

STEERING

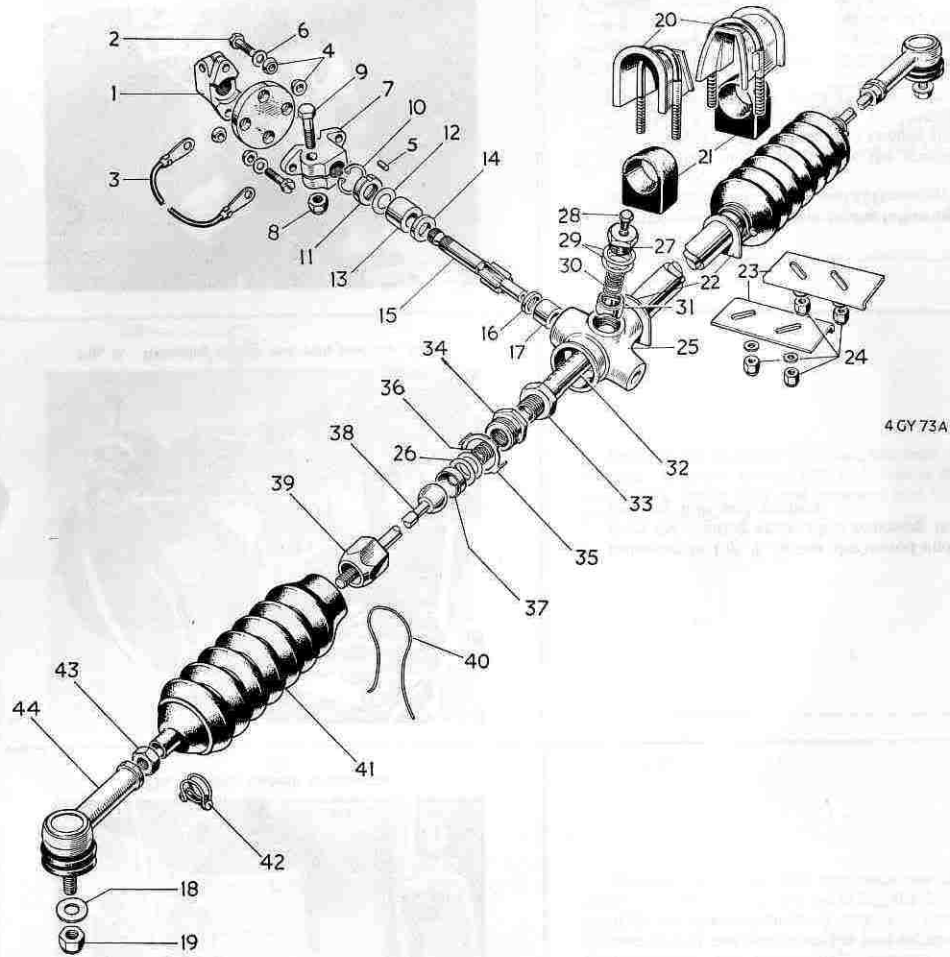


Fig. 4. Exploded steering unit

Key to Fig. 4

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

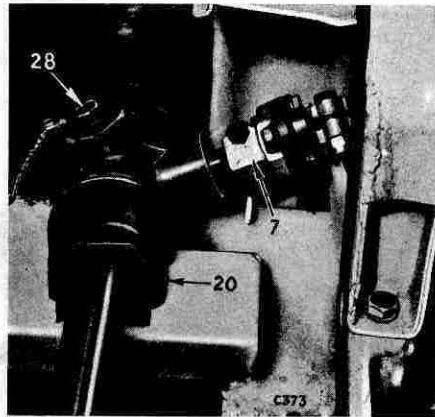


Fig. 8. Steering unit attachments

Steering Unit

Removal (Fig. 8)

1. Remove item (9) from the coupling (7). Disconnect the earth strap, secured by item (28) at one end, from the bolt securing it to the chassis frame.

