

INSTALLING 38MT & 39MT GEAR REDUCTION HEAVY DUTY STARTING MOTORS

WARNING!!! ALWAYS USE PROPER EYE PROTECTION WHEN PERFORMING ANY MECHANICAL REPAIRS TO A VEHICLE – INCLUDING, BUT NOT LIMITED TO, ANY INSTALLATION AND OR REPAIRS TO THE DELCO REMY STARTING MOTORS. FAILURE TO USE PROPER EYE PROTECTION CAN LEAD TO SERIOUS AND PERMANENT EYE DAMAGE. Only perform the mechanical functions that you are properly qualified to perform. A professional installation specialist should handle mechanical repairs that are beyond your technical capabilities.

DANGER!!! ALWAYS DISCONNECT BATTERY GROUND BEFORE REMOVING OR REPLACING CABLES AT THE STARTER. FAILURE TO DISCONNECT THE BATTERY GROUND CABLE CAN LEAD TO SERIOUS INJURY.

NOTICE! Some applications use a starter with a magnetic switch (relay) directly attached. Replacing it with a starter without an attached magnetic switch (relay) is not recommended. It requires installing a separately mounted switch (relay) and potentially upgrading the solenoid control circuit wiring. The separately mounted switch and wiring must meet or exceed a current rating of 300 amperes for 12V starters and 200 amperes for 24V starters.

FOLLOW ENGINE AND/OR VEHICLE MANUFACTURER'S INSTRUCTIONS CAREFULLY WHEN REMOVING AND INSTALLING THE STARTERS.

DRIVE HOUSING POSITION AND MOUNTING (Figures 1, 2 & 3, page 2)

- ◆ This starter with a fixed position nose less drive housing can also replace some starters with multiple position nose type drive housings.
- ◆ **IT IS IMPERATIVE ALL DRAIN OPENINGS ARE LOCATED BELOW A HORIZONTAL POSITION TO ENSURE DRAINS ARE NEAR THE BOTTOM FOR ADEQUATE DRAINAGE.**
- ◆ **CAUTION!!!** If any shims and/or flange spacer were used with the old starter, between the starter and flywheel housings, the shims and/or flange spacer **must** be reinstalled in exactly the same location with the replacement starter.
- ◆ Starter cable lengths must allow for normal engine movement in all operating ranges.

REPOSITIONING INTEGRATED MAGNETIC SWITCH (IMS) (Figure 2, page 2)

- ◆ Remove the two IMS mounting screws and loosen fasteners that attach the IMS leads to the solenoid, if necessary.
- ◆ Reposition IMS by using a different set of housing switch mounting bracket holes to obtain clearance.
- ◆ **Reinstall mounting screws and torque all fasteners according to values labeled in figure 2, page 2.**

MOUNTING FLANGE HOLES AND MOUNTING BOLTS (Figure 3, page2)

- ◆ This starter may have 10.7-10.9 mm (27/64") to 16.6-16.9 mm (5/8") diameter mounting flange holes.
- ◆ Starters with 16.6-16.9 mm (5/8") diameter mounting flange holes can also be mounted with 12.7 mm (1/2") mounting bolts. Hex Head Cap Screws (Grade 5) or harden washer (Grade 5 or better) must be used.
- ◆ Do not use any lock washers, star washers or soft washers with the starter mounting bolts.
- ◆ For 39 MTs – verify rotatable flange has counterbore holes facing forward and machine recessed ears to rear. See Figure #3

ELECTRICAL CONNECTIONS (Figure 1 & 2, page 2)

- ◆ Identify and tag all leads when removing old starter so they can be properly connected on the new starter. Be sure to connect the cables to correct solenoid terminals, because the terminals may be reversed.
- ◆ Clean or wire brush all terminals so that bare metal is exposed for good electrical connections.
- ◆ The connector for starters with optional Over Crank Protection (OCP) is the same for all series of starters.
- ◆ **CAUTION!!!** Verify the replacement starter has the same number of leads on the IMS (small solenoid). There are two types. 3 wire IMS (connected to start switch) and 2 wire IMS (connected to ECM). The new starter must have the same number of IMS leads as the old starter. The 2 wire and 3 wire units are not interchangeable.

