

Instructions

B&M StarTek Starter

(see www.bmracing.com for the latest vehicle fitment applications and model years)

Part Number 77104 & 77105– Small Block & Big Block GM, Straight & Staggered Mount

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Proper installation of your *StarTek* Starter is essential for trouble free operation. Correct alignment and spacing is required. Please read all instructions before installing your new high performance starter.

shims out at this time. Torque mounting bolts to 32 ft-lbs.

STEP 4. With the starter now in position, make sure the solenoid

housing has maximum clearance from heat sources and other components. The starter can be clocked in different locations on the mounting block to obtain the best

INTRODUCTION

This starter can be installed in about an hour by carefully following the instructions. It is suggested that the vehicle be allowed to cool off for a few hours to avoid burns from hot parts, especially any exhaust which might be near the starter. The vehicle should be off the ground for ease of installation - jack stands, wheel ramps or a hoist will work fine. **MAKE SURE VEHICLE IS FIRMLY SUPPORTED - DO NOT WORK UNDER A VEHICLE IF IT IS SUPPORTED BY ONLY A JACK!** Try to raise the vehicle 1-2 feet so you will have plenty of room to work.

INSTALLATION

STEP 1. Disconnect battery cables, removing the negative cable first.

STEP 2. Remove the old starter, and make sure the mounting flange is clean and burr free.

STEP 3. Install the starter with the supplied 3/8"-16 hardware. Leave all

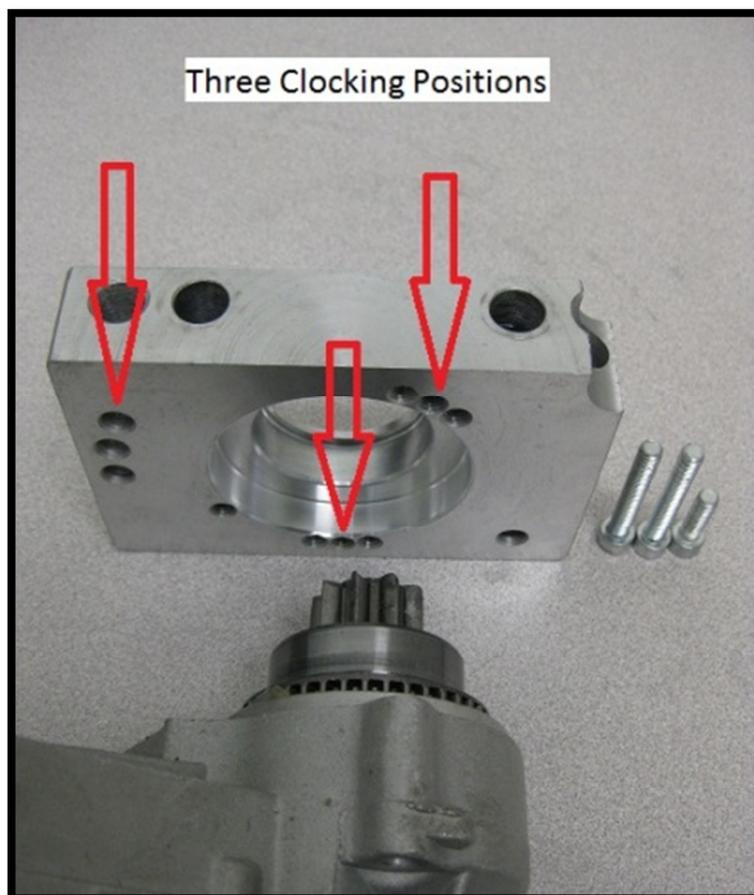


Figure 1: Starter Clocking Positions

position. To re-clock the starter, remove the three M6 x 1 mounting bolts between the starter and the mounting block and re-position accordingly. Re-Torque to 8 ft-lbs. Please see Figure 1.

