

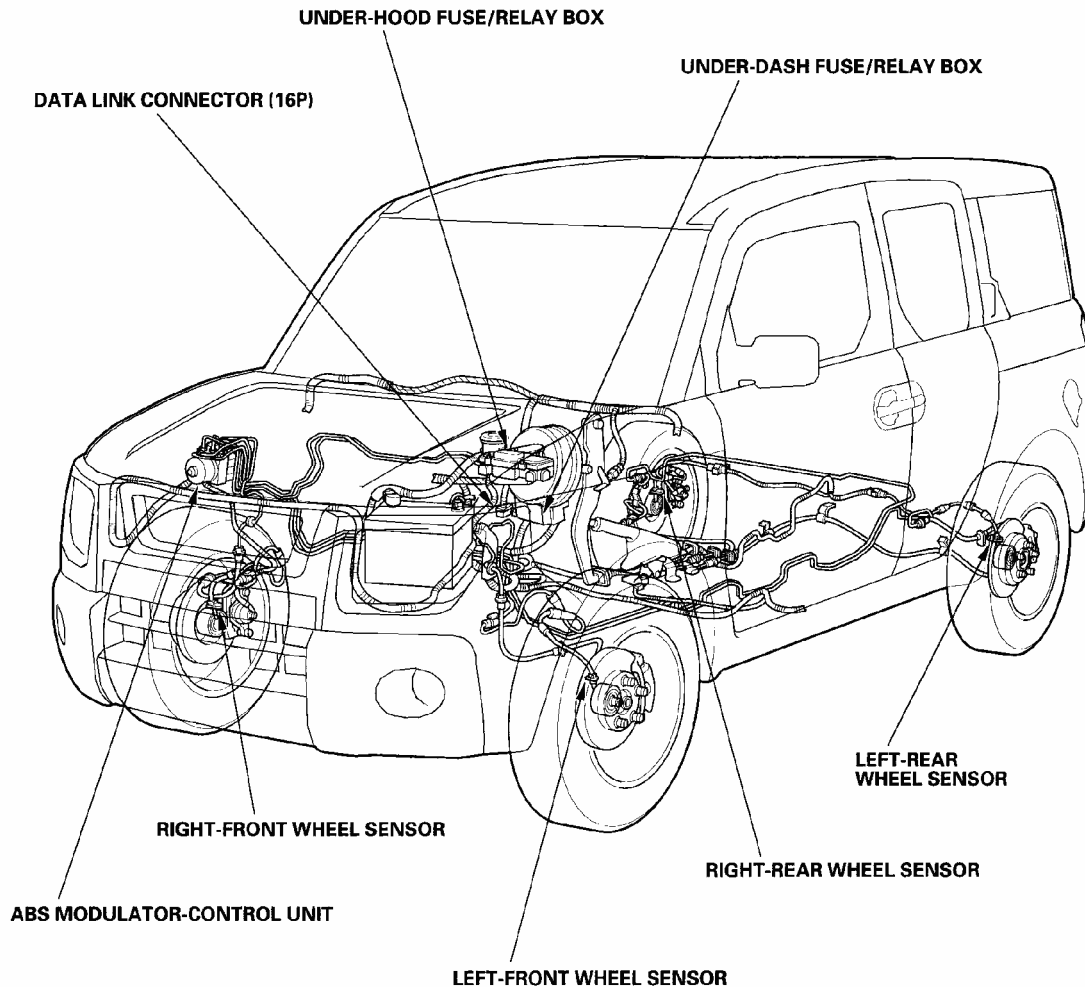
2004 Honda Element DX

2003-06 BRAKES ABS (Anti-Lock Brake System) - Element

2003-06 BRAKES

ABS (Anti-Lock Brake System) - Element

COMPONENT LOCATION INDEX



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Fig. 1: Locating ABS (Anti-Lock Brake System) Components
Courtesy of AMERICAN HONDA MOTOR CO., INC.

GENERAL TROUBLESHOOTING INFORMATION

ABS INDICATOR

- If the system is OK, the ABS indicator comes on, then goes off 2 seconds after turning the ignition switch ON (II).
- The ABS indicator comes on when the ABS modulator-control unit detects a problem in the system. However, even though the system is operating properly, the indicator can

come on under these conditions:

- Only the drive wheels rotate.
- One drive wheel is stuck.
- The vehicle goes into a spin.
- The ABS continues to operate for a long time.
- The vehicle is subjected to an electrical signal disturbance.

To determine the actual cause of the problem, question the customer about the problem, taking these conditions into consideration.

- When a problem is detected and the ABS indicator comes on, there are cases when the indicator stays on until the ignition switch is turned OFF, and cases when the indicator goes off automatically when the system returns to normal.
 - DTC 61 or 62: The ABS indicator goes off automatically when the system returns to normal.
 - DTC 11, 13, 15, 17, 31, 32, 33, 34, 35, 36, 37, 38, 54, or 81: The ABS indicator stays on until the ignition switch is turned OFF whether or not the system returns to normal.
 - DTC 12, 14, 16, 18, 21, 22, 23, 24, 51, 52, or 53: The ABS indicator goes off after the ignition switch is turned OFF and then back ON (II), the vehicle is driven, and the system is OK.

BRAKE SYSTEM INDICATOR

The brake indicator in the gauge assembly will come on under these conditions:

- Parking brake lever is pulled up.
- Low brake fluid in the brake master cylinder reservoir.
- ABS modulator-control unit detects a problem that affects the EBD.

DIAGNOSTIC TROUBLE CODE (DTC)

- The memory can hold any number of DTCs. However, when the same DTC is detected more than once, the more recent DTC is written over the earlier one. Therefore, when the same problem is detected repeatedly, it is memorized as a single DTC.
- The DTCs are indicated in the order they occurred, beginning with the most recent.
- The DTCs are memorized in the EEPROM (nonvolatile memory). Therefore, the memorized DTCs are not cleared when the battery is disconnected, the ignition switch is turned OFF, or the system returns to normal. Do the specified procedures to clear the DTCs.

SELF-DIAGNOSIS

- Self-diagnosis can be classified into two categories:
 - Initial diagnosis:

Done right after the ignition switch is turned ON (II) and until the ABS indicator goes off.
 - Regular diagnosis:

Done right after the initial diagnosis until the ignition switch is turned OFF.
- When a problem is detected by self-diagnosis, the system does the following:
 - Turns the ABS indicator and possibly the brake system indicator on.
 - Memorizes the DTC.
 - Stops ABS operation.

KICKBACK

The pump motor operates when the ABS is functioning, and the fluid in the reservoir is forced out to the master cylinder, causing kickback at the brake pedal.

PUMP MOTOR

- The pump motor operates when the ABS is functioning.
- The ABS modulator-control unit checks the pump motor operation when the vehicle is driven the first time after the ignition switch is turned ON (II). You may hear the motor operate at this time, but it is normal.

HOW TO TROUBLESHOOT DTCS

The troubleshooting procedures assume that the cause of the problem is still present, and the ABS indicator and possibly the brake system indicator are still on. Following the procedure when the ABS indicator does not come on can result in incorrect diagnosis. The connector illustrations show the female terminal connectors with a single outline and the male terminal connectors with a double outline.

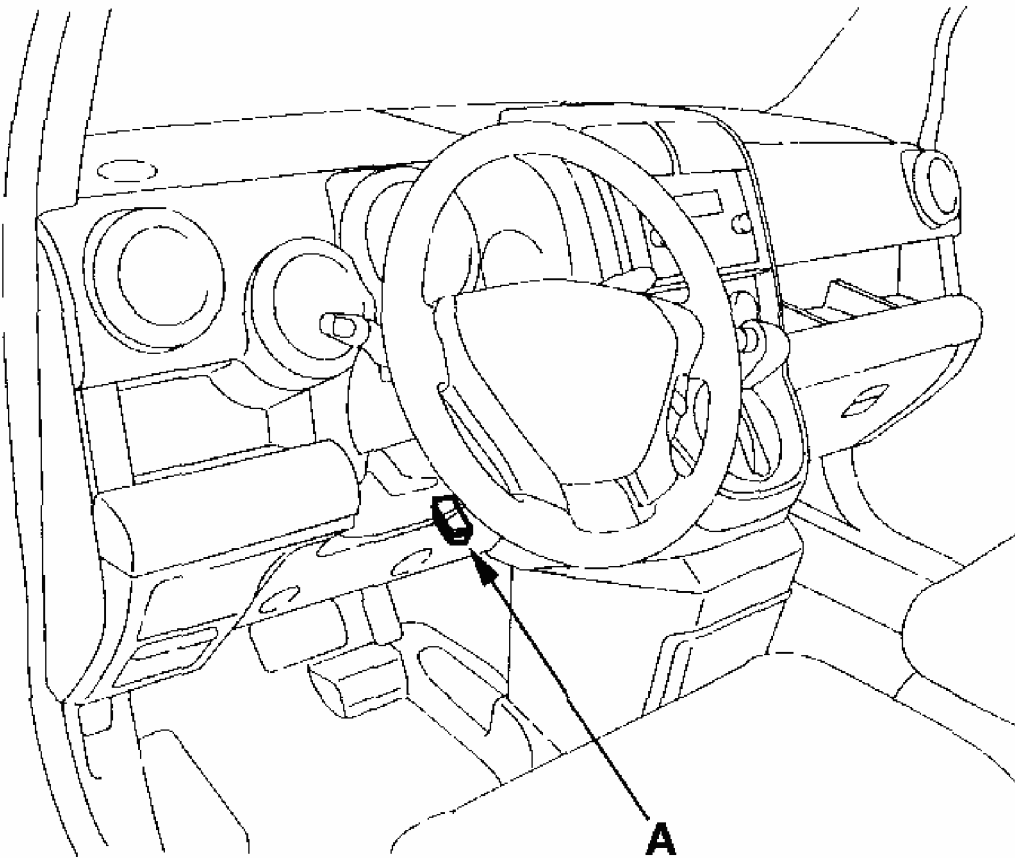
1. Ask the customer about the conditions when the problem occurred, and try to reproduce the same conditions for troubleshooting. Find out when the indicator and possibly the brake system indicator came on, such as during control, after control, when the vehicle was at a certain speed, etc.
2. When the ABS indicator and possibly the brake system indicator does not come on during the test-drive, but troubleshooting is done based on the DTC, check for loose connectors, poor terminal contact, etc., before you start troubleshooting.
3. After troubleshooting, clear the DTC, and test-drive the vehicle. Make sure the ABS indicator and possibly the brake system indicator does not come on.

INTERMITTENT FAILURES

The term "intermittent failure" means a system may have had a failure, but it checks OK now. If the indicator(s) of the system on the dash does not come on, check for poor connections or loose pins at all connectors related to the circuit that you are troubleshooting. If the indicators were on but then went out, the original problem may have been intermittent.

HOW TO RETRIEVE DTCS

1. With the ignition switch OFF, connect the HDS to the 16P data link connector (DLC) (A) under the driver's side of the dashboard.



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Fig. 2: Identifying Data Link Connector (DLC) (A) Under Driver's Side Of Dashboard

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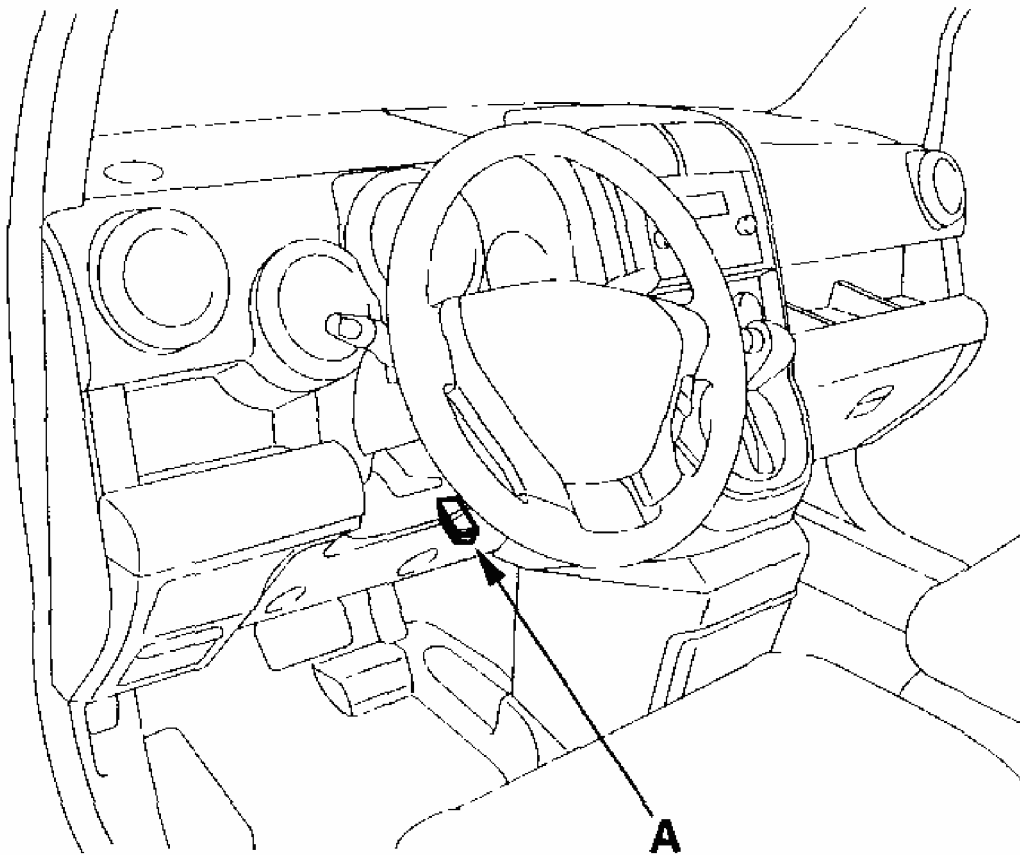
2. Turn the ignition switch ON (II), and follow the prompts on the HDS to display the

DTC(s) on the screen. After determining the DTC, refer to the **DTC TROUBLESHOOTING**.

NOTE: See the HDS Help menu for specific instructions.

HOW TO CLEAR DTCS

1. With the ignition switch OFF, connect the HDS to the 16P data link connector (DLC) (A) under the driver's side of the dashboard.



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Fig. 3: Identifying Data Link Connector (DLC) (A) Under Driver's Side Of Dashboard

Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Turn the ignition switch ON (II), and clear the DTC(s) by following the screen prompts on the HDS.

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NOTE: See the HDS Help menu for specific instructions.

