

LUBRICATION AND MAINTENANCE

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GENERAL INFORMATION

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INTRODUCTION

Jeep® lubrication and maintenance is divided into required and recommended service tasks.

The recommendations and procedures listed in this group are intended for Jeep® Dealer Service Personnel.

Because conditions vary, it is necessary to schedule service tasks according to a time interval as well as a distance interval.

It is the owner's responsibility to have vehicle serviced. Owner is to pay for labor and necessary parts that are not covered by the warranty.

Additional lubrication and maintenance information is listed in the Owner's Manual, which is included with the vehicle.

SEVERE DRIVING CONDITIONS

When a vehicle is subjected to a severe driving condition, time between recommended maintenance should be decreased.

Refer to Engine Maintenance for the engine oil and filter maintenance interval when involved with a severe driving condition.

A severe driving condition is defined as either:

- frequent short trip driving less than 24 km (15 miles);
- frequent driving in a dusty environment;
- trailer towing;
- extensive engine idling;
- sustained high-speed operation;
- desert operation;
- frequent starting and stopping;

- cold-climate operation;
- off-road driving; or
- commercial service.

To service a Jeep® vehicle for a severe driving condition, change all the lubricating fluids and lubricate:

- the body components,
- all the driveline coupling joints, and
- the steering linkage

more often than for a normal driving condition to prevent excessive wear of the components.

DUSTY AREAS

Driving in an area with dust-filled air increases the risk of particles entering the engine and crankcase. With this type of severe driving condition, attention should be given to the engine and crankcase components.

OFF-ROAD (4WD) OPERATION

After completion of off-road (4WD) operation, the underside of the vehicle should be thoroughly inspected. Examine threaded fasteners for looseness.

HARSH SURFACE ENVIRONMENTS

After vehicle operation in a harsh surface environment, the following components should be inspected and cleaned as soon as possible:

- brake drums,
- brake linings,
- front wheel bearings (2WD vehicles only), and
- axle coupling joints.

This will prevent wear and/or unpredictable brake action.

ROUTINE SERVICE

The following routine vehicle service is highly recommended on a monthly basis.

TIRES—Inspect the tires for unusual wear/damage and determine if the inflation pressure is acceptable for the vehicle load.

BATTERY—Inspect and clean the terminals. Tighten the terminals, if necessary.

FLUIDS—Determine if the coolant, brake fluid, power steering, automatic transmission, and clutch fluid level are acceptable. Add fluid, if necessary.

LIGHTS/ELECTRICAL—Test all the electrically operated systems in the vehicle for proper operation.

It is also recommended that the engine oil level and the windshield washer fluid level be determined (and corrected) during each fuel fill-up.

FUEL REQUIREMENTS

All Jeep® engines require the use of unleaded gasoline. In addition, the fuel must have a minimum octane rating of 87.

CAUTION: UNLEADED FUEL ONLY must be used in vehicles equipped with a catalyst emission control system. All vehicles have reminders printed on the instrument panel (Fig. 1) and on the fuel filler door (Fig. 2). Vehicles also have fuel filler tubes that are designed to accept only the small-diameter unleaded gasoline nozzles. It is illegal to defeat the design of an unleaded fuel filler tube.

CLASSIFICATION OF LUBRICANTS

Lubricating fluids and chassis component lubricants are classified and graded according to standards recommended by the:

- Society of Automotive Engineers (SAE),

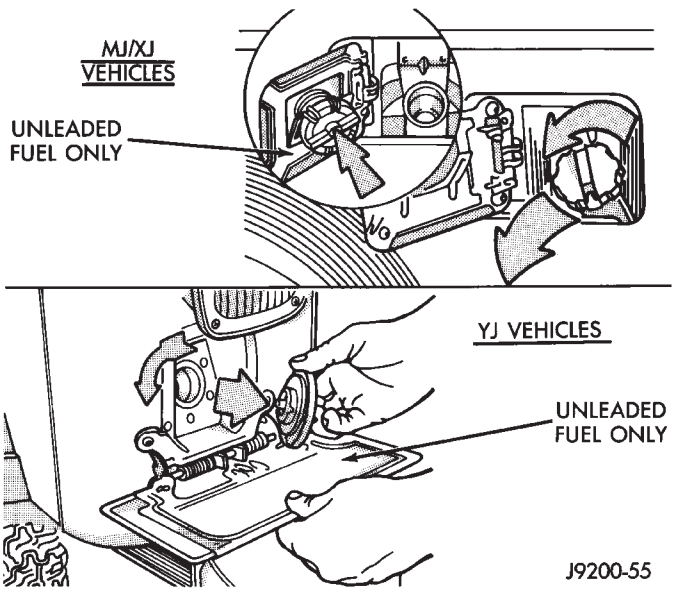


Fig. 2 Unleaded Fuel Only Reminder—Fuel Filler Door

- American Petroleum Institute (API), and
- National Lubricating Grease Institute (NLGI).

ENGINE OIL

SAE VISCOSITY GRADE

An SAE viscosity grade is used to specify viscosity of engine oil. SAE 30 specifies a single viscosity engine oil. Engine oils also have multiple viscosities (Fig. 3).

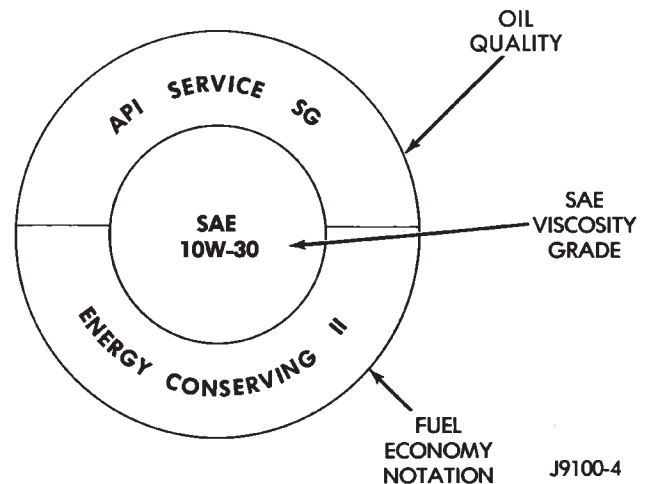


Fig. 3 SAE Oil Viscosity Grade & API Service Grade

The viscosity grade of an oil is an indicator of its thickness or flow capability. The lower the number, the better the flow. The second viscosity grade number (without a W suffix) is the warm/hot-temperature viscosity. The viscosity increases with engine temperature. With a single viscosity grade, the oil viscosity is valid only for one narrow temperature range.

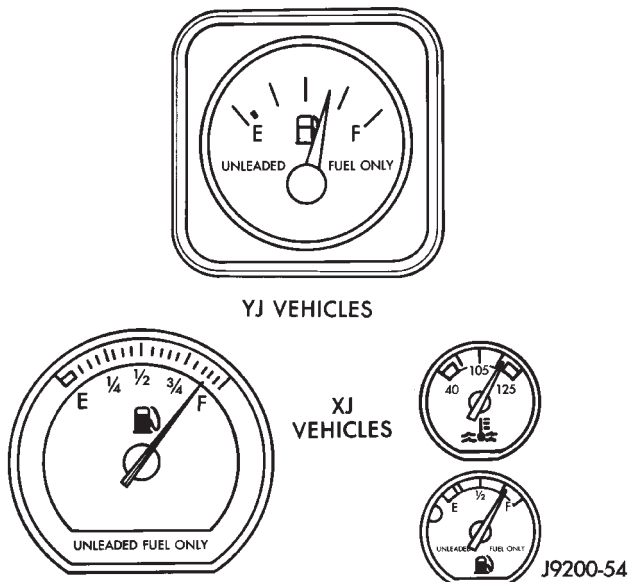


Fig. 1 Unleaded Fuel Only Reminders—Fuel Gauge

Above that temperature range the viscosity will decrease, and below that range the viscosity will increase.

An engine oil with an SAE 5W-30 viscosity grade provides good flow capability for fast cold weather engine starts. The viscosity will then increase with engine temperature to provide good high-temperature engine lubrication.

API SERVICE GRADE

The API Service Grade specifies the type of engine/operating conditions for which the oil is intended. The API Service Grade specifications also apply to energy conserving engine oils (Fig. 3). The API certification mark is also used indicating that the oil is certified to meet the most critical requirements established by the manufacturer (Fig. 4).



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Fig. 4 The API Engine Oil Certification Mark

For maximum protection, use API Service Grade SG, SG/CD or SG/CE engine oil in Jeep® engines.

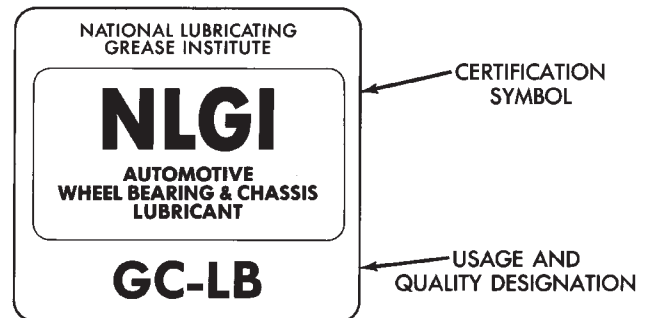
GEAR LUBRICANTS

A dual SAE viscosity grade is also used to specify the viscosity of multipurpose gear lubricants.

The API lubrication quality grade designation identifies gear lubricants in terms of recommended usage.

CHASSIS COMPONENT AND WHEEL BEARING LUBRICANTS

The chassis component and wheel bearing lubricants are identified by the NLGI Certification Symbol (Fig. 5).



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Fig. 5 NLGI Lubricant Certification/Identification Symbol

The letter **G** indicates wheel bearing lubricant and the letter **L** indicates chassis lubricant. When the letters are combined the lubricant can be used for dual applications. The suffix letters **C** and **B** indicates quality level of the lubricant. Use only lubricants that display the NLGI Certification Symbol.

RECOMMENDED LUBRICANT AND REPLACEMENT PARTS

Jeep® vehicles are engineered to provide many years of dependable operation. When necessary, **MO-PAR brand lubricants and genuine replacement parts** are highly recommended.

COMPONENTS REQUIRING NO LUBRICATION

There are many components that should not be lubricated. The components that should **not** be lubricated are:

- air pumps;
- generator bearings;
- drive belts;
- drive belt idler pulleys;
- rubber bushings;
- starter motor bearings;
- suspension strut bearings;
- throttle control cables;
- throttle linkage ball joints; and
- water pump bearings.

FLUID CAPACITIES

ENGINE OIL	CAPACITIES		API SERVICE GRADES
	QUARTS	LITERS	
2.5L Engine	4.0	3.8	SG, SG/CD or SG/CE
4.0L Engine	6.0	5.7	SG, SG/CD or SG/CE

COOLING SYSTEM	QUARTS	LITERS
2.5L Engine (XJ Vehicles)	10.0*	9.5*
2.5L Engine (YJ Vehicles)	9.0**	8.5**
4.0L Engine (XJ Vehicles)	12.0*	11.4*
4.0L Engine (YJ Vehicles)	10.5**	9.9**

*Includes 2.3 qt./2.2L for coolant reserve/recovery reservoir. **Includes 1 qt./0.9L for coolant recovery reserve reservoir.

TRANSMISSIONS (APPROX. CHANGE CAPACITIES)	PINTS	LITERS	TYPE
AX-5 (4 WD)	7.0	3.3	Man. 5 Speed
AX-15 (4 WD)	6.75	3.2	Man. 5 Speed
AX-5 (2 WD)	7.4	3.5	Man. 5 Speed
AX-15 (2 WD)	6.7	3.15	Man. 5 Speed
AW-4 (J Vehicles)	8.5*	4.0*	Automatic
998 (YJ Vehicles)	8.0*	3.8*	Automatic

Use API GL5/SAE 75W-90 grade lubrication for manual transmissions. Use MERCON® type ATF for AW-4 automatic transmission. Use DEXRON II® or ATF PLUS type 7176 for 998 automatic transmission. *Quantity will vary according to amount of ATF that remained in the converter.

FRONT/REAR AXLES	PINTS	LITERS	API QUALITY GRADE/SAE VISCOSITY
XJ Vehicles (1) (3)	2.5	1.2	API GL5/SAE 75W-90
YJ Vehicles (3) (2)	4.4	2.1	API GL5/SAE 75W-90
Heavy Duty Rear Axle (3) (2)	3.0	1.4	API GL5/SAE 75W-90

(1) With Trailer Two Class III Hitch (5000 lbs) use 75W-140 Synthetic Gear Lubricant in rear axle.
(2) With Trailer Two Package use API GL5 80W-140 Lubricant in rear axle.
(3) With Rear Axle Limited Slip Differential, Add 2 ounces of Friction Modifier Additive.

TRANSFER CASE	PINTS	LITERS	TYPE ATF
SELEC-TRAC 242 (XJ Vehicles)	3.0	1.4	ATF PLUS, MERCON® or DEXRON II®
COMMAND-TRAC 231 (XJ VEHICLES)	2.2	1.0	ATF PLUS, MERCON® or DEXRON II®
COMMAND-TRAC 231 (YJ VEHICLES)	3.25	1.5	ATF PLUS, MERCON® or DEXRON II®

FUEL TANK	GALLONS	LITERS
XJ Vehicles	20.2	76.4
YJ Vehicles (Standard)	15.0	56.8
YJ Vehicles (Optional)	20.0	75.7

MAINTENANCE SCHEDULES

INTRODUCTION

Chrysler Corporation has compiled recommended lubrication and maintenance schedules and procedures to help reduce premature wear or failure over a broad range of operating conditions.

SEVERE SERVICE MAINTENANCE

If the vehicle is involved with a severe driving condition, after each 4 800-km (3,000-miles)/3-month interval. A severe driving condition includes:

- frequent short trip driving less than 24 km (15 miles);
- frequent driving in a dusty environment;
- trailer towing;
- extensive engine idling;
- sustained high-speed operation;
- desert operation;
- frequent starting and stopping;
- cold-climate operation;
- off-road driving; or
- commercial service.

MAINTENANCE SCHEDULES

AT EACH STOP FOR FUEL

- Check engine oil level, add as required.
- Check windshield washer solvent and add if required.

ONCE A MONTH

- Check tire pressure and look for unusual wear or damage.
- Inspect battery and clean and tighten terminals as required.
- Check electrolyte level and add water as needed.
- Check fluid levels of coolant reservoir, power steering and transmission and add as needed.
- Check all lights and all other electrical items for correct operation.
- Check rubber seals on each side of the radiator for proper fit.

7,500 MILES (12 000 KM) OR AT 6 MONTHS

- Check engine coolant level, hoses and clamps.
- Change engine oil.
- Replace engine oil filter.
- Check exhaust system.
- Lubricate steering linkage (4x4 models).
- Lubricate propeller shaft universal joints.
- Rotate Tires.

15,000 MILES (24 000 KM) OR AT 12 MONTHS

- Check engine coolant level, hoses and clamps.
- Change engine oil.
- Replace engine oil filter.
- Check exhaust system.
- Lubricate steering linkage (4x4 models).
- Lubricate propeller shaft universal joints.

- Check fluid level in battery.
- Rotate Tires.

22,500 MILES (36 000 KM) OR AT 18 MONTHS

- Check engine coolant level, hoses and clamps.
- Change engine oil.
- Replace engine oil filter.
- Check exhaust system.
- Lubricate steering linkage (4x4 models).
- Lubricate propeller shaft universal joints.
- Rotate Tires.

30,000 MILES (48 000 KM) OR AT 24 MONTHS

- Replace air cleaner filter.
- Replace spark plugs.
- Adjust drive belt.
- Check engine coolant level, hoses and clamps.
- Change engine oil.
- Replace engine oil filter.
- Check exhaust system.
- Lubricate steering linkage (4x4 models).
- Lubricate propeller shaft universal joints.
- Check fluid level in battery.
- Drain and refill automatic transmission.
- Drain and refill transfer case.
- Rotate Tires.

37,500 MILES (60 000 KM) OR AT 30 MONTHS

- Check engine coolant level, hoses and clamps.
- Change engine oil.
- Replace engine oil filter.
- Check exhaust system.
- Lubricate steering linkage (4x4 models).
- Lubricate propeller shaft universal joints.
- Drain and refill manual transmission.
- Rotate Tires.

45,000 MILES (72 500 KM) OR AT 36 MONTHS

- Check engine coolant level, hoses and clamps.
- Change engine oil.
- Replace engine oil filter.
- Check exhaust system.
- Lubricate steering linkage (4x4 models).
- Lubricate propeller shaft universal joints.
- Check fluid level in battery.
- Rotate Tires.

52,500 MILES (84 500 KM) OR AT 42 MONTHS

- Flush and replace engine coolant.
- Check engine coolant system hoses and clamps.
- Change engine oil.
- Replace engine oil filter.
- Check exhaust system.
- Lubricate steering linkage (4x4 models).
- Lubricate propeller shaft universal joints.
- Rotate Tires.

60,000 MILES (96 500 KM) OR AT 48 MONTHS.

- Replace air cleaner filter.
- Replace distributor cap and rotor.
- Replace ignition wires.
- Replace spark plugs.
- Adjust or replace drive belt.
- Check engine coolant level, hoses and clamps.
- Change engine oil.
- Replace engine oil filter.
- Check exhaust system.
- Replace fuel filter (not required for Calif. vehicles).
- Lubricate steering linkage (4x4 models).
- Lubricate propeller shaft universal joints.
- Check fluid level in battery.
- Drain and refill automatic transmission.
- Drain and refill transfer case.
- Rotate Tires.

67,500 MILES (108 500 KM) OR AT 54 MONTHS

- Check engine coolant level, hoses and clamps.
- Change engine oil.
- Replace engine oil filter.
- Check exhaust system.
- Lubricate steering linkage (4x4 models).
- Lubricate propeller shaft universal joints.
- Rotate Tires.

75,000 MILES (120 500 KM) OR AT 60 MONTHS

- Check engine coolant level, hoses and clamps.
- Change engine oil.
- Replace engine oil filter.
- Check exhaust system.
- Lubricate steering linkage (4x4 models).
- Lubricate propeller shaft universal joints.
- Drain and refill manual transmission.
- Rotate Tires.

82,500 MILES (133 000 KM) OR AT 66 MONTHS

- Flush and replace engine coolant.
- Check engine coolant system, hoses and clamps.
- Change engine oil.
- Replace engine oil filter.
- Check exhaust system.
- Lubricate steering linkage (4x4 models).
- Lubricate propeller shaft universal joints.
- Rotate Tires.

90,000 MILES (145 000 KM) OR AT 72 MONTHS

- Replace air cleaner filter.
- Replace spark plugs.
- Adjust drive belt.
- Check engine coolant level, hoses and clamps.
- Change engine oil.
- Replace engine oil filter.

- Check exhaust system.
- Lubricate steering linkage (4x4 models).
- Lubricate propeller shaft universal joints.
- Check fluid level in battery.
- Drain and refill automatic transmission.
- Drain and refill transfer case.
- Rotate Tires.

97,500 MILES (157 000 KM) OR AT 78 MONTHS

- Check engine coolant level, hoses and clamps.
- Change engine oil.
- Replace engine oil filter.
- Check exhaust system.
- Lubricate steering linkage (4x4 models).
- Lubricate propeller shaft universal joints.
- Rotate Tires.

105,000 MILES (169 000 KM) OR AT 84 MONTHS

- Check engine coolant level, hoses and clamps.
- Change engine oil.
- Replace engine oil filter.
- Check exhaust system.
- Lubricate steering linkage (4x4 models).
- Lubricate propeller shaft universal joints.
- Rotate Tires.

112,500 MILES (181 000 KM) OR AT 90 MONTHS

- Flush and replace engine coolant.
- Check engine coolant system hoses and clamps.
- Change engine oil.
- Replace engine oil filter.
- Check exhaust system.
- Lubricate steering linkage (4x4 models).
- Lubricate propeller shaft universal joints.
- Rotate Tires.

120,000 MILES (193 000 KM) OR AT 96 MONTHS

- Replace air cleaner filter.
- Replace distributor cap and rotor.
- Replace ignition wires.
- Replace spark plugs.
- Adjust or replace drive belt.
- Check engine coolant level, hoses and clamps.
- Change engine oil.
- Replace engine oil filter.
- Check exhaust system.
- Replace fuel filter (not required for Calif. vehicles).
- Lubricate steering linkage (4x4 models).
- Lubricate propeller shaft universal joints.
- Check fluid level in battery.
- Drain and refill automatic transmission.
- Drain and refill transfer case.
- Rotate Tires.

JUMP STARTING, HOISTING AND TOWING

JUMP STARTING

WARNING: DO NOT ATTEMPT TO PUSH OR TOW A VEHICLE TO START THE ENGINE. UNBURNED FUEL COULD ENTER THE EXHAUST CATALYTIC CONVERTER AND IGNITE AFTER THE ENGINE IS STARTED. THIS COULD CAUSE THE CONVERTER TO OVERHEAT AND RUPTURE.

