






# Chapter 10

## Suspension and steering systems

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### Degrees of difficulty

<b>Easy</b> , suitable for novice with little experience		<b>Fairly easy</b> , suitable for beginner with some experience		<b>Fairly difficult</b> , suitable for competent DIY mechanic		<b>Difficult</b> , suitable for experienced DIY mechanic		<b>Very difficult</b> , suitable for expert DIY or professional	
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### Specifications

#### Front suspension

Type	Independent, by unequal length upper and lower suspension arms, with coil springs, telescopic shock absorbers and anti-roll bar
Hub bearing endfloat	0.05 mm

#### Rear suspension

Type	Independent, by transverse and training links, with coil springs, telescopic shock absorbers and anti-roll bar. Self-levelling suspension optional on certain models
Hub bearing endfloat	0.10 mm

#### Steering

Type	Power-assisted rack and pinion
Turns lock-to-lock:	
4-cylinder engine models without turbo	3.12
4-cylinder turbo engine models	2.97
V6 engine models	3.36

#### Front and rear wheel alignment

Front wheel toe setting:	
Pre-1992 model year	Parallel $\pm 0^{\circ} 8'$
1992 model year onward	Parallel $\pm 0^{\circ} 15'$
Rear wheel toe setting:	
Pre-1992 model year	$0^{\circ} 10' \pm 0^{\circ} 4'$ toe-in
1992 model year onward	$0^{\circ} 22' \pm 0^{\circ} 15'$ toe-in

#### Roadwheels

Type	Pressed steel or light alloy
Wheel size:	
4-cylinder engine models	6J x 14, 6J x 15, 6J x 16 or 7J x 17 (3.5J x 15 space saver spare wheel)
V6 engine models	6J x 15 or 6J x 16 (3.5J x 15 space saver spare wheel)

## 10•2 Suspension and steering systems

### Tyres

Tyre size:

4-cylinder engine models	195/70 VR 14, 195/65 VR 15, 205/55 VR 16 or 215/45 ZR 17 (115/70 R 15 space saver)
V6 engine models	195/65 VR 15, 205/60 VR 15 or 205/55 VR 16 (115/70 R 15 space saver)

Tyre pressures . . . . . See Chapter 1 Specifications

### Torque wrench settings

	Nm	lbf ft
<b>Front suspension</b>		
Anti-roll bar connecting link bolts	50	37
Anti-roll bar mounting bracket bolts	22	16
Driveshaft retaining nut	415	306
Upper suspension arm balljoint nut	50	37
Strut forked member to lower arm	90	66
Strut forked member clamp bolt	60	44
Shock absorber top mounting nuts	25	18
Shock absorber spindle nut	50	37
Upper suspension arm mounting nuts	80	59
Upper suspension arm pivot bolt	90	66
Lower suspension arm inner mounting bolt	50	37
Tie-bar front mounting nut	90	66
Tie-bar to lower suspension arm bolts	170	125
Longitudinal support member bolts	45	33
<b>Rear suspension</b>		
Anti-roll bar connecting link nuts	45	33
Anti-roll bar mounting bracket bolts	22	16
Hub carrier to trailing link bolt	70	52
Hub carrier to transverse link bolt	70	52
Shock absorber to hub carrier clamp bolt	70	52
Shock absorber upper mounting nuts	25	18
Shock absorber spindle nut	52	38
Hub flange retaining nut	245	181
Transverse link inner mounting bolt	50	37
Trailing link front mounting nut	45	33
Trailing link adjustment plate retaining bolt	70	52
Trailing link adjustment plate eccentric bolt	70	52
<b>Steering</b>		
Steering wheel nut	50	37
Air bag module to steering wheel bolts	8	6
Steering column upper mounting nuts	14	10
Steering column lower mounting bolts	22	16
Column universal joint clamp bolts	22	16
Steering track rod balljoint nut	44	32
Steering track rod locknut	45	33
Steering rack hydraulic unions	20	15
Steering gear mounting bolts	45	33
Steering gear lower cover plate bolts (V6 engine)	10	7
Steering knuckle balljoint nut	100	74
Power steering pump retaining bolts:		
4-cylinder engine - rear-mounted pump	25	18
4-cylinder engine - front-mounted pump:		
Early version (4 mounting bolts)	10	7
Later version (5 mounting bolts)	25	18
V6 engine:		
Mounting bolt	39	29
Adjusting nut	22	16
Power steering pump pulley nut/bolt:		
4-cylinder engine - rear-mounted pump	82	61
4-cylinder engine - front-mounted pump	25	18
V6 engine	33	24
Power steering pump drivebelt tensioner wheel retaining nut (4-cylinder engine - rear mounted pump)		
	45	33
Power steering pump high pressure pipe connector bolts (V6 engine)		
	11	8
<b>Roadwheels</b>		
Roadwheel nuts	110	81

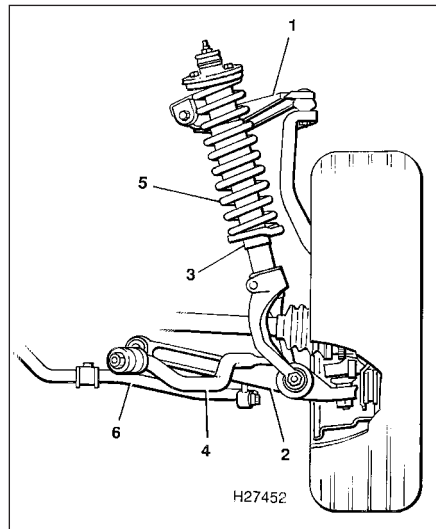
## 1 General information

The independent front suspension is by unequal length upper and lower suspension arms, and utilizes coil springs and telescopic shock absorbers (see illustration). Each spring and shock absorber assembly is attached to the body turret at its upper end by a rubber-cushioned mounting, and to the lower suspension arm by a forged, forked-shaped member. Fore and aft location of each suspension assembly is by a tie-bar, and an anti-roll bar is used to minimise body roll. The front steering knuckles, which carry the hub bearings, brake calipers and the hub/disc assemblies, pivot on balljoints - one incorporated in the upper suspension arm, and one secured to the lower part of the steering knuckle itself.

The independent rear suspension is by transverse and trailing links with coil springs, telescopic shock absorbers, and an anti-roll bar (see illustration). The shock absorbers are attached to the body at their upper ends by rubber-cushioned mountings, and clamped to the hub carriers at their lower ends. Lateral location of each suspension assembly is provided by the transverse link, which also provides the lower location of the coil spring. Fore and aft location of each suspension assembly is controlled by the trailing link, which is attached to the hub carrier by means of a bracket incorporating an eccentric mounting bolt for rear wheel toe adjustment.

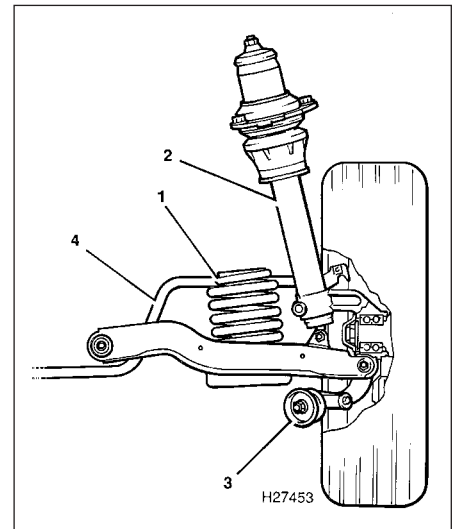
Self-levelling rear suspension, which reacts to vehicle loading and automatically maintains the normal trim heights, is available on certain models. The self-levelling units are sealed dampers fitted in place of the normal rear shock absorbers. A pump in the damper operates under the action of the suspension to raise the rear of the car until normal trim height is regained. On an undulating road, this process will be carried out within one mile. When the additional load is removed, the suspension remains at the correct level.

Power-assisted rack and pinion steering gear is standard equipment on all models. Movement of the steering wheel is transmitted to the steering gear by a steering column shaft containing two universal joints (see illustration). These allow for provision of a rake-adjustable column assembly, and also allow the necessary upward deflection of the column, for driver safety, in the event of front end impact. The front wheels are connected to the steering gear by track rods, each having an inner and outer balljoint. On early 4-cylinder engine models, hydraulic fluid pressure for the power assistance is provided by a pump, mounted on the left-hand end of the engine and belt-driven from a pulley on the inlet camshaft. On later 4-cylinder, and all V6 engine models, the pump is mounted at the timing belt end of the engine and is belt-driven from the crankshaft pulley.



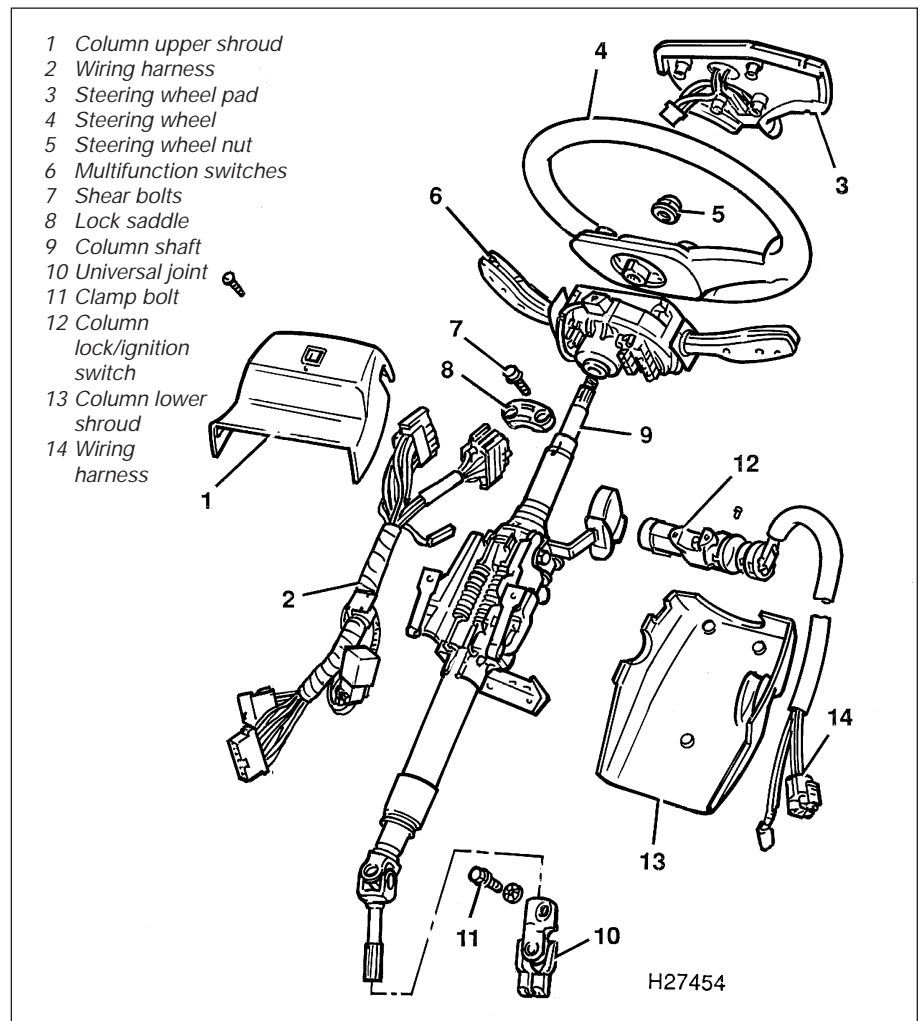
1.1 Front suspension assembly

- |                        |                 |
|------------------------|-----------------|
| 1 Upper suspension arm | 4 Tie-bar       |
| 2 Lower suspension arm | 5 Coil spring   |
| 3 Shock absorber       | 6 Anti-roll bar |



1.2 Rear suspension assembly

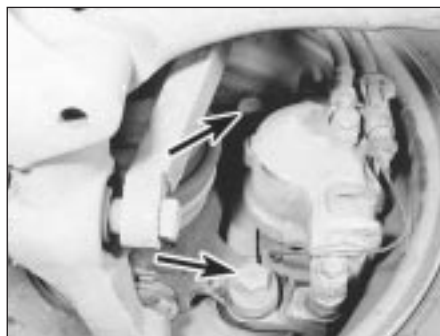
- |                  |                 |
|------------------|-----------------|
| 1 Coil spring    | 3 Trailing link |
| 2 Shock absorber | 4 Anti-roll bar |



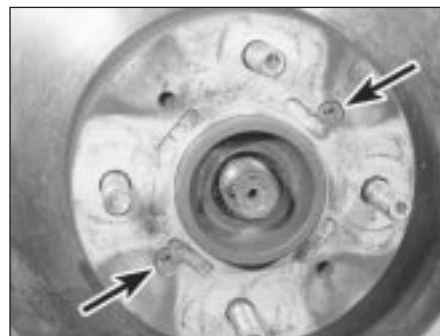
1.4 Exploded view of the steering column components



2.2 Knock up the staking (arrowed) securing the driveshaft retaining nut



2.6 Brake caliper carrier bracket securing bolts (arrowed)



2.8 Brake disc retaining screws (arrowed)

## 2 Front steering knuckle assembly - removal and refitting



**Note:** A new driveshaft retaining nut will be required for refitting.

### Removal

1 While the car is standing on its wheels, firmly apply the handbrake and put the transmission in gear (PARK on automatic models).

