Published: Jul 12, 2006

Specifications

Rear axle	
Type	Spiral bevel, fully floating shafts
Ratio	3.54:1

Sealers

Item	Land Rover Part No.
Rear axle differential case	STC 3811
Crown wheel to differential case bolts	STC 50552
Differential case bolts	STC 50552
Hub drive member bolts	STC 50552

Lubricants

Item	Specification
Final drive *	Molytex EP90

* Do not use any lubricant other than that specified **Capacities**

Unit	Capacity
Differential - 90 Models	1.70 litres (3.0 pints) (1.80 US quarts)
Differential - 110 Models	2.26 Litres (4.00 pints) (2.39 US Quarts)

Torque Specifications

Description	Nm	lb-ft
Pinion housing to axle case	41	30
Crown wheel to differential case	58*	43*
Differential bearing cap to pinion housing	90	65
Differential drive flange to drive shaft	47	34
Bevel pinion nut	129	96
Lower link to axle	176	130
Pivot bracket ball joint to axle	176	130
Brake disc to hub	73*	53*

* Apply sealant, Part No. STC 50550 to threads

Published: Feb 14, 2006

Rear Drive Axle and Differential

Description

The welded steel rear 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 rear wheels via the axle shafts and fully floating hubs which are mounted on tapered roller bearings.

Lubrication

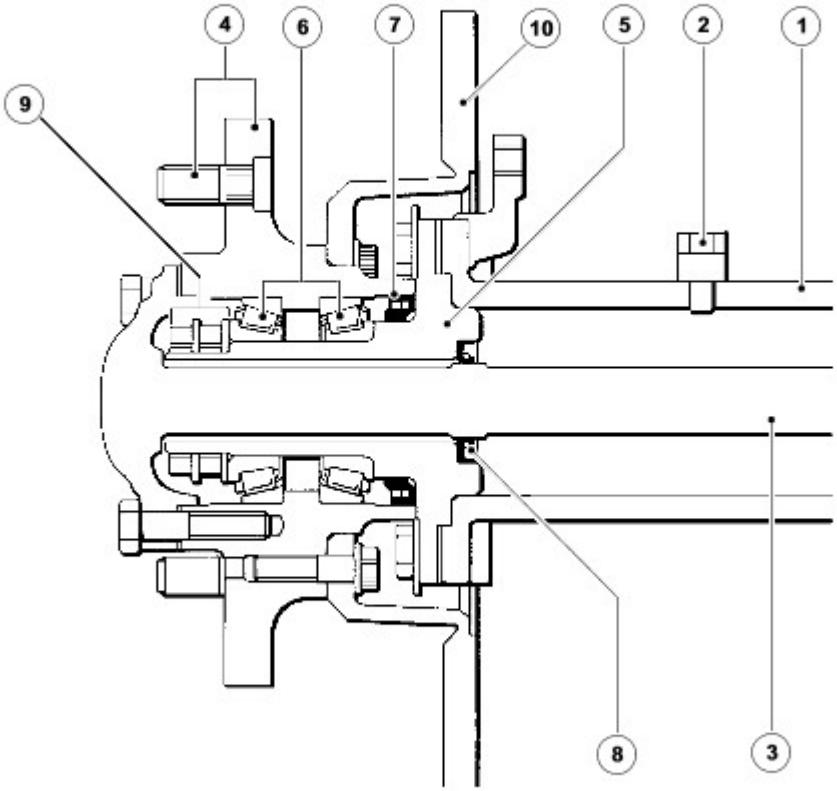
The differential is lubricated with oil and the hub bearings with grease.

The hub bearings are fitted with inner and outer seals. The outer seals prevent the differential oil mixing with the hub grease and the inner seals prevent dirt ingress into the hub.

Ventilation

Ventilation of the hub bearings is through the outer oil seals and the differential ventilation pipe, which terminates at a high level.

Rear axle hub - 90

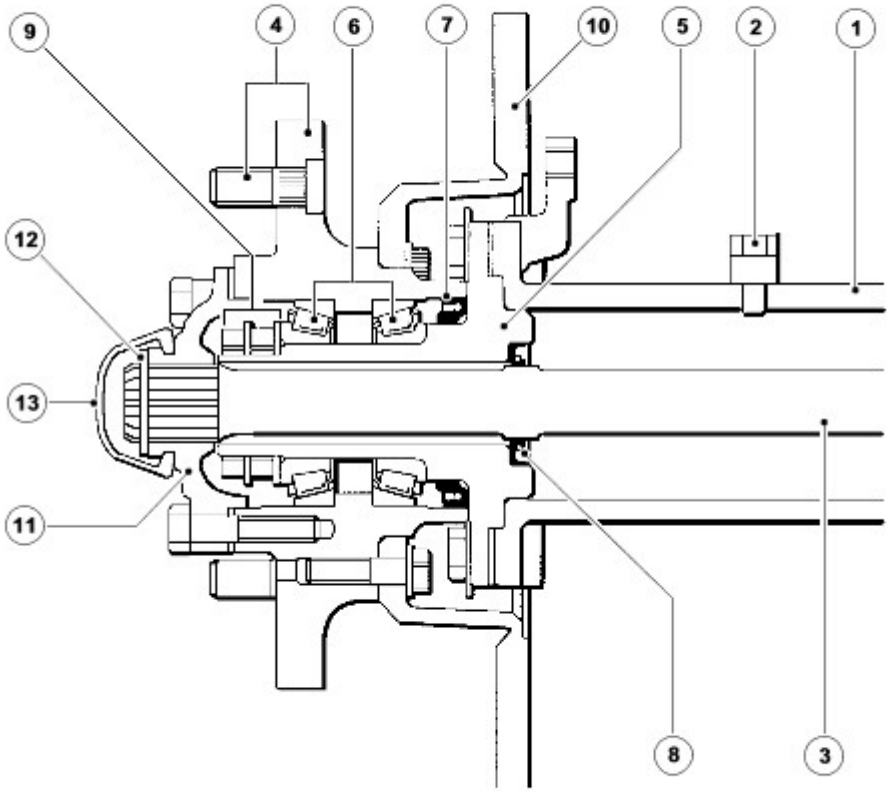


J6250A

Item	Part Number	Description
1		Axle casing
2		Ventilation pipe

3		Axle shaft
4		Wheel studs and hub
5		Wheel bearing stub axle
6		Wheel bearings
7		Inner hub seal
8		Outer hub/axle shaft seal
9		Hub lock plate, thrust washer and nuts
10		Brake disc

Rear axle hub - 110/130



J6251A

Item	Part Number	Description
1		Axle casing
2		Ventilation pipe
3		Axle shaft
4		Wheel studs and hub
5		Wheel bearing stub axle
6		Wheel bearings
7		Inner hub seal
8		Outer hub/axle shaft seal
9		Hub lock plate, thrust washer and nuts

10		Brake disc
11		Drive flange
12		Drive shaft circlip
13		Dust cap

Published: Apr 7, 2006

Rear Drive Axle and Differential

Complaint - Oil leaks

An external leak of lubrication from the hub seals can be caused by a faulty internal seal. For example, if the seals which separate the differential from the hubs are faulty and the vehicle is operating or parked on an embankment, oil from the differential may flood one hub resulting in a lack of lubrication in the differential.

