

HORN

TABLE OF CONTENTS

	page		page
HORN SYSTEM - ELECTRICAL DIAGNOSTICS.....	1	HORN SYSTEM - SERVICE INFORMATION	19

HORN SYSTEM - ELECTRICAL DIAGNOSTICS

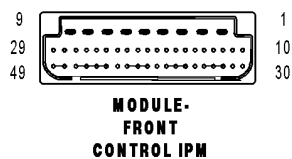
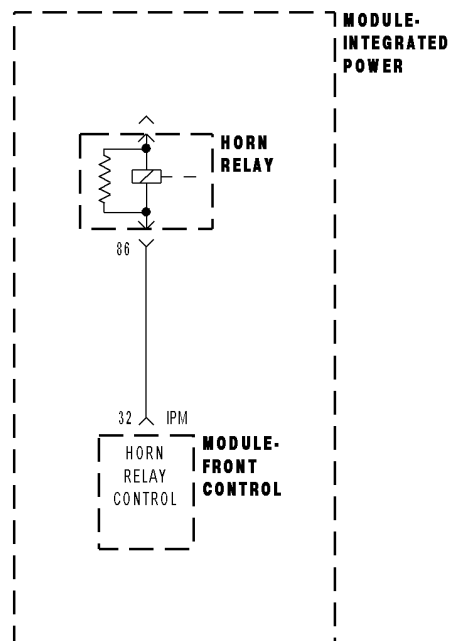
TABLE OF CONTENTS

	page		page
HORN SYSTEM - ELECTRICAL DIAGNOSTICS		HORN RELAY CONTROL CIRCUIT OPEN	8
DIAGNOSIS AND TESTING		*HORNS INOPERATIVE	11
HORN RELAY CONTROL CIRCUIT HIGH	2	SCHEMATICS AND DIAGRAMS	18
HORN RELAY CONTROL CIRCUIT LOW	5		

HORN SYSTEM - ELECTRICAL DIAGNOSTICS

DIAGNOSIS AND TESTING

HORN RELAY CONTROL CIRCUIT HIGH



HORN RELAY CONTROL CIRCUIT HIGH (CONTINUED)

For the Horn System circuit diagram (Refer to 8 - ELECTRICAL/HORN - SCHEMATICS AND DIAGRAMS)

For a complete wiring diagram **Refer to Section 8W.**

- **When Monitored:**
With the ignition ON.
- **Set Condition:**
When the Front Control Module detects excessive current on the Horn Relay Control circuit.

Possible Causes
INTERMITTENT DTC
INTEGRATED POWER MODULE
FRONT CONTROL MODULE

Diagnostic Test**1. HORN RELAY CONTROL CIRCUIT DTC ACTIVE**

Turn the ignition on.

With the DRBIII®, record and erase FCM DTC's.

With the DRBIII®, actuate the Horn Relay.

With the DRBIII®, read FCM DTC's.

Does the DRBIII® display a HORN RELAY CONTROL CIRCUIT DTC active?

Yes >> Go To 2

No >> Go To 3

2. INTEGRATED POWER MODULE

Turn the ignition off.

Remove the Front Control Module from the Integrated Power Module.

NOTE: NOTE: Check connectors - Clean/repair as necessary.

Use a fused jumper wire for the next step.

Momentarily jumper the Horn Relay Control circuit to ground at the FCM connector.

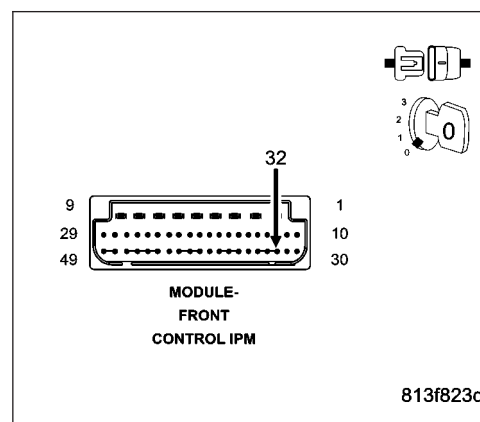
Does the Horn sound?

