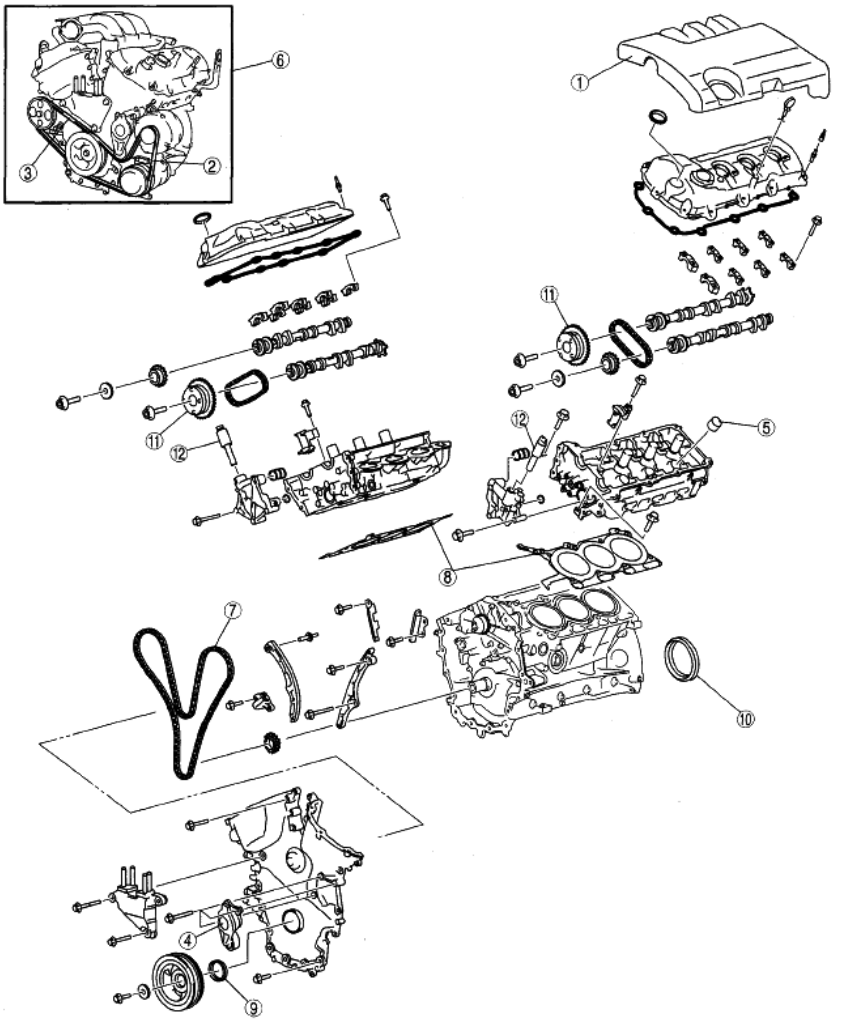
2008 BRAKES

Dynamic Stability Control/Roll Stability Control - Mazda CX-9

DSC/RSC LOCATION INDEX



1	Engine cover (See ENGINE COVER REMOVAL/ INSTALLATION [MZI-3.5].)
2	Generator and A/C drive belt (See DRIVE BELT INSPECTION [MZI-3.5].) (See DRIVE BELT REMOVAL/ INSTALLATION [MZI-3.5].)
3	Power steering oil pump drive belt (See DRIVE BELT INSPECTION [MZI-3.5].) (See DRIVE BELT REMOVAL/ INSTALLATION [MZI-3.5].)
4	Drive belt auto tensioner (See DRIVE BELT AUTO TENSIONER INSPECTION [MZI-3.5].)
5	Tappet (See VALVE CLEARANCE INSPECTION/ ADJUSTMENT [MZI-3.5].)
6	Engine (See COMPRESSION INSPECTION [MZI-3.5].) (See ENGINE REMOVAL/INSTALLATION [MZI-3.5].) (See ENGINE DISASSEMBLY/ ASSEMBLY [MZI-3.5].) (See ENGINE TUNE-UP [MZI-3.5].)

7	Timing chain (See TIMING CHAIN REMOVAL/ INSTALLATION [MZI-3.5].)
8	Cylinder head gasket (See CYLINDER HEAD GASKET REPLACEMENT [MZI-3.5].)
9	Front oil seal (See FRONT OIL SEAL REPLACEMENT [MZI-3.5])
10	Rear oil seal (See REAR OIL SEAL REPLACEMENT [MZI-3.5])
11	Variable valve timing actuator (See VARIABLE VALVE TIMING ACTUATOR REMOVAL/INSTALLATION [MZI-3.5].)
12	OCV (See OIL CONTROL VALVE (OCV) REMOVAL/INSTALLATION [MZI-3.5].) (See OIL CONTROL VALVE (OCV) INSPECTION [MZI-3.5].)

Fig. 1: Identifying DSC/RSC Parts Location
Courtesy of MAZDA MOTORS CORP.

DSC/RSC SYSTEM WIRING DIAGRAM

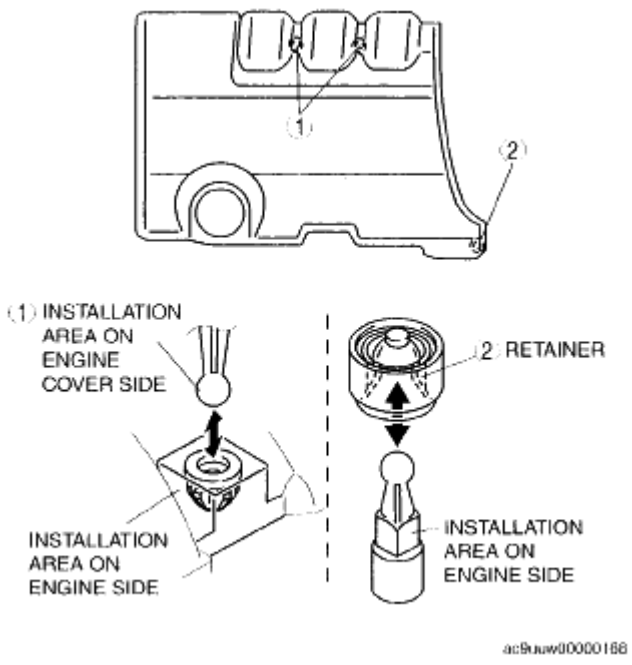


Fig. 2: DSC/RSC System Wiring Diagram
Courtesy of MAZDA MOTORS CORP.

DSC/RSC SYSTEM INSPECTION

PREPARATION

1. Verify that battery is fully charged.
2. Turn the ignition switch to the ON position, and verify that the ABS warning light goes out after approx. 3 s.
3. Turn the ignition switch off.
4. Jack up the vehicle and support it evenly on safety stands.
5. Shift to the N position.
6. Verify that all four wheels rotate.
7. Rotate the inspected wheels by hand, and verify there is no brake drag.
    - If there is any brake drag, perform regular brake inspection.
    - If there is no brake drag, perform DSC/RSC HU/CM operation inspection.

ABS CONTROL INSPECTION

1. Perform "Preparation".
2. Connect the M-MDS to the DLC-2.
3. Set up an active command mode inspection according to the combination of commands below.

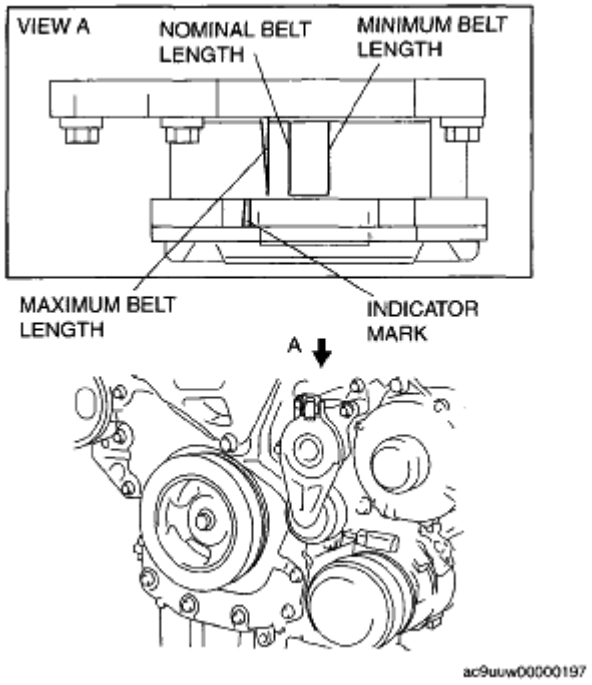


Fig. 3: Connecting M-MDS To DLC-2
Courtesy of MAZDA MOTORS CORP.

