REDUCTION GEAR STARTER MOTOR

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GENERAL INFORMATION

Conventional Starter

The starter has a 3.5 to 1 reduction gear set built into the Starter Assembly which is housed in an aluminum die casting, Fig. 1. The starter utilizes a solenoid shift device, the housing of the solenoid is integral with the starter drive end housing and is equipped with a shock absorber clutch drive unit (Fig. 3) which absorbs the initial shock of cranking and protects the clutch unit in case the engine backfires during cranking.

The starter system consists of two separate circuits. The supply circuit which supplies heavy current to power the starter motor and the control circuit which controls the starter solenoid.

Diesel Starter

The starter has a 3.75 to 1 reduction gear set between the armature shaft and the clutch assembly (Fig. 2). The starter utilizes a solenoid shift. The solenoid is mounted to the drive-end housing.

The starter system consists of two separate circuits: the supply circuit which supplies heavy current to power the starter motor and the control circuit which controls the solenoid.

Test procedures are the same for both starters.

TESTING STARTER SYSTEM

SUPPLY CIRCUIT

The supply circuit consists of the battery, battery cables, clamps, and connectors. In checking this circuit always begin with a visual inspection of the battery post and cable clamps.

Test the battery to make sure it is in good condition, minimum specific gravity reading of 1.220, temperature corrected and see that the battery passes the "High Rate Discharge Test" shown in the "Battery" section of this group.

If the connections and battery are good, proceed as follows in checking the supply circuit:

Starter Current Draw Test

Engine should be up to operating temperature before performing this test. Extremely heavy oil or a tight engine will increase starter amperage draw.

(1) Connect a reliable Battery-Starter Tester per instructions of its manufacturer.

(2) Turn the variable resistor control knob tester to the off or zero position.

(3) Connect a remote starter jumper per instructions of its manufacturer.

(4) Crank the engine long enough to read the cranking voltage on voltmeter and note.

CAUTION: Do not crank engine excessively or the starter may overheat and damage will occur.

(5) Without cranking the engine; turn the variable resistor control knob on the tester until the voltmeter reads the cranking voltage previously noted. When this point is reached you can read the equivalent of the starter current draw on the ammeter. Refer to "Specifications" for current draw limits.

Circuit Resistance Test

High resistance in the supply circuit wiring or connections will cause the starter motor to crank the engine at a slower rate than normal. These connections can be tested for high resistance with the use of a reliable voltmeter which will indicate tenths of a volt. **Also, all tests are made without separating or disconnecting any connection. Voltmeter leads are to be connected across each of the connections shown in the Circuit Resistance Chart. While the engine is being cranked note the reading of the voltmeter. If any of the readings are higher than the specified limits there is high resistance in that connection and it**