Yes >> Replace the Front Control Module in accordance with the Service Information.

Perform BODY VERIFICATION TEST - VER 1. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES/FRONT CONTROL MODULE - DIAGNOSIS AND TESTING)

No >> Replace the Integrated Power Module in accordance with the Service Information.

Perform BODY VERIFICATION TEST - VER 1. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES/FRONT CONTROL MODULE - DIAGNOSIS AND TESTING)



HORN RELAY CONTROL CIRCUIT HIGH (CONTINUED)

3. WIRING HARNESS INSPECTION

Turn the ignition off.

Visually inspect the related circuit connectors. Look for broken, bent, pushed out, or corroded terminals.

Refer to any Hotline letters or Technical Service Bulletins that may apply.

Were any problems found?

Yes >> Repair as necessary.

Perform BODY VERIFICATION TEST - VER 1. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES/FRONT CONTROL MODULE - DIAGNOSIS AND TESTING)

No >> Test Complete.

HORN RELAY CONTROL CIRCUIT LOW (CONTINUED)

For the Horn System circuit diagram (Refer to 8 - ELECTRICAL/HORN - SCHEMATICS AND DIAGRAMS)

For a complete wiring diagram **Refer to Section 8W.**

- **When Monitored:**
With the ignition ON.
- **Set Condition:**
When the Front Control Module detects a short on the Horn Relay Control circuit.

Possible Causes
INTERMITTENT DTC FUSE #45 INTEGRATED POWER MODULE FRONT CONTROL MODULE

Diagnostic Test**1. HORN RELAY CONTROL CIRCUIT DTC ACTIVE**

Turn the ignition on.

With the DRBIII®, record and erase FCM DTC's.

With the DRBIII®, read FCM DTC's.

Does the DRBIII® display a HORN RELAY CONTROL CIRCUIT DTC active?

Yes >> Go To 2

No >> Go To 4

2. CHECK FUSE #45

Turn the ignition off.

Check fuse #45 in the IPM.

Is the fuse open?

Yes >> Replace the fuse. Check for a short to ground in the Horn Relay Output circuit from the IPM to the horns.

Perform BODY VERIFICATION TEST - VER 1. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES/FRONT CONTROL MODULE - DIAGNOSIS AND TESTING)

No >> Go To 3

HORN RELAY CONTROL CIRCUIT LOW (CONTINUED)**3. INTEGRATED POWER MODULE**

Reinstall the fuse if previously removed.

Remove the Front Control Module from the Integrated Power Module.

NOTE: Check connectors - Clean/repair as necessary.

Turn the ignition on.

Measure the voltage of the Horn Relay Control circuit.

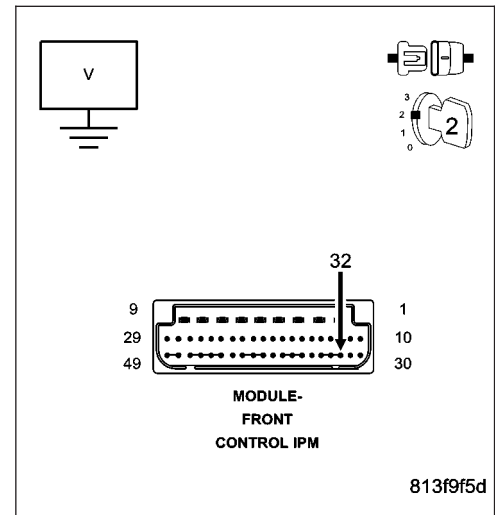
Is the voltage above 11.0 volts?

Yes >> Replace the Front Control Module in accordance with the Service Information.

Perform BODY VERIFICATION TEST - VER 1.

No >> Replace the Integrated Power Module in accordance with the Service Information.

Perform BODY VERIFICATION TEST - VER 1. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES/FRONT CONTROL MODULE - DIAGNOSIS AND TESTING)

**4. WIRING HARNESS INSPECTION**

Turn the ignition off.

