Component Procedures: Starter Motor

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Component Procedures: Starter Motor

Parts and Labor (itype_189)

Parts

Qualifier	Part #	Name	Price	Note
Starter	56041013	1 - Starter	265.00	1994-02 Serviced As Comple?

Labor

Operation	Qualifier Path	Skill	Std Hrs	Wty Hrs
Replace	Starter, R&R	B	0.9	0.4

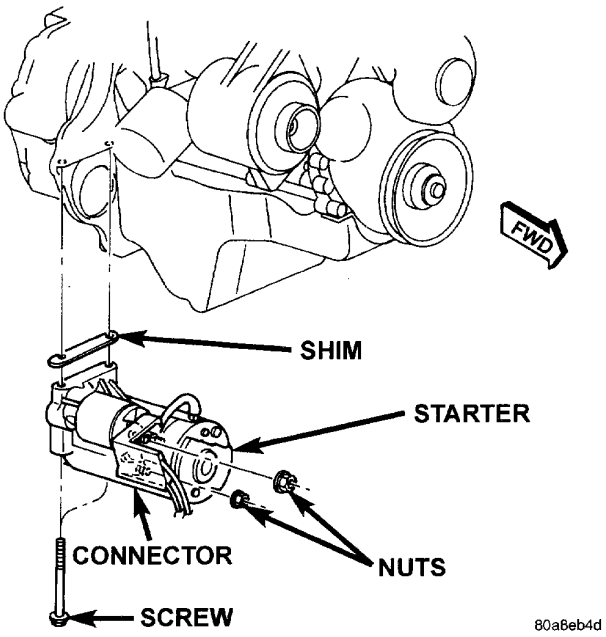
Components (itype_389)

Manufacturer = Mitsubishi
Number of Fields = 4
Number of Poles = 4
Number of Brushes = 4
Drive Type = Planetary Gear Reduction

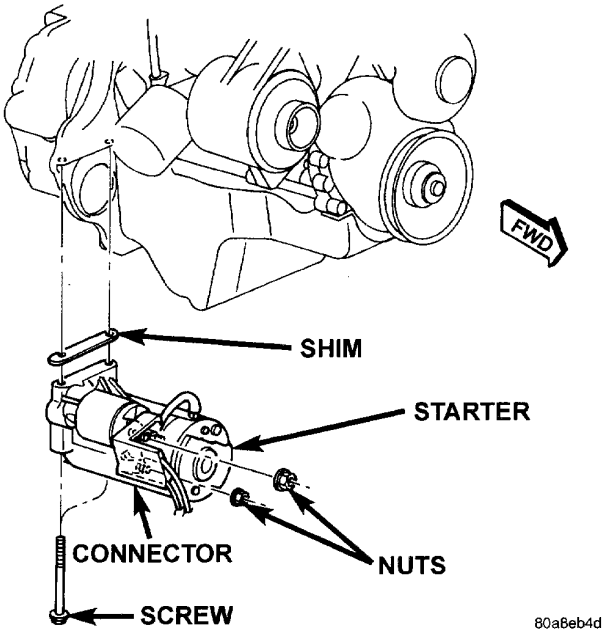
Components (itype_392)

DESCRIPTION
The
starter motor
s are not interchangeable. The
starter
motor is mounted to the right rear corner of the engine block.
Each of these starter motors incorporates several of the same features to create a reliable, efficient, compact, lightweight and powerful unit. The electric motors of both starters have four brushes contacting the motor commutator. The starter motor uses four permanent magnets for the field poles. The starter motor is rated at
1.2 kilowatts (about 1.6 horsepower)
output at
12 volts
.
Both of these starter motors are serviced only as a unit with their
starter solenoid
s, and cannot be repaired. If either component is faulty or damaged, the entire starter motor and starter solenoid unit must be replaced.
OPERATION
These starter motors are equipped with a planetary gear reduction (intermediate transmission) system. The planetary gear reduction system consists of a gear that is integral to the output end of the electric motor armature shaft that is in continual engagement with a larger gear that is splined to the input end of the
starter pinion
gear shaft. This feature makes it possible to reduce the dimensions of the starter. At the same time, it allows higher armature rotational speed and delivers increased torque through the starter pinion gear to the starter ring gear.
The starter motors for both engines are activated by an integral heavy duty starter solenoid switch mounted to the
overrunning clutch
housing. This electromechanical switch connects and disconnects the feed of battery voltage to the starter motor and actuates a shift fork that engages and disengages the starter pinion gear with the starter ring gear.
Both starter motors use an overrunning clutch and starter pinion gear unit to engage and drive a starter ring gear that is integral to the flywheel (manual transmission) or torque converter drive plate (automatic transmission) mounted on the rear crankshaft flange. Shims are available and can be used to adjust the starter motor mounting position to correct for improper starter pinion gear to starter ring gear engagement.

