Asmara
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Manual

Removal Velvet Drive from Ford Lehman Engine 2710 series

The Engine and it's drive

Engine

The engine a Ford Lehman 2710 series. In this case a 2715E 6-cylinder 6220 cc 120Hp engine, 380-CI Diesel

Velvet Drive

Model AS15.72C – 2.91:1 s/n 562 patent applied for Warner Gear Div. Borg Warner Corp. Munchie, Indiana, USA. Average weight incl. Reduction gear 150-160 Lbs(72Kg)

Tools

Apart from general wrenches, ratchet and socket set there are hardly any specific tools needed for removal except for listed below:

1. I think the use of a rachet hoist gives a fine adjustment for removal and re-installation. As long a that has a capability of at least hoisting 200lbs

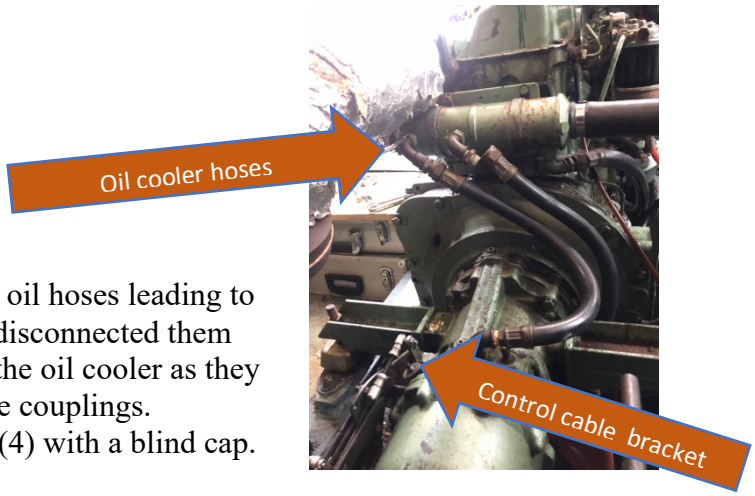
2. I used a small hydraulic jack and wooden bars of approx. 2" thickness to support the jack and engine during the removal of the engine mounts. If you need to buy such a jack, first measure the clearance between engine and bottom of the bilge, thereby critically looking where to put the support beams. I found a fair priced jack for only € 70, - with two cylinders max range 125mm and weight capacity 10ton
3. If you choose to use a jack as described above, you may need a hoist to lift the drive from the engine room as it weighs about 160Lbs. We took it out with two persons. Using a hoist to support the engine, you may need a second hoist to remove or install the drive.

Preparation

The engine oil is not affected, so the is no need to drain your engine oil. The velvet drive has its own oil and there is no need to drain that before removing the drive. Now let's get started:

Control cables

1. Remove the rod-end at the site of drive clutch handle.
2. Remove the complete bracket with the control cables attached to it from the drive by removing the two bolts.
3. Use a rope to attach and clear that bracket out of the way.

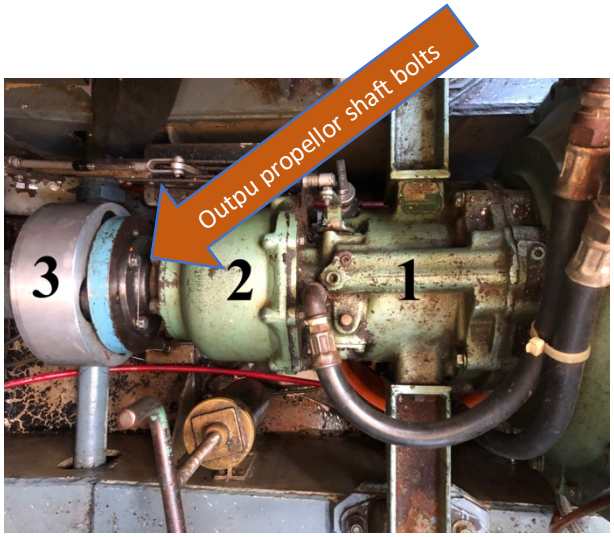


Oil lines

4. Remove the two oil hoses leading to the oil cooler. I disconnected them from the site of the oil cooler as they had quick release couplings.
4. Seal the fittings (4) with a blind cap.

Disconnecting drive from shaft

4. Remove the 4 bolts from the output propellor shaft. The drive is now disconnected from the engine on one side.



Prepare engine aft studs for removal

Now let us prepare the aft engine studs for removal. The studs can be seen in fig 1, below and above the # 1 in the left picture. The engine studs are attached with 2 bolts to the drive. So, to be able to remove the drive, we must remove the studs from the drive. But before that follow the items 1-3 as described below

