ABS

Precautions

Precautions for ABS

BEND15H24500001

Refer to “Precautions for Electrical Circuit Service” in Section 00 in related manual and “Precautions for ABS” in Section 00 (Page 00-1).

ABS Information

BEND15H24500002

⚠ WARNING

- **Be sure to bleed air from the brake fluid circuit when the brake is felt spongy or when a brake relating part is replaced.**
- **Never ride the motorcycle before bleeding the air.**

- Be sure to route the brake hoses correctly.
- The ABS does not shorten the motorcycle’s braking distance. When riding down slopes or on wet or bumpy roads the braking distance is lengthened as compared to a motorcycle without ABS. In addition, braking distance increases more, when the road is slippery.
- The ABS does not control slides which may occur when braking while turning. As with a motorcycle that does not have ABS, it is best not apply the brakes while turning.
- The brake lever and pedal may move by themselves when they are applied. This is not a malfunction.
- Only use the specified tires.

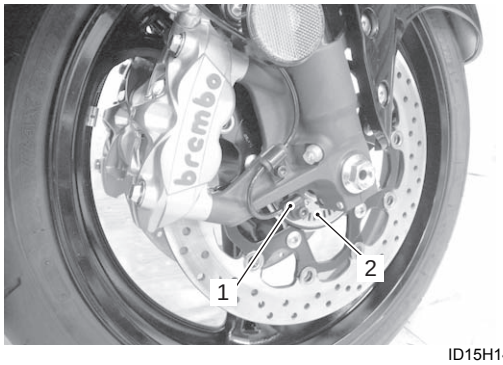
General Description

Wheel Speed Sensor Description

BEND15H24501001

Wheel speed sensor consists of wheel speed sensor (1) and sensor rotor (2).

Front



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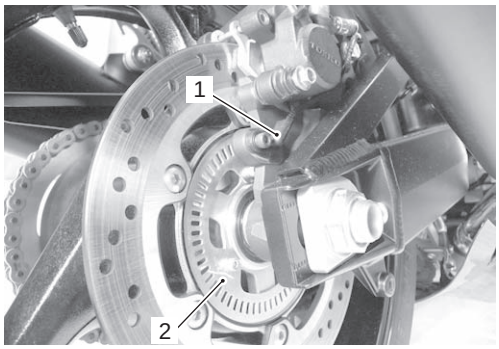
Rear

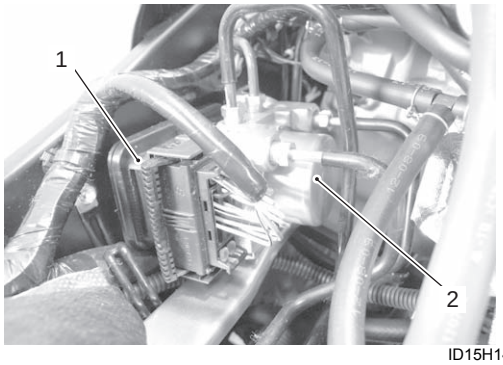


ID15H1450002-01

ABS Control Unit Description

BEND15H24501002

ABS control unit (1) calculates signals input from each one of front and rear wheel speed sensors, monitors the slipping conditions of the wheels and, at the same time, sends control signal to Hydraulic Unit (HU) (2).
This ABS control unit/HU can not be disassembled.



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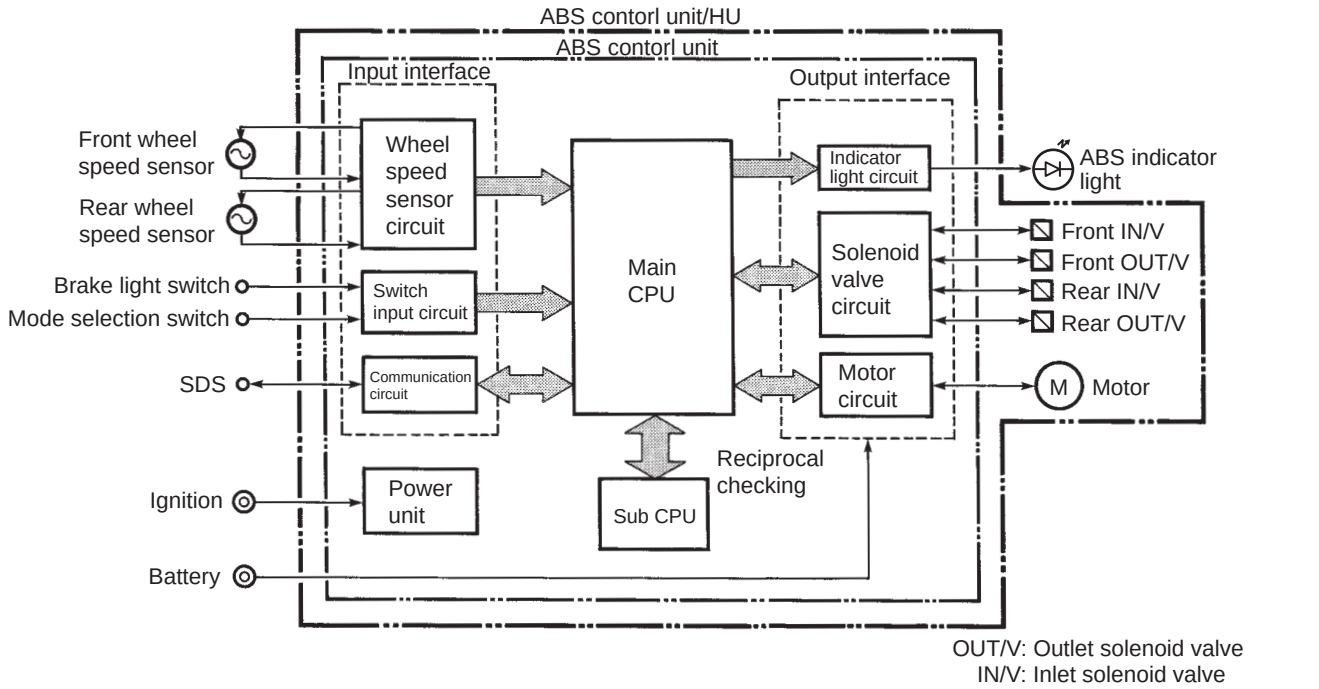
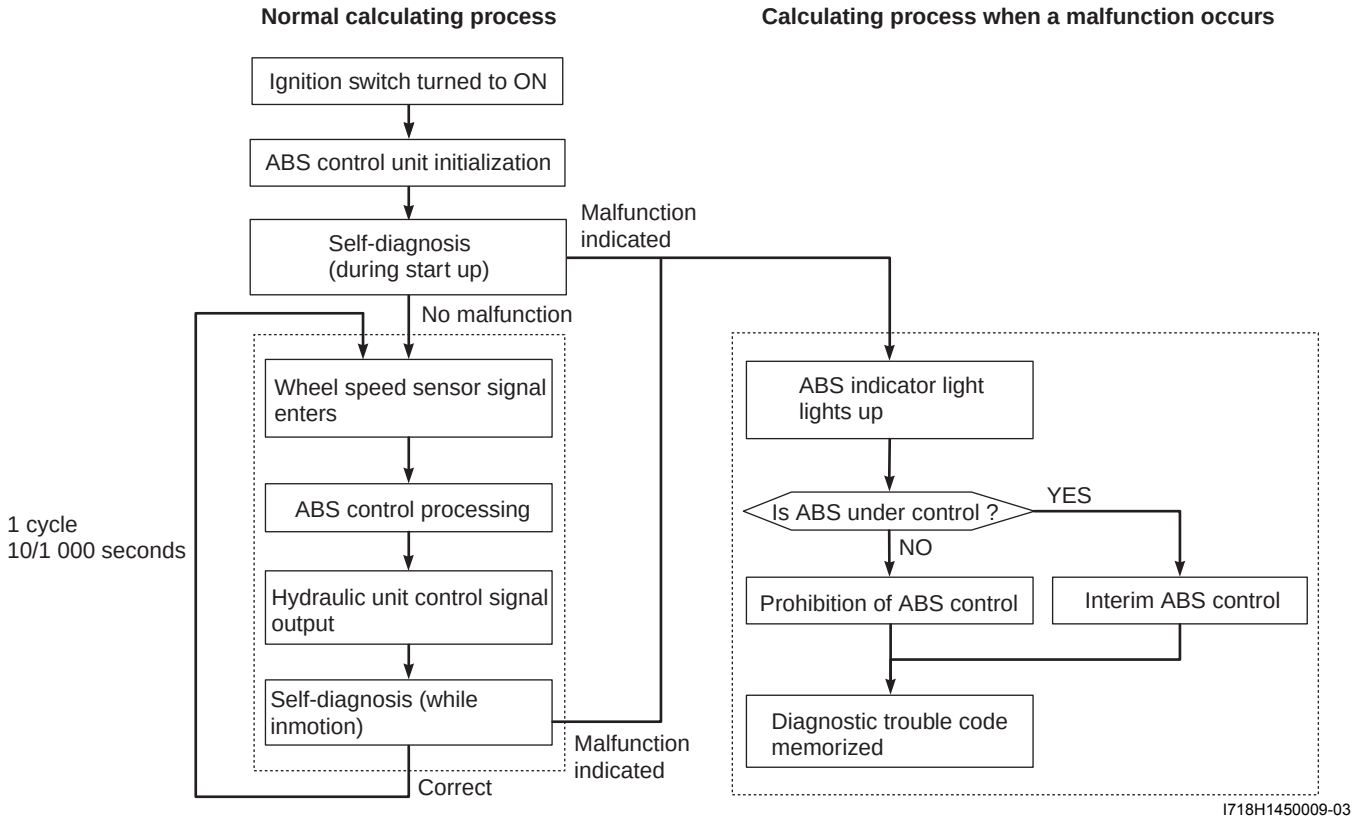


ID15H1450004-01

ABS Control Unit Calculating Process

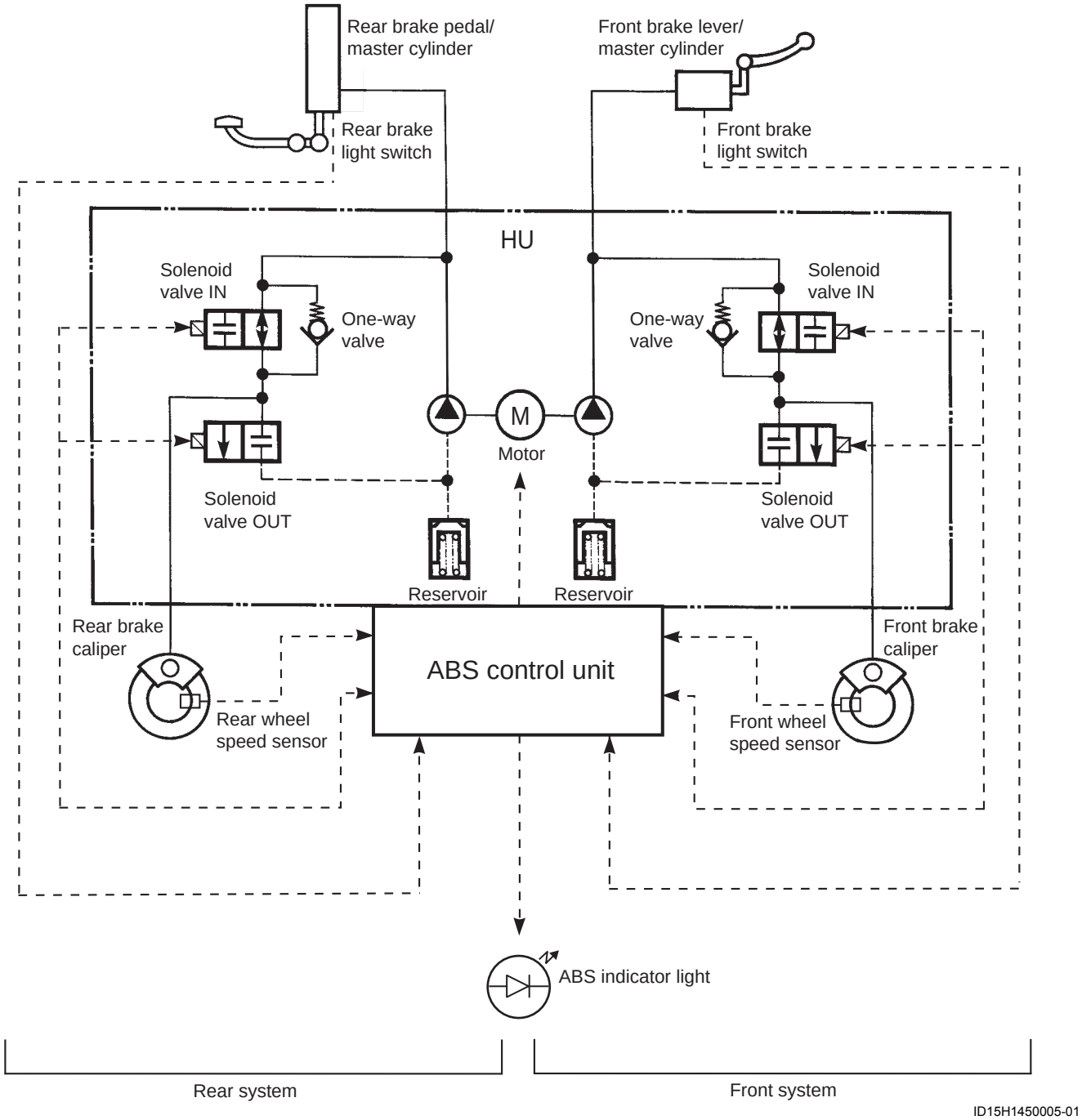
The ABS controls and its calculations, in addition to the self-diagnosing and the fail-safe processes, occur during the ABS control unit calculating process. ABS control is performed in one cycle every 10/1 000 seconds. In addition, if a malfunction is detected by the self-diagnosis function, the brake stops being controlled by the ABS and a diagnostic trouble code is stored.



Hydraulic Unit (HU) Description

BEND15H24501003

The hydraulic unit operates the solenoid valves based upon the signal which is output from the ABS control unit. The brake fluid pressure is then adjusted accordingly. The hydraulic unit controls the front and rear brake systems individually by operating separate components for the front and the rear, except for the pump drive motor, which is shared by both systems.



ID15H1450005-01

Self-diagnosis Function and ABS Indicator Light Description

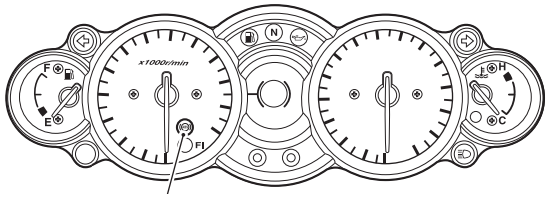
BEND15H24501004

The ABS control unit performs the self-diagnosis and can store any electronically detected malfunctions as diagnostic trouble codes. If a malfunction has occurred, the indicator light lights up to inform the rider of the malfunction. The special tool, when connected to the mode select coupler, enables the ABS indicator light to display the diagnostic trouble codes.

ABS Indicator Light

The ABS indicator light (1) informs the rider of any ABS malfunctions. If a malfunction occurred, the ABS indicator light flashes, during the self-diagnosis, to indicate the diagnostic trouble code so that the correct part can be repaired.

- When the ignition switch is turned to ON, the ABS indicator light lights up even if no malfunction has occurred, to indicate that the bulb is not burnt out. It will go off after the motorcycle is ridden at more than 10 km/h (6.2 mile/h).
- If an ABS malfunction has occurred, the ABS indicator light keeps lighting up.



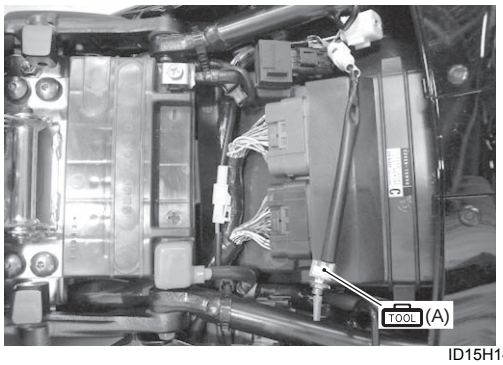
ID15H1450006-02

NOTE

When a malfunction has occurred in the ABS, connect the special tool to the mode select coupler to display the diagnostic trouble code on the ABS indicator light. Refer to "DTC (Diagnostic Trouble Code) Output" (Page 4E-20).

Special tool

TOOL (A): 09930–82760 (Mode select switch)

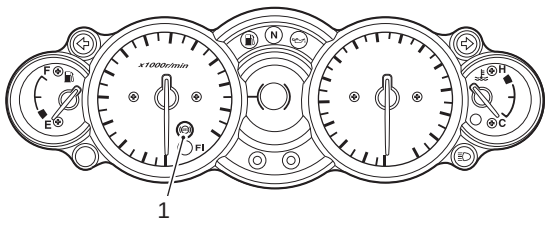


ID15H1450007-01

ABS Operation and ABS Indicator Light

The ABS indicator light (1) shows the ABS operating condition. During normal operation, the ABS indicator light lights up when the ignition switch is turned to ON and goes off after the motorcycle is ridden at more than 10 km/h (6.2 mile/h). If a malfunction has occurred, the ABS indicator light keeps lighting up.

The ABS indicator light goes off when the motorcycle is ridden at more than 10 km/h (6.2 mile/h).	The ABS is normally activated.
The ABS indicator light keeps lighting up even though the motorcycle is ridden at more than 10 km/h (6.2 mile/h).	One or more malfunction has been found and ABS activation been hanged up.
The ABS indicator light does not light up when turning the ignition switch ON.	Check the wire harness and combination meter. Refer to "ABS Indicator Light Inspection" (Page 4E-15).



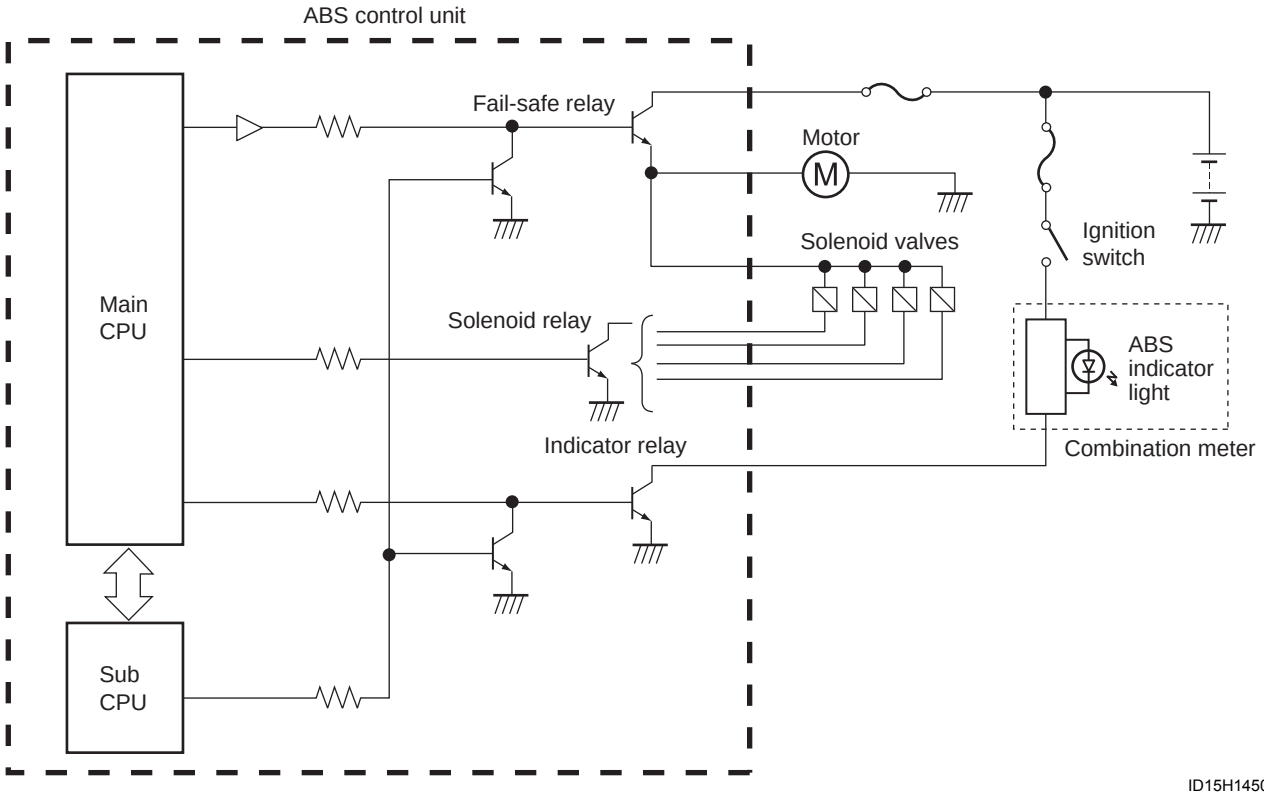
ID15H1450006-02

Stored DTCs (Diagnostic Trouble Codes)
As for the diagnostic trouble code, the code of the first malfunction occurred during one ignition ON period will be stored. Pay attention to the fact that even though there may occur several malfunctions in one ON period, only one code will be stored. Codes of malfunction that occurred in the past are all stored, but the same diagnostic trouble code will not be redundant.
Check and see if any diagnostic trouble code remains, by actually running the machine to activate ABS and by carrying out the self-diagnosis after deleting the diagnostic trouble code once the malfunctioned part is repaired.

Fail-safe Function Description

BEND15H24501005

If the main CPU detects an occurrence of a malfunction in the ABS, the fail-safe relay is set OFF and ABS indicator light is turned ON. Consequently, no current will be applied to the motor and solenoid valves and the ABS is not activated. In this case, the brake system functions as a conventional brake. The main and sub CPUs monitor each other and if a CPU detects a malfunction, the fail-safe relay is set OFF, ABS indicator light is turned ON and brake system is fixed in a conventional brake. However, if a malfunction occurs while the ABS is being activated and the main CPU judges that the ABS control can be continued, the ABS indicator light is turned ON and the provisional control of the ABS is set. Upon the moment when the ABS provisional control is over, the fail-safe relay will be set OFF.



