

08V-635



**THIS SAFETY RECALL HAS BEEN EXPANDED TO INCLUDE CANADA**

**SECTION: 205**

**SAFETY RECALL P041: Front Differential to Propeller Shaft Spline Wear - Repair Procedure**

**AFFECTED VEHICLE RANGE:**

Range Rover (LM)

VIN: 3A101029 - 5A198054  
Model Year: 2003 - 2005

**CONDITION SUMMARY:**

**Situation:** The front differential coupling sleeve and propeller shaft may be misaligned resulting in spline wear over time. As the wear between the propeller shaft and differential spline progresses, noise and vibration will be generated. If the driver continues to operate the vehicle and either ignores the noise and vibration or is unaware of it, the wear could eventually result in a loss of drive.

**Action:** Refer the Repair Procedure section of this bulletin for instructions on performing the Front Differential and Propeller shaft coupling repair.

**PARTS:**

|                 |   |  |
|-----------------|---|--|
| LR008114 .....  | Fixing Kit                                | Qty: 1                                       |
| LR008102 .....  | Propeller Shaft Kit                       | Qty: 1                                       |
| LR007758 .....  | Flange Kit                                | Qty: 1                                       |
| LR008106 .....  | Heat Shield Kit                           | Qty: 1                                       |
| LRN7591 .....   | Differential Oil                          | Qty: 1                                       |
| 568680 .....    | Cable Tie                                 | Qty: 1                                       |
| TKE000040 ..... | Snap Ring Clip                            | Qty: 2                                       |
| LRN2261 .....   | PAS Fluid - Texaco Cold Climate PSF 14315 | Qty: 1 quart*                                |
| STC50550 .....  | Sealant                                   | Qty: 1* (one tube sufficient for 2 vehicles) |

\*To be claimed under sundry item code 'ZZZ001'.

**△ NOTE:** Inspect PAS reservoir for 'Pentosin CHF202' label, indicating vehicle has been repaired under Technical Bulletin LTB00112. If label is present, Pentosin CHF202 PAS Fluid (LRN003401) must be used in lieu of Texaco Cold Climate PSF-14315.

**SPECIAL TOOLS:**

- LR-135 .....Kit - Front Differential Pinion Coupling Overhaul
  - LR-150 .....Front Differential Flange Holding Tool
- Refer to Workshop Manual (GTR) for any additional special tools (if required)

NOTE: The information in Technical Bulletins is intended for use by trained, professional technicians with the knowledge, tools, and equipment required to do the job properly and safely. It informs these technicians of conditions that may occur on some vehicles, or provides information that could assist in proper vehicle service. The procedures should not be performed by "do-it-yourselfers." If you are not a Retailer, do not assume that a condition described affects your vehicle. Contact an authorized Land Rover service facility to determine whether the bulletin applies to a specific vehicle.



**WARRANTY:**

△ NOTE: Please check DDW to ensure that the vehicle is affected by this Recall prior to undertaking any rework action as some vehicles may have been previously repaired by our ports. DDW will be updated to reflect only those vehicles affected.

△ NOTE: Repair procedures are under constant review, and therefore times are subject to change; those quoted here must be taken as guidance only. Always refer to DDW to obtain the latest repair time.

Warranty claims should be submitted quoting the Program Code 'P041' together with the relevant Option Code ('D' or 'E'). As Option Codes are used, there is no requirement to enter SRO or parts; these are repeated for information only. The option that allows for the drive in / drive out allowance may only be claimed if the vehicle is brought back into the workshop for this action alone to be undertaken.

|        |                     |                                  |                  |      |           |                     |   |   |
|--------|---------------------|----------------------------------|------------------|------|-----------|---------------------|---|---|
| P041   | D                   | Differential spline modification | 54.10.89/43      | 4.30 | LR008114  | Fixing Kit          | 1 | - |
|        |                     |                                  |                  |      | LR008102  | Propeller Shaft Kit | 1 | - |
|        |                     |                                  |                  |      | LR007758  | Flange Kit          | 1 | - |
|        |                     |                                  |                  |      | LR008106  | Heatshield Kit      | 1 | - |
|        |                     |                                  |                  |      | 568680    | Cable Tie           | 1 | - |
|        |                     |                                  |                  |      | TKE000040 | Snap Ring Clip      | 2 | - |
|        |                     |                                  |                  |      | LRN7591   | Differential Oil    | 1 | - |
| ZZZ001 | Sealant / PAS Fluid | -                                | 26.64            |      |           |                     |   |   |
| P041   | E                   | Differential spline modification | 54.10.89/43      | 4.30 | LR008114  | Fixing Kit          | 1 | - |
|        |                     |                                  |                  |      | LR008102  | Propeller Shaft Kit | 1 | - |
|        |                     |                                  |                  |      | LR007758  | Flange Kit          | 1 | - |
|        |                     |                                  |                  |      | LR008106  | Heatshield Kit      | 1 | - |
|        |                     | 568680                           | Cable Tie        | 1    | -         |                     |   |   |
|        |                     | TKE000040                        | Snap Ring Clip   | 2    | -         |                     |   |   |
|        |                     | LRN7591                          | Differential Oil | 1    | -         |                     |   |   |
| ZZZ001 | Sealant / PAS Fluid | -                                | 26.64            |      |           |                     |   |   |

*Normal warranty policy and procedures apply.*

*Material allowance is included in labor operation / option code.*

**SPECIAL PARTS RETENTION PROCEDURE – CANADA ONLY**

For Canadian Retailers only, there is a requirement to retain for AMM inspection or possible return two components removed from the differential. This is a new requirement specific to this Service Campaign.

