



Spline Drive Gears Installation Manual

(Covers N1 77mm, OEM 81mm, Jun, Nitto, Tomei and Toyota UZ Kits)



1. Collar installation on to the crankshaft

Note: We highly recommend that fitting of this kit is carried out by a competent and highly skilled engineer with the correct equipment and workshop facilities.

Warning: Prior to machining work, ensure the crankshaft is kept at the machine room temperature for at least 2 hours. The collar and crankshaft measurement procedure must be performed at around 20°C temperature.

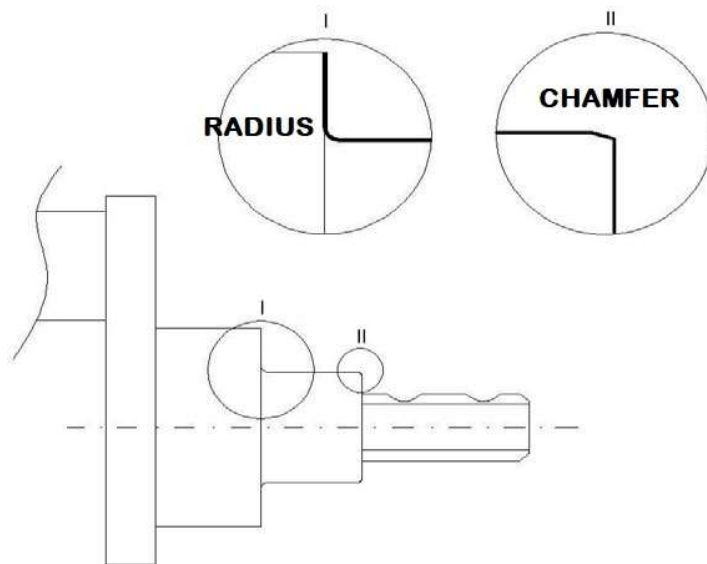
Grinding crank's nose working order:



- Measure the inner diameter of the spline collar using a bore gauge;
- Set the crank onto lathe. Check the crank is fixed correctly between the front and rear turning spindle unit by the aligning of the nose;
- Grind the crank nose (where the OEM oil pump inner flat drive gear mounts on to) for fitment of splined collar, ensure there is a preload of 0.08mm. Make a mandrel drift in the place for transition between crank's nose and splined collar's neck (Picture 1, figure I);
- * **Important** - Ensure there is a radius in front part of aligning crank's neck (Picture 1, figure II);
- * **Important** - Ensure there is a chamfer on the inner side of the collar under the adjacent surface of the fillet.

For the correct and convenient installation of collar you must make a mandrel with inner diameter of 35mm. The installation of collar must be performed under the heating of 400°C temperature – visually the metal will just begin to start to turning red.

Picture 1



2. Sequence of collar installation

- a) Heat the collar in the high frequency current equipment (RF current). If you do not have one you can use gas burner but the heating must be applied from all sides equally. Watch the collar going red cautiously, do not let the drawback (softening) happen.



- b) Put the collar on the prepared crank's nose (neck) using metalworking tongs. With the help of mandrel and hammer make sure the collar fitted correctly. Cool the crank.

Warning: it is prohibited to cool the crank using water or oil.



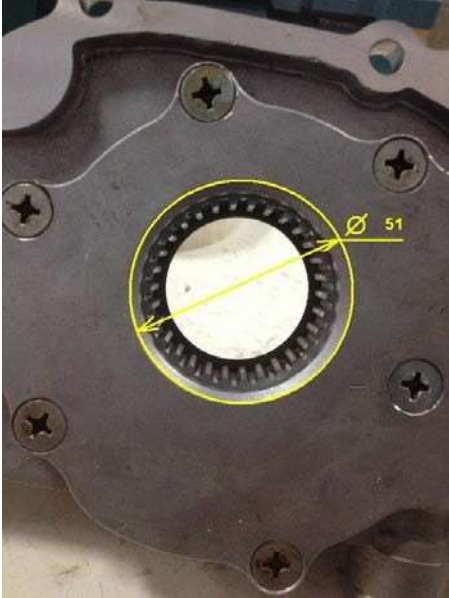
N1 collar and Inner gear

- c) Inspect the collar's work surface for seal and make sure there are no nicks or asperity, if necessary finish with fine grit wet and dry on a lathe.