When a seal is found to be leaking check the axle ventilation system, as a blockage can cause internal pressure to force oil past the seals.

Illustrations of oil seal locations are given in Description and Operation.
Rear Drive Axle and Differential

When investigating hub seal leaks check the grease for dilution with oil. Also check the differential oil level, for signs of metal particles in the oil and the condition of internal seals.

If the vehicle is driven in deep water with defective oil seals, water may contaminate the lubricants and raise the differential oil level, giving a false impression that the housing has been over filled. Do not assume that a high oil level in the differential is due to over filling or, that a low level is because of an external leak.

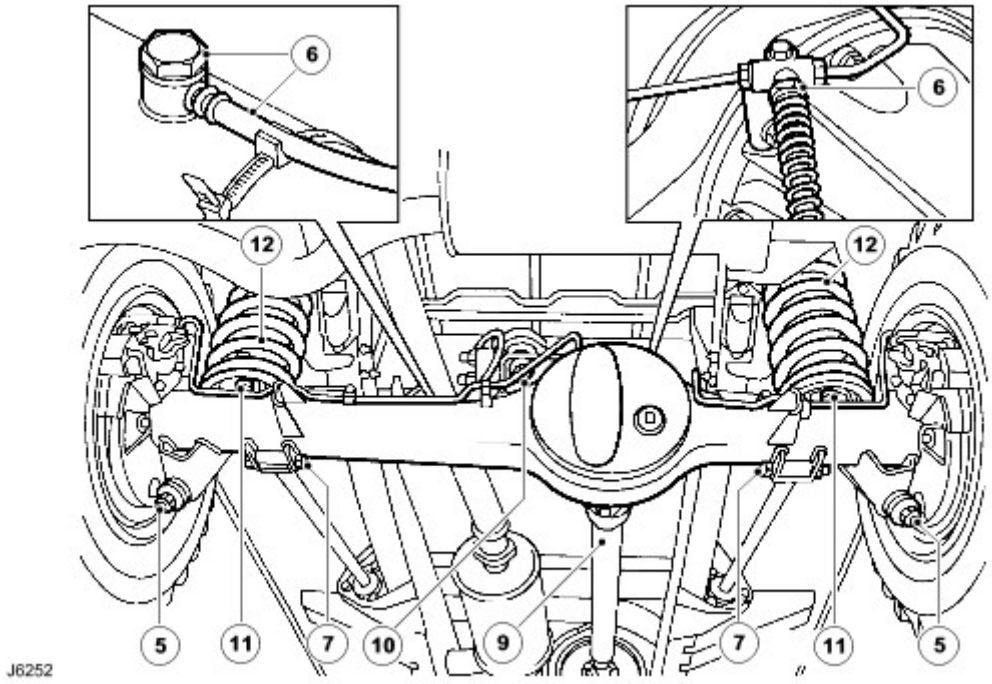
Published: Apr 7, 2006

Axle Assembly (51.15.01)

Removal

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

1 . Drain brake system.



2 . Support chassis rear.

3 . Remove road wheels.

4 . Support axle weight with hydraulic jack.

5 . Disconnect shock absorbers.

6 . Disconnect flexible brake hose at RH chassis side member and breather hose at banjo connection on axle casing.

7 . Disconnect lower links at axle.

8 . Mark differential and propeller shaft flanges with identification marks for assembly.

9 . Remove 4 nuts and bolts, lower propeller shaft and tie to one side.

10 . Disconnect pivot bracket ball joint at axle bracket.

11 . Release bolts and remove coil spring retaining plates.

12 . Lower axle and remove road springs.

13 . If applicable, remove stabilizer bar links at axle.

For additional information, refer to Rear Stabilizer Bar (64.35.08)

14 . Remove axle assembly.

Installation

1 . Position axle and fit lower links. Tighten fixings to 176 Nm (130 lbf/ft).

2 . If applicable, fit stabilizer bar links to axle.
For additional information, refer to Rear Stabilizer Bar (64.35.08)

3 . Raise axle and locate road springs.

4 . Fit coil spring retaining plates and secure with fixing bolts.

5 . Secure pivot bracket ball joint to axle bracket. Tighten fixing to 176 Nm (130 lbf/ft).

6 . Align propeller shaft to differential drive flange and tighten fixings to 47 Nm (35 lbf/ft).

7 . Reconnect flexible brake hose and axle breather hose.

8 . Refit shock absorbers.

9 . 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)

10 . Remove rear chassis support.

11 . Bleed brake system.
For additional information, refer to Brake System Bleeding (70.25.02)

Published: Jun 22, 2006

Differential Case - 90

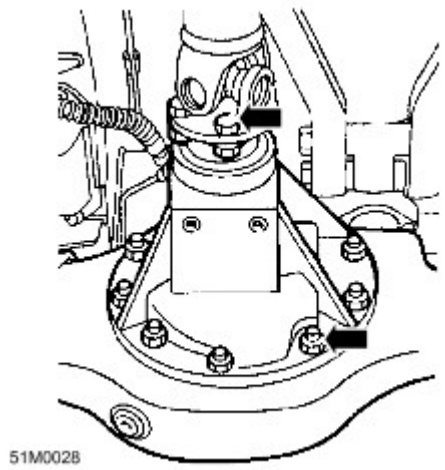
1 . Using suitable container, drain axle oil.

2 . Mark differential and propeller shaft flanges to facilitate reassembly.

3 . Remove 4 bolts and disconnect propeller shaft from differential. Tie aside.

4 . Remove 5 hub drive member bolts and withdraw axle half shafts sufficiently to disengage from differential unit.

5 . Remove 10 nuts securing differential to axle case.



6 . Withdraw differential unit.

7 . **NOTE:**

The differential unit can only be serviced as a complete assembly with matching drive pinion. For advice ring Land Rover Service Department.

Ensure mating faces are clean and apply a bead of sealant, Part No. STC 3811 to axle case.

8 . Support differential unit and position on axle casing.

9 . Secure with self locking nuts and tighten to 40 Nm (30lbf.ft).

10 . Align marks on flanges and secure propeller shaft to differential. Tighten bolts to 48 Nm (35 lbf.ft).

11 . Refit half shafts, using new drive member gaskets. Tighten bolts to 65 Nm (48 lbf.ft).

12 . Refill axle oil with approved lubricant.
For additional information, refer to Specifications

Published: Jul 12, 2006

Drive Pinion Seal - 110/130 (51.20.01)

Installation

1 . Clean pinion oil seal recess and pinion flange.

2 . Lubricate NEW oil seal lip with clean axle oil.

3 . Using LRT-51-009 fit pinion oil seal.

4 . Fit pinion flange.

5 . Restrain flange using LRT-51-003 and fit bolt. Tighten bolt to 100 Nm (74 lbf.ft).

6 . Position propeller shaft to differential housing and align reference marks.

7 . Fit flange bolts and tighten to 48 Nm (35 lbf.ft).

8 . Top-up differential oil level.

9 . Remove stands and lower vehicle.