Brake pressure retention

BRAKE PRESSURE RETENTION REFERENCE CHART

Command name	Inspected wheels			
	LF	RF	LR	RR
V_TRC_L	OFF			
V_TRC_R				
V_STB_L				
V_STB_R				
V_LF_INL	ON	OFF	OFF	OFF
V_LF_OTL	OFF			
V_LR_INL			ON	
V_LR_OTL			OFF	
V_RF_INL		ON		
V_RF_OTL		OFF		
V_RR_INL				ON
V_RR_OTL				OFF
PMP_MOTOR	OFF			

Brake pressure reduction

BRAKE PRESSURE RETENTION REFERENCE CHART

<table>
<tr><th rowspan="2">Command name</th><th colspan="4">Inspected wheels</th></tr>
<tr><th>LF</th><th>RF</th><th>LR</th><th>RR</th></tr>
<tr><td>V_TRC_L</td><td colspan="4" rowspan="4">OFF</td></tr>
<tr><td>V_TRC_R</td></tr>
<tr><td>V_STB_L</td></tr>
<tr><td>V_STB_R</td></tr>
<tr><td>V_LF_INL</td><td rowspan="2">ON</td><td rowspan="3">OFF</td><td>OFF</td><td rowspan="5">OFF</td></tr>
<tr><td>V_LF_OTL</td><td rowspan="2">ON</td></tr>
<tr><td>V_LR_INL</td><td rowspan="5">OFF</td></tr>
<tr><td>V_LR_OTL</td><td rowspan="3">OFF</td></tr>
<tr><td>V_RF_INL</td><td rowspan="2">ON</td></tr>
<tr><td>V_RF_OTL</td></tr>
<tr><td>V_RR_1NL</td><td rowspan="2">OFF</td><td rowspan="2">ON</td></tr>
<tr><td>V_RR_OTL</td></tr>
<tr><td>PMP_MOTOR</td><td colspan="4">ON</td></tr>
</table>

CAUTION:

- **To protect the DSC/RSC HU/CM, the solenoid valve and the pump motor used during active command mode stay on for only 10 s or less each time they are switched on.**

NOTE:

- **When working with two people, one should press on the brake pedal, and the other should attempt to rotate the wheel being inspected.**

4. Send the command while depressing on the brake pedal and attempting to rotate the wheel being inspected.
5. While brake pressure is maintained and a DSC/RSC HU/CM operation click sound is heard, confirm that the wheel does not rotate. While brake pressure is being reduced and an DSC/RSC HU/CM operation click sound is heard, confirm that the wheel rotates.
    - Performing the inspection above determines the following:
        - The DSC/RSC HU/CM brake lines are normal.
        - The DSC/RSC HU/CM hydraulic system is not significantly abnormal (including DSC/RSC HU/CM).
        - The DSC/RSC HU/CM internal electrical parts (solenoid, motor and other parts) are normal.
        - The DSC/RSC unit and DSC/RSC HU/CM output system wiring harnesses (solenoid valve, relay system) are normal.
    - However, the following items cannot be verified.
        - Malfunction with intermittent occurrence of the above items
        - Malfunction of DSC/RSC HU/CM input system wiring harnesses and parts
        - Extremely small leaks in the DSC/RSC HU/CM internal hydraulic system

DSC CONTROL INSPECTION

1. Perform "Preparation".
2. Connect the M-MDS to the DLC-2.
3. Set up an active command mode inspection according to the combination of commands below.

CAUTION:

- **To protect the DSC/RSC HU/CM, the solenoid valve and the pump motor used during active command mode stay on for only 10 s or less each time they are switched on.**

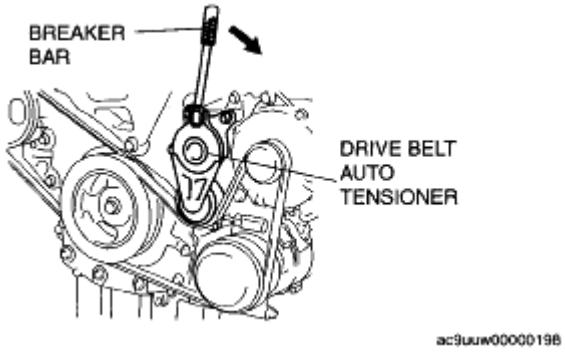


Fig. 4: Connecting M-MDS To DLC-2
Courtesy of MAZDA MOTORS CORP.

BRAKE PRESSURE RETENTION REFERENCE CHART

Command name	Inspected wheels			
	Understeer control inhibited		Oversteer control inhibited	
	LF	RF	LR	RR
V_TRC_L	ON	OFF		ON
V_TRC_R	OFF	ON		OFF
V_STB_L	OFF			
V_STB_R				
V_LF_INL	OFF	OFF	OFF	ON
V_LF_OTL				OFF
V_LR_INL		ON		
V_LR_OTL		OFF		
V_RF_INL			ON	
V_RF_OTL			OFF	
V_RR_INL	ON			
V_RR_OTL	OFF			
PMP_MOTOR	ON			

4. Send the command while rotating the wheel being inspected by hand in a forward direction.
5. Confirm that the wheel does not rotate easily while a DSC/RSC HU/CM operation click sound is heard.
   - Performing the inspection above determines the following:

  - The DSC/RSC HU/CM brake lines are normal.
  - The DSC/RSC HU/CM hydraulic system is not significantly abnormal (including DSC/RSC HU/CM).
  - The DSC/RSC HU/CM internal electrical parts (solenoid, motor and other parts) are normal.
  - The DSC/RSC unit and DSC/RSC HU/CM output system wiring harnesses (solenoid valve, relay system) are normal.
- However, the following items cannot be verified.
  - Malfunction with intermittent occurrence of the above items
  - Malfunction of DSC/RSC HU/CM input system wiring harnesses and parts
  - Extremely small leaks in the DSC/RSC HU/CM internal hydraulic system

DSC/RSC HU/CM REMOVAL/INSTALLATION

WARNING:

- **If the DSC/RSC sensor initialization procedure is not completed, it could result in an unexpected accident due to the DSC/RSC being inoperative. Therefore, after the DSC/RSC HU/CM is replaced, always perform the DSC/RSC sensor initialization procedure to ensure proper DSC/RSC operation. (See DSC/RSC SENSOR INITIALIZATION PROCEDURE.)**

CAUTION:

- **The internal parts of the DSC/RSC HU/CM could be damaged if dropped. Be careful not to drop the DSC/RSC HU/CM. Replace the DSC/RSC HU/CM if it is subjected to an impact.**

1. Remove the battery and battery tray. (See **BATTERY REMOVAL/INSTALLATION [MZI-3.7]** .)
2. Remove the battery tray bracket as shown in the figure.
3. Remove the windshield wiper arm and blade. (See **WINDSHIELD WIPER ARM AND BLADE REMOVAL/INSTALLATION** .)
4. Remove the cowl grille. (See **COWL GRILLE REMOVAL/INSTALLATION** .)
5. Remove the wiper motor. (See **WINDSHIELD WIPER MOTOR REMOVAL/INSTALLATION** .)
6. Remove the cowl panel. (See **COWL PANEL REMOVAL/INSTALLATION** .)

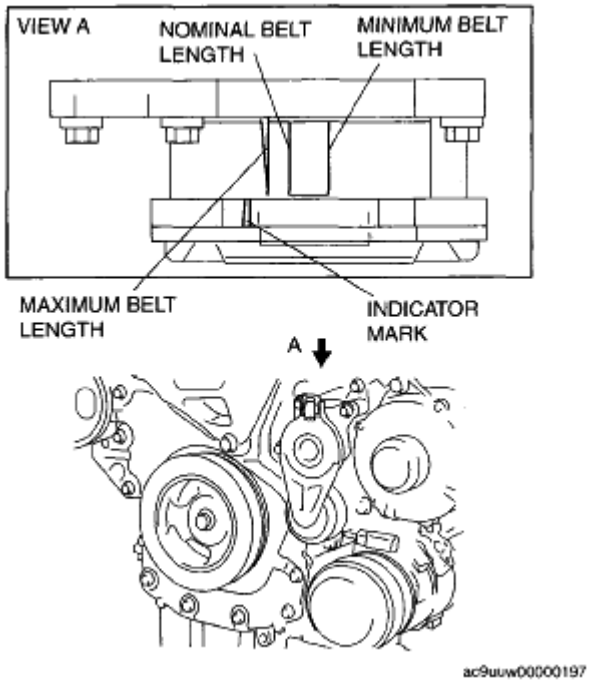


Fig. 5: Identifying Battery Tray Bracket & Torque Specifications
Courtesy of MAZDA MOTORS CORP.

7. Remove the nuts as shown in the figure, and move the front heater pipe.
8. Remove in the order indicated in the table.
9. Install in the reverse order of removal.
10. After installation, add brake fluid, bleed the air, and inspect for fluid leakage. (See **DSC/RSC HU AIR BLEEDING**.) (See **AIR BLEEDING** .)
11. After installation, perform the DSC/RSC sensor initialization procedure. (See **DSC/RSC SENSOR INITIALIZATION PROCEDURE**.)