2 Remove the wheel trim, and using a small punch, knock up the staking that secures the driveshaft retaining nut to the groove in the constant velocity joint stub shaft (see



2.10 Extract the track rod balljoint nut split pin (arrowed)



2.11 Using a two-legged puller to release the steering knuckle balljoint

illustration). Note that a new retaining nut will be needed for reassembly.

3 Using a socket, sturdy T-bar and long extension tube for leverage, slacken the retaining nut half a turn. Note that the retaining nut is tightened to a very high torque setting, and considerable effort will be required to slacken it.

4 Slacken the wheel nuts, jack up the front of the car and support it on stands. Remove the roadwheel and put the transmission in neutral.

5 Remove the driveshaft retaining nut.

6 Undo the two bolts securing the brake caliper carrier bracket to the steering knuckle, and the two bolts securing the brake hose bracket to the knuckle (see illustration).

7 Withdraw the caliper and carrier bracket assembly, complete with brake pads, off the disc, and tie it up using string or wire from a convenient place under the wheelarch. Take care to avoid straining the brake hose.

8 Undo the two retaining screws and remove the disc from the hub flange (see illustration).

9 On cars with ABS brakes, remove the front wheel speed sensor and wiring harness from the steering knuckle, as described in Chapter 9.

10 Extract the split pin and unscrew the nut securing the steering track rod balljoint to the steering knuckle arm (see illustration). Release the balljoint from the arm using a universal balljoint separator tool.

11 Undo the nut securing the steering knuckle balljoint to the lower suspension arm.



2.12 Undo the upper suspension arm balljoint nut (arrowed)

Release the balljoint from the arm using a separator tool or two-legged puller (see illustration).

12 Undo the nut securing the upper suspension arm balljoint to the steering knuckle, and release the balljoint using the same procedure as for the lower balljoint (see illustration).

13 Disengage the balljoint shanks, then withdraw the steering knuckle from the driveshaft (see illustration). If necessary, tap the end of the driveshaft with a copper or plastic mallet to release it from the hub splines. Remove the steering knuckle assembly from the car.

### Refitting

14 Refitting the steering knuckle is a reversal of removal, bearing in mind the following points:

- Tighten all retaining nuts and bolts to the specified torque and use a new split pin to secure the steering track rod balljoint nut.
- Use a new driveshaft retaining nut but do not attempt to tighten this nut fully until the weight of the car is on the roadwheels (see illustration). Peen the nut into the driveshaft groove using a small punch after tightening. If a torque wrench capable of recording the high figure required for tightening is not available, it is recommended that the old nut is fitted, tightened as securely as possible, then



2.13 Withdrawing the steering knuckle from the driveshaft



**2.14** Tighten the new driveshaft retaining nut fully only when the weight of the car is on the roadwheels

*peened into place. Take the car directly to a suitably-equipped garage, and have them fit and tighten the new nut for you.*

(c) On cars equipped with ABS brakes, refit the wheel speed sensor as described in Chapter 9.

### 3 Front hub bearing - renewal



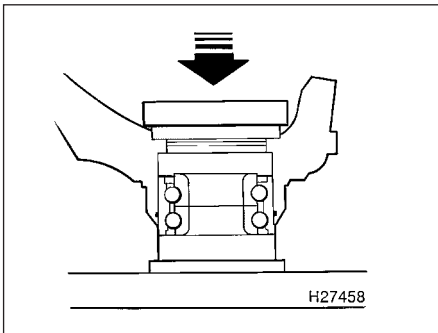
1 Remove the steering knuckle from the car as described in the previous Section.

2 Support the steering knuckle on blocks with the hub flange facing downwards. Using a hammer and socket, or tube, in contact with the inner edge of the hub flange, drive the flange out of the hub bearing (see illustration). Alternatively, if a press is available, support the steering knuckle on the press bed and press the hub flange out (see illustration).

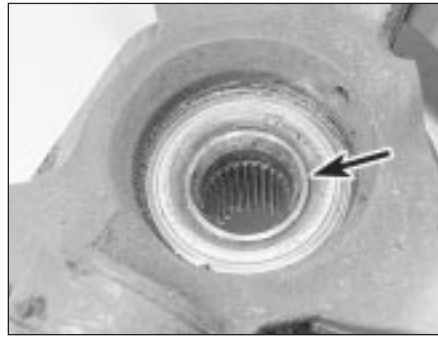
3 As the hub flange is withdrawn, one of the bearing inner races will come away with it, and must now be removed. To do this, engage the legs of a two-legged puller under the inner race and draw it off. It may be easier to do this if a horseshoe-shaped strip of metal is placed under the inner race, to give the puller legs greater purchase (see illustration).

4 With the hub flange removed, undo the four screws and remove the disc shield.

5 Using circlip pliers, extract the bearing retaining circlip from the steering knuckle.



**3.7** Fitting the new hub bearing to the steering knuckle



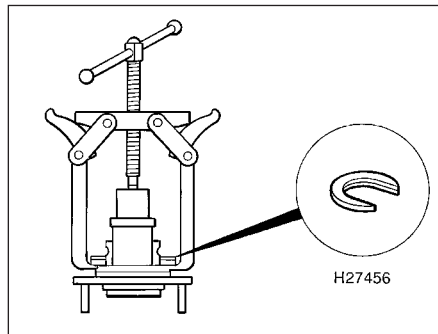
**3.2a** Remove the hub flange using a socket or tube in contact with its outer edge (arrowed) . . .

6 Support the steering knuckle face-down on blocks, or on the press bed as before, and with the tube or mandrel in contact with the edge of the outer bearing, drive or press the bearing out (see illustration).

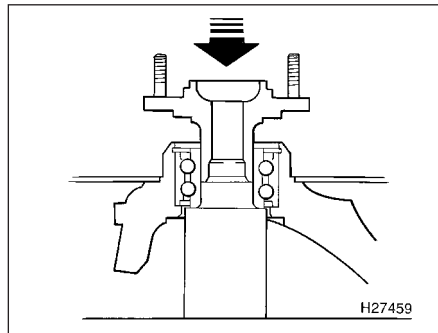
7 Fit the new bearing in the same way, ensuring that it is pressed fully home to the shoulder in the steering knuckle (see illustration). Keep the bearing square as it is fitted, otherwise it will jam and continued pressure could cause the outer race to crack. If the bearing does jam, tap or press it out, remove any burrs in the bore of the steering knuckle and try again.

8 Secure the bearing with the circlip, then refit the disc shield.

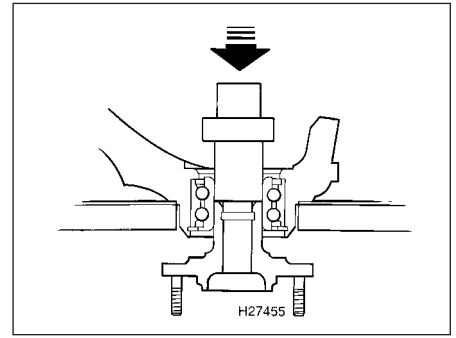
9 Support the bearing inner race on a socket



**3.3** Using a puller and horseshoe-shaped strip of metal to draw off the bearing inner race from the hub flange



**3.9** Fitting the hub flange to the new bearing



**3.2b** . . . or preferably support the steering knuckle on a press bed and press the hub flange out using a mandrel

or tube, and drive or press the hub flange into place (see illustration).

10 The steering knuckle can now be refitted to the car as described in the previous Section.

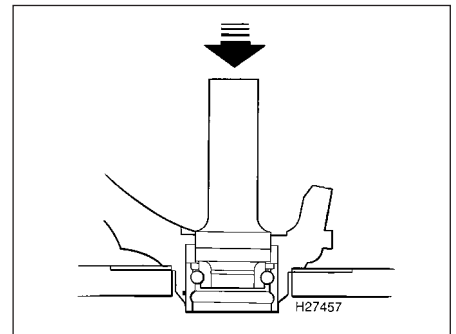
### 4 Steering knuckle balljoint - removal and refitting



#### Removal

1 Remove the steering knuckle from the car as described in Section 2.

2 Extract the balljoint retaining circlip and remove the dust cover (see illustration).

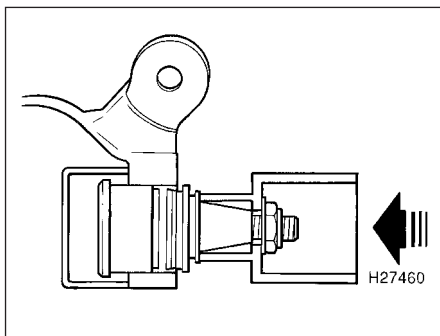


**3.6** Removing the hub bearing from the steering knuckle



**4.2** Balljoint retaining circlip (arrowed)



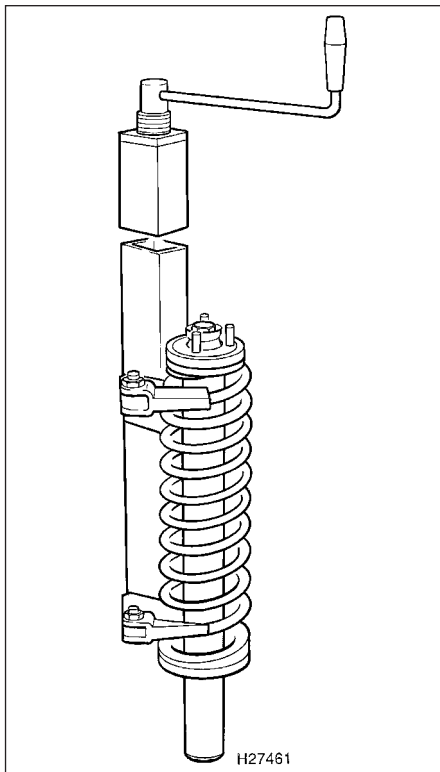


4.3 Rover special tool for steering knuckle balljoint removal

3 Support the steering knuckle in a wide-opening vice or on a press bed, and using tubes as mandrels and distance pieces, press the balljoint out of the knuckle. The manufacturer's special tools being used for this purpose are shown, to give an idea of the arrangement, but lengths of tubular steel work equally well (see illustration).

### Refitting

- 4 Using the same basic procedure as for removal, fit the new balljoint until its shoulder contacts the steering knuckle flange.
- 5 Fit the new dust cover and secure the assembly with the circlip.
- 6 Refit the steering knuckle to the car as described in Section 2.



6.2 Coil spring and shock absorber assembly, showing spring compressor tool in position



5.5 Removing the front suspension forked member

## 5 Front shock absorber and coil spring assembly - removal and refitting

### Removal

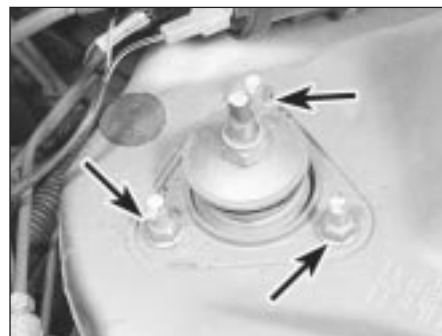
- 1 Apply the handbrake, prise off the front wheel trim and slacken the wheel nuts. Jack up the front of the car and support it on axle stands. Remove the front roadwheel.
- 2 Place a jack beneath the lower suspension arm and raise the arm slightly.
- 3 Undo the nut and remove the through-bolt securing the forked member to the lower suspension arm.
- 4 Undo the nut and remove the clamp bolt securing the forked member to the shock absorber.
- 5 Slowly lower the jack, and remove the forked member from the shock absorber and lower suspension arm (see illustration). It may be necessary to tap the member down using a copper or plastic mallet to release it from the shock absorber.
- 6 Have an assistant hold the assembly, from below, then undo the three nuts securing the shock absorber top mounting to the body turret in the engine compartment (see illustration).
- 7 Remove the shock absorber and spring assembly from under the wheelarch.

### Refitting

- 8 Refitting is a reversal of removal. Tighten all nuts and bolts to the specified torque, but do



6.3 Remove the retaining nut (arrowed) from the shock absorber spindle



5.6 Shock absorber top mounting retaining nuts (arrowed)

not fully tighten the forked member-to-lower arm bolt and nut until the weight of the car is on the roadwheels.