DTC TROUBLESHOOTING INDEX

DTC TROUBLESHOOTING CHART

DTC	ABS indicator	Brake system indicator	Detection Item	Troubleshooting
11	ON	ON or OFF	Right-front wheel sensor (open/short to body ground/short to power)	(see DTC TROUBLESHOOTING)
12	ON	ON or OFF	Right-front wheel sensor (electrical noise/intermittent interruption)	(see DTC 12,14,16,18: WHEEL SENSOR (ELECTRICAL NOISE/INTERMITTENT INTERRUPTION))
13	ON	ON or OFF	Left-front wheel sensor (open/short to body ground/short to power)	(see DTC TROUBLESHOOTING)
14	ON	ON or OFF	Left-front wheel sensor (electrical noise/intermittent interruption)	(see DTC 12,14,16,18: WHEEL SENSOR (ELECTRICAL NOISE/INTERMITTENT INTERRUPTION))
15	ON	ON or OFF	Right-rear wheel sensor (open/short to body ground/short to power)	(see DTC TROUBLESHOOTING)
16	ON	ON or OFF	Right-rear wheel sensor (electrical noise/intermittent interruption)	(see DTC 12,14,16,18: WHEEL SENSOR (ELECTRICAL NOISE/INTERMITTENT INTERRUPTION))
17	ON	ON or OFF	Left-rear wheel sensor (open/short to body ground/short to power)	(see DTC TROUBLESHOOTING)
18	ON	ON or OFF	Left-rear wheel sensor (electrical noise/intermittent interruption)	(see DTC 12,14,16,18: WHEEL SENSOR (ELECTRICAL NOISE/INTERMITTENT INTERRUPTION))
21	ON	ON or	Right-front magnetic	(see DTC 21,22,23,24:

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		OFF	encoder	MAGNETIC ENCODER)
22	ON	ON or OFF	Left-front magnetic encoder	(see DTC 21,22,23,24: MAGNETIC ENCODER)
23	ON	ON or OFF	Right-rear magnetic encoder	(see DTC 21,22,23,24: MAGNETIC ENCODER)
24	ON	ON or OFF	Left-rear magnetic encoder	(see DTC 21,22,23,24: MAGNETIC ENCODER)
31	ON	ON	Solenoid	(see DTC 21,22,23,24: MAGNETIC ENCODER)
32	ON	ON	Solenoid	(see DTC 21,22,23,24: MAGNETIC ENCODER)
33	ON	ON	Solenoid	(see DTC 21,22,23,24: MAGNETIC ENCODER)
34	ON	ON	Solenoid	(see DTC 21,22,23,24: MAGNETIC ENCODER)
35	ON	ON	Solenoid	(see DTC 21,22,23,24: MAGNETIC ENCODER)
36	ON	ON	Solenoid	(see DTC 21,22,23,24: MAGNETIC ENCODER)
37	ON	ON	Solenoid	(see DTC 21,22,23,24: MAGNETIC ENCODER)
38	ON	ON	Solenoid	(see DTC 21,22,23,24: MAGNETIC ENCODER)
51	ON	OFF	Motor lock	(see DTC 51: MOTOR LOCK)
52	ON	OFF	Motor stuck OFF	(see DTC 52: MOTOR STUCK OFF)
53	ON	OFF	Motor stuck ON	(see DTC 53: MOTOR STUCK ON)
54	ON	ON	ABS fail-safe relay	(see DTC 54: ABS FAIL-SAFE RELAY)
61	ON	ON or OFF	IG2 voltage low	(see DTC 61,62: IG2 VOLTAGE)
62	ON	ON	IG2 voltage high	(see DTC 61,62: IG2 VOLTAGE)
81	ON	ON or OFF	Central Processing Unit (CPU) diagnosis, and ROM/RAM diagnosis	(see DTC 81: CENTRAL PROCESSING UNIT (CPU) DIAGNOSIS, AND ROM/RAM DIAGNOSIS)

SYMPTOM TROUBLESHOOTING INDEX

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SYMPTOM TROUBLESHOOTING CHART

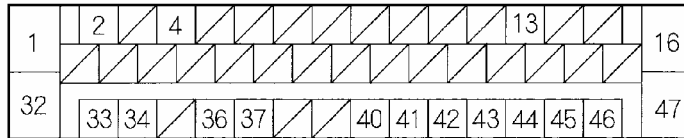
Symptom	Diagnostic procedure
ABS indicator does not come on	ABS Indicator Circuit Troubleshooting (see <u>ABS INDICATOR CIRCUIT TROUBLESHOOTING</u>)
ABS indicator does not go off, and no DTCs are stored	ABS Indicator Circuit Troubleshooting (see <u>ABS INDICATOR DOES NOT GO OFF, AND NO DTCs ARE STORED</u>)
Brake system indicator does not come on for the bulb check after the ignition switch is turned ON (II), and the parking brake switch and brake fluid reservoir switch are open	Brake System Indicator Circuit Troubleshooting (see <u>BRAKE SYSTEM INDICATOR CIRCUIT TROUBLESHOOTING</u>)
Brake system indicator does not go off, and no DTCs are stored	Brake System Indicator Circuit Troubleshooting (see <u>BRAKE SYSTEM INDICATOR CIRCUIT TROUBLESHOOTING</u>)
Both ABS and brake system indicator do not go off, and no DTCs are stored	ABS Indicator Circuit Troubleshooting (see <u>ABS INDICATOR CIRCUIT TROUBLESHOOTING</u>)

SYSTEM DESCRIPTION

ABS MODULATOR-CONTROL UNIT INPUTS AND OUTPUTS FOR 47P CONNECTOR

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Wire side of female terminals

Terminal number	Wire color	Terminal sign	Description	Measurement (Disconnect the ABS modulator-control unit 47P connector)			
				Terminal	Conditions	Voltage	
1	WHT/ RED	+B-P	Power source for the pump motor relay	1-GND	At all times	Battery Voltage	
2	GRY	DIAG-H	Communicates with HDS	---	---	---	
4	BLK/ ORN	IG2	Power source for activating the system	4-GND	Ignition switch ON (II)	Battery Voltage	
13	BRN/ YEL	EBD	Drives brake system indicator	13-GND	Parking brake released, ignition switch turned from OFF to ON	During bulb check (light ON)	About 10 V
						After bulb check (light OFF)	Below 1 V
16	BLK	GND-V	Ground for the system/solenoid valve	16-1	At all times	Battery Voltage	

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Fig. 4: Identifying ABS Modulator-Control Unit Inputs And Outputs For 47P Connector (1 Of 2)

Courtesy of AMERICAN HONDA MOTOR CO., INC.

Terminal number	Wire color	Terminal sign	Description	Measurement (Disconnect the ABS modulator-control unit 47P connector)			
				Terminal	Conditions	Voltage	
32	WHT/ GRN	+B-V	Power source for the system/solenoid valve	32-GND	At all times	Battery Voltage	
33	BLU	FR-GND	Detects right-front wheel sensor signal	---	---	---	
34	GRN/ BLK	FR +B					
36	YEL/ RED	RL +B	Detects left-rear wheel sensor signal	---	---	---	
37	GRY/ RED	RL-GND					
40	BRN	SCS	Use for DTC indication or clearing	40-GND	Ignition switch ON (II)	About 5 V	
41	WHT/ BLK	STOP	Detects brake switch signal	41-GND	Brake pedal	Pressed	Battery Voltage
						Released	Below 0.3 V
42	BLU/ YEL	RR-GND	Detects right-rear wheel sensor signal	---	---	---	
43	GRN/ YEL	RR +B					
44	BLU/ RED	ABS	Drive ABS indicator	44-GND	Ignition switch ON (II)	About 6 V	
45	BLU/ ORN	FL +B	Detects left-front wheel sensor signal	---	---	---	
46	BRN/ WHT	FL-GND					
47	BLK	GND-P	Ground for the pump motor	47-1	At all times	Battery Voltage	

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Fig. 5: Identifying ABS Modulator-Control Unit Inputs And Outputs For 47P Connector (2 Of 2)

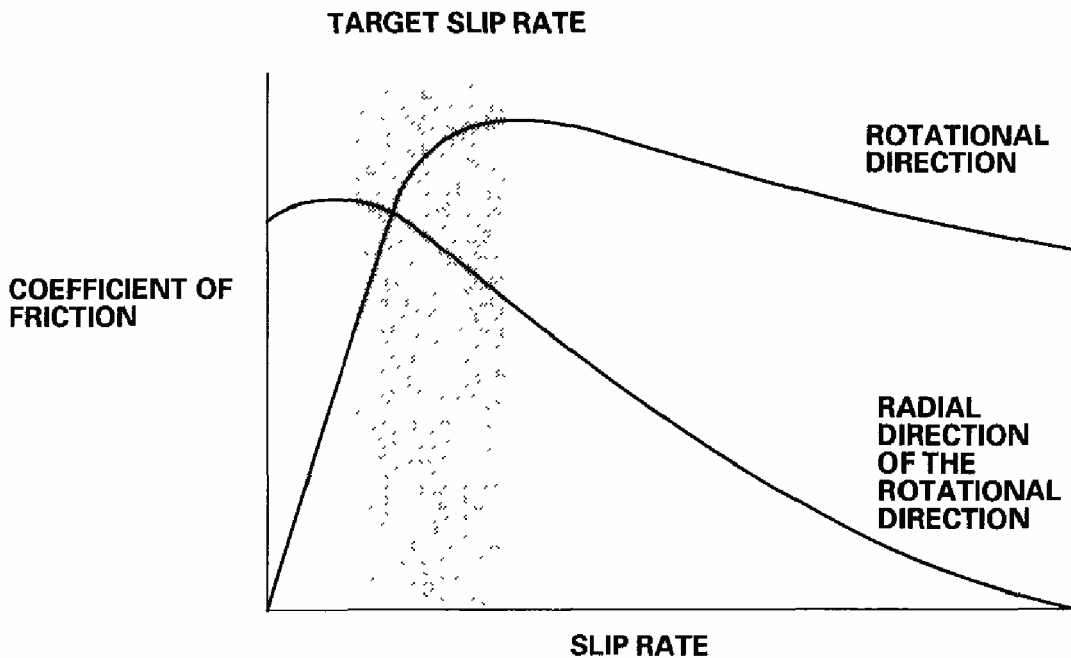
Courtesy of AMERICAN HONDA MOTOR CO., INC.

FEATURES

When the brake pedal is pressed during driving, the wheels can lock before the vehicle comes to a stop. In such an event, the maneuverability of the vehicle is reduced if the front wheels are locked, and the stability of the vehicle is reduced if the rear wheels are locked, creating an extremely unstable condition. The ABS precisely controls the slip rate of the wheels to ensure maximum grip force from the tires, thereby ensuring the maneuverability and stability of the vehicle.

The ABS calculates the slip rate of the wheels based on the vehicle speed and the wheel speed, then it controls the brake fluid pressure to reach the target slip rate.

Grip force of tire and road surface



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Fig. 6: Identifying Grip Force Of Tire And Road Surface

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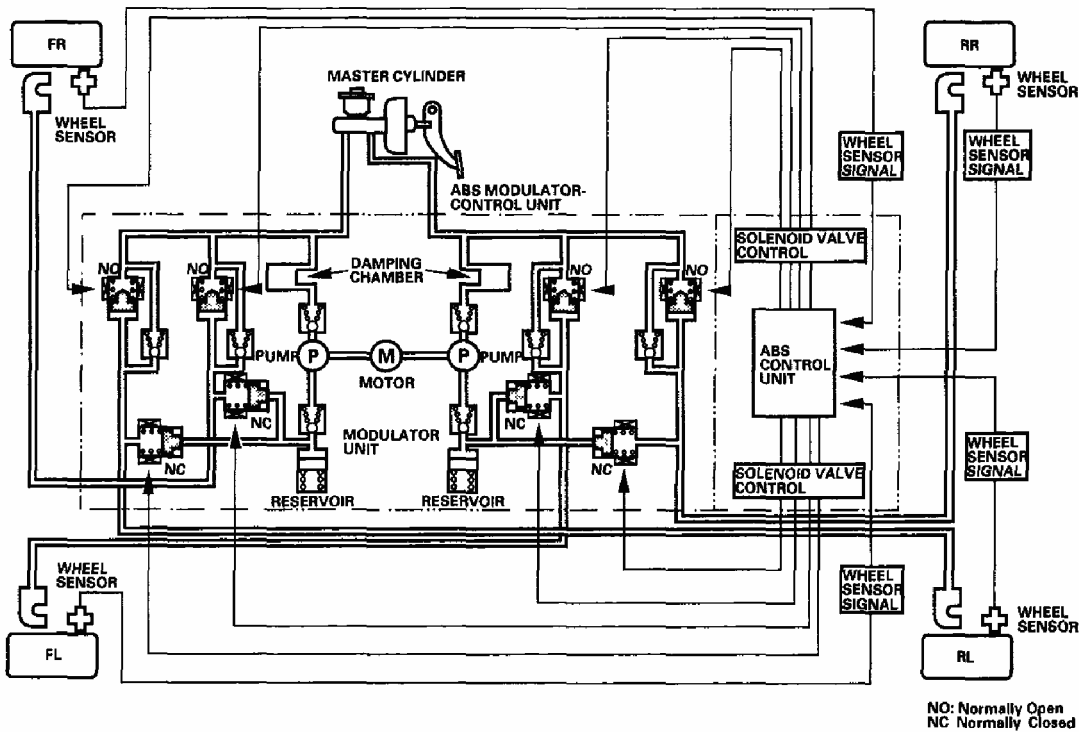
MAIN FUNCTION CHART

COMPONENTS	MAIN FUNCTION
Wheel sensor	The wheel sensor outputs the speed signal to the ABS control unit according to the magnetic

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		encoder's rotation speed.
ABS modulator-control unit	ABS control unit	The ABS control unit processes the signal from the wheel sensor, then outputs the ABS control signal to the modulator unit.
	Modulator unit	The modulator unit receives the control signal, then controls brake fluid pressure for each wheel.
Pump motor relay (inside of the ABS modulator-control unit)		The pump motor relay drives the pump motor.
ABS fail-safe relay (inside of the ABS modulator-control unit)		The ABS fail-safe relay cuts the power to the solenoid valve when a problem is detected.



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Fig. 7: Identifying ABS Fail-Safe Relay Inside Of ABS Modulator-Control Unit
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

ABS CONTROL UNIT

Main Control

The ABS control unit detects the wheel speed based on the wheel sensor signal it received, then it calculates the vehicle speed based on the detected wheel speed. The control unit detects the vehicle speed during deceleration based on the rate of deceleration.

The ABS control unit calculates the slip rate of each wheel, and transmits the control signal

to the modulator unit solenoid valve when the slip rate is high.

The hydraulic control has three modes: Pressure reducing, pressure retaining, and pressure intensifying.

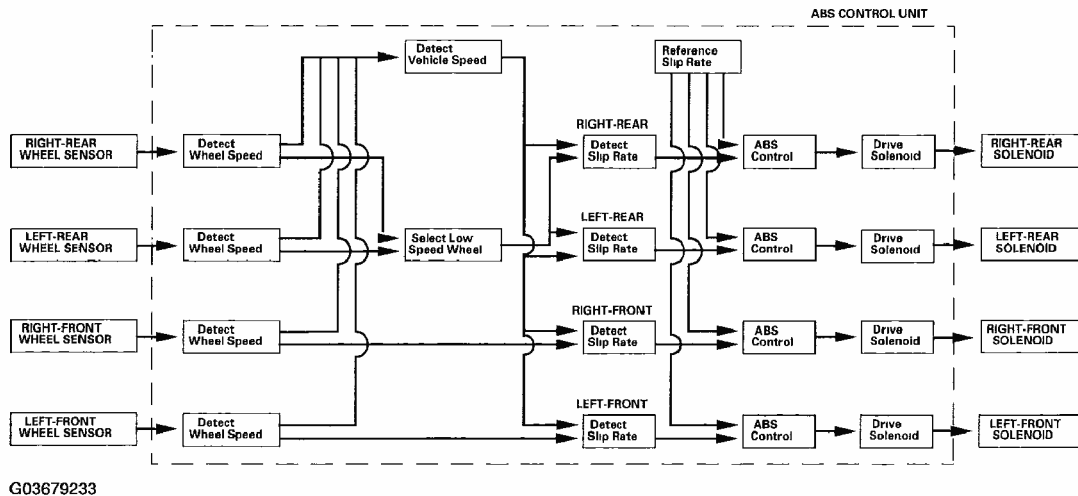


Fig. 8: Identifying Hydraulic Control Modes
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

Electronic Brake Distribution (EBD) Control

The electronic brake distribution (EBD) function helps control vehicle braking by adjusting the rear brake force before the ABS operates. Based on wheel sensor signals, the ABS control unit uses the modulator to control the rear brakes individually. When the rear wheel speed is less than the front wheel speed, the ABS control unit retains the current rear brake fluid pressure by closing the inlet valve in the modulator. As the rear wheel speed increases and approaches the front wheel speed, the control unit increases the rear brake fluid pressure by momentarily opening the inlet valve. This whole process is repeated very rapidly. While this is happening, there may be kickback at the brake pedal.