Published: Apr 19, 2006

Drive Pinion Seal - 90 (51.20.01)

Removal

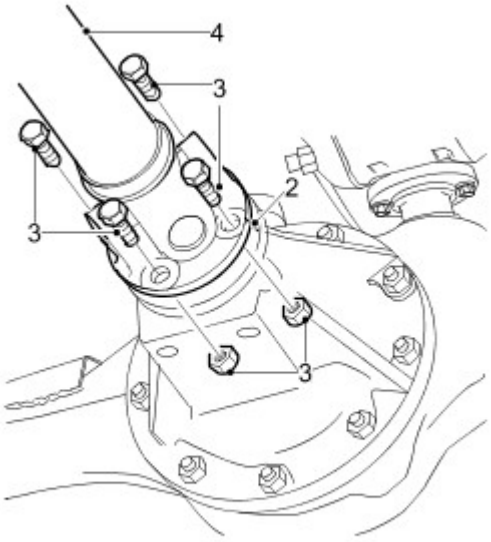
1 . Raise rear of vehicle.

WARNING: Do not work under a vehicle supported only by a jack. Always support the vehicle on safety stands.

2 . Reference mark the propeller shaft flanges for reassembly.

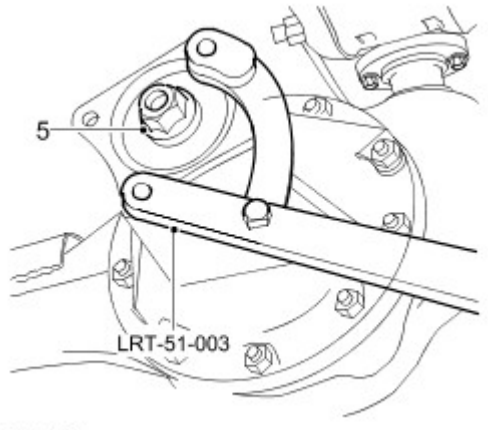
3 . Remove 4 nuts and bolts securing propeller shaft to differential housing.

4 . Release propeller shaft and tie aside.



51M0048

5 . Using LRT-51-003 to restrain the pinion flange, remove bolt securing pinion flange.



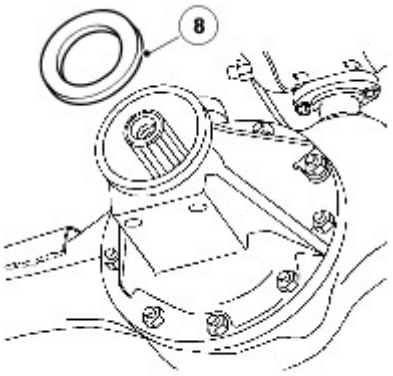
51M0049

6 . Remove pinion flange.

7 . Position container to catch oil spillage.

8 . **CAUTION: Take care to avoid damage to oil seal recess.**

Using a suitable lever, remove and discard pinion oil seal.



51M0050A

Installation

1 . Clean pinion oil seal recess and pinion flange.

2 . Lubricate NEW oil seal lip with clean oil.

3 . Using LRT-51-010 fit pinion oil seal.

4 . Clean the mating splines of the pinion flange and the differential pinion shaft.

5 . Apply high strength retainer STC50554 to the pinion flange splines.

6 . Instal pinion flange.

7 . Restrain flange using LRT-51-003 and instal bolt. Tighten bolt to 100 Nm (74 lbf.ft).

8 . Position propeller shaft to differential housing and align reference marks.

9 . Instal flange bolts and tighten to 48 Nm (35 lbf.ft).

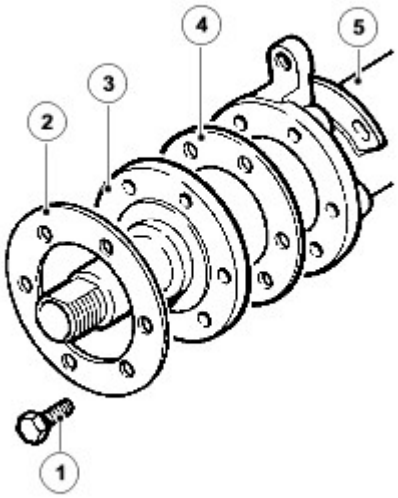
10 . Remove stands and lower vehicle.

11 . Top-up differential oil level.

Published: Feb 15, 2007

Stub Shaft Pilot Bearing and Seal - 90

Removal



J6263

Item	Description
1.	Stub shaft to axle casing bolt
2.	Mud shield
3.	Stub shaft
4.	Stub shaft gasket
5.	Axle case

NOTE:

This procedure covers removal and installation of the stub shaft and oil seal.

1 . Remove hub assembly.
For additional information, refer to
For additional information, refer to Wheel Bearing and Wheel Hub (64.15.14)

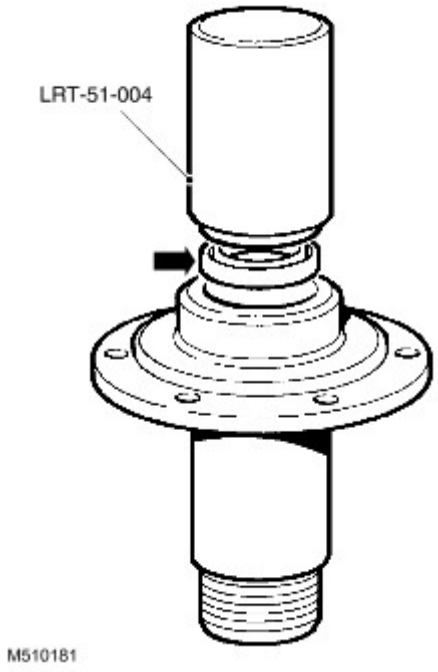
2 . Remove 6 bolts from stub shaft to axle casing; remove mud shield.

3 . Remove stub shaft and gasket.

4 . Remove and discard oil seal.

Installation

1 . Lubricate replacement seal with EP90 oil. Fit seal, lip side trailing using tool LRT-51-004. Drive seal into housing until it is flush with rear face of stub shaft.



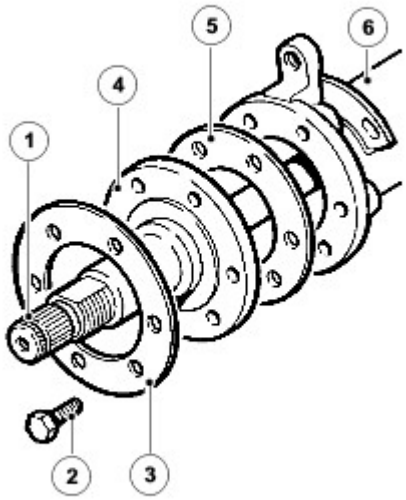
2 . Fit new gasket, stub shaft and mud shield. Fit bolts and tighten to 65 Nm (48 lbf/ft).

3 . Refit hub assembly.
For additional information, refer to
For additional information, refer to Wheel Bearing and Wheel Hub (64.15.14)

Published: Feb 15, 2007

Stub Shaft Pilot Bearing and Seal - 110/130

Removal



J6265

Item	Description
1.	Stub shaft
2.	Stub shaft to axle case bolt
3.	Mud shield
4.	Stub shaft
5.	Stub shaft gasket
6.	Axle case

NOTE:

This procedure covers removal and installation of the stub shaft and oil seal.

1 . Remove hub assembly.
For additional information, refer to
For additional information, refer to Wheel Bearing and Wheel Hub (64.15.14)

2 . Remove 6 bolts from stub shaft to axle case; remove mud shield.

