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Availability: ISIS

Revision: 7

Major System: ELECTRICAL SYSTEM

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Current Language: English

Last Modified: 4/19/2015

Other Languages: NONE

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Viewed: 3212

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Coding Information

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Title: Starter Diagnostics and Warranty Claim Procedure

Applies To: All engine, all chassis

CHANGE LOG

04/14/2015- Updated to new iKnow article criteria. Revised Diagnostic steps.

DESCRIPTION

The following information details the procedure for proper starter diagnostics and requirements for warranty. Use of this document will increase confidence that the right repair is made with minimal downtime and requires the use of the MidTronics EXP tester and the Starter Diagnostic Worksheet.

SYMPTOMS

Diagnostic Trouble Codes:

DTC/Light	Description
N/A	

Customer Observations or Symptoms:

- Click, No-Crank (solenoid clicks, starter does not crank, engine is in a no crank; no start state)
- No-Click; No-Crank (solenoid does not click, stater does not crank, engine is in a no crank no start state)
- Slow Crank (control circuit working, solenoid working, starter cranks the engine, engine is in a slow or no start state from cranking to slow)

SPECIAL TOOLS / SOFTWARE

Tool Description	Tool Number	Comments
Midtronics EXP	EXP 1000 HD	Dealer essetial tool per SFN-07-77

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DIAGNOSTIC STEPS

Following the step based procedure below will determine if there is an issue with a starter motor and help prevent warranty denials for No Trouble Found (NTF) .

Step	Action	Decision
1	Identify the Symptoms: Click No-Crank (Solenoid clicks, starter does not crank, engine is in a no crank no start state) No-Click No-Crank (solenoid does not click, stater does not crank, engine is in a no crank no start state) Slow Crank (control circuit working, solenoid working, starter cranks the engine, engine is in a slow or no start state from cranking to slow) Can the symptom be duplicated in the shop?	Yes. Step 2
		No. Contact driver for more information
Step	Action	Decision
2	Perform battery test: Inspect battery case (for cracked, buckled, corroded, or acid leaking case) and cables, terminals, & battery hold down (for corrosion, loose, missing, damage, improper routing, discoloration, terminal arching) Make required repairs Follow IK0800482- Battery Testing, Diagnostics & Maintenance Save test results (IK2700003- Midtronics Screen Print) Did any battery (not the pack or bank) generate a warranty approval code (WAC)?	Yes. Replace ONLY failed battery (the charging system MUST be checked to determine root cause of failed battery or charging system issue that could have failed the battery)
		No. Step 3
Step	Action	Decision
3	Starter To Battery Cable Voltage Drop Test: Inspect cable ends and terminals (for corrosion, loose, missing, damage, improper routing, discoloration, terminal arching) Make required repair Follow Midtronics cable drop test Save cable drop system test results (IK2700003- Midtronics Screen Print) Does the Starter Cable Voltage Drop Test fail (meaning +/- cables together = >0.5v)?	Yes. Make required repair
		No. Step 4
Step	Action	Decision
4	Symptom based diagnostic path: Which symptom is present?	Click No-Crank or No-Click No-Crank. Step 5
		Slow Crank. Step 6
Step	Action	Decision
5	Control Circuit Check: Integrated Magnetic Switch (IMS) system-Verify control circuit voltage is going to the IMS, repair as needed. Non IMS system- Perform voltage drop test on control circuit, repair as needed. Does the symptom still exist?	Yes. Step 7
		No. Release unit to customer
Step	Action	Decision
6	Slow crank condition check:	Yes. Determine if the batteries lost power during the testing

	Hookup EST Crank engine while monitoring Engine Speed (RPM) Is the engine cranking in spec for that engine?	No. Step 7
Step	Action	Decision
7	Engine Rotation check: Rotate engine by hand 360 degrees to determine if there is excessive resistance felt from a base internal engine issue such as hydrolock or mechanical failure, pulley, gear, PTO, transmission lockup Is rotating force of engine acceptable when rotating by hand?	Yes. Step 8 No. Further Investigate the issue
Step	Action	Decision
8	Flexplate/Flywheel Ring Gear Inspection: Remove flexplate or flywheel ring gear inspection cover Slowly bar the engine over by hand while inspecting each ring gear tooth for burs, milling, chipped teeth while the assistant is rotating the engine (If the ring gear is NOT inspected, a damaged ring gear can cause future starting symptoms) Are any ring gear teeth damaged?	Yes. Replace starter and ring gear No. Replace Starter

WARRANTY INFORMATION

Warranty Claim Coding:

Group:	08540- Cranking System
Noun:	202- Motor, Starter

Standard Repair Times:

Description	Chassis	Engine	SRT	Hours
Starter Diagnostics	All Chassis	All Engines	Click Here	0.9

Special Requirements:

As of November 1, 2012:

When testing for a Starter related failure, the technician will complete the proper [diagnostic worksheet](#). Critical diagnostic testing values are to be printed and submitted with the claim.

A copy of the completed [diagnostic worksheet](#) should be retained with the warranty claim repair order.

All Starters replaced under Warranty (Warranty Codes 01,03,39,55 and 98) will be requested back to be reviewed and tested. Any which are found non-defective or unnecessarily replaced will be charged back to the dealer.

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Feedback Information

Viewed: 3211

Helpful: 29

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Staff ID	Client ID	Comments	Created Date
	DYYRDW1	You received the following feedback From: dyyrdw1 - Dennis Whitaker Email Address: dennis.whitaker@summittruckgroup.com Job Classification: SE008, Service Technician Dealer: ROBERTS TRUCK CENTER-OKC Feedback: Can you please add a step that states if the starter drive spins but does not engage. What is done in this instance is to remove the starter and inspect drive and flywheel for damage. If no flywheel damage is found replace the starter.	4/23/2015 9:50:18 AM