Installation Guide

GM Starter



JEGS.com

1-800-345-4545

Table of Contents

Mounting the Starter.....02

Pinion Clearance.....02

Pinion Engagement & Clearance.....03

Common Wiring Diagrams.....04

Wiring.....05

Checking Starter Supply Voltage.....05

Troubleshooting.....06

WARNING

DISCONNECT THE BATTERY (-) BEFORE PROCEEDING

Mounting the Starter

- Check starter for clearance against oil pan and exhaust. If you encounter any interference re-clock the starter by removing the 3 hex head bolts attaching the starter to the mounting block. The starter can now be reattached in any combination of the 12 mounting holes and re-tightened to 50 in/lbs. (Fig.1)
- Making sure the mounting surface of the engine block is smooth, flat and free of paint buildup. You can now install the starter with the provided mounting bolts and torque to 32 ft/lbs.
    - We do not recommend heat wraps. A heat shield with an air gap between the starter and exhaust is optional.

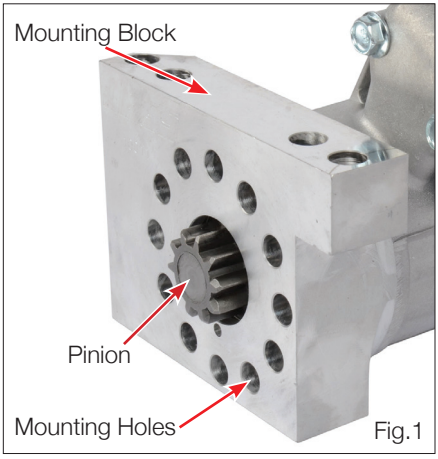


Fig.1

Pinion Clearance

- There should be a minimum of 0.100" clearance between the pinion gear and ring gear. This distance can be larger than 0.100" as long as the starter pinion engages properly. (Fig.2)

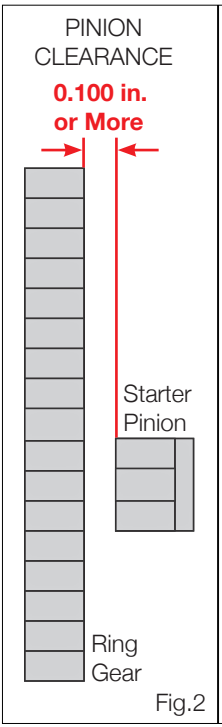


Fig.2

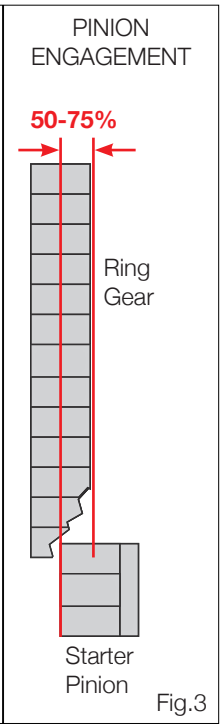


Fig.3

Pinion Enagement & Clearance

Pull pinion out to engage ring gear. This can be done by:

- Using a screwdriver to pry the pinion out of the starter. ***(OR)***
- Connect 12VDC to the "Switch" terminal ONLY (DO NOT connect battery cable to "BAT" terminal on the starter solenoid or leave the solenoid engaged like this for more than 5 seconds at a time as the solenoid will overheat).

Proper engagement is when the pinion gear is engaged 50-75% of the ring gear width.

- If your engagement is too shallow, you can remove the preinstalled inner shim. This will allow the pinion gear to engage 0.065 deeper. (Fig.3 & 4)

Use a pin gauge to check the clearance between the two gears. If a pin gauge is not available, a standard #1 paper clip can be used as they generally are about 0.035" in diameter. This clearance should be between 0.020-0.035". (Fig.6)

- To increase clearance: Use entire shim across both holes moving the starter down and out away from the flywheel. A 0.015" thick shim increases clearance by approximately 0.0075". DO NOT use more than 4 shims. (Fig.5)
- To decrease clearance: Use ½ of the shim only on the outer starter mounting bolt hole moving the starter up and in towards the flywheel. 0.015" thick shim decreases clearance approximately 0.010".

