

Instructions

B&M StarTek Starter

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

Part Number 77100 (3/4" Depth) & 77101 (3/8" Depth)
Ford 289, 302, & 351W

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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.

gears, and part number 77101 is for 3/8" depth ring gears. Please see Figure's 1 and 2 for clarification, along with Table 1.

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 parts 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.

APPLICATION NOTES

When selecting a starter for your particular Ford, year, model, and drivetrain specifications can sometimes be miss-leading.

B&M offers two starters of differing pinion depth for particular Ford 289, 302, and 351W applications. Part number 77100 is for 3/4" depth ring

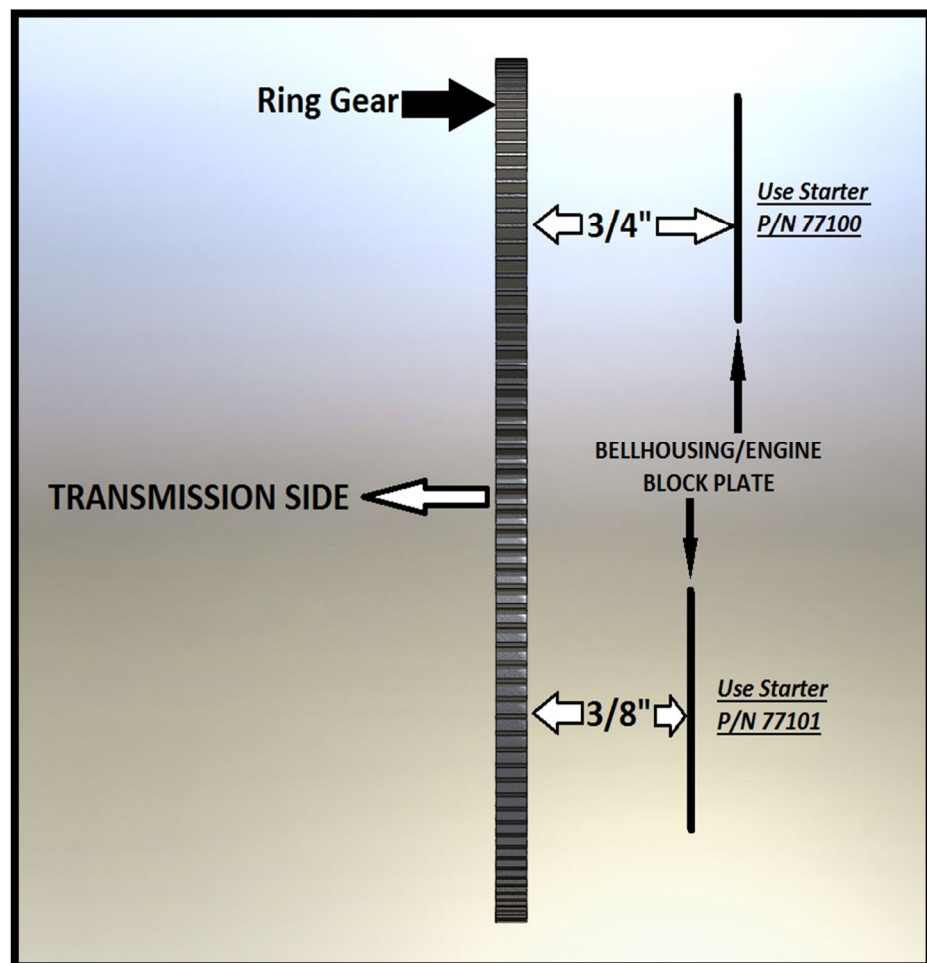


Figure 1: Application Side View

INSTALLATION

STEP 1. Disconnect the 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 StarTek starter. Leave all shims out at this time.

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 four different locations on the mounting block to obtain the best position. To re-clock the starter, first remove the starter, then 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 3.

STEP 5-1. (Pinion Engagement): There are two possible methods to measure pinion engagement. **The First (Preferred) Method:** With the starter removed, manually extend the pinion and measure the distance from the outer surface of the pinion to the starter mounting flange where it bolts to the bellhousing. Record this as dimension "A". Then measure from the bellhousing / block plate to the face of the ring gear. Record this as dimension "B" – this dimension should be close to 3/8" or 3/4", depending on your application. **Please see Figure 4.** A-B needs to be between 1/4" to 3/8". If A-B > 3/8", then remove the mounting block and install the shim ring and outer shim. (Please see Figure 5.) This will move the pinion away from the ring gear approximately .060", or 1/16". If A-B is significantly out of range, most likely the wrong application starter is being used.