**Failure to retain these components for inspection may result in the debit of the claim.**

The parts to be retained are:

- LR007770: Bearing - Driving Pinion (complete bearing assembly - inner and outer races)
- LR007771: Spacer - Bearing

Retain **ONLY** these components removed from the differential. These should be tied together, labeled with the repair order number and VIN, and held pending AMM review. AMM's will advise Retailers when parts may be disposed of.



**SPECIAL PARTS RETURN PROCEDURE – USA ONLY:**

For USA Retailers only, there is a requirement to return / retain two components removed from the differential. This is a new requirement specific to this Recall.

**Failure to return / retain these components will result in the debit of the claim.**

Upon payment of the warranty claim, a part return request will be submitted under part number **LR007758** and the two components to be returned / retained are:

- o LR007770: Bearing - Driving Pinion (complete bearing assembly - inner and outer races)
- o LR007771: Spacer - Bearing

Return **ONLY** these components removed from the differential. These should be tied together and accompanied by the warranty part return tag and packing slip when returned to the Land Rover parts return warehouse.

For further information, see Service ALERT SA08WA-26.

**CUSTOMER RE-IMBURSEMENT PROCESS:**

If a customer has indicated that they have already paid for the front differential to be renewed for this concern as a normal retail repair (vehicle outside warranty period), a copy of the repair invoice must be produced as proof of the repair. The retailer must directly reimburse the customer and a claim for recovery of this cost should be made using the related damage procedure.

Supplementary claims for related damages can only be made once this Recall claim has been paid / accepted.

Claims should be submitted quoting Program Code 'P041' and by clicking the 'Related Damage' radio button on the claim submission screen.

The warranty claim should be submitted using Option Code 'X' as detailed below and entering the cost to be reimbursed against the Sundry Code of 'Other'. All costs should be entered in local currency.

|             |          |                        |     |     |       |                        |
|-------------|----------|------------------------|-----|-----|-------|------------------------|
| <b>P041</b> | <b>X</b> | Re-imbusement to owner | N/A | N/A | Other | Retailer Entered Value |
|-------------|----------|------------------------|-----|-----|-------|------------------------|

A copy of the invoice must be appended to the repair order for Warranty Audit purposes and Warranty Specialist review.

A brief comment should be entered in the 'Technician Comments' field on the claim to itemize and explain the charges.

Only vehicles eligible for Recall **P041** are included in this process. Only one claim per vehicle for related damages will be accepted.



## **REPAIR PROCEDURE:**

### **REMOVE FRONT DIFFERENTIAL**

1. Position the vehicle on a suitable lift.
2. Raise the vehicle.
3. Remove the front road wheels.
4. Remove the six nuts and bolts securing drive flange and propeller shaft to coupling. Discard the locking nuts. (Figure 1)

**⚠ CAUTION:** Ensure when removing the propeller shaft at the transfer box end to not damage the centering flange seal.

5. Pull the propeller shaft forward.
6. Remove and set aside the coupling and the centering flange.
7. Remove the front propeller shaft.

**△ NOTE:** Global Technical Reference (GTR) lookup sequence is as follows:  
**GTR Home > NAS > LM - New Range Rover > Service Information > Model Year > Workshop Manuals > 57 - Steering: 57.10.01 Power steering rack - left-hand Drive - V8. It is not necessary to perform the front wheel alignment check.**

8. Refer to Workshop Manual (GTR) section 57 - STEERING (57.10.01) to remove the steering gear for access.
9. Remove the nut securing right-hand height sensor link to lower arm and release the link. (Figure 2)
10. Remove and discard the bolt securing the right-hand lower arm to the sub-frame. (Figure 3)
11. Remove and discard the bolt securing the right-hand tie rod to the sub-frame. (Figure 4)
12. Release the lower arm and tie rod from the sub-frame. Support the weight of both arms.
13. Drain the oil from the front differential.

Figure 1

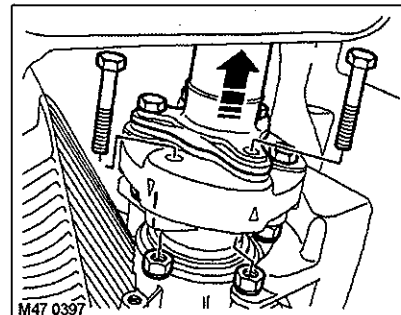


Figure 2

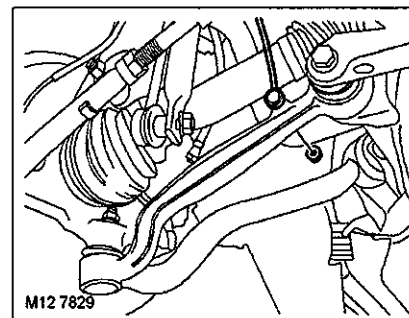


Figure 3

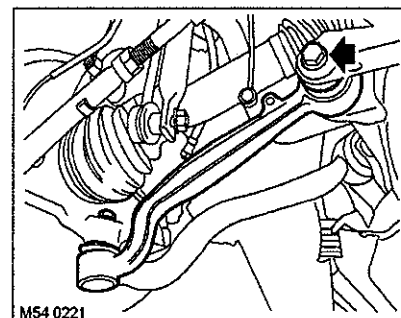
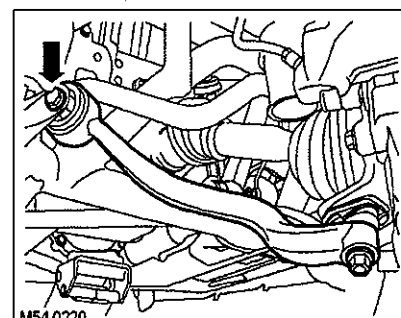


