

starter to flywheel housing, slide automatic transmission oil cooler tube bracket off the stud (if so equipped) and remove the starter. **Do not damage flywheel housing seal.**

Diesel Starter

- (1) Disconnect battery negative cable at battery.
- (2) Raise truck on hoist.
- (3) Disconnect battery and solenoid wiring at starter.
- (4) Remove bolt, nut, and washer securing starter engine.
- (5) Lift starter and solenoid assembly from engine.

TESTING THE STARTER (Bench Test)

Free Running Test (Conventional Starter)

- (1) Place starter in a vise and connect a fully charged, 12-volt battery to starter as follows:
 - (a) Connect a test ammeter (100 amperes scale) and a carbon pile rheostat in series with battery positive post and starter terminal.
 - (b) Connect a voltmeter (15 volt scale) across starter.
 - (c) Rotate carbon pile to full-resistance position.
 - (d) Connect battery cable from battery negative post to starter frame.
 - (e) Adjust the rheostat until battery voltage shown on voltmeter reads 11 volts. Amperage draw should be as shown in specifications.

Free Running Test (Diesel Starter)

- (1) Place starter in soft-jawed vise and connect a fully-charged 12-volt battery to starter as follows:
 - (a) Connect a test ammeter (250 amperes scale) and carbon pile rheostat in series with battery positive post and starter terminal.
 - (b) Connect voltmeter (15-volt scale) across starter.
 - (c) Rotate carbon pile to full-resistance position.
 - (d) Connect battery cable from battery negative post to starter frame.
- (2) Adjust rheostat until battery voltage reads 11 volts on voltmeter. Read amperage draw on ammeter. Amperage draw should be as specified (180 amperes or less).

Locked-Resistance Test (Conventional Starter)

- (1) Install starter in a test bench.
- (2) Follow instructions of test equipment manufacturers and test starter against following specifications. With applied battery voltage adjusted to 4 volts, amperage draw should be as shown in specifications.

Locked-Resistance Test (Diesel Starter)

- (1) Install starter in starter test bench following equipment manufacturer's instructions.

- (2) Adjust applied battery voltage to 3.5 volts. Read amperage draw on meter. Amperage draw should be as specified (1700 amperes or less).

DISASSEMBLING THE STARTER (Conventional Starter)

- (1) Remove through bolts and end head assembly (Fig. 4).
- (2) Carefully remove armature from gear housing and field frame assembly, by pulling outwards (Fig. 5).
- (3) Carefully pull field frame assembly from gear housing far enough to expose terminal screw.
- (4) Remove terminal screw. It may be necessary to support terminal by placing finger behind it (Fig. 6).
- (5) Remove field frame assembly.
- (6) Remove nuts attaching solenoid and brush holder plate assembly to gear housing (Fig. 7).
- (7) Remove solenoid and brush plate assembly from gear housing (Fig. 8).
- (8) Remove nut, steel washer, and sealing washer from solenoid terminal (Fig. 9).
- (9) Unwind solenoid lead wire from brush terminal (Fig. 10).

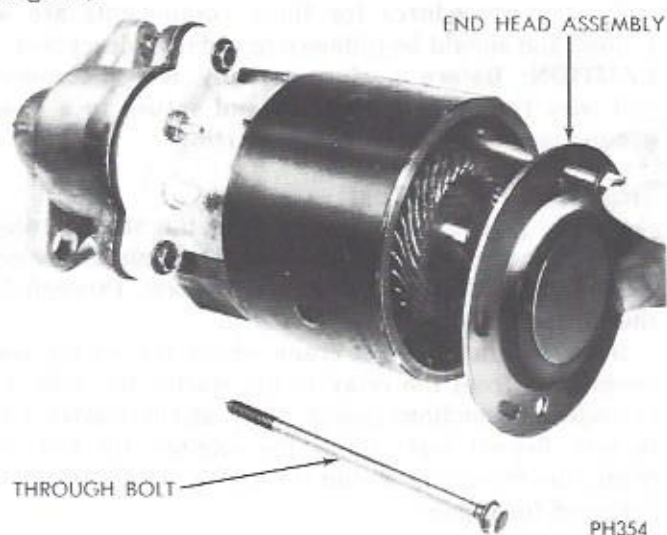


Fig. 4—Removing Through Bolts

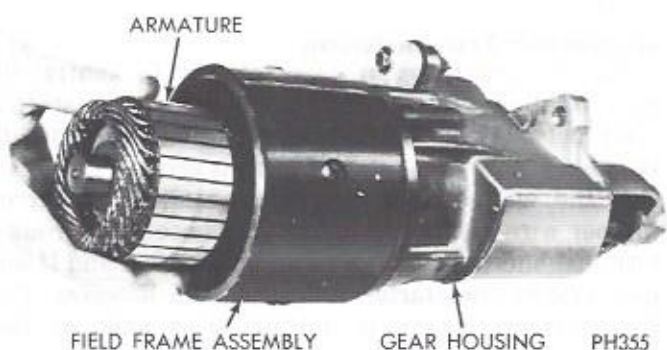


Fig. 5—Removing Armature