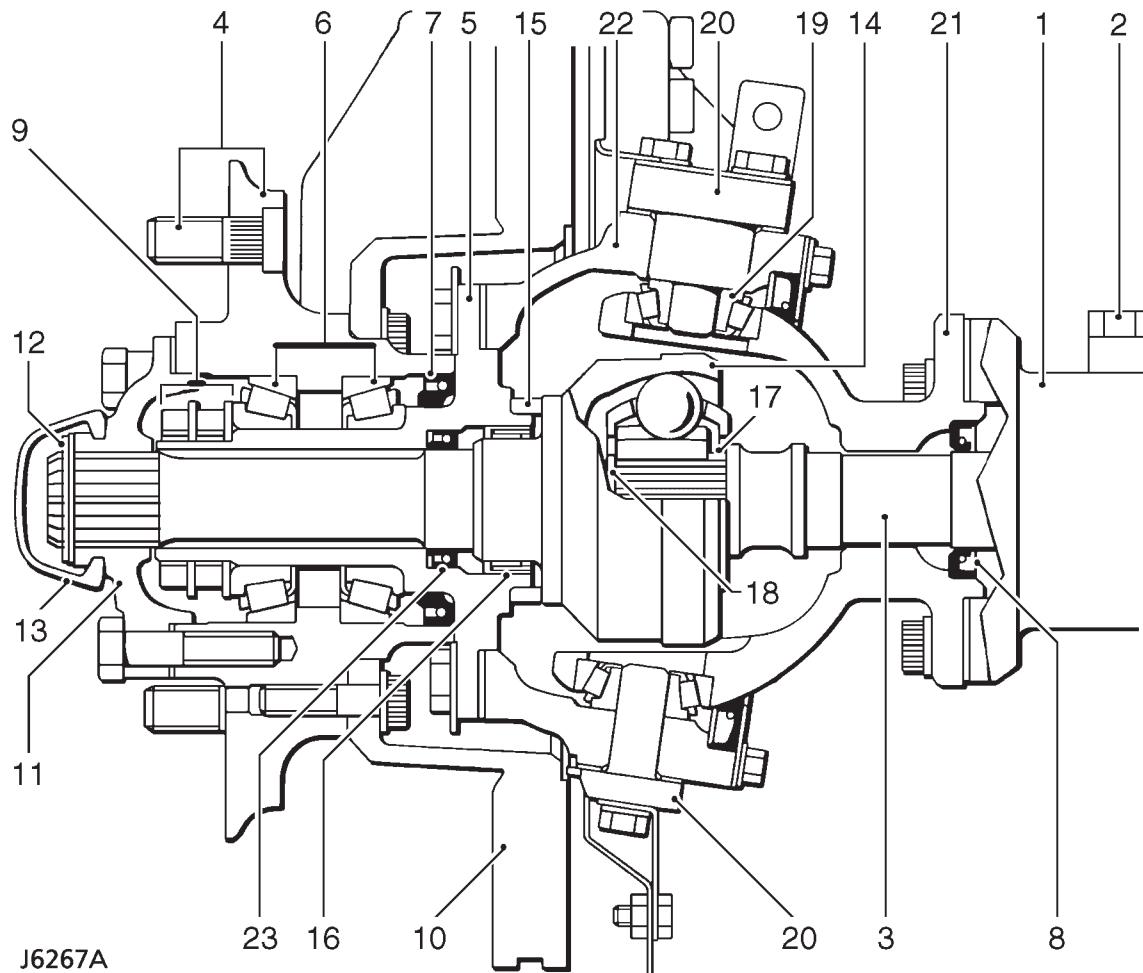




## DESCRIPTION

The welded steel front axle casing houses a separate spiral bevel type differential unit, which is off-set to the right of the vehicle centre line. The differential unit drives the front wheels via the axle shafts and constant velocity joints which are totally enclosed in the spherical and swivel housings.

The front wheels are pivoted on tape roller bearings at the top and bottom of the swivel housing. The wheel hubs on all axles are supported by two taper bearings and driven by drive flanges which are splined to the one piece, stub shaft/constant velocity joint.



## Front axle hub and swivel housing

1. Axle casing
2. Ventilation pipe
3. Axle shaft
4. Wheel studs and hub
5. Stub axle
6. Wheel bearings
7. Inner and outer hub seals
8. Axle shaft seal
9. Hub lock plate, thrust washer and nuts
10. Brake disc
11. Drive flange
12. Shim washer and circlip
13. Dust cap
14. Constant velocity joint/shaft
15. Thrust collar for CV joint
16. Roller bearing
17. Spacer
18. Circlip
19. Top and bottom swivel taper bearing
20. Top and bottom swivel pins
21. Spherical housing, seal and retainer
22. Swivel housing
23. Constant velocity shaft seal

### **Lubrication**

The differential, swivel pin housing and wheel hubs are individually lubricated and separated by oil seals (7) and (8), see J6267A, to prevent oil transfer across the axle when the vehicle is traversing steep inclines. The wheel bearings are lubricated with grease and the swivel housing and differential with oil. On later vehicles, identified by having only a filler plug in the swivel housing, grease is used to lubricate the housing assembly.