## 6 Front shock absorber and coil spring assembly - dismantling and reassembly

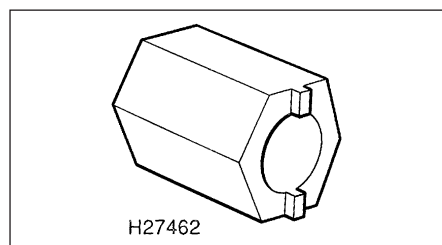


**Warning:** Before attempting to dismantle the shock absorber and coil spring assembly, a tool to hold the spring in

compression must be obtained. Adjustable coil spring compressors are readily available, and are recommended for this operation. Any attempt at dismantling without such a tool is likely to result in damage or personal injury.

### Dismantling

- 1 Remove the shock absorber and coil spring assembly as described in the previous Section.
- 2 Position the spring compressors on either side of the spring, and compress the spring evenly until there is no tension on the spring seat or upper mounting (see illustration).
- 3 Hold the unthreaded end of the shock absorber spindle with a self-locking wrench or similar tool, and unscrew the upper mounting retaining nut (see illustration).
- 4 Withdraw the washer under the nut, followed by the upper bush, the upper mounting plate and the spring seat.
- 5 To remove the threaded collar on the shock absorber spindle, it will be necessary to make up a tool which will engage in the slots on the collar, enabling it to be unscrewed. A tool can



6.5 Shock absorber threaded collar home-made removal tool

be made out of a large nut, with one end suitably shaped by cutting or filing so that two projections are left, which will engage with the collar slots (see illustration).

6 Engage the home-made tool with the threaded collar slots, then screw two 10 mm nuts onto the threaded end of the spindle, and lock them together. Hold these locknuts to prevent the spindle turning, and unscrew the threaded collar.

7 Remove the locknuts, home-made tool and collar, then withdraw the lower bush and washer.

8 Lift off the spring, then remove the bump-stop and shock absorber dust cover.

9 Examine the shock absorber for signs of fluid leakage. Check the spindle for signs of wear or pitting along its entire length, and check the shock absorber body for signs of damage or corrosion. Test the operation of the shock absorber, while holding it in an upright position, by moving the spindle through a full stroke, and then through short strokes of 50 to 100 mm. In both cases, the resistance felt should be smooth and continuous. If the resistance is jerky or uneven, or if there is any visible sign of wear, damage or fluid leakage, renewal is necessary.

10 If any doubt exists about the condition of the coil spring, remove the spring compressors and check the spring for distortion or damage. The spring free length can only be assessed by comparing it with a new item, and this should be done if the

spring is suspect. Renew the spring if necessary, ideally in pairs (both sides).

11 Check the condition of the spring seat and upper mounting components, and renew any parts which are suspect.

### Reassembly

12 Begin reassembly by refitting the shock absorber dust cover and bump-stop.

13 Refit the spring compressors, if previously removed, and place the spring in position on the shock absorber.

14 Refit the washer, lower bush and threaded collar. Tighten the collar using the same procedure as for removal.

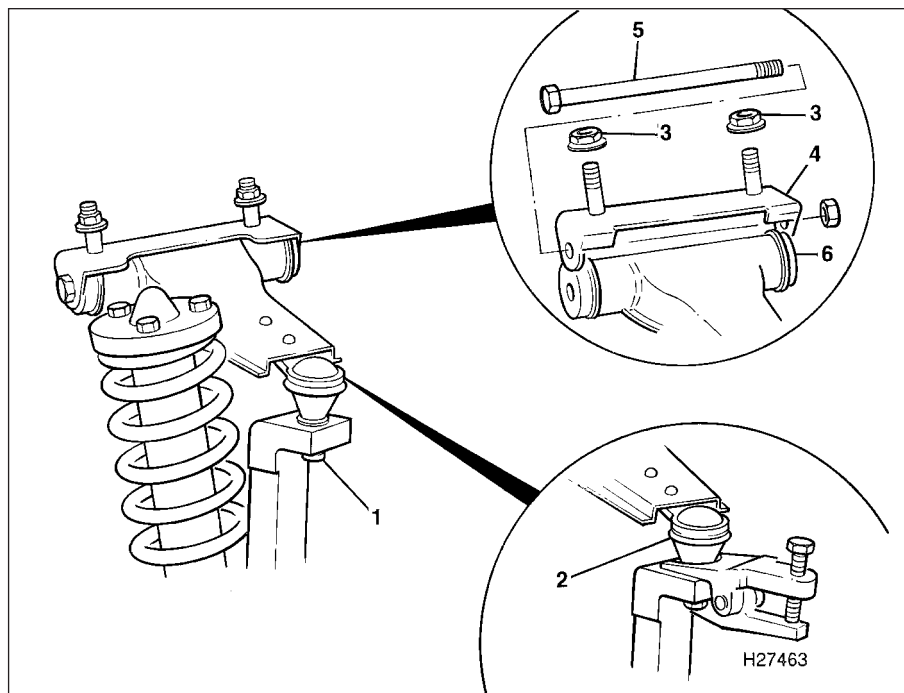
15 Refit the spring seat, upper mounting plate, upper bush and washer. Secure the upper mounting assembly with the retaining nut, tightened to the specified torque.

16 Remove the spring compressors, and refit the spring and shock absorber to the car as described in Section 5.

## 7 Front upper suspension arm - removal and refitting



**Note:** The upper suspension arm incorporates the steering knuckle upper support balljoint as a riveted integral assembly. If wear of the balljoint necessitates renewal, a complete upper suspension arm must be obtained.



7.2a Upper suspension arm attachment details

- 1 Balljoint-to-steering knuckle retaining nut
- 2 Releasing the balljoint with a separator tool
- 3 Mounting bracket retaining nuts

- 4 Mounting bracket
- 5 Pivot bolt
- 6 Upper suspension arm

### Removal

1 Apply the handbrake, prise off the front wheel trim and slacken the wheel nuts. Jack up the front of the car and support it on axle stands. Remove the front roadwheel.

2 Undo the nut securing the upper suspension arm balljoint to the steering knuckle (see illustrations). Release the balljoint using a separator tool or two-legged puller.

3 From within the engine compartment, undo the two nuts securing the suspension arm mounting bracket to the inner wing valance. For access to the rearmost nut, it may be necessary to move the wiring harness connectors aside, or if working on the left-hand suspension arm, to undo the bolts and move the wiper motor bracket slightly.

4 Withdraw the upper suspension arm assembly from under the wheelarch.

5 With the arm on the bench, undo the nut and withdraw the pivot bolt then remove the arm from its mounting bracket.

6 Check the condition of the balljoint dust cover, and check the balljoint for excess free play. Also check the condition of the pivot bushes and the arm itself. The bushes can be renewed by drifting them out then pressing in new ones. If the balljoint, balljoint dust cover or the suspension arm show signs of damage or wear, a complete new assembly must be obtained. Examine the pivot bolt for signs of wear ridges, and check the mounting bracket for elongation of the pivot bolt holes. Renew any components as necessary.

### Refitting

7 Refitting is a reversal of removal, but tighten all nuts and bolts to the specified torque.

## 8 Front lower suspension arm - removal and refitting



### Removal

1 Apply the handbrake, prise off the front wheel trim and slacken the wheel nuts. Jack up the front of the car and support it on axle stands. Remove the front roadwheel.



7.2b Undo the nut securing the upper arm balljoint to the steering knuckle (arrowed)



**8.2 Undo the nut securing the steering knuckle balljoint to the lower suspension arm**

2 Undo the nut securing the steering knuckle balljoint to the lower suspension arm (see illustration). Release the balljoint using a separator tool or two-legged puller.

3 Undo the nut and remove the through-bolt securing the shock absorber forked member to the arm.

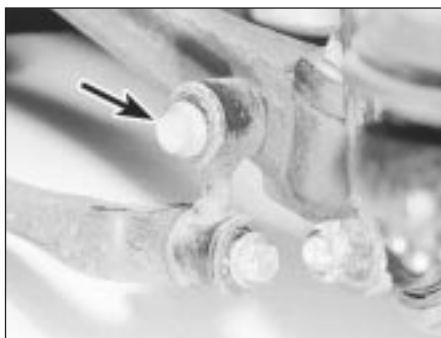
4 Undo the bolt securing the anti-roll bar connecting link to the arm.

5 Undo the two bolts securing the tie-bar to the arm.

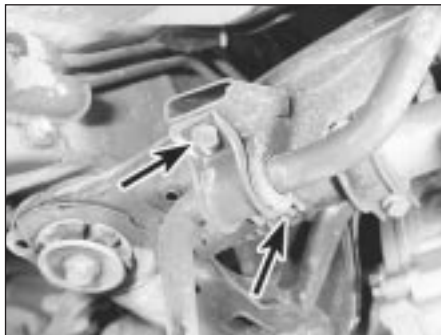
6 Undo the nut and remove the suspension arm inner mounting bolt (see illustration).

7 Withdraw the suspension arm from its inner mounting location, and remove it from under the wheelarch.

8 Check the condition of the two suspension arm bushes, and renew these if worn or damaged. To do this, a press will be required,



**9.2 Anti-roll bar connecting link bolt (arrowed)**



**9.3 Anti-roll bar mounting bracket bolts (arrowed)**



**8.6 Lower suspension arm inner mounting bolt (arrowed)**

together with mandrels and distance tubes. If this equipment is not available, have this work done by a Rover dealer or suitably-equipped garage.

### Refitting

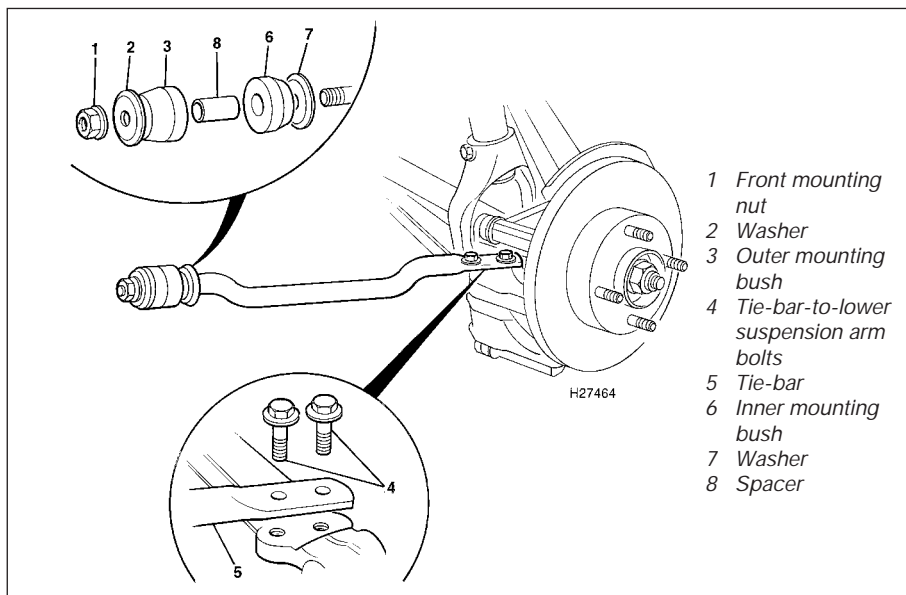
9 Refitting is a reversal of removal, but tighten all nuts and bolts to the specified torque. Do not fully tighten the inner mounting bolt or the forked member retaining bolt until the weight of the car is on its roadwheels.

## 9 Front anti-roll bar - removal and refitting

### Removal

1 Apply the handbrake, prise off the front wheel trims and slacken the wheel nuts. Jack up the front of the car and support it on axle stands. Remove the front roadwheels.

2 Undo the single bolt each side securing the anti-roll bar connecting links to the lower suspension arms (see illustration).



**10.3 Front tie-bar attachment details**

3 Undo the two bolts each side securing the anti-roll bar mounting brackets to the chassis members, and remove the bar from under the car (see illustration).

4 If required, the connecting links can be removed after undoing the retaining nut and bolt on each side.

5 Check the condition of the connecting link bushes and the anti-roll bar mounting bushes, and renew any that show signs of deterioration. The connecting link bushes come complete with new connecting links, and the mounting bushes are slit along their length to allow removal and refitting over the bar.

### Refitting

6 Refitting is a reversal of removal. Tighten the mounting and connecting link bushes to the specified torque only with the weight of the car on its roadwheels.

