






Chapter 10

Suspension and steering

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Degrees of difficulty

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

Front suspension

Type	Independent by MacPherson struts with coil springs and integral telescopic shock absorbers. Anti-roll bar fitted to all models except pre-1983 1.1 litre versions
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Rear suspension

Type:	Independent with coil springs, telescopic shock absorbers and tie-bars
Saloon and Estate models	Tubular axle located by semi-elliptic leaf springs and telescopic shock absorbers
Van models	To Ford specification SAM-1C-9111A
Hub bearing grease	

Steering

Type	Rack and pinion
Steering gear lubricant:	
Type:	To Ford specification SQM-2C9003-AA
Oil	To Ford specification SAM1C-9106-AA
Semi-fluid grease	
Quantity:	
Pre-May 1983 models	95 cc of semi-fluid grease
Post-May 1983 models	120 cc of oil, and 70 cc of semi-fluid grease (add grease to the rack ends)

10•2 Suspension and steering

Front wheel alignment

Toe setting:		
Pre-May 1983 models:		
Checking tolerance	.....	1.5 mm toe-in to 5.5 mm toe-out
Adjust to	.....	1.0 mm toe-in to 3.0 mm toe-out
May 1983 models onward:		
Checking tolerance	.....	0.5 mm toe-in to 5.5 mm toe-out
Adjust to	.....	1.5 mm to 3.5 mm toe-out

Roadwheels

Wheel size:	
Steel wheels	..... 13x4.50, 13x5, 14x6
Alloy wheels	..... 14x5.50, 14x6, 15x6

Tyres

Tyre size:	
Saloon and Estate models	..... 145 SR 13,155 SR/TR 13, 175/70 SR/HR 13, 175/65 HR 14, 185/60 HR 13, 185/60 HR 14, 195/50 VR 15
Van models	..... 155 SR 13, 165 RR 13

Torque wrench settings

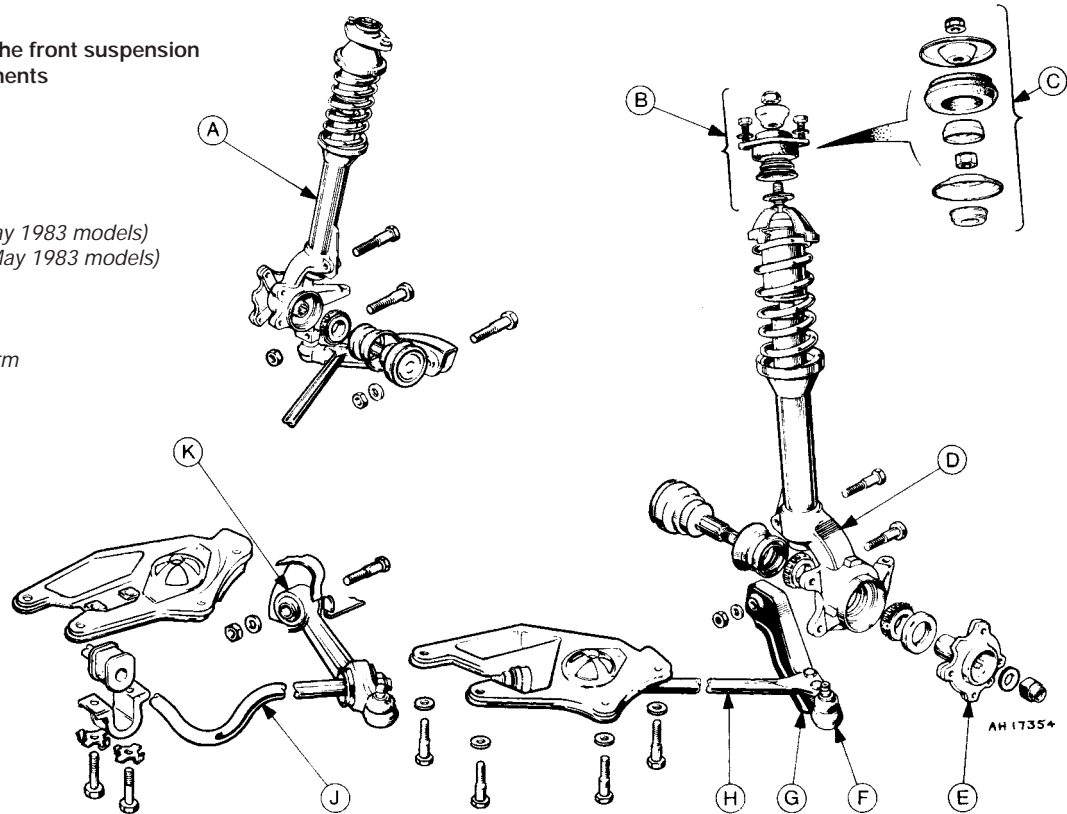
	Nm	lbf ft
Front suspension		
Driveshaft retaining nut (threads lightly greased)	205 to 235	151 to 173
Lower arm mounting pivot bolt	51 to 64	38 to 47
Lower arm balljoint pinch-bolt	48 to 60	35 to 44
Brake caliper anchor bracket mounting bolts	50 to 66	37 to 49
Suspension strut to hub carrier	80 to 90	59 to 66
Tie-bar to lower arm (pre-1983 1.1 litre models)	75 to 90	55 to 66
Tie-bar to mounting bracket (pre-1983 1.1 litre models)	44 to 55	32 to 41
Anti-roll bar to lower arm	90 to 110	66 to 81
Anti-roll bar clamp nuts and bolts	45 to 56	33 to 41
Tie-bar to lower arm (1985 RS Turbo models)	90 to 110	66 to 81
Tie-bar-to-anti-roll bar clamp (1985 RS Turbo models)	22 to 26	16 to 19
Tie-bar front pivot nut (1985 RS Turbo models)	70 to 90	52 to 66
Suspension strut top mounting to body (pre-May 1983 models)	20 to 24	15 to 18
Suspension strut-to-body retaining nut (May 1983 models onward)	40 to 52	30 to 38
Suspension strut top mounting piston rod nut	52 to 65	38 to 48
Rear suspension (Saloon and Estate models)		
Lower arm inboard pivot bolt	70 to 90	52 to 66
Lower arm-to-stub axle carrier through-bolt	60 to 70	44 to 52
Shock absorber top mounting nut	42 to 52	31 to 38
Shock absorber to stub axle carrier	70 to 90	52 to 66
Tie-bar front mounting pivot bolt	70 to 90	52 to 66
Tie-bar-to-stub axle carrier nut	70 to 90	52 to 66
Brake backplate to stub axle carrier	45 to 55	33 to 41
Rear suspension (Van models)		
Roadspring U-bolt nuts	36 to 45	27 to 33
Roadspring shackle nuts	40 to 50	30 to 37
Roadspring eye bolt nuts	70 to 90	52 to 66
Shock absorber top mounting bracket to body	20 to 25	15 to 18
Shock absorber to top mounting bracket	40 to 50	30 to 37
Brake backplate to stub axle	45 to 55	33 to 41
Steering		
Steering gear to bulkhead bolts	45 to 50	33 to 37
Tie-rod outer balljoint to steering arm	25 to 30	18 to 22
Tie-rod outer balljoint-to-tie-rod locknut	57 to 68	42 to 50
Steering column shaft coupling pinch-bolt	45 to 56	33 to 41
Steering wheel nut	27 to 34	20 to 25
Rack slipper cover plate bolts (pre-May 1983 models)	6 to 9	5 to 7
Pinion bearing cover plate bolts (pre-May 1983 models)	17 to 24	13 to 18
Rack slipper plug (post-May 1983 models)	4 to 5	3 to 4
Tie-rod inner balljoint to rack	68 to 90	50 to 66

Roadwheels

Roadwheel bolts (all models)	70 to 100	52 to 74
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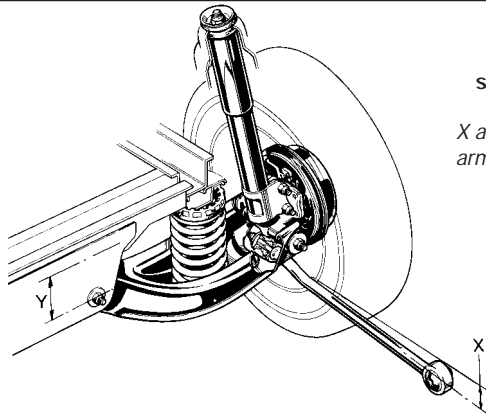
1.1 Exploded view of the front suspension components

- A Suspension strut
- B Top mounting (pre-May 1983 models)
- C Top mounting (post-May 1983 models)
- D Hub carrier
- E Front hub
- F Balljoint assembly
- G Pressed steel lower arm
- H Tie-bar
- J Anti-roll bar
- K Forged lower arm



1.2 General view of the rear suspension as used on Saloon and Estate models

X and Y indicate alternative lower arm and tie-bar mounting positions

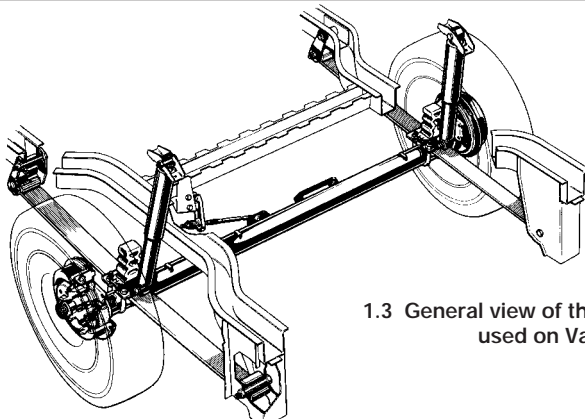


1 General description

The independent front suspension is of the MacPherson strut type, incorporating coil springs and integral telescopic shock absorbers. Lateral location of each strut assembly is by a forged or pressed steel lower suspension arm containing rubber inner mounting bushes and incorporating a balljoint at their outer ends. On pre-May 1983 1.1 litre models, fore and aft location of the pressed steel lower suspension arms is by a tie-bar. On post-May 1983 1.1 litre models and all other variants the forged steel lower arms are interconnected by an anti-roll bar which also provides fore and aft location of both suspension arms. Additional location is provided by an adjustable tie-bar on 1985 RS Turbo models. The hub carriers which contain the hub bearings, brake calipers and the hub/disc assemblies are bolted to the MacPherson struts and connected to the lower arms via the balljoints (see illustration).