STEP 5. With the starter installed and clocked at the best position, check clearance between the faces of the ring gear and pinion gear. There should be at least 1/16" (.0625", 1.6mm) space between gear faces. Please see Figure 2.

If there is not enough clearance, you will need to install the included shim kit. Remove the starter assembly from the engine and remove the mounting block. Install the shim ring into the bearing bore, place the outer shim on the starter body, then re-assemble. This will move the starter and pinion away from the ring gear by approximately 1/16". Please see Figure 3.

STEP 6. With the proper pinion to ring gear face distance and the starter assembly in place, the next step is to check "mesh" or center to center distance of the pinion and ring gear. **MAKE SURE THE BATTERY CABLES ARE DISCONNECTED.** Pull then gently pry out the pinion to engage the ring gear. Insert a wire gage as shown in Figure 4. There should be .020" - .035" clearance between the outer part of the ring gear tooth and the valley of the pinion. A standard 1.25" paper clip (wire size ~.035") has been used as a gage.

If there is too little clearance: Install one of the supplied mounting flange shims and check again. The mounting flange shim will move the starter out by approximately 1/64" (.016"). Please see Figure 5.

If there is too much clearance: Trim one of the mounting flange shims (see Figure 5) and install under at the outer bolt only. Check clearance again.

STEP 7. Connect the solenoid switch wire. With the amperage being considerable (~30A) to pull the bendix, B&M recommends 12 Ga. wire as a minimum. **Note:** If