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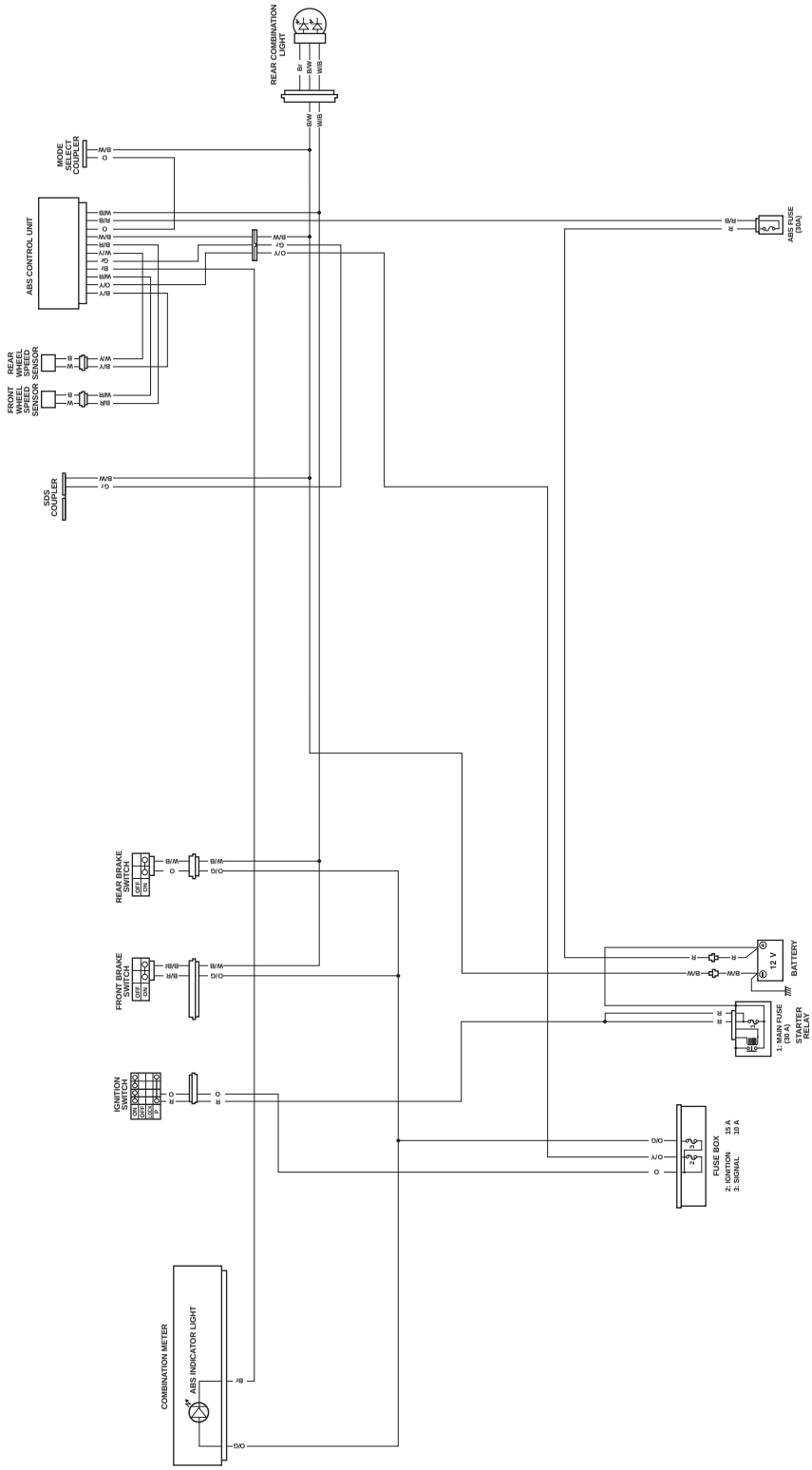
Schematic and Routing Diagram

ABS Wiring Diagram

BEND15H24502001

Refer to “Wire Color Symbols” in Section 0A in related manual.

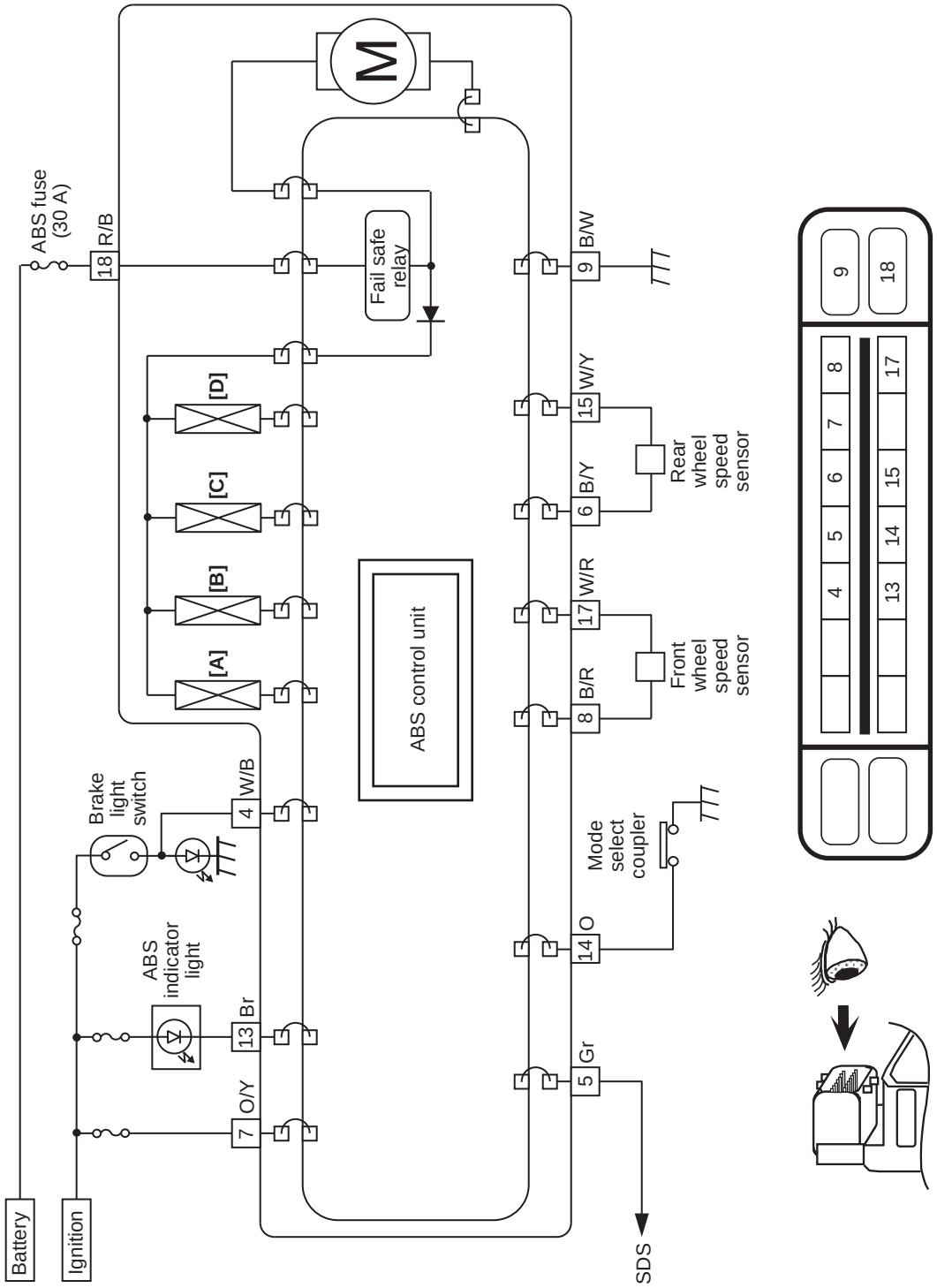


ID15H1450009-03

ABS Control Unit/HU Diagram

BEND15H24502002

Refer to “Wire Color Symbols” in Section 0A in related manual.

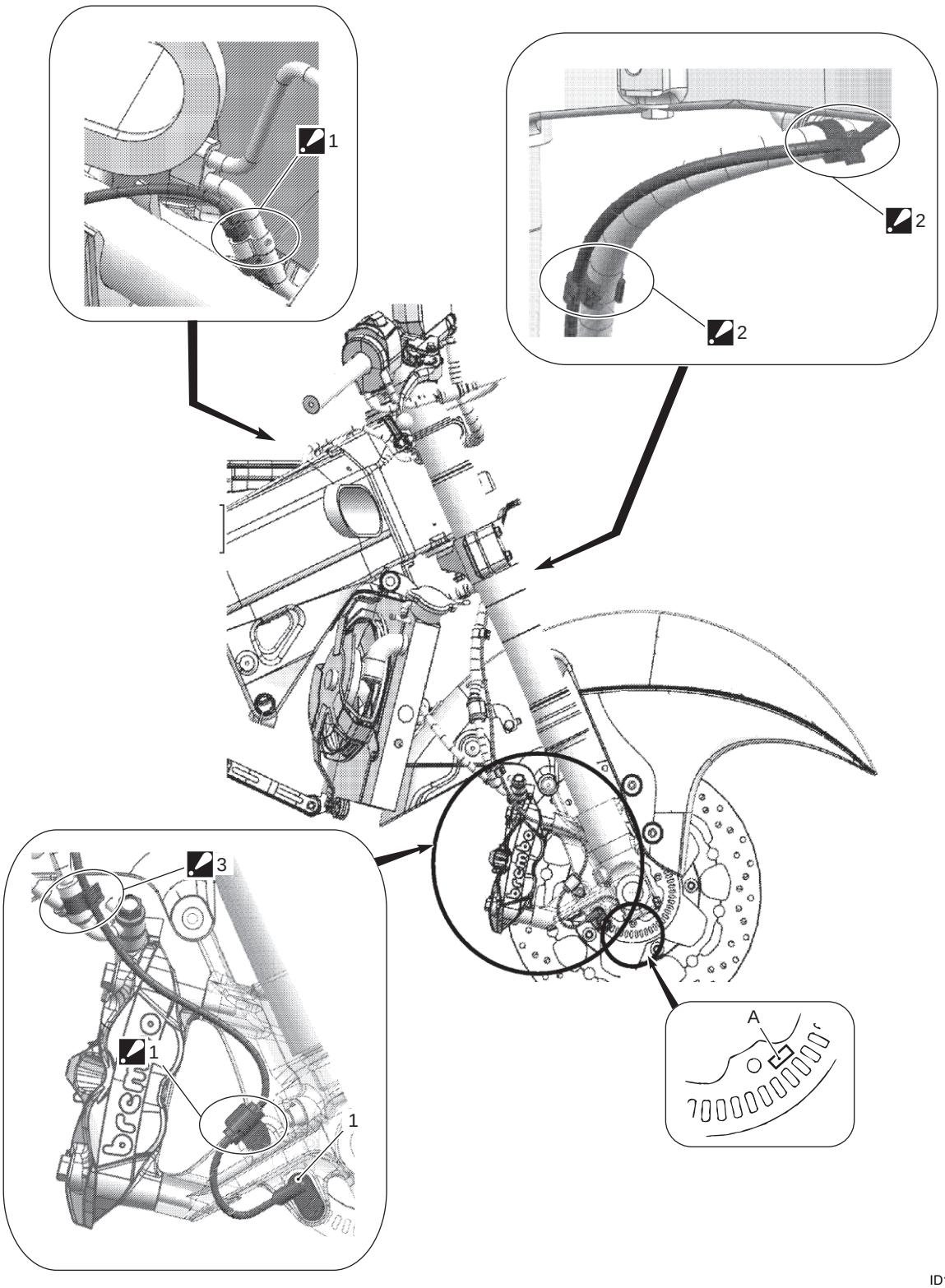


ID15H1450010-03

[A]: Front brake solenoid inlet valve	[C]: Rear brake solenoid inlet valve
[B]: Front brake solenoid outlet valve	[D]: Rear brake solenoid outlet valve

Front Wheel Speed Sensor Routing Diagram

BEND15H24502003

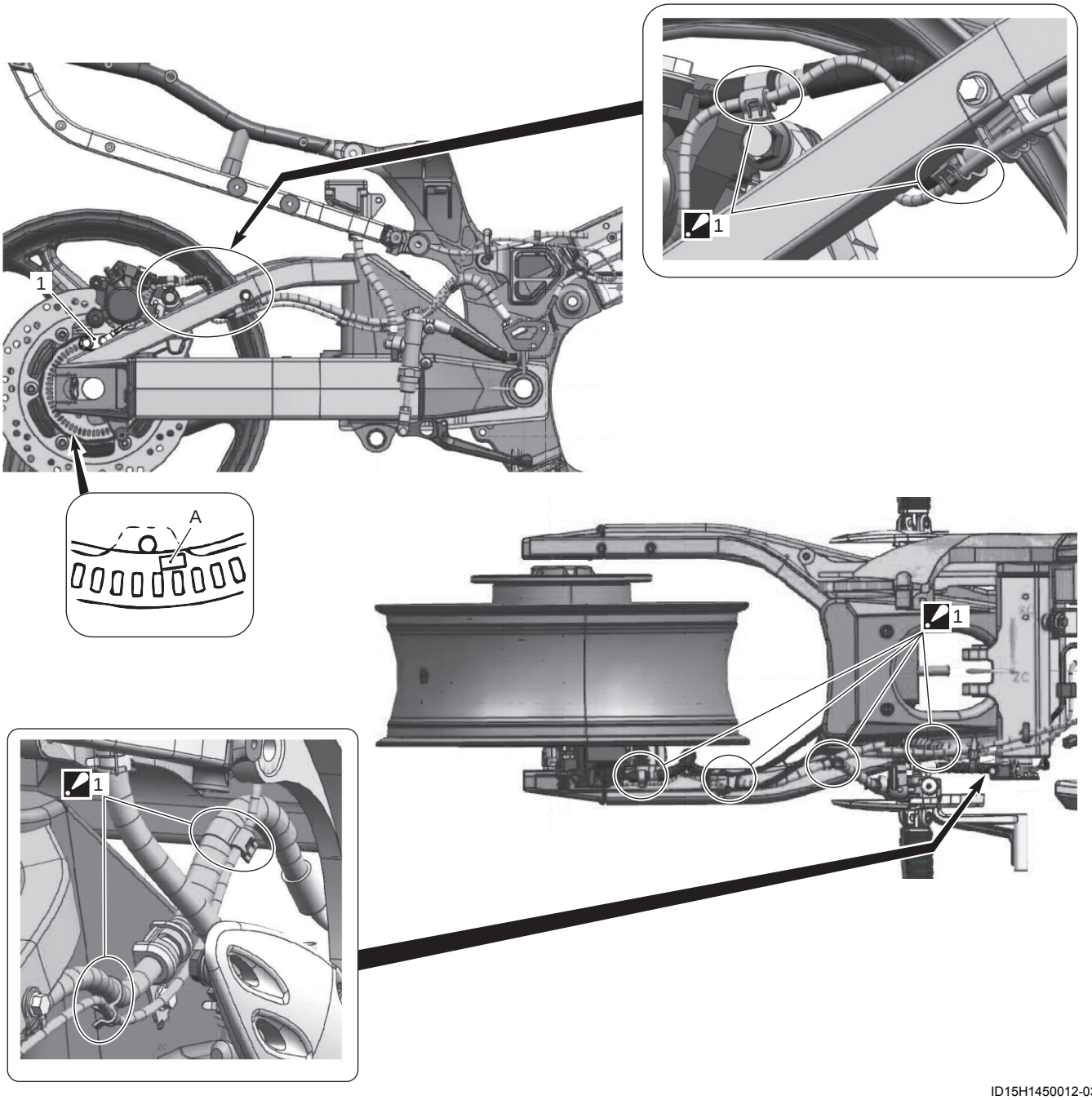


ID15H1450011-03

1. Front wheel speed sensor	2: Position the sensor lead wire in front of the brake hose and clamp the lead wire at the markings.
A: Outside marking.	3: Clamp the sensor lead wire at the marking.
1: Clamp the sleeve of the brake hose firmly.	

Rear Wheel Speed Sensor Routing Diagram

BEND15H24502004



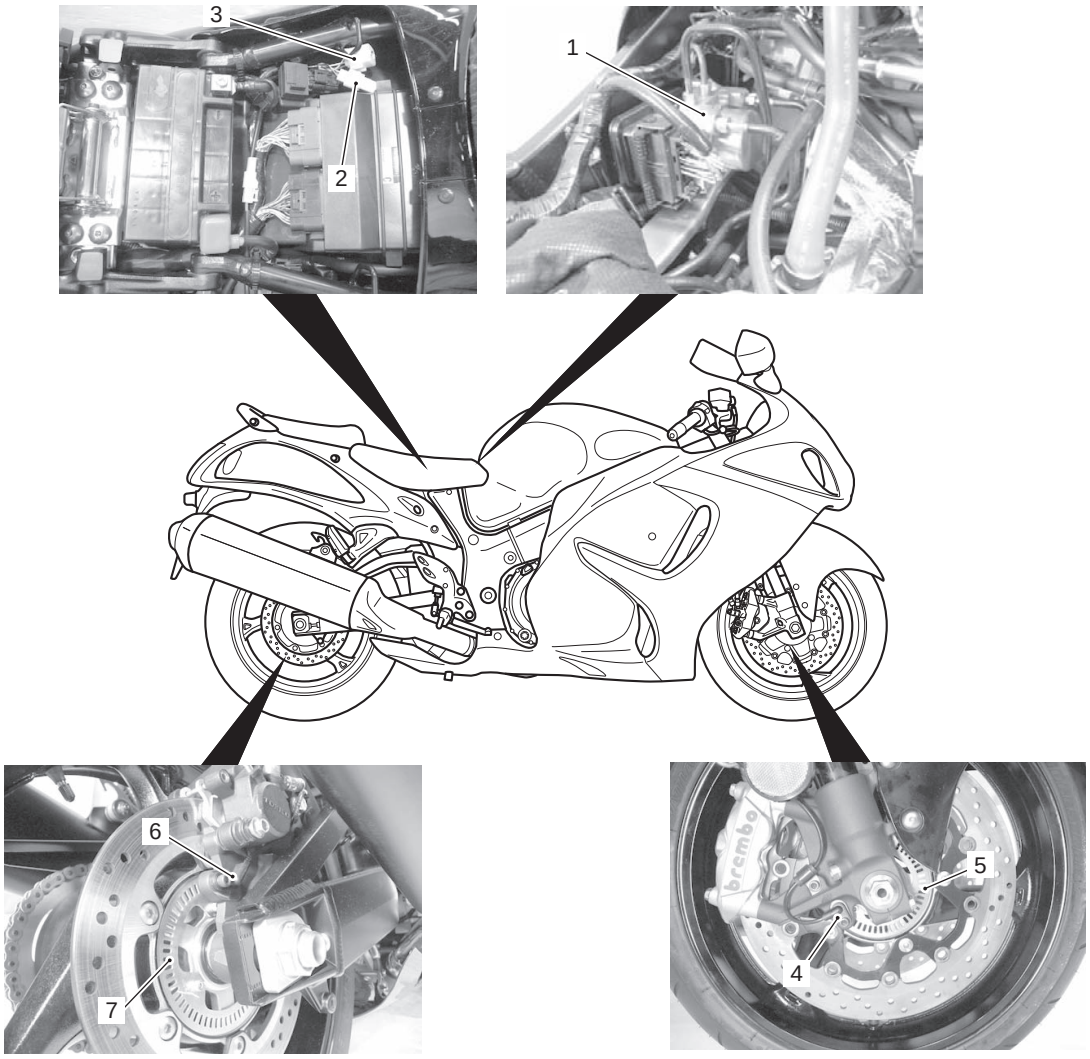
ID15H1450012-03

1. Rear wheel speed sensor	1: Clamp the sensor lead wire at the markings.
A: Outside marking.	

Component Location

ABS Components Location

BEND15H24503001



ID15H1450013-01

1. ABS control unit/HU	3. SDS coupler	5. Front wheel speed sensor rotor	7. Rear wheel speed sensor rotor
2. Mode select coupler	4. Front wheel speed sensor	6. Rear wheel speed sensor	

Diagnostic Information and Procedures

ABS Troubleshooting

BEND15H24504001

Many of the ABS malfunction diagnosing operations are performed by checking the wiring continuity. Quick and accurate detection of malfunctions within the complex circuitry assures the proper operation of the ABS. Before beginning any repairs, thoroughly read and understand this Service Manual.

The ABS is equipped with a self-diagnosis function. The detected malfunction is stored as a diagnostic trouble code which causes the ABS indicator light to light up or flash in set patterns to indicate the malfunction. Diagnostic trouble codes are stored even when the ignition switch is turned to OFF and they can only be erased manually. In order to repair the ABS correctly, ask the customer for the exact circumstances under which the malfunction occurred, then check the ABS indicator light and the output diagnostic trouble codes. Explain to the customer that depending on how the motorcycle is operated (e.g., if the front wheel is off the ground), the ABS indicator light may light up even though the ABS is operating correctly.

Troubleshooting Procedure

Troubleshooting should be proceed as follows. If the order is performed incorrectly or any part is omitted, an error in misdiagnosis may result.

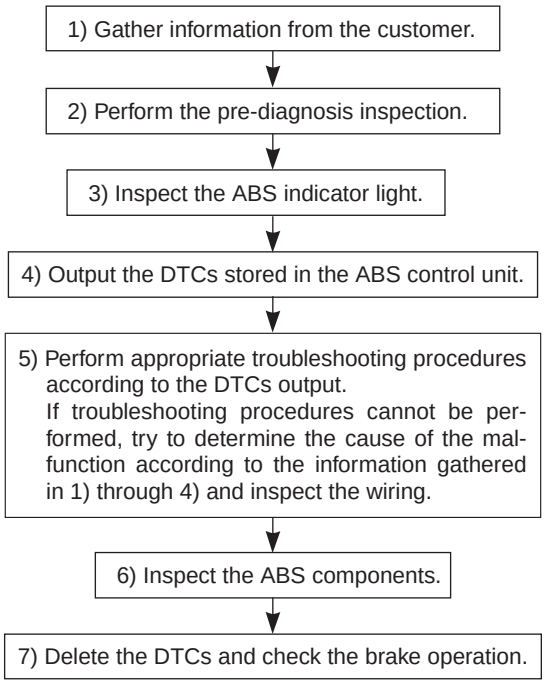
1) Gather information from the customer.
2) Perform the pre-diagnosis inspection. Refer to “Pre-diagnosis Inspection” (Page 4E-14).
3) Inspect the ABS indicator light. Refer to “ABS Indicator Light Inspection” (Page 4E-15).
4) Output the DTCs stored in the ABS control unit. Refer to “DTC (Diagnostic Trouble Code) Output” (Page 4E-20).
5) Perform appropriate troubleshooting procedures according to the DTCs output. Refer to “DTC Table” (Page 4E-30).
   If troubleshooting procedures cannot be performed, try to determine the cause of the malfunction according to the information gathered in 1) through 4) and inspect the wiring. Refer to “ABS Wiring Diagram” (Page 4E-7) and “ABS Control Unit/HU Diagram” (Page 4E-8).

⚠ CAUTION

- **When disconnecting couplers and turning the ignition switch ON, disconnect the ABS control unit coupler in order to prevent a DTC from being stored.**
- **Each time a resistance is measured, the ignition switch should be set to OFF.**

6) Inspect the ABS components. Refer to “Wheel Speed Sensor and Sensor Rotor Inspection” (Page 4E-63).
7) Delete the DTCs and check the brake operation. Refer to “DTC (Diagnostic Trouble Code) Deleting” (Page 4E-22).

Basic Troubleshooting Diagram



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Information Gathering

To properly diagnose a malfunction, one must not make guesses or assumptions about the circumstances that caused it. Proper diagnosis and repair require duplicating the situation in which the malfunction occurred. If a diagnosis is made without duplicating the malfunction, even an experienced service technician may make a misdiagnosis and not perform the servicing procedure correctly, resulting in the malfunction not being repaired. For example, a malfunction that occurs only while braking on slippery surfaces will not occur if the motorcycle is ridden on a non-slippery surface. Therefore, in order to properly diagnose and repair the motorcycle, the customer must be questioned about the conditions at the time that the malfunction occurred making “Information gathering” very important. In order that the information obtained from the customer to be used as a reference during troubleshooting, it is necessary to ask certain important questions concerning the malfunction. Therefore, a questionnaire has been created to improve the information-gathering procedure.

