TRIUMPH RACK & PINION

TR6
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.

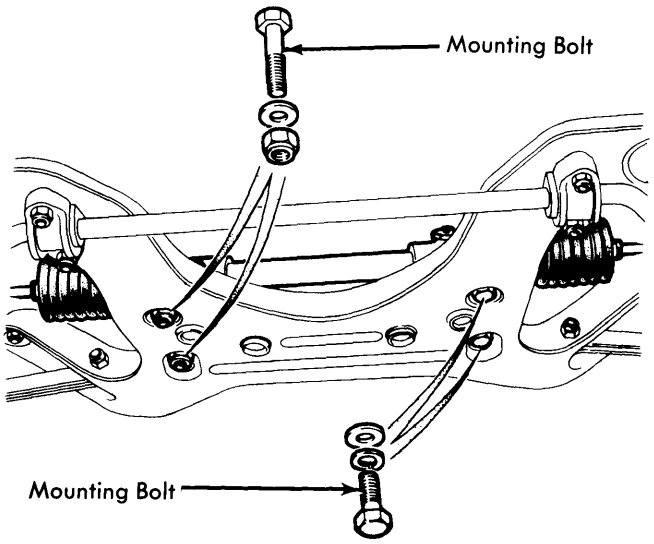

Fig. 1 Installed View of TR7 Rack Assembly

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 *(Fig. 1).*

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.

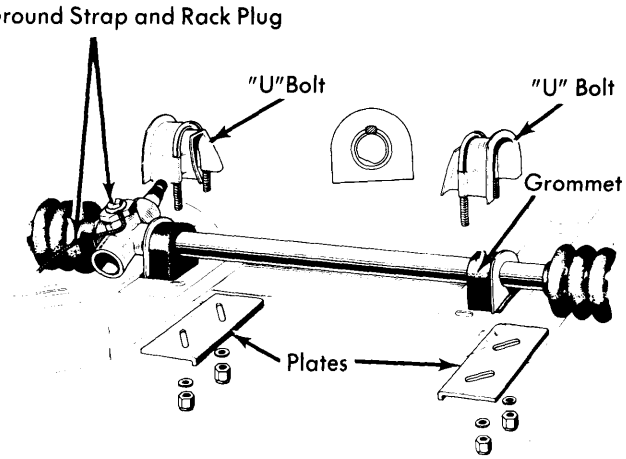

Fig. 2 Reassembly of Rack Rubber Grommets (TR6 and Spitfire)

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 both TR6 and 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.

TRIUMPH RACK & PINION (Cont.)

