1971-73 TRIUMPH STAG POWER STEERING

Stag (1971-73)

DESCRIPTION

Power steering rack is similiar to manual rack and pinion steering but employs a rack shaft fitted with a double acting piston which operates in an enclosed, sealed cylinder. By means of a spool type control valve-piston assembly, pressurized oil from engine driven hydraulic pump is directed to one or the other side of rack piston to provide power assistance to deflect wheels as required.

ADJUSTMENT

PUMP BELT

Loosen three bolts securing pump bracket to engine and pivot pump and bracket to obtain 1/2" belt deflection at midpoint.

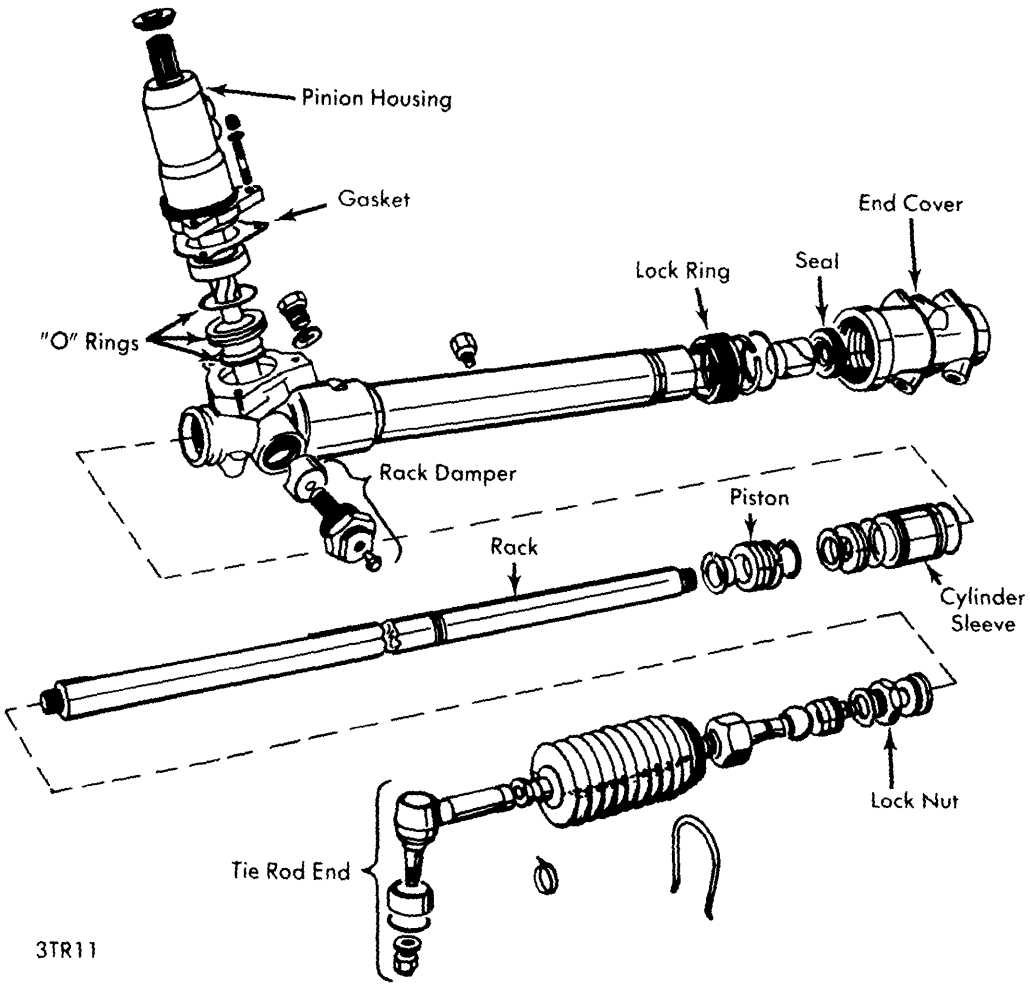
CAUTION — Excessive belt tension will shorten belt life and overload pump shaft bearing.