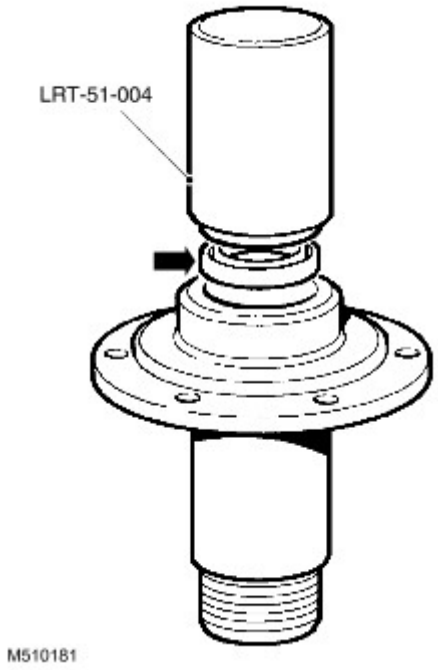
3 . Remove stub shaft and gasket.

4 . Remove axle shaft from axle case.

5 . Remove and discard oil seal.

Installation

1 . Lubricate replacement seal with EP90 oil. Fit seal, lip side trailing using tool LRT-51-004 until seal is flush with rear face of stub shaft.



2 . Fit new gasket, stub shaft and mud shield. Fit bolts and tighten to 65 Nm (48 lbf/ft).

3 . Fit axle shaft to axle case, avoid damaging stub shaft seal.

4 . Refit hub assembly.
For additional information, refer to
For additional information, refer to Wheel Bearing and Wheel Hub (64.15.14)

Published: Apr 19, 2006

Axle - 110/90

Disassembly

1 . **NOTE:**

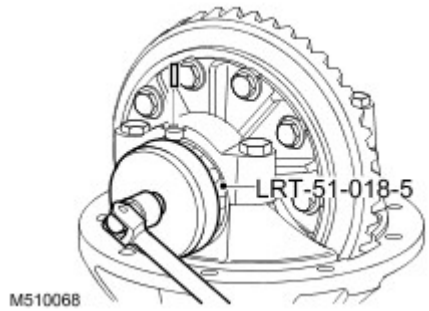
*This procedure is only applicable to 110 models up to the following VIN's:

- 110 Non ABS - 638163
- 110 With ABS - 638248

Remove differential assembly.

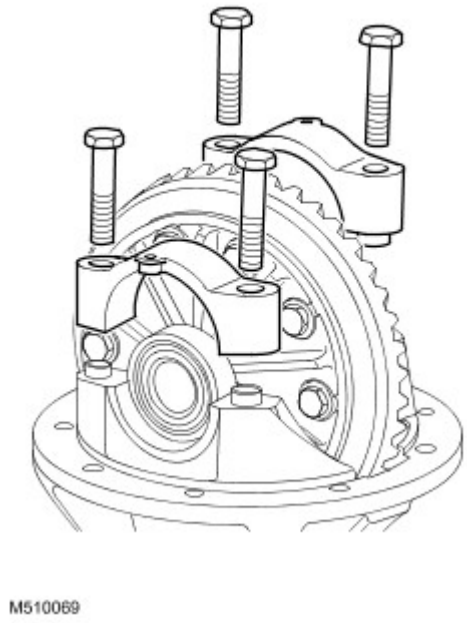
2 . Secure differential assembly in a vice or stand.

3 . Remove roll pins securing adjusting nuts, using LRT 51-018/5 loosen adjusting nuts.

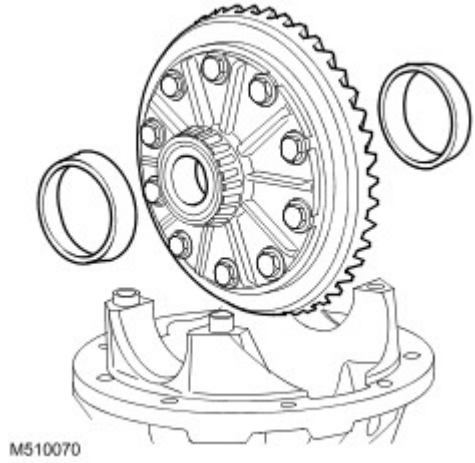


4 . Reference mark bearing caps to aid assembly.

5 . Remove bolts securing bearing caps and remove caps.

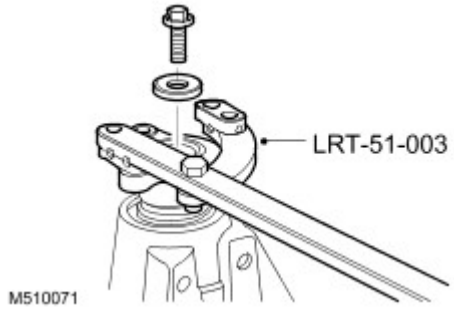


6 . Remove crown wheel assembly and collect bearing outer tracks.



7 . Mark outer tracks to bearings to aid assembly, if bearings are to be re-used.

8 . Using LRT-51-003 to restrain pinion flange remove bolt and collect washer.



9 . **NOTE:**

Older front differentials have a square flange and an extra spacer fitted, this spacer must be removed. Later front differentials have a round flange but no spacer fitted.

Remove pinion flange

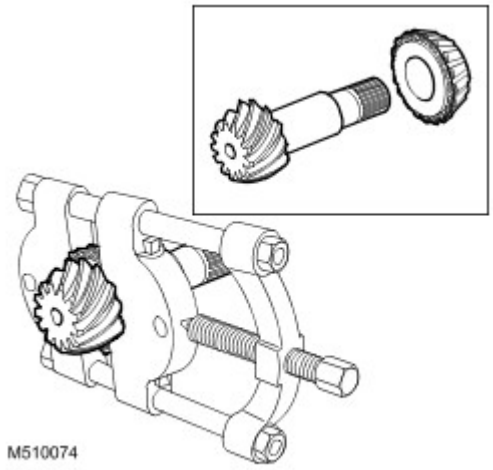
10 . **CAUTION: Take care to avoid damage to oil seal recess.**

Using a lever, remove pinion oil seal.

11 . Carefully tap pinion from housing, collect pinion and tail bearing.

12 . Remove pinion tail bearing shim and record shim size.

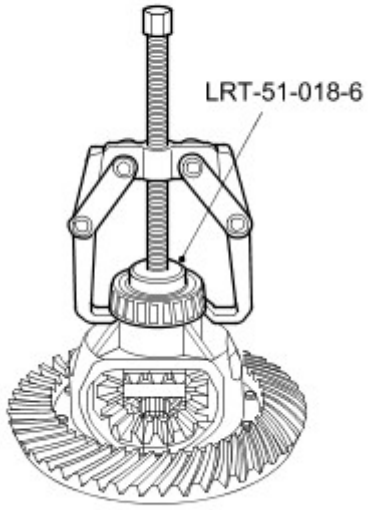
13 . Using a puller, remove pinion head bearing.



14 . Remove pinion bearing races.

15 . Remove pinion head bearing shim and record shim size.

16 . Using a two legged puller and LRT 51-018/6, remove the differential bearings.



M510076

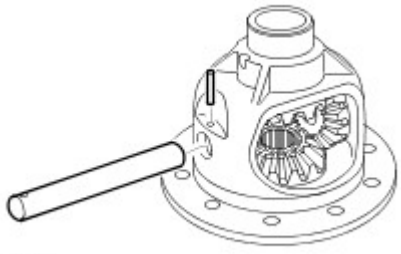
17 . Secure the crown wheel assembly in a vice.

