

TRIUMPH RACK & PINION

TR7
Spitfire

DESCRIPTION

Steering gear is a rack and pinion type with direct linkage (tie rods) to steering arms. Gear housing is mounted by "U" bolts to chassis and connected to steering shaft by a flexible coupling.

ADJUSTMENTS

Rack and pinion free play are adjusted through the use of shims on the rack damper and pinion shaft. These adjustments are performed as part of overhaul procedure. See *Overhaul* below.

REMOVAL & INSTALLATION

RACK AND PINION

Removal — 1) Raise vehicle and place on safety stands. Scribe an index mark on pinion shaft and lower steering coupling for installation purposes. Disconnect tie rod ends from steering knuckle.

2) Remove pinch bolt attaching lower steering coupling to rack pinion. On TR7 models only, withdraw bolts mounting pinion end of rack to chassis. On all other models, "U" bolts mount steering rack to chassis.

3) On TR7 only, remove remaining rack mounting hardware, disconnect lower pinion shaft coupling and take rack out driver's side. On all others, slide rack forward disengaging rack pinion splines from flexible coupling. Disconnect ground strap from rack plug and withdraw steering rack.

Installation — 1) If rack has been disassembled, it must be centralized before reinstallation: Remove center plug from thrust pad and, using a piece of welding rod, locate dimple in rack shaft. When dimple in rack shaft is aligned with plug hole rack is centralized.

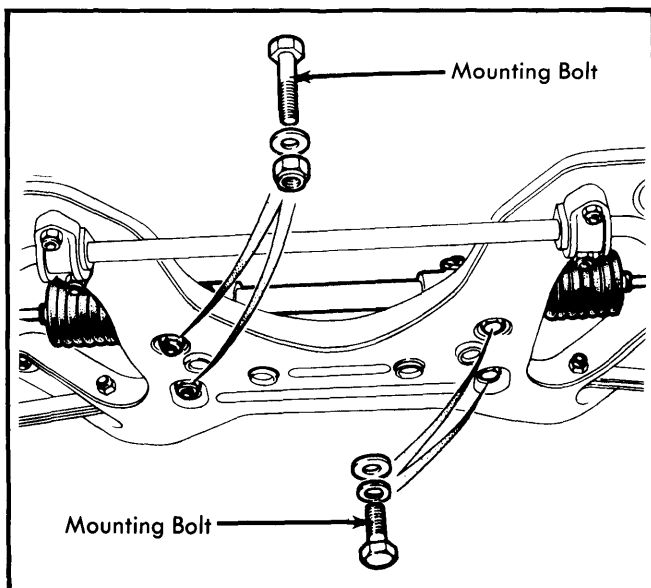


Fig. 1 Installed View of TR7 Rack Assembly

2) Carefully slide rack assembly into position but DO NOT disturb rack shaft. On TR7 models only, secure rack to chassis with mounting hardware, refit tie rod ends and tighten pinion coupling pinchbolt.

3) On all other models, hold steering wheel in straight-ahead position and engage rack pinion shaft splines in flexible coupling. Install and tighten pinch bolt. Keep rubber grommets correctly positioned on inboard side of rack flanges with lip under straight face of flange, then fit "U" bolts (Fig. 2). Refit tie rod outer ends to steering arms.

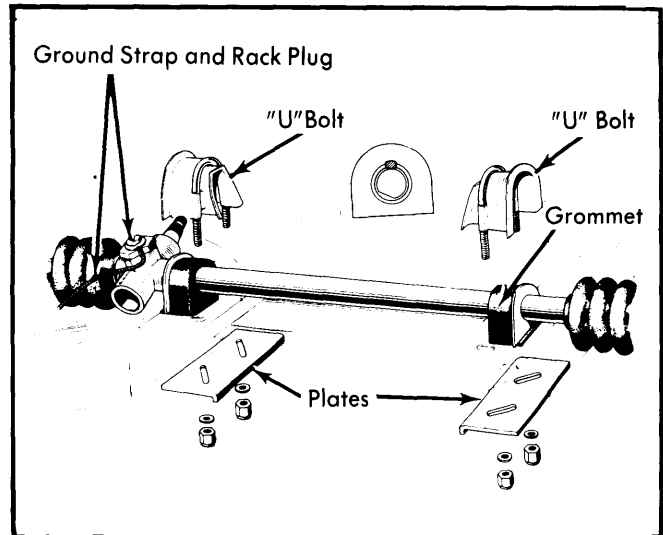


Fig. 2 Spitfire Rack with Rubber Grommets

4) Make sure all nuts and bolts are tightened and check front wheel alignment. See *Triumph* in *WHEEL ALIGNMENT* Section.

