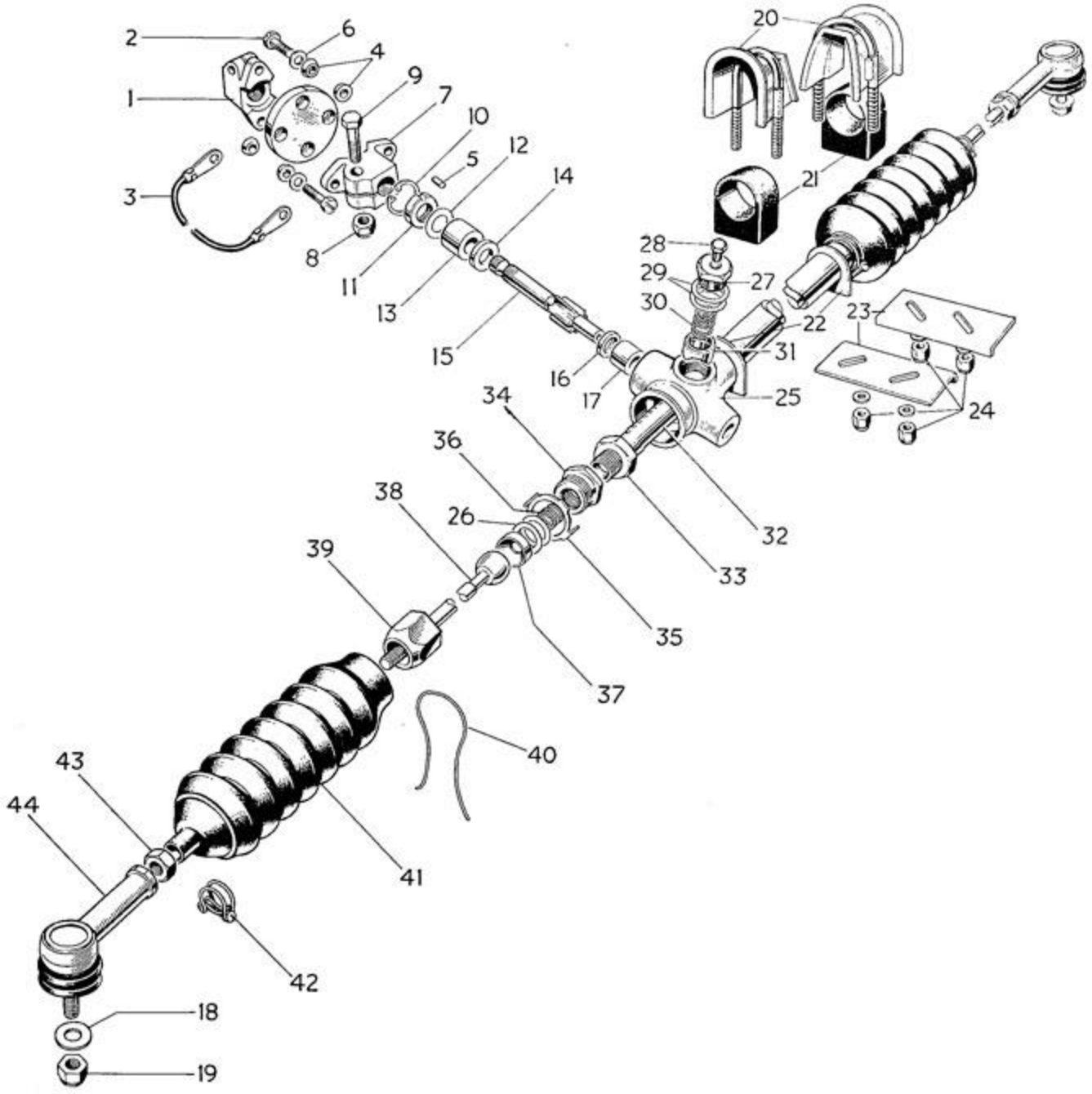
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1 Steering coupling (upper)
2 Bolt
3 Earth cable
4 Rubber bushes
5 Dowel
6 Washer
7 Steering coupling (lower)
8 Nyloc nut
9 Pinch bolt
10 Circlip
11 Retaining ring
12 Shims
13 Bush
14 Thrust washer
15 Pinion shaft
16 Thrust washer
17 Bush
18 Washer
19 Nyloc nut
20 "U" bolts
21 Rubber bushes
22 Abutment plates
23 Locating plates
24 Nyloc nuts
25 Rack assembly
26 Shims
27 Cap
28 Grease plug
29 Shims
30 Spring
31 Plunger
32 Rack
33 Locknut
34 Sleeve nut
35 Lock tab
36 Spring
37 Cup
38 Tie-rod
39 Cup nut
40 Locking wire
41 Rubber gaiter
42 Clip
43 Locknut
44 Tie-rod end