On Saloon and Estate models the rear suspension is also fully independent by means of pressed steel lower suspension arms, coil springs and separate telescopic shock absorbers. The suspension arms are attached to the underbody at their inner ends through rubber bushes and to the stub axle carrier at their outer ends, again through rubber bushes. The shock absorbers are

1.3 General view of the rear suspension as used on Van models



10•4 Suspension and steering

bolted to the stub axle carriers at their lower ends which also carry the rear brake backplate as well as the rear hub/drum assemblies. Fore and aft location of the lower arms is by a tie-bar and an anti-roll bar is also fitted to models with fuel-injection (see illustration).

The rear suspension on Van variants consists of a transverse beam axle located and supported by a single leaf spring on each side, and utilising telescopic shock absorbers to control vertical movement. A stub axle is welded to each end of the axle and these carry the rear brake backplates and the hub/drum assemblies (see illustration).

The steering gear is of the conventional rack and pinion type located behind the front wheels. Movement of the steering wheel is transmitted to the steering gear by means of a steering shaft containing two universal joints. The front wheels are connected to the steering gears by tie-rods each having an inner and outer balljoint.

2 Front hub bearings - renewal



Note: A new driveshaft nut, and a new tie-rod balljoint split-pin must be used on refitting.

1 Remove the wheel trim and release the staking on the driveshaft retaining nut using a suitable punch.

2 Slacken the driveshaft retaining nut and the wheel bolts.

3 Jack up the front of the car, support it on stands (see "Jacking and Vehicle Support") and remove the roadwheel.

4 Undo the two bolts securing the brake caliper anchor bracket to the hub carrier.

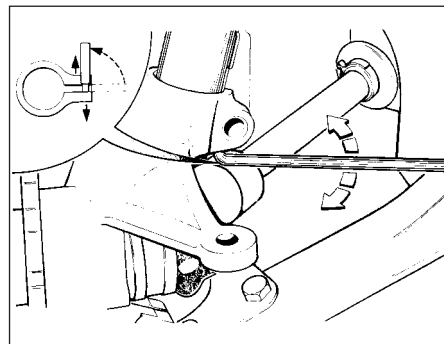
5 Withdraw the anchor bracket and brake caliper complete with disc pads and suspend it from a convenient place under the wheel arch.

6 Remove the driveshaft retaining nut and washer.

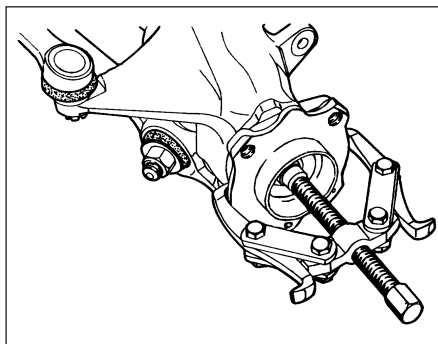
7 Undo the retaining screw and withdraw the brake disc from the hub.

8 Using a two-legged puller draw off the hub (see illustration).

9 Extract the split pin and unscrew the castellated nut from the steering tie-rod balljoint.



2.13 Using a lever to spread the hub carrier clamp jaws



2.8 Using a two-legged puller to draw off the wheel hub

10 Release the balljoint from the steering arm using a balljoint separator tool.

11 Disconnect the lower arm balljoint from the hub carrier by removing the nut and pinch-bolt (see illustration). Note that the pinch-bolt is of the socket-headed (Torx) type and a special key or socket bit (available from accessory shops) will be required for this purpose.

12 Undo the bolt which secures the hub carrier to the base of the suspension strut.

13 Using a suitable lever, separate the carrier from the strut by prising open the clamp jaws (see illustration).

14 Support the driveshaft so that it does not hang down by more than 20° from the horizontal then withdraw the hub carrier.

15 Support the hub carrier in a vice fitted with protected jaws.

16 Using pliers, pull out the dust shield from the groove in the hub carrier.

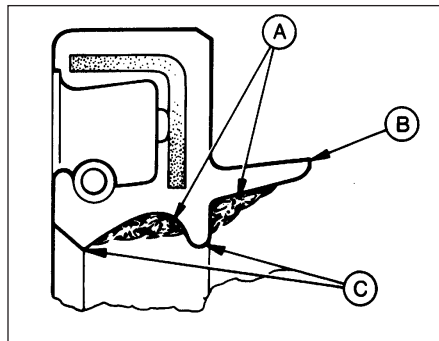
17 Prise out the inner and outer oil seals.

18 Lift out the bearings.

19 With a suitable drift, drive out the bearing tracks. Take care not to damage the bearing track carrier surface during removal since any burrs on the surface could prevent the new tracks seating correctly during assembly.

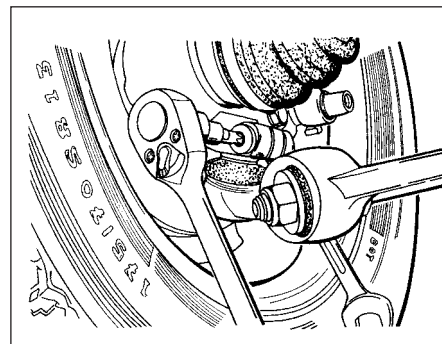
20 Clean away all old grease from the hub carrier.

21 Drive the new bearing tracks squarely into



2.23 Sectional view of the hub bearing oil seal

A Grease applied to cavity between oil seal lips
B Axial sealing lip
C Radial sealing lips



2.11 Removing the lower arm balljoint Torx type pinch-bolt

their seats using a piece of suitable diameter tubing.

22 Liberally pack a high quality lithium based grease into the bearings, making sure to work plenty into the spaces between the rollers. Note that the cavity between the inner and outer bearings in the carrier **must not** be packed with grease since this could cause a pressure build-up and result in the seals leaking.

23 Install the bearing to one side of the carrier, then fill the lips of the new oil seal with grease and tap it squarely into position (see illustration).

24 Fit the bearing and its seal to the opposite side in a similar way.

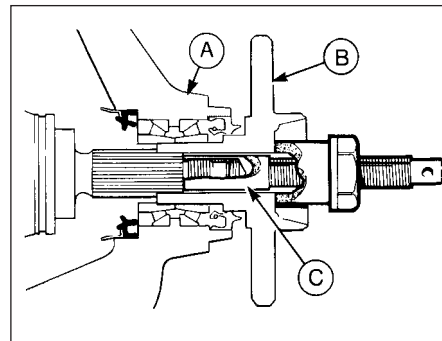
25 Fit the dust shield by tapping it into position using a block of wood.

26 Smear the driveshaft splines with grease, then install the carrier over the end of the driveshaft.

27 Connect the carrier to the suspension strut and tighten the bolt to the specified torque.

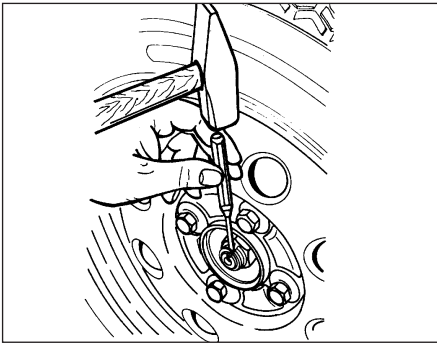
28 Reconnect the suspension lower arm balljoint to the carrier and secure by passing the pinch-bolt through the groove in the balljoint stud. The head of the pinch-bolt should be to the rear.

29 Reconnect the tie-rod to the steering arm, tighten the castellated nut to the specified torque and secure with a new split pin.



2.31 Using special tool 14-022 to fit the front hub and driveshaft

A Hub carrier
B Hub
C Tool 14-022



2.35 Staking the driveshaft retaining nut

30 Install the hub/disc and push it on to the driveshaft as far as it will go using hand pressure only.

31 The threaded end of the driveshaft joint should be protruding far enough through the hub to enable it to be drawn fully home using the old driveshaft nut and packing washers. If this is not the case it will be necessary to use Ford special tool 14-022 or a suitable alternative (see illustration).

32 With the hub in place fit a new driveshaft retaining nut and the washer but only tighten the nut hand tight at this stage.

33 Refit the brake disc and caliper anchor bracket, tightening the anchor bracket bolts to the specified torque.

34 Refit the roadwheel and lower the car to the ground.



3.4a Removing the lower arm balljoint pinch-bolt nut



3.4b Separating the balljoint from the hub carrier

35 Tighten the driveshaft retaining nut to the specified torque then stake the nut into the driveshaft groove using a small punch (see illustration).

36 Tighten the wheel bolts to the specified torque and refit the wheel trim.

3 Front suspension lower arm (forged type) - removal, overhaul and refitting

1 The forged type suspension arm is fitted to all models except pre-May 1983 1.1 litre versions.

Removal

2 Jack up the front of the car and support it on stands (see "Jacking and Vehicle Support").

3 Undo the nut and remove the pivot bolt securing the lower arm at its inboard end (see illustration).

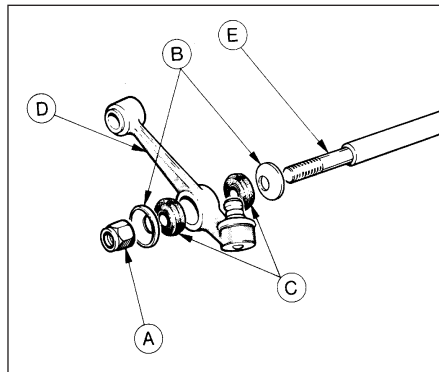
4 Disconnect the lower arm balljoint from the hub carrier by removing the nut and pinch-bolt. Note that the pinch-bolt is of the socket-headed (Torx) type and a special key or socket bit (available from accessory shops) will be required for this purpose (see illustrations).

5 Unscrew and remove the nut, washer and bush from the end of the anti-roll bar as described in Section 5 (or tie-bar on 1985 RS Turbo models) (see illustration). Withdraw the arm from under the car.

