

# SECTION LAN

## LAN SYSTEM

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## SERVICE INFORMATION

### PRECAUTIONS

#### Precaution for Trouble Diagnosis

INFOID:000000001647567

#### CAUTION:

- Never apply 7.0 V or more to the measurement terminal.
- Use a tester with open terminal voltage of 7.0 V or less.
- Turn the ignition switch OFF and disconnect the battery cable from the negative terminal when checking the harness.

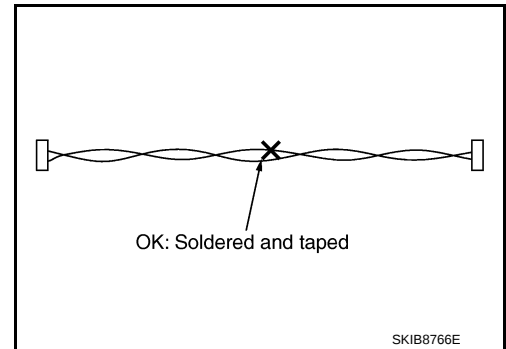
#### Precaution for Harness Repair

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- Solder the repaired area and wrap tape around the soldered area.

#### NOTE:

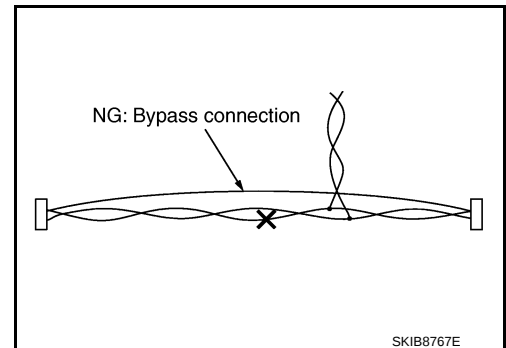
A fray of twisted lines must be within 110 mm (4.33 in).



- Bypass connection is never allowed at the repaired area.

#### NOTE:

Bypass connection may cause CAN communication error. The spliced wire becomes separated and the characteristics of twisted line are lost.



- Replace the applicable harness as an assembly if error is detected on the shield lines of CAN communication line.

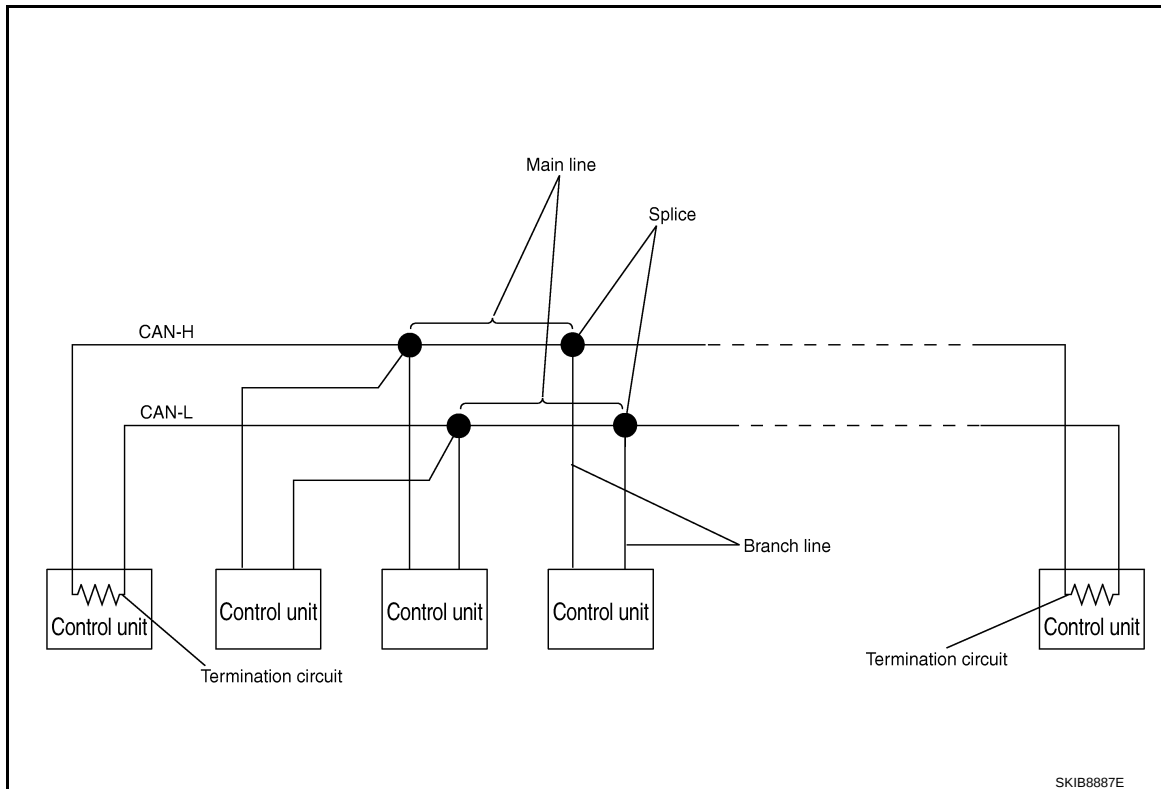
## SYSTEM DESCRIPTION

### CAN Communication System

INFOID:000000001647569

- CAN communication is a multiplex communication system. This enables the system to transmit and receive large quantities of data at high speed by connecting control units with two communication lines (CAN-H and CAN-L).
- Control units on the CAN network transmit signals using the CAN communication control circuit. They receive only necessary signals from other control units to operate various functions.
- CAN communication lines adopt twisted-pair line style (two lines twisted) for noise immunity.

### SYSTEM DIAGRAM



Each control unit passes an electric current to the termination circuits when transmitting CAN communication signal. The termination circuits produce an electrical potential difference between CAN-H and CAN-L. CAN communication system transmits and receives CAN communication signals by the potential difference.

| Component           | Description                                              |
|---------------------|----------------------------------------------------------|
| Main line           | CAN communication line between splices                   |
| Branch line         | CAN communication line between splice and a control unit |
| Splice              | A point connecting a branch line with a main line        |
| Termination circuit | Refer to "CAN COMMUNICATION CONTROL CIRCUIT".            |

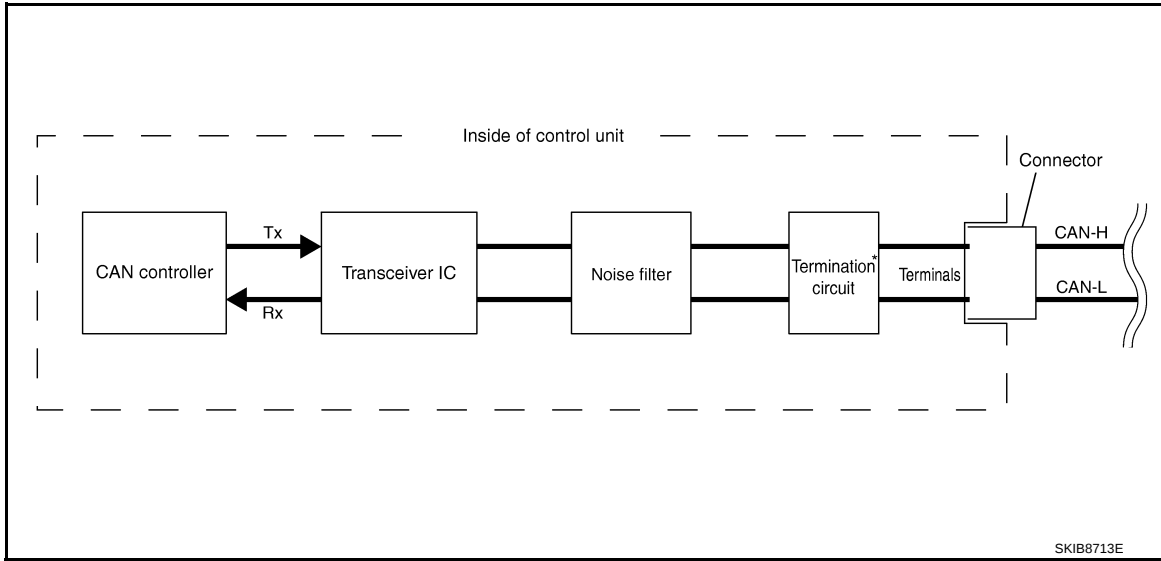
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# SYSTEM DESCRIPTION

< SERVICE INFORMATION >

[CAN FUNDAMENTAL]

## CAN COMMUNICATION CONTROL CIRCUIT



| Component                                             | System description                                                                                          |
|-------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| CAN controller                                        | It controls CAN communication signal transmission and reception, error detection, etc.                      |
| Transceiver IC                                        | It converts digital signal into CAN communication signal, and CAN communication signal into digital signal. |
| Noise filter                                          | It eliminates noise of CAN communication signal.                                                            |
| Termination circuit*<br>(Resistance of approx. 120 Ω) | It produces potential difference.                                                                           |

\*: These are the only control units wired with both ends of CAN communication system.

## Diag on CAN

INFOID:000000001647570

### DESCRIPTION

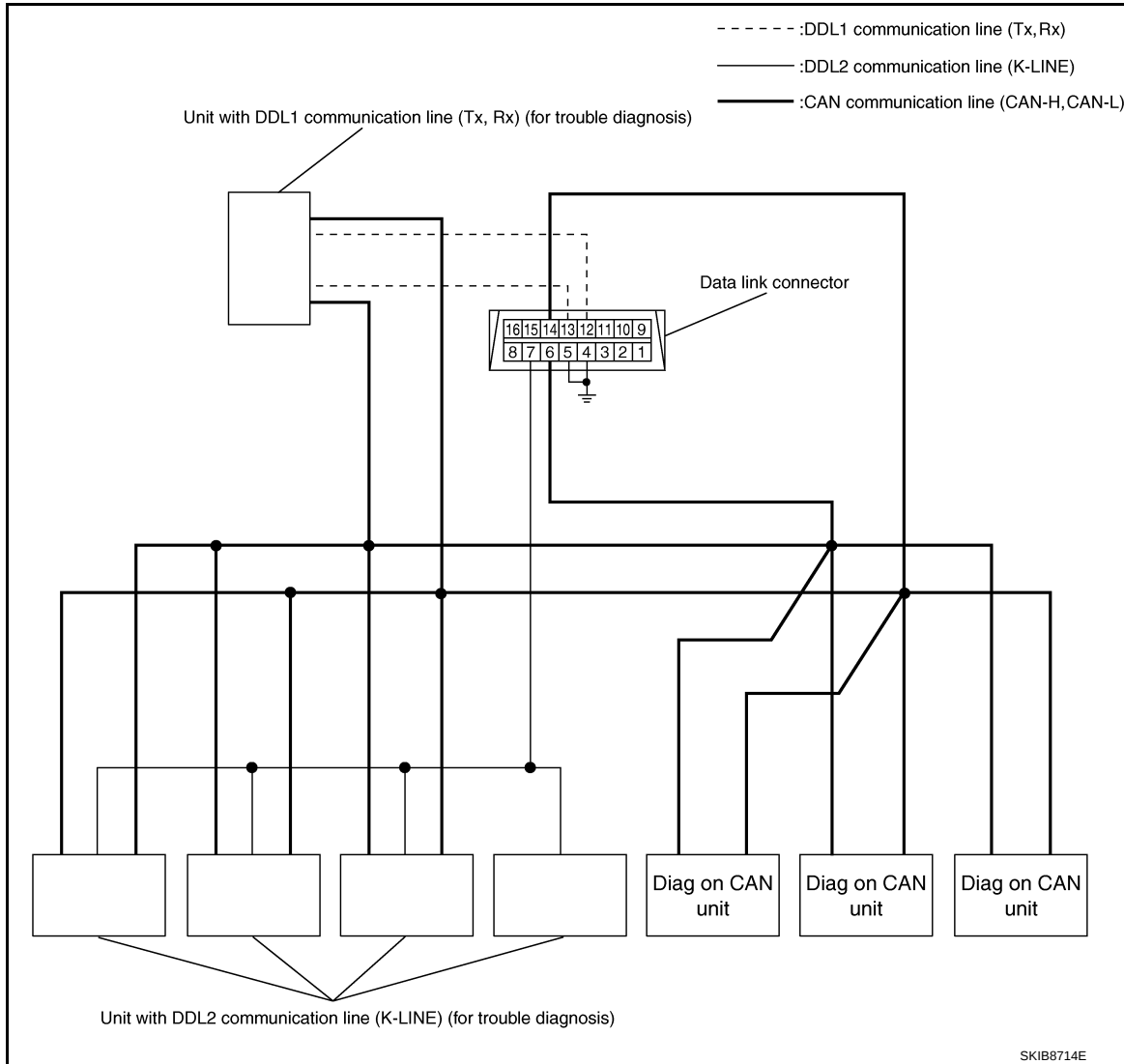
"Diag on CAN" is a diagnosis using CAN communication instead of previous DDL1 and DDL2 communication lines, between control units and diagnosis unit.

# SYSTEM DESCRIPTION

< SERVICE INFORMATION >

[CAN FUNDAMENTAL]

## System Diagram



| Name        | Harness        | Description                                                                  |
|-------------|----------------|------------------------------------------------------------------------------|
| DDL1        | Tx<br>Rx       | It is used for trouble diagnosis. (CAN-H and CAN-L are used for controlling) |
| DDL2        | K-LINE         | It is used for trouble diagnosis. (CAN-H and CAN-L are used for controlling) |
| Diag on CAN | CAN-H<br>CAN-L | It is used for trouble diagnosis and control.                                |

## TROUBLE DIAGNOSIS

## Condition of Error Detection

INFOID:000000001647571

“U1000” or “U1001” is indicated on SELF-DIAG RESULTS on CONSULT-III if CAN communication signal is not transmitted or received between units for 2 seconds or more.

## CAN COMMUNICATION SYSTEM ERROR

- CAN communication line open (CAN-H, CAN-L, or both)
- CAN communication line short (ground, between CAN communication lines, other harnesses)
- Error of CAN communication control circuit of the unit connected to CAN communication line

## WHEN “U1000” OR “U1001” IS INDICATED EVEN THOUGH CAN COMMUNICATION SYSTEM IS NORMAL

- Removal/installation of parts: Error may be detected when removing and installing CAN communication unit and related parts while turning the ignition switch ON. (A DTC except for CAN communication may be detected.)
- Fuse blown out (removed): CAN communication of the unit may cease.
- Voltage drop: Error may be detected if voltage drops due to discharged battery when turning the ignition switch ON (Depending on the control unit which carries out CAN communication).
- Error may be detected if the power supply circuit of the control unit, which carries out CAN communication, malfunctions (Depending on the control unit which carries out CAN communication).
- Error may be detected if reprogramming is not completed normally.

**NOTE:**

CAN communication system is normal if “U1000” or “U1001” is indicated on SELF-DIAG RESULTS of CONSULT-III under the above conditions. Erase the memory of the self-diagnosis of each unit.

## Symptom When Error Occurs in CAN Communication System

INFOID:000000001647572

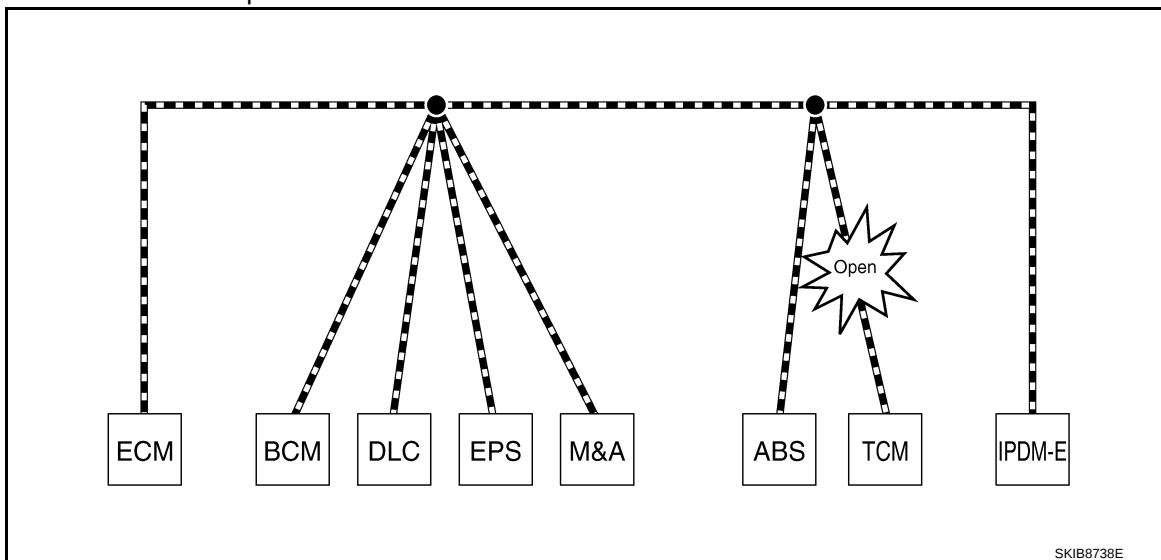
In CAN communication system, multiple units mutually transmit and receive signals. Each unit cannot transmit and receive signals if any error occurs on CAN communication line. Under this condition, multiple control units related to the root cause malfunction or go into fail-safe mode.

## ERROR EXAMPLE

**NOTE:**

- Each vehicle differs in symptom of each unit under fail-safe mode and CAN communication line wiring.
- Refer to [LAN-36, "Abbreviation List"](#) for the unit abbreviation.

Example: TCM branch line open circuit



| Unit name | Symptom                                                            |
|-----------|--------------------------------------------------------------------|
| ECM       | Engine torque limiting is affected, and shift harshness increases. |
| BCM       | Reverse warning chime does not sound.                              |

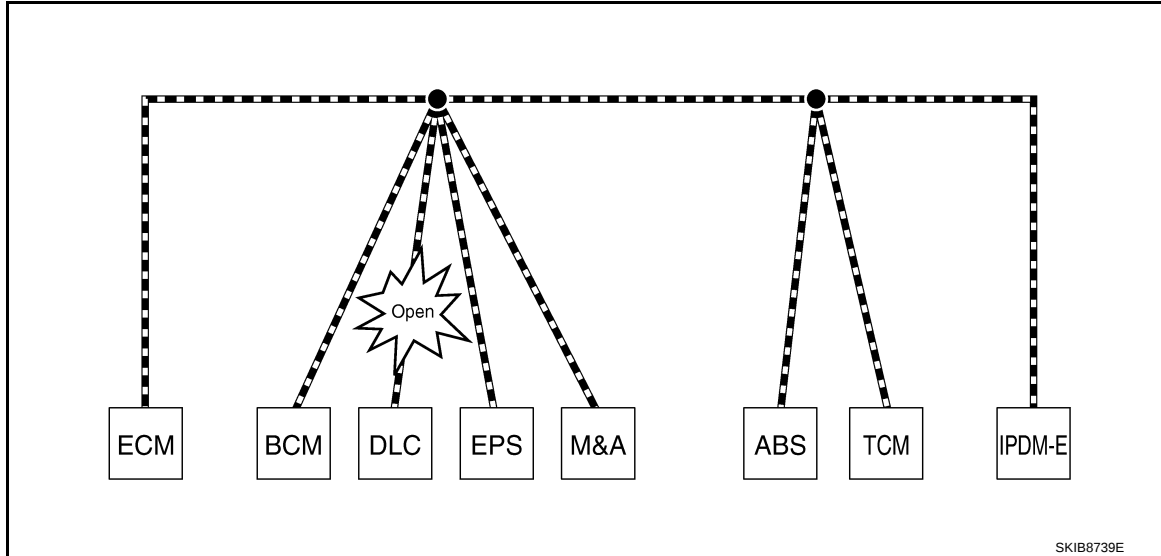
# TROUBLE DIAGNOSIS

< SERVICE INFORMATION >

[CAN FUNDAMENTAL]

| Unit name                                     | Symptom                                                                                                                                   |
|-----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| EPS control unit                              | Normal operation.                                                                                                                         |
| Combination meter                             | <ul style="list-style-type: none"> <li>Shift position indicator and OD OFF indicator turn OFF.</li> <li>Warning lamps turn ON.</li> </ul> |
| ABS actuator and electric unit (control unit) | Normal operation.                                                                                                                         |
| TCM                                           | No impact on operation.                                                                                                                   |
| IPDM E/R                                      | Normal operation.                                                                                                                         |

Example: Data link connector branch line open circuit



| Unit name                                     | Symptom           |
|-----------------------------------------------|-------------------|
| ECM                                           | Normal operation. |
| BCM                                           |                   |
| EPS control unit                              |                   |
| Combination meter                             |                   |
| ABS actuator and electric unit (control unit) |                   |
| TCM                                           |                   |
| IPDM E/R                                      |                   |

## NOTE:

- When data link connector branch line is open, transmission and reception of CAN communication signals are not affected. Therefore, no symptoms occur. However, be sure to repair malfunctioning circuit.
- When data link connector branch line is open, "ECU list" displayed on the CONSULT-III "CAN DIAG SUPPORT MNTR" may be the same as when the CAN communication line has short-circuit. However, symptoms differ depending on the case. See below chart for the differences.

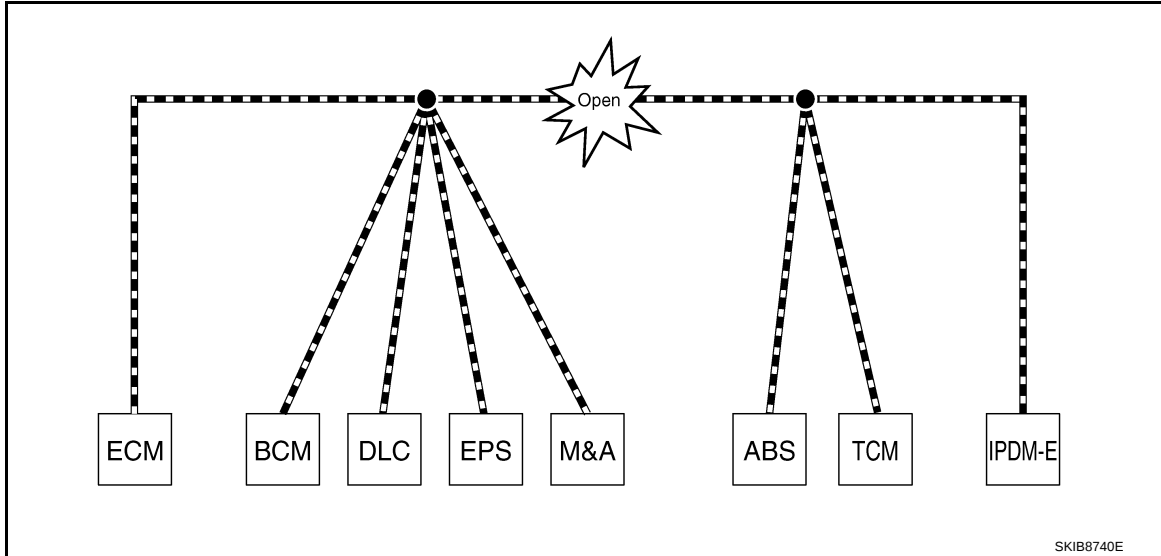
|                                              | "ECU list" on the "CAN DIAG SUPPORT MNTR" (CONSULT-III) | Difference of symptom                                                                                          |
|----------------------------------------------|---------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
| Data link connector branch line open circuit | All Diag on CAN units are not indicated.                | Normal operation.                                                                                              |
| CAN-H, CAN-L harness short-circuit           |                                                         | Most of the units which are connected to the CAN communication system enter fail-safe mode or are deactivated. |

# TROUBLE DIAGNOSIS

< SERVICE INFORMATION >

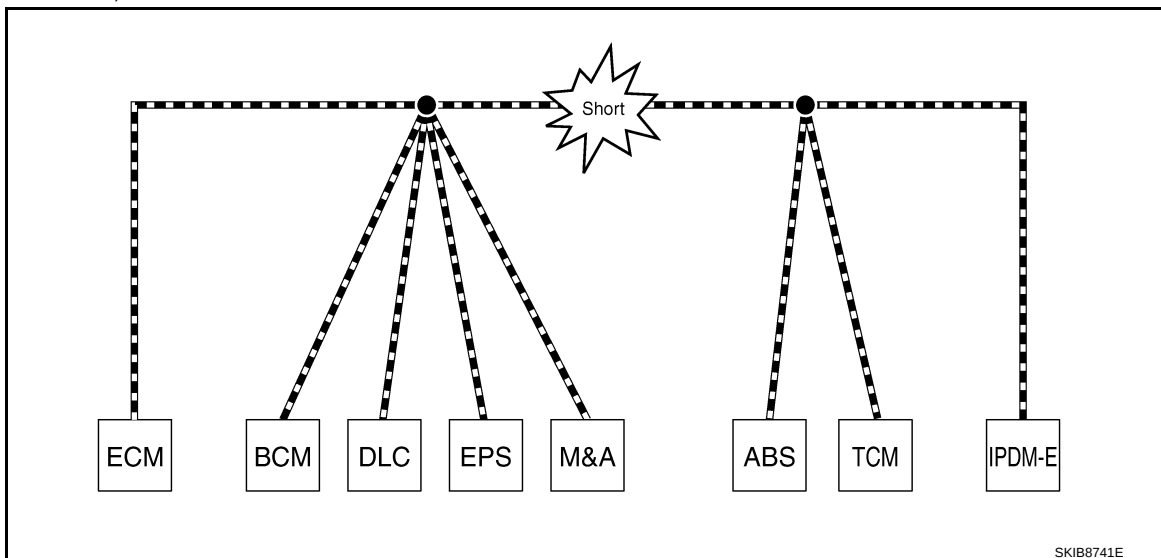
[CAN FUNDAMENTAL]

Example: Main Line Between Data Link Connector and ABS Actuator and Electric Unit (Control Unit) Open Circuit



| Unit name                                     | Symptom                                                                                                                                                                                                                       |
|-----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ECM                                           | Engine torque limiting is affected, and shift harshness increases.                                                                                                                                                            |
| BCM                                           | <ul style="list-style-type: none"> <li>Reverse warning chime does not sound.</li> <li>The front wiper moves under continuous operation mode even though the front wiper switch being in the intermittent position.</li> </ul> |
| EPS control unit                              | The steering effort increases.                                                                                                                                                                                                |
| Combination meter                             | <ul style="list-style-type: none"> <li>The shift position indicator and OD OFF indicator turn OFF.</li> <li>The speedometer is inoperative.</li> <li>The odo/trip meter stops.</li> </ul>                                     |
| ABS actuator and electric unit (control unit) | Normal operation.                                                                                                                                                                                                             |
| TCM                                           | No impact on operation.                                                                                                                                                                                                       |
| IPDM E/R                                      | When the ignition switch is ON, <ul style="list-style-type: none"> <li>The headlamps (Lo) turn ON.</li> <li>The cooling fan continues to rotate.</li> </ul>                                                                   |

Example: CAN-H, CAN-L Harness Short Circuit



# TROUBLE DIAGNOSIS

< SERVICE INFORMATION >

[CAN FUNDAMENTAL]

| Unit name                                     | Symptom                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ECM                                           | <ul style="list-style-type: none"> <li>Engine torque limiting is affected, and shift harshness increases.</li> <li>Engine speed drops.</li> </ul>                                                                                                                                                                                                                                                                                                                                                           |
| BCM                                           | <ul style="list-style-type: none"> <li>Reverse warning chime does not sound.</li> <li>The front wiper moves under continuous operation mode even though the front wiper switch being in the intermittent position.</li> <li>The room lamp does not turn ON.</li> <li>The engine does not start (if an error or malfunction occurs while turning the ignition switch OFF.)</li> <li>The steering lock does not release (if an error or malfunction occurs while turning the ignition switch OFF.)</li> </ul> |
| EPS control unit                              | The steering effort increases.                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Combination meter                             | <ul style="list-style-type: none"> <li>The tachometer and the speedometer do not move.</li> <li>Warning lamps turn ON.</li> <li>Indicator lamps do not turn ON.</li> </ul>                                                                                                                                                                                                                                                                                                                                  |
| ABS actuator and electric unit (control unit) | Normal operation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| TCM                                           | No impact on operation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| IPDM E/R                                      | When the ignition switch is ON, <ul style="list-style-type: none"> <li>The headlamps (Lo) turn ON.</li> <li>The cooling fan continues to rotate.</li> </ul>                                                                                                                                                                                                                                                                                                                                                 |

## Self-Diagnosis

INFOID:0000000001647573

| DTC   | Self-diagnosis item<br>(CONSULT-III indication) | DTC detection condition                                                                                                               | Inspection/Action                                                                    |
|-------|-------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| U1000 | CAN COMM CIRCUIT                                | When ECM is not transmitting or receiving CAN communication signal of OBD (emission-related diagnosis) for 2 seconds or more.         | Refer to <a href="#">LAN-12</a> .                                                    |
|       |                                                 | When a control unit (except for ECM) is not transmitting or receiving CAN communication signal for 2 seconds or more.                 |                                                                                      |
| U1001 | CAN COMM CIRCUIT                                | When ECM is not transmitting or receiving CAN communication signal other than OBD (emission-related diagnosis) for 2 seconds or more. |                                                                                      |
| U1002 | SYSTEM COMM                                     | When a control unit is not transmitting or receiving CAN communication signal for 2 seconds or less.                                  | Start the inspection. Refer to the applicable section of the indicated control unit. |
| U1010 | CONTROL UNIT [CAN]                              | When an error is detected during the initial diagnosis for CAN controller of each control unit.                                       | Replace the control unit indicating "U1010".                                         |

## CAN Diagnostic Support Monitor

INFOID:0000000001647574

CONSULT-III and CAN diagnostic support monitor (on-board diagnosis function) are used for detecting root cause.

