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FRONT SUSPENSION. (All Models)



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GENERAL DESCRIPTION.

The independent front suspension is the short and long arm type with coil springs and shock absorbers operating on the lower arms. The suspension arms are rubber bushed at their chassis locating points and carry the stub axle ball joints at their outer ends.

Two taper roller bearings are located on each stub axle and run in cups pressed into the wheel hubs. A spring loaded nitrile seal is provided at the inner end of the hub while the wheel mounting studs are splined and press fitted into the hub flange.

Tie bars bolted to the lower arms and polyurethane insulators mounted in the chassis give adjustment for the castor angle, which with the exception of front wheel toe setting, is the only adjustment.

The suspension lower arms are linked to a stabiliser bar. The linkage is made via a through bolt and spacer and is bushed at it's connecting points. The stabiliser bar assembly is mounted in split rubber bushes clamped by brackets bolted to the front of the chassis.

The TVR front suspension fulfils two functions;-

1. Damping the effect of road irregularities on vehicle ride.
2. Allowing the front wheels to turn in response to steering control.

The first objective is achieved by cushioning the movement imparted to the front road wheels, through compressed coil springs. The energy created is damped by the telescopic shock absorbers. The transmission of road noise and vibration is minimised by rubber insulated mounting points between the chassis and suspension pick up's and between the chassis and bodyshell.

The second objective is achieved by the front hub assemblies pivoting in response to steering movement. The pivot centres are ball joints mounted in the outer ends of the upper and lower suspension arms.

Fig. 1
FRONT SUSPENSION - LOCATION.

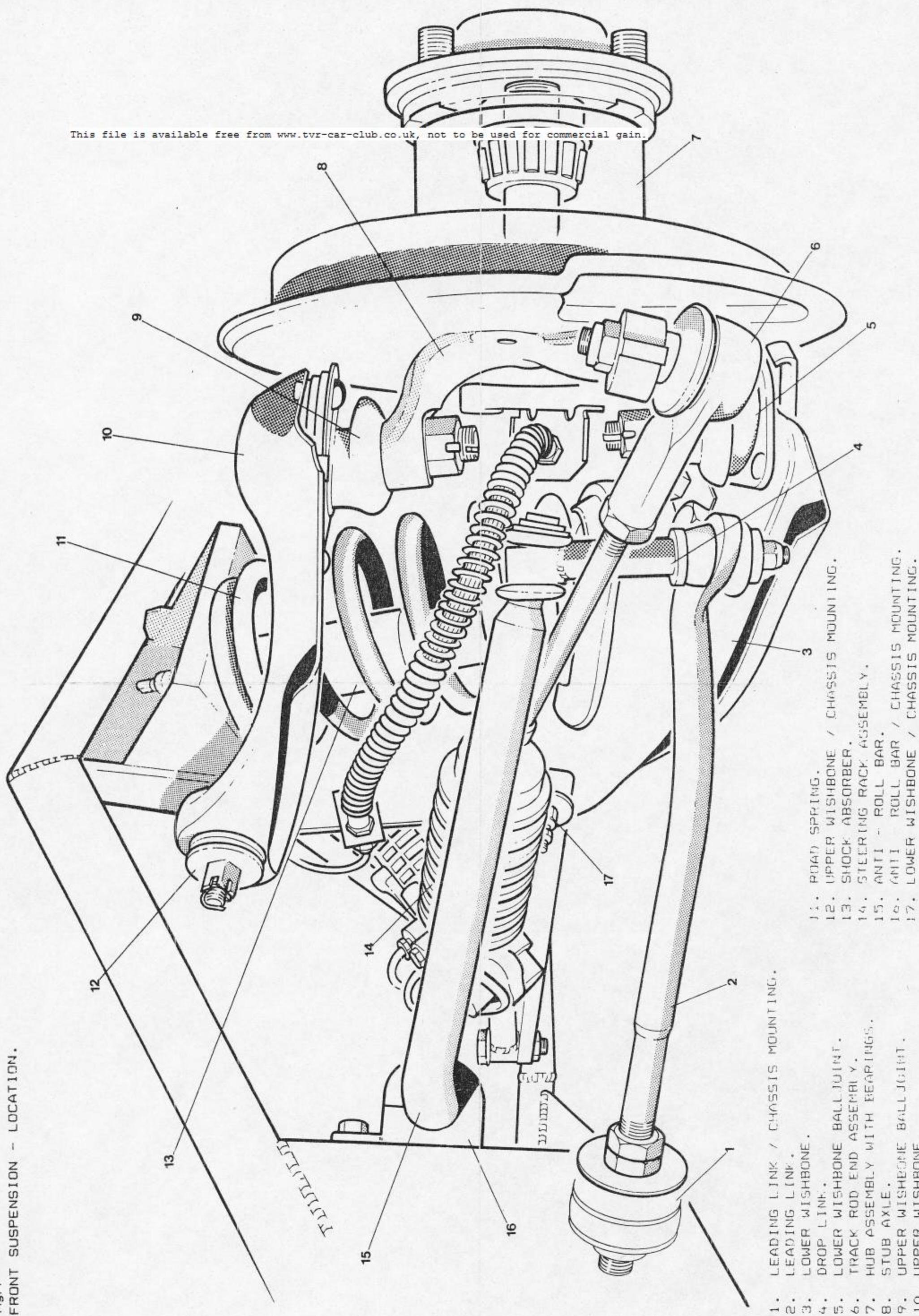
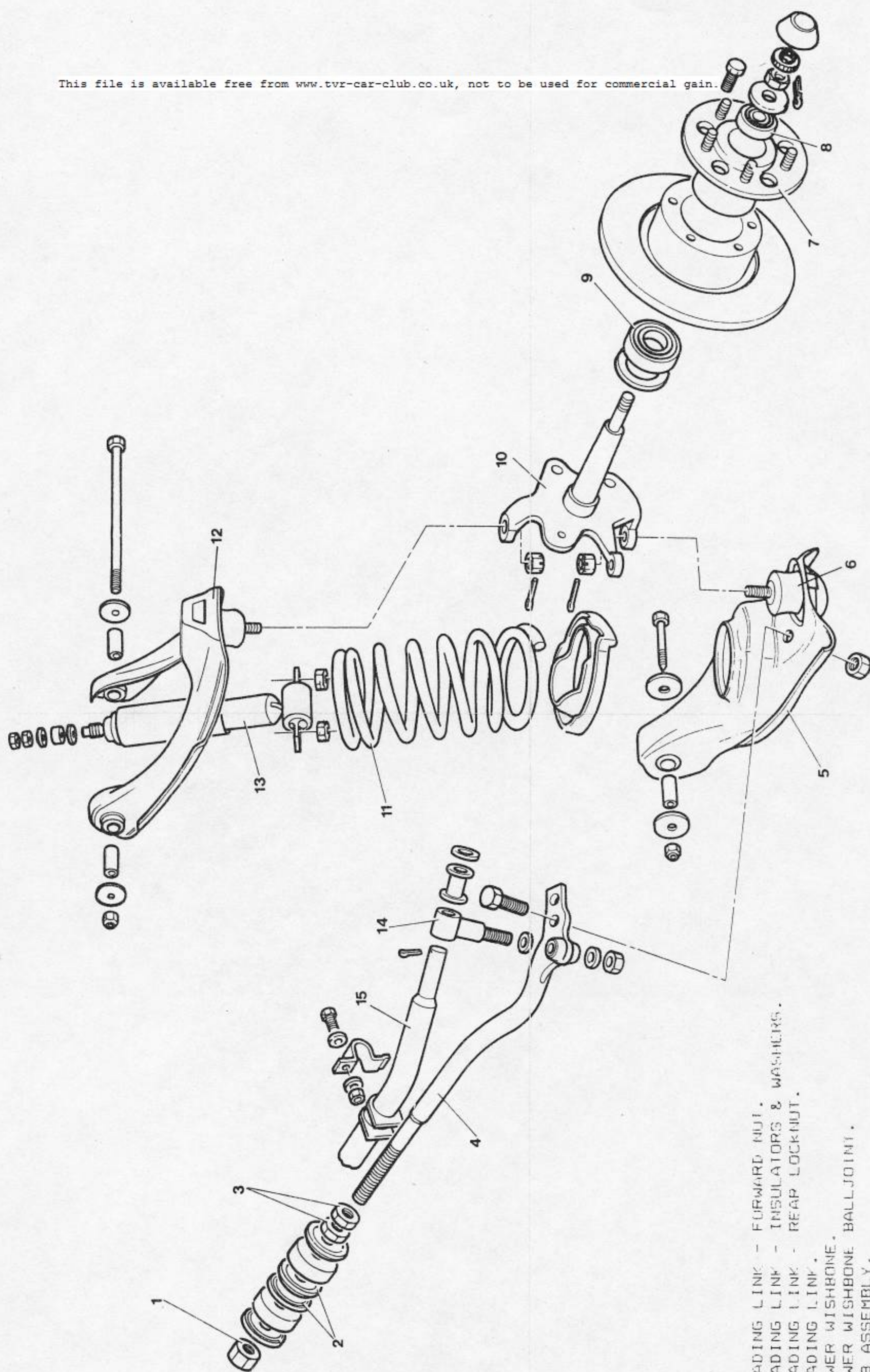


Fig. 2
FRONT SUSPENSION - EXPLODED VIEW.



1. LEADING LINK - FORWARD NUT.
2. LEADING LINK - INSULATORS & WASHERS.
3. LEADING LINK - REAR LOCKNUT.
4. LEADING LINK.
5. LOWER WISHBONE.
6. LOWER WISHBONE BALLJOINT.
7. HUB ASSEMBLY.
8. BEARING - FRONT HUB OUTER.
9. BEARING - FRONT HUB INNER.
10. STUB AXLE.
11. ROAD SPRING.
12. UPPER WISHBONE.
13. SHOCK ABSORBER.
14. DROP LINK.
15. ANTI - ROLL BAR.

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SERVICE ADJUSTMENTS AND CHECKS

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At specified service intervals, the following checks should be carried out:

Check condition of ball joints, gaiters, stabiliser and tie bar rubber mountings and upper/lower arm inner bushes.

If the above checks reveal evidence of excessive wear or faulty operation, the relevant items should be replaced by reference to the operations within this section of the workshop manual.

Although there is no routine service requirement to adjust front wheel bearings the bearing design has provision for adjustment to compensate for wear on higher mileage vehicles, Fig.3

If uneven tyre wear is evident, or if accident damage to the front suspension is suspected, a check on the toe setting of the vehicle should be carried out as detailed below.

For equipment with a facility to eliminate the effects of wheel runout (e.g. Optoflex) it is only necessary to take one toe reading. However for equipment that does not incorporate a facility to eliminate wheel runout (i.e. Churchill type 96 gauge) it is necessary to take two toe readings at wheel centre height on the wheel rim edges. The second reading must be recorded at a position on the wheels exactly 180° from first reading, and both readings averaged to reduce the effects of wheel runout, and give the actual toe measurement.

IMPORTANT: Vehicle should be in an unladen condition and must be rolled forwards onto a flat level surface before commencing toe measurement check.

When fitting equipment ensure projector spindle is in line with wheel centre, Fig.5.

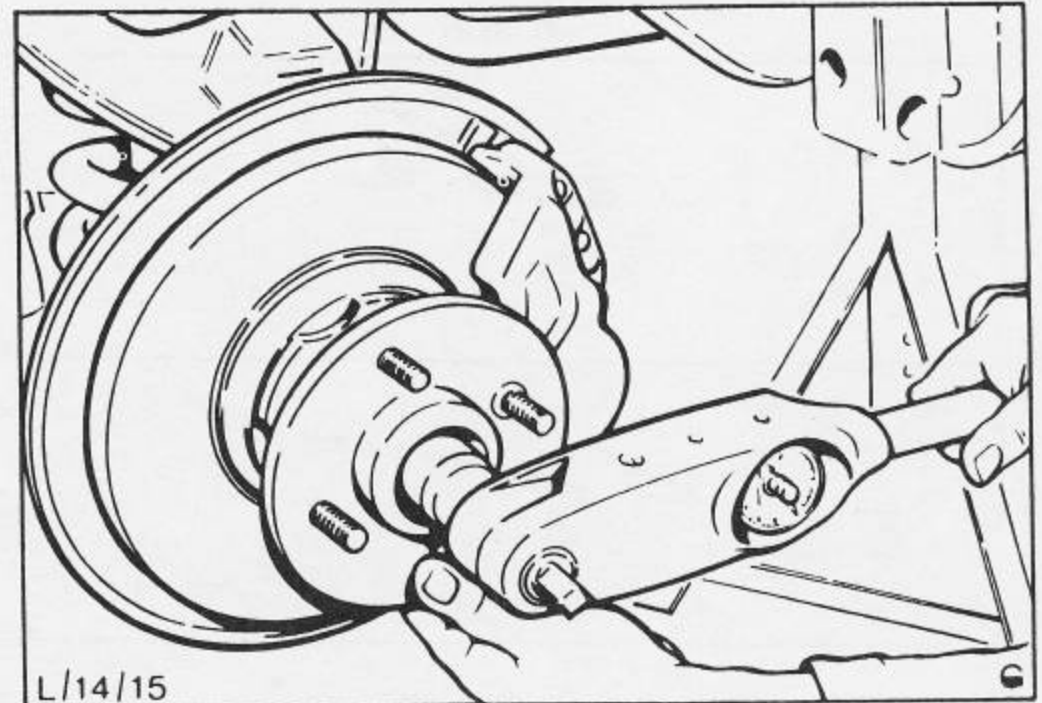


Fig.3. Torquing wheel bearing assembly.

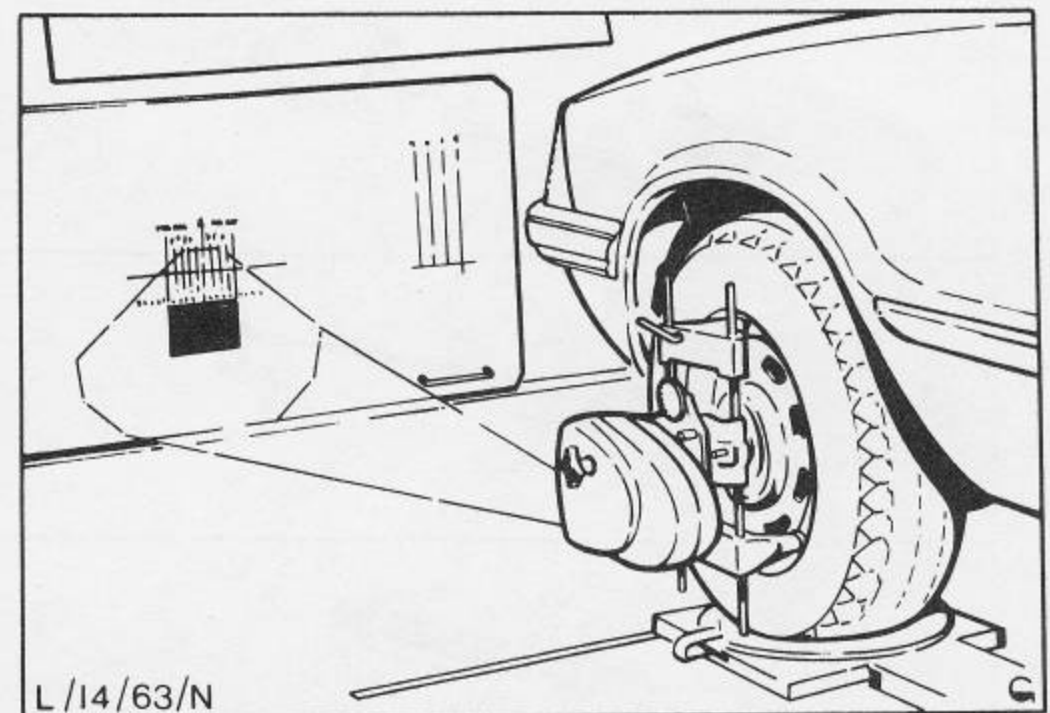


Fig.4. Optoflex showing total toe measurement.

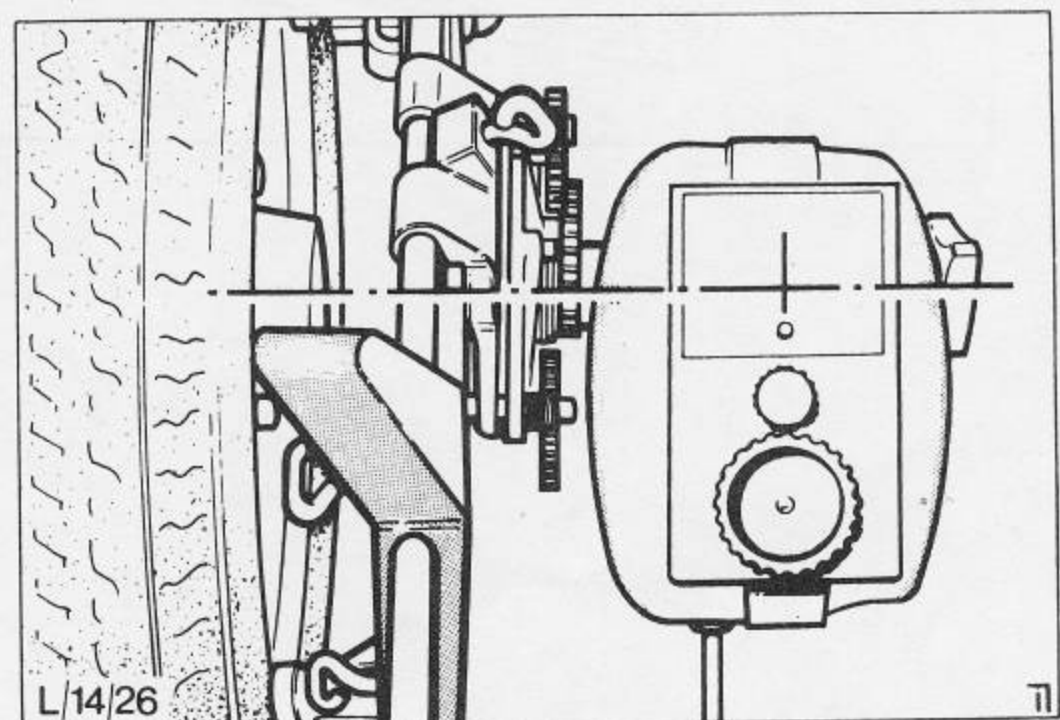




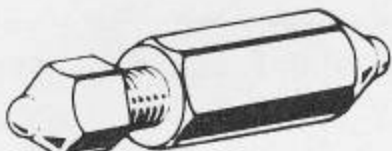


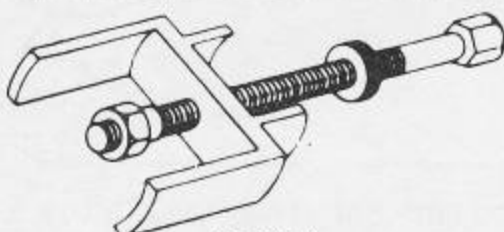
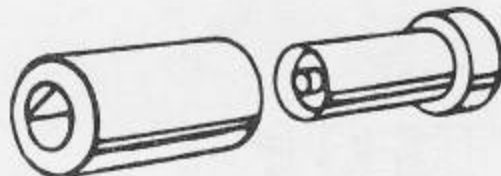
Fig.5. Optoflex projector aligned with wheel centre.



FRONT SUSPENSION – 280i & 350i

SPECIAL SERVICE TOOL RECOGNITION

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Tool Number	Tool Name
 13-006	Ball joint separator
 14-009	Front hub bearing cup replacer
 14-001-A	Ball joint separator
 14-004	Side members and suspension bush remover/replacer
 14-006	Spring compressor
 15-014	Front suspension mounting insulator remover/installer
 14-002	Stabiliser bar bush replacer

GL/I4/I/N

C1/4 CASTOR ANGLE – ADJUST

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Special service tools required;-

Optical castor angle gauge.

The vehicle should be placed on a level surface and fitted with the appropriate equipment to give a read out of the front wheel castor angle.

THE CORRECT SETTING IS 3.5 DEGREES POSITIVE.

If the castor angle is not within tolerance it may be adjusted as follows.

TO ADJUST.

1. Slacken the front nulock nut fitted to the leading link and the outer nut on the rear of the leading link. Fig.6

2. Turn the front nut on the leading link to adjust the castor angle either way, depending on whether more or less angle is required.

TO INCREASE POSITIVE CASTOR TIGHTEN OUTER NUT.

TO INCREASE NEGATIVE CASTOR SLACKEN OUTER NUT.