### **Ventilation**

Ventilation of the differential is through a plastic pipe (2) which terminates at a high level in the vehicle axle. The swivel housings ventilate through axle shaft oil seals (8) into the differential and the hub bearings vent via the oil seals into the swivel housing.



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## FAULT DIAGNOSIS

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### Complaint - Oil leaks

An external leak of lubrication can be caused by a faulty internal seal. For example, if the seals which separate the differential from the swivel housings are faulty and the vehicle is operating or parked on an embankment, oil may leak across the axle leaving one swivel with a high level and the opposite swivel and differential lacking lubrication.

See 'Description and Operation' for illustrations of oil seal locations.

When investigating leaks or checking oil levels, it is essential that all the lubrication is drained from any housing with a high level and that the other levels are checked.

Swivel oil should be checked for signs of grease leaking from the hub bearings and oil contamination of the hub grease.

Check that the axle ventilation system is clear, as a blockage can cause internal pressure to force oil past the seals.

If the vehicle is driven in deep water with defective oil seals, water may contaminate the lubricants and when checked, give a false impression that the housing has been overfilled with oil.

**Do not assume that a high oil level is due to over filling or, that a low level is because of an external leak.**



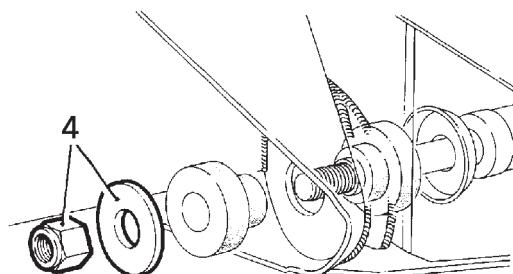
## FRONT AXLE ASSEMBLY

Service repair no - 54.10.01

### Remove

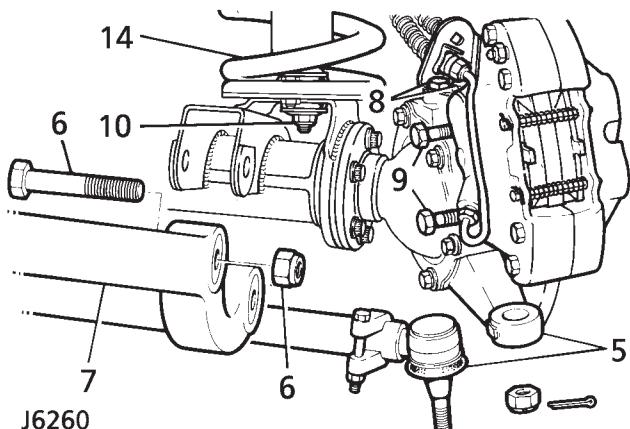
**WARNING:** Remove and refit of axle requires a further two persons to steady axle when lowering or repositioning axle.

1. Support chassis front.
2. Remove road wheels.
3. Support axle weight with hydraulic jack.



RR983

4. Remove radius arms to chassis frame nuts.
5. Disconnect steering damper from track rod. Using a extractor remove track rod links from swivel pin arms.
6. Remove four nuts and bolts securing radius arms to axle bracket.
7. Remove radius arms.
8. Remove bolts securing brake hose brackets. Refit bolts to prevent oil leakage.
9. Remove bolts from brake calipers and tie to one side.
10. Remove nuts and washers securing shock absorbers to axle.
11. Disconnect drag link from swivel pin housing arm.
12. Remove two nuts and bolts securing panhard rod to axle bracket. Lift rod clear of axle.
13. Mark for reassembly drive shaft flanges. Remove four nuts and bolts, tie propeller shaft to one side.



14. Release axle ventilation pipe banjo and lower axle assembly. Remove road springs.
15. Disconnect anti-roll bar link *See FRONT SUSPENSION, Repair, Anti-roll bar ball*.
16. Remove axle assembly.

### Refit

17. Position axle under vehicle, supporting left side of axle, and fit anti-roll bar links *See FRONT SUSPENSION, Repair, Anti-roll bar links*.
18. Fit propeller shaft. Tighten bolts to **47 Nm (35 lbf/ft)**.
19. Fit panhard rod to axle bracket. Tighten bolts to **88 Nm (65 lbf/ft)**.
20. Fit drag link to swivel pin arm. Tighten fixings to **40 Nm (30 lbf/ft)**.
21. Fit shock absorbers to axle.
22. Fit brake calipers. Tighten bolts to **82 Nm (60 lbf/ft)**.
23. Tighten upper swivel pin bolts to **78 Nm (58 lbf/ft)**.
24. Fit radius arms to axle brackets. Tighten bolts to **197 Nm (145 lbf/ft)**.
25. Fit steering damper to track rod.
26. Fit radius arms to chassis side member. Tighten fixings to **197 Nm (145 lbf/ft)**.
27. Tighten track rod end to **40 Nm (30 lbf/ft)** and fit new split pin.
28. Remove chassis supports, fit road wheels and tighten to correct torque:  
Alloy wheels - **130 Nm (96 lbf/ft)**  
Steel wheels - **100 Nm (80 lbf/ft)**  
Heavy duty wheels - **170 Nm (125 lbf/ft)**

