INDEX *(continued)*

FRONT SUSPENSION

DESCRIPTION

The right and left hand front suspension units are comprised of the upper and lower wishbones to which are attached the stub axle carriers, the torsion bars and the hydraulic dampers.

The torsion bars are attached at their forward end to the lower wishbones and at the rear end to brackets secured to the chassis frame.

Each torsion bar is controlled by a telescopic direct acting hydraulic damper.

The top of each damper is attached to brackets formed on the forward chassis assembly; the bottom of the damper being bolted to the lower wishbone.

The upper wishbone is a one piece forging secured to the threaded fulcrum shaft by means of pinch bolts through clamps formed on the wishbone inner mounting. The fulcrum shaft is mounted on two rubber/steel bonded bushes.

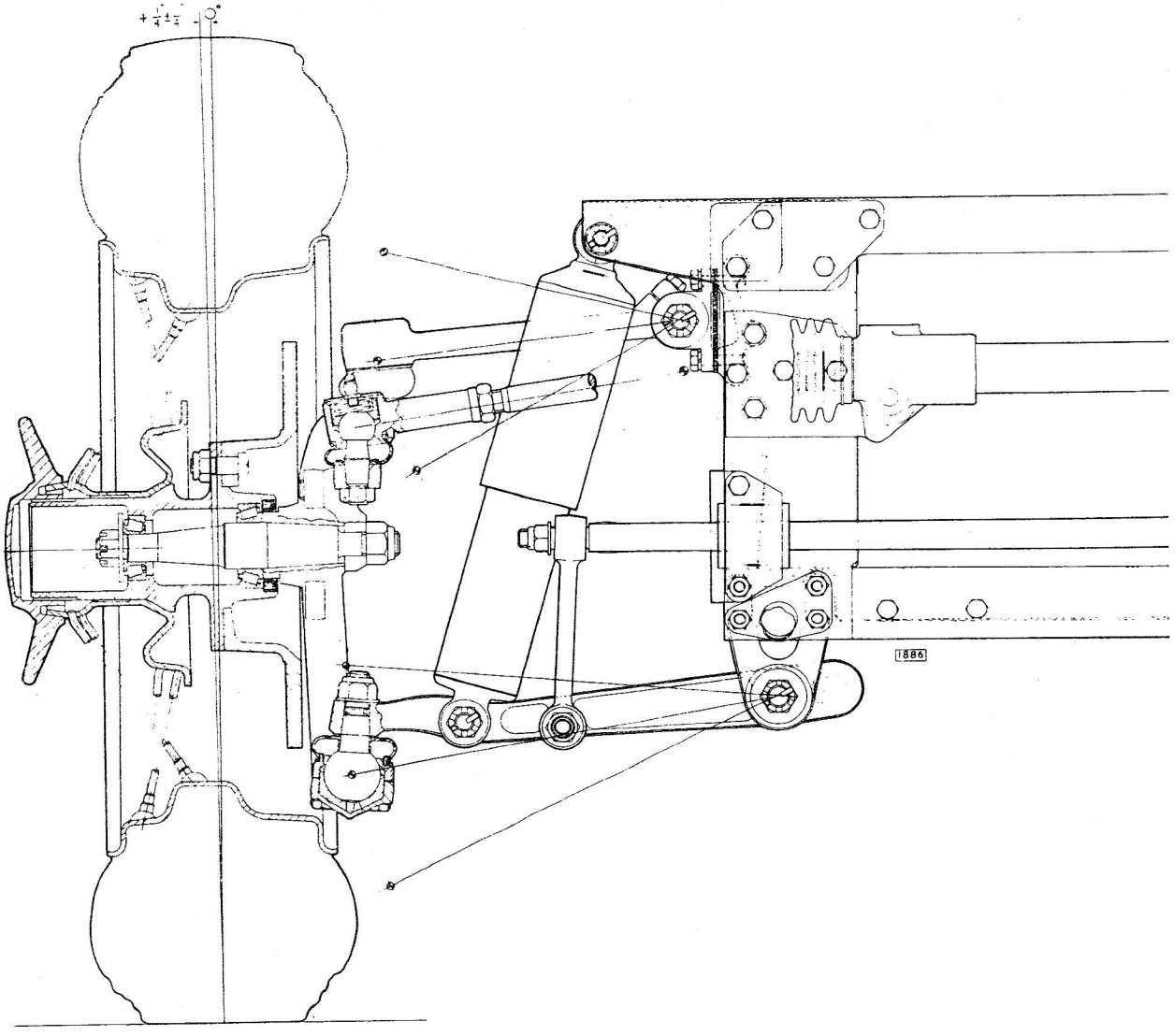

Fig. 1. The front suspension assembly.

The outer ends of the wishbone carry the upper wishbone ball joint which is in turn secured to the hub carrier by the tapered shank of the ball pin and a locknut.

The lower wishbone is a two piece assembly the inner ends of which are mounted at the fulcrum shaft end on rubber/steel bonded bushes.

The outer end of the lower wishbone is secured to the lower wishbone ball joint by the tapered shank of the ball pin and a locknut.

An anti-roll bar fitted between the lower wishbones is attached to the chassis front member by rubber insulated brackets.

The wheel hubs are supported on two tapered roller bearings, of which the inner races fit on a shaft located in a tapered hole bored in the stub axle carrier.

DATA

Type	Independent torsion bars
Dampers	Telescopic hydraulic
Castor Angle	$2° \pm \frac{1}{2}°$ positive
Camber Angle	$\frac{1}{4}° \pm \frac{1}{2}°$ positive
Swivel inclination	4°

ROUTINE MAINTENANCE

Wishbones and Anti-Roll Bar

The front suspension wishbone levers and the anti-roll bar are supported on rubber bushes which do not require any attention.

Front Hydraulic Dampers

The front hydraulic dampers are of the telescopic type, and no replenishment with fluid is necessary or provided for.

EVERY 2,500 MILES (4,000 KM.)

Wheel Swivels

Lubricate the nipples (four per car) fitted to the top and bottom of the wheel swivels. The nipples are accessible from underneath the front of the car. Lack of lubrication at these points may cause stiff steering.

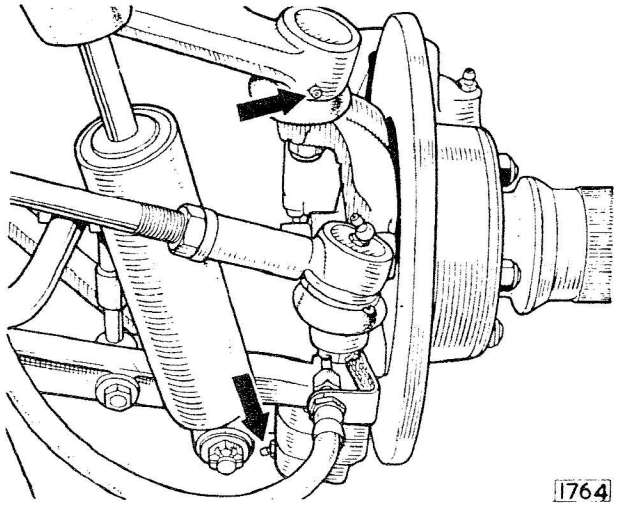

Fig. 2. The steering swivel grease nipples.

EVERY 10,000 MILES (16,000 KM.)

Wheel Bearings

Removal of the wheels will expose a grease nipple in the wheel bearing hubs. Lubricate sparingly with the recommended grade of lubricant. Always thoroughly clean the grease nipple before applying grease gun. An indication that sufficient grease has been applied is by the escape of grease past the outer hub bearing which can be observed through the bore of the splined hub.

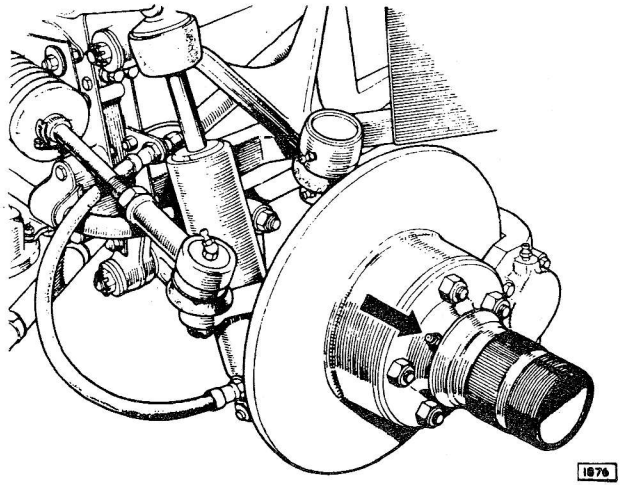

Fig. 3. The front wheel bearing grease nipple.