EXAMPLE: CUSTOMER PROBLEM INSPECTION FORM

User name:	**Model:**	**VIN:**	**Date of issue:**
Date Reg.	**Date of problem:**	**Mileage:**	

PROBLEM SYMPTOMS	
ABS operation	**Past malfunctions and repairs**
ABS does not work	
ABS works so often with	
Too long stopping distance	
Other	

CONDITION WHEN MALFUNCTION OCCURRED	
ABS indicator light	**Riding conditions**
Does not light up	**While stopping**
Lights up	**Over 10 km/h**
Goes off after running over 10 km/h: Yes / No	**When turning**
Flashes	**Others**
Tires	**Brake operating conditions**
Abnormal air pressure	**Usual braking**
Less thread depth	**Quick/hard braking**
No specified tires installed	
	Interface
Road surface	**Too big pulsations at brake levers**
Paved road:	**Too large brake lever strokes**
Dry / Wet / Others	**Others**
Unpaved road:	
Gravel / Muddy / Uneven / Others	**Others**
	Abnormal noise from the ABS control unit/HU
	Skid noise from the calipers
	Vibration at the brake levers
NOTE:	

NOTE

This form is a standard sample. The form should be modified according to conditions and characteristic of each market.

Pre-diagnosis Inspection

BEND15H24504002

The mechanical and hydraulic components of the brake system should be inspected prior to performing any electrical checks. These inspections may find problems that the ABS could not detect; thus, shortening repair time.

Brake

Brake fluid level check

Refer to “Brake System Inspection” in Section 0B (Page 0B-1).

Brake pad inspection

Refer to “Brake System Inspection” in Section 0B (Page 0B-1).

Brake fluid circuit air bleeding

Refer to “Air Bleeding from Brake Fluid Circuit” in Section 4A (Page 4A-4).

Tire

Tire type

Refer to “Tire Inspection” in Section 0B in related manual.

Tire pressure

Refer to “Tire Inspection” in Section 0B in related manual.

⚠ CAUTION

- **The standard tire fitted on this motorcycle is 120/70ZR17 M/C (58W) for front and 190/50ZR17 M/C (73W) for rear. The use of tires other than those specified may cause instability. It is highly recommended to use a SUZUKI Genuine Tire.**
- **Replace the tire as a set, otherwise the DTC “25” (C1625) may be stored.**

Wheel

Refer to “Front Wheel Related Parts Inspection” in Section 2D (Page 2D-5) and “Rear Wheel Related Parts Inspection” in Section 2D (Page 2D-11).

Battery

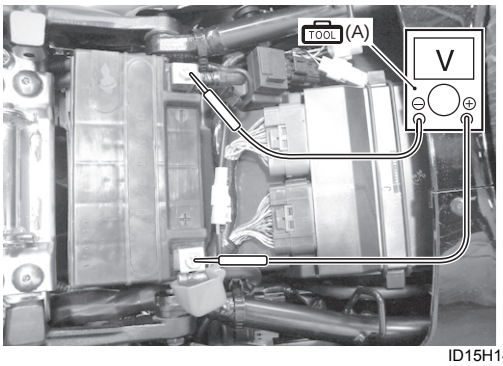
Battery voltage inspection

1) Turn the ignition switch OFF.
2) Remove the front seat. Refer to “Exterior Parts Removal and Installation” in Section 9D in related manual.
3) Measure the voltage between the (+) and (–) battery terminals using the multi-circuit tester.
   If the voltage is less than 12.0 V, charge or replace the battery and inspect the charging system. Refer to “Battery Runs Down Quickly” in Section 1J in related manual.

   Special tool
   TOOL (A): 09900–25008 (Multi-circuit tester set)

   Tester knob indication
   Voltage (⎓)

   Battery voltage
   12.0 V and more



ID15H1450014-02

4) Install the front seat.

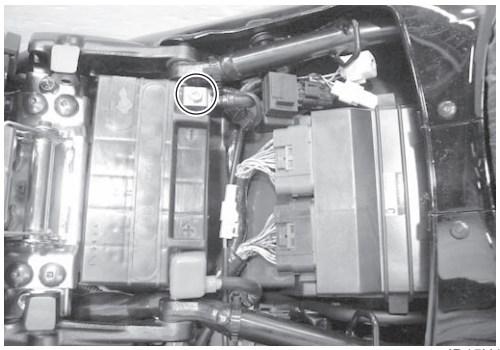
ABS Component

Wheel speed sensor – sensor rotor clearance inspection

Inspect the clearance between the wheel speed sensor and sensor rotor for each wheel using the thickness gauge.
Refer to “Front Wheel Speed Sensor Removal and Installation” (Page 4E-60) and “Rear Wheel Speed Sensor Removal and Installation” (Page 4E-60).

ABS control unit/HU ground wire inspection

1) Turn the ignition switch OFF.
2) Remove the front seat. Refer to “Exterior Parts Removal and Installation” in Section 9D in related manual.
3) Disconnect the battery (–) lead wire.

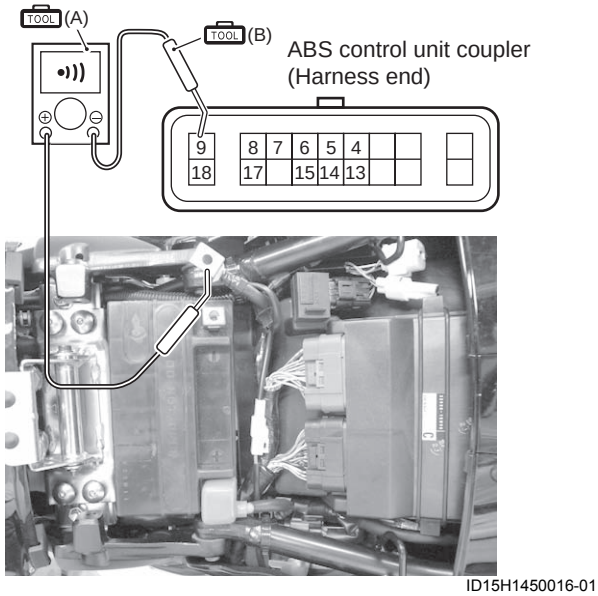


ID15H1450015-01

4) Disconnect the ABS control unit coupler. Refer to "ABS Control Unit Coupler Disconnect and Connect" (Page 4E-59).
5) Check for continuity between "9" (B/W) at the coupler and the battery (–) terminal.

Special tool
TOOL (A): 09900–25008 (Multi-circuit tester set)
TOOL (B): 09900–25009 (Needle-point probe set)

Tester knob indication
Continuity test (•))))



ID15H1450016-01

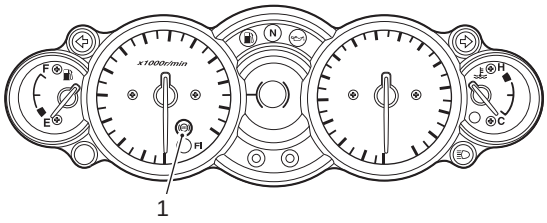
6) Install the removed parts.

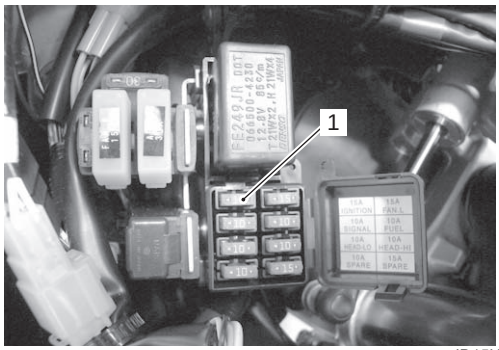
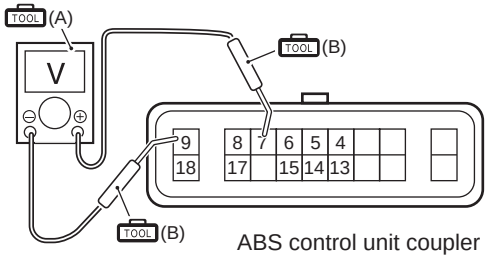
ABS Indicator Light Inspection

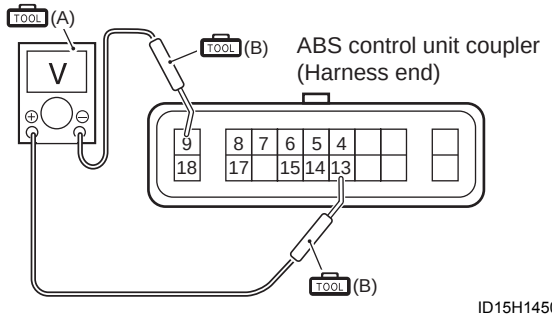
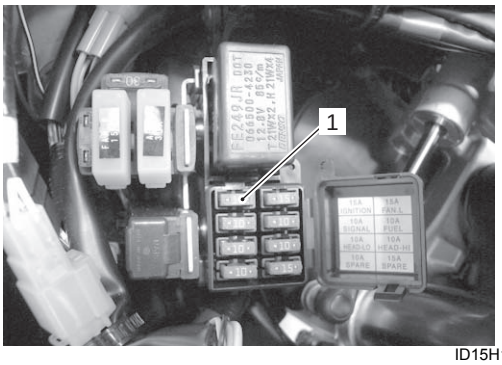
BEND15H24504003

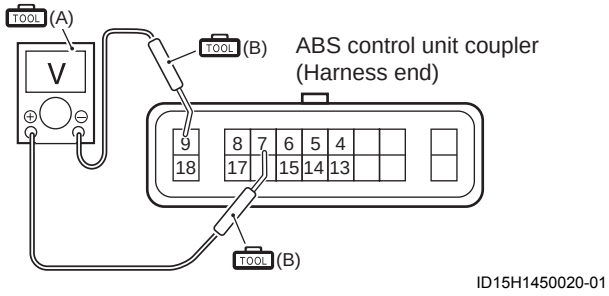
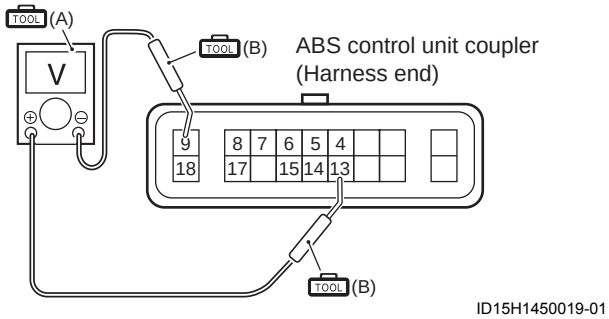
Wiring Diagram
Refer to "ABS Control Unit/HU Diagram" (Page 4E-8).

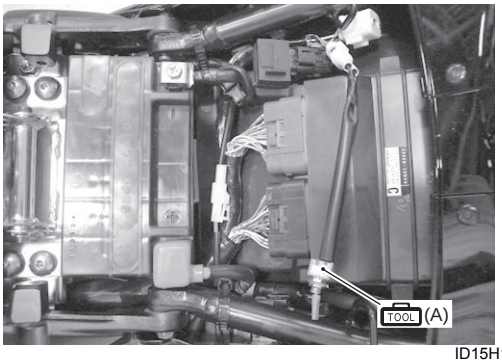
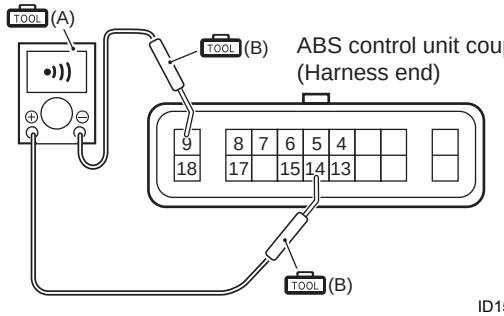
Troubleshooting

Step	Action	Yes	No
1	1) Check if the ABS indicator light (1) lights up when turning the ignition switch ON.  1 ID15H1450006-02 *Does the ABS indicator light light up?*	Go to Step 2.	Go to Step 3.
2	**(The ABS indicator light lights up)** 1) Ride the motorcycle at more than 10 km/h (6.2 mile/h). *Does the ABS indicator light go off?*	Normal. (No DTC exists)	• DTC output. (Refer to "DTC (Diagnostic Trouble Code) Output" (Page 4E-20).) • If DTC can not be output (the ABS indicator light does not flash), go to Step 6.

Step	Action	Yes	No
3	**(The ABS indicator light does not light up)** 1) Turn the ignition switch OFF. 2) Remove the upper panel (LH). Refer to “Exterior Parts Removal and Installation” in Section 9D in related manual. 3) Open the fuse box and inspect the ignition fuse (1). **NOTE** **If a fuse is blown, find the cause of the problem and correct it before replacing the fuse.** **Ignition fuse** **15 A**  ID15H1450017-01 *Is the ignition fuse OK?*	Go to Step 4.	Replace the ignition fuse.
4	1) Disconnect the ABS control unit coupler. Refer to “ABS Control Unit Coupler Disconnect and Connect” (Page 4E-59). 2) Turn the ignition switch ON with the ABS control unit coupler disconnected, measure the voltage between “7” (O/Y) and “9” (B/W) at the coupler. **Special tool** **TOOL (A): 09900–25008 (Multi circuit tester set)** **TOOL (B): 09900–25009 (Needle-point probe set)** **Tester knob indication** **Voltage (⎓)** **Normal value** **Battery voltage (12.0 V and more)**  ID15H1450018-01 *Is the voltage between “7” and “9” normal?*	Go to Step 5.	Inspect the wire harness. (Faulty ignition or ground wire)

Step	Action	Yes	No
5	1) Measure the voltage between “13” (Br) and “9” (B/W) at the coupler. **Special tool** **TOOL (A): 09900–25008 (Multi-circuit tester set)** **TOOL (B): 09900–25009 (Needle pointed probe set)** **Tester knob indication** **Voltage (⎓)** **Normal value** **7.0 V and more**  ID15H1450019-01 *Is the voltage between “13” and “9” normal?*	Replace the ABS control unit/HU. Refer to “ABS Control Unit/HU Removal and Installation” (Page 4E-63).	• Inspect the wire harness. (Faulty indicator light wire) • Signal fuse or indicator light is blown.
6	**(The ABS indicator light does not go off)** 1) Turn the ignition switch OFF. 2) Remove the upper panel (LH). Refer to “Exterior Parts Removal and Installation” in Section 9D in related manual. 3) Open the fuse box and inspect the ignition fuse (1). **NOTE** **If a fuse is blown, find the cause of the problem and correct it before replacing the fuse.** **Ignition fuse** **15 A**  ID15H1450017-01 *Is the ignition fuse OK?*	Go to Step 7.	Replace the ignition fuse.

Step	Action	Yes	No
7	1) Disconnect the ABS control unit coupler. Refer to “ABS Control Unit Coupler Disconnect and Connect” (Page 4E-59). 2) Turn the ignition switch ON with the ABS control unit coupler disconnected, measure the voltage between “7” (O/Y) and “9” (B/W) at the coupler. **Special tool** **(A): 09900–25008 (Multi-circuit tester set)** **(B): 09900–25009 (Needle pointed probe set)** **Tester knob indication** **Voltage (⎓)** **Normal value** **Battery voltage (12.0 V and more)**  ID15H1450020-01 *Is the voltage between “7” and “9” normal?*	Go to Step 8.	Inspect the wire harness. (Faulty ignition or ground wire)
8	1) Measure the voltage between “13” (Br) and “9” (B/W) at the coupler. **Special tool** **(A): 09900–25008 (Multi-circuit tester set)** **(B): 09900–25009 (Needle pointed probe set)** **Tester knob indication** **Voltage (⎓)** **Normal value** **7.0 V and more**  ID15H1450019-01 *Is the voltage between “13” and “9” normal?*	Go to Step 9.	Inspect the wire harness. (Faulty indicator light wire)

Step	Action	Yes	No
9	1) Turn the ignition switch OFF. 2) Short the mode select coupler terminals using the special tool. **Special tool** **TOOL (A): 09930–82760 (Mode select switch)**  ID15H1450007-01 3) Check for continuity between “14” (O) and “9” (B/W) at the coupler. **Special tool** **TOOL (A): 09900–25008 (Multi circuit tester set)** **TOOL (B): 09900–25009 (Needle-point probe set)** **Tester knob indication** **Continuity test (•)))**  ID15H1450021-01 *Is the continuity between “14” and “9”?*	Replace the ABS control unit/HU. Refer to “ABS Control Unit/HU Removal and Installation” (Page 4E-63).	Inspect the wire harness. (Faulty mode select coupler wire)

DTC (Diagnostic Trouble Code) Output

BEND15H24504004

NOTE

- **Even through the ABS is operating correctly, a DTC is memorized in any of the following conditions.**
  - **– Previous malfunctions were repaired, but the DTCs were not deleted.**
- **Don't disconnect couplers from ABS HU, the battery cable from the battery, ABS HU ground wire harness from the engine or main fuse before confirming the malfunction code (self-diagnostic trouble code) stored in memory. Such disconnection will erase the memorized information in ABS HU memory.**
- **Be sure to read "Precautions for Electrical Circuit Service" in Section 00 in related manual and "Precautions for ABS" in Section 00 (Page 00-1) before inspection and observe what is written there.**
- **After carrying out DTC deleting and ABS operation check, explain to the customer that the ABS is operating correctly. Refer to "DTC (Diagnostic Trouble Code) Deleting" (Page 4E-22).**

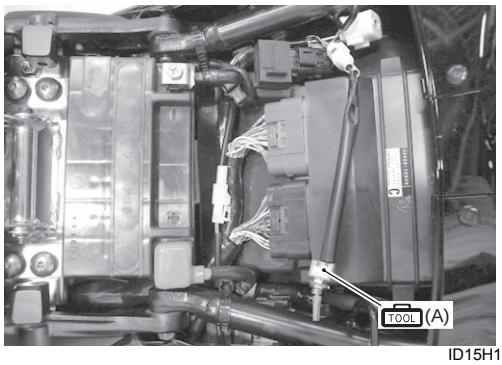
Use of Mode Select Switch

Connect the special tool to the mode select coupler to output the memorized DTCs on the ABS indicator light.

1) Turn the ignition switch OFF.
2) Remove the front seat. Refer to "Exterior Parts Removal and Installation" in Section 9D in related manual.
3) Connect the special tool to the mode select coupler.

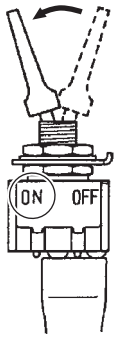
Special tool

(A): 09930–82760 (Mode select switch)



ID15H1450007-01

4) Switch the special tool to ON.

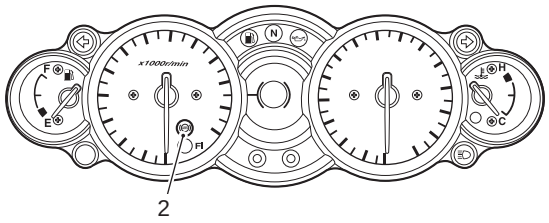


I718H1450040-02

5) Turn the ignition switch ON.
   The ABS indicator light (2) starts flashing to indicate the DTC. Refer to "DTC Table" (Page 4E-30).

NOTE

- **If there is a DTC, the ABS indicator light keeps flashing cyclically and repeatedly.**
- **If there is no DTC, the ABS indicator light keeps lighting ON.**
- **If the DTCs are to be output for a long time, remove the HEAD-LO fuse in order to prevent the battery from discharging.**



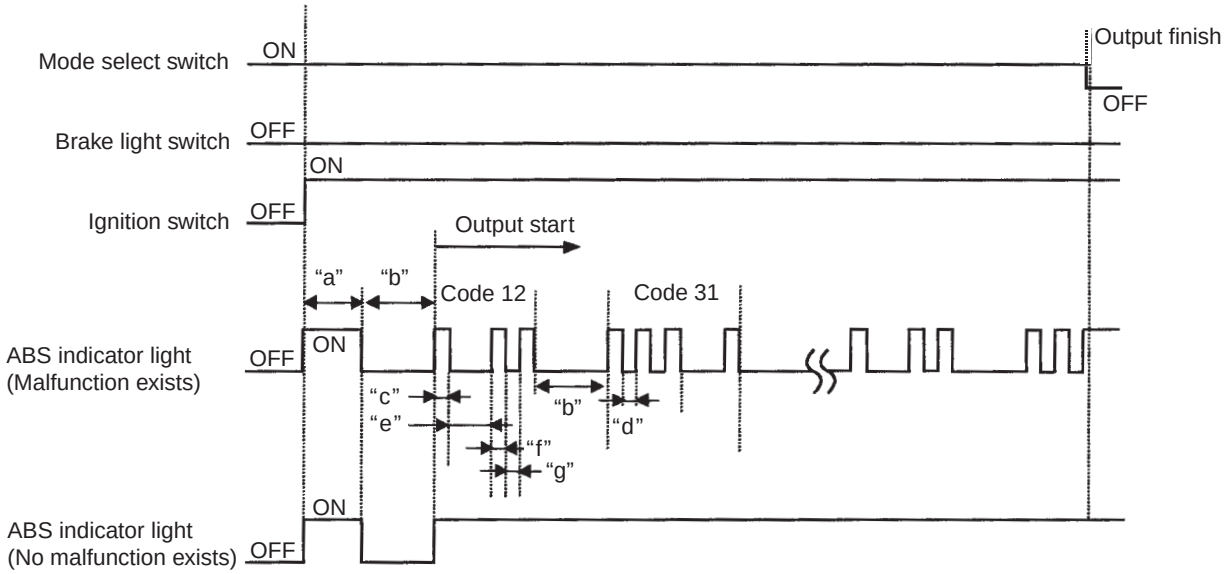
ID15H1450022-02

6) Turn the ignition switch OFF and disconnect the special tool.
7) Install the front seat.

Understanding the DTC (Diagnostic Trouble Code)

A two-digit DTC is shown through the flashing pattern of the ABS indicator light. A number between 1 and 9 is represented by the number of times that the ABS indicator light lights up in interval of 0.4 seconds and the separation between the tens and ones are indicated by the light staying off for 1.6 seconds. In addition, the separation between the start code and the DTC is indicated by the light being off for 3.6 seconds. After the start code is displayed, DTCs appear from the smallest number code.

If no DTCs are memorized, the ABS indicator light keeps lighting up.



I718H1450129-01

"a": Initial minimum light ON time (About 2 seconds)	"e": Main-sub code interval (1.6 seconds)
"b": Error code interval (About 3.6 seconds)	"f": Sub code light ON time (0.4 seconds)
"c": Main code light ON time (0.4 seconds)	"g": Sub code light OFF time (0.4 seconds)
"d": Main code light OFF time (0.4 seconds)	

Use of SDS

NOTE

DTC stored in ABS HU memory can be checked by the SDS.

1) Remove the front seat. Refer to "Exterior Parts Removal and Installation" in Section 9D in related manual.
2) Set up the SDS tool. (Refer to the SDS operation manual for further details.)

Special tool

TOOL : 09904–41010 (SUZUKI Diagnostic system set)

TOOL : 99565–01010–030 (CD-ROM Ver.30)

3) Read the DTC (Diagnostic Trouble Code) and show data when trouble (displaying data at the time of DTC) according to instructions displayed on SDS.