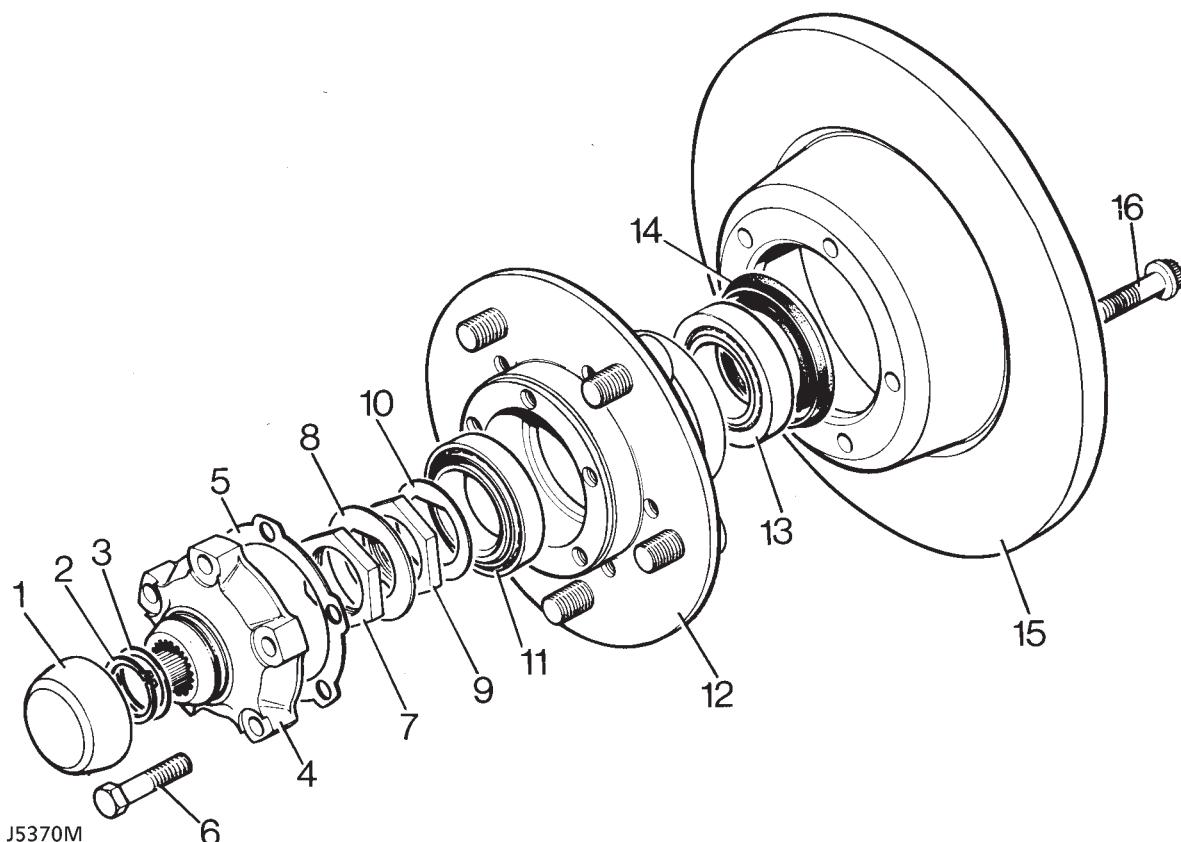
## FRONT HUB ASSEMBLY

Service repair no - 60.25.01.

### Remove

1. Loosen front wheel nuts, jack up vehicle and lower onto axle stands and remove road wheel.
2. Release brake hose clips and remove brake caliper and brake disc shield bolts. Secure to one side.

3. Lever off dust cap.
4. Remove circlip and drive shaft shim from driveshaft.
5. Remove 5 bolts and withdraw driving member and joint washer.
6. Bend back lock washer tabs.
7. Remove locknut and lock washer.
8. Remove hub adjusting nut.
9. Remove spacing washer.
10. Remove hub and brake disc assembly complete with bearings.



