

SECTION LAN

LAN SYSTEM

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PRECAUTION

PRECAUTIONS

Precaution for Trouble Diagnosis

INFOID:000000005530335

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.

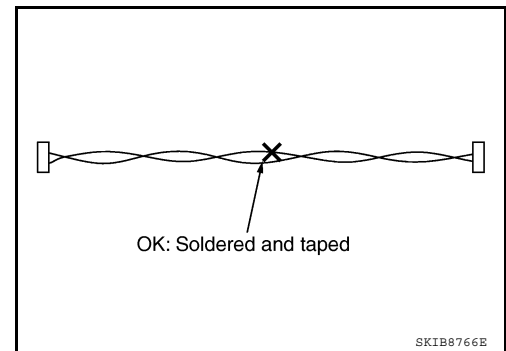
Precaution for Harness Repair

INFOID:000000005530336

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

NOTE:

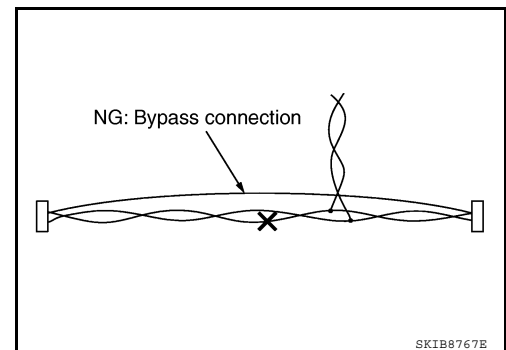
A fray of twisted lines must be within 110 mm (4.33 in).



- 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.

LAN

FUNCTION DIAGNOSIS

CAN COMMUNICATION SYSTEM

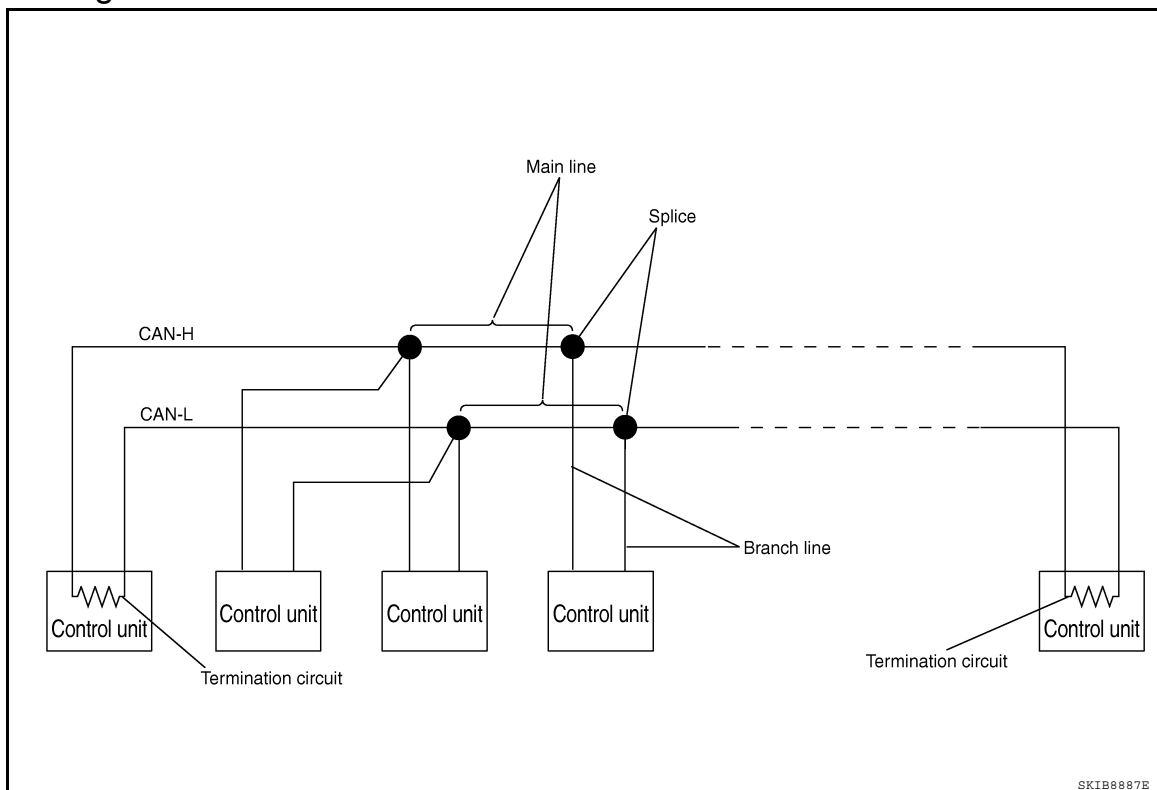
System Description

INFOID:000000005530337

- 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

INFOID:000000005530338



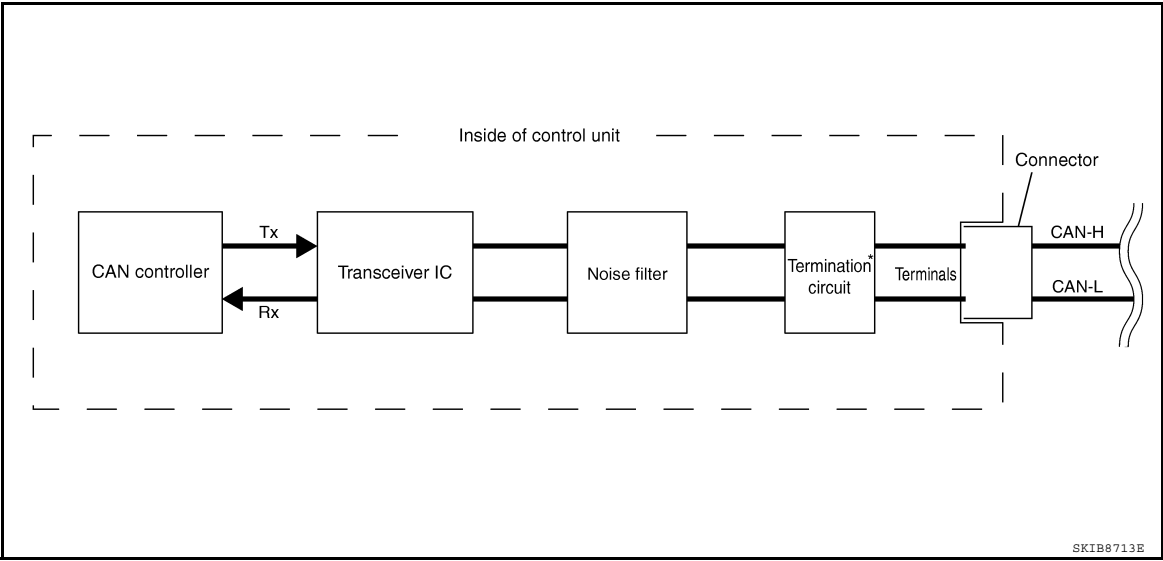
SKIB8887E

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 LAN-5, "CAN Communication Control Circuit" . |

CAN Communication Control Circuit

INFOID:000000005530339



| 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* (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

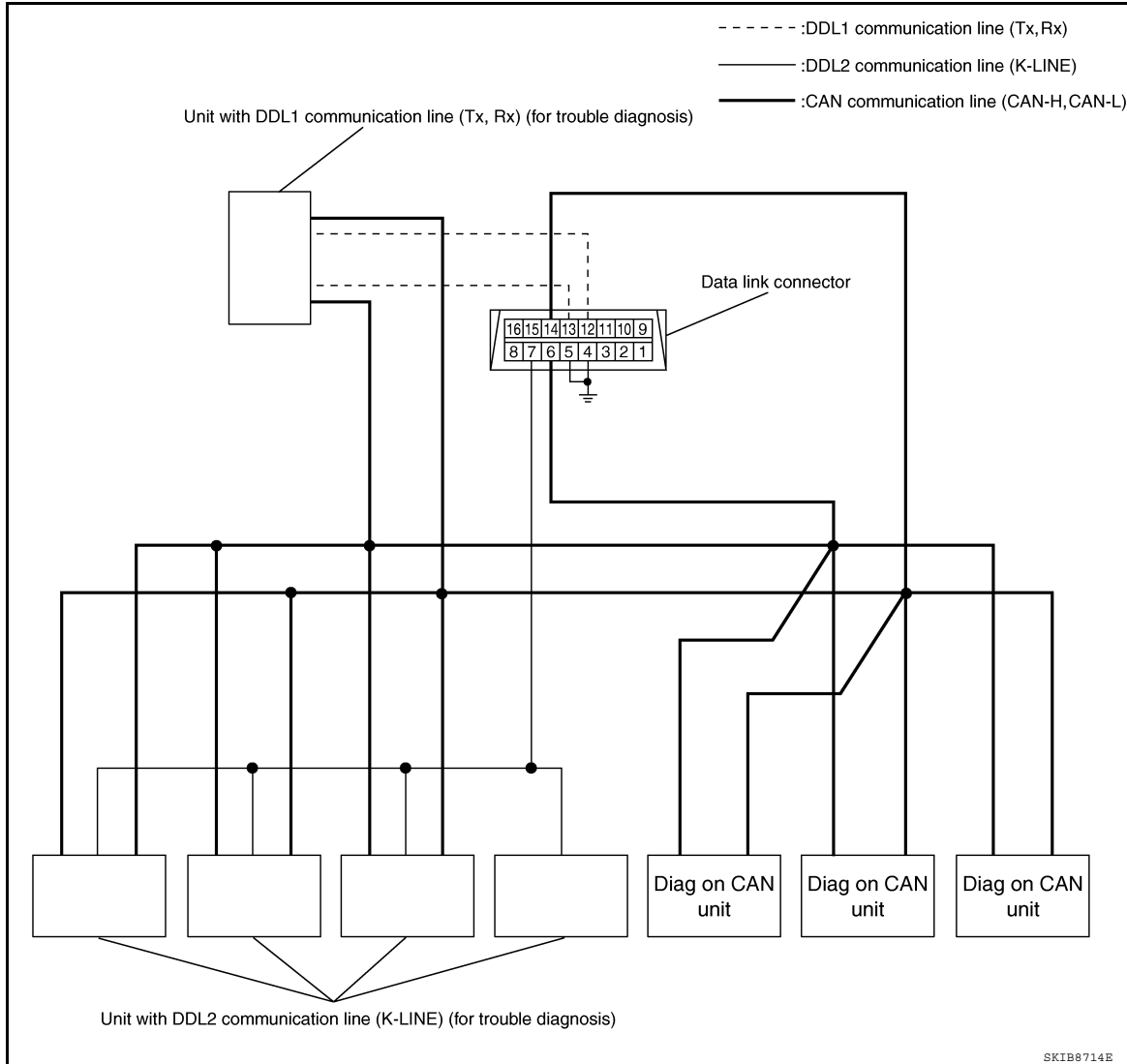
Description

INFOID:000000005530340

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

System Diagram

INFOID:000000005530341



| Name | Harness | Description |
|-------------|----------------|------------------------------------------------------------------------------|
| DDL1 | Tx 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 CAN-L | It is used for trouble diagnosis and control. |

TROUBLE DIAGNOSIS

Condition of Error Detection

INFOID:000000005530342

DTC of CAN communication is indicated on SELF-DIAG RESULTS on CONSULT-III if a CAN communication signal is not transmitted or received between units for 2 seconds or more.

NOTE:

DTCs of CAN communication are as follows:

- U0101
- U0140
- U0164
- U1000
- U1001

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 DTC OF CAN COMMUNICATION 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.

CAUTION:

CAN communication system is normal if DTC of CAN communication 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:000000005530343

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.

A

B

C

D

E

F

G

H

I

J

K

L

LAN

N

O

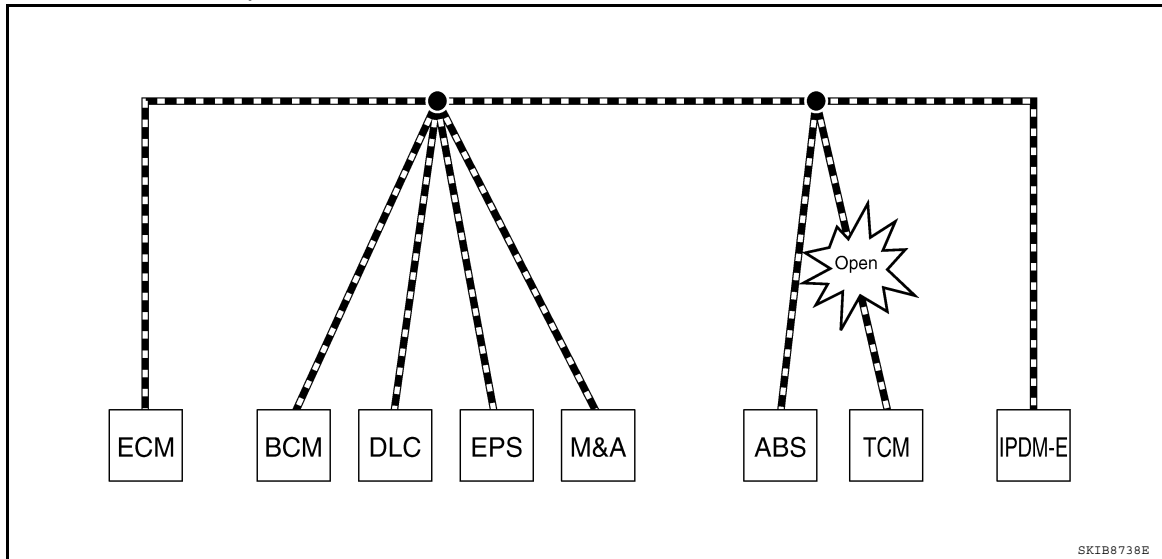
P

TROUBLE DIAGNOSIS

< FUNCTION DIAGNOSIS >

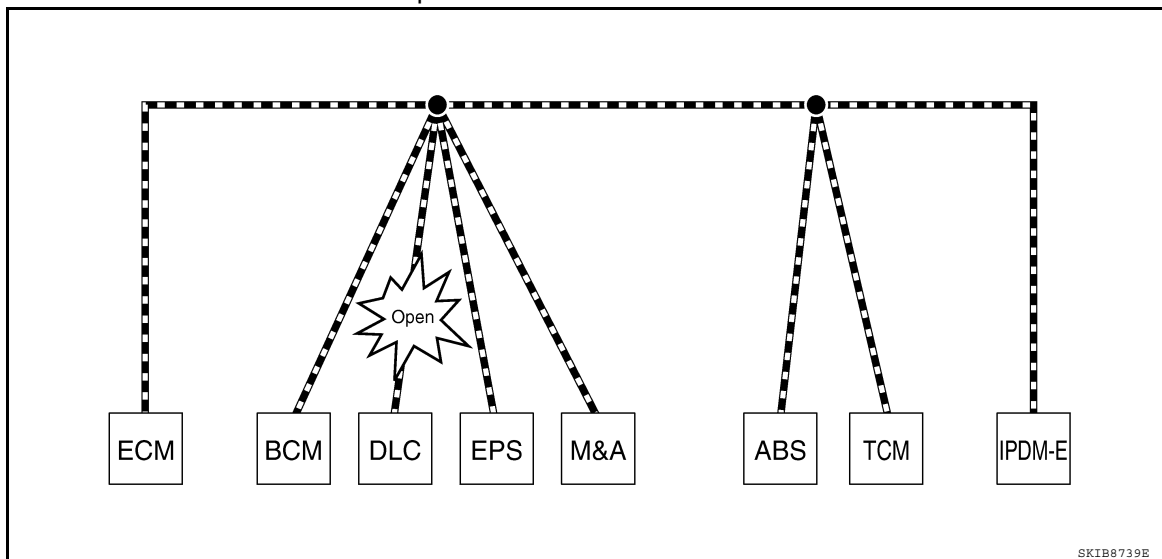
[CAN FUNDAMENTAL]

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. |
| EPS control unit | Normal operation. |
| Combination meter | <ul style="list-style-type: none"> Shift position indicator and OD OFF indicator turn OFF. Warning lamps turn ON. |
| 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



TROUBLE DIAGNOSIS

< FUNCTION DIAGNOSIS >

[CAN FUNDAMENTAL]

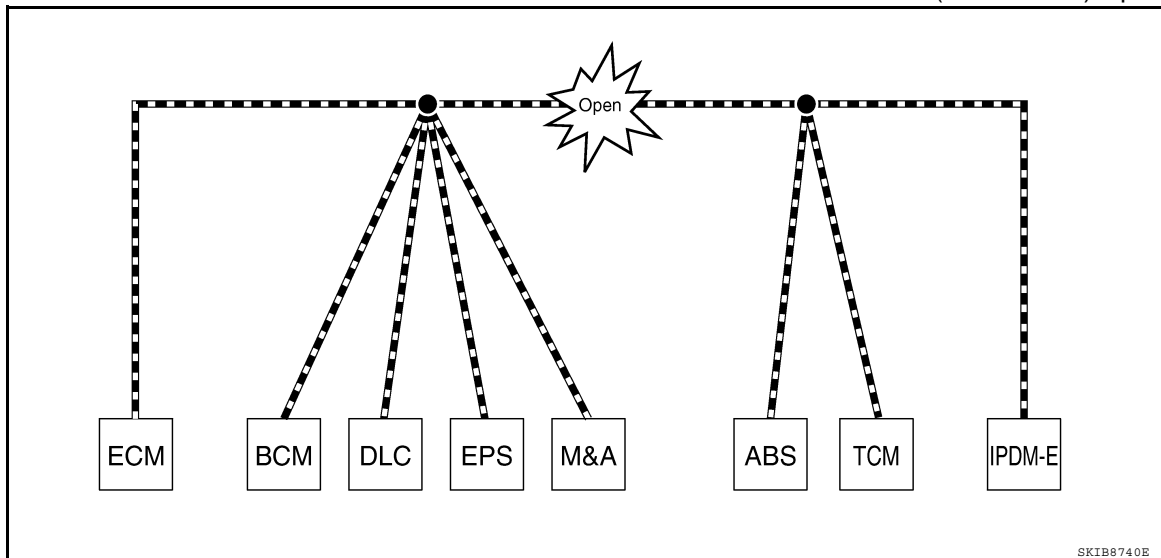
| Unit name | Symptom |
|-----------------------------------------------|-------------------|
| ECM | Normal operation. |
| BCM | |
| EPS control unit | |
| Combination meter | |
| ABS actuator and electric unit (control unit) | |
| TCM | |
| IPDM E/R | |

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. |

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"> Reverse warning chime does not sound. The front wiper moves under continuous operation mode even though the front wiper switch being in the intermittent position. |
| EPS control unit | The steering effort increases. |
| Combination meter | <ul style="list-style-type: none"> The shift position indicator and OD OFF indicator turn OFF. The speedometer is inoperative. The odo/trip meter stops. |
| ABS actuator and electric unit (control unit) | Normal operation. |