Visually inspect the related circuit connectors. Look for broken, bent, pushed out, or corroded terminals.

Refer to any Hotline letters or Technical Service Bulletins that may apply.

Were any problems found?

Yes >> Repair as necessary.

Perform BODY VERIFICATION TEST - VER 1. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES/FRONT CONTROL MODULE - DIAGNOSIS AND TESTING)

No >> Test Complete.

HORN RELAY CONTROL CIRCUIT OPEN (CONTINUED)

For the Horn System circuit diagram (Refer to 8 - ELECTRICAL/HORN - SCHEMATICS AND DIAGRAMS)

For a complete wiring diagram **Refer to Section 8W.**

- **When Monitored:**
With the ignition ON.
- **Set Condition:**
When the Front Control Module detects a short on the Horn Relay Control circuit.

Possible Causes
INTERMITTENT DTC FUSE #45 INTEGRATED POWER MODULE FRONT CONTROL MODULE

Diagnostic Test**1. HORN RELAY CONTROL CIRCUIT DTC ACTIVE**

Turn the ignition on.

With the DRBIII®, record and erase FCM DTC's.

With the DRBIII®, read FCM DTC's.

Does the DRBIII® display a HORN RELAY CONTROL CIRCUIT DTC active?

Yes >> Go To 2

No >> Go To 4

2. CHECK FUSE #45

Turn the ignition off.

Check fuse #45 in the IPM.

Is the fuse open?

Yes >> Replace the fuse. Check for a short to ground in the Horn Relay Output circuit from the IPM to the horns.

Perform BODY VERIFICATION TEST - VER 1. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES/FRONT CONTROL MODULE - DIAGNOSIS AND TESTING)

No >> Go To 3

HORN RELAY CONTROL CIRCUIT OPEN (CONTINUED)**3. INTEGRATED POWER MODULE**

Reinstall the fuse if previously removed.

Remove the Front Control Module from the Integrated Power Module.

NOTE: Check connectors - Clean/repair as necessary.

Turn the ignition on.

Measure the voltage of the Horn Relay Control circuit.

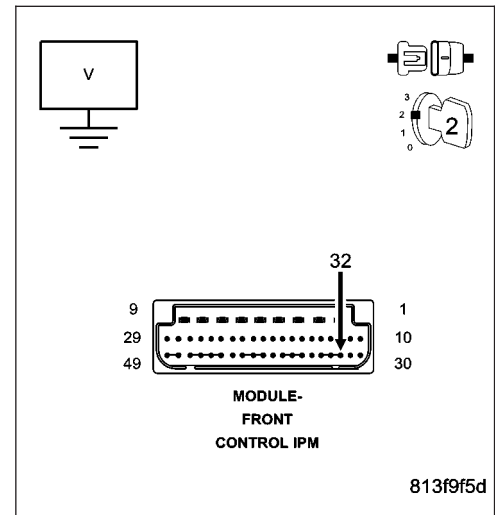
Is the voltage above 11.0 volts?

Yes >> Replace the Front Control Module in accordance with the Service Information.

Perform BODY VERIFICATION TEST - VER 1.

No >> Replace the Integrated Power Module in accordance with the Service Information.

Perform BODY VERIFICATION TEST - VER 1. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES/FRONT CONTROL MODULE - DIAGNOSIS AND TESTING)

**4. WIRING HARNESS INSPECTION**

Turn the ignition off.

Visually inspect the related circuit connectors. Look for broken, bent, pushed out, or corroded terminals.

Refer to any Hotline letters or Technical Service Bulletins that may apply.

Were any problems found?

Yes >> Repair as necessary.

Perform BODY VERIFICATION TEST - VER 1. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES/FRONT CONTROL MODULE - DIAGNOSIS AND TESTING)

No >> Test Complete.

