

TOYOTA COROLLA RECIRCULATING BALL

Corolla

DESCRIPTION

STEERING GEAR

Steering gear is a worm and sector gear using a recirculating ball. A worm bearing adjusting screw is provided to eliminate excessive backlash.

STEERING LINKAGE

Linkage consists of a pitman arm, relay rod, idler arm, and two adjustable tie rod ends which connect to steering knuckles. The pitman arm-to-relay rod connection and tie rod end-to-steering knuckle connection are ball joint type, completely sealed and requiring no lubrication service.

ADJUSTMENT

NOTE — All adjustment procedures are described in the Overhaul portion of this article.

REMOVAL & INSTALLATION

STEERING GEAR

Removal — Remove pinch bolt coupling yoke to steering gear worm shaft. Using a puller, separate pitman arm linkage. Remove mounting bolts and pull gear housing out toward lower side.

Installation — Fit steering worm shaft to flexible coupling yoke ("U" joint) and install the steering housing assembly to frame. Install and tighten pinch bolt. Reconnect pitman arm linkage. Fill steering box with SAE 90 gear oil.

STEERING LINKAGE

Removal — Raise and support front of vehicle, then remove front wheels. Disconnect pitman arm from sector shaft. Disconnect idler arm from frame. Using a puller, separate tie rod from steering knuckle, then take off entire linkage assembly.

Installation — To install, reverse removal procedure and note the following: Check tie rods to ensure they can be turned, then tighten clamp bolts. Check and reset wheel alignment.

OVERHAUL

Disassembly — Remove pitman arm. Remove sector shaft adjusting screw lock nut. Unscrew end cover bolts, then remove cover and sector shaft. Using suitable wrench, remove worm bearing adjusting screw lock nut. Remove worm bearing adjusting screw from gear housing. Take out steering worm assembly along with bearings.

NOTE — Ball nut and steering worm are an assembly, if defective, entire assembly must be replaced. If replacement of needle roller bearing or sector shaft is necessary, replace gear housing, needle roller bearing and sector shaft as sets.

Inspection — Check all components for looseness, damage, or wear and replace as required. Measure sector shaft bushing inner diameter for 1.103-1.104" (28-28.02 mm), and sector shaft diameter for 1.102-1.1029" (27.98-27.993 mm). Measure clearance between sector shaft and thrust washer, if clearance exceeds .002" (.05 mm), correct with selective fit washer. Washers are available in sizes for .078 to .086" (2.0 to 2.2 mm). Check bearing races for scoring, pitting, or other abnormalities and replace as necessary. Replace housing oil seal.