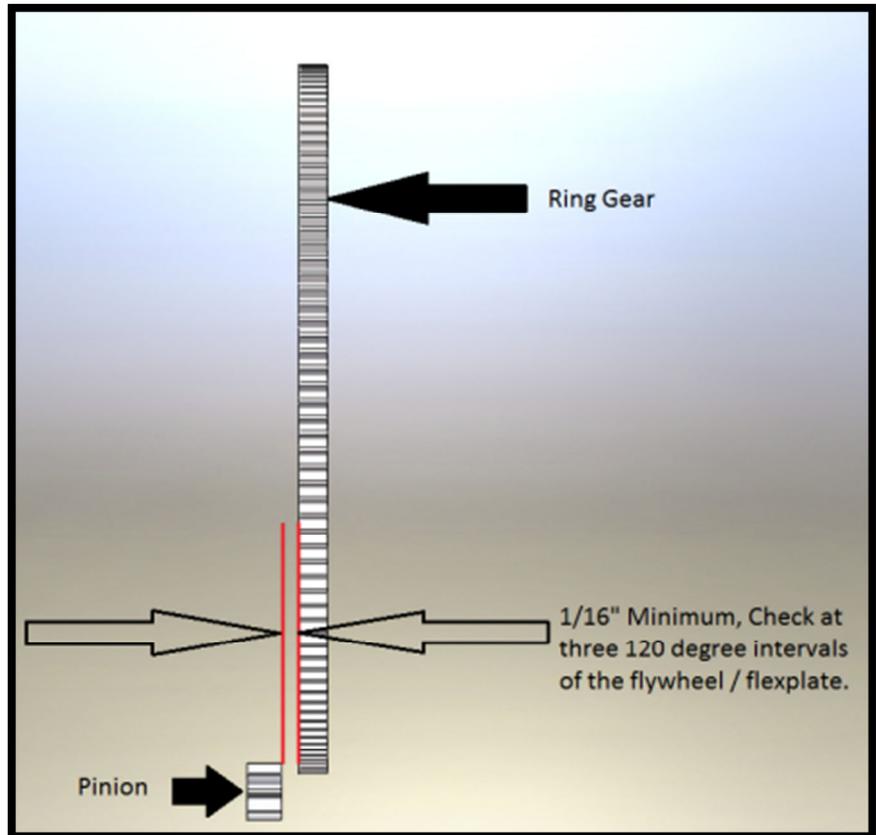


Figure 2: Pinion to Ring Gear Face Distance

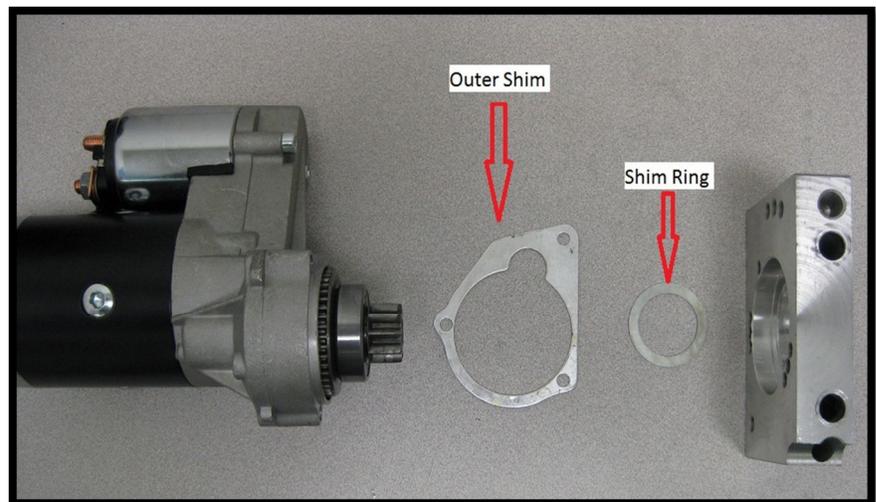


Figure 3: Face Distance Shims

your original starter had a second terminal, or "R" terminal, this can generally be omitted. Please see trouble shooting information at the end of this procedure for further information.

STEP 8. Connect the main cable to the starter. Due to the high

amperage required to turn the starter motor, it is important to size the wire in accordance to its length. Keep in mind to size all ground wires accordingly also, these are carrying equal current. Please see Table 1 for cable length versus gage recommendations.

STEP 9. Reconnect the battery terminals, starting with the positive and ending with the negative.

STEP 10. Start the engine. In order to not exceed the duty cycle of the starter, please do not operate the starter for more than 30 seconds at a time. Allow the starter to cool at least two minutes between repeated cycles.

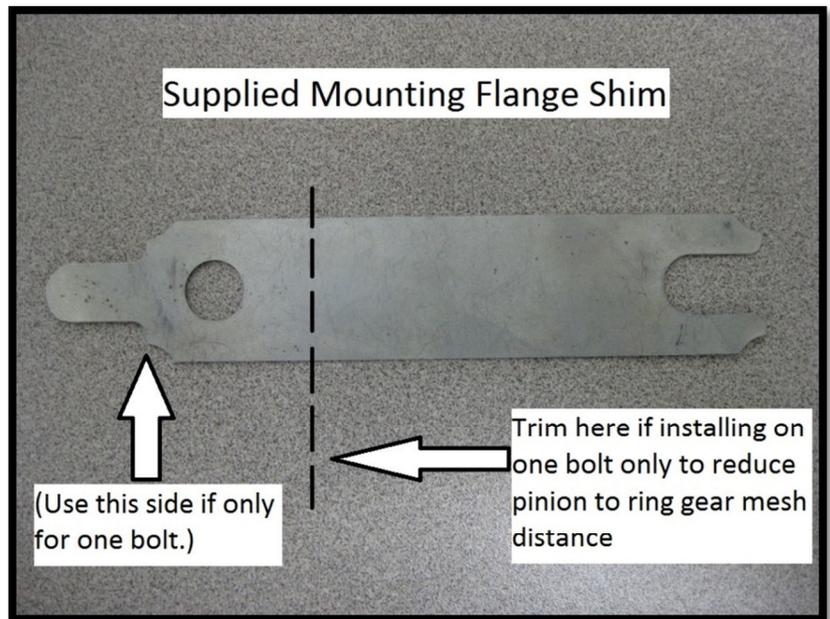
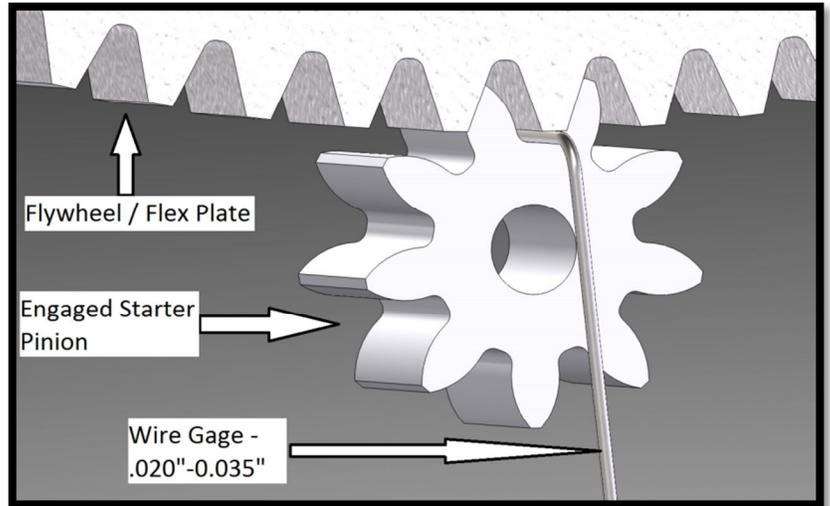


