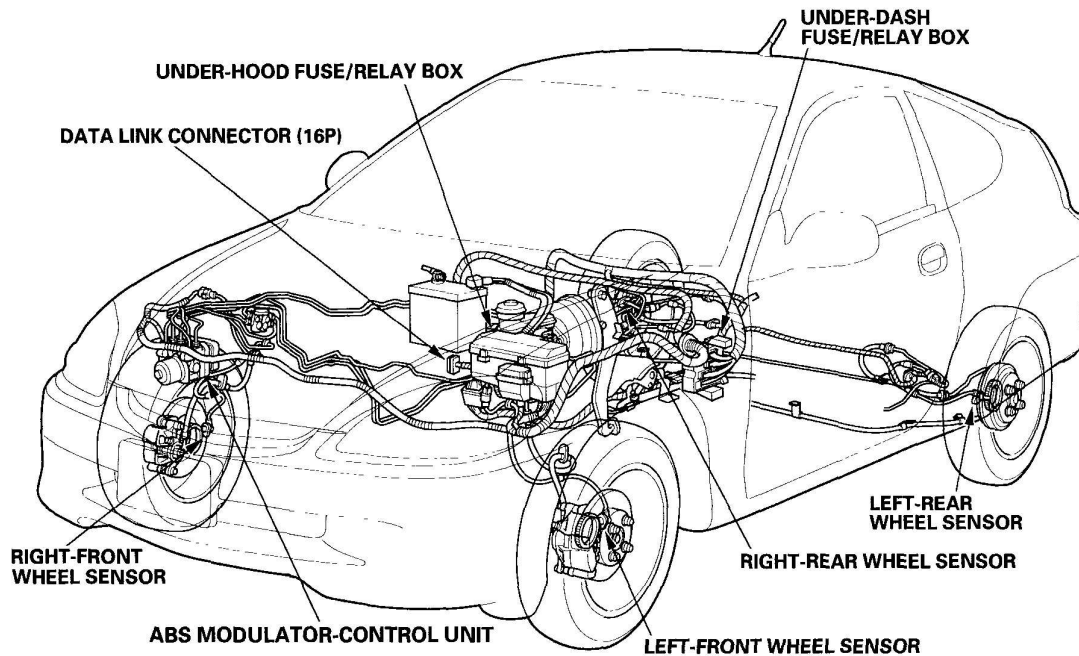


## 2000-06 BRAKES

### ABS (Anti-Lock Brake System) Components - Insight

#### COMPONENT LOCATION INDEX



G03682485

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

#### GENERAL TROUBLESHOOTING INFORMATION

##### ABS INDICATOR

- If the system is OK, the ABS indicator goes off 2 seconds after turning the ignition switch ON (II) without starting the engine, and then comes on again and goes off 2 seconds later after starting the engine. This occurs because the ABS modulator-control unit is turned on by the IG2 power source.
- 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 will 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 the above 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, 71, 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, 41, 42, 43, 44, 51, 52, or 53: The ABS indicator goes off when the vehicle is driven again and the system is OK after the ignition switch is turned from OFF to ON (II).

#### **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 ascending numerical order, not in the order that they occur.
- 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. Perform the specified procedures to clear the DTCs.

#### **SELF-DIAGNOSIS**

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

Done right after the engine starts 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 on
  - Memorizes the DTC
  - Stops ABS control

### **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 the first time you drive the vehicle 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 is still on. Following the flowchart 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. Question the customer about the conditions when the problem occurred, and try to reproduce the same conditions for troubleshooting. Find out when the

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2000-06 BRAKES ABS (Anti-Lock Brake System) Components - Insight

ABS indicator came on, such as during control, after control, when the vehicle was at a certain speed, on start up, etc.

2. When the ABS 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 does not come on.

### HOW TO RETRIEVE DTCS

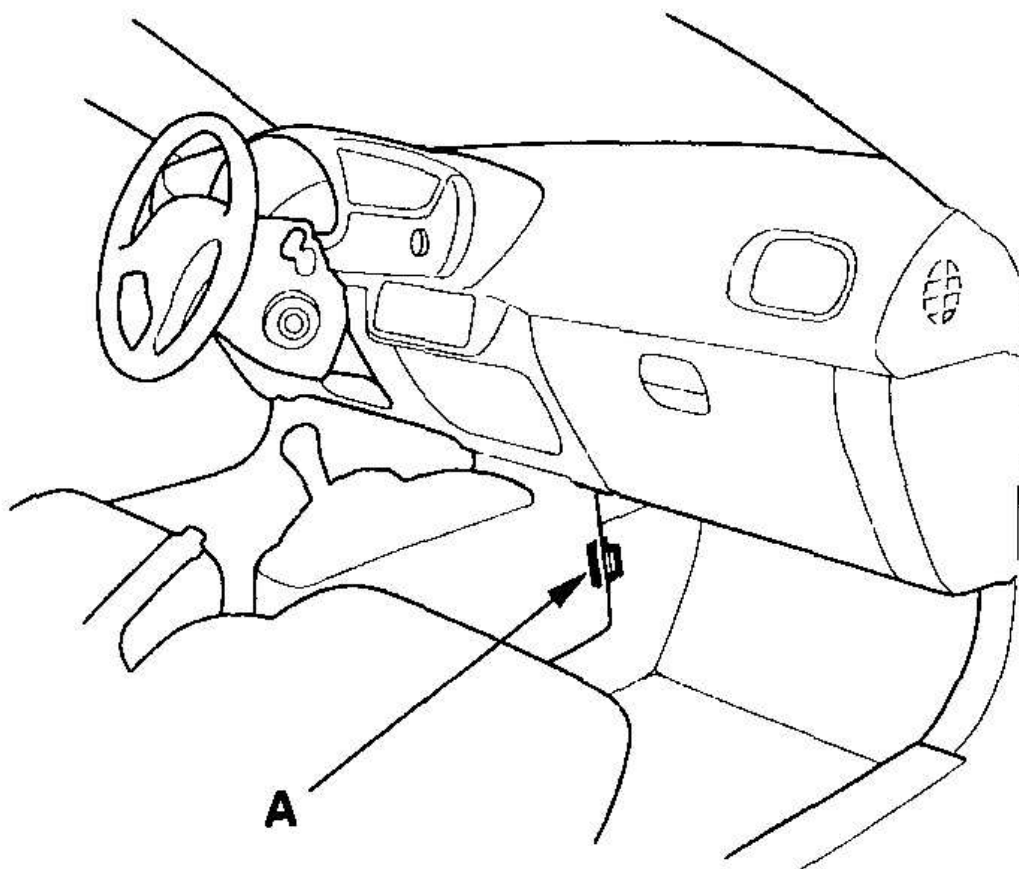
#### HDS (Honda Diagnostic System) Method

1. With the ignition switch OFF, connect the HDS to the 16P data link connector (DLC) (A).

#### 2000 model

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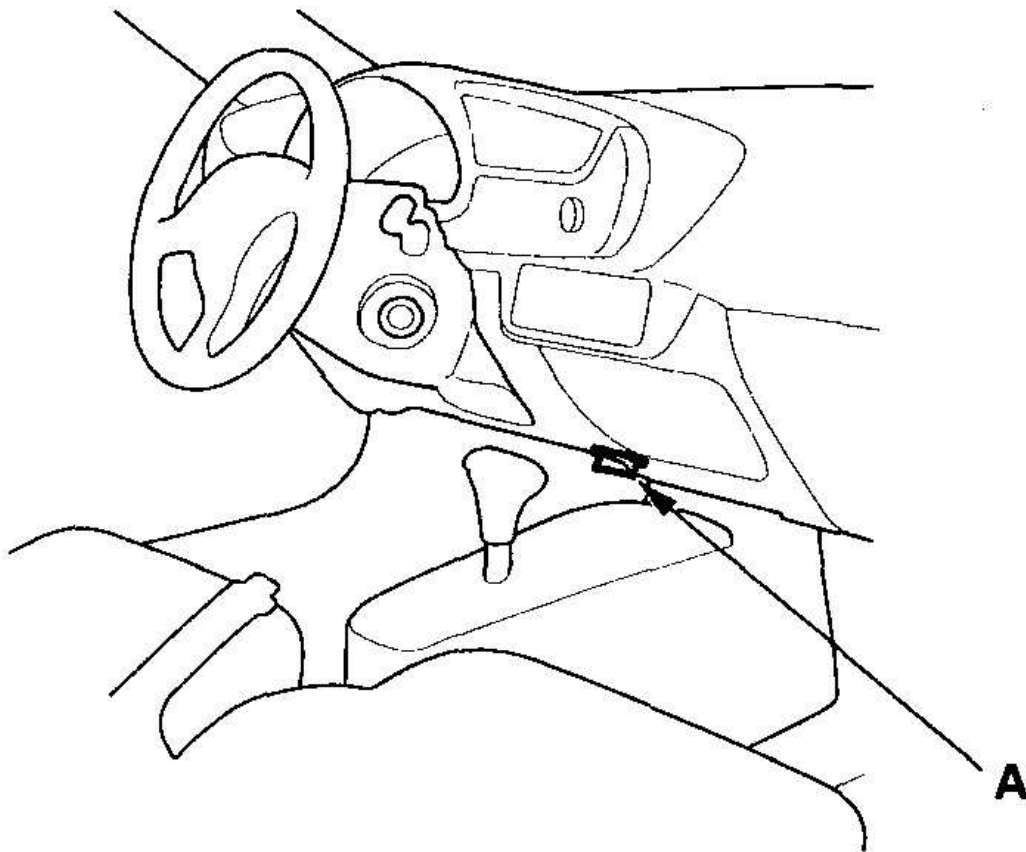
2000-06 BRAKES ABS (Anti-Lock Brake System) Components - Insight



G03682486

**Fig. 2: Identifying 16P Data Link Connector (DLC) 2000 Model**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

**2001-2006 models**



G03682487

**Fig. 3: Identifying 16P Data Link Connector (DLC) 2001-2006 Models**  
**Courtesy of AMERICAN HONDA MOTOR CO., INC.**

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** .

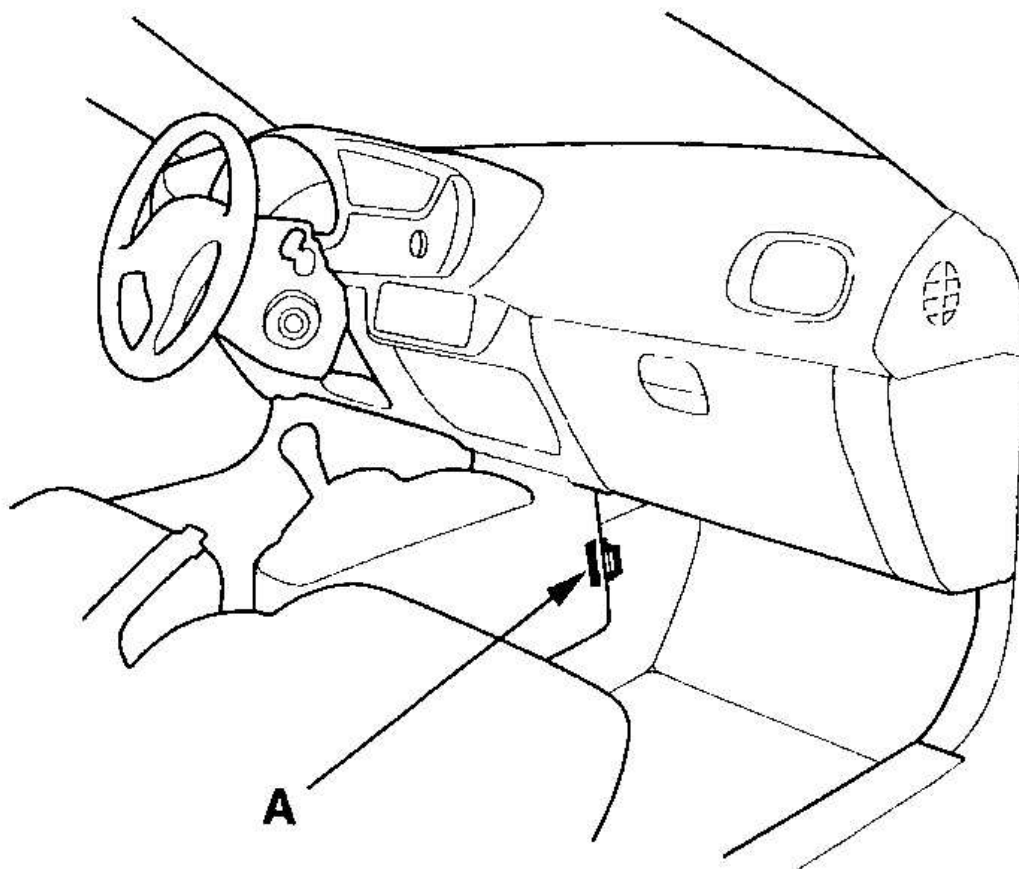
**NOTE:** See the HDS Help menu for specific instructions.

**Service Check Signal Circuit Method**

1. With the ignition switch OFF, connect the HDS to the 16P data link connector

(DLC) (A).

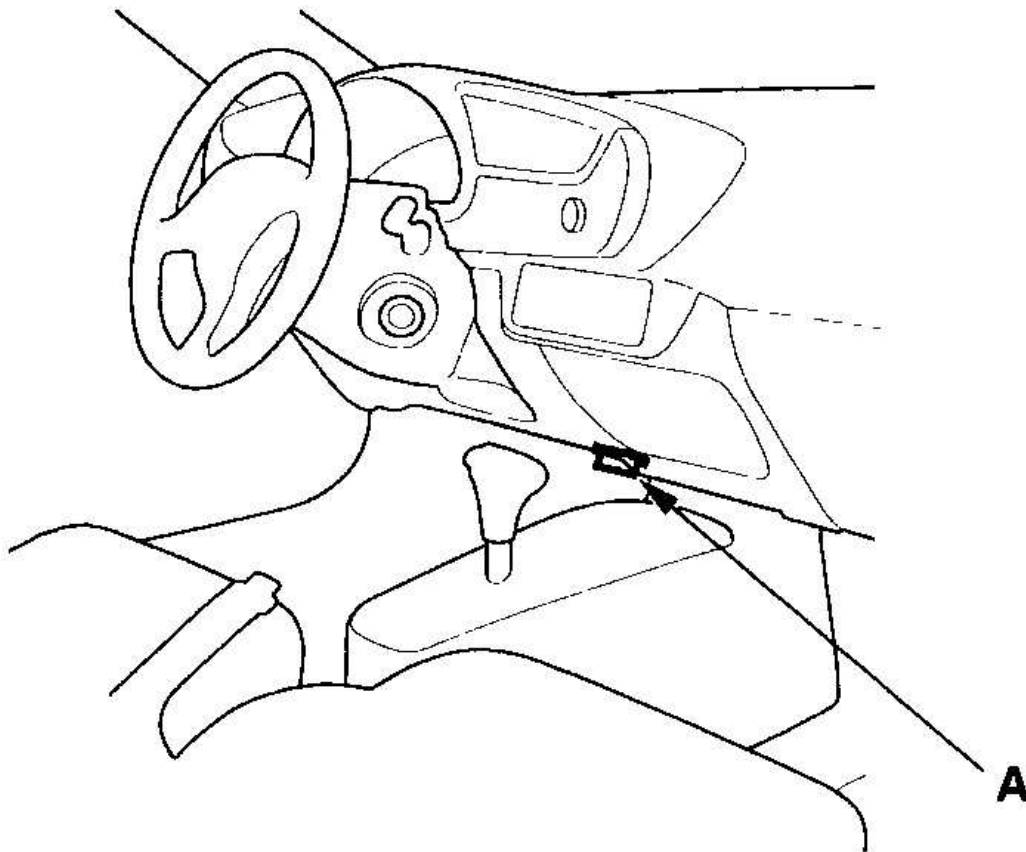
**2000 model**



G03682488

**Fig. 4: Identifying 16P Data Link Connector (DLC) 2000 Model**  
**Courtesy of AMERICAN HONDA MOTOR CO., INC.**

**2001-2006 models**



G03682489

**Fig. 5: Identifying 16P Data Link Connector (DLC) 2001-2006 Models**  
**Courtesy of AMERICAN HONDA MOTOR CO., INC.**

2. Short the SCS circuit to body ground using the HDS.
3. Turn the ignition switch ON (II) without pressing the brake pedal.

