SECTION BRC
BRAKE CONTROL SYSTEM

CONTENTS

ABS

TCS/ABS

VDC/TCS/ABS

APPLICATION NOTICE

PFP:00000

How to Check Vehicle Type

NFS000TH

Check the vehicle identification number (chassis number).

Identification number (chassis number)	Service information
For serial ● JN1AZ34D300001 – JN1AZ34D330000 ● JN1AZ34E350001 – JN1AZ34E380000 ● JN1AZ36D400001 – JN1AZ36D430000 ● JN1AZ36A450001 – JN1AZ36A480000	Type 1
From serial ● JN1AZ34D330001 – ● JN1AZ34E380001 – ● JN1AZ36D430001 – ● JN1AZ36A480001 –	Type 2

PRECAUTIONS

PFP:00001

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

NFS0001M

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 Battery Service

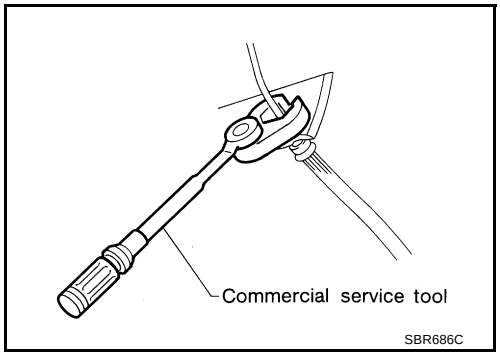
NFS0001N

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions for Brake System

NFS0001O

- Recommended fluid is brake fluid “DOT 3”. Refer to MA-12, "RECOMMENDED FLUIDS AND LUBRICANTS" .
- Never reuse drained brake fluid.
- Be careful not to splash brake fluid on painted areas such as body. If brake fluid is splashed, wipe it off and flush area with water immediately.
- Never use mineral oils such as gasoline or kerosene to clean. They will ruin rubber parts and cause improper operation.
- Use a flare nut wrench when removing flare nuts, and use a flare nut torque wrench when tighten brake tube flare nuts.
- When installing brake tubes, be sure to check torque.
- Brake system is an important safety part. If a brake fluid leak is detected, always disassemble the affected part. If a malfunction is detected, replace part with a new one.
- Before working, turn ignition switch OFF and disconnect electrical connector of ABS actuator and electric unit (control unit) or the battery cables.



WARNING:

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

Precautions for Brake Control

NFS0001P

- 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 booster operation, brake fluid level, and oil 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.

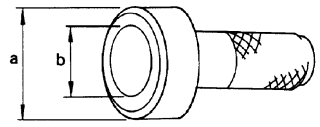
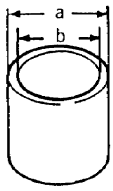
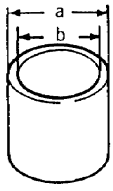
PREPARATION

PFP:00002

Special Service Tools

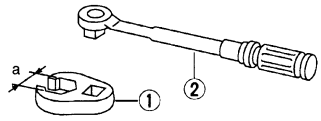
NFS0001Q

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name		Description
ST30720000 (J-25405) Drift a: 77 mm (3.03 in) dia. b: 55.5 mm (2.185 in) dia.	 ZZA0701D	Installation rear sensor rotor
ST27863000 (—) Drift a: 74.5 mm (2.933 in) dia. b: 62.5 mm (2.461 in) dia.	 ZZA0832D	
KV40104710 (—) Drift a: 76.3 mm (3.004 in) dia. b: 67.9 mm (2.673 in) dia.	 ZZA0832D	

Commercial Service Tools

NFS0001R

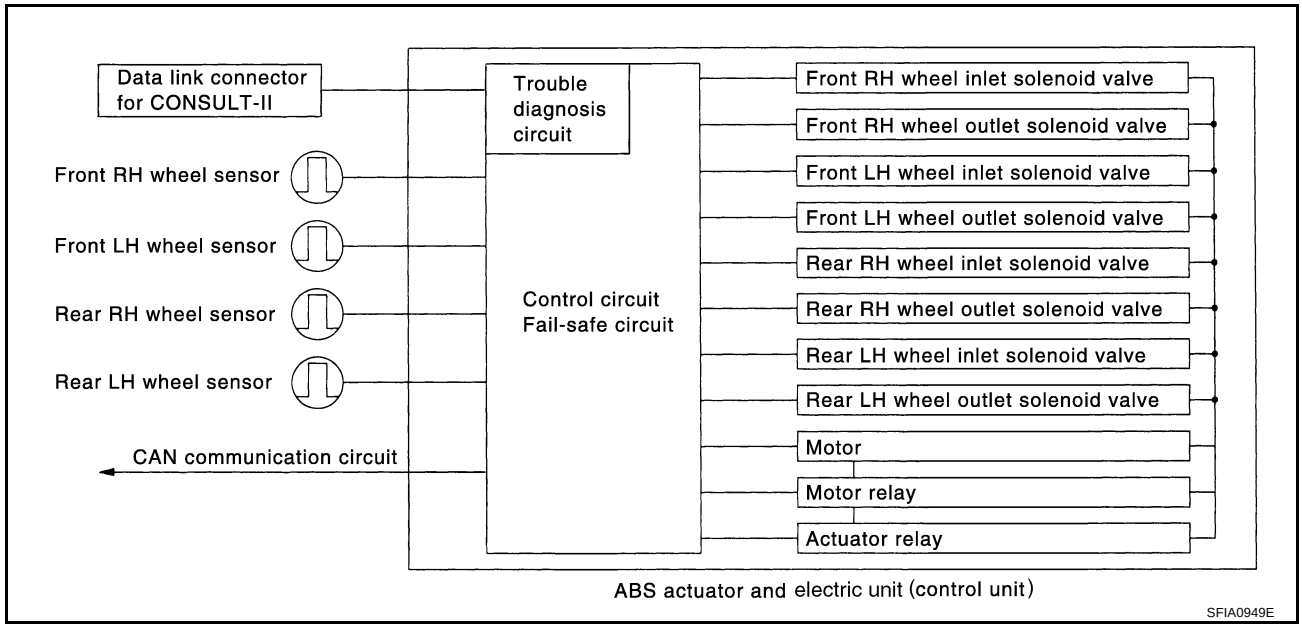
Tool name		Description
1. Flare nut crowfoot a: 10 mm (0.39 in) / 12 mm (0.47 in) 2. Torque wrench	 S-NT360	Installing brake tube

SYSTEM DESCRIPTION

PFP:00000

System Diagram

NFS0001S



ABS Function

NFS0001T

- 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 breaks down, then the Fail-Safe function starts, the ABS becomes inoperative, and the ABS warning lamp turns on.
- Electrical System Diagnosis by CONSULT-II is available.

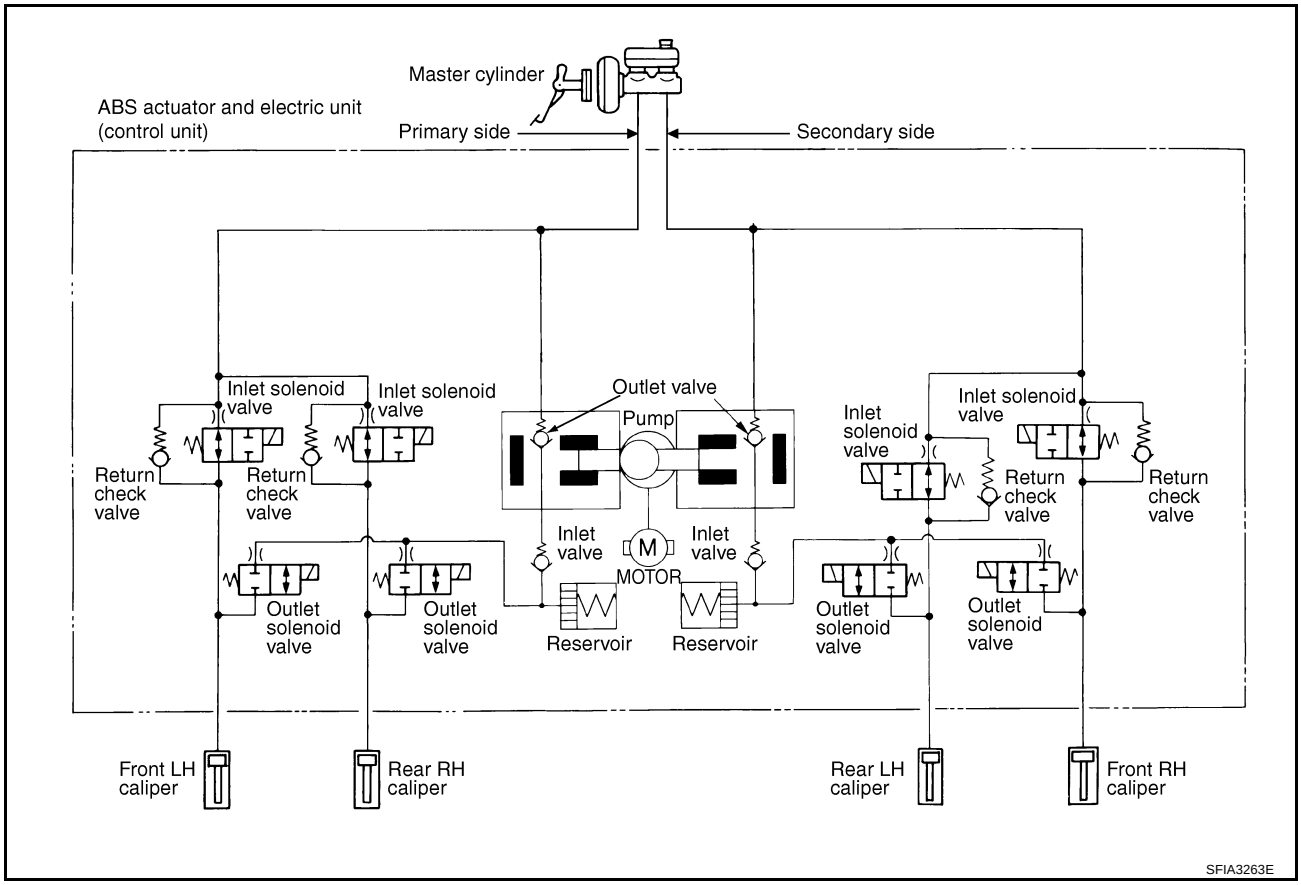
EBD Function

NFS0001U

- Electronic Brake Distributor is a function that detects subtle slippages between the front and rear wheels during braking, and it improves handling stability by electronically controlling the Brake Fluid Pressure which results in reduced rear wheel slippage.
- In case of electrical system break down, the Fail-Safe function is activated, the EBD and ABS becomes inoperative, and the ABS warning lamp and brake warning lamp are turned on.
- Electrical System Diagnosis by CONSULT-II is available.

Hydraulic Circuit Diagram

NFS0001W



CAN Communication

NFS0001X

SYSTEM DESCRIPTION

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-48, "CAN System Specification Chart" .

TROUBLE DIAGNOSIS

PFP:00004

Fail-Safe Function

NFS000II

ABS, EBD SYSTEM

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

- For ABS trouble, only the EBD is activated and the condition of the vehicle is the same condition of vehicle without ABS equipment.

  NOTE:
  ABS self diagnosis sound may be heard. That is a normal condition because a self diagnosis for “Ignition switch ON” and “The first starting” are being performed.
- For EBD trouble, The EBD and ABS become inoperative, are the condition of the vehicle is the same as the condition of vehicles without ABS, EBD equipment.

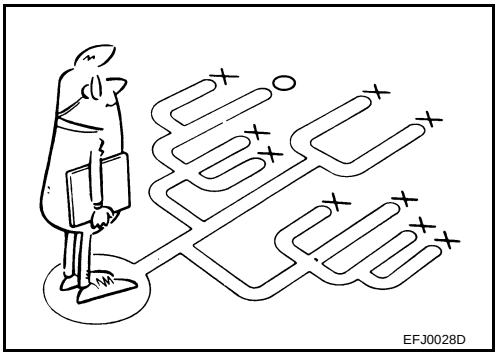
How to Proceed with Diagnosis

NFS0001Y

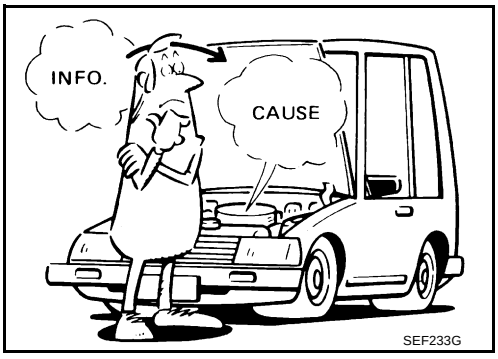
BASIC CONCEPT

- 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

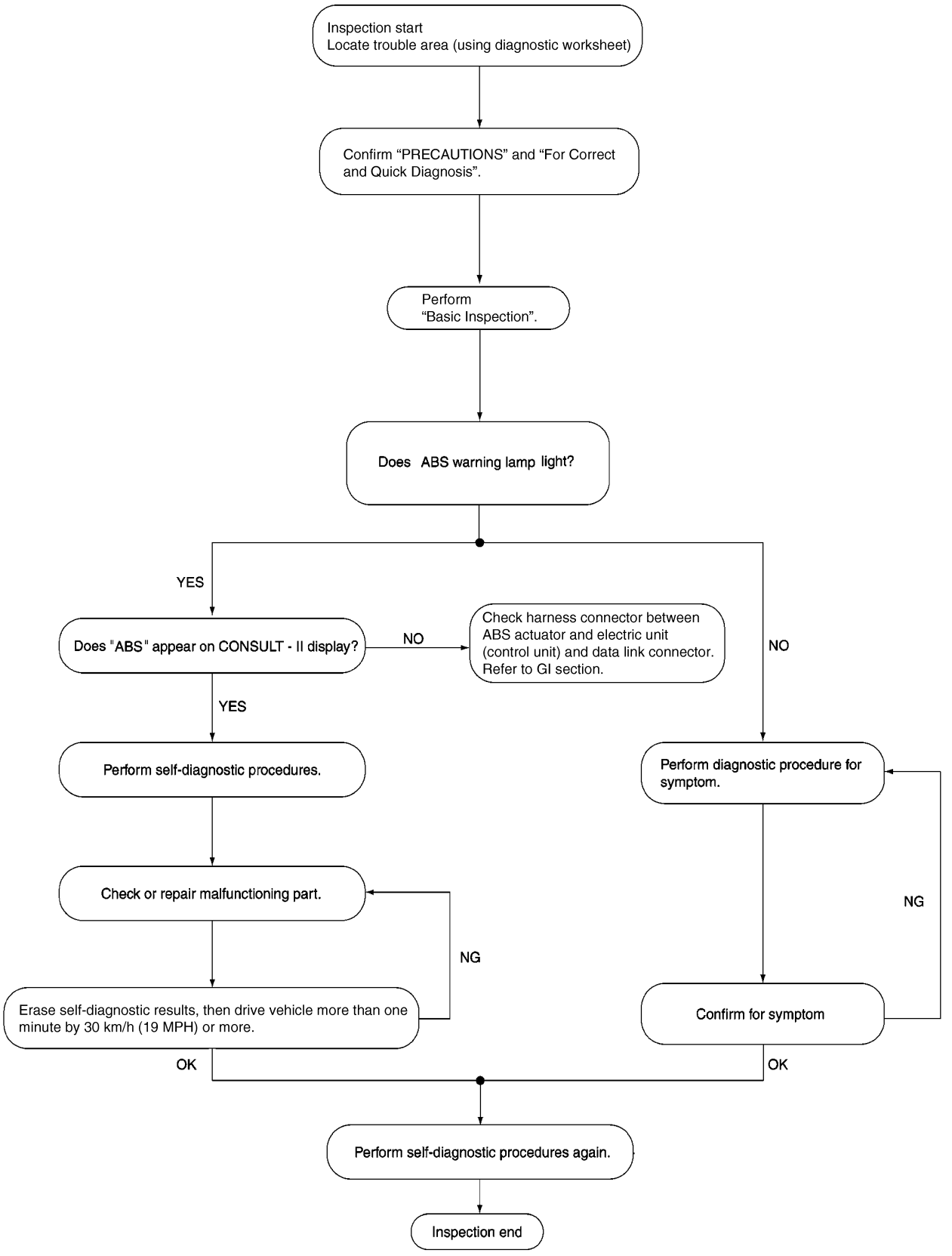
- It is essential to check symptoms right from beginning in order to repair a malfunction completely.
  For an intermittent malfunction, it is important to reproduce symptom based on interview with customer and past examples. Do not perform inspection on ad hoc basis. Most intermittent malfunctions are 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 carry out “erase memory”. Refer to BRC-25, "ERASE MEMORY" .
- 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-3, "General Precautions" .

DIAGNOSIS FLOWCHART



SFIA3270E

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 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

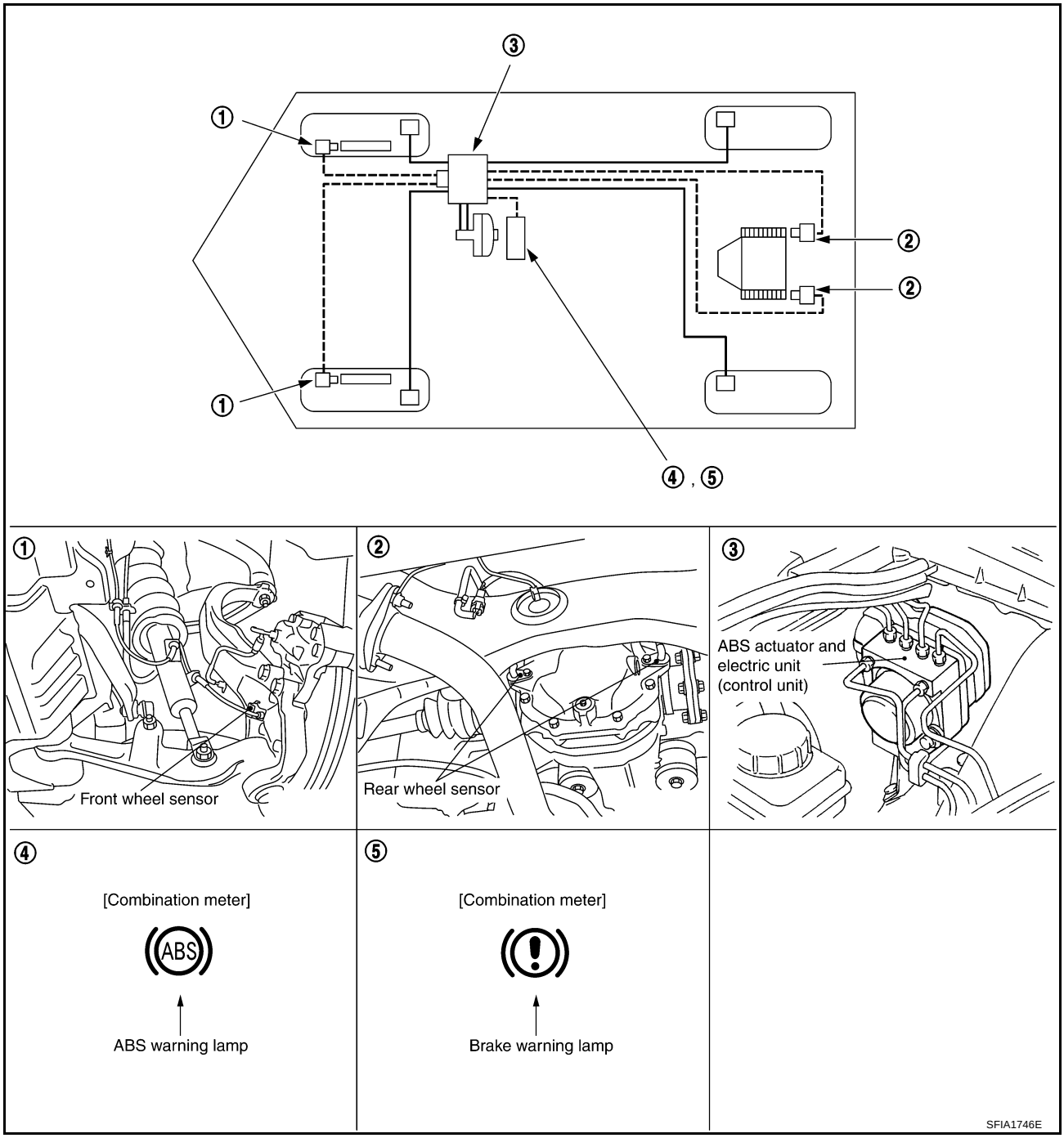
EXAMPLE OF DIAGNOSIS SHEET

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)	☐ 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		

SFIA3264E

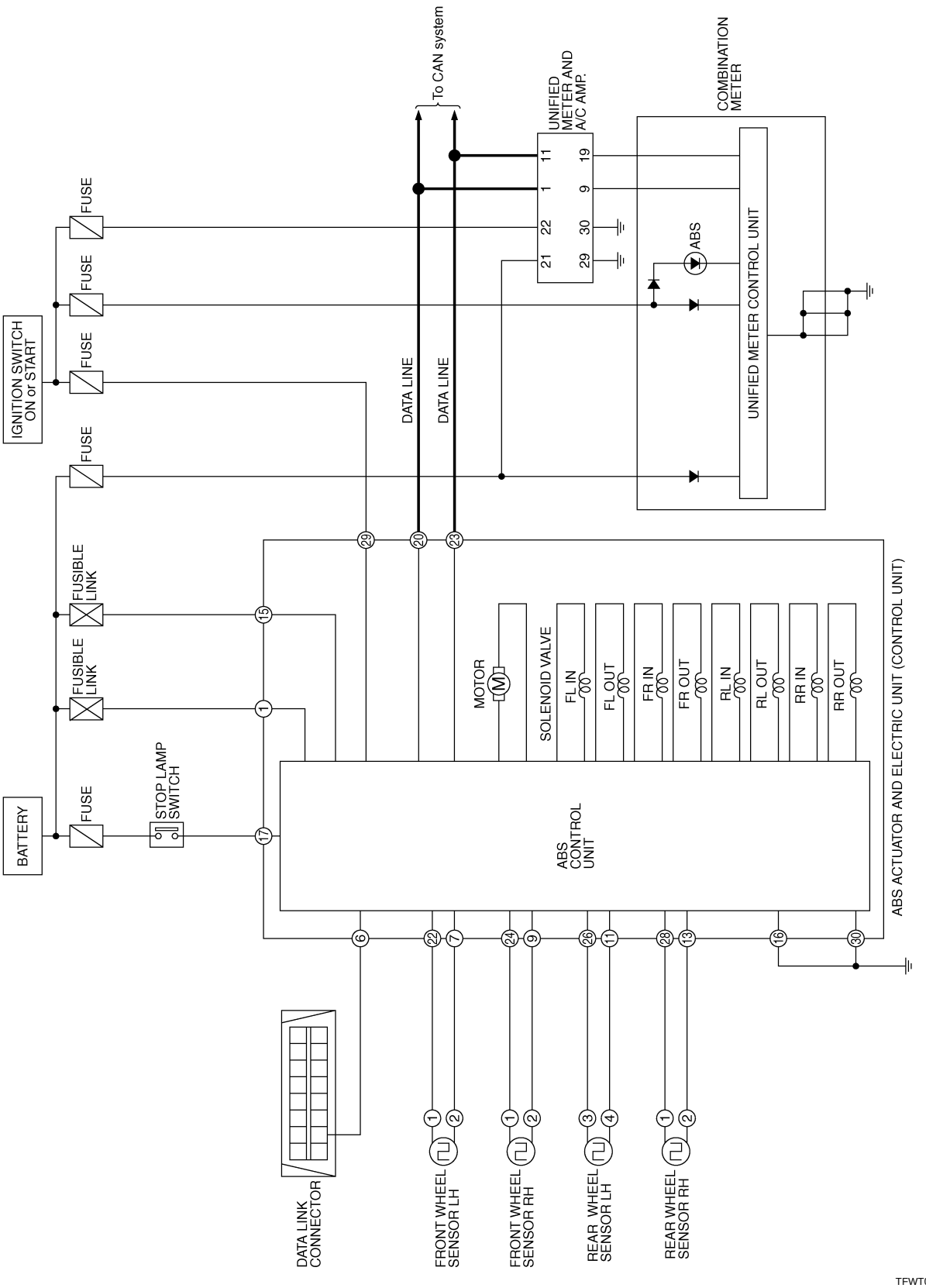
Component Parts Location

NFS0001Z



Schematic

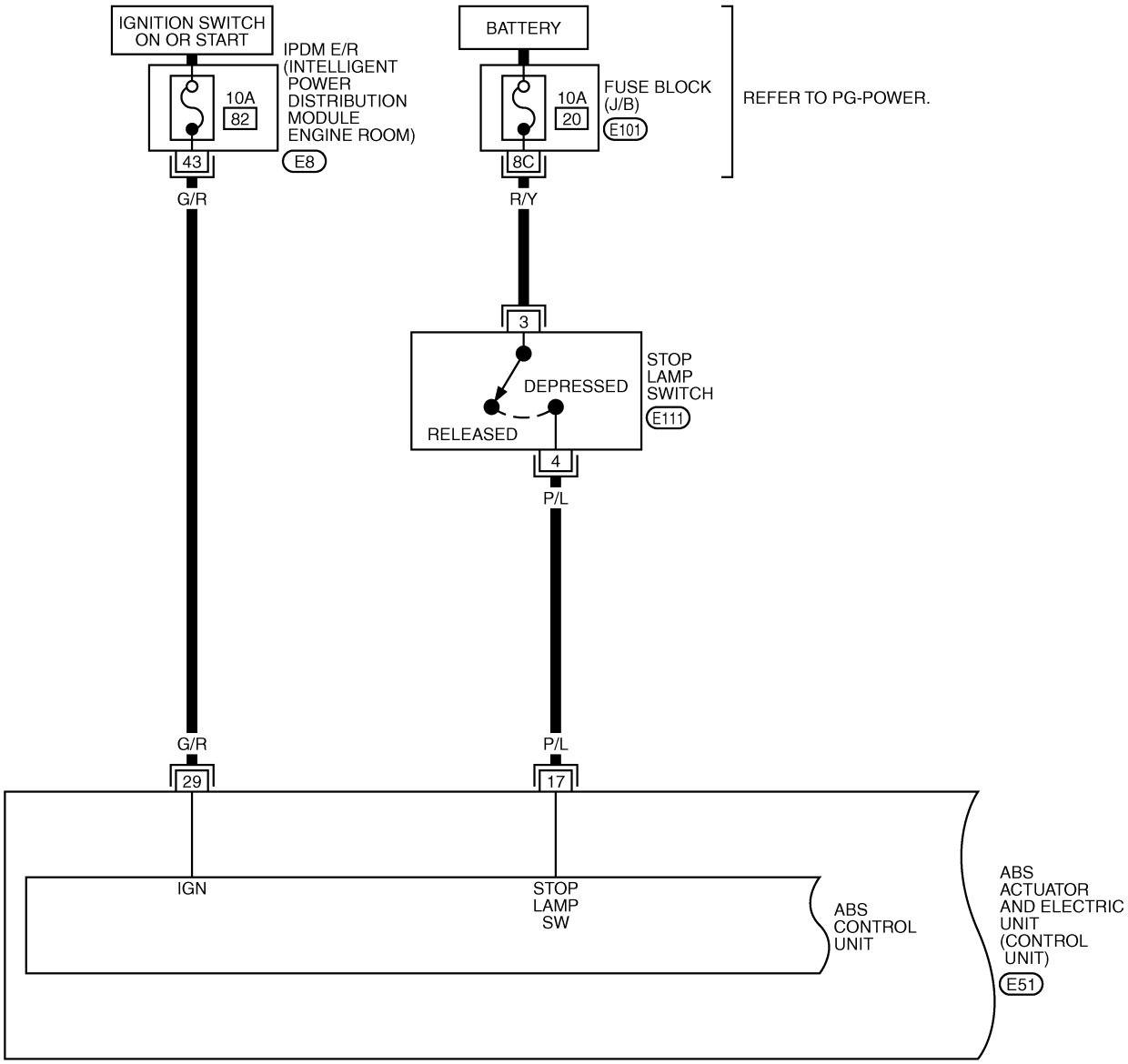
NFS00020

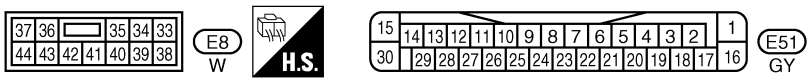


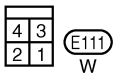
Wiring Diagram — ABS — / Type 1

NFS000TO

BRC-ABS-01



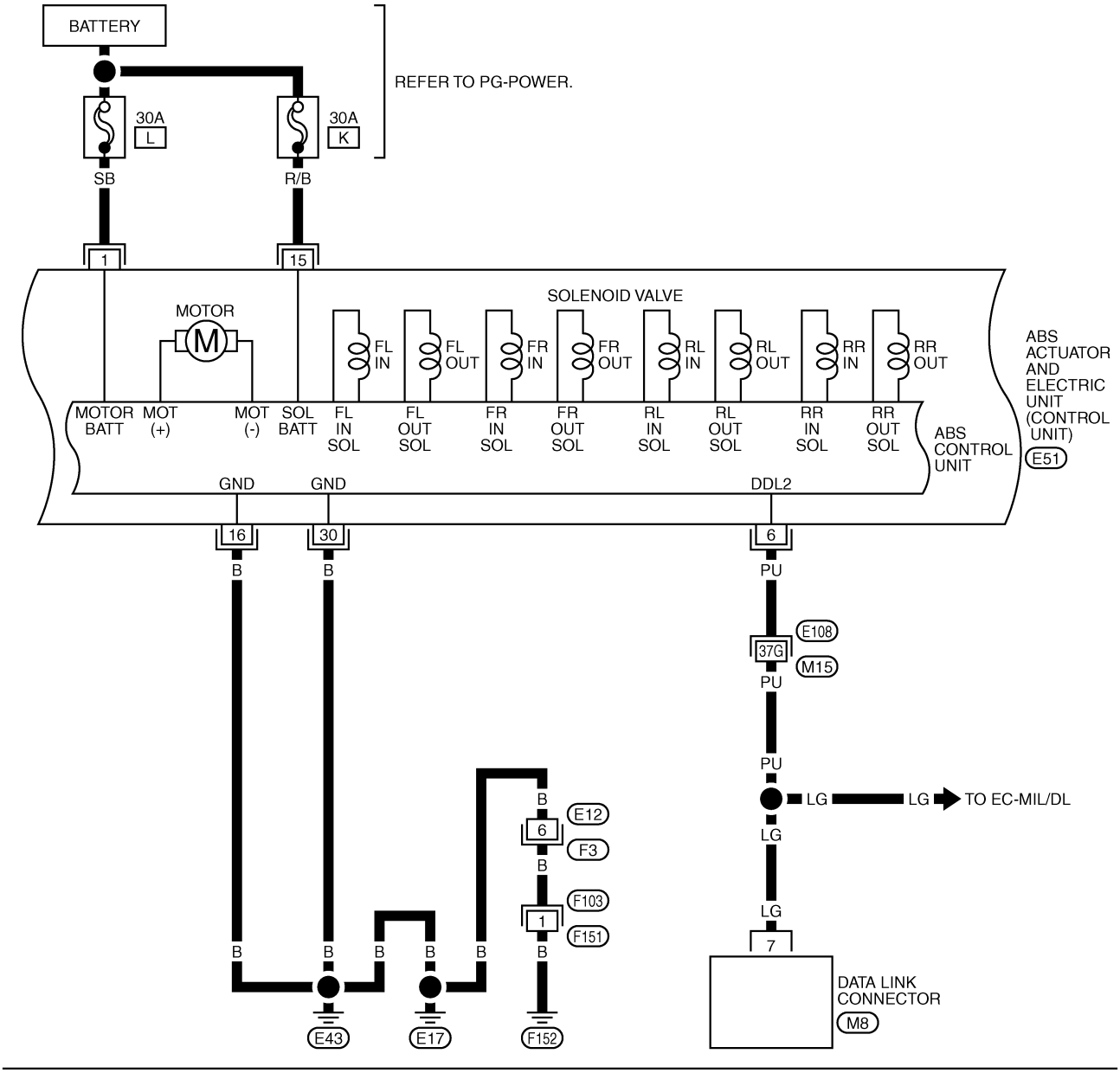


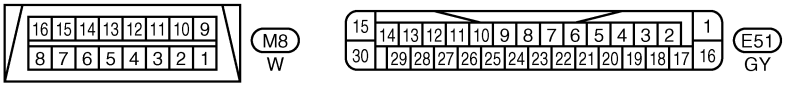


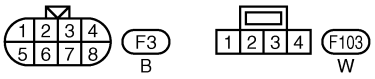
REFER TO THE FOLLOWING.
E101 -FUSE BLOCK-JUNCTION BOX (J/B)

TFWT0289E

BRC-ABS-02



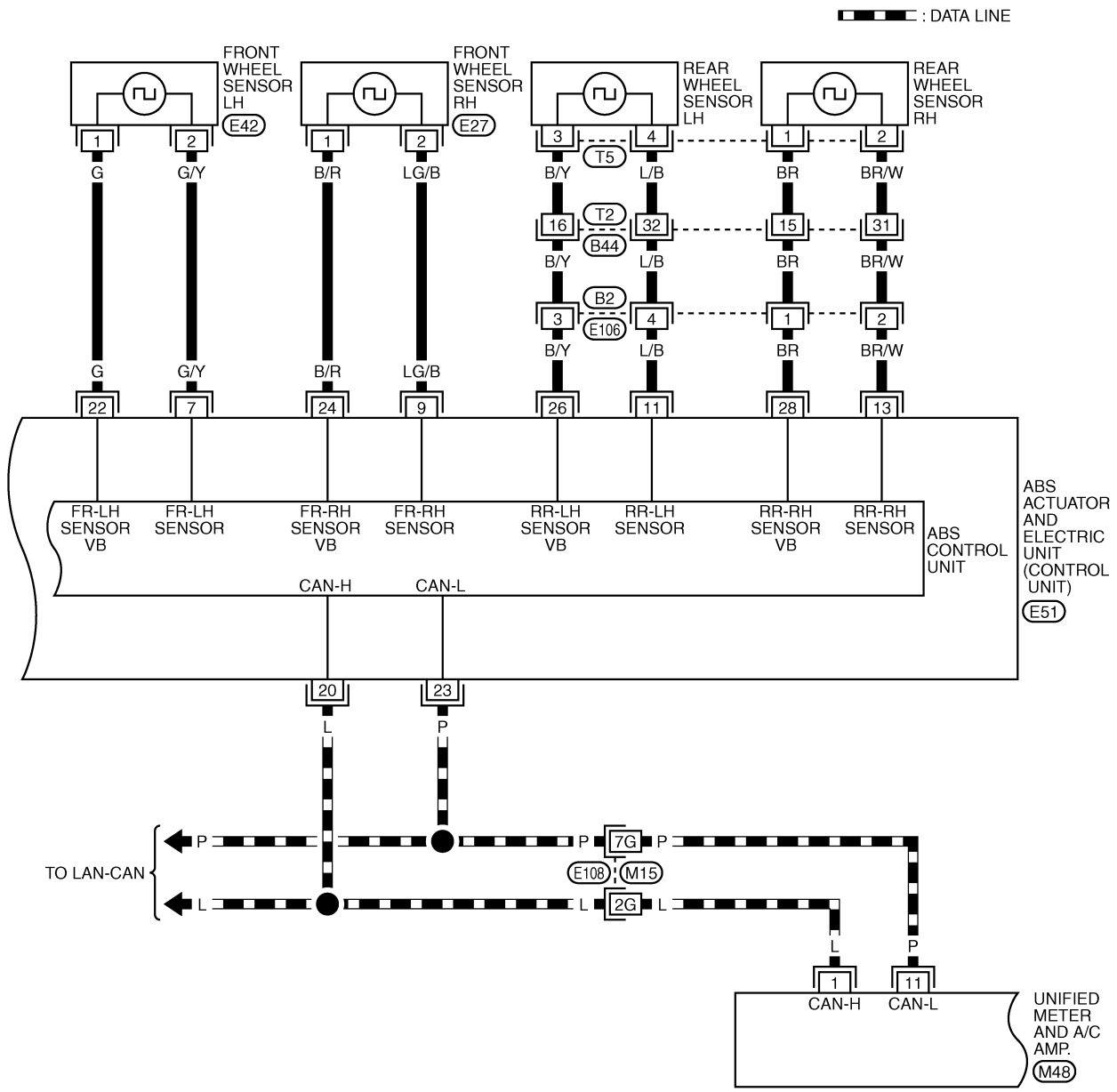


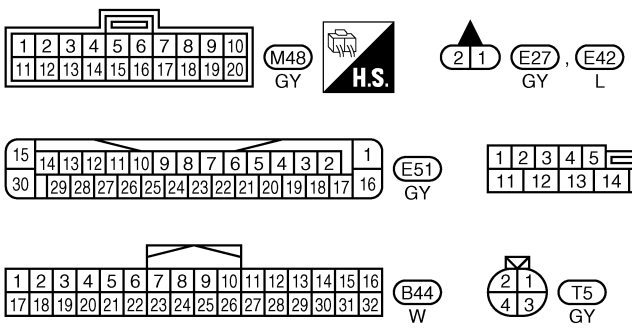


REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)

TFWT0290E

BRC-ABS-03

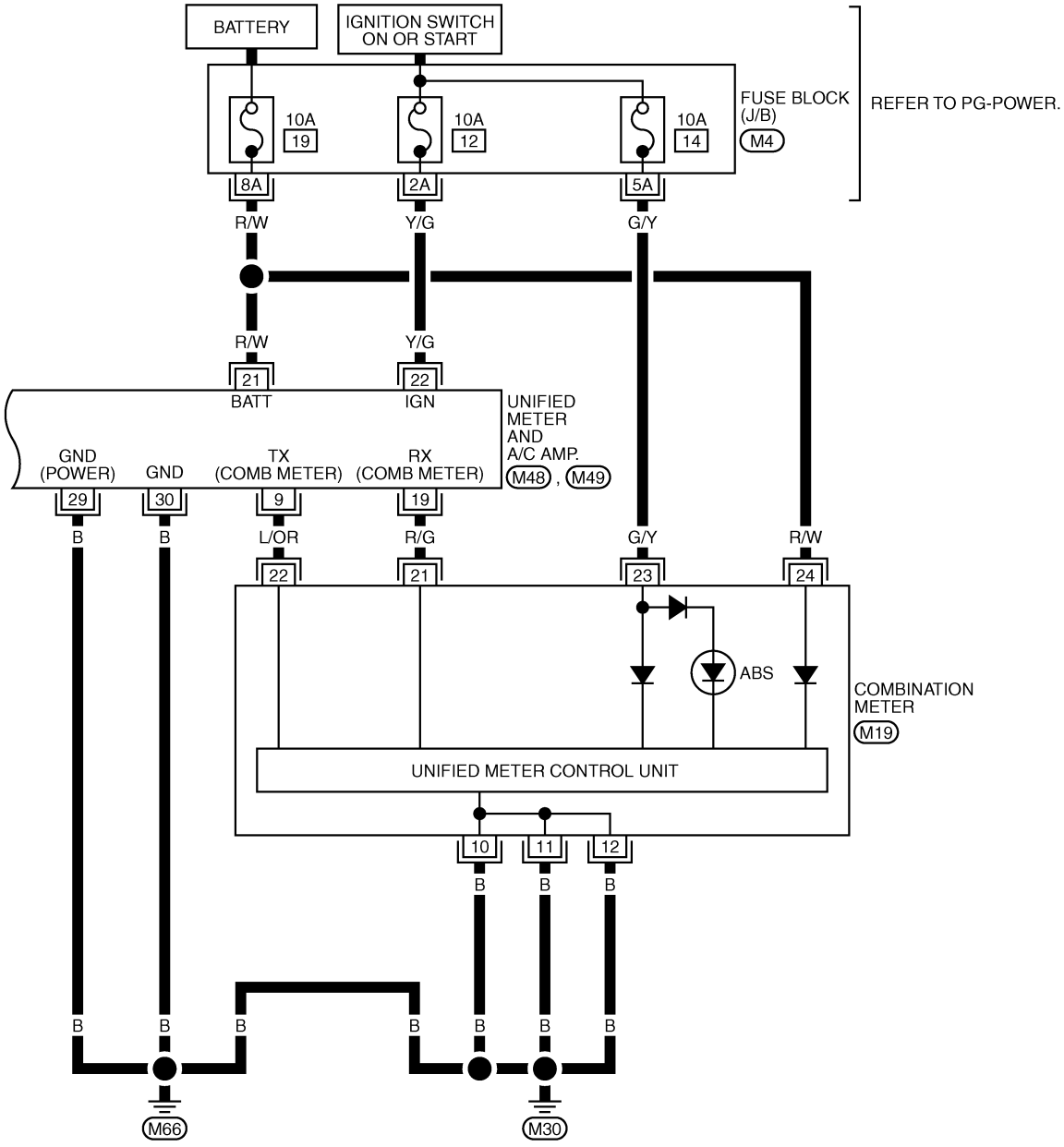


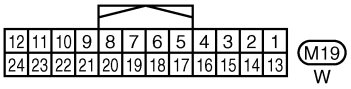


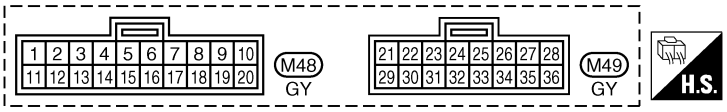
REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)

TFWT0291E

BRC-ABS-04







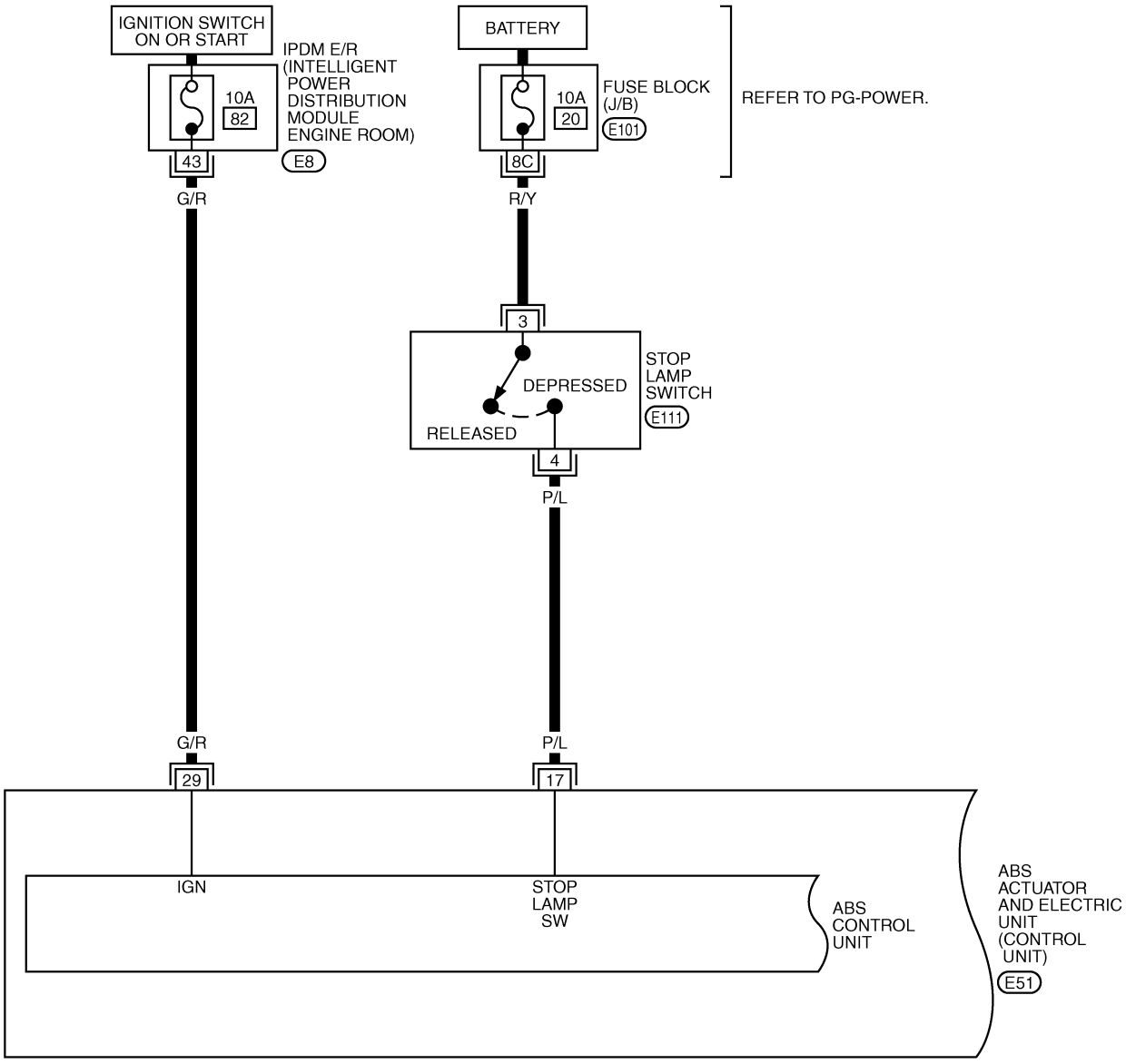
REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

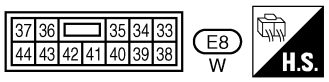
TFWT0046E

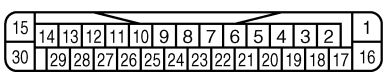
Wiring Diagram — ABS — / Type 2

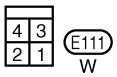
NFS00021

BRC-ABS-01





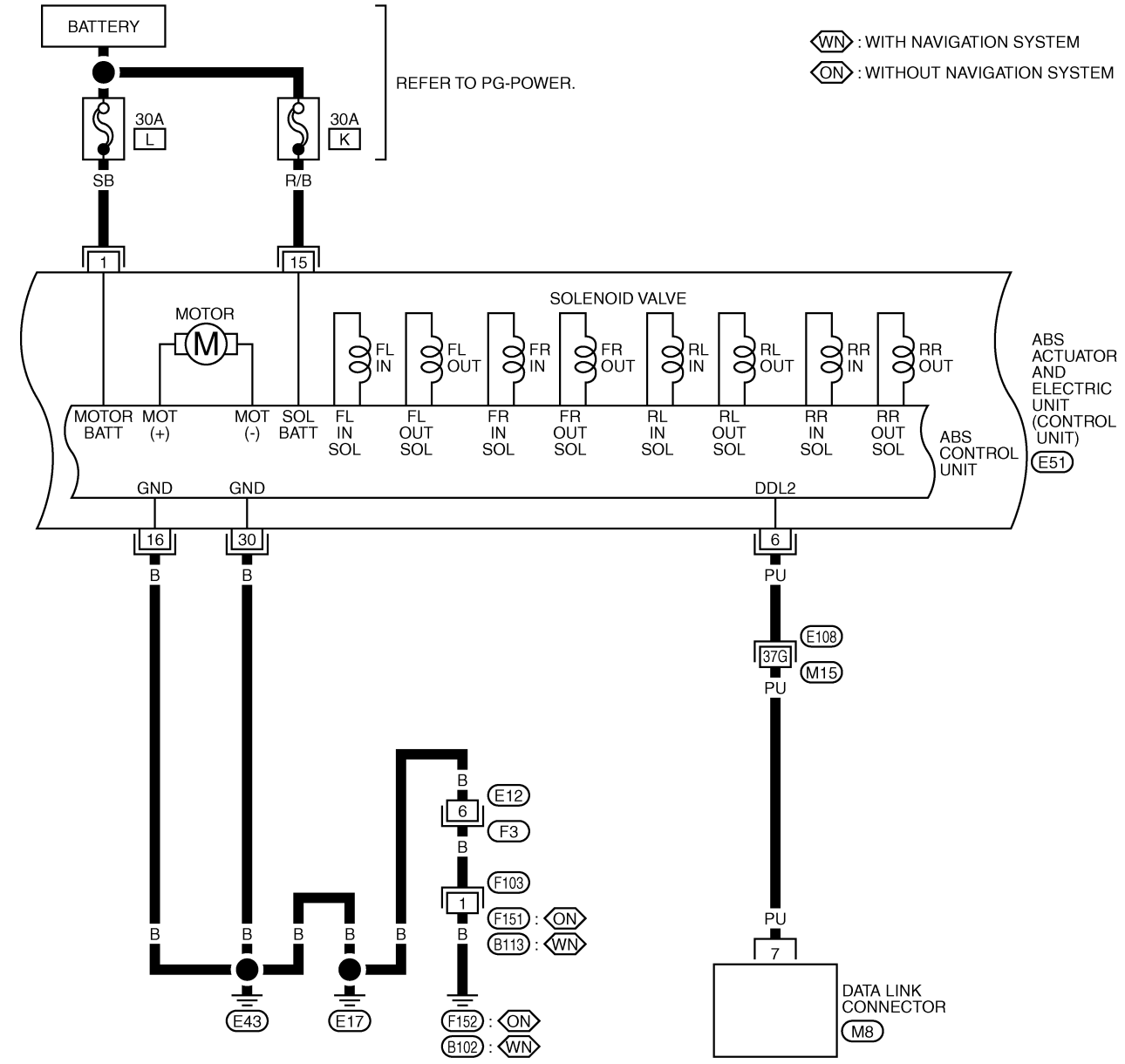


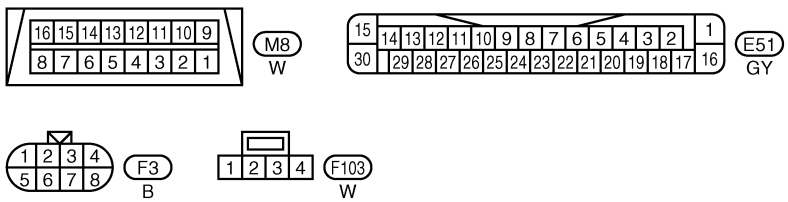


REFER TO THE FOLLOWING.
E101 -FUSE BLOCK-JUNCTION BOX (J/B)