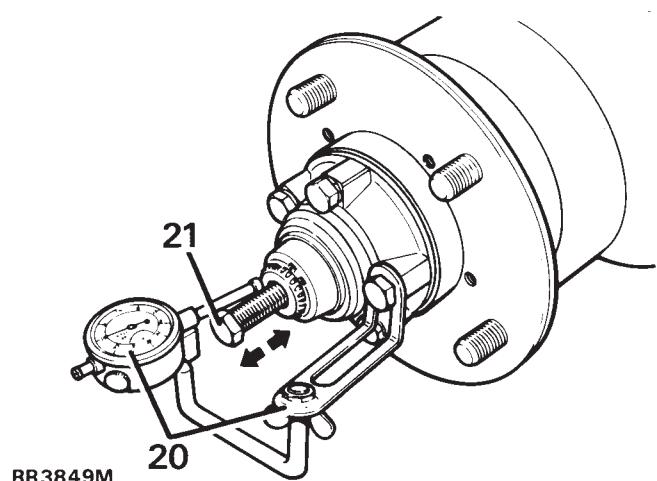
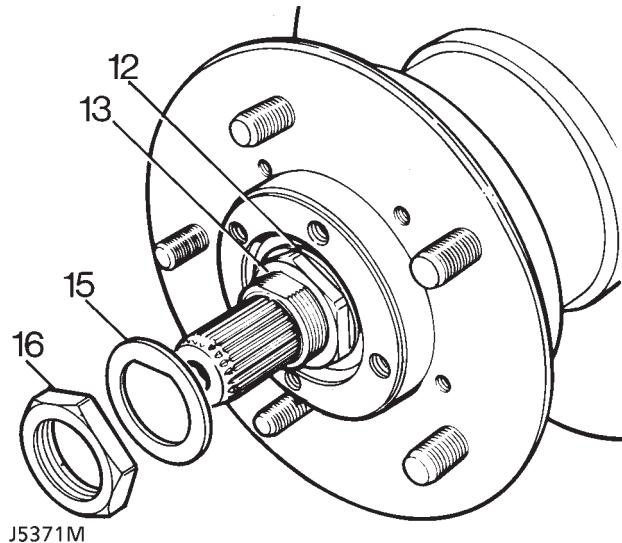
## HUB COMPONENTS

1. Dust cap.
2. Drive shaft circlip.
3. Drive shaft shim.
4. Drive member.
5. Drive member joint washer.
6. Drive member retaining bolt.
7. Lock nut.
8. Lock washer.
9. Hub adjusting nut.
10. Spacing washer.
11. Outer bearing.
12. Hub.
13. Inner bearing.
14. Grease seal.
15. Brake disc.
16. Disc retaining bolt.



## Refit

11. Clean stub axle and drive shaft and fit hub assembly to axle.



12. Fit spacing washer.  
 13. Fit hub adjusting nut. Tighten to **50 Nm (37 lbf/ft)**. Ensure hub is free to rotate with no bearing play.  
 14. Back off adjusting nut 90° and tighten to **10 Nm (7 lbf/ft)**.  
 15. Fit a new lock washer.  
 16. Fit locknut. Tighten to **50 Nm (37 lbf/ft)**.  
 17. Tab over lock washer to secure adjusting nut and locknut.  
 18. Fit a new joint washer to driving member and fit member to hub. Tighten bolts to **65 Nm (48 lbf/ft)**.  
 19. Fit original drive shaft shim and secure with a circlip.

20. To check drive shaft end play, mount a dial gauge using bracket **LRT-99-503** and rest pin in a loaded condition on end of drive shaft.  
 21. Fit a suitable bolt to threaded end of drive shaft. Move drive shaft in and out noting dial gauge reading. End play should be between 0,08 to 0,25 mm.  
 22. If end play requires adjustment, remove circlip, measure shim thickness and fit an appropriate shim to give required end-play.  
 23. Remove bolt from drive shaft, fit circlip and dust cap.  
 24. Fit brake disc shield and brake caliper. Tighten fixings to **82 Nm (60 lbf/ft)**.  
 25. Bleed brake system *See BRAKES, Repair, Brake system bleed*.  
 26. Fit road wheel, remove axle stands and tighten road wheel nuts to correct torque:  
     Alloy wheels - **130 Nm (96 lbf/ft)**  
     Steel wheels - **100 Nm (80 lbf/ft)**  
     Heavy duty wheels - **170 Nm (125 lbf/ft)**  
 27. Operate footbrake to locate brake pads before driving vehicle.

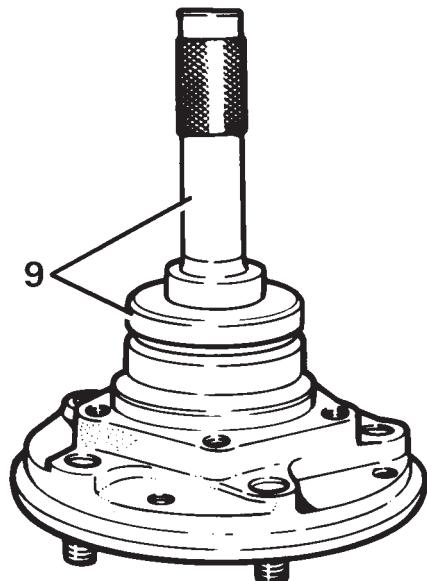


## FRONT DIFFERENTIAL

Service repair no - 54.10.07.

### Overhaul

**NOTE:** The front axle differential, for all models, is the same as that fitted to the 90 rear axle and can only be serviced as a complete assembly. See REAR AXLE AND FINAL DRIVE, Repair, Differential assembly - 90.