BOOSTER BATTERY

WARNING: TO PREVENT PERSONAL INJURY OR CLOTHING DAMAGE, DO NOT ALLOW BATTERY (ACID) TO CONTACT EYES, SKIN OR CLOTHING. DO NOT LEAN OVER A BATTERY WHEN CONNECTING JUMPER CABLES. DO NOT ALLOW THE POSITIVE AND NEGATIVE CABLE CONNECTOR CLAMPS TO CONTACT EACH OTHER. KEEP OPEN FLAMES AND SPARKS AWAY FROM THE BATTERY VENT HOLES. ALWAYS WEAR EYE PROTECTION WHEN INVOLVED WITH BATTERIES.

If it is necessary to use a booster battery and jumper cables to start an engine use the following procedure.

(1) Engage the parking brake and shift the automatic transmission to PARK, manual transmission shift to NEUTRAL.

(2) Turn off all lights, the heater-A/C blower motor, and all other electrical loads.

WARNING: WHEN THE AIR TEMPERATURE IS BELOW THE FREEZING POINT (0°C OR 32°F), THE ACID IN A DISCHARGED VEHICLE BATTERY CAN FREEZE. DO NOT ATTEMPT TO JUMP START AN ENGINE BEFORE DETERMINING THE CONDITION OF THE BATTERY.

(3) Inspect the general condition of the battery.

CAUTION: Do not permit metal surfaces on vehicles to contact because this could establish ground continuity between vehicle bodies.

(4) Attach a red cable connector clamp to the positive (+) terminal on the booster battery. Connect the other red cable connector clamp to the positive (+) terminal on the discharged battery (Fig. 6).

CAUTION: Use care to avoid allowing the positive (+) and negative (-) cable clamps to contact each other. DO NOT lean over the battery when connecting the cable clamps.

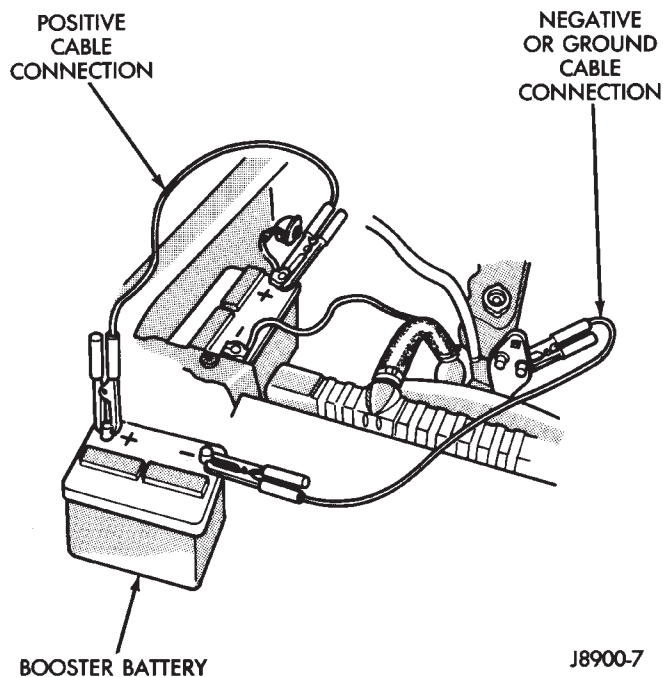


Fig. 6 Jumper Cable Connections

WARNING: DO NOT CONNECT A JUMPER CABLE CONNECTOR CLAMP TO THE NEGATIVE POST OF THE DISCHARGED BATTERY.

(5) Connect a black jumper cable connector clamp to the negative (-) terminal on the booster battery. Connect the other black jumper cable connector clamp to a good ground.

(6) Start the engine.

WARNING: THE USE OF ANY JUMPER CABLE DISCONNECTION PROCEDURE OTHER THAN THAT DESCRIBED BELOW COULD RESULT IN:

- PERSONAL INJURY CAUSED BY BATTERY ELECTROLYTE SQUIRTING FROM THE BATTERY VENTS.
- PERSONAL INJURY AND/OR PROPERTY DAMAGE CAUSED BY BATTERY EXPLOSION.
- DAMAGE TO THE BOOSTER VEHICLE OR THE DISABLED VEHICLE CHARGING SYSTEM.

(7) After the engine is started, or if the engine fails to start, the jumper cables must be disconnected in the following order:

- Black (negative) cable connector clamp from the engine ground contact.
- Black (negative) cable connector clamp from the negative terminal (-) on the booster battery.
- Red (positive) cable connector clamps from the positive (+) terminals on both batteries.

PORTABLE STARTING UNIT

There are many types of portable starting units available for starting engines. Follow the manufacturer's instructions when involved in any engine starting procedure.

HOISTING RECOMMENDATIONS

FLOOR JACK

When properly positioned, a floor jack can be used to lift a Jeep® vehicle. Support the vehicle in the raised position with jack stands at the front and rear ends as applicable (Fig. 7).

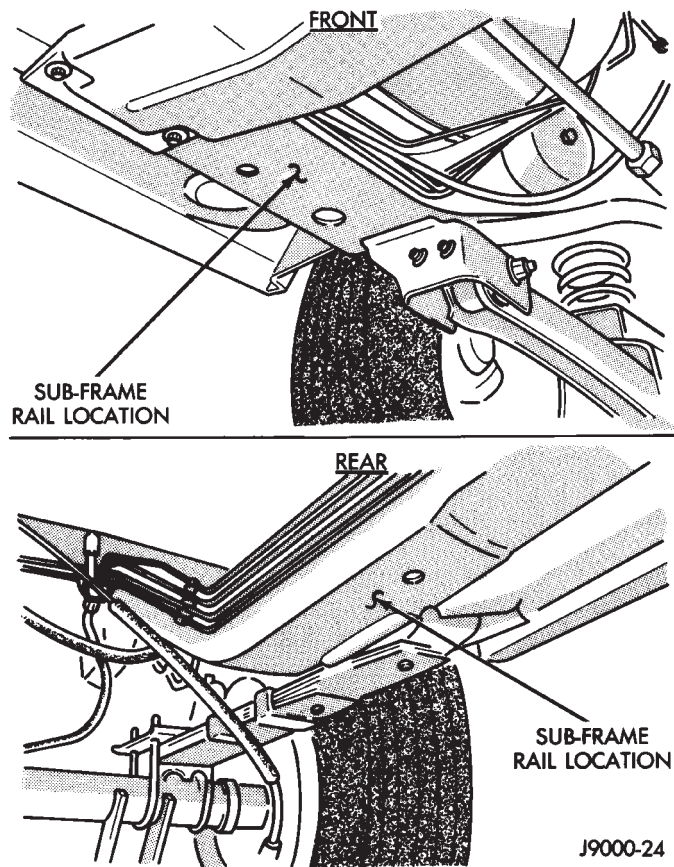


Fig. 7 Correct Vehicle Lifting Locations—Typical

CAUTION: Do not attempt to lift a Jeep® vehicle with a floor jack positioned under:

- an axle tube,
- a body side sill,
- a steering linkage component,
- a drive shaft,
- the engine or transmission oil pan,
- the fuel tank, or
- a front suspension arm.

Use the correct sub-frame rail or frame rail lifting locations only (Fig. 7).

HOIST

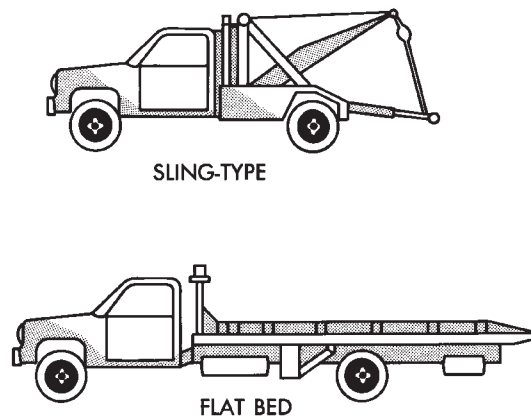
A Jeep® vehicle can be lifted with a swiveling-arm type hoist; with a wheel-lift, twin-post hoist; or with a ramp-type, drive-on hoist.

When a swiveling-arm, frame-contact type hoist is used, ensure that the lifting pads are positioned at the correct sub frame rail (Fig. 7).

TOWING RECOMMENDATIONS

TOWING EQUIPMENT

A vehicle equipped with SAE approved sling-type towing equipment can be used to tow all Jeep® vehicles (Fig. 8). When it is necessary to rear-tow a vehicle, use the wheel-lift towing method with a tow dolly located under the front wheels. A vehicle with flat-bed towing equipment can also be used to transport a disabled vehicle.



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Fig. 8 Tow Vehicles With Approved Equipment

A wooden crossbeam with spacer blocks could possibly be required for proper connection when using the sling-type, front-end towing method (Fig. 9).

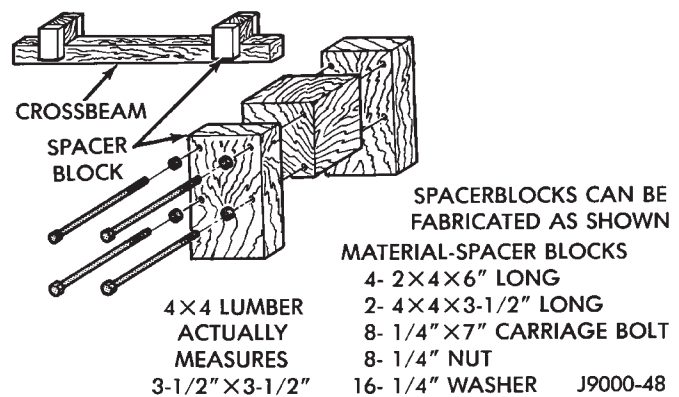


Fig. 9 Crossbeam & Spacer Block Construction

SAFETY PRECAUTIONS

The following safety precautions must be considered when preparing for and during a vehicle towing operation:

- if the vehicle is damaged, secure the loose and protruding parts;
- always use a safety chain system that is independent of the lifting and towing equipment;
- do not allow any of the towing equipment to contact the disabled vehicle's fuel tank;
- do not allow anyone to be under the disabled vehicle while it is lifted by the towing equipment;
- do not allow passengers to ride in a vehicle being towed;
- always observe all state and local laws involving warning signals, night illumination, speed, etc.
- do not attempt a towing operation that could jeopardize the safety of the operator, bystanders or other motorists;
- do not exceed a towing speed of 48 km/h (30 mph);
- avoid towing distances of more than 24 km (15 miles) whenever possible; and
- do not attach tow chains or a tow sling to a bumper, the steering linkage, the universal joints, the constant velocity (CV) joints, or a drive shaft.

CLEARANCES AND RAMP ANGLE

SURFACE CLEARANCE

The end of the disabled vehicle that is attached to the tow vehicle should be lifted a minimum of 10 cm or four inches off the surface. Inspect to ensure that the opposite end of the disabled vehicle has clearance from the surface.

RAMP ANGLE—FLAT-BED TOWING

If a vehicle with flat-bed towing equipment is used, the approach ramp angle should not exceed 15 degrees.

SLING-TYPE, FRONT-END TOWING

XJ VEHICLES

Use the following guidelines when the tow vehicle is attached to the front end of a disabled vehicle.

(1) Always tow with the front wheels lifted off the surface and turned all the way to the right.

(2) Attach a J-hook to the disabled vehicle at the left side of the axle (Fig. 10).

(3) Position the sling crossbar close to the J-hook and below the front bumper (Fig. 11).

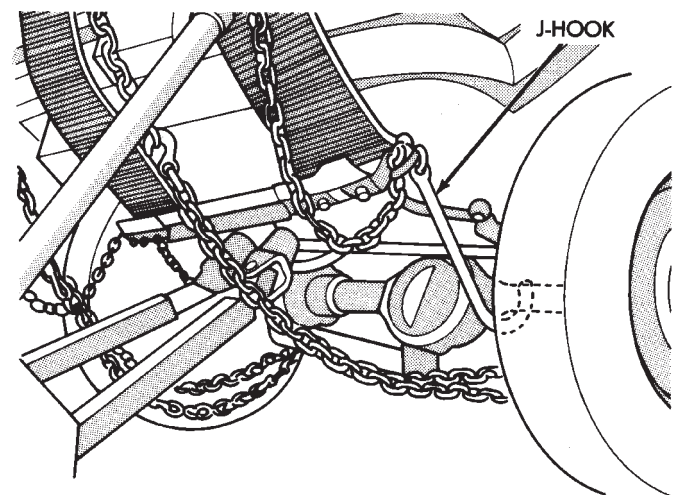
(4) Secure a chain to the right side of vehicle by placing it over the axle shaft tube and attaching it to a structural member.

(5) Attach the safety chains to the vehicle.

2WD With Manual Or Automatic Transmission

(6) Turn the ignition switch to the OFF position to unlock the steering wheel.

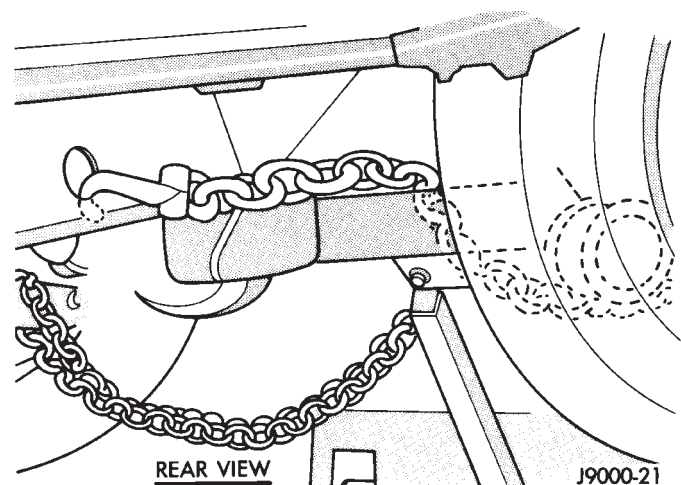
(7) Shift the transmission to NEUTRAL, mark the drive shaft and axle drive pinion gear shaft yoke for installation reference. Remove the drive shaft from the vehicle.



FRONT VIEW

J9000-20

Fig. 10 Sling-Type, Front-End Towing (XJ Front View)



REAR VIEW

J9000-21

Fig. 11 Sling-Type, Front-End Towing (XJ Rear View)

(8) Cover the exposed end of the transmission extension housing and the universal joints. Store the drive shaft in a safe place.

4WD, Command-Trac (231 Part-Time 4WD Transfer Case) And Manual Transmission

(6) Turn the ignition switch to the OFF position to unlock the steering wheel.

When the transfer case is in the NEUTRAL position, both axles are disengaged from the powertrain. This allows the vehicle to be towed without removing the drive shafts.

(7) Shift the manual transmission into a forward gear and the transfer case to NEUTRAL.

4WD, Command-Trac (231 Part-Time 4WD Transfer Case) And Automatic Transmission

(6) Turn the ignition switch to the OFF position to unlock the steering wheel.

When the transfer case is in the **NEUTRAL** position, both axles are disengaged from the powertrain. This allows the vehicle to be towed without removing the drive shafts.

(7) Shift the automatic transmission to **PARK** and the transfer case to **NEUTRAL**.

4WD, Selec-Trac (242 Full-Time 4WD Transfer Case) And Automatic Transmission

(6) Turn the ignition switch to the **OFF** position to unlock the steering wheel.

When the transfer case is in the **NEUTRAL** position, both axles are disengaged from the powertrain. This allows the vehicle to be towed without removing the drive shafts.

(7) Shift the automatic transmission to **PARK** and the transfer case to **NEUTRAL**.

YJ VEHICLES

Use the following guidelines when the tow vehicle is attached to the front of a disabled vehicle.

(1) Always tow with the front wheels lifted off the surface and turned all the way to the right.

CAUTION: Use tow chains with T-hooks for connecting to the disabled vehicle's frame rails (Fig. 12). Never use J-hooks.

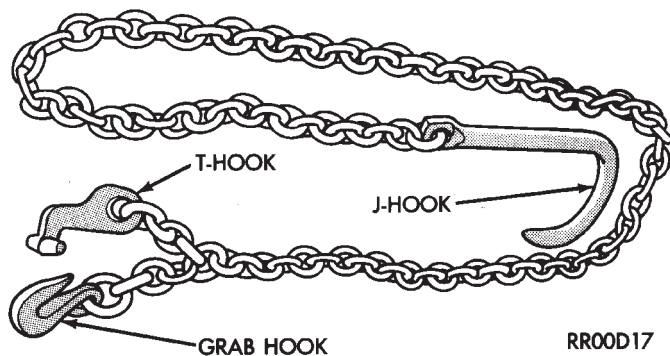


Fig. 12 Tow Chains & Hooks

(2) Attach the T-hooks to the slots in the front end of each frame rail (Fig. 13).

(3) Position each safety chain over the top of each front spring and inboard of each front spring shackle.

(4) Double wrap each chain.

(5) Position the sling crossbar under the front bumper.

Command-Trac (231 Part-Time 4WD Transfer Case) And Manual Transmission

(6) Turn the ignition switch to the **OFF** position to unlock the steering wheel.

When the transfer case is in the **NEUTRAL** position, both axles are disengaged from the powertrain. This allows the vehicle to be towed without removing the drive shafts.

(7) Shift the manual transmission to a forward gear and the transfer case to **NEUTRAL**.

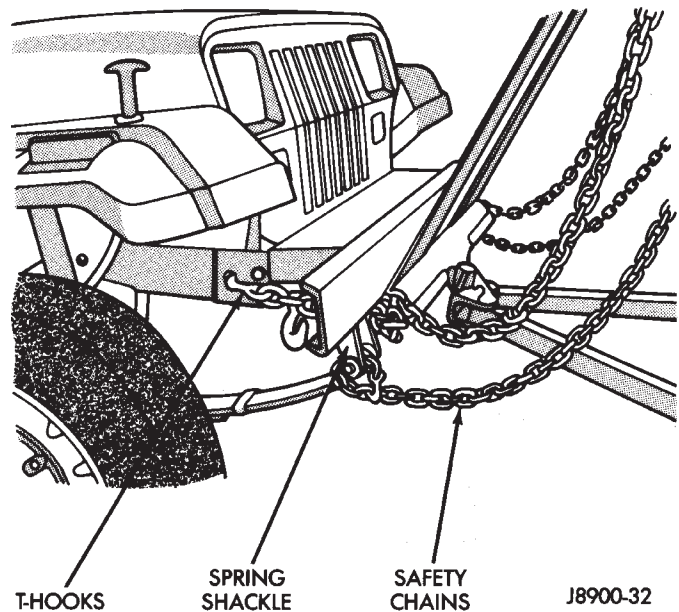


Fig. 13 Sling-Type, Front-End Towing (YJ Vehicles)

Command-Trac (231 Part-Time 4WD Transfer Case) And Automatic Transmission

(6) Turn the ignition switch to the **OFF** position to unlock the steering wheel.

When the transfer case is in the **NEUTRAL** position, both axles are disengaged from the powertrain. This allows the vehicle to be towed without removing the drive shafts.

(7) Shift the automatic transmission to **PARK** and the transfer case to **NEUTRAL**.

SLING-TYPE, REAR-END TOWING

YJ VEHICLES—Use wheel-lift equipment **ONLY** when towing from the rear end of the vehicle is necessary.

XJ VEHICLES—Use the following guidelines when the tow vehicle is attached to the rear of the disabled vehicle.

(1) Attach J-hooks around the axle shaft tubes outboard of the shock absorber.

(2) Place the sling crossbar under and forward of the bumper.

(3) Attach safety chains around the frame rails.

2WD With Manual Or Automatic Transmission

(1) Attach J-hooks around the axle shaft tubes outboard of the shock absorber.

(2) Place the sling crossbar under and forward of the bumper.

(3) Attach safety chains around the frame rails.

(4) Turn the ignition switch to the **OFF** position to unlock the steering wheel.

(5) Clamp the steering wheel with the front wheels in the straight ahead position. Do not use the steering column lock as a substitute for a clamping device.

(6) Shift the transmission to **NEUTRAL**.

4WD, Command-Trac (231 Part-Time 4WD Transfer Case) And Manual Transmission

- (1) Attach J-hooks around the axle shaft tubes outboard of the shock absorber.
- (2) Place the sling crossbar under and forward of the bumper.
- (3) Attach safety chains around the frame rails.
- (4) Turn the ignition switch to the OFF position to unlock the steering column.
- (5) Clamp the steering wheel with the front wheels in the straight ahead position. Do not use the steering column lock as a substitute for a clamping device.

When the transfer case is in the NEUTRAL position, both axles are disengaged from the powertrain. This allows the vehicle to be towed without removing the drive shafts.

- (6) Shift the transmission to a forward gear and the transfer case to NEUTRAL.

