

## TRUCK, LIGHT, MC2, LAND ROVER 110 6X6 - ALL TYPES

### FITTING OF REAR DISC BRAKES

## MODIFICATION INSTRUCTION

This instruction is authorised for use by command of the Chief of the General Staff. It provides direction, mandatory controls and procedures for the operation, maintenance and support of equipment. Personnel are to carry out any action required by this instruction in accordance with GENERAL A 001.

#### Introduction

1. This instruction details the fitting of disc brakes to the rear and intermediate axles on Land Rover 110 6x6 variants currently fitted with rear drum brakes. Land Rover 110 6x6 have been fitted with disc brakes, in production since mid 1991, to improve maintenance and brake efficiency.

#### General

2. **Associated Publications.** The latest issue of the following references should be read in conjunction with this instruction:

- a. EMEI Workshop A 850 - Modifications, Trial Modifications and Local Modifications to Equipment;
- b. EMEI Workshop A 851 - Modifications to Equipment - Use of Modification Record Plates and Documentary Requirements;
- c. EMEI Vehicle G 189-10 - Truck, Lightweight, Land Rover 110 4x4 and Truck, Light, Land Rover 110 6x6, Revised Adjustments to the Brake Booster Pushrod to Rectify Excess Brake Pedal Travel;
- d. EMEI Vehicle G 203 - Issue 1, Amdt 2, Truck, Light, MC2, Land Rover 110 6x6, Unit Repair, Group 12;
- e. EMEI Vehicle G 209 - Issue 2, Truck Light, MC2, Land Rover 6x6, Servicing Schedule; and
- f. Land Rover 110 6x6 variants, Repair Part Scales.

3. **Authority.** Project Perentie TVA TL9091 and Rover Australia Engineering Change 2249.

4. **Modification Application.**

- a. all Land Rover 110 6x6, with drum brakes fitted to rear and intermediate axles; and
- b. axles in stock under NSN 2520-66-128-4254 and 2520-66-128-4255 are to be

converted under the direction of the HQ Log Comd Fleet Manager.

5. **Items Affected.** Intermediate and rear axle brake assemblies and brake hydraulic pipes.

6. **Priority - Group 2.** All Land Rover 110 6x6 variants with drum brakes fitted to the intermediate and rear axles are to be modified at the next brake overhaul or alternate major service.

7. **Action Required.** Actions detailed in this instruction are to be performed by units or sub units authorised to carry out unit, field or base repairs.

8. **Estimated Manhours to Perform.** For initial planning purposes only, it is estimated that this modification will take 10 manhours to perform.

9. **Items to be Removed.** Items to be removed are shown in Table 1. All items are to be inspected and serviceable items retained for unit stock for use on Land Rover 110 4x4 variants. Unserviceable items are to be disposed of in accordance with GENERAL P series.

10. **Special Tools.** The special tools required are:

- a. NSN 5220-66-128-4307, Bracket, and DTI or NSN 5120-66-120-5140 magnetic base DTI; and
- b. NSN 5120-66-128-4322, Hub Nut Spanner.

11. **Stores Required.** The stores required are listed in Table 2 and are to be demanded through normal supply channels. Indents for the parts kit (Item 1, Table 2) are to show the ARN of vehicles for which parts are required. The parts kit is supplied on the basis of one kit per vehicle and is not to be ordered for stock or procured locally. The remaining consumables shown in Table 1 are to be ordered on an as required basis. The items listed in Table 3, form part of the kit shown in Table 2. The items are shown for identification purposes and are not to be ordered to complete the modification.

