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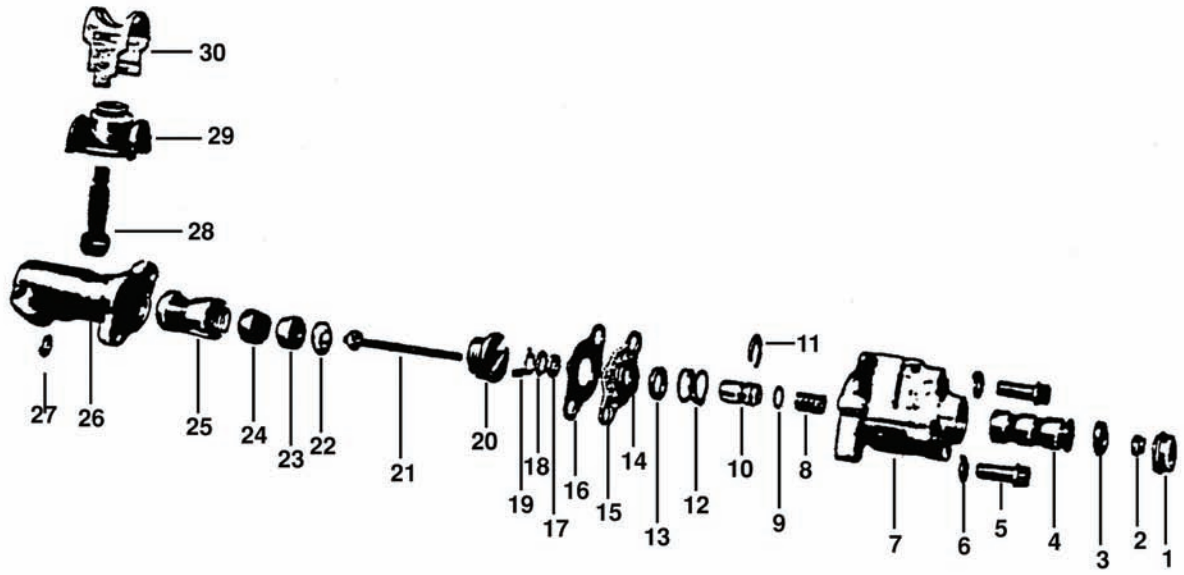
Suggested Installation Instructions for:
602-456, 1963-1982 Power Steering Control Valve Seal Rebuild Kit



1. Dust Cover
2. Adjusting Nut
3. Vee Block Seal
4. Valve Spool
5. Valve Mounting Bolts
6. Lock Washer
7. Valve Housing
8. Valve Adjustment Spring
9. "0" Ring Seal
10. Valve Reaction Spool
11. Spring Retainer
12. Valve Spring (Valve Reaction Spring)
13. Washer, Reaction Spring
14. Annulus Seal
15. Annulus Spacer
16. Gasket
17. Valve Shaft Washer
18. "0" Ring Seal *
19. Plug to Sleeve Key
20. Ball Adjuster Nut
21. Valve Shaft
22. Ball Seat Spring
23. Ball Seat
24. Ball Seat
25. Sleeve Bearing
26. Adapter Housing
27. Lubrication Fitting
28. Ball Stud
29. Seal
30. Clamp

*Part # 18 (0-Ring Seal) is not prevalent in stock control valves and is not included in this kit. It is pictured in all GM Service Manuals. It is not necessary in rebuilding this unit.

Disassembly

1. Place the valve in a vise.
2. Remove adjusting nut.
3. Remove the valve to adapter bolts and remove valve housing and spool from the adapter.
4. Remove spool from the housing.
5. Remove the spring, reaction spool, washer reaction spring, spring retainer, and seal. "0" ring may now be removed from the reaction spool.
6. Remove the annulus spacer valve shaft washer and plug to sleeve key.
7. Remove clamp by removing nut, bolt and spacer. Or, if crimped type clamp is used, straighten clamp end and pull clamp and seal off end of stud.
8. Carefully, so as not to nick the top surface, turn adjuster plug out of sleeve.
9. Remove the adapter from the vise and invert, permitting the spring and one of the two ball seats to fall free.
10. Remove the ball stud and the other ball seat and the sleeve will fall free.

