

64 - REAR SUSPENSION

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SPECIFICATIONS, TORQUE

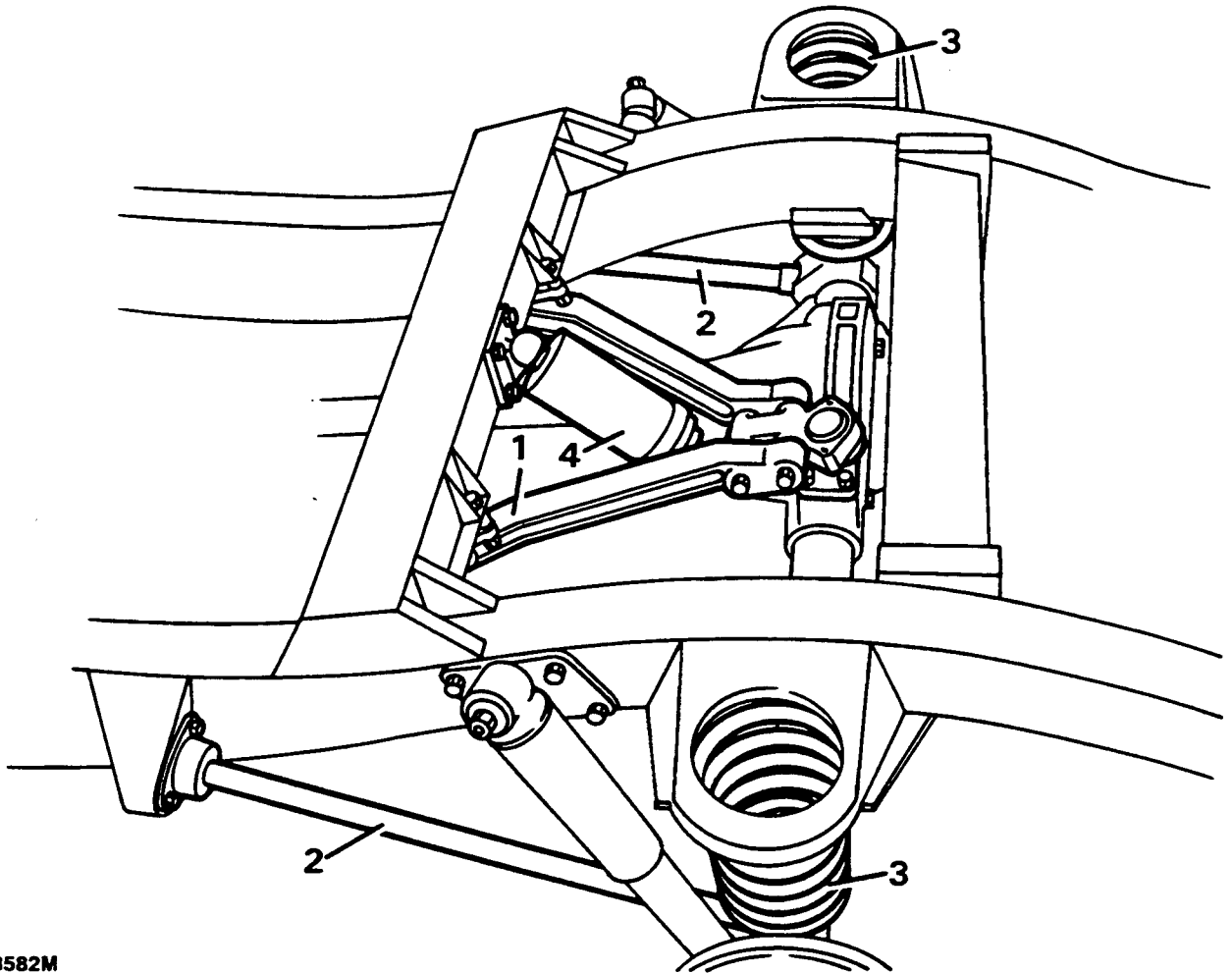
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AXLE LOCATION

Fore and aft location of the rear axle is by solid round section steel radius arms and a forged "A" frame which is secured to a chassis cross member and provides transverse control.