***Extra Machining for Tomei Gear Set – Revision 1 Only:**

If you have purchased a Tomei Spline kit (Revision 1), you will need to carry out slight machining work to the oil pump back plate. Enlarge to 51mm.

No modification needed on Revision 2 Kits – Which consist of Back plate and collar only.

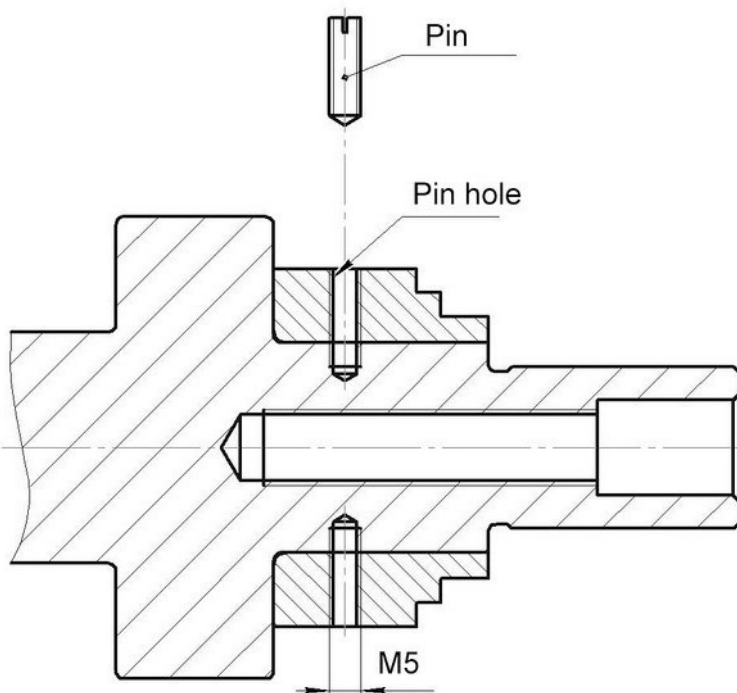


Tomei pump backing plate modification

Optional:

If you will be using your engine with launch control or continuously exceeding 8000rpm/ hitting the limiter for long periods of time for extra security, it is recommended that you secure the collar with two M5 grub screws: Please discuss this requirement with your machine shop at the time of fitting.

See Diagram Below:



Important: in order to have a minimal clearance between gears and case we recommend you use a brand-new oil pump.

- a) Disassemble the oil pump case (They can be tight and fitted with thread lock, applying some heat will help the removal process).
- b) Remove stock gears from pump.
- c) Lubricate installing gears with engine oil before putting them into oil pump case.
- d) Install gears with markers to the rear cover of oil pump (Picture 2). The notch of the big gear (with sharp angle) must be directed counter clockwise (except Tomei pumps).
- e) Check the rotation of the gears inside case. There must be no sticking or biting of gears.
- f) Install the rear cover of the oil pump.
- g) Evenly torque screws in cover (Use heat resistant thread lock) with 3.7-5.0 Nm (0.4-0.5 kg/m).
- h) Check the gears are rotating in the case normally. There must be no sticking or biting of gears. Picture 2

3. Installation of gears into the oil pump



Tomei and Jun pumps gears alignment

Alignment

Note: Before the final oil pump installation it is recommended to set it up on a cylinder block without seal and visually check clearances uniformity between the crank's collar and small oil pump's gear. Picture below showing 1200 bhp Drag RB30 install in an R34 GTR. To be fitted with Tomei Pump.