### MONITOR ITEM (CONSULT-III)

# TROUBLE DIAGNOSIS

< SERVICE INFORMATION >

[CAN FUNDAMENTAL]

Example: CAN DIAG SUPPORT MNTR indication

| Without PAST  |        |      | With PAST     |        |      |
|---------------|--------|------|---------------|--------|------|
| ECM           |        |      | ECM           |        |      |
|               | PRSENT | PAST |               | PRSENT | PAST |
| INITIAL DIAG  | OK     |      | TRANSMIT DIAG | OK     | OK   |
| TRANSMIT DIAG | OK     |      | VDC/TCS/ABS   | -      | -    |
| TCM           | OK     |      | METER/M&A     | OK     | OK   |
| VDC/TCS/ABS   | UNKWN  |      | BCM/SEC       | OK     | OK   |
| METER/M&A     | OK     |      | ICC           | -      | -    |
| ICC           | UNKWN  |      | HVAC          | -      | -    |
| BCM/SEC       | OK     |      | TCM           | OK     | OK   |
| IPDM E/R      | OK     |      | EPS           | -      | -    |
|               |        |      | IPDM E/R      | OK     | OK   |
|               |        |      | e4WD          | -      | -    |
|               |        |      | AWD/4WD       | OK     | OK   |

PKID1075E

Without PAST

| Item                                       | PRSENT | Description                                                                  |
|--------------------------------------------|--------|------------------------------------------------------------------------------|
| Initial diagnosis                          | OK     | Normal at present                                                            |
|                                            | NG     | Control unit error (Except for some control units)                           |
| Transmission diagnosis                     | OK     | Normal at present                                                            |
|                                            | UNKWN  | Unable to transmit signals for 2 seconds or more.<br>Diagnosis not performed |
| Control unit name<br>(Reception diagnosis) | OK     | Normal at present                                                            |
|                                            | UNKWN  | Unable to receive signals for 2 seconds or more.<br>Diagnosis not performed  |
|                                            |        | No control unit for receiving signals. (No applicable optional parts)        |

With PAST

| Item                                       | PRSENT | PAST   | Description                                                                                                                                                      |
|--------------------------------------------|--------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Transmission diagnosis                     | OK     | OK     | Normal at present and in the past                                                                                                                                |
|                                            |        | 1 – 39 | Normal at present, but unable to transmit signals for 2 seconds or more in the past. (The number indicates the number of ignition switch cycles from OFF to ON.) |
|                                            | UNKWN  | 0      | Unable to transmit signals for 2 seconds or more at present.                                                                                                     |
| Control unit name<br>(Reception diagnosis) | OK     | OK     | Normal at present and in the past                                                                                                                                |
|                                            |        | 1 – 39 | Normal at present, but unable to receive signals for 2 seconds or more in the past. (The number indicates the number of ignition switch cycles from OFF to ON.)  |
|                                            | UNKWN  | 0      | Unable to receive signals for 2 seconds or more at present.                                                                                                      |
|                                            | -      | -      | Diagnosis not performed.<br>No control unit for receiving signals. (No applicable optional parts)                                                                |

## MONITOR ITEM (ON-BOARD DIAGNOSIS)

### NOTE:

For some models, CAN communication diagnosis result is received from the vehicle monitor. (CONSULT-III is not available.)

# TROUBLE DIAGNOSIS

< SERVICE INFORMATION >

[CAN FUNDAMENTAL]

Example: Vehicle Display

| Item                                                 | Result indicated | Error counter | Description                                                                                                           |
|------------------------------------------------------|------------------|---------------|-----------------------------------------------------------------------------------------------------------------------|
| CAN_COMM<br>(Initial diagnosis)                      | OK               | 0             | Normal at present                                                                                                     |
|                                                      | NG               | 1 – 50        | Control unit error<br>(The number indicates how many times diagnosis has been run.)                                   |
| CAN_CIRC_1<br>(Transmission diagnosis)               | OK               | 0             | Normal at present                                                                                                     |
|                                                      | UNKWN            | 1 – 50        | Unable to transmit for 2 seconds or more at present.<br>(The number indicates how many times diagnosis has been run.) |
| CAN_CIRC_2 – 9<br>(Reception diagnosis of each unit) | OK               | 0             | Normal at present                                                                                                     |
|                                                      | UNKWN            | 1 – 50        | Unable to transmit for 2 seconds or more at present.<br>(The number indicates how many times diagnosis has been run.) |
|                                                      |                  |               | Diagnosis not performed.                                                                                              |
|                                                      |                  |               | No control unit for receiving signals. (No applicable optional parts)                                                 |

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# TROUBLE DIAGNOSES WORK FLOW

< SERVICE INFORMATION >

[CAN FUNDAMENTAL]

## TROUBLE DIAGNOSES WORK FLOW

### Information Needed for Trouble Diagnosis

INFOID:000000001647575

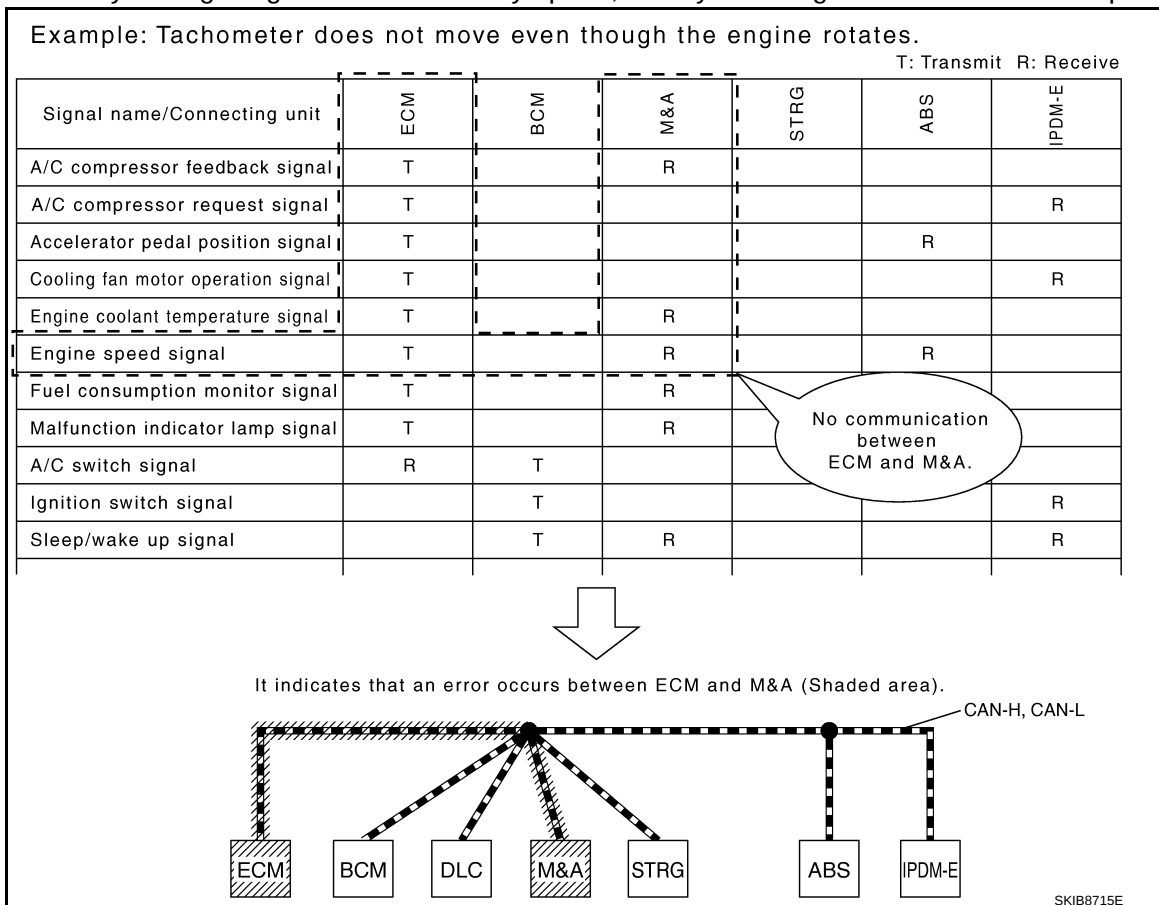
CAN communication system performs trouble diagnosis with the following tools.

| Tool                                         | Usage                                                                                                                                                                                                              |
|----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Interview sheet                              | For filling in vehicle information and interview with customer.                                                                                                                                                    |
| Data sheet                                   | For copying on-board diagnosis data.                                                                                                                                                                               |
| Diagnosis sheet                              | For detecting the root cause. (Diagnosis sheet includes system diagram for every CAN system type)                                                                                                                  |
| ECU list<br>(On the "CAN DIAG SUPPORT MNTR") | For checking the condition of control units and the status of CAN communication.                                                                                                                                   |
| SELF-DIAG RESULTS<br>(CONSULT-III)           |                                                                                                                                                                                                                    |
| CAN DIAG SUPPORT MNTR<br>(CONSULT-III)       |                                                                                                                                                                                                                    |
| CAN communication signal chart               | For converting information received from a customer into CAN communication signal transmission and reception. This information can be used to judge whether a circuit between control units is normal or abnormal. |
| Abbreviation list                            | For checking abbreviations in CAN communication signal chart and diagnosis sheet.                                                                                                                                  |

### How to Use CAN Communication Signal Chart

INFOID:000000001647576

The CAN communication signal chart lists the signals needed for trouble diagnosis. It is useful for detecting the root cause by finding a signal related to the symptom, and by checking transmission and reception unit.



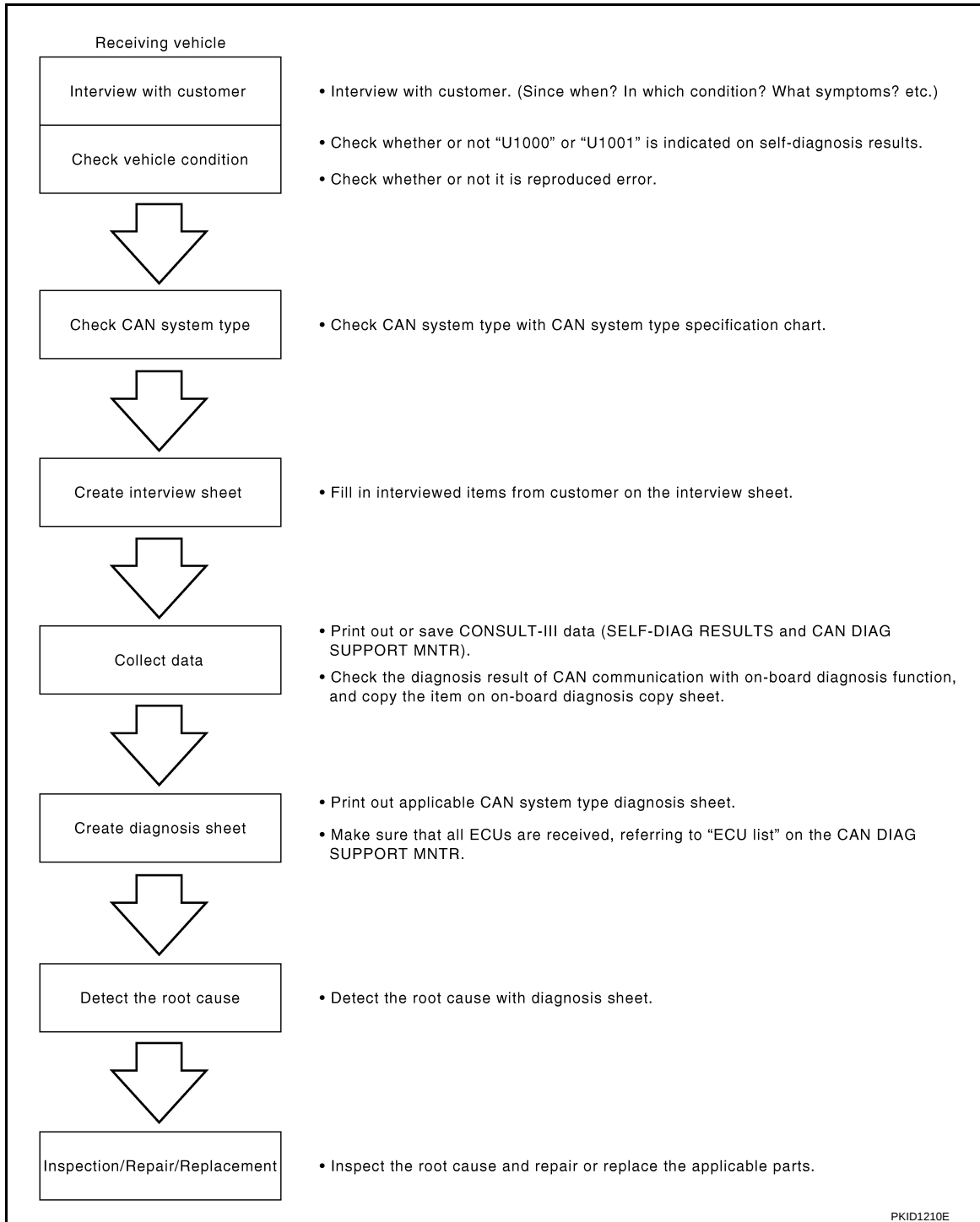
# TROUBLE DIAGNOSES WORK FLOW

< SERVICE INFORMATION >

[CAN FUNDAMENTAL]

## Trouble Diagnosis Flow Chart

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## Trouble Diagnosis Procedure

INFOID:000000001647578

### INTERVIEW WITH CUSTOMER

Interview with the customer is important to detect the root cause of CAN communication system errors and to understand vehicle condition and symptoms for proper trouble diagnosis.

Points in interview

- What: Parts name, system name
- When: Date, Frequency
- Where: Road condition, Place
- In what condition: Driving condition/environment

## TROUBLE DIAGNOSES WORK FLOW

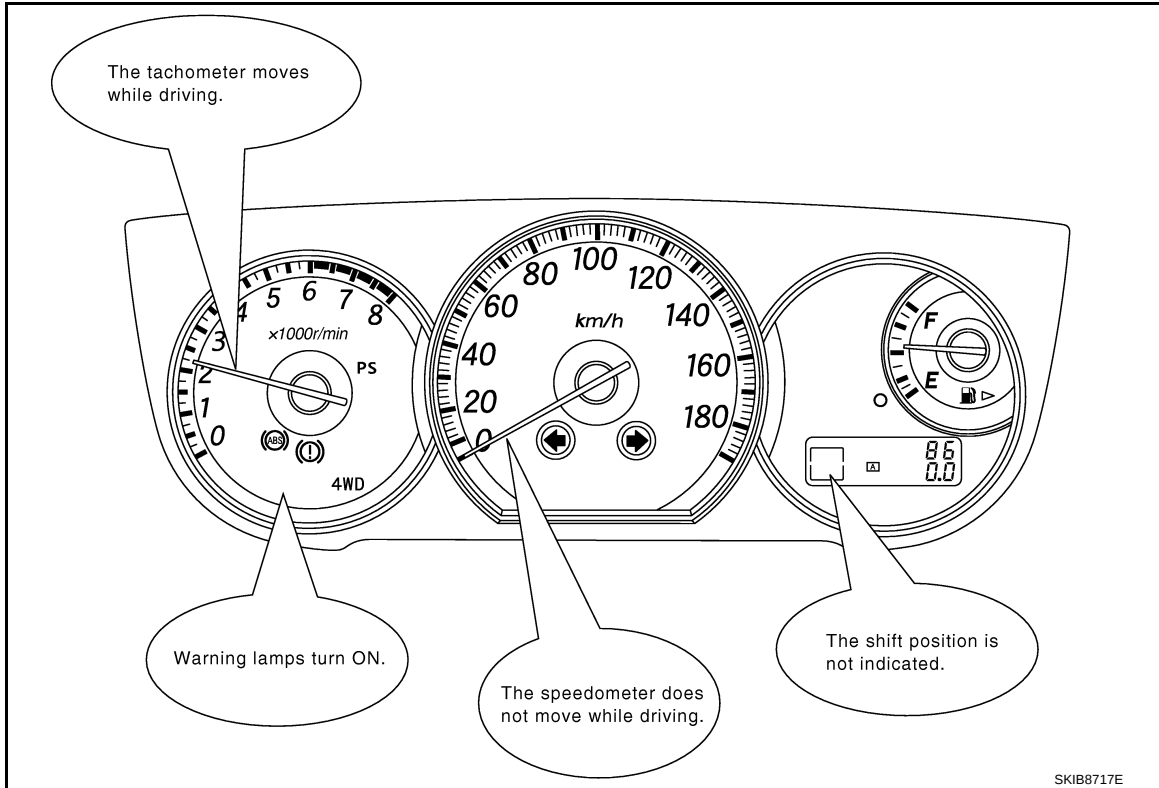
< SERVICE INFORMATION >

[CAN FUNDAMENTAL]

- Result: Symptom

**NOTE:**

- Check normal units as well as error symptoms.
- Example: Circuit between ECM and the combination meter is judged normal if the customer indicates tachometer functions normally.
- When a CAN communication system error is present, multiple control units may malfunction or go into fail-safe mode.
- Indication of the combination meter is important to detect the root cause because it is the most obvious to the customer, and it performs CAN communication with many units.



### INSPECTION OF VEHICLE CONDITION

- Check whether or not “U1000” or “U1001” is indicated on “SELF-DIAG RESULTS” by CONSULT-III.

**NOTE:**

Root cause cannot be detected using the procedure in this section if “U1000” or “U1001” is not indicated.

- Check whether the symptom is reproduced or not.

**NOTE:**

- Do not turn the ignition switch OFF or disconnect the battery cable while reproducing the error. The error may temporarily correct itself, making it difficult to determine the root cause.
- The procedures for present errors differ from the procedures for past errors. Refer to “DETECT THE ROOT CAUSE”.

### CHECK OF CAN SYSTEM TYPE (HOW TO USE CAN SYSTEM TYPE SPECIFICATION CHART)

Determine CAN system type based on vehicle equipment. Then choose the correct diagnosis sheet.

**NOTE:**

There are two styles for CAN system type specification charts. Depending on the number of available system types, either style A or style B may be used.

CAN System Type Specification Chart (Style A)

**NOTE:**

TROUBLE
DIAGNOSES
WORK FLOW

CAN system type is easily checked with the vehicle equipment identification information shown in the chart.

Example:

Vehicle is equipped as follows: Wagon, AWD, VQ35DE, CVT, VDC, and Intelligent Key system. (○ shows an example of CAN system type.)

**CAN System Specification Chart**

Determine CAN system type from the following specification chart. Then choose the correct diagnosis sheet.

|                                |                        |         |                        |         |                        |         |
|--------------------------------|------------------------|---------|------------------------|---------|------------------------|---------|
| Body type                      | Wagon                  |         |                        |         |                        |         |
| Axle                           | 2WD                    |         |                        | AWD     |                        |         |
| Engine                         | QR25DE                 |         | VQ35DE                 |         |                        |         |
| Transmission                   | A/T                    |         | CVT                    |         |                        |         |
| Brake control                  | ABS                    |         |                        | VDC     |                        |         |
| Intelligent Key system         |                        | X       |                        | X       |                        | X       |
| CAN system type                | 1                      | 2       | 3                      | 4       | 5                      | 6       |
| Diagnosis sheet                | (XX-XX)                | (XX-XX) | (XX-XX)                | (XX-XX) | (XX-XX)                | (XX-XX) |
| CAN communication signal chart | XX-XX. "TYPE 1/TYPE 2" |         | XX-XX. "TYPE 3/TYPE 4" |         | XX-XX. "TYPE 5/TYPE 6" |         |

X : Applicable

**VEHICLE EQUIPMENT IDENTIFICATION INFORMATION**

**NOTE:**

Check CAN system type from the vehicle shape and equipment.

With VDC

VDC OFF switch

With Intelligent Key system

Ignition knob

In the above example,

- Checking VDC OFF switch leads to judge whether or not VDC is equipped.
- Checking the ignition knob leads to judge whether or not Intelligent Key system is equipped.

For the above case, CAN system type is "6".

SKIB8888E

CAN System Type Specification Chart (Style B)

NOTE:

# TROUBLE DIAGNOSES WORK FLOW

< SERVICE INFORMATION >

[CAN FUNDAMENTAL]

CAN system type is easily checked with the vehicle equipment identification information shown in the chart.

Example:

Vehicle is equipped as follows: Sedan, 2WD, MR20DE, CVT, ABS, Active AFS, Intelligent Key system, Navigation system and Automatic drive positioner. (○ shows an example of CAN system type.)

## CAN System Specification Chart

Refer to the specification as shown in the chart.

|                     |                           |                           |                           |
|---------------------|---------------------------|---------------------------|---------------------------|
| Body type           | Sedan                     |                           |                           |
| Axle                | 2WD                       |                           | AWD                       |
| Engine              | HR15DE                    | MR20DE                    | HR15DE                    |
| Transmission        | A/T                       | CVT                       | A/T                       |
| Brake control       |                           | ABS                       |                           |
| Specification chart | AAA SPECIFICATION CHART A | YYY SPECIFICATION CHART B | AAA SPECIFICATION CHART C |

x: Applicable

Check the vehicle equipment with the vehicle identification number plate.

Check the vehicle equipment.

Select the applicable vehicle equipment. Refer to the specification chart.

## SPECIFICATION CHART B

Determine CAN system type from the following specification chart. Then choose the correct diagnosis sheet.

|                                |                                                                                                          |        |        |        |        |        |        |        |        |        |        |        |
|--------------------------------|----------------------------------------------------------------------------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Body type                      | Sedan                                                                                                    |        |        |        |        |        |        |        |        |        |        |        |
| Axle                           | 2WD                                                                                                      |        |        |        |        |        |        |        |        |        |        |        |
| Engine                         | MR20DE                                                                                                   |        |        |        |        |        |        |        |        |        |        |        |
| Transmission                   | CVT                                                                                                      |        |        |        |        |        |        |        |        |        |        |        |
| Brake control                  | ABS                                                                                                      |        |        |        |        |        |        |        |        |        |        |        |
| Active AFS                     |                                                                                                          | x      |        |        | x      | x      |        |        | x      | x      |        | x      |
| Intelligent Key system         |                                                                                                          |        | x      |        | x      |        | x      | x      | x      | x      |        | x      |
| Navigation system              |                                                                                                          |        |        | x      |        |        | x      | x      |        | x      |        | x      |
| Automatic drive positioner     |                                                                                                          |        |        |        |        |        |        | x      |        | x      | x      | x      |
| CAN system type                | 9                                                                                                        | 10     | 11     | 12     | 13     | 14     | 15     | 16     | 17     | 18     | 19     | 20     |
| Diagnosis sheet                | AA: XX                                                                                                   | AA: XX | AA: XX | AA: XX | AA: XX | AA: XX | AA: XX | AA: XX | AA: XX | AA: XX | AA: XX | AA: XX |
| CAN communication signal chart | XX-XX TYPE SWTYPE 10TYPE 11TYPE 12TYPE 13TYPE 14TYPE 15TYPE 16TYPE 17TYPE 18TYPE 19TYPE 20TYPE 21TYPE 22 |        |        |        |        |        |        |        |        |        |        |        |

x: Applicable

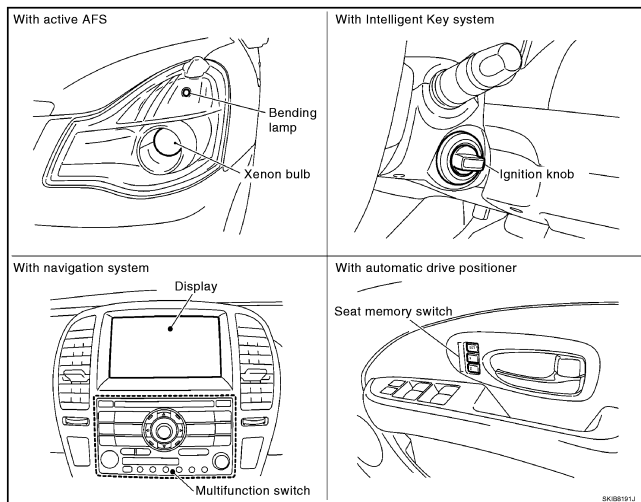
Check the vehicle equipment.