During self-diagnosis, if the ABS control unit detects a problem that affects the EBD, it turns on the brake system indicator and the ABS indicator.

Self-diagnosis Function

1. The ABS control unit is equipped with a CPU and a monitor IC. They check each other for problems.
2. The CPU checks the system circuits.
3. The ABS control unit turns on the ABS and possibly the brake system indicator when the unit detects a problem, and the unit stops ABS operation.
4. The self-diagnosis can be classified into these two categories:

- Initial diagnosis
- Regular diagnosis

On-board Diagnosis Function

The ABS can be diagnosed with the HDS.

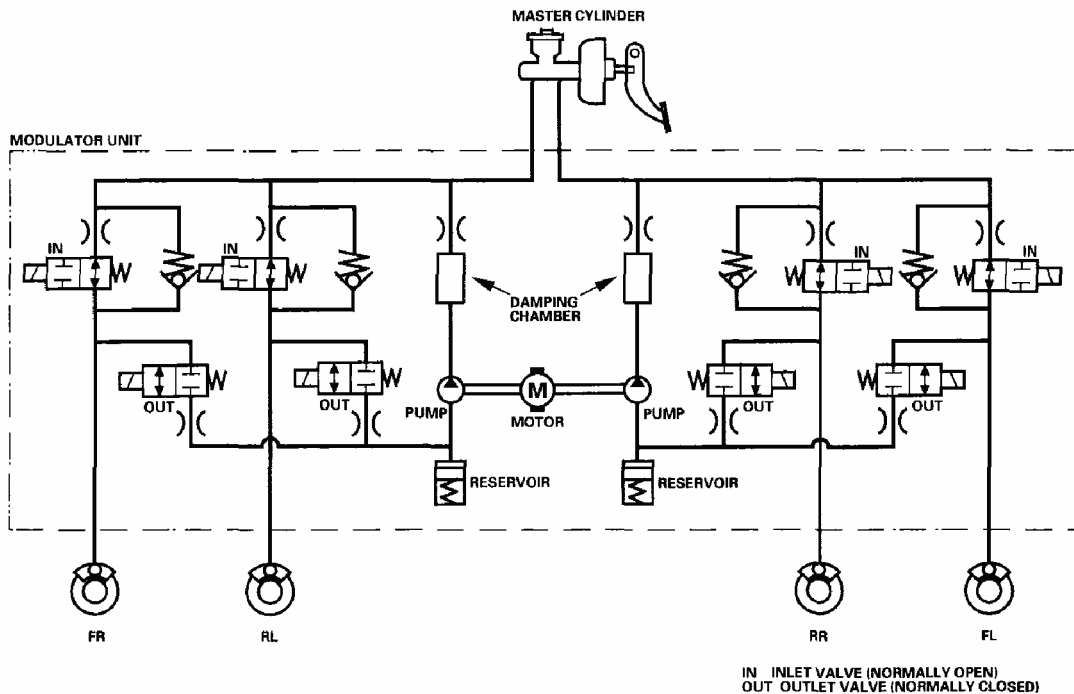
The ALB Checker cannot be used with this system. For air bleeding, and checking wheel sensor signals, use the HDS.

See the HDS Help menu for specific operating instructions.

MODULATOR UNIT

The ABS modulator consists of inlet solenoid valves, outlet solenoid valves, reservoir, pump, and the pump motor. The modulator reduces the caliper fluid pressure directly. It is a circulating-type modulator because the brake fluid circulates through the caliper, reservoir, and the master cylinder. The hydraulic control has three modes: Normal braking, pressure retaining, and pressure reducing. The hydraulic circuit is an independent four channel type, one channel for each wheel.

Shown in normal braking mode



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Fig. 9: Identifying Modulator Unit Wiring Diagram
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Normal braking mode: Inlet valve open, outlet valve closed:

Master cylinder fluid is pumped out to the caliper.

Pressure retaining mode: Inlet valve closed, outlet valve closed:

Caliper fluid is retained by the inlet valve and outlet valve.

Pressure reducing mode: Inlet valve closed, outlet valve open:

Caliper fluid flows through the outlet valve to the reservoir.

When in pressure reducing mode, the pump motor is ON.

The reservoir fluid is pumped out by the pump, through the damping chamber, to the master cylinder.

When stopping ABS operation, the pump motor is OFF.

WHEEL SENSORS

The wheel sensors are the magnetic contactless type. The wheel sensors detect changing of magnetic polarity on the magnetic encoder contained inside the wheel bearings. The ABS control unit calculates the wheel speed based on signals received from the wheel sensor.

NOTE: The wheel bearings are directional. Wheel speed and modulator control

Wheel speed and modulator control

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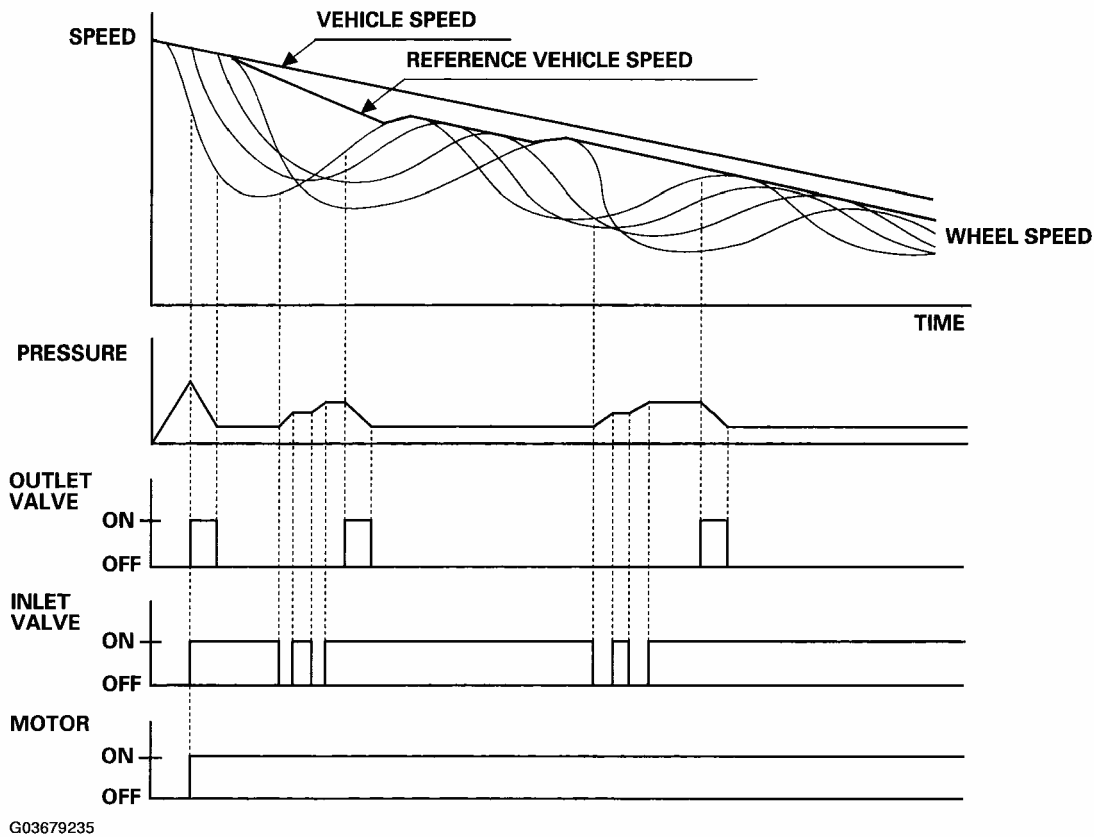


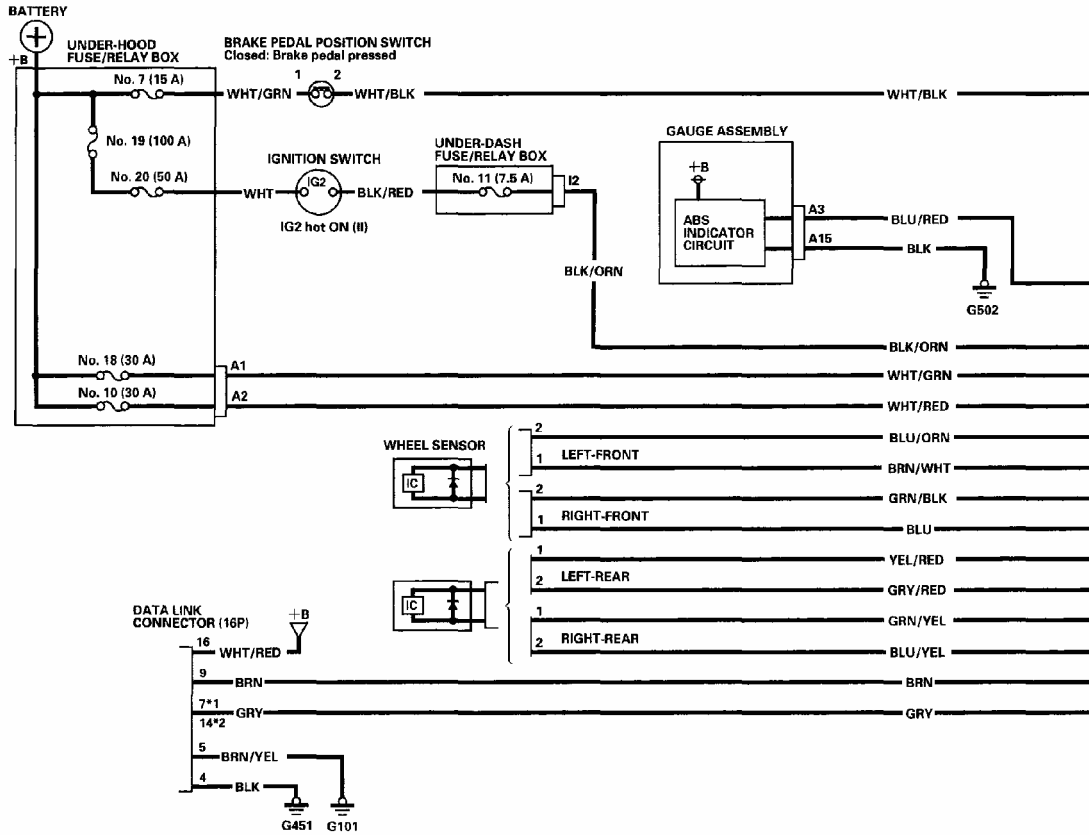
Fig. 10: Identifying Wheel Speed And Modulator Control
Courtesy of AMERICAN HONDA MOTOR CO., INC.

When the wheel speed drops sharply below the vehicle speed, the outlet valve opens momentarily to reduce the caliper fluid pressure. The pump motor starts at this time. As the wheel speed is restored, the inlet valve opens momentarily to increase the caliper fluid pressure.

CIRCUIT DIAGRAM

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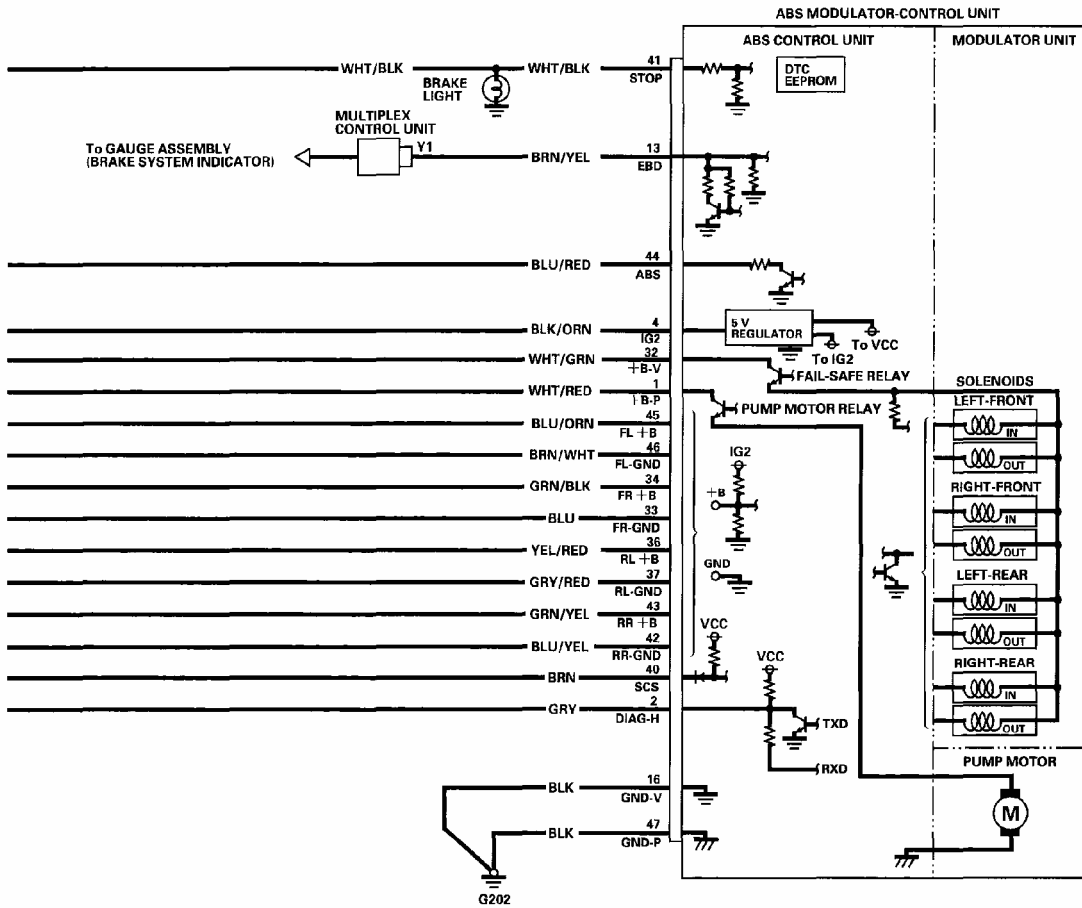
*1: 2003-2004 models
*2: 2005-2006 models

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Fig. 11: Identifying ABS Components Circuit Diagram (1 Of 3)
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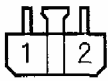
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Fig. 12: Identifying ABS Components Circuit Diagram (2 Of 3)
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

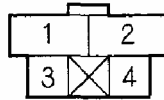
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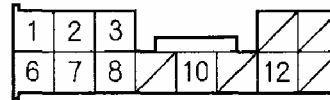
UNDER-HOOD FUSE/RELAY BOX CONNECTOR A (2P)