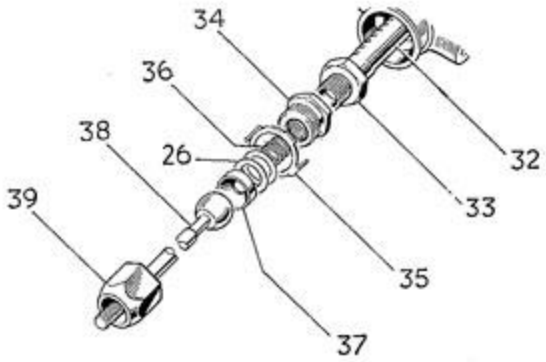


Fig. 13. Tie-rod inner ball joints

Steering Unit (Fig. 4)

Dismantle

Release the clips (42) and (40), and slide both bellows towards the outer ball joints. Slacken the locknuts (33) and unscrew both outer tie rod assemblies from the rack (32). Withdraw the coil spring (36) from each end of the rack.

Release the tabwasher (35), unscrew the sleeve nut (34) and remove the tabwasher (35), shims (26) and cup (37). Slacken the locknuts (43) and unscrew the outer ball joint assemblies (44) from the tie rods (38).

Remove the locknuts (43), rubber bellows (41), clips (42) and cup nut (39) from each outer tie-rod (38).

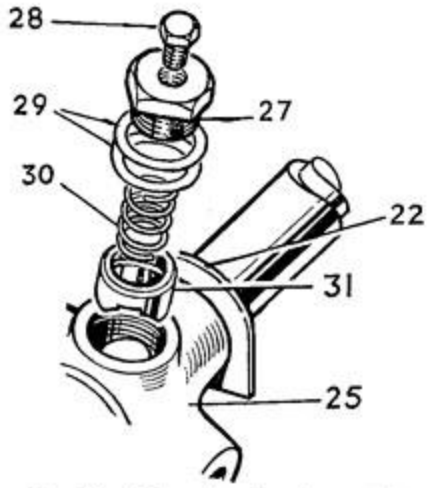


Fig. 14. Pinion thrust pad assembly

Remove the locknuts (33) from the ends of the rack. Unscrew the cap (27) and remove the shims (29), spring (30) and pressure pad (31) from the housing.

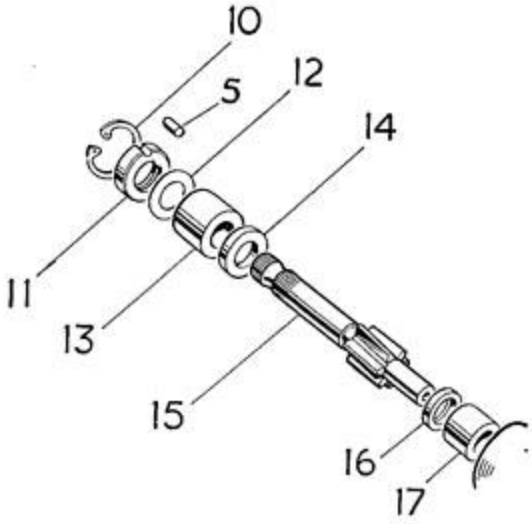


Fig. 15. Pinion assembly

Remove the circlip (10) and withdraw the pinion assembly, taking care not to lose the dowel peg (5). Remove the retaining ring (11), shims (12), bush (13) and thrust washer (14). Detach the rubber "O" ring from the annular groove in the retaining ring (11).

Withdraw the rack (32) from the tube (25) and remove the thrust washer (16) and bush (17) from the pinion housing.

Assembly

Insert the rack (32) into the tube (25) and place the bush (17) and thrust washer (16) into the pinion housing.

Adjust the pinion end float as follows:—

1. Assemble the thrust washer (14), bush (13) and retaining ring (11) to the pinion (15). Insert the assembly into the pinion housing and secure the pinion with the circlip (10).
2. Mount a dial gauge on the tube as shown on Fig. 17. Push the pinion down to its limit and zero the dial gauge. Lift the shaft until the retaining ring contacts the circlip and note the dial reading. This represents the total pinion shaft end float. Remove the circlip (10) and withdraw the pinion shaft assembly. Remove the retaining ring (11) and renew its rubber "O" ring.
3. Make up a shim pack to give minimum end float consistent with free rotation of the pinion shaft. Shims are available in 0·004″ (0·102 mm.) and 0·010″ (0·254 mm.) thickness.
4. Assemble the shim pack (12) and retainer ring (11) to the pinion. Re-insert the assembly into the housing and finally secure it by fitting the dowel (5) and circlip (10).

