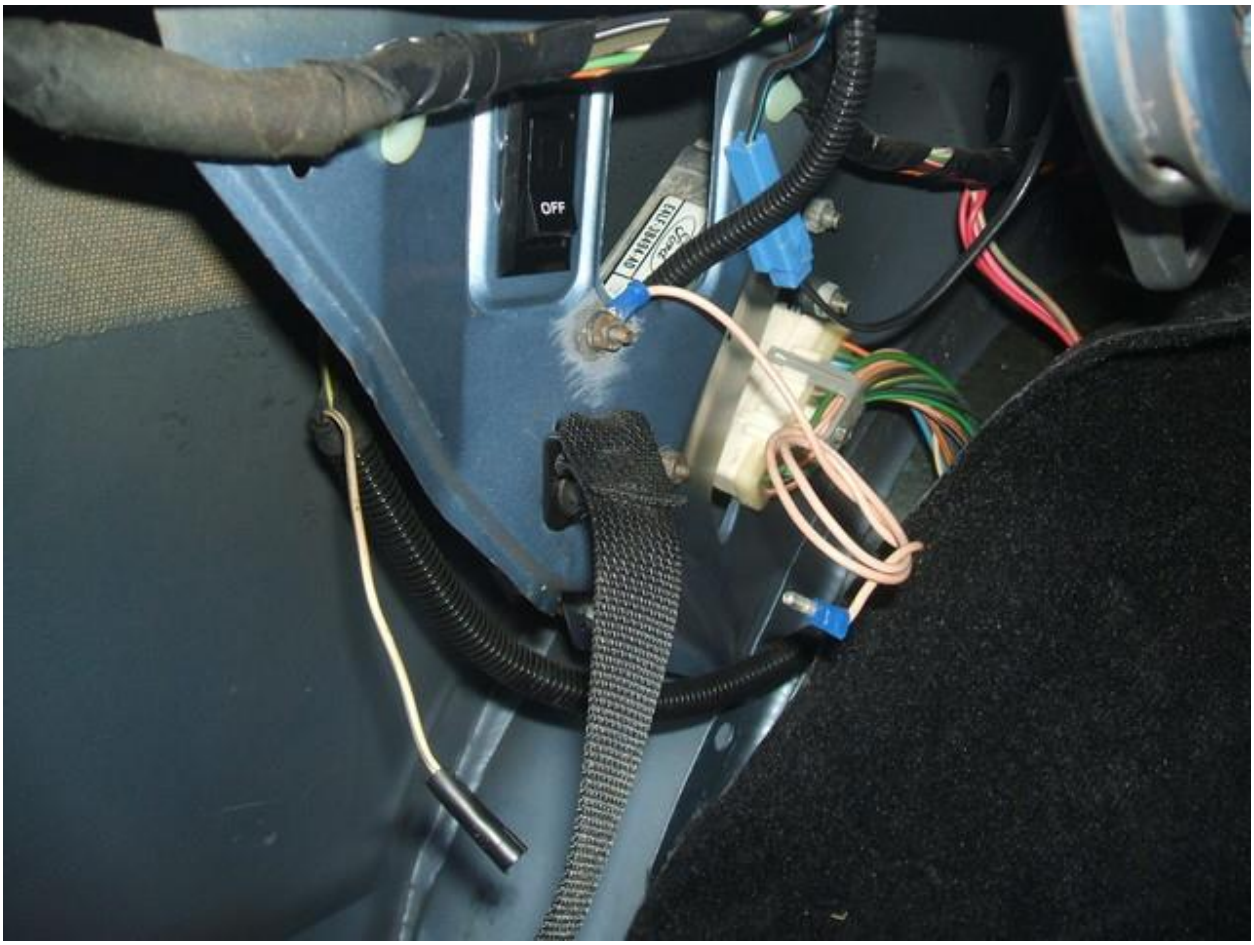
Lincoln Mark VII
Air Suspension Diagnosis

John Dancy

Diagnosing our Lincoln Mark VII Air Suspension Systems may **look** like rocket science, but it's not ☺

1) Ground the pigtail
   I connected one male and one ring connector to an 18-gauge length of wire (I used pink because no other wire in the system was pink) and connected it to a cleaned ground. I connected the ground to the Air Suspension Diagnostic Pigtail.
2) Initiate the tests
   See, 14-40-10 below
3) Read the test results
   Pass or fail
4) Replace or repair the components that failed testing
   Leaking o-ring, leaking air spring, failed compressor
5) Enjoy your car
   Drive drive drive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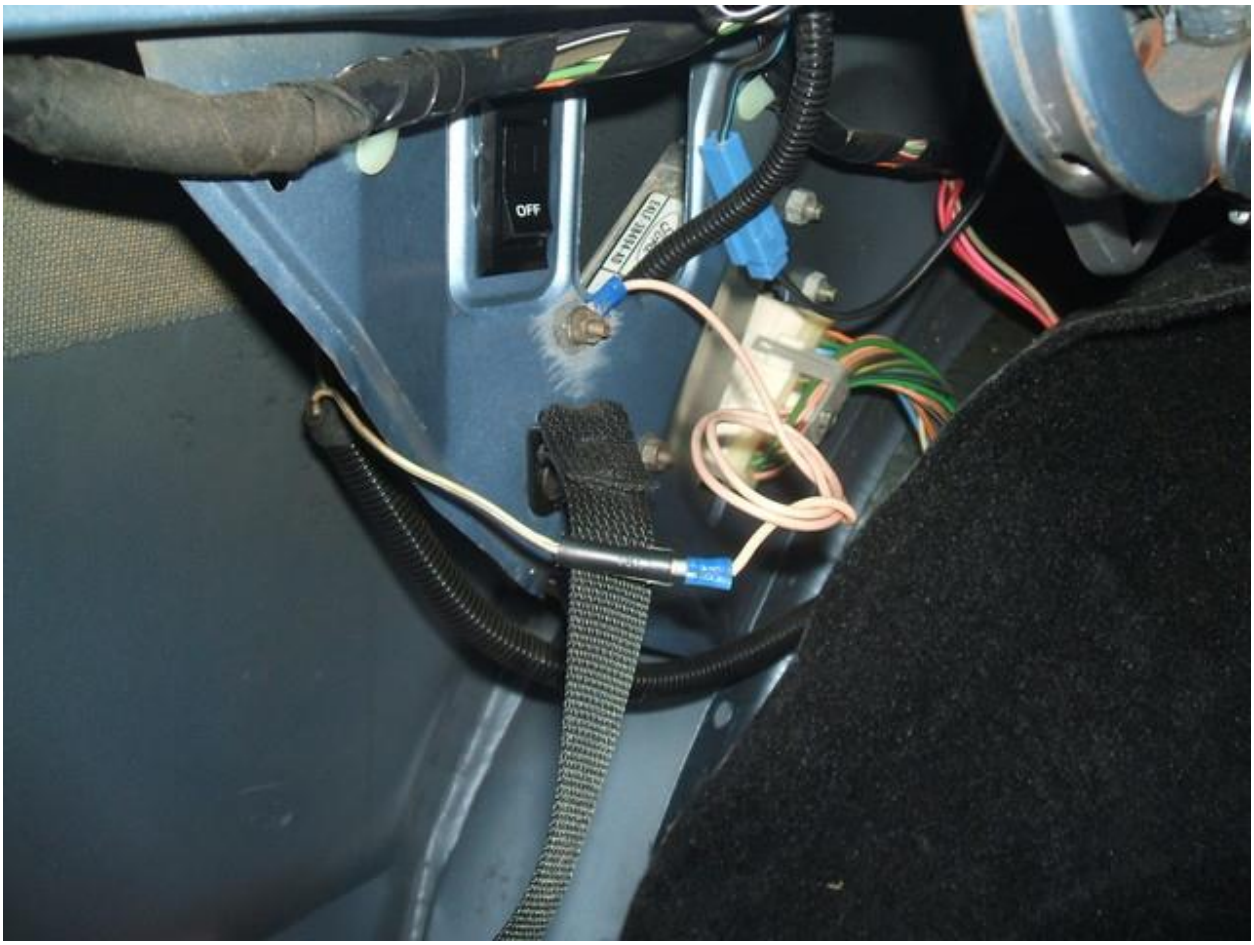
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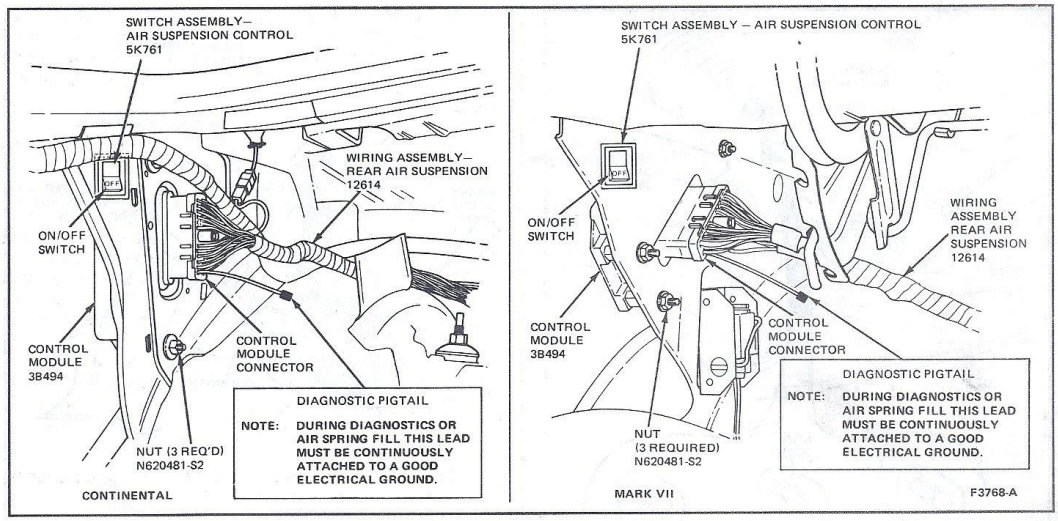
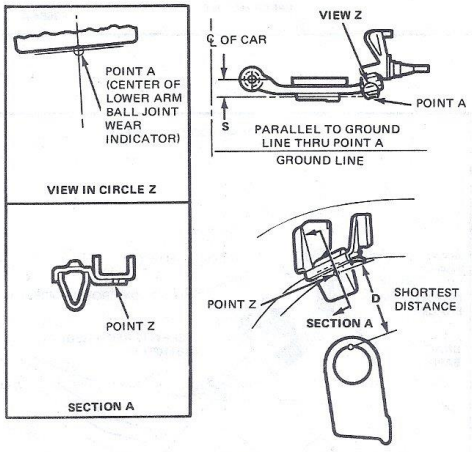