**NOTE:** If the brake pedal is pressed when turning the ignition switch ON (II), the system shifts to the DTC clearing mode.

4. The blinking frequency indicates the DTC. DTCs are indicated by a series of long and short blinks. One long blink equals ten short blinks. Add the long and

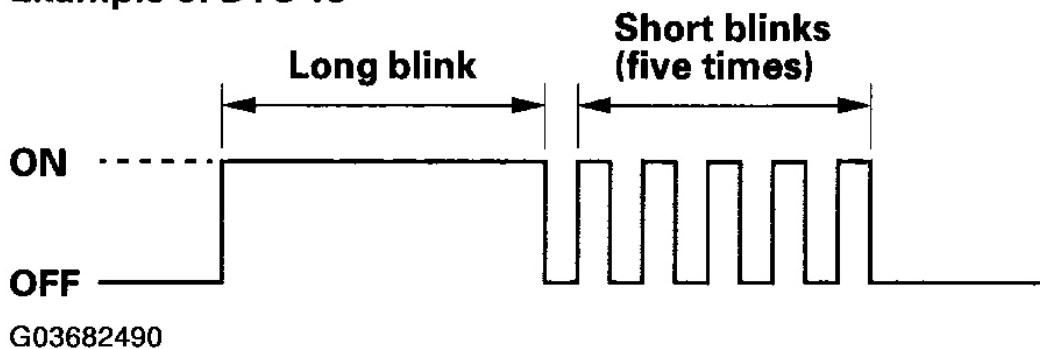
short blinks together to determine the DTC. After determining the DTC, refer to the **DTC TROUBLESHOOTING** .

**NOTE:**

- If the DTC is not memorized, the ABS indicator will go off for 3.6 seconds, and then come back on.
- If the ABS indicator stays on, troubleshoot for "ABS indicator does not go off, and no DTC is stored" (see **ABS INDICATOR DOES NOT GO OFF, AND NO DTC IS STORED** ).

The system will not indicate the DTC unless these conditions are met:

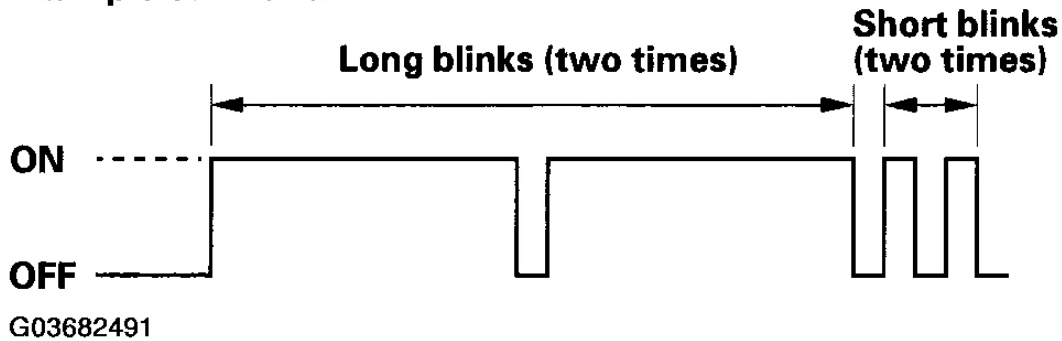
- The brake pedal is not pressed.
- The ignition switch is turned ON (II).
- The SCS circuit is shorted to body ground before the ignition switch is turned ON (II).

**Example of DTC 15**

**Fig. 6: Identifying Blinking Pattern (DTC 15)**

Courtesy of AMERICAN HONDA MOTOR CO., INC.

### Example of DTC 22



**Fig. 7: Identifying Blinking Pattern (DTC 22)**  
**Courtesy of AMERICAN HONDA MOTOR CO., INC.**

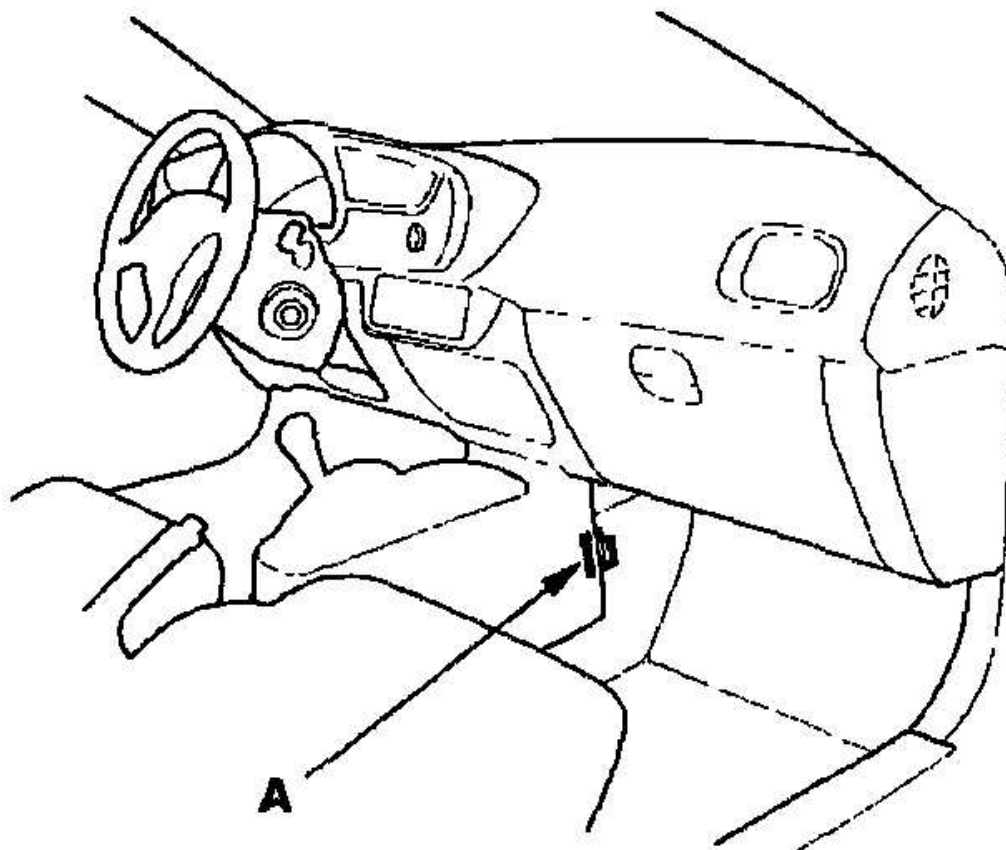
5. Turn the ignition switch OFF.
6. Disconnect the HDS from the DLC.

### HOW TO CLEAR DTCS

#### HDS (Honda Diagnostic System) Method

1. With the ignition switch OFF, connect the HDS to the 16P data link connector (DLC) (A).

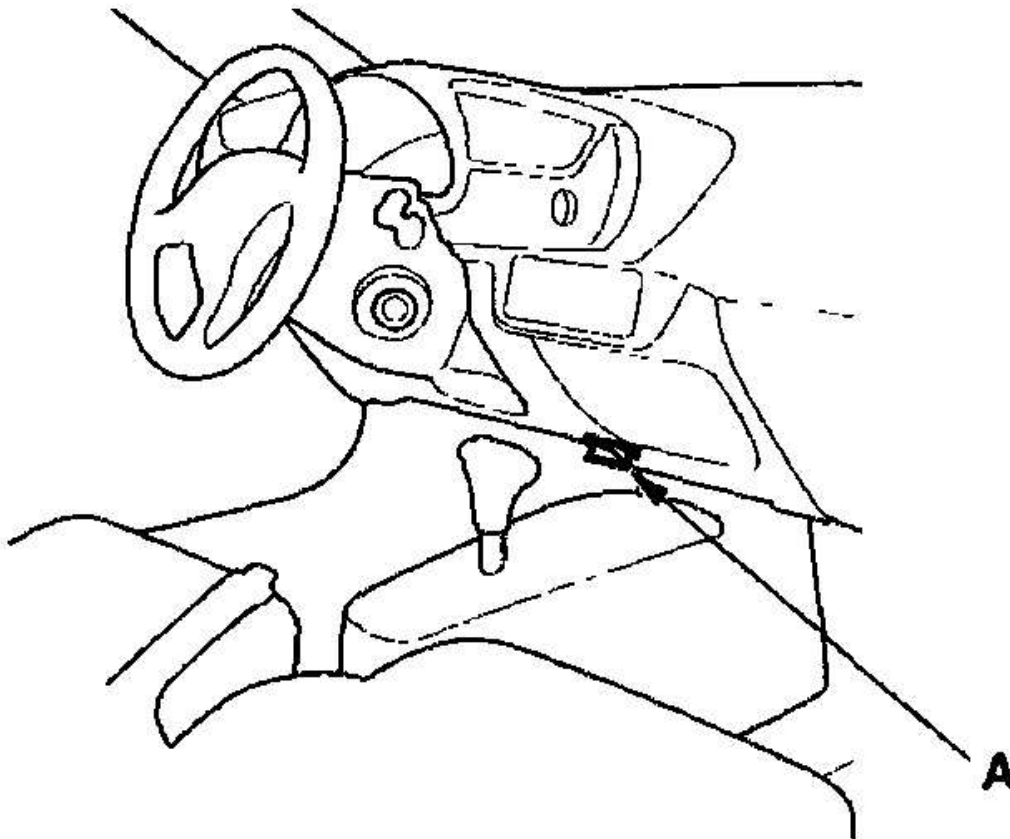
**2000 model**



G03682492

**Fig. 8: Identifying 16P Data Link Connector (DLC) 2000 Model**  
**Courtesy of AMERICAN HONDA MOTOR CO., INC.**

**2001-2006 models**



G03682493

**Fig. 9: Identifying 16P Data Link Connector (DLC) 2001-2006 Models**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

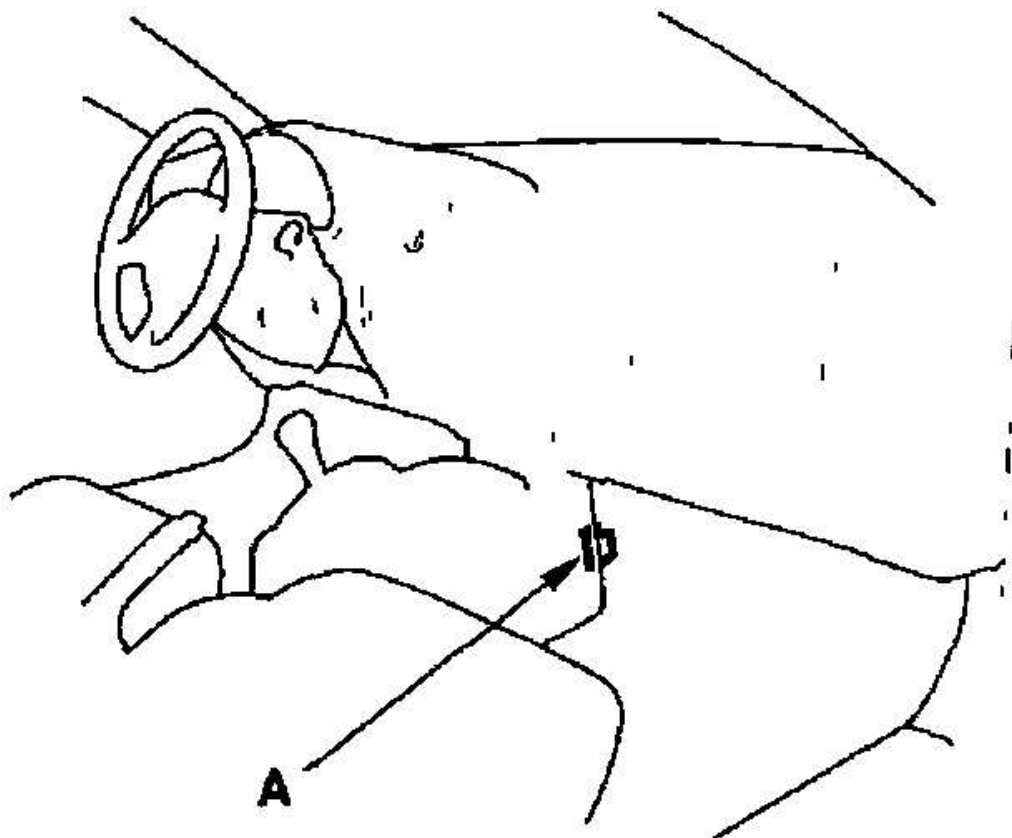
2. Turn the ignition switch ON (II), and clear the DTC(s) by following the screen prompts on the HDS.

**NOTE:** See the HDS Help menu for specific instructions.

**Service Check Signal Circuit Method**

1. With the ignition switch OFF, connect the HDS to the 16P data link connector (DLC) (A).

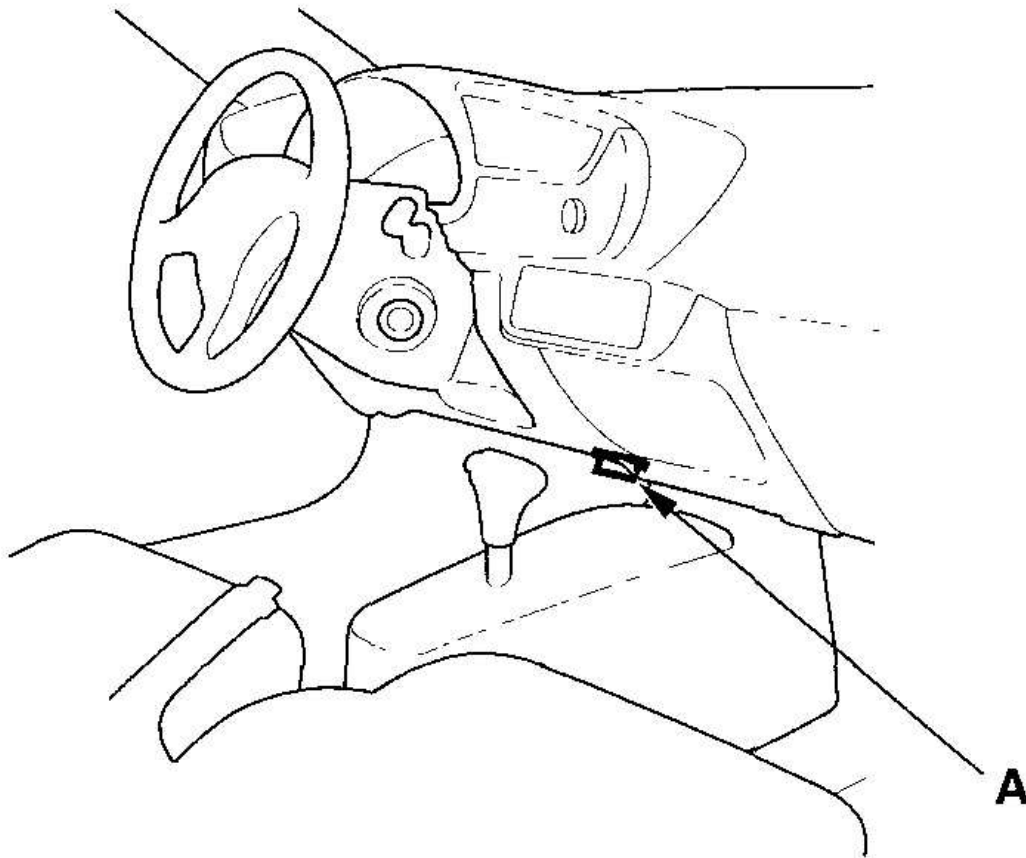
## 2000 model



G03682494

**Fig. 10: Identifying 16P Data Link Connector (DLC) 2000 Model**  
**Courtesy of AMERICAN HONDA MOTOR CO., INC.**

## 2001-2006 models



G03682495

**Fig. 11: Identifying 16P Data Link Connector (DLC) 2001-2006 Models**  
**Courtesy of AMERICAN HONDA MOTOR CO., INC.**

2. Short the SCS circuit to body ground using the HDS.
3. Press the brake pedal.
4. Turn the ignition switch ON (II) while continuing to press the brake pedal.
5. After the ABS indicator goes off, release the brake pedal.
6. After the ABS indicator comes on, press the brake pedal again.
7. After the ABS indicator goes off, release the brake pedal.