Table 1 - Stores to be Removed

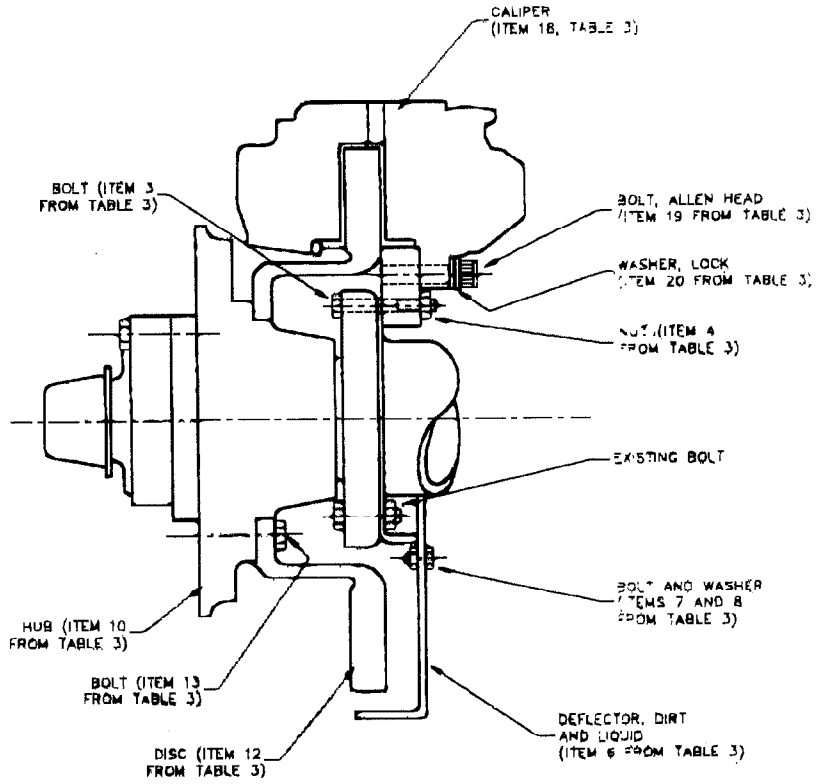
Item	NSN	Mfr Part No	Description	Unit of Issue	Qty per Equip
1	2530-99-820-5481	R576973	Brake Drum	ea	4
2	2530-99-722-1721	FRC8555	Hub	ea	4
3	2530-99-797-4653	AEU2496	Backing Plate RH	ea	2
4	2530-99-797-4654	AEU2497	Backing Plate LH	ea	2
5	2530-99-786-7626	RTC3626	Wheel Cyl Rear LH	ea	2
6	2530-99-786-7630	RTC3627	Wheel Cyl Rear RH	ea	2
7	3110-00-789-1842	RTC3429	Wheel Bearing	ea	8
8	5330-99-839-5349	FRC8221	Seal Hub	ea	4
9	5330-99-722-1723	FRC8222	Seal Outer	ea	4
10	5330-99-722-1724	FRC8227	Spacer	ea	4
11	5310-99-722-1722	FRC8002	Tab Washer	ea	4
12	4710-66-128-5757	AYG8687	Brake Pipe, Right Intermediate	ea	1
13	4710-66-128-5727	AYG8784	Brake Pipe, Left Intermediate	ea	1
14	4710-66-128-5760	AYG8689	Brake Pipe, Left Rear	ea	1
15	4710-66-128-5759	HYG1770	Brake Pipe, Right Rear	ea	1
16	2530-99-765-7520	RTC3418	Brake Shoe Set	set	2
17	2530-99-805-8972	R531893	Brake Spring	ea	4
18	2530-99-822-0420	R548169	Brake Spring	ea	4

Table 2 - Stores Required to Complete the Modification

Item	NSN	Mfr Part No	Description	Unit of Issue	Qty per Equip
1	2530-66-128-6442	AYG4354	KIT, DISC BRAKE CONVERSION, COMPRISING ITEMS 1 TO 22 IN TABLE 3	KIT	1
2	2530-66-128-4289	HYL8655	Brake Pad Front, set of four	set	as required
3	8030-66-091-3418	-	Loctite 271, 50 ml bottle	bt	as required
4	8030-01-025-1692	-	Loctite 242, 50 ml bottle	bt	as required