The number indicates the CAN system type of the vehicle.

## VEHICLE EQUIPMENT IDENTIFICATION INFORMATION

### NOTE:

Check CAN system type from the vehicle shape and equipment.



In the above example,

- Checking Xenon bulb and bending lamp lead to judge whether or not Active AFS is equipped.
- Checking the ignition knob leads to judge whether or not Intelligent Key system is equipped.
- Checking display and multifunction switch lead to judge whether or not Navigation system is equipped.
- Checking seat memory switch leads to judge whether or not Automatic drive positioner is equipped.

[ For the above case, CAN system type is "20". ]

SKIB8889E

## CREATE INTERVIEW SHEET

Fill out the symptom described by the customer, vehicle condition, and CAN system type on the interview sheet.

# TROUBLE DIAGNOSES WORK FLOW

< SERVICE INFORMATION >

[CAN FUNDAMENTAL]

Interview Sheet (Example)

| CAN Communication System Diagnosis Interview Sheet                                                                                                                                                                                                                                                                                                                                                                                          |                      |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| Date received: 3, Feb. 2005                                                                                                                                                                                                                                                                                                                                                                                                                 |                      |
| Type: DBA-KG11                                                                                                                                                                                                                                                                                                                                                                                                                              | VIN No.: KG11-005040 |
| Model: BDRARGZ397EDA-E-J-                                                                                                                                                                                                                                                                                                                                                                                                                   |                      |
| First registration: 10, Jan. 2005                                                                                                                                                                                                                                                                                                                                                                                                           | Mileage: 621         |
| CAN system type: Type 19                                                                                                                                                                                                                                                                                                                                                                                                                    |                      |
| Symptom (Results from interview with customer)                                                                                                                                                                                                                                                                                                                                                                                              |                      |
| <ul style="list-style-type: none"><li>• Headlamps suddenly turn ON while driving the vehicle.</li><li>• The engine does not restart after stopping the vehicle and turning the ignition switch OFF.</li><li>• The cooling fan continues rotating while turning the ignition switch ON.</li></ul>                                                                                                                                            |                      |
| Condition at inspection                                                                                                                                                                                                                                                                                                                                                                                                                     |                      |
| Error Symptom: Present / Past                                                                                                                                                                                                                                                                                                                                                                                                               |                      |
| <p>The engine does not start.</p> <p>While turning the ignition switch ON,</p> <ul style="list-style-type: none"><li>• The headlamps (Lo) turn ON, and the cooling fan continues rotating.</li><li>• The interior lamp does not turn ON.</li></ul> <p>On CONSULT-III screen,</p> <ul style="list-style-type: none"><li>• IPDM E/R is not indicated on SELECT SYSTEM.</li><li>• ENGINE: U1001</li><li>• BCM, ADAPTIVE LIGHT: U1000</li></ul> |                      |

PKID1211E

## COLLECT DATA

Collect CONSULT-III Data

Print out or save the following CONSULT-III data.

- SELF-DIAG RESULTS
- CAN DIAG SUPPORT MNTR ("ECU list" included)

**NOTE:**

**[CAN FUNDAMENTAL]**

Some items may not be needed depending on CAN system type of vehicle.

|                                                                                                                         |  |             |                     |
|-------------------------------------------------------------------------------------------------------------------------|--|-------------|---------------------|
| Device Data                                                                                                             |  |             |                     |
| System                                                                                                                  |  |             |                     |
| Job#                                                                                                                    |  |             |                     |
| <b>WARRANTY</b><br>Vehicle Name: 171401133<br>Model: NADA Model Name: 2007<br>Price: NADA Retail \$:<br>Country: U.S.A. |  |             |                     |
|                                                                                                                         |  | Customer:   |                     |
|                                                                                                                         |  | Print Date: | 2006/05/18 17:52:04 |
|                                                                                                                         |  | Website:    |                     |

| A/DTC Reading                       |      |                                                         |            |
|-------------------------------------|------|---------------------------------------------------------|------------|
| DTC RESULTS                         | TIME | DTC RESULTS                                             | TIME       |
| ALL MODE AWD/4WD                    |      |                                                         |            |
| C1203 : ABS SYSTEM                  | 8    | C1109 : BATTERY VOLTAGE[ABNORMAL]                       | 17         |
|                                     |      | IPDM/ER                                                 |            |
| ABS                                 |      | No DTC is detected.<br>Further testing may be required. |            |
| C1107 : FR RH SENSOR-2              | 8    | MULTI-TR                                                |            |
| C1115 : ABS SENSOR[ABNORMAL SIGNAL] |      | 8                                                       | No Support |

| C RESULTS                                | TIME | DTC RESULTS                                             | TIME |
|------------------------------------------|------|---------------------------------------------------------|------|
| BCM                                      |      | ENGINE                                                  |      |
| is detected.<br>Testing may be required. |      | No DTC is detected.<br>Further testing may be required. |      |
| TRANSMISSION                             |      |                                                         |      |
| MANU MODE C                              |      |                                                         |      |
| AIR BAG                                  |      |                                                         |      |
| is detected.<br>Testing may be required. |      |                                                         |      |
| METER/MMA                                |      |                                                         |      |
| is detected.<br>Testing may be required. |      |                                                         |      |

PKID1212E

**NOTE:**

# TROUBLE DIAGNOSES WORK FLOW

< SERVICE INFORMATION >

[CAN FUNDAMENTAL]

For some models, CAN communication diagnosis result is received from the vehicle monitor. (CONSULT-III is not available.)

Example: Copy the diagnosis result of CAN communication from the vehicle monitor.

Vehicle monitor indication

| CAN DIAG SUPPORT MONITOR |       |    | Delete |
|--------------------------|-------|----|--------|
| CAN_COMM                 | OK    | 0  |        |
| CAN_CIRC_1               | OK    | 0  |        |
| CAN_CIRC_2               | UNKWN | 12 |        |
| CAN_CIRC_3               | UNKWN | 12 |        |
| CAN_CIRC_4               | UNKWN | 0  |        |
| CAN_CIRC_5               | OK    | 0  |        |
| CAN_CIRC_6               | UNKWN | 0  |        |
| CAN_CIRC_7               | OK    | 0  |        |
| CAN_CIRC_8               | UNKWN | 0  |        |
| CAN_CIRC_9               | UNKWN | 50 |        |



Copy

Vehicle monitor (Display control unit) CAN DIAG SUPPORT MONITOR copy sheet

| Indication item<br>(Diagnosis item)      | Vehicle monitor  |               | Indication item<br>(Diagnosis item)                                | Vehicle monitor  |               |
|------------------------------------------|------------------|---------------|--------------------------------------------------------------------|------------------|---------------|
|                                          | Result indicated | Error counter |                                                                    | Result indicated | Error counter |
| CAN_COMM<br>(Initial diagnosis)          | OK               | 0             | CAN_CIRC_5<br>(Receive diagnosis of Unified meter<br>and A/C amp.) | OK               | 0             |
| CAN_CIRC_1<br>(Transmit diagnosis)       | OK               | 0             | CAN_CIRC_6                                                         | Not available    |               |
| CAN_CIRC_2<br>(Receive diagnosis of BCM) | UNKWN            | 12            | CAN_CIRC_7<br>(Receive diagnosis of IPDM E/R)                      | OK               | 0             |
| CAN_CIRC_3<br>(Receive diagnosis of ECM) | UNKWN            | 12            | CAN_CIRC_8                                                         | Not available    |               |
| CAN_CIRC_4                               | Not available    |               | CAN_CIRC_9                                                         | Not available    |               |

Result indicated: Fill in the indication (OK, NG or UNKWN).  
Error counter: Fill in the indicated number.

SKIB8722E

## CREATE DIAGNOSIS SHEET

### NOTE:

Be sure to use the diagnosis sheet for the correct CAN system type.

Print Diagnosis Sheet

Print the diagnosis sheet for the applicable CAN system type.

Check Collected Data

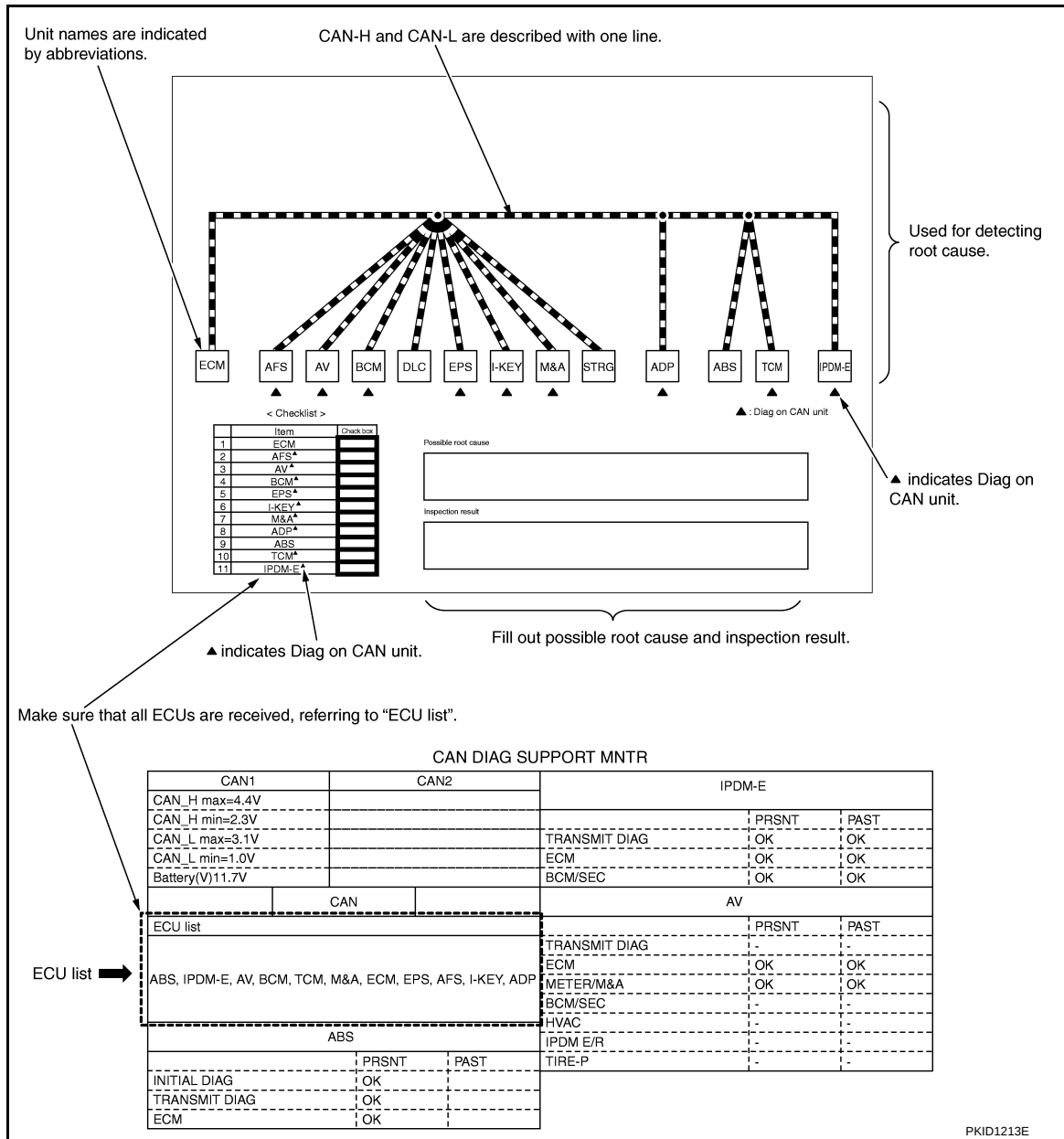
Make sure that all ECUs are received, referring to "ECU list".

# TROUBLE DIAGNOSES WORK FLOW

< SERVICE INFORMATION >

[CAN FUNDAMENTAL]

- For abbreviations, refer to [LAN-36, "Abbreviation List"](#).



## DETECT THE ROOT CAUSE

Identify the root cause using the created diagnosis sheet.

Identifying the root cause

- Draw a line on the diagnosis sheet to indicate the possible cause. Narrow the search.

### NOTE:

- Color-code when drawing lines.
- Do not draw a line onto a existing line.
- Drawing a line is not necessary if the circuit is shorted. Refer to "Present Error — Short Circuit —", "Past Error — Short Circuit —".

Refer to the following for details of the trouble diagnosis procedure.

- "Present Error — Open Circuit —"
- "Present Error — Short Circuit —"
- "Past Error — Open Circuit —"
- "Past Error — Short Circuit —"

### NOTE:

When the root cause appears to be a branch line or short circuit, be sure to check the control unit as well as the communication line.

Present Error — Open Circuit —

**[CAN FUNDAMENTAL]**

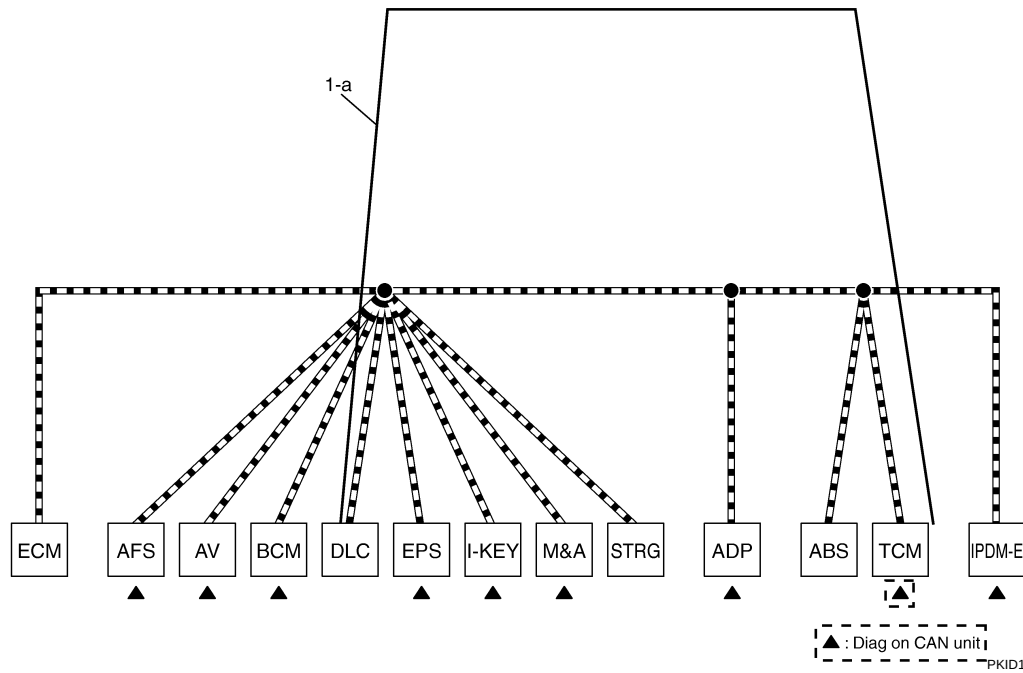
Identify the error circuit using information from the “CAN DIAG SUPPORT MNTR” (“ECU list” included).

- NOTE:**

**NOTE:**

- (Example)

| CAN DIAG SUPPORT MNTR                                |  |      |  |                                                                                                                                                                                                                                                                                                         |
|------------------------------------------------------|--|------|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CAN1                                                 |  | CAN2 |  | <div>IPDM-E</div> <div>PRSENT</div> <div>PAST</div> <div>TRANSMIT DIAG</div> <div>OK</div> <div>OK</div> <div>OK</div> <div>OK</div> <div>BCM/SEC</div> <div>OK</div> <div>OK</div>                                                                                                                     |
| CAN_H max=4.3V                                       |  |      |  |                                                                                                                                                                                                                                                                                                         |
| CAN_H min=1.0V                                       |  |      |  |                                                                                                                                                                                                                                                                                                         |
| CAN_L max=3.1V                                       |  |      |  |                                                                                                                                                                                                                                                                                                         |
| CAN_L min=0.6V                                       |  |      |  |                                                                                                                                                                                                                                                                                                         |
| Battery(V)11.7V                                      |  |      |  |                                                                                                                                                                                                                                                                                                         |
|                                                      |  | CAN  |  | AV                                                                                                                                                                                                                                                                                                      |
| ECU list                                             |  |      |  | <div>PRSENT</div> <div>PAST</div> <div>TRANSMIT DIAG</div> <div>-</div> <div>ECM</div> <div>OK</div> <div>OK</div> <div>METER/M&amp;A</div> <div>OK</div> <div>OK</div> <div>BCM/SEC</div> <div>-</div> <div>-</div> <div>HVAC</div> <div>-</div> <div>-</div> <div>ECU</div> <div>-</div> <div>-</div> |
| ABS, IPDM-E, AV, BCM, M&A, ECM, EPS, AFS, I-KEY, ADP |  |      |  |                                                                                                                                                                                                                                                                                                         |



- NOTE:**

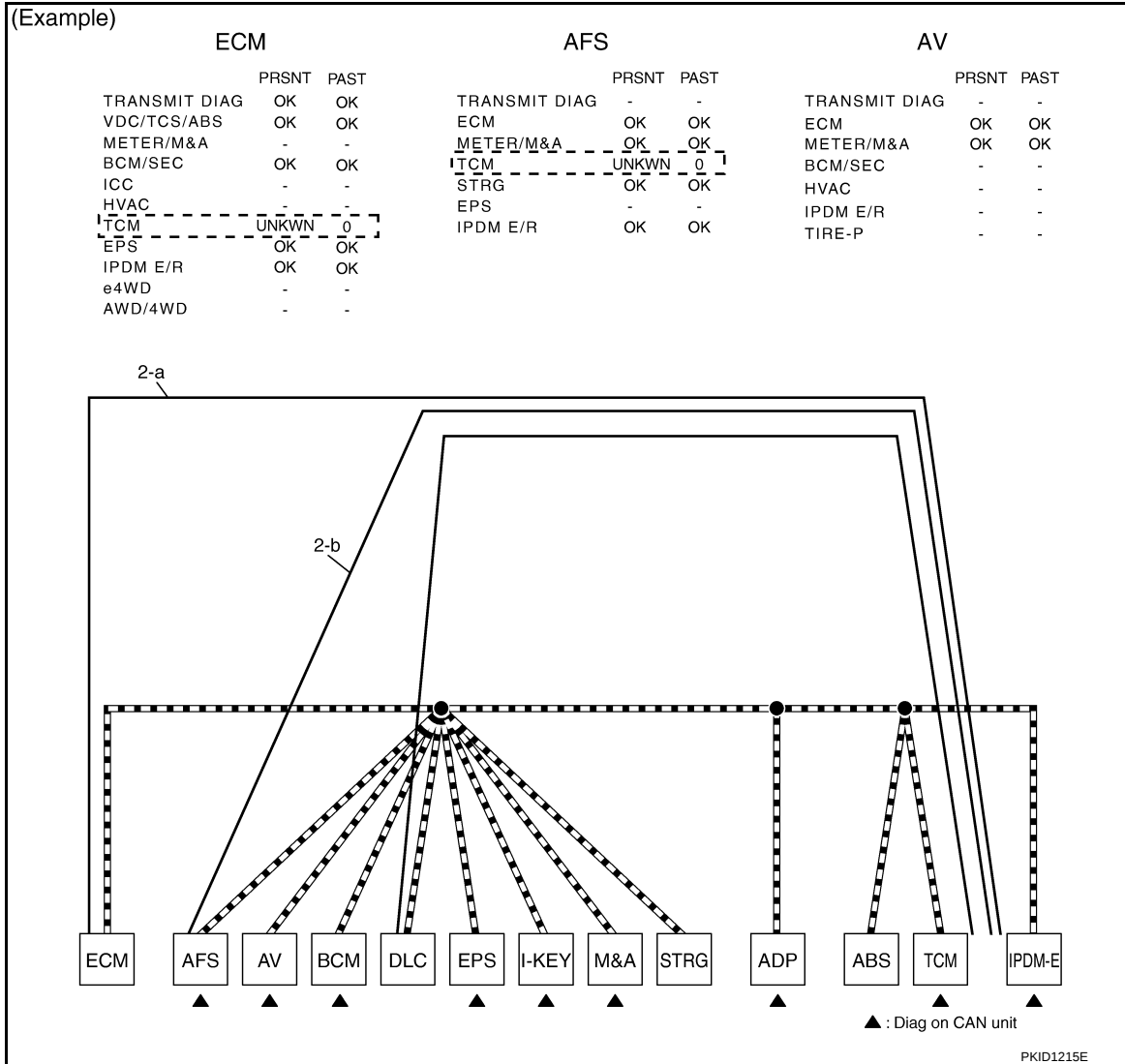
b. Reception item of "AFS": On "TCM", "UNKWN" is indicated. This means AFS cannot receive the signal from TCM. Draw a line to indicate an error between AFS and TCM (line 2-b in the figure below).

# TROUBLE DIAGNOSES WORK FLOW

< SERVICE INFORMATION >

[CAN FUNDAMENTAL]

- c. Reception item of "AV": "UNKWN" is not indicated. This indicates normal communication between AV and its receiving units. Do not draw any line.



- d. Reception item of "BCM": On "TCM", "UNKWN" is indicated. This means BCM cannot receive the signal from TCM. Draw a line to indicate an error between BCM and TCM (line 2-d in the figure below).
- e. Reception item of "EPS" and "I-KEY": "UNKWN" is not indicated. This indicates normal communication between EPS and I-KEY and their receiving units. Do not draw any line.

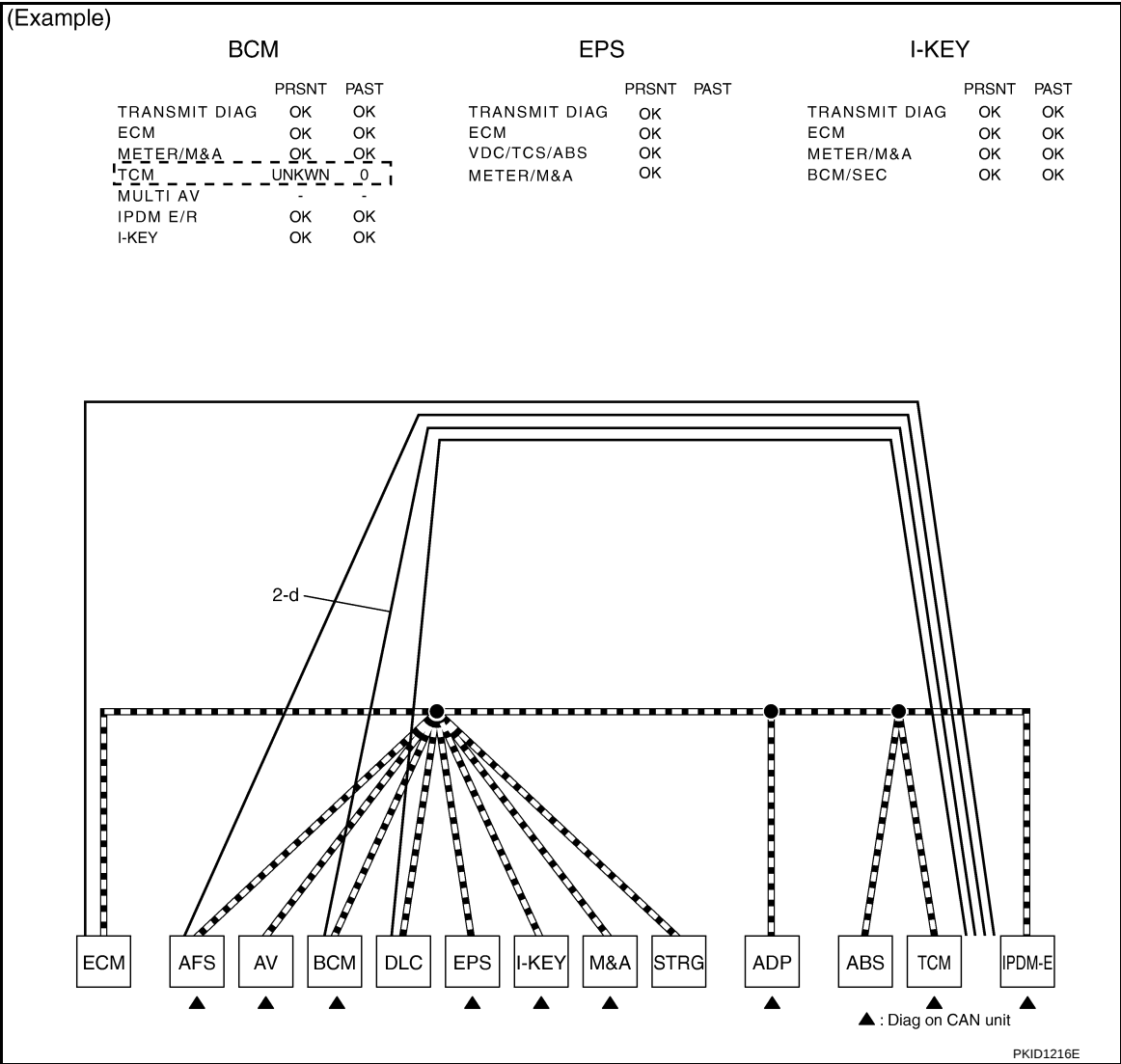
**NOTE:**

TROUBLE DIAGNOSES WORK FLOW

< SERVICE INFORMATION >

[CAN FUNDAMENTAL]

On CAN DIAG SUPPORT MNTR (without PAST), “UNKWN” is indicated even though the item is not used in the trouble diagnosis. For the details of each item on CAN diagnostic support monitor, refer to [LAN-39, "CAN Diagnostic Support Monitor"](#).