FIG. 5 Air Suspension On/Off Switch



SUSPENSION RIDE HEIGHT

VEHICLE		S	D
MARK VII/ CONTINENTAL	INCHES	0.24	5.06
	MM	6.0	128.6

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FIG. 6 Check Dimensions S and D

Ride Height

The **front suspension** ride height or S dimension is adjusted by moving the front left and/or right lower sensor attaching stud (there are three adjustment positions provided on the bracket). Loosen the attaching screw and adjust up or down as required. A one position change to the sensor attachment point will yield approximately 12.7mm (0.5 inches) change (up or down) to the S dimension (Figs. 6 and 7).

The **rear suspension** ride height D dimension is adjusted by moving the rear sensor attaching bracket up or down relative to the right rear upper arm (a slot adjustment is provided on the bracket). Loosen the attaching nut and adjust up or down as required. A one index mark change to the sensor attachment point will yield approximately 6.35mm (0.25 inches) change (up or down) to the D dimension (Figs. 6 and 8).

DIAGNOSIS

Leak Checks

If the air spring system is suspected of leakage, the standard soap solution check procedure is acceptable.

Warning Lamp (Check Suspension)

The air suspension warning lamp, located in the overhead console (Fig. 9), has three main functions:

1. During normal operation with the ignition in the Run position, the lamp glowing continuously indicates a possible air suspension system problem.
2. During diagnostic testing the lamp blinks at a rate of 1.8 blinks per second to show that diagnostic routine (in the module) has been entered and then blinks the test number that is being run during the test sequence.
3. During the air spring fill routine, the lamp blinks at a rate of 1 blink every two seconds to show that the air fill routine (in the module) has been entered.

Observation of the warning lamp during normal operation with the ignition switch On, can aid in detecting some system problems.

NOTE: Refer to the Diagnostic Testing portion of this Section for problem diagnosis.

1. On a vehicle operating normally, the warning lamp will glow for approximately one second and then go out when the ignition is turned from the Off to Run position. The lamp does not operate when the ignition is in either the Off or Start position.

