

**SELF LOCKING NUTS**

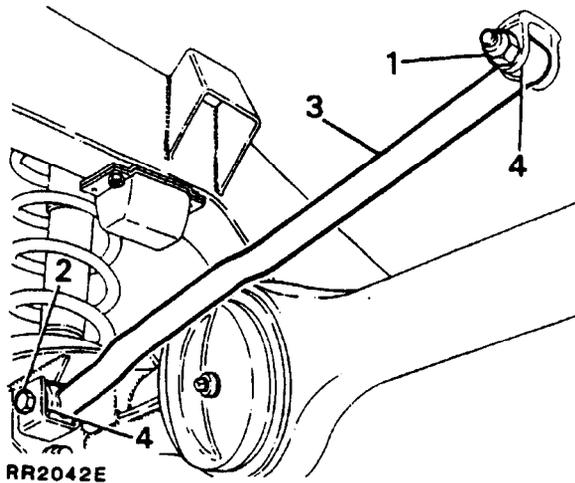
Many steering and suspension items are secured using self locking nuts. Where self locking nuts have been removed, they **MUST** be replaced with new items of the correct type.

**PANHARD ROD**

**Remove and refit**

**Removing**

1. Working underneath the vehicle remove the fixings at the mounting arm.
2. Remove the fixings at the axle bracket.
3. Withdraw the Panhard rod.
4. Using a suitable hydraulic or bench press and a piece of metal tubing slightly smaller than the outside diameter of the bush, press out the rubber mounted bushes. Ensure the steel tubing locates on the outer edge of the bush and not on the rubber inner.



**Refitting**

5. Fit replacement bushes centrally in the rod.

**CAUTION:** When pressing in the new bushes ensure that pressure is applied to the outer edge of the bush only and not to the rubber inner.

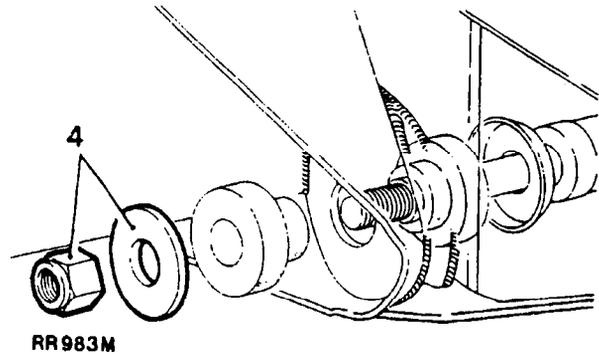
6. Reverse 1 to 4. Tighten the fixings to the correct torque (see section 06-Torque values).

**RADIUS ARM**

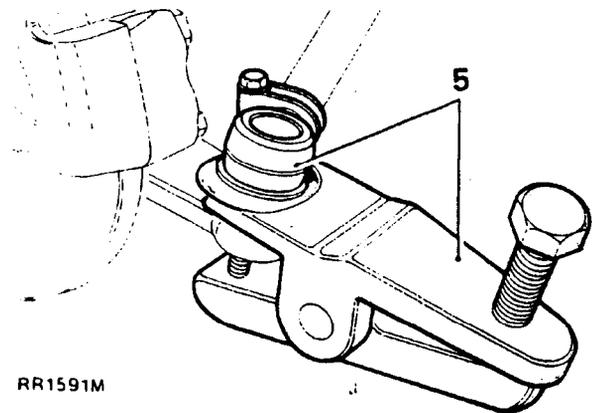
**Remove and refit**

**Removing**

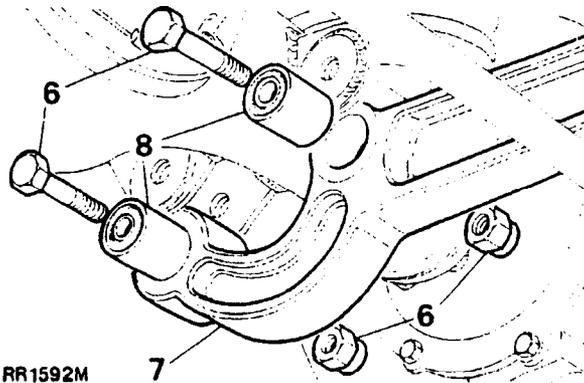
1. Loosen the road wheel retaining nuts.
2. Raise the front of the vehicle using a suitable hydraulic floor jack. Support chassis on suitable stands and remove the wheel, (remove both front wheels only if removing both radius arms).
3. Support the front axle weight **using the hydraulic floor jack**.
4. Remove the fixings - radius arm to chassis side member.



5. Disconnect the track rod at the ball joint, using a suitable extractor.
6. Remove the fixings, radius arm to axle.
7. Lower the radius arm front end to clear the axle and remove it from the vehicle.



