SECTION LAN

LAN SYSTEM

CONTENTS

CAN FUNDAMENTAL

CAN

PRECAUTIONS

PFP:00001

Precautions for Trouble Diagnosis

NKS004PA

CAUTION:

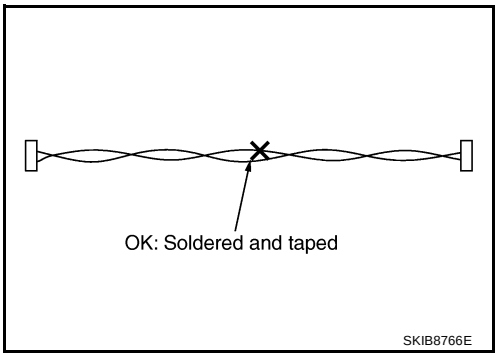
- **Never apply 7.0 V or more to the measurement terminal.**
- **Use a tester with open terminal voltage of 7.0 V or less.**
- **Turn the ignition switch OFF and disconnect the battery cable from the negative terminal when checking the harness.**

Precautions for Harness Repair

NKS004PB

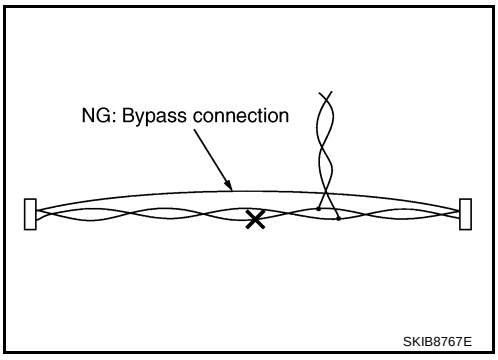
- Solder the repaired area and wrap tape around the soldered area.

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



- Bypass connection is never allowed at the repaired area.

