SECTION K

THE FRONT SUSPENSION

	Section
Castor and camber angles and swivel hub inclination	K.1
Rubber suspension	
Lower arms	K.6
Spring units	K.2
Struts	K.7
Upper arm	K.5
Hydrolastic suspension	
Description	H.7
Depressurizing, evacuating, pressurizing	H.8
Displacer units	K.8
Upper suspension arms	K.9
Swivel hub ball joints	K.4
Swivel hubs	K.3
Tools	End of Section

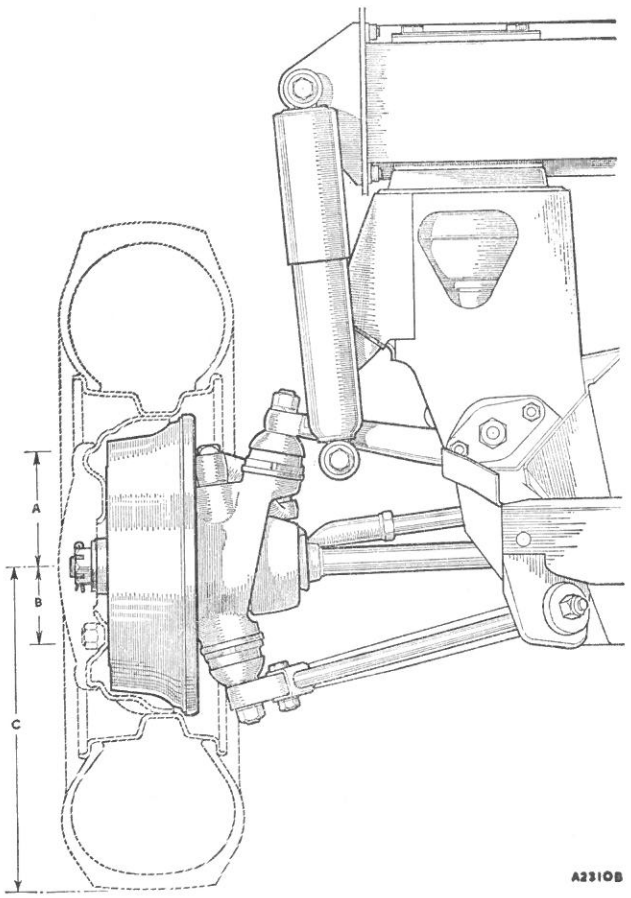

Fig. K.1

The general arrangement of the front suspension: (A) *indicates the maximum upward deflection from normal,* $3\frac{11}{32}$ *in.* (84·93 *mm.*); (B) *the rebound figure,* $2\frac{9}{32}$ *in.* (57·94 *mm.*); (C) *the normal distance above ground surface*

GENERAL DESCRIPTION

The independent front suspension comprises upper and lower suspension arms located in the side-members of the front sub-frame with their outer ends attached by ball joints to the swivel hubs. Rubber cone spring units are mounted in the front sub-frame towers with tubular struts interposed between the springs and the suspension upper support arms. Telescopic dampers are mounted on the upper support arms, with their top spigots anchored on the wing valance.

Maintenance is confined to lubrication as detailed in the Passport to Service and the Driver's Handbook.

WARNING.—When working on the front of the vehicle with the wheels hoisted clear of the ground forceful movement of the road wheels from lock to lock must be avoided. Some damage may occur within the steering mechanism when the considerable momentum of the steering-wheel (due to enforced rotation) is suddenly halted.

Section K.1

CASTOR AND CAMBER ANGLES AND SWIVEL HUB INCLINATION

The castor and camber angles and swivel hub inclination are three design settings of the front suspension that have a very important bearing on the steering and general riding of the car. Each of these settings is determined by machining and assembly of the components during manufacture, and are not adjustable.

Should the car suffer damage to the suspension, the angles (as given in **'GENERAL DATA'**) must be verified with a camber, castor, and hub inclination gauge and new parts fitted as found necessary.

Section K.2

SPRING UNITS
(Rubber Suspension)

Compressing

Knock down the locking tabs and slacken both bolts securing the front sub-frame towers to the engine bulkhead cross-member. Withdraw one bolt and move the washer plate to one side to expose the access hole in the cross-member, replace the bolt, and retighten both bolts, do not overtighten.

