

Power Steering

1968-73 BENDIX LINKAGE

Fairlane, Falcon (1968-70)
Mustang, Cougar (1968-70)
Montego, Torino (1968-71)
Lincoln Continental (1968-69)
Maverick, Comet (1970-73)

NOTE - Continentals may also use Ford "Torsion Bar" steering.

►CHANGES, CAUTIONS, CORRECTIONS

- 1968 FORD MOTOR CO. NOISY OR MALFUNCTIONING POWER STEERING PUMP CORRECTION: Noisy or malfunctioning power steering pump may be caused by improperly torqued front plate attaching screws, correct by torquing to 28-32 ft. lbs.
- 1968 FORD MOTOR CO. POWER CYLINDER PISTON ROD SEAL AND CONTROL VALVE SPOOL SEAL LEAKAGE CORRECTION: If leak is detected in the Power Cylinder Piston Rod Seal, install Kit No. 3A764. Leakage at Control Valve spool is corrected by Kit No. 3A650.
- 1968 MERCURY & LINCOLN REVISED INPUT SHAFT & CONTROL ASSEMBLY INTEGRAL POWER STEERING GEAR ASSEMBLY (FORD DESIGN): The input shaft and control assemblies for subject steering gears have been revised to shorten the housing shoulder adjacent to the piston and replace the two piece design retainer nut and lock nut with a single, wider retainer nut and a set screw. Set screw extends through valve housing bore to engage and lock retainer nut in position. The current retainer nut and lock nut cannot be used to service steering gears with a single retainer nut and set screw.

DESCRIPTION

A hydraulically controlled linkage type steering system including an integral pump and fluid reservoir, a control valve, a power cylinder, connecting fluid lines and the steering linkage.

OPERATION

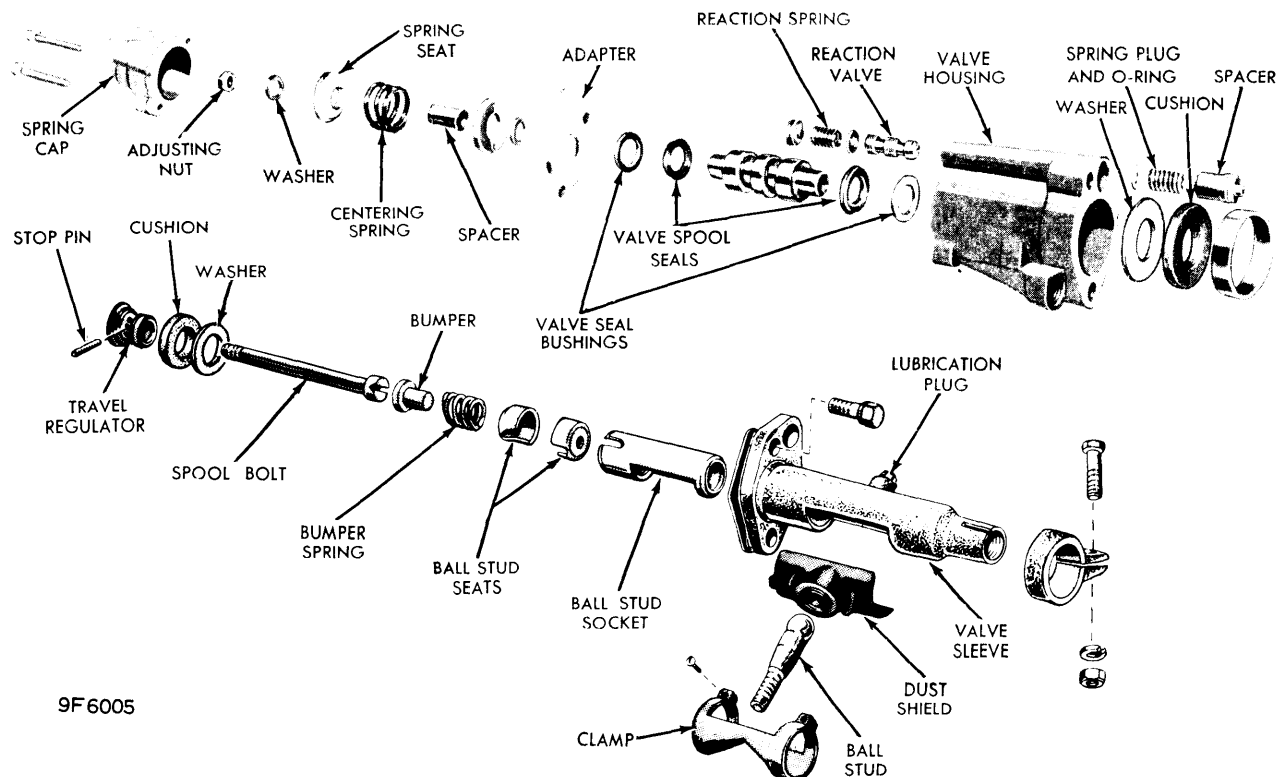
The hydraulic pump and belt, driven from the engine crankshaft, draws fluid from the reservoir and provides fluid pressure for the system. Within the pump, is a pressure relief valve, governing the pressures within the steering system according to varying conditions of operation. After fluid has passed from pump to control valve and power cylinder, it returns to the reservoir.