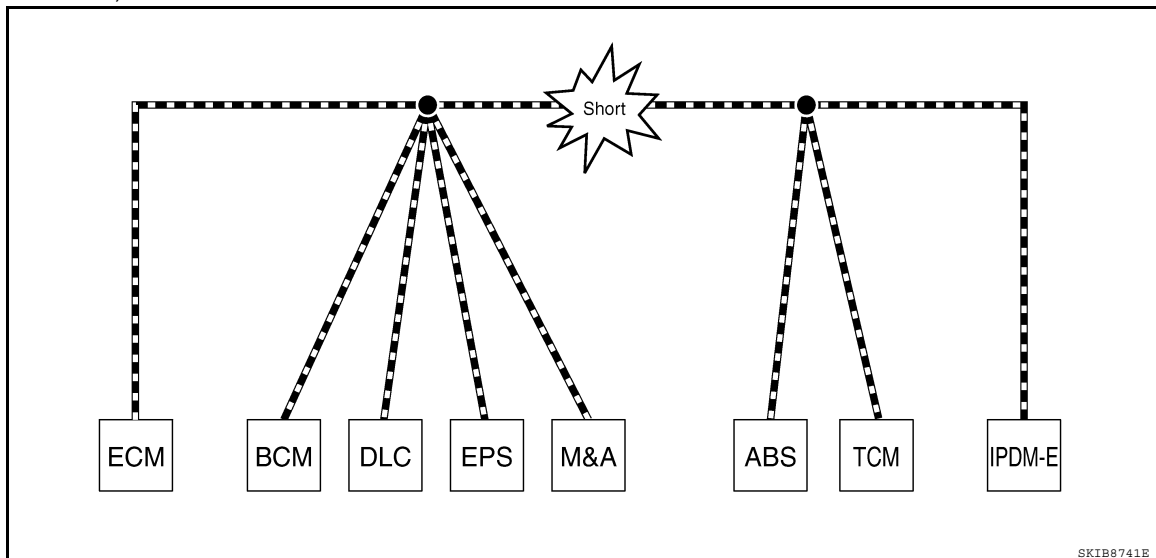
TROUBLE DIAGNOSIS

< FUNCTION DIAGNOSIS >

[CAN FUNDAMENTAL]

| Unit name | Symptom |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TCM | No impact on operation. |
| IPDM E/R | When the ignition switch is ON, <ul style="list-style-type: none"> The headlamps (Lo) turn ON. The cooling fan continues to rotate. |

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



| Unit name | Symptom |
|-----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ECM | <ul style="list-style-type: none"> Engine torque limiting is affected, and shift harshness increases. Engine speed drops. |
| BCM | <ul style="list-style-type: none"> Reverse warning chime does not sound. The front wiper moves under continuous operation mode even though the front wiper switch being in the intermittent position. The room lamp does not turn ON. The engine does not start (if an error or malfunction occurs while turning the ignition switch OFF.) The steering lock does not release (if an error or malfunction occurs while turning the ignition switch OFF.) |
| EPS control unit | The steering effort increases. |
| Combination meter | <ul style="list-style-type: none"> The tachometer and the speedometer do not move. Warning lamps turn ON. Indicator lamps do not turn ON. |
| 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"> The headlamps (Lo) turn ON. The cooling fan continues to rotate. |

TROUBLE DIAGNOSIS

< FUNCTION DIAGNOSIS >

[CAN FUNDAMENTAL]

Self-Diagnosis

INFOID:000000005530344

| DTC | Self-diagnosis item (CONSULT-III indication) | DTC detection condition | | Inspection/Action |
|-------|-------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| U0101 | LOST COMM (TCM) | When ECM is not transmitting or receiving CAN communication signal of OBD (emission-related diagnosis) from TCM for 2 seconds or more. | | Start the inspection. Refer to the applicable section of the indicated control unit. |
| U0140 | LOST COMM (BCM) | When ECM is not transmitting or receiving CAN communication signal of OBD (emission-related diagnosis) from BCM for 2 seconds or more. | | |
| U0164 | LOST COMM (HVAC) | When ECM is not transmitting or receiving CAN communication signal of OBD (emission-related diagnosis) from A/C auto amp. or unified meter and A/C amp. for 2 seconds or more. | | |
| U1000 | CAN COMM CIRCUIT | ECM | When ECM is not transmitting or receiving CAN communication signal of OBD (emission-related diagnosis) for 2 seconds or more. | |
| | | Except for ECM | 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. | | |
| 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” or “P0607”. |
| P0607 | ECM | | | |

CAN Diagnostic Support Monitor

INFOID:000000005530345

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

MONITOR ITEM (CONSULT-III)

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 |

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Without PAST

TROUBLE DIAGNOSIS

< FUNCTION DIAGNOSIS >

[CAN FUNDAMENTAL]

| Item | PRSNT | 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. |
| | | Diagnosis not performed |
| Control unit name (Reception diagnosis) | OK | Normal at present |
| | UNKWN | Unable to receive signals for 2 seconds or more. |
| | | Diagnosis not performed |
| | | No control unit for receiving signals. (No applicable optional parts) |

With PAST

| Item | PRSNT | 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 (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. |
| | | | 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.)

Example: Vehicle Display

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

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Information Needed for Trouble Diagnosis

INFOID:000000005530346

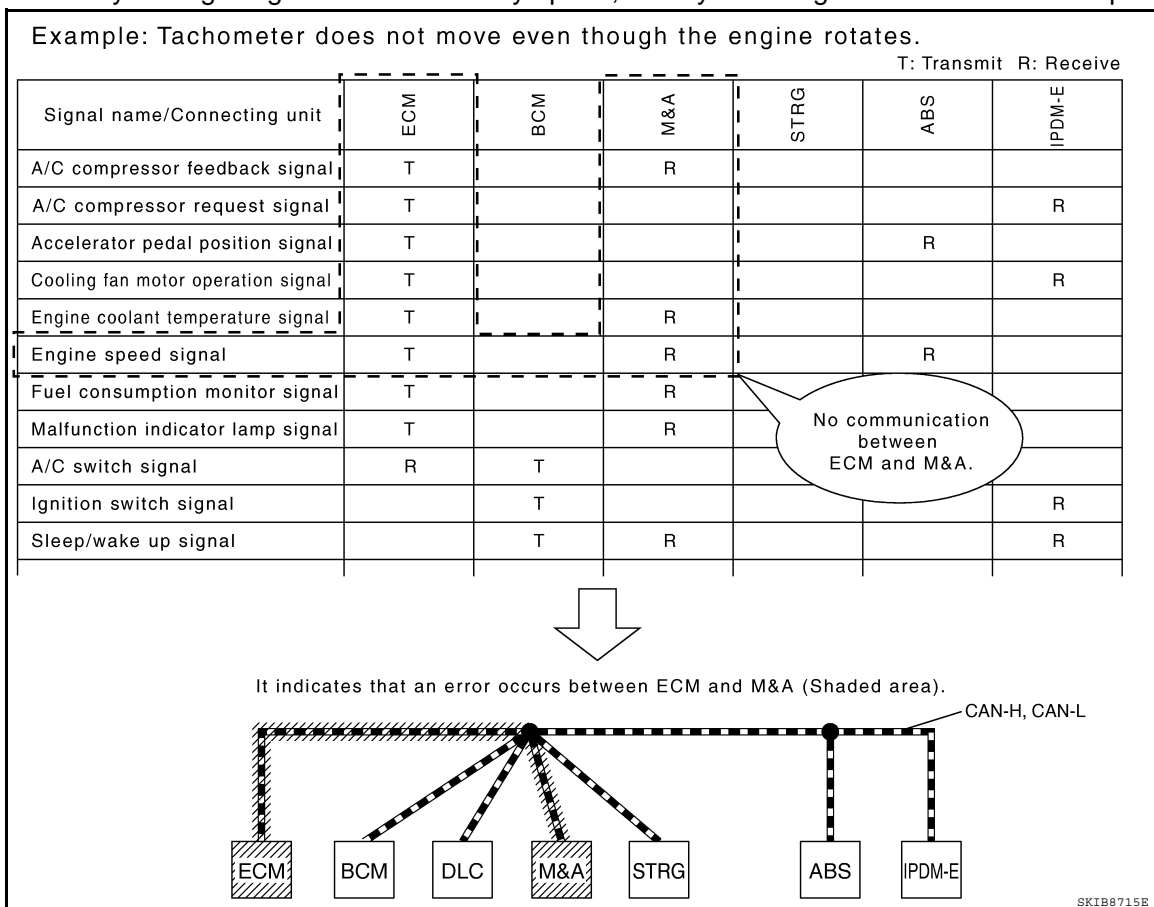
CAN communication system performs trouble diagnosis with the following tools.

| 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 (On the "CAN DIAG SUPPORT MNTR") | For checking the condition of control units and the status of CAN communication. |
| SELF-DIAG RESULTS (CONSULT-III) | |
| CAN DIAG SUPPORT MNTR (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

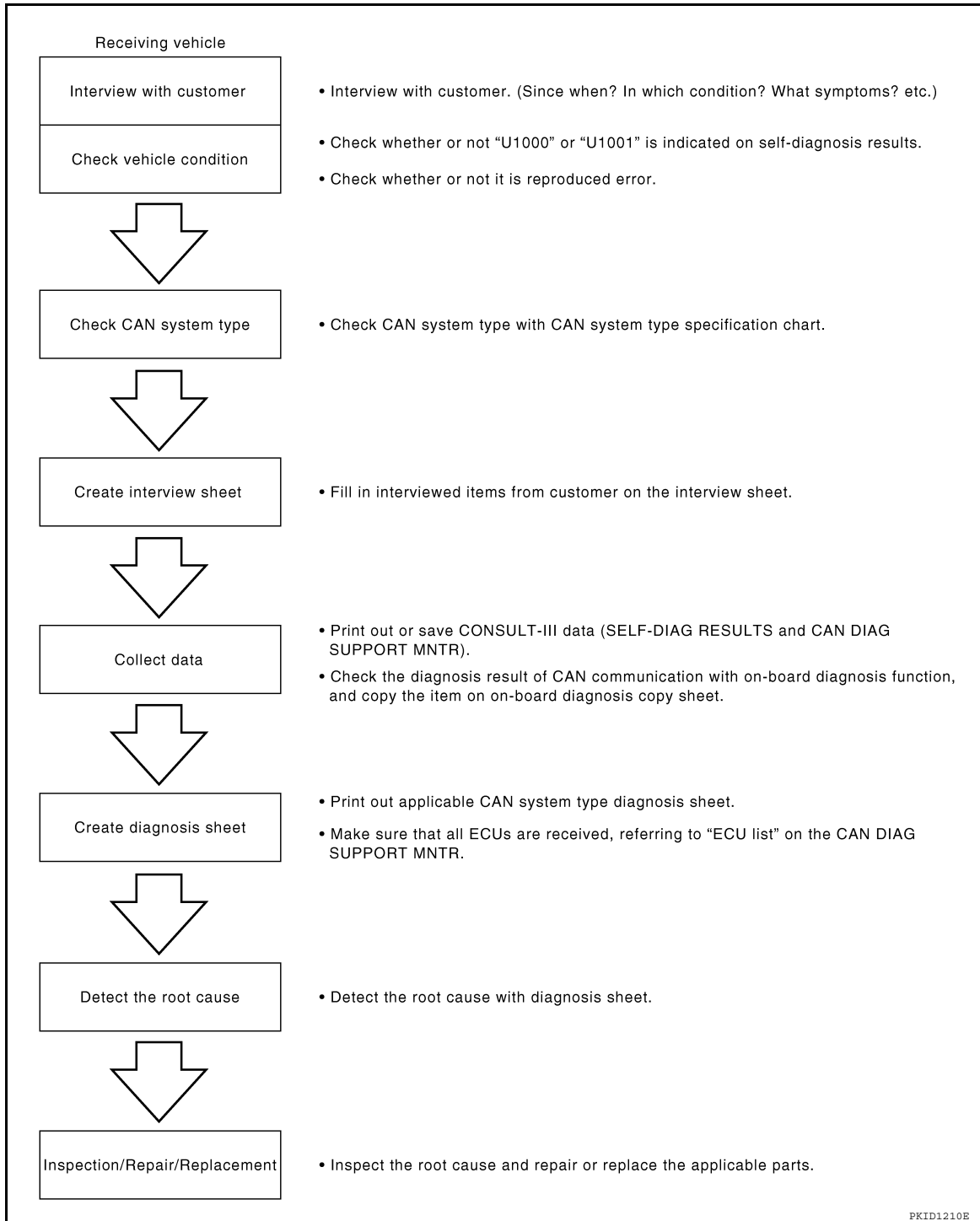
INFOID:000000005530347

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 Diagnosis Flow Chart

INFOID:000000005530348



Trouble Diagnosis Procedure

INFOID:000000005530349

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

DIAGNOSIS AND REPAIR WORKFLOW

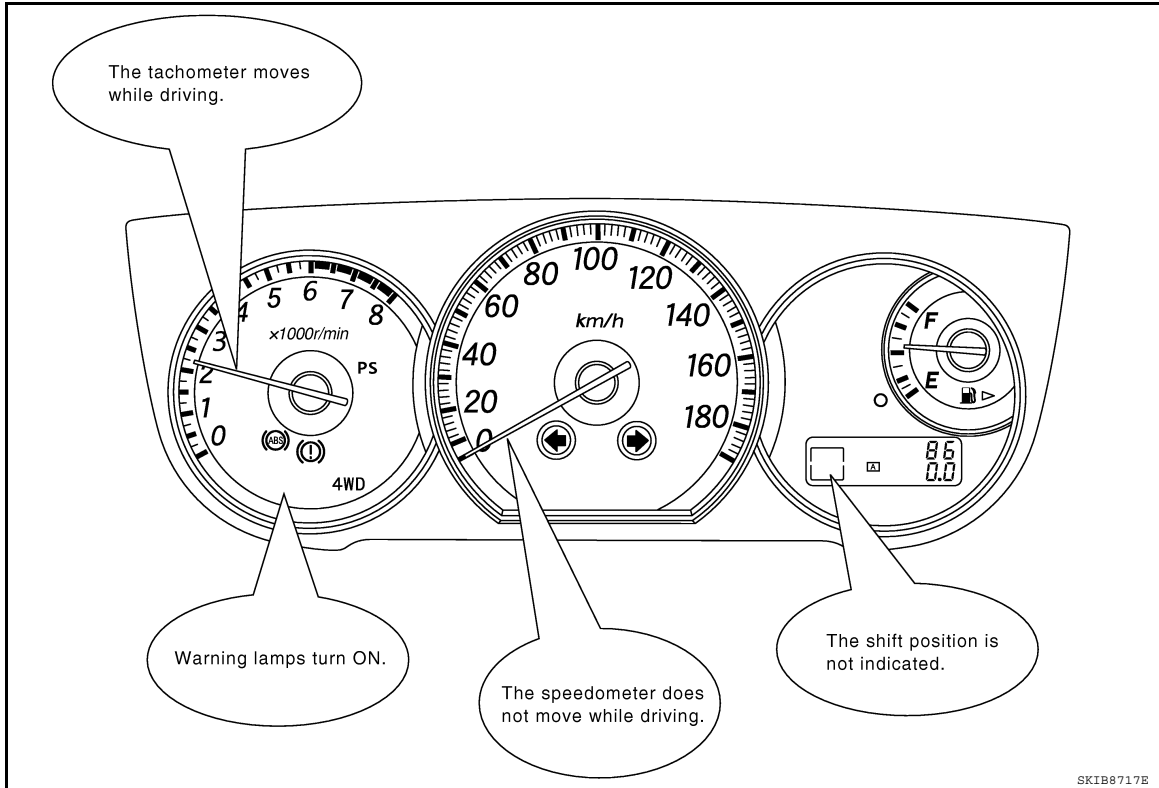
< BASIC INSPECTION >

[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:

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[CAN FUNDAMENTAL]

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.)

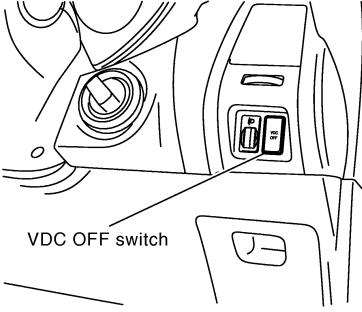
CAN System Specification Chart
Determine CAN system type from the following specification chart. Then choose the correct diagnosis sheet.

| | | | | | | |
|--------------------------------|------------------------|---------|------------------------|---------|------------------------|---------|
| 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

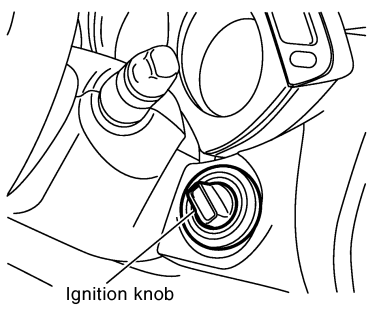
VEHICLE EQUIPMENT IDENTIFICATION INFORMATION
NOTE:
Check CAN system type from the vehicle shape and equipment.

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:

[CAN FUNDAMENTAL]

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

SKIB8889E

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[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">• Headlamps suddenly turn ON while driving the vehicle.• The engine does not restart after stopping the vehicle and turning the ignition switch OFF.• The cooling fan continues rotating while turning the ignition switch ON. | |
| 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">• The headlamps (Lo) turn ON, and the cooling fan continues rotating.• The interior lamp does not turn ON. <p>On CONSULT-III screen,</p> <ul style="list-style-type: none">• IPDM E/R is not indicated on SELECT SYSTEM.• ENGINE: U1001• BCM, ADAPTIVE LIGHT: U1000 | |

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]

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P

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

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

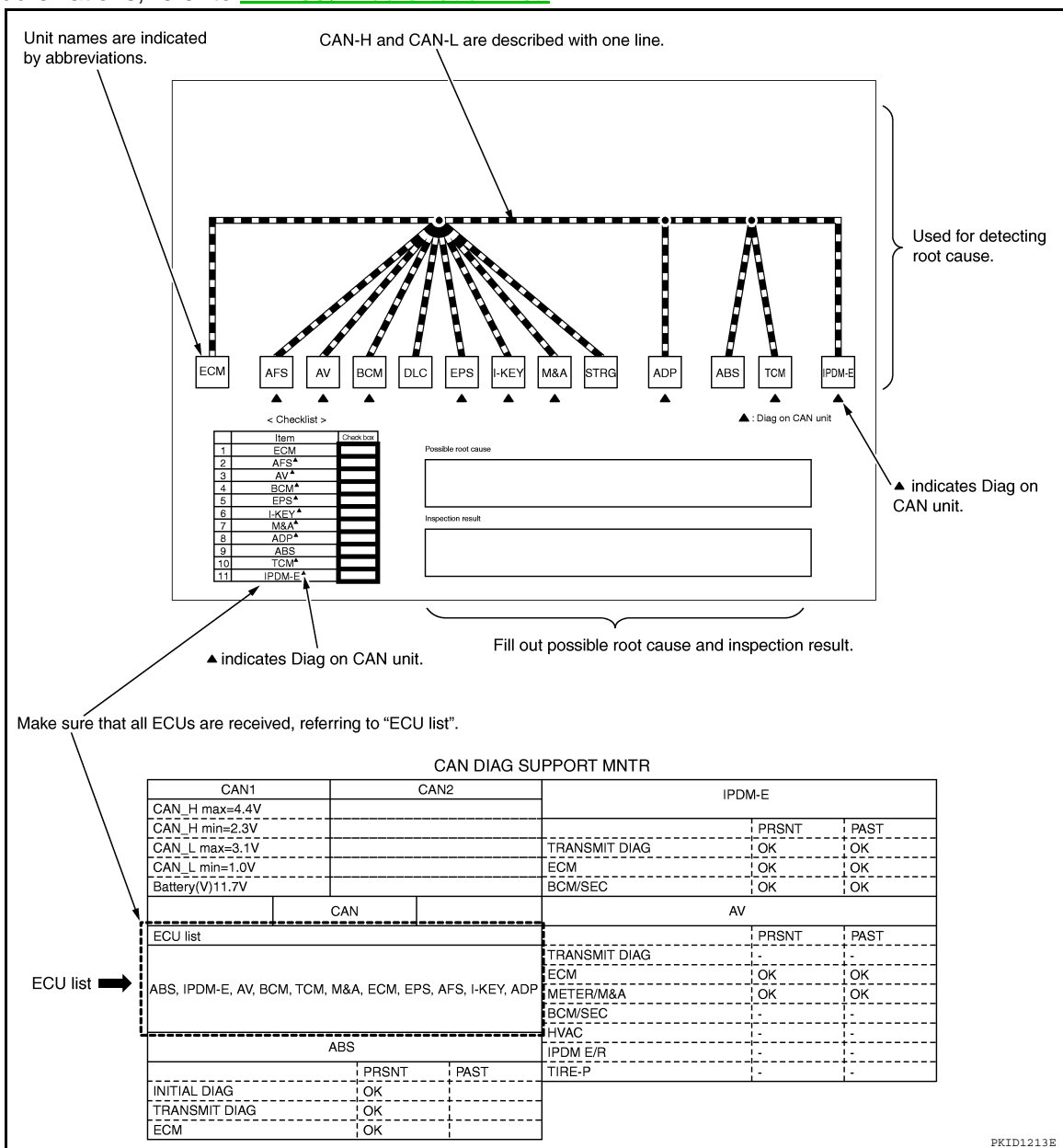
Make sure that all ECUs are received, referring to "ECU list".

