



Service Department:

THE ROVER COMPANY LIMITED

SOLIHULL
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ENGLAND

**LAND-ROVER SERVICE NEWS LETTER
No. 29**

December 1962

Item 142 SUBJECT: **GEAR CHANGING AND CLUTCH PLATE LIFE**

MODELS: Land-Rover Series I, II and IIA.

REMARKS: We feel that many complaints of reduced clutch plate life when using the Land-Rover under arduous conditions, are due to insufficient knowledge of the gear ratios available and the ability to select the correct gear for any particular set of conditions.

The following notes should be of assistance in this respect and Distributors and Dealers are requested to bring them to the attention of Operators and Fleet Owners as applicable.

Gear changing. General explanation.

The Land-Rover gearbox may be regarded as having 10 gear ratios, that is eight forward speeds and two reverse.

For convenience in use these gears are evenly divided into two groups, termed 'Low' range and 'High' range.

'Low' range consists of four low forward gears, plus a low reverse gear.

'High' range consists of four normal gear ratios, plus a normal reverse gear.

The two ranges may be used progressively when changing up, if conditions demand.

Three gear levers are provided to control the gearbox, these being:

1. The Transfer gear lever, which is fitted with a red knob. This control lever is used to select the high or low range of gears; it also has a neutral (mid-way) position.
2. The Main gear lever, fitted with a black knob. This is used in the normal way, and will engage the five gears within the range selected by the transfer lever.
3. The Front wheel drive control lever, fitted with a yellow knob. The use of this control is explained later.

When selecting the low range of gears with the transfer gear lever, the gearbox will automatically engage four-wheel drive at the same time.

Therefore, when using the low gear range, the vehicle automatically provides maximum traction with maximum torque.

When using the high range of gears under normal conditions, the drive is to the rear wheels only.

Should the operator encounter conditions calling for four-wheel drive in the high gear range, for example, ice or mud on the road, then this may be obtained immediately by operating the front wheel drive control (yellow knob).

As an example of how the full progressive range of the gearbox may be used, consider a vehicle which is heavily laden or towing a heavy trailer, and is required to pull away from a standing start, up a steep gradient.

With the transfer gear lever in the low range position, the vehicle will pull away in first gear, and the gear changes for the first four gears can be made in the normal way, with the main gear lever.

When road conditions are suitable for the higher gear range, they may be brought into operation without stopping the vehicle as follows:

Depress the clutch pedal, select the high range with the transfer gear lever and move the main gear lever into the second or third gear position, depending on road conditions. Release the clutch pedal and continue to change up in the normal way.

This operation can be carried out smoothly and quickly after a little practice.

By making use of the full range of the gearbox in this manner, the clutch life will not be shortened by having to compensate for the selection of an unsuitable gear ratio.

Certain conditions concerning the use of the gearbox are now explained in detail.

Main gear change lever, black knob.

The positions on the main gear change lever are marked on the lever top. It should be noted that the only reverse stop is a spring in the selector mechanism which tends to hold the lever away from the reverse selector shaft.

Synchro-mesh gears are provided for changing from third to top and top to third and in these cases single de-clutching may be used; for all other changes it is advisable to use the double de-clutch method.

Transfer gear lever, red knob.

The transfer gear lever has three positions:

1. 'High' range position, fully forward. In this position the main gear lever will select the gear ratios giving normal road speeds.
2. 'Neutral' mid-way position. Used when driving power take-off equipment.
3. 'Low' range position, fully rearwards. When in this position the low range of gears will be selected by the main gear lever.

Changing from 'High' to 'Low' transfer ratio should only be attempted when the vehicle is stationary. The engine may be left running, but the main gear lever must be in the neutral position. Depress the clutch pedal and pull the transfer lever right back; release the clutch. Should there be any hesitation in the gear engaging, do not force the lever. With the engine running, engage a gear with the main gear lever and let in the clutch momentarily; then return the main gear lever to neutral and try the transfer control again.

The only exception to the above procedure is when the vehicle is fitted with an 'easy change' transfer gearbox. This type is fitted to Forward Control models, and allows the change from High to Low Transfer, to be carried out while the vehicle is moving *slowly*.

Changing from 'Low' to 'High' transfer ratio may be accomplished at any time, regardless of vehicle speed. Release the accelerator pedal, depress the clutch pedal and push the transfer box lever right forward, pausing slightly in the neutral position; let in the clutch.

The important point to remember is that the vehicle must *always* be brought to a standstill before changing from 'High' to 'Low' range, except on Forward Control models.