## 10 Front tie-bar - removal and refitting

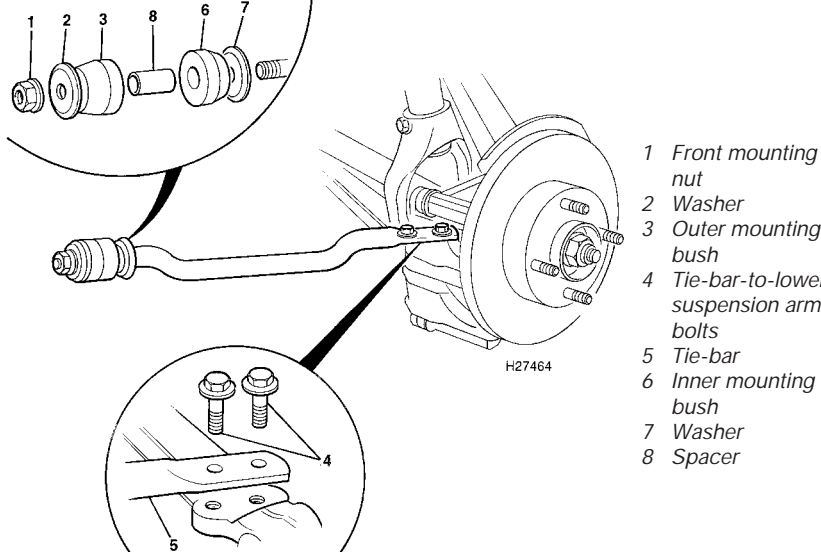
**Note:** On some models, it may be found that the tie-bar-to-lower suspension arm bolts cannot be withdrawn because of the proximity of the driveshaft. In this case, it will be necessary to release the lower suspension arm balljoint and disconnect the arm from the shock absorber, as described in Section 8.

### Removal

1 Apply the handbrake, prise off the front wheel trim and slacken the wheel nuts. Jack up the front of the car and support it on axle stands. Remove the front roadwheel.

2 Undo the five bolts and remove the undertray for access to the tie-bar front mounting.

3 Undo the front mounting nut and remove the tie-bar washer and outer mounting bush (see illustration).





4 Undo the two bolts securing the tie-bar to the lower suspension arm, and remove the bar from under the car.

5 Withdraw the spacer, inner mounting bush and washer.

6 Renew the mounting bushes if they show any sign of deformation or swelling of the rubber.

### Refitting

7 Fit the washer, inner bush and spacer, then locate the tie-bar in position.

8 Secure the tie-bar to the lower suspension arm, with the two bolts tightened to the specified torque.

9 Fit the outer bush and washer, followed by the retaining nut, but do not tighten the nut fully until the weight of the car is on its roadwheels.

10 Refit the roadwheel, then lower the car to the ground.

11 Tighten the roadwheel nuts and the tie-bar front mounting nut to the specified torque then refit the wheel trim.

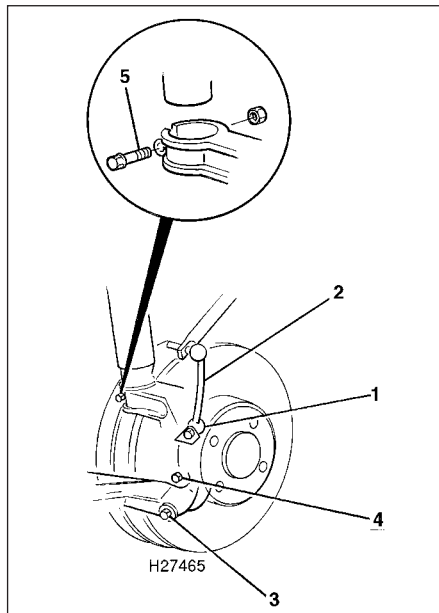
12 Refit the undertray.

## 11 Rear hub carrier - removal and refitting



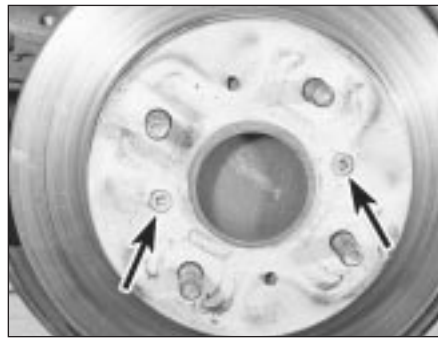
### Removal

1 Chock the front wheels, prise off the rear wheel trim and slacken the wheel nuts. Jack up the rear of the car and support it on axle stands. Remove the rear roadwheel and release the handbrake.



11.7 Rear hub carrier attachment details

- 1 Anti-roll bar connecting link nut
- 2 Anti-roll bar connecting link
- 3 Hub carrier-to-trailing link through bolt
- 4 Hub carrier-to-transverse link retaining bolt
- 5 Shock absorber clamp bolt



11.6a Undo the two screws (arrowed) . . .



11.6b . . . and remove the brake disc

2 Refer to Chapter 9 if necessary, and undo the two bolts securing the brake caliper carrier bracket to the hub carrier.

3 Undo the retaining bolt and release the flexible brake hose support bracket from the shock absorber strut.

4 Withdraw the carrier bracket, complete with caliper and brake pads, from the disc and hub carrier. Tie the caliper assembly from a convenient place under the wheelarch to avoid straining the brake hose.

5 On cars equipped with ABS, withdraw the rear wheel speed sensor and wiring harness from the hub carrier, as described in Chapter 9.

6 Undo the two screws and remove the brake disc from the hub flange (see illustrations).

7 Undo the nut and release the anti-roll bar connecting link from the suspension lower transverse link (see illustration).

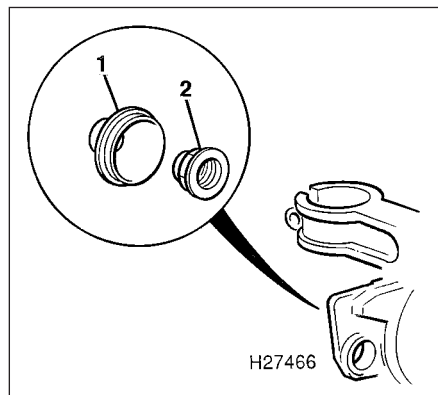
8 Place a jack beneath the transverse link, and raise the link slightly.

9 Undo the nut and remove the through-bolt and washers securing the hub carrier to the trailing link.

10 Undo the nut and remove the bolt securing the hub carrier to the transverse link.

11 Undo the nut and clamp bolt securing the shock absorber strut to the hub carrier.

12 Lower the jack slightly, and release the hub carrier from the shock absorber strut. If the strut is tight, spread the slot in the hub carrier with a screwdriver, and tap the carrier down with a copper or plastic mallet.



12.2 Cover (1) and hub flange retaining nut (2) at the rear of the hub carrier

13 Withdraw the hub carrier from the transverse and trailing links, and remove it from the car.

### Refitting

14 Refitting is a reversal of removal. Tighten all nuts and bolts to the specified torque, but do not fully tighten the transverse and trailing link retaining nuts until the weight of the car is on the roadwheels.

## 12 Rear hub bearing - renewal



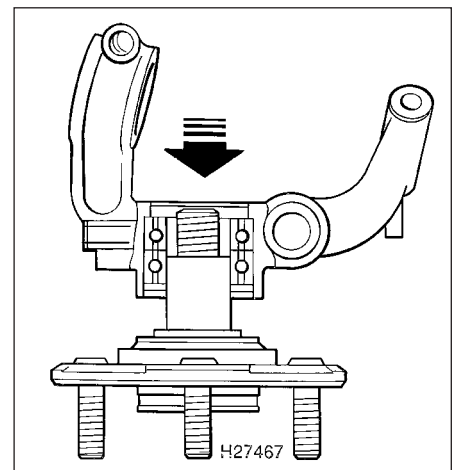
**Note:** A new hub flange retaining nut will be required for reassembly.

1 Remove the rear hub from the car as described in the previous Section.

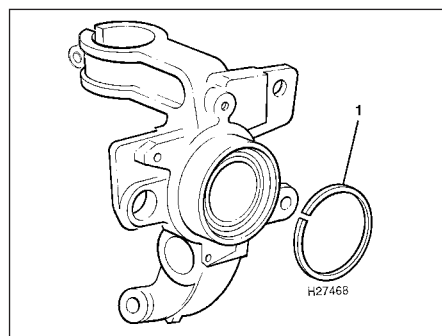
2 Prise off the cover over the hub flange retaining nut at the rear of the hub carrier, then secure the hub flange in a vice (see illustration).

3 Using a small punch or screwdriver, tap up the staking, then unscrew the hub flange retaining nut.

4 Support the hub carrier in a vice, and tap the hub flange out of the bearing (see illustration).



12.4 Removing the hub flange from the bearing



**12.6a** Extract the rear hub bearing retaining circlip (1) . . .

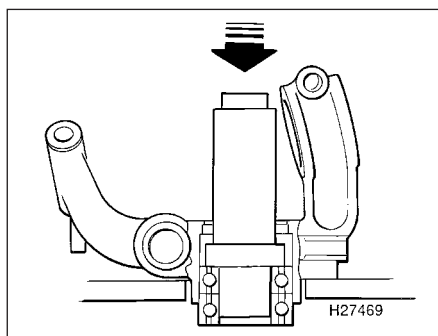
5 Undo the four screws and remove the disc shield.

6 Extract the bearing retaining circlip, then support the hub carrier face-down on blocks or on a press bed. Using a tube or mandrel in contact with the edge of the outer bearing, drive or press the bearing out (see illustrations).

7 Fit the new bearing in the same way, ensuring that it is pressed fully home to the shoulder in the hub carrier. Keep the bearing square as it is fitted, otherwise it will jam, and continued pressure could cause the outer race to crack. If the bearing does jam, tap or press it out, remove any burrs in the bore of the carrier and try again.

8 Secure the bearing with the circlip, then refit the disc shield.

9 Tap the hub flange into the bearing and fit a



**12.6b** . . . then remove the bearing from the hub using a mandrel

new retaining nut. Tighten the nut to the specified torque, and secure by staking the nut flange into the groove in the hub. Tap on the nut cover.

10 Refit the hub carrier to the car as described in the previous Section.

### 13 Rear shock absorber - removal and refitting



**Note:** The following procedures are applicable equally to cars with standard suspension or self-levelling damper units.

#### Removal

1 Chock the front wheels, prise off the rear wheel trim and slacken the wheel nuts. Jack

up the rear of the car and support it on axle stands. Remove the rear roadwheel.

2 Undo the retaining bolt and release the flexible brake hose support bracket from the shock absorber strut.

3 Undo the nut and release the anti-roll bar connecting link from the suspension lower transverse link (see illustration).

4 Place a jack below the transverse link, and raise the link slightly.

5 Undo the nut and remove the through-bolt and washers securing the hub carrier to the trailing link.

6 Undo the nut and remove the bolt securing the hub carrier to the transverse link.

7 Undo the nut and clamp bolt securing the shock absorber strut to the hub carrier.

8 Lower the jack slightly, and release the hub carrier from the shock absorber strut. If the strut is tight, spread the slot in the hub carrier with a screwdriver, and tap the carrier down with a copper or plastic mallet.

9 From inside the luggage compartment, remove the trim as necessary to gain access to the shock absorber upper mounting.

10 Undo the three nuts securing the upper mounting to the body, and remove the shock absorber from under the wheelarch.

11 If the upper mounting is to be removed, undo the shock absorber spindle nut and withdraw the upper mounting, followed by the bump-stop and dust cover.

12 Examine the shock absorber for signs of fluid leakage. Check the spindle for signs of wear or pitting along its entire length, and check the shock absorber body for signs of damage or corrosion. Test the operation of the shock absorber, while holding it in an upright position, by moving the spindle through a full stroke, and then through short strokes of 50 to 100 mm. In both cases, the resistance felt should be smooth and continuous. If the resistance is jerky or uneven, or if there is any visible sign of wear, damage or fluid leakage, renewal is necessary. Also check the condition of the upper mounting, bump-stop and dust cover, and renew any components as necessary.

#### Refitting

13 Refitting is a reversal of removal. Tighten all nuts and bolts to the specified torque, but do not fully tighten the transverse and trailing link retaining nuts until the weight of the car is on the roadwheels.

