



Service Department:

THE ROVER COMPANY LIMITED

SOLIHULL
WARWICKSHIRE
ENGLAND

LAND-ROVER SERVICE NEWS LETTER

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Item 146 SUBJECT: **TEST PROCEDURE FOR HYDRAULIC WINCH**

MODELS: Land-Rover Series II and IIA 88 and 109, Petrol and Diesel.

REMARKS: When the efficiency of the hydraulic winch is considered to be below standard, or in the case of complete failure, the following test should be carried out to hydraulic pump and winch installation.

- (a) Ensure that the winch mechanism and the winch cable are in good condition.
- (b) Ensure that there are no external leaks from hydraulic units and pipes.
- (c) Check the oil levels in both hydraulic tank and gear case. See Owner's Instruction Manual for correct grade of oils to use.

Pump Test

Equipment required	Qty.	Part No.
Elbow for oil pressure gauge (to be modified, see below)	.... 1	580088
'O' ring, for elbow	.... 1	267828
Adaptor } For	.... 1	580086
Special seal } elbow	.... 1	580087
Jump hose, fitted to elbow	.... 1	219824
Oil pressure gauge—up to 3,000 lb/sq.in. (210.0 kg/cm ²)		Local purchase

PROCEDURE:

1. Drill the elbow $\frac{25}{64}$ in. (10 mm) and tap $\frac{7}{16}$ in. UNF.
2. Assemble the elbow, adaptor with seal, jump hose and 3,000 lb/sq.in. gauge to the hydraulic pump as shown in Fig. 1.
3. Remove the centre seat panel, giving access to the hydraulic pump fitted to gear box and the control valve fitted to heel board.
4. Thoroughly remove all dirt and clean around pump connections and cap nut for adjusting screw on control valve.
5. Remove the outlet connection from pump and fit slave elbow and gauge assembly, using new 'O' ring.
6. Reconnect pump delivery pipe to slave elbow.
7. Secure the rear of the vehicle to a solid fixture, using a suitable chain fixed to the towing hook. Where no towing hook is fitted, the chain should pass through the large hole in rear cross-member and a strong straight bar used behind the cross-member.
8. Pay out the winch cable and secure to a solid fixture.
9. Place the transfer box gear lever in the neutral position.

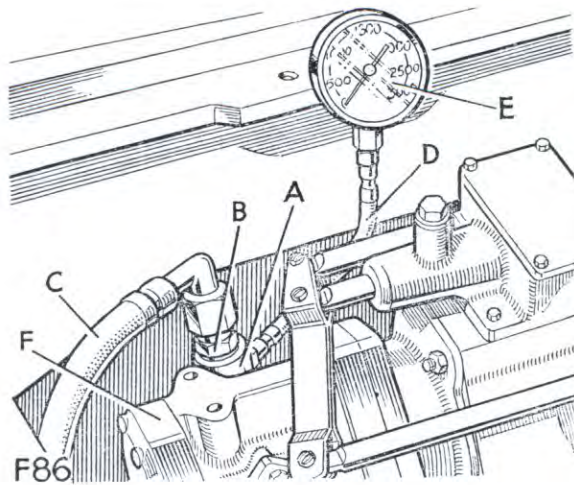


Fig. 1. Pressure gauge fitted to hydraulic pump

- | | |
|-----------------|--|
| A—Elbow | D—Hose, gauge to pump |
| B—Adaptor | E—Pressure gauge 3,000 lb/sq.in. (210,0 kg/cm ²) |
| C—Delivery pipe | |

10. With the engine running, engage third gear in the main gear box and pull out the power-take-off lever. The hydraulic pump will then be driving when the clutch is released.
11. Engage the winch driving dog, and run the engine up to a speed of 2,000 r.p.m. in third gear. Pull the valve control lever upwards to pay in the winch cable, so that the winch drum is stalled. Where hand speed control is fitted to the vehicle, the control lever can be set to give the desired engine r.p.m. on the quadrant.

