SECTION BRC
BRAKE CONTROL SYSTEM

CONTENTS

ABS

VDC/TCS/ABS

PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

AFS0035O

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted.
Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

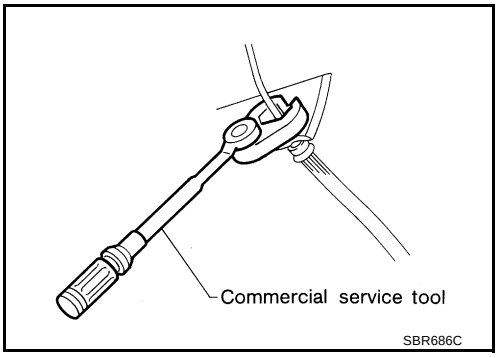
WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Brake System

AFS001ZN

- Recommended fluid is brake fluid “DOT 3”.
- Do not reuse drained brake fluid.
- Be careful not to splash brake fluid on painted areas.
- To clean or wash all parts of master cylinder, disc brake caliper and wheel cylinder, use clean brake fluid.
- Never use mineral oils such as gasoline or kerosene. They will ruin rubber parts of the hydraulic system.
- Use flare nut wrench when removing and installing brake tube.
- Always torque brake lines when installing.
- Before working, turn ignition switch OFF and disconnect electrical connectors of ABS actuator and electric control unit or battery terminals.
- Burnish the brake contact surfaces after refinishing or replacing drums or rotors, after replacing pads or linings, or if a soft pedal occurs at very low mileage.
  Refer to BR-32, "BRAKE BURNISHING PROCEDURE" .



WARNING:

Clean brake pads and shoes with a waste cloth, then wipe with a dust collector.

Precautions for Brake Control

AFS0018B

- During ABS operation, brake pedal lightly vibrates and a mechanical noise may be heard. This is normal.
- Just after starting vehicle after ignition switch ON, brake pedal may vibrate or motor operating noise may be heard from engine compartment. This is a normal status of operation check.
- Stopping distance may be longer than that of vehicles without ABS when vehicle drives on rough, gravel, or snow-covered (fresh, deep snow) roads.
- When an error is indicated by ABS or another warning lamp, collect all necessary information from customer (what symptoms are present under what conditions) and check for simple causes before starting diagnostic servicing. Besides electrical system inspection, check brake booster operation, brake fluid level, and fluid leaks.
- If tire size and type are used in an improper combination, or brake pads are not Genuine NISSAN parts, stopping distance or steering stability may deteriorate.
- If there is a radio, antenna, or antenna lead-in wire (including wiring) near control module, ABS function may have a malfunction or error.

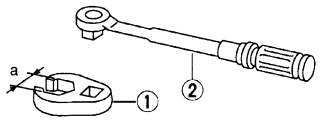
- If aftermarket parts (car stereo, CD player, etc.) have been installed, check for incidents such as harness pinches, open circuits, and improper wiring.

PREPARATION

PFP:00002

Commercial Service Tools

AFS0018E

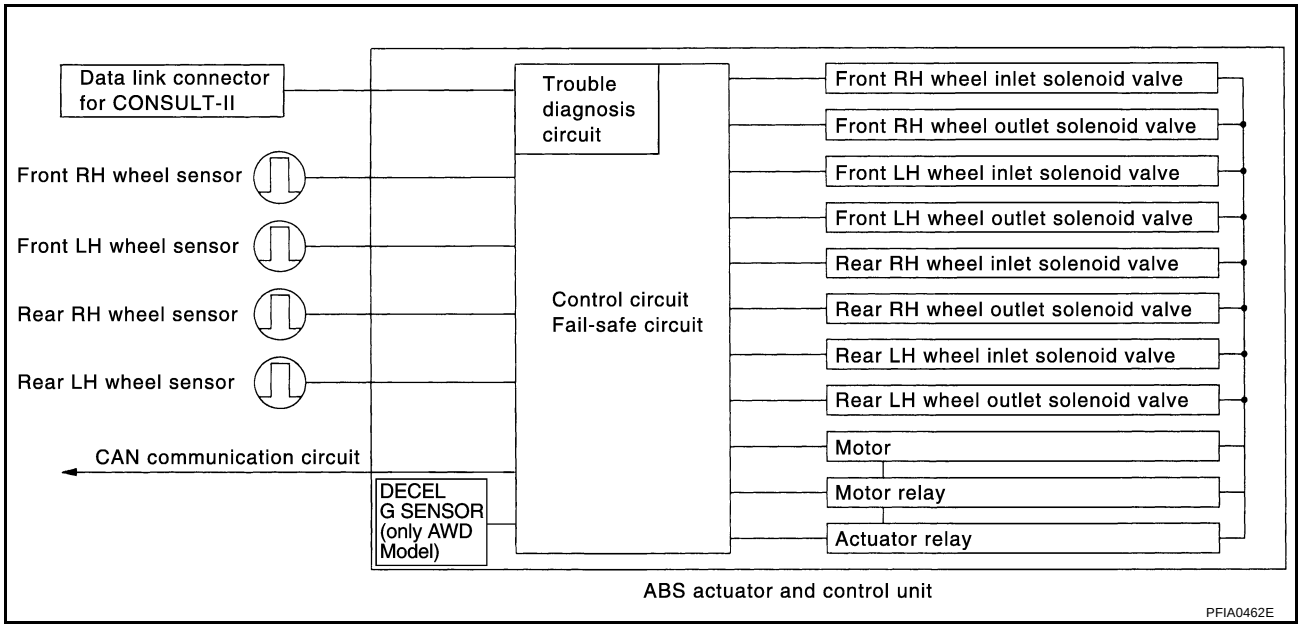
Tool name	Description
1. Flare nut crowfoot a : 10 mm (0.39 in) 2. Torque wrench  S-NT360	Removing and installing each brake piping

SYSTEM DESCRIPTION

PFP:00000

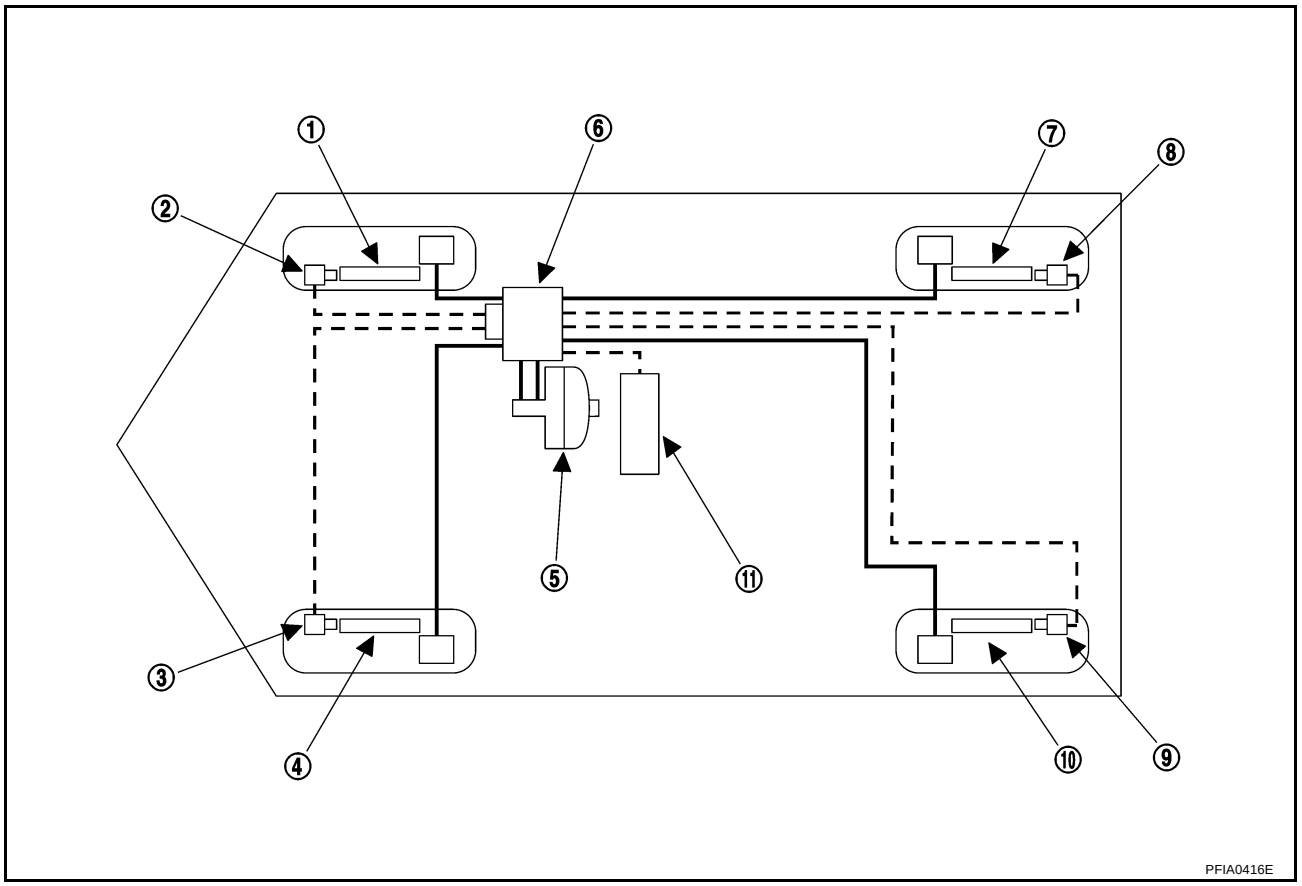
System Diagram

AFS0018F



System Component Parts

AFS0018G



1. Sensor rotor (FR)
2. Wheel sensor (FR)
3. Wheel sensor (FL)
4. Sensor rotor (FL)
5. Brake booster and Master cylinder
6. ABS actuator and electric unit (control unit)
7. Sensor rotor (RR)
8. Wheel sensor (RR)
9. Wheel sensor (RL)
10. Sensor rotor (RL)
11. Combination meter [Brake warning lamp, ABS warning lamp]

ABS Function

AFS0018H

- The Anti-Lock Brake System is a function that detects wheel revolution while braking, and it improves handling stability during sudden braking by electrically preventing 4 wheel lock. Maneuverability is also improved for avoiding obstacles.
- If the electrical system malfunctions, then fail-safe function is activated, ABS becomes inoperative, and ABS warning lamp turns on.
- Electrical System Diagnosis by CONSULT-II is available.
- During ABS operation, brake pedal lightly vibrates and a mechanical noise may be heard. This is normal.
- Just after starting vehicle after ignition switch ON, brake pedal may vibrate or motor operating noise may be heard from engine compartment. This is a normal status of operation check.
- Stopping distance may be longer than that of vehicles without ABS when vehicle drives on rough, gravel, or snow-covered (fresh, deep snow) roads.

EBD Function

AFS0018I

- Electronic Brake Distributor is a function that detects subtle slippages between front and rear wheels during braking, and it improves handling stability by electronically controlling Brake Fluid Pressure which results in reduced rear wheel slippage.
- In case of electrical system malfunction, fail-safe function is activated, EBD and ABS becomes inoperative, and ABS warning lamp and brake warning lamp are turned on.
- Electrical System Diagnosis by CONSULT-II is available.
- During EBD operation, brake pedal lightly vibrates and a mechanical noise may be heard. This is normal.
- Just after starting vehicle after ignition switch ON, brake pedal may vibrate or motor operating noise may be heard from engine compartment. This is a normal status of operation check.
- Stopping distance may be longer than that of vehicles without EBD when vehicle drives on rough, gravel, or snow-covered (fresh, deep snow) roads.

Fail-Safe Function

AFS0018J

ABS, EBD SYSTEM

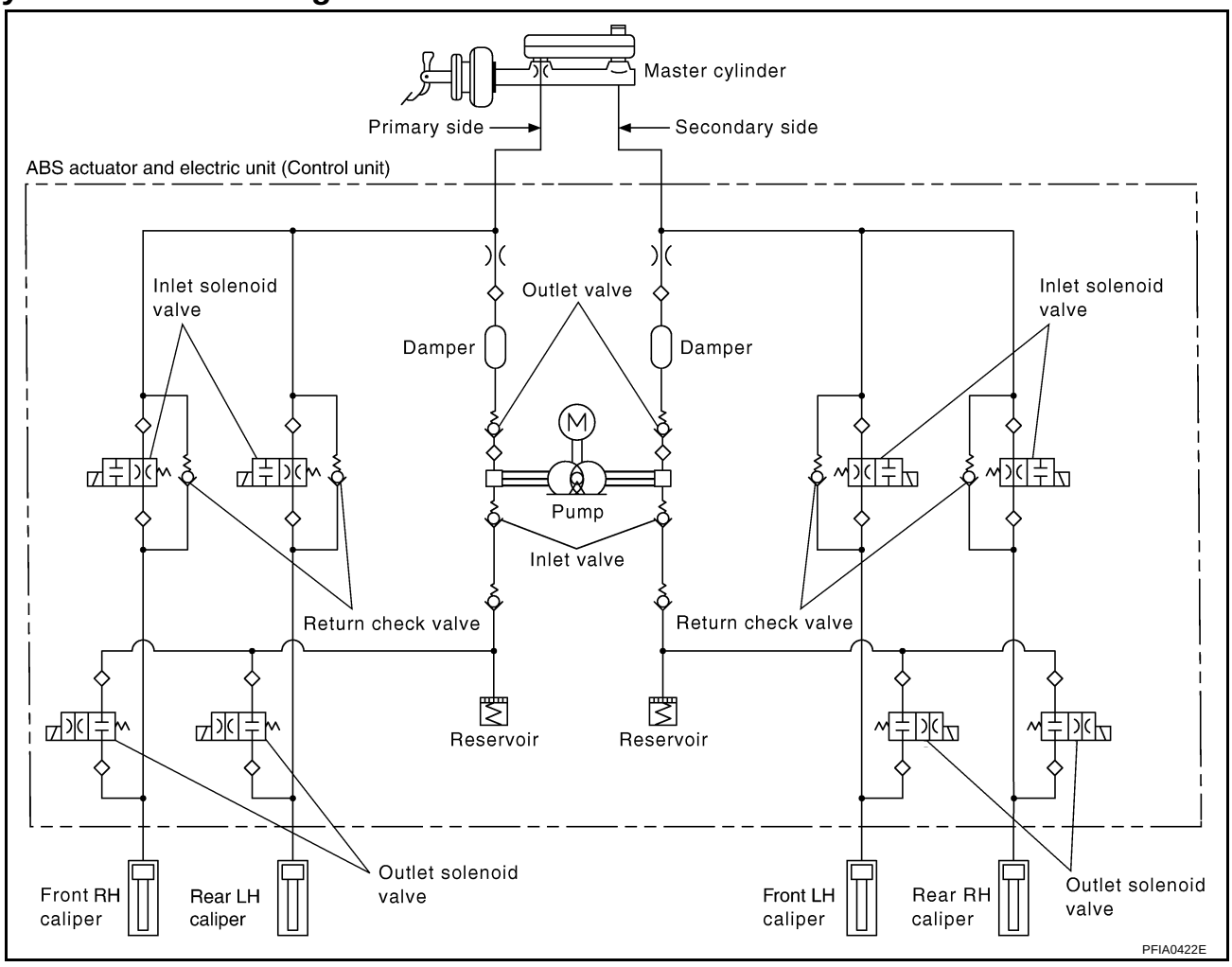
In case of electrical malfunctions with ABS, ABS warning lamp will turn on. In case of electrical malfunctions with EBD, brake warning lamp and ABS warning lamp will turn on. Simultaneously, ABS become one of following conditions of Fail-Safe function.

1. For ABS malfunction, only EBD is activated and condition of vehicle is same condition of vehicles without ABS system.
2. For EBD malfunction, EBD and ABS become inoperative, and condition of vehicle is same as condition of vehicles without ABS, EBD system.

NOTE:
In step 1 shown above, self-diagnosis when ignition switch is turned ON and when vehicle starts at initial time is performed. ABS self-diagnosis noise may be hard as usual.

Hydraulic Circuit Diagram

AFS0018K



CAN COMMUNICATION

PFP:23710

System Description

AFS0029P

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only. Refer to LAN-29, "CAN Communication Unit" .

TROUBLE DIAGNOSIS

PFP:00004

How to Perform Trouble Diagnosis for Quick and Accurate Repair

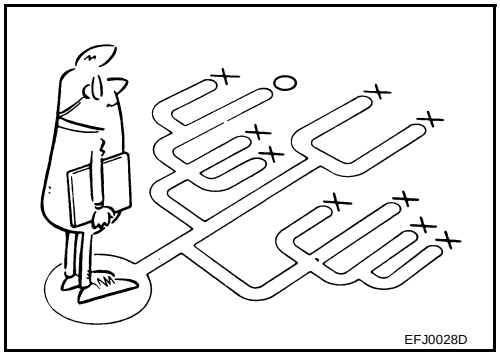
AFS0018N

INTRODUCTION

- Most important point to perform diagnosis is to understand systems (control and mechanism) in vehicle thoroughly.

- It is also important to clarify customer complaints before inspection.
  First of all, reproduce symptom, and understand it fully.
  Ask customer about his/her complaints carefully. In some cases, it will be necessary to check symptom by driving vehicle with customer.

  NOTE:
  Customers are not professionals. Do not assume “maybe customer means...” or “maybe customer mentioned this symptom”.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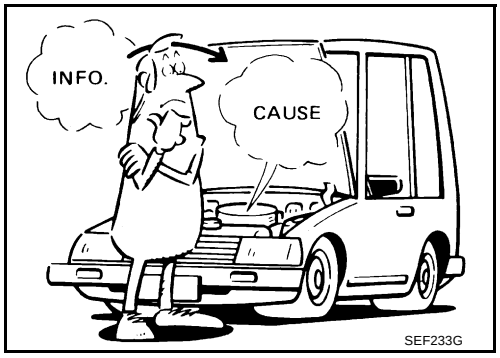
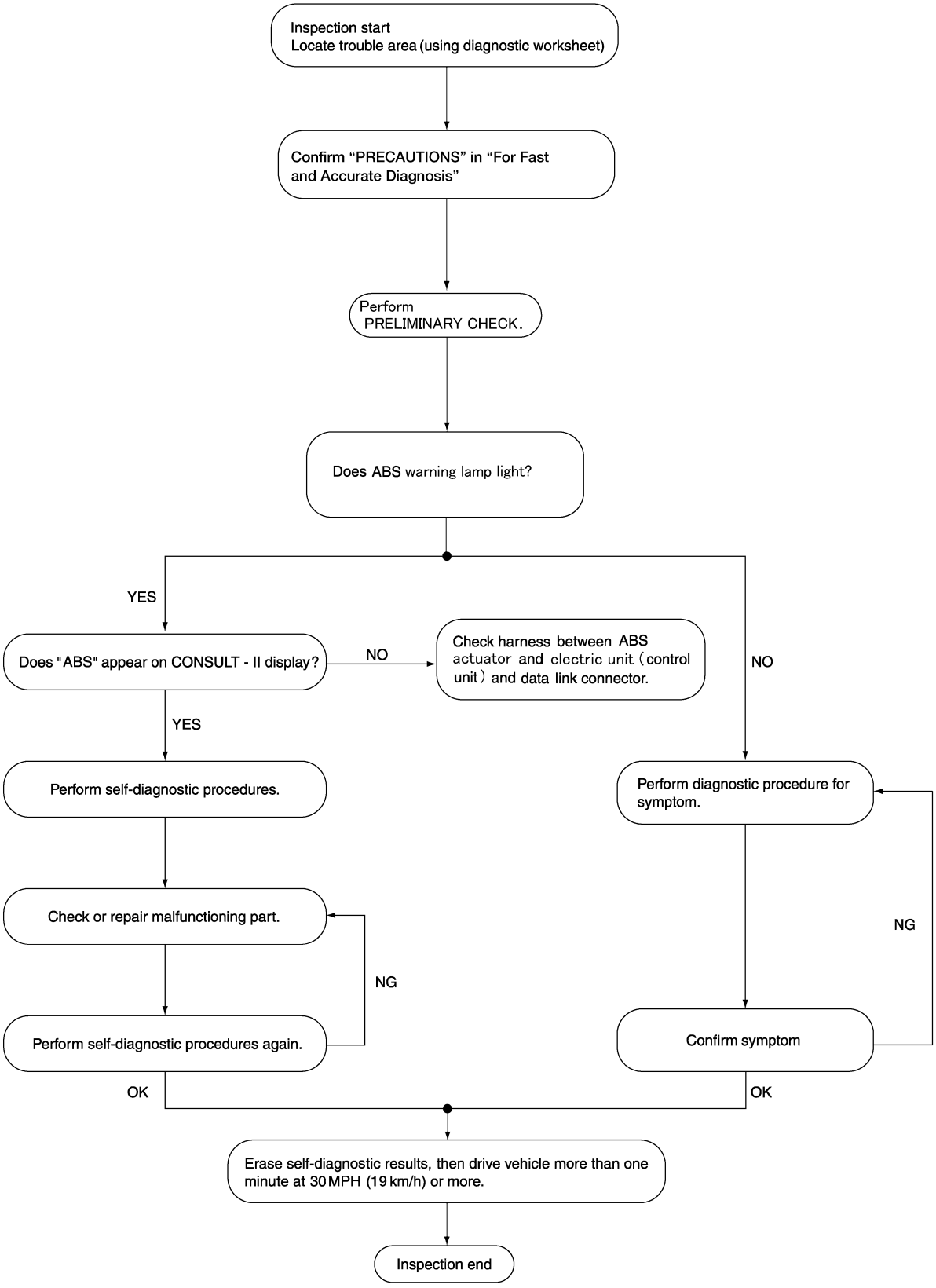
- It is essential to check symptoms right from beginning in order to repair a malfunction completely.
  For an intermittent malfunction, it is important to reproduce symptom based on interview with customer and past examples. Do not perform inspection on ad hoc basis. Most intermittent malfunctions are caused by poor contacts. In this case, it will be effective to shake suspected harness or connector by hand. When repairs are performed without any symptom check, no one can judge if malfunction has actually been eliminated.
- After diagnosis, make sure to perform “erase memory”. Refer to BRC-22, "Operation Procedure" .
- For an intermittent malfunction, move harness or harness connector by hand to check poor contact or false open circuit.



SEF233G

- Always read “GI General Information” to confirm general precautions. Refer to GI-4, "General Precautions" .

DIAGNOSIS FLOWCHART



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ASKING COMPLAINTS

- Complaints against malfunction vary depending on each person. It is important to clarify customer complaints.
- Ask customer about what symptoms are present and under what conditions. Use information to reproduce symptom while driving.
- It is also important to use the diagnosis sheet so as not to miss information.

KEY POINTS

WHAT ..... Vehicle model
WHEN ..... Date, Frequencies
WHERE ..... Road conditions
HOW ..... Operating conditions, Weather conditions, Symptoms

SBR339B

EXAMPLE OF DIAGNOSIS SHEET

Customer name MR/MS	Model & Year		VIN
Engine #	Trans.		Mileage
Incident Date	Manuf. Date		In Service Date
Symptoms	☐ Noise and vibration (from engine compartment) ☐ Noise and vibration (from axle)	☐ Warning / Indicator activate	☐ Firm pedal operation Large stroke pedal operation
	☐ ABS does not work (Wheels lock when braking)	☐ ABS does not work (wheels slip when braking)	☐ Lack of sense of acceleration
Engine conditions	☐ When starting ☐ After starting		
Road conditions	☐ Low friction road (☐Snow ☐Gravel ☐Other) ☐ Bumps / potholes		
Driving conditions	☐ Full-acceleration ☐ High speed cornering ☐ Vehicle speed: Greater than 10 km/h (6 MPH) ☐ Vehicle speed: 10 km/h (6 MPH) or less ☐ Vehicle is stopped		
Applying brake conditions	☐ Suddenly ☐ Gradually		
Other conditions	☐ Operation of electrical equipment ☐ Shift change ☐ Other descriptions		

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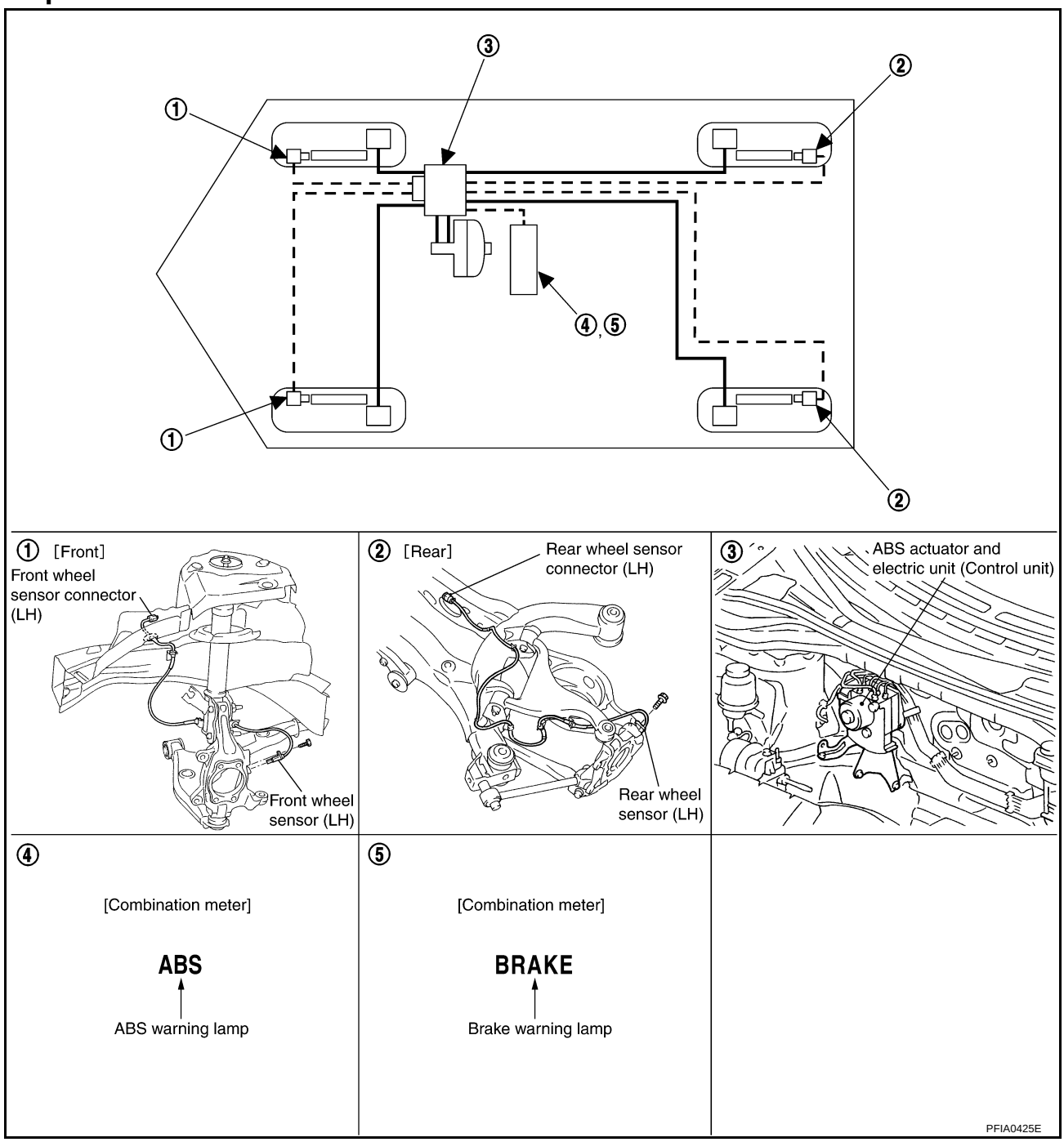
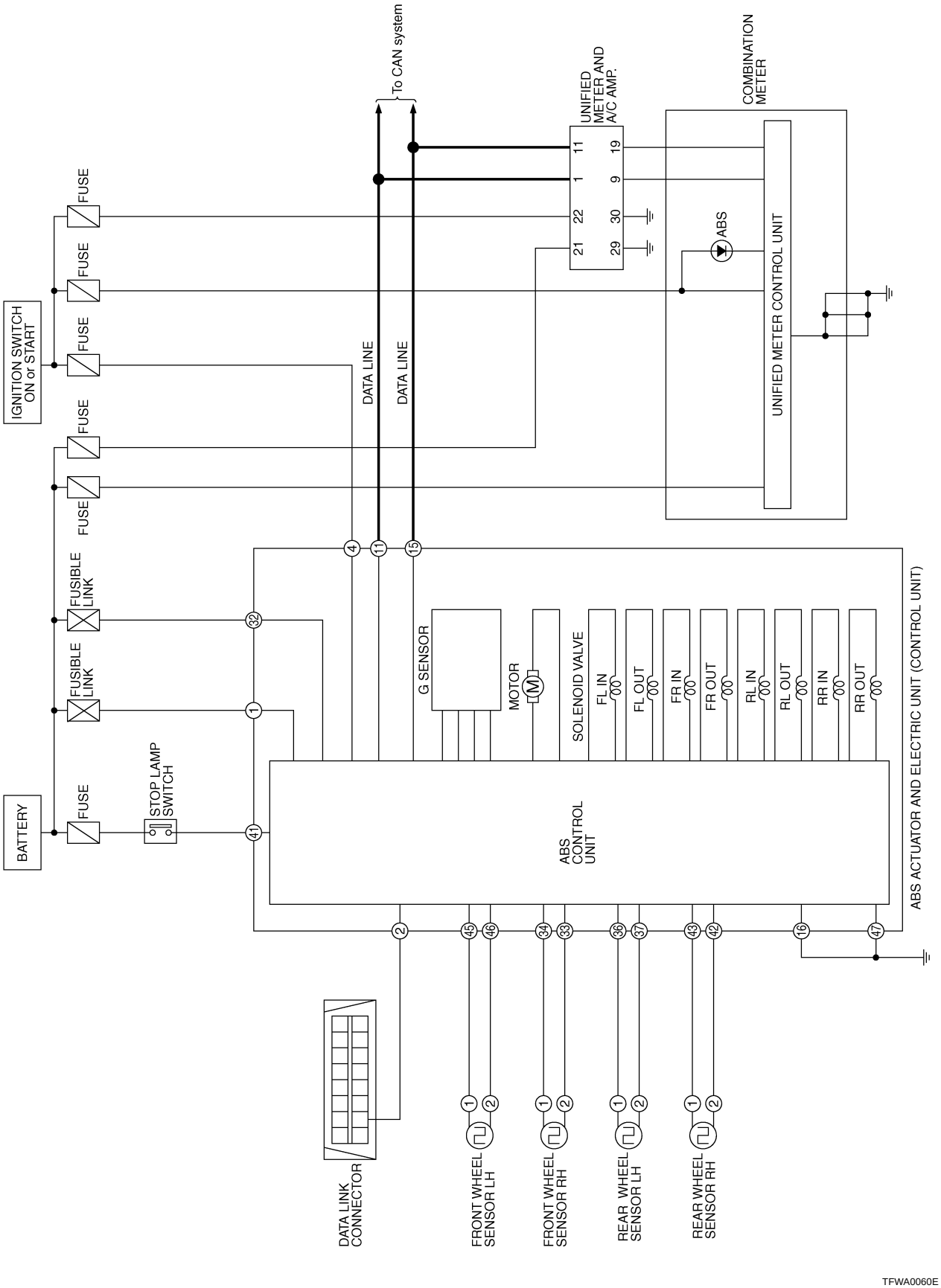
Component Installation Location

AFS0018O



Schematic — ABS —

AFS0018P



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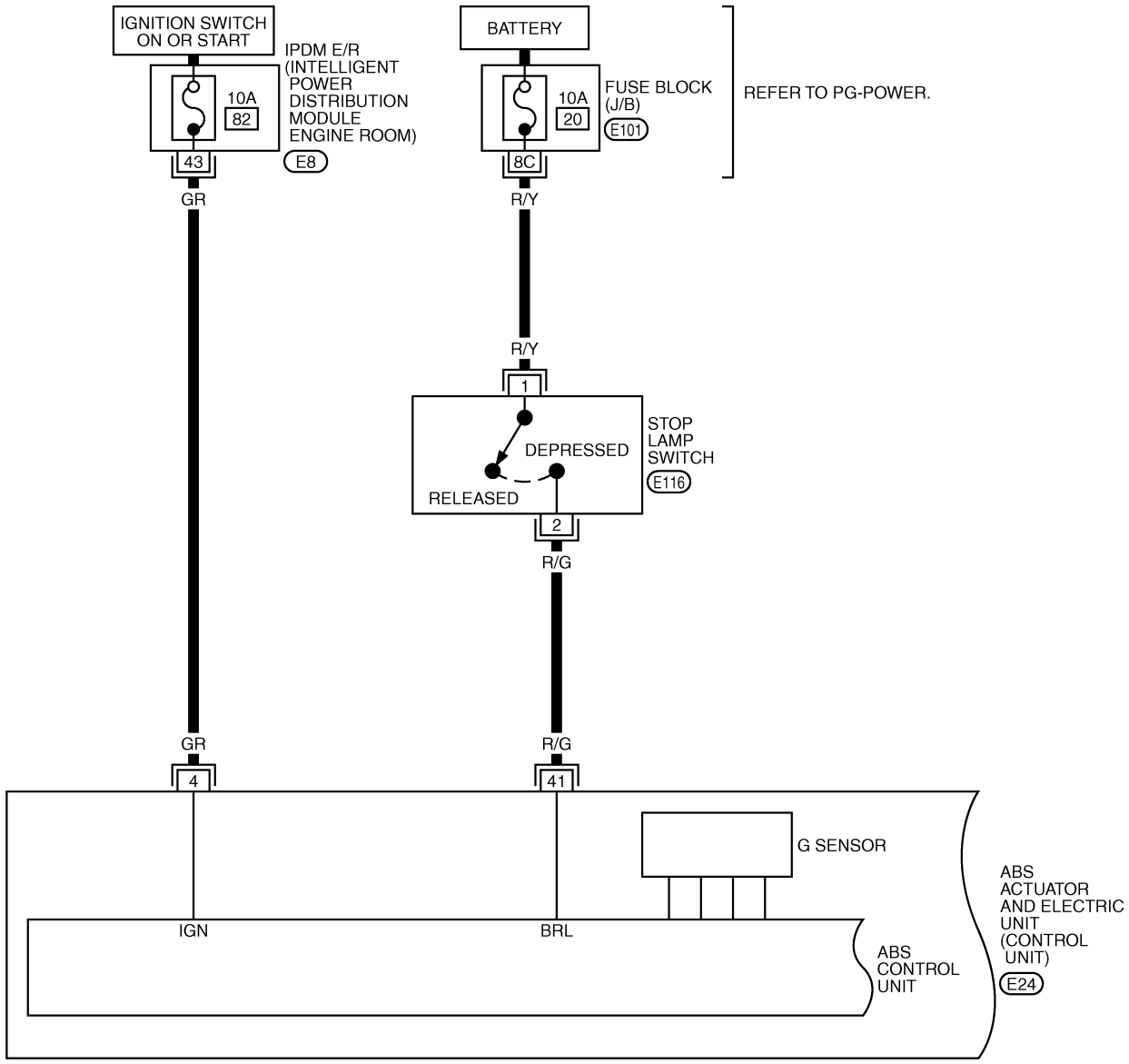
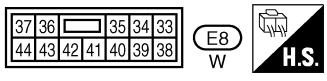
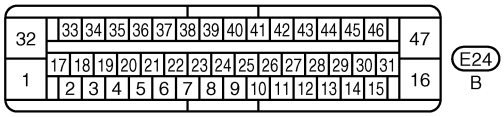
Wiring Diagram — ABS —