If oil pump's gear will be clamped in one side of the collar, you must drill two guiding holes (7mm) in the oil pump case (holes guiding block/pump case). Also, you need to make a mandrel to align (centre) the oil pump relatively to the crank. Install the oil pump with mandrel to the block and tighten the screws. Remove mandrel and set the seal.

Important – Correct engine block preparation is highly advised and that you ask the machine shop to carry out a line bore of the main bearing tunnel and more so if fitting main end studs. Also recommended to check crank for run out and to have it straightened if out of tolerance.



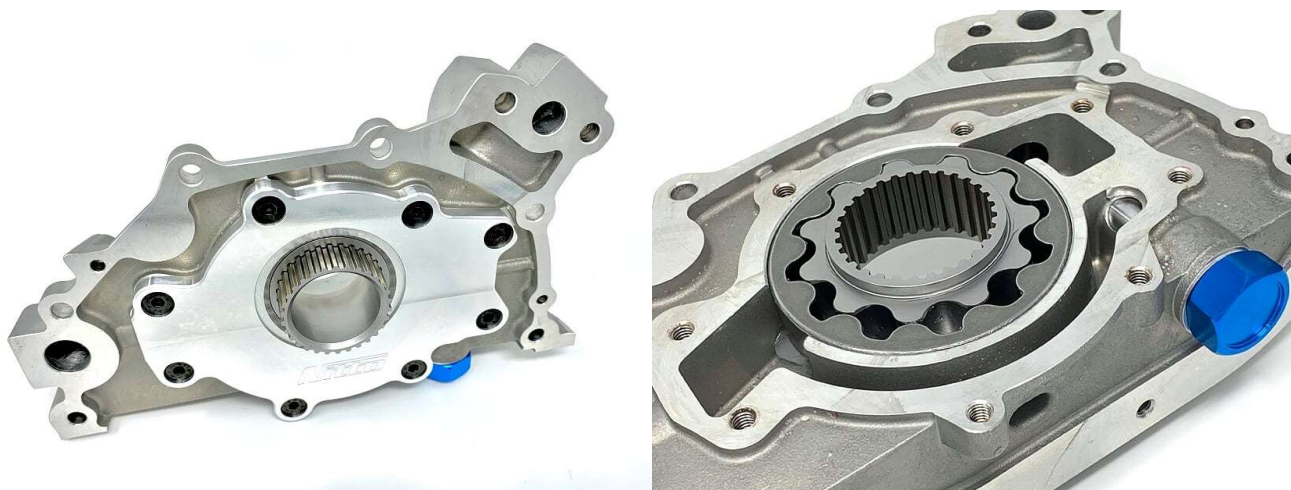
Once fitted and aligned.



Fitment of Nitto Dedicated Kit

As of May 2019, we now sell Nitto dedicated spline drive gear kit consisting of inner gear and collar. No machining of the back plate is needed. Once the back plate is removed simply remove the original Nitto gear and replace with the splined gear.

*We advise the use of new hex screws with thread lock when securing backing plate and using the correct torque values.