3. When the correct angle is obtained tighten the rear locknut up and torque the front nut to 35 - 40 FT. LBS. Fig.7

4. Recheck the castor and make any adjustments that are necessary.

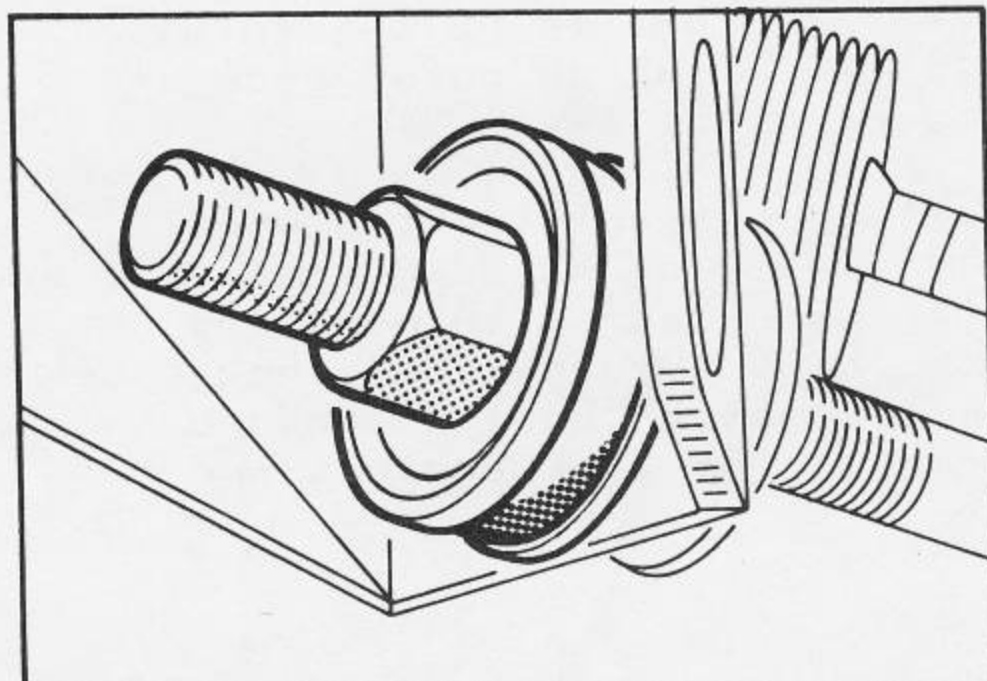


Fig.6 Front link nut.

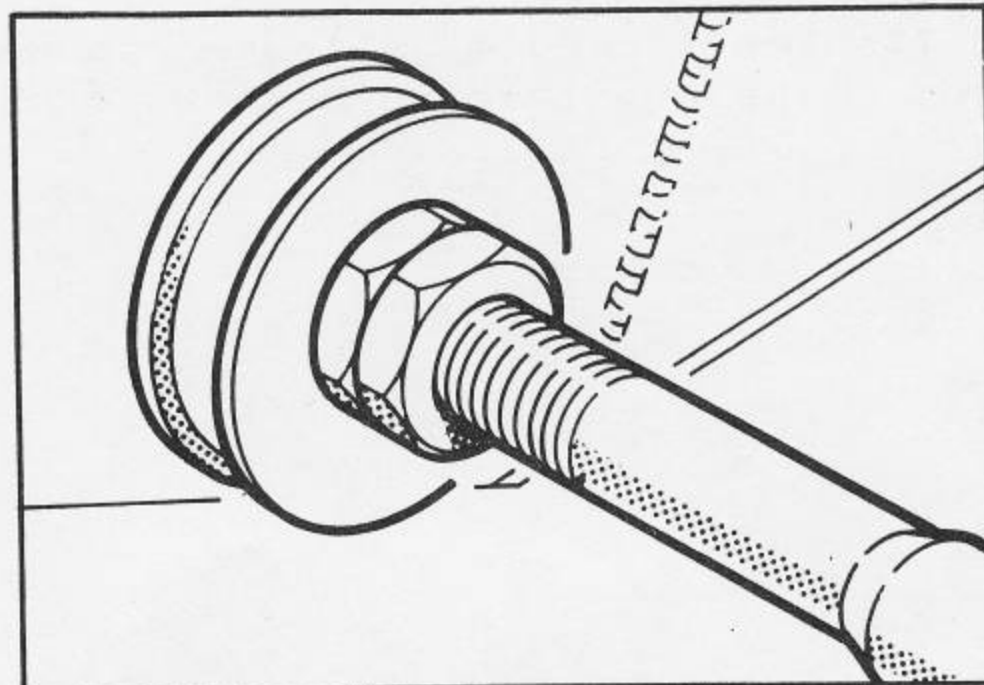


Fig.7 Rear link locknut.

C1/1 FRONT WHEEL ALIGNMENT

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Special service tools required;-

Mechanical or optical wheel alignment equipment.

For this operation the vehicle must be placed on a level surface, unladen and should be checked using track gauges or an optical wheel alignment machine.

THE CORRECT SETTINGS ARE 1/8" TOE IN.

TO ADJUST.

1. Slacken nuts on track rod outer ends adjacent to ball joints. Slacken clips on outer ends of steering bellows.
2. To preserve steering wheel alignment adjust each track rod end by equal amounts. Dimensions "A" on R.H. & L.H. track rods should be approximately equal to ensure equality of lock angles. Fig.8

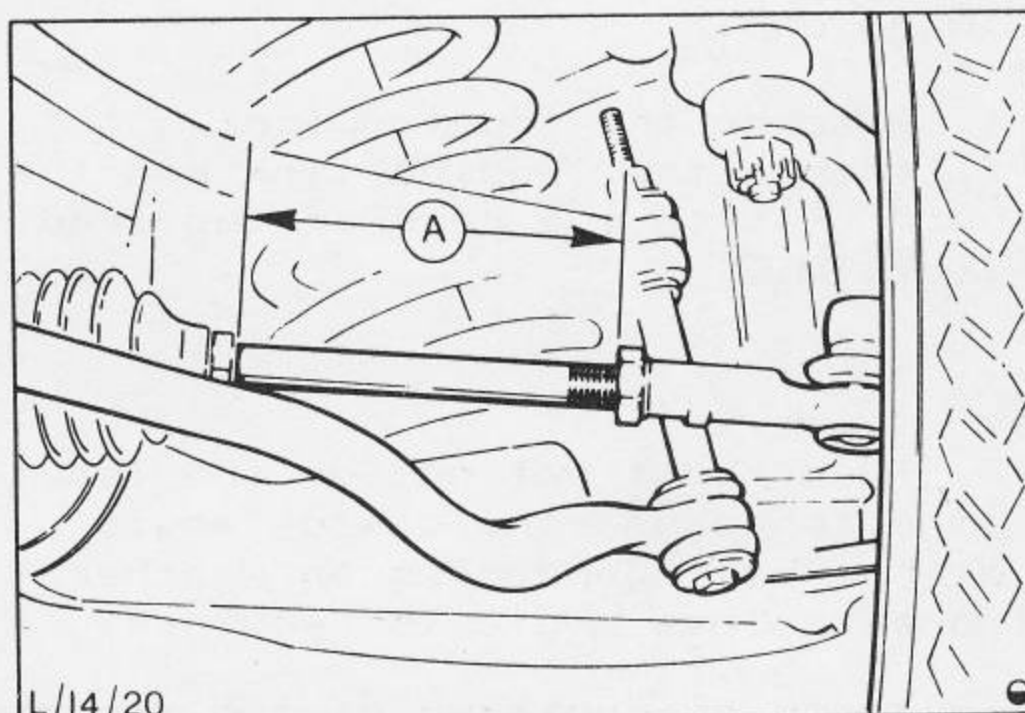


Fig.8 . Track rod adjustment.

3. Tighten locknuts on track rod ends and clips on steering bellows. Fig.9

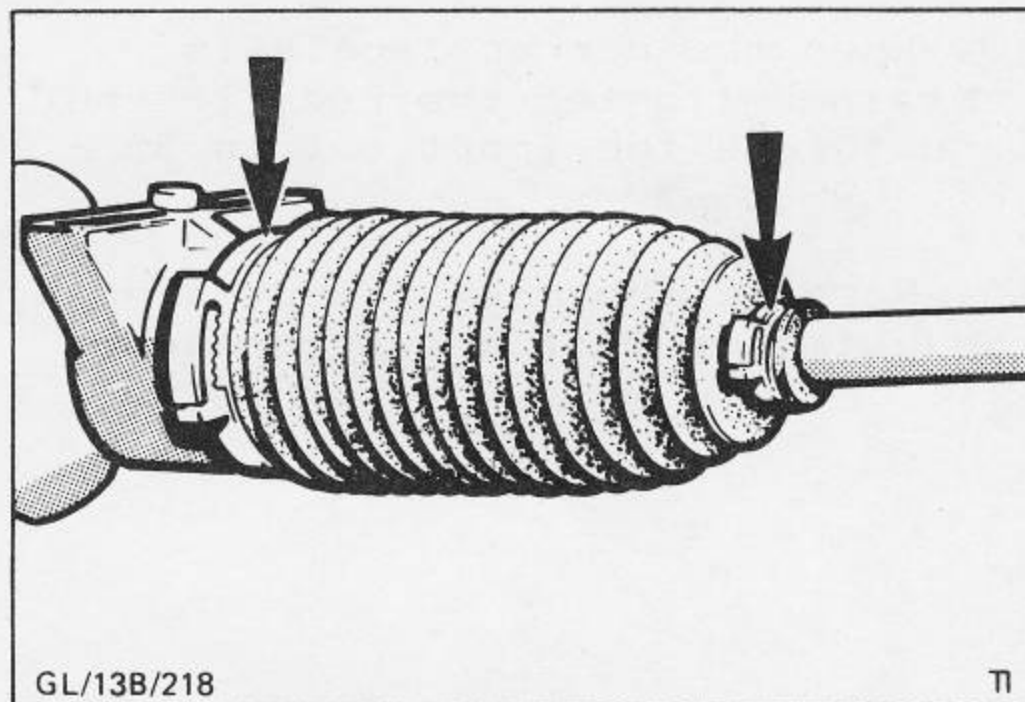


Fig.9 . Rack bellows snapper clips.

C2/1 – STUB AXLE

REMOVE This file is available free from www.tvr-car-club.co.uk, not to be used for commercial gain.

TO REMOVE.

1. Jack up vehicle and place on axle stands.
2. Remove appropriate road wheel.
3. Remove front hub and disc assembly as outlined in Section C3/1
4. Remove top shock absorber Fig.10 mounting nut and two lower mounting nuts and remove unit from vehicle. Fig.11

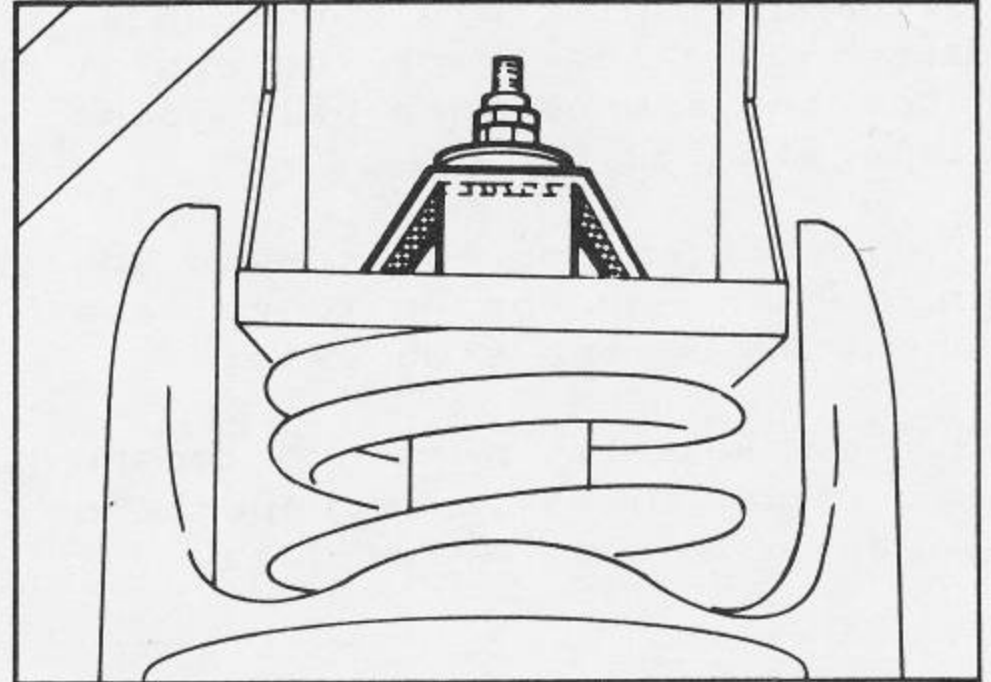


Fig.10 Shock absorber top mount.

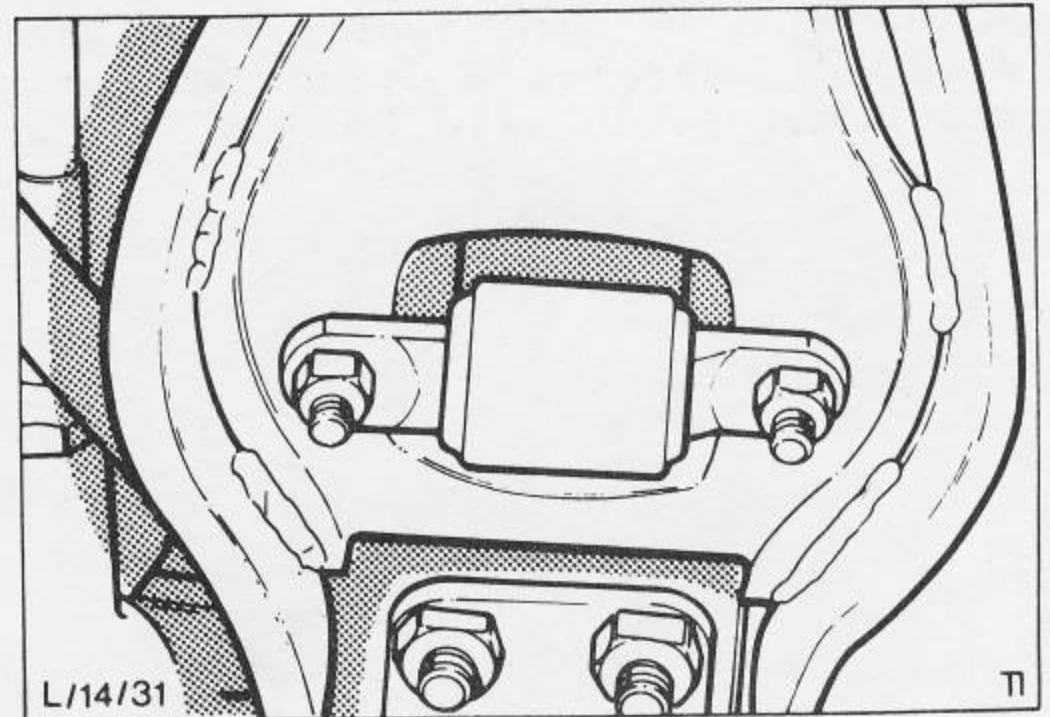


Fig.11 Shock absorber lower mount.

5. Bend back lock tabs and remove bolts retaining brake splash shield to stub axle. Remove splash shield Fig.12

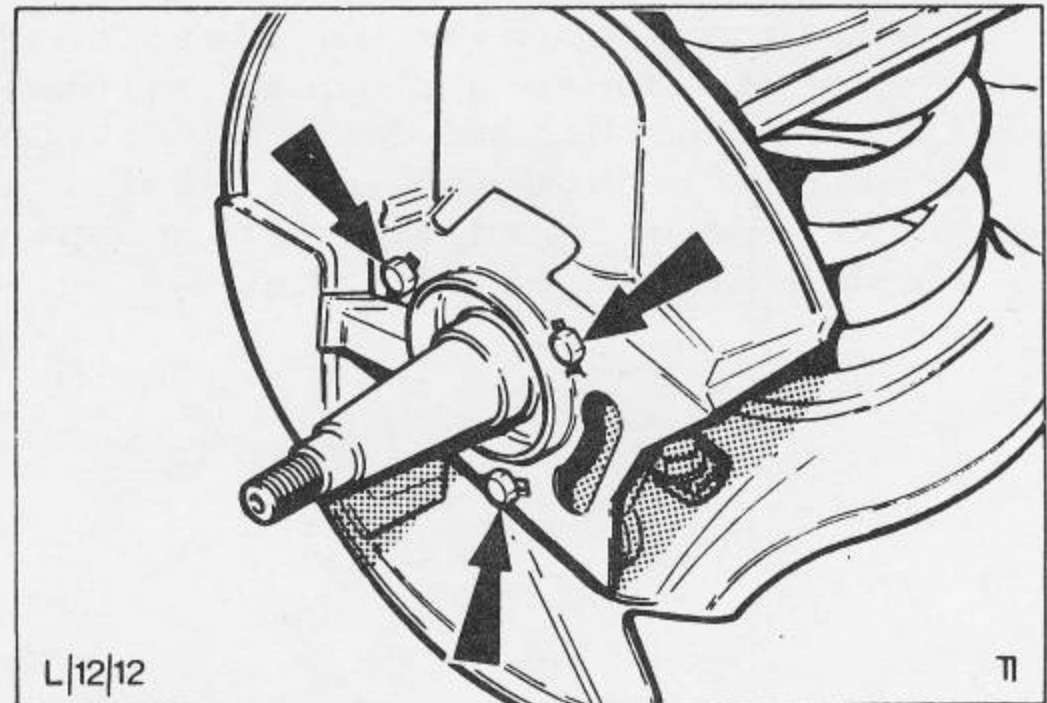


Fig.12 Splash shield retaining bolts.

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6. Remove split pin & nut and disconnect the track rod end at the steering arm using a ball joint separator. Fig.13

7. Insert spring compressor and take up tension on spring to relieve pressure on the stub axle.

8. Remove split pins and loosen nuts securing stub axle to upper and lower arms and remove nuts.

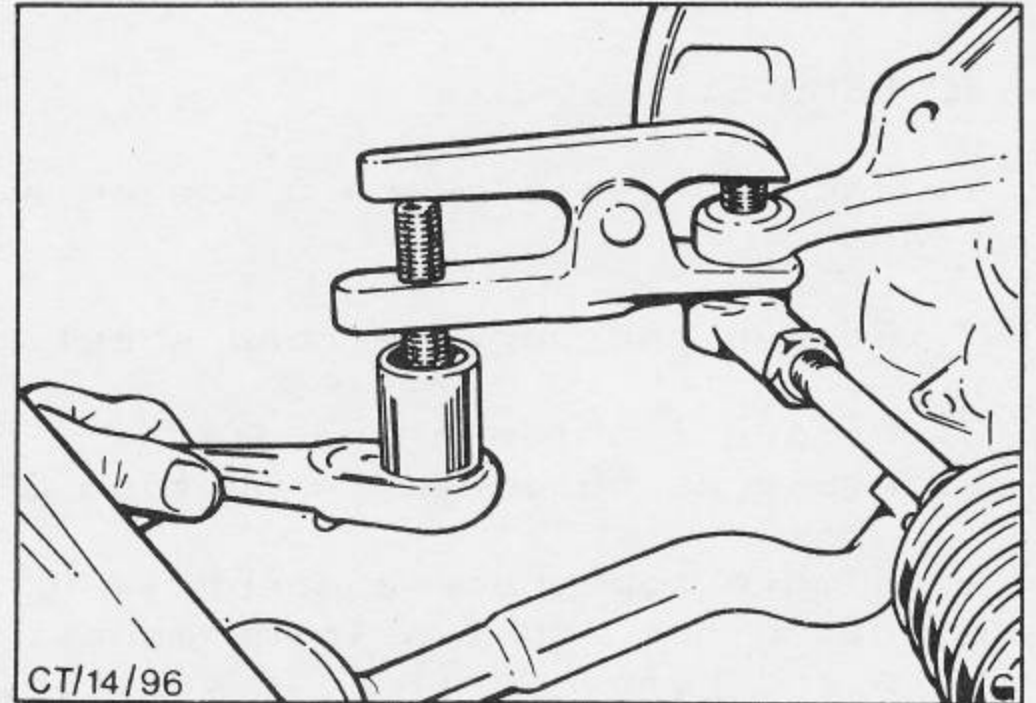


Fig.13 . Ball joint separator Tool No. 13 006.

9. Free ball joint tapers from their stub axle locations using separator and remove stub axle. Fig.14

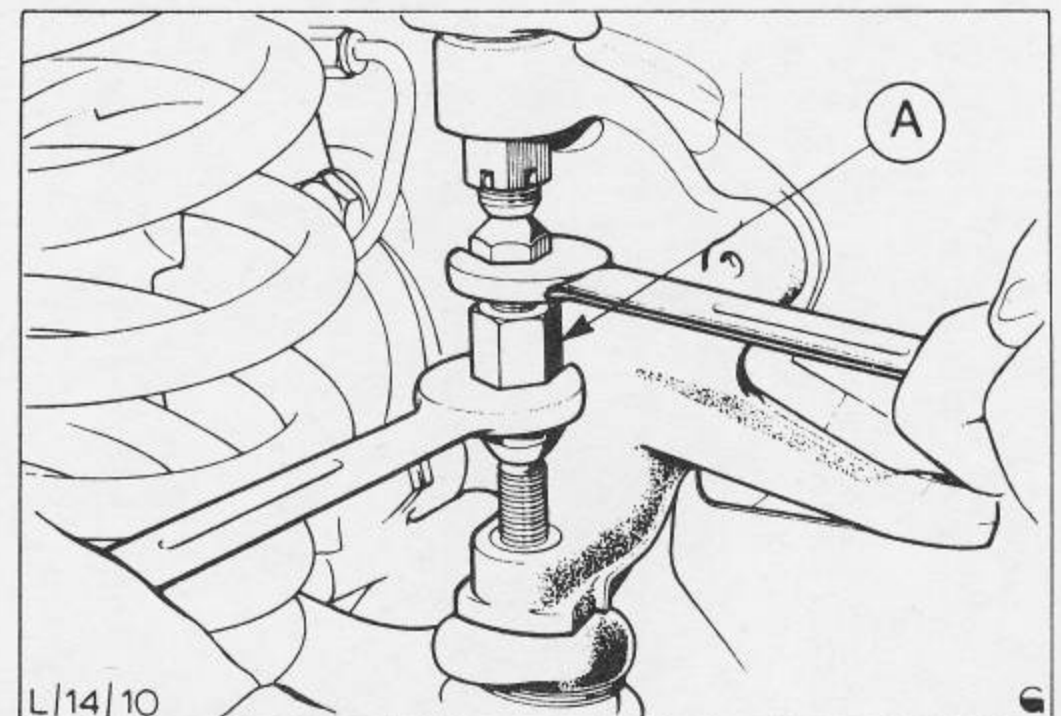


Fig.14 Free ball joint tapers.
A - Ball joint separator tool no. 14-001 A.

