

## MG MIDGET RACK & PINION

### Midget

### DESCRIPTION

Steering gear is a rack and pinion type and is secured above front frame crossmember, immediately behind the radiator. Tie rods, operating swivel arms, are attached to each end of rack by ball joint enclosed in rubber bellows. Steering column engages splined end of pinion. Pinion end play is eliminated by adjustment of shims beneath pinion lower bearing. A damper pad, inserted in rack, controls backlash between pinion and rack.

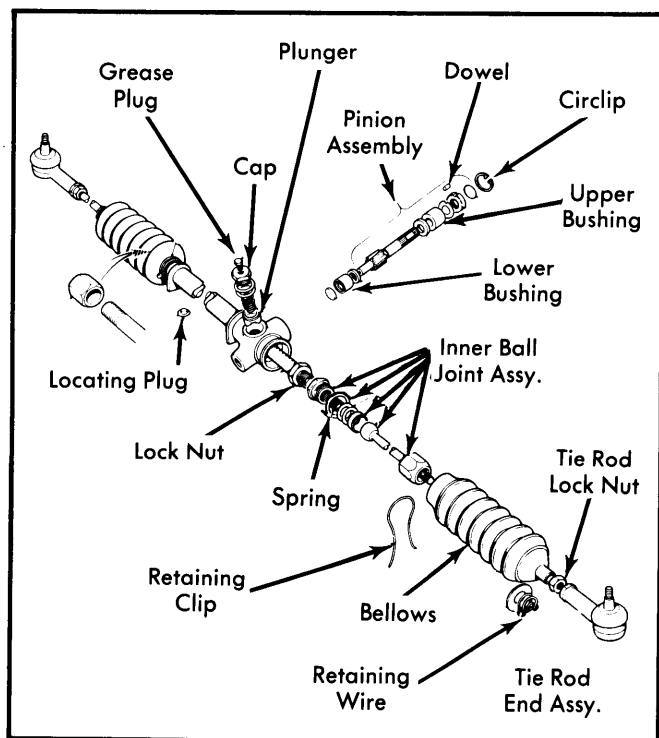


Fig. 1 MG Midget Rack & Pinion Assembly

### REMOVAL & INSTALLATION

**Removal** — 1) Remove radiator. Detach tie rod ball joints from swivel arms. Remove column-to-pinion pinch bolt. Unscrew six bolts securing rack assembly to body crossmember.

2) Move rack assembly forward as far as possible, collecting any shims between mounting bracket and body. Note location and number of these shims for reassembly reference.

**NOTE** — If these shims are lost or unmarked for reinstallation, steering rack and column must be realigned. See Alignment in MG Midget article under STEERING COLUMNS in this section.

3) Unscrew three toe plate bolts. Slacken three upper column attaching bolts and pull column back sufficiently to disengage column sleeve from pinion. Remove front wheels and pull rack assembly from vehicle.

**Installation** — To install, reverse removal procedure, noting the following: Ensure shims are returned to original positions. When joining column to pinion, check that rack and column are both in straight-ahead position. If new rack is being installed, column and rack alignment is necessary. See Alignment in MG Midget article under STEERING COLUMNS in this section.

### OVERHAUL

**Disassembly** — 1) Loosen lock nuts and remove tie rod end assemblies. Release retaining clips and wires, then remove bellows and protective shields.

2) Loosen lock nuts and unscrew tie rod inner ball joint assemblies. Remove coil spring and remove lock nuts from each end of rack.

3) Disassemble inner ball joint assembly by unlocking tab washer and unscrewing sleeved nut. Remove grease plug, cap, and shims, then withdraw spring and plunger from housing. Remove circlips and withdraw pinion assembly with dowel, then press lower bushing and end plug from housing bore.

**Inspection** — Thoroughly clean all components and check rack and pinion for wear, cracks or damage. Examine seals and replace any faulty parts.

**Reassembly** — 1) Reassemble by reversing disassembly procedure, noting the following: Heat the pinion bushing and plunger in 212°F (100°C) SAE 20 engine oil for 2 hours and allow to cool to ensure pores of bushing and plunger are properly lubricated.

2) Install large bushing on pinion shaft. Place end plug into recess in lower bushing and install on pinion shaft. Position pinion housing over bushing and press housing onto bushing.

3) Insert thrust washer, chamfered bore up, into housing. Coat rack with grease and fit into housing, making sure 3½" (88.9 mm) of teeth end protrude from inner face of housing.

4) Tape locating plug against flat of rack (plug will be held in place by mounting bracket after rack is installed). With the rack in the straight-ahead position make sure the flat on pinion is within 30° of either side of pinion housing centerline on plunger cap side.