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



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

SYSTEM DESCRIPTION

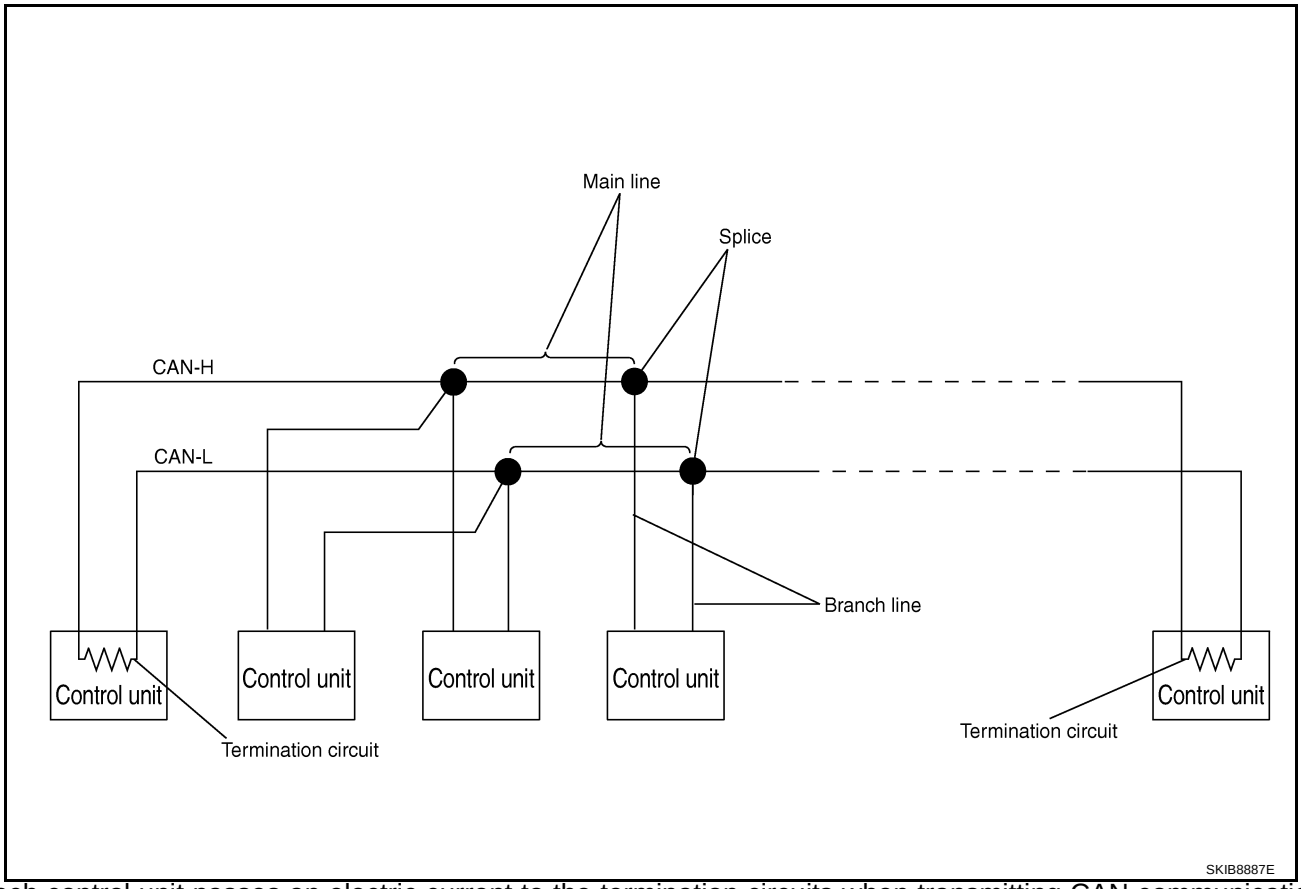
PFP:00000

CAN Communication System

NKS004PC

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

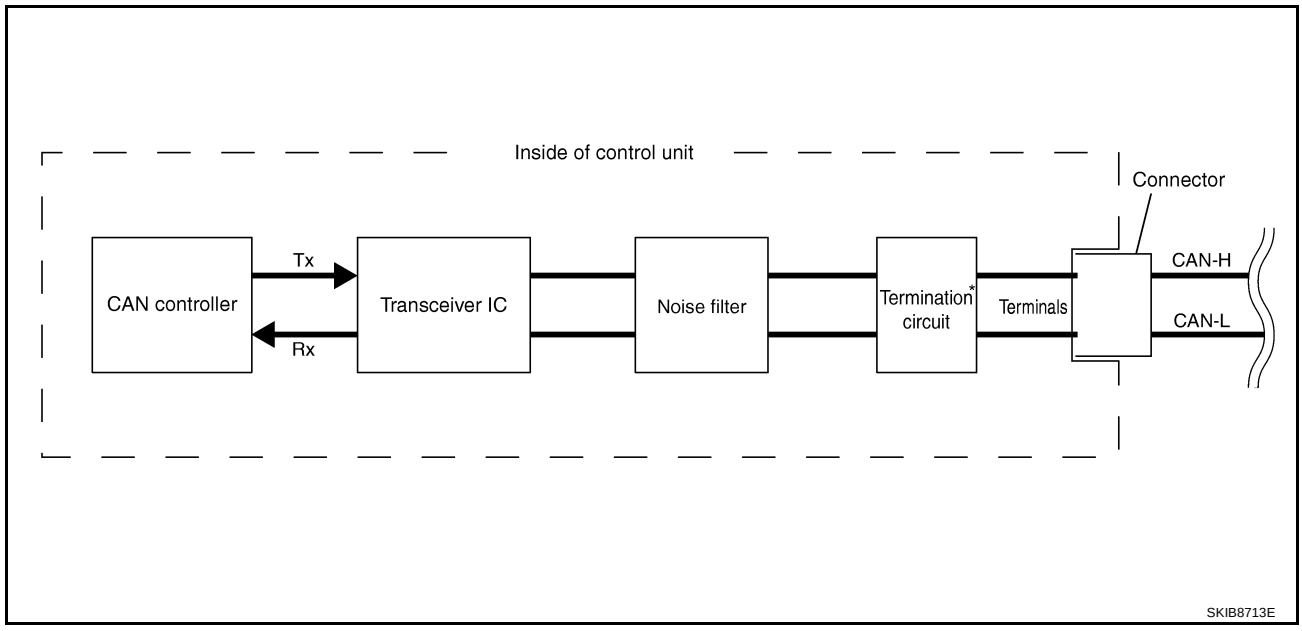
SYSTEM DIAGRAM



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

Component	Description
Main line	CAN communication line between splices
Branch line	CAN communication line between splice and a control unit
Splice	A point connecting a branch line with a main line
Termination circuit	Refer to LAN-5, "CAN COMMUNICATION CONTROL CIRCUIT" .