Components (itype_32)



Starter Motor Replacement (Article 2037256)



General Specifications (Article 2037257)

Power Rating =
1.2 Kilowatt (1.6 Horsepower)
Voltage =
12 Volts
Free Running Test Voltage =
11.2 Volts
Free Running Test Maximum Amperage Draw =
90 Amperes
Free Running Test Minimum Speed =
2600 rpm
Solenoid Closing Maximum Voltage Required =
7.8 Volts

*Cranking Amperage Draw Test =
130 Amperes
*Test at operating temperature. Cold engine, tight (new) engine, or heavy oil will increase
starter
amperage draw.

Mechanical (including Torque) (itype_28)

Starter Moter Mounting Bolts 33 ft.lb

Starter Motor Operation (Article 2037243)

Correct
starter motor
operation can be confirmed by performing the following free running bench test. This test can only be
performed with the
starter
motor removed from the vehicle. Refer to
Starting System
in the Specifications for the starter motor specifications.
CAUTION
: The engine uses a permanent magnet starter. Permanent magnet starters are highly sensitive to hammering, shocks, external pressure and reverse polarity. This starter motor must never be clamped in a vise by the starter field frame. The starter should only be clamped by the mounting flange. Do not reverse the
battery cable
connections to this starter motor when testing. The permanent magnets may be damaged and the starter rendered unserviceable if it is subjected to any of these conditions.
1. Remove the starter motor from the vehicle. Refer to Starter Motor/Service and Repair for the procedures.
2. Mount the starter motor securely in a soft-jawed bench vise. The vise jaws should be clamped on the mounting flange of the starter motor. Never clamp on the starter motor by the field frame.
3. Connect a suitable volt-ampere tester and a
12-volt
battery
to the starter motor in series, and set the ammeter to the
100 ampere
scale. See the instructions provided by the manufacturer of the volt-ampere tester being used.
4. Install a jumper wire from the solenoid terminal to the solenoid battery terminal. The starter motor should operate. If the starter motor fails to operate, replace the faulty starter motor assembly
5. Adjust the carbon pile load of the tester to obtain the free running test voltage. Refer to Starting System in the Specifications for the starter motor free running test voltage specifications.
6. Note the reading on the ammeter and compare this reading to the free running test maximum amperage draw. Refer to Starting System in the Specifications for the starter motor free running test maximum amperage draw specifications.
7. If the ammeter reading exceeds the maximum amperage draw specification, replace the faulty starter motor assembly

Starter Motor Noise (Article 2037244)

CONDITION	POSSIBLE CAUSE	CORRECTION
1. VERY HIGH FREQUENCY WHINE BEFORE ENGINE STARTS; ENGINE STARTS OK.	1. Excessive distance between pinion gear and flywheel/drive plate gear.	1. Move starter motor toward flywheel/drive plate by removing shim(s), if possible.
2. VERY HIGH FREQUENCY WHINE AFTER ENGINE STARTS WITH IGNITION KEY RELEASED. ENGINE STARTS OK.	2. Insufficient distance between starter motor pinion gear and flywheel/drive plate runout can cause noise to be intermittent.	2. Shim starter motor away from flywheel/drive plate. Inspect flywheel/drive plate for damage; bent, unusual wear, and excessive runout. Replace flywheel/drive plate as necessary.
3. A LOUD "WHOOP" AFTER ENGINE STARTS WHILE STARTER MOTOR IS ENGAGED.	3. Most probably cause is defective overrunning clutch.	3. Replace starter motor.
4. A "RUMBLE," "GROWL," OR "KNOCK" AS STARTER MOTOR COASTS TO STOP AFTER ENGINE STARTS.	4. Most probable cause is bent or unbalanced starter motor armature.	4. Replace starter motor.

NOTE: A high frequency whine during cranking is normal for this starter motor.

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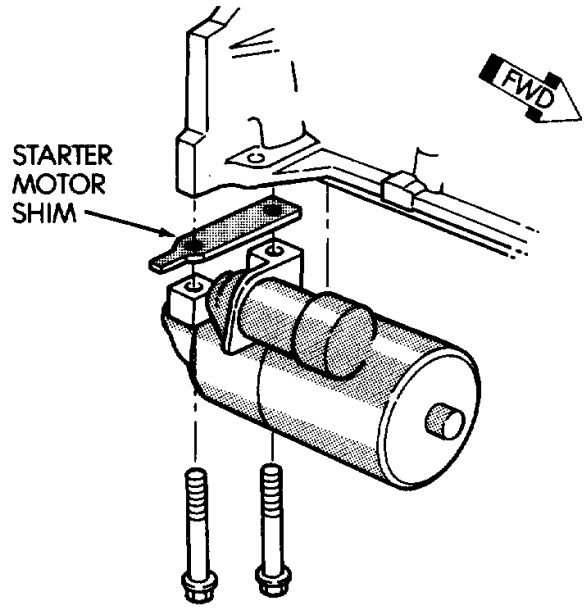

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