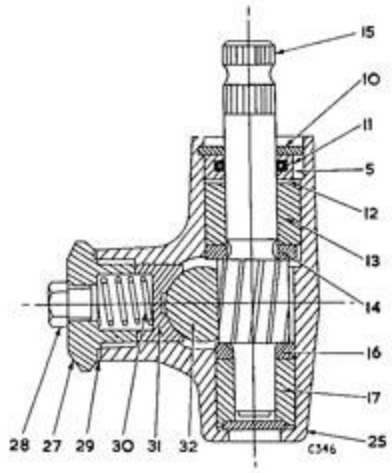


Fig. 16. Cross-section through steering unit

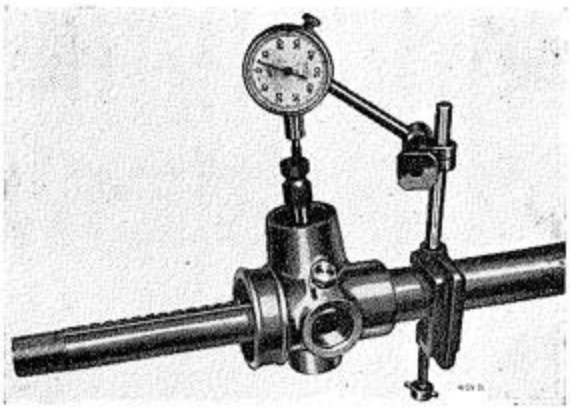


Fig. 17. Measuring pinion end float

Adjust the pinion pressure pad as follows:—

5. Fit the plunger (31) and cap nut (27) to the rack tube (25). Tighten the nut to eliminate all end float and, using feeler gauges, measure the clearance between the nut and the rack tube faces as shown on Fig. 18. Remove the cap nut (27) and plunger (31).
6. Make up a shim pack equal to the cap housing clearance plus 0·004″ (0·1 mm.) nominal end float.
7. Pack the unit with grease and assemble the cap nut (27), shim pack (29), spring (30) and plunger (31) to the housing (25) and tighten the cap nut.
8. When the unit is correctly adjusted, a force of 2 lb. (0·91 kg.) is required to rotate the pinion shaft at a radius of 7·9″ (20·3 cm.) see Fig. 19. Check and re-adjust the unit, if necessary, by adding or subtracting shims from beneath the cap nut (27).

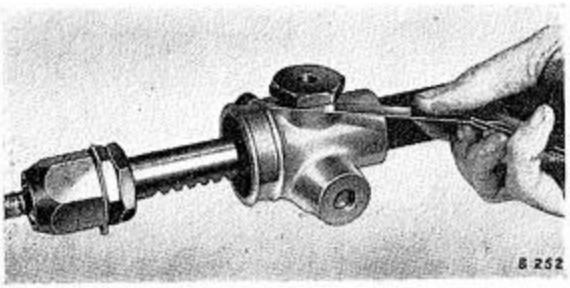


Fig. 18. Using feeler gauge to determine shim thickness required under cap nut

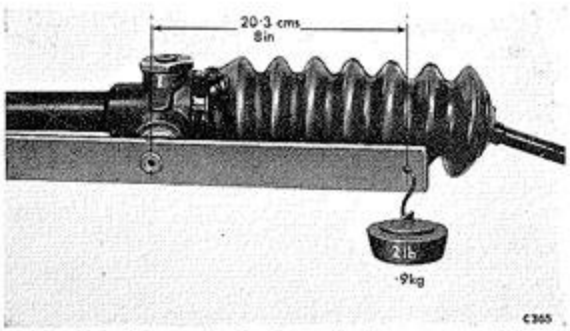


Fig. 19. Measuring load required to rotate pinion

Assembling and Adjusting Tie-rod Inner Ball Joints

1. Slide the cup nut (39) over the tie-rod (38) and insert the cup (37) into the cup nut (39).

2. Position the lock tab (35) over the sleeve nut (34) and screw this fully into the cup nut (39). With the cup nut held in a vice, move the tie-rod (38) axially to determine the approximate shim pack thickness required. Remove the assembly from the vice and remove sleeve nut (34).