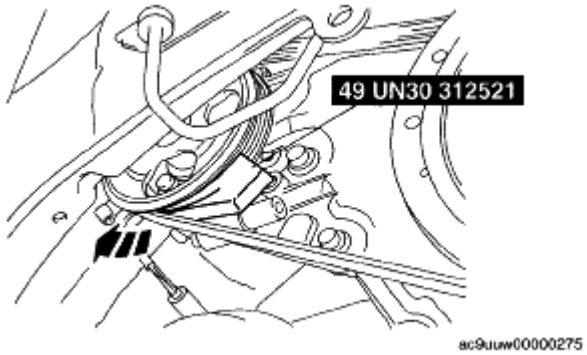


Fig. 6: Identifying Front Heater Pipe & Torque Specifications
Courtesy of MAZDA MOTORS CORP.

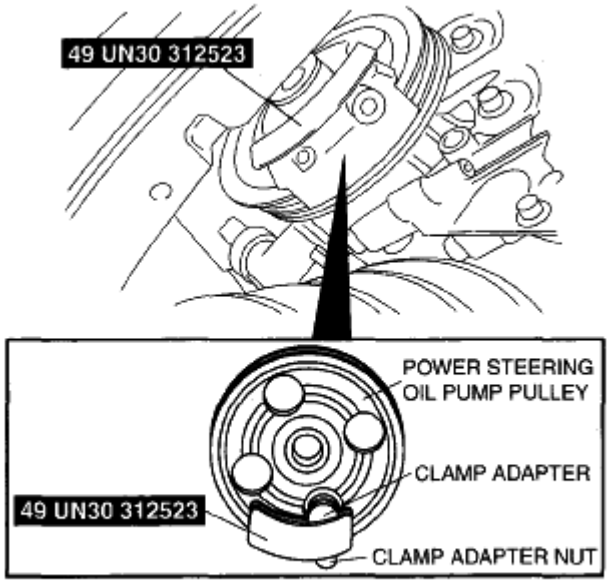


Fig. 7: Identifying DSC/RSC HU/CM Components & Torque Specifications
Courtesy of MAZDA MOTORS CORP.

DSC/RSC HU/CM CONNECTOR REMOVAL NOTE

1. Remove the DSC/RSC HU/CM connector using the following procedure:
    1. Press down the lock lever while pressing the upper tab to release the lock.
    2. Press down the lock lever and lock it using the lower tab.
    3. Remove the DSC/RSC HU/CM connector by pulling it in the direction of the arrow.

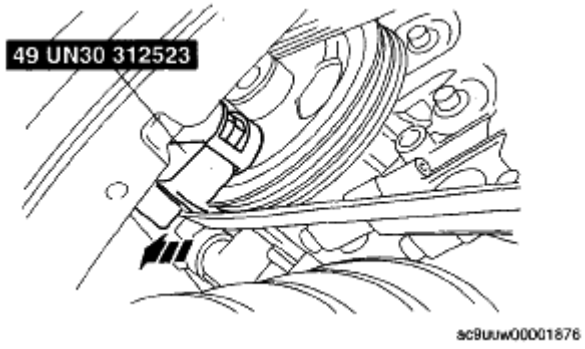


Fig. 8: View Of DSC/RSC HU/CM Connector
Courtesy of MAZDA MOTORS CORP.

BRAKE PIPE REMOVAL NOTE

1. Place an alignment mark on the brake pipe and DSC/RSC HU/CM.

2. Apply protective tape to the DSC/RSC HU/CM connector to prevent brake fluid from entering.
3. Remove the brake pipe.

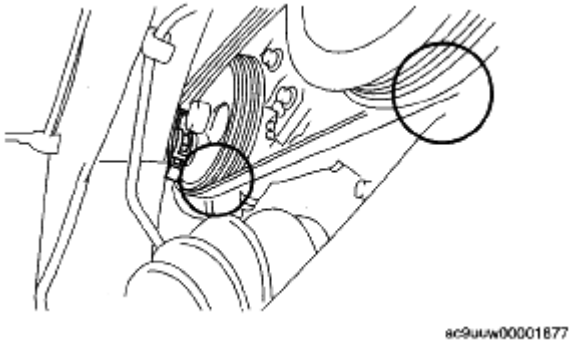


Fig. 9: Identifying Alignment Mark On Brake Pipe & DSC/RSC HU/CM
Courtesy of MAZDA MOTORS CORP.

DSC/RSC HU/CM COMPONENT INSTALLATION NOTE

1. Insert the DSC/RSC HU/CM bracket tab to the vehicle frame hole as shown in the figure.
2. Install the DSC/RSC HU/CM component.

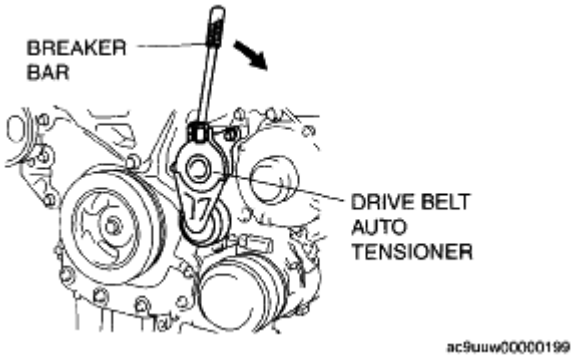


Fig. 10: Identifying DSC/RSC HU/CM Bracket
Courtesy of MAZDA MOTORS CORP.

BRAKE PIPE INSTALLATION NOTE

1. Align the marks made before removal and install the brake pipe to the DSC/RSC HU/CM and brake pipe joint referring to the figure.
2. Tighten the brake pipe to the specified torque using the **SST** (49 0259 770B) and the commercially available flare nut wrench.

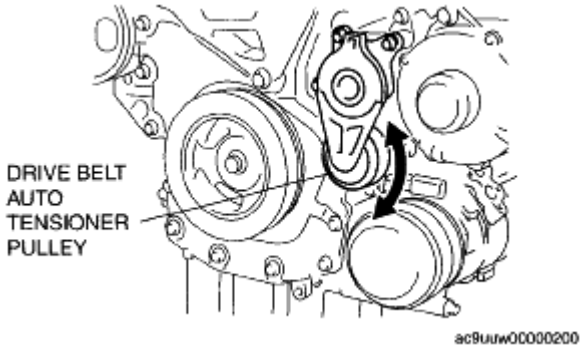


Fig. 11: Identifying Master Cylinder (Primary Side & Secondary Side)
Courtesy of MAZDA MOTORS CORP.

DSC/RSC HU/CM CONNECTOR INSTALLATION NOTE

1. Install the DSC/RSC HU/CM connector using the following procedure:
    1. After verifying that the lock lever is locked by the lower tab, connect the DSC/RSC HU/CM connector to the DSC/RSC HU/CM.
    2. Pull up the lock lever by pressing the lower tab, and release the lock.
    3. Pull up the lock lever and lock it using the upper tab.
2. Verify that the DSC/RSC HU/CM connector is installed securely.

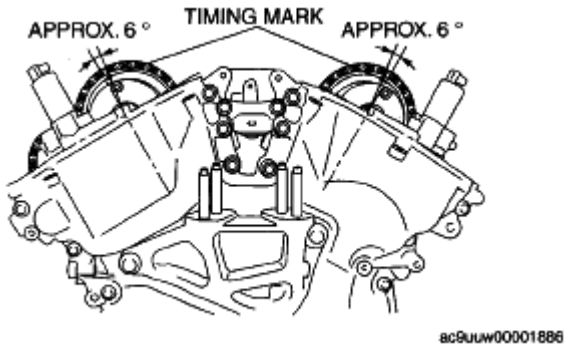


Fig. 12: View Of DSC/RSC HU/CM Connector
Courtesy of MAZDA MOTORS CORP.

DSC/RSC HU AIR BLEEDING

1. Turn the ignition switch off.
2. Connect the M-MDS to the DLC-2.
3. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.
    - When using the IDS (laptop PC)
        1. Select "Chassis".
        2. Select "Braking".

- When using the PDS (Pocket PC)
    1. Select "All Tests and Calibrations".
4. Then, select items from the screen menu in the following order.
    - Select "ABS Service Bleed"
5. Perform the air bleeding according to the directions on the screen.

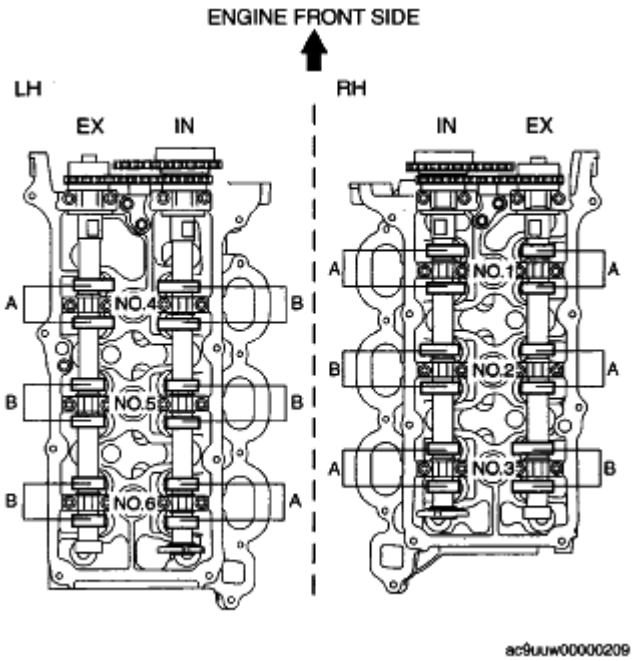


Fig. 13: Connecting M-MDS To DLC-2
Courtesy of MAZDA MOTORS CORP.