BLEEDING SYSTEM

Ensure all hydraulic connections are tight and fill reservoir to high level mark on dipstick. Place wheels in straight ahead position, and with pump belt loosened or removed, rotate pulley by hand to prime system. Install and adjust drive belt. Check, and if necessary, fill reservoir. Start engine and allow to idle. Turn steering wheel to full lock position and return to straight ahead position, check fluid level. Turn steering wheel to opposite lock and return to straight ahead position, and again check fluid level. Turn steering wheel lock to lock several times, then return to straight ahead position. Finally recheck fluid level once more.

RACK DAMPER

Remove small hexagonal plug from plunger adjusting screw and ensure that rack is near central position of travel. Using a suitable dial indicator, contacting rack shaft, gently rock rack shaft toward front and rear of vehicle and observe readings on dial indicator. Correct reading is .003-.007" (.076-.178 mm). To increase rack movement, rotate adjusting screw counterclockwise; to decrease rack movement, rotate adjusting screw clockwise. Hold adjusting screw and tighten lock nut when adjustment is correct. Recheck reading before removing dial indicator and replacing hexagonal plug.



STAG POWER-ASSISTED RACK & PINION GEAR

1971-73 TRIUMPH STAG POWER STEERING (Cont.)

REMOVAL & INSTALLATION

POWER STEERING GEAR

Removal – Disconnect tie rod ball joints from steering arms. Remove pinch bolt connecting intermediate shaft to control valve pinion shaft. Release hydraulic lines at control valve. Remove bolts securing rack housing to crossmember, and withdraw assembly.

Installation – To install, reverse removal procedure and bleed system.

POWER STEERING PUMP

Removal – Disconnect flexible hoses from pump. Loosen bolts securing pump mounting bracket to engine and relieve belt tension. Remove drive belt from pump pulley. Remove pump securing bolts and lift out pump, complete with bracket. Remove mounting bracket from pump.

Installation – To install, reverse removal procedure and bleed system.

CONTROL VALVE & PINION

Removal – With rack removed from vehicle, slacken lock nut on rack plunger adjusting screw and loosen screw. Disconnect rack pipes from control valve. Remove nuts securing control valve assembly to rack. Withdraw control valve and pinion unit.

Installation – Position new pinion seal and housing gasket. Fit control valve to rack, ensuring pinion does not damage new oil seal. Make rack damper adjustment as previously outlined. Install gear assembly and bleed system.

OVERHAUL

POWER STEERING GEAR

Disassembly – 1) Loosen clamps securing bellows and slide bellows along tie rods to expose rack ends. Release tab washers and unscrew tie rod seats from rack.

2) Detach unions connecting rack pipes to control valve and rack housing. Remove pipes. Loosen lock nut on rack plunger adjusting screw and remove screw, spring, and plunger. Remove nuts and washer securing control valve to rack housing. Remove control valve.

3) Remove pinion seal housing and wahser from rack. Using suitable tool (S355), release ring secruing end housing to rack housing and remove end housing. Remove union from center of rack housing and remove rack. Remove cylinder sleeve from center of cylinder. Remove circlips and carefully extract piston from rack shaft, taking care not to scratch rack shaft.

Reassembly – 1) *NOTE – During reassembly, all "O" rings and seals must be replaced.* Place new seal and nylon backing ring to cylinder sleeve, with lip of seal adjacent to locating hole and square edge of nylon ring against seal.

2) Install new "O" rings on cylinder sleeve and lubricate cylinder bore with hydraulic oil. Lube seal lip and slide cylinder sleeve (seal first) over rack shaft (at end opposite rack teeth), and move sleeve along rack until beyond location of piston but not over rack teeth.

3) Fit piston inner circlip to rack shaft, taking care not to score shaft. Install piston inner "O" ring to rack shaft. Seat piston ring on piston and slide assembly into position on rack shaft and secure with circlip.

4) Align tapped hole in cylinder sleeve with countersunk hole in cylinder and carefully slide sleeve and rack shaft into cylinder. Through countersunk hole in cylinder, locate tapped hole in cylinder sleeve.