NOTE

- **Not only is SDS used for detecting Diagnostic Trouble Codes but also for reproducing and checking on screen the failure condition as described by customers using the trigger.**
- **How to use trigger. (Refer to the SDS operation manual for further details.)**

4) Close the SDS tool and turn the ignition switch OFF.
5) Install the front seat.

DTC (Diagnostic Trouble Code) Deleting

BEND15H24504005

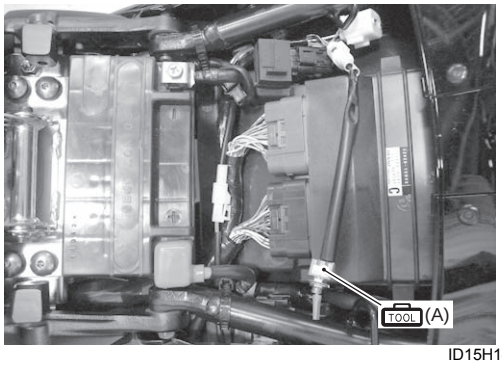
Use of Mode Select Switch

NOTE

- **Even though the current history code is cleared, the previous malfunction history code (Past DTC) still remains stored in the ABS HU. Therefore, erase the history code memorized in the ABS HU using SDS tool. Refer to "Use of SDS" (Page 4E-23).**
- **The DTC is memorized in the ABS HU also when the wire coupler of any sensor is disconnected. Therefore, when a wire coupler has been disconnected at the time of diagnosis, erase the stored malfunction history code using SDS. Refer to "Use of SDS" (Page 4E-23).**

1) Remove the front seat. Refer to "Exterior Parts Removal and Installation" in Section 9D in related manual.
2) Connect the special tool to the mode select coupler and output the DTCs.

Special tool
TOOL (A): 09930–82760 (Mode select switch)



ID15H1450007-01

3) Switch the special tool to ON and turn the ignition switch ON.
4) While the DTCs are being output, set the special tool to OFF.

NOTE

The DTC deletion mode is started after the switch is set to OFF.

I718H1450050-01

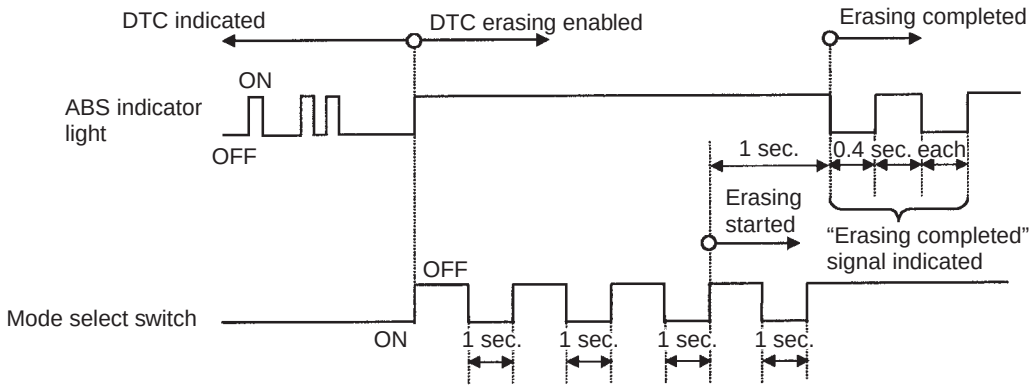
5) In the DTC deletion mode, switch the special tool from OFF to ON three times, each time leaving it at ON for more than 1 second.

NOTE

The DTC deletion can be made within 12.5 seconds after the switch is turned ON.

I718H1450051-01

DTC Deleting Diagram



I718H1450052-02

6) After deleting the DTCs, repeat the code output procedure and make sure that no DTCs remain (the ABS indicator light no longer flashes).

NOTE

If any DTCs remain, perform the appropriate procedures, then delete the codes. If DTCs are left stored, confusion may occur and unnecessary repairs may be made.

7) Turn the ignition switch OFF and disconnect the special tool.
8) Install the front seat.
9) Afterwards, ride the motorcycle at more than 30 km/h (18.6 mile/h) and quickly apply the brakes to check that the ABS activates correctly.

Use of SDS

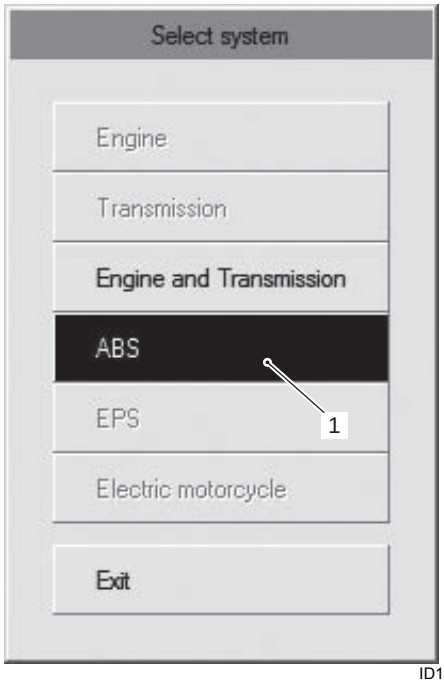
NOTE

- **The previous malfunction history code (Past DTC) still remains stored in the ABS HU. Therefore, erase the history code memorized in the ABS HU using SDS tool.**
- **The DTC is memorized in the ABS HU also when the wire coupler of any sensor is disconnected. Therefore, when a wire coupler has been disconnected at the time of diagnosis, erase the stored malfunction history code using SDS.**

1) Remove the front seat. Refer to “Exterior Parts Removal and Installation” in Section 9D in related manual.
2) After repairing the trouble, turn OFF the ignition switch.
3) Set up the SDS tool. (Refer to the SDS operation manual for further details.)

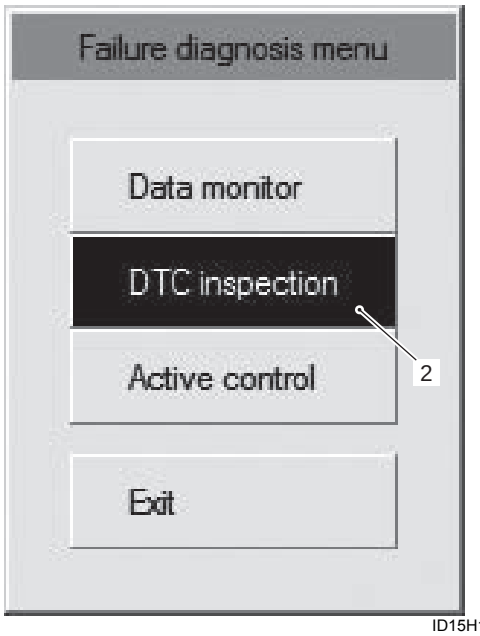
Special tool
TOOL : 09904–41010 (SUZUKI Diagnostic system set)
TOOL : 99565–01010–030 (CD-ROM Ver.30)

4) Click the ABS button (1).



ID15H1450023-01

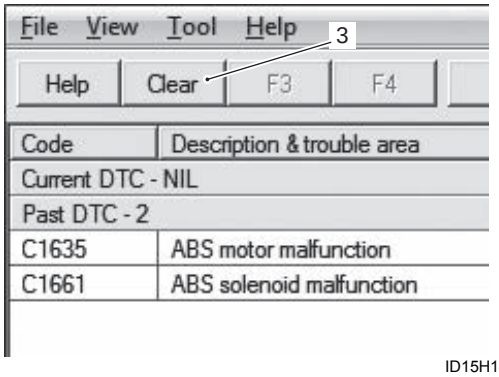
5) Click the “DTC inspection” button (2).



ID15H1450024-01

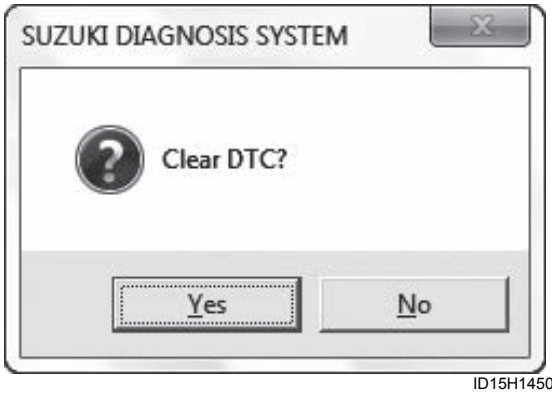
6) Check the DTC.

7) Click “Clear” (3) to delete history code (Past DTC).

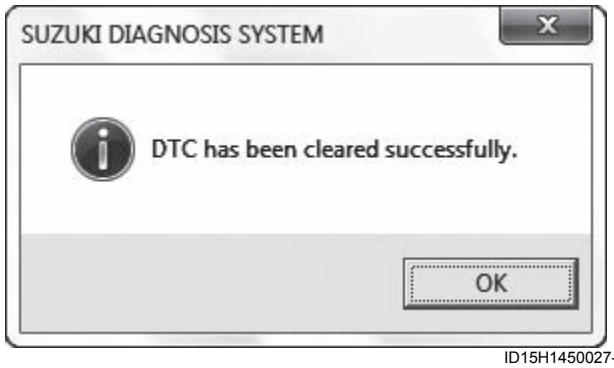


ID15H1450025-01

8) Follow the displayed instructions.

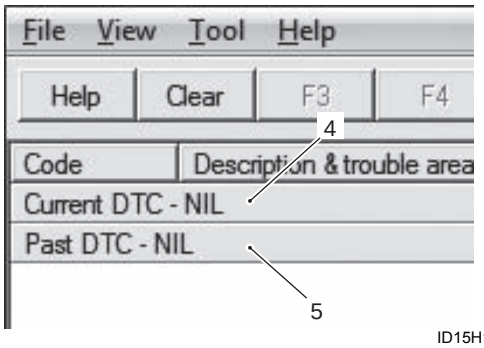


ID15H1450026-01



ID15H1450027-01

9) Check that both “Current DTC” (4) and “Past DTC” (5) are deleted (NIL).



ID15H1450028-01

10) Close the SDS tool and turn the ignition switch OFF.

11) Disconnect the SDS tool and install the front seat.

12) Ride the motorcycle at more than 30 km/h (18.6 mile/h) and quickly apply the brakes to check that the ABS activates correctly.

SDS Check

BEND15H24504006

Using SDS, take the sample of data from the new motorcycle and at the time of periodic maintenance at your dealer. Save the data in the computer or by printing and filing the hard copies. The saved or filed data are useful for troubleshooting as they can be compared periodically with changes over time or failure conditions of the motorcycle. For example, when a motorcycle is brought in for service but the troubleshooting is difficult, comparison with the normal data that have been saved or filed can allow the specific ABS failure to be determined.

1) Remove the front seat. Refer to “Exterior Parts Removal and Installation” in Section 9D in related manual.
2) Set up the SDS tool. (Refer to the SDS operation manual for further details.)

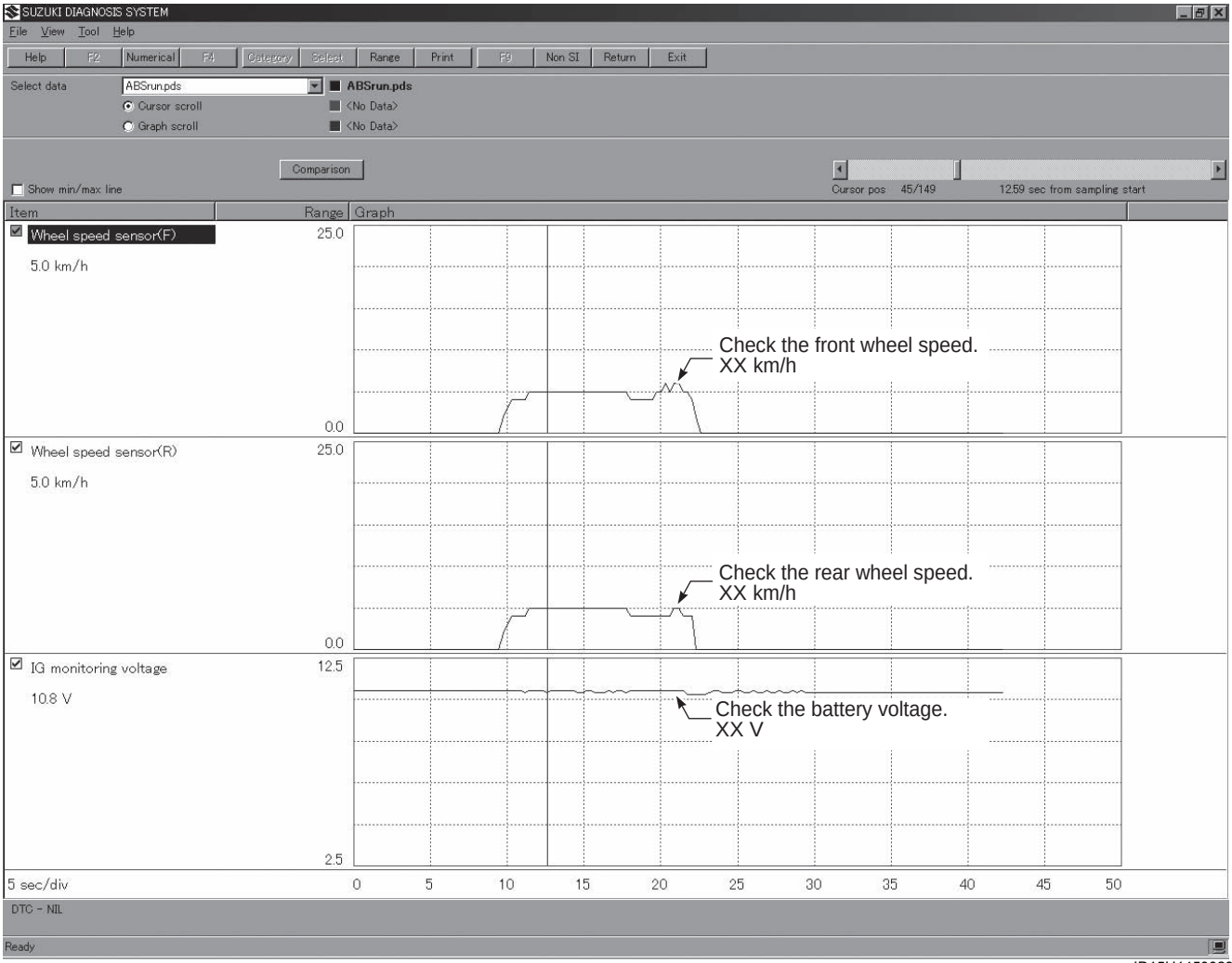
NOTE

- **Before taking the sample of data, check and clear the Past DTC. Refer to “DTC (Diagnostic Trouble Code) Deleting” (Page 4E-22).**
- **A number of different data under a fixed condition as shown should be saved or filed as sample.**

Special tool

TOOL : 09904–41010 (SUZUKI Diagnostic system set)
TOOL : 99565–01010–030 (CD-ROM Ver.30)

DATA sampled from ABS HU system

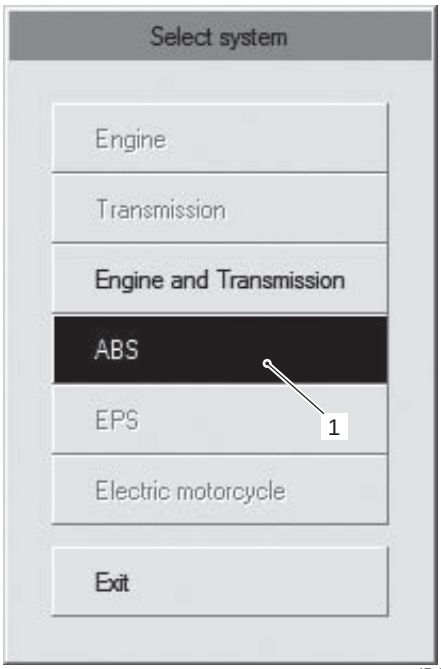


ID15H1450029-01

Active Control Inspection

BEND15H24504007

1) Remove the front seat. Refer to “Exterior Parts Removal and Installation” in Section 9D in related manual.
2) Set up the SDS tool. (Refer to the SDS operation manual for further details.)
3) Click “ABS” (1).

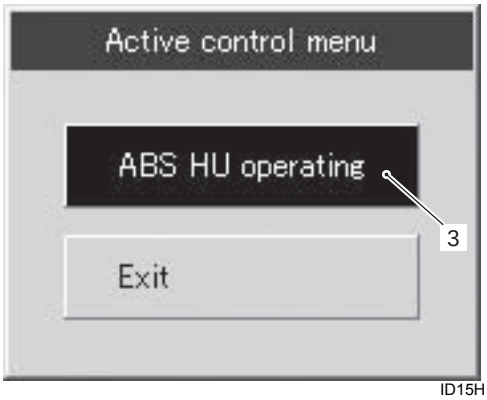


ID15H1450023-01

4) Click “Active control” (2).

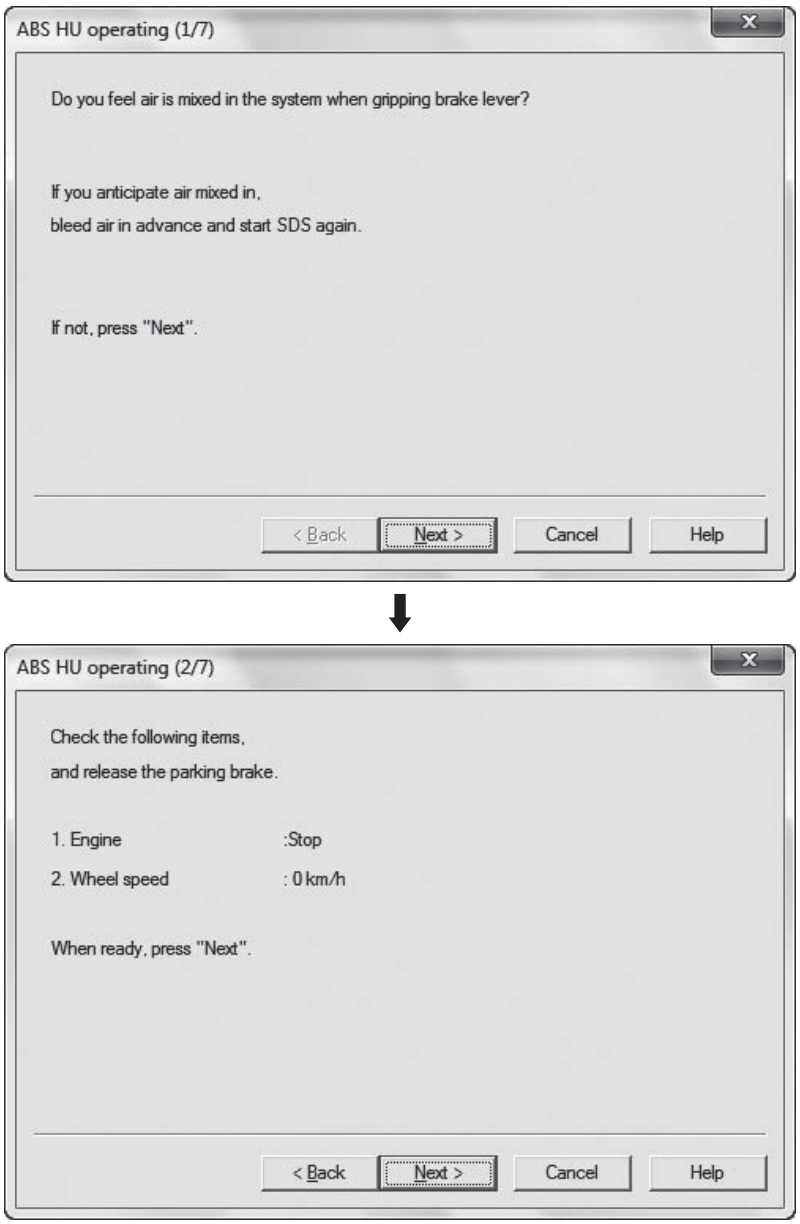
ID15H1450030-01

5) Click “ABS HU operating” (3).



ID15H1450031-01

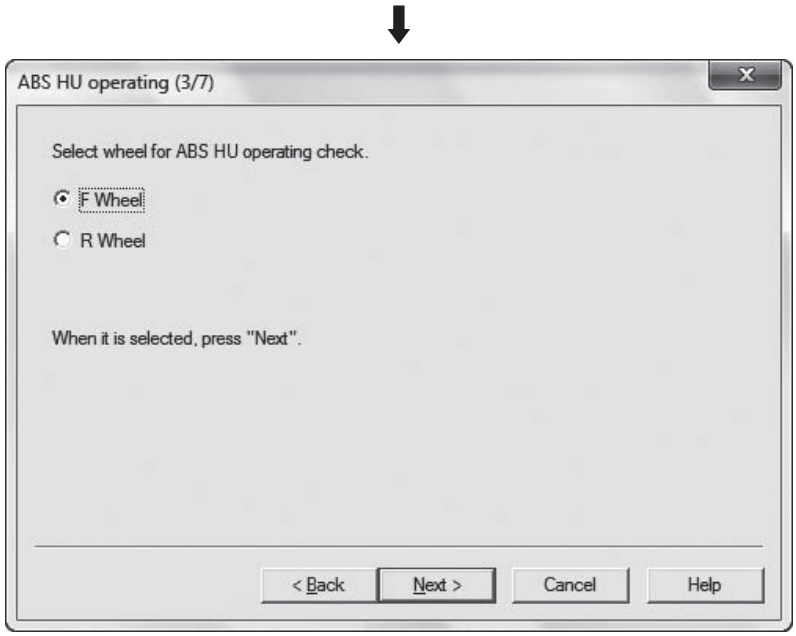
6) Click “Next” according to the screen indication.