Assemble Service tool 18G 574 B, making certain that the spindle nut is fully tightened to lock the spindle firmly into the end of the centre screw. Insert the tool through the cross-member, locate the body of the tool over the heads of the two sub-frame bolts, and screw the centre screw of the tool nine complete turns, not more nor less, into the spring unit. Keep the ratchet handle screwed well up the centre screw, clear of the cross-member, during this operation. Operate the ratchet handle to turn the centre nut down to make contact with the body of the tool. Hold the centre screw to prevent further rotation and operate the ratchet handle clockwise

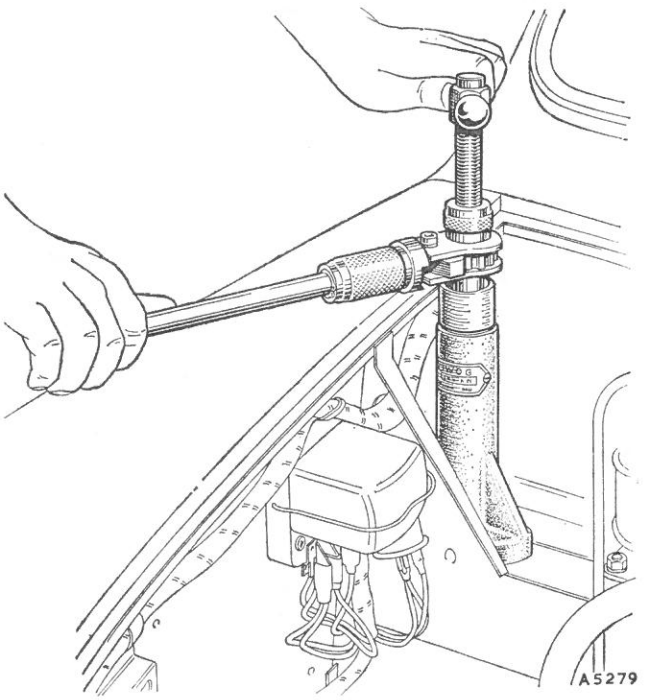

Fig. K.2

The front sub-frame mounting on the engine bulkhead cross-member, showing the method of compressing the spring unit using Service tool 18G 574 B