5) Ensuring end cover securing ring is at open end of cylinder, smear conical seat of union with hydraulic sealing compound, install, and tighten union. Place new lip seal (lip toward cylinder bore) and "O" ring on end cover. Lubricate seal lip and slide end cover into position. Align mounting feet and secure end cover by tightening threaded retaining ring.

6) Fit lip seal and "O" ring to retainer. Position washer in recess of pinion housing and install retainer (lip seal downward). Place new gasket on control valve flange. Locate rack shaft in cylinder so that rack teeth are visible through control valve flange and are aligned to permit engagement of pinion gear.

7) Carefully enter pinion through seal and engage rack teeth, locating control valve over studs. Install and tighten Nyloc secruing nuts. Rotate pinion until rack is centralized: dimple on rack shaft is visible through thrust plunger opening.

8) Install rack damper, spring, adjusting screw, and lock nut to rack housing. Remove small plug from center of adjusting screw, install dial gauge, and make rack damper adjustment, as previously outlined. Install grease nipple in place of small plug and lubricate rack. Replace plug.

9) Position new end washer complete with "D" type lock plates to rack (recessed side toward rack). Attach tie rod inner ends to rack. *NOTE – Tighten both inner ends simultaneously to prevent stress on pinion.* Secure inner ends by bending tabs of lock plates. Check ball joints for free movement.

10) Grease rack ends and inner ball ends. Slide bellows into postion and secure with clamps. Fit tubing to control valve and rack housing.

POWER STEERING PUMP

NOTE – Where "front" and "rear" are mentioned, interpret "front" to indicate pulley end of pump.

Disassembly – 1) Drain oil from reservoir and clean pump exterior. Remove nut and washer securing pulley to shaft, and using a suitable puller, remove pulley. Remove Woodruff key from pump shaft.

2) Remove mounting stud from rear of pump body. Remove pressure outlet complete with "O" ring and remove relief/flow valve and spring. Remove bolt securing reservoir to pump and remove reservoir. Remove circlip securing pump end plate by inserting a pin punch or stiff wire into small hole drilled in body casing. Remove end plate and spring and extract end plate "O" ring from pump body.

3) Carefully slide pump shaft to rear of body and remove shaft complete with pressure plate, thrust plate and rotor assembly. Remove thrust plate, dowel pins, eccentric ring and rotor vanes. Thrust plate may be removed from shaft by removing circlip from shaft.

Reassembly – Inspect all components for wear or damage. Oil seal and all "O" rings should be replaced. Lubricate all components with automatic transmission fluid during reassembly. To reassemble, reverse disassembly procedure.

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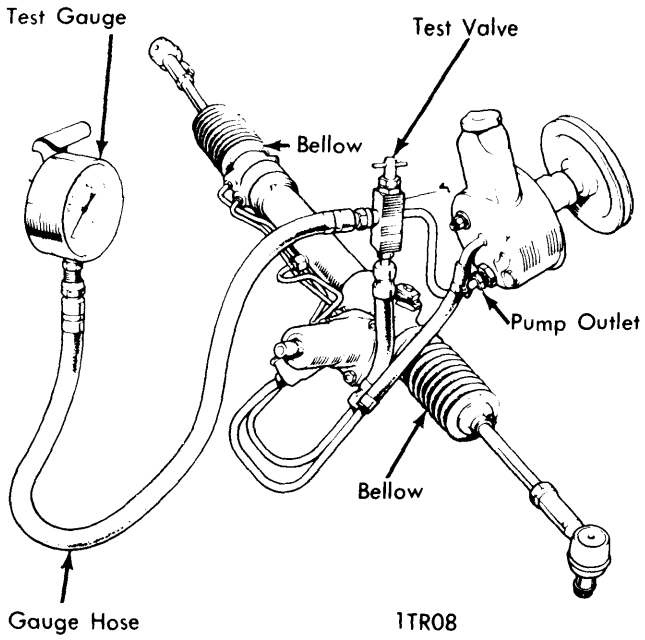
POWER STEERING SYSTEM TEST

1) Check reservoir level and examine power steering units and connections for leaks. All leaks must be corrected before proceeding with test. Check drive belt for tension and condition. Release bellows from rack ends and check for fluid leakage. Install suitable test gauge (JD10) and test valve (10-2) to pump outlet line as shown in illustration. Ensure all air is exhausted from circuit, oil level in reservoir is correct, and oil is at normal operating temperature.