Recommended Lubricants

Component	Mobil	Castrol	Shell	Esso	B.P.	Duckham	Regent Caltex/Texaco
Front Wheel Bearings	Mobilgrease MP	Castrolease LM	Retinax A	Esso Multi-purpose Grease H	Energrease L2	LB10	Marfak All purpose
Wheel Swivels	Mobilgrease MP	Castrolease LM	Retinax A	Esso Multi-purpose Grease H	Energrease L2	LB10	Marfak All purpose

FRONT SUSPENSION ASSEMBLY—DISMANTLING

It is not advisable to attempt to remove the right hand and left hand front suspension assemblies as complete units. The various components should be removed as separate items.
To dismantle proceed as follows.

UPPER WISHBONE

Removal

Slacken off, but do not remove the hub caps from the road wheels; the hub caps are marked "RIGHT (OFF) SIDE" and "LEFT (NEAR) SIDE" and the direction of rotation to remove, that is, clockwise for the right hand side and anti-clockwise for the left hand side.

Place the jack under the lower wishbone fulcrum support bracket and raise the car until the wheels are clear of the ground.

Place a stand under the wishbone fulcrum rear support bracket.

Complete the removal of the road wheels.

Do NOT place the jack or stands under the forward frame cross tubes.

Remove the self-locking nut and drift out the upper wishbone ball joint from the stub axle carrier, into which it is a taper fit, by tapping on the side face of the carrier adjacent to the pin.

Remove the two bolts, nuts and lock washers retaining the fulcrum shaft rear carrier bracket to the chassis frame.

Identify and remove the shims fitted between the bracket and the chassis frame, and the stiffener plate located behind the two nuts on the inner face of the frame member.

Note: DO NOT confuse the shims with this stiffener plate when refitting the bracket.

Remove the three setscrews and lock washers retaining the fulcrum shaft front carrier bracket to the chassis frame.

Identify and remove the shims fitted between the bracket and the chassis frame.

Remove the upper wishbone.

Extract the split pins and unscrew the nuts retaining the brackets to the fulcrum shaft. Withdraw the brackets and rubber bushes. Note the relative positions of the shims removed from the front and rear brackets as these control the camber angle.

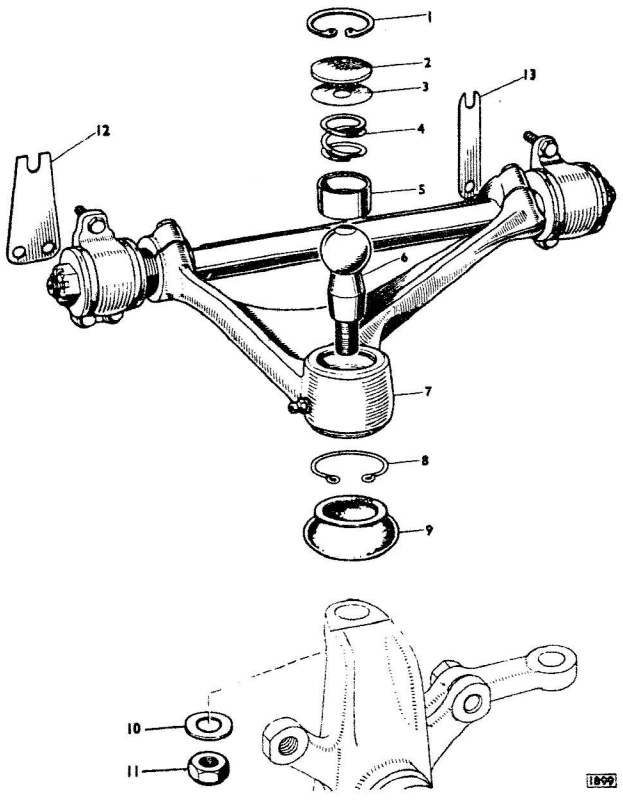

Fig. 4. The upper wishbone and ball pin.

1. Circlip
2. Top cover
3. Shims
4. Socket spring
5. Ball pin socket
6. Ball pin
7. Upper wishbone
8. Circlip
9. Rubber gaiter
10. Washer
11. Nut
12. Camber shims (front carrier bracket)
13. Camber shims (rear carrier bracket)

Note: When carrying out the above operation do not allow the flexible brake hose to become extended. Tie up the axle carrier to the frame member.

Refitting

The refitting of the upper wishbone assembly is the reverse of the removal procedure, but the slotted nuts at each end of the fulcrum shafts must not be tightened until the upper wishbone assembly has been fitted and the full weight of the car is on the suspension. Omitting to carry out this procedure will result in undue torsional loading of the rubber bushes with possible premature failure.

Note: Check the ball joint rubber gaiter (9). Replace if worn or damaged.

Check the castor and camber angles after refitting upper wishbone as described on pages J.17 and J.18.

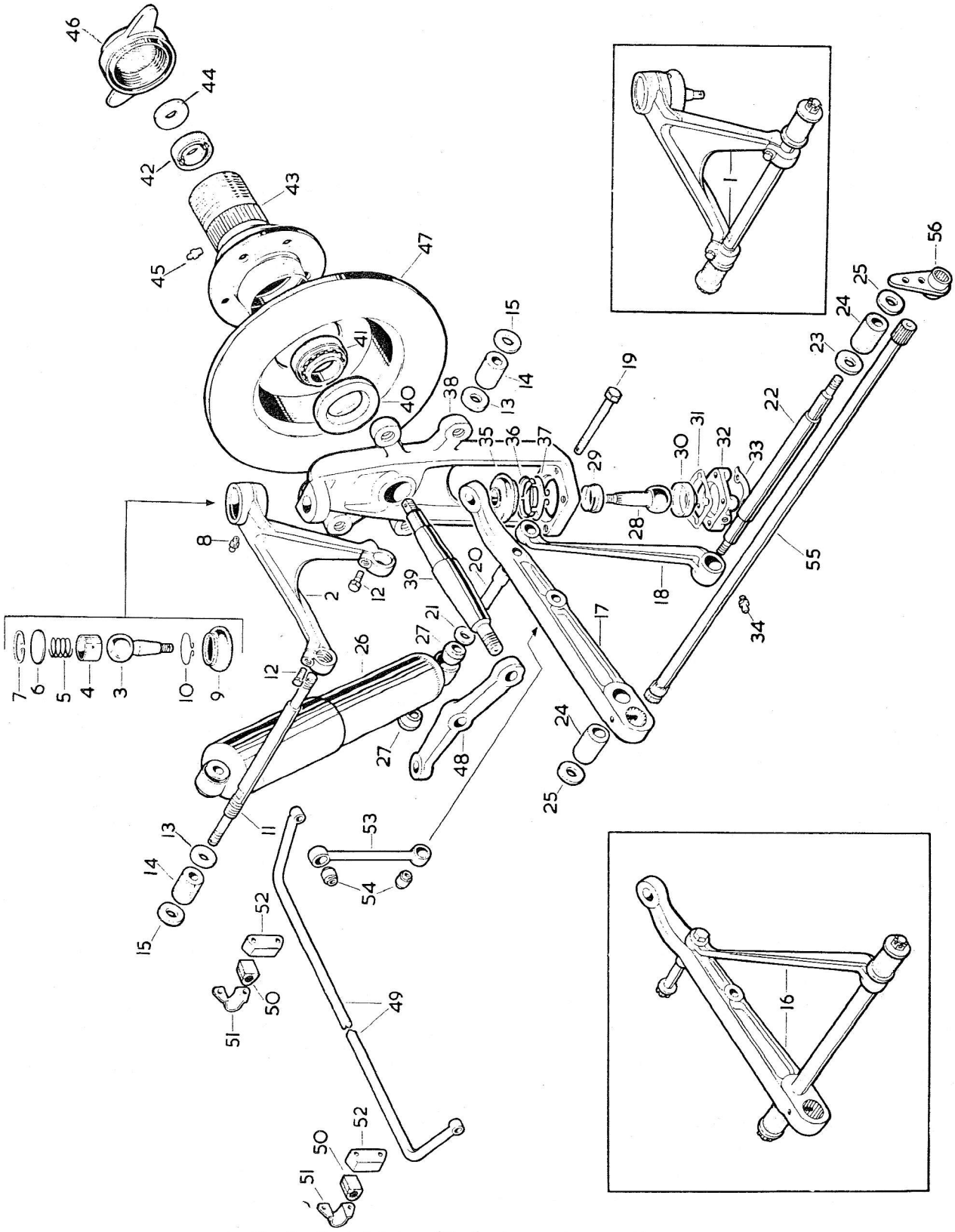

Fig. 5. Exploded view of the front suspension assembly.