Front wheel drive control, yellow knob.

When in 'High' transfer ratio, the vehicle may be operated in two-wheel or four-wheel drive as required; the drive to the front wheels is controlled by the gear lever with the yellow knob.

It has two positions:

1. Disengaged. This position is fully up on 'Regular' and 'Long' models or lever to the right on Forward Control models.
2. Engaged. Control pushed down on 'Regular' and 'Long' models, or to the left on Forward Control models.

Front-wheel drive in 'High' transfer can be engaged at any time, irrespective of road speed.

However, in order to prevent excessive tyre wear, it is strongly recommended that 30 m.p.h. (50 k.p.h.) should not be exceeded when using four-wheel drive in the 'High' transfer, and also that a return to two-wheel drive be made as soon as road conditions permit.

In order to regain two-wheel drive, stop the vehicle, move the transfer lever to the 'Low' position then back to the 'High' position. Front-wheel drive will be automatically disengaged, and the yellow control lever will return to the disengaged position.

General.

Before moving off in the vehicle after it has been parked for some time, it is a wise precaution to check that front-wheel drive is not engaged unknowingly.

The following chart showing various work conditions alongside the recommended gearbox setting will be found useful until the operator has become conversant with the gearbox.

Work conditions 1	Control lever position			Drive condition on vehicle 5	To obtain recommended drive setting 6	To regain normal drive setting 7	Remarks 8	
	Main Gear Lever 2	Transfer box Lever—Red 3	Front Wheel Drive Control—Yellow 4					
Normal road work	Select gear required	'High' position—fully forward	Disengaged	Driving rear wheels only through the high range of gears	With vehicle stationary, check by moving transfer lever into 'Low' position, fully back and return to the 'High' position—fully forward	—	Carry out operations in Column 6 while vehicle is stationary, engine idling and the clutch pedal depressed	
Hard pulling on road, ice or mud on road and grass-land	Select gear required	'High' position—fully forward	Engaged	Drive on four wheels, in the high range of gears	Operate front wheel drive control (yellow) when vehicle is in motion or stationary	Stop the vehicle. Select 'Low' transfer (Red) then return to 'High' position	Do not exceed 30 m.p.h. (50 k.p.h.) in four-wheel drive, or excessive tyre wear will take place. Return to normal drive as soon as conditions permit	
Very heavy load pulling, heavy ground work, ascending or descending steep gradients	Select gear required	'Low' position—fully rearwards	Front-wheel drive is automatically engaged by selection of low transfer	Drive on four wheels through the low range of gears	Stop vehicle, depress clutch, move transfer lever to the 'Low' position—fully back	Release throttle pedal, depress clutch pedal, push transfer lever forward firmly and slowly to the 'High' position	Changing to the high gear range may be accomplished with the vehicle on the move, as soon as conditions permit	
Driving rear and centre power take-off equipment	Vehicle stationary (include hydraulic winching)	Third gear selected, or as conditions demand	Neutral—mid-way position	Disengaged	No drive to any road wheels. Drive to the equipment is through the main gearbox, after engagement of the P.T.O. selector lever	Select neutral—mid-way position, with the transfer lever and the gear required with the main gear lever. Engage the P.T.O. selector when required	Disengage P.T.O. selector lever, move main gear lever to neutral and transfer lever to 'High'—fully forward	When hydraulic winching, leave the P.T.O. selector in the engaged position and control the winch with the 'Pay-out'—'Pay-in' control lever. These remarks do not apply to the operation of the front capstan winch, which carries its own control lever and is driven direct from the front of the engine
	Vehicle on the move	Select gear required	Select 'Low' or 'High' dependent upon the r.p.m. required by the equipment in use	Engage if required when in 'High' transfer	Two- or four-wheel drive, as dictated by the nature of the work	Engage P.T.O. selector lever and use gearbox and transfer control as conditions demand	Disengage P.T.O. selector lever, move transfer lever into 'Low' position and back to 'High' while stationary	The use of a high gear will reduce the engine speed, and so result in an economical fuel consumption
Parking with heavy load on steep gradient, hand brake applied	First or reverse gear engaged	Low position—fully back	Disengaged	Stationary engine coupled to all wheels	Depress clutch and select 'Low' transfer ratio, select first or reverse, stop engine and release clutch	Depress the clutch pedal and move transfer lever into the 'High' position	Hand brake is effective on both axles in this condition	

Item 143 SUBJECT: CLUTCH PEDAL SETTING

MODELS: Land-Rover Series IIA, with hydrostatic clutch.