DSC/RSC SENSOR INITIALIZATION PROCEDURE

WARNING:

- **Unless the initialization procedure of the combined sensor is completed, the DSC/RSC will not operate, causing an unexpected accident. Therefore, always perform the initialization procedure to ensure DSC/RSC operation if the combined sensor and DSC/RSC HU/CM have been removed or replaced.**

1. Inspect the wheel alignment and inflation pressure.
    - If there is any malfunction, adjust the applicable part.
2. Park the vehicle on level ground.
3. Turn the ignition switch off.
4. Connect the M-MDS to the DLC-2.
5. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.
    - When using the IDS (laptop PC)

1. Select "Chassis".
2. Select "ABS/DSC".
3. Select "Sensor Initialization".

- When using the PDS (Pocket PC)
  1. Select "Module Test".
  2. Select "ABS".
  3. Select "Datalogger".
  4. Select "SSR_INTL".

6. Perform the initialization according to the directions on the screen.

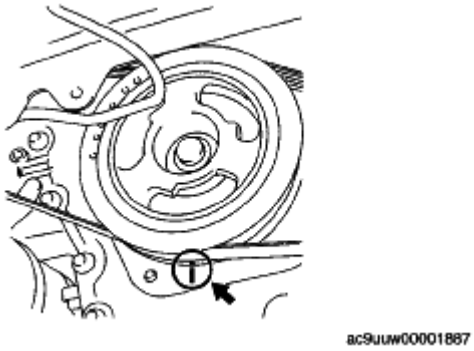


Fig. 14: Connecting M-MDS To DLC-2
Courtesy of MAZDA MOTORS CORP.

DSC/RSC HU/CM INSPECTION

1. Disconnect the DSC/RSC HU/CM connector. (See **DSC/RSC HU/CM REMOVAL/INSTALLATION**.)
2. Connect the negative battery cable. (See **BATTERY REMOVAL/INSTALLATION [MZI-3.7]** .)
3. Attach the tester lead to the DSC/RSC HU/CM harness side connector, then inspect voltage, continuity or resistance according to the standard (reference value) on the table.

STANDARD (REFERENCE VALUE)

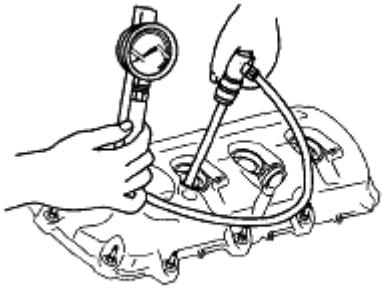


Fig. 15: Identifying DSC/RSC HU/CM Connector Terminal
Courtesy of MAZDA MOTORS CORP.

CONNECTOR TERMINAL REFERENCE CHART

Terminal	Signal name	Connected to	Measured item	Measured terminal (measured condition)	Standard	Inspection item(s)
A	Ground (DSC/RSC system)	Ground point	Continuity	A-ground point	Continuity detected	• Wiring harness (A- ground point)
B	Ground (ABS motor)	Ground point	Continuity	B-ground point	Continuity detected	• Wiring harness (B- ground point)
C	-	-	-	-	-	-
D	-	-	-	-	-	-
E	-	-	-	-	-	-
F	LR wheel-speed sensor (power supply)	LR ABS wheel-speed sensor	Continuity	F-LR ABS wheel-speed sensor connector terminal B	Continuity detected	• Wiring harness (F-LR ABS wheel-speed sensor connector terminal B)
G	RR wheel-speed sensor (power supply)	RR ABS wheel-speed sensor	Continuity	G-RR ABS wheel-speed sensor connector terminal B	Continuity detected	• Wiring harness (G-RR ABS wheel-speed sensor connector terminal B)
H	-	-	-	-	-	-
I	LR wheel-speed sensor (signal)	LR ABS wheel-speed sensor	Continuity	I-LR ABS wheel-speed sensor connector terminal A	Continuity detected	• Wiring harness (I-LR ABS wheel-speed sensor connector terminal A)
J	RR wheel-speed sensor (signal)	RR ABS wheel-speed sensor	Continuity	J-RR ABS wheel-speed sensor connector terminal A	Continuity detected	• Wiring harness (J-RR ABS wheel-speed sensor connector terminal A)
K	-	-	-	-	-	-
L	-	-	-	-	-	-
M	CAN2_L	-	Inspect under DTC inspection			-
N	-	-	-	-	-	-
O	-	-	-	-	-	-

P	CAN2_H	-	Inspect under DTC inspection			-
Q	-	-	-	-	-	-
R	-	-	-	-	-	-
S	-	-	-	-	-	-
T	-	-	-	-	-	-
U	TCS OFF switch	TCS OFF switch	Continuity	U-TCS OFF switch connector terminal A	Continuity detected	• Wiring harness (U- TCS OFF switch connector terminal A)
V	HS_CAN_L	-	Inspect under DTC inspection			-
W	-	-	-	-	-	-
X	Power supply (system)	Ignition switch	Voltage	Ignition switch at ON	B+	• Wiring harness (X- ignition switch)
				Ignition switch is off.	1 V or less	-
Y	HS_CAN_H	-	Inspect under DTC inspection			-
Z	-	-	-	-	-	-
AA	-	-	-	-	-	-
AB	RF wheel-speed sensor (signal)	RF ABS wheel-speed sensor	Continuity	AB-RF ABS wheel-speed sensor connector terminal B	Continuity detected	• Wiring harness (AB- RF ABS wheel-speed sensor connector terminal B)
AC	-	-	-	-	-	-
AD	LF wheel-speed sensor (signal)	LF ABS wheel-speed sensor	Continuity	AD-LF ABS wheel-speed sensor connector terminal B	Continuity detected	• Wiring harness (AD-LF ABS wheel-speed sensor connector terminal B)
AE	RF wheel-speed sensor (power supply)	RF ABS wheel-speed sensor	Continuity	AE-RF ABS wheel-speed sensor connector terminal A	Continuity detected	• Wiring harness (AE- RF ABS wheel-speed sensor connector terminal A)
AF	-	-	-	-	-	-
AG	LF wheel-speed sensor (power supply)	LF ABS wheel-speed sensor	Continuity	AG-LF ABS wheel-speed sensor connector terminal A	Continuity detected	• Wiring harness (AG-LF ABS wheel-speed sensor connector terminal A)
AH	-	-	-	-	-	-

Al	-	-	-	-	-	-
AJ	-	-	-	-	-	-
AK	Power supply (ABS motor operation)	Battery	Voltage	Under any condition	B+	• Wiring harness (AK- battery)
AL	Power supply (solenoid operation)	Battery	Voltage	Under any condition	B+	• Wiring harness (AL- battery)

FRONT ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION

1. When removing the right front ABS wheel-speed sensor, perform the following procedure.
    1. Remove the coolant reserve tank installation bolts and move the coolant reserve tank. (See **COOLANT RESERVE TANK REMOVAL/INSTALLATION [MZI-3.7]** .)
    2. Remove the power steering reserve tank installation bolt and nut, and move the power steering reserve tank. (See **POWER STEERING OIL PUMP REMOVAL/INSTALLATION** .)
2. When removing the left front ABS wheel-speed sensor, perform the following procedure:
    1. Remove the air cleaner case. (See **INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [MZI-3.7]** .)
3. Remove in the order indicated in the table.

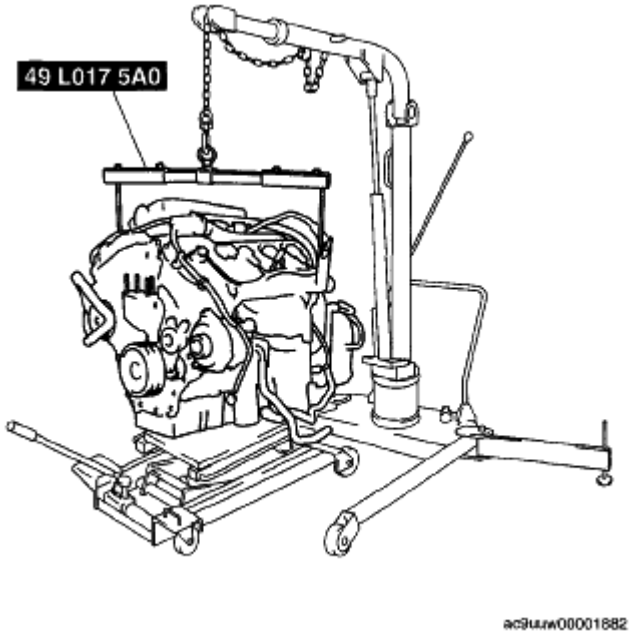


Fig. 16: Identifying Front ABS Wheel Speed Sensor Connector, Front ABS Wheel Speed Sensor, Bolt & Torque Specifications
Courtesy of MAZDA MOTORS CORP.