TO INSTALL.

10. Place stub axle in position, Fig.15 secure upper and lower joints, tightening nuts to 30 - 40 Ft. Lbs, continue tightening until split pin holes are aligned and fit new pins.. Do not exceed 66 Ft. Lbs.

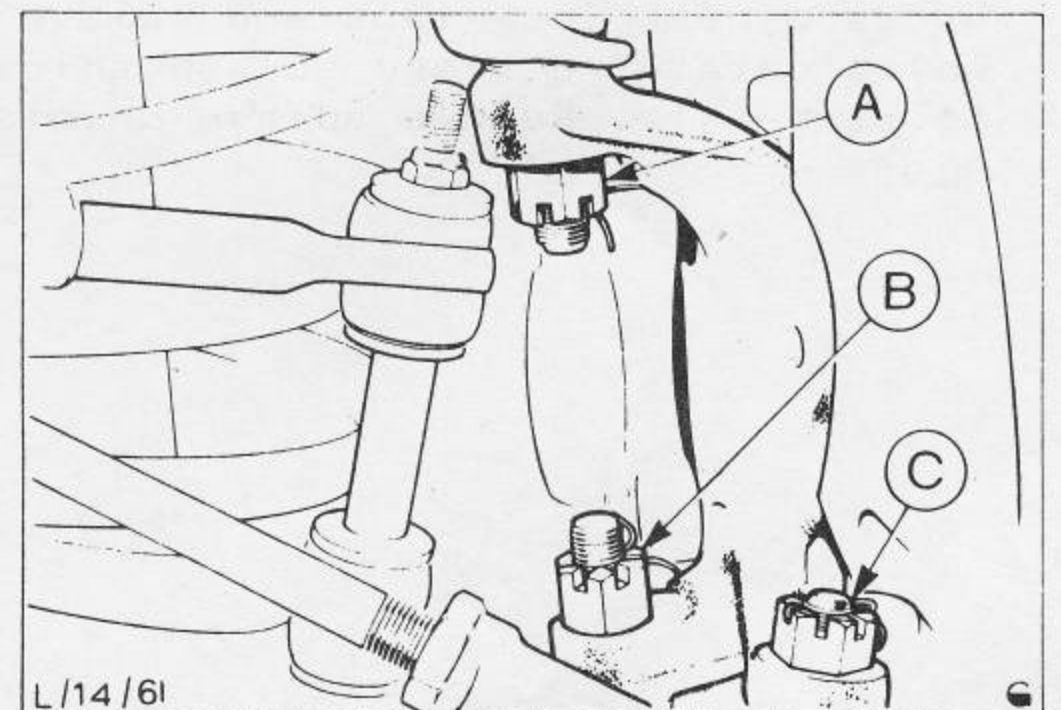


Fig.15 Stub axle securing points.
A - Upper joint
B - Lower joint
C - Tie rod end

11. Remove spring compressor from assembly.

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12. Connect track rod end to stub axle and fit a new split pin.

13. Refit shock absorber.

14. Position brake splash shield and secure with bolts. Fit new lock tab.

14. Refit front hub and disc assembly as outlined in operation number C3/1

----- C3/1- FRONT HUB ASSEMBLY - REMOVE & INSTALL -----

Special service tools required ;-

NONE.

TO REMOVE.

1. Jack up the front of the vehicle under the front suspension chassis crossmember. Place axle stands under the chassis front outriggers and lower vehicle onto stands.

2. Remove appropriate road wheel(s)

3. Bend back the lock tabs, remove two caliper bolts and detach caliper assembly. Support or tie the Fig.16 assembly to prevent it's weight being taken by the flexible hose.

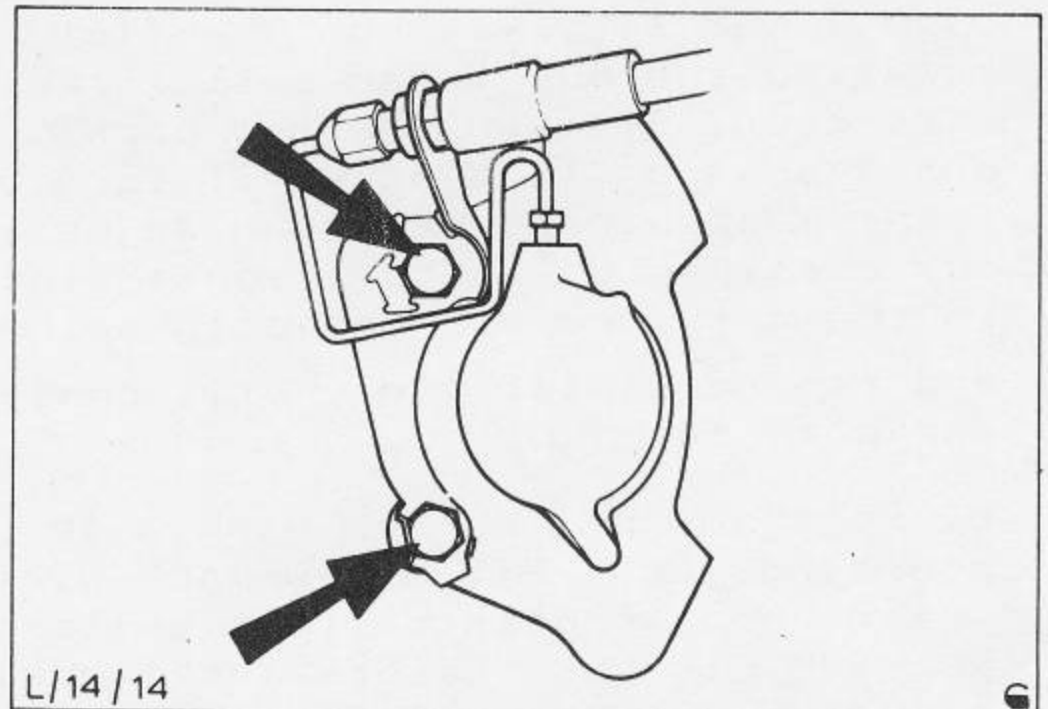


Fig.16. Caliper retaining bolt location.

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4. Remove bearing dust cap, split pin, adjusting nut, washer and outer bearing. Slide disc and hub assembly clear of the spindle. Fig.17

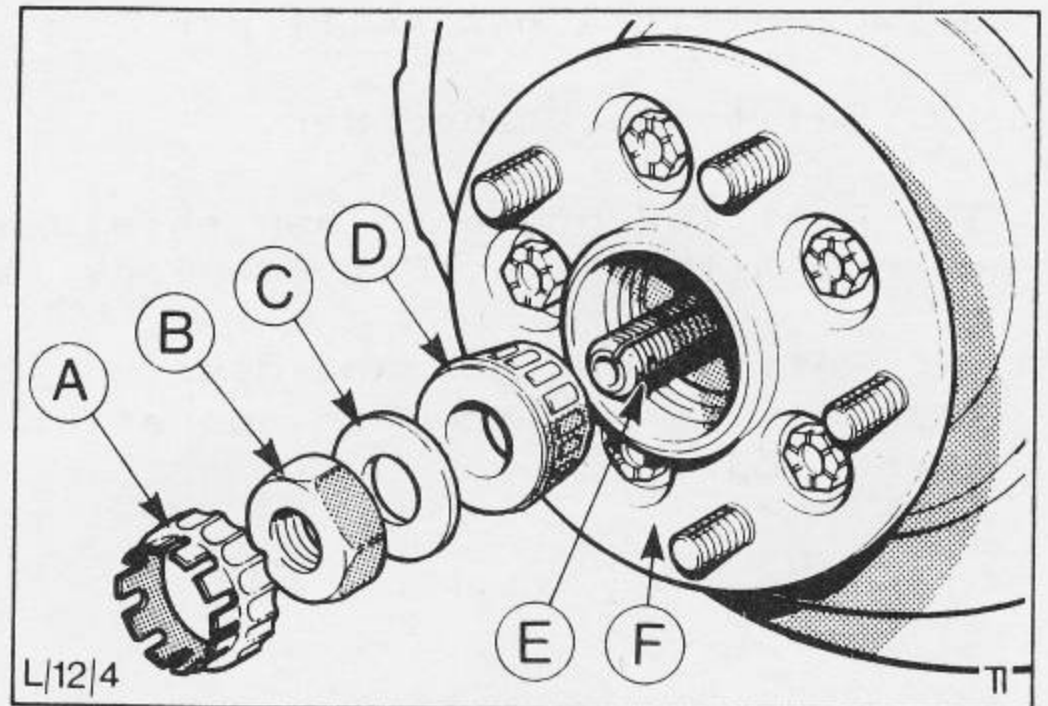


Fig. 17 Wheel bearing assembly.

- | | |
|-------------------|---------------------------|
| A - Adjusting nut | D - Outer bearing |
| B - Adjusting nut | E - Spindle |
| C - Washer | F - Hub and disc assembly |

TO INSTALL.

5. Thoroughly clean spindle at grease retainer journal and smear retainer lips with a lithium based grease.

6. Slide disc and hub assembly onto the spindle, check bearing to ascertain condition, replace if required Fig. Refit washer and adjusting nut and adjust wheel bearing as follows.

7. Tighten adjuster nut to a torque of 3.7 Kgm (27 Ft. Lbs) whilst rotating the hub in an anticlockwise direction. Slacken the nut back until an end float of 0.001 to 0.003 inch is obtained. Position adjusting nut retainer so as to align a slot in the retainer with hole in spindle and fit new split pin. Refit centre and dust cap. Fig.18

8. Position caliper on stub axle mounting lugs. Fit a new lock plate, insert and tighten caliper bolts to 48 - 55 Ft. Lbs. Secure lock tabs.

9. Refit roadwheel, remove chassis stands and lower vehicle to the ground.

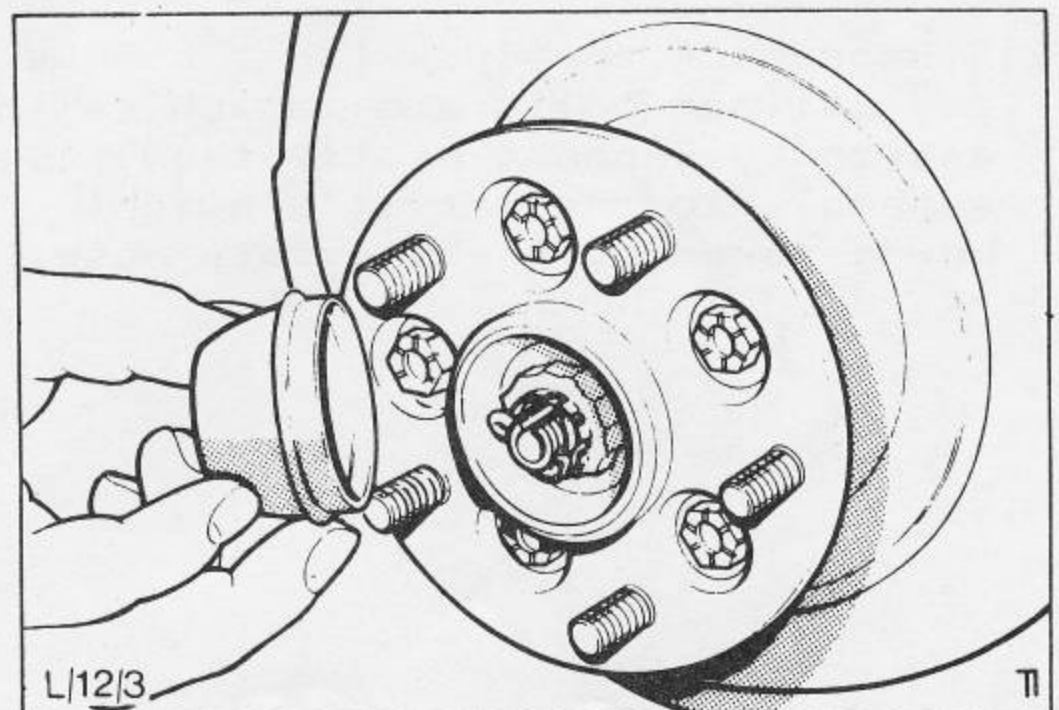


Fig. 18 Replacing wheel bearing dust cap.

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C4/1 – WHEEL BEARINGS – FRONT ADJUST BEARINGS –

Special service tools required;–

NONE.

TO ADJUST.

1. Jack up the front of the vehicle under the front suspension chassis crossmember. Place axle stands under the chassis front outriggers and lower vehicle onto stands.

2. Remove appropriate road wheel(s)

3. Tighten adjusting nut to a torque of 27 Ft. Lbs. whilst rotating the hub in an anticlockwise direction.

Fig.19

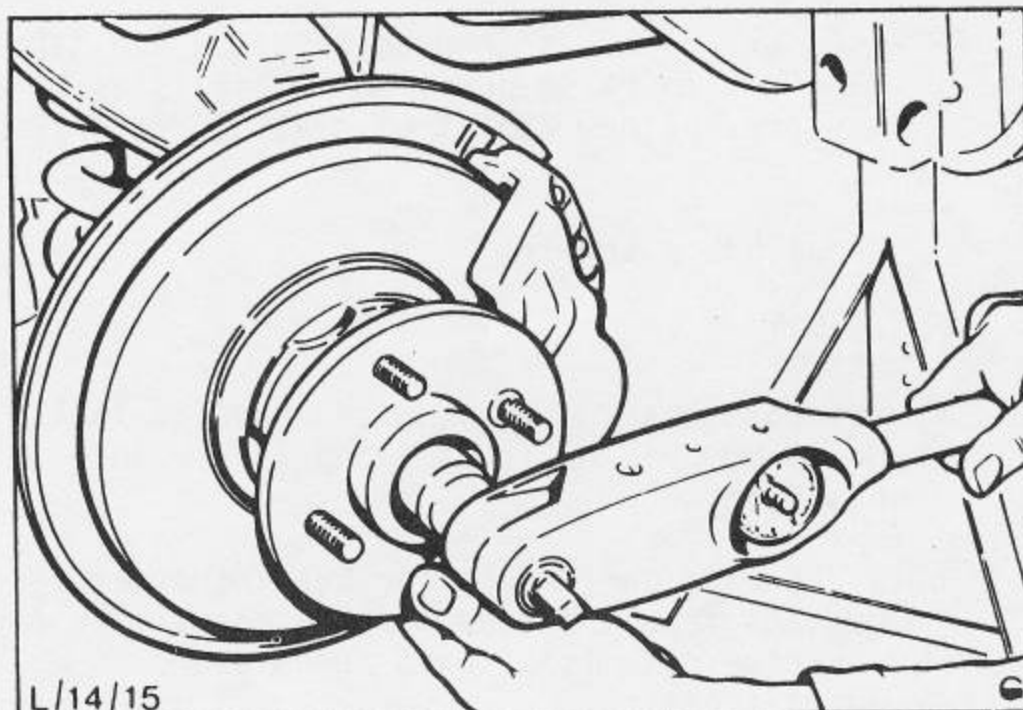


Fig.19 Torquing wheel bearing.

4. Slacken the nut back until an end float of 0.001 to 0.003 inch is obtained. Position adjusting nut retainer so as to align a slot in the retainer with hole in spindle and fit new split pin. Refit centre and dust cap. Fig.20

5. Refit roadwheel, remove chassis stands and lower vehicle to the ground.

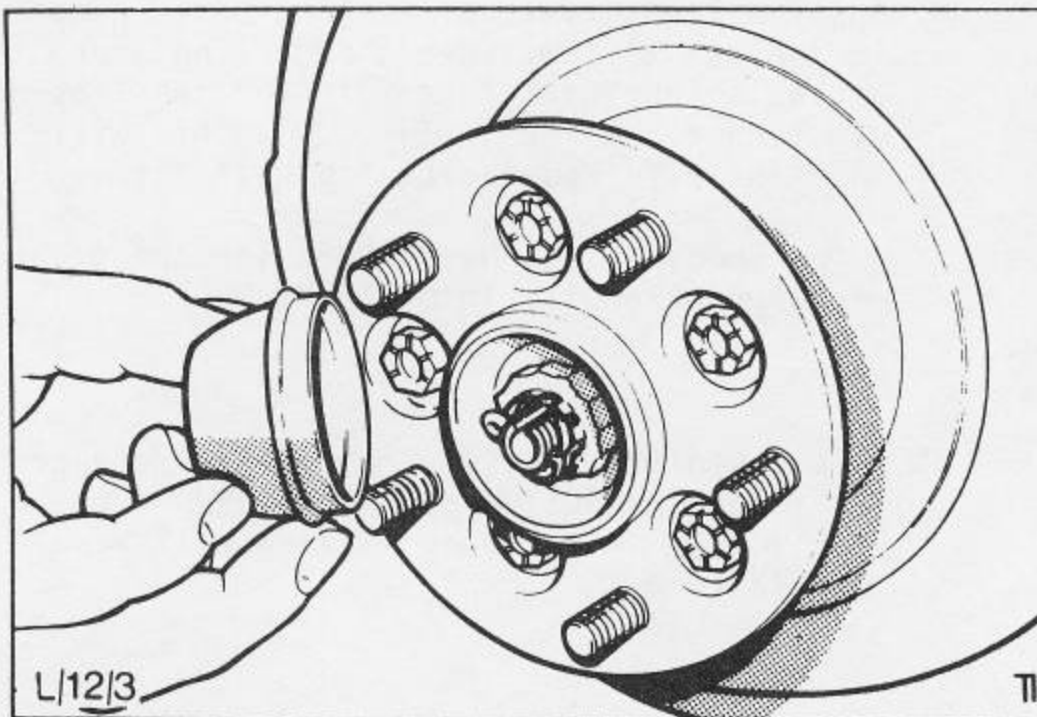


Fig.20 Replacing wheel bearing dust cap.

C 4/4

FRONT WHEEL BEARINGS AND CUPS - INNER AND OUTER - REPLACE (HUB ASSEMBLY REMOVED)

SPECIAL SERVICE TOOLS REQUIRED:

Rear hub bearing cup installer ..	14-009
Front hub seal installer ..	14-028
Multi purpose oil seal remover ..	21-051

To Remove

1. Remove grease retainer and bearing cone. Use Special Tool No.21 051 to prise grease retainer out of hub, Fig.21 An alternative method is to prise out the oil seal using a suitable screwdriver. Remove bearing cone.
2. Remove both bearing cups. Use punch and hammer to tap alternately at diametrically opposite points of the cup, do not allow cup to tilt in hub.

NOTE: Ensure punch is in good condition and take care not to raise burrs on cup seats as this may prevent new cups from seating properly.

3. Clean hub assembly.

To Install

4. Fit both bearing cups, using Special Tool No.14-009, to drift each cup firmly into position.

NOTE: Bearing cup and roller bearing assemblies must be from the same manufacturer. See parts list for details of part numbers and identification.

5. Pack cone and roller assembly with lithium base grease meeting Ford Specification S-MIC-4515-A. Ensure that grease is well packed between the rollers.
6. Apply a light smear of lithium based grease in the cavities between the sealing lips, to act as a lubricant reservoir for the lips of a new grease retainer, (Fig.22). This will substantially reduce the lip wear rate.
7. Using Special Tool No.14-028, tap the grease retainer carefully into the hub.

NOTE: It essential that the hub grease retainer is fitted correctly against the hub inner lip, Fig.23 Incorrect fitting will result in seal failure.

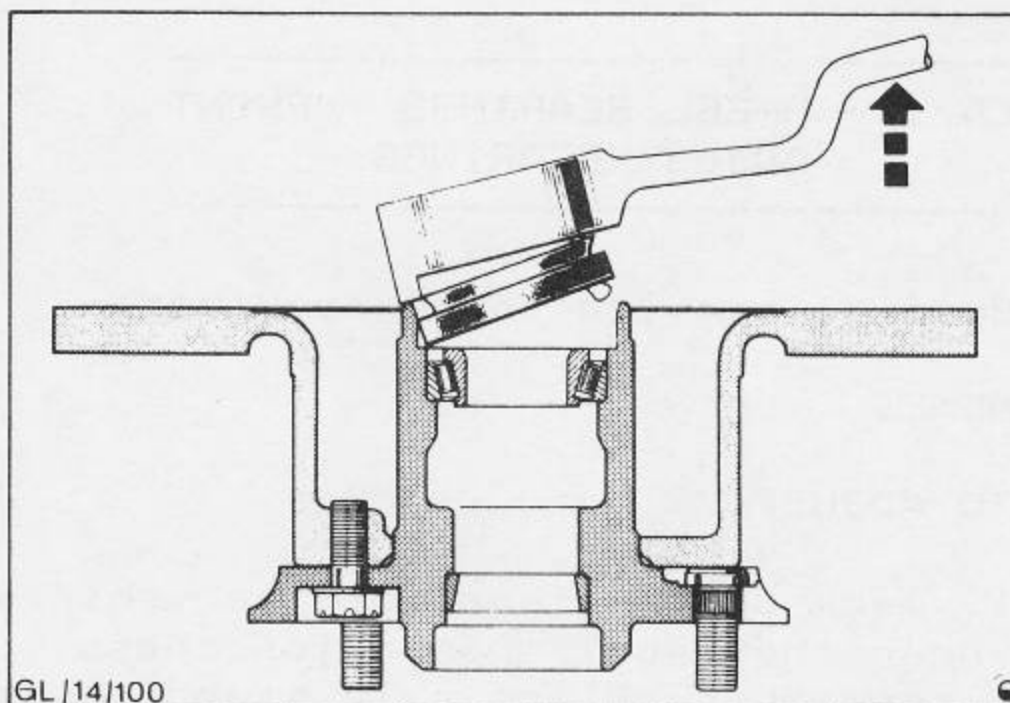


Fig.21 Method of using Special Tool 21-051.