Overhaul

6 Renewal of the pivot bush at the inboard end of the arm is possible using a vice and small tubes of suitable diameter (see illustration). Lubricate the new bush thoroughly with rubber grease to ease installation.

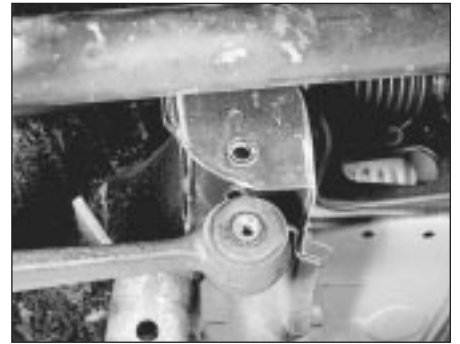
7 If the balljoint is worn it will be necessary to renew the arm complete as the balljoint cannot be removed separately.



3.5 Anti-roll bar-to-lower arm mounting

A Nut
B Dished washer
C Bushes

D Lower arm
E Anti-roll bar



3.3 Suspension lower arm disconnected at inboard end

Refitting

8 Refitting is the reverse sequence to removal. Tighten all nuts and bolts to the specified torque with the weight of the car on its roadwheels. When refitting the Torx pinch-bolt, note that the head of the bolt must face the rear of the car.

4 Front suspension lower arm (pressed steel type) - removal, overhaul and refitting

1 The pressed steel type suspension is only fitted to pre-May 1983 1.1 litre models (see illustration).

Removal

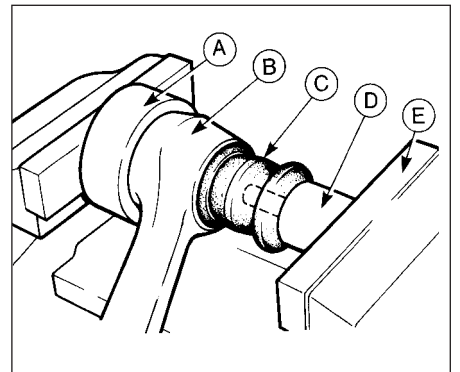
2 Jack up the front of the car and support it on stands (see "Jacking and Vehicle Support").

3 Undo the nut and remove the pivot bolt securing the lower arm at its inboard end.

4 Undo the two nuts which secure the tie-bar and lower arm balljoint to the lower arm. Separate the arm from the tie-bar and remove it from under the car.

Overhaul

5 Renewal of the pivot bush is carried out in the same way as described in Section 3.



3.6 Method of fitting lower arm inboard pivot bush

A Tubular spacer
B Lower arm
C Bush

D Tube or socket
E Vice

6 If the balljoint is worn it can be renewed after removing it from the hub carrier as described in Section 3.

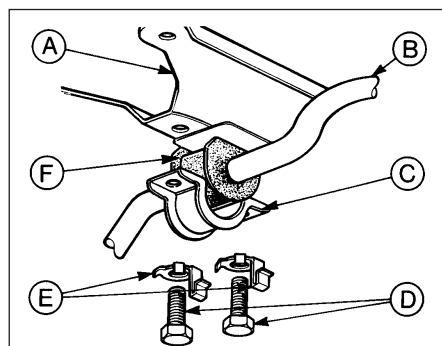
Refitting

7 Refitting is the reverse sequence to removal. Tighten all nuts and bolts to the specified torque with the weight of the car on its roadwheels. If the balljoint has been removed, refit the Torx pinch-bolt with its head towards the rear of the car.

5 Front anti-roll bar - removal and refitting

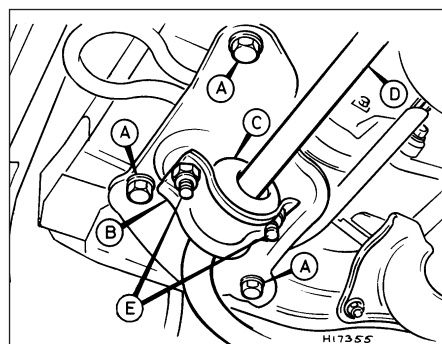
Removal

- 1 The anti-roll bar is used in conjunction with the forged type suspension lower arm.
- 2 Jack up the front of the car and support it on stands (see "Jacking and Vehicle Support").
- 3 Where fitted flatten the lockplate tabs and unscrew the two bolts or two nuts each side securing the anti-roll bar clamps to the underbody (see illustrations).
- 4 Disconnect the ends of the anti-roll bar by unscrewing the nuts and removing the



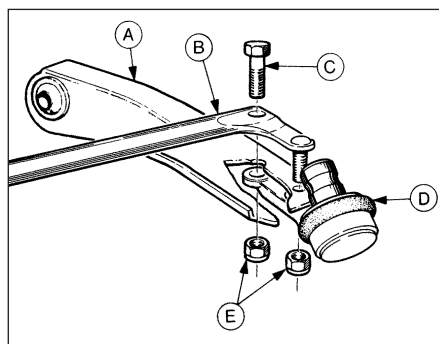
5.3a Anti-roll bar front mounting clamp details - pre-1986 models

- | | |
|-----------------|-------------------|
| A Body bracket | D Retaining bolts |
| B Anti-roll bar | E Lockplates |
| C Clamp | F Bush |



5.3b Anti-roll bar front mounting clamp details - post-1986 models

- | | |
|----------------------|-----------------|
| A Body bracket bolts | C Bush |
| B Clamp | D Anti-roll bar |
| E Retaining nuts | |



4.1 Pressed steel type lower arm components

- | | |
|------------------|------------------|
| A Lower arm | D Balljoint |
| B Tie-bar | E Retaining nuts |
| C Retaining bolt | |

washers and the bushes (see illustration). Note that the nut on the right-hand side of the anti-roll bar has a left-hand thread and is unscrewed by turning it clockwise.

5 On 1985 RS Turbo models separate the ends of the anti-roll bar from the tie-bars by releasing the clamp nuts and bolts (see illustration 6.12).

6 On all models except 1985 RS Turbo undo the nut and remove the pivot bolt securing one of the suspension lower arms at its inboard end.

7 Withdraw the anti-roll bar from the lower arms and remove it from under the car.

8 Remove the remaining rubber bush and washer from each end of the anti-roll bar. Smear the bar with rubber grease to aid bush removal.

Refitting

9 Inspect the bushes carefully and renew them if they show any signs of cracking, splitting or deformation. Bushes of different material have been introduced on Escort models during the course of production and it is therefore essential that the bushes are always renewed in sets of two to ensure that all are of the same type.

10 Refitting is the reverse sequence to removal but bearing in mind the following points:



5.4 Anti-roll to lower arm retaining nut

- a) Lubricate the bushes with rubber grease to aid refitting.
- b) Ensure that the end of the anti-roll bar with the left-hand thread is fitted to the right-hand side of the car.
- c) Fit the washers with their concave sides facing away from the bushes.
- d) Tighten all nuts and bolts with the weight of the car on its roadwheels.
- e) Where lockplates are used, bend up the tabs to lock the bolts after tightening.

6 Front tie-bar - removal and refitting

Pre-May 1983 1.1 litre models

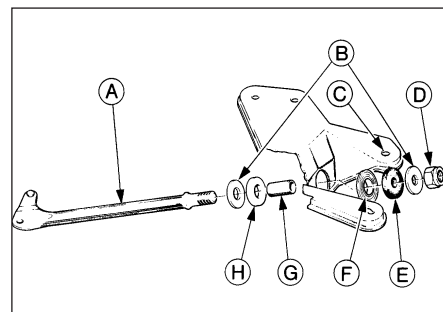
Removal

- 1 Jack up the front of the car and support it on stands (see "Jacking and Vehicle Support").
- 2 Unscrew and remove the nut which holds the tie-bar to the large pressed steel mounting bracket (see illustration). Take off the dished washer and the rubber insulator.
- 3 Disconnect the lower arm balljoint from the hub carrier by removing the nut and pinch-bolt. Note that the pinch-bolt is of the socket-headed (Torx) type and a special key or socket bit (available from accessory shops) will be required for this purpose.
- 4 Unbolt the opposite end of the tie-bar from the suspension arm.
- 5 Withdraw the tie-bar from its pressed steel bracket and take off the remaining washer, insulator and steel sleeve.

Refitting

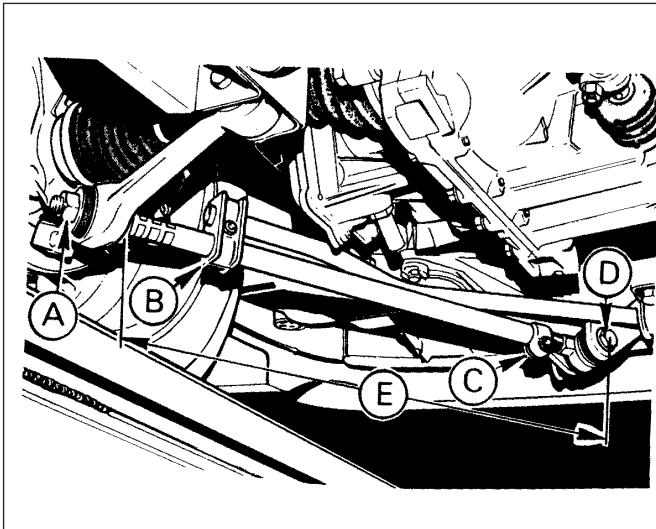
6 Where necessary the bush in the pressed steel mounting bracket can be renewed if the old bush is drawn out using a bolt, nut and suitable distance pieces.

7 Refitting the tie-bar is a reversal of removal. Finally tighten all nuts and bolts to the specified torque only when the weight of the vehicle is again on its roadwheels. When refitting the Torx pinch-bolt note that the head of the bolt must face the rear of the car.