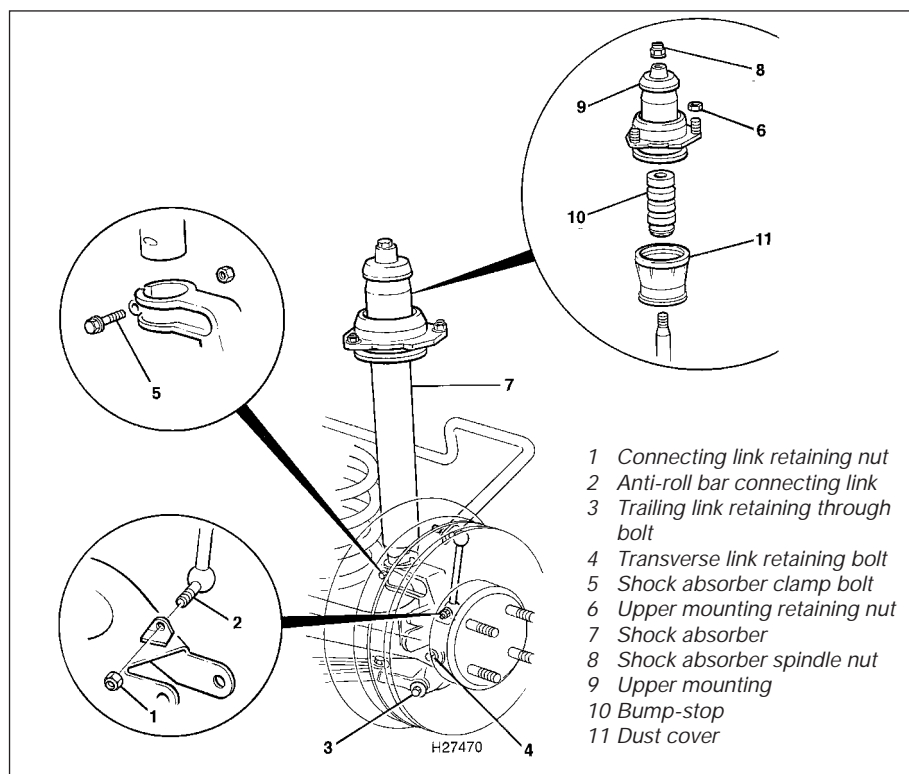
### 14 Rear coil spring - removal and refitting



#### Removal

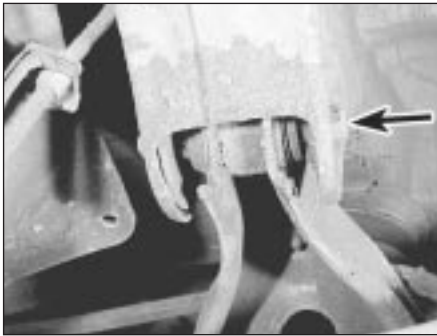
1 Refer to Section 13 and carry out the operations described in paragraphs 1 to 6 inclusive, with the exception of paragraph 2.

2 Ease the hub carrier away from the trailing link, and move the trailing link end clear as much as possible.



**13.3** Rear shock absorber attachment details

- 1 Connecting link retaining nut
- 2 Anti-roll bar connecting link
- 3 Trailing link retaining through bolt
- 4 Transverse link retaining bolt
- 5 Shock absorber clamp bolt
- 6 Upper mounting retaining nut
- 7 Shock absorber
- 8 Shock absorber spindle nut
- 9 Upper mounting
- 10 Bump-stop
- 11 Dust cover



15.2 Transverse link inner mounting bolt (arrowed)

3 Lower the jack slowly and carefully to release the tension on the coil spring.

4 When all the tension is released, withdraw the spring from its location, and recover the upper and lower spring seats. Note the fitted position of the lower seat in the transverse link as it is removed.

5 Examine the spring carefully for signs of distortion or damage. The spring free length can only be assessed by comparing it with a new item, and this should be done if the spring is suspect. Renew the spring if necessary, ideally in pairs (both sides). Also check the condition of the upper and lower spring seats, and renew any components as necessary.

### Refitting

6 Refitting is a reversal of removal, but ensure that the tang on the lower spring seat engages with the slot in the transverse link. Tighten all nuts and bolts to the specified torque, but do not fully tighten the transverse and trailing link retaining nuts until the weight of the car is on the roadwheels.

### 15 Transverse link - removal and refitting



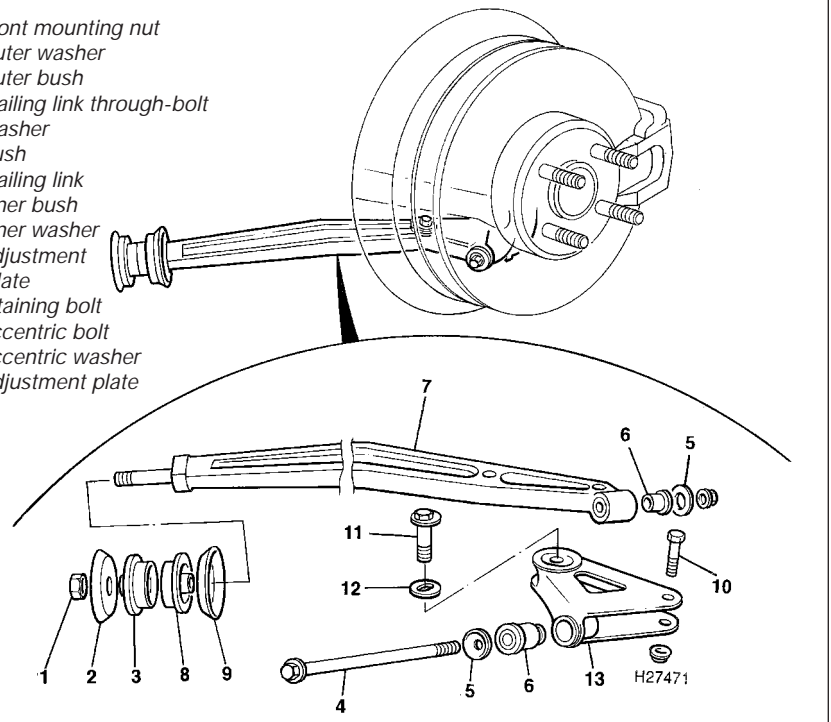
### Removal

1 Remove the rear coil spring as described in the previous Section.  
2 Undo the nut and remove the transverse link inner mounting bolt (see illustration).  
3 Ease the link away from its inner location, and remove it from under the car.  
4 If the transverse link inner mounting bush requires renewal, a hydraulic press and mandrels will be needed to replace the bush. If this equipment is not available, have the work carried out by a Rover dealer or suitably-equipped garage. A similar procedure must be used for renewal of the outer bush, which is located in the hub carrier, after removal of this component from the car (see Section 11).

### Refitting

5 Refitting is a reversal of removal, but do not

- 1 Front mounting nut
- 2 Outer washer
- 3 Outer bush
- 4 Trailing link through-bolt
- 5 Washer
- 6 Bush
- 7 Trailing link
- 8 Inner bush
- 9 Inner washer
- 10 Adjustment plate retaining bolt
- 11 Eccentric bolt
- 12 Eccentric washer
- 13 Adjustment plate



16.2 Trailing link components and attachments

fully tighten the inner mounting nut until the weight of the car is on the roadwheels.

### 16 Trailing link - removal and refitting



### Removal

1 Chock the front wheels, prise off the rear wheel trim and slacken the wheel nuts. Jack up the rear of the car and support it on axle stands. Remove the rear roadwheel.  
2 Undo the trailing link front mounting nut and remove the outer washer and bush (see illustration).  
3 Undo the nut and remove the through-bolt and washers securing the trailing link to the hub carrier.  
4 Ease the link away from the hub carrier, withdraw the front mounting from its location and remove the link from under the car.  
5 Withdraw the front mounting inner bush and washer, and the two rear mounting bushes.  
6 If the adjustment plate is to be removed, first mark the position of the forward eccentric bolt in relation to the plate, so that an approximate rear wheel toe setting can be obtained on reassembly. Undo the nuts, remove the retaining bolt and eccentric bolt, then withdraw the adjustment plate from the trailing link.  
7 Examine all the mounting bushes for

damage, deformation or swelling of the rubber, and check the remaining components for damage or distortion. Renew any parts as necessary.

### Refitting

8 Refit the adjustment plate to the link, and secure with the retaining and adjustment bolts and nuts. Before fully tightening the nuts, set the eccentric adjustment bolt in the position marked before removal.

9 The remainder of the refitting procedure is a reversal of removal. Do not fully tighten the trailing link-to-hub carrier through-bolt until the weight of the car is on the roadwheels.

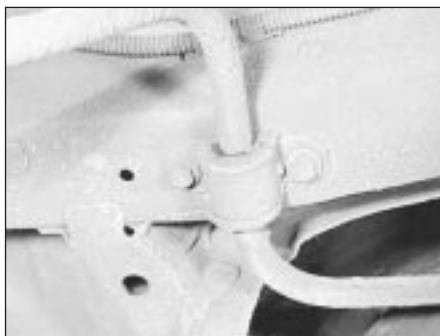
10 On completion, have the rear wheel alignment checked and if necessary adjusted (see Section 28).

### 17 Rear anti-roll bar - removal and refitting



### Removal

1 Apply the handbrake, prise off the rear wheel trims and slacken the wheel nuts. Jack up the rear of the car and support it on axle stands. Remove the rear roadwheels.  
2 Undo the single nut each side securing the anti-roll bar connecting links to the rear suspension transverse links.  
3 Undo the two bolts each side securing the anti-roll bar mounting brackets to the chassis



17.3 Anti-roll bar right-hand side mounting bracket

members, and remove the bar from under the car (see illustration).

4 If required, the connecting links can be removed after undoing the retaining nut on each side.

5 Check the condition of the connecting link bushes and the anti-roll bar mounting bushes, and renew any that show signs of deterioration. The mounting bushes are slit along their length to allow removal and refitting over the bar.

### Refitting

6 Refitting is a reversal of removal. Tighten the mounting and connecting link bushes to the specified torque only with the weight of the car on its roadwheels.

## 18 Steering wheel - removal and refitting



### Models without airbag supplementary restraint system

#### Removal

1 Disconnect the battery negative (earth) lead (refer to Chapter 5, Section 1).

2 Set the front wheels in the straight-ahead position.

3 On early models, carefully prise off the



18.3a Prise off the steering wheel pad . . .

steering wheel pad, disconnect the two horn switch leads and remove the pad (see illustrations).

4 On later models, undo the two screws at the rear of the steering wheel and lift off the steering wheel pad.

5 On models equipped with cruise control, disconnect the cruise control switch multiplug from the rotary coupler wiring harness.

6 With an assistant holding the wheel, undo and remove the centre retaining nut using a socket and bar (see illustration).

7 Mark the steering wheel and column shaft in relation to each other, and withdraw the wheel from the shaft splines.

#### Refitting

8 Before refitting, check that the wheels are still in the straight-ahead position and, where applicable, turn the direction indicator cancelling bush so that the slot is pointing upwards (see illustration).

9 Engage the steering wheel over the shaft splines, ensuring that the previously-made marks are aligned, and make sure that the lug on the wheel boss engages with the slot in the direction indicator cancelling bush (see illustration).

10 On models equipped with cruise control, ensure that the rotary coupler lugs engage with the steering wheel slots.

11 Refit the retaining nut and tighten it to the specified torque while your assistant holds the wheel.



18.3b . . . and disconnect the two horn switch leads

12 Reconnect the horn switch wires (early models) and refit the steering wheel pad.

13 Reconnect the battery.

### Models with airbag supplementary restraint system



**Warning:** Handle the airbag unit with extreme care as a precaution against personal injury, and always hold it with the cover facing away from the body. If in doubt concerning any proposed work involving the airbag unit or its control circuitry, consult a Rover dealer or other qualified specialist.

#### Removal

14 Disconnect the battery negative (earth) lead first, followed by the positive lead (refer to Chapter 5, Section 1).



**Warning:** Before proceeding, wait a minimum of 20 minutes, as a precaution against accidental firing of the airbag unit. This period ensures that any stored energy in the back-up capacitor is dissipated.

15 Release the four turnbuckles and lift off the fusebox cover below the steering column.

16 Disconnect the airbag wiring multiplug from the steering column wiring harness at the base of the column.

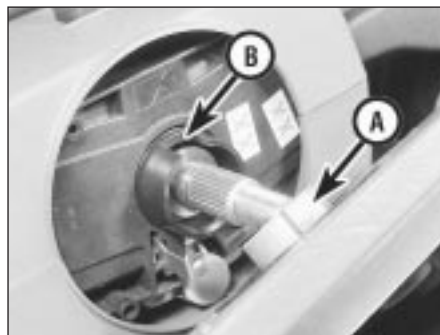
17 Using a Torx type socket bit, unscrew the



18.6 Undo the steering wheel retaining nut

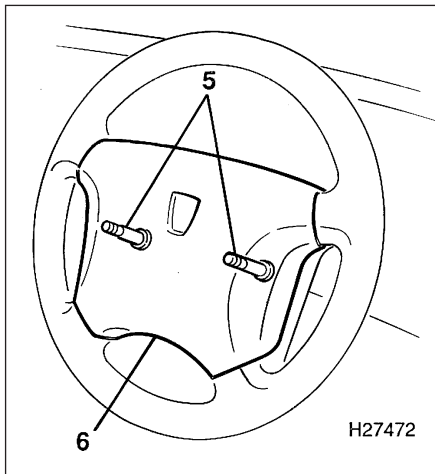


18.8 Position the direction indicator cancelling bush with the slot pointing upwards

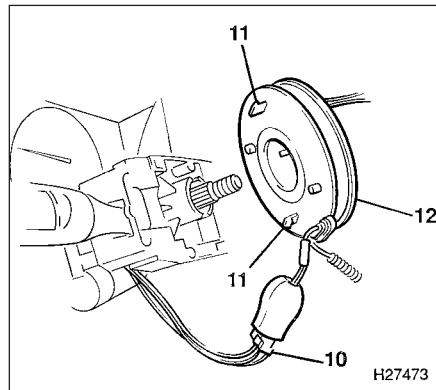


18.9 Ensure that the lug on the steering wheel boss (A) engages the cancelling bush slots (B)



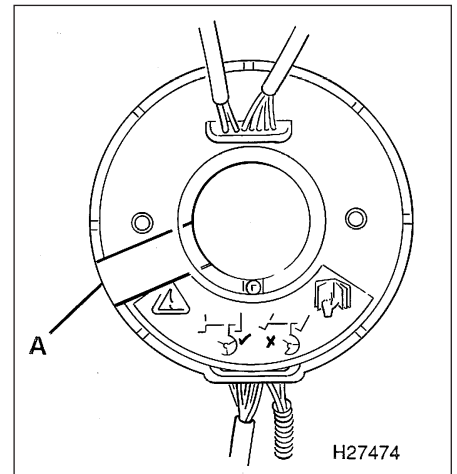


**18.17** Unscrew the two retaining screws (5) securing the airbag (6) to the steering wheel



**19.6** Rotary coupler connections on models with airbag supplementary restraint system and/or cruise control

- 10 Rotary coupler multiplug  
11 Plastic retaining clips  
12 Rotary coupler



**19.7** After removal, secure the two halves of the rotary coupler to prevent rotation, using adhesive tape applied to position (A)

two airbag module retaining screws from the rear of the steering wheel (see illustration).  
**18** Lift the airbag module off the steering wheel, disconnect the multiplug from the rear of the module and remove the module from the vehicle.