STEP 5-2. (Pinion Engagement): **The Second Method: This method is NOT preferred. Steps 6-10 must be complete before this procedure is performed. Performing this procedure will**

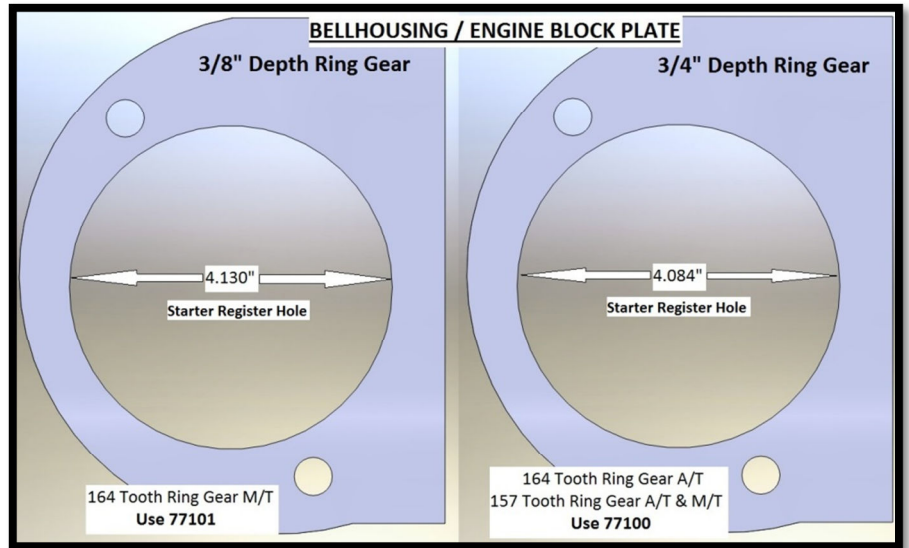


Figure 2: Application Register Diameters

Table 1: Application Reference Chart

Ring Gear Tooth #	Transmission	Starter Register Diameter	Depth	Starter
164	4 Spd	4.130"	3/8"	77101
164	Automatic	4.084	3/4"	77100
157	4 Spd & Auto	4.084	3/4"	77100