Continued



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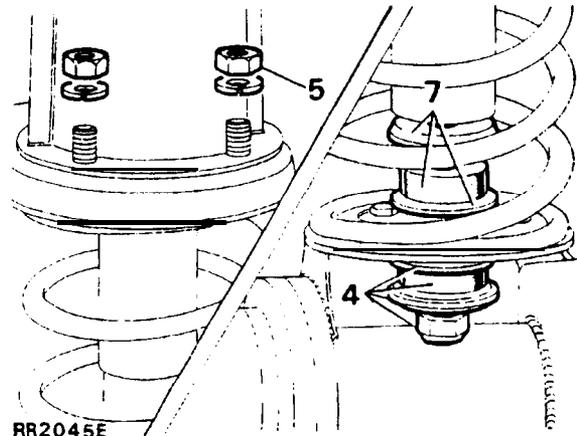
8. Using a suitable hydraulic or bench press and a piece of metal tubing slightly smaller than the outside diameter of the bush, press out the rubber mounted bushes. Ensure the steel tubing locates on the outer edge of the bush and not on the rubber inner.

**Refitting**

9. Fit the replacement bushes centrally in the arm.

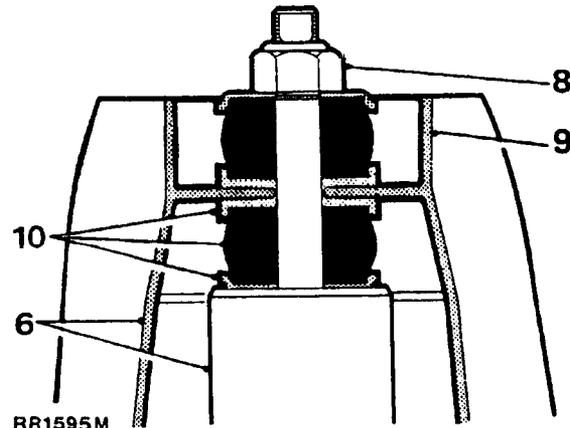
**CAUTION:** When pressing in the new bushes ensure that pressure is applied to the outer edge of the bush only and not to the rubber inner.

10. Reverse 1 to 7. Tighten the fixings to the correct torque (see section 06-Torque values).



RR2045E

4. Remove the shock absorber lower fixing and withdraw the cupwasher, rubber bush and seating washer.
5. Remove the four shock absorber bracket fixings.
6. Withdraw the shock absorber and bracket complete.



RR1595M

7. Withdraw the lower seating washer, rubber bush and cupwasher.
8. Remove the fixings, shock absorber to mounting bracket.
9. Withdraw the mounting bracket.
10. Lift off the top seating washer, rubber bush and cupwasher.

**Refitting**

11. Reverse instructions 1 to 10.

**FRONT SHOCK ABSORBER**

**Remove and refit**

**Removing**

1. Loosen the road wheel retaining nuts.
2. Raise the front of the vehicle using a suitable hydraulic floor jack. Support the chassis on suitable stands and remove the road wheel. (Remove both front wheels only if removing both shock absorbers).
3. Support the front axle weight using the hydraulic floor jack.

### FRONT ROAD SPRING

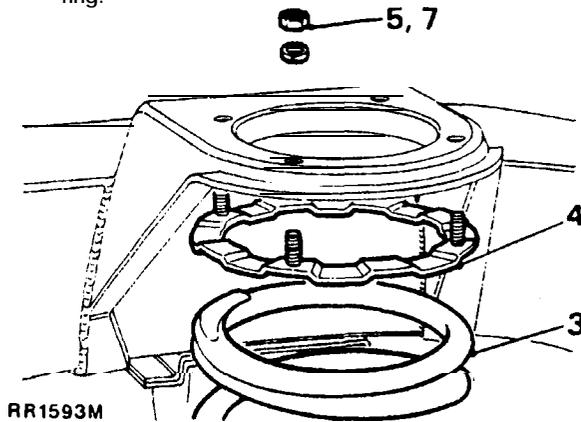
Remove and refit

Removing

1. Remove the front shock absorber.

**CAUTION:** During the following procedure avoid over stretching the brake hoses. If necessary, loosen the hose connector locknuts to allow the hoses to follow the axle.

2. Lower the axle sufficient to free the road spring.
3. Withdraw the road spring.
4. Withdraw the shock absorber bracket securing ring.



Refitting

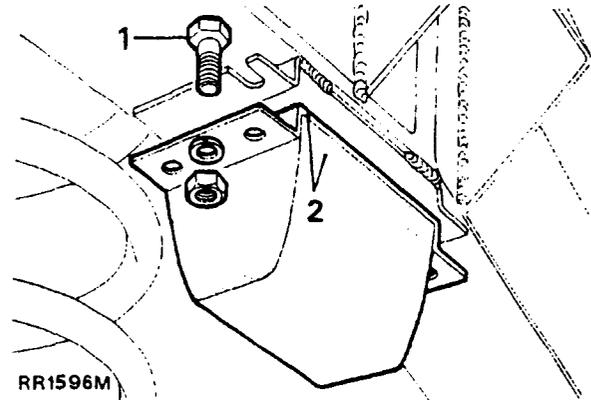
5. Fit the shock absorber bracket retaining ring. Retain in position with a nut.
6. Reverse 2 and 3.
7. Remove the nut retaining the securing ring.
8. Fit the front shock absorber.

