SECTION K

THE FRONT SUSPENSION

General Description.

Maintenance.

Section No. K.1 Removing the front suspension.

Section No. K.2 Dismantling the swivel pins.

Section No. K.3 Examining parts for wear.

Section No. K.4 Hub ball bearings.

Section No. K.5 Replacing the front suspension.

Section No. K.6 Reassembling the swivel pins.

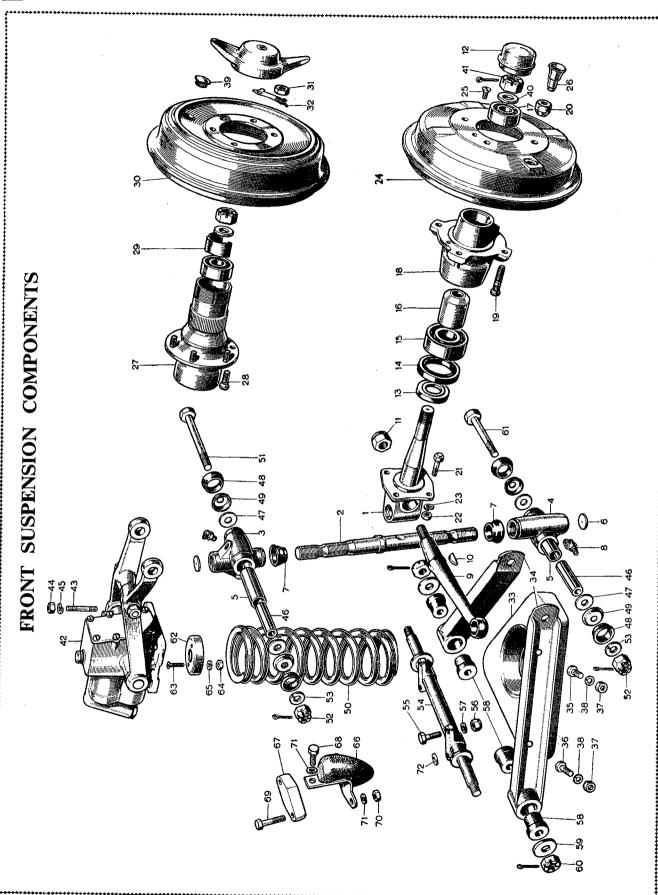
Section No. K.7 Removing the brake-drum and hub.

Section No. K.8 Replacing the front hub.

Section No. K.9 Removing and replacing the front coil spring.

Section No. K.10 Fitting new rubber bushes.

Section No. K.11 Modified front coil springs.



KEY TO FRONT SUSPENSION COMPONENTS (Disc or Wire Wheel)

No.	Description	No.	Description	No.	Description
_:	Steering knuckle-L/H.	26.	Plug—large—brake-drum. DW.	50.	Spring—coil.
ri	Swivel pin—L/H.	27.	Hub assembly—front L/H. WW.	51.	Bolt—wishbone to link.
<u>ښ</u>	Link—swivel pin—upper L/H.	28.	Stud. WW.	52.	Nut-castle-wishbone to link.
4.	Link—swivel pin—lower L/H.	29.	Grease retainer. WW.	53.	Washer-spring-wishbone to link.
s.	Bush.	30.	Drum-brake. WW.	%	Wishbone pivot.
9	Plate.	31.	Nut-drum to hub. WW.	55.	Bolt—pivot to member.
7:	Seal-swivel pin.	32.	Locking tab—drum to hub. WW.	S6 .	Nut—pivot to member bolt.
∞:	Grease nipple—link.	33.	Spring pan assembly.	57.	Washer-spring-pivot to member bolt.
9.	Steering lever—L/H.	34.	Bottom wishbone assembly.	58.	Bush-bottom wishbone.
<u>.</u>	Key-Woodruff No. 8-steering lever.	35.	Screw-spring pan to wishbone.	59.	Washer-wishbone pivot.
Ξ	Nut-steering lever.	36.	Screw-spring pan to wishbone.	99	Nut-slotted-wishbone pivot.
12.	Grease-retaining cup. DW.	37.	Nut-spring pan to wishbone screw.	61.	Bolt—bottom wishbone to link.
<u>.</u>	Distance washer-hub.	38.	Washer-spring pan to wishbone screw.	62.	Spigot—spring.
4.	Oil seal —hub.	39.	Plug-brake-drum-large. WW.	63.	Screw-spigot to member.
15.	Bearing—large—hub.	6.	Washer.	2 .	Nut-spigot to member screw.
16.	Distance-piece—hub bearing.	41.	Nut-L/H thread.	65.	Washer—spigot to member screw.
17.	Bearing-small-hub.	42.	Hydraulic damper.	.99	Check rubber.
18.	Hub assembly—front.	43.	Stud—hydraulic damper to cross-member.	.19	Distance piece—check rubber.
19.	Stud-wheel. DW.	4.	Nut-hydraulic damper to cross-member stud.	989	Screw-check rubber to member,
20.	Nut-wheel stud. DW.	45.	Washer-spring-hydraulic damper to cross-	69	Bolt—check rubber to member.
21.	Bolt-brake backplate.		member.	70.	Nut—check rubber to member—bolt.
22.	Nut-backplate bolt.	46.	Distance tube-link.	71.	Washer—spring—check rubber to member
23.	Washer-spring-backplate bolt.	47.	Thrust washer—link.	5	Washernlain_under front outer head niver to
24.	Drum-brake. DW.	48.	Seal—link.	į	member bolt.
25	Screw—countersunk—drum to hub. DW.	49	Support—link seal.		