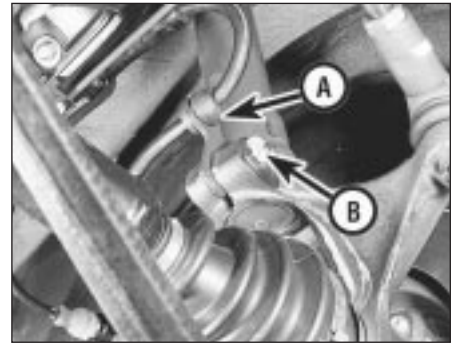
6.2 Front tie-bar mountings - pre-May 1983 1.1 litre models

- | | |
|--------------------|-------------------|
| A Tie-bar | E Front insulator |
| B Flat washers | F Bush |
| C Mounting bracket | G Steel sleeve |
| D Retaining nut | H Rear insulator |



6.12 Front tie-bar mountings - 1985 RS Turbo models

- A Retaining nut
- B Anti-roll bar clamp
- C Adjustment clamp
- D Front mounting bolt
- E Basic setting length
= 565 ± 1.5 mm
(22.24 \pm 0.6 in)



7.3 Brake hose and grommet location in strut (A) and strut-to-hub carrier pinch-bolt (B)

Overhaul

Note: Spring compressor tools will be required for this operation.

6 Clean away external dirt and mud.

7 If the strut has been removed due to oil leakage or to lack of damping, then it should be renewed with a new or factory reconditioned unit. Dismantling of the original strut is not recommended and internal components are not generally available.

8 Before the strut is exchanged, the coil spring will have to be removed. To do this, a spring compressor or compressors will be needed. These are generally available from tool hire centres or they can be purchased at most motor accessory shops.

9 Engage the compressor over four coils of the spring and compress the spring sufficiently to release spring tension from the top mounting (see illustration).

10 Once the spring is compressed, unscrew and remove the nut from the end of the piston rod which retains the top mounting. As there will be a tendency for the piston rod to turn while the nut is unscrewed, insert a 6 mm Allen key to hold the rod still.

11 Remove the top mounting and lift off the spring and compressor.

12 The compressor need not be released if the spring is to be fitted immediately to a new strut. If the compressor is to be released from the spring, make sure that you do it slowly and progressively.

1985 RS Turbo models

Removal

8 Jack up the front of the vehicle and support it on stands (see "Jacking and Vehicle Support").

9 Undo the nut and remove the washer and bush securing the end of the tie-bar to the suspension arm.

10 Undo the nut and bolt and remove the tie-bar-to-anti-roll bar clamp.

11 Undo the tie-bar front nut and pivot bolt and remove the bar from under the car.

Refitting

12 Do not alter the length of the tie-rod otherwise the steering castor angle will have to be reset. If the length has been altered or if a new tie-bar is being fitted, set the length to the basic setting as shown (see illustration). The length can be adjusted by slackening the forward clamp bolt and turning the threaded portion as necessary. Tighten the clamp after adjustment.

13 Refitting is the reverse sequence to removal but tighten all nuts and bolts to the specified torque with the weight of the car on its roadwheels.

7 Front suspension strut - removal, overhaul and refitting

Removal

1 Slacken the roadwheel bolts, raise the front of the vehicle and support it securely on stands (see "Jacking and Vehicle Support"), then remove the roadwheel.

2 Support the underside of the driveshaft on blocks or by tying it up to the rack-and-pinion steering housing.

3 Where fitted, detach the brake hose and location grommet from the strut location bracket, then unscrew and remove the pinch-bolt which holds the base of the suspension strut to the hub carrier (see illustration). Using a suitable tool, lever the sides of the slot in the carrier apart until it is free from the strut.

4 On pre-May 1983 models undo the two bolts securing the strut to the inner wing turret. On post-May 1983 models lift off the cover then unscrew the strut retaining nut. Prevent the piston rod from turning using a 6 mm Allen key (see illustrations).

5 Withdraw the complete strut assembly from under the front wing.



7.4a Suspension strut-to-turret mounting bolts on pre-1983 models

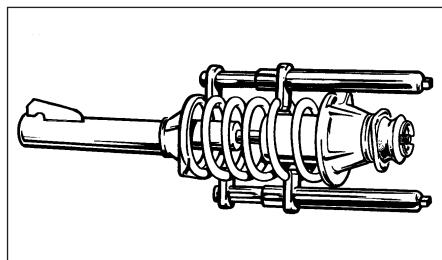


7.4b Removing the nut cover ...



7.4c ... and strut retaining nut on post-1983 models

Note Allen key to prevent piston rod turning



7.9 Coil spring retained with spring compressors

13 The top mounting can be dismantled by sliding off the thrust bearing and withdrawing the spring upper seat, gaiter spring and, where fitted, insulator. Also, if fitted, slide the bump stop from the piston rod (see illustration).

14 Renew any worn or damaged components. If the front strut and/or coil spring is to be removed then it is advisable also to renew the equivalent assembly on the other side.

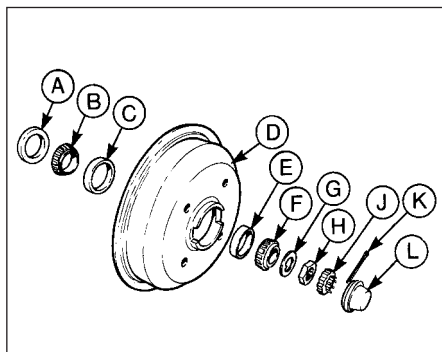
15 Fit the spring to the strut, making sure that the ends of the coils locate correctly in the shaped parts of the spring seats.

16 Fit the top mounting components, being very careful to maintain the correct order of assembly of the individual components.

17 Gently release and remove the spring compressor. Check that the ends of the spring are correctly located in the shaped sections of the spring seatings.

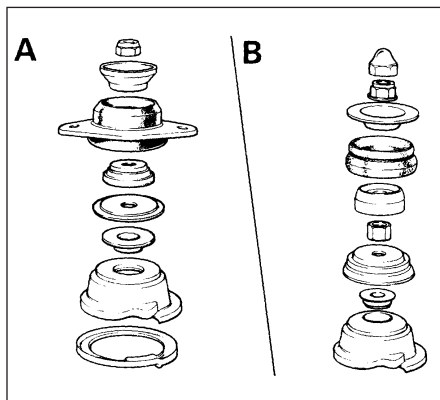
Refitting

18 Refit the strut using the reverse of the removal procedure. Lower the vehicle so that it is standing on its roadwheels before tightening the top mounting bolts or nut to the specified torque.



9.3 Exploded view of the rear hub bearings

- | | |
|-----------------------|--------------------|
| A Oil seal | F Outboard bearing |
| B Inboard bearing | G Thrustwasher |
| C Bearing outer track | H Retaining nut |
| D Hub and drum | J Nut retainer |
| E Bearing outer track | K Split pin |
| | L Dust cap |



7.13 Exploded view of the suspension strut upper mounting components

- A Pre-May 1983 models
B Post-May 1983 models

8 Rear hub bearings - adjustment

Note: A new hub nut split-pin must be used on refitting.

1 Raise and support the rear of the vehicle on stands. Release the handbrake.

2 This adjustment will normally only be required if, when the top and bottom of the roadwheel are gripped and "rocked" excessive movement can be detected in the bearings. Slight movement is essential.

3 Remove the roadwheel. Using a hammer and cold chisel, tap off the dust cap from the end of the hub.

4 Extract the split pin and take off the nut retainer.

5 Tighten the hub nut to a torque of between 20 and 25 Nm (15 and 18 lbf ft), at the same time rotating the brake drum in an anti-clockwise direction.

6 Unscrew the nut one half a turn and then tighten it only finger tight.

7 Fit the nut retainer so that two of its slots line up with the split pin hole. Insert a new split pin, bending the end around the nut, not over the end of the stub axle.

8 Tap the dust cap into position.

9 Recheck the play as described in paragraph 2.



9.6 Rear hub outboard bearing removal

A fractional amount of wheel movement must be present.

10 Repeat the operations on the opposite hub, refit the roadwheels and lower the vehicle to the floor.

9 Rear hub bearings - renewal

1 Raise and support the rear of the vehicle on stands (see "Jacking and Vehicle Support"). Remove the roadwheel and release the handbrake.

2 On fuel-injected models and Van versions undo the retaining screw and withdraw the brake drum from the hub.

3 Tap off the dust cap from the end of the hub (see illustration).

4 Extract the split pin and remove the nut retainer.

5 Unscrew and remove the nut and take off the thrustwasher.

6 Pull the hub/drum off the stub axle slightly then push it back. This will now leave the outboard bearing ready to be taken off the stub axle (see illustration).

7 Withdraw the hub/drum.

8 Prise the oil seal from the hub and take out the inboard taper roller bearing (see illustration).

9 Using a punch, drive out the bearing outer tracks, taking care not to burr the bearing seats.

10 If new bearings are being fitted to both hubs, do not mix up the bearing components but keep them in their individual packs until required.

11 Drive the new bearing tracks squarely into their hub recesses.

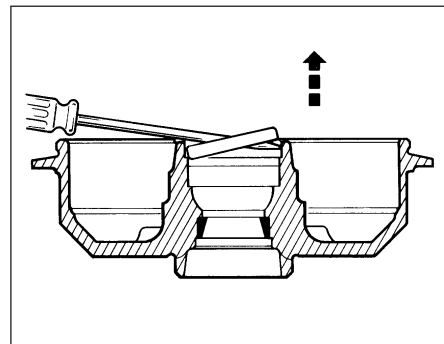
12 Pack both bearings with the specified grease, working plenty into the rollers. Be generous, but there is no need to fill the cavity between the inner and outer bearings.

13 Locate the inboard bearing and then grease the lips of a new oil seal and tap it into position.

14 Fit the hub onto the stub axle, taking care not to catch the oil seal lips.

15 Fit the outboard bearing and the thrustwasher and screw on the nut.

16 Adjust the bearings (Section 8).



9.8 Removing the hub bearing oil seal



10.3 Rear shock absorber top mounting

17 On fuel-injected models and Van versions refit the brake drum and secure with the retaining screw.

18 Refit the roadwheel and lower the car to the ground.

10 Rear shock absorber (Saloon and Estate models) - removal, testing and refitting



Removal

1 Slacken the roadwheel bolts, raise the rear of the vehicle, support it on stands (see "Jacking and Vehicle Support") and remove the roadwheel.