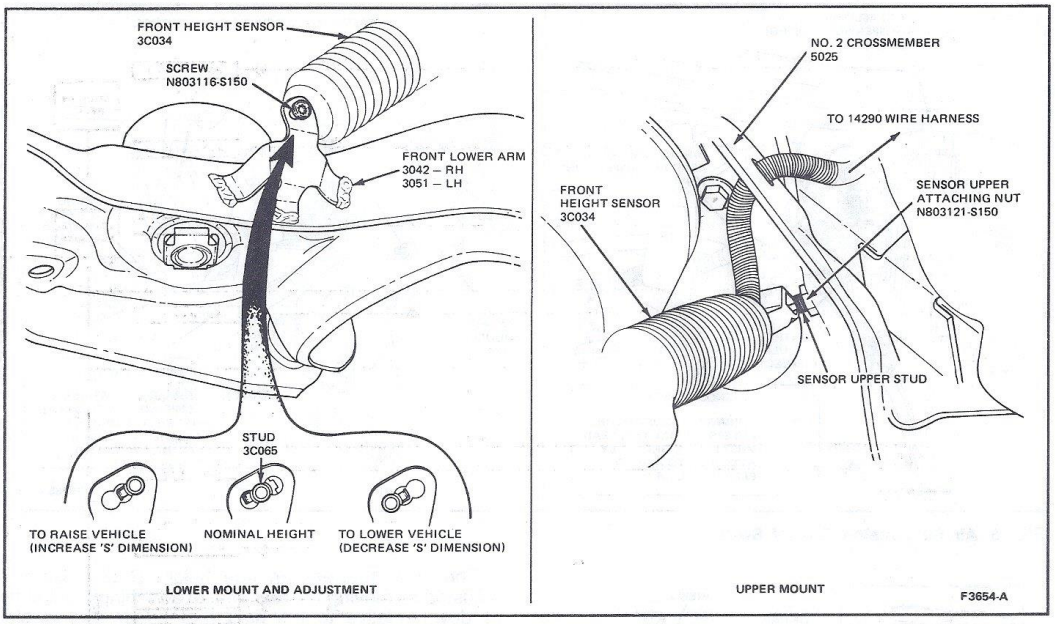


FIG. 7 Suspension, Front Ride Height Adjustment

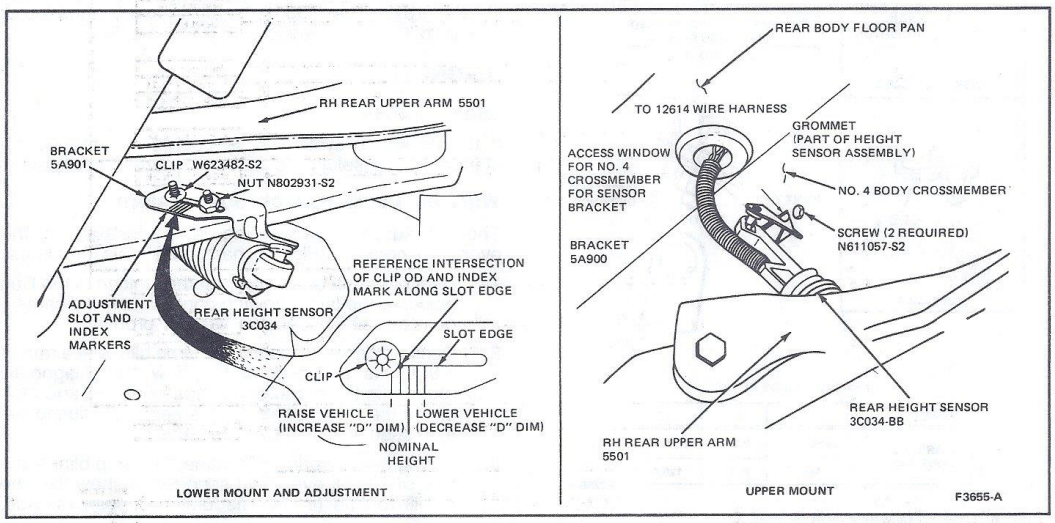
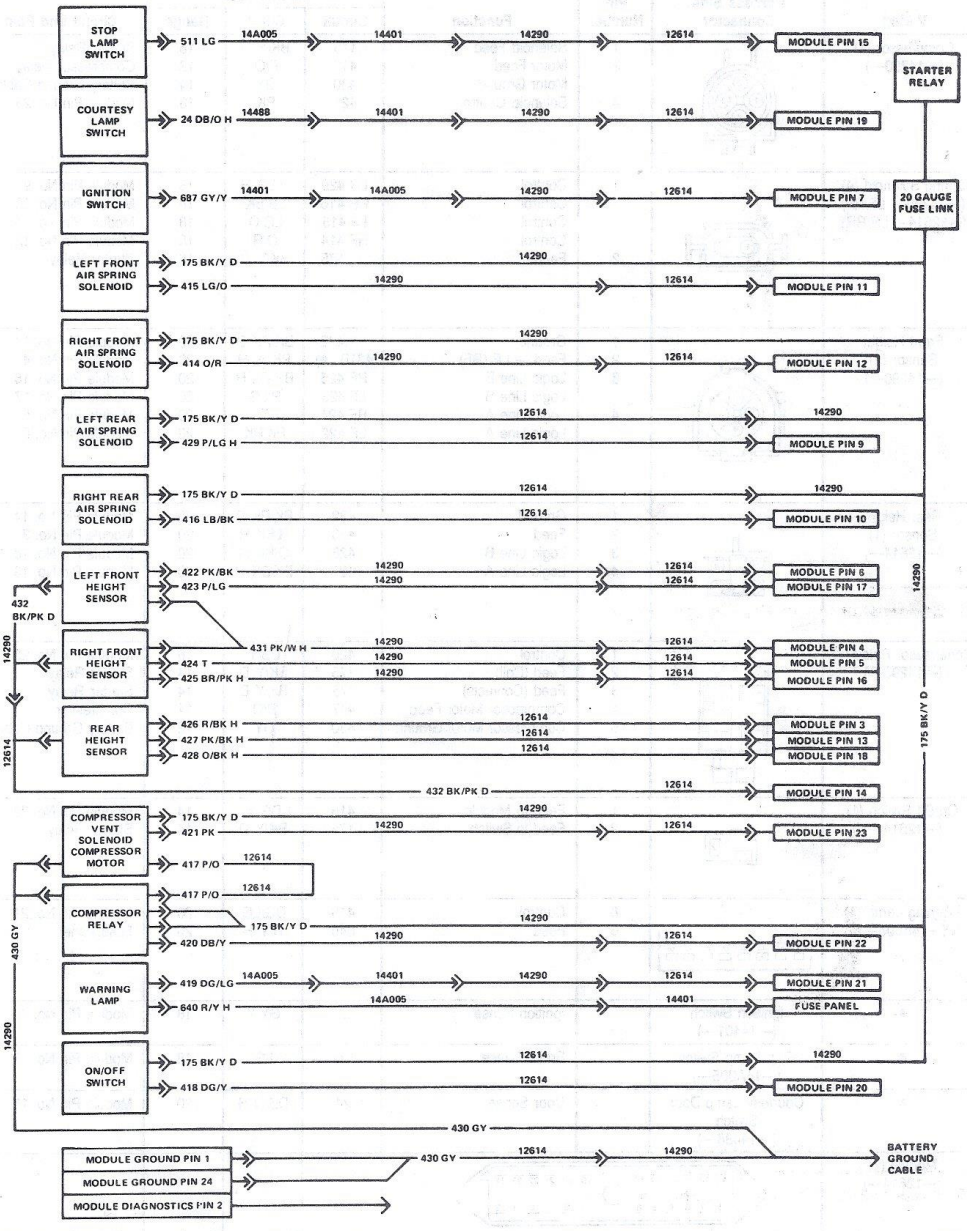
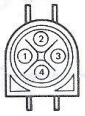
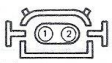
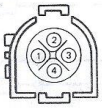
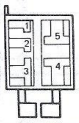
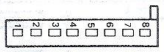
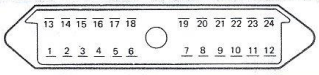


FIG. 8 Suspension, Rear Ride Height Adjustment

2. If lamp does not go out after turning the ignition from the Off to Run position, it indicates no battery power to the module.
3. If lamp glows for approximately 1/2 second, goes out, and then glows continuously after 5-8 seconds, when the ignition is turned from the Off to Run position, a height sensor or harness problem is indicated.
4. After ignition is turned from the Off to Run position, if the lamp comes on and glows continuously at any time after 8 seconds, a system problem is indicated.
5. Once the warning lamp comes on during an ignition On cycle, it will glow continuously for that ignition On cycle.


STOP LAMP SWITCH
511 LG
14A005
14401
14290
12614
MODULE PIN 15
STARTER RELAY
COURTESY LAMP SWITCH
24 DB/O H
14488
14401
14290
12614
MODULE PIN 19
IGNITION SWITCH
687 GY/Y
14401
14A005
14290
12614
MODULE PIN 7
20 GAUGE FUSE LINK
LEFT FRONT AIR SPRING SOLENOID
175 BK/Y D
415 LG/O
14290
12614
MODULE PIN 11
RIGHT FRONT AIR SPRING SOLENOID
175 BK/Y D
414 O/R
14290
12614
MODULE PIN 12
LEFT REAR AIR SPRING SOLENOID
175 BK/Y D
429 P/LG H
12614
14290
MODULE PIN 9
RIGHT REAR AIR SPRING SOLENOID
175 BK/Y D
416 LB/BK
12614
14290
MODULE PIN 10
LEFT FRONT HEIGHT SENSOR
422 PK/BK
423 P/LG
14290
12614
MODULE PIN 6
MODULE PIN 17
432 BK/PK D
RIGHT FRONT HEIGHT SENSOR
431 PK/W H
424 T
425 BR/PK H
14290
12614
MODULE PIN 4
MODULE PIN 5
MODULE PIN 16
REAR HEIGHT SENSOR
426 R/BK H
427 PK/BK H
428 O/BK H
12614
MODULE PIN 3
MODULE PIN 13
MODULE PIN 18
432 BK/PK D
MODULE PIN 14
COMPRESSOR VENT SOLENOID
COMPRESSOR MOTOR
175 BK/Y D
421 PK
417 P/O
MODULE PIN 23
COMPRESSOR RELAY
417 P/O
175 BK/Y D
420 DB/Y
MODULE PIN 22
WARNING LAMP
419 DG/LG
640 R/Y H
14A005
MODULE PIN 21
FUSE PANEL
ON/OFF SWITCH
175 BK/Y D
418 DG/Y
MODULE PIN 20
430 GY
MODULE GROUND PIN 1
MODULE GROUND PIN 24
MODULE DIAGNOSTICS PIN 2
BATTERY GROUND CABLE
NOTE: FIVE DIGIT NUMBERS ON WIRING DENOTE WIRING HARNESS BASE PART NUMBERS.
CF3666-A