LUBRICATION

Check fluid level in reservoir every 6000 miles. Start engine and turn wheels right and left a few times to warm the fluid, then shut engine off. Add Automatic Transmission Fluid Type A, Suffix A to bring fluid level up to base of filler neck.

ADJUSTMENT

CAUTION - If a 2 post hoist is used to raise vehicle, place the adapters under the front suspension lower arms. Do not allow adapters to contact steering linkage.



BENDIX POWER STEERING CONTROL VALVE ASSEMBLY

1968-73 BENDIX LINKAGE (Cont.)

Control Valve Centering Spring Adjustment

Raise vehicle and remove spring cap attaching screws and lock washers, remove the spring cap. Tighten adjusting nut snug (90-100 INCH Lbs.), then loosen nut $\frac{1}{4}$ turn. **NOTE** - Make sure nut rotates $\frac{1}{4}$ turn (90 degrees) on the threads of the bolt. Do not tighten the adjusting nut too tight. Position spring cap to valve housing. Lubricate and install attaching screws and washers. Torque screws to 72-100 INCH lbs. Lower Vehicle, start engine and check turning effort with a spring scale. Spring scale attached to rim of steering wheel, the effort to turn wheel in both directions should not exceed 12 pounds.

TROUBLE SHOOTING

Binding Or Poor Recovery

Check pitman arm ball stud in control valve sleeve which may be rubbing against the sleeve slot. If this is the case, the roll pin may be missing. Check idler arm bushings. Check all steering gear adjustments. Check operation of control valve and for interference between sector shaft arm and dust shield. Check control valve travel regulator stop adjustment. Check for damaged control valve sleeve and socket tube.

Hard Steering

Check to see that pump drive belt is properly tightened and that pump pressure is correct. If pump pressure is within specifications, check control valve spool centering spring adjustment. Check control valve spool for free movement and repair as necessary.

Excessive Freeplay

Check steering gear worm and roller mesh adjustment. Check for excessive clearance between steering arm ball stud and ball stud seats. If ball stud is loose in seat, adjust control valve travel regulator stop. Check control valve centering spring adjustment.

Noisy Pump

Check pump belt tension. Noise may also result if correct hose is not used.

Steering Chatter

A loose pump belt can cause chatter against the wheel stops during an extremely sharp turn. Check belt tension. Check for looseness in idler arm connection, and check idler arm bushings. Check power cylinder rod insulators for looseness.

Loss Of Power Assist

Check for damaged or broken hoses. Check pump pressure (see above). Disconnect power cylinder piston from idler arm bracket and operate piston by hand to check for resistance of movement. If piston moves freely with little or no resistance, internal parts of power piston are damaged. Replace cylinder. Check adjustment of valve spool centering spring. Check operation of control valve check valve.

REMOVAL & INSTALLATION

Power Steering Control Valve

Removal - Disconnect 4 fluid line fittings at control valve, drain fluid from lines. Turn wheels to left and right

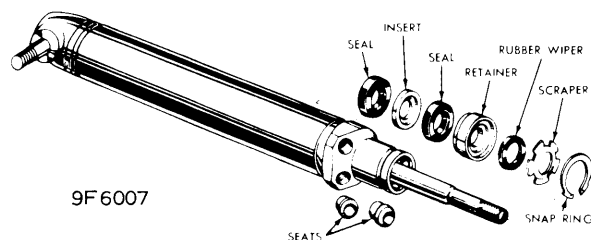
several times to force all fluid from system. Loosen clamping nut and bolt at right end of sleeve. Remove roll pin from steering arm-to-idler arm rod through the slot in the sleeve. Remove control valve ball stud nut. Using a suitable tool, remove the ball stud from sector shaft arm. After turning front wheels fully to left, unthread control valve from center link steering arm-to-idler arm rod.

Installation - Thread valve onto center link until about four threads are still visible. Position ball stud in sector shaft arm. Measure distance between center of grease plug in sleeve and center of stud at inner end of left spindle connecting rod. Measured distance should be $5 \frac{5}{8}$ " for Torino, Montego, Falcon and Fairlane models, $5 \frac{7}{8}$ " for Maverick and Comet, and $4 \frac{7}{8}$ " for Mustang and Cougar. If distance is not correct, disconnect ball stud from sector shaft arm and turn valve on center link to increase or decrease distance. Align hole in steering arm-to-idler arm rod with slot near end of valve sleeve. Install roll pin, in rod hole, to lock valve in position. Install nut on ball stud. Connect fluid lines to control valve. **CAUTION** - Do not over tighten. Fill fluid reservoir with recommended fluid, to cross hatched area on dipstick.