	Hand Control Positions	Engine r.p.m.
Petrol models	5	2100
Diesel models	9	2000

12. Check the oil pressure, which should be 2,000 lb/sq.in. (140,0 kg/cm²) + 100 lb/sq.in. (7,0 kg/cm²)

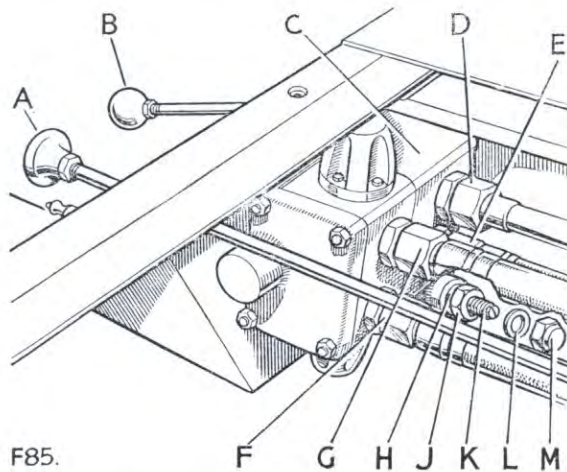


Fig. 2. Control valve in position

- | | |
|-------------------------------|--------------------------------------|
| A—P.T.O. lever | G—Hose, control valve to winch motor |
| B—Control valve lever | H—Sealing washer |
| C—Control valve | J—Locknut |
| D—Steel pipe, valve to tank | K—Adjusting screw |
| E—Hose, pump to control valve | L—Sealing washer |
| F—Hose, valve to winch motor | M—Cap nut |

13. Adjustment can be made by removing the cap nut and bonded seal on control valve. Loosen the locknut and turn the adjusting screw in a clockwise direction to increase the pressure and anti-clockwise to decrease the pressure.

Important—A very small amount of movement of the adjusting screw can have a significant effect on the pressure.

14. Lock the locknut and replace the cap nut and bonded seal before each test.
15. When satisfactory, remove the slave elbow and pressure gauge assembly. Refit the original outlet connections and delivery pipe to pump.
16. Run up again to drum stall speed for one minute and check for leaks.

Winch Operating Test

17. Remove the anchorage from the rear of vehicle.
18. Load the vehicle to give a total weight of 3,800 lbs. (1.721 kg).

Land-Rover Series II and IIA	Weight of Vehicle	Additional Weight to give 3,800 lb (1.721 kg)
88 Basic	2,900 lb. (1.315 kg)	900 lb. (408 kg)
88 Station Wagon	3,228 lb. (1.465 kg)	572 lb. (255 kg)
109 Basic	3,294 lb. (1.494 kg)	506 lb. (227 kg)
109 Station Wagon	3,745 lb. (1.700 kg)	55 lb. (25 kg)
88 Basic	3,118 lb. (1.324 kg)	682 lb. (308 kg)
88 Station Wagon	3,446 lb. (1.563 kg)	354 lb. (160 kg)
109 Basic	3,496 lb. (1.585 kg)	304 lb. (137 kg)
109 Station Wagon	3,947 lb. (1.853 kg)	— —

} Including Driver

19. With the vehicle on a level dry surface. Pay out the winch cable and secure to a solid fixture.
20. Lock all the four wheels by applying the foot brake hard down.
21. Operate the winch to pay-in the winch cable, pulling the locked and weighted vehicle along the ground, giving a 3,800 lb. (1.721 kg) cable pull.
22. It may be found necessary to carry out the above test two or three times to prove the 3,800 lb. (1.721 kg) pull on the cable.
23. On no account must the oil pressure at the hydraulic pump be raised above the specified poundage, or damage to the installation may occur.
24. If the above test is not satisfactory, the hydraulic motor should be removed from the winch and examined for cause of failure and rectified, or a new hydraulic motor fitted.
25. Replace the seat panel.