18 . Remove and discard 10 bolts securing the crown wheel to carrier.

M510077

19 . Carefully remove the crown wheel from the carrier.

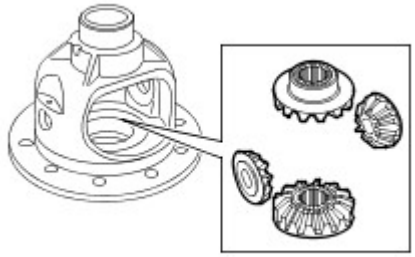
20 . Remove and discard roll pin securing carrier cross shaft and remove cross shaft.



M510078

21 . Rotate gears to the open part of carrier and remove planet gears.

22 . Remove sun gears.



M510079

23 . Clean and inspect all components for wear and damage.

Assembly

1 . Instal planet gears and rotate to align cross shaft holes.

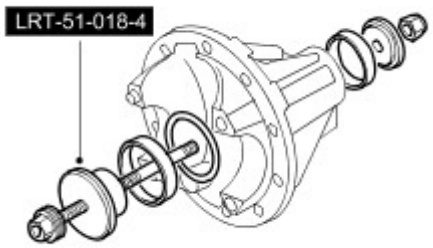
2 . Instal cross shaft, ensure roll pin hole is aligned.

3 . Secure cross shaft with new roll pin.

4 . Instal crown wheel to carrier, instal new bolts and tighten to 60 Nm (44 lbf.ft).

5 . Ensure original head bearing shim is clean and free from burrs and instal under bearing race.

6 . Ensure pinion bearing cup recesses are clean and free of burrs and using LRT 51-018-4 instal pinion head and tail bearing races.



M510105A

7 . Instal pinion head bearing to pinion.

8 . Lubricate bearings with thin oil.

9 . Ensure original tail bearing shim is clean and free from burrs and instal under bearing race.

10 . Instal pinion and pinion tail bearing.

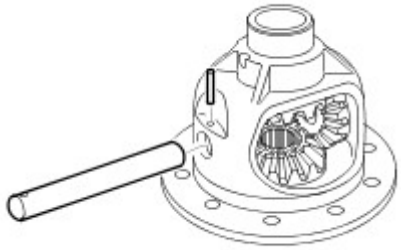
11 . Instal pinion flange, washer and bolt.

12 . Use LRT-51-003 to restrain pinion flange.

13 . Tighten pinion flange bolt to 100 Nm (74 lbf.ft).

14 . Check pinion for end float. Should read zero.

15 . Rotate pinion several times to settle bearings, check pinion torque to turn. Torque to turn should be recorded during pinion rotation. Pinion torque to turn should be 4 to 6 Nm (3 to 4.5 lbf.ft).



M510083

16 . **NOTE:**

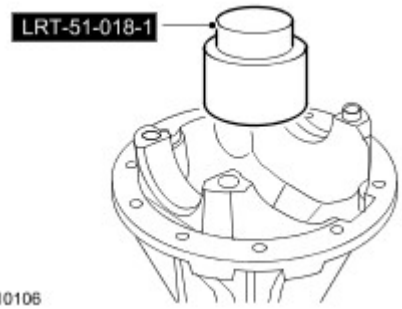
To increase torque to turn, instal narrower spacer; to decrease torque to turn instal wider spacer.

Adjust size of tail bearing shim to obtain correct pinion torque to turn, (0.025 mm = 1 Nm (0.001' = 0.7 lbf.ft) approx).

17 . Position LRT-51-018/7 on surface plate, establish zero and reference DTI.

18 . Ensure pinion height setting block, setting gauge and mating faces are clean and free from burrs.

19 . Locate setting block LRT 51-018/1 over pinion head, ensure it is fully seated in position.

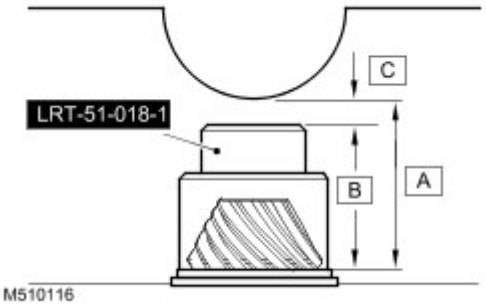


M510106

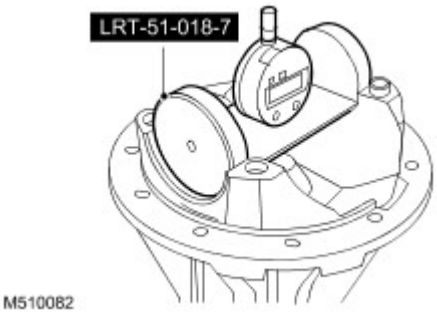
20 . **CAUTION: Setting block height must be checked using figures on side of block.**

Pinion height setting procedure: 'C' = 'A' - 'B'. Subtract nominal pinion height 'A' from setting block height 'B' (on side of setting block). Example: 74.390 - 73.130 = 1.26 mm (2.929' - 2.88' = 0.049') Therefore pinion head height reading is 1.260 mm ± 0.025 mm (0.049' ± 0.001').

- 'A' = Nominal pinion height setting, 74.390
- 'B' = Setting block height.
- 'C' = Head height setting.



21 . Align setting gauge LRT-51-018/7 to setting block, rock gauge to obtain minimum reading. If reading is lower than required reading, decrease shim size. If reading is higher than required reading, increase shim size.



22 . Using LRT-51-003 to restrain pinion flange, remove bolt and washer. Remove pinion flange.

23 . Remove pinion, collect tail bearing and tail bearing shim.

24 . Remove pinion head bearing outer race and shim. Discard shim. Ensure bearing race recess is clean and free from burrs.

25 . Instal calculated shim, and using LRT-51-018-4 instal head bearing outer race.

26 . Instal pinion, pinion tail bearing and tail bearing shim.

27 . Instal pinion flange and bolt and washer. Using LRT-51-003 to restrain pinion flange, tighten bolt to 100 Nm (74 lbf.ft).

28 . Rotate pinion in both directions to settle bearings.

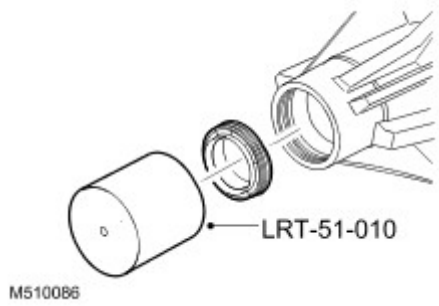
29 . Recheck pinion torque to turn, adjust if necessary.

30 . Recheck pinion head height.

31 . Using LRT-51-003 to restrain pinion flange, remove bolt and washer. Remove pinion flange.

32 . Discard bolt.

33 . Using LRT-51-010 instal pinion seal.



34 . Ensure spacer and tail bearing are correctly located.

35 . Instal pinion, pinion flange and washer.

36 . Instal new pinion flange bolt and tighten to 100 Nm (74 lbf.ft).