Wiring	Harness Side Connector	Pin Number	Function	Wire Harness			Circuit End Point
				Circuit	Color	Gauge	
Compressor (1) (—14290—)		1	Solenoid Feed	175	BK/Y D	16	Starter Relay
		2	Motor Feed	417	P/O	12	Compressor Relay
		3	Motor Ground	430	GY	14	Battery Ground Cable
		4	Solenoid Control	421	PK	18	Module Pin No. 23
Spring Solenoid (4) (—14290— LF/RF) (—12614— LR/RR)		1	Control	LR 429	P/LG H	18	Module Pin No. 9
			Control	RR 416	LB/BK	18	Module Pin No. 10
			Control	LF 415	LG/O	18	Module Pin No. 11
			Control	RF 414	O/R	18	Module Pin No. 12
		2	Feed	175	BK/Y D	16	Starter Relay
Front Height Sensor (2) (—14290—)		1	Ground	432	BK/PK D	20	Module Pin No. 14
		2	Feed — LF (RF)	431B (A)	PK/W H	20	Module Pin No. 4
		3	Logic Line B	RF 425	BR/PK H	20	Module Pin No. 16
			Logic Line B	LF 423	P/LG	20	Module Pin No. 17
		4	Logic Line A	RF 424	T	20	Module Pin No. 5
			Logic Line A	LF 422	PK/BK	20	Module Pin No. 6
Rear Height Sensor (1) (—12614—)		1	Ground	432	BK/PK D	20	Module Pin No. 14
		2	Feed	426	R/BK H	20	Module Pin No. 3
		3	Logic Line B	428	O/BK H	20	Module Pin No. 18
		4	Logic Line A	427	PK/BK H	20	Module Pin No. 13
Compressor Relay (1) (—14290—)		1	Control	420	DB/Y	18	Module Pin No. 22
		2	Feed (Coil)	175	BK/Y D	14	Starter Relay
		3	Feed (Contacts)	175	BK/Y D	14	Starter Relay
		4	Compressor Motor Feed	417	P/O	14	Compressor
		5	Compressor Motor Ground	430	GY	12	Battery Ground Cable
On/Off Switch (1) (—12614—)		1	Feed to Module	418	DG/Y	14	Module Pin No. 20
		2	Feed to Switch	175	BK/Y D	14	Starter Relay
Warning Lamp (1) (—14A005—)		8	Control	419	DG/LG	20	Module Pin No. 21
		6	Feed	640	R/Y H	20	Fuse Panel
•	Ignition Switch (—14401—)		Ignition Sense	687	GY/Y	18	Module Pin No. 7
•	Stop Lamp Switch (—14A005—)		Brake Sense	511	LG	18	Module Pin No. 15
•	Courtesy Lamp Door Switch (—14488—)		Door Sense	24	DB/O H	20	Module Pin No. 19
Module (1) (—12614—)							

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6. Erratic operation of the warning lamp (blinking or occasional flashing) during an ignition On cycle indicates a system problem.

Diagnostic and Air Fill Instructions

The control module has the capability of performing either a series of diagnostic tests on the air suspension system or to selectively fill the front and/or rear air springs. Specific instructions for using the air fill capability are in Removal and Installation. Instructions for entering diagnostics and test descriptions follow.

Entering Diagnostics

1. Turn On the air suspension switch. Diagnostic pigtail is to be ungrounded (Fig. 5).
2. Install battery charger to reduce battery drain.
3. Cycle the ignition from the Off to Run position, hold in the Run position for a minimum of five seconds, then return to the Off position. Driver's door is open with all other doors shut.
4. Change the diagnostic pigtail from an ungrounded state to a grounded state by attaching a lead from the diagnostic pigtail to vehicle ground. The pigtail must remain grounded during the spring fill sequence (Fig. 5).
5. Turn the ignition switch to the Run position. (Do not start vehicle). The warning lamp will blink continuously at a rate of 1.8 blinks per second to indicate diagnostics has been entered and is ready (Fig. 9).

Warning Lamp Function

During diagnostics the warning lamp continuously blinks either the "ready" status or the current test number.

Door Function

Each successive transition from **door closed to door open** will cause the module to advance to the next step in the test sequence.

Terminating Diagnostics

Diagnostics may be terminated and the module returned to the normal operational mode at any time by cycling the ignition, actuating the brake or ungrounding the diagnostic pigtail.

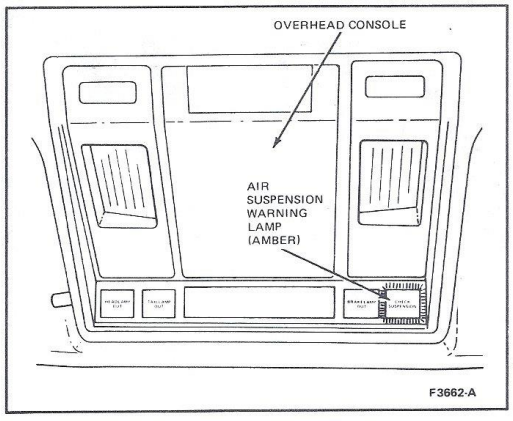

FIG. 9 Air Suspension Warning Lamp

Test Steps

The following tests will be run during Diagnostics.

For Tests 1, 2 and 3, PASS/FAIL will be determined by the module at the conclusion of Step A, B or C.

For Tests 4 through 10, PASS/FAIL will be determined by the technician observing the operation of the specific component.

Test 1

Rear Suspension.

Test 2

Right Front Suspension.

Test 3

Left Front Suspension.

The following Steps occur in each of the first three Tests:

1. Raise the (rear, right front, left front) of the vehicle for 15 seconds. Continue raising vehicle for an additional 15 seconds (30 seconds total maximum) or until a 'Vehicle High' signal, or an illegal sensor read is received from the (rear, right front, left front) sensor.
2. Lower the (rear, right front, left front) of vehicle for 30 seconds or until a 'Vehicle Low' signal, or an illegal sensor read is received from the (rear, right front, left front) sensor.
3. Raise the (rear, right front, left front) of vehicle 30 seconds or until a Vehicle Trim signal, or an illegal sensor read is received from the (rear, right front, left front) sensor.

If the expected signal is not received within the 30 second limit, the test will stop and the warning lamp will turn on continuously. Also, if an illegal sensor read is received, the test will stop and the warning lamp will flash rapidly.

The failed test may then be repeated by closing/opening the door or the next test may be initiated by closing/opening the door twice within 15 seconds.

Test 4

Compressor is cycled On/Off at 0.25 Hz. The compressor is limited to cycling a maximum of 50 times.

Test 5

Vent solenoid is cycled open/closed at 1 Hz.

Test 6

Left front solenoid is cycled open/closed at 1 Hz. and the vent solenoid is opened. Left front corner of the vehicle will drop slowly as test progresses.

Test 7

Right front solenoid is cycled open/closed at 1 Hz. and the vent solenoid is opened. Right front corner of the vehicle will drop slowly so test progresses.

Test 8

Right rear solenoid is cycled open/closed at 1 Hz and the vent solenoid is opened. Right rear corner of the vehicle will drop slowly as test progresses.

Test 9

Left rear solenoid is cycled open/closed at 1 Hz and the vent solenoid is opened. Left rear corner of the vehicle will drop slowly as test progresses.

Test 10

Actuating the brake, turning the ignition switch to Off, or disconnecting the diagnostic lead returns the module from diagnostics to the normal operating mode.

Diagnostic Testing Index

- **Quick Test:** Perform System Self-Diagnostic Quick Test
- **Pinpoint Test B:** Cannot Enter/Sequence or Exit Self-Test Diagnostic Quick Test
- **Pinpoint Test C:** Diagnose Sensor Related Problem
- **Pinpoint Test D:** Diagnose Vehicle Rear Problem
- **Pinpoint Test E:** Diagnose Vehicle Right Front Problem
- **Pinpoint Test F:** Diagnose Vehicle Left Front Problem
- **Pinpoint Test G:** Diagnose Compressor Motor Electrical Problem
- **Pinpoint Test H:** Diagnose Compressor Vent Solenoid Electrical Problem

