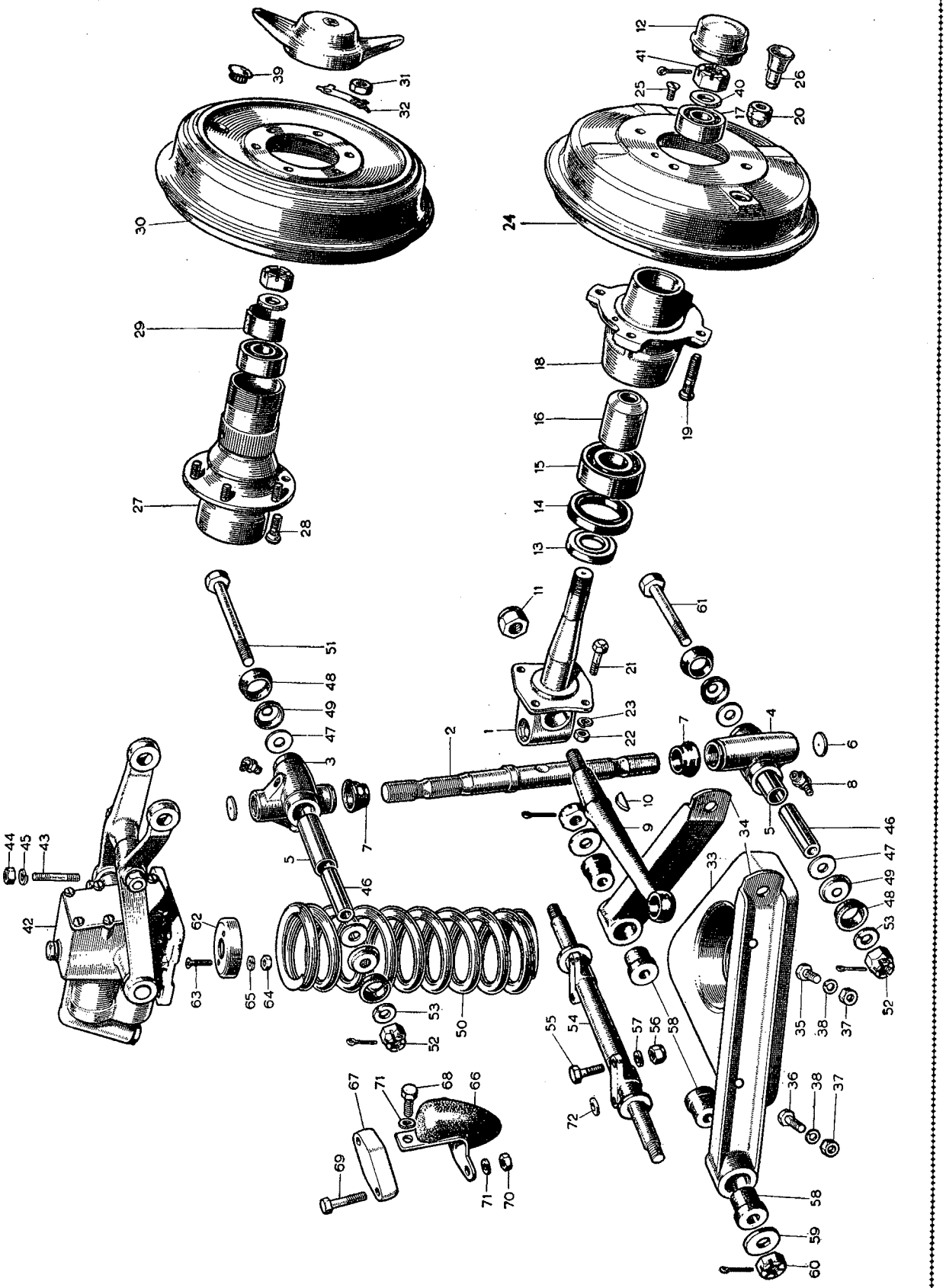
SECTION K

THE FRONT SUSPENSION

General Description.

Maintenance.