RR3582M

Rear axle suspension

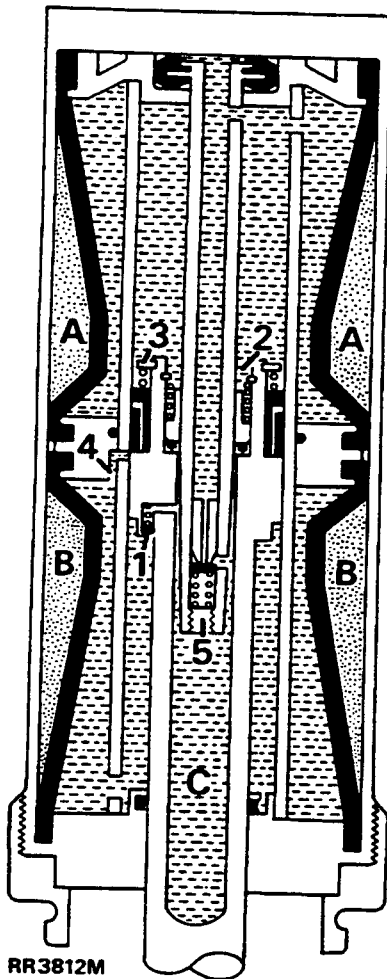
- 1. "A" frame - transverse location
- 2. Radius arms - fore aft location
- 3. Coil springs
- 4. Self levelling unit

Long travel coil springs and hydraulic shock absorbers, provide the springing for each wheel. On the rear only, a self levelling unit is mounted in conjunction with the "A" frame to provide automatic self levelling of the vehicle, when heavily loaded or towing a trailer.

SELF LEVELING UNIT

DESCRIPTION

The leveling unit fitted to the rear axle is a self contained and sealed for life hydropneumatic device, which resembles a large telescopic damper. The unit utilizes the energy produced by the relative movement of the axle to the vehicle, when the vehicle is in motion, to maintain the vehicle at nominally level height. The unit will compensate for additional loads placed on the vehicle up to the recommended maximum. Excess load beyond the design limits of the unit will prevent it leveling the vehicle but, will not impede its capabilities as a damper.



RR3812M

OPERATION

Leveling the suspension (Pumping up)

The unit, contains hydraulic fluid and an inert gas, pressurized to approximately 65 bar during manufacture. The gas which provides the springing medium, is contained in two chambers **A** and **B** and is separated from the fluid by rubber sleeves. The movement of the axle and pumping action of the piston shaft when the vehicle is in motion, causes fluid to be transferred from the lower chamber to the upper chamber via internal valves **1** and **2** and high pressure chamber **C**. As the fluid is transferred to the upper section of the unit, pressure is applied to the gas in chamber **A** which provides the springing. At the same time the piston shaft is forced outwards increasing the operating length of the leveling unit.

Level position (Fluid circulates)

When the optimum level position is reached, as illustrated in RR3812M, fluid pumped from the lower section to the upper section as previously explained, circulates via valve **3** and port **4** back to the lower section.

Full bump/over load

If the vehicle suspension encounters a large 'bump' in the road or is over loaded the unit provides a damping effect only, as valves **5** and **1** are forced open allowing the pressure to escape from the upper to the lower chamber.

Full rebound

If the vehicle suspension encounters a large 'hole' in the road, the unit extends causing port **4** to allow free flow of fluid between the upper and lower chambers and the pressures to equalise.

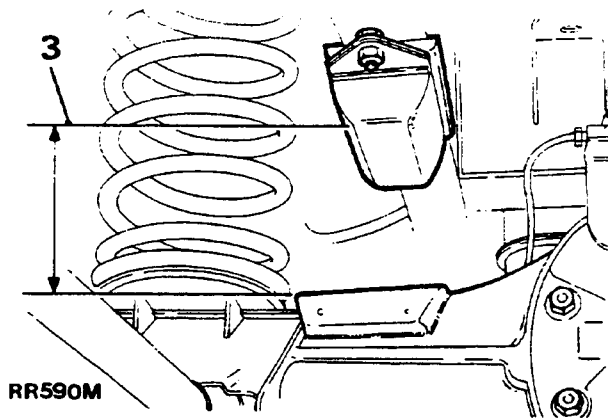


SELF LEVELLING UNIT

Functional check

Before carrying out checks, verify vehicle is used within specified maximum loading capability.