You cannot clear the DTC unless these conditions are met:

- The vehicle speed is 6 mph (10 km/h) or less.
  - The SCS circuit is shorted to body ground before the ignition switch is turned ON (II).
  - The brake pedal is pressed before the ignition switch is turned ON (II).
8. After a few seconds, the ABS indicator blinks twice and the DTC is cleared. If the indicator does not blink twice, repeat steps 1 thru 7 . If the ABS indicator stays on after it blinks twice, check the DTC, because a problem was detected during initial diagnosis before shifting to DTC clearing mode.
  9. Turn the ignition switch OFF.
  10. Disconnect the HDS from the DLC.

## DTC TROUBLESHOOTING INDEX

### DTC TROUBLESHOOTING INDEX

| DTC | Detection Item                                                                 | Note                                                                                                        |
|-----|--------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| 11  | Right-front wheel sensor<br>(open/short to body<br>ground/short to power)      | (see <b><u>DTC 11,13,15,17: WHEEL SENSOR<br/>(OPEN/SHORT TO BODY<br/>GROUND/SHORT TO POWER)</u></b> )       |
| 12  | Right-front wheel sensor<br>(electrical<br>noise/intermittent<br>interruption) | (see <b><u>DTC 12,14,16,18: WHEEL SENSOR<br/>(ELECTRICAL<br/>NOISE/INTERMITTENT<br/>INTERRUPTION)</u></b> ) |
| 13  | Left-front wheel sensor<br>(open/short to body<br>ground/short to power)       | (see <b><u>DTC 11,13,15,17: WHEEL SENSOR<br/>(OPEN/SHORT TO BODY<br/>GROUND/SHORT TO POWER)</u></b> )       |
| 14  | Left-front wheel sensor<br>(electrical<br>noise/intermittent<br>interruption)  | (see <b><u>DTC 12,14,16,18: WHEEL SENSOR<br/>(ELECTRICAL<br/>NOISE/INTERMITTENT<br/>INTERRUPTION)</u></b> ) |
| 15  | Right-rear wheel sensor<br>(open/short to body<br>ground/short to power)       | (see <b><u>DTC 11,13,15,17: WHEEL SENSOR<br/>(OPEN/SHORT TO BODY<br/>GROUND/SHORT TO POWER)</u></b> )       |
|     | Right-rear wheel sensor<br>(electrical                                         | (see <b><u>DTC 12,14,16,18: WHEEL SENSOR<br/>(ELECTRICAL</u></b> )                                          |

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2000-06 BRAKES ABS (Anti-Lock Brake System) Components - Insight

|    |                                                                     |                                                                                                 |
|----|---------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|
| 16 | noise/intermittent interruption)                                    | <b><u>NOISE/INTERMITTENT INTERRUPTION)</u></b>                                                  |
| 17 | Left-rear wheel sensor (open/short to body ground/short to power)   | (see <b><u>DTC 11,13,15,17: WHEEL SENSOR (OPEN/SHORT TO BODY GROUND/SHORT TO POWER)</u></b> )   |
| 18 | Left-rear wheel sensor (electrical noise/intermittent interruption) | (see <b><u>DTC 12,14,16,18: WHEEL SENSOR (ELECTRICAL NOISE/INTERMITTENT INTERRUPTION)</u></b> ) |
| 21 | Right-front pulser                                                  | (see <b><u>DTC 21,22,23,24: PULSER</u></b> )                                                    |
| 22 | Left-front pulser                                                   | (see <b><u>DTC 21,22,23,24: PULSER</u></b> )                                                    |
| 23 | Right-rear pulser                                                   | (see <b><u>DTC 21,22,23,24: PULSER</u></b> )                                                    |
| 24 | Left-rear pulser                                                    | (see <b><u>DTC 21,22,23,24: PULSER</u></b> )                                                    |
| 31 | Solenoid                                                            | (see <b><u>DTC 31,32,33,34,35,36,37,38: SOLENOID</u></b> )                                      |
| 32 | Solenoid                                                            | (see <b><u>DTC 31,32,33,34,35,36,37,38: SOLENOID</u></b> )                                      |
| 33 | Solenoid                                                            | (see <b><u>DTC 31,32,33,34,35,36,37,38: SOLENOID</u></b> )                                      |
| 34 | Solenoid                                                            | (see <b><u>DTC 31,32,33,34,35,36,37,38: SOLENOID</u></b> )                                      |
| 35 | Solenoid                                                            | (see <b><u>DTC 31,32,33,34,35,36,37,38: SOLENOID</u></b> )                                      |
| 36 | Solenoid                                                            | (see <b><u>DTC 31,32,33,34,35,36,37,38: SOLENOID</u></b> )                                      |
| 37 | Solenoid                                                            | (see <b><u>DTC 31,32,33,34,35,36,37,38: SOLENOID</u></b> )                                      |
| 38 | Solenoid                                                            | (see <b><u>DTC 31,32,33,34,35,36,37,38: SOLENOID</u></b> )                                      |
| 41 | Right-front wheel lock                                              | (see <b><u>DTC 31,32,33,34,35,36,37,38: SOLENOID</u></b> )                                      |
| 42 | Left-front wheel lock                                               | (see <b><u>DTC 31,32,33,34,35,36,37,38: SOLENOID</u></b> )                                      |
|    |                                                                     |                                                                                                 |

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2000-06 BRAKES ABS (Anti-Lock Brake System) Components - Insight

|    |                                                                |                                                                                             |
|----|----------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| 43 | Right-rear wheel lock                                          | (see <b><u>DTC 31,32,33,34,35,36,37,38: SOLENOID</u></b> )                                  |
| 44 | Left-rear wheel lock                                           | (see <b><u>DTC 31,32,33,34,35,36,37,38: SOLENOID</u></b> )                                  |
| 51 | Motor lock                                                     | (see <b><u>DTC 51: MOTOR LOCK</u></b> )                                                     |
| 52 | Motor stuck OFF                                                | (see <b><u>DTC 52: MOTOR STUCK OFF</u></b> )                                                |
| 53 | Motor stuck ON                                                 | (see <b><u>DTC 53: MOTOR STUCK ON</u></b> )                                                 |
| 54 | ABS fail-safe relay                                            | (see <b><u>DTC 53: MOTOR STUCK ON</u></b> )                                                 |
| 61 | Low FSR +B voltage                                             | (see <b><u>DTC 61,62: FSR +B VOLTAGE</u></b> )                                              |
| 62 | High FSR +B voltage                                            | (see <b><u>DTC 61,62: FSR +B VOLTAGE</u></b> )                                              |
| 71 | Different diameter tire                                        | (see <b><u>DTC 61,62: FSR +B VOLTAGE</u></b> )                                              |
| 81 | Central Processing Unit (CPU) diagnosis, and ROM/RAM diagnosis | (see <b><u>DTC 81: CENTRAL PROCESSING UNIT (CPU) DIAGNOSIS, AND ROM/RAM DIAGNOSIS</u></b> ) |

## SYMPTOM TROUBLESHOOTING INDEX

### SYMPTOM TROUBLESHOOTING INDEX

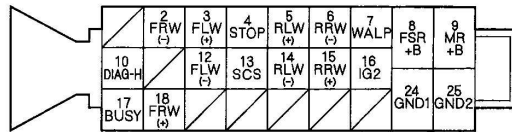
| Symptom                                               | Diagnostic procedure                                                                                                              |
|-------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| ABS indicator does not come on                        | ABS Indicator Circuit Troubleshooting (see <b><u>DTC 81: CENTRAL PROCESSING UNIT (CPU) DIAGNOSIS, AND ROM/RAM DIAGNOSIS</u></b> ) |
| ABS indicator does not go off, and no DTCs are stored | ABS Indicator Circuit Troubleshooting (see <b><u>ABS INDICATOR DOES NOT GO OFF, AND NO DTCS ARE STORED</u></b> )                  |

## SYSTEM DESCRIPTION

### ABS MODULATOR-CONTROL UNIT INPUTS AND OUTPUTS FOR 25P CONNECTOR

## 2006 Honda Insight

### 2000-06 BRAKES ABS (Anti-Lock Brake System) Components - Insight



Wire side of female terminals

| Terminal number | Wire color | Terminal sign (Terminal name)           | Description                                | Measurement (Disconnect the ABS modulator-control unit 25P connector) |                         |                             |                                                                   |
|-----------------|------------|-----------------------------------------|--------------------------------------------|-----------------------------------------------------------------------|-------------------------|-----------------------------|-------------------------------------------------------------------|
|                 |            |                                         |                                            | Terminals                                                             | Conditions              |                             | Voltage                                                           |
| 2               | BLU        | FRW (－)<br>(Front-right wheel negative) | Detects right-front wheel sensor signal    | 2—18                                                                  | Wheel                   | Turn wheel at 1 turn/second | AC: 0.053 V or above<br>Reference Oscilloscope 0.15 Vp-p or above |
| 3               | BLU/ORN    | FLW (＋)<br>(Front-left wheel positive)  | Detects left-front wheel sensor signal     | 3—12                                                                  |                         |                             |                                                                   |
| 4               | GRN/WHT    | STOP                                    | Detects brake pedal position switch signal | 4—GND                                                                 | Brake pedal             | Pressed                     | Battery Voltage                                                   |
|                 |            |                                         |                                            |                                                                       |                         | Released                    | Below 0.3 V                                                       |
| 5               | LT BLU     | RLW (＋)<br>(Rear-left wheel positive)   | Detects left-rear wheel sensor signal      | 5—14                                                                  | Wheel                   | Turn wheel at 1 turn/second | AC: 0.053 V or above<br>Reference Oscilloscope 0.15 Vp-p or above |
| 6               | BLU/YEL    | RRW (－)<br>(Rear-right wheel negative)  | Detects right-rear wheel sensor signal     | 6—15                                                                  |                         |                             |                                                                   |
| 7               | BLU/RED    | WALP<br>(Warning lamp)                  | Drives ABS indicator                       | 7—GND                                                                 | Ignition switch ON (II) |                             | About 6 V                                                         |
| 8               | WHT/GRN    | FSR ＋B<br>(ABS fail-safe relay battery) | Power source for the ABS fail-safe relay   | 8—GND                                                                 | Every time              |                             | Battery Voltage                                                   |
| 9               | WHT/BLU    | MR ＋B<br>(Motor relay battery)          | Power source for the motor relay           | 9—GND                                                                 | Every time              |                             | Battery Voltage                                                   |
| 10              | LT BLU     | DIAG-H<br>(Diagnosis-H)                 | Communicates with the HDS                  | —                                                                     | —                       |                             | —                                                                 |

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**Fig. 12: ABS Modulator-Control Unit Inputs And Outputs For 25P Connector**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

## 2006 Honda Insight

### 2000-06 BRAKES ABS (Anti-Lock Brake System) Components - Insight

| Terminal number | Wire color  | Terminal sign (Terminal name)           | Description                                                   | Measurement (Disconnect the ABS modulator-control unit 25P connector) |                                      |                                                                   |
|-----------------|-------------|-----------------------------------------|---------------------------------------------------------------|-----------------------------------------------------------------------|--------------------------------------|-------------------------------------------------------------------|
|                 |             |                                         |                                                               | Terminals                                                             | Conditions                           | Voltage                                                           |
| 12              | BRN/ WHT    | FLW (—)<br>(Front-left wheel negative)  | Detects left-front wheel sensor signal                        | 12—3                                                                  | Wheel<br>Turn wheel at 1 turn/second | AC: 0.053 V or above<br>Reference Oscilloscope 0.15 Vp-p or above |
| 13              | BRN         | SCS<br>(Service check signal)           | Detects service check signal (DTC indication or DTC clearing) | —                                                                     | —                                    | —                                                                 |
| 14              | GRY/ RED    | RLW (—)<br>(Rear-left wheel negative)   | Detects left-rear wheel sensor signal                         | 14—5                                                                  | Wheel<br>Turn wheel at 1 turn/second | AC: 0.053 V or above<br>Reference Oscilloscope 0.15 Vp-p or above |
| 15              | GRN/ YEL    | RRW (+)<br>(Rear-right wheel positive)  | Detects right-rear wheel sensor signal                        | 15—6                                                                  |                                      |                                                                   |
| 16              | BLK/ YEL    | IG2<br>(Ignition 2)                     | Power source for activating the system                        | 16—GND                                                                | —                                    | Battery Voltage                                                   |
| 17              | LT GRN/ RED | BUSY                                    | Outputs ABS operating condition signal                        | —                                                                     | —                                    | —                                                                 |
| 18              | GRN/ BLK    | FRW (+)<br>(Front-right wheel positive) | Detects right-front wheel sensor signal                       | 18—2                                                                  | Wheel<br>Turn wheel at 1 turn/second | AC: 0.053 V or above<br>Reference Oscilloscope 0.15 Vp-p or above |
| 24              | BLK         | GND1<br>(Ground 1)                      | Ground                                                        | 24—GND                                                                | —                                    | 0.3 V                                                             |
| 25              | BLK         | GND2<br>(Ground 2)                      | Ground                                                        | 25—GND                                                                | —                                    | 0.3 V                                                             |

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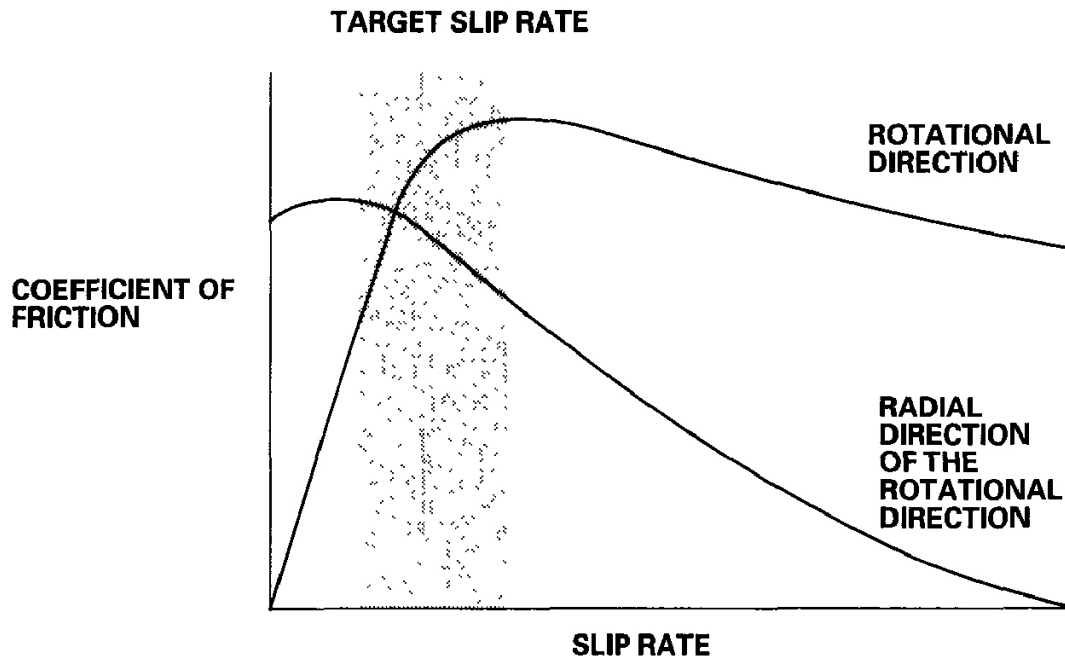
**Fig. 13: ABS Modulator-Control Unit Inputs And Outputs For 25P Connector**  
**Courtesy of AMERICAN HONDA MOTOR CO., INC.**

#### 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, and it thereby ensures 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 attain the target slip rate.