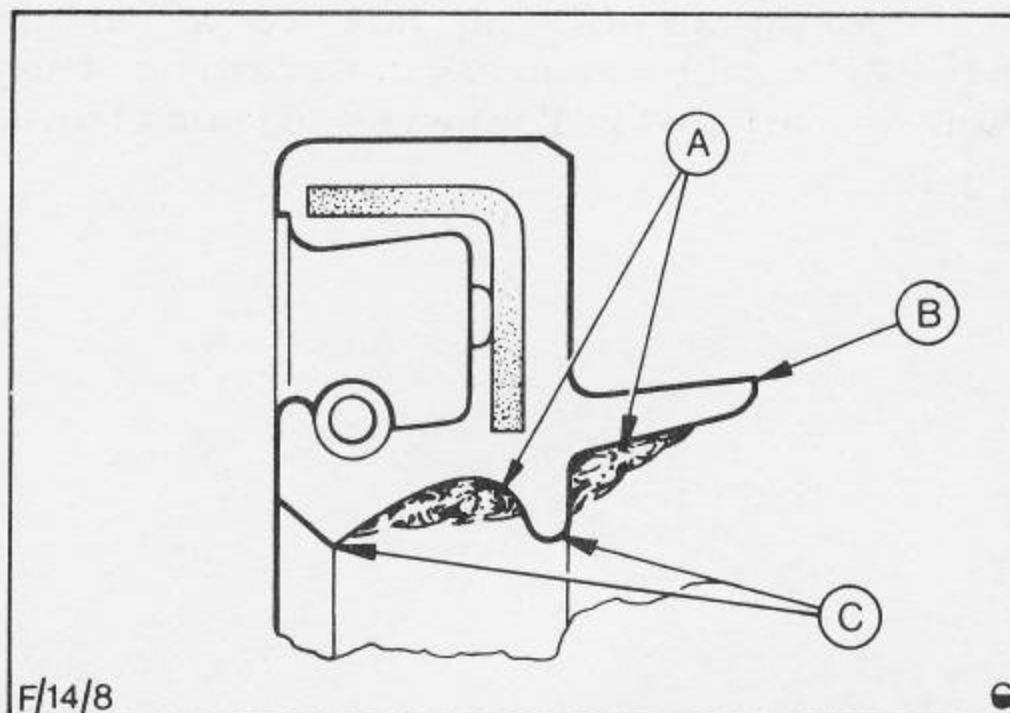


Fig. 22 Sectional view of hub grease retainer.
A - Apply grease on assembly (half to fully filled)
B - Axial sealing lip
C - Radial sealing lips

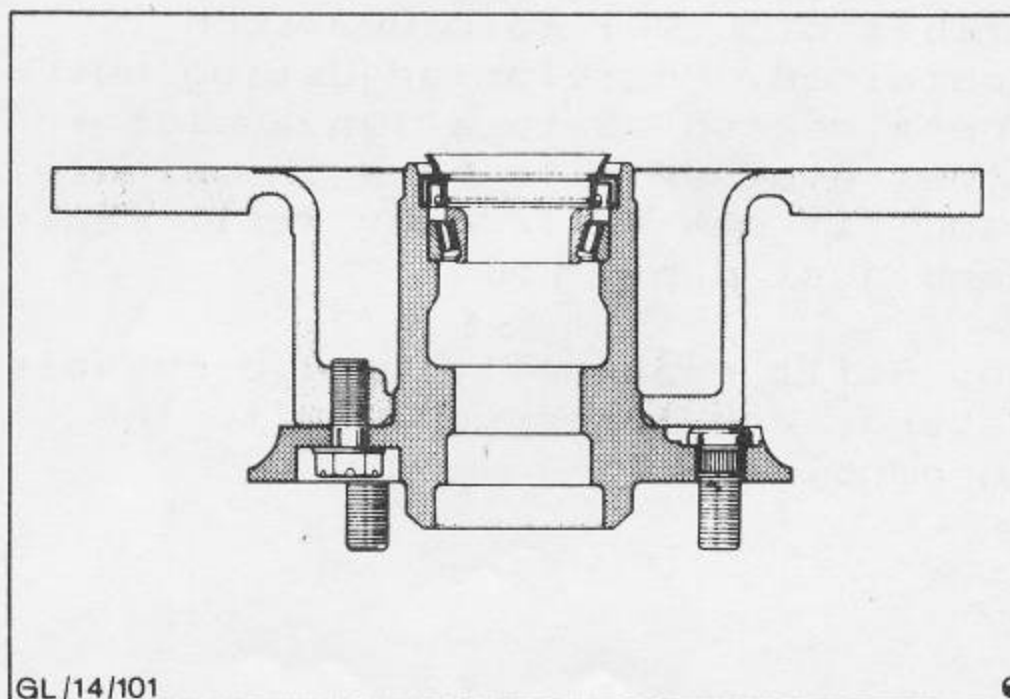


Fig.23 Correct fitting of hub grease retainer.

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C4/8 – FRONT WHEEL STUD – REPLACE –

Special service tools required:-

Ball joint separator _____ 13-006

TO REMOVE

1. Slacken wheel nuts.
2. Jack up front of car and fit axle stands.
3. Remove road wheel.
4. Using ball joint separator tool number 13-006 press stud out of hub flange Fig.24

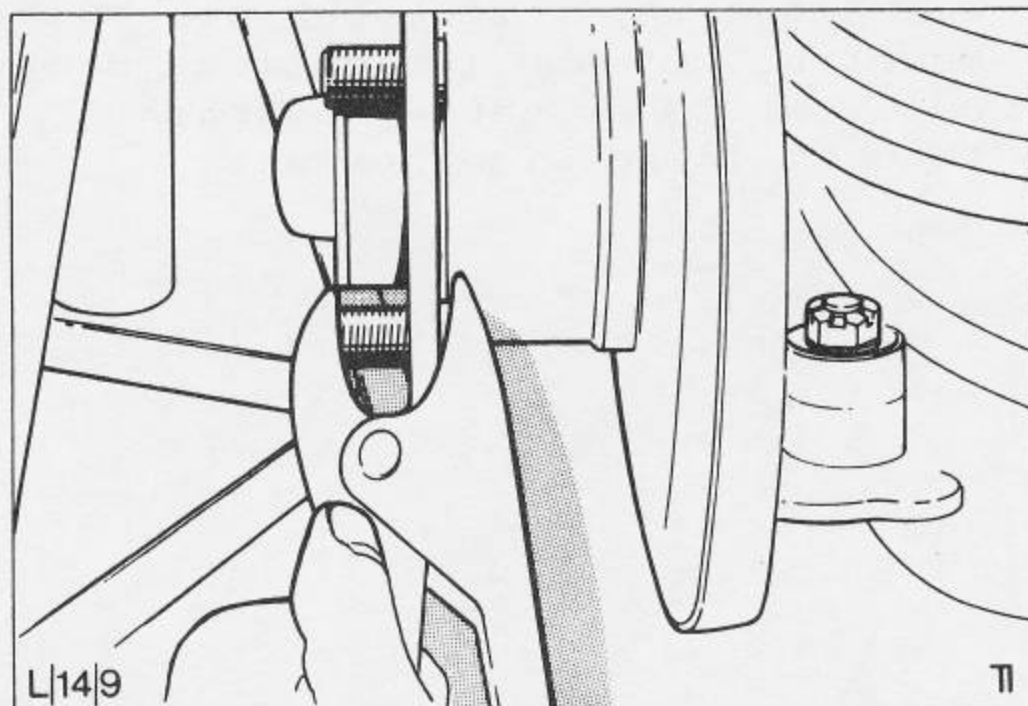


Fig.24 Pressing out wheel stud.

TO INSTALL

5. Lightly lubricate new stud splines. Locate stud in it's hole and draw it into position using a suitable spacer and wheel nut reversed ie tapered face outwards Fig.25
6. Fit road wheel, refit wheel nuts.
7. Raise vehicle, remove axle stands and lower to ground.
8. Fully tighten wheel nuts.

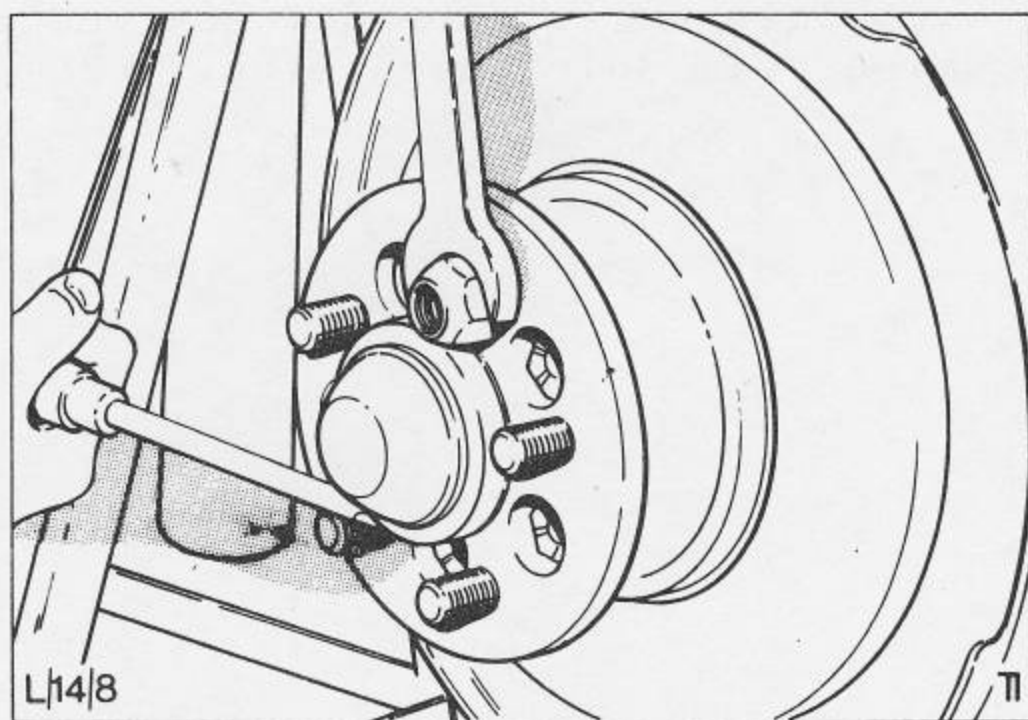


Fig.25 Drawing wheel stud into position.

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C5/1 – FRONT SPRING REMOVE & INSTALL.

Special service tools required;-

Spring compressor _____ 999C-001A
Ball joint separator .

TO REMOVE.

1. Jack up the front of the vehicle under the front suspension chassis crossmember. Place axle stands under the chassis front outriggers and lower vehicle onto stands.
2. Remove appropriate road wheel(s)
3. Remove shock absorber top Fig.26 mounting nut and two bottom mounting nuts. Withdraw shock absorber through lower wishbone arm.

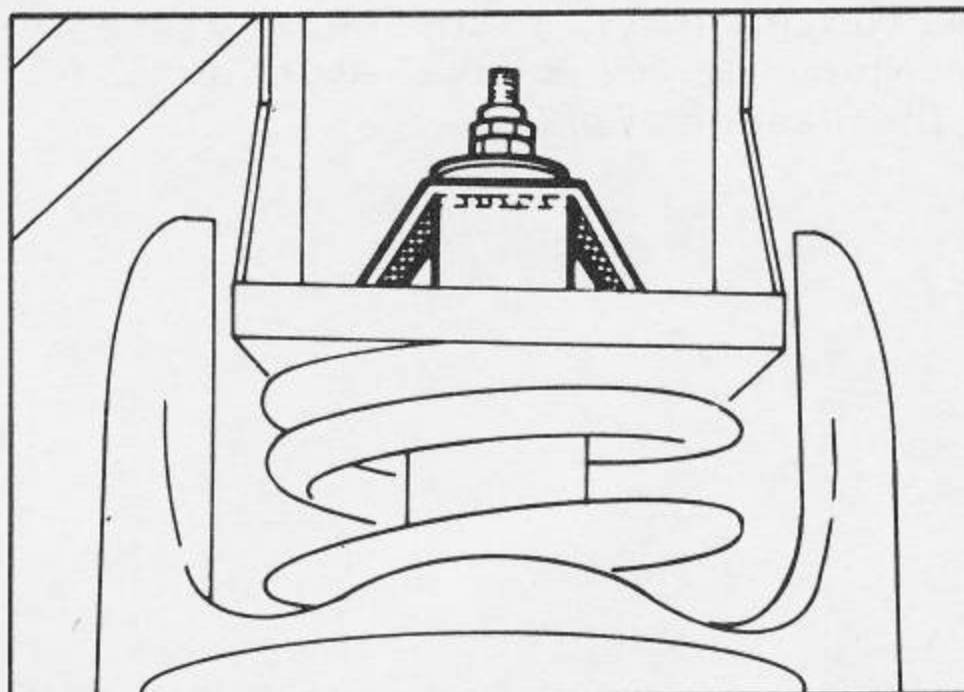


Fig.26 Shock absorber top mount.

4. Disconnect steering track rod end using ball joint separator. Fig.27

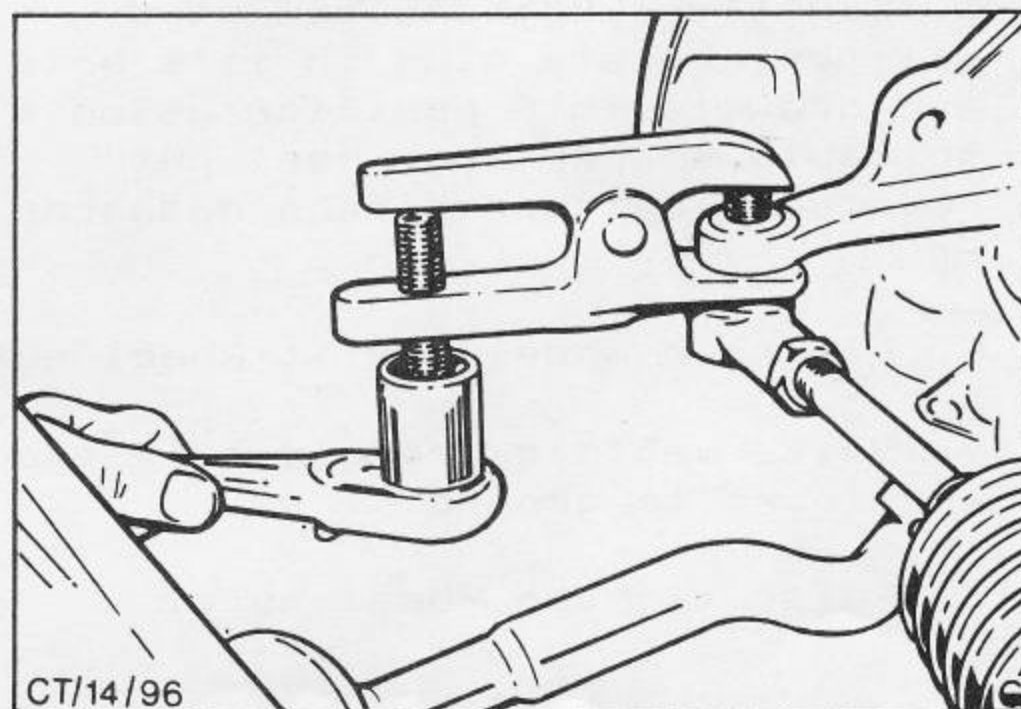


Fig.27 Ball joint separator Tool No. 13 006.

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5. Place spring compressor in position through centre of lower wishbone and spring, locating top of compressor through shock absorber top mounting turret. Fig.28

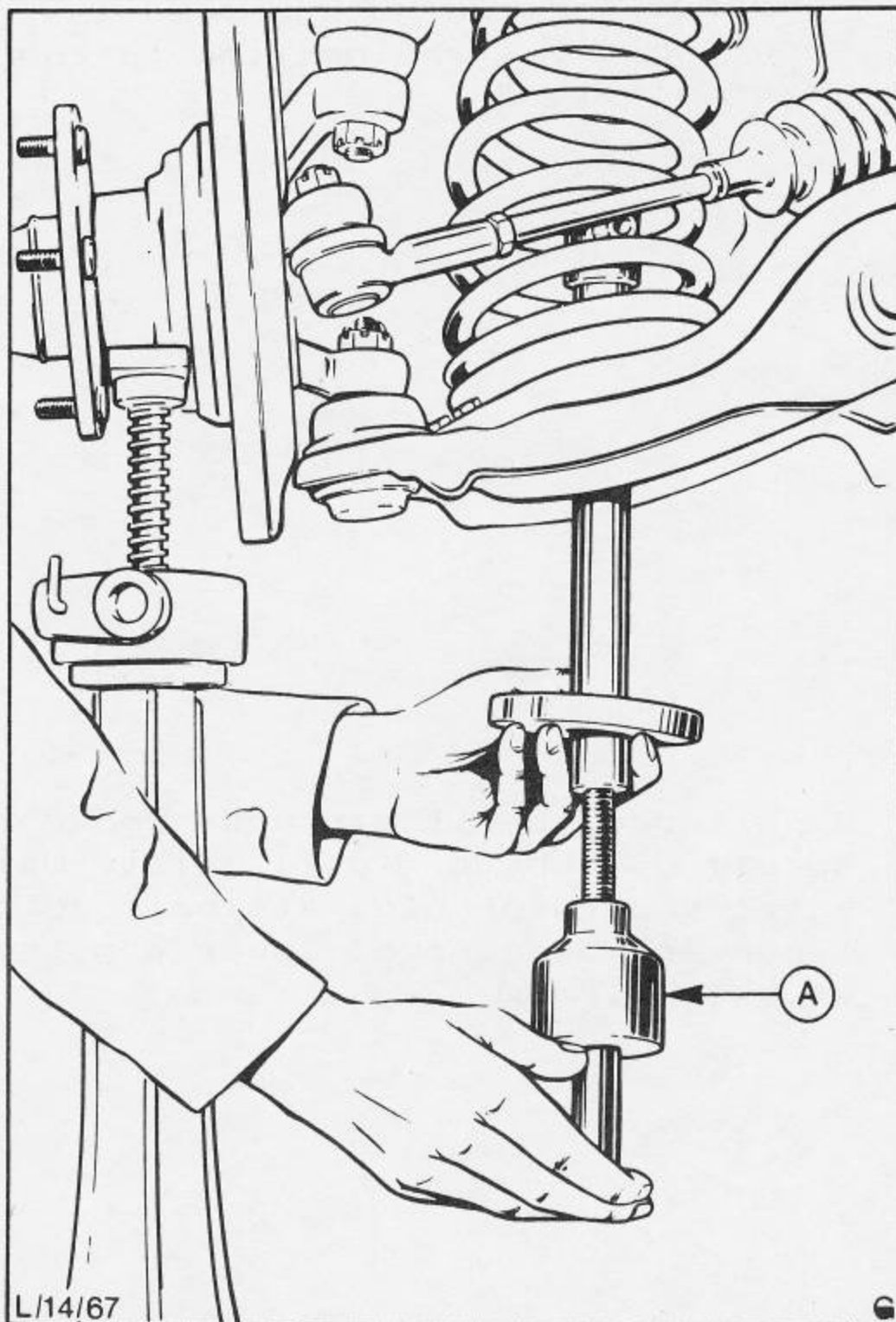


Fig. 28 Positioning Tool No.14-006 'A' inside spring.

6. Fit the flat plate of the tool to the lower arm. Two of the four Fig.29 mounting holes in the plate are marked A. It is essential that the shock absorber mounting studs are in holes A. Loosely secure the plate with the shock absorber mounting studs and compress the spring by using a bar or socket to turn the hexagonal head of the tool.