### BUMP STOP

Remove and refit

Removing

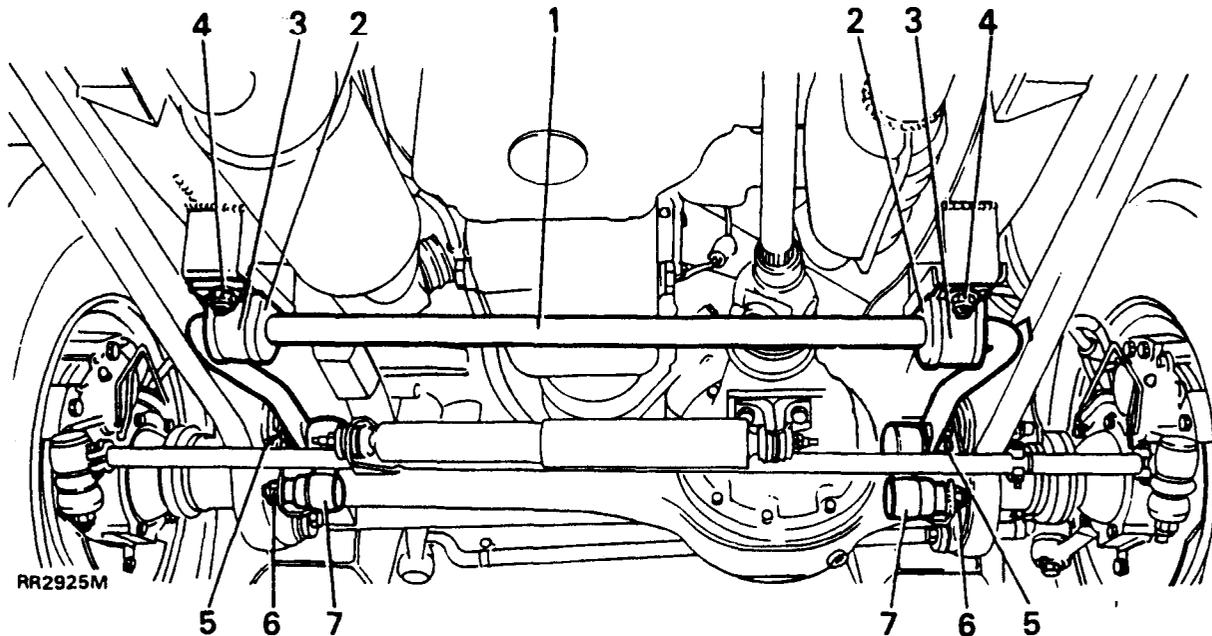
1. Remove the fixings.
2. Withdraw the bump stop assembly.



Refitting

3. Position the fixing bolts in the slots in the chassis brackets.
4. Fit the bump stop assembly.

## ANTI-ROLL BAR ASSEMBLY FRONT



## KEY

- |                      |                                   |
|----------------------|-----------------------------------|
| 1. Anti-roll bar     | 5. Nut and washer                 |
| 2. Rubber bush       | 6. Castellated nut and cotter pin |
| 3. Strap             | 7. Ball joint link arm            |
| 4. Nut, bolt, washer |                                   |

## ANTI-ROLL BAR FRONT

## Remove and refit

## Remove

1. Mark for reassembly position of rubber bushes on the anti-roll bar.
2. Remove the four nuts, bolts and washers securing the two bush straps.
3. Remove the nuts, bolts, washers and rubber bushes from the ball joint links and remove anti-roll bar.

## Refit

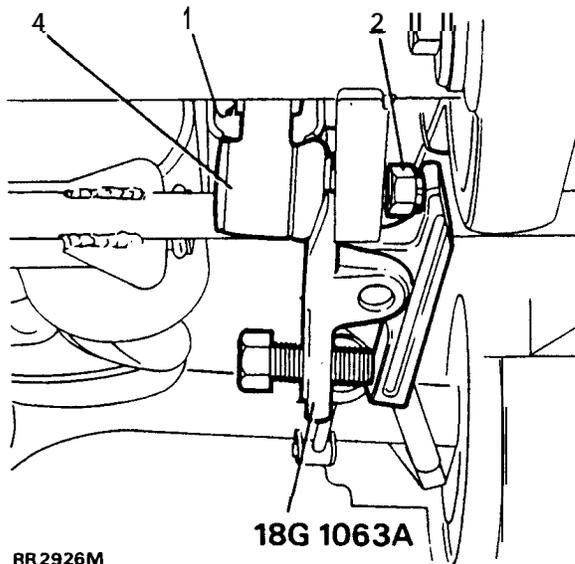
4. Position bushes on the anti-roll bar. Ensure the split points towards axle.
5. Fit the anti-roll bar with the two straps. To ensure correct fit the angled sides of the bar should point down as shown. Loosely fit the bolts washers and nyloc nuts.
6. Fit bolt washers and rubber bushes. Using new nuts fit anti-roll bar to ball joint links. Tighten to the correct torque.
7. Tighten to the correct torque the nuts securing the straps.

### ANTI-ROLL BAR BALL JOINT LINKS-FRONT

#### Remove and refit

##### Remove

1. Remove the two nuts, bolts, washers and rubber bushes from the ball joint links.
2. Remove cotter pin and loosen castellated nut a few turns.
3. Release ball joint using special tool 18G 1063A as shown.
4. Remove castellated nut and ball joint link.



##### Refit

5. Fit ball joint link and castellated nut. Ensure the ball joint link arm points up. Tighten to the correct torque and fit new cotter pin.
6. Align anti-roll bar to ball joint links.
7. Fit bolts, washers and rubber bushes using new self locking nuts secure anti-roll bar to ball joint links. Tighten to the correct torque.