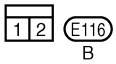
AFS0018Q

BRC-ABS-01





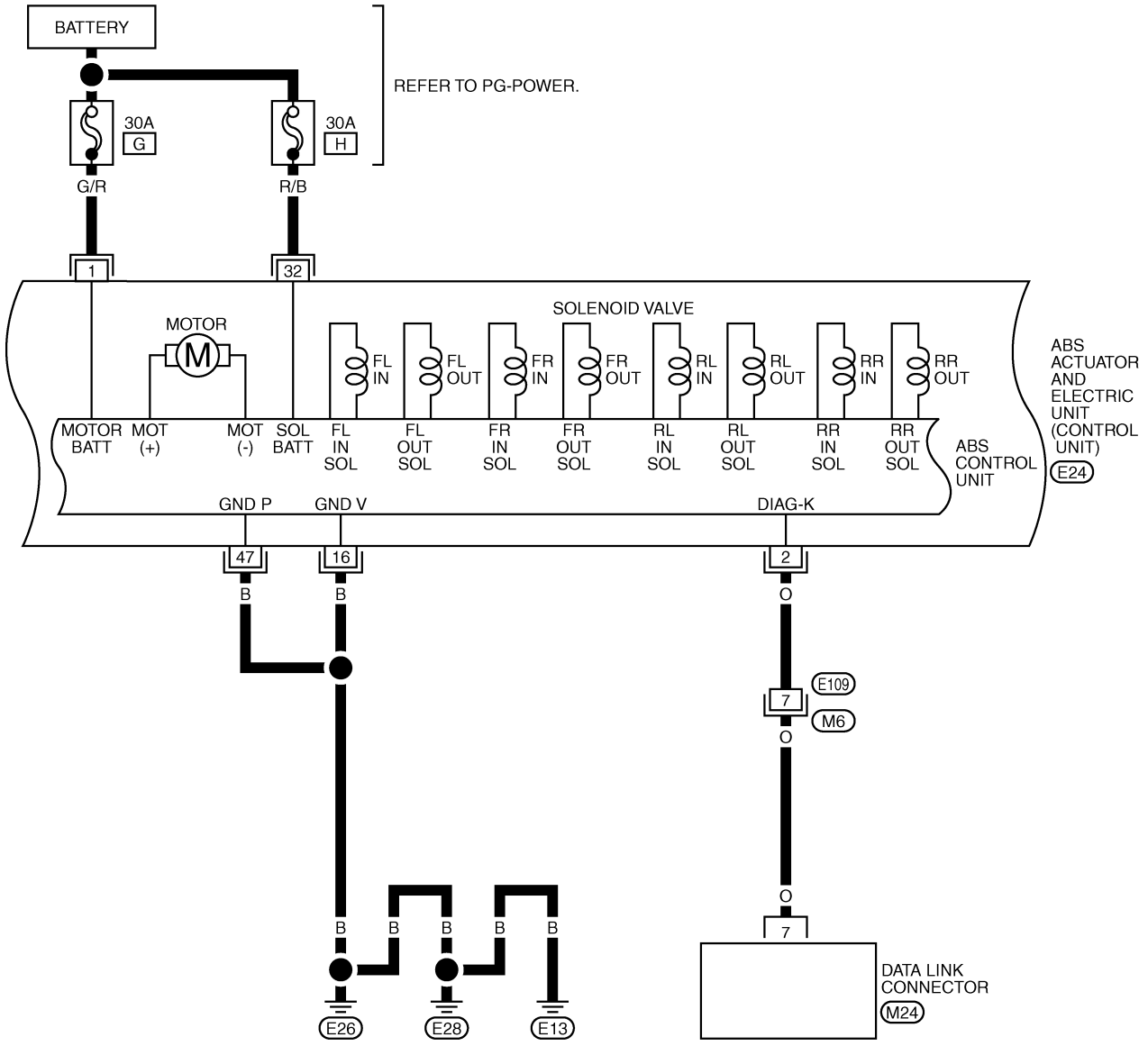


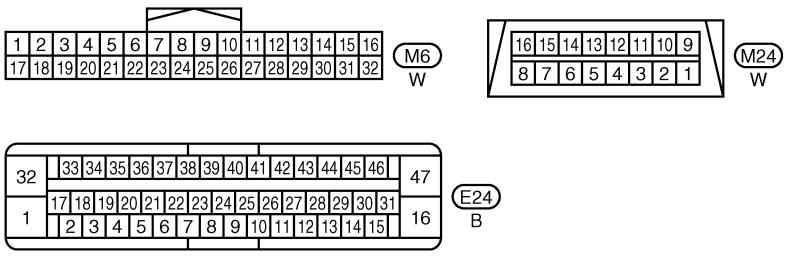


REFER TO THE FOLLOWING.
E101 -FUSE BLOCK-JUNCTION BOX (J/B)

TFWA0100E

BRC-ABS-02





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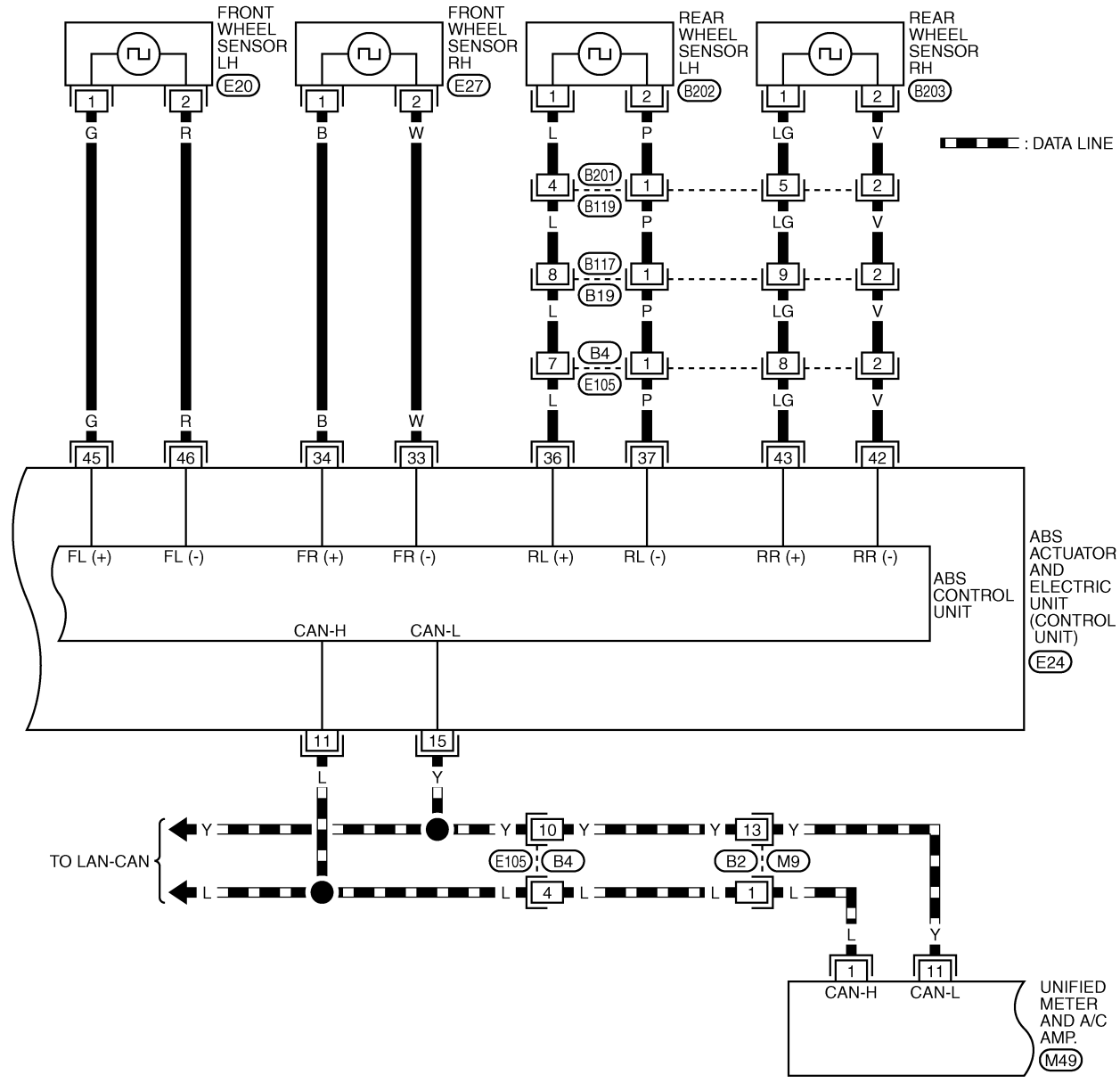
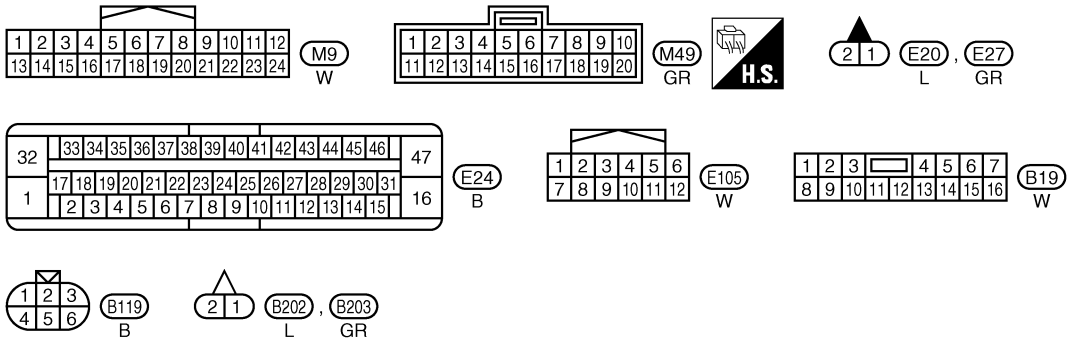
BRC-ABS-03





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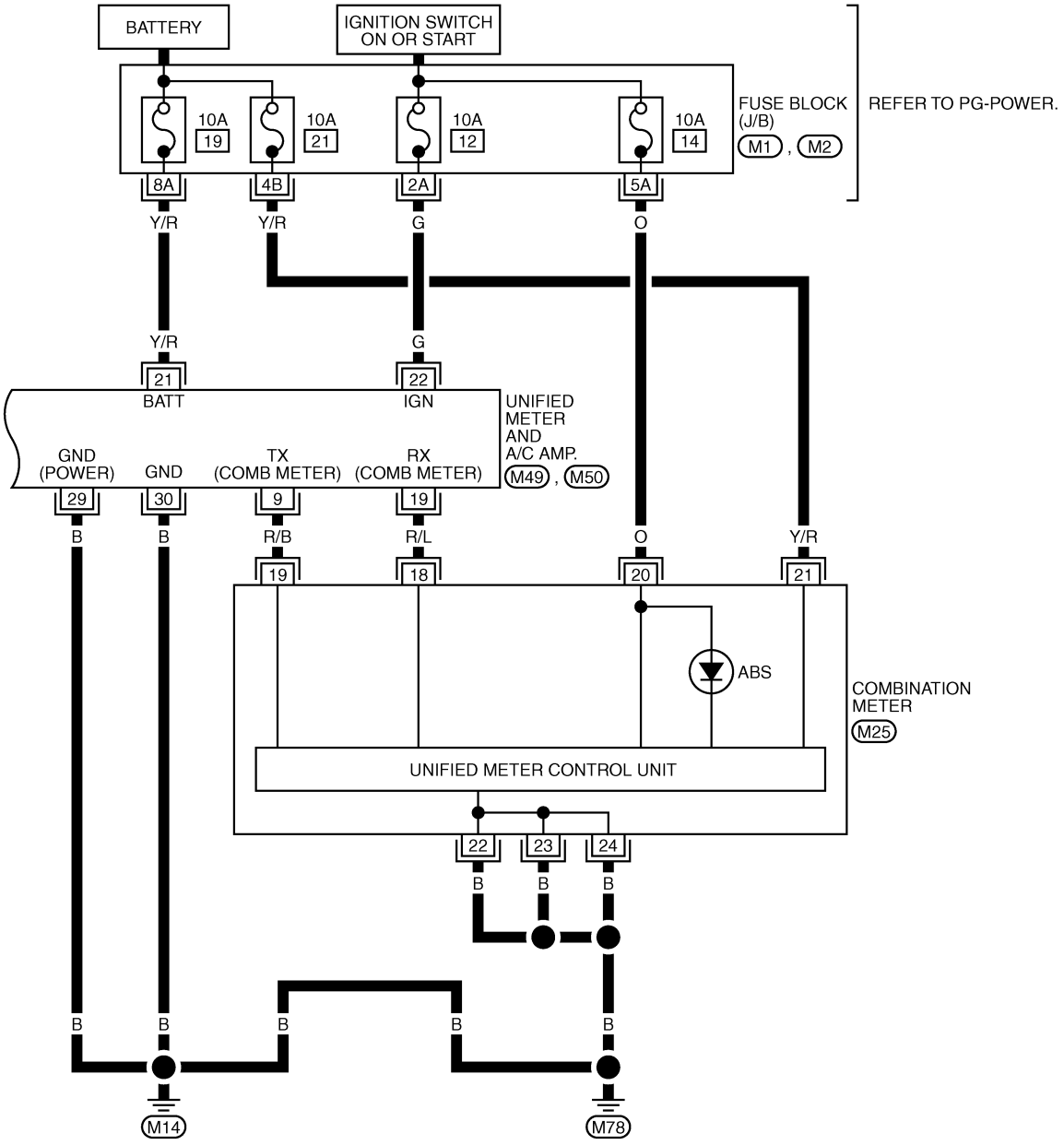
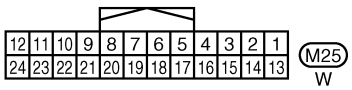
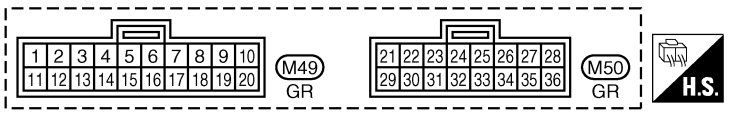
BRC-ABS-04







REFER TO THE FOLLOWING.
M1 , M2 -FUSE BLOCK-JUNCTION BOX (J/B)

TFWA0064E

Control Unit Input/Output Signal Standard

AFS0018R

REFERENCE VALUE FROM CONSULT-II

CAUTION:

The display shows control unit calculation data, so a normal value might be displayed even in the event the output circuit (harness) is open or short - circuited.

Monitor item	Display content	Data monitor		Check item
		Condition	Reference value in normal operation	
FR RH SENSOR FR LH SENSOR RR RH SENSOR RR LH SENSOR	Wheel speed	Vehicle stopped	0 [km/h]	BRC-30, "Inspection 1 Wheel Sensor System"
		Vehicle running (Note 1)	Almost in accordance with speedometer display (within ±10 %)	
BATTERY VOLT	Battery voltage supplied to ABS actuator and electric unit (control unit)	Ignition switch ON	10 - 16 V	BRC-36, "Inspection 6 ABS Actuator and Electric Unit (Control Unit) Power Supply and Ground Circuit"
STOP LAMP SW	Brake pedal operation	Brake pedal depressed	ON	–
		Brake pedal not depressed	OFF	
ABS WARN LAMP	ABS warning lamp ON condition (Note 2)	ABS warning lamp ON	ON	–
		ABS warning lamp OFF	OFF	
MOTOR RELAY	Operation status of motor and motor relay	Ignition switch ON or engine running (ABS not operated)	OFF	BRC-35, "Inspection 5 Actuator Motor, Motor Relay, and Circuit"
		Ignition switch ON or engine running (ABS operated)	ON	
ACTUATOR RLY	Actuator relay operation status	Vehicle stopped (Ignition switch ON)	OFF	BRC-35, "Inspection 5 Actuator Motor, Motor Relay, and Circuit"
		Vehicle stopped (Engine running)	ON	
FR LH IN SOL FR LH OUT SOL FR RH IN SOL FR RH OUT SOL RR RH IN SOL RR RH OUT SOL RR LH IN SOL RR LH OUT SOL	Solenoid valve operation	Actuator (solenoid) is active (“ACTIVE TEST” with CONSULT-II) or actuator relay is inactive (in fail-safe mode).	ON	BRC-34, "Inspection 3 Solenoid Valve Circuit"
		When actuator (solenoid) is not active and actuator relay is active (ignition switch ON).	OFF	
ABS FAIL SIG EBD FAIL SIG	Fail signal status	ABS fail EBD fail	ON	ABS system EBD system
		EBD normal ABS normal	OFF	
DECEL G-SEN	Longitudinal acceleration detected by Decel G-Sensor	Vehicle stopped	Approx. 0G	BRC-38, "Inspection 7 G Sensor System"
		Vehicle running	-1.7 - +1.7G	
EBD WARN LAMP	Brake warning lamp on condition (Note 3)	Brake warning lamp ON	ON	–
		Brake warning lamp OFF	OFF	
EBD SIGNAL	EBD operation	EBD active	ON	
		EBD not active	OFF	
ABS SIGNAL	ABS operation	ABS active	ON	
		ABS not active	OFF	

Note 1: Confirm tire pressure is normal.

Note 2: ON/OFF timing of ABS warning lamp

ON: For approximately 2 seconds after ignition switch is turned ON, or when a malfunction is detected.

OFF: Approximately 2 seconds after ignition switch is turned ON (when system is in normal operation).

Note3: Serves as EBD warning lamp.

CONSULT- II Functions

AFS0018S

CONSULT-II MAIN FUNCTION

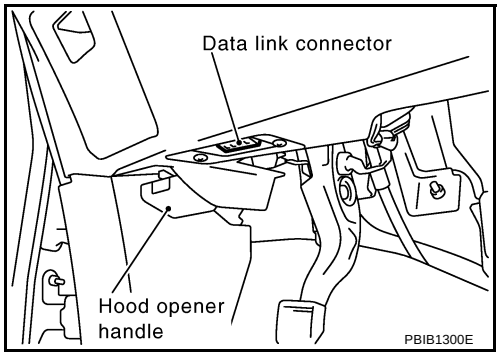
In a diagnosis function (main function), there are “SELF-DIAGNOSTIC RESULTS”, “DATA MONITOR”, “CAN DIAG SUPPORT MNTR”, “ACTIVE TEST”, “FUNCTION TEST”, “ECU PART NUMBER”.

Diagnostic test mode	Function	Reference
SELF-DIAG-NOSTIC RESULTS	Self-diagnostic results can be read and erased quickly.	BRC-22, "SELF-DIAGNOSIS"
DATA MONI-TOR	Input/Output data in the ABS actuator and electric unit (control unit) can be read.	BRC-24, "DATA MONITOR"
CAN DIAG SUPPORT MNTR	The results of transmit/receive diagnosis of communication can be read.	—
ACTIVE TEST	Diagnostic Test Mode in which CONSULT-II drives some actuators apart from the ABS actuator and electric unit (control unit) and also shifts some parameters in a specified range.	BRC-26, "ACTIVE TEST"
FUNCTION TEST	Performed by CONSULT-II instead of a technician to determine whether each system is “OK” or “NG”.	—
ECU PART NUMBER	ABS actuator and electric unit (control unit) part number can be read.	—

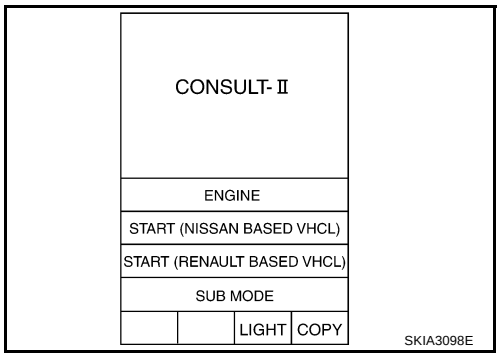
CONSULT-II BASIC OPERATION PROCEDURE

1. Turn ignition switch OFF.
2. Connect CONSULT-II and CONSULT-II CONVERTER to data link connector.

   CAUTION:
   If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which performs CAN communication.
3. Turn ignition switch ON.

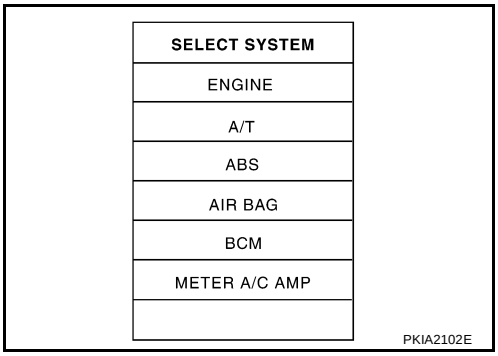


4. Touch “START (NISSAN BASED VHCL)”.

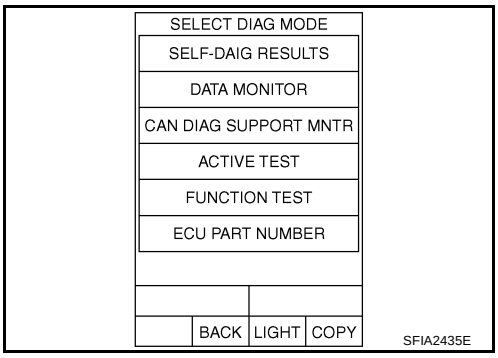


5. Touch “ABS” in “SELECT SYSTEM” screen.

If “ABS” is not indicated, go to GI-39, "CONSULT-II Data Link Connector (DLC) Circuit" .



6. Select required diagnostic location from “SELECT DIAG MODE” screen.



SELF-DIAGNOSIS

Description

If an error is detected in system, ABS warning lamp and brake warning lamp on combination meter turns on. In this case, perform self-diagnosis as follows.

Operation Procedure

1. Turn ignition switch OFF.
2. Connect CONSULT-II and CONSULT-II CONVERTER to data link connector.

   CAUTION:
   If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which performs CAN communication.

3. Turn ignition switch ON.
4. Start engine and drive at approximately 30 km/h (19 MPH)/h for approximately 1 minute.
5. After stopping vehicle, with engine running at idle speed, touch “START (NISSAN BASED VHCL)”, “ABS”, “SELF-DIAG RESULTS” in order on CONSULT-II screen.
   If “ABS” is not indicated, go to GI-39, "CONSULT-II Data Link Connector (DLC) Circuit" .

   CAUTION:
   - **If there is no error during CONSULT-II use, ABS warning lamp may be turned ON/OFF.**
   - **If “START (NISSAN BASED VHCL)” is touched immediately after starting engine or turning on ignition switch, “ABS” might not be displayed in System Selection screen. In this case, repeat operation from step 1. If it connect be shown after several attempts, ABS actuator and electric unit (control unit) may have malfunction. Repair or replace control unit.**

6. The self-diagnostic results are displayed. (If necessary, self-diagnostic results can be printed out by touching “PRINT”.)
   - When “NO FAILURE” is displayed, check ABS warning lamp.
7. Conduct appropriate inspection from the display item list, and repair or replace malfunctioning component.
8. Start engine and drive at approximately 30 km/h (19 MPH) for approximately 1 minute.

   CAUTION:
   - **When a wheel sensor “short-circuit” is detected, if vehicle is not driven at 30 km/h (19 MPH) for at least 1 minute, ABS warning lamp will not turn off even if everything is normal.**
   - **Check again to make sure that there is no malfunction on other parts.**

9. Turn ignition switch OFF to prepare for erasing the memory.
10. Start engine and touch “START (NISSAN BASED VHCL)”, “ABS”, “SELF-DIAG RESULTS”, “ERASE MEMORY” in order on CONSULT-II screen to erase the error memory.

    CAUTION:
    If the error memory is not erased, re-conduct the operation from step 5.

11. For final inspection, drive at approximately 30 km/h (19 MPH) or more for approximately 1 minute and confirm that ABS warning lamp turn OFF.

Display Item List

Self-diagnostic item	Malfunction detecting condition	Check system
FR LH SENSOR-1 [C1104]	Circuit of front LH wheel sensor is open, or shorted or sensor power voltage is unusual.	BRC-30, "Inspection 1 Wheel Sensor System" (Note 1)
RR RH SENSOR-1 [C1101]	Circuit of rear RH wheel sensor is open, or shorted or sensor power voltage is unusual.	
FR RH SENSOR-1 [C1103]	Circuit of front RH wheel sensor is open, or shorted or sensor power voltage is unusual.	
RR LH SENSOR-1 [C1102]	Circuit of rear LH wheel sensor is open, or shorted or sensor power voltage is unusual.	
FR LH SENSOR-2 [C1108]	ABS actuator and electric unit (control unit) can not identify sensor pulses, because of large gap between wheel sensor and sensor rotor.	
RR RH SENSOR-2 [C1105]	ABS actuator and electric unit (control unit) can not identify sensor pulses, because of large gap between wheel sensor and sensor rotor.	
FR RH SENSOR-2 [C1107]	ABS actuator and electric unit (control unit) can not identify sensor pulses, because of large gap between wheel sensor and sensor rotor.	
RR LH SENSOR-2 [C1106]	ABS actuator and electric unit (control unit) can not identify sensor pulses, because of large gap between wheel sensor and sensor rotor.	
FR LH IN ABS SOL [C1120]	Circuit of front LH IN ABS solenoid is open or shorted, or control line is open or shorted to power supply or ground.	BRC-34, "Inspection 3 Solenoid Valve Circuit"
FR LH OUT ABS SOL [C1121]	Circuit of front LH OUT ABS solenoid is open or shorted, or control line is open or shorted to power supply or ground.	
RR RH IN ABS SOL [C1126]	Circuit of rear RH IN ABS solenoid is open or shorted, or control line is open or shorted to power supply or ground.	
RR RH OUT ABS SOL [C1127]	Circuit of rear RH OUT ABS solenoid is open or shorted, or control line is open or shorted to power supply or ground.	
FR RH IN ABS SOL [C1122]	Circuit of front RH IN ABS solenoid is open or shorted, or control line is open or shorted to power supply or ground.	
FR RH OUT ABS SOL [C1123]	Circuit of front RH OUT ABS solenoid is open or shorted, or control line is open or shorted to power supply or ground.	
RR LH IN ABS SOL [C1124]	Circuit of rear LH IN ABS solenoid is open or shorted, or control line is open or shorted to power supply or ground.	
RR LH OUT ABS SOL [C1125]	Circuit of rear LH OUT ABS solenoid is open or shorted, or control line is open or shorted to power supply or ground.	
PUMP MOTOR (Note 2) [C1111]	During actuator motor operation with ON, when actuator motor turns OFF or when control line for actuator motor relay is open.	BRC-35, "Inspection 5 Actuator Motor, Motor Relay, and Circuit"
	During actuator motor operation with OFF, when actuator motor turns ON or when control line for relay is shorted to ground.	
ABS SENSOR [MALFUNCTION SIGNAL] [C1115]	Wheel sensor input is malfunction.	BRC-30, "Inspection 1 Wheel Sensor System" (Note 1)
BATTERY VOLTAGE [MALFUNCTION] [C1109]	ABS actuator and electric unit (control unit) power voltage is too low.	BRC-36, "Inspection 6 ABS Actuator and Electric Unit (Control Unit) Power Supply and Ground Circuit"
CONTROLLER FAILURE [C1110]	Internal malfunction of ABS actuator and electric unit (control unit)	BRC-33, "Inspection 2 ABS Actuator and Electric Unit (Control Unit)"
G - SENSOR [C1113] (Only AWD model)	Decel G sensor is malfunctioning, or signal line of Decel G- sensor is open or shorted.	BRC-38, "Inspection 7 G Sensor System"

Self-diagnostic item	Malfunction detecting condition	Check system
CAN COMM CIRCUIT [U1000]	● CAN communication line is open or shorted. ● ABS actuator and electric unit (control unit) internal malfunction ● Battery voltage for EMC is suddenly interrupted for approximately 0.5 seconds or more.	BRC-35, "Inspection 4 CAN Communication Circuit" (Note 2)
ACTUATOR RLY [C1140]	● Actuator solenoid valve relay is ON, even if control unit sends off signal. ● Actuator solenoid valve relay is OFF, even if control unit sends on signal.	–

Note 1: After completing repairs of shorted sensor circuit, when ignition switch is turned ON, ABS warning lamp turns on. Make sure that ABS warning lamp turns off while driving vehicle at approximately 30 km/h (19 MPH) for approximately 1 minute according to self-diagnosis procedure. In addition, if wheel sensor 2 is displayed for wheels, check wheel sensor circuit and also check control unit power voltage.
Note 2: When errors are detected in several systems, including CAN communication system [U1000], troubleshoot CAN communication system.

DATA MONITOR

Operation Procedure

1. Touch “ABS”, “DATA MONITOR” in order on CONSULT-II screen.
   If “ABS” is not indicated, go to GI-39, "CONSULT-II Data Link Connector (DLC) Circuit" .
   CAUTION:
   When “START (NISSAN BASED VHCL)” is touched immediately after starting engine or turning on ignition switch, “ABS” might not be displayed in system selection screen. In this case, repeat the operation from step 2.
2. Return to “SELECT MONITOR ITEM” screen, and touch “ECU INPUT SIGNALS”, “MAIN SIGNALS” or “SELECTION FROM MENU”. Refer to following information.
3. When “START” is touched, data monitor screen is displayed.

Display Item List

Monitor item	monitor item selection			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
FR RH SENSOR (km/h)	×	×	×	Wheel speed calculated by front RH wheel sensor signal is displayed.
FR LH SENSOR (km/h)	×	×	×	Wheel speed calculated by front LH wheel sensor signal is displayed.
RR RH SENSOR (km/h)	×	×	×	Wheel speed calculated by rear RH wheel sensor signal is displayed.
RR LH SENSOR (km/h)	×	×	×	Wheel speed calculated by real LH sensor signal is displayed.
BATTERY VOLT (V)	×	×	×	Voltage supplied to ABS actuator and electric unit (control unit) is displayed.
STOP LAMP SW (ON/OFF)	×	×	×	Stop lamp switch (ON/OFF) status is displayed.
ABS WARN LAMP (ON/OFF)	–	×	×	ABS warning lamp (ON/OFF) status is displayed.
FR LH IN SOL (ON/OFF)	–	×	×	Front LH IN ABS solenoid (ON/OFF) status is displayed.
FR LH OUT SOL (ON/OFF)	–	×	×	Front LH OUT ABS solenoid (ON/OFF) status is displayed.

Monitor item	monitor item selection			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
RR RH IN SOL (ON/OFF)	–	×	×	Rear RH IN ABS solenoid (ON/OFF) status is displayed.
RR RH OUT SOL (ON/OFF)	–	×	×	Rear RH OUT ABS solenoid (ON/OFF) status is displayed.
FR RH IN SOL (ON/OFF)	–	×	×	Front RH IN ABS solenoid (ON/OFF) status is displayed.
FR RH OUT SOL (ON/OFF)	–	×	×	Front RH OUT ABS solenoid (ON/OFF) status is displayed.
RR LH IN SOL (ON/OFF)	–	×	×	Rear LH IN ABS solenoid (ON/OFF) status is displayed.
RR LH OUT SOL (ON/OFF)	–	×	×	Rear LH OUT ABS solenoid (ON/OFF) status is displayed.
MOTOR RELAY (ON/OFF)	–	×	×	ABS motor relay signal (ON/OFF) status is displayed.
ACTUATOR RLY (ON/OFF)	–	×	×	ABS actuator relay signal (ON/OFF) status is displayed.
ABS FAIL SIG (ON/OFF)	–	–	×	ABS fail signal (ON/OFF) status is displayed.
EBD FAIL SIG (ON/OFF)	–	–	×	EBD fail signal (ON/OFF) status is displayed.
EBD SIGNAL (ON/OFF)	–	–	×	EBD operation (ON/OFF) status is displayed.
ABS SIGNAL (ON/OFF)	–	–	×	ABS operation (ON/OFF) status is displayed.
DECEL G SEN (G) (Only AWD model)	×	×	×	Decel acceleration detected by Decel G-sensor is displayed.
EBD WARN LAMP (ON/OFF)	–	–	×	Brake warning lamp (ON/OFF) status is displayed. (Note)

×: Applicable
–: Not applicable

NOTE:
Serves as EBD warning lamp.

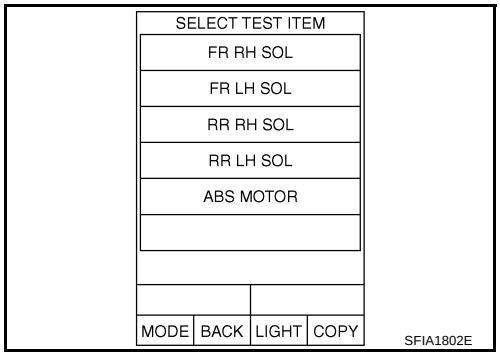
ACTIVE TEST

CAUTION:

- **Do not perform active test while driving vehicle.**
- **Make sure to completely bleed air from brake system.**
- **Active test can not be performed when ABS warning lamp is on.**
- **ABS and Brake Warming lamps turn on during active test.**

Operation Procedure

1. Touch “ABS”.
   If “ABS” is not indicated, go to GI-39, "CONSULT-II Data Link Connector (DLC) Circuit"
2. Touch “ACTIVE TEST”.
3. Test item selection screen is displayed.
4. Touch necessary test item.