1. Check levelling unit for excessive oil leakage, if so, change unit. Slight oil seepage is permissible.
2. Remove excessive mud deposits from underneath vehicle and any heavy items from vehicle that is not original equipment.
3. Measure clearance between rear axle bump pad and bump stop rubber at front outer corner on both sides. Average clearance should be in excess of 67mm. If less, remove rear springs and check their free length against Road Spring Data. *See GENERAL SPECIFICATION DATA, Information, Road Spring Data*
4. Replace any spring whose free length is more than 20mm shorter than figure given. If after replacing a spring the average bump clearance is still less than 67mm, replace levelling unit.
5. With rear seat upright, load 450 kg into rear of vehicle, distributing the load evenly. Check bump stop clearance, with driving seat occupied.
6. Drive vehicle for 3 miles over undulating roads or graded tracks. Stop vehicle without disturbing loading. With driving seat occupied, check bump stop clearance again.
7. If change in clearance is less than 20mm levelling unit must be replaced. *See Repair, Levelling unit*





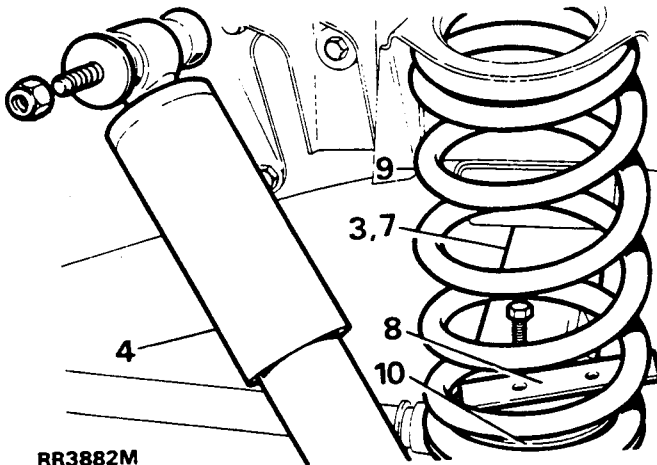
REAR ROAD SPRING

Service repair no - 64.20.01.

Remove and refit

Remove

1. Loosen rear road wheel retaining nuts.
2. Support chassis on stands and remove wheels.
3. Support rear axle weight with jack.
4. Disconnect shock absorbers at one end.



RR3882M

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



CAUTION: Avoid lowering axle further than rear brake flexible hose will allow.

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

Refit

11. Reverse removal procedure.

REAR SHOCK ABSORBER

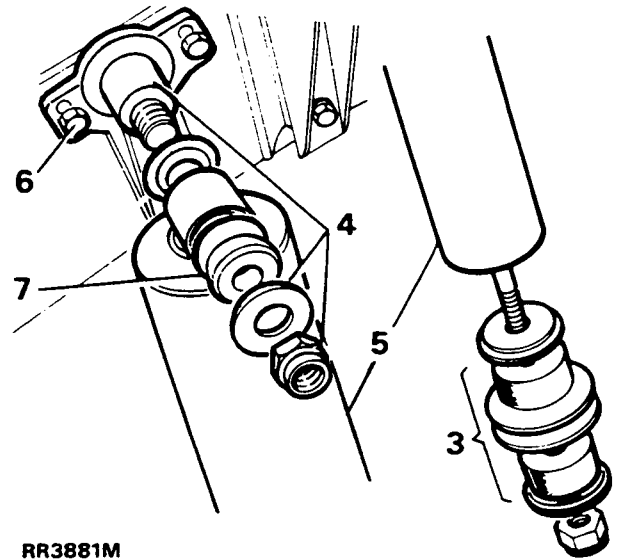
Service repair no - 64.30.02.

Remove and refit

Remove

NOTE: Air suspension vehicles: See AIR SUSPENSION, Repair, Rear shock absorber

1. Loosen road wheel retaining nuts.
2. Support chassis on stands. Remove road wheel and support rear axle weight with jack.
3. Remove fixings and withdraw shock absorber from axle bracket.