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**SELF LOCKING NUTS**

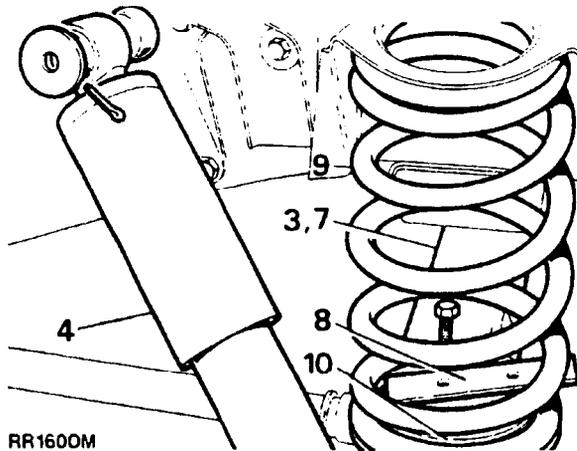
Many steering and suspension items are secured using self locking nuts. Where self locking nuts have been removed, they **MUST** be replaced with new items of the correct type.

**REAR ROAD SPRING**

**Remove and refit**

**Removing**

1. Loosen the rear road wheel retaining nuts.
2. Raise the rear of the vehicle using a suitable hydraulic floor jack. Support the chassis on stands and remove the wheels.
3. Support the rear axle weight with the floor jack.
4. Disconnect the shock absorbers at one end.



RR1600M

5. Position a suitable coil spring compressor correctly on the road spring.
6. Compress the spring evenly to facilitate removal.
7. Lower the axle sufficient to free the road spring from the upper seat.

**CAUTION:** Avoid lowering the axle further than necessary otherwise the rear brake flexible hose will be damaged.

8. Remove the spring retainer plate.
9. Withdraw the road spring.
10. Lift off the spring seat.

**Refitting**

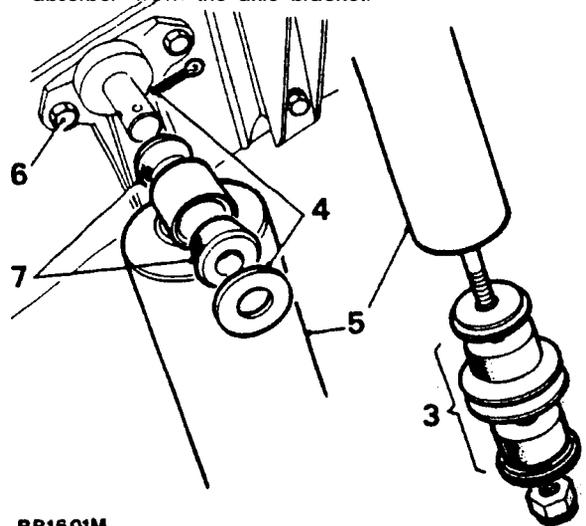
11. Reverse 1 to 10. Ensure that the cotter pin securing the top shock absorber mounting is located in the inboard hole.

**REAR SHOCK ABSORBER**

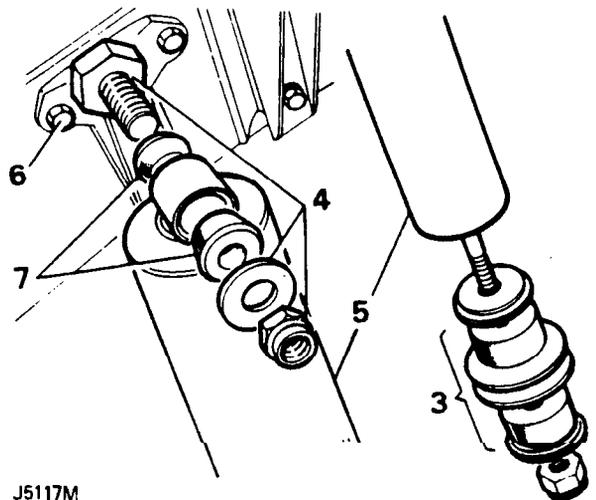
**Remove and refit**

**Removing**

1. Loosen the road wheel retaining nuts and raise the rear of the vehicle using a suitable hydraulic floor jack.
2. Support the chassis on stands. Remove the road wheels and support the rear axle weight with the floor jack.
3. Remove the fixings and withdraw the shock absorber from the axle bracket.



RR1601M



J5117M

4. Remove upper fixings.

NOTE: J511M shows 1990 Model Year top damper fixing.

5. Withdraw the shock absorber.
6. If required, remove the mounting bracket at the chassis side member.
7. If required, lift out the mounting rubbers at the upper end.

#### Refitting

8. Reverse items 7 and 6 as applicable.
9. Reverse items 1 to 5. Vehicles up to 1990 Model Year when fitting the top shock absorber fixings compress the mounting rubbers and locate the cotter pin in the INBOARD hole. The outer hole is NOT designed for this purpose.

#### LEVELLING UNIT

##### Functional check

A Boge Hydromat levelling unit is located in the centre of the rear axle.

When the vehicle is unladen the levelling unit has little effect. The unit is self-energising and hence the vehicle has to be driven before the unit becomes effective, the time taken for this to happen being dependent upon the vehicle load, the speed at which it is driven and the roughness of the terrain being crossed.

