Bulletin: 16-12-02

Date: 2/2016

SERVICE INFORMATION BULLETIN

Subject: ABS WHEEL SPEED SENSOR DIAGNOSTICS AND HUB BEARING ASSEMBLY REPLACEMENT

Models Affected: ALL 2011- 2014 MV-1 VEHICLES

BACKGROUND

There have been an abnormally high number of hub bearing assemblies returned to warranty for ABS wheel speed sensor faults, despite that they are functioning properly. Because of the high return rate of non defective parts, all returned hub bearings assemblies will be tested. If a hub bearing assembly is verified as being good, the associated warranty claim will be rejected.

PROCEDURE

DTC C1025, C1026, C1027, C1028, C1032, C1033, C1034, C1035, C1206, C1207, C1208 or C1211

DTC Descriptor

This diagnostic procedure supports the following DTCs:
DTC C1025: Left Front Excessive Wheel Speed Variation
DTC C1026: Right Front Excessive Wheel Speed Variation
DTC C1027: Left Rear Excessive Wheel Speed Variation
DTC C1028: Right Rear Excessive Wheel Speed Variation
DTC C1032: Left Front Wheel Speed Circuit Open or Shorted to Ground/Battery
DTC C1033: Right Front Wheel Speed Circuit Open or Shorted to Ground/Battery
DTC C1034: Left Rear Front Wheel Speed Circuit Open or Shorted to Ground/Battery
DTC C1035: Right Rear Front Wheel Speed Circuit Open or Shorted to Ground/Battery
DTC C1206: Left Front Wheel Speed Frequency Out of Range
DTC C1207: Right Front Wheel Speed Frequency Out of Range
DTC C1208: Left Rear Wheel Speed Frequency Out of Range
DTC C1211: Right Rear Wheel Speed Frequency Out of Range

Conditions for Running the DTC

The vehicle speed is above 24 kph (15 mph)

Conditions for Setting the DTC

C1025, C1026, C1027 or C1028
This code will set when an increase greater than 15 kph (9 mph) occurs 3 times. The time between occurrences must be less than 200 msec.

C1032, C1033, C1034 or C1035

This code is set when either of the following fault conditions are detected continuously for 20 msec: a short to battery is detected, an open circuit is detected, a short to ground is detected.

C1206, C1207, C1208 or C1211

This code will set when the right front wheel speed frequency is detected to be out of range for 20 msec.

Action Taken When the DTC Sets

The control module illuminates the Anti-Lock Brake System (ABS) lamp.

Conditions for Clearing the DTC

Clear the Anti-Lock Brake System (ABS) lamp and the DTC with a scan tool.

Diagnostic Aids

C1025, C1026, C1027 or C1028
Possible causes

- Brake switch always off or open.
- External or internal wheel speed circuit intermittent open.
- Intermittent wheel speed high and low inputs shorted together (passive sensors).
- internal integral bearing malfunction (i.e. damaged tooth on speed ring).
- Worn suspension or drivetrain components.
- Electrical noise coupled onto wheel speed wires.

C1032, C1033, C1034 or C1035
Possible causes

- One or both wheel speed input wires open.
- One or both wheel speed input wires shorted to ground.
- Low wheel speed input wire shorted to battery.
- Wheel speed sensor open.

C1206, C1207, C1208 or C1211
Possible causes

- Electrical noise on the wheel speed input.