Figure 4





14. Install tool 205-735 to the right-hand driveshaft inboard joint. (Figure 5)
15. Using levers, release the driveshaft from the differential.
16. Using a suitable 3/8"-drive extension through the sub-frame mount, support the right-hand driveshaft, lower arm and tie rod. (Figure 6)
17. Remove tool 205-735 from the right-hand driveshaft inboard joint.
18. Raise the stabilizer bar and retain in the raised position with a wooden block between the stabilizer bar and the sub-frame.
19. Disconnect the breather hose from the differential. (Figure 7)

△ **NOTE:** Securing bolt above pinion remains captive to differential due to access.

20. Remove the four differential securing bolts. (Figure 7)
21. With assistance, remove the differential assembly through the sub-frame by:
  - Releasing the differential assembly from the engine sump.
  - Raising and twisting the differential assembly so that its input end is pointing downwards. (Figure 8)

Figure 5

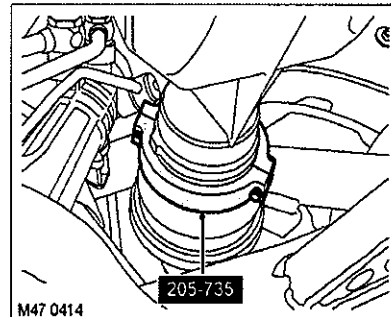


Figure 6

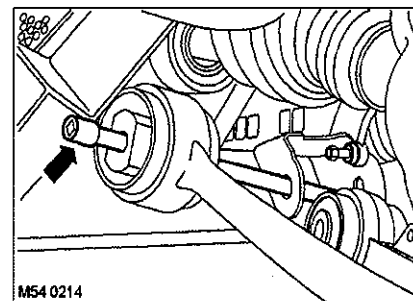


Figure 7

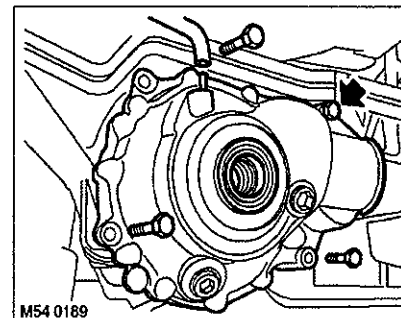
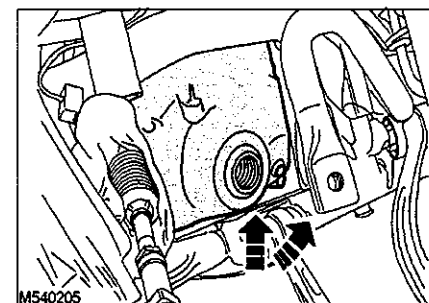


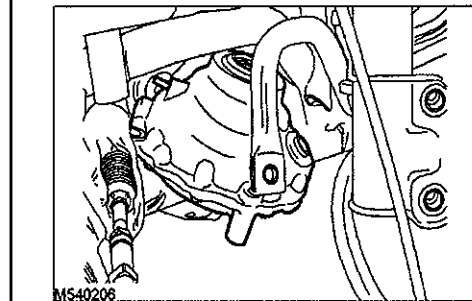
Figure 8





22. With assistance, remove the differential assembly through the left-hand wheel opening. (Figure 9)
23. Remove and discard the right-hand driveshaft clip.
24. Place the front differential on a suitable work bench.
25. Remove and discard the differential housing O-ring.