NOTE - With engine running, check position of steering wheel (front wheels in straight ahead position). Do not make any adjustments until toe-in is checked. If either toe-in or steering wheel position is not correct, make all adjustments at spindle connecting rod sleeves.

Power Cylinder

Removal - Disconnect fluid lines from power cylinder, allow them to drain into a container. Remove pal nut, attaching nut, washer and insulator from end of power cylinder rod. Remove cotter pin and castellated nut securing power cylinder stud to center link. Disconnect power cylinder stud from center link. Remove insulator sleeve and washer from end of power cylinder rod. Inspect tube fittings and seats in power cylinder for nicks, burrs or damage. Replace the seats in the cylinder or the tubes as required.



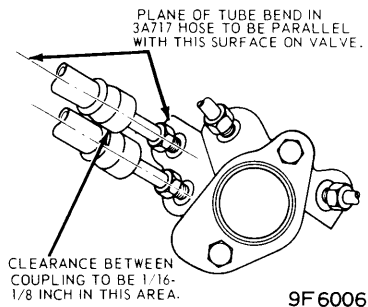
POWER CYLINDER ASSEMBLY

Installation - Install washer, sleeve and insulator on end of power cylinder rod. Extend rod as far as possible. Insert rod in bracket on frame and compress rod as necessary to insert stud in center link. Secure stud with a castellated nut and cotter pin. Secure power cylinder rod with an insulator, washer, nut and a pal nut. Connect fluid lines to their respective ports in the cylinder. Fill reservoir to correct level.

1968-73 BENDIX LINKAGE (Cont.)

Power Steering Pump
To Control Valve Hose

Removal – Remove fluid from pump reservoir with a suction gun. Raise vehicle on hoist, remove clamp retaining hose tubes to control valve. Disconnect fluid return and pressure hoses from control valve and allow fluid to drain into a pan. Lower vehicle, disconnect fluid return hose from reservoir. Disconnect fluid pressure hose from pump outlet fitting. Remove bolt attaching hoses, insulator and retainer to frame side rail. Remove hoses, insulator and retainer as an assembly. Remove pressure and return hoses from retainer and insulator.



HOSE INSTALLATION

Installation – To install, reverse removal procedure and note that Paint stripe on pressure hose must be aligned with slot in insulator. Paint or Tape band on return hose must be centered in insulator.

Power Steering Pump

Ford Motor Co. – Eaton Roller Type and Thompson Slipper (Integral Reservoir). See *Power Steering Pumps* in this section.

OVERHAUL

Control Valve

Disassembly – 1) Clean exterior of unit. Remove centering spring cap from valve housing. **CAUTION** – To hold control valve for disassembly, use a soft-jawed vise and clamp valve only around sleeve flange to prevent damage.

2) Remove nut from end of valve spool bolt. Remove washers, spacer, centering spring, adapter and bushing from bolt and valve housing. Remove bolts holding valve housing and sleeve together, separate housing from sleeve. Remove plug from valve sleeve.

3) Push valve spool out of centering spring end of valve housing, remove seal from spool. Remove spacer, bushing and seal from sleeve end of valve housing. Drive stop pin out of travel regulator stop with a punch. **NOTE** – Pull head of valve spool bolt tightly against travel regulator stop before driving pin out of stop.

4) Turn travel regulator stop counterclockwise in valve sleeve to remove stop from sleeve. Remove valve spool bolt, spacer and rubber washer from travel regulator stop. Remove rubber boot and clamp from valve sleeve.

5) Slide bumper, spring and ball stud seat out of valve sleeve, remove ball stud socket from sleeve. After removing return port hose seat, remove return port relief valve. After removing spring plug and O-ring, remove reaction limiting valve.

Tube Seat Replacement – If a hose seat is worn or damaged it should be replaced. Remove using an Easy-Out or by using a bolt as a puller. Tap existing hole in hose seat with starting tap of suitable size. **NOTE** – Be sure to remove all metal chips from hose seat port after tapping. Place a nut and large flat washer on a bolt of the same size as the tapped hole. The washer must be large enough to cover hose seat port. Insert bolt in tapped hole, using nut as a puller, remove hose seat. Place a new hose seat in the port and thread a bolt, of suitable size, into the port. Tighten bolt enough to bottom the seat in the port.