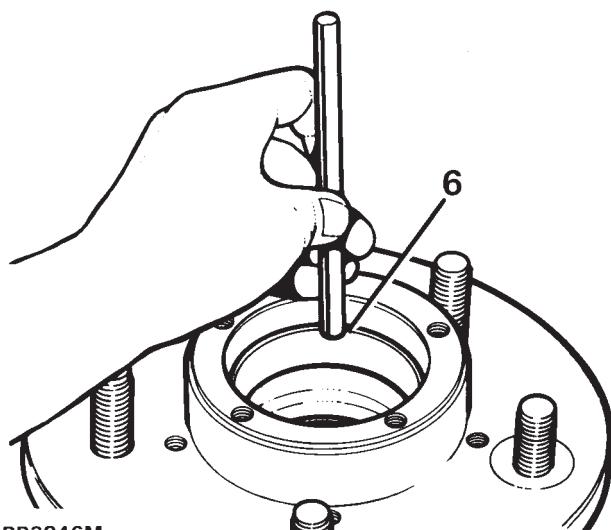
RR3845M

## FRONT HUB

Service repair no - 60.25.14.

### Overhaul

1. Remove hub assembly See Repair, Front hub assembly.
2. Remove outer bearing.
3. Mark, for reassembly, relationship between hub and brake disc, if original hub is to be refitted.
4. Remove 5 bolts and separate hub from brake disc.
5. Drift out grease seal and inner bearing from hub and discard seal.



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9. With lip side leading fit new seal to hub using special tool LST 137 seal replacer and drift 18G 134. Drive in seal flush with rear face of hub. Apply grease between seal lips.
10. Fit brake disc to hub, lining up to marks made during dismantling. Applying Loctite 270, fit retaining bolts. Tighten to 73 Nm (54 lbf/ft).
11. Grease and fit outer bearing to hub.
12. Fit hub assembly See Repair, Front hub assembly.

6. Drift out inner and outer bearing tracks.
7. Clean hub and drift in inner and outer bearing tracks.
8. Pack hub inner bearing with recommended grease and fit to hub.

## 54 FRONT AXLE AND FINAL DRIVE

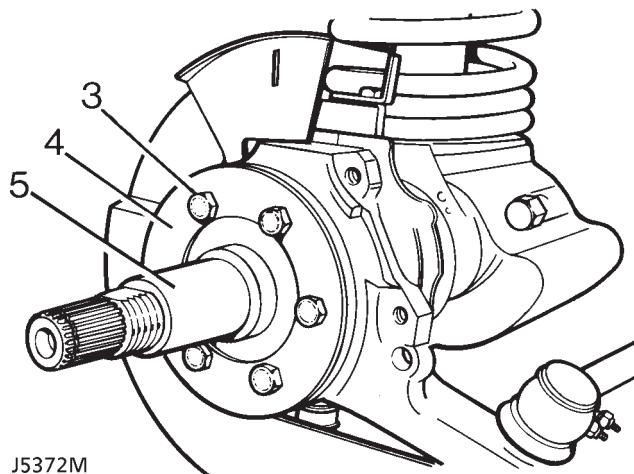
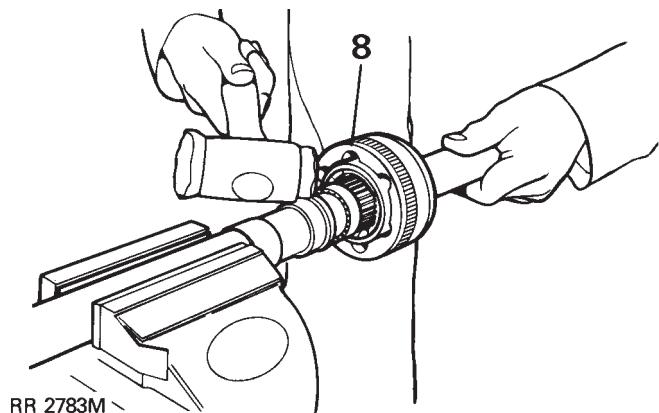
### FRONT STUB AXLE, CONSTANT VELOCITY JOINT AND SWIVEL PIN HOUSING

Service repair no - 60.15.43.

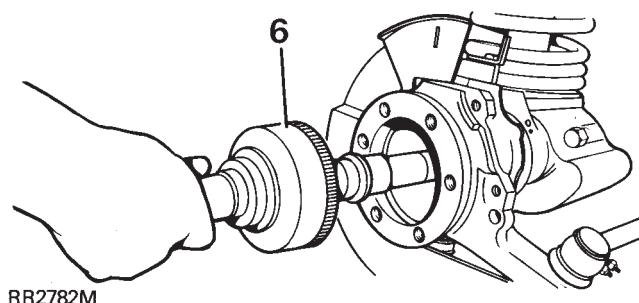
Remove stub axle, axle shaft and constant velocity joint.

1. Remove front hub assembly *See Repair, Front hub assembly*.
2. Drain swivel pin housing and refit plug.

 **NOTE:** On later vehicles the swivel pin housing is filled with grease for life, the level and drain plugs being deleted.