1. Upper wishbone assembly (Right-hand)
2. Upper wishbone (Right-hand)
3. Upper wishbone ball pin
4. Ball pin socket
5. Spring
6. Top cover
7. Circlip
8. Grease nipple
9. Rubber gaiter
10. Clip
11. Upper wishbone fulcrum shaft
12. Pinch bolt
13. Distance washer
14. Rubber bush (Upper wishbone)
15. Special washer
16. Lower wishbone assembly (Right-hand)
17. Lower wishbone lever (Right-hand front)
18. Lower wishbone lever (Right-hand rear)
19. Bolt
20. Sleeve
21. Washer
22. Lower wishbone fulcrum shaft
23. Distance washer
24. Rubber bush (lower wishbone)
25. Special washer
26. Shock absorber (front)
27. Shock absorber (bottom bush)
28. Lower wishbone ball pin
29. Ball pin spigot
30. Morganite socket
31. Shims
32. Lower ball pin cap
33. Tab washers
34. Grease nipple
35. Rubber gaiter
36. Gaiter retainer
37. Clip
38. Stub axle carrier
39. Stub axle
40. Oil seal
41. Inner bearing
42. Outer bearing
43. Front hub (Right-hand)
44. "D" washer
45. Grease nipple
46. Hub cap
47. Brake disc
48. Steering arm
49. Anti-roll bar
50. Rubber bush
51. Bracket
52. Distance piece
53. Anti-roll bar link
54. Rubber bush
55. Torsion bar
56. Bracket—torsion bar (rear end)

IMPORTANT

It is essential that the top wishbone ball pin is not allowed to come into hard contact with the sides of the ball socket. When testing the movement of the ball in its socket, move the ball only in the direction of the elongation.

If the top wishbone is removed complete with the stub axle carrier the assembly must not be held by the top wishbone and the axle carrier allowed to swing on the ball pin.

Removal of the Fulcrum Shaft

Release the two clamp screws locking wishbone to fulcrum shaft. Turn shaft in a clockwise direction, looking from the rear, until the threaded portion of the shaft is clear of the wishbone. Withdraw the shaft through the wishbone arms.

Adjustment of the Ball Joint

The correct clearance of the ball pin in its socket is ·004″ (·10 mm.).

Shims for the adjustment of the ball joint are now available in ·004″ (·10 mm.) thicknesses.

To adjust the ball pin clearance to the correct figure, Fig. 4, remove the circlip (1), cover plate (2) and spring (4) from the ball joint. Clean thoroughly all the component parts.

Fit shims (3) between cover plate (2) and upper ball socket (5) until the ball is tight in its sockets when the cover plate and circlip are refitted without the spring.

Remove shims to the value of ·004″ (·10 mm.) and re-assemble ball joint complete with the spring, when it should be possible to move the ball pin by hand.

Finally lubricate with the recommended lubricant.

Note: Shims should not be added to take up excessive wear in the ball pin and sockets; if these parts are badly worn replacements must be fitted.

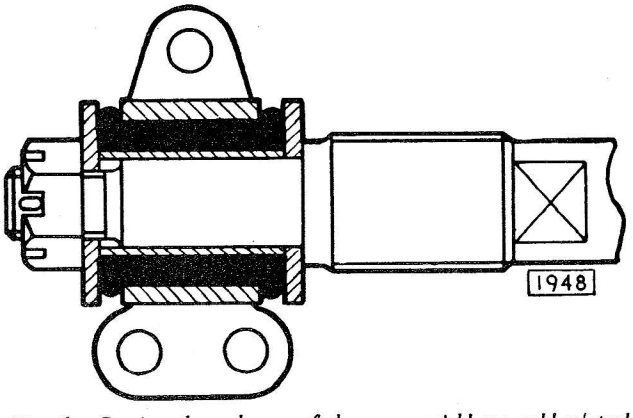

Fig. 6. Section through one of the upper wishbone rubber/steel bushed mounting brackets.

Renewing the Rubber/Steel Bushes

Drift or press out the bush from the bracket. Press the new bush into the bracket ensuring that the bush projects from each side of the bracket by an equal amount. Fitting of the bush will be facilitated if a lubricant made up of twelve parts of water to one part of liquid soap is used.

LOWER WISHBONE

Removal

Slacken off but do not remove the hub caps from the road wheels; the hub caps are marked "RIGHT (OFF) SIDE" and "LEFT (NEAR) SIDE" and the direction of rotation to remove, that is, clockwise for the right hand and anti-clockwise for the left hand side. Make up a block of hard wood to fit into the frame lower cross tube section as shown in Fig. 7.

Remove the cable harness band clips from the cross tube and insert the block of wood under the cross tube; place the jack under the wooden block and raise the car until the road wheels are clear of the ground.

Place stands under the blocks at the two outer ends of the cross tube adjacent to the lower wishbone fulcrum pivots. Complete the removal of the road wheels. Do NOT place the jack or stands under the frame cross tube without the wooden block inserted.

Disconnect the hydraulic brake pipe from the frame connection, remove the brake pipe carrier brackets and blank off the connector to prevent ingress of dirt or loss of fluid.

Remove the split pin and nut from the steering tie rod ball joint and drift out the tie rod end from its tapered seating in the steering arm by tapping on the side face of the steering arm adjacent to the ball pin.

Disconnect the upper wishbone ball joint as described on page J.7. If it is not required to remove the upper wishbone completely for servicing raise the wishbone to its full extent and tie to the frame.

Disconnect the lower wishbone ball joint by removing the self-locking nut and drifting out the ball pin from its tapered seating in the lower wishbone. Remove the axle carrier complete with the brake caliper and disc. Place the jack under the lower suspension arm and raise the jack to take up the weight of the car.

Note: Do not lift the car off the stands.

Remove the self locking nut retaining the anti-roll bar to the lower suspension arm.

Remove the split pin and nuts retaining the telescopic damper to the frame and the wishbone, extract the upper mounting bolt and withdraw the damper.

Lower and remove the jack. Unscrew the two bolts and lock washers securing the torsion bar rear adjuster lever to the frame and slide the lever forward until it is clear of the torsion bar splines.

Remove the locking bolt from the torsion bar front

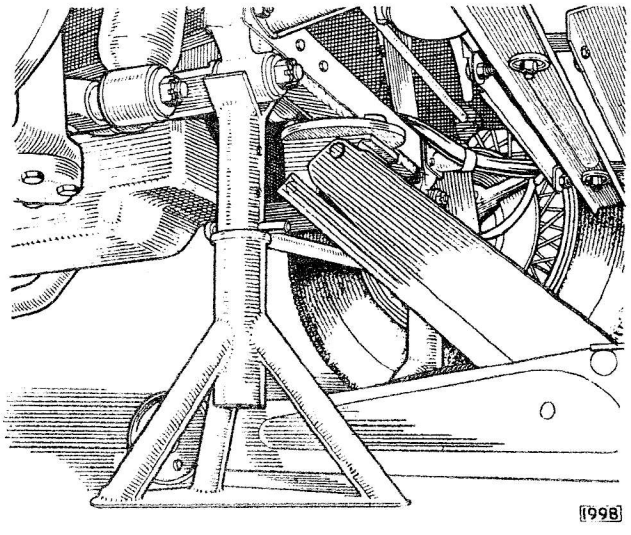

Fig. 7. Showing the front of the car jacked up under the front cross member; note the piece of hardwood which must first be inserted in the member. If only one front wheel is to be raised, the jack can be placed at the front end of the lower wishbone fulcrum shaft at the point where the stand is in position.

mounting. Slide the torsion bar rearwards until the front splines are clear of the wishbone and withdraw in a forward direction.

Remove the two bolts and washers retaining the fulcrum shaft rear carrier to the chassis frame.

Remove the four bolts, nuts and washers retaining the fulcrum shaft front carrier bracket to the chassis frame. Extract the split pin and remove the nuts from the lower wishbone shaft. Withdraw the brackets and rubber bushes.

Refitting

Refitting of the lower wishbone assembly is the reverse of the removal procedure, but it will be necessary to reset the torsion bar as described under "Torsion Bar—Adjustment" page J.15. Check the lower wishbone ball joint for clearance as described under "Lower Wishbone Ball Joint".

Examine the ball joint rubber gaiter. Replace if worn or damaged.

The slotted nuts at each side of the fulcrum shaft must not be tightened until the complete front suspension assembly has been fitted and the full weight of the car is on the suspension. Omitting to carry out this procedure will result in undue torsional loading of the rubber bushes with possible premature failure.

It will be necessary to re-bleed the front hydraulic brakes after refitting the lower wishbone assembly as described in Section L "Brakes".

Renewing the Rubber/Steel Bushes

Drift or press out the bush from the bracket. Press the new bush into the bracket so that the bush projects from each side of the bracket by an equal amount. Fitting of the bush will be facilitated if a lubricant made up of twelve parts of water to one of liquid soap is used.