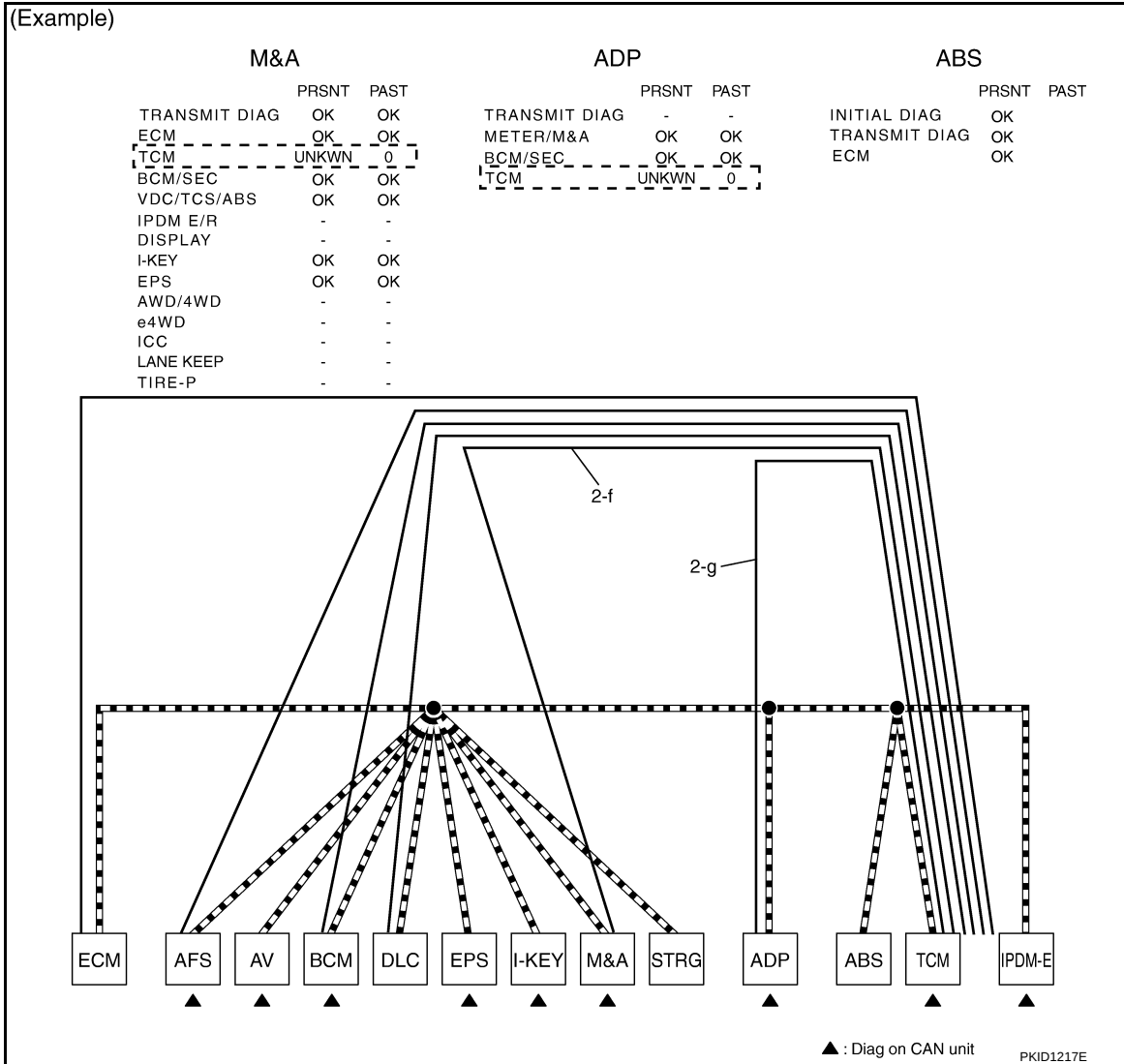
- f. Reception item of “M&A”: On “TCM”, “UNKWN” is indicated. This means M&A cannot receive the signal from TCM. Draw a line to indicate an error between M&A and TCM (line 2-f in the figure below).
- g. Reception item of “ADP”: On “TCM”, “UNKWN” is indicated. This means ADP cannot receive the signal from TCM. Draw a line to indicate an error between ADP and TCM (line 2-g in the figure below).

# TROUBLE DIAGNOSES WORK FLOW

< SERVICE INFORMATION >

[CAN FUNDAMENTAL]

- h. Reception item of "ABS": "UNKWN" is not indicated. This indicates normal communication between ABS and its receiving units. Do not draw any line.



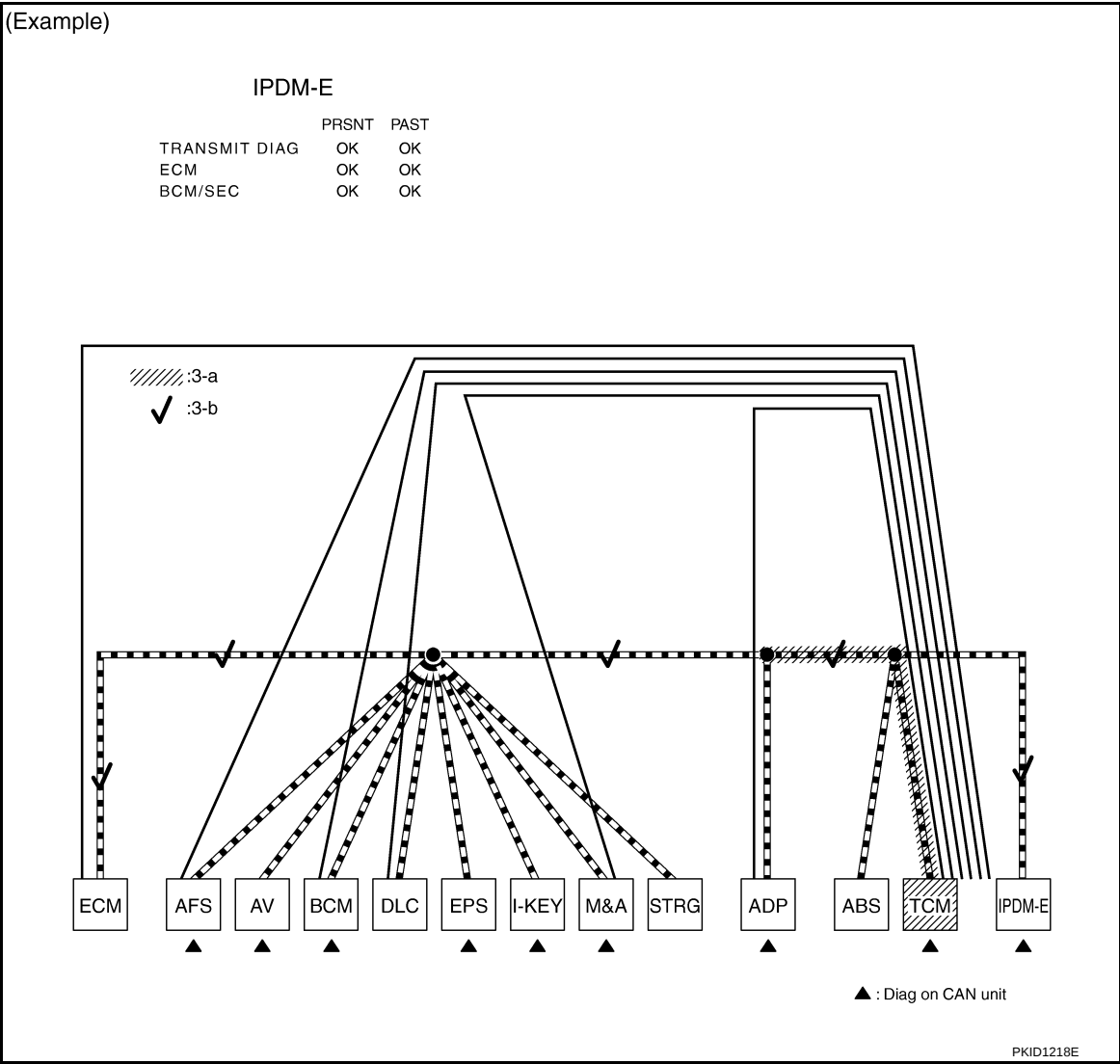
- i. Reception item of "IPDM-E": "UNKWN" is not indicated. This indicates normal communication between IPDM-E and its receiving units. Do not draw any line.
3. Based on information received from "CAN DIAG SUPPORT MNTR", place a check mark on the known good CAN communication line between ECM and IPDM-E.
- a. Through the previous procedure, the circuit between ADP splice and TCM has the most amount of lines (shade 3-a in the figure below).
- b. Place a check mark on the known good lines to establish the error circuit.

TROUBLE DIAGNOSES WORK FLOW

< SERVICE INFORMATION >

[CAN FUNDAMENTAL]

Reception item of "IPDM-E": On "ECM", "OK" is indicated. IPDM-E communicates normally with ECM. Put a check mark on the normal circuit between ECM and IPDM-E (check mark 3-b in the figure below).



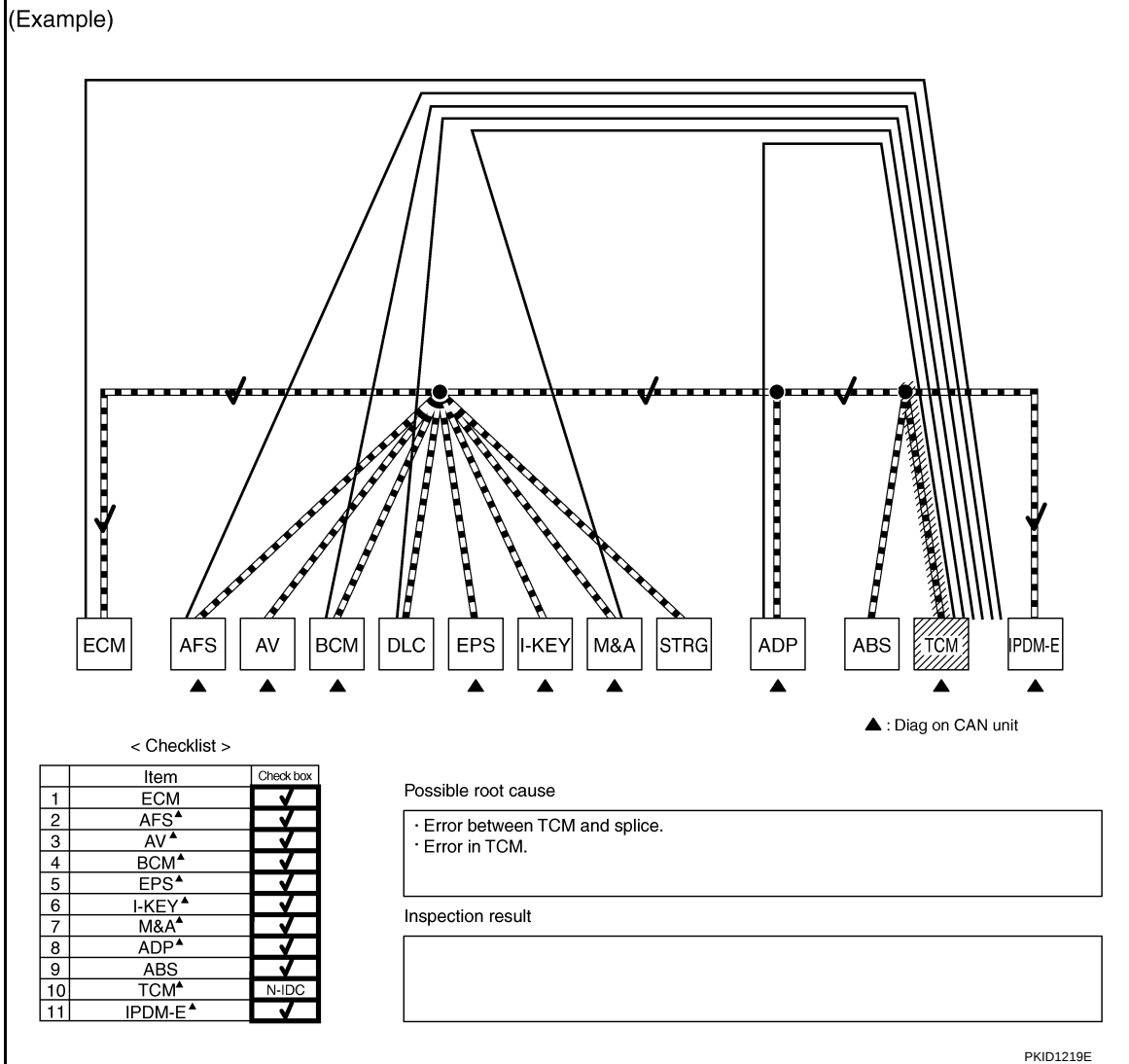
4. Through the above procedure, the error is detected in the TCM branch line (shaded in the figure below).
- NOTE:**  
 For abbreviations, refer to [LAN-36. "Abbreviation List"](#).

# TROUBLE DIAGNOSES WORK FLOW

< SERVICE INFORMATION >

[CAN FUNDAMENTAL]

- Perform the inspection for the detected error circuit. For the inspection procedure, refer to [LAN-57. "Mal-function Area Chart"](#).



Present Error — Short Circuit —

When the symptoms listed below exist, a short circuit of the CAN communication line is a possible cause.

Received data

| Item (CONSULT-III)                      | Indication                                                           |
|-----------------------------------------|----------------------------------------------------------------------|
| ECU list (on the CAN DIAG SUPPORT MNTR) | All Diag on CAN units are not indicated.                             |
| CAN DIAG SUPPORT MNTR                   | "UNKWN" is indicated under "TRANSMIT DIAG" and most reception items. |

## Error symptom

- Most the units connected to the CAN communication system go into fail-safe mode or are deactivated.

## Inspection procedure

**[CAN FUNDAMENTAL]**

- Refer to [LAN-57, "Malfunction Area Chart"](#).

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Review CAN communication signal chart based on information received from the interview with the customer and on past error information from SELF-DIAG RESULTS and CAN DIAG SUPPORT MNTR.

# TROUBLE DIAGNOSES WORK FLOW

< SERVICE INFORMATION >

[CAN FUNDAMENTAL]

- SELF-DIAG RESULTS: Inspect the control units indicating "U1000" or "U1001" on SELF-DIAG RESULTS.

| ALL DTC READING                                      |      |                                                      |      |
|------------------------------------------------------|------|------------------------------------------------------|------|
| DTC RESULTS                                          | TIME | DTC RESULTS                                          | TIME |
| ABS                                                  |      | BCM                                                  |      |
| U1000 : CAN COMM CIRCUIT                             | 3    | No DTC is detected. Further testing may be required. |      |
| IPDM E/R                                             |      | TRANSMISSION                                         |      |
| No DTC is detected. Further testing may be required. |      | U1000 : CAN COMM CIRCUIT                             | 3    |
| MULTI AV                                             |      | METER                                                |      |
| No DTC is detected. Further testing may be required. |      | U1000 : CAN COMM CIRCUIT                             | 3    |
| DTC RESULTS                                          | TIME | DTC RESULTS                                          | TIME |
| EPS                                                  |      | AUTO DRIVE POS.                                      |      |
| U1000 : CAN COMM CIRCUIT                             | PAST | No DTC is detected. Further testing may be required. |      |
| ENGINE                                               |      |                                                      |      |
| U1001 : CAN COMM CIRCUIT                             | 1t   |                                                      |      |
| ADAPTIVE LIGHT                                       |      |                                                      |      |
| No DTC is detected. Further testing may be required. |      |                                                      |      |
| INTELLIGENT KEY                                      |      |                                                      |      |
| No DTC is detected. Further testing may be required. |      |                                                      |      |

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- CAN DIAG SUPPORT MNTR (with PAST): Check the CAN DIAG SUPPORT MNTR (with PAST) of units indicating "U1000" or "U1001" on SELF-DIAG RESULTS. Draw a line on the diagnosis sheet to indicate the possible error circuit.

## NOTE:

For the details of each indication on CAN DIAG SUPPORT MNTR, refer to [LAN-39, "CAN Diagnostic Support Monitor"](#).

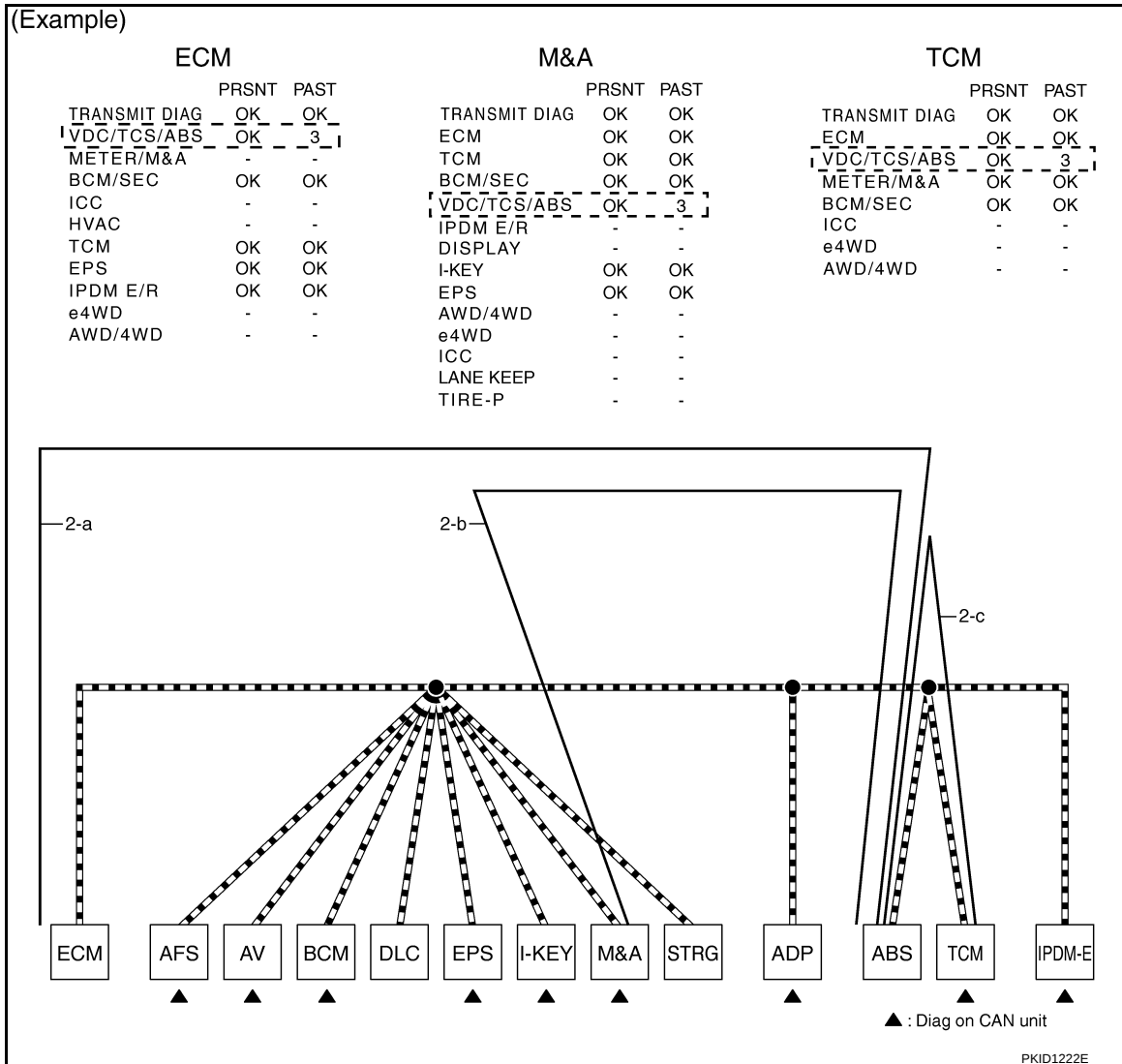
- Reception item of "ECM": "VDC/TCS/ABS", "3" is indicated in the "PAST". This means ECM could not receive the signal from ABS in the past. Draw a line between ECM and ABS (line 2-a in the figure below).
- Reception item of "M&A": "VDC/TCS/ABS", "3" is indicated in the "PAST". This means M&A could not receive the signal from ABS in the past. Draw a line between M&A and ABS (line 2-b in the figure below).

# TROUBLE DIAGNOSES WORK FLOW

< SERVICE INFORMATION >

[CAN FUNDAMENTAL]

- c. Reception item of "TCM": "VDC/TCS/ABS", "3" is indicated in the "PAST". This means TCM could not receive the signal from ABS in the past. Draw a line between TCM and ABS (line 2-c in the figure below).



3. CAN DIAG SUPPORT MNTR (without PAST): Check the CAN DIAG SUPPORT MNTR (without PAST) of units indicating "U1000" or "U1001" on SELF-DIAG RESULTS. Draw a line on the diagnosis sheet to indicate the possible error circuit.

## NOTE:

- While an error occurred in the past according to SELF-DIAG RESULTS, it is unclear which signal is not received. Assume that errors were detected from all reception items.
- Draw a single line among the unit and all reception items. (Work flow differs from CAN DIAG SUPPORT MNTR (with PAST).)

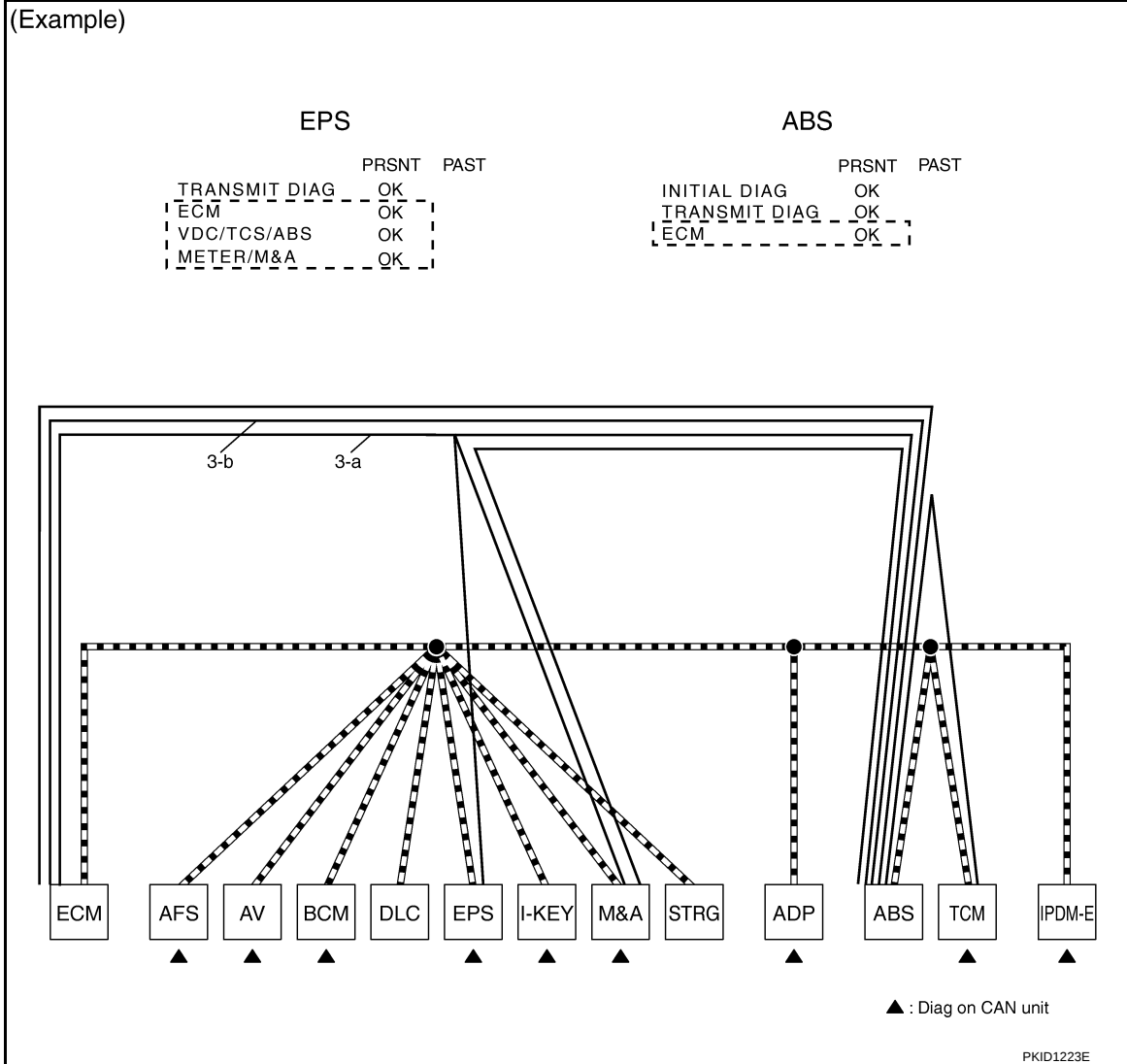
- a. Reception item of "EPS": Assume that the unit could not receive the signals from ECM, ABS, and M&A. Draw a line among EPS, ECM, ABS, and M&A (line 3-a in the figure below).

# TROUBLE DIAGNOSES WORK FLOW

< SERVICE INFORMATION >

[CAN FUNDAMENTAL]

- b. Reception item of "ABS": Assume that the unit could not receive the signal from ECM. Draw a line between ABS and ECM (line 3-b in the figure below).



4. Search for the possible cause using CAN communication signal chart using information from the interview with the customer.