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

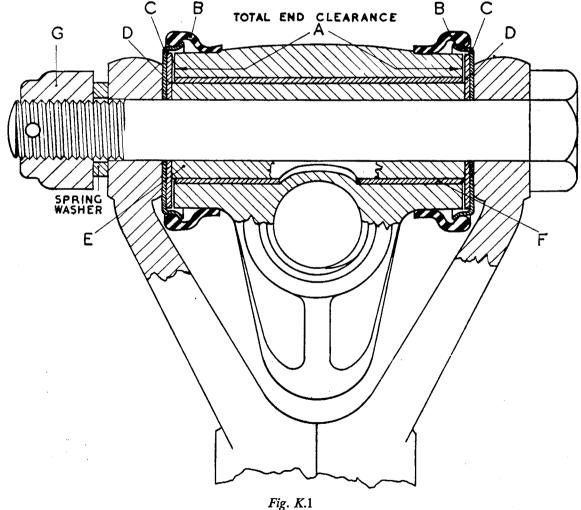
REMOVING THE FRONT SUSPENSION

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.)



The assembly of the king pin swivel link



Slacken the steering tie-rod nuts and screw the tierods 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 $\frac{21}{24}$ 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.).

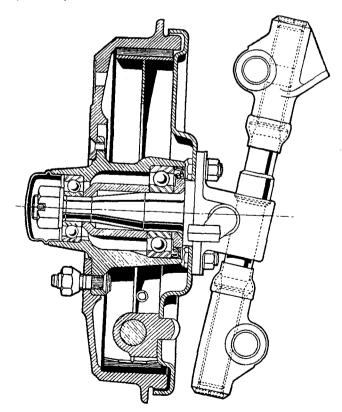


Fig. K.2.

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.

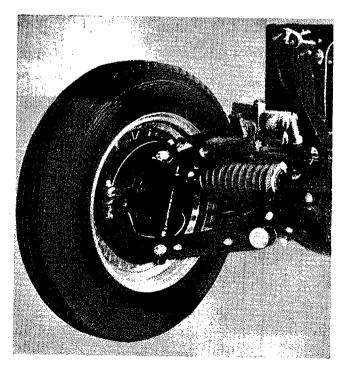


Fig. K.3.

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.

NOTE.—The king pin bearing threads, the stub axles, and the stub axle nuts are right-hand-threaded on the right-hand side of the car and left-hand-threaded on the left-hand side.

Fit the front hub units to the suspension levers.

Ensure that the thrust washers, rubber seals and retainers are assembled in the right order. (See Fig. K.1.)

Lubricate these parts and the fulcrum pins during assembly and again afterwards with the grease gun, using the recommended lubricant as detailed on page P.2.

Do not tighten up the top or the bottom slotted nuts solid, but leave them half a turn slack.

Connect up the hydraulic brake hoses. See correct method as explained in Section M.13.

Screw the steering tie-rods into the outer steering ball joints. Screw the rods right in and then slack off five complete turns. This will give a rough wheel alignment and render subsequent accurate alignment easier.

Adjust and bleed the front brakes as detailed in Sections M.2 and M.3.

Fit the front wheels.

Bounce the front end of the car up and down a few times. This allows the suspension fulcrums to settle down.

