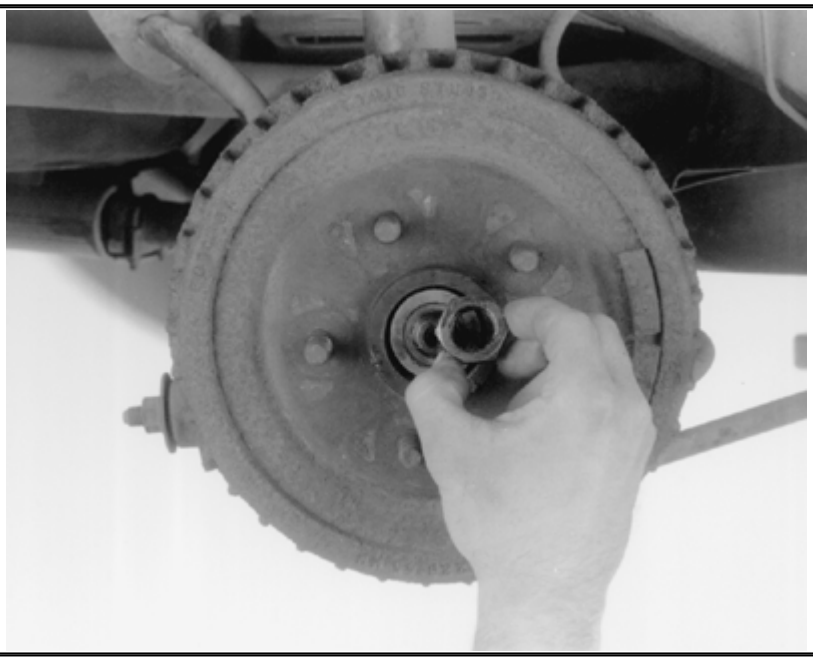
Pry the grease cap from the hub. Be careful not to distort or damage the flange



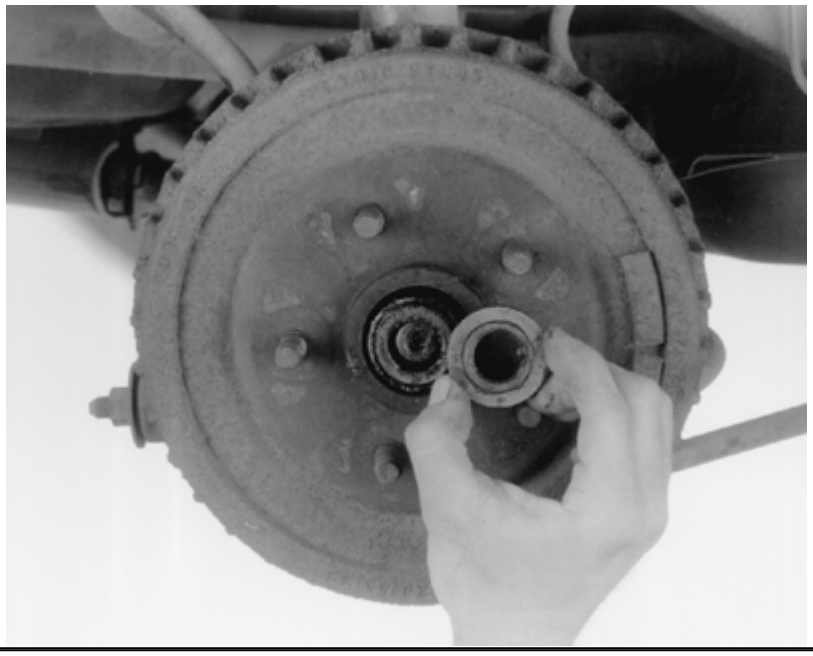
After removing the grease cap, unbend the cotter pin



Grasp the cotter pin with needle-nose pliers and pull or pry it free of the spindle. Discard the cotter pin and replace it with a new one during installation

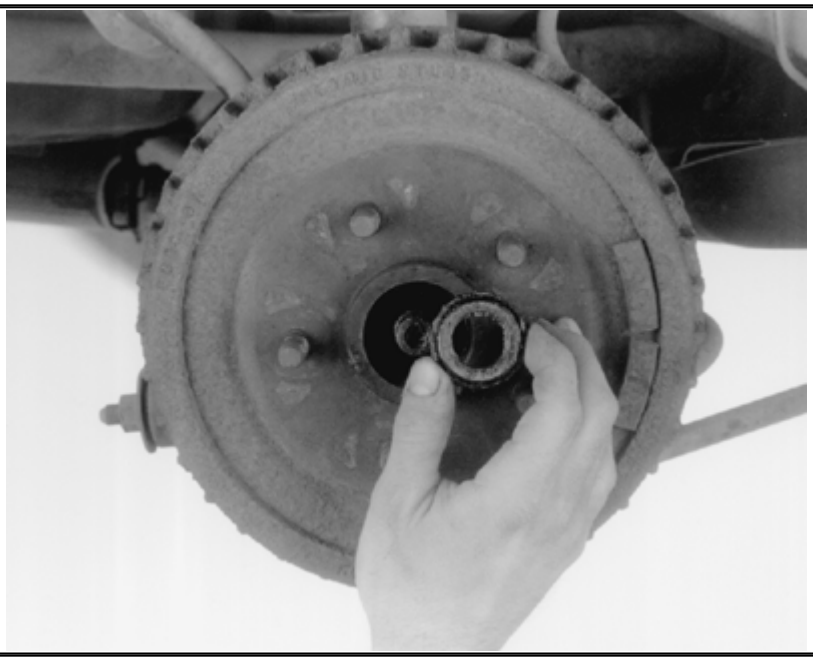


Remove the adjusting nut from the spindle

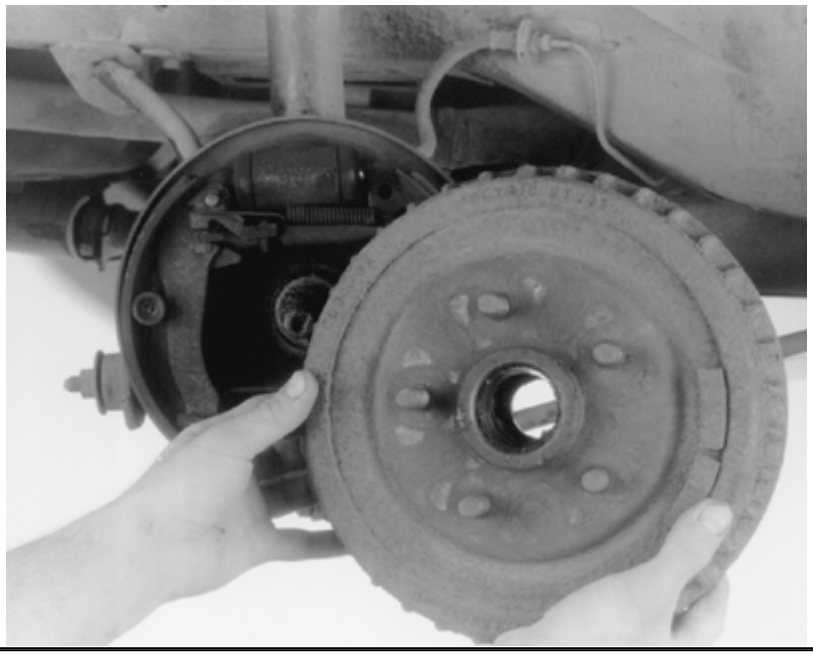


Remove the keyed washer from the spindle

3. **Pull the hub and drum assembly off the spindle, being careful not to drop the outer bearing assembly.**
4. **Remove the outer bearing assembly.**

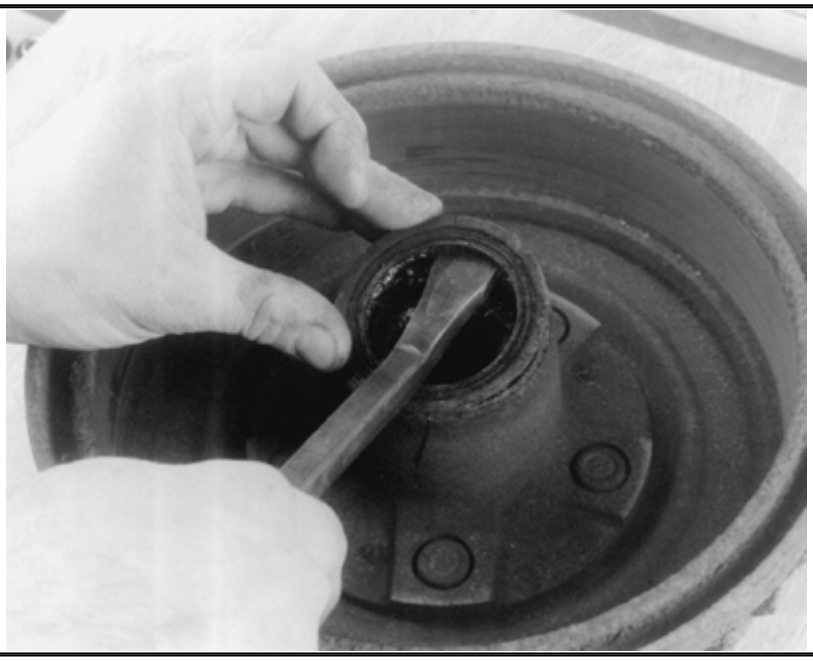


Remove the outer bearing assembly. Note that this can be done with the hub and drum on or off the vehicle



Remove the hub and drum assembly from the spindle

5. **Using seal remover tool 1175-AC or equivalent, remove and discard the grease seal. Remove the inner bearing assembly from the hub.**



Removing the grease seal; discard the seal after removing. Note that the preferred method for removing the seal is with a proper seal remover tool

With the seal removed, the inner bearing may be removed from the hub

6. **Wipe all the lubricant from the spindle and inside of the hub. Cover the spindle with a clean cloth, then vacuum all loose dust and dirt from the brake assembly. Carefully remove the cloth to prevent dirt from falling on the spindle.**
7. **Clean both bearing assemblies and cups using a suitable solvent. Inspect the bearing assemblies and cups for excessive wear, scratches, pits or other damage and replace as necessary.**
8. **If the cups are to be replaced, remove them with impact slide hammer T50T-100-A and bearing cup puller T77F-1102-A, or equivalent.**

To install:

9. **If the inner and outer bearing cups were removed, install the replacement cups using driver handle T80T-4000-W as well as bearing cup replacers T73T-1217-A and T77F-1217-A, or equivalent. Support the drum hub on a block of wood to prevent damage. Make sure the cups are properly seated in the hub.**

Do NOT use the cone and roller assembly to installthe cups. This will result in damage to the bearing cup as well as the cone androller assembly.

10. **Make sure all of the spindle and bearing surfaces are clean.**
11. **Using a bearing packer, pack the bearing assemblies with a suitable wheel bearing grease. If a packer is not available, work in as much grease as possible between the rollers and cages with your hands; also grease the cup surfaces.**

Allow all of the cleaning solvent to dry before repackingthe bearings. Do not spin-dry the bearings with air pressure.

12. **Install the inner bearing cone and roller assembly in the inner cup. Apply a light film of grease to the lips of a new grease seal and install the seal with rear hub seal replacer T56T-4676-B or equivalent. Make sure the retainer flange is seated all around.**

This is NOT the proper method for installing the grease seal, refer to the procedure for the proper tool to use when installing the seal

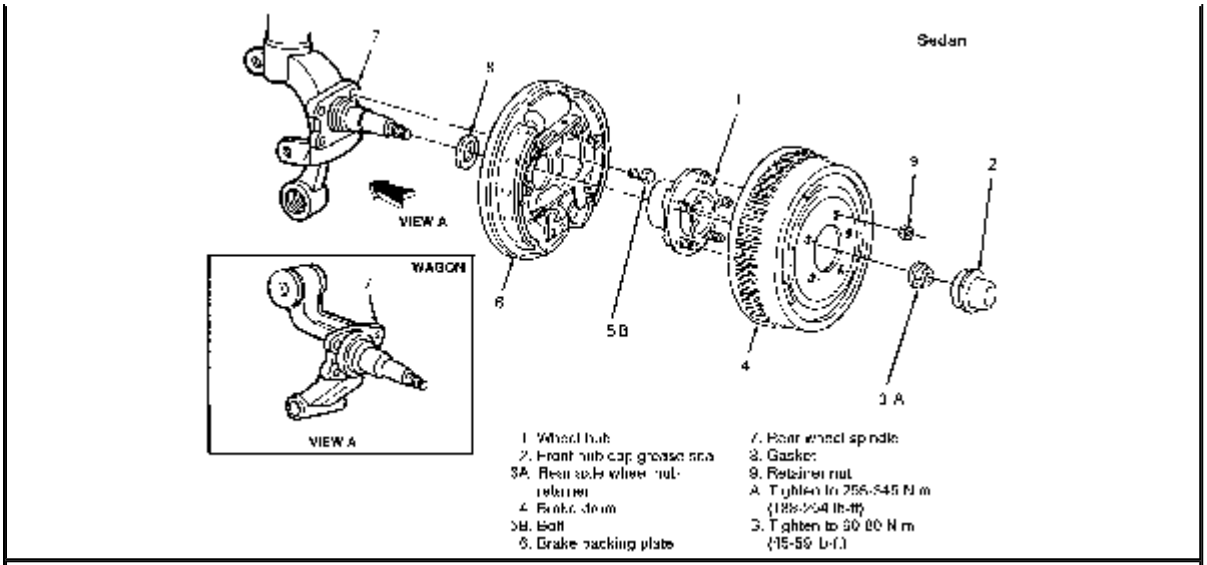
13. **Apply a light film of grease on the spindle shaft bearing surfaces. Install the hub and drum assembly on the spindle. Keep the hub centered on the spindle to prevent damage to the grease seal and spindle threads.**
14. **Install the outer bearing assembly and the keyed flat washer on the spindle.**
15. **Install the adjusting nut and adjust the wheel bearings, as previously described.**
16. **Install a new cotter pin, then install the grease cap.**

Replace the grease cap if there is corrosion on the innersurface of the cap.

17. **Place the wheel and tire on the drum, then install the lug nuts and tighten them alternately to draw the wheel evenly against the hub and drum.**
18. **Carefully lower the vehicle, then tighten the lug nuts (with a hand tool) to 85-105 ft. lbs. (115-142 Nm). Do NOT use power tools to tighten the lug nuts. Install the wheelcover.**

1990-95 VEHICLES

1. **Loosen the rear wheel lug nuts.**
2. **Raise and safely support the vehicle on jackstands.**
3. **Remove the rear wheel and tire assembly.**
4. **Remove the two pushnuts retaining the brake drum to the hub, then remove the drum.**
5. **Remove and discard the hub cap grease seal from the rear hub assembly.**
6. **Remove the rear axle hub retaining nut, then discard the nut.**
7. **Remove the bearing and hub assembly from the rear wheel spindle.**



Exploded view of the rear wheel assembly-1990-95 vehicles with drum brakes

Click to enlarge

To install:

8. **Position the bearing and hub assembly onto the spindle.**
9. **Install a new rear axle wheel hub retaining nut, then tighten the nut to 188-254 ft. lbs. (255-345 Nm).**
10. **Using Coil Remover T89P-19623 or equivalent, install a new hub cap grease seal. Lightly tap on the tool until the seal is fully seated.**
11. **Install the brake drum onto the rear hub, then attach the two pushnuts that retain the brake drum.**
12. **Install the wheel and tire assembly, then carefully lower the vehicle.**

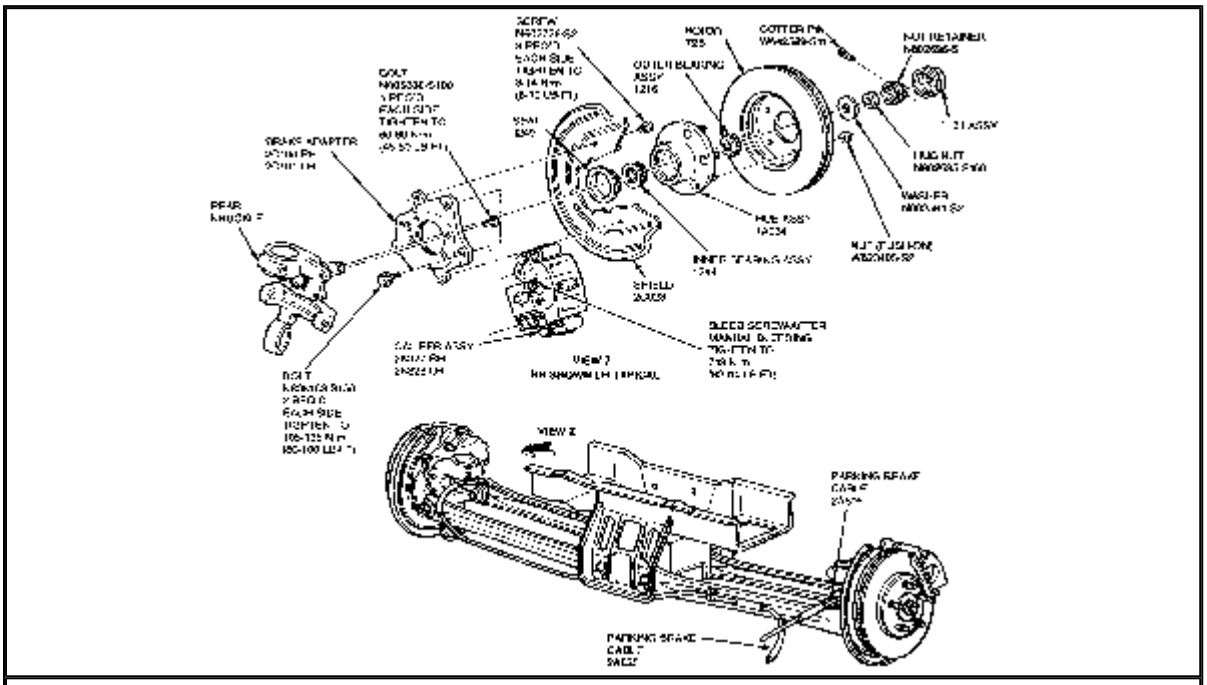
With Disc Brakes

1989 SHO

1. **Raise the vehicle and support it safely on jackstands. Remove the tire and wheel assembly from the hub.**
2. **Remove the brake caliper after removing the 2 bolts that attach the caliper support to the cast iron brake adapter. Do NOT remove the caliper pins from the caliper assembly. Lift the caliper off of the rotor and support it with a length of wire. Do not allow the caliper assembly to hang from the brake hose.**
3. **Remove the rotor from the hub by pulling it off the hub bolts. If the rotor is difficult to remove, strike the rotor sharply between the studs with a rubber or plastic hammer.**
4. **Remove the grease cap from the hub. Remove the cotter pin, nut retainer, adjusting nut and keyed flat washer from the spindle. Discard the cotter pin.**
5. **Pull the hub assembly off of the spindle. Remove the outer bearing assembly.**
6. **Using seal remover tool 1175AC or equivalent, remove and discard the grease seal. Remove the inner bearing assembly from the hub.**
7. **Wipe all of the lubricant from the spindle and inside of the hub. Cover the spindle with a clean cloth and vacuum all of the loose dust and dirt from the brake assembly. Carefully remove the cloth to prevent dirt from falling on the spindle.**

8. **Clean both bearing assemblies and cups using a suitable solvent. Inspect the bearing assemblies and cups for excessive wear, scratches, pits or other damage and replace as necessary.**

9. **If the cups are being replaced, remove them with impact slide hammer tool T50T-100-A and bearing cup puller tool T77F-1102-A, or equivalent.**



Rear wheel assembly-1989 SHO

Click to enlarge

To install:

10. **If the inner and outer bearing cups were removed, install the replacement cups using driver handle tool T80T-4000-W as well as bearing cup replacer tools T73F-1217-A and T77F-1217-B, or equivalent. Support the hub on a block of wood to prevent damage. Make sure the cups are properly seated in the hub.**

Do not use the cone and roller assembly to install the cups.This will result in damage to the bearing cup, as well as the cone and rollerassembly.

11. **Make sure all of the spindle and bearing surfaces are clean.**

12. **Pack the bearing assemblies with suitable wheel bearing grease using a bearing packer. If a packer is not available, work in as much grease as possible between the rollers and the cages with your hands. Grease the cup surfaces.**

Allow all of the cleaning solvent to dry before repackingthe bearings. Do not spin-dry the bearings with compressed air.

13. **Place the inner bearing cone and roller assembly in the inner cup. Apply a light film of grease to the lips of a new grease seal and install the seal with rear hub seal replacer tool T56T-4676-B or equivalent. Make sure the retainer flange is seated all around.**

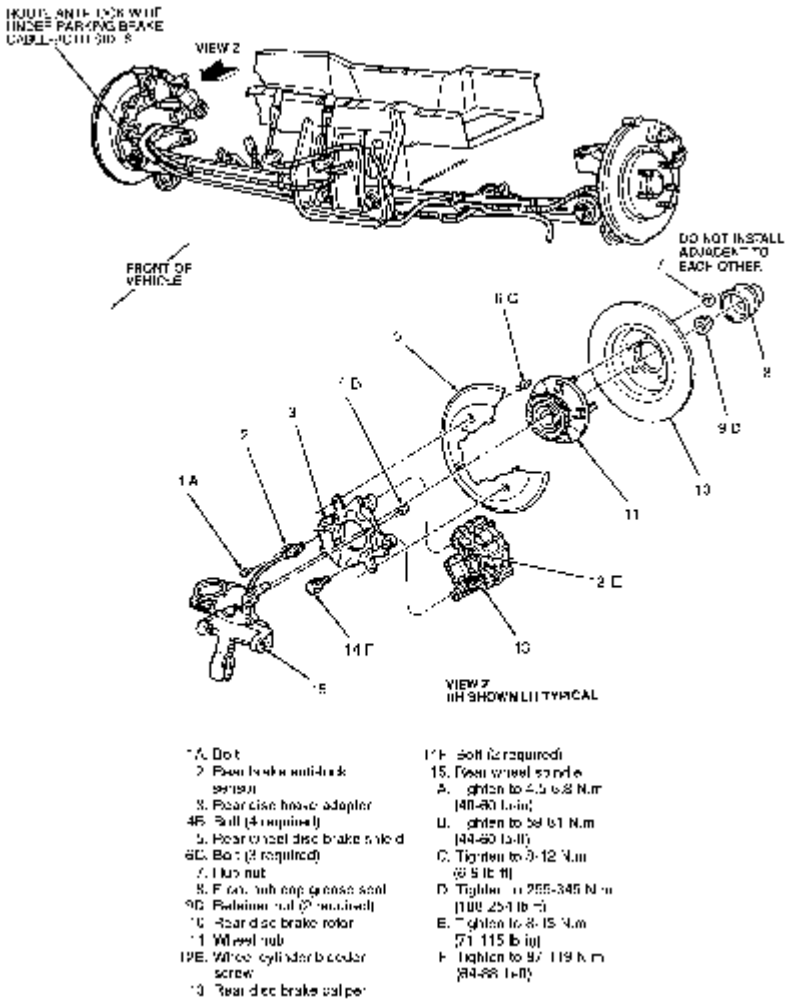
14. **Apply a light film of grease on the spindle shaft bearing surfaces. Install the hub assembly on the spindle. Keep the hub centered on the spindle to prevent damage to the grease seal and spindle threads.**

15. **Install the outer bearing assembly and keyed flat washer on the spindle. Install the adjusting nut and adjust the wheel bearings as previously described. Install a new cotter pin and the grease cap.**
16. **Install the disc brake rotor to the hub assembly. Install the disc brake caliper over the rotor.**
17. **Install the wheel and tire assembly, then lower the vehicle.**

1990-95 VEHICLES

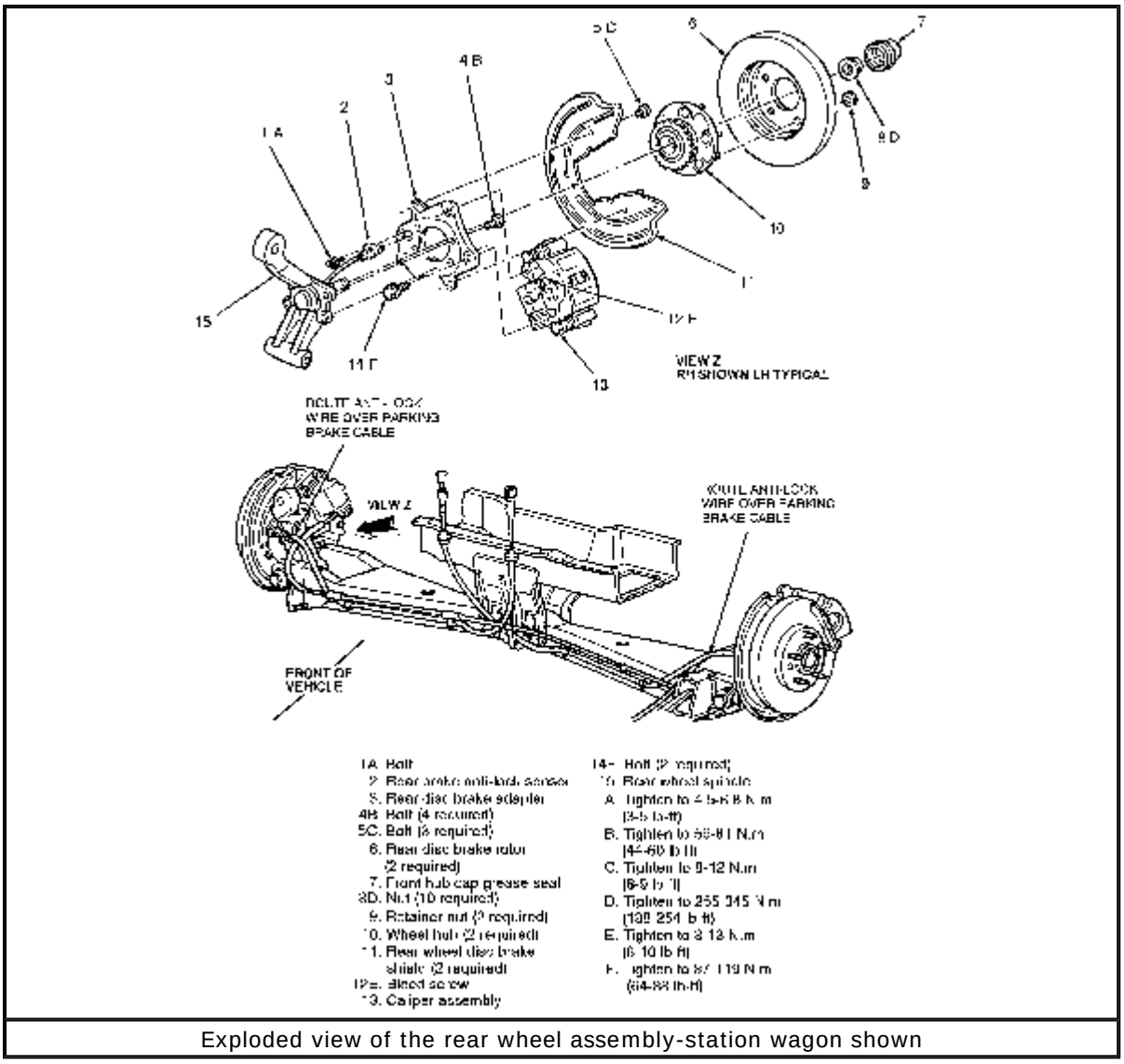
1. **Raise and safely support the vehicle with jackstands.**
2. **Remove the rear wheel and tire assembly.**
3. **Remove the rear caliper assembly from the brake adapter. Support the caliper assembly with a length of wire.**
4. **Remove the push-on nuts that retain the rotor to the hub, then remove the rotor.**
5. **Remove and discard the hub cap grease seal from the bearing and hub assembly.**
6. **Remove and discard the rear axle bearing and hub assembly retainer.**
7. **Remove the rear wheel hub from the rear wheel spindle.**

To install:



Exploded view of the rear wheel assembly-sedan shown

Click to enlarge



Exploded view of the rear wheel assembly-station wagon shown

Click to enlarge

8. **Position the rear hub on the rear wheel spindle.**
9. **Install a new rear axle wheel hub retainer. Tighten the retainer to 188-254 ft. lbs. (255-345 Nm).**
10. **Using Coil Remover T89P-19623-FH or equivalent, install a new rear hub cap grease seal. Gently tap on the tool until the rear hub cap grease seal is fully seated.**
11. **Install the rear disc brake rotor on the hub. Install the two push-on nuts that retain the rotor.**
12. **Install the rear disc brake caliper to the brake adapter.**
13. **Install the wheel and tire assembly, then carefully lower the vehicle.**

TRAILER TOWING

General Recommendations

Do NOT tow a trailer unless your vehicle has been driven at least 500 miles!

Towing a trailer puts additional load on your vehicle's engine, drivetrain, brakes, tires and suspension. For your safety, as well as your car's well being, make sure the trailer towing equipment is properly matched to the trailer. All towing equipment should be of the proper weight class, and must be safely attached to the vehicle.

Trailer towing should only be attempted with the 3.0L or 3.8L V6 engine!

The maximum trailer weight that your vehicle can tow is 1,000 lbs. (454 kg) gross trailer axle weight with a maximum tongue load of 100 lbs. (45 kg). Be sure to observe the following qualifications:

- **Any model equipped with an overdrive transaxle should be shifted to the "D" (DRIVE) position to avoid excessive shifting between the overdrive and third gears.**
- **Auxiliary oil coolers are recommended for the power steering system and the automatic transaxle during long distance towing (more than 50 miles/80 km), while towing in hilly terrain or for frequent towing.**
- **Vehicle speed no higher than 55 mph (88 km/h) is recommended while towing a trailer.**

Towing Tips

Before starting on a trip, practice turning, stopping and backing up in an area away from other traffic (such as a deserted shopping center parking lot) to gain experience in handling the extra weight and length of the trailer. Take enough time to get the feel of the vehicle/trailer combination under a variety of situations.

Skillful backing requires practice. Back up slowly with an assistant acting as a guide and watching for obstructions. Use both rear view mirrors. Place your hand at the bottom of the steering wheel and move it in the direction you want the rear of the trailer to swing. Make small corrections, instead of exaggerated ones, as a slight movement of the steering wheel will result in a much larger movement of the rear of the trailer.

Allow considerably more room for stopping when a trailer is attached to the vehicle. Keep in mind, the car/trailer combination is a considerable increase in the weight that your car's brakes have to bring to a stop. If you have a manual brake controller, lead with the trailer brakes when approaching a stop. Trailer brakes are also handy for correcting side sway. Just touch them for a moment without using your vehicle brakes, and the trailer should settle down and track straight

again.

To assist in obtaining good handling with the car/trailer combination, it is important that the trailer tongue load be maintained at approximately 10-15% of the loaded trailer weight.

Check everything before starting out on the road, then stop after you've traveled about 50 miles (80 km). Double-check the trailer hitch and electrical connections to make sure everything is still OK. Listen for sounds like chains dragging on the ground (indicating that a safety chain has come loose) and check your rearview mirrors frequently to make sure the trailer is still there and tracking properly. Check the trailer wheel lug nuts to make sure they're tight and never attempt to tow the trailer with a compact spare tire installed on the car.

Remember that a car/trailer combination is more sensitive to cross winds, so slow down when crossing bridges or wide open expanses in gusty wind conditions. Exceeding the speed limit while towing a trailer is not only illegal, it is foolhardy and invites disaster. A strong gust of wind can send a speeding car/trailer combination out of control.

Because the trailer wheels are closer than the towing vehicle wheels to the inside of a turn, drive slightly beyond the normal turning point when negotiating a sharp turn at a corner. Allow extra distance for passing other vehicles and downshift if necessary for better acceleration. Allow at least the equivalent of one vehicle and trailer length combined for each 10 mph of road speed.

Finally, remember to check the height of the loaded car/trailer, allowing for roof-mounted luggage racks, antenna, etc., and take note of low bridges or parking garage clearances.

Necessary Equipment

Use the right equipment for the type of trailer you are going to tow, and make sure that all of the towing equipment is properly attached to your vehicle. To assist in obtaining good handling with the car/trailer combination, it is important that the trailer tongue load be maintained at approximately 10-15% of the loaded trailer weight. Make sure to securely tie down the load so that it does not shift and change the weight on the hitch.

CONNECTING THE SAFETY CHAINS

Always attach the trailer's safety chains to your vehicle. They will help protect your trailer if the hitch breaks. Follow the manufacturer's directions for installing the safety chains. When connecting the safety chains, cross the chains under the trailer's tongue and attach them to the vehicle's frame or hook retainers. NEVER attach the safety chains to the vehicle's bumper. The bumper is not designed to handle that kind of weight. Make sure that you leave enough slack in the chains to allow you to turn corners.

CONNECTING THE TRAILER'S BRAKES

WARNING

NEVER connect a trailer's hydraulic braking system directly to your vehicle's brake system! If you do, your vehicle may not have enough

braking power and your chances of an accident greatly increase.

Electric brakes and manual, automatic, or surge-type brakes are safe if you install them properly and adjust them according to the manufacturer's instructions. Always follow the manufacturer's instructions and make sure that the brakes you are using meet local and federal regulations.

CONNECTING THE TRAILER'S LIGHTS

Do not connect your trailer's lighting system wiring directly to that of your vehicle. Be sure you use the correct equipment and that you follow the manufacturer's directions carefully. If you do not install the lighting system properly, the warning lights on your vehicle's instrument panel may not function.

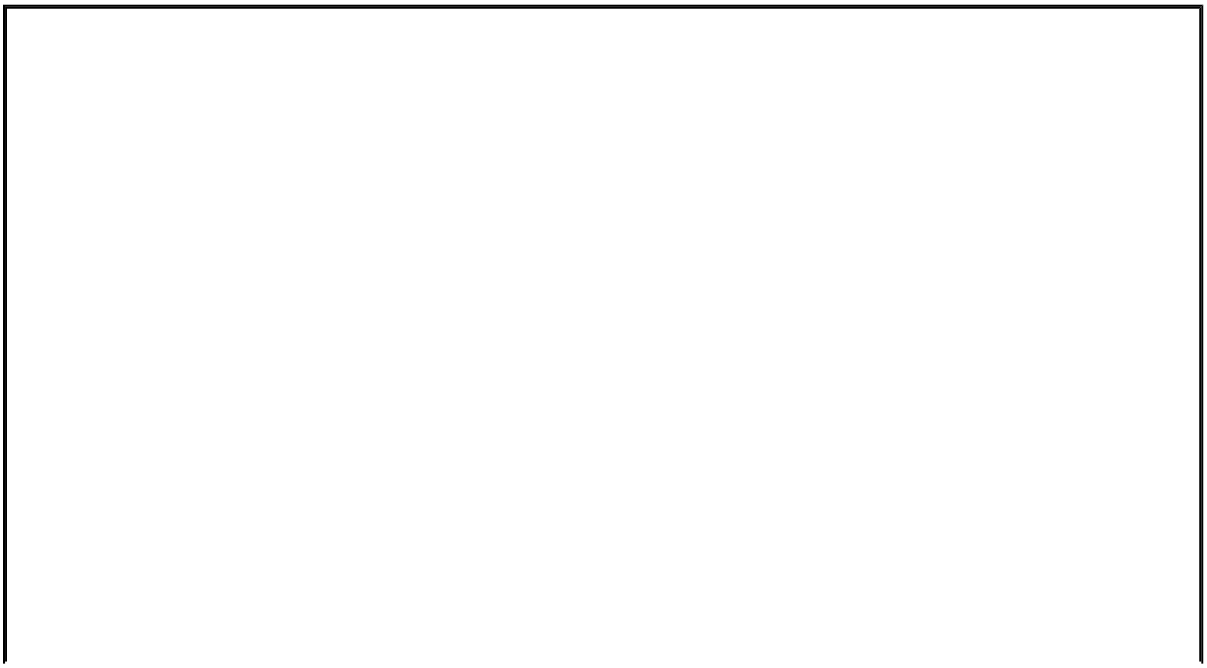
TOWING THE VEHICLE

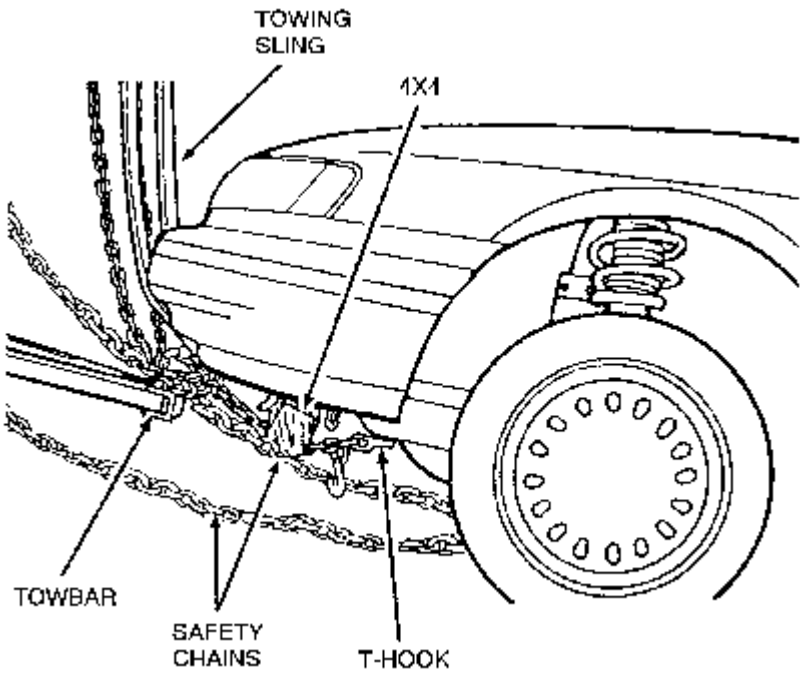
WARNING

Do NOT allow the vehicle to be towed using J-hooks under any circumstances. J-hooks will damage the vehicle's halfshafts and control arms.