## NOTE:

For the details of CAN communication signal, refer to [LAN-42, "CAN Communication Signal Chart"](#).

- a. ABS warning lamp turned ON and speedometer did not move: This means that "ABS warning lamp signal" and "Vehicle speed signal" could not communicate between M&A and ABS (4-a in the figure below).

**[CAN FUNDAMENTAL]**

b. The tachometer moved normally: This means that "Engine speed signal" could communicate normally between ECM and M&A (4-b in the figure below).

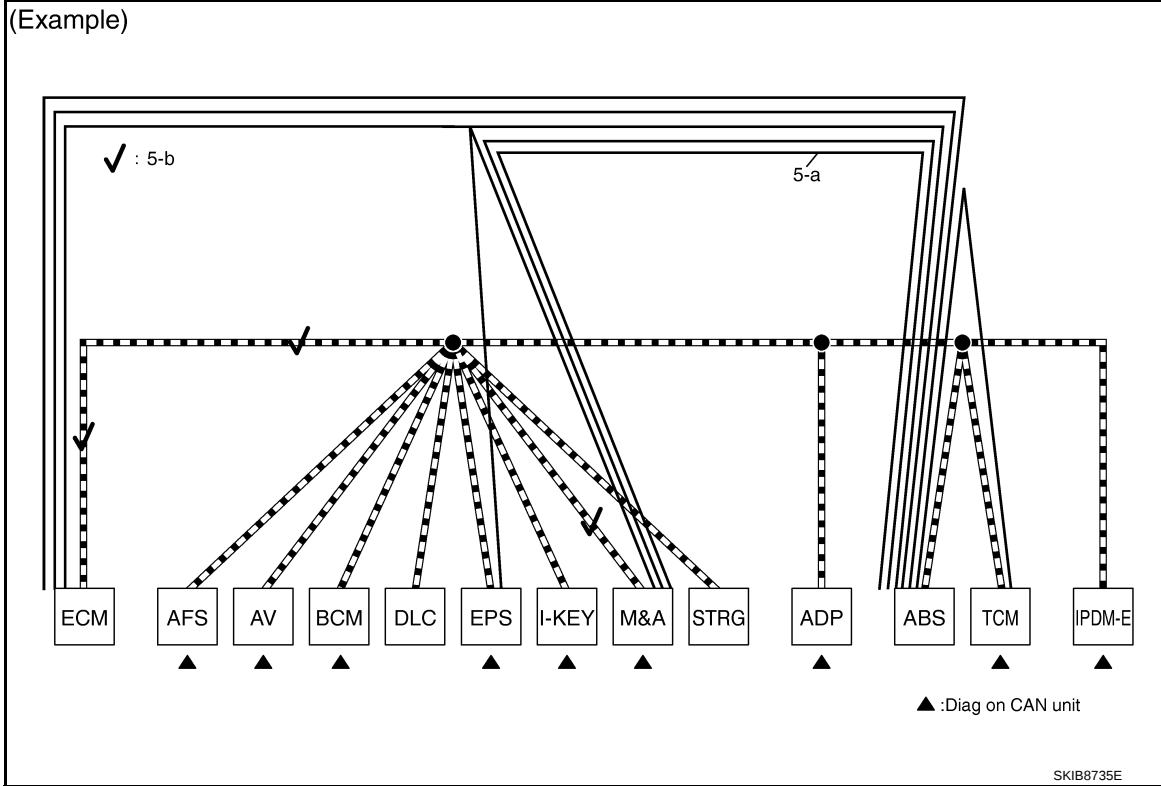
SKIB8895E

# TROUBLE DIAGNOSES WORK FLOW

< SERVICE INFORMATION >

[CAN FUNDAMENTAL]

- b. The tachometer moved normally: Put check marks between ECM and M&A. The circuit between ECM and M&A is functioning properly (check marks 5-b in the figure below).



6. The circuit which has the most amount of lines are the possible cause. Error is detected from ABS actuator and electric unit (control unit) branch line (shaded in the figure below).

## NOTE:

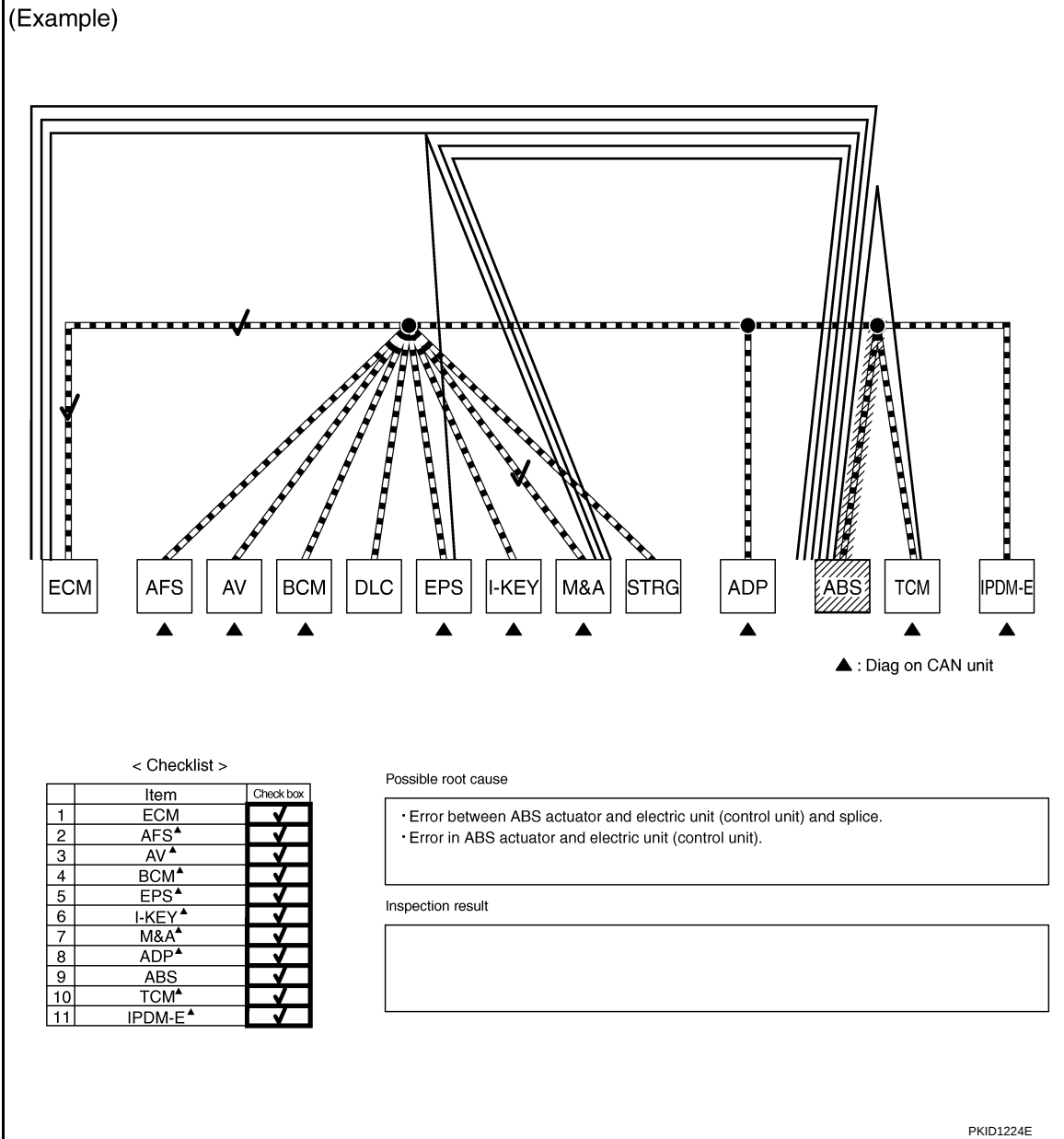
For abbreviations, refer to [LAN-36, "Abbreviation List"](#).

# TROUBLE DIAGNOSES WORK FLOW

< SERVICE INFORMATION >

[CAN FUNDAMENTAL]

- Perform the inspection procedure for the possible cause. Refer to [LAN-57, "Malfunction Area Chart"](#).



Past Error — Short Circuit —

When the symptoms listed below exist, a short circuit of the CAN communication line is a possible cause.

| Item (CONSULT-III)    | Indication                                                                                                            | Inspection procedure                                        |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|
| SELF-DIAG RESULTS     | "U1000" and "U1001" is indicated in the past for most units.                                                          | Refer to <a href="#">LAN-57, "Malfunction Area Chart"</a> . |
| CAN DIAG SUPPORT MNTR | Only on CAN DIAG SUPPORT MNTR (with PAST), "1 - 39" is indicated on "PAST" of "TRANSMIT DIAG" and the reception item. |                                                             |

# TROUBLE DIAGNOSES WORK FLOW

< SERVICE INFORMATION >

[CAN FUNDAMENTAL]

(Example)

| DTC RESULTS              | TIME | DTC RESULTS              | TIME | DTC RESULTS              | TIME | DTC RESULTS              | TIME |
|--------------------------|------|--------------------------|------|--------------------------|------|--------------------------|------|
| ENGINE                   |      | ADAPTIVE LIGHT           |      | MULTI AV                 |      | BCM                      |      |
| U1000 : CAN COMM CIRCUIT | 1t   | U1000 : CAN COMM CIRCUIT | 5    | U1000 : CAN COMM CIRCUIT | 5    | U1000 : CAN COMM CIRCUIT | 5    |
| U1001 : CAN COMM CIRCUIT | 1t   |                          |      |                          |      |                          |      |

| DTC RESULTS              | TIME | DTC RESULTS              | TIME | DTC RESULTS              | TIME | DTC RESULTS              | TIME |
|--------------------------|------|--------------------------|------|--------------------------|------|--------------------------|------|
| EPS                      |      | INTELLIGENT KEY          |      | METER                    |      | AUTO DRIVE POS.          |      |
| U1000 : CAN COMM CIRCUIT | 5    | U1000 : CAN COMM CIRCUIT | 5    | U1000 : CAN COMM CIRCUIT | 5    | U1000 : CAN COMM CIRCUIT | PAST |

"U1000" and "U1001" is indicated in the past for most units.

| ECM           |        |      | AFS           |        |      | AV            |        |      | BCM           |        |      |
|---------------|--------|------|---------------|--------|------|---------------|--------|------|---------------|--------|------|
| TRANSMIT DIAG | PRSENT | PAST | TRANSMIT DIAG | PRSENT | PAST | TRANSMIT DIAG | PRSENT | PAST | TRANSMIT DIAG | PRSENT | PAST |
| VDC/TCS/ABS   | OK     | 5    | ECM           | OK     | 5    | ECM           | OK     | 5    | ECM           | OK     | 5    |
| METER/M&A     | -      | -    | METER/M&A     | OK     | 5    | METER/M&A     | OK     | 5    | METER/M&A     | OK     | 5    |
| BCM/SEC       | OK     | 5    | TCM           | OK     | 5    | BCM/SEC       | -      | -    | TCM           | OK     | 5    |
| ICC           | -      | -    | STRG          | OK     | 5    | HVAC          | -      | -    | MULTI AV      | -      | -    |
| HVAC          | -      | -    | EPS           | -      | -    | IPDM E/R      | -      | -    | IPDM E/R      | OK     | 5    |
| TCM           | OK     | 5    | IPDM E/R      | OK     | 5    | TIRE-P        | -      | -    | I-KEY         | OK     | 5    |
| EPS           | OK     | 5    |               |        |      |               |        |      |               |        |      |
| IPDM E/R      | OK     | 5    |               |        |      |               |        |      |               |        |      |
| e4WD          | -      | -    |               |        |      |               |        |      |               |        |      |
| AWD/4WD       | -      | -    |               |        |      |               |        |      |               |        |      |

Only on CAN DIAG SUPPORT MNTR (with PAST), "1-39" is indicated on "PAST" of "TRANSMIT DIAG" and the reception item.

| EPS           |        |      | I-KEY         |        |      | M&A           |        |      | ADP           |        |      |
|---------------|--------|------|---------------|--------|------|---------------|--------|------|---------------|--------|------|
| TRANSMIT DIAG | PRSENT | PAST | TRANSMIT DIAG | PRSENT | PAST | TRANSMIT DIAG | PRSENT | PAST | TRANSMIT DIAG | PRSENT | PAST |
| ECM           | OK     | 5    | ECM           | OK     | 5    | ECM           | OK     | 5    | ECM           | OK     | 5    |
| VDC/TCS/ABS   | OK     | 5    | METER/M&A     | OK     | 5    | TCM           | OK     | 5    | BCM/SEC       | OK     | 5    |
| METER/M&A     | OK     | 5    |               |        |      | BCM/SEC       | OK     | 5    | TCM           | OK     | 5    |
|               |        |      |               |        |      | VDC/TCS/ABS   | OK     | 5    |               |        |      |
|               |        |      |               |        |      | IPDM E/R      | -      | -    |               |        |      |
|               |        |      |               |        |      |               | -      | -    |               |        |      |
|               |        |      |               |        |      |               | OK     | 5    |               |        |      |

PKID1225E

SERVICE INFORMATION

INDEX FOR DTC

DTC No. Index

INFOID:0000000001647579

| DTC   | Self-diagnosis item<br>(CONSULT-III indication) | DTC detection condition                                                                                                               | Inspection                                                                           |
|-------|-------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| U1000 | CAN COMM CIRCUIT                                | When ECM is not transmitting or receiving CAN communication signal of OBD (emission-related diagnosis) for 2 seconds or more.         | Refer to <a href="#">LAN-36</a> .                                                    |
|       |                                                 | When a control unit (except for ECM) is not transmitting or receiving CAN communication signal for 2 seconds or more.                 |                                                                                      |
| U1001 | CAN COMM CIRCUIT                                | When ECM is not transmitting or receiving CAN communication signal other than OBD (emission-related diagnosis) for 2 seconds or more. |                                                                                      |
| U1002 | SYSTEM COMM                                     | When a control unit is not transmitting or receiving CAN communication signal for 2 seconds or less.                                  | Start the inspection. Refer to the applicable section of the indicated control unit. |
| U1010 | CONTROL UNIT [CAN]                              | When an error is detected during the initial diagnosis for CAN controller of each control unit.                                       | Replace the control unit indicating "U1010".                                         |

## HOW TO USE THIS SECTION

< SERVICE INFORMATION >

[CAN]

### HOW TO USE THIS SECTION

#### Caution

INFOID:0000000001647580

- This section describes information peculiar to a vehicle, sheets for trouble diagnosis, and inspection procedures.
- For trouble diagnosis procedure, refer to [LAN-13, "Trouble Diagnosis Procedure"](#).

#### Abbreviation List

INFOID:0000000001647581

Abbreviations in CAN communication signal chart, and the diagnosis sheet are as per the following list.

| Abbreviation | Unit name                                     | SELECT SYSTEM<br>(CONSULT-III) | CAN DIAG SUPPORT MNTR<br>(CONSULT-III) |
|--------------|-----------------------------------------------|--------------------------------|----------------------------------------|
| A-BAG        | Air bag diagnosis sensor unit                 | AIR BAG                        | —                                      |
| ABS          | ABS actuator and electric unit (control unit) | ABS                            | VDC/TCS/ABS                            |
|              | VDC/TCS/ABS control unit                      |                                |                                        |
| BCM          | BCM                                           | BCM                            | BCM/SEC                                |
| DLC          | Data link connector                           | —                              | —                                      |
| ECM          | ECM                                           | ENGINE                         | ECM                                    |
| IPDM-E       | IPDM E/R                                      | IPDM E/R                       | IPDM E/R                               |
| M&A          | Unified meter and A/C amp.                    | METER/M&A                      | METER/M&A                              |
| STRG         | Steering angle sensor                         | —                              | STRG                                   |
| TCM          | TCM                                           | TRANSMISSION                   | TCM                                    |

## PRECAUTIONS

### Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"

INFOID:000000003024035

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 "SUPPLEMENTAL RESTRAINT SYSTEM" and "SEAT BELTS" 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 "SUPPLEMENTAL RESTRAINT SYSTEM".
- 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 WHEN USING POWER TOOLS (AIR OR ELECTRIC) AND HAMMERS

#### **WARNING:**

- When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the ignition ON or engine running, DO NOT use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.
- When using air or electric power tools or hammers, always switch the ignition OFF, disconnect the battery, and wait at least 3 minutes before performing any service.

### Precaution for Battery Service

INFOID:0000000003024036

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.

### Precaution for Trouble Diagnosis

INFOID:0000000001647584

#### **CAUTION:**

- Never apply 7.0 V or more to the measurement terminal.
- Use a tester with open terminal voltage of 7.0 V or less.
- Turn the ignition switch OFF and disconnect the battery cable from the negative terminal when checking the harness.

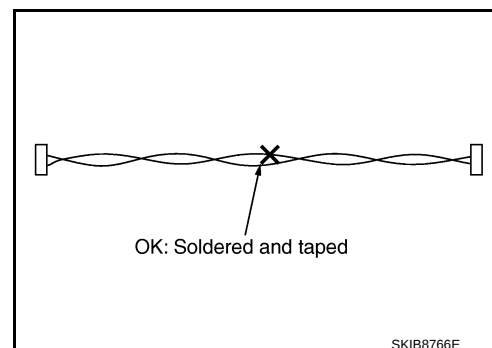
### Precaution for Harness Repair

INFOID:0000000001647585

- Solder the repaired area and wrap tape around the soldered area.

#### **NOTE:**

A fray of twisted lines must be within 110 mm (4.33 in).



## PRECAUTIONS

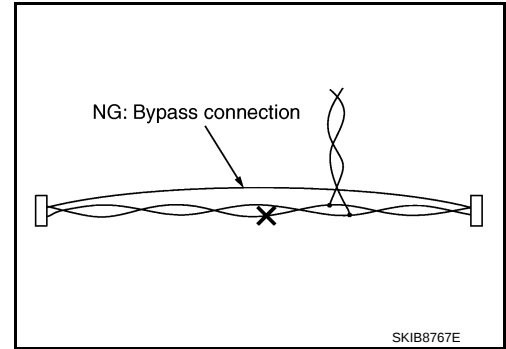
### < SERVICE INFORMATION >

[CAN]

- Bypass connection is never allowed at the repaired area.

**NOTE:**

Bypass connection may cause CAN communication error. The spliced wire becomes separated and the characteristics of twisted line are lost.



- Replace the applicable harness as an assembly if error is detected on the shield lines of CAN communication line.

# TROUBLE DIAGNOSIS

< SERVICE INFORMATION >

[CAN]

## TROUBLE DIAGNOSIS

### CAN Diagnostic Support Monitor

INFOID:000000001647586

Use “CAN DIAG SUPPORT MNTR” for detecting the root cause.

#### MONITOR ITEM LIST (CONSULT-III)

##### ECM

0: Error at present, 1 – 39: Error in the past (Number means the number of times the ignition switch is turned OFF→ON)

| ITEM | CAN DIAG SUP-<br>PORT MNTR | Description                                                                              | Normal |                     | Error |      |
|------|----------------------------|------------------------------------------------------------------------------------------|--------|---------------------|-------|------|
|      |                            |                                                                                          | PRSNT  | PAST                | PRSNT | PAST |
| ECM  | TRANSMIT DIAG              | Signal transmission status                                                               | OK     | OK<br>or<br>1 – 39* | UNKWN | 0    |
|      | VDC/TCS/ABS                | With VDC: Signal receiving status from the VDC/TCS/ABS control unit                      |        |                     |       |      |
|      |                            | With TCS: Signal receiving status from the ABS actuator and electric unit (control unit) |        |                     |       |      |
|      |                            | With ABS: Not used even though indicated                                                 |        |                     |       |      |
|      | METER/M&A                  | Signal receiving status from the unified meter and A/C amp.                              | OK     | OK<br>or<br>1 – 39* | UNKWN | 0    |
|      | BCM/SEC                    | Signal receiving status from the BCM                                                     |        |                     |       |      |
|      | ICC                        | Not used even though indicated                                                           |        |                     |       |      |
|      | HVAC                       |                                                                                          |        |                     |       |      |
|      | TCM                        | Signal receiving status from the TCM                                                     | OK     | OK<br>or<br>1 – 39* | UNKWN | 0    |
|      | EPS                        | Not used even though indicated                                                           |        |                     |       |      |
|      | IPDM E/R                   | Signal receiving status from the IPDM E/R                                                | OK     | OK<br>or<br>1 – 39* | UNKWN | 0    |
|      | e4WD                       | Not used even though indicated                                                           |        |                     |       |      |
|      | AWD/4WD                    |                                                                                          |        |                     |       |      |

\*: 39 or higher number is fixed at 39 until the self-diagnosis result is erased.

##### VDC/TCS/ABS Control Unit

| ITEM | CAN DIAG SUP-<br>PORT MNTR | Description                                                 | Normal | Error                 |
|------|----------------------------|-------------------------------------------------------------|--------|-----------------------|
|      |                            |                                                             | PRSNT  |                       |
| ABS  | INITIAL DIAG               | Status of CAN controller                                    | OK     | NG <sup>Caution</sup> |
|      | TRANSMIT DIAG              | Signal transmission status                                  |        | UNKWN                 |
|      | ECM                        | Signal receiving status from the ECM                        |        |                       |
|      | TCM                        | Signal receiving status from the TCM                        |        |                       |
|      | METER/M&A                  | Signal receiving status from the unified meter and A/C amp. |        |                       |
|      | STRG                       | Signal receiving status from the steering angle sensor      |        |                       |

#### CAUTION:

Never replace the unit even when “NG” is indicated on the “INITIAL DIAG” at this stage. Follow the trouble diagnosis procedures.

##### TCM

#### NOTE:

Replace the unit when “NG” is indicated on the “INITIAL DIAG”.

# TROUBLE DIAGNOSIS

< SERVICE INFORMATION >

[CAN]

| ITEM | CAN DIAG SUP-<br>PORT MNTR | Description                                                                                 | Normal | Error |
|------|----------------------------|---------------------------------------------------------------------------------------------|--------|-------|
|      |                            |                                                                                             | PRSNT  |       |
| TCM  | INITIAL DIAG               | Status of CAN controller                                                                    | OK     | NG    |
|      | TRANSMIT DIAG              | Signal transmission status                                                                  |        | UNKWN |
|      | ECM                        | Signal receiving status from the ECM                                                        |        |       |
|      | VDC/TCS/ABS                | With VDC: Signal receiving status from the VDC/TCS/ABS control unit                         |        |       |
|      |                            | Without VDC: Signal receiving status from the ABS actuator and electric unit (control unit) |        |       |
|      | METER/M&A                  | Signal receiving status from the unified meter and A/C amp.                                 |        |       |
|      | ICC/e4WD                   | Not used even though indicated                                                              |        |       |
|      | AWD/4WD                    |                                                                                             |        |       |

BCM

**NOTE:**

Replace the unit when “NG” is indicated on the “INITIAL DIAG”.

| ITEM | CAN DIAG SUP-<br>PORT MNTR | Description                                                 | Normal | Error |
|------|----------------------------|-------------------------------------------------------------|--------|-------|
|      |                            |                                                             | PRSNT  |       |
| BCM  | INITIAL DIAG               | Status of CAN controller                                    | OK     | NG    |
|      | TRANSMIT DIAG              | Signal transmission status                                  |        | UNKWN |
|      | ECM                        | Signal receiving status from the ECM                        |        |       |
|      | IPDM E/R                   | Signal receiving status from the IPDM E/R                   |        |       |
|      | METER/M&A                  | Signal receiving status from the unified meter and A/C amp. |        |       |
|      | I-KEY                      | Not used even though indicated                              |        |       |

Unified Meter and A/C Amp.

0: Error at present, 1 – 39: Error in the past (Number means the number of times the ignition switch is turned OFF→ON)

| ITEM | CAN DIAG SUP-<br>PORT MNTR | Description                                                                                 | Normal |                     | Error |      |
|------|----------------------------|---------------------------------------------------------------------------------------------|--------|---------------------|-------|------|
|      |                            |                                                                                             | PRSNT  | PAST                | PRSNT | PAST |
| M&A  | TRANSMIT DIAG              | Signal transmission status                                                                  | OK     | OK<br>or<br>1 – 39* | UNKWN | 0    |
|      | ECM                        | Signal receiving status from the ECM                                                        |        |                     |       |      |
|      | TCM                        | Signal receiving status from the TCM                                                        |        |                     |       |      |
|      | BCM/SEC                    | Signal receiving status from the BCM                                                        |        |                     |       |      |
|      | VDC/TCS/ABS                | With VDC: Signal receiving status from the VDC/TCS/ABS control unit                         |        |                     |       |      |
|      |                            | Without VDC: Signal receiving status from the ABS actuator and electric unit (control unit) |        |                     |       |      |
|      | IPDM E/R                   | Not used even though indicated                                                              |        |                     |       |      |
|      | DISPLAY                    |                                                                                             |        |                     |       |      |
|      | I-KEY                      |                                                                                             |        |                     |       |      |
|      | EPS                        |                                                                                             |        |                     |       |      |
|      | AWD/4WD                    |                                                                                             |        |                     |       |      |
|      | e4WD                       |                                                                                             |        |                     |       |      |
|      | ICC                        |                                                                                             |        |                     |       |      |
|      | LANE KEEP                  |                                                                                             |        |                     |       |      |
|      | TIRE-P                     |                                                                                             |        |                     |       |      |

\*: 39 or higher number is fixed at 39 until the self-diagnosis result is erased.

# TROUBLE DIAGNOSIS

## < SERVICE INFORMATION >

[CAN]

### ABS Actuator and Electric Unit (Control Unit)

Models with ABS

| ITEM | CAN DIAG SUP-PORT MNTR | Description                          | Normal | Error                 |
|------|------------------------|--------------------------------------|--------|-----------------------|
|      |                        |                                      | PRSNT  |                       |
| ABS  | INITIAL DIAG           | Status of CAN controller             | OK     | NG <sup>Caution</sup> |
|      | TRANSMIT DIAG          | Signal transmission status           |        | UNKWN                 |
|      | ECM                    | Signal receiving status from the ECM |        |                       |

#### CAUTION:

Never replace the unit even when “NG” is indicated on the “INITIAL DIAG” at this stage. Follow the trouble diagnosis procedures.