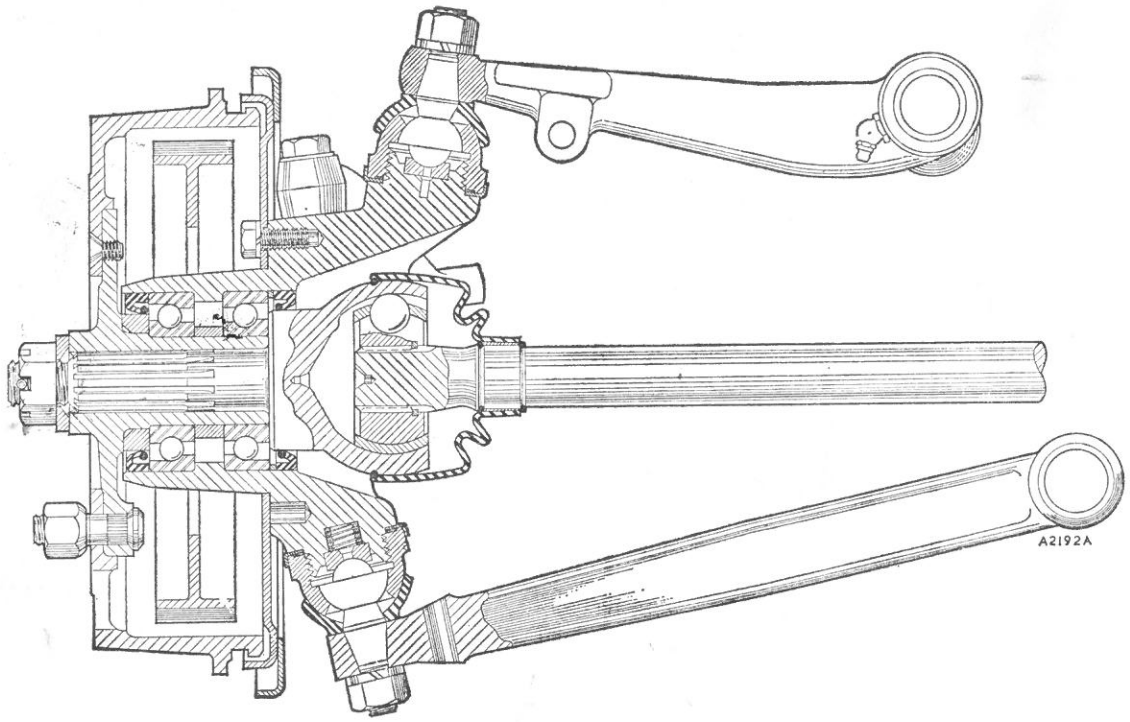

Fig. K.3
A section through the front suspension assembly

to compress the spring unit sufficiently to allow the spring strut to be extracted from the sub-frame tower. Do not over-compress the spring.

Removing

Jack up the car after compressing the spring as detailed above and remove the road wheel.

Remove the bump rubber from the sub-frame tower.

Take off the nut securing the upper arm to the swivel hub ball and remove the arm from the ball pin.

With the spring unit compressed the strut can be levered away from its seating in the spring unit.

Detach the hydraulic damper, dismantle the upper arm pivot, and remove the upper arm (see Section K.5).

Hold the centre screw of the compressing tool to prevent it turning, screw the ratchet handle up to release the pressure on the spring unit, and extract the spring from within the sub-frame tower.

Slacken off the compressing nut before attempting to remove the centre screw from the spring unit.

To alter the direction of operation of the ratchet handle rotate the milled sleeve at the inner end of the handle.

Refitting

Ensure that the spring unit is seating correctly on its spigot within the sub-frame tower. Compress the spring, using Service tool 18G 574. Refit the upper arm to the frame and swivel hub, and the strut between the arm and the spring. Secure the dust seal over the lip of the nylon seating in the upper arm. Refit the bump rubber to the sub-frame, the hydraulic damper, and release the spring unit from compression.

Section K.3

SWIVEL HUBS

Removing

Jack up the vehicle and remove the road wheel.

Remove the steering rack ball joint retaining nut and release the ball joint with Service tool 18G 1063.

Disconnect the drive shaft at the inner flexible joint, removing only the four outer nuts from the coupling 'U' bolts. Mark the drive flange and the flexible joint to enable them to be replaced in their original position.

Slacken the brake hose at the frame union and remove it from the brake backplate.

Release the upper suspension arm from the swivel hub ball pin. Remove the nut and spring washer from the rear end of the lower arm pivot pin and push the pin forward to release the arm. Withdraw the swivel hub assembly complete with the drive shaft.

Dismantling

Unscrew the two brake-drum retaining screws and remove the brake-drum.

Extract the split cotter pin and remove the slotted nut and spacing washer from the end of the drive shaft.

Remove the drive shaft with Service tool 18G 304 using adaptor bolts (2) 18G 304 F.

Remove the driving flange from the hub using Service tool 18G 575.

Remove the outer bearing spacer and extract both the inner and outer grease seals together with the spacing ring between the inner seal and the inner bearing.

Drift the inner races of both the inner and outer bearings from the hub bore, and use Service tool 18G 260 together with adaptor 18G 260 H to withdraw the outer races.