If the car is being towed with the front (drive) wheels on the ground, never depend on the steering lock to keep the wheels straight, as damage to the steering could occur. Remember the old saying, "you can pay me now, or you can pay me later''. Your steering wheel should be clamped in the straight ahead position using a suitable steering wheel clamping device.

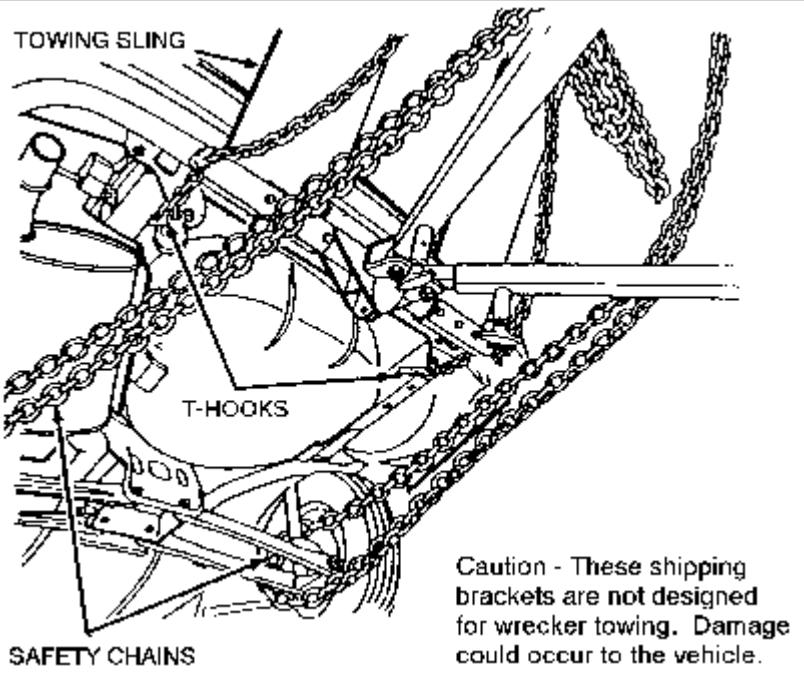
As a general rule, your vehicle should be towed with the front (drive) wheels off the ground. Whenever you are being towed, make sure the strap or chain is sufficiently long and strong. Straps are recommended because they have more stretch than a chain. Attach the strap or chain securely at a point on the frame; there are shipping tie-down slots at the front and rear of the car which should be used. Never attach a strap or chain to any steering or suspension part. Never try to start the vehicle when being towed, as it might run into the back of the tow vehicle. Do not allow too much slack in the tow line, because the towed car could run over the line and cause damage to both vehicles. If your car is being towed by a tow truck, the towing speed should be limited to 50 mph (80 km/h) with the driving wheels off the ground. If it is necessary to tow the car with the drive wheels on the ground, speed should be limited to no more than 35 mph (56 km/h) and the towing distance should not be greater than 50 miles (80 km). If the towing distance is more than 50 miles (80 km) the front of the car should be put on dollies.





Schematic of front towing connections

Click to enlarge



Schematic of rear towing connections

Click to enlarge

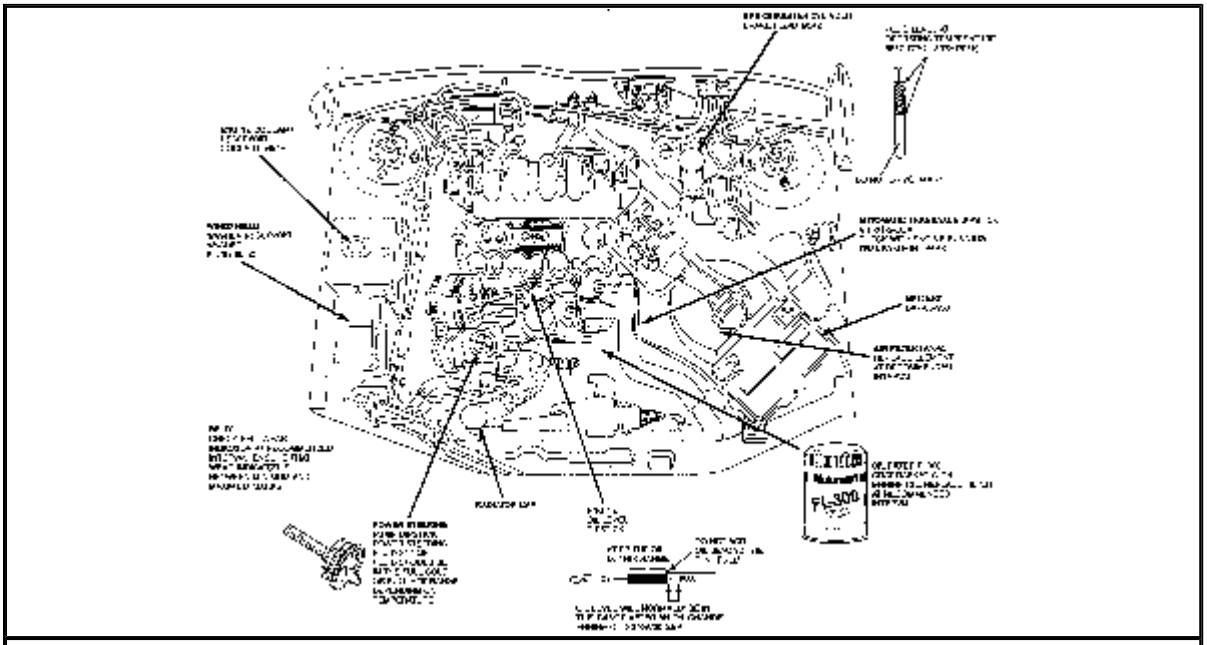
JACKING

The service jack that is provided with your vehicle is designed for changing tires. It should NOT, under any circumstances be used to support the car while you crawl under it and work. To do so is to recklessly jeopardize your life. Whenever it is necessary to get under a car to perform service operations, always be sure that it is adequately supported using jackstands at the proper points. Also, be sure to always block the wheels when changing tires.

Once the jackstands are in position and the vehicle's weight has been lowered onto them, shake the car a few times before crawling underneath to make sure the jackstands are securely supporting the weight.

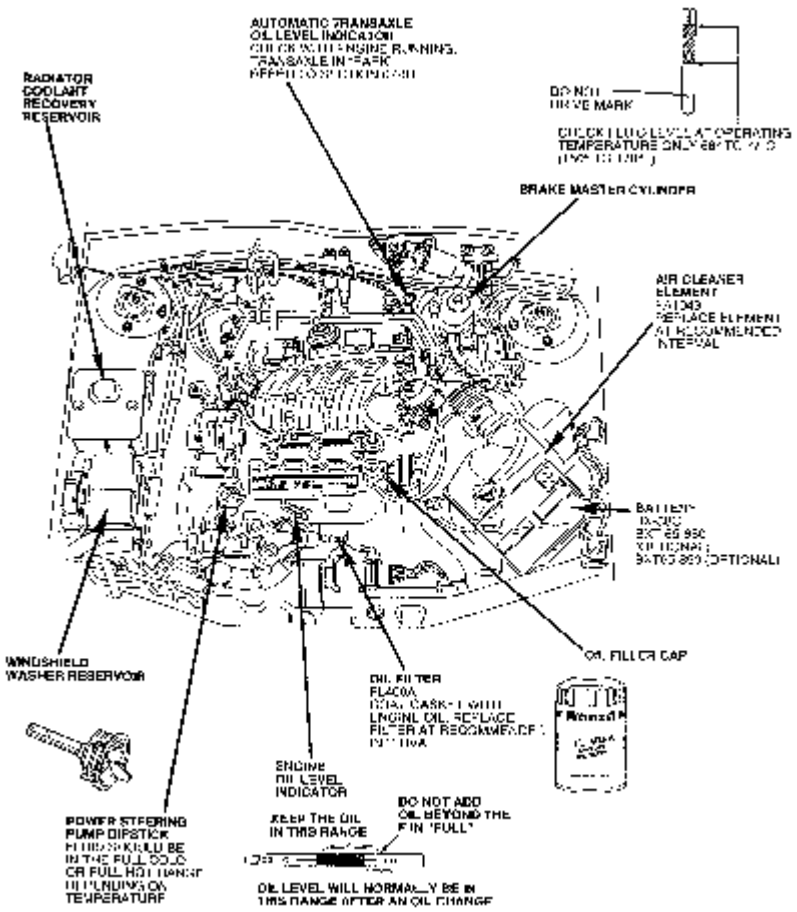
Service operations in this book often require that one end or both ends of the car be raised and safely supported. The ideal method, of course, would be to use a grease pit or a hydraulic hoist. Since this is beyond both the resources and requirements of the do-it-yourselfer, consider more practical equipment. A small hydraulic, screw or scissors jack; or else a floor jack will raise the vehicle sufficiently for almost all the procedures in this guide. The rolling floor jack is probably the easiest and most convenient of these to use. But the vehicle must still be supported by at least two sturdy jackstands, if you intend to work under the car at any time. When using a floor jack, raise the front of the vehicle by positioning the floor jack under either the subframe or body side rail behind the engine support bracket. The rear may be lifted by positioning a floor jack under either rear suspension body bracket. Under no circumstances should the vehicle ever be lifted by the front or rear control arms, halfshafts or CV joints. Severe damage to the vehicle could result. An alternate method of raising the car would be drive-on ramps. Be sure to block the wheels when using ramps. Spend a little extra time to ensure that your car is lifted and supported safely.

MAINTENANCE COMPONENT LOCATIONS



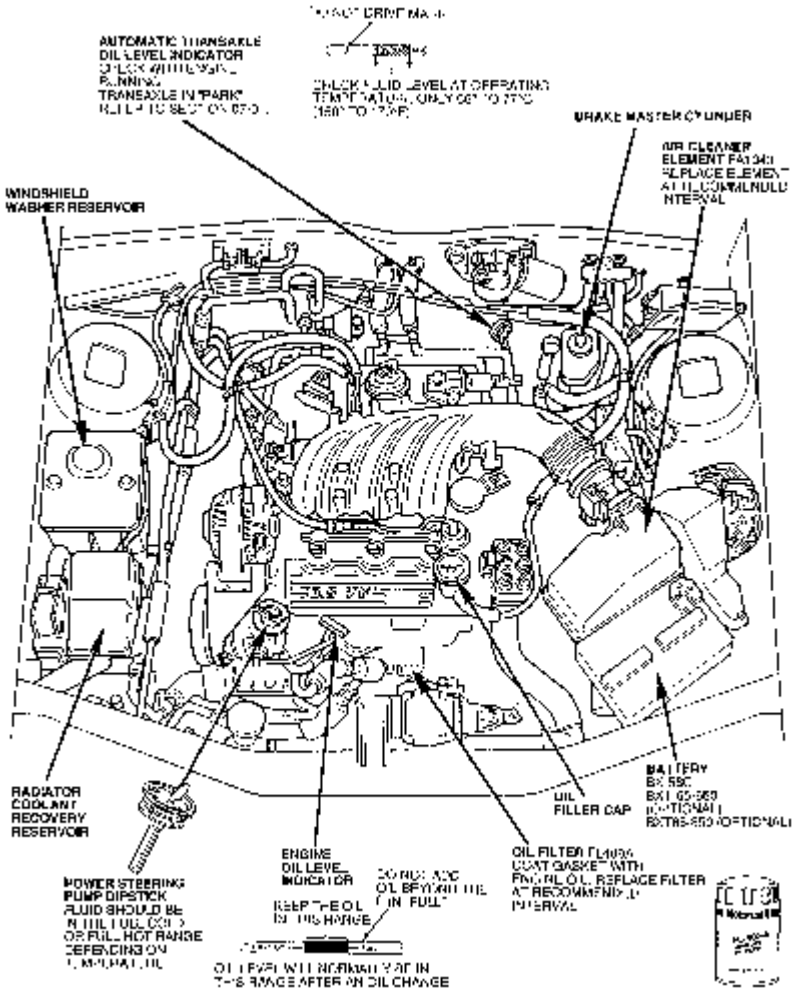
Engine component service points-2.5L engine

Click to enlarge



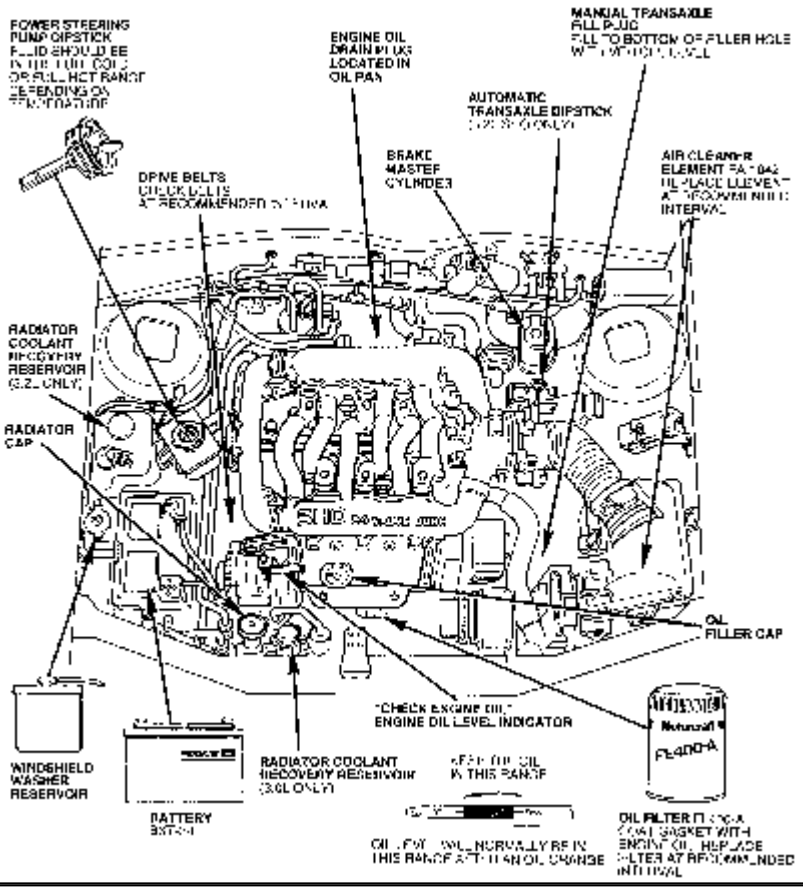
Engine component service points-3.0L engine

Click to enlarge



Engine component service points-3.0L Flexible Fuel (FF) engine

Click to enlarge



Engine component service points-3.0L/3.2L SHO engines

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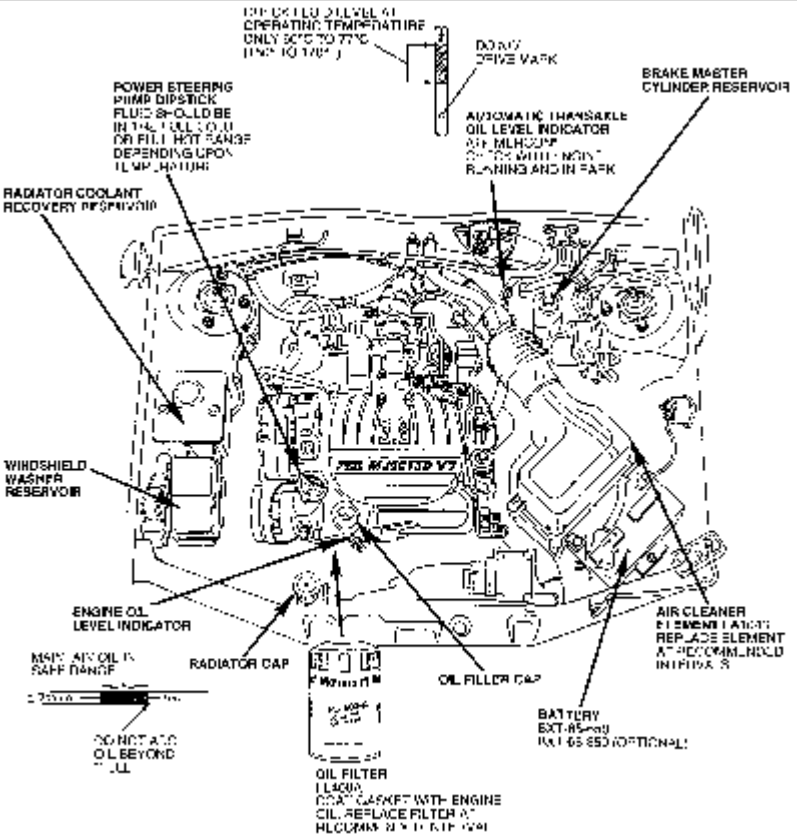

Engine component service points-3.8L engine

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SPECIFICATION CHARTS

VEHICLE IDENTIFICATION CHART

Engine Code					
Code	Liters	Cu. In. (cc)	Cyl.	Fuel Sys.	Eng. Mfg.
D (88-91)	2.5	154 (2524)	4	CFI	Ford
D (1991)	2.5	154 (2524)	4	MFI	Ford
U (88-92)	3.0	181 (2971)	6	MFI	Ford
U (88-95)	3.0	181 (2971)	6	SFI	Ford
1 (88-92)	3.0	232 (3802)	6	MFI	Ford
4 (88-95)	3.8	232 (3802)	6	SFI	Ford
Y (88-95)	3.0	182 (2960)	6	SFI	Yamaha
F (92-95)	3.2	196 (3191)	6	SFI	Yamaha

MFI - Multiport fuel injection
SFI - Sequential fuel injection

Model Year	
Code	Year
G	1986
H	1987
J	1988
K	1989
L	1990
M	1991
N	1992
P	1993
R	1994
S	1995

Vehicle Identification Chart

Click to enlarge

ENGINE IDENTIFICATION

Year	Model	Engine Displacement Liters (cc)	Engine Series (ID/VIN)	Fuel System	No. of Cylinders	Engine Type
1988	Taurus	2.5 (2524)	D	CFI	4	OHV
	Taurus	3.0 (2971)	U	EFI	6	OHV
	Sable	2.5 (2524)	D	CFI	4	OHV
	Sable	3.0 (2971)	U	EFI	6	OHV
1987	Taurus	2.5 (2524)	D	CFI	4	OHV
	Taurus	3.0 (2971)	U	EFI	6	OHV
	Sable	2.5 (2524)	D	CFI	4	OHV
	Sable	3.0 (2971)	U	EFI	6	OHV
1988	Taurus	2.5 (2524)	D	CFI	4	OHV
	Taurus	3.0 (2971)	U	EFI	6	OHV
	Taurus	3.8 (3802)	4	EFI	6	OHV
	Sable	3.0 (2971)	U	EFI	6	OHV
	Sable	3.8 (3802)	4	EFI	6	OHV
1989	Taurus	2.5 (2524)	D	CFI	4	OHV
	Taurus	3.0 (2971)	U	EFI	6	OHV
	Taurus	3.8 (3802)	4	EFI	6	OHV
	Taurus SHO	3.0 (2980)	Y	SFI	6	DOHC
	Sable	3.0 (2971)	U	EFI	6	OHV
	Sable	3.8 (3802)	4	EFI	6	OHV
1990	Taurus	2.5 (2524)	D	SFI	4	OHV
	Taurus	3.0 (2971)	U	EFI	6	OHV
	Taurus	3.8 (3802)	4	EFI	6	OHV
	Taurus SHO	3.0 (2980)	Y	SFI	6	DOHC
	Sable	3.0 (2971)	U	EFI	6	OHV
	Sable	3.8 (3802)	4	EFI	6	OHV
1991	Taurus	2.5 (2524)	D	CFI	4	OHV
	Taurus	3.0 (2971)	U	EFI	6	OHV
	Taurus	3.8 (3802)	4	EFI	6	OHV
	Taurus SHO	3.0 (2980)	Y	SFI	6	DOHC
	Sable	3.0 (2971)	U	EFI	6	OHV
	Sable	3.8 (3802)	4	EFI	6	OHV
1992	Taurus	3.0 (2971)	U	EFI	6	OHV
	Taurus	3.8 (3802)	4	EFI	6	OHV
	Taurus SHO	3.0 (2980)	Y	SFI	6	DOHC
	Sable	3.0 (2971)	U	EFI	6	OHV
	Sable	3.8 (3802)	4	CFI	6	OHV
1993	Taurus	3.0 (2971)	U	SFI	6	OHV
	Taurus	3.8 (3802)	4	SFI	6	OHV
	Taurus SHO	3.0 (2980)	Y	SFI	6	DOHC
	Taurus SHO	3.2 (3191)	F	SFI	6	DOHC
	Sable	3.0 (2971)	U	SFI	6	OHV
	Sable	3.8 (3802)	4	SFI	6	OHV
1994	Taurus	3.0 (2971)	U	SFI	6	OHV
	Taurus	3.8 (3802)	4	SFI	6	OHV
	Taurus SHO	3.0 (2980)	Y	SFI	6	DOHC
	Taurus SHO	3.2 (3191)	F	SFI	6	DOHC
	Sable	3.0 (2971)	U	SFI	6	OHV
	Sable	3.8 (3802)	4	SFI	6	OHV

Engine Identification

Click to enlarge

ENGINE IDENTIFICATION

Year	Model	Engine Displacement Liters (cc)	Engine Series (ID/VIN)	Fuel System	No. of Cylinders	Engine Type
1995	Taurus	3.0 (2960)	U	SF	6	OHV
	Taurus	3.8 (3802)	4	SF	6	OHV
	Taurus SHO	3.0 (2980)	Y	SF	6	DOHC
	Taurus SHO	3.2 (3165)	P	SF	6	DOHC
	Sable	3.0 (2971)	U	SF	6	OHV
	Sable	3.8 (3802)	4	SF	6	OHV

SF - Sequential fuel injection
OHV - Overhead valve
DOHC - Double overhead camshaft

Engine Identification

Click to enlarge

CAPACITIES

Year	Model	Engine ID/VIN	Engine Displacement Liters (cc)	Engine Oil with Filter	Transmission (pts.) 4-Spd	5-Spd	Auto.	Drive Axle Front (pts.)	Drive Axle Rear (pts.)	Fuel Tank (gal.)	Cooling System (qts.)
1988	Taurus	E	2.5 (2501)	5.0	-	9.2	19.5	1	-	15	15.2
	Taurus	L	3.0 (2986)	4.5	-	-	21.5	1	-	15	11
	Sable	E	2.5 (2501)	5.0	-	9.2	19.5	1	-	15	14
	Sable	L	3.0 (2986)	4.5	-	-	21.0	1	-	15	14
1987	Taurus	E	2.5 (2501)	5.0		9.2	19.5	1	-	15	15.2
	Taurus	L	3.0 (2986)	4.5	-	-	23.2	1		15	14
	Sable	E	2.5 (2501)	5.0	-	9.2	19.5	1	-	15	14
	Sable	L	3.0 (2986)	4.5	-	-	23.2	1	-	15	14
1988	Taurus	E	2.5 (2501)	5.0	-	-	23.2	1	-	15	15.2
	Taurus	L	3.0 (2986)	4.5	-	9.2	19.5	1	-	15	11
	Taurus	4	3.8 (3802)	4.5		-	25.2	1	-	15	12.1
	Sable	L	3.0 (2986)	4.5		9	25.2	1	-	15	14
	Sable	4	3.8 (3802)	4.5			25.2	1		15	12.1
1989	Taurus	E	2.5 (2501)	5.0	-	-	25.6	1		15	15.2
	Taurus	U	3.0 (2980)	4.5	-	-	19.8	1	-	15	14
	Taurus	4	3.8 (3802)	4.5	-	-	25.6	1	-	15	12.1
	Taurus SHO	Y	3.0 (2986)	5.0	-	9.2	-	1	-	15.8	11.8
	Sable	U	3.0 (2986)	4.5	-	-	19.8	1	-	15	11
	Sable	4	3.8 (3802)	4.5	-	-	25.6	1	-	15	12.1
1990	Taurus	E	2.5 (2501)	5.0			19.6	1		15	15.2
	Taurus	U	3.0 (2986)	4.5	-	-	25.6	1		15	14
	Taurus	4	3.8 (3802)	4.5	-	-	25.6	1	-	15	12.1
	Taurus SHO	Y	3.0 (2986)	5.0	-	-	-	1	-	15.8	11.8
	Sable	U	3.0 (2986)	4.5	-	-	25.6	1	-	15	14
	Sable	4	3.8 (3802)	4.5	-	-	25.6	1	-	15	12.1
1991	Taurus	E	2.5 (2501)	5.0	-	-	25.6	1	-	15	15.2
	Taurus	U	3.0 (2986)	4.5			25.6	1		15	14
	Taurus	4	3.8 (3802)	4.5	-	-	25.6	1		15	12.1
	Taurus SHO	Y	3.0 (2986)	5.0	-	9.2	-	1	-	15.8	11.8
	Sable	U	3.0 (2986)	4.5	-	-	25.6	1	-	15	14
	Sable	4	3.8 (3802)	4.5	-	-	25.6	1	-	15	12.1
1992	Taurus	U	3.0 (2986)	4.5	-	-	25.6	1	-	15	11
	Taurus	4	3.8 (3802)	4.5			25.6	1		15	12.1
	Taurus SHO	Y	3.0 (2986)	5.0		9.2		1		15.8	11.8
	Sable	U	3.0 (2986)	4.5	-	-	25.6	1	-	15	14
	Sable	4	3.8 (3802)	4.5	-	-	25.6	1	-	15	12.1
1993	Taurus	U	3.0 (2986)	4.5	-	-	25.6	1	-	15	14
	Taurus	4	3.8 (3802)	4.5	-	-	25.6	1	-	15	12.1
	Taurus SHO	Y	3.0 (2986)	5.0	-	9.1	-	1	-	15.8	11.8
	Taurus SHO	P	3.2 (3181)	5.0	-	-	23.6	1	-	15.8	11.8
	Sable	U	3.0 (2986)	4.5			23.6	1		15	14
	Sable	4	3.8 (3802)	4.5	-	-	25.6	1	-	15	12.1
1994	Taurus	U	3.0 (2986)	4.5	-	-	24.6	1	-	15	11.3
	Taurus	4	3.8 (3802)	4.5	-	-	24.6	1	-	15	12.1
	Taurus SHO	Y	3.0 (2986)	5.0	-	9.2	-	1	-	15.8	11.8
	Taurus SHO	P	3.2 (3181)	5.0	-	-	24.6	1	-	15.8	12

Capacities

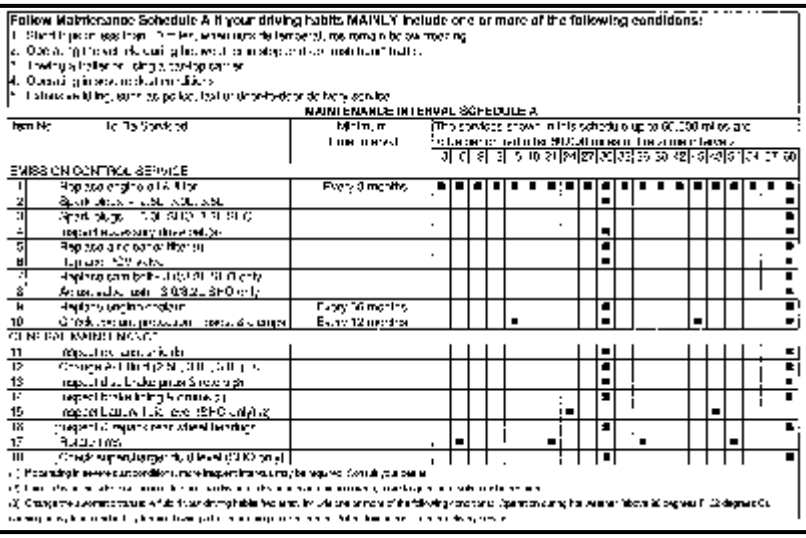
Click to enlarge

CAPACITIES

Year	Model	Engine ID/VIN	Engine Displacement Liters (cc)	Engine Oil with Filter	Transmission (pts.) 4-Spd	5-Spd	Auto.	Drive Axle Front (pts.)	Drive Axle Rear (pts.)	Fuel Tank (gal.)	Cooling System (qts.)
	Sable	U	3.0 (2986)	4.5	-	-	24.6		-	15	11.3
	Sable	4	3.8 (3802)	4.5	-	-	24.6		-	15	12
1996	Taurus	U	3.0 (2986)	4.5	-	-	23.6			15	11.3
	Taurus	4	3.8 (3802)	4.5	-	-	25.6			15	12.1
	Taurus SHO	Y	3.0 (2986)	5.0	-	9.2	-			15.4	11.8
	Taurus SHO	P	3.2 (3181)	5.0			24.6			15.4	11.4
	Sable	U	3.0 (2986)	4.5	-	-	23.6		-	15	11.3
	Sable	4	3.8 (3802)	4.5	-	-	24.6		-	15	12.1