**Grip Force of Tire and Road Surface**



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**Fig. 14: Identifying Grip Force Of Tire And Road Surface**  
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

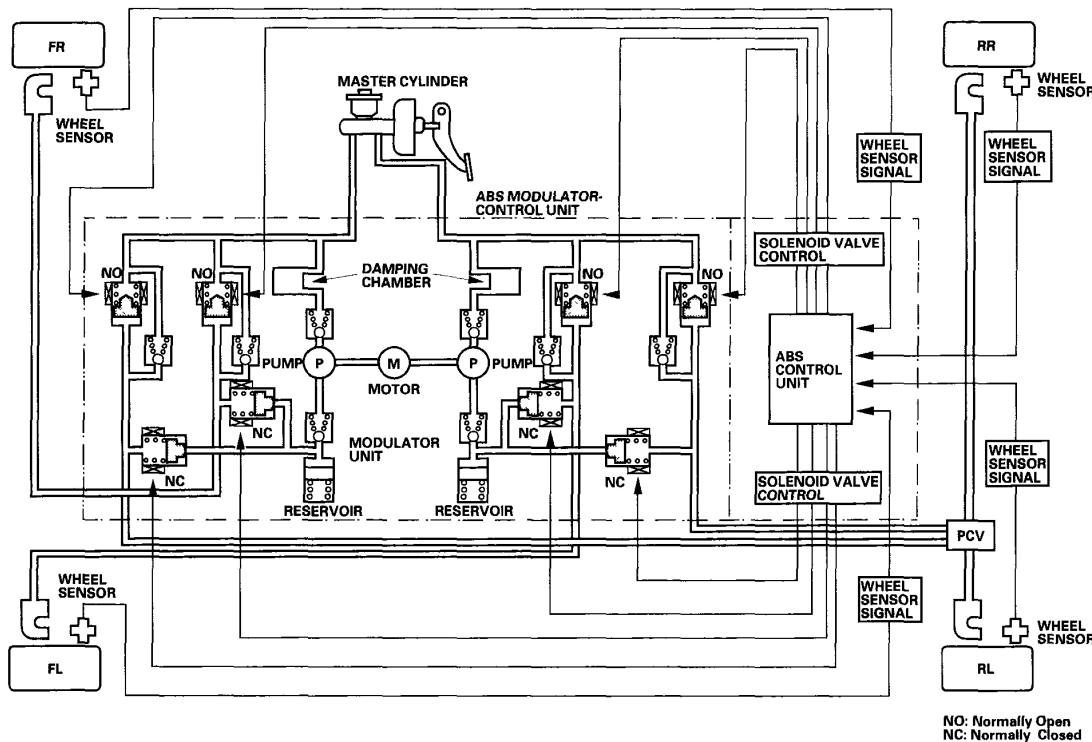
### COMPONENTS MAIN FUNCTION

| COMPONENTS                 |                  | MAIN FUNCTION                                                                                                               |
|----------------------------|------------------|-----------------------------------------------------------------------------------------------------------------------------|
| Wheel sensor               |                  | The wheel sensor outputs the speed signal to the ABS modulator-control unit according to the pulser'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                                                                                     |

## 2006 Honda Insight

### 2000-06 BRAKES ABS (Anti-Lock Brake System) Components - Insight

|                                                                |                                                                                          |
|----------------------------------------------------------------|------------------------------------------------------------------------------------------|
|                                                                | 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. 15: Identifying ABS System**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

#### ABS CONTROL UNIT

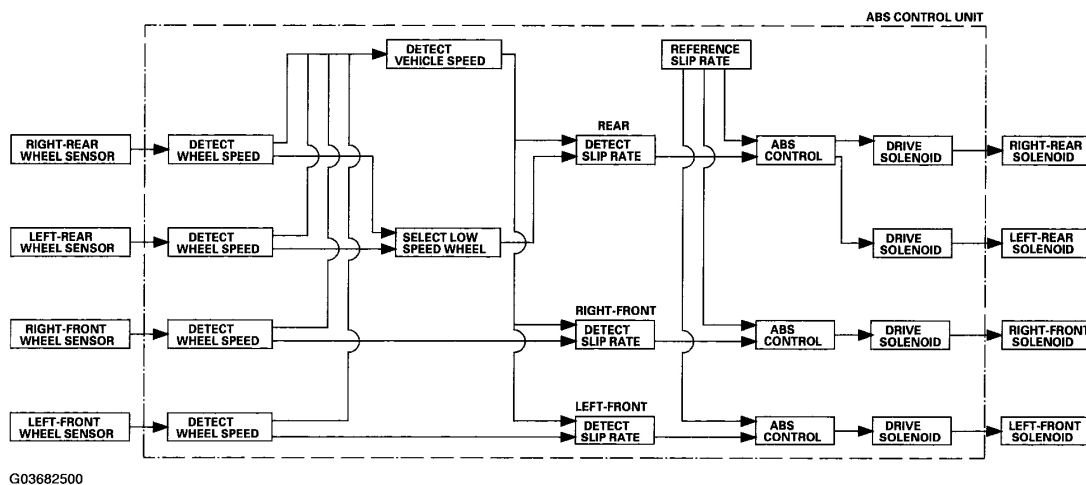
##### Main Control

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 ABS 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 pressure reduction control has three modes: Pressure reducing, pressure retaining, and pressure intensifying.



**Fig. 16: Identifying ABS Control Unit**  
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

#### Self-diagnosis Function

1. The ABS control unit is equipped with a main CPU and a sub CPU. Each CPU checks the other for problems.
2. The CPUs check the circuit of the system.
3. The ABS control unit turns on the ABS indicator when the unit detects a problem and the unit stops the system.
4. The self-diagnosis can be classified into these two categories:
  - Initial diagnosis
  - Regular diagnosis

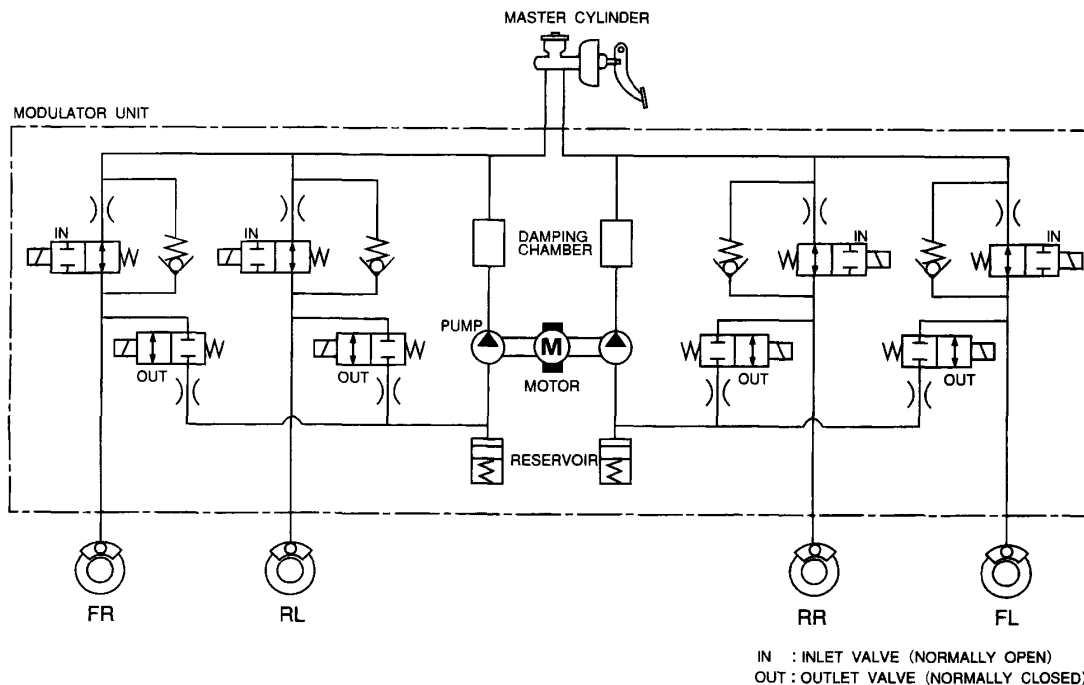
#### On-board Diagnosis Function

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 the inlet solenoid valve, outlet solenoid valve, reservoir, pump, pump motor, and the damping chamber. 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: Pressure intensifying, pressure retaining, and pressure reducing. The hydraulic circuit is an independent four-channel type, one channel for each wheel.



G03682501

**Fig. 17: Identifying Modulator Unit**  
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

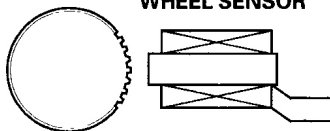
**PRESSURE INTENSIFYING MODE INLET VALVE OPEN, OUTLET**

**VALVE CLOSED**

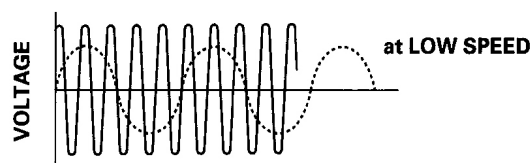
|                             |                                                                                                                                                                                                                             |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Pressure intensifying mode: | Inlet valve open, outlet valve closed:<br>Master cylinder fluid is pumped out to the caliper.                                                                                                                               |
| Pressure retaining mode:    | Inlet valve closed, outlet valve closed:<br>Caliper fluid is retained by the inlet valve and outlet valve.                                                                                                                  |
| Pressure reducing mode:     | Inlet valve closed, outlet valve open:<br>Caliper fluid flows through the outlet valve to the reservoir.                                                                                                                    |
| Motor operation mode:       | When starting the pressure reducing mode, the pump motor is ON.<br>When stopping ABS operation, the pump motor is OFF.<br>The caliper fluid is pumped out by the pump, through the damping chamber, to the master cylinder. |

**WHEEL SENSORS**

The wheel sensors are the magnetic contactless type. As the gear pulser teeth rotate past the wheel sensor's magnetic coil, AC current is generated. The AC frequency changes in accordance with the wheel speed. The ABS control unit detects the wheel sensor signal frequency and thereby detects the wheel speed.

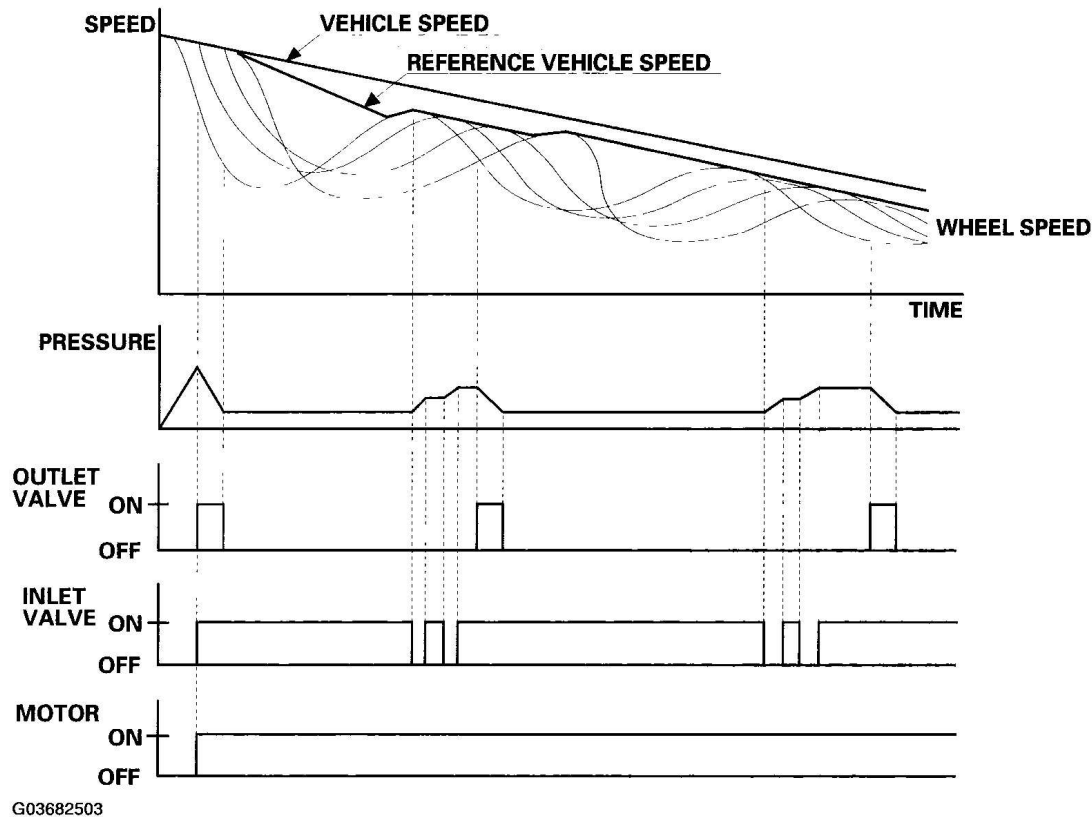
**GEAR PULSER****WHEEL SENSOR**

G03682502

**at HIGH SPEED****Fig. 18: Identifying Wheel Sensors**

Courtesy of AMERICAN HONDA MOTOR CO., INC.

Wheel Speed and Modulator Control



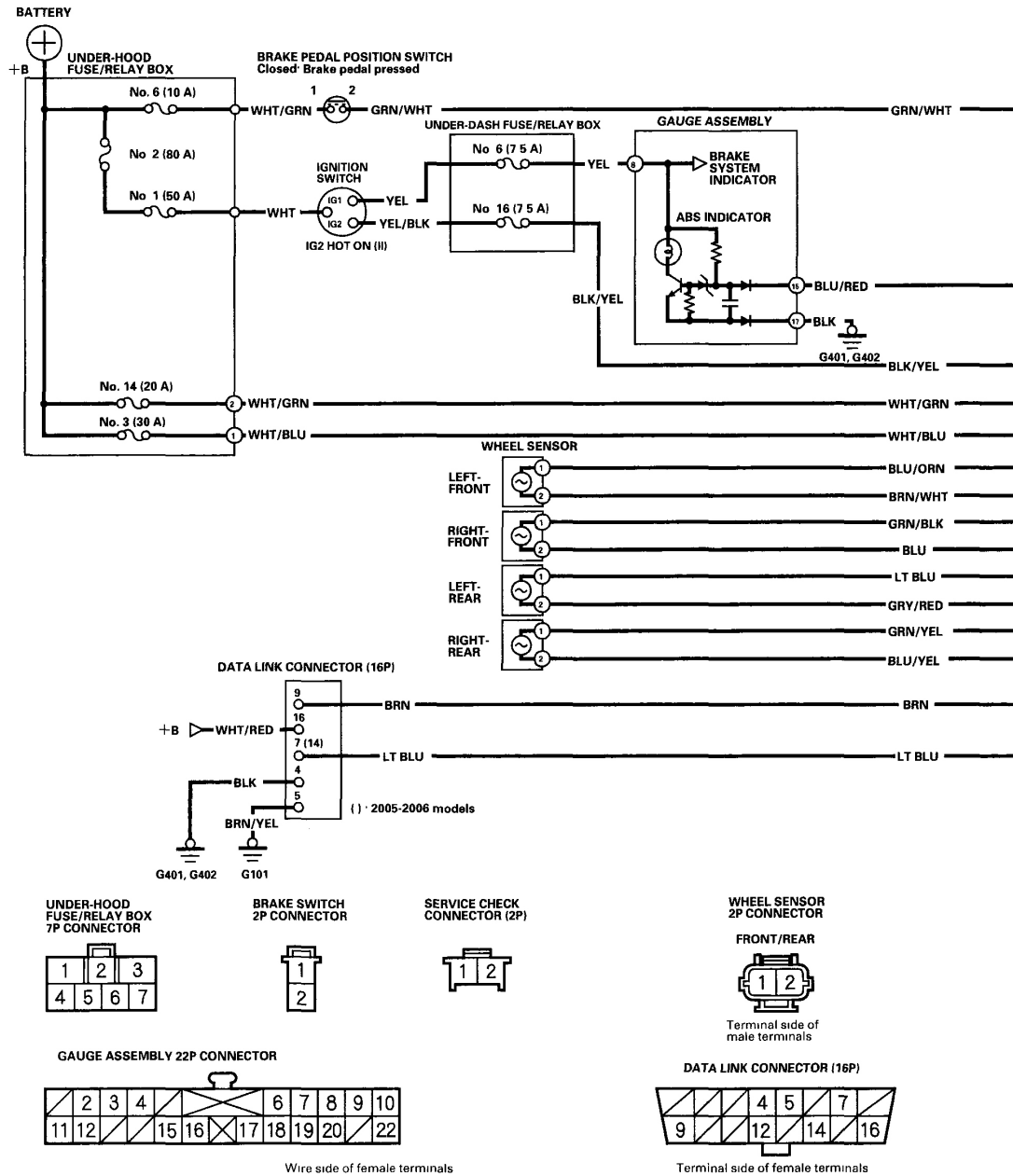
**Fig. 19: Wheel Speed and Modulator Control**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