Models with TCS

| ITEM | CAN DIAG SUP-PORT MNTR | Description                          | Normal | Error                 |
|------|------------------------|--------------------------------------|--------|-----------------------|
|      |                        |                                      | PRSNT  |                       |
| ABS  | INITIAL DIAG           | Status of CAN controller             | OK     | NG <sup>Caution</sup> |
|      | TRANSMIT DIAG          | Signal transmission status           |        | UNKWN                 |
|      | ECM                    | Signal receiving status from the ECM |        |                       |
|      | TCM                    | Signal receiving status from the TCM |        |                       |

#### CAUTION:

Never replace the unit even when “NG” is indicated on the “INITIAL DIAG” at this stage. Follow the trouble diagnosis procedures.

IPDM E/R

0: Error at present, 1 – 39: Error in the past (Number means the number of times the ignition switch is turned OFF→ON)

| ITEM   | CAN DIAG SUP-PORT MNTR | Description                          | Normal |                     | Error |      |
|--------|------------------------|--------------------------------------|--------|---------------------|-------|------|
|        |                        |                                      | PRSNT  | PAST                | PRSNT | PAST |
| IPDM-E | TRANSMIT DIAG          | Signal transmission status           | OK     | OK<br>or<br>1 – 39* | UNKWN | 0    |
|        | ECM                    | Signal receiving status from the ECM |        |                     |       |      |
|        | BCM/SEC                | Signal receiving status from the BCM |        |                     |       |      |

\*: 39 or higher number is fixed at 39 until the self-diagnosis result is erased.

## CAN System Specification Chart

INFOID:000000001647587

Determine CAN system type from the following specification chart. Then choose the correct diagnosis sheet.

#### NOTE:

Refer to [LAN-13. "Trouble Diagnosis Procedure"](#) for how to use CAN system specification chart.

|                                |                        |                        |                        |                        |                        |
|--------------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| Body type                      | Coupe/Roadster         |                        |                        |                        |                        |
| Axle                           | 2WD                    |                        |                        |                        |                        |
| Engine                         | VQ35HR                 |                        |                        |                        |                        |
| Transmission                   | M/T                    |                        | A/T                    | M/T                    | A/T                    |
| Brake control                  | ABS                    | TCS                    |                        | VDC                    |                        |
| CAN system type                | 1                      | 2                      | 3                      | 4                      | 5                      |
| Diagnosis sheet                | <a href="#">LAN-52</a> | <a href="#">LAN-53</a> | <a href="#">LAN-54</a> | <a href="#">LAN-55</a> | <a href="#">LAN-56</a> |
| CAN communication signal chart | “TYPE 1”               | “TYPE 2/TYPE 3”        |                        | “TYPE 4/TYPE 5”        |                        |

## VEHICLE EQUIPMENT IDENTIFICATION INFORMATION

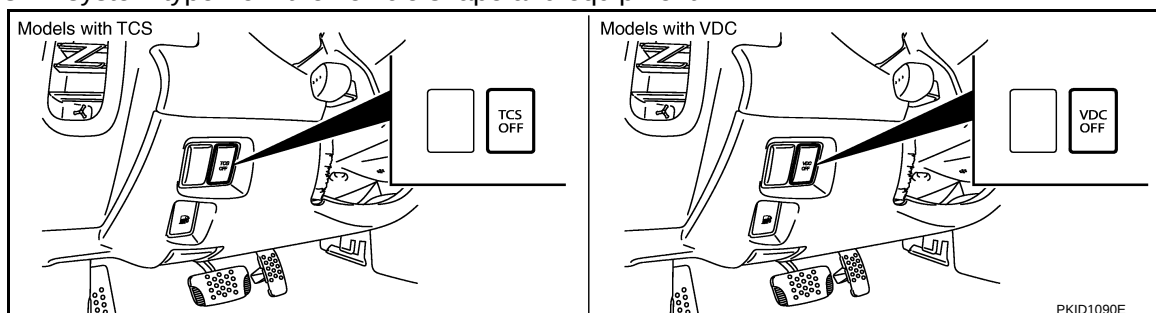
#### NOTE:

# TROUBLE DIAGNOSIS

< SERVICE INFORMATION >

[CAN]

Check CAN system type from the vehicle shape and equipment.



## CAN Communication Signal Chart

INFOID:0000000001647588

Refer to [LAN-12. "How to Use CAN Communication Signal Chart"](#) for how to use CAN communication signal chart.

### TYPE 1

#### NOTE:

Refer to [LAN-36. "Abbreviation List"](#) for the abbreviations of the connecting units.

T: Transmit R: Receive

| Signal name/Connecting unit           | ECM | BCM | M&A | ABS | IPDM-E |
|---------------------------------------|-----|-----|-----|-----|--------|
| A/C compressor feedback signal        | T   |     | R   |     |        |
| A/C compressor request signal         | T   |     |     |     | R      |
| Accelerator pedal position signal     | T   |     |     | R   |        |
| ASCD CRUISE lamp signal               | T   |     | R   |     |        |
| ASCD SET lamp signal                  | T   |     | R   |     |        |
| Cooling fan speed request signal      | T   |     |     |     | R      |
| Engine coolant temperature signal     | T   |     | R   |     |        |
| Engine speed signal                   | T   |     | R   | R   |        |
| Fuel consumption monitor signal       | T   |     | R   |     |        |
| Malfunction indicator lamp signal     | T   |     | R   |     |        |
| A/C switch signal                     | R   | T   |     |     |        |
| Blower fan motor switch signal        | R   | T   |     |     |        |
| Buzzer output signal                  |     | T   | R   |     |        |
| Day time running light request signal |     | T   |     |     | R      |
| Door switch signal                    |     | T   | R   |     | R      |
| Front wiper request signal            |     | T   |     |     | R      |
| High beam request signal              |     | T   | R   |     | R      |
| Horn chirp signal                     |     | T   |     |     | R      |
| Ignition switch signal                |     | T   |     |     | R      |
| Low beam request signal               |     | T   |     |     | R      |
| Position lights request signal        |     | T   | R   |     | R      |
| Rear window defogger switch signal    |     | T   |     |     | R      |
| Sleep request 1 signal                |     | T   | R   |     |        |
| Sleep request 2 signal                |     | T   |     |     | R      |
| Theft warning horn request signal     |     | T   |     |     | R      |
| Tire pressure signal                  |     | T   | R   |     |        |
| Turn indicator signal                 |     | T   | R   |     |        |

# TROUBLE DIAGNOSIS

< SERVICE INFORMATION >

[CAN]

| Signal name/Connecting unit         | ECM | BCM | M&A | ABS | IPDM-E |
|-------------------------------------|-----|-----|-----|-----|--------|
| Wake up request 1 signal            |     | T   | R   |     |        |
| Fuel level sensor signal            | R   |     | T   |     |        |
| Seat belt buckle switch signal      |     | R   | T   |     |        |
| Vehicle speed signal                | R   | R   | T   |     |        |
|                                     |     |     | R   | T   |        |
| ABS warning lamp signal             |     |     | R   | T   |        |
| Brake warning lamp signal           |     |     | R   | T   |        |
| Front wiper stop position signal    |     | R   |     |     | T      |
| High beam status signal             | R   |     |     |     | T      |
| Hood switch signal                  |     | R   |     |     | T      |
| Low beam status signal              | R   |     |     |     | T      |
| Rear window defogger control signal | R   |     |     |     | T      |

**NOTE:**

CAN data of the air bag diagnosis sensor unit is not used by usual service work, thus it is omitted.

**TYPE 2/TYPE 3**

**NOTE:**

Refer to [LAN-36. "Abbreviation List"](#) for the abbreviations of the connecting units.

T: Transmit R: Receive

| Signal name/Connecting unit              | ECM | TCM | BCM | M&A | ABS | IPDM-E |
|------------------------------------------|-----|-----|-----|-----|-----|--------|
| A/C compressor feedback signal           | T   |     |     | R   |     |        |
| A/C compressor request signal            | T   |     |     |     |     | R      |
| Accelerator pedal position signal        | T   | R   |     |     | R   |        |
| ASCD CRUISE lamp signal                  | T   |     |     | R   |     |        |
| ASCD OD cancel request signal            | T   | R   |     |     |     |        |
| ASCD operation signal                    | T   | R   |     |     |     |        |
| ASCD SET lamp signal                     | T   |     |     | R   |     |        |
| Battery voltage signal                   | T   | R   |     |     |     |        |
| Closed throttle position signal          | T   | R   |     |     |     |        |
| Cooling fan speed request signal         | T   |     |     |     |     | R      |
| Engine coolant temperature signal        | T   |     |     | R   |     |        |
| Engine and A/T integrated control signal | T   | R   |     |     |     |        |
|                                          | R   | T   |     |     |     |        |
| Engine speed signal                      | T   | R   |     | R   | R   |        |
| Fuel consumption monitor signal          | T   |     |     | R   |     |        |
| Malfunction indicator lamp signal        | T   |     |     | R   |     |        |
| Wide open throttle position signal       | T   | R   |     |     |     |        |
| A/T CHECK indicator lamp signal          |     | T   |     | R   |     |        |
| A/T position indicator signal            |     | T   |     | R   | R   |        |
| A/T self-diagnosis signal                | R   | T   |     |     |     |        |
| Input speed signal                       | R   | T   |     |     |     |        |
| Manual mode gear position signal         |     | T   |     | R   |     |        |
| Manual mode indicator signal             |     | T   |     | R   |     |        |

# TROUBLE DIAGNOSIS

< SERVICE INFORMATION >

[CAN]

| Signal name/Connecting unit             | ECM | TCM | BCM | M&A | ABS | IPDME |
|-----------------------------------------|-----|-----|-----|-----|-----|-------|
| Output shaft revolution signal          | R   | T   |     |     |     |       |
| A/C switch signal                       | R   |     | T   |     |     |       |
| Blower fan motor switch signal          | R   |     | T   |     |     |       |
| Buzzer output signal                    |     |     | T   | R   |     |       |
| Day time running light request signal   |     |     | T   |     |     | R     |
| Door switch signal                      |     |     | T   | R   |     | R     |
| Front wiper request signal              |     |     | T   |     |     | R     |
| High beam request signal                |     |     | T   | R   |     | R     |
| Horn chirp signal                       |     |     | T   |     |     | R     |
| Ignition switch signal                  |     |     | T   |     |     | R     |
| Low beam request signal                 |     |     | T   |     |     | R     |
| Position lights request signal          |     |     | T   | R   |     | R     |
| Rear window defogger switch signal      |     |     | T   |     |     | R     |
| Sleep request 1 signal                  |     |     | T   | R   |     |       |
| Sleep request 2 signal                  |     |     | T   |     |     | R     |
| Theft warning horn request signal       |     |     | T   |     |     | R     |
| Tire pressure signal                    |     |     | T   | R   |     |       |
| Turn indicator signal                   |     |     | T   | R   |     |       |
| Wake up request 1 signal                |     |     | T   | R   |     |       |
| Fuel level sensor signal                | R   |     |     | T   |     |       |
| Manual mode shift down signal           |     | R   |     | T   |     |       |
| Manual mode shift up signal             |     | R   |     | T   |     |       |
| Manual mode signal                      |     | R   |     | T   |     |       |
| Not manual mode signal                  |     | R   |     | T   |     |       |
| Seat belt buckle switch signal          |     |     | R   | T   |     |       |
| Stop lamp switch signal                 |     | R   |     | T   |     |       |
| Vehicle speed signal                    | R   | R   | R   | T   |     |       |
|                                         |     |     |     | R   | T   |       |
| A/T shift schedule change demand signal |     | R   |     |     | T   |       |
| ABS operation signal                    |     | R   |     |     | T   |       |
| ABS warning lamp signal                 |     |     |     | R   | T   |       |
| Brake warning lamp signal               |     |     |     | R   | T   |       |
| SLIP indicator lamp signal              |     |     |     | R   | T   |       |
| TCS OFF indicator lamp signal           |     |     |     | R   | T   |       |
| Front wiper stop position signal        |     |     | R   |     |     | T     |
| High beam status signal                 | R   |     |     |     |     | T     |
| Hood switch signal                      |     |     | R   |     |     | T     |
| Low beam status signal                  | R   |     |     |     |     | T     |
| Rear window defogger control signal     | R   |     |     |     |     | T     |

**NOTE:**

CAN data of the air bag diagnosis sensor unit is not used by usual service work, thus it is omitted.

TYPE 4/TYPER 5

**NOTE:**

# TROUBLE DIAGNOSIS

< SERVICE INFORMATION >

[CAN]

Refer to [LAN-36, "Abbreviation List"](#) for the abbreviations of the connecting units.

T: Transmit R: Receive

| Signal name/Connecting unit              | ECM | ABS | TCM | BCM | M&A | STRG | IPDM-E |
|------------------------------------------|-----|-----|-----|-----|-----|------|--------|
| A/C compressor feedback signal           | T   |     |     |     | R   |      |        |
| A/C compressor request signal            | T   |     |     |     |     |      | R      |
| Accelerator pedal position signal        | T   | R   | R   |     |     |      |        |
| ASCD CRUISE lamp signal                  | T   |     |     |     | R   |      |        |
| ASCD OD cancel request signal            | T   |     | R   |     |     |      |        |
| ASCD operation signal                    | T   |     | R   |     |     |      |        |
| ASCD SET lamp signal                     | T   |     |     |     | R   |      |        |
| Battery voltage signal                   | T   |     | R   |     |     |      |        |
| Closed throttle position signal          | T   |     | R   |     |     |      |        |
| Cooling fan speed request signal         | T   |     |     |     |     |      | R      |
| Engine and A/T integrated control signal | T   |     | R   |     |     |      |        |
|                                          | R   |     | T   |     |     |      |        |
| Engine coolant temperature signal        | T   |     |     |     | R   |      |        |
| Engine speed signal                      | T   | R   | R   |     | R   |      |        |
| Fuel consumption monitor signal          | T   |     |     |     | R   |      |        |
| Malfunction indicator lamp signal        | T   |     |     |     | R   |      |        |
| Wide open throttle position signal       | T   |     | R   |     |     |      |        |
| A/T shift schedule change demand signal  |     | T   | R   |     |     |      |        |
| ABS operation signal                     |     | T   | R   |     |     |      |        |
| ABS warning lamp signal                  |     | T   |     |     | R   |      |        |
| Brake warning lamp signal                |     | T   |     |     | R   |      |        |
| SLIP indicator lamp signal               |     | T   |     |     | R   |      |        |
| VDC OFF indicator lamp signal            |     | T   |     |     | R   |      |        |
| Vehicle speed signal                     |     | T   |     |     | R   |      |        |
|                                          | R   |     | R   | R   | T   |      |        |
| A/T CHECK indicator lamp signal          |     |     | T   |     | R   |      |        |
| A/T position indicator signal            |     | R   | T   |     | R   |      |        |
| A/T self-diagnosis signal                | R   |     | T   |     |     |      |        |
| Input speed signal                       | R   |     | T   |     |     |      |        |
| Manual mode gear position signal         |     |     | T   |     | R   |      |        |
| Manual mode indicator signal             |     |     | T   |     | R   |      |        |
| Output shaft revolution signal           | R   |     | T   |     |     |      |        |
| A/C switch signal                        | R   |     |     | T   |     |      |        |
| Blower fan motor switch signal           | R   |     |     | T   |     |      |        |
| Buzzer output signal                     |     |     |     | T   | R   |      |        |
| Day time running light request signal    |     |     |     | T   |     |      | R      |
| Door switch signal                       |     |     |     | T   | R   |      | R      |
| Front wiper request signal               |     |     |     | T   |     |      | R      |
| High beam request signal                 |     |     |     | T   | R   |      | R      |
| Horn chirp signal                        |     |     |     | T   |     |      | R      |
| Ignition switch signal                   |     |     |     | T   |     |      | R      |

# TROUBLE DIAGNOSIS

< SERVICE INFORMATION >

[CAN]

| Signal name/Connecting unit         | ECM | ABS | TCM | BCM | M&A | STRG | IPDM-E |
|-------------------------------------|-----|-----|-----|-----|-----|------|--------|
| Low beam request signal             |     |     |     | T   |     |      | R      |
| Position lights request signal      |     |     |     | T   | R   |      | R      |
| Rear window defogger switch signal  |     |     |     | T   |     |      | R      |
| Sleep request 1 signal              |     |     |     | T   | R   |      |        |
| Sleep request 2 signal              |     |     |     | T   |     |      | R      |
| Theft warning horn request signal   |     |     |     | T   |     |      | R      |
| Tire pressure signal                |     |     |     | T   | R   |      |        |
| Turn indicator signal               |     |     |     | T   | R   |      |        |
| Wake up request 1 signal            |     |     |     | T   | R   |      |        |
| Fuel level sensor signal            | R   |     |     |     | T   |      |        |
| Manual mode shift down signal       |     |     | R   |     | T   |      |        |
| Manual mode shift up signal         |     |     | R   |     | T   |      |        |
| Manual mode signal                  |     |     | R   |     | T   |      |        |
| Not manual mode signal              |     |     | R   |     | T   |      |        |
| Seat belt buckle switch signal      |     |     |     | R   | T   |      |        |
| Stop lamp switch signal             |     |     | R   |     | T   |      |        |
| Steering angle sensor signal        |     | R   |     |     |     | T    |        |
| Front wiper stop position signal    |     |     |     | R   |     |      | T      |
| High beam status signal             | R   |     |     |     |     |      | T      |
| Hood switch signal                  |     |     |     | R   |     |      | T      |
| Low beam status signal              | R   |     |     |     |     |      | T      |
| Rear window defogger control signal | R   |     |     |     |     |      | T      |

## NOTE:

CAN data of the air bag diagnosis sensor unit is not used by usual service work, thus it is omitted.

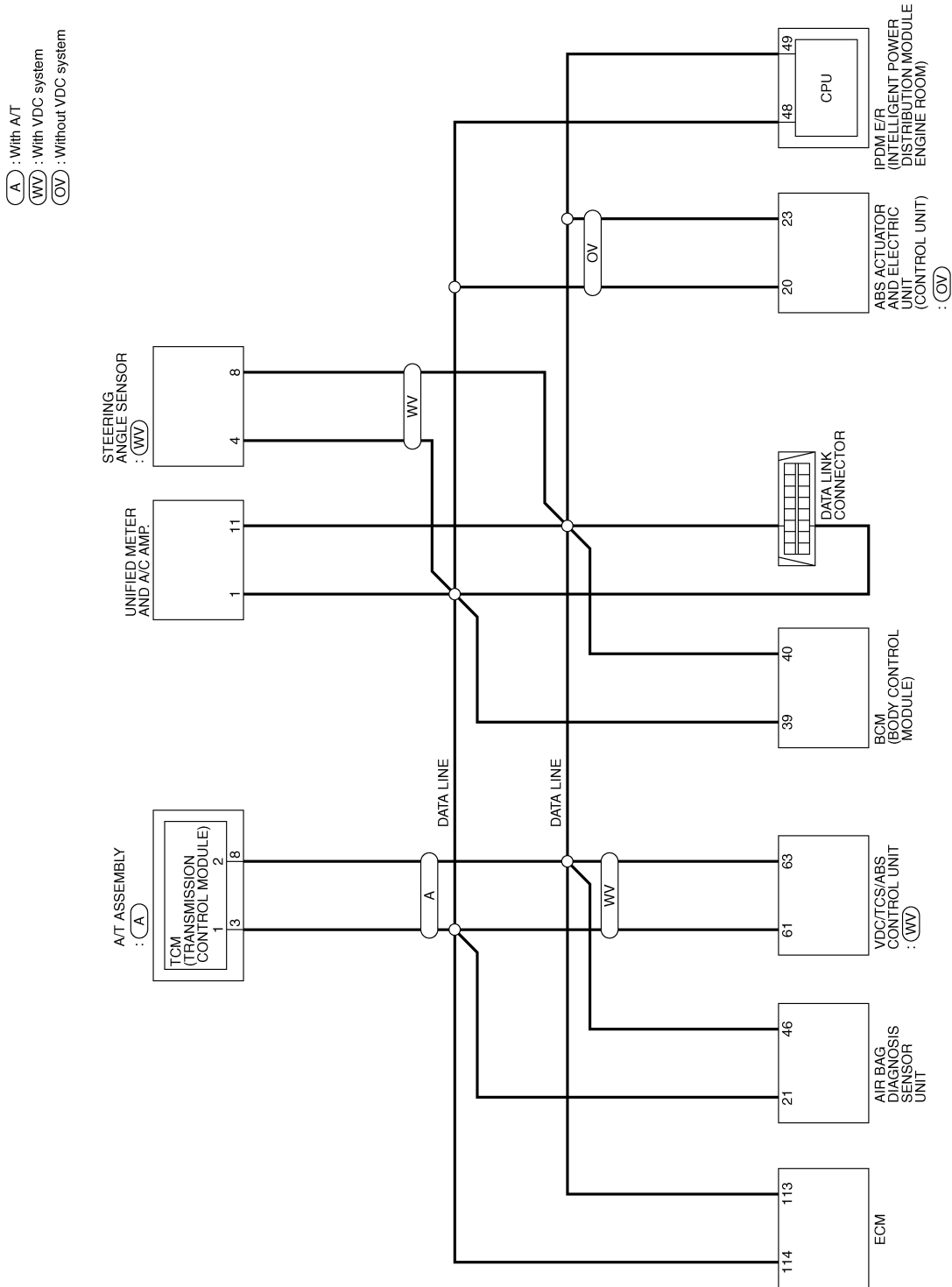
# TROUBLE DIAGNOSIS

< SERVICE INFORMATION >

[CAN]

## Schematic

INFOID:000000001647589



TKWT6665E

A  
B  
C  
D  
E  
F  
G  
H  
I  
J  
**LAN**  
L  
M  
N  
O  
P

# TROUBLE DIAGNOSIS

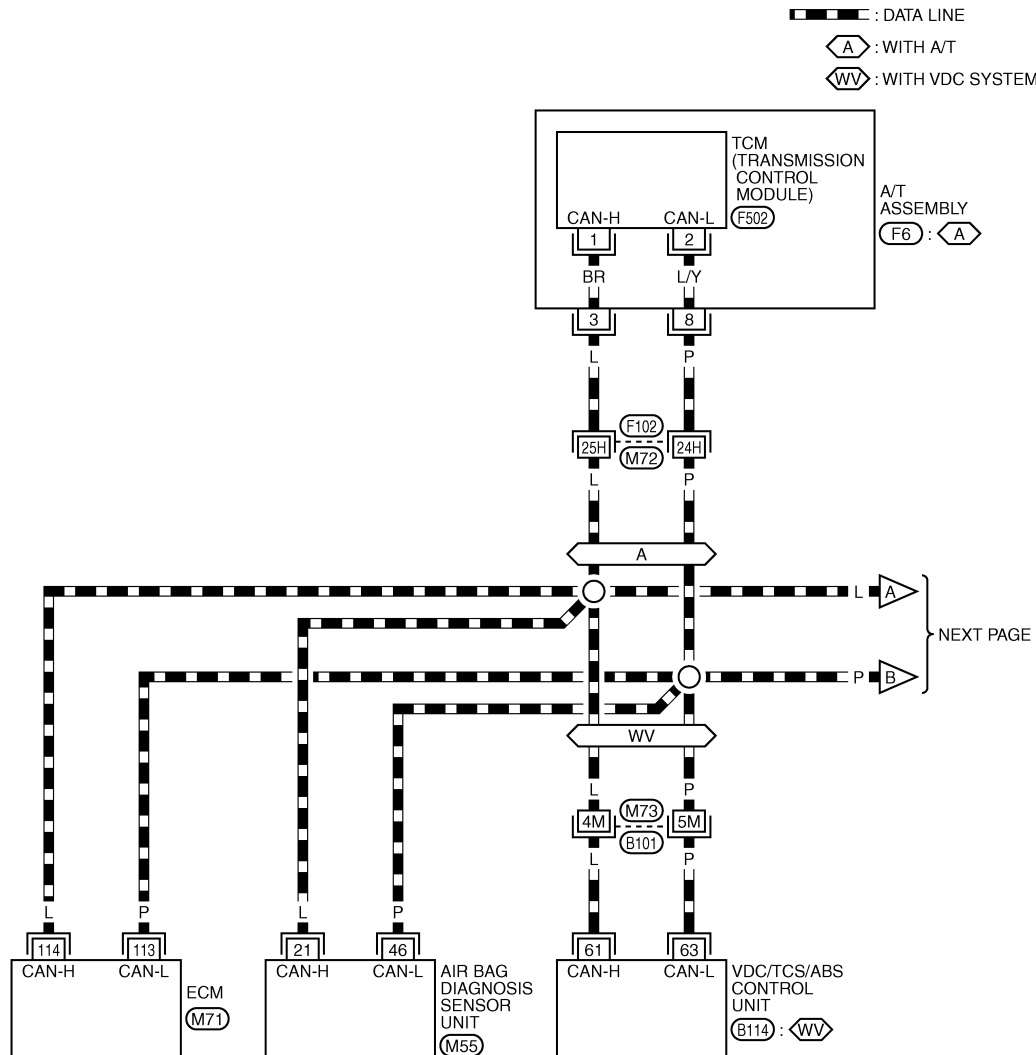
< SERVICE INFORMATION >

[CAN]

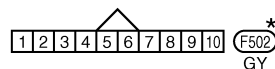
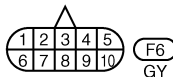
## Wiring Diagram - CAN -

INFOID:000000001647590

### LAN-CAN-01



|   |    |    |    |    |    |
|---|----|----|----|----|----|
| 1 | 49 | 24 | 17 | 21 | 20 |
| 5 | 6  | 4  | 3  | 13 | 45 |
| 2 | 52 | 18 | 50 | 23 | 51 |



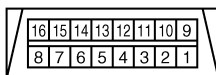
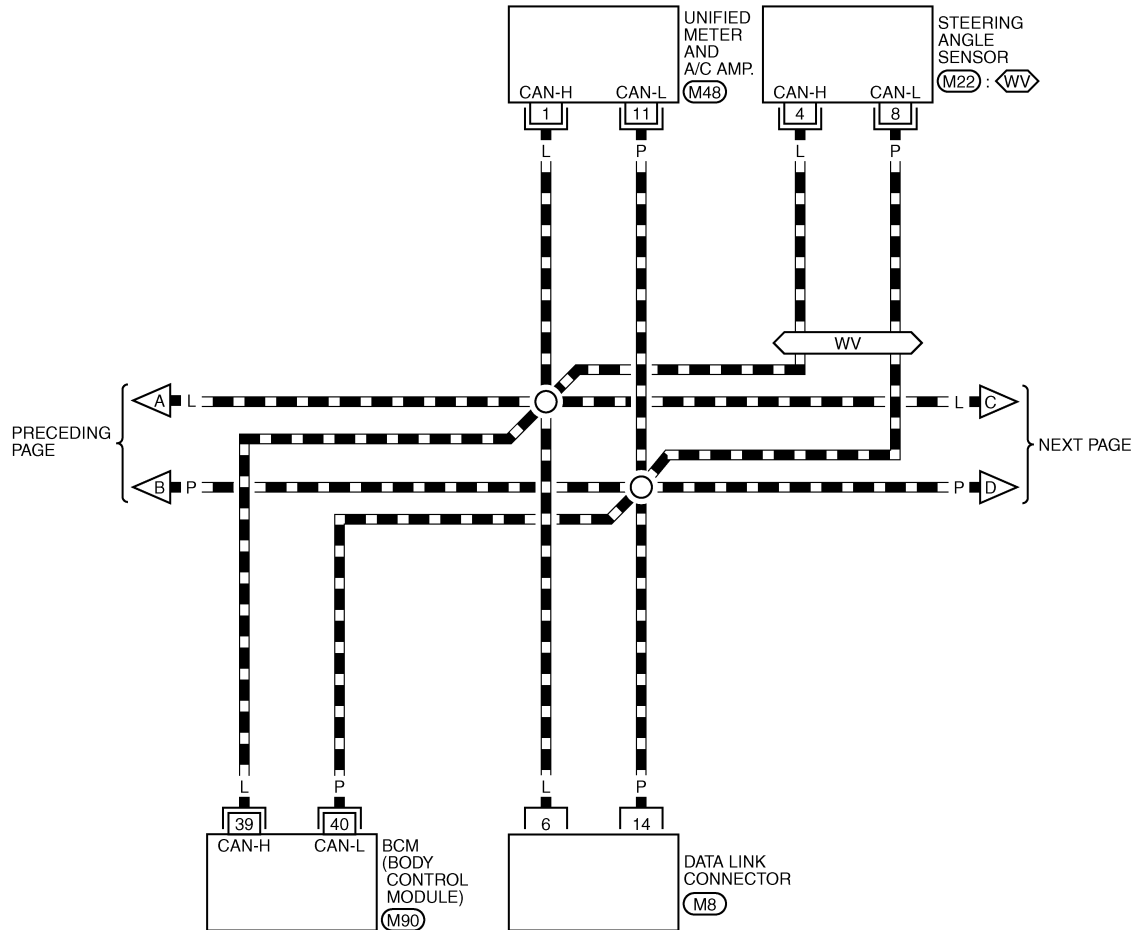
REFER TO THE FOLLOWING.  
 (F102), (B101) -SUPER MULTIPLE JUNCTION (SMJ)  
 (M71), (B114) -ELECTRICAL UNITS

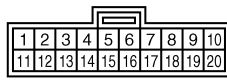
★: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TKWT5781E

## LAN-CAN-02

 : DATA LINE

 : WITH VDC SYSTEM

 M8  
W

 M22  
W

 M48  
GY


REFER TO THE FOLLOWING.