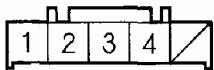
BRAKE PEDAL POSITION SWITCH 4P CONNECTOR



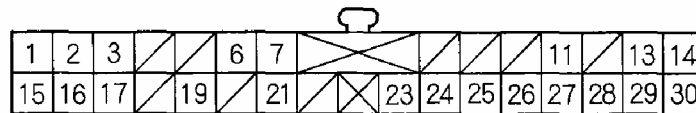
MULTIPLEX CONTROL UNIT 13P CONNECTOR (Under-dash fuse/relay box connector Y)



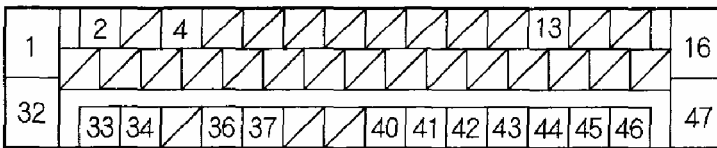
UNDER-DASH FUSE/RELAY BOX CONNECTOR I (5P)



GAUGE ASSEMBLY CONNECTOR A (30P)

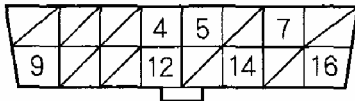


ABS MODULATOR-CONTROL UNIT 47P CONNECTOR



Wire side of female terminals

DATA LINK CONNECTOR (16P)



Terminal side of female terminals

WHEEL SENSOR 2P CONNECTORS FRONT REAR



Wire side of female terminals



Terminal side of male terminals

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Fig. 13: Identifying ABS Components Circuit Diagram (3 Of 3)
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DTC TROUBLESHOOTING

DTC INDEX

DTC	Description
DTC 11,13,15,17	Wheel Sensor (Open/Short to Body Ground/Short to Power)
DTC 12,14,16,18	Wheel Sensor (Electrical Noise/Intermittent Interruption)
DTC 21,22,23,24	Magnetic Encoder
DTC 31, 32, 33, 34, 35, 36, 37, 38	Solenoid
DTC 51	Motor Lock; DTC 52: Motor Stuck OFF
DTC 53	Motor Stuck ON
DTC 54	ABS Fail-safe Relay

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DTC 61,62	IG2 Voltage
DTC 81	Central Processing Unit (CPU) Diagnosis, and ROM/RAM Diagnosis

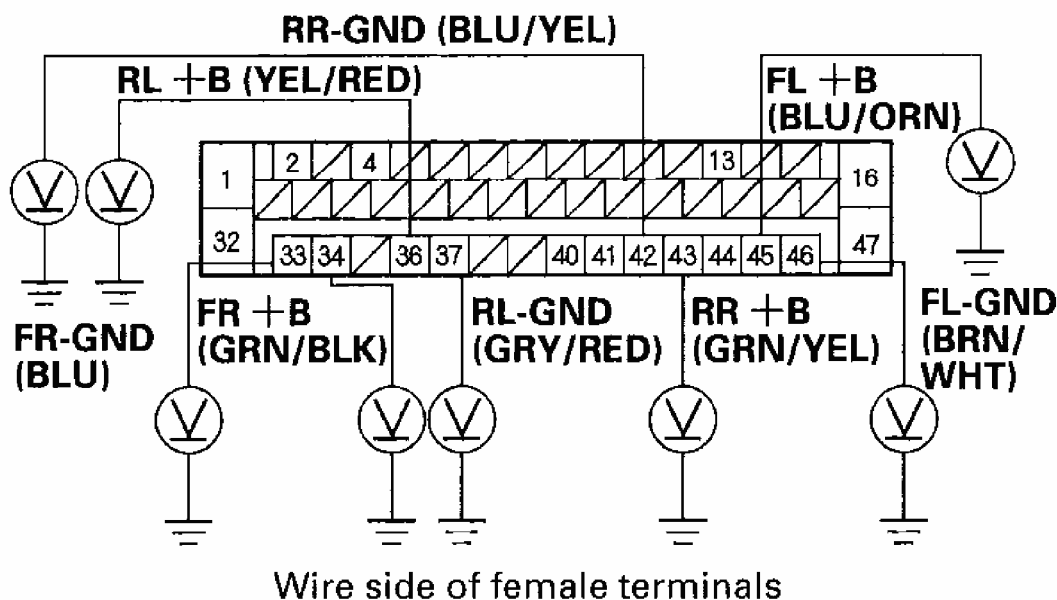
DTC 11,13,15,17: WHEEL SENSOR (OPEN/SHORT TO BODY GROUND/SHORT TO POWER)

1. Disconnect the ABS modulator-control unit 47P connector.
2. Start the engine.
3. Measure the voltage between body ground and the appropriate wheel sensor +B and GND terminals of the ABS modulator-control unit 47P connector individually (see table).

WHEEL SENSOR TERMINAL IDENTIFICATION CHART

DTC	Appropriate Terminal	
	+B	GND
11 (Right-front)	FR+B: No. 34	FR-GND: No. 33
13 (Left-front)	FL+B: No. 45	FL-GND: No. 46
15 (Right-rear)	RR+B: No. 43	RR-GND: No. 42
17 (Left-rear)	RL+B: No. 36	RL-GND: No. 37

ABS MODULATOR-CONTROL UNIT 47P CONNECTOR



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Fig. 14: Identifying Wheel Sensor To Control Unit Circuits

Courtesy of AMERICAN HONDA MOTOR CO., INC.

Is there 0.1 V or more?

YES- Repair short to power in the wire between the ABS modulator-control unit and the appropriate wheel sensor.

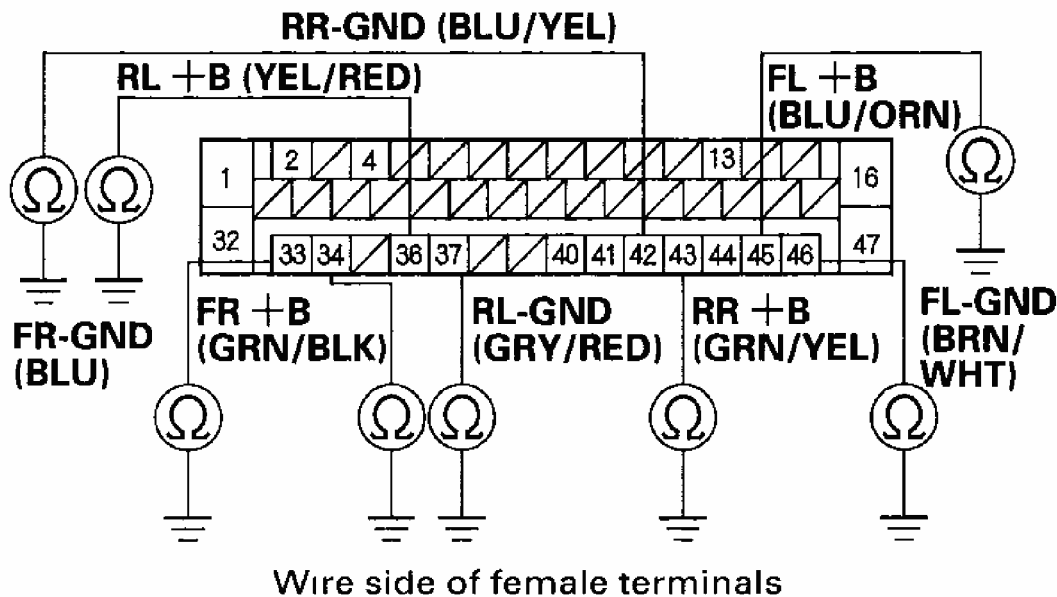
NO- Go to step 4.

4. Turn the ignition switch OFF.
5. Check for continuity between body ground and the appropriate wheel sensor +B and GND terminals of the ABS modulator-control unit 47P connector individually (see table).

WHEEL SENSOR TERMINAL IDENTIFICATION CHART

DTC	Appropriate Terminal	
	+B	GND
11 (Right-front)	FR+B: No. 34	FR-GND: No. 33
13 (Left-front)	FL+B: No. 45	FL-GND: No. 46
15 (Right-rear)	RR+B: No. 43	RR-GND: No. 42
17 (Left-rear)	RL+B: No. 36	RL-GND: No. 37

ABS MODULATOR-CONTROL UNIT 47P CONNECTOR



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Fig. 15: Identifying Wheel Sensor To Control Unit Circuits
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

Is there continuity?

YES- Go to step 6.

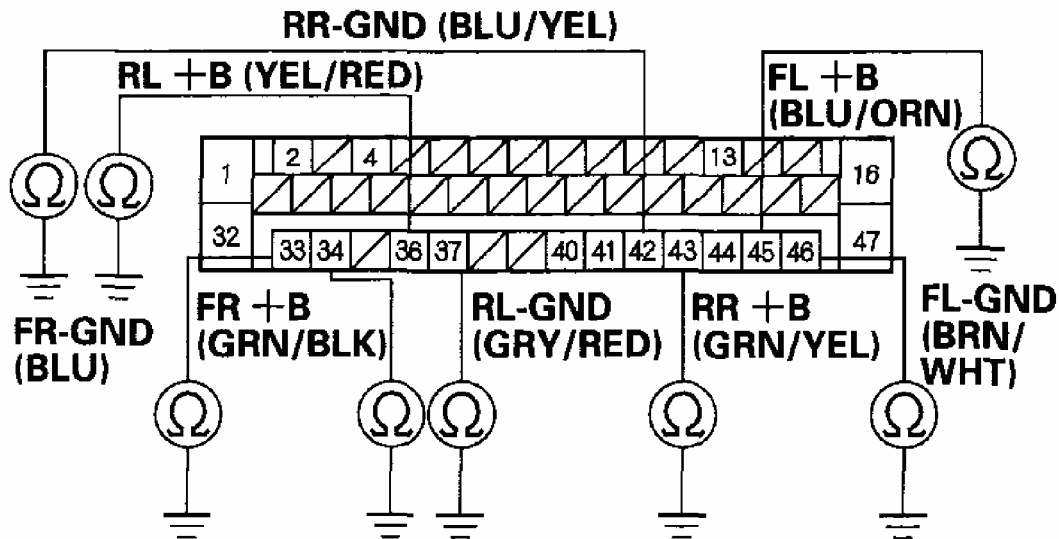
NO- Go to step 8.

6. Disconnect the appropriate wheel sensor 2P connector.
7. Check for continuity between body ground and the appropriate wheel sensor +B and GND terminals of the ABS modulator-control unit 47P connector individually (see table).

WHEEL SENSOR TERMINAL IDENTIFICATION CHART

DTC	Appropriate Terminal	
	+B	GND
11 (Right-front)	FR+B: No. 34	FR-GND: No. 33
13 (Left-front)	FL+B: No. 45	FL-GND: No. 46
15 (Right-rear)	RR+B: No. 43	RR-GND: No. 42
17 (Left-rear)	RL+B: No. 36	RL-GND: No. 37

ABS MODULATOR-CONTROL UNIT 47P CONNECTOR



Wire side of female terminals

G03679241

Fig. 16: Identifying Wheel Sensor To Control Unit Circuits
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

Is there continuity?

YES- Repair short to body ground in the wire between the ABS modulator-

control unit and the wheel sensor.

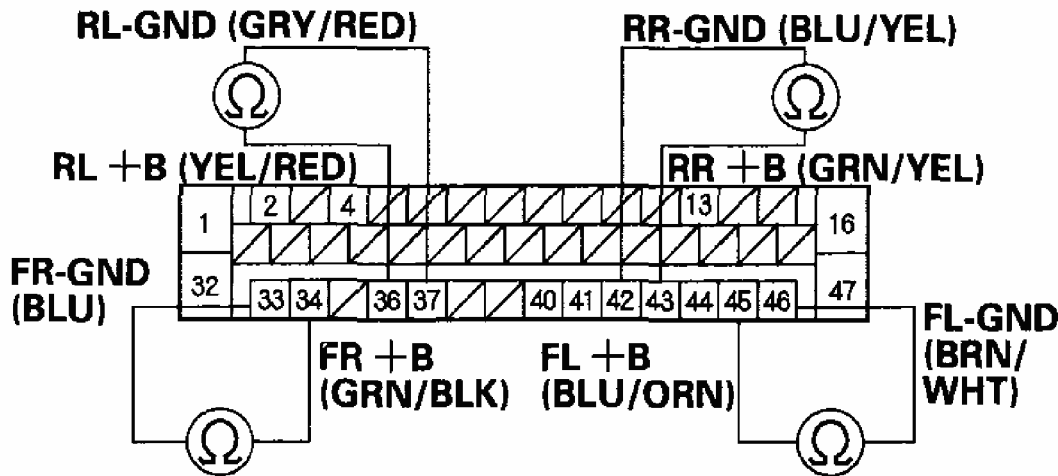
NO- Replace the wheel sensor (see **WHEEL SENSOR REPLACEMENT**).

8. Measure the resistance between the appropriate wheel sensor +B and GND terminals of the ABS modulator-control unit 47P connector (see **WHEEL SENSOR TERMINAL IDENTIFICATION CHART**), then measure the resistance between the same terminals and reverse the positive and negative tester probes.

WHEEL SENSOR TERMINAL IDENTIFICATION CHART

DTC	Appropriate Terminal	
	+B	GND
11 (Right-front)	FR+B: No. 34	FR-GND: No. 33
13 (Left-front)	FL+B: No. 45	FL-GND: No. 46
15 (Right-rear)	RR+B: No. 43	RR-GND: No. 42
17 (Left-rear)	RL+B: No. 36	RL-GND: No. 37

ABS MODULATOR-CONTROL UNIT 47P CONNECTOR



Wire side of female terminals

G03679242

Fig. 17: Identifying Wheel Sensor To Control Unit Circuits
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

Is the resistance infinity (open circuit) in both directions?

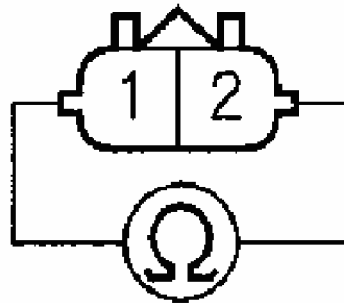
YES- Go to step 9.

NO- Go to step 11.

9. Disconnect the appropriate wheel sensor 2P connector.
10. Measure the resistance between the appropriate wheel sensor 2P connector terminals, then measure the resistance between the same terminals and reverse the positive and negative tester probes.

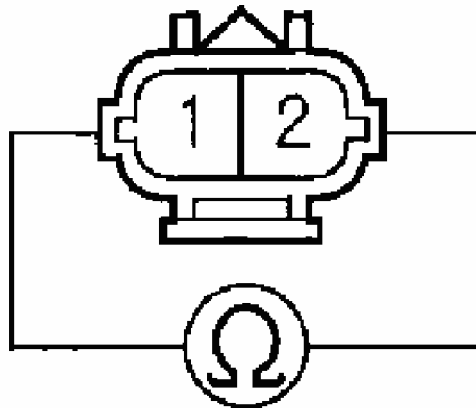
WHEEL SENSOR 2P CONNECTOR

FRONT



Wire side of female terminals

REAR



Terminal side of male terminals

G03679243

Fig. 18: Disconnecting Appropriate Wheel Sensor 2P Connector

Courtesy of AMERICAN HONDA MOTOR CO., INC.