4WD, Command-Trac (231 Part-Time 4WD Transfer Case) And Automatic Transmission

- (1) Attach J-hooks around the axle shaft tubes outboard of the shock absorber.
- (2) Place the sling crossbar under and forward of the bumper.
- (3) Attach safety chains around the frame rails.
- (4) Turn the ignition switch to the OFF position to unlock the steering column.
- (5) Clamp the steering wheel with the front wheels in the straight ahead position. Do not use the steering column lock as a substitute for a clamping device.

When the transfer case is in the NEUTRAL position, both axles are disengaged from the powertrain. This allows the vehicle to be towed without removing the drive shafts.

- (6) Shift the transmission to PARK and the transfer case to NEUTRAL.

4WD, Selec-Trac (242 Full-Time 4WD Transfer Case) And Automatic Transmission

- (1) Attach J-hooks around the axle shaft tubes outboard of the shock absorber.
- (2) Place the sling crossbar under and forward of the bumper.
- (3) Attach safety chains around the frame rails.
- (4) Turn the ignition switch to the OFF position to unlock the steering column.
- (5) Clamp the steering wheel with the front wheels in the straight ahead position. Do not use the steering column lock as a substitute for a clamping device.

When the transfer case is in the NEUTRAL position, both axles are disengaged from the powertrain. This allows the vehicle to be towed without removing the drive shafts.

- (6) Shift the transmission to PARK and the transfer case to NEUTRAL.

TOWING WHEN IGNITION KEYS ARE NOT AVAILABLE

VEHICLE DOORS UNLOCKED

2WD Vehicles

Either one of two methods can be used:

- tow the vehicle with the drive shaft removed (refer to Sling-Type, Front-End Towing); or
- place a tow dolly under the rear wheels (Fig. 14) and tow with the front end raised (refer to Sling-Type, Front-End Towing).

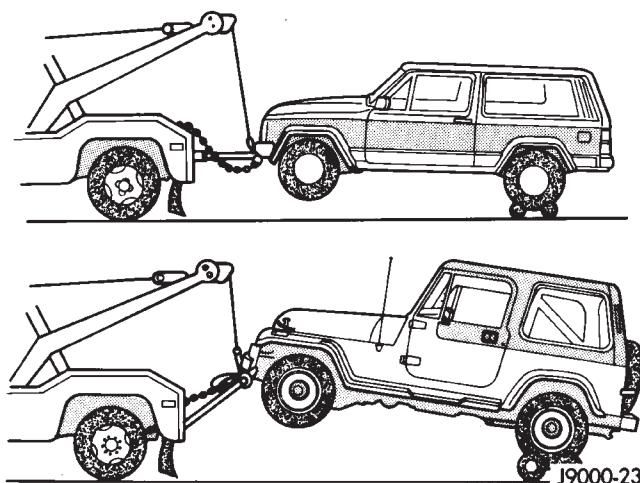


Fig. 14 Sling-Type, Front-End Towing With Rear Wheels On A Tow Dolly

4WD, Command-Trac (231 Part-Time 4WD Transfer Case) And Manual Transmission

- (1) Shift the manual transmission to a forward gear.

When the transfer case is in the NEUTRAL position, both axles are disengaged from the powertrain. This allows the vehicle to be towed without removing the drive shafts.

- (2) Shift the transfer case to NEUTRAL.
- (3) The vehicle can now be towed with the front wheels raised (refer to Sling-Type, Front-End Towing).

4WD, Command-Trac (231 Part-Time 4WD Transfer Case) And Automatic Transmission

- (1) Check and ensure that the automatic transmission is in PARK.

When the transfer case is in the NEUTRAL position, both axles are disengaged from the powertrain. This allows the vehicle to be towed without removing the drive shafts.

- (2) Shift the transfer case to NEUTRAL.
- (3) The vehicle can now be towed with the front wheels raised (refer to Sling-Type, Front-End Towing).

4WD, Selec-Trac (242 Full-Time 4WD Transfer Case) And Automatic Transmission

- (1) Check and ensure that the automatic transmission is in PARK.

When the transfer case is in the NEUTRAL position, both axles are disengaged from the powertrain. This allows the vehicle to be towed without removing the drive shafts.

(2) Shift the transfer case to NEUTRAL.

(3) The vehicle can now be towed with the front wheels raised (refer to Sling-Type, Front-End Towing).

VEHICLE DOORS LOCKED

Place a tow dolly under the rear wheels (Fig. 14) and tow with the front end raised (refer to Sling-Type, Front-End Towing).

4WD EMERGENCY TOWING—TRANSFER CASE NOT SHIFTED TO NEUTRAL

When a situation arises and the transfer case cannot be shifted to NEUTRAL, any of the following methods can be used to tow a 4WD vehicle.

Drive shafts not removed, place the rear wheels on a tow dolly and tow with the front end raised.

Drive shafts not removed, place the front wheels on a tow dolly and tow with the rear end raised.

Rear drive shaft removed, tow with the front end raised.

Front drive shaft removed, tow with the rear end raised.

Both drive shafts removed, tow with all four wheels on the road surface.

(1) Turn ignition key switch to the unlocked (OFF) position.

(2) Shift the transmission to the NEUTRAL position.

(3) Determine the method by which the vehicle will be towed and prepare the vehicle for towing.

(4) Connect the vehicle to the tow vehicle. Refer to the applicable procedure.

FLAT TOWING (4 TIRES/WHEELS ON SURFACE)

Tow a vehicle in this manner only when all four wheels will freely rotate. Prepare the vehicle according to the following procedures.

2WD VEHICLES

(1) Mark the drive shaft and the axle drive pinion gear shaft yoke for installation alignment reference.

(2) Remove the drive shaft. Install a protective covering over the drive shaft U-joints to retain them assembled and protected.

(3) Cover the open end of the transmission extension housing.

4WD VEHICLES

(1) Mark the drive shafts and the axle drive pinion gear shaft yokes for installation alignment reference.

(2) Remove the drive shafts. Install a protective covering over the drive shaft U-joints/CV-joints to retain them assembled and protected.

(3) Cover the exposed ends of the transfer case.

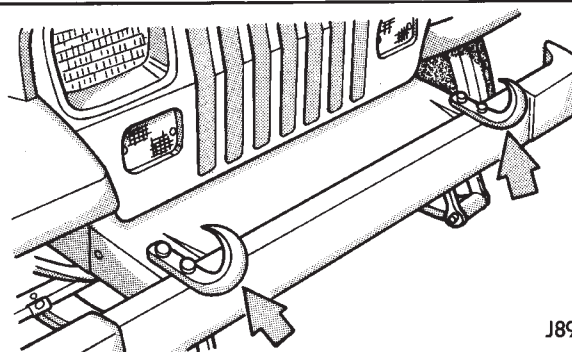
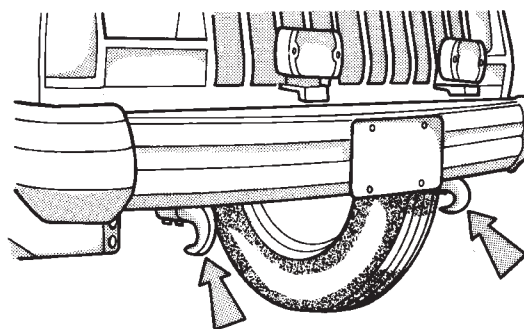
CAUTION: Whenever a drive shaft has been removed and installed, check the transmission fluid level of the transmission and transfer case. Driving a vehicle with low transfer case fluid can damage the transmission and transfer case.

EMERGENCY TOW HOOKS

WARNING: REMAIN AT A SAFE DISTANCE FROM A VEHICLE THAT IS BEING TOWED VIA ITS TOW HOOKS. THE TOW STRAPS/CHAINS COULD POSSIBLY BREAK AND CAUSE SERIOUS INJURY.

Some Jeep® vehicles are equipped with emergency tow hooks located at the front end (Fig. 15). Some Jeep® vehicles also have emergency tow hooks located at the rear end. The tow hooks should be used for **EMERGENCY** purposes only.

CAUTION: DO NOT use emergency tow hooks for tow truck hook-up or highway towing.



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Fig. 15 Emergency Front Tow Hooks—XJ & YJ Vehicles

ENGINE MAINTENANCE

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ENGINE BREAK-IN

After first starting a new engine, allow it to idle and warm up for at least 15 seconds before shifting the transmission into a drive gear.

Drive the vehicle at:

- varying speeds less than 80 km/h (50 mph) for the first 160 km (100 miles), and
- speeds less than 88 km/h (55 mph) for the first 800 km (500 miles).

Avoid driving at full-throttle for extended periods of time. Also, avoid fast acceleration and sudden stops.

A special break-in engine oil is not required. The original oil installed in a vehicle is a quality lubricant. There is no requirement to have the oil changed or the oil filter replaced until the first scheduled maintenance interval.

The engine oil, coolant and all the other engine related fluid levels should be determined on a regular basis.

ENGINE OIL

SPECIFICATIONS

API SERVICE GRADE

For maximum engine protection during all driving conditions, install an engine oil that conforms to API Service Grade. MOPAR Engine Oil conforms to all of these API Service Grades.

SAE VISCOSITY

SAE designated multi-viscosity grade engine oil is to protect engines. This type of engine oil can usually be installed and remain in the engine until the next scheduled oil change. Select the engine oil viscosity according to the lowest ambient air temperature expected before the next scheduled oil change (Fig.1). Low viscosity engine oil allows easier engine starting during cold weather. SAE 5W-30 viscosity engine oil is recommended when the ambient air temperatures consistently decrease to below 10°F (-12°C).

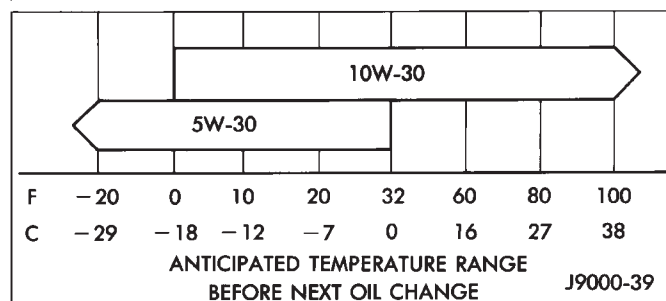


Fig. 1 Temperature/Engine Oil Viscosity

ENERGY CONSERVING OIL

In selecting the correct API grade and SAE grade, an **ENERGY CONSERVING** type engine oil is also recommended.

CONTAINER IDENTIFICATION

Standard engine oil notations have been adopted for selection of engine oil. The notations are located on side of plastic bottles and on the top of engine oil cans (Fig. 2).

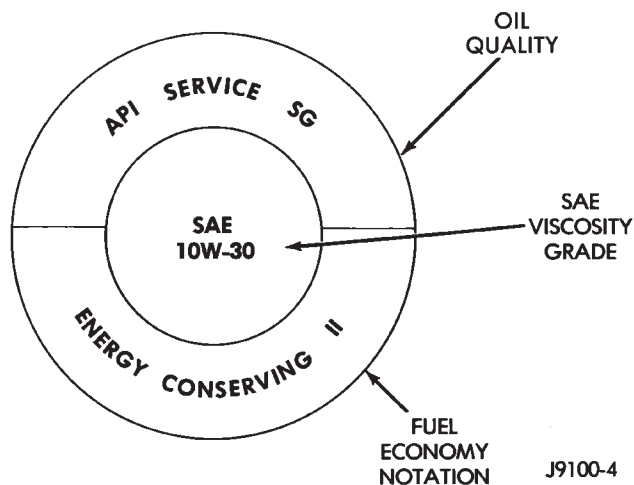


Fig. 2 Engine Oil Container Standard Notations

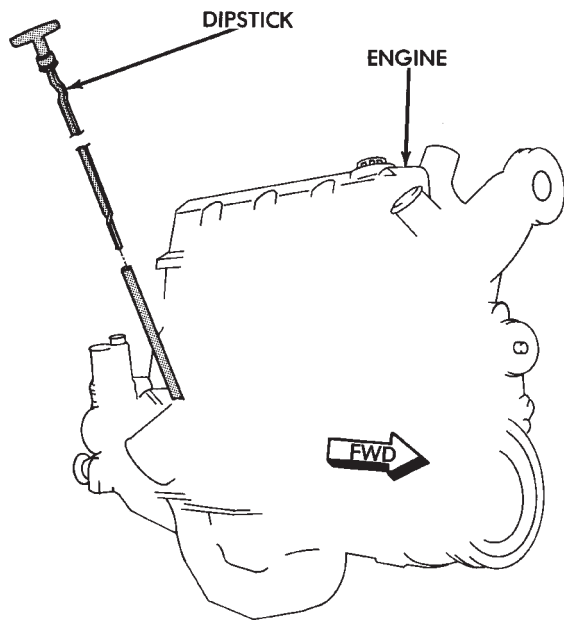
- The top, outer field contains the **API Service Grade** notation for the engine oil.

- The center field contains the **SAE viscosity grade** notation for the engine oil.
- The lower, outer field contains either the **ENERGY CONSERVING** or the **ENERGY CONSERVING II** notation for the engine oil.

CAUTION: Non-detergent engine oil or straight-mineral oil must never be used to lubricate a Jeep® engine. These type of oils will not provide proper engine lubrication and can result in engine damage.

LEVEL INDICATOR (DIPSTICK)

The engine oil level indicator is located at the right rear of both 2.5L engines and 4.0L engines (Fig. 3).



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Fig. 3 Engine Oil Dipstick Location—Typical

ACCEPTABLE LEVEL

To ensure proper lubrication of an engine, the engine oil must be maintained at an acceptable level. The acceptable levels are indicated between the ADD and FULL marks on the engine oil dipstick (Figs. 4 and 5). The engine oil level should be determined at the end of each regular driving interval. The vehicle should be on a level surface. Wait for approximately five minutes after stopping the engine. Add engine oil only when the level indicated on the dipstick is at or below the ADD mark.

CAUTION: Do not overfill the engine crankcase with oil. This will cause oil aeration and result in a decrease in the engine oil pressure.

ADDITIVES

It is not necessary to add a special additive to engine oil for most types of vehicle operation. However, the addition of special additives containing anti-rust

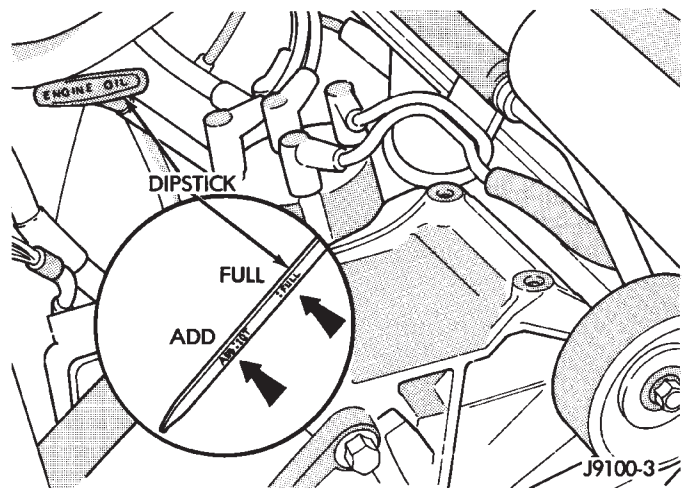


Fig. 4 Engine Oil Dipstick—2.5L Engine

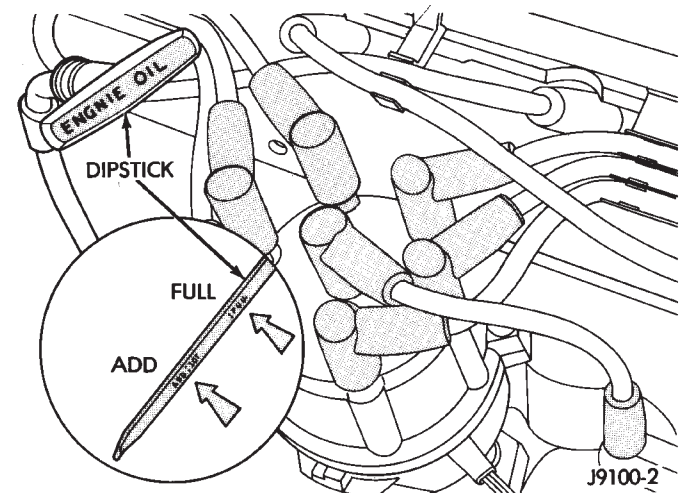


Fig. 5 Engine Oil Dipstick—4.0L Engine

and anti-scuff compounds can be helpful in some instances. For example:

- with infrequent vehicle operation or short-trip only operation, or
- during engine break-in after a major engine overhaul and/or replacement piston installation.

MOPAR Engine Oil Supplement (or an equivalent product) is acceptable for the conditions listed above.

ENGINE OIL FILTER

FILTER SPECIFICATION

All Jeep® engines are equipped with a high quality full-flow, throw-away type oil filter. The same type of replacement oil filter is recommended when a replacement is required.

ENGINE OIL CHANGE AND FILTER REPLACEMENT

WARNING: CARE SHOULD BE TAKEN WHEN CHANGING OIL. PROTECTIVE CLOTHING AND GLOVES SHOULD BE WORN. EXPOSED SKIN SHOULD BE WASHED WITH SOAP AND WATER TO REMOVE ANY ENGINE OIL. DO NOT USE GASOLINE, THINNER, OR SOLVENTS TO REMOVE ENGINE OIL FROM SKIN.

REQUIRED MAINTENANCE

With normal driving conditions, engine oil and filter must be changed after each 12 000-km (7,500-miles)/12-month interval. If the vehicle is involved with a severe driving condition, after each 4 800-km (3,000-miles)/3-month interval. A severe driving condition includes:

- frequent short trip driving less than 24 km (15 miles);
- frequent driving in a dusty environment;
- trailer towing;
- extensive engine idling;
- sustained high-speed operation;
- desert operation;
- frequent starting and stopping;
- cold-climate operation;
- off-road driving; or
- commercial service.

OIL CHANGE AND FILTER REPLACEMENT

(1) Drain the engine oil from the crankcase. Wait until after the engine has attained the normal operating temperature to ensure complete drainage of oil.

(2) Install the drain-hole plug with a replacement gasket.

The oil filter should be replaced during every engine oil change.

(3) Rotate the oil filter counterclockwise to remove it from the cylinder block oil filter boss (Figs. 6 and 7).

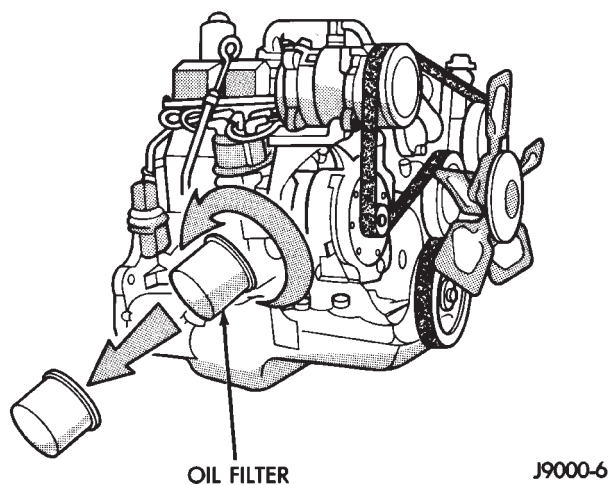


Fig. 6 Oil Filter Removal—2.5L Engine

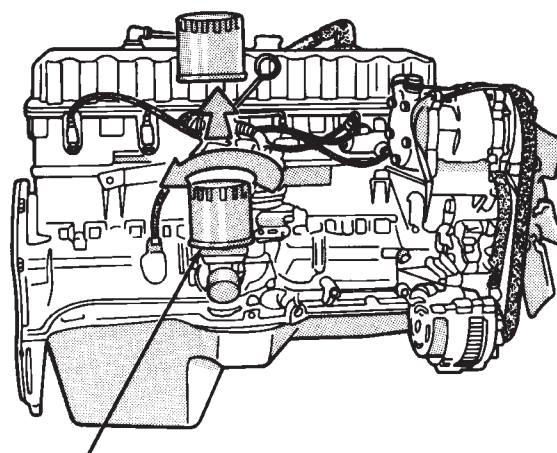


Fig. 7 Oil Filter—4.0L Engine

- (4) Clean the cylinder block oil filter boss.
- (5) Apply a light coat of engine oil to the rubber seal on the replacement oil filter.

CAUTION: Do not use oil filter with metric threads. The proper oil filter has SAE type 3/4 X 16 threads. The use of an oil filter with metric threads can result in engine oil leaks and engine failure.

(6) Install and **hand tighten** the oil filter 1/2 to 3/4 of-a-turn clockwise beyond the point where the seal first contacts the cylinder block.

(7) Add engine oil in fill hole located on top of engine cylinder head cover (Fig. 8).

(8) Observe the oil level on the dipstick. Add oil, if necessary, to increase the level to the FULL mark.