**Warning:** Position the airbag unit in a safe place, with the mechanism facing downwards as a precaution against accidental operation.



**Warning:** Do not attempt to open or repair the airbag unit, or apply any electrical current to it. Do not use any airbag which is

visibly damaged or which has been tampered with.

**19** Set the front wheels in the straight-ahead position.

**20** On models equipped with cruise control, disconnect the cruise control switch multiplug from the rotary coupler wiring harness and release the harness from the steering wheel clip.

**21** With an assistant holding the wheel, undo and remove the centre retaining nut using a socket and bar.

**22** Mark the steering wheel and column shaft in relation to each other, and withdraw the wheel from the shaft splines.

**23** On models with cruise control, feed the wiring harness through the hole in the steering wheel as it is withdrawn.

## Refitting

**24** Check that the front wheels are still in the straight-ahead position, then engage the steering wheel over the shaft splines, while at the same time feeding the wiring harness through the hole in the wheel. Ensure that the previously-made marks are aligned, and that the rotary coupler lugs engage with the steering wheel slots.

**25** Refit the retaining nut and tighten it to the

specified torque while your assistant holds the wheel.

**27** Reconnect the cruise control wiring (where applicable).

**28** Reconnect the wiring multiplug to the rear of the airbag module with the harness pointing downward.

**29** Locate the airbag module on the steering wheel and secure with the two retaining screws.

**30** Reconnect the airbag wiring multiplug to the steering column wiring harness and refit the fusebox cover.

**31** Reconnect the battery.

## 19 Rotary coupler - removal and refitting



### Removal

**1** A rotary coupler is fitted between the steering wheel and steering column multifunction switch on vehicles equipped with an airbag supplementary restraint system and/or cruise control.

**2** Remove the steering wheel as described in Section 18.

**3** From inside the car, release the turnbuckles and lift out the trim panels over the clutch, brake and accelerator pedals.

**4** Release the rake lock on the side of the steering column, and move the column to its lowest position.

**5** Undo the single upper screw and the three lower screws, and remove the upper and lower steering column shrouds.

**6** Disconnect the rotary coupler multiplug from the steering column wiring harness (see illustration). On models equipped with an airbag, release the airbag wiring harness connector from the steering column bracket

and remove the harness cable ties from the column.

**7** Ensure that the front roadwheels are in the straight-ahead position then release the two plastic clips and withdraw the coupler from the steering column multifunction switch.

**Note:** The rotary coupler must not be turned whilst it is removed. To prevent rotation of the two coupler halves, place a piece of adhesive tape around the moulding as shown (see illustration). Store the coupler in a plastic bag after removal as an added precaution against rotation or damage.

## Refitting

**8** Refitting is a reversal of removal bearing in mind the following points:

- If a new rotary coupler is being fitted it will be supplied with sealing tape around the moulding to prevent rotation of the coupler halves. Do not use the coupler if the sealing tape is broken.
- If the original rotary coupler is being refitted, remove the previously applied adhesive tape before positioning the unit on the steering column.
- Use new cable ties to secure the wiring harness to the steering column.
- Refit the steering wheel as described in Section 18.

## 20 Steering column lock - removal and refitting

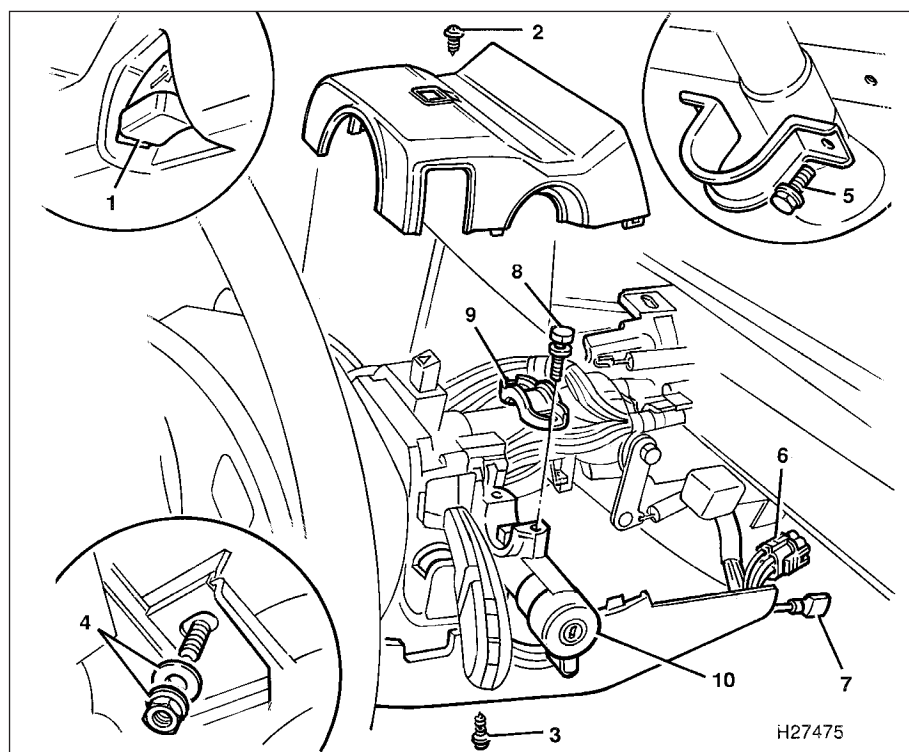


### Removal

**1** Remove the steering wheel as described in Section 18.

**2** From inside the car, release the turnbuckles and lift out the trim panels over the clutch, brake and accelerator pedals.

**3** Release the rake lock on the side of the



### 20.3 Steering column lock attachments

- |  |                                    |
|--|------------------------------------|
| 1 Steering column rake lock            | 6 Ignition switch wiring multiplug |
| 2 Upper shroud retaining screw         | 7 Additional switch lead           |
| 3 Lower shroud retaining screws        | 8 Shear bolt                       |
| 4 Column upper mounting nut and washer | 9 Lock saddle                      |
| 5 Column lower mounting bolts          | 10 Steering column lock            |

steering column, and move the column to its lowest position (see illustration).

4 Undo the single upper screw and the three lower screws, and remove the upper and lower steering column shrouds.

5 Undo the two nuts and remove the washers from the steering column upper mounting.

6 Undo the two bolts and remove the mounting strap from the column lower mounting. Lower the column slightly, and support it in this position.

7 Disconnect the two ignition switch wiring multiplugs from the fusebox.

8 Centre-punch the steering column lock

shear-bolts, then drill off the bolt heads.

9 Remove the lock saddle, then withdraw the lock from the column.

10 With the lock removed, unscrew the shear-bolt studs with a self-locking wrench or a pair of grips on the protruding bolt ends.

### Refitting

11 Refitting is a reversal of removal, but tighten all the mounting bolts and nuts to the specified torque. Use new shear-bolts to secure the lock, and tighten them until the heads shear off, but check the operation of the lock before doing this.

## 21 Steering column - removal and refitting



### Removal

1 Disconnect the battery negative (earth) lead (refer to Chapter 5, Section 1).

2 Remove the steering wheel and, where fitted, the rotary coupler as described in Sections 18 and 19 respectively.

3 From inside the car, release the turnbuckles and lift out the trim panels over the clutch, brake and accelerator pedals (see illustrations).

4 Release the rake lock on the side of the steering column, and move the column to its lowest position.

5 Undo the single upper screw and the three lower screws, and remove the upper and lower steering column shrouds.

6 At the base of the steering column, release the two retaining clips and slide the cover up over the column shaft universal joint (see illustration).

7 Move the carpets aside to gain access to the floor-mounted cover plate.

8 Prise out the retaining studs to release the cover plate and gasket from the floor.

9 Undo the clamp bolt securing the universal joint to the steering gear pinion.

10 Undo the two nuts and remove the washers from the steering column upper mounting (see illustration).

11 Undo the two bolts and remove the mounting strap from the column lower mounting (see illustration). Lower the column slightly, and support it in this position.

12 Release the flasher unit from its bracket above the fusebox.

13 Disconnect the two ignition switch wiring multiplugs from the fusebox and, where applicable, the additional multiplugs at the base of the column. Release the multiplugs and wiring from the column brackets as necessary.

14 Lift the column assembly upwards to disengage the universal joint from the steering gear pinion, then remove the column from the car.

15 If the universal joint is to be removed, mark the joint in relation to the column shaft. Undo the clamp bolt and slide the joint off the shaft.

### Refitting

16 Before refitting the column, set the roadwheels to the straight-ahead position.

17 Refit the universal joint to the column shaft (if previously removed), ensuring that the marks made during removal are aligned.

18 Engage the universal joint with the steering gear pinion, and push it fully home.

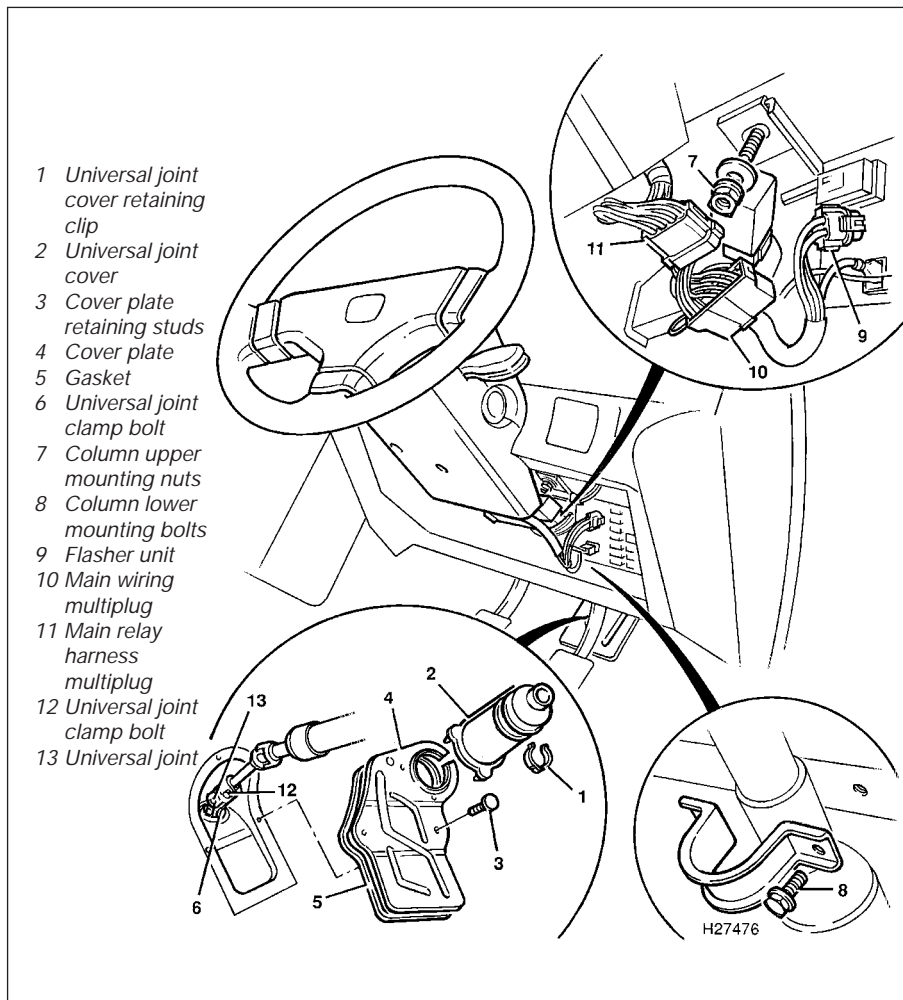
19 Reconnect the wiring multiplugs and refit the flasher unit.