OVERHAUL

NOTE — Overhaul operation is based on Spitfire models, but procedures can be generalized to include TR7.

RACK AND PINION

Disassembly — 1) Release clip and slide bellows toward outer ball joint. Slacken inner lock nut and unscrew tie rod assembly from rack. Withdraw spring from rack end. Straighten tab washer, unscrew sleeve nut, and remove tab washer, shims, and cup.

2) Slacken outer lock nut and unscrew tie rod end from tie rod. Remove outer lock nut, bellows, and cup nut. Remove inner lock nut from rack. Repeat on other end.

3) From gear housing, remove cap of rack damper assembly. Withdraw shims, spring, and damper. Then, remove circlip from top end of pinion and pull out pinion (take care not to lose dowel pin). Remove retaining ring, shims, bushing, and thrust washer. Extract "O" ring from groove in retaining ring. Pull rack from tube and remove pinion lower thrust washer and bushing (from housing). If required, bushings may be removed from rack tube.

Reassembly — 1) Install end cover and lower bushing in pinion housing, making sure recessed end of bushing is next to end cover. Insert lower thrust washer with chamfered edge of hole facing away from bushing.

TRIUMPH RACK & PINION (Cont.)

- 2) Place rack shaft into housing with rack teeth toward pinion end. Install lock nuts, tie rods, springs and adaptors, then tighten lock nuts to specification.
- 3) Pack tie rod inner ball joints with grease and install bellows and clips.
- 4) Rotate rack shaft until teeth mesh with pinion, then install pinion, upper thrust washer, bushing, and shims in housing.

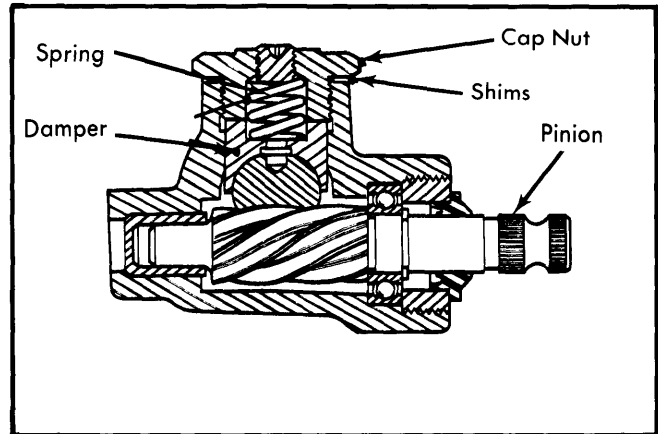


Fig. 4 Cross Sectional View of TR7 Pinion with Housing and Rack Damper (Spitfire Similar)