ID15H1450032-01

NOTE

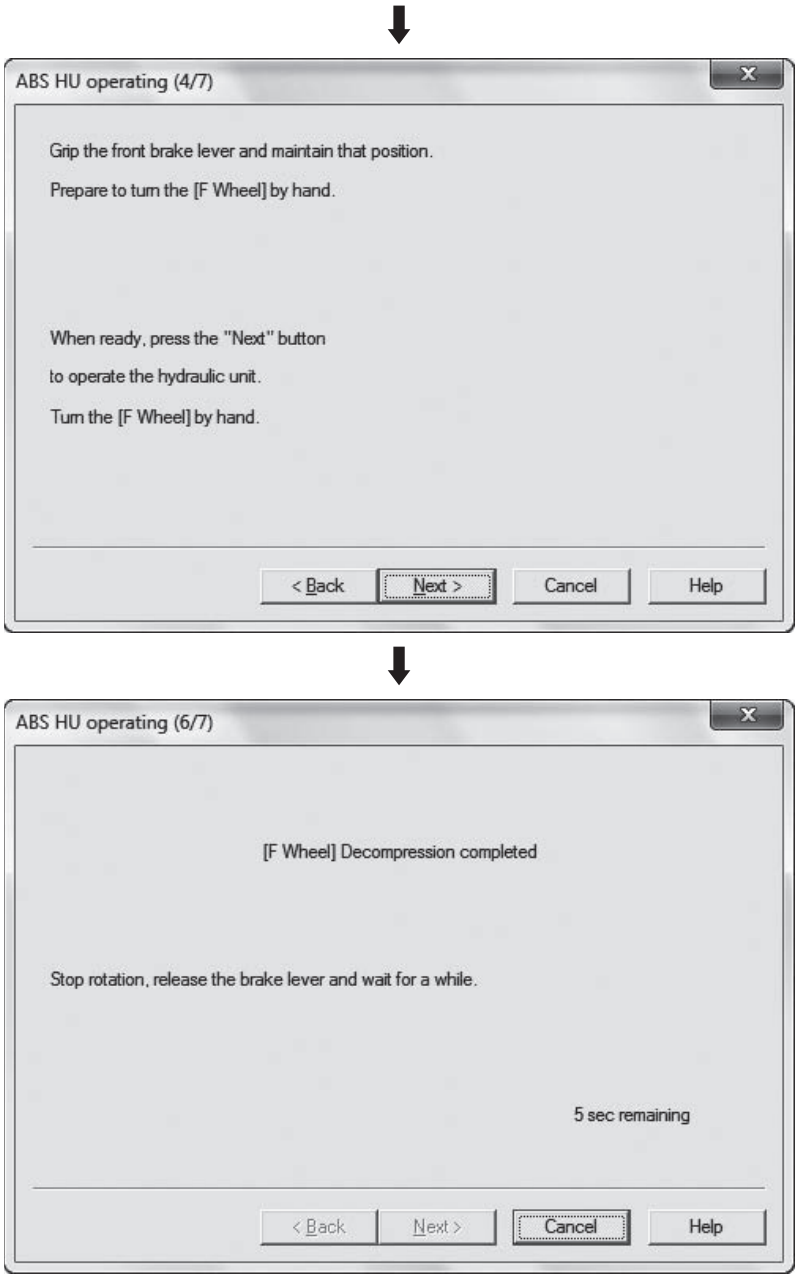
Skip this screen as this vehicle is not equipped with parking brake.



ID15H1450033-01

NOTE

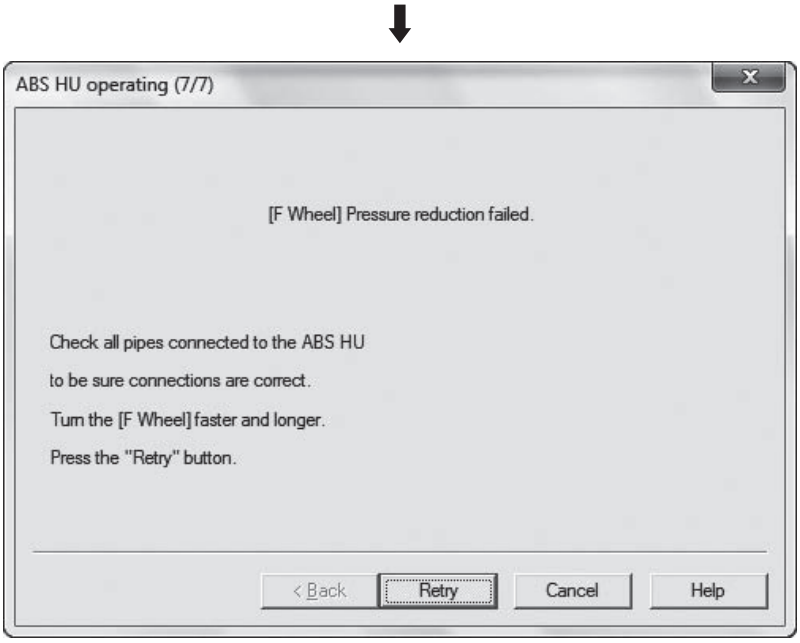
- **If the front wheel is selected, lift the front wheel off the ground using a jack.**
- **Two operators are needed in this work; One should apply a rotational force to the front wheel.**



ID15H1450034-01

NOTE

- **In normal cases, the front brake lever feels a reaction force and the front wheel turns discontinuously. At the same time, the ABS HU operating sound will be heard.**
- **The ABS HU motor operates for 6 seconds and then stops automatically.**



ID15H1450035-01

NOTE

- **Inspect the rear brake in the same manner of front brake.**
- **If the ABS does not function, the cause may lie in the ABS control unit/HU.**
- **In checking the rear brake at the time of pressure reduction drive (4/7), "brake lever" appears on the screen. This is because the present screen shares with other model having front brake only. Therefore, in the case of rear brake pedal equipped vehicle, ignore this instruction and operate the rear brake pedal.**

7) Close the SDS tool and turn the ignition switch OFF.
8) Disconnect the SDS tool and install the front seat.

DTC Table

BEND15H24504008

DTC	Malfunction cause	Indicator status	Reference
None	Normal	ON *1	—
13 (C1613)	Wheel speed sensor rotor malfunction (F)	ON	Refer to "DTC "13" (C1613): Wheel Speed Sensor Rotor Malfunction (F)" (Page 4E-32).
14 (C1614)	Wheel speed sensor rotor malfunction (R)	ON	Refer to "DTC "14" (C1614): Wheel Speed Sensor Rotor Malfunction (R)" (Page 4E-33).
22 (C1622)	ABS actuator circuit malfunction (F)	ON	Refer to "DTC "22" (C1622): ABS Actuator Circuit Malfunction (F)" (Page 4E-35).
23 (C1623)	ABS actuator circuit malfunction (R)	ON	Refer to "DTC "23" (C1623): ABS Actuator Circuit Malfunction (R)" (Page 4E-36).
25 (C1625)	Wheel speed sensor related malfunction	ON	Refer to "DTC "25" (C1625): Wheel Speed Sensor Related Malfunction" (Page 4E-37).

DTC	Malfunction cause	Indicator status	Reference
35 (C1635)	ABS motor malfunction	ON	Refer to “DTC “35” (C1635): ABS Motor Malfunction” (Page 4E-38).
41 (C1641)	Wheel speed sensor signal malfunction (F) *2	ON	Refer to “DTC “41” (C1641): Wheel Speed Sensor Signal Malfunction (F)” (Page 4E-38).
42 (C1642)	Wheel speed sensor circuit open (F) *2	ON	Refer to “DTC “42” (C1642): Wheel Speed Sensor Circuit Open (F)” (Page 4E-39).
43 (C1643)	Wheel speed sensor circuit short (F) *2	ON	Refer to “DTC “43” (C1643): Wheel Speed Sensor Circuit Short (F)” (Page 4E-45).
44 (C1644)	Wheel speed sensor signal malfunction (R) *2	ON	Refer to “DTC “44” (C1644): Wheel Speed Sensor Signal Malfunction (R)” (Page 4E-46).
45 (C1645)	Wheel speed sensor circuit open (R) *2	ON	Refer to “DTC “45” (C1645): Wheel Speed Sensor Circuit Open (R)” (Page 4E-47).
46 (C1646)	Wheel speed sensor circuit short (R) *2	ON	Refer to “DTC “46” (C1646): Wheel Speed Sensor Circuit Short (R)” (Page 4E-51).
47 (C1647)	Supply voltage (Increased)	ON	Refer to “DTC “47” (C1647): Supply Voltage (Increased)” (Page 4E-53).
48 (C1648)	Supply voltage (Decreased)	ON	Refer to “DTC “48” (C1648): Supply Voltage (Decreased)” (Page 4E-55).
55 (C1655)	ABS control unit malfunction	ON	Refer to “DTC “55” (C1655): ABS Control Unit Malfunction” (Page 4E-57).
61 (C1661)	ABS solenoid malfunction	ON	Refer to “DTC “61” (C1661): ABS Solenoid Malfunction” (Page 4E-58).

*1: It goes off after running at more than 10 km/h (6.2 mile/h).
*2: The wheel speed sensor lead wire is connected to the ABS control unit, but a short-circuit or faulty continuity inside the ABS control unit caused this DTC to appear, therefore, the ABS control unit/HU assembly must be replaced. An insufficient wheel speed sensor output voltage is the cause of a malfunction in which the ABS is activated even if the brakes are not suddenly applied. If this occurs frequently even though the wheel speed sensor is operating correctly, the ABS control unit/HU assembly should be replaced.

⚠ CAUTION

When disconnecting couplers and turning the ignition switch ON, disconnect the ABS control unit coupler in order to prevent a DTC from being stored. Each time a resistance is measured, the ignition switch should be set to OFF.

DTC “13” (C1613): Wheel Speed Sensor Rotor Malfunction (F)

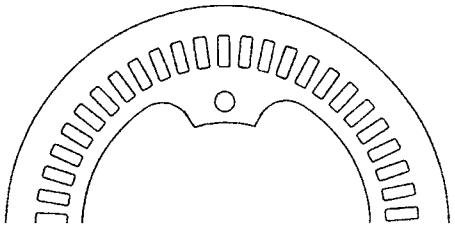
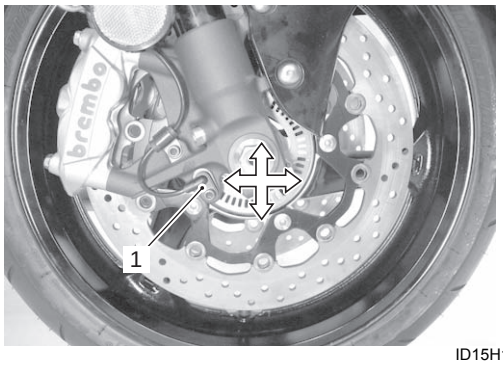
BEND15H24504009

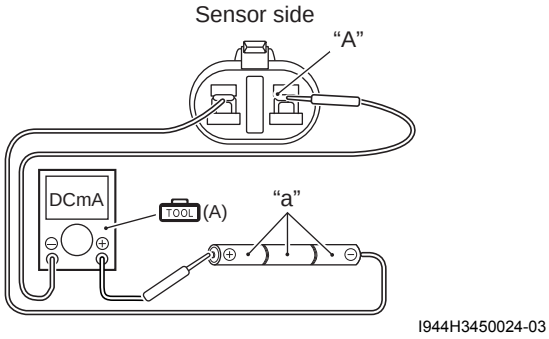
Possible Cause
• Front wheel speed sensor rotor distortion
• Faulty front wheel speed sensor or wiring discontinuity, etc.

Troubleshooting

NOTE

After repairing the trouble, clear the DTC using SDS tool. Refer to “DTC (Diagnostic Trouble Code) Deleting” (Page 4E-22).

Step	Action	Yes	No
1	1) Inspect the clearance between the front wheel speed sensor and sensor rotor using the thickness gauge. Refer to “Front Wheel Speed Sensor Removal and Installation” (Page 4E-60). *Is the clearance OK?*	Go to Step 2.	Adjust the clearance.
2	1) Inspect the front wheel speed sensor rotor for damage and check that no foreign objects are caught in the rotor openings.  I718H1450064-01 *Is the sensor rotor OK?*	Go to Step 3.	Clean or replace the sensor rotor. Refer to “Front Wheel Speed Sensor Rotor Removal and Installation” (Page 4E-61).
3	1) Check that the front wheel speed sensor (1) is mounted securely.  ID15H1450036-01 *Is the sensor mounted securely?*	Go to Step 4.	Tighten the mounting bolt.
4	1) Inspect the front tire type, size, pressure and wheel runout. Refer to “Front Wheel Related Parts Inspection” in Section 2D (Page 2D-5). *Are the front tire type, tire pressure and wheel runout OK?*	Go to step 5.	Adjust or replace the front tire and wheel.

Step	Action	Yes	No
5	1) Disconnect the front wheel speed sensor coupler. Refer to “Front Wheel Speed Sensor Removal and Installation” (Page 4E-60). 2) Connect three 1.5 V dry cells “a” in series as shown and make sure that their total voltage is more than 4.5 V. Measure the current between (+) dry cells terminal and “A” (W) on the wheel speed sensor coupler. **Special tool** **TOOL (A): 09900–25008 (Multi circuit tester set)** **Tester knob indication** **Current (⎓ , 20 mA)** **Normal value** **3 – 17 mA**  I944H3450024-03 *Is the current OK?*	Replace the ABS control unit/HU. Refer to “ABS Control Unit/HU Removal and Installation” (Page 4E-63).	Faulty front wheel speed sensor. Refer to “Front Wheel Speed Sensor Removal and Installation” (Page 4E-60).

DTC “14” (C1614): Wheel Speed Sensor Rotor Malfunction (R)

BEND15H24504010

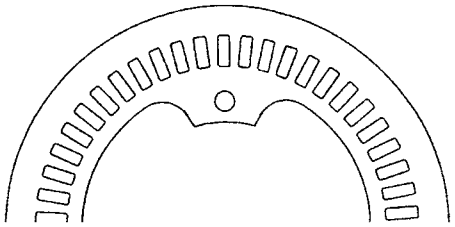
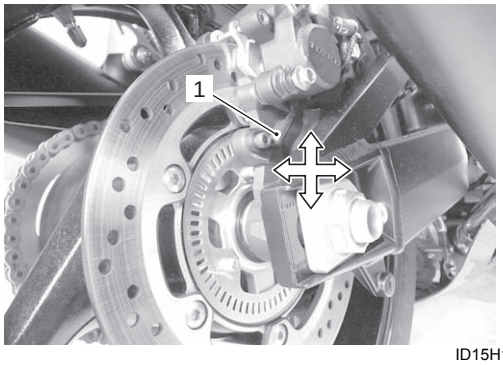
Possible Cause
• Rear wheel speed sensor rotor distortion
• Faulty rear wheel speed sensor or wiring discontinuity, etc.

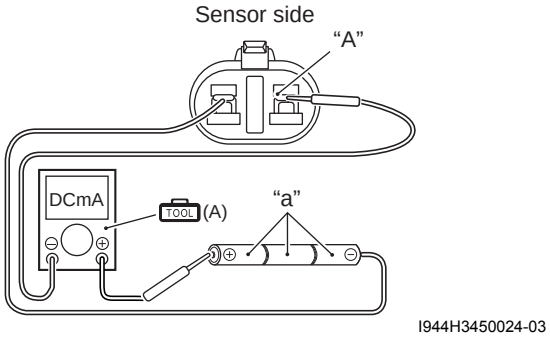
Troubleshooting

NOTE

After repairing the trouble, clear the DTC using SDS tool. Refer to “DTC (Diagnostic Trouble Code) Deleting” (Page 4E-22).

Step	Action	Yes	No
1	1) Inspect the clearance between the rear wheel speed sensor and sensor rotor using the thickness gauge. Refer to “Rear Wheel Speed Sensor Removal and Installation” (Page 4E-60). *Is the clearance OK?*	Go to Step 2.	Adjust the clearance.

Step	Action	Yes	No
2	1) Inspect the rear wheel speed sensor rotor for damage and check that no foreign objects are caught in the rotor openings.  I718H1450064-01 *Is the sensor rotor OK?*	Go to Step 3.	Clean or replace the sensor rotor. Refer to “Front Wheel Speed Sensor Rotor Removal and Installation” (Page 4E-61).
3	1) Check that the rear wheel speed sensor (1) is mounted securely.  ID15H1450037-01 *Is the sensor mounted securely?*	Go to Step 4.	Tighten the mounting bolt.
4	1) Inspect the rear tire type, size, pressure and wheel runout. Refer to “Rear Wheel Related Parts Inspection” in Section 2D (Page 2D-11). *Are the rear tire type, tire pressure and wheel runout OK?*	Go to step 5.	Adjust or replace the rear tire and wheel.

Step	Action	Yes	No
5	1) Disconnect the rear wheel speed sensor coupler. Refer to “Rear Wheel Speed Sensor Removal and Installation” (Page 4E-60). 2) Connect three 1.5 V dry cells “a” in series as shown and make sure that their total voltage is more than 4.5 V. Measure the current between (+) dry cells terminal and “A” (W) on the wheel speed sensor coupler. **Special tool** **TOOL (A): 09900–25008 (Multi circuit tester set)** **Tester knob indication** **Current (⎓ , 20 mA)** **Normal value** **3 – 17 mA**  I944H3450024-03 *Is the current OK?*	Replace the ABS control unit/HU. Refer to “ABS Control Unit/HU Removal and Installation” (Page 4E-63).	Faulty rear wheel speed sensor. Refer to “Rear Wheel Speed Sensor Removal and Installation” (Page 4E-60).

DTC “22” (C1622): ABS Actuator Circuit Malfunction (F)

BEND15H24504011

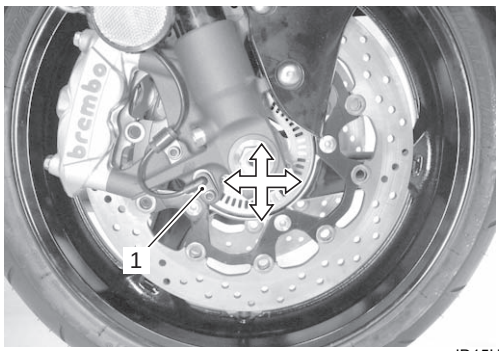
Possible Cause
• Wire harness discontinuity
• Front wheel locking, etc.

Troubleshooting

NOTE

After repairing the trouble, clear the DTC using SDS tool. Refer to “DTC (Diagnostic Trouble Code) Deleting” (Page 4E-22).

Step	Action	Yes	No
1	1) Raise the front wheel off the ground and support the motorcycle with a jack or wooden block. 2) Inspect the dragging of the front brake. *Is there any dragging in the front brake?*	Inspect the front brake master cylinder and the calipers.	Go to Step 2.
2	1) Inspect the clearance between the front wheel speed sensor and sensor rotor using the thickness gauge. Refer to “Front Wheel Speed Sensor Removal and Installation” (Page 4E-60). *Is the clearance OK?*	Go to Step 3.	Adjust the clearance.

Step	Action	Yes	No
3	1) Check that the front wheel speed sensor (1) is mounted securely.  ID15H1450036-01 *Is the sensor mounted securely?*	Replace the ABS control unit/HU. Refer to "ABS Control Unit/HU Removal and Installation" (Page 4E-63).	Tighten the mounting bolt.

DTC "23" (C1623): ABS Actuator Circuit Malfunction (R)

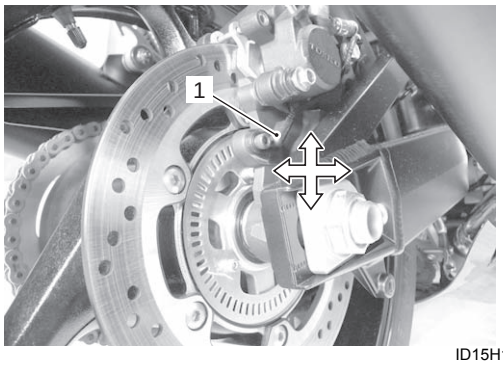
BEND15H24504012

Possible Cause
• Wire harness discontinuity
• Rear wheel locking, etc.

Troubleshooting

NOTE

After repairing the trouble, clear the DTC using SDS tool. Refer to "DTC (Diagnostic Trouble Code) Deleting" (Page 4E-22).

Step	Action	Yes	No
1	1) Raise the rear wheel off the ground and support the motorcycle with a jack or wooden block. 2) Inspect the dragging of the rear brake. *Is there any dragging in the rear brake?*	Inspect the rear brake master cylinder and the caliper.	Go to Step 2.
2	1) Inspect the clearance between the rear wheel speed sensor and sensor rotor using the thickness gauge. Refer to "Rear Wheel Speed Sensor Removal and Installation" (Page 4E-60). *Is the clearance OK?*	Go to Step 3.	Adjust the clearance.
3	1) Check that the rear wheel speed sensor (1) is mounted securely.  ID15H1450037-01 *Is the sensor mounted securely?*	Replace the ABS control unit/HU. Refer to "ABS Control Unit/HU Removal and Installation" (Page 4E-63).	Tighten the mounting bolt.

DTC “25” (C1625): Wheel Speed Sensor Related Malfunction

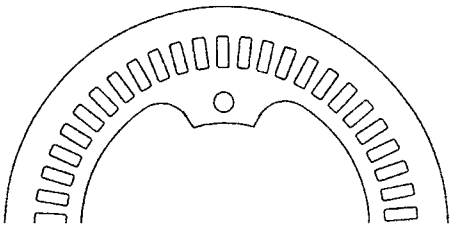
BEND15H24504013

Possible Cause
• Incorrect tire size, poor tire pressure • Deformed wheel, etc.

Troubleshooting

NOTE

After repairing the trouble, clear the DTC using SDS tool. Refer to “DTC (Diagnostic Trouble Code) Deleting” (Page 4E-22).

Step	Action	Yes	No
1	1) Check that the specified tires are installed. Refer to “Tire Inspection” in Section 0B in related manual. *Are the tires OK?*	Go to Step 2.	Use the specified tires.
2	1) Make sure the tire pressure for each tire. Refer to “Tire Inspection” in Section 0B in related manual. *Is the tire pressure for each tire correct?*	Go to Step 3.	Adjust the tire pressure.
3	1) Inspect both wheel speed sensor rotors for damage and check that no foreign objects are caught in the rotor openings.  I718H1450064-01 *Are the rotors OK?*	Go to Step 4.	Clean or replace the rotor. Refer to “Front Wheel Speed Sensor Rotor Removal and Installation” (Page 4E-61) and “Rear Wheel Speed Sensor Rotor Removal and Installation” (Page 4E-62).
4	1) Inspect the clearances of the front and rear wheel speed sensor – sensor rotor using the thickness gauge. Refer to “Front Wheel Speed Sensor Removal and Installation” (Page 4E-60) and “Rear Wheel Speed Sensor Removal and Installation” (Page 4E-60). *Are the clearances OK?*	Replace the ABS control unit/HU. Refer to “ABS Control Unit/HU Removal and Installation” (Page 4E-63).	Adjust the clearance.

DTC “35” (C1635): ABS Motor Malfunction

BEND15H24504014

Possible Cause
Faulty HU motor

Troubleshooting

NOTE

After repairing the trouble, clear the DTC using SDS tool. Refer to “DTC (Diagnostic Trouble Code) Deleting” (Page 4E-22).

Step	Action	Yes	No
1	1) Delete DTCs and repeat the code output procedure. Refer to “DTC (Diagnostic Trouble Code) Deleting” (Page 4E-22) and “DTC (Diagnostic Trouble Code) Output” (Page 4E-20). *Is the DTC “35” (C1635) output again?*	Replace the ABS control unit/HU. Refer to “ABS Control Unit/HU Removal and Installation” (Page 4E-63).	Intermittent trouble.

DTC “41” (C1641): Wheel Speed Sensor Signal Malfunction (F)

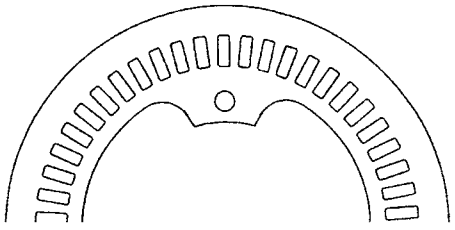
BEND15H24504015

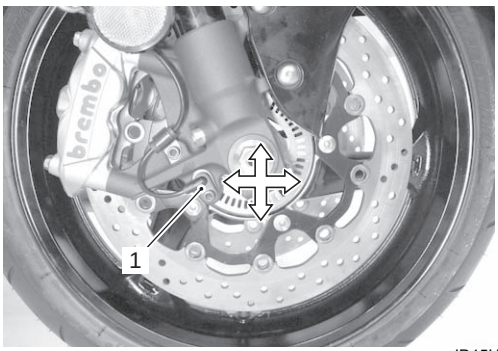
Possible Cause
• Poor contact in the front wheel speed sensor coupler
• Faulty front wheel speed sensor, etc.

