



Power Steering Internal Leakage Test Procedure

The following procedure can be used to detect internal problems of the steering gear when there is a complaint of hard steering in one or both directions. All other steering components should be inspected to be free of defects prior to conducting this test. History has shown most steering problems are not the result of a faulty steering gear. A complete pressure and flow test should be completed prior to conducting this test.

Tools Required:

Pressure and Flow Test Kit (Sheppard Part No.5517641 or equivalent)
1 to 1 1/2" Steel Block (minimum thickness)
2 - 7/8" Wrenches
3331812K Test Plug (if applicable)
Drain Pan

Procedure:

1. Park the vehicle on a clean dry surface, preferably concrete, with the transmission in neutral. Set the parking brake and shut off the engine. Place the drain pan under the steering gear.
2. Install the pressure and flow test kit in series in the pressure line of the power steering pump. Ensure all fittings and connections are tight but do not over tighten them. If the steering gear is built with a pressure relief valve (PRV), it must be removed and replaced with the 3331812K Test Plug for testing purposes only. If the PRV is not replaced with the test plug, the PRV will open during the test and show excessive internal leakage. The PRV looks like a 1 1/2" nut on the side of the steering gear bearing cap. Simply unscrew it and replace it with the test plug. Do not over tighten the plug.
3. Check and correct the fluid level. Start the engine. Check the flow meter to ensure flow is in the proper direction as indicated by the arrow on the flow gage. Close the hand valve until 1000 psi is reached. Maintain this pressure until a temperature reading of 180 degrees Fahrenheit is reached at the reservoir.
4. Close the tester hand valve all the way and note the maximum pump pressure. Make sure the flow drops to zero. Immediately open the valve all the way.

CAUTION: Keeping the tester hand valve completely closed for longer than 15 seconds at a time can damage the power steering pump.

5. Place the 1" block (minimum thickness) between the axle stop bolt and the axle on the left front wheel. (The block needs to be at least 1" thick to prevent the gear from going into relief.) While holding the block in place have the wheels turned slowly to a full left squeeze the block between the axle stop bolt and the axle. Pull firmly on the steering wheel to ensure the valve in the steering gear is completely open. When properly done, the steering system should achieve maximum pump pressure and flow should be less than one gallon per minute. Note the pressure and flow readings with the 1" block in place.

CAUTION: Take care when squeezing the block between the axle stop and the axle. The block can slip out of place and personal injury could result.

6. Repeat step 5 for a right turn, placing the block between the axle stop bolt and axle on the right side of the vehicle.
7. If excessive internal leakage was noted in one or both directions (flow greater than 1 gpm), the steering gear should be replaced.

NOTE: If this test is being performed on a dual steering gear system (master and slave gear, or assist cylinder) and excessive internal leakage is noted, remove and plug (or cap) the 2 pressure lines coming off the master gear which lead to the slave gear or cylinder. Disconnect the draglink for the slave gear or disconnect one end of the assist cylinder. Repeat steps 5 and 6. If the internal leakage drops below 1 gpm, the problem is in the slave gear or assist cylinder. If the internal leakage is still above 1 gpm, the problem is in the master steering gear.

8. Shut off the engine. Remove the pressure and flow test kit. Replace the test plug (if used) with the PRV. Do not over tighten. Reconnect all lines and linkages previously disconnected.
9. Check and correct the fluid level. Remove the drain pan and return the vehicle to service.

Contact the RH Sheppard Co. Field Service Hotline at **1-800-274-7437** if you have any questions concerning the diagnosis of a steering complaint or your test results. Refer to the Sheppard website at www.rhsheppard.com for additional service information and our online service manual.