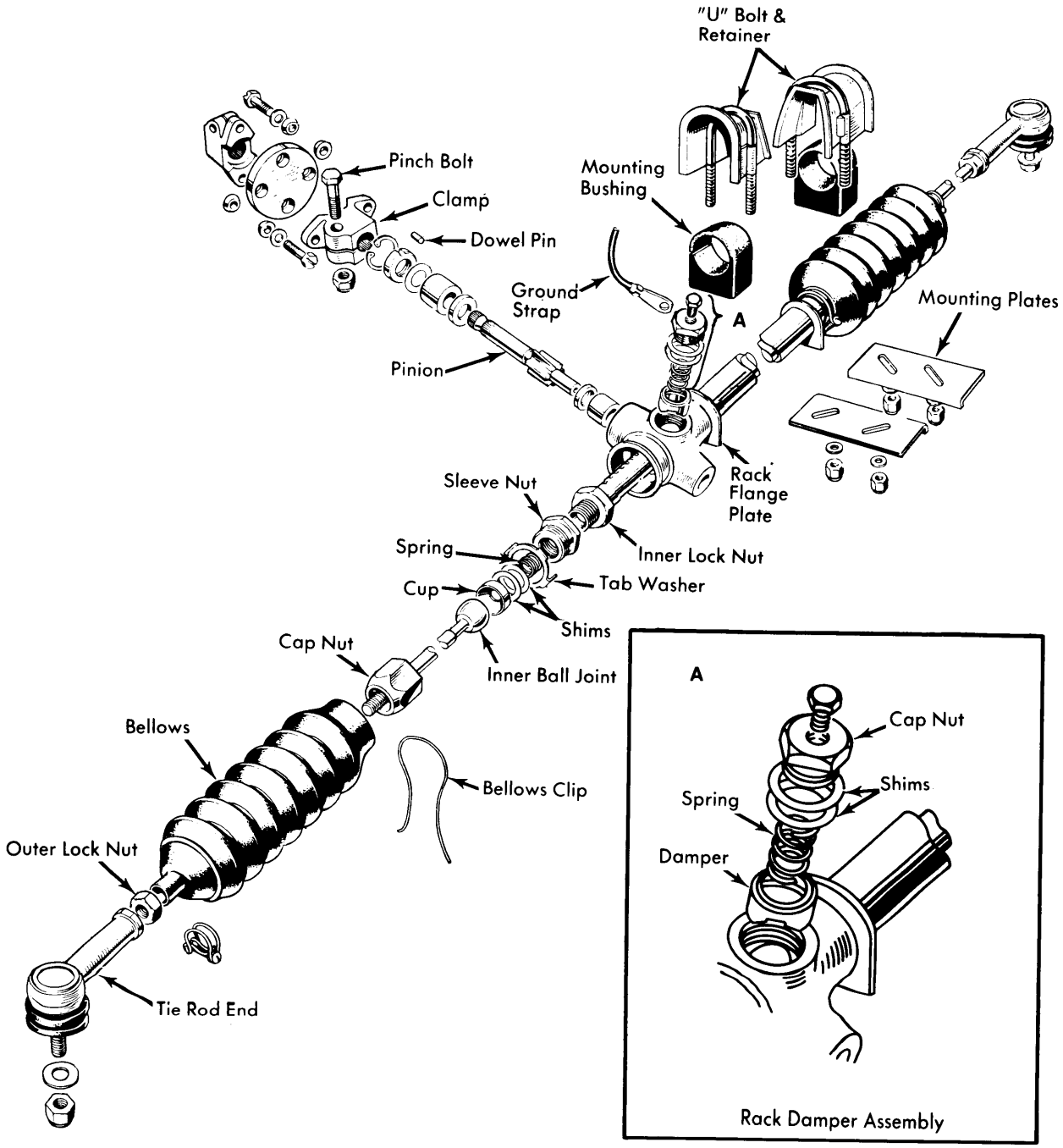

Fig. 5 Triumph Spitfire Rack and Pinion Steering

TRIUMPH RACK & PINION (Cont.)

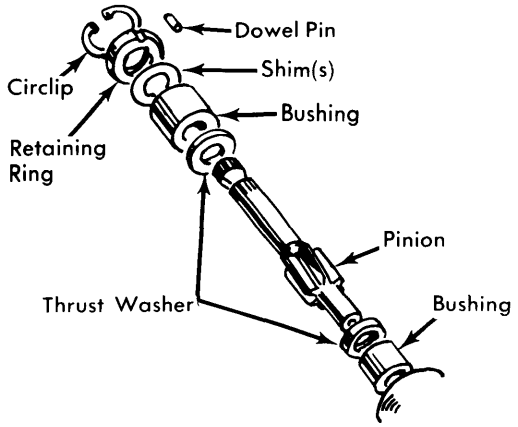

Fig. 3 Detailed View of Spitfire Pinion

Assembly – **1)** Place rack into tube and replace pinion lower thrust washer and bushing. Assemble pinion and components into housing without shims. Mount dial gauge such that pinion end play may be measured. Push pinion down to limit and zero the gauge. Lift pinion until stop is felt and record reading. Remove circlip and withdraw pinion assembly. Remove retaining ring and install new "O" ring.

2) Make up a shim pack to give minimum end play but with free rotation. Assemble shim pack and retainer ring to pinion. Reinsert assembly into housing and finally secure it with dowel pin and circlip.

3) Insert rack damper and cap nut into pinion housing. Tighten cap nut until all end play is eliminated. With a feeler gauge, measure clearance between cap head and housing flat. Remove cap nut and damper.

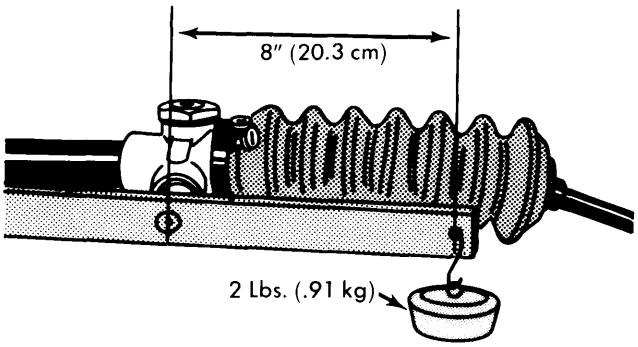

Fig. 4 Measuring Spitfire Pinion Rotational Force

4) Make up a shim pack equal to cap nut-to-housing clearance plus .004" (.1 mm). Pack unit with grease and assemble all rack damper components with shim pack. Tighten cap nut until a force of 2 lbs. (.91 kg) is required to rotate pinion shaft at a radius of 8" (20.3 cm). See *illustration*. Make shim adjustments, if necessary, to obtain this setting.