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[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]

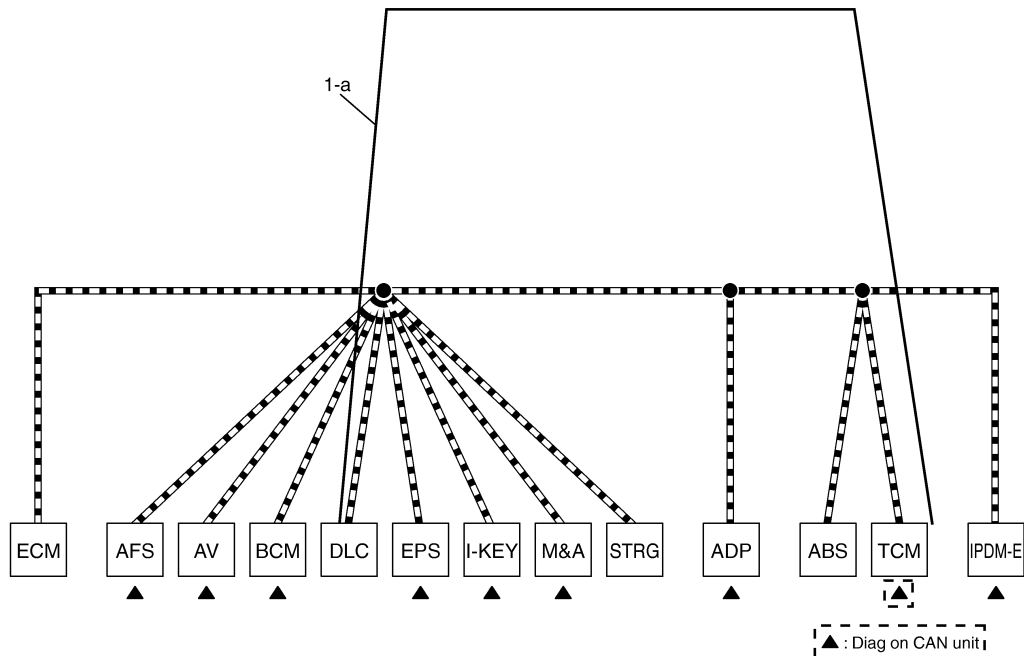
Identify the error circuit using information from the “CAN DIAG SUPPORT MNTR” (“ECU list” included).

- NOTE:**

NOTE:

- (Example)

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



- NOTE:**

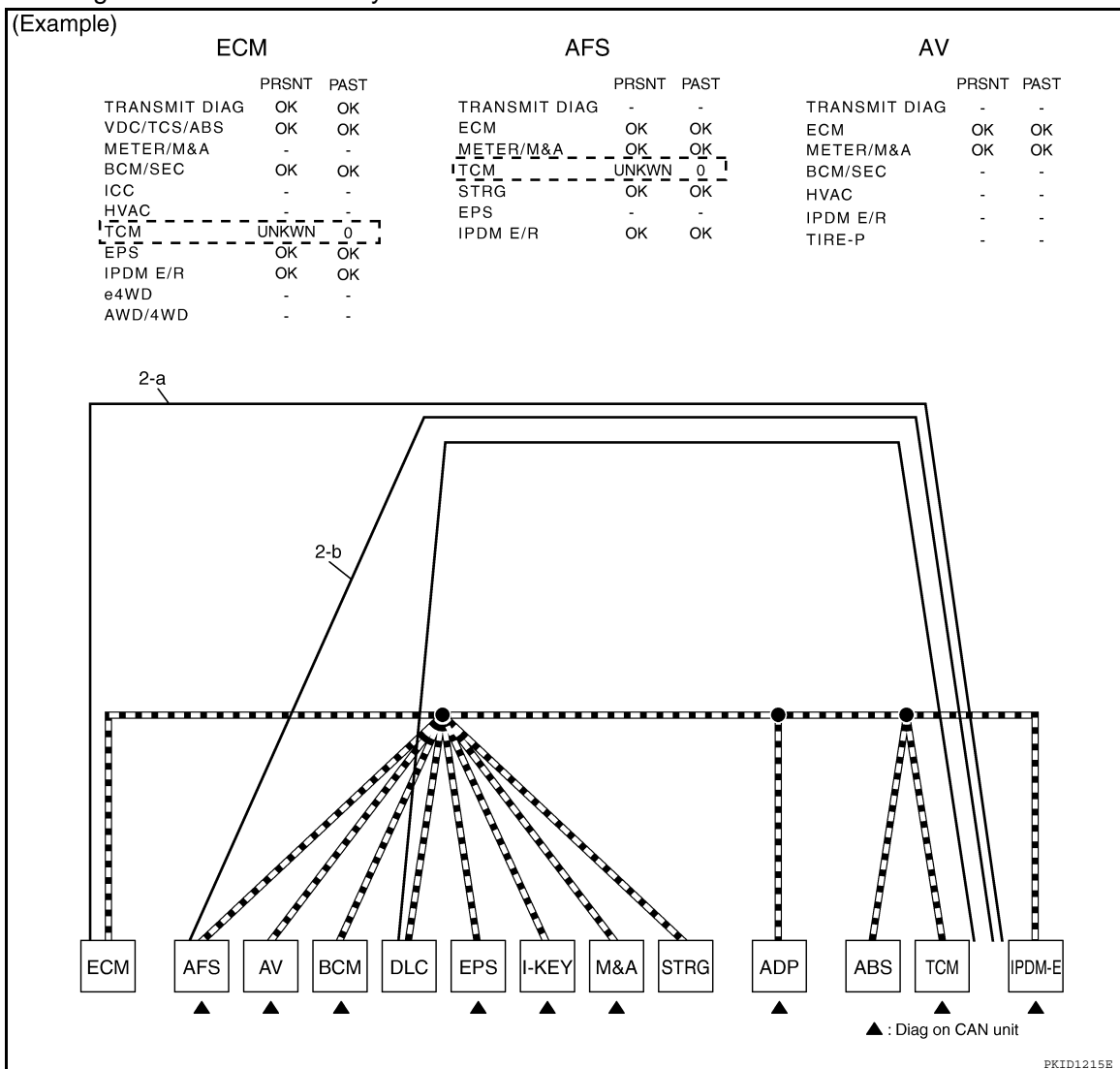
b. Reception item of "AFS": On "TCM", "UNKWN" is indicated. This means AFS cannot receive the signal from TCM. Draw a line to indicate an error between AFS and TCM (line 2-b in the figure below).

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[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:

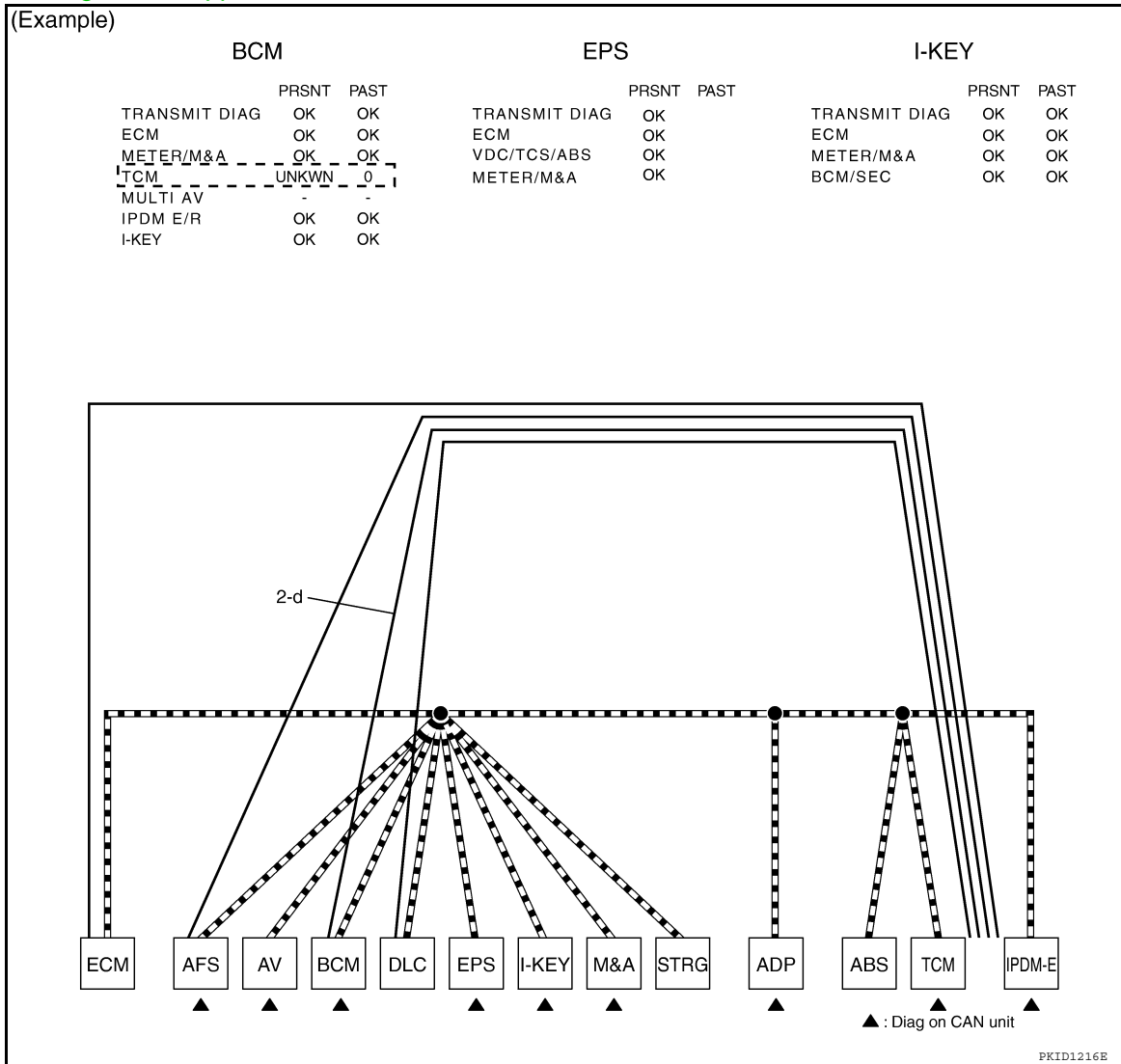
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DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[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-51, "CAN Diagnostic Support Monitor"](#).



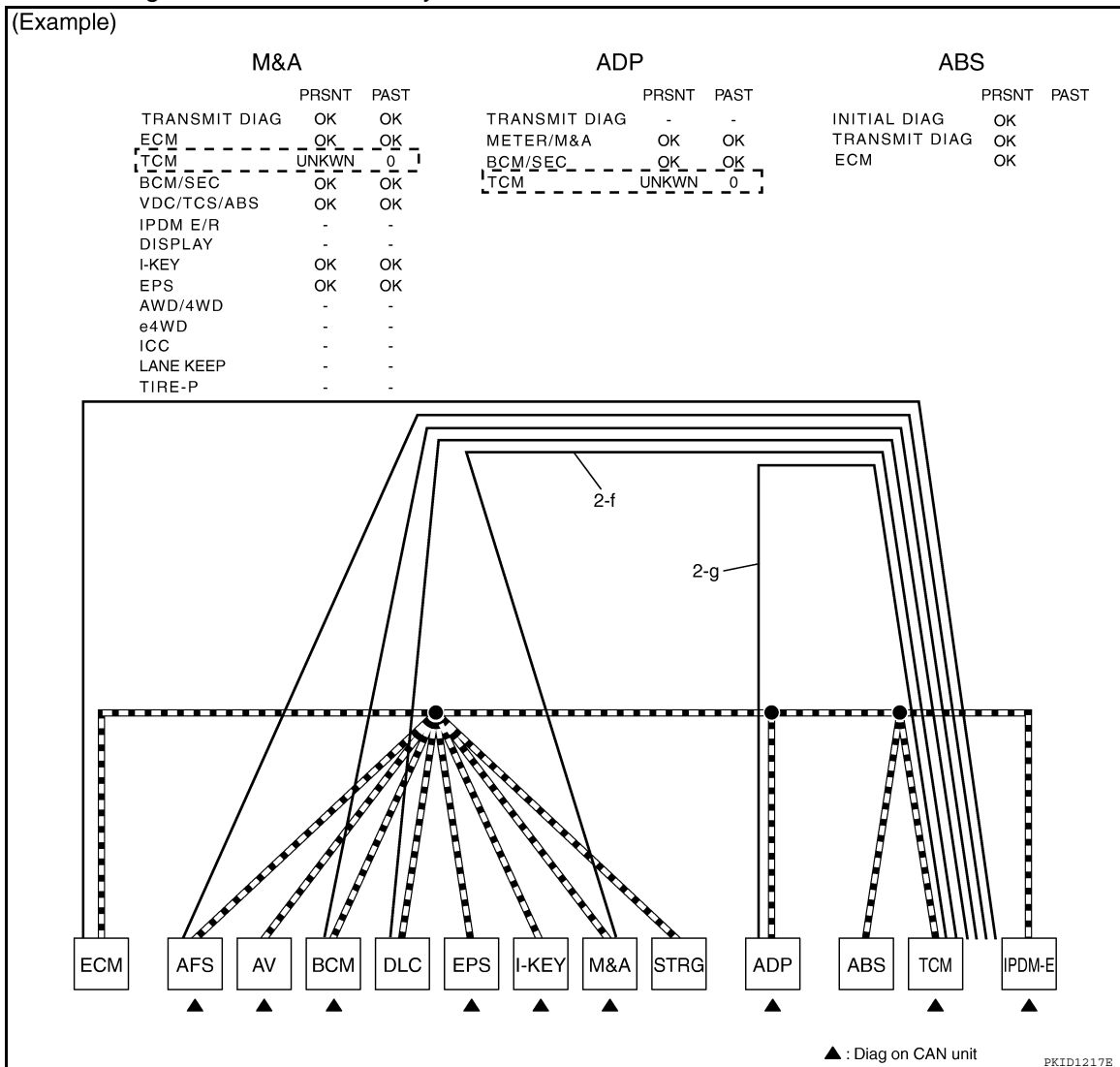
- Reception item of “M&A”: On “TCM”, “UNKWN” is indicated. This means M&A cannot receive the signal from TCM. Draw a line to indicate an error between M&A and TCM (line 2-f in the figure below).
- Reception item of “ADP”: On “TCM”, “UNKWN” is indicated. This means ADP cannot receive the signal from TCM.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

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[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.

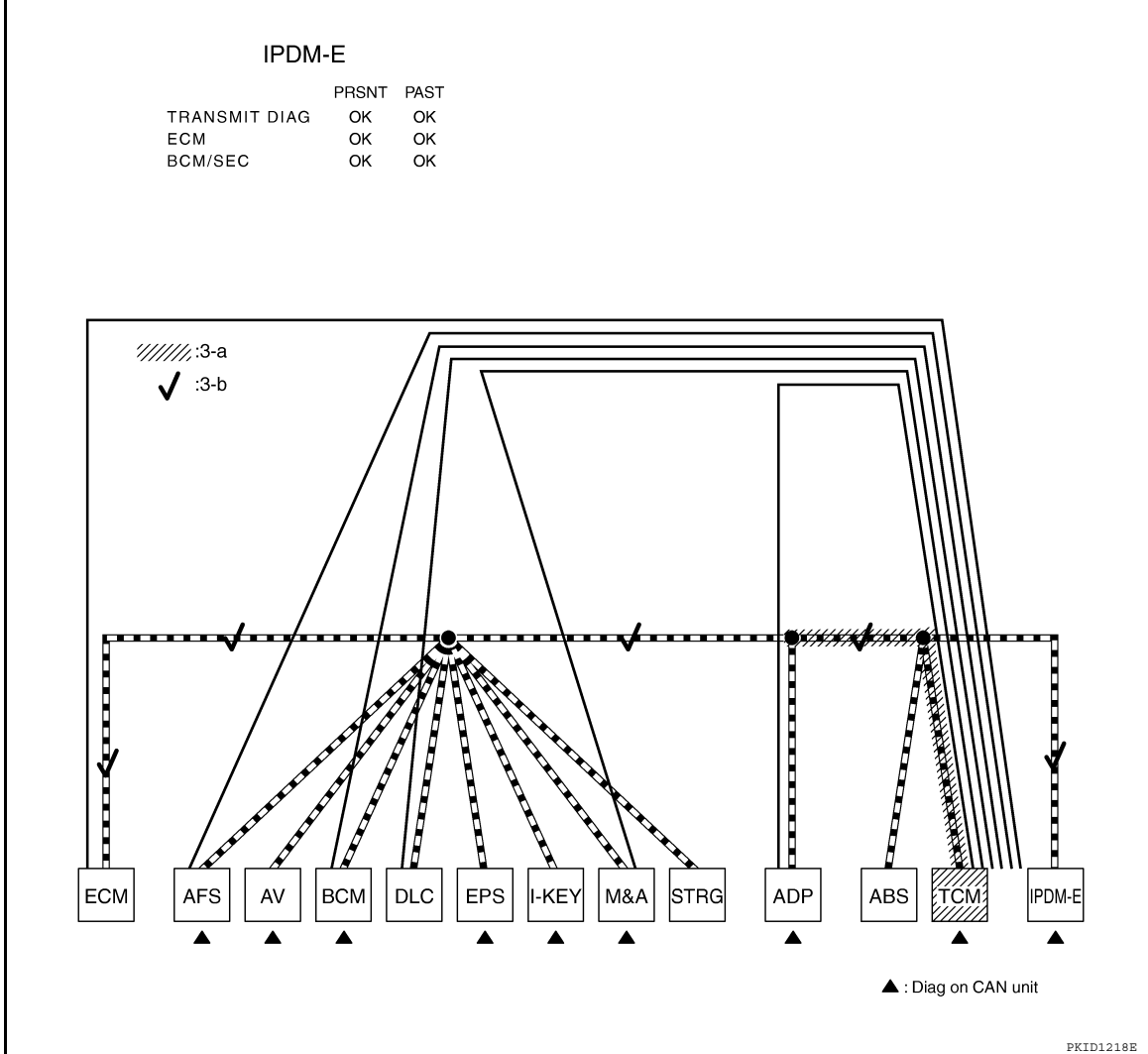
DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[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).

(Example)



- Through the above procedure, the error is detected in the TCM branch line (shaded in the figure below).