QUICK TEST

TEST STEP		RESULT ▶	ACTION TO TAKE
A1	CHECK VEHICLE LOAD		
	• Check vehicle passenger compartment and luggage compartment for overloading, and unload as necessary. • Allow the vehicle to sit with the Ignition Switch in the Run position for 5 minutes minimum (door closed, brake off).	▶	GO to **A2**.
A2	LEVEL VEHICLE, INITIALIZE SYSTEM		
	• Turn the Ignition Switch to the Off position. • Turn the Ignition Switch to the Run position and observe the Air Suspension Warning Lamp.	Warning lamp blinks or turns On ▶	GO to **A3**.
		Warning lamp does not blink or turn On ▶	GO to **B1**.
A3	ENTER DIAGNOSTICS		
	• Before entering Diagnostics, connect a battery charger to the vehicle and leave On, until completion of Diagnostics. • After Diagnostics are entered do not open the door, depress the brake pedal, or start the engine unless you are specifically asked to do so. • Turn the Ignition Switch to the Off position. • Ground the diagnostic pigtail. If it is already grounded, unground and then ground it. • Turn the Ignition Switch to the Run position. Do not start the engine, open the door, or depress the brake.	Warning lamp blinks continuously ▶	Diagnostics entered. GO to **A4**.
		The warning lamp blinks once ▶	Diagnostics not entered. GO to **B10**.
		Warning lamp stays On ▶	Warning lamp not functioning properly. GO to **B13**.
A4	RUN TEST #1 — REAR SUSPENSION		
	• To start Test #1 open and close the door. • After Test #1 has been entered, a properly operating vehicle will raise the rear evenly for 15 to 30 seconds. When a vehicle high is received from the rear sensor, the rear will be lowered for a maximum of 30 seconds. When a rear low is received at the module, the rear of the vehicle will raise for a maximum of 30 seconds or until a rear trim signal is received at the module. Test 1 is now completed. The warning lamp will flash test #1 at a constant rate during the whole test. Maximum test time is 90 seconds. • After 90 seconds observe the warning lamp. • Record the test results for future reference.	Warning lamp flashes rapidly (approx. 4 blinks per second), or warning lamp On ▶	Rear failed test. GO to **A5**.
		Warning lamp flashes the test number ▶	Rear passed test. GO to **A5**.
		Warning lamp does not flash the test number, flash rapidly, or turn On ▶	GO to **B22**.

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QUICK TEST (Cont'd.)

TEST STEP		RESULT ▶	ACTION TO TAKE
A5	RUN TEST #2 — RIGHT FRONT SUSPENSION		
	• To start Test #2 open and close the door. If Test #1 failed, open and close the door twice. • After Test #2 has been entered, a properly operating vehicle will raise the right front for 15 to 30 seconds. When a vehicle high is received from the right front sensor, the right front will be lowered for a maximum of 30 seconds. When a right front low is received at the module, the right front of the vehicle will raise for a maximum of 30 seconds or until a right front trim signal is received at the module. Test 2 is now completed. The warning lamp will flash test #2 at a constant rate during the whole test. Maximum test time is 90 seconds. • After 90 seconds observe the warning lamp. • Record the test results for future reference.	Warning lamp flashes rapidly (approx. 4 blinks per second), or warning lamp is On ▶ Warning lamp flashes the test number ▶	Right front failed test. GO to **A6**. Right front passed test. GO to **A6**.
A6	RUN TEST #3 — LEFT FRONT SUSPENSION		
	• To start Test #3 open and close the door. If Test #2 failed, open and close the door twice. • After Test #3 has been entered a properly operating vehicle will raise the left front for 15 to 30 seconds. When a vehicle high is received from the left front sensor, the left front of the vehicle will raise for a maximum of 30 seconds or until a left front trim signal is received at the module. Test #3 is now completed. The warning lamp will flash Test #3 at a constant rate during the test. Maximum test time is 90 seconds. • After 90 seconds observe the warning lamp. • Record the test results for future reference.	Warning lamp flashes rapidly (approx. 4 blinks per second) or warning lamp is On steady ▶ Warning lamp flashes the test number ▶	Left front failed test. GO to **A7**. Left front passed test. GO to **A7**.
A7	RUN TEST #4 — COMPRESSOR		
	• To start Test #4 open and close the door. If Test #3 failed, open and close the door twice. • During Test #4 the compressor is cycled on and off. The warning lamp will continuously blink Test #4. The compressor will only cycle 50 times. • Lift the hood and listen for the compressor to cycle. • Record the test results for future reference. **NOTE:** The rear of the vehicle may raise during this test.	Compressor does not cycle, (runs continuously or does not run at all) ▶ Compressor cycles ▶	Compressor failed test. GO to **A8**. Compressor passed test. GO to **A8**.
A8	RUN TEST #5 — VENT SOLENOID		
	• To start Test #5, open and close the door to cycle the vent solenoid (part of compressor assembly). • During Test #5, vent solenoid is cycled On and Off, and the warning lamp will continuously blink Test #5. • Lift the hood and listen for the vent solenoid to cycle. • Record the test results for future reference.	Vent Solenoid does not cycle ▶ Vent Solenoid cycles ▶	Vent Solenoid failed test. GO to **A9**. Vent Solenoid passed test. GO to **A9**.

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QUICK TEST (Cont'd.)

	TEST STEP	RESULT ▶	ACTION TO TAKE
A9	RUN TEST #6 — LEFT FRONT AIR SPRING SOLENOID		
	• Open and close the door to cycle the left front Air Spring Solenoid. • Listen for air escaping from the vent solenoid. • Listen for the solenoid to cycle at the left front wheel well opening. • Record the test results for future reference. **NOTE:** The left front corner of the vehicle will drop during this test.	Left front Air Spring Solenoid does not cycle, or air is not escaping from the vent solenoid ▶	Left front Air Spring System failed test. GO to **A10**.
		Left front Air Spring Solenoid cycles, and air is escaping from the vent solenoid ▶	Left front Air Spring System passes test. GO to **A10**.
A10	RUN TEST #7 — RIGHT FRONT AIR SPRING SOLENOID		
	• Open and close the door to cycle the right front Air Spring Solenoid. • Listen for air escaping from the vent solenoid. • Listen for the solenoid to cycle at the right front wheel well opening. • Record the test results for future reference. **NOTE:** The right front corner of the vehicle will drop during this test.	Right front Air Spring Solenoid does not cycle, or air is not escaping from the vent solenoid ▶	Right front Air Spring System failed test. GO to **A11**.
		Right front Air Spring Solenoid cycles, and air is escaping from the vent solenoid ▶	Right front Air Spring System passed test. GO to **A11**.
A11	RUN TEST #8 — RIGHT REAR AIR SPRING SOLENOID		
	• Open and close the door to cycle the right rear Air Spring Solenoid. • Listen for air escaping from the vent solenoid. • Listen for the solenoid to cycle at the right rear wheel well opening. • Record the test results for future reference. **NOTE:** The right rear corner of the vehicle will drop during this test.	Right rear Air Spring Solenoid does not cycle, or air is not escaping from the vent solenoid ▶	Right rear Air Spring System failed test. GO to **A12**.
		Right rear Air Spring Solenoid cycles, and air is escaping from the vent solenoid ▶	Right rear Air spring system passed test. GO to **A12**.
A12	RUN TEST #9 — LEFT REAR AIR SPRING SOLENOID		
	• Open and close the door to cycle the left rear Air Spring Solenoid. • Listen for air escaping from the vent solenoid. • Listen for the solenoid to cycle at the left rear wheel well opening. • Record the test results for future reference. **NOTE:** The left rear corner of the vehicle will drop during this test.	Left rear Air Spring Solenoid does not cycle, or air is not escaping from the vent solenoid ▶	Left rear Air Spring System failed test. GO to **A13**.
		Left rear Air Spring Solenoid cycles, and air is escaping from the vent solenoid ▶	Left rear Air Spring System passed test. GO to **A13**.

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QUICK TEST (Cont'd.)

TEST STEP	RESULT	ACTION TO TAKE
A13 RUN TEST #10 — BRAKE CIRCUIT • Open the door and sit in the driver's seat. • Depress the brake pedal and observe the warning lamp.	Warning lamp continues to blink ▶	Brake Circuit fails test. GO to **B30**.
	Warning lamp stops blinking ▶	Brake Circuit passes test. Diagnostic Sequence completed. Unground the diagnostic pigtail. GO to **A14**.
A14 **ANY FAILURES?** • Have any failures occured during diagnostics?	Yes ▶	GO to **A15**.
	No ▶	Air Spring Suspension System OK. No further diagnostics required.
• To perform pinpoint tests, the following special equipment will be required: 1) A test light using a #194 bulb with test pointed probes. 2) A volt ohmmeter. 3) A pressure gauge capable of indicating 150 PSI.		
A15 • Did the warning lamp flash rapidly for **any** of the first three tests?	Yes ▶	The module read the sensor incorrectly. GO to **C1**.
	No ▶	Sensors OK. GO to **A16**.
A16 • Did the warning lamp stay on after the completion of Test #1?	Yes ▶	Check rear of vehicle. GO to **D1**.
	No ▶	GO to **A17**.
A17 • Did the warning lamp stay on after the completion of Test #2?	Yes ▶	Check right front. GO to **E1**.
	No ▶	Right front OK. GO to **A18**.
A18 • Did the warning lamp stay on after the completion of Test #3?	Yes ▶	Check left front. GO to **F1**.
	No ▶	Left front OK. GO to **A19**.