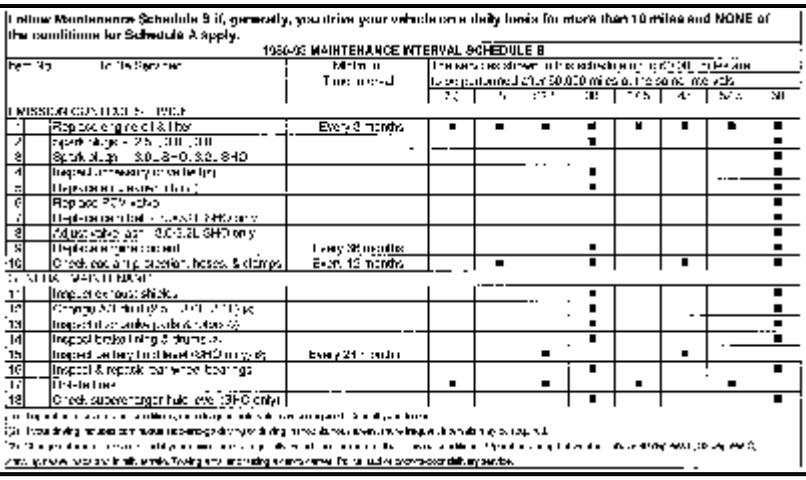
Capacities

Click to enlarge



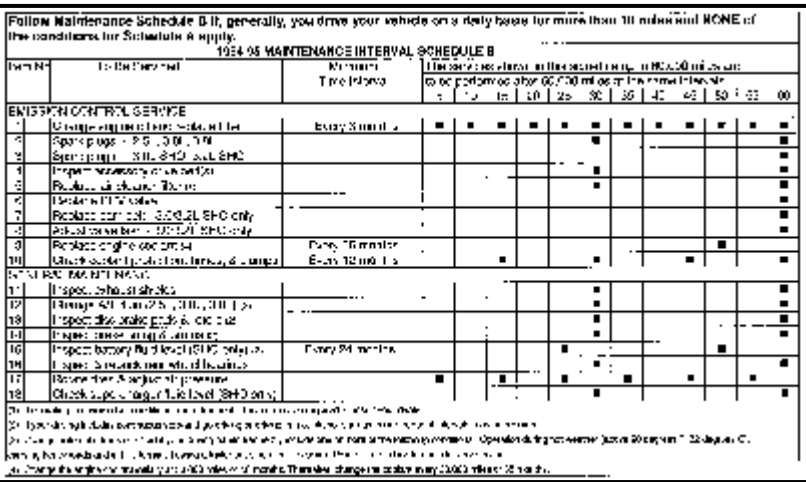
Maintenance Inverval Schedule A

Click to enlarge



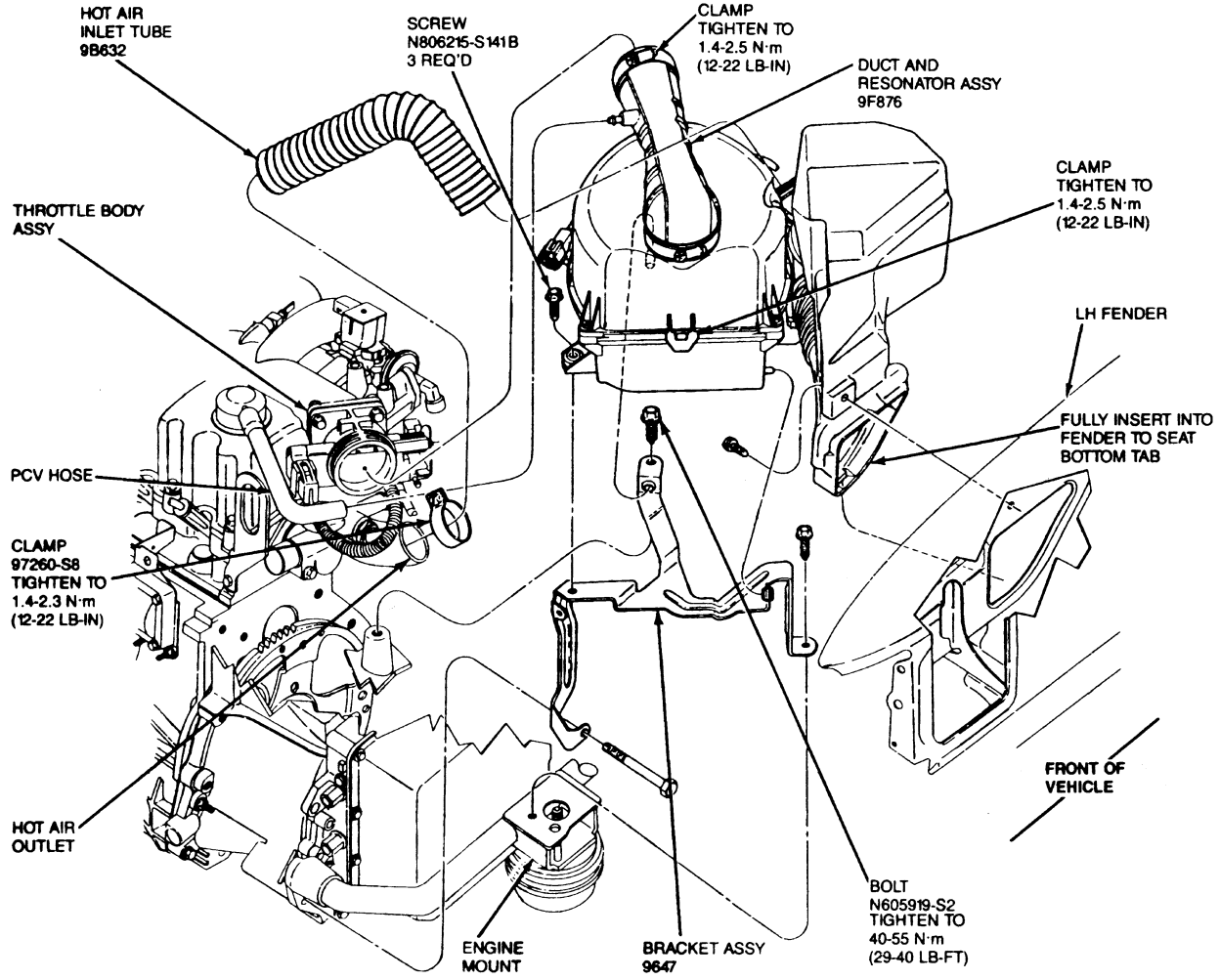
1986-93 Maintenance Interval Schedule B

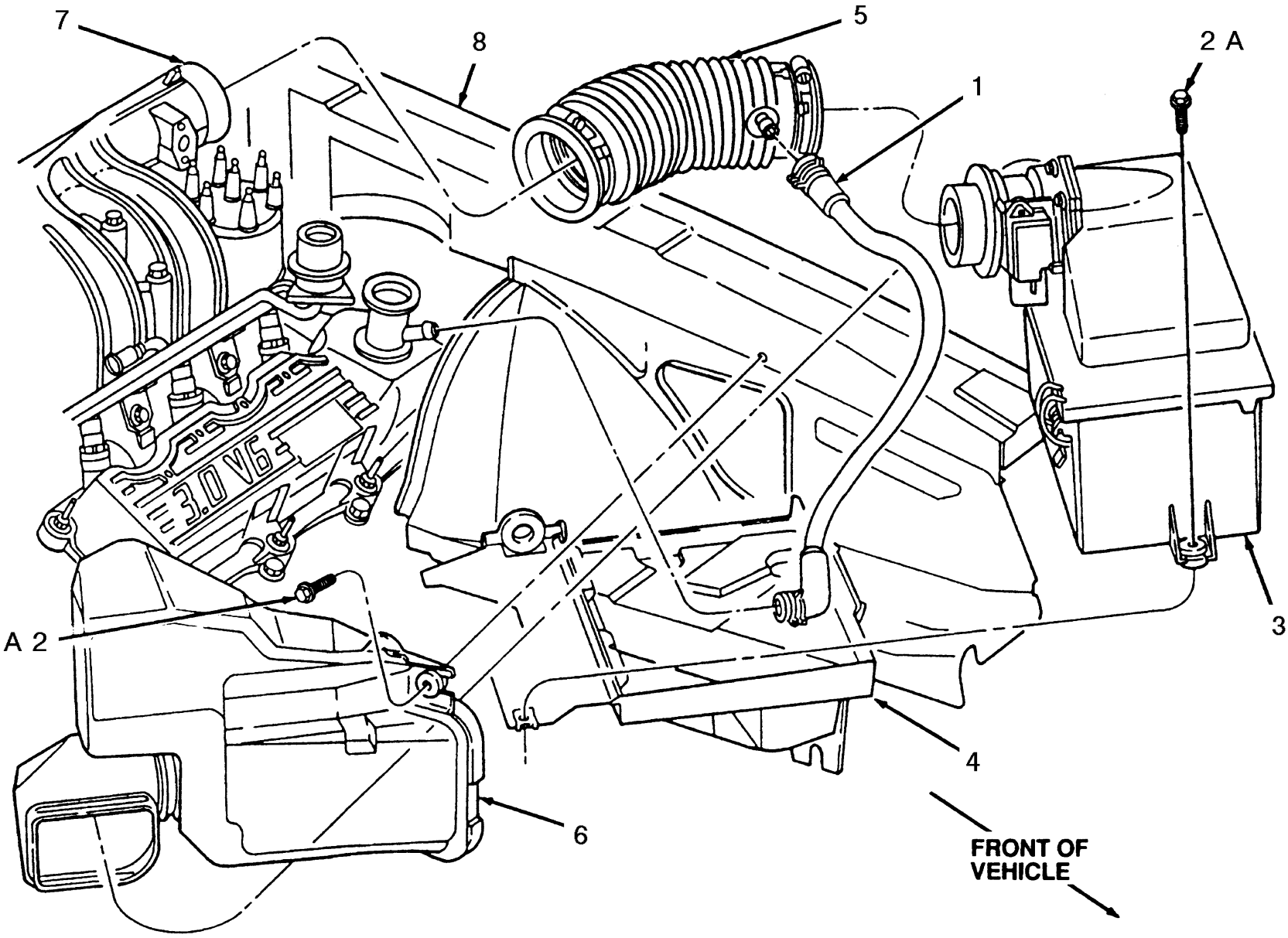
Click to enlarge



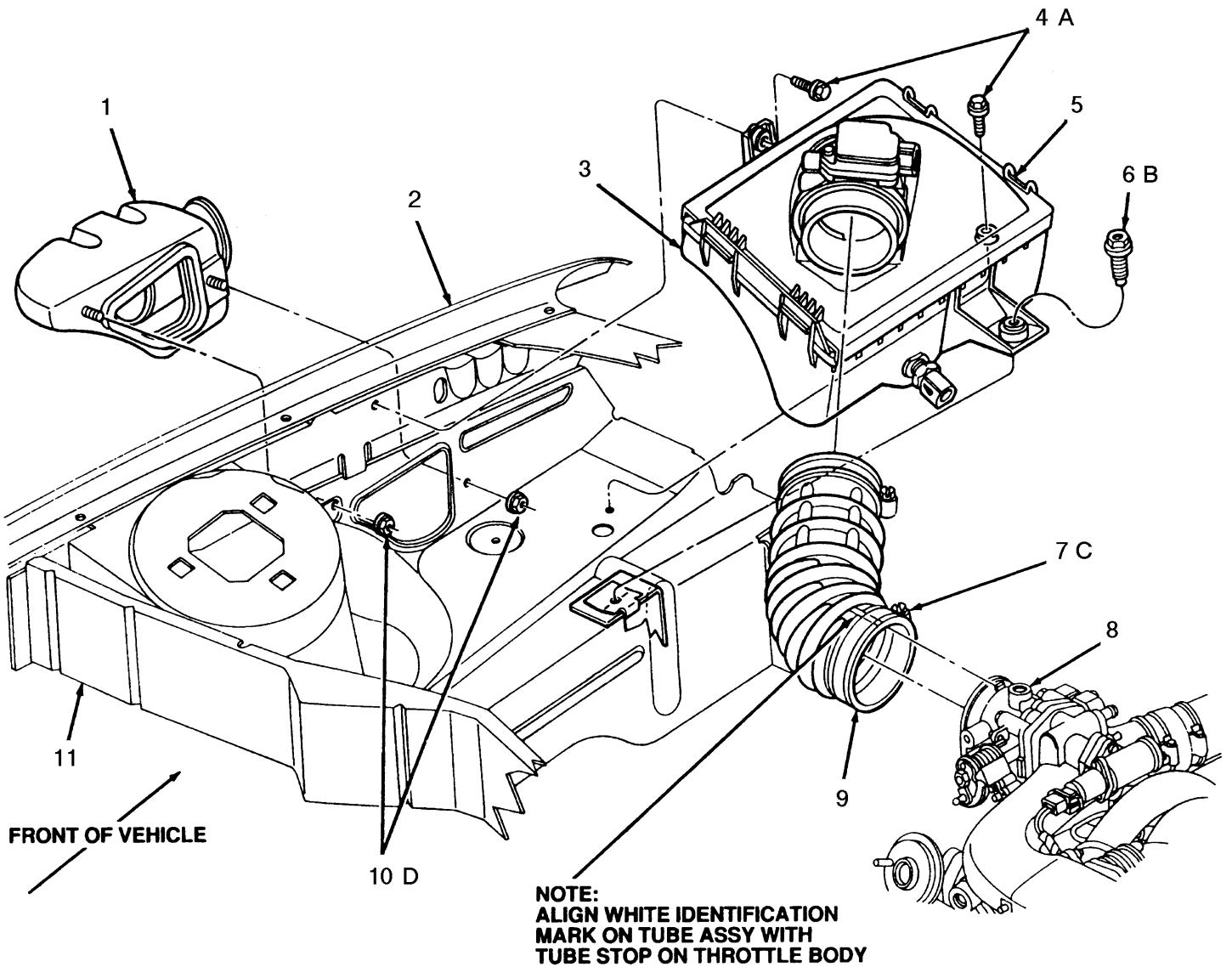
1994-95 Maintenance Interval Schedule B

Click to enlarge


HOT AIR INLET TUBE 9B632
SCREW N806215-S141B 3 REQ'D
CLAMP TIGHTEN TO 1.4-2.5 N·m (12-22 LB-IN)
DUCT AND RESONATOR ASSY 9F876
CLAMP TIGHTEN TO 1.4-2.5 N·m (12-22 LB-IN)
THROTTLE BODY ASSY
LH FENDER
FULLY INSERT INTO FENDER TO SEAT BOTTOM TAB
PCV HOSE
CLAMP 97260-S8 TIGHTEN TO 1.4-2.3 N·m (12-22 LB-IN)
FRONT OF VEHICLE
HOT AIR OUTLET
BOLT N605919-S2 TIGHTEN TO 40-55 N·m (29-40 LB-FT)
ENGINE MOUNT
BRACKET ASSY 9647



1. Hose assembly
2A. Screw (2 required)
3. Engine air cleaner
4. Battery tray
5. Air cleaner outlet tube
6. Engine air intake resonator
7. Manifold assembly
8. LH fender apron
A. Tighten to 2.7-5.4 N·m (24-47 lb-in)



1. Engine air intake resonator
2. LH fender
3. Engine air cleaner

4A. Screw

5. Air cleaner cover retainer clip

6B. Bolt

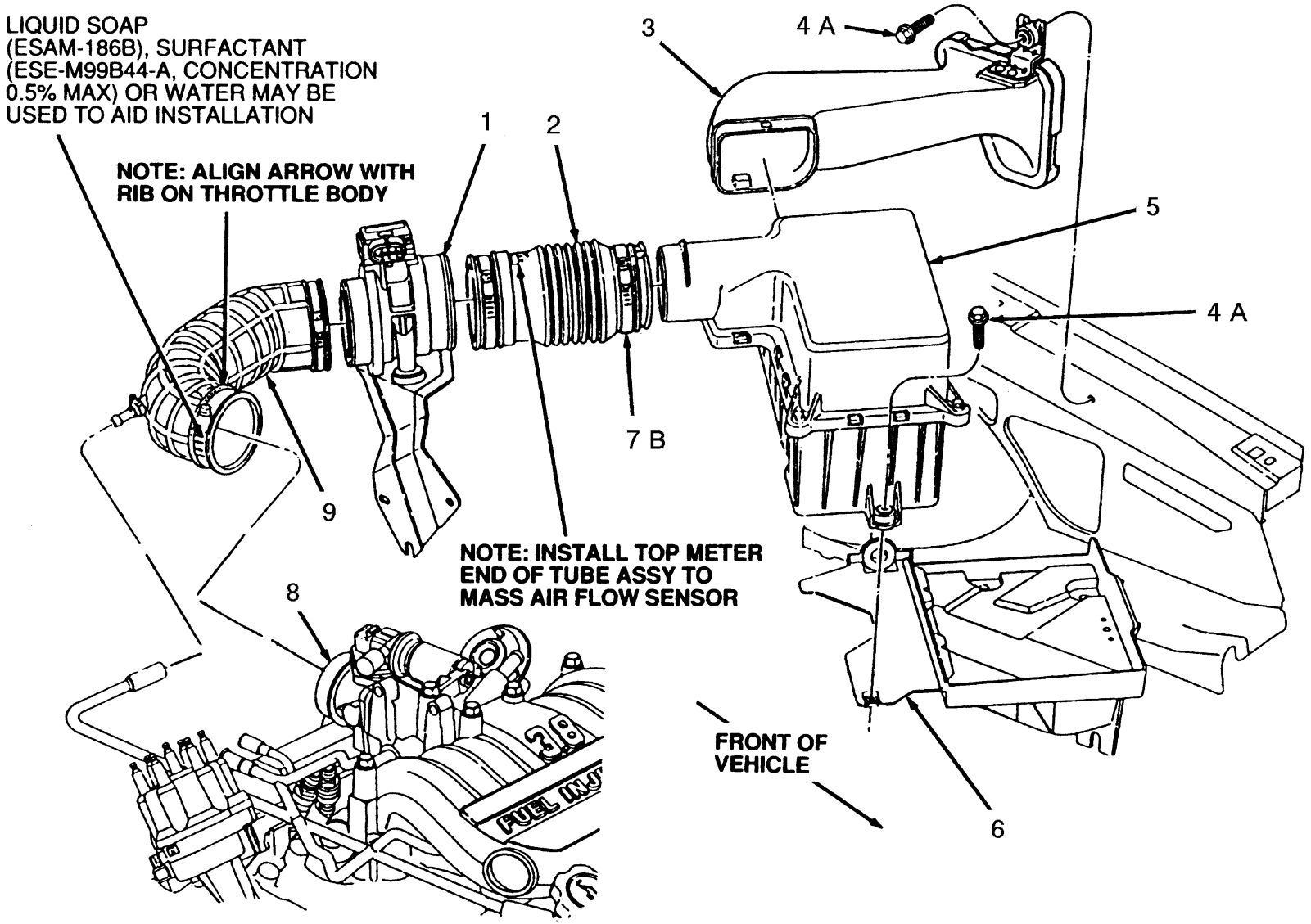
7C. Clamp assembly (2 required)

8. Throttle body
9. Air cleaner outlet tube

10D. Nut and washer assembly

11. Cowl

A. Tighten to 12-18 N.m (9-13 lb-ft)
B. Tighten to 8-11 N.m (6-8 lb-ft)
C. Tighten to 1.4-2.3 N.m (12-20 lb-in)
D. Tighten to 5-5.7 N.m (49-62 lb-in)



1. Mass air flow sensor and bracket assembly
2. Engine air outlet tube
3. Engine air cleaner intake tube and duct

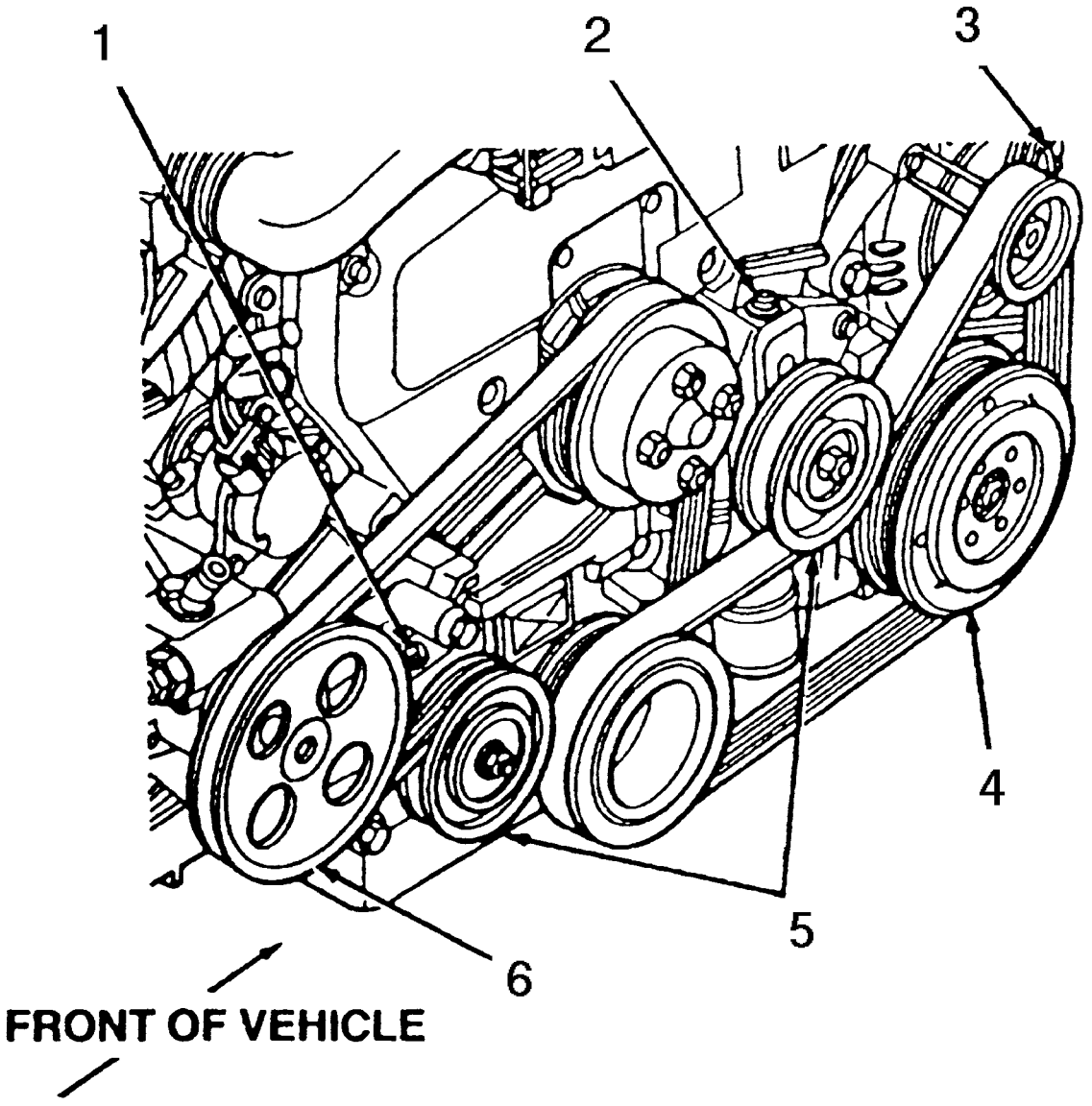
4A. Screw

5. Engine air cleaner
6. Battery tray

7B. Engine air cleaner tube clamp

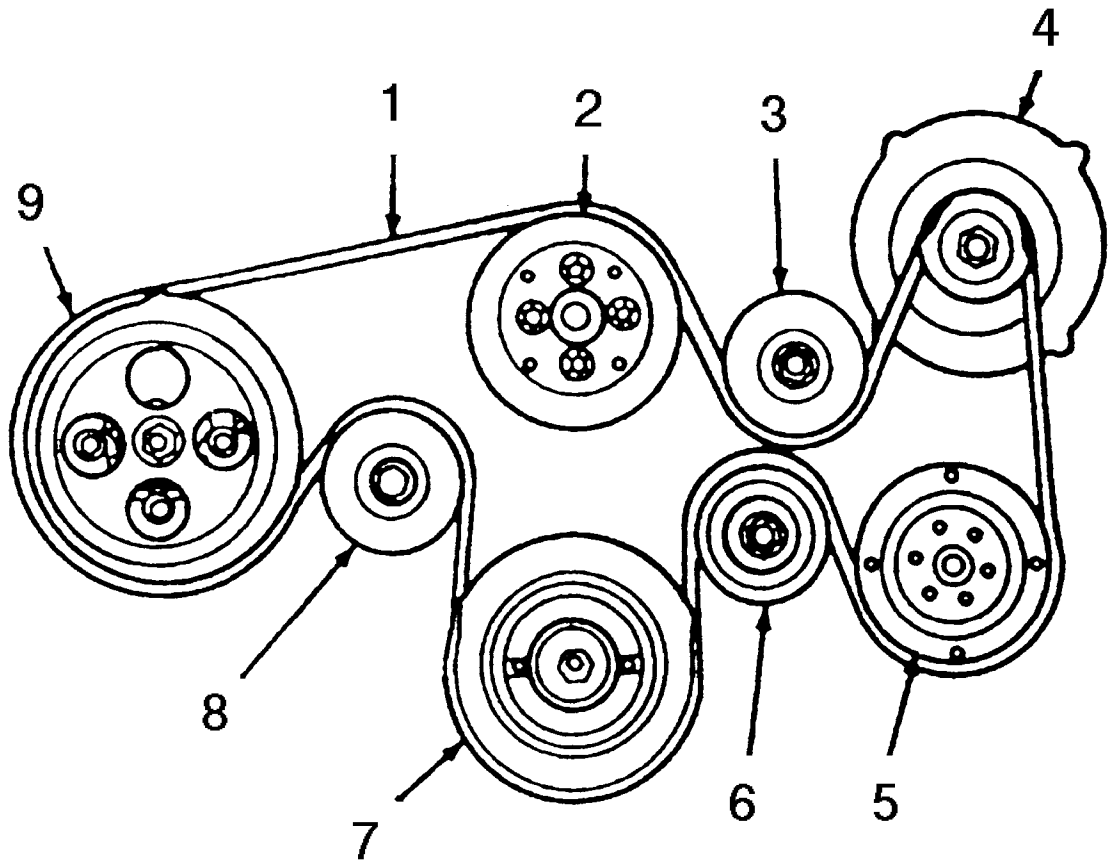
8. Throttle body
9. Air cleaner outlet tube

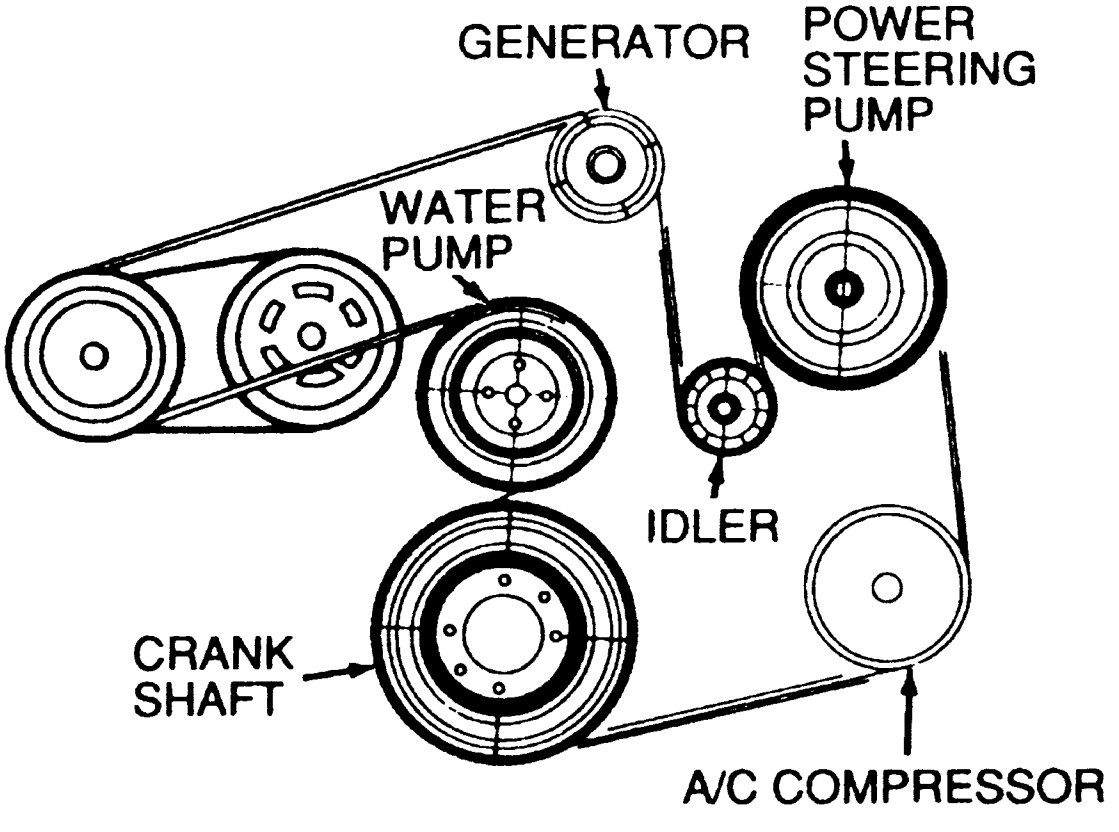
A. Tighten to 4 N.m (36 lb-in)
B. Tighten to 1.4-2.5 N.m (12-22 lb-in)

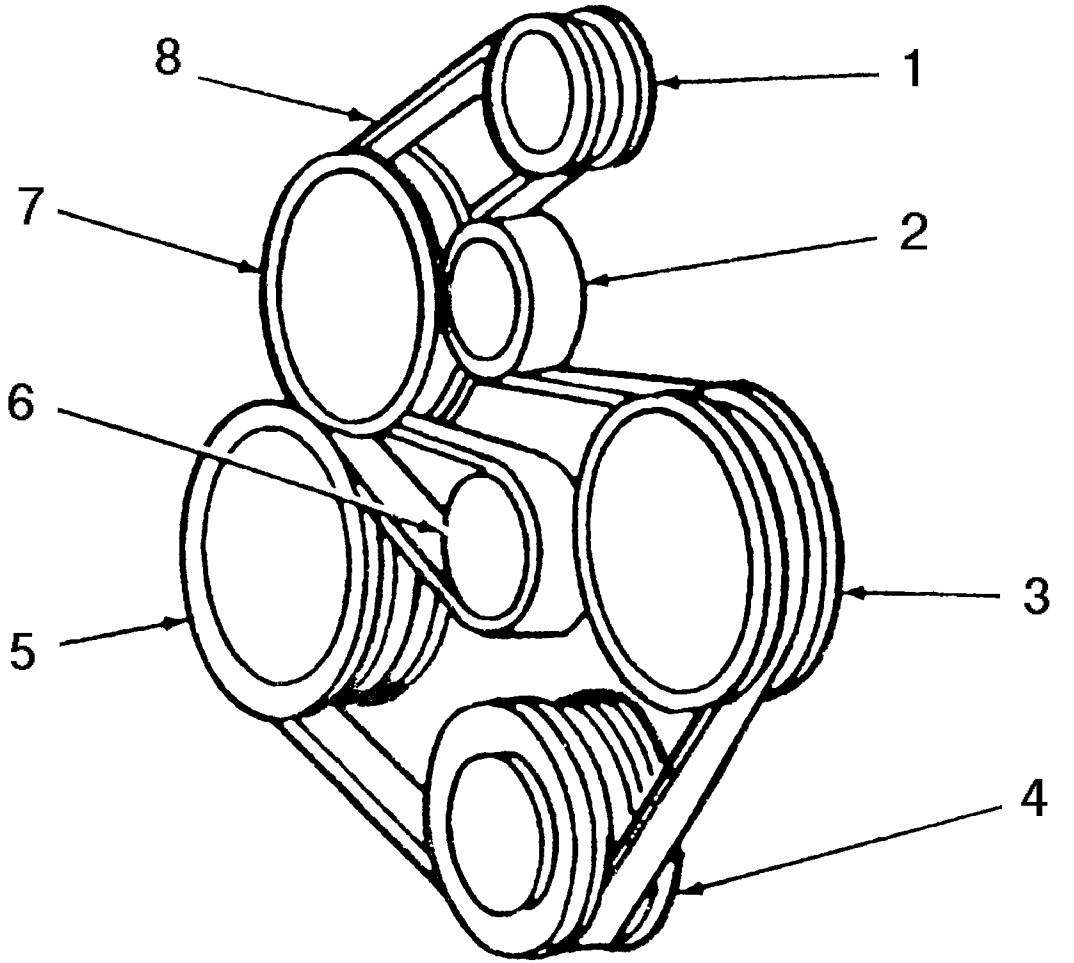


1. P/S water pump belt tension adjusting screw
2. A/C generator belt tension adjusting screw
3. Generator
4. A/C compressor
5. Drive belt tensioner pulley
6. Power steering pump

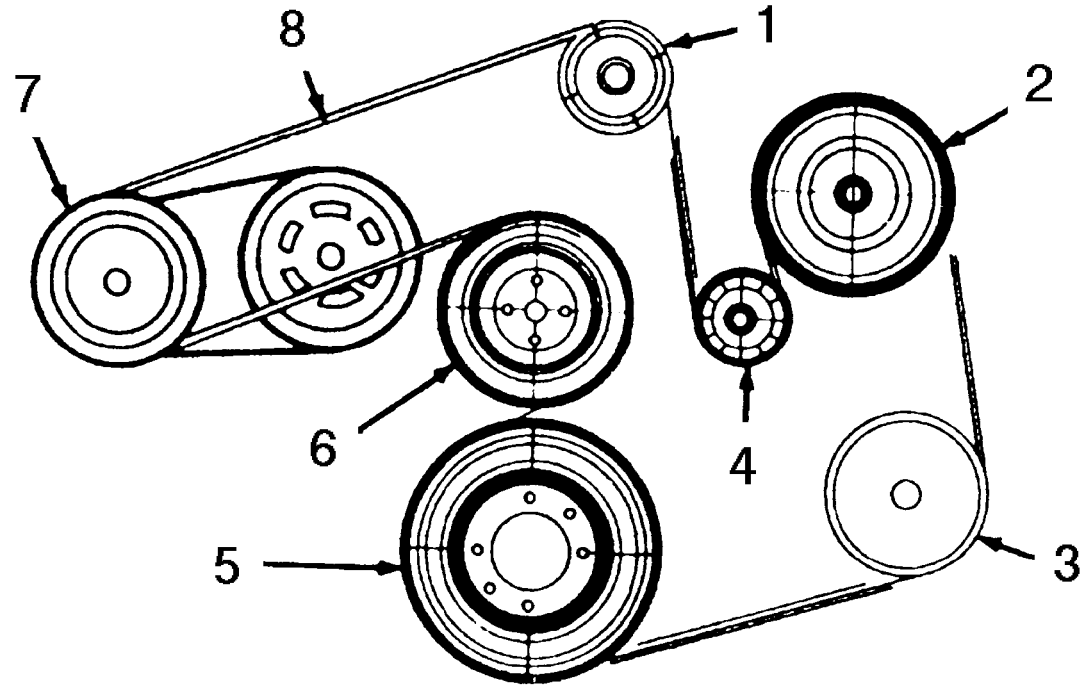
1. Drive belt
2. Water pump
3. Idler pulley
4. Generator
5. A/C compressor
6. Idler pulley
7. Crankshaft vibration damper and pulley
8. Drive belt tensioner
9. Power steering pump



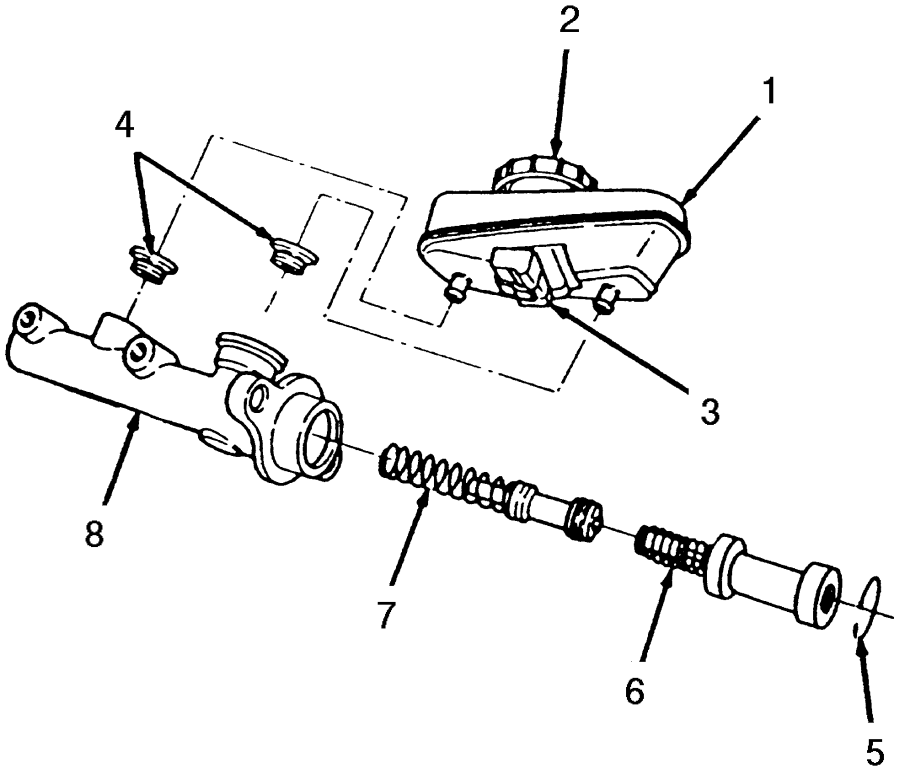

GENERATOR
POWER STEERING PUMP
WATER PUMP
IDLER
CRANK SHAFT
A/C COMPRESSOR

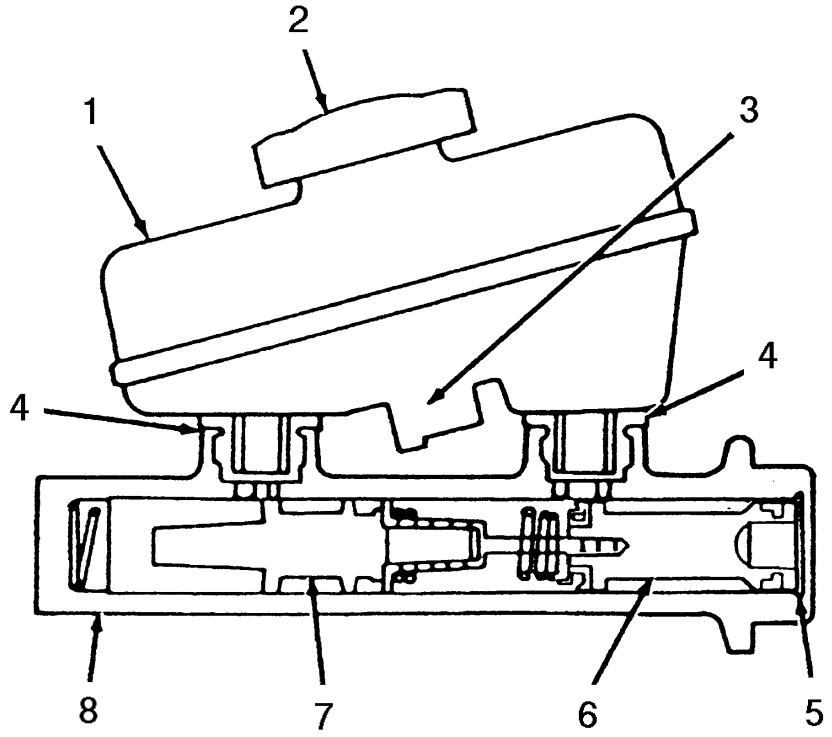


1. Generator
2. Drive belt tensioner
3. Power steering pump
4. A/C compressor
5. Crankshaft pulley
6. Idler pulley
7. Water pump
8. Drive belt

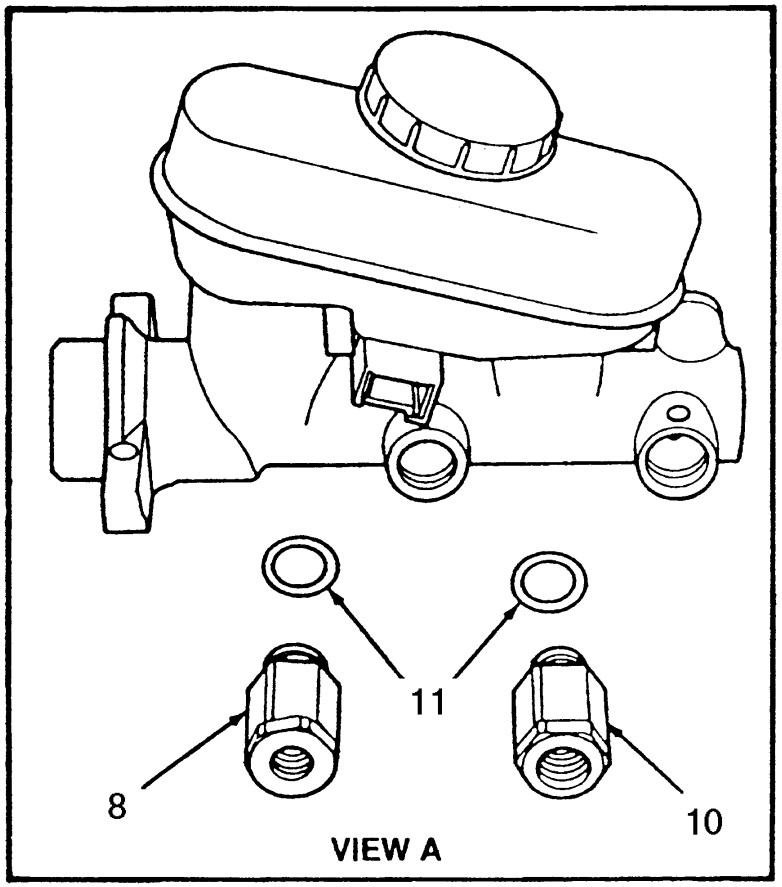


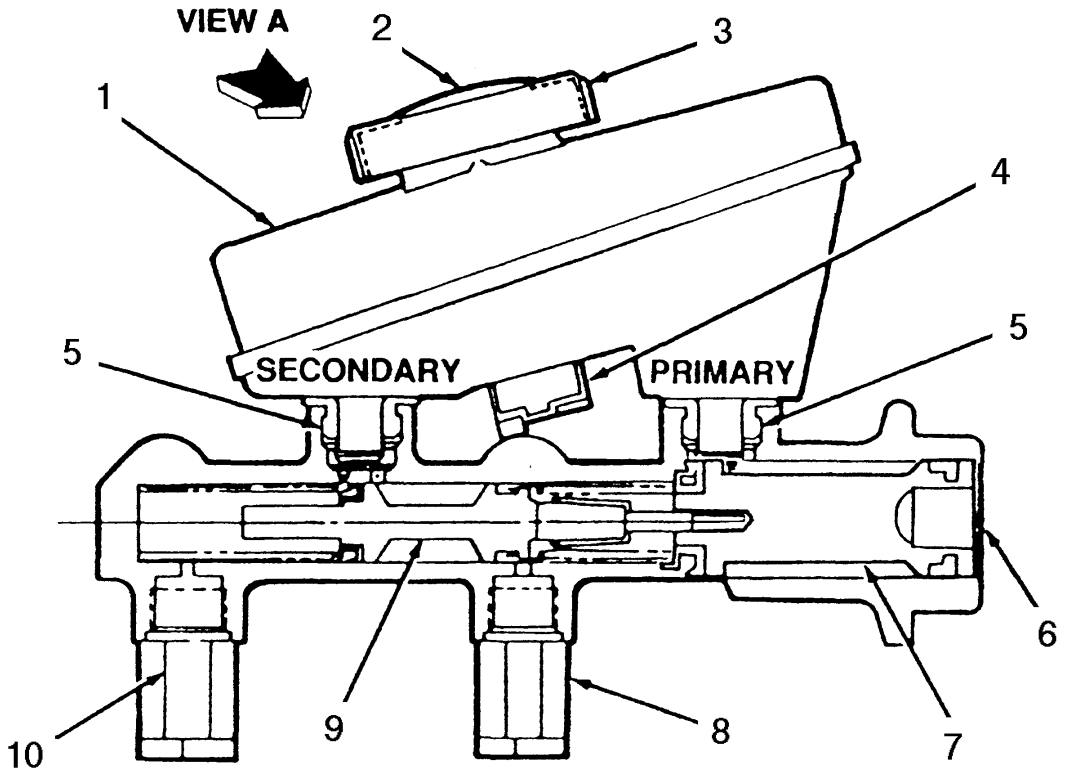
1. Generator
2. Power steering pump
3. A/C compressor
4. Idler pulley
5. Crankshaft vibration damper and pulley
6. Water pump
7. Drive belt tensioner
8. Drive belt





1. Brake master cylinder reservoir
2. Cap and gasket assembly (part of 2K478)
3. Reed switch assembly (part of 2K478)
4. Grommet (2 required)
5. Snap ring (part of 2K478)
6. Primary piston (part of 2140)
7. Secondary piston (part of 2140)
8. Brake master cylinder





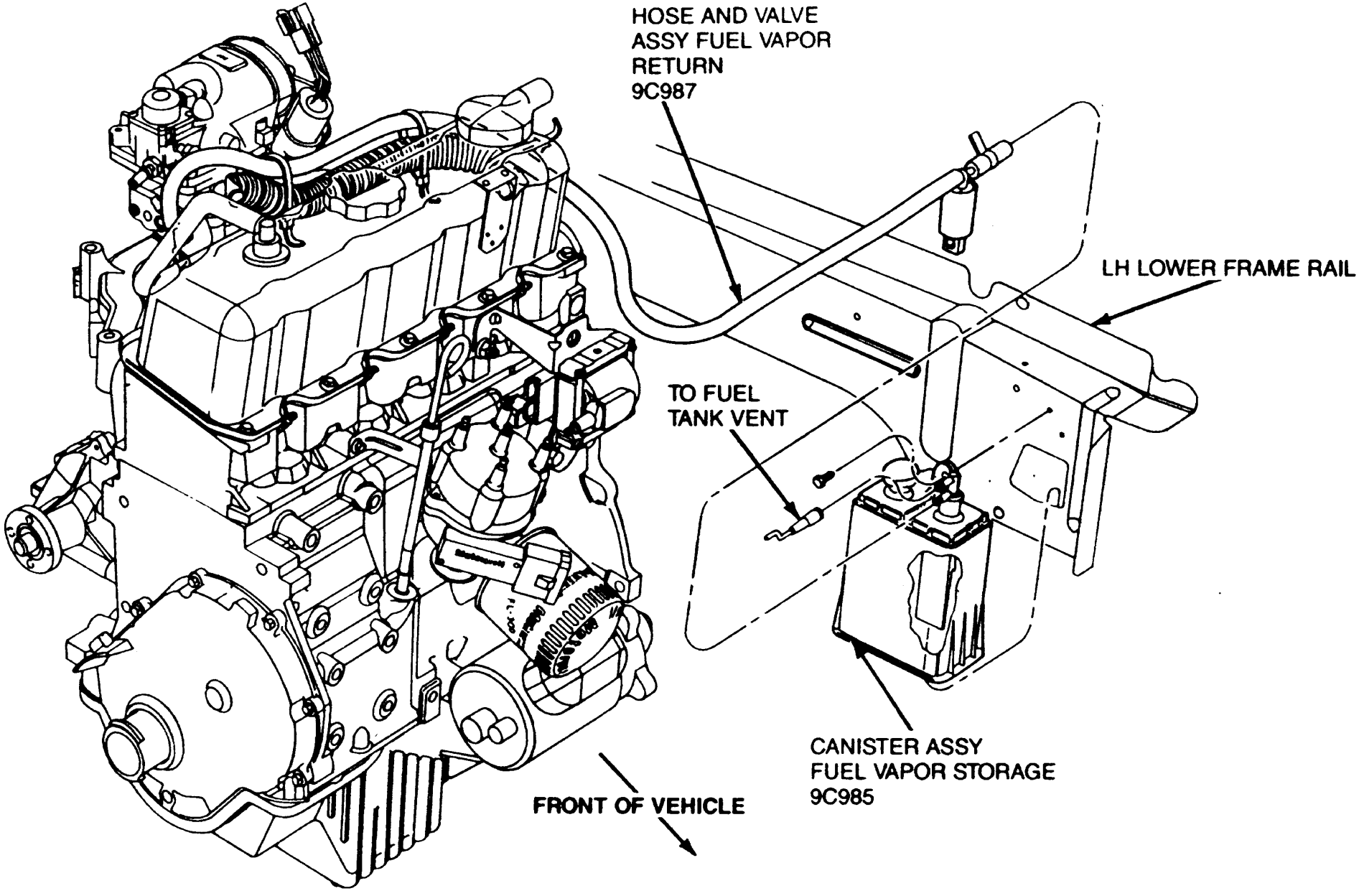
NOTE: ILLUSTRATION HAS BEEN ROTATED 90 DEGREES FOR CLARITY.