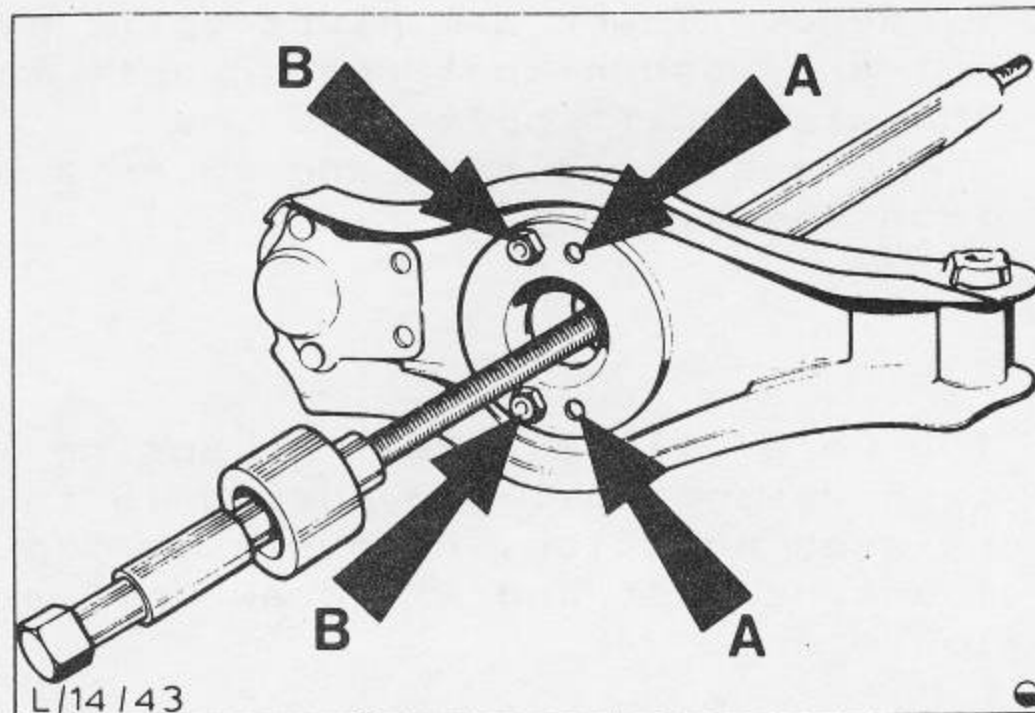


Fig. 29 Tool No.14-001 A plate showing location holes.

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7. Remove the two nuts and bolts securing the leading link to the lower arm. Fig.30

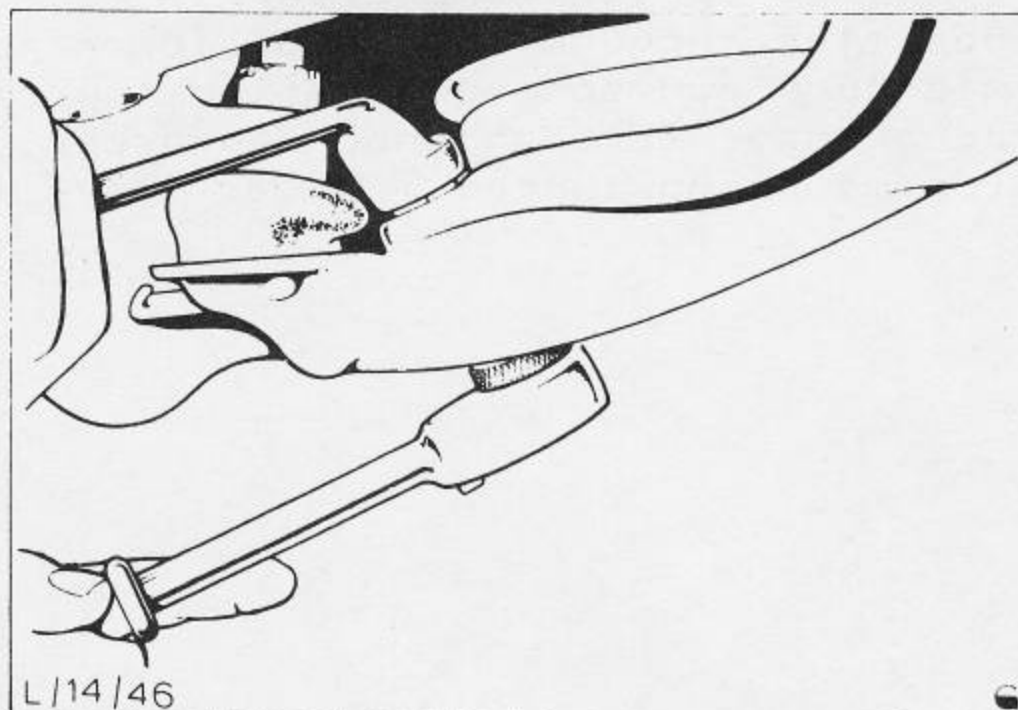


Fig. 30
Remove link to lower arm bolts.

8. Withdraw split pin and remove nut securing lower arm ball joint. Using joint separator separate ball joint taper and disconnect lower arm from stub axle. Fig.31

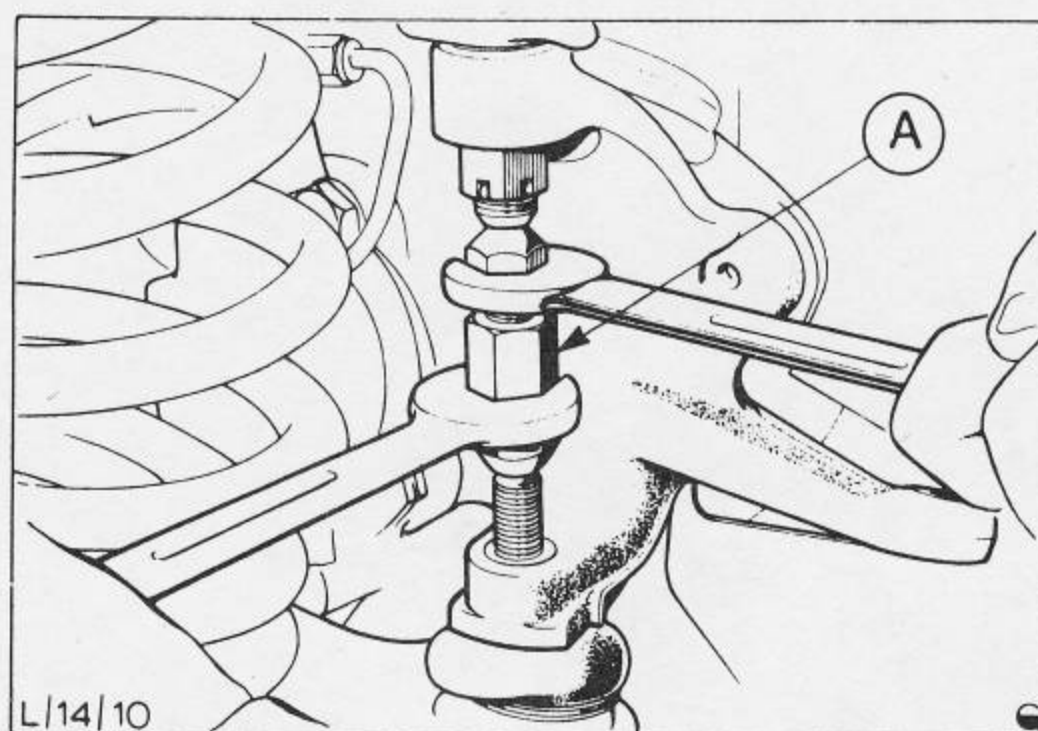


Fig. 31 Free ball joint tapers.
A - Ball joint separator tool no. 14-001 A.

9. Remove lower arm pivot split pin, nut and washer that retain bolt to chassis. Drift bolt from its arm/chassis position and lever arm from chassis. Fig.32

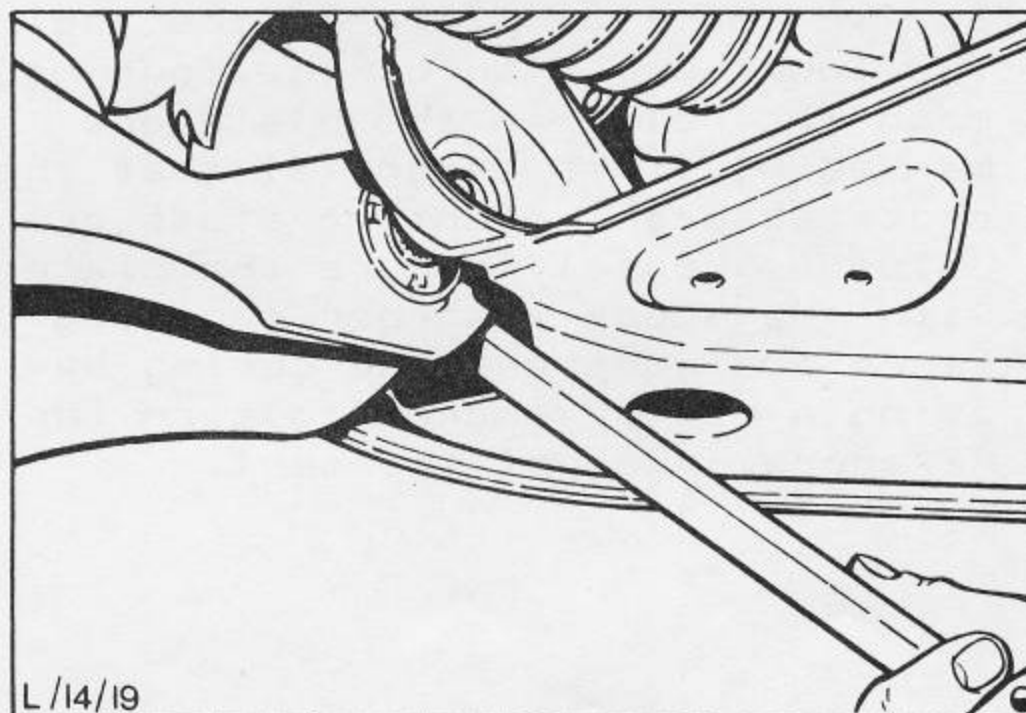


Fig. 32 Prising out lower arm.

10. Carefully slacken the spring compressor until the spring is in a relaxed position, remove it's top mounting bolt and withdraw unit with lower arm.

11. Remove compressor from lower arm.

TO INSTALL.

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12. Position spring on lower arm Fig.33 ensuring that lower spring pad is fitted correctly. Also ensure that spring is fitted with the open coil facing lower spring pad and that spring is seated correctly in pad.

13. Locate spring compressor through the arm and spring ensuring that the plate is correctly positioned on the underside of the arm.

14. Engage track rod end ball joint taper in stub axle, tightening the taper nut by hand only. Locate spring, arm and tool on chassis and locate top mounting of tool as before.

15. Compress spring and engage lower arm ball joint in stub axle as soon as possible, tightening taper nut by hand only.

16. Lubricate ends of lower arm bush with soap/water solution. Locate arm in chassis and refit pivot Fig.34 bolt, washer and nut ensuring that bolt head is positioned towards rear of vehicle. Do not fully tighten nut at this stage.

17. Place stub axle in position, secure lower joint tightening nut to 30 - 40 Ft. Lbs., continue Fig.35 tightening nut until split pin hole is aligned. Fit new split pin and do not exceed 66 Ft. Lbs.

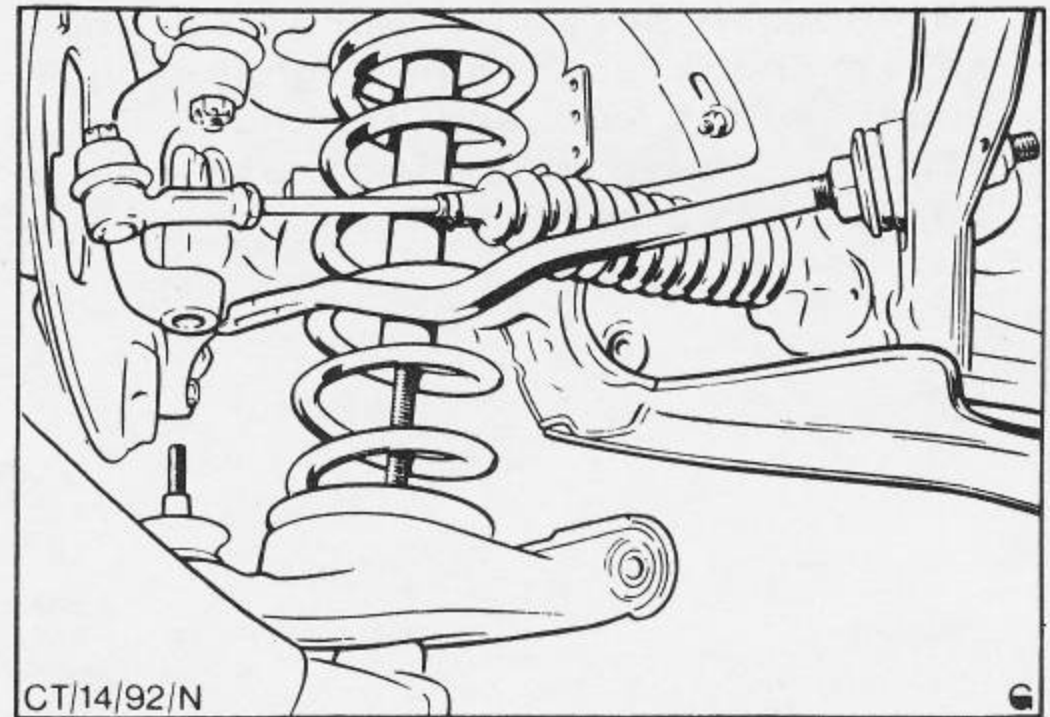


Fig.33 Positioning spring on lower arm.

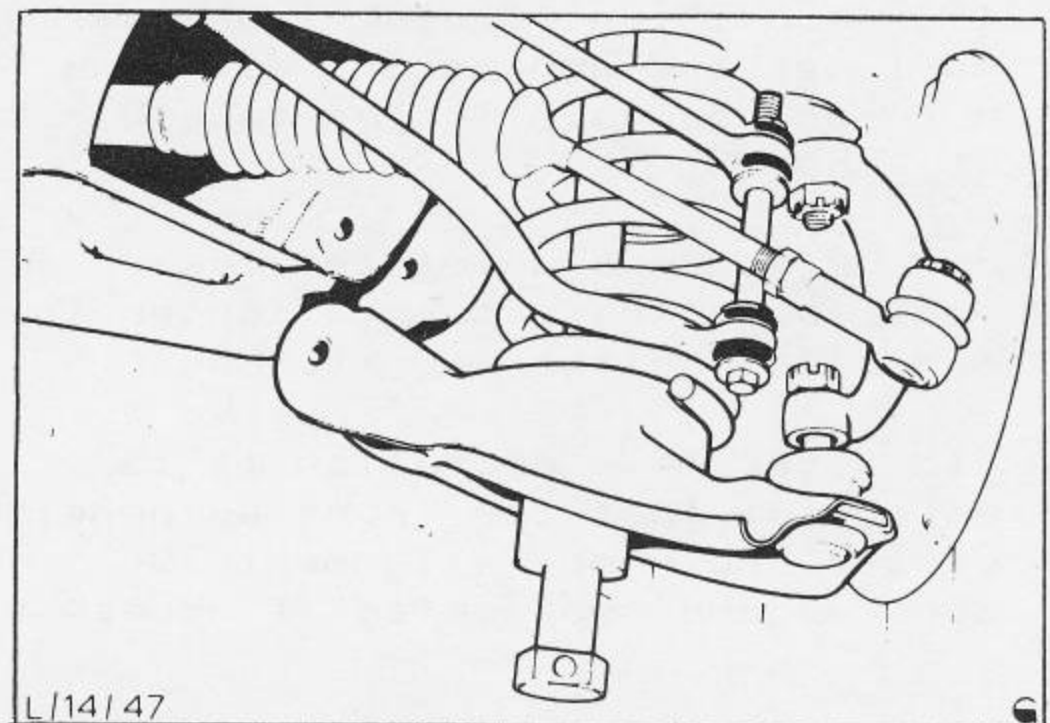


Fig.34 Locating lower arm to frame.

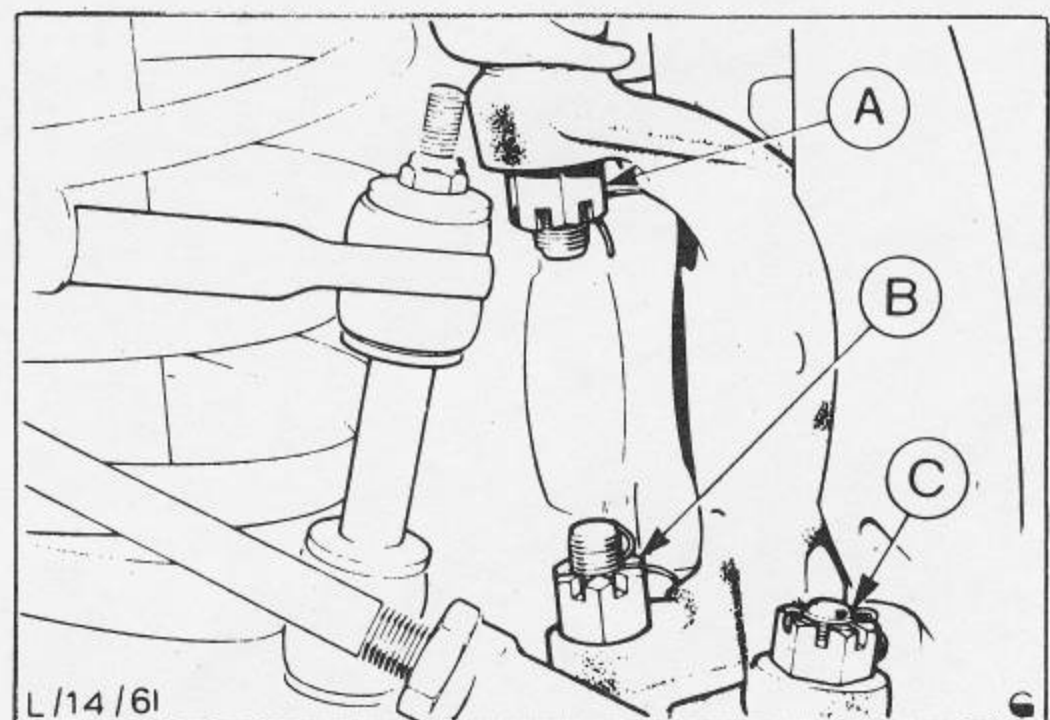


Fig.35 Stub axle securing points.

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18. Remove spring compressor and refit shock absorber tightening upper mount nut and locknut. Fit and tighten lower mounting nuts to 12 - 15 Ft. Lbs. Fig.36

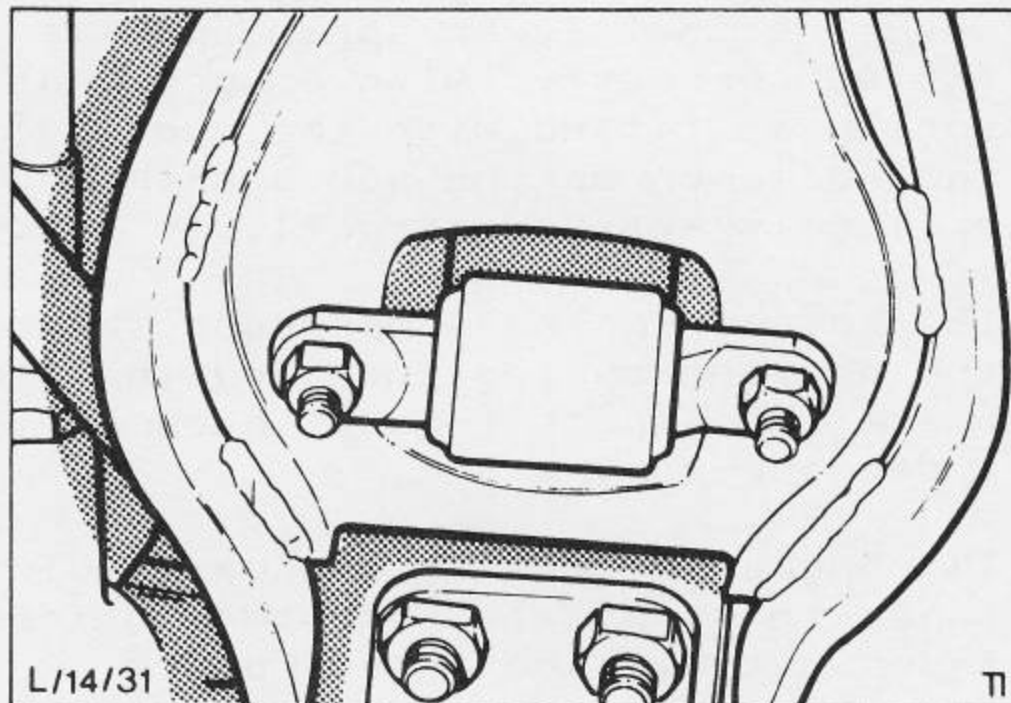


Fig.36 Shock absorber lower mount.

19. Reposition leading link assembly on lower arm and secure with two nuts and bolts. Tighten to 43 - 50 Ft. Lbs. Fig.37

20. Refit road wheel and lower vehicle to the ground. Tighten lower arm pivot bolt to 60 Ft. Lbs.

21. After this operation it is essential that the front suspension caster and wheel alignment is checked and readjusted if necessary.