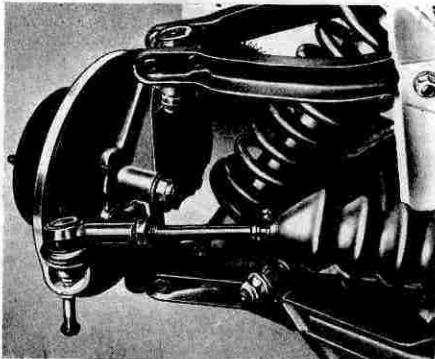


Fig. 9. Releasing tie-rod end with tool No. S.160

2. Referring to Fig. 9, extract the tie-rod ends from the steering arms, after removing the securing nuts and washers.

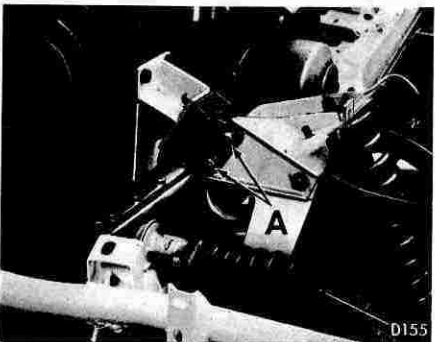
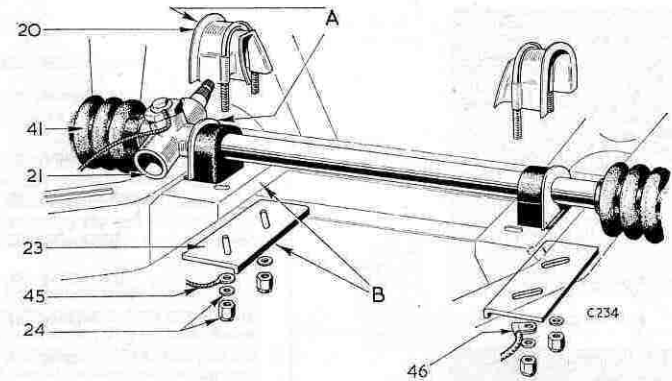


Fig. 10. Engine mounting bolts "A"

3. Referring to Fig. 4, remove in the following order, items (24), (23), (20) and (21).
4. Using a sling and hoist, relieve the vehicle of the weight of the engine, and remove the bolts (A) Fig. 10; then raise the engine approximately 4" (19 mm.) (Vitesse only).
5. Move the steering unit forward to disengage the coupling from the steering column, and manoeuvre the unit from the vehicle, via the valance aperture on the driver's side.



Refitting

1. Referring to Figs. 1 and 11, ensure that the steering unit is assembled to the dimensions given.
2. Rotate the pinion shaft from lock to lock, counting the number of revolutions. Turn the pinion shaft back half this number of rotations; thus centralizing the rack in relation to the pinion.
3. Position the steering wheel in the straight ahead position, *i.e.*, with the spokes horizontal and beneath the wheel boss centre.
4. Manoeuvre the steering unit through the wing valance aperture on the driver's side of the vehicle (Herald and Vitesse) and engage the steering column in the flexible coupling.
5. Fit the rubber bushes (21) to the steering unit. Assemble the "U" bolts (20) as shown on Fig. 11 and loosely secure them with the plates (23) and nyloc nuts (24).
6. Push the "U" bolt assemblies outwards until a 3/4" (3.175 mm.) clearance exists between the flange plates welded on the rack tube and the retainers welded to the "U" bolts.
7. Hold the "U" bolts in the position achieved in (6), whilst an assistant slides the plates (23) inwards to abut their flanged faces against the chassis frame flange. Tighten the nuts.
8. Fit the nyloc nut (8) and bolt (9) to the steering coupling (7).
9. Re-connect the earth strap from the steering unit to the chassis frame.
10. Refit the tie-rod ends (44) to the steering arms and secure with plain washers (18) and nyloc nuts (19).
11. Check the front wheel alignment as described on page 4-201.

- A Distance between flanges must be 3/4" (3.17 mm.)
- B Flange of item (23) must contact innermost flange of frame.
- 20 "U" bolt
- 21 Rubber bush
- 23 Locating plates
- 24 Nyloc nuts
- 41 Rubber gaiter
- 45 Steering column earth cables
- 46 Engine earth cable