Now tighten the spring pan bolts and then tighten and cotter up the outer fulcrum bolts.

Check and adjust the front wheel alignment.

Section K.6

REASSEMBLING THE SWIVEL PINS

The swivel pin assembly may be reassembled without difficulty by carrying out the removal instructions in the reverse order, provided the following points are given special attention:

- (1) The swivel pin and links fitted to the left-hand side of the car have left-hand threads at each end and those fitted to the right-hand side have right-hand threads.
- (2) The swivel pin links screw onto threads on each end of the swivel pin and the threads are waisted at their centre to avoid fouling the pivot bolts passing through the links. Before the pivot bolt is replaced the link must be correctly positioned on the thread.

First screw the link onto the swivel pin until the waisted portion of the pin lines up with the pivot bolt hole. Place the pivot bolt in position in the link and screw the link to the extent of its maximum travel on the swivel pin thread; this is about three revolutions total. Screw the link back approximately one and a half times to obtain the maximum clearances for the pivot pin in each direction.

If the brake plate has been removed from the swivel pin assembly, the lower link must also be centralized in a similar manner before the brake plate is replaced and before the swivel pin is fitted to the suspension arm.

(3) Before the lower steering knuckle link is bolted in position ensure that both thrust washers and rubber seals are fitted correctly (see Fig. K.4) and make sure that the links have a total end clearance of .008 to .013 in. (.2 to .33 mm.) between the end faces of the link and the thrust washers.

NOTE.—Be sure to locate the lower link assembly correctly because it cannot be set once the brake back-plate is fitted.

Section K.7

REMOVING THE BRAKE-DRUM AND HUB

Prise off the hub cover by inserting the flattened end of the wheel nut spanner in the depressions provided adjacent to the cover holding studs and giving a sideways twist—not a radial movement.

Slacken the wheel stud nuts.

Apply the hand brake and raise the car until the wheel to be operated on is clear of the ground.

Unscrew the stud nuts and remove the wheel.

Withdraw the two countersunk-headed screws and remove the brake-drum.

Remove the grease-retaining cap and withdraw the split pin from the stub axle nut and unscrew the nut, remembering that the axle on the left-hand side of the car has a left-hand thread.

Place the hub extractor (special tool 18G304 with adaptor bolts 18G304B in position and use the central extractor screw to withdraw the hub assembly.

IMPORTANT.—When the front hub has been removed the inner bearing, oil seal, and hub distance washer MUST be removed from the stub axle and replaced in the hub before it is refitted to the stub axle. If the hub is pressed on the shaft without first fitting the bearing and oil seal to it, the inner bearing will re-enter its housing but the oil seal will only be pushed farther from its correct position.

Section K.8

REPLACING THE FRONT HUB

If all grease has been cleaned from the hub and the bearings washed for examination, ensure that they are repacked with grease before the hub is reassembled.

Replace the bearing spacer with the chamfered side towards the small outer bearing and then press the large bearing into position. Replace the oil seal and distance washer. The metal face of the oil seal and the chamfered side of the distance washer are fitted away from the bearing.

Replace the hub on the stub axle shaft. Replace and tighten the hub nut, and replace grease-retaining cap.

Section K.9

REMOVING AND REPLACING THE FRONT COIL SPRING

Apply the hand brake and jack up the front end of the car until the wheels are clear of the ground, using a suitable jack placed under the centre of the front crossmember.

Remove the front wheel on the side affected.

Place an additional jack under the lower spring pan and jack up until the hydraulic damper levers are clear of the rebound rubber.

Remove the lower fulcrum bolt.

Swing up the hub unit and rest on a suitable block. Release the jack from under the spring pan, press

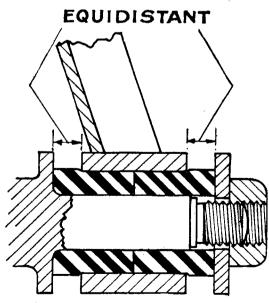
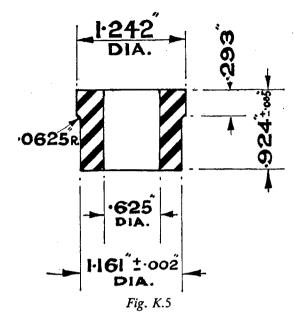


Fig. K.4

The correct method of clamping the rubber bushes of the lower suspension arm



The dimensions of the lower wishbone bushes when in new condition

down the lower wishbone assembly and remove the coil spring.