4. Install in the reverse order of removal.

FRONT ABS WHEEL-SPEED SENSOR INSPECTION

INSTALLATION VISUAL INSPECTION

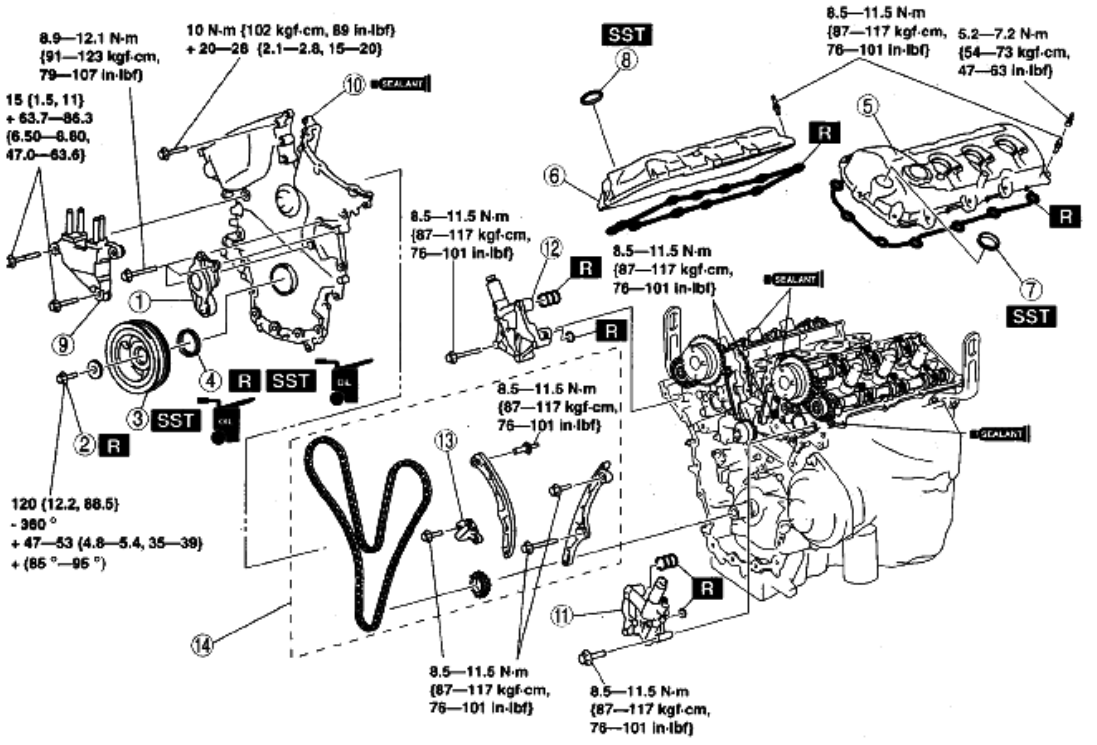
1. Inspect the following items:
    - If there is any malfunction, replace the applicable part.
    1. Excessive play of the ABS wheel-speed sensor
    2. Deformation of the ABS wheel-speed sensor
    3. Deformation or damage of the ABS sensor rotor

CLEARANCE INSPECTION

1. Verify the clearance between the ABS sensor rotor and the ABS wheel-speed sensor.
    - If there is any malfunction, check for improper installation, and replace if necessary.

    Clearance

    - **0.7-1.5 mm {0.028-0.059 in}**



1	Drive belt auto tensioner
2	Crankshaft pulley lock bolt (See Crankshaft Pulley Lock Bolt Removal Note.) (See Crankshaft Pulley Lock Bolt Installation Note.)
3	Crankshaft pulley (See Crankshaft Pulley Removal Note.) (See Crankshaft Pulley Installation Note.)
4	Front oil seal (See Front Oil Seal Removal Note.) (See Front Oil Seal Installation Note.)
5	Cylinder head cover (LH) (See Cylinder Head Cover Removal Note.) (See Cylinder Head Cover Installation Note.)
6	Cylinder head cover (RH) (See Cylinder Head Cover Removal Note.) (See Cylinder Head Cover Installation Note.)
7	Cylinder head cover oil seal (LH) (See Cylinder Head Cover Oil Seal Removal Note.) (See Cylinder Head Cover Oil Seal Installation Note.)

8	Cylinder head cover oil seal (RH) (See Cylinder Head Cover Oil Seal Removal Note.) (See Cylinder Head Cover Oil Seal Installation Note.)
9	No.3 engine mount bracket (See Engine Front Cover and No.3 Engine Mount Bracket Removal Note.) (See Engine Front Cover and No.3 Engine Mount Bracket Installation Note.)
10	Engine front cover (See Engine Front Cover and No.3 Engine Mount Bracket Removal Note.) (See Engine Front Cover and No.3 Engine Mount Bracket Installation Note.)
11	OCV component (LH) (See OCV Component Removal Note.) (See OCV Component Installation Note.)
12	OCV component (RH) (See OCV Component Removal Note.) (See OCV Component Installation Note.)
13	Chain tensioner
14	Timing chain component (See Timing Chain Component Removal Note.) (See Timing Chain Component Installation Note.)

Fig. 17: Identifying Clearance Between ABS Sensor Rotor & ABS Wheel-Speed Sensor
Courtesy of MAZDA MOTORS CORP.

SENSOR OUTPUT VALUE INSPECTION

1. Turn the ignition switch off.

2. Connect the M-MDS to the DLC-2.
3. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.
    - When using the IDS (laptop PC)
        1. Select "DataLogger".
        2. Select "Modules".
        3. Select "ABS".
    - When using the PDS (Pocket PC)
        1. Select "Module Tests".
        2. Select "ABS".
        3. Select "DataLogger".

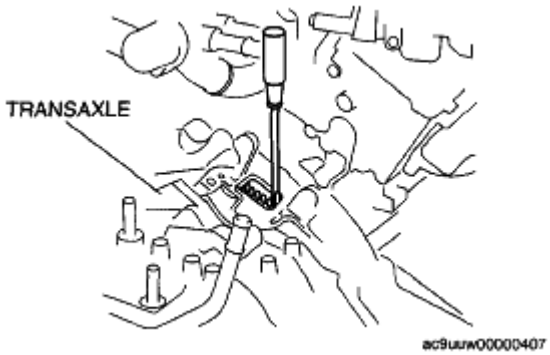


Fig. 18: Connecting M-MDS To DLC-2
Courtesy of MAZDA MOTORS CORP.

4. Select the following PIDs using the M-MDS:
    - WSPD_LF

      (LF ABS wheel-speed sensor)

    - WSPD_RF

      (RF ABS wheel-speed sensor)

5. Start the engine and drive the vehicle.
6. Verify that the display of the M-MDS shows the same value as the speedometer.
    - If there is any malfunction, replace the front ABS wheel-speed sensor.

REAR ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION [2WD]

1. Remove the trunk box. (See **TRUNK BOX REMOVAL/INSTALLATION** .)
2. Remove the seat side box. (See **SEAT SIDE BOX REMOVAL/INSTALLATION** .)
3. Remove the third-row seat. (See **THIRD-ROW SEAT REMOVAL/INSTALLATION** .)

4. Remove the rear scuff plate inner. (See **REAR SCUFF PLATE REMOVAL/INSTALLATION** .)
5. Remove the third-row seat belt lower anchor installation bolt. (See **THIRD-ROW SEAT BELT REMOVAL/INSTALLATION** .)
6. Remove the trunk side trim. (See **TRUNK SIDE TRIM REMOVAL/INSTALLATION** .)
7. Remove in the order indicated in the table.
8. Install in the reverse order of removal.

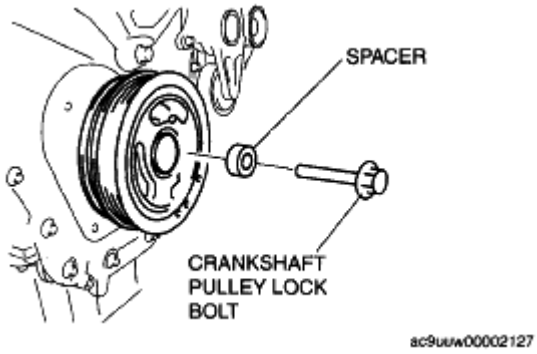


Fig. 19: Identifying Rear ABS Wheel Speed Sensor Connector, Rear ABS Wheel Speed Sensor, Bolt & Torque Specifications
Courtesy of MAZDA MOTORS CORP.