3. Prepare a shim pack (26) in excess of the estimated ball end movement and insert this in the cup nut behind the cup (37).

4. Screw the sleeve nut (34) with lock tab (35) fully into the cup nut (39).

5. Using feeler gauges, measure the gap between the sleeve nut flange, lock tab (35) and cup nut face (39). This dimension, plus 0·002″ (0·05 mm.) is the amount by which the trial shim pack must be reduced to give correct ball end movement.

6. Dismantle the ball joint and re-assemble it with the correct shim pack determined in (5). Test adjustment by applying a load of 1½ lb. (0·681 kg.) at the outer end of the tie-rod (38), when the tie-rod should articulate freely. If necessary, adjust the shim pack until correct operation is obtained. Shims are obtainable in 0·002″ (0·05 mm.) and 0·010″ (0·254 mm.) thickness.

7. When adjustment is correct, lock the assembly by bending the lock tab (35) over the sleeve nut (34) and cup nut (39).

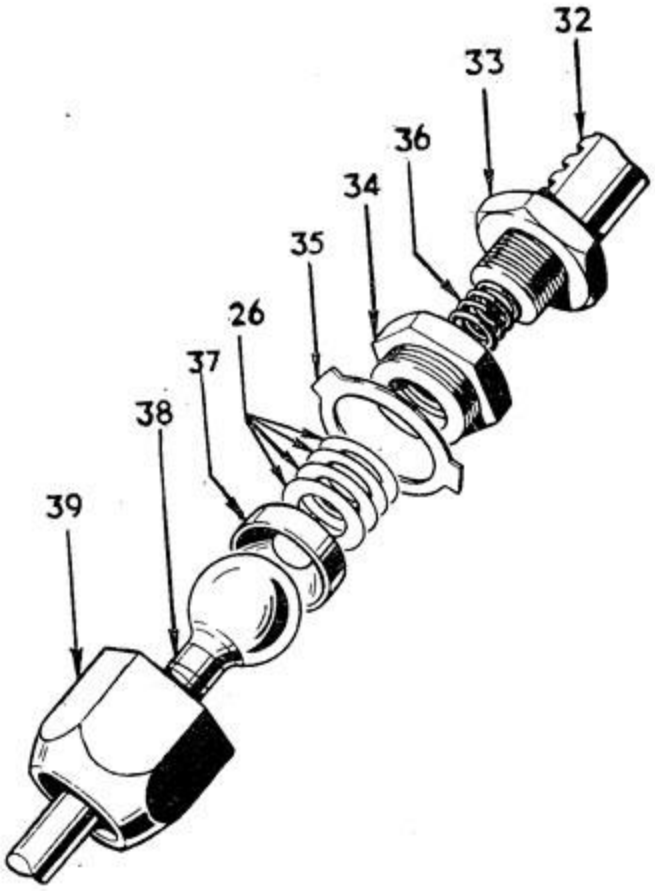
Refitting Ball Joint to Steering Rack

1. Screw the locknut (33) on to the end of the rack (32) so that its position corresponds with dimensions 3 + 4 + 5 + 3 on Fig. 1, *i.e.*, 24·40″ (619·76 mm.) between inner locknut faces.

2. Insert the spring (36) into the end of the rack and screw the ball joint assembly as far as possible up to the locknut (33).

3. Repack the bellows (41) with grease (½ oz. Retinax "A" from dry) before securing them in position with clips (42) and wire (40).

4. Fit the locknuts (43) and outer tie-rod ends (44) to the tie-rods (38), adjusting them so that they correspond with dimensions 1 + 2, Fig. 1, *i.e.*, 10·13″ (257·43 mm.).



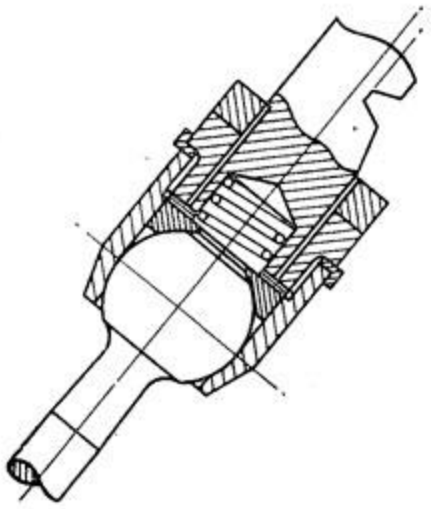


Fig. 21. Tie-rod coupling details