REMARKS: When converting early Land-Rover Series II and IIA models to the hydrostatic type of clutch mechanism (see Land-Rover News Letter No. 26, Item 132), it is important that the pedal height is adjusted to 5½ in. (140 mm) as it is possible to excessively load the linkage due to over-travel of the clutch if the setting is left at the original figure of 6½ in. (158 mm). Adjust pedal position by means of the setting bolt A and the pushrod locknuts C to attain the correct figure. See Fig. 1 overleaf.

When the pedal position has been correctly set, check the free-play between the master cylinder pushrod and the piston. This free-play should be 1/16 in. (1.5 mm) at the pushrod and is felt as approximately 5/16 in. (8 mm) at the pedal pad. The pedal height of 5½ in. (140 mm) applies to all late Series IIA Land-Rover models which have been fitted with the hydrostatic clutch mechanism as original equipment.

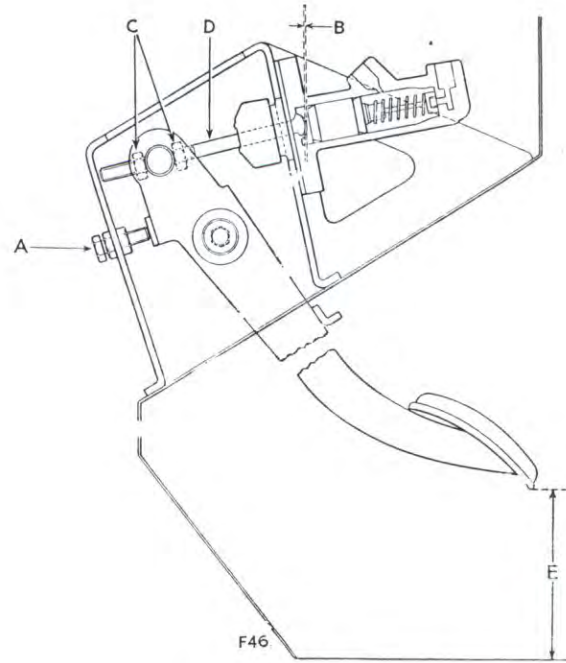


Fig. 1—Clutch linkage setting

- A—Pedal position setting bolt
- B—Free-play against master cylinder push rod $\frac{1}{16}$ in. (1,5 mm)
- C—Master cylinder pushrod locknuts
- D—Master cylinder pushrod
- E—Models with non-hydrostatic clutch mechanism: $6\frac{1}{4}$ in. (158 mm) } From underside of pedal
 Models with hydrostatic clutch mechanism: $5\frac{1}{2}$ in. (140 mm) } pad to floor board

Item 144 SUBJECT: BRAKE SHOES
MODELS: Land-Rover Series I, II and IIA.
REMARKS:

There have been some part number changes on Land-Rover brake shoes recently and we feel it will be of help to Distributors and Dealers to have the latest information concerning these items. See chart below:

Models	Location	Qty.	Part No.	Remarks	Identification and colour code
Series I, II and IIA, 88 1954 107 with 10 in. brakes	Foot brake, front and rear L.H.	2	505675	Boxed pair	} 10 in. brakes. Bonded Mintex M22 lining Marking—three green squares on edge
	Foot brake, front and rear R.H.	2	505676	Boxed pair	
1954 107 with 11 in. brakes 1955-57 107 Series I, II and IIA, 109	Foot brake, front L.H.	1	512415	Boxed pair	} 11 in. brakes Bonded Mintex M22 lining Marking—three green squares on edge
	Foot brake, front R.H.	1	512416	Boxed pair	
	Foot brake, rear	1	512417	Boxed pair	
Series I and II*	Handbrake, transmission	1	264374	Boxed pair	Riveted Chekko XL3 linings. Blue and red on edge
Series II and IIA†	Handbrake, transmission	1	516031	Boxed pair	Riveted Don RY lining. Two red flashes on edge

* Up to gearboxes numbered 146000565, 156000430 and 151005187.
 † From gearboxes numbered 146000566, 156000431 and 151005188.

Item 145 SUBJECT: HYDRAULIC STEERING DAMPER ASSEMBLY
MODELS: Land-Rover Series II and IIA, 88 and 109.
REMARKS:

Please note that the hydraulic steering damper conversion kit, specified in Land-Rover Service New Letter No. 25, Item 129, cannot be used on a Land-Rover which already has a front hydraulic winch fitted.