RR3881M

4. Remove upper fixings.
5. Withdraw shock absorber.
6. If required remove mounting bracket
7. If required remove mounting rubbers.

Refit

8. Reverse removal procedure.

LEVELLING UNIT

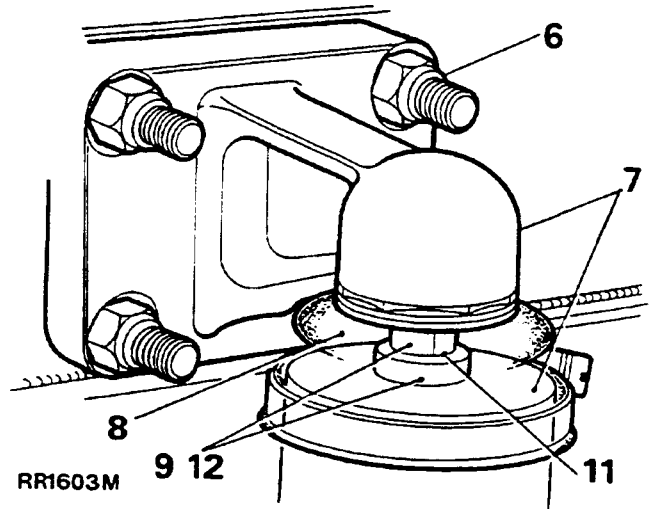
Service repair no - 64.30.09.

Remove and refit

Remove

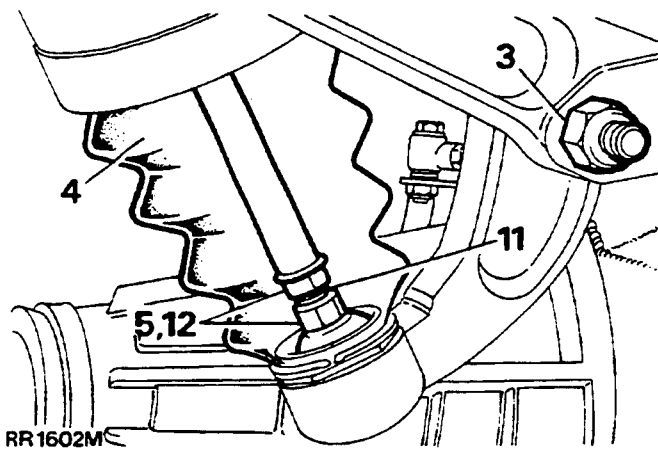
WARNING: The levelling unit contains pressurised gas and must not be dismantled or casing screws removed. Repair is by replacement of complete unit only.

1. Support chassis rear on stands.
2. Support axle weight with jack.
3. Disconnect suspension upper links at pivot bracket.

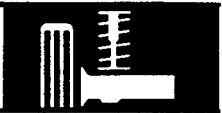


Refit

11. Coat ball pin threads with 'Loctite' grade CVX or equivalent sealant.
12. Reverse removal procedure. 1 to 10. Fit all items in position, then tighten to correct torque. See *Specifications, torque, Torque Values*



4. Lift up lower boot.
5. Unscrew lower ball joint at levelling unit push rod.
6. Remove top bracket fixings at cross member.
7. Withdraw levelling unit and top bracket complete.
8. Lift up upper boot.
9. Unscrew upper ball joint at levelling unit.
10. Withdraw upper and lower boots and retaining spring.



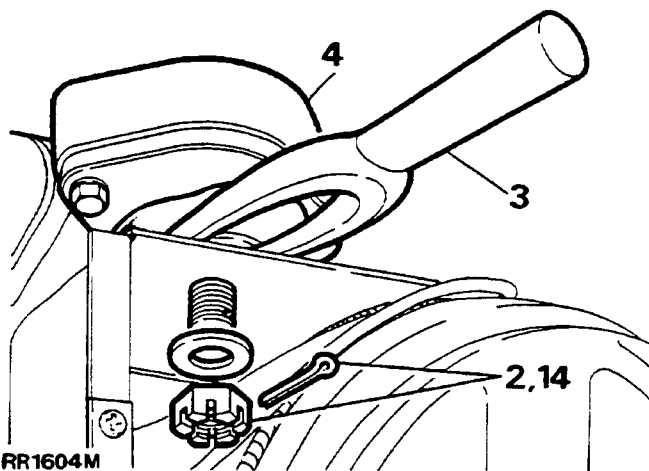
LEVELLING UNIT BALL JOINTS

Service repair no - 64.30.10.

