

## ALL MODELS

American Motors  
Chrysler Corp.  
Ford Motor Co.  
General Motors

## LUBRICATION

### SERVICE INTERVALS

**American Motors** — Check fluid level every 5,000 miles.

**Chrysler Corp.** — Check fluid level every oil change.

**Ford Motor Co.** — Check fluid level every 5,000 miles.

**General Motors** — Check fluid level every 12 months or 7,500 miles.

### CHECKING FLUID LEVEL

**American Motors & General Motors** — Check fluid level with engine stopped and fluid at normal operating temperature (about 170°F). Fluid level must be to full mark on dipstick.

**Chrysler Corp.** — Check fluid level with engine stopped and fluid at ambient temperature (70-80°F). Fluid level must be to "FULL COLD" mark on dipstick.

**Ford Motor Co.** — With engine running and fluid at normal operating temperature, turn steering wheel all the way from left to right several times, then shut off engine. Fluid level must show between full "COLD" and full "HOT" marks on dipstick. DO NOT overfill.

### Recommended Fluid Type

Application	Fluid Type
American Motors	② AMC Power Steering Fluid
Chrysler Corp.	② Power Steering Fluid (2084329)
Ford Motor Co.	Type "F" Auto. Trans. Fluid
General Motors	① Power Steering Fluid (1050017)
① — Dexron type automatic transmission fluid may be used in an emergency.	
② — DO NOT use automatic transmission fluid.	

### REFILLING & BLEEDING SYSTEM

**All Models** — 1) Fill pump reservoir to proper level. Start engine and run momentarily. Stop engine and recheck fluid level. Add fluid if necessary. Repeat procedure until fluid level remains constant after running engine. Raise and support vehicle so that front wheels are off of ground.

2) Start engine and turn steering wheel from side to side several times (without hitting stops). Do not hold wheel in full left or right position. Ensure that fluid level remains above pump inlet in reservoir. Fluid with air in it will have a light tan or red appearance. All air in fluid must be eliminated before normal steering action can be obtained.

3) Return wheels to center position and operate engine for another 2-3 minutes. Road test vehicle and recheck fluid level. Level must be at hot mark on dipstick.

**NOTE** — On Ford Motor Co. models, if air remains in system after REFILLING & BLEEDING SYSTEM procedure, refer to PURGING SYSTEM (FORD MOTOR CO. ONLY).

### PURGING SYSTEM (FORD MOTOR CO. ONLY)

1) Air trapped in the power steering system can be removed by using an air evacuation tool. To fabricate an air evacuation tool, a vacuum source capable of drawing 15" of Hg is required (DO NOT use engine vacuum). Connect this vacuum source, using a piece of 1/4"-5/16" tubing, to a single hole rubber stopper that is large enough to form a tight seal in the reservoir cap opening.

2) Fill power steering reservoir to proper level. Raise and support front of vehicle so that front wheels are off of ground. Remove coil wire, crank engine, and recheck fluid level while turning wheels from side to side. Add fluid if necessary. Replace coil wire and insert evacuation tool into reservoir filler.

3) Start engine and let it idle. Apply vacuum to reservoir for 3 minutes. Recheck fluid level and apply vacuum again. Cycle steering from lock to lock every 30 seconds for 5 minutes. Remove tool, recheck fluid level and add if necessary. Lower vehicle and road test.

## SERVICING

### BELT TENSION

#### Tension (Lbs.) Using Strand Tension Gauge

Application	New Belt	Used Belt
American Motors	125-155	90-115
Chrysler Corp.	120	70
Ford Motor Co.		
Ford, Lincoln Town Car, Mark VI & Mercury	160-180	140-160
All Others	120-150	90-120
General Motors		
Cadillac		
4.1L (250) V8	200	90
All Others	145	65
Buick, Chevrolet, Oldsmobile & Pontiac		
5/16" Belt	80	50
3/8" Belt	140	70
15/16" Belt	165	90
3/8" Cogged Belt		60

## TROUBLE SHOOTING

### RATTLE OR CHUCKLE NOISE

Loose steering gear mountings. Worn steering linkage. Loose pitman shaft. Incorrect overcenter adjustment. Pressure hose touching body or frame.

## ALL MODELS (Cont.)

### SQUAWK IN GEAR WHEN TURNING

Worn spool valve damper "O" ring.

### CHIRP OR SQUEAL AT FULL WHEEL TRAVEL

Loose drive belt tension.

### WHINE OR GROWL NOISES

Low fluid level. Hose restriction or kink. Pressure hose touching body or frame. Worn or damaged pump.

### GROANING NOISE

Low fluid level. Air in system. Worn or damaged pump.

### POOR STEERING RETURN

Binding in steering column or linkage. Incorrect tire pressure. Incorrect wheel alignment. Power cylinder damaged. Defective spool valve. Steering gear damaged or adjusted too tight. Bent power cylinder rod (non-integral steering only). Hose restriction or kink.

### STEERING WANDER

Incorrect tire pressure. Incorrect wheel bearing adjustment. Defective valve body. Incorrect steering gear adjustment. Incorrect wheel alignment. Loose steering gear mountings.

### HARD STEERING OR LACK OF ASSIST

Incorrect tire pressure. Loose drive belt tension. Low fluid level. Sticking flow control valve. Low pump pressure. Internal steering gear leakage. Steering column misalignment. Incorrect wheel alignment. Hose restriction or kink.

### KICKBACK OR LOOSE STEERING

Air in system. Loose steering gear mountings. Loose flexible coupling. Steering linkage worn. Incorrect wheel bearing adjustment. Worn poppet valve. Excessive overcenter lash. Loose steering gear preload.

### STEERING WHEEL JERKS

Low fluid level. Loose drive belt tension. Low pump pressure. Steering linkage hitting chassis or engine at turn wheel travel.