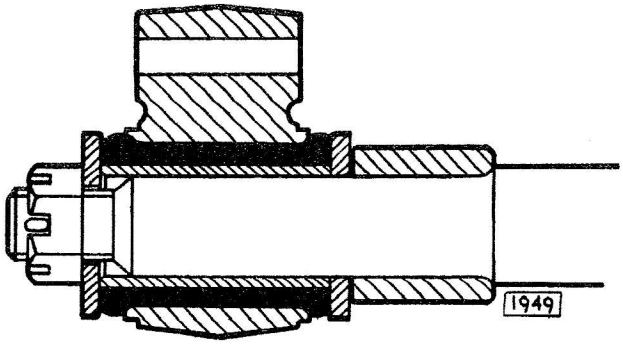

Fig. 8. Section through one of the lower wishbone rubber/steel bushed mounting brackets.

LOWER WISHBONE BALL JOINT

Dismantling

Release the wire clip (4, Fig. 9) and remove the rubber gaiter (3).

Tap back the tab washers (11) and unscrew the four setscrews (12) securing the ball pin cap (9) to the stub axle carrier.

Remove the cap (9), shims (8), ball pin socket (7), and ball pin (6).

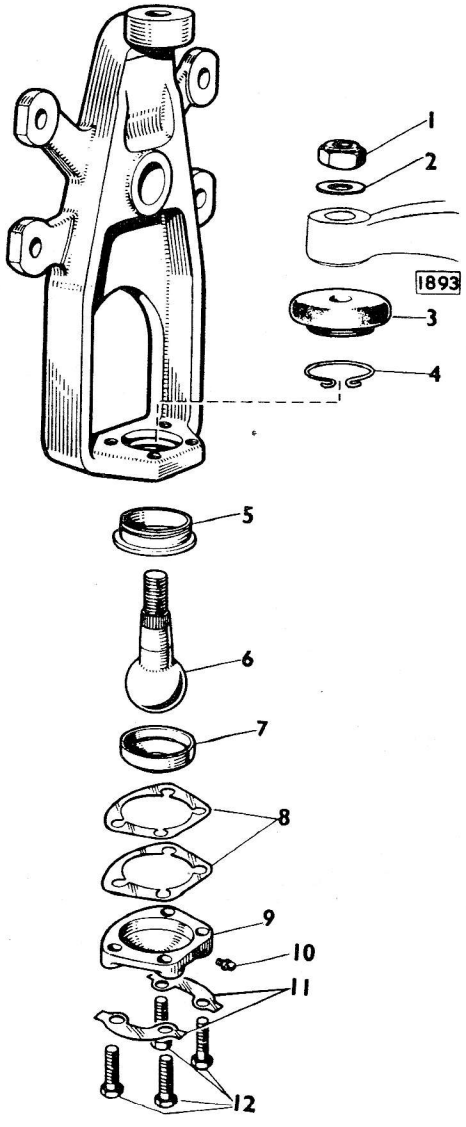

Fig. 9. The lower wishbone ball joint.

1. Nut
2. Washer
3. Rubber gaiter
4. Circlip
5. Spigot
6. Ball pin
7. Socket
8. Shims
9. Ball pin cap
10. Grease nipple
11. Tab washers
12. Setscrews

Re-assembling

Re-assembling is the reverse of the dismantling procedure but, if necessary, re-shim the ball joint to obtain the correct clearance of ·004″ to ·006″(·10 mm. to ·15 mm.).

Note: Shims should not be removed to take up excessive wear in the ball pin and sockets; if these parts are badly worn, replacements should be fitted.

Adjustment of the Ball Joint

The correct clearance of the ball pin in its socket is ·004″ to ·006″(·10mm. to ·15 mm.). Shims for adjustment of the ball joint are available in ·002″ (·05 mm.) and ·004″ (·10 mm.) thicknesses. To adjust the ball pin clearance to the correct figure, remove the shims one by one until, with the ball cap fully tightened, the ball is tight in its sockets. Fit shims to the value of ·004″ to ·006″ (·10 mm. to ·15 mm.) which should enable the shank of the ball pin to be moved by hand.

STUB AXLE CARRIER

Removal

Jack up the car and remove the road wheels as described under "Upper Wishbone—Removal" Page J.7.

Disconnect the hydraulic brake pipe from the frame connection, remove the brake pipe carrier and blank off the connector to prevent ingress of dirt and loss of fluid.

Remove the self-locking nut and plain washer securing the upper wishbone ball joint to the stub axle carrier. Drift out the ball from its tapered seating, by tapping on the side face of the carrier adjacent to the pin.

Raise the wishbone to its full extent and tie back to frame.

Remove the split pin and nut from the steering tie rod ball joint and drift out the tie rod end from its tapered seating by tapping on the side face of the carrier adjacent to the pin.

Remove the self-locking nut and plain washer securing the lower wishbone ball joint to the stub axle

carrier. Drift out the ball pin from its tapered seating by tapping on the side face of the lower wishbone adjacent to the ball pin.

Remove the axle carrier.

Refitting

Refitting is the reverse of the removal procedure. It will be necessary to bleed the front hydraulic brakes system after refitting the axle carrier and suspension arms as described in Section L "Brakes".

WHEEL HUBS

Removal

Jack up the car and remove the road wheel. Disconnect the flexible hydraulic brake pipe from the frame connection and blank off the connector to prevent the ingress of dirt and loss of fluid.

Remove the locking wire from the two brake caliper mounting bolts and unscrew the bolts noting the shims fitted between the caliper and the mounting plate. Remove the caliper. Remove the split pin, (2, Fig. 10), retaining the hub nut; holes are provided in the side of the hub through which the split pin can be withdrawn. Remove the slotted nut (1) and plain washer (3) from the end of the stub axle shaft. The hub can now be withdrawn by hand.

Dismantling

Extract the oil seal (8). Withdraw the inner races of the taper roller bearings (7). Examine bearing for wear. If new bearings are to be fitted the outer races can be drifted out from the hub.

Refitting

Refitting is the reverse of the removal procedure but it will be necessary to re-lubricate the bearings as detailed in "Routine Maintenance" at the beginning of this section and adjust the end float of the hub bearings as described in the following paragraph.

When refitting the brake caliper care should be taken to ensure that the correct clearances are maintained between the inner faces of the caliper and each face of the brake disc. For method of checking the clearance and tolerance permissible refer to Section L "Brakes". Re-bleed the hydraulic brakes after refitting as described in Section L "Brakes".

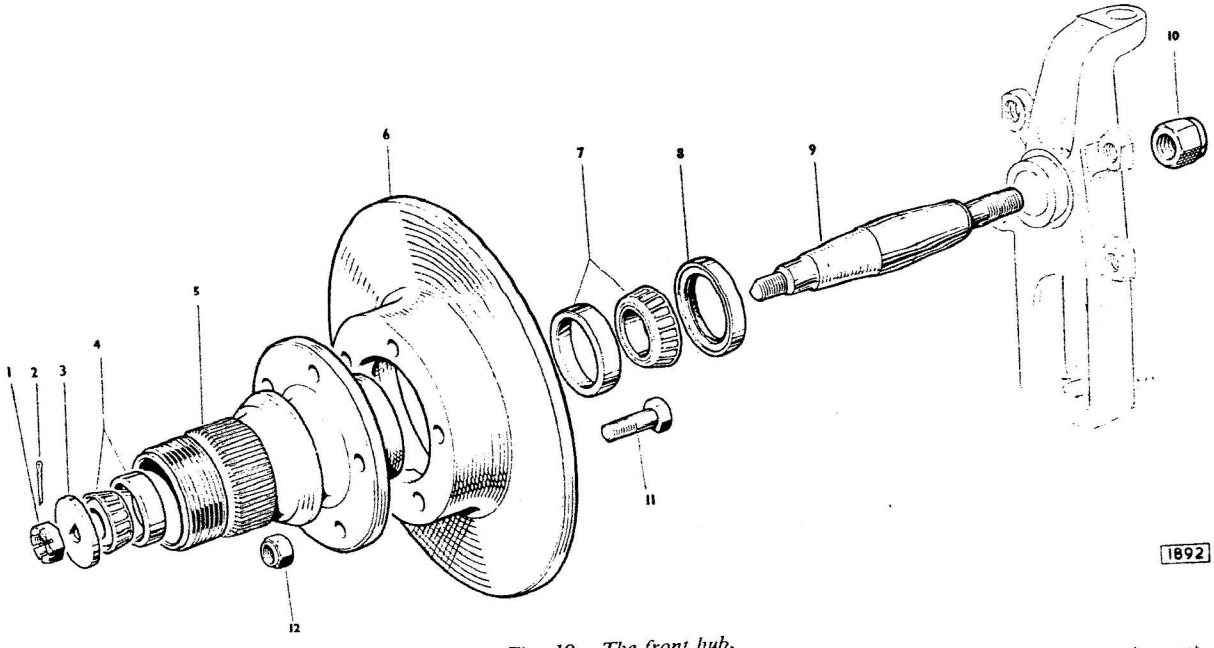

Fig. 10. The front hub.