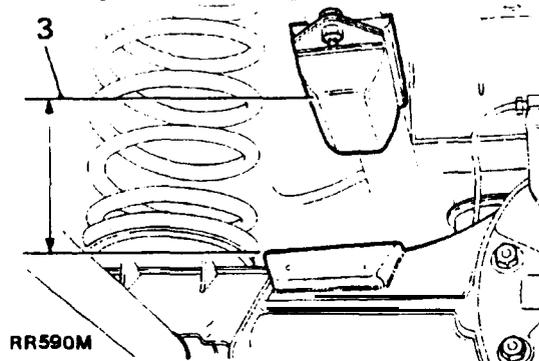
If the vehicle is overloaded the unit will fail to level fully and more frequent bump stop contact will be noticed.

Should the vehicle be left for a lengthy period, e.g. overnight, in a laden condition, it may settle. This is due to normal internal fluid movement in the unit and is not detrimental to the unit performance.

Before carrying out the checks below, verify that the vehicle is being operated within the specified maximum loading capabilities. If the levelling unit is then believed to be at fault, the procedure below should be followed.

1. Check the levelling unit for excessive oil leakage and if present the unit must be changed. Slight oil seepage is permissible.

2. Remove excessive mud deposits from underneath the vehicle and any heavy items from inside the vehicle that are not part of the original equipment.
3. Measure the clearance between the rear axle bump pad and the bump stop rubber at the front outer corner on both sides of the vehicle. The average clearance should be in excess of 67mm (2.8 in). If it is less than this figure remove the rear springs and check their free length against the 'Road Spring Data'. Replace any spring whose free length is more than 20mm (0.787 in) shorter than the figure given. If after replacing a spring the average bump clearance is still less than 67mm (2.8 in), replace the levelling unit.



4. With the rear seat upright, load 450 kg (992 lb) into the rear of the vehicle, distributing the load evenly over the floor area. Check the bump stop clearance, with the driving seat occupied.
5. Drive the vehicle for approximately 5 km (3 miles) over undulating roads or graded tracks. Bring the vehicle to rest by light brake application so as not to disturb the vehicle loading. With the driving seat occupied, check the bump stop clearance again.
6. If the change in clearance is less than 20mm (0.787 in) the levelling unit must be replaced.

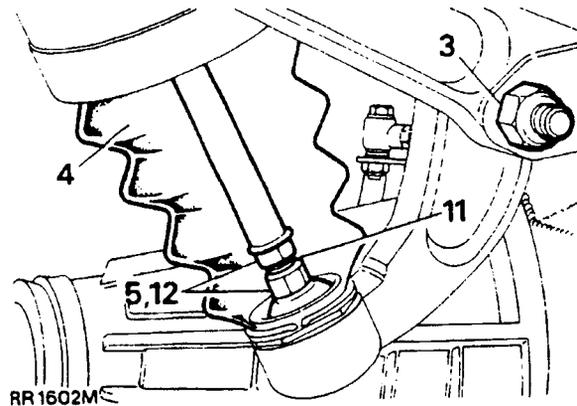
**LEVELLING UNIT**

Remove and refit

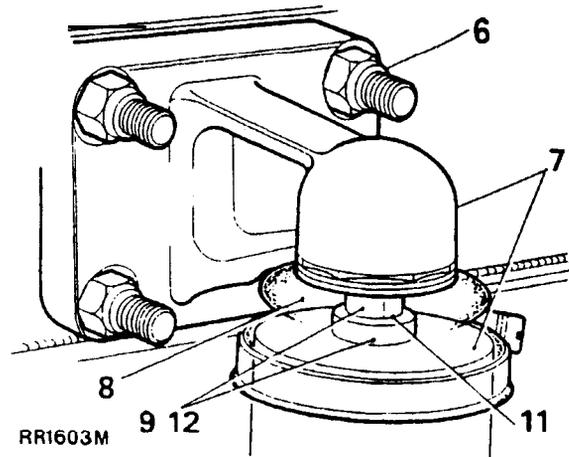
Removing

**WARNING:** The levelling unit contains pressurized gas and must not be dismantled nor the casing screws removed. Repair is by replacement of complete unit only.

1. Raise the rear of the vehicle using a suitable hydraulic floor jack. Support the chassis on stands.
2. Support the axle weight using the floor jack.
3. Disconnect the suspension upper links at the pivot bracket.



4. Ease up the lower boot.
5. Unscrew the lower ball joint at the levelling unit push rod, using thin jawed wrenches.
6. Remove the top bracket fixings at the cross member.
7. Withdraw the levelling unit and top bracket complete.
8. Ease back the upper boot.
9. Unscrew the upper ball joint at the levelling unit, using thin jawed wrenches.
10. Withdraw the upper and lower boots and their retaining spring rings.



Refitting

11. Coat the ball pin threads with 'Loctite' grade CVX or suitable equivalent sealant.
12. Reverse items 1 to 10. Do not fully tighten the fixings until all items are in their fitted position. Finally tighten to the correct torque (see section 06-Torque values).