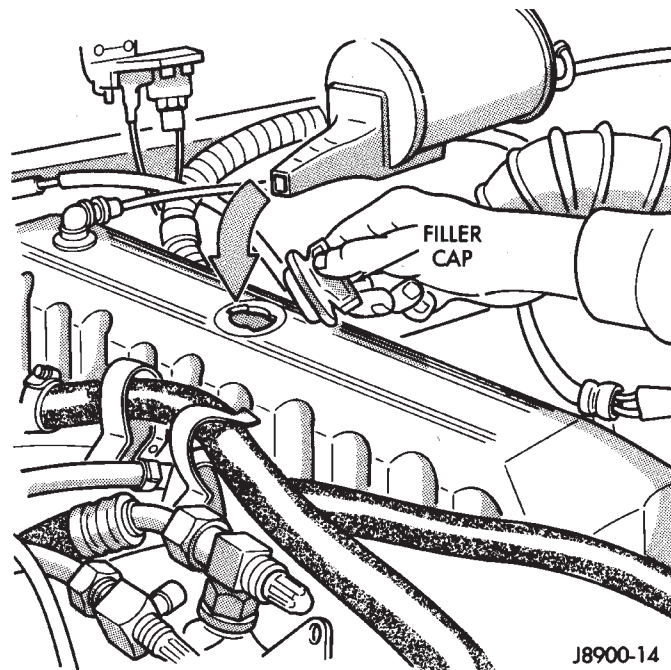


Fig. 8 Adding Engine Oil—Typical

CAUTION: Do not overfill the engine crankcase with oil. This will cause oil aeration and result in a decrease in the engine oil pressure.

(9) Start the engine and observe the oil pressure gauge or warning lamp. If the pressure does not increase or the warning lamp does not go out, stop the engine and determine the cause of the problem.

USED ENGINE OIL DISPOSAL

Care should be exercised when disposing used engine oil after it has been drained from a vehicle engine. Refer to the WARNING listed above.

COOLING SYSTEM

WARNING: USE EXTREME CAUTION WHEN REMOVING THE RADIATOR CAP IF THE ENGINE IS OPERATING. DO NOT PUT YOUR HANDS NEAR THE DRIVE BELT(S), PULLEYS OR FAN BLADE. DO NOT STAND IN A DIRECT LINE WITH THE FAN BLADE.

RECOMMENDED MAINTENANCE

The engine coolant level should be determined at least once a month and more often during periods of hot weather. Add coolant as necessary.

COOLANT LEVEL

With the engine at normal operating temperature, observe the coolant level in the **coolant recovery bottle**. The coolant level must be at least above the ADD mark and preferably at the FULL mark. Add coolant to the coolant recovery bottle **only**, if necessary.

REQUIRED MAINTENANCE

Check coolant level, and inspect condition of cooling system hoses and clamps after each 12 000-km (7,500-miles).

Initially, coolant must be drained and cooling system flushed and filled after the first 36 months of operation. Thereafter, after each 24-months interval of vehicle operation.

RECOMMENDED MAINTENANCE

The engine cooling system should be inspected for proper operation and for component failure at least every 12 months.

WARNING: IF THE ENGINE HAS BEEN RECENTLY OPERATED, USE EXTREME CARE WHEN REMOVING THE RADIATOR CAP TO AVOID SCALDING WITH HOT, PRESSURIZED COOLANT.

For additional information, refer to Section 7, Cooling System.

COOLANT FREEZE PROTECTION

Jeep® cooling systems contain a 50/50 mixture of anti-freeze and distilled water coolant. This is the recommended coolant mixture for most ambient temperatures. The factory-installed anti-freeze is formulated to prevent corrosion on all cooling system metal surfaces.

The degree of coolant freeze protection should be tested every 12 months. If the coolant is contaminated or **rusty** in appearance, cooling system should be drained and filled with a 50/50 mixture of fresh coolant. For additional information, refer to Group 7—Cooling System.

ENGINE AIR CLEANER FILTER ELEMENT

RECOMMENDED MAINTENANCE

Engine performance and fuel economy can be affected by a restricted air cleaner filter. The filter should be inspected on a regular basis for excessive air restriction.

If the filter element is saturated with oil, replace the filter element.

REQUIRED MAINTENANCE

Engine air cleaner filter must be replaced after each 48 000-km (30,000-miles).

If a vehicle is frequently operated in dusty areas, the air cleaner filter should be inspected often.

FILTER ELEMENT SERVICE/REPLACEMENT

(1) Remove the air cleaner cover from the body/housing (Fig. 9).

(2) Remove the air cleaner filter element from the body/housing.

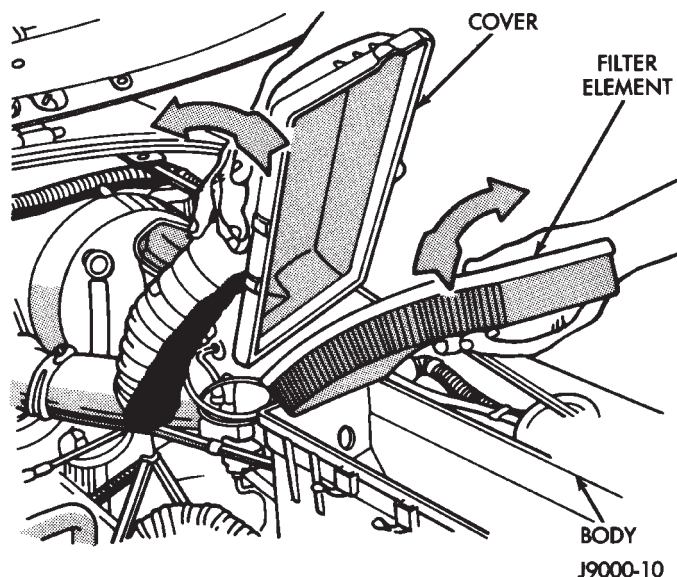


Fig. 9 Air Cleaner & Filter Element—2.5L and 4.0L Engines

CAUTION: Do not tap the filter element or immerse the filter in liquid to remove trapped particles.

(3) Clean filter element by gently blowing the trapped particles from the filter with compressed air. Direct air in the opposite direction of normal intake air flow. Keep air nozzle at least two inches away from the filter to avoid damage to filter.

(4) If the filter has become partially saturated with oil, replace the filter. Test the crankcase ventilating (CCV) system for proper operation.

(5) Wash the air cleaner cover and body/housing (Figs. 10) with cleaning solvent and wipe dry.

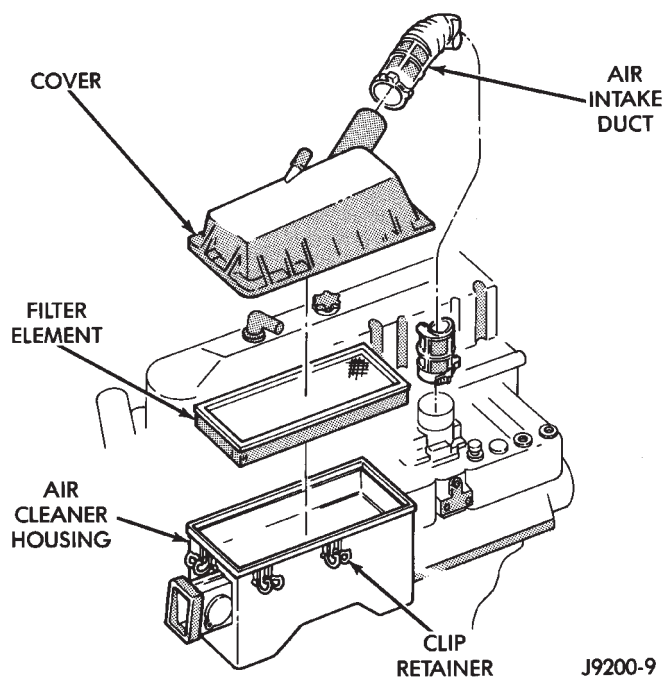


Fig. 10 Air Cleaner Body/Housing & Cover

(6) Install the air cleaner filter element and attach the cover to the body/housing.

CRANKCASE VENTILATION SYSTEM

All Jeep® 2.5L and 4.0L engines are equipped with a crankcase ventilation (CCV) system. Refer to Group 25—Emissions, for additional information.

FUEL USAGE STATEMENT—GAS ENGINES

Jeep® vehicles are designed to meet all emission regulations and provide excellent fuel economy using high quality unleaded gasoline. Only use unleaded gasolines having a minimum posted octane of 87.

If a Jeep® vehicle develops occasional light spark knock (ping) at low engine speeds, this is not harmful. However, **continued heavy knock at high speeds can cause damage and should be checked immediately.** Engine damage as a result of heavy knock operation may not be covered by the new vehicle warranty.

In addition to using unleaded gasoline with the proper octane rating, **those that contain detergents, corrosion and stability additives are recommended.** Using gasolines that have these additives will help improve fuel economy, reduce emissions and maintain vehicle performance. Generally, premium unleaded gasolines contain more additive than regular unleaded gasolines.

Poor quality gasoline can cause problems such as hard starting, stalling and stumble. If these problems occur, use another brand of gasoline before considering servicing the vehicle.

GASOLINE/OXYGENATE BLENDS

Some fuel suppliers blend unleaded gasoline with materials that contain oxygen such as alcohol, MTBE and ETBE. The type and amount of oxygenate used in the blend is important. The following are generally used in gasoline blends:

ETHANOL

Ethanol (Ethyl or Grain Alcohol) properly blended, is used as a mixture of 10 percent ethanol and 90 percent gasoline. **Gasoline with ethanol may be used in your vehicle.**

METHANOL

CAUTION: Do not use gasolines containing methanol. Use of methanol/gasoline blends may result in starting and driveability problems. In addition, damage may be done to critical fuel system components.

Methanol (Methyl or Wood Alcohol) is used in a variety of concentrations blended with unleaded gasoline. You may encounter fuels containing 3 percent or more methanol along with other alcohols called co-solvents.

Problems that are the result of using methanol/gasoline blends are not the responsibility of Chrysler Corporation. They may not be covered by the vehicle warranty.

MTBE/ETBE

Gasoline and MTBE (Methyl Tertiary Butyl Ether) blends are a mixture of unleaded gasoline and up to 15 percent MTBE. Gasoline and ETBE (Ethyl Tertiary Butyl Ether) are blends of gasoline and up to 17 percent ETBE. Gasoline blended with MTBE or ETBE may be used.

CLEAN AIR GASOLINE

Many gasolines are now being blended that contribute to cleaner air, especially in those areas of the country where air pollution levels are high. These new blends provide a cleaner burning fuel and some are referred to as **Reformulated Gasoline.**

In areas of the country where carbon monoxide levels are high, gasolines are being treated with oxygenated materials such as MTBE, ETBE and ethanol.

Chrysler Corporation supports these efforts toward cleaner air and recommends the use of these gasolines as they become available.

IGNITION CABLES, DISTRIBUTOR CAP AND ROTOR

REQUIRED IGNITION SYSTEM MAINTENANCE

The ignition cables, distributor cap and rotor must be replaced after each 96 000-km (60,000-miles). Refer to Group 8D—Ignition Systems for additional information.

IGNITION TIMING

The ignition timing for 2.5L and 4.0L engines is not adjustable. Refer to the specifications listed on the engine Emission Control Information Label. Refer to Group 25—Emission Control Systems for additional information.

SPARK PLUGS

REQUIRED MAINTENANCE

The spark plugs must be replaced after each 48 000-km (30,000-miles). Refer to the Spark Plugs chart below and to Group 8D—Ignition Systems for additional information.

SPARK PLUGS

ENGINE	PLUG	GAP	TORQUE
2.5L	RC-12LYC	0.88 mm 0.035 in	37 N•m 27 ft. lbs.
4.0L	RC-12LYC	0.88 mm 0.035 in	37 N•m 27 ft. lbs.

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BATTERY

RECOMMENDED MAINTENANCE

The battery electrolyte level should be checked and the cable clamps should be inspected for corrosion. This should be done when the oil is changed and the oil filter is replaced.

The battery cables should be inspected for abnormal clamp and battery terminal post corrosion. Service the terminals and cable clamps as necessary.

In addition, the general condition of the battery should be determined before the start of cold and hot weather seasons. If the battery condition is marginal or worse, it should be replaced.

Care should be taken when disposing a battery after removal from a vehicle. Lead-acid batteries are highly poisonous and, when indiscriminately disposed, could create a problem for the environment. Contact the applicable local city or county government agency to determine where automobile (lead-acid) batteries can be properly disposed in the local area.

INSPECTION/SERVICE

WARNING: WEAR SAFETY GLASSES, RUBBER GLOVES AND PROTECTIVE CLOTHING WHEN HANDLING/SERVICING A BATTERY. THE BATTERY ELECTROLYTE CONTAINS SULFURIC ACID AND WILL CAUSE HARM IF IT CONTACTS SKIN, EYES OR CLOTHING. IT WILL ALSO DAMAGE PAINTED (AS WELL AS UN-PAINTED) SURFACES OF A VEHICLE. IF SULFURIC ACID CONTACTS ANY OF THESE, FLUSH IMMEDIATELY WITH LARGE AMOUNTS OF WATER. IF SULFURIC ACID CONTACTS SKIN OR EYES, GET IMMEDIATE MEDICAL ATTENTION. DO NOT SMOKE IN THE VICINITY OF A BATTERY. KEEP OPEN FLAMES AND SPARKS AWAY FROM BATTERY FILLER CAPS BECAUSE EXPLOSIVE GAS IS ALWAYS PRESENT.

(1) Disconnect the battery negative cable and then the positive cable.

(2) Clean the battery cable clamps and terminal posts with a wire brush and a battery terminal cleaner.

(3) Pry the battery cell filler caps upward to remove them and inspect each filler well (low-maintenance batteries only, not applicable to maintenance-free batteries). It could possibly be necessary to loosen the battery holddown clamp to remove the caps. Maintain the electrolyte level above the battery plates and at the bottom of the filler well ring. Add distilled water or low-mineral content drinking water, if necessary. In freezing weather (below 0°C/32°F), add the water just before driving to ensure that it mixes thoroughly with the electrolyte. This will prevent it from freezing.

(4) Remove the battery holddown strap and clean the battery case/battery tray. Clean with bicarbonate of soda (baking soda) and water. Rinse and dry the battery case/tray thoroughly after cleaning.

(5) Position the battery in the tray and install the holddown strap. **Do not over-tighten the nuts.**

(6) Connect the battery positive cable and then the negative cable to the battery.

(7) Apply a small amount of chassis lubricant (or an equivalent protective coating) to the cable terminals to minimize corrosion.

RUBBER AND PLASTIC DUCTS/HOSES/TUBING

RECOMMENDED MAINTENANCE

Rubber and plastic ducts/hoses/tubing should be inspected at the same time the engine oil is changed and the oil filter is replaced.

The conditions associated with vehicle operation determines the usable life of the rubber and plastic ducts/hoses/tubing. These conditions include:

- the extent and quality of vehicle maintenance,
- the geographic area of vehicle operation, and
- the length of exposure time to excess heat and chemical contaminants.

DUCT/HOSE/TUBING INSPECTION—EXCEPT EMISSION CONTROL HOSES/TUBING

Refer to Group 25—Emission Control Systems. Engine performance could be affected by air leaks into various hoses.

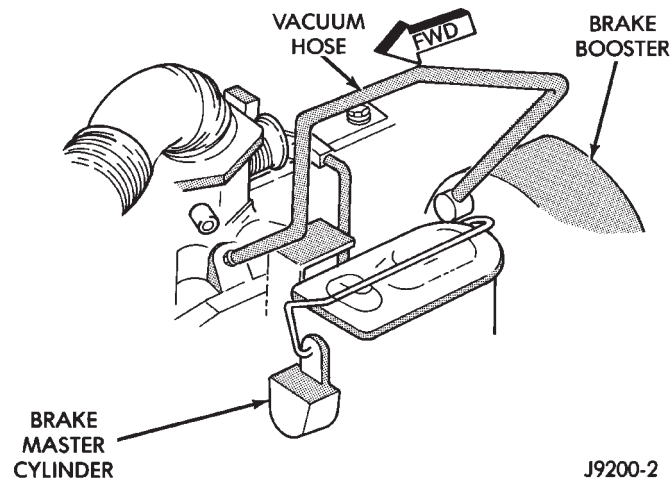


Fig. 11 Brake Booster Vacuum Hose (XJ)—Typical

Rubber/plastic ducts, hoses and tubing should be replaced immediately if there is any evidence of deterioration.

(1) Inspect all hose fittings for looseness and corrosion. Inspect rubber ducts (Fig. 12) and hoses for brittleness and cracks. Examine the hose ends (those that are slipped over nipple connectors) for splits.

(2) Inspect surface of hoses and tubing (Fig. 13) for heat and mechanical damage. **The hose and tubing that is located near an exhaust manifold should be given special attention.**

(3) Inspect the rubber hose routing to ensure that the hoses do not contact any heat source, moving component, etc., that could potentially cause heat or mechanical damage (Figs. 14, 15, and 16).

(4) Inspect all the hose connections to ensure that they are secure and that there is no fluid leakage. In

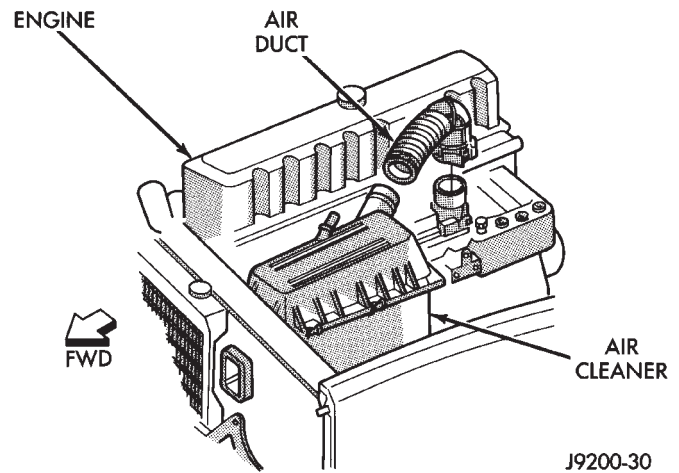


Fig. 12 Intake Air Duct (XJ)—Typical

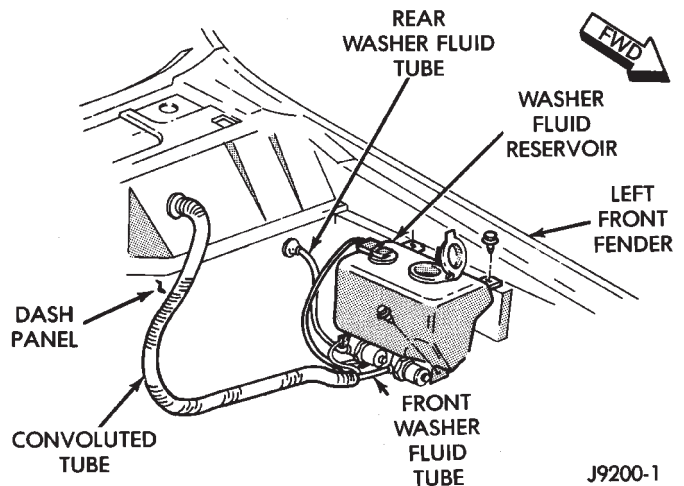


Fig. 13 Washer Fluid Tubing—Typical

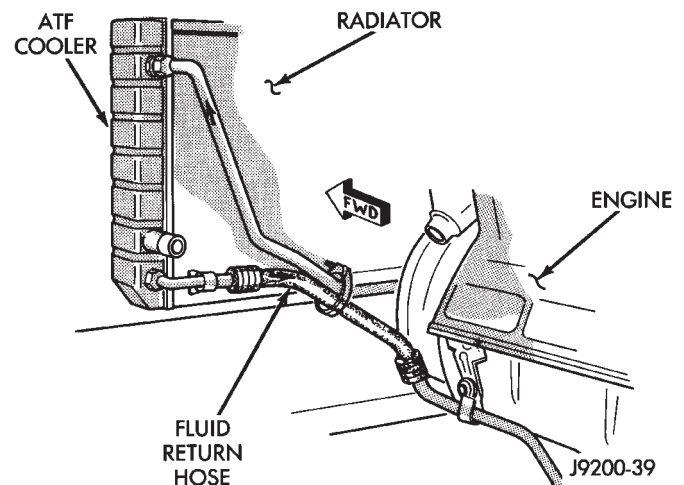


Fig. 14 ATF Cooler Hoses —XJ Vehicles

many instances, liquid lubricants are used to aid in the connection of hoses to couplings.

