

THE
The Lincoln/Mercury Old Parts Store

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INSTALLING A 1960-69 LINCOLN CRANK DRIVEN POWER STEERING PUMP

GREAT CARE must be taken when you install a rebuilt power steering pump, so it is not damaged during the installation process. Several components make up the power steering system, and all must be in good working order, free of contaminants and leaks for the installation to be successful. Take the time to check your system thoroughly to insure success.

To remove the power steering pump

- Disconnect the battery;
- Remove the radiator and related parts;
- Remove the fan;
- Remove the fan belts;
- Remove the crank shaft end bolt;
- Remove the pressure and return lines (use care not to spill the power steering fluid);
- Remove the harmonic balancer (a puller is required);
- Remove the harmonic balancer Woodruff key;
- Remove the two shoulder bolts (1/2" heads) that hold the pump;
- And finally, remove the pump.

Once the pump is removed, start your inspection.

- Check the lines both inside and outside for cracks, leaks, rot, blockage, stripped fittings. If the lines are original, the chances are that they suffer from all these problems and we strongly advise they be replaced.
- Open the fluid reservoir, remove the fluid and filter, and clean the reservoir thoroughly;
- Replace the filter;
- It makes great sense to replace all original hydraulic lines and filter, if possible.

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Flushing the system

It is extremely important to flush the power steering system thoroughly in order to remove all contamination, particulates, and metals that have entered the system over the years. To do this requires putting the pressure side of the hose into a bucket of transmission fluid and an empty bucket on the return line so that you can flush your system properly. With the wheels of your car off the ground and your power steering pump removed, turn your steering wheel back and forth several times until no more old fluid and contaminants come out. Remember to have a container to catch the fluid. Dispose of the old fluid in a safe and responsible manner.

When you're sure that the system has been flushed out completely, you're ready to install the rebuilt power steering pump.

Installing the rebuilt power steering pump

- Install a new front engine seal;
- Install the rebuilt power steering pump using new cushions and grommets;
- Install a new pressure line, a new return line from the reservoir to the power steering pump, and clamp securely;
- Install the two shoulder bolts that hold the pump in position;
- Install the Woodruff key;
- Install the harmonic balancer
- Install the crank shaft end bolt
- Add transmission fluid to the reservoir until full (approximately one quart);
- With the wheels still off the ground, turn the steering wheel back and forth several times and check and refill the reservoir level;
- Repeat this several times until you are sure that the system is full;
- Next, start the engine and run for approximately five to six seconds;
- Stop, check fluid level again and top off the reservoir;
- Start the engine again for approximately ten to 15 seconds;
- Stop, check levels, and refill as needed;
- Start the engine again and let it idle for several minutes, making sure that the wheels stay centered, and that they do not try and turn to one side or the other;
- Next, gently turn the steering wheel from left to right, being extremely careful not to lock the steering wheel in either direction for more than a fraction of a second;
- Stop the engine. Check the power steering fluid levels and fill as needed.
- Restart the engine and let it run for several minutes to give the system a chance to remove any air blockages that may occur. This is a good time to turn on any hydraulically operated systems, such as the wiper motor, with the wiper arms and blades removed. Turn off the engine, wait five to 10 minutes, put the car on the ground, and go for a ride.
- Pay attention to any unusual whining or groaning of the system. It could a sign of a problem.
- After you've taken your ride, let the car sit for a period of time. Then check for any leaks or drips under the engine.

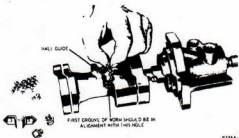


FIG. 36—Assembling Piston on Worm Shaft

9. Position a new lube passage O-ring in the counterbore of the gear housing.

10. Apply vaseline to the teflon seal on the piston.

11. Place a new O-ring on the valve housing.

12. Position the housing spacer ring (Fig. 23) in the gear housing. Then, slide the piston and valve into the gear housing being careful not to damage the teflon seal.

13. Align the lube passage in the valve housing with the one in the gear housing, and install but do not tighten the attaching bolts.

14. Rotate the ball out so that the teeth are in the same plane as the sector teeth. Tighten the four valve housing attaching bolts to specifications.

15. Position the sector shaft cover O-ring in the steering gear housing. Turn the input shaft as required to center the piston.

16. Position the sector shaft and cover assembly in the gear housing. Install the steering identification tag and the two sector shaft cover attaching bolts. Torque the bolts to specifications.

17. Attach an in-lb torque wrench to the input shaft. Adjust the mesh load to specifications as shown in Fig. 37.

POWER STEERING PUMP

DISASSEMBLY

A clean working area should be used when overhauling the power steering pump. Foreign matter picked up on working parts may cause damage or failure of the unit.



FIG. 37—Adjusting Mesh Load

Clean containers should be used for parts.

1. Drain the fluid from the pump. Remove the pump cover to housing cap screws (Fig. 38). Place the pump on the bench, cover side down. Lift the housing from the cover.

2. Remove the large and the small O-rings from the pump cover. Remove the O-ring from the pressure plate hub.

3. Remove the pressure plate to cover screws, and remove the plate. Lift the cam ring off the dowel pins.

4. Remove the rollers. Lift the rotor off the shaft, and remove the drive key from the shaft. Remove the dowel pins from the cover.