CAN COMMUNICATION CONTROL CIRCUIT



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

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

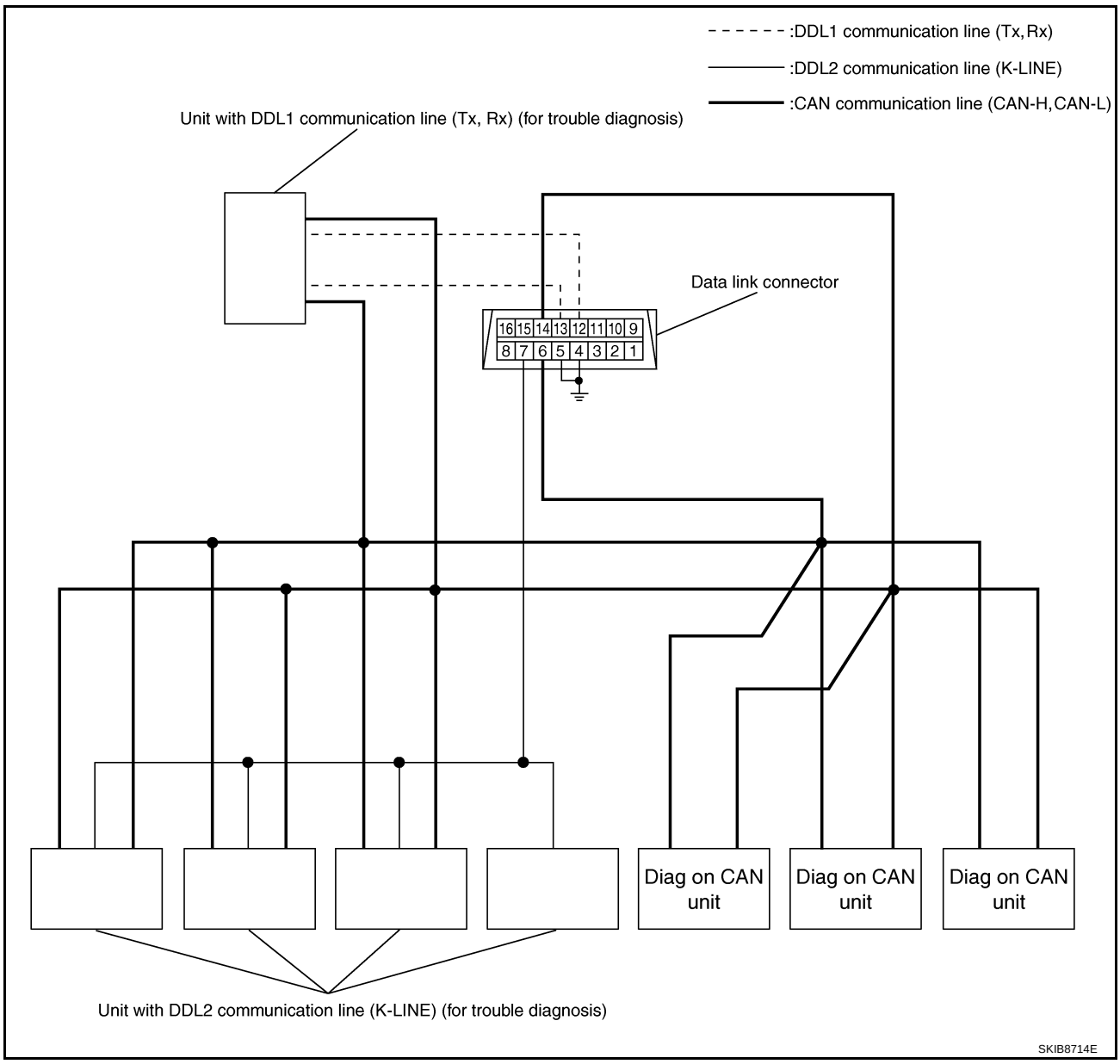
Diag on CAN

NKS004PD

DESCRIPTION

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

SYSTEM DIAGRAM



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

PFP:00004

Condition of Error Detection

NKS004PE

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

CAN COMMUNICATION SYSTEM ERROR

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