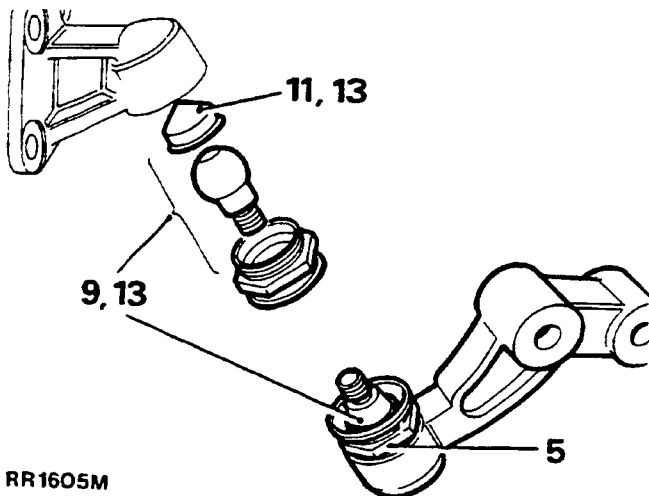
Remove and refit

Remove

1. Remove levelling unit. *See Levelling unit*
2. Remove cotter pin and nut at rear axle bracket.
3. Extract ball pin from axle bracket using extractor RO1006.
4. Withdraw pivot bracket with ball joints.



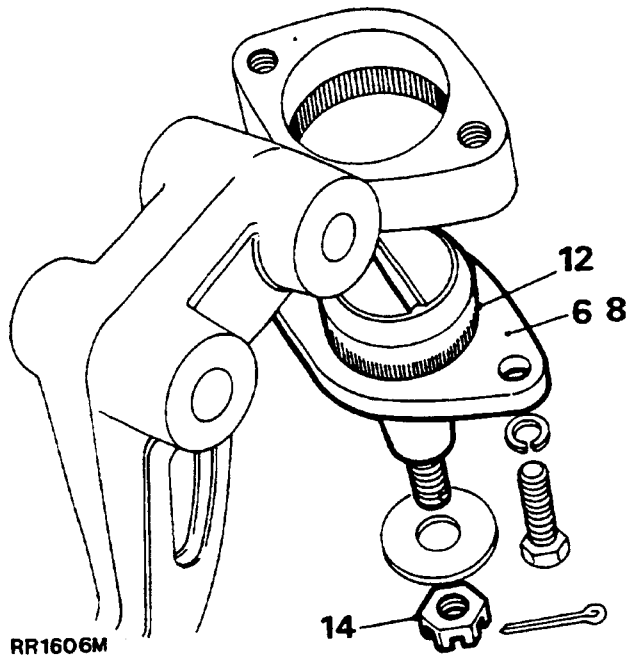
5. Unscrew ball joint assembly.
6. Remove ball joint assembly from axle bracket.



7. Replacement ball joints are supplied complete, less fixings, and greased.
8. Axle bracket ball joint must not be dismantled.
9. Levelling unit ball joint may be dismantled and cleaned.
10. Pack ball joint with Dextagrease GP or equivalent grease.
11. Ensure that ball is square in housing before refitting.

Refit

12. Press knurled ball joint into pivot bracket.
13. Screw levelling unit ball joints into mounting brackets. Ball joints should screw in easily and fully. Tighten to correct torque. *See Specifications, torque, Torque Values*