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

## CIRCUIT DIAGRAM

## 2006 Honda Insight

### 2000-06 BRAKES ABS (Anti-Lock Brake System) Components - Insight

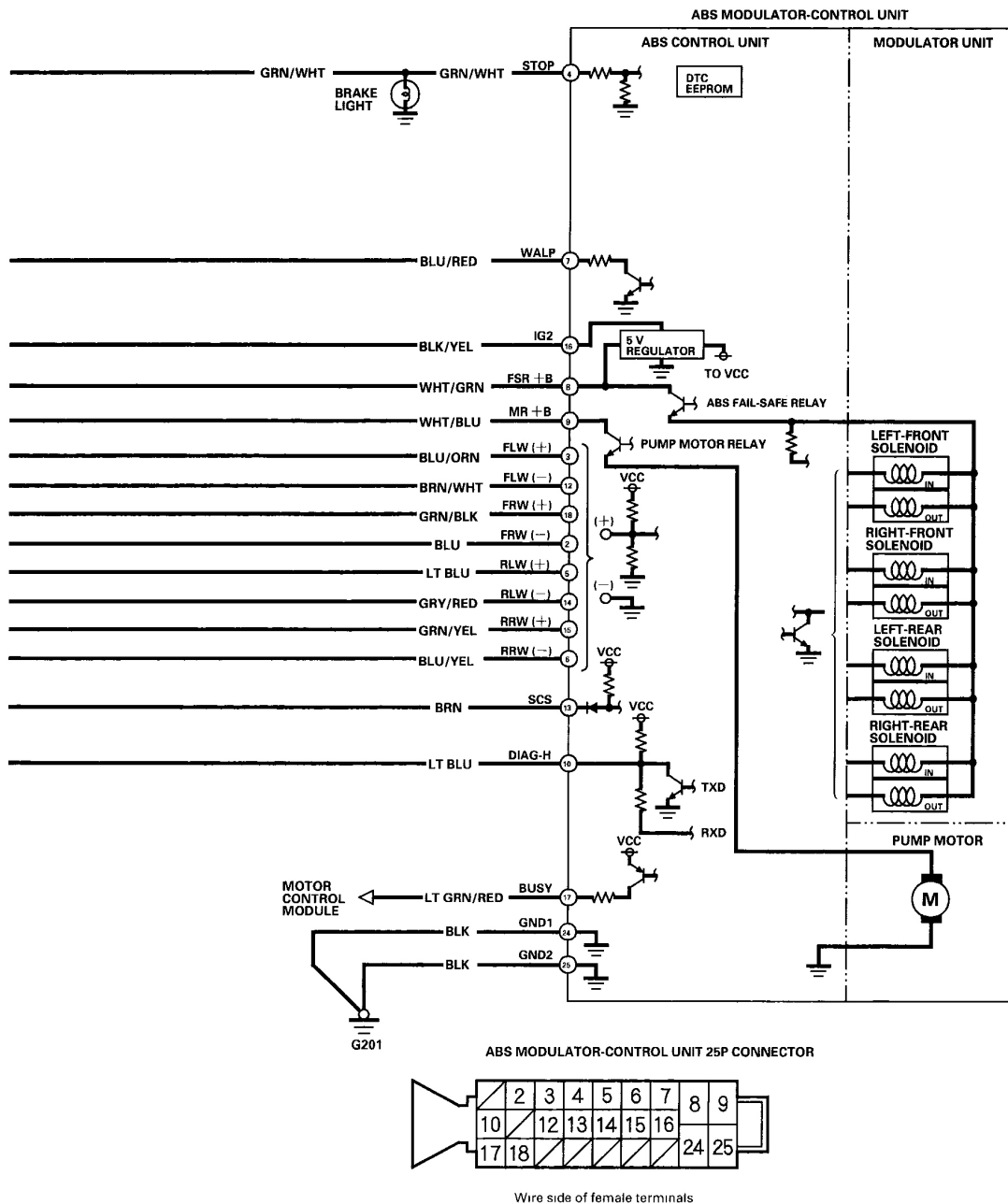


G03682504

**Fig. 20: ABS Circuit Diagram (1 Of 2)**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

## 2006 Honda Insight

### 2000-06 BRAKES ABS (Anti-Lock Brake System) Components - Insight



G03682505

**Fig. 21: ABS Circuit Diagram (2 Of 2)**  
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

## DTC TROUBLESHOOTING

## DTC INDEX

**2006 Honda Insight**

2000-06 BRAKES ABS (Anti-Lock Brake System) Components - Insight

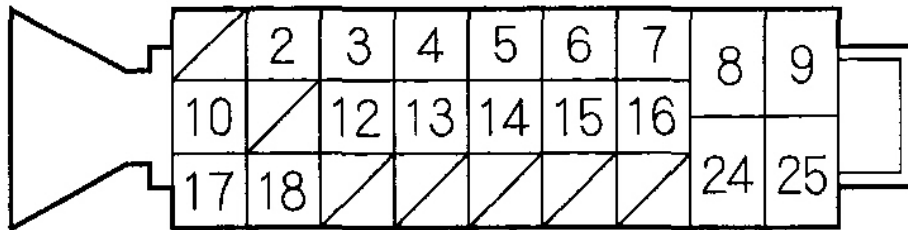
| <b>DTC</b>                                | <b>Description</b>                                             |
|-------------------------------------------|----------------------------------------------------------------|
| <b><u>DTC 11,13,15,17</u></b>             | Wheel Sensor (Open/Short to Body Ground/Short to Power)        |
| <b><u>DTC 12,14,16,18</u></b>             | Wheel Sensor (Electrical Noise/Intermittent Interruption)      |
| <b><u>DTC 21,22,23,24</u></b>             | Pulser                                                         |
| <b><u>DTC 31,32,33,34,35,36,37,38</u></b> | Solenoid                                                       |
| <b><u>DTC 41,42,43,44</u></b>             | Wheel Lock                                                     |
| <b><u>DTC 51</u></b>                      | Motor Lock                                                     |
| <b><u>DTC 52</u></b>                      | Motor Stuck OFF                                                |
| <b><u>DTC 53</u></b>                      | Motor Stuck ON                                                 |
| <b><u>DTC 54</u></b>                      | ABS Fail-safe Relay                                            |
| <b><u>DTC 61,62</u></b>                   | FSR +B Voltage                                                 |
| <b><u>DTC 71</u></b>                      | Different Diameter Tire                                        |
| <b><u>DTC 81</u></b>                      | 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 25P connector.
2. Start the engine.
3. Measure the voltage between the appropriate wheel sensor (+) circuit terminal of the ABS modulator-control unit 25P connector and body ground (see table).

**DTC AND APPROPRIATE TERMINAL**

| <b>DTC</b>       | <b>Appropriate Terminal</b> |
|------------------|-----------------------------|
| 11 (Right-front) | No. 18: FRW (+)             |
| 13 (Left-front)  | No. 3: FLW (+)              |
| 15 (Right-rear)  | No. 15: RRW (+)             |
| 17 (Left-rear)   | No. 5: RLW (+)              |

**ABS MODULATOR-CONTROL UNIT 25P CONNECTOR**

Wire side of female terminals

G03682506

**Fig. 22: ABS Modulator-Control Unit 25P Connector**  
**Courtesy of AMERICAN HONDA MOTOR CO., INC.**

*Is there 0.1 V or more?*

**YES** -Repair short to power in the (+) circuit 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 the appropriate wheel sensor (+) circuit terminal of the ABS modulator-control unit 25P connector and body ground (see table).

**DTC AND APPROPRIATE TERMINAL**

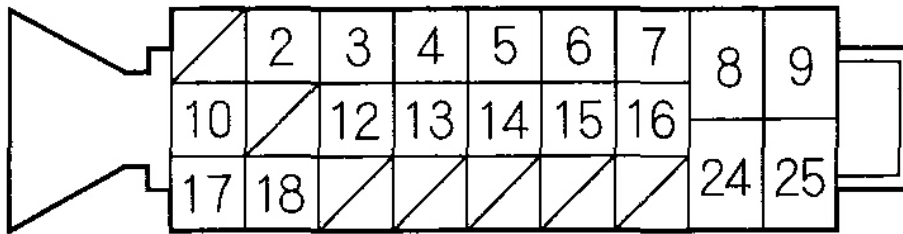
| DTC              | Appropriate Terminal |
|------------------|----------------------|
| 11 (Right-front) | No. 18: FRW (+)      |
| 13 (Left-front)  | No. 3: FLW (+)       |
|                  |                      |

## 2006 Honda Insight

2000-06 BRAKES ABS (Anti-Lock Brake System) Components - Insight

|                 |                 |
|-----------------|-----------------|
| 15 (Right-rear) | No. 15: RRW (+) |
| 17 (Left-rear)  | No. 5: RLW (+)  |

### ABS MODULATOR-CONTROL UNIT 25P CONNECTOR



Wire side of female terminals

G03682507

**Fig. 23: ABS Modulator-Control Unit 25P Connector**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

*Is there continuity?*

**YES** -Go to step 6.

**NO** -Go to step 7 .

- Disconnect the harness 2P connector from the appropriate wheel sensor, then check for continuity between the (+) and (-) terminals of the harness and body ground.

*Is there continuity?*

**YES** -Repair short to body ground in the (+) or (-) circuit wire between the

ABS modulator-control unit and the wheel sensor.

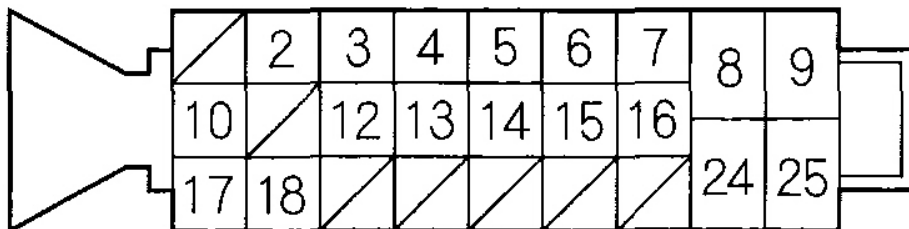
**NO** -Replace the wheel sensor (see **REPLACE THE WHEEL SENSOR** ).

7. Check the resistance between the appropriate wheel sensor (+) and (-) circuit terminals of the ABS modulator-control unit 25P connector (see table).

### DTC AND APPROPRIATE TERMINAL

| DTC              | Appropriate Terminal |                 |
|------------------|----------------------|-----------------|
|                  | (+) Side             | (-) Side        |
| 11 (Right-front) | No.18: FRW (+)       | No.2: FRW (-)   |
| 13 (Left-front)  | No. 3: FLW (+)       | No. 12: FLW (-) |
| 15 (Right-rear)  | No. 15: RRW (+)      | No.6: RRW (-)   |
| 17 (Left-rear)   | No.5: RLW (+)        | No. 14: RLW (-) |

### ABS MODULATOR-CONTROL UNIT 25P CONNECTOR



Wire side of female terminals

G03682508

**Fig. 24: ABS Modulator-Control Unit 25P Connector**  
**Courtesy of AMERICAN HONDA MOTOR CO., INC.**

*Is the resistance between 450-2,000 ohm ?*

**YES** -Check for loose terminals in the ABS modulator-control unit 25P connector. If necessary, substitute a known-good ABS modulator-control unit, and recheck.

**NO** -Go to step 8.

8. Disconnect the harness 2P connector from the appropriate wheel sensor, and check the resistance between the (+) and (-) terminals of the wheel sensor.

*Is the resistance between 450-2,000 ohm ?*

**YES** -Repair open in the (+) or (-) circuit wire, or short between the (+) circuit wire and the (-) circuit wire between the ABS modulator-control unit and the wheel sensor.

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

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

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

1. Visually check for appropriate wheel sensor and pulser installation (see table). Measure pulser-to-sensor clearance. Inspect the pulsers for chipped or damaged teeth (see **WHEEL SENSOR INSPECTION** ).

#### **DTC AND APPROPRIATE WHEEL SENSOR**

| <b>DTC</b> | <b>Appropriate Wheel Sensor</b> |
|------------|---------------------------------|
| 12         | Right-front                     |
| 14         | Left-front                      |
| 16         | Right-rear                      |
| 18         | Left-rear                       |

*Are the wheel sensors and pulsers OK?*

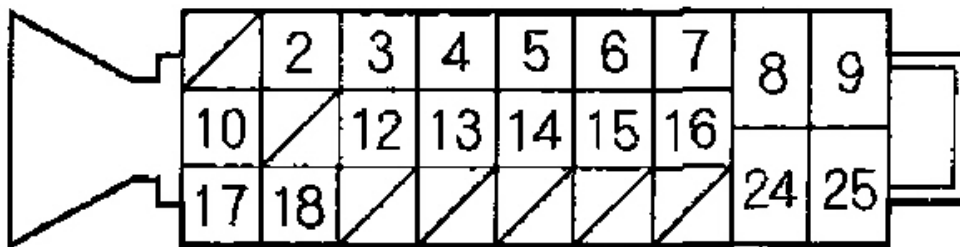
**YES** -Go to step 2.

**NO** -Reinstall or replace the appropriate wheel sensor or pulser (see **WHEEL SENSOR INSPECTION** ).

2. Disconnect the ABS modulator-control unit 25P connector.
3. Measure the resistance between the appropriate wheel sensor (+) and (-) circuit terminals of the ABS modulator-control unit 25P connector (see table).

#### **DTC AND APPROPRIATE TERMINAL**

| <b>DTC</b>       | <b>Appropriate Terminal</b> |                 |
|------------------|-----------------------------|-----------------|
|                  | <b>(+) Side</b>             | <b>(-) Side</b> |
| 12 (Right-front) | No.18: FRW (+)              | No.2: FRW (-)   |
| 14 (Left-front)  | No.3: FLW (+)               | No.12: FLW (-)  |
| 16 (Right-rear)  | No.15: RRW (+)              | No.6: RRW (-)   |
| 18 (Left-rear)   | No.5: RLW (+)               | No.14: RLW (-)  |

**ABS MODULATOR-CONTROL UNIT 25P CONNECTOR****Wire side of female terminals****G03682509**

**Fig. 25: ABS Modulator-Control Unit 25P Connector**  
**Courtesy of AMERICAN HONDA MOTOR CO., INC.**

*Is there less than 450 ohm ?*

**YES** -Repair short to wire between the appropriate wheel sensor (+) and (-) circuits.

**NO** -Go to step 4.

4. Check for continuity between the appropriate wheel sensor (+) circuit terminal and other wheel sensor (+) circuit terminals of the ABS modulator-control unit 25P connector (see table).

**DTC AND APPROPRIATE TERMINAL**

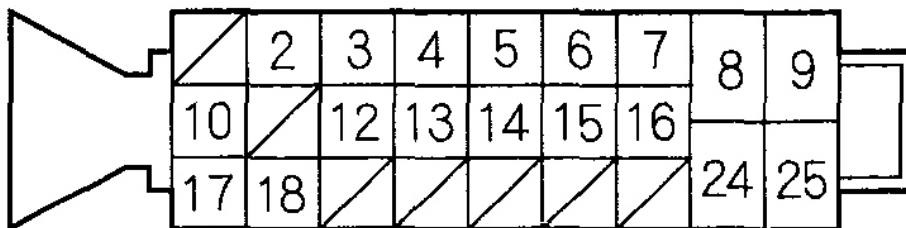
| DTC | Appropriate Terminal | Other Terminal |  |  |
|-----|----------------------|----------------|--|--|
|     |                      |                |  |  |

## 2006 Honda Insight

2000-06 BRAKES ABS (Anti-Lock Brake System) Components - Insight

|    |                 |                 |                 |                 |
|----|-----------------|-----------------|-----------------|-----------------|
| 12 | No. 18: FRW (+) | No. 3: FLW (+)  | No. 15: RRW (+) | No. 5: RLW (+)  |
| 14 | No. 3: FLW (+)  | No. 18: FRW (+) | No. 15: RRW (+) | No. 5: RLW (+)  |
| 16 | No. 15: RRW (+) | No. 18: FRW (+) | No. 3: FLW (+)  | No. 5: RLW (+)  |
| 18 | No. 5: RLW (+)  | No. 18: FRW (+) | No. 3: FLW (+)  | No. 15: RRW (+) |

### ABS MODULATOR-CONTROL UNIT 25P CONNECTOR



Wire side of female terminals

G03682510

**Fig. 26: ABS Modulator-Control Unit 25P Connector**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

*Is there continuity?*

**YES** -Repair short to wire between the appropriate wheel sensor and the other wheel sensor harnesses.

**NO** -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** ).

**DTC 21, 22, 23, 24: PULSER**

1. Clear the DTC using the HDS (see **HOW TO CLEAR DTCS** ).
2. Disconnect the HDS from the 16P DLC.
3. Turn the ignition switch OFF, then turn it ON (II) again.
4. Test-drive the vehicle at 19 mph (30 km/h) or more.