TFWT0289E

BRC-ABS-02

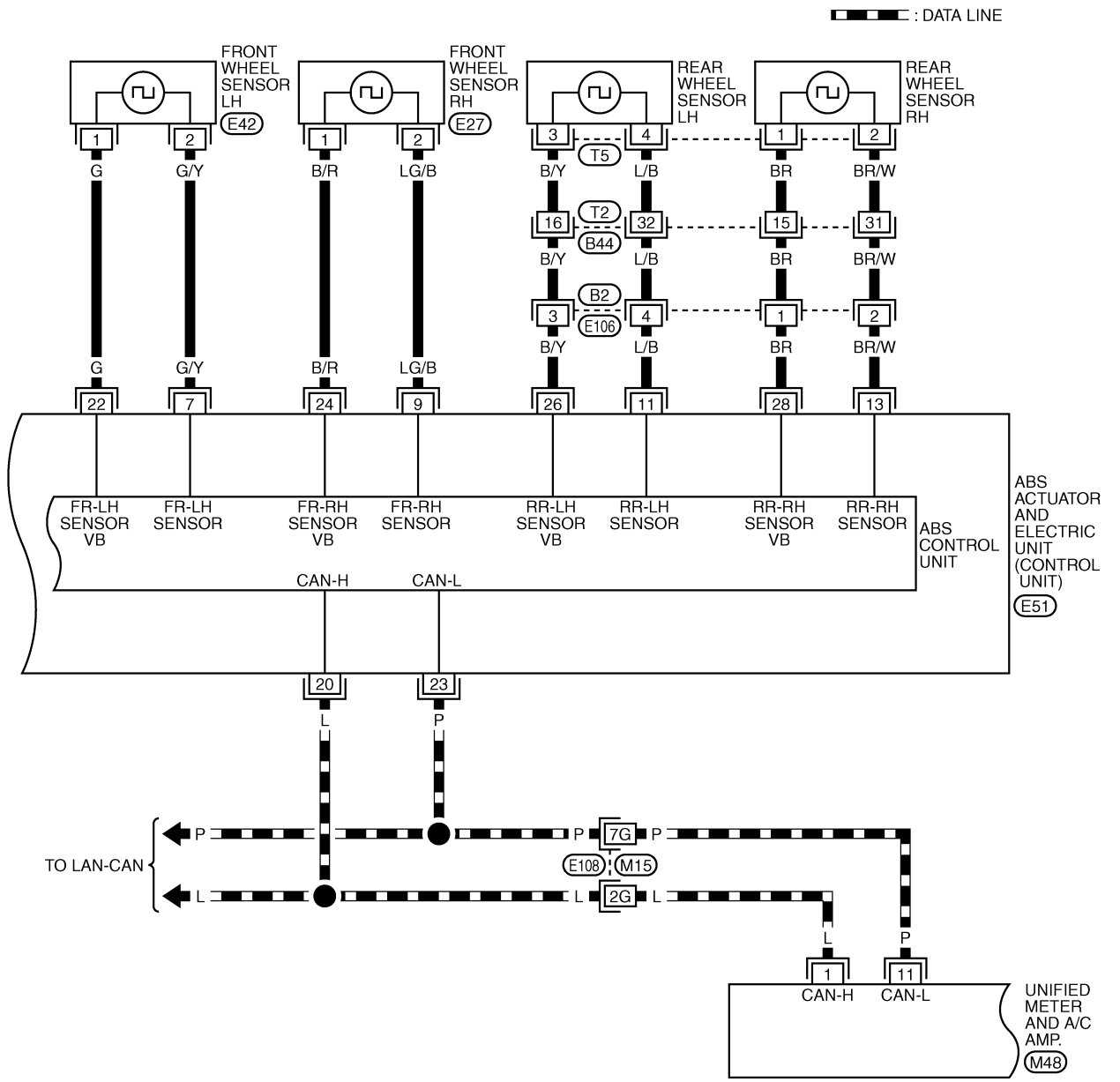


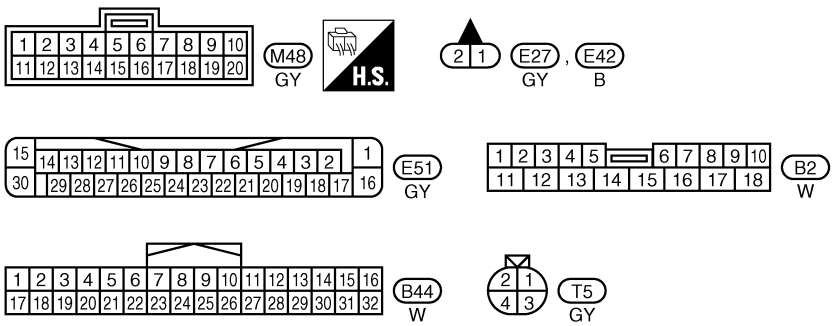


REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)

TFWT0365E

BRC-ABS-03



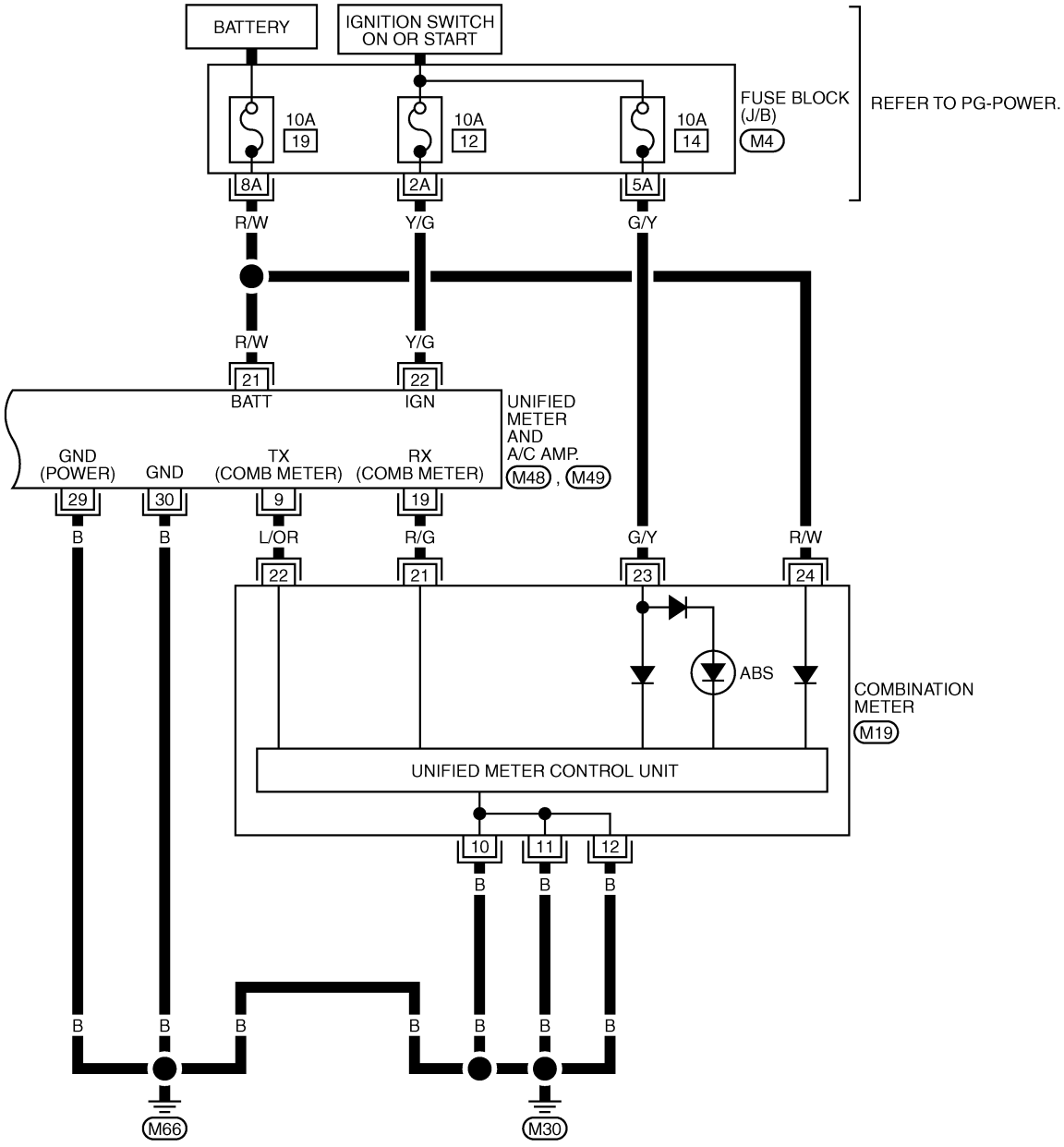


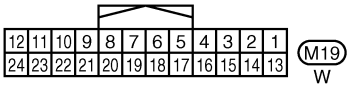
REFER TO THE FOLLOWING.

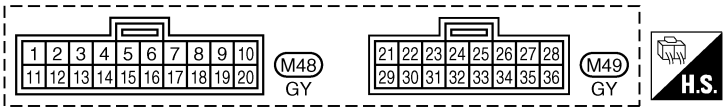
E108 -SUPER MULTIPLE JUNCTION (SMJ)

TFWT0366E

BRC-ABS-04







REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TFWT0046E

Control Unit Input/Output Signal Standard

NFS00022

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		Reference: Inspection item
		Condition	Reference values for normal operation	
WHEEL SENSOR	Wheel speed calculated using signals from all four wheel sensors	Vehicle stopped	0 km/h (0 MPH)	BRC-32, "Wheel Sensor System"
		While driving (Note 1)	Nearly matches the speedometer display (± 10% or less)	
IN ABS S/V OUT ABS S/V	Operation status of all solenoids	When the actuator solenoid operates or during a fail-safe	ON	—
		When the actuator relay operates and the actuator solenoid does not operate	OFF	
EBD WARN LAMP	Brake warning lamp on condition (Note 2)	Brake warning lamp ON	ON	—
		Brake warning lamp OFF	OFF	
STOP LAMP SW	Brake pedal operation	Brake pedal depressed	ON	BRC-37, "Stop Lamp Switch System"
		Brake pedal not depressed	OFF	
MOTOR RELAY	Motor and motor relay operation status	When the motor relay and motor are operating	ON	BRC-36, "ABS Actuator Relay or ABS Motor Relay Power System"
		When the motor relay and motor are not operating	OFF	
ACTUATOR RLY	Actuator relay operation status	When the actuator relay is operating	OFF	BRC-36, "ABS Actuator Relay or ABS Motor Relay Power System"
		When the actuator relay is not operating	ON	
ABS WARN LAMP	ABS warning lamp on condition (Note 2)	ABS warning lamp ON	ON	—
		ABS warning lamp OFF	OFF	
BATTERY VOLT	Battery voltage supplied to ABS control unit	Ignition switch ON	10 - 16V	BRC-36, "ABS Actuator Relay or ABS Motor Relay Power System"
GEAR	Determined gear shift position from the A/T PNP switch signal	Driving	M/T vehicles are always left in 1.	—
ENGINE RPM	Engine running	With engine stopped	0 rpm	Engine speed signal system
		With engine running	Almost in accordance with tachometer display	
FAIL SIGNAL	Fail signal status	During ABS fail-safe During EBD fail-safe	ON	ABS system EBD system

Note 1: Confirm tire pressure is normal.
Note 2: ON/OFF timing of ABS warning lamp
ON: For approximately 1 second after the ignition switch is turned on or when an error is detected.
OFF: Approximately 1 second after the ignition switch is turned on (when system is normal).

CONSULT- II Functions (ABS)

NFS00023

CONSULT-II MAIN FUNCTION

CONSULT-II can display each diagnostic item using the diagnostic test modes shown following.

Diagnostic test mode	Function	Reference
SELF-DIAG RESULTS	Self-diagnostic results can be read and erased quickly.	BRC-25, "Self-Diagnosis"
DATA MONITOR	Input/Output data in the ABS actuator and electric unit (control unit) can be read.	BRC-27, "Data Monitor"
CAN DIAG SUPPORT MNTR	The results of transmit/receive diagnosis of communication can be read.	LAN-45, "CAN Diagnostic Support Monitor"
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-28, "Active Test"
FUNCTION TEST	Conducted 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 SETTING PROCEDURE

Refer to GI-36, "CONSULT-II Start Procedure" .

Self-Diagnosis

NFS000HD

DESCRIPTION

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

OPERATION PROCEDURE

1. Perform “CONSULT-II Start Procedure”. Refer to GI-36, "CONSULT-II Start Procedure" .
2. Start engine and drive at approximately 30 km/h (19 MPH) or more for approximately 1 minute.
3. After stopping the vehicle, with the engine running, touch “SELF-DIAG RESULTS”.
4. 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 the ABS warning lamp.
5. Conduct the appropriate inspection from the display item list, and repair or replace the malfunctioning component.
6. Start the 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) or more for at least 1 minute, the ABS warning lamp will not turn off even if everything is normal.**

ERASE MEMORY

1. Turn ignition switch OFF.
2. Start the engine and select “SELF-DIAG RESULTS”.
3. Touch “ERASE MEMORY” on the CONSULT-II screen to erase the error memory.

   CAUTION:
   If the error memory is not erased, perform applicably diagnosis.
4. Perform self-diagnosis again, and make sure that diagnostic memory is erased.
5. Drive vehicle at 30 km/h (19 MPH) or more for approximately 1 minute as the final inspection, and make sure that the ABS warning lamp turn off.

DISPLAY ITEM LIST

Display item	Malfunction detecting condition	Check item
RR RH SENSOR-1	When the circuit in the rear RH wheel sensor is open.	BRC-32, "Wheel Sensor System" (Note 1)
RR LH SENSOR-1	When the circuit in the rear LH wheel sensor is open.	
FR RH SENSOR-1	When the circuit in the front RH wheel sensor is open.	
FR LH SENSOR-1	When the circuit in the front LH wheel sensor is open.	
RR RH SENSOR-2	When the circuit in the rear RH wheel sensor is short-circuited. Or when the sensor power voltage is outside the standard. When the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
RR LH SENSOR-2	When the circuit in the rear LH wheel sensor is short-circuited. Or when the sensor power voltage is outside the standard. When the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
FR RH SENSOR-2	When the circuit in the front RH wheel sensor is short-circuited. Or when the sensor power voltage is outside the standard. When the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
FR LH SENSOR-2	When the circuit in the front LH wheel sensor is short-circuited. Or when the sensor power voltage is outside the standard. When the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
MAIN RELAY	When the control unit detects an error in the actuator relay system.	BRC-36, "ABS Actuator Relay or ABS Motor Relay Power System"
STOP LAMP SW	When a stop lamp switch open-circuit is detected.	BRC-37, "Stop Lamp Switch System"
FR LH IN ABS SOL	When the control unit detects an error in the front left inlet solenoid system.	—
FR LH OUT ABS SOL	When the control unit detects an error in the front left outlet solenoid system.	
FR RH IN ABS SOL	When the control unit detects an error in the front right inlet solenoid system.	
FR RH OUT ABS SOL	When the control unit detects an error in the front right outlet solenoid system.	
RR LH IN ABS SOL	When the control unit detects an error in the rear left inlet solenoid system.	
RR LH OUT ABS SOL	When the control unit detects an error in the rear left outlet solenoid system.	
RR RH IN ABS SOL	When the control unit detects an error in the rear right inlet solenoid system.	
RR RH OUT ABS SOL	When the control unit detects an error in the rear right outlet solenoid system.	
BATTERY VOLTAGE [ABNORMAL]	When the ABS actuator and electric unit (control unit) power supply voltage is lower than normal.	BRC-34, "ABS Actuator and Electric Unit (Control Unit) Power and Ground Systems"
EMERGENCY BRAKE	When the ABS actuator and electric unit (control unit) malfunctions (pressure increase is too much or too little).	BRC-38, "ABS Actuator and Electric Unit (Control Unit) 2"
CONTROLLER FAILURE	When there is an internal malfunction in the ABS actuator and electric unit (control unit).	BRC-34, "ABS Actuator and Electric Unit (Control Unit)"
CAN COMM CIRCUIT	When ABS actuator and electric unit (control unit) is not transmitting or receiving CAN communication signal for 2 seconds or more.	BRC-38, "CAN Communication System" (Note 2)

Note 1: After completing repairs of the shorted sensor circuit, when ignition switch is turned ON, ABS warning lamp turns on. Check that ABS warning lamp turns off while driving the 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 the wheels, check the wheel sensor circuit and also check the control unit power voltage.

Note 2: When errors are detected in several systems, including the CAN communication system [U1000], troubleshoot the CAN communication system.

Data Monitor

NFS000HE

OPERATION PROCEDURE

1. Perform “CONSULT-II Start Procedure”. Refer to GI-36, "CONSULT-II Start Procedure" .
2. Touch “DATA MONITOR”.
3. Select from “SELECT MONITOR ITEM”, screen of data monitor mode is displayed.

DISPLAY ITEM LIST

Item (Unit)	SELECT MONITOR ITEM			Remarks
	ECM INPUT SIGNALS	MAIN SIGNALS	SELECTION MENU	
FR LH SENSOR [km/h (MPH)]	×	×	×	Wheel speed calculated by front LH wheel sensor signal is displayed.
FR RH SENSOR [km/h (MPH)]	×	×	×	Wheel speed calculated by front RH wheel sensor signal is displayed.
RR LH SENSOR [km/h (MPH)]	×	×	×	Wheel speed calculated by rear LH wheel sensor signal is displayed.
RR RH SENSOR [km/h (MPH)]	×	×	×	Wheel speed calculated by rear RH wheel sensor signal is displayed.
FR LH IN SOL (ON/OFF)	—	×	×	Front left inlet ABS solenoid valve (ON/OFF) status is displayed.
FR LH OUT SOL (ON/OFF)	—	×	×	Front left outlet ABS solenoid valve (ON/OFF) status is displayed.
RR RH IN SOL (ON/OFF)	—	×	×	Rear right inlet ABS solenoid valve (ON/OFF) status is displayed.
RR RH OUT SOL (ON/OFF)	—	×	×	Rear right outlet ABS solenoid valve (ON/OFF) status is displayed.
FR RH IN SOL (ON/OFF)	—	×	×	Front right inlet ABS solenoid valve (ON/OFF) status is displayed.
FR RH OUT SOL (ON/OFF)	—	×	×	Front right outlet ABS solenoid valve (ON/OFF) status is displayed.
RR LH IN SOL (ON/OFF)	—	×	×	Rear left wheel inside ABS solenoid valve (ON/OFF) status is displayed.
RR LH OUT SOL (ON/OFF)	—	×	×	Rear left outlet ABS solenoid valve (ON/OFF) status is displayed.
EBD WARN LAMP (ON/OFF)	—	×	×	Brake warning lamp (ON/OFF) status is displayed.
STOP LAMP SW (ON/OFF)	×	×	×	Stop lamp switch (ON/OFF) status is displayed.
MOTOR RELAY (ON/OFF)	—	×	×	ABS motor relay (ON/OFF) condition is displayed.
ACTUATOR RLY (ON/OFF)	—	×	×	ABS actuator relay (ON/OFF) status is displayed.
ABS WARN LAMP (ON/OFF)	—	×	×	ABS warning lamp (ON/OFF) status is displayed.
BATTERY VOLT (V)	×	×	×	The voltage supplied to the ABS control unit is displayed.
EBD SIGNAL (ON/OFF)	—	—	×	EBD operation (ON/OFF) status is displayed.
ABS SIGNAL (ON/OFF)	—	—	×	ABS operation (ON/OFF) status is displayed.

Item (Unit)	SELECT MONITOR ITEM			Remarks
	ECM INPUT SIGNALS	MAIN SIGNALS	SELECTION MENU	
EBD FAIL SIG (ON/OFF)	—	—	×	EBD fail-safe signal (ON/OFF) status is displayed.
ABS FAIL SIG (ON/OFF)	—	—	×	ABS fail-safe signal (ON/OFF) status is displayed.

×: Applicable
–: Not applicable

Active Test

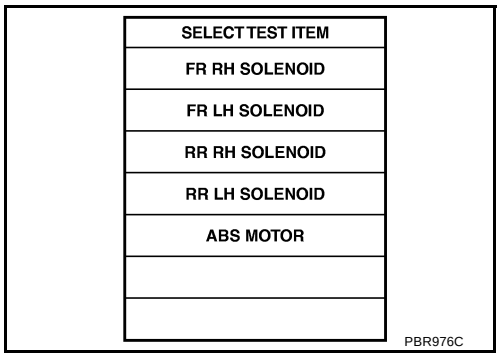
NFS000IN

CAUTION:

- **Do not perform active test while driving.**
- **Make sure to completely bleed air from the brake system.**
- **The ABS and brake warning lamps turn on during the active test.**

OPERATION PROCEDURE

1. Perform “CONSULT-II Start Procedure”. Refer to GI-36, "CONSULT-II Start Procedure" .
2. Touch “ACTIVE TEST”.
3. The test item selection screen is displayed.
4. Touch necessary test item.



5. With the “MAIN ITEM” display shown in reverse, touch “START”.
6. The “ACTIVE TEST” screen will be displayed, so conduct the following test.

NOTE:

- When the active test is conducted while depressing the pedal, the pedal depression amount will change, but this is normal.
- Approximately 10 seconds after the operation is begun, “TEST STOP” will be displayed.
- To conduct a retest after “TEST STOP” is displayed, touch “BACK” and conduct the test from the step6.

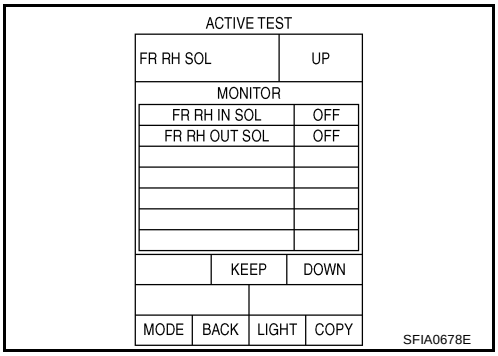
TEST ITEM

Solenoid valve

CAUTION:

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

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.



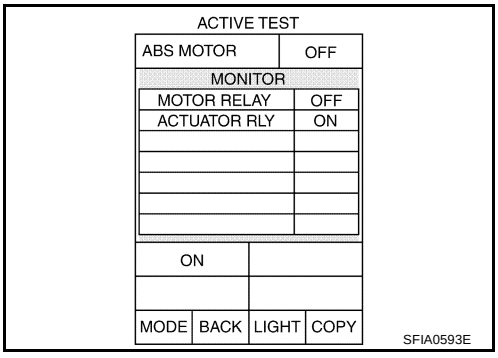
Operation	ABS solenoid valve		
	UP	KEEP	DOWN
FR RH IN SOL	OFF	ON	ON
FR RH OUT SOL	OFF	OFF	ON*

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

ABS Motor

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

Operation	ON	OFF
MOTOR RELAY	ON	OFF
ACTUATOR RLY	ON	ON



Correct and Quick Diagnosis

NFS00024

DIAGNOSIS PRECAUTIONS

- Before performing the trouble diagnosis, always read the general information (GI) to confirm the general precautions. Refer to GI-3, "General Precautions" .
- After completing service, always erase the self-diagnosis results. Refer to BRC-25, "ERASE MEMORY" .
- When inspection of the continuity or voltage between units is performed, check connector terminals for disconnection, looseness, bend, or collapse. If any non-standard condition is detected, repair or replace applicable part.
- Intermittent errors may be caused by a poor connection in the 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 the check, be careful not to forcibly extend any connector terminal.
- ABS is a system that uses electronic control to perform brake control and engine power control. Therefore, phenomena like those shown in the following table may occur, but this is because the system is working normally.

Symptom	Symptom description	Result
Motor operation noise	This is the sound of the motor operating inside ABS actuator, and there may be some low sounds while the ABS is operating.	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

ABS WARNING LAMP ON/OFF TIMING

×: ON –: OFF

Condition	ABS warning lamp	Remarks
Ignition switch OFF	—	—
For approximately “1” second after ignition switch ON	×	—
After approximately “1” second after ignition switch ON. (When system is normal)	—	Turns off 2 second after engine start
ABS error	×	When there is an ABS actuator and electric unit error (power or ground error)

Basic Inspection

NFS00025

BRAKE FLUID AMOUNT, LEAKS, AND BRAKE PADS INSPECTION

1. Check fluid level in the brake reservoir tank. If fluid level is low, refill the brake fluid.
2. Check brake tubes or hoses and around ABS actuator for leaks. If there is leaking or oozing fluid, check following items.
   - If ABS actuator connection is loose, tighten the piping to the specified torque and re-conduct the leak inspection to make sure there are no leaks.
   - If there is damage to the connection flare nut or ABS actuator screw, replace the damaged part and re-conduct the leak inspection to make sure there are no leaks.
   - When there is fluid leaking or oozing from a part other than ABS actuator connection, if the fluid is just oozing out, use a clean cloth to wipe off the oozing fluid and re-check for leaks. If fluid is still oozing out, replace the damaged part.
   - When there is fluid leaking or oozing at ABS actuator, if the fluid is just oozing out, use a clean cloth to wipe off the oozing fluid and re-check for leaks. If fluid is still oozing out, replace ABS actuator body.

     CAUTION:
     ABS actuator and electric unit (control unit) cannot be disassembled.
3. Check brake pad degree of wear. Refer to BR-26, "PAD WEAR INSPECTION" in “Front Disc Brake” and BR-39, "PAD WEAR INSPECTION" in “Rear Disc Brake”.

POWER SYSTEM TERMINAL LOOSENESS AND BATTERY INSPECTION

Make sure the battery positive cable, negative cable and ground connection are not loose. In addition, check the battery voltage to make sure it has not dropped.

ABS WARNING LAMP INSPECTION

1. Make sure ABS warning lamp turned on approximately 1 second when the ignition switch is turned ON. Check CAN communications. Refer to BRC-38, "CAN Communication System" .
2. Make sure lamp turns off approximately 1 second after the ignition switch is turned on. If the lamp does not turn off, conduct self-diagnosis.
3. Make sure ABS warning lamp turn off 2 seconds after the engine is started. If ABS warning lamp has not turned off 10 seconds after the engine has been started, conduct self-diagnosis of the ABS actuator and electric unit.
4. After conducting the self-diagnosis, be sure to erase the error memory. Refer to BRC-25, "ERASE MEMORY"

TROUBLE DIAGNOSIS FOR SYSTEM

PFP:00000

Wheel Sensor System

NFS00026

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

CAUTION:

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

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

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

Is the above displayed in the self-diagnosis display items?

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

2. CHECK TIRE

Check air pressure, wear, and size.

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

YES >> GO TO 3.
NO >> Adjust air pressure, or replace tire.

3. CHECK SENSOR AND SENSOR ROTOR

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

OK or NG

OK >> GO TO 4.
NG >> Repair wheel sensor mount or replace the sensor rotor.

4. CHECK CONNECTOR

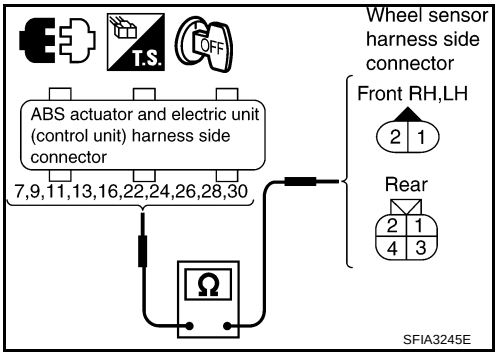
1. Disconnect ABS control unit connector and the malfunctioning wheel sensor connector E42 (FR - LH) or E27 (FR - RH) or T5 (RR - RH, LH). Check the terminal to see if it is deformed, disconnected, loose, etc., and replace it if any non-standard condition is found.
2. Reconnect connector, drive at a speed of approximately 30 km/h (19 MPH) or more for approximately 1 minute, and then perform self-diagnosis.

Is the result of self-diagnosis normal?

YES >> The connector terminal contact is loose, damaged, open or shorted.
NO >> GO TO 5.

5. CHECK WHEEL SENSOR HARNESS

1. Turn ignition switch OFF and disconnect the wheel sensor connector E42 (FR - LH) or E27 (FR - RH) or T5 (RR - RH, LH) and ABS control unit (control unit) connector E51.
2. Check continuity between terminals. (Also check the continuity when the steering wheel is turned right and left and when the sensor harness inside the wheel well is moved.)



	Power system		Signal system		Ground system	
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) (signal)	ABS actuator and electric unit (control unit) (ground)
Front RH	24	1	9	2	24, 9	16, 30
Front LH	22	1	7	2	22, 7	
Rear RH	28	1	13	2	28, 13	
Rear LH	26	3	11	4	26, 11	

Power system : Continuity should exist.
Signal system : Continuity should exist.
Ground system : Continuity should not exist.

OK or NG

OK >> GO TO 6.
NG >> Repair or replace harness and connector that have malfunction.

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.

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

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”.

ABS Actuator and Electric Unit (Control Unit)

NFS00028

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
CONTROLLER FAILURE

Is the above displayed in the self-diagnosis display items?

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

ABS Actuator and Electric Unit (Control Unit) Power and Ground Systems

NFS00029

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
BATTERY VOLTAGE [ABNORMAL]

Is the above displayed in the self-diagnosis display items?

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

2. CHECK CONNECTOR

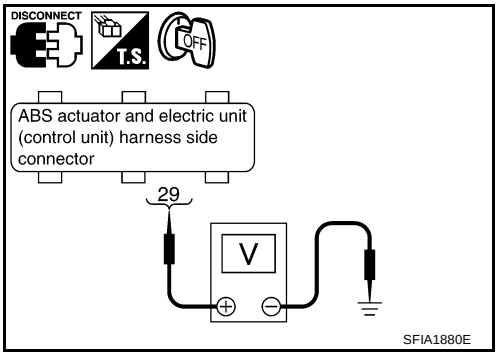
1. Disconnect ABS actuator and electric unit (control unit) control unit connector and check terminal for deformation, disconnection, looseness, and so on, If there is an error, repair or replace the terminal.
2. Securely reconnect the connector and then perform self-diagnosis.

Is the result of self-diagnosis normal?

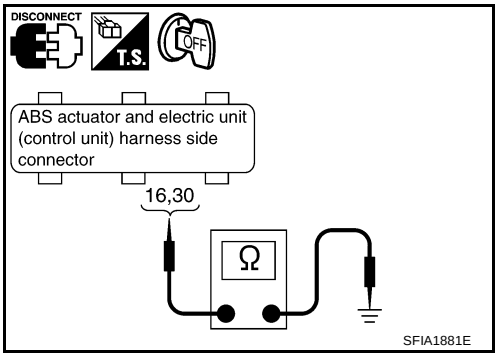
YES >> The connector terminal contact is loose, damaged, open or shorted.
NO >> GO TO 3.

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

1. Disconnect ABS actuator and electric unit (control unit) connector E51.
2. Check continuity and voltage between connector terminals and ground.



Signal name	ABS actuator and electric unit (control unit)	Measurement condition	Voltage
Power supply	29	Ignition switch ON	Battery voltage (Approx. 12 V)
		Ignition switch OFF	Approx. 0 V



Signal name	ABS actuator and electric unit (control unit)	Measurement condition	Continuity
Ground	16, 30	Ignition switch OFF	Yes

OK or NG

OK >> Check battery (terminal looseness, power drop, etc.) Error. If there is an error, make repairs.
NG >> Corresponding harness circuit error. Repair the circuit.

ABS Actuator Relay or ABS Motor Relay Power System

NFS0002A

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
IN ABS SOL
OUT ABS SOL
MAIN RELAY

Is the above displayed in the self-diagnosis display item?

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

2. CHECK CONNECTOR

1. Disconnect ABS actuator and electric unit (control unit) connector E51, check terminal to see if it is deformed, disconnected, loose, etc., and if there is an error, repair or replace the terminal.
2. Securely reconnect the connector and then perform self-diagnosis.

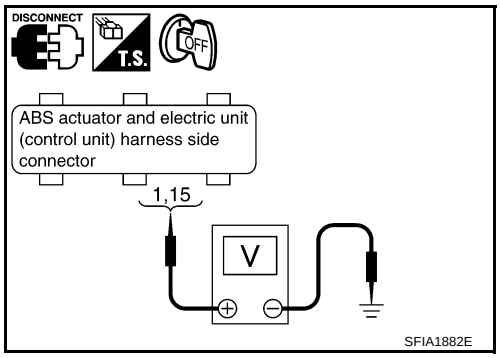
Is the result of self-diagnosis normal?

YES >> The connector terminal contact is loose, damaged, open or shorted.
NO >> GO TO 3.

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

1. Disconnect ABS actuator and electric unit (control unit) connector E51.
2. For ABS actuator relay, measure the voltage between the connector terminal 1 and ground. For ABS motor relay, measure the voltage between connector terminal 15 and ground.

ABS actuator and electric unit (control unit)	Ground	Voltage
1, 15	—	Battery voltage (Approx. 12 V)



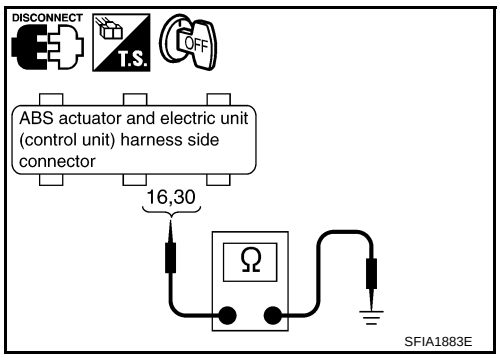
OK or NG

OK >> GO TO 4
NG >> Error in the circuit 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, 30	—	Yes



OK or NG

OK >> Replace ABS actuator and electric unit (control unit).
NG >> Open or short in harness. Repair or replace the harness.

Stop Lamp Switch System

NFS0002B

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
STOP LAMP SW

Is the above displayed in the self-diagnosis display item?

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

2. CHECK CONNECTOR

1. Disconnect ABS actuator and electric unit (control unit) connector E51 and stop lamp switch connector E112, check the terminal for deformation, disconnection, looseness, and so on. If there is an error, repair or replace the terminal.
2. Securely reconnect the connector and conduct self-diagnosis.
3. Start engine.
4. Repeat Pumping brake pedal carefully several times, then perform self-diagnosis again.

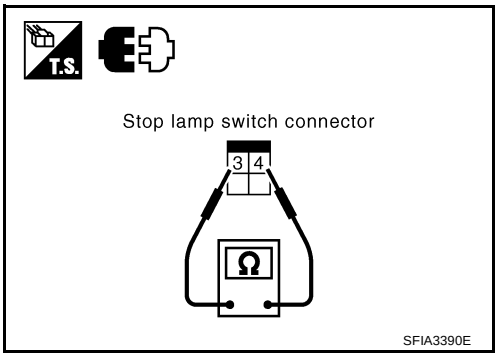
Is the result of self-diagnosis normal?

YES >> The connector terminal contact is loose, damaged, open or shorted.
NO >> GO TO 3.

3. CHECK STOP LAMP SWITCH

1. Turn ignition switch OFF and disconnect stop lamp switch connector E111.
2. Disconnect stop lamp switch connector
3. Check continuity between stop lamp switch connector terminal 3 and 4.

Stop lamp switch	Condition	Continuity
3 – 4	Release stop lamp switch (When brake pedal is depressed.)	Yes
	Push stop lamp switch (When brake pedal is released.)	No

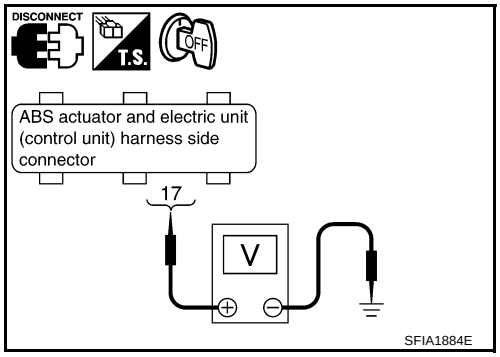


OK or NG

OK >> GO TO 4.
NG >> Replace stop lamp switch. Refer to BR-8, "Components" .

4. CHECK STOP LAMP SWITCH CIRCUIT

1. Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector E51.
2. Check voltage between ABS actuator and electric unit (control unit) connector terminal and ground.



ABS actuator and electric unit (control unit)	Ground	Measurement condition	Voltage
17	—	Brake pedal depressed.	Battery voltage (Approx. 12 V)
		Brake pedal not depressed.	Approx. 0 V

OK or NG

OK >> INSPECTION END
NG >> Open or short in harness between ABS actuator and electric unit and stop lamp switch. Repair or replace the harness.

ABS Actuator and Electric Unit (Control Unit) 2

NFS0002C

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
EMERGENCY BRAKE

When any item other than “EMERGENCY BRAKE” is indicated in self-diagnosis display, follow the instructions below.

CAUTION:

“EMERGENCY BRAKE” is indicated when control unit itself is detected as an error. If this display item is indicated, replace control unit.

Is the above displayed in the self-diagnosis display items?

YES >> Replace the ABS actuator and electric unit (control unit).
NO >> INSPECTION END

CAN Communication System

NFS0002D

INSPECTION PROCEDURE

1. CHECK CONNECTOR

1. Turn ignition switch OFF, disconnect the ABS actuator and electric unit (control unit) connector, and check 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-48, "CAN System Specification Chart" .
NO >> Connector terminal connector is loose, damaged, open, or shorted.

TROUBLE DIAGNOSIS FOR SYMPTOMS

PFP:00007

Excessive ABS Function Operation Frequency

NFS0002E

1. CHECK START

Check brake force distribution.

OK or NG

OK >> GO TO 2.
NG >> Check brake system.

2. CHECK FRONT AND REAR AXLE

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

OK or NG

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

3. CHECK WHEEL SENSOR

Wheel Sensor Inspection

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

OK or NG

OK >> GO TO 4.
NG >>
- Replace wheel sensor or sensor rotor.
- Repair harness.

4. CHECK ABS WARNING LAMP DISPLAY

Make sure warning lamp turns off approximately 1 second after the ignition switch is turned on or when driving.

OK or NG

OK >> Normal
NG >> Perform self-diagnosis. Refer to BRC-25, "DESCRIPTION" .

Unexpected Pedal Reaction

NFS0002F

1. CHECK BRAKE PEDAL STROKE

Check brake pedal stroke.

Is the stroke too big?

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

NO >> GO TO 2.

2. CHECK FUNCTION

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

OK or NG

OK >> GO TO 3. CHECK WHEEL SENSOR in BRC-39, "Excessive ABS Function Operation Frequency" .
NG >> Check brake system.

The Braking Distance is Long

NFS0002G

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

1. CHECK FUNCTION

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

OK or NG

OK >> GO TO 3. CHECK WHEEL SENSOR in BRC-39, "Excessive ABS Function Operation Frequency" .

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

The ABS Function Does Not Operate

NFS0002H

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

1. CHECK ABS WARNING LAMP DISPLAY

Make sure warning lamp turns off approximately 1 second after the ignition switch is turned on or when driving.

OK or NG

OK >> GO TO 3. CHECK WHEEL SENSOR in BRC-39, "Excessive ABS Function Operation Frequency" .

NG >> Perform self-diagnosis. Refer to BRC-25, "DESCRIPTION" .

Pedal Vibration or ABS Operation Sound Occurs

NFS0002I

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 [50 mm (1.97 in) or more]**
- **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 the engine is started.

OK or NG

OK >> GO TO 2.

NG >> Perform self-diagnosis. Refer to BRC-25, "DESCRIPTION" .

2. SYMPTOM CHECK 2

Check symptom when electrical component (headlamps, etc.) Switches are operated.

Does the symptom occur when the electrical component (head lamp, etc.) Switches are operated?

YES >> Check if there is a radio, antenna, antenna lead wire, or wiring close to the control unit (or its wiring), and if there is, move it farther away.

NO >> GO TO 3. CHECK WHEEL SENSOR in BRC-39, "Excessive ABS Function Operation Frequency"

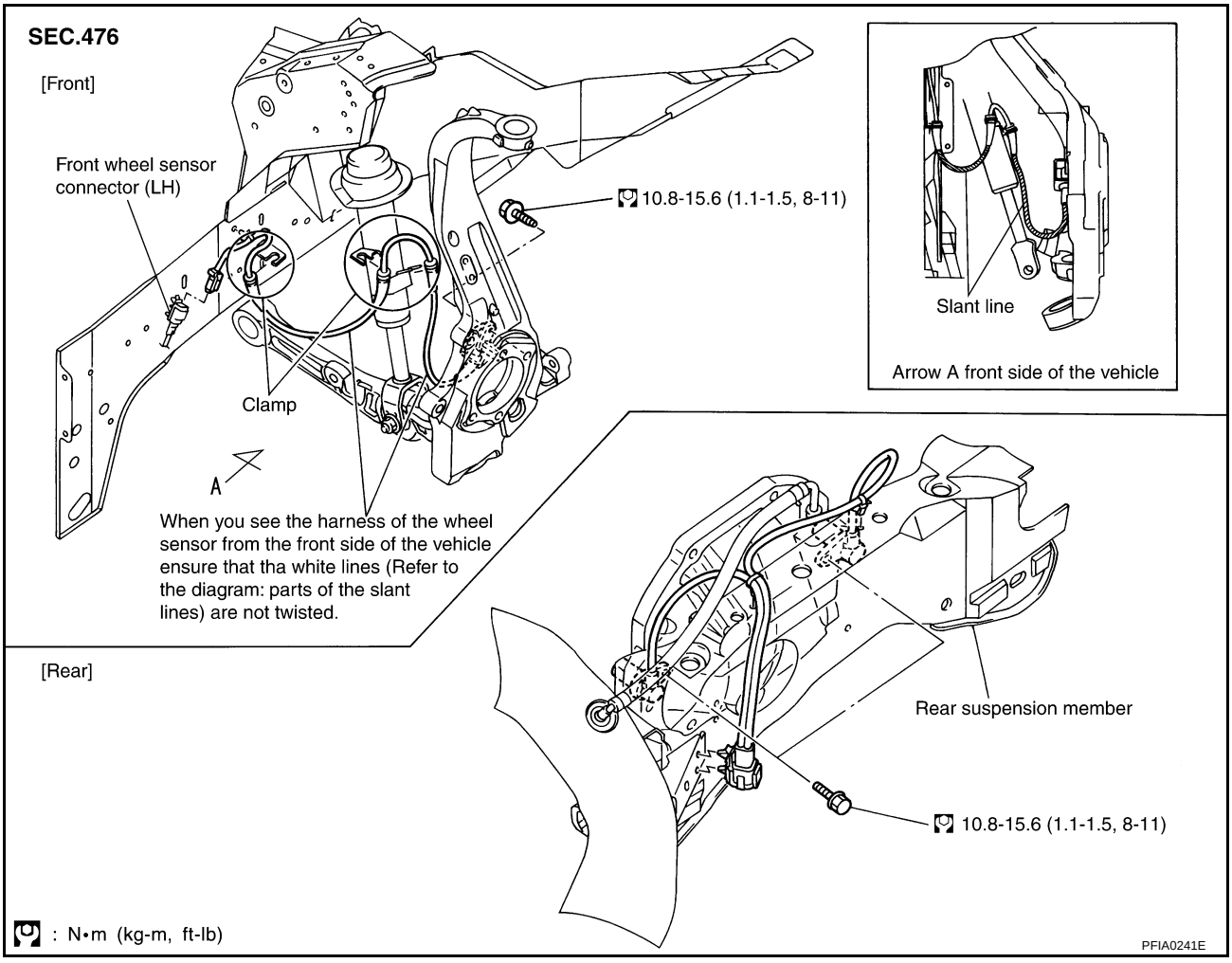
WHEEL SENSORS

PFP:47910

Removal and Installation

NFS0002J

COMPONENTS



REMOVAL

Pay attention to the following when removing sensor.

CAUTION:

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

INSTALLATION

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

- When installing, check that there is no foreign material such as iron chips on pick-up and mounting hole of the sensor. Check that no foreign material has been caught in the sensor rotor motor. Remove any foreign material and clean the mount.
- When installing front sensor, be sure to press rubber grommets in until they lock at the three locations shown in diagram (2 at shock absorbers and 1 at body panel). When installed, harness must not be twisted. White line on harness (shaded part) must be visible from front.

SENSOR ROTOR

PFP:47970

Removal and Installation

NFS0002K

REMOVAL

Front

Sensor rotor cannot be disassembled. To replace sensor rotor, replace hub bearing assembly. Refer to FAX-4, "Removal and Installation" in “Front Axle/Drive Shaft” in “FAX” section.

Rear

- Follow procedure below to remove rear sensor rotor.
- Remove side flange. Refer to RFD-15, "SIDE OIL SEAL" in “Rear Final Drive” in “RFD” section.
- Using a bearing replacer (special service tool) and puller (commercial service tool), remove sensor rotor from the companion flange.

INSTALLATION

Front

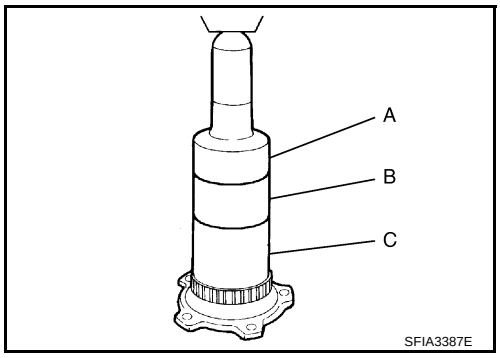
Sensor rotor cannot be disassembled. To replace sensor rotor, replace hub bearing assembly. Refer to FAX-4, "Removal and Installation" in “Front Axle/Drive Shaft” in “FAX” section.

Rear

- Follow procedure below to install rear sensor rotor.
- Using a drift (special service tool), press rear sensor rotor onto the side flange.

Tool number	A: ST30720000 (J-25405)
	B: ST27863000 (—)
	C: KV40104710 (—)

- Install side flange. Refer to RFD-15, "SIDE OIL SEAL" in “Rear Final Drive” in “RFD” section.