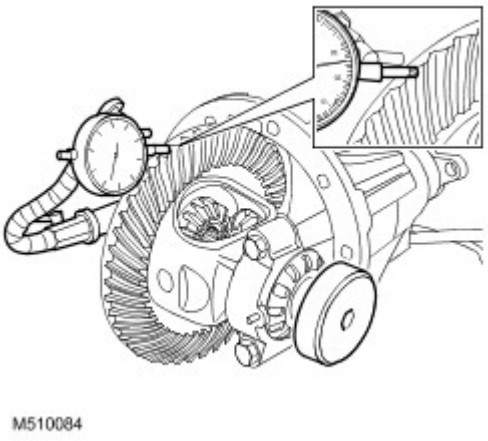
37 . Lightly oil differential bearings.

38 . Ensure spring dowels are fitted in bearing caps.

39 . Instal differential bearing outer races and locate differential assembly into housing.

40 . Instal bearing caps and tighten bolts to 10 Nm (7.5 lbf.ft).

41 . Instal adjusting nuts, tighten crown wheel side nut to 22 Nm (16 lbf.ft). Ensure opposing nut is loose.



42 . Position DTI to check crown wheel backlash. Adjust opposing nut to obtain correct crown wheel backlash.

43 . Rotate pinion in both directions to settle bearings.

44 . **NOTE:**

Crown wheel backlash should be within 0.076 mm to 0.177 mm (0.003 in to 0.007 in).

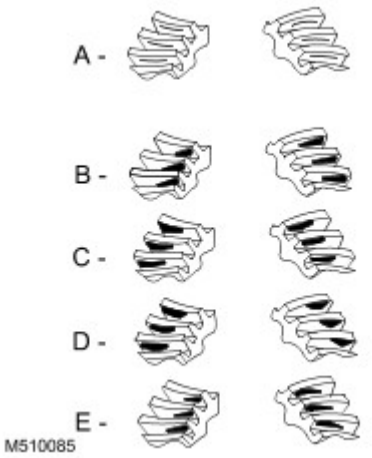
Measure in 3 places to obtain correct crown wheel backlash.

45 . Align adjusting nuts to next roll pin slot, do not loosen nuts to align slots.

46 . Tighten bearing cap bolts to 90 Nm (66.5 lbf.ft).

47 . Secure adjusting nuts with new roll pins.

48 . Apply Prussian Blue to crown wheel teeth to check tooth contact.



49 . **NOTE:**

Note assembly torque to turn when checking tooth contact. Total torque to turn should not exceed 10.85 Nm (8 lbf.ft).

Rotate pinion several times to obtain full tooth contact.

- A = Normal pattern:The drive pattern should be centered on the gear teeth. The coast pattern should be centered on the gear teeth but may be towards the toe. There should be some clearance between the pattern and the top of the gear teeth.
- B = Backlash incorrect:Thinner pinion shim required.
- C = Backlash incorrect:Thicker pinion shim required.
- D = Pinion shim incorrect:Decrease backlash.
- E = Pinion shim incorrect:Increase backlash.

50 . Instal differential assembly.

Published: Apr 14, 2006

Axle - 110/130

Disassembly

1 . **NOTE:**

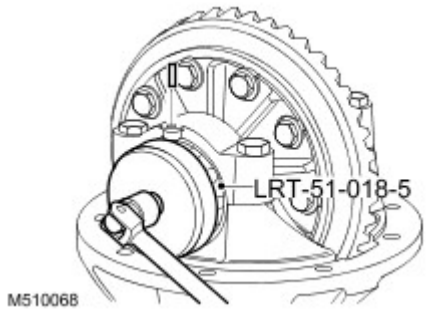
*This procedure is applicable to 110 and 130 models from the following VIN's:

- 110 Non ABS - 638164
- 110 Heavy Duty and 130, Non ABS - 638224
- 110 Heavy Duty and 130, With ABS - 638134

Remove differential assembly.

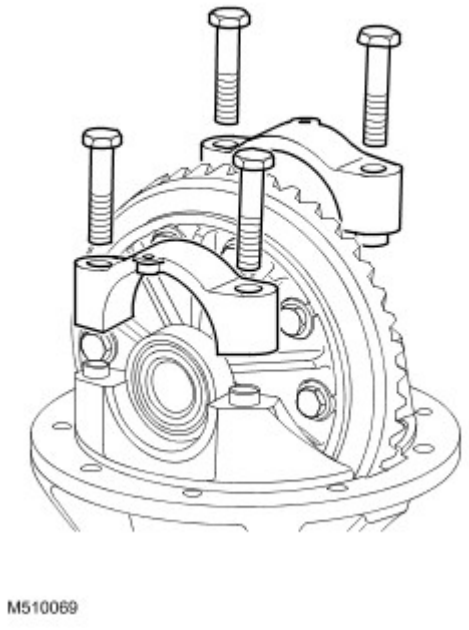
2 . Secure differential assembly in a vice or stand.

3 . Remove roll pins securing adjusting nuts, using LRT 51-018/5 loosen adjusting nuts.

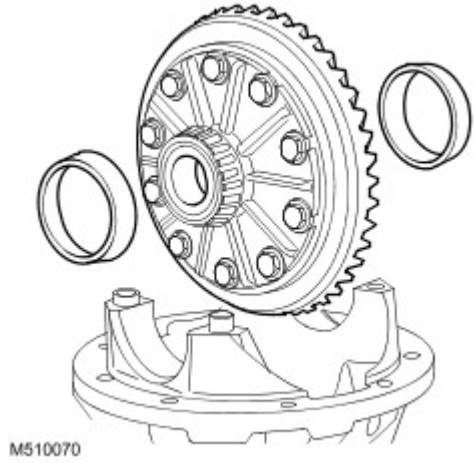


4 . Reference mark bearing caps to aid assembly.

5 . Remove 4 bolts securing bearing caps and remove caps.

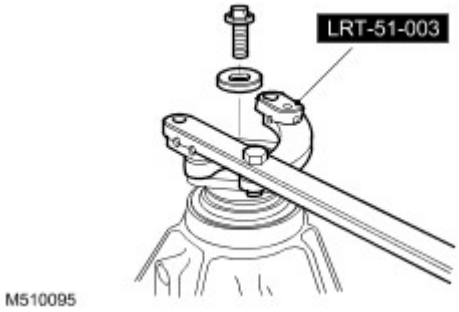


6 . Remove crown wheel assembly and collect bearing outer tracks.



7 . Mark outer bearing tracks if bearings are to be re-used.

8 . Using LRT-51-003 to restrain pinion flange remove bolt and collect washer.

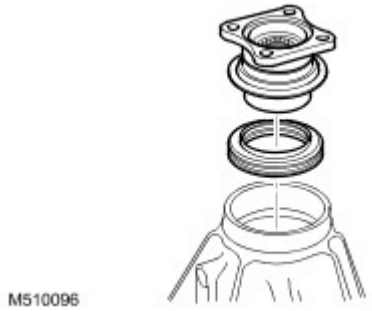


9 . **NOTE:**

Older front differentials have a square flange and an extra spacer fitted, this spacer must be removed. Later front differentials have a round flange but no spacer fitted.

Remove pinion flange

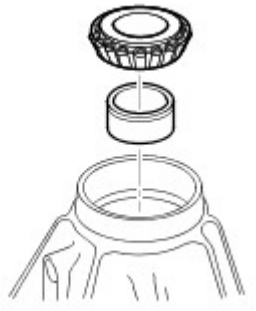
10 . Using a lever, remove pinion oil seal.