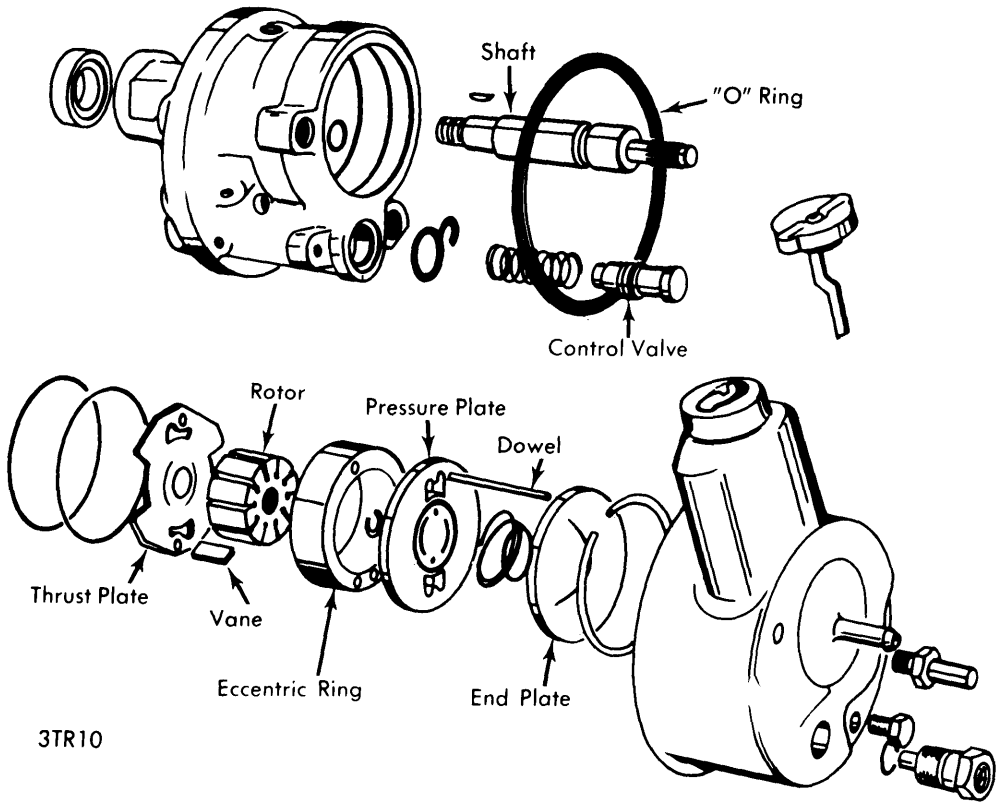
2) With test valve open and engine running, gently turn steering wheel to left and right lock while observing pressure gauge. A pressure of 750-850 psi (52.73-59.76 kg/sq. cm) should be recorded in both cases. If pressure is not within specifications, or a pressure imbalance exists, a fault exists in system.

3) Close test valve for a period not exceeding five seconds. If gauge fails to read 750-850 psi (52.73-59.76 kg/sq. cm), pump is inefficient and pump relief/flow valve should be examined and replaced as necessary. Repeat this test after replacing relief/flow valve and bleeding system. If pump still falls below specifications, repair or replace pump.

4) Remove rack cylinder pipes from rack control valve and seal ports using suitable plugs. With engine idling, turn steering gently to left and right, observing gauge reading. *CAUTION – Do not hold wheel in either direction for periods exceeding five seconds.* Check that 750-850 psi (52.73-59.76 kg/sq. cm) is obtained in both directions. If pressure is not to specifications, rack control valve is defective. If pressure is within specifications, fault lies in rack assembly.



POWER STEERING SYSTEM TEST



STAG POWER STEERING PUMP