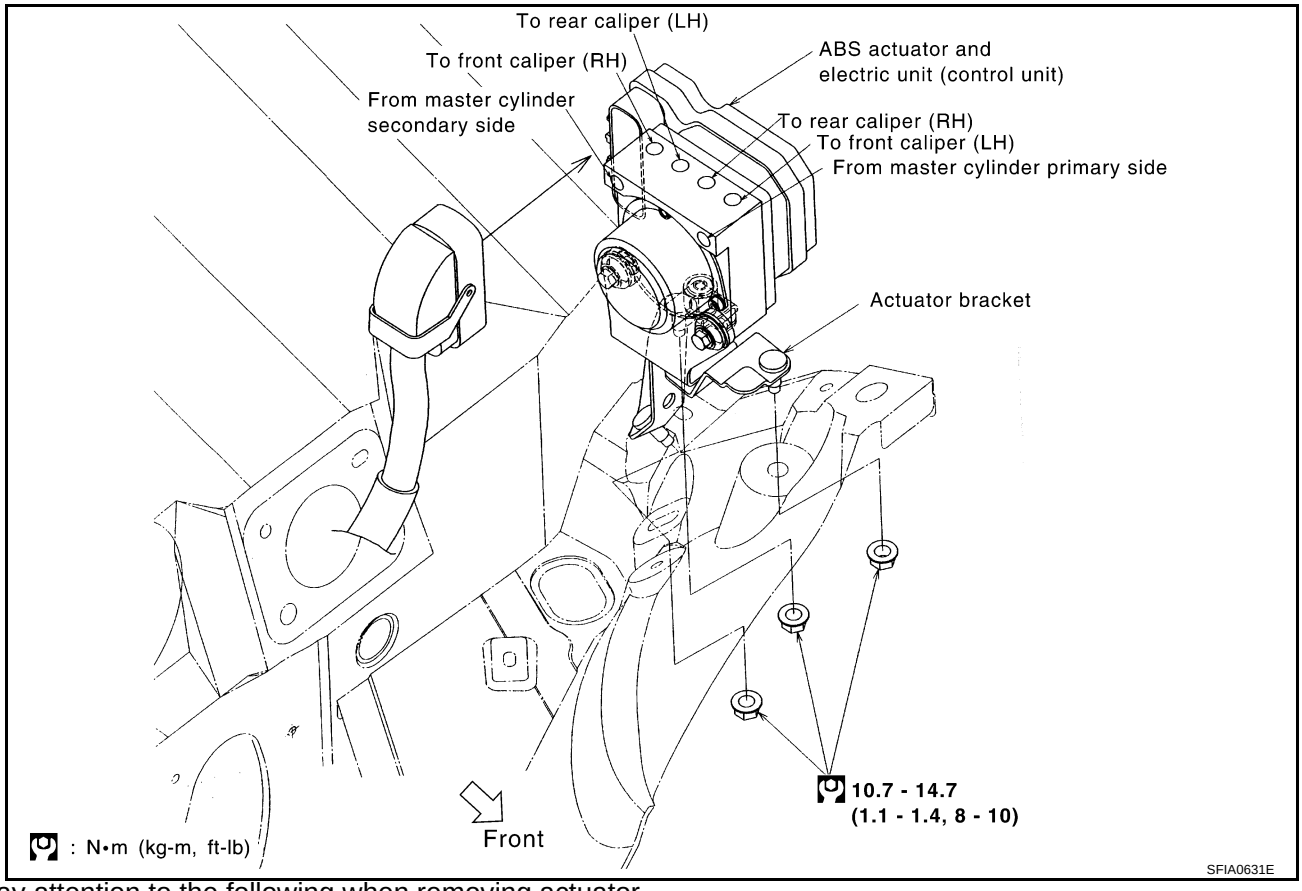
ABS ACTUATOR AND ELECTRIC UNIT (ASSEMBLY)

PFP:47660

Removal and Installation

NFS0002L

COMPONENTS



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 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-11, "Bleeding Brake System" .**
- **Be sure to securely connect the ground cable.**

APPLICATION NOTICE

PFP:00000

How to Check Vehicle Type

NFS000TI

Check the vehicle identification number (chassis number).

Identification number (chassis number)	Service infomation
For serial ● JN1AZ34D300001 – JN1AZ34D330000 ● JN1AZ34E350001 – JN1AZ34E380000 ● JN1AZ36D400001 – JN1AZ36D430000 ● JN1AZ36A450001 – JN1AZ36A480000	Type 1
Form serial ● JN1AZ34D330001 – ● JN1AZ34E380001 – ● JN1AZ36D430001 – ● JN1AZ36A480001 –	Type 2

PRECAUTIONS

PFP:00001

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

NFS0002M

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 Battery Service

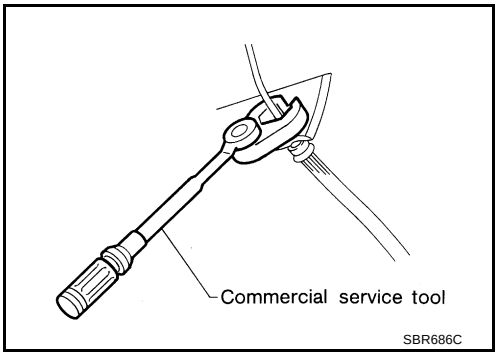
NFS0002N

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions for Brake System

NFS0002O

- Recommended fluid is brake fluid “DOT 3”. Refer to MA-12, "RECOMMENDED FLUIDS AND LUBRICANTS" .
- Never reuse drained brake fluid.
- Be careful not to splash brake fluid on painted areas such as body. If brake fluid is splashed, wipe it off and flush area with water immediately.
- Never use mineral oils such as gasoline or kerosene. They will ruin rubber parts of the hydraulic system.
- Use a flare nut wrench when removing flare nuts, and use a flare nut torque wrench when tighten brake tube flare nuts.
- When installing brake tubes, be sure to check torque.
- Brake system is an important safety part. If a brake fluid leak is detected, always disassemble the affected part. If a malfunction is detected, replace part with a new one.
- Before working, turn ignition switch OFF and disconnect electrical connector of ABS actuator and electric unit (control unit) or the battery cables.



WARNING:

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

Precautions for Brake Control

NFS0002P

- 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 booster operation, brake fluid level, and oil 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.

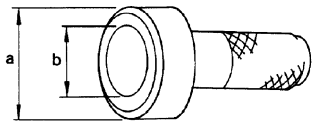
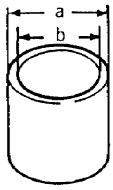
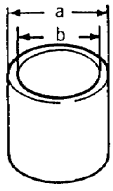
PREPARATION

PFP:00002

Special Service Tools

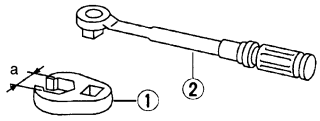
NFS0002Q

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name		Description
ST30720000 (J-25405) Drift a: 77 mm (3.03 in) dia. b: 55.5 mm (2.185 in) dia.	 ZZA0701D	
ST27863000 (—) Drift a: 74.5 mm (2.933 in) dia. b: 62.5 mm (2.461 in) dia.	 ZZA0832D	Installation rear sensor rotor
KV40104710 (—) a: 76.3 mm (3.004 in) dia. b: 67.9 mm (2.673 in) dia.	 ZZA0832D	

Commercial Service Tools

NFS0002R

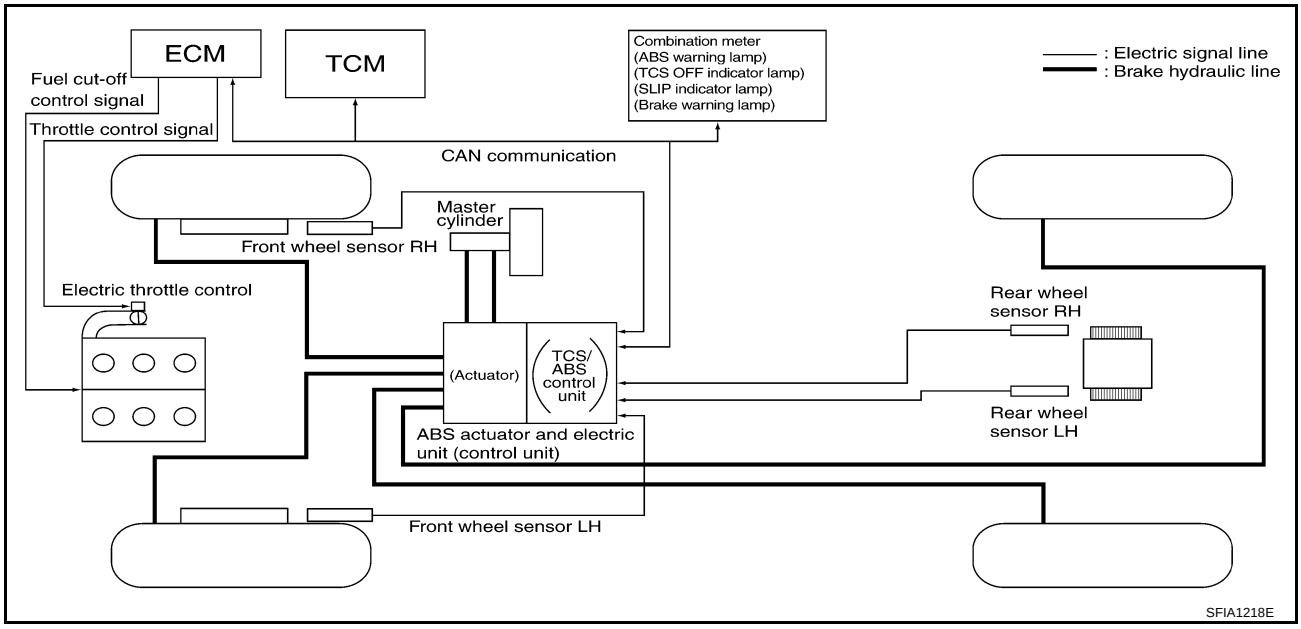
Tool name		Description
1. Flare nut crowfoot a: 10 mm (0.39 in) / 12mm (0.47 in) 2. Torque wrench	 S-NT360	Installing brake tube

SYSTEM DESCRIPTION

PFP:00000

System Diagram

NFS0002S



TCS Function

NFS0002T

- The wheel spin occurrence of the drive wheels is detected by the ABS actuator and electric unit (control unit) using the wheel speed signals from all four wheels, so when wheel spin occurs, the amount of wheel spin is reduced by cutting the fuel to the engine, and partially closing the throttle valve to reduce the engine torque. The throttle opening is also controlled to obtain 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, suddenly downshifts, 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

NFS0002U

- 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 breaks down, then the Fail-Safe function starts, the ABS becomes inoperative, and the ABS warning lamp turns on.
- Electrical system diagnosis by CONSULT-II is available.

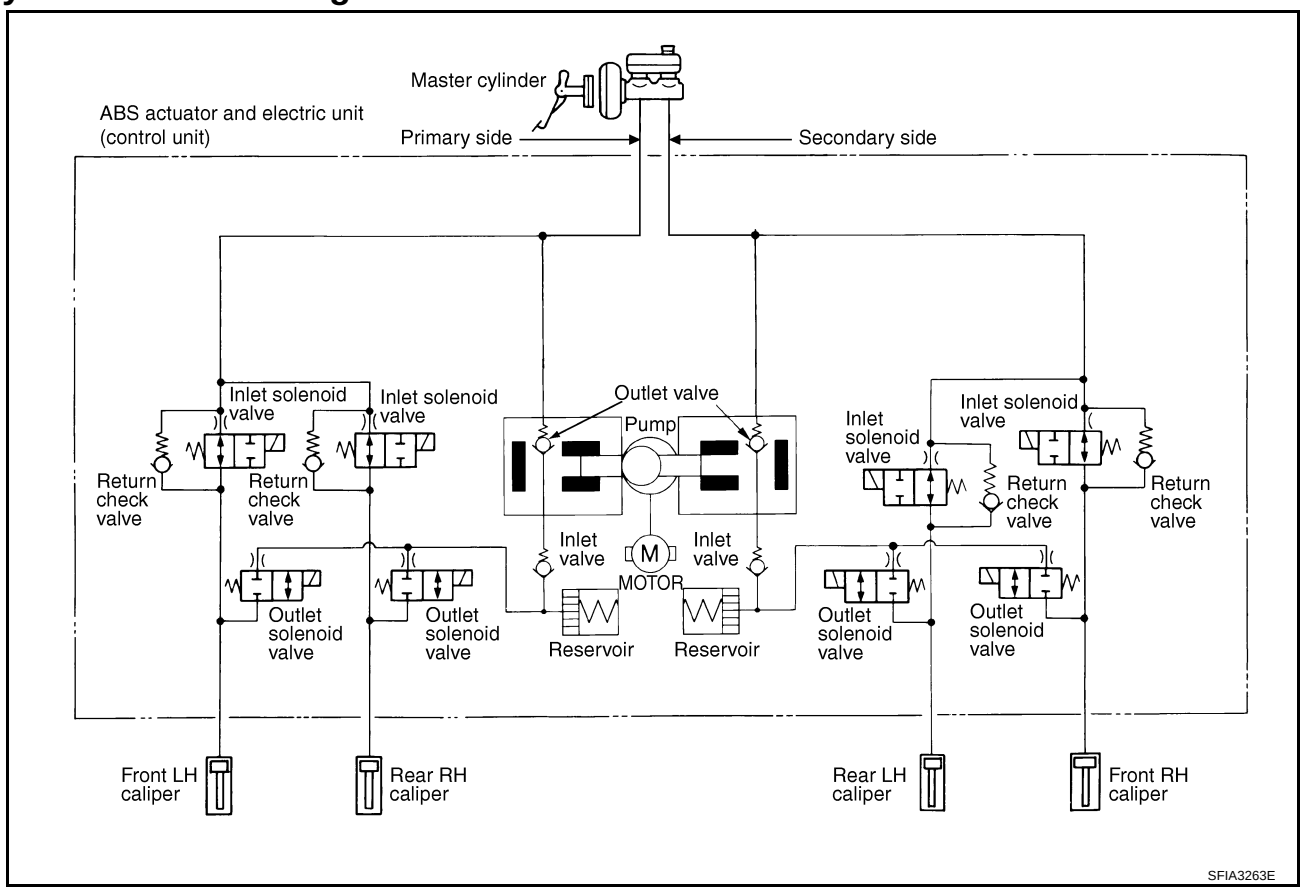
EBD Function

NFS0002V

- The Electronic Brake Distributor is a function that detects subtle slippages between the front and rear wheels during braking, and it improves handling stability by electronically controlling the Brake Fluid Pressure which results in reduced rear wheel slippage.
- In case of electrical system break down, the Fail-Safe function is activated, the EBD and ABS becomes inoperative, and the ABS warning lamp and brake warning lamp are turned on.
- Electrical system diagnosis by CONSULT-II is available.

Hydraulic Circuit Diagram

NFS0002X



CAN Communication

NFS0002Y

SYSTEM DESCRIPTION

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-48, "CAN System Specification Chart" .

TROUBLE DIAGNOSIS

PFP:00004

Fail-Safe Function

NFS000IJ

TCS SYSTEM

In case of Throttle Control System trouble, the TCS 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 TCS equipment. In case of trouble to the Throttle Control System, the ABS control continues to operate normally without TCS control.

CAUTION:

If the Fail-Safe function is activated, then perform the self-diagnosis for TCS/ABS control system.

ABS, EBD SYSTEM

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

- For ABS trouble, only the EBD is activated and the condition of the vehicle is the same condition of vehicles without TCS/ABS equipment.

  NOTE:
  ABS self diagnosis sound may be heard. That is a normal condition because a self diagnosis for “Ignition switch ON” and “The first starting” are being performed.

How to Proceed with Diagnosis

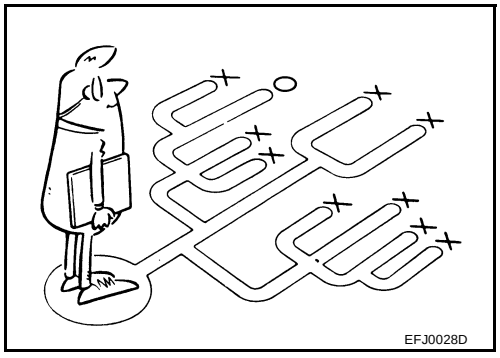
NFS0002Z

BASIC CONCEPT

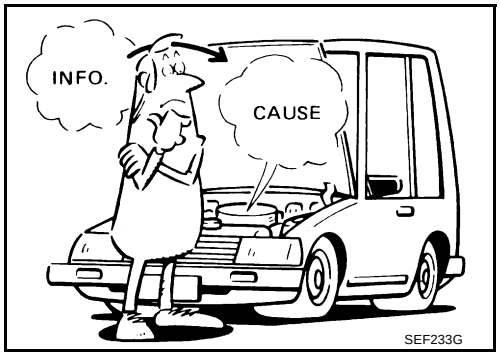
- Most important point to perform diagnosis is to understand systems (control and mechanism) in vehicle thoroughly.

- 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

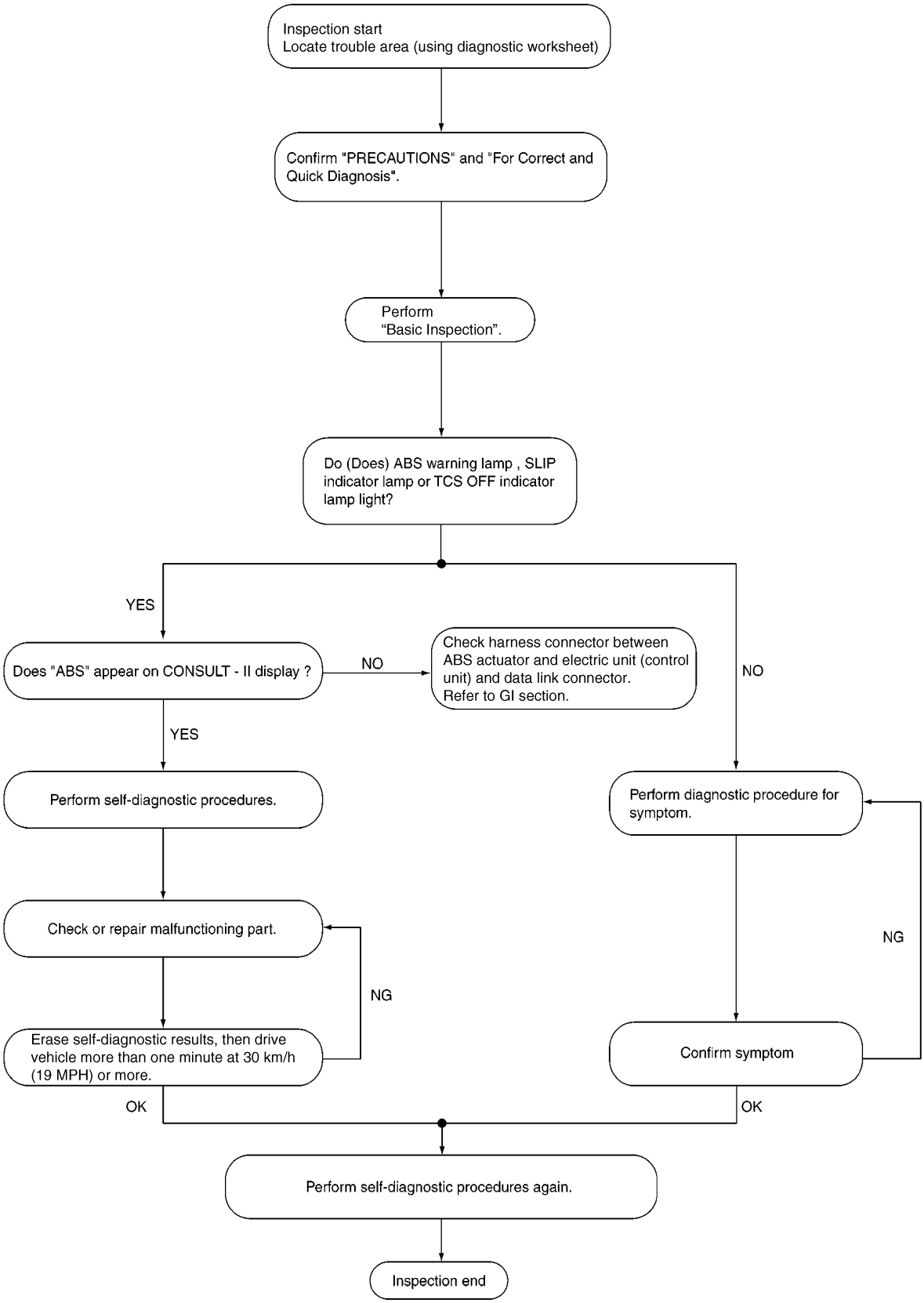
- It is essential to check symptoms right from beginning in order to repair a malfunction completely.
  For an intermittent malfunction, it is important to reproduce symptom based on interview with customer and past examples. Do not perform inspection on ad hoc basis. Most intermittent malfunctions are 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 carry out “erase memory”. Refer to BRC-65, "ERASE MEMORY" .
- 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-3, "General Precautions"

DIAGNOSIS FLOWCHART



SFIA3271E

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 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

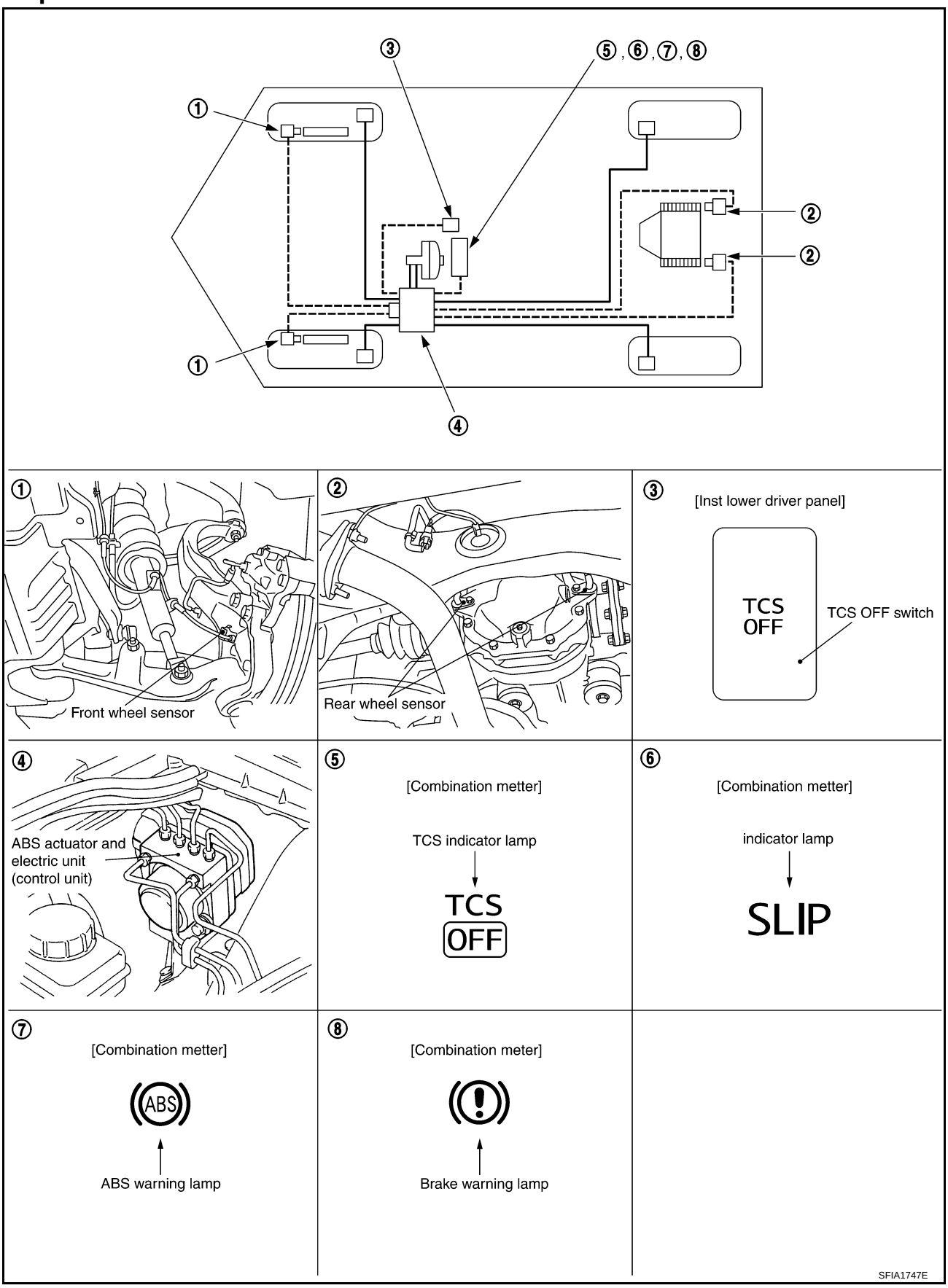
EXAMPLE OF DIAGNOSIS SHEET

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
	☐ TCS does not work (Rear wheels slip when accelerating)	☐ ABS does not work (Wheels lock 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		

SFIA3265E

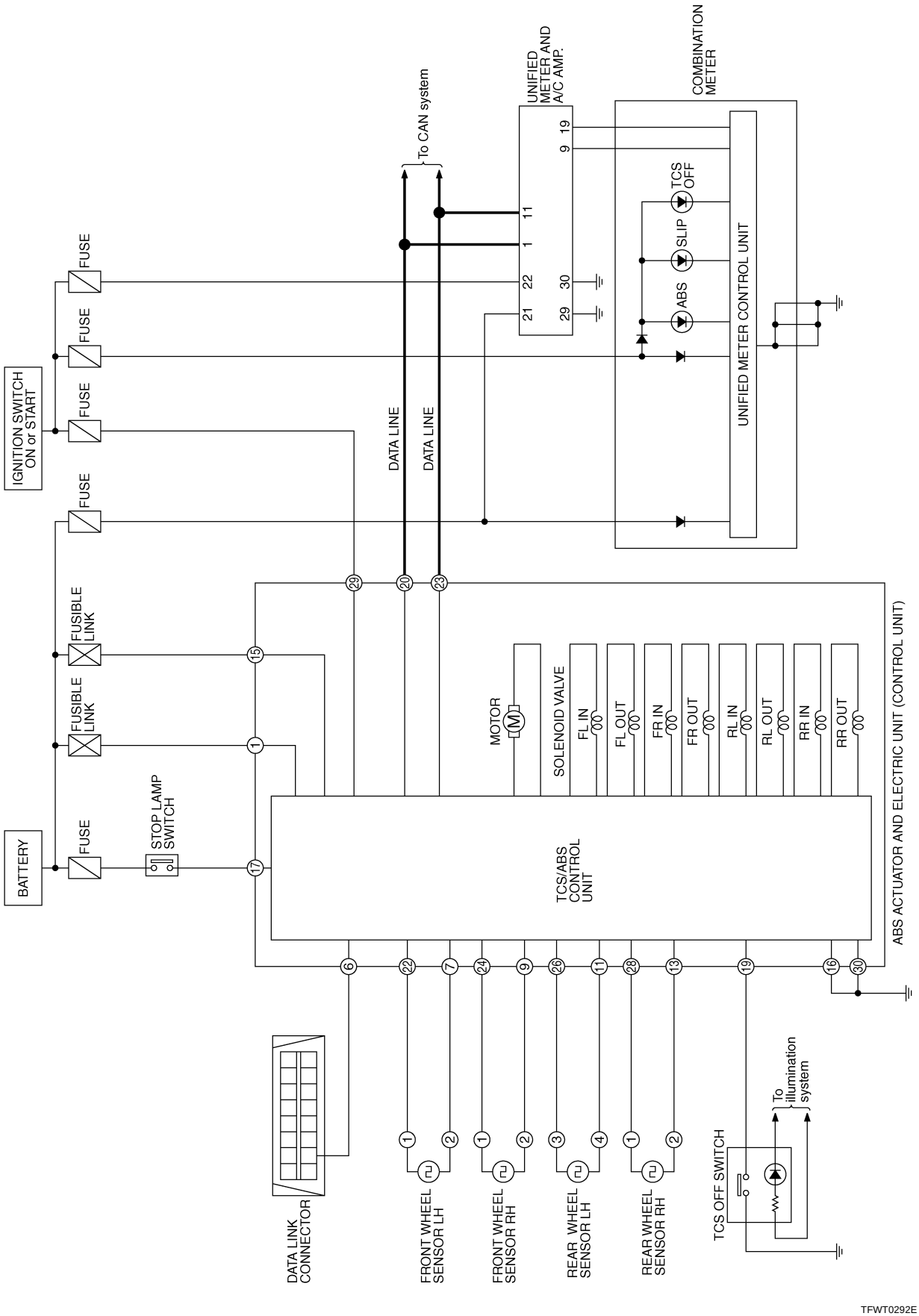
Component Parts Location

NFS00030



Schematic

NFS00031

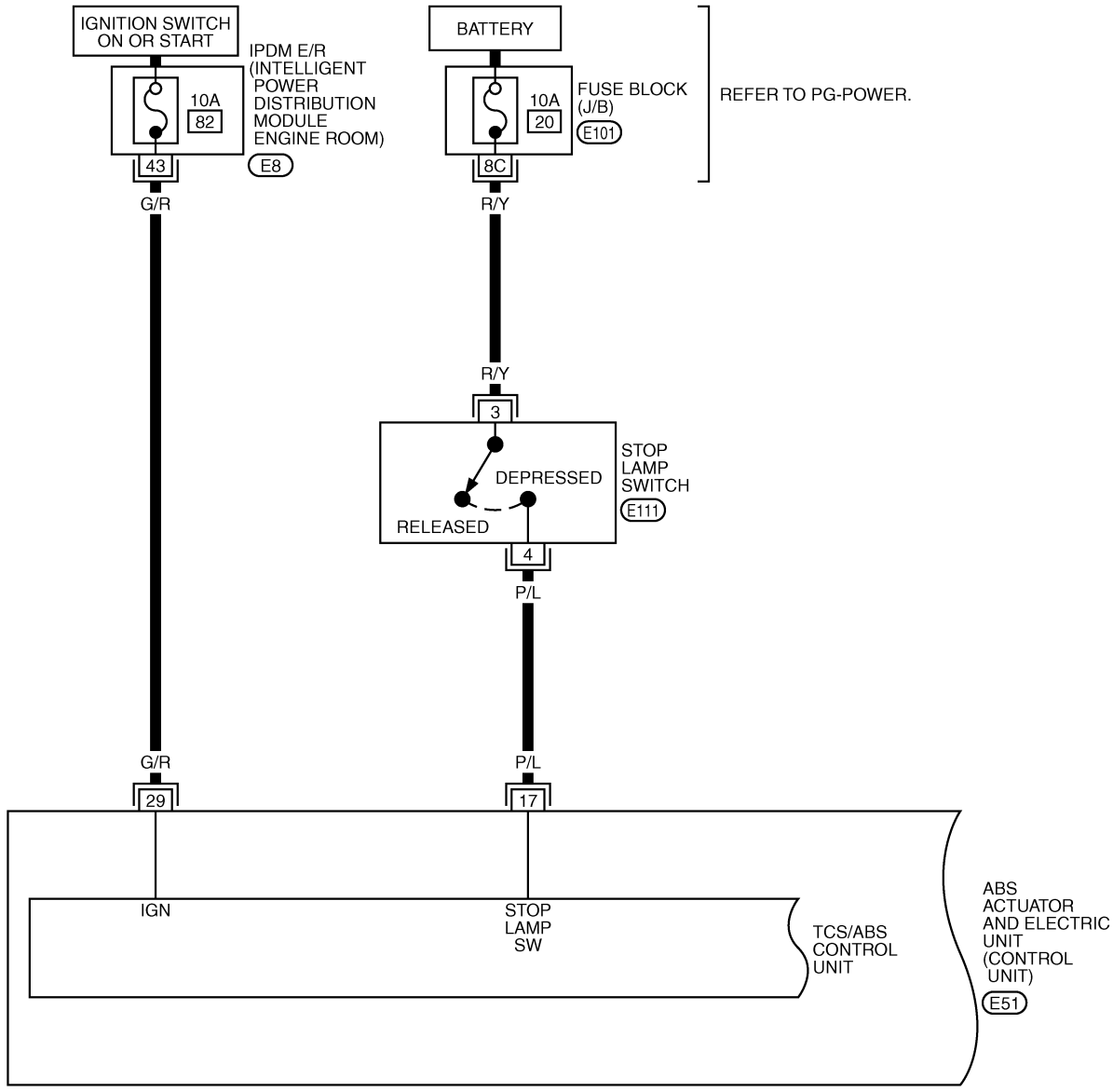


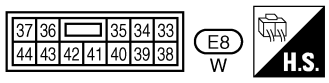
TFWT0292E

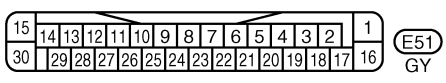
Wiring Diagram — TCS — / Type 1

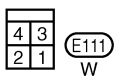
NFS000TK

BRC-TCS-01





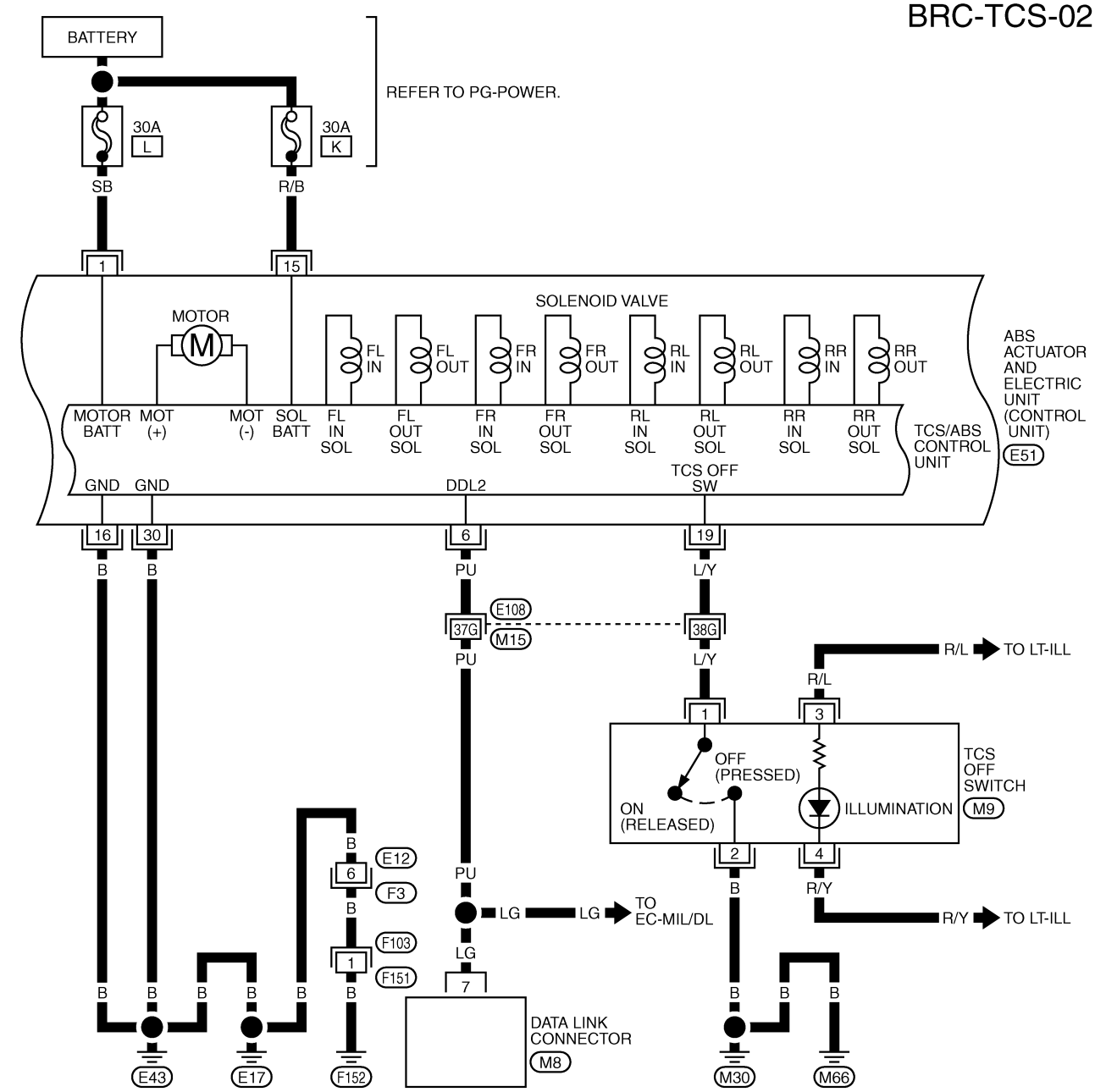


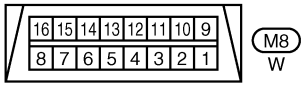


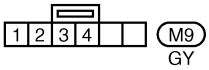
REFER TO THE FOLLOWING.
E101 -FUSE BLOCK-JUNCTION BOX (J/B)

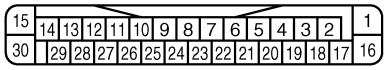
TFWT0293E

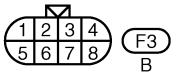
BRC-TCS-02

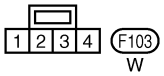








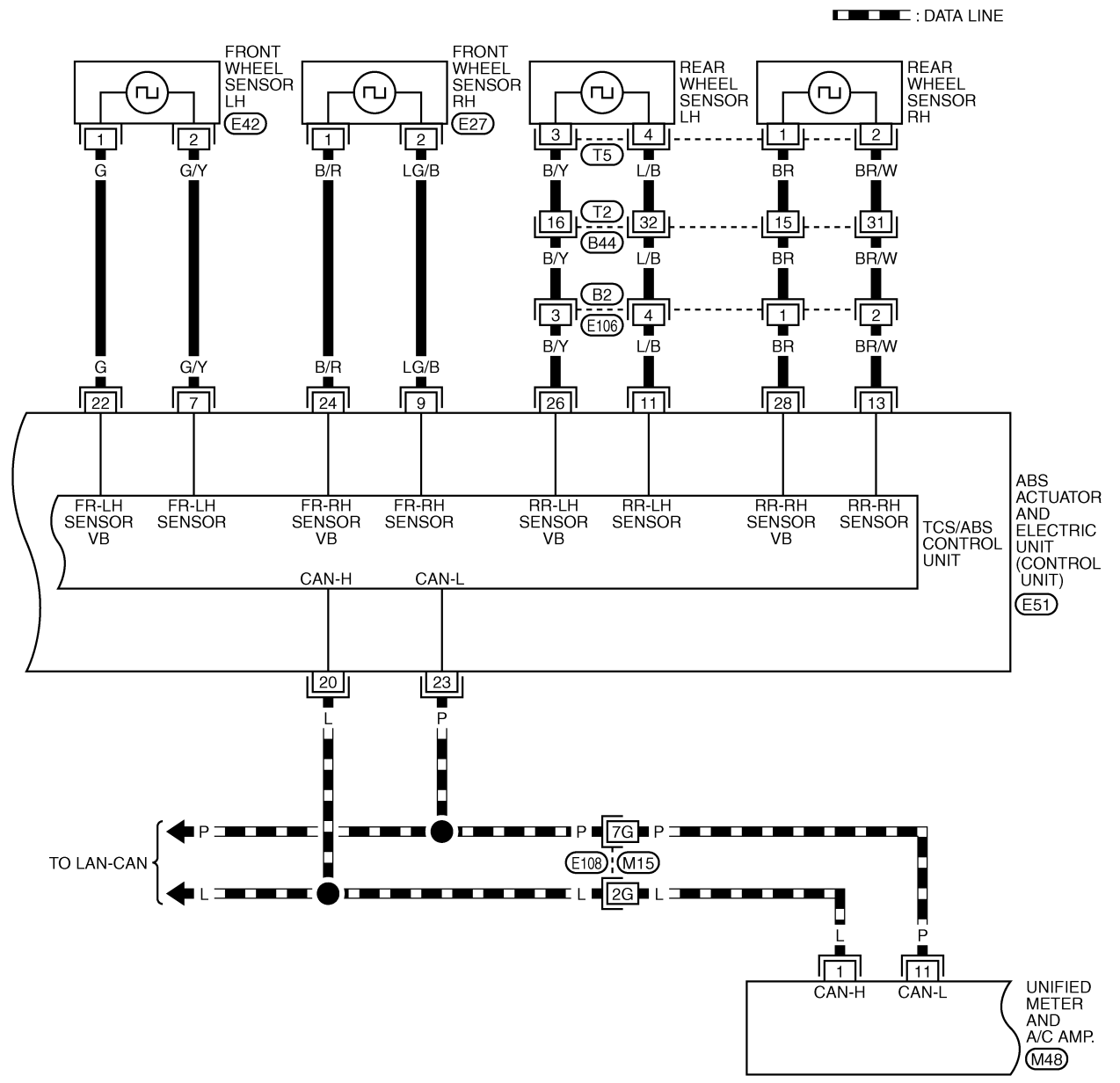


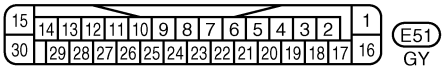


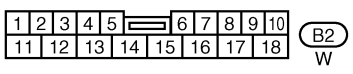
REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)

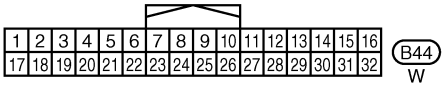
TFWT0294E

BRC-TCS-03





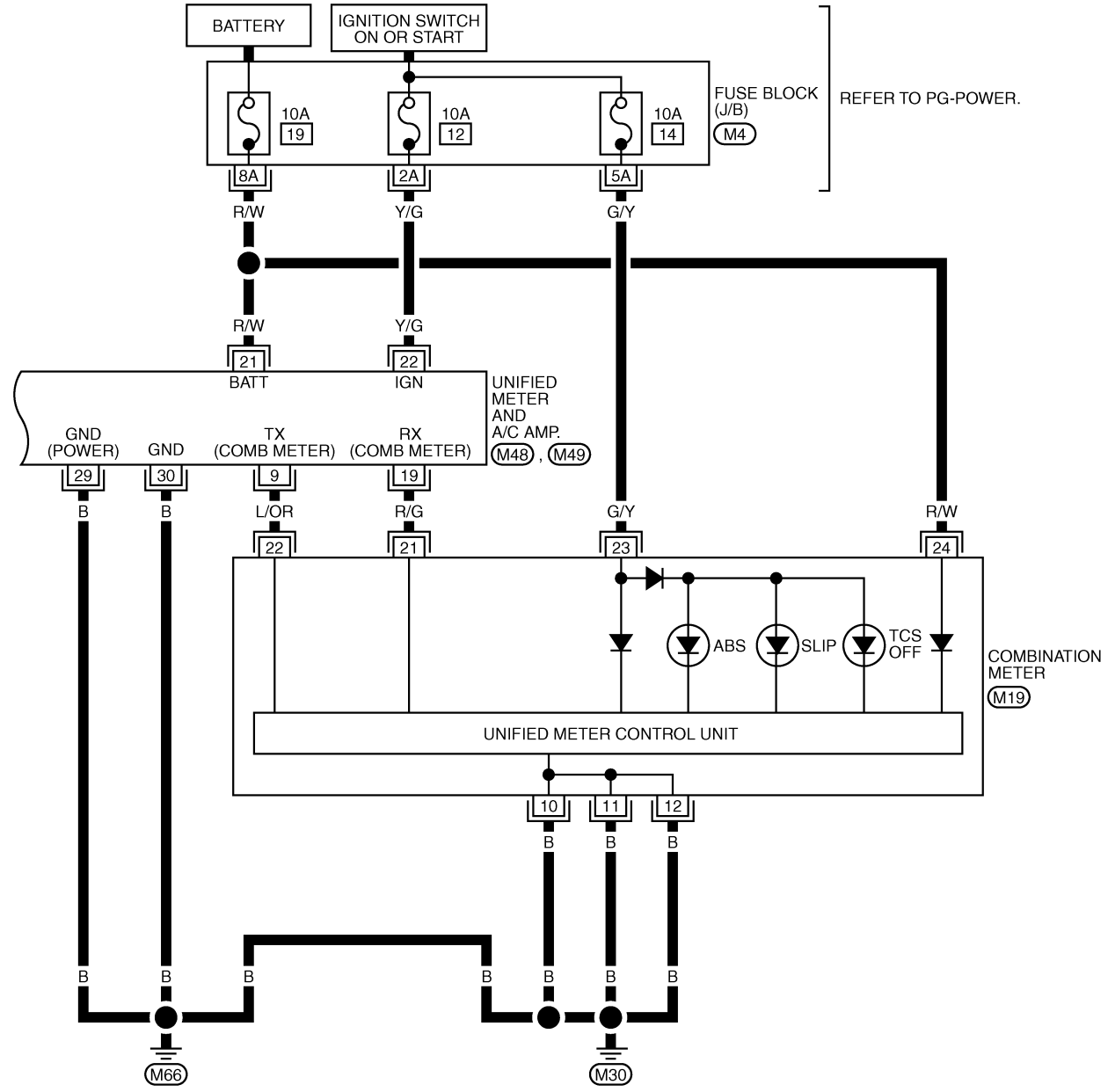


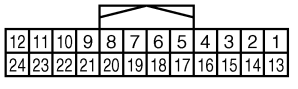


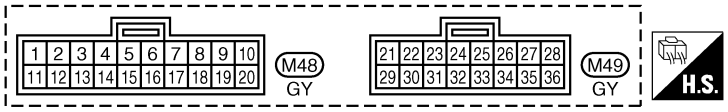
REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)

TFWT0295E

BRC-TCS-04







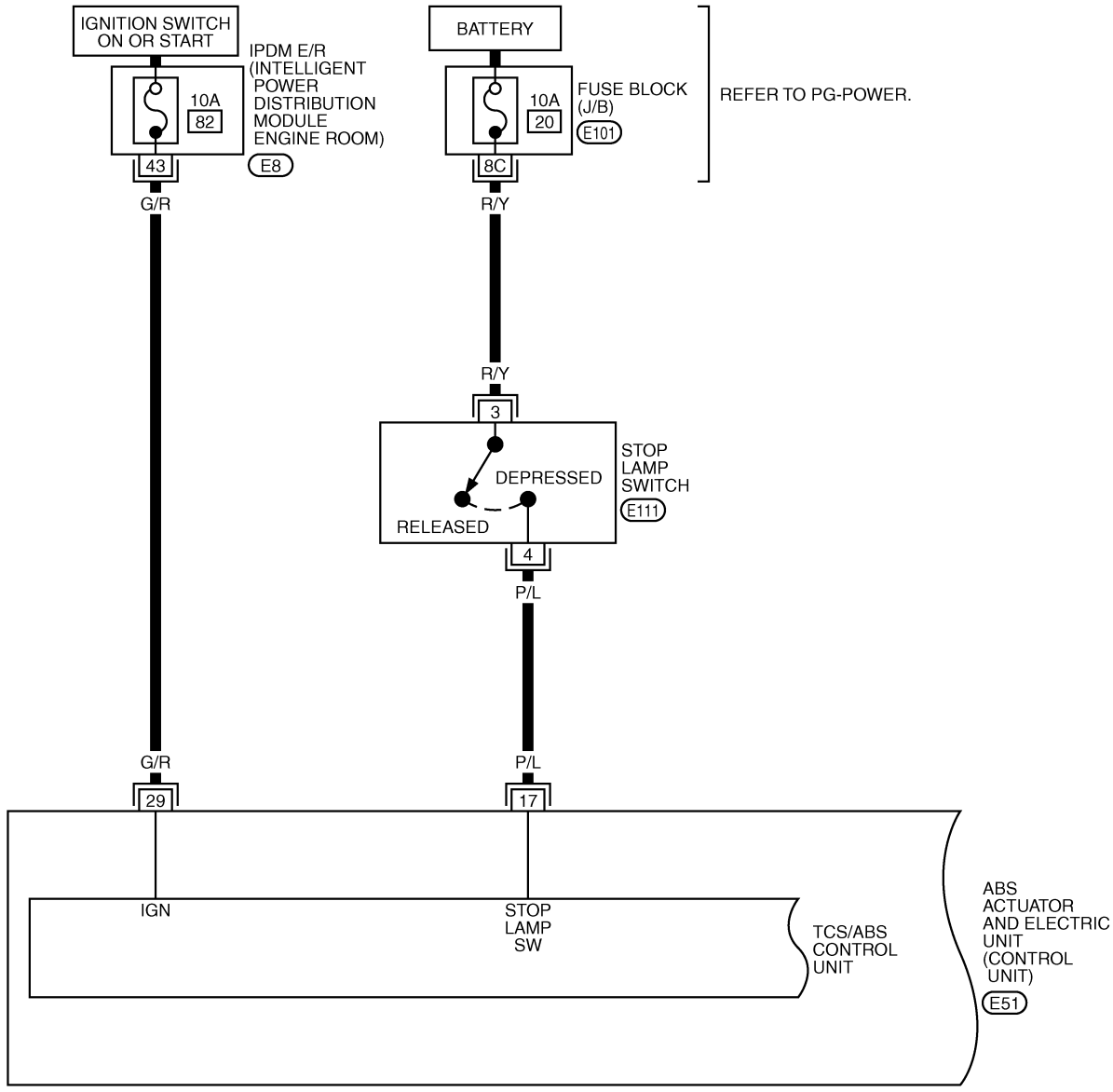
REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