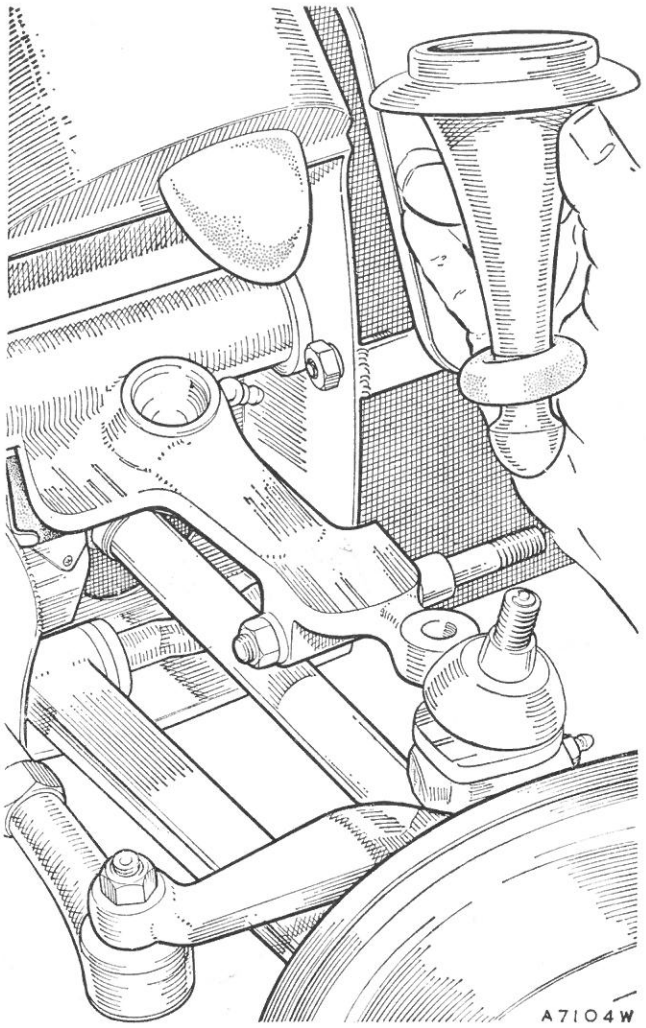

Fig. K.4

The method of removing the spring strut with the spring unit compressed and the upper support arm removed from the hub ball pin

The hub bore is machined to form a register between the two bearings; removal must thorefore be from their respective sides of the hub bore.

Reassembling

Reassembly is a reversal of the removal procedure, with particular attention given to the following points.

Pack the bearings with grease to Ref. C and make certain that they are fitted with their outer races hard against their register in the swivel hub bore.

When fitting the grease-retaining seals, the outer bearing spacer, and the driving flange washer make certain that they are fitted the right way round; the outer bearing spacer must have the chamfered bore facing outwards and the driving flange washer inwards.

Refitting

Refitting is a reversal of the removal procedure.

When refitting the lower arm follow the procedure given in Section K.6.

Tighten the steering lever ball joint to the correct torque figure (see **'GENERAL DATA'**).

Bleed the hydraulic system when the operations are completed.

Section K.4

SWIVEL HUB BALL JOINTS

Removing

Compress the spring unit as in Section K.2 or depressurize the Hydrolastic system as Section H.8.

Jack up the car and place supports under the front sub-frame side-member. Remove the road wheel and release the tie-rod yoke from the lower arm.

Remove the upper suspension arm retaining nut and spring washer and release the arm from the pin using Service tool 18G 1063. Take off the ball housing dust seal, remove the lubricator, and knock up the tab of the locking washer; unscrew the housing to release the ball and ball seat. The same procedure is used to remove the lower ball joint. Note the spring fitted under the lower ball joint seat.

Refitting

Thoroughly clean all components and refit the ball seat, pin, and ball housing without the packing shims, locking washer, or lower ball joint seat spring. Screw down the ball housing until there is no free movement between the ball and the ball seating, and measure with a feeler gauge the gap between the housing and the swivel hub. Remove the housing and ball pin (refit the spring under the lower joint ball seat), and repack the assembly with grease to Ref. C. Add shims to the value of the feeler gauge measurement less the thickness of the locking washer, ·036 in. (·91 mm.). The final assembly must have a condition of 'no nip' to ·003 in. (·076 mm.) end float and a further shim must be added to the initial feeler gauge measurement to produce this condition. Replace the locking washer and refit the assembly to the swivel hub. Should there be evidence of excessive end float or tightness the housing shims must be adjusted accordingly.