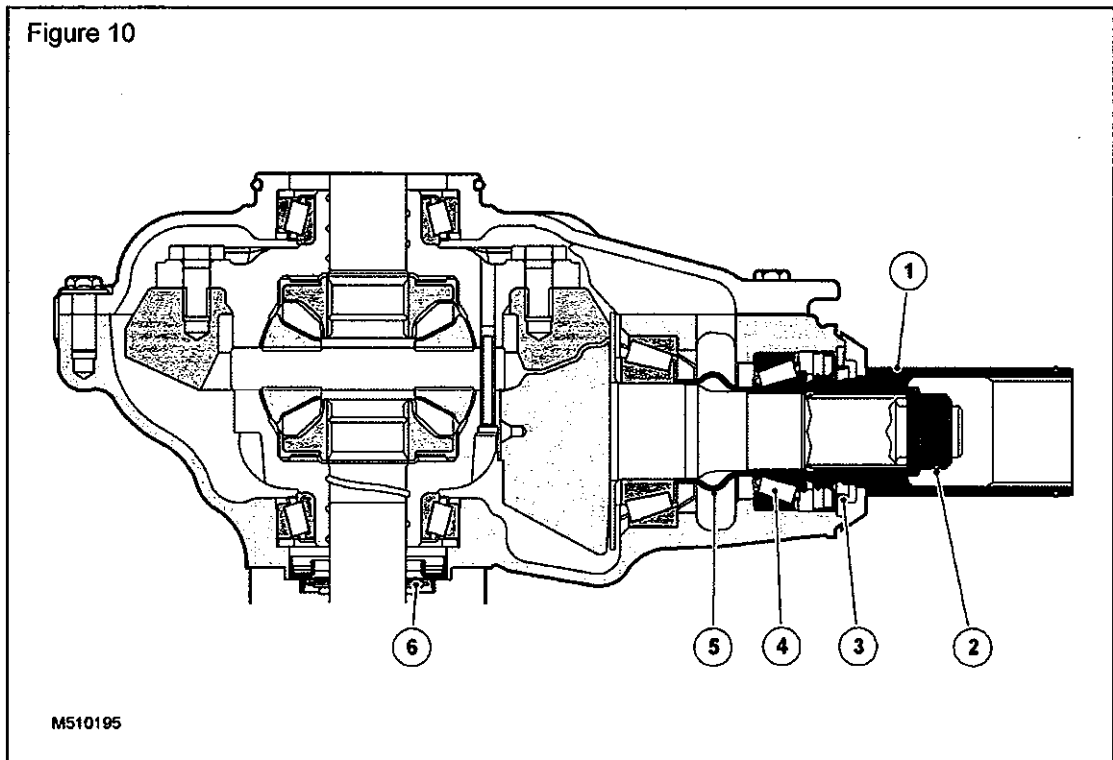
Figure 9



**COMPONENTS TO BE REPLACED IN THE FRONT DIFFERENTIAL (FIGURE 10)**

- ① Pinion Flange
- ② Pinion Flange Nut
- ③ Pinion Seal
- ④ Pinion shaft Tail Bearing
- ⑤ Collapsible Spacer
- ⑥ LH Driveshaft Oil Seal

Figure 10





### DISASSEMBLE FRONT DIFFERENTIAL

1. Remove and discard the left-hand driveshaft oil seal from the differential housing.
2. Remove the 12 differential casing bolts. (Figure 11)
3. Using the recess, release the front differential upper casing. (Figure 12)

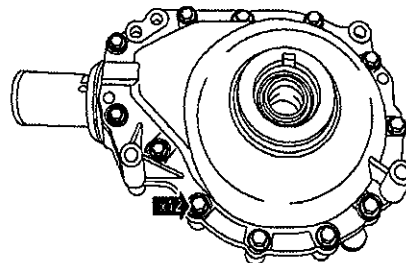
**⚠ CAUTION:** Ensure the bearing cup and shim are retained in the differential casing.

4. Remove the differential upper casing. (Figure 13)
5. Remove the crown wheel assembly. (Figure 14)

**⚠ CAUTION:** Do not use solvents or cleaning agents of any type to clean the differential (as this could contaminate the head bearing), clean with a dry cloth only.

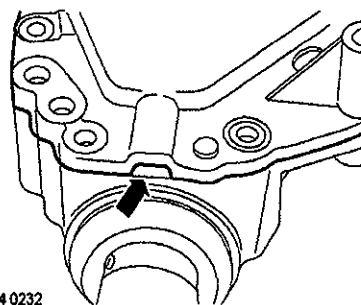
6. Clean the differential mating faces.

Figure 11



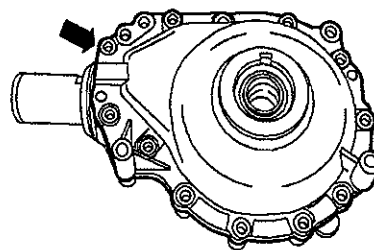
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Figure 12



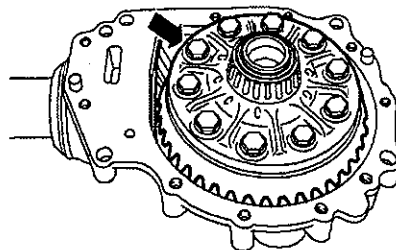
M54 0232

Figure 13



M54 0233

Figure 14



M54 0234



**⚠ CAUTION:** Ensure that the bearing cup and shim are retained in the differential casing and all case-to-tool bolts are used. Failure to follow these directions may cause damage to the special tool.

7. Install the differential casing and pinion assembly to special tool 205-890. (Figure 15)
8. Position the special tool in a suitable vice. (Figure 16)

**⚠ CAUTION:** Do not use air tools or heat to remove the nut (as this could contaminate the head bearing). Failure to follow this instruction may result in damage to the component. Do not tighten the bolt used to locate special tool 205-891 in special tool 205-890.

9. Using special tool 205-891, remove and discard the pinion flange nut. (Figure 17)

**⚠ CAUTION:** Twisting or damage to the differential housing / special tool may occur if base plates are not used to support the special tool in the press or the four jig fixings are not used.

10. Remove the special tool from the vice and position the assembly in a suitable hydraulic press.

**⚠ CAUTION:** Suitable hand and eye protection must be worn when removing the pinion flange.

**⚠ CAUTION:** During the removal process, the pinion may be expelled from the differential housing with considerable force. Do not use hands in an attempt to 'catch' the pinion during the removal process.

**⚠ CAUTION:** To avoid damaging the pinion, prevent the pinion from contacting differential housing /workbench during the removal process.

**⚠ CAUTION:** Do not exceed 15 tons of pressure when removing the pinion flange. If difficulty is encountered during this operation, contact the Land Rover Technical HelpLine for further assistance.