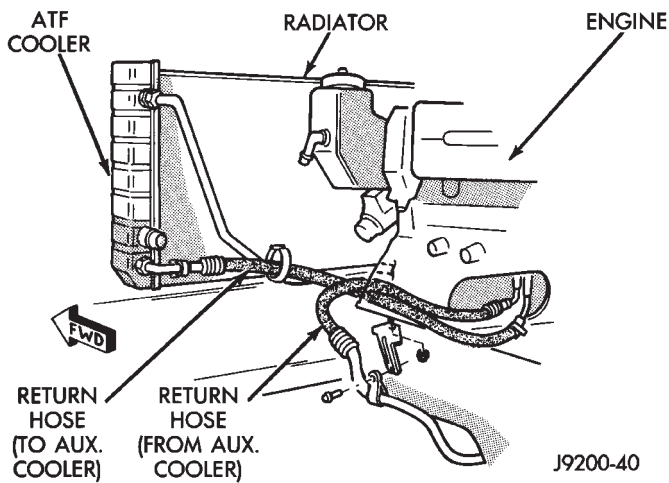


Fig. 15 ATF Cooler Hoses —XJ Vehicles

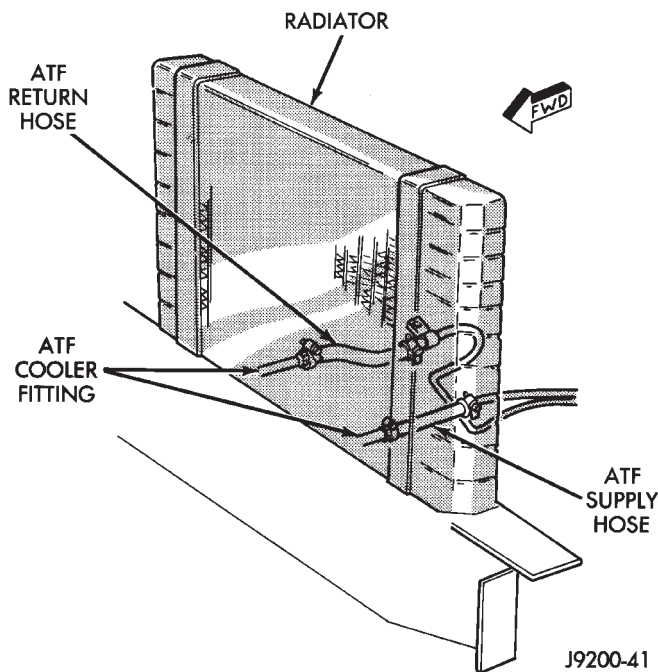


Fig. 16 ATF Cooler Hoses (4.0L)—YJ Vehicles

ENGINE SUPPORTS

RECOMMENDED MAINTENANCE

The general condition of the engine supports should be inspected at the same time as the engine oil is changed and the oil filter is replaced.

INSPECTION

- (1) Test the hardware that attaches the engine cylinder block to the engine support brackets (Figs. 17 and 18) for the specified tightening torque.
- (2) Inspect the rubber in the engine support cushions for softening and swelling. Slight surface deterioration and wear at the ends will not affect the functioning of an engine support.

ACCESSORY DRIVE BELT

RECOMMENDED MAINTENANCE

The accessory drive belt should be inspected for cracks, fraying, and excessive wear. If necessary, refer to Group 7—Cooling Systems for replacement procedures and adjustment specifications.

REQUIRED MAINTENANCE

The drive belt must be adjusted after each 48 000-km (30,000-miles) interval of vehicle operation has elapsed. The accessory drive belt must be replaced after each 96 000-km (60,000-miles). If necessary, refer to Group 7—Cooling Systems.

EXHAUST SYSTEM

REQUIRED MAINTENANCE

The general condition of the exhaust system must be inspected after each 12 000-km (7,500-miles).

An exhaust system must be properly aligned to prevent stress, leakage, and vehicle body contact.

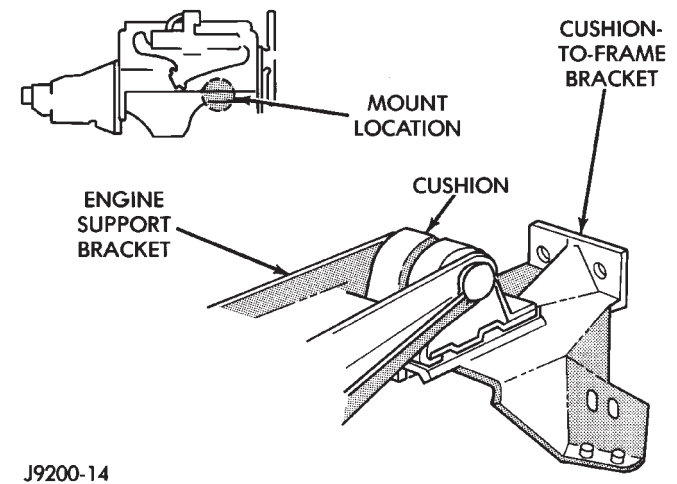


Fig. 17 Front Engine Support—Typical

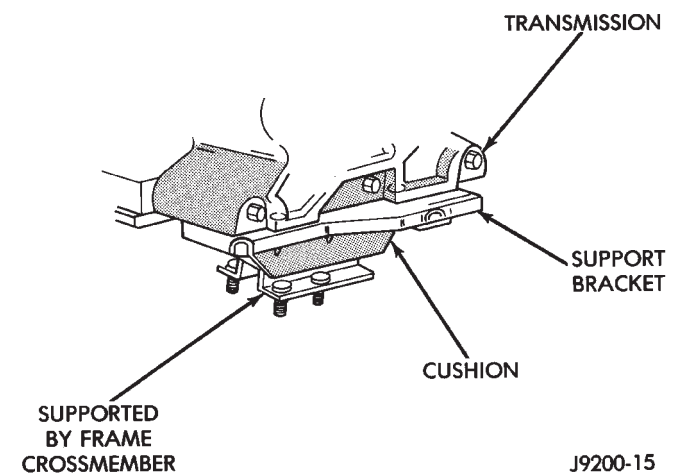


Fig. 18 Rear Engine Support—Typical

INSPECTION

When inspecting an exhaust system, inspect for cracked or loose joints, stripped screw/bolt threads, corrosion damage, and worn or broken hangers. Replace all components that are corroded or damaged. Do not attempt repair. Also, inspect for the following obvious conditions and correct as necessary:

- exhaust system leaks, damage, misalignment;
- contact with body panels metal or the frame; and
- catalytic converter bulging or excessive heat damage.

CAUTION: A catalytic converter will become contaminated if leaded gasoline is burned in the engine. If this occurs, the complete converter must be replaced.

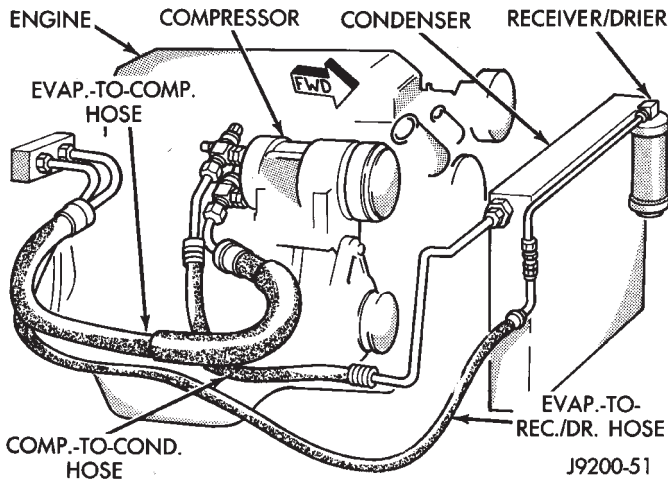


Fig. 19 A/C System (XJ)—2.5L Engine

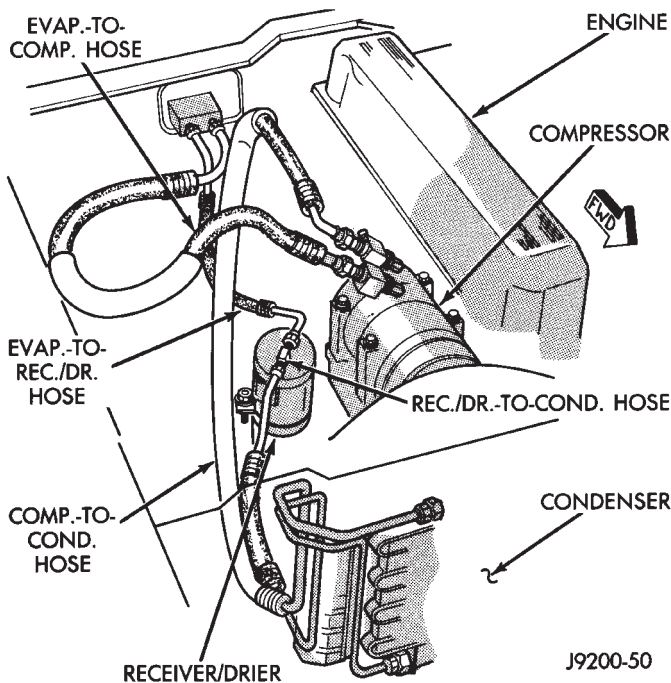


Fig. 20 A/C System (XJ)—4.0L Engine

AIR-CONDITIONER COMPRESSOR/HOSES/FITTINGS

RECOMMENDED MAINTENANCE

The general condition of the A/C compressor, hoses and fittings should be inspected at the same time as the engine oil is changed (Figs. 19, 20 and 21).

LUBRICANT AND REFRIGERANT

In addition to inspection, the lubricant level in the compressor (Fig. 22) should be determined if there are indications that oil was lost.

Loss of lubricating oil usually accompanies a loss of refrigerant. The presence of bubbles/white foam within the receiver/drier sight glass indicates that some loss of refrigerant has occurred.

For additional information involving the A/C system, refer to Group 24—Heater And Air Conditioning.

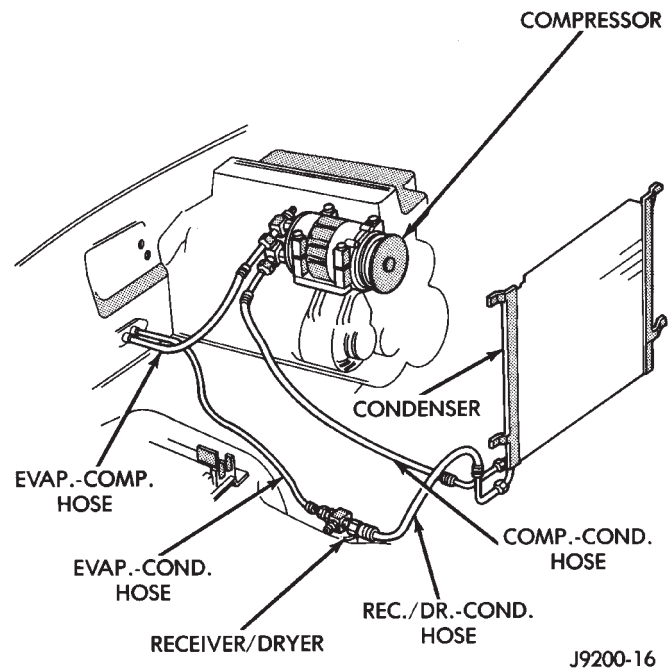


Fig. 21 A/C System (YJ)—4.0L Engine

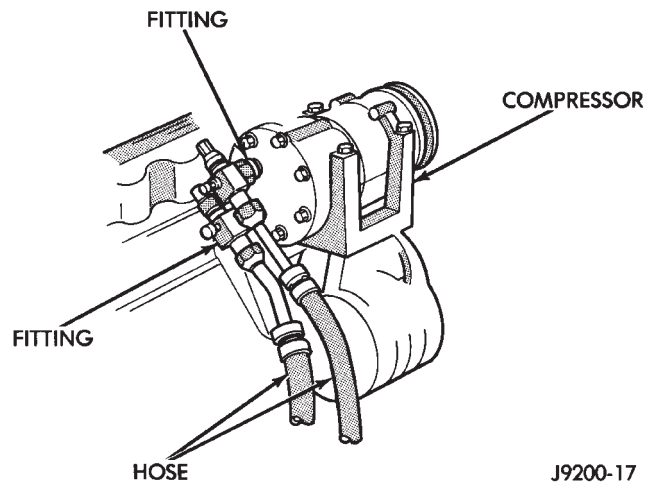


Fig. 22 A/C Compressor—Typical

DRIVETRAIN

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HYDRAULIC CLUTCH

RECOMMENDED MAINTENANCE

Check fluid level in the hydraulic clutch master cylinder reservoir (Fig. 1) at the same time engine oil is changed and oil filter is replaced. Add fluid as necessary.

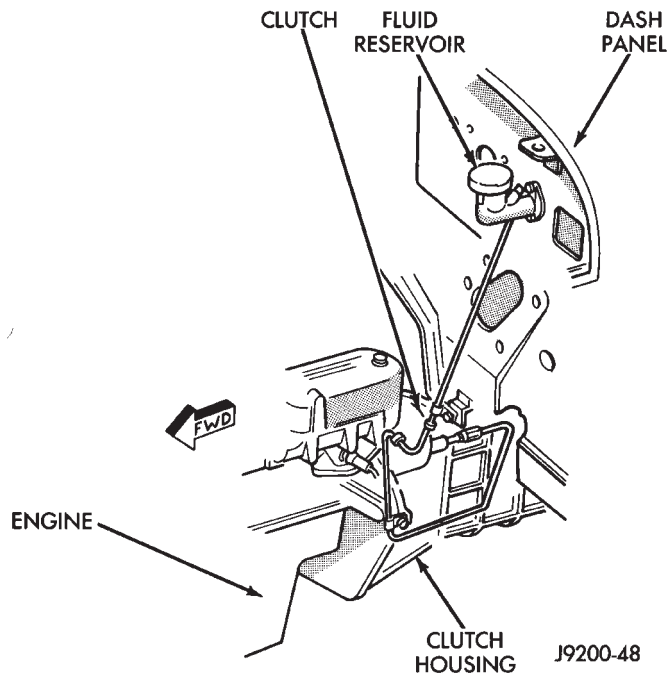


Fig. 1 Hydraulic Clutch (YJ)—Typical

FLUID SPECIFICATION

The only fluid recommended for use in a hydraulic clutch system is MOPAR Brake And Hydraulic Clutch Fluid., or an equivalent fluid.

CAUTION: Never use reclaimed brake fluid or fluid from an unsealed container. In addition, do not use fluid from a container that has been opened and allowed to stand for an extended length of time. Moisture in the air can be absorbed by the fluid, which causes dilution with loss of effectiveness.

FLUID LEVEL

Remove the master cylinder fluid reservoir cap (Fig. 2). The fluid level is determined by its height in

relation to the level indicator ring (Fig. 3) located inside the reservoir. If necessary, add fluid until the height is level with the indicator ring.

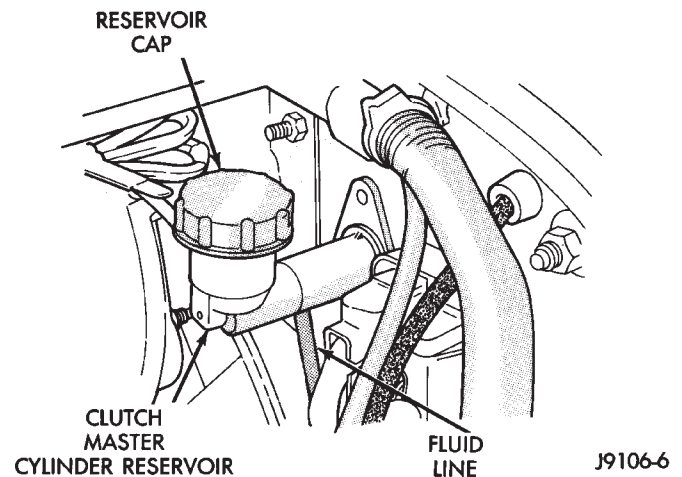


Fig. 2 Hydraulic Clutch Master Cylinder Fluid Reservoir

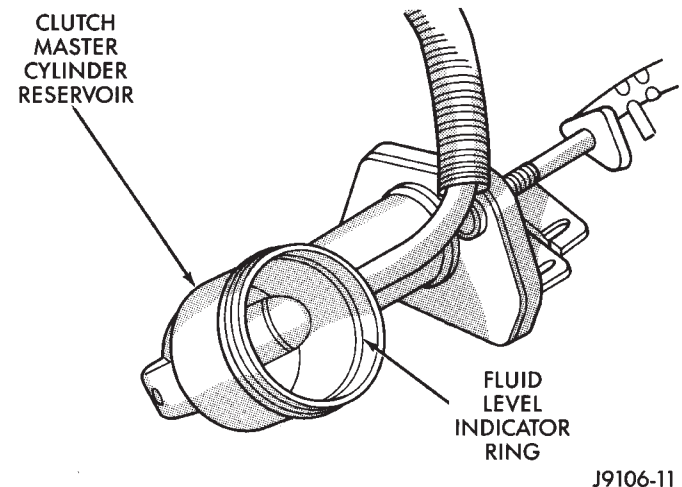


Fig. 3 Hydraulic Clutch Fluid Level

MANUAL TRANSMISSION

RECOMMENDED MAINTENANCE

The lube oil level in manual transmissions should be determined at the same time as the engine oil is changed and the oil filter is replaced. Add lube oil as necessary.

Under normal driving conditions, manual transmission lube oil should be changed after each 60 000-km (37,500 miles). With severe driving conditions, after each 29 000-km (18,000 miles).

LUBRICANT SPECIFICATION

When it becomes necessary to add to or change the lube oil in a Jeep® manual transmission, use SAE 75W-90, API Quality Grade GL-5 gear lubricant.

LUBRICANT LEVEL

The fill-hole plug for all manual transmissions is located on the right side of the case (Fig. 4). Determine the lubricant level according to the following procedure.

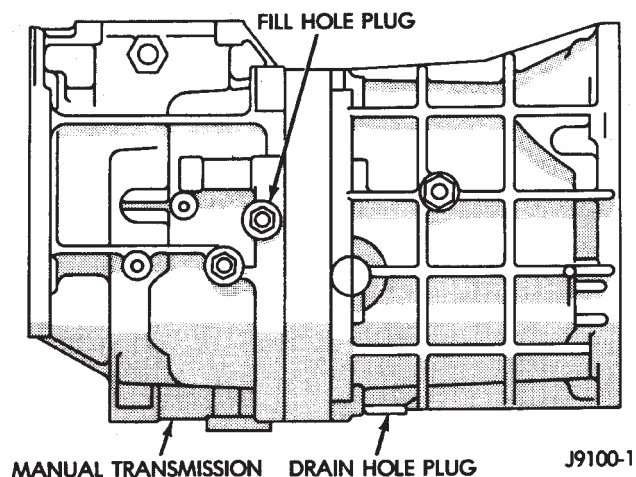


Fig. 4 Manual Transmission Fill- & Drain-Hole Plugs—Typical

(1) Remove the fill-hole plug (Fig. 4) from the transmission. The lube oil should be level with the bottom edge of the fill hole. The level can be slightly below the bottom edge of the fill hole if the lube oil is cold.

If the transmission is warm, lube oil could drip out of the fill hole. This is acceptable but the lube oil should not gush out of the fill hole.

(2) If not acceptable, raise the lube oil level to the bottom edge of the transmission fill hole. Use SAE 75W-90, API Quality Grade GL-5 gear lubricant.

Add lube oil in small amounts to raise the level.

(3) Install the fill-hole plug in the transmission. Tighten the plug with 37 N•m (27 ft. lbs.) torque.

LUBE OIL CHANGE

When it becomes necessary to change manual transmission lube oil, use the following procedure.

- (1) Raise and support the vehicle.
- (2) Remove the fill-hole plug from the transmission.
- (3) Place a container to collect the lube oil under the transmission drain-hole plug.

(4) Remove the drain-hole plug and drain the lube oil from the transmission into the container.

Care should be exercised when disposing used lube oil after it has been drained from a transmission.

(5) Install the drain-hole plug in the transmission. Tighten the plug with 37 N•m (27 ft. lbs.) torque.

(6) Fill the transmission until the lube oil begins to drip out of the fill hole with SAE 75W-90, API Quality Grade GL-5 gear lubricant.

(7) Install the fill-hole plug in the transmission. Tighten the plug with 37 N•m (27 ft. lbs.) torque.

(8) Remove the support and lower the vehicle.

AUTOMATIC TRANSMISSION

RECOMMENDED MAINTENANCE

Check fluid level in automatic transmissions (Fig. 5) the same time the engine oil is changed and the oil filter is replaced. Add ATF as necessary.

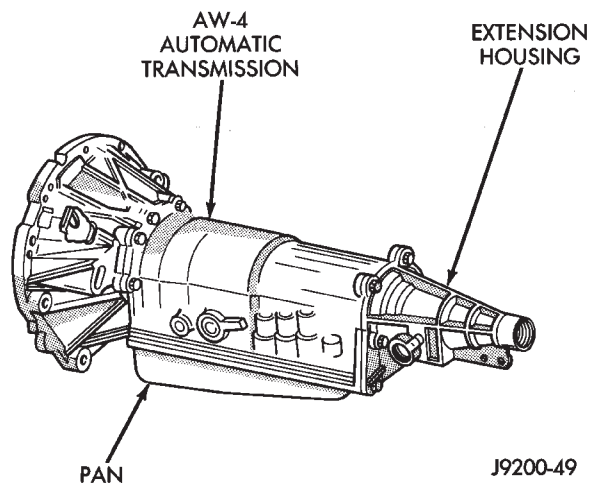


Fig. 5 AW-4 Automatic Transmission (XJ)

Under normal driving conditions, the ATF should be changed and the filter replaced after each 48 000-km (30,000-miles). With severe driving conditions, after each 29 000-km (12,000-miles).

