GM Corvette 1984-1996 Repair Guide

Starter

- TESTING
- REMOVAL & INSTALLATION

TESTING

No-Load Test

See Figure 1

1. With the carbon pile "OFF", make connections as shown in the accompanying figure. Close the switch, adjust the carbon pile to get 10 volts, and compare with the following RPM, current and voltage readings:

   1984-87 5.7L (VIN 8) engine: No load test @ 10.6 volts-70-110 amps, RPM at drive pinion-6,500-10,700 rpm

   1988 5.7L (VIN 8) engine: No load test @ 10.6 volts-90 amps (max.), RPM at drive pinion-3,300 rpm

   1989-90 5.7L (VIN 8) engine: No load test @ 10 volts-45-90 amps, RPM at drive pinion-3,300-5,000 rpm

   5.7L (VIN J) engine: No load test @ 10 volts-45-90 amps, RPM at drive pinion-3,300-5,500 rpm

   5.7L (VIN P) engine: No load test @ 10 volts-45-90 amps, RPM at drive pinion-2,800-5,000 rpm

   5.7L (VIN 5) engine: No load test @ 10 volts-45-90 amps, RPM at drive pinion-3,500-5,000 rpm

2. Rated current draw and no load speed indicates normal condition of the starter motor.

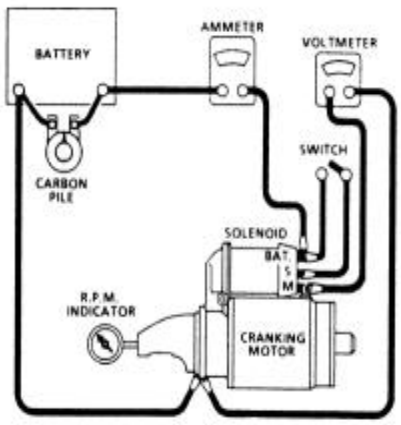

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Fig. Fig. 1: Starter motor no-load test connections

3. Low free speed and high current draw indicates:

   Too much friction. Tight, dirty, or worn bushings, bent armature shaft allowing armature to drag.

   Shorted armature. This can be further checked on a growler after disassembly.

   Grounded armature or fields. Check further after assembly.

4. Failure to operate with high current draw indicates:

   A direct ground in the terminal or fields.

   "Frozen" bearings.

5. Failure to operate with low or no current draw indicates:

   Open solenoid windings.

   Open field circuit. This can be checked after disassembly by inspecting internal connections and tracing the circuit with a test lamp.

   Open armature coils. Inspect the commutator for badly burned bar after disassembly.

   Broken brush springs, worn brushes, high insulation between the commutator bars of other causes which would prevent good contact between the brushes and commutator.

6. Low no-load speed and low current draw indicates:

   High internal resistance due to poor connections, defective leads, dirty commutator and causes listed under Step 6.

7. High free speed and high current drain usually indicate shorted fields. If shorted fields are suspected, replace the field and frame assembly. Also check for shorted armature using a growler.

REMOVAL & INSTALLATION

5.7L (VIN 8) Engine

See Figures 2 through 20

1. Disconnect the negative battery cable.
2. Raise and safely support the vehicle.
3. For 1984-88 vehicles, perform the following:
   a. Remove the retainers and the flywheel cover.

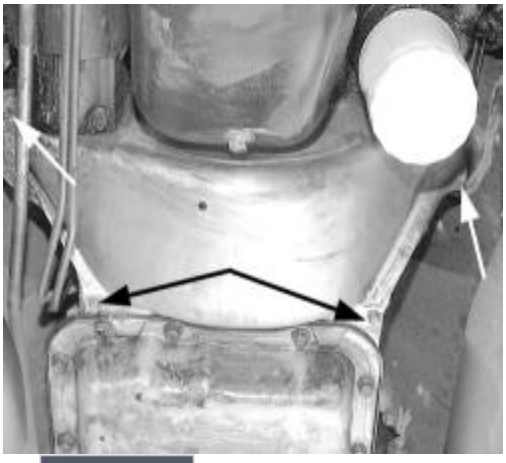

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Fig. Fig. 2: The flywheel cover is retained with 4 bolts

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Fig. Fig. 3: Remove the bolts, then lower the flywheel cover. It will probably take some maneuvering to get the cover out

2. If necessary for access, unbolt the exhaust system from the manifold and behind the catalytic converter, then remove it from the vehicle.