***HORNS INOPERATIVE (CONTINUED)**

For the Horn System circuit diagram (Refer to 8 - ELECTRICAL/HORN - SCHEMATICS AND DIAGRAMS)

For a complete wiring diagram **Refer to Section 8W.**

Possible Causes
DTC PRESENT
FUSE #45
HORNS
HORN GROUND CIRCUIT OPEN
HORN RELAY OUTPUT CIRCUIT OPEN
HORN SWITCH
HORN SWITCH GROUND
CLOCKSPRING
HORN SWITCH SENSE OPEN
INTEGRATED POWER MODULE
INSTRUMENT CLUSTER
FRONT CONTROL MODULE

Diagnostic Test**1. HORN RELAY CONTROL CIRCUIT DTC ACTIVE**

Turn the ignition on.

With the DRBIII®, read FCM DTC's.

Does the DRBIII® display a HORN RELAY CONTROL CIRCUIT DTC active?

Yes >> Refer to symptom list.
Perform BODY VERIFICATION TEST - VER 1.

No >> Go To 2

2. ACTUATE HORN RELAY

With the DRBIII®, actuate the Horn Relay.

Do the horns operate?

Yes >> Go To 3

No >> Go To 7

***HORNS INOPERATIVE (CONTINUED)**

3. HORN SWITCH

WARNING: TURN THE IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.

CAUTION: DO NOT PLACE AN INTACT UNDEPLOYED AIRBAG FACE DOWN ON A HARD SURFACE, THE AIRBAG WILL PROPEL INTO THE AIR IF ACCIDENTALLY DEPLOYED, AND COULD RESULT IN SERIOUS OR FATAL INJURY.

Gain access to the horn switch.

Measure the resistance of the Horn Switch ground circuit.

Is the resistance below 5.0 ohms?

Yes >> Go To 4

No >> Repair the horn switch ground as necessary.

Perform BODY VERIFICATION TEST - VER 1. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES/FRONT CONTROL MODULE - DIAGNOSIS AND TESTING)

4. HORN SWITCH

WARNING: TURN THE IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.

CAUTION: DO NOT PLACE AN INTACT UNDEPLOYED AIRBAG FACE DOWN ON A HARD SURFACE, THE AIRBAG WILL PROPEL INTO THE AIR IF ACCIDENTALLY DEPLOYED, AND COULD RESULT IN SERIOUS OR FATAL INJURY.

Gain access to the horn switch connector.

WARNING: TURN THE IGNITION ON, THEN RECONNECT THE BATTERY.

Momentarily connect a jumper wire between the Horn Switch Sense circuit at the Horn switch connector and ground.

Did the horns sound?

Yes >> Replace the horn switch.

Perform BODY VERIFICATION TEST - VER 1. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES/FRONT CONTROL MODULE - DIAGNOSIS AND TESTING)

No >> Go To 5

HORNS INOPERATIVE (CONTINUED)*5. CLOCKSPRING**

Turn the ignition off.

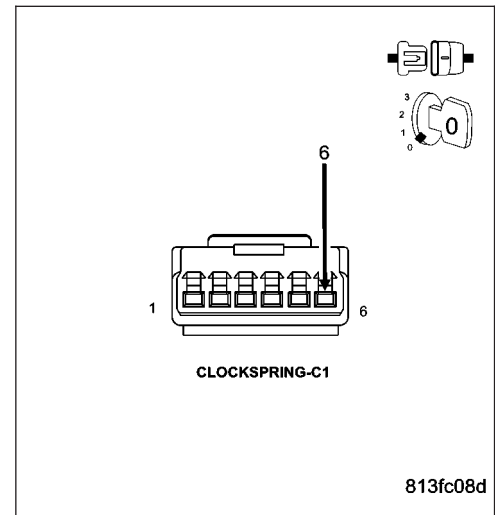
Disconnect the clockspring C1 connector.

Momentarily connect a jumper wire between the Horn Switch Sense circuit at the clockspring connector and ground.

Did the horns sound?

Yes >> Replace the clockspring.
Perform BODY VERIFICATION TEST - VER 1. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES/ FRONT CONTROL MODULE - DIAGNOSIS AND TESTING)

No >> Go To 6

**6. HORN SWITCH SENSE**

Turn the ignition off.

