



# GM Mini Starter

## INSTRUCTIONS

**Proper installation of this starter is important! Following these few steps will assure proper installation and extend the life of the starter. When the starter is positioned correctly, the starter pinion will engage the ring gear without binding, therefore minimizing the chance of starter pinion and/or ring gear damage.**

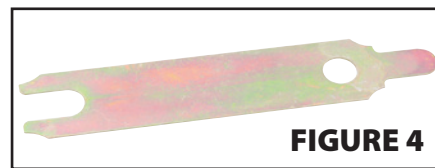
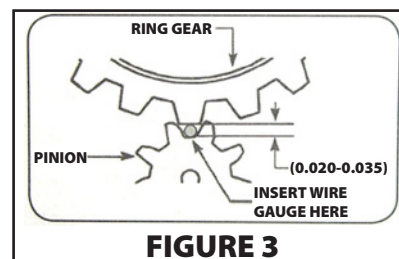
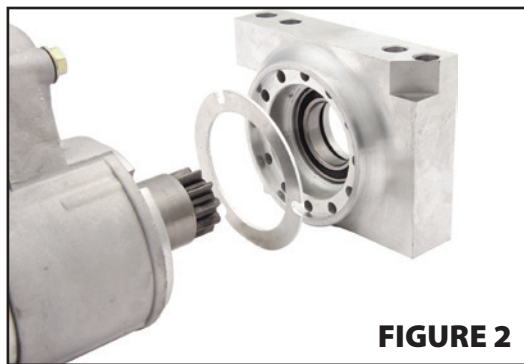
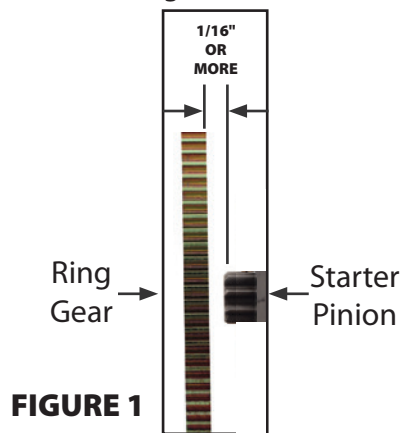
- 1. MOUNTING STARTER** - Make sure the mounting surface of the engine block is smooth, flat and free of paint. A good engine ground is critical to performance of the starting and charging systems. Torque starter mounting bolts to engine to 32 ft. lbs.
- 2. CLOCKING STARTER** - This starter comes "clocked" from the factory to fit most applications. It may be necessary to re-clock the starter mounting block to gain adequate clearance to the oil pan, exhaust or frame. If this is required, remove the fasteners attaching mounting block to starter motor and reposition the block as needed. Hold the starter block squarely against the starter-mating surface while tightening the bolts in an alternating manner. Final installation (after shimming, if necessary) will require these fasteners to be torqued to 50 in/lbs., medium strength Loctite is also recommended.
- 3. CHECKING STATIC PINION CLEARANCE** - There should be a minimum clearance of 1/16" between the ring gear and the starter pinion. Check this clearance in at least three locations on the ring gear as shown in FIGURE 1. If additional clearance is needed, place included shim(s) between the starter mounting block and the starter motor as shown in FIGURE 2.

### ADJUSTING STATIC PINION CLEARANCE:

1. Remove the three (3) fasteners securing starter mounting block to front of starter.
2. Remove the starter block by lifting it on both ends while pressing on the pinion.
3. Clean any grease or dirt from all mounting surfaces
4. Place the ring in the bearing bore.
5. Reinstall the block and tighten the three (3) fasteners.