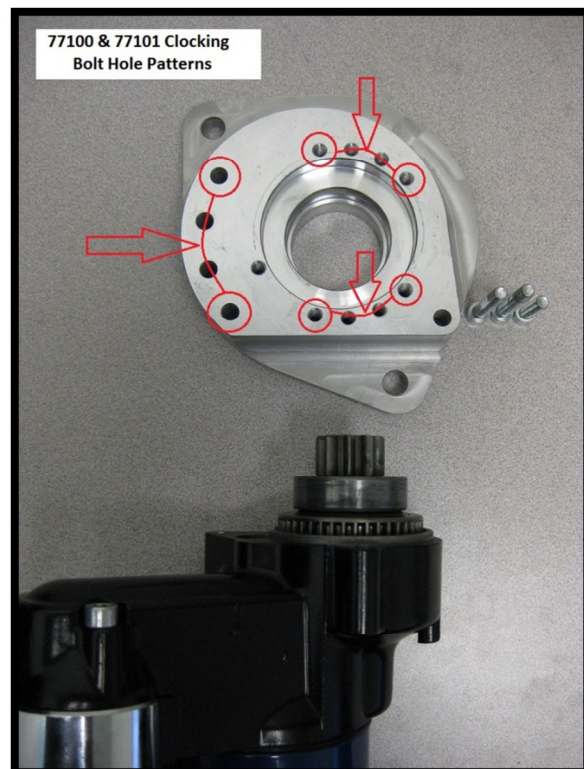


Figure 3: Starter Clocking Positions

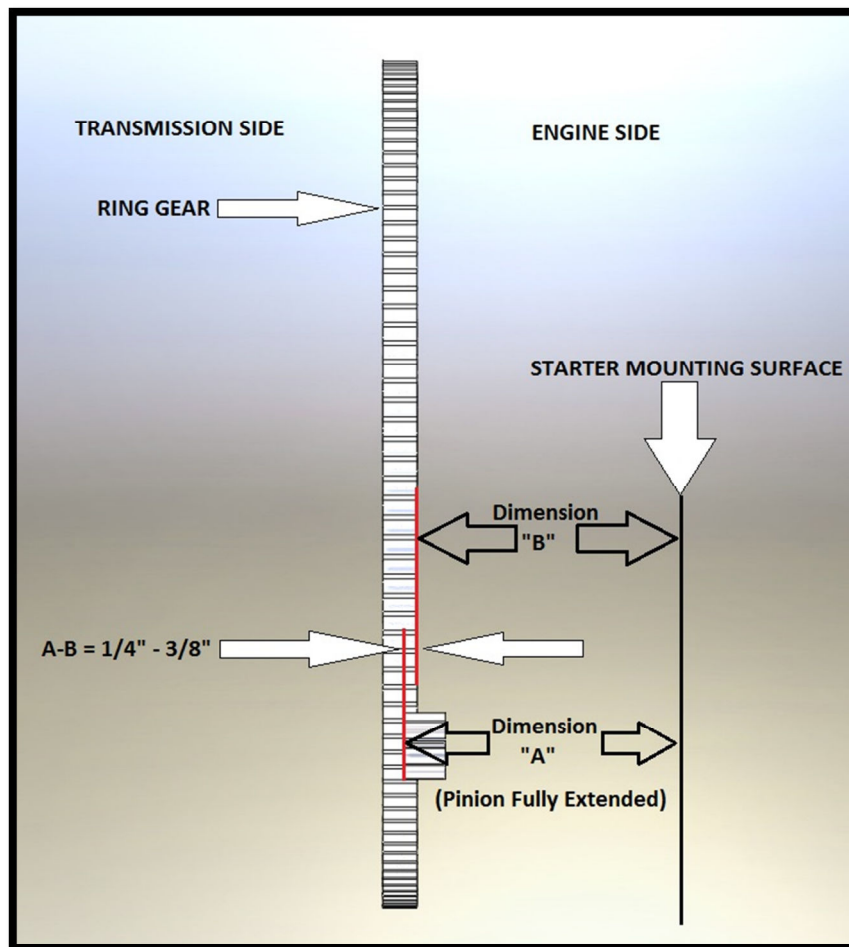


Figure 4: Calculating Pinion Engagement

generally prevent you from being able to return your starter: With the installation procedure complete, start the engine several times. Remove the starter. 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. If the mark exceeds 3/8" in length, remove the mounting block from the starter and install the shim ring and outer shim. This will move the pinion away from the ring gear .060", or 1/16. If the witness pattern is less than 1/4" or the starter skips or grinds during engagement, most likely the wrong application starter is being used.

STEP 6. Connect the solenoid switch wire. With the amperage being considerable (~30A) to pull the bendix, B&M recommends 12

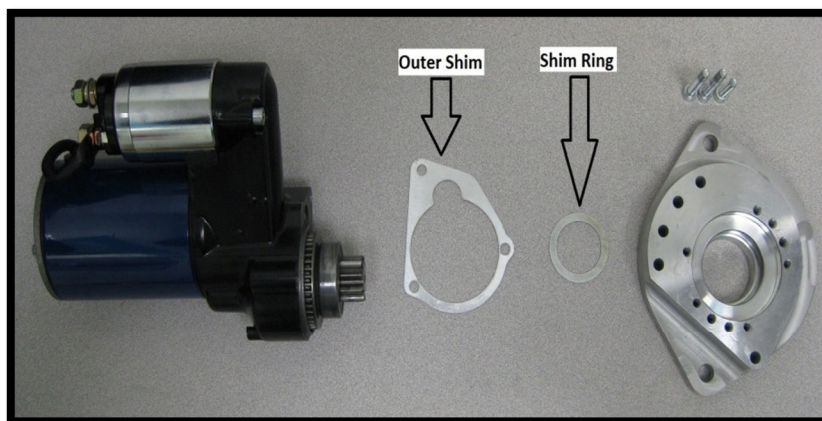


Figure 5: Starter Shim Assembly, (If Required)

Ga. wire as a minimum. Figure 6 shows wiring without a remote solenoid, Figure 7 shows wiring with a remote solenoid. While your B&M starter does not require a remote solenoid, it is generally easier to keep as much of the original wiring as possible. **Note:** If 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 7. Connect the main cable to the starter. Please see Figures 6 and 7 for reference. 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 2 for cable length versus gage recommendations.