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

**YES** -Go to step 5.

**NO** -The system is OK at this time.

5. Check the appropriate pulser gear for a chipped tooth (see table).

**DTC AND APPROPRIATE PULSER**

| <b>DTC</b> | <b>Appropriate Pulser</b> |
|------------|---------------------------|
| 21         | Right-front               |
| 22         | Left-front                |
| 23         | Right-rear                |
| 24         | Left-rear                 |

*Are the pulser gears OK?*

**YES** -Check for loose terminals in the ABS modulator-control unit 25P connector. If necessary, substitute a known-good ABS modulator-control unit, and recheck.

**NO** -Replace the driveshaft or the hub unit with the chipped tooth on pulser gear.

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

1. Clear the DTC using the HDS (see **HOW TO CLEAR 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, 38 indicated?*

**YES** -Check for loose terminals in the ABS modulator-control unit 25P connector. If necessary, substitute a known-good ABS modulator-control unit, and recheck.

**NO** -The system is OK at this time.

#### **DTC 41, 42, 43, 44: WHEEL LOCK**

1. Check for brake drag.

*Do the brakes drag?*

**YES** -Repair the brake drag.

**NO** -Go to step 2.

2. Check the installation of the appropriate wheel sensor (see table).

#### **DTC AND APPROPRIATE WHEEL SENSOR**

| <b>DTC</b> | <b>Appropriate Wheel Sensor</b> |
|------------|---------------------------------|
| 41         | Right-front                     |
| 42         | Left-front                      |
| 43         | Right-rear                      |
| 44         | Left-rear                       |

*Is it correct?*

**YES** -The probable cause was the vehicle spun during cornering. If the problem recurs, check the modulator using the HDS.

**NO** -Reinstall the wheel sensor correctly (see **WHEEL SENSOR INSPECTION** ).

#### **DTC 51: MOTOR LOCK**

1. Check the No. 3 (30 A) fuse in the under-hood fuse/relay box, and reinstall the fuse if it is OK.

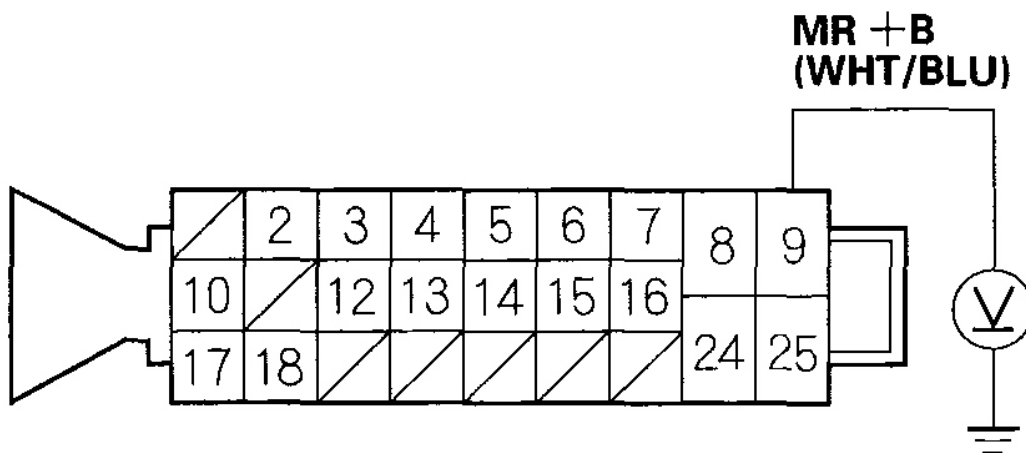
*Is the fuse OK?*

**YES** -Go to step 2.

**NO** -Replace the fuse, and recheck.

2. Disconnect the ABS modulator-control unit 25P connector.
3. Measure the voltage between the ABS modulator-control unit 25P connector No. 9 terminal and body ground.

### ABS MODULATOR-CONTROL UNIT 25P CONNECTOR



Wire side of female terminals

G03682511

**Fig. 27: Measuring Voltage Between ABS Modulator-Control Unit 25P Connector No. 9 Terminal And Body Ground**  
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

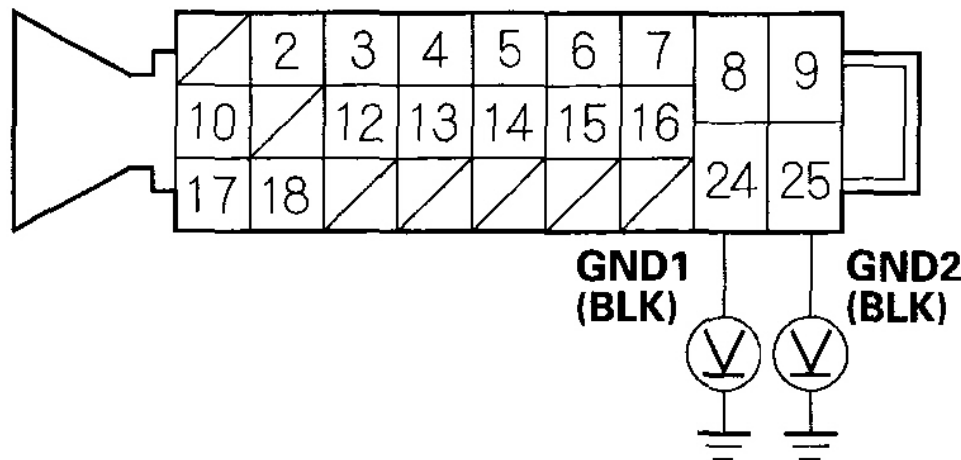
*Is there battery voltage?*

**YES** -Go to step 4.

**NO** -Repair open in the wire between the No. 3 (30 A) fuse and the ABS modulator-control unit.

4. Reconnect the ABS modulator-control unit 25P connector.
5. Turn the ignition switch ON (II).
6. Measure the voltage on No. 24 and No. 25 at the ABS modulator-control unit 25P connector.

### ABS MODULATOR-CONTROL UNIT 25P CONNECTOR



Wire side of female terminals

G03682512

**Fig. 28: Measuring Voltage On No. 24 And No. 25 At ABS Modulator-Control Unit 25P Connector**

**Courtesy of AMERICAN HONDA MOTOR CO., INC.**

*Is there less than 0.3 V?*

**YES** -Go to step 7.

**NO** -Repair open in the wire(s) between the ABS modulator-control unit 25P connector and G201, or repair loose G201.

7. Clear the DTC using the HDS (see **HOW TO CLEAR DTCS** ).
8. Turn the ignition switch OFF, and disconnect the HDS.
9. Test-drive the vehicle at 6 mph (10 km/h) or more.

*Does the ABS indicator come on and is DTC 51 indicated?*

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

**NO** -The system is OK at this time.

**DTC 52: MOTOR STUCK OFF**

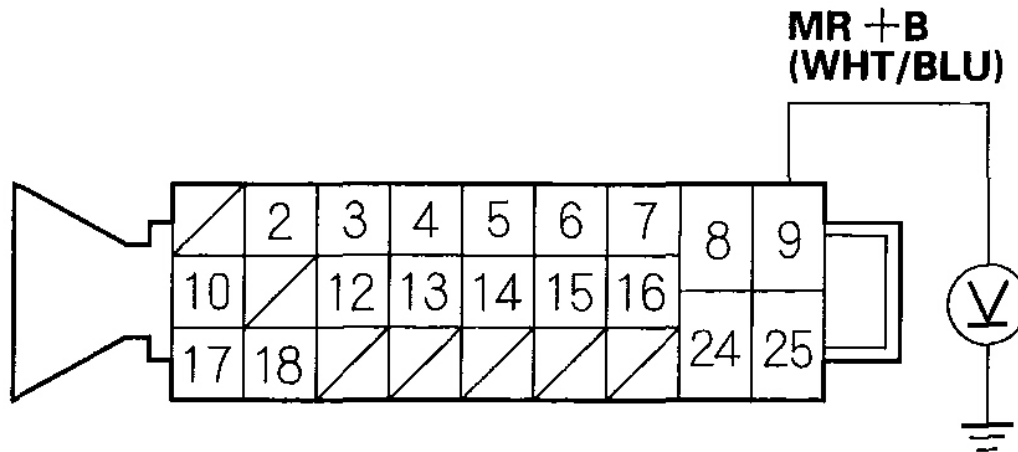
1. Check the No. 3 (30 A) fuse in the under-hood fuse/relay box, and reinstall the fuse if it is OK.

*Is the fuse OK?*

**YES** -Go to step 2.

**NO** -Replace the fuse, and recheck.

2. Disconnect the ABS modulator-control unit 25P connector.
3. Measure the voltage between the ABS modulator-control unit 25P connector No. 9 terminal and body ground.

**ABS MODULATOR-CONTROL UNIT 25P CONNECTOR**

Wire side of female terminals

G03682513

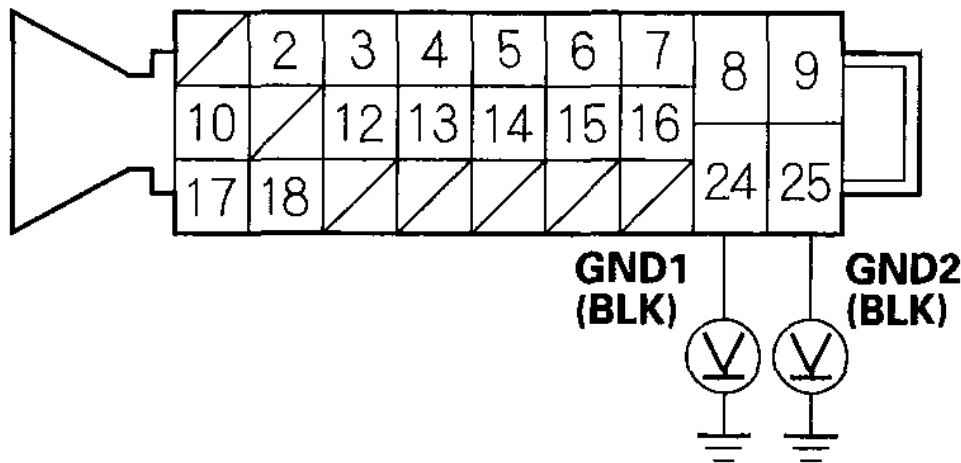
**Fig. 29: Measuring Voltage Between ABS Modulator-Control Unit 25P Connector No. 9 Terminal And Body Ground**  
**Courtesy of AMERICAN HONDA MOTOR CO., INC.**

*Is there battery voltage?*

**YES** -Go to step 4.

**NO** -Repair open in the wire between the No. 3 (30 A) fuse and the ABS modulator-control unit.

4. Reconnect the ABS modulator-control unit 25P connector.
5. Turn the ignition switch ON (II).
6. Measure the voltage on No. 24 and No. 25 at the ABS modulator-control unit 25P connector.

**ABS MODULATOR-CONTROL UNIT 25P CONNECTOR**

Wire side of female terminals

G03682514

**Fig. 30: Measuring Voltage On No. 24 And No. 25 At ABS Modulator-Control Unit 25P Connector**

**Courtesy of AMERICAN HONDA MOTOR CO., INC.**

*Is there less than 0.3 V?*

**YES** -Check the connections at the ABS modulator-control unit 25P connector. If connections are OK, replace the ABS modulator-control unit (see **ABS MODULATOR-CONTROL UNIT REMOVAL AND INSTALLATION** ).

**NO** -Repair open in the wire(s) between the ABS modulator-control unit 25P connector terminal and No. 24 or No. 25 and G201, or repair loose G201.

**DTC 53: MOTOR STUCK ON**

1. Clear the DTC using the HDS (see **HOW TO CLEAR DTCS** ).

2. Disconnect the HDS from the 16P DLC.
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 53 indicated?*

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

**NO** -The system is OK at this time.

**DTC 54: ABS FAIL-SAFE RELAY**

1. Clear the DTC using the HDS (see **HOW TO CLEAR DTCS** ).
2. Disconnect the HDS from the 16P DLC.
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** -Replace the ABS modulator-control unit (see **ABS MODULATOR-CONTROL UNIT REMOVAL AND INSTALLATION** ).

**NO** -Intermittent failure; the vehicle is OK at this time.

**DTC 61,62: FSR +B VOLTAGE**

1. Clear the DTC using the HDS (see **HOW TO CLEAR DTCS** ).
2. Disconnect the HDS from the 16P DLC.
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** -Check the charging system.

**NO** -Intermittent failure; the vehicle is OK at this time.

**DTC 71: DIFFERENT DIAMETER TIRE**

1. Clear the DTC using the HDS (see **HOW TO CLEAR DTCS** ).
2. Disconnect the HDS from the 16P DLC.
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 71 indicated?*

**YES** -Make sure all four tires are the specified size and are inflated to proper specification.

**NO** -Intermittent failure; the vehicle is OK at this time.

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

1. Clear the DTC using the HDS (see **HOW TO CLEAR DTCS** ).
2. Disconnect the HDS from the 16P DLC.
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 81 indicated?*

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

**NO** -Intermittent failure; the vehicle is OK at this time.

**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** -The system is OK at this time.

**NO** -Go to step 2.

2. Turn the ignition switch OFF then ON (II) again.

*Does the brake system indicator come on?*

**YES** -Go to step 3.

**NO** -Repair open in the indicator power source circuit:

- Blown No. 6 (7.5 A) fuse in the under-dash fuse/relay box.
- Open in the wire between the No. 6 (7.5 A) fuse and the gauge assembly.
- Open circuit inside the under-dash fuse/relay box.

3. Turn the ignition switch OFF.
4. Disconnect the ABS modulator-control unit 25P 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 25P connector. If necessary, substitute a known-good ABS modulator-control unit, and recheck.

**NO** -Go to step 6.

6. Check the ABS indicator bulb in the gauge assembly.

*Is the bulb OK?*

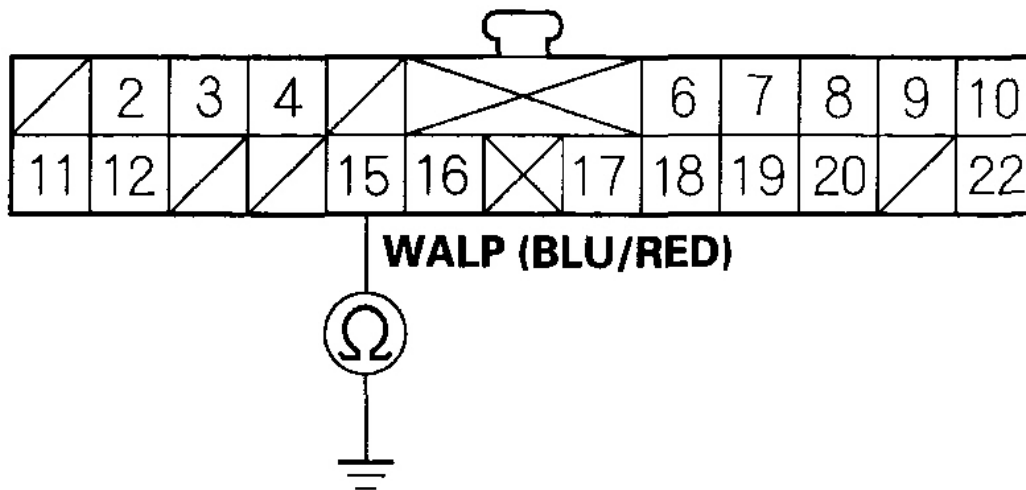
**YES** -Go to step 7.

