

Tilton Super Starter - 54-4XXXX Series

DESCRIPTION

Tilton Engineering's Super Starter® is designed to fit much like the OEM starter whenever possible. Its compact size will often provide significantly more clearance for various engine and chassis components. Many of the top manufacturers of oil pans, exhaust systems, and engine accessories have designed their products for use with the Super Starter®. Unfortunately, with the wide variety of components currently on the market, it is not possible to guarantee that the installation of a starter will be a simple "bolt-on" for every application. From time to time, a customer will have to perform minor modifications to the engine block, oil pan, or even the starter mounting nose (only when recommended by Tilton) to achieve the recommended clearance. Any modifications undertaken to install the Tilton Super Starter® are well worth the time and effort, as they will be rewarded with the superior performance of the original high-torque mini-starter.

INSTALLATION

In all models of the Super Starter®, the relationship between the starter pinion and the ring gear is important for proper operation. Due to the starter's high operating torque, failure to install correctly will usually result in starter and/or ring gear damage. Be sure to check the following items before attempting to use your Super Starter®. For proper operation, the starter pinion-to-ring-gear must be $.100" (\pm .040")$ when pinion is in its relaxed position (See Figure 2). Check this at several flywheel locations by manually rotating the flywheel to be sure that the ring gear is running true. If the pinion is too close, use the housing shaped shim and round shim (See Figure 1) included with the starter, to move the pinion $.062"$ away from the ring gear. If it is impossible to see the pinion when the starter is installed (as with some cars with bellhousing-mounted starters), measure in from the face of the bellhousing that the starter rests against to the ring gear. Then measure from the face of the starter nose to the end of the relaxed pinion. The difference between the two measurements is the pinion-to-ring-gear clearance. When the pinion is engaged into the ring gear, there needs to be $.010"$ -. $.030"$ backlash between them (See Figure 3). This can be checked with a wire gauge when holding the pinion engaged into the ring gear. (A small pry bar or flat-blade screwdriver can be used to help hold the pinion out.) If the fit is too tight on an engine-block-mounted starter, use the rectangular shim (See Figure 1) between the starter nose and engine block.

**Note: For block mounted starter applications, additional rectangular shims, if required, can be purchased at most local auto parts stores.*

If the starter solenoid interferes with the engine block or any component, determine if the nose on the starter is an indexable model (most are). If so, the entire starter can be rotated about the nose to gain additional clearance. Care must be taken that the starter motor does not interfere with some of the kickout configurations of aftermarket oil pans.

**Maximize the clearance between the solenoid and heat sources like exhaust headers to prevent heat soak. Use of heat insulation wrap or a heat shield may be needed.*

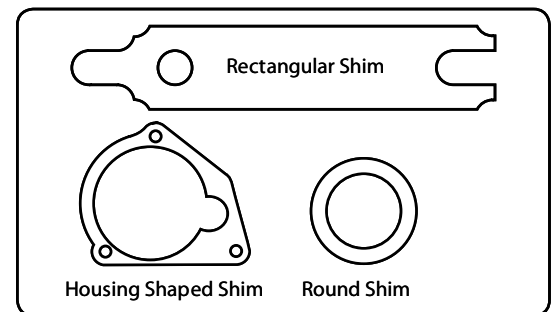
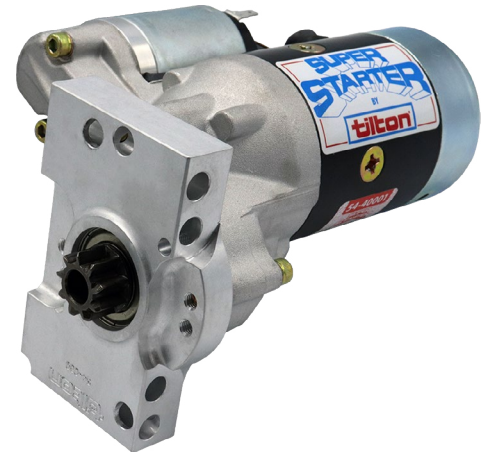


Figure 1
(Shim-Type definitions)

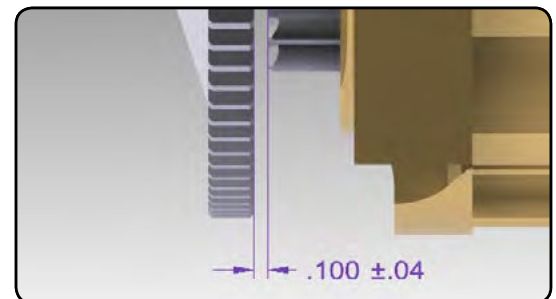


Figure 2
(Pinion Ring Gear Clearance)