21.3a Remove the upper trim panel . . .



21.3b . . . and lower trim panel over the pedals



21.6 Steering column attachments and components



21.10 Steering column upper mounting nut (arrowed)



21.11 Steering column lower mounting bolt (arrowed)

- 20 Refit the column mountings, and tighten the nuts and bolts to the specified torque.
- 21 Tighten the universal joint clamp bolt.
- 22 Refit the cover plate and gasket, followed by the universal joint cover.
- 23 Refit the steering column shrouds and the trim panels.
- 24 Refit the rotary coupler (where applicable) and steering wheel as described in Sections 19 and 18, then reconnect the battery.

## 22 Steering track rod - removal and refitting

### Removal

- 1 Apply the handbrake, remove the front wheel trim and slacken the wheel nuts. Jack up the front of the car and support it on axle

stands. Remove the front roadwheel.

- 2 Slacken the track rod retaining locknut by a quarter of a turn (see illustration).

- 3 Extract the split pin, then unscrew the nut securing the track rod balljoint to the steering knuckle arm (see illustration).

- 4 Using a universal balljoint separator tool, release the tapered ball-pin from the arm (see illustration).

- 5 Engage a spanner over the flats on the inner track rod that protrudes from the rubber gaiter, then unscrew the steering track rod and outer balljoint assembly.

### Refitting

- 6 Fit the new track rod by screwing it on to the inner track rod until it contacts the locknut.



22.2 Steering track rod retaining locknut (arrowed)



22.3 Extract the split pin and remove the track rod retaining nut (arrowed)

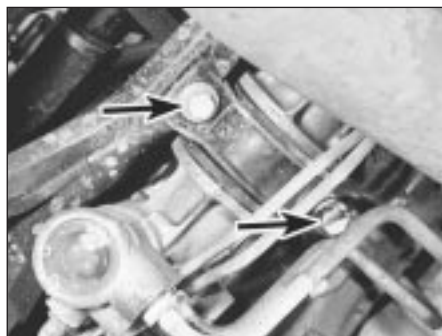


22.4 Using a universal balljoint separator tool to release the track rod balljoint





**24.10** Unscrew the two fluid pipe union nuts (arrowed)



**24.12a** Steering gear right-hand mounting bracket bolts (arrowed) . . .



**24.12b** . . . and left-hand mounting bracket bolts (arrowed)

**7** Insert the balljoint into the steering knuckle arm and refit the retaining nut. Tighten the nut to the specified torque, then tighten it further, slightly, to align the next split pin hole. Secure the nut with a new split pin.

**8** Tighten the track rod retaining locknut securely, refit the roadwheel and lower the car to the ground. Tighten the wheel nuts and refit the wheel trim.

**9** Check the front wheel alignment as described in Section 28.

### 23 Steering gear rubber gaiter - renewal



#### Removal

**1** Remove the steering track rod as described in the previous Section.

**2** Count and record the number of exposed threads from the end of the inner track rod to the locknut, then unscrew and remove the locknut.

**3** Release the rubber gaiter retaining clips, remove the transfer tube (V6 engine models) and withdraw the gaiter from the steering gear and inner track rod.

#### Refitting

**4** Slide the new gaiter into position and secure it with new retaining clips. Where applicable, refit the transfer tube.

**5** Refit the locknut to the inner track rod, and position it so that the same number of threads are exposed as counted on removal.

**6** Refit the steering track rod as described in the previous Section.

### 24 Steering gear - removal and refitting



#### 4-cylinder engine models

##### Removal

**1** From inside the car, release the two retaining clips and slide up the cover over the universal joint at the base of the steering column (see illustration 21.6).

**2** Move the carpets aside to gain access to the floor-mounted cover plate.

**3** Prise out the retaining studs to release the cover plate and gasket from the floor.

**4** Undo the clamp bolt securing the universal joint to the steering gear pinion.

**5** Apply the handbrake, remove the front wheel trims and slacken the wheel nuts. Jack up the front of the car and support it on axle stands. Remove the front roadwheels.

**6** Remove the exhaust front pipes as described in the relevant Part of Chapter 4.

**7** Extract the split pins, then unscrew the nuts securing each track rod balljoint to the steering knuckle arm.

**8** Using a universal balljoint separator tool, release the balljoint tapered ball-pins from the arms.

**9** Position a suitable container beneath the pinion end of the steering gear.

**10** Wipe clean the area around the fluid pipe unions, then unscrew the two rearward-facing union nuts on the pinion housing (see illustration). Allow the power steering fluid to drain into the container.

**11** Remove the two O-ring seals from the disconnected pipes, then plug or tape over the pipe ends and orifices.

**12** Undo the two bolts each side securing the steering gear to the chassis members, and remove the mounting brackets (see illustrations).

**13** Lower the steering gear to release the pinion from the column universal joint, then manipulate the assembly sideways and out through the wheelarch.

**14** Check the condition of the rubber mountings, and renew them if there is any sign of deterioration or swelling of the rubber.

#### Refitting

**15** Refitting the steering gear is a reversal of removal, bearing in mind the following points:

- Tighten all nuts, bolts and unions to the specified torque.
- Use new O-ring seals on the pipe unions, and new split pins on the balljoint retaining nuts.
- Fill the system with fresh fluid, and bleed the steering gear as described in Section 25.
- If necessary, reposition the steering wheel

*so that the spokes are horizontal when the steering gear is in the straight-ahead position (see Section 18).*

### V6 engine models

#### Removal

**16** Proceed as described in paragraphs 1 to 8 above.

**17** Undo the bolts securing the longitudinal support member to the underbody beneath the engine and remove the member.

**18** Engage a spanner over the flats on the left-hand inner track rod that protrudes from the rubber gaiter, then unscrew the steering track rod and outer balljoint assembly. Remove the right-hand steering track rod in the same way.

**19** Undo the four bolts and remove the cover plate from below the pinion end of the steering gear.

**20** Position a suitable container beneath the steering gear fluid pipes.

**21** Wipe clean the area around the fluid pipe unions, then unscrew the four union nuts on the pinion housing. Allow the power steering fluid to drain into the container.

**22** Plug or tape over the disconnected pipe ends and orifices to prevent dirt entry.

**23** Undo the two bolts each side securing the steering gear to the chassis members, and remove the mounting brackets.

**24** Lower the steering gear to release the pinion from the column universal joint, then manipulate the assembly sideways and out through the wheelarch.

**25** Check the condition of the rubber mountings, and renew them if there is any sign of deterioration or swelling of the rubber.

#### Refitting

**26** Refitting the steering gear is a reversal of removal, bearing in mind the following points:

- Tighten all nuts, bolts and unions to the specified torque.
- Use new split pins on the balljoint retaining nuts.
- Fill the system with fresh fluid, and bleed the steering gear as described in Section 25.
- If necessary, reposition the steering wheel so that the spokes are horizontal when the steering gear is in the straight-ahead position (see Section 18).





26.7 Slacken the tensioner wheel retaining nut



26.8 Unscrew the pump pulley retaining nut

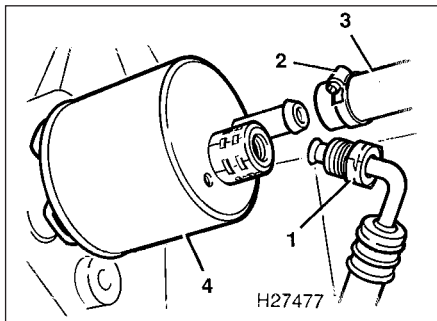


26.9 Withdraw the pulley and drivebelt from the pump

## 25 Power steering gear - bleeding



- 1 Remove the filler cap on the power steering fluid reservoir, and fill the reservoir with the specified fluid until the level is up to the MAX mark on the cap dipstick.
- 2 Disconnect the HT lead from the centre of the ignition coil.
- 3 Crank the engine on the starter motor for five seconds to prime the power steering pump.
- 4 Top up the reservoir, then crank the engine again for a further five seconds.
- 5 Turn the steering onto full right-hand lock, and crank the engine for five seconds.
- 6 Turn the steering onto full left-hand lock, top up the reservoir, and reconnect the HT lead to the coil.
- 7 Start the engine and run it for approximately two minutes. During this time, turn the steering wheel one turn each way.
- 8 With the engine stopped, check the condition of the power steering fluid. If it is aerated, leave it until clear. Once the fluid is clear, top up the reservoir, start the engine again and run it for a further two minutes. During this time, turn the steering wheel one turn each way as before.



26.14 Fluid pipe connections at the rear-mounted power steering pump

- 1 High pressure pipe union
- 2 Return hose clip
- 3 Return hose
- 4 Power steering pump

## 26 Power steering pump - removal and refitting



### 4-cylinder engine models with rear-mounted, camshaft-driven pump

#### Removal

- 1 Disconnect the battery negative (earth) lead (refer to Chapter 5, Section 1).
- 2 Drain the cooling system as described in Chapter 1.
- 3 Refer to the relevant Part of Chapter 4 and remove the air cleaner assembly.
- 4 Slacken the hose clips and disconnect the heater bypass hose from the thermostat housing, and the radiator bottom hose from the main coolant pipe below the distributor.
- 5 Undo the bolts securing the heater pipe and coolant pipe to their support brackets, and move the pipe and hose assembly away from the vicinity of the power steering pump as far as possible.
- 6 Undo the retaining screw and remove the cover over the camshaft pulley.
- 7 Slacken the centre retaining nut on the drivebelt tensioner wheel, then turn the tension adjuster clockwise until the bolt is slack (see illustration).
- 8 Using a socket and bar, unscrew and



26.15 Undo the four pump retaining bolts

remove the power steering pump pulley retaining nut (see illustration). To prevent the pulley turning as the nut is undone, engage a large screwdriver with one of the slots on the pulley, rest the screwdriver over the socket, and apply clockwise leverage to the screwdriver.

9 Withdraw the pulley and drivebelt from the pump (see illustration). Use two screwdrivers to lever off the pulley if it is tight.

10 Apply the handbrake, jack up the front of the car and support it on axle stands.

11 Undo the bolts securing the longitudinal support member to the underbody beneath the engine and remove the member.

12 Position a suitable container beneath the engine, below the power steering pump.

13 Wipe clean the area around the pipe and hose unions at the rear of the pump.

14 Unscrew the union nut and slacken the hose clip, then disconnect the high pressure pipe and return hose from the pump (see illustration). Allow the power steering fluid to drain into the container. Plug or tape over the disconnected unions when the fluid has drained.

15 Undo the four power steering pump retaining bolts, and remove the pump from under the car (see illustration).

#### Refitting

16 Refitting is a reversal of removal, bearing in mind the following points:

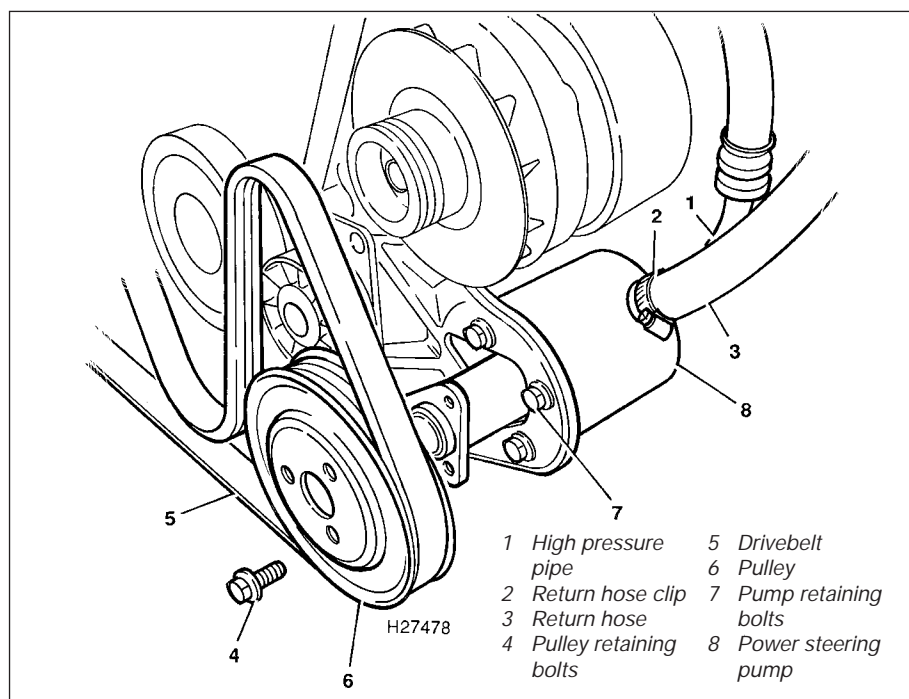
- (a) Tighten all nuts, bolts and unions to the specified torque.
- (b) Refit and tension the drivebelt as described in Chapter 1.
- (c) Bleed the power steering gear as described in Section 25.
- (d) Refill the cooling system and refit the air cleaner as described in Chapters 1 and 4 respectively.