**NO** -Replace the ABS indicator bulb.

7. Turn the ignition switch OFF.
8. Remove the gauge assembly (see **GAUGE ASSEMBLY REPLACEMENT** ), and disconnect the gauge assembly 22P connector.

9. Check for continuity between the gauge assembly 22P connector terminal No. 15 and body ground.

### GAUGE ASSEMBLY 22P CONNECTOR



Wire side of female terminals

G03682515

**Fig. 31: Identifying Gauge Assembly 22P Connector**  
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

*Is there continuity?*

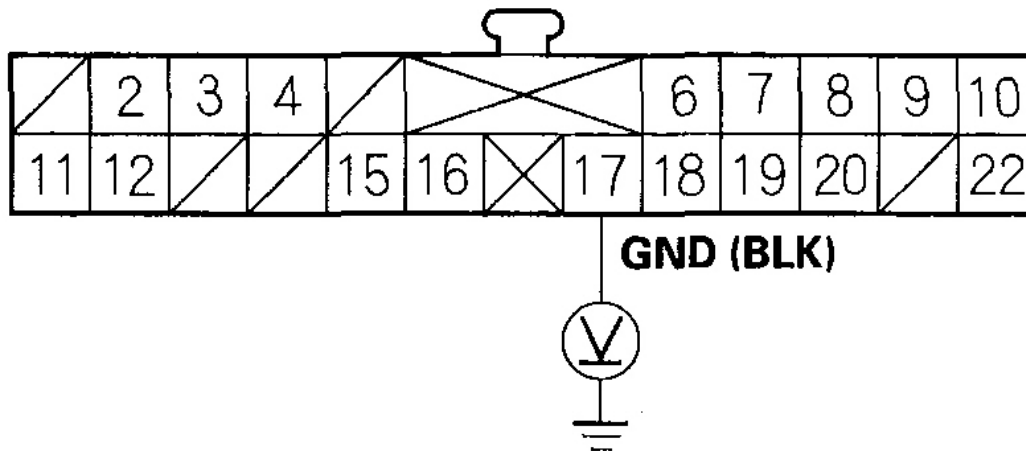
**YES** -Repair short to body ground in the wire between the gauge assembly and the ABS modulator-control unit.

**NO** -Go to step 10.

10. Reconnect the gauge assembly 22P connector, and turn the ignition switch ON (II).
11. Measure the voltage between the gauge assembly 22P connector terminal No.

17 and body ground.

### GAUGE ASSEMBLY 22P CONNECTOR



Wire side of female terminals

G03682516

**Fig. 32: Measuring Voltage Between Gauge Assembly 22P Connector Terminal No. 17 And Body Ground**  
**Courtesy of AMERICAN HONDA MOTOR CO., INC.**

*Is there less than 0.3 V?*

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

**NO** -Repair open in the wire between the gauge assembly and body ground (G401, G402).

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

1. Check the No. 14 (20 A) fuse in the under-hood fuse/relay box, and reinstall

the fuse if it is OK.

*Is the fuse OK?*

**YES** -Go to step 2.

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

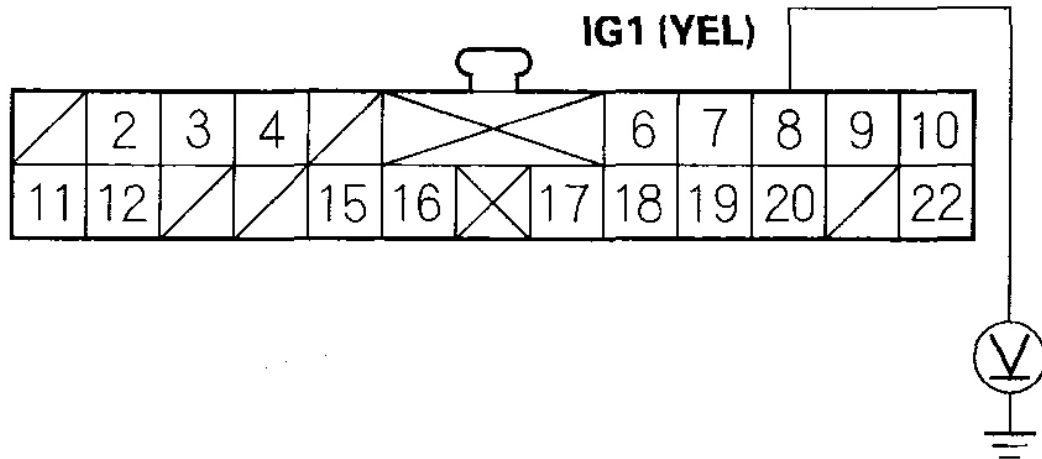
2. Check the No. 16 (7.5 A) fuse in the under-dash fuse/relay box, and reinstall the fuse if it is OK.

*Is the fuse OK?*

**YES** -Go to step 3.

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

3. Disconnect the gauge assembly 22P connector.
4. Measure the voltage between terminal No. 8 and body ground.

**GAUGE ASSEMBLY 22P CONNECTOR**

Wire side of female terminals

G03682517

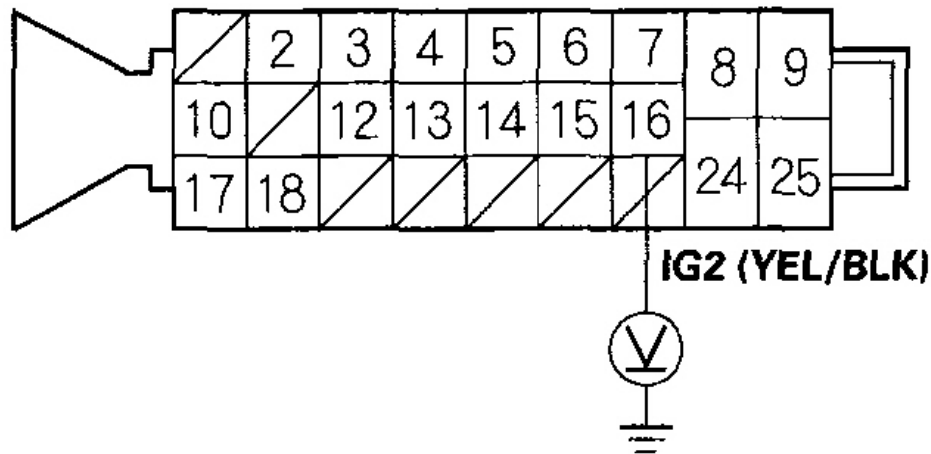
**Fig. 33: Measuring Voltage Between Terminal No. 8 And Body Ground**  
**Courtesy of AMERICAN HONDA MOTOR CO., INC.**

*Is there battery voltage?*

**YES** -Go to step 5.

**NO** -Repair open in the wire between the No. 14 (20 A) fuse and the ABS modulator-control unit.

5. Turn the ignition switch ON (II).
6. Measure the voltage between the ABS modulator-control unit 25P connector terminal No. 16 and body ground.

**ABS MODULATOR-CONTROL UNIT 25P CONNECTOR**

Wire side of female terminals

G03682518

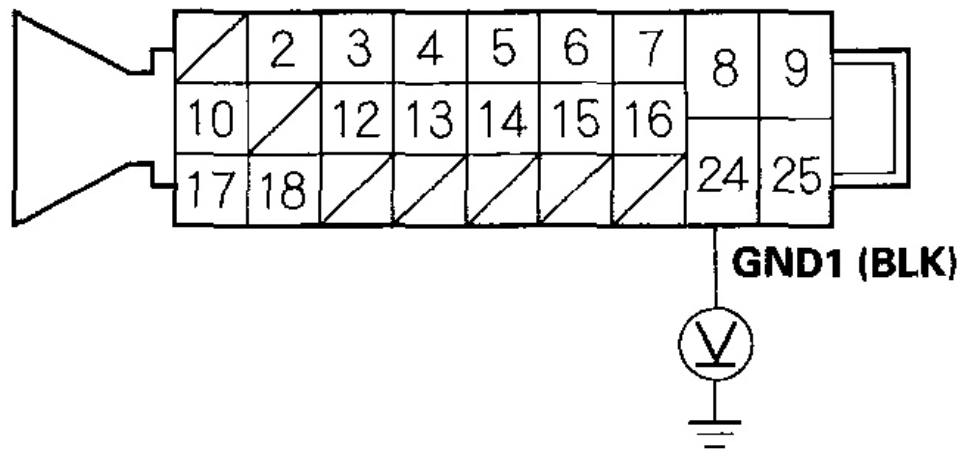
**Fig. 34: Measuring Voltage Between ABS Modulator-Control Unit 25P Connector Terminal No. 16 And Body Ground**  
**Courtesy of AMERICAN HONDA MOTOR CO., INC.**

*Is there battery voltage?*

**YES** -Go to step 7.

**NO** -Repair open in the wire between the No. 16 (7.5 A) fuse and the ABS modulator-control unit.

7. Turn the ignition switch OFF.
8. Reconnect the ABS modulator-control unit 25P connector.
9. Turn the ignition switch ON (II).
10. Measure the voltage between the ABS modulator-control unit 25P connector terminal No. 24 and body ground.

**ABS MODULATOR-CONTROL UNIT 25P CONNECTOR**

Wire side of female terminals

G03682519

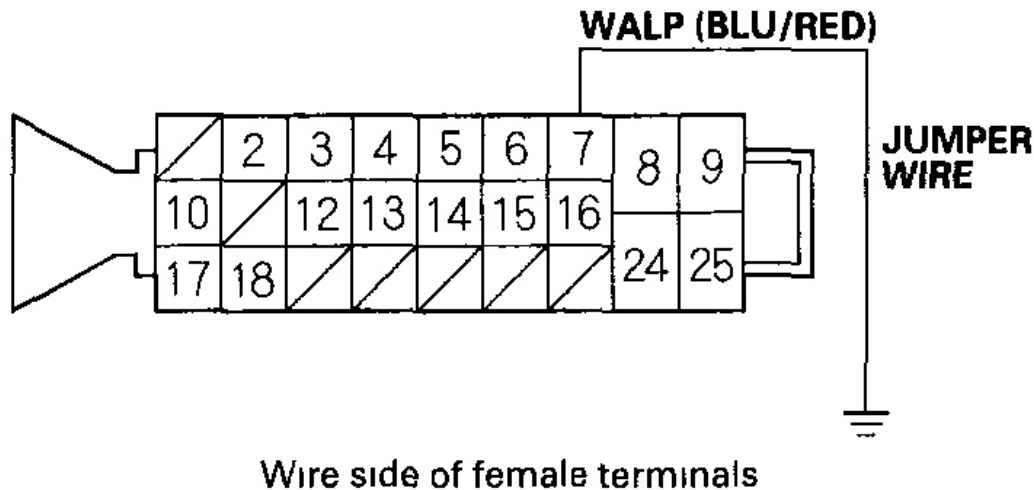
**Fig. 35: Measuring Voltage Between ABS Modulator-Control Unit 25P Connector Terminal No. 24 And Body Ground**  
**Courtesy of AMERICAN HONDA MOTOR CO., INC.**

*Is there less than 0.3 V?*

**YES** -Go to step 11.

**NO** -Repair open in the wire between the ABS modulator-control unit and body ground (G20D).

11. Turn the ignition switch OFF, disconnect the ABS modulator-control unit 25P connector.
12. Turn the ignition switch ON (II).
13. Connect the ABS modulator-control unit 25P connector terminal No. 7 and body ground with a jumper wire.

**ABS MODULATOR-CONTROL UNIT 25P CONNECTOR**

G03682520

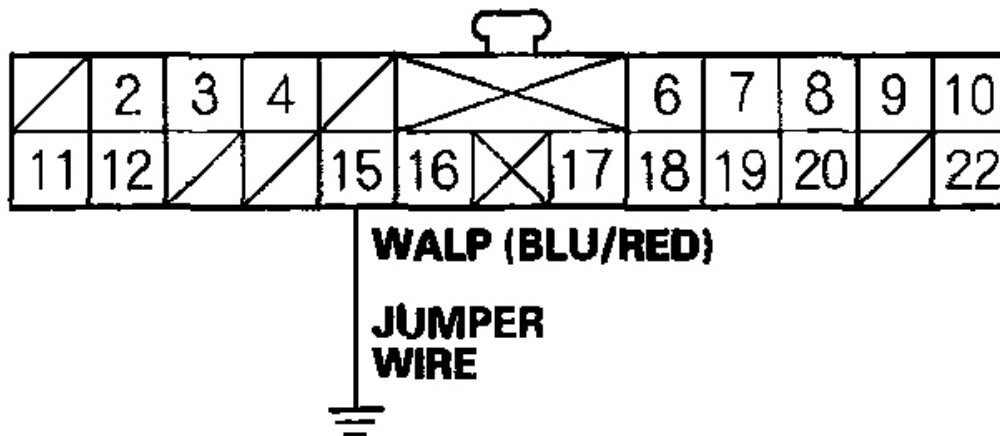
**Fig. 36: Connecting ABS Modulator-Control Unit 25P Connector Terminal No. 7 And Body Ground With A Jumper Wire**  
**Courtesy of AMERICAN HONDA MOTOR CO., INC.**

*Does the ABS indicator go off?*

**YES** -Check for loose terminals in the ABS modulator-control unit 25P connector. If necessary, substitute a known-good ABS modulator-control unit, and recheck.

**NO** -Go to step 14.

14. Turn the ignition switch OFF, reconnect the gauge assembly 22P connector.
15. Connect the gauge assembly 22P connector terminal No. 15 and body ground with a jumper wire.
16. Turn the ignition switch ON (II).

**GAUGE ASSEMBLY 22P CONNECTOR**

Wire side of female terminals

G03682521

**Fig. 37: Connecting Gauge Assembly 22P Connector Terminal No. 15 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 gauge assembly and the ABS modulator-control unit.

**NO** -Check for loose gauge assembly 22P connector. If the connector is OK, replace the gauge assembly (see **GAUGE ASSEMBLY REPLACEMENT** ).

## **ABS MODULATOR-CONTROL UNIT REMOVAL AND INSTALLATION**

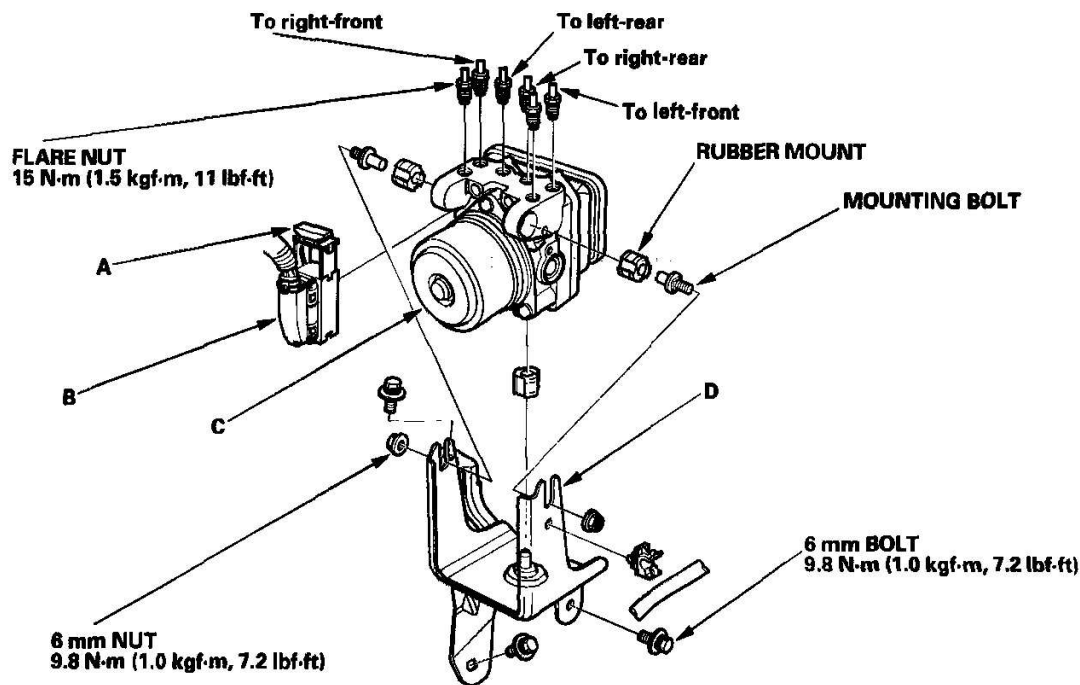
**NOTE:**      • Do not spill brake fluid on the vehicle; it may damage

the paint; if brake fluid gets on the paint, wash it off immediately with water.