NOTE:

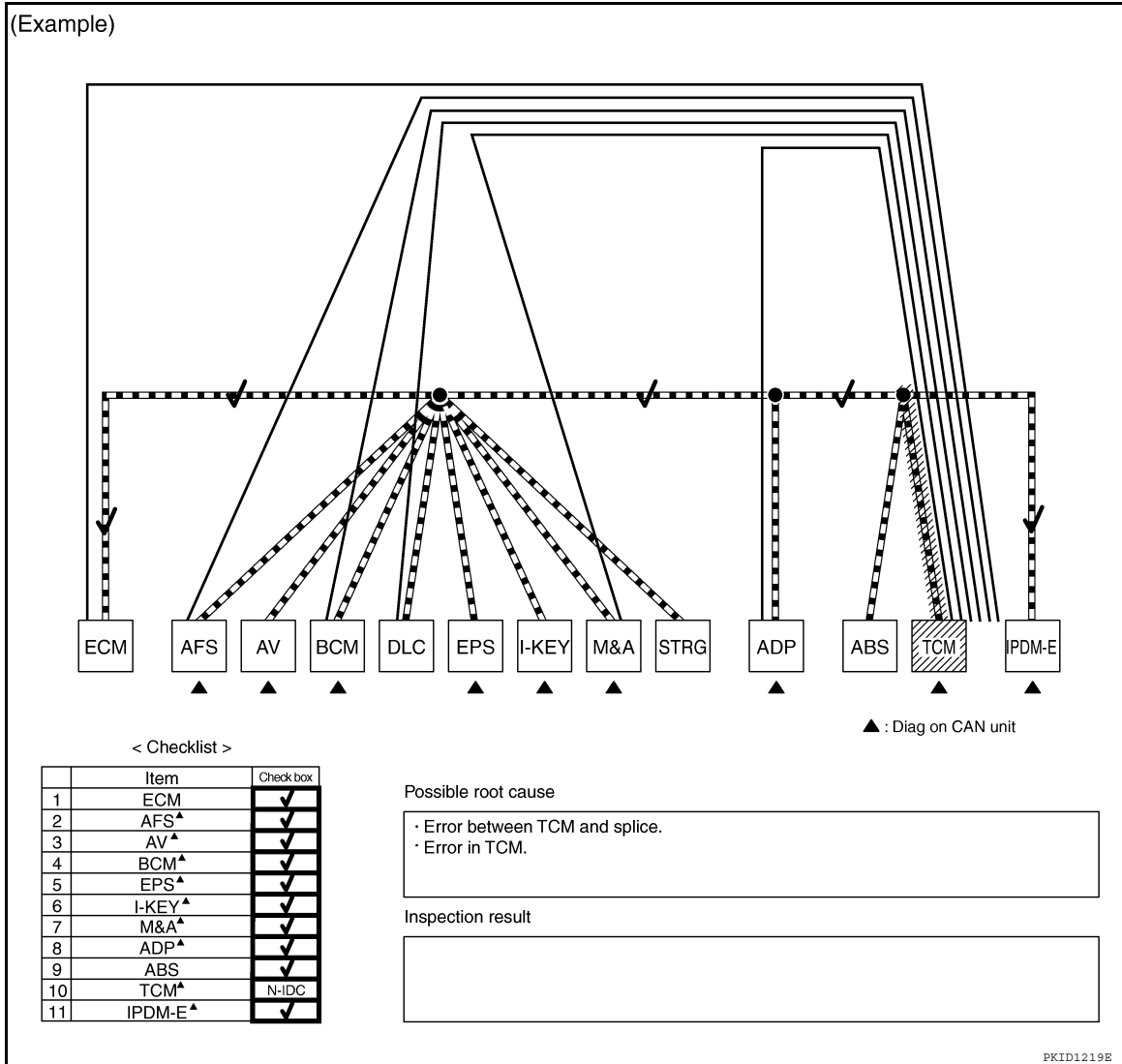
For abbreviations, refer to [LAN-36. "Abbreviation List"](#).

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[CAN FUNDAMENTAL]

- Perform the inspection for the detected error circuit. For the inspection procedure, refer to "MALFUNCTION 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

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[CAN FUNDAMENTAL]

- Refer to "MALFUNCTION AREA CHART".

(Example)

| CAN DIAG SUPPORT MNTR | | | | | |
|-----------------------|--|------|--|---------------|-------|
| CAN1 | | CAN2 | | ECM | |
| CAN_H max=4.3V | | | | TRANSMIT DIAG | PAST |
| CAN_H min=1.0V | | | | UNKWN | 0 |
| CAN_L max=3.1V | | | | VDC/TCS/ABS | 0 |
| CAN_L min=0.6V | | | | UNKWN | 0 |
| Battery(V)11.7V | | | | METER/M&A | - |
| | | | | BCM/SEC | 0 |
| | | | | UNKWN | 0 |
| | | | | ICC | - |
| ECU list | | | | HVAC | - |
| | | | | TCM | 0 |
| | | | | UNKWN | 0 |
| | | | | EPS | 0 |
| | | | | UNKWN | 0 |
| | | | | IPDM E/R | 0 |
| | | | | UNKWN | 0 |
| | | | | e4WD | - |
| | | | | AWD/4WD | - |
| | | | | - | - |
| CAN | | ABS | | | |
| | | | | PRSENT | PAST |
| | | | | NG | |
| | | | | TRANSMIT DIAG | UNKWN |
| | | | | ECM | UNKWN |

All Diag on CAN units are not indicated.

"UNKWN" is indicated under most reception items of CAN DIAG SUPPORT MNTR.

PKID1220E

Past Error — Open Circuit —

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.

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[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. | | | |

FKID1221E

- 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-51, "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).

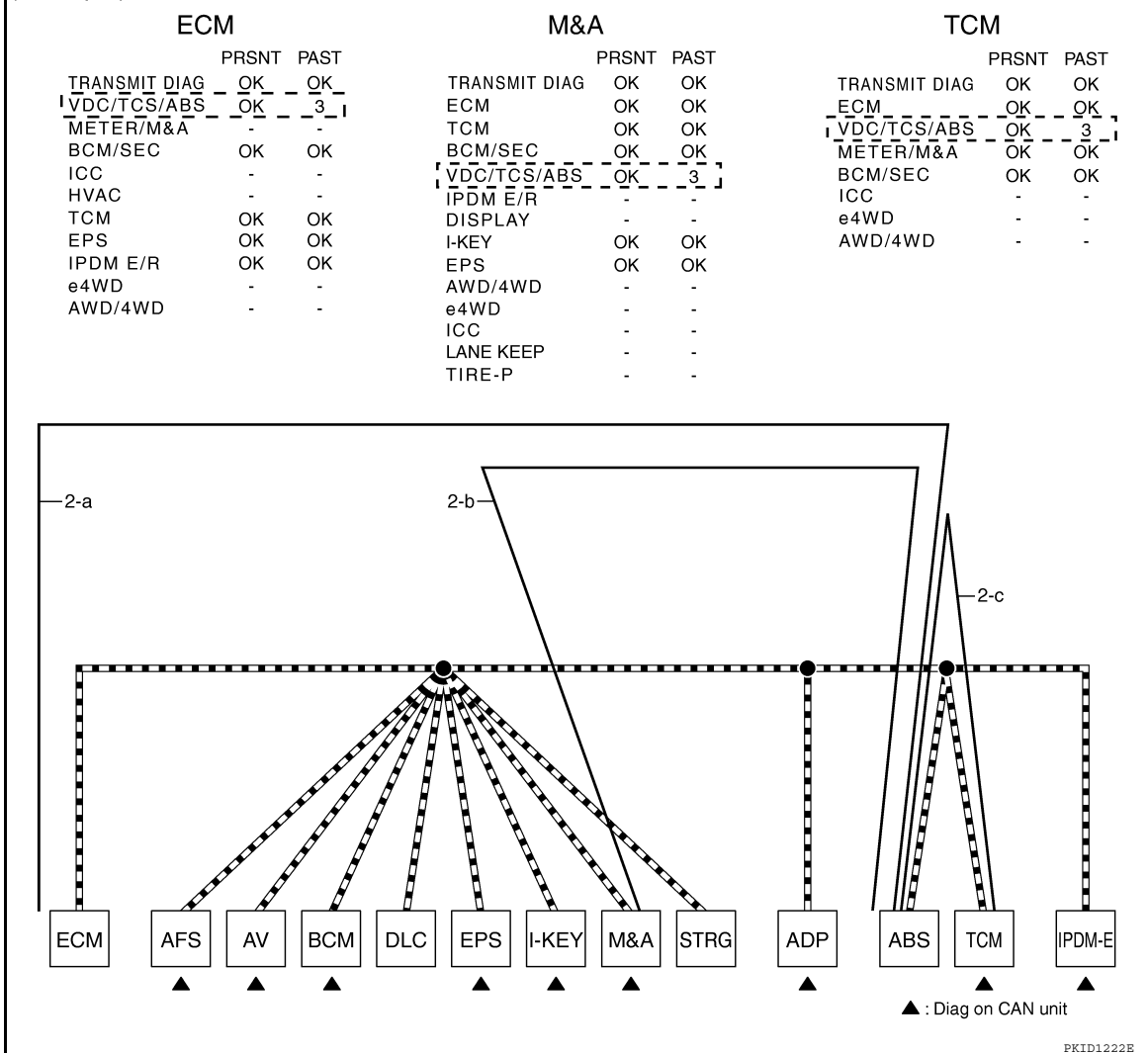
DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[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).

(Example)



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).)

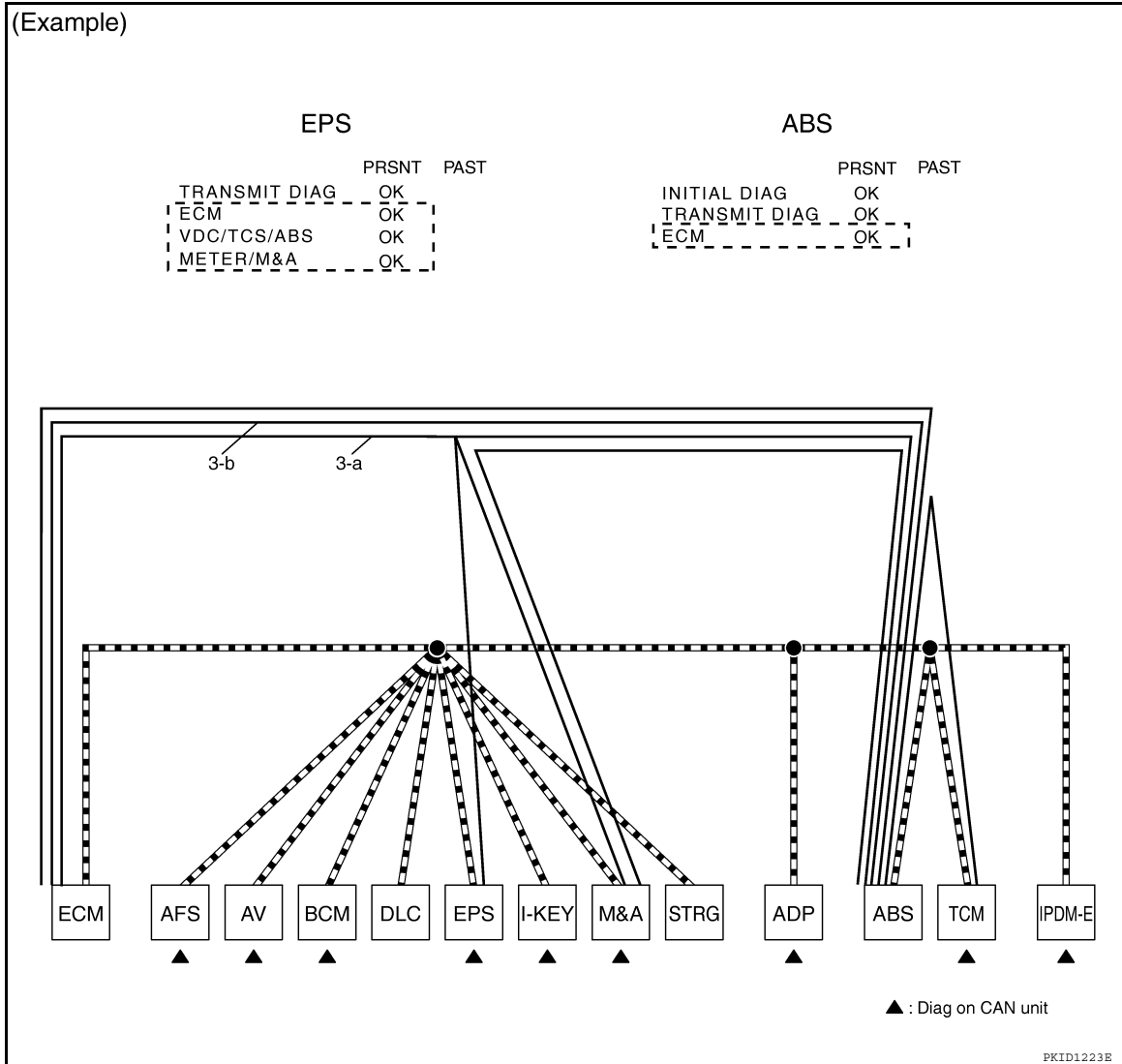
- a. Reception item of "EPS": Assume that the unit could not receive the signals from ECM, ABS, and M&A. Draw a line among EPS, ECM, ABS, and M&A (line 3-a in the figure below).

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[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-51, "CAN Diagnostic Support Monitor"](#).

- 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).

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DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[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).

(Example)

First registration: 28, Jan. 2005

CAN system type: Type 20

Symptom (Results from interview with customer)

While driving,

- ABS warning lamp turned ON.
- Speedometer did not move.
- Tachometer moved normally.

↓

CAN Communication Signal Chart

T: Transmit R: Receive

| Signal name/Connecting unit | ECM | AFS ¹ | AV ² | BCM | EPS | I-KEY ³ | M&A | STRG ¹ | ADP ⁴ | ABS | TCM | IPDME |
|------------------------------------------|--------|------------------|-----------------|----------------|-----|--------------------|-----|-------------------|------------------|-----|--------|-------|
| A/C compressor request signal | T | | | | | | | | | | | R |
| Accelerator pedal position signal | T | | | | | | | | | | R | |
| Closed throttle position signal | T | | | | | | | | | | R | |
| Cooling fan speed request signal | T | | | | | | | | | | | R |
| Engine and CVT integrated control signal | T R | | | | | | | | | | R T | |
| Engine coolant temperature signal | T | | | | | | R | | | | R | |
| 4-b Engine speed signal | T | | | | | | R | | | | R | |
| Engine status signal | T | | R | | R | | | | | | | |
| Fuel consumption monitor signal | T | | R | | | | R | | | | | |
| MI signal | T | | | | | | R | | | | | |
| Wide open throttle position signal | T | | | | | | | | | | | R |
| 4-a ABS warning lamp signal | | | | | | | R | | | T | | |
| Brake warning lamp signal | | | | | | | R | | | T | | |
| Steering angle sensor signal | | R | | | | | | T | | | | |
| Vehicle speed signal | R | | R | R | R | R | T | | R | | T | R |
| Input shaft revolution signal | R | | | | | | | | | | | T |
| Output shaft revolution signal | R | | | | | | | | | | | T |
| Shift position indicator signal | R | R | R | R ⁵ | | | R | | R ⁶ | | | T |
| Second position indicator signal | | | | | | | R | | | | | T |
| Front wiper stop position signal | | | | R | | | | | | | | T |
| High beam status signal | R | R | | | | | | | | | | T |
| Low beam status signal | R | R | | | | | | | | | | T |

SKIB8895E

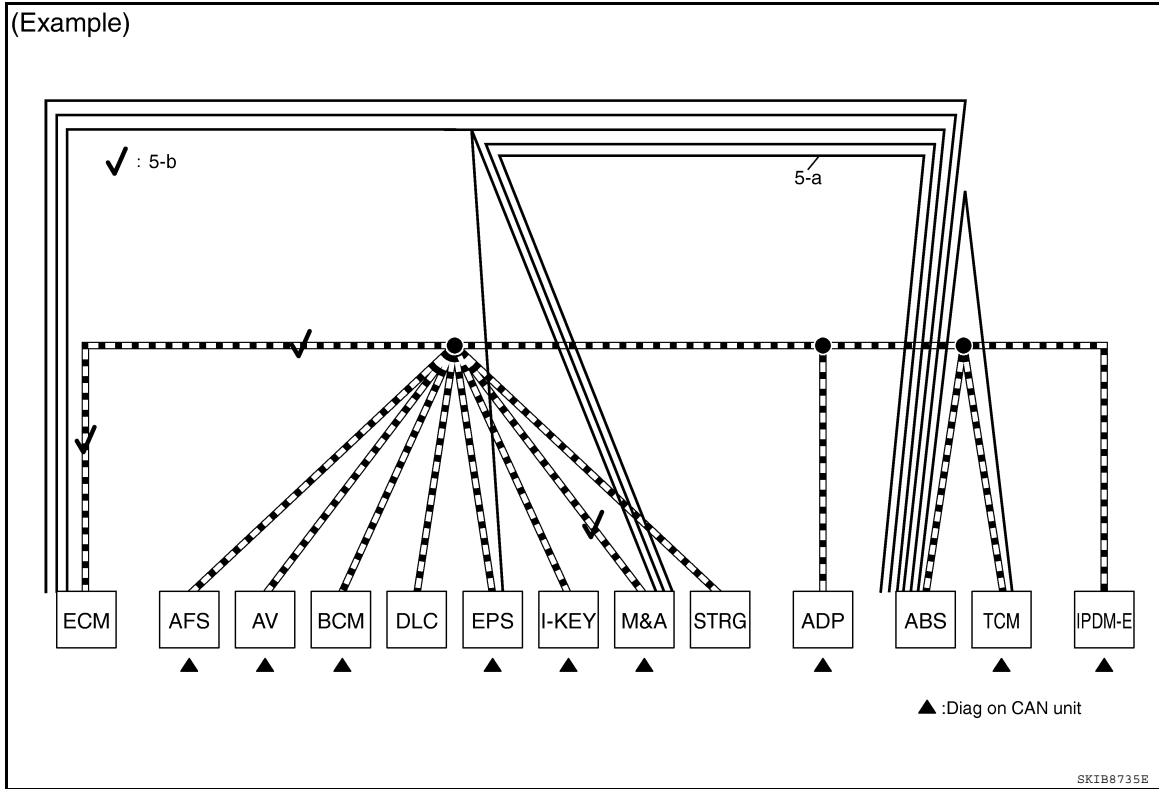
5. Fill out the diagnosis sheet based on information from step 4.
- a. The ABS warning lamp turned ON and speedometer did not move: Assume that a possible cause is no communication between M&A and ABS. Draw a line between M&A and ABS. (Line 5-a in the figure below).

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[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"](#).

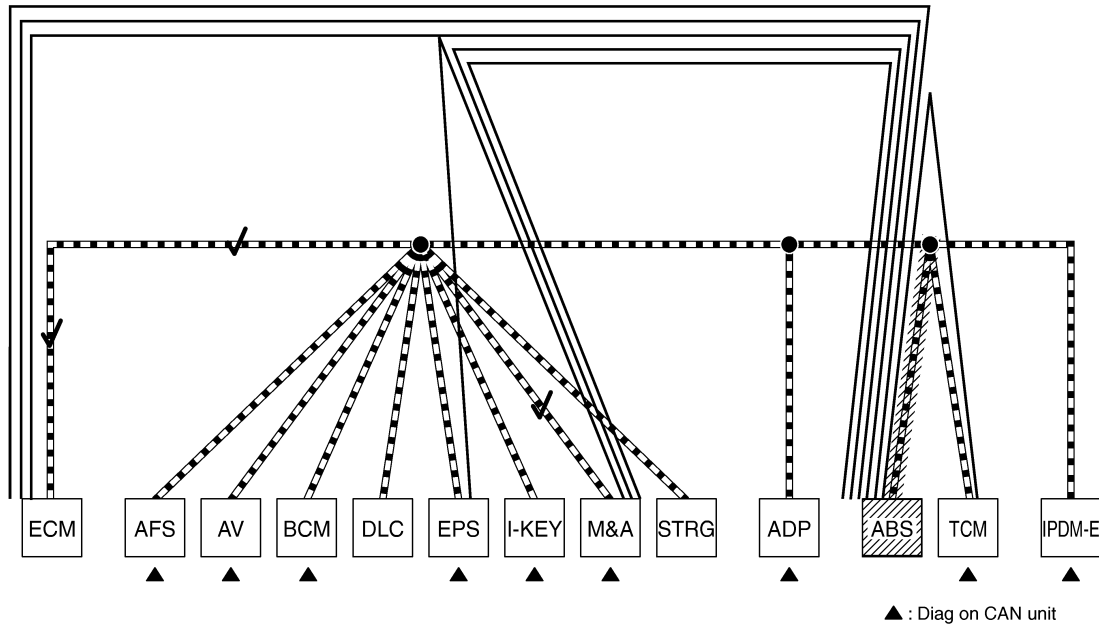
DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[CAN FUNDAMENTAL]

7. Perform the inspection procedure for the possible cause. Refer to “MALFUNCTION AREA CHART”.

(Example)



< Checklist >

| | Item | Check box |
|----|---------|-------------------------------------|
| 1 | ECM | <input checked="" type="checkbox"/> |
| 2 | AFS▲ | <input checked="" type="checkbox"/> |
| 3 | AV▲ | <input checked="" type="checkbox"/> |
| 4 | BCM▲ | <input checked="" type="checkbox"/> |
| 5 | EPS▲ | <input checked="" type="checkbox"/> |
| 6 | I-KEY▲ | <input checked="" type="checkbox"/> |
| 7 | M&A▲ | <input checked="" type="checkbox"/> |
| 8 | ADP▲ | <input checked="" type="checkbox"/> |
| 9 | ABS | <input checked="" type="checkbox"/> |
| 10 | TCM▲ | <input checked="" type="checkbox"/> |
| 11 | IPDM-E▲ | <input checked="" type="checkbox"/> |

Possible root cause

- Error between ABS actuator and electric unit (control unit) and splice.
- Error in ABS actuator and electric unit (control unit).