Is the resistance infinity (open circuit) in both directions?

YES- Replace the wheel sensor (see **WHEEL SENSOR REPLACEMENT**).

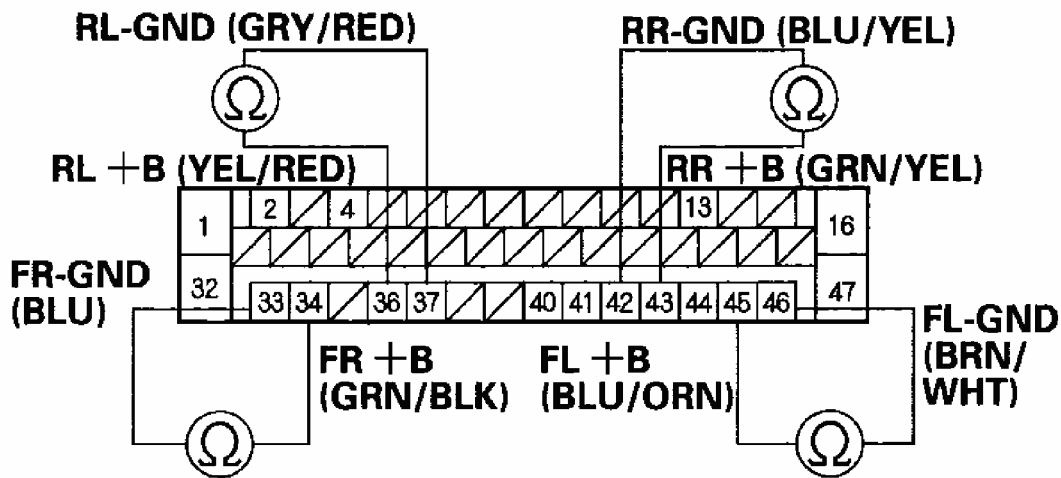
NO- Repair open in the wire between the ABS modulator-control unit and the wheel sensor.

11. Disconnect the appropriate wheel sensor 2P connector.
12. Check for continuity between the appropriate wheel sensor +B and GND terminals of the ABS modulator-control unit 47P connector (see table).

WHEEL SENSOR TERMINAL IDENTIFICATION CHART

DTC	Appropriate Terminal	
	+B	GND
11 (Right-front)	FR+B: No. 34	FR-GND: No. 33
13 (Left-front)	FL+B: No. 45	FL-GND: No. 46
15 (Right-rear)	RR+B: No. 43	RR-GND: No. 42
17 (Left-rear)	RL+B: No. 36	RL-GND: No. 37

ABS MODULATOR-CONTROL UNIT 47P CONNECTOR



Wire side of female terminals

G03679244

Fig. 19: Identifying Wheel Sensor To Control Unit Circuits
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

Is there continuity?

YES- Repair the wires between the ABS modulator-control unit and the wheel sensor that are shorted to each other.

NO- Go to step 13.

13. Replace the appropriate wheel sensor, then test-drive the vehicle.

Does the ABS indicator come on?

YES- Check for loose or poor connections at the ABS modulator-control unit 47P connector and the appropriate wheel sensor 2P connector. If the connectors are good, clear the DTC, and test-drive the vehicle. If the ABS indicator comes on and the same DTC is indicated, replace the ABS modulator-control unit (see **ABS MODULATOR-CONTROL UNIT REMOVAL AND INSTALLATION**).

NO- Troubleshooting is complete.

DTC 12,14,16,18: WHEEL SENSOR (ELECTRICAL NOISE/INTERMITTENT INTERRUPTION)

NOTE: If the ABS indicator comes on because of electrical noise, the indicator will go off when you test-drive the vehicle at 19 mph (30 km/h).

1. Clear the DTC using the HDS (see **HOW TO TROUBLESHOOT DTCS**).
2. Disconnect the HDS.
3. Turn the ignition switch OFF, then turn it ON (II) again.
4. Test-drive the vehicle.

Does the ABS indicator come on?

YES- Go to step 5.

NO- Intermittent failure, the system is OK at this time (see **HOW TO TROUBLESHOOT DTCS**).

5. Check the appropriate wheel sensor and magnetic encoder (see **WHEEL SENSOR INSPECTION**).

TERMINAL DIAGNOSTIC CHART

DTC	Appropriate Wheel Sensor
12	Right-front
14	Left-front
16	Right-rear
18	Left-rear

2004 Honda Element DX

2003-06 BRAKES ABS (Anti-Lock Brake System) - Element

Are they OK?

YES- Go to step 6.

NO- Reinstall or replace the appropriate wheel sensor and magnetic encoder (see **WHEEL SENSOR REPLACEMENT**).

6. Disconnect the ABS modulator-control unit 47P connector.
7. Check for continuity between the appropriate wheel sensor GND terminal and all other wheel sensor GND terminals (see table).

TERMINAL DIAGNOSTIC CHART

DTC	Appropriate Terminal	Other Terminals		
12	FR-GND: No. 33	No. 46	No. 42	No. 37
14	FL-GND: No. 46	No. 33	No. 42	No. 37
16	RR-GND: No. 42	No. 33	No. 46	No. 37
18	RL-GND: No. 37	No. 33	No. 46	No. 42

ABS MODULATOR-CONTROL UNIT 47P CONNECTOR



Wire side of female terminals

G03679245

Fig. 20: Identifying Wheel Sensor GND Terminals
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

Is there continuity?

2004 Honda Element DX

2003-06 BRAKES ABS (Anti-Lock Brake System) - Element

YES- Repair the short in the wires between the appropriate wheel sensor and the other wheel sensor.

NO- Go to step 8.

8. Replace the appropriate wheel sensor, and test-drive the vehicle.

Does the ABS indicator come ON?

YES- Clear the DTC, and test-drive the vehicle. If the ABS indicator comes on and the same DTC is indicated, replace the ABS modulator-control unit (see **ABS MODULATOR-CONTROL UNIT REMOVAL AND INSTALLATION**).

NO- The sensor was faulty. Troubleshooting is complete.

DTC 21,22,23,24: MAGNETIC ENCODER

1. Clear the DTC using the HDS (see **HOW TO TROUBLESHOOT DTCS**).
2. Disconnect the HDS from the 16P DLC.
3. Test-drive the vehicle at 19 mph (30 km/h) or more.

Does the ABS indicator come on, and are DTCs 21, 22,23, and/or 24 indicated?

YES- Go to step 4.

NO- Intermittent failure, the system is OK at this time (see **HOW TO TROUBLESHOOT DTCS**).

4. Check the appropriate wheel sensor and magnetic encoder (see table) (see **WHEEL SENSOR INSPECTION**).

TERMINAL DIAGNOSTIC CHART

DTC	Appropriate Wheel Sensor
21	Right-front
22	Left-front
23	Right-rear
24	Left-rear

Is the encoder OK?

YES- Go to step 5.

NO- Replace the encoder/wheel sensor (see **WHEEL SENSOR REPLACEMENT**).

5. Check that the encoders are installed correctly, and free from debris:
 - Front encoder (see **KNUCKLE/HUB/WHEEL BEARING REPLACEMENT**)
 - Rear encoder (see **KNUCKLE/HUB/WHEEL BEARING REPLACEMENT**)

Are they clean and installed correctly?

YES- Check for loose terminals in the ABS modulator-control unit 47P connector. If necessary, substitute a known-good ABS modulator-control unit, and recheck.

NO- Clean and reinstall or replace the appropriate encoder.

DTC 31, 32, 33, 34, 35, 36, 37, 38: SOLENOID

1. Clear the DTC using the HDS (see **HOW TO TROUBLESHOOT DTCS**).
2. Turn the ignition switch ON (II).
3. Verify the DTC.

Does the ABS indicator come on, and are DTCs 31, 32, 33, 34, 35, 36, 37, and/or 38 indicated?

YES- Check for loose terminals in the ABS modulator-control unit 47P connector. If necessary, substitute a known-good ABS modulator-control unit, and recheck. Replace the ABS modulator-control unit (see **ABS MODULATOR-CONTROL UNIT REMOVAL AND INSTALLATION**).

NO- Intermittent failure, the system is OK at this time (see **HOW TO TROUBLESHOOT DTCS**).

DTC 51: MOTOR LOCK; DTC 52: MOTOR STUCK OFF

1. Check the No. 10 (30 A) fuse in the under-hood fuse/relay box.

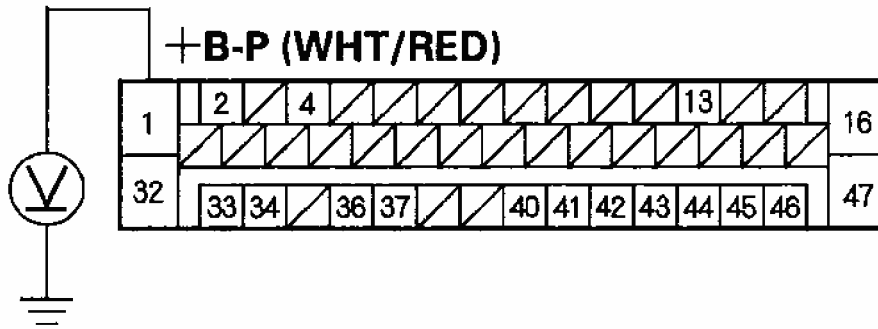
Is the fuse OK?

YES- Reinstall the fuse, and go to step 2.

NO- Replace the fuse, and recheck. If the fuse is blown, check for a short to body ground in this fuse circuit. If the circuit is OK, replace the ABS modulator-control unit (see **ABS MODULATOR-CONTROL UNIT REMOVAL AND INSTALLATION**).

2. Disconnect the ABS modulator-control unit 47P connector.
3. Measure the voltage between the ABS modulator-control unit 47P connector terminal No. 1 and body ground.

ABS MODULATOR-CONTROL UNIT 47P CONNECTOR



Wire side of female terminals

G03679246

Fig. 21: Measuring Voltage Between ABS Modulator-Control Unit 47P Connector Terminal And Body Ground

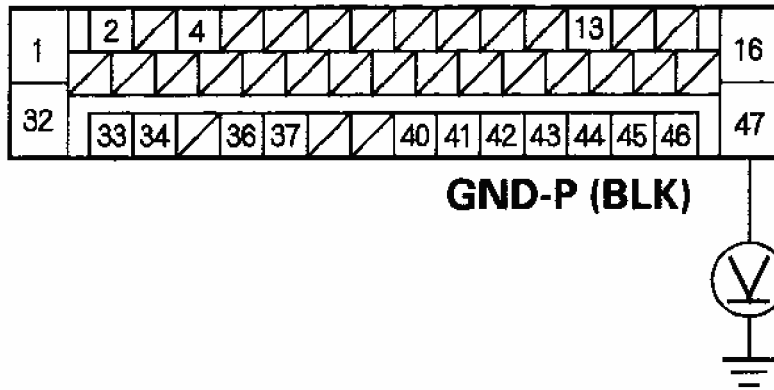
Courtesy of AMERICAN HONDA MOTOR CO., INC.

Is there battery voltage?

YES- Go to step 4.

NO- Repair open in the wire between the No. 10 (30 A) fuse and the ABS modulator-control unit.

4. Reconnect the ABS modulator-control unit 47P connector.
5. Turn the ignition switch ON (II).
6. Measure the voltage between the ABS modulator-control unit 47P connector terminal No. 47 and body ground.

ABS MODULATOR-CONTROL UNIT 47P CONNECTOR**Wire side of female terminals**

G03679247

Fig. 22: Measuring Voltage Between ABS Modulator-Control Unit 47P Connector Terminal No. 47 And Body Ground

Courtesy of AMERICAN HONDA MOTOR CO., INC.

*Is there less than 0.1 V?***YES-** Go to step 7.**NO-** Repair open in the wire between the ABS modulator-control unit and body ground (G202). If the wire is OK, repair G202.

7. Clear the DTC using the HDS (see **HOW TO TROUBLESHOOT DTCS**).
8. Disconnect the HDS from the 16P DLC.
9. Test-drive the vehicle at 6 mph (10 km/h) or more.

*Does the ABS indicator come on, and are DTC 51 or 52 indicated?***YES-** Check for loose or poor connections in the ABS modulator-control unit 47P connector. If the connections are good, replace the ABS modulator-control unit (see **ABS MODULATOR-CONTROL UNIT REMOVAL AND INSTALLATION**).**NO-** Intermittent failure, the system is OK at this time (see **HOW TO TROUBLESHOOT DTCS**).

DTC 53: MOTOR STUCK ON

1. Clear the DTC using the HDS (see page **HOW TO TROUBLESHOOT DTCS**).
2. Disconnect the HDS from the 16P DLC.
3. Test-drive the vehicle.

Does the ABS indicator come on, and is DTC 53 indicated?

YES- Replace the ABS modulator-control unit (see **ABS MODULATOR-CONTROL UNIT REMOVAL AND INSTALLATION**).

NO- Intermittent failure, the system is OK at this time (see **HOW TO TROUBLESHOOT DTCS**).

DTC 54: ABS FAIL-SAFE RELAY

1. Clear the DTC using the HDS (see **HOW TO TROUBLESHOOT DTCS**).
2. Disconnect the HDS.
3. Turn the ignition switch OFF, then turn it ON (II) again.
4. Test-drive the vehicle.

Does the ABS indicator come on, and is DTC 54 indicated?

YES- Go to step 5.

NO- Intermittent failure, the vehicle is OK at this time. Check for loose terminals at the ABS modulator-control unit.

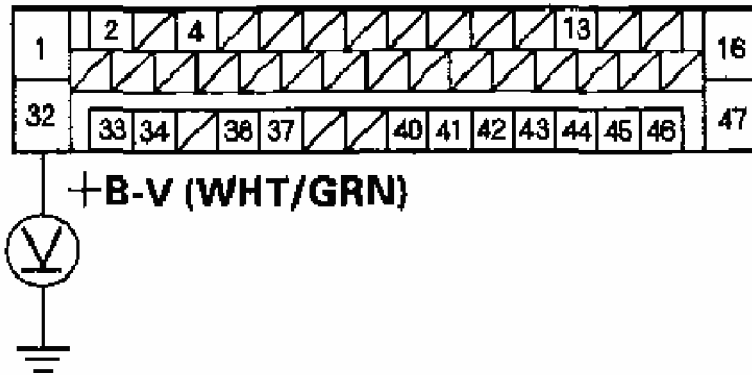
5. Check the No. 18 (30 A) fuse in the under-hood fuse/relay box.

Is the fuse OK?

YES- Reinstall the fuse, and go to step 6.

NO- Replace the fuse, and recheck. If the fuse is blown, check for a short to body ground in the +B-V circuit. If the circuit is OK, replace ABS modulator-control unit (see **ABS MODULATOR-CONTROL UNIT REMOVAL AND INSTALLATION**).

6. Disconnect the ABS modulator-control unit 47P connector.
7. Measure the voltage between the ABS modulator-control unit 47P connector terminal No. 32 and body ground.