11. Using special tool 205-893, remove the pinion flange from the pinion shaft assembly. (Figure 18)

Figure 15

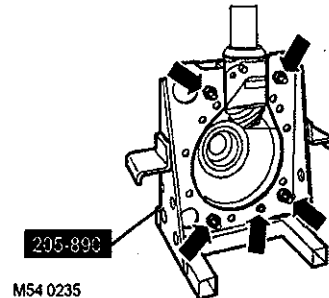


Figure 16

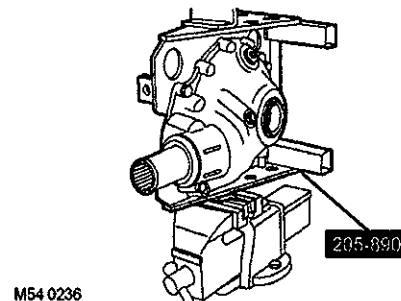


Figure 17

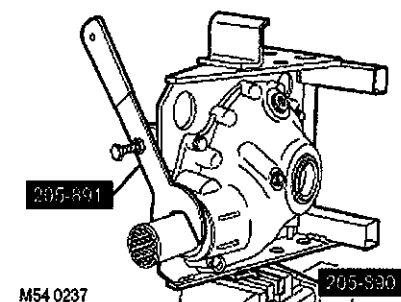
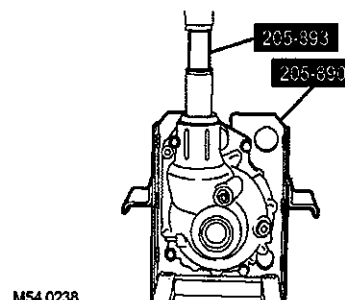


Figure 18







**!** CAUTION: Ensure that the pinion seal recess is not damaged as the seal is removed.

12. Remove and discard the pinion seal. (Figure 19)
13. Remove and retain the pinion shaft tail bearing for return. (Figure 20)
14. Remove and retain the collapsible spacer for return.
15. Wipe shaft with a clean cloth. (Figure 21)

**!** CAUTION: Ensure special tool 205-895 is installed between the two bearing cups.

16. Using special tools 205-895 and 100-012 remove and retain the pinion shaft tail bearing cup for return. (Figure 22)

Figure 22

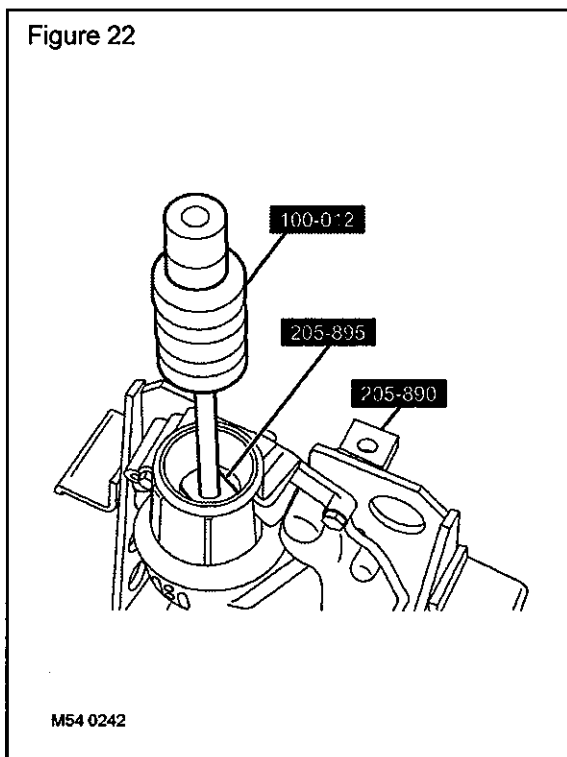


Figure 19

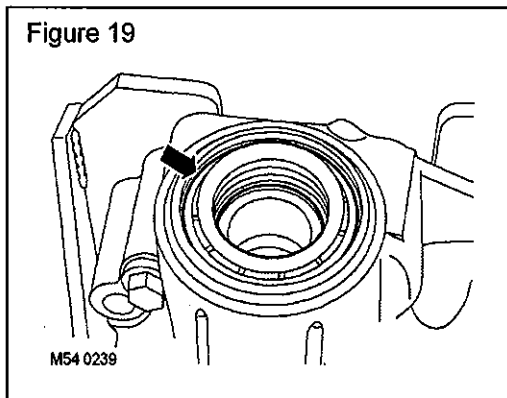


Figure 20

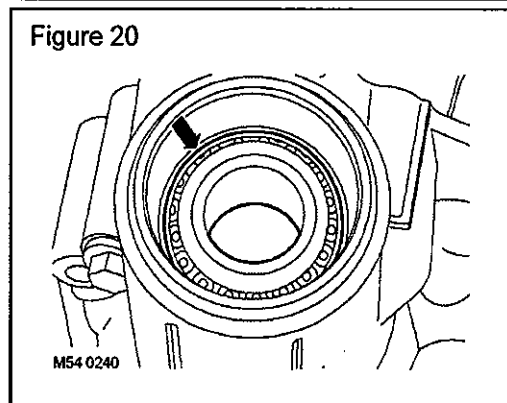
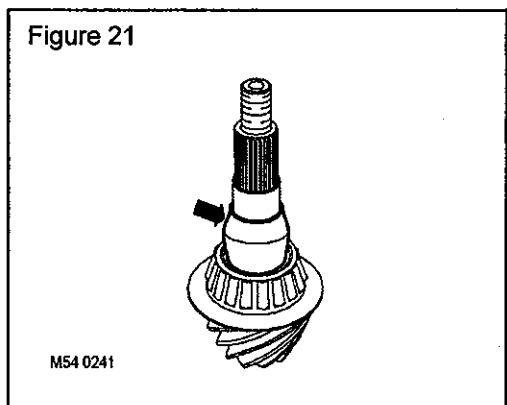


Figure 21





## ASSEMBLE FRONT DIFFERENTIAL

**⚠ CAUTION:** Do not clean or lubricate the new pinion shaft tail bearing, as it is supplied coated with a low friction oil. Failure to follow this instruction will require the pinion shaft tail bearing to be replaced before the differential can be successfully assembled.