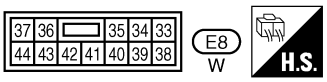
TFWT0041E

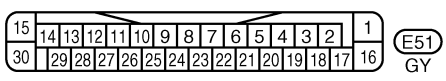
Wiring Diagram — TCS — / Type 2

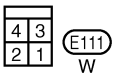
NFS00032

BRC-TCS-01





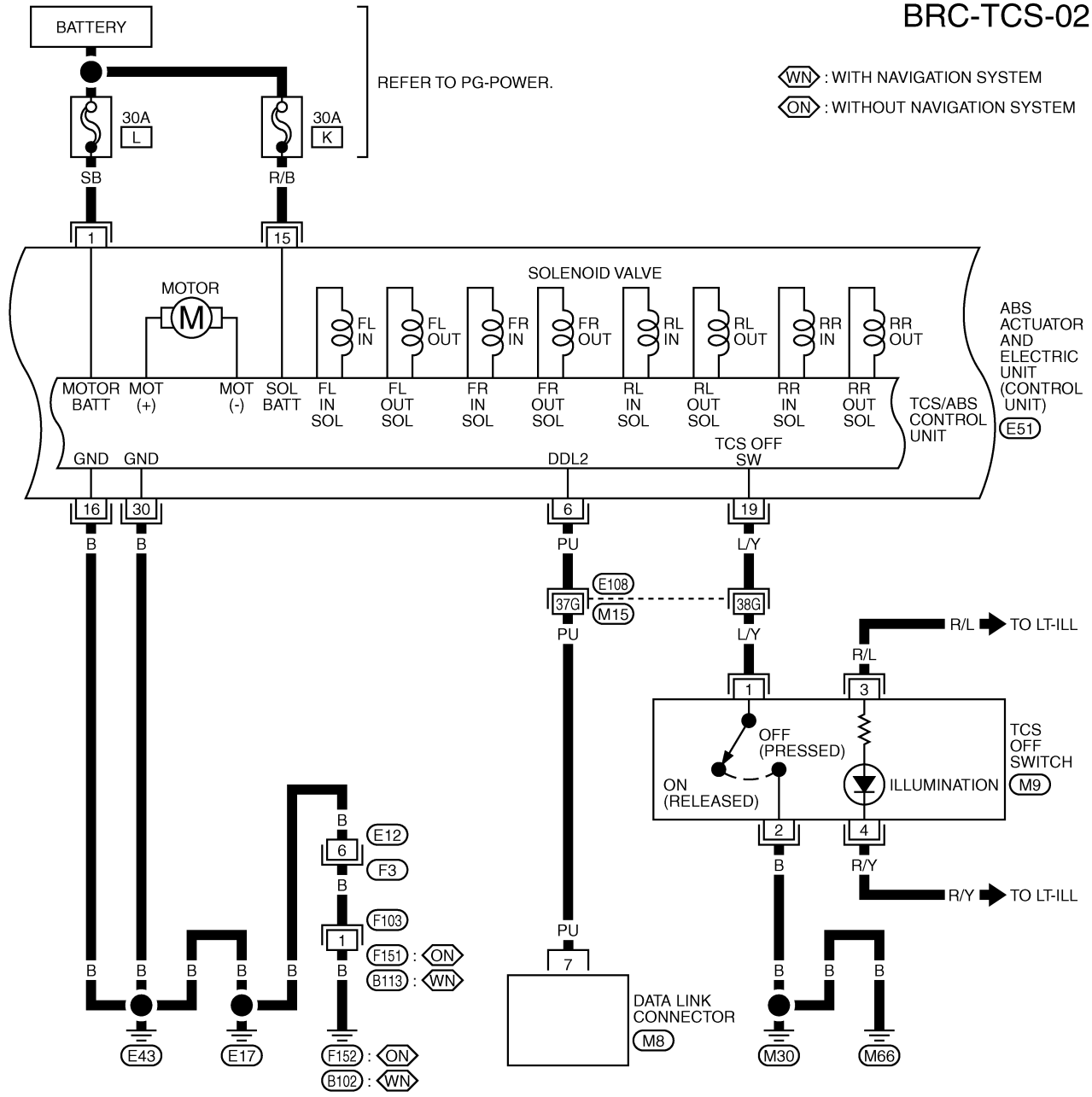


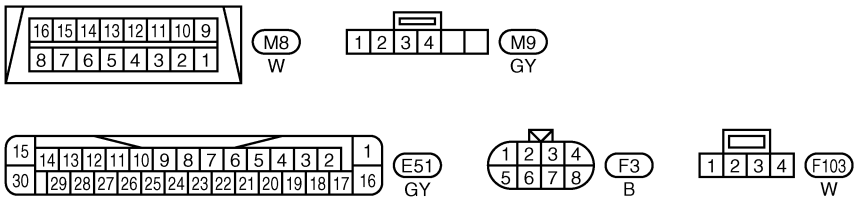


REFER TO THE FOLLOWING.
E101 -FUSE BLOCK-JUNCTION BOX (J/B)

TFWT0293E

BRC-TCS-02

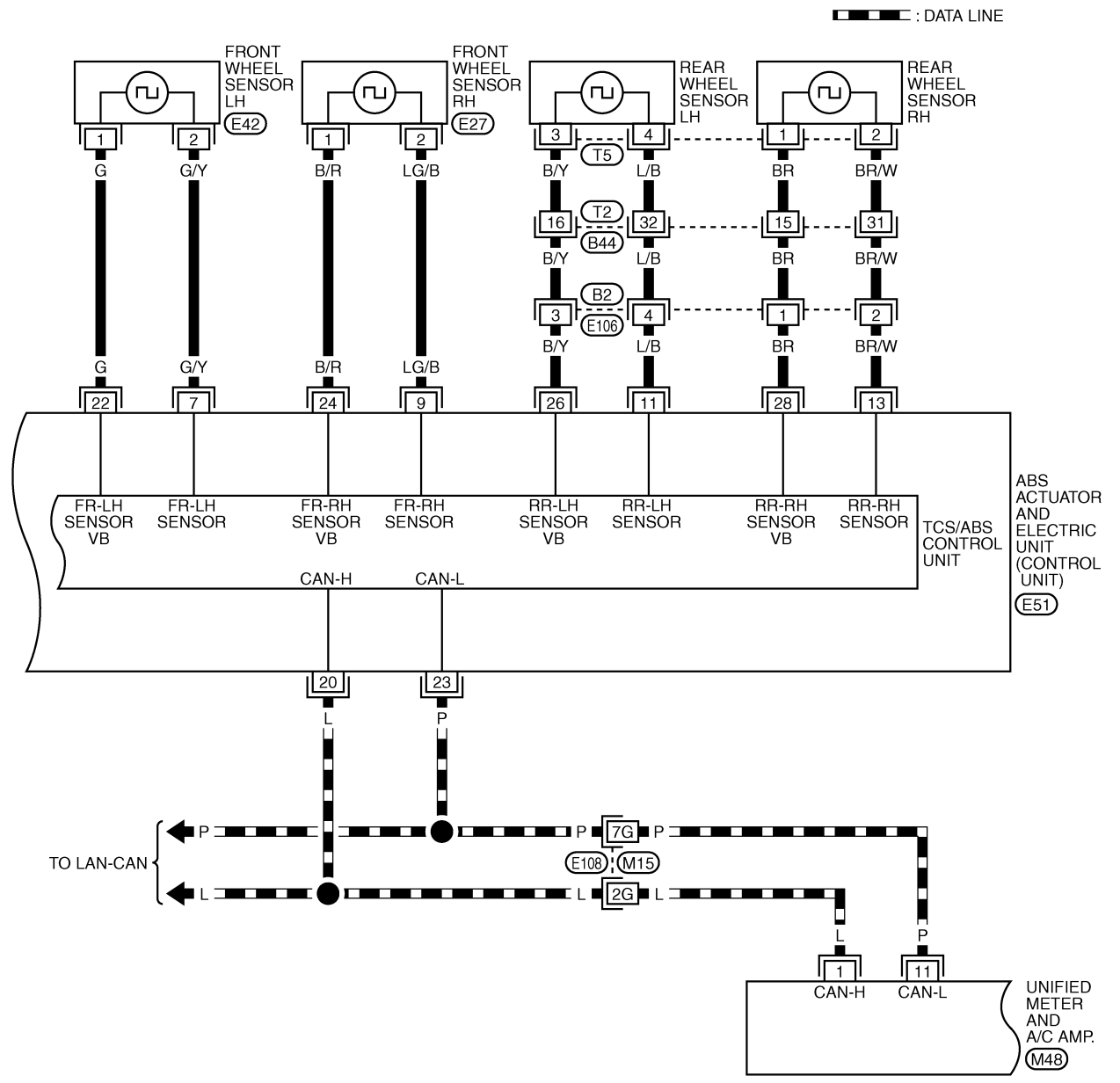


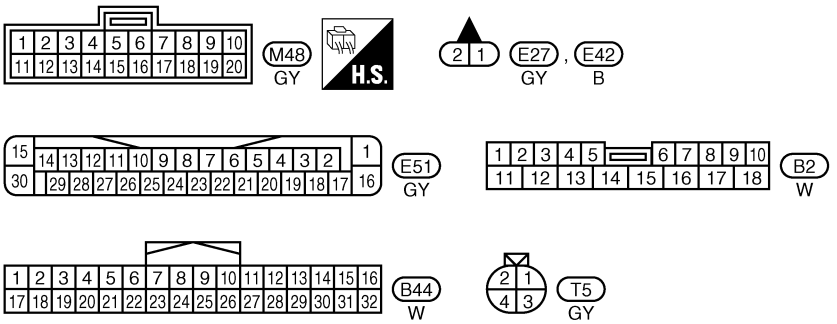


REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)

TFWT0367E

BRC-TCS-03

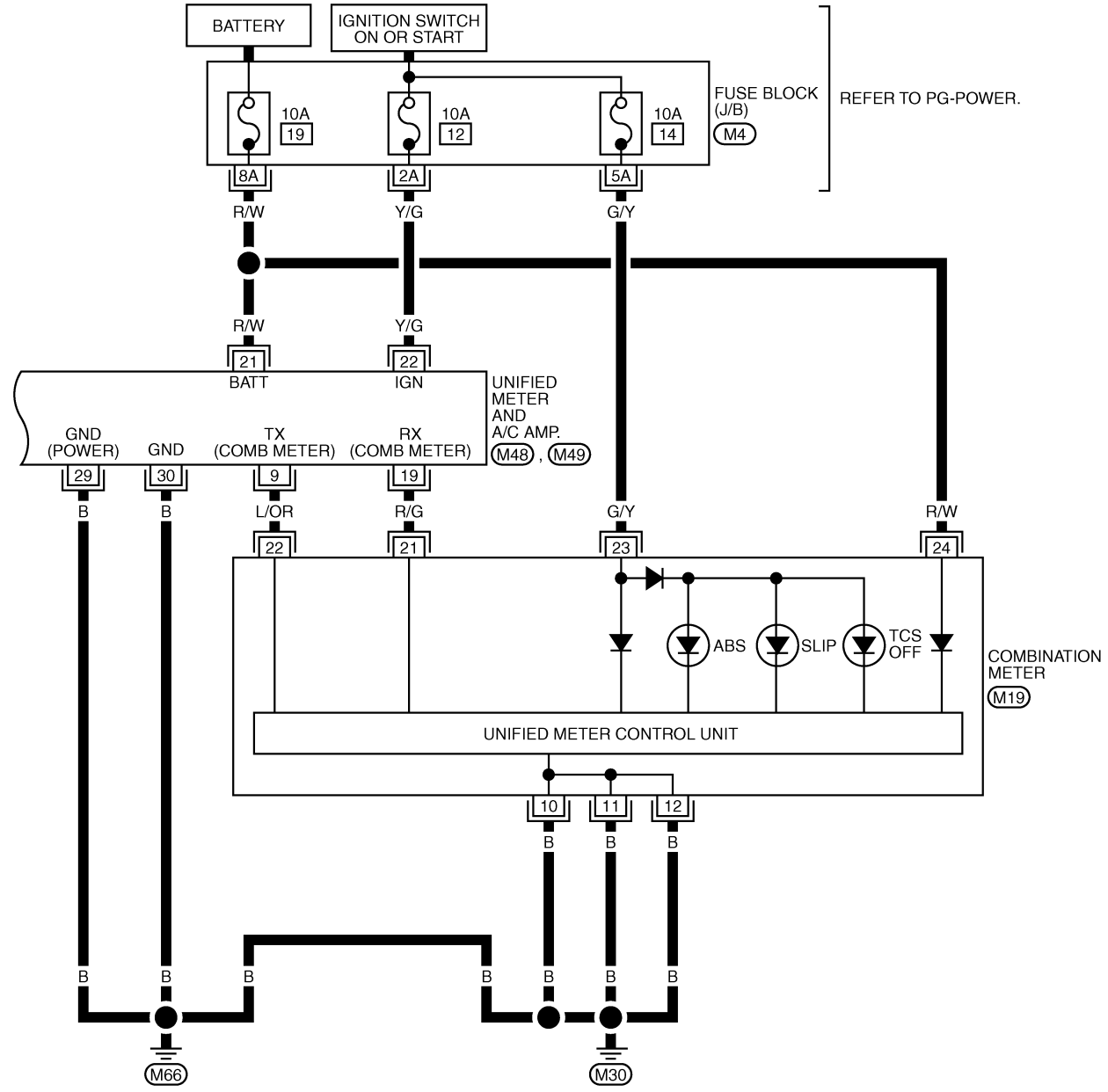


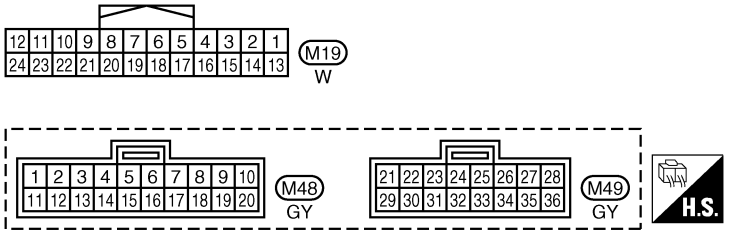


REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)

TFWT0295E

BRC-TCS-04





REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TFWT0041E

Control Unit Input/Output Signal Standard

NFS00034

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		Reference: Inspection item
		Condition	Reference values for normal operation	
WHEEL SENSOR	Wheel speed calculated using signals from all four wheel sensors	Vehicle stopped	0 km/h (0 MPH)	BRC-73, "Wheel Sensor System"
		While driving (Note 1)	Nearly matches the speedometer display (±10% or less)	
IN ABS S/V OUT ABS S/V	Operation status of all solenoids	When the actuator solenoid operates or during a fail-safe	ON	—
		When the actuator relay operates and the actuator solenoid does not operate	OFF	
STOP LAMP SW	Brake pedal operation	Brake pedal depressed	ON	BRC-79, "Stop Lamp Switch System"
		Brake pedal not depressed	OFF	
MOTOR RELAY	Motor and motor relay operation status	When the motor relay and motor are operating	ON	BRC-78, "ABS Actuator Relay or ABS Motor Relay Power System"
		When the motor relay and motor are not operating	OFF	
ACTUATOR RLY	Actuator relay operation status	When the actuator relay is operating	OFF	
		When the actuator relay is not operating	ON	
ABS WARN LAMP	ABS warning lamp on condition (Note 2)	ABS warning lamp ON	ON	BRC-72, "ABS WARNING LAMP, TCS OFF INDICATOR LAMP, SLIP INDICATOR LAMP INSPECTION"
		ABS warning lamp OFF	OFF	
EBD WARN LAMP	Brake warning lamp on condition (Note 2)	Brake warning lamp ON	ON	
		Brake warning lamp OFF	OFF	
OFF LAMP	TCS OFF indicator lamp on condition (Note 3)	TCS OFF indicator lamp ON	ON	
		TCS OFF indicator lamp OFF	OFF	
SLIP LAMP	SLIP indicator lamp on condition (Note 4)	SLIP indicator lamp ON	ON	
		SLIP indicator lamp OFF	OFF	
OFF SW	TCS switch ON-OFF status	TCS OFF switch ON (TCS OFF indicator lamp ON)	ON	BRC-81, "TCS OFF SWITCH"
		TCS OFF switch OFF (TCS OFF indicator lamp OFF)	OFF	
BATTERY VOLT	Battery voltage supplied to TCS/ABS control unit	Ignition switch ON	10 - 16 V	BRC-76, "ABS Actuator and Electric Unit (Control Unit) Power and Ground Systems"
GEAR	Determined gear shift position from the A/T PNP switch signal	Driving	1 - 5 ● Differs depending on the transmission status. (M/T vehicles are always left in 1.)	—

Monitor item	Display Content	Data monitor		Reference: Inspection item
		Condition	Reference values for normal operation	
ENGINE RPM	Engine running	With engine stopped	0 rpm	Engine speed signal system
		With engine running	Almost in accordance with tachometer display	
N POSITION SIGNAL	Determined gear shift position from the A/T PNP switch signal (Note 5)	N position	ON	—
		Other than N position	OFF	
P POSITION SIGNAL	Determined gear shift position from the A/T PNP switch signal (Note5)	P position	ON	—
		Other than P position	OFF	
FAIL SIGNAL	Fail signal status	During TCS fail-safe During ABS fail-safe During EBD fail-safe	ON	TCS system ABS system EBD system
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 TCS/ABS control unit and ECM
		Depress accelerator pedal (ignition switch is ON)	0 to 100 %	

Note 1: Confirm tire pressure is normal.
Note 2: ON/OFF timing of ABS warning lamp
ON: For approximately 1 second after the ignition switch is turned on or when an error is detected.
OFF: Approximately 1 second after the ignition switch is turned on (when system is normal).
Note 3: ON/OFF timing of TCS OFF indicator lamp
ON: For approximately 1 second after the ignition switch is turned on, when an error is detected, or when the TCS OFF switch is on.
OFF: Approximately 1 second after the ignition switch is turned on (when system is normal), when TCS OFF switch is off.
Note 4: ON/OFF timing of SLIP indicator lamp
ON: For approximately 1 second after the ignition switch is turned on or when an error is detected.
OFF: Approximately 1 second after the ignition switch is turned on (when system is normal), when TCS function is not operating
Flash: When the TCS function is operating during driving.
Note 5: A/T model.

CONSULT- II Functions (ABS)

NFS00035

CONSULT-II MAIN FUNCTION

CONSULT-II can display each diagnostic item using the diagnostic test modes shown following.

Diagnostic test mode	Function	Reference
SELF-DIAG RESULTS	Self-diagnostic results can be read and erased quickly.	BRC-65, "Self-diagnosis"
DATA MONITOR	Input/Output data in the ABS actuator and electric unit (control unit) can be read.	BRC-67, "Data Monitor"
CAN DIAG SUPPORT MNTR	The results of transmit/receive diagnosis of communication can be read.	LAN-45, "CAN Diagnostic Support Monitor"
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-69, "Active Test"
FUNCTION TEST	Conducted 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 SETTING PROCEDURE

Refer to GI-36, "CONSULT-II Start Procedure" .

Self-diagnosis

NFS000HG

DESCRIPTION

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

OPERATION PROCEDURE

1. Perform “CONSULT-II Start Procedure”. Refer to GI-36, "CONSULT-II Start Procedure" .
2. Start engine and drive at approximately 30 km/h (19 MPH) or more for approximately 1 minute.
3. After stopping the vehicle, with the engine running, touch “SELF-DIAG RESULTS”.
4. 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 the ABS warning lamp, TCS OFF indicator lamp, and SLIP indicator lamp.
5. Conduct the appropriate inspection from the display item list, and repair or replace the malfunctioning component.
6. Start the 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) or more for at least 1 minute, the ABS warning lamp will not turn off even if everything is normal.**

ERASE MEMORY

1. Turn ignition switch OFF.
2. Start the engine and select “SELF-DIAG RESULTS”.
3. Touch “ERASE MEMORY” on the CONSULT-II screen to erase the error memory.

   CAUTION:
   If the error memory is not erased, perform applicably diagnosis.
4. Perform self-diagnosis again, and make sure that diagnostic memory is erased.
5. Drive vehicle at 30 km/h (19MPH) or more for approximately 1 minute as the final inspection, and make sure that the ABS warning lamp, TCS OFF indicator lamp and SLIP indicator lamp turn OFF.

   NOTE:
   TCS OFF switch should not stay “ON” position.

DISPLAY ITEM LIST

Display item	Malfunction detecting condition	Check item
RR RH SENSOR-1	When the circuit in the rear RH wheel sensor is open.	BRC-73, "Wheel Sensor System" (Note 1)
RR LH SENSOR-1	When the circuit in the rear LH wheel sensor is open.	
FR RH SENSOR-1	When the circuit in the front RH wheel sensor is open.	
FR LH SENSOR-1	When the circuit in the front LH wheel sensor is open.	
RR RH SENSOR-2	When the circuit in the rear RH wheel sensor is short-circuited. Or when the sensor power voltage is outside the standard. When the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
RR LH SENSOR-2	When the circuit in the rear LH wheel sensor is short-circuited. Or when the sensor power voltage is outside the standard. When the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
FR RH SENSOR-2	When the circuit in the front RH wheel sensor is short-circuited. Or when the sensor power voltage is outside the standard. When the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
FR LH SENSOR-2	When the circuit in the front LH wheel sensor is short-circuited. Or when the sensor power voltage is outside the standard. When the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
MAIN RELAY	When the control unit detects an error in the actuator relay system	BRC-78, "ABS Actuator Relay or ABS Motor Relay Power System"
STOP LAMP SW	When a stop lamp switch open-circuit is detected.	BRC-79, "Stop Lamp Switch System"
FR LH IN ABS SOL	When the control unit detects an error in the front left inlet solenoid system.	—
FR LH OUT ABS SOL	When the control unit detects an error in the front left outlet solenoid system.	
FR RH IN ABS SOL	When the control unit detects an error in the front right inlet solenoid system.	
FR RH OUT ABS SOL	When the control unit detects an error in the front right outlet solenoid system.	
RR LH IN ABS SOL	When the control unit detects an error in the rear left inlet solenoid system.	
RR LH OUT ABS SOL	When the control unit detects an error in the rear left outlet solenoid system.	
RR RH IN ABS SOL	When the control unit detects an error in the rear right inlet solenoid system.	
RR RH OUT ABS SOL	When the control unit detects an error in the rear right outlet solenoid system.	
BATTERY VOLTAGE [ABNORMAL]	When the ABS actuator and electric unit (control unit) power supply voltage is lower than normal.	BRC-76, "ABS Actuator and Electric Unit (Control Unit) Power and Ground Systems"
EMERGENCY BRAKE	When the ABS actuator and electric unit (control unit) malfunctions (pressure increase is too much or too little).	BRC-80, "ABS Actuator and Electric Unit (Control Unit) 2"
PUMP MOTOR	When the ABS actuator and electric unit (control unit) detects an error in the motor or motor relay.	BRC-78, "ABS Actuator Relay or ABS Motor Relay Power System"
CONTROLLER FAILURE	When there is an internal error in the ABS actuator and electric unit (control unit).	BRC-75, "ABS Actuator and Electric Unit (Control Unit)"

Display item	Malfunction detecting condition	Check item
ENGINE SIGNAL 1	Major engine components are malfunctioning.	BRC-75, "Engine System"
ENGINE SIGNAL 2		
ENGINE SIGNAL 3		
ENGINE SIGNAL 4		
ENGINE SIGNAL 5		
ENGINE SIGNAL 6		
CAN COMM CIRCUIT	When ABS actuator and electric unit (control unit) is not transmitting or receiving CAN communication signal for 2 seconds or more.	BRC-80, "CAN Communication System" (Note 2)

Note 1: After completing repairs of the shorted sensor circuit, when ignition switch is turned ON, ABS warning lamp turns on. Check that ABS warning lamp turns off while driving the 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 the wheels, check the wheel sensor circuit and also check the control unit power voltage.
Note 2: When errors are detected in several systems, including the CAN communication system [U1000], troubleshoot the CAN communication system.

Data Monitor

NFS000HH

OPERATION PROCEDURE

1. Perform “CONSULT-II Start Procedure”. Refer to GI-36, "CONSULT-II Start Procedure" .
2. Touch “DATA MONITOR”.
3. Select from “SELECT MONITOR ITEM”, screen of data monitor mode is displayed.

DISPLAY ITEM LIST

Item (Unit)	SELECT MONITOR ITEM			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
FR LH SENSOR [km/h (MPH)]	×	×	×	Wheel speed calculated by front LH wheel sensor signal is displayed.
FR RH SENSOR [(km/h (MPH)]	×	×	×	Wheel speed calculated by front RH wheel sensor signal is displayed.
RR LH SENSOR [km/h (MPH)]	×	×	×	Wheel speed calculated by Rear LH wheel sensor signal is displayed.
RR RH SENSOR [km/h (MPH)]	×	×	×	Wheel speed calculated by Rear RH wheel sensor signal is displayed.
FR LH IN SOL (ON/OFF)	–	×	×	Front left inlet ABS solenoid valve (ON/OFF) status is displayed.
FR LH OUT SOL (ON/OFF)	–	×	×	Front left outlet ABS solenoid valve (ON/OFF) status is displayed.
RR RH IN SOL (ON/OFF)	–	×	×	Rear right inlet ABS solenoid valve (ON/OFF) status is displayed.
RR RH OUT SOL (ON/OFF)	–	×	×	Rear right outlet ABS solenoid valve (ON/OFF) status is displayed.
FR RH IN SOL (ON/OFF)	–	×	×	Front right inlet ABS solenoid valve (ON/OFF) status is displayed.
FR RH OUT SOL (ON/OFF)	–	×	×	Front right outlet ABS solenoid valve (ON/OFF) status is displayed.
RR LH IN SOL (ON/OFF)	–	×	×	Rear left rear wheel inside ABS solenoid valve (ON/OFF) status is displayed.
RR LH OUT SOL (ON/OFF)	–	×	×	Rear left outlet ABS solenoid valve (ON/OFF) status is displayed.
EBD WARN LAMP (ON/OFF)	–	×	×	Brake warning lamp (ON/OFF) status is displayed.

Item (Unit)	SELECT MONITOR ITEM			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
STOP LAMP SW (ON/OFF)	×	×	×	Stop lamp switch (ON/OFF) status is displayed.
MOTOR RELAY (ON/OFF)	–	×	×	ABS motor relay (ON/OFF) condition is displayed.
ACTUATOR RLY (ON/OFF)	–	×	×	ABS actuator relay (ON/OFF) status is displayed.
ABS WARN LAMP (ON/OFF)	–	×	×	ABS warning lamp (ON/OFF) status is displayed.
OFF LAMP (ON/OFF)	–	×	×	TCS OFF indicator lamp (ON/OFF) status is displayed.
OFF SW (ON/OFF)	×	×	×	TCS OFF switch (ON/OFF) status is displayed.
SLIP LAMP (ON/OFF)	–	×	×	SLIP indicator lamp (ON/OFF) status is displayed.
BATTERY VOLT (V)	×	×	×	The voltage supplied to the ABS actuator and electric unit (control unit) is displayed.
GEAR (A/T model)	×	×	×	The gear position determined from the A/T PNP switch signal is displayed.
ENGINE SPEED (rpm)	×	×	×	Engine speed status determined from the CAN communication signal is displayed.
N POSI SIG (ON/OFF) (A/T model)	–	–	×	Shift position determined from the A/T PNP switch signal is displayed.
P POSI SIG (ON/OFF) (A/T model)	–	–	×	Shift position determined from the A/T PNP switch signal is displayed.
ACCEL POS SIG (%)	×	–	×	Throttle position status determined from the CAN communication signal 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.
EBD FAIL SIG (ON/OFF)	–	–	×	EBD fail-safe signal (ON/OFF) status is displayed.
ABS FAIL SIG (ON/OFF)	–	–	×	ABS fail-safe signal (ON/OFF) status is displayed.
TCS FAIL SIG (ON/OFF)	–	–	×	TCS fail-safe signal (ON/OFF) status is displayed.
CRANKING SIG (ON/OFF)	–	–	×	Ignition switch START position signal input status is displayed.
ASCD SIGNAL (ON/OFF)	–	–	×	ASCD (ON/OFF) status is displayed.

×: Applicable
–: Not applicable

Active Test

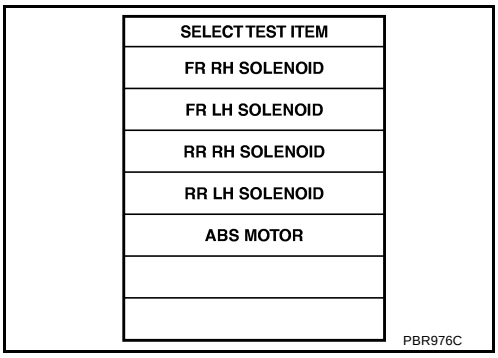
NFS000IO

CAUTION:

- **Do not perform active test while driving.**
- **Make sure to completely bleed air from the brake system.**
- **The ABS and brake warning lamps turn on during the active test.**

OPERATION PROCEDURE

1. Perform “CONSULT-II Start Procedure”. Refer to GI-36, "CONSULT-II Start Procedure" .
2. Touch “ACTIVE TEST”.
3. The test item selection screen is displayed.
4. Touch necessary test item.



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

NOTE:

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

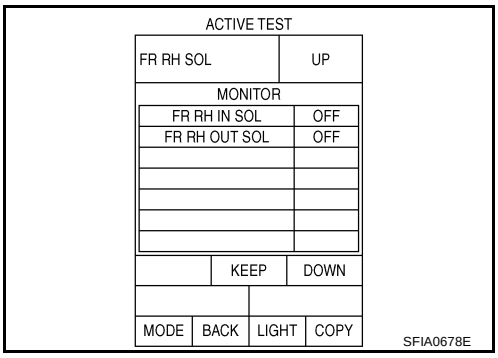
TEST ITEM

Solenoid valve

CAUTION:

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

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”.



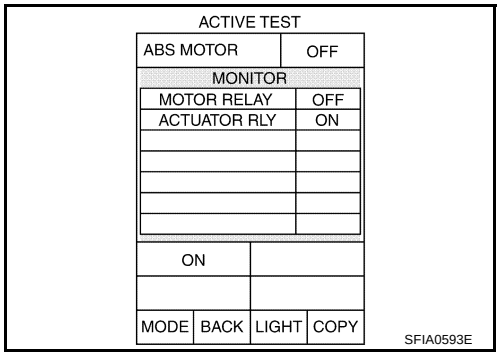
Operation	ABS solenoid valve		
	UP	KEEP	DOWN
FR RH IN SOL	OFF	ON	ON
FR RH OUT SOL	OFF	OFF	ON*

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

ABS Motor

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

Operation	ON	OFF
MOTOR RELAY	ON	OFF
ACTUATOR RLY	ON	ON



Correct and Quick Diagnosis

NFS00036

DIAGNOSIS PRECAUTIONS

- Before performing the trouble diagnosis, always read the general information (GI) to confirm the general precautions. Refer to GI-3, "General Precautions" .
- After completing service, always erase the self-diagnosis results. Refer to BRC-65, "ERASE MEMORY" .
- When inspection of the continuity or voltage between units is performed, check connector terminals for disconnection, looseness, bend, or collapse. If any non-standard condition is detected, repair or replace applicable part.
- Intermittent errors may be caused by a poor connection in the 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 the check, be careful not to forcibly extend any connector terminal.
- TCS/ABS is a system that uses electronic control to perform brake control and engine power control. Therefore, phenomena like those shown in the following table may occur, but this is because the system is working normally.

Symptom	Symptom description	Result
Motor operation noise	This is the sound of the motor operating inside ABS actuator and electric unit (control unit), and there may be some low sounds while TCS or ABS is operating.	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
TCS operation (SLIP indicator lamp ON)	TCS may be activated any time the vehicle suddenly accelerates, suddenly downshifts, or is driven on a road with a varying surface friction coefficient.	Normal When conducting the inspection on a chassis dynamometer, cancel the TCS function.
	When inspecting the speedometer, etc., press TCS OFF switch to turn off TCS function before conducting the work.	
	When accelerator pedal is depressed on a chassis dynamometer (front wheel fixing type), the vehicle speed will not increase. This is normal, because TCS is activated by the stationary front wheels. The warning lamp may also turn on to show “sensor system error” in this case. This is not a malfunction either, because the stationary front wheels are detected. Restart engine, and drive the vehicle at 30 km/h (19 MPH) or more or higher to check that the warning lamp no longer turns on.	
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
Sluggish feel	Depending on road circumstances, the driver may have a sluggish feel. This is normal, because under TCS operation optimum traction has the highest priority (safety first). Sometimes the driver has a slight sluggish feel in response to substantial accelerator pedal operation.	Normal

ABS WARNING LAMP, TCS OFF INDICATOR LAMP AND SLIP INDICATOR LAMP ON/OFF TIMING

×: ON –: OFF

Condition	ABS warning lamp	TCS OFF indicator lamp	SLIP indicator lamp	Remarks
Ignition switch OFF	—	—		—
For approximately “1” second after ignition switch ON	×	×	×	—
After approximately “1” second after ignition switch ON (When system is normal)	—	—	—	Turns off 2 second after engine start
When the TCS OFF switch is turned on (TCS function off)	—	×	—	—
TCS/ABS error	×	×	×	—
	×	×	—	When there is an ABS actuator and electric unit (control unit) error (power or ground error)
TCS error	—	×	×	—

Basic Inspection

NFS00037

BRAKE FLUID AMOUNT, LEAKS, AND BRAKE PADS INSPECTION

1. Check fluid level in the brake reservoir tank. If fluid level is low, refill the brake fluid.
2. Check brake tubes or hoses and around ABS actuator and electric unit (control unit) for leaks. If there is leaking or oozing fluid, check the following items.
   - If ABS actuator and electric unit (control unit) connection is loose, tighten the piping to the specified torque and re-conduct the leak inspection to 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.
   - When there is fluid leaking or oozing from a part other than ABS actuator and electric unit (control unit) connection, if the fluid is just oozing out, use a clean cloth to wipe off the oozing fluid and re-check for leaks. If fluid is still oozing out, replace the damaged part.
   - When there is fluid leaking or oozing at ABS actuator and electric unit (control unit), if the fluid is just oozing out, use a clean cloth to wipe off the oozing fluid and re-check for leaks. If fluid is still oozing out, replace the ABS actuator and electric unit (control unit) body.

     CAUTION:
     ABS actuator and electric unit (control unit) cannot be disassembled.
3. Check brake pad degree of wear. Refer to BR-26, "PAD WEAR INSPECTION" in “Front Disc Brake” and BR-39, "PAD WEAR INSPECTION" in “Rear Disc Brake”.

POWER SYSTEM TERMINAL LOOSENESS AND BATTERY INSPECTION

Make sure the battery positive cable, negative cable and ground connection are not loose. In addition, check the battery voltage to make sure it has not dropped.

ABS WARNING LAMP, TCS OFF INDICATOR LAMP, SLIP INDICATOR LAMP INSPECTION

1. Make sure ABS warning lamp, TCS OFF indicator lamp (when TCS OFF switch is OFF), and SLIP indicator lamp turns ON approximately 1 second when the ignition switch is turned ON. If they do not, check the TCS OFF indicator lamp and then TCS OFF switch. Refer to BRC-81, "TCS OFF SWITCH" . Check CAN communications. Refer to “CAN Communication Inspection”. If there are no errors with TCS OFF switch and CAN communication system, check combination meter. Refer to BRC-80, "CAN Communication System" .
2. Make sure lamp turns off approximately 1 second after the ignition switch is turned on. If the lamp does not turn off, conduct self-diagnosis.
3. With the engine running, make sure TCS OFF indicator lamp turns on and off when TCS OFF switch is turned on and off. If the indicator lamp status does not correspond to switch operation, check the TCS OFF switch system. Refer to BRC-81, "TCS OFF SWITCH" .
4. Make sure ABS warning lamp, TCS OFF indicator lamp, and SLIP indicator lamp turn off 2 seconds after the engine is started. If ABS warning lamp, TCS OFF indicator lamp, and SLIP indicator lamp have not turned off 10 seconds after the engine has been started, conduct self-diagnosis of the ABS actuator and electric unit.
5. After conducting the self-diagnosis, be sure to erase the error memory. Refer to BRC-65, "ERASE MEMORY" .

TROUBLE DIAGNOSIS FOR SYSTEM

PFP:00000

Wheel Sensor System

NFS00038

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

CAUTION:

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

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

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

Is the above displayed in the self-diagnosis display items?

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

2. CHECK TIRE

Check air pressure, wear, and size.

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

YES >> GO TO 3.
NO >> Adjust air pressure, or replace tire.

3. CHECK SENSOR AND SENSOR ROTOR

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

OK or NG

OK >> GO TO 4.
NG >> Repair wheel sensor mount or replace the sensor rotor.

4. CHECK CONNECTOR

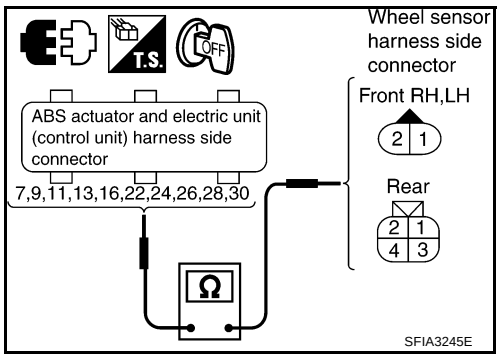
1. Disconnect TCS/ABS control unit connector and malfunctioning wheel sensor connector E42 (FR - LH) or E27 (FR - RH) or T5 (RR - RH, LH). Check the terminal to see if it is deformed, disconnected, loose, etc., and replace it if any non-standard condition is found.
2. Reconnect connector, drive at a speed of approximately 30 km/h (19 MPH) or more for approximately 1 minute, and then perform self-diagnosis.

Is the result of self-diagnosis normal?

YES >> The connector terminal contact is loose, damaged, open or shorted.
NO >> GO TO 5.

5. CHECK WHEEL SENSOR HARNESS

1. Turn ignition switch OFF and disconnect wheel sensor connector E42 (FR - LH) or E27 (FR - RH) or T5 (RR - RH, LH) and ABS actuator and electric unit (control unit) connector E51.
2. Check continuity between terminals. (Also check the continuity when the steering wheel is turned right and left and when the sensor harness inside the wheel well is moved.)



	Power system		Signal system		Ground system	
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) (signal)	ABS actuator and electric unit (control unit) (ground)
Front RH	24	1	9	2	24, 9	16, 30
Front LH	22	1	7	2	22, 7	
Rear RH	28	1	13	2	28, 13	
Rear LH	26	3	11	4	26, 11	

Power system : Continuity should exist.
Signal system : Continuity should exist.
Ground system : Continuity should not exist.

OK or NG

OK >> GO TO 6.
NG >> Repair or replace harness and connector that have malfunction.

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.

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

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”.

Engine System

NFS00039

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
ENGINE SIGNAL 1
ENGINE SIGNAL 2
ENGINE SIGNAL 3
ENGINE SIGNAL 4
ENGINE SIGNAL 5
ENGINE SIGNAL 6

Is the above displayed in the self-diagnosis display items?

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

2. CHECK ENGINE SYSTEM

1. Conduct an ECM self-diagnosis and repair or replace any non-standard items. Re-conduct ECM self-diagnosis.
2. Re-conduct ABS actuator and electric unit (control unit) self-diagnosis.

OK or NG

OK >> INSPECTION END
NG >> Repair or replace any non-standard items. Re-conduct the self-diagnosis.

ABS Actuator and Electric Unit (Control Unit)

NFS0003A

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
CONTROLLER FAILURE

Is the above displayed in the self-diagnosis display items?

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

ABS Actuator and Electric Unit (Control Unit) Power and Ground Systems

NFS0003B

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
BATTERY VOLTAGE [ABNORMAL]

Is the above displayed in the self-diagnosis display items?

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

2. CHECK CONNECTOR

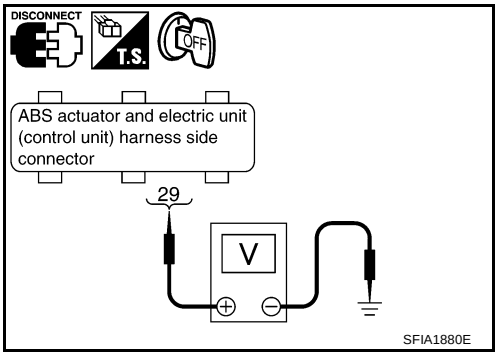
1. Disconnect ABS actuator and electric unit (control unit) connector, check terminal to see if it is deformed, disconnected, loose, etc., and if there is an error, repair or replace the terminal.
2. Securely reconnect the connector and then perform self-diagnosis.

Is the result of self-diagnosis normal?

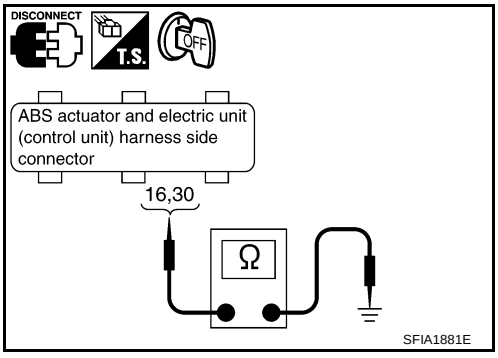
YES >> The connector terminal contact is loose, damaged, open or shorted.
NO >> GO TO 3.

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

Disconnect ABS actuator and electric unit connector E51. Check continuity and voltage between connector terminals and ground.



Signal name	ABS actuator and electric unit (control unit)	Measurement condition	Voltage
Power supply	29	Ignition switch ON	Battery voltage (Approx. 12 V)
		Ignition switch OFF	Approx. 0 V



Signal name	ABS actuator and electric unit (control unit)	Measurement condition	Continuity
Ground	16, 30	Ignition switch OFF	Yes

OK or NG

OK >> Check battery (terminal looseness, power drop, etc.) Error. If there is an error, make repairs.
NG >> Corresponding harness circuit error. Repair the circuit.

ABS Actuator Relay or ABS Motor Relay Power System

NFS0003C

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
IN ABS SOL
OUT ABS SOL
PUMP MOTOR
MAIN RELAY

Is the above displayed in the self-diagnosis display item?

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

2. CHECK CONNECTOR

1. Disconnect ABS actuator and electric unit (control unit) connector, check terminal to see if it is deformed, disconnected, loose, etc., and if there is an error, repair or replace the terminal.
2. Securely reconnect the connector and then perform self-diagnosis.

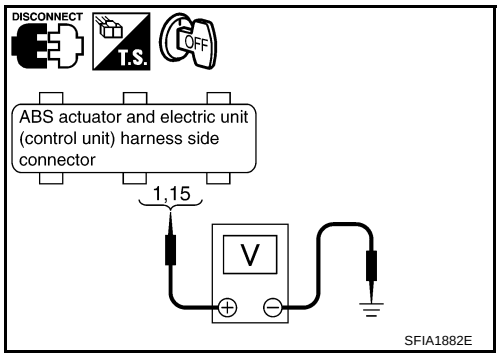
Is the result of self-diagnosis normal?

YES >> The connector terminal contact is loose, damaged, open or shorted.
NO >> GO TO 3.

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

1. Disconnect ABS actuator and electric unit (control unit) connector E51.
2. For ABS actuator relay, measure the voltage between the connector terminal 1 and ground. For ABS motor relay, measure the voltage between connector terminal 15 and ground.

ABS actuator and electric unit (control unit)	Ground	Voltage
1, 15	—	Battery voltage (Approx. 12 V)



OK or NG

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

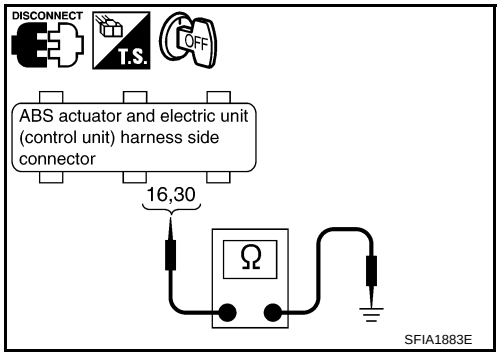
4. CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) GROUND CIRCUIT

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

ABS actuator and electric unit (control unit)	Ground	Continuity
16, 30	—	Yes

OK or NG

OK >> Replace ABS actuator and electric unit (control unit).
NG >> Open or short in harness. Repair or replace the harness.



Stop Lamp Switch System

NFS0003D

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
STOP LAMP SW

Is the above displayed in the self-diagnosis display item?

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

2. CHECK CONNECTOR

1. Disconnect ABS actuator and electric unit (control unit) connector and stop lamp switch connector E112 (M/T model) or E111 (A/T model), check the terminal for deformation, disconnection, looseness, and so on. If there is an error, repair or replace the terminal.
2. Securely reconnect the connector and conduct self-diagnosis.
3. Start engine
4. Repeat pumping brake pedal carefully several time, then perform self-diagnosis again

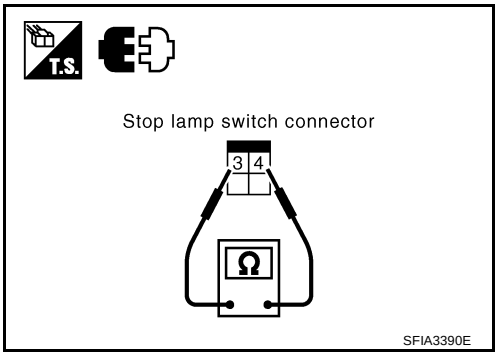
Is the result of self-diagnosis normal?

YES >> The connector terminal contact is loose, damaged, open or shorted.
NO >> GO TO 3.

3. CHECK STOP LAMP SWITCH

1. Turn ignition switch OFF and disconnect stop lamp switch connector E111.
2. Disconnect stop lamp switch connector
3. Check continuity between stop lamp switch connector terminal 3 and 4.

Stop lamp switch	Condition	Continuity
3 – 4	Release stop lamp switch (When brake pedal is depressed.)	Yes
	Push stop lamp switch (When brake pedal is released.)	No

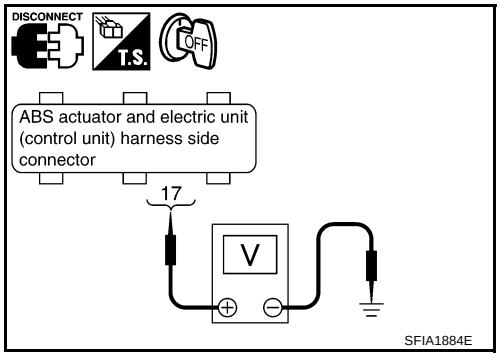


OK or NG

OK >> GO TO 4.
NG >> Replace stop lamp switch. Refer to BR-8, "Components" .

4. CHECK STOP LAMP SWITCH CIRCUIT

1. Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector E51.
2. Check voltage between ABS actuator and electric unit (control unit) connector terminal and the ground.



ABS actuator and electric unit (control unit)	Ground	Measurement condition	Voltage
17	—	Brake pedal depressed.	Battery voltage (Approx. 12 V)
		Brake pedal not depressed.	Approx. 0 V

OK or NG

OK >> INSPECTION END
NG >> Open or short in harness between ABS actuator and electric unit (control unit) and stop lamp switch. Repair or replace the harness.

ABS Actuator and Electric Unit (Control Unit) 2

NFS0003E

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
EMERGENCY BRAKE

When any item other than “EMERGENCY BRAKE” is indicated in self-diagnosis display, follow the instructions below.

CAUTION:
“EMERGENCY BRAKE” is indicated when control unit itself is detected as an error. If this display item is indicated, replace control unit.

Is the above displayed in the self-diagnosis display items?

YES >> Replace the ABS actuator and electric unit (control unit).
NO >> INSPECTION END

CAN Communication System

NFS0003F

INSPECTION PROCEDURE

1. CHECK CONNECTOR

1. Turn ignition switch OFF, disconnect the ABS actuator and electric unit (control unit) connector, and check 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-48, "CAN System Specification Chart" .
NO >> Connector terminal connection is loose, damaged, open, or shorted.

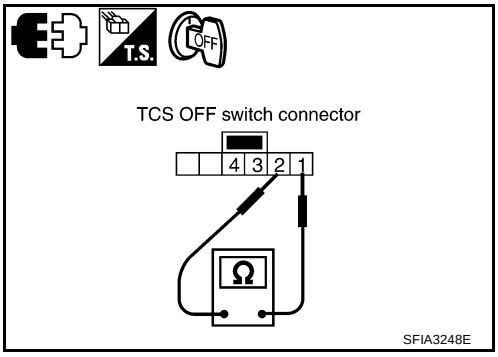
Component Inspection

NFS0003G

TCS OFF SWITCH

- Turn ignition switch OFF, disconnect the TCS OFF switch connector M9, 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.



TROUBLE DIAGNOSIS FOR SYMPTOMS

PFP:00007

Excessive ABS Function Operation Frequency

NFS0003H

1. CHECK START

Check brake force distribution.

OK or NG

OK >> GO TO 2.
NG >> Check brake system.

2. CHECK FRONT AND REAR AXLE

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

OK or NG

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

3. CHECK WHEEL SENSOR

Wheel Sensor Inspection

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

OK or NG

OK >> GO TO 4.
NG >>
- Replace wheel sensor or sensor rotor.
- Repair harness.

4. CHECK ABS WARNING LAMP DISPLAY

Make sure the warning lamp turns off approximately 1 second after the ignition switch is turned on or when driving.

OK or NG

OK >> Normal
NG >> Perform self-diagnosis. Refer to BRC-65, "DESCRIPTION" .

Unexpected Pedal Reaction

NFS0003I

1. CHECK BRAKE PEDAL STROKE

Check brake pedal stroke.