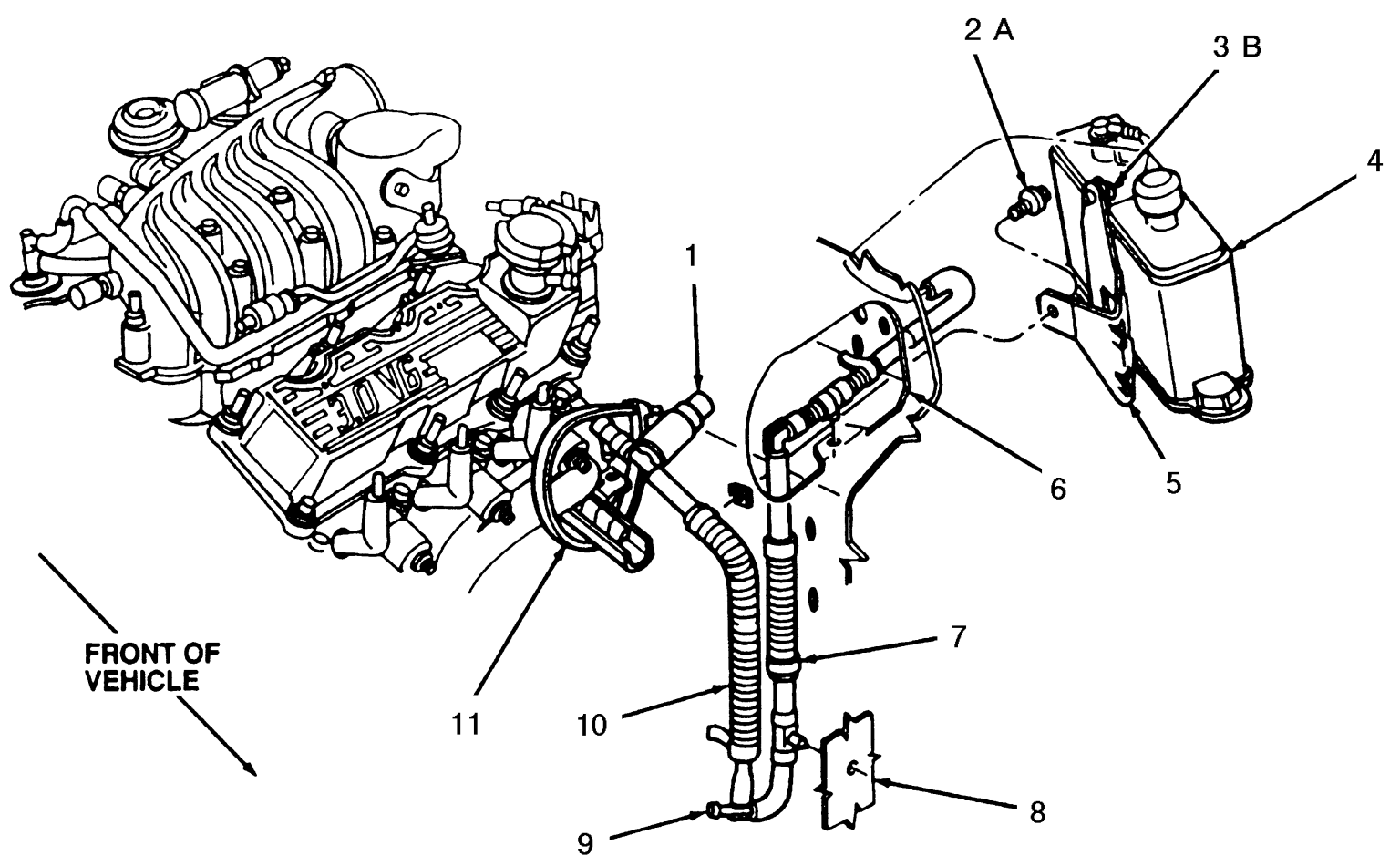
1. Brake master cylinder reservoir
2. Cap and gasket assembly (part of 2K478)
3. Cap vent slot (2 places)
4. Reed switch assembly (part of 2K478)
5. Grommet
6. Snap ring
7. Primary piston assembly (part of 2140)
8. LH rear brake pressure control valve
9. Secondary piston assembly (part of 2140)
10. RH rear brake pressure control valve
11. O-ring

Your Current Chilton Manual

Year: *1986 - 1995*
Mfg: *Ford*
Make: *Ford*
Model: *Taurus*

Print Content >>>

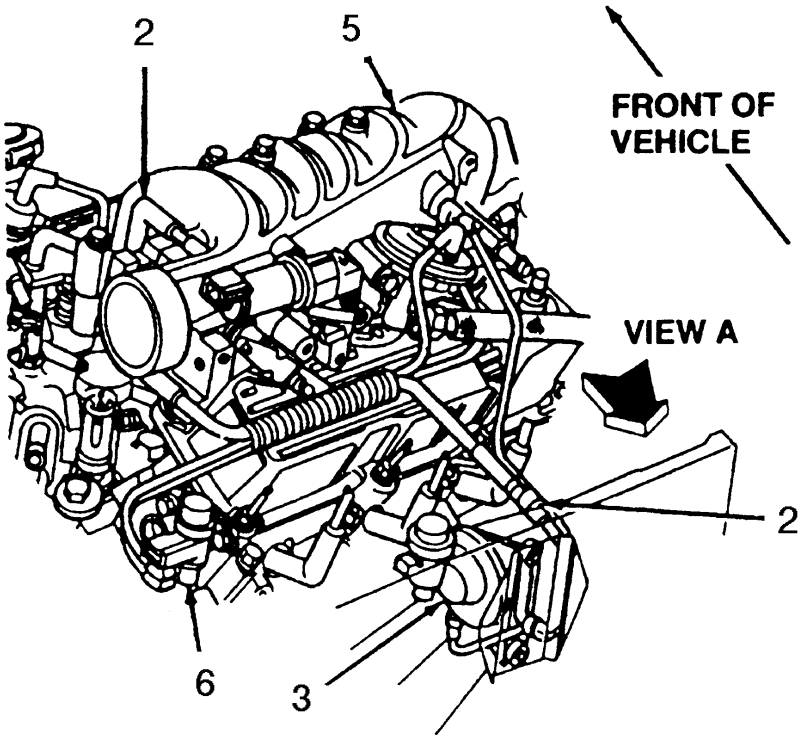

HOSE AND VALVE
ASSY FUEL VAPOR
RETURN
9C987
LH LOWER FRAME RAIL
TO FUEL
TANK VENT
CANISTER ASSY
FUEL VAPOR STORAGE
9C985
FRONT OF VEHICLE

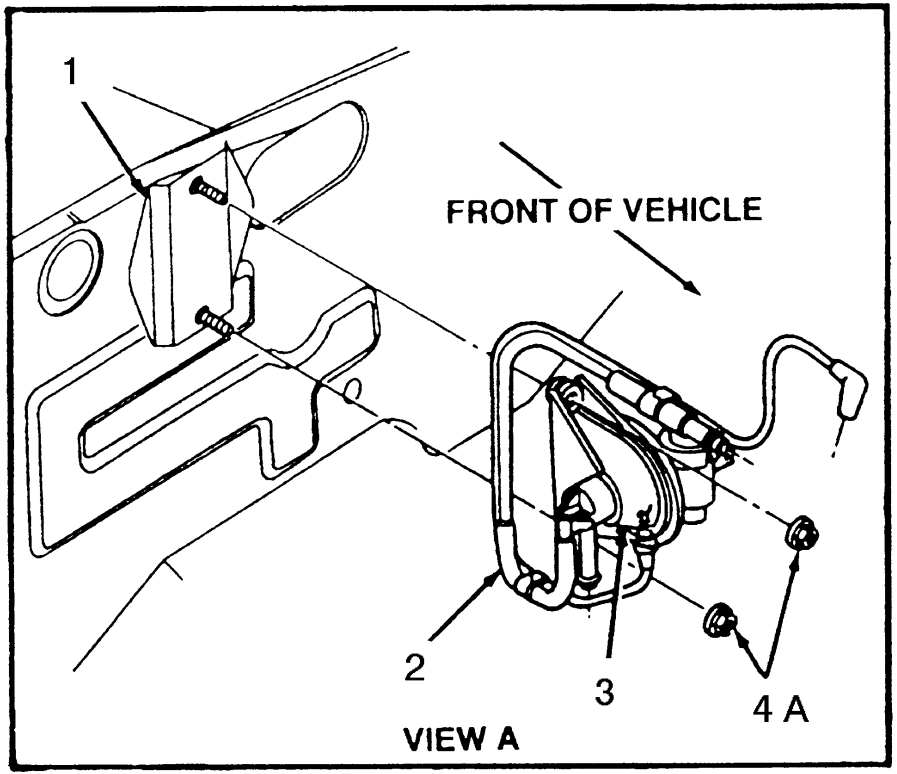


1. Evaporative emission canister purge solenoid
2. Bolt
3. Bolt
4. Evaporative emissions canister
5. evaporative emisson canister bracket
6. LH headlamp opening (part of 16138)
7. Evaporative emission tube
8. Radiator support
9. Fuel tank vent tube (part of 9K313)
10. Evaporator emission hose
11. Tie strap

A. Tighten to 21.2-28.8 N.m (15-21 lb-ft)

B. Tighten to 5.2-7.2 N.m (46-63 lb-in)



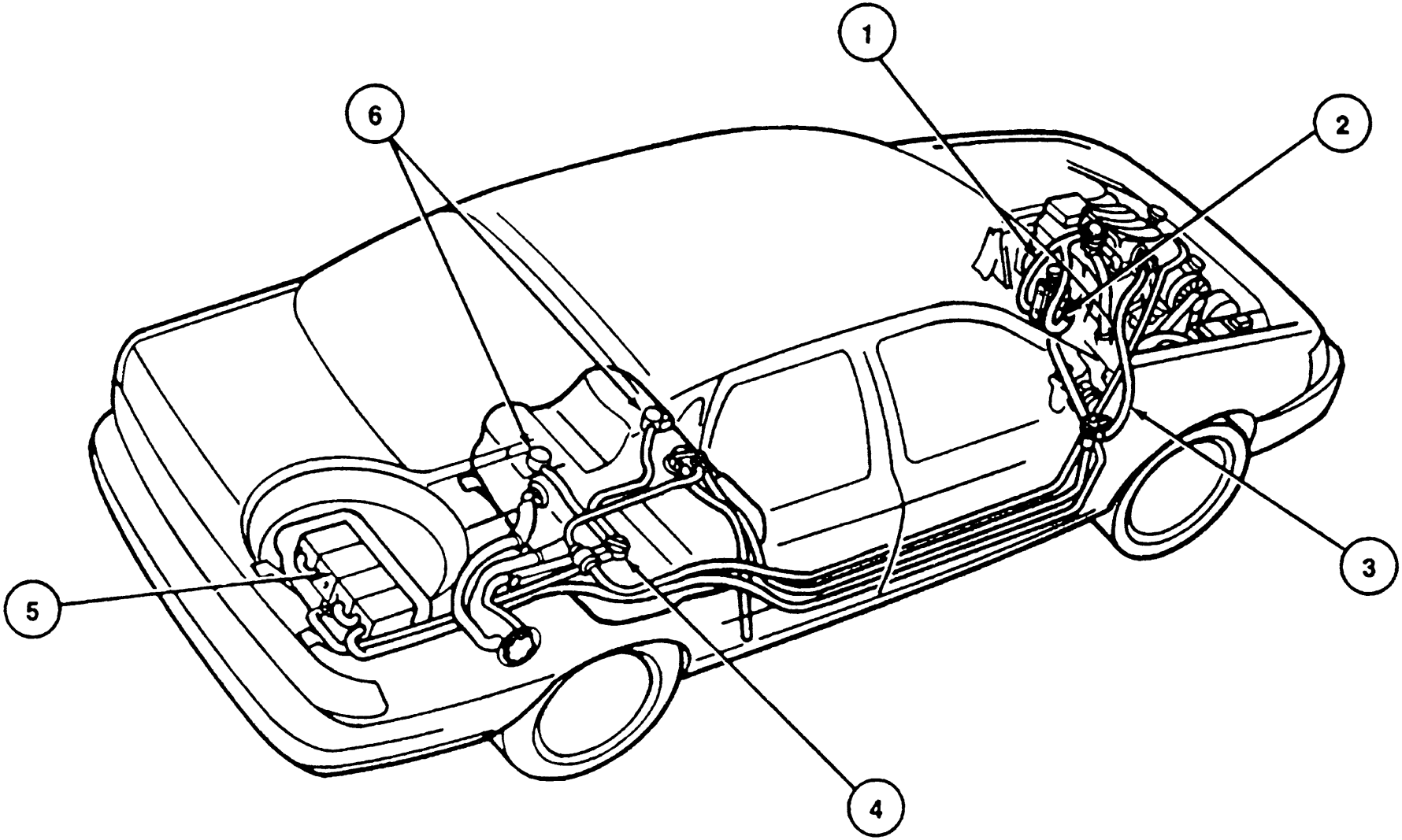


1. Dash panel
2. Main emission vacuum control connector
3. Fuel vapor canister purge regulator valve

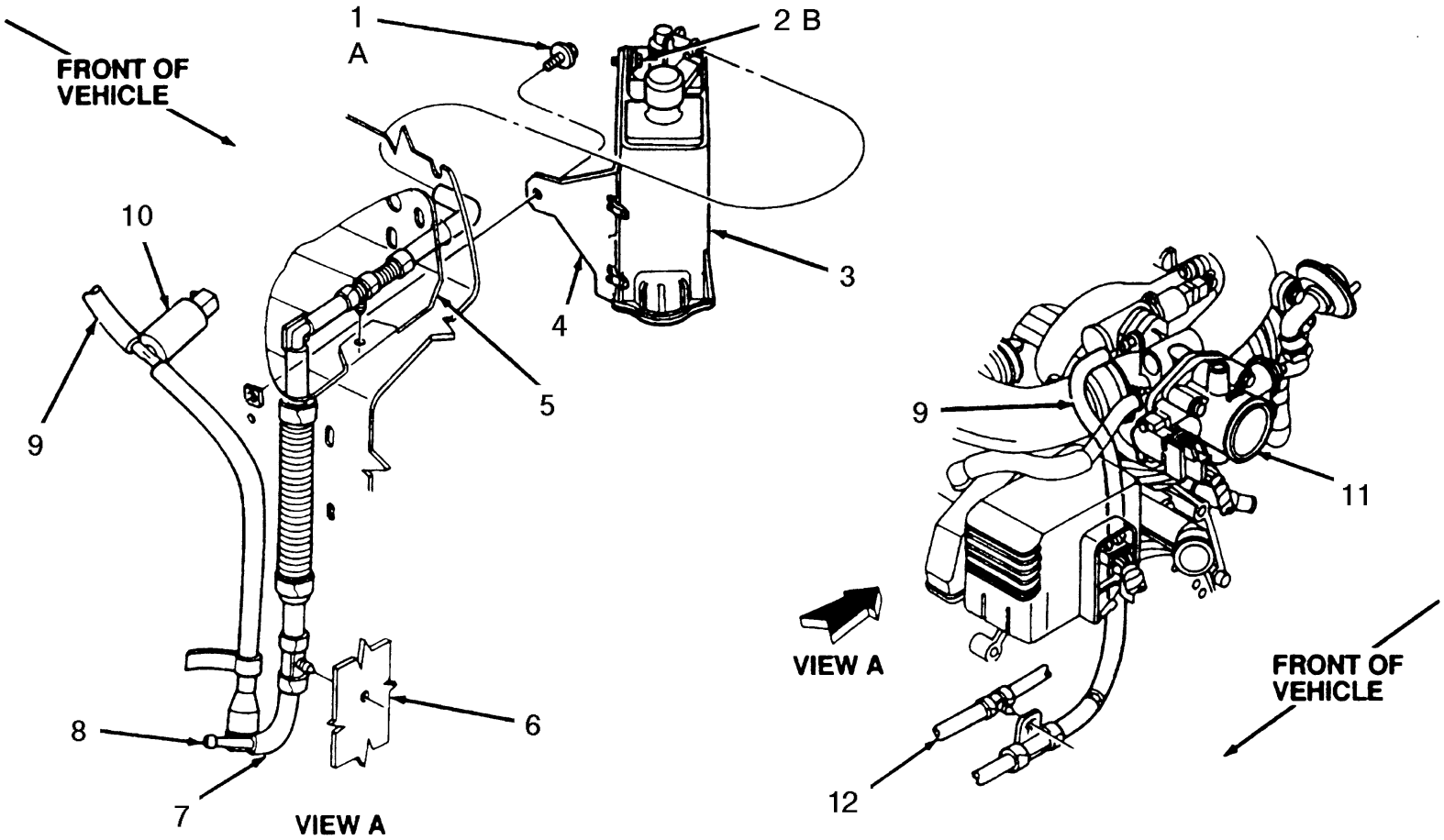
4A. Nut (2 required)

5. Throttle body
6. EGR vacuum regulator control

A. Tighten to 7.6-10.4 N.m (67-92 lb-in)

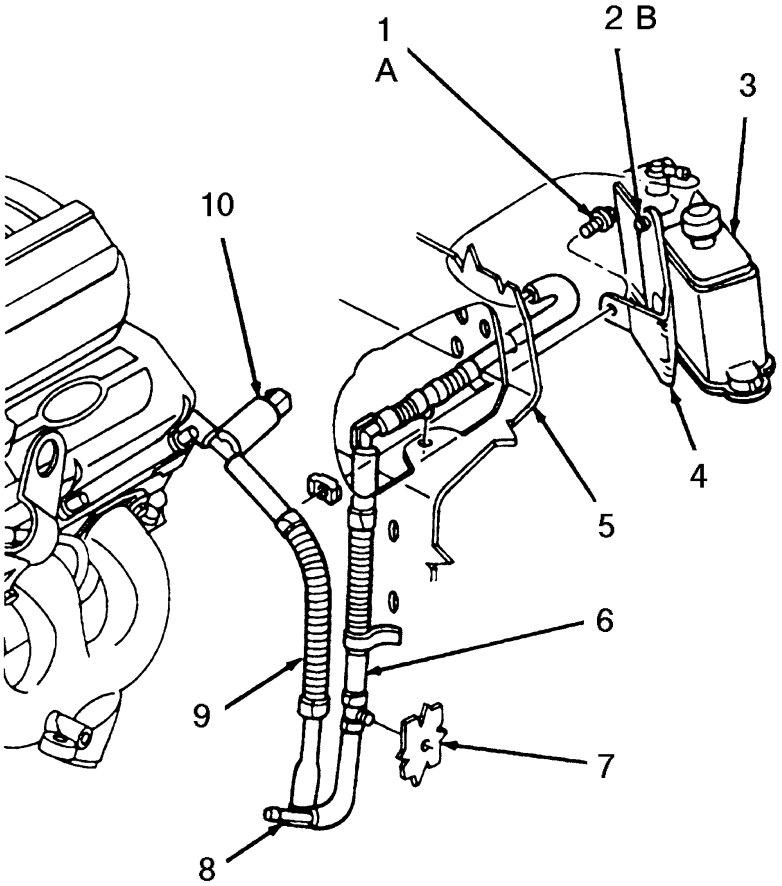


1. Main emission vacuum control connector
2. Evaporative emission canister purge solenoid
3. Fuel and vapor return tube
4. Evaporative emission tube shut off valve
5. Evaporative emissions canister (4 required)
6. Evaporative emission valve (2 required)

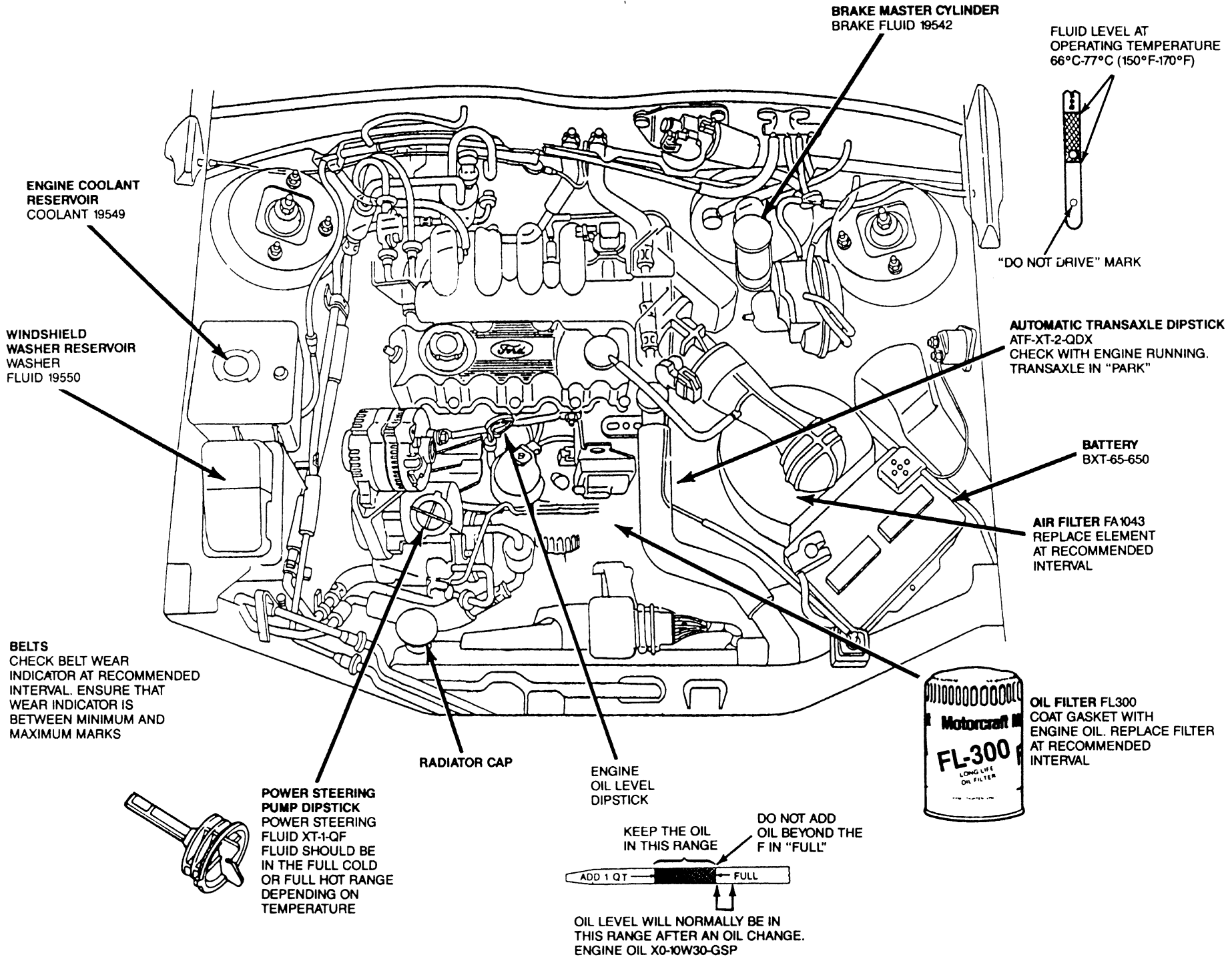


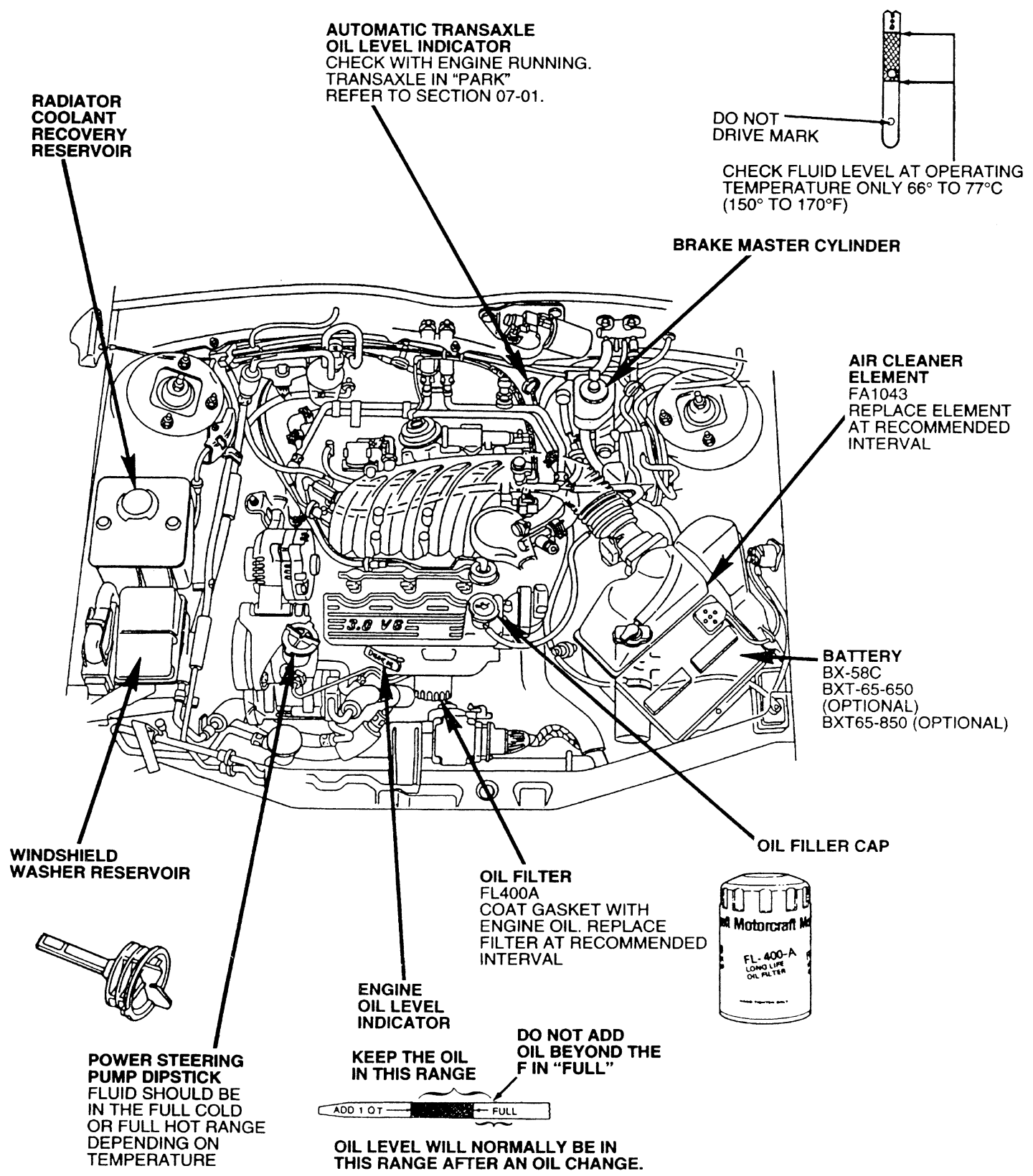
1. Bolt
2. Bolt
3. Evaporative emissions canister
4. Evaporative emissions canister bracket
5. LH headlamp opening (part of 16138)
6. Radiator support
7. Evaporative emission tube
8. Fuel tank vent tube (part of 9K313)
9. Evaporative emission hose
10. Evaporative emission canister purge solenoid
11. Throttle body
12. Battery ground cable

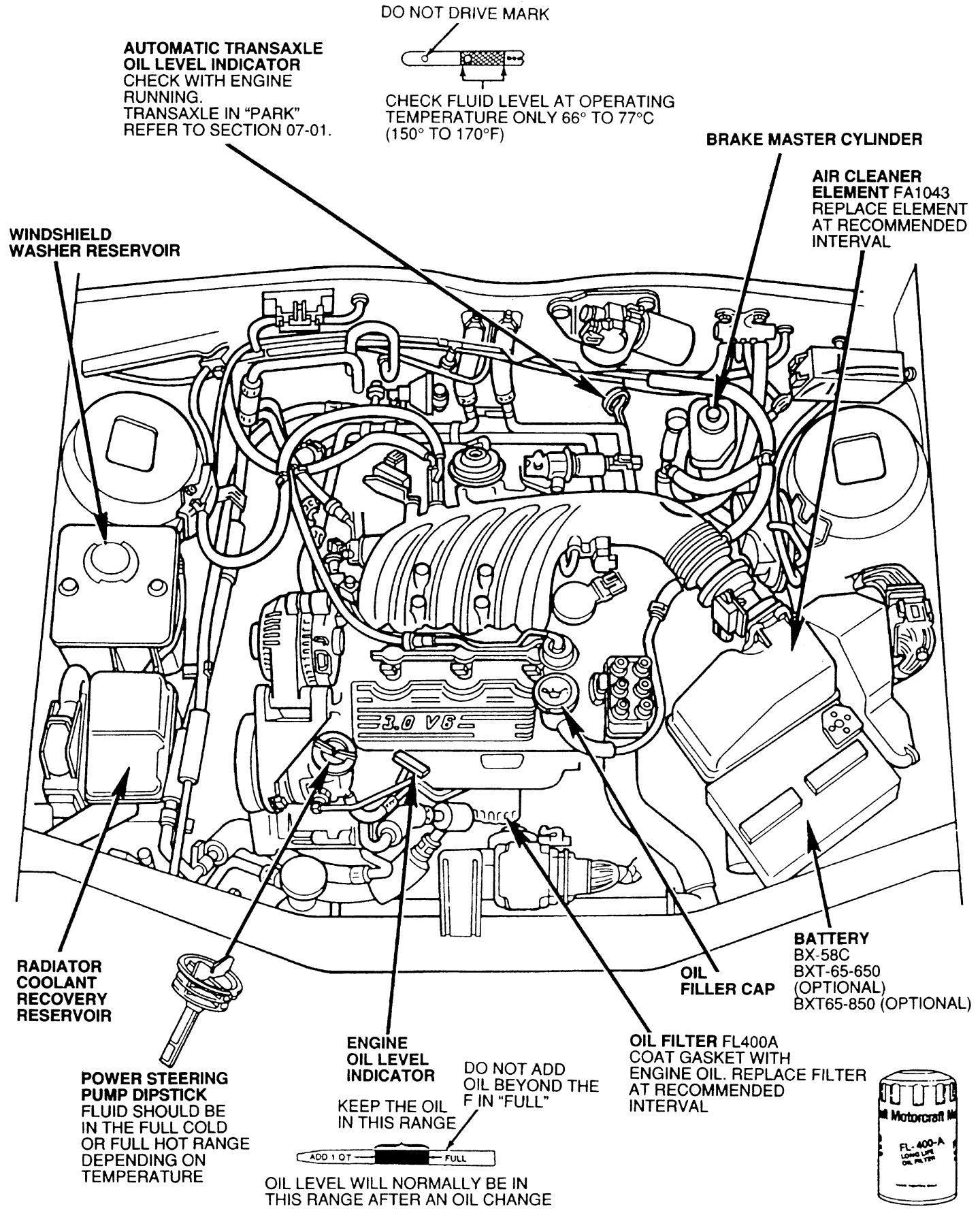
A. Tighten to 21.2-28.8 N.m (15-21 lb-ft)
B. Tighten to 5.2-7.2 N.m (46-63 lb-in)