5. With “SELECT TEST SIGNALS” display shown in reverse, touch “START”.
6. “ACTIVE TEST” screen will be displayed, so conduct following test.

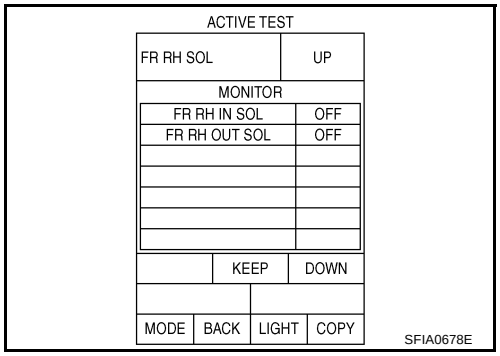
Test Item

Solenoid valve

CAUTION:

The example shown is for the front right wheel. The procedure for the other wheels is the same as given below.

1. For ABS solenoid valve, touch “UP”, “KEEP”, and “DOWN”. Then use screen monitor to check that solenoid valve operates as shown in Solenoid Valve Operation Chart. Refer to “Solenoid Valve Operation Chart”.



Solenoid Valve Operation Chart

Operation	ABS solenoid valve		
	UP	KEEP	DOWN
FR RH IN SOL	OFF	ON	ON
FR RH OUT SOL	OFF	OFF	ON*
FR LH IN SOL	OFF	ON	ON
FR LH OUT SOL	OFF	OFF	ON*
RR RH IN SOL	OFF	ON	ON
RR RH OUT SOL	OFF	OFF	ON*
RR LH IN SOL	OFF	ON	ON
RR LH OUT SOL	OFF	OFF	ON*

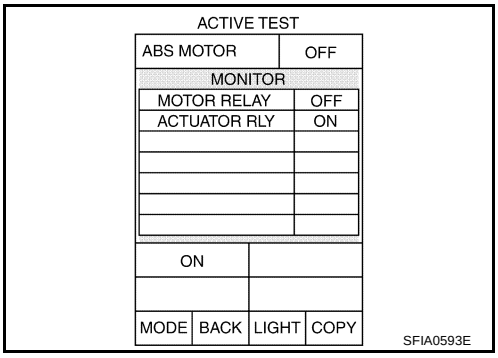
*: ON for 1 to 2 seconds after the touch, and then OFF

NOTE:
- When active test is performed while depressing pedal, pedal depression amount will change, but this is normal.
- Approximately 10 seconds after operation is begun, “TEST STOP” will be displayed.
- To perform retest after “TEST STOP” is displayed, touch “BACK” and conduct the test from Step 6.

ABS Motor

Touch “ON”, “OFF” on display screen and make sure ABS motor relay is operating as shown in table below.

Operation	ON	OFF
ABS motor relay	ON	OFF
ABS actuator relay	ON	ON



NOTE:
- When active test is performed while depressing pedal, pedal depression amount will change, but this is normal.
- Approximately 10 seconds after operation has begun, “TEST STOP” will be displayed.
- To perform a retest after “TEST STOP” is displayed, touch “BACK” and perform test from step 6.

For Fast and Accurate Diagnosis

AFS0018T

PRECAUTIONS FOR DIAGNOSIS

- Before performing trouble diagnosis, always read general information (GI) to confirm general precautions. Refer to GI-4, "General Precautions" .
- After completing service, always erase self-diagnosis results. Refer to BRC-20, "CONSULT- II Functions" .
- When inspection of continuity or voltage between units is performed, check connector terminals for disconnection, looseness, bends, or collapses. If any non-standard condition is detected, repair or replace applicable part.
- Intermittent errors may be caused by a poor connection in harness, connector, or terminal. Move harnesses, harness connectors, or terminals by hand to make sure all connections are solid and undamaged.
- If a circuit tester is used for check, be careful not to forcibly extend any connector terminal.
- ABS is a system that uses electronic control to perform brake control. Therefore, phenomena like those shown in the following table may occur, but this is because system is working normally.
- To use CONSULT-II to perform self-diagnosis of ABS actuator and electric unit (control unit), active tests, or work support, first stop work, then connect CONSULT-II and select “ABS”.
- When CONSULT-II is used, ABS warning lamp may be ON/OFF.

Symptom	Symptom description	Result
Motor operation noise	This is the noise of motor operating inside ABS actuator and electric unit (control unit). Slight noise may occur during ABS operation.	Normal
	Just after the engine starts, the motor operating noise may be heard. This is a normal status of the system operation check.	
System operation check noise	When the engine is started, you may barely be able to hear a slight thudding sound from the engine room, but this sound is made by the system operation check and is normal.	Normal
ABS operation (longer stopping distance)	Stopping distance may be longer for vehicles with ABS when the vehicle drives on rough or snow-covered roads. Use lower speeds when driving on these kinds of roads.	Normal

ON and OFF Timing for ABS Warning Lamp, Brake Warning Lamp

×: ON –: OFF

Condition	ABS warning lamp	Brake warning lamp [Note 1]	Remarks
Ignition SW OFF.	–	—	—
Approx. 2 seconds after ignition switch is turned ON.	×	× [Note 2]	—
Approx. 2 seconds later after ignition switch ON.	–	× [Note 2]	Go out 2 seconds after ignition switch is turned ON.
ABS error.	×	—	There is an ABS actuator and electric unit (control unit) error. (Power, ground or system malfunction)
EBD error.	×	×	—

NOTE:

1. Brake warning lamp will turn on in case of operating parking brake (switch turned on) or of actuating brake fluid level switch (brake fluid is insufficient).
2. After starting engine, turn OFF.

Basic Inspection

AFS0018U

BASIC INSPECTION 1 BRAKE FLUID LEVEL, LEAKS, AND BRAKE PADS

1. Check fluid level in the brake reservoir tank. If fluid level is low, refill brake fluid.
2. Check brake piping and around ABS actuator and electric unit (control unit) for leaks. If leakage or seepage is found, check the following items.
   - If ABS actuator and electric unit (control unit) connection is loose, tighten piping to the specified torque and re-conduct the leak inspection to make sure there are no leakage.
   - If there is damage to the connection flare nut or ABS actuator and electric unit (control unit) screw, replace the damaged part and re-conduct the leak inspection to make sure there are no leakage.
   - If there is leakage or seepage at any location other than ABS actuator and electric unit (control unit) connection, wipe away leakage or seepage with clean cloth. Then inspect again and confirm than there is on leakage.
   - If there is leakage from ABS actuator and electric unit (control unit), wipe away leakage or seepage with clean cloth. Then inspect again. If there is leakage or seepage, replace ABS actuator and electric unit (control unit).

     CAUTION:
     ABS actuator and electric unit (control unit) body can not be disassembled.
3. Check the brake disc rotor and pads. Refer to BR-28, "Removal and Installation of Brake Pad" in “Front Disc Brake” and BR-34, "Removal and Installation of Brake Pad" in “Rear Disc Brake”.

BASIC INSPECTION 2 POWER SYSTEM TERMINAL LOOSENESS AND BATTERY INSPECTION

Make sure battery positive cable, negative cable and ground connection are not loose. If looseness is detected, tighten the piping to the specified torquer. In addition, check the battery voltage to make sure it has not dropped and alternator is normal.

BASIC INSPECTION 3 ABS WARNING LAMP INSPECTION

1. Make sure that ABS warning lamp turns on approximately 2 seconds after ignition switch is turned ON. Check CAN communications. Refer to BRC-35, "Inspection 4 CAN Communication Circuit" . If there are no errors with CAN communication system, check ABS warning lamp and combination meter. Refer to DI-4, "COMBINATION METERS" .
2. Make sure that ABS warning lamp turns OFF approximately 2 seconds after ignition switch is turned ON. If ABS warning lamp does not turn OFF, perform self-diagnosis.
3. Make sure that ABS warning lamp turns OFF 2 seconds after engine is started. If ABS warning lamp has not turned OFF 10 seconds after engine has been started, perform self-diagnosis of ABS actuator and electric unit (control unit).
4. After performing self-diagnosis, be sure to erase the error memory. Refer to BRC-20, "CONSULT- II Functions" .

Inspection 1 Wheel Sensor System

AFS001ZE

After using CONSULT-II SELF-DIAG RESULTS to determine position of malfunctioning wheel sensor, check all areas to determine the component to be replaced.

CAUTION:

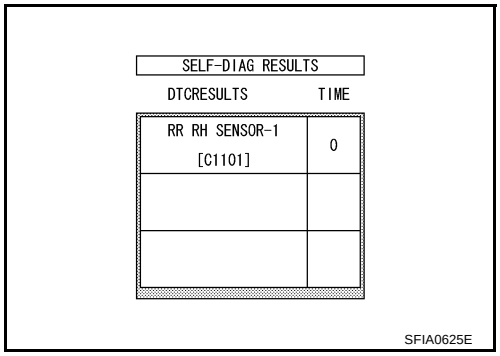
- **Do not measure resistance value and also voltage between sensor terminal with tester etc., because sensor is an active sensor.**
- **Do not expand terminal of connector with a tester terminal stick, when it does inspection with tester.**

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULT

Check self-diagnosis results.

Self-diagnosis results
FR RH SENSOR-1,-2
FR LH SENSOR- 1,-2
RR RH SENSOR-1,-2
RR LH SENSOR-1,- 2
ABS SENSOR



Is above displayed in self-diagnosis display items?

YES >> GO TO 2.
NO >> INSPECTION END

2. CHECK CONNECTOR

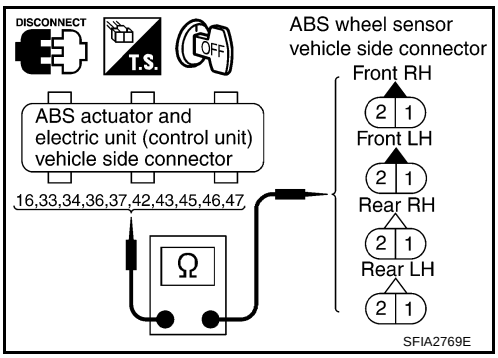
1. Disconnect ABS actuator and electric unit (control unit) connector E24 and malfunctioning wheel sensor connector E20 (FR - LH) or E27 (FR - RH) or B202 (RR - LH), B203 (RR - RH). Check terminal to see if it is deformed, disconnected, loose, etc., and repair or replace it if any malfunction condition is found.
2. Reconnect connectors and check that interference with other parts has not cut wheel sensor cables, drive vehicle at a speed of 30 km/h (19 MPH) or above for at least 1minute, and perform self-diagnosis.

OK or NG

OK >> Connector terminal contact is loose, damaged, open or shorted.
NG >> GO TO 3.

3. CHECK WHEEL SENSOR HARNESS

1. Turn ignition switch OFF and disconnect wheel sensor connector E20 (FR - LH), E27 (FR - RH), B202 (RR - LH), B203 (RR - RH) and ABS actuator and electric unit (control unit) connector E24.
2. Check continuity between terminals. (Also check continuity when steering wheel is turned right and left and when sensor harness inside wheel well is moved.)



	Power supply circuit		Signal circuit		Ground circuit	
Wheel	ABS actuator and electric unit (control unit)	Wheel sensor	ABS actuator and electric unit (control unit)	Wheel sensor	ABS actuator and electric unit (control unit)	ABS actuator and electric unit (control unit) (Ground)
Front RH	34 (B)	1 (B)	33 (W)	2 (W)	33 (W), 34 (B)	16 (B), 47 (B)
Front LH	45 (G)	1 (G)	46 (R)	2 (R)	45 (G), 46 (R)	
Rear RH	43 (LG)	1 (LG)	42 (V)	2 (V)	43 (LG), 42 (V)	
Rear LH	36 (L)	1 (L)	37 (P)	2 (P)	36 (L), 37 (P)	

Power supply circuit : Continuity should exist.
Signal circuit : Continuity should exist.
Ground circuit : Continuity should not exist.

OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness and connector that have malfunction.

4. CHECK TIRE

Check air pressure, wear, and size.

Are air pressure, wear, and size within the standard values?

YES >> GO TO 5.
NO >> Adjust air pressure, or replace tire.

5. CHECK SENSOR AND SENSOR ROTOR

- Check condition of sensor mount (for looseness, etc.).
- Check surface of front sensor rotor rubber for damage.
- Check rear sensor rotor for damage.

OK or NG

OK >> GO TO 6.
NG >> Repair or replace the malfunctioning component.

6. CHECK WHEEL SENSOR

1. Replace wheel sensor that resulted in malfunction by self-diagnosis.
2. Reconnect connectors, drive vehicle at 30 km/h (19 MPH) or more for approximately 1 minute, and then perform self-diagnosis.

Is above displayed on self-diagnosis display?

OK >> Wheel sensor has malfunction.
NG >>
- Replace ABS actuator and electric unit (control unit).
- Perform to self-diagnosis again, and make sure that the result shows “NO DTC IS DETECTED. FURTHER TESTING MAY BE REQUIRED”.

Inspection 2 ABS Actuator and Electric Unit (Control Unit)

AFS0018X

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULT

Check self-diagnosis results.

Self-diagnosis results
CONTROLLER FAILURE

Is above displayed in self-diagnosis display items?

YES >> Replace ABS actuator and electric unit (control unit). Perform ABS actuator and electric unit (control unit) self-diagnosis again.

NO >> INSPECTION END

Inspection 3 Solenoid Valve Circuit

AFS0018Z

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULT

Check self-diagnosis results.

Self-diagnosis results
FR LH IN ABS SOL
FR LH OUT ABS SOL
RR RH IN ABS SOL
RR RH OUT ABS SOL
FR RH IN ABS SOL
FR RH OUT ABS SOL
RR LH IN ABS SOL
RR LH OUT ABS SOL

Is above displayed in self-diagnosis item?

YES >> GO TO 2.
NO >> INSPECTION END

2. CHECK CONNECTOR

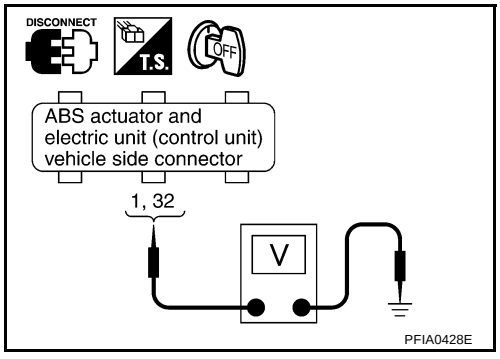
1. Disconnect ABS actuator and electric unit (control unit) connector E24, check terminal for is deformation, disconnection, looseness, etc., and if there is any malfunction, repair or replace terminal.
2. Securely reconnect connector and perform self-diagnosis.

OK or NG

OK >> Connector terminal contact is loose, damaged, open or shorted.
NG >> GO TO 3.

3. CHECK ABS ACTUATOR RELAY OR ABS MOTOR RELAY POWER SUPPLY CIRCUIT

1. Disconnect ABS actuator and electric unit (control unit) connector E24.
2. Check voltage between ABS actuator and electric unit (control unit) harness connector E24.



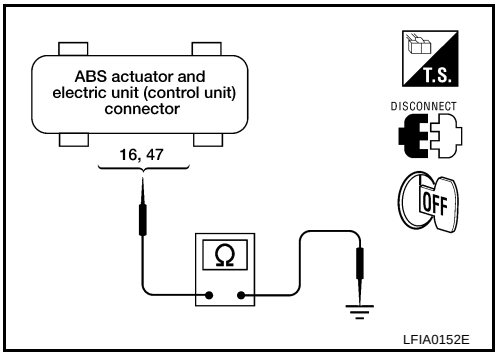
ABS actuator and electric unit (Control unit)	Ground	Voltage
1 (G/R)	—	Battery voltage (approx. 12 V)
32 (R/B)	—	Battery voltage (approx. 12 V)

OK or NG

OK >> GO TO 4
NG >> Circuit malfunction between battery and ABS actuator and electric unit (control unit). Repair the circuit.

4. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) GROUND CIRCUIT

Check ABS actuator and electric unit (control unit) ground circuit.



ABS actuator and electric unit (Control unit)	Ground	Continuity
16 (B), 47 (B)	—	Yes

OK or NG

OK >> Perform self-diagnosis again. If the same results appear, replace ABS actuator and electric unit (control unit).

NG >> Open or short in harness. Repair or replace harness.

Inspection 4 CAN Communication Circuit

AFS00192

INSPECTION PROCEDURE

1. CHECK CONNECTOR

1. Turn ignition switch OFF, disconnect the ABS actuator and electric unit (control unit) connector, and check the terminal for deformation, disconnection, looseness, and so on. If there is a malfunction, repair or replace the terminal.
2. Reconnect connector to perform self-diagnosis.

Is “CAN COMM CIRCUIT” displayed in the self-diagnosis display items?

YES >> Print out the self-diagnostic results, and refer to LAN-5, "Precautions When Using CONSULT-II" .

NO >> Connector terminal connector is loose, damaged, open, or shorted.

Inspection 5 Actuator Motor, Motor Relay, and Circuit

AFS001ZF

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULT (1)

Check self-diagnosis results.

Self-diagnosis results
PUMP MOTOR
ACTUATOR RLY

Is above displayed in self-diagnosis display items?

YES >> GO TO 2.

NO >> INSPECTION END

2. CHECK SELF-DIAGNOSIS RESULT (2)

1. Disconnect ABS actuator and electric unit (control unit) connector E24. Then reconnect it securely.
2. Preform self-diagnosis again.

DO any self-diagnosis items appear?

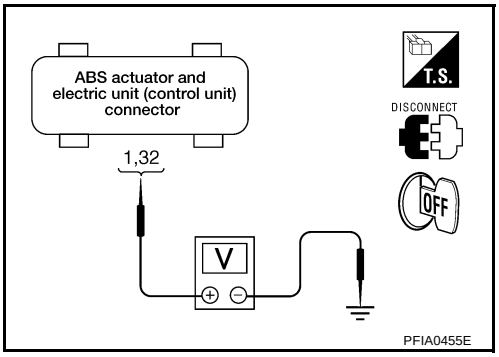
YES >> GO TO 3

NO >> Poor connection. Repair or replace the applicable connector.

3. CHECKING ABS MOTOR AND MOTOR RELAY POWER SYSTEM

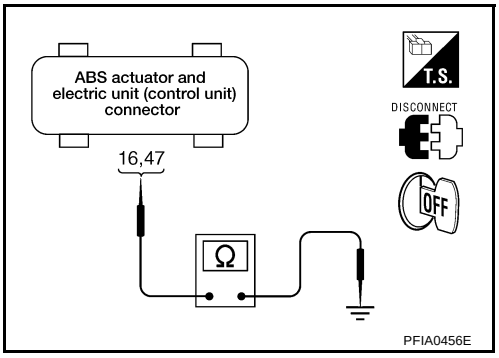
1. Disconnect ABS actuator and electric unit (control unit) connector.
2. Check voltage between ABS actuator and electric (control unit) unit connector E24 and ground.

ABS actuator and electric unit (control unit)	Body ground	Voltage (V) (Approx.)
1 (G/R), 32(R/B)	–	12 V



3. Check resistance between ABS actuator and electric unit (control unit) connector E24 and ground.

ABS actuator and electric unit (control unit)	Body ground	Resistance value (Ω) (Approx.)
16 (B), 47 (B)	–	0 Ω



OK or NG

OK >> Perform self-diagnosis again. If the same result appears, replace ABS actuator and electric unit (control unit). Refer to BRC-45, "ACTUATOR AND ELECTRIC UNIT (ASSEMBLY)" .

NG >> Repair harness or connectors.

Inspection 6 ABS Actuator and Electric Unit (Control Unit) Power Supply and Ground Circuit

AFS001ZG

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULT

Check self-diagnosis results.

Self-diagnosis results
BATTERY VOLTAGE

Dose “BATTERY VOLTAGE” appear in self-diagnosis results display?

YES >> GO TO 2.
NO >> INSPECTION END

2. CHECK SELF-DIAGNOSIS RESULT (2)

1. Disconnect ABS actuator and electric unit (control unit) connector E24. Then reconnect it securely.
2. Preform self-diagnosis again.

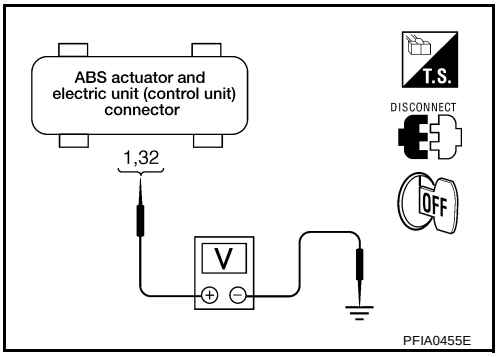
Do any self-diagnosis items appear?

YES >> GO TO 3
NO >> Poor connection. Repair or replace the applicable connector.

3. CHECK ABS MOTOR AND MOTOR RELAY POWER SYSTEM

1. Disconnect ABS actuator and electric unit (control unit) connector.
2. Check voltage between ABS actuator and electric unit (control unit) connector E24 and ground.

ABS actuator and electric unit (control unit)	Body ground	Voltage (V) (Approx.)
1(G/R),32 (R/B)	–	12 V



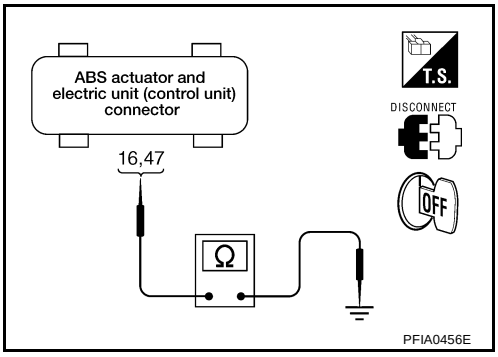
OK or NG

OK >> GO TO 4.
NG >> GO TO 5.

4. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) GROUND CIRCUITS

Check resistance between ABS actuator and electric unit (control unit) connector E24 and ground.

ABS actuator and electric unit (control unit)	Body ground	Resistance value (Ω) (Approx.)
16 (B), 47 (B)	–	0 Ω



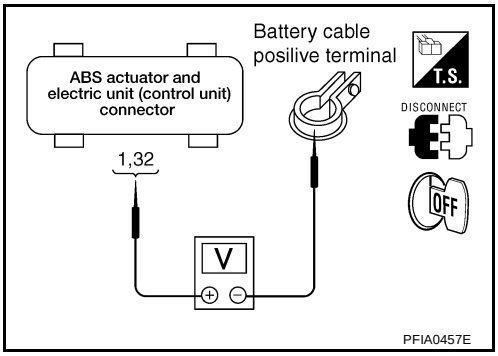
OK or NG

OK >> Perform ABS actuator and electric unit (control unit) self-diagnosis again.
NG >> Repair harness or connectors.

5. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SYSTEM

1. Check fuse.
2. Check continuity between battery positive terminal and ABS actuator and electric unit (control unit) connector E24.

ABS actuator and electric unit (control unit)	Battery positive terminal	Continuity
1 (G/R), 32 (R/B)	–	YES



OK or NG

OK >> Check for non-standard condition in battery (terminal looseness, low voltage, etc.) and alternator.
NG >>
- Replace fuse.
- Open or short in harness.

Inspection 7 G Sensor System

AFS001ZH

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULT

Check self-diagnosis results.

Self-diagnosis results
G-SENSOR

Is above displayed in self-diagnosis display items?

YES >> GO TO 2.
NO >> INSPECTION END

2. CHECK G SENSOR

Use “Data Monitor” to check if the G sensor are normal.

Vehicle status	G sensor (Data monitor standard)
When stopped	–0.11 G to +0.11 G
Speed up	Negative value
Speed down	Positive value

OK or NG

OK >> INSPECTION END
NG >> Replace ABS actuator and electric unit (control unit) and then perform ABS actuator and electric unit (control unit) self-diagnosis again.

Symptom 1 Excessive ABS Function Operation Frequency

AFS00193

1. CHECK WHEEL SENSOR

Perform the following inspections:

- Sensor mount and damage inspection
- Sensor rotor mount and damage inspection
- Sensor connector connection inspection
- Sensor harness inspection

OK or NG

OK >> GO TO 2.
NG >> Replace sensor or sensor rotor.

2. CHECK FRONT AND REAR AXLE

Make sure there is no excessive play in the front and rear axles.

OK or NG

OK >> Refer to Symptom 2.
NG >> Repair.

3. CHECK ABS WARNING LAMP DISPLAY

Make sure the ABS warning lamp turns off approximately 2 seconds after the ignition switch is turned on or when driving.

OK or NG

OK >> Normal
NG >> Perform self-diagnosis. Refer to BRC-22, "SELF-DIAGNOSIS" .

Symptom 2 Unexpected Pedal Action

AFS001ZI

1. CHECK BRAKE PEDAL STROKE

Check brake pedal stroke.

Is the stroke too long?

YES >>
- Bleed air from the brake piping.
- Check the brake pedal, brake booster, and master cylinder mount for play, looseness, and brake system for fluid leaks, etc. If any malfunctions are found, make repair.

NO >> GO TO 2.

2. CHECK PEDAL FORCE

Make sure that brake is effective with pedal depressed.

Is pedal heavy but affective?

YES >> Normal
NO >> GO TO 3

3. CHECK PERFORMANCE

Disconnect ABS actuator and electric unit (control unit) connector E24 and make sure the braking force us sufficient when ABS in not operating. After the inspection, reconnect connector.

OK or NG

OK >> GO TO 4.
NG >> Check brake system.

4. CHECK ABS WARNING LAMP DISPLAY

Make sure the warning lamp turns OFF approximately 2 seconds after the ignition switch is turned ON or when driving.

OK or NG

OK >> Normal
NG >> GO TO 5.

5. CHECK WHEEL SENSOR

Perform the following inspections:

- Sensor mount and damage inspection
- Sensor rotor mount and damage inspection
- Sensor connector connection inspection
- Sensor harness inspection

OK or NG

OK >> Normal
NG >> Replace sensor or sensor rotor.

Symptom 3 Long Stopping Distance

AFS001ZJ

CAUTION:
On slippery road surfaces, the stopping distance might be longer with ABS operating than when ABS is not operating.

1. CHECK PERFORMANCE

Disconnect ABS actuator and electric unit (control unit) connector E24 to deactivate ABS. In this condition, check stopping distance. After inspection, connect connector.

Is stopping distance still long?

YES >> ● Bleed air from the brake piping.
● Check brake system.
NO >> GO TO 2.

2. CHECK ABS WARNING LAMP DISPLAY

Make sure the ABS warning lamp turns OFF approximately 2 seconds after the ignition switch is turned ON or when driving.

OK or NG

OK >> Normal
NG >> GO TO 3

3. CHECK WHEEL SENSOR

Perform the following inspections:

- Sensor mount and damage inspection
- Sensor rotor mount and damage inspection
- Sensor connector connection inspection
- Sensor harness inspection

OK or NG

OK >> Normal
NG >> Replace sensor or sensor rotor.

Symptom 4 ABS Function Dose Not Operate

AFS001ZK

CAUTION:
ABS does not operate when the speed is 10 km/h (6 MPH) or less.

1. CHECK ABS WARNING LAMP DISPLAY

Make sure the ABS warning lamp turns off approximately 2 seconds after the ignition switch is turned on or when driving.

OK or NG

OK >> GO TO 2.
NG >> Perform self-diagnosis. Refer to BRC-20, "CONSULT- II Functions" .

2. CHECK WHEEL SENSOR

Perform the following inspections:

- Sensor mount and damage inspection
- Sensor rotor mount and damage inspection
- Sensor connector connection inspection
- Sensor harness inspection

OK or NG

OK >> Normal
NG >> Sensor or sensor rotor replacement

Symptom 5 Pedal Vibration or ABS Operation Sound Occurs

AFS001ZL

CAUTION:
Under the following conditions, when brake pedal is lightly depressed (just place a foot on it), ABS is activated and vibration is felt. However, this is normal.

- **When shifting gears**
- **When driving on slippery road**
- **During cornering at high speed**
- **When passing over bumps or grooves.**
- **When driving just after starting engine (at approximately 10 km/h (6 MPH) or higher)**

1. SYMPTOM CHECK 1

Check if pedal vibration or operation sound occurs when the engine is started.

OK or NG

OK >> Perform self-diagnosis. Refer to BRC-22, "SELF-DIAGNOSIS" .
NG >> GO TO 2.

2. INSPECTION (1)

Does vibration occur during normal parking?

CAUTION:
In addition to activation for sudden braking, ABS may activate in conditions such as those listed below.

- **Roads with low surface.**
- **Turning at high speed.**
- **Passing through gusts of wind.**

OK or NG

OK >> GO TO 3.
NG >> Normal

3. INSPECTION (2)

Check for vibration when engine speed is increased while vehicle is stopped.

OK or NG

OK >> GO TO 4
NG >> ● Normal

CAUTION:
Vibration may occur when vehicle is stopped.

4. INSPECTION (3)

Check for vibration when switches of electrical components are operated.

OK or NG

OK >> Check for any wireless devices, or antenna lead near control unit (including wiring).
NG >> GO TO 5.

5. CHECK ABS WARNING LAMP INDICATION

Confirm ABS warning lamp turns on.

OK or NG

OK >> Execute self-diagnosis.
NG >> GO TO 6.

6. CHECK WHEEL SENSORS

Perform the following inspections:

- Sensor mounting inspection
- Sensor pick-up inspection for iron chips
- Sensor connector engagement inspection
- Inspection of wheel sensor circuit

OK or NG

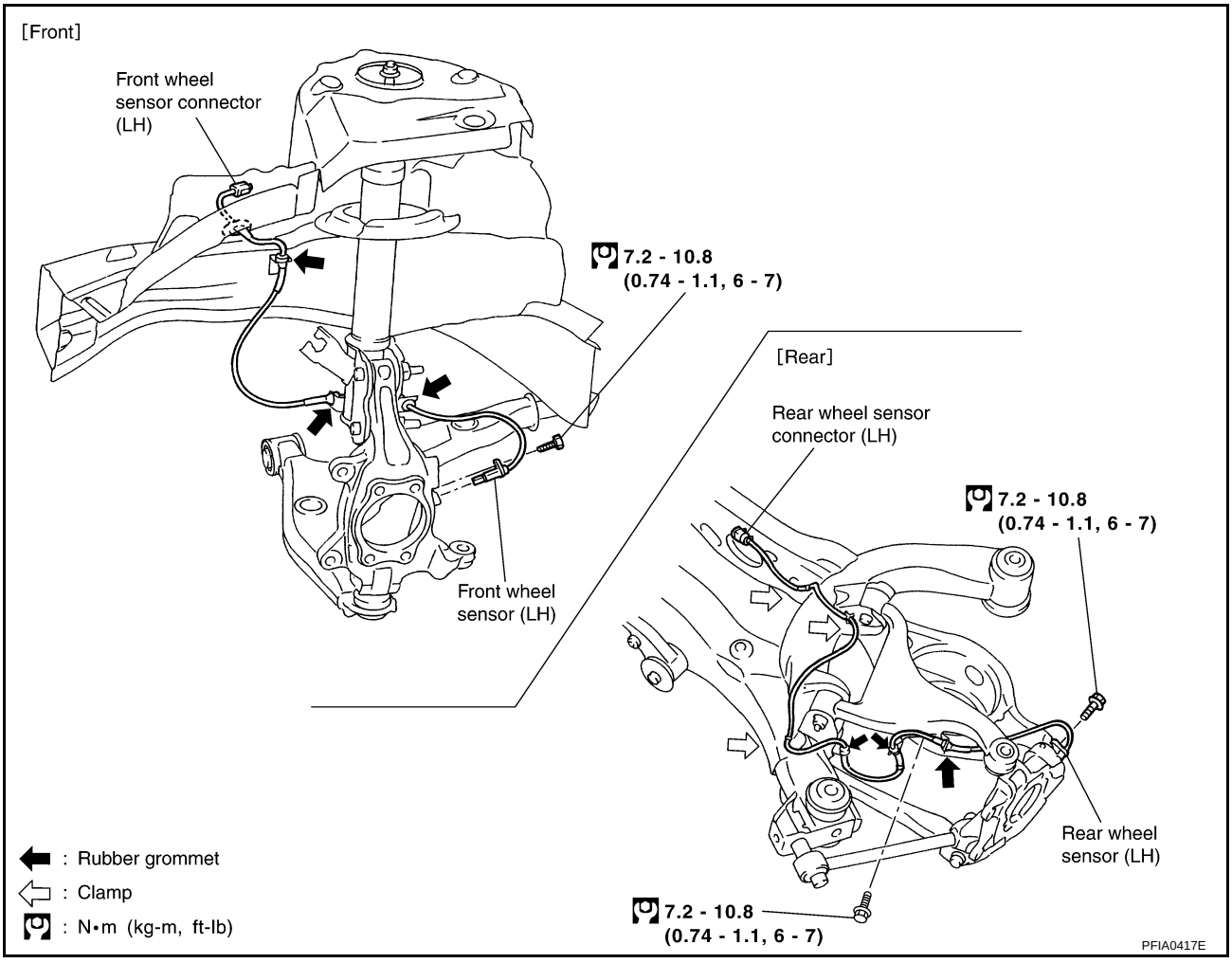
OK >> Normal
NG >> Repair wheel sensor and sensor rotor system.

WHEEL SENSORS

PFP:47910

Removal and Installation

AFS00198



REMOVAL

Pay attention to the following when removing wheel sensor.

CAUTION:

- **As much as possible, avoid rotating wheel sensor when removing it. Pull wheel sensors out without pulling on sensor harness.**
- **Take care to avoid damaging wheel sensor edges or rotor teeth. Remove wheel sensor first before removing front or rear wheel hub. This is to avoid damage to wheel sensor wiring and loss of sensor function.**

INSTALLATION

Pay attention to the following when installing wheel sensor. Tighten installation bolts and nuts to the specified torques.

