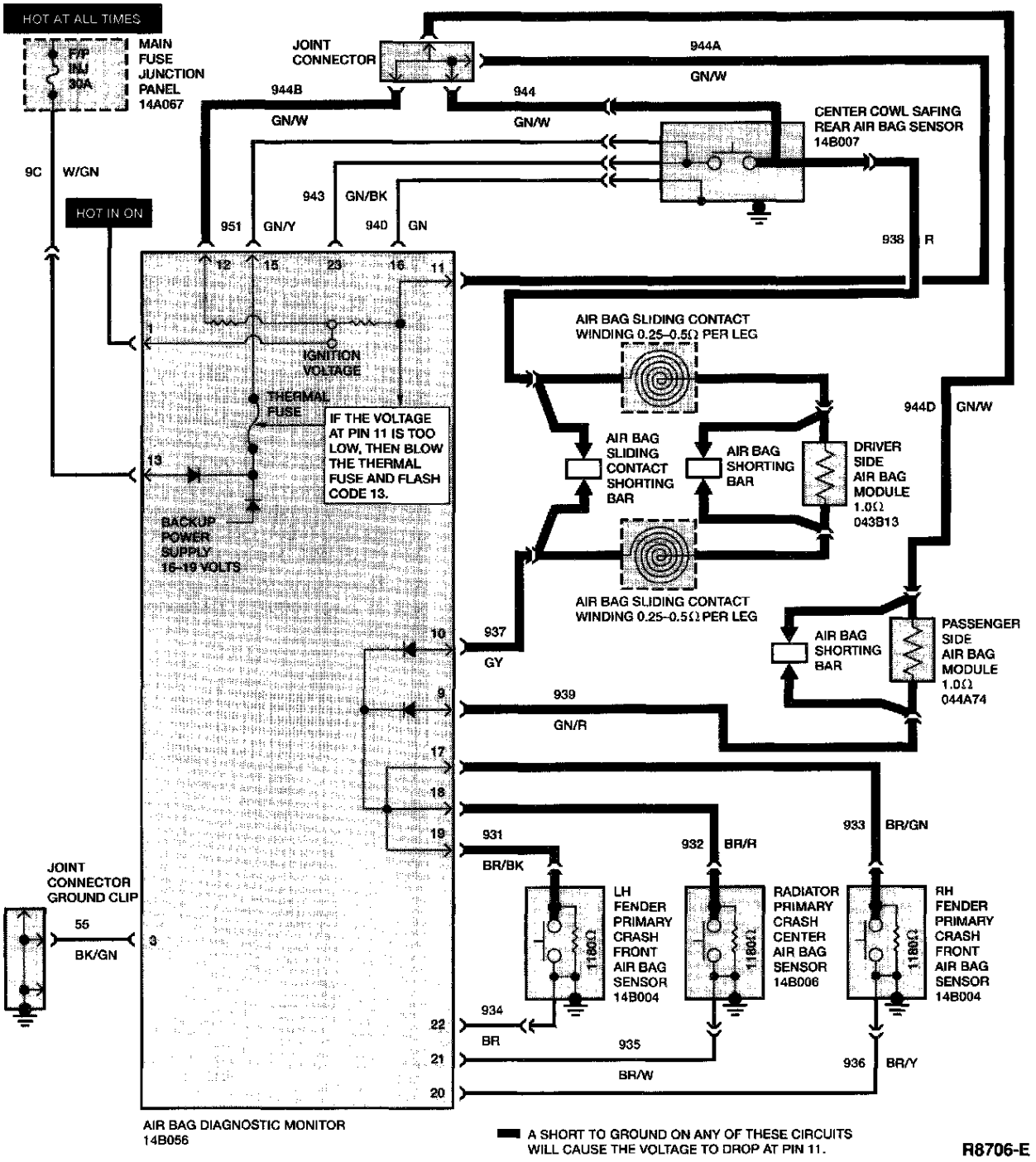
DTC 13: Air Bag Or Crash Sensor Circuit Shorted to Ground