Replacement is carried out in the reverse manner to that detailed for removal.

NOTE.—Take care that the thrust washers, rubber seals, and retainers are assembled in the right order. (See Fig. K.1.)

Lubricate these parts and the fulcrum pins during and after assembly.

Smear each end of the coil spring with grease and ensure that the upper end of the spring is correctly located.

Section K.10

FITTING NEW RUBBER BUSHES

Remove the coil springs as detailed in Section K.9. 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.

Fit the new rubber bushes into the levers. These will be found to be quite 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 by the rubber deflecting torsionally in itself. 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. When central, the outer flanges of the bushes should be of equal proportions.

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

Now fit the spring pan 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 assembly.

Smear each end of the coil spring with grease, and push the spring up into the front cross-member and over its top locating plate.

Jack up the lower wishbone assembly until it is approximately parallel to the ground.

Swing down the hub unit and fit the lower fulcrum bolt.

Note.—Take care that the thrust washers, rubber seals and retainers are assembled in the right order.

(See Fig. K.4.)

Lubricate these and the fulcrum pin during and after assembly with the grease gun.

Remove the jack from under the wishbone assembly. Finally tighten up the spring pan bolts, and insert the split cotter pins in all castellated nuts.

Section K.11

MODIFIED FRONT COIL SPRINGS

Modified front coil springs are introduced at Car No. 15152. The new springs (Part No. AHH5546) are interchangeable on earlier cars in pairs only.

SECTION KK

THE FRONT SUSPENSION

(MGA 1600)

Section No. KK.1 Removing and dismantling a front hub.

Section No. KK.2 Reassembling and replacing a front hub.

Section KK.1

REMOVING AND DISMANTLING A FRONT HUB

Apply the hand brake and raise the front of the car until the wheel to be operated on is clear of the ground. Remove the road wheel.

Remove the brake unit as detailed in Section MM.2. Withdraw the grease retainer and extract the split pin from the stub axle nut and unscrew the nut, remembering that the stub axle on the left-hand side of the car has a left-hand thread.

Draw off the hub and brake disc assembly, using special tool 18G363 (wire wheels) or 18G304 with adaptors 18G304B and 18G304J (pressed-steel wheels).

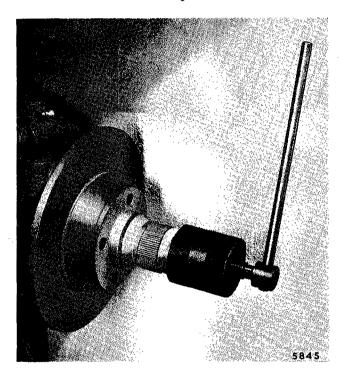


Fig. KK.1

Withdrawing a front hub (wire wheel type), using special tool 18G363. Special tool 18G304 should be used on vehicles fitted with pressed-steel wheels

The brake disc can now be removed from the hub, if necessary, by removing the four nuts and spring washers.

Tap out the small bearing with a drift; remove the spacer tube and tap out the large bearing and oil seal.

IMPORTANT.—If the inner bearing, oil seal, and distance washer remain on the stub axle as the hub is removed they must be replaced in the hub before it is fitted to the stub axle to ensure that the oil seal is in its correct position.

Section KK.2

REASSEMBLING AND REPLACING A FRONT HUB

If all the grease has been cleaned from the hub and the bearings washed for examination ensure that they are repacked with grease before the hub is reassembled.

Replace the outer bearing and the bearing distance piece with the chamfered side towards the outer bearing and then press the large (inner) bearing into position. Replace the oil seal and distance washer. The metal face

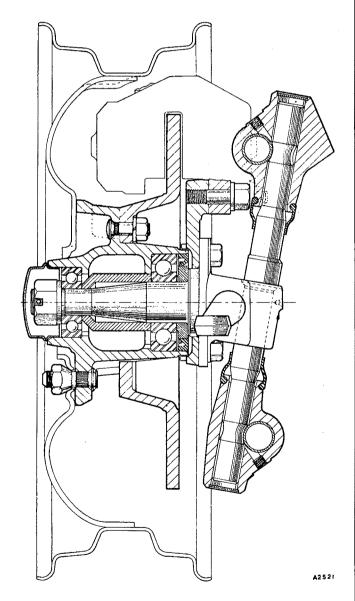


Fig. KK.2

A section of the front hub (pressed-steel wheel type) and brake disc. The brake unit is shown out of position for clarity

of the oil seal and the recessed side of the distance washer are fitted away from the bearing.