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Fig. Fig. 4: On some vehicles, it will be necessary to unfasten the exhaust pipe-to-catalytic converter attaching bolts

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Fig. Fig. 5: Unfasten the exhaust pipe clamp retaining bolts

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Fig. Fig. 6: Then, unfasten the clamp from the exhaust pipe

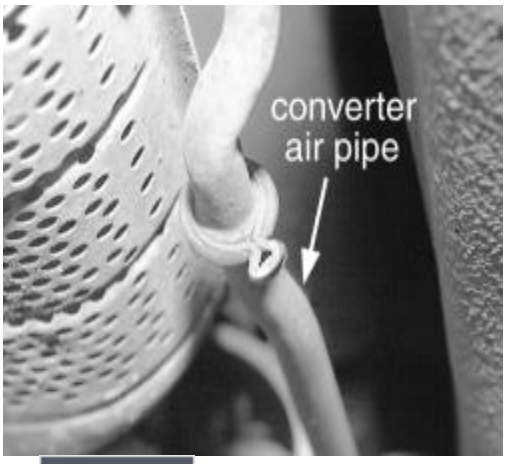

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Fig. Fig. 7: You must unfasten the converter air pipe retaining clamp

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Fig. Fig. 8: Then move the clamp aside and separate the converter air pipe for exhaust removal

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Fig. Fig. 9: Unfasten the bolts that are holding the exhaust pipe clamp in place, just below the y-pipe

Fig. Fig. 10: With the exhaust system supported with jackstands, unfasten the exhaust pipe flange-to-manifold nuts

Fig. Fig. 11: With the help of at least one assistant, carefully lower the exhaust and place in a safe place

c. Unfasten the retainers and remove the rear support brace.

4. Label and disconnect the starter wiring.

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Fig. Fig. 12: Unfasten the outer electrical wiring retaining nut ...

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Fig. Fig. 13: ...then pull the wiring off of the stud

5. Remove the starter mounting bolts, then carefully lower and remove the starter from the vehicle. Make sure to note the position of any shims, if used.

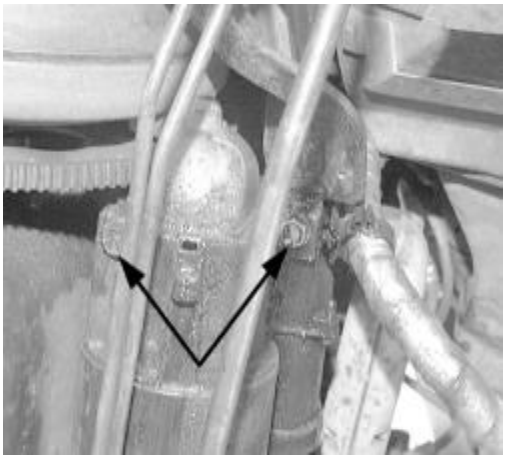

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Fig. Fig. 14: The starter is secured with 2 mounting bolts

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Fig. Fig. 15: Overall view of the starter mounting

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Fig. Fig. 16: Be careful when lowering the starter, because it is heavier than it looks!

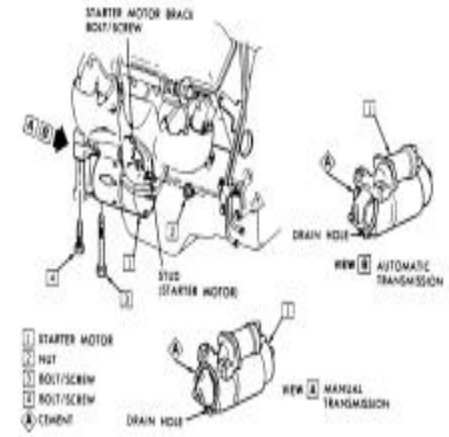

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Fig. Fig. 17: Exploded view of the starter motor mounting-1984-88 5.7L (VIN 8) engines

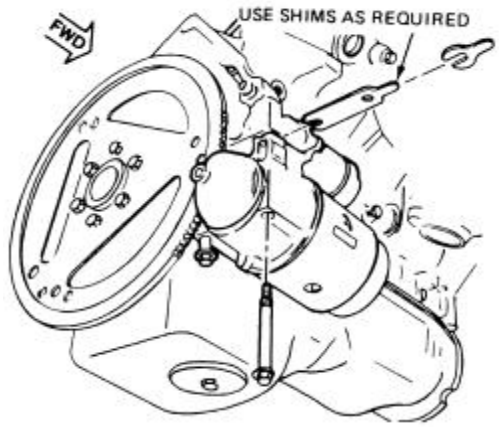

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Fig. Fig. 18: You must note the location of any shims used, for installation purposes

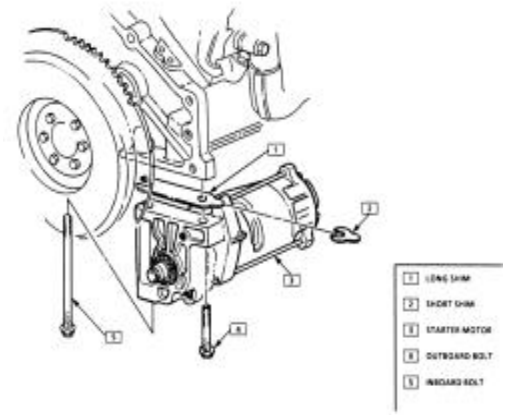

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Fig. Fig. 19: View of the starter motor mounting-1989-91 5.7L (VIN 8) engines

To install:

6. Position the starter to the vehicle and secure using the mounting bolts. Make sure to replace any shims that were removed. Check the flywheel-to-pinion clearance, as shown in the accompanying figure.