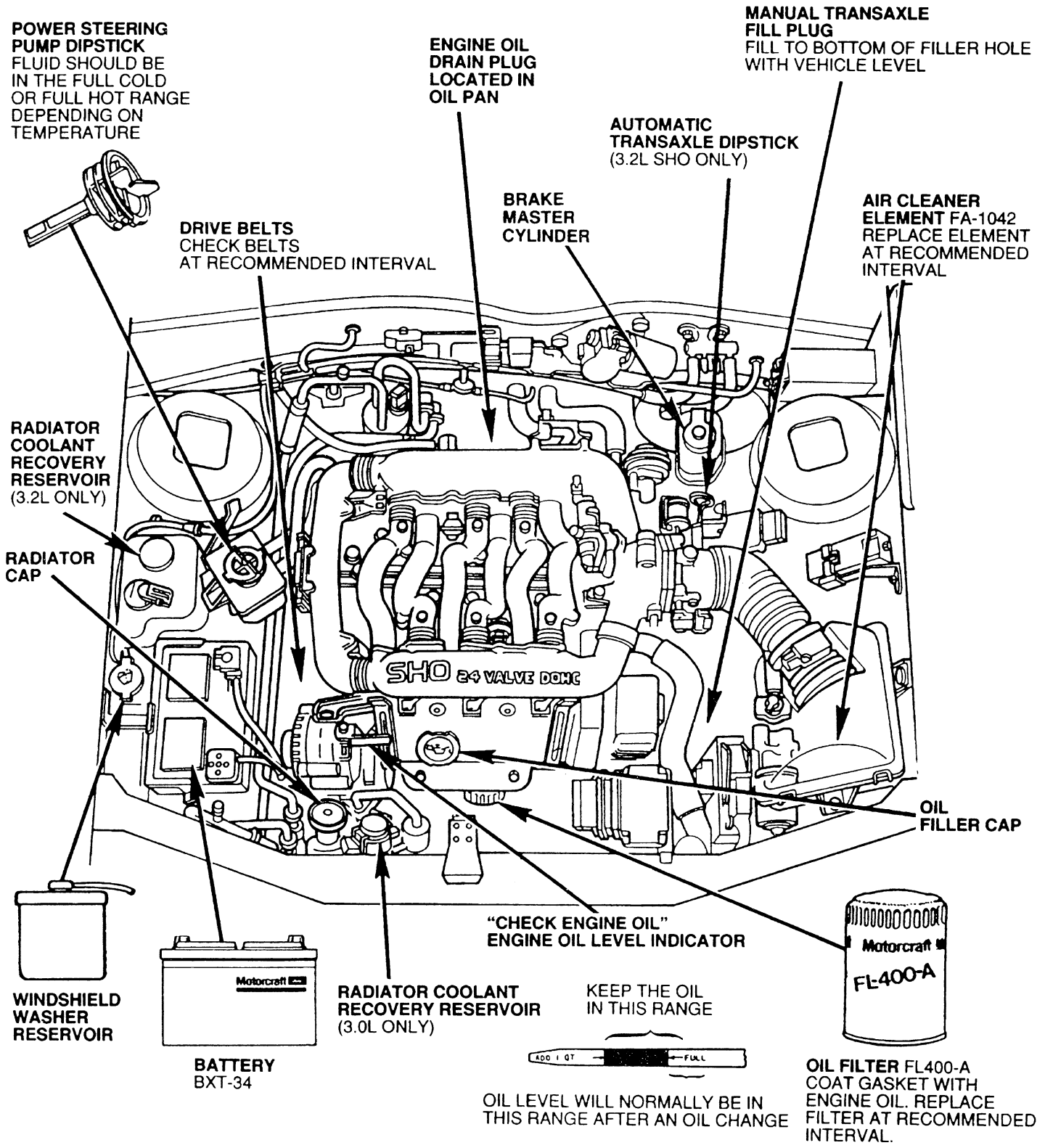


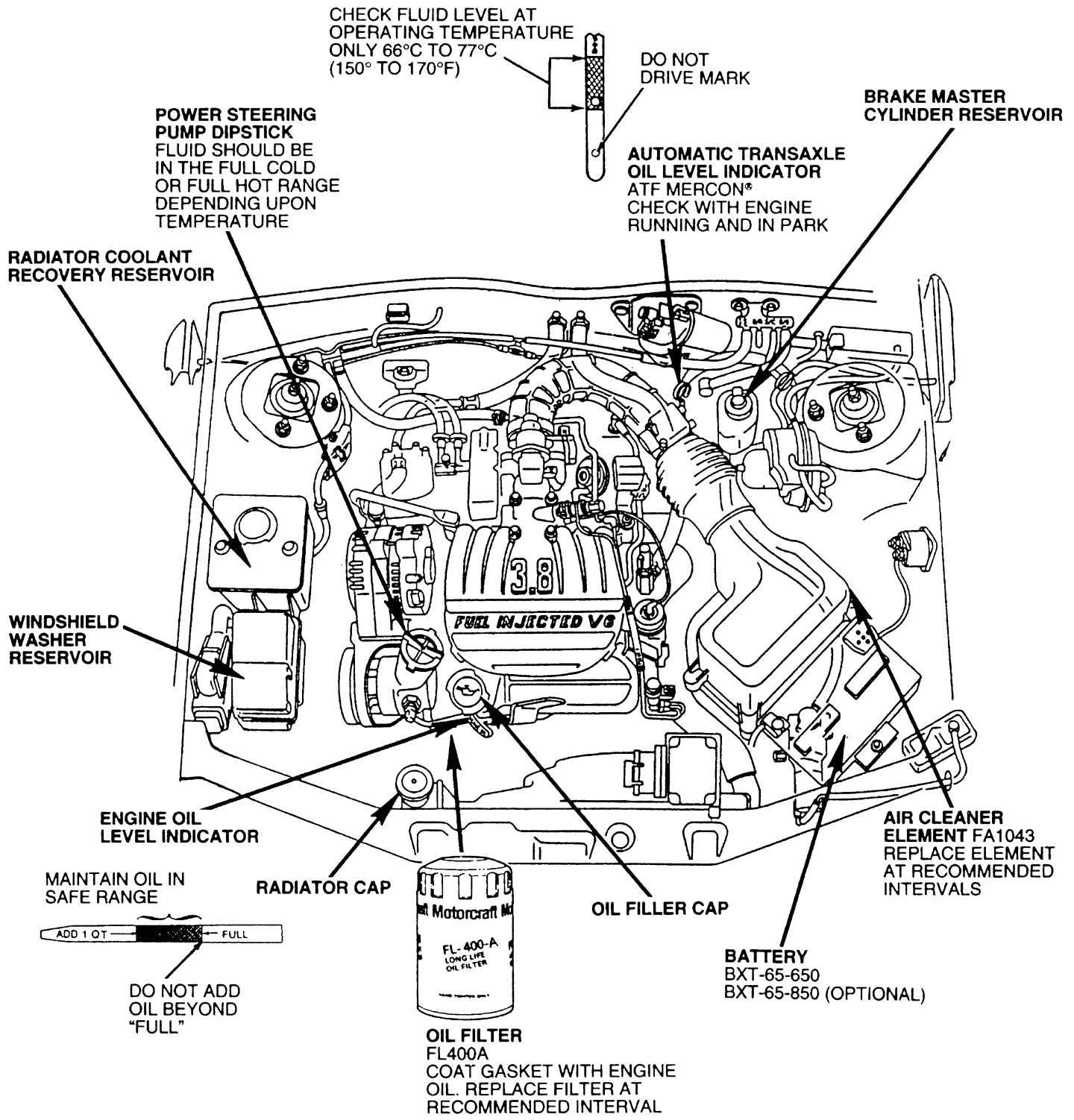
1A. Bolt
2B. Bolt
3. Fuel vapor canister
4. Fuel vapor canister bracket
5. LH headlamp opening (part of 16138)
6. Fuel vapor tube
7. Radiator support
8. To fuel tank vent tube
9. Fuel vapor hose
10. Fuel vapor canister purge regulator valve
A. Tighten to 21.2-28.8 N.m (15-21 lb-ft)
B. Tighten to 5.2-7.2 N.m (46-63 lb-in)

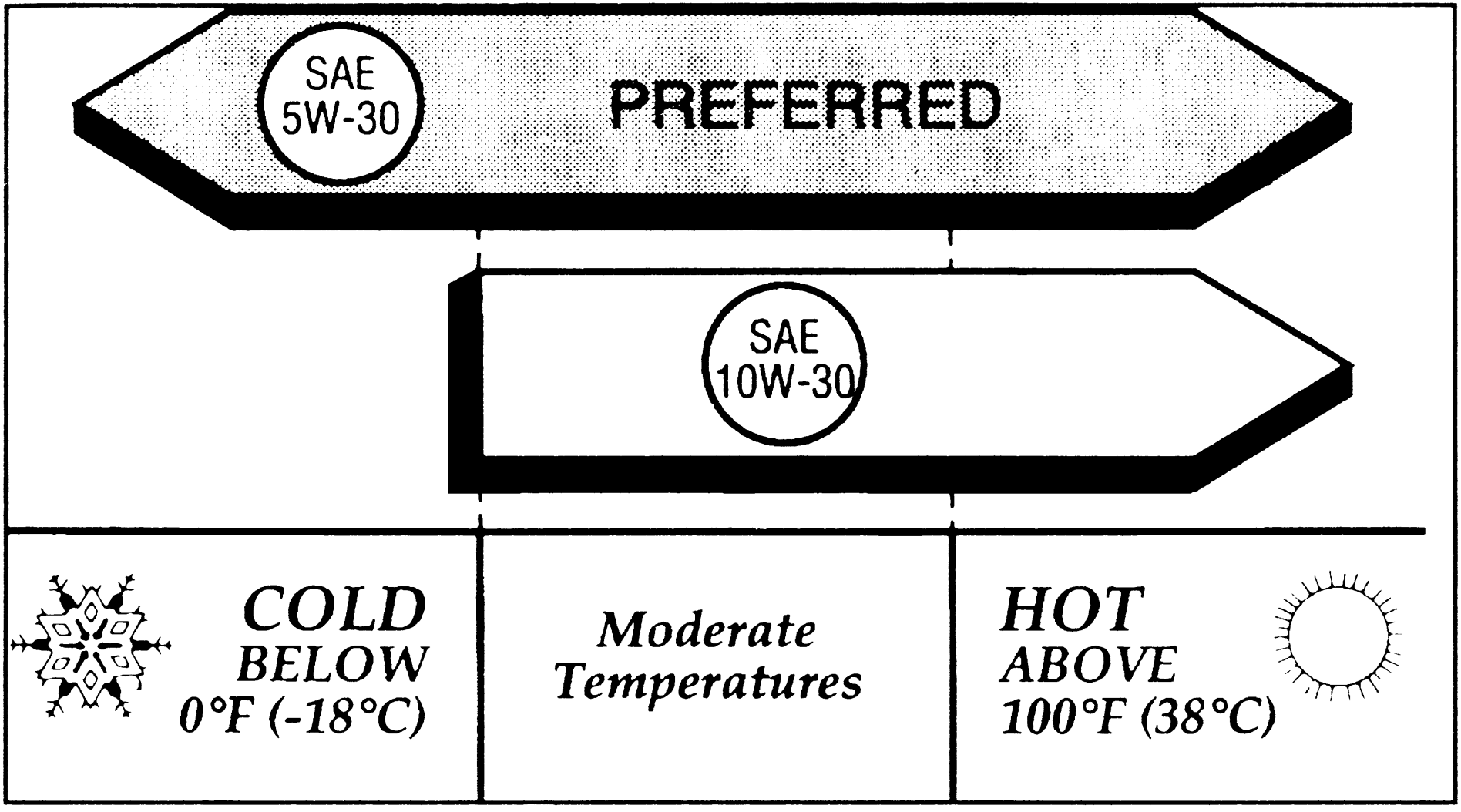

BRAKE MASTER CYLINDER
BRAKE FLUID 19542
FLUID LEVEL AT
OPERATING TEMPERATURE
66°C-77°C (150°F-170°F)
"DO NOT DRIVE" MARK
ENGINE COOLANT RESERVOIR
COOLANT 19549
WINDSHIELD WASHER RESERVOIR
WASHER
FLUID 19550
AUTOMATIC TRANSAXLE DIPSTICK
ATF-XT-2-QDX
CHECK WITH ENGINE RUNNING.
TRANSAXLE IN "PARK"
BATTERY
BXT-65-650
AIR FILTER FA1043
REPLACE ELEMENT
AT RECOMMENDED
INTERVAL
BELTS
CHECK BELT WEAR
INDICATOR AT RECOMMENDED
INTERVAL. ENSURE THAT
WEAR INDICATOR IS
BETWEEN MINIMUM AND
MAXIMUM MARKS
RADIATOR CAP
ENGINE
OIL LEVEL
DIPSTICK
Motorcraft
FL-300
LONG LIFE
OIL FILTER
OIL FILTER FL300
COAT GASKET WITH
ENGINE OIL. REPLACE FILTER
AT RECOMMENDED
INTERVAL
POWER STEERING PUMP DIPSTICK
POWER STEERING
FLUID XT-1-QF
FLUID SHOULD BE
IN THE FULL COLD
OR FULL HOT RANGE
DEPENDING ON
TEMPERATURE
KEEP THE OIL
IN THIS RANGE
DO NOT ADD
OIL BEYOND THE
F IN "FULL"
ADD 1 QT
FULL
OIL LEVEL WILL NORMALLY BE IN
THIS RANGE AFTER AN OIL CHANGE.
ENGINE OIL XO-10W30-GSP

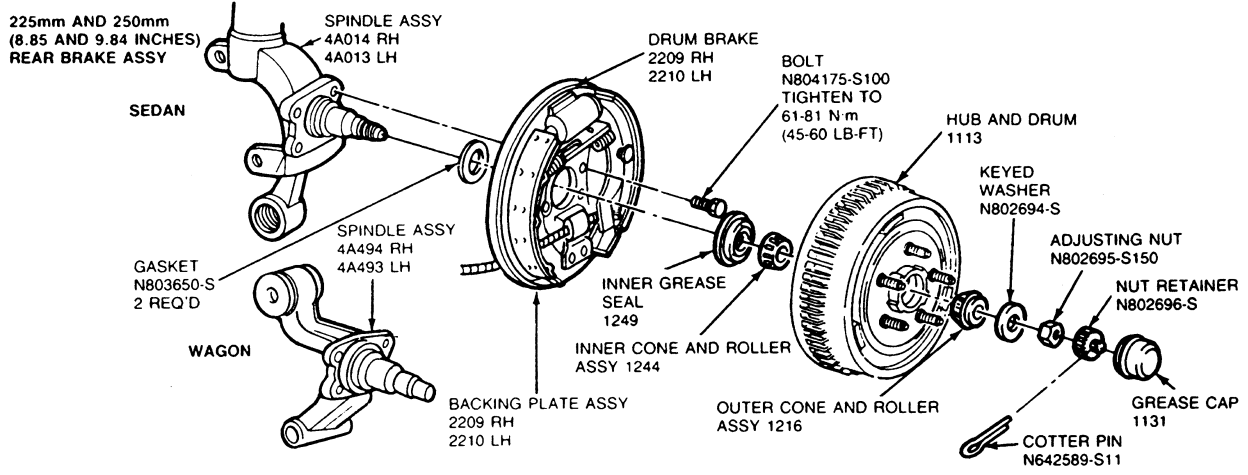

AUTOMATIC TRANSAXLE
OIL LEVEL INDICATOR
CHECK WITH ENGINE RUNNING.
TRANSAXLE IN "PARK"
REFER TO SECTION 07-01.
RADIATOR
COOLANT
RECOVERY
RESERVOIR
DO NOT
DRIVE MARK
CHECK FLUID LEVEL AT OPERATING
TEMPERATURE ONLY 66° TO 77°C
(150° TO 170°F)
BRAKE MASTER CYLINDER
AIR CLEANER
ELEMENT
FA1043
REPLACE ELEMENT
AT RECOMMENDED
INTERVAL
BATTERY
BX-58C
BXT-65-650
(OPTIONAL)
BXT65-850 (OPTIONAL)
OIL FILLER CAP
WINDSHIELD
WASHER RESERVOIR
OIL FILTER
FL400A
COAT GASKET WITH
ENGINE OIL. REPLACE
FILTER AT RECOMMENDED
INTERVAL
Motorcraft
FL-400-A
LONG LIFE
OIL FILTER
ENGINE
OIL LEVEL
INDICATOR
POWER STEERING
PUMP DIPSTICK
FLUID SHOULD BE
IN THE FULL COLD
OR FULL HOT RANGE
DEPENDING ON
TEMPERATURE
KEEP THE OIL
IN THIS RANGE
DO NOT ADD
OIL BEYOND THE
F IN "FULL"
ADD 1 QT
FULL
OIL LEVEL WILL NORMALLY BE IN
THIS RANGE AFTER AN OIL CHANGE.

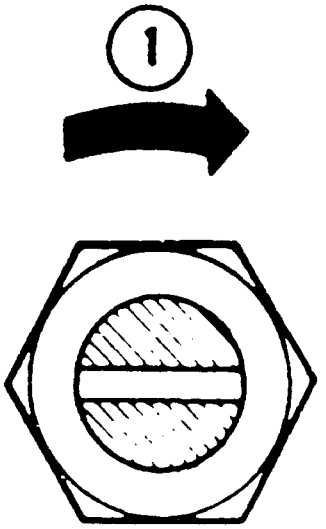

DO NOT DRIVE MARK
AUTOMATIC TRANSAXLE OIL LEVEL INDICATOR CHECK WITH ENGINE RUNNING. TRANSAXLE IN "PARK" REFER TO SECTION 07-01.
CHECK FLUID LEVEL AT OPERATING TEMPERATURE ONLY 66° TO 77°C (150° TO 170°F)
BRAKE MASTER CYLINDER
AIR CLEANER ELEMENT FA1043 REPLACE ELEMENT AT RECOMMENDED INTERVAL
WINDSHIELD WASHER RESERVOIR
3.0 V6
RADIATOR COOLANT RECOVERY RESERVOIR
POWER STEERING PUMP DIPSTICK FLUID SHOULD BE IN THE FULL COLD OR FULL HOT RANGE DEPENDING ON TEMPERATURE
ENGINE OIL LEVEL INDICATOR
KEEP THE OIL IN THIS RANGE
DO NOT ADD OIL BEYOND THE F IN "FULL"
ADD 1 QT
FULL
OIL LEVEL WILL NORMALLY BE IN THIS RANGE AFTER AN OIL CHANGE
OIL FILLER CAP
OIL FILTER FL400A COAT GASKET WITH ENGINE OIL. REPLACE FILTER AT RECOMMENDED INTERVAL
BATTERY BX-58C BXT-65-650 (OPTIONAL) BXT65-850 (OPTIONAL)
Motorcraft
FL-400-A


POWER STEERING PUMP DIPSTICK
FLUID SHOULD BE IN THE FULL COLD OR FULL HOT RANGE DEPENDING ON TEMPERATURE
ENGINE OIL DRAIN PLUG LOCATED IN OIL PAN
MANUAL TRANSAXLE FILL PLUG
FILL TO BOTTOM OF FILLER HOLE WITH VEHICLE LEVEL
AUTOMATIC TRANSAXLE DIPSTICK
(3.2L SHO ONLY)
BRAKE MASTER CYLINDER
AIR CLEANER ELEMENT FA-1042
REPLACE ELEMENT AT RECOMMENDED INTERVAL
DRIVE BELTS
CHECK BELTS AT RECOMMENDED INTERVAL
RADIATOR COOLANT RECOVERY RESERVOIR
(3.2L ONLY)
RADIATOR CAP
SHO 24 VALVE DOHC
OIL FILLER CAP
"CHECK ENGINE OIL"
ENGINE OIL LEVEL INDICATOR
WINDSHIELD WASHER RESERVOIR
Motorcraft
BATTERY
BXT-34
RADIATOR COOLANT RECOVERY RESERVOIR
(3.0L ONLY)
KEEP THE OIL IN THIS RANGE
ADD 1 QT
FULL
OIL LEVEL WILL NORMALLY BE IN THIS RANGE AFTER AN OIL CHANGE
Motorcraft
FL-400-A
OIL FILTER FL400-A
COAT GASKET WITH ENGINE OIL. REPLACE FILTER AT RECOMMENDED INTERVAL.

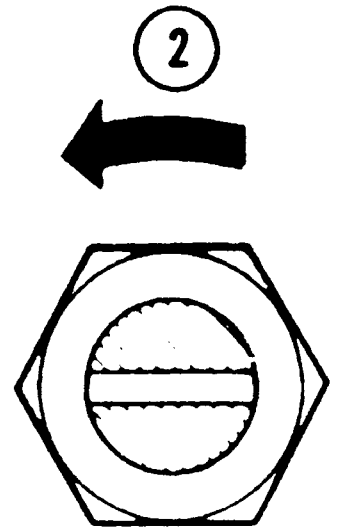

CHECK FLUID LEVEL AT OPERATING TEMPERATURE ONLY 66°C TO 77°C (150° TO 170°F)
DO NOT DRIVE MARK
POWER STEERING PUMP DIPSTICK FLUID SHOULD BE IN THE FULL COLD OR FULL HOT RANGE DEPENDING UPON TEMPERATURE
AUTOMATIC TRANSAXLE OIL LEVEL INDICATOR ATF MERCON® CHECK WITH ENGINE RUNNING AND IN PARK
BRAKE MASTER CYLINDER RESERVOIR
RADIATOR COOLANT RECOVERY RESERVOIR
WINDSHIELD WASHER RESERVOIR
3.8
FUEL INJECTED V6
ENGINE OIL LEVEL INDICATOR
RADIATOR CAP
OIL FILLER CAP
AIR CLEANER ELEMENT FA1043 REPLACE ELEMENT AT RECOMMENDED INTERVALS
MAINTAIN OIL IN SAFE RANGE
ADD 1 QT
FULL
DO NOT ADD OIL BEYOND "FULL"
Motorcraft
FL-400-A
LONG LIFE OIL FILTER
OIL FILTER FL400A COAT GASKET WITH ENGINE OIL. REPLACE FILTER AT RECOMMENDED INTERVAL
BATTERY BXT-65-650 BXT-65-850 (OPTIONAL)


SAE
5W-30
PREFERRED
SAE
10W-30
COLD
BELOW
0°F (-18°C)
Moderate
Temperatures
HOT
ABOVE
100°F (38°C)

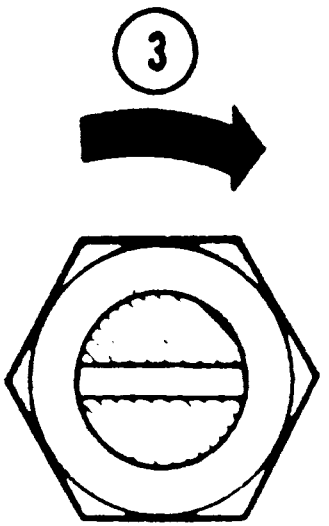

225mm AND 250mm
(8.85 AND 9.84 INCHES)
REAR BRAKE ASSY
SEDAN
SPINDLE ASSY
4A014 RH
4A013 LH
DRUM BRAKE
2209 RH
2210 LH
BOLT
N804175-S100
TIGHTEN TO
61-81 N·m
(45-60 LB-FT)
HUB AND DRUM
1113
KEYED
WASHER
N802694-S
ADJUSTING NUT
N802695-S150
NUT RETAINER
N802696-S
GREASE CAP
1131
GASKET
N803650-S
2 REQ'D
SPINDLE ASSY
4A494 RH
4A493 LH
WAGON
INNER GREASE
SEAL
1249
INNER CONE AND ROLLER
ASSY 1244
BACKING PLATE ASSY
2209 RH
2210 LH
OUTER CONE AND ROLLER
ASSY 1216
COTTER PIN
N642589-S11



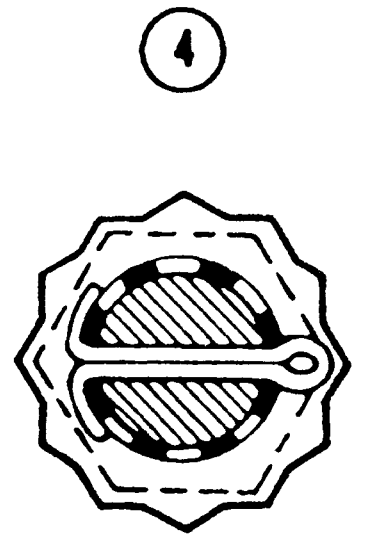
WITH WHEEL ROTATING
TIGHTEN ADJUSTING NUT
TO 23-34 N·m (17-25 LB-FT)



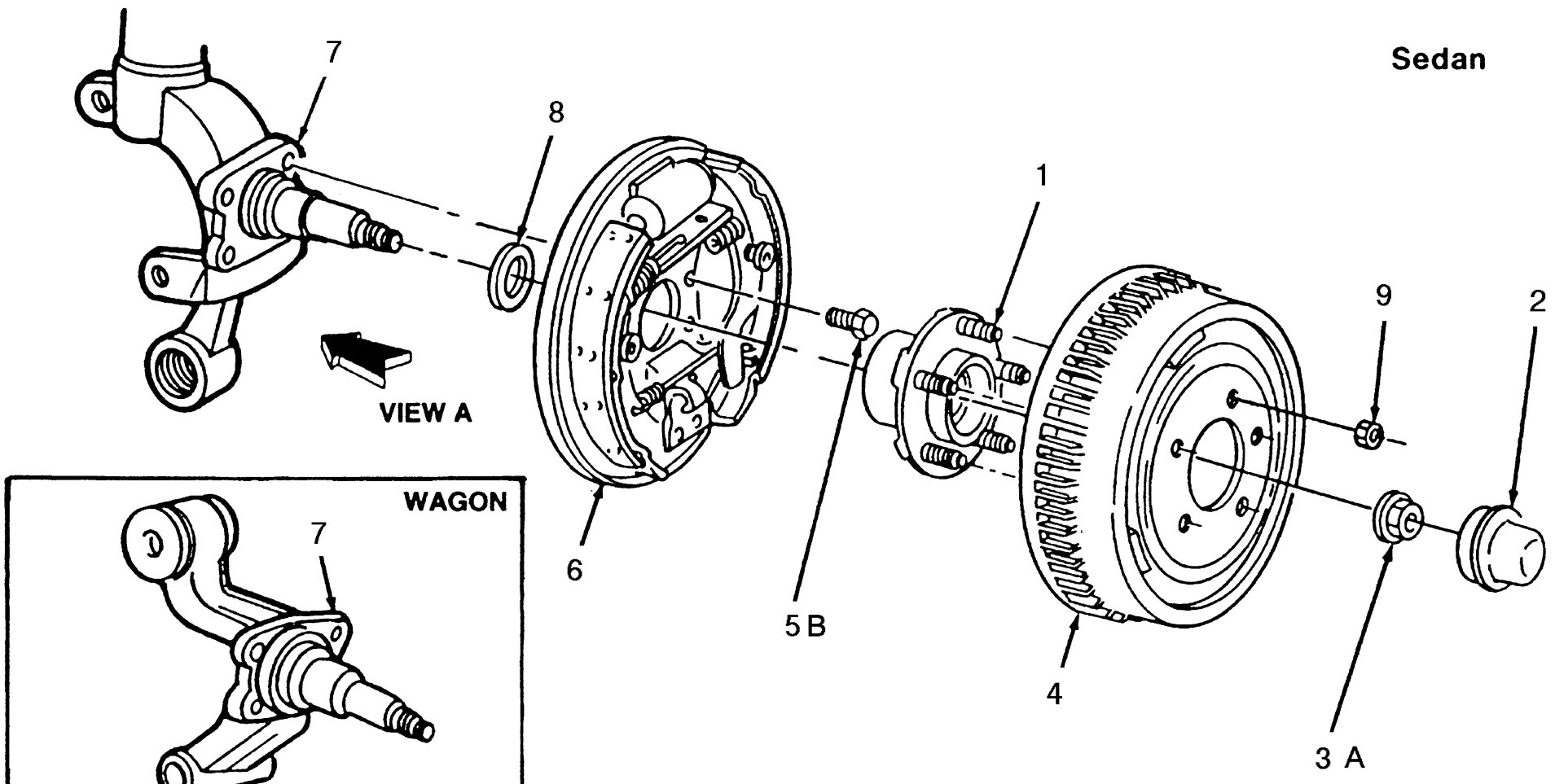
BACK ADJUSTING
NUT OFF 1/2 TURN



TIGHTEN ADJUSTING
NUT TO 2.7-3.2 N·m
(24-28 LB-IN)

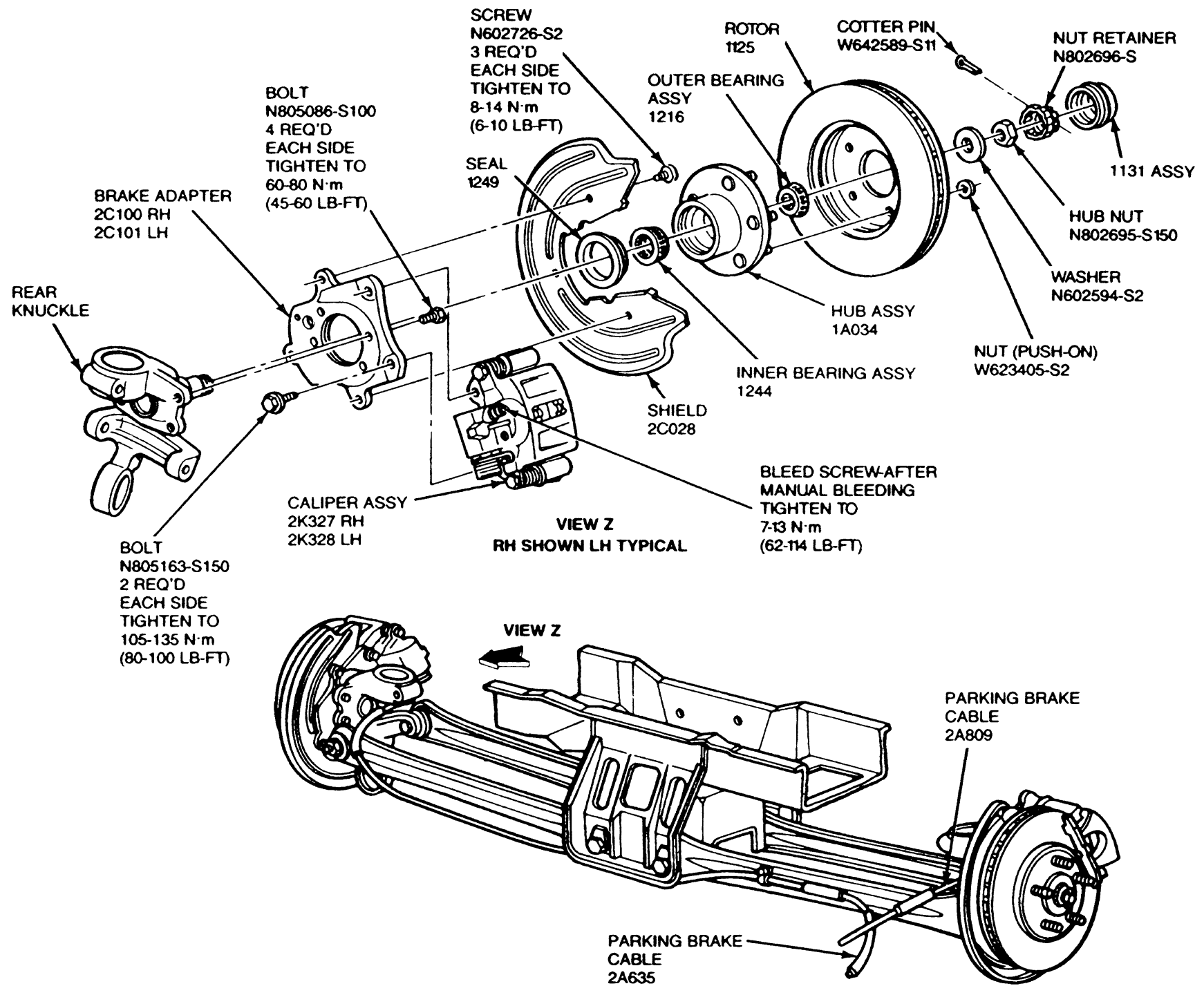


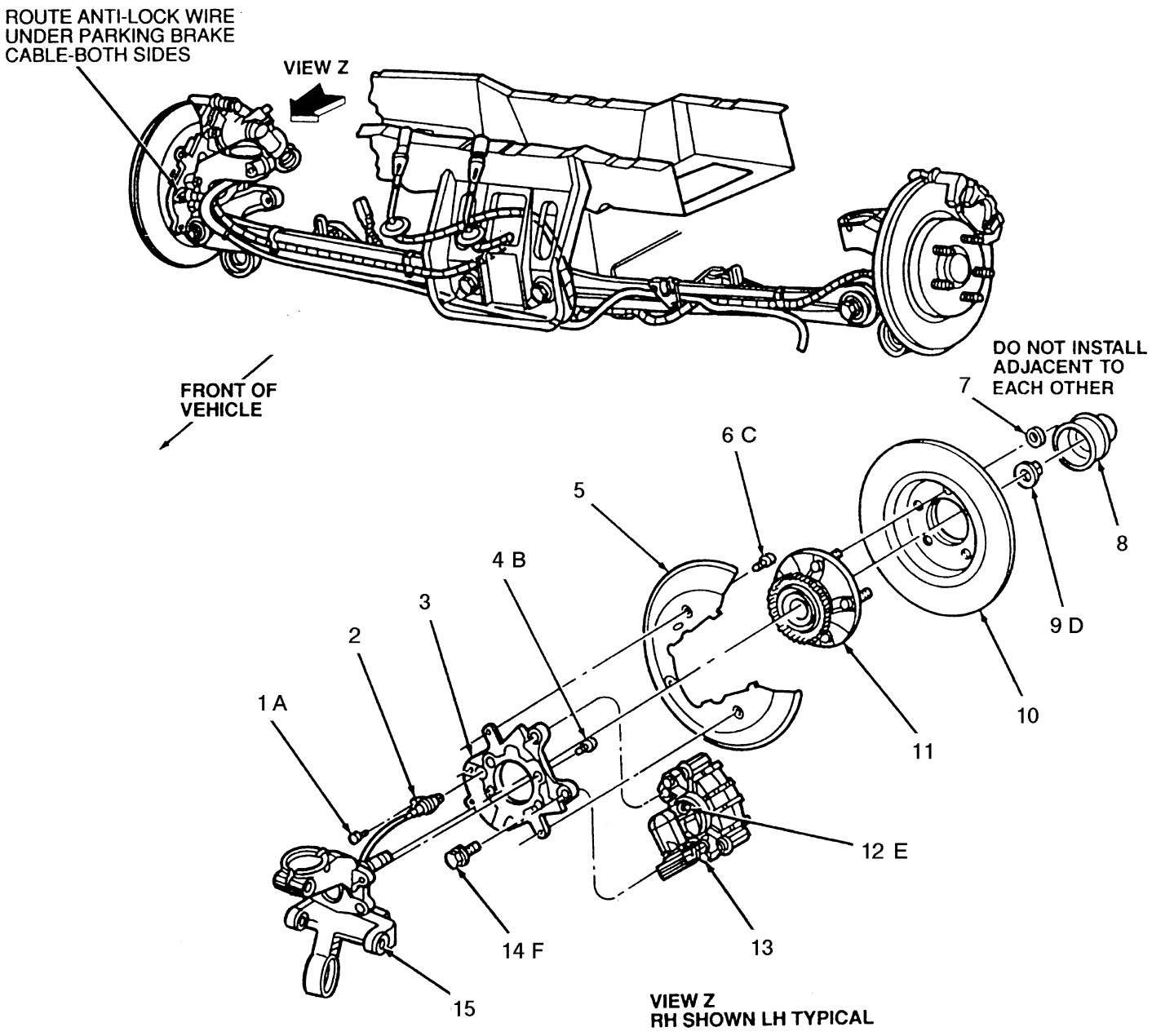
INSTALL THE RETAINER
AND A NEW COTTER PIN



1. Wheel hub
2. Front hub cap grease seal
3A. Rear axle wheel hub retainer
4. Brake drum
5B. Bolt
6. Brake backing plate
7. Rear wheel spindle
8. Gasket
9. Retainer nut

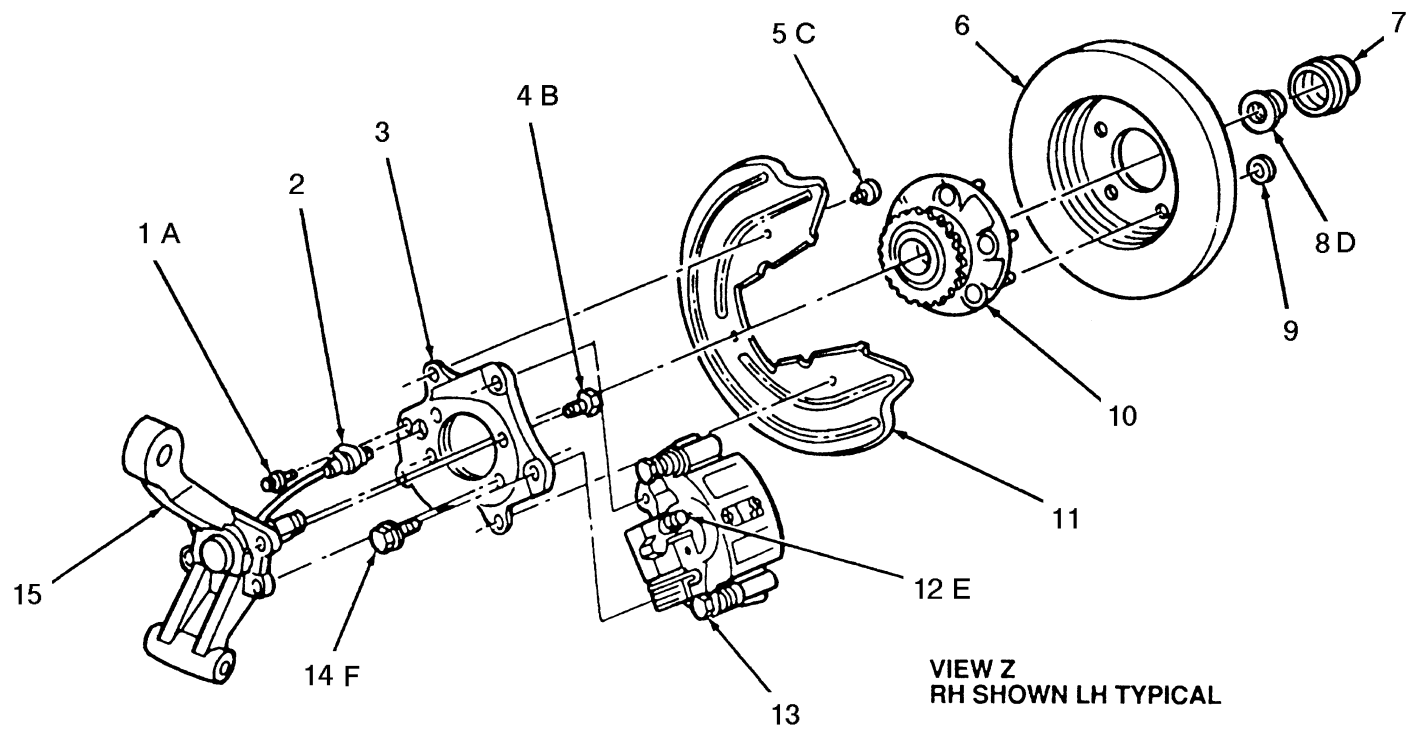
A. Tighten to 255-345 N.m (188-254 lb-ft)
B. Tighten to 60-80 N.m (45-59 lb-ft)