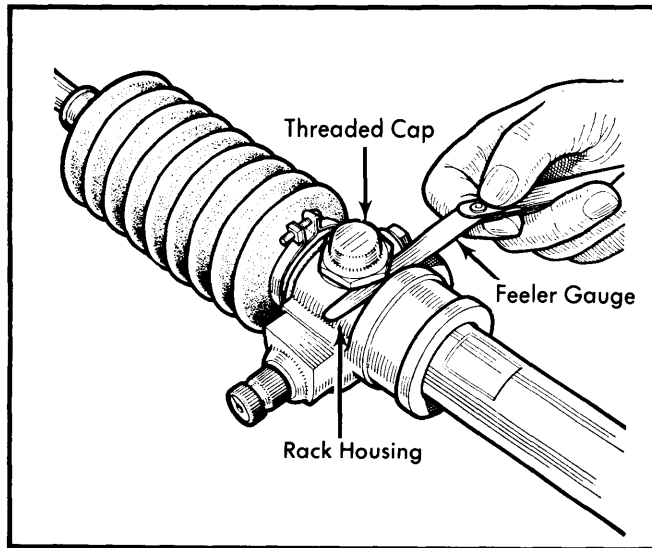
5) Insert reassembled pinion assembly into housing and adjust end play by measuring with dial gauge and fitting proper shims to bring end play to .010" (0.25 mm).

6) To adjust preload, fit plunger and cap to rack housing and tighten threaded cap until end play is eliminated. Measure the clearance between cap and rack housing with a feeler gauge.

7) Make up a shim pack equal to previous clearance measurement, plus .004" (.1 mm). It is important to have at least one .004" (.1 mm) shim in assembly.

# Steering Gears & Linkage

## MG MIDGET RACK & PINION (Cont.)



**Fig. 2** Checking Rack Damper Clearance Preload Adjustment

8) Remove cap and plunger, grease plunger, then install cap, plunger and shims on the housing and tighten cap.

9) Replace grease plug with fitting and inject  $\frac{1}{2}$  to  $\frac{3}{4}$  ounce of grease into unit. Replace grease plug, then check pinion shaft torque for 2 ft. lbs. (.91 mkg). Adjust by adding or subtracting shims.

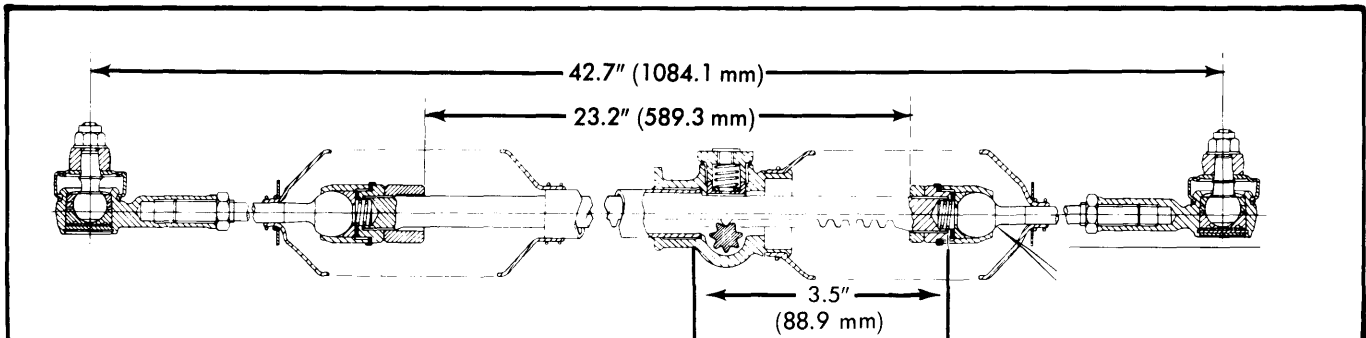
10) Lubricate tie rod inner ball joint with graphite grease and reassemble by reversing disassembly procedures noting the following: Use a new tab washer and adjust ball end movement by measuring clearance between cap nut and tab washer.

11) Add or subtract shims to arrive at the following torque values: For steel cups 40 INCH lbs. (.46 cmkg) or for nylon cups 15-50 INCH lbs. (.17-.57 cmkg).

12) Install bellows, clips and wires and screw lock nuts on rack, making sure the distance between faces of lock nuts is 23.2" (589.3 mm).

13) Insert thrust springs into ends of rack (steel cup type only) and screw tie rod end assembly as far as possible up to the lock nut. Tighten lock nuts to 80 ft. lbs. (11.1 mkg), push bellows onto tie rods, grease ball joints, and secure bellows with clips and wires.

14) Screw tie rod end assemblies onto tie rods and check that there is 42.7" (1084.1 mm) between ball stud centers. Tighten locknuts to 30-35 ft. lbs. (4.2-4.8 mkg).



**Fig. 3** MG Midget Rack Assembly Adjustments