REAR ABS WHEEL-SPEED SENSOR REMOVAL/INSTALLATION [AWD]

1. Remove the trunk box. (See **TRUNK BOX REMOVAL/INSTALLATION** .)
2. Remove the seat side box. (See **SEAT SIDE BOX REMOVAL/INSTALLATION** .)
3. Remove the third-row seat. (See **THIRD-ROW SEAT REMOVAL/INSTALLATION** .)
4. Remove the rear scuff plate inner. (See **REAR SCUFF PLATE REMOVAL/INSTALLATION** .)
5. Remove the third-row seat belt lower anchor installation bolt. (See **THIRD-ROW SEAT BELT REMOVAL/INSTALLATION** .)
6. Remove the trunk side trim. (See **TRUNK SIDE TRIM REMOVAL/INSTALLATION** .)
7. Remove in the order indicated in the table.

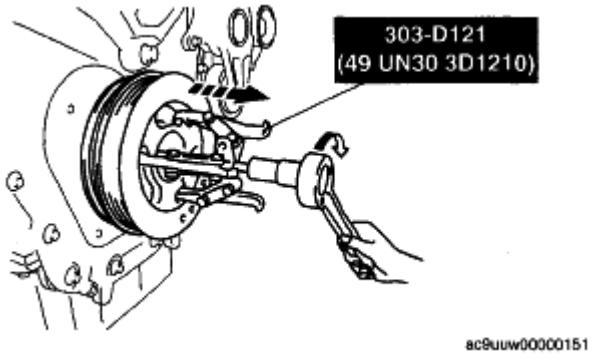


Fig. 20: Identifying Rear ABS Wheel Speed Sensor Connector, Rear ABS Wheel Speed Sensor, Bolt & Torque Specifications
Courtesy of MAZDA MOTORS CORP.

8. Install in the reverse order of removal.

REAR ABS WHEEL-SPEED SENSOR INSPECTION [2WD]

INSTALLATION VISUAL INSPECTION

1. Inspect the following items:
   - If there is any malfunction, replace the applicable part.
   1. Excessive play of the ABS wheel-speed sensor
   2. Deformation of the ABS wheel-speed sensor

CLEARANCE INSPECTION

1. Remove the rear ABS wheel-speed sensor.
2. Measure the distance between the rear ABS wheel-speed sensor installation surface and the ABS sensor rotor. This is dimension A.
3. Calculate the clearance between the front ABS wheel-speed sensor and the ABS sensor rotor using the following formula:

   Clearance (mm {in}) = A-15.0 {0.60 in}

4. Verify that the clearance between the ABS sensor rotor and the rear ABS wheel-speed sensor is as indicated below.
   - If there is any malfunction, replace it.

   Clearance

   - **0.3-1.1 mm {0.012-0.043 in}**

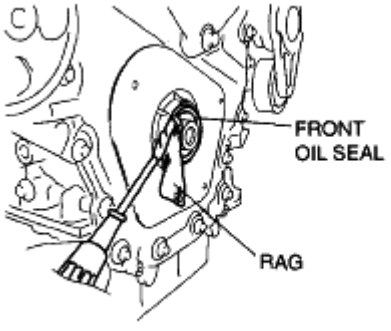


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Fig. 21: Identifying Distance Between Rear ABS Wheel-Speed Sensor & ABS Sensor Rotor

Courtesy of MAZDA MOTORS CORP.

SENSOR OUTPUT VALUE INSPECTION

1. Turn the ignition switch off.
2. Connect the M-MDS to the DLC-2.
3. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.
   - When using the IDS (laptop PC)
     1. Select "DataLogger".
     2. Select "Modules".
     3. Select "ABS".
   - When using the PDS (Pocket PC)
     1. Select "Module Tests".
     2. Select "ABS".
     3. Select "DataLogger".

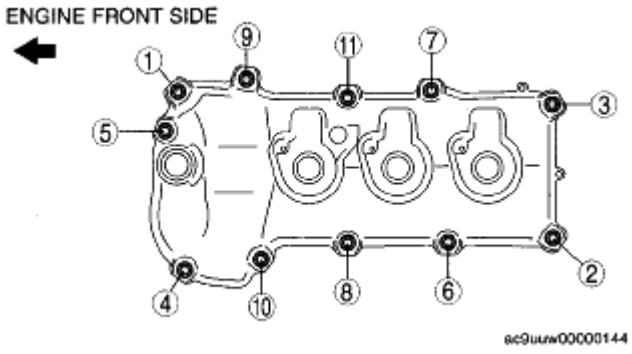

Fig. 22: Connecting M-MDS To DLC-2
Courtesy of MAZDA MOTORS CORP.

4. Select the following PIDs using the M-MDS:
   - WSPD_LR

     (LR ABS wheel-speed sensor)

   - WSPD_RR

     (RR ABS wheel-speed sensor)

5. Start the engine and drive the vehicle.
6. Verify that the display of the M-MDS shows the same value as the speedometer.
   - If there is any malfunction, replace the rear ABS wheel-speed sensor.

REAR ABS WHEEL-SPEED SENSOR INSPECTION [AWD]

INSTALLATION VISUAL INSPECTION

1. Inspect the following items:
   - If there is any malfunction, replace the applicable part.
   1. Excessive play of the ABS wheel-speed sensor
   2. Deformation of the ABS wheel-speed sensor
   3. Deformation or damage of the ABS sensor rotor

CLEARANCE INSPECTION

1. Verify the clearance between the ABS sensor rotor and the ABS wheel-speed sensor.
   - If there is any malfunction, check for improper installation, and replace if necessary.

   Clearance

   - **0.95-1.75 mm {0.038-0.068 in}**

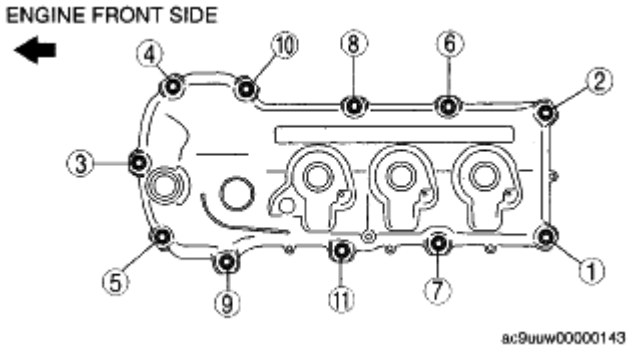

Fig. 23: Identifying Clearance Between ABS Sensor Rotor & ABS Wheel-Speed Sensor
Courtesy of MAZDA MOTORS CORP.

SENSOR OUTPUT VALUE INSPECTION

1. Turn the ignition switch off.
2. Connect the M-MDS to the DLC-2.
3. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.
   - When using the IDS (laptop PC)
     1. Select "DataLogger".
     2. Select "Modules".
     3. Select "ABS".
   - When using the PDS (Pocket PC)
     1. Select "Module Tests".
     2. Select "ABS".

3. Select "DataLogger".

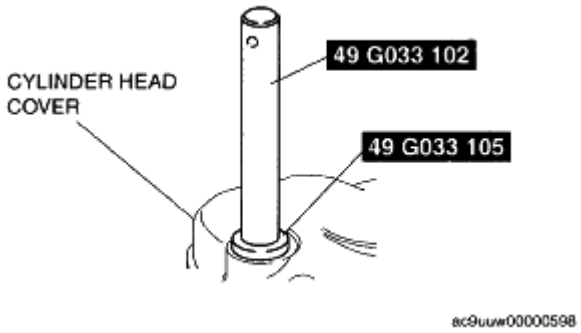

Fig. 24: Connecting M-MDS To DLC-2
Courtesy of MAZDA MOTORS CORP.

4. Select the following PIDs using the M-MDS:
   - WSPD_LR

     (LR ABS wheel-speed sensor)

   - WSPD_RR

     (RR ABS wheel-speed sensor)

5. Start the engine and drive the vehicle.
6. Verify that the display of the M-MDS shows the same value as the speedometer.
   - If there is any malfunction, replace the rear ABS wheel-speed sensor.

COMBINED SENSOR REMOVAL/INSTALLATION

WARNING:

- **If the DSC/RSC sensor initialization procedure is not completed, it could result in an unexpected accident due to the DSC/RSC being inoperative. Therefore, after the combined sensor is replaced, always perform the DSC/RSC sensor initialization procedure to ensure proper DSC/RSC operation.**

CAUTION:

- **The internal parts of the combined sensor could be damaged if dropped. Be careful not to drop the combined sensor. Replace the combined sensor if it is subjected to an impact. Also, do not use an impact wrench or other similar air tools when removing/installing the sensor.**

1. Remove the second-row seat (RH). (See **SECOND-ROW SEAT REMOVAL/INSTALLATION** .)
2. Remove the edge cover. (See **LONG SLIDER REMOVAL/INSTALLATION** .)

3. Remove the long slider cover. (See **LONG SLIDER REMOVAL/INSTALLATION** .)
4. Separate the floor carpet at the area shown in the figure.