Troubleshooting

NOTE

After repairing the trouble, clear the DTC using SDS tool. Refer to “DTC (Diagnostic Trouble Code) Deleting” (Page 4E-22).

Step	Action	Yes	No
1	1) Inspect the clearance between the front wheel speed sensor and sensor rotor using the thickness gauge. Refer to “Front Wheel Speed Sensor Removal and Installation” (Page 4E-60). *Is the clearance OK?*	Go to Step 2.	Adjust the clearance.
2	1) Inspect the front wheel speed sensor rotor for damage and check that no foreign objects are caught in the rotor openings.  I718H1450064-01 *Is the sensor rotor OK?*	Go to Step 3.	Clean or replace the sensor rotor. Refer to “Front Wheel Speed Sensor Rotor Removal and Installation” (Page 4E-61).

Step	Action	Yes	No
3	1) Check that the front wheel speed sensor (1) is mounted securely.  ID15H1450036-01 *Is the sensor mounted securely?*	Go to DTC “42” (C1642). Refer to “DTC “42” (C1642): Wheel Speed Sensor Circuit Open (F)” (Page 4E-39).	Tighten the mounting bolt.

DTC “42” (C1642): Wheel Speed Sensor Circuit Open (F)

BEND15H24504016

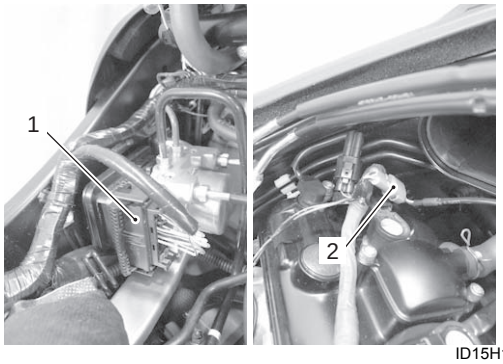
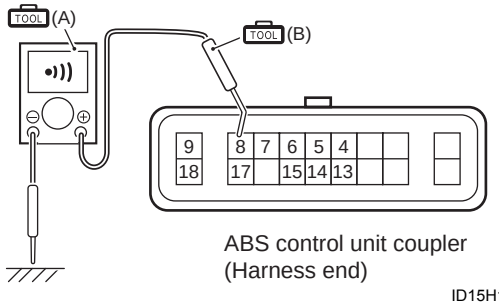
Possible Cause
• Poor contact in the front wheel speed sensor coupler
• Faulty front wheel speed sensor, etc.

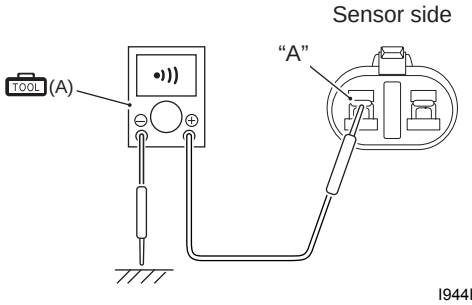
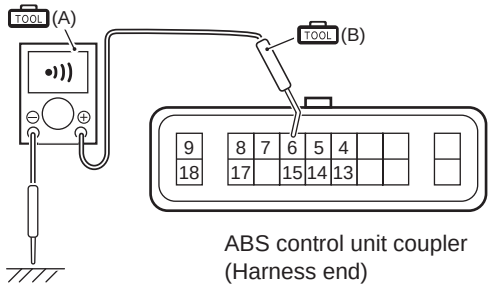
Wiring Diagram

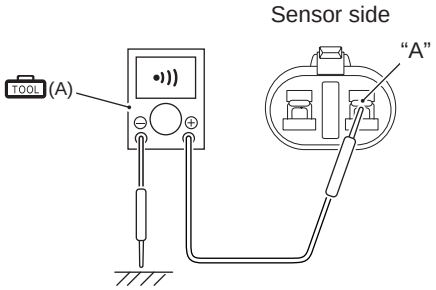
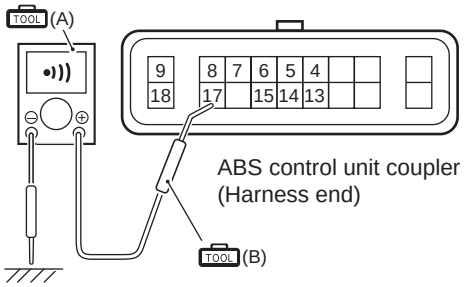
Refer to “ABS Control Unit/HU Diagram” (Page 4E-8).

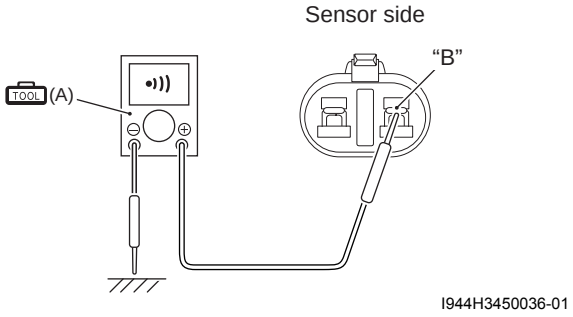
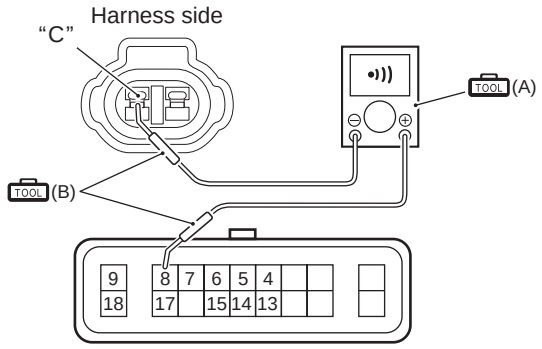
NOTE

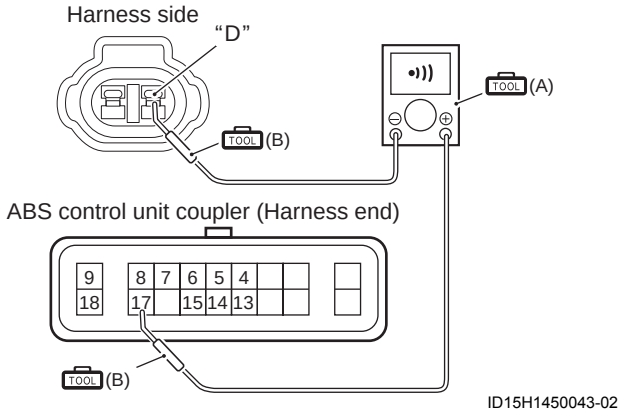
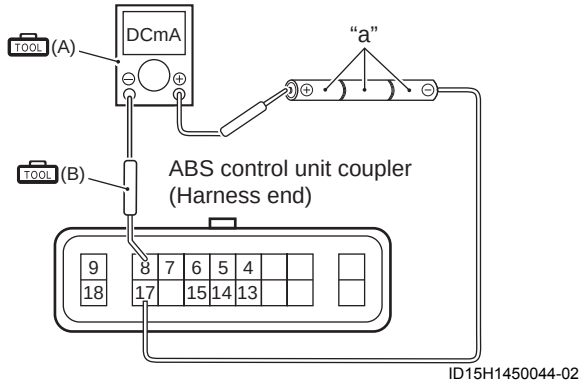
After repairing the trouble, clear the DTC using SDS tool. Refer to “DTC (Diagnostic Trouble Code) Deleting” (Page 4E-22).

Step	Action	Yes	No
1	1) Turn the ignition switch OFF. 2) Lift and support the fuel tank with the prop stay. Refer to “Fuel Tank Removal and Installation” in Section 1G (Page 1G-3). 3) Remove the air cleaner box. Refer to “Air Cleaner Box Removal and Installation” in Section 1D in related manual. 4) Check the ABS control unit coupler (1) and front wheel speed sensor coupler (2) for loose or poor contacts. If OK, then disconnect the ABS control unit coupler. Refer to “ABS Control Unit Coupler Disconnect and Connect” (Page 4E-59).  ID15H1450038-01 5) Check for continuity between “8” (B/R) and ground at the ABS control unit coupler. **Special tool** **TOOL (A): 09900–25008 (Multi-circuit tester set)** **TOOL (B): 09900–25009 (Needle pointed probe set)** **Tester knob indication** **Continuity test (•))))** **Normal value** **No continuity**  ID15H1450039-01 *Is the continuity between “8” and ground OK?*	Go to Step 3.	Go to Step 2.

Step	Action	Yes	No
2	1) Disconnect the front wheel speed sensor coupler. 2) Check for continuity between “A” (B) and ground at the front wheel speed sensor coupler. **Special tool** **TOOL (A): 09900–25008 (Multi circuit tester set)** **Tester knob indication** **Continuity test (•))))** **Normal value** **No continuity**  I944H3450085-01 *Is the continuity between “A” and ground OK?*	Inspect the wire harness. (Faulty B/R wire)	Faulty front wheel speed sensor. Refer to “Front Wheel Speed Sensor Removal and Installation” (Page 4E-60).
3	1) Check for continuity between “6” (B/Y) and ground at the ABS control unit coupler. **Special tool** **TOOL (A): 09900–25008 (Multi circuit tester set)** **TOOL (B): 09900–25009 (Needle-point probe set)** **Tester knob indication** **Continuity test (•))))** **Normal value** **No continuity**  ID15H1450040-01 *Is the continuity between “6” and ground OK?*	Go to Step 5.	Go to Step 4.

Step	Action	Yes	No
4	1) Disconnect the rear wheel speed sensor coupler. 2) Check for continuity between “A” (W) and ground at the rear wheel speed sensor coupler. **Special tool** **(A): 09900–25008 (Multi circuit tester set)** **Tester knob indication** **Continuity test (•))))** **Normal value** **No continuity**  I944H3450034-01 *Is the continuity between “A” and ground OK?*	Inspect the wire harness. (Faulty B/Y wire)	Faulty rear wheel speed sensor. Refer to “Rear Wheel Speed Sensor Removal and Installation” (Page 4E-60).
5	1) Check for continuity between “17” (W/R) and ground at the ABS control unit coupler. **Special tool** **(A): 09900–25008 (Multi circuit tester set)** **(B): 09900–25009 (Needle-point probe set)** **Tester knob indication** **Continuity test (•))))** **Normal value** **No continuity**  ID15H1450041-02 *Is the continuity between “17” and ground OK?*	Go to Step 7.	Go to Step 6.

Step	Action	Yes	No
6	1) Disconnect the front wheel speed sensor coupler. 2) Check for continuity between “B” (W) and ground at the front wheel speed sensor coupler. **Special tool** **TOOL (A): 09900–25008 (Multi circuit tester set)** **Tester knob indication** **Continuity test (•))))** **Normal value** **No continuity**  I944H3450036-01 *Is the continuity between “B” and ground OK?*	Inspect the wire harness. (Faulty W/R wire)	Faulty front wheel speed sensor. Refer to “Front Wheel Speed Sensor Removal and Installation” (Page 4E-60).
7	1) Disconnect the front wheel speed sensor coupler. 2) Check for continuity between “8” (B/R) on the ABS control unit coupler and “C” (B/R) on the front wheel speed sensor coupler. **Special tool** **TOOL (A): 09900–25008 (Multi circuit tester set)** **TOOL (B): 09900–25009 (Needle-point probe set)** **Tester knob indication** **Continuity test (•))))** **Normal value** **Continuity (•))))**  ABS control unit coupler (Harness end) ID15H1450042-02 *Is the continuity between “8” and “C”?*	Go to Step 8.	Inspect the wire harness. (B/R wire open)

Step	Action	Yes	No
8	1) Check for continuity between “17” (W/R) on the ABS control unit coupler and “D” (W/R) on the front wheel speed sensor coupler. **Special tool** **(A): 09900–25008 (Multi circuit tester set)** **(B): 09900–25009 (Needle-point probe set)** **Tester knob indication** **Continuity test (•))))** **Normal value** **Continuity (•))))**  *Is the continuity between “17” and “D”?*	Go to Step 9.	Inspect the wire harness. (W/R wire open)
9	1) Connect the front wheel speed sensor coupler. 2) Connect three 1.5 V dry cells “a” in series as shown and make sure that their total voltage is more than 4.5 V. Measure the current between (+) dry cell terminal and “8” (B/R) on the ABS control unit coupler. **Special tool** **(A): 09900–25008 (Multi circuit tester set)** **(B): 09900–25009 (Needle-point probe set)** **Tester knob indication** **Current (⎓ , 20 mA)** **Normal value** **3 – 17 mA**  *Is the current OK?*	Replace the ABS control unit/HU. Refer to “ABS Control Unit/HU Removal and Installation” (Page 4E-63).	Faulty front wheel speed sensor. Refer to “Front Wheel Speed Sensor Removal and Installation” (Page 4E-60).

DTC “43” (C1643): Wheel Speed Sensor Circuit Short (F)

BEND15H24504017

Possible Cause
• Poor contact in the front wheel speed sensor coupler
• Faulty front wheel speed sensor, etc.

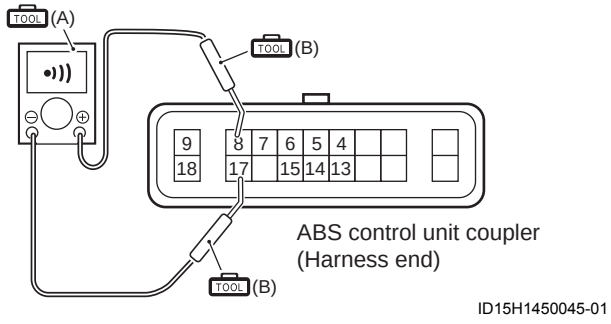
Wiring Diagram

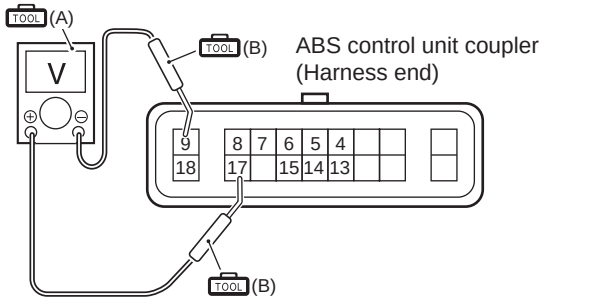
Refer to “ABS Control Unit/HU Diagram” (Page 4E-8).

Troubleshooting

NOTE

After repairing the trouble, clear the DTC using SDS tool. Refer to “DTC (Diagnostic Trouble Code) Deleting” (Page 4E-22).

Step	Action	Yes	No
1	1) Turn the ignition switch OFF. 2) Lift and support the fuel tank with the prop stay. Refer to “Fuel Tank Removal and Installation” in Section 1G (Page 1G-3). 3) Check the ABS control unit coupler for loose or poor contacts. If OK, then disconnect the ABS control unit coupler. Refer to “ABS Control Unit Coupler Disconnect and Connect” (Page 4E-59). 4) Check for continuity between “17” (W/R) and “8” (B/R) at the coupler. **Special tool** **TOOL (A): 09900–25008 (Multi circuit tester set)** **TOOL (B): 09900–25009 (Needle-point probe set)** **Tester knob indication** **Continuity test (•)))**  ID15H1450045-01 *Is the continuity between “17” and “8”?*	• Inspect the wire harness. (W/R or B/R wires short) • Faulty front wheel speed sensor. Refer to “Front Wheel Speed Sensor Removal and Installation” (Page 4E-60).	Go to Step 2.

Step	Action	Yes	No
2	1) Turn the ignition switch ON with the ABS control unit coupler disconnected, measure the voltage between “17” (W/R) and “9” (B/W) at the coupler. **Special tool** **(A): 09900–25008 (Multi circuit tester set)** **(B): 09900–25009 (Needle-point probe set)** **Tester knob indication** **Voltage (⎓)** **Normal value** **0 V**  ID15H1450046-01 *Is the voltage between “17” and “9” normal value?*	Replace the ABS control unit/HU. Refer to “ABS Control Unit/HU Removal and Installation” (Page 4E-63).	Inspect the wire harness. (Faulty sensor signal or power supply wire)

DTC “44” (C1644): Wheel Speed Sensor Signal Malfunction (R)

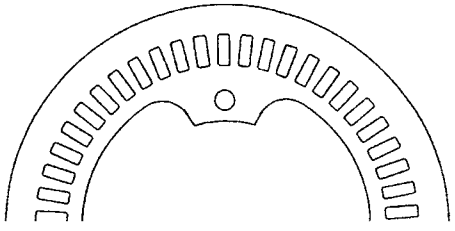
BEND15H24504018

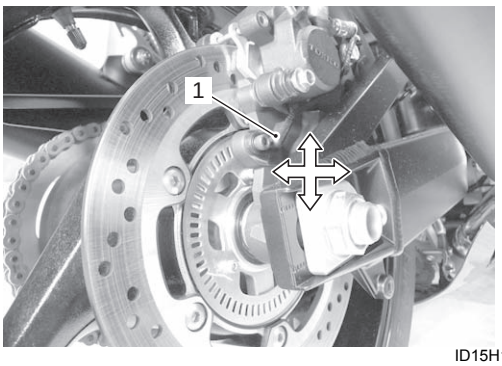
Possible Cause
• Poor contact in the rear wheel speed sensor coupler
• Faulty rear wheel speed sensor, etc.

Troubleshooting

NOTE

After repairing the trouble, clear the DTC using SDS tool. Refer to “DTC (Diagnostic Trouble Code) Deleting” (Page 4E-22).

Step	Action	Yes	No
1	1) Inspect the clearance between the rear wheel speed sensor and sensor rotor using the thickness gauge. Refer to “Rear Wheel Speed Sensor Removal and Installation” (Page 4E-60). *Is the clearance OK?*	Go to Step 2.	Adjust the clearance.
2	1) Inspect the rear wheel speed sensor rotor for damage and check that no foreign objects are caught in the rotor openings.  I718H1450064-01 *Is the sensor rotor OK?*	Go to Step 3.	Clean or replace the sensor rotor. Refer to “Rear Wheel Speed Sensor Rotor Removal and Installation” (Page 4E-62).

Step	Action	Yes	No
3	1) Check that the rear wheel speed sensor (1) is mounted securely.  ID15H1450037-01 *Is the sensor mounted securely?*	Go to DTC “45” (C1645). Refer to “DTC “45” (C1645): Wheel Speed Sensor Circuit Open (R)” (Page 4E-47).	Tighten the mounting bolt.

DTC “45” (C1645): Wheel Speed Sensor Circuit Open (R)

BEND15H24504019

Possible Cause
• Poor contact in the rear wheel speed sensor coupler
• Faulty rear wheel speed sensor, etc.

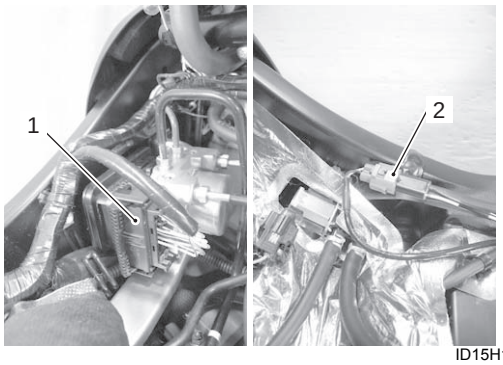
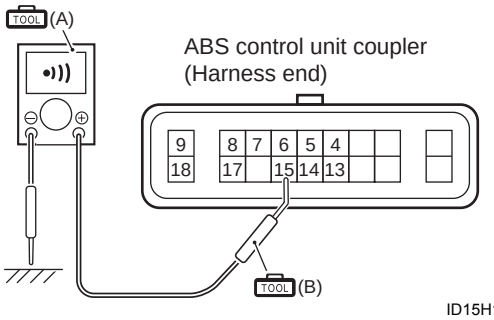
Wiring Diagram

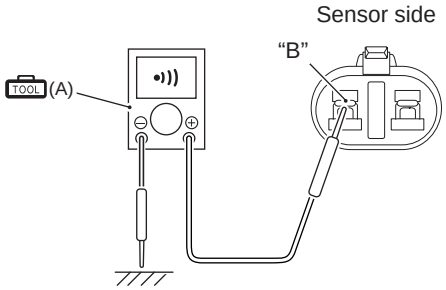
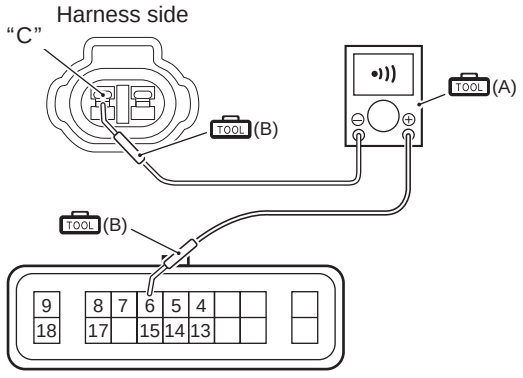
Refer to “ABS Control Unit/HU Diagram” (Page 4E-8).

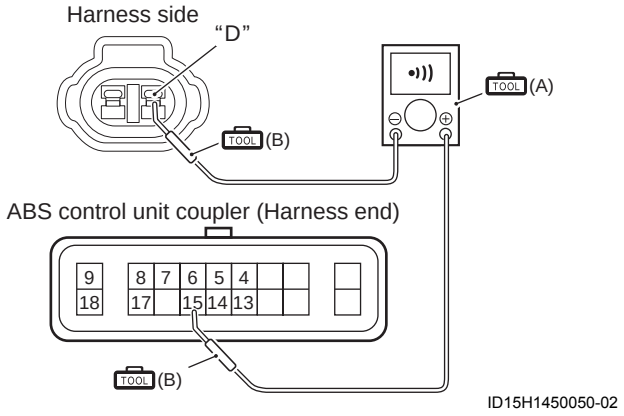
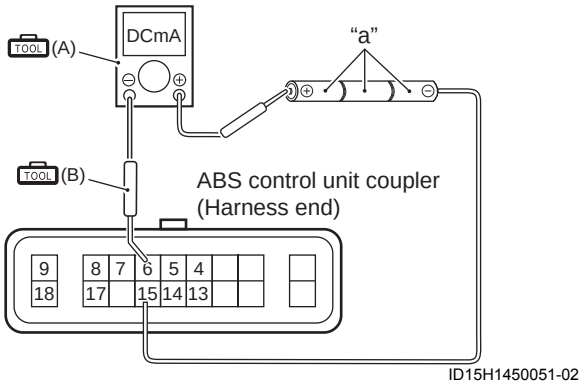
Troubleshooting

NOTE

After repairing the trouble, clear the DTC using SDS tool. Refer to “DTC (Diagnostic Trouble Code) Deleting” (Page 4E-22).

Step	Action	Yes	No
1	1) Turn the ignition switch OFF. 2) Lift and support the fuel tank with the prop stay. Refer to “Fuel Tank Removal and Installation” in Section 1G (Page 1G-3). 3) Check the ABS control unit coupler (1) and rear wheel speed sensor coupler (2) for loose or poor contacts. If OK, then disconnect the ABS control unit coupler. Refer to “ABS Control Unit Coupler Disconnect and Connect” (Page 4E-59).  ID15H1450047-01 4) Check for continuity between “15” (W/Y) and ground at the ABS control unit coupler. **Special tool** **TOOL (A): 09900–25008 (Multi circuit tester set)** **TOOL (B): 09900–25009 (Needle-point probe set)** **Tester knob indication** **Continuity test (•))))** **Normal value** **No continuity**  ID15H1450048-01 *Is the continuity between “15” and ground OK?*	Go to Step 3.	Go to Step 2.