- When installing, make sure there is no foreign material such as iron chips on and in the mounting hole of the wheel sensor. Make sure no foreign material has been caught in the sensor rotor. Remove any foreign material and clean the mount.
- When installing wheel sensor, be sure to press rubber grommets in until they lock at locations shown above in figure. When installed, harness must not be twisted.

SENSOR ROTOR

PFP:47970

Removal and Installation

AFS00199

REMOVAL

Front

Sensor rotor cannot be disassembled. To replace sensor rotor, replace hub bearing assembly. Refer to FAX-5, "FRONT WHEEL HUB AND KNUCKLE" in “FAX” section.

Rear

Sensor rotor cannot be disassembled. To replace sensor rotor, replace hub bearing assembly. Refer to RAX-5, "WHEEL HUB" in “RAX” section.

INSTALLATION

Front

Sensor rotor cannot be disassembled. To replace sensor rotor, replace hub bearing assembly. Refer to FAX-5, "FRONT WHEEL HUB AND KNUCKLE" in “FAX” section.

Rear

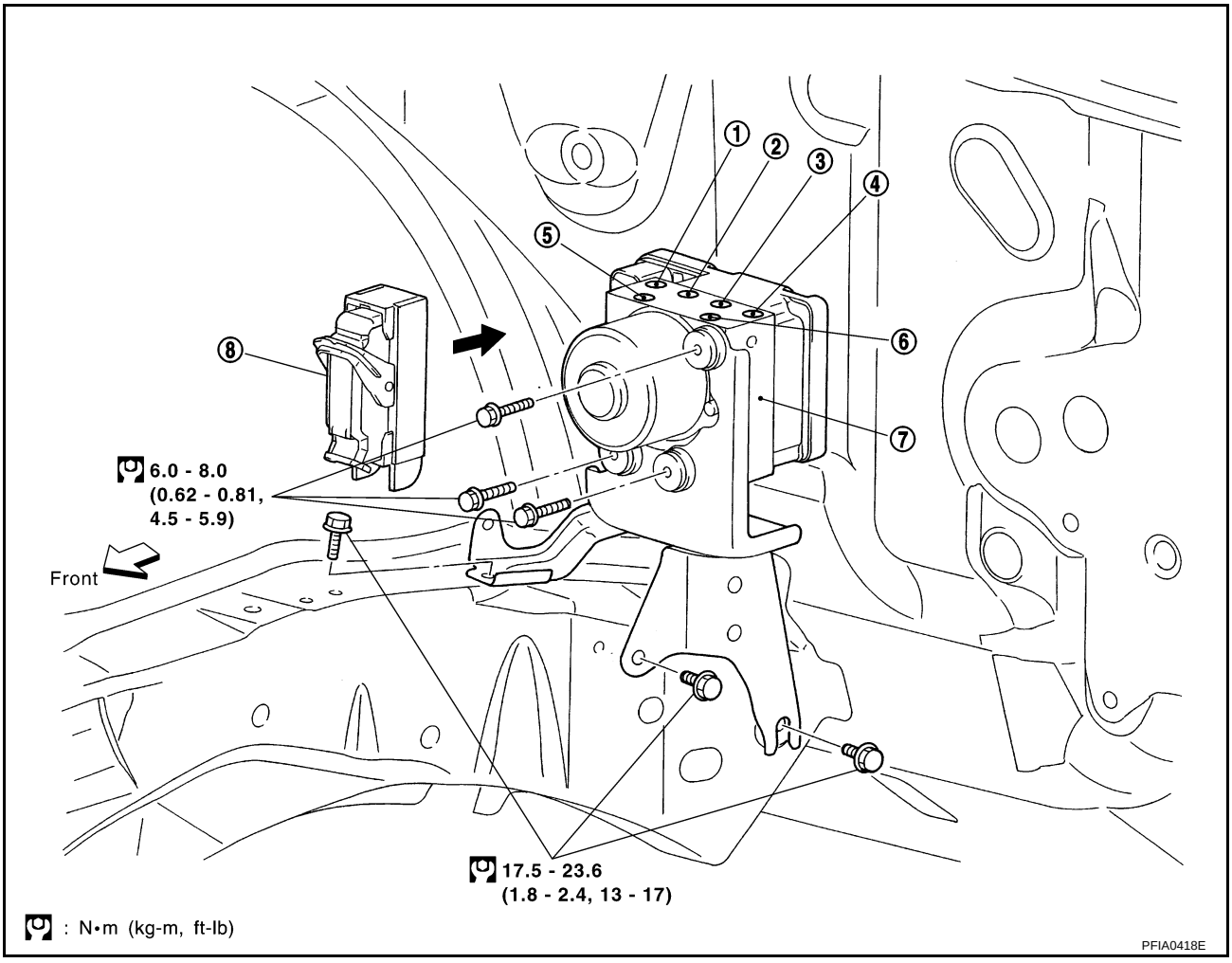
Sensor rotor cannot be disassembled. To replace sensor rotor, replace hub bearing assembly. Refer to RAX-5, "WHEEL HUB" in “RAX” section.

ACTUATOR AND ELECTRIC UNIT (ASSEMBLY)

PFP:47660

Removal and Installation

AFS0019A



1.	To front left	2.	To rear right	3.	To rear left
4.	To front right	5.	From master cylinder secondary side	6.	From master cylinder primary side
7.	ABS actuator and electric unit (control unit)	8.	Harness connector		

Pay attention to the following when removing actuator.

CAUTION:

- **Before servicing, disconnect battery cables.**
- **To remove brake tube, use flare nut wrench to prevent flare nuts and brake tube from being damaged. To install, use flare nut torque wrench (commercial service tool).**
- **Do not remove and install actuator by holding harness.**
- **After work is completed, bleed air from brake piping. Refer to BR-12, "Bleeding Brake System" .**

PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

AFS001AI

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

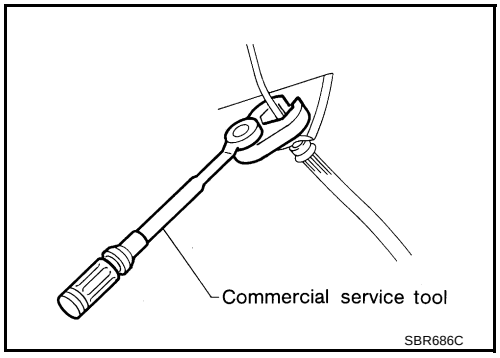
WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for Brake System

AFS001ZP

- Recommended fluid is brake fluid “DOT 3”.
- Do not reuse drained brake fluid.
- Be careful not to splash brake fluid on painted areas.
- To clean or wash all parts of master cylinder, disc brake caliper and wheel cylinder, use clean brake fluid.
- Never use mineral oils such as gasoline or kerosene. They will ruin rubber parts of the hydraulic system.
- Use flare nut wrench when removing and installing brake tube.
- When installing brake piping, be sure to torque.
- Before working, turn ignition switch OFF and disconnect connectors of ABS actuator and control unit or battery negative terminals.
- Burnish the brake contact surfaces after refinishing or replacing drums or rotors, after replacing pads or linings, or if a soft pedal occurs at very low mileage.
  Refer to BR-32, "BRAKE BURNISHING PROCEDURE" .



WARNING:

- **Clean brake pads and shoes with a waste cloth, then wipe with a dust collector.**

Precautions for Brake Control

AFS001AL

- During ABS operation, brake pedal lightly vibrates and a mechanical noise may be heard. This is normal.
- Just after starting vehicle after turning ignition switch ON, brake pedal may vibrate or motor operating noise may be heard from engine compartment. This is a normal status of operation check.
- Stopping distance may be longer than that of vehicles without ABS when vehicle drives on rough, gravel, or snow-covered (fresh, deep snow) roads.
- When an error is indicated by ABS or another warning lamp, collect all necessary information from customer (what symptoms are present under what conditions) and check for simple causes before starting diagnostic servicing. Besides electrical system inspection, check brake booster operation, brake fluid level, and fluid leaks.
- If tire size and type are used in an improper combination, or brake pads are not Genuine NISSAN parts, stopping distance or steering stability may deteriorate.
- If there is a radio, antenna, or antenna lead-in wire (including wiring) near control module, ABS function may have a malfunction or error.

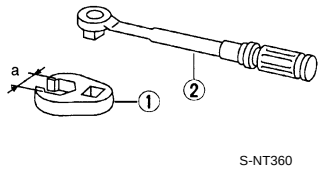
- If aftermarket parts (car stereo, CD player, etc.) have been installed, check for incidents such as harness pinches, open circuits, and improper wiring.
- If the following components are replaced with non-genuine components or converted, the VDC OFF indicator lamp and SLIP indicator lamp may turn on or the VDC system may not operate properly. Components related to suspension (Shock Absorber, Strut, Spring, Bushing, etc.), Tires, wheels (exclude specified size), components related to brake (Pad, Rotor, Caliper, etc.), Components related to engine (Muffler, ECM, etc.), Components related to body reinforcement (Roll bar, Tower bar, etc.).
- Driving in the condition of breakage or excessive wear of the suspension, tires or components related to the brakes may cause the VDC OFF indicator lamp and the SLIP indicator lamp to turn on, and the VDC system may not operate properly.
- When the TCS or VDC is activated by sudden acceleration or sudden turn, some noise may occur. The noise is a result of the normal operation of the TCS and VDC.
- When driving on roads which have extreme slopes (such as mountainous roads) or high banks (such as sharp carves on a freeway), the VDC may not operate normally, or the VDC warning lamp and the SLIP indicator lamp may turn on. However, this is not a malfunction if normal operation can be resumed after restarting the engine.
- Sudden turns (such as spin turns, acceleration turns), drifting, etc. When VDC function is OFF (VDC SW ON) may cause the yaw rate/side G sensor system indicate a malfunction. However, this is not a malfunction if normal operation can be resumed after restarting the engine.

PREPARATION

PFP:00002

Commercial Service Tools

AFS001AP

Tool name	Description
1. Flare nut crowfoot a:10 mm (0.39 in) / 12 mm (0.47 in) 2. Torque wrench  S-NT360	Removing and installing each brake piping

ON-VEHICLE SERVICE

PFP:00000

Adjustment of Steering Angle Sensor Neutral Position

AFS001I6

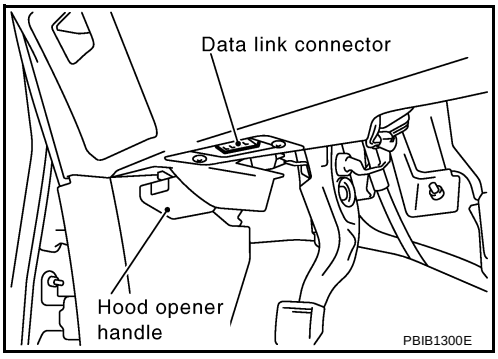
After removing/installing or replacing ABS actuator and electric unit (control unit), steering angle sensor, steering components, suspension components, or after adjusting wheel alignment, make sure to adjust neutral position of steering angle sensor before running vehicle.

Situation	Adjustment of Steering Angle Sensor Neutral Position
Removing/Installing ABS actuator and electric unit (control unit)	–
Replacing ABS actuator and electric unit (control unit)	×
Removing/Installing steering angle sensor	×
Removing/Installing steering components	×
Removing/Installing suspension components	×
Change tires to new ones	–
Tire rotation	–
Adjustment wheel alignment	×

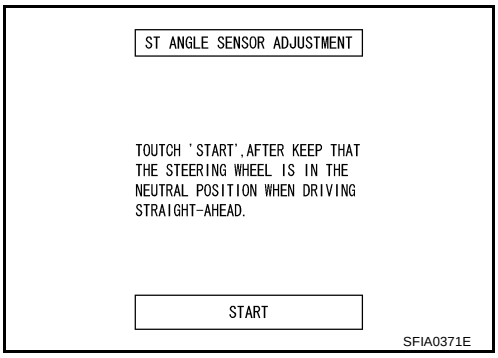
×: Required
–: Not required

CAUTION:
To adjust neutral position of steering angle sensor, make sure to use CONSULT-II.
(Adjustment can not be done without CONSULT-II.)

1. Stop vehicle with front wheels in straight-ahead position.
2. Connect CONSULT-II and CONSUL-II CONVERTER to data link connector on vehicle, and turn ignition switch ON (do not start engine).
3. Touch “ABS”, “WORK SUPPORT” and “ST ANGLE SENSOR ADJUSTMENT” on CONSULT-II screen in this order.



4. Touch “START”.
   CAUTION:
   Do not touch steering wheel while adjusting steering angle sensor.
5. After approximately 10 seconds, touch “END”. (After approximately 60 seconds, it ends automatically.)
6. Turn ignition switch OFF, then turn it ON again.
   CAUTION:
   Be sure to perform above operation.
7. Run vehicle with front wheels in straight-ahead position, then stop.



8. Select “DATA MONITOR”, “SELECTION FROM MENU”, and “STR ANGLE SIG” on CONSULT-II screen. Then make sure “STR ANGLE SIG” is within 0±2.5 deg. If value is more than specification, repeat steps 3 to 7.
9. Erase memory of ABS actuator and electric unit (control unit) and ECM.
10. Turn ignition switch OFF.

Calibration of Decel G Sensor

AFS001Z7

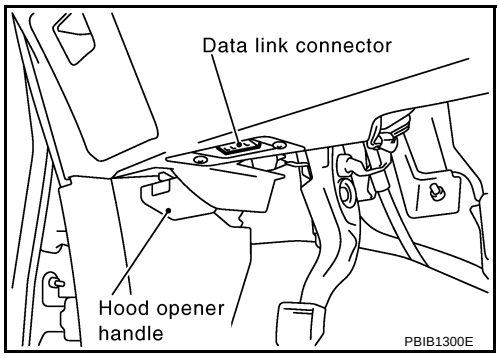
After removing/installing or replacing Yaw rate/side/decel G sensor, ABS actuator and electric unit (control unit) make sure to Calibration of Decel G Sensor before running vehicle.

Situation	Calibration of Decel G Sensor
Removing/Installing ABS actuator and electric unit (control unit)	×
Removing/Installing steering components	–
Removing/Installing suspension components	–
Change tires to new ones	–
Tire rotation	–
Adjusting wheel alignment	–
Removing/Installing Yaw rate/side/decel G sensor	×

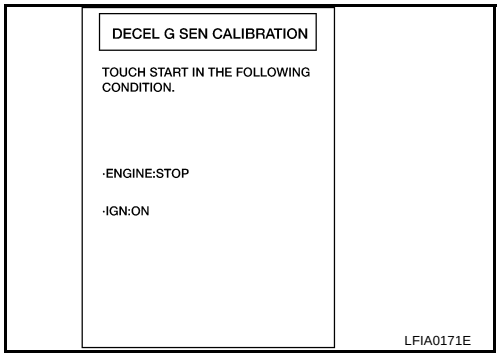
×: Required
–: Not required

CAUTION:
To calibrate decel G sensor, make sure to use CONSULT- II (Adjustment can not be done without CONSULT- II)

1. Stop vehicle with front wheels in straight-ahead position.
   CAUTION:
   - **Keep all tires inflated to correct pressures. Adjust the tire pressure to the specified pressure value.**
   - **See that there is on-load in vehicle other than the driver (or equivalent weight placed in driver's position).**
2. Connect CONSULT- II to data link connector on vehicle, and turn ignition switch ON (do not start engine).
3. Touch “ABS”, “WORK SUPPORT” and “DECEL G SEN CALIBRATION” on CONSULT- II screen in this order.



4. Touch “START”.
5. After approximately 10 seconds, touch “END”. (After approximately 60 seconds, it ends automatically.)
6. Turn ignition switch OFF, then turn it ON again.
   CAUTION:
   Be sure to carry out above operation.
7. Run vehicle with front wheels in straight-ahead position, then stop.
8. Select “DATA MONITOR”, “SELECTION FROM MENU”, and “DECEL G SEN” on CONSULT- II screen. Then check that “DECEL G SEN” is within ±0.08G. If value is more than specification, repeat steps 1 to 5.



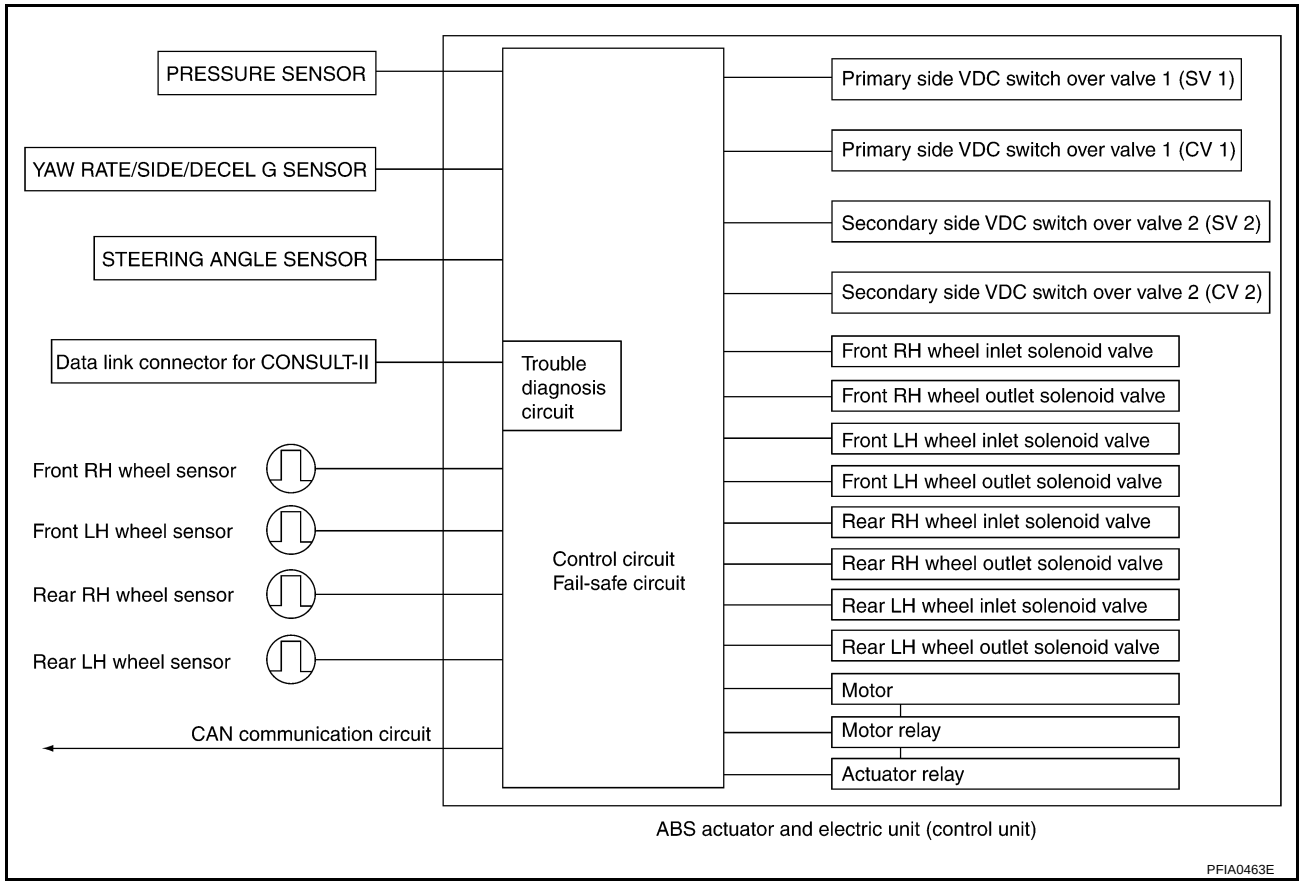
9. Erase memory of ABS actuator and electric unit (control unit) and ECM.
10. Turn ignition switch OFF.

SYSTEM DESCRIPTION

PFP:00000

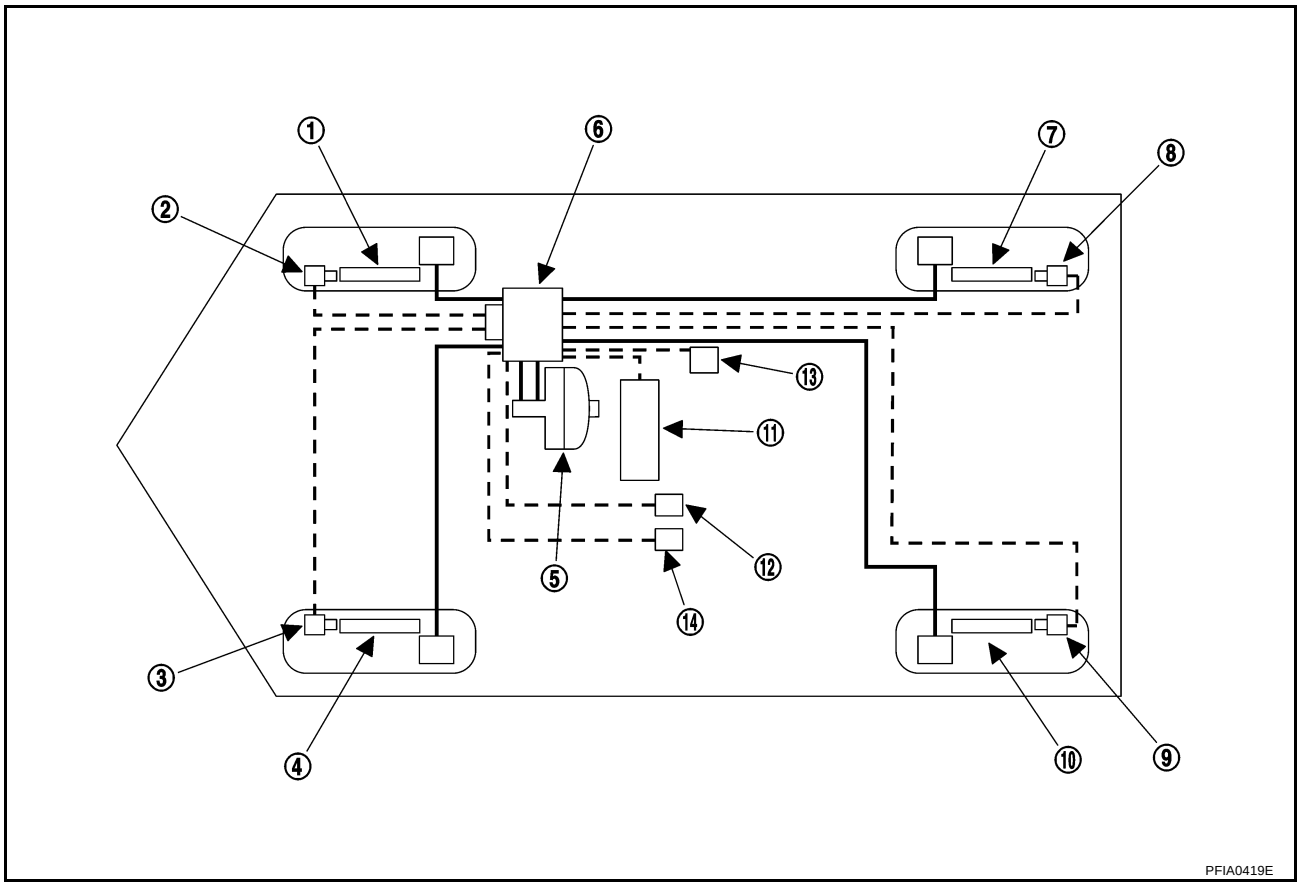
System Diagram

AFS00210



System Component Parts

AFS001AR



1. Sensor rotor (FR)
2. Wheel sensor (FR)
3. Wheel sensor (FL)
4. Sensor rotor (FL)
5. Brake booster and master cylinder
6. ABS actuator and electric unit (control unit)
7. Sensor rotor (RR)
8. Wheel sensor (RR)
9. Wheel sensor (RL)
10. Sensor rotor (RL)
11. Combination meter [Brake warning lamp, ABS warning lamp, VDC OFF indicator lamp, SLIP indictor lamp]
12. VDC OFF switch
13. Yaw rate/side/decel G sensor
14. Steering angle sensor

VDC Function

AFS001AT

- In addition to the TCS/ABS function, the driver steering amount and brake operation amount are detected from the steering angle sensor and pressure sensor, and the vehicle's driving status (amount of under steering / over steering) is determined from information from the yaw rate /side/decel G sensor, wheel sensor, etc., and this information is used to improve vehicle stability by controlling the braking and engine power to all four wheels.
- The SLIP indicator lamp flashes to inform the driver of VDC operation.
- During VDC operation, the body and brake pedal lightly vibrate and mechanical noises may be heard. This is normal.
- The ABS warning lamp, VDC OFF indicator lamp, and SLIP indicator lamp might turn on when the vehicle is subject to strong shaking or large vibration, such as when the vehicle is on a turn table or a ship while the engine is running or steep slope such as bank. In this case, restart the engine on a normal road, and if the ABS warning lamp, VDC OFF indicator lamp, and SLIP indicator lamp turn off, there is no malfunction.

TCS Function

AFS001AU

- The wheel spin of the drive wheels is detected by the ABS actuator and electric unit (control unit) from the wheel speed signals from the four wheels, so if wheel spin occurs, the drive wheel right and left brake fluid pressure control and engine fuel cut are conducted while the throttle value is restricted to reduce the engine torque and decrease the amount of wheel spin. In addition, the degree the throttle is opened is controlled to achieve the optimum engine torque.
- Depending on road circumstances, the driver may have a sluggish feel. This is normal, because the optimum traction has the highest priority under TCS operation.
- TCS may be activated any time the vehicle suddenly accelerates, depressing accelerator peal fully, suddenly downshifts, upshifts, or is driven on a road with a varying surface friction coefficient.
- During TCS operation, it informs a driver of system operation by flashing SLIP indicator lamp.

ABS Function

AFS001ZQ

- The Anti-Lock Brake System is a function that detects wheel revolution while braking, and it improves handling stability during sudden braking by electrically preventing 4 wheel lock. Maneuverability is also improved for avoiding obstacles.
- If the electrical system malfunction, then Fail-Safe function is activated, ABS becomes inoperative, and ABS warning lamp turns on.
- Electrical System Diagnosis by CONSULT-II is available.
- During ABS operation, brake pedal lightly vibrates and a mechanical noise may be heard. This is normal.
- Just after starting vehicle after ignition switch ON, brake pedal may vibrate or motor operating noise may be heard from engine compartment. This is a normal status of operation check.
- Stopping distance may be longer than that of vehicles without ABS when vehicle drives on rough, gravel, or snow-covered (fresh, deep snow) roads.

EBD Function

AFS001ZR

- Electronic Brake Distributor is a function that detects subtle slippages between front and rear wheels during braking, and it improves handling stability by electronically controlling Brake Fluid Pressure which results in reduced rear wheel slippage.
- In case of electrical system malfunction, Fail-Safe function is activated, EBD and ABS becomes inoperative, and ABS warning lamp and brake warning lamp are turned on.
- Electrical System Diagnosis by CONSULT-II is available.
- During EBD operation, brake pedal lightly vibrates and a mechanical noise may be heard. This is normal.
- Just after starting vehicle after ignition switch ON, brake pedal may vibrate or motor operating noise may be heard from engine compartment. This is a normal status of operation check.
- Stopping distance may be longer than that of vehicles without EBD when vehicle drives on rough, gravel, or snow-covered (fresh, deep snow) roads.

Fail-Safe Function

AFS0020Z

VDC/TCS SYSTEM

In case of malfunction with TCS, the VDC OFF indicator lamp and SLIP indicator lamp are turned on, and the condition of the vehicle is the same as the condition of vehicles without VDC/TCS system. In case of malfunction with TCS, the ABS control continues to operate normally without VDC/TCS control.

CAUTION:

If the Fail-Safe function is activated, then perform the Self Diagnosis for VDC/TCS/ABS control system.

ABS, EBD SYSTEM

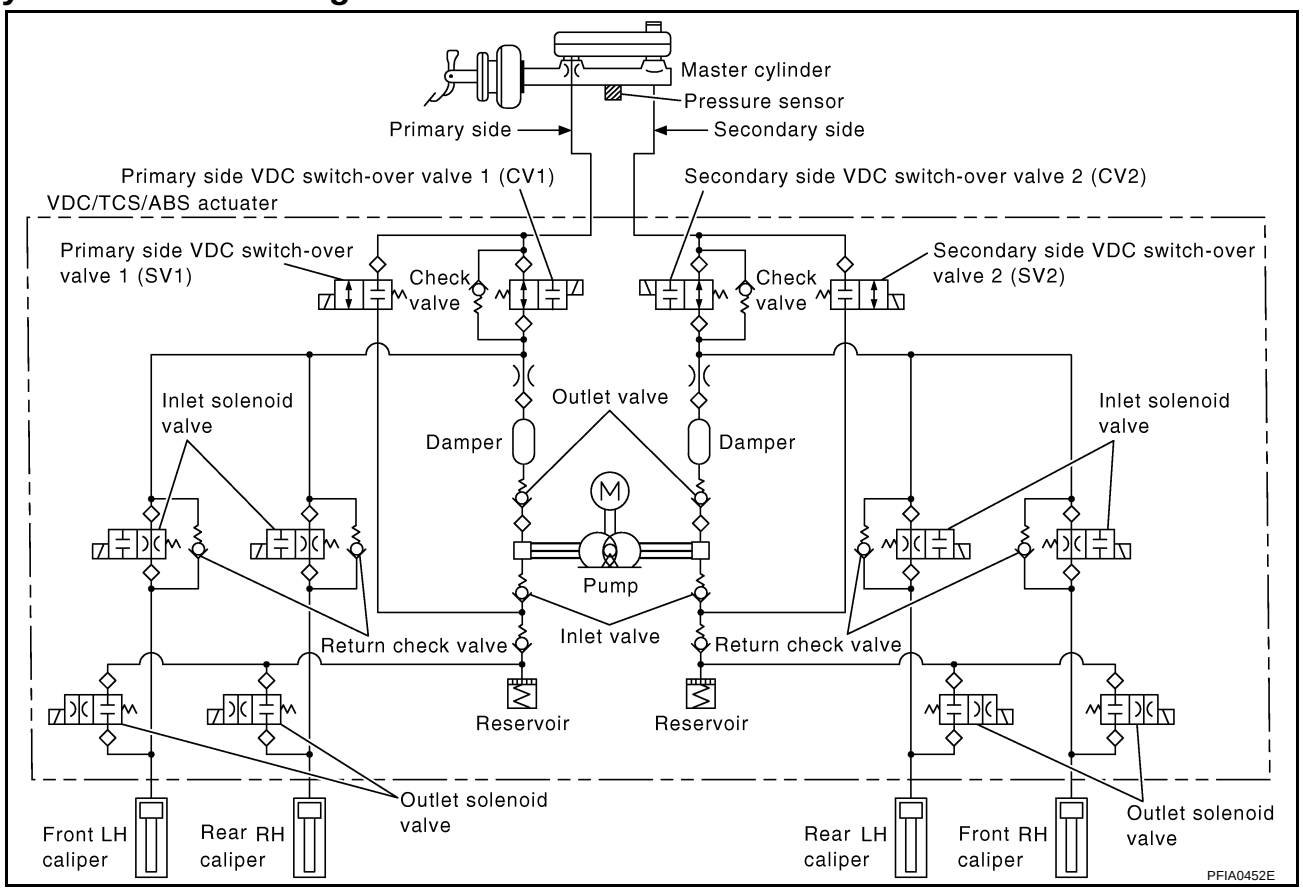
In case of electrical malfunction with the ABS, the ABS warning lamp, VDC OFF indicator lamp and SLIP indicator lamp will turn on. In case of electrical malfunction with the EBD, Brake warning lamp, ABS warning lamp, VDC OFF indicator lamp and SLIP indicator lamp will turn on. Simultaneously, the VDC/TCS/ABS become one of the following conditions of the Fail- Safe function.

1. For ABS malfunction, only the EBD is activated and the condition of the vehicle is the same condition of vehicles without TCS/ABS system.
2. For EBD malfunction, the EBD and ABS become inoperative, and the condition of the vehicle is the same as the condition of vehicles without VDC/TCS/ABS, EBD system.

NOTE:
In condition 1 described above, an ABS Self Diagnosis sound may be heard. That is a normal condition because a self diagnosis for “Key Switch ON” and “the First Starting” are being performed.

Hydraulic Circuit Diagram

AFS00211



CAN COMMUNICATION

PFP:23710

System Description

AFS0028H

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only. Refer to LAN-29, "CAN Communication Unit" .

TROUBLE DIAGNOSIS

PFP:00004

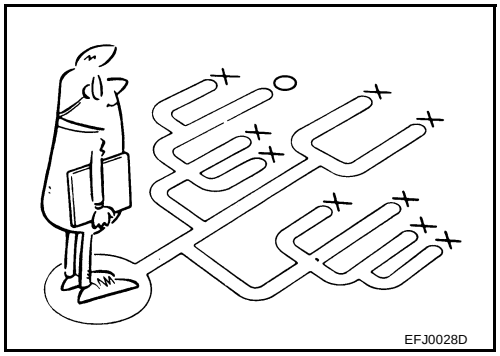
How to Perform Trouble Diagnosis for Quick and Accurate Repair

AFS001ZW

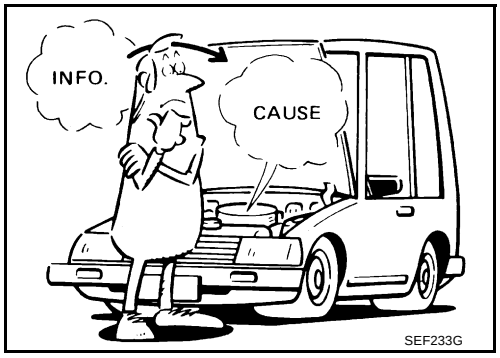
INTRODUCTION

- Most important point to perform diagnosis is to understand systems (control and mechanism) in vehicle thoroughly.

- It is also important to clarify customer complaints before inspection.
  First of all, reproduce symptom, and understand it fully.
  Ask customer about his/her complaints carefully. In some cases, it will be necessary to check symptom by driving vehicle with customer.
  NOTE:
  Customers are not professionals. Do not assume “maybe customer means...” or “maybe customer mentioned this symptom”.