CAUTION:

- **When separating the floor carpet, the wiring harnesses under the floor carpet could be damaged. Separate the floor carpet while lifting it so as not to damage the wiring harnesses.**

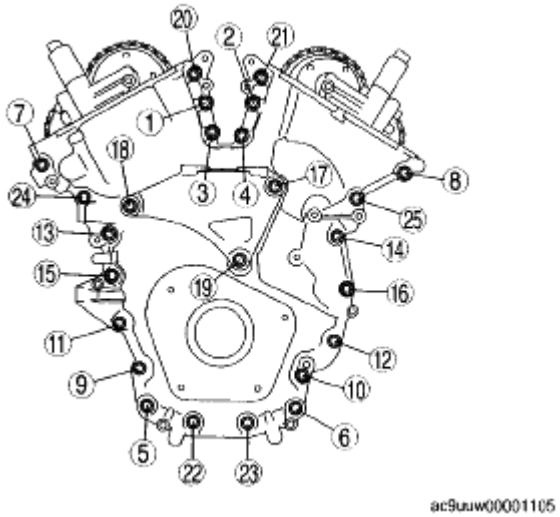

Fig. 25: Identifying Rear Heat Duct No.4 & Cutting Line
Courtesy of MAZDA MOTORS CORP.

5. Partially peel back the floor carpet from where it is separated as shown in the figure.
6. Remove the rear heat duct No.4.
7. Remove in the order indicated in the table.
8. Install in the reverse order of removal.
9. After installation, perform the DSC/RSC sensor initialization procedure. (See **DSC/RSC SENSOR INITIALIZATION PROCEDURE**.)

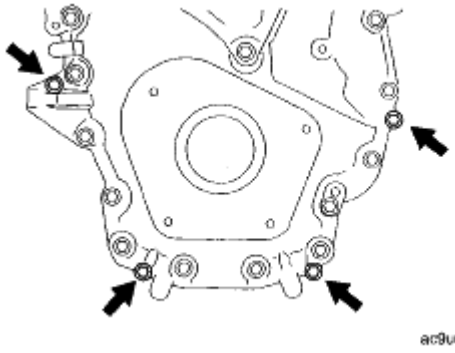

Fig. 26: Identifying Rear Heat Duct No.4 & Floor Covering
Courtesy of MAZDA MOTORS CORP.

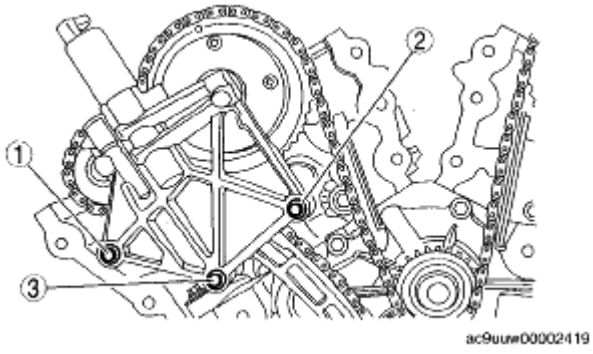

Fig. 27: Identifying Combined Sensor Cover, Combined Sensor Connector, Combined Sensor, Combined Sensor Bracket & Torque Specifications
Courtesy of MAZDA MOTORS CORP.

COMBINED SENSOR INSPECTION

1. Turn the ignition switch off.
2. Remove the combined sensor installation nut.
3. Connect the M-MDS to the DLC-2.
4. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.
    - When using the IDS (laptop PC)
        1. Select "DataLogger".
        2. Select "Modules".
        3. Select "ABS".
    - When using the PDS (Pocket PC)
        1. Select "Module Tests".
        2. Select "ABS".
        3. Select "DataLogger".

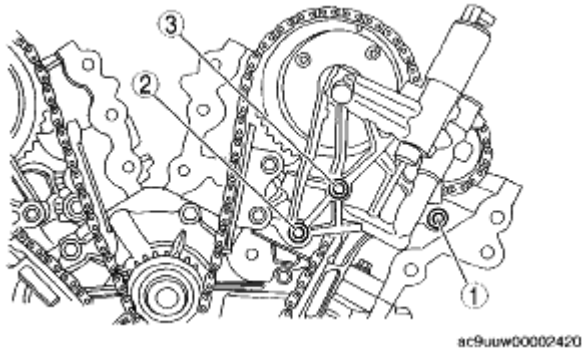

Fig. 28: Connecting M-MDS To DLC-2
Courtesy of MAZDA MOTORS CORP.

5. Select the following PIDs, then inspect the lateral acceleration speed, longitudinal acceleration speed, roll rate and yaw rate.
    - LAT_ACCL: (lateral acceleration speed)
    - ACCLMTR: (longitudinal acceleration speed)
    - YAW_RATE: (yaw rate)
    - ROLL_RATE (roll rate)
    1. Lateral acceleration speed inspection
        1. Verify the LAT_ACCL change when the combined sensor is tilted to the left and right.
            - If there is any malfunction, replace the combined sensor.

            Standard

            When the sensor is tilted to the right (A):

            LAT ACCL changes negatively.

            When the sensor is tilted to the left (B):

            LAT_ACCL changes positively.

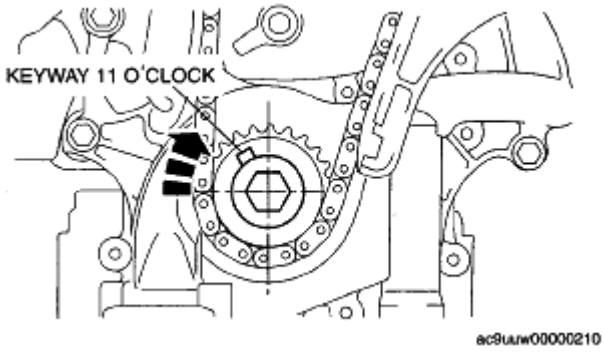

Fig. 29: Tilting Sensor Right & Left
Courtesy of MAZDA MOTORS CORP.

    2. Longitudinal acceleration speed inspection
        1. Verify the ACCLMTR change when the combined sensor is moved forward and backward.
            - If there is any malfunction, replace the combined sensor.

            Standard

            When the sensor is tilted to forward (A):

            ACCLMTR changes negatively.

When the sensor is tilted to backward (B):

ACCLMTR changes positively.

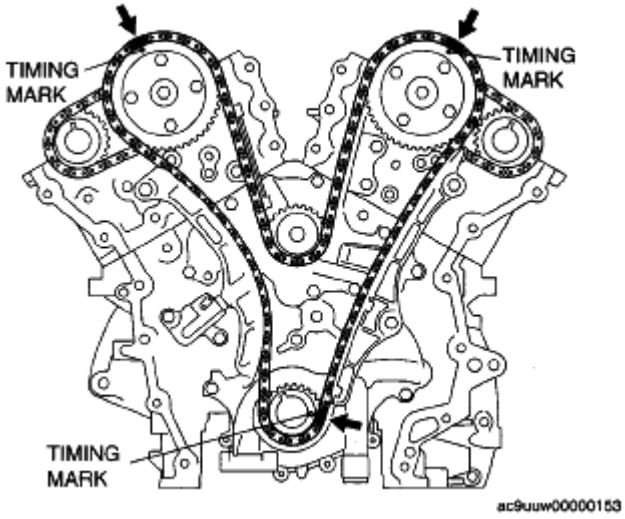

Fig. 30: Tilting Sensor Forward & Backward
Courtesy of MAZDA MOTORS CORP.

3. Yaw rate inspection
    1. Verify the YAW_RATE change when the combined sensor is rotated to the left and right.
        - If there is any malfunction, replace the combined sensor.

        Standard

        When the sensor is rotated to the right (A):

        YAW_RATE changes positively.

        When the sensor is rotated to the left (B):

        YAW_RATE changes negatively.

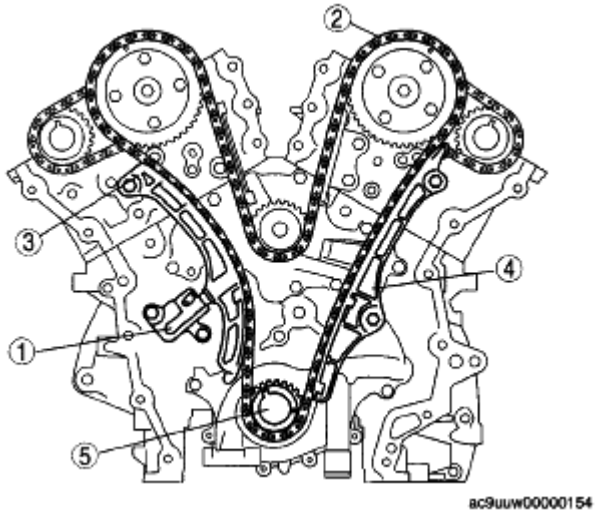

Fig. 31: Rotating Sensor Right & Left
Courtesy of MAZDA MOTORS CORP.