Ensure adequate support plates are placed between special tool 208-890 and press. Failure to follow this instruction may cause damage to the special tool.

1. Using special tool 205-896, install a new pinion shaft tail bearing cup and apply a press load of 2-5 tons, until the bearing cup is fully installed. (Figure 23)

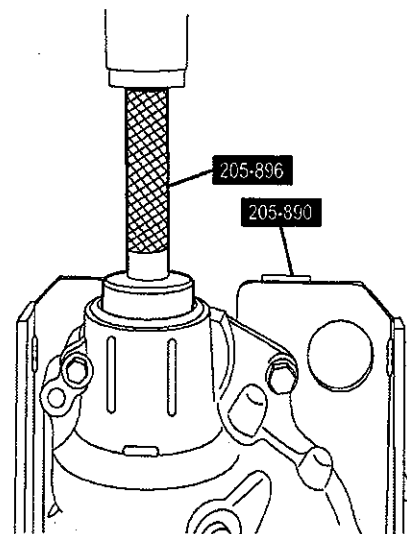
**⚠ CAUTION:** Do not clean or lubricate the new pinion shaft tail bearing, as it is supplied coated with a low friction oil. Failure to follow this instruction will require the pinion shaft tail bearing to be replaced before the differential can be successfully assembled.

2. Install the new pinion shaft tail bearing. (Figure 24)

**⚠ CAUTION:** Do not lubricate the pinion seal.

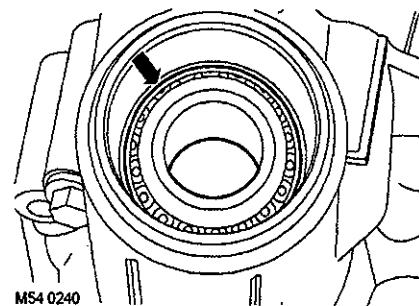
3. Using special tool 205-892, install the new pinion seal. (Figure 25)

Figure 23



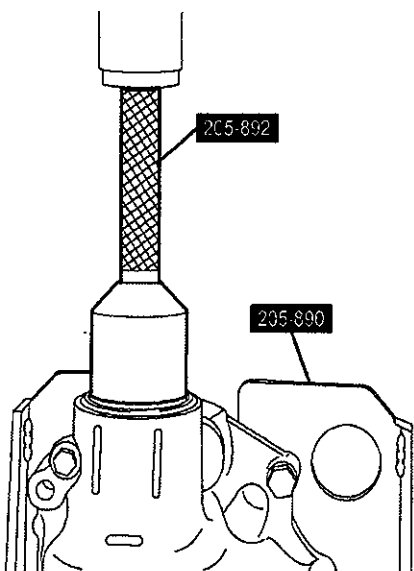
MS4 0243

Figure 24



MS4 0240

Figure 25



MS4 0244



4. Position special tool 205-890 in a suitable vice. (Figure 26)
5. Install the new collapsible spacer. (Figure 27)
6. Lubricate the existing pinion shaft head bearing with a light coating of differential oil.

**⚠ CAUTION:** Ensure the special tool is correctly aligned. Failure to follow this instruction may result in damage to the pinion seal.

7. Using special 205-892 tool, install the pinion shaft assembly. (Figure 28)

**⚠ NOTE:** The pinion flange may be a tight fit on the pinion shaft splines. If the pinion flange is tight, support the pinion shaft and seat the pinion flange with a soft-face hammer.

8. Install the new pinion flange. (Figure 29)

Figure 26

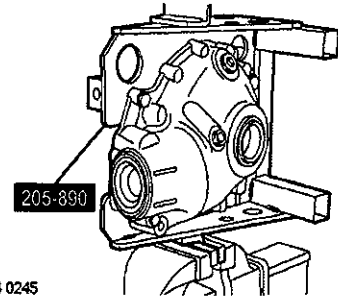


Figure 27

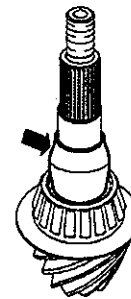


Figure 28

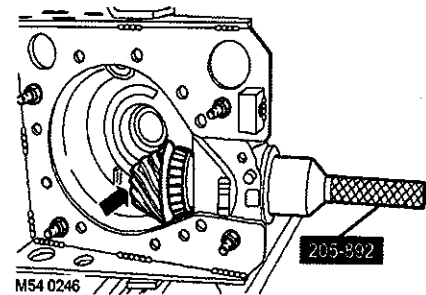
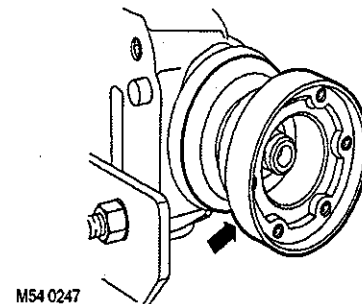


Figure 29





**CAUTION:** Ensure the specified torque to rotate the pinion shaft is not exceeded. If excess preload is applied to the joint, the pinion shaft must be removed and a new collapsible spacer, pinion shaft tail bearing, pinion shaft tail bearing cup and pinion flange nut must be installed.