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QUICK TEST (Cont'd.)

TEST STEP	RESULT	ACTION TO TAKE
A19		
• Did the right rear solenoid cycle and air escape from the vent solenoid during Test #8?	Yes ▶	Right Rear Solenoid OK. GO to **A20**.
	No ▶	Check Right Rear Solenoid System. GO to **D1**.
A20		
• Did the left rear solenoid cycle and air escape from the vent solenoid during Test #9?	Yes ▶	Left Rear Solenoid OK. GO to **A1**.
	No ▶	Check Left Rear Solenoid System. GO to **D1**.

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QUICK TEST (Cont'd.)

TEST STEP	RESULT ▶	ACTION TO TAKE
Will not initialize or enter diagnostics.		
B1 CHECK BULB		
• Is Air Suspension warning lamp bulb burned out?	Yes ▶	REPLACE bulb. REPEAT Quick Test.
	No ▶	GO to **B2**.
B2 MAKE A TEST LAMP		
• Attach 2 test leads, with pointed probes, to a #194 Lamp for use as a test lamp. Any other lamp will cause damage to the Air Suspension system.	▶	GO to **B3**.
B3 CHECK IGNITION CIRCUIT		
• Turn the Air Suspension On/Off switch to the Off position. • Turn ignition to the Off position.	Warning lamp on ▶	SERVICE short to battery on ignition circuit #687 or the ignition switch. Turn Air Suspension On/Off switch to the On position. REPEAT Quick Test.
	Warning lamp off ▶	GO to **B4**.
B4 CHECK IGNITION CIRCUIT		
• Attach one lead of the test lamp to ignition circuit #640 at the warning lamp. Attach the other lead to ground. • Turn the key to Run and observe the test lamp.	Test lamp on ▶	GO to **B6**.
	Test lamp off ▶	GO to **B5**.
B5 CHECK FUSE		
• Check fuse in ignition circuit #640.	Fuse OK ▶	SERVICE open in ignition circuit #640. REPEAT Quick Test.
	Fuse blown ▶	REPLACE fuse. SERVICE short in ignition circuit #640, if second fuse fails. REPEAT Quick Test.
B6 CHECK IGNITION CIRCUIT		
• Attach one test lamp lead to ignition circuit #687 pin 7 of the module connector. • Attach the other test lamp lead to a good ground. • Turn the key to Run and observe the test lamp.	Test lamp on ▶	Ignition Circuit OK. GO to **B7**.
	Test lamp off ▶	SERVICE open or short in ignition circuit #687. Turn Air Suspension On/Off switch to On position. REPEAT Quick Test.

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QUICK TEST (Cont'd.)

TEST STEP		RESULT	ACTION TO TAKE
B7	CHECK MODULE GROUND CIRCUIT		
• Attach one test lamp lead to ignition circuit #687 pin 7 of the module connector. • Turn the key to Run and observe the test lamp. • Attach the other test lamp to ground circuit #430 pin 1 of the module connector. • Move the test lamp lead attached to pin 1 of the module connector to pin 24.		Test lamp on ▶ Test lamp off ▶	Ground circuit OK. GO to **B8**. SERVICE open in circuit #430. REPEAT Quick Test.
B8	CHECK WARNING LAMP CIRCUIT		
• Set up a volt meter to read 12 volts DC. • Attach the negative (black) test lead to a good ground. • Attach the positive (red) test lead to the warning lamp circuit #419 pin 21 of the module connector. • Turn the ignition switch to the Run position.		Voltage greater than 5 volts ▶ Voltage less than or equal to 5 volts ▶	Warning lamp circuit OK. GO to **B9**. SERVICE open in the warning lamp circuit #419 from the module connector to the warning lamp connector. Turn Air Suspension On/Off switch to the On position. REPEAT Quick Test.
B9	CHECK BATTERY VOLTAGE		
• Attach the negative (black) test lead to ground circuit #430 pin 24 of the module connector. • Attach the positive (red) test lead to Battery circuit #418 pin 20 at the module connector. • Measure DC Voltage.		Less than 11 volts ▶ Greater than 11 volts ▶	SERVICE low voltage condition due to a faulty connection, low battery, etc. REPEAT Quick Test. REPLACE air suspension module. REPEAT Quick Test.
B10			
• Repeat steps A2 and A3 and insure the diagnostic pigtail is grounded to a good ground. **NOTE:** Steps A2 and A3 **must** be performed exactly as indicated to enter diagnostics.		Warning lamp blinks once ▶ Warning lamp blinks ▶	GO to **B11**. REPEAT Quick Test
B11	MAKE A TEST LAMP		
• Attach 2 test leads, with probes, to a #194 lamp for use as a test lamp. Any other lamp will cause damage to the air suspension lamp.		▶	GO to **B12**.

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QUICK TEST (Cont'd.)

TEST STEP		RESULT	ACTION TO TAKE
B12	CHECK PIGTAIL		
Attach one test lamp lead to diagnostic circuit #606 pin 2 at the module connector. • Attach the other test lamp lead to ignition circuit #687 pin 7 at the module connector. • Turn key to Run. • Ground and then unground the pigtail.		Test lamp on then off ▶ Test lamp on or off ▶	Pigtail OK, GO to **B9**. REPAIR open or short to ground in the diagnostic pigtail circuit #606. REPEAT Quick Test.
B13	CHECK FOR SYSTEM IN DIAGNOSTIC		
• Open and close the door and observe the compressor.		Compressor starts running ▶ Compressor is already running or does not start running ▶	In diagnostics. GO to **B20**. Not in diagnostics. GO to **B14**.
B14	MAKE A TEST LAMP		
• Attach 2 test leads, with pointed probes, to a #194 lamp for use as a test lamp. Any other lamp will cause damage to the air suspension system.		▶	GO to **B15**.
B15	CHECK BATTERY CIRCUIT		
• Attach one test lamp lead to Battery circuit #418 pin 20 at the module connector. • Attach the other test lamp lead to a good ground.		Test lamp on ▶ Test lamp off ▶	GO to **B21**. GO to **B16**.
B16	CHECK FUSE LINK		
• Check the fuse link in battery circuit #175.		Fuse link OK ▶ Fuse link blown ▶	GO to **B17**. REPLACE fuse link. REPEAT Quick Test.
B17			
• Verify that the Air Suspension On/Off switch is in the On position.		Switch in On position ▶ Switch in Off position ▶	GO to **B18**. PLACE switch in On position. REPEAT Quick Test.
B18	CHECK BATTERY CIRCUIT		
• Attach one test lamp lead to Battery circuit #175 at the Air Suspension On/Off switch pin 2 (battery side).		Test lamp on ▶ Test lamp off ▶	GO to **B19**. SERVICE the open or short in Battery circuit #175 from the Air Suspension ON/OFF switch pin 2 to the Battery. REPEAT Quick Test.

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QUICK TEST (Cont'd.)

TEST STEP		RESULT ▶	ACTION TO TAKE
B19	CHECK ON/OFF SWITCH		
• Attach one test lamp lead to Battery circuit #418 at the Air Suspension On/Off switch pin 1 (module side). • Attach the other test lead to a good ground.		Test lamp on ▶	SERVICE the open or short in Battery circuit #418 from the Air Suspension ON/OFF switch pin 1 to the battery. REPEAT Quick Test.
		Test lamp off ▶	REPLACE the Air Suspension ON/OFF switch. REPEAT Quick Test.
B20	CHECK WARNING LAMP CIRCUIT		
• Disconnect the module connector and observe the warning lamp.		Warning lamp on ▶	SERVICE short to ground in the warning lamp circuit #419 from the module connector to the warning lamp. RECONNECT the module connector. REPEAT Quick Test.
		Warning lamp off ▶	Warning lamp circuit OK. GO to **B21**.
B21	CHECK BATTERY VOLTAGE		
• Attach the negative (black) test lead to ground circuit #430 pin 24 of the module connector. • Attach the positive (red) test lead to Battery circuit #418 pin 20 at the module connector. • Measure DC voltage.		Less than 11 volts ▶	SERVICE low voltage condition due to a faulty connection, low battery, etc. RECONNECT connectors as required. REPEAT Quick Test.
		Greater than 11 volts ▶	REPLACE the Air Suspension module. RECONNECT connectors as required. REPEAT Quick Test.
B22	MAKE A TEST LAMP		
• Attach 2 test leads with pointed probes to a #194 lamp for use as a test lamp. Any other lamp will damage the Air Suspension system.		▶	GO to **B23**.