CAUTION: Take care to avoid damage to oil seal recess.

11 . Carefully tap pinion from housing, collect pinion and tail bearing.

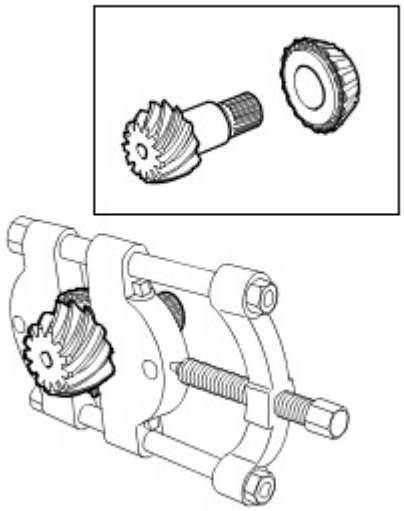
12 . Remove pinion tail bearing spacer and record spacer size.



M510097

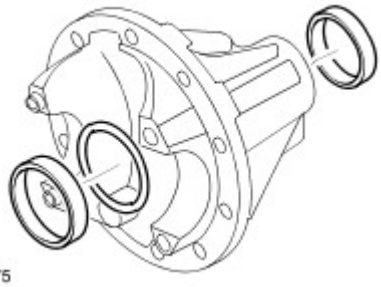
CAUTION: Do not discard spacer at this stage.

13 . Using a bearing puller, remove pinion head bearing, if bearing is to be replaced.



M510098

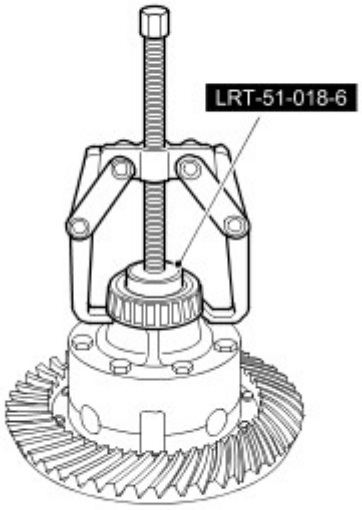
14 . Remove pinion head and tail bearing tracks.



M510075

15 . Remove pinion head bearing shim and record shim size.

16 . Using a two legged puller and LRT 51-018/6, remove the differential bearings.

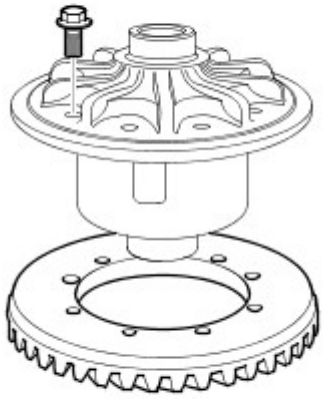


M510099

17 . Secure the crown wheel assembly in a vice.

18 . Reference mark position of crown wheel to carrier to aid assembly.

19 . Remove and discard 10 bolts securing the crown wheel to the carrier.

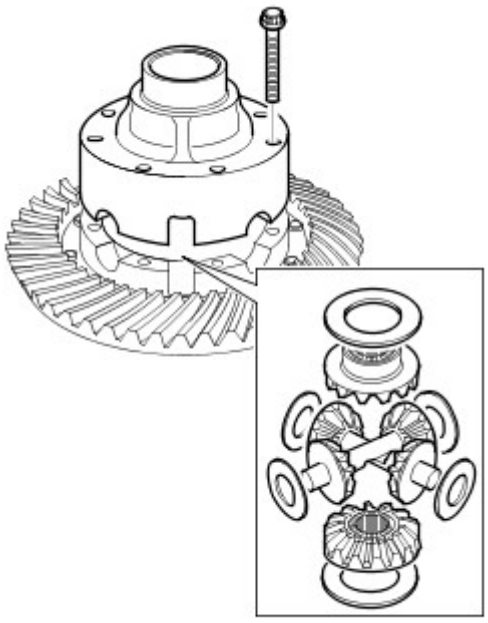


M510100

20 . Carefully remove the crown wheel from the carrier.

21 . Reference mark position of differential casing to aid assembly.

22 . Remove 8 bolts securing differential gear upper casing and remove casing.



M510188

23 . Remove upper sun gear, recover shim.

24 . Noting their fitted position, remove planet gears, cross pins; recover spherical washer from each planet gear.

25 . Remove lower sun gear from differential gear lower casing, recover shim.

26 . Clean and inspect all components for wear and damage.

Assembly

1 . Lubricate sun and planet gears, spherical washers, shims and cross pins.

2 . Fit shim to lower sun gear and fit sun gear to differential gear lower casing.

3 . Fit all planet gears, cross shafts and spherical washers into lower casing. Ensure gears and cross shafts are fully engaged.

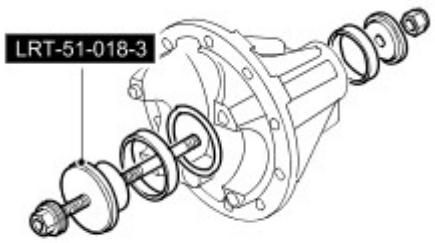
4 . Fit shim to upper sun gear, position upper sun gear to planet gears ensuring full teeth engagement.

5 . Ensuring differential gear casing reference marks are aligned, position differential gear upper casing. Fit bolts and tighten progressively by diagonal selection to 32 Nm (24 lbf.ft).

6 . Fit crown wheel to carrier ensuring reference marks are aligned, fit new bolts and tighten progressively to 60 Nm (44 lbf.ft).

7 . Ensure original pinion head bearing shim is clean and free from burrs, fit shim in bearing outer track recess.

8 . Using LRT-51-018/3 fit pinion head and tail bearing outer tracks.



M510080A

9 . Lubricate bearings with thin oil.

10 . Fit pinion head bearing to pinion.

11 . Fit pinion into pinion housing and hold in place.

12 . Ensure original spacer is clean and free from burrs, fit to pinion shaft ensuring that groove in spacer is facing towards drive flange. Push spacer hard against pinion head bearing.

13 . Fit pinion tail bearing.

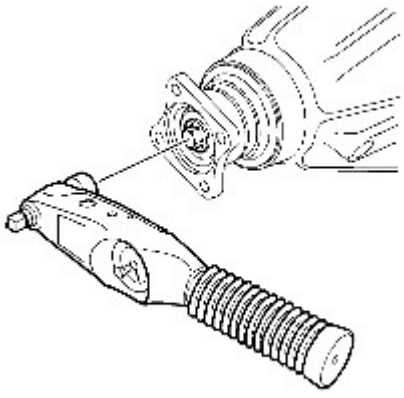
14 . Fit pinion flange, washer and bolt.

15 . Use LRT-51-003 to restrain pinion flange.

16 . Tighten pinion flange bolt to 100 Nm (74 lbf.ft).

17 . Check pinion for end float. Should read zero.

18 . Rotate pinion several times to settle bearings, check pinion torque to turn. Torque to turn should be recorded during pinion rotation. Pinion torque to turn should be 4 to 6 Nm (3 to 4.5 lbf.ft).



M510102

19 . Adjust size of tail bearing spacer to obtain correct pinion torque to turn (0.025 mm = 1 Nm (0.001' = 0.7 lbf.ft) approx).