GROUNDING INSULATED STARTING MOTORS (Figures 1 & 2, page 2)

This may be an insulated starter replacing a grounded type starter. Insulated starters have a flexible cable connecting the solenoid ground terminal to the terminal located on the commutator end of the starter (labeled Insulated/Ground). An insulated starter must have a cable connecting this terminal to the battery ground (-) connection for the starter to function. This grounding cable between the starter and battery should be a copper cable the same size as the positive (+) battery cable being used.

RING GEAR

If the ring gear is damaged, it must be replaced to avoid a potential premature failure and risk rejection of a warranty claim.

BATTERY COLD CRANKING AMPERES (CCA)

Excessive available CCA can damage starters. CCA rating is the current a battery can supply at "0" degree F (-18C) [See TMC RP 109A]. Following are Maximum Battery CCA Recommendations for Delco Remy Starters by Series:

38MT	12V	1875 CCA	39MT	12V	2500 CCA
	24V	900 CCA		24V	1250 CCA

ELECTRICAL INSTALLATION INSTRUCTIONS (Figures 1 & 2, page 2)

REVIEW DESCRIPTIONS IN THE TABLE BELOW TO DETERMINE THE FEATURES OF THIS STARTER VS THE ONE BEING REPLACED. THE SET

OF INSTRUCTIONS TO FOLLOW MUST BE SELECTED BASED ON FEATURES OF BOTH STARTERS. **NOTE:** THIS STARTER MAY ALSO BE VERY DIFFERENT IN SIZE AND APPEARANCE THAN THE ONE BEING REPLACED.

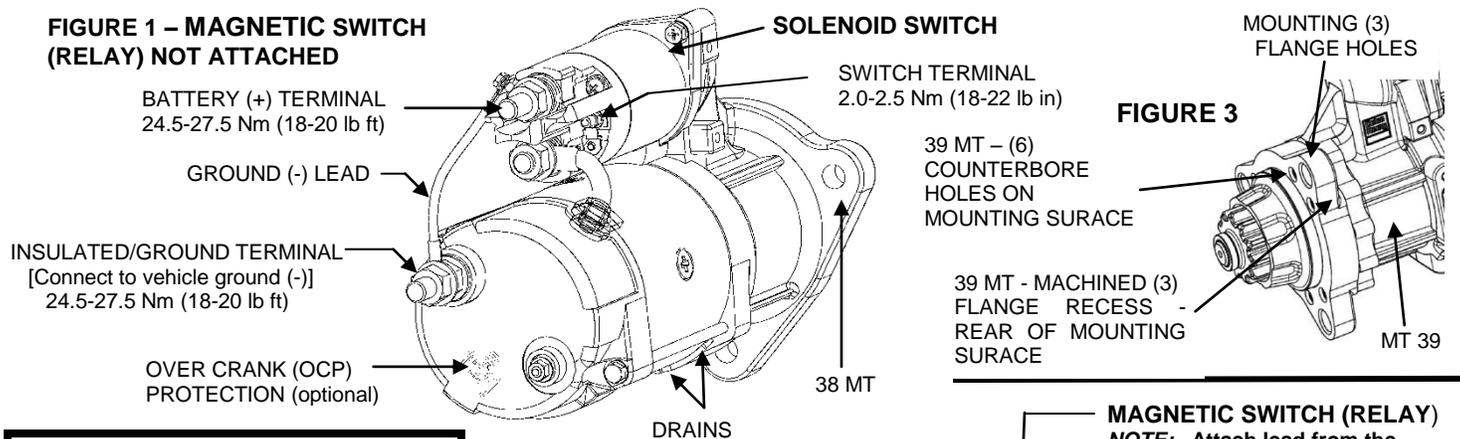
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	New Starter	Old Starter	Install
A	Magnetic Switch (Relay) not attached to starter	Magnetic Switch (Relay) not attached to starter	Yes
B	Magnetic Switch (Relay) attached to starter	Magnetic Switch (Relay) attached to starter	Yes
C	Magnetic Switch (Relay) attached to starter	Magnetic Switch (Relay) not attached to starter	Yes
D	Magnetic Switch (Relay) not attached to starter	Magnetic Switch (Relay) attached to starter	* No

* Installation can only be successful if the magnetic switch (relay) and solenoid control circuits meet requirements previously stated on page one of this document.