EFJ0028D

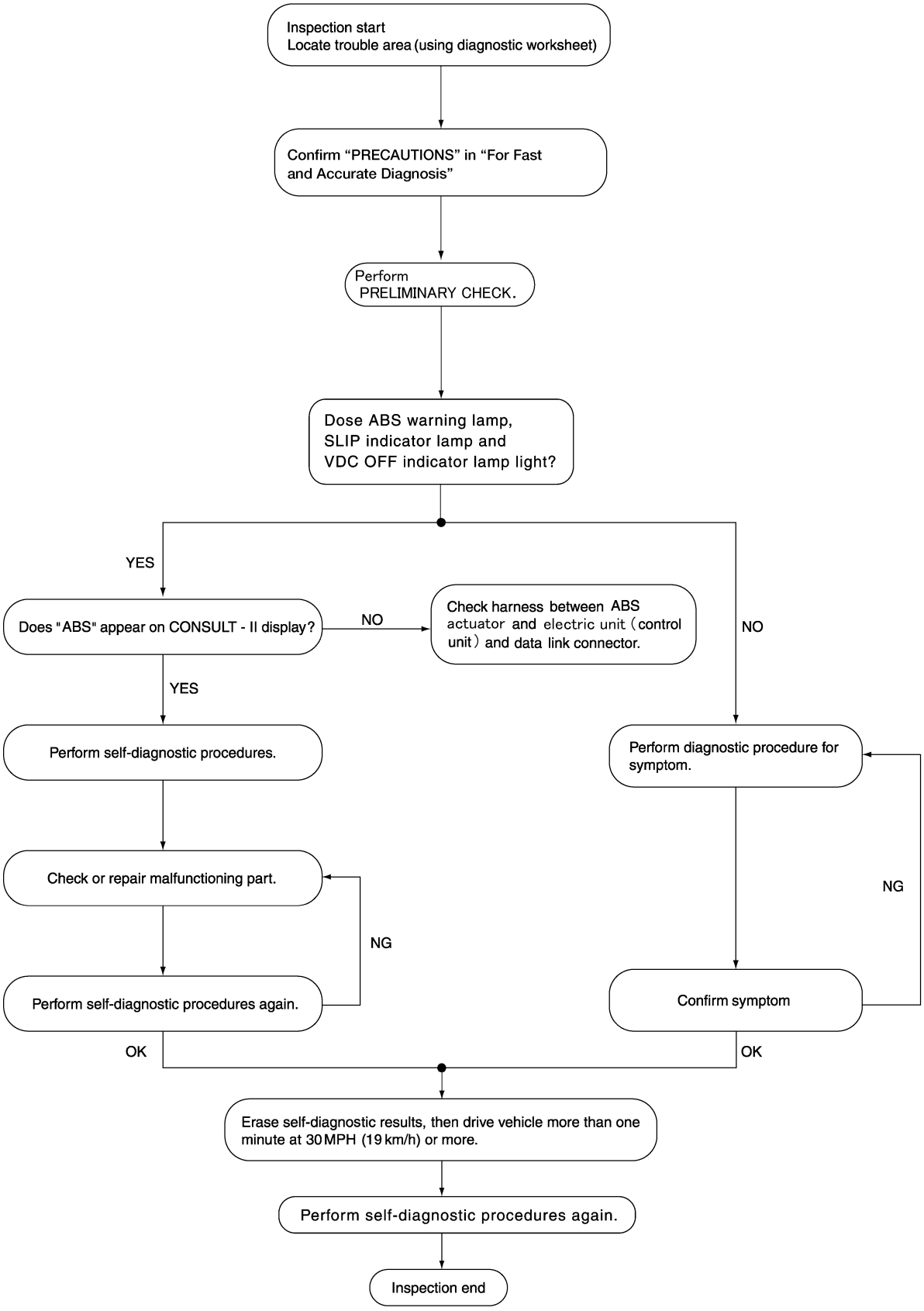
- It is essential to check symptoms right from beginning in order to repair a malfunction completely.
  For an intermittent malfunction, it is important to reproduce symptom based on interview with customer and past examples. Do not perform inspection on ad hoc basis. Most intermittent malfunctions are caused by poor contacts. In this case, it will be effective to shake suspected harness or connector by hand. When repairs are performed without any symptom check, no one can judge if malfunction has actually been eliminated.
- After diagnosis, make sure to perform “erase memory”. Refer to BRC-72, "Operation Procedure" .
- For an intermittent malfunction, move harness or harness connector by hand to check poor contact or false open circuit.



SEF233G

- Always read “GI General Information” to confirm general precautions. Refer to GI-4, "General Precautions" .

DIAGNOSIS FLOWCHART



PFIA0464E

ASKING COMPLAINTS

- Complaints against malfunction vary depending on each person. It is important to clarify customer complaints.
- Ask customer about what symptoms are present and under what conditions. Use information to reproduce symptom while driving.
- It is also important to use the diagnosis sheet so as not to miss information.

KEY POINTS

WHAT ..... Vehicle model
WHEN ..... Date, Frequencies
WHERE ..... Road conditions
HOW ..... Operating conditions, Weather conditions, Symptoms

SBR339B

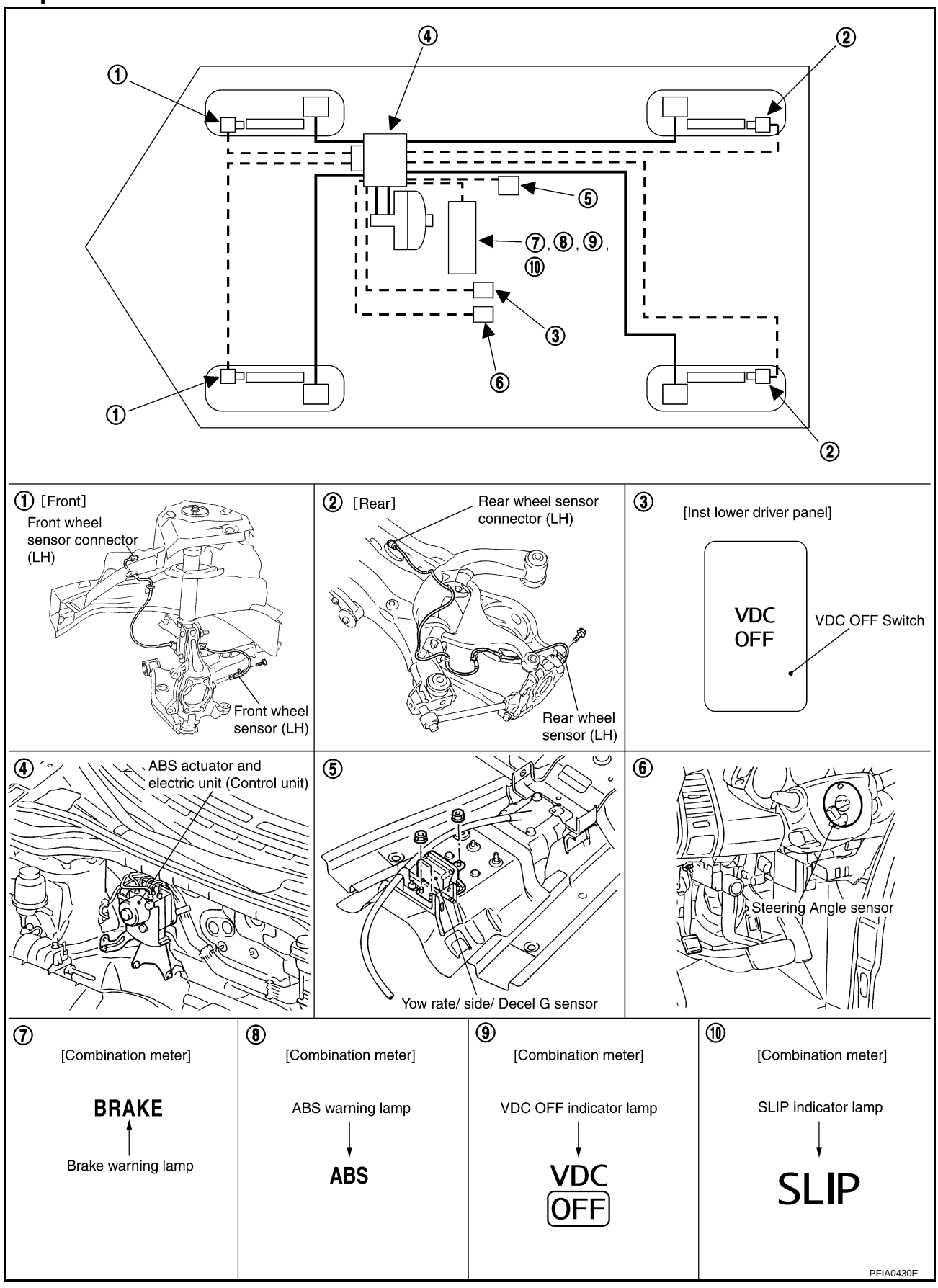
EXAMPLE OF DIAGNOSIS SHEET

Customer name MR/MS	Model & Year		VIN
Engine #	Trans.		Mileage
Incident Date	Manuf. Date		In Service Date
Symptoms	☐ Noise and vibration (from engine compartment) ☐ Noise and vibration (from axle)	☐ Warning / Indicator activate	☐ Firm pedal operation Large stroke pedal operation
	☐ ABS does not work (Wheels lock when braking)	☐ ABS does not work (wheels slip when braking)	☐ Lack of sense of acceleration
Engine conditions	☐ When starting ☐ After starting		
Road conditions	☐ Low friction road (☐Snow ☐Gravel ☐Other) ☐ Bumps / potholes		
Driving conditions	☐ Full-acceleration ☐ High speed cornering ☐ Vehicle speed: Greater than 10 km/h (6 MPH) ☐ Vehicle speed: 10 km/h (6 MPH) or less ☐ Vehicle is stopped		
Applying brake conditions	☐ Suddenly ☐ Gradually		
Other conditions	☐ Operation of electrical equipment ☐ Shift change ☐ Other descriptions		

LFIA0176E

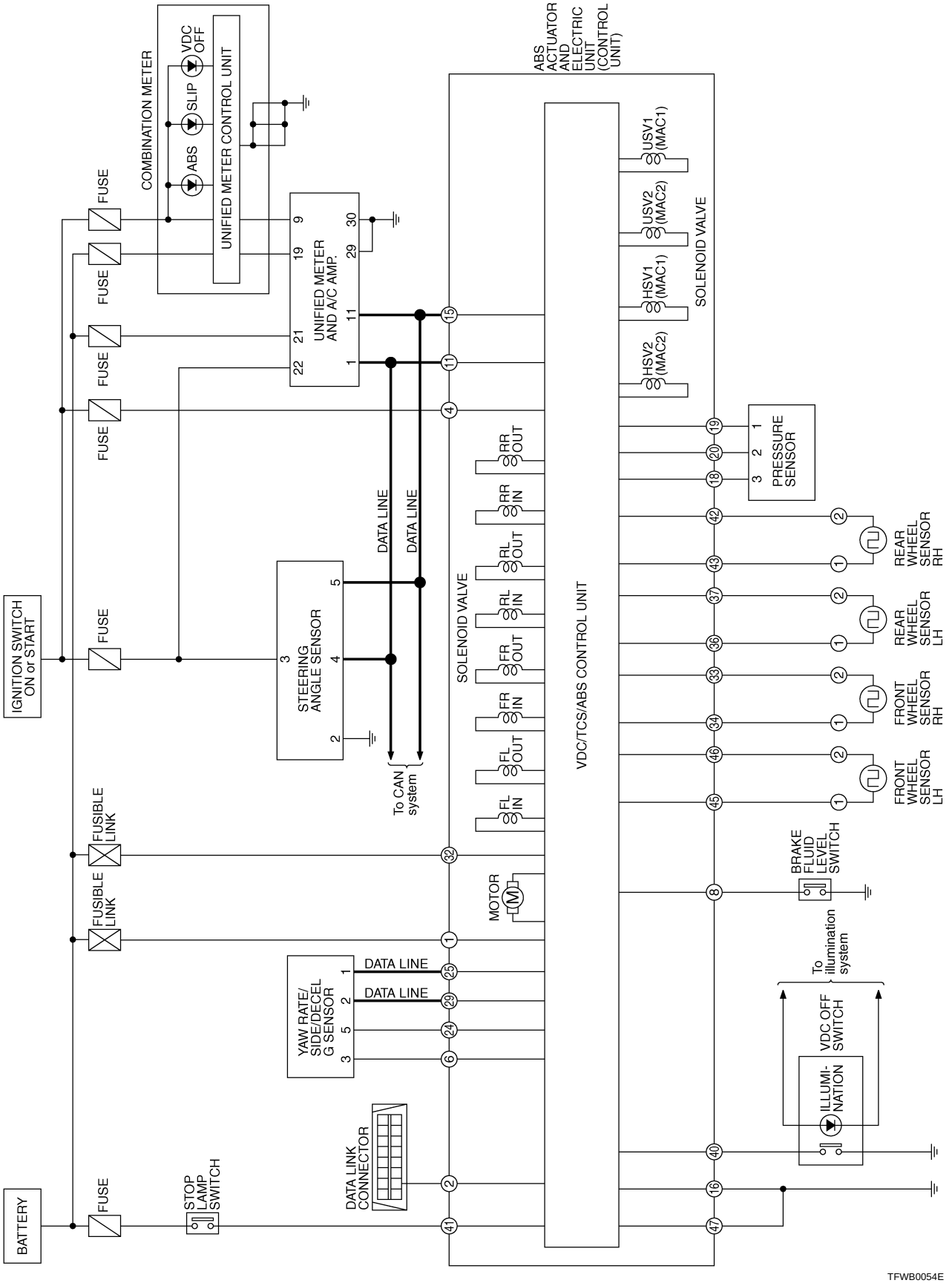
Component Installation Location

AFS001ZX



Schematic

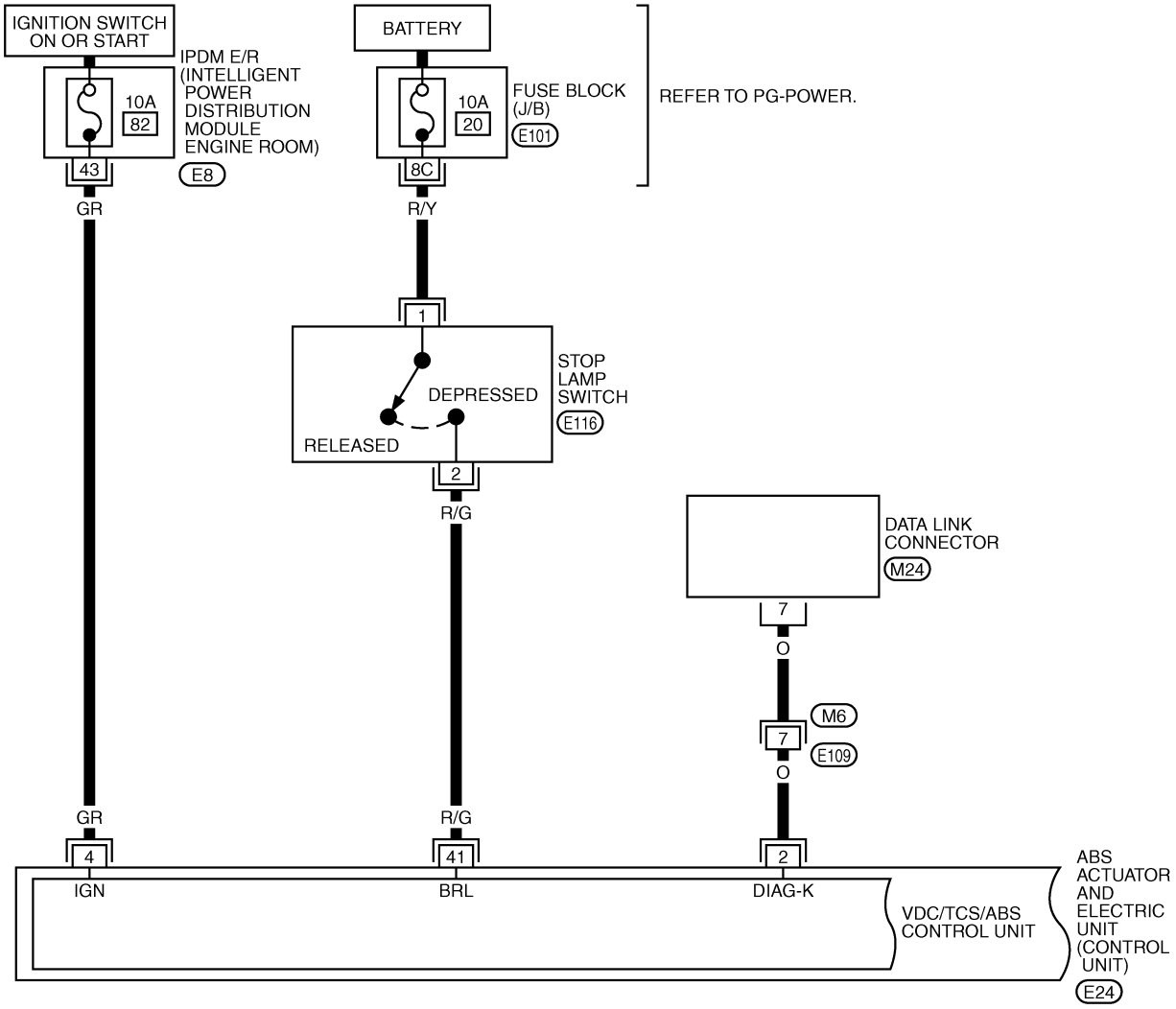
AFS001ZY

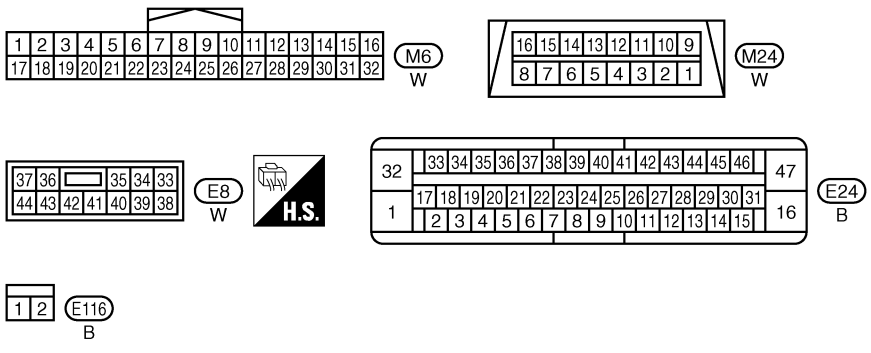


Wiring Diagram — VDC —

AFS001ZZ

BRC-VDC-01

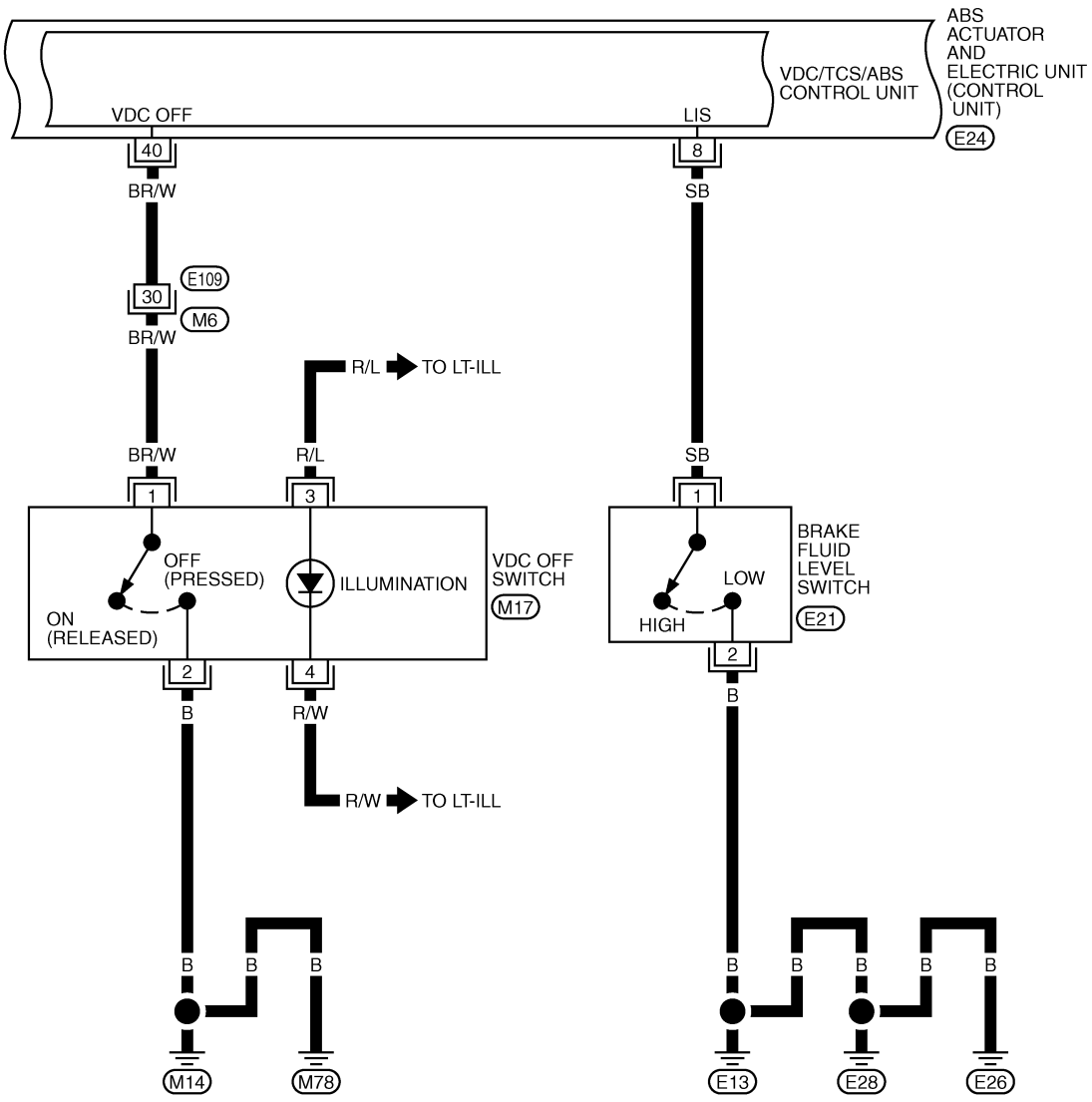


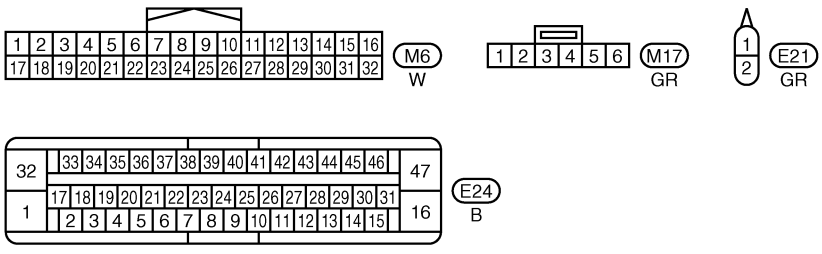


REFER TO THE FOLLOWING.
E101 -FUSE BLOCK-JUNCTION BOX (J/B)