ABS MODULATOR-CONTROL UNIT 47P CONNECTOR

Wire side of female terminals

G03679248

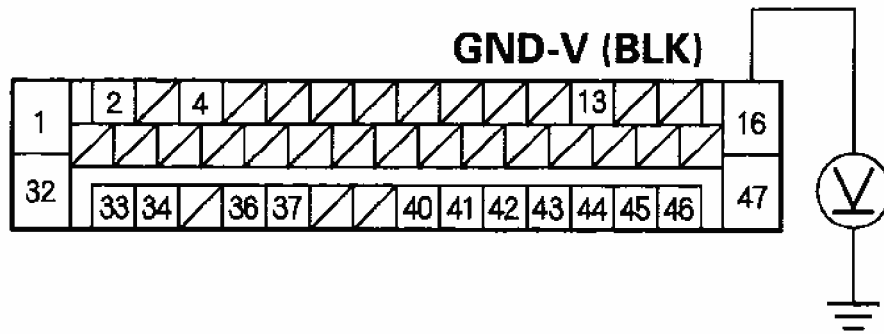
Fig. 23: Measuring Voltage Between ABS Modulator-Control Unit 47P Connector Terminal No. 32 And Body Ground
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

Is there battery voltage?

YES- Go to step 8.

NO- Repair open in the wire between the No. 18 (30 A) fuse and the ABS modulator-control unit.

8. Turn the ignition switch OFF.
9. Reconnect the ABS modulator-control unit 47P connector.
10. Turn the ignition switch ON (II).
11. Measure the voltage between the ABS modulator-control unit 47P connector terminal No. 16 and body ground.

ABS MODULATOR-CONTROL UNIT 47P CONNECTOR**Wire side of female terminals**

G03679249

Fig. 24: Measuring Voltage Between ABS Modulator-Control Unit 47P Connector Terminal No. 16 And Body Ground

Courtesy of AMERICAN HONDA MOTOR CO., INC.

Is there less than 0.1 V?

YES- Check for loose terminals in the ABS modulator-control unit 47P connector. If the terminals are OK, replace the ABS modulator-control unit (see **ABS MODULATOR-CONTROL UNIT REMOVAL AND INSTALLATION**).

NO- Repair open in the wire between the ABS modulator-control unit and body ground (G202). If the wire is OK, repair G202.

DTC 61,62: IG2 VOLTAGE

1. Clear the DTC using the HDS (see page **HOW TO TROUBLESHOOT DTCS**).
2. Disconnect the HDS.
3. Turn the ignition switch OFF, then turn it ON (II) again.
4. Test-drive the vehicle at 6 mph (10 km/h) or more.

Does the ABS indicator come on?

YES- Go to step 5.

NO- The system is OK at this time.

5. Verify the DTC.

Is DTC 61 or 62 indicated?

YES- Go to step 6.

NO- Do the appropriate troubleshooting for the DTC.

6. Check the charging system.

Is charging system OK?

YES- Check for loose terminals at the ABS modulator-control unit 47P connector and G202. If the terminals and ground are OK, replace the ABS modulator-control unit (see **ABS MODULATOR-CONTROL UNIT REMOVAL AND INSTALLATION**).

NO- Troubleshoot and repair the charging system.

DTC 81: CENTRAL PROCESSING UNIT (CPU) DIAGNOSIS, AND ROM/RAM DIAGNOSIS

1. Check for other DTCs.

Is another DTC present?

YES- Do the appropriate troubleshooting for the other DTC.

NO- Go to step 2.

2. Clear the DTC using the HDS (see **HOW TO TROUBLESHOOT DTCS**).
3. Disconnect the HDS from the 16P DLC.
4. Turn the ignition switch OFF, then turn it ON (II) again.
5. Test-drive the vehicle.

Does the ABS indicator come on, and is DTC 81 indicated?

YES- Check for loose terminals in the ABS modulator-control unit 47P connector, if connections are OK, replace the ABS modulator-control unit (see **ABS MODULATOR-CONTROL UNIT REMOVAL AND INSTALLATION**).

NO- Intermittent failure, the vehicle is OK at this time (see **HOW TO TROUBLESHOOT DTCS**).

ABS INDICATOR CIRCUIT TROUBLESHOOTING

ABS INDICATOR DOES NOT COME ON

1. Turn the ignition switch ON (II), and watch the ABS indicator.

Does the ABS indicator come on?

YES- Intermittent failure, the system is OK at this time (see **HOW TO TROUBLESHOOT DTCS**).

NO- Go to step 2.

2. Do the gauge assembly self-diagnosis function procedure (see **SELF-DIAGNOSTIC FUNCTION**).

Is the gauge assembly OK?

YES- Go to step 3.

NO- Replace the gauge assembly (see **GAUGE ASSEMBLY REPLACEMENT**).

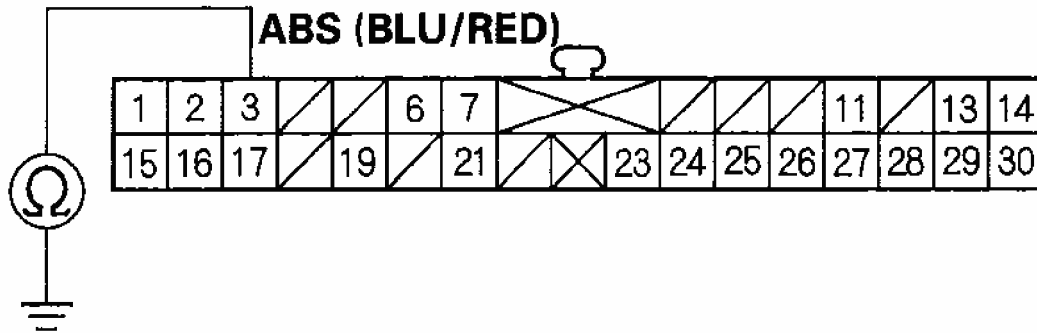
3. Turn the ignition switch OFF.
4. Disconnect the ABS modulator-control unit 47P connector.
5. Turn the ignition switch ON (II).

Does the ABS indicator come on?

YES- Check for loose terminals in the ABS modulator-control unit 47P connector. If necessary, substitute a known-good ABS modulator-control unit, and recheck.

NO- Go to step 6.

6. Turn the ignition switch OFF.
7. Remove the gauge assembly (see **GAUGE ASSEMBLY REPLACEMENT**).
8. Disconnect gauge assembly connector A (30P).
9. Check for continuity between gauge assembly connector A (30P) terminal No. 3 and body ground.

GAUGE ASSEMBLY CONNECTOR A (30P)

Wire side of female terminals

G03679250

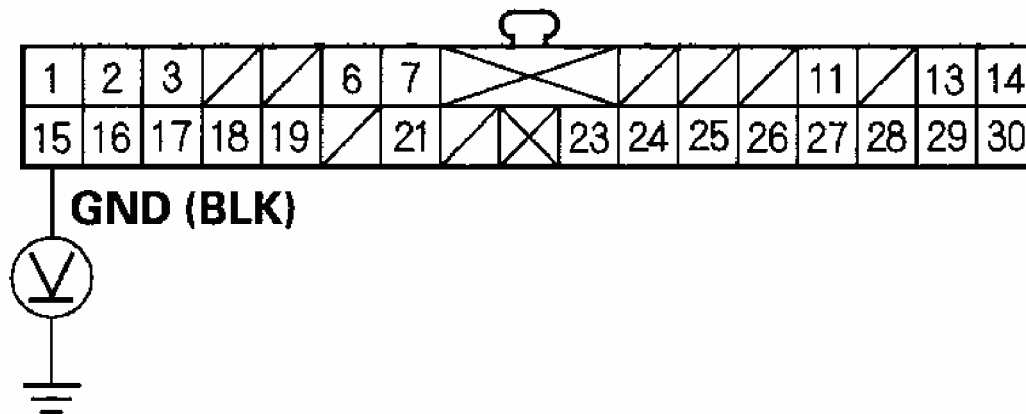
Fig. 25: Checking Continuity Between Gauge Assembly Connector A (30P) Terminal No. 3 And Body Ground
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

Is there continuity?

YES- Repair short to body ground in the wire between the gauge assembly and the ABS modulator-control unit.

NO- Go to step 10.

10. Reconnect the gauge assembly 30P connector, and turn the ignition switch ON (II).
11. Measure the voltage between gauge assembly connector A (30P) terminal No. 15 and body ground.

GAUGE ASSEMBLY CONNECTOR A (30P)

Wire side of female terminals

G03679251

Fig. 26: Measuring Voltage Between Gauge Assembly Connector A (30P) Terminal No. 15 And Body Ground
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

Is there less than 0.1 V?

YES- Check for loose terminals in the gauge assembly connectors. If the terminals are OK, replace the gauge assembly (see **GAUGE ASSEMBLY REPLACEMENT**).

NO- Repair open in the wire between the gauge assembly and body ground (G502). If the wire is OK, repair G502.

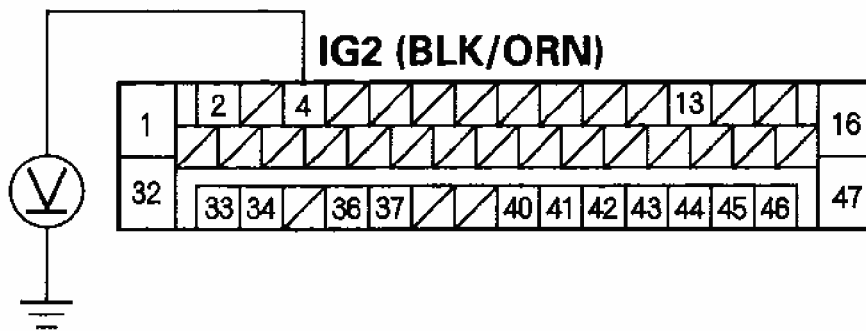
ABS INDICATOR DOES NOT GO OFF, AND NO DTCS ARE STORED

NOTE: The ABS indicator will stay ON any time the HDS is connected to the 16P DLC and in an ABS-related menu or function. Make sure you check the ABS indicator function after disconnecting the HDS.

1. Disconnect the ABS modulator-control unit 47P connector.
2. Turn the ignition switch ON (II).

3. Measure the voltage between the ABS modulator-control unit 47P connector terminal No. 4 and body ground.

ABS MODULATOR-CONTROL UNIT 47P CONNECTOR



Wire side of female terminals

G03679252

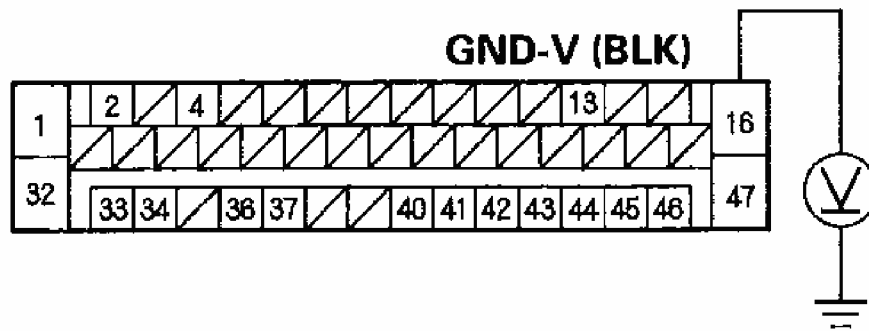
Fig. 27: Measuring Voltage Between ABS Modulator-Control Unit 47P Connector Terminal No. 4 And Body Ground
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

Is there battery voltage?

YES- Go to step 4.

NO- Repair open in the wire between the No. 11 (7.5 A) fuse and the ABS modulator-control unit.

4. Turn the ignition switch OFF, and reconnect the ABS modulator-control unit 47P connector.
5. Turn the ignition switch ON (II).
6. Measure the voltage between the ABS modulator-control unit 47P connector terminal No. 16 and body ground.

ABS MODULATOR-CONTROL UNIT 47P CONNECTOR

Wire side of female terminals

G03679253

Fig. 28: Measuring Voltage Between ABS Modulator-Control Unit 47P Connector Terminal No. 16 And Body Ground

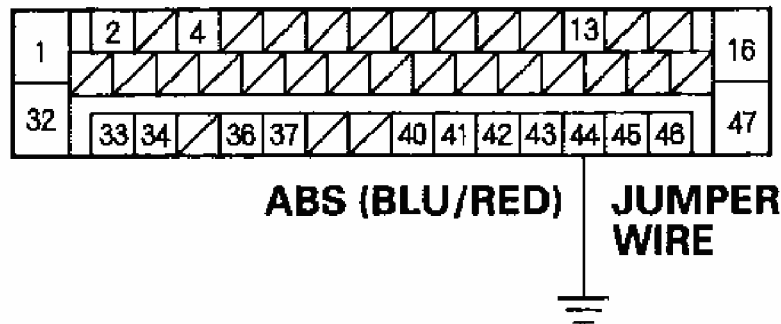
Courtesy of AMERICAN HONDA MOTOR CO., INC.

Is there less than 0.1 V?

YES- Go to step 7.

NO- Repair open in the wire between the ABS modulator-control unit and body ground (G202). If the wire is OK, repair G202.

7. Turn the ignition switch OFF.
8. Disconnect the ABS modulator-control unit 47P connector.
9. Turn the ignition switch ON (II).
10. Connect the ABS modulator-control unit 47P connector terminal No. 44 and body ground with a jumper wire.

ABS MODULATOR-CONTROL UNIT 47P CONNECTOR

Wire side of female terminals

G03679254

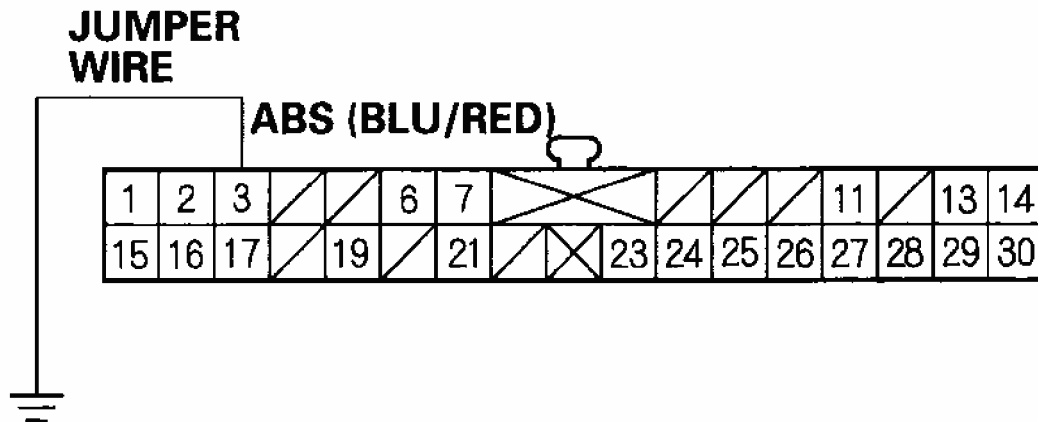
Fig. 29: Connecting ABS Modulator-Control Unit 47P Connector Terminal No. 44 And Body Ground With A Jumper Wire
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

Does the ABS indicator go off?

YES- Check for loose terminals in the ABS modulator-control unit 47P connector. If necessary, substitute a known-good ABS modulator-control unit, and recheck.

NO- Go to step 11.

11. Remove the gauge assembly, and leave the connector connected.
12. Connect gauge assembly connector A (30P) terminal No. 3 and body ground with a jumper wire.

GAUGE ASSEMBLY CONNECTOR A (30P)

Wire side of female terminals

G03679255

Fig. 30: Connecting Gauge Assembly Connector A (30P) Terminal No. 3 And Body Ground With A Jumper Wire

Courtesy of AMERICAN HONDA MOTOR CO., INC.