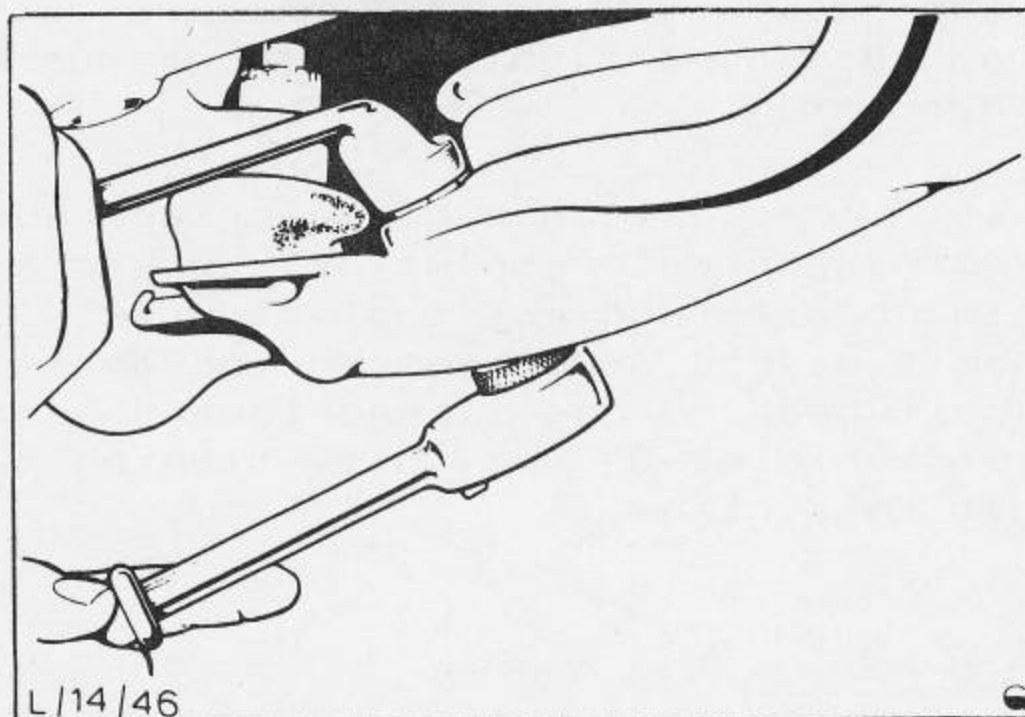


Fig.37 Tightening tie bar lower arm bolts.

C6/1 – UPPER WISHBONE –

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Special service tools requires;-

Spring compressor _____ 999C-001A
Ball joint separator

TO REMOVE.

1. Jack up the front of the vehicle under the front suspension chassis crossmember. Place axle stands under the chassis front outriggers and lower vehicle onto stands.
2. Remove appropriate road wheel(s)
3. Remove shock absorber top Fig.38 mounting nut and two bottom mounting nuts. Withdraw shock absorber through lower wishbone arm.

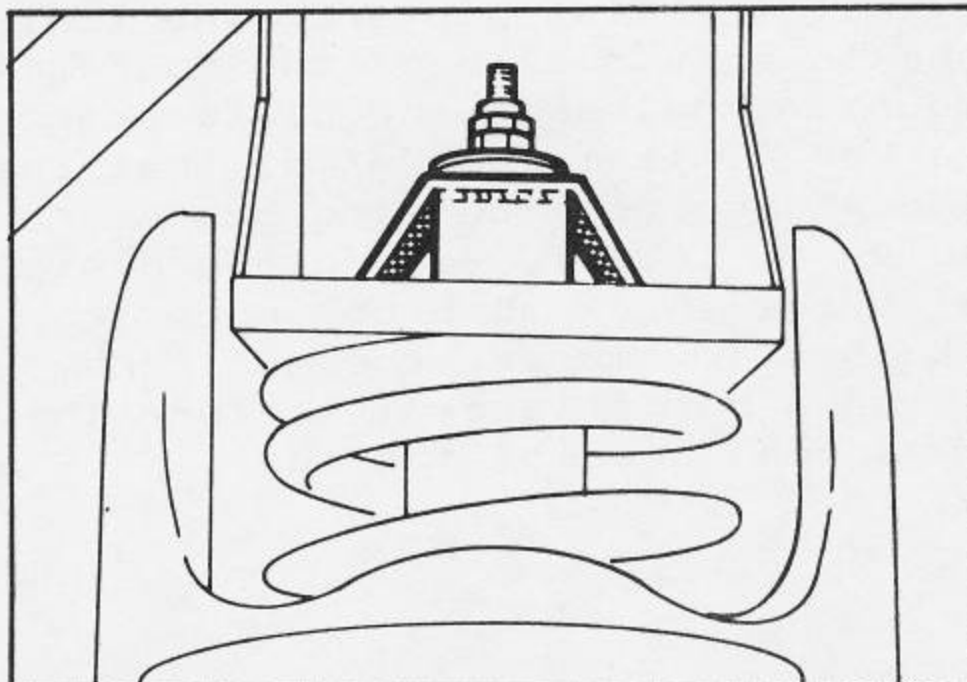


Fig.38 Shock absorber top mount.

4. Place spring compressor in position through centre of lower wishbone and spring, locating top of compressor through shock absorber top mounting turret. Fig.39

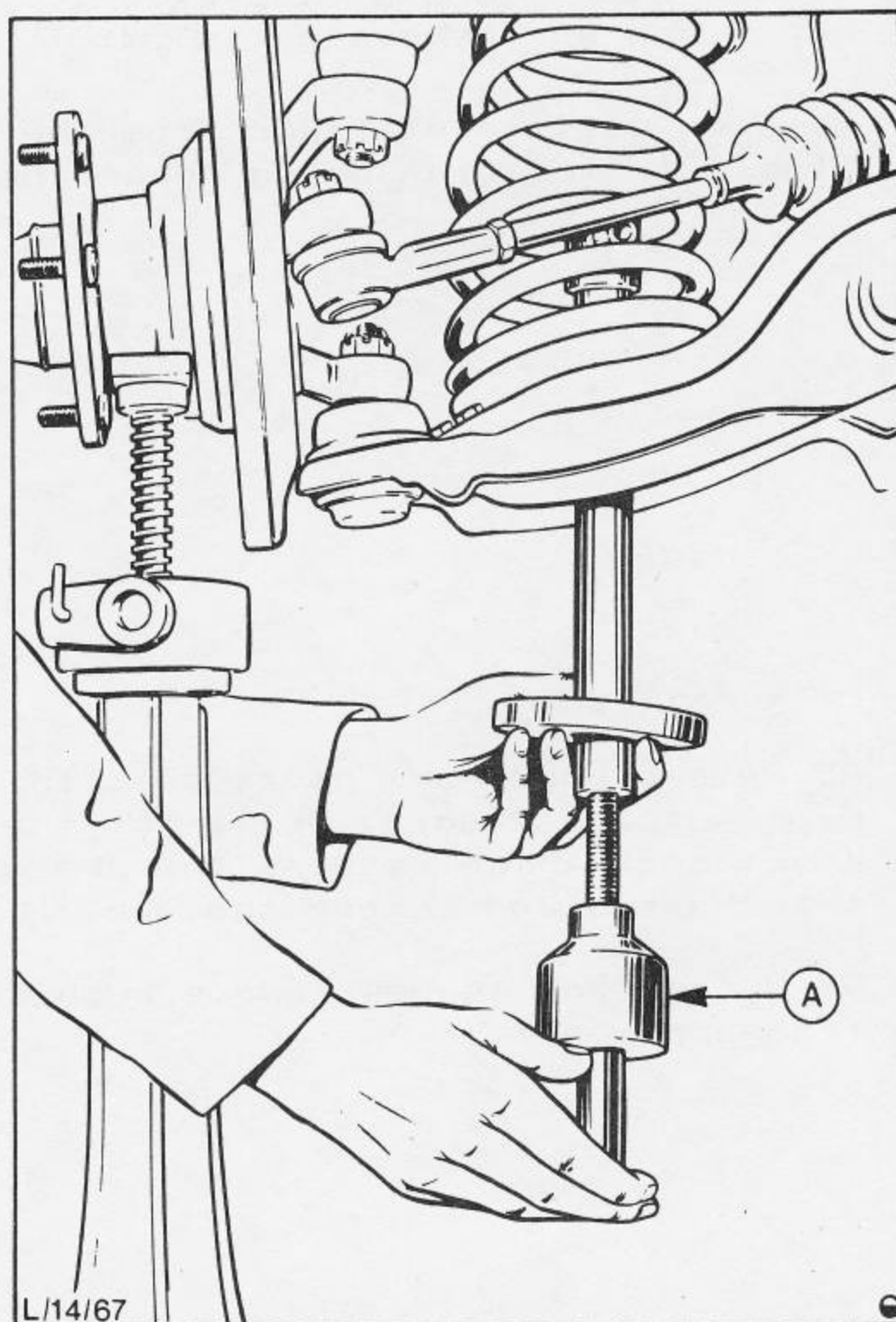


Fig.39 Positioning Tool No.14-006 'A' inside spring.

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5. Fit the flat plate of the tool to the lower arm. Two of the four Fig.40 mounting holes in the plate are marked A. It is essential that the shock absorber mounting studs are in holes A. Loosely secure the plate with the shock absorber mounting studs and compress the spring by using a bar or socket to turn the hexagonal head of the tool.

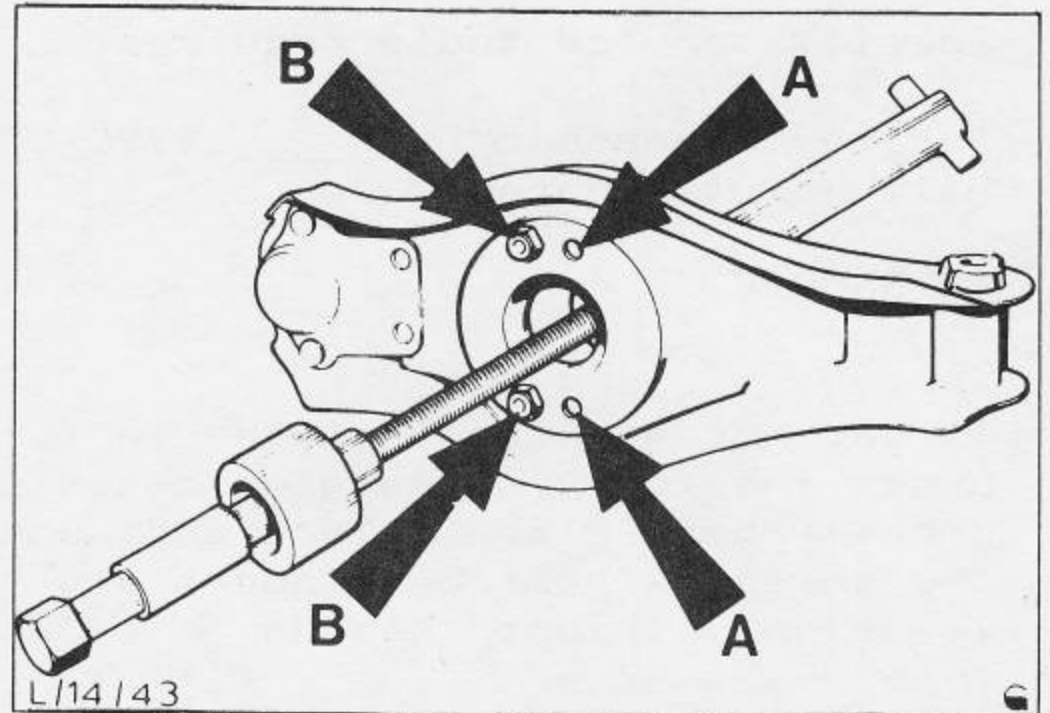


Fig.40 Spring compressor Tool and lower arm.

6. Having taken the weight off the suspension remove split pin and loosen nut securing stub axle to upper arm and remove nut. Fig.41

7. Free ball joint taper from the stub axle location using separator.

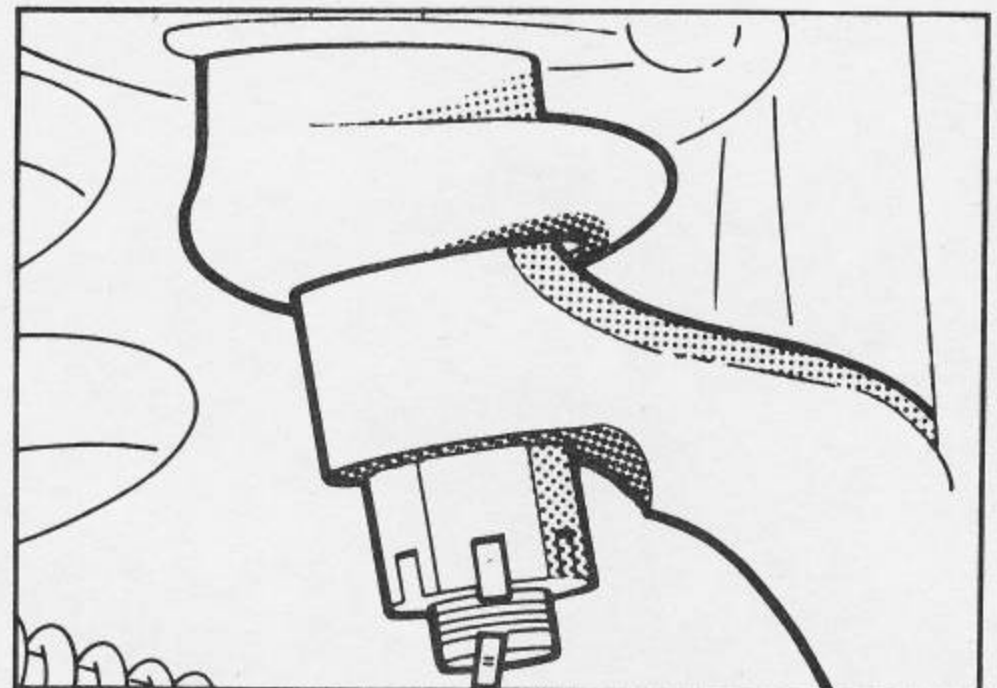


Fig.41 Remove stub axle securing nut.

8. Remove upper arm pivot bolt split pin, nut and washer. Drift out the pivot bolt which retains the arm to the chassis and remove the arm. Fig.42

9. Using tool 14-004 remove bushes from upper arm.

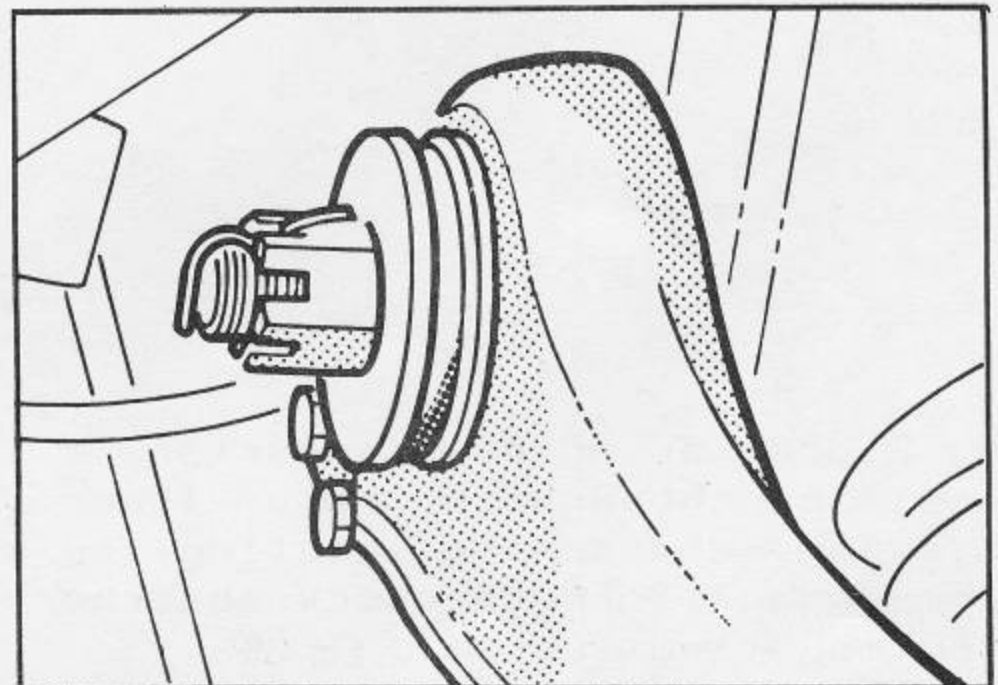


Fig. 42

Remove upper aem pivot bolt nut.

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TO INSTALL.

10. Using tool 14-004 install new bushes into the upper arm. Fig.43

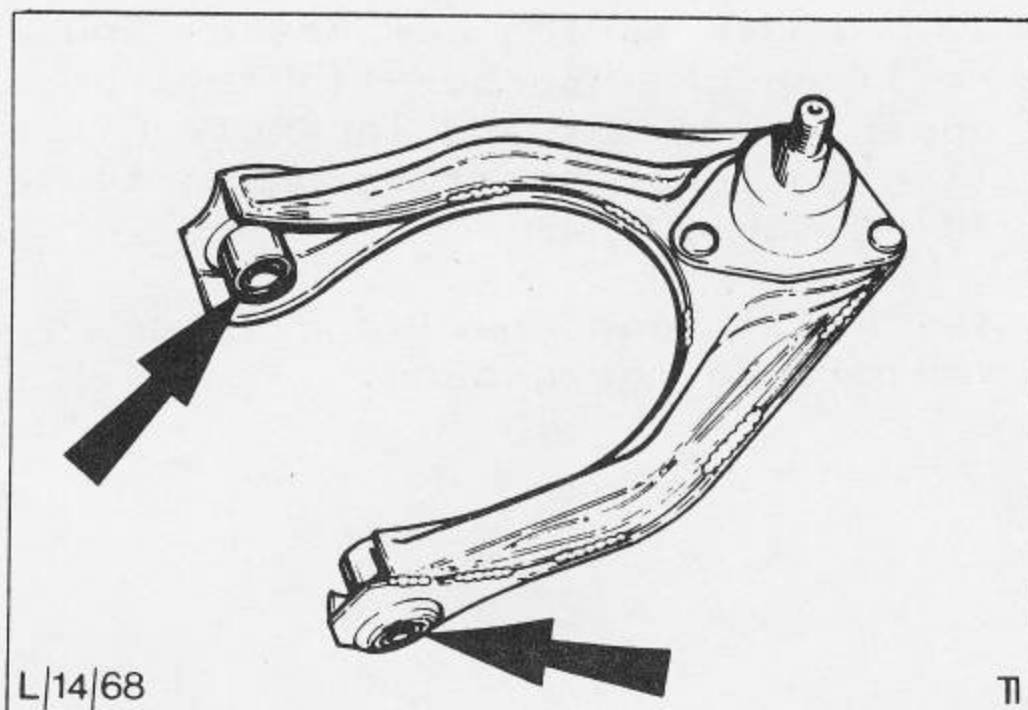


Fig.43 Upper arm bush location.

11. Place the upper arm in position and secure to the chassis with the bolt, washer and nut, tightening to a torque of 60 Ft. Lbs. Fit new split pin. Fig.44

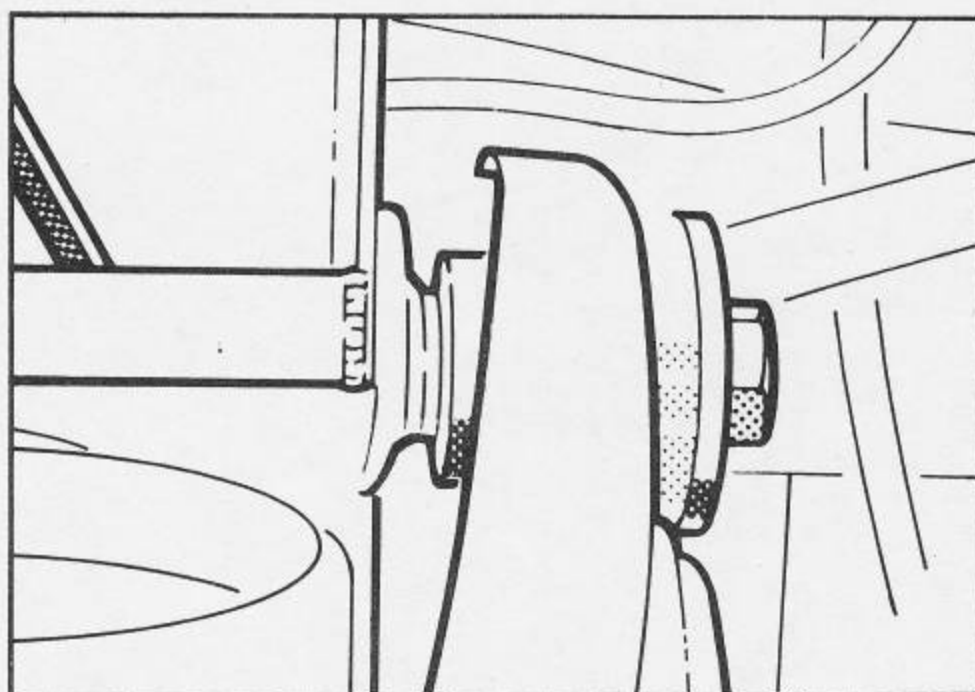


Fig.44 Fit pivot bolt.

