

# RED WINCHES

the ultimate high performance winch



## Fitting Instructions for:

### **Direct Mounted Hydraulic PTO, Landrover Defender**

The PTO is designed to adapt Hydraulic pumps (clockwise rotation) having the standard 'SAE' A or B two bolt flange onto the Land Rover LT230 transfer case.

The design of the PTO is such that the movable dog clutch, which engages the PTO teeth on the transfer gear, actually slides back and forth on the splined pump shaft.

With the pump we supply, when the PTO is in the 'engaged / operating' position, the dog is still fully engaged with the pump shaft splines. When in the 'disengaged / normal' position the dog moves back over the relieved portion of the pump shaft.

Pumps are available ranging from 22cc to 80cc displacement.

Best practice is working from under the vehicle, preferably on a hoist.

### **Control Rod Hole**

Carefully drill a 8mm hole through the left hand heel board app 30mm to the left of the gearbox tunnel and app 100mm down from the seat base. (Be careful the drill does not 'pick up' the carpet and wind it up. With a sharp instrument pierce the carpet for the control rod.) Or, alternatively this hole maybe drilled from inside the cab estimating its position from the aforementioned description.

Remove the 6 bolts securing the PTO cover plate at the rear of the transfer case. (These bolts have usually been factory 'Loctited' and can be very tight so use a single hex socket to avoid 'rounding' the heads)

Remove the cover plate only, leaving the rear bearing support plate in place on the transfer case. Clean away all old sealant and oil spillage.

Apply good quality silicone sealant to the face of the PTO.  
Apply a small amount of 'blue nut lock' Loctite to the 6 bolt threads.

With the control lever to the left and the oil feed hole uppermost, offer the PTO to the transfer case. The six bolts are not evenly spaced, so it will only fit up in the correct location unless it is orientated correctly. Secure with the six socket cap bolts supplied. Torque to 35 Nm (26 ft/lbs)

The PTO unit has two pairs of mounting holes for the pump and as the pump flange holes are 180 degrees apart you have four possible pump positions.

Establish which is the suction port, bearing in mind that the pump will be rotating 'clockwise' (i.e. same as engine) and decide the best way to pipe up the pump before permanently securing.

Apply the same sealant to the pump face and Loctite to selected mount holes.

Offer pump, rotate pump to engage splines into dog, and secure with two bolts M10 and washers supplied. 35 Nm (26ftlbs).

Insert the control rod through the pre-drilled hole in the heel board and attach the 'rose' ball end to the PTO lever and secure with nyloc nut. Fit yellow knob to rod. Control rod and lever are moved forward to 'engage' the PTO.

### **Vehicles other than Defender.**

You may be able to use the pull rod or use a cable if required. For alternative control set ups the lever can be rotated to any position on the selector shaft by simply loosening the pinch bolt. It is secured by pinch bolt friction only. The lever must move through 90 degrees arc to operate correctly.

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### Important Notes

This PTO will transmit full engine power and most pumps DO NOT have a built –in relief valve. Therefore an adequate relief valve, set to max pump pressure, MUST be fitted into the delivery line to prevent pump shaft failure as a result of hydraulic pressure overload.

The hydraulic system must be ventilated (within the reservoir) to allow for heat expansion, failure to do so could result in seal rupture of the pump.

The hydraulic pump supplied with this system has a clockwise rotation, and therefore the PTO must not be engaged when reverse gear is selected on the gear box.

### Mounting the tank for the PTO in the Battery Compartment

#### Land Rover Defender Only

With the adaptors loosely screwed into the tank (using the 3/4bsp-3/4bsp in the lower port) offer the tank up to the back of the seat-box with its side against the transmission tunnel. Then, with a marker pen draw around the adaptors to establish the hole positions.



Then estimate and mark with a cross, the hole centres ready for drilling with a hole-saw.

Use a 50mm hole-saw for the two adaptors, foam washers or silicone may be used to seal the gap, if desired, but water ingress isn't a huge problem in this situation.

The tank should be secured by forming the aluminium strip into a securing strap. Other methods can be adopted but ultimately the responsibility will be with the owner of the vehicle.