Step	Action	Yes	No
2	1) Disconnect the rear wheel speed sensor coupler. 2) Check for continuity between “B” (B) and ground at the rear wheel speed sensor coupler. **Special tool** **TOOL (A): 09900–25008 (Multi circuit tester set)** **Tester knob indication** **Continuity test (•)))** **Normal value** **No continuity**  I944H3450046-02 *Is the continuity between “B” and ground OK?*	Inspect the wire harness. (Faulty W/Y wire)	Faulty rear wheel speed sensor. Refer to “Rear Wheel Speed Sensor Removal and Installation” (Page 4E-60).
3	1) Disconnect the rear wheel speed sensor coupler. 2) Check for continuity between “6” (B/Y) on the ABS control unit coupler and “C” (B/Y) on the rear wheel speed sensor coupler. **Special tool** **TOOL (A): 09900–25008 (Multi circuit tester set)** **TOOL (B): 09900–25009 (Needle-point probe set)** **Tester knob indication** **Continuity test (•)))** **Normal value** **Continuity (•)))**  ABS control unit coupler (Harness end) ID15H1450049-02 *Is the continuity between “6” and “C”?*	Go to Step 4.	Inspect the wire harness. (B/Y wire open)

Step	Action	Yes	No
4	1) Check for continuity between “15” (W/Y) on the ABS control unit coupler and “D” (W/Y) on the rear wheel speed sensor coupler. **Special tool** **TOOL (A): 09900–25008 (Multi circuit tester set)** **TOOL (B): 09900–25009 (Needle-point probe set)** **Tester knob indication** **Continuity test (•))))** **Normal value** **Continuity (•))))**  *Is the continuity between “15” and “D”?*	Go to Step 5.	Inspect the wire harness. (W/Y wire open)
5	1) Connect the rear wheel speed sensor coupler. 2) Connect three 1.5 V dry cells “a” in series as shown and make sure that their total voltage is more than 4.5 V. Measure the current between (+) dry cell terminal and “6” (B/Y) on the ABS control unit coupler. **Special tool** **TOOL (A): 09900–25008 (Multi circuit tester set)** **TOOL (B): 09900–25009 (Needle-point probe set)** **Tester knob indication** **Current (⎓ , 20 mA)** **Normal value** **3 – 17 mA**  *Is the current OK?*	Replace the ABS control unit/HU. Refer to “ABS Control Unit/HU Removal and Installation” (Page 4E-63).	Faulty rear wheel speed sensor. Refer to “Rear Wheel Speed Sensor Removal and Installation” (Page 4E-60).

DTC “46” (C1646): Wheel Speed Sensor Circuit Short (R)

BEND15H24504020

Possible Cause
• Poor contact in the rear wheel speed sensor coupler
• Faulty rear wheel speed sensor, etc.

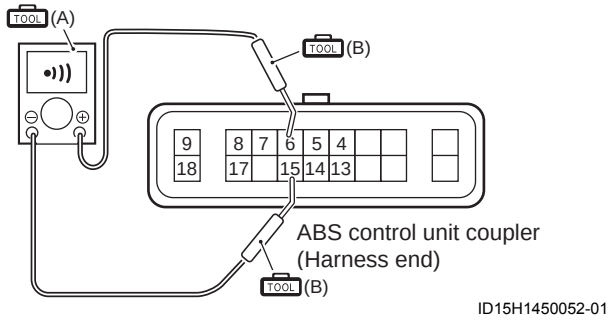
Wiring Diagram

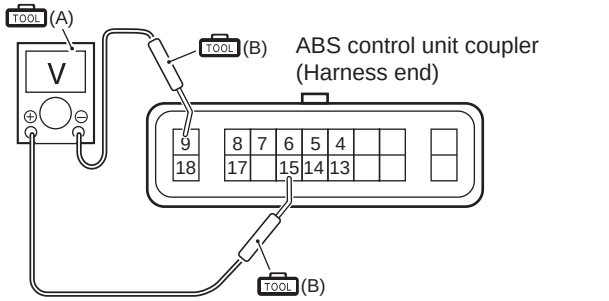
Refer to “ABS Control Unit/HU Diagram” (Page 4E-8).

Troubleshooting

NOTE

After repairing the trouble, clear the DTC using SDS tool. Refer to “DTC (Diagnostic Trouble Code) Deleting” (Page 4E-22).

Step	Action	Yes	No
1	1) Turn the ignition switch OFF. 2) Lift and support the fuel tank with the prop stay. Refer to “Fuel Tank Removal and Installation” in Section 1G (Page 1G-3). 3) Check the ABS control unit coupler for loose or poor contacts. If OK, then disconnect the ABS control unit coupler. Refer to “ABS Control Unit Coupler Disconnect and Connect” (Page 4E-59). 4) Check for continuity between “6” (B/Y) and “15” (W/Y) at the coupler. **Special tool** **TOOL (A): 09900–25008 (Multi circuit tester set)** **TOOL (B): 09900–25009 (Needle-point probe set)** **Tester knob indication** **Continuity test (•)))**  *Is the continuity between “6” and “15”?*	• Inspect the wire harness. (B/Y or W/Y wires short) • Faulty rear wheel speed sensor. Refer to “Rear Wheel Speed Sensor Removal and Installation” (Page 4E-60).	Go to Step 2.

Step	Action	Yes	No
2	1) Turn the ignition switch ON with the ABS control unit coupler disconnected, measure the voltage between “15” (W/Y) and “9” (B/W) at the coupler. **Special tool** **TOOL (A): 09900–25008 (Multi circuit tester set)** **TOOL (B): 09900–25009 (Needle-point probe set)** **Tester knob indication** **Voltage (⎓)** **Normal value** **0 V**  ID15H1450053-01 *Is the voltage between “15” and “9” normal value?*	Replace the ABS control unit/HU. Refer to “ABS Control Unit/HU Removal and Installation” (Page 4E-63).	Inspect the wire harness. (Faulty sensor signal or power supply wire)

DTC “47” (C1647): Supply Voltage (Increased)

BEND15H24504021

Possible Cause
• Faulty regulator/rectifier • Faulty ABS control unit • Faulty wire harness, etc.

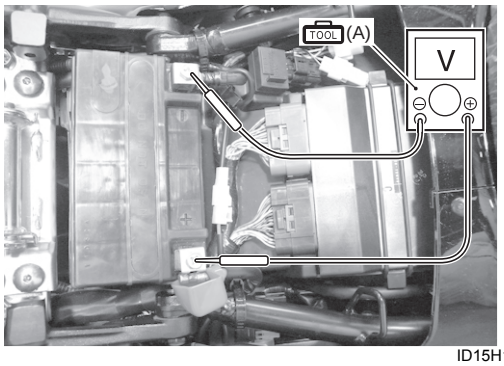
Wiring Diagram

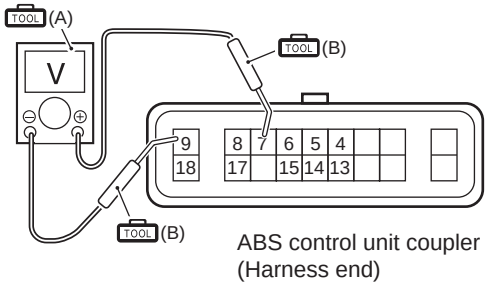
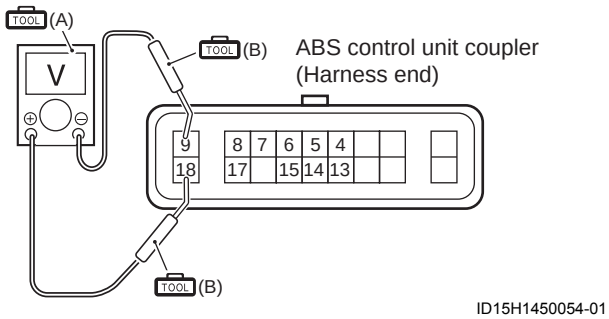
Refer to “ABS Control Unit/HU Diagram” (Page 4E-8).

Troubleshooting

NOTE

After repairing the trouble, clear the DTC using SDS tool. Refer to “DTC (Diagnostic Trouble Code) Deleting” (Page 4E-22).

Step	Action	Yes	No
1	1) Turn the ignition switch to OFF. 2) Remove the front seat. Refer to “Exterior Parts Removal and Installation” in Section 9D in related manual. 3) Measure the voltage between the (+) and (–) battery terminals using the multi-circuit tester. **Special tool** **TOOL (A): 09900–25008 (Multi-circuit tester set)** **Tester knob indication** **Voltage (⎓)** **Battery voltage** **12.0 V and more**  ID15H1450014-02 *Is the voltage over 12 V?*	Go to Step 2.	Charge or replace the battery.
2	1) Start the engine at 5 000 r/min with the dimmer switch set to HI. 2) Measure the voltage between the (+) and (–) battery terminals. **Special tool** **TOOL : 09900–25008 (Multi-circuit tester set)** **Tester knob indication** **Voltage (⎓)** **Regulated voltage** **14.0 – 15.5 V at 5 000 r/min** *Is the voltage 14.0 – 15.5 V?*	Go to Step 3.	Inspect the regulator/ rectifier. Refer to “Regulator / Rectifier Inspection” in Section 1J (Page 1J-1).

Step	Action	Yes	No
3	1) Turn the ignition switch OFF. 2) Lift and support the fuel tank with the prop stay. Refer to "Fuel Tank Removal and Installation" in Section 1G (Page 1G-3). 3) Check the ABS control unit coupler for loose or poor contacts. If OK, then disconnect the ABS control unit coupler. Refer to "ABS Control Unit Coupler Disconnect and Connect" (Page 4E-59). 4) Remove the prop stay and lower the fuel tank. 5) Start the engine at 5 000 r/min with the dimmer switch set to HI. 6) Measure the voltage between "7" (O/Y) and "9" (B/W) at the coupler. **Special tool** **TOOL (A): 09900–25008 (Multi-circuit tester set)** **TOOL (B): 09900–25009 (Needle pointed probe set)** **Tester knob indication** **Voltage (⎓)**  *Is the voltage same as Step 2?*	Go to Step 4.	Inspect the wire harness. (Faulty ignition or ground wire)
4	1) Start the engine at 5 000 r/min with the dimmer switch set to HI. 2) Measure the voltage between "18" (R/B) and "9" (B/W) at the coupler. **Special tool** **TOOL (A): 09900–25008 (Multi circuit tester set)** **TOOL (B): 09900–25009 (Needle-point probe set)** **Tester knob indication** **Voltage (⎓)**  *Is the voltage same as Step 2?*	Replace the ABS control unit/HU. Refer to "ABS Control Unit/HU Removal and Installation" (Page 4E-63).	Inspect the wire harness. (Faulty power supply wire)

DTC “48” (C1648): Supply Voltage (Decreased)

BEND15H24504022

Possible Cause
• Faulty generator or regulator/rectifier
• Faulty ABS control unit
• Faulty wire harness, etc.

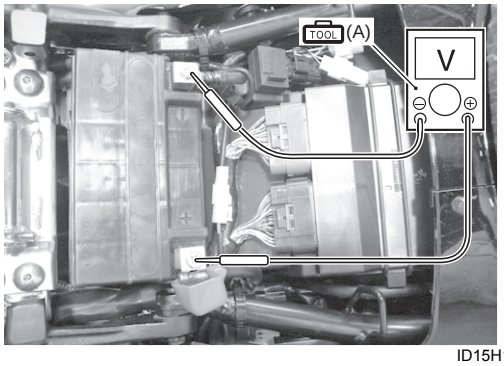
Wiring Diagram

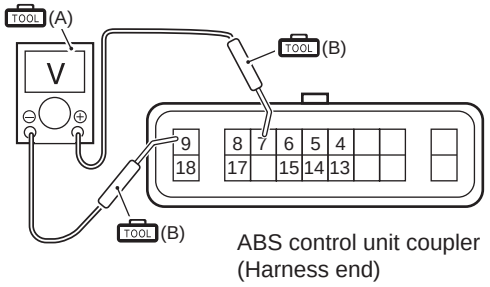
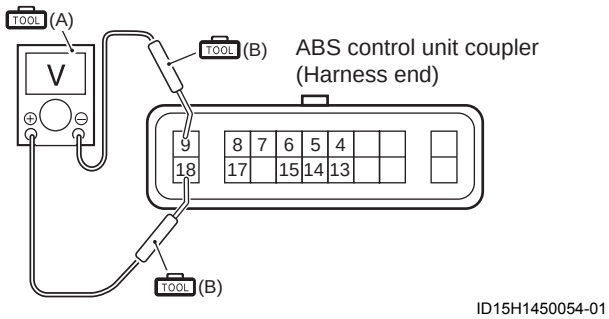
Refer to “ABS Control Unit/HU Diagram” (Page 4E-8).

Troubleshooting

NOTE

After repairing the trouble, clear the DTC using SDS tool. Refer to “DTC (Diagnostic Trouble Code) Deleting” (Page 4E-22).

Step	Action	Yes	No
1	1) Turn the ignition switch OFF. 2) Remove the front seat. Refer to “Exterior Parts Removal and Installation” in Section 9D in related manual. 3) Measure the voltage between the (+) and (–) battery terminals using the multi-circuit tester. **Special tool** **TOOL (A): 09900–25008 (Multi-circuit tester set)** **Tester knob indication** **Voltage (⎓)** **Battery voltage** **12.0 V and more**  ID15H1450014-02 *Is the voltage over 12 V?*	Go to Step 2.	Charge or replace the battery.
2	1) Start the engine at 5 000 r/min with the dimmer switch set to HI. 2) Measure the voltage between the (+) and (–) battery terminals. **Special tool** **TOOL : 09900–25008 (Multi-circuit tester set)** **Tester knob indication** **Voltage (⎓)** **Regulated voltage** **14.0 – 15.5 V at 5 000 r/min** *Is the voltage 14.0 – 15.5 V?*	Go to Step 3.	Inspect the generator and regulator/rectifier. Refer to “Generator Inspection” in Section 1J in related manual and “Regulator / Rectifier Inspection” in Section 1J (Page 1J-1).

Step	Action	Yes	No
3	1) Turn the ignition switch OFF. 2) Lift and support the fuel tank with the prop stay. Refer to "Fuel Tank Removal and Installation" in Section 1G (Page 1G-3). 3) Check the ABS control unit coupler for loose or poor contacts. If OK, then disconnect the ABS control unit coupler. Refer to "ABS Control Unit Coupler Disconnect and Connect" (Page 4E-59). 4) Remove the prop stay and lower the fuel tank. 5) Start the engine at 5 000 r/min with the dimmer switch set to HI. 6) Measure the voltage between "7" (O/Y) and "9" (B/W) at the coupler. **Special tool** **TOOL (A): 09900–25008 (Multi-circuit tester set)** **TOOL (B): 09900–25009 (Needle pointed probe set)** **Tester knob indication** **Voltage (⎓)**  *Is the voltage same as Step 2?*	Go to Step 4.	Inspect the wire harness. (Faulty ignition or ground wire)
4	1) Start the engine at 5 000 r/min with the dimmer switch set to HI. 2) Measure the voltage between "18" (R/B) and "9" (B/W) at the coupler. **Special tool** **TOOL (A): 09900–25008 (Multi circuit tester set)** **TOOL (B): 09900–25009 (Needle-point probe set)** **Tester knob indication** **Voltage (⎓)**  *Is the voltage same as Step 2?*	Replace the ABS control unit/HU. Refer to "ABS Control Unit/HU Removal and Installation" (Page 4E-63).	Inspect the wire harness. (Faulty power supply wire)

DTC “55” (C1655): ABS Control Unit Malfunction

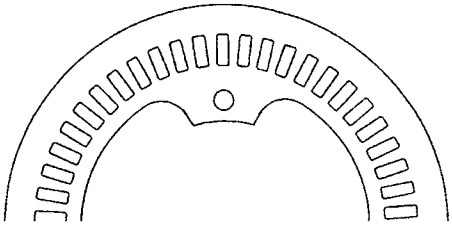
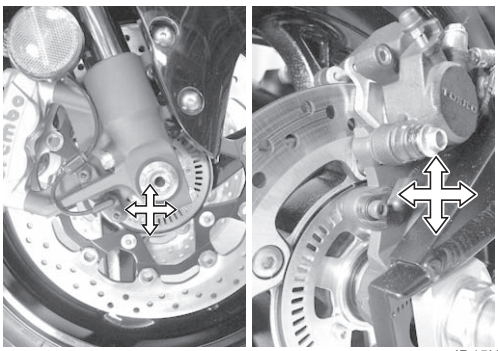
BEND15H24504023

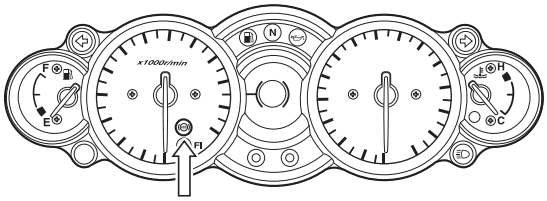
Possible Cause
Faulty ABS control unit

Troubleshooting

NOTE

After repairing the trouble, clear the DTC using SDS tool. Refer to “DTC (Diagnostic Trouble Code) Deleting” (Page 4E-22).

Step	Action	Yes	No
1	1) Inspect the clearances of the front and rear wheel speed sensor – sensor rotor using the thickness gauge. Refer to “Front Wheel Speed Sensor Removal and Installation” (Page 4E-60) and “Rear Wheel Speed Sensor Removal and Installation” (Page 4E-60). *Are the clearances OK?*	Go to Step 2.	Adjust the clearance.
2	1) Inspect both of the wheel speed sensor rotors for damage and check that no foreign objects are caught in the rotor openings.  I718H1450064-01 *Are the rotors OK?*	Go to Step 3.	Clean or replace the rotor. Refer to “Front Wheel Speed Sensor Rotor Removal and Installation” (Page 4E-61) and “Rear Wheel Speed Sensor Rotor Removal and Installation” (Page 4E-62).
3	1) Check that the front and rear wheel speed sensors are mounted securely.  ID15H1450055-01 *Are the sensors mounted securely?*	Go to Step 4.	Tighten the mounting bolts.

Step	Action	Yes	No
4	1) Delete DTCs and repeat the code output procedure. Refer to “DTC (Diagnostic Trouble Code) Deleting” (Page 4E-22) and “DTC (Diagnostic Trouble Code) Output” (Page 4E-20).  ID15H1450056-01 *Is the DTC “55” (C1655) output again?*	Replace the ABS control unit/HU. Refer to “ABS Control Unit/HU Removal and Installation” (Page 4E-63).	Intermittent trouble.

DTC “61” (C1661): ABS Solenoid Malfunction

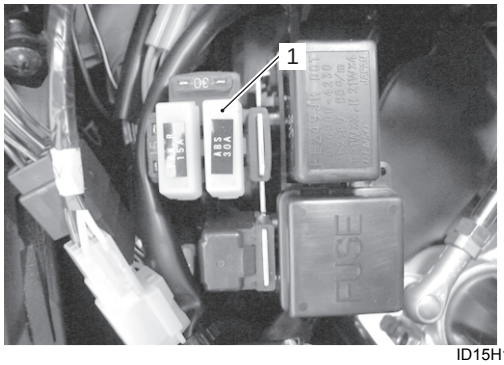
BEND15H24504024

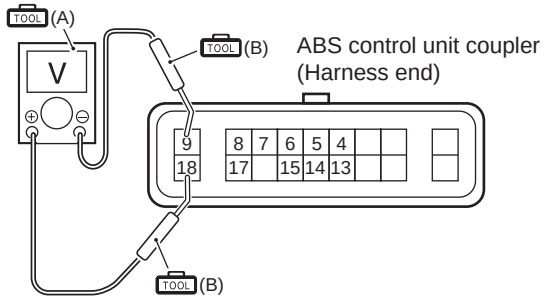
Possible Cause
Faulty solenoid valve or relay

Troubleshooting

NOTE

After repairing the trouble, clear the DTC using SDS tool. Refer to “DTC (Diagnostic Trouble Code) Deleting” (Page 4E-22).

Step	Action	Yes	No
1	1) Turn the ignition switch OFF. 2) Remove the upper panel (LH). Refer to “Exterior Parts Removal and Installation” in Section 9D in related manual. 3) Inspect the ABS fuse (1). **NOTE** **If a fuse is blown, find the cause of the problem and correct it before replacing the fuse.** **ABS fuse** **30 A**  ID15H1450057-01 *Is the ABS fuse OK?*	Go to Step 2.	Replace the ABS fuse.

Step	Action	Yes	No
2	1) Check the ABS control unit coupler for loose or poor contacts. If OK, then disconnect the ABS control unit coupler. Refer to “ABS Control Unit Coupler Disconnect and Connect” (Page 4E-59). 2) Measure the voltage between “18” (R/B) and “9” (B/W) at the coupler. **Special tool** **TOOL (A): 09900–25008 (Multi-circuit tester set)** **TOOL (B): 09900–25009 (Needle-point probe set)** **Tester knob indication** **Voltage (⎓)** **Normal value** **Battery voltage (12.0 V and more)**  ID15H1450054-01 *Is the voltage between “18” and “9” normal?*	Replace the ABS control unit/HU. Refer to “ABS Control Unit/HU Removal and Installation” (Page 4E-63).	Inspect the wire harness. (Faulty power supply or ground wire)

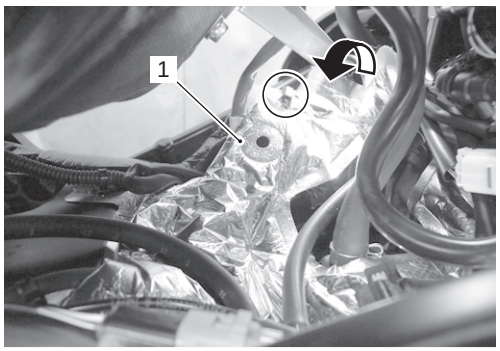
Repair Instructions

ABS Control Unit Coupler Disconnect and Connect

BEND15H24506001

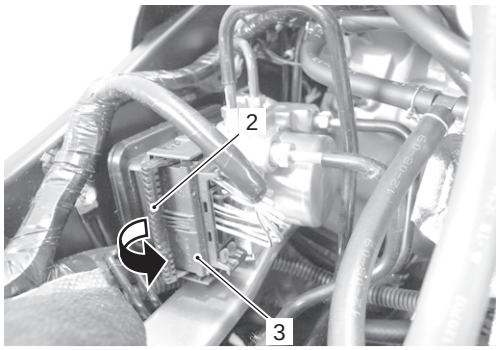
Disconnect

1) Turn the ignition switch OFF.
2) Lift and support the fuel tank with the prop stay. Refer to “Fuel Tank Removal and Installation” in Section 1G (Page 1G-3).
3) Turn over the heat shield (1).



ID15H1450058-01

4) Release the lock lever (2) and disconnect the ABS control unit coupler (3).



ID15H1450059-02

Connect

Connect the ABS control unit coupler in the reverse order of disconnect.