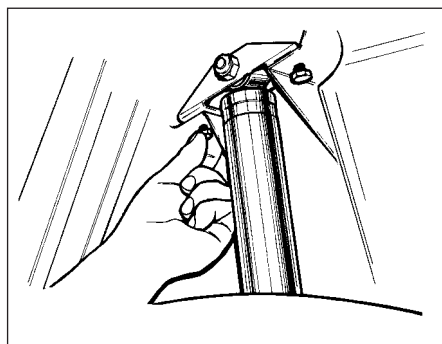
2 Support the suspension lower arm with a jack.

3 Open the tailgate and lift the parcel tray to expose the shock absorber top mounting (see illustration).

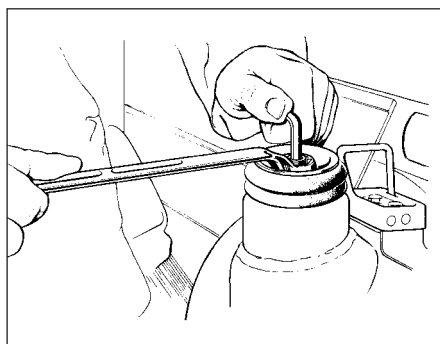
4 Remove the cap and then unscrew the nut from the shock absorber spindle. To prevent the spindle turning, use an Allen key in the socket provided (see illustration).

5 Take off the cap and insulator.

6 Separate the brake hydraulic hose from the shock absorber by slackening the centre locking nut and easing the hose and pipe down and out of the slot in the bracket (see illustration). On the right-hand side there is very little clearance for a spanner and it may be easier if the roadspring is removed as described in Section 13.



11.3 Removing the rear shock absorber top mounting bracket - Van models



10.4 Removing the shock absorber top mounting nut - Saloon and Estate models

7 Undo the two bolts securing the shock absorber to the stub axle carrier and withdraw the unit, together with cup and bump rubber, from under the wheel arch.

Testing

8 To test the shock absorber, grip its lower mounting in a vice so that the unit is vertical.

9 Fully extend and retract the shock absorber ten or twelve times. Any lack of resistance in either direction will indicate the need for renewal, as will evidence of leakage of fluid.

Refitting

10 Refitting is a reversal of removal, but if a new unit is being installed, prime it first in a similar way to that described for testing.

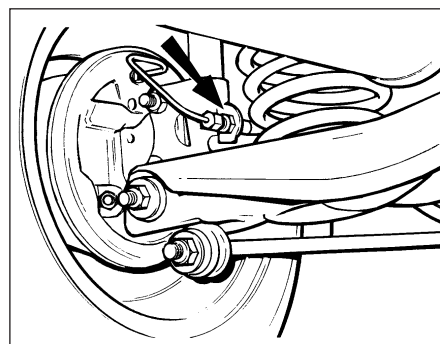
11 Rear shock absorbers (Van models) - removal, testing and refitting



Removal

1 Raise and support the rear of the vehicle on stands (see "Jacking and Vehicle Support"). Place a jack beneath the rear axle tube and just raise it slightly.

2 Disconnect the shock absorber lower mounting by unscrewing the nut and pivot bolt.



10.6 Brake hydraulic hose-to-shock absorber attachment (arrowed) - Saloon and Estate models

3 Unbolt the top mounting bracket from the body and withdraw the unit (see illustration).

4 Undo the nut and pivot bolt to separate the mounting bracket from the shock absorber.

Testing

5 Proceed as described in Section 10.

Refitting

6 Refitting is a reversal of removal, but if a new unit is being installed, prime it first in a similar way to that described for testing.

12 Rear tie-bar (Saloon and Estate models) - removal and refitting



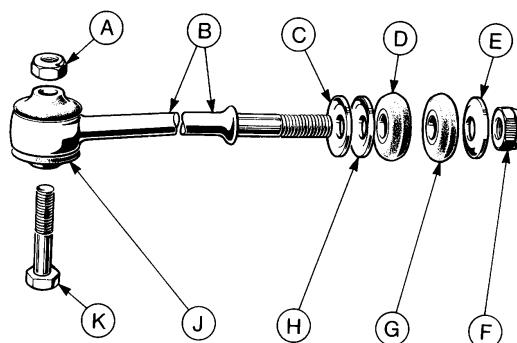
Removal

1 Before attempting to remove a tie-bar, note the location of all washers and bushes. These control the rear wheel alignment and they must be returned to their original locations.

2 Raise the rear of the vehicle and support it with stands (see "Jacking and Vehicle Support").

3 Unscrew and remove the pivot bolt from the eye at the front end of the tie-bar (see illustration).

12.3 Exploded view of the rear tie-bar mountings - Saloon and Estate models



- A Nut
- B Tie-bar
- C Washer (additional washers may be fitted)
- D Bush
- E Washer
- F Nut
- G Bush
- H Washer (additional washers may be fitted)
- J Bush
- K Pivot bolt



12.4 Tie-bar-to-stub axle carrier retaining nut (arrowed) - Saloon and Estate models

4 Unscrew the nut from the rear end of the tie-bar, take off the washers and bushes as the tie-bar is withdrawn and keep them in strict sequence for refitting (see illustration).

Refitting

5 Renewal of the tie-bar flexible bush is quite easily carried out using sockets or distance pieces and applying pressure in the jaws of a vice.

6 Refit the tie-bar by reversing the removal operations.

13 Rear roadspring (Saloon and Estate models) - removal and refitting

Removal

1 Raise the rear of the car and support it on stands (see "Jacking and Vehicle Support"). Remove the roadwheel.

2 Support the suspension lower arm by placing a jack beneath the spring seating.

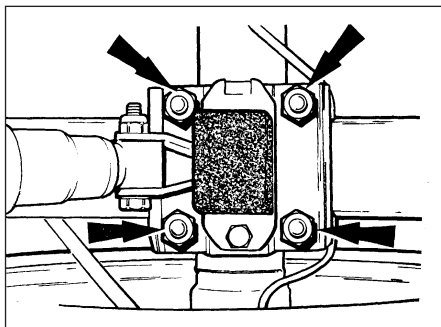
3 On models equipped with a rear anti-roll bar disconnect the bar from the shackles by levering them apart with a screwdriver (see illustration).

4 Undo the nut and remove the lower arm inboard pivot bolt (see illustration).

5 Slowly lower the jack beneath the arm and remove the spring and insulator pad.

Refitting

6 Refitting is the reverse sequence to



14.2 Rear roadspring U-bolt nuts (arrowed) - Van models



13.3 Anti-roll bar-to-lower arm shackle attachment (arrowed)

removal. If applicable the plastic sleeved end of the coil spring must be at the upper end when fitted. Tighten all nuts and bolts to the specified torque with the car standing on its roadwheels.

14 Rear roadspring (Van models) - removal and refitting

Removal

1 To remove the single leaf type rear roadspring from the Van, raise the rear of the vehicle and support it securely under the body members (see "Jacking and Vehicle Support"). Support the axle tube using a jack or stands.

2 Unscrew the spring U-bolt nuts and withdraw the bump rubber plate complete with shock absorber lower attachment (see illustration).

3 Disconnect the shackle from the rear end of the roadspring and pull the spring downward.

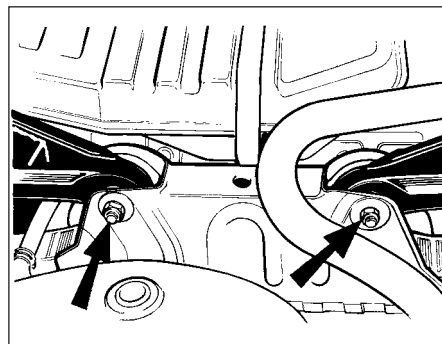
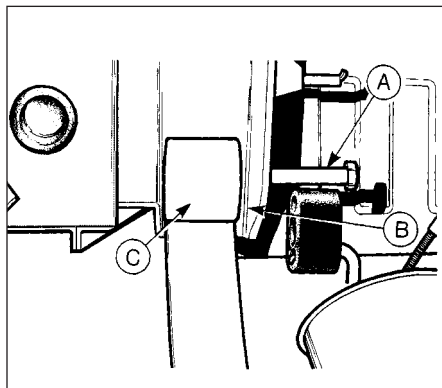
4 Unscrew and remove the spring front eye bolt and nut (see illustration).

5 Remove the spring from under the vehicle.

Refitting

6 Refit by reversing the removal operations, but do not tighten the nuts to the specified torque until the weight of the vehicle has been lowered onto the wheels.

7 On completion adjust the braking system light laden valve as described in Chapter 9.



13.4 Lower arm inboard pivot nuts and bolts (arrowed) - Saloon and Estate models

15 Rear suspension lower arm (Saloon and Estate models) - removal and refitting

Removal

1 Raise the rear of the car and support it on stands (see "Jacking and Vehicle Support").

2 On cars equipped with the anti-lock braking system, refer to Chapter 9 and remove the load apportioning valve adjusting bracket from the lower arm.

3 If an anti-roll bar is fitted, disconnect the shackles from the lower arm by levering them apart with a screwdriver (see illustration 13.3).

4 Support the lower arm using a jack located beneath the roadspring.

5 Undo the nut and remove the arm inboard pivot bolt.

6 Undo the nut, remove the outboard pivot through-bolt then lower the jack and remove the spring and insulator pad.

7 Withdraw the lower arm from the car.

Refitting

8 Refitting is the reverse sequence to removal, bearing in mind the following points:

- If applicable the plastic sleeved end of the coil spring must be at the upper end when fitted.
- Tighten all nuts and bolts to the specified torque with the car standing on its roadwheels.
- On cars equipped with the anti-lock braking system, refit the load apportioning valve adjusting bracket as described in Chapter 9.