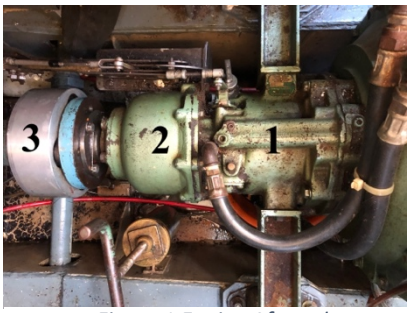


Figure 1 Engine Aft studs

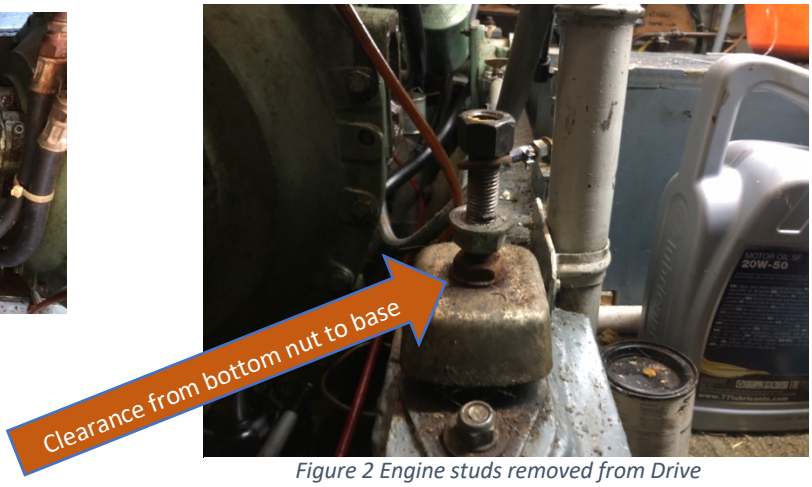


Figure 2 Engine studs removed from Drive

1. The studs are resting on the on the bottom nut from the engine mount. (Fig.2 already removed) It is very important not to turn this bottom nut as it determines the angle of the engine with the shaft. Either you measure the gap that is at the bottom of this nut(see arrow), or to be safe put some duck-tape around this bottom nut, to the bottom of the structure to prevent it from turning.
2. Loosen both top nuts from the studs create to a gap of about 0,2" (5mm) between the bottom of the nut and the top of the stud.
3. Now we are ready to support or hoist the engine. While watching the gap as mentioned in 2, carefully pump or hoist up the engine, when you see it is going up and thus the weight of the engine is fully supporting the engine, secure your hoist or jack.

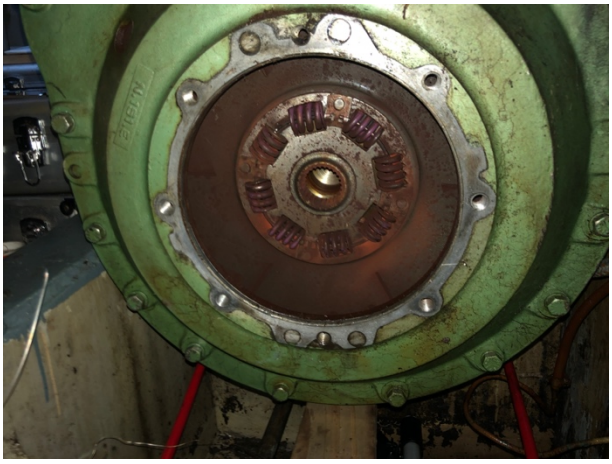
Note: When using a hydraulic jack with wooden beams, make sure it leaves the drive free and only support the engine.

4. Now remove the 2 bolts that attach the studs to the drive, you should not have difficulties to do that. And remove the 2 studs from the drive. This is what picture 2 shows.

Move the propellor shaft aft

To be able to remove the drive from the engine some clearance must be made of about 2,5-3". (63-76mm) by moving the propellor shaft aft. (fig.3)

1. To move the propellor shaft remove the two large bolts (socket 30mm) and the nuts from the trust bearing from the frame. On this picture the trust bearing is already unbolted from the structure.
2. Move the propellor shaft with the trust bearing 3-4 “aft.
3. Good practice is to support the velvet drive and hang it in a sling or a hoist to prevent it from falling when further removing.
4. Now remove the last 6 long bolts from the drive, attaching the drive to the flywheel casing. (engine)
5. Remove the Velvet drive from the engine, mind the weight and your fingers. The splined input shaft should become clear of the engine.
6. Sometimes it may be a little sticky and some force is needed.
7. Hoist or lift the drive for overhaul/repair in a specialized shop



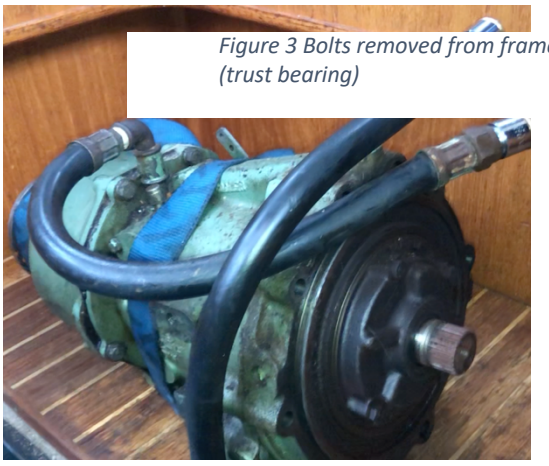


Figure 3 Bolts removed from frame (trust bearing)

Re-installation

Re-install the Velvet drive in reversed order