Inspection result

PKID1224E

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 “MALFUNCTION AREA CHART”. |
| 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. | |

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[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 | | | | | | |
| 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 | PRSNT | PAST | TRANSMIT DIAG | PRSNT | PAST | TRANSMIT DIAG | PRSNT | PAST | TRANSMIT DIAG | PRSNT | 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 | - | - | | | | | | | | | |
| EPS | | | I-KEY | | | M&A | | | ADP | | |
| TRANSMIT DIAG | PRSNT | PAST | TRANSMIT DIAG | PRSNT | PAST | TRANSMIT DIAG | PRSNT | PAST | TRANSMIT DIAG | PRSNT | PAST |
| ECM | OK | 5 | ECM | OK | 5 | ECM | OK | 5 | METER/M&A | 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 | | | |

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

PKID1225E

HOW TO USE THIS MANUAL

HOW TO USE THIS SECTION

Caution

INFOID:000000005272365

- This section describes information peculiar to a vehicle, sheets for trouble diagnosis, and inspection procedures.
- For trouble diagnosis procedure, refer to [LAN-14, "Trouble Diagnosis Procedure"](#).

Abbreviation List

INFOID:000000005272366

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

| Abbreviation | Unit name | SELECT SYSTEM (CONSULT-III) | CAN DIAG SUPPORT MNTR (CONSULT-III) |
|--------------|-----------------------------------------------|--------------------------------|----------------------------------------|
| 4WD | Transfer control unit | ALL MODE AWD/4WD | AWD/4WD |
| A-BAG | Air bag diagnosis sensor unit | AIR BAG | — |
| ABS | ABS actuator and electric unit (control unit) | ABS | VDC/TCS/ABS |
| BCM | BCM | BCM | BCM/SEC |
| DIFF | Differential lock control unit | DIFF LOCK | DIFF LOCK |
| DLC | Data link connector | — | — |
| ECM | ECM | ENGINE | ECM |
| IPDM-E | IPDM E/R | IPDM E/R | IPDM E/R |
| M&A | Combination meter | METER/M&A | METER/M&A |
| STRG | Steering angle sensor | — | STRG |
| TCM | TCM | TRANSMISSION | TCM |

PRECAUTION

PRECAUTIONS

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

INFOID:000000005530356

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

WARNING:

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.
- Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the "SRS AIR BAG".
- 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.

Precautions for Trouble Diagnosis

INFOID:000000005530357

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.

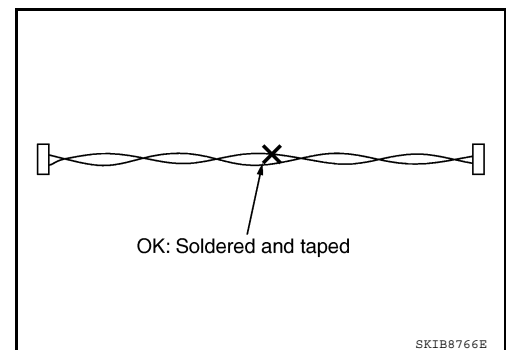
Precautions for Harness Repair

INFOID:000000005530358

- 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

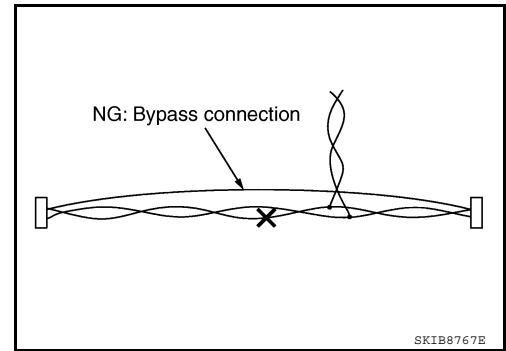
< PRECAUTION >

[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.

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Interview Sheet

INFOID:000000005272370

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

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LAN

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[CAN]

Diagnosis Sheet (CAN Type 1)

INFOID:000000005272371

```

graph TD
    Start(( )) --- ECM[ECM]
    Start --- A_BAG[A-BAG]
    Start --- BCM[BCM]
    Start --- DLC[DLC]
    Start --- M_A[M&A]
    Start --- Node2(( ))
    Node2 --- ABS[ABS]
    Node2 --- IPDM_E[IPDM-E]
    style Start fill:none,stroke-dasharray: 5 5
    style ECM fill:none,stroke-dasharray: 5 5
    style A_BAG fill:none,stroke-dasharray: 5 5
    style BCM fill:none,stroke-dasharray: 5 5
    style DLC fill:none,stroke-dasharray: 5 5
    style M_A fill:none,stroke-dasharray: 5 5
    style Node2 fill:none,stroke-dasharray: 5 5
    style ABS fill:none,stroke-dasharray: 5 5
    style IPDM_E fill:none,stroke-dasharray: 5 5
            
```

▲ : Diag on CAN unit

Possible root cause

Inspection result

< Checklist >

| Item | Check box |
|-----------|--------------------------|
| 1 ECM▲ | <input type="checkbox"/> |
| 2 BCM▲ | <input type="checkbox"/> |
| 3 M&A▲ | <input type="checkbox"/> |
| 4 ABS | <input type="checkbox"/> |
| 5 IPDM-E▲ | <input type="checkbox"/> |

JPMIA0738GB

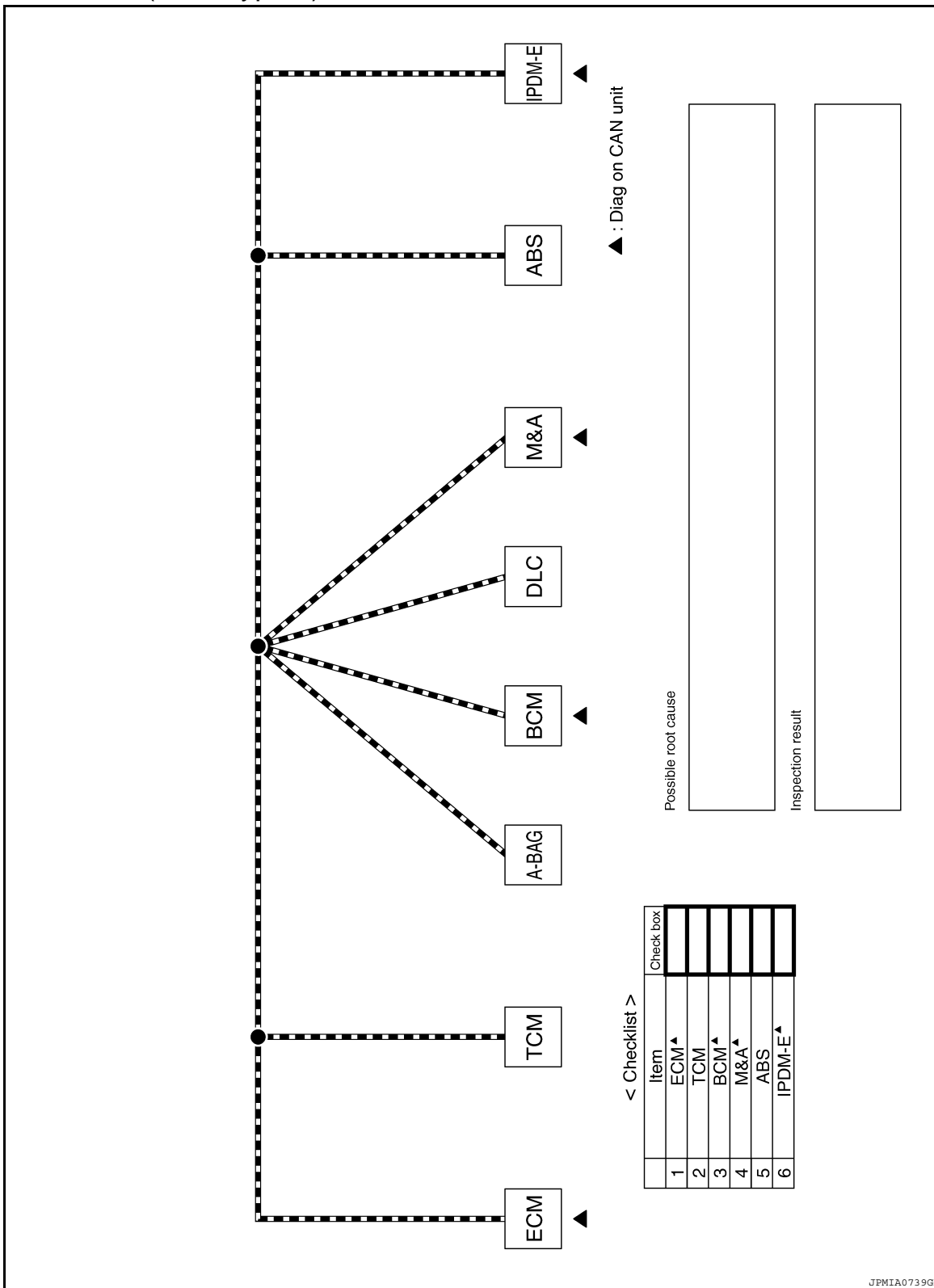
DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[CAN]

Diagnosis Sheet (CAN Type 2)

INFOID:000000005272372



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DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[CAN]

Diagnosis Sheet (CAN Type 3)

INFOID:000000005272373

```

graph TD
    Root(( )) --- Solid1[ ]
    Solid1 --- ECM[ECM]
    Solid1 --- Solid2[ ]
    Solid2 --- A-BAG[A-BAG]
    Solid2 --- Solid3[ ]
    Solid3 --- BCM[BCM]
    Solid3 --- Solid4[ ]
    Solid4 --- DLC[DLC]
    Solid3 --- Dashed1[ ]
    Dashed1 --- M&A[M&A]
    Dashed1 --- Dashed2[ ]
    Dashed2 --- STRG[STRG]
    Dashed1 --- Dashed3[ ]
    Dashed3 --- ABS[ABS]
    Dashed1 --- Dashed4[ ]
    Dashed4 --- IPDM-E[IPDM-E]
    
```

▲ : Diag on CAN unit

Possible root cause

Inspection result

< Checklist >

| Item | Check box |
|-----------|--------------------------|
| 1 ECM▲ | <input type="checkbox"/> |
| 2 BCM▲ | <input type="checkbox"/> |
| 3 M&A▲ | <input type="checkbox"/> |
| 4 ABS | <input type="checkbox"/> |
| 5 IPDM-E▲ | <input type="checkbox"/> |

JPMIA0746GB

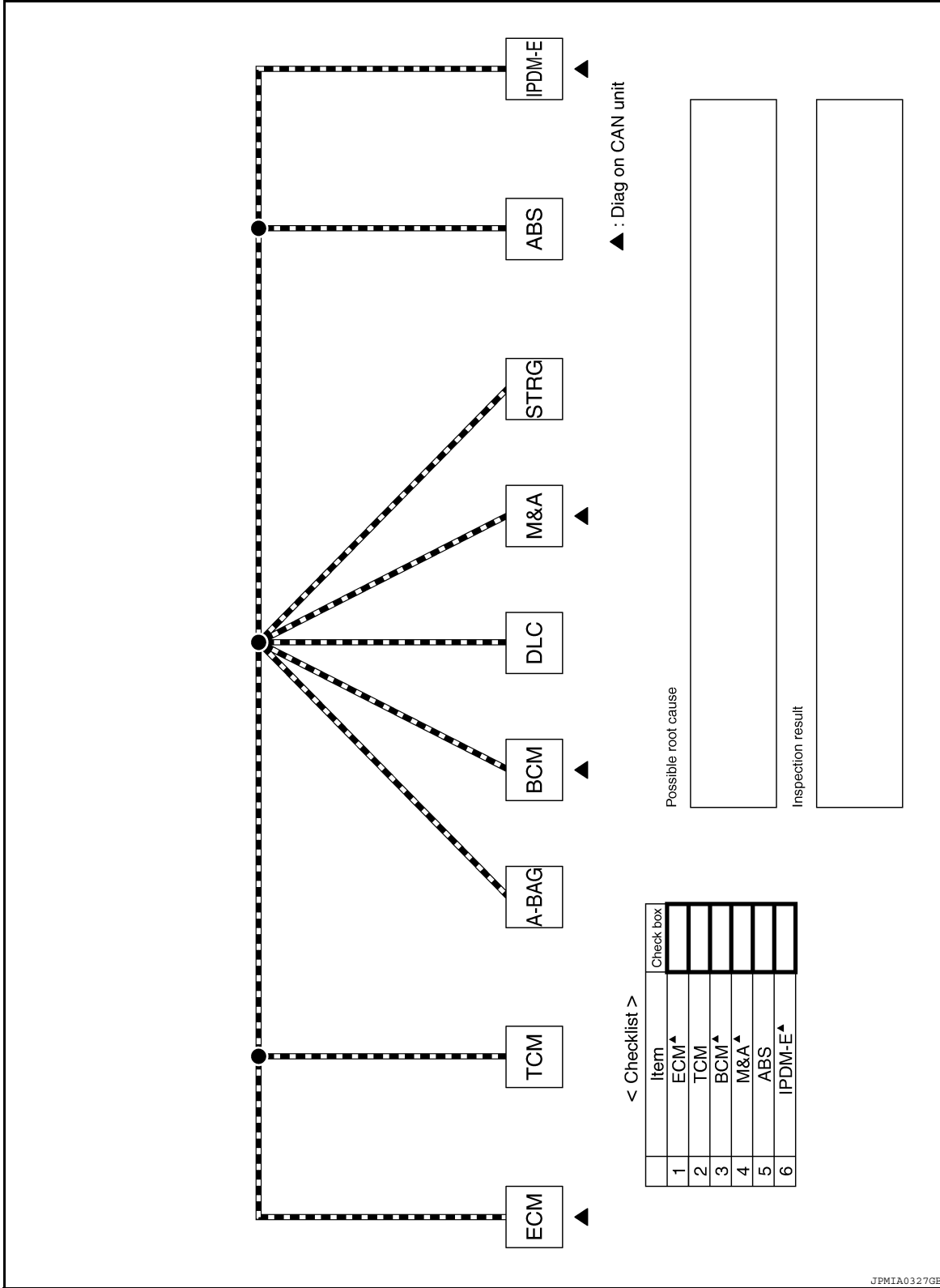
DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[CAN]

Diagnosis Sheet (CAN Type 4)

INFOID:000000005272374



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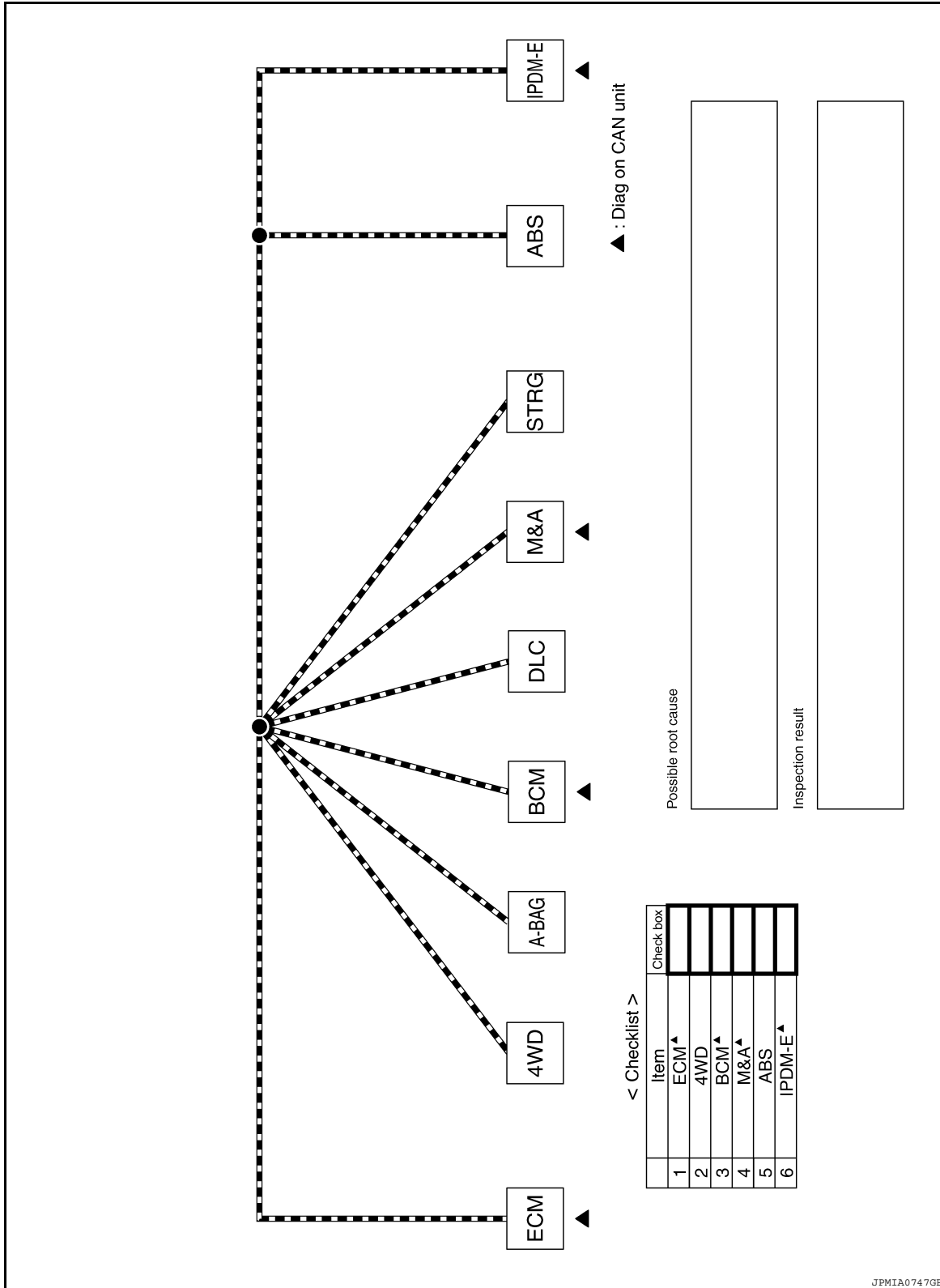
DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[CAN]

Diagnosis Sheet (CAN Type 5)