Reassembly is then a reversal of the instructions given in Section KK.1.

NOTE.—The brake unit securing bolts must be tightened to the correct torque figure and reference should be made to Section MM.3. If the brake disc has been disturbed the run-out must be checked (see Section MM.9).

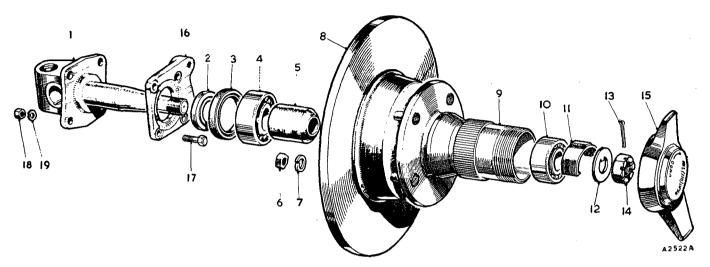


Fig. KK.3

The front hub components (wire wheel type)

- Steering knuckle.
 Distance washer.
 Oil seal.

- Large (inner) bearing.
- 5. Distance piece.
- 6. Disc securing nut.7. Spring washer.

- 8. Brake disc.9. Hub assembly.10. Small (outer) bearing.
- Grease retainer Washer.
- 13. Split pin.
 14. Hub securing nut.
- 15. Hub cap.16. Adaptor plate.17. Adaptor plate bolt.18. Nut for bolt.
- 19. Spring washer.



SECTION KKK

THE FRONT SUSPENSION

(MGA 1600 fitted with Dunlop disc brakes)

Section KKK.1 Removing and dismantling a front hub.

Section KKK.2 Reassembling and replacing a front hub.

Section KKK.3 Adjusting the front hub bearings.

Section KKK.4 Fitting the anti-roll bar.

Section KKK.1

REMOVING AND DISMANTLING A FRONT HUB

Apply the hand brake and raise the front of the car until the wheel to be operated on is clear of the ground. Remove the wheel.

Remove the wheel brake unit as detailed in Section MMM.7.

Withdraw the grease retainer cap using service tool 18G568.

Extract the split pin from the stub axle nut and remove the nut, remembering that the stub axle on the left-hand side of the car has a left-hand thread.

Draw off the hub and brake disc assembly, using service tool 18G304. The brake disc can now be removed from the hub by removing the four securing screws and spring washers.

Remove the distance washer, which will have remained on the stub axle.

The centre of the outer hub bearing may now be withdrawn together with the shims which are fitted between the bearing and the distance piece.

Remove the oil seal and draw out the centre of the inner bearing and the bearing distance piece.

Place the hub on a press with the outer end downwards and press out the outer bearing ring. Press out the inner bearing ring in the same manner with the inner end of the hub downwards.

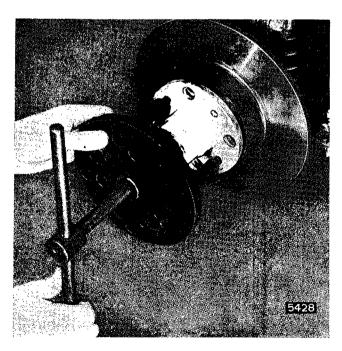


Fig. KKK.1
Withdrawing the front hub, using tool 18G304

Section KKK.2

REASSEMBLING AND REPLACING A FRONT HUB

If all grease has been cleaned from the hub and the bearings washed for examination, ensure that they are repacked with grease before the hub is reassembled.

Press the two bearing outer rings into the hub. Insert the bearing distance piece. Fit the inner bearing centre, the oil seal, and the distance washer, with the metal face of the oil seal and the chamfered side of the distance washer away from the bearing.

Mount the assembly on the stub axle shaft and fit the adjusting shims and outer bearing centre. Adjust the bearing end-float if necessary, and, finally, lock up as detailed in Section KKK.3.

Pack the assembly with grease and replace the greaseretaining cap. Replace the wheel brake unit as detailed in Section MMM.10.

Section KKK.3

ADJUSTING THE FRONT HUB BEARINGS

The end-float in the hub bearings must be checked and adjusted whenever the hub has been dismantled for attention or when the play in the hub bearings becomes excessive. The end-float is adjustable by means of shims situated between the outer bearing and the bearing distance piece.