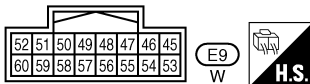
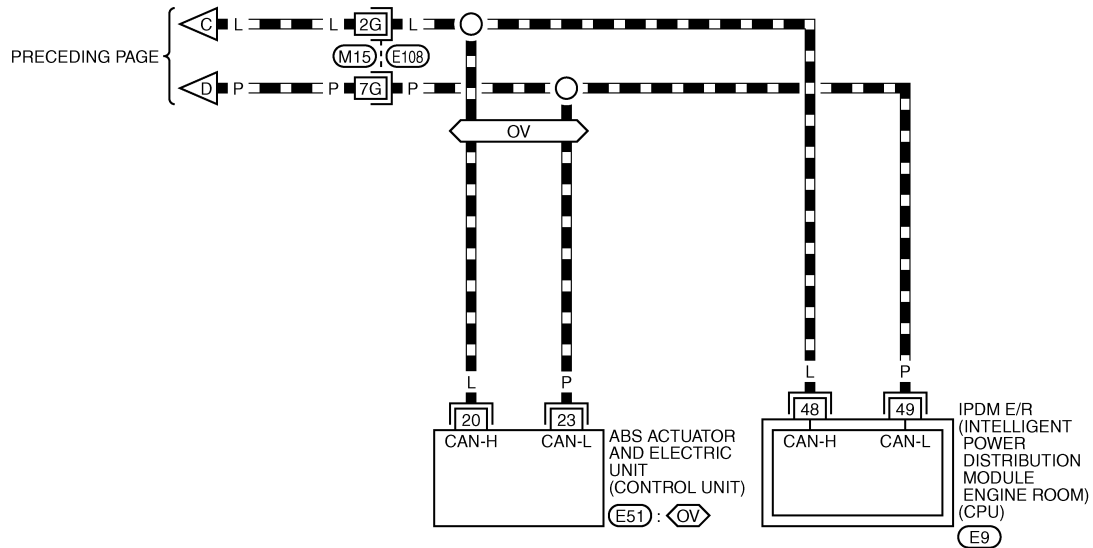
(M90) -ELECTRICAL UNITS

TKWT6666E

 A  
B  
C  
D  
E  
F  
G  
H  
I  
J  
LAN  
L  
M  
N  
O  
P

## LAN-CAN-03

 : DATA LINE  
 : WITHOUT VDC SYSTEM



REFER TO THE FOLLOWING.

(E108) -SUPER MULTIPLE JUNCTION (SMJ)

(E51) -ELECTRICAL UNITS

TKWB4321E

# TROUBLE DIAGNOSIS

< SERVICE INFORMATION >

[CAN]

## Interview Sheet

INFOID:000000001647591

### CAN Communication System Diagnosis Interview Sheet

Date received:

Type:

VIN No.:

Model:

First registration:

Mileage:

CAN system type:

Symptom (Results from interview with customer)

Condition at inspection

Error symptom : Present / Past

SKIB8898E

A  
B  
C  
D  
E  
F  
G  
H  
I  
J  
LAN  
L  
M  
N  
O  
P

# TROUBLE DIAGNOSIS

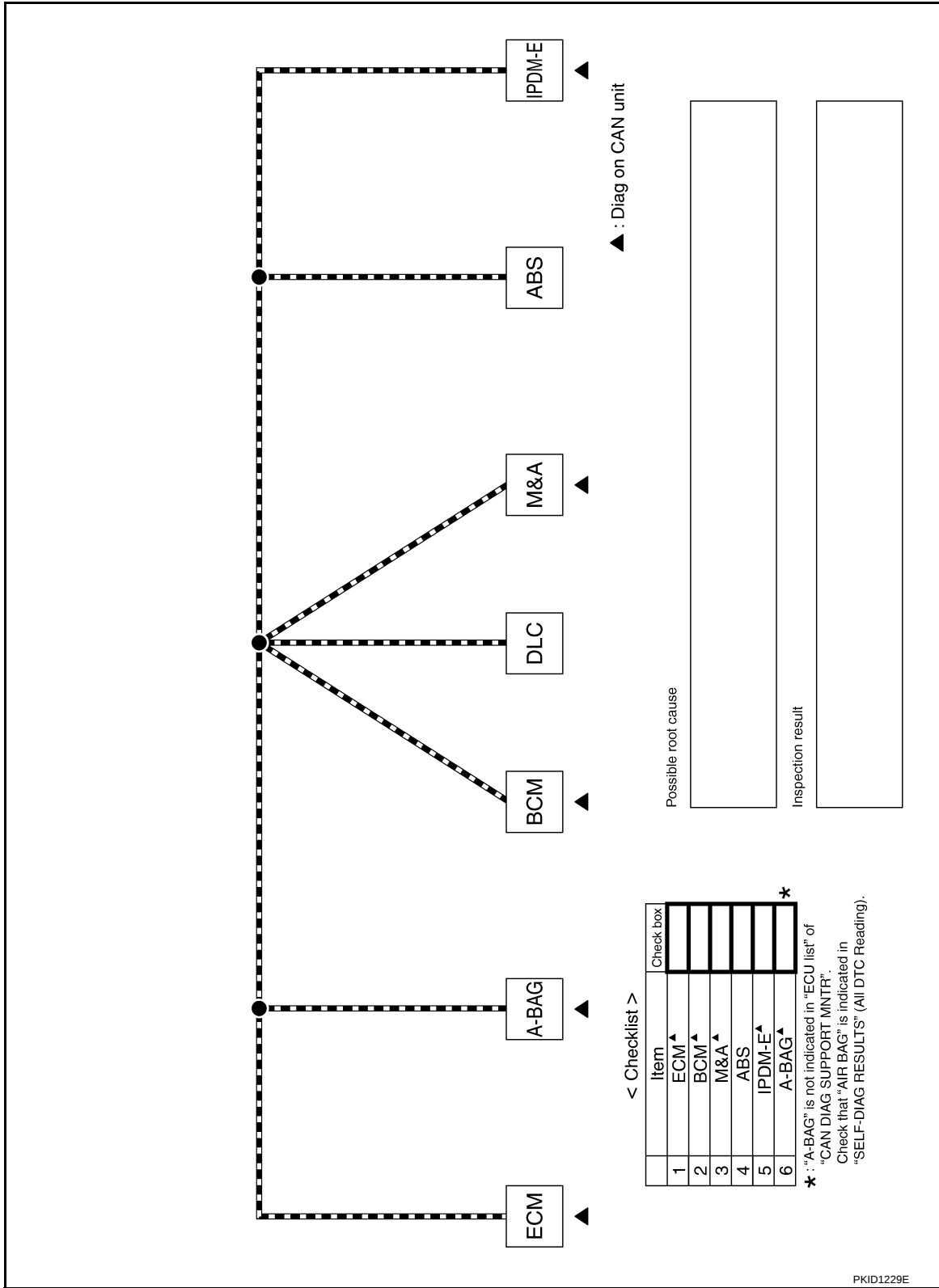
< SERVICE INFORMATION >

[CAN]

CAN System (Type 1)

INFOID:000000001647592

## DIAGNOSIS SHEET

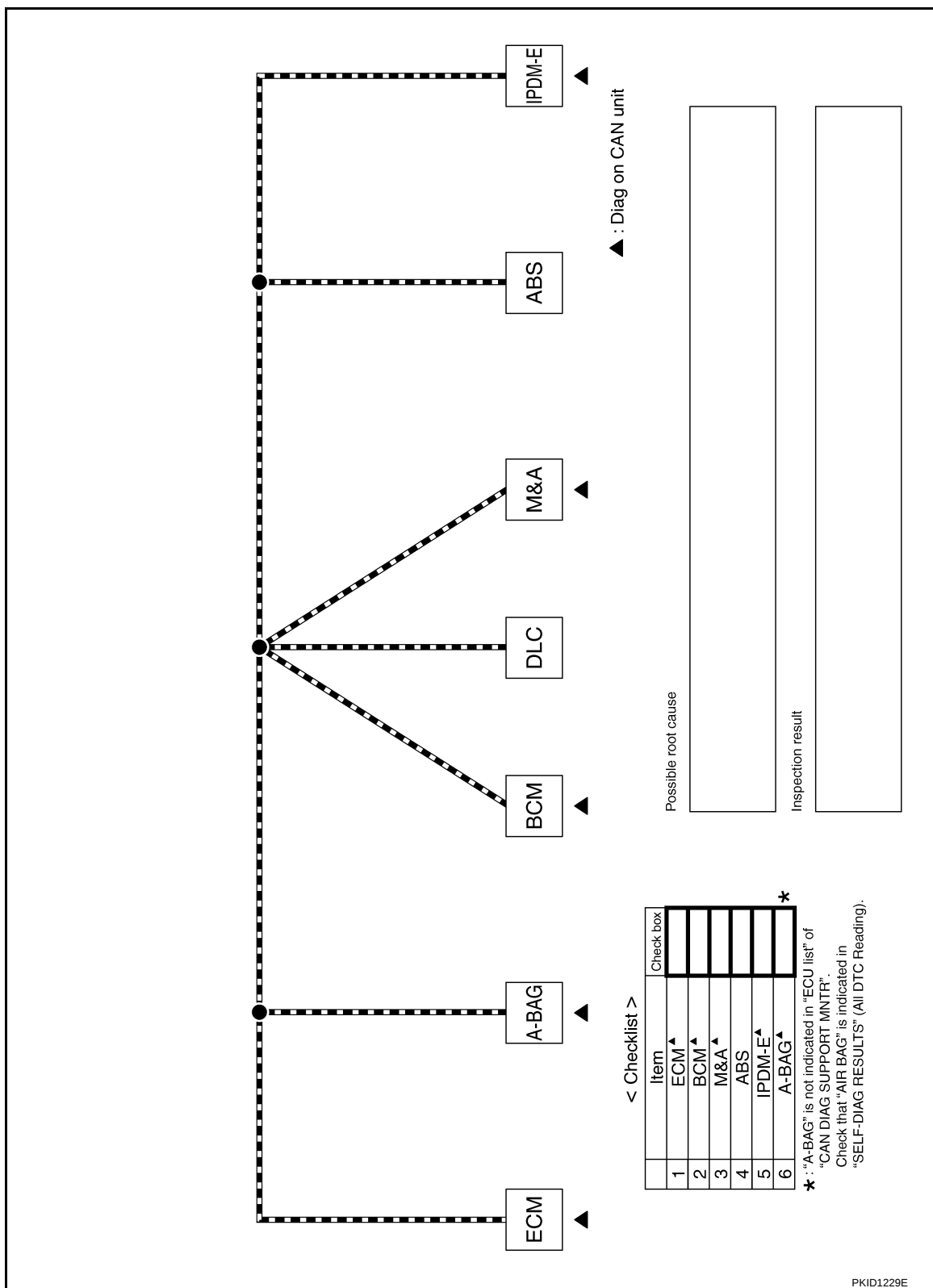


**[CAN]**

INFOID:0000000001647593

## CAN System (Type 2)

## DIAGNOSIS SHEET



A  
B  
C  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M  
N  
O  
P

TROUBLE DIAGNOSIS

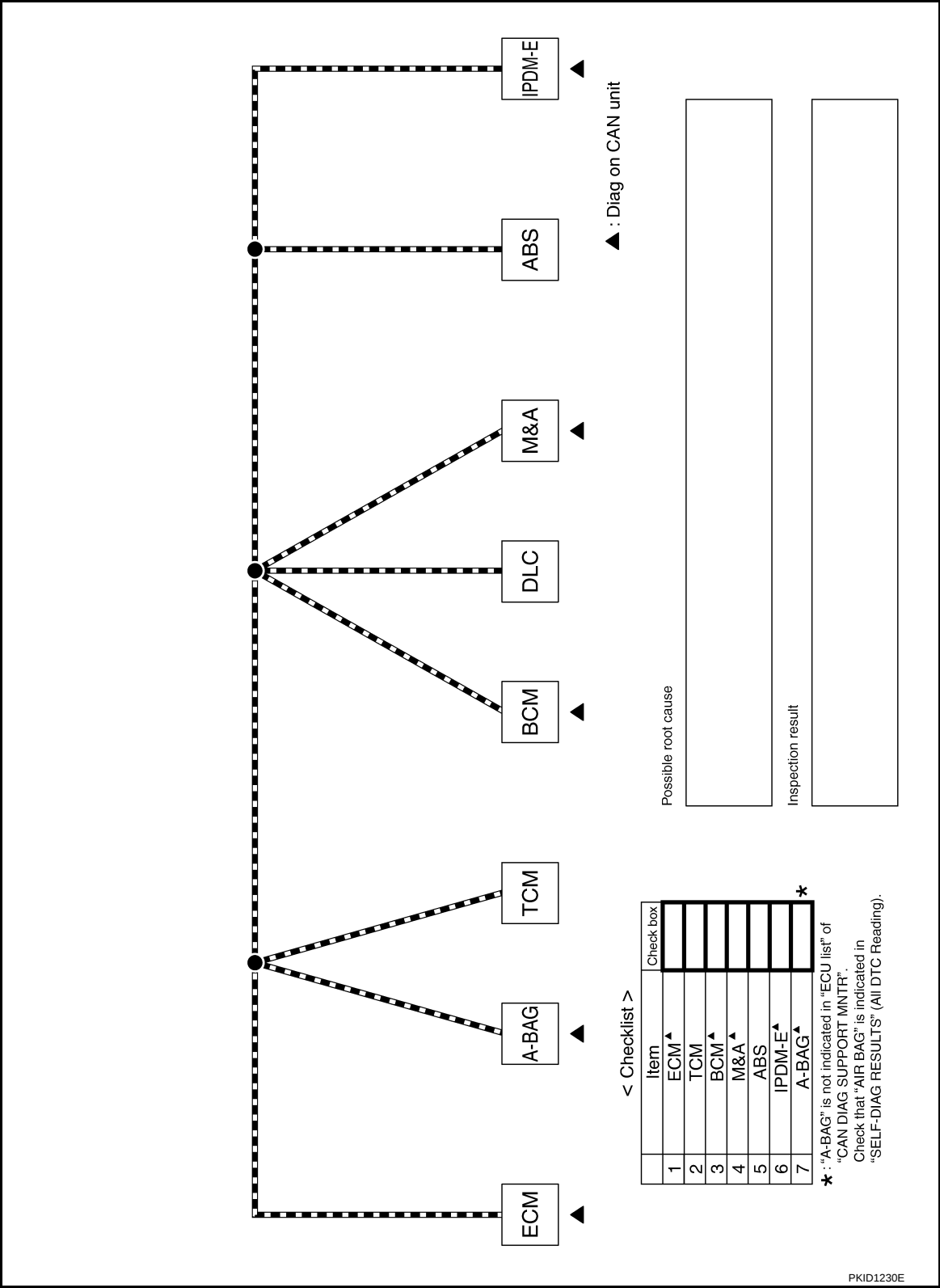
< SERVICE INFORMATION >

CAN System (Type 3)

[CAN]

INFOID:000000001647594

DIAGNOSIS SHEET

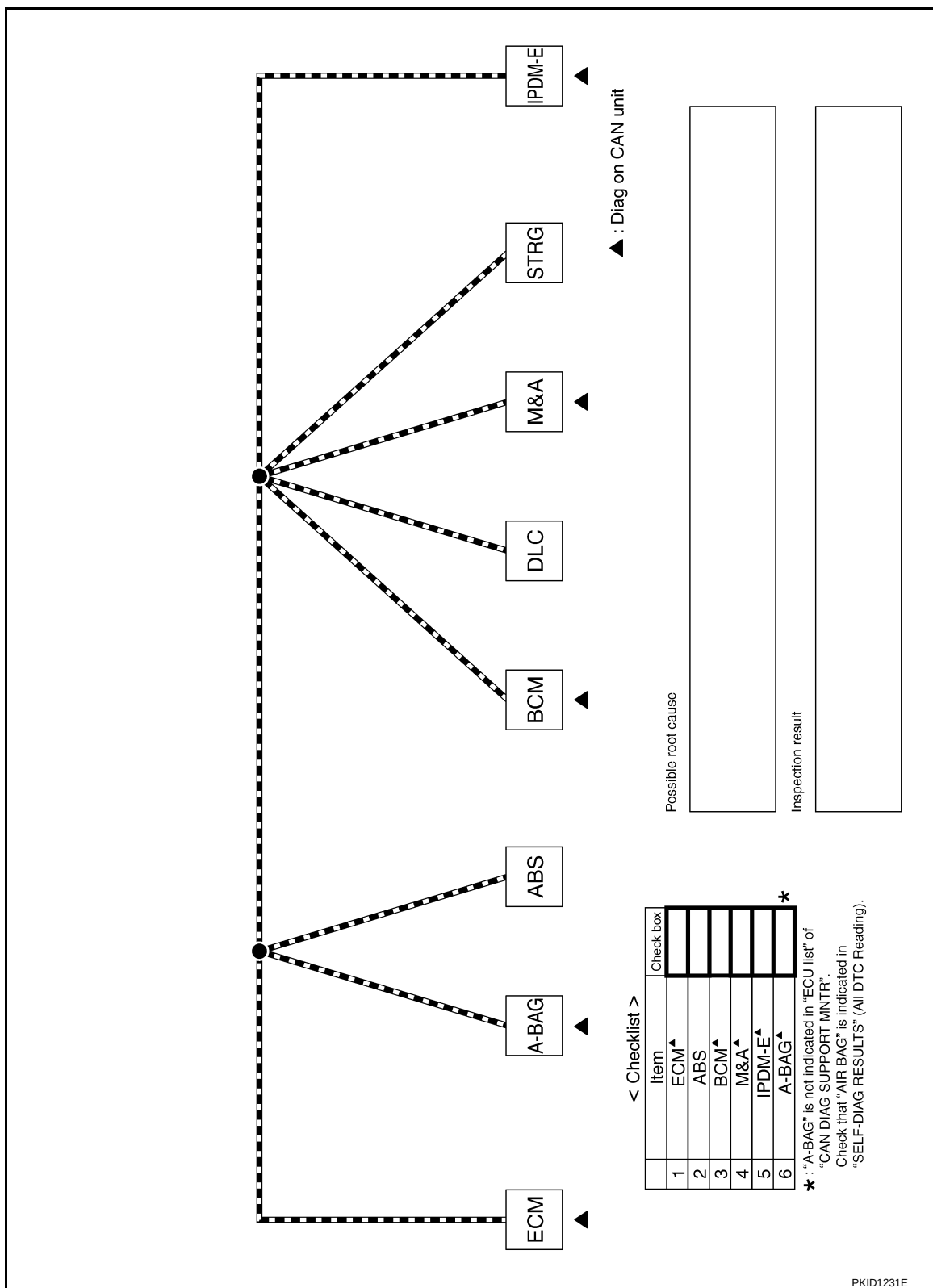


**[CAN]**

INFOID:0000000001647595

## CAN System (Type 4)

## DIAGNOSIS SHEET



A  
B  
C  
D  
E  
F  
G  
H  
I  
J  
LAI  
L  
M  
N  
O  
P

# TROUBLE DIAGNOSIS

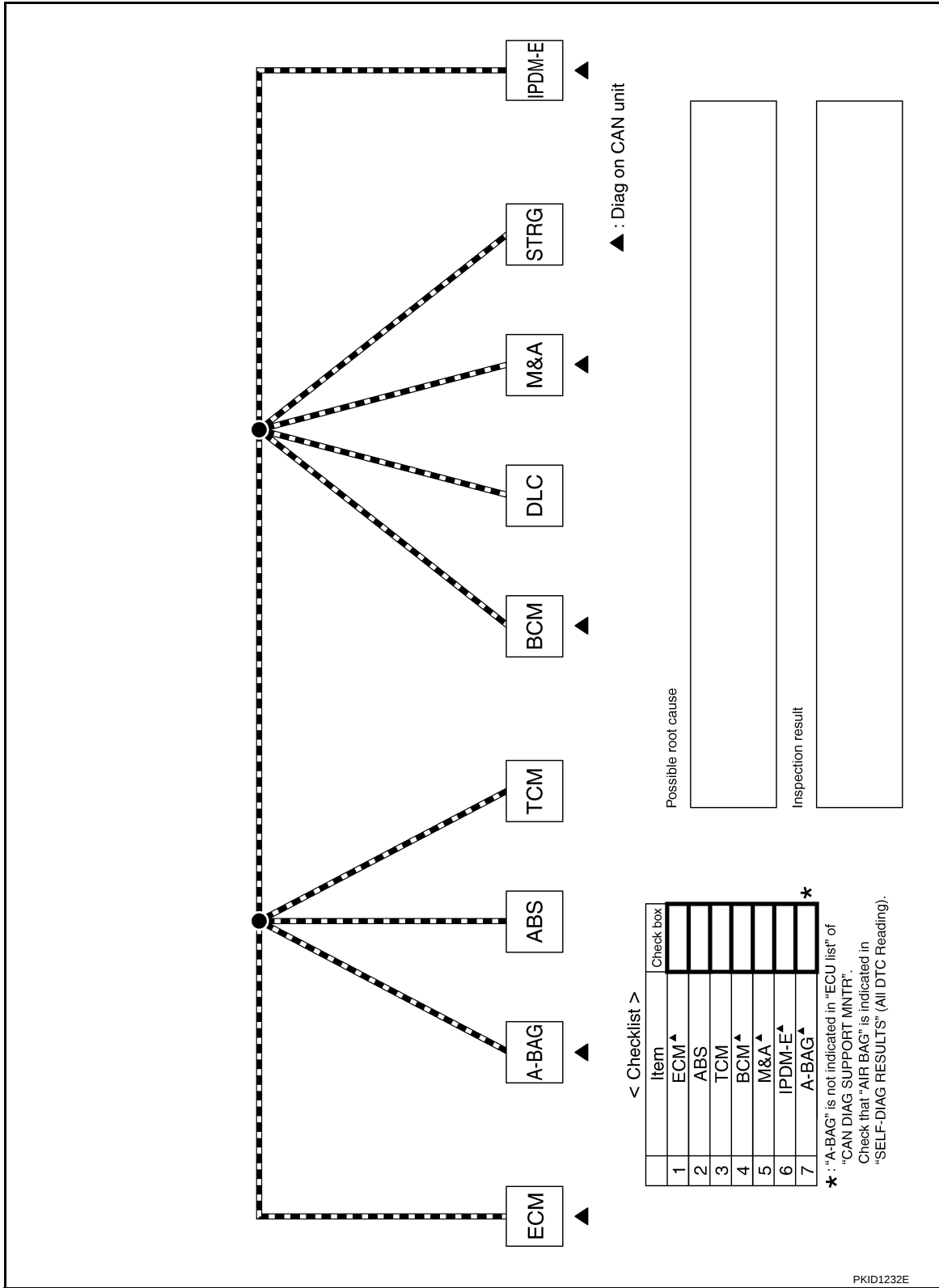
< SERVICE INFORMATION >

[CAN]

CAN System (Type 5)

INFOID:000000001647596

## DIAGNOSIS SHEET



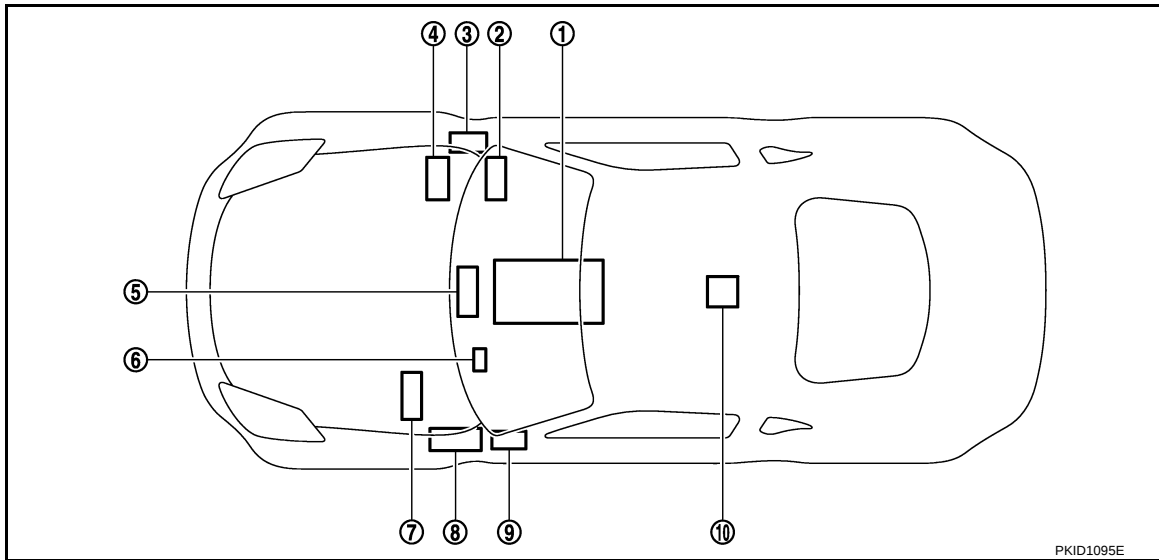
# TROUBLE DIAGNOSIS

< SERVICE INFORMATION >

[CAN]

## Component Parts Location

INFOID:000000001647597



- |                                                      |                                   |                                  |
|------------------------------------------------------|-----------------------------------|----------------------------------|
| 1. A/T assembly F6                                   | 2. ECM M71                        | 3. VDC/TCS/ABS control unit B114 |
| 4. IPDM E/R E9                                       | 5. Unified meter and A/C amp. M48 | 6. Steering angle sensor M22     |
| 7. ABS actuator and electric unit (control unit) E51 | 8. BCM M90                        | 9. Data link connector M8        |
| 10. Air bag diagnosis sensor unit M55                |                                   |                                  |

## Harness Layout

INFOID:000000001647598

Refer to [PG-39, "Harness Layout"](#).