TFWB0037E

BRC-VDC-02

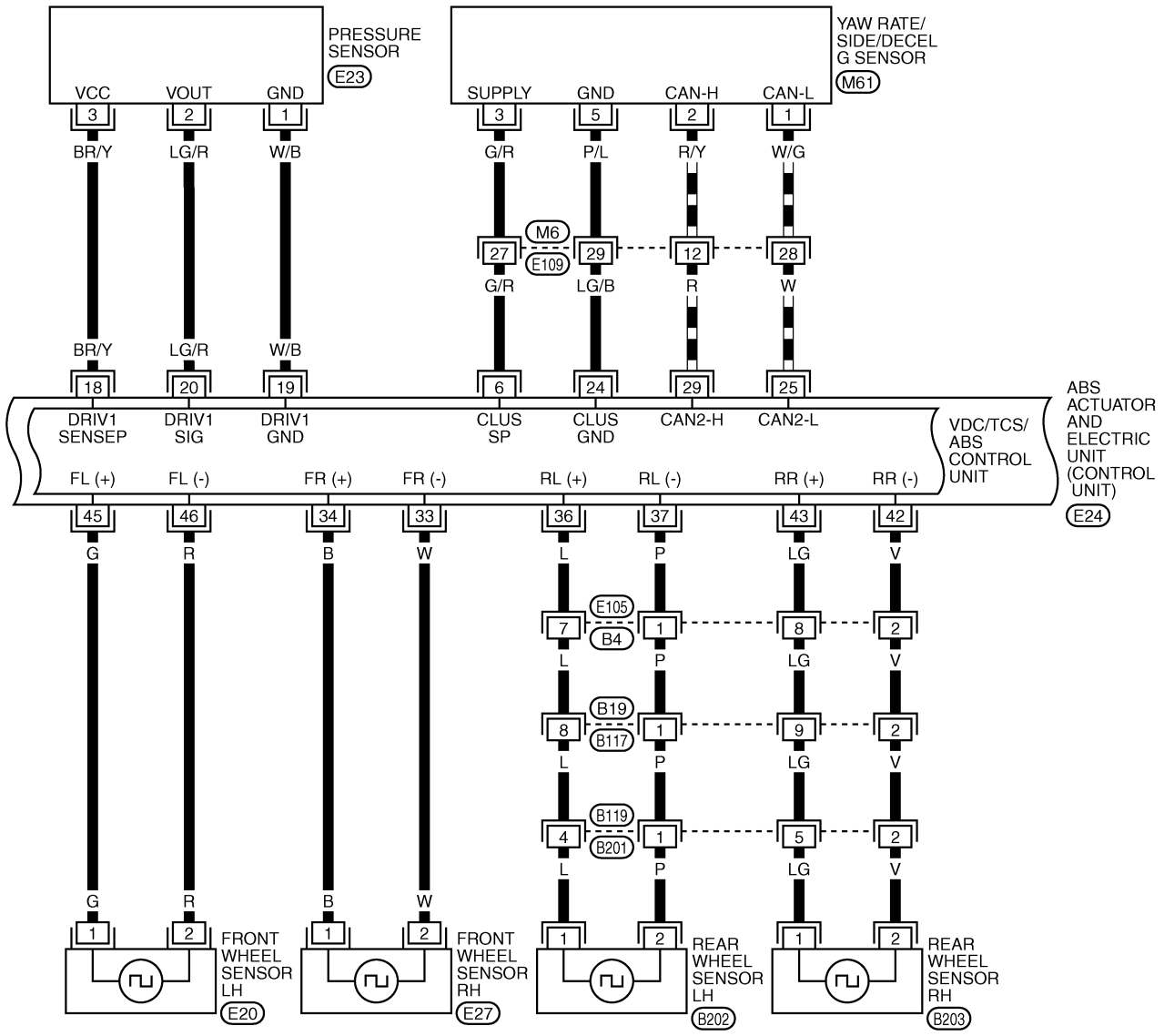


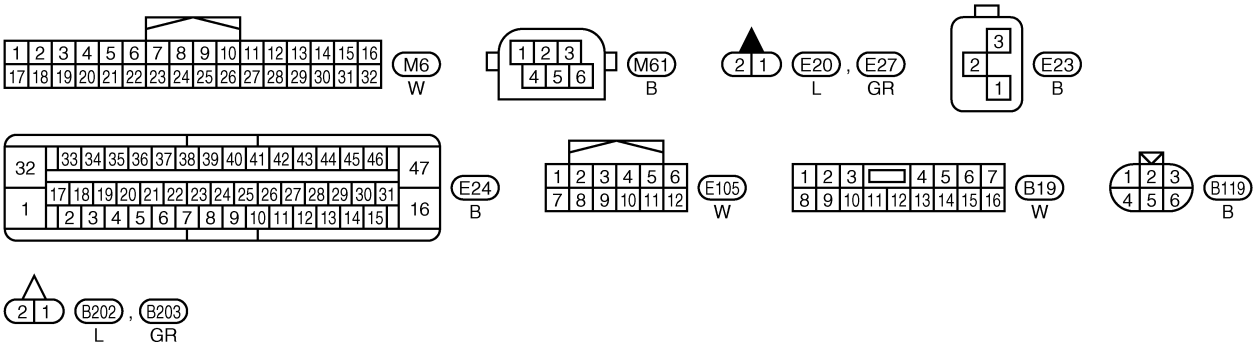


TFWB0038E

BRC-VDC-03

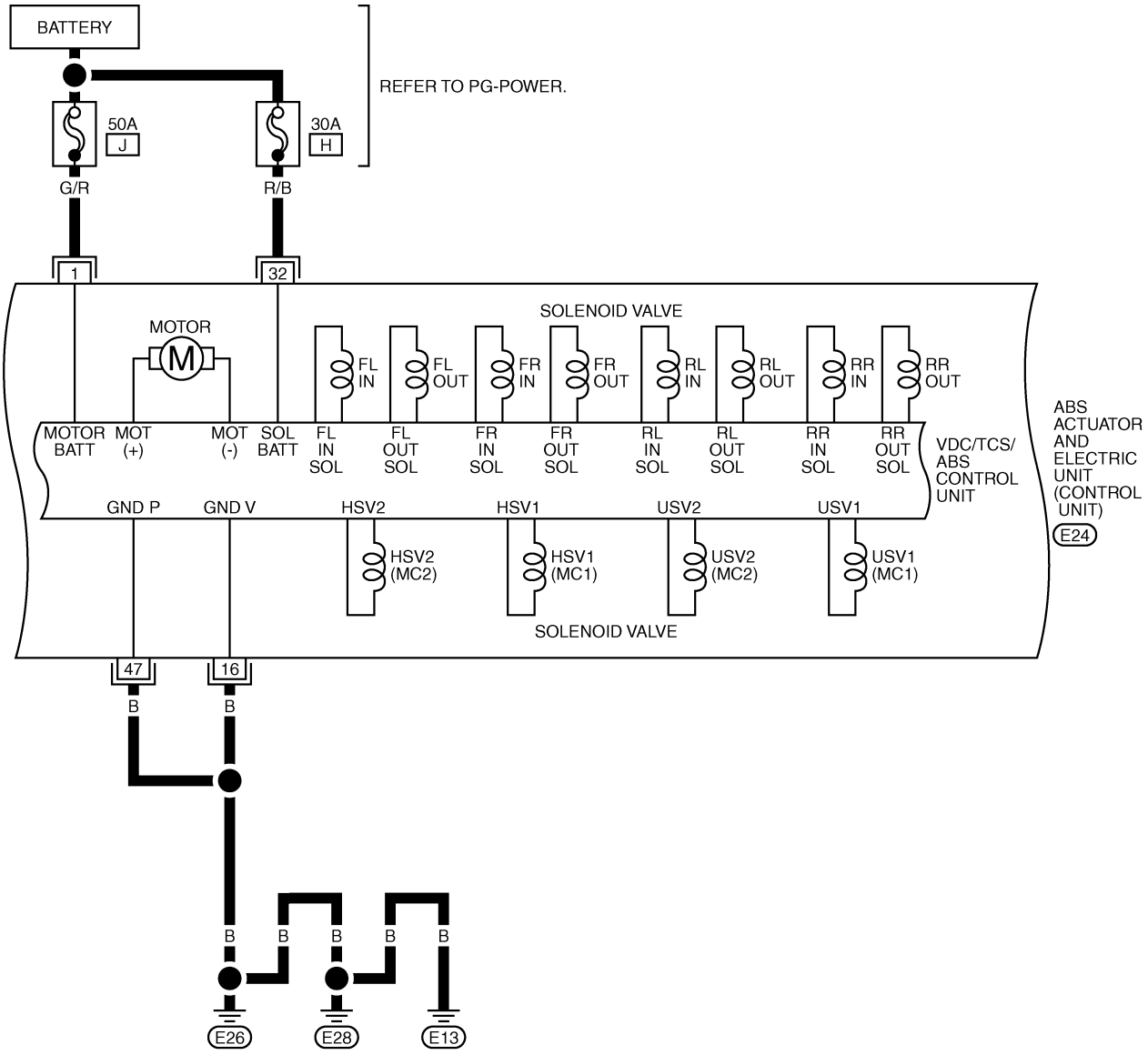
: DATA LINE

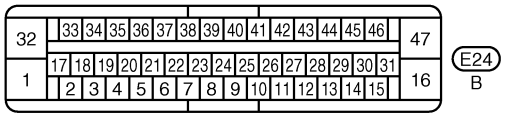




TFWB0039E

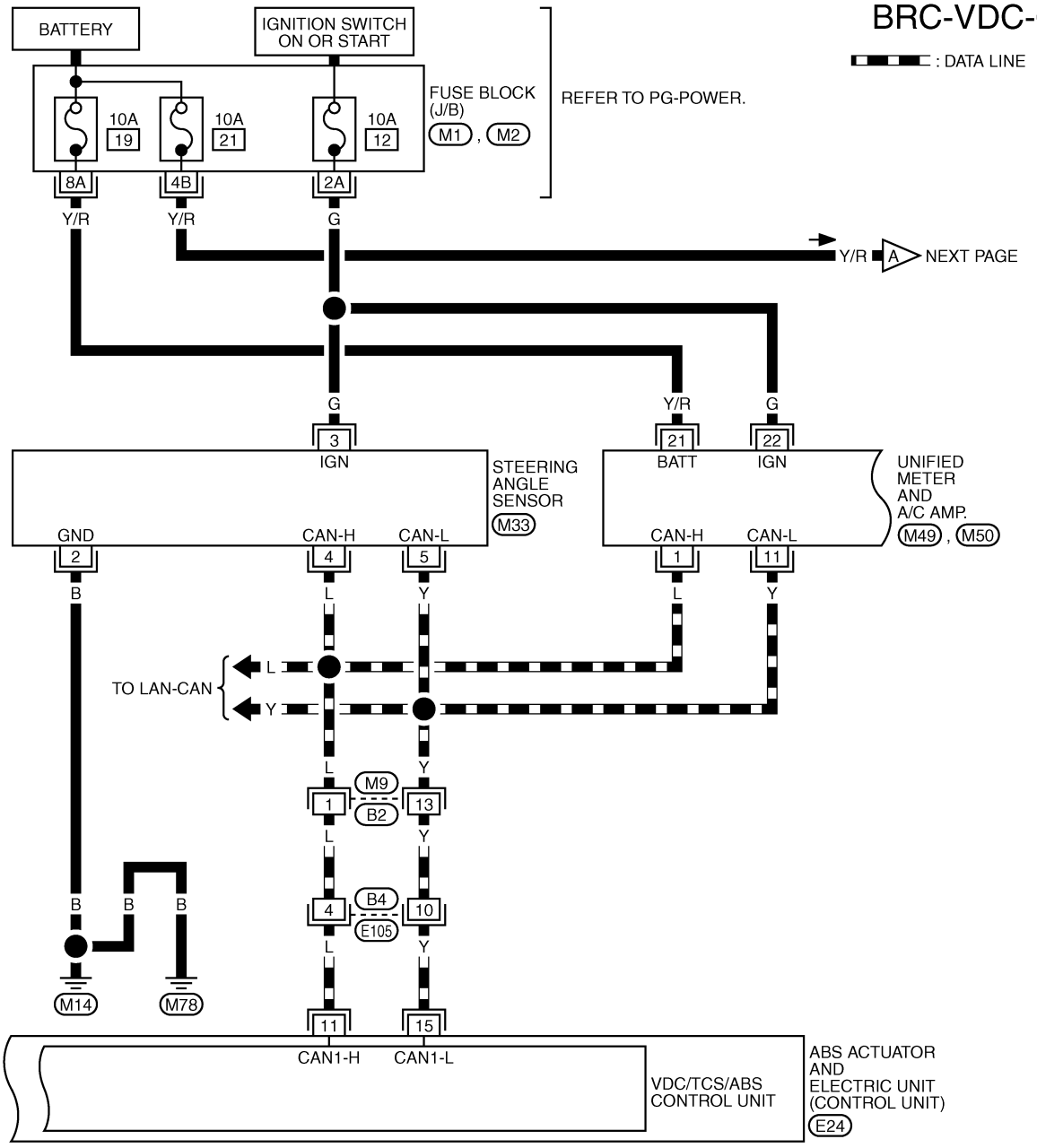
BRC-VDC-04

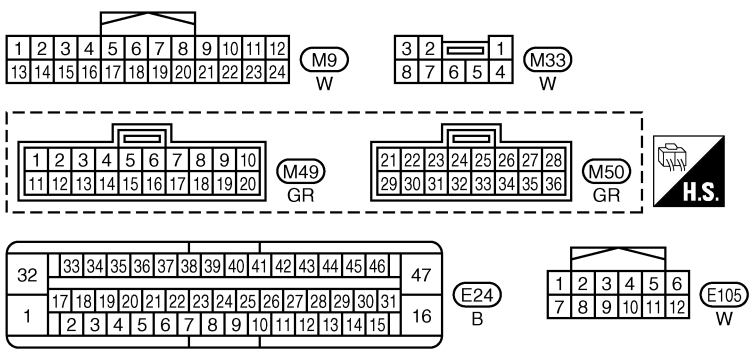




TFWA0069E

BRC-VDC-05

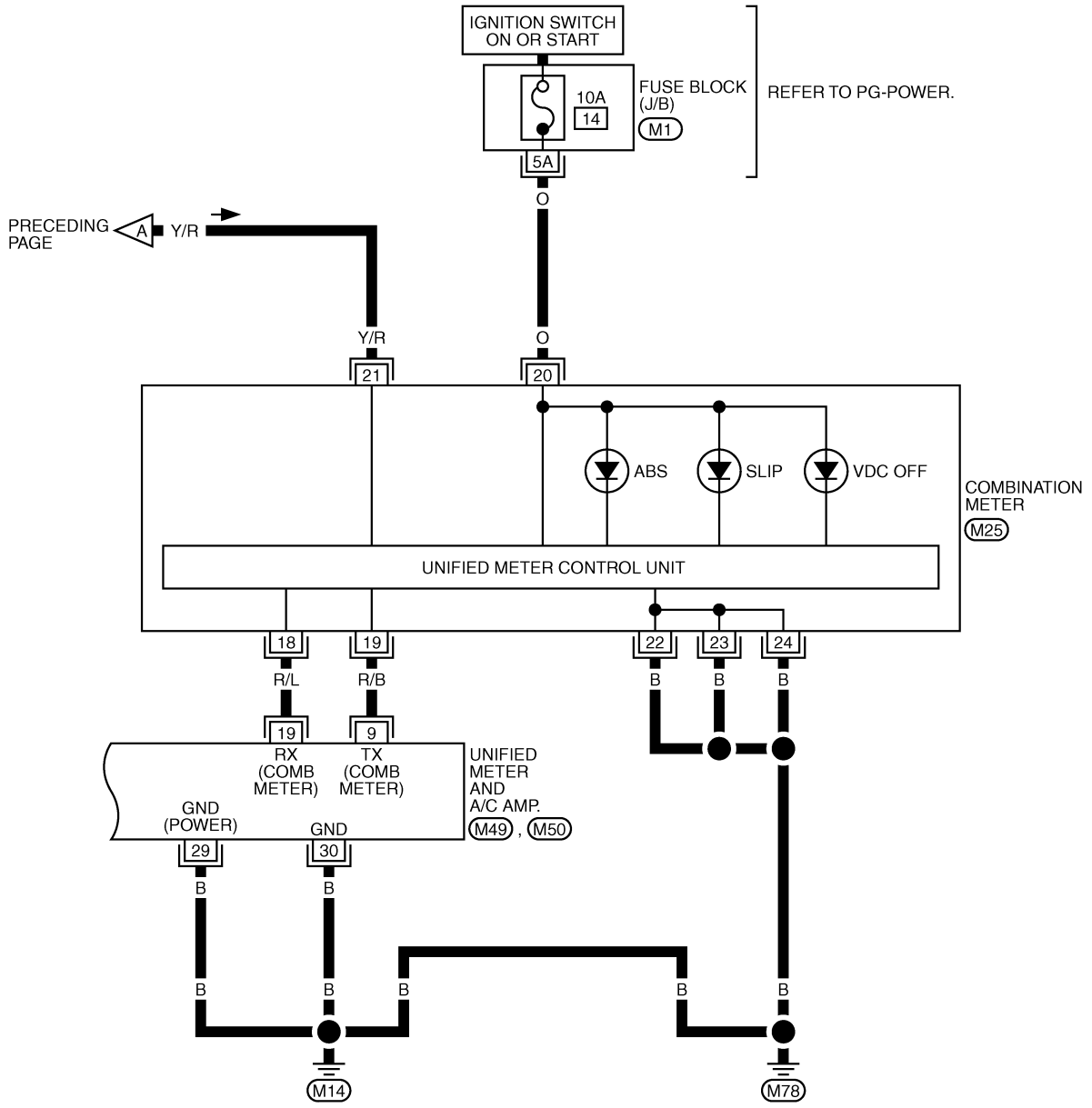


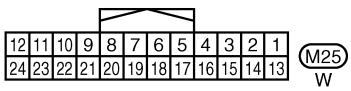


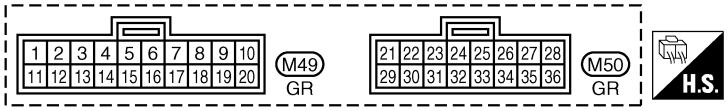
REFER TO THE FOLLOWING.
M1 , M2 -FUSE BLOCK-JUNCTION BOX (J/B)

TFWB0040E

BRC-VDC-06







REFER TO THE FOLLOWING.
M1 -FUSE BLOCK-JUNCTION BOX (J/B)

TFWA0071E

Control Unit Input/Output Signal Standard

AFS00200

REFERENCE VALUE FROM CONSULT-II

CAUTION:

The display shows the control unit calculation data, so a normal value might be displayed even in the event the output circuit (harness) is open or short - circuited.

Monitor item	Display content	Data monitor		Check item
		Condition	Reference value in normal operation	
SLCT LVR POSI	Select shift position	CVT shift position = P, R, D, L, N position	Display selected shift position one of P, R, D, L, and N.	–
		S position	##	
FR RH SENSOR FR LH SENSOR RR RH SENSOR RR LH SENSOR	Wheel speed	Vehicle stopped	0 [km/h]	BRC-84, "Inspection 1 Wheel Sensor Circuit"
		Vehicle running (Note 1)	Almost in accordance with speedometer display (within ± 10%)	
ACCEL POS SIG	Open/close condition of throttle valve (linked with accelerator pedal).	Accelerator pedal not depressed (ignition switch is ON)	0%	Communication circuit between ABS actuator and electric unit (control unit) and ECM
		Depress accelerator pedal (ignition switch is ON)	0 - 100%	
ENGINE SPEED	With engine running	With engine stopped	0 rpm	BRC-86, "Inspection 2 Engine System"
		Engine running	Almost in accordance with tachometer display	
STR ANGLE SIG	Steering angle detected by steering angle sensor	Straight-ahead	Approx. 0°	BRC-90, "Inspection 5 Steering Angle Sensor Circuit"
		Steering wheel turned	–756 - 756°	
YAW RATE SEN	Yaw rate detected by yaw rate/side G sensor	Vehicle stopped	Approx. 0 d/s	BRC-91, "Inspection 6 Yaw Rate/Side/Decel G sensor Circuit"
		Vehicle running	–100 - 100 d/s	
SIDE G SENSOR	Transverse G detected by yaw rate/side G sensor	Vehicle stopped	Approx. 0 m/s^2	BRC-91, "Inspection 6 Yaw Rate/Side/Decel G sensor Circuit"
		Vehicle running	–16.7 - 16.7 m/s^2	
PRESS SENSOR	Brake fluid pressure detected by pressure sensor	With ignition switch turned ON and brake pedal released	Approx. 0 bar	BRC-88, "Inspection 4 Pressure Sensor Circuit"
		With ignition switch turned ON and brake pedal depressed	–0 - 170 bar	
BATTERY VOLT	Battery voltage supplied to ABS actuator and electric unit (control unit)	Ignition switch ON	10 - 16 V	BRC-95, "Inspection 9 ABS Actuator and Electric Unit (Control Unit) Power Supply and Ground Circuit"
STOP LAMP SW	Brake pedal operation	Brake pedal depressed	ON	BRC-96, "Inspection 10 Stop Lamp Switch Circuit"
		Brake pedal not depressed	OFF	
OFF SW	VDC OFF switch ON/OFF status	VDC OFF switch ON (When VDC OFF indicator lamp is ON)	ON	BRC-100, "VDC OFF SWITCH"
		VDC OFF switch OFF (When VDC OFF indicator lamp is OFF)	OFF	

Monitor item	Display content	Data monitor		Check item
		Condition	Reference value in normal operation	
ABS WARN LAMP	ABS warning lamp ON condition (Note 2)	ABS warning lamp ON	ON	BRC-82, "BASIC INSPECTION 3 ABS WARNING LAMP, VDC OFF INDICATOR LAMP, SLIP INDICATOR LAMP INSPECTION"
		ABS warning lamp OFF	OFF	
MOTOR RELAY	Operation status of motor and motor relay	Ignition switch ON or engine running (ABS not operated)	OFF	BRC-94, "Inspection 8 Actuator Motor, Motor Relay, and Circuit"
		Ignition switch ON or engine running (ABS operated)	ON	
ACTUATOR RLY	Actuator relay operation status	Vehicle stopped (Ignition switch ON)	OFF	BRC-94, "Inspection 8 Actuator Motor, Motor Relay, and Circuit"
		Vehicle stopped (Engine running)	ON	
OFF LAMP	VDC OFF indicator lamp status (Note 3)	When VDC OFF indicator lamp is ON	ON	BRC-99, "Inspection 16 VDC OFF Indicator Lamp Does Not Illuminate"
		When VDC OFF indicator lamp is OFF	OFF	
SLIP LAMP	SLIP indicator lamp status (Note 4)	When SLIP indicator lamp is ON	ON	BRC-82, "BASIC INSPECTION 3 ABS WARNING LAMP, VDC OFF INDICATOR LAMP, SLIP INDICATOR LAMP INSPECTION"
		When SLIP indicator lamp is blinking		
		When SLIP indicator lamp is OFF	OFF	
FR LH IN SOL FR LH OUT SOL FR RH IN SOL FR RH OUT SOL RR RH IN SOL RR RH OUT SOL RR LH IN SOL RR LH OUT SOL	Solenoid valve operation	Actuator (solenoid) is active (“ACTIVE TEST” with CONSULT-II) or actuator relay is inactive (in fail-safe mode).	ON	BRC-93, "Inspection 7 Solenoid and VDC Change-Over Valve Circuit"
		When actuator (solenoid) is not active and actuator relay is active (ignition switch ON).	OFF	
CV1 CV2 SV1 SV2	VDC/TCS switch-over valve status	When actuator (switch-over valve) is active (“ACTIVE TEST” with CONSULT-II) or actuator relay is inactive (when in fail-safe mode).	ON	
		When actuator (switch-over valve) is not active and actuator relay is active (ignition switch ON).	OFF	
DECEL G-SEN	Longitudinal acceleration detected by Decel G Sensor (Note5)	Vehicle stopped	Approx. 0G	BRC-91, "Inspection 6 Yaw Rate/Side/Decel G sensor Circuit"
		Vehicle running	-1.7 - +1.7G	
FLUID LEV SW	ON/OFF status of brake fluid level switch	When brake fluid level switch ON	ON	BRC-97, "Inspection 11 Brake Fluid Level Sensor Circuit"
		When brake fluid level switch OFF	OFF	

Monitor item	Display content	Data monitor		Check item
		Condition	Reference value in normal operation	
VDC FAIL SIG TCS FAIL SIG ABS FAIL SIG EBD FAIL SIG	Fail signal status	VDC fail TCS fail ABS fail EBD fail	ON	VDC system TCS system ABS system EBD system
		VDC normal TCS normal ABS normal EBD normal	OFF	
EBD WARN LAMP	Brake warning lamp on condition (Note 6)	Brake warning lamp ON	ON	BRC-82, "BASIC INSPECTION 3 ABS WARNING LAMP, VDC OFF INDICATOR LAMP, SLIP INDICATOR LAMP INSPECTION"
		Brake warning lamp OFF	OFF	
EBD SIGNAL	EBD operation	EBD active	ON	–
		EBD not active	OFF	
ABS SIGNAL	ABS operation	ABS active	ON	
		ABS not active	OFF	
TCS SIGNAL	TCS operation	TCS active	ON	
		TCS not active	OFF	
VDC SIGNAL	VDC operation	VDC active	ON	
		VDC not active	OFF	
CRANKING SIG	CRANKING status	Cranking	ON	
		Not cranking	OFF	
4WD FAIL REQ	ETS fail status (Note 5)	ETS fail	ON	–
		ETS normal	OFF	
2WD/4WD	Drive axle	2WD model	2WD	
		AWD model	4WD	

Note 1: Confirm tire pressure is normal.
Note 2: ON/OFF timing of ABS warning lamp
ON: After ignition switch is turned ON, or when a malfunction is detected.
OFF: After ignition switch is turned ON (when system is in normal operation) condition by VDC.
Note 3: ON/OFF timing of VDC OFF indicator lamp
ON: After ignition switch is turned ON, or when a malfunction is detected and VDC OFF switch is ON.
OFF: After ignition switch is turned ON (when system is in normal operation.) And when VDC OFF switch is OFF.
Note 4: SLIP indicator lamp ON/OFF timing
ON: After ignition switch is turned ON, or when a malfunction is detected.
OFF: After ignition switch is turned ON (when system is in normal operation) and VDC/TCS function is not activated.
Blinking: VDC/TCS function is active during driving
Note 5: Only AWD model.
Note 6: Serves as EBD warning lamp.

CONSULT-II Functions

AFS00201

CONSULT-II MAIN FUNCTION

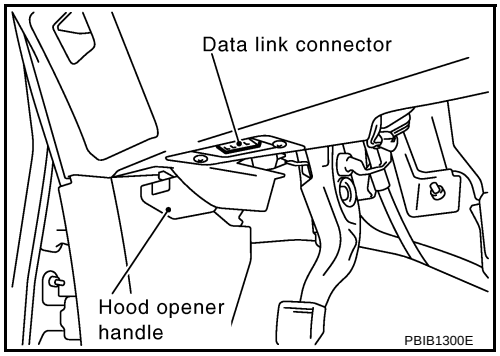
In a diagnosis function (main function), there are “WORK SUPPORT”, “SELF-DIAGNOSTIC RESULTS”, “DATA MONITOR”, “CAN DIAG SUPPORT MNTR”, “ACTIVE TEST”, “FUNCTION TEST”, “ECU PART NUMBER”.

Diagnostic test mode	Function	Reference
WORK SUPPORT	This mode enables a technician to adjust some devices faster and more accurately by following the indications on CONSULT-II.	BRC-49, "ON-VEHICLE SERVICE"
SELF-DIAGNOSTIC RESULTS	Self-diagnostic results can be read and erased quickly.	BRC-72, "SELF-DIAGNOSIS"
DATA MONITOR	Input/Output data in the ABS actuator and electric unit (control unit) can be read.	BRC-76, "DATA MONITOR"
CAN DIAG SUPPORT MNTR	The results of transmit/receive diagnosis of communication can be read.	—
ACTIVE TEST	Diagnostic Test Mode in which CONSULT-II drives some actuators apart from the ABS actuator and electric unit (control unit) and also shifts some parameters in a specified range.	BRC-79, "ACTIVE TEST"
FUNCTION TEST	Performed by CONSULT-II instead of a technician to determine whether each system is “OK” or “NG”.	—
ECU PART NUMBER	ABS actuator and electric unit (control unit) part number can be read.	—

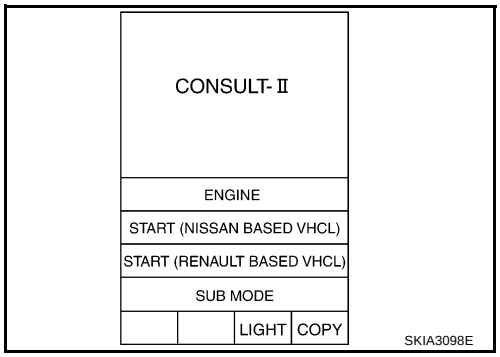
CONSULT-II BASIC OPERATION PROCEDURE

1. Turn ignition switch OFF.
2. Connect CONSULT-II and CONSULT-II CONVERTER to the data link connector.

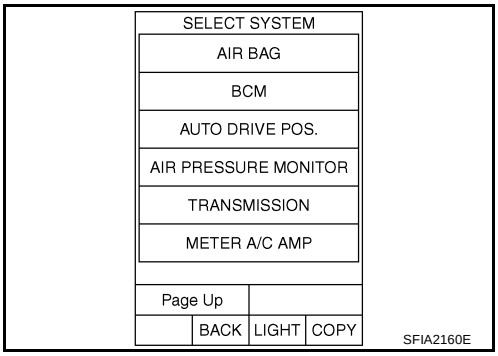
   CAUTION:
   If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which performs CAN communication.
3. Turn ignition switch ON.



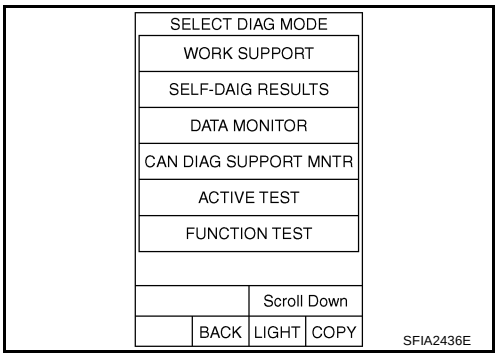
4. Touch “START (NISSAN BASED VHCL)”.



5. Touch “ABS” in the “SELECT SYSTEM” screen.
If “ABS” is not indicated, go to GI-39, "CONSULT-II Data Link Connector (DLC) Circuit" .



6. Select the required diagnostic location from the “SELECT DIAG MODE” screen.
For further information, see the CONSULT-II Operation Manual.



SELF-DIAGNOSIS

Description

If an error is detected in the system, ABS warning lamp, VDC OFF indicator lamp, SLIP indicator lamp on the combination meter turn on. In this case, perform self-diagnosis as follows.

Operation Procedure

1. Turn ignition switch OFF.
2. Connect CONSULT-II and CONSULT-II CONVERTER to the data link connector.

   CAUTION:
   If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which performs CAN communication.

3. Turn ignition switch ON.
4. Start engine and drive at approximately 30 km/h (19 MPH) or more for approximately 1 minute.
5. After stopping the vehicle, with engine running at idle speed, touch “START (NISSAN BASED VHCL)”, “ABS”, “SELF-DIAG RESULTS” in order on the CONSULT-II screen.
   If “ABS” is not indicated, go to GI-39, "CONSULT-II Data Link Connector (DLC) Circuit" .

   CAUTION:
   - **If there is no error during CONSULT-II use, ABS warning lamp, VDC OFF indicator lamp, SLIP indicator lamp may be turned ON/OFF.**
   - **If “START (NISSAN BASED VHCL)” is touched immediately after starting engine or turning on ignition switch, “ABS” might not be displayed in the System Selection screen. In this case, repeat the operation from step 1. If it connect be shown after several attempts, ABS actuator and electric unit (control unit) may have malfunction. Repair or replace control unit.**
6. The self-diagnostic results are displayed. (If necessary, the self-diagnostic results can be printed out by touching “PRINT”.)
   - When “NO FAILURE” is displayed, check ABS warning lamp, VDC OFF indicator lamp, and SLIP indicator lamp.
7. Conduct the appropriate inspection from the display item list, and repair or replace the malfunctioning component.
8. Start engine and drive at approximately 30 km/h (19 MPH) or more for approximately 1 minute.

   CAUTION:
   - **When a wheel sensor “short-circuit” is detected, if the vehicle is not driven at 30 km/h (19 MPH) for at least 1 minute, ABS warning lamp will not turn off even if everything is normal.**
   - **Check again to make sure that there is no malfunction on other parts.**
9. Turn ignition switch OFF to prepare for erasing the memory.
10. Start engine and touch “START (NISSAN BASED VHCL)”, “ABS”, “SELF-DIAG RESULTS”, “ERASE MEMORY” in order on the CONSULT-II screen to erase the error memory.

    CAUTION:
    If the error memory is not erased, re-conduct the operation from step 5.
11. For final inspection, drive at approximately 30 km/h (19 MPH) or more for approximately 1 minute and confirm that ABS warning lamp, VDC OFF indicator lamp, and SLIP indicator lamp are OFF.

    CAUTION:
    VDC “OFF” switch should not stay in the “ON” position.

Display Item List

Self-diagnostic item	Malfunction detecting condition	Check item
FR LH SENSOR- 1 [C1104]	Circuit of front LH wheel sensor is open or sensor power voltage is unusual.	BRC-84, "Inspection 1 Wheel Sensor Circuit" (Note 1)
RR RH SENSOR- 1 [C1101	Circuit of rear RH wheel sensor is open or sensor power voltage is unusual.	
FR RH SENSOR- 1 [C1103]	Circuit of front RH wheel sensor is open or sensor power voltage is unusual.	
RR LH SENSOR- 1 [C1102]	Circuit of rear LH wheel sensor is open or sensor power voltage is unusual.	
FR LH SENSOR- 2 [C1108]	ABS actuator and electric unit (control unit) can not identify sensor pulses, because of large gap between wheel sensor and sensor rotor.	
RR RH SENSOR- 2 [C1105]	ABS actuator and electric unit (control unit) can not identify sensor pulses, because of large gap between wheel sensor and sensor rotor.	
FR RH SENSOR- 2 [C1107]	ABS actuator and electric unit (control unit) can not identify sensor pulses, because of large gap between wheel sensor and sensor rotor.	
RR LH SENSOR- 2 [C1106]	ABS actuator and electric unit (control unit) can not identify sensor pulses, because of large gap between wheel sensor and sensor rotor.	
STOP LAMP SW [C1116]	Stop lamp switch circuit is open or shorted.	BRC-96, "Inspection 10 Stop Lamp Switch Circuit"
PRESS SEN CIRCUIT [C1142]	Pressure sensor signal line is open or shorted, sensor power voltage is unusual, or pressure sensor is malfunctioning.	BRC-88, "Inspection 4 Pressure Sensor Circuit"
ST ANGLE SEN CIRCUIT [C1143]	Neutral position of steering angle sensor is dislocated, or steering angle sensor is malfunctioning.	BRC-98, "Inspection 12 When “ST ANG SEN SIGNAL” Appears on Self-Diagnosis Results Display"
YAW RATE SENSOR [C1145]	Yaw rate/side G sensor has generated an error, or yaw rate/side G sensor signal line is open or shorted.	BRC-91, "Inspection 6 Yaw Rate/Side/Decel G sensor Circuit"

Self-diagnostic item	Malfunction detecting condition	Check item
FR LH IN ABS SOL [C1120]	Circuit of front LH IN ABS solenoid is open or shorted, or control line is open or shorted to power supply or ground.	BRC-93, "Inspection 7 Solenoid and VDC Change-Over Valve Circuit"
FR LH OUT ABS SOL [C1121]	Circuit of front LH OUT ABS solenoid is open or shorted, or control line is open or shorted to power supply or ground.	
RR RH IN ABS SOL [C1126]	Circuit of rear RH IN ABS solenoid is open or shorted, or control line is open or shorted to power supply or ground.	
RR RH OUT ABS SOL [C1127]	Circuit of rear RH OUT ABS solenoid is open or shorted, or control line is open or shorted to power supply or ground.	
FR RH IN ABS SOL [C1122]	Circuit of front RH IN ABS solenoid is open or shorted, or control line is open or shorted to power supply or ground.	
FR RH OUT ABS SOL [C1123]	Circuit of front RH OUT ABS solenoid is open or shorted, or control line is open or shorted to power supply or ground.	
RR LH IN ABS SOL [C1124]	Circuit of rear LH IN ABS solenoid is open or shorted, or control line is open or shorted to power supply or ground.	
RR LH OUT ABS SOL [C1125]	Circuit of rear LH OUT ABS solenoid is open or shorted, or control line is open or shorted to power supply or ground.	
CV1 [C1164]	Front side VDC switch-over solenoid valve (cut valve 1) is open or shorted, or control line is open or shorted to power supply or ground.	
CV2 [C1165	Rear side VDC switch-over solenoid valve (cut valve 2) is open or shorted, or control line is open or shorted to power supply or ground.	
SV1 [C1166]	Front side VDC switch-over solenoid valve (suction valve 1) is open or shorted, or control line is open or shorted to power supply or ground.	
SV2 [C1167]	Rear side VDC switch-over solenoid valve (suction valve 2) is open or shorted, or control line is open or shorted to power supply or ground.	
PUMP MOTOR (Note 3) [C1111]	During actuator motor operation with ON, when actuator motor turns OFF or when control line for actuator motor relay is open.	BRC-94, "Inspection 8 Actuator Motor, Motor Relay, and Circuit"
	During actuator motor operation with OFF, when actuator motor turns ON or when control line for relay is shorted to ground.	
ABS SENSOR [MALFUNCTION SIGNAL] [C1115]	Wheel sensor input is malfunction.	BRC-84, "Inspection 1 Wheel Sensor Circuit" (Note 1)
BATTERY VOLTAGE [MALFUNCTION] [C1109]	ABS actuator and electric unit (control unit) power voltage is too low.	BRC-95, "Inspection 9 ABS Actuator and Electric Unit (Control Unit) Power Supply and Ground Circuit"
ST ANGLE SEN SIGNAL [C1144]	Neutral position correction of steering angle sensor is not finished.	BRC-98, "Inspection 12 When “ST ANG SEN SIGNAL” Appears on Self-Diagnosis Results Display"
ST ANG SEN COM CIR [C1156]	CAN communication line or steering angle sensor has generated an error.	
SIDE G-SEN CIRCUIT [C1146]	Yaw rate/side G sensor is malfunctioning, or signal line of yaw rate/side G sensor is open or shorted.	BRC-91, "Inspection 6 Yaw Rate/Side/Decel G sensor Circuit"
CONTROLLER FAILURE [C1110]	Internal malfunction of ABS actuator and electric unit (control unit)	BRC-87, "Inspection 3 VDC/TCS/ABS Control Unit Circuit"

Self-diagnostic item	Malfunction detecting condition	Check item
CAN COMM CIRCUIT [U1000]	● CAN communication line is open or shorted. ● ABS actuator and electric unit (control unit) internal malfunction ● Battery voltage for EMC is suddenly interrupted for approximately 0.5 seconds or more.	BRC-98, "Inspection 13 CAN Communication Circuit" (Note 2)
BR FLUID LEVEL LOW [C1155]	Brake fluid level drops or circuit between ABS actuator and electric unit (control unit) and brake fluid level switch is open or shorted.	BRC-97, "Inspection 11 Brake Fluid Level Sensor Circuit"
VARIANT CODING [C1170]	V coding is not functioning.	ABS actuator and electric unit (control unit) and circuit
G - SENSOR [C1113]	Decel G sensor is malfunctioning, or signal line of Decel G sensor is open or shorted.	BRC-91, "Inspection 6 Yaw Rate/Side/Decel G sensor Circuit"
ENGINE SIGNAL 1 [C1130]	Based on the signal from ECM, ABS actuator and electric unit (control unit) judges that engine fuel cut system is malfunctioning.	–
ENGINE SIGNAL 2 [C1131]	Based on the signal from ECM, ABS actuator and electric unit (control unit) judges that engine ETC system is malfunctioning.	–
ENGINE SIGNAL 3 [C1132]	Based on the signal from ECM, ABS actuator and electric unit (control unit) judges that engine CAN system is malfunctioning.	–
ENGINE SIGNAL 4 [C1133]	Based on the signal from ECM, ABS actuator and electric unit (control unit) judges that engine torque down system is malfunctioning.	–
ENGINE SIGNAL 6 [C1136]	Based on the signal from ECM, ABS actuator and electric unit (control unit) judges that engine control system is malfunctioning.	–
ACTUATOR RLY [C1140]	● Actuator solenoid valve relay is ON, even if control unit sends off signal. ● Actuator solenoid valve relay is OFF, even if control unit sends on signal.	BRC-94, "Inspection 8 Actuator Motor, Motor Relay, and Circuit"
DECEL G SEN SET [C1160]	Neutral position correction of Decel G -sensor is not finished.	BRC-99, "Inspection 14 When “DECEL G SEN SET” Appears on Self-Diagnosis Results Display"

Note 1: After completing repairs of shorted sensor circuit, when ignition switch is turned ON, ABS warning lamp turns on. Make sure that ABS warning lamp turns off while driving vehicle at approximately 30 km/h (19 MPH) or more for approximately 1 minute according to self-diagnosis procedure. In addition, if wheel sensor 2 is displayed for wheels, check wheel sensor circuit and also check control unit power voltage.
Note 2: If multiple malfunctions are detected including CAN communication line [U1000], perform diagnosis for CAN communication line first.

DATA MONITOR

Operation Procedure

1. Touch “ABS”, “DATA MONITOR” in order on CONSULT-II screen.
   If “ABS” is not indicated, go to GI-39, "CONSULT-II Data Link Connector (DLC) Circuit" .

   CAUTION:
   When “START (NISSAN BASED VHCL)” is touched immediately after starting engine or turning on ignition switch, “ABS” might not be displayed in system selection screen. In this case, repeat the operation from step 2.
2. Return to “SELECT MONITOR ITEM” screen, and touch “ECU INPUT SIGNALS”, “MAIN SIGNALS” or “SELECTION FROM MENU”. Refer to following information.
3. When “START” is touched, data monitor screen is displayed.

Display Item List

Monitor item	Monitor item selection			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
FR RH SENSOR (km/h)	×	×	×	Wheel speed calculated by front RH wheel sensor signal is displayed.
FR LH SENSOR (km/h)	×	×	×	Wheel speed calculated by front LH wheel sensor signal is displayed.
RR RH SENSOR (km/h)	×	×	×	Wheel speed calculated by rear RH wheel sensor signal is displayed.
RR LH SENSOR (km/h)	×	×	×	Wheel speed calculated by rear LH wheel sensor signal is displayed.
BATTERY VOLT (V)	×	×	×	Voltage supplied to ABS actuator and electric unit (control unit).
SLCT LVR POSI	×	×	×	Shift position judged by CVT PNP switch signal.
ACCEL POS SIG (%)	×	–	–	Throttle valve open/close status judged by CAN communication signal is displayed.
ENGINE SPEED (rpm)	×	×	×	Engine speed judged by CAN communication signal is displayed.
STR ANGLE SIG (°)	×	–	–	Steering angle detected by steering angle sensor is displayed.
YAW RATE SEN (d/s)	×	×	–	Yaw rate detected by yaw rate side G sensor is displayed.
DECEL G SEN (G) (Only AWD model)	×	×	×	Decel acceleration detected by Decel G sensor is displayed.
SIDE G-SENSOR (m/s^2)	×	–	–	Lateral acceleration detected by yaw rate/side G sensor is displayed.
PRESS SENSOR (bar)	×	–	–	Brake fluid pressure detected by pressure sensor is displayed.
STOP LAMP SW (ON/OFF)	×	×	×	Stop lamp switch (ON/OFF) status is displayed.
OFF SW (ON/OFF)	×	×	×	VDC OFF switch (ON/OFF) status is displayed.
ABS WARN LAMP (ON/OFF)	–	×	×	ABS warning lamp (ON/OFF) status is displayed.
SLIP LAMP (ON/OFF)	–	×	×	SLIP indicator lamp (ON/OFF) status is displayed.