Is the stroke too big?

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 repairs.

NO >> GO TO 2.

2. CHECK FUNCTION

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

OK or NG

OK >> GO TO 3. CHECK WHEEL SENSOR in BRC-82, "Excessive ABS Function Operation Frequency" .

NG >> Check brake system.

The Braking Distance Is Long

NFS0003J

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

1. CHECK FUNCTION

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

OK or NG

OK >> GO TO 3. CHECK WHEEL SENSOR in BRC-82, "Excessive ABS Function Operation Frequency" .

NG >> ● Bleed air from the brake piping.
● Check brake system.

The ABS Function Does Not Operate

NFS0003K

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

1. CHECK ABS WARNING LAMP DISPLAY

Make sure warning lamp turns off approximately 1 second after the ignition switch is turned on or when driving.

OK or NG

OK >> GO TO 3. CHECK WHEEL SENSOR in BRC-82, "Excessive ABS Function Operation Frequency" .

NG >> Perform self-diagnosis. Refer to BRC-65, "CONSULT- II Functions (ABS)" .

Pedal Vibration or ABS Operation Sound Occurs

NFS0003L

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 [50 mm (1.97 in) or more]**
- **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 the engine is started.

OK or NG

OK >> GO TO 2.
NG >> Perform self-diagnosis. Refer to BRC-65, "DESCRIPTION" .

2. SYMPTOM CHECK 2

Check symptom when electrical component (headlamps, etc.) Switches are operated.

Does the symptom occur when the electrical component (head lamp, etc.) Switches are operated?

YES >> Check if there is a radio, antenna, antenna lead wire, or wiring close to the control unit (or its wiring), and if there is, move it farther away.
NO >> GO TO 3. CHECK WHEEL SENSOR in BRC-82, "Excessive ABS Function Operation Frequency"

The Vehicle Jerks Around During TCS/ABS Control

NFS0003M

1. CHECK ENGINE SPEED SIGNAL

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

Is the speed during idling 400 rpm or higher?

YES >> GO TO 3.
NO >> GO TO 2.

2. CHECK ECM SELF-DIAGNOSIS RESULT ITEM

Perform ECM self-diagnosis.

Are self-diagnosis items displayed?

YES >> Check the corresponding items. Refer to EC-83, "TROUBLE DIAGNOSIS" in “Engine Control (EC section)”.
NO >> GO TO 3.

3. SYMPTOM CHECK 1

Check if the vehicle jerks during TCS/ABS control.

OK or NG

OK >> Inspection End
NG >> GO TO 4.

4. CHECK A/T SELF-DIAGNOSIS RESULT ITEM

Perform A/T self-diagnosis.

OK or NG

OK >> GO TO 5.
NG >> Check the corresponding items. Refer toAT-42, "TROUBLE DIAGNOSIS" in “A/T”.

5. SYMPTOM CHECK 2

Check if the vehicle jerks during TCS/ABS control.

OK or NG

OK >> Inspection End
NG >> GO TO 6.

6. CHECK SELF-DIAGNOSIS RESULT ITEM 1

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

Are self-diagnosis items displayed?

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

7. CHECK CONNECTOR

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

OK or NG

OK >> If the connector terminal contact is loose, damaged, open or shorted, repair or replace the connector terminal.
NG >> GO TO 8.

8. CHECK SELF-DIAGNOSIS RESULT ITEM 2

Re-conduct the ABS actuator and electric unit (control unit) self-diagnosis.

Are self-diagnosis items displayed?

YES >> Repair or replace any non-standard items.
NO >> GO TO 9.

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

Check CAN communication system. Refer to BRC-80, "CAN Communication System" .

OK or NG

OK >> Inspection End
NG >> Connect the connector and re-conduct the ABS actuator and electric unit (control unit) self-diagnosis.

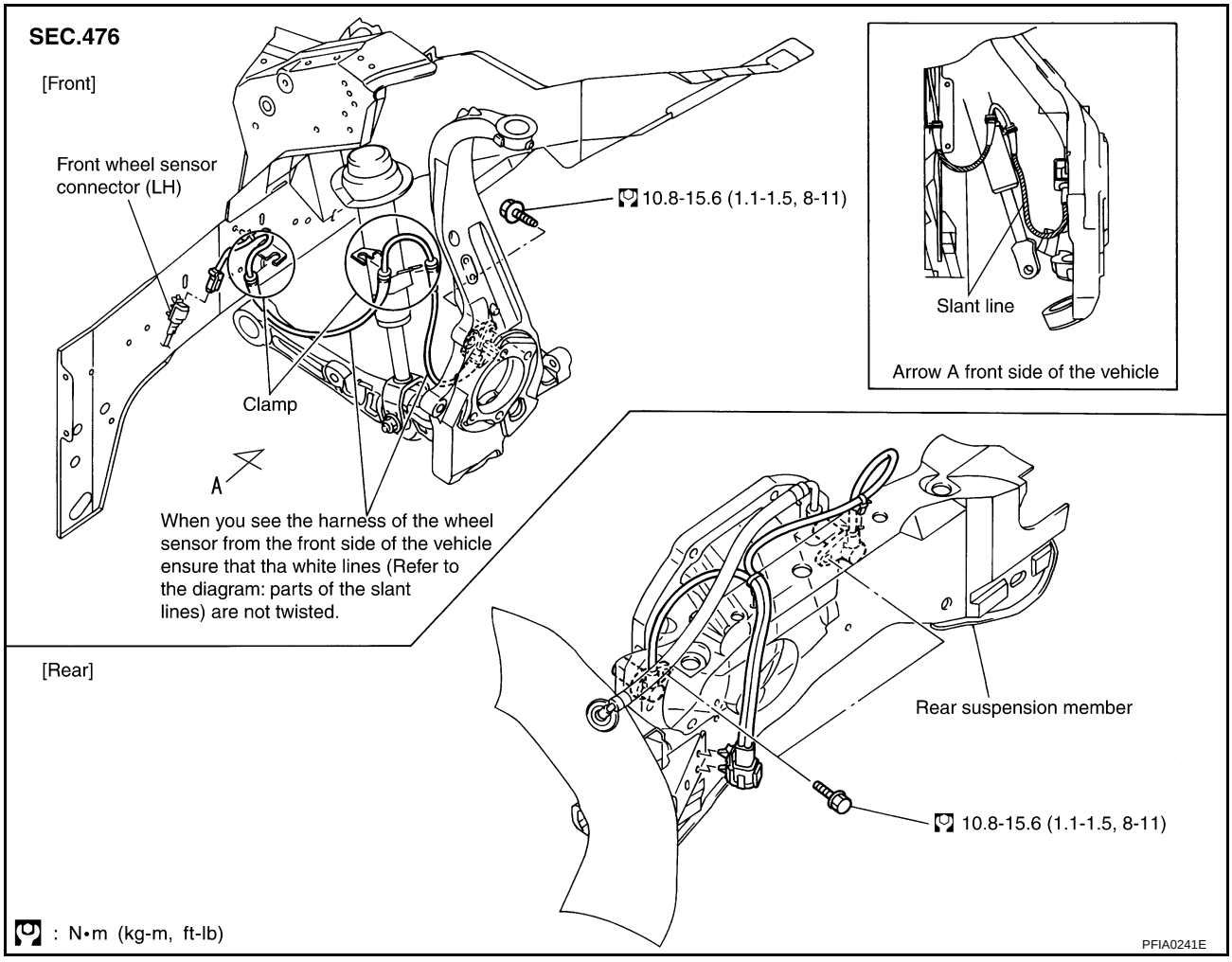
WHEEL SENSORS

PFP:47910

Removal and Installation

NFS0003N

COMPONENTS



REMOVAL

Pay attention to the following when removing sensor.

CAUTION:

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

INSTALLATION

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

- When installing, check that there is no foreign material such as iron chips on pick-up and mounting hole of the sensor. Check that no foreign material has been caught in the sensor rotor motor. Remove any foreign material and clean the mount.
- When installing front sensor, be sure to press rubber grommets in until they lock at the three locations shown in diagram (2 at shock absorbers and 1 at body panel). When installed, harness must not be twisted. White line on harness (shaded part) must be visible from front.

SENSOR ROTOR

PFP:47970

Removal and Installation

NFS0003O

REMOVAL

Front

Sensor rotor cannot be disassembled. To replace sensor rotor, replace hub bearing assembly. Refer to FAX-4, "Removal and Installation" in “Front Axle/Drive Shaft” in “FAX” section.

Rear

- Follow procedure below to remove rear sensor rotor.

– Remove side flange. Refer to RFD-15, "SIDE OIL SEAL" in “Rear Final Drive” in “RFD” section.

– Using a bearing replacer (special service tool) and puller (commercial service tool), remove sensor rotor from the side flange.

INSTALLATION

Front

Sensor rotor cannot be disassembled. To replace sensor rotor, replace hub bearing assembly. Refer to FAX-4, "Removal and Installation" in “Front Axle/Drive Shaft” in “FAX” section.

Rear

- Follow procedure below to install rear sensor rotor.

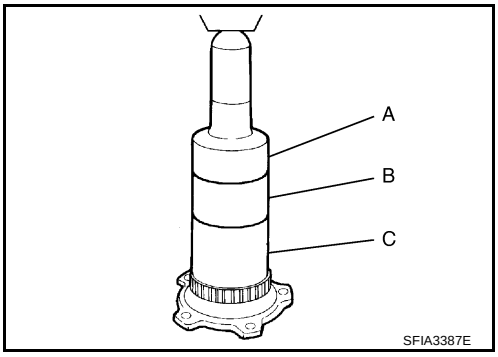
– Using a drift (special service tool), press rear sensor rotor onto the side flange.

Tool number

A: ST30720000 (J-25405)

B: ST27863000 (—)

C: KV40104710 (—)



– Install side flange. Refer to RFD-15, "SIDE OIL SEAL" in “Rear Final Drive” in “RFD” section.

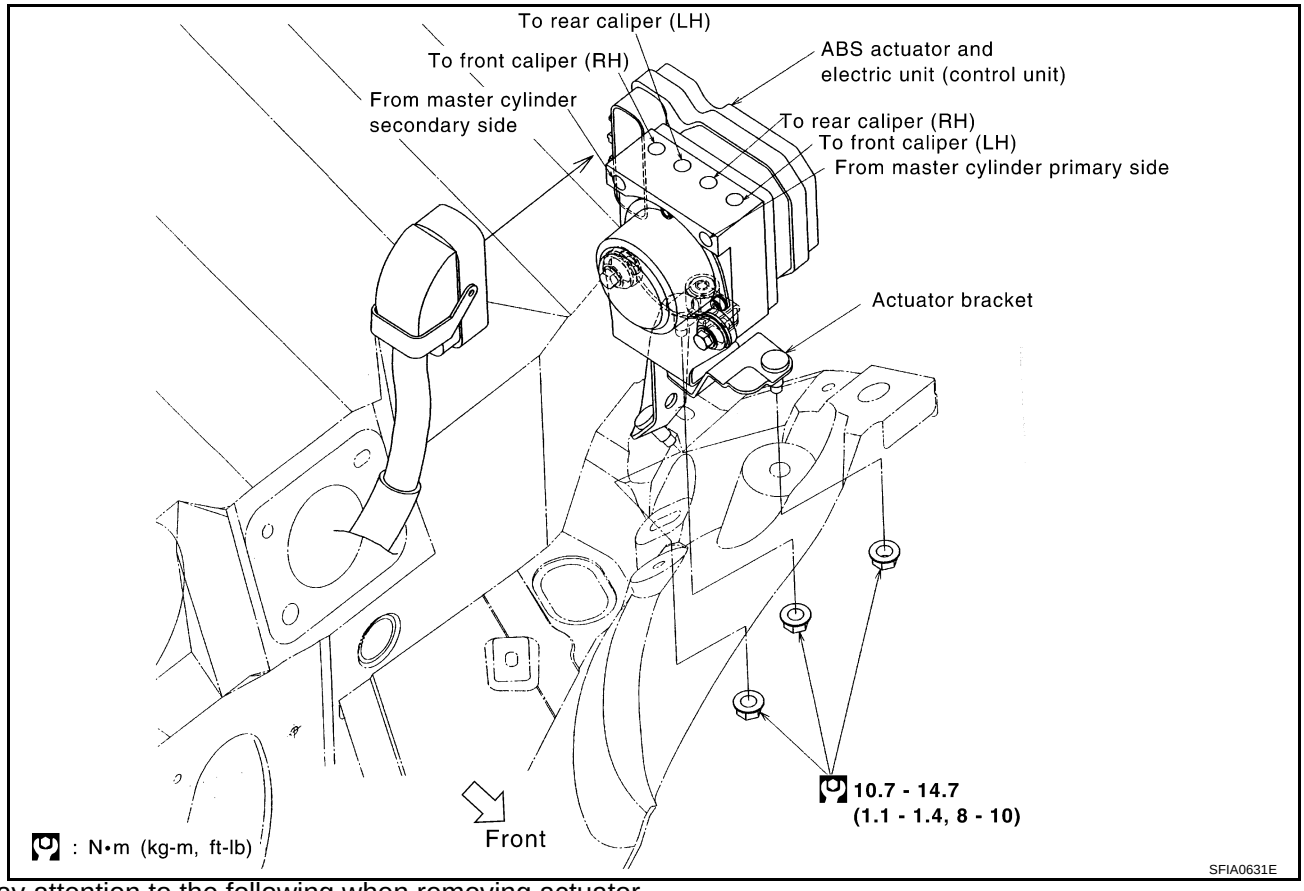
ABS ACTUATOR AND ELECTRIC UNIT (ASSEMBLY)

PFP:47660

Removal and Installation

NFS0003P

COMPONENTS



Pay attention to the following when removing actuator.

CAUTION:

- **Before servicing, disconnect battery cables.**
- **To remove brake tube, use a flare nut 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 toBR-11, "Bleeding Brake System" .**
- **Be sure to securely connect the ground cable.**

APPLICATION NOTICE

PFP:00000

How to Check Vehicle Type

NFS000TJ

Check the vehicle identification number (chassis number).

Identification number (chassis number)	Service infomation
For serial ● JN1AZ34D300001 – JN1AZ34D330000 ● JN1AZ34E350001 – JN1AZ34E380000 ● JN1AZ36D400001 – JN1AZ36D430000 ● JN1AZ36A450001 – JN1AZ36A480000	Type 1
Form serial ● JN1AZ34D330001 – ● JN1AZ34E380001 – ● JN1AZ36D430001 – ● JN1AZ36A480001 –	Type 2

PRECAUTIONS

PFP:00001

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

NFS0003Q

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 Battery Service

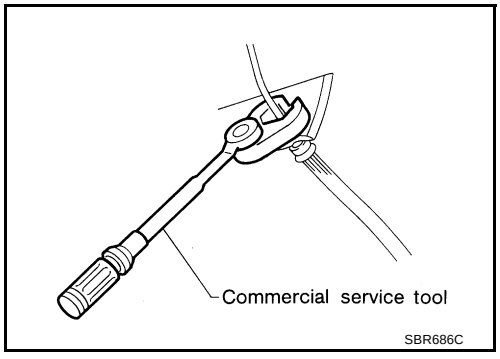
NFS0003R

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Precautions for Brake System

NFS0003S

- Recommended fluid is brake fluid “DOT 3”. Refer to MA-12, "RECOMMENDED FLUIDS AND LUBRICANTS" .
- Never reuse drained brake fluid.
- Be careful not to splash brake fluid on painted areas such as body. If brake fluid is splashed, wipe it off and flush area with water immediately.
- Never use mineral oils such as gasoline or kerosene. They will ruin rubber parts of the hydraulic system.
- Use a flare nut wrench when removing flare nuts, and use a flare nut torque wrench when tighten brake tube flare nuts.
- When installing brake tubes, be sure to check torque.
- Brake system is an important safety part. If a brake fluid leak is detected, always disassemble the affected part. If a malfunction is detected, replace part with a new one.
- Before working, turn ignition switch OFF and disconnect electrical connector of VDC/TCS/ABS control unit or the battery cables.



WARNING:

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

Precautions for Brake Control

NFS0003T

- 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 booster operation, brake fluid level, and oil 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, Bush, 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 if the brake pedal is used. 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 may turn on. However, this is not a problem 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 problem. However this is not a problem if normal operation can be resumed after restarting the engine.

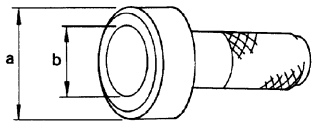
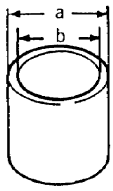
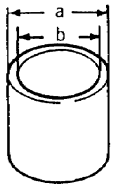
PREPARATION

PFP:00002

Special Service Tools

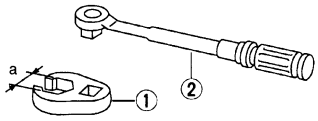
NFS0003U

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name		Description
ST30720000 (J-25405) Drift a: 77 mm (3.03 in) dia. b: 55.5 mm (2.185 in) dia.	 ZZA0701D	Installation rear sensor rotor
ST27863000 (—) Drift a: 74.5 mm (2.933 in) dia. b: 62.5 mm (2.461 in) dia.	 ZZA0832D	
KV40104710 (—) a: 76.3 mm (3.004 in) dia. b: 67.9 mm (2.673 in) dia.	 ZZA0832D	

Commercial Service Tools

NFS0003V

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

ON-VEHICLE SERVICE

PFP:00000

Adjustment of Steering Angle Sensor Neutral Position

NFS0003W

In case of doing work that applies to the list below, make sure to adjust neutral position of steering angle sensor before running vehicle.

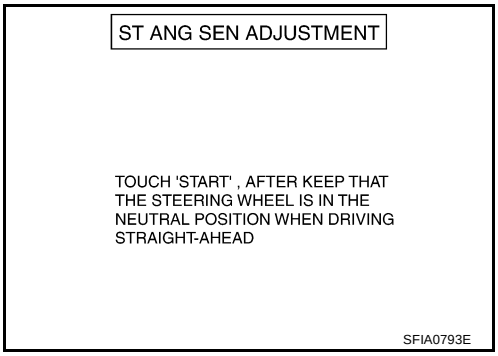
Situation	Adjustment of Steering Angle Sensor Neutral Position
Removing/Installing VDC/TCS/ABS control unit	–
Replacing VDC/TCS/ABS control unit	×
Removing/Installing steering angle sensor	×
Removing/Installing steering components	×
Removing/Installing suspension components	×
Change 4 tires to new ones	–
Tire rotation	–
Adjusting wheel alignment	×

×: Required
–: Not required

1. Stop vehicle with front wheels in straight-ahead position.
2. Perform “CONSULT-II Start Procedure”. Refer to GI-36, "CONSULT-II Start Procedure" .
3. Turn ignition switch ON and in the following order touch “ABS” “WORK SUPPORT” “ANGLE SENSOR ADJUSTMENT” in CONSULT-II screen.
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 carry out above operation.
7. Run vehicle with front wheels in straight-ahead position, then stop.
8. Select “DATA MONITOR”, “ECU INPUT SIGNALS”, and “STEERING ANGLE SIGNAL” on CONSULT-II screen. Then check that “STEERING ANGLE SIGNAL” is within 0±2.5 deg. If value is more than specification, repeat steps 1 to 5.
9. Erase memory of VDC/TCS/ABS control unit and ECM.
10. Turn ignition switch to OFF.

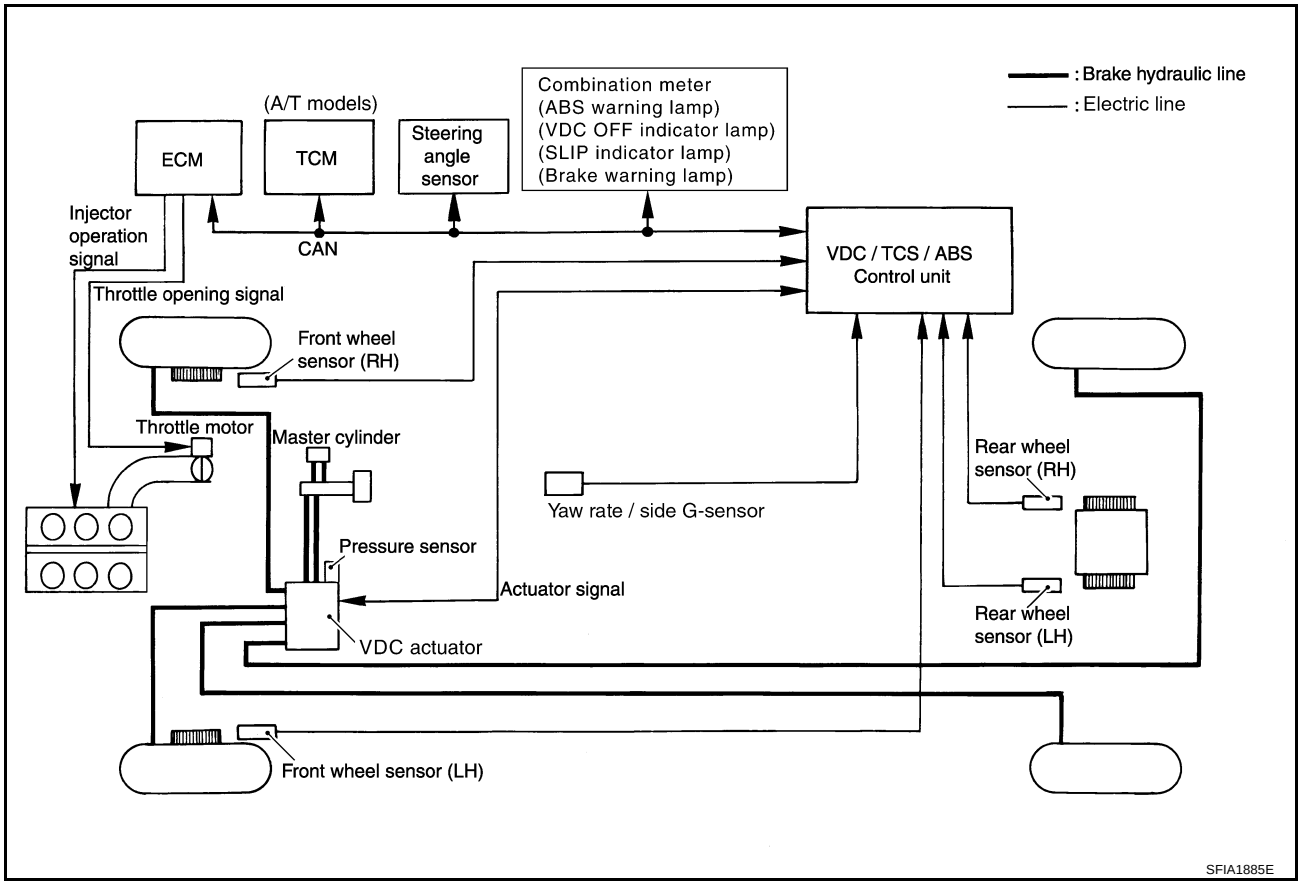


SYSTEM DESCRIPTION

PFP:00000

System Diagram

NFS0003X



VDC Function

NFS0003Y

- 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 sensor/side 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. 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 problem.

TCS Function

NFS0003Z

- The wheel spin of the drive wheels is detected by the VDC/TCS/ABS control unit from the wheel speed signals from the four wheels, so if wheel spin occurs, the rear 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, suddenly downshifts, 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

NFS00040

- 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 breaks down, then the Fail-Safe function starts, the ABS becomes inoperative, and the ABS warning lamp turns on.
- Electrical System Diagnosis by CONSULT-II is available.

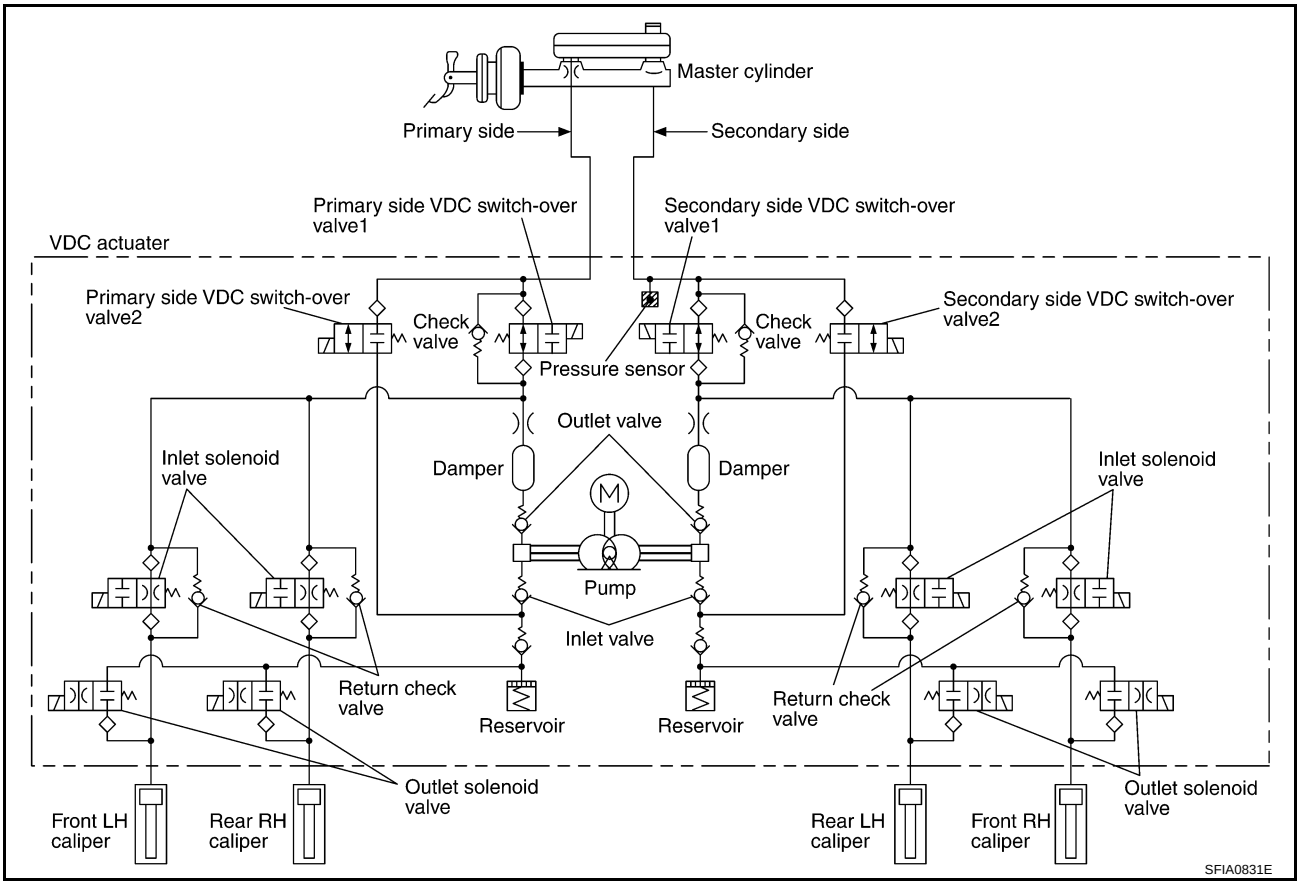
EBD Function

NFS00041

- Electronic Brake Distributor is a function that detects subtle slippages between the front and rear wheels during braking, and it improves handling stability by electronically controlling the Brake Fluid Pressure which results in reduced rear wheel slippage.
- In case of electrical system break down, the Fail-Safe function is activated, the EBD and ABS becomes inoperative, and the ABS warning lamp and brake warning lamp are turned on.
- Electrical System Diagnosis by CONSULT-II is available.

Hydraulic Circuit Diagram

NFS00043



CAN Communication

NFS00044

SYSTEM DESCRIPTION

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-48, "CAN System Specification Chart" .

TROUBLE DIAGNOSIS

PFP:00004

Fail-Safe Function

NFS000IK

VDC/TCS SYSTEM

In case of Throttle Control System trouble, 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 equipment. In case of trouble to the Throttle Control System, 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 the electrical problems with the ABS, the ABS warning lamp, VDC OFF indicator lamp and SLIP indicator lamp will turn on. In case of the electrical problem 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.

- For ABS trouble, only the EBD is activated and the condition of the vehicle is the same condition of vehicle without TCS/ABS equipment.

  NOTE:

  ABS self diagnosis sound may be heard. That is a normal condition because a self diagnosis for “Ignition switch ON” and “The first starting” are being performed.
- For EBD trouble, the EBD and ABS become inoperative, and the condition of the vehicle is the same as the condition of vehicles without TCS/ ABS, EBD equipment.

How to Proceed With Diagnosis

NFS00045

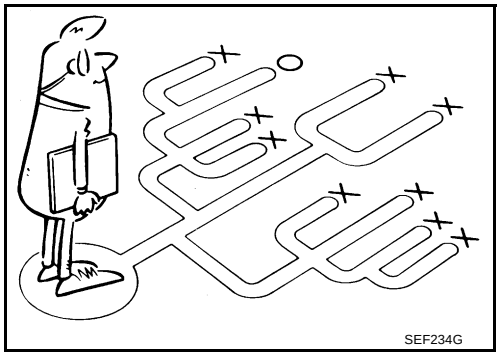
BASIC CONCEPT

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

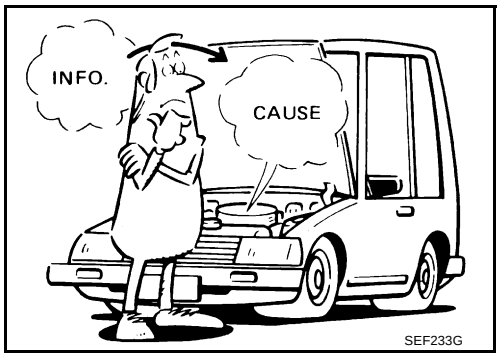
- It is also important to clarify customer complaints before inspection.
  First of all, reproduce symptom, and understand it fully.
  Ask customer about his/her complaints carefully. In some cases, it will be necessary to check symptom by driving vehicle with customer.

  NOTE:

  Customers are not professionals. Do not assume “maybe customer means...” or “maybe customer mentioned this symptom”.


SEF234G

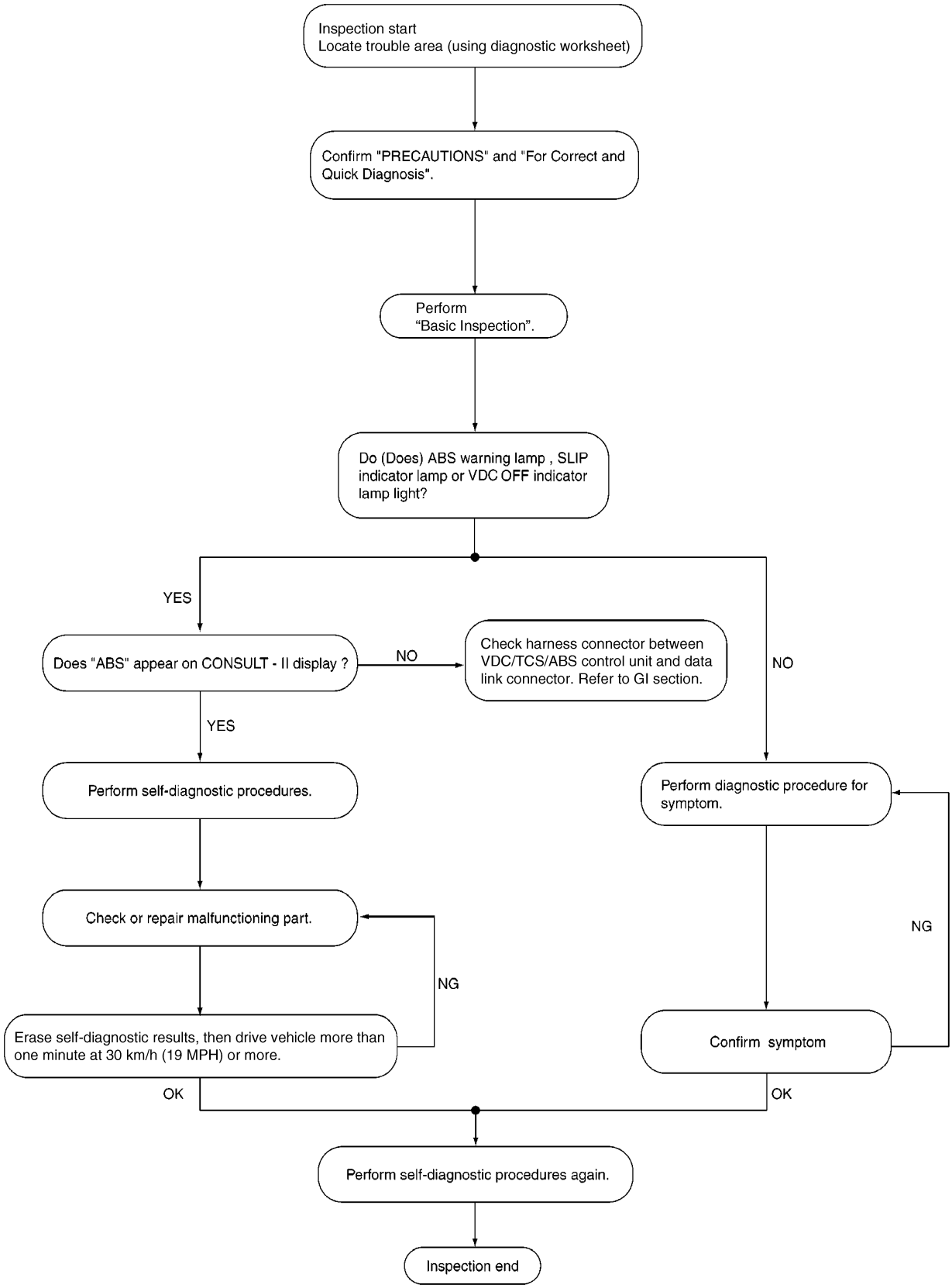
- It is essential to check symptoms right from beginning in order to repair a malfunction completely.
  For an intermittent malfunction, it is important to reproduce symptom based on interview with customer and past examples. Do not perform inspection on ad hoc basis. Most intermittent malfunctions are 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 carry out “erase memory”. Refer to BRC-119, "ERASE MEMORY" .
- 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-3, "General Precautions"

DIAGNOSIS FLOWCHART



SFIA3272E

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 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

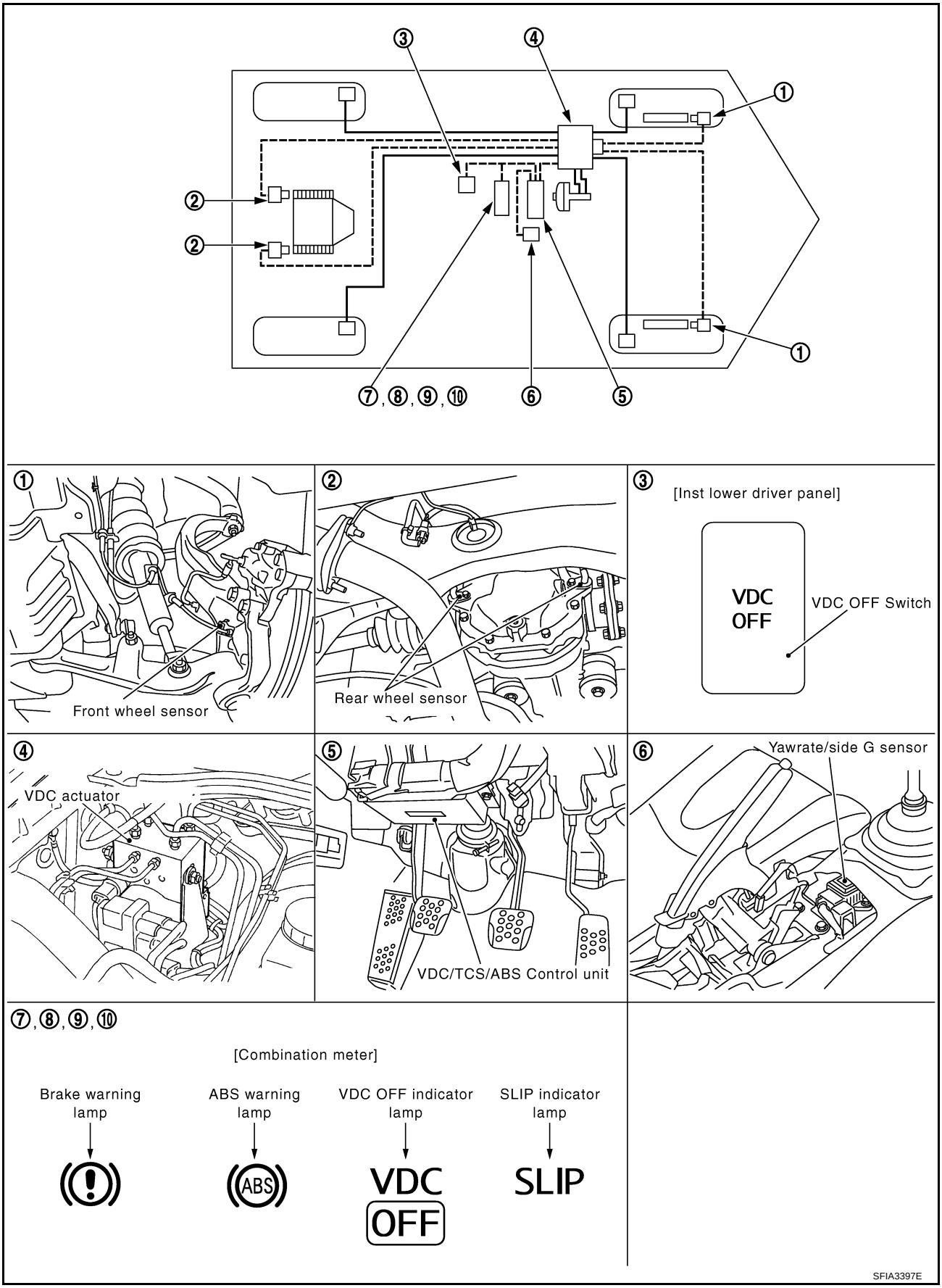
Customer name MR/MS	Model & Year		VIN
Engine #	Trans.		Mileage
Incident Date	Manuf. Date		In Service Date
Symptoms	☐ Noise and vibration (from engine compartment) ☐ Noise and vibration (from axle)	☐ Warning / Indicator activate	☐ Firm pedal operation Large stroke pedal operation
	☐ TCS does not work (Rear wheels slip when accelerating)	☐ ABS does not work (Wheels lock 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		

SFIA3265E

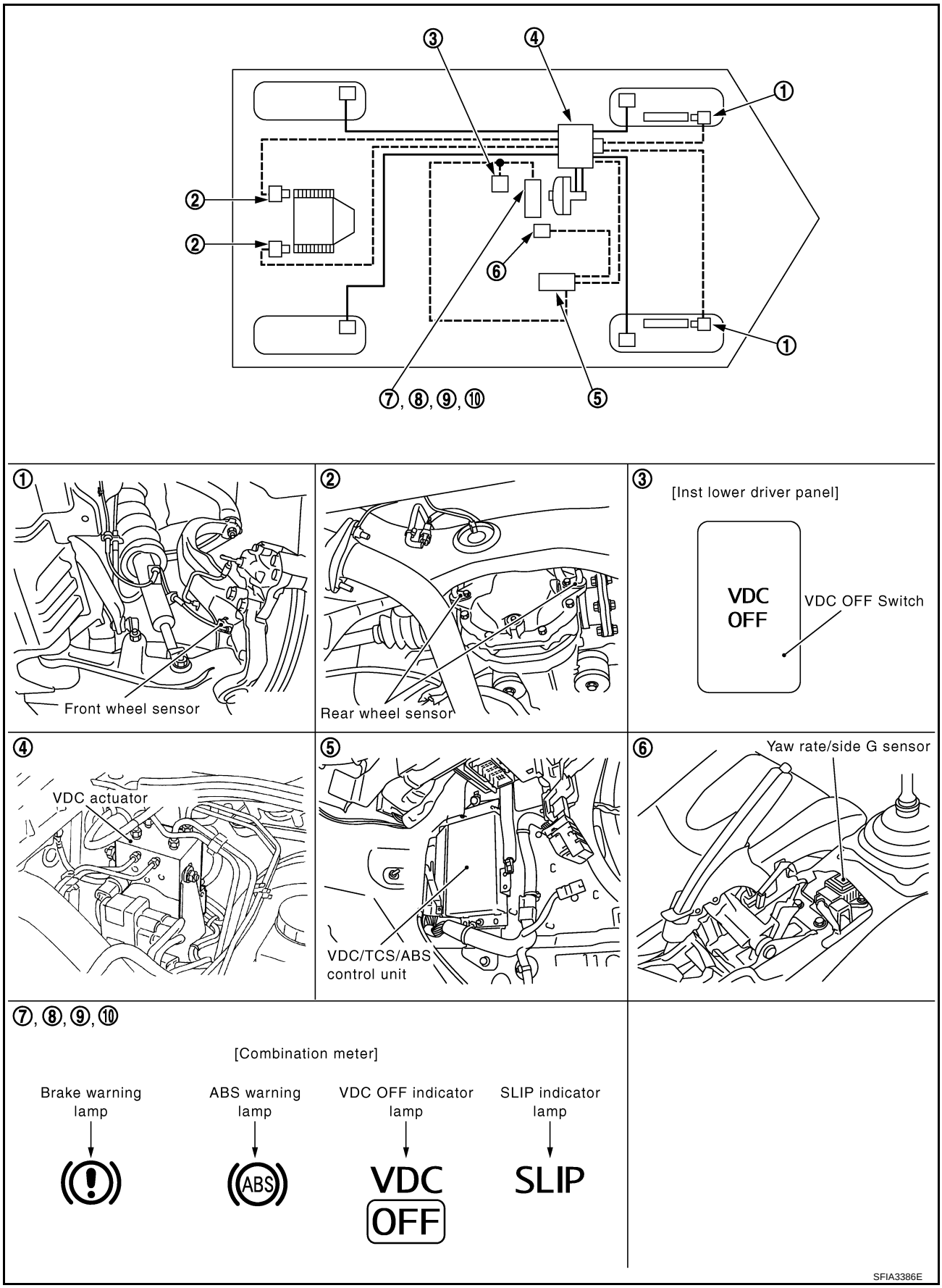
Component Parts Location

NFS000TL

TYPE 1

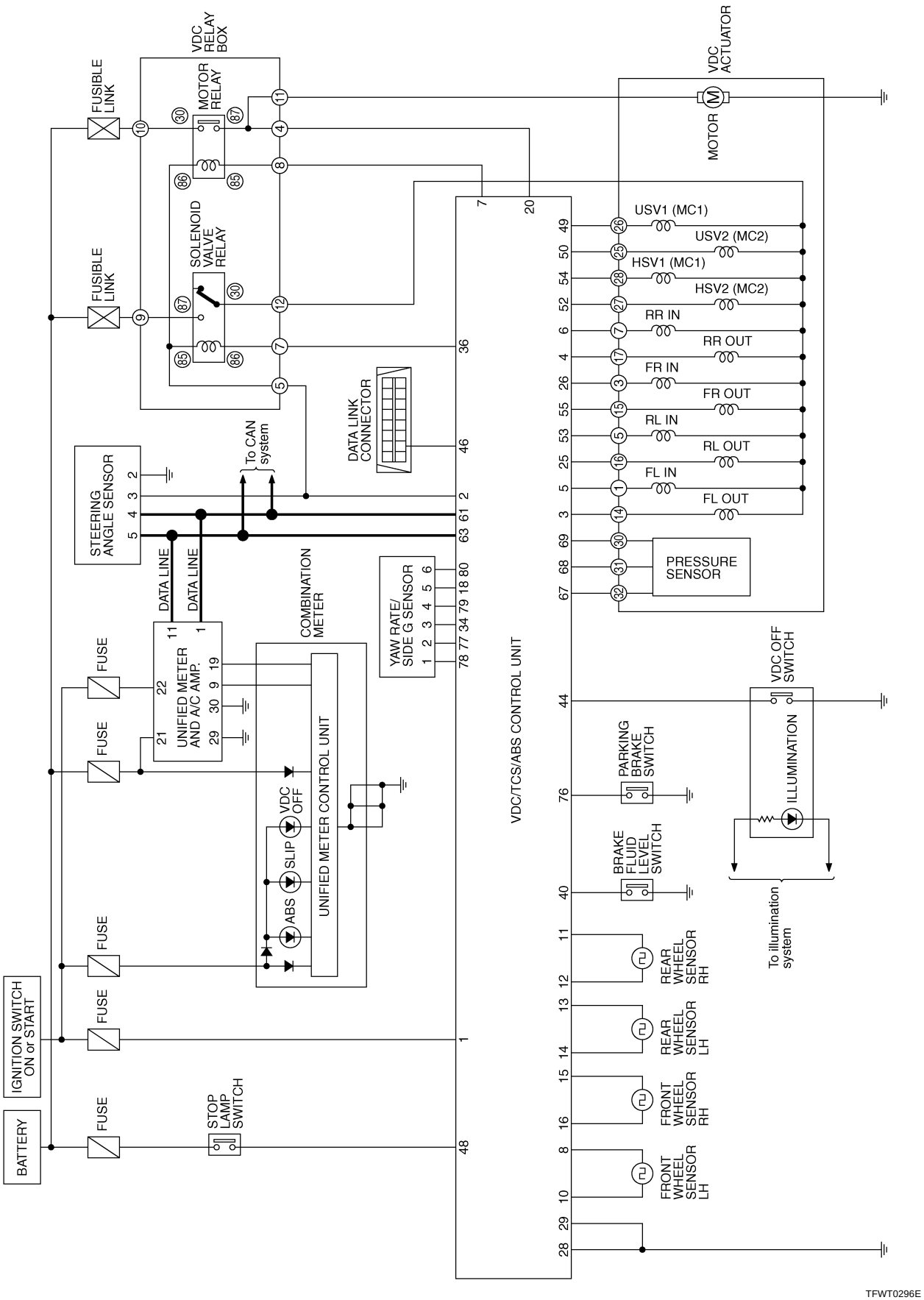


TYPE 2


③
④
①
②
②
⑥
①
⑦, ⑧, ⑨, ⑩
⑤
①
Front wheel sensor
②
Rear wheel sensor
③
[Inst lower driver panel]
VDC OFF
VDC OFF Switch
④
VDC actuator
⑤
VDC/TCS/ABS control unit
⑥
Yaw rate/side G sensor
⑦, ⑧, ⑨, ⑩
[Combination meter]
Brake warning lamp
ABS warning lamp
VDC OFF indicator lamp
SLIP indicator lamp
VDC OFF
SLIP
SFIA3386E