Fig. 11. Steering unit attachments

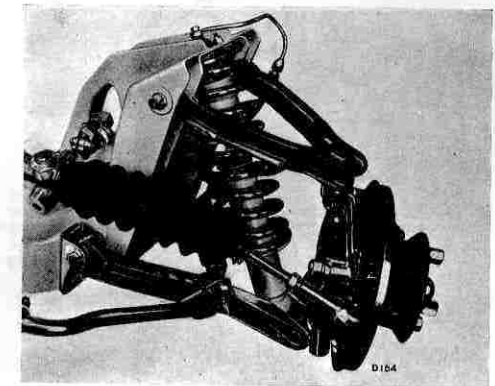


Fig. 12. Tie-rod attachments

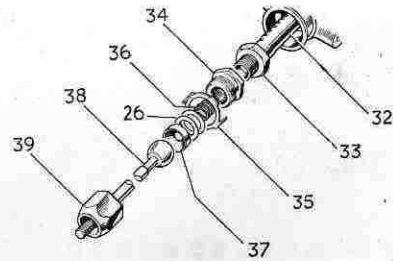


Fig. 13. Tie-rod inner ball joints

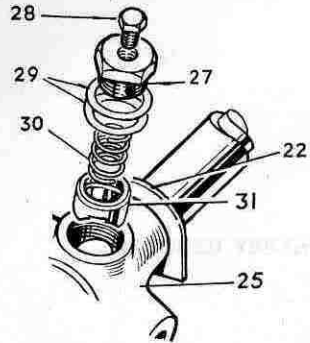


Fig. 14. Pinion thrust pad assembly

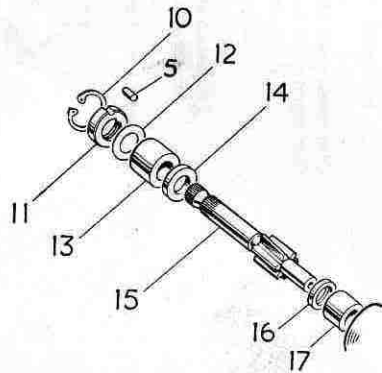


Fig. 15. Pinion assembly

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).

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.

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).

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. 16. Cross-section through steering unit

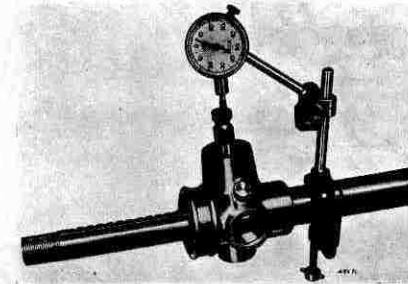
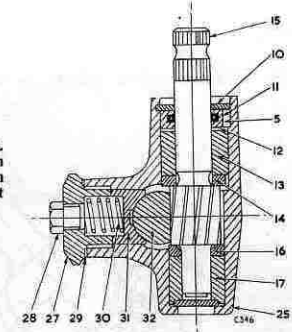


Fig. 17. Measuring pinion end float



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

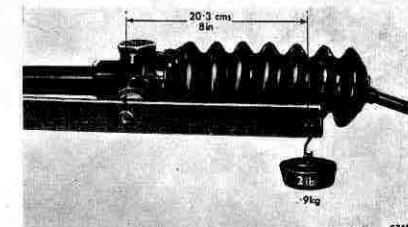


Fig. 19. Measuring load required to rotate pinion

EXPLODED ARRANGEMENT OF STEERING COLUMN

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).
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.).

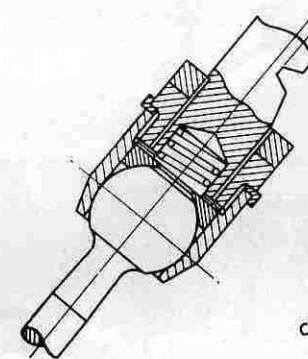
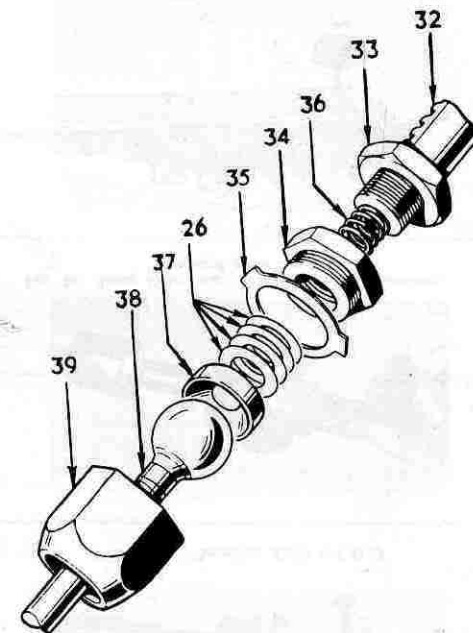


Fig. 21. Tie-rod coupling details

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