## Malfunction Area Chart

INFOID:000000001647599

### MAIN LINE

| Malfunction Area                                                                        | Reference                                                                                                         |
|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| Main line between VDC/TCS/ABS control unit and data link connector                      | <a href="#">LAN-58, "Main Line Between VDC/TCS/ABS Control Unit and Data Link Connector"</a>                      |
| Main line between TCM and data link connector                                           | <a href="#">LAN-58, "Main Line Between TCM and Data Link Connector"</a>                                           |
| Main line between data link connector and ABS actuator and electric unit (control unit) | <a href="#">LAN-59, "Main Line Between Data Link Connector and ABS Actuator and Electric Unit (Control Unit)"</a> |

### BRANCH LINE

| Malfunction Area                                  | Reference                                                                   |
|---------------------------------------------------|-----------------------------------------------------------------------------|
| ECM branch line circuit                           | <a href="#">LAN-60, "ECM Branch Line Circuit"</a>                           |
| Air bag diagnosis sensor unit branch line circuit | <a href="#">LAN-60, "Air Bag Diagnosis Sensor Unit Branch Line Circuit"</a> |
| VDC/TCS/ABS control unit branch line circuit      | <a href="#">LAN-60, "VDC/TCS/ABS Control Unit Branch Line Circuit"</a>      |
| TCM branch line circuit                           | <a href="#">LAN-61, "TCM Branch Line Circuit"</a>                           |
| BCM branch line circuit                           | <a href="#">LAN-62, "BCM Branch Line Circuit"</a>                           |
| Data link connector branch line circuit           | <a href="#">LAN-62, "Data Link Connector Branch Line Circuit"</a>           |
| Unified meter and A/C amp. branch line circuit    | <a href="#">LAN-63, "Unified Meter and A/C Amp. Branch Line Circuit"</a>    |
| Steering angle sensor branch line circuit         | <a href="#">LAN-63, "Steering Angle Sensor Branch Line Circuit"</a>         |

# TROUBLE DIAGNOSIS

< SERVICE INFORMATION >

[CAN]

| Malfunction Area                                                  | Reference                                                                                   |
|-------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| ABS actuator and electric unit (control unit) branch line circuit | <a href="#">LAN-64, "ABS Actuator and Electric Unit (Control Unit) Branch Line Circuit"</a> |
| IPDM E/R branch line circuit                                      | <a href="#">LAN-64, "IPDM E/R Branch Line Circuit"</a>                                      |

## SHORT CIRCUIT

| Malfunction Area          | Reference                                           |
|---------------------------|-----------------------------------------------------|
| CAN communication circuit | <a href="#">LAN-65, "CAN Communication Circuit"</a> |

## Main Line Between VDC/TCS/ABS Control Unit and Data Link Connector INFOID:000000001647600

### INSPECTION PROCEDURE

#### 1. CHECK HARNESS CONTINUITY (OPEN CIRCUIT)

- Turn the ignition switch OFF.
- Disconnect the battery cable from the negative terminal.
- Disconnect the following harness connectors.
  - ECM
  - Harness connectors B101 and M73
- Check the continuity between the harness connector M73 and the data link connector.

| Harness connector |              | Data link connector |              | Continuity |
|-------------------|--------------|---------------------|--------------|------------|
| Connector No.     | Terminal No. | Connector No.       | Terminal No. |            |
| M73               | 4M           | M8                  | 6            | Yes        |
|                   | 5M           |                     | 14           | Yes        |

#### OK or NG

- OK >> • Present error: Check the following items again.
- Decision of CAN system type.
  - Not received CONSULT-III data [SELF-DIAG RESULTS, CAN DIAG SUPPORT MNTR ("ECU list" included)].
  - Procedure for detecting root cause.
- Past error: Error was detected in the main line between the VDC/TCS/ABS control unit and the data link connector.
- NG >> Repair the main line between the harness connector M73 and the data link connector.

## Main Line Between TCM and Data Link Connector INFOID:000000001647601

### INSPECTION PROCEDURE

#### 1. CHECK HARNESS CONTINUITY (OPEN CIRCUIT)

- Turn the ignition switch OFF.
- Disconnect the battery cable from the negative terminal.
- Disconnect the following harness connectors.
  - ECM
  - Harness connectors F102 and M72
- Check the continuity between the harness connector M72 and the data link connector.

| Harness connector |              | Data link connector |              | Continuity |
|-------------------|--------------|---------------------|--------------|------------|
| Connector No.     | Terminal No. | Connector No.       | Terminal No. |            |
| M72               | 25H          | M8                  | 6            | Yes        |
|                   | 24H          |                     | 14           | Yes        |

#### OK or NG

- OK >> • Present error: Check the following items again.
- Decision of CAN system type.

# TROUBLE DIAGNOSIS

## < SERVICE INFORMATION >

[CAN]

- Not received CONSULT-III data [SELF-DIAG RESULTS, CAN DIAG SUPPORT MNTR ("ECU list" included)].
- Procedure for detecting root cause.
- Past error: Error was detected in the main line between the TCM and the data link connector.

NG >> Repair the main line between the harness connector M72 and the data link connector.

## Main Line Between Data Link Connector and ABS Actuator and Electric Unit (Control Unit)

INFOID:0000000001647602

### INSPECTION PROCEDURE

#### 1.CHECK CONNECTOR

1. Turn the ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check the following terminals and connectors for damage, bend and loose connection (connector side and harness side).
  - Harness connector M15
  - Harness connector E108

#### OK or NG

OK >> GO TO 2.

NG >> Repair the terminal and connector.

#### 2.CHECK HARNESS CONTINUITY (OPEN CIRCUIT)

1. Disconnect the harness connectors M15 and E108.
2. Check the continuity between the data link connector and the harness connector.

| Data link connector |              | Harness connector |              | Continuity |
|---------------------|--------------|-------------------|--------------|------------|
| Connector No.       | Terminal No. | Connector No.     | Terminal No. |            |
| M8                  | 6            | M15               | 2G           | Yes        |
|                     | 14           |                   | 7G           | Yes        |

#### OK or NG

OK >> GO TO 3.

NG >> Repair the main line between the data link connector and the harness connector M15.

#### 3.CHECK HARNESS CONTINUITY (OPEN CIRCUIT)

1. Disconnect the connector of ABS actuator and electric unit (control unit).
2. Check the continuity between the harness connector and the ABS actuator and electric unit (control unit) harness connector.

| Harness connector |              | ABS actuator and electric unit (control unit)<br>harness connector |              | Continuity |
|-------------------|--------------|--------------------------------------------------------------------|--------------|------------|
| Connector No.     | Terminal No. | Connector No.                                                      | Terminal No. |            |
| E108              | 2G           | E51                                                                | 20           | Yes        |
|                   | 7G           |                                                                    | 23           | Yes        |

#### OK or NG

OK >> • Present error: Check the following items again.

- Decision of CAN system type.
- Not received CONSULT-III data [SELF-DIAG RESULTS, CAN DIAG SUPPORT MNTR ("ECU list" included)].
- Procedure for detecting root cause.
- Past error: Error was detected in the main line between the data link connector and the ABS actuator and electric unit (control unit).

NG >> Replace the main line between the harness connector E108 and the ABS actuator and electric unit (control unit).

# TROUBLE DIAGNOSIS

[CAN]

< SERVICE INFORMATION >

## ECM Branch Line Circuit

INFOID:000000001647603

### INSPECTION PROCEDURE

#### 1.CHECK CONNECTOR

1. Turn the ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check the terminals and connectors of the ECM for damage, bend and loose connection (unit side and connector side).

#### OK or NG

- OK >> GO TO 2.  
NG >> Repair the terminal and connector.

#### 2.CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect the connector of ECM.
2. Check the resistance between the ECM harness connector terminals.

| ECM harness connector |              |     | Resistance (Ω)    |
|-----------------------|--------------|-----|-------------------|
| Connector No.         | Terminal No. |     |                   |
| M71                   | 114          | 113 | Approx. 108 – 132 |

#### OK or NG

- OK >> GO TO 3.  
NG >> Repair the ECM branch line.

#### 3.CHECK POWER SUPPLY AND GROUND CIRCUIT

Check the power supply and the ground circuit of the ECM. Refer to [EC-135, "Wiring Diagram"](#).

#### OK or NG

- OK >> • Present error: Replace the ECM. Refer to [EC-75, "Procedure After Replacing ECM"](#).  
• Past error: Error was detected in the ECM branch line.  
NG >> Repair the power supply and the ground circuit.

## Air Bag Diagnosis Sensor Unit Branch Line Circuit

INFOID:000000001647604

### INSPECTION PROCEDURE

#### 1.CHECK AIR BAG DIAGNOSIS SENSOR UNIT

Check the air bag diagnosis sensor unit. Refer to [SRS-14, "Trouble Diagnosis Introduction"](#).

#### OK or NG

- OK >> Replace the main harness.  
NG >> Replace parts whose air bag system has a malfunction.

## VDC/TCS/ABS Control Unit Branch Line Circuit

INFOID:000000001647605

### INSPECTION PROCEDURE

#### 1.CHECK CONNECTOR

1. Turn the ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check the following terminals and connectors for damage, bend and loose connection (unit side and connector side).
  - VDC/TCS/ABS control unit
  - Harness connector B101
  - Harness connector M73

#### OK or NG

- OK >> GO TO 2.  
NG >> Repair the terminal and connector.

# TROUBLE DIAGNOSIS

< SERVICE INFORMATION >

[CAN]

## 2.CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect the connector of VDC/TCS/ABS control unit.
2. Check the resistance between the VDC/TCS/ABS control unit harness connector terminals.

| VDC/TCS/ABS control unit harness connector |              |    | Resistance (Ω)  |
|--------------------------------------------|--------------|----|-----------------|
| Connector No.                              | Terminal No. |    |                 |
| B114                                       | 61           | 63 | Approx. 54 – 66 |

OK or NG

- OK >> GO TO 3.  
NG >> Repair the VDC/TCS/ABS control unit branch line.

## 3.CHECK POWER SUPPLY AND GROUND CIRCUIT

Check the power supply and the ground circuit of the VDC/TCS/ABS control unit. Refer to [BRC-114, "VDC/TCS/ABS Control Unit Power and Ground Systems"](#).

OK or NG

- OK >> • Present error: Replace the VDC/TCS/ABS control unit. Refer to [BRC-122, "Removal and Installation"](#).  
• Past error: Error was detected in the VDC/TCS/ABS control unit branch line.  
NG >> Repair the power supply and the ground circuit.

## TCM Branch Line Circuit

INFOID:000000001647606

### INSPECTION PROCEDURE

## 1.CHECK CONNECTOR

1. Turn the ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check the following terminals and connectors for damage, bend and loose connection (unit side and connector side).
  - A/T assembly
  - Harness connector F102
  - Harness connector M72

OK or NG

- OK >> GO TO 2.  
NG >> Repair the terminal and connector.

## 2.CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect the connector of A/T assembly.
2. Check the resistance between the A/T assembly harness connector terminals.

| A/T assembly harness connector |              |   | Resistance (Ω)  |
|--------------------------------|--------------|---|-----------------|
| Connector No.                  | Terminal No. |   |                 |
| F6                             | 3            | 8 | Approx. 54 – 66 |

OK or NG

- OK >> GO TO 3.  
NG >> Repair the TCM branch line.

## 3.CHECK POWER SUPPLY AND GROUND CIRCUIT

Check the power supply and the ground circuit of the TCM. Refer to [AT-156, "Wiring Diagram - AT - MAIN"](#).

OK or NG

- OK >> • Present error: Replace the control valve with TCM. Refer to [AT-229, "Removal and Installation"](#).  
• Past error: Error was detected in the TCM branch line.  
NG >> Repair the power supply and the ground circuit.

# TROUBLE DIAGNOSIS

[CAN]

## < SERVICE INFORMATION >

### BCM Branch Line Circuit

INFOID:000000001647607

#### INSPECTION PROCEDURE

##### 1.CHECK CONNECTOR

1. Turn the ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check the terminals and connectors of the BCM for damage, bend and loose connection (unit side and connector side).

##### OK or NG

- OK >> GO TO 2.  
NG >> Repair the terminal and connector.

##### 2.CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect the connector of BCM.
2. Check the resistance between the BCM harness connector terminals.

| BCM harness connector |              |    | Resistance (Ω)  |
|-----------------------|--------------|----|-----------------|
| Connector No.         | Terminal No. |    |                 |
| M90                   | 39           | 40 | Approx. 54 – 66 |

##### OK or NG

- OK >> GO TO 3.  
NG >> Repair the BCM branch line.

##### 3.CHECK POWER SUPPLY AND GROUND CIRCUIT

Check the power supply and the ground circuit of the BCM. Refer to [BCS-10, "Schematic"](#).

##### OK or NG

- OK >> • Present error: Replace the BCM. Refer to [BCS-15, "Removal and Installation of BCM"](#).  
• Past error: Error was detected in the BCM branch line.  
NG >> Repair the power supply and the ground circuit.

### Data Link Connector Branch Line Circuit

INFOID:000000001647608

#### INSPECTION PROCEDURE

##### 1.CHECK CONNECTOR

1. Turn the ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check the terminals and connectors of the data link connector for damage, bend and loose connection (connector side and harness side).

##### OK or NG

- OK >> GO TO 2.  
NG >> Repair the terminal and connector.

##### 2.CHECK HARNESS FOR OPEN CIRCUIT

Check the resistance between the data link connector terminals.

| Data link connector |              |    | Resistance (Ω)  |
|---------------------|--------------|----|-----------------|
| Connector No.       | Terminal No. |    |                 |
| M8                  | 6            | 14 | Approx. 54 – 66 |

##### OK or NG

- OK >> • Present error: Check the following items again.  
- Decision of CAN system type.  
- Not received CONSULT-III data [SELF-DIAG RESULTS, CAN DIAG SUPPORT MNTR ("ECU list" included)].  
- Procedure for detecting root cause.

# TROUBLE DIAGNOSIS

## < SERVICE INFORMATION >

[CAN]

- Past error: Error was detected in the data link connector branch line circuit.

NG >> Repair the data link connector branch line.

### Unified Meter and A/C Amp. Branch Line Circuit

INFOID:000000001647609

#### INSPECTION PROCEDURE

##### 1.CHECK CONNECTOR

1. Turn the ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check the terminals and connectors of the unified meter and A/C amp. for damage, bend and loose connection (unit side and connector side).

##### OK or NG

OK >> GO TO 2.

NG >> Repair the terminal and connector.

##### 2.CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect the connector of unified meter and A/C amp.
2. Check the resistance between the unified meter and A/C amp. harness connector terminals.

| Unified meter and A/C amp. harness connector |              |    | Resistance (Ω)  |
|----------------------------------------------|--------------|----|-----------------|
| Connector No.                                | Terminal No. |    |                 |
| M48                                          | 1            | 11 | Approx. 54 – 66 |

##### OK or NG

OK >> GO TO 3.

NG >> Repair the unified meter and A/C amp. branch line.

##### 3.CHECK POWER SUPPLY AND GROUND CIRCUIT

Check the power supply and the ground circuit of the unified meter and A/C amp. Refer to [DI-46, "Power Supply and Ground Circuit Inspection"](#).

##### OK or NG

OK >> • Present error: Replace the unified meter and A/C amp. Refer to [DI-52, "Removal and Installation of Unified Meter and A/C Amp"](#).

- Past error: Error was detected in the unified meter and A/C amp. branch line.

NG >> Repair the power supply and the ground circuit.

### Steering Angle Sensor Branch Line Circuit

INFOID:000000001647610

#### INSPECTION PROCEDURE

##### 1.CHECK CONNECTOR

1. Turn the ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check the terminals and connectors of the steering angle sensor for damage, bend and loose connection (unit side and connector side).

##### OK or NG

OK >> GO TO 2.

NG >> Repair the terminal and connector.

##### 2.CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect the connector of steering angle sensor.
2. Check the resistance between the steering angle sensor harness connector terminals.

| Steering angle sensor harness connector |              |   | Resistance (Ω)  |
|-----------------------------------------|--------------|---|-----------------|
| Connector No.                           | Terminal No. |   |                 |
| M22                                     | 4            | 8 | Approx. 54 – 66 |

##### OK or NG

# TROUBLE DIAGNOSIS

[CAN]

## < SERVICE INFORMATION >

- OK >> GO TO 3.  
NG >> Repair the steering angle sensor branch line.

### 3.CHECK POWER SUPPLY AND GROUND CIRCUIT

Check the power supply and the ground circuit of the steering angle sensor. Refer to [BRC-85, "Schematic"](#).

#### OK or NG

- OK >> • Present error: Replace the steering angle sensor. Refer to [BRC-126, "Removal and Installation"](#).  
• Past error: Error was detected in the steering angle sensor branch line.  
NG >> Repair the power supply and the ground circuit.

## ABS Actuator and Electric Unit (Control Unit) Branch Line Circuit

INFOID:000000001647611

### INSPECTION PROCEDURE

#### 1.CHECK CONNECTOR

1. Turn the ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check the terminals and connectors of the ABS actuator and electric unit (control unit) for damage, bend and loose connection (unit side and connector side).

#### OK or NG

- OK >> GO TO 2.  
NG >> Repair the terminal and connector.

#### 2.CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect the connector of ABS actuator and electric unit (control unit).
2. Check the resistance between the ABS actuator and electric unit (control unit) harness connector terminals.

| ABS actuator and electric unit (control unit) harness connector |              |    | Resistance (Ω)  |
|-----------------------------------------------------------------|--------------|----|-----------------|
| Connector No.                                                   | Terminal No. |    |                 |
| E51                                                             | 20           | 23 | Approx. 54 – 66 |

#### OK or NG

- OK >> GO TO 3.  
NG >> Repair the ABS actuator and electric unit (control unit) branch line.

### 3.CHECK POWER SUPPLY AND GROUND CIRCUIT

Check the power supply and the ground circuit of the ABS actuator and electric unit (control unit). Refer to [BRC-27, "ABS Actuator and Electric Unit \(Control Unit\) Power and Ground Systems"](#)(ABS models) or [BRC-62, "ABS Actuator and Electric Unit \(Control Unit\) Power and Ground Systems"](#)(TCS models).

#### OK or NG

- OK >> • Present error: Replace the ABS actuator and electric unit (control unit). Refer to [BRC-35, "Removal and Installation"](#)(ABS models) or [BRC-72, "Removal and Installation"](#)(TCS models).  
• Past error: Error was detected in the ABS actuator and electric unit (control unit) branch line.  
NG >> Repair the power supply and the ground circuit.

## IPDM E/R Branch Line Circuit

INFOID:000000001647612

### INSPECTION PROCEDURE

#### 1.CHECK CONNECTOR

1. Turn the ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check the following terminals and connectors for damage, bend and loose connection (unit side and connector side).
  - IPDM E/R
  - Harness connector E108 (Models with VDC)
  - Harness connector M15 (Models with VDC)

# TROUBLE DIAGNOSIS

[CAN]

## < SERVICE INFORMATION >

### OK or NG

- OK >> GO TO 2.  
NG >> Repair the terminal and connector.

### 2.CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect the connector of IPDM E/R.
2. Check the resistance between the IPDM E/R harness connector terminals.

| IPDM E/R harness connector |              |    | Resistance (Ω)    |
|----------------------------|--------------|----|-------------------|
| Connector No.              | Terminal No. |    |                   |
| E9                         | 48           | 49 | Approx. 108 – 132 |

### OK or NG

- OK >> GO TO 3.  
NG >> Repair the IPDM E/R branch line.

### 3.CHECK POWER SUPPLY AND GROUND CIRCUIT

Check the power supply and the ground circuit of the IPDM E/R. Refer to [PG-22, "IPDM E/R Power/Ground Circuit Inspection"](#).

### OK or NG

- OK >> • Present error: Replace the IPDM E/R. Refer to [PG-23, "Removal and Installation of IPDM E/R"](#).  
• Past error: Error was detected in the IPDM E/R branch line.  
NG >> Repair the power supply and the ground circuit.

## CAN Communication Circuit

INFOID:000000001647613

## INSPECTION PROCEDURE

### 1.CONNECTOR INSPECTION

1. Turn the ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Disconnect all the unit connectors on CAN communication system.
4. Check terminals and connectors for damage, bend and loose connection.

### OK or NG

- OK >> GO TO 2.  
NG >> Repair the terminal and connector.

### 2.CHECK HARNESS CONTINUITY (SHORT CIRCUIT)

Check the continuity between the data link connector terminals.

| Data link connector |              |    | Continuity |
|---------------------|--------------|----|------------|
| Connector No.       | Terminal No. |    |            |
| M8                  | 6            | 14 | No         |

### OK or NG

- OK >> GO TO 3.  
NG >> Check the harness and repair the root cause.

### 3.CHECK HARNESS CONTINUITY (SHORT CIRCUIT)

Check the continuity between the data link connector and the ground.

| Data link connector |              | Ground | Continuity |
|---------------------|--------------|--------|------------|
| Connector No.       | Terminal No. |        |            |
| M8                  | 6            |        | No         |
|                     | 14           |        | No         |

### OK or NG

- OK >> GO TO 4.

# TROUBLE DIAGNOSIS

[CAN]

## < SERVICE INFORMATION >

NG >> Check the harness and repair the root cause.

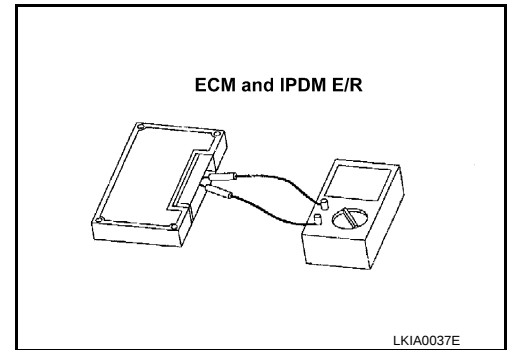
### 4.CHECK ECM AND IPDM E/R TERMINATION CIRCUIT

1. Remove the ECM and the IPDM E/R.
2. Check the resistance between the ECM terminals.

| ECM          |     | Resistance (Ω)    |
|--------------|-----|-------------------|
| Terminal No. |     |                   |
| 114          | 113 | Approx. 108 – 132 |

3. Check the resistance between the IPDM E/R terminals.

| IPDM E/R     |    | Resistance (Ω)    |
|--------------|----|-------------------|
| Terminal No. |    |                   |
| 48           | 49 | Approx. 108 – 132 |



#### OK or NG

OK >> GO TO 5.

NG >> Replace the ECM and/or the IPDM E/R.

### 5.CHECK SYMPTOM

Connect all the connectors. Check if the symptoms described in the “Symptom (Results from interview with customer)” are reproduced.

#### Inspection result

Reproduced>>GO TO 6.

Non-reproduced>>Start the diagnosis again. Follow the trouble diagnosis procedure when past error is detected.

### 6.CHECK UNIT REPRODUCTION

Perform the reproduction test as per the following procedure for each unit.

1. Turn the ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Disconnect one of the unit connectors of CAN communication system.

#### NOTE:

ECM and IPDM E/R have a termination circuit. Check other units first.

4. Connect the battery cable to the negative terminal. Check if the symptoms described in the “Symptom (Results from interview with customer)” are reproduced.

#### NOTE:

Although unit-related error symptoms occur, do not confuse them with other symptoms.

#### Inspection result

Reproduced>>Connect the connector. Check other units as per the above procedure.

Non-reproduced>>Replace the unit whose connector was disconnected.