12. Fit upper arm ball joint to stub axle and secure with nut. Tighten nut to 30 - 40 Ft. Lbs. and continue tightening until split pin hole is aligned and fit new pin. Do not exceed 66 Ft. Lbs. Fig.45

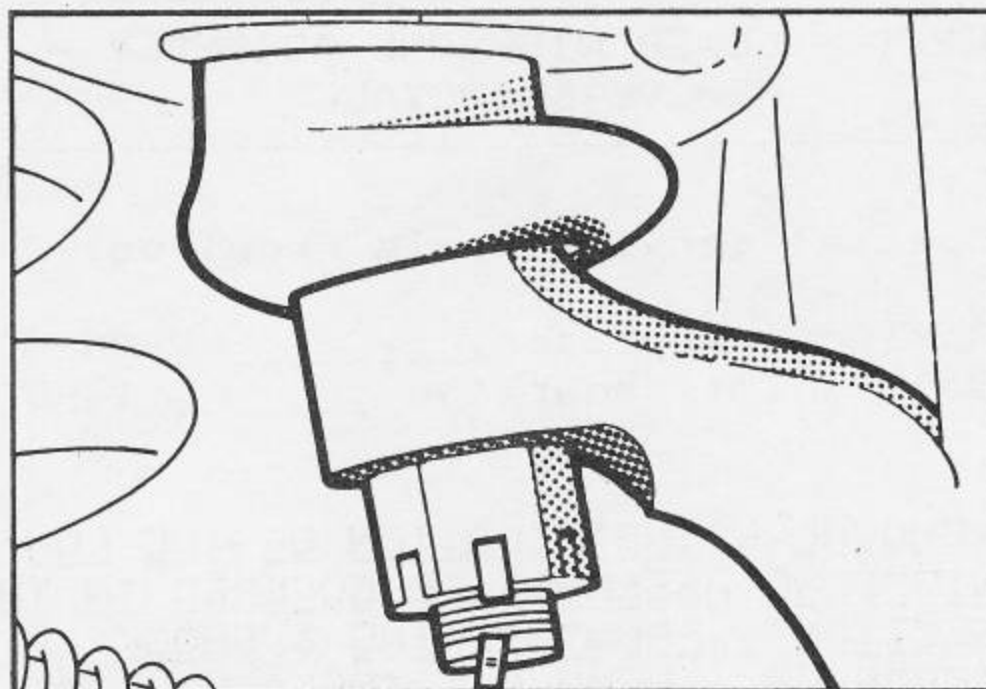


Fig.45 Fit stub axle securing nut & split pin.

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13. Remove spring compressor and refit shock absorber tightening upper mount nut and locknut. Fit and tighten lower mounting nuts to 12 - 15 Ft. Lbs. Fig.46

14. Refit road wheel and lower vehicle to the ground.

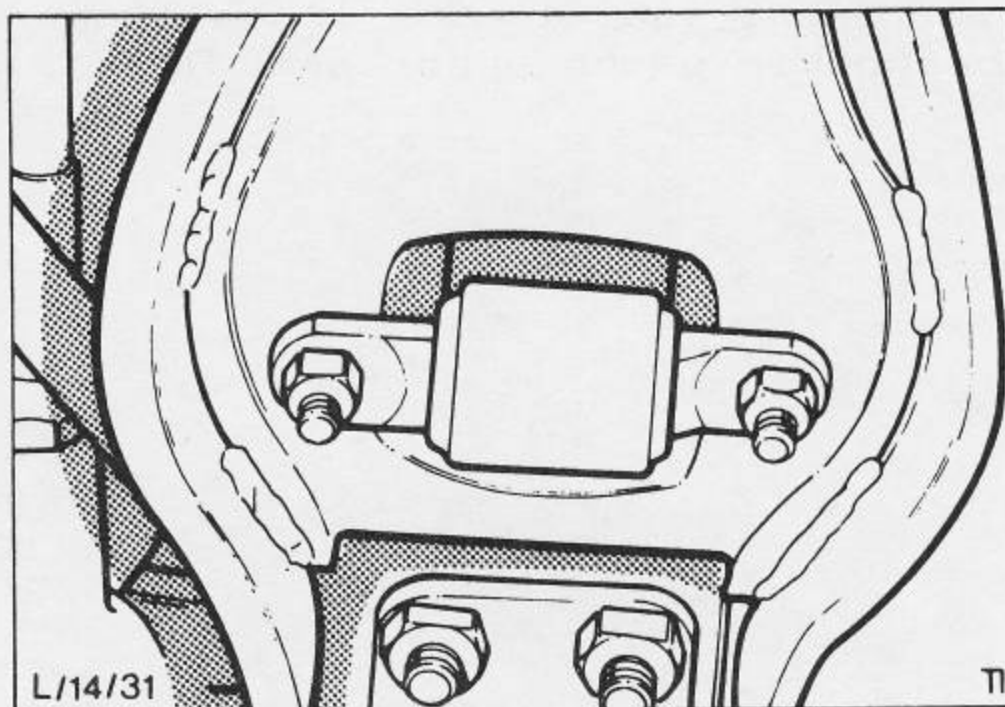


Fig. 46 Shock absorber lower mount.

----- C7/1 - LOWER WISHBONE ASSEMBLY - REMOVE & INSTALL -----

Special service tools required;-

Spring compressor _____ 999C-001A
Ball joint separator _____ 14-001A

REMOVAL & INSTALLATION OF THE LOWER WISHBONE ASSEMBLY IS COVERED IN THE SECTION - FRONT SPRING & SHOCK ABSORBER - REMOVE & INSTALL.

C8 – WISHBONE BALL JOINTS –

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Special service tools required;-

Spring compressor _____ 999c-001a

Ball joint separator _____ 14-001A

TO REMOVE

1. Remove top or bottom wishbone as described in the relevant section.

2. With the wishbone on a suitable workbench drill existing rivets to a depth of 3/16" using a 1/8" diameter drill as a pilot. Increase by convenient stages up to a diameter of 3/8" to completely remove material, taking care not to increase diameter of existing holes in the wishbone.

3. Punch out the rivets enabling the existing ball joint to be removed.

TO INSTALL.

4. Bolt replacement joint into position and grease. Fig.47

5. Refit wishbone to vehicle as outlined in relevant section.

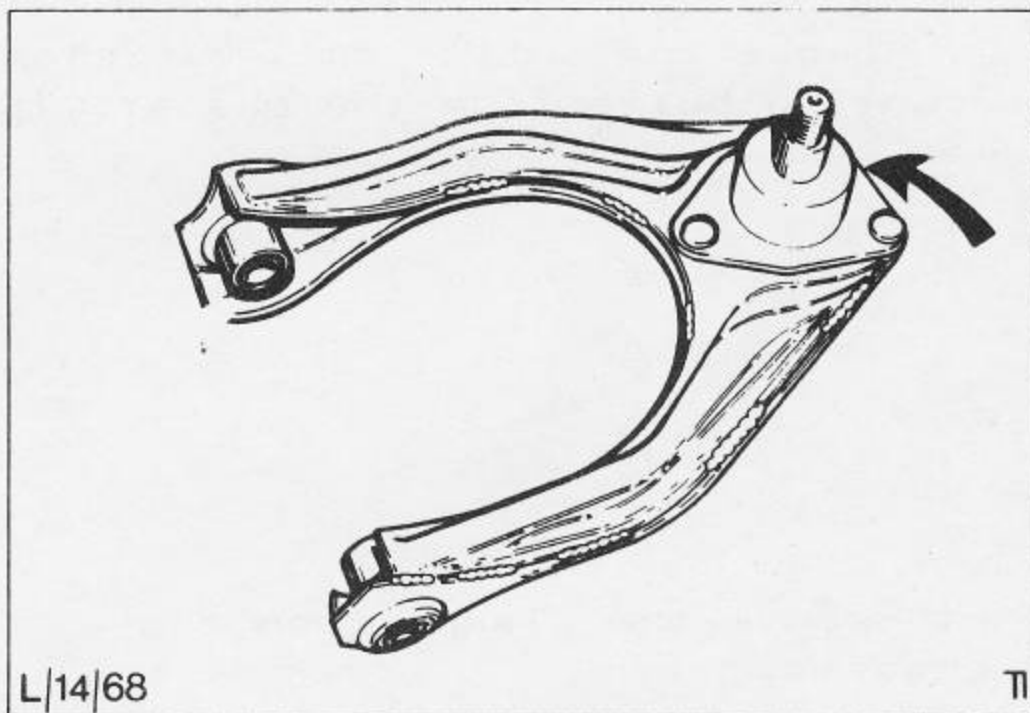


Fig.47 Ball joint location.

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----- C9/1 – ANTI – ROLL BAR – REMOVE & INSTALL -----

Special service tools required;–

NONE.

TO REMOVE.

1. Jack up the front of the vehicle under the front suspension chassis crossmember. Place axle stands under the chassis front outriggers and lower vehicle onto stands.

2. Remove appropriate road wheel(s)

3. Remove the anti – roll bar clamp mounting bolts from the chassis. Fig.48

4. Remove the clamps from the chassis.

5. Remove the split pins from either end of anti – roll bar to the connecting drop link.

6. Force the anti – roll bar drop links from the anti – roll bar and remove the bar.

TO INSTALL.

7. Fit end of anti – roll bar into drop link and secure with new split pins. Fig.49

8. Position anti – roll bar chassis retaining clamps in position and install bolts. Torque to 13 – 18 Ft. Lbs.

9. Refit road wheel, remove chassis stands and lower vehicle to the ground.

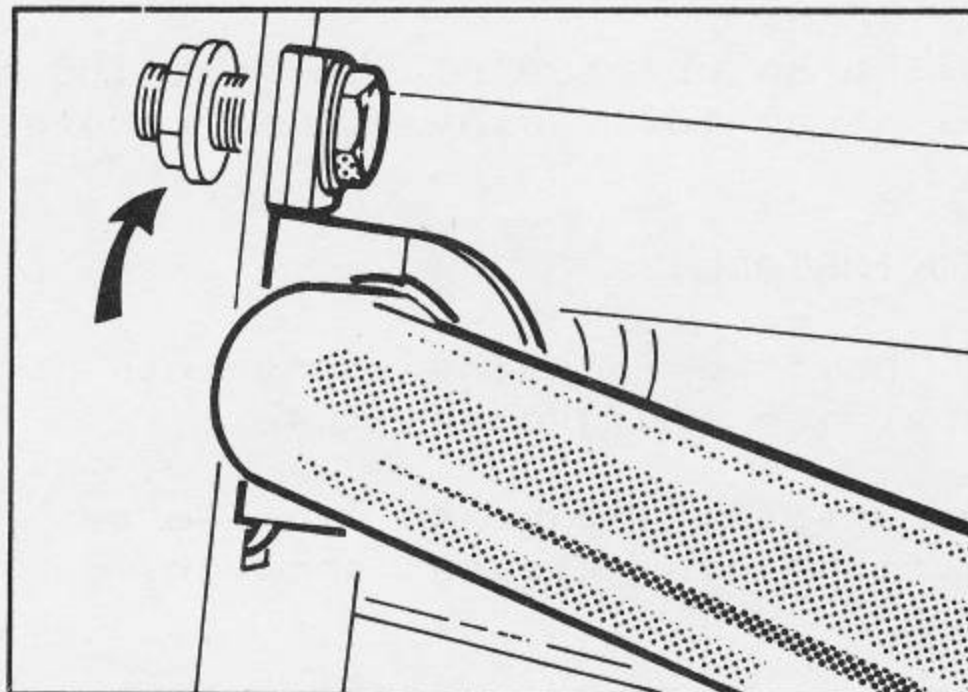


Fig. 48

Remove anti-roll bar clamp bolt.

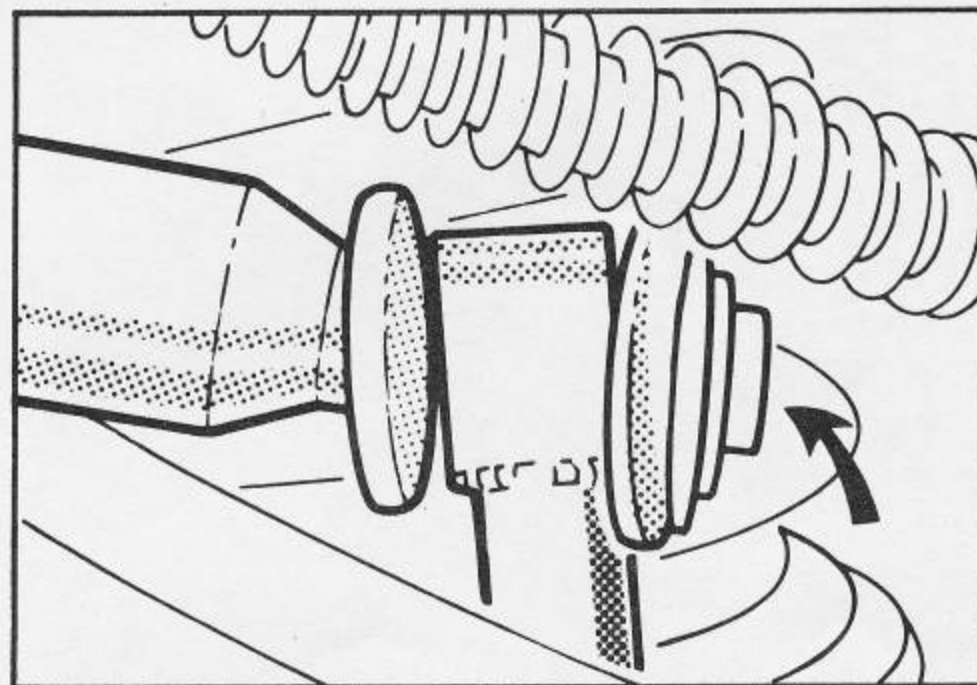


Fig. 49

Fit anti-roll bar split pin.

C9/2 – BUSHES – ANTI – ROLL BAR

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Special service tools required;-

NONE.

1. Remove mounting to chassis retaining bolt either side.
2. Remove old bush and slide new one over bar.Fig.50
3. Install mounting retaining bolt to chassis and torque to 13 – 18 Ft. Lbs.

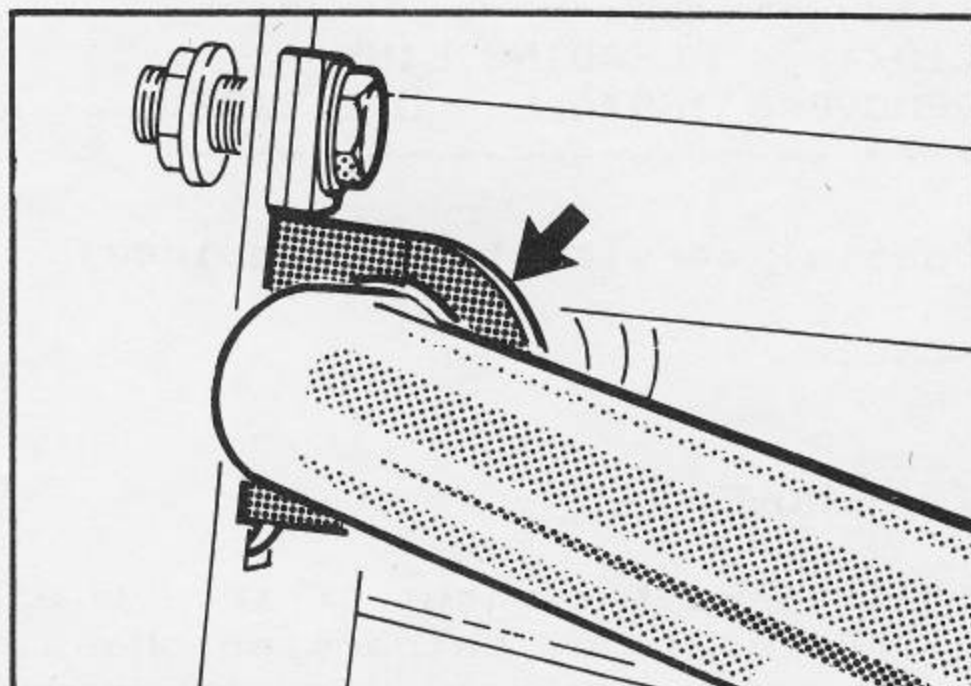


Fig.50 Remove anti-roll bar bush.

C9/3 – BUSHES – ANTI ROLL BAR TO DROP LINK REPLACE

Special service tools required;-

NONE.

1. Remove split pin and washer at end of anti – roll bar.
2. Force drop link off end of anti – roll bar.
3. Remove bush from drop link. Fig.51
4. Replace bush in drop link.
5. Force end of anti – roll bar through drop link.
6. Install washer and new split pin.

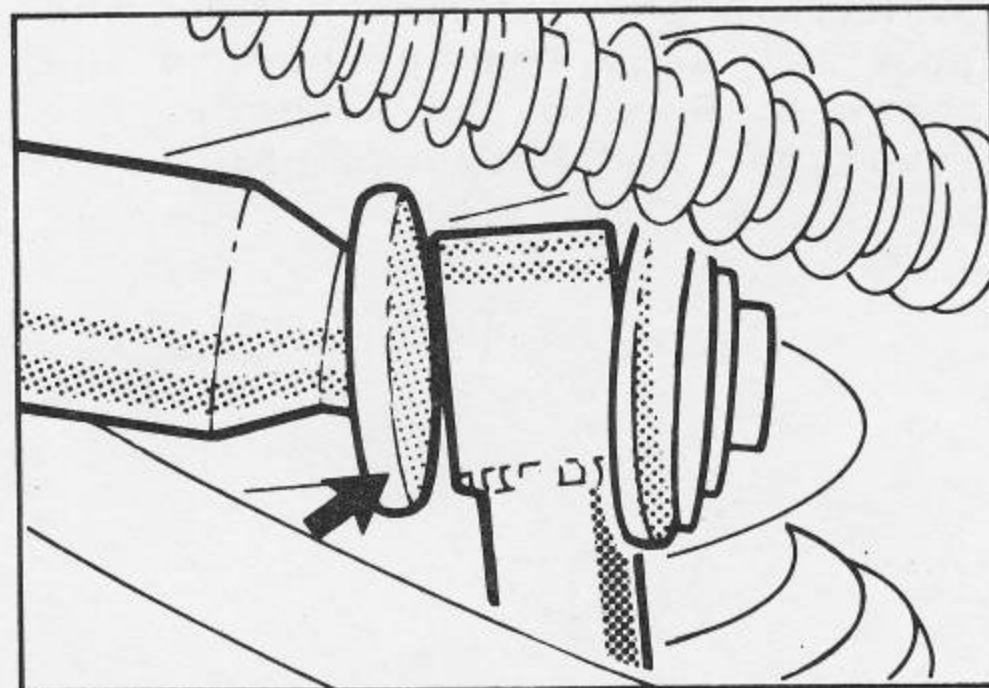


Fig.51 Remove drop link bush.

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C10/1 – LEADING LINK – REMOVE & INSTALL – ONE SIDE.

Special service tools required;-

NONE.

TO REMOVE.

1. Jack up the front of the vehicle under the front suspension chassis crossmember. Place axle stands under the chassis front outriggers and lower vehicle onto stands.

2. Remove appropriate road wheel(s)

3. Disconnect the anti - roll bar link arm from the leading link. Fig.52

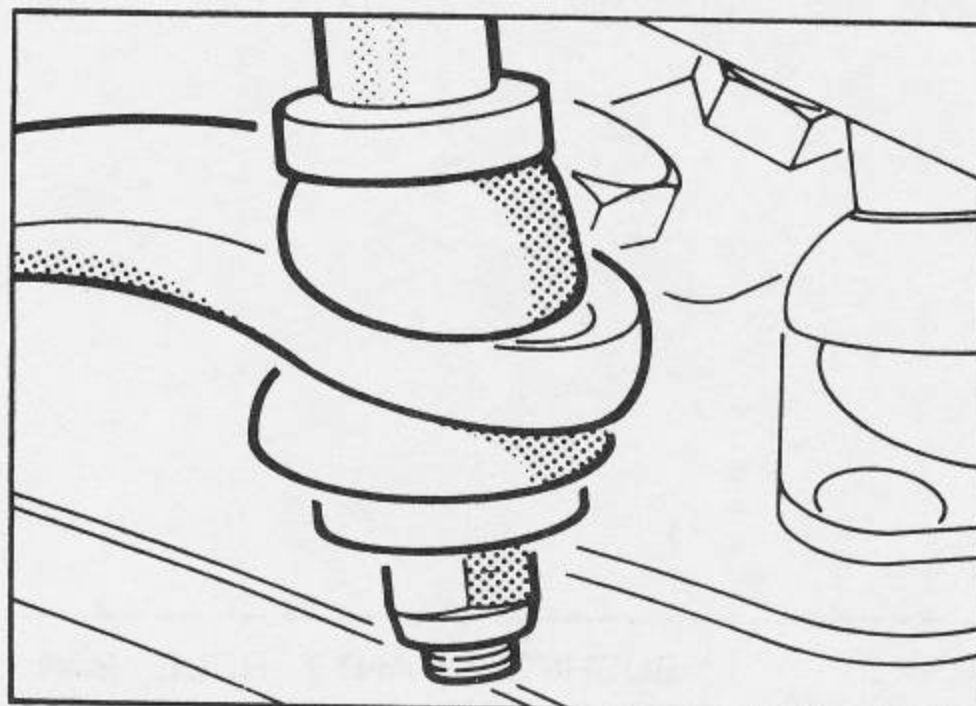


Fig. 52

Remove drop link retaining nut.