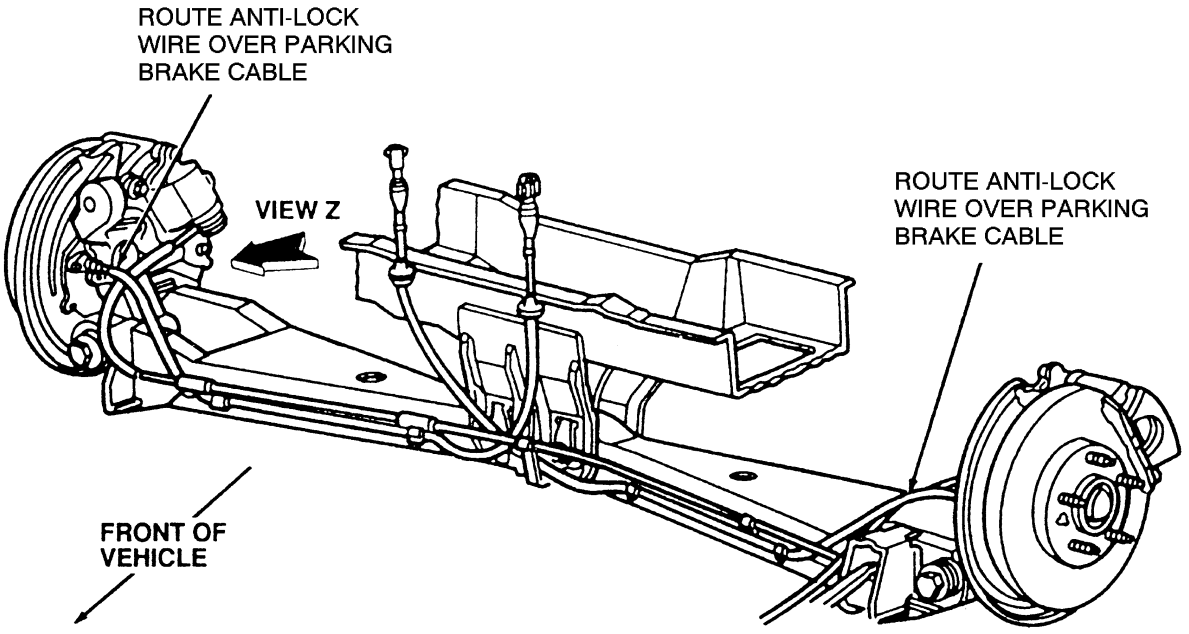

SCREW
N602726-S2
3 REQ'D
EACH SIDE
TIGHTEN TO
8-14 N·m
(6-10 LB-FT)
ROTOR
1125
COTTER PIN
W642589-S11
NUT RETAINER
N802696-S
OUTER BEARING
ASSY
1216
BOLT
N805086-S100
4 REQ'D
EACH SIDE
TIGHTEN TO
60-80 N·m
(45-60 LB-FT)
SEAL
1249
1131 ASSY
BRAKE ADAPTER
2C100 RH
2C101 LH
HUB NUT
N802695-S150
WASHER
N602594-S2
REAR
KNUCKLE
HUB ASSY
1A034
NUT (PUSH-ON)
W623405-S2
INNER BEARING ASSY
1244
SHIELD
2C028
BLEED SCREW-AFTER
MANUAL BLEEDING
TIGHTEN TO
7-13 N·m
(62-114 LB-FT)
CALIPER ASSY
2K327 RH
2K328 LH
VIEW Z
RH SHOWN LH TYPICAL
BOLT
N805163-S150
2 REQ'D
EACH SIDE
TIGHTEN TO
105-135 N·m
(80-100 LB-FT)
VIEW Z
PARKING BRAKE
CABLE
2A809
PARKING BRAKE
CABLE
2A635



1A. Bolt
2. Rear brake anti-lock sensor
3. Rear disc brake adapter
4B. Bolt (4 required)
5. Rear wheel disc brake shield
6C. Bolt (3 required)
7. Hub nut
8. Front hub cap grease seal
9D. Retainer nut (2 required)
10. Rear disc brake rotor
11. Wheel hub
12E. Wheel cylinder bleeder screw
13. Rear disc brake caliper
14F. Bolt (2 required)
15. Rear wheel spindle

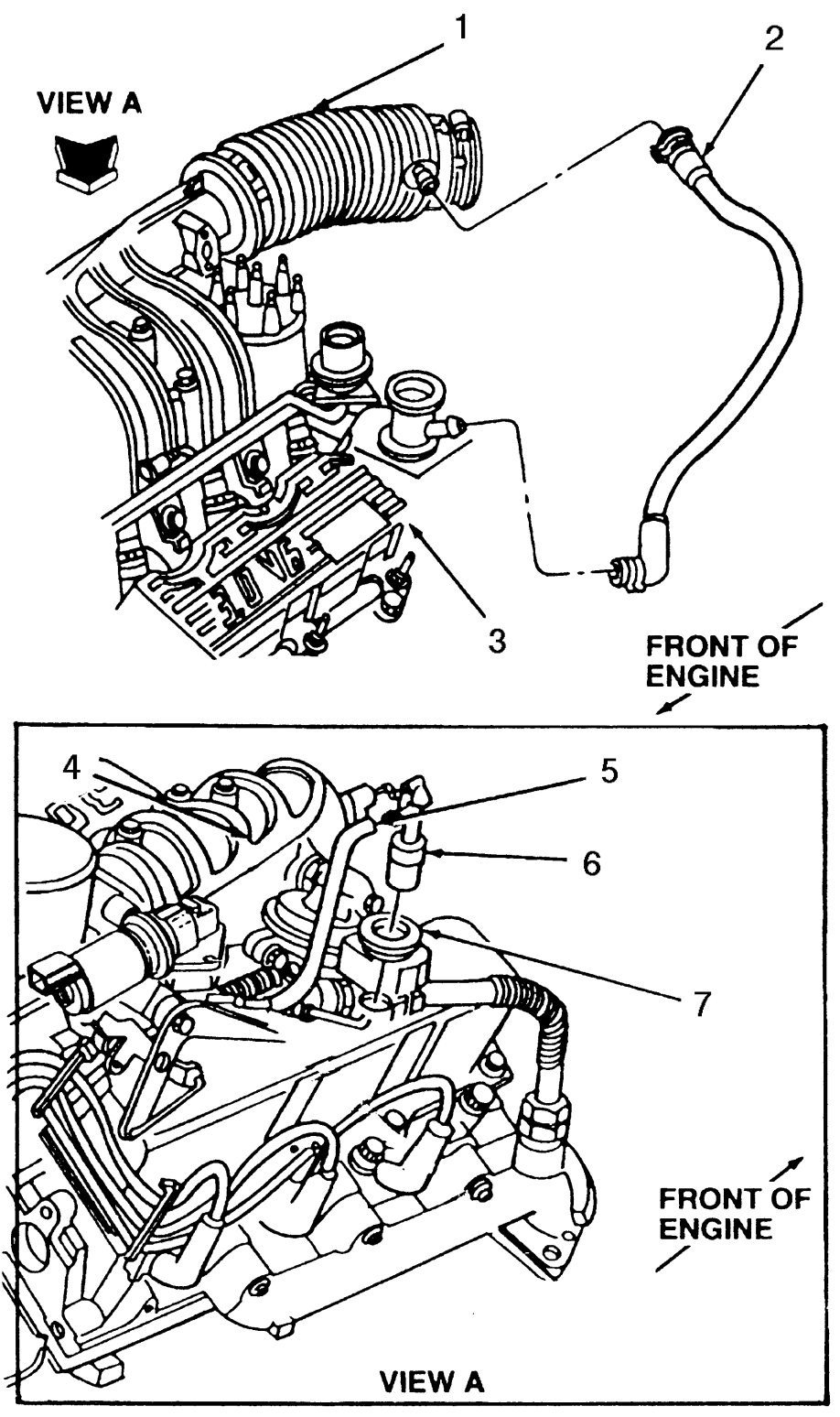
A. Tighten to 4.5-6.8 N.m (40-60 lb-in)
B. Tighten to 59-81 N.m (44-60 lb-ft)
C. Tighten to 8-12 N.m (6-9 lb-ft)
D. Tighten to 255-345 N.m (188-254 lb-ft)
E. Tighten to 8-13 N.m (71-115 lb-in)
F. Tighten to 87-119 N.m (64-88 lb-ft)



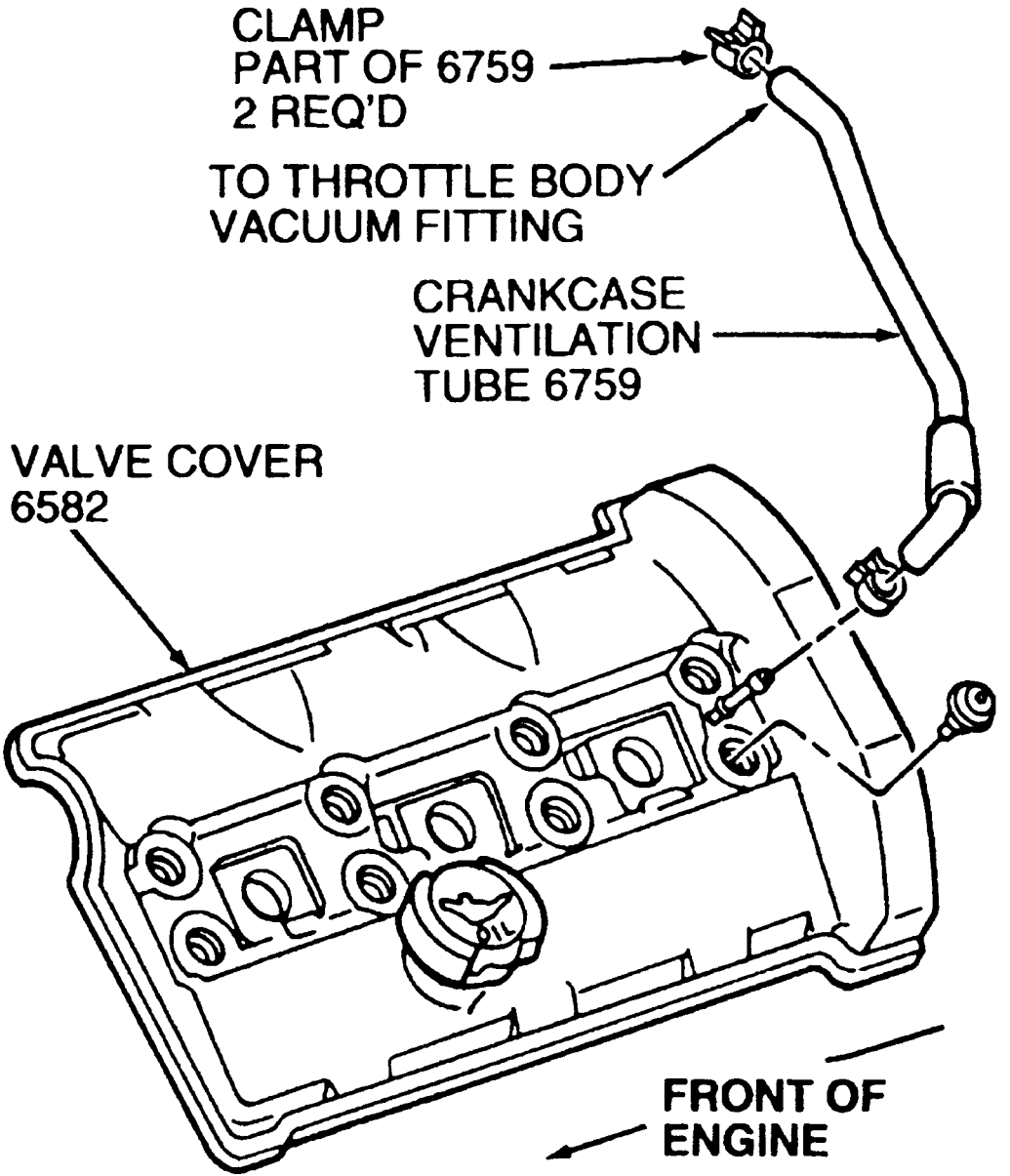


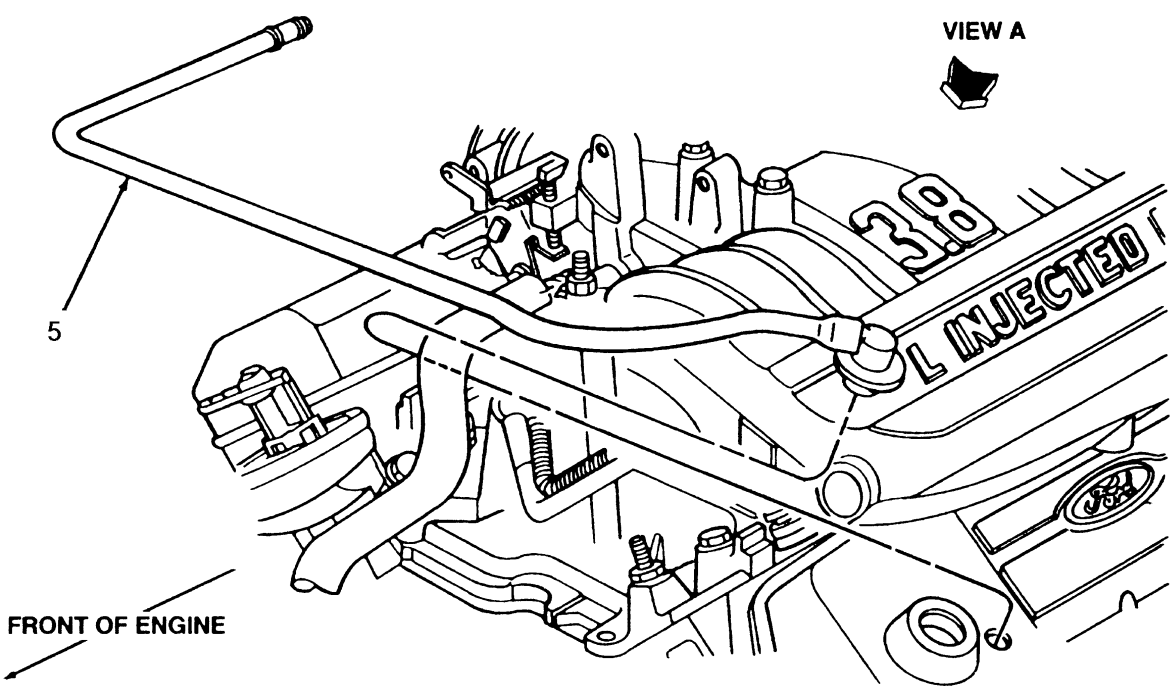
1A. Bolt
2. Rear brake anti-lock sensor
3. Rear disc brake adapter
4B. Bolt (4 required)
5C. Bolt (3 required)
6. Rear disc brake rotor (2 required)
7. Front hub cap grease seal
8D. Nut (10 required)
9. Retainer nut (2 required)
10. Wheel hub (2 required)
11. Rear wheel disc brake shield (2 required)
12E. Bleed screw
13. Caliper assembly
14F. Bolt (2 required)
15. Rear wheel spindle

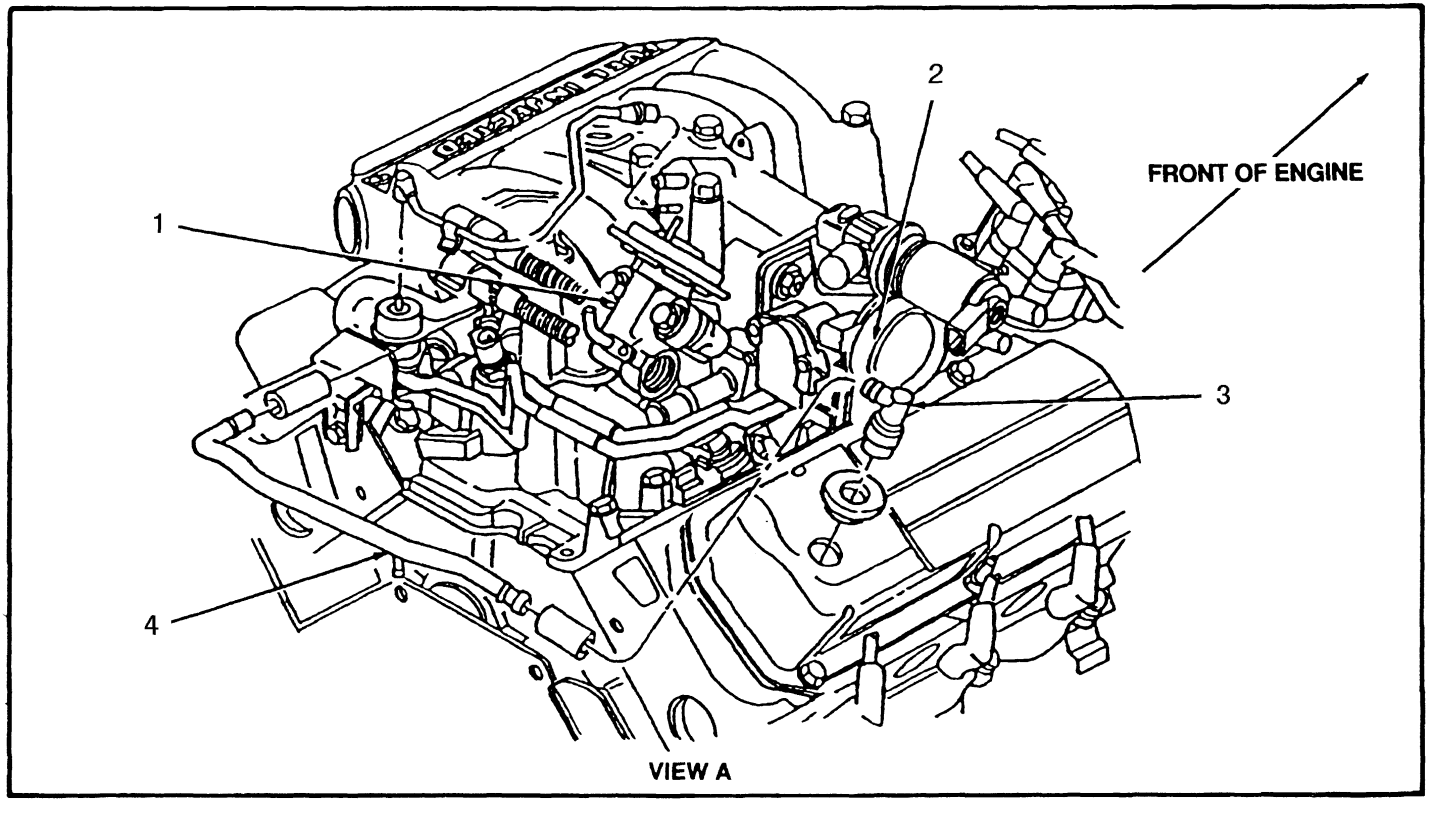
A. Tighten to 4.5-6.8 N.m (3-5 lb-ft)
B. Tighten to 59-81 N.m (44-60 lb ft)
C. Tighten to 8-12 N.m (6-9 lb ft)
D. Tighten to 255-345 N.m (188-254 lb-ft)
E. Tighten to 8-13 N.m (6-10 lb-ft)
F. Tighten to 87-119 N.m (64-88 lb-ft)



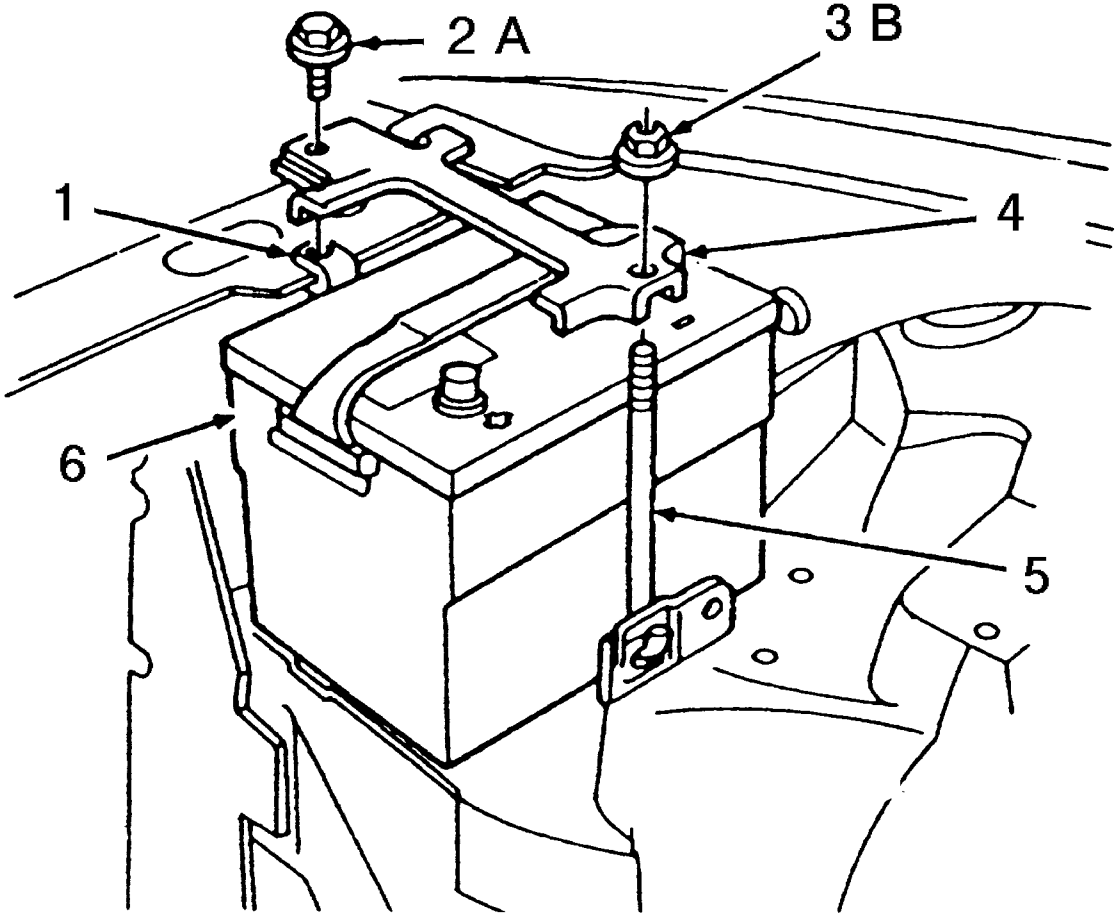
1. Air cleaner outlet tube
2. Crankcase ventilation hose
3. Valve cover
4. Throttle body
5. Crankcase ventilation hose
6. Positive crankcase ventilation valve
7. Grommet


CLAMP
PART OF 6759
2 REQ'D
TO THROTTLE BODY
VACUUM FITTING
CRANKCASE
VENTILATION
TUBE 6759
VALVE COVER
6582
FRONT OF
ENGINE





1. EGR valve
2. Throttle body
3. Positive crankcase ventilation valve
4. Crankcase ventilation tube
5. Crankcase ventilation hose



1. U-nut
2A. Bolt (1 required)
3B. Nut (1 required)
4. Bracket
5. J-bolt
6. Battery assembly
A. Tighten to 7-10 N.m (62-88 lb-in)
B. Tighten to 3-5 N.m (27-44 lb-in)

VEHICLE IDENTIFICATION CHART

Engine Code

Code	Liters	Cu. In. (cc)	Cyl.	Fuel Sys.	Eng. Mfg.
D (86-90)	2.5	154 (2524)	4	CFI	Ford
D (1991)	2.5	154 (2524)	4	MFI	Ford
U (86-92)	3.0	181 (2971)	6	MFI	Ford
U (93-95)	3.0	181 (2971)	6	SFI	Ford
4 (88-92)	3.8	232 (3802)	6	MFI	Ford
4 (93-95)	3.8	232 (3802)	6	SFI	Ford
Y (89-95)	3.0	182 (2980)	6	SFI	Yamaha
P (93-95)	3.2	195 (3191)	6	SFI	Yamaha

CFI - Central fuel injection

MFI - Multiport fuel injection

SFI- Sequential fuel injection

Model Year

Code	Year
G	1986
H	1987
J	1988
K	1989
L	1990
M	1991
N	1992
P	1993
R	1994
S	1995

ENGINE IDENTIFICATION

Year	Model	Engine Displacement Liters (cc)	Engine Series (ID/VIN)	Fuel System	No. of Cylinders	Engine Type
1986	Taurus	2.5 (2524)	D	CFI	4	OHV
	Taurus	3.0 (2971)	U	EFI	6	OHV
	Sable	2.5 (2524)	D	CFI	4	OHV
	Sable	3.0 (2971)	U	EFI	6	OHV
1987	Taurus	2.5 (2524)	D	CFI	4	OHV
	Taurus	3.0 (2971)	U	EFI	6	OHV
	Sable	2.5 (2524)	D	CFI	4	OHV
	Sable	3.0 (2971)	U	EFI	6	OHV
1988	Taurus	2.5 (2524)	D	CFI	4	OHV
	Taurus	3.0 (2971)	U	EFI	6	OHV
	Taurus	3.8 (3802)	4	EFI	6	OHV
	Sable	3.0 (2971)	U	EFI	6	OHV
	Sable	3.8 (3802)	4	EFI	6	OHV
1989	Taurus	2.5 (2524)	D	CFI	4	OHV
	Taurus	3.0 (2971)	U	EFI	6	OHV
	Taurus	3.8 (3802)	4	EFI	6	OHV
	Taurus SHO	3.0 (2980)	Y	SFI	6	DOHC
	Sable	3.0 (2971)	U	EFI	6	OHV
	Sable	3.8 (3802)	4	EFI	6	OHV
1990	Taurus	2.5 (2524)	D	CFI	4	OHV
	Taurus	3.0 (2971)	U	EFI	6	OHV
	Taurus	3.8 (3802)	4	EFI	6	OHV
	Taurus SHO	3.0 (2980)	Y	SFI	6	DOHC
	Sable	3.0 (2971)	U	EFI	6	OHV
	Sable	3.8 (3802)	4	EFI	6	OHV
1991	Taurus	2.5 (2524)	D	EFI	4	OHV
	Taurus	3.0 (2971)	U	EFI	6	OHV
	Taurus	3.8 (3802)	4	EFI	6	OHV
	Taurus SHO	3.0 (2980)	Y	SFI	6	DOHC
	Sable	3.0 (2971)	U	EFI	6	OHV
	Sable	3.8 (3802)	4	EFI	6	OHV
1992	Taurus	3.0 (2971)	U	EFI	6	OHV
	Taurus	3.8 (3802)	4	EFI	6	OHV
	Taurus SHO	3.0 (2980)	Y	SFI	6	DOHC
	Sable	3.0 (2971)	U	EFI	6	OHV
	Sable	3.8 (3802)	4	EFI	6	OHV
1993	Taurus	3.0 (2971)	U	SFI	6	OHV
	Taurus	3.8 (3802)	4	SFI	6	OHV
	Taurus SHO	3.0 (2980)	Y	SFI	6	DOHC
	Taurus SHO	3.2 (3191)	P	SFI	6	DOHC
	Sable	3.0 (2971)	U	SFI	6	OHV
	Sable	3.8 (3802)	4	SFI	6	OHV
1994	Taurus	3.0 (2971)	U	SFI	6	OHV
	Taurus	3.8 (3802)	4	SFI	6	OHV
	Taurus SHO	3.0 (2980)	Y	SFI	6	DOHC
	Taurus SHO	3.2 (3191)	P	SFI	6	DOHC
	Sable	3.0 (2971)	U	SFI	6	OHV
	Sable	3.8 (3802)	4	SFI	6	OHV

ENGINE IDENTIFICATION

Year	Model	Engine Displacement Liters (cc)	Engine Series (ID/VIN)	Fuel System	No. of Cylinders	Engine Type
1995	Taurus	3.0 (2980)	U	SFI	6	OHV
	Taurus	3.8 (3802)	4	SFI	6	OHV
	Taurus SHO	3.0 (2980)	Y	SFI	6	DOHC
	Taurus SHO	3.2 (3191)	P	SFI	6	DOHC
	Sable	3.0 (2971)	U	SFI	6	OHV
	Sable	3.8 (3802)	4	SFI	6	OHV

EFI - Electronic fuel injection

CFI - Central fuel injection

SFI - Sequential fuel injection

OHV - Overhead valve

DOHC - Double overhead camshaft

CAPACITIES

Year	Model	Engine ID/VIN	Engine Displacement Liters (cc)	Engine Oil with Filter	Transmission (pts.)			Drive Axle		Fuel Tank	Cooling System
					4-Spd	5-Spd	Auto.	Front (pts.)	Rear (pts.)	(gal.)	(qts.)
1986	Taurus	D	2.5 (2501)	5.0	-	6.2	16.6	1	-	2	8.3
	Taurus	U	3.0 (2980)	4.5	-	-	21.8	1	-	2	4
	Sable	D	2.5 (2501)	5.0	-	6.2	16.6	1	-	2	4
	Sable	U	3.0 (2980)	4.5	-	-	21.8	1	-	2	4
1987	Taurus	D	2.5 (2501)	5.0	-	6.2	16.8	1	-	2	8.3
	Taurus	U	3.0 (2980)	4.5	-	-	26.2	1	-	2	4
	Sable	D	2.5 (2501)	5.0	-	6.2	16.8	1	-	2	4
	Sable	U	3.0 (2980)	4.5	-	-	26.2	1	-	2	4
1988	Taurus	D	2.5 (2501)	5.0	-	-	26.2	1	-	2	8.3
	Taurus	U	3.0 (2980)	4.5	-	6.1	16.8	1	-	2	4
	Taurus	4	3.8 (3802)	4.5	-	-	26.2	1	-	2	12.1
	Sable	U	3.0 (2980)	4.5	-	6.1	26.8	1	-	2	4
	Sable	4	3.8 (3802)	4.5	-	-	26.2	1	-	2	12.1
1989	Taurus	D	2.5 (2501)	5.0	-	-	25.6	1	-	2	8.3
	Taurus	U	3.0 (2980)	4.5	-	-	16.8	1	-	2	4
	Taurus	4	3.8 (3802)	4.5	-	-	25.6	1	-	2	12.1
	Taurus SHO	Y	3.0 (2980)	5.0	-	6.1	-	1	-	18.6	11.6
	Sable	U	3.0 (2980)	4.5	-	-	16.8	1	-	2	4
	Sable	4	3.8 (3802)	4.5	-	-	25.6	1	-	2	12.1
1990	Taurus	D	2.5 (2501)	5.0	-	-	16.8	1	-	2	8.3
	Taurus	U	3.0 (2980)	4.5	-	-	25.6	1	-	2	4
	Taurus	4	3.8 (3801)	4.5	-	-	25.6	1	-	2	12.1
	Taurus SHO	Y	3.0 (2980)	5.0	-	-	-	1	-	18.6	11.6
	Sable	U	3.0 (2980)	4.5	-	-	25.6	1	-	2	4
	Sable	4	3.8 (3801)	4.5	-	-	25.6	1	-	2	12.1
1991	Taurus	D	2.5 (2501)	5.0	-	-	25.6	1	-	3	8.3
	Taurus	U	3.0 (2980)	4.5	-	-	25.6	1	-	3	4
	Taurus	4	3.8 (3801)	4.5	-	-	25.6	1	-	3	12.1
	Taurus SHO	Y	3.0 (2980)	5.0	-	6.1	-	1	-	18.4	11.6
	Sable	U	3.0 (2980)	4.5	-	-	25.6	1	-	3	4
	Sable	4	3.8 (3801)	4.5	-	-	25.6	1	-	3	12.1
1992	Taurus	U	3.0 (2980)	4.5	-	-	25.6	1	-	3	4
	Taurus	4	3.8 (3801)	4.5	-	-	25.6	1	-	3	12.1
	Taurus SHO	Y	3.0 (2980)	5.0	-	6.2	-	1	-	18.4	11.6
	Sable	U	3.0 (2980)	4.5	-	-	25.6	1	-	3	4
	Sable	4	3.8 (3801)	4.5	-	-	25.6	1	-	3	12.1
1993	Taurus	U	3.0 (2980)	4.5	-	-	25.6	1	-	3	4
	Taurus	4	3.8 (3801)	4.5	-	-	25.6	1	-	3	12.1
	Taurus SHO	Y	3.0 (2980)	5.0	-	6.1	-	1	-	18.4	11.6
	Taurus SHO	P	3.2 (3191)	5.0	-	-	25.6	1	-	18.4	11.4
	Sable	U	3.0 (2980)	4.5	-	-	25.6	1	-	3	4
	Sable	4	3.8 (3801)	4.5	-	-	25.6	1	-	3	12.1
1994	Taurus	U	3.0 (2980)	4.5	-	-	24.5	1	-	3	11.0
	Taurus	4	3.8 (3801)	4.5	-	-	24.5	1	-	3	12.1
	Taurus SHO	Y	3.0 (2980)	5.0	-	6.2	-	1	-	18.4	11.6
	Taurus SHO	P	3.2 (3191)	5.0	-	-	24.5	1	-	18.4	11.4

CAPACITIES

Year	Model	Engine ID/VIN	Engine Displacement Liters (cc)	Engine Oil with Filter	Transmission (pts.)			Drive Axle		Fuel Tank (gal.)	Cooling System (qts.)
					4-Spd	5-Spd	Auto.	Front (pts.)	Rear (pts.)		
	Sable	U	3.0 (2980)	4.5	-	-	24.5	1	-	3	11.0
	Sable	4	3.8 (3801)	4.5	-	-	24.5	1	-	3	12
1995	Taurus	U	3.0 (2980)	4.5	-	-	28.0	1	-	3	11.0
	Taurus	4	3.8 (3801)	4.5	-	-	24.5	1	-	3	12.1
	Taurus SHO	Y	3.0 (2980)	5.0	-	6.2	-	1	-	18.4	11.6
	Taurus SHO	P	3.2 (3191)	5.0	-	-	24.5	1	-	18.4	11.4
	Sable	U	3.0 (2980)	4.5	-	-	28.0	1	-	3	11.0
	Sable	4	3.8 (3802)	4.5	-	-	24.5	1	-	3	12.1

1 Included in transaxle capacity
2 Standard Tank: 16.0 Gals.
Optional Extended Range Tank: 18.6 Gals.
3 Standard Tank: 16.0 Gals.
Optional Extended Range Tank: 18.4 Gals.
4 All except wagon w/ A/C: 11.0 qts.
Wagon w/ A/C: 11.8 qts.

Follow Maintenance Schedule A if your driving habits MAINLY include one or more of the following conditions:

1. Short trips of less than 10 miles, when outside temperatures remain below freezing.
2. Operating the vehicle during hot weather in stop-and-go "rush hour" traffic.
3. Towing a trailer or using a car-top carrier
4. Operating in severe dust conditions
5. Extensive idling, such as police, taxi or door-to-door delivery service.

MAINTENANCE INTERVAL SCHEDULE A

Item No.		To Be Serviced	Minimum Time Interval	The services shown in this schedule up to 60,000 miles are to be performed after 60,000 miles at the same intervals																		
				3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60
EMISSION CONTROL SERVICE																							
1		Replace engine oil & filter	Every 3 months	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
2		Spark plugs - 2.5L, 3.0L, 3.8L											■										■
3		Spark plugs - 3.0L SHO, 3.2L SHO																					■
4		Inspect accessory drive belt(s)											■										■
5		Replace air cleaner filter (1)											■										■
6		Replace PCV valve											■										■
7		Replace cam belt - 3.0/3.2L SHO only																					■
8		Adjust valve lash - 3.0/3.2L SHO only																					■
9		Replace engine coolant	Every 36 months										■										■
10		Check coolant protection, hoses, & clamps	Every 12 months					■					■					■					■
GENERAL MAINTENANCE																							
11		Inspect exhaust shields											■										■
12		Change A/T fluid (2.5L, 3.0L, 3.8L) (3)											■										■
13		Inspect disc brake pads & rotors (2)											■										■
14		Inspect brake lining & drums (2)											■										■
15		Inspect battery fluid level (SHO only) (2)									■								■				
16		Inspect & repack rear wheel bearings											■										■
17		Rotate tires			■					■					■					■			
18		Check supercharger fluid level (SHO only)											■										■

(1) If operating in severe dust conditions, more frequent intervals may be required. Consult your dealer.

(2) If your driving includes continuous stop-and-go driving or driving in mountainous areas, more frequent intervals may be required.

(3) Change the automatic transaxle fluid if your driving habits frequently include one or more of the following conditions: Operation during hot weather (above 90 degrees F, 32 degrees C), carrying heavy loads and in hilly terrain. Towing a trailer or using a car-to carrier. Police, taxi or door-to-door delivery service.

Follow Maintenance Schedule B if, generally, you drive your vehicle on a daily basis for more than 10 miles and NONE of the conditions for Schedule A apply.

1986-93 MAINTENANCE INTERVAL SCHEDULE B

Item No		To Be Serviced	Minimum Time Interval	The services shown in this schedule up to 60,000 miles are to be performed after 60,000 miles at the same intervals							
				7.5	15	22.5	30	37.5	45	52.5	60
EMISSION CONTROL SERVICE											
1		Replace engine oil & filter	Every 3 months	■	■	■	■	■	■	■	■
2		Spark plugs - 2.5L, 3.0L, 3.8L					■				■
3		Spark plugs - 3.0L SHO, 3.2L SHO									■
4		Inspect accessory drive belt(s)					■				■
5		Replace air cleaner filter (1)					■				■
6		Replace PCV valve									■
7		Replace cam belt - 3.0/3.2L SHO only									■
8		Adjust valve lash - 3.0/3.2L SHO only									■
9		Replace engine coolant	Every 36 months				■				■
10		Check coolant protection, hoses, & clamps	Every 12 months		■		■		■		■
GENERAL MAINTENANCE											
11		Inspect exhaust shields					■				■
12		Change A/T fluid (2.5L, 3.0L, 3.8L) (3)					■				■
13		Inspect disc brake pads & rotors (2)					■				■
14		Inspect brake lining & drums (2)					■				■
15		Inspect battery fluid level (SHO only) (2)	Every 24 months			■			■		
16		Inspect & repack rear wheel bearings					■				■
17		Rotate tires		■		■		■		■	
18		Check supercharger fluid level (SHO only)					■				■

(1) If operating in severe dust conditions, more frequent intervals may be required. Consult your dealer.

(2) If your driving includes continuous stop-and-go driving or driving in mountainous areas, more frequent intervals may be required.

(3) Change automatic transaxle fluid it your driving habits frequently include one or more of the following conditions: Operation during hot weather (above 90 degrees F, 32 degrees C), carrying heavy loads and in hilly terrain. Towing a trailer or using a car-to carrier. Police, taxi or door-to-door delivery service.

Follow Maintenance Schedule B if, generally, you drive your vehicle on a daily basis for more than 10 miles and NONE of the conditions for Schedule A apply.