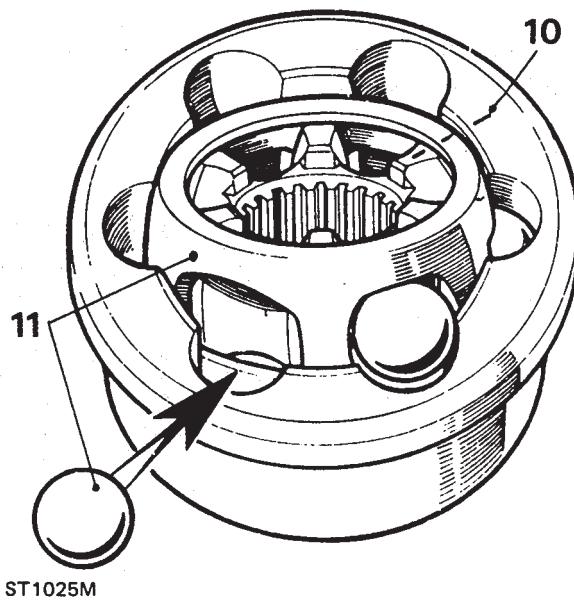
3. Remove 6 bolts retaining stub axle to swivel housing.
4. Remove mud shield.
5. Remove stub axle and joint washer.



6. Withdraw axle shaft and constant velocity joint from axle casing.

### Remove constant velocity joint from axle shaft

7. Hold axle shaft firmly in a soft jawed vice.
8. Using a soft mallet drive constant velocity joint from shaft.
9. Remove circlip and collar from axle shaft.



### Constant velocity joint

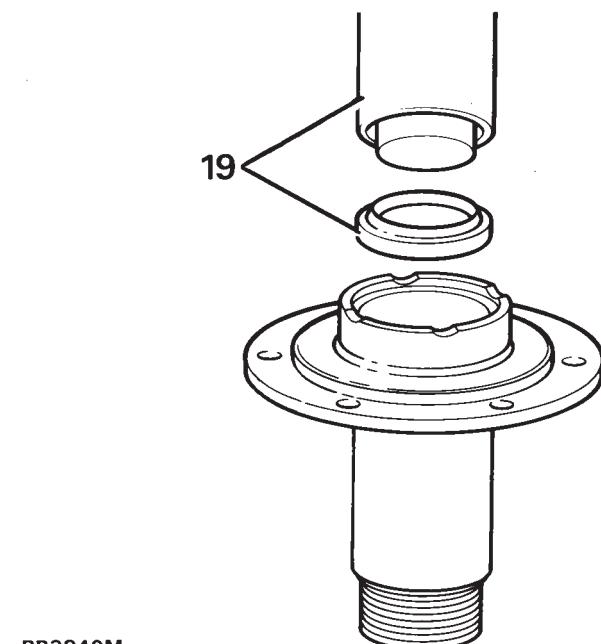
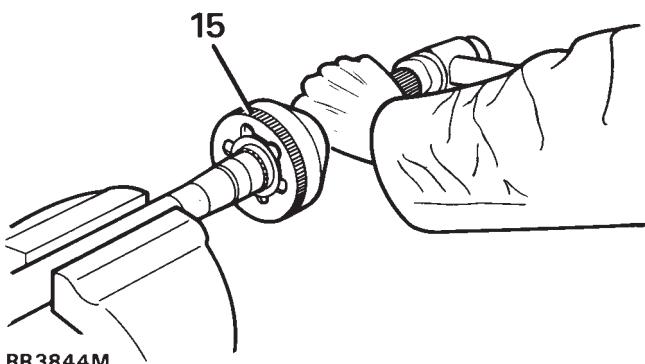
10. Mark positions of constant velocity joint, inner and outer race and cage for reassembly.
11. Swivel cage and inner race to remove balls.



12. Examine all components, in particular, inner and outer track, cage balls and bearing surfaces for damage and excessive wear.
13. Maximum acceptable end-float on assembled joint 0,64mm. Renew if worn or damaged. Lubricate with a recommended oil during assembly.

#### Fit constant velocity joint to axle

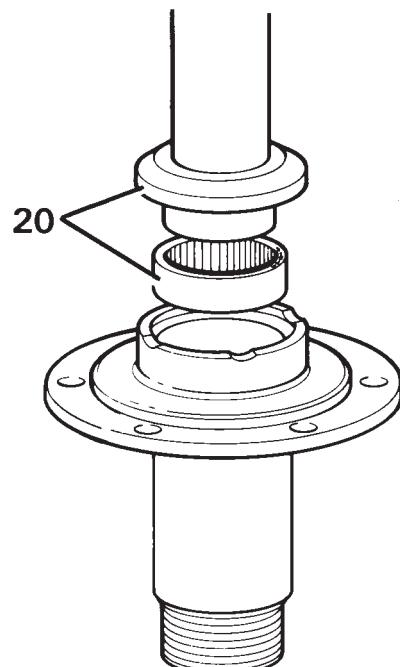
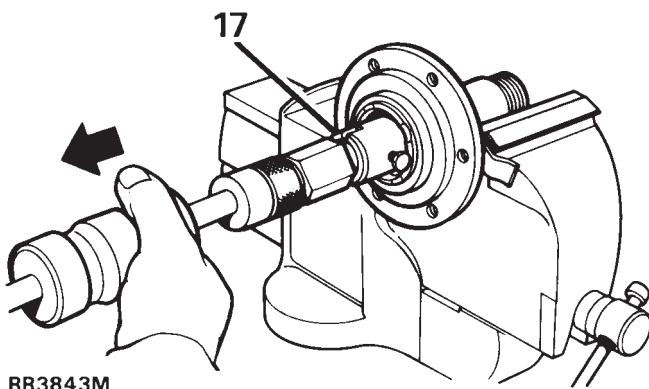
14. Fit collar and a new circlip.
15. Engage constant velocity joint on axle shaft splines and using a soft mallet, drive joint in fully.