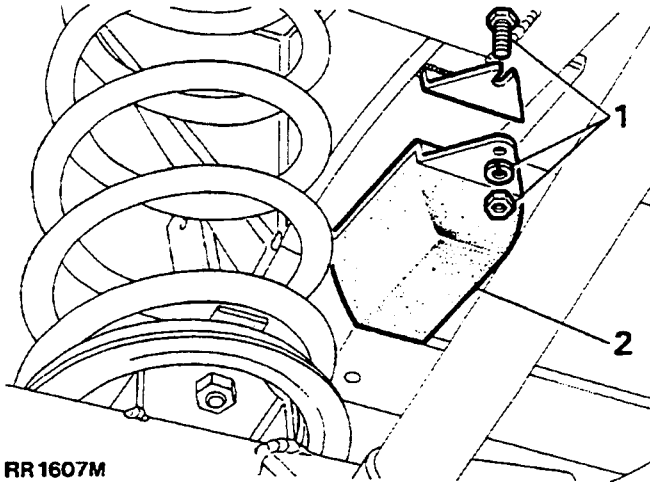
14. Fit pivot bracket complete with ball joints to rear axle. Tighten to **176 Nm**.
15. Fit levelling unit.

BUMP STOP

Service repair no - 64.30.15.

Remove and refit**Remove**

1. Remove fixings.
2. Remove bump stop.



RR1607M

Refit

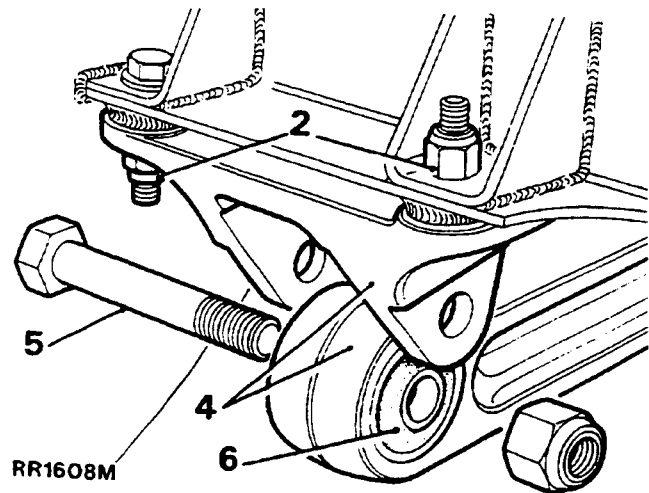
3. Position bolts in slots in bracket.
4. Fit bump stop secure with washer and nuts.

SUSPENSION LINK UPPER

Service repair no - 64.35.44.

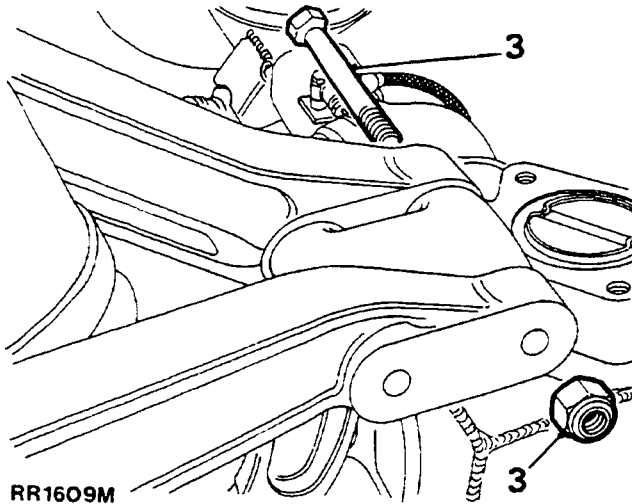
Remove/renew bush and refit**Remove**

1. Support rear of chassis on stands, allow axle to hang freely.
2. Remove fixings, upper link bracket to frame.
3. Remove fixings, upper links to pivot bracket.
4. Remove upper link complete with frame bracket.



RR1608M

5. Remove bolt.
6. Separate link from bracket.



RR1609M

SUSPENSION LINK LOWER

Service repair no - 64.35.02.