Use Service tool 18G 372 with adaptor 18G 587 to

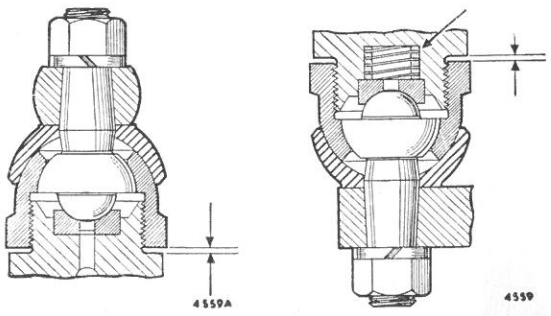

Fig. K.5

A section through the swivel hub ball joints. Take feeler gauge measurements at the positions indicated without the locking washers fitted and without the seat spring fitted to the lower ball joint

tighten the ball pin retainer to the correct torque figure (see **'GENERAL DATA'**). Tap up the locking washer on three flats to secure the housing.

Replace the dust seal, refit the suspension arm and tighten the ball pin nut to the correct torque figure (see **'GENERAL DATA'**).

Reconnect the tie-rod yoke to the lower arm.

Refit the road wheel.

Release the rubber spring unit from compression or pressurize Hydrolastic system as in Section H.8.

Section K.5

UPPER ARM
(Rubber Suspension)

Removing

Compress the spring unit to remove the load from the upper arm as in Section K.2.

Jack up the vehicle and remove the road wheel and the hydraulic damper.

Remove the upper suspension arm retaining nut and spring washer and release the arm from the pin, using Service tool 18G 1063.

Remove the nuts from the arm pivot pin. Take off the front thrust washer retaining plate, extract the washer, and push the pivot pin forward. Remove the rear thrust washer and manœuvre the arm from the frame.

The needle-roller bearings fitted in each side of the arm bore can be removed with Service tool 18G 581 and new bearings fitted with Service tool 18G 582 and adaptor 18G 582 A. This adaptor will ensure that the new bearings are fitted to the correct depth. The nylon seating fitted to the spring strut recess can also be prised out and a new seating fitted.

Refitting

Before the arm is refitted make certain that the hole in the lubricating nipple is clear. Apply a smear of grease to the inner face of both the thrust washers before they are refitted.

Place the pivot pin rear thrust washer against the bore of the arm and secure it in this position with its rubber dust seal. Stretch the front dust seal over the arm and insert the pivot pin into the arm bore. With the spring unit compressed, insert the arm into the sub-frame member and locate the spring unit strut in the nylon seating.

The nylon seating cup and the rubber dust seal must be repacked with Dextagrease Super G.P., supplied by BMC Service Ltd. in 1-lb. (·45-kg.) tins under Part No. 97H 2276.

Push the pivot pin into its correct position, refit the front thrust washer, and secure it with the retaining plate. Slide the dust seal over the thrust washer and refit the strut ball end dust seal over the lip of the nylon seating. Replace and tighten up the pivot pin nuts and spring washers.

Reconnect the outer end of the arm to the swivel hub ball pin and secure it with the nut and spring washer.

