TOYOTA TERCEL RACK & PINION

DESCRIPTION

Steering assembly is a direct-acting rack and pinion system. This unit consists of a rack bar and toothed pinion. Adjustment is provided for pinion gear preload. Rack is protected from dirt by rubber boots.

ADJUSTMENT

NOTE – *Adjustments are performed during gear reassembly. See overhaul as outlined.*

REMOVAL & INSTALLATION

Removal – 1) Raise front of vehicle and support with safety stands. Position steering wheel so front wheels point straight ahead. Remove pinch bolts from intermediate shaft. Disconnecting pinion side first, remove intermediate shaft.

2) Remove cotter pins and nuts from tie rod ends. Use a puller to disconnect tie rod ends from steering knuckles. Remove 6 lower crossmember retaining bolts, then remove lower crossmember. Remove rack housing brackets, taking care not to damage rack boots. Remove steering gear.

Installation – To install, reverse removal procedure and note the following: Check toe-in. See *WHEEL ALIGNMENT Section for specifications and procedures.*

OVERHAUL

Disassembly – 1) Place steering gear in a vice and mark rack end threaded areas for reassembly reference. Remove tie rods, spring clips, rack end dust seals and rack boot clamps. Remove rack boots.

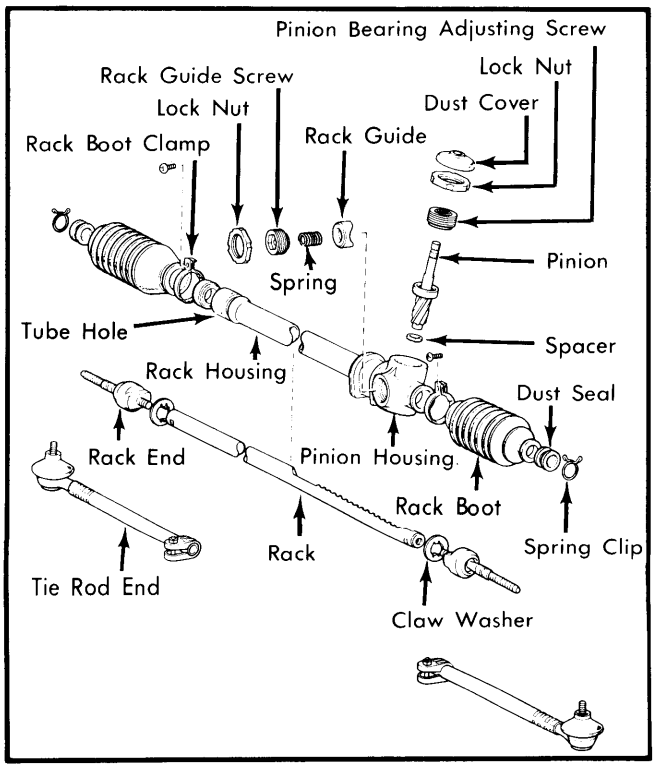

Fig. 1 Exploded View of Tercel Rack and Pinion Steering Gear Assembly

NOTE – *Left and right tie rod ends, rack boots and rack ends are different and should be marked accordingly.*

2) Unstake claw washers and remove rack ends. Using guide screw lock nut wrench (09617-10010), remove lock nut. Then, using rack guide screw wrench (09612-10020), remove guide screw and spring. Remove rack guide by pulling out with needle-nose pliers.

3) Remove pinion bearing adjusting screw lock nut with lock nut wrench (09617-10010) and pinion bearing adjusting screw with pin tool (09616-10091).

4) Pull rack completely through pinion housing side and align notched portion of rack with pinion. Pull pinion and upper pinion bearing out of pinion housing. Remove rack from pinion housing side without rotating it.

Inspection – 1) Check all parts for damage or deterioration. Check for play in rack ends and tie rod end ball joints. Check pinion teeth surfaces for wear or damage.

2) If pinion oil seal must be replaced, drive it in until it protrudes .020" (0.5 mm) from tip of pinion bearing adjusting screw.

3) If pinion upper bearing must be replaced, remove with a puller. Drive new bearing on with installer tool (09612-10061).

NOTE – *Seal side of bearing faces down.*

4) If pinion lower bearing must be replaced, heat rack to at least 176°F (80°C). Tap bearing out with plastic hammer. Reheat pinion housing and drive in new bearing.

5) Check rack for runout and tooth wear. Runout must not exceed .012" (0.3 mm). If rack bushing must be replaced, remove with puller. Press in new bushing.

Reassembly & Adjustment – 1) Pack pinion lower bearing and rack bushing with grease. Fill rack housing about half full of grease. Coat rack with grease and insert into pinion housing side. Position notches so pinion can be inserted.

2) Pack grease into pinion bearing. Coat pinion teeth with grease and insert spacer and pinion into pinion housing. Pinion end must be securely positioned in pinion lower bearing. Coat oil seal with grease and install pinion bearing adjusting screw. Place an INCH Lb. torque wrench and adapter (09616-10010) on end of pinion and tighten adjusting screw until pinion turning torque is 3.5 INCH Lbs. (4 cmkg). Then, loosen adjusting screw until pinion turning torque is 1.7-2.6 INCH Lbs. (2-3 cmkg).

3) Apply liquid sealer to adjusting screw lock nut and housing contact points. Tighten lock nut to 58-75 ft. lbs. (8.0-10.5 mkg). Check pinion turning torque. It should be 1.3-2.2 INCH Lbs. (1.5-2.2 cmkg).

NOTE – *Tightening lock nut decreases pinion turning torque by 0.4 INCH Lbs. (0.5 cmkg).*

4) Mesh rack and pinion. Coat rack guide with grease. Install rack guide, spring and rack guide screw. Using torque wrench and guide screw wrench, tighten guide screw to 18 ft. lbs. (2.5 mkg). Loosen screw about 30° from tightened position. Measure pinion turning torque and adjust by turning guide screw. Acceptable range is 4.3-11.3 INCH Lbs. (5-13 cmkg).

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5) Apply liquid sealer to lock nut and housing contact points, and, using torque wrench and lock nut wrench, tighten lock nut to 37-47 ft. lbs. (5.0-6.5 mkg). Recheck total preload with a full stroke of the rack. Apply grease to rack end ball joints. Align claw washer with rack groove and tighten rack end into housing. Stake claw washer.

6) Coat rack end dust seal with grease. Clear rack housing tube hole of any grease. Install rack boots. Spring clips must have bends facing outward. Rack boot clamp on pinion housing side should have a gap of .197-.236" (5-6 mm) but tube side clamp should have no gap.

7) Rotate pinion and check rack stroke. Rack stroke should be 4.88" (124 mm). There should be no contour change of rack boots during this operation. Install tie rod ends and position them according to marks made on threads during disassembly.

TIGHTENING SPECIFICATIONS

Application	Ft. Lbs. (mkg)
Intermediate Shaft Pinch Bolts	22-28 (3.0-4.0)
Pinion Bearing Adjusting Screw Lock Nut	73-94 (10.0-13.0)
Rack Guide Screw Lock Nut	44-57 (6.0-8.0)
Rack End-to-Rack	48-65 (6.5-9.0)
Rack Housing Bracket-to-Body	22-32 (3.0-4.5)
Tie Rod-to-Knuckle	37-50 (5.0-7.0)
Tie Rod-to-Rack End	11-14 (1.5-2.0)