FRONT SUSPENSION COMPONENTS



KEY TO FRONT SUSPENSION COMPONENTS (Disc or Wire Wheel)

No.	Description
1.	Steering knuckle—L/H.
2.	Swivel pin—L/H.
3.	Link—swivel pin—upper L/H.
4.	Link—swivel pin—lower L/H.
5.	Bush.
6.	Plate.
7.	Seal—swivel pin.
8.	Grease nipple—link.
9.	Steering lever—L/H.
10.	Key—Woodruff No. 8—steering lever.
11.	Nut—steering lever.
12.	Grease-retaining cup. DW.
13.	Distance washer—hub.
14.	Oil seal—hub.
15.	Bearing—large—hub.
16.	Distance-piece—hub bearing.
17.	Bearing—small—hub.
18.	Hub assembly—front.
19.	Stud—wheel. DW.
20.	Nut—wheel stud. DW.
21.	Bolt—brake backplate.
22.	Nut—backplate bolt.
23.	Washer—spring—backplate bolt.
24.	Drum—brake. DW.
25.	Screw—countersunk—drum to hub. DW.
26.	Plug—large—brake-drum. DW.
27.	Hub assembly—front L/H. WW.
28.	Stud. WW.
29.	Grease retainer. WW.
30.	Drum—brake. WW.
31.	Nut—drum to hub. WW.
32.	Locking tab—drum to hub. WW.
33.	Spring pan assembly.
34.	Bottom wishbone assembly.
35.	Screw—spring pan to wishbone.
36.	Screw—spring pan to wishbone.
37.	Nut—spring pan to wishbone screw.
38.	Washer—spring pan to wishbone screw.
39.	Plug—brake-drum—large. WW.
40.	Washer.
41.	Nut—L/H thread.
42.	Hydraulic damper.
43.	Stud—hydraulic damper to cross-member.
44.	Nut—hydraulic damper to cross-member stud.
45.	Washer—spring—hydraulic damper to cross-member.
46.	Distance tube—link.
47.	Thrust washer—link.
48.	Seal—link.
49.	Support—link seal.
50.	Spring—coil.
51.	Bolt—wishbone to link.
52.	Nut—castle—wishbone to link.
53.	Washer—spring—wishbone to link.
54.	Wishbone pivot.
55.	Bolt—pivot to member.
56.	Nut—pivot to member bolt.
57.	Washer—spring—pivot to member bolt.
58.	Bush—bottom wishbone.
59.	Washer—wishbone pivot.
60.	Nut—slotted—wishbone pivot.
61.	Bolt—bottom wishbone to link.
62.	Spigot—spring.
63.	Screw—spigot to member.
64.	Nut—spigot to member screw.
65.	Washer—spigot to member screw.
66.	Check rubber.
67.	Distance piece—check rubber.
68.	Screw—check rubber to member.
69.	Bolt—check rubber to member.
70.	Nut—check rubber to member—bolt.
71.	Washer—spring—check rubber to member.
72.	Washer—plain—under front outer head pivot to member bolt.

GENERAL DESCRIPTION

The independent front suspension is the wishbone type with coil springing. The front wheels follow the road surface without influencing each other, and each wheel is permitted to rise and fall vertically. The suspension gives perfect stability with riding comfort and, by the combination of the direct-acting rack-and-pinion steering gear, it also provides light and accurate control under all conditions.

The inner mountings of the lower wishbones are fitted with flexing rubber bearings which require no lubrication and form a silent and resilient connection to the robust box-section chassis frame cross-member.

The steering swivel pins are of a special design, with the top and bottom bearings threaded to provide large areas and absorb both thrust and journal loads. The swivel pin threads are of opposite hand on each side of the car and are therefore not interchangeable. The steering connection from wheel to wheel is provided by the steering gearbox rack bar and two short tie-rods, with ball joints at each end. The outer ball joints are fitted with grease gun nipples, but the inner ball sockets are enclosed in the telescopic rubber dust excluders and are automatically lubricated from the steering gearbox.

Section K.1

REMOVING THE FRONT SUSPENSION

Jack up the front of the car with a jack placed under the centre of the front cross-member until the front wheels are just clear of the ground.

Remove the front wheels.

Place the jack under each spring pan and lift until the hydraulic damper arms are just clear of the rebound rubbers.

Disconnect the hydraulic brake hose (Section M.13.)