1994-95 MAINTENANCE INTERVAL SCHEDULE B

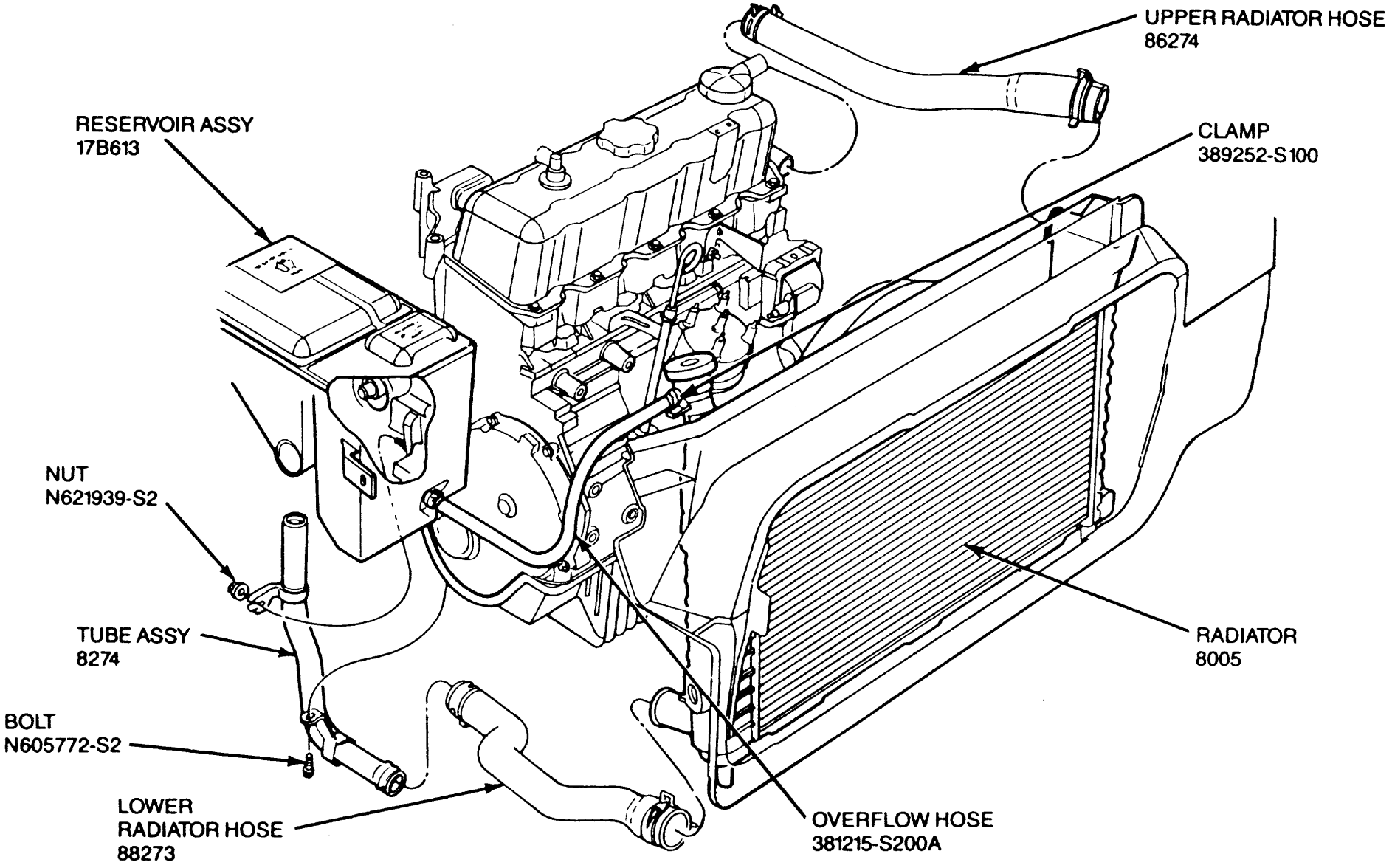
Item No		To Be Serviced	Minimum Time Interval	The services shown in this schedule up to 60,000 miles are to be performed after 60,000 miles at the same intervals											
				5	10	15	20	25	30	35	40	45	50	55	60
EMISSION CONTROL SERVICE															
1		Change engine oil and replace filter	Every 3 months	■	■	■	■	■	■	■	■	■	■	■	■
2		Spark plugs - 2.5L, 3.0L, 3.8L							■						■
3		Spark plugs - 3.0L SHO, 3.2L SHO													■
4		Inspect accessory drive belt(s)							■						■
5		Replace air cleaner filter (1)							■						■
6		Replace PCV valve													■
7		Replace cam belt - 3.0/3.2L SHO only													■
8		Adjust valve lash - 3.0/3.2L SHO only													■
9		Replace engine coolant (4)	Every 36 months										■		
10		Check coolant protection, hoses, & clamps	Every 12 months			■			■			■			■
GENERAL MAINTENANCE															
11		Inspect exhaust shields							■						■
12		Change A/T fluid (2.5L, 3.0L, 3.8L) (3)							■						■
13		Inspect disc brake pads & rotors (2)							■						■
14		Inspect brake lining & drums (2)							■						■
15		Inspect battery fluid level (SHO only) (2)	Every 24 months					■					■		
16		Inspect & repack rear wheel bearings							■						■
17		Rotate tires & adjust air pressure		■		■		■		■		■		■	
18		Check supercharger fluid level (SHO only)							■						■

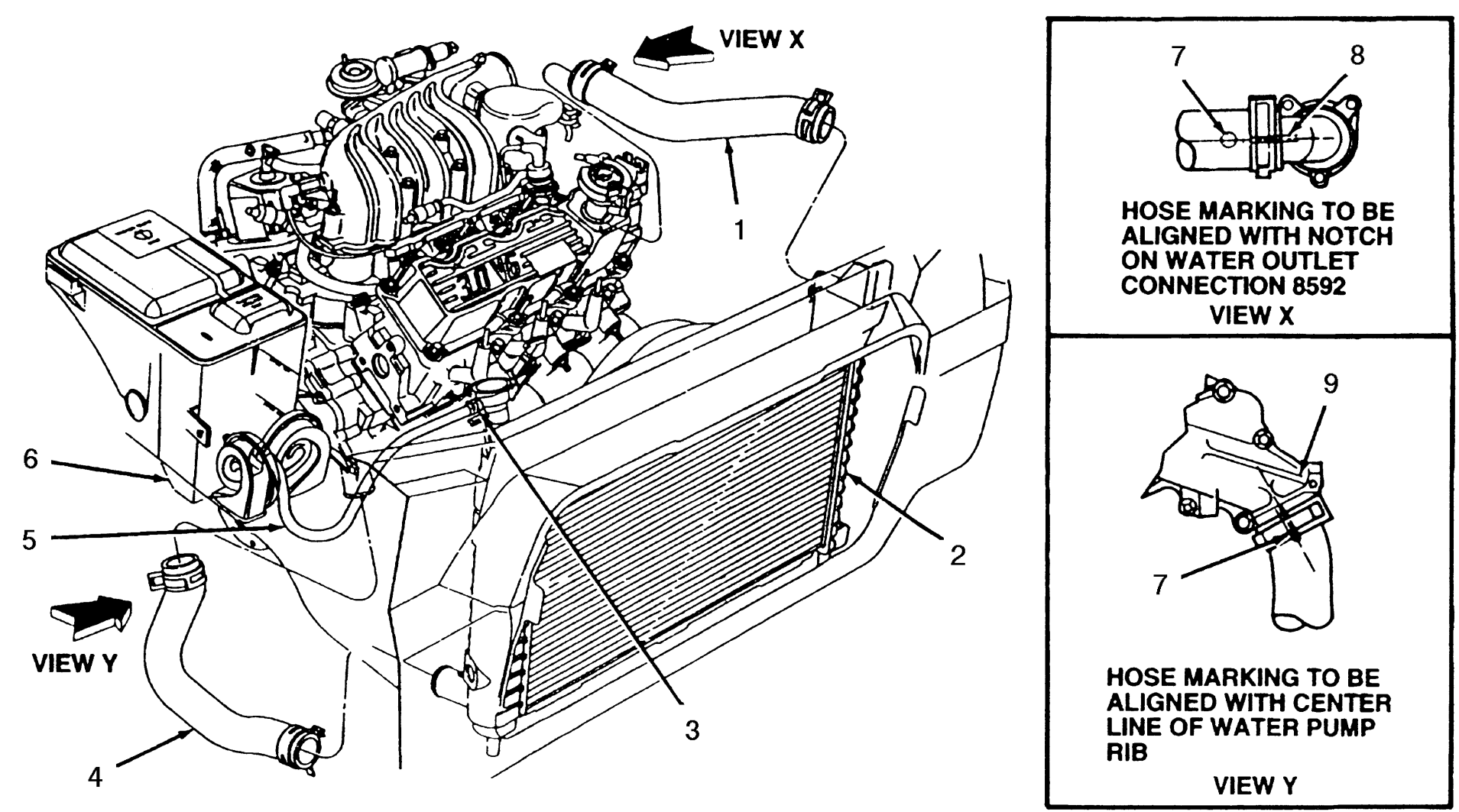
(1) If operating in severe dust conditions, more frequent intervals may be required. Consult your dealer.

(2) If your driving includes continuous stop-and-go driving or driving in mountainous areas, more frequent intervals may be required.

(3) Change automatic transaxle fluid it your driving habits frequently include one or more of the following conditions: Operation during hot weather (above 90 degrees F, 32 degrees C), carrying heavy loads and in hilly terrain. Towing a trailer or using a car-to carrier. Police, taxi or door-to-door delivery service.

(4) Change the engine coolant initially at 50,000 miles or 48 months. Thereafter, change the coolant every 30,000 miles or 36 months.


UPPER RADIATOR HOSE
86274
RESERVOIR ASSY
17B613
CLAMP
389252-S100
NUT
N621939-S2
TUBE ASSY
8274
RADIATOR
8005
BOLT
N605772-S2
LOWER
RADIATOR HOSE
88273
OVERFLOW HOSE
381215-S200A



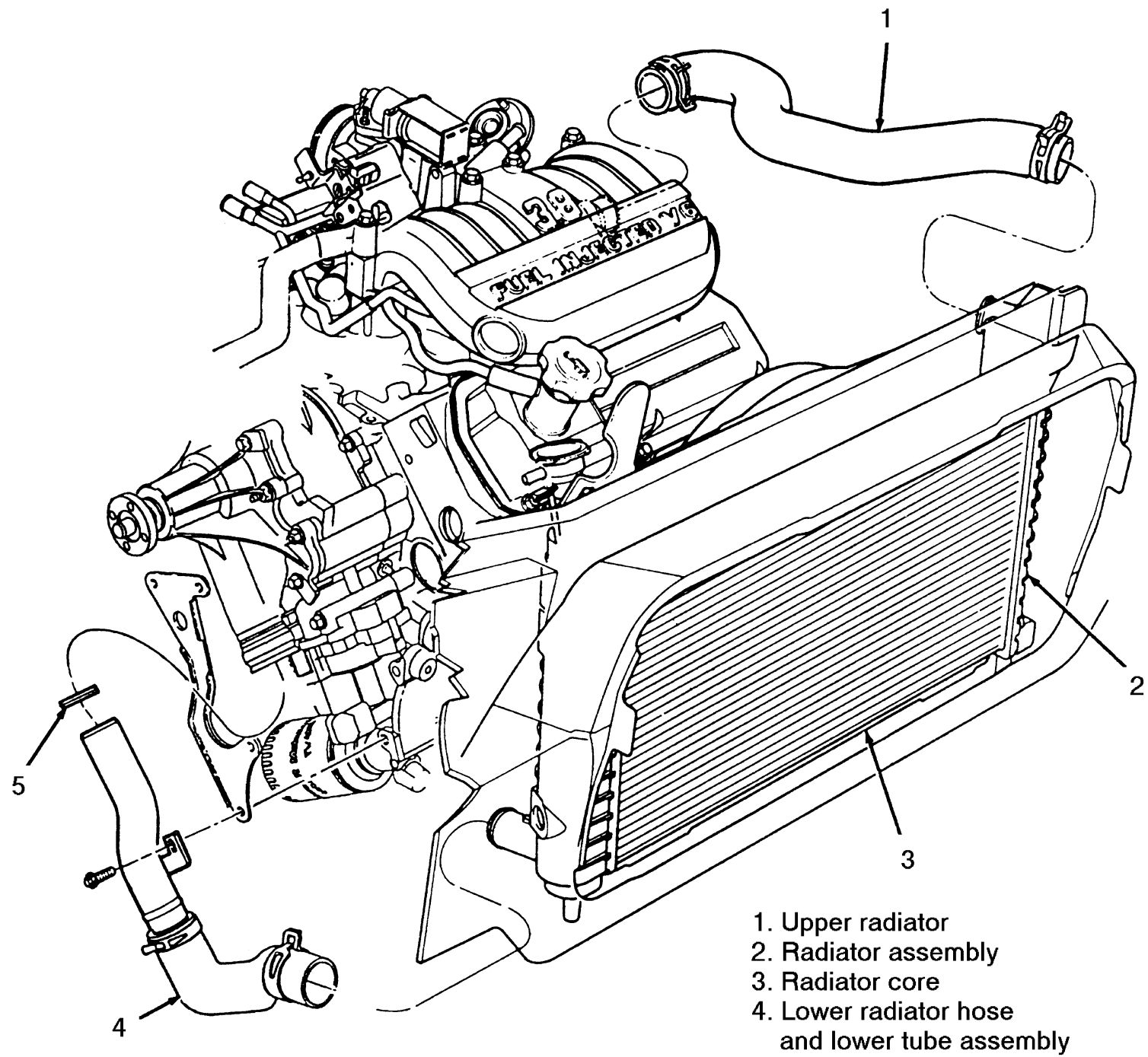
HOSE MARKING TO BE ALIGNED WITH NOTCH ON WATER OUTLET CONNECTION 8592

VIEW X

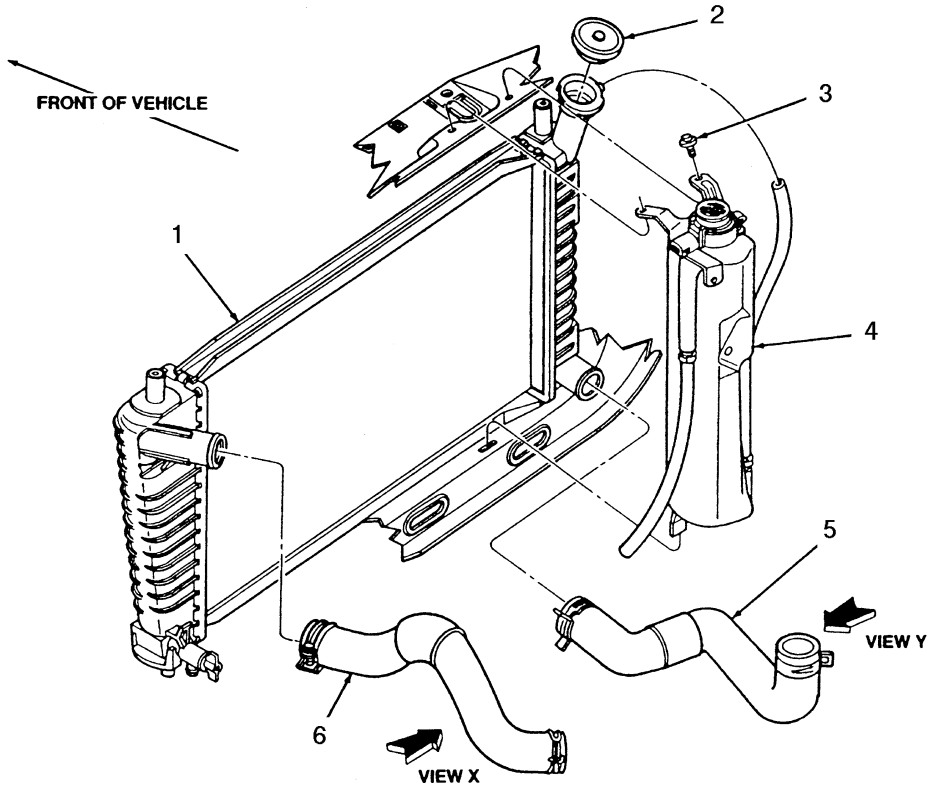
HOSE MARKING TO BE ALIGNED WITH CENTER LINE OF WATER PUMP RIB

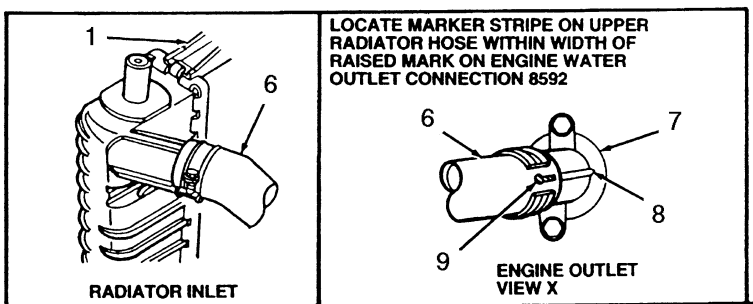
VIEW Y

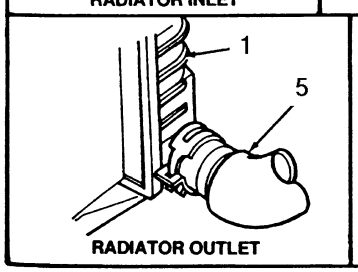
1. Upper radiator hose
2. Radiator
3. Clamp (2 required)
4. Lower radiator hose
5. Radiator overflow hose
6. Radiator coolant recovery reservoir
7. Hose marking
8. Notch (part of 8592)
9. Water pump

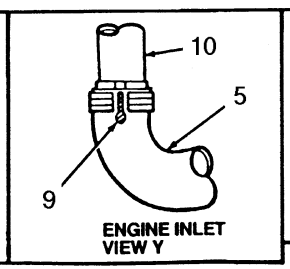


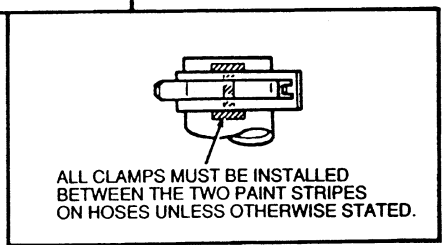
1. Upper radiator
2. Radiator assembly
3. Radiator core
4. Lower radiator hose and lower tube assembly
5. O-ring



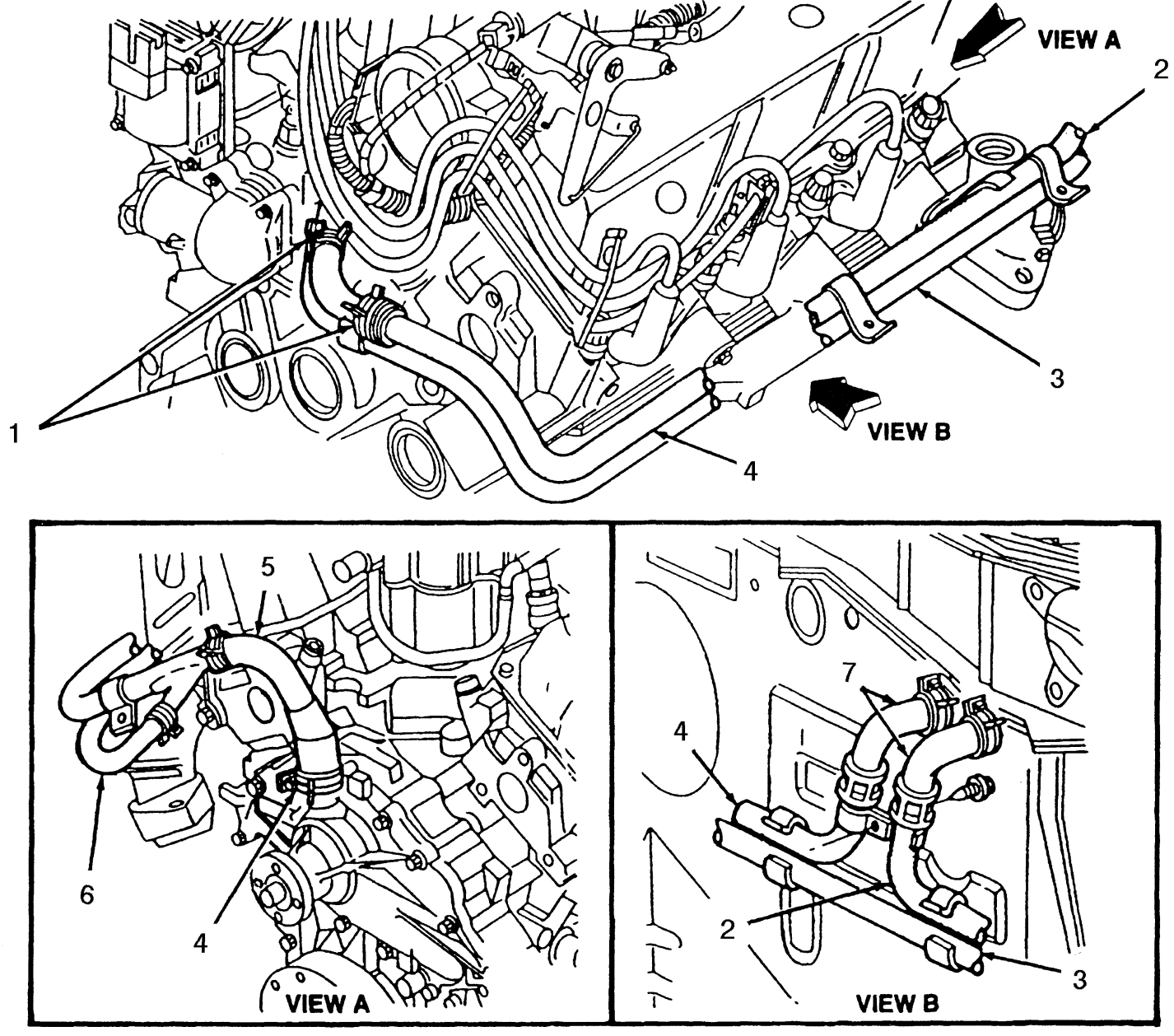




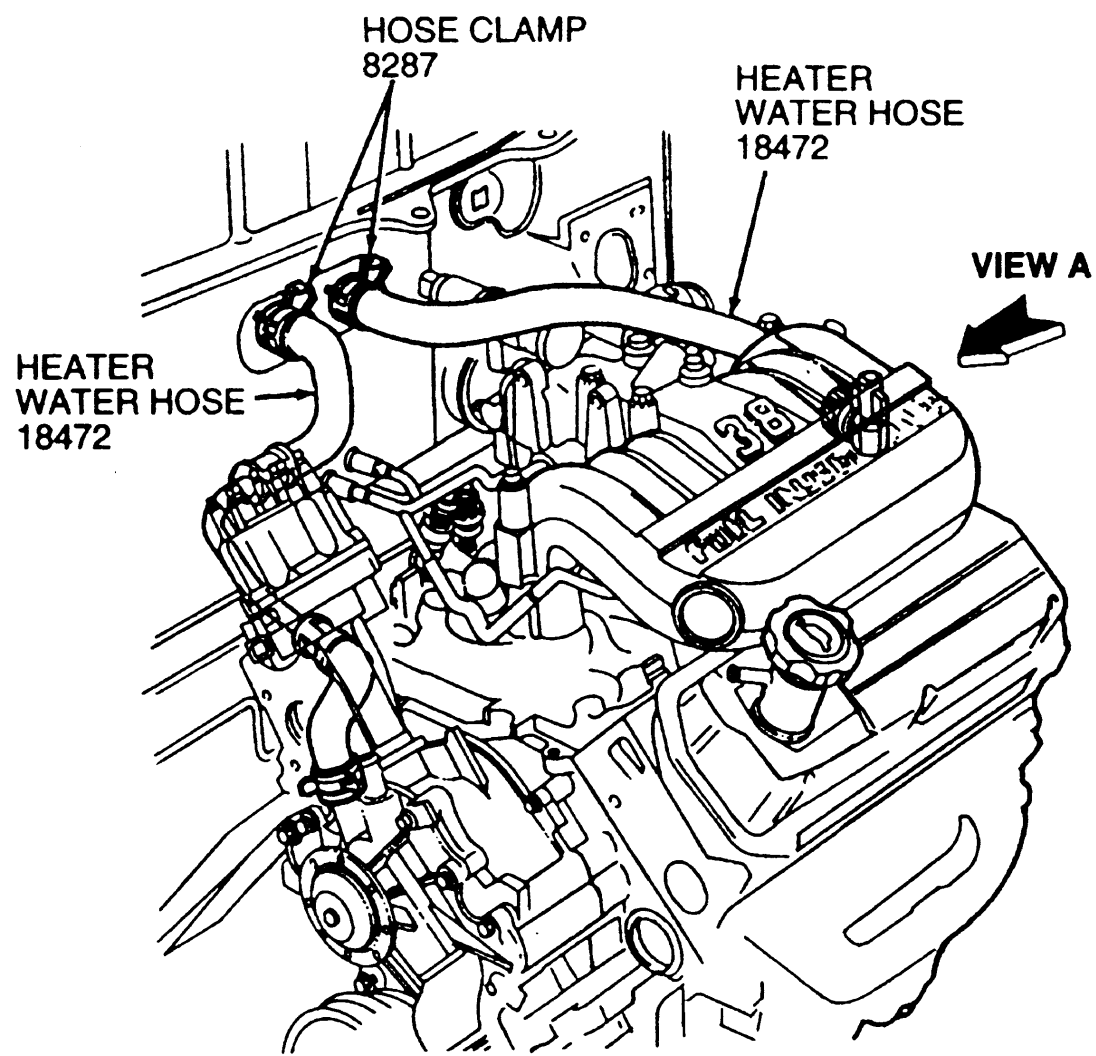


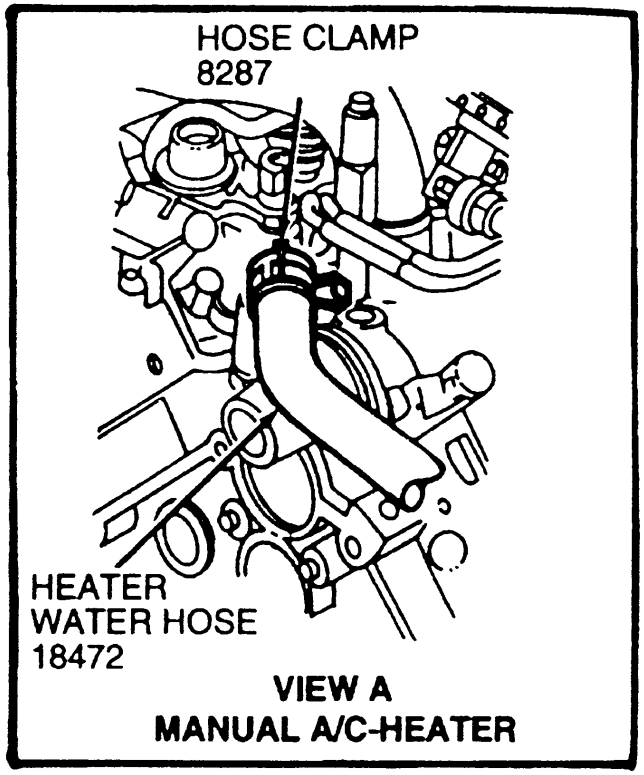


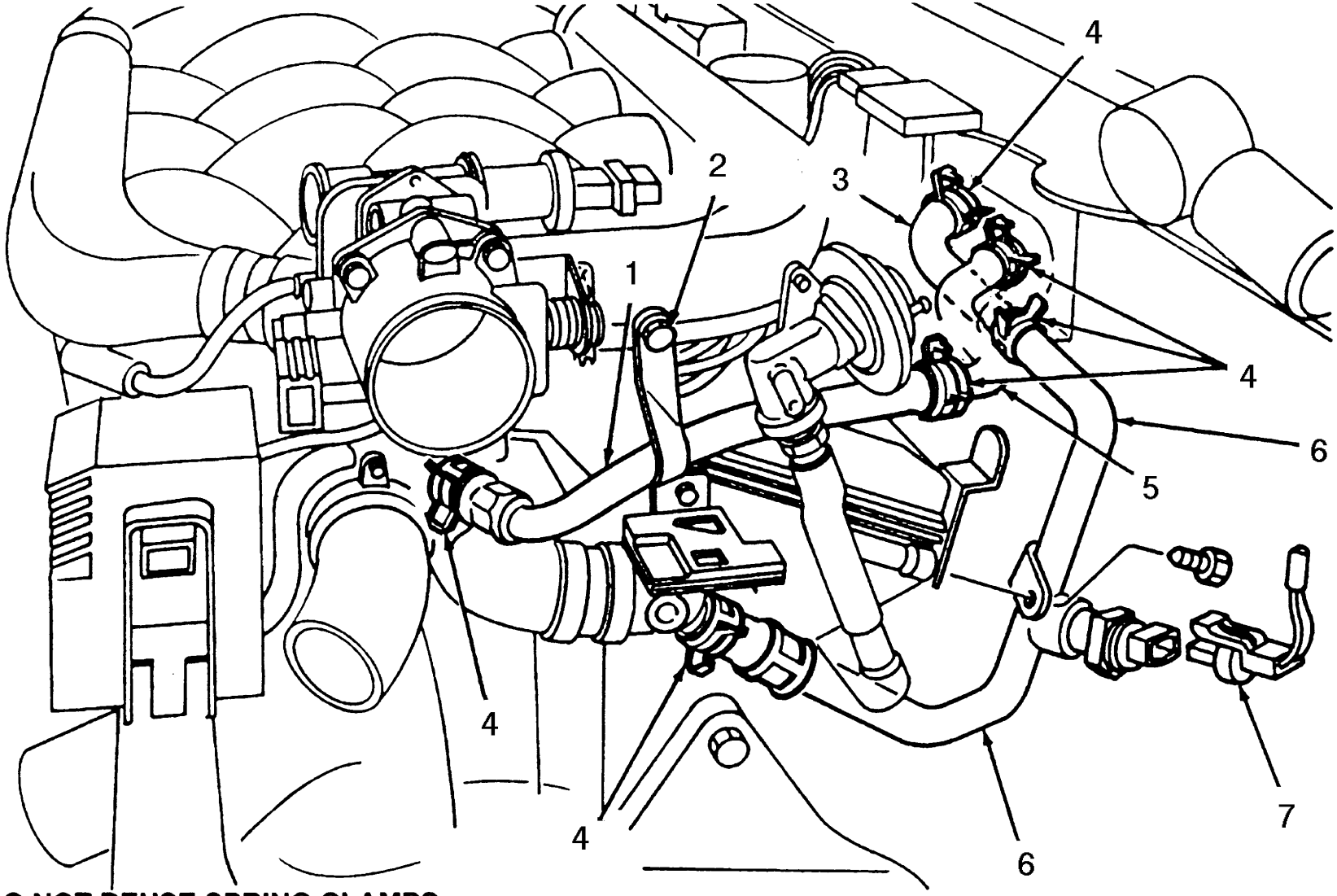
1. Radiator
2. Radiator cap
3. Screw and washer assembly
4. Radiator coolant recovery reservoir (3.OL SHO shown)
5. Lower radiator hose
6. Upper radiator hose
7. Water outlet connection
8. Rib alignment (part of 8592)
9. Alignment stripe
10. Radiator lower hose tube



1. Hose clamp
2. Heater hot water tube
3. Water bypass tube
4. Heater hot water tube
5. Heater water hose
6. Water inlet connector hose
7. Heater water hose

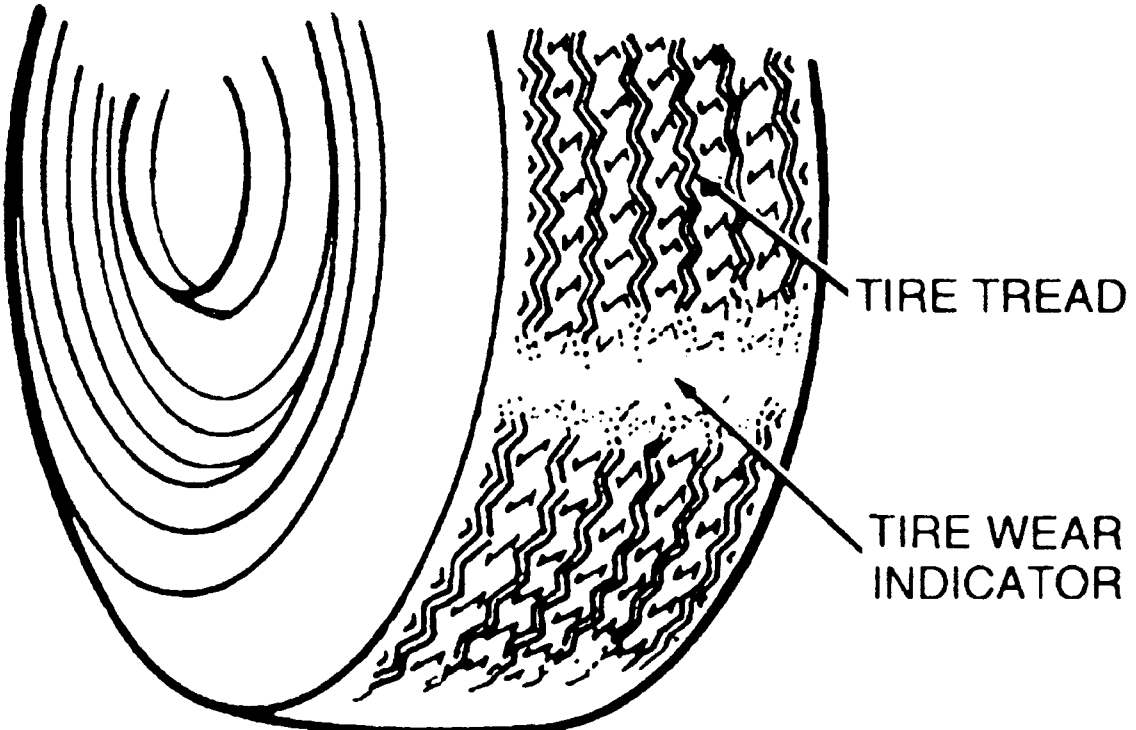

HOSE CLAMP
8287
HEATER
WATER HOSE
18472
VIEW A
HEATER
WATER HOSE
18472

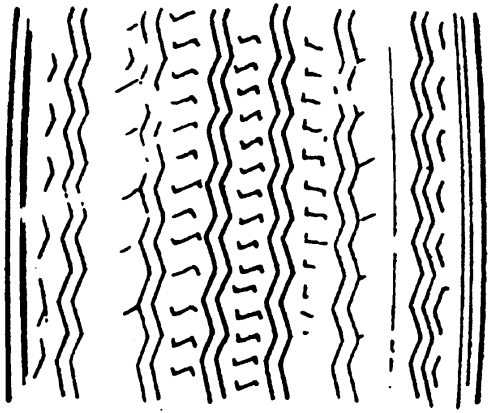

HOSE CLAMP
8287
HEATER
WATER HOSE
18472
VIEW A
MANUAL A/C-HEATER



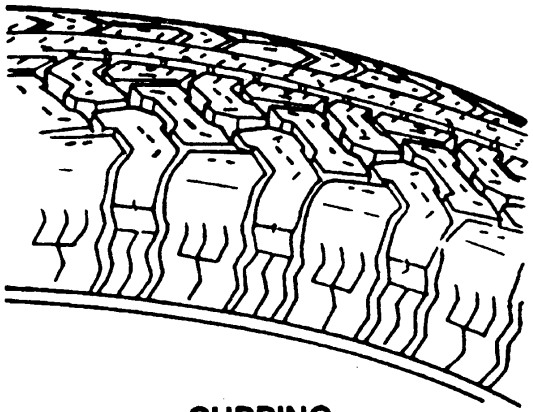
NOTE: DO NOT REUSE SPRING CLAMPS.
REPLACE WITH SCREW TIGHTENED CLAMPS.