Proceed as follows to obtain the correct setting:

- (1) Assemble the hub, using no shims, and mount the assembly on the stub axle. Fit the stub axle nut and washer and tighten the nut until the hub bearings bind. This will pull the outer rings of the bearings fully against their locating flanges inside the hub.
- (2) Remove the stub axle nut and washer and pull out the centre of the outer bearing. Insert a sufficient thickness of shims to produce an excessive amount of end-float and note the total thickness of the shims used. Fit the bearing centre, stub axle nut, and washer and tighten the nut.
- (3) Measure accurately the total amount of end-float in the bearings. Remove the stub axle nut, washer, and outer bearing centre. Reduce the number of shims to a thickness which will give an end-float of between ⋅002 and ⋅004 in. (⋅051 and ⋅102 mm.).
- (4) Replace the stub axle nut and washer and tighten the nut to a torque wrench reading of 40 to 70 lb. ft. (5.33 to 9.68 kg. m.). Latitude for the torque wrench reading is given so that the nut can be tightened sufficiently to align a castellation with the stub axle split pin hole. Insert a new split pin.



Section KKK.4

FITTING THE ANTI-ROLL BAR

NOTE.—Andrex Dampers and anti-roll bar equipment MUST NOT be used simultaneously.

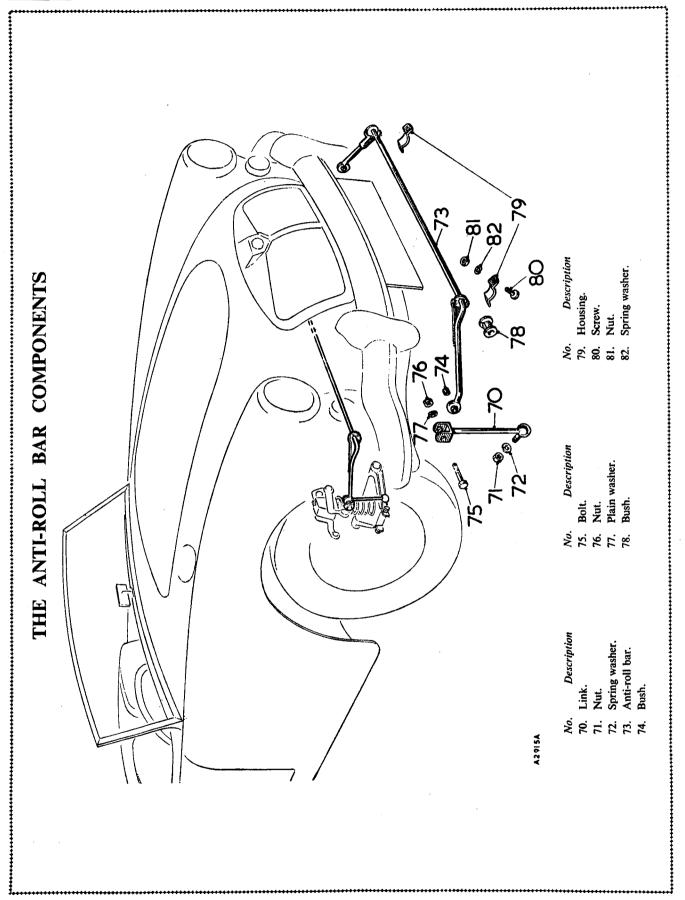
Place a jack under the centre of the front cross-member and lift the front of the car; support the chassis sidemembers on stands. Remove the bumper bar and the front apron and the four body holding bolts on the front extension. Unscrew and remove the eight nuts and bolts securing the front extension to the chassis and remove the extension.

Locate the anti-roll bar, the split bushes, and the bush housings on the front extension cradles and ensure that the washers on the bar are interposed between the locating plates and the flange on the bushes. Secure the bush housings to the extension with the four $\frac{7}{16}$ in. bolts, spring washers, and nuts.

Refit the front extension to the chassis and secure the body to the body plates on the extension.

Fit the fork end of the left-hand link and the right-hand link to the appropriate ends of the anti-roll bar, insert a $\frac{7}{16}$ in. washer between each side of the Metalastik bushes and the fork ends, and secure the links with the $\frac{7}{16}$ in. clamp bolts and Aerotight nuts. Locate the ball end of each link in the appropriate wishbone and spring pan assembly and secure them with the $\frac{1}{2}$ in. spring washers and nuts.

Replace the front apron and the bumper bar.



KKK.4

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