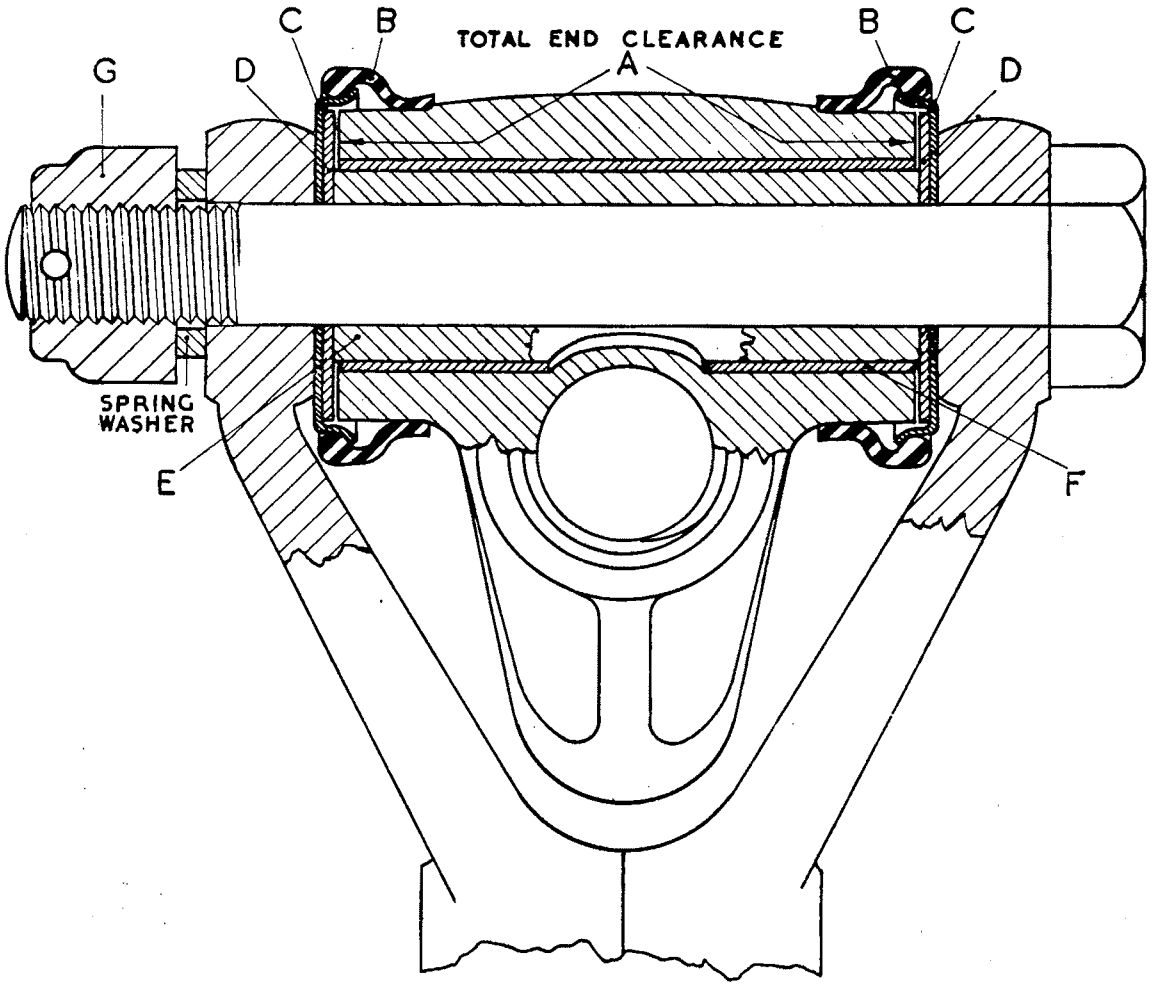


Fig. K.1

The assembly of the king pin swivel link

Slacken the steering tie-rod nuts and screw the tie-rods out of the steering ball joints, using a spanner on the flats on the rods.

Remove the cotters and nuts from the two outer fulcrum bolts. Draw out the bolts and take away the front hub and swivel pin units complete. (Take care of the thrust washers, rubber seals, retainers and fulcrum pins.)

Release the jacks from under the spring pans.

Press down the lower wishbone assemblies and remove the coil springs.

Remove the four bolts holding the spring pan to the levers.