ATF SPECIFICATIONS

When it becomes necessary to add fluid (ATF) to a Jeep® automatic transmission (or when the ATF is replaced), use:

- Mercon™ ATF **only** for AW-4 automatic transmissions (XJ vehicles), and
- MOPAR ATF PLUS type 7176 (or an equivalent Mercon™/Dexron II™ ATF) for 998 automatic transmissions (YJ vehicles).

SPECIAL ADDITIVES

The addition of any special-type fluid to a Jeep® automatic transmission is not recommended. The only exception is the addition of black-light detection

dye to aid in detecting the source of ATF leaks. The use of transmission sealing additives should also be avoided.

Black-light detection dye is factory-installed in automatic transmissions and, unless the ATF has been drained and re-placed, it is not necessary to add dye.

ATF LEVEL

Determine the ATF level according to the following procedure.

WARNING: USE EXTREME CAUTION WHEN THE ENGINE IS OPERATING. DO NOT PUT YOUR HANDS NEAR THE DRIVE BELT, PULLEYS OR FAN BLADE. DO NOT STAND IN A DIRECT LINE WITH THE FAN BLADE.

(1) Operate the engine and allow the automatic transmission sufficient time to warm to the normal operating temperature (77°C/170°F).

When at normal operating temperature, ATF will be uncomfortable to fingertips when the dipstick is touched. Normally, 25 km (15 miles) is a sufficient driving distance for a transmission to warm to normal operating temperature (77°C/170°F).

- (2) Place the vehicle on a level surface.
- (3) Operate the engine at idle speed.
- (4) Engage the parking brake.
- (5) Place a block in front of and at the rear of one wheel/tire to prevent vehicle movement.

(6) Depress the brake pedal and move the transmission selector lever through all the positions and then place the selector lever in NEUTRAL position.

(7) Remove the dipstick (Fig. 6) from the transmission filler tube and wipe it clean.

(8) Insert the dipstick into the transmission filler tube and seat the cap on top of the tube.

(9) Remove the dipstick and observe the ATF level on both sides of the dipstick. The ATF level is acceptable when it is between the ADD and FULL marks.

(10) While determining the ATF level in a transmission, also note the general condition of the fluid. Examine the fluid closely. If doubtful about its condition, drain a sample into a small container for evaluation.

(11) If the ATF level is either at or below the ADD mark, add sufficient ATF to raise the level to the FULL mark on the dipstick.

CAUTION: Do not over-fill an automatic transmission. Over-filling can cause the ATF to foam, which will result in over-heating, fluid oxidation and varnish formation.

(12) When it is necessary to add ATF, insert a long-necked funnel into the transmission filler tube.

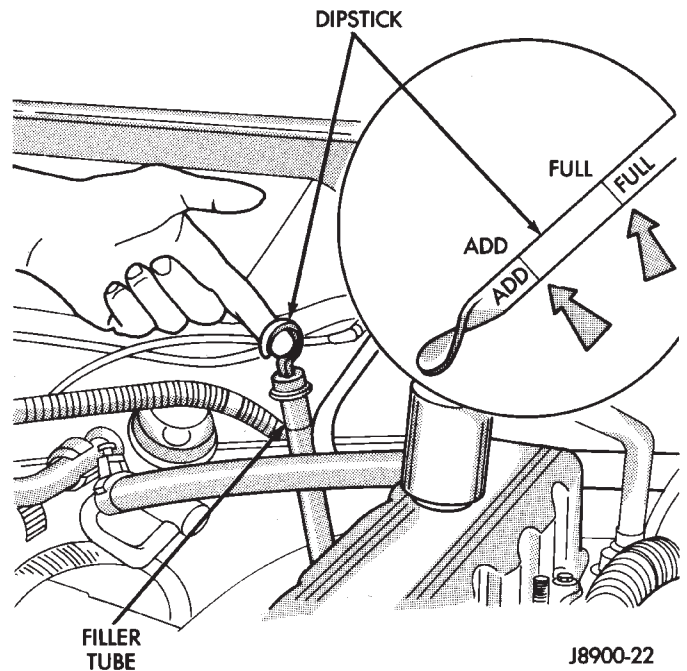
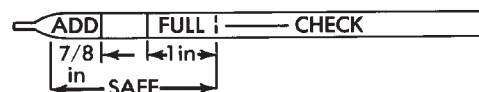


Fig. 6 Dipstick & ATF Level—Typical

DETERMINE THE ATF LEVEL WITH THE VEHICLE LEVEL, THE TRANSMISSION IN NEUTRAL AND THE FLUID TEMPERATURE ABOVE 22°C



THE VEHICLE SHOULD NOT BE DRIVEN IF THE ATF LEVEL IS LOWER THAN 7/8 INCH BELOW THE ADD MARK OR MORE THAN 1 INCH ABOVE THE FULL MARK. J9200-10

Fig. 7 Safe ATF Level Above 22°C/72°F

It requires only 0.5 liter (1.0 pint) of ATF to raise the level from the ADD mark to the FULL mark.

(13) Inspect for ATF leaks and correct as necessary.

(14) Remove the wheel/tire blocks.

ATF AND FILTER CHANGE

Automatic transmission fluid (ATF) does not deteriorate or wear out, but it does become contaminated. These contaminants will eventually restrict passages and orifices. The result is hard or rough shifting, or complete transmission failure. Also, the varnish eventually causes rubber seals to harden and become brittle.

When it is necessary to change the ATF and replace the filter in a Jeep® automatic transmission, use the following procedures.

DRAINING ATF/FILTER REMOVAL

Drain the automatic transmission fluid (ATF) immediately after stopping the engine (before the ATF cools).

- (1) Raise and support the vehicle.
- (2) Loosen the transmission pan bolts and drain the original ATF into an appropriate container. Remove the pan bolts, the pan and the gasket.

Care should be exercised when disposing used ATF after it has been drained from a vehicle transmission.

- (3) Remove the screws and the ATF filter (Fig. 8). Discard the filter.

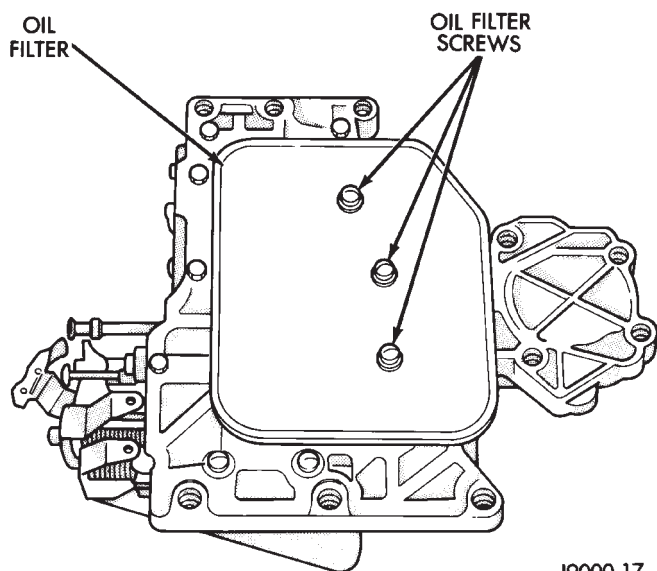


Fig. 8 ATF Filter—Typical

FILTER INSTALLATION/ATF RE-FILL

- (1) Install a replacement ATF filter. Tighten the screws with 4 N•m (35 in. lbs.) torque.
- (2) Clean the pan thoroughly. Install a replacement gasket on the pan. Install the pan with the attaching bolts:
 - model AW-4 transmission — tighten the pan bolts with 7 N•m (60 in. lbs.) torque; and
 - model 998 transmission — tighten the pan bolts with 17 N•m (150 in. lbs.) torque.
- (3) Remove the support and lower the vehicle.
- (4) Pour approximately 4.7 liters (5 quarts) of ATF into the filler tube. Use Mercon™ ATF for AW-4 automatic transmissions. Use MOPAR ATF PLUS type 7176 or equivalent, for 998 automatic transmissions.
- (5) Place a block in front of and at the rear of one wheel/tire to prevent vehicle movement.
- (6) Start the engine and allow it to idle a few minutes.
- (7) Apply the brake pedal and engage the parking brake. Move the transmission selector lever through all positions, then place the selector lever in NEUTRAL position.

- (8) With the transmission at normal operating temperature, observe the ATF level on the dipstick. Add ATF (if necessary) to raise the level to the FULL mark on the dipstick. **Only 0.5 liter (1.0 pint) will raise the level from the ADD mark to the FULL mark when the ATF is at normal operating temperature.**

- (9) Inspect for fluid leaks and correct as necessary.
- (10) Remove the wheel/tire blocks.

TRANSFER CASE

RECOMMENDED MAINTENANCE

The fluid (ATF) level in transfer cases should be determined at the same time as the engine oil is changed and the oil filter is replaced. Add ATF as necessary.

In addition, transfer case ATF should be changed after each 48 000-km (30,000-miles) interval of vehicle operation has elapsed.

FLUID SPECIFICATIONS

If it is necessary to add fluid to a transfer case (or when the fluid is changed), use MOPAR ATF PLUS type 7176 or an equivalent Mercon™/Dexron II™ ATF.

FLUID LEVEL

The transfer case fill-hole plug is located at the rear of the housing (Fig. 9).

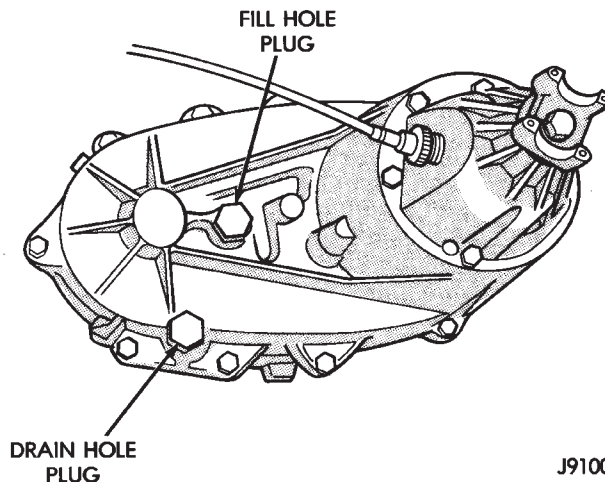


Fig. 9 Transfer Case—Typical

Determine the transfer case fluid (ATF) level according to the following procedure.

- (1) Raise and support the vehicle.
- (2) Remove the fill-hole plug from the transfer case. The ATF level should be at the bottom edge of the fill hole. The level can be slightly below the bottom edge of the fill hole if the fluid is cold.

If the transfer case ATF is warm, it is acceptable for the fluid to drip out of the fill hole. If the fluid gushes out of the fill hole, the level is too high.

(3) If the level is low, raise it to the bottom edge of the fill hole with MOPAR ATF PLUS type 7176 or an equivalent Mercon™/Dexron II™ ATF.

(4) Install the fill-hole plug. Tighten the plug with 47 N•m (35 ft. lbs.) torque.

(5) Remove the support and lower the vehicle.

FLUID CHANGE

When it becomes necessary to change the ATF in a Jeep® transfer case, use the following procedure.

(1) Raise and support the vehicle.

(2) Remove the fill-hole plug from the transfer case.

(3) Place an appropriate container under the transfer case drain-hole plug.

(4) Remove the drain-hole plug and drain the ATF from the transfer case into the container.

Care should be exercised when disposing used ATF after it has been drained from a transfer case.

CAUTION: Do not over-tighten the drain and fill-hole plugs. Over-tightening can strip the hole threads and/or crack the aluminum housing.

(5) Install the drain-hole plug in the transfer case. Tighten the plug with 47 N•m (35 ft. lbs.) torque.

(6) Fill the transfer case to the bottom edge of the fill hole with MOPAR ATF PLUS type 7176 (or an equivalent Mercon™/Dexron II™ ATF).

(7) Install the fill-hole plug in the transfer case. Tighten the plug with 47 N•m (35 ft. lbs.) torque.

(8) Remove the support and lower the vehicle.

FRONT AND REAR AXLES

RECOMMENDED MAINTENANCE

The lubricant level in axle differential housings should be determined at the same time as the engine oil is changed and the oil filter is replaced. Add lubricant as necessary.

In addition, with normal driving conditions, the axle lubricant should be changed after each 48 000-km (30,000-miles). With severe driving conditions, after each 29 000-km (12,000-miles).

LUBRICANT SPECIFICATIONS

For normal vehicle operation, use SAE 75W-90, API Quality Grade GL-5 gear lubricant in all Jeep® front (4WD only) and rear axles. Vehicles equipped with a Trac-Loc rear axle also require a friction modifier additive with the gear lubricant.

When involved in trailer towing applications use SAE 80W-140, API Quality Grade GL-5 gear

lubricant in the rear axle. XJ Vehicles equipped with a class III trailer hitch require SAE 75W-140 synthetic gear lubricant in the rear axle.

LUBRICANT LEVEL

Determine the axle differential housing lubricant level according to the following procedure.

(1) Raise and support the vehicle.

(2) Remove the fill-hole plug (Figs. 10 and 11) from the axle differential housing cover. The gear lubricant should be 13 mm (1/2 inch) below the bottom edge of the fill hole.

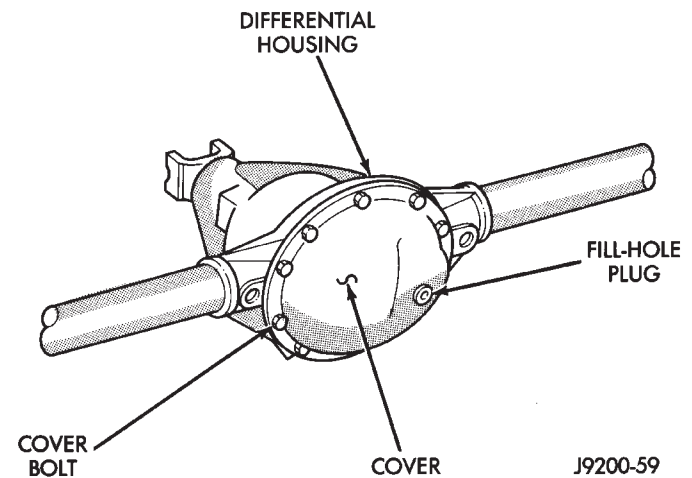


Fig. 10 Rear Axle—Typical

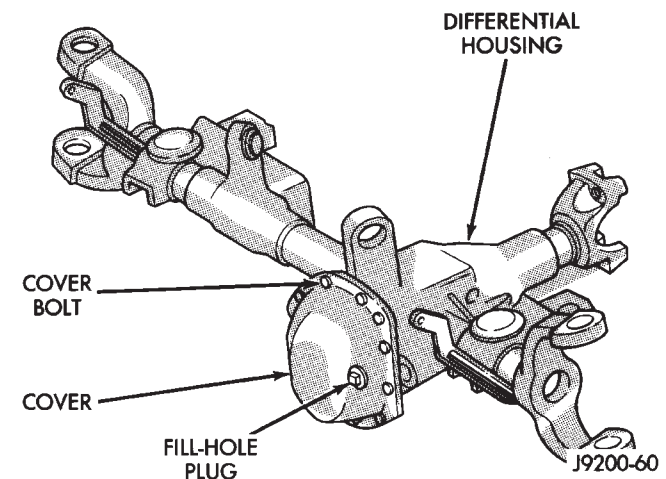


Fig. 11 Front Axle (4WD)—Typical

(3) If not acceptable, raise the lubricant level to 13 mm (1/2 inch) below the bottom edge of the fill hole.

Add lubricant in small amounts to raise the level.

(4) Install the fill-hole plug in the differential housing cover. Tighten the plug with 34 N•m (25 ft. lbs.) torque.

(5) Remove the support and lower the vehicle.

LUBRICANT CHANGE

When it becomes necessary to change the axle lubricant in a Jeep® front or rear axle, use the following procedure.

- (1) Raise and support the vehicle.
- (2) Place a container under the axle differential housing.
- (3) Remove the axle differential housing cover bolts. Remove the housing cover.
- (4) Allow the axle gear lubricant to completely drain into the container.

CAUTION: Do not flush a rear axle Trac-Loc differential. Trac-Loc differentials may be cleaned only by disassembling the unit and wiping the components with clean, lint-free cloth.

(5) Flush the inside of the differential housing with a flushing oil. **Do not use water, steam, kerosene or gasoline for flushing.**

(6) Remove any residual RTV sealant/gasket material from the differential housing and cover. Thoroughly clean the contact surfaces with mineral spirits and dry the surfaces completely.

(7) Apply a bead of MOPAR RTV Sealant, or an equivalent sealant, around the bolt circle on the housing and on the cover (Fig. 12).

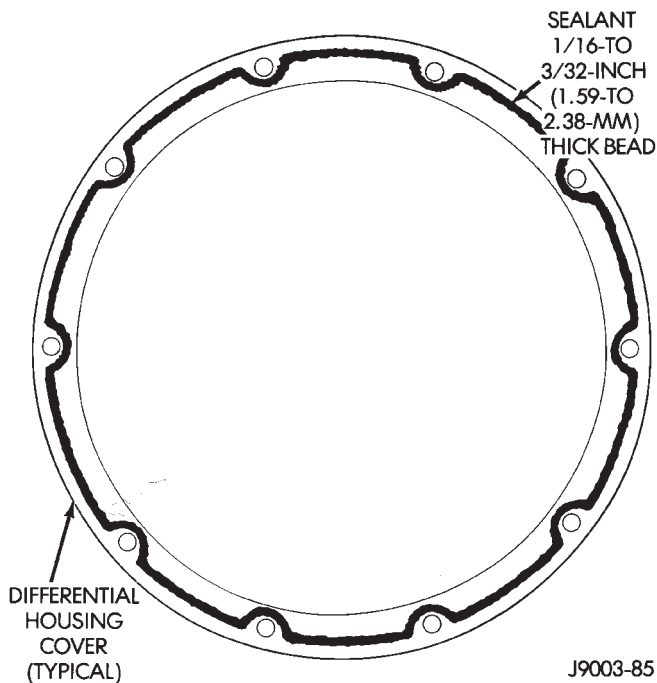


Fig. 12 RTV Sealant Application—Typical

If differential housing cover is not installed within 20 minutes after applying sealant, the sealant must be removed and another bead applied.

(8) Install the cover on the differential housing with the attaching bolts (Fig. 13). Tighten the cover bolts with 47 N•m (35 ft. lbs.) torque.

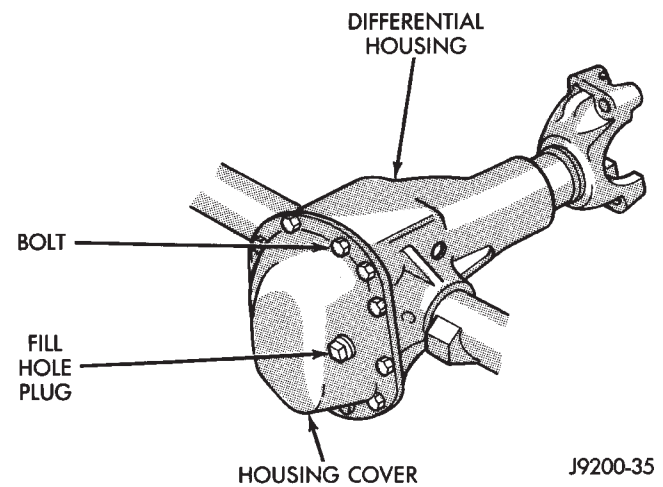


Fig. 13 Differential Housing Cover Installed

(9) Remove the fill-hole plug and add the replacement gear lubricant to the differential housing. Refer to Specifications above.

(10) Install the fill-hole plug. Tighten the plug with 34 N•m (25 ft. lbs.) torque.

(11) Remove the support and lower the vehicle.

DRIVE SHAFTS

RECOMMENDED LUBRICATION

With normal driving conditions, the drive shaft U-joint couplers and slip yoke splines (Figs. 14 and 15) should be lubricated after each 12 000-km (7,500-miles). With severe driving conditions, after each 4 800-km (3,000-miles).