Front Wheel Speed Sensor Removal and Installation

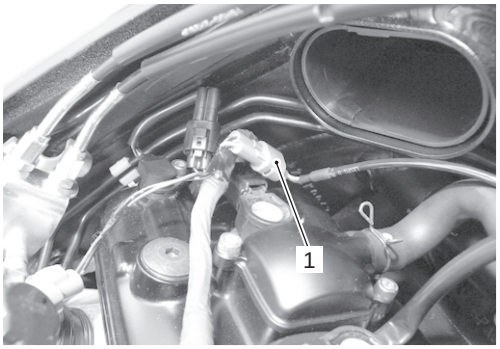
BEND15H24506002

⚠ CAUTION

- **The ABS is made up of many precision parts; never subject it to strong impacts or allow it to become dirty or dusty.**
- **The wheel speed sensor cannot be disassembled.**

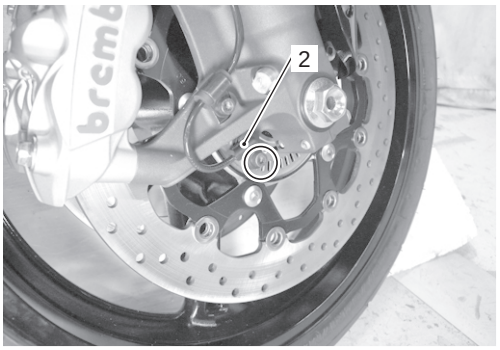
Removal

1) Turn the ignition switch OFF.
2) Lift and support the fuel tank with the prop stay. Refer to “Fuel Tank Removal and Installation” in Section 1G (Page 1G-3).
3) Remove the air cleaner box. Refer to “Air Cleaner Box Removal and Installation” in Section 1D in related manual.
4) Disconnect the front wheel speed sensor coupler (1).



ID15H1450060-01

5) Remove the front wheel speed sensor (2).



ID15H1450061-01

6) Remove the front wheel speed sensor lead wire as shown in the front wheel speed sensor routing diagram. Refer to “Front Wheel Speed Sensor Routing Diagram” (Page 4E-9).

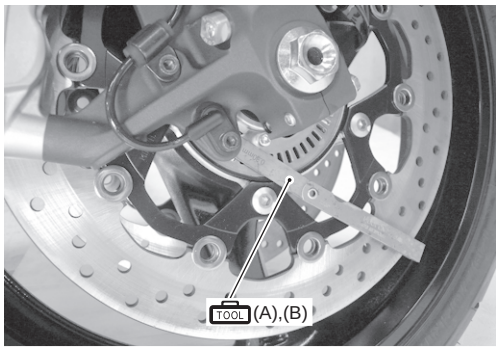
Installation

Install the front wheel speed sensor in the reverse order of removal. Pay attention to the following points:

- Install the front wheel speed sensor lead wire as shown in the front wheel speed sensor routing diagram. Refer to “Front Wheel Speed Sensor Routing Diagram” (Page 4E-9).
- Check the clearance between the front wheel speed sensor and sensor rotor using the thickness gauge.

Special tool
TOOL (A): 09900–20803 (Thickness gauge)
TOOL (B): 09900–20806 (Thickness gauge)

Wheel speed sensor – Sensor rotor clearance
0.43 – 1.75 mm (0.017 – 0.069 in)



ID15H1450062-03

Rear Wheel Speed Sensor Removal and Installation

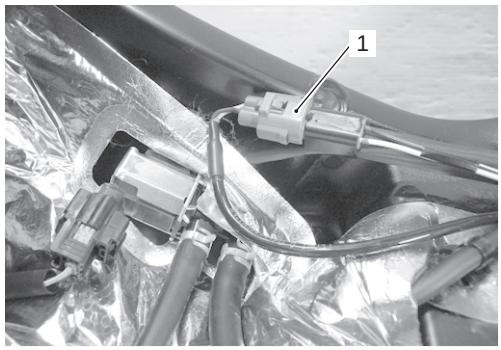
BEND15H24506003

⚠ CAUTION

- **The ABS is made up of many precision parts; never subject it to strong impacts or allow it to become dirty or dusty.**
- **The wheel speed sensor cannot be disassembled.**

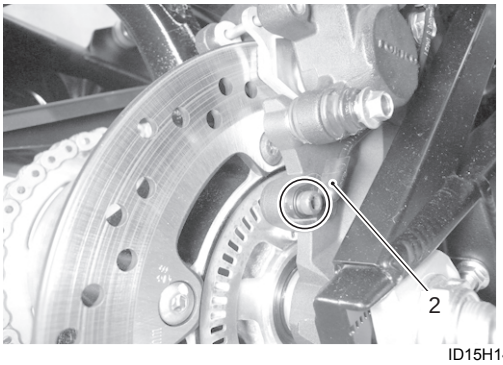
Removal

1) Turn the ignition switch OFF.
2) Lift and support the fuel tank with the prop stay. Refer to “Fuel Tank Removal and Installation” in Section 1G (Page 1G-3).
3) Disconnect the rear wheel speed sensor coupler (1).



ID15H1450063-01

4) Remove the rear wheel speed sensor (2).



ID15H1450064-01

5) Remove the rear wheel speed sensor lead wire as shown in the rear wheel speed sensor routing diagram. Refer to “Rear Wheel Speed Sensor Routing Diagram” (Page 4E-10).

Installation

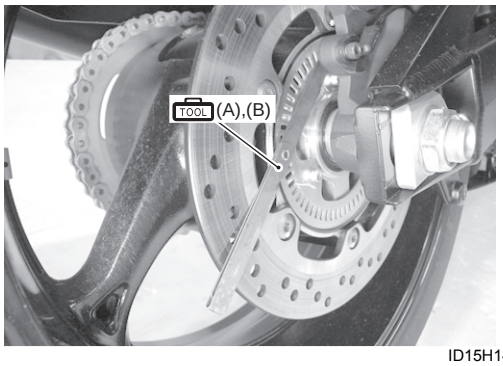
Install the rear wheel speed sensor in the reverse order of removal. Pay attention to the following points:

- Install the rear wheel speed sensor lead wire as shown in the rear wheel speed sensor routing diagram. Refer to “Rear Wheel Speed Sensor Routing Diagram” (Page 4E-10).
- Check the clearance between the rear wheel speed sensor and sensor rotor using the thickness gauge.

Special tool

TOOL (A): 09900–20803 (Thickness gauge)
TOOL (B): 09900–20806 (Thickness gauge)

Wheel speed sensor – Sensor rotor clearance
0.18 – 1.50 mm (0.007 – 0.059 in)



ID15H1450065-03

Front Wheel Speed Sensor Rotor Removal and Installation

BEND15H24506004

⚠ CAUTION

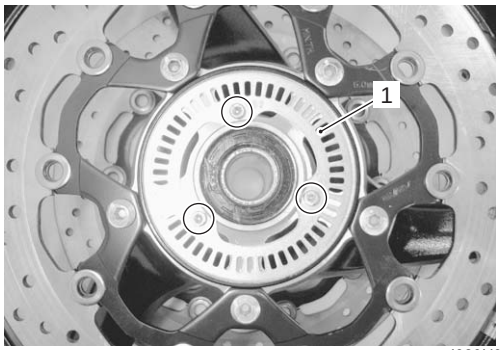
- **The ABS is made up of many precision parts; never subject it to strong impacts or allow it to become dirty or dusty.**
- **Do not hit the front wheel speed sensor rotor when dismounting the front wheel.**

Removal

1) Remove the front wheel assembly. Refer to “Front Wheel Assembly Removal and Installation” in Section 2D (Page 2D-3).
2) Remove the front wheel speed sensor rotor (1).

⚠ CAUTION

When replacing the tire, make sure not to damage the sensor rotor.



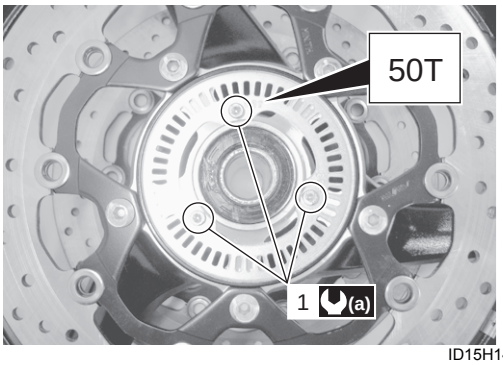
I823H3450062-01

Installation

Install the front wheel speed sensor rotor in the reverse order of removal. Pay attention to the following points:

- Install the front wheel speed sensor rotor as the letters “50T” face outside.
- Tighten the front wheel speed sensor rotor bolts (1) to the specified torque.

Tightening torque
Wheel speed sensor rotor bolt (a): 6.5 N·m (0.65 kgf-m, 4.5 lbf-ft)



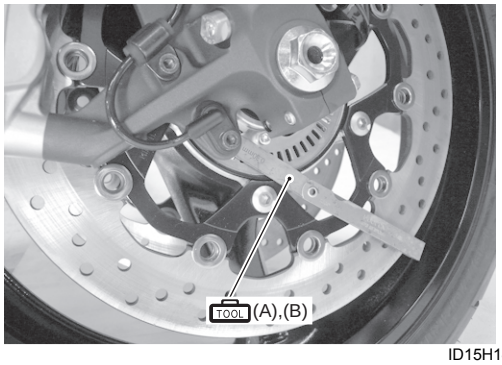
ID15H1450066-02

- Install the front wheel assembly. Refer to “Front Wheel Assembly Removal and Installation” in Section 2D (Page 2D-3).

- Check the clearance between the front wheel speed sensor and sensor rotor using the thickness gauge.

Special tool
(A): 09900–20803 (Thickness gauge)
(B): 09900–20806 (Thickness gauge)

Wheel speed sensor – Sensor rotor clearance
0.43 – 1.75 mm (0.017 – 0.069 in)



ID15H1450062-03

Rear Wheel Speed Sensor Rotor Removal and Installation

BEND15H24506005

⚠ CAUTION

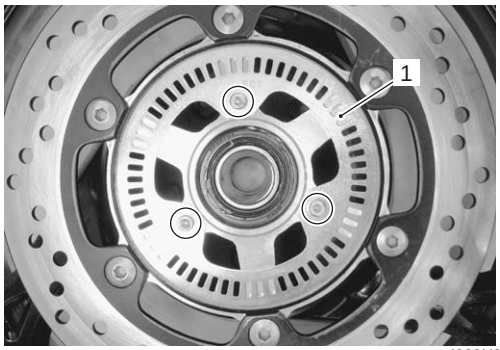
- **The ABS is made up of many precision parts; never subject it to strong impacts or allow it to become dirty or dusty.**
- **Do not hit the rear wheel speed sensor rotor when dismounting the rear wheel.**

Removal

1) Remove the rear wheel assembly. Refer to “Rear Wheel Assembly Removal and Installation” in Section 2D (Page 2D-10).
2) Remove the rear wheel speed sensor rotor (1).

⚠ CAUTION

When replacing the tire, make sure not to damage the sensor rotor.



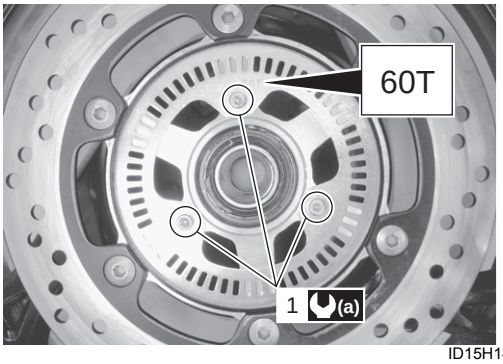
I823H3450064-01

Installation

Install the rear wheel speed sensor rotor in the reverse order of removal. Pay attention to the following points:

- Install the rear wheel speed sensor rotor as the letters “60T” face outside.
- Tighten the rear wheel speed sensor rotor bolts (1) to the specified torque.

Tightening torque
Wheel speed sensor rotor bolt (a): 6.5 N·m (0.65 kgf-m, 4.5 lbf-ft)

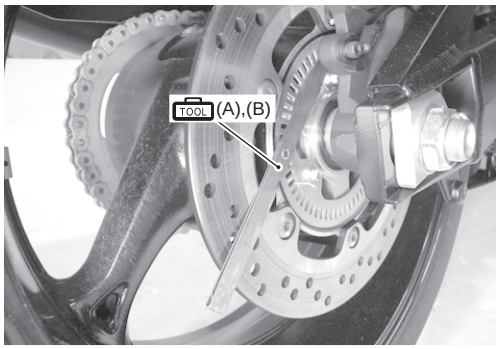


ID15H1450067-02

- Install the rear wheel assembly. Refer to “Rear Wheel Assembly Removal and Installation” in Section 2D (Page 2D-10).
- Check the clearance between the rear wheel speed sensor and sensor rotor using the thickness gauge.

Special tool
(A): 09900–20803 (Thickness gauge)
(B): 09900–20806 (Thickness gauge)

Wheel speed sensor – Sensor rotor clearance
0.18 – 1.50 mm (0.017 – 0.059 in)



ID15H1450065-03

Wheel Speed Sensor and Sensor Rotor Inspection

BEND15H24506006

Wheel Speed Sensor

1) Remove the wheel speed sensor. Refer to “Front Wheel Speed Sensor Removal and Installation” (Page 4E-60) and “Rear Wheel Speed Sensor Removal and Installation” (Page 4E-60).
2) Inspect the wheel speed sensor for damage. Clean the sensor if any metal particle or foreign material stuck on it.

ID15H1450068-01

3) After finishing the speed sensor inspection, install the wheel speed sensor. Refer to “Front Wheel Speed Sensor Removal and Installation” (Page 4E-60) and “Rear Wheel Speed Sensor Removal and Installation” (Page 4E-60).

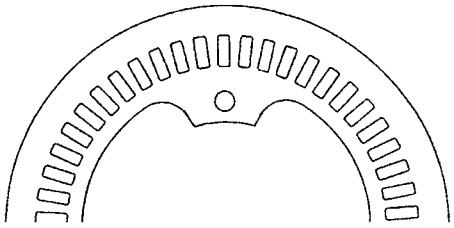
Wheel Speed Sensor Rotor

1) Raise the wheel off the ground and support the motorcycle with a jack or wooden block.

⚠ CAUTION

Make sure that the motorcycle is supported securely.

2) Check that no wheel speed sensor rotor teeth are broken and that no foreign objects are caught in the wheel speed sensor.



I718H1450064-01

ABS Control Unit/HU Removal and Installation

BEND15H24506007

⚠ WARNING

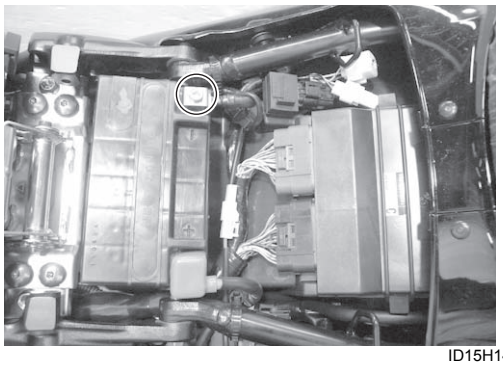
When storing the brake fluid, seal the container completely and keep away from children.

⚠ CAUTION

- **This brake system is filled with an ethylene glycol-based DOT 4 brake fluid. Do not mix different types of fluid such as silicone-based or petroleum-based.**
- **Do not use any brake fluid taken from old, used or unsealed containers. Never reuse brake fluid left over from the last servicing or stored for long periods.**
- **Handle brake fluid with care: the fluid reacts chemically with paint, plastics, rubber materials etc. and will damage then severely.**
- **The ABS is made up of many precision parts; never subject it to strong impacts or allow it to become dirty or dusty.**
- **The ABS control unit/HU cannot be disassembled.**

Removal

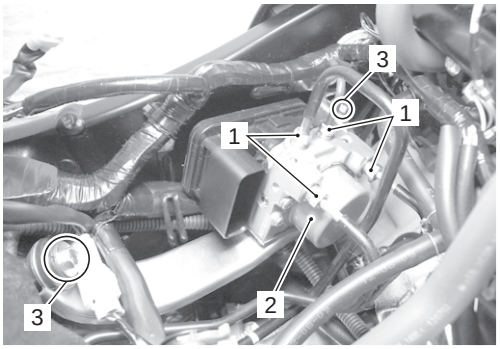
1) Turn the ignition switch OFF.
2) Remove the front seat. Refer to “Exterior Parts Removal and Installation” in Section 9D in related manual.
3) Disconnect the battery (–) lead wire.



ID15H1450015-01

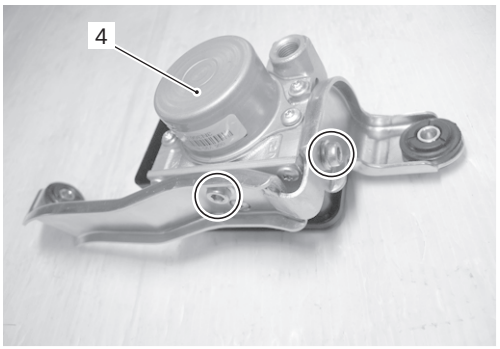
4) Remove the fuel tank. Refer to “Fuel Tank Removal and Installation” in Section 1G (Page 1G-3).
5) Drain the brake fluid. Refer to “Brake Fluid Replacement” in Section 4A (Page 4A-5).
6) Disconnect the ABS control unit coupler. Refer to “ABS Control Unit Coupler Disconnect and Connect” (Page 4E-59).

7) Loosen the flare nuts (1) and disconnect the brake pipes.
8) Remove the ABS control unit/HU assembly (2) by removing the holder mounting bolts (3).



ID15H1450069-01

9) Remove the ABS control unit/HU (4) from the holder.



ID15H1450070-01

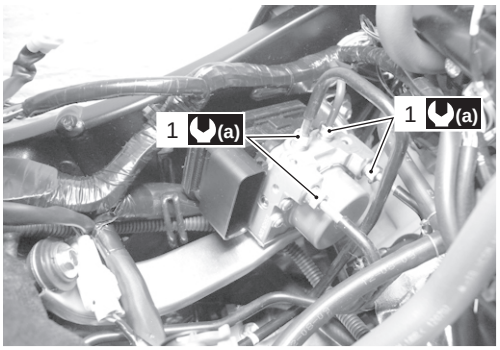
Installation
Installation is in the reverse order of removal. Pay attention to the following points:

⚠ CAUTION

- **Route the brake hoses and pipes correctly. Refer to "Front Brake Hose Routing Diagram" in Section 4A (Page 4A-1) or "Rear Brake Hose Routing Diagram" in Section 4A (Page 4A-3).**
- **Make sure to hold the brake pipe when tightening the flare nut, or it may be misaligned.**

- Tighten the brake pipe flare nuts (1) to the specified torque.

Tightening torque
Brake pipe flare nut (a): 16 N·m (1.6 kgf-m, 11.5 lbf-ft)



ID15H1450071-02

- Bleed air from the brake fluid circuit. Refer to "Air Bleeding from Brake Fluid Circuit" in Section 4A (Page 4A-4).

Specifications

Tightening Torque Specifications

BEND15H24507001

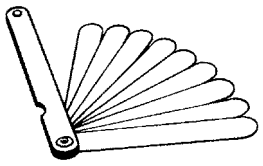
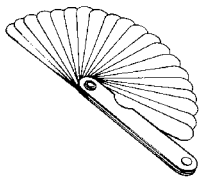
Fastening part	Tightening torque			Note
	N·m	kgf-m	lbf-ft	
Wheel speed sensor rotor bolt	6.5	0.65	4.5	☞(Page 4E-61) / ☞(Page 4E-62)
Brake pipe flare nut	16	1.6	11.5	☞(Page 4E-64)

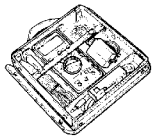
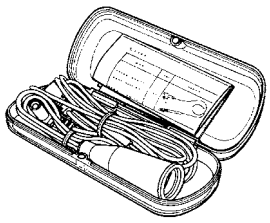
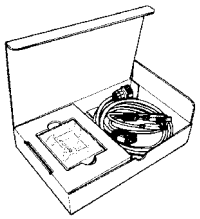
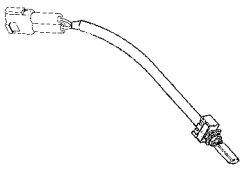
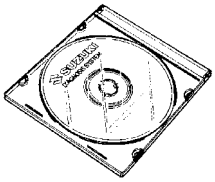
Reference:
For the tightening torques of fasteners not specified in this page, refer to:
“Tightening Torque List” in Section 0C (Page 0C-3)

Special Tools and Equipment

Special Tool

BEND15H24508001

09900–20803 Thickness gauge ☞(Page 4E-60) / ☞(Page 4E-61) / ☞(Page 4E-62) / ☞(Page 4E-62)		09900–20806 Thickness gauge ☞(Page 4E-60) / ☞(Page 4E-61) / ☞(Page 4E-62) / ☞(Page 4E-62)	

09900–25008 Multi circuit tester set  ☞(Page 4E-14) / ☞(Page 4E-15) / ☞(Page 4E-16) / ☞(Page 4E-17) / ☞(Page 4E-18) / ☞(Page 4E-18) / ☞(Page 4E-19) / ☞(Page 4E-33) / ☞(Page 4E-35) / ☞(Page 4E-40) / ☞(Page 4E-41) / ☞(Page 4E-41) / ☞(Page 4E-42) / ☞(Page 4E-42) / ☞(Page 4E-43) / ☞(Page 4E-43) / ☞(Page 4E-44) / ☞(Page 4E-44) / ☞(Page 4E-45) / ☞(Page 4E-46) / ☞(Page 4E-48) / ☞(Page 4E-49) / ☞(Page 4E-49) / ☞(Page 4E-50) / ☞(Page 4E-50) / ☞(Page 4E-51) / ☞(Page 4E-52) / ☞(Page 4E-53) / ☞(Page 4E-53) / ☞(Page 4E-54) / ☞(Page 4E-54) / ☞(Page 4E-55) / ☞(Page 4E-55) / ☞(Page 4E-56) / ☞(Page 4E-56) / ☞(Page 4E-59)	09900–25009 Needle-point probe set  ☞(Page 4E-15) / ☞(Page 4E-16) / ☞(Page 4E-17) / ☞(Page 4E-18) / ☞(Page 4E-18) / ☞(Page 4E-19) / ☞(Page 4E-40) / ☞(Page 4E-41) / ☞(Page 4E-42) / ☞(Page 4E-43) / ☞(Page 4E-44) / ☞(Page 4E-44) / ☞(Page 4E-45) / ☞(Page 4E-46) / ☞(Page 4E-48) / ☞(Page 4E-49) / ☞(Page 4E-50) / ☞(Page 4E-50) / ☞(Page 4E-51) / ☞(Page 4E-52) / ☞(Page 4E-54) / ☞(Page 4E-54) / ☞(Page 4E-56) / ☞(Page 4E-56) / ☞(Page 4E-59)
09904–41010 SUZUKI Diagnostic system set  ☞(Page 4E-21) / ☞(Page 4E-23) / ☞(Page 4E-25)	09930–82760 Mode select switch  ☞(Page 4E-5) / ☞(Page 4E-19) / ☞(Page 4E-20) / ☞(Page 4E-22)
99565–01010–030 CD-ROM Ver.30  ☞(Page 4E-21) / ☞(Page 4E-23) / ☞(Page 4E-25)	