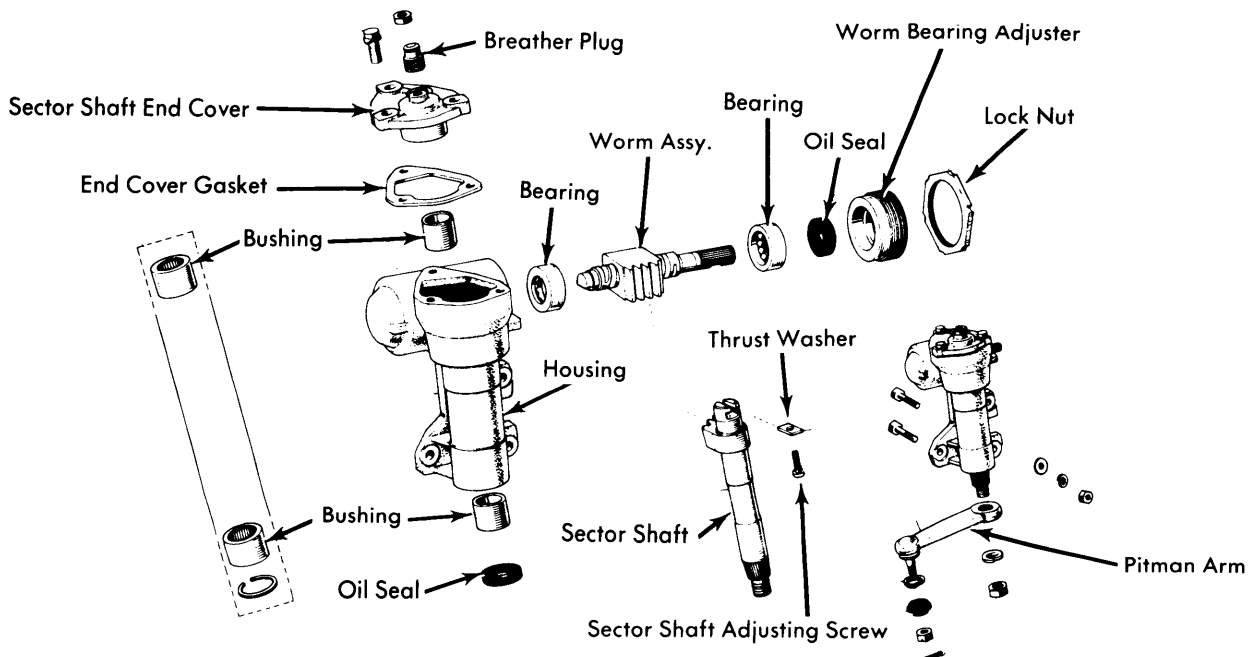


Fig. 1 Exploded View of Corolla Steering Gear Assembly

TOYOTA COROLLA RECIRCULATING BALL (Cont.)

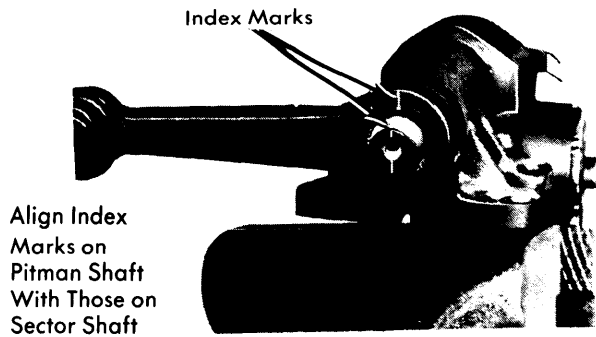


Fig. 2 Pitman Arm Sector Shaft Index Marks

Reassembly and Adjustment – 1) Apply gear lubricant to all bearings and sliding portions as they are reassembled.

2) Insert worm and assemble adjusting screw. Tighten adjusting screw within turning range of steering worm, allowing bearings to properly seat. Then, loosen adjusting screw and preload bearing by gradually tightening screw. Worm bearing preload starting torque, measured with pull scale, should be 3.5-4.3 lbs. (4-5 cmkg). Rotating torque should be 8.8-11 lbs (4-5 kg). Tighten lock nut.

3) Set ball nut at center and insert sector shaft so shaft gear center will mesh with worm. *NOTE* – On constant mesh types, check that needle roller bearings have not loosened.

4) Install adjusting screw, gasket and end cover. Adjust overall preload by screwing in sector shaft adjusting screw. Starting torque should be 6.9-9.5 lbs. (8-11 cmkg) and turning torque should be 17.6-24.3 lbs. (8-11kg). *NOTE* – Measurements should be made with gear meshed at center.

5) Install pitman arm and check deflection at arm end with dial gauge. Backlash should be within 5° at either side of center position. After completing measurement, tighten adjusting screw lock nut.

TIGHTENING SPECIFICATIONS

Application	Ft. Lbs. (mkg)
Steering Gear Housing-to-Frame	25-36 (3.5-5.0)
Steering Coupling Pinch Bolt.....	14-22 (1.9-3.0)
Pitman Arm-to-Steering Linkage	72-100 (10-13.8)
Pitman Arm-to-Steering Linkage	36-51 (5.0-7.1)
Sector Shaft End Cover	11-16 (1.5-2.2)