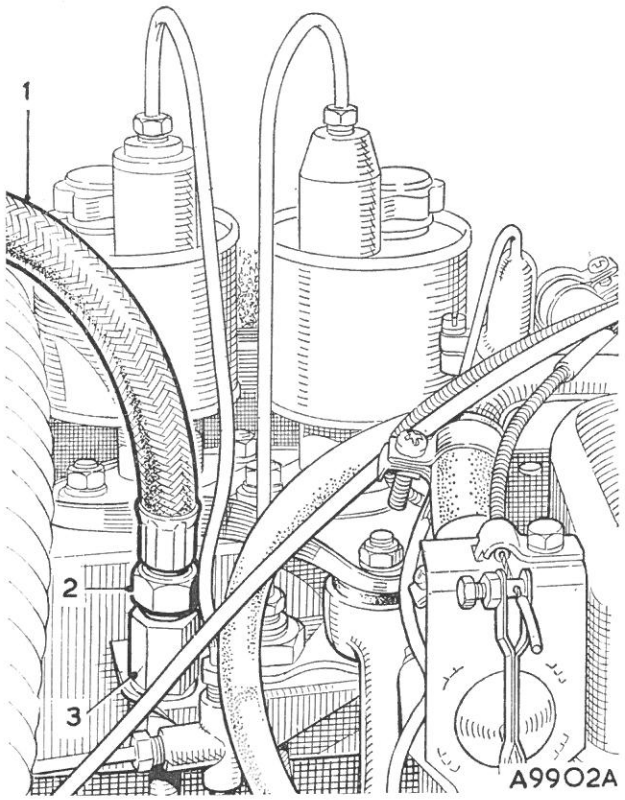

Fig. K.6

The right-hand front displacer hose connector

1. Displacer hose.
2. Hose nut.
3. Connector.

Refit the hydraulic damper, apply a grease gun to the lubricator on the pivot arm, and refit the road wheel.

Release the spring unit from compression.

Section K.6

LOWER ARM
(Rubber Suspension)

Removing

Jack up the vehicle and remove the road wheel and hydraulic damper.

Support the suspension beneath the brake-drum; disconnect the outer end of the arm from the swivel hub ball pin and from the tie-rod yoke.

Remove the nut and spring washer from the rear end of the pivot pin and push the pin forward to remove it and release the arm.

Refitting

Refitting is a reversal of the removal sequence. Make certain that the rubber bushes fitted in the bore of the arm are in good condition; new bushes should be fitted if they show signs of wear or deterioration.

The front suspension lower arm must be supported in its normal position (see Fig. K.1) when the lower arm pivot pin is locked up. This will prevent the rubber bushes being subjected to preloading, as would be the case if the pin were locked up with the lower arm hanging down.

Section K.7

DISPLACER UNITS
(Hydrolastic Suspension)

Removing

(1) Jack up the car and remove the road wheel.

(2) Depressurize and evacuate the Hydrolastic system, see Section H.8.

(3) Release the displacer strut dust seal from the nylon seat and extract the strut from the displacer unit.

(4) Disconnect the displacer hose from the union on the engine bulkhead.

(5) Remove the suspension top arm (see Section K.5).

(6) Push the displacer upwards and remove two screws to release the support bracket from inside the sub-frame tower.

(7) Rotate the displacer anti-clockwise and withdraw it from the sub-frame.

Refitting

(8) Reverse the removal instructions.

(9) Rotate the displacer clockwise to lock it into the registers on the locating plate.

(10) Lubricate the strut ball end and the nylon seat with Dextagrease Super G.P. and make sure the dust seal is fitted over the lip of the nylon cup.

(11) Evacuate and pressurize the system, see Section H.8.

Section K.8

UPPER SUSPENSION ARMS
(Hydrolastic Suspension)

Removal

Depressurize the Hydrolastic system as in Section H.8 and follow the instruction in K.5 for arm removal.

Section K.9

SWIVEL HUB OUTER OIL SEAL

The following instructions will permit a leaking outer seal to be replaced when the driving flange is removed.

NOTE.—A bearing overhaul will still require swivel hub removal as in Section K.3.

Removal

(1) Remove the hub cover, extract the split pin and slacken the drive shaft nut.

(2) Slacken the wheel nuts and jack up the vehicle.

(3) Take off the road wheel and remove the brake drum.

(4) Remove the drive shaft nut and assemble the Service tool 18G 304 and 18G 304 F to the drive flange.

(5) Replace the Service tool centre screw with adaptor 18G 304 P and use the impulse extractor 18G 284 to remove the flange.

(6) Should the outer bearing inner race come away with the driving flange, it can be removed with Service tool 18G 705 and adaptor 18G 705 B.

Refitting

(7) Refit the inner bearing race (if extracted).

(8) Fit the new seal and apply a suitable amount of lubricant to the lip to prevent burning.

(9) Insert the outer bearing distance piece into the seal with the chamfered bore to the outside.

(10) Assemble the drive flange to the hub, drifting it into position gently, turning the flange 180° several times to align the bearing distance piece with the flange boss.

(11) Refit the brake drum.

(12) Refit the drive shaft washer, chamfered bore facing inward, and replace the nut.

(13) Tighten the shaft nut to the torque figure given in **'GENERAL DATA'** and secure with the split pin.