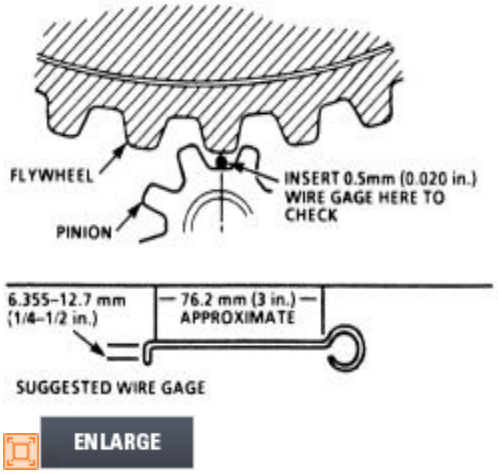

Fig. Fig. 20: You must check to be sure the flywheel-to-pinion clearance is sufficient

7. Tighten both bolts to 35 ft. lbs. (47 Nm).
8. On 1989-91 vehicles, sealer must be applied after the starter motor is installed.
9. Connect the starter motor wiring.
10. If removed, install the rear support brace and the flywheel cover, securing with the retaining bolts.
11. Carefully lower the vehicle.
12. Connect the negative battery cable.

5.7L (VIN J) Engines

See Figure 21

1. Disconnect the negative battery cable.
2. Remove the intake plenum.
3. Remove the ignition coil pack.
4. Disconnect the positive battery cable and starter motor solenoid connector from the starter.
5. Unfasten the starter motor-to-engine block mounting bolts, then carefully remove the starter motor from the vehicle.

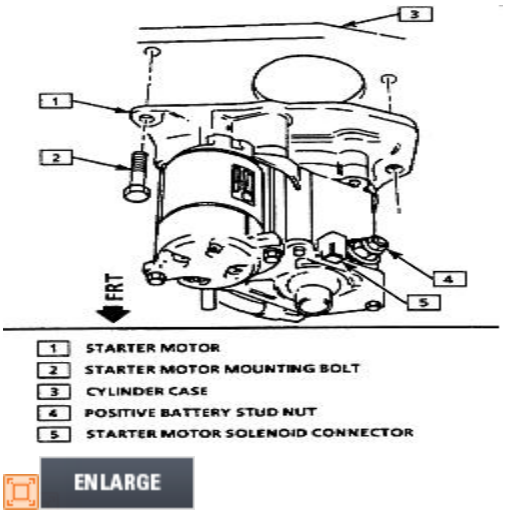

Fig. Fig. 21: Exploded view of the starter motor mounting-5.7L (VIN J) engine

To install:

6. Position the starter to the engine block.
7. Coat the starter mounting bolt threads with Loctite® 262, or equivalent, then install the bolts and tighten them to 38 ft. lbs. (52 Nm).
8. Connect the positive battery cable to the starter motor and tighten the stud nut to 10 ft. lbs. (14 Nm).
9. Attach the starter motor solenoid connector.
10. Install the ignition coil pack and intake plenum.
11. Connect the negative battery cable.

5.7L (VIN P & 5) Engine

See Figure 22

1. Disconnect the negative battery cable.
2. Raise and safely support the vehicle.
3. Disconnect the positive battery cable and the "S" terminal from the starter motor.
4. Remove the starter mounting bolts.
5. Carefully lower and remove the starter motor, sealer and shim(s) from the vehicle. Make sure to note the position of any shims, if used.

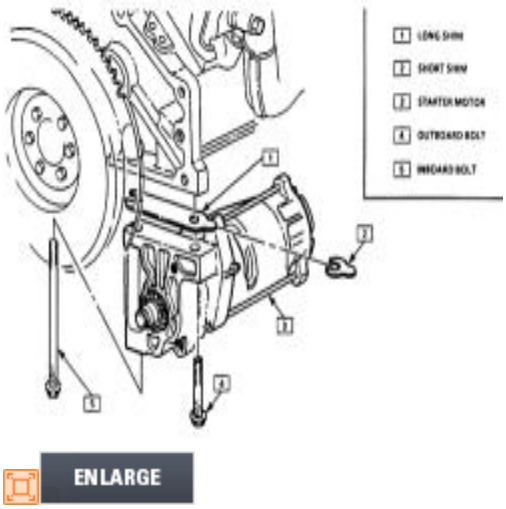

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Fig. Fig. 22: Exploded view of the starter motor mounting-5.7L (VIN P & 5) engines

To install:

6. Position the starter to the vehicle and secure using the mounting bolts. Make sure to replace any shims that were removed. Check the flywheel-to-pinion clearance, as shown in the accompanying figure.
7. Tighten both bolts to 35 ft. lbs. (47 Nm).
8. Apply a suitable sealer to the front of the starter motor. The sealer MUST be applied after the starter motor is installed.
9. Connect the positive battery cable to the starter and tighten the nut to 10 ft. lbs. (14 Nm).
10. Secure the "S" terminal to the starter and secure with the washer and nut. Tighten the nut to 35 inch lbs. (4 Nm).
11. Carefully lower the vehicle.
12. Connect the negative battery cable.

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