19. Lubricate seal and lip with EP90 oil and with cavity side leading press in a new oil seal using special tool **LRT-54-004**.

#### Renew stub axle, thrust ring, oil seal and bearing

16. Drill and chisel off thrust ring taking care to avoid damaging stub axle.



17. Remove bearing and oil seal using special tool **TRT-37-004** and slide hammer **LRT-99-004**. Ensure lip of tool locates behind bearing to to drive it out.
18. Repeat instruction for removal of oil seal.

RR3839M

20. Using special tool **LRT-54-005**, fit bearing with its part number visible when fitted, and flush with end face of stub axle.
21. Press fit a new thrust ring onto stub axle.

## Swivel pin housing

22. Remove bolts securing oil seal retaining plate and joint washer. Release assembly from swivel pin housing.

 **NOTE: Removal of oil seal and retaining plate is achieved when swivel bearing housing is removed.**

23. Remove 2 bolts, retaining lower swivel pin to housing.  
 24. Remove brake disc shield bracket.  
 25. Tap lug to remove lower swivel pin and joint washer.  
 26. Remove two bolts retaining brake hose bracket and top swivel pin.  
 27. Remove bracket, top swivel pin and shims.  
 28. Remove swivel pin housing while retrieving lower and upper bearings.

## Swivel bearing housing

29. Remove lower bearing track from swivel bearing housing.

 **NOTE: Use upper bearing opening to gain access to lower bearing track.**

30. Remove 7 bolts retaining swivel bearing housing to axle case.  
 31. Remove inner oil seal from back of housing.  
 32. Remove top bearing track from swivel bearing housing.

 **NOTE: Use lower bearing opening to gain access to upper bearing track.**

33. If worn, pitted or damaged, renew housing.  
 34. Fit upper and lower bearing tracks into swivel bearing housing.

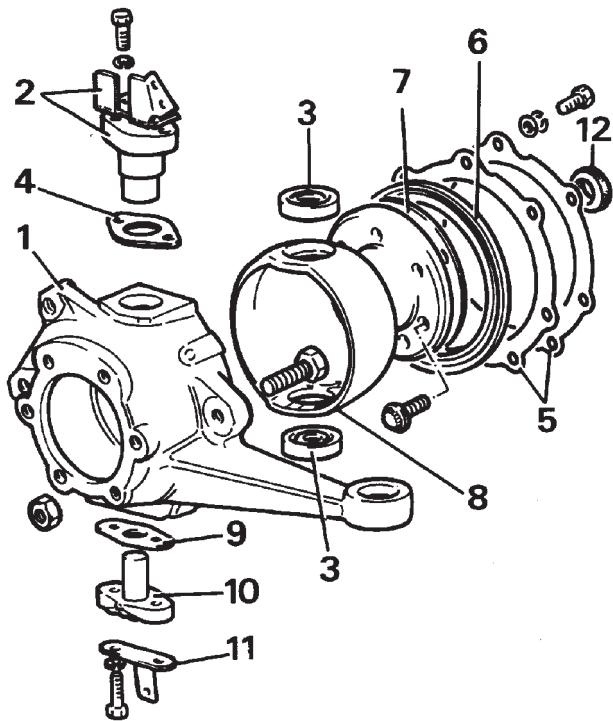
 **CAUTION: Ensure bearing tracks are fitted square or damage could occur.**

35. With seal lips trailing, fit swivel housing inner oil seal into rear of housing. Grease seal lips.

## Fit swivel pin housing

36. Coat swivel bearing housing to axle casing bolts with Loctite 270 or equivalent.  
 37. Coat both sides of joint washer with a sealing compound. Position swivel bearing housing to axle mating face.