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QUICK TEST (Cont'd.)

TEST STEP	RESULT ▶	ACTION TO TAKE
B23 CHECK DOOR CIRCUIT		
• Attach one test lamp lead to Door circuit #24 pin 19 at the module connector. • Attach the other test lamp lead to a good ground. • Close the door.	Test lamp on ▶	SERVICE short to Battery or ignition in door circuit #24 or faulty door switch. REPEAT Quick Test.
	Test lamp off ▶	GO to **B24**.
B24 CHECK DOOR CIRCUIT		
• Open the door.	Test lamp on ▶	Door circuit OK. GO to **B25**.
	Test lamp off ▶	REPAIR open or short in door circuit #24 or defective door switch. REPEAT Quick Test.
B25 CHECK BRAKE CIRCUIT		
• Depress and release the brake pedal. Observe the rear brake lamps.	Brake lamps operate properly ▶	Brake circuit OK. GO to **B26**.
	Brake lamps do not operate properly ▶	SERVICE as necessary. REPEAT Quick Test
B26 CHECK COMPRESSOR CIRCUIT		
• Disconnect the compressor relay electrical connector. • Perform steps A2-A4. • Observe the warning lamp.	Warning lamp flashes rapidly, flashes the test number or stays on ▶	GO to **B27**.
	Warning lamp does something else ▶	Compressor circuit OK. GO to **B21**.
B27 CHECK COMPRESSOR CIRCUIT		
• Do not reconnect the compressor relay connector. • Attach the negative (black) lead of volt-ohm meter to ground. • Attach the positive (red) lead to compressor circuit #417 pin 2 on the harness side of the compressor connector. • Measure resistance.	Greater than 1000 Ohms ▶	GO to **B28**.
	Less than 1000 Ohms ▶	SERVICE short to ground on compressor circuit #417. REPEAT Quick Test.

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QUICK TEST (Cont'd.)

TEST STEP		RESULT	ACTION TO TAKE
B28	CHECK COMPRESSOR CURRENT		
• Disconnect compressor connector. • Connect a jumper (14 ga. wire minimum) between compressor connector (compressor side) pin 3 and a good ground. • Attach the negative (black) lead of an amp meter to pin 3 at the compressor connector (compressor side). The ammeter must be capable of measuring 40 amps minimum. • Attach the positive (red) lead to Battery positive (+) terminal. • Measure current after the compressor has run for 10 seconds. Do not allow the compressor to run more than 60 seconds.		Greater than 35 amps ▶ Less than 35 amps ▶	REPLACE and RECONNECT a new compressor assembly. REPEAT Quick Test. GO to **B29**.
B29	CHECK COMPRESSOR VOLTAGE		
• Perform step B28 except measure the Battery voltage while the compressor is running.		Greater than 11 volts ▶ Less than 11 volts ▶	REPLACE the Air Suspension module. RECONNECT connectors as required. REPEAT Quick Test. CHARGE battery, REPEAT Quick Test.
B30	MAKE A TEST LAMP		
• Attach 2 test leads, with pointed probes, to a #194 lamp for use as a test lamp. Any other lamp will damage the Air Suspension system.		▶	GO to **B31**.
B31	CHECK BRAKE CIRCUIT		
• Depress and release the brake pedal and verify the rear brake lamps operate properly.		Brake lamps operate properly ▶ Brake lamps do not operate properly ▶	GO to **B32**. SERVICE as necessary. REPEAT Quick Test.
B32	CHECK BRAKE CIRCUIT		
• Attach one lead of the test lamp to Brake circuit #511 pin 15 at the module connector. • Attach the other test lead to a good ground. • Depress the brake pedal and observe the test lamp.		Test lamp on ▶ Test lamp off ▶	REPLACE the Air Suspension module. RECONNECT connectors as required. REPEAT Quick Test. SERVICE open or short in the brake circuit #511. REPEAT Quick Test.

CF3712-A

PROBLEM SENSING VEHICLE ATTITUDE

TEST STEP	RESULT	ACTION TO TAKE
C1		
• Did the warning lamp flash for all three tests? (Test #1, 2 and 3).	Yes	GO to **C2**.
	No	GO to **C11**.
C2 CHECK SENSOR GROUND CIRCUIT		
• Attach one lead of the test lamp to sensor ground circuit #432 pin 1 at the left front sensor connector. • Attach the other test lamp lead to the battery positive (+) terminal. • Observe the test lamp.	Test lamp on	Sensor Ground circuit OK. GO to **C5**.
	Test lamp off	GO to **C3**.
C3 CHECK SENSOR GROUND CIRCUIT		
• Attach one lead of the test lamp to sensor ground circuit #432 pin 14 at the module connector (do not disconnect the module connector). • Attach the other test lamp lead to Battery pin #20 at the module connector (do not disconnect the module connector).	Test lamp on	SERVICE open in sensor ground circuit #432. REPEAT Quick Test.
	Test lamp off	GO to **C4**.
C4		
Disconnect the module connector and inspect sensor ground pin 14, module ground pins 1 & 24 for corrosion and or damage.	Corrosion or damage found	SERVICE as necessary. REPEAT Quick Test.
	No corrosion or damage found	REPLACE the Air Suspension module. REPEAT Quick Test.
C5		
• Set up a volt meter to read 3 volts DC. • Attach the negative (black) test lead to sensor ground circuit #432 pin 14 of the module connector. • Attach the positive (red) test lead to sensor power circuit #431 pin 4 of the module connector. • Turn ignition to Run and observe the Voltmeter.	Voltage less than 1.0 volt and steady	GO to **C6**.
	Voltage erratic or greater than 1.0 volt but less than 5 volts	SERVICE open in sensor power circuit #426 or 431 between the module and the sensors. REPEAT Quick Test.
	Voltage greater than 5 volts and steady	REPLACE Air Suspension module. REPEAT Quick Test.
C6 CHECK LEFT FRONT SENSOR		
• Electrically disconnect the left front sensor and observe the volt meter.	Voltage less than 1.0 volts and steady	Left front sensor OK. GO to **C7**.
	Voltage erratic or greater than 1.0 volt	REPLACE and connect the left front sensor. REPEAT Quick Test.

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PROBLEM SENSING VEHICLE ATTITUDE (Cont'd.)

TEST STEP		RESULT	ACTION TO TAKE
C7	CHECK RIGHT FRONT SENSOR		
	• Do not reconnect the left front sensor. • Electrically disconnect the right front sensor and observe the volt meter.	Voltage less than 1.0 volt and steady	Right front sensor OK. GO to **C8**.
		Voltage erratic or greater than 1.0 volt	REPLACE and connect the right front sensor. RECONNECT the left front sensor. REPEAT Quick Test.
C8	CHECK THE REAR SENSOR		
	• Do not reconnect the right front sensor. • Electrically disconnect the rear sensor and observe the volt meter.	Voltage less than 1.0 volt and steady	Rear sensor OK. GO to **C9**.
		Voltage erratic or greater than 1.0 volt	REPLACE and connect the rear sensor. RECONNECT the left front and right front sensors. REPEAT Quick Test.
C9	CHECK SENSOR POWER CIRCUIT		
	• Do not reconnect the rear sensor. • Disconnect the Air Suspension module. • Attach the negative (black) test lead of a volt-ohm meter to module ground circuit #430 pin 1 of the module connector. • Attach the positive (red) test lead to sensor power circuit #426 pin 3 at the module connector. • Measure resistance.	Greater than 1000 Ohms	GO to **C10**.
		Less than 1000 Ohms	SERVICE short to ground in sensor power circuit #426. RECONNECT right front sensors left front sensor, rear sensor and control module. REPEAT Quick Test.
C10	CHECK SENSOR POWER CIRCUIT		
	• Move the positive (red) test lead to sensor power circuit #431 pin 4 at module connector. • Measure resistance.	Greater than 1000 Ohms	REPLACE the Air Suspension control module. REPEAT Quick Test.
		Less than 1000 Ohms	SERVICE short to ground in sensor power circuit #431. RECONNECT right front sensor, left front sensor, rear sensor and control module. REPEAT Quick Test.
C11			
	• Did the warning lamp flash rapidly for Test #1?	Yes	GO to **C12**.
		No	GO to **C23**.