**Table 3 - Stores Detailed in Parts Kit (not to be ordered to complete the modification)**

Item	NSN	Mfr Part No	Description	Unit of Issue	Qty per Kit
1	5910-99-733-3093	FRC3136	Gasket, paper, for stub axle	ea	4
2	-	AYG7308	Mounting, Calliper and Dust Shield	ea	4
3	-	BX110111	Bolt, 10 mm dia by 55 mm lg, Dust Shield mounting to stub axle	ea	8
4	-	NY110041	Nut, Nyloc, 10 mm dia	ea	8
5	5365-66-128-6004	AYG7310	Spacer, Dust Shield	ea	4
6	2530-66-128-6005	AYG7302	Deflector, Dirt and Liquid	ea	4
7	-	WL110001	Washer, Lock, 10 mm dia	ea	32
8	-	SH110201	Screw, 10 mm dia by 20 mm lg, for spacer backing plate	ea	12
9	3110-00-789-1842	RTC3429	Bearing, Assy, wheel bearing comprising	ea	8
a	-	R561845	Cup Bearing		
b	-	R561844	Cone Bearing		
10	-	AYG7350	Hub, Disc, including studs	ea	4
10a	5306-99-797-4658	FRC6137	Wheel Stud, Hub (part of hub)	ea	20
11	5330-99-839-5349	FRC8221	Seal, Hub Inner	ea	4
12	2530-99-786-7625	FRC7329	Brake Disc	ea	4
13	-	FRC7257	Bolt, 10 mm by 35 mm lg, Disc to Hub	ea	20
14	5330-99-722-1723	FRC8222	Seal, Outer	ea	4
15	5330-99-722-1724	FRC8227	Spacer	ea	4
16	5310-99-722-1722	FRC8002	Tab Washer	ea	4
17	5330-99-797-4662	FRC3988	Gasket, fibre, hub drive flange	ea	4
18a	2530-99-767-0608	RTC4998	Calliper RHI & LHR	ea	2
18b	2530-99-767-0609	RTC4999	Calliper LHI & RHR	ea	2
18c	2530-66-128-6003	AYG4306	Brake Pad Kit (part of calliper)	set	2
19	-	SS112350	Screw, 12 mm dia, 35 mm lg, 10 mm allen key head, for calliper mounting	ea	8
20	-	WL120001	Washer, Lock, 12 mm dia	ea	8
21	-		Brake Pipe Assembly		
a	-	BYG5201	Intermediate Left (longest pipe)	ea	1
b	-	BYG5202	Intermediate Right (shortest pipe)	ea	1
c	-	BYG5286	Rear Right (2nd longest)	ea	1
d	-	BYG5287	Rear Left (3rd longest)	ea	1
22	-	11820L	Clip, Strap, for brake pipe	ea	6



SECTION SHOWING CALIPER FIXINGS FOR REAR AXLE.