## Swivel assembly components



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1. Swivel pin housing
2. Top swivel pin and brake hose bracket
3. Upper and lower swivel pin bearings
4. Shim
5. Retaining plate and washer
6. Oil seal
7. Joint washer
8. Swivel bearing housing
9. Joint washer
10. Lower swivel pin
11. Mudshield bracket
12. Swivel housing inner oil seal

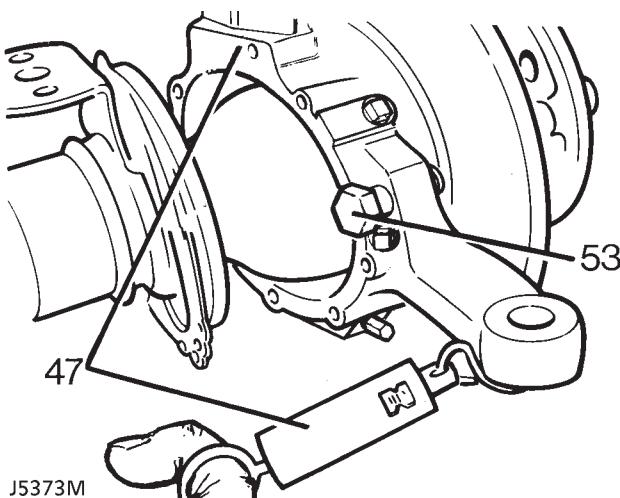


38. Place retaining plate, joint washer and oil seal over axle flange ready for assembly.
39. Fit swivel bearing housing to axle flange with 7 bolts. Tighten to **73 Nm (54 lbf/ft)**.
40. Grease and fit upper and lower swivel pin taper roller bearings.
41. Position swivel pin housing over swivel bearing housing.
42. Coat joint washer both sides with sealing compound and position on lower swivel pin.
43. Loosely fit brake shield bracket plus lower swivel pin with lug outboard to swivel pin housing.
44. Loosely fit top swivel pin plus existing shims and brake hose bracket to swivel pin housing.
45. Apply Loctite 270 or equivalent to lower swivel pin bolts. **78 Nm (58 lbf/ft)**, bend over lock tabs.
46. Tighten top swivel pin bolts to **78 Nm (58 lbf/ft)**.
50. Fit oil seal, joint washer and retaining plate with 7 bolts and spring washers. Tighten to **11 Nm (8 lbf/ft)**.
51. Fit tie rod and drag link and secure with new cotter pins. Tighten fixing to **40 Nm (30 lbf/ft)**.
52. Fit brake disc shield.
53. Loosely fit lock stop bolt and nut.
54. Apply a recommended grease between lips of swivel housing oil seal.
55. Secure oil seal with retaining plate and securing bolts. Tighten to **11 Nm (8 lbf/ft)**.
56. Fit track-rod and drag link and secure with new cotter pins.
57. Loosely fit lock stop bolt for later adjustment.
58. Fit brake disc shield.

#### Check and adjust preload on bearings



**NOTE: Swivel housing oil seal and axle should not be fitted.**



47. Attach a spring balance to ball joint bore and pull balance to determine effort required to turn swivel pin housing. Resistance, once initial inertia has been overcome, should be **1.16 to 1.46 kg**. Adjust by removing or adding shims to top swivel pin.
48. When setting is correct remove top swivel bolts, apply Loctite 270 or equivalent. Refit bolts and tighten to **78 Nm (58 lbf/ft)**, and bend over lock tabs.
49. Apply recommended grease between lips of swivel oil seal.

#### Fit driveshaft and stub axle

59. Insert axle shaft, and when differential splines are engaged, push assembly in fully.



**CAUTION: Take care not to damage axle shaft oil seals.**

60. Place a new joint washer in position on swivelpin housing to stub axle mating face. Coat threads of stub axle bolts with Loctite 270.
61. Fit stub axle with flat at 12 O'clock position.



**CAUTION: Ensure that constant velocity joint bearing journal is butted against thrust ring on stub axle before stub axle is secured.**

62. Place mud shield in position and secure stub axle to swivel pin housing with 6 bolts and tighten evenly to **65 Nm (48 lbf/ft)**.
63. Fit brake jump hoses to brake jump hose bracket.
64. Fit complete front hub assembly **See Repair, Front hub assembly**.
65. Check swivel pin housing oil drain plug is fitted.
66. Fill swivel assembly to correct level, with new oil **See SECTION 10, Maintenance, Under vehicle maintenance**.



**NOTE: On later vehicles fill swivel pin housing with 0.33 Litres of Molytex EP 00 grease.**

67. Set steering lock stop bolts **See STEERING, Adjustment, Steering lock stops**.

**TORQUE VALUES**

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

Nm

**FRONT AXLE**

Hub driving member to hub .....	65*
Brake disc to hub .....	73
Stub axle to swivel pin housing .....	65*
Brake caliper to swivel pin housing .....	82
Upper swivel pin to swivel pin housing .....	78*
Lower swivel pin to swivel pin housing .....	78*
Oil seal retainer to swivel pin housing .....	11
Swivel bearing housing to axle case .....	73*
Pinion housing to axle case .....	41
Crown wheel to differential housing .....	58
Differential bearing cap to pinion housing .....	90
Differential drive flange to drive shaft .....	47
Mudshield to bracket lower swivel pin .....	11
Bevel pinion nut .....	130
Draglink to hub arm .....	40
Panhard rod to axle bracket .....	88
Radius arm to axle .....	190
Radius arm to chassis side member .....	190



**NOTE:** \* These bolts to be coated with Loctite 270 prior to assembly.