Schematic

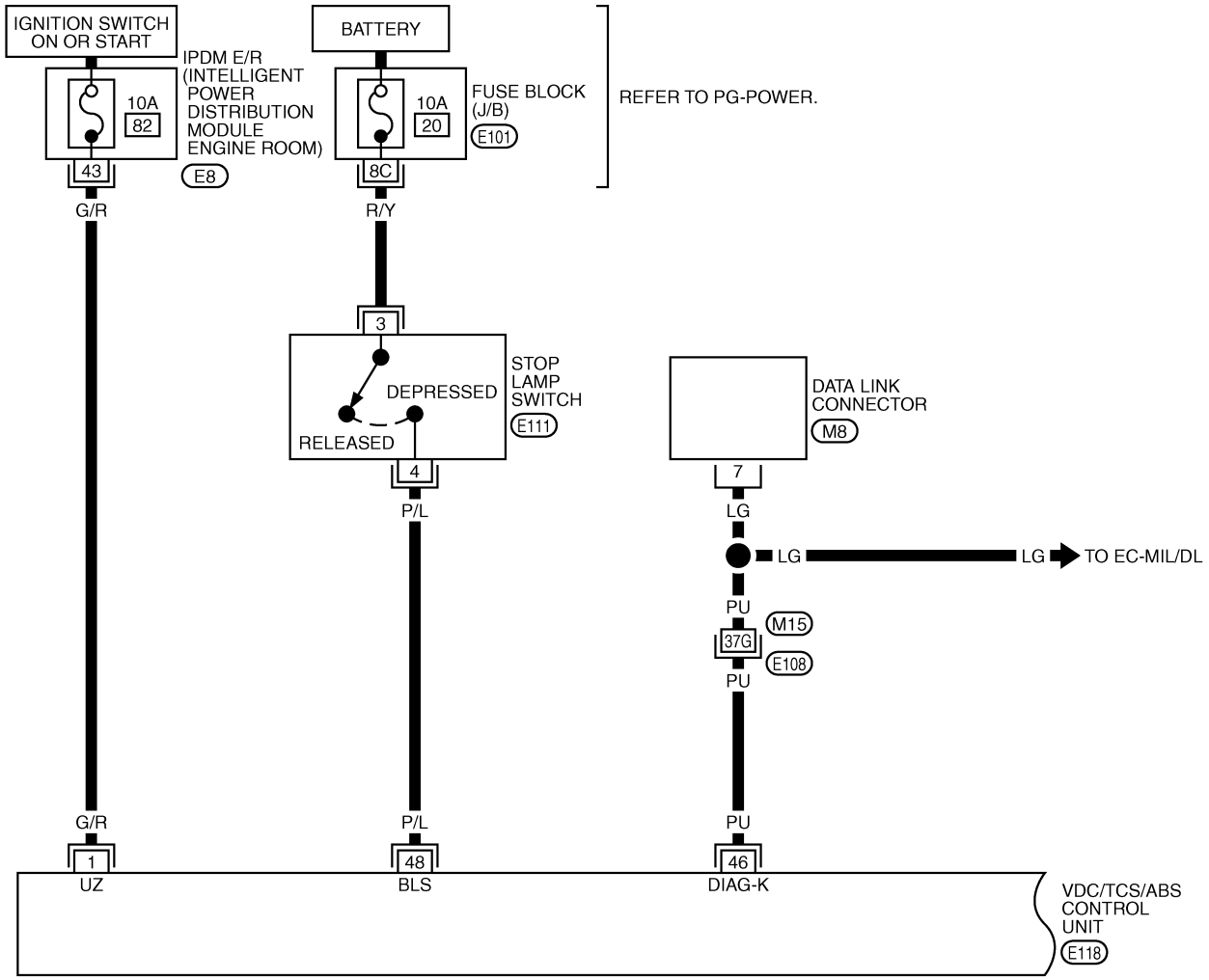
NFS00047

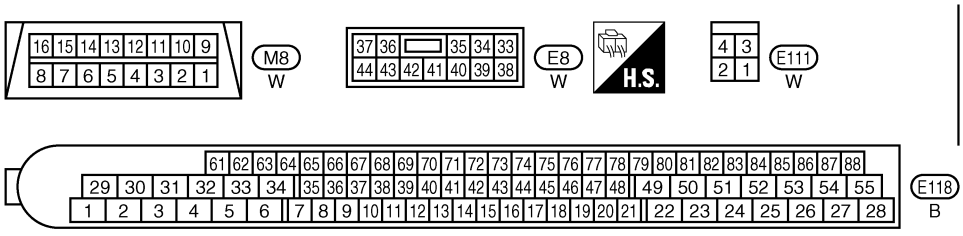


Wiring Diagram — VDC — / Type 1

NFS000TM

BRC-VDC-01

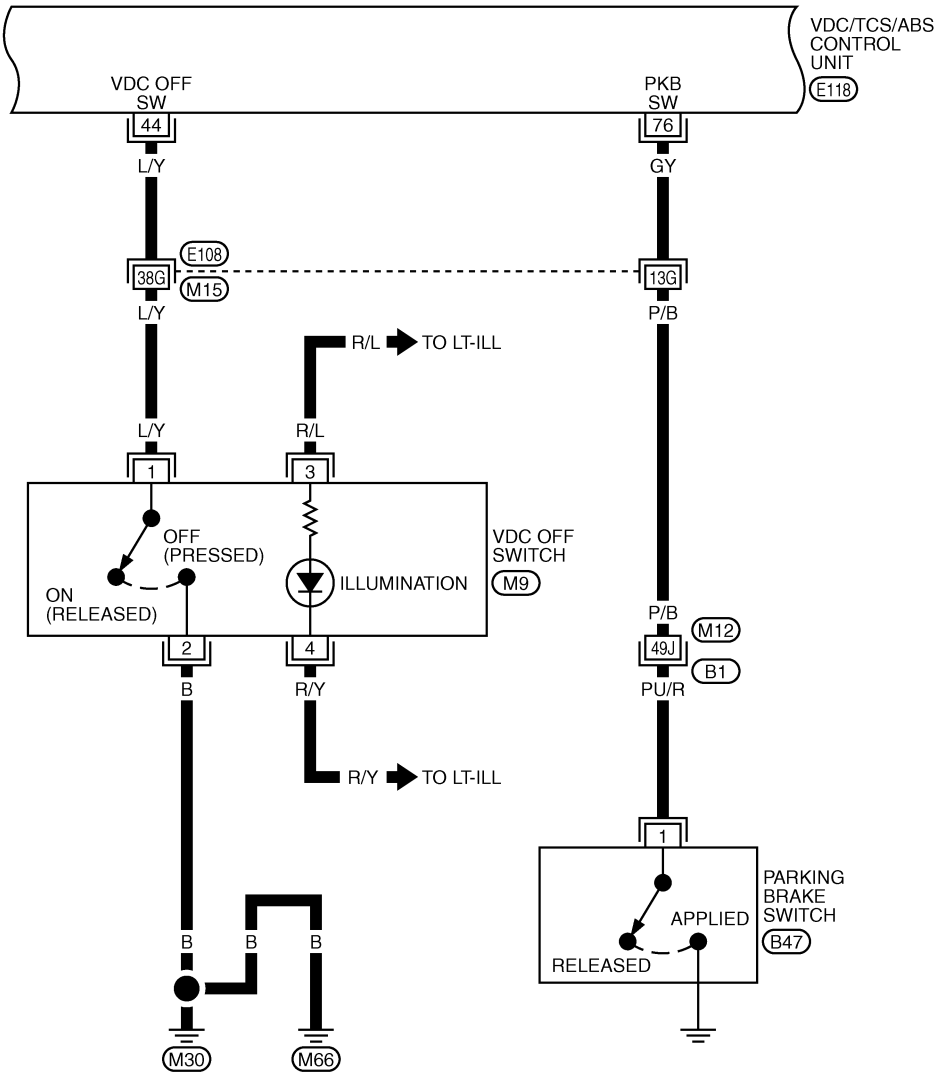


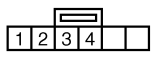


REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
E101 -FUSE BLOCK-JUNCTION BOX (J/B)

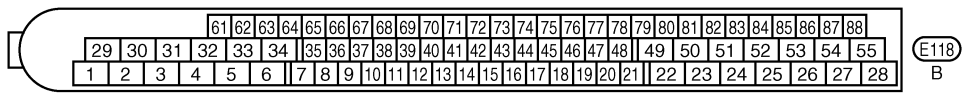
TFWT0297E

BRC-VDC-02



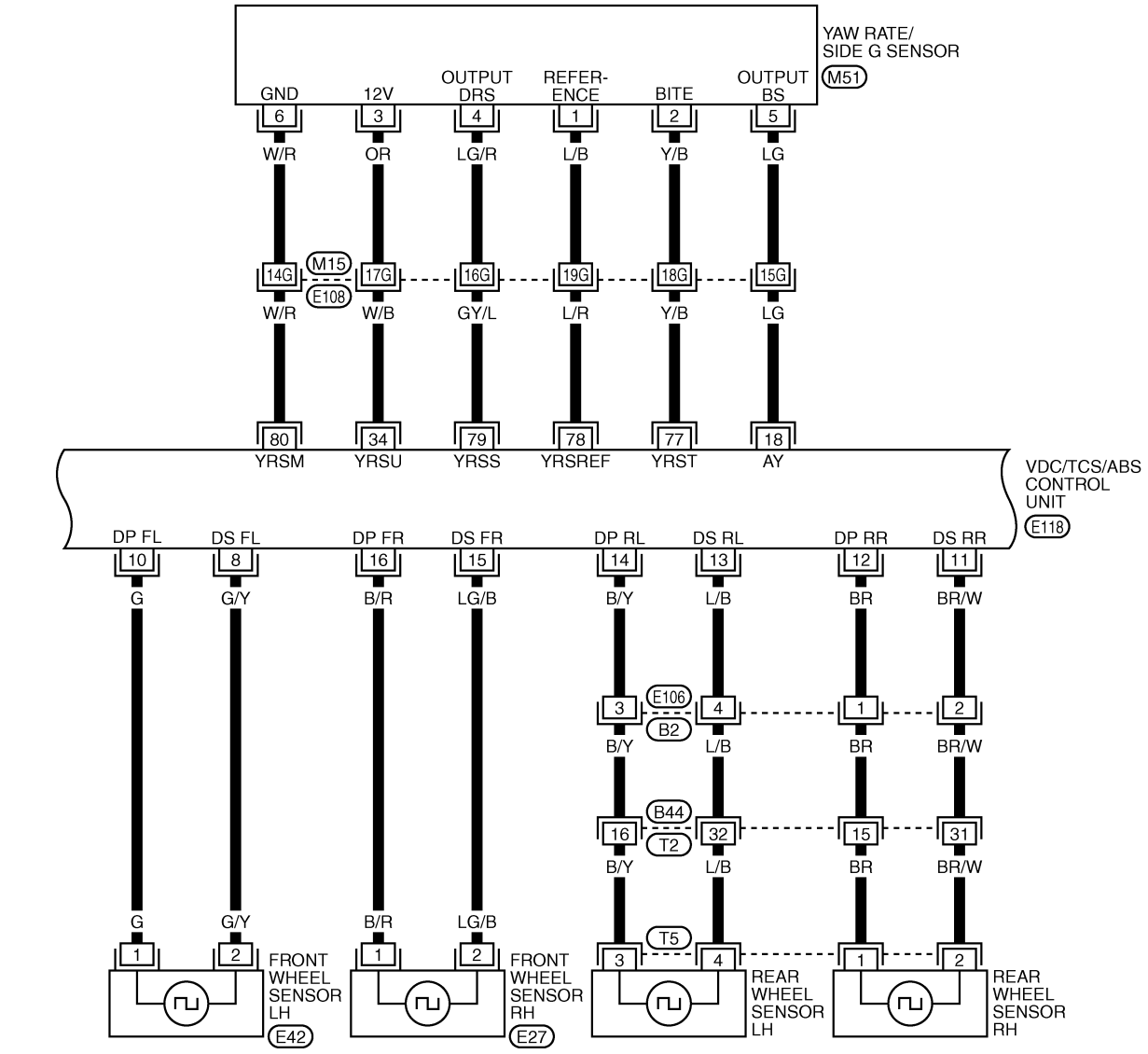


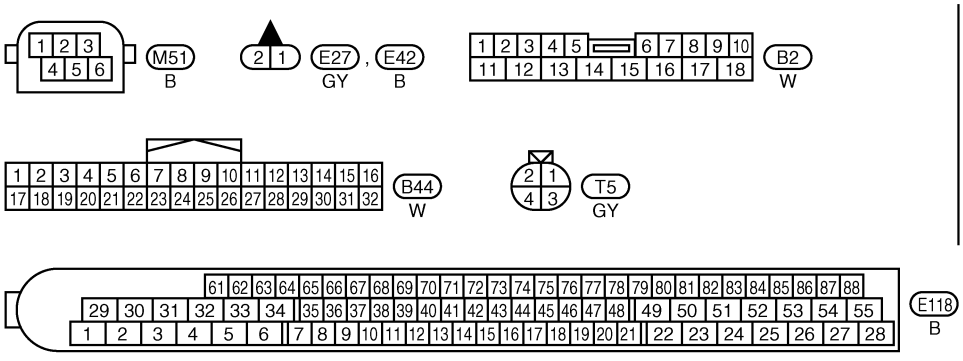
REFER TO THE FOLLOWING.
E108 , B1 -SUPER MULTIPLE JUNCTION (SMJ)



TFWT0298E

BRC-VDC-03

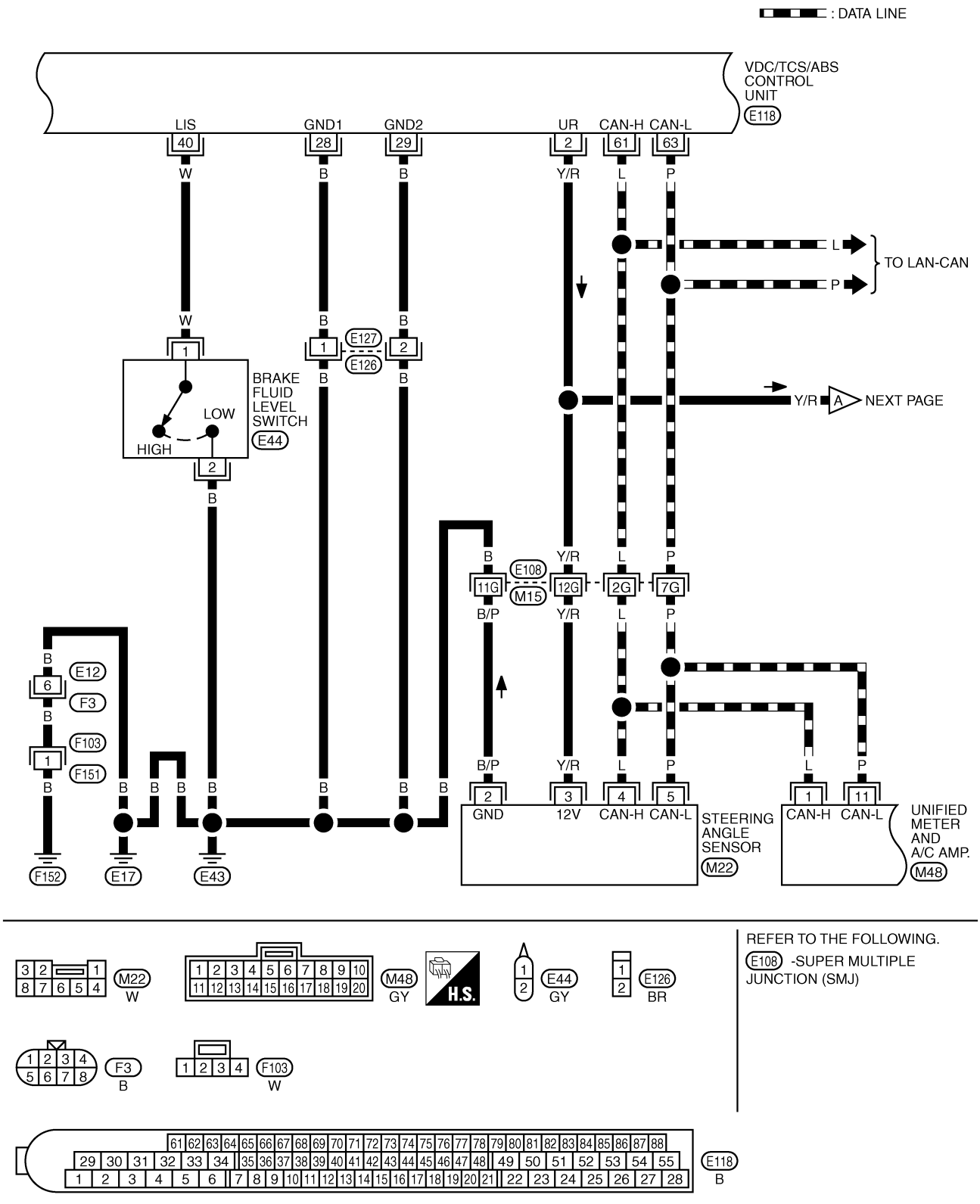




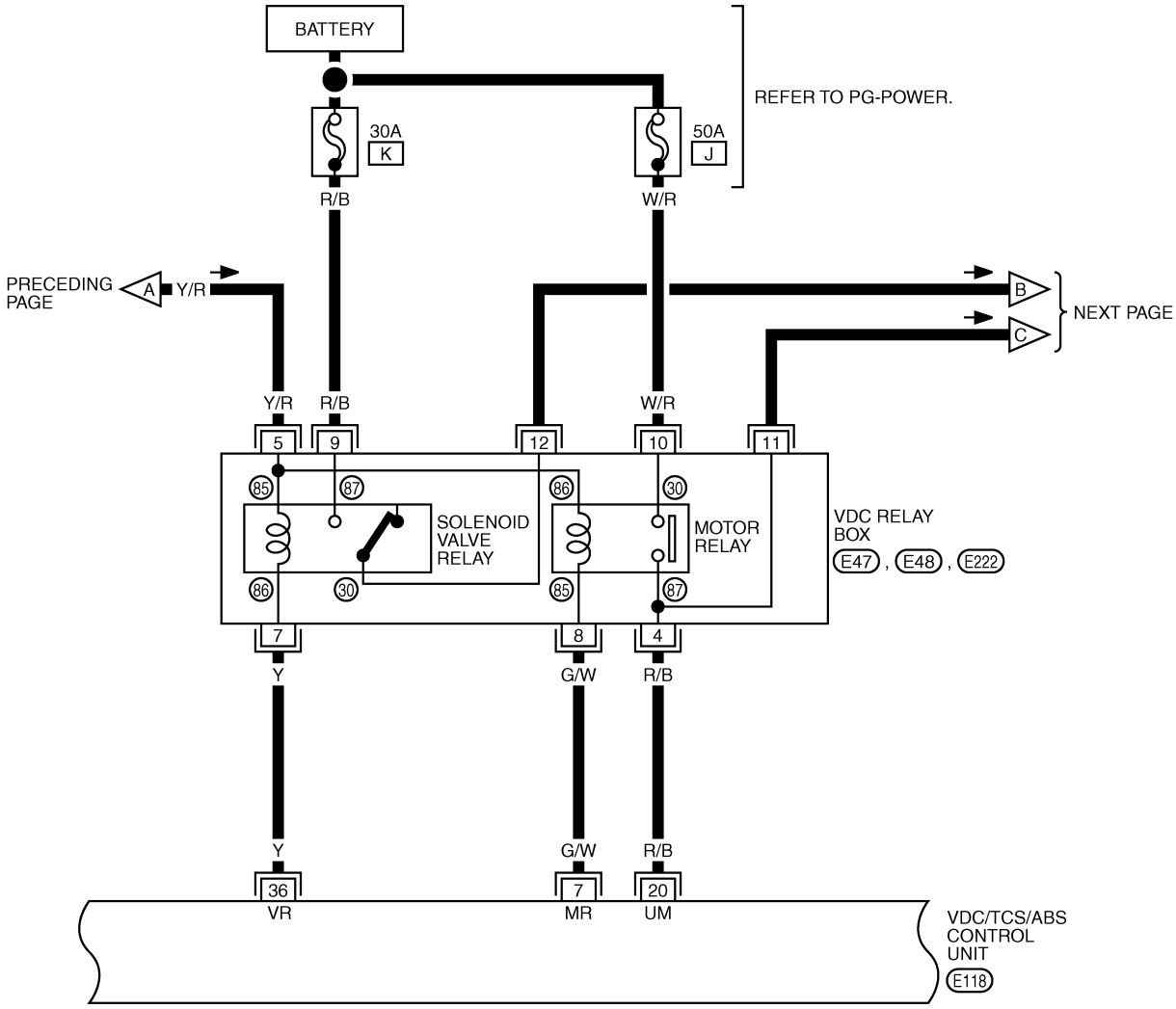
REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)

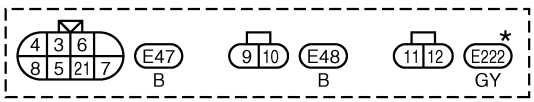
TFWT0299E

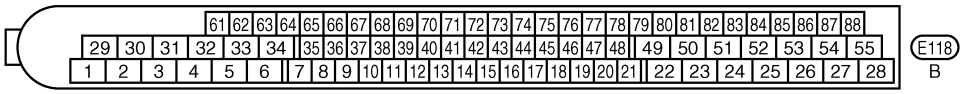
BRC-VDC-04



TFWT0300E



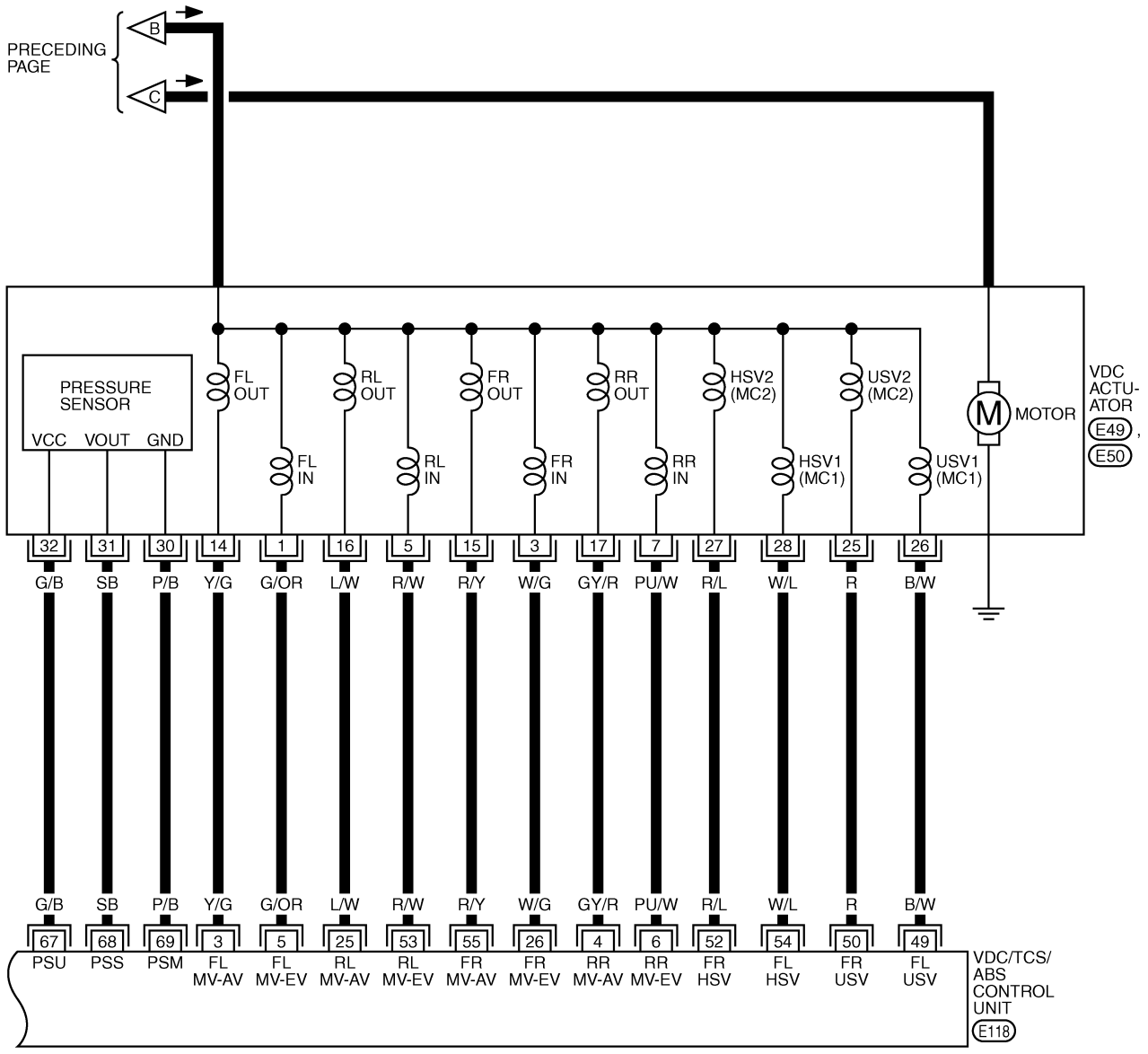


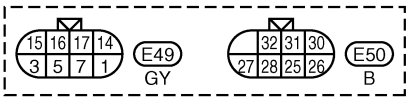


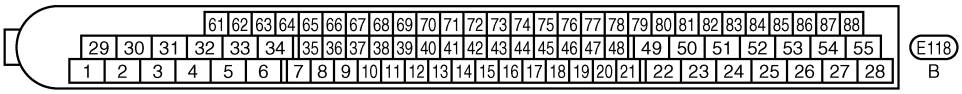
*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TFWT0301E

BRC-VDC-06

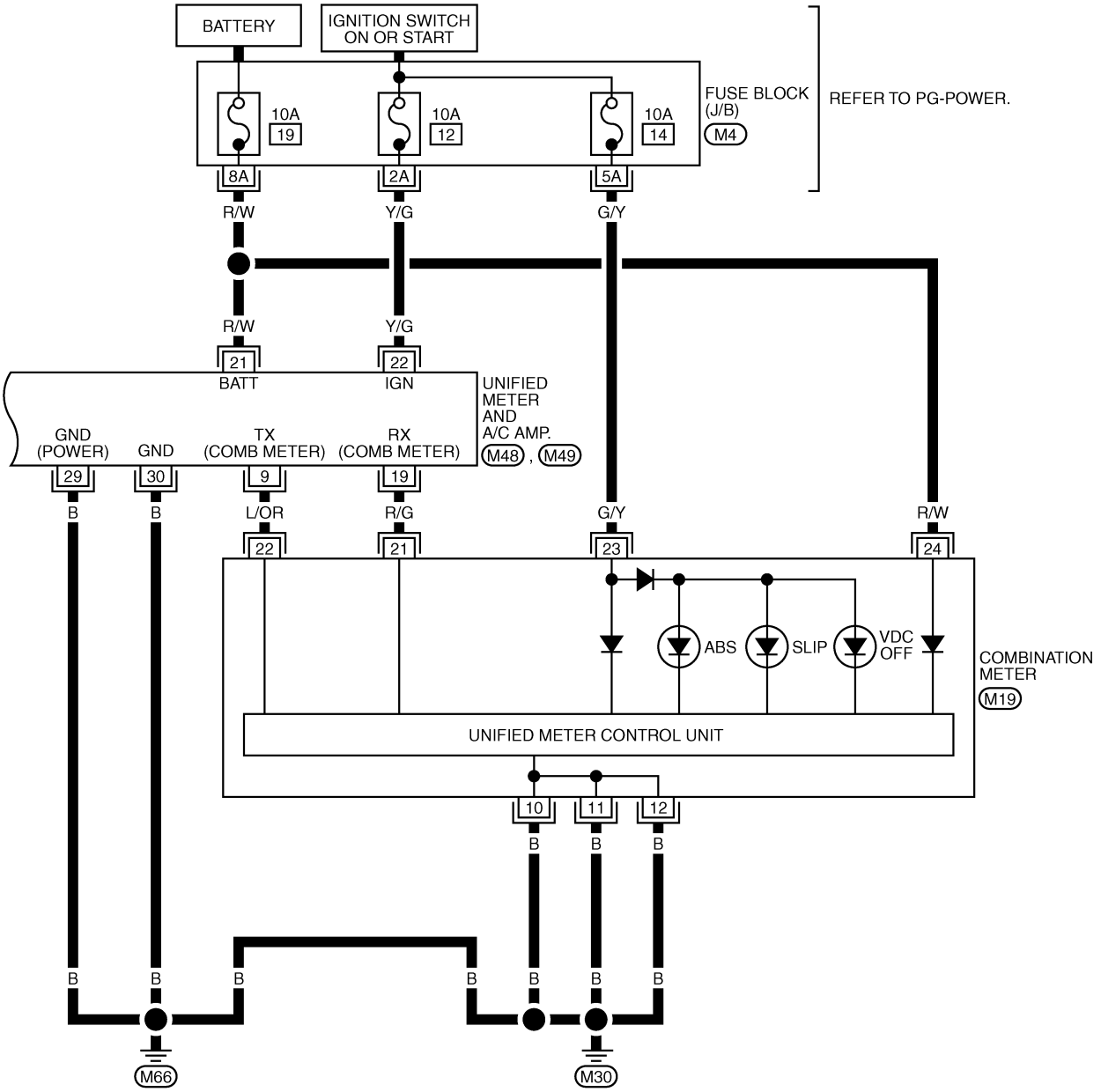


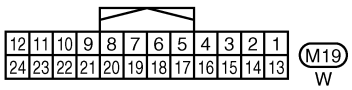


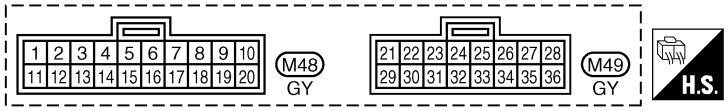


TFWT0302E

BRC-VDC-07







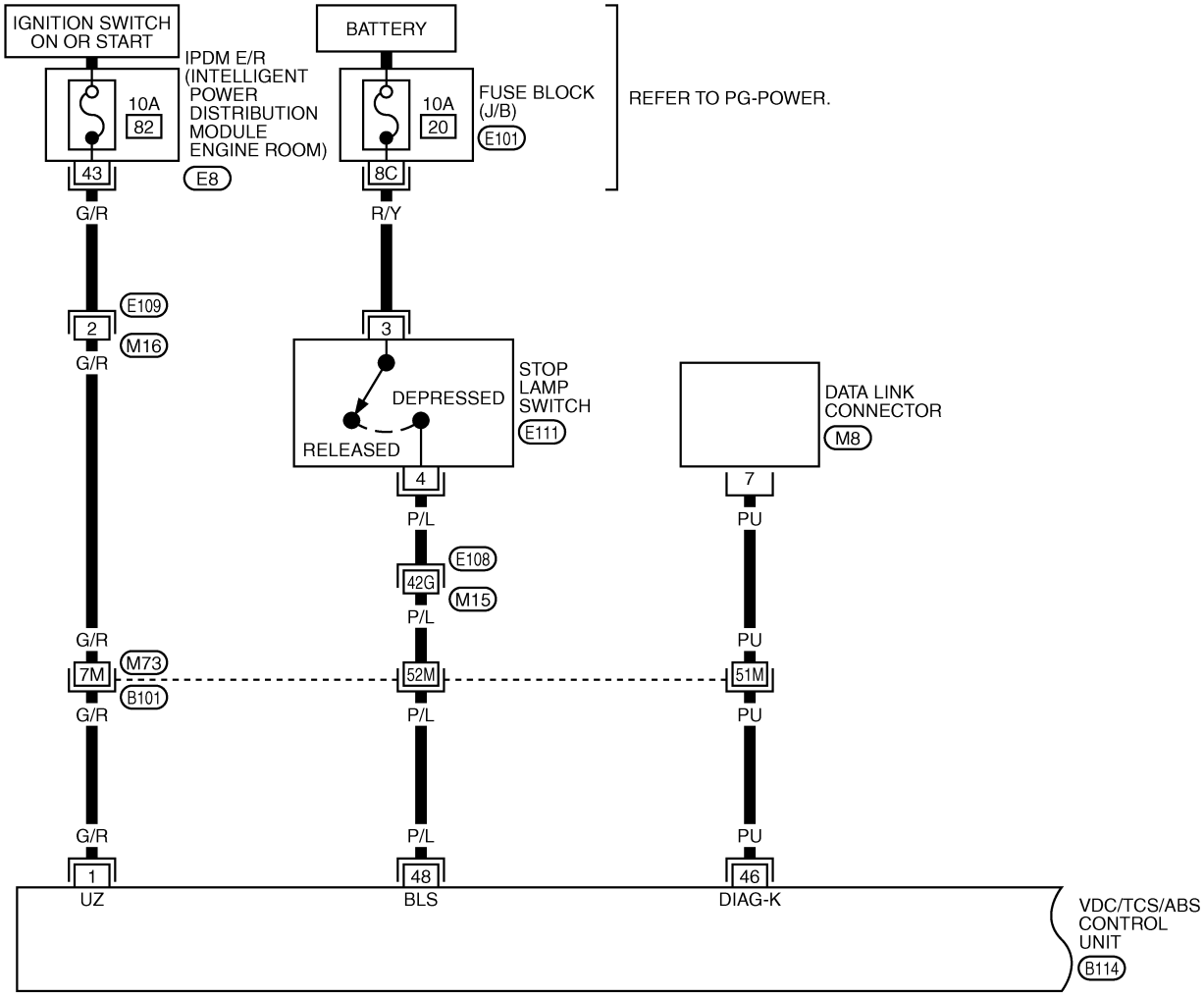
REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

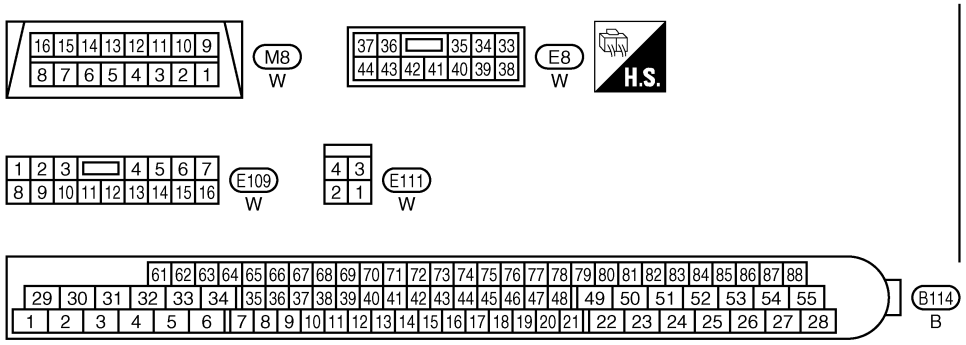
TFWT0303E

Wiring Diagram — VDC — / Type 2

NFS00048

BRC-VDC-01

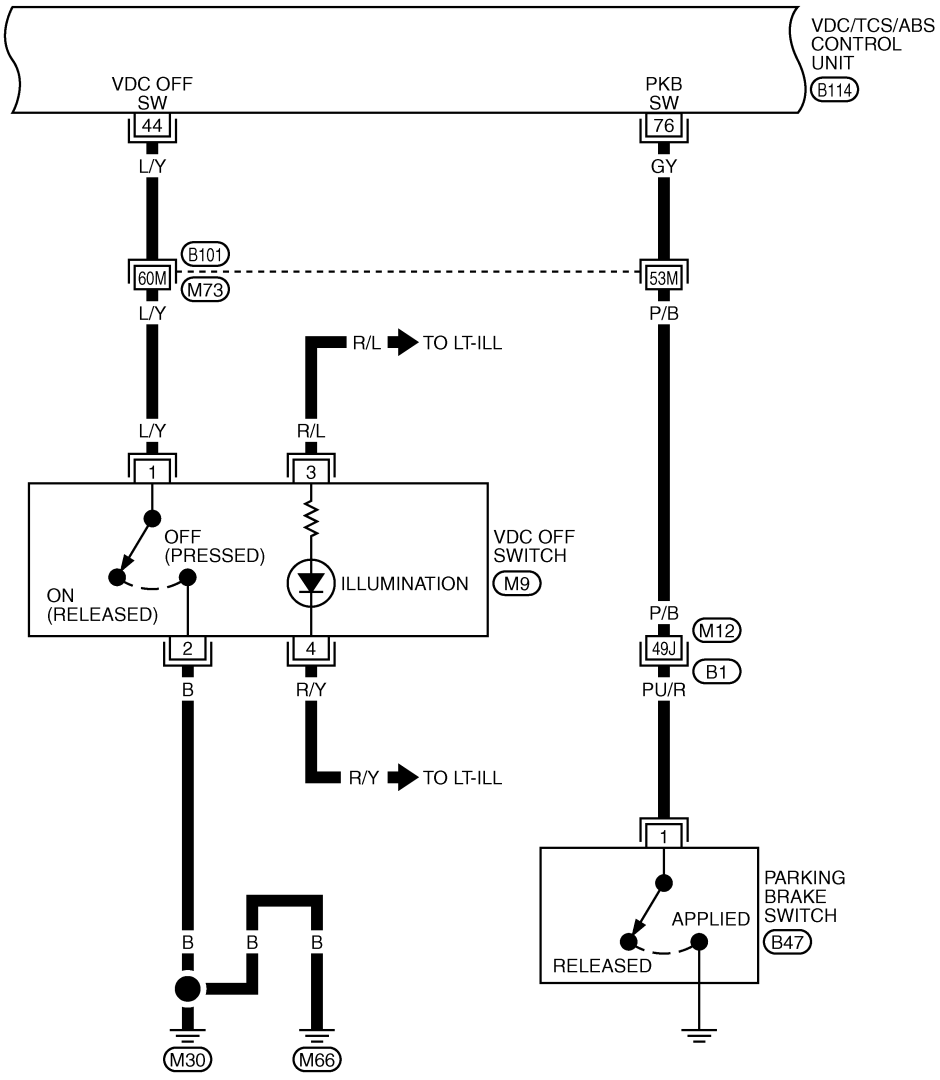


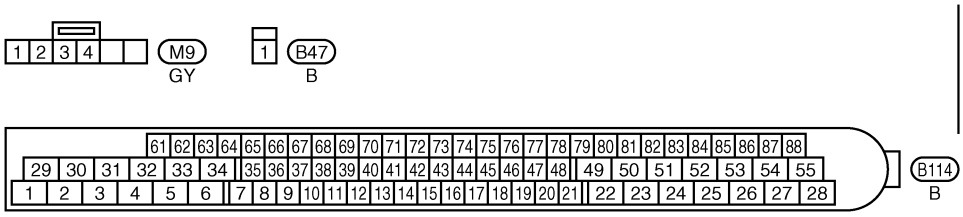


REFER TO THE FOLLOWING.
E108 , B101 -SUPER MULTIPLE JUNCTION (SMJ)
E101 -FUSE BLOCK-JUNCTION BOX (J/B)

TFWT0368E

BRC-VDC-02

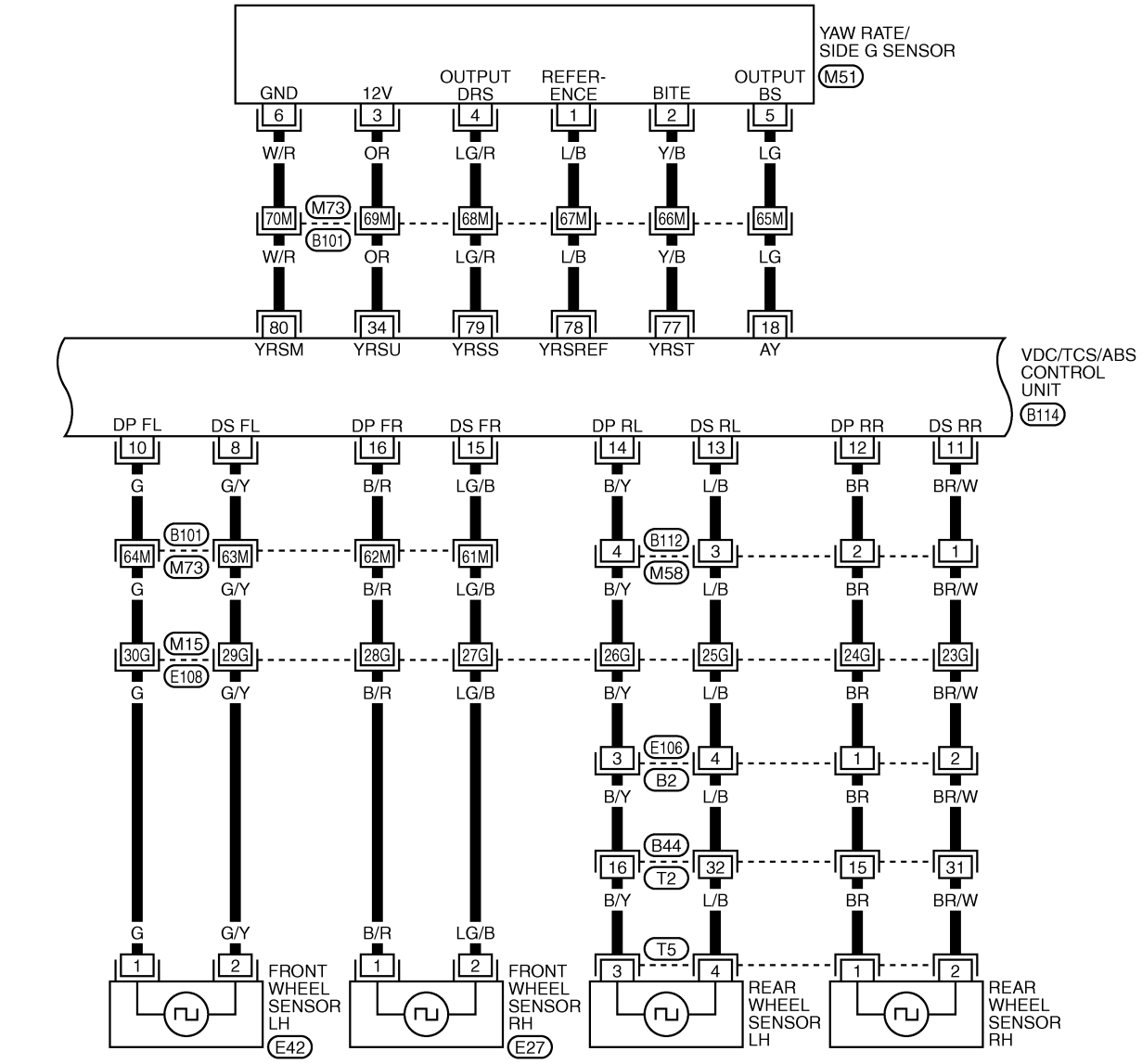


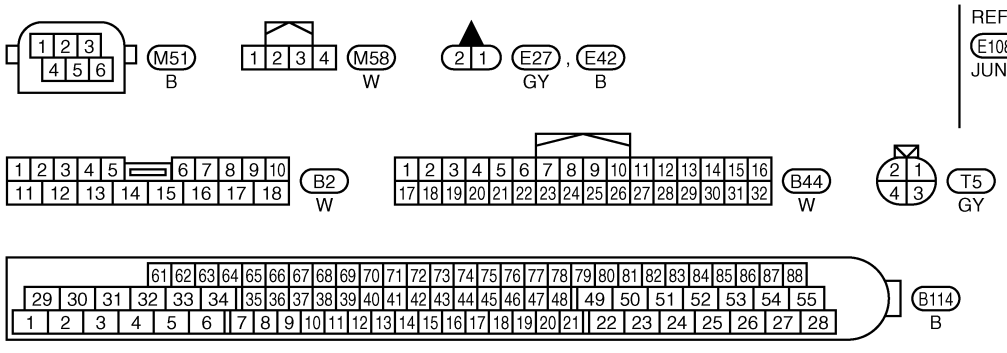


REFER TO THE FOLLOWING.
B1 , B101 -SUPER MULTIPLE JUNCTION (SMJ)

TFWT0369E

BRC-VDC-03

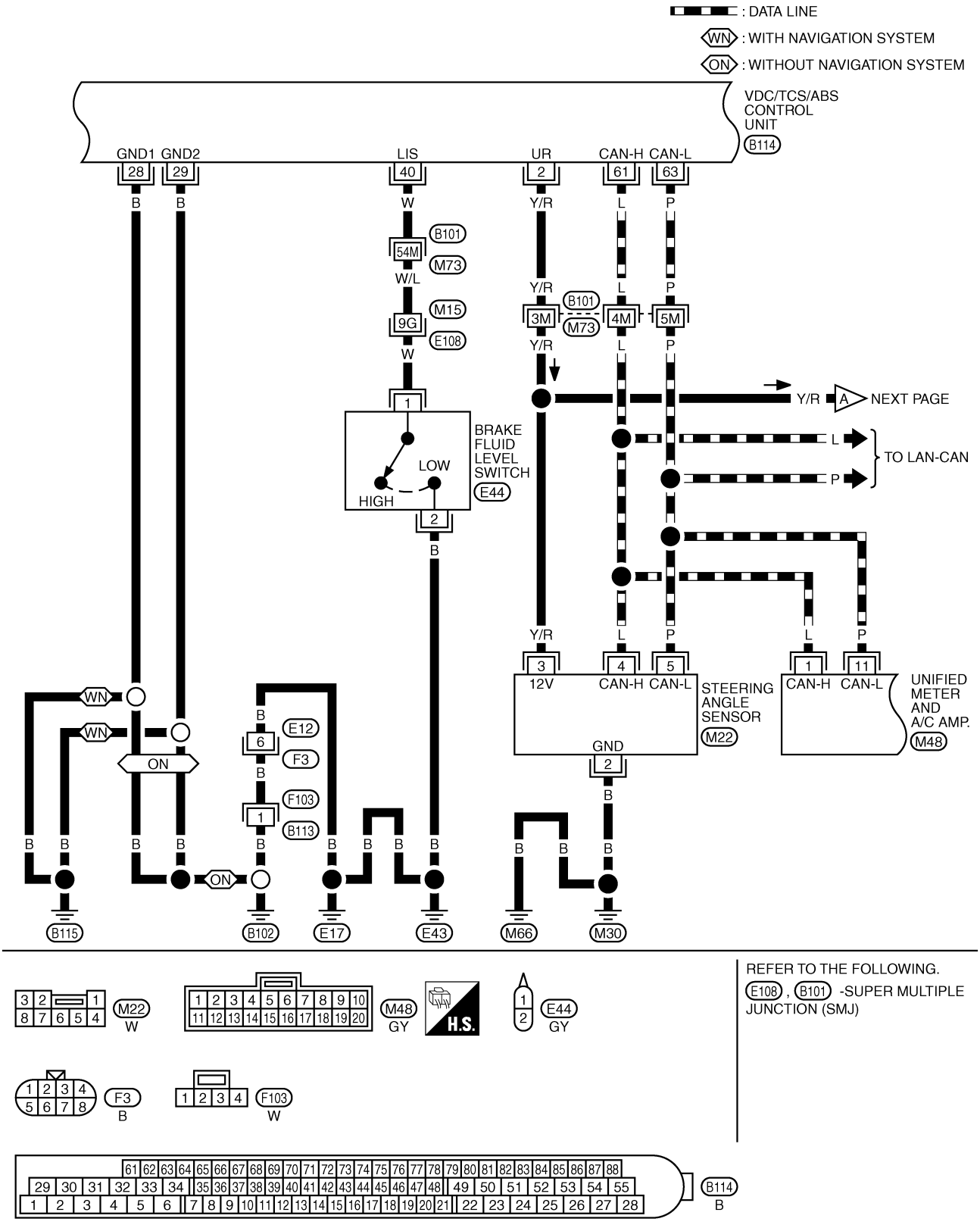




REFER TO THE FOLLOWING.
E108 , B101 -SUPER MULTIPLE JUNCTION (SMJ)

TFWT0370E

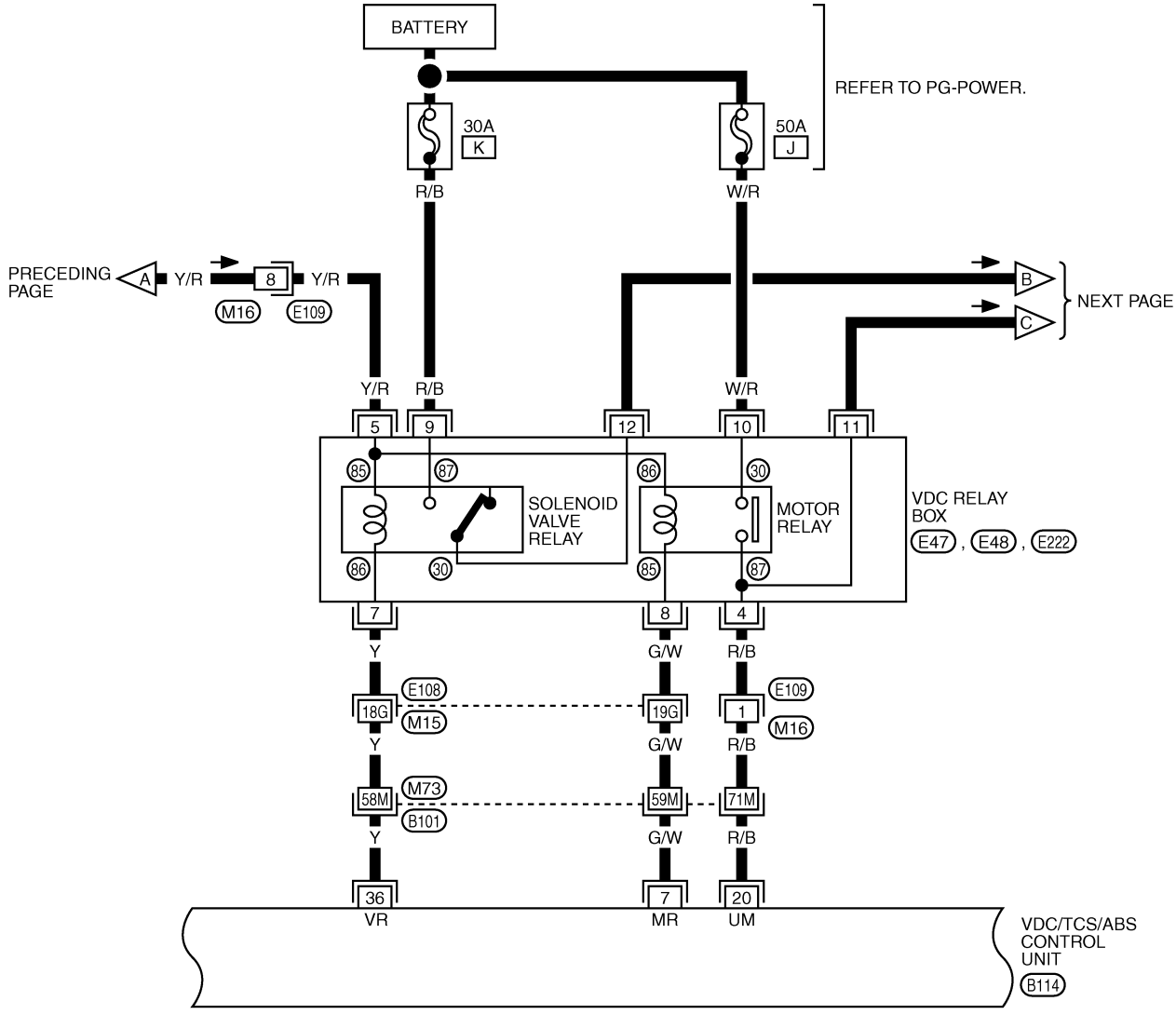
BRC-VDC-04

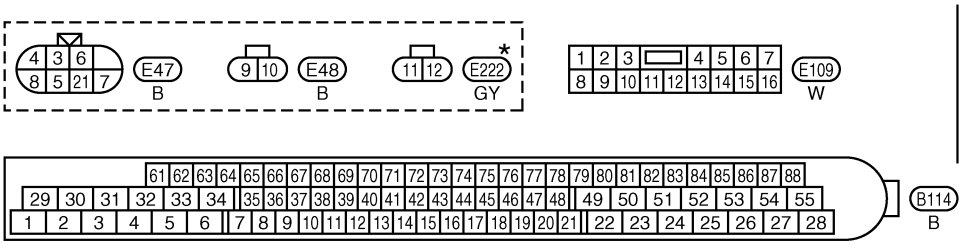


REFER TO THE FOLLOWING.
E108 , B101 -SUPER MULTIPLE JUNCTION (SMJ)