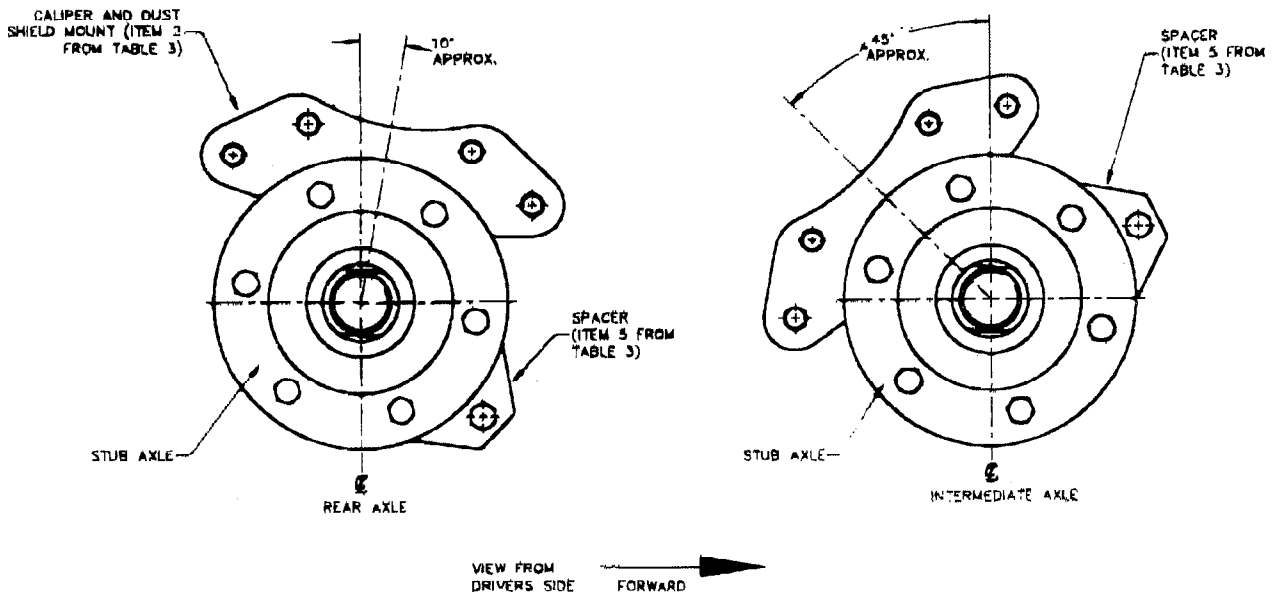


Figure 1 - Disc Brake Assembly

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**Fitting of Disc Brake Assemblies to Intermediate and Rear Axles**

12. Figure 1 shows the assembly of the rear and intermediate disc brakes. Proceed as detailed in the following paragraphs, using Table 3 for component identification:

- a. Chock the front wheels, engage the differential lock then jack up the vehicle rear axles and mount on safety stands.
- b. Remove the road wheels and brake drums.
- c. Remove the axle dust caps, circlips and hub flange bolts and remove the axle flange.

**NOTE**

Check that the axle half shaft can be removed with the stub axle in position. The half shaft may require machining to allow the half shaft to be removed with the stub axle in position.

- d. Dismantle wheel bearings and the drum brake assemblies until the backing plate assemblies are removed, as detailed in VEHICLE G 203, Group 12.

**NOTE**

Retain the backing plate bolts and wheel bearing hub nuts for use during reassembly.

- e. Remove the rear and intermediate axle brake pipes (retain the brake pipe retaining brackets and fixings).
- f. Remove the stub axles and clean the area around the axle flanges and stub axle.
- g. Refit the stub axle and new gasket (Item 1).

**NOTE**

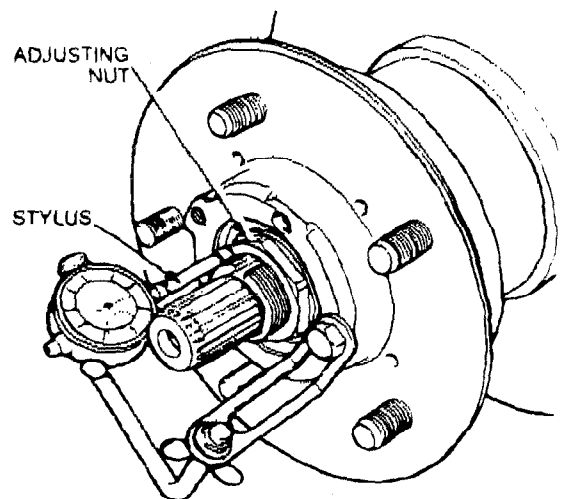
The position of the shield mounts and spacers for the intermediate and rear axles are different (see Fig 1).