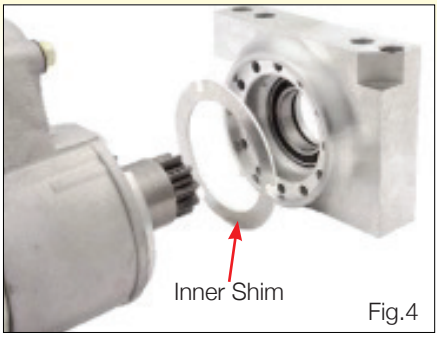


Fig.4

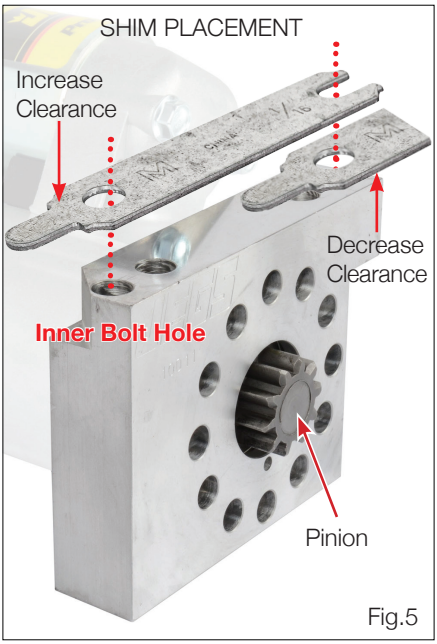


Fig.5

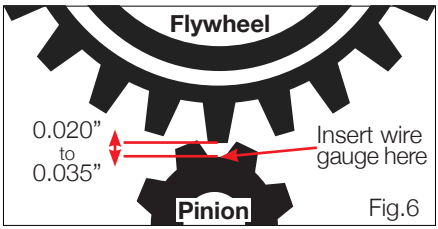
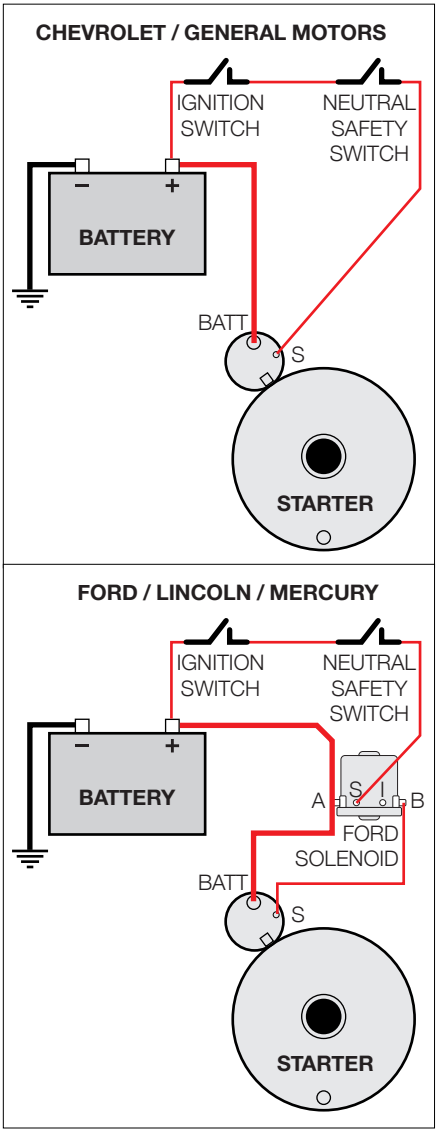
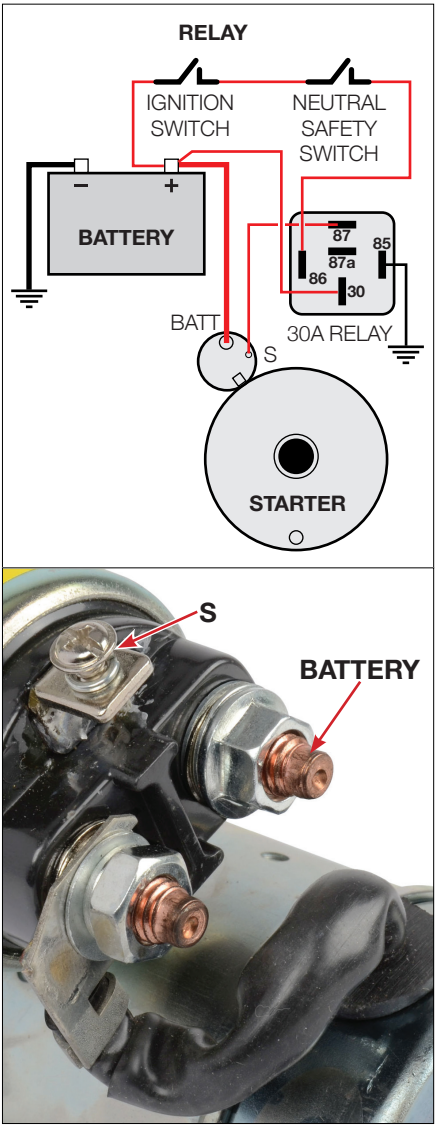


Fig.6

Common Wiring Diagrams





Wiring

- Check that all grounds are in good condition.
  - **NOTE:** A good ground is **NOT** painted, powder coated, or anodized.
- Ensure power cable is sufficient size and in good condition.

