

## Flywheel Mounting Instructions

**Properly mounting your flywheel is important because it is the foundation which**

**the clutch assembly is then mounted to. Improper mounting could cause excess vibration, clutch spline wear, clutch engagement/dis-engagement problems, catastrophic damage to the engine and drivetrain, severe injury or possibly death. Properly mounting the flywheel also improves starter pinion to ring gear engagement.**

**Precautionary Note:** Race cars are necessarily more complex than un-modified street cars. It is assumed that if you are working on a race car, that you have mastered the fundamentals of automotive mechanics. If you do not have the required skills to work on high performance vehicles, please seek qualified help.

**Check for Correct Parts ~** Ensure that you have the correct parts for your application. Remove the flywheel and any fasteners from the shipping box and check-fit them to your engine.

**Inspect Used Parts for Damage ~** Inspect the crank face of the flywheel for any signs of fretting. Inspect the area around the crank bolt holes for deformation. Inspect the friction face of the flywheel for heat warpage, and/or heat checking. Ensure the crank face and threaded holes are in good shape. Ensure that all crank bolts are in good condition (no dents, nicks, fractures, missing threads, or rounded head. Replace the crank bolts if they look questionable.

**Clean All Parts ~** The flywheel has to be perfectly mounted to the crank face to ensure that it has no face run-out. If a small metal chip, debris, or old, hardened Loctite™ is left on the crank face, or flywheel face (if you are re-installing a used flywheel) the flywheel will have the potential to sit crooked on the crank, causing what is known as 'face run-out'.

You may have to use a sharp scraper or Scotch-Brite™ type of abrasive pad to remove stubborn deposits. All parts have to be surgically clean, with no signs of old Loctite™, corrosion, or damage to the mating surfaces. If the mating surfaces of the crank or flywheel are damaged, they may have to be resurfaced or replaced.

**Check Flywheel Bolts for Proper Length & Grip ~** Aftermarket flywheels sometimes have a thinner mounting surface, than the stock flywheel they replace. For racing and high performance street applications we recommend the use of high performance flywheel bolts. Whether you are using stock bolts or high performance aftermarket bolts you must always check for proper grip length.

Thread all bolts into the crank and lightly bottom them in the hole by hand. Using a caliper, or some other suitably precise measuring instrument, measure the distance from the face of the crank to under the head of the bolt. This measured distance must be less than the thickness of the flywheel mounting flange. If it is not, the flywheel will not be properly fastened to the crank when you torque the bolts down.

You also need to ensure that there is enough of the bolt's thread engaged in the crank. Measure the thickness of the mounting flange of your flywheel. Then measure the length of your flywheel bolt. Subtracting the flange thickness from the bolt length equals the amount of thread engagement the bolt has. A note about bolt length: All bolt lengths are measured from the end of the thread (end of the bolt) to the under-side of the bolt head. To measure this dimension you use the step measuring

capability of your caliper. The bolt length is NOT the overall length (which includes the head height of the bolt)

**How Much Crank Bolt Thread Engagement Is Required? ~** It is recommended that you have at least 2 times the diameter of the crank bolt in engagement with the crank's threaded flywheel mounting holes. So... if you have a 10mm diameter thread on your crank bolt, you should be able to thread that bolt 20mm into the crank's threaded hole when the flywheel is installed. If you have less than this, get the proper bolts. Do not take a chance on having the flywheel bolts (or crank) fail because of short thread engagement. The resulting damage is catastrophic, and could lead to severe injury or death.

On cranks that have threaded through holes, you will also need to ensure that the crank bolts do not extend so far out the backside of the crank flange that they hit anything, potentially causing rear main seal damage or engine block damage. If your crank bolts are too long, get proper length bolts. PTT does not recommend or endorse shortening crank bolts. High performance crank bolts are heat treated, and shortening can damage the heat treat, which could cause the bolt to prematurely fail.

If the bolt is slightly too long, it is possible to use a hardened steel washer under the bolt head. There are washers made specifically for this. They are ground absolutely parallel, and are hardened, so that they do not put undue stress on the head of the bolt, and will withstand the extreme clamp load a good crank bolt exerts on the flywheel.

**Prepare All Parts for Assembly ~** After thoroughly cleaning the crank, flywheel, and flywheel bolts, all parts must be degreased. Using brake parts cleaner, thoroughly clean and degrease the crank and its threaded holes, the flywheel mounting surface, and the crank bolts. Do not contaminate the parts by handling them with bare hands. Blow excess brake cleaner from all parts, so that they are clean, oil free, and dry. There should be NO hardened Loctite™ residue left on any of the parts.

**Install Flywheel ~** The flywheel should be a snug fit onto the crank register. It should NOT have to be forced (hammered) on, and once in place, it should easily rotate on the crank, with no sign of excess side-to-side play. You should also be able to push on the flywheel at various locations, to ensure it sits flat on the crank face, and does not 'rock' in any way, on the crank face.

**Install Crank Bolts ~** Apply Loctite™ 262 (commonly known as 'red' Loctite) to the crank bolt threads, per Loctite's instructions. Install all crank bolts and snug them down by hand. Using a proper tool to hold the flywheel, and keep the engine from rotating, torque all bolts to 10 to 15 ft.lbs. (14 to 20 N-m) to seat them. After properly seating the bolts, you may then torque the bolts to final torque as recommended in your factory service manual, or the crank manufacturer's recommendations (if you are using an aftermarket crank). Wipe any excess Loctite™ away. If you used the proper amount of Loctite™, you will have very little, if any, Loctite to wipe off. If you used too much Loctite™, you do not want the excess Loctite™ to contaminate the clutch friction material.

**Check The Flywheel Installation ~** Good racecar mechanics will never leave details to chance. They will always check the flywheel for run-out after installation. Use a dial indicator & magnetic holder, solidly mounted to the engine block and rotate the crank 360° to check the face run-out of the flywheel. It should measure less than 0.002" (0.050mm) total indicated run-out (T.I.R.) at the friction material surface. You must press firmly on the flywheel while rotating the crank, so that you do not get an incorrect reading, due to crank end play. Then move the dial indicator to the rim of the clutch register diameter, and check for radial run-out. The clutch register diameter should be concentric to the crank rotation within 0.002" to 0.004" (0.050 to 0.100mm) T.I.R.