DTC C1025, C1026, C1027, C1028, C1032, C1033, C1034, C1035, C1206, C1207, C1208 OR C1211

Step	Action	Values	Yes	No
1	Was the Diagnostic Circuit Check Completed?	—	Go to Step 2	Perform Diagnostic Circuit Check
2	1. Turn OFF the ignition. 2. Inspect the wheel speed sensor (WSS), connectors and harness for physical damage. Was physical damage found?	—	Go to Step 12	Go to Step 3
3	1. Connect the scan tool and select data list. 2. Monitor the wheel speed sensors. 3. Test drive the above 24 kph (15 mph) and slowly decelerate to 0. Do this several times. Did the DTC reset or did the suspect wheel speed suddenly drop to zero prior to the vehicle coming to a complete stop?	—	Go to Step 4	Intermittent Condition. Refer to Diagnostic Aids.
4	1. Turn OFF the ignition. 2. Disconnect the suspect WSS harness connector. 3. Turn ON the ignition. 4. Measure the wheel speed reference voltage between the suspect WSS harness connector WSS HIGH terminal and the body ground. Is the voltage within the specified range?	+/- 2 Volts	Go to Step 5	Go to Step 6

DTC C1025, C1026, C1027, C1028, C1032, C1033, C1034, C1035, C1206, C1207, C1208 OR C1211

Step	Action	Values	Yes	No
5	1. Connect a 3A fused jumper wire between Battery and WSS HIGH terminal. 2. Connect an ammeter between the suspect WSS LOW terminal and the body ground. 3. Measure the current while spinning the wheel very slowly. Are the HIGH and LOW current within the specified value?	HIGH 11-16 mA LOW 4-8 mA	Go to Step 8	Go to Step 10
6	1. Disconnect the ECU harness connector. 2. Check the resistance between the suspect WSS harness connector WSS LOW terminal and the ECU harness connector WSS LOW terminal. Is the resistance less than the specified value?	2 Ohms	Go to Step 7	Go to Step 13
7	Check the resistance between the suspect WSS harness connector WSS HIGH terminal and the body ground. Is the resistance less than the specified value?	Infinite	Go to Step 11	Go to Step 14
8	Check the resistance between the suspect WSS harness connector WSS LOW terminal and the ECU harness connector WSS LOW terminal. Is the resistance less than the specified value?	2 Ohms	Go to Step 9	Go to Step 15
9	Check the resistance between the suspect WSS harness connector WSS LOW terminal and the body ground. Is the resistance less than the specified value?	Infinite	Go to Step 11	Go to Step 16

DTC C1025, C1026, C1027, C1028, C1032, C1033, C1034, C1035, C1206, C1207, C1208 OR C1211

Step	Action	Values	Yes	No
10	Replace the Wheel Speed Sensor. **Note: the wheel speed sensor is part of the wheel bearing and hub.** Did you complete the replacement?	—	Go to Step 17	Refer to the Axles, Suspension, and Frame Mechanical section in the MV-1 Connect site http://connect.mv-1.us/
11	Replace the electronic brake control module. Did you complete the replacement?	—	Go to Step 17	Refer to the Brakes section in the MV-1 Connect site http://connect.mv-1.us/
12	Repair the damage to the WSS and/or harness. Did you complete the repair?	—	Go to Step 17	Refer to Circuit Maintenance and Repair in the MV-1 Connect site http://connect.mv-1.us/
13	Find and repair the open or high resistance in the WSS HIGH circuit. Did you complete the repair?	—	Go to Step 17	Refer to Circuit Maintenance and Repair in the MV-1 Connect site http://connect.mv-1.us/
14	Find and repair short to ground in the WSS HIGH circuit. Did you complete the repair?	—	Go to Step 17	Refer to Circuit Maintenance and Repair in the MV-1 Connect site http://connect.mv-1.us/

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Step	Action	Values	Yes	No
15	Find and repair the open or high resistance in the WSS LOW circuit. Did you complete the repair?	—	Go to Step 17	Refer to Circuit Maintenance and Repair in the MV-1 Connect site http://connect.mv-1.us/
16	Find and repair short to ground in the WSS LOW circuit. Did you complete the repair?	—	Go to Step 17	Refer to Circuit Maintenance and Repair in the MV-1 Connect site http://connect.mv-1.us/
17	Use the scan tool to clear the DTCs. Does the DTC reset when conditions for setting DTC are met?	—	Go to Step 2	System OK

WARRANTY

The provisions of the normal warranty policy apply.