14.4 Rear roadspring front eye bolt - Van models

- Pivot bolt
- Mounting bracket
- Spring eye

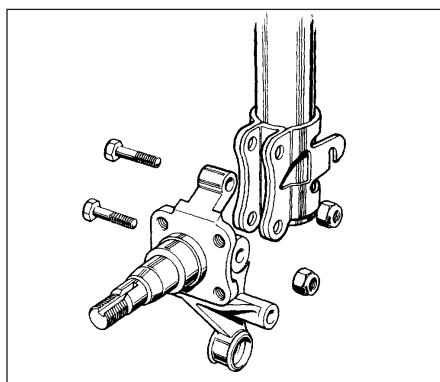
16 Rear stub axle carrier (Saloon and Estate models) - removal and refitting

Removal

- 1 Raise and support the rear of the car on stands (see "Jacking and Vehicle Support"). Remove the roadwheel.
- 2 Remove the rear hub as described in Section 9.
- 3 Remove the rear brake shoe assembly, as described in Chapter 9. You will also need to disconnect the brake fluid pipe at its connection to the wheel cylinder. Plug the pipe and cylinder connections to prevent fluid loss and the ingress of dirt.
- 4 Extract the handbrake cable through the backplate, then unscrew the four backplate retaining bolts and withdraw the backplate.
- 5 Position a jack under the lower arm and support it.
- 6 Undo the two nuts and remove the bolts securing the shock absorber to the stub axle carrier (see illustration).
- 7 Undo the nut and remove the lower arm outboard pivot through-bolt.
- 8 Accurately record the location and number of washers at the tie-bar attachment then undo the nut and withdraw the stub axle carrier.

Refitting

- 9 If the stub axle is damaged or worn excessively then it must be renewed.
- 10 Refitting is a reversal of the removal procedure, but note the following:
 - a) When reassembling the tie-bar to the stub axle ensure that the spacers, washers and bushes are correctly located (as noted during removal).
 - b) Do not fully tighten the suspension retaining nuts and bolts to their specified torque settings until the vehicle is lowered and standing on its roadwheels.
 - c) Refit and connect the brake assembly components, as given in Chapter 9. Leave



16.6 Rear stub axle and shock absorber attachment - Saloon and Estate models

bleeding the hydraulic circuit until after the hub and brake drum are refitted.
d) Adjust the hub bearings, as detailed in Section 8.

17 Rear axle tube (Van models) - removal and refitting

Removal

- 1 Raise the rear of the vehicle and support it on stands (see "Jacking and Vehicle Support"). Remove the rear roadwheels.
- 2 Support the axle tube on a jack preferably of trolley type.
- 3 Remove the rear hub as described in Section 9.
- 4 Disconnect the brake hydraulic pipes and hoses at the axle tube bracket. Plug the pipe and hose ends after removal.
- 5 Disconnect the brake pipe unions at the rear wheel cylinders then undo the four bolts each side and remove both rear brake backplates.
- 6 Undo the axle-to-roadspring retaining U-bolt nuts and remove the U-bolts.
- 7 Lower the axle tube to the ground while at the same time sliding the light laden valve link rod from its spacer tube. Remove the link rod and bush from the axle tube.
- 8 Withdraw the axle from under the vehicle.

Refitting

- 9 Refitting is the reverse sequence to removal bearing in mind the following:
 - a) Adjust the hub bearings as described in Section 8.
 - b) Tighten the U-bolt nuts to the specified torque with the weight of the vehicle on its roadwheels.
 - c) Bleed the brake hydraulic system and adjust the light laden valve as described in Chapter 9.

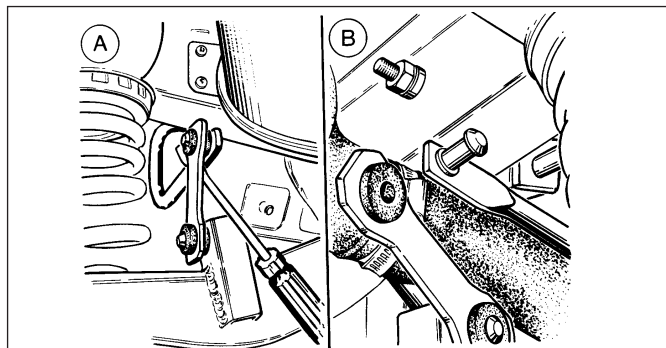
18 Rear anti-roll bar (Saloon and Estate models) - removal and refitting

Removal

- 1 Slacken the left-hand roadwheel bolts, raise and support the rear of the car on stands (see "Jacking and Vehicle Support"). Remove the roadwheel.
- 2 Lever the shackles from the right and left-hand suspension lower arms (see illustration).
- 3 Unbolt the anti-roll bar from the underbody, carefully noting the relative fixing locations.
- 4 Release the fuel lines from their securing clips. Support the fuel tank and remove the three tank mounting bolts. Carefully lower the tank on its support (see illustration).
- 5 Withdraw the anti-roll bar from the left-hand side of the vehicle.
- 6 To remove the rubber bushes from the anti-roll bar simply prise open the bush retainers with a screwdriver. Press the retainers together so that the fixing holes are in line when refitting.

Refitting

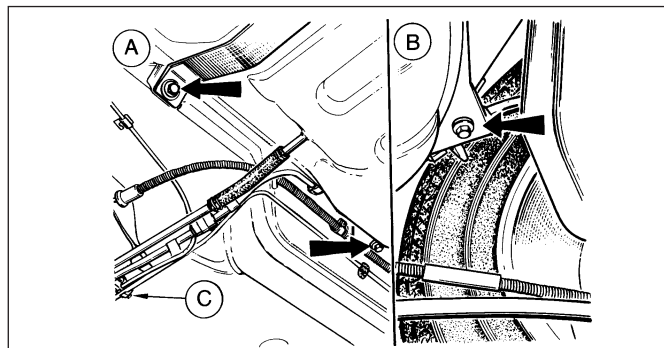
- 7 Refitting is a reversal of removal. The fuel tank must be bolted in position before securing the anti-roll bar. Ensure that the underbody fixings are refitted in their original locations.
- 8 Lubricate the shackle bushes with soap solution before reconnecting them to the lower arms.



18.2 Disconnecting the rear anti-roll bar shackles - Saloon and Estate models

A Left-hand side

B Right-hand side



18.4 Fuel tank attachment details

A Mounting bolts (arrowed)

B Mounting bolt (arrowed)

C Fuel line clips

19 Rear suspension angles - general

The rear wheel toe and camber angles are set in production and do not require checking under normal service conditions. Of the two, only the toe setting can be adjusted, the camber angle being fixed by production sizes and tolerances.

The only time that angles will need to be checked will be after an accident in which the rear of the car has suffered damage or where a rear end skid has caused a side impact on a rear roadwheel.

Severely worn components of the rear suspension can also cause the angles to be misaligned, in which case renewal of the defective components should rectify the suspension angles and alignment.

The actual settings have been revised a number of times as a result of component changes during the course of production and also to improve directional stability. The settings also vary according to model year, engine size and optional equipment, and to list all the settings would be beyond the scope of this manual. If in any doubt about the rear suspension angles, or if the rear tyre wear appears excessive it is recommended that the car be taken to a Ford dealer for accurate checking on optical alignment equipment.

20 Steering gear bellows - renewal



- 1 At the first indication of a split or grease leakage from the bellows, renew them.
- 2 Loosen off the roadwheel bolts, raise the front of the vehicle and support it on stands (see *Jacking and Vehicle Support*). Remove the roadwheels.
- 3 Measure and take note of the amount of thread on the tie-rod which is exposed (see illustration). This will ensure correct toe-setting on reassembly.
- 4 Loosen off the tie-rod outer ball-joint locknut.
- 5 Extract the split pin and remove the nut from the balljoint taper pin.



20.8 Bellows-to-rack and pinion housing wire type retaining clip (arrowed)



20.3 Steering tie-rod outer balljoint showing exposed threads (A) on tie-rod

- 6 Using a suitable balljoint extractor, separate the balljoint taper pin from the eye of the steering arm (see illustration).

- 7 Unscrew the balljoint from the end of the tie-rod, also the locknut. As a double check for correct repositioning of the tie-rod balljoint when reassembling, note the number of turns required to remove it.

- 8 Release the clip from the end of the damaged bellow and slide it from the rack and the tie-rod (see illustration).

- 9 When ordering the new bellows and retaining clips also specify the diameter of the tie-rod which will vary according to manufacture and can be checked with a ruler or calipers. This is important since if the wrong size bellows are fitted they will not seal or possibly be damaged on fitting.

- 10 If a damaged bellow has caused steering lubricant loss it will be necessary to drain any remaining lubricant and renew it. To do this turn the steering wheel gently to expel as much lubricant as possible from the rack housing. If the opposing bellow is not being renewed it is recommended that it is released from the rack housing to allow the old lubricant to be removed from that end, too.

- 11 Smear the narrow neck of the new bellows with grease and slide into position over the tie-rod, ensuring that the bellows are correctly located in the tie-rod groove on the outer bellow end (where applicable) (see illustration).

- 12 If new bellows are being fitted to the pinion



20.6 Releasing tie-rod balljoint using separator tool

- end of the rack, leave the bellows unclamped at this stage.

- 13 If the bellows are being fitted to the rack support bush end of the rack housing, clamp the inner end of the bellows.

- 14 Always use new screw-type clamps, never re-use the old factory-fitted wire type when securing the bellows.

- 15 Screw the locknut into position on the tie-rod, followed by the outer tie-rod balljoint. Screw the joint the exact number of turns noted during removal.

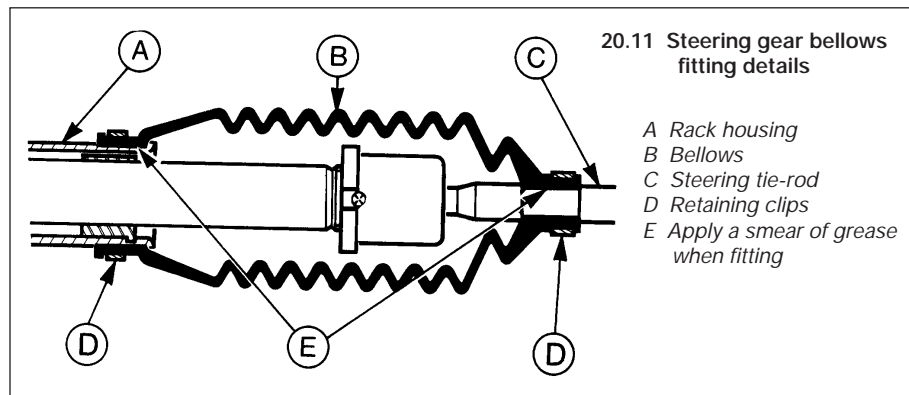
- 16 Connect the balljoint to the steering arm, tighten the nut to the specified torque and insert a new split pin to secure.