Remove the cotters, nuts and washers from the ends of the inner lower fulcrum pin and slide off the levers and the rubber bushes.

Remove the bolts holding the lower fulcrum pins to the chassis cross-member.

Remove the nuts from studs securing the hydraulic dampers to the top of the suspension cross-member.

Inside the outer ends of the suspension cross-member will be found the coil spring locating plates. These are each attached by two bolts and nuts.

Section K.2

DISMANTLING THE SWIVEL PINS

Unscrew the upper and lower links from the ends of the swivel pins. The left-hand swivel pin has a left-hand thread at each end.

The stub axle is located by a collar on the swivel pin and the stem of the steering lever engaging a groove in the pin. To separate the two, the steering lever must be withdrawn from the stub axle, but this procedure is not advised unless absolutely necessary.

Section K.3

EXAMINING PARTS FOR WEAR

Examine the following parts before reassembling :—

Bushes for bottom wishbone

If these are split, perished, eccentric or oil-soaked, they should be renewed.

Bottom wishbone

Examine the end holes for elongation and the assembly for looseness. If there is any sign of slackness between the wishbone arms and the pan, separate the components and check the bolt holes for elongation. The bolt holes are $\frac{13}{32}$ in. (8·33 mm.) diameter.

Coil spring

Examine for cracks and check for tension, if necessary, to details in the General Data Section. Renew the springs if they are defective.

Swivel link assemblies

Check the swivel links. The dimension across the thrust faces should be 2·327 in. (59·11 mm.). If these are appreciably worn the assembly of link and bush should be renewed. If the bush only is worn, a new one should be pressed in and reamed and burnished to ·750 in. (19·05 mm.).

Note.—When pressing in this bush see that the hole in the bush faces the threaded bore. (See Fig. K.1.)

Check the threaded bores of the links on the swivel pins. When new, these are a free turning fit without slack. An appreciable amount of slack is permissible in these threaded bearings and they do not require renewal unless they are very slack.

Check the fulcrum pin distance tubes for scoring or wear. These should be 2·337 in. (59·36 mm.) long by ·7480 in. (19·00 mm.) diameter.

Examine the case-hardened thrust washers for ridges; the faces should be flat and parallel within ·0005 in. (·01 mm.).

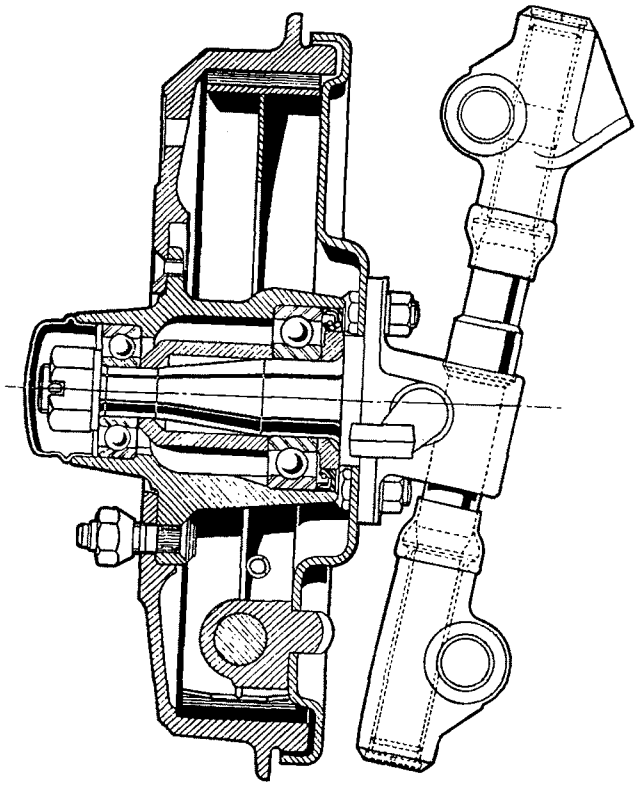


Fig. K.2.

A section through the front hub and brake drum (disc wheel type).

The thickness should be ·068 to ·065 in. (1·73 to 1·68 mm.), the bore ·510 to ·505 in. (12·95 to 12·83 mm.) and the outside diameter 1·25 in. (31·75 mm.).