### LOW PUMP PRESSURE

Defective flow control valve. Defective pressure plate. Worn cam ring. Scored pressure plate, thrust plate or rotor. Defective or mis-assembled vanes (vane type pump).

## TESTING

### PRESSURE TEST

**All Except Ford Motor Co. — 1)** With belt tension correct, disconnect power steering pump pressure hose, keeping hose end raised to prevent excess fluid loss. Connect pressure hose of power steering pressure gauge to power steering pump fitting. Connect a second pressure hose from valve side of tester to steering gear inlet. Open valve fully and run engine until fluid obtains normal operating temperature. Check fluid level and add fluid if necessary.

**2)** Note the pressure reading with the engine idling and the valve open. On all models except Chrysler Corp. FWD, pressure should be 80-125 psi. On Chrysler Corp. FWD models, pressure should be 30-50 psi. If pressure is in excess of 200 psi, check hoses for restrictions and poppet valve (in steering gear) for proper assembly.

**3)** On all models, close tester valve fully and re-open 3 times. Record highest pressure noted each time valve is closed. If pressures are within specifications and range of readings is within 50 psi of each other, pump is operating satisfactory.

**CAUTION** — DO NOT hold valve closed for more than 5 seconds as pump damage may result.

**4)** If pressures recorded are high but do not repeat within 50 psi, flow control valve is sticking. If pump performance is to specifications, turn steering wheel to both stops with valve open and note highest pressures. If pump output cannot be met in either side of gear, gear is leaking internally. Shut off engine and remove tester. Reconnect all hoses and recheck fluid level.

**CAUTION** — DO NOT hold wheel against stops for more than 5 seconds as pump may be damaged.

**Ford Motor Co. — 1)** Pump flow and pressure tests are conducted using a flow/pressure analyzer (14-0207) to determine system back pressure, pump flow and internal leakage in the steering gear, control valve and cylinder. Prior to making these tests, make sure that tire pressure, belt tension and fluid levels are correct.

**2)** Check entire system for damage. Check pulley size and pump model for proper application. Reservoir must be kept full and at normal operating temperature during testing. Attach tester between pressure line and pump with gauge between pump and tester valve.

**3)** Start engine and let idle for 2 minutes. With engine idling and fluid at normal operating temperature, record the pressure (with tester valve open) and the flow. If flow is below minimum listed in chart, pump may require service. However, proceed with testing at this point. If pressure is above idle specification listed in chart, check hoses for restrictions.

**4)** Partially close the tester valve to build up 740 psi and record flow. If flow is below minimum listed in chart, pump cam pack requires replacement. Proceed with testing.

**5)** Completely close and partially open the tester valve 3 times, DO NOT allow tester valve to remain closed for more than 5 seconds. Observe and record pressure each time valve is closed. If readings vary more than 50 psi, flow control valve may be sticking. If pressure is lower than minimum specification listed in chart, replace the flow control valve. If the pressure is above maximum listed in chart, remove flow control valve and clean or replace as necessary.

**6)** Increase engine speed to about 1500 RPM. With valve all the way open, observe and record flow. If flow exceeds maximum free flow listed in chart, remove flow control valve and clean or replace as necessary.

## ALL MODELS (Cont.)

7) Return engine to idle speed. Turn steering wheel to left and right stops. Observe and record flow at both stops. Pressure readings should be at or near maximum pressure specification listed in chart. Flow should drop below .5 gpm. If pressure does not reach maximum or if flow does not drop below .5 gpm, excessive internal leakage of the steering gear is occurring.

### TURNING EFFORT TEST (FORD MOTOR CO. ONLY)

With front wheels properly aligned and tire pressures correct, park vehicle on dry concrete and set parking brake. Idle engine for 2-3 minutes and turn steering wheel side to side several times to warm fluid. With engine running, attach a pull scale to rim of steering wheel. Measure pull required to turn wheel one complete revolution in each direction. Pull should be 5 lbs. during turning.

### PUMP TEST SPECIFICATIONS

Application	Pressure (psi)			Flow (gpm) <sup>②</sup>	
	Idle	Relief		Min.	Max. (free flow)
		Min.	Max.		
A.M.C. (All)	80-125	1100	1200	.....	.....
Chrysler Corp. All FWD All RWD	30-50 80-125	..... 1200	..... 1300	..... .....	..... .....
Ford Motor Co.①					
1.6L (CG)	150	750	950	.95	2.20
2.3L (CA)	150	950	1230	1.40	2.60
3.3L (CA)	150	950	1230	1.25	2.60
3.8L (CA)	150	950	1230	1.20	2.60
3.3L & 3.8L (BZ)	150	950	1230	1.25	2.60
3.8L & 5.0L (CE)	150	1100	1380	1.60	2.60
4.2L & 5.0L (BY)	150	1100	1380	1.35	2.60
4.2L & 5.0L (BW)	150	1100	1380	1.60	3.00
5.0L & 5.8L (BX)	150	1100	1380	1.60	3.40
General Motors					
Cadillac					
4-Cyl	80-125	.....	1380	.....	.....
4.1L V6 & V8	80-125	1350	1450	1.32	3.10
5.7L V8 Diesel					
Fleetwood & Deville	80-125	1465	1515	1.32	3.50
Eldorado & Seville	80-125	1350	1450	1.32	3.50
6.0L V8	80-125	1250	1350	1.85	3.50
Chevrolet Corvette	80-125	1250	1350	.....	.....
All Other General Motors Vehicles	80-125	1250	1350	.....	.....

① — On Ford Motor Co. models, the 2 letter code listed is the pump model code, which can be found on a tag attached to the pump reservoir. All pump model codes have the prefix HBC-.

② — Flow is measured in gallons per minute.