Disconnect the clockspring C1 connector.

Disconnect the Instrument Cluster C3 connector.

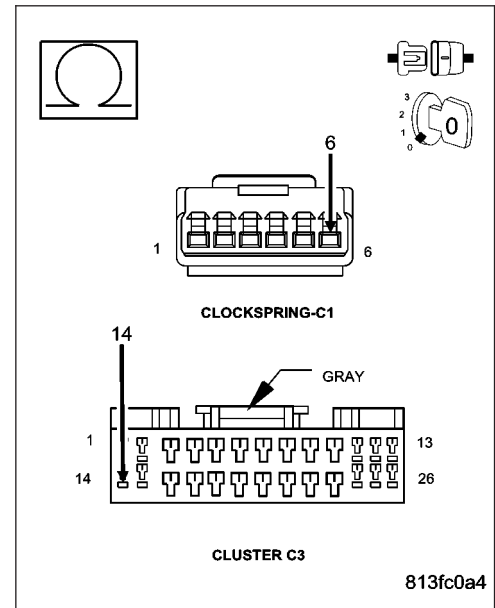
NOTE: Check connectors - Clean/repair as necessary.

Measure the resistance of the Horn Switch Sense circuit between the clockspring C1 connector and the Instrument Cluster C3 connector.

Is the resistance below 5.0 ohms?

Yes >> Replace the Instrument Cluster in accordance with the service information.
Perform BODY VERIFICATION TEST - VER 1. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES/ FRONT CONTROL MODULE - DIAGNOSIS AND TESTING)

No >> Repair the Horn Switch Sense circuit for an open.
Perform BODY VERIFICATION TEST - VER 1.



HORNS INOPERATIVE (CONTINUED)*7.****CHECK FUSE #45**

Turn the ignition off.

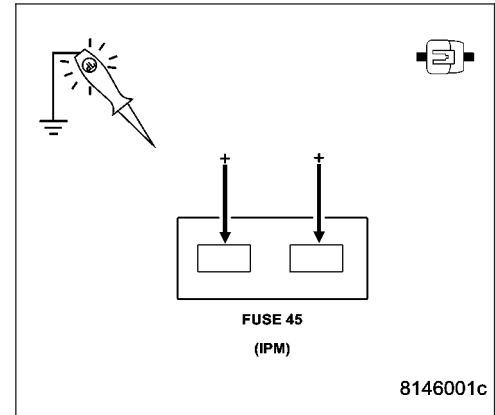
Using a 12-volt test light connected to ground, check the Horn fuse #45 in the IPM.

Is the fuse open?

Yes >> Replace the fuse. Check for a short to ground in the Horn Relay Output circuit from the IPM to the horns.

Perform BODY VERIFICATION TEST - VER 1. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES/ FRONT CONTROL MODULE - DIAGNOSIS AND TESTING)

No >> Go To 8

**8. HORN RELAY OUTPUT**

Disconnect a horn connector.

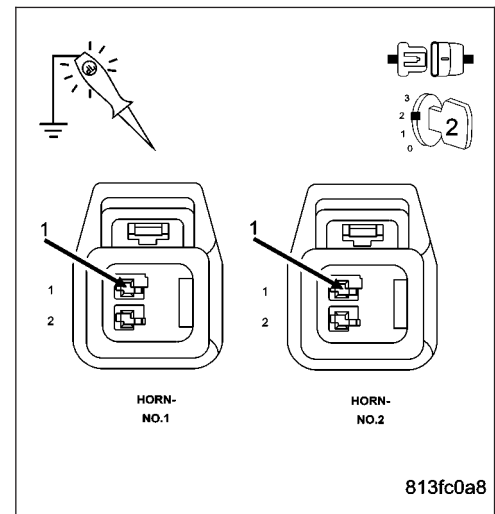
With the DRBIII®, actuate the Horn Relay.

Using a 12-volt test light connected to ground, check the Horn Relay Output circuit.

Does the test light illuminate brightly?