**LEVELLING UNIT BALL JOINTS**

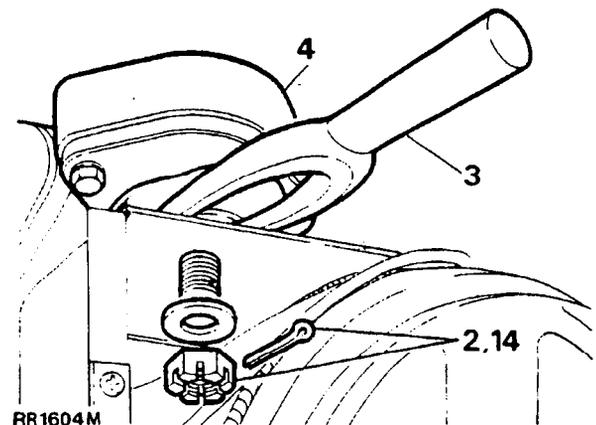
Remove and refit

Service tools:

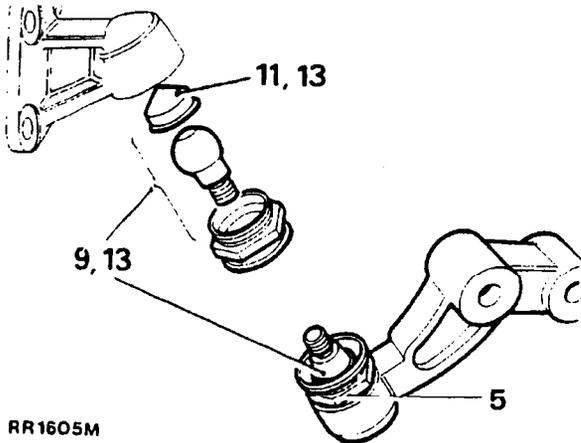
R01006 Extractor for axle bracket ball joint

Removing

1. Remove the levelling unit.
2. Remove the cotter pin and nut at the rear axle bracket.
3. Extract the ball pin from the axle bracket using Extractor RO1006.



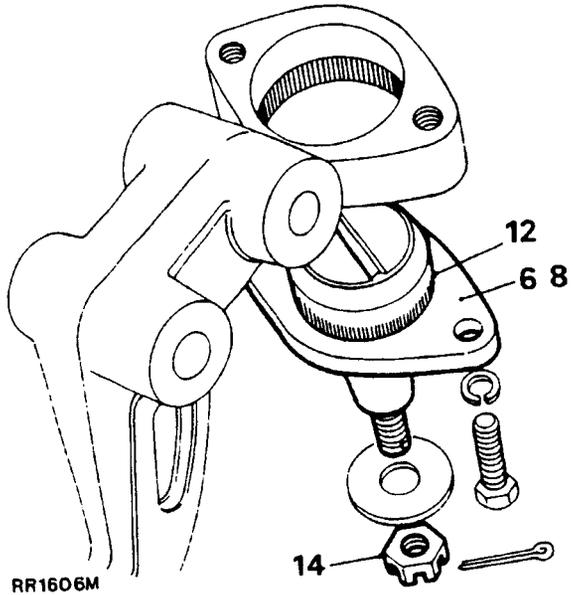
4. Withdraw the pivot bracket complete with ball joints.
5. Unscrew the ball joint assembly for the levelling unit.
6. Remove the ball joint assembly from the axle bracket.



7. Replacement ball joints are supplied as complete assemblies, less fixings, and are pre-packed with grease.
8. The ball joint for the axle bracket must not be dismantled.
9. The ball joints for the levelling unit may be dismantled and cleaned if required.
10. Pack the ball joint with Dextagrease GP or an equivalent grease when assembling.
11. Ensure that the ball seating is square in its housing before refitting.

Refitting

12. Press the knurled ball joint into the pivot bracket.
13. Screw the ball joints for the levelling unit into the mounting brackets. If the ball joints do not screw in easily and fully, remove and the assemblies ensuring that the plastic seats do not jam in the housings. Tighten to the correct torque (see section 06-Torque values).



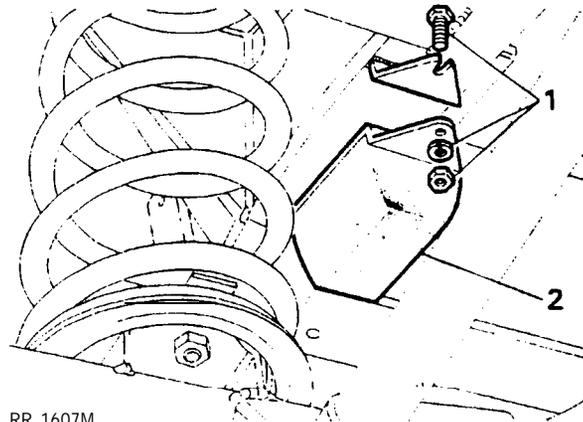
14. Fit the pivot bracket complete with ball joints to the rear axle. Tighten to the correct torque (see section 06-Torque values).
15. Fit the levelling unit.

BUMP STOP

Remove and refit

Removing

1. Remove the fixings.
2. Withdraw the bump stop assembly.



Refitting

3. Position the fixing bolts in the slots in the chassis brackets.
4. Fit the bump stop assembly, position the shoulder on the carrier to suit the chassis configuration.