INFOID:000000005272375



JPMIA0747GB

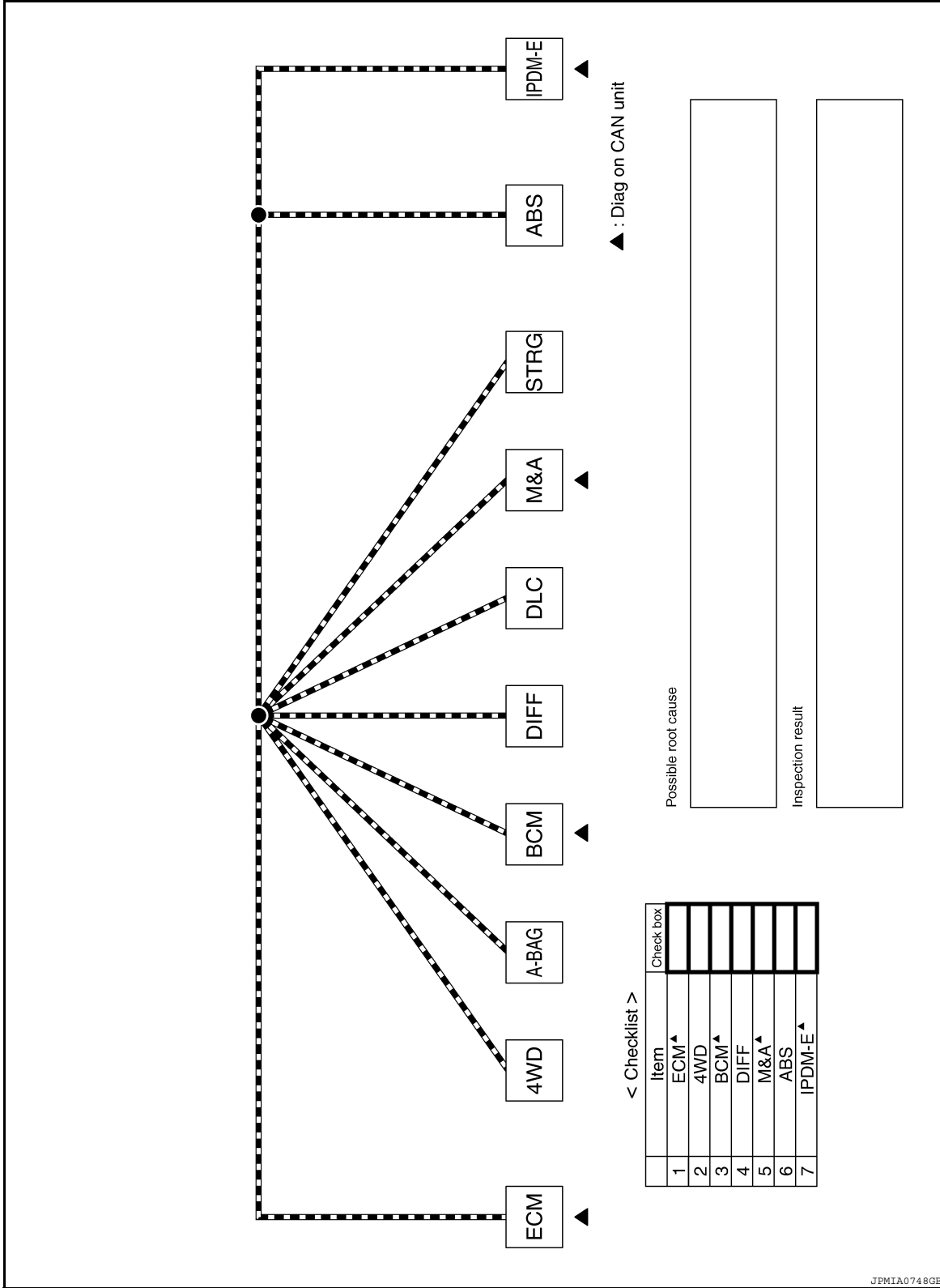
DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[CAN]

Diagnosis Sheet (CAN Type 6)

INFOID:000000005272376



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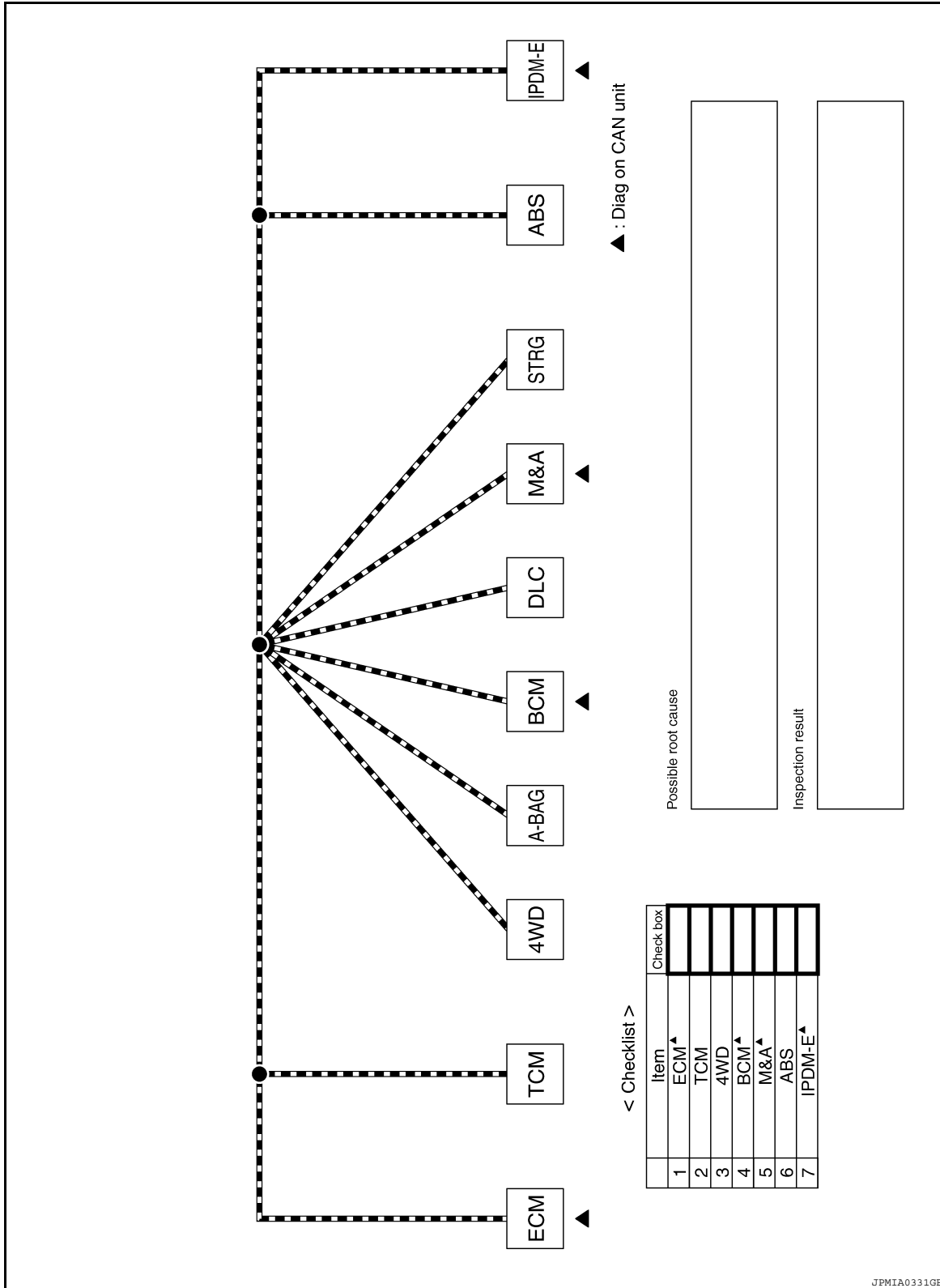
DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[CAN]

Diagnosis Sheet (CAN Type 7)

INFOID:000000005272377



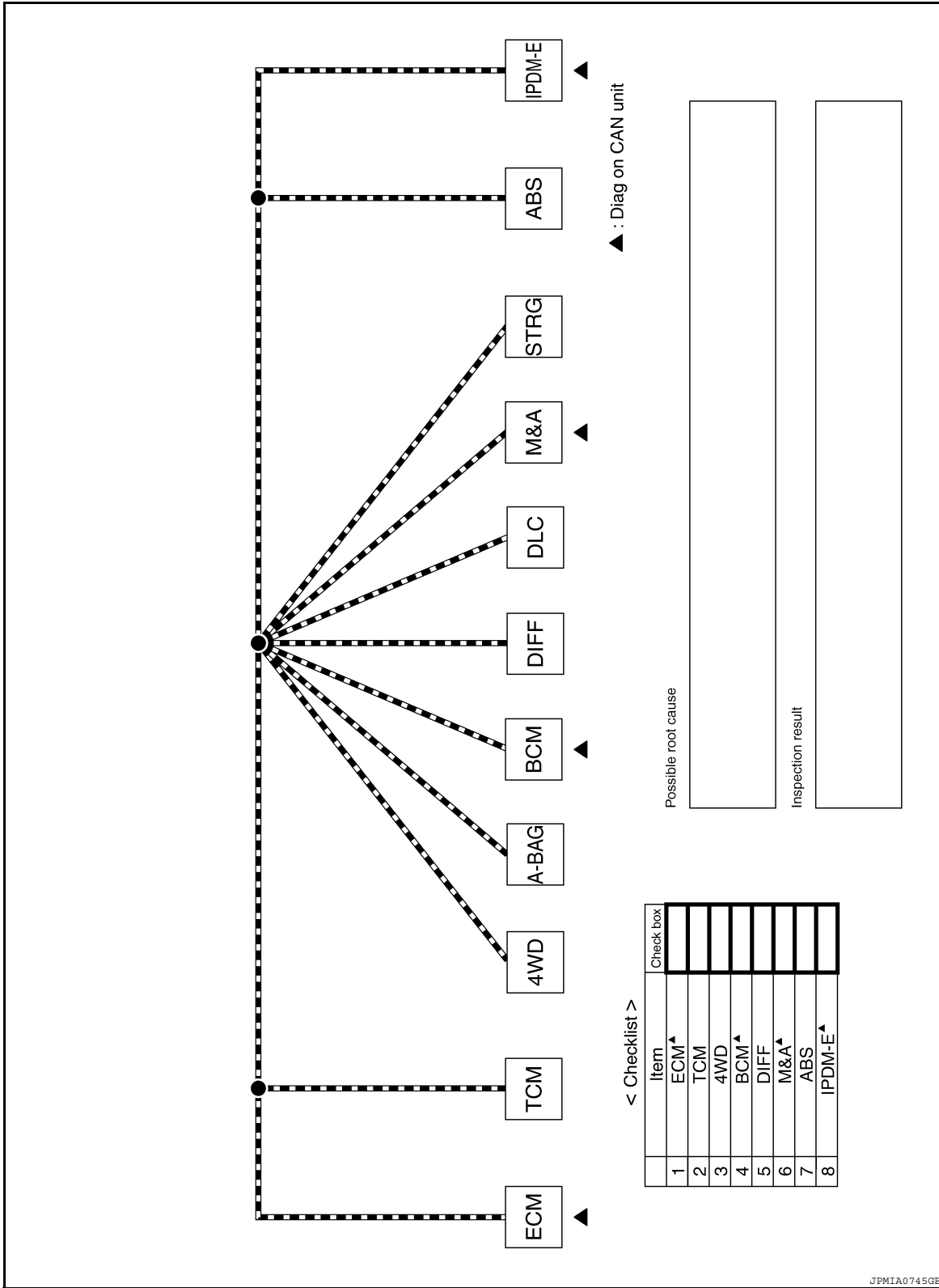
DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[CAN]

Diagnosis Sheet (CAN Type 8)

INFOID:000000005272378



JPMIA0745GB

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CAN COMMUNICATION SYSTEM

< FUNCTION DIAGNOSIS >

[CAN]

FUNCTION DIAGNOSIS

CAN COMMUNICATION SYSTEM

CAN System Specification Chart

INFOID:000000005272386

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

NOTE:

Refer to [LAN-14, "Trouble Diagnosis Procedure"](#) for how to use CAN system specification chart.

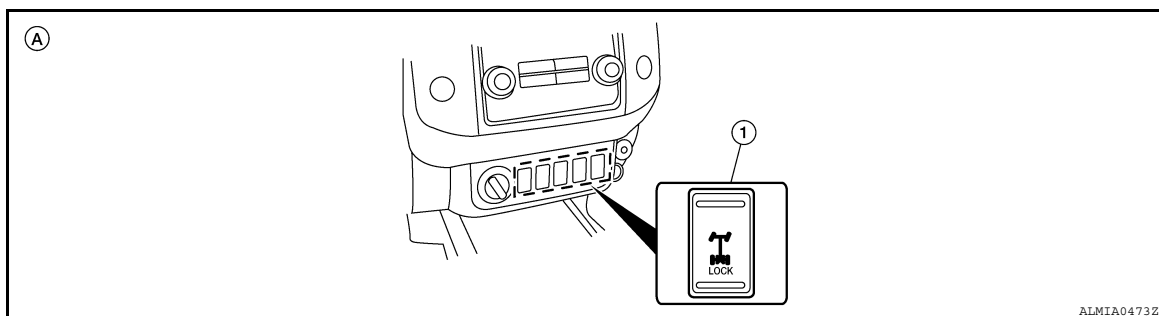
| | | | | | | | | |
|--------------------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| Body type | Truck | | | | | | | |
| Axle | 2WD | | | | 4WD | | | |
| Engine | QR25DE | | | | VQ40DE | | | |
| Transmission | M/T | A/T | M/T | A/T | M/T | A/T | M/T | A/T |
| Brake control | ABS | | | | VDC | | | |
| Electronic locking rear differential | | | | | | × | | × |
| CAN system type | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Diagnosis sheet | LAN-40 | LAN-41 | LAN-42 | LAN-43 | LAN-44 | LAN-45 | LAN-46 | LAN-47 |

×: Applicable

VEHICLE EQUIPMENT IDENTIFICATION INFORMATION

NOTE:

Check CAN system type from the vehicle shape and equipment.



ALMIA0473ZZ

1. Differential lock mode switch
- A. With electronic locking rear differential

CAN Communication Signal Chart

INFOID:000000005272387

Refer to [LAN-13, "How to Use CAN Communication Signal Chart"](#) for how to use CAN communication signal chart.

NOTE:

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

T: Transmit R: Receive

| Signal name/Connecting unit | ECM | TCM | 4WD | BCM | DIFF | M&A | STRG | ABS | IPDM-E |
|-----------------------------------|-----|-----|-----|-----|------|-----|------|-----------------|--------|
| A/C compressor request signal | T | | | | | | | | R |
| Accelerator pedal position signal | T | R | | | | | | R ^{*1} | |
| ASCD CRUISE lamp signal | T | | | | | R | | | |
| ASCD OD cancel request | T | R | | | | | | | |
| ASCD operation signal | T | R | | | | | | | |
| ASCD SET lamp signal | T | | | | | R | | | |

CAN COMMUNICATION SYSTEM

< FUNCTION DIAGNOSIS >

[CAN]

| Signal name/Connecting unit | ECM | TCM | 4WD | BCM | DIFF | M&A | STRG | ABS | IPDM-E | |
|---------------------------------------|-----|-----|-----|-----|------|-----|------|-----|--------|-----|
| Battery voltage signal | T | R | | | | | | | | A |
| Closed throttle position signal | T | R | | | | | | | | B |
| Cooling fan speed request signal | T | | | | | | | | R | |
| Engine coolant temperature signal | T | | | | | R | | | | C |
| Engine speed signal | T | R | R | | | R | | R*1 | | |
| Engine status signal | T | | | R | | | | | | D |
| Fuel consumption monitor signal | T | | | | | R | | | | |
| Malfunction indicator lamp signal | T | | | | | R | | | | |
| Power generation command value signal | T | | | | | | | | R | E |
| Wide open throttle position signal | T | R | | | | | | | | |
| A/T fluid temperature sensor signal | | T | | | | R | | | | |
| A/T position indicator lamp signal | | T | R | | | R | | R*1 | | F |
| A/T self-diagnosis signal | R | T | | | | | | | | |
| Input speed signal | R | T | | | | | | | | G |
| O/D OFF indicator signal | | T | | | | R | | | | |
| Output shaft revolution signal | R | T | R | | | | | | | |
| 4WD shift switch signal | | | T | | R | | | | | H |
| A/C switch signal | R | | | T | | | | | | |
| Blower fan motor switch signal | R | | | T | | | | | | I |
| Buzzer output signal | | | | T | | R | | | | |
| Day time running light request signal | | | | T | | R | | | R | |
| Door switch signal | | | | T | | R | | | R | J |
| Front fog light request signal | | | | T | | R | | | R | |
| Front wiper request signal | | | | T | | | | | R | K |
| High beam request signal | | | | T | | R | | | R | |
| Horn chirp signal | | | | T | | | | | R | |
| Ignition switch signal | | | | T | | | | | R | L |
| Low beam request signal | | | | T | | | | | R | |
| Position light request signal | | | | T | | R | | | R | |
| Rear window defogger switch signal | | | | T | | | | | R | LAN |
| Sleep wake up signal | | | | T | | R | | | R | |
| Theft warning horn request signal | | | | T | | | | | R | N |
| Turn indicator signal | | | | T | | R | | | | |
| Differential lock indicator signal | | | | | T | | | R | | |
| Differential lock switch signal | | | | | T | | | R | | O |
| 1st position switch signal | | R | | | | T | | | | |
| Fuel level sensor signal | R | | | | | T | | | | P |
| Overdrive control switch signal | | R | | | | T | | | | |
| Seat belt buckle switch signal | | | | R | | T | | | | |
| Stop lamp switch signal | | R | | R | | T | | | | |
| | | | R | | | | | T | | |

CAN COMMUNICATION SYSTEM

< FUNCTION DIAGNOSIS >

[CAN]

| Signal name/Connecting unit | ECM | TCM | 4WD | BCM | DIFF | M&A | STRG | ABS | IPDM-E |
|----------------------------------------------|-----|-----|-----|-----|------|-----|------|-----|--------|
| Vehicle speed signal | R | R | | R | | T | | | |
| | R | | R | | R | R | | T | |
| Steering angle sensor signal*1 | | | | | | | T | R | |
| ABS warning lamp signal | | | | | | R | | T | |
| Brake warning lamp signal | | | | | | R | | T | |
| Hill descent control indicator lamp signal*2 | | | | | | R | | T | |
| SLIP indicator lamp signal*1 | | | | | | R | | T | |
| VDC OFF indicator lamp signal*1 | | | | | | R | | T | |
| Front wiper stop position signal | | | | R | | | | | T |
| High beam status signal | R | | | | | | | | T |
| Low beam status signal | R | | | | | | | | T |
| Rear window defogger control signal | R | | | | | | | | T |

• *1: Models with VDC

• *2: Models with hill descent control

NOTE:

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

TROUBLE DIAGNOSIS

< FUNCTION DIAGNOSIS >

[CAN]

TROUBLE DIAGNOSIS

CAN Diagnostic Support Monitor

INFOID:000000005272388

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- PORT MNTR | Description | Normal | | Error | |
|------|----------------------------|---------------------------------------------------------------------------------------------|------------------------------------------|---------------------|-------|------|
| | | | PRSNT | PAST | PRSNT | PAST |
| ECM | TRANSMIT DIAG | Signal transmission status | OK | OK or 1 – 39* | UNKWN | 0 |
| | VDC/TCS/ABS | With VDC: 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 combina- tion meter | OK | OK or 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 or 1 – 39* | UNKWN | 0 |
| | MULTI AV | Not used even though indicated | | | | |
| | EPS | | | | | |
| | IPDM E/R | Signal receiving status from the IPDM E/R | OK | OK or 1 – 39* | UNKWN | 0 |
| | e4WD | Not used even though indicated | | | | |
| | AWD/4WD | Signal receiving status from the transfer control unit | OK | OK or 1 – 39* | UNKWN | 0 |

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

TCM

NOTE:

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

| ITEM | CAN DIAG SUP- 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 ABS: Not used even though indicated | | |
| | | With VDC: Signal receiving status from the ABS actuator and elec- tric unit (control unit) | OK | UNKWN |
| | METER/M&A | Signal receiving status from the combination meter | | |
| | ICC/e4WD | Not used even though indicated | | |
| AWD/4WD | Signal receiving status from the transfer control unit | OK | UNKWN | |

Transfer Control Unit

NOTE:

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

TROUBLE DIAGNOSIS

< FUNCTION DIAGNOSIS >

[CAN]

| ITEM | CAN DIAG SUP- PORT MNTR | Description | Normal | Error |
|------|----------------------------|--------------------------------------------------------------------------------|--------|-------|
| | | | PRSNT | |
| 4WD | INITIAL DIAG | Status of CAN controller | OK | NG |
| | TRANSMIT DIAG | Signal transmission status | | UNKWN |
| | ECM | Signal receiving status from the ECM | | |
| | VDC/TCS/ABS | Signal receiving status from the ABS actuator and electric unit (control unit) | | |
| | TCM | Signal receiving status from the TCM | | |
| | METER/M&A | Signal receiving status from the combination meter | | |

BCM

NOTE:

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

| ITEM | CAN DIAG SUP- 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 combination meter | | |
| | I-KEY | Not used even though indicated | | |

Differential Lock Control Unit

NOTE:

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

| ITEM | CAN DIAG SUP- PORT MNTR | Description | Normal | Error |
|------|----------------------------|--------------------------------------------------------------------------------|--------|-------|
| | | | PRSNT | |
| DIFF | INITIAL DIAG | Status of CAN controller | OK | NG |
| | TRANSMIT DIAG | Signal transmission status | | UNKWN |
| | ECM | Signal receiving status from the ECM | | |
| | VDC/TCS/ABS | Signal receiving status from the ABS actuator and electric unit (control unit) | | |
| | AWD/4WD | Signal receiving status from the transfer control unit | | |

Combination Meter

TROUBLE DIAGNOSIS

< FUNCTION DIAGNOSIS >

[CAN]

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 |
| M&A | TRANSMIT DIAG | Signal transmission status | OK | OK or 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 | Signal receiving status from the ABS actua- tor and electric unit (control unit) | | | | |
| | IPDM E/R | Signal receiving status from the IPDM E/R | | | | |
| | DISPLAY | Not used even though indicated | | | | |
| | I-KEY | | | | | |
| | EPS | | | | | |
| | AWD/4WD | | | | | |
| | e4WD | | | | | |
| | ICC | | | | | |
| | LANE CAMERA | | | | | |
| | TIRE-P | | | | | |

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

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 ^{Caution} |
| | 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.