1. Nut
2. Split pin
3. "D" washer
4. Outer bearing
5. Wheel hub
6. Brake disc
7. Inner bearing
8. Oil seal
9. Stub axle
10. Stub axle securing nut
11. Brake disc securing bolt
12. Nut

Bearing End-float Adjustment

The correct end float of the wheel bearings is ·003″ to ·005″ (·07 mm. to ·13 mm.). It is particularly important that the end float does not exceed ·005″ (·13 mm.) otherwise the brakes may tend to drag and not function correctly.

The wheel bearing end float can be measured with a dial indicator gauge, mounted with the plunger against the hub. If a gauge is not available proceed as follows:

Tighten the end nut until there is no end float, that is, when rotation of the hub feels slightly "sticky".

Slacken back the hub nut between one and two flats depending on the split pin hole relative to the slots in the nut.

HYDRAULIC DAMPERS

The telescopic hydraulic dampers are of the sealed type with no provision for adjustment or "topping-up" with fluid, therefore, in the event of a damper being unserviceable a replacement damper must be fitted.

Before fitting a damper to the car it is advisable to carry out the following procedure to "bleed" any air from the pressure chamber that may have accumulated due to the damper having been stored in a horizontal position.

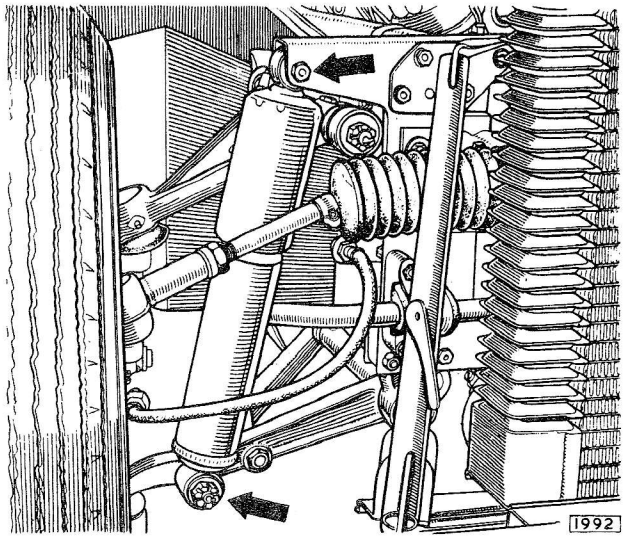

Fig. 11. The hydraulic damper attachment points.

Hold the damper in its normal vertical position with the shroud uppermost and make several short strokes (not exceeding more than half-way) until there is no lost motion and finish by extending the damper to its full extent once or twice. Do not extend the damper fully until several short strokes have been made first. After the operation of "bleeding" the hydraulic dampers should be kept in their normal upright position until they are fitted to the car.

IMPORTANT

If the hydraulic damper is to be removed do not allow the suspension unit to drop lower than the normal rebound position, otherwise the top ball joint may "neck" in its housing.

Support the outer end of the lower wishbone before removing the damper.

Removal

Jack up the car under the lower wishbone at a point adjacent to the damper lower mounting until the wheels are clear of the ground.

Remove the road wheel.

Remove the split pin and nut from the damper top and bottom mounting bolts.

Remove the top mounting bolt, withdraw the damper from the bottom mounting and remove from the car.

Refitting

Refitting is the reverse of the removal procedure, but the slotted nuts should not be tightened until the full weight of the car is on the suspension. Omitting to carry out this procedure will result in undue torsional loading of the rubber bushes with possible ultimate failure.

ANTI-ROLL BAR

Removal

Remove the four bolts, nuts and washers from the anti-roll bar support brackets (51, Fig. 5) on the chassis member. Withdraw the two distance pieces.

Remove the self-locking nuts and withdraw the two bolts attaching the arm to the lower wishbone. To separate the anti-roll bar (49) from the link arm (53), remove the self-locking nuts and the washers and withdraw the two bolts. The anti-roll bar bracket rubbers are split to enable them to be removed from the anti-roll bar.

Renewing the Link Arm Bushes

Drift or press out the bushes from the link arm upper and lower eyes. Press the new bush into the eye ensuring the bush projects from each side by an equal amount. The fitting of the bush will be facilitated if a lubricant made up of twelve parts of water to one part of liquid soap is used.

Refitting

Refitting is the reverse of the removal procedure. It is most important when attaching the support bracket to the frame member and also when tightening the self-locking nuts on the link arm attachment bolts to have the full weight of the car on the suspension. Omitting to carry out this procedure will result in undue torsional loading of the rubber bushes with possible premature failure.

TORSION BAR—ADJUSTMENT

Checking

Check that the car is full of petrol, oil and water. If not additional weight must be added to compensate for, say, a low level of petrol (the weight of 10 gallons of petrol is approximately 80 lbs. (36·0 kg.)). Before any check on torsion bar setting is made the car must be placed on a perfectly level surface, wheels in the straight ahead position and tyre pressures correctly adjusted to:

Front 23 lbs. per sq. in. (1·62 kg./cm.^{2})

Rear 25 lbs. per sq. in. (1·76 kg./cm.^{2})

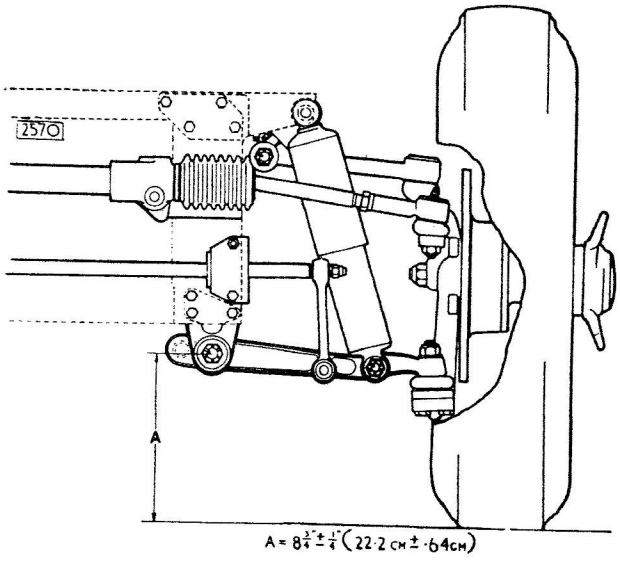

Fig. 12. Showing the method of checking the standing height.

Roll car forward three lengths.

With the torsion bar correctly adjusted the measurement A should be $8\frac{3}{4}" \pm \frac{1}{4}"$ (22·2 ± ·64 cm.).

Adjustment

If adjustment is necessary proceed as follows.

Jack up the car and place stands under the lower wishbone fulcrum support bracket.

Note: DO NOT place jack or stand immediately under the forward frame tubes.

Remove the road wheels.

Disconnect the upper wishbone ball joint from the stub axle carrier, as described on page J.7.

Disconnect the steering tie-rod ball joint from the stub axle carrier as described on page J.12.

Disconnect the anti-roll bar as described on page J.15.

Place the jack under the lower wishbone at a point adjacent to the damper lower mounting. Raise jack but do not lift the car off the stands.

Remove the split pins and slacken the nuts retaining the lower wishbone rubber mountings.

Remove the hydraulic damper as described on page J.14. Lower the jack.

Remove the two bolts and nuts securing the torsion bar rear adjuster lever to the frame. Fit setting gauge, with two holes drilled at $17\frac{13}{16}"$ (45·24 cm.) centres to damper mounting points to position lower wishbone.

Note: The setting gauge can be easily made using Fig. 13 as a reference.

The two holes in the torsion bar rear adjuster lever and the corresponding holes in the frame should now be in line. If holes are not in line adjustment must be made as follows:

(i) Note which way lever requires to be rotated to bring holes in line. Mark position of the lever on shaft, remove by sliding off the splines, turn in direction required, and locate on fresh splines. Check lever position.

(ii) Repeat operation if further adjustment is necessary. It should be noted that the rear end of the torsion bar has 25 splines whereas the front end has only 24 splines. This permits the bar to be used as its own vernier and allows for a very fine adjustment. If this very fine adjustment is necessary slide torsion bar out of front splines after first removing the locking bolt.

Turn in direction required and engage fresh splines.

If position of lever is now correct refit rear bolts and nuts, also front locking bolt and nut and fully tighten.

Remove the setting gauge and locate damper on lower mounting.

Raise jack until damper upper retaining bolt will pass through bracket and damper eye. Refit nuts but do not tighten. Refit top wishbone steering tie-rod and anti-roll bar.