WARNING: Air suspension vehicles: Depressurise system before commencing work, See *AIR SUSPENSION, Repair, Depressurise system*

Remove/renew bush and refit

Remove

1. Site vehicle on a ramp
2. Alternatively, support vehicle on stands under rear axle.
3. Remove rear fixings.

Renew bush

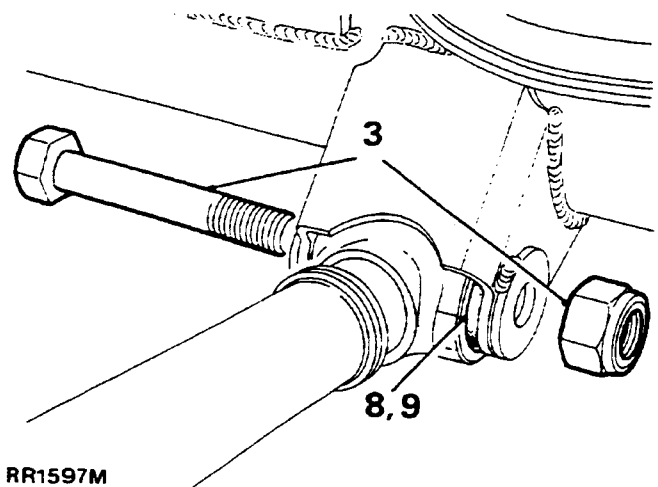
7. Press out rubber bushes.
8. Fit bush centrally in housing.



CAUTION: Apply pressure to outer edge of bush, and not rubber inner.

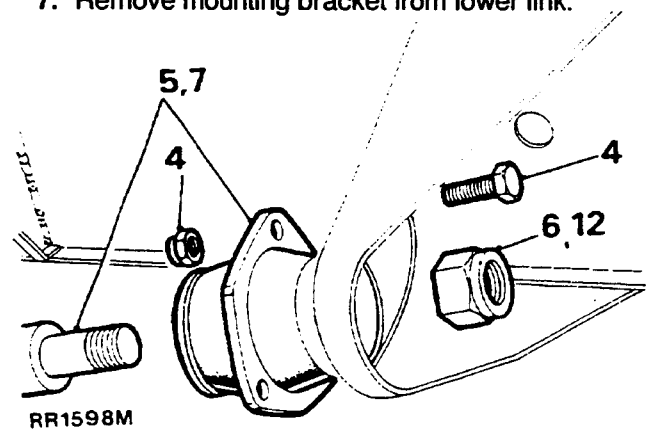
Refit

9. Reverse removal procedure. 1 to 6. Do not fully tighten fixings until all components are in position.
10. Tighten fixings to correct torque. See *Specifications, torque, Torque Values*



RR1597M

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



RR1598M

Renew bush

8. Press out rubber bushes.
9. Fit bush centrally in housing.



CAUTION: Apply pressure to outer edge of bush, and not rubber inner.

Refit

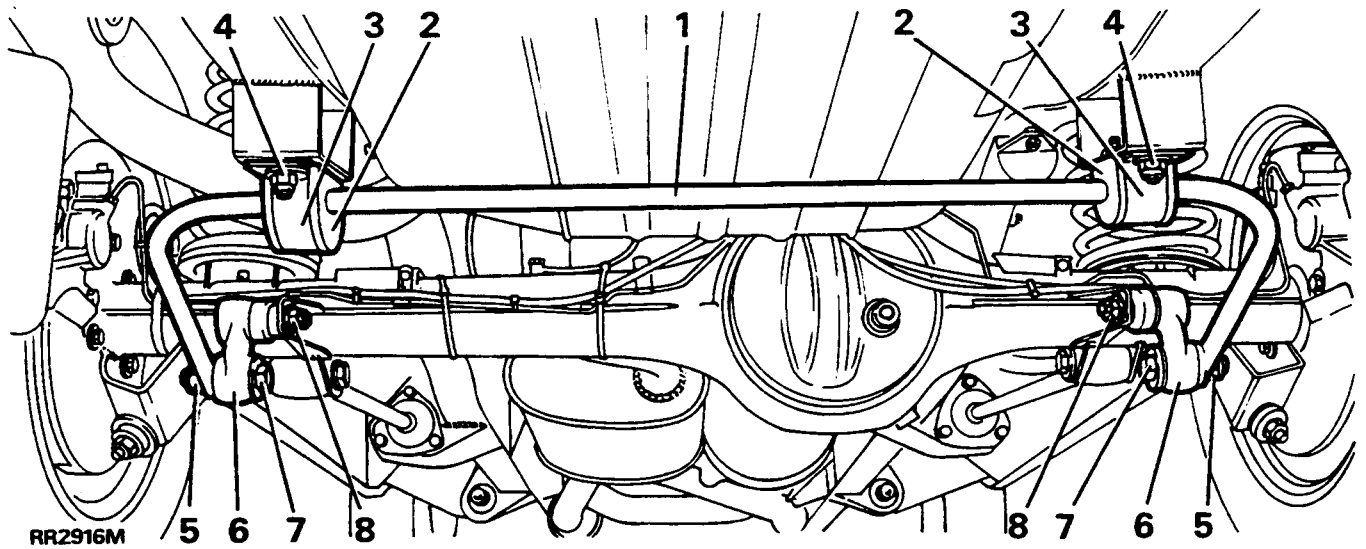
10. Reverse instructions 6 and 7. Do not tighten locknut.
11. Reverse instructions 3 to 5.
12. Lower vehicle, allow axle to take up static laden position. Tighten locknut to **176Nm**