1. Heater hot water tube
2. Bolt
3. Heater water hose
4. Hose clamp
5. Heater water hose
6. Heater hot water tube
7. Main wiring

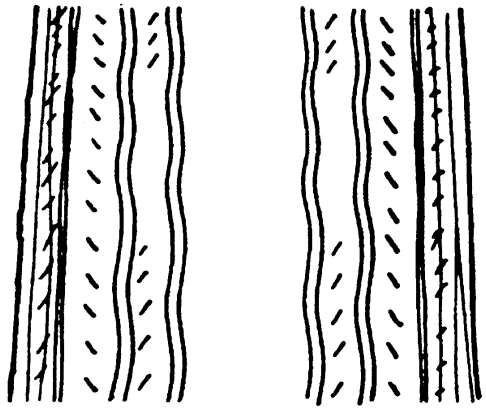

TIRE TREAD
TIRE WEAR
INDICATOR



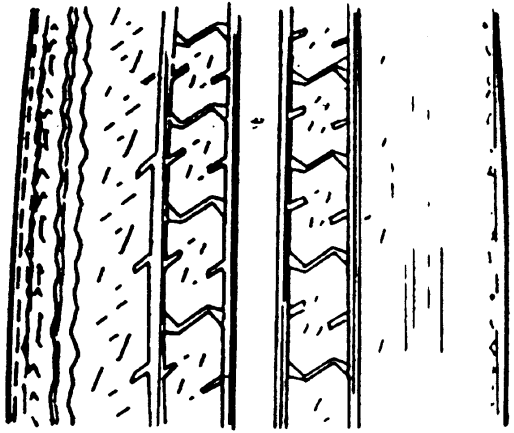
UNDERINFLATION



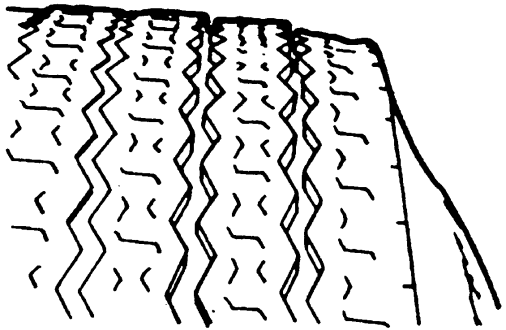
CUPPING



OVERINFLATION

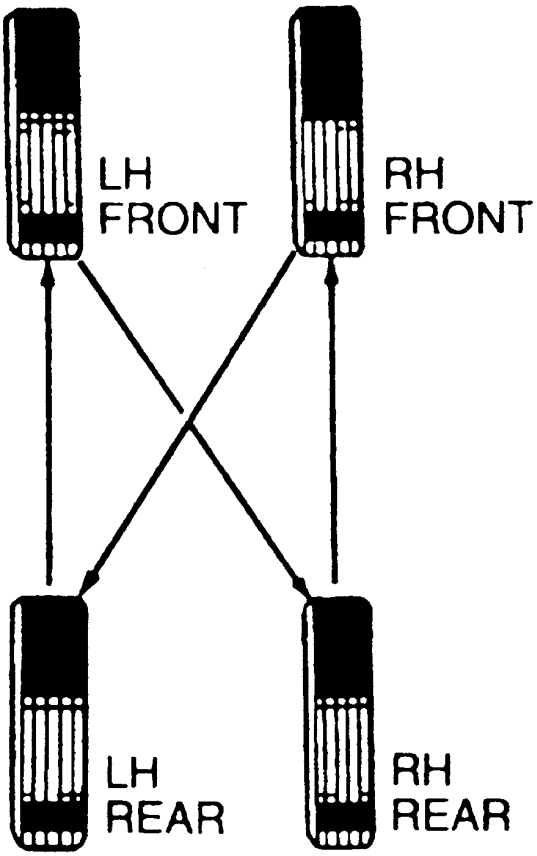


INCORRECT TOE-IN OR EXTREME CAMBER

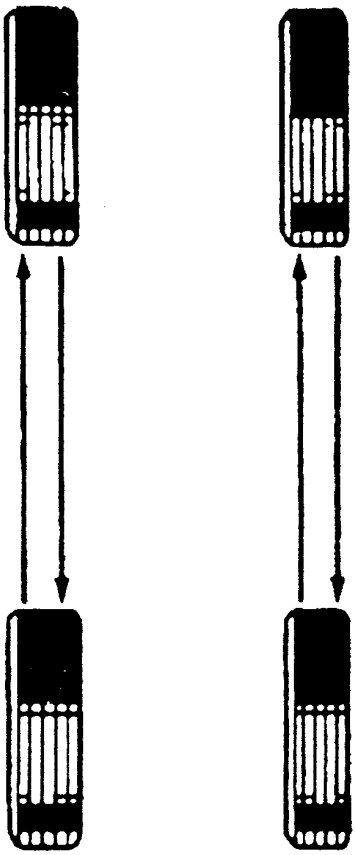


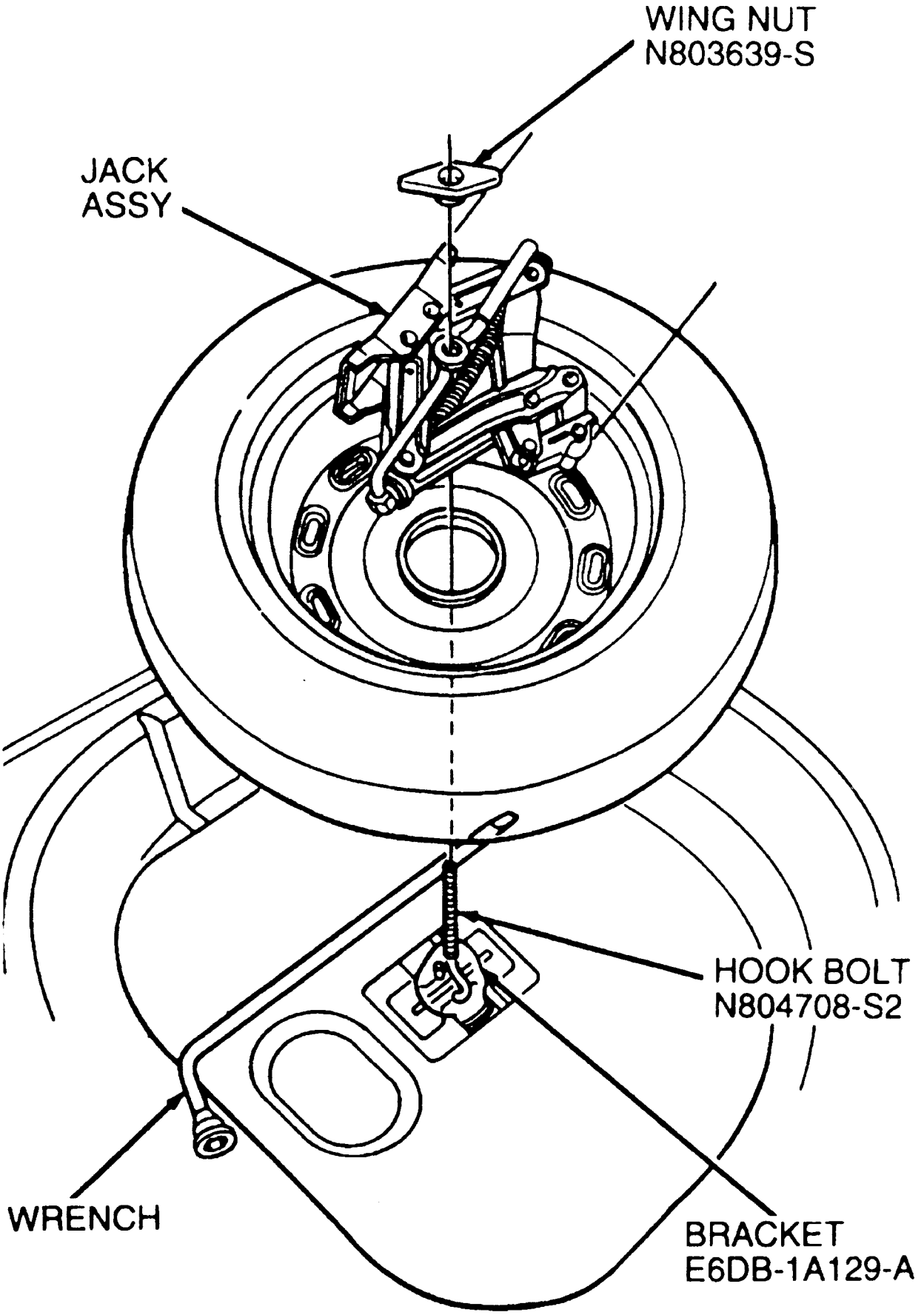
FEATHERING DUE TO MISALIGNMENT

FOUR TIRE ROTATION

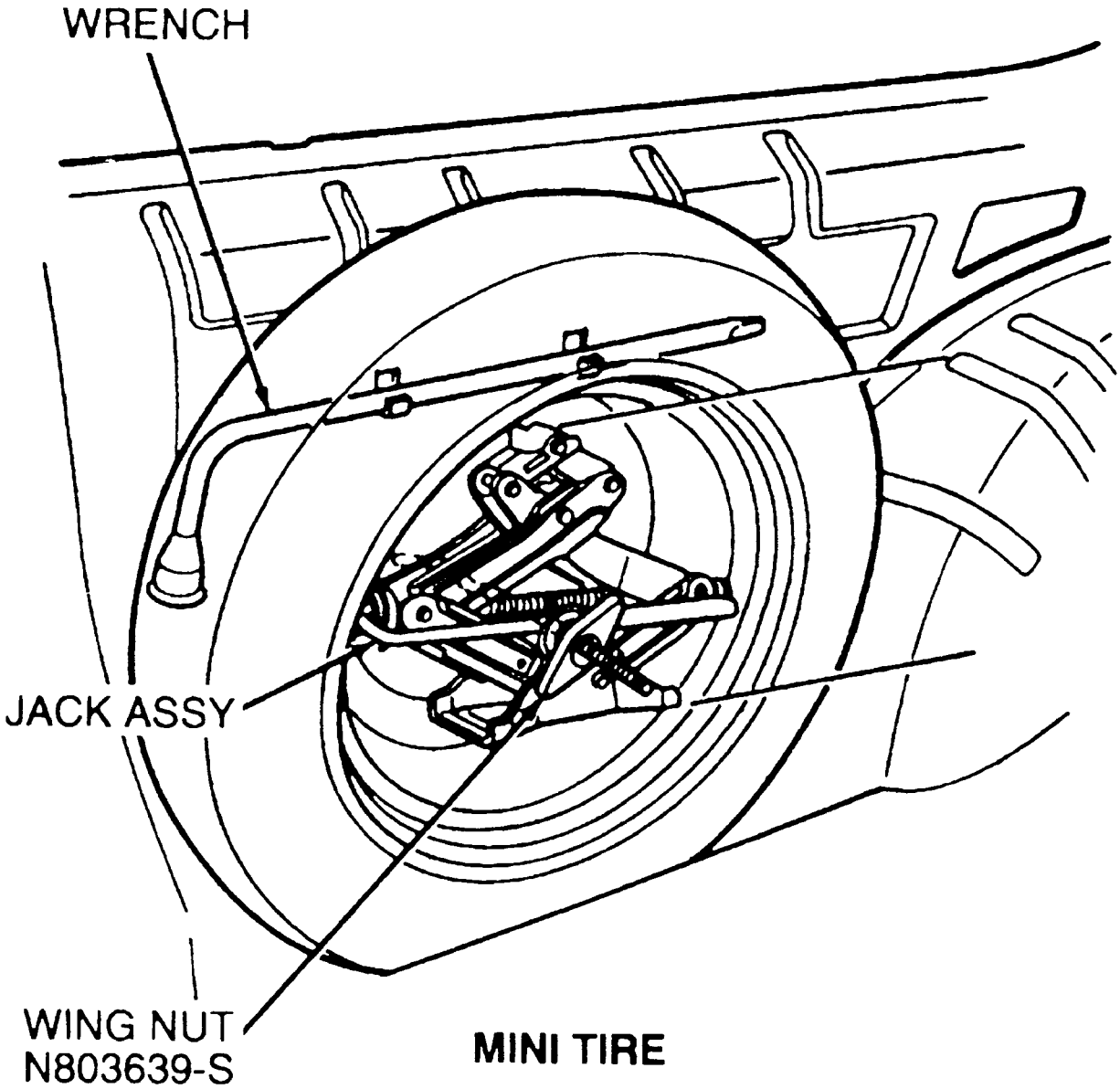


UNI-DIRECTIONAL TIRE AND/OR UNI-DIRECTIONAL WHEEL (1007) 4 TIRE ROTATION

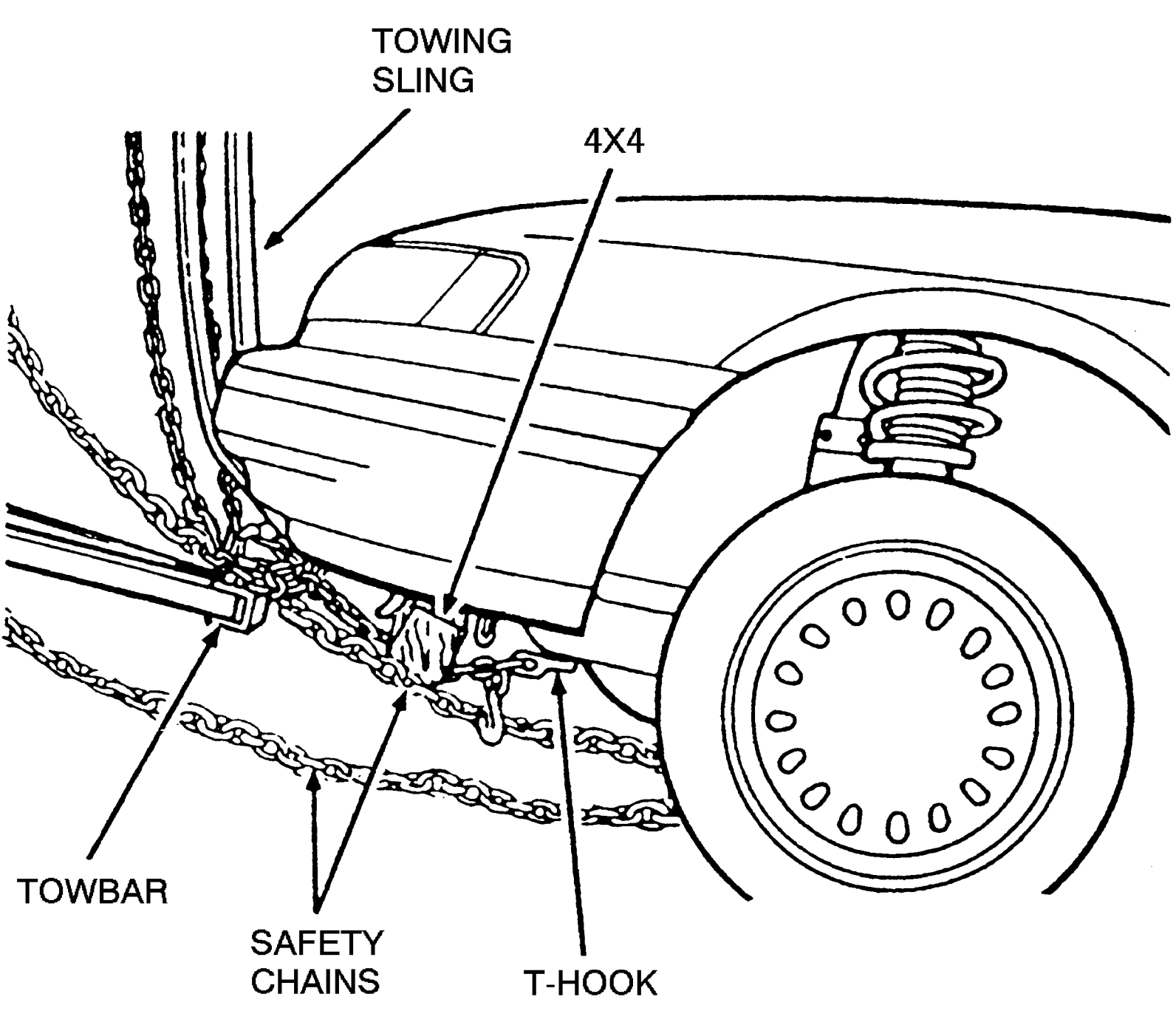


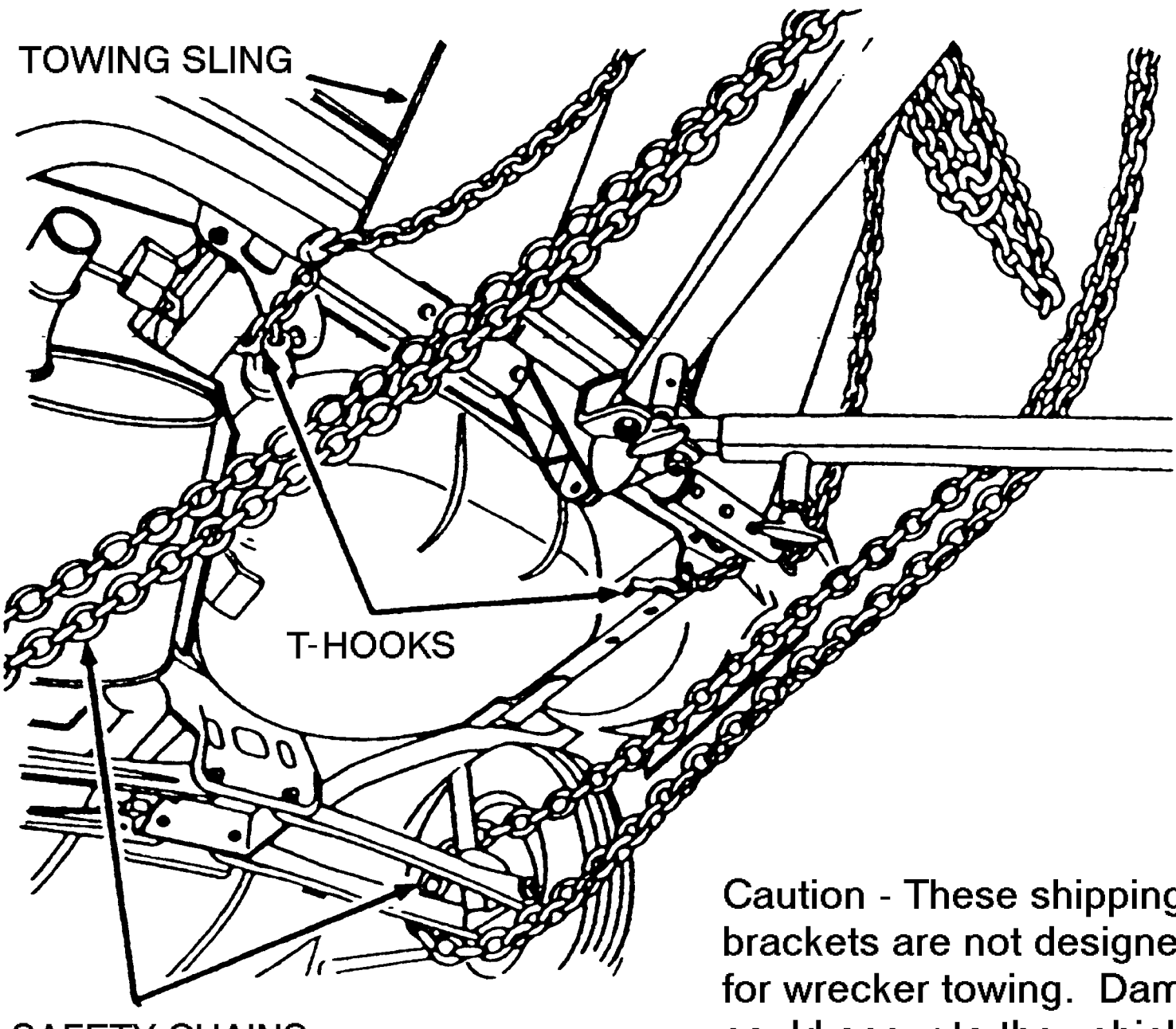


MINI TIRE SHOWN
CONVENTIONAL TIRE SIMILAR

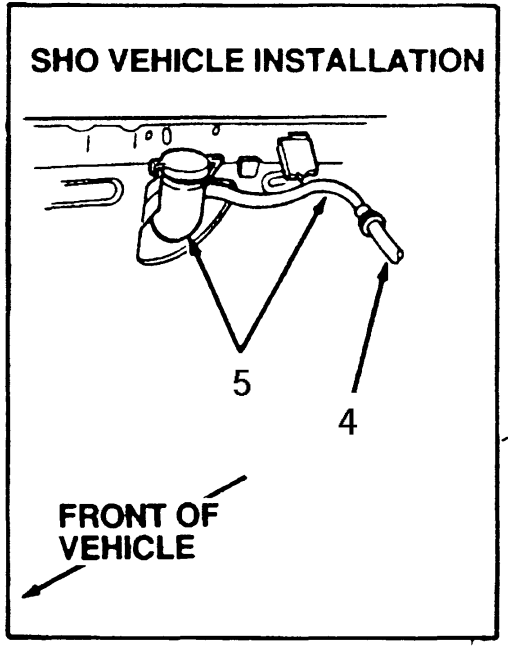


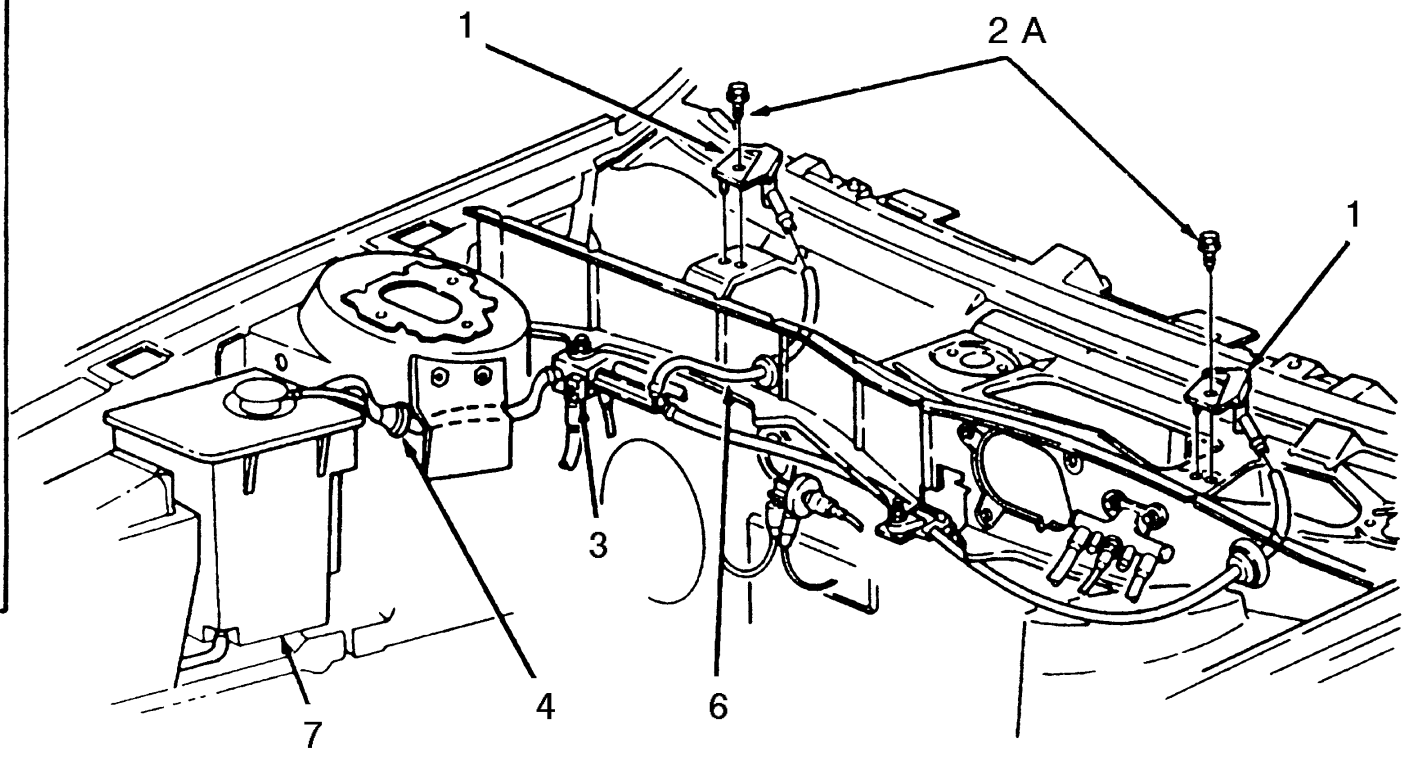
MINI TIRE


TOWING
SLING
4X4
TOWBAR
SAFETY
CHAINS
T-HOOK



Caution - These shipping brackets are not designed for wrecker towing. Damage could occur to the vehicle.

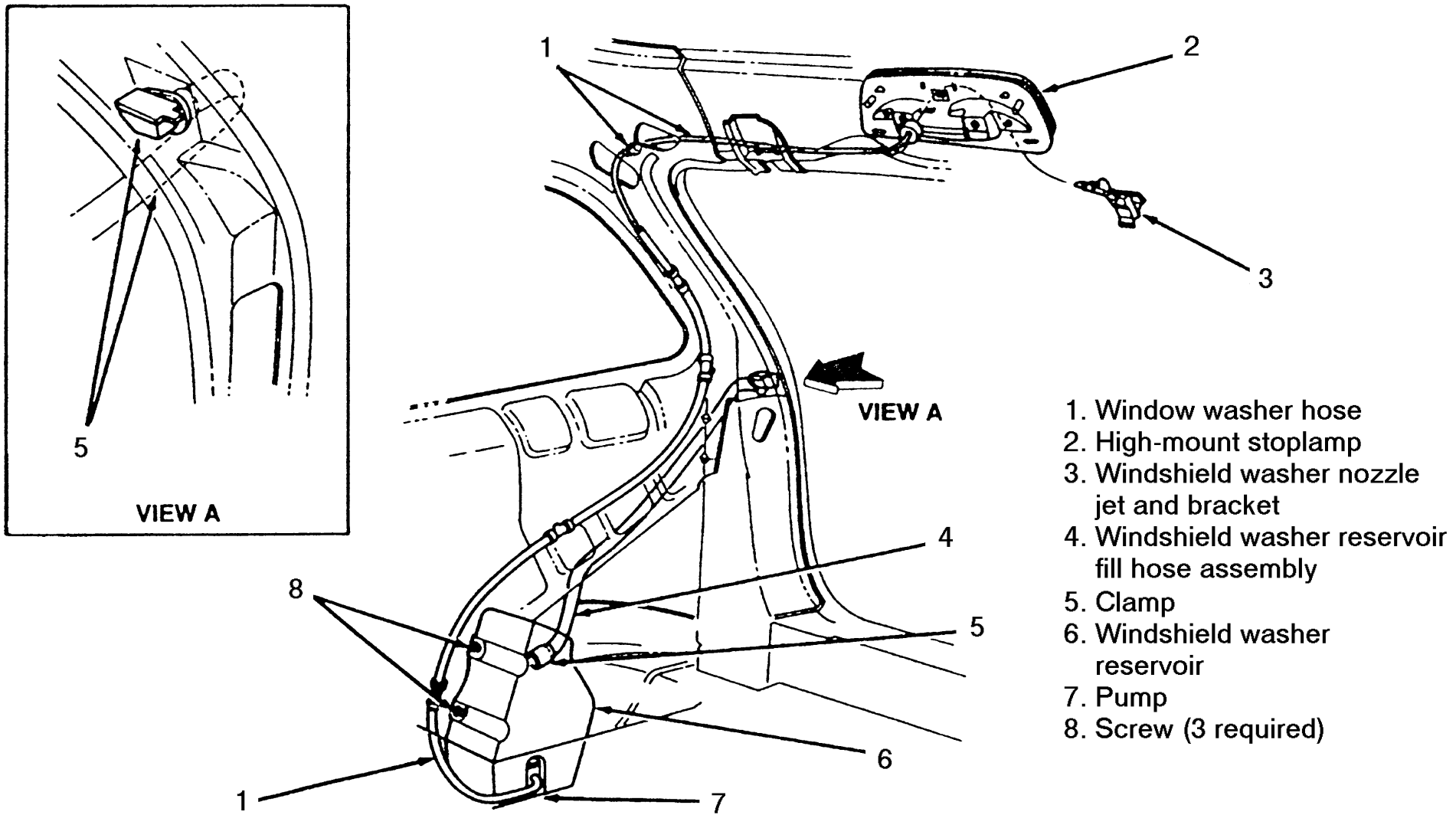




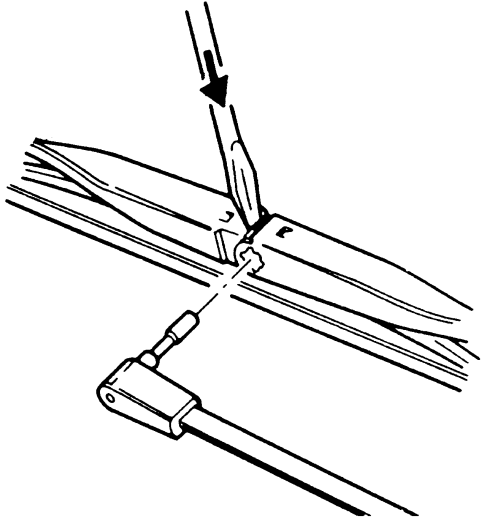
REGULAR PRODUCTION VEHICLE INSTALLATION

1. Windshield washer nozzle jet and bracket
2. Bolt (2 required)
3. Vacuum and water distribution manifold
4. Filter
5. Windshield washer reservoir assembly (SHO)
6. Windshield washer hose
7. Windshield washer reservoir

A. Tighten to 1.8-2.6 N.m (16-23 lb-in)



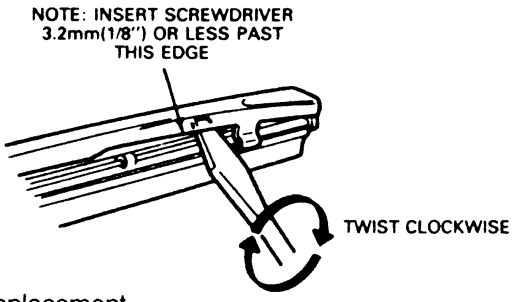
1. Window washer hose
2. High-mount stoplamp
3. Windshield washer nozzle jet and bracket
4. Windshield washer reservoir fill hose assembly
5. Clamp
6. Windshield washer reservoir
7. Pump
8. Screw (3 required)



Blade replacement

1. Cycle arm and blade assembly to up position on the windshield where removal of blade assembly can be performed without difficulty. Turn ignition key off at desired position.
2. To remove blade assembly, insert screwdriver in slot, push down on spring lock and pull blade assembly from pin (View A).
3. To install, push the blade assembly on the pin so that the spring lock engages the pin (View A). Be sure the blade assembly is securely attached to pin.

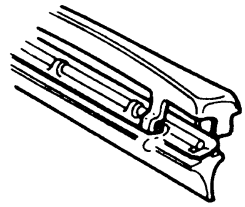
VIEW A



Element replacement

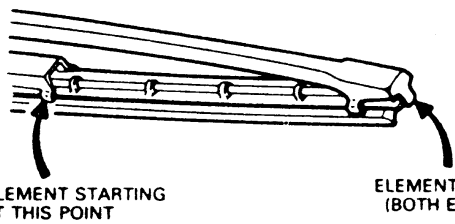
1. Insert screwdriver between the edge of the super structure and the blade backing drip (View B). Twist screwdriver slowly until element clears one side of the super structure claw.
2. Slide the element out of all the super structure claws.

VIEW B



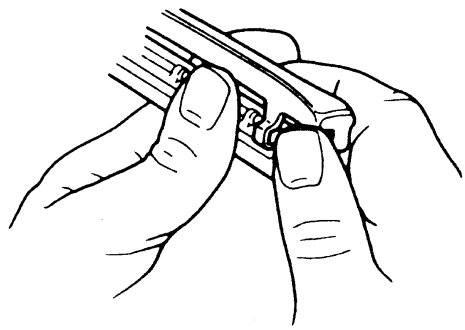
4. Insert element into one side of the end claws (View D) and with a rocking motion push element upward until it snaps in (View E).

VIEW D



3. Slide the element into the super structure claws, starting with second set from either end (View C) and continue to slide the blade element into all the super structure claws to the element stop (View C).

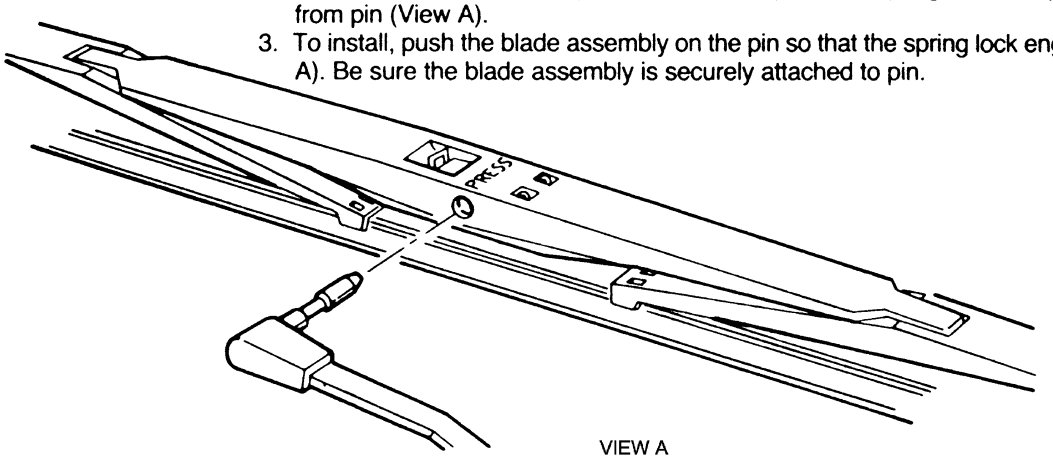
VIEW C



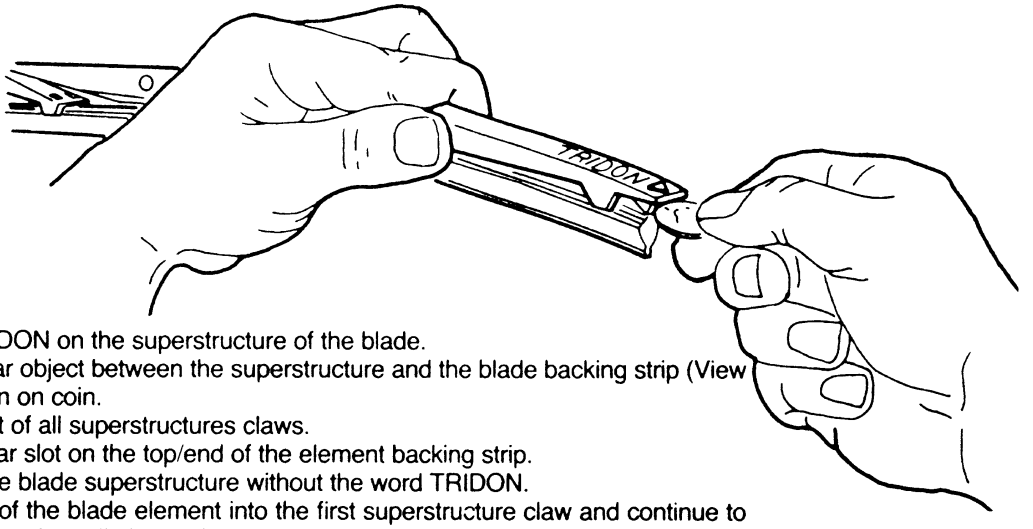
VIEW E

Blade replacement

1. Cycle arm and blade assembly to a position on the windshield where removal of blade assembly can be performed without difficulty. Turn ignition key off at desired position.
2. To remove blade assembly from wiper arm, press on spring lock and pull blade assembly from pin (View A).
3. To install, push the blade assembly on the pin so that the spring lock engages the pin (View A). Be sure the blade assembly is securely attached to pin.



VIEW A

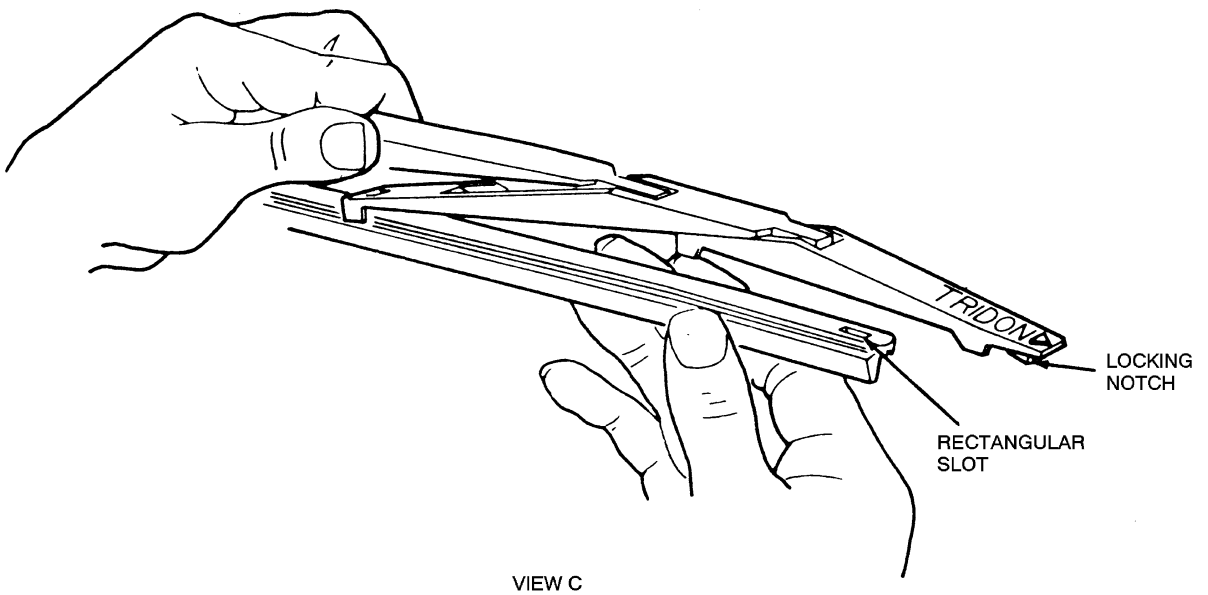


Element replacement

1. Locate the word TRIDON on the superstructure of the blade.
2. Insert a coin or similar object between the superstructure and the blade backing strip (View B). Push down and in on coin.
3. Slide the element out of all superstructures claws.
4. Locate the rectangular slot on the top/end of the element backing strip.
5. Locate the end on the blade superstructure without the word TRIDON.
6. Insert the "slot" end of the blade element into the first superstructure claw and continue to slide the blade element into all claws of the superstructure. The blade element will "snap" into place when the element is fully installed through the last superstructure claw (located at the end with the word TRIDON) (View C).

   NOTE: Make sure that the element backing strip has been installed into all the superstructure claws and that the locking rib is securely engaged.

VIEW B



VIEW C