Yes >> Go To 9

No >> Go To 10



HORNS INOPERATIVE (CONTINUED)*9. HORN GROUND CIRCUIT OPEN**

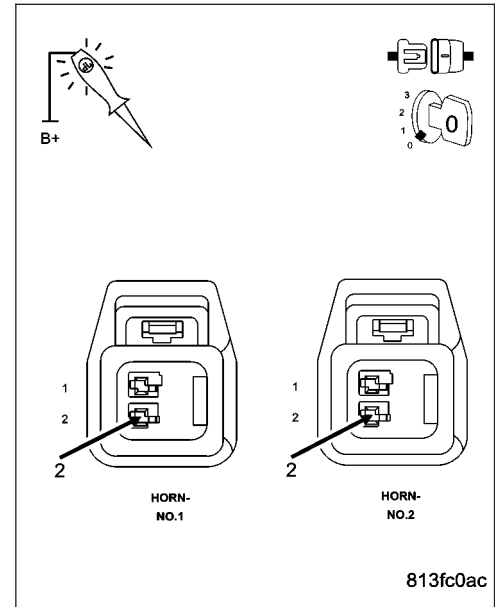
Turn the ignition off.

Disconnect the Horn connector.

Using a 12-volt test light connected to 12-volts, check the Ground circuit in the horn connector.

Does the test light illuminate brightly?

- Yes** >> Replace the Horns.
Perform BODY VERIFICATION TEST - VER 1. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES/ FRONT CONTROL MODULE - DIAGNOSIS AND TESTING)
- No** >> Repair the Ground circuit for an open.
Perform BODY VERIFICATION TEST - VER 1.

**10. HORN RELAY OUTPUT CIRCUIT OPEN**

Gain access to the IPM C1 connector.

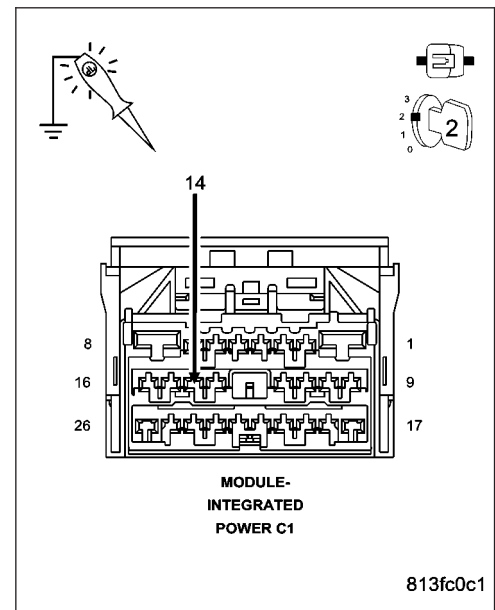
Using a 12-volt test light connected to ground, back probe the Horn Relay Output circuit in the IPM C1 connector.

Turn the ignition on.

With the DRBIII®, actuate the horn relay.

Does the test light illuminate brightly?

- Yes** >> Repair the Horn Relay Output circuit for an open.
Perform BODY VERIFICATION TEST - VER 1. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES/ FRONT CONTROL MODULE - DIAGNOSIS AND TESTING)
- No** >> Go To 11



HORNS INOPERATIVE (CONTINUED)*11. INTEGRATED POWER MODULE**

Turn the ignition off.

Remove the Front Control Module from the Integrated Power Module.

NOTE: Check connectors - Clean/repair as necessary.

NOTE: The test light is still connected to the C1 connector.

Momentarily jumper the Horn Relay Control circuit to ground at the FCM connector.

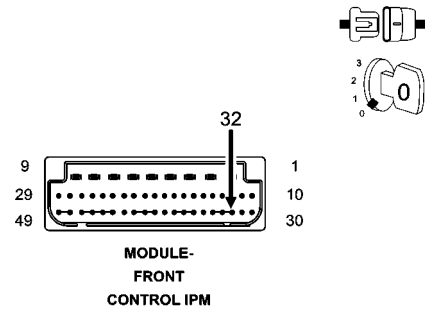
Does the test light illuminate brightly?