### 4-cylinder engine models with front-mounted, crankshaft-driven pump

#### Removal

17 Remove the auxiliary drivebelt as described in Chapter 1.

18 On later models, refer to Chapter 5 and remove the alternator if access to the pump mounting bolts is limited.



**26.22 Power steering pump attachments on 4-cylinder engine models with front mounted pump (early version shown, later version similar)**

**19** On models with air conditioning, remove the heat shield (where fitted) from the rear of the pump.

**20** Position a suitable container beneath the engine, below the power steering pump.



**26.27b** ... release the pipes and cables from the support brackets ...

**21** Wipe clean the area around the pipe and hose unions at the rear of the pump.

**22** Unscrew the union nut and slacken the hose clip, then disconnect the high pressure pipe and return hose from the pump (see illustration). Allow the power steering fluid to drain into the container. Plug or tape over the disconnected unions when the fluid has drained.

**23** Undo the three bolts and remove the power steering pump pulley.

**24** Undo the four bolts (early version) or five bolts (later version) securing the pump to its mounting bracket. Slide the pump out of the bracket, and remove it from under the car.

### Refitting

**25** Refitting is a reversal of removal, bearing in mind the following points:

(a) Tighten all nuts, bolts and unions to the specified torque.



**26.27a** Undo the three nuts/bolts (arrowed) securing the pulley covers to the top of the engine ...

(b) Refit and tension the drivebelt as described in Chapter 1.

(c) Bleed the power steering gear as described in Section 25.

## V6 engine models

### Removal

**26** Disconnect the battery negative (earth) lead (refer to Chapter 5, Section 1).

**27** Undo the three bolts or nuts securing the power steering pump and alternator pulley covers to the top of the engine. Move the pipes and cables clear and lift off the covers (see illustration).

**28** Wipe clean the area around the pipe and hose unions on the top of the pump.

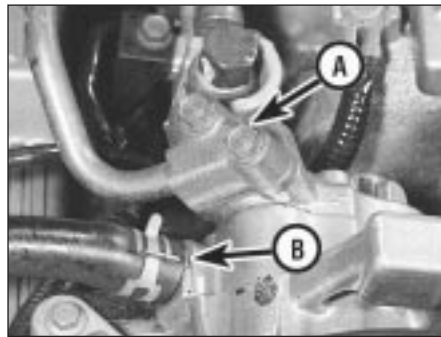
**29** Place absorbent rags around the power steering pump and be prepared for fluid spillage.

**30** Undo the two bolts securing the high pressure pipe connector, lift off the connector and recover the O-ring (see illustration).

**31** Slacken the hose clip, then disconnect the return hose from the pump. Plug or tape over the disconnected unions to prevent dirt entry.

**32** Slacken the pump adjusting nut and mounting bolt, push the pump down and slip the drivebelt off the pump pulley (see illustrations).

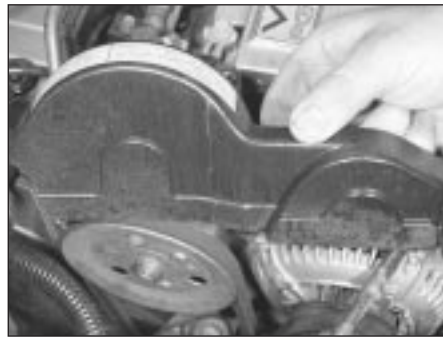
**33** Remove the mounting bolt and adjusting nut and lift the pump off the engine.



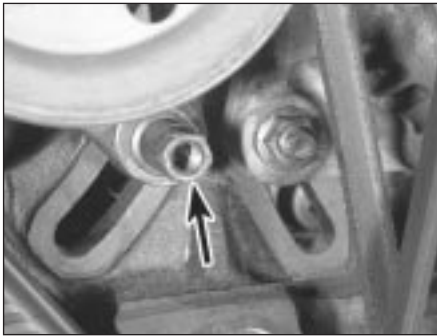
**26.30** High pressure pipe connector (A) and return hose connection (B) at the power steering pump



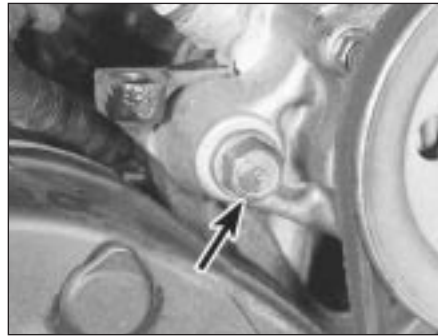
**26.27c** ... and cover clips ...



**26.27d** ... and lift off the two covers



26.32a Power steering pump adjusting nut (arrowed) . . .



26.32b . . . and mounting bolt (arrowed)

### Refitting

34 Refitting is a reversal of removal, bearing in mind the following points:

- (a) Tighten all nuts, bolts and unions to the specified torque.
- (b) Use a new O-ring on the high pressure pipe connector.
- (c) Refit and tension the drivebelt as described in Chapter 1.
- (c) Bleed the power steering gear as described in Section 25.

## 27 Power steering fluid cooler - removal and refitting



### 4-cylinder engine models

#### Removal

- 1 Disconnect the battery negative (earth) lead (refer to Chapter 5, Section 1).
- 2 Remove the front bumper as described in Chapter 11.
- 3 Position a suitable container beneath the engine, below the power steering fluid reservoir and place absorbent rags under the reservoir.
- 4 Slacken the hose clip and disconnect the fluid cooler hose at the reservoir. Plug the disconnected unions quickly to minimise fluid spillage.
- 5 Locate the remaining hose-to-pipe connectors and release the hose clips or disconnect the pipe connectors as applicable.
- 6 Undo the two fluid cooler retaining nuts and remove the cooler.

#### Refitting

- 7 Refitting is a reversal of removal. Bleed the power steering gear as described in Section 25 on completion.

### V6 engine models

#### Removal

- 8 Disconnect the battery negative (earth) lead (refer to Chapter 5, Section 1).
- 9 Remove the side lights and the right-hand headlight as described in Chapter 12. On early

models, remove the radiator grille as described in Chapter 11.

10 Position a suitable container beneath the front of the car, below the fluid cooler unions.

11 Slacken the hose clips and disconnect the four fluid cooler hose connections, two at each end of the cooler. Plug the disconnected unions quickly to minimise fluid spillage.

12 Undo the two fluid cooler retaining nuts and remove the cooler.

### Refitting

13 Refitting is a reversal of removal. Bleed the power steering gear as described in Section 25 on completion.

## 28 Wheel alignment and steering angles - general information



1 Accurate front wheel alignment is essential to provide positive steering and prevent excessive tyre wear. Before considering the steering/suspension geometry, check that the tyres are correctly inflated, that the front wheels are not buckled, and that the steering linkage and suspension joints are in good order, without slackness or wear.

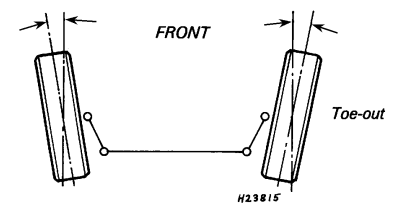
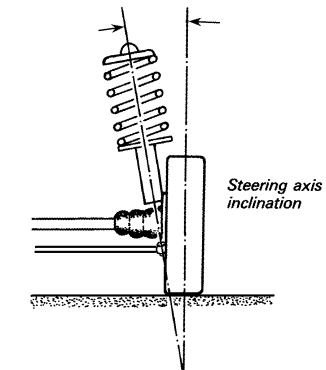
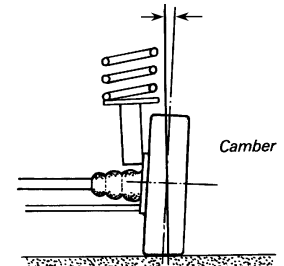
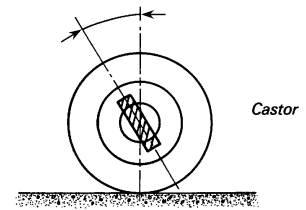
2 Wheel alignment consists of four factors (see illustration):

**Camber** is the angle at which the front wheels are set from the vertical when viewed from the front of the vehicle. "Positive camber" is the amount (in degrees) that the wheels are tilted outward at the top from the vertical.

**Castor** is the angle between the steering axis and a vertical line when viewed from each side of the car. "Positive castor" is when the steering axis is inclined rearward at the top.

**Steering axis inclination** is the angle (when viewed from the front of the vehicle) between the vertical and an imaginary line drawn through the steering knuckle upper and lower balljoints.

**Toe setting** is the amount by which the distance between the front inside edges of the roadwheels (measured at hub height) differs from the diametrically opposite distance measured between the rear inside edges of the front roadwheels.



28.2 Wheel alignment and steering angle measurements

3 With the exception of the front and rear toe setting, all other suspension and steering angles are set during manufacture and no adjustment is possible. It can be assumed, therefore, that unless the vehicle has suffered accident damage all the preset angles will be correct. Should there be some doubt about their accuracy it will be necessary to seek the help of a Rover dealer, as special gauges are needed to accurately check the suspension and steering angles.

4 The front and rear toe settings are adjustable, and two methods are available to the home mechanic for doing this. One method is to use a gauge to measure the distance between the front and rear inside

edges of the roadwheels. The other method is to use a scuff plate, in which the roadwheel is rolled across a movable plate which records any deviation, or scuff, of the tyre relative to the straight-ahead position, as it moves across the plate. Relatively inexpensive equipment of both types is available from accessory outlets to enable these checks, and subsequent adjustments, to be carried out at home.

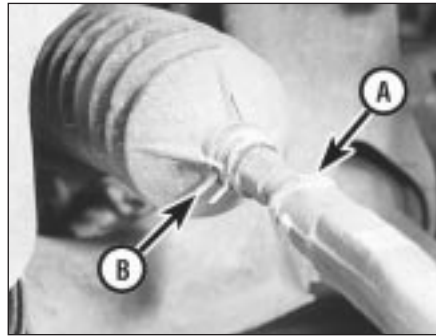
### Toe setting - checking and adjusting

#### Front wheel toe setting

5 With the car on level ground and the steering in the straight-ahead position, bounce the front and rear to settle the suspension, then push the car backwards then forwards. Follow the equipment manufacturer's instructions according to the equipment being used, and check the toe setting.

6 If adjustment is required, slacken the steering track rod locknuts on both sides, and release the rubber gaiter retaining clips (see illustration).

7 Using a spanner engaged with the flat on the inner track rod, turn both track rods, by equal amounts clockwise to increase the toe-in, or anti-clockwise to increase the toe-out. Push the car forwards, then recheck the setting. If a gauge is being used, take three readings, at 120° intervals around the wheel,



28.6 Steering track rod locknut (A) and gaiter clip (B)

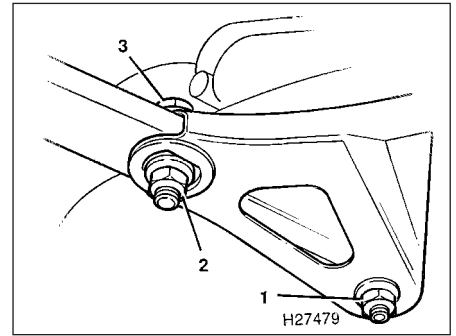
pushing the car forward a little each time. Use the mean average of the three readings as the setting.

8 Repeat this procedure until the setting is as specified, then tighten the track rod locknuts and refit the gaiter clips. Ensure that the gaiters are not twisted.

#### Rear wheel toe setting

9 With the car on level ground and the steering in the straight-ahead position, bounce the front and rear to settle the suspension, then push the car backwards then forwards. Follow the equipment manufacturer's instructions according to the equipment being used, and check the toe setting.

10 If adjustment is required, slacken the adjustment plate-to-trailing link retaining bolt



28.10 Rear wheel toe setting adjustment points

- 1 Adjustment plate retaining bolt locknut
- 2 Eccentric bolt locknut
- 3 Eccentric bolt

locknut, and the eccentric bolt locknut on each side (see illustration).

11 Turn both eccentric bolts, by equal amounts in whichever direction is necessary, then tighten the locknuts and recheck the toe setting.

12 If a gauge is being used, take three readings, at 120° intervals around the wheel, pushing the car forward a little each time. Use the mean average of the three readings as the setting.

13 Repeat this procedure until the setting is as specified, then fully tighten the retaining bolt and eccentric bolt locknuts to the specified torque.