**CAUTION:** The collapsible spacer will collapse under a load of 8-10 tons.

**CAUTION:** Use a suitable pin to prevent special tool LR-150 from rotating while tightening the new pinion flange nut. (Figure 30)

Using special tool LR-150 tighten the new pinion flange nut until the end float on the pinion shaft is eliminated. (Figure 30)

**CAUTION:** Ensure the specified torque to rotate the pinion shaft is not exceeded. If excess preload is applied to the joint the pinion shaft must be removed and a new collapsible spacer, pinion shaft tail bearing, pinion shaft tail bearing cup and pinion flange nut must be installed.

**NOTE:** The special tool (205-067) should be rotated at 60 rpm (1 revolution per second) to produce a consistent reading.

**NOTE:** The pinion shaft should be rotated through two full revolutions by hand before the torque measurement is performed.

**NOTE:** It is not necessary to remove special tool LR-150 when checking the torque required to rotate the pinion shaft.

9. Using special tool 205-067, check the torque required to rotate the pinion shaft. The specified torque is 1.4 N m +/- 0.2 N m. (Figure 31)

**CAUTION:** Ensure the specified torque to rotate the pinion shaft is not exceeded. If excess preload is applied to the joint the pinion shaft must be removed and a new collapsible spacer, pinion shaft tail bearing, pinion shaft tail bearing cup and pinion flange nut must be installed.

10. If the specified torque to rotate the pinion shaft is not reached, use special tool LR-150 to tighten the pinion flange nut in one-degree increments. (Figure 30)

- Check the rotational torque after each increment until the specified torque of 1.4 N m +/- 0.2 N m is achieved.

11. Remove the special tool LR-150 from the pinion flange.

12. Remove the special tool (205-890) from the vice.

13. Remove the differential casing and pinion assembly from the special tool. (Figure 32)

Figure 30

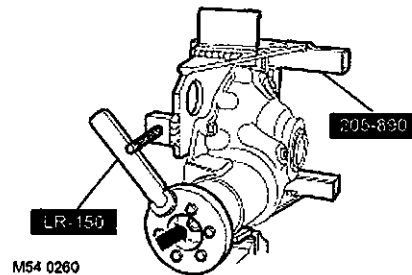


Figure 31

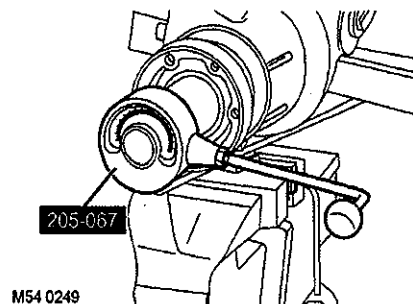
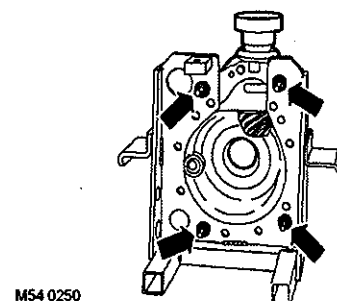


Figure 32





14. Install the crown wheel assembly. (Figure 33)
15. Use a center punch to mark the differential with three dots in a triangular pattern in the position shown. (Figure 34)

**⚠ CAUTION:** Ensure the mating faces are clean, before the sealant is applied.

16. Apply sealant to the differential upper casing mating faces. (Figure 35)

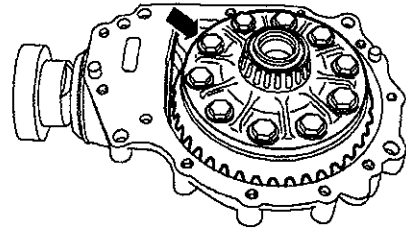
**⚠ CAUTION:** Ensure the bearing cup and shim is retained in the differential casing.

17. Install the differential upper casing.

**△ NOTE:** Tighten the bolts in the sequence shown.

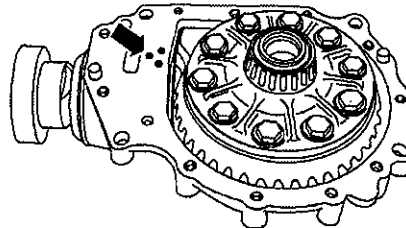
18. Following the sequence shown, install the 12 differential casing bolts and tighten to **45 N m (33 lbf ft)**. (Figure 36)
19. Clean the RH driveshaft where the new clip is to be installed.
20. Install a **new** clip to the right-hand driveshaft.
21. Install a **new** O-ring to the differential housing and lubricate with petroleum jelly.
22. Using LRT-54-028, install a **new** left-hand driveshaft oil seal to the differential housing.