Repeat operation to left hand side.

Refit road wheels, jack up car, remove stands and lower car.

Tighten damper securing nuts and insert split pins. Tighten lower wishbone fulcrum shaft nuts and insert split pins. Tighten nuts securing anti-roll bar.

Roll car forward three lengths and re-check standing height of car which should now be as shown in Fig. 12.

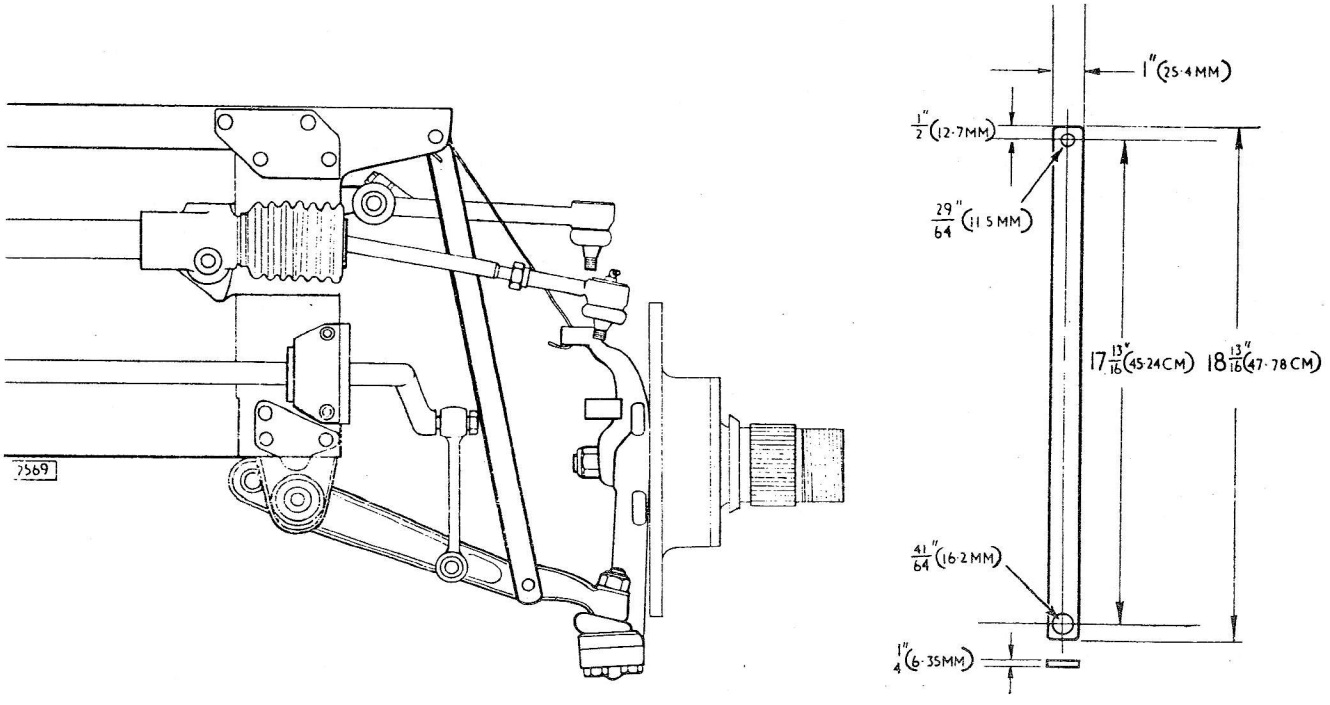

Fig. 13. The torsion bar setting gauge.

CASTOR ANGLE—ADJUSTMENT

Special links must be used when setting the castor angle of the front wheels. Dimensions for making the links are given in Fig. 15. The links, which fit over the top and bottom shock absorber mountings, hold the suspension in the mid-laden position.

Set the rear suspension in the mid-laden position utilising the setting links as described in Section K "Rear Suspension".

Using an approved gauge check the castor angle.

Castor angle $2° \pm \frac{1}{2}°$ positive.

Note: The castor angle for each wheel must not vary by more than $\frac{1}{2}°$.

Adjustment is effected by rotating the round threaded shaft on the front suspension upper wishbone bracket.

Remove the split pins and release the nuts situated at the rear and front of the fulcrum shaft and release the wishbone clamping bolts. The shaft may now be turned with a spanner placed on the two flats provided on the shaft.

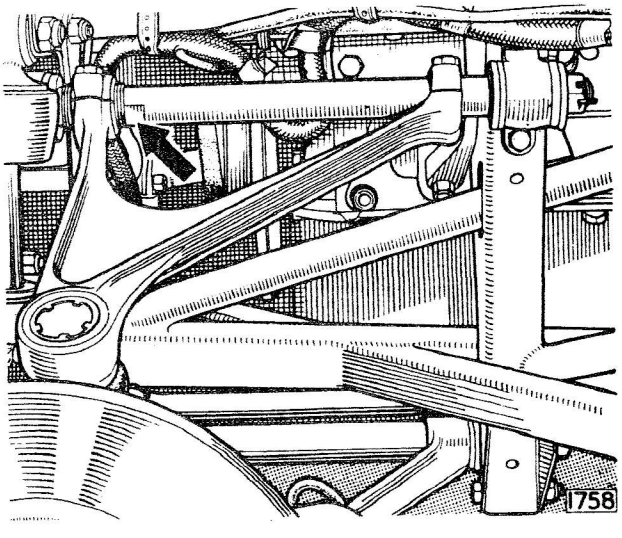

Fig. 14. The castor angle is adjusted by rotating the shaft indicated by the arrow.

Note: It is essential that the split pins be removed and the nuts released from the shaft otherwise a strain will be placed on the rubber mounting bushes.

To increase positive castor angle rotate the shaft anti-clockwise (viewed from the front of the car).

To decrease positive castor angle rotate the shaft clockwise. After adjustment retighten the clamp bolts.

The slotted nuts situated at the front and rear of the fulcrum shaft should not be tightened until the full weight of the car is on the suspension. Omitting to carry out this procedure will result in undue torsional loading of the rubber bushes with possible ultimate failure. Refit split pins.

The front of the car should be jacked up when turning the wheels from lock to lock during checking.

If any adjustment is made to the castor angle, the front wheel alignment should be checked and if necessary reset as described in Section I "Steering".

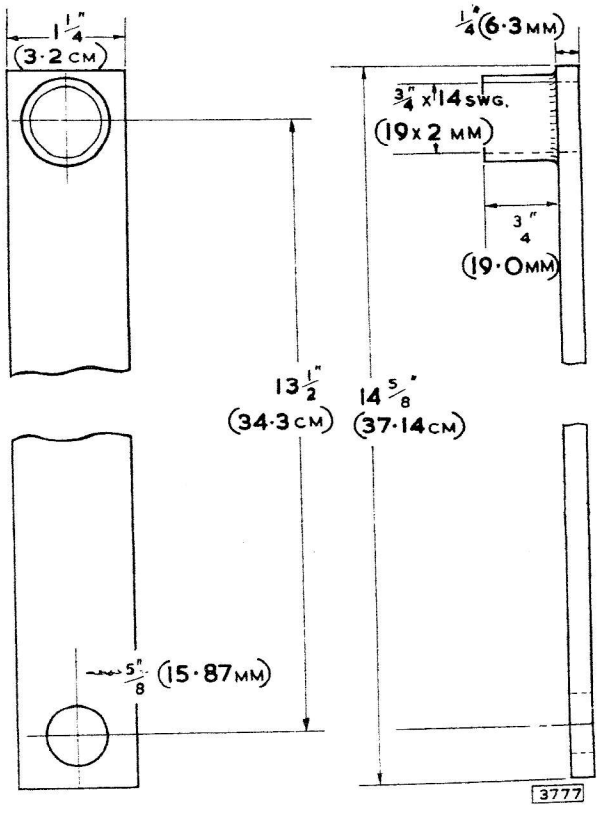

Fig. 15. Dimensions for front suspension setting links.

CAMBER ANGLE—ADJUSTMENT

When setting the camber angle of the front wheels the front and rear suspensions must be locked in the mid-laden position as detailed under the heading "Castor Angle—Adjustment".

Ensure that the tyre pressures are correct and that the car is standing on a level surface. Camber angle $\frac{1}{4}° \pm \frac{1}{2}°$ positive. The camber for each wheel must not vary by more than $\frac{1}{2}°$.

Line up the front wheel being checked parallel to the centre line of the car.

Using an approved gauge check the camber angle. Rotate the wheel being checked through 180° and re-check.

Adjustment is effected by removing or adding shims to the front suspension top wishbone bracket at two points, namely, the front and rear of the bracket.

