ARROW & COLT RECIRCULATING BALL

Arrow
Colt

DESCRIPTION

Steering system uses a recirculating ball gear of variable ratio. This type of gear minimizes gear ratio at the straight-ahead position, resulting in high stability at center; however, as the wheel is turned from center, gear ratio increases, allowing easy maneuvering.

REMOVAL & INSTALLATION

STEERING GEAR

Disconnect steering shaft from gear box main shaft. Using suitable puller, separate relay rod from pitman arm. Remove gear box from frame. Pull pitman arm from cross shaft. To install, reverse removal procedure.

TIE ROD ASSEMBLY

Removal – Disconnect tie rod ends from steering knuckle, using a suitable puller (CT-1116). NOTE – *If disc brake pad is excessively worn, the caliper will interfere with operation of the puller. If this problem exists, remove the worn pad, and pull the caliper outward.* Unscrew tie rod ends from tie rod.

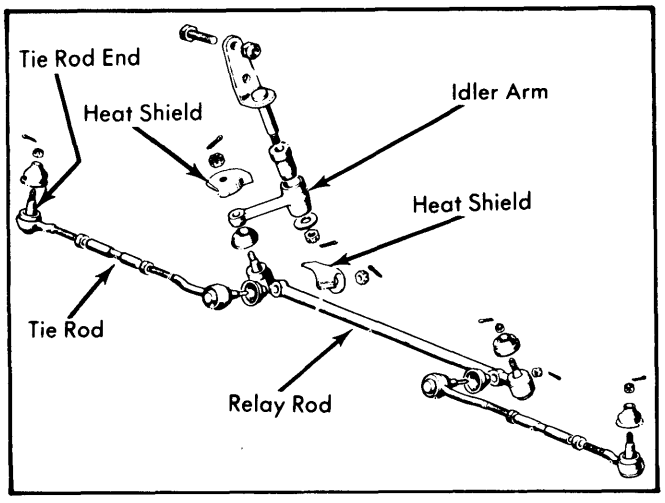

Fig. 1 Exploded View of Steering Linkage

RELAY ROD

Removal – Disconnect tie rod ends from steering knuckle arms using suitable puller (CT-1116). Detach pitman arm and idler arm, using suitable puller (C-3894-A). Remove relay rod.

Installation – Grease tie rod end dust cover and coat lower edge of cup with packing sealer before installation. Temporarily install tie rod ends to rod, so that distance from center of inner tie rod end stud to outer tie rod end stud is 12.25" (311.15 mm). Now turn tie rods until amount of threaded area showing on each side of tie rod sleeve is equal. Install assembly on vehicle and check toe-in. See *Colt in WHEEL ALIGNMENT section.*

Installation – To install, reverse removal procedure, noting the following: Ensure dust covers are well greased and that lower edge of covers are coated with packing sealer.

IDLER ARM

Removal – Disconnect idler arm from relay rod, using suitable tool (C-3894-A). Detach idler arm bracket from body frame, and remove idler arm assembly. Disassemble idler arm from bracket.

Installation – Apply soapy water to idler arm and bushing, then insert bushing as far as stepped portion will cover. Apply soapy solution to bracket shaft and, using a vise, force bracket shaft into bushing until bushing ends spread an equal amount. Tighten lock nut to specification, then further to line up cotter pin hole. Replace bracket to frame.

PITMAN ARM

Removal – After removing steering gear, disconnect pitman arm from cross shaft, using a suitable puller (CT-1106).

Installation – During installation, ensure slit on cross shaft aligns with pitman arm mark.

OVERHAUL

STEERING GEAR

Disassembly – 1) Prior to disassembly, record starting torque of main shaft (as guide during assembly). Remove adjusting screw lock nut, turn screw counterclockwise (partial turn), then remove cover. When cover is free of sector shaft, remove adjusting screw. Set gear in straight ahead (center) position and withdraw sector shaft from gear box.

2) Measure and record main shaft starting torque with sector shaft removed. Remove end cover and record quantity and thickness of shims. Carefully draw out main shaft, ball nut assembly and bearing.

Inspection – Check components for excess wear or free play. If rough rotation or excess play is found in main shaft or ball nut, replace both as an assembly. NOTE – *Do not move ball nut fully to either end of main shaft.*

Assembly & Adjustment – 1) Place gear box in vise with main shaft in horizontal position. Replace end cover with shim (same as removed) and torque to specifications. Measure main shaft preload. If less or greater than 3.0-4.8 INCH lbs. (.42-.66 cmkg), reduce or increase shim size to obtain proper preload.

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2) Install adjusting screw and proper shim in groove on sector shaft. Be sure axial play of shaft is no greater than .002" (.051 mm). If greater, change shim size. Lubricate and install sector shaft in housing. Replace cover and cover bolts. Turn sector shaft several times from side to side, then turn adjusting screw in and out several times, to set proper gear mesh.