DISTANCE (ft.)	3	5	7	10	+10
AWG	4	2	1	1/0	2/0

- These starters do not have a post for the "R Terminal" connection. If you are using an electronic ignition, this post is normally not needed. If you are using the factory type points ignition, a diode can be added to the starter to function this circuit (part number #555-10038).

Checking Starter Supply Voltage

The goal is to check the voltage with a digital voltmeter at BOTH, the battery cable connection and the ignition terminal of the starter WHILE CRANKING the engine.

1. Make sure the battery is fully charged. The battery must be at least 12.6 volts before checking the voltage values at the starter terminals. If the battery does not read 12.6 or higher, charge it or replace it.
2. Connect your voltmeter to the battery (BATT) terminal of the starter. It should read the same at the starter as it did across the battery terminals. If not, there is an issue within the cable/terminals from the battery positive post to the starter terminal.
3. If the voltage is the same at the battery as the starter, have someone crank the engine for about 3-5 seconds and note the voltage on the battery terminal of the starter while cranking. It should stay above 11 volts.
4. Next, connect your voltmeter to the small (S) terminal of the starter (ignition) and to ground. Have someone crank the starter for 3-5 seconds and note the voltage. It should also be over 11 volts.

If less than 11 Volts:

1. For block mounted starters, ensure the engine block mount is clean of all paint. This is the ground source for hundreds of amps being used by the starter. A poor ground will affect the voltage values and performance of the starter.
2. Inspect the wiring. Original cables need to be replaced. Corrosion can build up inside an older cable which you'll never see. Also, the gauge may be too small to carry the current and voltage needed for a high torque starter. We recommend a high quality, multi-strand copper wire and remember that trunk mounted batteries require heavier gauge cables. You can't go too big on the battery cable! Low voltage on the ignition terminal can be due to factory resistor wiring, excessive engine heat or how it is routed through a park/neutral switch.
3. Inspect the ring lug/terminals. Use the proper ring lugs and ensure they are crimped to the bare wire strands – not the insulation!

Troubleshooting

PROBLEM	CAUSE	SOLUTION
• **My new starter has more/less teeth then my OE unit**	We specifically engineer each starter block to work with the specified ring gear. This means depending on the starter used a 9,10,11 tooth gear may all fit the same application.	• You're good to go!
• **Starter clicks when hot or cold** • **Starter only cranks intermittently** • **Starter drive jumps in and out during cranking** • **Starter drive grinds on engagement** • **Starter hangs up on disengagement**	This is typically caused by low voltage from the ignition circuit (ignition switch, neutral safety/clutch switch, remote mounted solenoid if equipped). The starter must have a minimum of 11.5V at the ignition switch post during cranking (voltage will normally be lower when the engine is hot), voltage lower than 11V will cause premature solenoid failure and intermittent cranking. Ignition circuit voltage is independent of the battery and can even occur with even the best battery installed.	• Check starter grounding • Increase wire gauge on ignition circuit • Check for voltage drop across neutral safety/ignition switch • Check for loose crimps or connections
• **Starter drags or cranks slowly**	This can be caused by few different issues. • Poor starter grounding • Improper cable sizing • Low battery voltage • Battery doesn't hold voltage under load • Initial engine timing set to high	• Clean mounting surface and/or add ground strap • Increase starter battery cable gauge • Load test battery to verify condition • Consider start retard box to step down timing
• **Starter drive is too close to ring gear**	This is due to the +/-tolerances in the engine block, crank flange, flexplate/flywheel. Due to core shifts in OE engine blocks, previously unknown issues may become present.	• Adjust starter by adding/removing inner shim • Check for tolerance issues in ring gear (Cracks, damage, etc) • Verify ring is flush with crank flange

If you have any issues, or if this starter is damaged, please contact customer service at: 1.800.345.4545.

Return Information: ***Once this starter has been modified, it will not be accepted for return.***