The top holes in both front and rear shims are slotted and the bolts need only be slackened off to remove or add shims. The bottom holes are not slotted and it is necessary to remove bracket fixing bolts completely.

Inserting shims increases positive camber angle; removing shims increases negative camber angle or decreases positive camber angle. Remove or add an equal thickness of shims from each position otherwise the castor angle will be affected.

It should be noted the $\frac{1}{16}$" (1·6 mm.) of shimming will alter the camber by approximately $\frac{1}{4}°$.

Check the other front wheel in a similar manner. If any adjustment is made to the camber angle the front wheel alignment should be checked and if necessary be re-set as described in Section I "Steering".

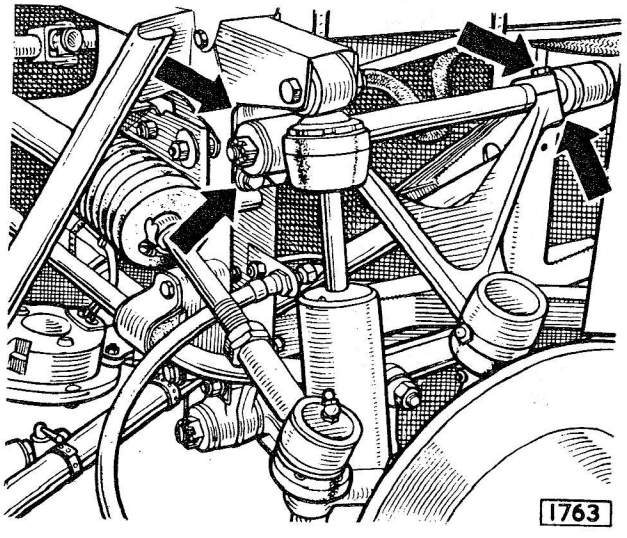

Fig. 16. The camber angle is adjusted by means of shims indicated by the arrows. Remove or add an equal thickness of shims from each position.

ACCIDENTAL DAMAGE

The following dimensional drawings are provided to assist in assessing accidental damage. A component suspected of being damaged should be removed from the car, cleaned off, the dimensions checked and compared with those given in the appropriate illustration.

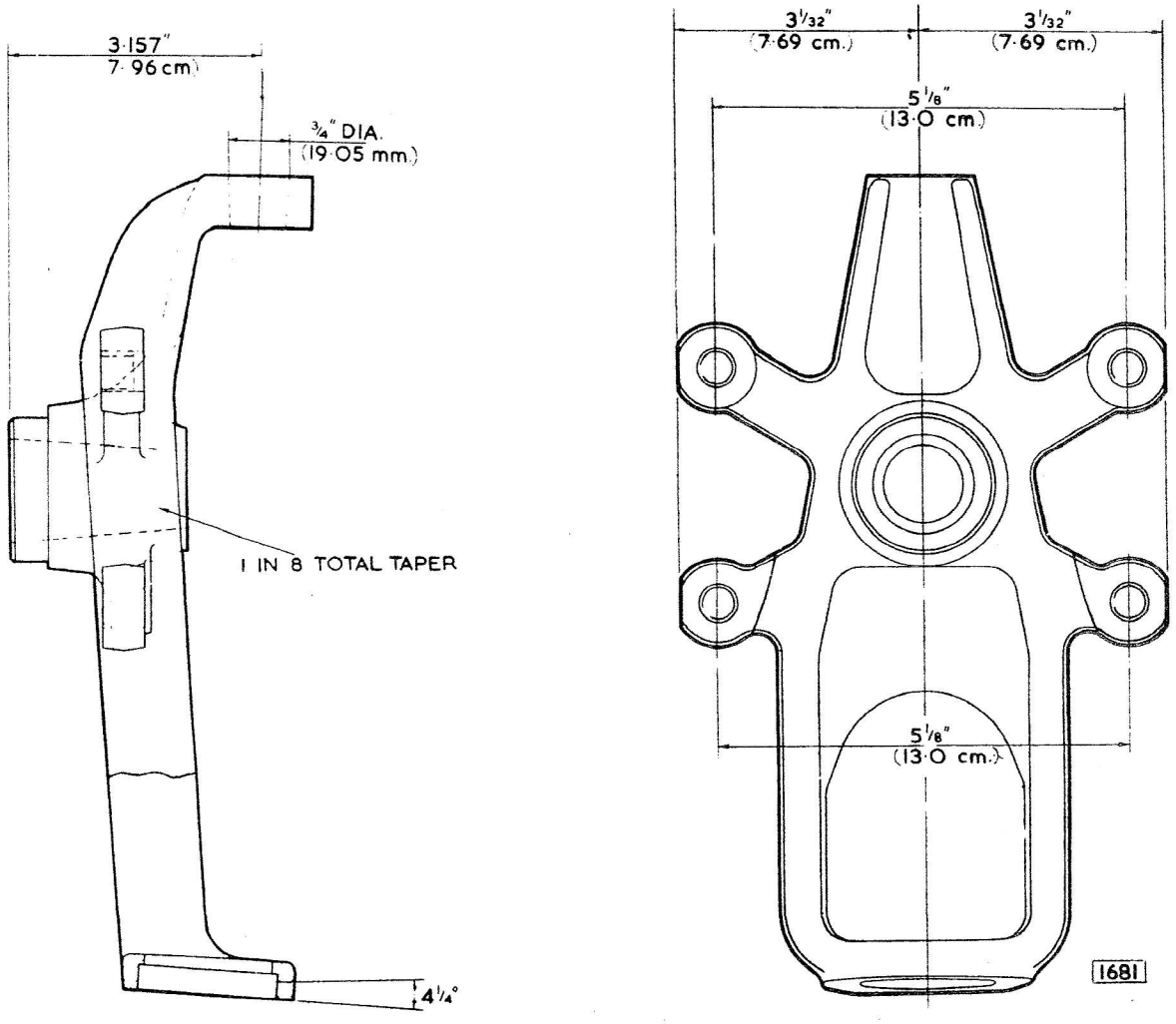

Fig. 17. The stub axle carrier.

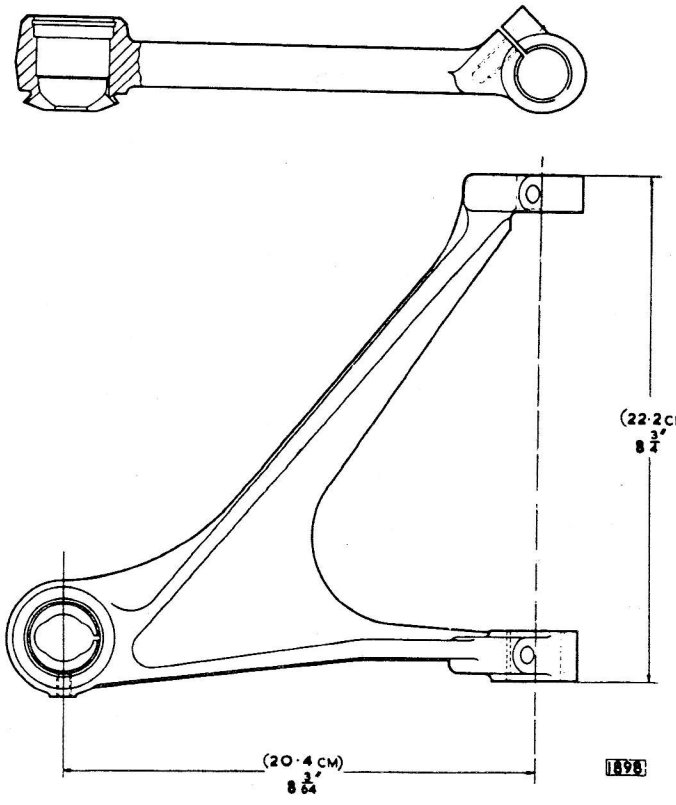

Fig. 18. The upper wishbone.

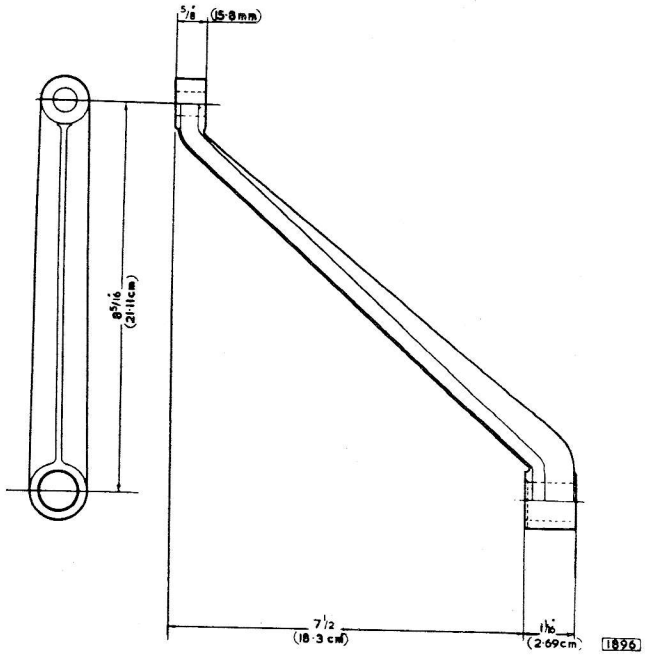

Fig. 19. The lower wishbone lever—rear.