Does the ABS indicator go off?

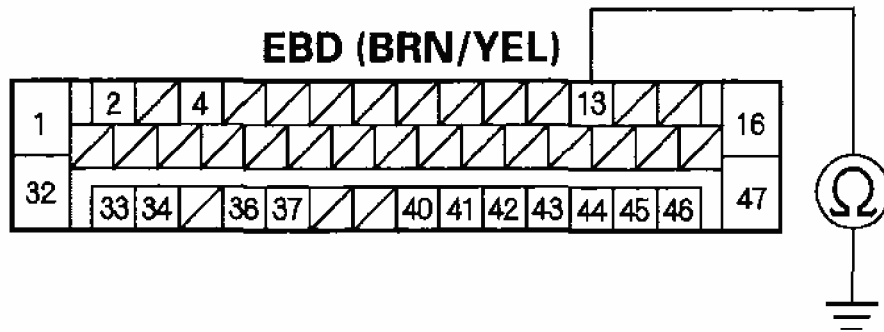
YES- Repair open in the wire between the ABS modulator-control unit and the gauge assembly.

NO- Check for loose gauge assembly connectors. If the connectors are OK, replace the gauge assembly (see **GAUGE ASSEMBLY REPLACEMENT**).

BRAKE SYSTEM INDICATOR CIRCUIT TROUBLESHOOTING

BRAKE SYSTEM INDICATOR DOES NOT COME ON

1. Disconnect the multiplex control unit 13P(under-dash fuse/relay box Y) connector and the ABS modulator-control unit 47P connector.
2. Check for continuity between the ABS modulator-control unit 47P connector terminal No. 13 and body ground.

ABS MODULATOR-CONTROL UNIT 47P CONNECTOR

Wire side of female terminals

G03679256

Fig. 31: Identifying ABS Modulator-Control Unit 47P Connector Terminal No. 13 And Body Ground

Courtesy of AMERICAN HONDA MOTOR CO., INC.

Is there continuity?

YES- Repair short to body ground in the wire between the multiplex control unit and the ABS modulator-control unit.

NO- Do the multiplex control system troubleshooting (see **TROUBLESHOOTING**).

BRAKE SYSTEM INDICATOR DOES NOT GO OFF, AND NO DTCS ARE STORED

1. Release the parking brake.
2. Turn the ignition switch ON (II).

Does the brake system indicator go off after several seconds?

YES- Intermittent failure, the system is OK at this time (see **HOW TO TROUBLESHOOT DTCS**).

NO- Go to step 3.

3. Check the brake fluid level (see **BRAKE SYSTEM BLEEDING**).

Is the level OK?

YES- Go to step 4.

NO- Inspect the brake system for leaks. If no leaks are found, replace any worn brake lining.

4. Check the ABS indicator.

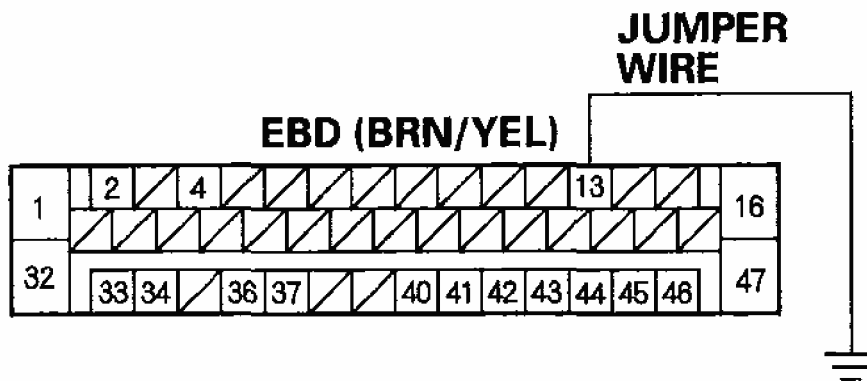
Does the ABS indicator stay on?

YES- Read the ABS DTC (see **HOW TO TROUBLESHOOT DTCS**), and do the applicable troubleshooting for the DTC.

NO- Go to step 5.

5. Turn the ignition switch OFF.
6. Disconnect the ABS modulator-control unit 47P connector.
7. Turn the ignition switch ON (II).
8. Connect the ABS modulator-control unit 47P connector terminal No. 13 and body ground with a jumper wire.

ABS MODULATOR-CONTROL UNIT 47P CONNECTOR



Wire side of female terminals

G03679257

Fig. 32: Connecting ABS Modulator-Control Unit 47P Connector Terminal No. 13 And Body Ground With A Jumper Wire

Courtesy of AMERICAN HONDA MOTOR CO., INC.

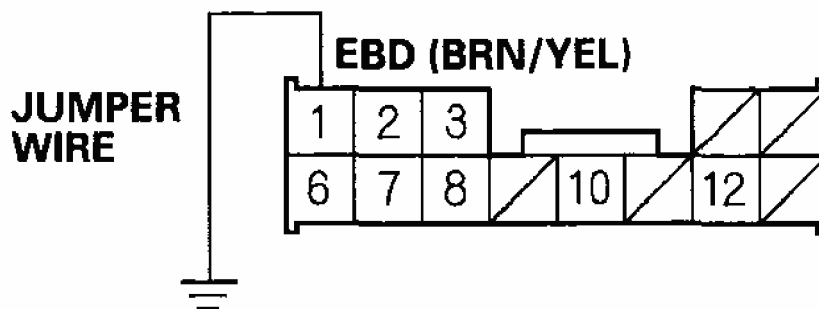
Does the brake system indicator go off?

YES- Check for loose terminal at the ABS modulator-control unit 47P connector and G202. If the terminals and ground are OK, replace the ABS modulator-control unit (see **ABS MODULATOR-CONTROL UNIT REMOVAL AND INSTALLATION**).

NO- Go to step 9.

9. Connect the multiplex control unit 13P (under-dash fuse/relay box connector Y) connector terminal No. 1 and body ground with a jumper wire.

MULTIPLEX CONTROL UNIT 13P CONNECTOR



Wire side of female terminals

G03679258

Fig. 33: Connecting Multiplex Control Unit 13P (Under-Dash Fuse/Relay Box Connector Y) Connector Terminal No. 1 And Body Ground
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

Does the brake system indicator go off?

YES- Repair open in the wire between the multiplex control unit and the ABS modulator-control unit.

NO- Do the multiplex control system troubleshooting (see **TROUBLESHOOTING**).

ABS MODULATOR-CONTROL UNIT REMOVAL AND INSTALLATION

NOTE:

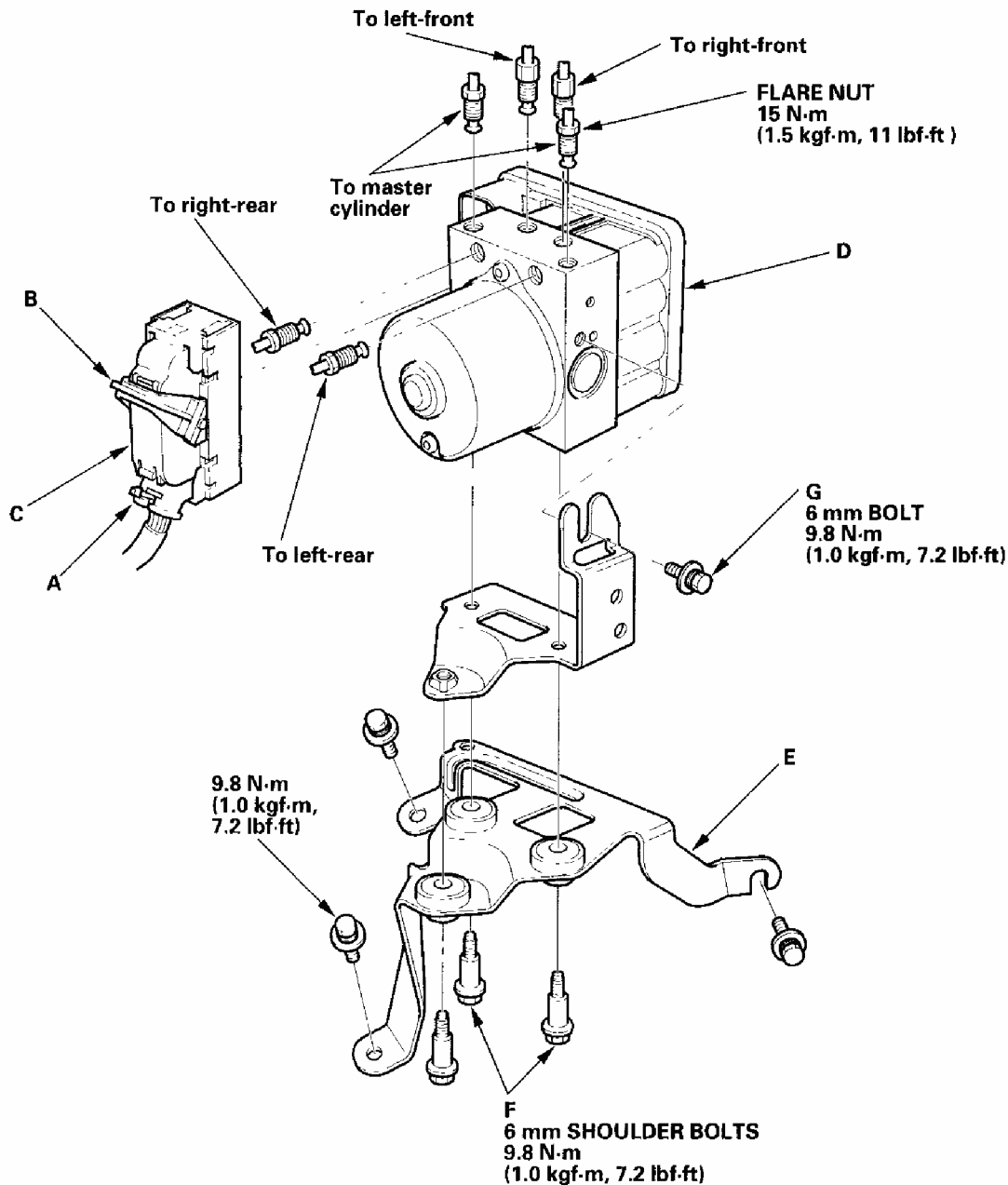
- Do not spill brake fluid on the vehicle; it may damage the paint; if brake fluid gets on the paint, wash it off immediately with water.
- Be careful not to damage or deform the brake lines during removal and installation.
- To prevent the brake fluid from flowing, plug and cover the hose ends and joints with a shop towel or equivalent material.

REMOVAL

1. Push in the locking tab (A) and pull up the lock (B) of the ABS modulator-control unit 47P connector (C), and the connector disconnects itself.

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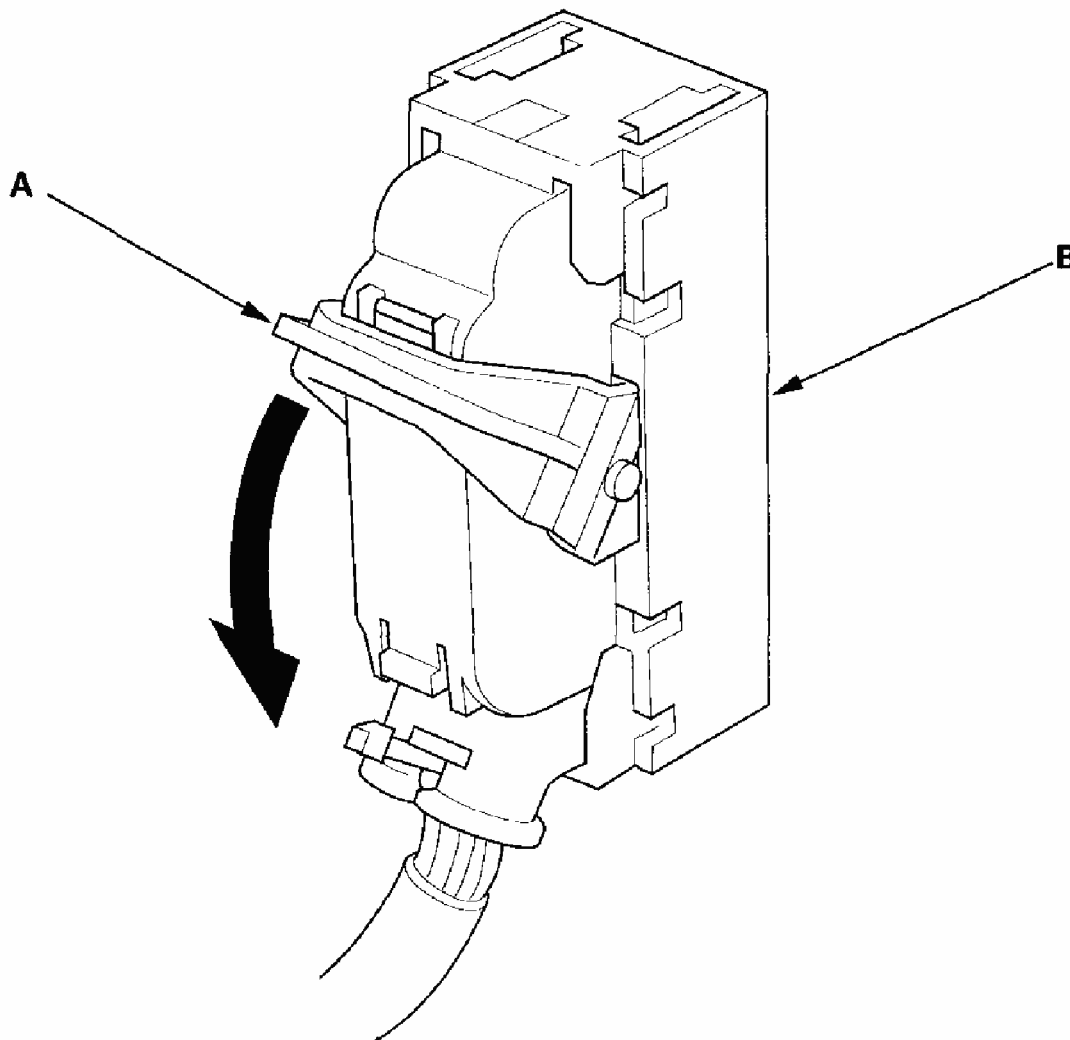
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Fig. 34: Pushing In Locking Tab And Pull Up Lock Of ABS Modulator-Control Unit 47P Connector With Specified Torques
Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Disconnect the six brake lines.
3. Remove the ABS modulator-control unit (D) bracket (E) from the body.
4. Remove the two 6 mm shoulder bolts (F) and 6 mm bolt (G) from the bracket, then remove the ABS modulator-control unit from the bracket.

INSTALLATION

1. Install the ABS modulator-control unit on the bracket, then tighten the two 6 mm shoulder bolts and 6 mm bolt.
2. Install the ABS modulator-control unit/bracket on the body.
3. Align the connecting surface of the ABS modulator-control unit 47P connector.
4. Push in the lock (A) of the ABS modulator-control unit 47P connector (B), then connect the connector.



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Fig. 35: Pushing Lock (A) Of ABS Modulator-Control Unit 47P Connector (B), Connector
Courtesy of AMERICAN HONDA MOTOR CO., INC.