**UPPER SUSPENSION LINK**

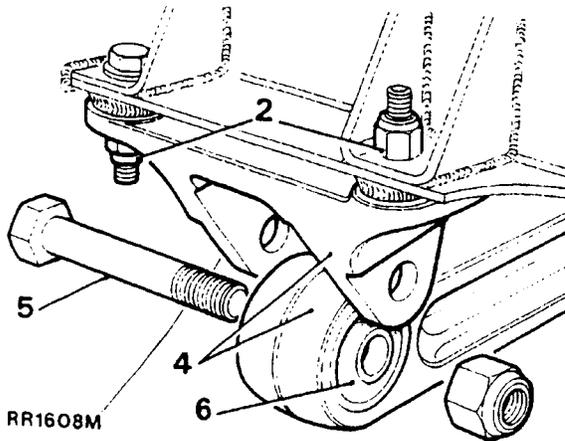
Remove and refit 1 to 6 and 9

**BUSH**

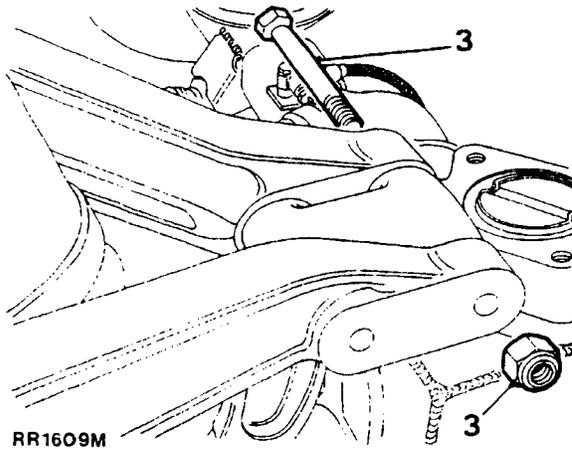
Remove and refit 7 and 8

**Removing**

1. Raise the rear of the vehicle using a suitable hydraulic floor jack. Support the rear of the chassis on stands allowing the axle to be freely suspended.
2. Remove the fixings, upper link bracket to frame.



3. Remove the fixings, upper links to pivot bracket.
4. Withdraw the upper link complete with frame bracket.
5. Remove the fixing bolt.
6. Separate link and bush assembly from bracket.



**Replacing the bush**

7. Using a suitable hydraulic or bench press and a piece of metal tubing slightly smaller than the outside diameter of the bush, press out the rubber mounted bushes. Ensure the steel tubing locates on the outer edge of the bush and not on the rubber inner.
8. Fit the replacement bush assembly centrally in the housing.

**CAUTION:** When pressing in the new bushes ensure that pressure is applied to the outer edge of the bush only and not to the rubber inner.

**Refitting**

9. Reverse 1 to 6. Do not fully tighten the fixings until all components are in position.
10. Finally tighten all fixings to the correct torque (See Section 06 Torque Values).

**LOWER SUSPENSION LINK**

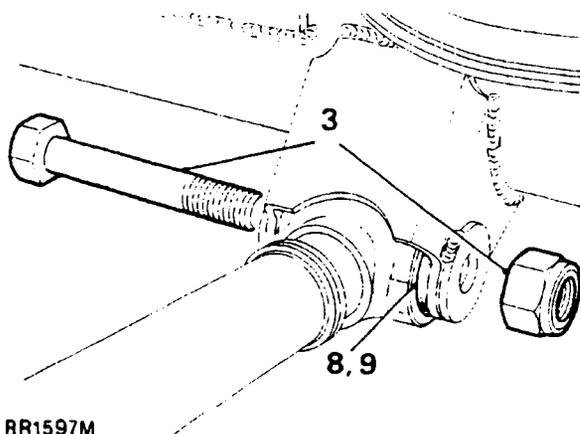
Remove and refit 1 to 7, 10 to 12

**BUSH**

Remove and refit 8 and 9

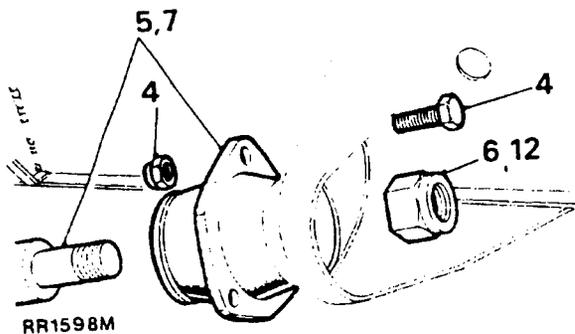
**Removing**

1. Place the vehicle on a suitable hydraulic hoist for accessibility.
2. Alternatively, raise the rear of the vehicle using a suitable hydraulic floor jack and support the vehicle using stands placed under the axle.
3. Remove the link rear fixings.



RR1597M

4. Remove the mounting bracket fixings at the side member bracket.
5. Withdraw lower link complete with mounting bracket.
6. Remove the locknut.
7. Withdraw the mounting bracket from the lower link.