NOTE: Air suspension vehicles:
Repressurise system



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

Service repair no - 64.35.08.

Remove and refit**Remove**

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

Refit

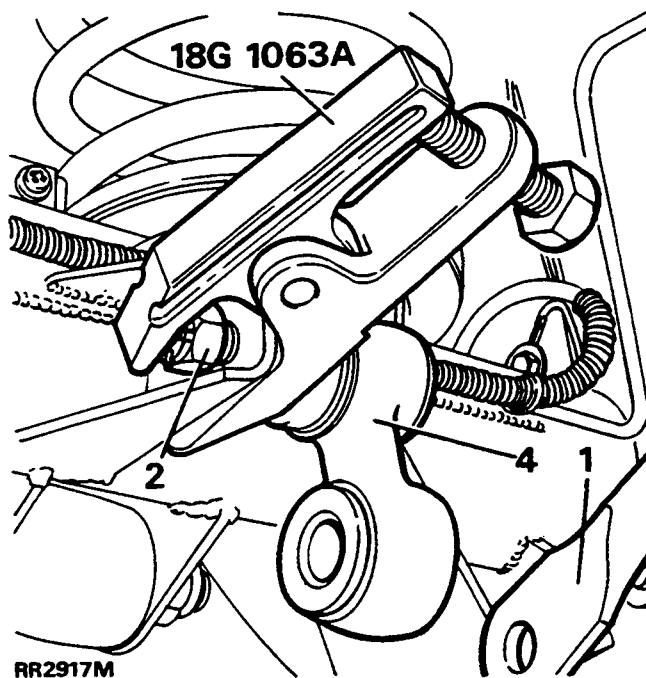
4. Position rubber bushes on anti-roll bar. Fit joint towards axle.
5. Fit anti-roll bar with two straps. Ensure ball joint link arms point down as shown. Loosely fit, bolts, washers and new nyloc nuts.
6. Fit bolt, washers and rubber bushes. Fit anti-roll bar to ball joint links. Tighten to **68Nm**
7. Tighten nuts securing straps to **30Nm**.

ANTI-ROLL BAR BALL JOINT LINKS

Service repair no - 64.35.24.

Remove and refit**Remove**

1. Remove two nuts, bolts, washers and rubber bushes from 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. Point ball joint link arm down as shown. Tighten to **40Nm** 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 **68Nm**.



TORQUE VALUES



NOTE: Torque wrenches should be regularly checked for accuracy to ensure that all fixings are tightened to the correct torque.

	Nm
Anti-roll bar rear	
Strap nyloc nuts	30
Ball link self lock nut	68
Castellated nut	40
Ball joint - levelling unit to rear axle	176
Top link to levelling unit	115
Top link to mounting bracket	176
Upper joint to levelling unit	34
Lower joint to levelling unit	34
Bottom link to axle	176
Bottom link to chassis	176
Top link bracket to rear cross member	47
Levelling unit to cross member	47
Shock absorber to axle	37

Torque values below are for all screws and bolts used except for those that are specified otherwise.

	Nm
METRIC	
M5	6
M6	9
M8	25
M10	45
M12	90
M14	105
M16	180
UNC / UNF	
1/4	9
5/16	24
3/8	39
7/16	78
1/2	90
5/8	136