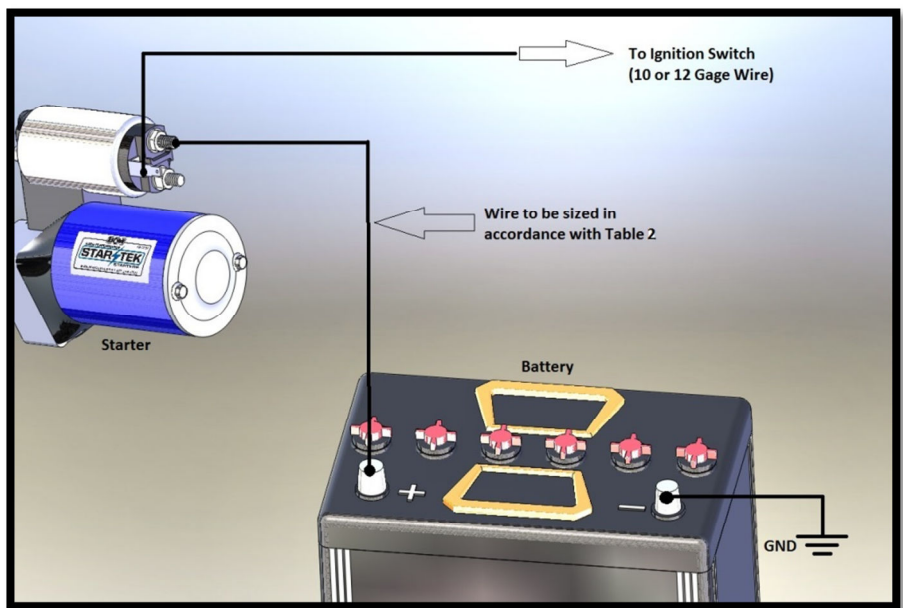


Figure 6: Starter Wiring Without Remote Solenoid

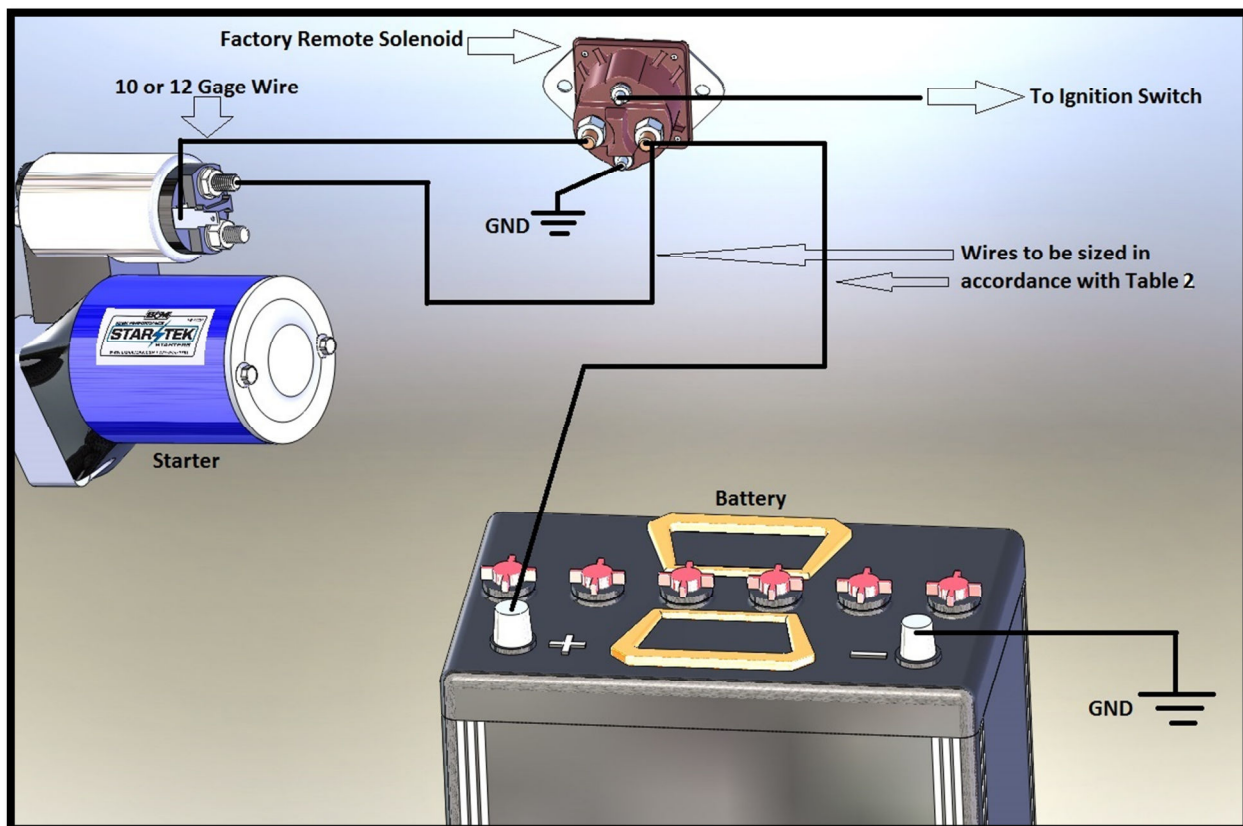


Figure 7: Starter Wiring With Remote Solenoid

Table 2: Cable Gage Chart

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

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.

Parts List

- (1) B&M StarTek Starter
- (1) Shim Ring
- (1) Outer Shim

Trouble Shooting Information:

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.

Gear Mesh: The gear mesh, or radial distance between gears is not adjustable on this application. Please make sure that all parts are correct for the application, and that the starter is mounted properly on the block plate.

Tools List

- Jack & Jack Stands
- Work Light
- 5mm Allen
- 3/8" Drive Std. Socket Set
- 3/8" Drive Ratchet
- 1/2" Wrench
- 9/16" Wrench



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