Yes >> Replace the Front Control Module in accordance with the Service Information.

Perform BODY VERIFICATION TEST - VER 1. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES/FRONT CONTROL MODULE - DIAGNOSIS AND TESTING)

No >> Replace the Integrated Power Module in accordance with the Service Information.

Perform BODY VERIFICATION TEST - VER 1. (Refer to 8 - ELECTRICAL/ELECTRONIC CONTROL MODULES/FRONT CONTROL MODULE - DIAGNOSIS AND TESTING)



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HORN SYSTEM

HORN SYSTEM - SERVICE INFORMATION

TABLE OF CONTENTS

	page		page
HORN SYSTEM - SERVICE INFORMATION		REMOVAL	20
DESCRIPTION	19	INSTALLATION	20
OPERATION	19	SWITCH-HORN	
DIAGNOSIS AND TESTING		DESCRIPTION	21
HORN SYSTEM	19	DIAGNOSIS AND TESTING	
HORN		HORN SWITCH	21
DIAGNOSIS AND TESTING			
HORN	20		

HORN SYSTEM - SERVICE INFORMATION

DESCRIPTION

The dual-note horn system features two electromagnetic horn units. The horn system includes the following major components:

- **Horn** - The two horns are located on the left side of the engine compartment below the Integrated Power Module (IPM).
- **Horn Switch** - The horn switch is molded into the driver airbag trim cover.

OPERATION

The horn system operates on battery current received through a fuse in the Integrated Power Module (IPM). The horn system circuit is designed so that the system will remain operational, regardless of the ignition switch position.

DIAGNOSIS AND TESTING

HORN SYSTEM

The most reliable, efficient, and accurate means to diagnose the horn system requires the use of a scan tool and the proper Diagnostic Procedures information.

Refer to the appropriate wiring information.

In most cases, any problem involving continually sounding horns can be quickly alleviated by removing the horn fuse from the Integrated Power Module (IPM).

WARNING: DISABLE THE AIRBAG SYSTEM BEFORE ATTEMPTING ANY STEERING WHEEL, STEERING COLUMN, SEAT BELT TENSIONER, SIDE AIRBAG, OR INSTRUMENT PANEL COMPONENT DIAGNOSIS OR SERVICE. DISCONNECT AND ISOLATE THE BATTERY NEGATIVE (GROUND) CABLE, THEN WAIT TWO MINUTES FOR THE AIRBAG SYSTEM CAPACITOR TO DISCHARGE BEFORE PERFORMING FURTHER DIAGNOSIS OR SERVICE. THIS IS THE ONLY SURE WAY TO DISABLE THE AIRBAG SYSTEM. FAILURE TO TAKE THE PROPER PRECAUTIONS COULD RESULT IN ACCIDENTAL AIRBAG DEPLOYMENT AND POSSIBLE PERSONAL INJURY.

HORN

DIAGNOSIS AND TESTING

HORN

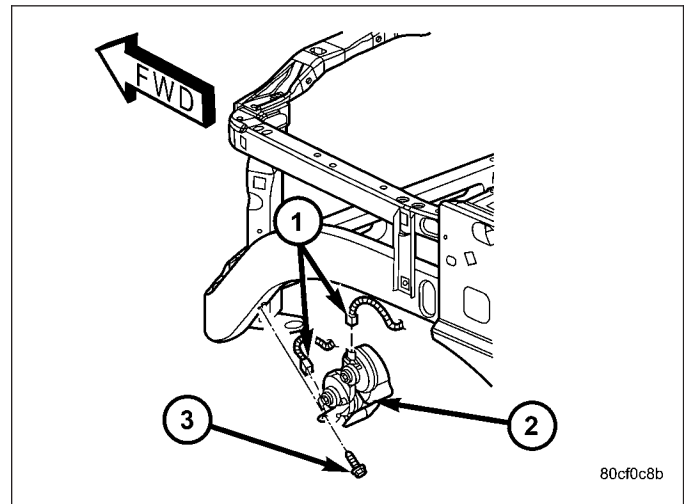
The most reliable, efficient, and accurate means to diagnose the horn system requires the use of a scan tool and the proper Diagnostic Procedures information.