RR1598M

**Replacing the bush**

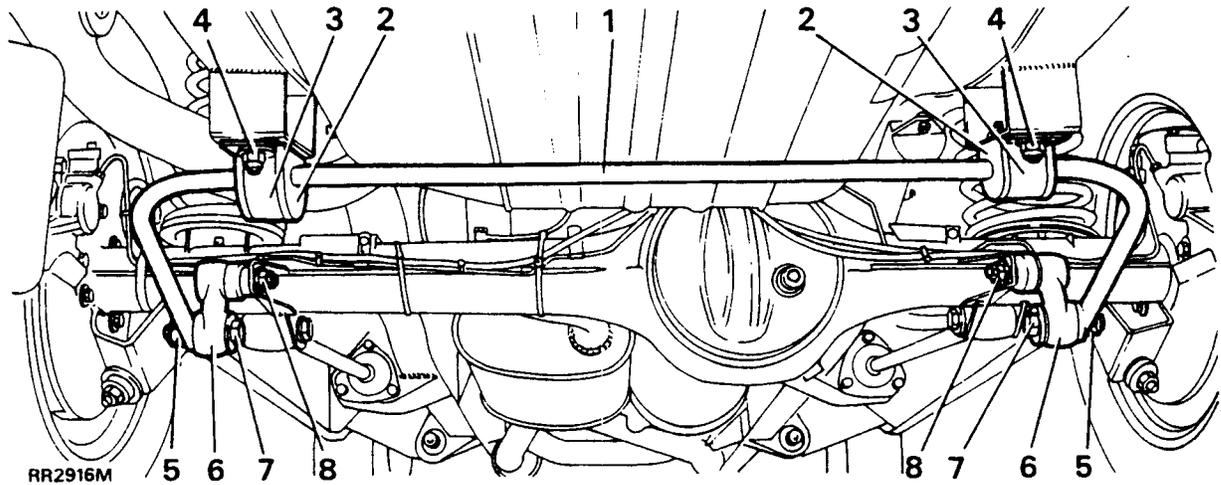
8. Using a suitable hydraulic or bench press and a piece of metal tubing slightly smaller than the outside diameter of the bush, press out the rubber mounted bushes. Ensure the steel tubing locates on the outer edge of the bush and not on the rubber inner.
9. Fit the replacement bush assembly centrally in the housing.

**CAUTION:** When pressing in the new bush ensure that pressure is applied to the outer edge of the bush only and not to the rubber inner.

**Refitting**

10. Reverse items 6 and 7. Do not tighten the locknut at this stage.
11. Reverse items 3 to 5.
12. Lower the vehicle, remove the jack and allow the axle to take up its static laden position. Finally tighten the locknut to the correct torque (see section 06-Torque values).

ANTI-ROLL BAR ASSEMBLY REAR



KEY

- |                      |                                   |
|----------------------|-----------------------------------|
| 1. Anti-roll bar     | 5. Nut and washer                 |
| 2. Rubber bush       | 6. Ball joint link arm            |
| 3. Strap             | 7. Bolt and washer                |
| 4. Nut, bolt, washer | 8. Castellated nut and cotter pin |

ANTI-ROLL BAR REAR

Remove and refit

Remove

1. Note for reassembly, the position of rubber bushes on the anti-roll bar.
2. Remove the four nuts, bolts and washers securing the two bush straps.
3. Remove the nuts, bolts, washers and rubber bushes from the ball joint links and remove anti-roll bar.

Refit

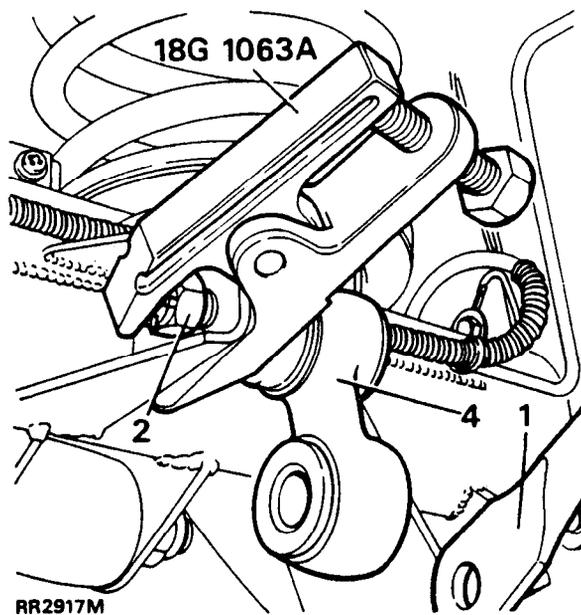
4. Position the rubber bushes on the anti-roll bar. Ensure the split points towards axle.
5. Fit the anti-roll bar with the two straps. Ensure the ball joint link arms point down as shown. Loosely fit, the bolts, washers and new nyloc nuts.
6. Fit bolt, washers and rubber bushes. Using new nuts fit anti-roll bar to ball joint links. Tighten to the correct torque.
7. Tighten to the correct torque the nuts securing the straps.

## ANTI-ROLL BAR BALL JOINT LINKS-REAR

## Remove and refit

## Remove

1. Remove the two nuts, bolts, washers and rubber bushes from the ball joint links and lower anti-roll bar to clear links.
2. Remove cotter pin and loosen castellated nut a few turns.
3. Release ball joint using special tool 18G 1063A as shown.
4. Remove castellated nut and ball joint link.



## Refit

5. Fit ball joint link arm and castellated nut. Ensuring the ball joint link arm points down as shown. Tighten to the correct torque and fit new cotter pin.
6. Align anti-roll bar to ball joint links.
7. Fit bolts, washers and rubber bushes using new self locking nuts secure anti-roll bar to ball joint links. Tighten to the correct torque.