Inspection

1. Wash all metal parts in nontoxic solvent and blow dry with compressed air.
2. Inspect all parts for scratches, burrs, distortion, evidence of wear and replace all worn or damaged parts, including mating parts when necessary.
3. Replace all seals, gaskets, and covers with approved service parts.

Repairs

NOTE: The Corvette valve incorporates a 40 lb. centering spring. The Corvette valve incorporating this spring is identified by a "C" stamped on the dust cover.

In case a connector seat becomes damaged, proceed as follows:
To remove connector seat, tap threads in center hole using a 5/16-18 tap. Thread a bolt with nut and flat washer attached into tapped hole so that the washer rides against the face of the port boss and the nut rides against the washer. Hold the bolt from rotating while turning the nut off the bolt. This will force the washer against the port boss face and will back out the bolt thus drawing the connector seat from the top cover housing. Discard the connector seat. Clean the housing out thoroughly to remove any tapping chips. Drive new connector seat against housing seat, using a tool with similar diameter, being careful not to damage either the connector seat or the housing seat.

Assembly

1. Replace the sleeve and ball seat in the adapter, then the ball stud, and finally the other ball seat and the spring, small coil down.
2. Clamp the adapter in vise, put the shaft through the seat in the adjuster plug in sleeve.
3. Turn the plug in until it is tight, then back it off until the slot lines up with notches in the sleeve.
4. Install new seal and clamp over stud so lips on seal mate with clamp. (A nut and bolt attachment type clamp replaces the crimped type for service.)
5. Center the ball stud, seal and clamp at opening in adapter housing, then install spacer, bolt and nut.
6. Insert the key, making sure that the small tang on the ends of the key fit into the notches in the sleeve.
7. Install the valve shaft washer, annulus spacer, and the reaction seal (lip up), spring retainer, reaction spring and spool washer and adjustment spring. (Install the washer with the chamfer "up".
8. Install the seal on the valve spool (lip down), then install spool in housing being careful not to jam spool in housing.
9. Install housing and spool onto adapter. The side ports should be on the same side as the ball stud. Bolt the housing to the adapter.
10. Depress the valve spool and turn the locknut onto the shaft about four turns with a clean wrench or socket.
    NOTE: Always use a new nut.

Valve Balancing

The control valve must be adjusted after being disassembled, as outlined in the following procedure. The same procedure may be followed to correct a complaint of harder steering effort required in one direction than the other.

1. Install valve in vehicle. Connect all hoses and fill the pump reservoir with oil. Do not connect the piston rod to the frame bracket. If the vehicle is already in operation, it will be necessary to detach the piston rod from the frame bracket.
2. With the car on a hoist, start the engine. One of the following two conditions will exist.
   a. If the piston rod remains retracted, turn the adjusting nut clockwise until the rod begins to move out. Then turn the nut counter-clockwise until the rod just begins to move in. Now turn the nut clockwise to exactly one-half the rotation needed to change the direction of the piston rod movement.
   b. If the rod extends upon starting the pump, move the nut counter-clockwise until the rod begins to move in. Now position the nut exactly one-half the rotation needed to change the direction of the piston rod movement.
   CAUTION: Do not turn the nut back and forth more than is absolutely necessary to balance the valve.
3. With the valve balanced it should be possible to move the rod in and out manually.
4. Turn off the engine and connect the cylinder rod to the frame bracket.
5. Restart the engine. If the front wheels (still on the hoist) do not turn in either direction from center, the valve has been properly balanced. Correct the valve adjustment if necessary.
6. When the valve is properly adjusted, grease end of valve and install dust cap. If steering wheel surges, perform the following operation:
7. Air may become trapped in the power steering cylinder, control valve, or lines, causing surging and requiring bleeding of the system.
8. To bleed the system, first place a drain pan or suitable fluid absorbent directly beneath the control valve.
9. Loosen the two lines that cross on the end of the control valve approximately 1/8-1/4 turn (counterclockwise).
10. Start the vehicle while firmly grasping the steering wheel. Turn the steering completely from left to right, while an assistant verifies that a small amount of fluid is spraying out of both lines.
11. After turning the wheel from left to right 3 or 4 times, hold the wheel to the right while an assistant tightens the two lines on the end of the control valve.
12. Check the power steering fluid level and add as necessary.
13. If necessary repeat the valve balancing procedure. Refer to #2-6 under Valve Balancing.