4. Remove the two bolts securing link to lower wishbone assembly.

5. Remove the forward nut on the link securing the bar to the chassis. Remove the washer, insulator and washer. Fig.53

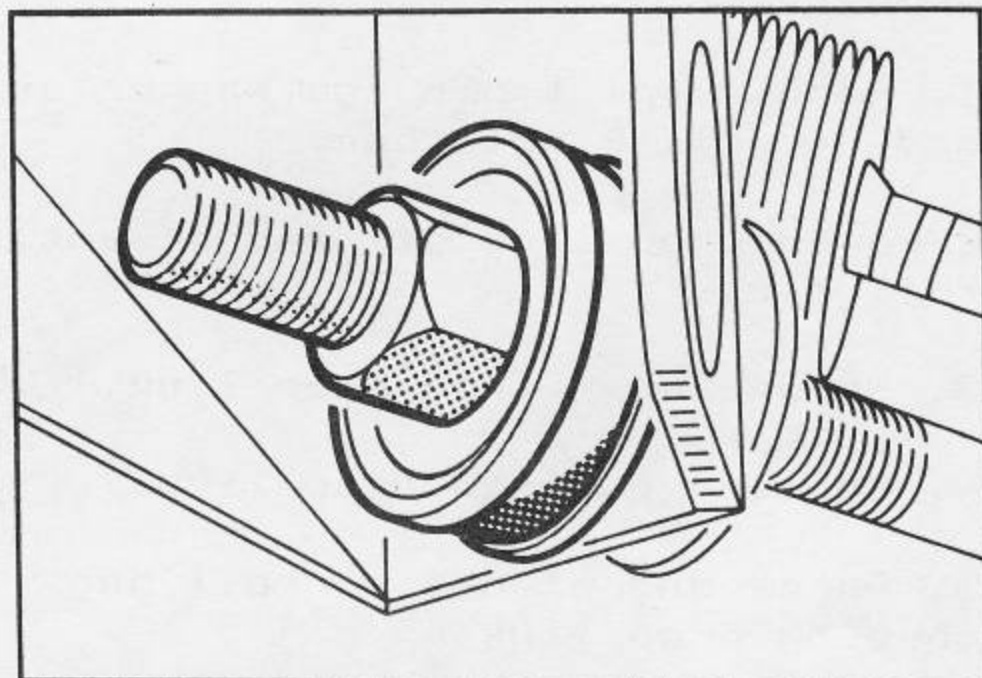


Fig.53 Remove link forward nut.

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6. Making a note of the positioning of the other insulators and washers remove the link from the vehicle.

Fig. 54

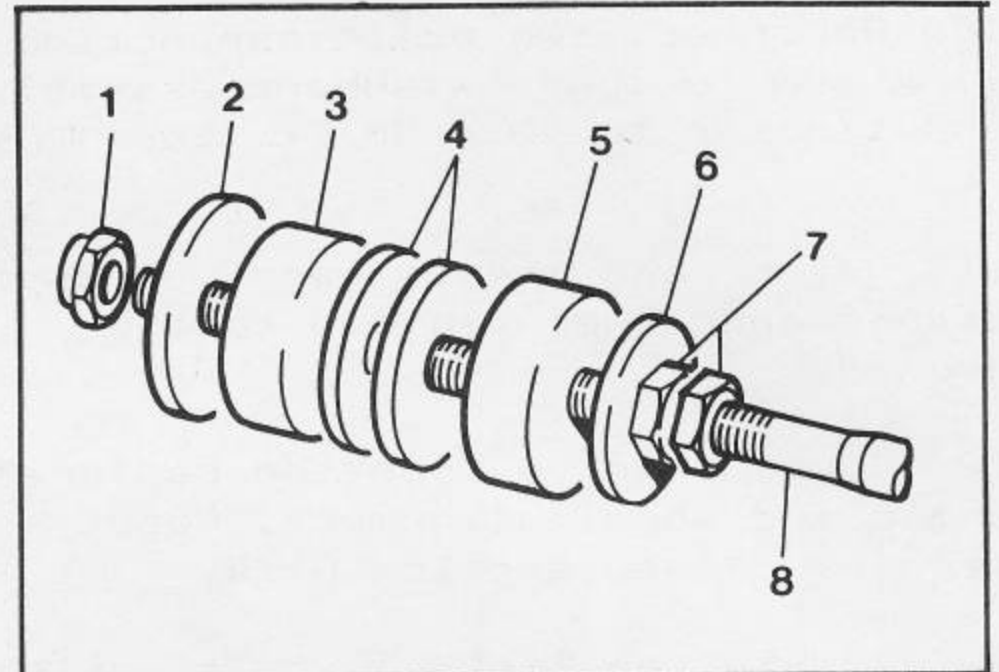


Fig. 54

- | | |
|------------------------|------------------------|
| 1. Front nut. | 5. Orange insulator. |
| 2. Front thick washer. | 6. Rear thick washer. |
| 3. Black insulator. | 7. Rear nut & locknut. |
| 4. Thin washers. | 8. Leading link. |

TO INSTALL.

7. Assemble rear two nuts, thick washer, orange insulator and thin washer onto the link arm and Fig. 55 relocate arm through chassis.

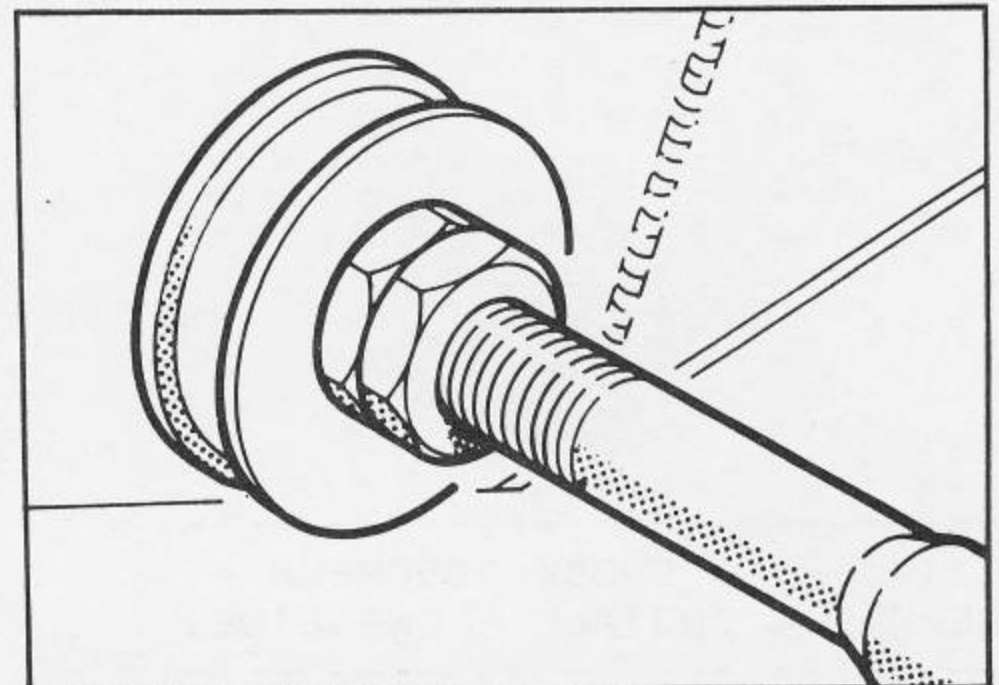


Fig. 55 Assemble insulator/washers.

8. Refit front thin washer, black insulator, thick washer and nut to front end of link. Ensure the bar is central on frame.

9. Reconnect anti - roll bar link arm and tighten to 12 - 15 Ft. Lbs.

Fig. 56

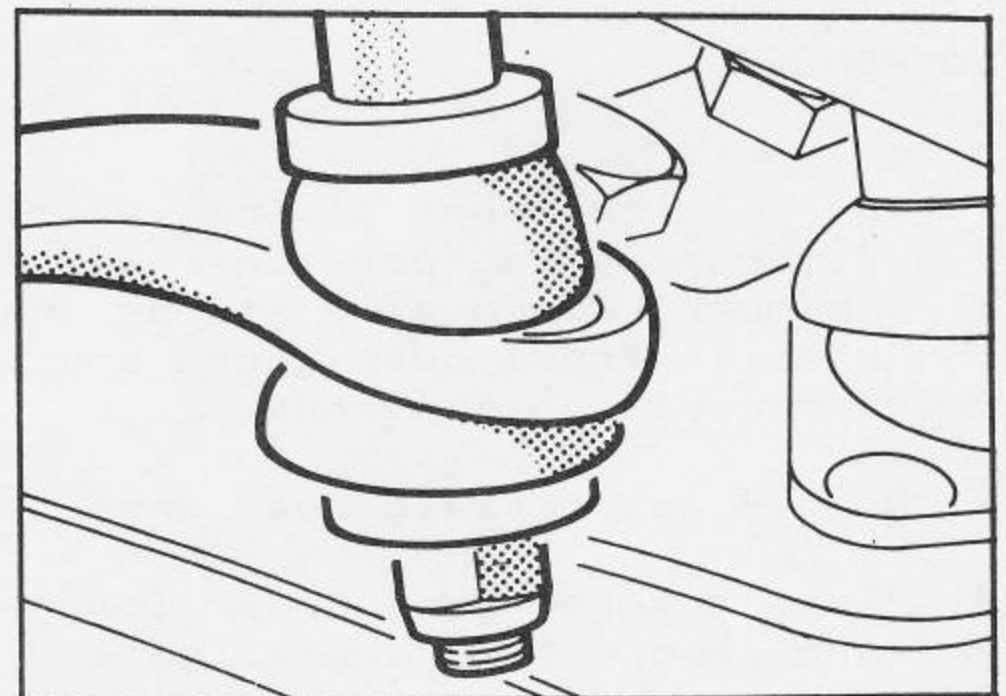


Fig. 56

Install & tighten drop link nut.

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10. Reconnect two bolts connecting link arm to lower wishbone assembly and tighten to 43 – 50 Ft. Lbs Fig.57

11. Refit road wheel, remove chassis stands and lower vehicle to the ground.

12. Check front suspension castor angle and wheel alignment. Reset as required – see section C1/4

NOTE – Slacken link bar nuts whilst adjusting castor setting.

NOTE – Wheel alignment must be measured and reset after castor has been adjusted.

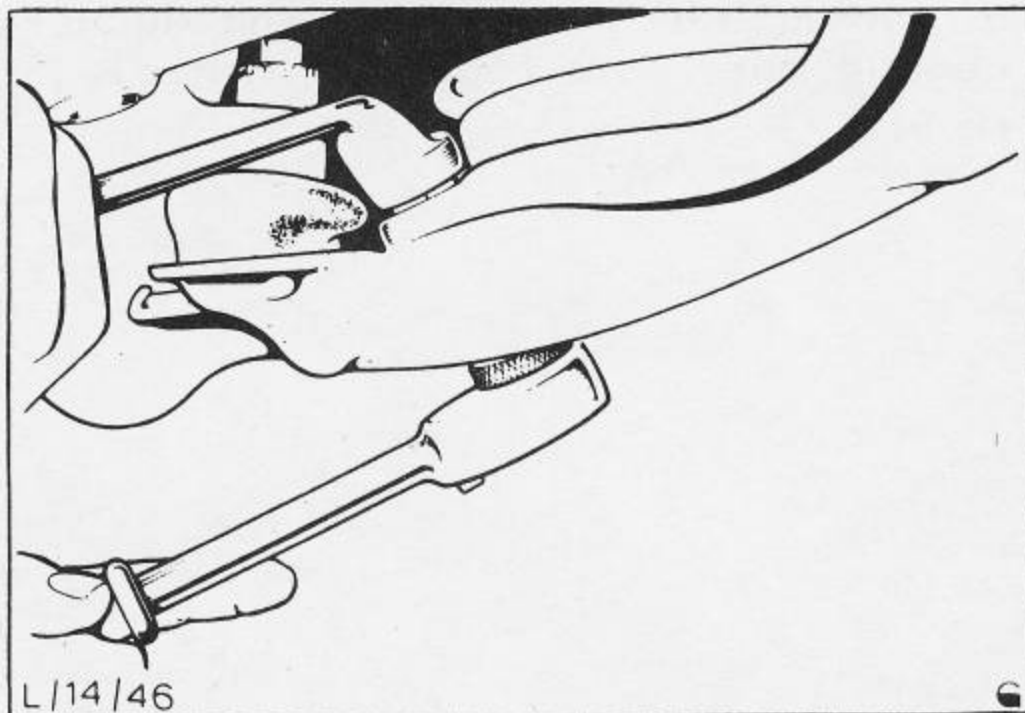


Fig. 57

Reconnect link to lower arm bolts.

----- C11/1 – SHOCK ABSORBER – REMOVE & INSTALL – ONE SIDE. -----

Special service tools required;-

NONE.

TO REMOVE.

1. Jack up the front of the vehicle under the front suspension chassis crossmember. Place axle stands under the chassis front outriggers and lower vehicle onto stands.

2. Remove appropriate road wheel(s)

3. Place a screw jack under lower arm and compress spring slightly.

Fig. 58

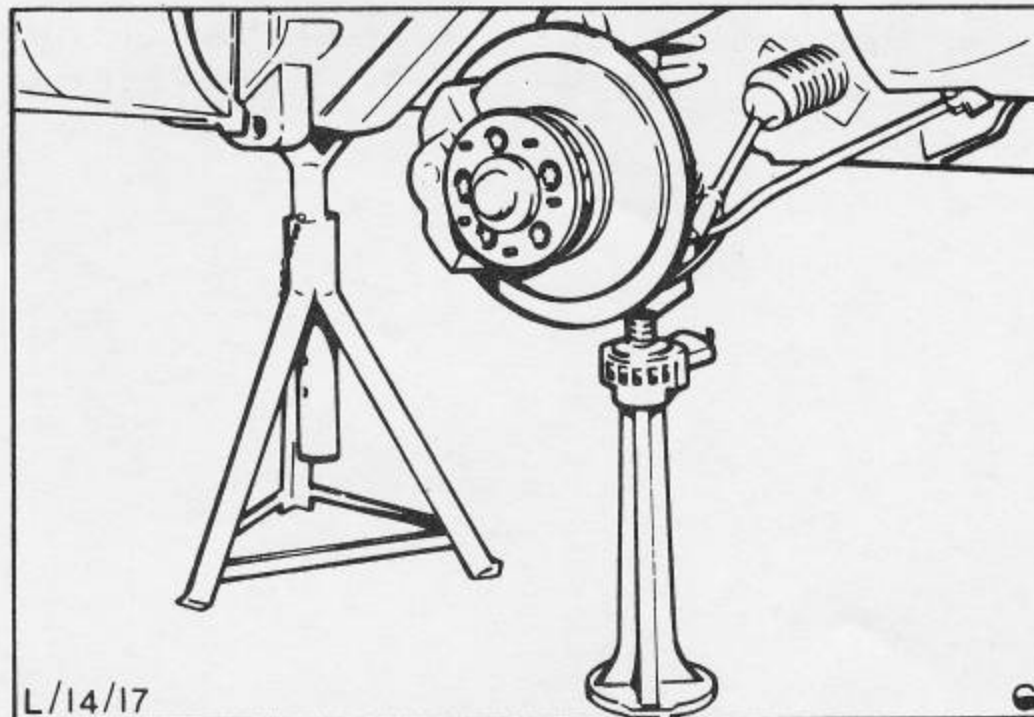


Fig. 58 Screw jack below lower arm.

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4. Remove shock absorber top mounting nut and locknut Fig.59

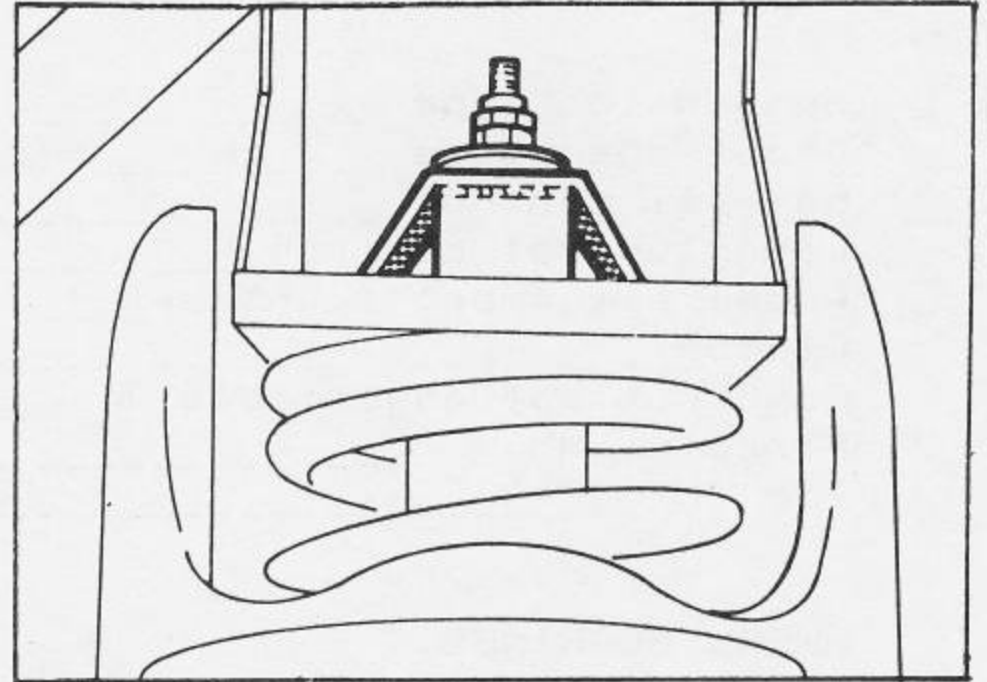


Fig.59 Shock absorber top mount.

5. Remove two nuts retaining shock absorber lower mounting and with draw shock absorber downwards through aperture in lower arm.

TO INSTALL.

6. Position shock absorber within coil spring and secure the upper mounting with the nut which is nipped to the shoulder on the stem, while holding the top of stem with a wrench. The locknut is then tightened.

7. Refit two lower shock absorber mounting nuts and torque to 12 - 15 Ft. Lbs. Fig.60

8. Relieve pressure on the lower wishbone and withdraw screw jack.

9. Refit road wheel, remove chassis stands and lower vehicle to the ground.

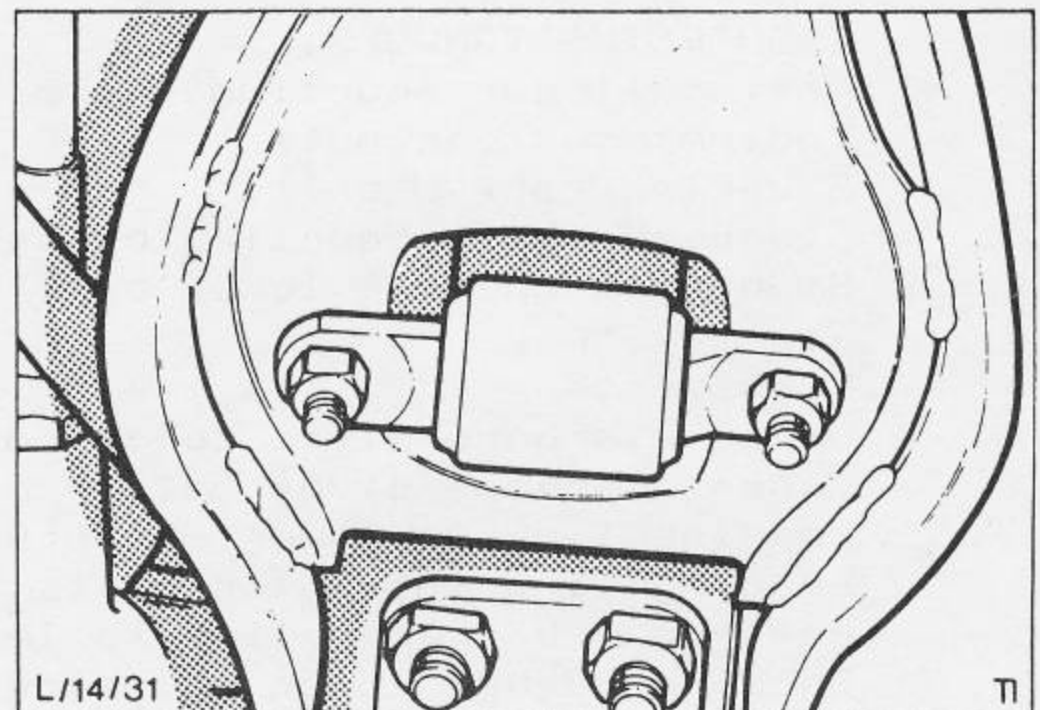


Fig.60 Shock absorber lower mount.



FRONT SUSPENSION – 280i & 350i

TECHNICAL DATA.

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FRONT SUSPENSION.

Suspension type ----- Independant short & long arm
Shock absorbers ----- Telescopic hydraulic double acting
Lateral control ----- Lower wishbone
Longitudinal control ----- Leading link
Wheel alignment (unladen)
Castor ----- $3.5^{\circ} \pm 0.5^{\circ}$
Camber (not adjustable) ----- $0^{\circ} \pm 1/2^{\circ}$
Kingpin angle ----- 6.0°
Toe in ----- $1/8"$ (3.2 mm = - 1.5 mm)

WHEEL BEARINGS.

Torque ----- Tighten to 27 Ft. Lbs while rotating hub in anticlockwise direction. Slacken nut back until end float of 0.001 - 0.003 is obtained.

TIGHTENING TORQUES.

	Nm.	Ft. Lbs.
Anti-roll bar mounting clamp bolts.	17 - 24	13 - 18
Engine mounting nuts	41 - 51	30 - 45
Steering rack U bolts	20 - 24	15 - 18
Steering shaft coupling bolts	16.5 - 20.5	12 - 15
Stub axle upper & lower ball joint nuts		
Firstly to	41 - 61	30 - 45
Finally to	58 - 89	43 - 66
Upper wishbone pivot bolt - midladen	70 - 95	52 - 70
Lower wishbone pivot bolt - midladen	70 - 80	52 - 59
Leading link to lower wishbone	58 - 68	43 - 50
Leading link insulator bolts	47 - 54	35 - 40
Anti-roll bar drop link to leading link	16 - 20	12 - 15
Shock absorber lower mounting nuts	16 - 20	12 - 15
Shock absorber top mounting	nut is nipped to shoulder on stem while holding stem with a wrench, then locknut tightened. Spring must be in compressed position during this operation.	
Gearbox mounting rubber to chassis	16 - 20	12 - 15
Gearbox mounting rubber to gearbox	16 - 20	12 - 15