3) Loosen adjusting screw until no play is noticed at main shaft when gear in in central position. Tighten lock nut. Recheck main shaft preload; it should now be 5.7-7.4 INCH lbs. (.79-1.02 cmkg). Fill gear box with SAE 90 gear oil. Check oil level through lower right bolt hole. Proper level from hole is 0.7" (18 mm) for 1600 cc engine and .87" (22 mm) for 2000 cc engine.

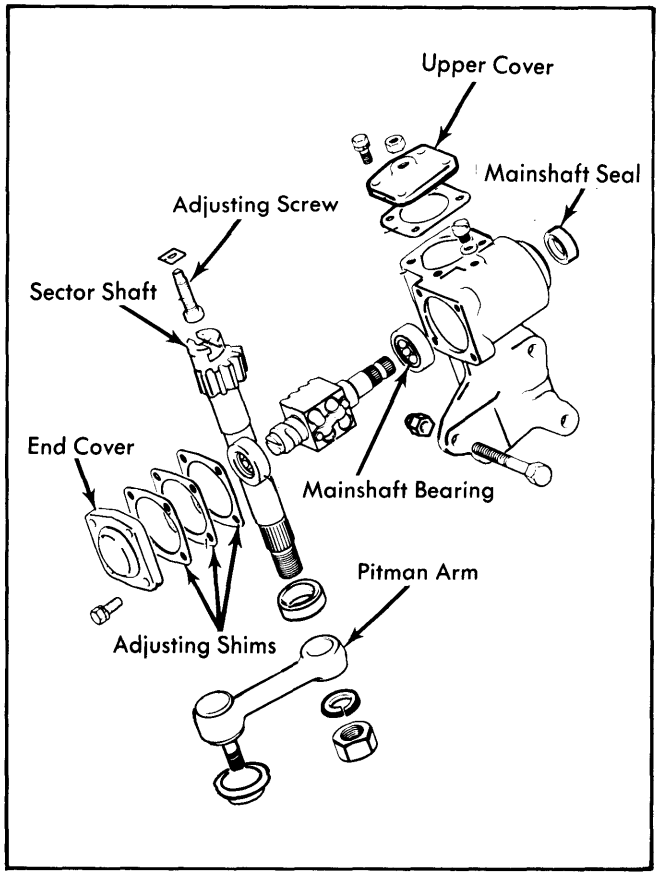

Fig. 2 Exploded View of Recirculating Ball & Nut Steering Gear — 1600 cc Engine

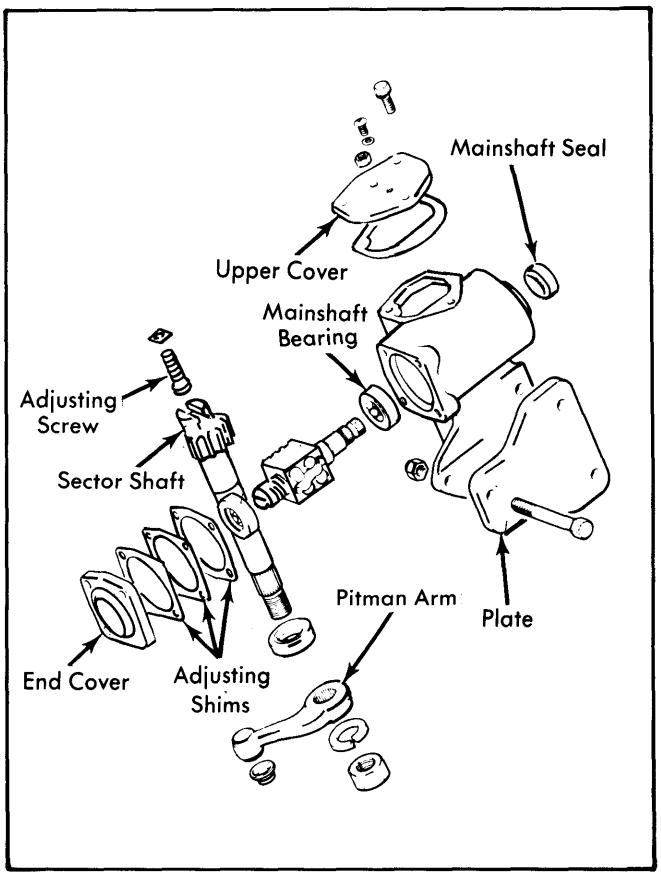

Fig. 3 Exploded View of Recirculating Ball & Nut Steering Gear — 2000 cc Engine

TIGHTENING SPECIFICATIONS

Application	Ft. Lbs. (mkg)
Gear Box-to-Frame	
1600 cc	25-29 (3.5-4.0)
2000 cc	32-36 (4.4-5.0)
Pitman Arm-to-Gear Box	94-108 (13.0-14.9)
Tie Rod Stud Nuts	29-36 (4.0-5.0)
Relay Rod-to-Pitman Arm	29-43 (4.0-6.0)
Tie Rod End Lock Nut	29-36 (4.0-5.0)
Relay Rod-to-Tie Rod	29-36 (4.0-5.0)
Turnbuckle Lock Nut	36-40 (5.0-5.5)
Idler Bracket-to-Frame	25-29 (3.5-4.0)
End Cover	11-14 (1.5-2.0)