Reassembly – 1) Coat all parts with automatic transmission fluid. Install reaction limiting valve, spring and plug. Install return port relief valve and hose seat. Insert one of the ball stud seats (flat end first) into ball stud socket, and insert threaded end of ball stud into the socket.

2) Place socket in control valve sleeve so that threaded end of ball stud can be pulled out through slot in sleeve. Place the other ball stud seat, and spring, and bumper in socket, install and tighten travel regulator stop.

3) Loosen stop just enough to align nearest hole in stop with slot in ball stud socket, install stop pin in ball stud socket, travel regulator stop and valve spool bolt. Install rubber boot, clamp and plug on control valve sleeve. **NOTE** – Make sure lubrication fitting is turned on tightly and does not bind on ball stud socket.

4) Insert valve spool in valve housing. Rotate spool while inserting. Move spool toward centering spring end of housing, place small seal bushing and spacer in sleeve end of housing. Press valve spool against inner lip of seal and, at the same time, guide lip of seal over spool with a small screwdriver. **CAUTION** – Do not nick or scratch seal or spool during installation.

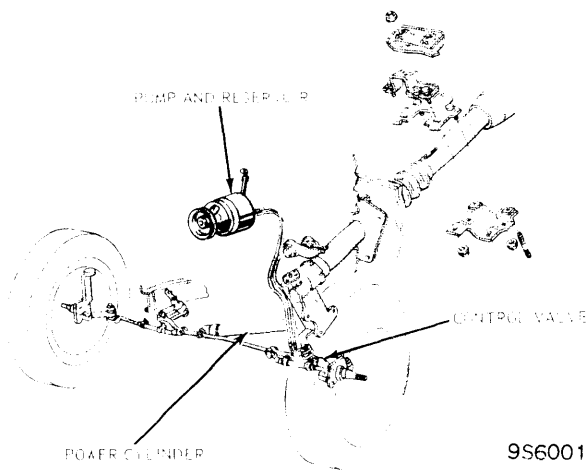
5) Place sleeve end of housing on a flat surface so that seal, bushing and spacer are at the bottom end and push down valve spool until it stops. Install spool seal and bushing in centering spring end of housing. Press seal against end of spool, guiding seal over spool with a small screwdriver. Pick up housing, slide spool back and forth in housing to check for free movement.

6) Place valve sleeve on housing so that ball stud is on same side of housing as the ports for the two power cylinder lines. Install two bolts in sleeve and tighten to specifications. Place adapter on centering spring end of housing, install bushing, washers, spacers and centering spring on valve spool bolt.

1968-73 BENDIX LINKAGE (Cont.)

7) Compress centering spring, install nut on bolt and tighten (90-100 INCH lbs.); then loosen it not more than 1/4 turn. **CAUTION** - Excessive tightening may break the stop pin at the travel regulator stop. Move ball stud back and forth in sleeve slot to check for free movement. Lubricate cap attaching bolts. Install centering spring cap on valve housing and torque bolts to specifications.

8) Install nut on ball stud so that valve can be positioned in a vise. Push forward on cap end of valve to check valve spool for free movement. Turn valve around in vise, and push forward on sleeve end to check the spool for free movement.



POWER CYLINDER & CONTROL VALVE LOCATION

Power Cylinder Seal

Removal - Clamp power cylinder in vise, remove snap ring from end of cylinder. **CAUTION** - Do not distort or crack cylinder in vise. Pull piston rod out all the way to remove scraper, bushing and seals. If seals cannot be removed in this manner, remove them from cylinder with a sharp pick. **CAUTION** - When using pick, take care not to damage shaft or seal seat.

Installation - **NOTE** - When replacing power cylinder seals, install all parts supplied in repair kit. Coat new seals with a suitable lubricant and place the parts on the piston rod which has been coated with the same grease. Push rod in all the way, and install parts in the cylinder with a deep socket slightly smaller than the cylinder opening.

Tightening Specifications	
Location	Ft. Lbs.
Cylinder Mounting Bracket (side hole).....	28-35
(bottom hole).....	35-43
Power Cylinder to Bracket.....	18-24
Power Cylinder to Bracket Locknut	3-5
Connecting Arm to Spindle Arm	
Cougar, Fairlane, Falcon,	
Montego & Mustang	① 30-40
Ford, Mercury & Meteor	① 35-47
Thunderbird & Continental Mark III	① 35-47
Lincoln Continental	40-55
Idler Arm Mounting Bracket	
All Except Lincoln Continental	28-35
Lincoln Continental	20-30
Pitman Arm to Control Valve.....	① 35-47
Steering Gear to Side Rail or Frame.....	50-65
Pitman Arm to Sector Shaft	
All Except Lincoln Continental	150-225
Lincoln Continental	150-200
① Torque to low limit of specifications, then tighten nut to nearest cotter pin slot.	