Figure 33



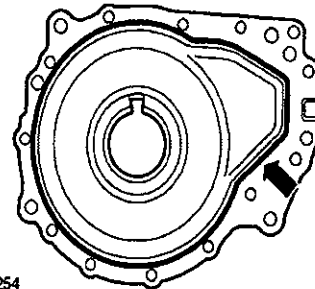
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Figure 34



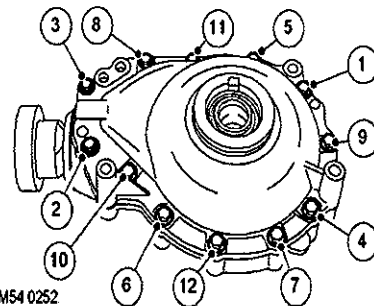
M54 0253

Figure 35



M54 0254

Figure 36



M54 0252



## INSTALL FRONT DIFFERENTIAL

**NOTE:** The bolt above the pinion must be located in the differential prior to installation.

1. With assistance, carefully install the differential to the engine sump.
2. Tighten the front differential securing bolts to **110 N m (81 lbf ft)**.
3. Connect the breather hose to the differential.
4. Remove the screw securing the left-hand stabilizer bar heatshield. (Figure 37)
5. Install the **new** front propeller shaft heatshield. (Figure 38)
6. Install and tighten the nuts and bolts securing the front propeller shaft heatshield to **15 N m (11 lbf ft)**.
7. Install and tighten the screw securing the front propeller shaft heatshield and the stabilizer bar heatshield.
8. Remove plastic cap from the **new** front propeller shaft.
9. Install new gasket to front propeller shaft.
10. Extend the front propeller shaft joint and fill with grease. (Figure 39)
11. Install the front propeller shaft.
12. Clean the coupling and flange mating faces.

Figure 37

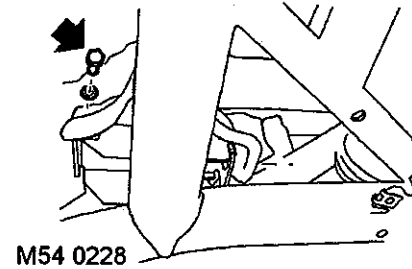


Figure 38

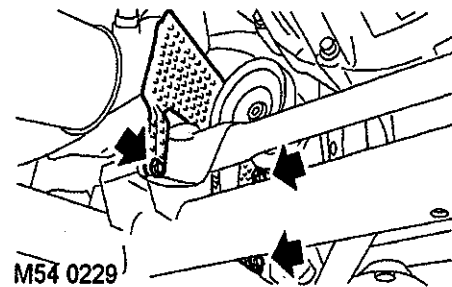
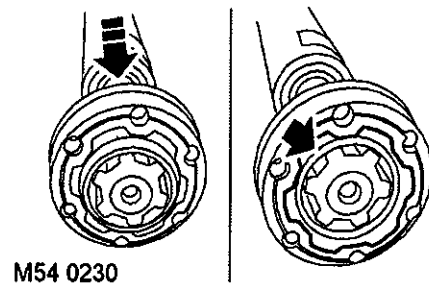


Figure 39





13. Install the coupling and flange with arrows on coupling pointing towards securing bolts as illustrated. (Figure 40)
14. Install the bolts securing the coupling and tighten the new nuts to 110 N m (81 lbf ft).

**⚠ CAUTION:** Ensure gasket is correctly located in propeller shaft joint.

15. Install three new washers and six new bolts securing the propeller shaft to the differential flange.
  - Tighten to 45 N m (33 lbf ft) then a further 90 degrees. (Figure 41)

16. Remove the wooden block and allow the stabilizer bar to return to the lowered position.
17. Remove the right-hand driveshaft support.

**⚠ CAUTION:** Pull the driveshaft to ensure the clip is fully engaged and retains the shaft in the differential.

18. Install the right-hand driveshaft to the differential, ensuring the clip is fully engaged.
19. Remove the right-hand tie rod and lower arm support.

**⚠ CAUTION:** Nuts and bolts must be tightened with the weight of the vehicle on the suspension.

20. Position the right-hand lower suspension arm and align to the sub-frame; install a new bolt but do not tighten at this stage.

**⚠ CAUTION:** Nuts and bolts must be tightened with the weight of the vehicle on the suspension.

21. Position the right-hand tie rod and align to the sub-frame; install a new bolt but do not tighten at this stage.

**⚠ CAUTION:** Use an open ended wrench on the flats provided to prevent the ball joint from rotating.

22. Connect the right-hand front height sensor link and tighten the nut to 8N m (6 lbf ft).

**⚠ CAUTION:** Inspect PAS reservoir for presence of a 'Pentosin CHF202' label:

- If label is present, indicating Technical Bulletin LTB00112 has been performed, use only Pentosin CHF202 PAS fluid (LRN003401).
- If label is not present and Technical Bulletin LTB00112 has not been performed, use PAS Fluid - Texaco Cold Climate PSF 14315 (LRN2261).

**△ NOTE:** It is not necessary to perform the front wheel alignment check.

23. Refer to Workshop Manual (GTR) section 57 - STEERING (57.10.01) to install the steering gear. It is not necessary to perform the front wheel alignment check.
24. Lower the vehicle.
25. Tighten the bolt securing the right-hand lower suspension arm to the sub-frame to 165 N m (121 lbf ft) plus a further 90-degrees.
26. Tighten the bolt securing the right-hand tie rod to the sub-frame to 165 N m (121 lbf ft), plus a further 90-degrees.
27. Fill the differential to the correct level with oil (LRN7591).

Figure 40

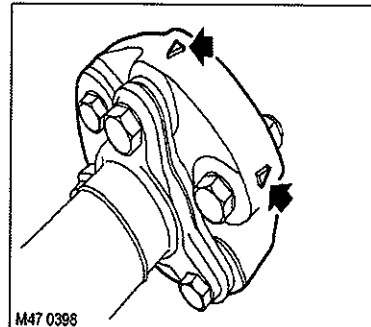


Figure 41