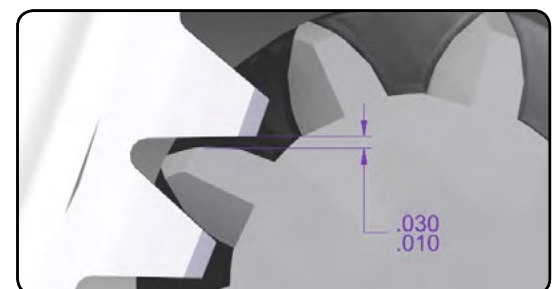
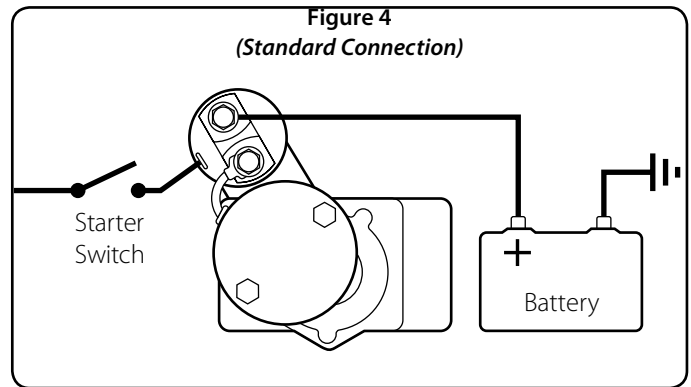


Figure 3
(Ring gear backlash)

SOLENOID CONFIGURATIONS

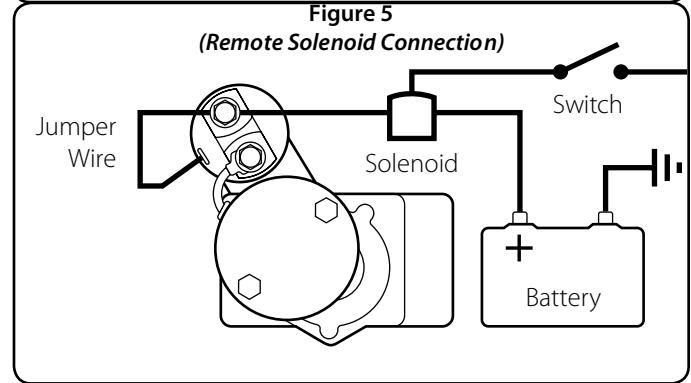
Standard (General Motors) *Figure 4*

Connect the positive battery lead to the unused post on the solenoid. Connect the smaller switch lead to the spade terminal on the solenoid.



Remote Solenoid Connection (Ford Or Chrysler) *Figure 5*

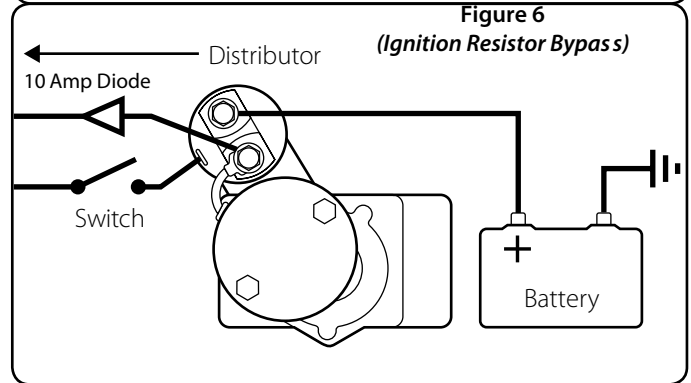
If your vehicle has a remote solenoid, connect the large positive lead from the remote solenoid to the unused post on the starter solenoid. Use the short jumper wire (provided) to connect the spade terminal to the same starter solenoid post as shown.



Ignition Resistor Bypass *Figure 6*

If your vehicle requires an ignition resistor bypass, you can connect the existing bypass wire to the lower stud IF a 10 amp diode is placed in the wire to prevent feedback voltage from reaching the starter.

Note: Resistor bypass was used only on some GM models (late-60's, early-70's) and applies to cars still using the OEM distributor and point-type ignition. If you are running an aftermarket distributor, you will not connect the extra wire (usually purple) to anything



Minimum Sizes For Battery and Wiring

- Battery CCA's double the cubic inch displacement of the engine (Example: 350 CID = 700 CCA minimum)
- 1/0 AWG copper wire for positive and negative cables
- 10 AWG copper wire for starter switch (Switch rating of at least 30 amps)
- Engine and chassis grounded (Both of equal size)

***Following these guidelines will eliminate many common issues and allow the starter to perform as designed.**

• Note: Battery voltage, either standard 12 volt or racing 16 volt, should always be checked when installing a new starter. Voltage measured at the starter should be within 1 volt of the measured voltage at the battery. *If the voltage drop is more than 1 volt, all wiring should be checked for proper size, and grounds checked for good connection.

• Voltage during cranking should not be less than 10 volts. If voltage is below 10 volts, verify wire size and that contact surfaces are clean of any paint, powdercoating, corrosion. Verify battery condition with a load tester. Checking battery condition before every event should become routine.

• Note: Vehicles with long wire runs from remote mounted batteries may need larger gauge wire. Keep in mind that every connection (terminal, switch, splice or union) is a likely place for current drop or loss. Connections should be solidly crimped or soldered, and sealed from the elements to prevent corrosion. All connections should be secure to resist loosening from vibration. Keeping wires away from high heat areas wherever possible and using high temperature reflective wrap where needed is recommended.