- 17 If applicable, add the correct quantity of the specified lubricant to the end of the steering rack (insert the grease into the bellows), then move the rack from lock-to-lock to assist the entry of the lubricant into the steering gear.

- 18 Where applicable, ensure that the fresh lubricant has worked its way into the steering gear, then tighten the bellow retaining clamp(s).

- 19 Refit the roadwheels and lower the vehicle to the ground. Settle the suspension by bouncing the front end.

- 20 Tighten the balljoint locknut and check the amount of tie-rod thread exposed. It should be as noted when dismantling and therefore provide the correct toe-setting, but in any case the alignment should really be checked at the earliest opportunity, as described in Section 27 or by your Ford dealer.





22.1a Steering wheel trim removal



22.1b Prising up the steering wheel horn push . . .



22.1c . . . followed by the contact plate

21 Steering tie-rod outer balljoint - renewal



1 If as the result of inspection the tie-rod outer balljoints are found to be worn, remove them as described in Section 20.

2 When the balljoint nuts are unscrewed, it is sometimes found that the balljoint taper pin turns in the eye of the steering arm to prevent the nut from unscrewing. Should this happen, apply pressure to the top of the balljoint using a length of wood as a lever to seat the taper pin while the nut is unscrewed. When this condition is met with, a balljoint extractor is unlikely to be required to free the taper pin from the steering arm.

3 With the tie-rod removed, wire brush the threads of the tie-rod and apply grease to them.

4 Screw on the new balljoint to take up a position similar to the original. Due to manufacturing differences, the fitting of a new component will almost certainly mean that the front wheel alignment will require some adjustment. Check this as described in Section 27.

5 Connect the balljoint to the steering arm, as described in Section 20.

22 Steering wheel - removal and refitting



Removal

1 According to model, either pull off the steering wheel trim, prise out the insert which carries the Ford motif at the centre, or carefully prise up and lift off the horn push followed by the contact plate (see illustrations).

2 Insert the ignition key and turn it to position I.

3 Hold the steering wheel from turning and have the front roadwheels in the straight-ahead attitude. Unscrew the steering wheel retaining nut using a socket and extension.

4 Withdraw the steering wheel from the shaft. No great effort should be necessary, as the wheel is located on a hexagonal-section shaft, which does not normally cause the binding associated with splined shafts. However, if difficulty is experienced, a puller may be used

to withdraw the wheel - take adequate precautions to avoid damage to the finish.

5 Where applicable note the steering shaft direction indicator cam which has its peg uppermost.

Refitting

6 Refitting is the reverse sequence to removal. Ensure that the direction indicator switch is in the neutral position (this will avoid the possibility of damage to the self-cancelling mechanism). Check that the roadwheels are still in the straight-ahead position and locate the steering wheel with the larger section between the spokes uppermost. Tighten the steering wheel retaining nut to the specified torque.

23 Steering wheel - alignment

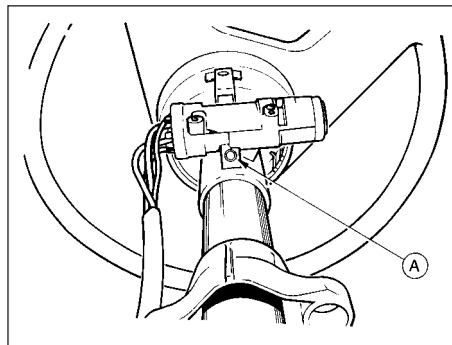


1 Owing to the fact that the steering wheel is located on a hexagon shaped steering shaft, it may be difficult to obtain perfect steering wheel alignment due to lack of fine adjustment.

2 It is therefore acceptable to adjust the tie-rods to give unequal lengths.

3 Check that the front roadwheels are in the straight-ahead position and that the toe setting is as specified.

4 If the steering wheel is more than 30° out of alignment, remove it and centralise it as much as possible on its shaft.



24.6a Steering column lock assembly shear bolt (A)
Pre-1986 version shown

5 To adjust the steering wheel through a small angle, carry out the following operations.

6 Release the tie-rod balljoint locknuts.

7 Turn one tie-rod clockwise and the opposite one anti-clockwise by the identical amount. For every 1° of steering wheel angular error, turn each tie-rod through 30°.

8 Once the steering wheel has been centralised (front wheels in straight-ahead position), retighten the tie-rod balljoint locknuts.

9 Although the toe setting should not have altered, check the front wheel alignment as described in Section 27.

24 Steering column lock - removal and refitting

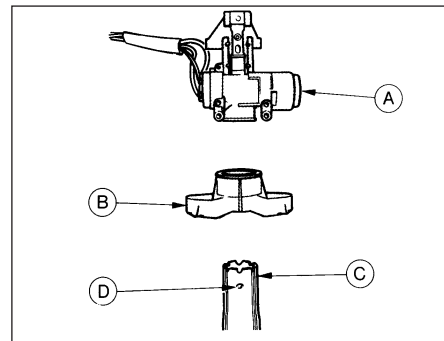


Note: For ignition switch removal see Chapter 5. A new shear-bolt will be required on refitting.

Removal

1 To remove the ignition switch/column lock, the shear-head bolt must be drilled out.

2 Access for drilling can only be obtained if the steering column is lowered. To do this, remove the shrouds from the upper end of the column by extracting the fixing screws. Disconnect the battery earth lead.



24.6b Steering column lock components - pre-1986 models

A Lock housing
B Upper clamp
C Column tube

D Shear bolt indentation



25.6a Removing the steering column upper . . .



25.6b . . . and lower shrouds on a pre-1986 model . . .



25.6c . . . and on a post-1986 version

3 Unscrew the bonnet release lever mounting screw and position the lever to one side.

4 Disconnect the steering column clamps. The lower one is of bolt and nut type, while the upper one is of stud and nut design.

5 Lower the shaft/column carefully until the steering wheel rests on the seat cushion.

6 Centre-punch the end of the shear-bolt which secures the steering column lock and then drill it out. Remove the ignition switch/column lock (see illustrations).

Refitting

7 When refitting the lock, check for correct operation and then tighten the new shear-bolt securing bolt until its head breaks off.

8 Raise the steering column and reconnect the clamps.

9 Refit the bonnet release lever and the column shrouds.

10 Reconnect the battery.

25 Steering column - removal, overhaul and refitting

Removal

1 Disconnect the battery negative terminal.

2 Turn the ignition key and rotate the steering wheel to bring the front roadwheels to the straight-ahead position.

3 Working within the engine compartment, unscrew and remove the pinch-bolt which holds the steering shaft to the splined pinion shaft of the rack-and-pinion steering gear.



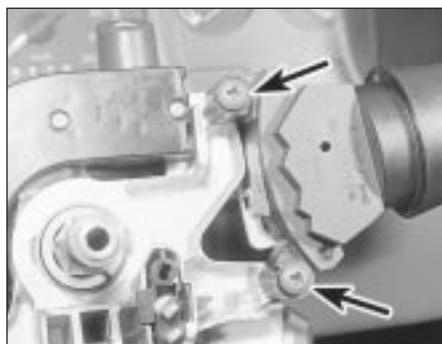
25.7 Removing the facia lower panel



25.8 Removing the bonnet release lever



25.9a Steering column switch removal on a pre-1986 model . . .



25.9b . . . and switch retaining screw locations (arrowed) on post-1986 versions



25.11a Steering column lower mounting clamp bolts (arrowed)

4 Remove the steering wheel, as described in Section 22.

5 Remove the direction indicator cam from the top end of the steering shaft (where fitted).

6 Extract the fixing screws and remove the upper and lower shrouds from the upper end of the steering column (see illustrations).

7 Remove the insulation panel from the lower part of the facia (see illustration).

8 Extract the screw, remove the bonnet release lever mounting and place it to one side (see illustration).

9 Take out the fixing screws and remove the switches from the steering column (see illustrations).

10 Disconnect the wiring harness multi-plug at the side of the column.

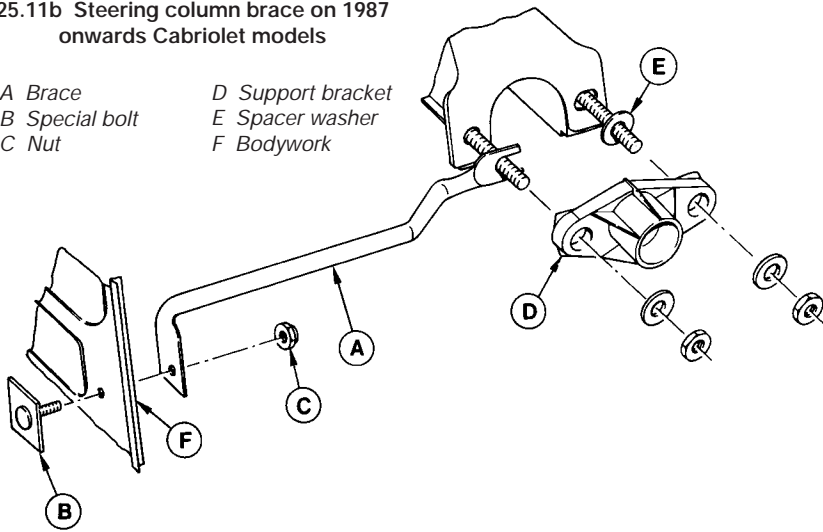
11 Unbolt the upper and lower clamps from the steering column and then withdraw the column/shaft into the vehicle. If any difficulty is experienced in separating the lower shaft from the pinion gear, prise the coupling open very slightly with a screwdriver. Note that on certain models (including all Cabriolets), an additional bracing bracket may be fitted between the column support bracket and the body (see illustrations).