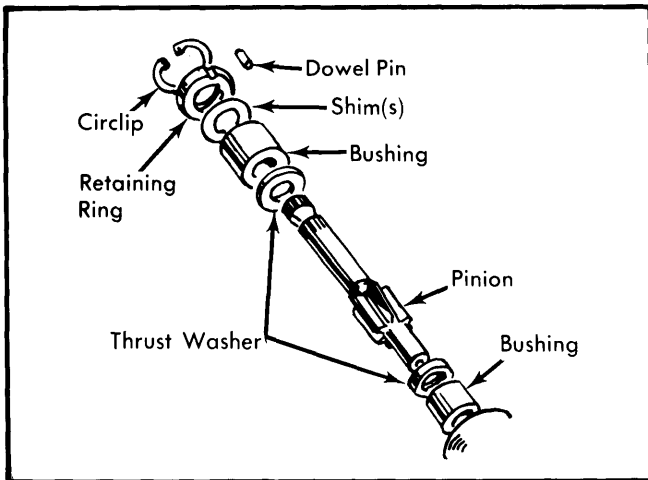


Fig. 3 Detailed View of Spitfire Pinion

- 5) Insert new "O" ring in retaining ring, then install retaining ring and dowel pin in housing. Install circlip and check that pinion end play does not exceed .010" (.254 mm). Adjust shim pack as necessary to meet this specification (See Fig. 3).
- 6) Install rack damper, shims, spring and cap nut. Check rack side play (90° to shaft axis) is within .004-.008" (.1-.2 mm). Adjust as required by adding or subtracting shims (Fig. 4), then reconnect ground strap (if removed).

TIGHTENING SPECIFICATIONS

Application	Ft. Lbs. (mkg)
Steering Gear-to-Frame	
TR7	22-29 (3.0-4.0)
Spitfire	16 (2.2)
Tie Rod Lock Nuts	
TR7	30-37 (4.1-5.1)
Spitfire	38 (5.2)
Universal Joint Pinch Bolts	
TR7	16-21 (2.2-2.9)
Spitfire	14 (1.9)

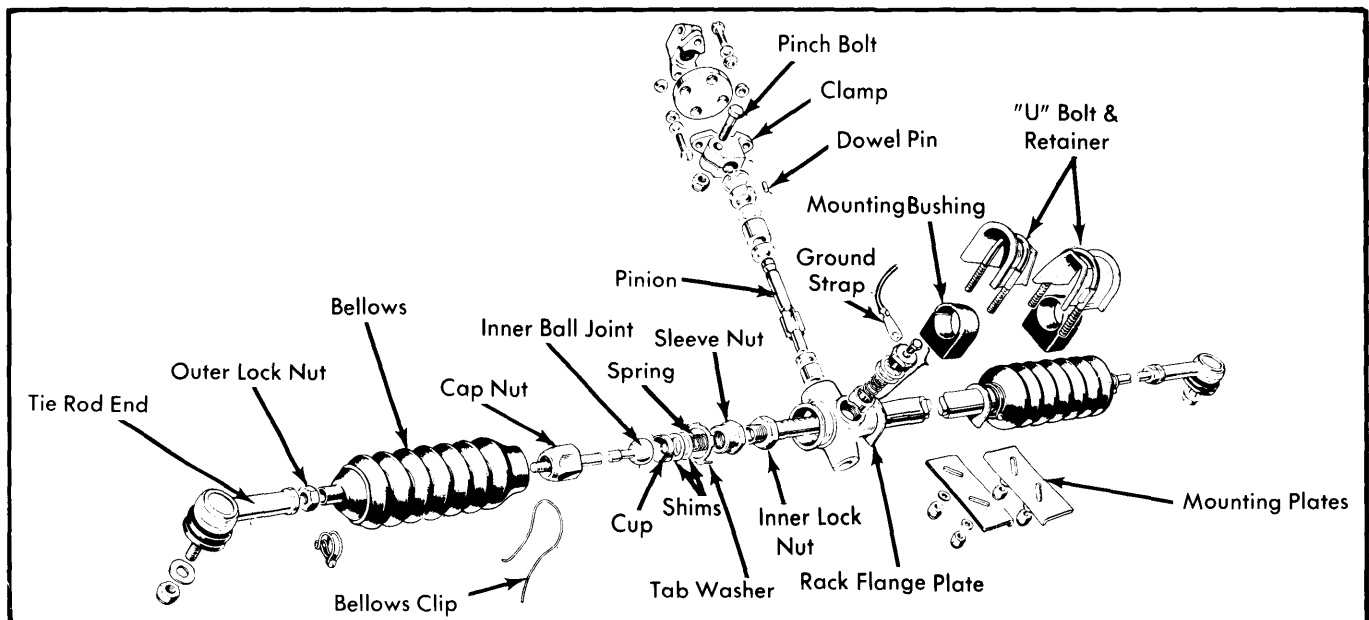


Fig. 5 Triumph Spitfire Rack and Pinion Steering