Figure 5: Mounting Flange Shim with Trimming Instructions (if required)

Table 1:

Starter Cable Length vs. Gage					
Length	3'	5'	7'	10'	10+'
AWG	4	2	1	0	00

Trouble Shooting Information:

Pinion Gear Engagement: While setting the face distance between the pinion and the ring gear (see Step 5) should yield proper engagement, a final check should be performed. After cranking the engine multiple times, you should be able to inspect the witness pattern on the pinion gear to check for proper engagement. The gear should show wear from the outer face to between 1/4" & 3/8" back towards the body of the starter.

Excessive Noise: If there is a high pitched whine during cranking, the pinion to ring gear mesh may be too great. If there is a whine after cranking there may be too little clearance. Please see Step 6, Figure 4 and Figure 5 for setting the mesh, or center to center distance.

Slow Cranking: Generally this can be attributed to low voltage at the starter. The battery should be checked, as well as wire size, terminals, and switches. *Keep in mind any switches (such as master kill switches used in race cars) must have very high amperage ratings, between 400 to 700 amps.*

R-Terminal: On older vehicles with point type ignition systems, there was an extra terminal and wire on the original starter. This fed 12V during cranking directly to the

ignition coil when cranking, serving as a ballast resistor by-pass. The B&M StarTek starter does not have this terminal, as most modern ignition systems do not require it. If it is found that your ignition system has low or no voltage during cranking, connect a 10A/250V diode in-line with the starter motor connection to the positive on the coil. The banded end of the diode goes away from the starter. This acts as a check valve, allowing current to travel from the starter to the coil during cranking, and not allowing current to feed back to the starter while the engine is running.

Cast Iron Starters: The B&M StarTek Starter is intended to replace OEM starters that were equipped with an aluminum front housing, or nose. If your original starter was cast iron, more shims may be required to obtain proper ring gear engagement.

Parts List	
(1)	B&M StarTek Starter
(2)	Mounting Bolts
(2)	Mounting Block Shims
(1)	Shim Ring
(1)	Outer Shim

Tools List	
	Jack & Jack Stands
	Work Light
	Torque Wrench
	5mm Allen
	9/16" Socket + Ratchet
	Flat Blade Screwdriver
	1/2" Wrench
	Tin Snips for cutting shims, (if required)



Customer Assistance Helpline
Phone: 707-544-4761

B&M provides a telephone helpline staffed by knowledgeable people to assist you with answers to questions regarding any B&M product. Our Customer Assistance Department is available 6AM to 5PM Monday through Friday, and 7:30AM to 5:00 PM Saturday, PST.