- Take care 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. Pull up the lock (A) of the ABS modulator-control unit 25P connector (B), then disconnect the connector.



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**Fig. 38: Pulling Up Lock Of ABS Modulator-Control Unit 25P Connector And Torque Specifications**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Disconnect the six brake lines.

3. Remove the two 6 mm nuts.
4. Remove the ABS modulator-control unit (C) from the bracket (D).

## **INSTALLATION**

1. Install the ABS modulator-control unit on the bracket, then tighten the two 6 mm nuts.
2. Connect the six brake lines to the ABS modulator-control unit, and tighten the flare nuts to the specified torque.
3. Align the connecting surface of the ABS modulator-control unit 25P connector.
4. Push in the lock of the ABS modulator-control unit 25P connector until you hear it click into place, then connect the connector.
5. Bleed the brake system, starting with the front wheels (see **BRAKE SYSTEM BLEEDING** ).
6. Start the engine, and check that the ABS indicator goes off.
7. Test-drive the vehicle, check the ABS operation, and check that the ABS indicator does not come on.
8. If the brake pedal is now spongy, there may be air trapped in the modulator and then induced into the normal brake system during modulation. Bleed the brake system again, starting with the front wheels (see **BRAKE SYSTEM BLEEDING** ).

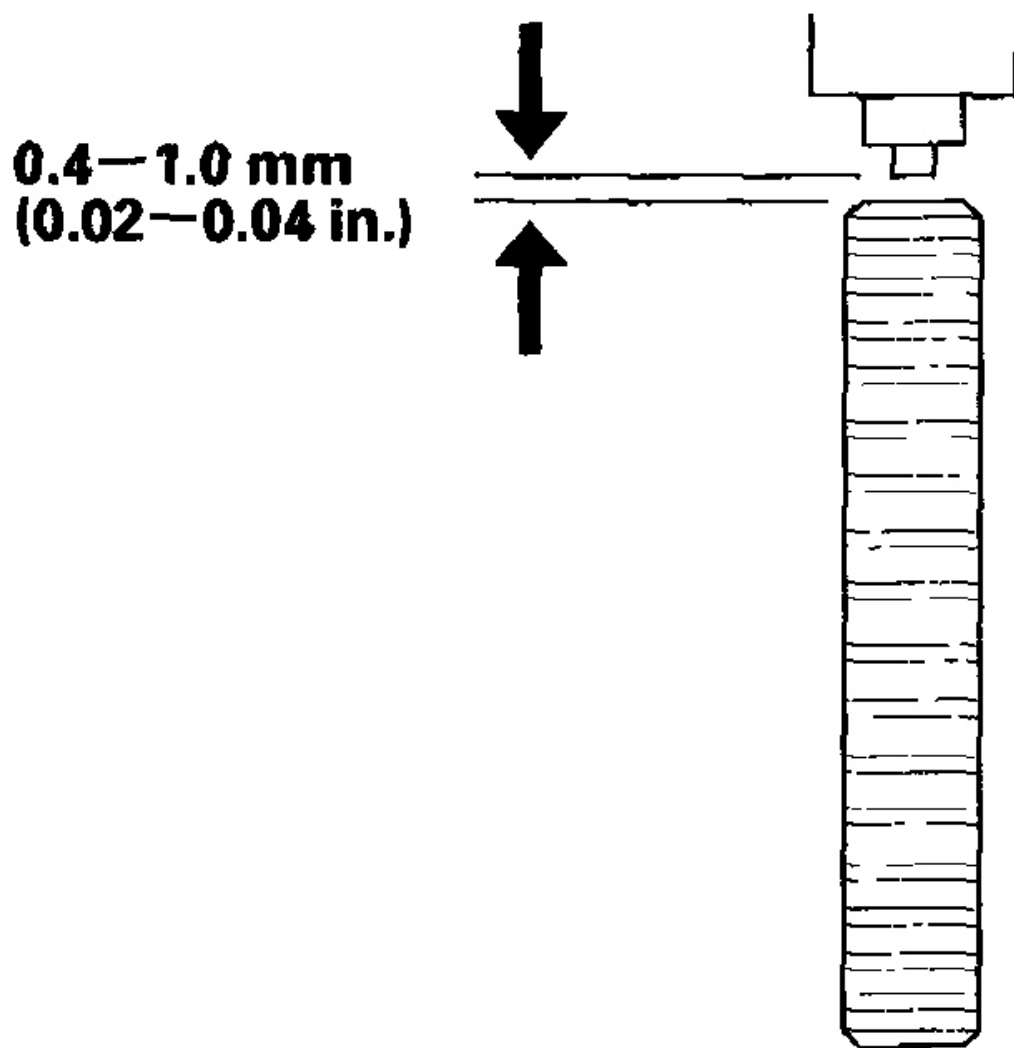
## **WHEEL SENSOR INSPECTION**

1. Inspect the front and rear pulsers for chipped or damaged teeth.
2. Measure the air gap between the wheel sensor and the pulser all the way around while rotating the pulser. Remove the rear brake disc to measure the gap on the rear wheel sensor. If the gap exceeds 1.0 mm (0.04 in.), check for a bent suspension arm.

### **Standard**

**Front/Rear: 0.4-1.0 mm (0.02-0.04 in.)**

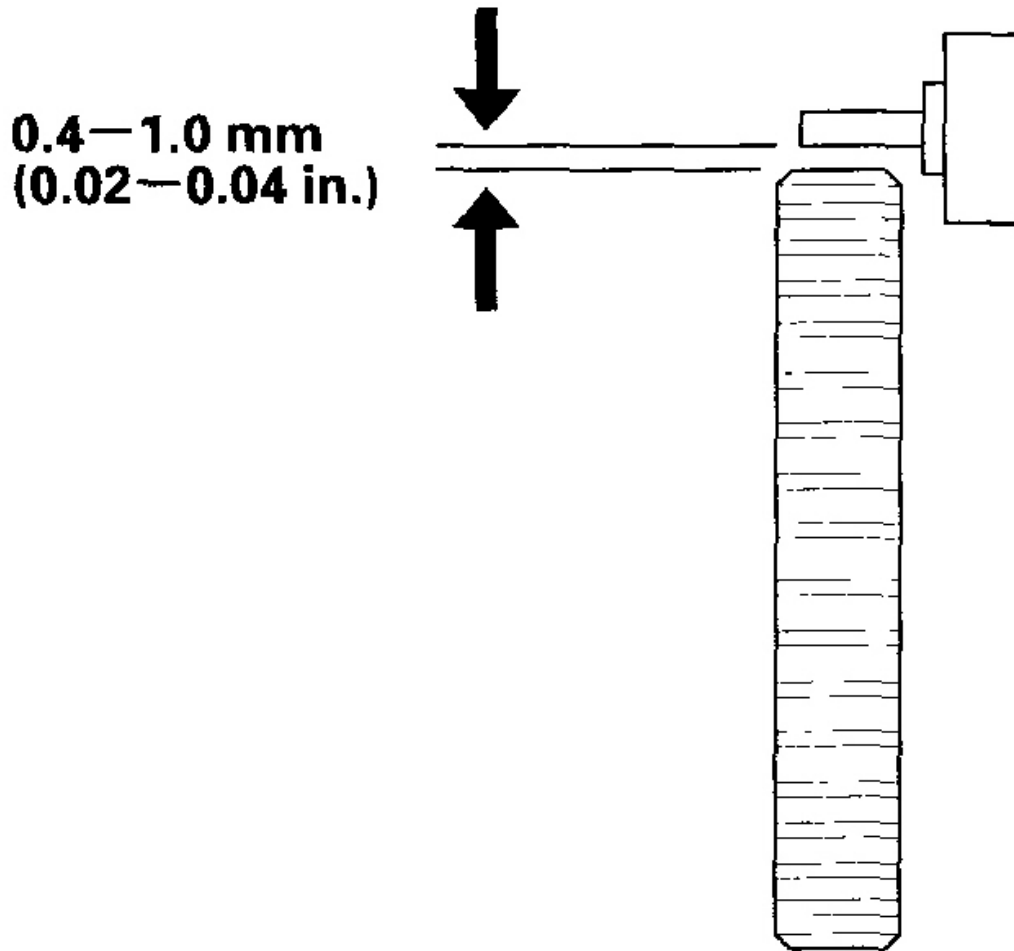
### **Front**



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**Fig. 39: Measuring Air Gap Between Wheel Sensor And Pulser Front**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

Rear



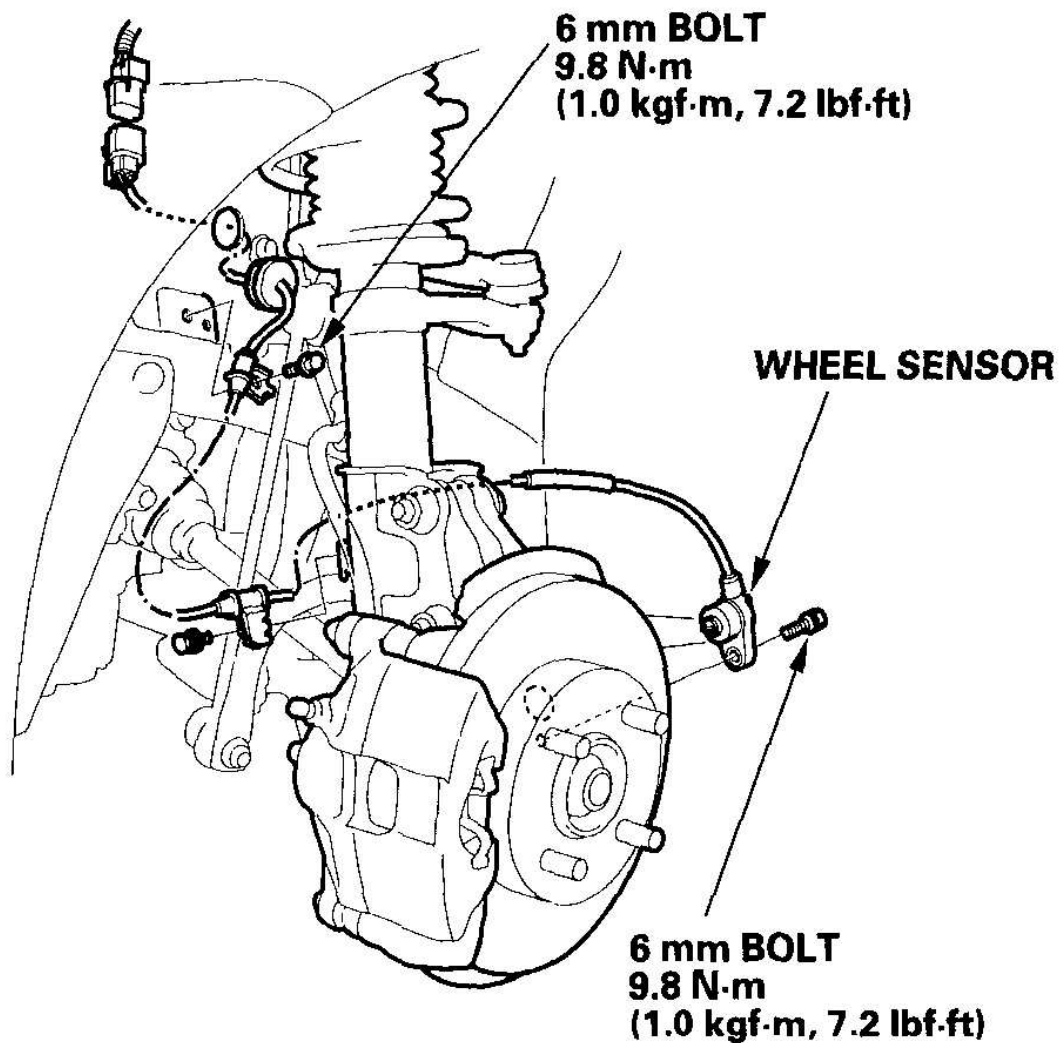
G03682524

**Fig. 40: Measuring Air Gap Between Wheel Sensor And Pulser Rear**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

## WHEEL SENSOR REPLACEMENT

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

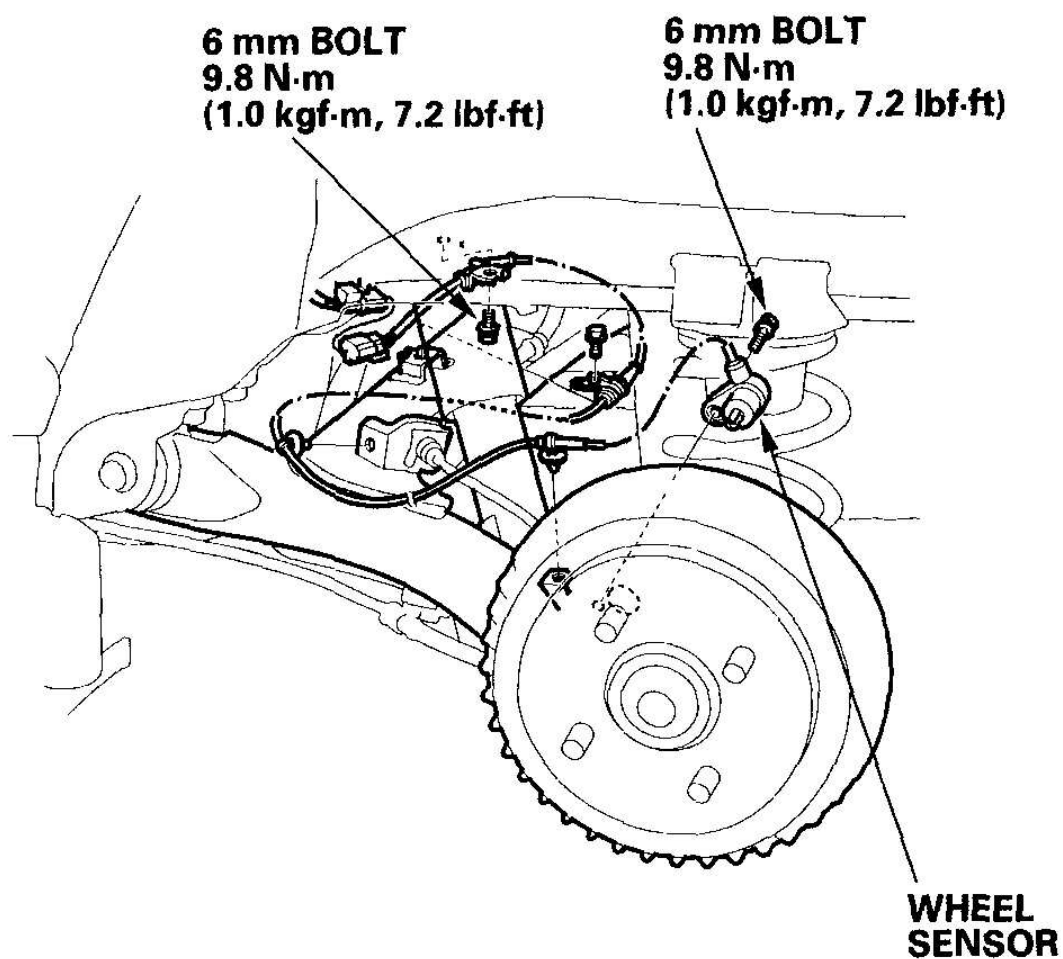
**Front**



G03682525

**Fig. 41: Identifying Wheel Sensor Front And Torque Specifications**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

Rear



G03682526

**Fig. 42: Identifying Wheel Sensor Rear**  
**Courtesy of AMERICAN HONDA MOTOR CO., INC.**