TFWT0371E

BRC-VDC-05



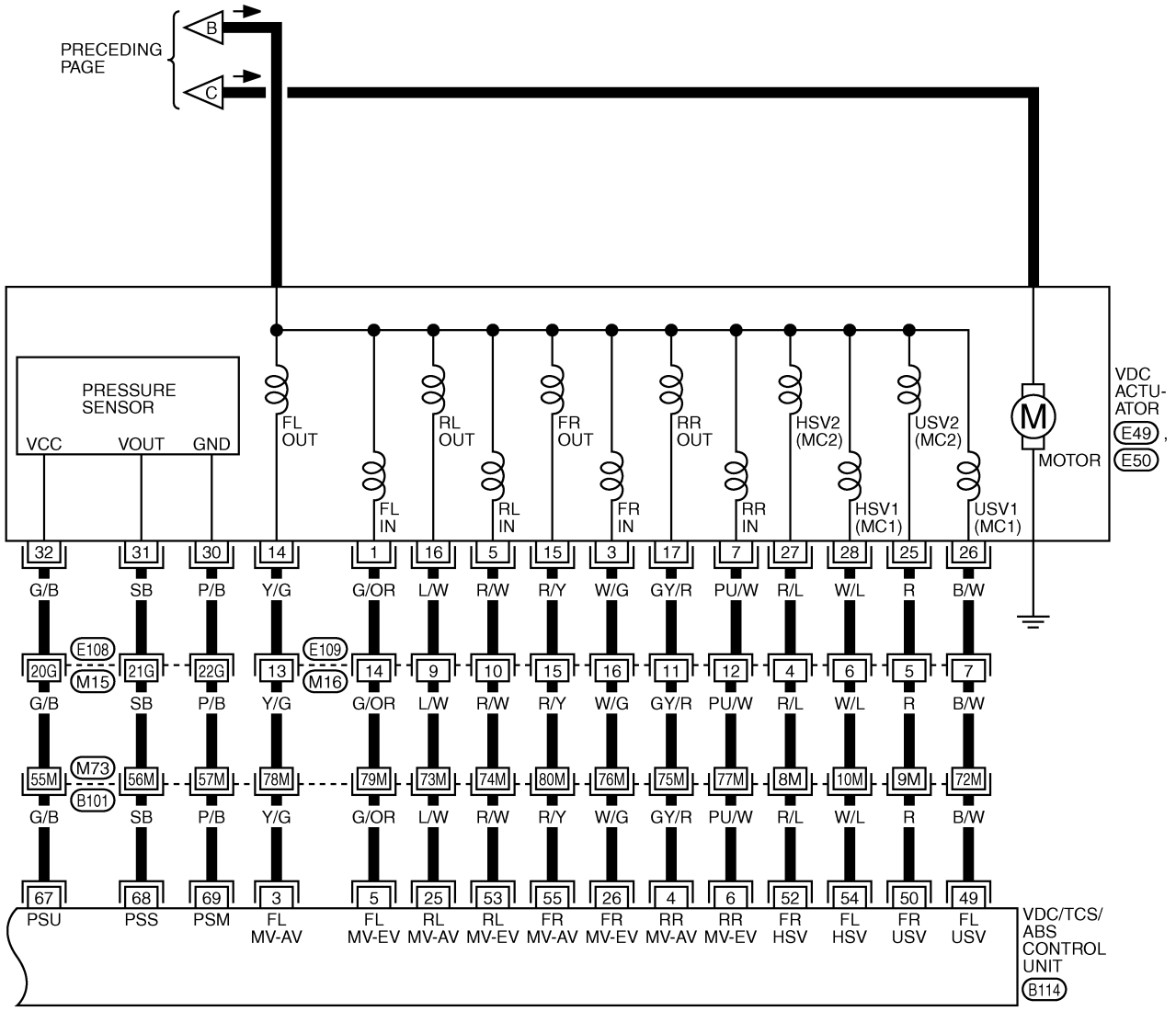


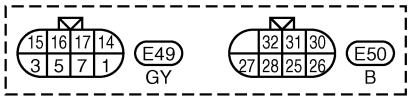
REFER TO THE FOLLOWING.
E108 , B101 -SUPER MULTIPLE JUNCTION (SMJ)

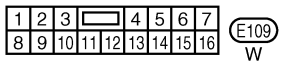
*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TFWT0372E

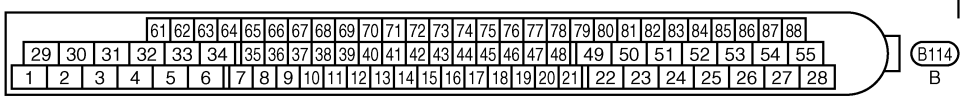
BRC-VDC-06





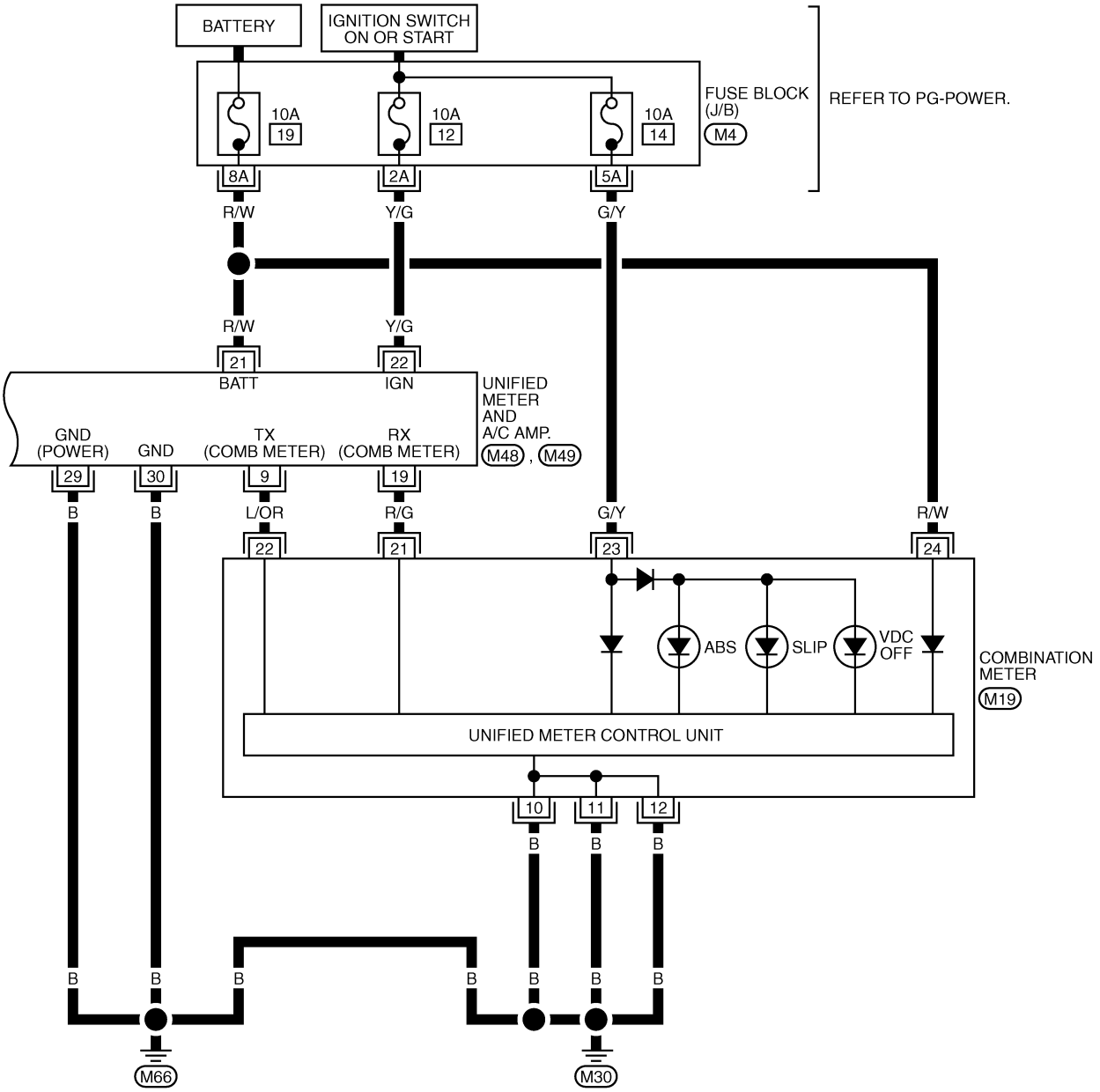


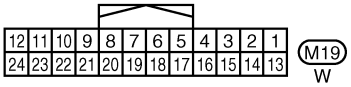
REFER TO THE FOLLOWING.
E108 , B101 -SUPER MULTIPLE JUNCTION (SMJ)

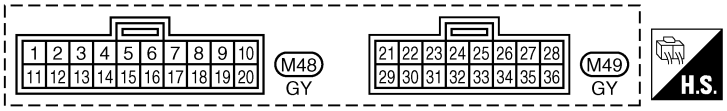


TFWT0373E

BRC-VDC-07







REFER TO THE FOLLOWING.
M4 -FUSE BLOCK-JUNCTION BOX (J/B)

TFWT0303E

Control Unit Input/Output Signal Standard

NFS00049

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		Reference: Inspection item
		Condition	Reference values for normal operation	
WHEEL SENSOR	Vehicle speed calculated using signals from all four wheel sensors	Vehicle stopped	0 km/h (0 MPH)	BRC-129, "Wheel Sensor System"
		While driving (Note 1)	Nearly matches the speedometer display (±10% or less)	
IN ABS S/V OUT ABS S/V	Operation status of all solenoids	When the actuator solenoid operates or during a fail-safe	ON	BRC-137, "Solenoid and VDC Change-Over Valve System"
		When the actuator relay operates and the actuator solenoid does not operate	OFF	
STOP LAMP SW	Brake pedal operation	Brake pedal depressed	ON	BRC-143, "Stop Lamp Switch System"
		Brake pedal not depressed	OFF	
MOTOR RELAY	Motor and motor relay operation status	When the motor relay and motor are operating	ON	BRC-140, "ABS Motor and Motor Relay System"
		When the motor relay and motor are not operating	OFF	
ACTUATOR RLY	Actuator relay operation status	When the actuator relay is operating	OFF	BRC-142, "Actuator Relay System"
		When the actuator relay is not operating	ON	
ABS WARN LAMP	ABS warning lamp on condition (Note 2)	ABS warning lamp ON	ON	BRC-128, "ABS WARNING LAMP, VDC OFF INDICATOR LAMP, SLIP INDICATOR LAMP INSPECTION"
		ABS warning lamp OFF	OFF	
OFF LAMP	VDC OFF indicator lamp on condition (Note 3)	When the VDC OFF indicator lamp on	ON	BRC-128, "ABS WARNING LAMP, VDC OFF INDICATOR LAMP, SLIP INDICATOR LAMP INSPECTION"
		When the VDC OFF indicator lamp off	OFF	
OFF SW	VDC OFF switch ON-OFF status	VDC OFF switch ON (When the VDC OFF indicator lamp on)	ON	BRC-147, "VDC OFF SWITCH"
		When VDC OFF switch OFF (When the VDC OFF indicator lamp off)	OFF	
SLIP LAMP	SLIP indicator lamp on condition (Note 4)	When SLIP indicator lamp is ON	ON	BRC-128, "ABS WARNING LAMP, VDC OFF INDICATOR LAMP, SLIP INDICATOR LAMP INSPECTION"
		When SLIP indicator lamp is OFF	OFF	
BATTERY VOLT	Battery voltage supplied to VDC/TCS/ABS control unit	Ignition switch ON	10 - 16V	BRC-144, "VDC/TCS/ABS Control Unit Power and Ground Systems"
GEAR	Determined gear shift position from the A/T PNP switch signal	Always	1 (M/T vehicles normally remain at 1)	—

Monitor item	Display Content	Data monitor		Reference: Inspection item
		Condition	Reference values for normal operation	
POSITION	Shift position determined by the A/T PNP switch signal	Always	## (M/T vehicles normally remain at ##)	—
YAW RATE SEN	Yaw rate detected by yaw rate sensor	Vehicle stopped	Approx. 0 d/s	BRC-135, "Yaw Rate/ Side G Sensor System"
		While driving	-70 - 70d/s	
ACCEL POS SIG	Throttle open/close status (linked to the accelerator pedal)	Do not step on the accelerator pedal (When ignition switch is on)	0%	Communication system between VDC/TCS/ABS control unit and ECM
		Step on the Brake pedal (When ignition switch is on)	0 to 100%	
SIDE G-SENSOR	Side G detected by side G sensor	Vehicle stopped	Approx. 0 m/s^2	BRC-135, "Yaw Rate/ Side G Sensor System"
		While driving	-24.3 - 24.1 m/s^2	
ST ANGLE SIG	Steering angle detected by steering angle sensor	Straight-ahead condition	Approx. 0 deg.	BRC-134, "Steering Angle Sensor System"
		Steering wheel turned	-720 - 720 deg.	
PRESS SENSOR	Brake fluid pressure detected by pressure sensor	Do not step on the Brake pedal (When ignition switch is on)	Approx. 0 bar	BRC-132, "Pressure Sensor System"
		Step on the accelerator pedal (When ignition switch is on)	-40 - 300 bar	
ENGINE RPM	Engine running	With engine stopped	0rpm	Engine speed signal system
		Engine running	Almost in accordance with tachometer display	
SNOW MODE SW	Snow mode switch ON/OFF condition	Snow mode switch ON	ON	—
		Snow mode switch OFF	OFF	
CONTROL BOOSTER	Boost control status	When control booster is operating	ON	—
		When control booster is not operating	OFF	
M MODE	A/T manual mode status	Always	OFF (M/T vehicles normally remain OFF)	—
OD OFF SW	A/T OD switch status	Always	OFF (M/T vehicles normally remain OFF)	—
PARK BRAKE SW	Parking brake status	Parking brake depressed	ON	Parking brake switch and system
		Parking brake not depressed	OFF	
USV HSV	VDC switch-over valve status	During actuator change-over valve operation or during a fail-safe	ON	BRC-137, "Solenoid and VDC Change-Over Valve System"
		When the actuator relay operates and the actuator change-over valve does not operate	OFF	—
V/R POWER	Actuator relay activated (ON/OFF)	When actuator relay is active (engine is running).	ON	BRC-142, "Actuator Relay System"
		When actuator relay is not active (before engine starts and in fail-safe mode).	OFF	

Monitor item	Display Content	Data monitor		Reference: Inspection item
		Condition	Reference values for normal operation	
M/R OUTPUT	Actuator motor and motor relay status (ON/OFF)	When actuator motor and motor relay are active (“ACTIVE TEST” with CONSULT-II).	ON	BRC-140, "ABS Motor and Motor Relay System"
		When the actuator motor and motor relay are not operating	OFF	
FLUID LEV SW	Brake fluid level sensor ON/OFF status	When brake fluid level sensor is on	ON	BRC-146, "Brake Fluid Level Switch System"
		When the brake fluid level sensor is off	OFF	
FAIL SIGNAL	Fail signal status	During VDC fail-safe During TCS fail-safe During ABS fail-safe During EBD fail-safe	ON	VDC system TCS system ABS system EBD system

Note 1: Confirm tire pressure is normal.
Note 2: ON/OFF timing of ABS warning lamp
ON: Approximately 1 sec. After turning on the ignition switch or when an error is detected.
OFF: Approximately 1 sec. After the ignition switch is turned on (when system is normal).
Note 3: ON/OFF timing of VDC OFF indicator lamp
ON: Approximately 1 sec. After the ignition switch is turned on, an error is detected, or the VDC OFF switch is on
OFF: Approximately 1 sec. After the ignition switch is turned on (when system is normal) and the VDC OFF switch is off
Note 4: ON/OFF timing of SLIP indicator lamp
ON: Approximately 1 sec. After turning on the ignition switch or when an error is detected.
OFF: Approximately 1 sec. After the ignition switch is turned on (when system is normal) and the VDC/TCS function is not operating
Flashing: VDC/TCS function is active during driving

CONSULT-II Functions (ABS)

NFS0004A

CONSULT-II MAIN FUNCTION

CONSULT-II can display each diagnostic item using the diagnostic test modes shown following.

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-93, "Adjustment of Steering Angle Sensor Neutral Position"
SELF-DIAG RESULTS	Self-diagnostic results can be read and erased quickly.	BRC-119, "Self-Diagnosis"
DATA MONITOR	Input/Output data in the VDC/TCS/ABS control unit can be read.	BRC-121, "Data Monitor"
CAN DIAG SUPPORT MNTR	The results of transmit/receive diagnosis of communication can be read.	LAN-45, "CAN Diagnostic Support Monitor"
ACTIVE TEST	Diagnostic Test Mode in which CONSULT-II drives some actuators apart from the VDC/TCS/ABS control unit and also shifts some parameters in a specified range.	BRC-124, "Active Test"
FUNCTION TEST	Conducted by CONSULT-II instead of a technician to determine whether each system is “OK” or “NG”.	—
ECU PART NUMBER	VDC/TCS/ABS control unit part number can be read.	—

CONSULT-II SETTING PROCEDURE

Refer to GI-36, "CONSULT-II Start Procedure" .

Self-Diagnosis

NFS000HK

DESCRIPTION

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

OPERATION PROCEDURE

1. Perform “CONSULT-II Start Procedure”. Refer to GI-36, "CONSULT-II Start Procedure" .
2. Start the engine and drive at approximately 30 km/h (19 MPH) or more for approximately 1 minute.
3. After stopping the vehicle, with the engine running, touch “SELF-DIAG RESULTS”.
4. 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 the ABS warning lamp, VDC OFF indicator lamp, and SLIP indicator lamp.
5. Conduct the appropriate inspection from the display item list, and repair or replace the malfunctioning component.
6. Start the 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, the ABS warning lamp will not turn off even if everything is normal.**

ERASE MEMORY

1. Turn ignition switch OFF.
2. Start the engine and select “SELF-DIAG RESULTS”.
3. Touch “ERASE MEMORY” on the CONSULT-II screen to erase the error memory.

   CAUTION:
   If the error memory is not erased, perform applicably diagnosis.
4. Perform self-diagnosis again, and make sure that diagnostic memory is erased.
5. Drive vehicle at 30 km/h (19MPH) or more for approximately 1 minute as the final inspection, and make sure that the ABS warning lamp, VDC OFF indicator lamp and SLIP indicator lamp turn off.

   NOTE:
   VDC OFF switch should not stay “ON” position.

DISPLAY ITEM LIST

Display item	Malfunction detecting condition	Check item
RR RH SENSOR -1	When the circuit in the rear RH wheel sensor is open.	BRC-129, "Wheel Sensor System" (Note 1)
RR LH SENSOR - 1	When the circuit in the rear LH wheel sensor is open.	
FR RH SENSOR - 1	When the circuit in the front RH wheel sensor is open.	
FR LH SENSOR - 1	When the circuit in the front LH wheel sensor is open.	
RR RH SENSOR -2	When the circuit in the rear RH wheel sensor is short-circuited. Or when the sensor power voltage is outside the standard. When the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
RR LH SENSOR - 2	When the circuit in the rear LH wheel sensor is short-circuited. Or when the sensor power voltage is outside the standard. When the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
FR RH SENSOR -2	When the circuit in the front RH wheel sensor is short-circuited. Or when the sensor power voltage is outside the standard. When the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
FR LH SENSOR - 2	When the circuit in the front LH wheel sensor is short-circuited. Or when the sensor power voltage is outside the standard. When the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
MAIN RELAY	When the control unit detects an error in the actuator relay system.	BRC-142, "Actuator Relay System"

Display item	Malfunction detecting condition	Check item
STOP LAMP SW	When a stop lamp switch open-circuit is detected.	BRC-143, "Stop Lamp Switch System"
PRESS SEN CIRCUIT	Pressure sensor open-circuit. When a short-circuit is detected. Or, when a pressure sensor error is detected.	BRC-132, "Pressure Sensor System"
ST ANG SEN CIRCUIT	When the steering angle sensor neutral point has deviated. Or, when a steering angle sensor error is detected.	BRC-134, "Steering Angle Sensor System"
YAW RATE SENSOR	When a yaw rate sensor error is detected. Or, when the yaw rate sensor circuit is open. When a short-circuit is detected.	BRC-135, "Yaw Rate/ Side G Sensor System"
FR LH IN ABS SOL	When the VDC/TCS/ABS control unit detects an error in the front left inlet solenoid system.	BRC-137, "Solenoid and VDC Change-Over Valve System"
FR LH OUT ABS SOL	When the VDC/TCS/ABS control unit detects an error in the front left outlet solenoid system.	
FR RH IN ABS SOL	When the VDC/TCS/ABS control unit detects an error in the front right inlet solenoid system.	
FR RH OUT ABS SOL	When the VDC/TCS/ABS control unit detects an error in the front right outlet solenoid system.	
RR LH IN ABS SOL	When the VDC/TCS/ABS control unit detects an error in the rear left inlet solenoid system.	
RR LH OUT ABS SOL	When the VDC/TCS/ABS control unit detects an error in the rear left outlet solenoid system.	
RR RH IN ABS SOL	When the VDC/TCS/ABS control unit detects an error in the rear left inlet solenoid system.	
RR RH OUT ABS SOL	When the VDC/TCS/ABS control unit detects an error in the rear right outlet solenoid system.	
USV LINE [FL-RR]	When the primary side VDC change-over valve 1 circuit is open or short-circuit.	BRC-137, "Solenoid and VDC Change-Over Valve System"
USV LINE [FR-RL]	When the secondary side VDC change-over valve 1 circuit is open or short-circuit.	
HSV LINE [FL-RR]	When the primary side VDC change-over valve 2 circuit is open or short-circuit.	
HSV LINE [FR-RL]	When the secondary side VDC change-over valve 2 circuit is open or short-circuit.	
PUMP MOTOR	When the control unit detects an error in the motor or motor relay.	BRC-140, "ABS Motor and Motor Relay System"
BATTERY VOLTAGE [ABNORMAL]	When the VDC/TCS/ABS power voltage is lower than normal.	BRC-144, "VDC/TCS/ ABS Control Unit Power and Ground Systems"
ST ANG SEN SIGNAL	Neutral position correction of steering angle sensor is not finished.	BRC-93, "Adjustment of Steering Angle Sensor Neutral Position"
ST ANG SEN COM CIR	CAN communication line or steering angle sensor has generated an error.	BRC-146, "CAN Communication System"
SIDE G - SEN CIRCUIT	When there is an error in the side G sensor. Or, when the side G sensor circuit is open or short-circuited.	BRC-135, "Yaw Rate/ Side G Sensor System"
EMERGENCY BRAKE	When the VDC/TCS/ABS control unit is malfunctioning (excessive pressure increase or insufficient pressure increase).	BRC-145, "VDC/TCS/ ABS Control Unit 2"
CONTROLLER FAILURE	When there is an internal error in the VDC/TCS/ABS control unit.	BRC-131, "VDC/TCS/ ABS Control Unit 1"
BR FLUID LEVEL LOW	The brake fluid level has dropped. Or, when there is a short to ground in the circuit between the VDC/TCS/ABS control unit and the fluid level sensor.	BRC-146, "Brake Fluid Level Switch System"

Display item	Malfunction detecting condition	Check item
ENGINE SIGNAL 1	Major engine components malfunctioning.	BRC-131, "Engine System"
ENGINE SIGNAL 2		
ENGINE SIGNAL 3		
ENGINE SIGNAL 4		
ENGINE SIGNAL 5		
ENGINE SIGNAL 6		
CAN COMM CIRCUIT	When VDC/TCS/ABS control unit is not transmitting or receiving CAN communication signal for 2 seconds or more.	BRC-146, "CAN Communication System" (Note 2)

Note 1: After completing repairs of the shorted sensor circuit, when ignition switch is turned ON, ABS warning lamp turns on. Check that ABS warning lamp turns off while driving the 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 the wheels, check the wheel sensor circuit and also check the control unit power voltage.
Note 2: When errors are detected in several systems, including the CAN communication system [U1000], troubleshoot the CAN communication system.

Data Monitor

NFS000HL

OPERATION PROCEDURE

1. Perform “CONSULT-II Start Procedure”. Refer to GI-36, "CONSULT-II Start Procedure" .
2. Touch “DATA MONITOR”.
3. Select from “SELECT MONITOR ITEM”, screen of data monitor mode is displayed.

DISPLAY ITEM LIST

Item (Unit)	SELECT MONITOR ITEM			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
FR LH SENSOR [km/h (MPH)]	x	x	x	Wheel speed calculated by front LH wheel sensor signal is displayed.
FR RH SENSOR [km/h (MPH)]	x	x	x	Wheel speed calculated by front RH wheel sensor signal is displayed.
RR RH SENSOR [km/h (MPH)]	x	x	x	Wheel speed calculated by Rear RH wheel sensor signal is displayed.
RR LH SENSOR [km/h (MPH)]	x	x	x	Wheel speed calculated by Rear LH wheel sensor signal is displayed.
FR LH IN SOL (ON/OFF)	–	x	x	Front left inlet ABS solenoid valve (ON/OFF) status is displayed.
FR LH OUT SOL (ON/OFF)	–	x	x	Front left outlet ABS solenoid valve (ON/OFF) status is displayed.
RR RH IN SOL (ON/OFF)	–	x	x	Rear right inlet ABS solenoid valve (ON/OFF) status is displayed.
RR RH OUT SOL (ON/OFF)	–	x	x	Rear right outlet ABS solenoid valve (ON/OFF) status is displayed.
FR RH IN SOL (ON/OFF)	–	x	x	Front right inlet ABS solenoid valve (ON/OFF) status is displayed.
FR RH OUT SOL (ON/OFF)	–	x	x	Front right outlet ABS solenoid valve (ON/OFF) status is displayed.
RR LH IN SOL (ON/OFF)	–	x	x	Rear left inlet ABS solenoid valve (ON/OFF) status is displayed.
RR LH OUT SOL (ON/OFF)	–	x	x	Rear left outlet ABS solenoid valve (ON/OFF) status is displayed.
STOP LAMP SW (ON/OFF)	x	x	x	Stop lamp switch (ON/OFF) status is displayed.

Item (Unit)	SELECT MONITOR ITEM			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
MOTOR RELAY (ON/OFF)	–	x	x	ABS motor relay (ON/OFF) condition is displayed.
ACTUATOR REL (ON/OFF)	–	x	x	ABS actuator relay (ON/OFF) status is displayed.
ABS WARN LAMP (ON/OFF)	–	x	x	ABS warning lamp (ON/OFF) status is displayed.
OFF LAMP (ON/OFF)	–	x	x	VDC OFF indicator lamp (ON/OFF) status is displayed.
OFF SW (ON/OFF)	x	x	x	VDC OFF switch (ON/OFF) status is displayed.
SLIP LAMP (ON/OFF)	–	x	x	SLIP indicator lamp (ON/OFF) status is displayed.
BATTERY VOLT (V)	x	x	x	The voltage supplied to the VDC/TCS/ABS control unit is displayed.
GEAR	x	x	x	The gear position determined from the A/T PNP switch signal is displayed.
SLCT LVR POSI (For A/T models)	x	x	x	Shift position determined from the A/T PNP switch signal is displayed.
YAW RATE SEN (d/s)	x	x	x	Yaw rate detected by the yaw rate sensor is displayed.
ACCEL POS SIG (%)	x	–	x	Throttle position status determined from the CAN communication signal is displayed.
SIDE G SENSOR (m/s^2)	x	–	x	Side G detected by the side G sensor is displayed.
STR ANGLE SIG (deg)	x	–	x	Steering angle detected by the steering angle sensor is displayed.
PRESS SENSOR (bar)	x	–	x	Brake hydraulic pressured detected by the pressure sensor is displayed.
ENGINE RPM (rpm)	x	–	x	The engine speed status determined from the CAN communication signal is displayed.
SNOW MODE SW (ON/OFF)	–	–	x	Snow mode switch (ON/OFF) status determined from the CAN communication signal is displayed.
BST OPER SIG (ON/OFF)	–	–	x	Control booster operation signal (ON/OFF) status determined from the CAN communication signal is displayed.
M - MODE SIG (ON/OFF)	–	–	x	M mode (ON/OFF) status determined from the CAN communication signal is displayed.
OD OFF SW (ON/OFF)	–	–	x	OD cancel switch (ON/OFF) status determined from the CAN communication signal is displayed.
EBD SIGNAL (ON/OFF)	–	–	x	EBD operation (ON/OFF) status is displayed.
ABS SIGNAL (ON/OFF)	–	–	x	ABS operation (ON/OFF) status is displayed.
TCS SIGNAL (ON/OFF)	–	–	x	TCS operation (ON/OFF) status is displayed.
VDC SIGNAL (ON/OFF)	–	–	x	VDC operation (ON/OFF) status is displayed.
EBD FAIL SIG (ON/OFF)	–	–	x	EBD fail-safe signal (ON/OFF) status is displayed.

Item (Unit)	SELECT MONITOR ITEM			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
ABS FAIL SIG (ON/OFF)	–	–	x	ABS fail-safe signal (ON/OFF) status is displayed.
TCS FAIL SIG (ON/OFF)	–	–	x	TCS fail-safe signal (ON/OFF) status is displayed.
VDC FAIL SIG (ON/OFF)	–	–	x	The VDC fail-safe signal (ON/OFF) status is displayed.
CRANKING SIG (ON/OFF)	–	–	x	Ignition switch START position signal input status is displayed.
ASCD SIGNAL (ON/OFF)	–	–	x	ASCD (ON/OFF) status is displayed.
FLUID LEV (ON/OFF)	x	–	x	Brake fluid level sensor (ON/OFF) status is displayed.
PARKING BRAKE SW (ON/OFF)	x	–	x	Parking brake switch (ON/OFF) status is displayed.
USV FL-RR (ON/OFF)	–	–	x	Primary side USV solenoid valve (ON/OFF) status is displayed.
USV FR-RL (ON/OFF)	–	–	x	Secondary side USV solenoid valve (ON/OFF) status is displayed.
HSV FL-RR (ON/OFF)	–	–	x	Primary side HSV solenoid valve (ON/OFF) status is displayed.
HSV FR-RL (ON/OFF)	–	–	x	Secondary side HSV solenoid valve (ON/OFF) status is displayed.
V/R OUTPUT (ON/OFF)	–	–	x	Valve relay operation signal (ON/OFF) status is displayed.
M/R OUTPUT (ON/OFF)	–	–	x	Monitor relay operation signal (ON/OFF) status is displayed.

×: Applicable
–: Not applicable

Active Test

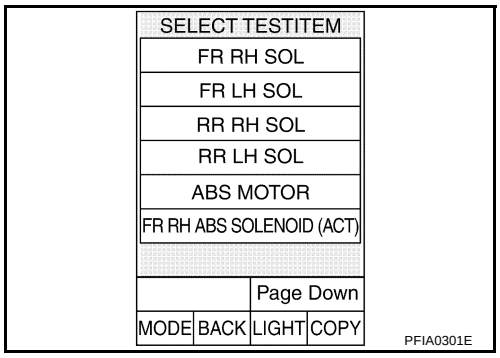
NFS000IP

CAUTION:

- **Do not perform active test while driving.**
- **Make sure to completely bleed air from the brake system.**
- **The ABS and brake warning lamps turn on during the active test.**

OPERATION PROCEDURE

1. Perform “CONSULT-II Start Procedure”. Refer to GI-36, "CONSULT-II Start Procedure" .
2. Touch “ACTIVE TEST”.
3. The test item selection screen is displayed.
4. Touch necessary test item.



5. With the “MAIN ITEM” display shown in reverse, touch “START”.
6. The “ACTIVE TEST” screen will be displayed, so conduct the following test.

NOTE:

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

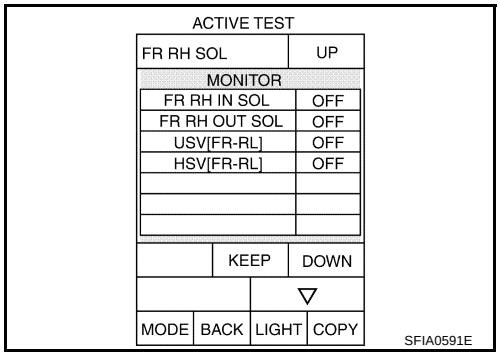
TEST ITEM

Solenoid valve

CAUTION:

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

- When conducting an active test of the ABS function, select the main item for each test item. In addition, when conducting an active test of the VDC/TCS function, select the item menu for each test item.
- For the ABS solenoid valve, touch “UP”, “KEEP”, “DOWN” on the display screen.
  For the ABS solenoid valve (ACT), touch “UP”, “ACT UP”, “ACT KEEP” and confirm that the solenoid valves (in, out, USV, HSV) operate as shown in the table below.



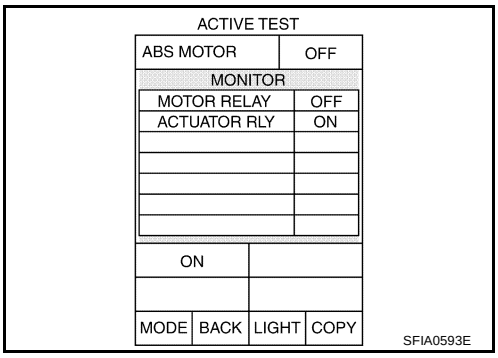
Operation	ABS solenoid valve			ABS solenoid valve (ACT)		
	UP	KEEP	DOWN	UP	ACT UP	ACT KEEP
FR RH IN SOL	OFF	ON	ON	OFF	OFF	OFF
FR RH OUT SOL	OFF	OFF	ON*	OFF	OFF	OFF
USV [FR - RL]	OFF	OFF	OFF	OFF	ON	ON
HSV [FR - RR]	OFF	OFF	OFF	OFF	ON*	OFF

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

ABS Motor

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

Operation	ON	OFF
MOTOR RELAY	ON	OFF
ACTUATOR RLY	ON	ON



Correct and Quick Diagnosis

NFS0004B

DIAGNOSIS PRECAUTIONS

- Before performing the trouble diagnosis, always read the general information (GI) to confirm the general precautions. Refer to GI-3, "General Precautions" .
- When replacing steering angle sensor, steering system components or suspension system components, and when adjusting the alignment, be sure to adjust the steering angle sensor neutral position before driving. Refer to BRC-93, "Adjustment of Steering Angle Sensor Neutral Position" .
- After completing service, always erase the self-diagnosis results. Refer to BRC-119, "ERASE MEMORY" .
- When inspection of the continuity or voltage between units is performed, check connector terminals for disconnection, looseness, bend, or collapse. If any non-standard condition is detected, repair or replace applicable part.
- Intermittent errors may be caused by a poor connection in the 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 the check, be careful not to forcibly extend any connector terminal.
- VDC/TCS/ABS is a system that uses electronic control to perform brake control and engine power control. Therefore, phenomena like those shown in the following table may occur, but this is because the system is working normally.

Symptom	Symptom description	Result
Motor operation noise	The is a motor operation sound inside VDC/TCS/ABS actuator, and sometimes there is a slight sound when VDC, TCS, or ABS operates.	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
TCS operation (SLIP indicator lamp ON)	TCS may be activated any time the vehicle suddenly accelerates, suddenly downshifts, or is driven on a road with a varying surface friction coefficient.	Normal Cancel the VDC/TCS function for the inspection on a chassis dynamometer.
	When inspecting the speedometer, etc., press VDC OFF switch to turn off TCS function before conducting the work.	
	When accelerator pedal is depressed on a chassis dynamometer (front wheel fixing type), the vehicle speed will not increase. This is normal, because TCS is activated by the stationary front wheels. The warning lamp may also turn on to show “sensor system error” in this case. This is not a malfunction either, because the stationary front wheels are detected. Restart engine, and drive the vehicle at 30 km/h (19 MPH) or higher to check that the warning lamp no longer turns on.	

Symptom	Symptom description	Result
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
Sluggish feel	Depending on road circumstances, the driver may have a sluggish feel. This is normal, because under TCS operation optimum traction has the highest priority (safety first). Sometimes the driver has a slight sluggish feel in response to substantial accelerator pedal operation.	Normal

ABS WARNING LAMP, VDC OFF INDICATOR LAMP, SLIP INDICATOR LAMP AND BRAKE WARNING LAMP ON/OFF TIMING

×: ON —: OFF

Condition	ABS warning lamp	VDC OFF indicator lamp	SLIP indicator lamp	Brake warning lamp (Note 1)	Remarks
Ignition switch OFF.	—	—	—	—	—
Approx. Within 1 seconds after ignition switch is turned ON.	×	×	×	× (Note 1)	—
Approx. 1 seconds after ignition switch ON.	—	—	—	× (Note 1)	Turns OFF 2 seconds after engine starts.
VDC OFF switch is turned ON. (VDC function is OFF.)	—	×	—	—	—
VDC/TCS/ABS error.	×	×	—	—	There is a malfunction in VDC/TCS/ABS control unit, SLIP indicator lamp turns off (when the power supply or ground circuits return an error).
	×	×	×	—	—
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).

Basic Inspection

NFS0004C

BRAKE FLUID AMOUNT, LEAKS, AND BRAKE PADS INSPECTION

1. Check fluid level in the brake reservoir tank. If fluid level is low, refill the brake fluid.
2. Check brake tubes or hoses and around VDC actuator for leaks. If there is leaking or oozing fluid, check the following items.
   - If VDC actuator connection is loose, tighten the piping to the specified torque and re-conduct the leak inspection to make sure there are no leaks.
   - If there is damage to the connection flare nut or VDC actuator screw, replace the damaged part and re-conduct the leak inspection to make sure there are no leaks.
   - When there is fluid leaking or oozing from a part other than VDC actuator connection, if the fluid is just oozing out, use a clean cloth to wipe off the oozing fluid and re-check for leaks. If fluid is still oozing out, replace the damaged part.
   - When there is fluid leaking or oozing at VDC actuator, if the fluid is just oozing out, use a clean cloth to wipe off the oozing fluid and re-check for leaks. If fluid is still oozing out, replace the VDC actuator body.

     CAUTION:
     VDC actuator cannot be disassembled.
3. Check the brake pad degree of wear. Refer to BR-26, "PAD WEAR INSPECTION" in “Front Disc Brake” and BR-39, "PAD WEAR INSPECTION" in “Rear Disc Brake”.

POWER SYSTEM TERMINAL LOOSENESS AND BATTERY INSPECTION

Make sure the battery positive cable, negative cable and ground connection are not loose. In addition, check the battery voltage to make sure it has not dropped.

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

1. Make sure ABS warning lamp, VDC OFF indicator lamp (when VDC OFF switch is OFF), and SLIP indicator lamp turns ON approximately 1 second when the ignition switch is turned ON. If they do not, check the VDC OFF indicator lamp and then VDC OFF switch. Refer to BRC-147, "VDC OFF SWITCH" . Check CAN communications. Refer to “CAN Communication Inspection”. If there are no errors with VDC OFF switch and CAN communication system, check combination meter. Refer to BRC-146, "CAN Communication System" .
2. Make sure lamp turns off approximately 1 second after the ignition switch is turned on. If the lamp does not turn off, conduct self-diagnosis.
3. With the 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 the VDC OFF switch system. Refer to BRC-147, "VDC OFF SWITCH" .
4. Make sure ABS warning lamp, VDC OFF indicator lamp, and SLIP indicator lamp turn off 2 seconds after the engine is started. If ABS warning lamp, VDC OFF indicator lamp, and SLIP indicator lamp have not turned off 10 seconds after the engine has been started, conduct self-diagnosis of the VDC/TCS/ABS control unit.
5. After conducting the self-diagnosis, be sure to erase the error memory. Refer to BRC-119, "ERASE MEMORY"

TROUBLE DIAGNOSIS FOR SYSTEM

PFP:00000

Wheel Sensor System

NFS0004D

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

CAUTION:

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

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

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

Is the above displayed in the self-diagnosis display items?

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

2. CHECK TIRE

Check air pressure, wear, and size.

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

YES >> GO TO 3.
NO >> Adjust air pressure, or replace tire.

3. CHECK SENSOR AND SENSOR ROTOR

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

OK or NG

OK >> GO TO 4.
NG >> Repair wheel sensor mount or replace the sensor rotor.

4. CHECK CONNECTOR

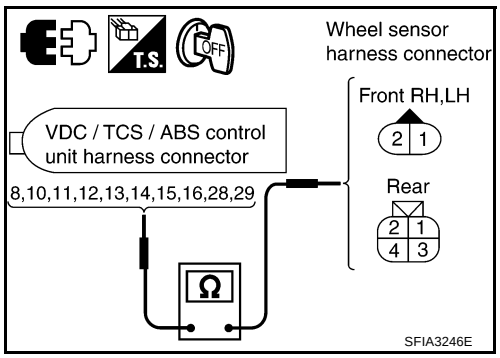
1. Disconnect VDC/TCS/ABS control unit connector and malfunctioning wheel sensor connector E42 (FR - LH) or E27 (FR - RH) or T5 (RR - RH, LH). Check the terminal to see if it is deformed, disconnected, loose, etc., and replace it if any non-standard condition is found.
2. Reconnect connectors, drive at a speed of approximately 30 km/h (19 MPH) or more for approximately 1minute, and then perform self-diagnosis.

Is the result of self-diagnosis normal?

YES >> The connector terminal contact is loose, damaged, open or shorted.
NO >> GO TO 5.

5. CHECK WHEEL SENSOR HARNESS

1. Turn ignition switch OFF and disconnect wheel sensor connector E42 (FR - LH), E27 (FR - RH), T5 (RR - RH, LH) and VDC/TCS/ABS control unit connector E118 (Type 1) / B114 (Type 2).
2. Check continuity between terminals. (Also check the continuity when the steering wheel is turned right and left and when the sensor harness inside the wheel well is moved.)



	Power system		Signal system		Ground system	
Wheel	VDC/TCS/ABS control unit	Wheel sensor	VDC/TCS/ABS control unit	Wheel sensor	VDC/TCS/ABS control unit (signal)	VDC/TCS/ABS control unit (ground)
Front RH	16	1	15	2	16, 15	28, 29
Front LH	10	1	8	2	10, 8	
Rear RH	12	1	11	2	12, 11	
Rear LH	14	3	13	4	14, 13	

Power system : Continuity should exist.
Signal system : Continuity should exist.
Ground system : Continuity should not exist.

OK or NG

OK >> GO TO 6.
NG >> Repair or replace harness and connector that have malfunction.

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.

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

Is above displayed on self-diagnosis display?

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

Engine System

NFS0004E

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
ENGINE SIGNAL 1
ENGINE SIGNAL 2
ENGINE SIGNAL 3
ENGINE SIGNAL 4
ENGINE SIGNAL 5
ENGINE SIGNAL 6

Is the above displayed in the self-diagnosis display items?

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

2. CHECK ENGINE SYSTEM

1. Conduct an ECM self-diagnosis and repair or replace any non-standard items. Re-conduct the ECM self-diagnosis.
2. Re-conduct VDC/TCS/ABS control unit self-diagnosis.

OK or NG

OK >> INSPECTION END
NG >> Repair or replace any non-standard items. Re-conduct the self-diagnosis.

VDC/TCS/ABS Control Unit 1

NFS0004F

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
CONTROLLER FAILURE

Is the above displayed in the self-diagnosis display items?

YES >> Replace VDC/TCS/ABS control unit. Re-conduct the self-diagnosis.
NO >> INSPECTION END

Pressure Sensor System

NFS0004G

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
PRESS SEN CIRCUIT

Is the above displayed in the self-diagnosis display items?

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

2. CHECK STOP LAMP SWITCH CONNECTOR

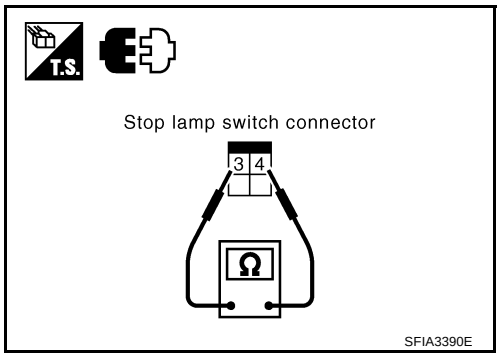
1. Disconnect stop lamp switch connector and VDC/TCS/ABS control unit connector and check the terminals for deformation, disconnection, looseness, and so on. If there is an error, repair or replace the terminal.
2. Securely reconnect the connectors.
3. Start engine.
4. Repeat pumping brake pedal carefully several times, then perform self-diagnosis again.

Is the result of self-diagnosis normal?

YES >> The connector terminal contact is loose, damaged, open or shorted.
NO >> GO TO 3.

3. CHECK STOP LAMP SWITCH

1. Turn ignition switch OFF and disconnect stop lamp switch connector E111.
2. Disconnect stop lamp switch connector
3. Check continuity between stop lamp switch connector terminal 3 and 4.



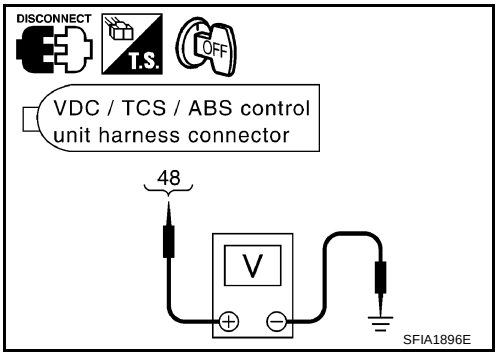
Stop lamp switch	Condition	Continuity
3 – 4	Release stop lamp switch (When brake pedal is depressed.)	Yes
	Push stop lamp switch (When brake pedal is released.)	No

OK or NG

OK >> GO TO 4.
NG >> Replace stop lamp switch. Refer to BR-8, "Components" .

4. CHECK STOP LAMP SWITCH CIRCUIT

1. Turn ignition switch OFF and disconnect VDC/TCS/ABS control unit connector E118 (Type 1) / B114 (Type 2).
2. Check voltage between VDC/TCS/ABS control unit connector E118 (Type 1) / B114 (Type 2) terminal 48 and ground.



VDC/TCS/ABS control unit	Ground	Measurement condition	Voltage
48	—	Brake pedal depressed.	Battery voltage (Approx. 12 V)
		Brake pedal not depressed.	Approx. 0 V

OK or NG

OK >> GO TO 5.
NG >> Open or short in harness. Repair or replace the harness.

5. CHECK PRESSURE SENSOR CONNECTOR

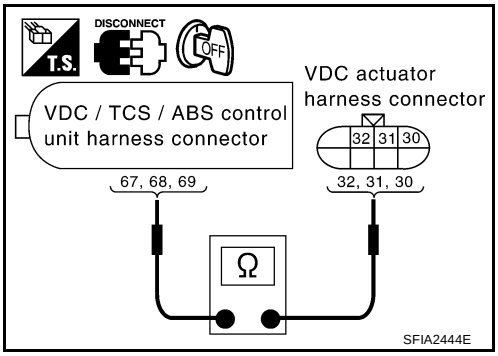
1. Disconnect VDC actuator connector E50 and VDC/TCS/ABS control unit connector, check terminals for deformation, disconnection, looseness, and so on. If there is an error, repair or replace the terminal.
2. Reconnect the connectors and then perform self-diagnosis.

Is the result of self-diagnosis normal?