ABS Actuator and Electric Unit (Control Unit) (Models with VDC)

| ITEM | CAN DIAG SUP- PORT MNTR | Description | Normal | Error |
|------|----------------------------|-----------------------------------------------------------------|--------|-----------------------|
| | | | PRSNT | |
| ABS | INITIAL DIAG | Status of CAN controller | OK | NG ^{Caution} |
| | TRANSMIT DIAG | Signal transmission status | | UNKWN |
| | ECM | Signal receiving status from the ECM | | |
| | TCM | Signal receiving status from the TCM | | |
| | METER/M&A | Not used even though indicated | | |
| | STRG | Signal receiving status from the steering angle sensor | OK | UNKWN |
| | ICC | Not used even though indicated | | |
| | AWD/4WD | Signal receiving status from the transfer control unit | OK | UNKWN |
| | DIFF LOCK | Signal receiving status from the differential lock control unit | | |

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

TROUBLE DIAGNOSIS

< FUNCTION DIAGNOSIS >

[CAN]

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 or 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.

DTC Index

INFOID:0000000005272389

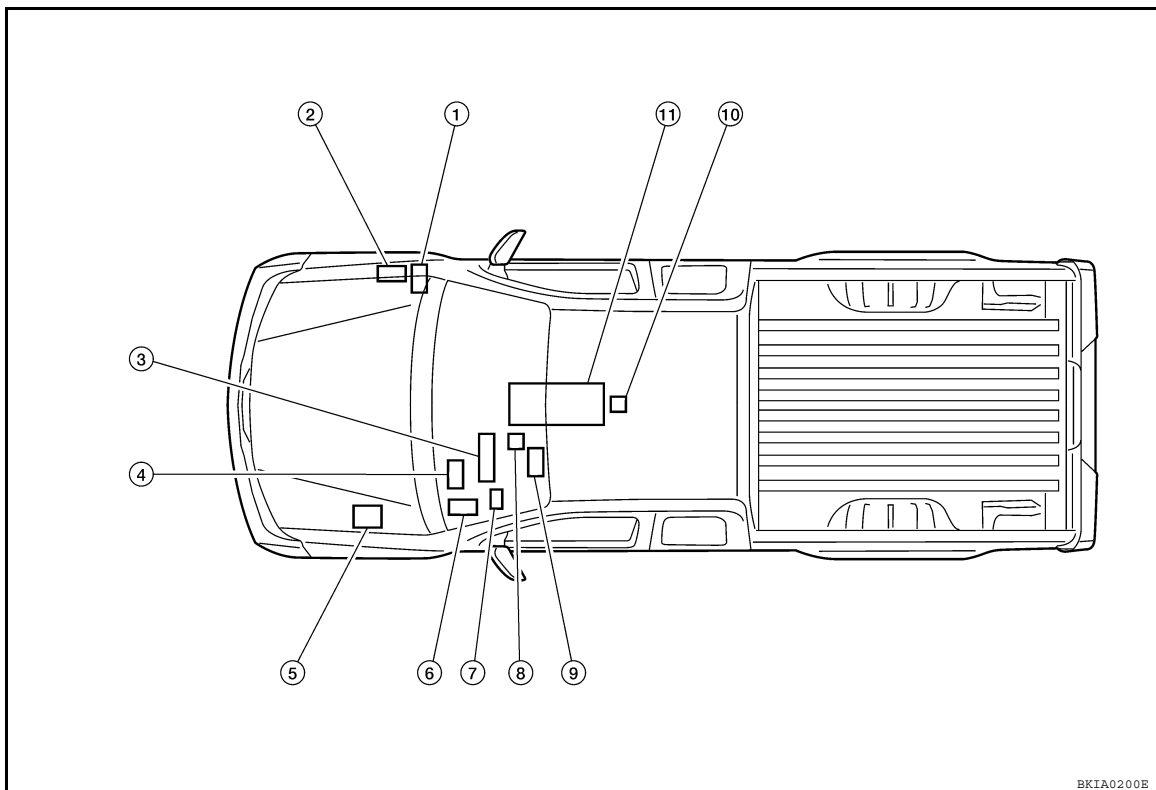
| DTC | Self-diagnosis item (CONSULT-III indication) | DTC detection condition | | Inspection/Action |
|-------|-------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| U0101 | LOST COMM (TCM) | When ECM is not transmitting or receiving CAN communication signal of OBD (emission-related diagnosis) from TCM for 2 seconds or more. | | Refer to LAN-36 . |
| U0140 | LOST COMM (BCM) | When ECM is not transmitting or receiving CAN communication signal of OBD (emission-related diagnosis) from BCM for 2 seconds or more. | | |
| U0164 | LOST COMM (HVAC) | When ECM is not transmitting or receiving CAN communication signal of OBD (emission-related diagnosis) from A/C auto amp. or unified meter and A/C amp. for 2 seconds or more. | | |
| U1000 | CAN COMM CIRCUIT | ECM | When ECM is not transmitting or receiving CAN communication signal of OBD (emission-related diagnosis) for 2 seconds or more. | |
| | | Except for ECM | 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” or “P0607”. |
| P0607 | ECM | | | |

COMPONENT DIAGNOSIS

CAN COMMUNICATION SYSTEM

Component Parts Location

INFOID:000000005272390



- | | | |
|---------------------------------------|-----------------------------------------------------------------------------------------|-------------------------------|
| 1. IPDM E/R E122 | 2. ECM E8: VQ engine models E16: QR engine models | 3. Combination meter M24 |
| 4. BCM M18 | 5. ABS actuator and electric unit (control unit) E125: Without VDC E127: With VDC | 6. Transfer control unit M152 |
| 7. Differential lock control unit M70 | 8. Data link connector M22 | 9. Steering angle sensor M47 |
| 10. Air bag diagnosis sensor unit M35 | 11. A/T assembly F9 | |

LAN

CAN COMMUNICATION SYSTEM

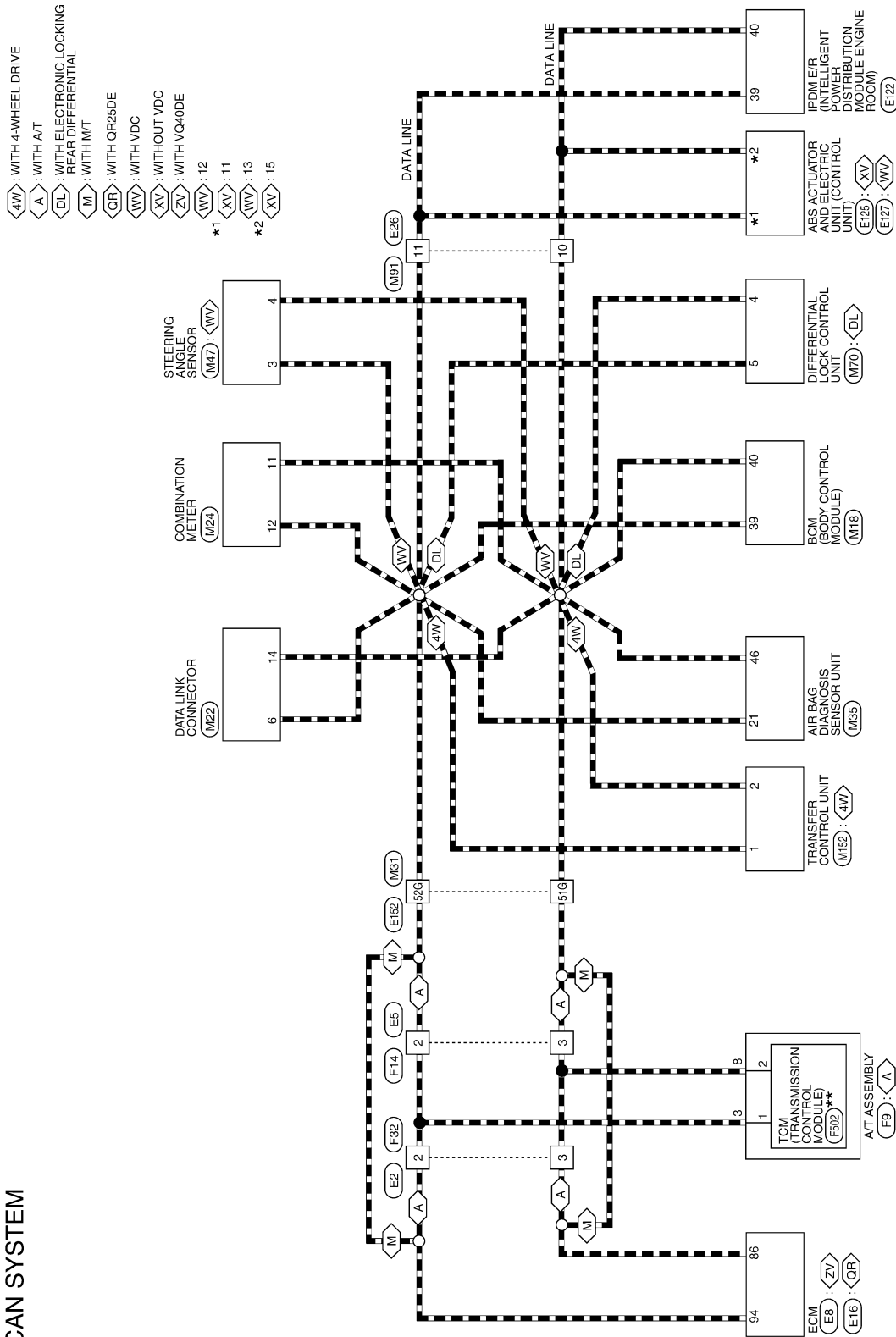
[CAN]

< COMPONENT DIAGNOSIS >

Wiring Diagram - CAN SYSTEM -

INFOID:000000005272391

CAN SYSTEM



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

ABMWA0497GB

CAN COMMUNICATION SYSTEM

< COMPONENT DIAGNOSIS >

[CAN]

CAN SYSTEM CONNECTORS

| | |
|-----------------|---------------------------|
| Connector No. | M18 |
| Connector Name | BCM (BODY CONTROL MODULE) |
| Connector Color | WHITE |



| | | | | | | | | | | | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |

| Terminal No. | Color of Wire | Signal Name |
|--------------|---------------|-------------|
| 39 | L | CAN-H |
| 40 | P | CAN-L |

| | |
|-----------------|---------------------|
| Connector No. | M22 |
| Connector Name | DATA LINK CONNECTOR |
| Connector Color | WHITE |



| | | | | | | | |
|---|----|----|----|----|----|----|----|
| 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

| Terminal No. | Color of Wire | Signal Name |
|--------------|---------------|-------------|
| 6 | L | - |
| 14 | P | - |

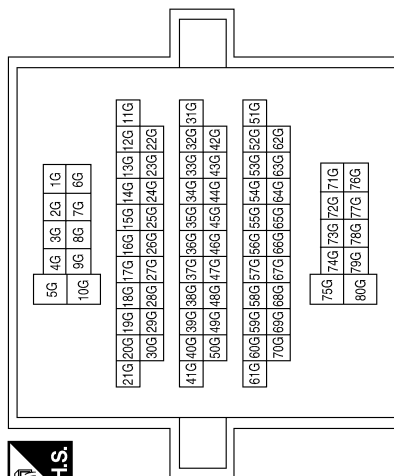
| | |
|-----------------|-------------------|
| Connector No. | M24 |
| Connector Name | COMBINATION METER |
| Connector Color | WHITE |



| | | | | | | | | | | | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
| 40 | 39 | 38 | 37 | 36 | 35 | 34 | 33 | 32 | 31 | 30 | 29 | 28 | 27 | 26 | 25 | 24 | 23 | 22 | 21 |

| Terminal No. | Color of Wire | Signal Name |
|--------------|---------------|-------------|
| 11 | P | CAN-L |
| 12 | L | CAN-H |

| | |
|-----------------|--------------|
| Connector No. | M31 |
| Connector Name | WIRE TO WIRE |
| Connector Color | WHITE |



| Terminal No. | Color of Wire | Signal Name |
|--------------|---------------|-------------|
| 51G | P | - |
| 52G | L | - |

| | |
|-----------------|-------------------------------|
| Connector No. | M35 |
| Connector Name | AIR BAG DIAGNOSIS SENSOR UNIT |
| Connector Color | YELLOW |



| | | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|---|---|
| 21 | 22 | 11 | 46 | 48 | 47 | 45 | 3 | 4 | 6 | 5 |
| 16 | 12 | 19 | 15 | | | | 18 | | | 2 |
| | | | | | | | 24 | 49 | 1 | |

| Terminal No. | Color of Wire | Signal Name |
|--------------|---------------|-------------|
| 21 | L | CAN-H |
| 46 | P | CAN-L |

| | |
|-----------------|-----------------------|
| Connector No. | M47 |
| Connector Name | STEERING ANGLE SENSOR |
| Connector Color | WHITE |



| | | |
|---|---|---|
| 8 | 1 | 2 |
| 3 | 4 | |

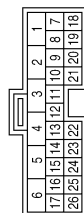
| Terminal No. | Color of Wire | Signal Name |
|--------------|---------------|-------------|
| 3 | L | CAN-H |
| 4 | P | CAN-L |

CAN COMMUNICATION SYSTEM

< COMPONENT DIAGNOSIS >

[CAN]

| | |
|-----------------|-----------------------|
| Connector No. | M152 |
| Connector Name | TRANSFER CONTROL UNIT |
| Connector Color | WHITE |



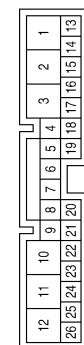
| Terminal No. | Color of Wire | Signal Name |
|--------------|---------------|-------------|
| 1 | L | CAN-H |
| 2 | P | CAN-L |

| | |
|-----------------|--------------|
| Connector No. | M91 |
| Connector Name | WIRE TO WIRE |
| Connector Color | WHITE |



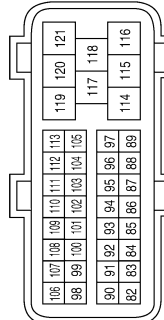
| Terminal No. | Color of Wire | Signal Name |
|--------------|---------------|-------------|
| 10 | P | - |
| 11 | L | - |

| | |
|-----------------|--------------------------------|
| Connector No. | M70 |
| Connector Name | DIFFERENTIAL LOCK CONTROL UNIT |
| Connector Color | WHITE |



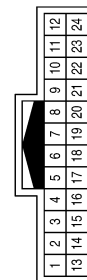
| Terminal No. | Color of Wire | Signal Name |
|--------------|---------------|-------------|
| 4 | P | CAN-L |
| 5 | L | CAN-H |

| | |
|-----------------|-------------------|
| Connector No. | E8 |
| Connector Name | ECM (WITH VQ40DE) |
| Connector Color | BLACK |



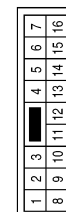
| Terminal No. | Color of Wire | Signal Name |
|--------------|---------------|-------------|
| 86 | P | CAN-L |
| 87 | L | CAN-H |

| | |
|-----------------|--------------|
| Connector No. | E5 |
| Connector Name | WIRE TO WIRE |
| Connector Color | WHITE |



| Terminal No. | Color of Wire | Signal Name |
|--------------|---------------|-------------|
| 2 | L | - |
| 3 | P | - |

| | |
|-----------------|--------------|
| Connector No. | E2 |
| Connector Name | WIRE TO WIRE |
| Connector Color | WHITE |



| Terminal No. | Color of Wire | Signal Name |
|--------------|---------------|-------------|
| 2 | L | - |
| 3 | P | - |

ABM1A1390GB

CAN COMMUNICATION SYSTEM

< COMPONENT DIAGNOSIS >

[CAN]

| | |
|-----------------|--------------------------------------------------------------|
| Connector No. | E122 |
| Connector Name | IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) |
| Connector Color | WHITE |



| | | | | | |
|----|----|----|----|----|----|
| 42 | 41 | 40 | 39 | 38 | 37 |
| 48 | 47 | 46 | 45 | 44 | 43 |

| Terminal No. | Color of Wire | Signal Name |
|--------------|---------------|-------------|
| 39 | L | CAN-H |
| 40 | P | CAN-L |

| | |
|-----------------|--------------|
| Connector No. | E26 |
| Connector Name | WIRE TO WIRE |
| Connector Color | WHITE |



| | | | | | | | | |
|---|---|----|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | | 5 | 6 | 7 | |
| 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |

| Terminal No. | Color of Wire | Signal Name |
|--------------|---------------|-------------|
| 10 | P | - |
| 11 | L | - |

| | |
|-----------------|-------------------|
| Connector No. | E16 |
| Connector Name | ECM (WITH QR25DE) |
| Connector Color | BLACK |



| | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 105 | 107 | 106 | 108 | 110 | 111 | 112 | 113 | 119 | 120 | 121 |
| 98 | 99 | 100 | 101 | 102 | 103 | 104 | 105 | 117 | 118 | |
| 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 114 | 115 | 116 |
| 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | | | |

| Terminal No. | Color of Wire | Signal Name |
|--------------|---------------|-------------|
| 86 | P | CAN-L |
| 94 | L | CAN-H |

| | |
|-----------------|----------------------------------------------------------|
| Connector No. | E127 |
| Connector Name | ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) (WITH VDC) |
| Connector Color | BLACK |



| | | | | | | | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | |
| 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 |

| Terminal No. | Color of Wire | Signal Name |
|--------------|---------------|-------------|
| 12 | L | CAN-H |
| 13 | P | CAN-L |

| | |
|-----------------|-------------------------------------------------------------|
| Connector No. | E125 |
| Connector Name | ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) (WITHOUT VDC) |
| Connector Color | BLACK |



| | | | | | | | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | |
| 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 |

| Terminal No. | Color of Wire | Signal Name |
|--------------|---------------|-------------|
| 11 | L | CAN-H |
| 15 | P | CAN-L |

ABM1A1330GB

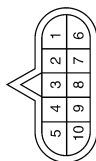
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CAN COMMUNICATION SYSTEM

< COMPONENT DIAGNOSIS >

[CAN]

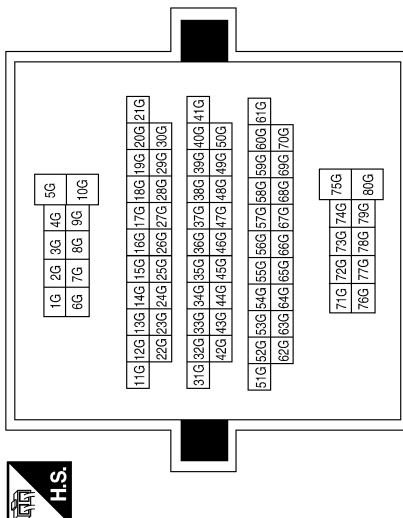
| | |
|-----------------|--------------|
| Connector No. | F9 |
| Connector Name | A/T ASSEMBLY |
| Connector Color | GREEN |



