

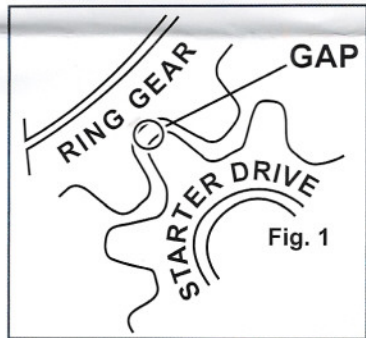
to shim **OR** not to shim

Noisy, Grinding Starter?

In some GM applications the following may be necessary.

In order for the starter to operate efficiently and quietly, shimming **may** be required, even if shims were not used on original installation.

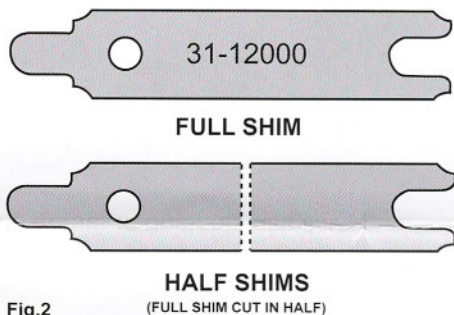
On some applications, you will have to either add shim(s) or remove shim(s) to achieve correct "gap" (clearance).



Measure the "gap" (Clearance) between the starter Drive Gear and Ring Gear. This should not be less than .025" (0.63mm) and not more than .060" (1.52mm). A paper clip is approx .035" (0.88mm) and may be used as a gauge.

Proper clearance between the starter drive gear teeth and flywheel ring gear is critical for correct operation of starter.

To achieve correct gap between ring gear and starter drive, usage of one or more shims **may be required** on certain GM engines. (See Fig. 2)



Does your starter motor require a shim(s)? Listen for problem sounds.

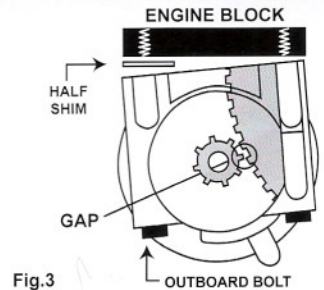
Gap Too Loose?

Do you hear a high pitched whine or clanging sound while cranking, before the engine starts?

Problem: Excessive Clearance!

- Is the gap **greater** than the thickness of a paper clip? See Fig.1.
- Starter must be shimmed closer (into) ring gear to reduce gap (clearance)
- Remove any existing shims.

- Start with one .015" (0.38mm) shim cut in half on **outboard** bolt only (the bolt on outside of starter motor away from engine) See Fig.3.
- This will move starter closer into the ring gear.



Gap Too Tight?

Do you hear a high pitched whine after the engine has started, as the key is being released?

Problem: Not Enough Clearance!

- Is the gap **less** than thickness of a paper clip? See Fig.1.
- Starter must be shimmed away from ring gear to increase gap (clearance).
- Install one .015" (0.38mm) shim across both bolt holes to increase gap. See Fig.4.

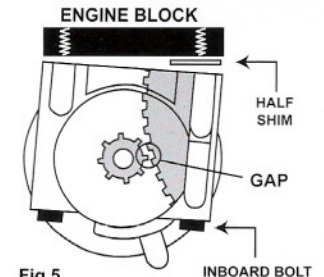
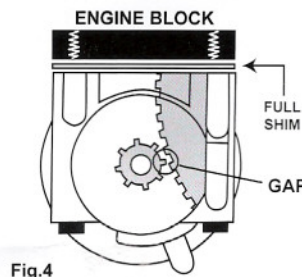
OR

- Install one .015" (0.38mm) shim cut in half or a substitute shim on **inboard** bolt only. (the bolt on inside of starter motor closest to engine) See Fig.5.
- Usage of one shim on inboard bolt only, will provide greater clearance.

Note: Do not use more than 3 shims on either side.

When installing a replacement starter motor:

- **DO NOT** use an impact gun or breaker bar to tighten bolts! Nose cones are made of aluminium and are very easy to distort or crack by over tightening.
- Always reinstall any existing heat shields and rear support brackets.
- Make sure all connections at solenoid are clean and tight.
- Add or remove shims one at a time to avoid damage.



Providing the proper gap, will award you with a starter that is quieter and has a longer life!