Installing Your Mini M45 PTO Gear Set

Tools/Parts you may require:

- Workshop Press, Welder, Lathe
- 3-Jaw Puller, 10mm Socket etc, Scraper, Torque Wrench, Copper Grease
- M16 x 80mm Bolt & Nut, M8 x 60mm + Bolt & Nut, M8 Penny washers, Steel Plate
- Sealant (Loctite 516/518 or Permatex Anaerobic Gasket Maker), Thread lock
- Supercharger Oil (185ml), Case-PTO Replacement Seal, Bearing Grease

1. **Old Gear Removal**. – To remove, the supercharger will need to be dismantled.
    a. Drain the oil from the front of the supercharger. It is assumed the PTO has been dismantled to diagnose.
    b. Unbolt the snout, tap the external casting lugs around the snout to loosen and remove. Use a suitable cloth under the supercharger to catch residual oil.
    c. Tap the lugs on the rotor plate to loosen the bond but do not try to remove as it is held in by the gear in the PTO.
    d. To remove the gear, it is unlikely a 3-Jaw puller will be suitable unless very small with low profile jaws. A tool will likely need to be fabricated or hired. One push method will need a sheet of steel approx. 6mm thickness to span the PTO bolts/cavity.
        i. Drill to mount in place of the PTO casing.
        ii. Drill a matching hole inline with the end of the supercharger shaft 14mm diameter.
        iii. Using the hole as a guide, install an M14 bolt through, tighten a nut keeping the nut inside the PTO cavity.
        iv. Tack weld the nut in place, remove the bolt and tack in a few more locations.
    e. Bolt the plate to the case, grease the bolt and to push the shaft/rotor pack out. DO NOT start this if you have not broken the rotor pack/case bond. This will load the rotor bearings and could cause damage.
    f. Draw the supercharger Rotors out of the case.
    g. Clean all faces of the snout, rotor pack and case ready for re-assembly. Run an M8 tap down each bolt hole to remove old threadlock taking care not to get debris in the supercharger. Check for dents that may impede mating faces sitting flat and dress as required.

    Note: Driving the shaft through the gear may leave indents from the teeth in the supercharger case. In some cases, these indents will need to be dressed so not to impede a new seal being fitted. If desired a 1-2mm thick support plate can be fabricated to slide between the gear and the case to support and stop these indents during removal.

2. **New Drive Gear Installation.**

    Note: If the gears have been worn it is assumed that the PTO-Case seal has failed and lost oil. This seal must be replaced to prevent recurrence of gear failure. It is also advised to check the play in the case bearings as excessive play can be a significant contributor to the original failure. If required these can be re-greased or replaced.

    a. **Method 1** – Use a relevant sized socked, long m8 bolt, penny washers & a nut. Install a nut on to a long m8 bolt (high tensile preferred), lubricate the threads with grease and feed on a washer or 2. Feed the bolt through a socket that is larger than the supercharger shaft, add a penny washer and finally the gear. Fasten the bolt in to the supercharger shaft, no less than 10mm. Holding the supercharger rotors fasten the nut to drive the new gear in to place ensuring it goes on square and flush with the shaft. The gear is symmetrical so can install on either face. Stop when the penny washer bottoms out and the gear is flush with the end of the shaft (only applies to new gears, original gears sit further in).

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b. **Method 2** – *Direct press*, used to assemble without a special tool. To complete the gear must be installed at the same time as assembling the rotor pack and snout. Apply the recommended sealant to the open face of the supercharger case & insert the rotor pack. Holding the rotor pack and case together, sit the rotor pack gears down onto a workshop press. Support the gears evenly so that the drive pins are not pressed against. Align the new drive gear onto the shaft and press squarely until the gear is flush with the end of the shaft. The gear is symmetrical so can install on either face. Install the coupler to either the snout or rotor drive pins. Ensure the rotor face & pack faces are still clean, apply sealant to the snout face and install the snout. Use thread lock on each snout bolt and tighten evenly by hand until flush. Tighten to 20Nm(14-15ft·lb). Wipe off the excess sealant.

Note: The OE drive gear sits below the end of the shaft. Our new gears have been widened specifically to make it easier for DIY installation and therefore need only to be flush with the end of the shaft.

3. **New PTO Gear Installation.** Align the face of the new gear with the deepest recess towards the PTO plate. Press the new gear directly onto the PTO shaft end while supporting the opposite end of the shaft until seated against its shoulder point. DO NOT press while supporting the plate as this will push the shaft out of the plate.

4. **Sealing & Oiling.** – If Method 1 has been used above please follow the sealing of rotor and snout procedure from Method 2 before proceeding. Ensure the mating faces for the PTO plate are free from old sealant and dents that would stop the plate sitting perfectly flat. Ensure the PTO cavity is clean and free from debris. Torque the bolts to 20Nm(14-15ft·lb) and wipe off the excess sealant. Leave this for the recommended curing time of the sealant used. Once cured, unfasten the oil bungs and fill the PTO gearbox with 40ml of supercharger oil and fill the rotor gearbox with 145ml.

For additional parts and services please check out our website @ www.superchargerrebuild.uk, visit our Ebay Store or get in touch. We are happy to help with any of your supercharger queries.

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