5. Remove the rotor shaft from the cover. Do not remove the snap ring from the shaft unless it, or the shaft, is damaged.

6. Pry the rotor shaft seals out of the cover and the housing.

7. Do not disturb the control valve unless diagnosis indicated a control valve problem or foreign matter in the valve. To remove the valve, drive the roll pin out of the housing. Remove the plug and O-ring, control valve, and the spring. If the plug or valve is stuck, tap the end of the housing on a piece of wood or tap it with a soft-faced hammer. Remove the O-ring from the plug.

ASSEMBLY

Apply automatic transmission fluid to all parts as they are assembled. Always use new seals and O-rings.

1. Install the control valve spring in the housing. Install the valve with the small sensing hole in the end of the valve toward the spring. Install a new O-ring on the plug. The plug O-ring is $\frac{1}{4}$ inch smaller in diameter than the bypass O-ring. Make sure the proper O-ring is used. Install the plug and a new roll pin (Fig. 38).

2. The rotor shaft oil seals are installed in the cover and the housing with Tool 3583-J, which consists of a driver and an adapter. The procedure is as follows:

a. Support the cover on wood blocks (Fig. 39) to provide tool clearance. Use clean blocks that will not nick or damage the inner face of the cover.

b. Start the seal (metal shell upward) squarely into the bore with finger pressure. Place the adaptor on the driver with the square corner of the adaptor toward the seal (Fig. 39). Drive the seal into the cover, as shown in Fig. 40 until it bottoms.

Driving the seal beyond this point can damage it. Install the seal in the pump housing in the same manner.

3. Install the rotor shaft in the cover as shown in Fig. 41 to prevent damage to the seal.

4. Install the 'dowel pins in the cover. Place the rotor drive key in the shaft. Install the rotor on the shaft with the drive key groove aligned with the key and the counter-bore side of the rotor toward the cover so that it goes over the snap ring.

5. Place the cam ring on the dowel pins with the chamfered edge upward (Fig. 42). Place the rollers in the rotor.

6. Place the pressure plate on the cover pins. Install and tighten the

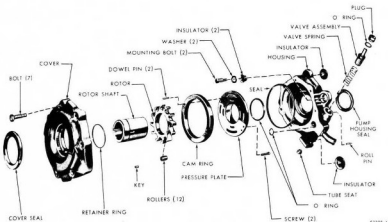


FIG. 38—Power Steering Pump



FIG. 39—Preparation for Installing Rotor Shaft Seals

screws to 20 in-lbs torque. Install the O-ring on the pressure plate hub. Install O-rings in the groove at the oil bypass hole and around the cam ring (Fig. 43).

7. Place the tool shown in Fig. 43 in the rotor shaft to prevent damage to the oil seal, then install the housing on the cover. Install and torque the cap screws to 15-20 ft-lbs.

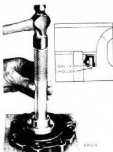


FIG. 40—Installing Rotor Shaft Seals



FIG. 41—Installing the Rotor Shaft in Cover



FIG. 42—Cam Ring Installation

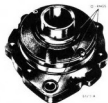


FIG. 43—O-Ring Installation

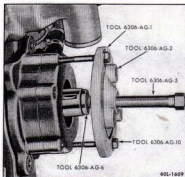


Fig. 5-15—Removing Power Steering Pump

Tighten the two mounting bolts to 10-13 lbs. ft. torque.

8. Inspect the pressure and inlet hoses for cleanliness and condition of flare and threads. Install the pressure hose end in the pump and tighten the nut to 20-30 lbs. ft. torque. Install inlet hose and tighten clamp. *To prevent transmission of*

sound, make certain the pressure hose does not touch the body sheet metal.

9. Insert the Woodruff key in the crankshaft; place the pulley on the shaft and secure it with the washer and bolt. Tighten the bolt to 75-90 lbs. ft. torque.
10. Tighten the generator adjusting strap and the generator belt to the specified deflection.
11. Replace the radiator and hoses.
12. Fill the reservoir and bleed the system as follows:
 - a. Start the engine and run it at idle. **Do not touch the steering wheel.**
 - b. When the reservoir is free of foam (inspect with a light), rotate the steering wheel from stop to stop to remove air from the hydraulic system.
 - c. Refill the reservoir to the "level" mark on the reservoir.
 - d. Replace the reservoir cover.
 - e. Check the system for leakage.

DISASSEMBLY AND ASSEMBLY

A clean working area should be provided when disassembly is begun. Foreign matter and dirt picked up on any of the working parts may cause damage or premature failure of the unit. Sealed containers should also be provided for disassembly.

Figure 5-16 will assist in identifying the parts.

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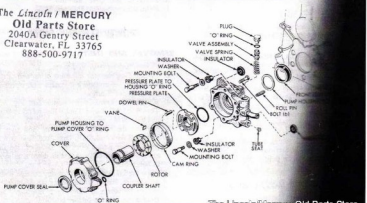


Fig. 5-16—Pump Assembly—Disassembled View

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