YES >> The connector terminal contact is loose, damaged, open or shorted.
NO >> GO TO 6.

6. CHECK PRESSURE SENSOR HARNESS

1. Turn ignition switch OFF and disconnect VDC actuator connector E50 and VDC/TCS/ABS control unit connector E118 (Type 1) / B114 (Type 2).
2. Check continuity between VDC/TCS/ABS control unit connector and VDC actuator connector.



VDC/TCS/ABS control unit	VDC actuator	Continuity
69	30	Yes
68	31	
67	32	

OK or NG

OK >> GO TO 7.
NG >> If the open or short in harness, repair or replace the harness.

7. CHECK PRESSURE SENSOR

1. Connect VDC actuator and VDC/TCS/ABS control unit connectors.
2. Conduct “DATA MONITOR” of the “PRESS SENSOR” to check if the status is normal.

Condition	Data monitor display
When brake pedal is depressed.	– 40 – 300 bar
When brake pedal is released.	Approx. 0 bar

OK or NG

OK >> INSPECTION END
NG >> If the pressure sensor is damaged or malfunctioning, replace the VDC actuator (pressure sensor it built in).

Steering Angle Sensor System

NFS0004H

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
ST ANG SEN CIRCUIT

Is the above displayed in the self-diagnosis item?

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

2. CHECK CONNECTOR

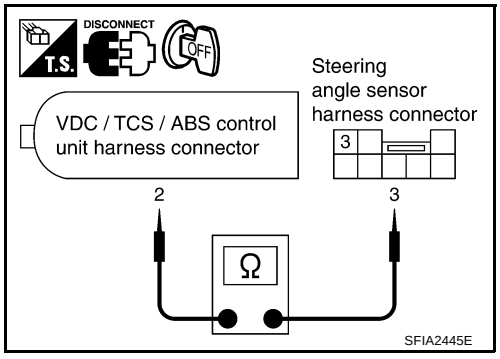
1. Disconnect steering angle sensor connector and VDC/TCS/ABS control unit connector and check terminals for deformation, disconnection, looseness, and so on. If there is an error, repair or replace the terminal.
2. Reconnect the connectors and then preform self-diagnosis.

Is the result of self-diagnosis normal?

YES >> The connector terminal contact is loose, damaged, open or shorted.
NO >> GO TO 3.

3. CHECK STEERING ANGLE SENSOR HARNESS

1. Check CAN communication system. Refer to BRC-146, "CAN Communication System" .
2. Turn ignition switch OFF and disconnect steering angle sensor connector M22 and VDC/TCS/ABS control unit connector E118 (Type 1) / B114 (Type 2).
3. Check continuity between VDC/TCS/ABS control unit connector terminal 2 and steering angle sensor connector terminal 3.



VDC/TCS/ABS control unit	Steering angle sensor	Continuity
2	3	Yes

OK or NG

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

4. CHECK DATA MONITOR

1. Connect steering angle sensor and VDC/TCS/ABS control unit connectors.
2. Conduct “DATA MONITOR” of the “STR ANGLE SIG” to check if the status is normal.

Steering condition	Data monitor
Straight-ahead	- 5 deg – + 5 deg
Turn wheel to the right by 90 °	Approx. + 90 deg
Turn wheel to the left by 90 °	Approx. - 90 deg

OK or NG

OK >> Re-conduct VDC/TCS/ABS control unit self-diagnosis.
NG >> Replace spiral cable (steering angle sensor) and adjust neutral position of steering angle sensor. Refer to BRC-93, "Adjustment of Steering Angle Sensor Neutral Position" .

Yaw Rate/Side G Sensor System

NFS0004I

CAUTION:
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 problem. However this is not a problem if normal operation can be resumed after restarting the engine.

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
YAW RATE SENSOR
SIDE G-SENSOR

CAUTION:
When on a turntable, such as at a parking structure entrance, or when on a moving object with the engine running, the VDC OFF indicator lamp might turn on and the self-diagnosis using the CONSULT-II the yaw rate sensor system might be displayed, but in this case there is no problem with the yaw rate sensor system. As soon as the vehicle leaves the turntable or moving object, restart the engine to return the system to normal.

Is the above displayed in the self-diagnosis display items?

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

2. CHECK CONNECTOR

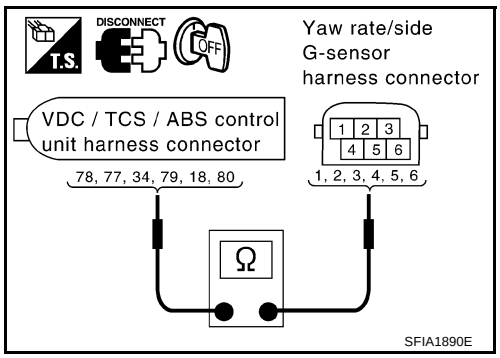
1. Disconnect yaw rate/side G sensor connector and VDC/TCS/ABS control unit connector and check the terminals for deformation, disconnection, looseness, and so on. If there is an error, repair or replace the terminal.
2. Reconnect the connectors and then preform self-diagnosis.

Is the result of self-diagnosis normal?

YES >> The connector terminal contact is loose, damaged, open or shorted.
NO >> GO TO 3.

3. CHECK YAW RATE/SIDE G SENSOR HARNESS

1. Turn ignition switch OFF and disconnect yaw rate/side G sensor connector M51 and VDC/TCS/ABS control unit connector E118 (Type 1) / B114 (Type 2).
2. Check continuity between VDC/TCS/ABS control unit vehicle side connector and yaw rate/side G sensor vehicle side connector.



VDC/TCS/ABS control unit	Yaw rate/side G sensor	Continuity
18	5	Yes
34	3	
77	2	
78	1	
79	4	
80	6	

OK or NG

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

4. CHECK YAW RATE SENSOR/SIDE G SENSOR

1. Connect yaw rate sensor/side G sensor and VDC/TCS/ABS control unit connectors.
2. Use “DATA MONITOR” to check if the yaw rate sensor/side G sensor are normal.

Vehicle status	Yaw rate sensor (Data monitor standard)	Side G sensor (Data monitor standard)
When stopped	- 4 to + 4 deg/s	- 1.1 to + 1.1 m/s^2
Right turn	Negative value	Negative value
Left turn	Positive value	Positive value

OK or NG

OK >> INSPECTION END
NG >> Replace the malfunctioning yaw rate sensor/side G sensor, and then re-conduct the VDC/TCS/ABS control unit self-diagnosis.

Solenoid and VDC Change-Over Valve System

NFS0004J

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
IN ABS SOL
OUT ABS SOL
USV LINE [FL-RR]
USV LINE [FR-RL]
HSV LINE [FL-RR]
HSV LINE [FR-RL]

Is the above displayed in the self-diagnosis display items?

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

2. CHECK CONNECTOR

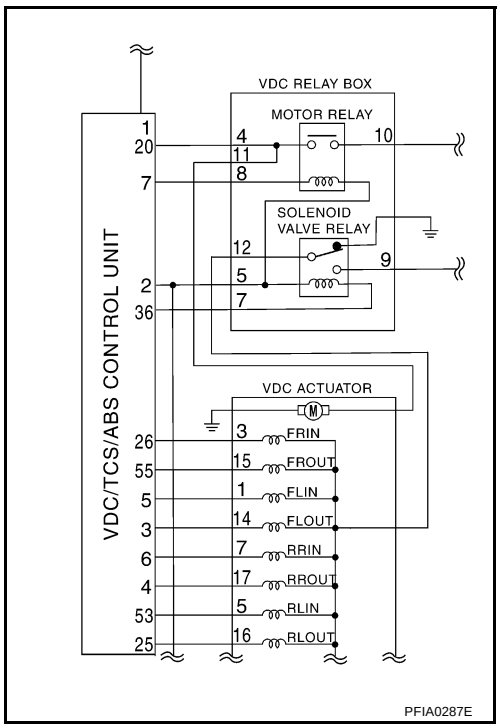
1. Disconnect VDC/TCS/ABS control unit connector and solenoid connector E49, E50 and check the terminals for deformation, disconnection, looseness, and so on. If there is an error, repair or replace the terminal.
2. Securely reconnect the connectors and then preform self-diagnosis.

Is the result of self-diagnosis normal?

YES >> The connector terminal contact is loose, damaged, open or shorted.
NO >> GO TO 3.

3. CHECK SOLENOID INPUT SIGNAL

1. Turn ignition switch OFF and disconnect VDC/TCS/ABS control unit connector.
2. Check resistance between VDC/TCS/ABS control unit connector and ground.



VDC/TCS/ABS control unit	Ground	Resistance value
26	—	6.0 – 11 Ω
5		
6		
53		
55		3.0 – 5.0 Ω
3		
4		
25		
49		6.0 – 11 Ω
50		
54		3.0 – 5.0 Ω
52		

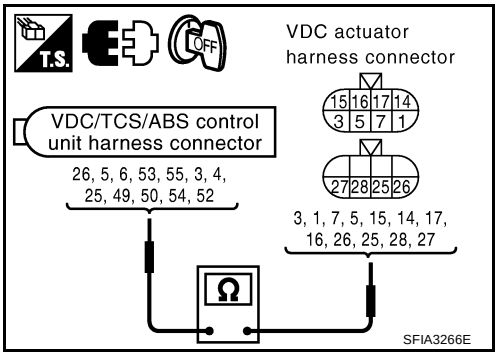
OK or NG

OK >> Check the VDC/TCS/ABS control unit power system. Refer to BRC-144, "VDC/TCS/ABS Control Unit Power and Ground Systems" .

NG >> GO TO 4.

4. CHECK SOLENOID HARNESS

1. Disconnect VDC actuator connector.
2. Check continuity between VDC/TCS/ABS control unit connector E118 (Type 1) / B114 (Type 2) and VDC actuator connector E49.



VDC/TCS/ABS control unit	VDC actuator	Continuity
26	3	Yes
5	1	
6	7	
53	5	
55	15	
3	14	
4	17	
25	16	
49	26	
50	25	
54	28	
52	27	

OK or NG

OK >> Replace VDC/TCS/ABS actuator assembly.
NG >> Open or short in harness. Repair or replace the harness.

ABS Motor and Motor Relay System

NFS0004K

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
PUMP MOTOR

Is the above displayed in the self-diagnosis display items?

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

2. CHECK CONNECTOR

1. Disconnect relay box connector E47, E48, E222 and VDC/TCS/ABS control unit connector and check the terminals for deformation, disconnection, looseness, and so on. If there is an error, repair or replace the terminal.
2. Securely reconnect the connectors and then preform self-diagnosis.

Is the result of self-diagnosis normal?

YES >> The connector terminal contact is loose, damaged, open or shorted.
NO >> GO TO 3.

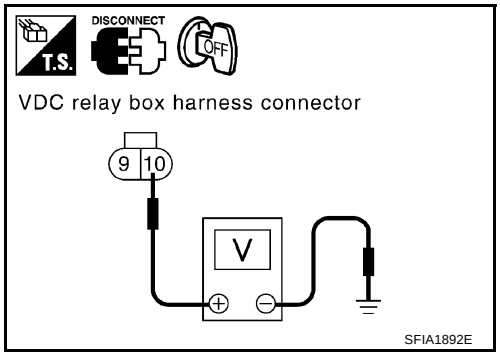
3. CHECK ABS MOTOR AND MOTOR RELAY POWER SYSTEM

1. Disconnect VDC relay box connectors E48.
2. Check voltage between VDC relay box connector and ground.

VDC relay box	Ground	Voltage
10	—	Battery voltage (Approx. 12 V)

OK or NG

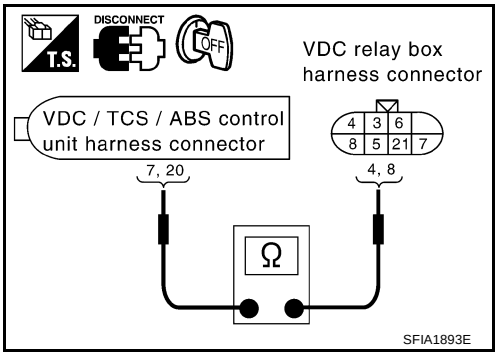
OK >> GO TO 4.
NG >> The circuit between battery and VDC relay box terminal 10 is open or shorted. Repair the circuit.



4. CHECK ABS MOTOR AND MOTOR RELAY HARNESS

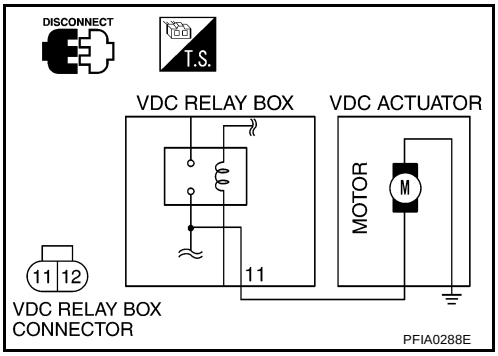
1. Turn ignition switch OFF and disconnect VDC/TCS/ABS control unit connector E118(Type 1) / B114(Type 2) and VDC relay box connector E47.
2. Check continuity between VDC/TCS/ABS control unit connector and VDC relay box vehicle side connector.

VDC/TCS/ABS control unit	VDC relay box	Continuity
20	4	Yes
7	8	



3. Check if the actuator motor operates when a 12V voltage is applied to the VDC relay box connector E222 terminal 12.

CAUTION:
Operate the actuator motor for 4 seconds or less to prevent heat generation.



OK or NG

OK >> GO TO 5.
NG >> The actuator motor or actuator motor circuit open or short in harness. Repair or replace the actuator motor or actuator motor circuit harness.

5. CHECK ABS MOTOR RELAY

ABS motor relay independent inspection. Refer toBRC-147, "ABS MOTOR RELAY AND ACTUATOR RELAY"
.

OK or NG

OK >> Replace VDC actuator assembly.
NG >> Replace VDC relay box.

Actuator Relay System
NFS0004L

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
MAIN RELAY

Is the above displayed in the self-diagnosis display items?

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

2. CHECK CONNECTOR

1. Disconnect relay box connector E47, E48, E222 and VDC/TCS/ABS control unit connector and check terminals for deformation, disconnection, looseness, and so on. If there is an error, repair or replace the terminal.
2. Securely reconnect the connectors and then preform self-diagnosis.

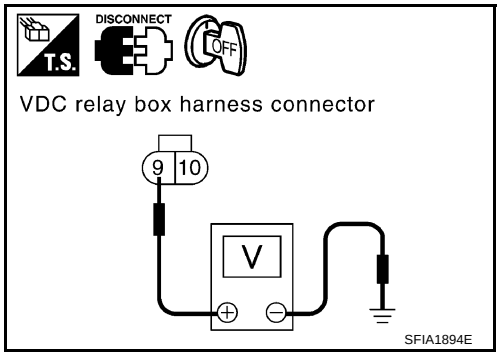
Is the result of self-diagnosis normal?

YES >> The connector terminal contact is loose, damaged, open or shorted.
NO >> GO TO 3.

3. CHECK ACTUATOR RELAY POWER SYSTEM

1. Turn ignition switch OFF and disconnect VDC relay box connector E48.
2. Check voltage between VDC relay box connector and ground.

VDC relay box	Ground	Voltage
9	—	Battery voltage (Approx. 12 V)



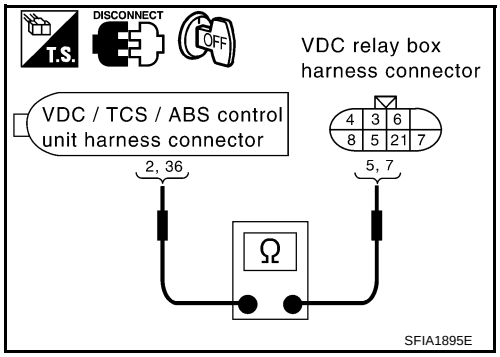
OK or NG

OK >> GO TO 4.
NG >> The circuit between battery and VDC relay box harness connector E48 terminal 9 is open or shorted. Repair the circuit.

4. CHECK ACTUATOR RELAY HARNESS

1. Disconnect VDC/TCS/ABS control unit connector E47.
2. Check continuity between VDC/TCS/ABS control unit connector E118 (Type 1) / B114 (Type 2) and VDC relay box connector E47.

VDC/TCS/ABS control unit	VDC relay box	Continuity
2	5	Yes
36	7	



OK or NG

OK >> GO TO 5.
NG >> Open or short in harness. Repair or replace the harness.

5. CHECK ACTUATOR RELAY

Independently check VDC actuator relay. Refer to BRC-147, "ABS MOTOR RELAY AND ACTUATOR RELAY".

OK or NG

OK >> Replace VDC actuator assembly.
NG >> Replace VDC relay box.

Stop Lamp Switch System

NFS0004M

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
STOP LAMP SW

Is the above displayed in the self-diagnosis display items?

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

2. CHECK CONNECTOR

1. Disconnect stop lamp switch connector and VDC/TCS/ABS control unit connector and check the terminals for deformation, disconnection, looseness, and so on. If there is an error, repair or replace the terminal.
2. Securely reconnect the connectors.
3. Start engine.
4. Repeat pumping brake pedal carefully several times, then perform self-diagnosis again.

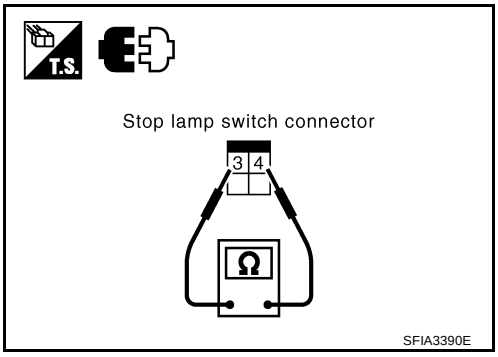
Is the result of self-diagnosis normal?

YES >> The connector terminal contact is loose, damaged, open or shorted.
NO >> GO TO 3.

3. CHECK STOP LAMP SWITCH

1. Turn ignition switch OFF and disconnect stop lamp switch connector E111.
2. Disconnect stop lamp switch connector
3. Check continuity between stop lamp switch connector terminal 3 and 4.

Stop lamp switch	Condition	Continuity
3 – 4	Release stop lamp switch (When brake pedal is depressed.)	Yes
	Push stop lamp switch (When brake pedal is released.)	No

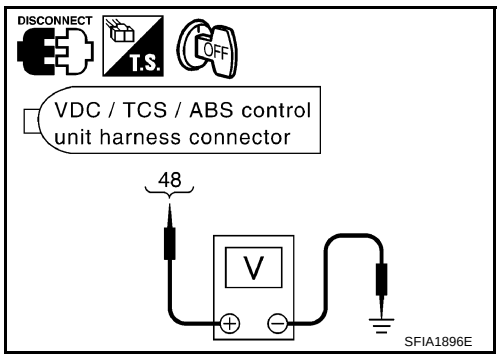


OK or NG

OK >> GO TO 4.
NG >> Replace stop lamp switch. Refer to BR-8, "Components" .

4. CHECK STOP LAMP SWITCH CIRCUIT

1. Turn ignition switch OFF and disconnect VDC/TCS/ABS control unit connector E118 (Type 1) / B114 (Type 2).
2. Check voltage between VDC/TCS/ABS control unit connector E118 (Type 1) / B114 (Type 2) terminal 48 and ground.



VDC/TCS/ABS control unit	Ground	Measurement condition	Voltage
48	—	Brake pedal depressed.	Battery voltage (Approx. 12 V)
		Brake pedal not depressed.	Approx. 0 V

OK or NG

OK >> Connect the connectors and conduct a VDC/TCS/ABS control unit self-diagnosis.
NG >> Open or short in harness. Repair or replace the harness.

VDC/TCS/ABS Control Unit Power and Ground Systems

NFS0004N

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
BATTERY VOLTAGE [ABNORMAL]

Is the above displayed in the self-diagnosis item?

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

2. CHECK CONNECTOR

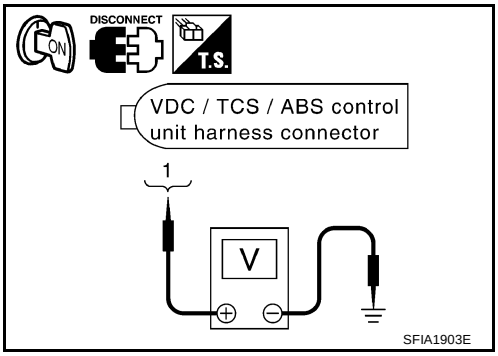
1. Disconnect VDC/TCS/ABS control unit connector and check the terminal for deformation, disconnection, looseness, and so on. If there is an error, repair or replace the terminal.
2. Securely reconnect the connector and then perform self-diagnosis.

Is the result of self-diagnosis normal?

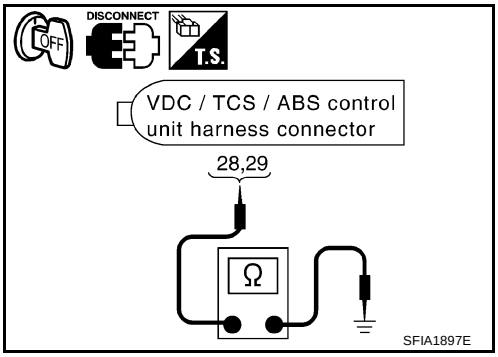
YES >> The connector terminal contact is loose, damaged, open or shorted.
NO >> GO TO 3.

3. CHECK VDC/TCS/ABS CONTROL UNIT POWER AND GROUND CIRCUIT

1. Disconnect VDC/TCS/ABS control unit connector.
2. With the ignition switch turned on and off, check voltage and continuity between VDC/TCS/ABS control unit connector E118 (Type 1) / B114 (Type 2) and ground.



Signal name	VDC/TCS/ABS control unit	Ground	Measured value
Power supply	1	—	Battery voltage (Approx. 12 V)



Signal name	VDC/TCS/ABS control unit	Ground	Continuity
Ground	28	—	Yes
	29		

OK or NG

OK >> Check battery (terminal looseness, low voltage, etc.) For any non-standard condition. If any non-standard condition exists, recharge or replace battery as necessary.

NG >> The corresponding harness circuit is open or shorted. Repair the circuit.

VDC/TCS/ABS Control Unit 2

NFS0004O

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check self-diagnosis results.

Self-diagnosis results
EMERGENCY BRAKE

When any item other than “EMERGENCY BRAKE” is indicated in self-diagnosis display, follow the instructions below.

CAUTION:

“EMERGENCY BRAKE” is indicated when control unit itself is detected as an error. If this display item is indicated, replace control unit.

Is the above displayed in the self-diagnosis display items?

YES >> Replace VDC/TCS/ABS control unit and re-conduct the self-diagnosis.

NO >> INSPECTION END

Brake Fluid Level Switch System

NFS0004P

INSPECTION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

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

Self-diagnosis results
BR FLUID LEVEL LOW

Is the above displayed in the self-diagnosis display items?

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

2. CHECK CONNECTOR

1. Disconnect brake fluid level switch connector and VDC/TCS/ABS control unit connector and check terminal for deformation, disconnection, looseness, and so on. If there is any non-standard condition, repair or replace the terminal.
2. Securely reconnect the connectors and then perform self-diagnosis.

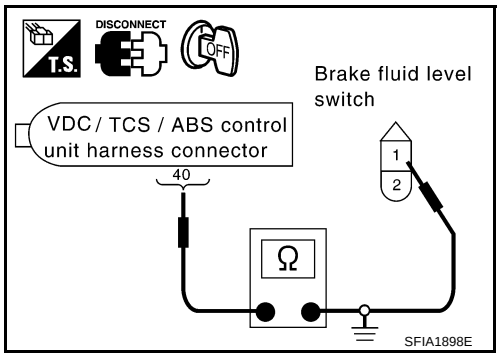
Is the result of self-diagnosis normal?

YES >> The connector terminal contact is loose, damaged, open or shorted.
NO >> GO TO 3.

3. CHECK HARNESS BETWEEN THE BRAKE FLUID LEVEL SWITCH AND THE VDC/TCS/ABS CONTROL UNIT

1. Turn ignition switch OFF and disconnect brake fluid level switch connector, VDC/TCS/ABS control unit, connectors.
2. Check continuity between brake fluid level switch connector E44 and VDC/TCS/ABS control unit connector E118 (Type 1) / B114 (Type 2).

VDC/TCS/ABS control unit	Brake fluid level switch	Continuity
40	1	Yes
	Ground	No
Ground	2	Yes



OK or NG

OK >> Connect connectors and conduct a VDC/TCS/ABS control unit self-diagnosis.
NG >> If the open or short in harness, repair or replace the harness.

CAN Communication System

NFS0004Q

INSPECTION PROCEDURE

1. CHECK CONNECTOR

1. Turn ignition switch OFF, disconnect the VDC/TCS/ABS 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-48, "CAN System Specification Chart" .
NO >> Connector terminal connection is loose, damaged, open, or shorted.

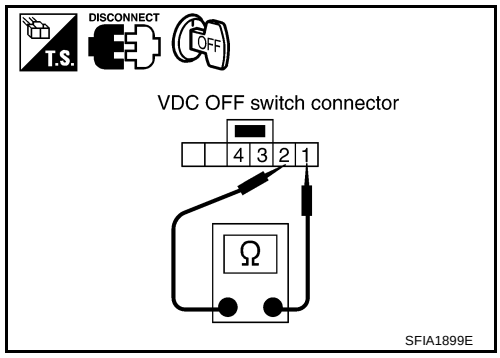
Component Inspection

NFS0004R

VDC OFF SWITCH

- Turn ignition switch OFF, and disconnect the VDC OFF switch connector M9, and check the continuity between terminals 1 and 2.

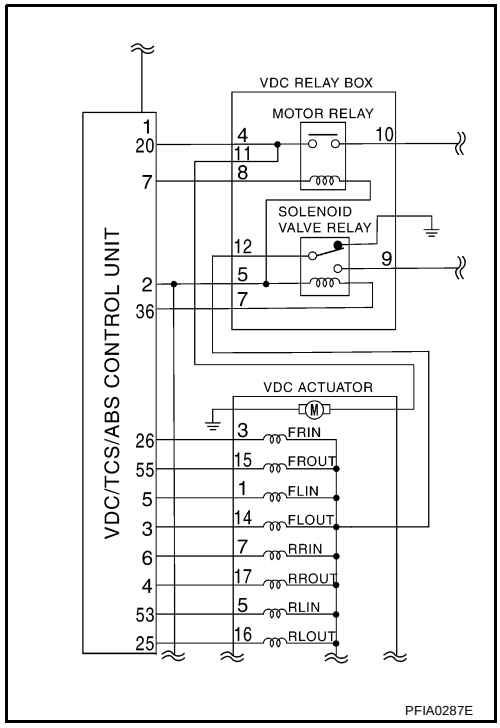
1 - 2 :Continuity should exist when pushing the switch.
continuity should not exist when releasing the switch.



ABS MOTOR RELAY AND ACTUATOR RELAY

- Turn ignition switch OFF and disconnect the VDC relay box connector E47, E48, E222.
- Apply a voltage of 12 V between the ABS motor relay terminal 8 and the actuator relay terminal 7 and then check the continuity between the following terminals.

ABS motor relay	Between terminal 4 to 10	Continuity should exist.
Actuator relay	Between terminal 9 to 12	Continuity should exist.



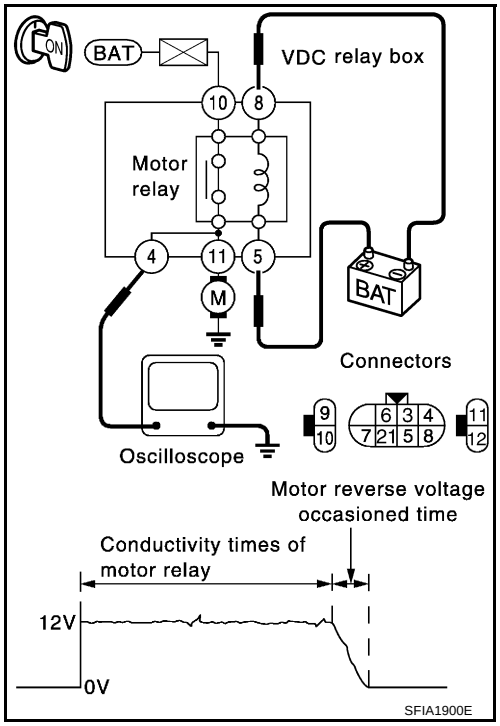
VDC/TCS/ABS ACTUATOR

Actuator Operation Inspection

1. Turn ignition switch ON, apply a voltage of 12 V between the relay box terminal 5 and 8, use an oscilloscope to measure the motor voltage at this time (between terminal 11 and the ground), and check the motor reverse voltage occurrence time when operation is stopped.

Motor counter-electromotive force duration:

0.1 second or more



CAUTION:

- **The above check should be performed after motor relay unit inspection to make sure relay operates normally.**
- **To prevent overheating, do not drive actuator motor more than 4 seconds.**
- **The motor reverse voltage occurrence time is standard when the battery voltage is 12 V and the air temperature is 20°C (68°F), and this time is a little shorter when the battery voltage is low or the air temperature is low.**

TROUBLE DIAGNOSIS FOR SYMPTOMS

PFP:00007

Excessive ABS Function Operation Frequency

NFS0004S

1. CHECK START

Check brake force distribution.

OK or NG

OK >> GO TO 2.
NG >> Check brake system

2. CHECK FRONT AND REAR AXLE

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

OK or NG

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

3. CHECK WHEEL SENSOR

Wheel Sensor Inspection

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

OK or NG

OK >> GO TO 4.
NG >>
- Replace wheel sensor or sensor rotor.
- Repair harness.

4. CHECK ABS WARNING LAMP DISPLAY

Make sure the warning lamp turns off approximately 1 sec. After the ignition switch is turned on or when driving.

OK or NG

OK >> Normal
NG >> Perform self-diagnosis. Refer to BRC-119, "DESCRIPTION" .

Unexpected Pedal Reaction

NFS0004T

1. CHECK BRAKE PEDAL STROKE

Check brake pedal stroke.

Is the stroke too big?

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 FUNCTION

Disconnect the VDC/TCS/ABS control unit connector and make sure the braking force is sufficient when the ABS in not operating. After the inspection, reconnect the connector.

OK or NG

OK >> GO TO 3. CHECK WHEEL SENSOR in BRC-149, "Excessive ABS Function Operation Frequency" .
NG >> Check brake system.

The Braking Distance Is Long

NFS0004U

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

1. CHECK FUNCTION

Disconnect VDC/TCS/ABS control unit connector to deactivate ABS. In this condition, check stopping distance. After inspection, connect connector.

OK or NG

OK >> GO TO 3. CHECK WHEEL SENSOR in BRC-149, "Excessive ABS Function Operation Frequency" .

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

The ABS Function Does Not Operate

NFS0004V

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

1. CHECK ABS WARNING LAMP DISPLAY

Make sure the warning lamp turns off approximately 1 second after the ignition switch is turned on or when driving.

OK or NG

OK >> GO TO 3. CHECK WHEEL SENSOR in BRC-149, "Excessive ABS Function Operation Frequency" .

NG >> Perform self-diagnosis. Refer to BRC-118, "CONSULT-II Functions (ABS)" .

Pedal Vibration or ABS Operation Sound Occurs

NFS0004W

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 [50 mm (1.97 in) or more]**
- **When pulling away just after starting engine (at approximately 10 km/h (6MPH) or higher)**

1. SYMPTOM CHECK 1

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

OK or NG

OK >> GO TO 2.
NG >> Perform self-diagnosis. Refer to BRC-119, "DESCRIPTION" .

2. SYMPTOM CHECK 2

Check symptom when electrical component (headlamps, etc.) Switches are operated.

Does the symptom occur when the electrical component (head lamp, etc.) Switches are operated?

YES >> Check if there is a radio, antenna, antenna lead wire, or wiring close to the control unit (or its wiring), and if there is, move it farther away.
NO >> GO TO 3. CHECK WHEEL SENSOR in BRC-149, "Excessive ABS Function Operation Frequency" .

Vehicle Jerks During VDC/TCS/ABS Control

NFS0004X

1. CHECK ENGINE SPEED SIGNAL

Conduct CONSULT-II VDC/TCS/ABS control unit “Data Monitor”.

Is engine speed at idle 400 rpm or higher?

YES >> GO TO 3.
NO >> GO TO 2.

2. CHECK ECM SELF-DIAGNOSIS RESULT ITEM

Perform ECM self-diagnosis.

Are self-diagnosis items displayed?

YES >> Check the corresponding items. Refer to EC-83, "TROUBLE DIAGNOSIS" in “Engine Control (EC section)”.
NO >> GO TO 3.

3. SYMPTOM CHECK 1

Check if the vehicle jerks during VDC/TCS/ABS control.

OK or NG

OK >> Inspection End
NG >> GO TO 4.

4. CHECK A/T SELF-DIAGNOSIS RESULTS ITEM

Perform A/T self-diagnosis.

OK or NG

OK >> GO TO 5.
NG >> Check the corresponding items. Refer to AT-42, "TROUBLE DIAGNOSIS" in “A/T”.

5. SYMPTOM CHECK 2

Check if the vehicle jerks during VDC/TCS/ABS control.

OK or NG

OK >> Inspection End
NG >> GO TO 6.

6. CHECK SELF-DIAGNOSIS RESULT ITEM 1

Conduct self-diagnosis of the VDC/TCS/ABS control unit.

Are self-diagnosis items displayed?

YES >> Check the corresponding items, make repairs, and re-conduct the VDC/TCS/ABS control unit self-diagnosis.
NO >> GO TO 7.

7. CHECK CONNECTOR

1. Disconnect the VDC/TCS/ABS control unit and the ECM connectors, check the terminals for deformation, disconnection, looseness, and so on. If there is an error, repair or replace the connector.
2. Securely reconnect the connector and conduct self-diagnosis.

OK or NG

OK >> If the connector terminal contact is loose, damaged, open or shorted, repair or replace the connector terminal.
NG >> GO TO 8.

8. CHECK SELF-DIAGNOSIS RESULT ITEM 2

Re-conduct the VDC/TCS/ABS control unit self-diagnosis.

Are self-diagnosis items displayed?

YES >> Repair or replace any non-standard items.
NO >> GO TO 9.

9. CHECK CIRCUIT BETWEEN VDC/TCS/ABS CONTROL UNIT AND THE ECM

Check CAN communication system. Refer to BRC-146, "CAN Communication System" .

OK or NG

OK >> Inspection End
NG >> Connect the connectors, and re-conduct the VDC/TCS/ABS control unit self-diagnosis.

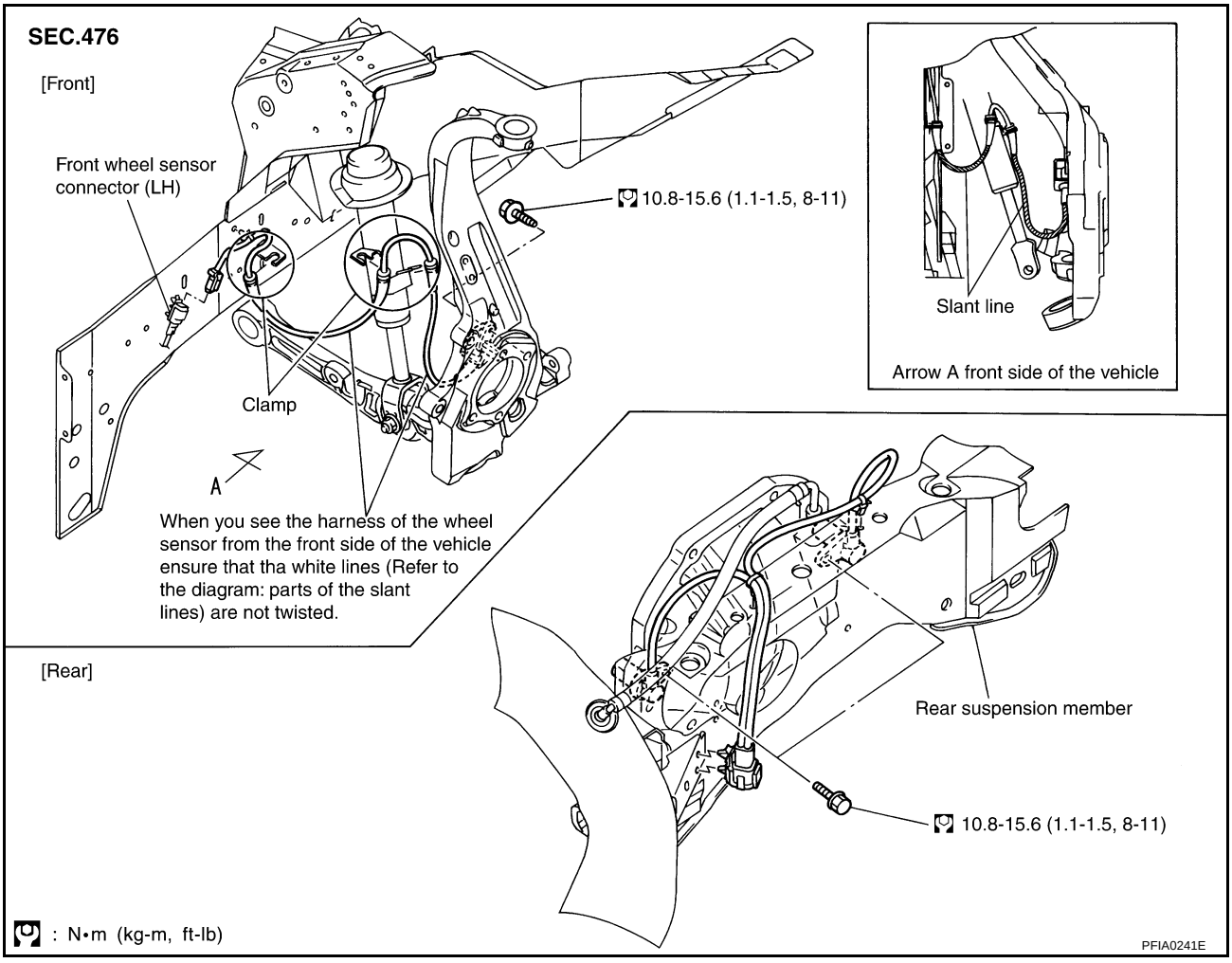
WHEEL SENSORS

PFP:47910

Removal and Installation

NFS0004Y

COMPONENTS



REMOVAL

Pay attention to the following when removing sensor.

CAUTION:

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

INSTALLATION

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

- When installing, check that there is no foreign material such as iron chips on pick-up and mounting hole of the sensor. Check that no foreign material has been caught in the sensor rotor motor. Remove any foreign material and clean the mount.
- When installing front sensor, be sure to press rubber grommets in until they lock at the three locations shown in diagram (2 at shock absorbers and 1 at body panel). When installed, harness must not be twisted. White line on harness (shaded part) must be visible from front.

VDC/TCS/ABS CONTROL UNIT

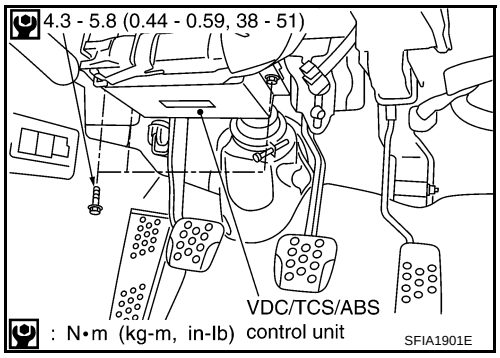
PFP:47660

Removal and Installation (Type 1)

NFS000TN

REMOVAL

1. Remove driver-side lower instrument panel. Refer to IP-10, "INSTRUMENT PANEL ASSEMBLY" .
2. Remove VDC/TCS/ABS control unit.



INSTALLATION

Install in the reverse order of removal.

CAUTION:

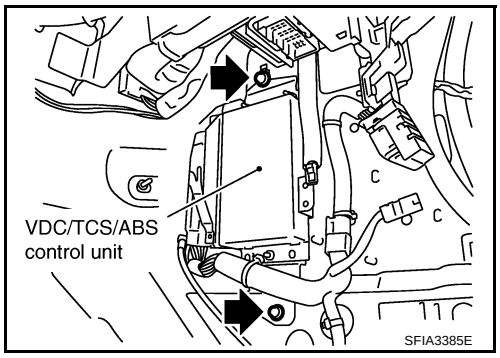
When replacing VDC/TCS/ABS control unit, make sure to adjust neutral position of steering angle sensor. Refer to BRC-93, "Adjustment of Steering Angle Sensor Neutral Position" .

Removal and Installation (Type 2)

NFS0004Z

REMOVAL

1. Remove dash side finisher (RH). Refer to IP-12, "(C) Dash Side Finisher (RH/LH)" .
2. Remove VDC/TCS/ABS control unit bolts.
3. Remove VDC/TCS/ABS control unit.



INSTALLATION

Installation in the reverse order of removal.

- When installing the VDC/TCS/ABS control unit, tighten bolts to the specified torque.

  VDC/TCS/ABS control unit bolts : 8.3 N·m (0.85 kg–m, 73 in–lb)

  CAUTION:

  When replacing VDC/TCS/ABS control unit, make sure to adjust neutral position of steering angle sensor. Refer to BRC-93, "Adjustment of Steering Angle Sensor Neutral Position" .

SENSOR ROTOR

PFP:47970

Removal and Installation

NFS00050

REMOVAL

Front

Sensor rotor cannot be disassembled. To replace sensor rotor, replace hub bearing assembly. Refer to FAX-4, "Removal and Installation" in “Front Axle/Drive Shaft” in “FAX” section.

Rear

- Follow procedure below to remove rear sensor rotor.

– Remove side flange. Refer to RFD-15, "SIDE OIL SEAL" in “Rear Final Drive” in “RFD” section.

– Using a bearing replacer (special service tool) and puller (commercial service tool), remove sensor rotor from the companion flange.

INSTALLATION

Front

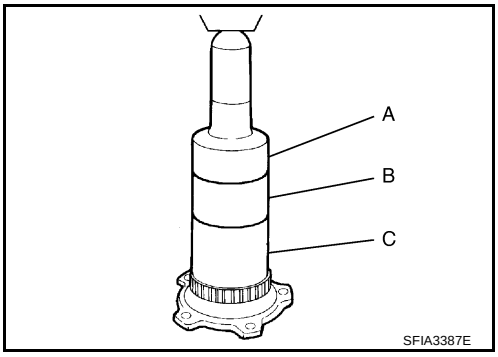
Sensor rotor cannot be disassembled. To replace sensor rotor, replace hub bearing assembly. Refer to FAX-4, "Removal and Installation" in “Front Axle/Drive Shaft” in “FAX” section.

Rear

- Follow procedure below to install rear sensor rotor.

– Using a drift (special service tool), press rear sensor rotor onto the side flange.

Tool number **A: ST30720000 (J-25405)**
B: ST27863000 (—)
C: KV40104710 (—)



– Install side flange. Refer to RFD-15, "SIDE OIL SEAL" in “Rear Final Drive” in “RFD” section.

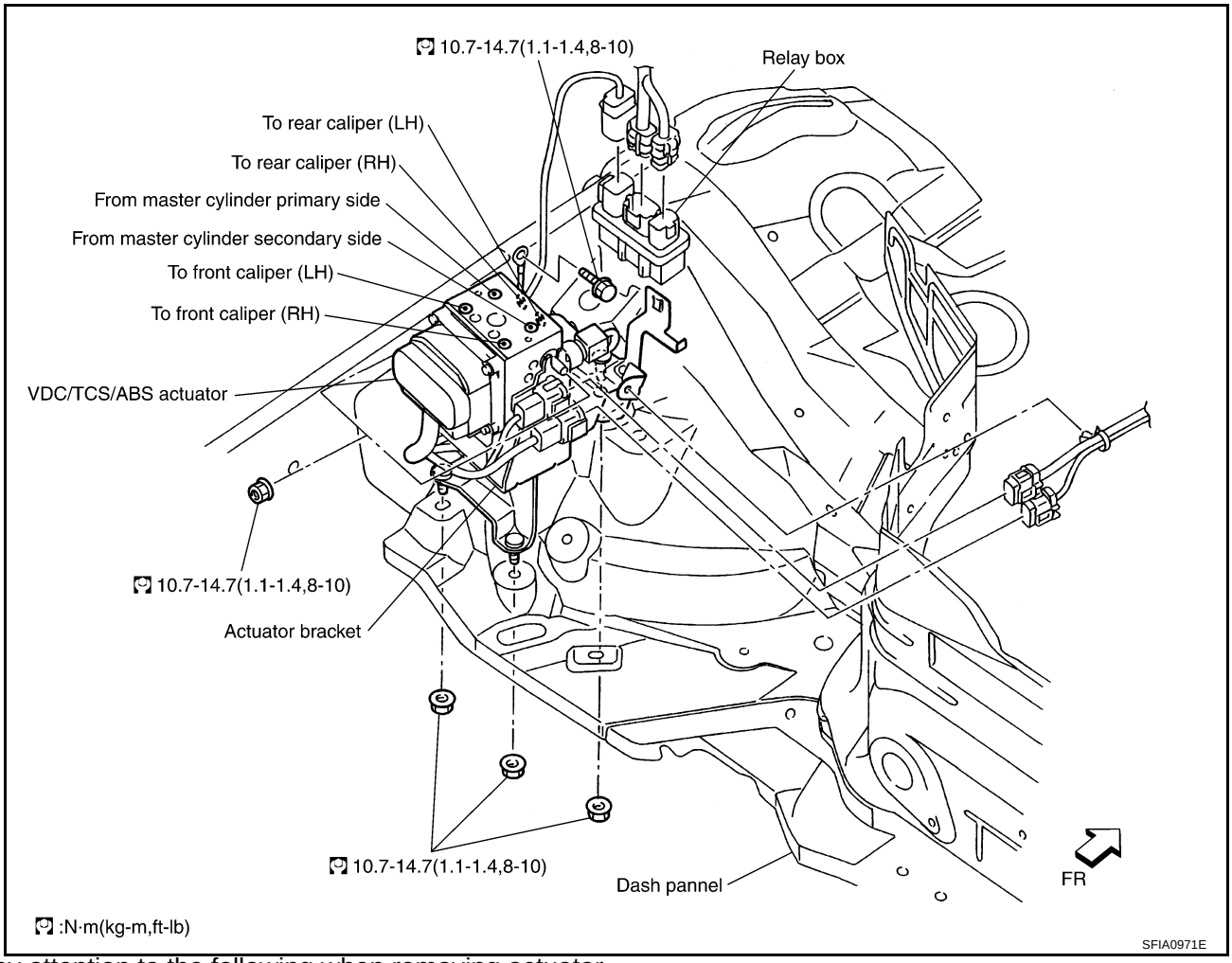
VDC/TCS/ABS ACTUATOR

PFP:47660

Removal and Installation

NFS00051

COMPONENTS



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 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-11, "Bleeding Brake System" .**
- **Be sure to securely connect the ground cable.**

G SENSOR

PFP:47930

Removal and Installation

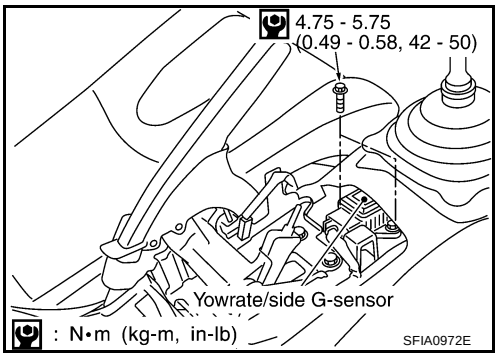
NFS00052

REMOVAL

1. Install center console. Refer to IP-16, "CENTER CONSOLE" .
2. Remove harness connector.
3. Remove installation bolts. Remove yaw rate/side G-sensor.

CAUTION:

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



INSTALLATION

To install, follow procedure for removal in reverse order.

CAUTION:

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

STEERING ANGLE SENSOR

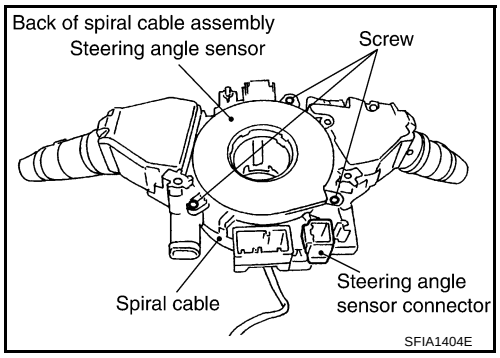
PFP:25554

Removal and Installation

NFS00053

REMOVAL

1. Remove spiral cable assembly. Refer to SRS-48, "SPIRAL CABLE" .
2. Remove steering angle sensor.



INSTALLATION

Install in the reverse order of removal.

NOTE:

After work, make sure to adjust neutral position of steering angle sensor. Refer to BRC-93, "Adjustment of Steering Angle Sensor Neutral Position" .