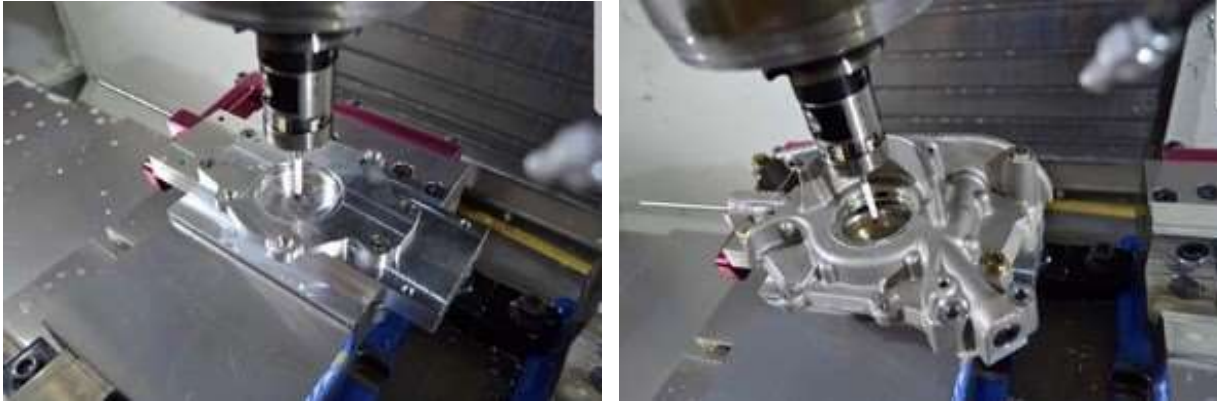


Fitment of Jun gears into Nitto RB26 Pump

It is possible to fit Jun gears into Nitto RB26 Pump. You must first measure Nitto inner pump gear bore that slots into both main case and back plate - check clearance against Jun Spline gears. Once this has been done under 20 degrees Celsius room temperature, machine the difference.

* At the time of writing the differences is approximately 0.5mm between Jun and Nitto pump case and back plate bore. We cannot be responsible or have any control should Nitto change specs.

*We advise the use of new hex screws with thread lock when securing backing plate and using the correct torque values.



New Revision 2 Tomei Kit. 2 Piece

With this kit you must remove the inner most Tomei gear. No need to machine the backing plate. The collar fits to Tomei middle gear. Collar fitment is per normal. See details on how to machine crank and fit collar.

*We advise the use of new hex screws with thread lock when securing backing plate and using the correct torque values.



N1 High Flow Kit - 4 Piece

With the high flow kit, oil pump flow is increased from 47L@6000 rpm to 53.5L@6000 rpm – 13.8% increase in flow. It is advised that you increase your oil sump capacity by at least 2 litres to meet the demands of the extra flow and prevent oil from being depleted from sump as well as using a 1.5mm or a 1.25mm oil restrictor for the block to prevent excessing pooling of oil in the cylinder head.

*We advise the use of new hex screws with thread lock when securing backing plate and using the correct torque values.



Toyota UZ kit

Can be fitted to Toyota UZ family engines (1UZ-FE, 2UZ-FE, 3UZ-FE). Only suitable for VVTi version of oil pump but it can be installed into older non VVTi engines. The collar installation procedure is the same as for RB26. The only slight modification to a OEM UZ VVTi pump case required is making a slight chamfer with sandpaper to reprofile the edge to ensure fit (removing the sharp edge) as shown on pictures below.



4. Guarantees and Warranties

A) In accordance with normal practice and custom Supertec give no warranties or guarantees in respect of any goods supplied and/or fitted and used in applications modified in any way from OEM designs, racing, rallying or similar high performance leading edge applications.

B) It is your responsibility to familiarise yourself with our and other manufacturers' recommendations as to the care of all goods supplied and to comply with our and other manufacturers' recommendations as to the care of all goods supplied and to comply with such recommendations. Lubricants in particular are of vital importance and good quality motor oil, not synthetic oil, must be used to run-in engines. We accept no liability for any loss or damage caused by your failure to take proper care nor do we accept any liability for any loss or damage caused following any works carried out by you or others fitting, modifying, servicing or repairing goods supplied by us.

C) Most of goods we supply are for use in racing applications and you must not assume, unless advised in writing to the contrary, that such goods will be suitable for non-racing conditions even if fitted to road vehicles.

D) Subject to 4(a) above we will not be liable for any consequential loss or damage caused by defects in any goods supplied by us and, in the absence of personal injury or loss of life, our liability shall be limited at our election to repair or replacement of any defective goods or the return of the price.

E) Once the item has been shipped under no circumstances we can offer a refund. If there is a manufacturing defect or we have supplied the incorrect kit to what you have requested, we will re issue the correct kit. We may under such circumstances ask you to ship the kit back with proof of shipping or ask you to destroy the kit with photo or video evidence.