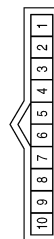
| Terminal No. | Color of Wire | Signal Name |
|--------------|---------------|-------------|
| 3 | L | — |
| 8 | P | — |

| Terminal No. | Color of Wire | Signal Name |
|--------------|---------------|-------------|
| 51G | P | — |
| 52G | L | — |

| | |
|-----------------|--------------|
| Connector No. | E152 |
| Connector Name | WIRE TO WIRE |
| Connector Color | WHITE |



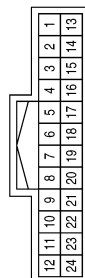
| | |
|-----------------|-----------------------------------|
| Connector No. | F502 |
| Connector Name | TCM (TRANSMISSION CONTROL MODULE) |
| Connector Color | GRAY |



| | |
|-----------------|--------------|
| Connector No. | F32 |
| Connector Name | WIRE TO WIRE |
| Connector Color | WHITE |



| | |
|-----------------|--------------|
| Connector No. | F14 |
| Connector Name | WIRE TO WIRE |
| Connector Color | WHITE |



| Terminal No. | Color of Wire | Signal Name |
|--------------|---------------|-------------|
| 1 | BR | CAN-H |
| 2 | LY | CAN-L |

| Terminal No. | Color of Wire | Signal Name |
|--------------|---------------|-------------|
| 2 | L | — |
| 3 | P | — |

| Terminal No. | Color of Wire | Signal Name |
|--------------|---------------|-------------|
| 2 | L | — |
| 3 | P | — |

ABM1A1391GB

MALFUNCTION AREA CHART

< COMPONENT DIAGNOSIS >

[CAN]

MALFUNCTION AREA CHART

Main Line

INFOID:0000000005272392

| Malfunction area | Reference |
|-----------------------------------------------------------------------------------------|-----------------------------------------------|
| Main line between TCM and data link connector | LAN-62, "Diagnosis Procedure" |
| Main line between data link connector and ABS actuator and electric unit (control unit) | LAN-64, "Diagnosis Procedure" |

Branch Line

INFOID:0000000005272393

| Malfunction area | Reference |
|-------------------------------------------------------------------|-----------------------------------------------|
| ECM branch line circuit | LAN-65, "Diagnosis Procedure" |
| TCM branch line circuit | LAN-66, "Diagnosis Procedure" |
| Transfer control unit branch line circuit | LAN-67, "Diagnosis Procedure" |
| BCM branch line circuit | LAN-68, "Diagnosis Procedure" |
| Differential lock control unit branch line circuit | LAN-69, "Diagnosis Procedure" |
| Data link connector branch line circuit | LAN-70, "Diagnosis Procedure" |
| Combination meter branch line circuit | LAN-71, "Diagnosis Procedure" |
| Steering angle sensor branch line circuit | LAN-72, "Diagnosis Procedure" |
| ABS actuator and electric unit (control unit) branch line circuit | LAN-73, "Diagnosis Procedure" |
| IPDM E/R branch line circuit | LAN-74, "Diagnosis Procedure" |

Short Circuit

INFOID:0000000005272394

| Malfunction area | Reference |
|---------------------------|-----------------------------------------------|
| CAN communication circuit | LAN-75, "Diagnosis Procedure" |

LAN

MAIN LINE BETWEEN TCM AND DLC CIRCUIT

< COMPONENT DIAGNOSIS >

[CAN]

MAIN LINE BETWEEN TCM AND DLC CIRCUIT

Diagnosis Procedure

INFOID:000000005272395

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 F14
 - Harness connector E5
 - Harness connector E152
 - Harness connector M31

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair the terminal and connector.

2.CHECK HARNESS CONTINUITY (OPEN CIRCUIT)

1. Disconnect the following harness connectors.
 - A/T assembly
 - Harness connectors F14 and E5
2. Check the continuity between the A/T assembly harness connector and the harness connector.

| A/T assembly harness connector | | Harness connector | | Continuity |
|--------------------------------|--------------|-------------------|--------------|------------|
| Connector No. | Terminal No. | Connector No. | Terminal No. | |
| F9 | 3 | F14 | 2 | Existed |
| | 8 | | 3 | Existed |

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair the main line between the A/T assembly and the harness connector F14.

3.CHECK HARNESS CONTINUITY (OPEN CIRCUIT)

1. Disconnect the harness connectors E152 and M31.
2. Check the continuity between the harness connectors.

| Harness connector | | Harness connector | | Continuity |
|-------------------|--------------|-------------------|--------------|------------|
| Connector No. | Terminal No. | Connector No. | Terminal No. | |
| E5 | 2 | E152 | 52G | Existed |
| | 3 | | 51G | Existed |

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair the main line between the harness connectors E5 and E152.

4.CHECK HARNESS CONTINUITY (OPEN CIRCUIT)

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

| Harness connector | | Data link connector | | Continuity |
|-------------------|--------------|---------------------|--------------|------------|
| Connector No. | Terminal No. | Connector No. | Terminal No. | |
| M31 | 52G | M22 | 6 | Existed |
| | 51G | | 14 | Existed |

Is the inspection result normal?

YES (Present error)>>Check the following items again.

- Decision of CAN system type.

MAIN LINE BETWEEN TCM AND DLC CIRCUIT

[CAN]

< COMPONENT DIAGNOSIS >

- Not received CONSULT-III data [SELF-DIAG RESULTS, CAN DIAG SUPPORT MNTR (“ECU list” included)].
- Procedure for detecting root cause.

YES (Past error)>>Error was detected in the main line between the TCM and the data link connector.

NO >> Repair the main line between the harness connector M31 and the data link connector.

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O

P

MAIN LINE BETWEEN DLC AND ABS CIRCUIT

< COMPONENT DIAGNOSIS >

[CAN]

MAIN LINE BETWEEN DLC AND ABS CIRCUIT

Diagnosis Procedure

INFOID:000000005272396

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 M91
 - Harness connector E26

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair the terminal and connector.

2.CHECK HARNESS CONTINUITY (OPEN CIRCUIT)

1. Disconnect the harness connectors M91 and E26.
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. | |
| M22 | 6 | M91 | 11 | Existed |
| | 14 | | 10 | Existed |

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair the main line between the data link connector and the harness connector M91.

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.
 - Models with VDC

| Harness connector | | ABS actuator and electric unit (control unit) harness connector | | Continuity |
|-------------------|--------------|--------------------------------------------------------------------|--------------|------------|
| Connector No. | Terminal No. | Connector No. | Terminal No. | |
| E26 | 11 | E127 | 12 | Existed |
| | 10 | | 13 | Existed |

- Models without VDC

| Harness connector | | ABS actuator and electric unit (control unit) harness connector | | Continuity |
|-------------------|--------------|--------------------------------------------------------------------|--------------|------------|
| Connector No. | Terminal No. | Connector No. | Terminal No. | |
| E26 | 11 | E125 | 11 | Existed |
| | 10 | | 15 | Existed |

Is the inspection result normal?

YES (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.

YES (Past error)>>Error was detected in the main line between the data link connector and the ABS actuator and electric unit (control unit).

NO >> Repair the main line between the harness connector E26 and the ABS actuator and electric unit (control unit).

ECM BRANCH LINE CIRCUIT

< COMPONENT DIAGNOSIS >

[CAN]

ECM BRANCH LINE CIRCUIT

Diagnosis Procedure

INFOID:000000005272397

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).
 - M/T models
 - ECM
 - Harness connector E152
 - Harness connector M31
 - A/T models
 - ECM
 - Harness connector E2
 - Harness connector F32

Is the inspection result normal?

YES >> GO TO 2.

NO >> 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.
 - QR engine models

| ECM harness connector | | | Resistance (Ω) |
|-----------------------|--------------|----|-------------------|
| Connector No. | Terminal No. | | |
| E16 | 94 | 86 | Approx. 108 – 132 |

- VQ engine models

| ECM harness connector | | | Resistance (Ω) |
|-----------------------|--------------|----|-------------------|
| Connector No. | Terminal No. | | |
| E8 | 94 | 86 | Approx. 108 – 132 |

Is the measurement value within the specification?

YES >> GO TO 3.

NO >> 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 the following.

- QR25DE: [EC-87, "Diagnosis Procedure"](#)
- VQ40DE: [EC-546, "Diagnosis Procedure"](#)

Is the inspection result normal?

YES (Present error)>>Replace the ECM. Refer to the following.

- QR25DE: [EC-23, "Procedure After Replacing ECM"](#)
- VQ40DE: [EC-472, "Procedure After Replacing ECM"](#)

YES (Past error)>>Error was detected in the ECM branch line.

NO >> Repair the power supply and the ground circuit.

TCM BRANCH LINE CIRCUIT

< COMPONENT DIAGNOSIS >

[CAN]

TCM BRANCH LINE CIRCUIT

Diagnosis Procedure

INFOID:000000005272398

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 A/T assembly for damage, bend and loose connection (unit side and connector side).

Is the inspection result normal?

YES >> GO TO 2.

NO >> 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. | | |
| F9 | 3 | 8 | Approx. 54 – 66 |

Is the measurement value within the specification?

YES >> GO TO 3.

NO >> Repair the TCM branch line.

3.CHECK HARNESS FOR OPEN CIRCUIT

1. Remove the control valve with TCM. Refer to [TM-280, "Removal and Installation"](#).
2. Disconnect the connector of TCM.
3. Check the continuity between the A/T assembly harness connector and TCM harness connector.

| A/T assembly harness connector | TCM harness connector | | Continuity |
|--------------------------------|-----------------------|--------------|------------|
| Terminal No. | Connector No. | Terminal No. | |
| 3 | F502 | 1 | Existed |
| 8 | | 2 | Existed |

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair the harness between the A/T assembly harness connector and the TCM harness connector.

4.CHECK POWER SUPPLY AND GROUND CIRCUIT

Check the power supply and the ground circuit of the TCM. Refer to [TM-210, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES (Present error)>>Replace the control valve with TCM. Refer to [TM-280, "Removal and Installation"](#).

YES (Past error)>>Error was detected in the TCM branch line.

NO >> Repair the power supply and the ground circuit.

4WD BRANCH LINE CIRCUIT

< COMPONENT DIAGNOSIS >

[CAN]

4WD BRANCH LINE CIRCUIT

Diagnosis Procedure

INFOID:000000005272399

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 transfer control unit for damage, bend and loose connection (unit side and connector side).

Is the inspection result normal?

- YES >> GO TO 2.
NO >> Repair the terminal and connector.

2.CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect the connector of transfer control unit.
2. Check the resistance between the transfer control unit harness connector terminals.

| Transfer control unit harness connector | | | Resistance (Ω) |
|-----------------------------------------|--------------|---|-----------------|
| Connector No. | Terminal No. | | |
| M152 | 1 | 2 | Approx. 54 – 66 |

Is the measurement value within the specification?

- YES >> GO TO 3.
NO >> Repair the transfer control unit branch line.

3.CHECK POWER SUPPLY AND GROUND CIRCUIT

Check the power supply and the ground circuit of the transfer control unit. Refer to [DLN-21, "Diagnosis Procedure"](#).

Is the inspection result normal?

- YES (Present error)>>Replace the transfer control unit. Refer to [DLN-94, "Removal and Installation"](#).
YES (Past error)>>Error was detected in the transfer control unit branch line.
NO >> Repair the power supply and the ground circuit.

LAN

BCM BRANCH LINE CIRCUIT

< COMPONENT DIAGNOSIS >

[CAN]

BCM BRANCH LINE CIRCUIT

Diagnosis Procedure

INFOID:000000005272400

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).

Is the inspection result normal?

YES >> GO TO 2.

NO >> 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. | | |
| M18 | 39 | 40 | Approx. 54 – 66 |

Is the measurement value within the specification?

YES >> GO TO 3.

NO >> 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-29, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES (Present error)>>Replace the BCM. Refer to [BCS-54, "Removal and Installation"](#).

YES (Past error)>>Error was detected in the BCM branch line.

NO >> Repair the power supply and the ground circuit.

DIFF BRANCH LINE CIRCUIT

< COMPONENT DIAGNOSIS >

[CAN]

DIFF BRANCH LINE CIRCUIT

Diagnosis Procedure

INFOID:000000005272401

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 differential lock control unit for damage, bend and loose connection (unit side and connector side).

Is the inspection result normal?

- YES >> GO TO 2.
NO >> Repair the terminal and connector.

2.CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect the connector of differential lock control unit.
2. Check the resistance between the differential lock control unit harness connector terminals.

| Differential lock control unit harness connector | | | Resistance (Ω) |
|--------------------------------------------------|--------------|---|-----------------|
| Connector No. | Terminal No. | | |
| M70 | 5 | 4 | Approx. 54 – 66 |

Is the measurement value within the specification?

- YES >> GO TO 3.
NO >> Repair the differential lock control unit branch line.

3.CHECK POWER SUPPLY AND GROUND CIRCUIT

Check the power supply and the ground circuit of the differential lock control unit. Refer to [DLN-275, "Diagnosis Procedure"](#).

Is the inspection result normal?

- YES (Present error)>>Replace the differential lock control unit. Refer to [DLN-310, "Removal and Installation"](#).
YES (Past error)>>Error was detected in the differential lock control unit branch line.
NO >> Repair the power supply and the ground circuit.

LAN

DLC BRANCH LINE CIRCUIT

< COMPONENT DIAGNOSIS >

[CAN]

DLC BRANCH LINE CIRCUIT

Diagnosis Procedure

INFOID:000000005272402

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).

Is the inspection result normal?

YES >> GO TO 2.

NO >> 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. | | |
| M22 | 6 | 14 | Approx. 54 – 66 |

Is the measurement value within the specification?

YES (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.

YES (Past error)>>Error was detected in the data link connector branch line circuit.

NO >> Repair the data link connector branch line.

M&A BRANCH LINE CIRCUIT

< COMPONENT DIAGNOSIS >

[CAN]

M&A BRANCH LINE CIRCUIT

Diagnosis Procedure

INFOID:000000005272403

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 combination meter for damage, bend and loose connection (unit side and connector side).

Is the inspection result normal?

- YES >> GO TO 2.
NO >> Repair the terminal and connector.

2.CHECK HARNESS FOR OPEN CIRCUIT

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

| Combination meter harness connector | | | Resistance (Ω) |
|-------------------------------------|--------------|----|-----------------|
| Connector No. | Terminal No. | | |
| M24 | 12 | 11 | Approx. 54 – 66 |

Is the measurement value within the specification?

- YES >> GO TO 3.
NO >> Repair the combination meter branch line.

3.CHECK POWER SUPPLY AND GROUND CIRCUIT

Check the power supply and the ground circuit of the combination meter. Refer to [MWI-29, "COMBINATION METER : Diagnosis Procedure"](#).

Is the inspection result normal?

- YES (Present error)>>Replace the combination meter. Refer to [MWI-95, "Removal and Installation"](#).
YES (Past error)>>Error was detected in the combination meter branch line.
NO >> Repair the power supply and the ground circuit.

LAN

STRG BRANCH LINE CIRCUIT

< COMPONENT DIAGNOSIS >

[CAN]

STRG BRANCH LINE CIRCUIT

Diagnosis Procedure

INFOID:000000005272404

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).

Is the inspection result normal?

YES >> GO TO 2.

NO >> 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. | | |
| M47 | 3 | 4 | Approx. 54 – 66 |

Is the measurement value within the specification?

YES >> GO TO 3.

NO >> 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 the following.

- Type 2: [BRC-154, "Wiring Diagram - BRAKE CONTROL SYSTEM - WITHOUT HILL DESCENT CONTROL/HILL START ASSIST"](#)
- Type 3: [BRC-275, "Wiring Diagram - BRAKE CONTROL SYSTEM - WITH HILL DESCENT CONTROL/HILL START ASSIST"](#)

Is the inspection result normal?

YES (Present error)>>Replace the steering angle sensor. Refer to the following.

- Type 2: [BRC-182, "Removal and Installation"](#)
- Type 3: [BRC-302, "Removal and Installation"](#)

YES (Past error)>>Error was detected in the steering angle sensor branch line.

NO >> Repair the power supply and the ground circuit.

ABS BRANCH LINE CIRCUIT

< COMPONENT DIAGNOSIS >

[CAN]

ABS BRANCH LINE CIRCUIT

Diagnosis Procedure

INFOID:000000005272405

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).

Is the inspection result normal?

- YES >> GO TO 2.
NO >> 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.
- Models with VDC

| ABS actuator and electric unit (control unit) harness connector | | | Resistance (Ω) |
|-----------------------------------------------------------------|--------------|----|-----------------|
| Connector No. | Terminal No. | | |
| E127 | 12 | 13 | Approx. 54 – 66 |

- Models without VDC

| ABS actuator and electric unit (control unit) harness connector | | | Resistance (Ω) |
|-----------------------------------------------------------------|--------------|----|-----------------|
| Connector No. | Terminal No. | | |
| E125 | 11 | 15 | Approx. 54 – 66 |

Is the measurement value within the specification?

- YES >> GO TO 3.
NO >> 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 the following.

- Type 1: [BRC-31, "Diagnosis Procedure"](#)
- Type 2: [BRC-106, "Diagnosis Procedure"](#)
- Type 3: [BRC-224, "Diagnosis Procedure"](#)

Is the inspection result normal?

YES (Present error)>>Replace the ABS actuator and electric unit (control unit). Refer to the following.

- Type 1: [BRC-71, "Removal and Installation"](#)
- Type 2: [BRC-180, "Removal and Installation"](#)
- Type 3: [BRC-300, "Removal and Installation"](#)

YES (Past error)>>Error was detected in the ABS actuator and electric unit (control unit) branch line.

NO >> Repair the power supply and the ground circuit.

IPDM-E BRANCH LINE CIRCUIT

< COMPONENT DIAGNOSIS >

[CAN]

IPDM-E BRANCH LINE CIRCUIT

Diagnosis Procedure

INFOID:000000005272406

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 IPDM E/R for damage, bend and loose connection (unit side and connector side).

Is the inspection result normal?

YES >> GO TO 2.

NO >> 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. | | |
| E122 | 39 | 40 | Approx. 108 – 132 |

Is the measurement value within the specification?

YES >> GO TO 3.

NO >> 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 [PCS-18, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES (Present error)>>Replace the IPDM E/R. Refer to [PCS-33, "Removal and Installation of IPDM E/R"](#).

YES (Past error)>>Error was detected in the IPDM E/R branch line.

NO >> Repair the power supply and the ground circuit.

CAN COMMUNICATION CIRCUIT

< COMPONENT DIAGNOSIS >

[CAN]

CAN COMMUNICATION CIRCUIT

Diagnosis Procedure

INFOID:000000005272407

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.

Is the inspection result normal?

YES >> GO TO 2.

NO >> 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. | | |
| M22 | 6 | 14 | Not existed |

Is the inspection result normal?

YES >> GO TO 3.

NO >> 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. | | |
| M22 | 6 | | Not existed |
| | 14 | | Not existed |

Is the inspection result normal?

YES >> GO TO 4.

NO >> 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. | | |
| 94 | 86 | Approx. 108 – 132 |

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

| IPDM E/R | | Resistance (Ω) |
|--------------|----|-------------------|
| Terminal No. | | |
| 39 | 40 | Approx. 108 – 132 |

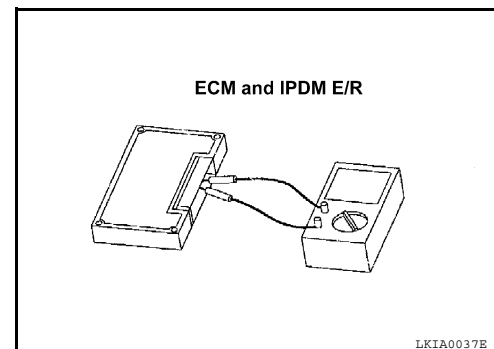
Is the measurement value within the specification?

YES >> GO TO 5.

NO >> 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.



CAN COMMUNICATION CIRCUIT

< COMPONENT DIAGNOSIS >

[CAN]

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.