- h. Install the shield mounts (Item 2) using new mounting bolts and (Items 3 and 4).
- i. Install the spacers (Item 5) and the remaining original mounting bolts and nuts. Tension all mounting bolts to 70 - 80 Nm.
- j. Fit the dust shields (Item 6) using the mounting bolts and washers (Items 7 and 8).

**NOTE**

Check the clearance between the end of the mounting bolts and the dust shield. Trim the bolts if necessary.

- k. Install new wheel bearing cups (Item 9a) to the hubs, pack the wheel bearings (Item 9b) and hubs (Item 10) with XG274 grease. Fit the inner wheel bearings and hub seals (Item 11) to the hub.
- l. Fit the discs (Item 12) to the hubs.
- m. Apply Loctite 271 or equivalent to the disc mounting bolts (Item 13). Fit the mounting bolts and washers (Item 7) and tension the bolts to 65 -80 Nm.
- n. Fit the hub to the stub axle and install the outer hub bearing, outer seal, spacer (Items 9b, 14 and 15) and the original hub nut.
- o. Spin the hub to settle the bearings and tighten the hub nut by hand until there is no endfloat.



**Figure 2 - Wheel Bearing Free Play Adjustment**

- p. Using a dial indicator, as shown Figure 2, rest the stylus in a loaded condition on the adjusting nut.

- q. Slacken the adjusting nut until an end float of 0.05 mm - 0.10 mm (0.002 - 0.004 in) is achieved.

**WARNING**

**OVER TIGHTENING OF THE WHEEL BEARINGS WILL CAUSE ACCELERATED WHEEL BEARING WEAR AND FAILURE. THE END FLOAT IS TAKEN UP WHEN THE VEHICLE IS LOWERED TO THE GROUND AND THE WEIGHT OF THE VEHICLE IS BORNE BY THE BEARINGS.**

- r. Fit the tab washer (Item 16) and original lock nut. Tighten the lock nut securely.
- s. Check and readjust the end float, if necessary, then bend the lock tab to secure the hub nut.
- t. Remove the dial indicator and bracket and install the driving flange and gasket (Item 17) using existing bolts.
- u. Apply Loctite 242 to the mounting bolts (Item 19). Fit the callipers (Items 18a, 18b) to the mountings using bolts and washers (Item 20). Tension the mounting bolts to 120 - 150 Nm.

**NOTE**

The LHI Calliper is the same as the RHR calliper and the LHR Calliper is the same as the RHI calliper. The rear callipers are fitted to the uppermost mounting holes as shown in Figure 1. The bleed nipples are toward the front of the vehicle on the intermediate axles and toward the rear of the vehicle on the rear axles.

- v. Fit new brake pipes (Item 21) and securing clips (Item 22).

- w. Inspect the front brake pad wear and replace pads (Item 2, Table 2), as necessary.

- x. Flush brake hydraulic system and bleed the brakes as detailed in VEHICLE G 203.

**NOTE**

Air can be trapped in the callipers and pressure differential valve. The bleeding process may be assisted by raising the rear of the vehicle on a jack or ramp during calliper bleeding and cracking the pressure differential valve during system bleeding.

- y. Adjust the brake pedal pushrod to achieve the correct free travel, as detailed in VEHICLE G 189-10.

- z. Refit road wheels, lower the vehicle to the ground and check the security of the wheel nuts.

- aa. Check and top up the differential oil levels.

13. *Post Modification Testing.* Road test the vehicle ensuring that brake pads are bedded in before conducting any brake lockup testing.

14. *Recording Action.* On completion of the modification:

- a. deface the number 27 on the modification plate located on the driver's seat base;
- b. enter the details of the modification in Part 3 of the GM 120, Record Book for Service Equipment, for the subject vehicles, including the vehicles modified in production; and
- c. notify HQ Log Comd Fleet Manager Light B Vehicles that the modification has been completed quoting affected ARN and owner unit.

END

List VEH G 20.0 - Code 1 (MEA 920130)