- 4. CHECKING PINION ENGAGEMENT** - Engage the pinion gear into the flywheel by carefully prying the pinion out of the starter or by connecting a 12 Volt (+) Positive jumper wire or remote starter button to the "Switch" terminal only. (DO NOT connect battery cable to "BAT" terminal on the starter solenoid at this time) this engages the solenoid but does not spin the starter. CAUTION: Do not leave the solenoid engaged like this for more than 30 seconds at a time as the solenoid will overheat. Insert a wire gauge to check for proper clearance between the ring gear and starter pinion shown in FIGURE 3. Clearance measured from the valley of the starter pinion to the tip of the ring gear tooth should be 0.020" to 0.035". (NOTE: A #1 standard paper clip is usually about 0.035" in diameter and makes an easy tool.) Check clearance at least three places on the ring gear. If the clearance is too small, add shim shown in FIGURE 4, one at a time between the starter mounting block and the engine block to gain adequate clearance. In many installations, no shims are necessary. If clearance is too great, machining of the starter mounting block may be required.

**PLEASE NOTE: After releasing the solenoid, the pinion may STAY ENGAGED in the ring ear until the engine is started. This is normal for gear reduction starters and does NOT require shimming to correct.**





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5. **ELECTRICAL CONNECTIONS** - The battery cables are very important and must be the proper size for the length of the cable (see chart). A good engine ground is critical to the performance of the starting and charging systems. It is recommend to secure the battery ground cable directly to the engine and install a ground wire from the engine to the chassis. Do not depend on engine mounts to ground engine to the chassis as many mounts are suspended in rubber and/or many chassis are painted or coated and do not provide sufficient ground connections.

Note: This starter does not have a provision for the early model point ignition applications which require a connection to the "R" terminal (ballast resistor bypass). This connection supplied 12v current directly to the ignition coil during start-up, bypassing the factory resistor.

CABLE RECOMMENDATIONS					
DISTANCE:	3'	5'	7'	10'	+10'
AWG:	4	2	1	0	00

**CAUTION! NEVER OPERATE A STARTER MORE THAN 30 SECONDS AT A TIME WITHOUT ALLOWING TIME TO COOL (AT LEAST TWO MINUTES). OVERHEATING WILL DAMAGE THE STARTER!**

### Tech Tips:

<b>Initial Installation</b>	<ul style="list-style-type: none"> <li>• Always disconnect negative battery terminal first, positive terminal last. When installing cables, install the positive cable first then install the ground cable last. Following this procedure, prevents accidental shorting of the positive battery connection to a ground source such as the body or chassis.</li> <li>• Make sure battery is fully charged to avoid damaging new starter.</li> <li>• To ensure a good electrical connection, make sure terminal connections and the starter mounting surface are clean and free of any paint, coatings, oil, grease or dirt.</li> <li>• Install starter on engine first by hand threading mounting bolts until starter is in a properly aligned position, and then torque all fasteners.</li> </ul>
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### Trouble Shooting:

Problem:	Solution:
Pinion Gear Tips Worn	<p>Improper shimming, pinion needs to be closer (centerlines) to the ring gear. Remove shims between starter mounting block and engine block. If there are no shims installed, material may need to be machined off of the starter mounting surface.</p> <p>Faulty ring gear, check for out of round, or egg-shaped ring gear, this is especially possible with new, inexpensive ring gears. Check the pinion to ring gear engagement dimensions in at least six places (60 degrees apart) on the flex plate.</p>
Pinion Does Not Spin	Poor battery cable connections including ground cables or battery voltage is not sufficient. Make sure all connections are clean and battery is fully charged.

### Warranty:

Important! This starter is intended for use with 12 volt batteries only. Use of this starter with any other voltage battery may damage starter and will void all warranty.
Original proof of purchase (dated receipt) is required for all starter returns. An RGA (Return Goods Authorization) must also be obtained by calling and requesting one.
Allstar Performance warrants this starter for 90 days from the date of installation to be free of defects in workmanship and materials. Warranty is limited to repair or replacement only. Starter should be returned to the dealer from which it was purchased, or shipped directly to Allstar Performance with RGA and proof of purchase.