

## Fitting Instruction for EFO02 – 12/4 and 15/6 starter ring gear.

**Please read the whole document before starting the process.**

Original Riley flywheels had the ring gear machined on the flywheel as an integral part of the component. So, to use the RRSL replacement ring gear the flywheel must be machined to create a register for the new replacement ring gear. It is essential that this work is entrusted to a competent machinist, as the register must be concentric with the hub of the flywheel where it mounts on the crankshaft.

If you are also considering fitting a modern high-torque starter motor you are advised to seek advice from others who have done the same and make careful consideration as with some high-torque starter motors the ring gear position may need to be adjusted so the pinion teeth properly engage. Note, if fitting an alternate starter motor, the designed gear centre distances are 6.563 inches.

This repair can be applied to the flywheels of cars with either the Preselector gearbox with 2<sup>nd</sup> or 3<sup>rd</sup> type clutch or the 4 speed manual gearbox BUT cannot be applied to the flywheel used on the 3 Speed and Overdrive Warner gearbox as there is not sufficient material in the flywheel to allow the machining to be completed without loss of critical strength. An image of this unacceptable flywheel is included in this document.

Machine the register on the flywheel to a diameter of 11.132" +0.000"/-0.003" and to a depth of 0.910" +/- 0.005", and by so doing remove the old flywheel teeth. Note that the diameter of the register needs to be concentric with the mounting bore of the flywheel to a tolerance of +\_/0.002" between the ring gear register and the flywheel. The aim is to have an interference fit of circa 0.020" between the ring gear and the flywheel, so you might want to take a few accurate measurements of the bore of the new ring gear before you commence the machining. Take the measurements at various points around the gear as the heat treatment may have introduced a small degree of distortion. The expected diameter of the inner bore of the replacement ring is 11.112" -.000"/+0.003"

**It is essential that the relief on the gear teeth is aligned as per the relief on the original teeth on the flywheel and this really is one of those aspects where check, cross-check and then check again is important. Folks have been known to fit the replacement ring gear the wrong way around and then have had to destroy the replacement to remove it.**

It is probably best to use a combination of heat and cold to fit the new ring gear but please clear this with the "management" before commencing. The ring gear needs to soak in an oven to create the required expansion at around 220 to 240 degrees C for an hour or so. Similarly, the flywheel should be cooled in the freezer overnight to contract that component. Ensure that you have suitable heavy-duty welding gloves to hand, as you will need to handle the hot ring gear to fit to the flywheel. *Note: - one tip is to make up a bar with ball ends, where the length is 11.132"; this can then be used to check the replacement ring gear on several diameters to ensure the heating has created sufficient expansion to allow the fitting to commence.*

Repeating the previous point, ensure you have adequate marking on both components so that you fit the gear with the teeth relief in the correct manner. Place the cooled flywheel on a solid surface and ensure it is well supported, and then quickly press the ring gear into place. We cannot emphasise enough that this all need to be done very quickly as the components will rapidly heat up and cool down respectively.

Replacement ring gears have been successfully fitted by heating with a gas torch but we must emphasise that this method has risks because if the new gear is heated to too greater temperature in any area the outcome could be that the gear teeth are softened in this area, resulting in rapid wear in service.

Image of the 3 Speed and Overdrive flywheel where there is insufficient strength to fit the replacement ring gear.