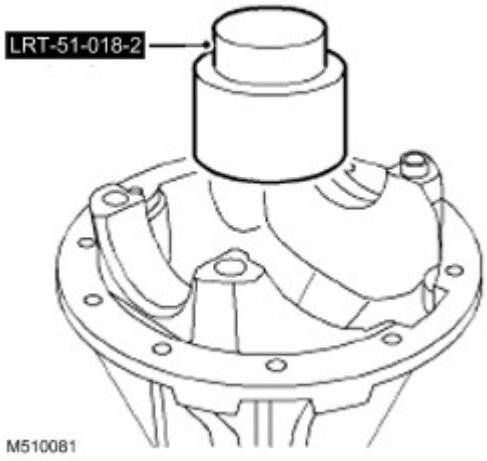
NOTE:

To increase torque to turn, fit narrower spacer; to decrease torque to turn fit wider spacer.

20 . Position LRT-51-018/7 on surface plate, secure DTI with grub screw, establish zero and reference DTI.

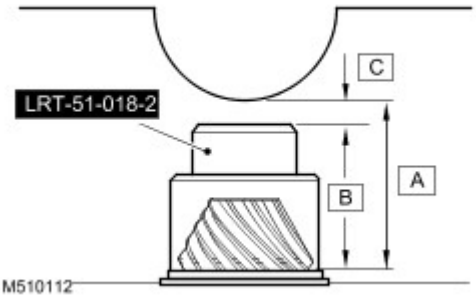
21 . Ensure pinion height setting block, setting gauge and mating faces are clean and free from burrs.

22 . Locate setting block LRT- 51-018/2 over pinion head, ensure it is fully seated in position.



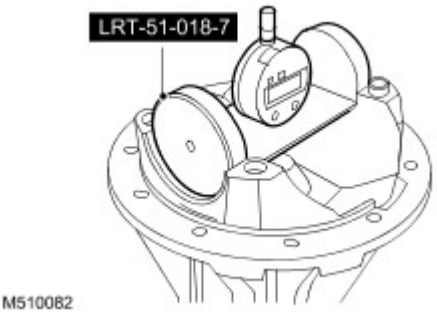
23 . Pinion height setting procedure: 'C' = 'A' - 'B'. Subtract nominal pinion height 'A' from setting block height 'B' (on side of setting block) Example: 76.04 - 74.7 = 1.34 mm (2.993' - 2.941' = 0.053'). Therefore pinion head height reading is 1.34 mm ± 0.025 mm (0.053' ± 0.001').

- 'A' = Nominal pinion height setting, 76.04.
- 'B' = Setting block height.
- 'C' = Head height setting.



CAUTION: Setting block height must be checked using figures on side of block.

24 . Align setting gauge LRT-51-018-7 to setting block, rock gauge to obtain minimum reading. If reading is lower than required reading, decrease shim size. If reading is higher than required reading, increase shim size.



25 . Using LRT-51-003 to restrain pinion flange, remove bolt and washer. Remove pinion flange.

26 . Remove pinion, collect tail bearing and tail bearing spacer.

27 . Remove pinion head bearing outer track and shim, discard shim. Ensure bearing track recess is clean and free from burrs.

28 . Fit calculated shim and using LRT-51-018/3, fit pinion head bearing outer track.

29 . Fit pinion, spacer and pinion tail bearing.

30 . Fit pinion flange, bolt and washer. Using LRT-51-003 to restrain pinion flange, tighten bolt to 100 Nm (74 lbf.ft).

31 . Rotate pinion in both directions to settle bearings.

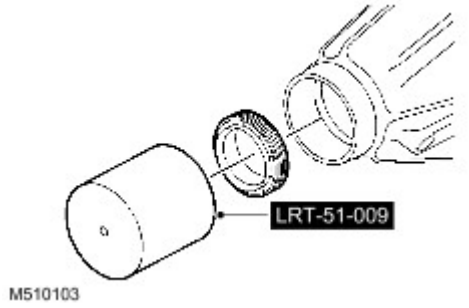
32 . Recheck pinion torque to turn, adjust if necessary.

33 . Recheck pinion head height.

34 . Using LRT-51-003 to restrain pinion flange, remove bolt and washer. Remove pinion flange.

35 . Discard bolt.

36 . Using LRT-51-009, fit pinion seal.



37 . Ensure spacer and tail bearing are correctly located.

38 . Fit pinion, flange and washer.

39 . Fit new pinion flange bolt and tighten to 100 Nm (74 lbf.ft).

40 . Lightly oil differential bearings.

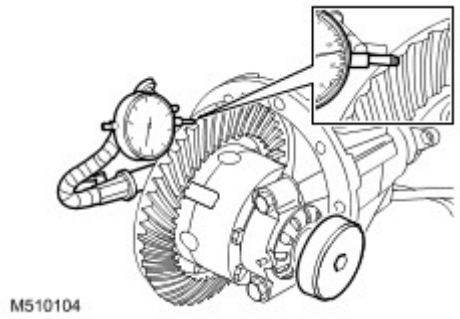
41 . Ensure dowels are fitted in bearing caps.

42 . Fit differential bearing outer races and locate differential assembly into housing.

43 . Fit bearing caps and tighten bolts to 10 Nm (7.5 lbf.ft).

44 . Fit adjusting nuts, tighten crown wheel side nut to 22 Nm (16 lbf.ft). Ensure opposing nut is loose.

45 . Position DTI to check crown wheel backlash. Adjust opposing nut to obtain correct crown wheel backlash.



46 . Rotate crown wheel in both directions to settle bearings.

47 . Measure crown wheel backlash in 3 positions , adjust as required.

NOTE:

Crown wheel backlash should be within 0.076 mm to 0.177 mm (0.003 in to 0.007 in).

48 . Align adjusting nuts to next roll pin slot, do not loosen nuts to align slots.

49 . Tighten bearing cap bolts to 180 Nm (133 lbf.ft).

50 . Secure adjusting nuts with new roll pins.

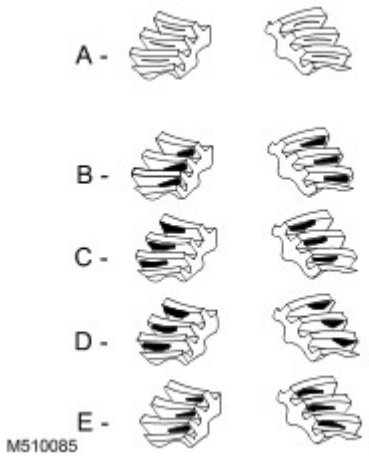
51 . Apply Prussian Blue to crown wheel teeth to check tooth contact.

52 . **NOTE:**

Note assembly torque to turn when checking tooth contact. Total torque to turn should not exceed 10.85 Nm (8 lbf.ft).

Rotate pinion several times to obtain full tooth contact.

- A = Normal pattern:The drive pattern should be centered on the gear teeth. The coast pattern should be centered on the gear teeth but may be towards the toe. There should be some clearance between the pattern and the top of the gear teeth.
- B = Backlash correct:Thinner pinion shim required.
- C = Backlash correct:Thicker pinion shim required.
- D = Pinion shim correct:Decrease backlash.
- E = Pinion shim correct:Increase backlash.



53 . Fit differential assembly.