Electrical Schematic:



Pin 11 Voltage Chart:

Charging System Voltage	Voltage at Pin 11
9.0	1.9
9.5	2.0
10.0	2.1
10.5	2.2
11.0	2.3
11.5	2.4
12.0	2.5
12.5	2.6
13.0	2.7
13.5	2.8
14.0	2.9
14.5	3.0
15.0	3.1
15.5	3.2
16.0	3.3

Normal Operation

The air bag diagnostic monitor measures the voltage at pin 11 (circuit 944A "GN/W") of the air bag diagnostic monitor connector. The voltage at pin 11 varies with the charging system voltage as shown in the provided chart.

Note that circuit 944A is connected to circuit 937 ("GY") and circuit 939 ("GN/R") through the driver side air bag module, passenger side air bag module and center cowl safing rear air bag sensor. Also, note that circuit 937 and 939 are connected to the RH, LH and center primary crash air bag sensor feed circuits (933 ["BR/GN"], 932 ["BR/R"], and 931 ["BR/BK"]) through diodes inside the air bag diagnostic monitor. If the air bag diagnostic monitor measures a voltage of **2.0 volts** or less at pin 11, the air bag diagnostic monitor will flash a code 13 to indicate a possible short to ground on this circuit (see possible causes below for additional circuits that may be shorted to ground). When flashing code 13, the air bag diagnostic monitor blows its internal thermal fuse. This disables the air bag deployment circuit. If the voltage at pin 11 returns to normal (because the short to ground no longer exists), a fault code 51 will be present on the air bag warning indicator, due to the open thermal fuse (see DTC 51 for details).

Possible Causes

Low voltage at air bag diagnostic monitor pin 11 can be caused by:

1. A short to ground within the wiring harness on circuits 944A ("GN/W"), 944 ("GN/W"), 944B ("GN/W"), 944D ("GN/W"), 938 ("R"), 937 ("GY"), 939 ("GN/R"), 933 ("BR/GN"), 932 ("BR/R") or 931 ("BR/BK") causing the air bag diagnostic monitor voltage to drop.
2. An internal short to ground within the air bag sliding contact causing the driver side air bag module circuit(s) to be shorted to ground.
3. An internal short to ground within the center cowl safing rear air bag sensor causing circuit 944A ("GN/W"), 944 ("GN/W"), 944B ("GN/W"), 944D ("GN/W"), or 938 ("R") to be shorted to ground.
4. An internal short to ground within one or more of the primary crash air bag sensors causing circuits 933 ("BR/GN"), 932 ("BR/R"), and 931 ("BR/BK") to be shorted to ground.

NOTE: Circuits 933 ("BR/GN"), 932 ("BR/R") and 931 ("BR/BK") are all connected together inside the air bag diagnostic monitor. Therefore, a short to ground on any of these circuits will short all of the circuits to ground.

5. An internal short to case ground within the driver side air bag module or passenger side air bag module.

Pinpoint Test Steps:

13-1 - 13-4:

Test Step		Result ▶	Action to Take
13-1	VERIFY CONDITION		
	• Key ON. • Count the fault code (if any). • **Is code 13 flashing?**	Yes ▶ No ▶	GO to **13-2**. READ the normal operation description for this fault code. EXAMINE the fault code schematic and look for areas where intermittent problems would occur (connectors, splices, crimps, etc.). NOTE: Do not proceed with pinpoint tests until the code is flashing! Failure to do so will result in needless replacement of the air bag diagnostic monitor and repeat repairs.
13-2	CHECK FOR SHORTED DRIVER SIDE AIR BAG MODULE		
	• Deactivate the air bag system, but leave the passenger side air bag module connected. • Carefully disconnect the driver side air bag module. Try not to disturb the wiring as much as possible. • Turn the key ON. • **Is code 13 still flashing?**	Yes ▶ No ▶	GO to **13-3**. EXAMINE the air bag sliding contact wiring in the steering wheel hub for pinched or chafed wires. REPLACE air bag sliding contact (part of the multi-function switch) if damaged wires are located. Otherwise GO to **13-7**.
13-3	CHECK FOR SHORTED PASSENGER SIDE AIR BAG MODULE		
	• Deactivate the air bag system. • Carefully disconnect the passenger side air bag module. Try not to disturb the wiring. • Turn the key ON. • **Is code 13 still flashing?**	Yes ▶ No ▶	GO to **13-4**. REPLACE the passenger side air bag module. GO to **13-7**.
13-4	CHECK FOR SHORTED WIRING		
	• Set the ohmmeter to the 2000 ohm scale or AUTO. • Disconnect the battery ground cable. • Disconnect the air bag diagnostic monitor connectors. • Measure the resistance between pin 3 (ground) and the following pins at the air bag diagnostic monitor connectors.	Yes ▶ No ▶	If Pin 11 is shorted to ground, GO to **13-5**. If Pin 17, 18, or 19 is shorted to ground, GO to **13-6**. GO to **13-7**.

Pin	Air Bag Sensor	Circuit	Wire Color	Normal Resistance
11	—	944A	GN/W	Infinite Resistance
17	RH	933	BR/GN	1180 ± 12 ohms
18	Center	932	BR/R	1180 ± 12 ohms
19	LH	931	BR/BK	1180 ± 12 ohms

• **Are any of these circuits shorted to ground?**

Test Step		Result ▶	Action to Take
13-5	CHECK FOR SHORT IN AIR BAG SLIDING CONTACT		
	• Examine the wiring and connector where air bag sliding contact mates to the main vehicle harness underneath the steering column. Check for pinched and / or chafed wires. Service any damaged wiring. Go to **13-7** if damaged wiring is located. • If no damaged wiring is located, disconnect the air bag sliding contact from the main harness. Connect Rotunda Air Bag Simulator 105-00009 or equivalent to the main vehicle harness in place of the air bag sliding contact. • Measure the resistance of pin 11 to ground at the air bag diagnostic monitor connector. • **Is pin 11 still shorted to ground?**	Yes ▶ No ▶	LOCATE and SERVICE the short to ground in either circuit 938, 944, 944A, 944B , 944D, 939 or 937. CHECK OASIS for potential locations where shorts may occur. When short has been serviced, GO to **13-7**. REPLACE the air bag sliding contact (part of the multi-function switch). GO to **13-7**.
13-6	LOCATE SHORTED AIR BAG SENSOR WIRING		
	• Locate and disconnect the air bag sensor that was shorted to ground. • Measure the resistance across the air bag sensor contacts at the air bag sensor connector(s). Normal resistance for an air bag sensor is 1180 ± 12 ohms. • **Is the air bag sensor shorted?**	Yes ▶ No ▶	REPLACE the air bag sensor. GO to **13-7**. LOCATE and SERVICE the short to ground in the wiring harness on the shorted circuit. GO to **13-7**.
13-7	SHORT TO GROUND REPAIRED OR CORRECTED ITSELF		
	• After a short to ground has been corrected, the air bag diagnostic monitor will flash out code 51. Code 51 indicates that the fuse inside the air bag diagnostic monitor is blown and the short to ground no longer exists. If a short to ground has not been located and serviced (short to ground corrected itself), consult OASIS for potential wiring shorts. If a short to ground has been correctly located and serviced, then replace the air bag diagnostic monitor. Do not replace the air bag diagnostic monitor until the short to ground has been positively located and serviced. Replacing the air bag diagnostic monitor before servicing a short to ground will result in repeat repairs. • **Was the short to ground repaired?**	Yes ▶ No ▶	REPLACE the air bag diagnostic monitor. CONSULT OASIS for potential wiring shorts.