- A Starter and starter being replaced do not have an attached magnetic switch (relay).**
1. Connect lead to solenoid switch terminal as removed from old starter solenoid and torque to 2.0-2.5 Nm (18-22 lb in).
 2. Connect cable to solenoid battery (+) terminal as removed from old starter and torque to 24.5-27.5 Nm (18-20 lb ft). Connect the ground (-) cable to insulated/ground terminal on starters that have one and torque to 24.5-27.5 Nm (18-20 lb ft). Starters with this terminal will not function without being connected.
- B Starter and starter being replaced both have an attached magnetic switch (relay).**
1. Connect lead to switch terminal of the magnetic switch (relay), as removed from old the starter. Torque the screw to 1.9-2.4 Nm (17-21 lb in) or plug into the mating connector, if it has an attached wiring harness.
 2. Connect cables to solenoid battery (+) terminal as removed from old starter and torque to 24.5-27.5 Nm (18-20 lb ft).
 3. Connect ground (-) cable to insulated/ground terminal on starters that have one and torque to 24.5-27.5 Nm (18-20 lb ft). Starters with this terminal will not function without being connected.
- C Starter with attached magnetic switch (relay) replacing starter without an attached magnetic switch (relay).**
1. **Note:** The externally mounted magnetic switch (relay) and attached magnetic switch (relay) are both used in the circuit. The separately mounted magnetic switch (relay) will remain in the circuit and continue to function.
 2. Connect lead removed from the old starter solenoid switch terminal to switch terminal of the attached magnetic switch (relay) on the new starter. Torque screw to 1.9-2.4 Nm (17-21 lb in).
 3. Connect cables to solenoid battery (+) terminal as removed from old starter and torque to 24.5-27.5 Nm (18-20 lb ft). Connect ground (-) cable to insulated/ground terminal on starters that have one and torque to 24.5-27.5 Nm (18-20 lb ft). Starters with this terminal will not function without being connected.

FIGURE 1 – MAGNETIC SWITCH (RELAY) NOT ATTACHED



NOTICE! DRAINS OPENINGS MUST BE NEAR THE BOTTOM FOR PROPER DRAINAGE

FIGURE 3
MAGNETIC SWITCH (RELAY)
NOTE: Attach lead from the separately mounted magnetic switch to switch terminal on this relay. Both magnetic switches should remain in the circuit.

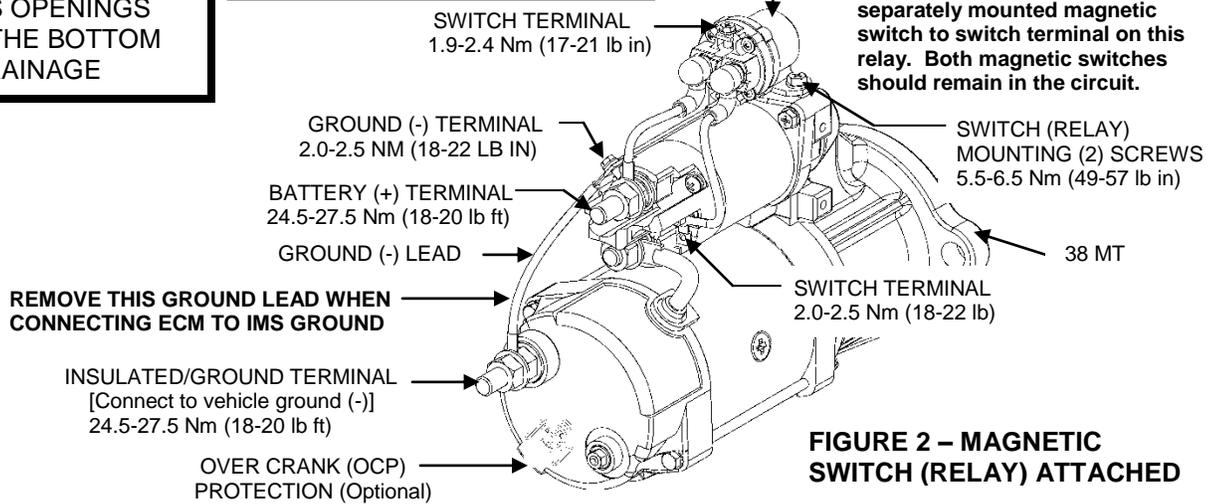


FIGURE 2 – MAGNETIC SWITCH (RELAY) ATTACHED

Technical support: USA 800 372 0222. Mexico 01 800 000 7378. Brazil 0800 703 3526. South America 55 11 2106 6510 or visit delcoremy.com

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