Refer to the appropriate wiring information.

WARNING: DISABLE THE AIRBAG SYSTEM BEFORE ATTEMPTING ANY STEERING WHEEL, STEERING COLUMN, SEAT BELT TENSIONER, SIDE AIRBAG, OR INSTRUMENT PANEL COMPONENT DIAGNOSIS OR SERVICE. DISCONNECT AND ISOLATE THE BATTERY NEGATIVE (GROUND) CABLE, THEN WAIT TWO MINUTES FOR THE AIRBAG SYSTEM CAPACITOR TO DISCHARGE BEFORE PERFORMING FURTHER DIAGNOSIS OR SERVICE. THIS IS THE ONLY SURE WAY TO DISABLE THE AIRBAG SYSTEM. FAILURE TO TAKE THE PROPER PRECAUTIONS COULD RESULT IN ACCIDENTAL AIRBAG DEPLOYMENT AND POSSIBLE PERSONAL INJURY.

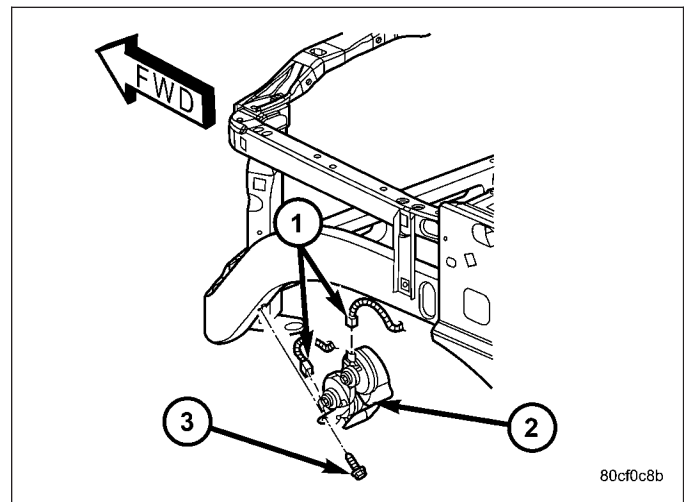
REMOVAL

1. Disconnect and isolate the battery negative cable.
2. Disconnect the wire harness connectors (1) from the horns (2).
3. Remove mounting bolt (3) and remove horns.



INSTALLATION

1. Position horns (2). Install and tighten mounting bolt (2).
2. Connect wire harness connectors (1).
3. Connect battery negative cable.



SWITCH-HORN

DESCRIPTION

The horn switch is molded into the driver airbag. The horn switch can not be serviced separately. For service procedures, (Refer to 8 - ELECTRICAL/RESTRAINTS/DRIVER AIRBAG - REMOVAL).

DIAGNOSIS AND TESTING

HORN SWITCH

The most reliable, efficient, and accurate means to diagnose the horn system requires the use of a scan tool and the proper Diagnostic Procedures information.

For complete circuit diagrams, refer to the appropriate wiring information.

WARNING: DISABLE THE AIRBAG SYSTEM BEFORE ATTEMPTING ANY STEERING WHEEL, STEERING COLUMN, SEAT BELT TENSIONER, SIDE AIRBAG, OR INSTRUMENT PANEL COMPONENT DIAGNOSIS OR SERVICE. DISCONNECT AND ISOLATE THE BATTERY NEGATIVE (GROUND) CABLE, THEN WAIT TWO MINUTES FOR THE AIRBAG SYSTEM CAPACITOR TO DISCHARGE BEFORE PERFORMING FURTHER DIAGNOSIS OR SERVICE. THIS IS THE ONLY SURE WAY TO DISABLE THE AIRBAG SYSTEM. FAILURE TO TAKE THE PROPER PRECAUTIONS COULD RESULT IN ACCIDENTAL AIRBAG DEPLOYMENT AND POSSIBLE PERSONAL INJURY.