Monitor item	Monitor item selection			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
FR LH IN SOL (ON/OFF)	–	×	×	Front LH IN ABS solenoid (ON/OFF) status is displayed.
FR LH OUT SOL (ON/OFF)	–	×	×	Front LH OUT ABS solenoid (ON/OFF) status is displayed.
RR RH IN SOL (ON/OFF)	–	×	×	Rear RH IN ABS solenoid (ON/OFF) status is displayed.
RR RH OUT SOL (ON/OFF)	–	×	×	Rear RH OUT ABS solenoid (ON/OFF) status is displayed.
FR RH IN SOL (ON/OFF)	–	×	×	Front RH IN ABS solenoid (ON/OFF) status is displayed.
FR RH OUT SOL (ON/OFF)	–	×	×	Front RH OUT ABS solenoid (ON/OFF) status is displayed.
RR LH IN SOL (ON/OFF)	–	×	×	Rear LH IN ABS solenoid (ON/OFF) status is displayed.
RR LH OUT SOL (ON/OFF)	–	×	×	Rear LH OUT ABS solenoid (ON/OFF) status is displayed.
OFF LAMP (ON/OFF)	–	×	×	OFF Lamp (ON/OFF) status is displayed.
MOTOR RELAY (ON/OFF)	–	×	×	ABS motor relay signal (ON/OFF) status is displayed.
ACTUATOR RLY (ON/OFF)	–	×	×	ABS actuator relay signal (ON/OFF) status is displayed.
CV1 (ON/OFF)	–	–	×	Front side switch-over solenoid valve (cut valve 1) (ON/OFF) status is displayed.
CV2 (ON/OFF)	–	–	×	Rear side switch-over solenoid valve (cut-valve 2) (ON/OFF) status is displayed.
SV1 (ON/OFF)	–	–	×	Front side switch-over solenoid valve (suction valve 1) (ON/OFF) status is displayed.
SV2 (ON/OFF)	–	–	×	Rear side switch-over solenoid valve (suction valve 2) (ON/OFF) status is displayed.
VDC FAIL SIG (ON/OFF)	–	–	×	VDC fail signal (ON/OFF) status is displayed.
TCS FAIL SIG (ON/OFF)	–	–	×	TCS fail signal (ON/OFF) status is displayed.
ABS FAIL SIG (ON/OFF)	–	–	×	ABS fail signal (ON/OFF) status is displayed.
EBD FAIL SIG (ON/OFF)	–	–	×	EBD fail signal (ON/OFF) status is displayed.
FLUID LEV SW (ON/OFF)	×	–	–	Brake fluid level switch (ON/OFF) status is displayed.
EBD SIGNAL (ON/OFF)	–	–	×	EBD operation (ON/OFF) status is displayed.
ABS SIGNAL (ON/OFF)	–	–	×	ABS operation (ON/OFF) status is displayed.
TCS SIGNAL (ON/OFF)	–	–	×	TCS operation (ON/OFF) status is displayed.
VDC SIGNAL (ON/OFF)	–	–	×	VDC operation (ON/OFF) status is displayed.

Monitor item	Monitor item selection			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
EBD WARN LAMP (ON/OFF)	–	–	×	Brake warning lamp (ON/OFF) status is displayed. (Note)
CRANKING SIG (ON/OFF)	–	–	×	Cranking condition (ON/OFF) status is displayed.
4WD FAIL REQ (ON/OFF)	–	–	×	AWD fail-safe signal (ON/OFF) status is displayed.
2WD/4WD (2WD/4WD)	–	–	×	Distinguish 2WD and AWD

×: Applicable
–: Not applicable
Note: Serves as EBD warning lamp.

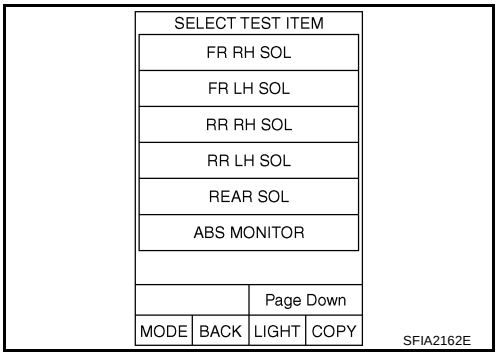
ACTIVE TEST

CAUTION:

- **Do not perform active test while driving vehicle.**
- **Make sure to completely bleed air from the brake system.**
- **Active test can not be performed when ABS warning lamp is on.**
- **ABS and brake warning lamps turn on during the active test.**

Operation Procedure

1. Touch “ABS”.
   If “ABS” is not indicated, go to GI-39, "CONSULT-II Data Link Connector (DLC) Circuit" .
2. Touch “ACTIVE TEST”.
3. Test item selection screen is displayed.
4. Touch necessary test item.



5. With “SELECT TEST SIGNALS” display shown in reverse, touch “START”.
6. “ACTIVE TEST” screen will be displayed, so conduct following test.

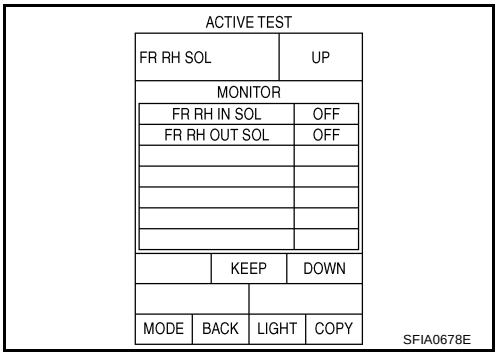
Test Item

Solenoid valve

CAUTION:

The example shown is for front right wheel. The procedure for the other wheels is the same as given below.

1. For ABS solenoid valve, touch “UP”, “KEEP”, and “DOWN”. Then use screen monitor to check that solenoid valve operates as shown in Solenoid Valve Operation Chart. Refer to “Solenoid Valve Operation Chart”.



Solenoid Valve Operation Chart

Operation	ABS solenoid valve			ABS solenoid valve (ACT)		
	UP	KEEP	DOWN	UP	ACTUATOR UP	ACTUATOR KEEP
FR RH IN SOL	OFF	ON	ON	OFF	OFF	OFF
FR RH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
FR LH IN SOL	OFF	ON	ON	OFF	OFF	OFF
FR LH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
RR RH IN SOL	OFF	ON	ON	OFF	OFF	OFF
RR RH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
RR LH IN SOL	OFF	ON	ON	OFF	OFF	OFF
RR LH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
Primary side VDC switch over valve 1 (SV 1)	OFF	OFF	OFF	OFF	ON*	OFF
Primary side VDC switch over valve 1 (CV 1)	OFF	OFF	OFF	OFF	ON	ON
Secondary side VDC switch over valve 2 (SV 2)	OFF	OFF	OFF	OFF	ON*	OFF
Secondary side VDC switch over valve 2 (CV 2)	OFF	OFF	OFF	OFF	ON	ON

*: ON for 1 to 2 seconds after the touch, and then OFF

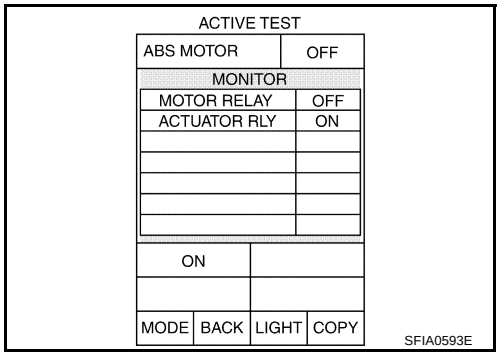
NOTE:

- When active test is performed while depressing pedal, pedal depression amount will change, but this is normal.
- Approximately 10 seconds after operation is begun, “TEST STOP” will be displayed.
- To perform retest after “TEST STOP” is displayed, touch “BACK” and conduct the test from the Step 6.

ABS Motor

Touch “ON” and “OFF” on the screen. Make suer ABS motor relay operates as shown in table below.

Operation	ON	OFF
ABS actuator relay	ON	ON
ABS motor relay	ON	OFF



NOTE:

- When active test is performed while depressing pedal, pedal depression amount will change, but this is normal.
- Approximately 10 seconds after operation is begun, “TEST STOP” will be displayed.
- To perform retest after “TEST STOP” is displayed, touch “BACK” and conduct the test from the Step 6.

For Fast and Accurate Diagnosis

AFS00202

PRECAUTIONS FOR DIAGNOSIS

- Before performing diagnosis, always read precautions. Refer to GI-4, "General Precautions" .
- If ABS actuator and electric unit (control unit), steering angle sensor, steering system parts, suspension system parts, or tires have been replaced, or if alignment has been adjusted, be sure to adjust neutral position of steering angle sensor before driving. Refer to BRC-49, "Adjustment of Steering Angle Sensor Neutral Position" .
- After diagnosis is finished, be sure to erase memory. Refer to BRC-72, "Operation Procedure" .
- When checking continuity and voltage between units, be sure to check for disconnection, looseness, bend, or collapse of connector terminals. If any malfunction is found, repair or replace connector terminals.
- For intermittent symptoms, possible cause is malfunction in harness, harness connector, or terminals. Move harness, harness connector, and terminals to check for poor connections.
- If a circuit tester is used for the check, be careful not to forcibly extend any connector terminal.
- To use CONSULT-II to perform self-diagnosis of ABS actuator and electric unit (control unit), active tests, or work support, first stop work, then connect CONSULT-II and select “ABS”.
- While self-diagnosis results of CONSULT-II shows malfunction, if CONSULT-II active test is performed, an engine system error may be indicated. In this case, start engine to resume the normal screen.
- VDC/TCS/ABS system electronically controls brake operation and engine output. The following symptoms may be caused by normal operations:
- When CONSULT-II is used, ABS warning lamp, VDC OFF indicator lamp, SLIP indicator lamp may be ON/OFF.

Symptom	Symptom description	Result
Motor operation noise	This is noise of motor inside ABS actuator and electric unit (control unit). Slight noise may occur during VDC, TCS, and ABS operation.	Normal
	When the vehicle speed goes over 20 km/h (12.5MPH), the motor and valves operating noise may be heard. It happens only once after IGN (ignition) is ON. This is a normal status of the system operation check.	
System operation check noise	When engine starts, slight “click” noise may be heard from engine compartment. This is normal and is part of system operation check.	Normal
VDC/TCS operation (SLIP lamp Blinking)	TCS may activate momentarily if wheel speed changes when driving over location where friction coefficient varies, when downshifting, or when fully depressing accelerator pedal.	Normal Cancel the VDC/TCS function for the inspection on a chassis dynamometer.
	For inspection of speedometer or other instruments, press VDC OFF SW to turn VDC/TCS function off.	
	When accelerator pedal is depressed on a chassis dynamometer (fixed front-wheel type), vehicle speed will not increase. This is not normal. It is result of TCS being activated by stationary front wheels. Warning lamp may also illuminate to indicate “sensor system error”. This is also normal, and is the result of the stationary front wheels being detected. To be certain, restart engine, and drive vehicle at 30 km/h (19 MPH) or above. Make sure that warning lamp does not illuminate.	
ABS operation (Longer stopping distance)	On roads with low friction coefficients, such as snowy roads or gravel roads, vehicles with ABS may require a longer stopping distance. Therefore, when driving on such roads, avoid overconfidence and keep speed sufficiently low.	Normal
Insufficient feeling of acceleration	Depending on road conditions, driver may feel that feeling of acceleration is insufficient. This is because traction control, which controls engine and brakes to achieve optimal traction, has the highest priority (for safety). As a result, there may be times when acceleration is slightly less than usual for the same accelerator pedal operation.	Normal

ON and OFF Timing for ABS Warning Lamp, VDC OFF Indicator Lamp, SLIP Indicator Lamp, Brake Warning Lamp

×: ON –: OFF

Condition	ABS warning lamp	VDC OFF indicator lamp	SLIP indicator lamp	Brake warning lamp [Note 1]	Remarks
Ignition SW OFF.	–	–	–	—	—
Approx. 2 seconds after ignition switch is turned ON.	×	×	×	× [Note 2]	—
Approx. 2 seconds later after ignition switch ON.	–	–	–	× [Note 2]	Go out 2 seconds after ignition switch is turned ON.
VDC OFF SW is turned ON. (VDC/TCS function is OFF.)	–	×	–	—	—
VDC/TCS/ABS error.	×	×	×	—	There is an ABS actuator and electric unit (control unit) error. (Power, ground or system malfunction)
When VDC/TCS is not functioning normally.	–	×	×	—	—
EBD error.	×	×	×	×	—

NOTE:
1. Brake warning lamp will turn on in case of operating parking brake (switch turned on) or of actuating brake fluid level switch (brake fluid is insufficient).
2. After starting engine, turn OFF.

Basic Inspection

AFS00203

BASIC INSPECTION 1 BRAKE FLUID LEVEL, LEAKS, AND BRAKE PADS

1. Check fluid level in the brake reservoir tank. If fluid level is low, refill the brake fluid.
2. Check the brake piping and around the ABS actuator and electric unit (control unit) for leaks. If leakage or seepage is found, check the following items.
   - If ABS actuator and electric unit (control unit) connection is loose, tighten the piping to the specified torque and make sure there are no leaks.
   - If there is damage to the connection flare nut or ABS actuator and electric unit (control unit) screw, replace the damaged part and re-conduct the leak inspection to make sure there are no leaks.
   - If there is leakage or seepage at any location other than ABS actuator and electric unit (control unit) connection, wipe away leakage or seepage with clean cloth. Then inspect again and confirm the there is on leakage.
   - If there is leakage from ABS actuator and electric unit (control unit), wipe away leakage or seepage with clean cloth. Then inspect again. If there is leakage or seepage, replace ABS actuator and electric unit (control unit).

     CAUTION:
     ABS actuator body can not be disassembled.
3. Check brake disc and pads. Refer to BR-28, "Removal and Installation of Brake Pad" in “Front Disc Brake” and BR-34, "Removal and Installation of Brake Pad" in “Rear Disc Brake”.

BASIC INSPECTION 2 POWER SYSTEM TERMINAL LOOSENESS AND BATTERY INSPECTION

Make sure the battery positive cable, negative cable and ground connection are not loose. If looseness is detected, tighten the piping to the specified torquer. In addition, check the battery voltage to make sure it has not dropped and the altimeter is normal.

BASIC INSPECTION 3 ABS WARNING LAMP, VDC OFF INDICATOR LAMP, SLIP INDICATOR LAMP INSPECTION

1. Make sure that ABS warning lamp, VDC OFF indicator lamp (when VDC OFF switch is OFF), and SLIP indicator lamp turn ON when ignition switch is turned ON. If they do not, check the VDC OFF indicator lamp and then VDC OFF switch. Refer to BRC-100, "VDC OFF SWITCH" . Check CAN communications. Refer to BRC-98, "Inspection 13 CAN Communication Circuit" . If there are no errors with VDC OFF

switch and CAN communication system, check ABS warning lamp, VDC OFF indicator lamp, SLIP indicator lamp and combination meter. Refer to DI-4, "COMBINATION METERS" .

2. Make sure the lamp turns OFF after ignition switch is turned ON. If the lamp does not turn OFF, conduct self-diagnosis.
3. With engine running, make sure VDC OFF indicator lamp turns ON and OFF when VDC OFF switch is turned ON and OFF. If the indicator lamp status does not correspond to switch operation, check VDC OFF switch system. Refer to BRC-100, "VDC OFF SWITCH" .
4. Make sure ABS warning lamp, VDC OFF indicator lamp, and SLIP indicator lamp turns OFF 2 seconds after engine is started. If ABS warning lamp, VDC OFF indicator lamp, and SLIP indicator lamp have not turned off 10 seconds after engine has been started, conduct self-diagnosis of ABS actuator and electric unit (control unit).
5. After conducting self-diagnosis, be sure to erase the error memory. Refer to BRC-70, "CONSULT-II Functions"

Inspection 1 Wheel Sensor Circuit

AFS00204

After using the CONSULT-II SELF-DIAG RESULTS to determine positions of malfunctioning wheel sensor, check all areas to determine the component to be replaced.

CAUTION:

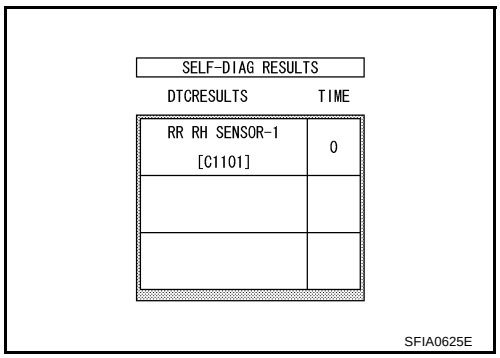
- **Do not measure the resistance value and also voltage between sensor terminal with tester etc., because e sensor is an active sensor.**
- **Do not expand terminal of connector with a tester terminal stick, when it does the inspection with the tester.**

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSTIC RESULTS

Check self-diagnosis results.

Self-diagnostic results
FR RH SENSOR-1,-2
FR LH SENSOR- 1,-2
RR RH SENSOR-1,-2
RR LH SENSOR-1,- 2
ABS SENSOR



Is above displayed in self-diagnosis display items?

YES >> GO TO 2.
NO >> INSPECTION END

2. CHECK CONNECTOR

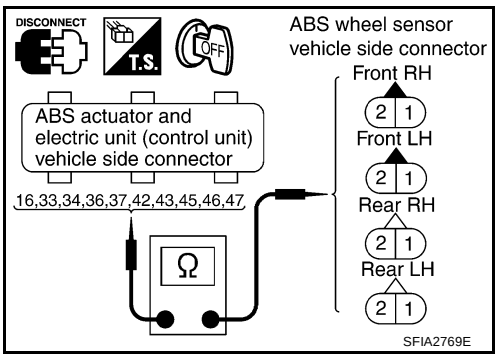
1. Disconnect ABS actuator and electric unit (control unit) connector E24 and the malfunctioning wheel sensor connector E20 (FR - LH) or E27 (FR - RH) or B202 (RR - LH), B203 (RR - RH). Check terminal to see if it is deformed, disconnected, loose, etc., and repair or replace it if any malfunction condition is found.
2. Reconnect connectors and check that interference with other parts has not cut wheel sensor cables, drive at a speed of 30 km/h (19 MPH) or above for at least 1minute, and conduct self-diagnosis.

OK or NG

OK >> Connector terminal contact is loose, damaged, open or shorted.
NG >> GO TO 3.

3. CHECK WHEEL SENSOR HARNESS

1. Turn ignition switch OFF and disconnect the wheel sensor connector E20 (FR - LH), E27 (FR - RH), B202 (RR - LH), B203 (RR - RH) and ABS actuator and electric unit (control unit) connector E24.
2. Check continuity between terminals. (Also check continuity when steering wheel is turned right and left and when sensor harness inside the wheel house is moved.)



	Power supply circuit		Signal circuit		Ground circuit	
Wheel	ABS actuator and electric unit (control unit)	Wheel sensor	ABS actuator and electric unit (control unit)	Wheel sensor	ABS actuator and electric unit (control unit)	ABS actuator and electric unit (control unit) (Ground)
Front RH	34 (B)	1 (B)	33 (W)	2 (W)	33 (W), 34 (B)	16 (B), 47 (B)
Front LH	45 (G)	1 (G)	46 (R)	2 (R)	45 (G), 46 (R)	
Rear RH	43 (LG)	1 (LG)	42 (V)	2 (V)	43 (LG), 42 (V)	
Rear LH	36 (L)	1 (L)	37 (P)	2 (P)	36 (L), 37 (P)	

Power supply circuit : Continuity should exist.
Signal circuit : Continuity should exits.
Ground circuit : Continuity should not exist.

OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness and connector that have malfunction.

4. CHECK TIRE

Check air pressure, wear, and size.

Are air pressure, wear, and size within the standard values?

YES >> GO TO 5.
NO >> Adjust air pressure, or replace tire.

5. CHECK SENSOR AND SENSOR ROTOR

- Check condition of sensor mount (for looseness, etc.).
- Check surface of front sensor rotor rubber for damage.
- Check rear sensor rotor for damage.

OK or NG

OK >> GO TO 6.
NG >> Repair or replace the malfunctioning component.

6. CHECK WHEEL SENSOR

1. Replace wheel sensor that resulted in malfunction by self-diagnosis.
2. Reconnect connectors, drive vehicle at 30 km/h (19 MPH) or more for approximately 1 minute, and then perform self-diagnosis.

Is above displayed on self-diagnosis display?

OK >> Wheel sensor has malfunction.
NG >>
- Replace ABS actuator and electric unit (control unit).
- Perform to self-diagnosis again, and make sure that the result shows “NO DTC IS DETECTED. FURTHER TESTING MAY BE REQUIRED”.

Inspection 2 Engine System

AFS00205

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSTIC RESULTS

Check self-diagnostic results.

Self-diagnostic results
ENGINE SIGNAL 1
ENGINE SIGNAL 2
ENGINE SIGNAL 3
ENGINE SIGNAL 4
ENGINE SIGNAL 6

Is above displayed in self-diagnosis display items?

YES >> GO TO 2.
NO >> INSPECTION END

2. CHECK ENGINE SYSTEM

1. Perform an ECM self-diagnosis and repair or replace any malfunction items. Perform the ECM self-diagnosis again.
2. Perform ABS actuator and electric unit (control unit) self-diagnosis again.

OK or NG

OK >> INSPECTION END
NG >> Repair or replace any malfunction items. Perform self-diagnosis again.

Inspection 3 VDC/TCS/ABS Control Unit Circuit

AFS00206

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSTIC RESULTS

Check self-diagnostic results.

Self-diagnostic results
CONTROLLER FAILURE

Is above displayed in self-diagnosis display items?

YES >> Replace ABS actuator and electric unit (control unit). Perform self-diagnosis.
NO >> INSPECTION END

Inspection 4 Pressure Sensor Circuit

AFS00207

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSTIC RESULTS

Check self-diagnostic results.

Self-diagnostic results
PRESS SEN CIRCUIT

Is above displayed in self-diagnosis display items?

YES >> GO TO 2.
NO >> INSPECTION END

2. CHECK CONNECTOR

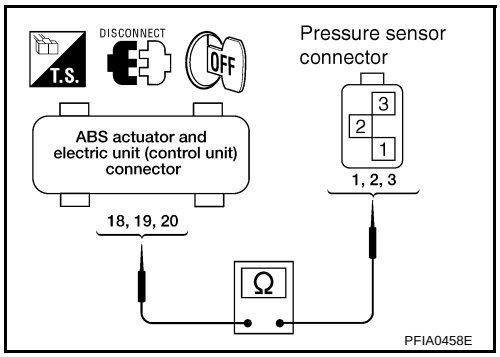
1. Disconnect pressure sensor connector E23 and ABS actuator and electric unit (control unit) connector E24, check terminals for deformation, disconnection, looseness, and so on. If there is an error, repair or replace terminal.
2. Reconnect connectors and perform ABS actuator and electric unit (control unit) self-diagnosis again.

OK or NG

OK >> Connector terminal contact is loose, damaged, open or shorted.
NG >> GO TO 3.

3. CHECK PRESSURE SENSOR HARNESS

1. Turn ignition switch OFF and disconnect pressure sensor connector E23 and ABS actuator and electric unit (control unit) connector E24.
2. Check continuity between ABS actuator and electric unit (control unit) connector and pressure sensor connector.



ABS actuator and electric unit (control unit)	Pressure sensor	Continuity
19 (W/B)	1 (W/B)	Yes
20 (LG/R)	2 (LG/R)	Yes
18 (BR/Y)	3 (BR/Y)	Yes

OK or NG

OK >> GO TO 4.
NG >> If the open or short in harness, repair or replace harness.

4. CHECK PRESSURE SENSOR

1. Connect pressure sensor connector E23 and ABS actuator and electric unit (control unit) connectors E24.
2. Use “Data Monitor” to check the pressure sensor value.

Condition	Data monitor display
When brake pedal is depressed.	Positive value
When brake pedal is released.	Approx. 0 bar

OK or NG

OK >> INSPECTION END
NG >> Pressure sensor is damaged or malfunctioning, replace pressure sensor.

Inspection 5 Steering Angle Sensor Circuit

AFS00208

INSPECTION PROCEDURE

1. CHECK SELF- DIAGNOSTIC RESULTS

Check self-diagnostic results.

Self-diagnostic results
ST ANGLE SEN CIRCUIT

Is above displayed in self-diagnosis item?

YES >> GO TO 2.
NO >> INSPECTION END

2. CHECK CONNECTOR

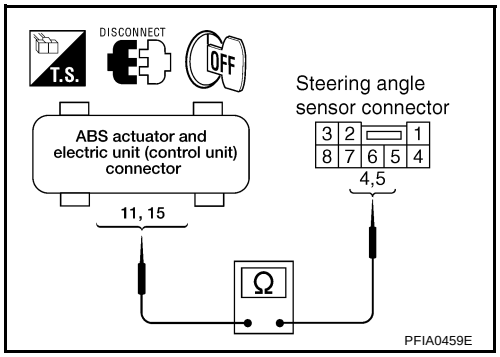
1. Disconnect steering angle sensor connector M33 and ABS actuator and electric unit (control unit) connector E24 and check terminals for deformation, disconnection, looseness, and so on. If there is an error, repair or replace terminal.
2. Reconnect connectors and perform an ABS actuator and electric unit (control unit) self-diagnosis again.

OK or NG

OK >> Connector terminal contact is loose, damaged, open or shorted.
NG >> GO TO 3.

3. CHECK STEERING ANGLE SENSOR HARNESS

1. Check CAN communication system. Refer to BRC-98, "Inspection 13 CAN Communication Circuit" .
2. Turn ignition switch OFF and disconnect steering angle sensor connector M33 and ABS actuator and electric unit (control unit) connector E24.
3. Check continuity between ABS actuator and electric unit (control unit) connector terminal and steering angle sensor connector terminal.



ABS actuator and electric unit (control unit)	Steering angle sensor	Continuity
11 (L)	4 (L)	Yes
15 (Y)	5 (Y)	Yes

OK or NG

OK >> GO TO 4.
NG >> If the open or short in harness, repair or replace harness.

4. CHECK STEERING WHEEL PLAY

Check steering wheel play. Refer to PS-9, "CHECKING STEERING WHEEL PLAY" .

OK or NG

OK >> GO TO 5
NG >> Adjust steering wheel play.

5. CHECK DATA MONITOR

1. Connect steering angle sensor and ABS actuator and electric unit (control unit) connectors.
2. Perform “Data Monitor” of the “STEERING ANGLE SIGNAL” to check if the status is normal.

Steering condition	Data monitor
Straight-ahead	–3.5° to +3.5°
Turn wheel to the right by 90°	Approx. - 90°
Turn wheel to the left by 90°	Approx.+ 90°

OK or NG

OK >> Perform ABS actuator and electric unit (control unit) self-diagnosis again.
NG >> Replace spiral cable (steering angle sensor) and adjust neutral position of steering angle sensor. Refer to BRC-49, "Adjustment of Steering Angle Sensor Neutral Position" .

Inspection 6 Yaw Rate/Side/Decel G sensor Circuit

AFS00209

CAUTION:
Sudden turns (such as spin turns, acceleration turns), drifting, etc. may cause yaw rate/side/decel G sensor circuit indicate a malfunction. However this is not a malfunction if normal operation can be resumed after restarting engine.

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSTIC RESULTS

Check self-diagnostic results.

Self-diagnostic results
YAW RATE SENSOR
SIDE G-SEN CIRCUIT
G-SENSOR

CAUTION:
When on a turntable, such as at a parking structure entrance, or when on a moving object with engine running, the VDC OFF indicator lamp might turn on and self-diagnosis using the CONSULT-II yaw rate sensor system malfunction might be displayed, but in this case there is no malfunction with yaw rate/side/decel G sensor circuit. As soon as the vehicle leaves the turntable or moving object, restart engine to return the system to normal. And after doing spin turns or acceleration turns with VDC “OFF” (VDC OFF switch “ON”), too, the results will return to a normal state by restarting vehicle.

Is above displayed in self-diagnosis display items?

YES >> GO TO 2.
NO >> INSPECTION END

2. CHECK CONNECTOR

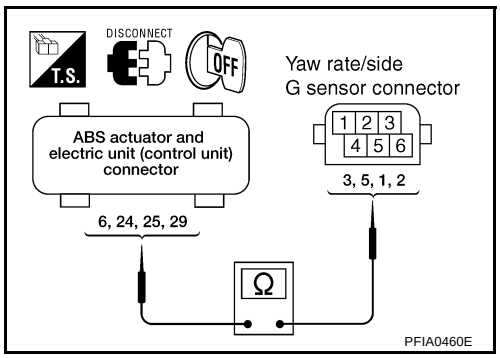
1. Disconnect yaw rate/side/decel G sensor connector M61 and ABS actuator and electric unit (control unit) connector E24 and check terminals for deformation, disconnection, looseness, and so on. If there is an error, repair or replace terminal.
2. Reconnect connectors and perform a ABS actuator and electric unit (control unit) self-diagnosis again.

OK or NG

OK >> Connector terminal contact is loose, damaged, open or shorted.
NG >> GO TO 3.

3. CHECK YAW RATE SENSOR/SIDE G SENSOR HARNESS

1. Turn ignition switch OFF and disconnect yaw rate/side/decel G sensor connector M61 and ABS actuator and electric unit (control unit) connector E24.
2. Check continuity between ABS actuator and electric unit (control unit) vehicle side connector and yaw rate/side/decel G sensor vehicle side connector.



ABS actuator and electric unit (control unit)	Yaw rate/side/decel G sensor	Continuity
6 (G/R)	3 (G/R)	Yes
24 (LG/B)	5 (P/L)	Yes
25 (W)	1 (W/G)	Yes
29 (R)	2 (R/Y)	Yes

OK or NG

OK >> GO TO 4.
NG >> If open or short in harness, repair or replace harness.

4. CHECK YAW RATE SENSOR/SIDE/DECEL G SENSOR

1. Connect yaw rate /side/decel G sensor M61 and ABS actuator and electric unit (control unit) connector E24.
2. Use “Data Monitor” to check if yaw rate sensor/side/decel G sensor are normal.

Vehicle status	Yaw rate sensor (Data monitor standard)	Side G sensor (Data monitor standard)	Decel G sensor (Data monitor standard)
When stopped	–4 to +4°/s	–1.1 to +1.1 m/s^2	–0.11 G to +0.11 G
Right turn	Negative value	Negative value	–
Left turn	Positive value	Positive value	–
Speed up	–	–	Negative value
Speed down	–	–	Positive value

OK or NG

OK >> Perform ABS actuator and electric unit (control unit) self diagnosis again.
NG >> Replace the malfunctioning yaw rate sensor/side/decel G sensor, and then perform ABS actuator and electric unit (control unit) self-diagnosis again.

Inspection 7 Solenoid and VDC Change-Over Valve Circuit

AFS0020A

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSTIC RESULTS

Check self-diagnostic results.

Self-diagnostic results
FR LH IN SOL
FR LH OUT SOL
RR RH IN SOL
RR RH OUT SOL
FR RH IN SOL
FR RH OUT SOL
RR LH IN SOL
RR LH OUT SOL
CV 1
CV 2
SV 1
SV 2

Is above displayed in self-diagnosis display items?

YES >> GO TO 2.
NO >> INSPECTION END

2. CHECK CONNECTOR

1. Disconnect ABS actuator and electric unit (control unit) connector E24 check terminals for deformation, disconnection, looseness, and so on. If there is an error, repair or replace terminal.
2. Securely reconnect connectors and perform self-diagnosis.

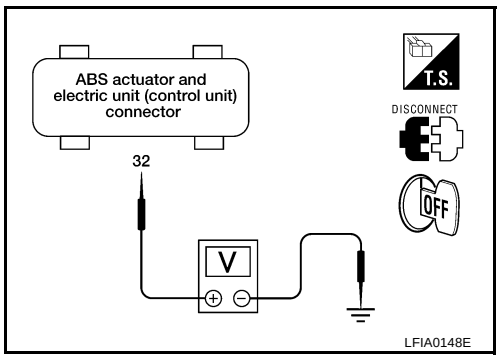
OK or NG

OK >> Connector terminal contact is loose, damaged, open or shorted.
NG >> GO TO 3.

3. CHECK SOLENOID POWER AND GROUND CIRCUIT

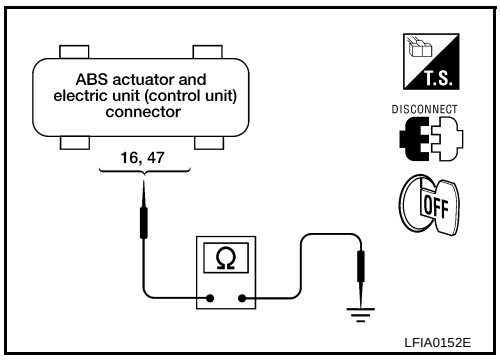
1. Disconnect ABS actuator and electric unit (control unit) connector E24.
2. Check voltage between ABS actuator and electric unit (control unit) harness connector E24 and ground.

ABS actuator and electric unit (control unit)	Ground	Voltage (V) (Approx.)
32 (R/B)	—	12 V



3. Check resistance between ABS actuator and electric unit (control unit) harness connector E24 and ground.

ABS actuator and electric unit (control unit)	Ground	Resistance (Ω) (Approx.)
16 (B), 47 (B)	—	0 Ω



OK or NG

OK >> Perform self-diagnosis again. If the same results appear, replace ABS actuator and electric unit (control unit). Refer to BRC-107, "ACTUATOR AND ELECTRIC UNIT (ASSEMBLY)" .

NG >> Repair harness or connectors.

Inspection 8 Actuator Motor, Motor Relay, and Circuit

AFS0020B

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSTIC RESULTS (1)

Check self-diagnostic results.

Self-diagnostic results
CONSULT-II display items
PUMP MOTOR
ACTUATOR RLY

Is above displayed in self-diagnosis display items?

YES >> GO TO 2.
NO >> INSPECTION END.

2. CHECK SELF-DIAGNOSIS RESULTS (2)

1. Disconnect ABS actuator and electric unit (control unit) connector E24. Then reconnect it securely.
2. Perform self-diagnosis again.

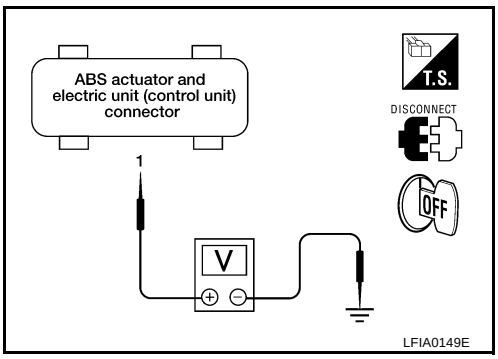
Do any self-diagnosis items appear?