4. Roll rate inspection
    1. Verify the ROLL_RATE change when the combined sensor is tilted to the left and right.
        - If there is any malfunction, replace the combined sensor

        Standard

        When the sensor is tilted to the right (A):

        ROLL_RATE changes positively

        When the sensor is tilted to the left (B):

        ROLL RATE changes negatively

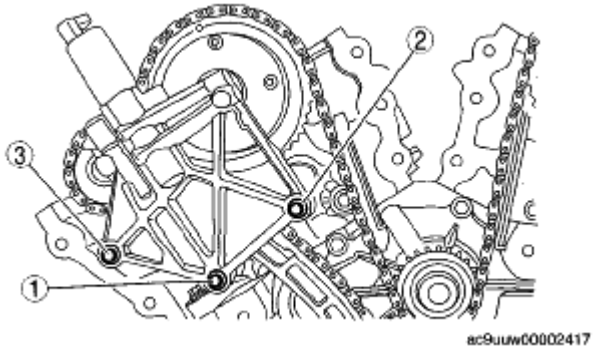

Fig. 32: Tilting Sensor Right & Left
Courtesy of MAZDA MOTORS CORP.

BRAKE FLUID PRESSURE SENSOR INSPECTION

NOTE:

- **The brake fluid pressure sensor is integrated into the DSC HU/CM and installed to the brake line of RF- LR brake system. Therefore, perform the brake fluid pressure sensor inspection with the SST installed to the brake pipe on the left front wheel.**

1. Turn the ignition switch off.
2. Disconnect the brake pipe flare nut area using a commercially available flare nut wrench.
3. Remove the clamp and disconnect the brake hose.

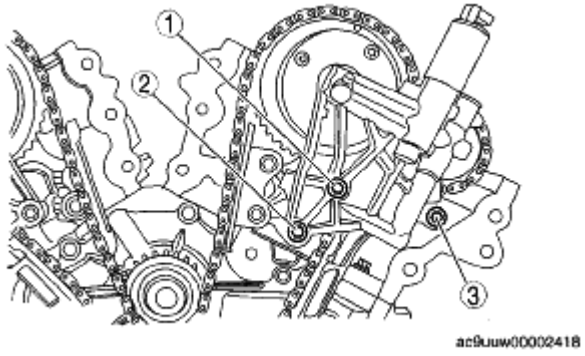

Fig. 33: Identifying Brake Pipe, Brake Hose & Clamp
Courtesy of MAZDA MOTORS CORP.

4. Install the **SSTs** to the brake pipe as shown in the figure.
5. Bleed the brake line and the **SSTs** of air. Bleed the air from the SSTs using bleeder screw A.

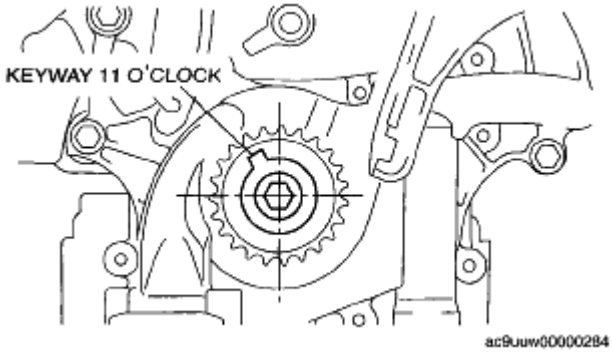

Fig. 34: Identifying Brake Pipe With SST
Courtesy of MAZDA MOTORS CORP.

6. Connect the M-MDS to the DLC-2.
7. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.
   - When using the IDS (laptop PC)

1. Select "DataLogger".
2. Select "Modules".
3. Select "ABS".

- When using the PDS (Pocket PC)
  1. Select "Module Tests".
  2. Select "ABS".
  3. Select "DataLogger".

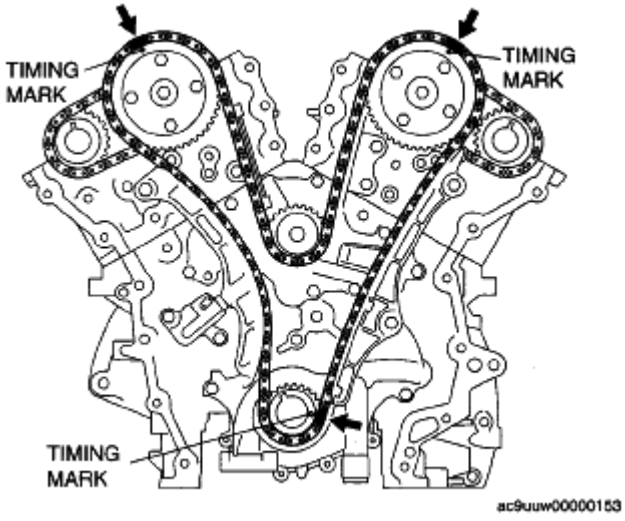

Fig. 35: Connecting M-MDS To DLC-2
Courtesy of MAZDA MOTORS CORP.

8. Select the "MCYLIP" PID.
9. Start the engine.
10. Depress the brake pedal, and confirm that the fluid pressure value of the SST (Gauge) and the value shown on the M-MDS are equal
    - If the fluid pressures are different, replace the DSC/RSC HU/CM. (See **DSC/RSC HU/CM REMOVAL/INSTALLATION**.)
11. After the inspection, remove the SSTs, install the brake hose, clamp, and brake pipe to the original positions, and then bleed the air from the brake line.

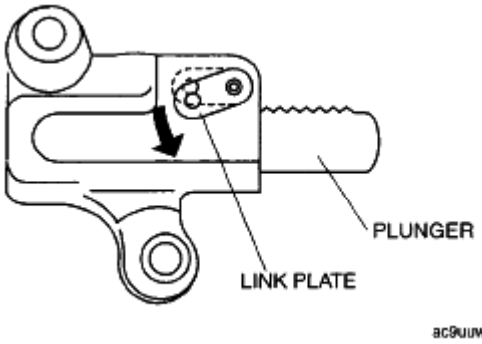

Fig. 36: Identifying Brake Pipe & Torque Specifications
Courtesy of MAZDA MOTORS CORP.

TCS OFF SWITCH REMOVAL/INSTALLATION

1. Remove the dashboard under cover (LH). (See **DASHBOARD REMOVAL/INSTALLATION** .)
2. Remove the hood release lever. (See **HOOD LATCH AND RELEASE LEVER REMOVAL/INSTALLATION** .)
3. Remove in the order indicated in the table.

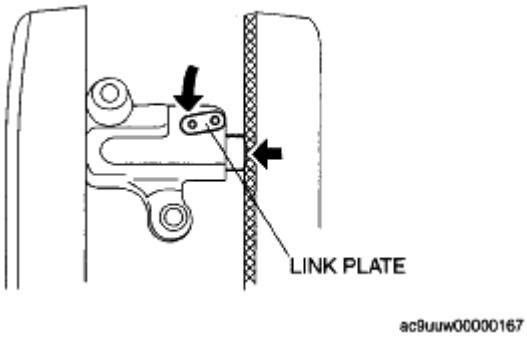

Fig. 37: Identifying TCS OFF Switch & TCS OFF Switch Connector
Courtesy of MAZDA MOTORS CORP.

4. Install in the reverse order of removal.

TCS OFF SWITCH REMOVAL NOTE

1. Access the TCS OFF switch from behind of the dashboard, and squeeze the tabs of the switch.
2. Remove the TCS OFF switch from the dashboard.

TCS OFF SWITCH INSPECTION

1. Remove the TCS OFF switch. (See **TCS OFF SWITCH REMOVAL/INSTALLATION**.)
2. Verify that the continuity is as indicated in the table.

- If not as indicated in the table, replace the TCS OFF switch.

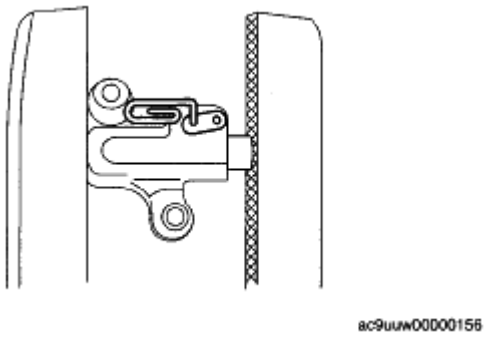

Fig. 38: Connector Terminal Reference
Courtesy of MAZDA MOTORS CORP.

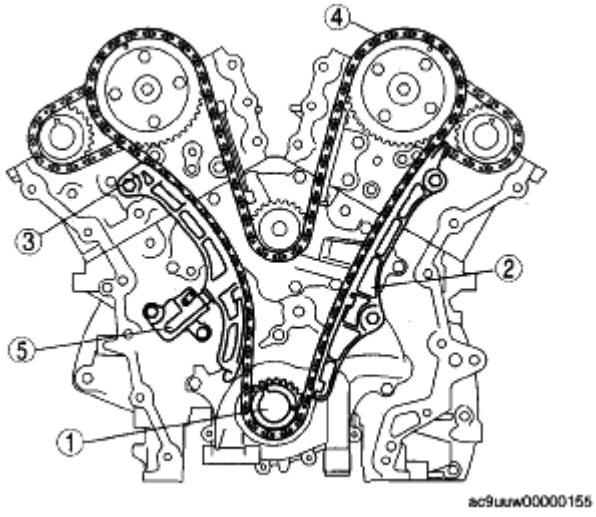

Fig. 39: Identifying TCS OFF Switch Connector Terminal
Courtesy of MAZDA MOTORS CORP.