5. Connect the six brake lines.

6. Bleed the brake system, starting with the front wheels (see **BRAKE SYSTEM BLEEDING**).
7. Start the engine, and check that the ABS indicator and brake system indicator go off.
8. Test-drive the vehicle, and check that the ABS indicator and brake system indicator do not come on.

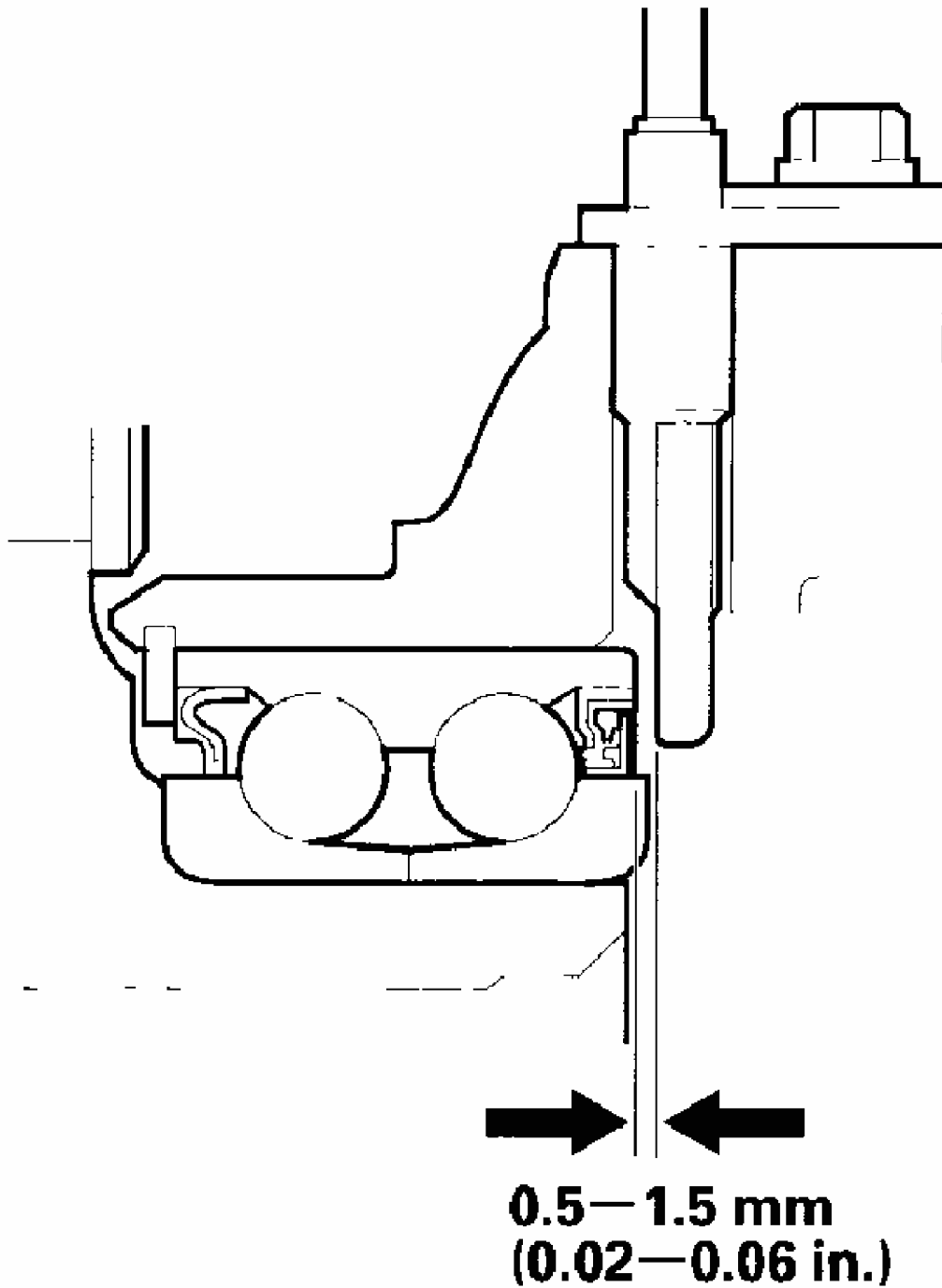
WHEEL SENSOR INSPECTION

1. Remove the appropriate front driveshaft (see **FRONT DRIVESHAFT REMOVAL**) or rear driveshaft (see **REAR DRIVESHAFT REMOVAL**).
2. Check the magnetic encoder after cleaning the encoder. If necessary, replace the front wheel bearing (see **KNUCKLE/HUB/WHEEL BEARING REPLACEMENT**) or rear wheel bearing unit (see **KNUCKLE/HUB/WHEEL BEARING REPLACEMENT**).

Front

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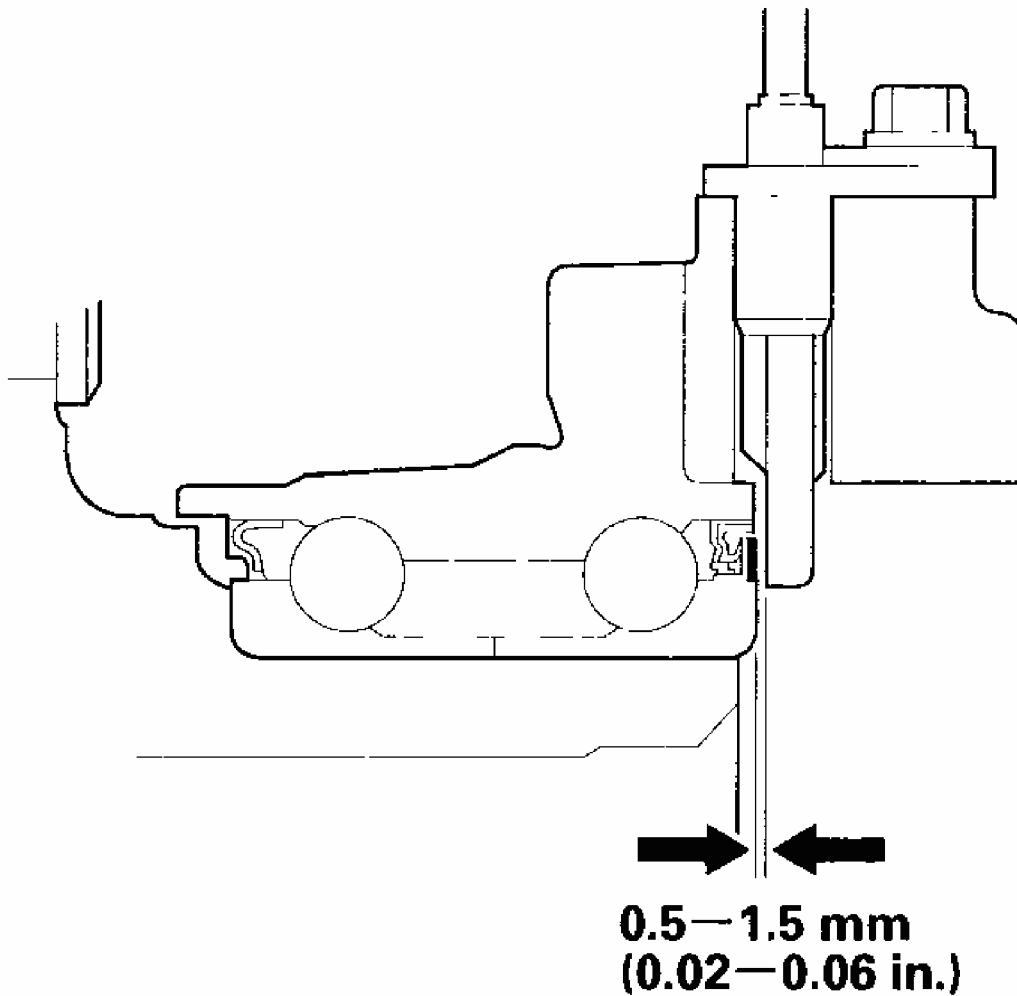
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Fig. 36: Checking Magnetic Encoder Cleaning Encoder (Front)
Courtesy of AMERICAN HONDA MOTOR CO., INC.

Rear



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Fig. 37: Checking Magnetic Encoder Cleaning Encoder (Rear)
Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Measure the air gap between the wheel sensor and the magnetic encoder all the way around while rotating the encoder.

Standard:

Front/Rear: 0.5-1.5 mm (0.02-0.06 in.)

NOTE:

- Install the wheel bearing with the magnetic encoder

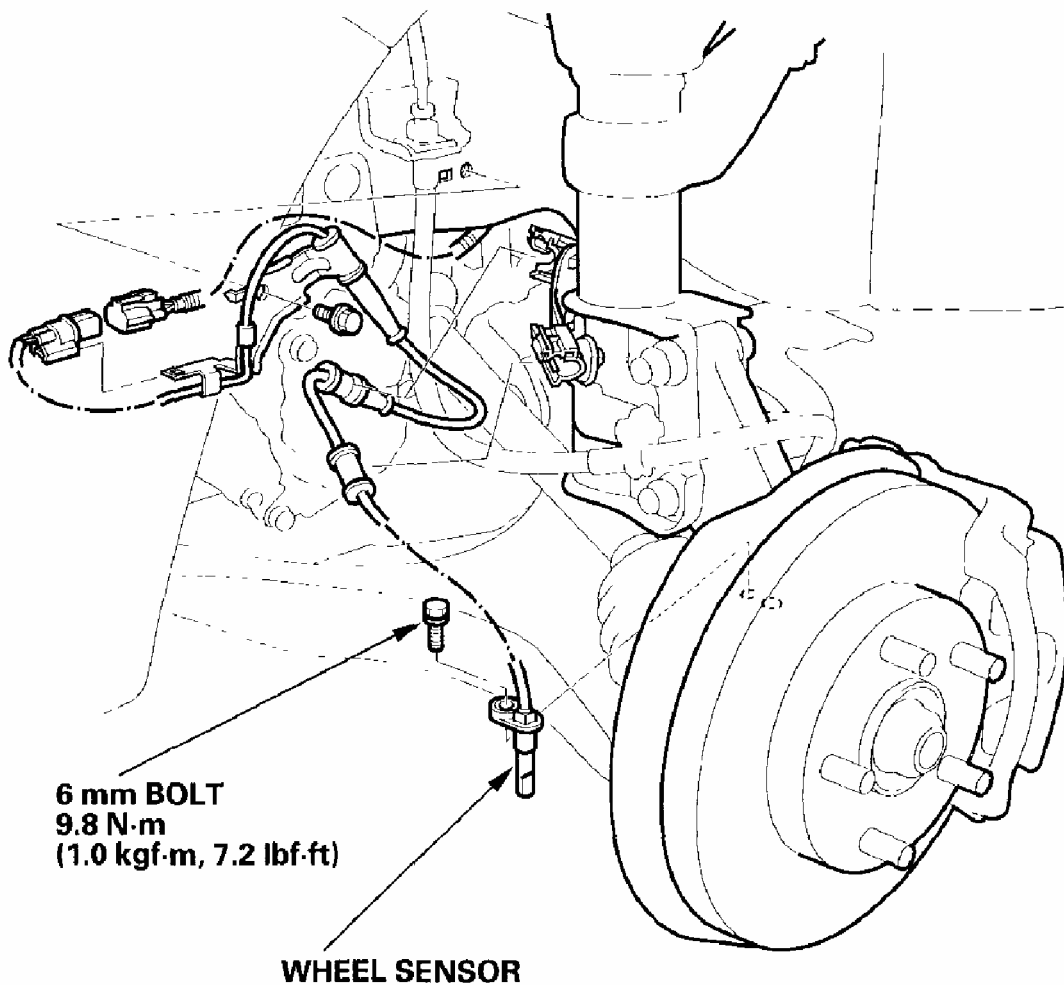
(brown color) toward the inside of the knuckle.

- Remove any oil, grease, dust, or other foreign material from the encoder surface.
- Keep magnetic tools away from the encoder surface.
- Be careful not to damage the encoder surface when you insert the wheel bearing.

WHEEL SENSOR REPLACEMENT

NOTE: Install the sensors carefully to avoid twisting the wires.

Front

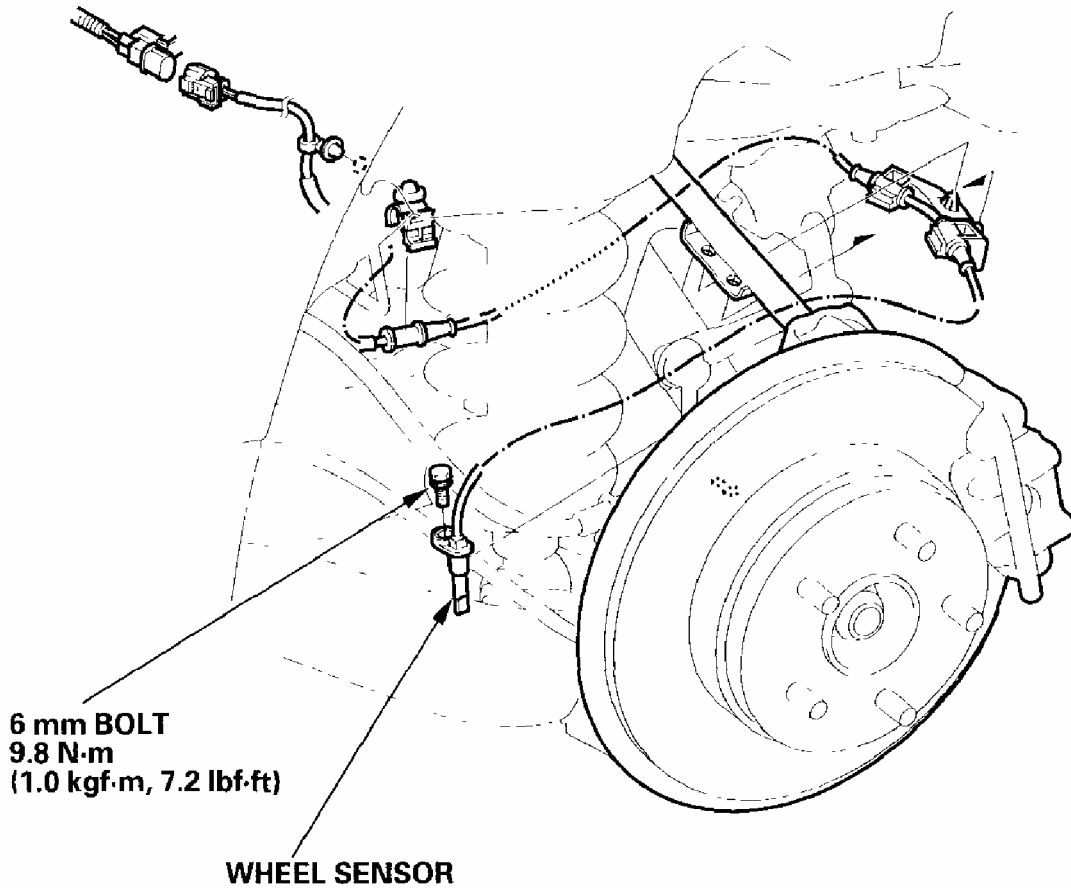


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Fig. 38: Installing Sensors And Torque Specifications (Front)

Courtesy of AMERICAN HONDA MOTOR CO., INC.

Rear



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Fig. 39: Installing Sensors And Torque Specifications (Rear)
Courtesy of AMERICAN HONDA MOTOR CO., INC.