Overhaul

12 Wear in the column bearings can be rectified by renewing them. Access to them is obtained by extracting the tolerance ring from the upper end of the column and then withdrawing the shaft from the lower end of the column. The lower bearing and spring will

25.11b Steering column brace on 1987 onwards Cabriolet models

- A Brace
B Special bolt
C Nut
D Support bracket
E Spacer washer
F Bodywork



come with it. Make sure that the steering column lock is unlocked before withdrawing the shaft.

13 If the upper bearing is to be renewed, first remove the lock assembly by drilling out the shear-head bolt. The upper bearing may now be levered out of its seat.

14 Commence reassembly by tapping the new upper bearing into its seat in the lock housing. Refit the column upper clamp and bush.

15 Locate the column lock on the column tube and screw in a new shear-head bolt until its head breaks off.

16 Insert the conical spring into the column tube so that the larger diameter end of the spring is against the lowest convolution of the collapsible section of the column tube.

17 Slide the lower bearing onto the shaft so that its chamfered edge will mate with the corresponding one in the column lower bearing seat when the shaft is installed.

18 Insert the shaft into the lower end of the steering column. Make sure that the lock is unbolted and pass the shaft up carefully through the upper bearing.

19 Fit the bearing tolerance ring and waved washer.



26.6a Steering gear-to-bulkhead mounting retaining bolt and locktab (arrowed)

Refitting

20 Fit the direction indicator cancelling cam to the top of the shaft, making sure that the peg will be uppermost when the column is in the in-car attitude (where fitted).

21 Fit the steering wheel to the shaft, screwing on the nut sufficiently tightly to be able to pull the lower bearing into the column tube with the bearing slots correctly aligned with the pegs on the tube.

22 Refit the column, making sure to engage the coupling at its lower end with the splined pinion shaft.

23 Bolt up the column upper and lower clamps.

24 Reconnect the wiring harness multi-plug.

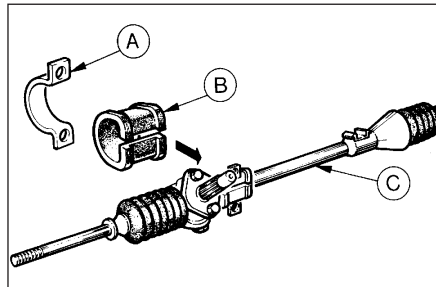
25 Refit the combination switches to the steering column.

26 Reconnect the bonnet release lever.

27 Fit the column shrouds.

28 Check that the steering wheel is correctly aligned (wheels in the straight-ahead position). If not, remove the steering wheel and realign it (see also Section 23).

29 Tighten the steering wheel nut to the specified torque and then insert the motif or horn push into the centre of the steering wheel.



26.6b Steering gear mounting details

- A Clamp
B Bush
C Steering gear

30 Refit the insulation panel to the lower facia.

31 Tighten the coupling pinch-bolt at the base of the steering shaft.

32 Reconnect the battery negative terminal.

26 Steering gear - removal, overhaul and refitting

Removal

Note: New tie-rod balljoint split-pins must be used on refitting.

1 Set the front roadwheels in the straight-ahead position.

2 Raise the front of the vehicle and fit stands (see *Jacking and Vehicle Support*). Remove the front roadwheels.

3 Working under the bonnet, remove the pinch-bolt from the coupling at the base of the steering column shaft.

4 Extract the split pins from the tie-rod balljoint taper pin nuts, unscrew the nuts and remove them.

5 Separate the balljoints from the steering arms using a suitable separator tool.

6 Flatten the locktabs on the steering gear securing bolts and unscrew and remove the bolts. Withdraw the steering gear downwards to separate the coupling from the steering shaft and then take it out from under the front wing (see illustrations).

Overhaul

7 Examine the steering gear assembly for signs of wear or damage, and check that the rack moves freely throughout the full length of its travel, with no signs of roughness or excessive free play between the steering gear pinion and rack. It is possible to overhaul the steering gear assembly housing components, but this task should be entrusted to a Ford dealer. It is likely to be cheaper to obtain an exchange reconditioned steering gear assembly (which will be supplied complete with tie-rods) than to overhaul a worn or damaged assembly. The only components which can be renewed easily by the home mechanic are the steering gear bellows, and the tie-rod outer balljoints. Renewal procedures for the bellows and tie-rod outer balljoints are given in Sections 20 and 21 respectively.

Refitting

8 If a new steering gear assembly is being installed, the tie-rods balljoints may have to be removed from the original unit and screwed onto the new tie-rods to approximately the same setting. If a note was not made of the position of the original tie-rod balljoints on their rods, inspection of the threads will probably indicate their original location. In any event it is important that the new balljoints are screwed on an equal amount at this stage.

9 Make sure that the steering gear is centred. Do this by turning the pinion shaft to full lock in one direction and then count the number of turns required to rotate it to the opposite lock. Now turn the splined pinion shaft through half the number of turns just counted.

10 Check that the roadwheels and the steering wheel are in the straight-ahead attitude, offer up the steering gear and connect the shaft coupling without inserting the pinch-bolt.

11 Bolt up the gear housing and lock the bolts with their lockplate tabs.

12 Reconnect the tie-rod balljoints to the steering arms. Tighten the securing nuts to the specified torque setting and fit new split pins to secure.

13 Tighten the coupling pinch-bolt to the specified torque. Refit the roadwheels and lower the vehicle to the floor.

14 If the tie-rods were disturbed or if a new assembly was installed, check and adjust the wheel alignment, as described in Section 27.

27 Steering angles and wheel alignment



1 Accurate front wheel alignment is essential to good steering and for even tyre wear. Before considering the steering angles, check that the tyres are correctly inflated, that the roadwheels are not buckled, the hub bearings are not worn or incorrectly adjusted and that the steering linkage is in good order.

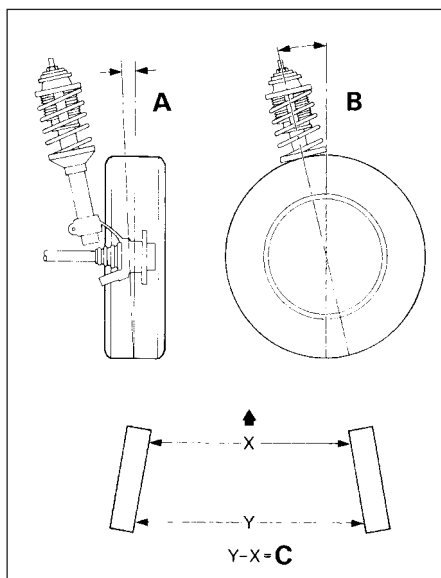
2 Wheel alignment consists of four factors (see illustration):

Camber is the angle at which the roadwheels are set from the vertical when viewed from the front or rear of the vehicle. Positive camber is the angle (in degrees) that the wheels are tilted outwards 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 vehicle. Positive castor is indicated when the steering axis is inclined towards the rear of the vehicle at its upper end.

Steering axis inclination is the angle, when viewed from the front or rear of the vehicle, between the vertical and an imaginary line drawn between the upper and lower suspension swivel balljoints or upper and lower strut mountings.

Toe is the amount by which the distance between the front inside edges of the roadwheel rims differs from that between the rear inside edges. If the distance at the front is less than that at the rear, the wheels are said



27.2 Wheel alignment diagram

- A Camber
- B Castor
- C Toe setting

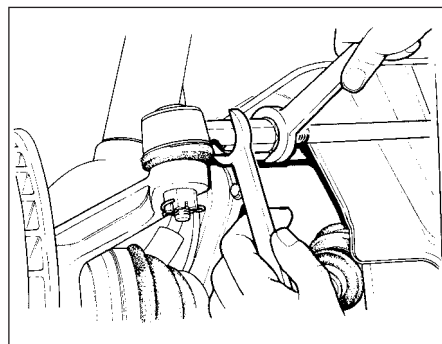
to toe-in. If the distance at the front inside edges is greater than that at the rear, the wheels toe-out.

3 Due to the need for precision gauges to measure the small angles of the steering and suspension settings, it is preferable to leave this work to your dealer. Camber and castor angles are set in production and are not adjustable. If these angles are ever checked and found to be outside specification then either the suspension components are damaged or distorted, or wear has occurred in the bushes at the attachment points.

4 If you wish to check the toe setting yourself, first make sure that the lengths of both tie-rods are equal when the steering is in the straight-ahead position. This can be measured reasonably accurately by counting the number of exposed threads on the tie-rod adjacent to the balljoint assembly (refer to Section 23).

5 Adjust, if necessary, by releasing the locknut from the balljoint assembly and the clamp at the small end of the bellows (see illustration).

6 Obtain a tracking gauge. These are available in various forms from accessory stores, or one can be fabricated from a length of steel tubing, suitably cranked to clear the sump and bellhousing, and having a setscrew and locknut at one end.



27.5 Slackening tie-rod balljoint locknut for toe setting adjustment

7 With the gauge, measure the distance between the two inner rims of the roadwheels (at hub height) at the rear of the wheel. Push the vehicle forward to rotate the wheel through 180° (half a turn) and measure the distance between the wheel inner rims, again at hub height, at the front of the wheel. This last measurement should differ from the first one by the specified toe-in/toe-out (see "Specifications").

8 Where the toe setting is found to be incorrect, release the tie-rod balljoint locknuts and turn the tie-rods by an equal amount. Only turn them through a quarter turn at a time before re-checking the alignment. Do not grip the threaded part of the tie-rod during adjustment and make sure that the bellows outboard clip is released, otherwise the bellows will twist as the tie-rod is rotated. When each tie-rod is viewed from the rack housing, turning the rods clockwise will increase the toe-out. Always turn the tie-rods in the same direction when viewed from the centre of the vehicle, otherwise they will become unequal in length. This would cause the steering wheel spoke alignment to alter and also cause problems on turning with tyre scrubbing.

9 On completion of adjustment, tighten the tie-rod balljoint locknuts without altering the setting of the tie-rods. Hold the balljoint assembly at the mid-point of its arc of travel (flats are provided on it for a spanner) while the locknuts are tightened.

10 Finally, tighten the bellows clamps.

11 For rear wheel alignment refer to Section 19.