CF3718-A

PROBLEM SENSING VEHICLE ATTITUDE (Cont'd.)

TEST STEP		RESULT	ACTION TO TAKE
C12	CHECK SENSOR GROUND CIRCUIT		
	• Turn the Air Suspension On/Off switch to the Off position. • Attach the positive (red) test lead of a volt-ohm meter to sensor ground circuit #432 pin 1 at the rear sensor. • Attach the negative (black) test lead to a good ground. • Measure resistance.	Greater than 5 Ohms ▶	SERVICE the open in sensor ground circuit #432 between the module connector and the rear sensor. REPEAT Quick Test.
		Less than 5 Ohms ▶	GO to **C13**.
C13	CHECK SENSOR POWER CIRCUIT		
	• Place the Air Suspension On/Off switch in the On position. • Attach the negative (black) test lead of a volt-ohm meter to sensor ground pin 1 circuit #432 at the rear sensor connector. • Attach the positive (red) test lead to sensor power pin 2 circuit #426 at the rear sensor connector. • Turn ignition to the Run position. • Measure resistance.	Voltage less than 1.0 volt and steady ▶	SERVICE open in sensor power circuit #426 from the rear sensor to the module. REPEAT Quick Test.
		Voltage erratic or greater than 1.0 volt ▶	Sensor power circuit OK. GO to **C14**.
C14	CHECK REAR SENSOR **A** CIRCUIT		
	• Move the positive (red) test lead to rear sensor **A** circuit #427 pin 4 at the rear sensor connector. • Measure DC voltage.	Greater than 1.5 volts or erratic ▶	Rear sensor **A** circuit OK. GO to **C18**.
		Less than 1.5 volts ▶	GO to **C15**.
C15	CHECK REAR SENSOR		
	• Disconnect the rear sensor connector. • Measure DC voltage.	Greater than 1.5 volts ▶	REPLACE the rear sensor. REPEAT Quick Test.
		Less than 1.5 volts ▶	GO to **C16**.
C16	CHECK REAR SENSOR **A** CIRCUIT		
	• Do not reconnect the rear sensor. • Attach the negative (black) test lead of a volt-ohm meter to sensor ground pin 14 circuit #432 at the module connector. • Attach the positive (red) test lead to rear sensor **A** circuit #427 pin 13 at the module connector. • Measure DC voltage.	Greater than 1.5 volts ▶	SERVICE open in rear sensor **A** circuit #427 between the module and the sensor. RECONNECT the rear sensor connector. REPEAT Quick Test.
		Less than 1.5 volts ▶	GO to **C17**.

CF3719-A

PROBLEM SENSING VEHICLE ATTITUDE (Cont'd.)

TEST STEP		RESULT	ACTION TO TAKE
C17	CHECK REAR SENSOR **A** CIRCUIT		
	• Disconnect the module. • Attach the negative (black) test lead of a volt-ohm meter to module ground pin 1 circuit #430 at the module connector. • Attach the positive (red) test lead to rear sensor **A** circuit #427 pin 13 at the module connector. • Measure resistance.	Greater than 1000 Ohms ▶	REPLACE the Air Suspension Module. RECONNECT the rear sensor. REPEAT Quick Test.
		Less than 1000 Ohms ▶	SERVICE short to ground on rear sensor **A** circuit #427 between the module and the rear sensor. RECONNECT the rear sensor. REPEAT Quick Test.
C18	CHECK REAR **B** SENSOR CIRCUIT		
	• Move the positive (red) test lead to rear sensor **B** circuit #428 pin 3 at the rear sensor connector. • Measure the DC voltage.	Greater than 1.5 volts or erratic ▶	Rear Sensor B circuit OK. GO to **C19**.
		Less than 1.5 volts ▶	GO to **C20**.
C19	CHECK FOR MODULE DAMAGE		
	• Rerun diagnostics test #1 by performing steps A2-A4.	Warning lamp flashing rapidly ▶	REPLACE the Air Suspension control module. REPEAT Quick Test.
		Warning lamp not flashing rapidly ▶	REPEAT Quick Test.
C20	CHECK REAR SENSOR		
	• Disconnect the rear sensor connector. • Measure the DC voltage.	Greater than 1.5 volts ▶	INSTALL a new rear sensor. REPEAT Quick Test.
		Less than 1.5 volts ▶	Rear sensor OK. GO to **C21**.
C21	CHECK REAR SENSOR **B** CIRCUIT		
	• Do not reconnect the rear sensor. • Attach the negative (black) test lead of a volt-ohm meter to sensor ground pin 14 circuit #432 at the module connector. • Attach the positive (red) test lead to rear sensor **B** circuit #428 pin 18 at the module connector. • Measure DC voltage.	Greater than 1.5 volts ▶	SERVICE open in rear sensor **B** circuit #428 between the module and the sensor. RECONNECT the rear sensor connector. REPEAT Quick Test.
		Less than 1.5 volts ▶	GO to **C22**.

CF3720-A

PROBLEM SENSING VEHICLE ATTITUDE (Cont'd.)

TEST STEP	RESULT	ACTION TO TAKE
C22 CHECK REAR SENSOR **B** CIRCUIT		
• Disconnect the module. • Attach the negative (black) test lead of a volt-ohm meter to module ground pin 1 circuit #430 at the module connector. • Attach the positive (red) test lead to rear sensor **B** circuit #428 pin 18 at the module connector. • Measure resistance.	Greater than 1000 Ohms ▶	REPLACE the Air Suspension module. RECONNECT the rear sensor. REPEAT Quick Test.
	Less than 1000 ohms ▶	SERVICE short to ground on rear sensor **B** circuit #428 between the module and the rear sensor. REPEAT Quick Test.
C23		
• Did the warning lamp flash rapidly for Test #2?	Yes ▶	GO to **C24**.
	No ▶	GO to **C35**.
C24 CHECK SENSOR GROUND CIRCUIT		
• Attach one test lamp lead to sensor ground circuit #432 pin 1 at the right front sensor. • Attach the other test lamp lead to the Battery positive (+) terminal. • Observe the test lamp.	Test lamp on ▶	Sensor ground circuit OK. GO to **C25**.
	Test lamp off ▶	SERVICE the open in sensor ground circuit #432 between the module connector and the right front sensor. REPEAT Quick Test.
C25 CHECK SENSOR POWER CIRCUIT		
• Attach the negative (black) test lead of a volt-ohm meter to sensor ground pin 1 circuit #432 at the right front sensor connector. • Attach the positive (red) test lead to sensor power pin 2 circuit #431 at the right front sensor connector. • Turn ignition to the Run position. • Measure DC voltage.	Voltage less than 1.0 volt and steady ▶	SERVICE open in sensor power circuit #431 from the right front sensor to the module. REPEAT Quick Test.
	Voltage erratic or greater than 1.0 volt ▶	Sensor power OK. GO to **C26**.
C26 CHECK RIGHT FRONT SENSOR **A** CIRCUIT		
• Move the positive (red) test lead to right front sensor **A** circuit #424 pin 4 at the right front sensor connector. • Measure DC voltage.	Greater than 1.5 volts or erratic ▶	Right front sensor **A** circuit OK. GO to **C30**.
	Less than 1.5 volts ▶	OK. GO to **C27**.
C27 CHECK RIGHT FRONT SENSOR		
• Disconnect the right front sensor connector. • Measure DC voltage.	Greater than 1.5 volts ▶	REPLACE the right front sensor. REPEAT Quick Test.
	Less than 1.5 volts ▶	Right front sensor OK. GO to **C28**.

CF3721-A