When the swivel links, distance tubes and thrust washers are assembled, the total end clearance between the link and the thrust washers should be ·008 to ·013 in. (·2 to ·33 mm.). (See " A " Fig. K.1.)

Check that all grease nipples are clear.

Examine the rubber seals, and if these are perished or split, renew them.

Section K.4

HUB BALL BEARINGS

As far as possible, bearings which come under review during the overhaul of the car should be cleaned and inspected without being withdrawn from the housings to which they are fitted. Unnecessary withdrawal causes deterioration of the fitting surfaces, and may damage the bearing, whereas if bearings are examined in position and found still to be serviceable, they can be left undisturbed with advantage.

Rust on the exterior surfaces of the bearing is not detrimental unless the fit is affected, but if the tracks, balls or rollers are severely pitted, the running life of the bearing is at an end and a new one should be fitted.

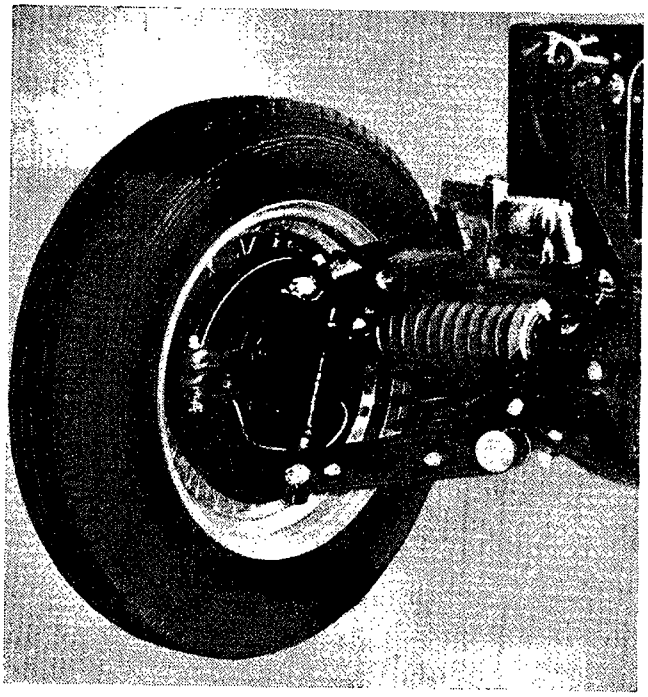


Fig. K.3.
A right-hand front suspension (L.H.D. car).

Ball bearings should be cleaned thoroughly with paraffin. Bearings which have been washed in this manner should be rinsed thoroughly and dried, and should be immersed in mineral oil as soon as possible after they have been examined.

After cleaning, bearings should be examined for cracks in the races, chipped or broken balls, and worn or damaged tracks or cages.

If either race is cracked or chipped, or if the tracks have spalled or flaked, the bearing should be scrapped.

Section K.5

REPLACING THE FRONT SUSPENSION

Bolt up the coil spring top locating plates inside the front cross-member.

Replace the hydraulic dampers.

The dampers are interchangeable from side to side.

Bolt up the lower fulcrum pins. The two front outer bolts have their nuts uppermost and the six other bolts have their nuts below.

Fit the rubber bushes into the lower levers. These bushes will be found to be a loose fit in the lever, but when clamped up by the nut and washer will expand into their housing. These bushes do not rotate on their surfaces, the angular movement being taken up by the rubber itself flexing.

Special care should be taken when assembling these bushes to maintain a central location, so that the expansion of each half of the bush is equal.

To attain this, insert each bush so that it protrudes equally each side of the housing (see Fig. K.4), and then clamp up with the washer and nut and fit the cotter pins. When central, the outer flanges of the bushes should all be of equal proportions.

It is essential to clamp up the bushes when the lower suspension levers are set parallel with the ground to ensure even stresses on the bushes in service.

Fit the spring pans between the levers, but with the heads of the bolts inside the spring pan.

Do not tighten up the spring pan bolts solid, but leave them half a turn slack.

Press down the lower wishbone assemblies.

Smear each end of the coil springs with grease to prevent any slight squeaking in operation.

Push the coil springs up into the cross-member and over the locating plates.

Jack up the lower wishbone assemblies until they are approximately parallel to the ground.

Assemble the hub units and swivel pins as detailed in Sections K.6 and K.8.