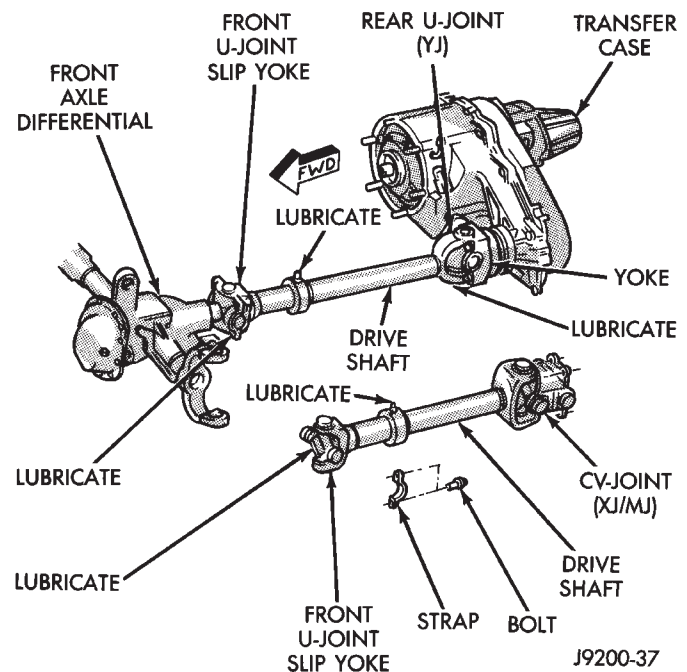
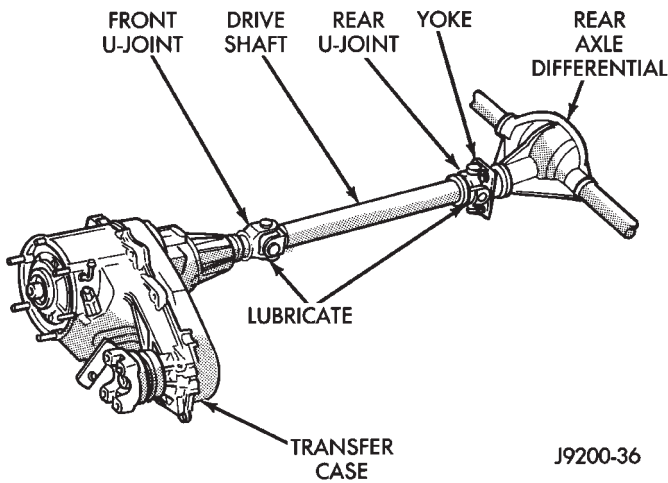


Fig. 14 Front Drive Shaft (4WD)—Typical



J9200-36

Fig. 15 Rear Drive Shaft (4WD)—Typical

CAUTION: It is very important that drive shafts be lubricated at periodic intervals and that the specified type of lubricant be used. Failure to properly lubricate could result in premature wear of drive shaft components.

LUBRICATION FITTINGS

The drive shaft universal-joint couplers (U-joints) and the front drive shaft slip yoke splines are equipped with Zerk fittings. The (CV-joints) are lubricated when assembled during manufacture and do not require additional lubrication.

LUBRICANT SPECIFICATION

Drive shaft U-joint couplers and slip yoke splines should be lubricated with a lubricant that is identified as NLGI GC-LB lubricant.

SLIP-YOKE SPLINE LUBRICATION

The method below will ensure complete lubrication of the front drive shaft slip-yoke splines (Fig. 14).

- (1) Clean the tips of the Zerk type fittings.
- (2) Use a gun or another appropriate lubricant dispenser to force pressurized lubricant into the slip yoke Zerk fittings.
- (3) When the lubricant appears, cover the pressure relief hole with a finger. Force pressurized lubricant into fitting until it appears at slip-yoke seal.

RUBBER AND PLASTIC HOSES/TUBING

RECOMMENDED MAINTENANCE

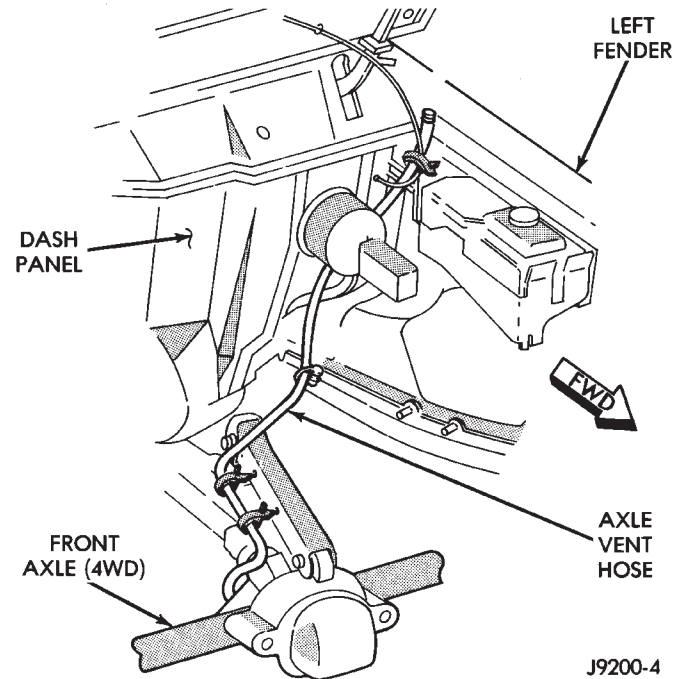
The condition of underbody rubber hose and plastic tubing should be inspected for failure at the same time as oil is changed and oil filter is replaced.

HOSE/TUBING INSPECTION

Vehicle operating conditions determine the useable life of underbody hoses and tubing. These conditions include:

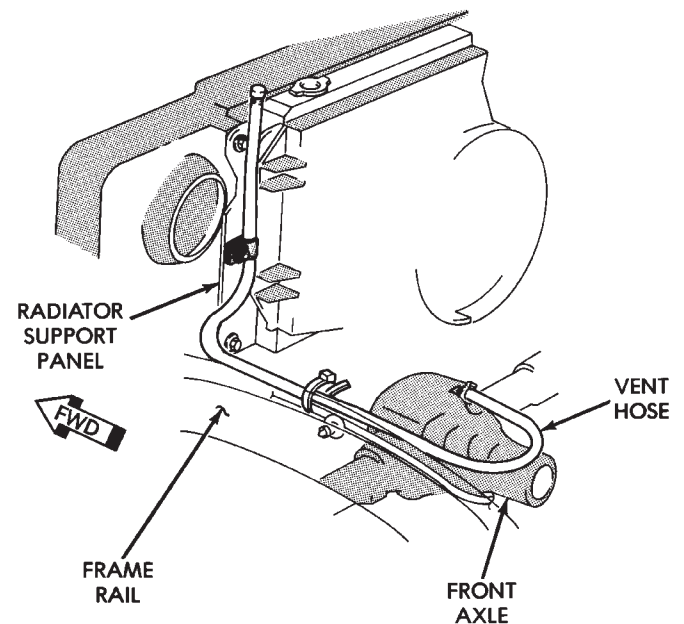
- the extent and quality of vehicle maintenance,
- the geographic area of vehicle operation, and
- the length of exposure time to excess heat and chemical contaminants.

(1) Inspect all hose and tubing fittings for looseness and corrosion. Inspect the rubber hoses for brittleness and cracks. Thoroughly inspect the hose ends (those that are slipped over nipple connectors) for splits (Figs. 16, 17, 18, 19, 20, 21 and 22).



J9200-4

Fig. 16 Front Axle Vent Hose (4WD)—XJ Vehicles



J9200-27

Fig. 17 Front Axle Vent Hose—YJ Vehicles

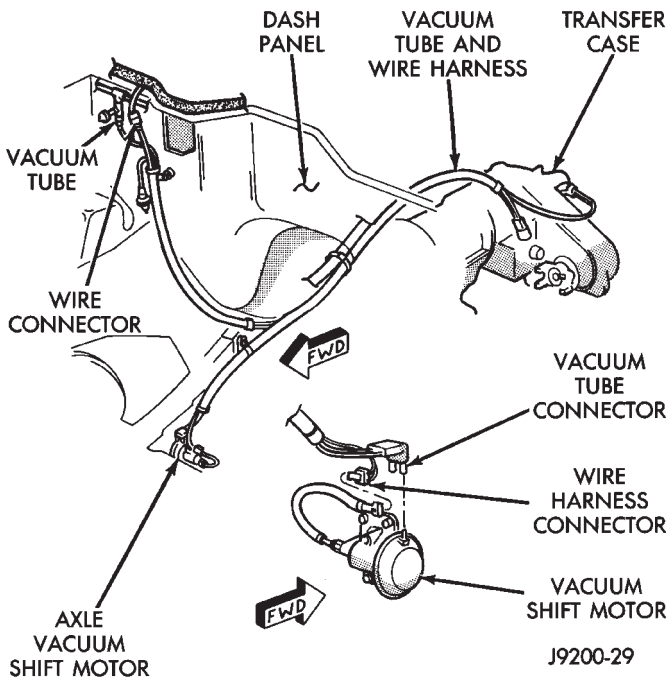


Fig. 18 Front Axle Vacuum Shift Tubing

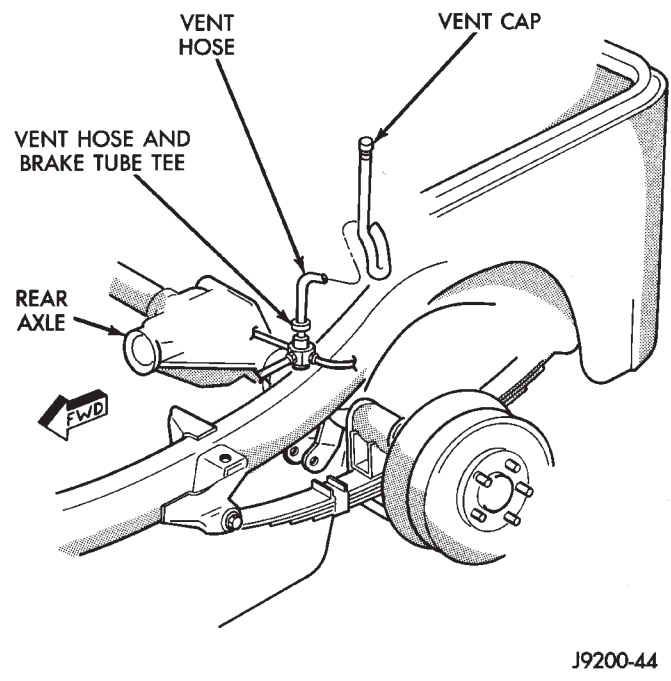


Fig. 21 Rear Axle Vent Hose—YJ Vehicles

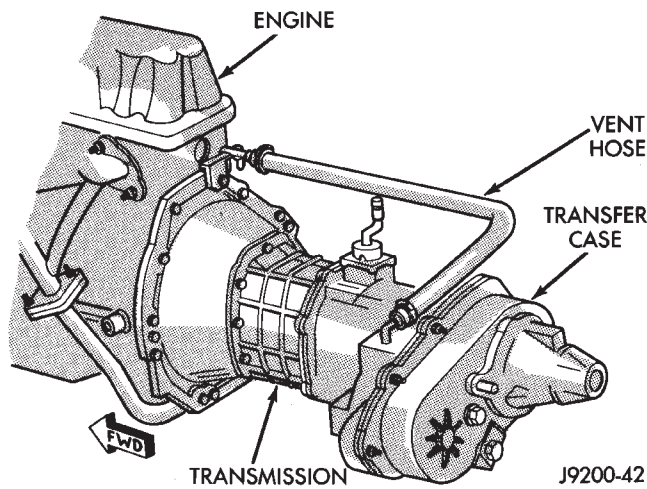


Fig. 19 Transfer Case Vent Hose (4WD)—Typical

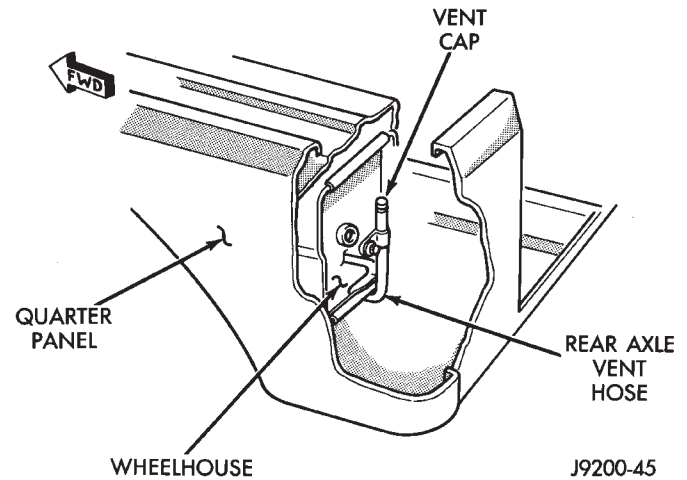


Fig. 22 Rear Axle Vent Hose At Wheelhouse—YJ Vehicles

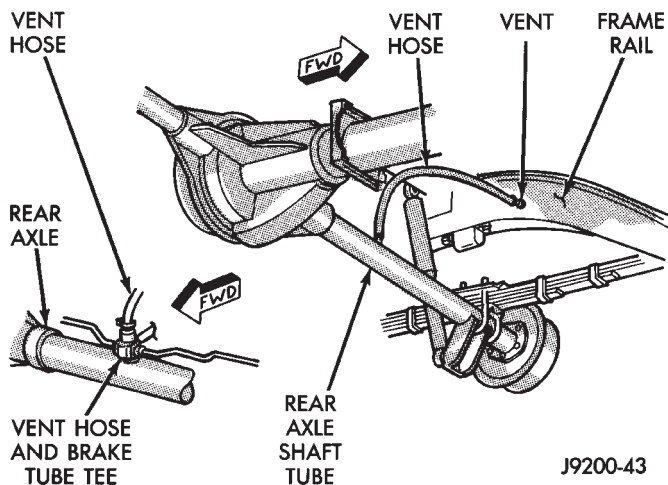


Fig. 20 Rear Axle Vent Hose—XJ Vehicles

(2) Inspect the surface of hoses and tubing for heat and mechanical damage. Hose and tubing located close to an exhaust pipe should be given special attention.

(3) Inspect the rubber hose routing to ensure that the hoses do not contact any heat source, moving component, etc., that would potentially cause heat or mechanical damage.

(4) Inspect all the hose connections to ensure that they are secure and there is no fluid leakage. Actual dripping of hot fluid should be noted and the clamps tightened in an attempt to stop the leakage before replacing the hose.

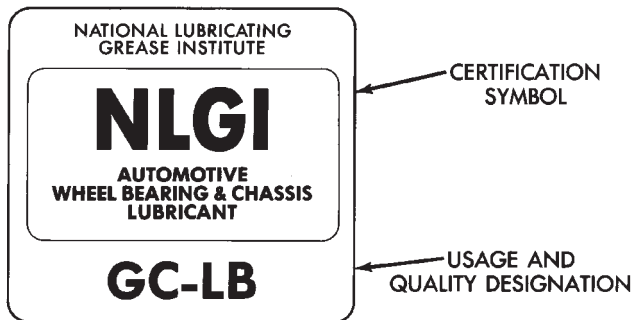
CHASSIS AND BODY COMPONENTS

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CHASSIS COMPONENT AND WHEEL BEARING LUBRICANTS

The chassis component and wheel bearing lubricants that are recommended for Jeep® vehicles are identified by the NLGI Certification Symbol (Fig. 1). The symbol contains a coded designation that identifies the usage and quality of the lubricant.



J9200-57

Fig. 1 NLGI Lubricant Container Certification/ Identification Symbol

The letter **G** designates wheel bearing lubricant. Letter **L** designates chassis lubricant. When the letters are combined the lubricant can be used for dual applications. The suffix letters **C** and **B** designate the level of the lubricant for the application. The letter **C** represents level available for wheel bearing lubricant (G) and the letter **B** represents level available for chassis lubricant (L).

STEERING LINKAGE AND BALL STUDS

RECOMMENDED MAINTENANCE

The general condition of the steering linkage (Fig. 2) should be inspected and the ball studs should be lubricated:

- 2WD vehicles — after each 24 000-km (15,000-miles) or six-months interval of vehicle operation has elapsed; or
- 4WD vehicles — after each 12 000-km (7,500-miles) or six-months interval of vehicle operation has elapsed.

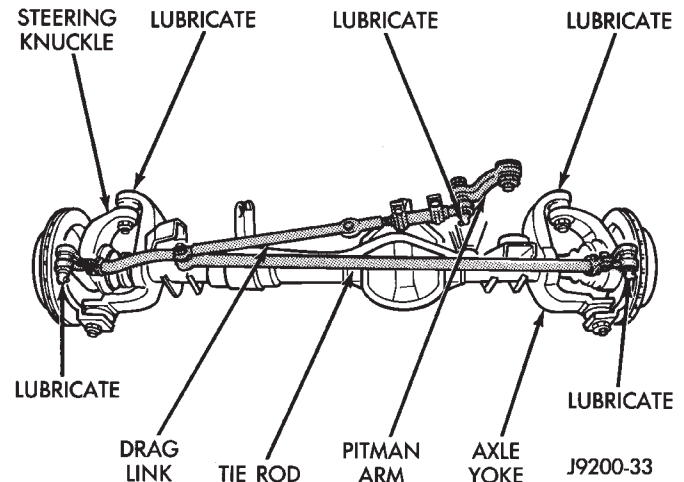


Fig. 2 Steering Components (XJ)—Typical

LUBRICANT SPECIFICATION

Steering linkage should be lubricated with a dual-purpose, lithium-base lubricant that is identified as NLGI GC-LB lubricant.

INSPECTION/LUBRICATION

(1) Inspect the steering linkage. Examine the tie rods and the drag link for bending, and the ball studs for looseness and excessive wear.

(2) Replace, as necessary, all torn/ruptured ball-stud seals and damaged/defective steering linkage components.

CAUTION: Use care to prevent lubricant from contacting the brake rotors.

- (3) Lubricate the ball studs:
- clean the tips of the Zerk type lubrication fittings on the tie-rod and drag-link ball-stud ends to avoid lubricant contamination;
 - lubricate the ball studs with high quality, dual-purpose, lithium base chassis/wheel bearing lubricant (NLGI GC-LB lubricant);
 - cease the lubricant pressure when lubricant begins to freely exit the base of the seal, or if the seal begins to expand; and
 - wipe the excess lubricant from the exterior surfaces of the ball joints and the adjacent surfaces.

FRONT WHEEL BEARINGS

Only 2WD XJ vehicles are equipped with front wheel bearings. XJ vehicles have semi-floating axle shafts and axle shaft bearings that are lubricated via differential lube oil.

RECOMMENDED MAINTENANCE—2WD XJ VEHICLES

The front wheel bearings should be lubricated (re-packed) at the same time as front brake pad/caliper service is conducted.

LUBRICANT SPECIFICATION

Wheel bearings should be lubricated with a lubricant that is identified as NLGI GC-LB lubricant.

INSPECTION/LUBRICATION

(1) Remove the wheel/tire and the disc brake caliper. **Do not disconnect the caliper brake fluid hose unless the caliper must also be removed for maintenance. Support the caliper with a hanger to prevent brake fluid hose damage.**

(2) Remove the dust cap, the cotter pin, the nut retainer, the adjustment nut, and the thrust washer from the spindle (Fig. 3). Discard the cotter pin.

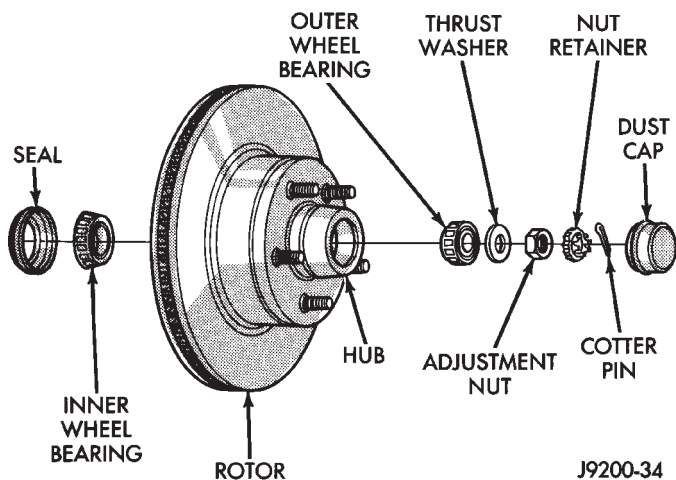


Fig. 3 2WD Front Wheel Bearings—XJ Vehicles

(3) Remove the wheel outer bearing from the hub.
 (4) Remove the wheel hub/disc brake rotor from the spindle.

(5) Remove the seal and the inner wheel bearing from the hub cavity.

(6) After removal, inspect both front wheel bearing races for indications of pitting, brinelling and excessive heat.

(7) Wipe the spindle clean and apply a small amount of chassis/wheel bearing lubricant (NLGI GC-LB lubricant) to prevent rust. Wipe the wheel hub cavity clean.

CAUTION: Do not over-fill the wheel hub cavity with lubricant. Excessive lubricant can cause overheat-

ing and bearing damage. Also, excessive lubricant can be forced out of the wheel hub cavity and contaminate the brake rotor/pads.

(8) Partially fill the wheel hub cavity with chassis/wheel bearing lubricant (NLGI GC-LB lubricant).