YES >> GO TO 3.
NO >> Repair or replace the applicable connector.

3. CHECK ABS MOTOR AND MOTOR RELAY POWER SUPPLY CIRCUIT

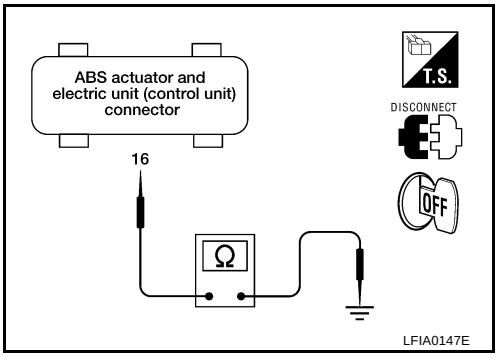
1. Disconnect ABS actuator and electric unit (control unit) connector E24.
2. Check voltage between ABS actuator and electric unit (control unit) connector E24 and ground.

ABS actuator and electric unit (control unit)	Ground	Voltage (V) (Approx.)
1 (G/R)	—	12 V



3. Check resistance between ABS actuator and electric unit (control unit) connector E24 and ground.

ABS actuator and electric unit (control unit)	Ground	Resistance (Ω) (Approx.)
16 (B)	—	0 Ω



OK or NG

OK >> Perform self-diagnosis again. If the same result appears, replace ABS actuator and electric unit (control unit). Refer to BRC-107, "ACTUATOR AND ELECTRIC UNIT (ASSEMBLY)" .

NG >> Repair harness or connectors.

Inspection 9 ABS Actuator and Electric Unit (Control Unit) Power Supply and Ground Circuit

AFS0020C

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSTIC RESULTS

Check self-diagnostic results.

Self-diagnostic results
CONSULT-II display items
BATTERY VOLTAGE

Does “BATTERY VOLTAGE” appear in self-diagnosis results display?

YES >> GO TO 2.

NO >> INSPECTION END.

2. CHECK STARTING

1. Disconnect ABS actuator and electric unit (control unit) connector E24. Then reconnect it securely.
2. Perform self-diagnosis.

Do any self-diagnosis items appear?

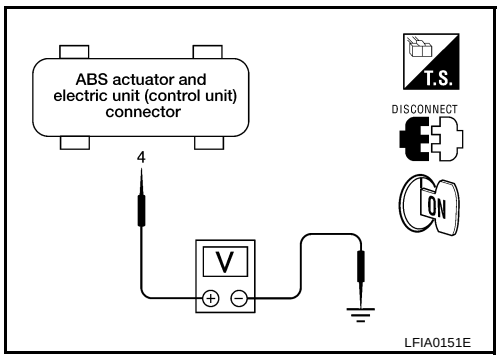
YES >> GO TO 3.

NO >> Repair or replace connector.

3. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY

1. Disconnect ABS actuator and electric unit (control unit) connector E24.
2. Turn ignition switch ON (but do not start engine). Check voltage between ABS actuator and electric unit (control unit) harness connector E24 and ground.

ABS actuator and electric unit (control unit)	Ground	Voltage (V) (Approx.)
4 (GR)	—	12 V



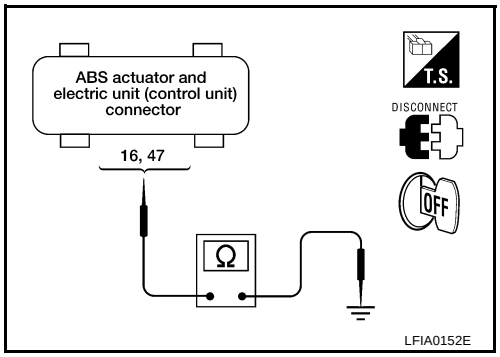
OK or NG

OK >> GO TO 4.
NG >> GO TO 5

4. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) GROUND CIRCUITS

Check ABS actuator and electric unit (control unit) ground circuits.

ABS actuator and electric unit (control unit)	Ground	Continuity
16 (B), 47 (B)	—	Yes



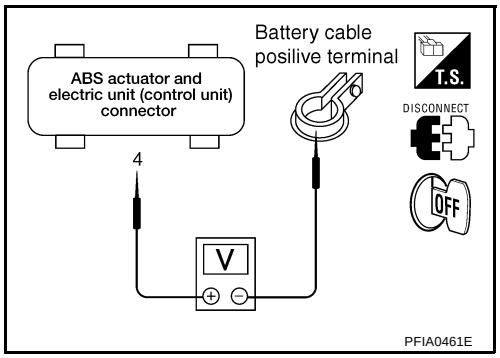
OK or NG

OK >> Perform ABS actuator and electric unit (control unit) self-diagnosis again.
NG >> Repair harness or connectors.

5. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY CIRCUIT

1. Disconnect ABS actuator and electric unit (control unit) connector E24.
2. Check continuity between battery positive terminal and ABS actuator and electric unit (control unit) connector E24.

ABS actuator and electric unit (control unit)	Battery positive terminal	Continuity
4 (G/R)	—	Yes



OK or NG

YES >> Check for malfunction conditions in battery (terminal looseness, low voltage, etc.) and alternator.
NO >> Repair harness or connectors.

Inspection 10 Stop Lamp Switch Circuit

AFS0020D

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSTIC RESULTS

Check self-diagnostic results.

Self-diagnostic results
STOP LAMP SW

Is above displayed in self-diagnosis display items?

YES >> GO TO 2.
NO >> INSPECTION END

2. CHECK CONNECTOR

1. Disconnect the stop lamp switch connector E116 and ABS actuator and electric unit (control unit) connector E24 and check terminals for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
2. Securely reconnect connectors.
3. Start engine.
4. Repeat pumping brake pedal carefully several times, then perform self-diagnosis again.

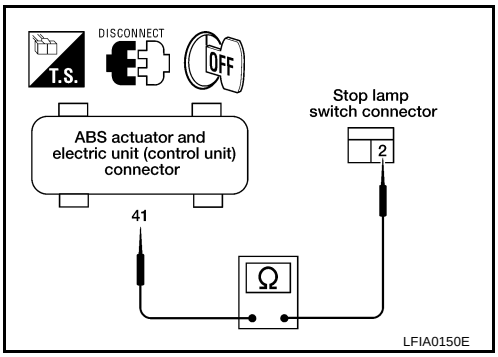
OK or NG

OK >> Connector terminal contact is loose, damaged, open or shorted.
NG >> GO TO 3.

3. CHECK STOP LAMP SWITCH CIRCUIT

1. Turn ignition switch OFF and disconnect stop lamp switch connector E116 and ABS actuator and electric unit (control unit) connector E24.
2. Check continuity between stop lamp switch harness connector E116 and ABS actuator and electric unit (control unit) harness connector E24.

ABS actuator and electric unit (control unit)	Stop lamp switch	Continuity
41 (R/G)	2 (R/G)	Yes



OK or NG

OK >> Connect connectors and perform an ABS actuator and electric unit (control unit) self-diagnosis.
NG >> Open or short in harness. Repair or replace harness.

Inspection 11 Brake Fluid Level Sensor Circuit

AFS0020E

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSTIC RESULTS

1. Check the brake reservoir tank fluid level. If the level is low, add brake fluid.
2. Erase self-diagnosis results and check self-diagnosis results.

Self-diagnostic results
BR FLUID LEVEL LOW

Is above displayed in self-diagnosis display items?

YES >> GO TO 2.
NO >> INSPECTION END

2. CHECK CONNECTOR

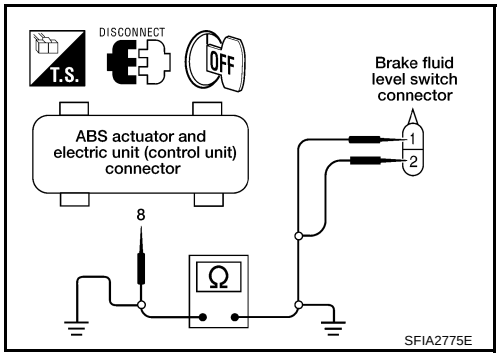
1. Disconnect the brake fluid level sensor connector E21 and ABS actuator and electric unit (control unit) connector E24 and check terminal for deformation, disconnection, looseness, and so on. If there is any malfunction condition, repair or replace terminal.
2. Securely reconnect connectors and perform self-diagnosis.

OK or NG

OK >> Connector terminal contact is loose, damaged, open or shorted.
NG >> GO TO 3.

3. CHECK HARNESS BETWEEN THE BRAKE FLUID LEVEL SENSOR AND ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

1. Turn ignition switch OFF and disconnect the brake fluid level sensor connector E21, ABS actuator and electric unit (control unit) connectors E24.
2. Check continuity between the brake fluid level sensor connector E21 and ABS actuator and electric unit (control unit) connector E24 and ground.



ABS actuator and electric unit (control unit)	Brake fluid level sensor	Continuity
8 (SB)	1 (SB)	Yes
8 (SB)	Ground	No
Ground	2 (B)	Yes

OK or NG

OK >> Connect connectors and perform an ABS actuator and electric unit (control unit) self-diagnosis.
NG >> If the open or short in harness, repair or replace harness.

Inspection 12 When “ST ANG SEN SIGNAL” Appears on Self-Diagnosis Results Display

AFS0020F

INSPECTION PROCEDURE

1. CHECK SELF DIAGNOSTIC RESULTS (1)

Check self-diagnostic results.

Self-diagnostic results
ST ANG SEN SIGNAL

Does anything besides “ST ANG SEN SIGNAL” appear on self-diagnosis results display?

YES >> Inspect and repair the indicated items. Then perform self-diagnosis again.
NO >> Perform adjustment of steering angle sensor neutral position. Then GO TO 2.

2. CHECK SELF DIAGNOSIS RESULTS (2)

Turin ignition switch OFF, and ON to erase self-diagnosis results, and perform ABS actuator and electric unit (control unit) self-diagnosis again.

Dose anything appear on self-diagnosis results display?

YES >> Replace steering angle sensor. Then perform adjustment of neutral position and perform self-diagnosis again.
NO >> INSPECTION END.

Inspection 13 CAN Communication Circuit

AFS0020G

INSPECTION PROCEDURE

1. CHECK CONNECTOR

1. Turn ignition switch OFF, disconnect the ABS actuator and electric unit (control unit) connector, and check the terminal for deformation, disconnection, looseness, and so on. If there is a malfunction, repair or replace the terminal.
2. Reconnect connector to perform self-diagnosis.

Is “CAN COMM CIRCUIT” or “ST ANG SEN COM CIR” displayed in the self-diagnosis display items?

YES >> Print out the self-diagnostic results, and refer to LAN-5, "Precautions When Using CONSULT-II" .
NO >> Connector terminal connection is loose, damaged, open, or shorted.

Inspection 14 When “DECEL G SEN SET” Appears on Self-Diagnosis Results Display

AFS0020H

INSPECTION PROCEDURE

1. CHECK SELF DIAGNOSTIC RESULTS (1)

Check self-diagnostic results.

Self-diagnostic results
DECEL G SEN SET

Dose anything besides “DECEL G SEN SET” appear on self-diagnosis results display?

YES >> Inspect and repair the indicated items. Then perform self-diagnosis again.
NO >> Perform adjustment of Decel G Sensor neutral position. Then GO TO 2.

2. CHECK SELF-DIAGNOSTIC RESULTS (2)

Turn ignition switch OFF, and ON to erase self-diagnosis results, and perform ABS actuator and electric unit (control unit) self-diagnosis again.

Dose anything appear on self-diagnosis results display?

YES >> Replace Yaw rate/side/decel G sensor. Then perform adjustments of neutral position and perform self-diagnosis again.
NO >> INSPECTION END.

Inspection 15 When “ESTM VEH SPD SIG” Appears on Self-Diagnosis Results Display

AFS0020I

INSPECTION PROCEDURE

1. CHECK SELF DIAGNOSTIC RESULTS

Check CVT self-diagnostic results.

Self-diagnostic results
ESTM VEH SPD SIG

Does anything besides “ESTM VEH SPD SIG” appear on self-diagnosis results display?

YES >> Inspect and repair the indicated items. Then perform self-diagnosis again.
NO >> ● Erase CVT self-diagnosis. The inspection is complete.

NOTE:
If there is no error about ABS actuator and electric unit (control unit), “ESTM VHE SPD SIG” may be displayed in CVT self-diagnosis depending no the timing of cranking.

Inspection 16 VDC OFF Indicator Lamp Does Not Illuminate

AFS0020J

INSPECTION PROCEDURE

1. CHECK VDC OFF INDICATOR LAMP

Disconnect ABS actuator and electric unit (control unit) connector E24.

Do ABS warning lamp and VDC OFF indicator lamp illuminate?

OK >> Malfunction in combination meter system. Inspect combination meter.
NG >> Malfunction of ABS actuator and electric unit (control unit). Repair or replace control unit.

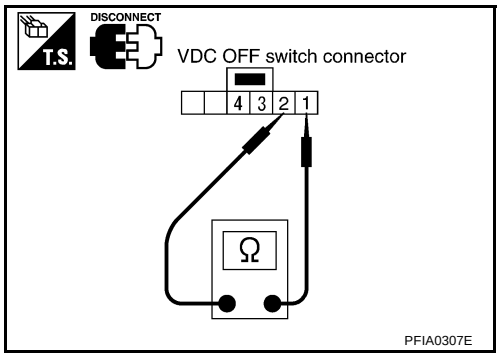
Component Inspection

AFS0020K

VDC OFF SWITCH

- Turn ignition switch OFF, and disconnect the VDC OFF switch connector M17, and check continuity between terminals 1 and 2.

1 -2 : Continuity should exist when pushing the switch.
Continuity should not exist when releasing the switch.



Symptom 1 Excessive ABS Function Operation Frequency

AFS0020L

1. CHECK WHEEL SENSOR

Wheel Sensor Inspection

- Sensor mount and damage inspection
- Sensor rotor mount and damage inspection
- Sensor connector connection inspection
- Sensor harness inspection

OK or NG

OK >> GO TO 2.
NG >> Replace sensor or sensor rotor.

2. CHECK FRONT AND REAR AXLE

Make sure there is no excessive play in front and rear axles.

OK or NG

OK >> GO TO 3.
NG >> Repair.

3. CHECK ABS WARNING LAMP DISPLAY

Make sure ABS warning lamp turns OFF after ignition switch is turned on or when driving.

OK or NG

OK >> Normal
NG >> Perform self-diagnosis. Refer to BRC-72, "SELF-DIAGNOSIS" .

Symptom 2 Unexpected Pedal Reaction

AFS0020M

1. CHECK BRAKE PEDAL STROKE

Check brake pedal stroke.

Is the stroke too long?

YES >>
- Bleed air from the brake piping.
- Check the brake pedal, brake booster, and master cylinder mount for play, looseness, and brake system for fluid leaks, etc. If any malfunctions are found, make repair.

NO >> GO TO 2.

2. CHECK PEDAL FORCE

Make sure that brake is effective with pedal depressed.

Is pedal heavy, but affective?

YES >> Normal
NO >> GO TO 3.

3. CHECK PERFORMANCE

Disconnect ABS actuator and electric unit (control unit) connector E24 and make sure the braking force us sufficient when ABS in not operating. After the inspection, reconnect connector.

OK or NG

OK >> GO TO 4.
NG >> Check brake system.

4. CHECK ABS WARNING LAMP DISPLAY

Make sure ABS warning lamp turns OFF after ignition switch is turned ON or when driving.

OK or NG

OK >> Normal
NG >> GO TO 5

5. CHECK WHEEL SENSOR

Wheel Sensor Inspection

- Sensor mount and damage inspection
- Sensor rotor mount and damage inspection
- Sensor connector connection inspection
- Sensor harness inspection

OK or NG

OK >> Normal
NG >> Sensor or sensor rotor replacement

Symptom 3 The Braking Distance Is Long

AFS0020N

CAUTION:
On slippery road surfaces, the stopping distance might be longer with ABS operating than when ABS is not operating.

1. CHECK PERFORMANCE

Disconnect ABS actuator and electric unit (control unit) connector E24 to deactivate ABS. In this condition, check stopping distance. After inspection, connect connector.

Is stopping distance still long?

YES >>
- Bleed air from the brake piping.
- Check brake system.

NO >> GO TO 2.

2. CHECK ABS WARNING LAMP DISPLAY

Make sure ABS warning lamp turns OFF after ignition switch is turned ON or when driving.

OK or NG

OK >> Normal
NG >> GO TO 3.

3. CHECK WHEEL SENSOR

Wheel Sensor Inspection

- Sensor mount and damage inspection
- Sensor rotor mount and damage inspection
- Sensor connector connection inspection
- Sensor harness inspection

OK or NG

OK >> Normal
NG >> Replace sensor or sensor rotor.

Symptom 4 ABS Function Does Not Operate

AFS0020O

CAUTION:
ABS does not operate when vehicle speed is 10 km/h (6 MPH) or less.

1. CHECK ABS WARNING LAMP DISPLAY

Make sure ABS warning lamp turns OFF after ignition switch is turned on or when driving.

OK or NG

OK >> GO TO 2.
NG >> Perform self-diagnosis. Refer to BRC-72, "SELF-DIAGNOSIS" .

2. CHECK WHEEL SENSOR

Wheel Sensor Inspection

- Sensor mount and damage inspection
- Sensor rotor mount and damage inspection
- Sensor connector connection inspection
- Sensor harness inspection

OK or NG

OK >> Normal
NG >> Replace sensor or sensor rotor.

Symptom 5 Pedal Vibration or ABS Operation Sound Occurs

AFS0020P

CAUTION:
Under the following conditions, when brake pedal is lightly depressed (just place a foot on it), ABS is activated and vibration is felt. However, this is normal.

- **When shifting gears**
- **When driving on slippery road**
- **During cornering at high speed**
- **When passing over bumps or grooves**
- **When pulling away just after starting engine [at approximately 10 km/h (6 MPH) or higher]**

1. SYMPTOM CHECK 1

Check if pedal vibration or operation sound occurs when engine is started.

OK or NG

OK >> Perform self-diagnosis. Refer to BRC-72, "SELF-DIAGNOSIS" .
NG >> GO TO 2.

2. INSPECTION (1)

Does vibration occur during normal parking?

CAUTION:
In addition to activation for sudden braking, ABS may activate in conditions such as those listed below.

- **Roads with low surface**
- **Turning at high speed**
- **Passing through gusts of wind**

OK or NG

OK >> GO TO 3.
NG >> Normal

3. INSPECTION (2)

Check for vibration when engine speed is increased while vehicle is stopped.

OK or NG

OK >> GO TO 4
NG >> ● Normal

CAUTION:
Vibration may occur when vehicle is stopped.

4. INSPECTION (3)

Check for vibration when switches of electrical components are operated.

OK or NG

OK >> Check for any wireless devices, or antenna lead near control unit (including wiring).
NG >> GO TO 5.

5. CHECKING ABS WARNING LAMP INDICATION

Confirm ABS warning lamp turns on.

OK or NG

OK >> Perform self-diagnosis.
NG >> GO TO 6.

6. CHECK WHEEL SENSORS

Inspect wheel sensor system.

- Sensor mounting inspection.
- Sensor pick-up inspection for iron chips.
- Sensor connector engagement inspection.
- Inspection of wheel sensor circuit.

OK of NG

OK >> Normal
NG >> Repair wheel sensor and sensor rotor system.

Symptom 6 Vehicle Jerks During VDC/TCS/ABS Control

AFS0020Q

1. CHECK ENGINE SPEED SIGNAL

Perform CONSULT-II ABS actuator and electric unit (control unit) “Data Monitor”.

Is engine speed at idle 400 rpm or higher?

YES >> Normal.
NO >> GO TO 2.

2. CHECK ABS WARNING LAMP DISPLAY

Make sure ABS warning lamp turns OFF after ignition switch is turned on or when driving.

OK or NG

OK >> GO TO 3.
NG >> Perform self-diagnosis. Refer to BRC-72, "SELF-DIAGNOSIS" .

3. CHECK ECM SELF-DIAGNOSIS RESULT ITEM

Perform ECM self-diagnosis.

Are self-diagnosis items displayed?

YES >> Check the corresponding items. Refer to EC-94, "TROUBLE DIAGNOSIS" in “Engine Control (EC section)”.
NO >> GO TO 4.

4. CHECK CVT SELF-DIAGNOSIS RESULTS ITEM

Perform CVT self-diagnosis.

OK or NG

OK >> GO TO 6.
NG >> Check the corresponding items. Refer to CVT-33, "TROUBLE DIAGNOSIS" in “CVT”.

5. SELF-DIAGNOSIS RESULT ITEM INSPECTION 1

Perform self-diagnosis of ABS actuator and electric unit (control unit).

Are self-diagnosis items displayed?

YES >> Check the corresponding items, make repairs, and perform ABS actuator and electric unit (control unit) self-diagnosis again.
NO >> GO TO 7.

6. CHECK CONNECTOR

1. Disconnect ABS actuator and electric unit (control unit) E24 and the ECM connector, check terminals for deformation, disconnection, looseness, and so on. If there is an error, repair or replace connector.
2. Securely reconnect connector and perform self-diagnosis.

OK or NG

OK >> If connector terminal contact is loose, damaged, open or shorted, repair or replace connector terminal.
NG >> GO TO 7.

7. SELF-DIAGNOSIS RESULT ITEM INSPECTION 2

Perform the self-diagnosis.

Are self-diagnosis items displayed?

YES >> Repair or replace any malfunction items.
NO >> GO TO 8.

8. CHECK CIRCUIT BETWEEN ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) AND ECM

Check CAN communication system. Refer to BRC-98, "Inspection 13 CAN Communication Circuit" .

OK or NG

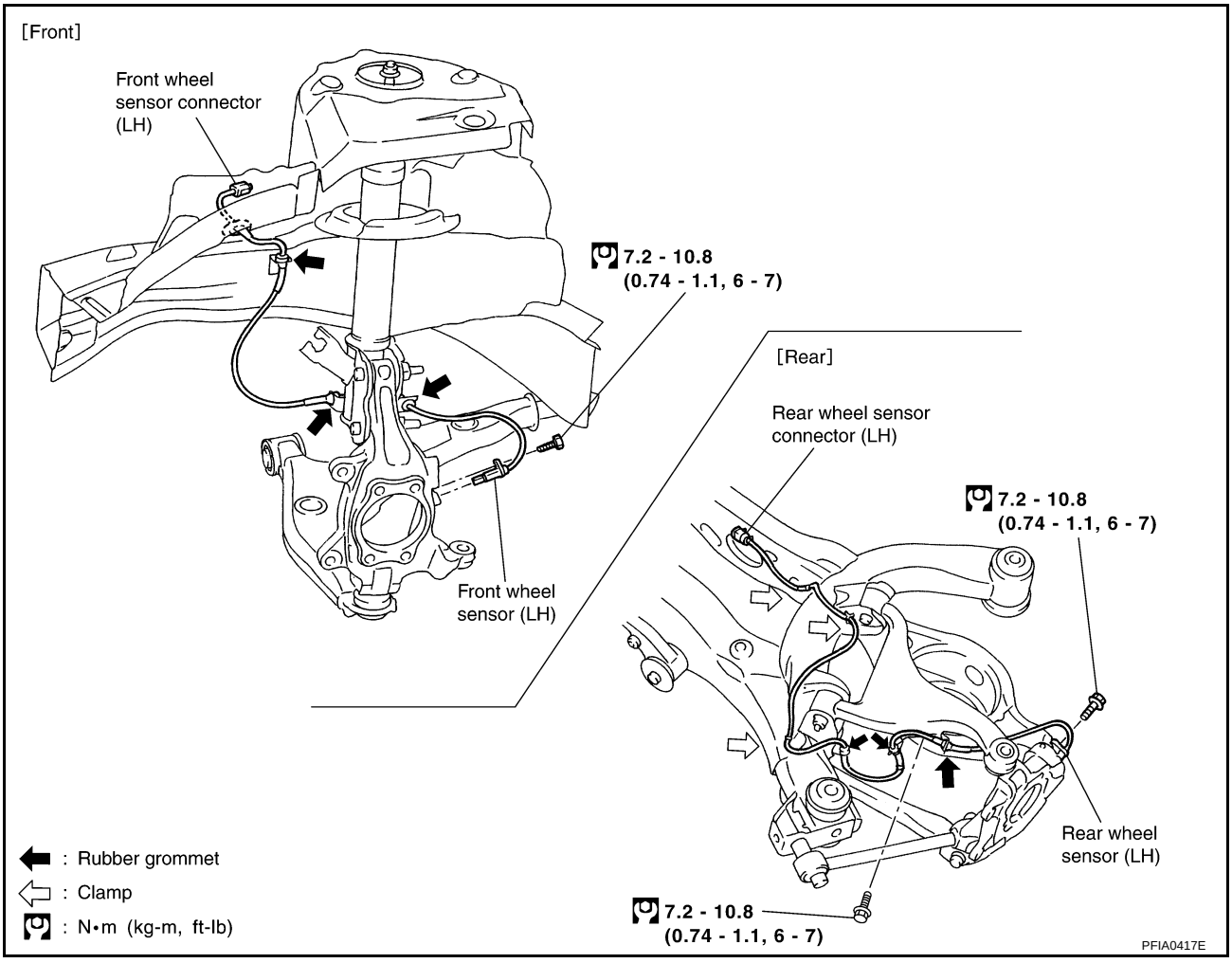
OK >> INSPECTION END
NG >> Connect connectors, and perform ABS actuator and electric unit (control unit) self-diagnosis.

WHEEL SENSORS

PFP:47910

Removal and Installation

AFS0020R



REMOVAL

Pay attention to the following when removing wheel sensor.

CAUTION:

- **As much as possible, avoid rotating wheel sensor when removing it. Pull wheel sensors out without pulling on sensor harness.**
- **Take care to avoid damaging wheel sensor edges or rotor teeth. Remove wheel sensor first before removing front or rear wheel hub. This is to avoid damage to wheel sensor wiring and loss of sensor function.**

INSTALLATION

Pay attention to the following when installing wheel sensor. Tighten installation bolts and nuts to the specified torques.

- When installing, make sure there is no foreign material such as iron chips on and in the mounting hole of the wheel sensor. Make sure no foreign material has been caught in the sensor rotor. Remove any foreign material and clean the mount.
- When installing wheel sensor, be sure to press rubber grommets in until they lock at locations shown above in figure. When installed, harness must not be twisted.

SENSOR ROTOR

PFP:47970

Removal and Installation

AFS0020S

REMOVAL

Front

Sensor rotor cannot be disassembled. To replace sensor rotor, replace hub bearing assembly. Refer to FAX-5, "FRONT WHEEL HUB AND KNUCKLE" in “FAX” section.

Rear

Sensor rotor cannot be disassembled. To replace sensor rotor, replace hub bearing assembly. Refer to RAX-5, "WHEEL HUB" in “RAX” section.

INSTALLATION

Front

Sensor rotor cannot be disassembled. To replace sensor rotor, replace hub bearing assembly. Refer to FAX-5, "FRONT WHEEL HUB AND KNUCKLE" in “FAX” section.

Rear

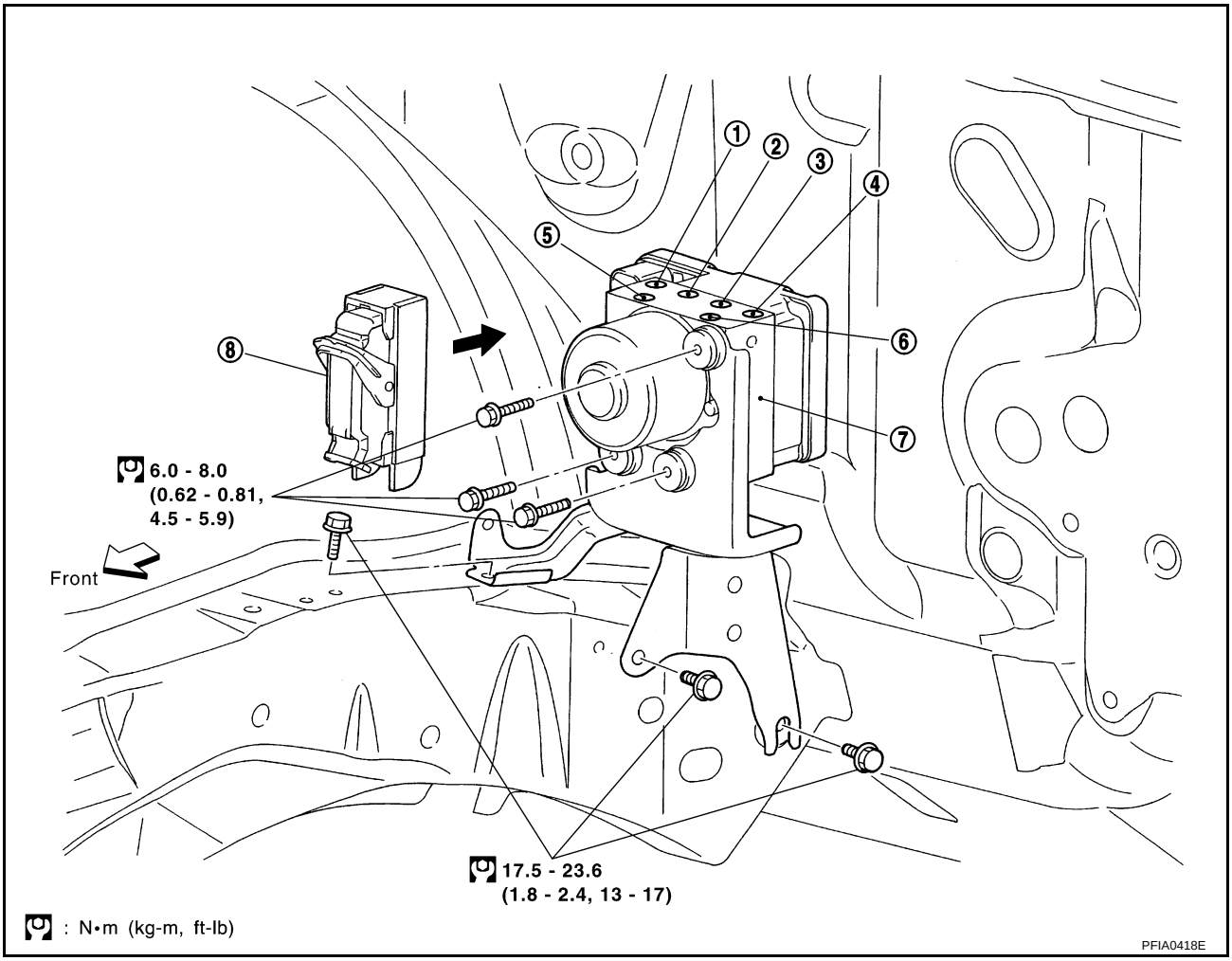
Sensor rotor cannot be disassembled. To replace sensor rotor, replace hub bearing assembly. Refer to RAX-5, "WHEEL HUB" in “RAX” section.

ACTUATOR AND ELECTRIC UNIT (ASSEMBLY)

PFP:47660

Removal and Installation

AFS001ZU



1.	To front left	2.	To rear right	3.	To rear left
4.	To front right	5.	From master cylinder secondary side	6.	From master cylinder primary side
7.	ABS actuator and electric unit (control unit)	8.	Harness connector		

Pay attention to the following when removing actuator.

CAUTION:

- **If the part number on the part number label (pasted on actuator upper surface) is the same, ABS actuator and electric unit (control unit) (integrated in control unit, part No. : 47660 *****) can not be used on another vehicle.**
  If it is used on another vehicle, ABS warning lamp, SLIP indicator lamp, VDC OFF indicator lamp may turn ON or VDC/TCS/ABS may not operate normally.
  When replacing ABS actuator and electric unit (control unit) (integrated in control unit), must use new service parts.
- **Before servicing, disconnect battery cables.**
- **To remove brake tube, use flare nut torque wrench to prevent flare nuts and brake tube from being damaged. To install, use flare nut wrench (commercial service tool).**
- **Do not remove and install actuator by holding harness.**
- **After work is completed, bleed air from brake piping. Refer to BR-12, "Bleeding Brake System" .**

NOTE:

- After performing above works, calibrate decel G sensor (AWD model). Refer to BRC-50, "Calibration of Decel G Sensor" .

- In the case that ABS actuator and electric unit (control unit) are replaced, make sure to adjust position of steering angle sensor. Refer to BRC-49, "Adjustment of Steering Angle Sensor Neutral Position" .

G SENSOR

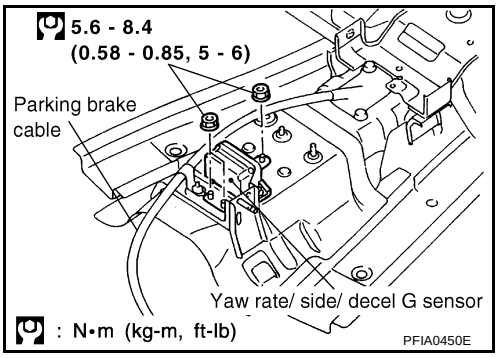
PFP:47930

Removal and Installation

AFS001BY

REMOVAL

1. Remove center console. Refer to IP-17, "CENTER CONSOLE ASSEMBLY" .
2. Disconnect harness connector.
3. Remove installation nuts. Remove yaw rate/side/decel G sensor.



CAUTION:

- **Do not drop or strike the yaw rate/side/decel G sensor, because it has little endurance to impact.**
- **Do not use power tool etc., because yaw rate/side/decel G sensor is weak for the impact.**

INSTALLATION

Installation is in the revers order of removal.

CAUTION:

- **Do not drop or strike the yaw rate/side/decel G sensor, because it has little endurance to impact.**

NOTE:

- After performing above work, calibrate decel G sensor (AWD model). Refer to BRC-50, "Calibration of Decel G Sensor" .

STEERING ANGLE SENSOR

PFP:25554

Removal and Installation

AFS00212

Refer to SRS-38, "SPIRAL CABLE" .

NOTE:

- Steering angle sensor is built into the spiral cable.
- In the case that ABS actuator and electric unit (control unit) are replaced, make sure to adjust position of steering angle sensor. Refer to BRC-49, "Adjustment of Steering Angle Sensor Neutral Position" .