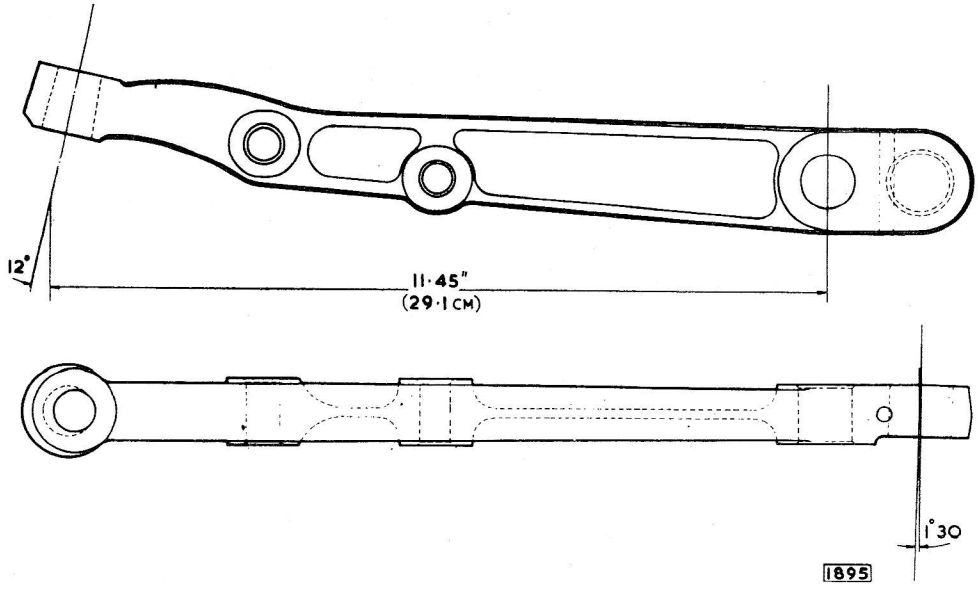

Fig. 20. The lower wishbone lever—front.

SECTION J

FRONT SUSPENSION

TORSION BAR—CHECKING

Before any check on torsion bar setting is made the car must be placed on a perfectly level surface, wheels in the straight ahead position and the tyre pressures correctly adjusted.

Referring to the illustration overpage, take the measurement "A" from the centre line of each road wheel to the ground. Record the measurement "B" from the centre line of each inner fulcrum of the lower wishbone assembly. Subtract "B" from "A" to give the dimension "C". This should be $3\frac{1}{2}" \pm \frac{1}{4}"$ (88·9± 6·35 mm.) for 4·2 "E" Type cars and $3\frac{3}{4}" \pm \frac{1}{4}"$ (95·25± 6·35 mm.) for 2+2 cars.

If any adjustment is required, this should be carried out in accordance with instructions given in Section J.

The correct dimensions between hole centres for the setting links are as follows:

4·2 "E" Type F.H.C. ..	$17\frac{13}{16}"$ (45·25 cm.)
Open Sports ..	$17\frac{13}{16}"$ (45·25 cm.)
4·2 "E" Type 2+2	$18\frac{1}{4}"$ (46·36 cm.)
4·2 "E" Type F.H.C. ..	1E.35382 (L.H.D.)
Open Sports ..	1E.17532 (L.H.D.)
4·2 "E" Type 2+2	1E.50875 (R.H.D.)
	1E.77407 (L.H.D.)

commencing at the above chassis numbers, torsion bars of larger diameter (·780"—·784" (19·81—19·9 mm.)) are fitted. Cars with these torsion bars require setting links with the following centres between the holes:—

4·2 "E" Type F.H.C. (L.H.D.)	$17\frac{3}{4}"$ (45·1 cm.)
Open Sports (L.H.D.) ..	$17\frac{3}{4}"$ (45·1 cm.)
4·2 "E" Type 2+2 (R.H.D.) and L.H.D.) ..	18" (45·7 cm.)

All Air-conditioned 4·2 "E" Type and 2+2 cars have been fitted with the larger diameter torsion bars, the correct distance between the hole centres of the setting link for these cars being as follows:—

4·2 "E" Type F.H.C. ..	$17\frac{3}{4}"$ (45·1 cm.)
Open Sports ..	$17\frac{3}{4}"$ (45·1 cm.)
4·2 "E" Type 2+2	$18\frac{1}{8}"$ (48·87 cm.)

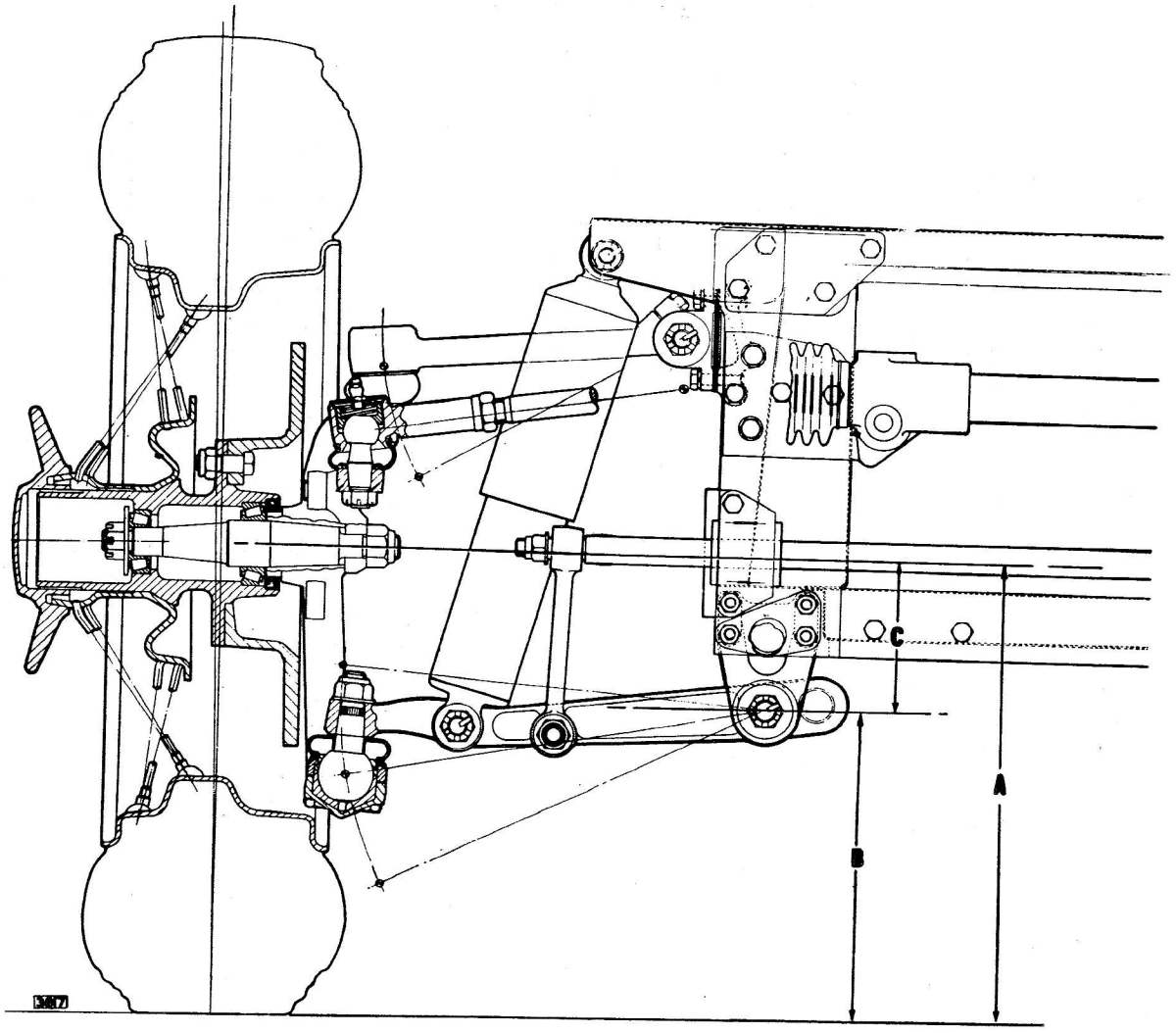

Fig. 1. *Showing the method of checking car standing height.*