(9) Pack the wheel bearings with chassis/wheel bearing lubricant (NLGI GC-LB lubricant). Ensure that sufficient lubricant is forced between the bearing rollers.

(10) Install the wheel inner bearing in the wheel hub and install a replacement seal.

(11) Clean the disc brake rotor contact surfaces, if necessary.

(12) Install the wheel hub/disc brake rotor on the spindle.

(13) Install the wheel outer bearing, the thrust washer, and the spindle nut.

(14) Tighten the spindle nut with 28 N•m (21 ft. lbs.) torque while rotating the disc brake rotor to seat the bearings.

(15) Loosen the spindle nut 1/2 turn. While rotating the disc brake rotor, tighten the spindle nut with 2 N•m (19 in. lbs.) torque.

(16) Install the nut retainer and a replacement cotter pin.

(17) Clean the dust cap and apply wheel bearing lubricant to the inside surface. **Do not fill the dust cap with lubricant.**

(18) Install the dust cap.

(19) Install the disc brake caliper.

POWER STEERING SYSTEM

RECOMMENDED MAINTENANCE

The condition of power steering system should be inspected and the fluid level checked. Add fluid as necessary.

FLUID SPECIFICATION

Jeep® power steering systems require MOPAR Power Steering Fluid, or an equivalent product.

The original power steering fluid installed in Jeep® vehicles includes black-light leak detection dye.

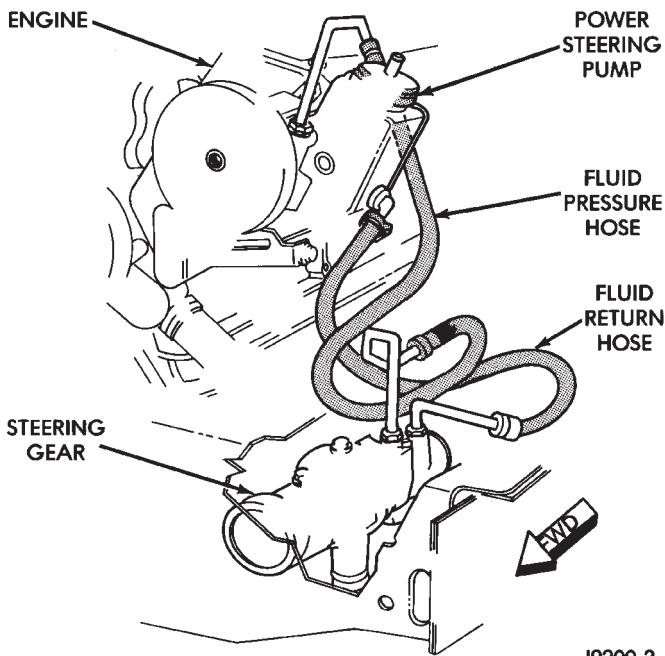
INSPECTION

Inspect the power steering system (Figs. 4 and 5) for the sources of fluid leaks, steering gear housing cracks and ensure that the steering gear is securely attached to the vehicle frame rail. Inspect the steering damper for leaks and loose connections.

FLUID LEVEL

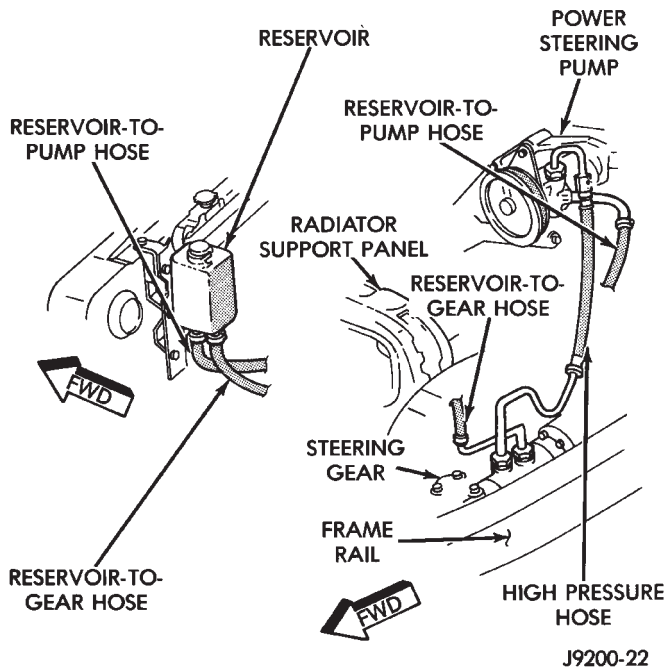
The fluid level dipstick is attached to the reservoir cap (Fig. 6). The fluid level in the reservoir can be determined with the fluid either hot or cold.

(1) Remove the cap from the reservoir.



J9200-3

Fig. 4 Power Steering System—XJ Vehicles



J9200-22

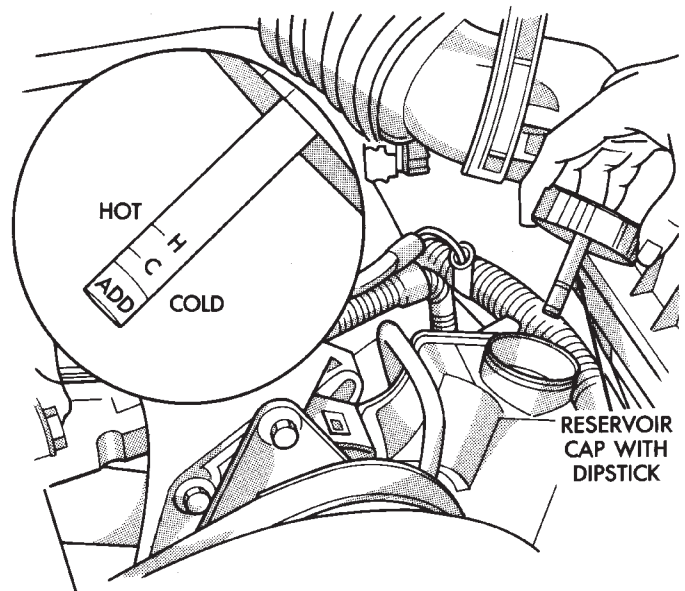
Fig. 5 Power Steering System—YJ Vehicles

- (2) Depending on fluid temperature, if the level is below the FULL HOT mark or the FULL COLD mark on the dipstick, add power steering fluid.
- (3) Install the cap on the reservoir.

MANUAL STEERING GEAR—YJ VEHICLES

RECOMMENDED MAINTENANCE

The manual steering gear should be inspected for damage at the same time as the engine oil is changed and the oil filter is replaced. Repair as nec-



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Fig. 6 Power Steering Fluid Reservoir Dipstick—Typical

essary (refer to Group 19—Steering for additional information and service procedures).

POWER BRAKE SYSTEM

RECOMMENDED MAINTENANCE

The condition of the brake system should be inspected and the fluid level in the master cylinder should be checked each time the brake system is serviced. Add brake fluid and repair as necessary.

In addition, the brake system should be operationally tested periodically to ensure that it is functioning normally.

FLUID SPECIFICATION

Jeep® power brake systems require MOPAR Heavy-Duty Brake Fluid, or an equivalent product identified as conforming to FMVSS No. 116, DOT-3 and SAE J-1703 specifications.

Use **new brake fluid only** when adding fluid to the reservoir, to fill the brake system. Never use reclaimed fluid.

BRAKE FLUID LEVEL

STANDARD POWER BRAKE SYSTEM

- (1) Clean the cover and the sides of the brake fluid reservoir.
- (2) Detach the bail retainer from the reservoir cover and remove the cover from the reservoir.
- (3) The brake fluid level should be 6 mm (1/4 in) below the rim of each reservoir well for XJ and YJ Vehicles (Fig. 7). If not, add brake fluid as necessary.
- (4) Inspect the reservoir cover bail retainer for tension and the cover for proper fit. The cover should fit tight and have a good seal.

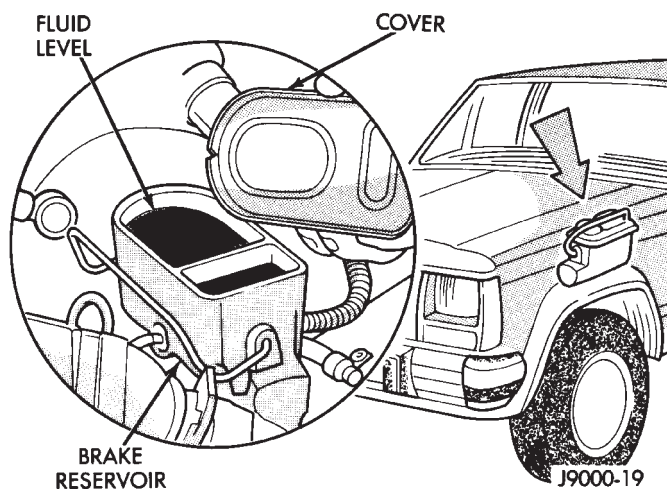


Fig. 7 Reservoir Fluid Level—Typical

(5) Inspect the reservoir rubber diaphragm seal for cracks, cuts and distortion.

(6) Inspect the brake fluid tubing fittings and the master cylinder housing for indications of fluid leakage. Repair as necessary.

(7) Install the brake fluid reservoir cover.

ANTI-LOCK BRAKE SYSTEM—XJ VEHICLES

The anti-lock brake system fluid reservoir for XJ Vehicles is located in the engine compartment at the left side of the dash panel.

(1) Turn the ignition switch ON and allow the pump motor to operate until it automatically de-energizes.

(2) Clean the cover before removing it.

CAUTION: Over-filling could cause fluid overflow and possible reservoir damage when the pump motor energizes.

(3) The brake fluid level should be no lower than the MIN arrow indicator on the side of the reservoir (Fig. 8). If not, add brake fluid as necessary. Raise the fluid level to the MAX arrow indicator only. Do not over-fill the reservoir.

(4) Turn the ignition switch OFF.

BRAKE SYSTEM INSPECTION

BRAKE FLUID HOSES/TUBING

(1) Inspect all brake fluid rubber hoses (Fig. 9) for cracks, swelling, kinks, a distorted condition and fluid leakage.

(2) Inspect the brake fluid hoses and tubing that are routed along the frame rail.

PADS/LININGS, ADJUSTER, WHEEL CYLINDERS AND CALIPER

The front disk brake pads can be visually inspected via the brake caliper inspection ports.

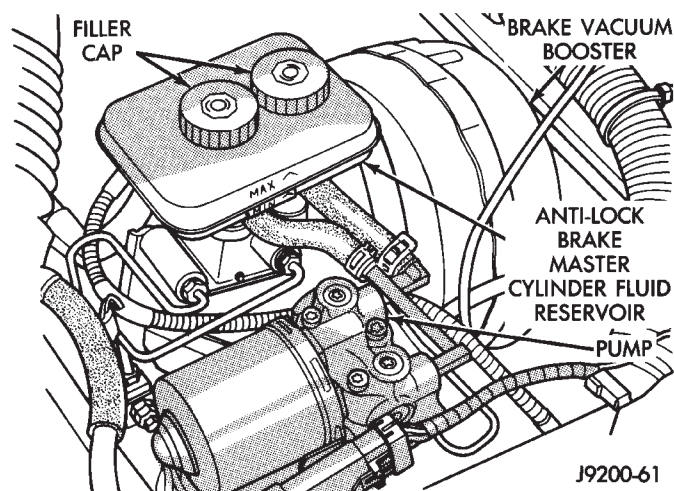


Fig. 8 Reservoir Fluid Level—Anti-Lock Brake System

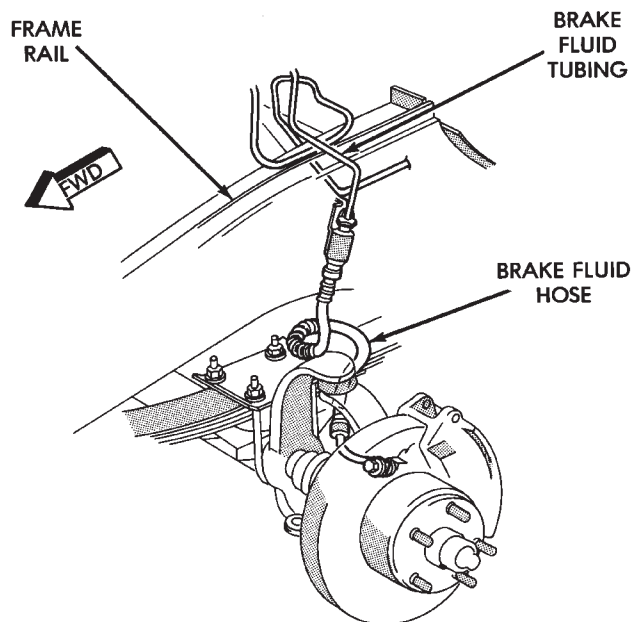


Fig. 9 Rubber Brake Fluid Hose—Typical

(1) Inspect the brake pads and linings for excessive wear, cracks, charred surfaces and broken rivets.

(2) Inspect the brake pads and linings for contamination with brake fluid, axle lubricant and/or another fluid.

(3) Replace the brake pads and/or linings if they are worn to within 0.78 mm (1/32 in) of the rivet head.

(4) Operate the rear brake self-adjuster lever and pivot. Test the operation of the self-adjuster screw for ease of movement.

(5) Inspect the self-adjuster components for bent areas, frayed cables, loose or overheated springs, and a binding condition.

(6) Inspect the disc brake caliper dust boot for correct installation, damage/tears and indications of brake fluid leakage. Inspect the bushings and pins for corrosion, tears and a binding condition.

(7) Pull the rear wheel cylinder dust boot back to expose the wheel cylinder housing and inspect for fluid leaks. Inspect the pistons and cylinder bores for proper appearance.

(8) Inspect the brake differential warning valve and housing for indications of leakage, kinked hoses and loose fittings.

PARK BRAKE

(1) As applicable, engage the park brake lever or pedal and then release it.

(2) If the park brake is functioning normally, test it for smooth operation and vehicle-holding capability.

(3) Inspect the park brake cables for kinks, fraying and a binding condition.

(4) With the park brake released, the rear wheels should rotate without restriction. Adjust the park brake cable tension at the equalizer (Fig. 10), if necessary.

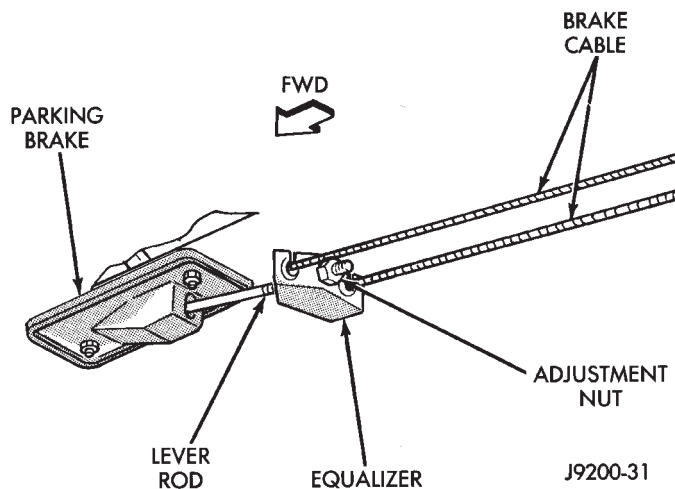


Fig. 10 Park Brake Equalizer (XJ)—Typical

(5) Repair any park brake malfunctions.

BRAKE OPERATIONAL TEST

(1) Drive the vehicle and test for proper brake action.

(2) Note any indication of drum/rotor overheating, wheel dragging or the vehicle pulling to one side when the brakes are applied.

(3) Evaluate any performance complaints received from the owner/operator.

(4) Repair the brake system as necessary (refer to Group 5—Brakes for additional information and service procedures).

TIRES

RECOMMENDED MAINTENANCE

The general condition of the tires and the inflation pressures should be inspected at the same time the engine oil is changed and the oil filter is replaced.

In addition, the tires/wheels should be rotated periodically to ensure even tread wear and maximum tread life. The tires/wheels should be rotated initially after the first 12 000-km (7,500-miles). Thereafter, after each 24 000-km (15,000-miles) interval of vehicle operation has elapsed.

INSPECTION

Inspect the tires for excessive wear, damage, etc. Test the tires for the recommended inflation pressure. Refer to the tire inflation pressure decal located on the inside of the glove box door, and also to Group 22—Tires And Wheels.

ROTATION

Refer to Group 22—Tires And Wheels for the recommended method of tire/wheel rotation for a Jeep® vehicle.

BODY COMPONENTS

RECOMMENDED MAINTENANCE

Body components should be lubricated (as required) after each 48 000-km (30,000-miles) interval of vehicle operation has elapsed.

LUBRICANT SPECIFICATIONS

All applicable exterior and interior body components should be:

- inspected for excessive wear,
- cleaned, and
- all pivot/sliding contact areas of the components should be lubricated with the specified lubricant.

Refer to the Body Lubricant Specifications chart below. When excessive wear is apparent, replace/repair as necessary.

LUBRICATION

All pivoting and sliding contact areas, including:

- seat tracks,
- door hinges/latches/strikers, and
- liftgate/tailgate/hood hinges (Fig. 11),

should be lubricated periodically to ensure quiet, easy operation and to protect against wear and corrosion.

(1) As required, lubricate the body components with the specified lubricants.

(2) When lubricating door weatherstrip seals, apply the lubricant to a cloth and wipe it on the seal.

(3) Prior to the application of lubricant, the component should be wiped clean to remove dust, grit and debris. After lubrication, any excess lubricant should be removed.

BODY LUBRICANT SPECIFICATIONS

COMPONENT	SERVICE INTERVAL	LUBRICANT
Door Latches	As Required	Multi-Purpose Grease NLGI GC-LB (Water Resistant) (1)
Hood Latch Release Mechanism & Safety Latch	As Required (When Performing Other Underhood Services)	Multi-Purpose Grease NLGI GC-LB 2 EP (2)
Hood Hinges	As Required	Engine Oil
Seat Regulator & Track Release Mechanism	As Required	Multi-Purpose Grease NLGI GC-LB 2 EP (2)
Tailgate Hinge	As Required	Multi-Purpose Grease NLGI GC-LB 2 EP (2)
Tailgate Support Arms	As Required	Engine Oil
Tailgate Latches	As Required	White Spray Lubricant (3)
Tailgate Release Handle (Pivot & Slide Contact Surfaces)	As Required	Multi-Purpose Grease NLGI GC-LB 2 EP (2)
Window System Components (Regulators, Tracks, Rods & Channel Areas — Except Glass Run Weatherstrips and Felt Lubricator, if Equipped)	As Required	White Spray Lubricant (3)
Lock Cylinders	Twice/Year	Lock Cylinder Lubricant (4)
Parking Brake Mechanism	As Required	Multi-Purpose Grease NLGI GC-LB (1)
1. Mopar Wheel Bearing Grease (High Temperature) 2. Mopar Multi-Mileage Lubricant 3. Mopar Spray White Lube 4. Mopar Lock Cylinder Lubricant		

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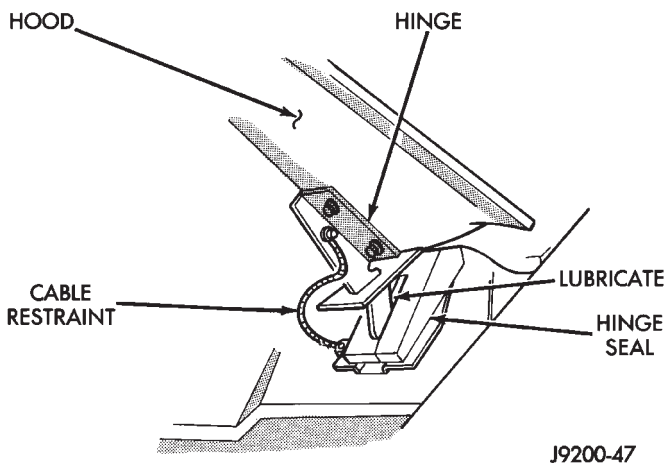


Fig. 11 Hood Hinge Lubrication—XJ Vehicles

(4) Extra close attention should be given to external key lock cylinders during the autumn and winter months to ensure protection from water and ice.

(5) Extra close attention should also be given to the hood latch components to ensure proper functioning.

HEADLAMPS

RECOMMENDED MAINTENANCE

Approximately every six months the headlamps should be displayed on a vertical test surface. This will ensure that the headlamps are positioned for safe night-time driving.

BEAM AIM ADJUSTMENT

(1) Changes in the vehicle front and rear suspension will alter the headlamp beam patterns and this can cause unsafe night-time driving conditions.

(2) If a vehicle is loaded the headlamp beam patterns should be displayed on an vertical test surface and the headlamps re-aimed.

(3) Observe the headlamp beam patterns on an appropriate vertical test surface and, if necessary, adjust the headlamp beam aim.

(4) If necessary, refer to Group 8L—Lamps for headlamp aim adjustment procedures.