WHEN INDICATED "U1000" OR "U1001" IS INDICATED EVEN THOUGH CAN COMMUNICATION SYSTEM IS NORMAL

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

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

Symptom When Error Occurs in CAN Communication System

NKS004PF

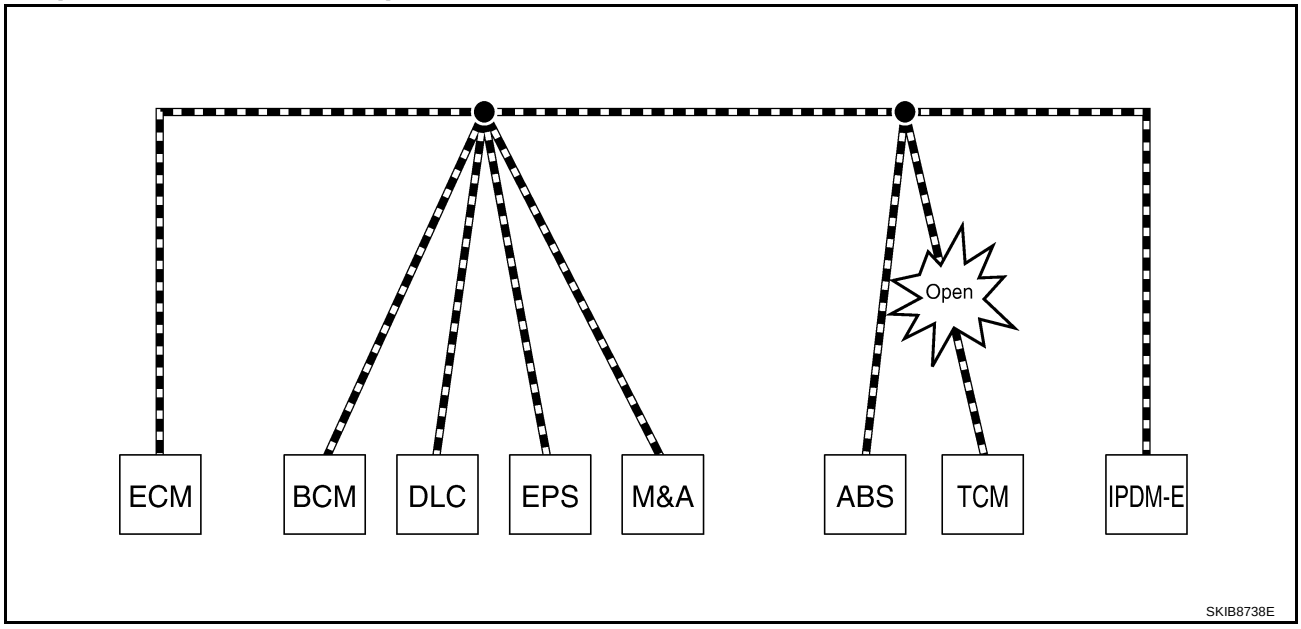
In CAN communication system, multiple units mutually transmit and receive signals. Each unit cannot transmit and receive signals if any error occurs on CAN communication line. Under this condition, multiple control units related to the root cause malfunction or go into fail-safe mode.

ERROR EXAMPLE

NOTE:

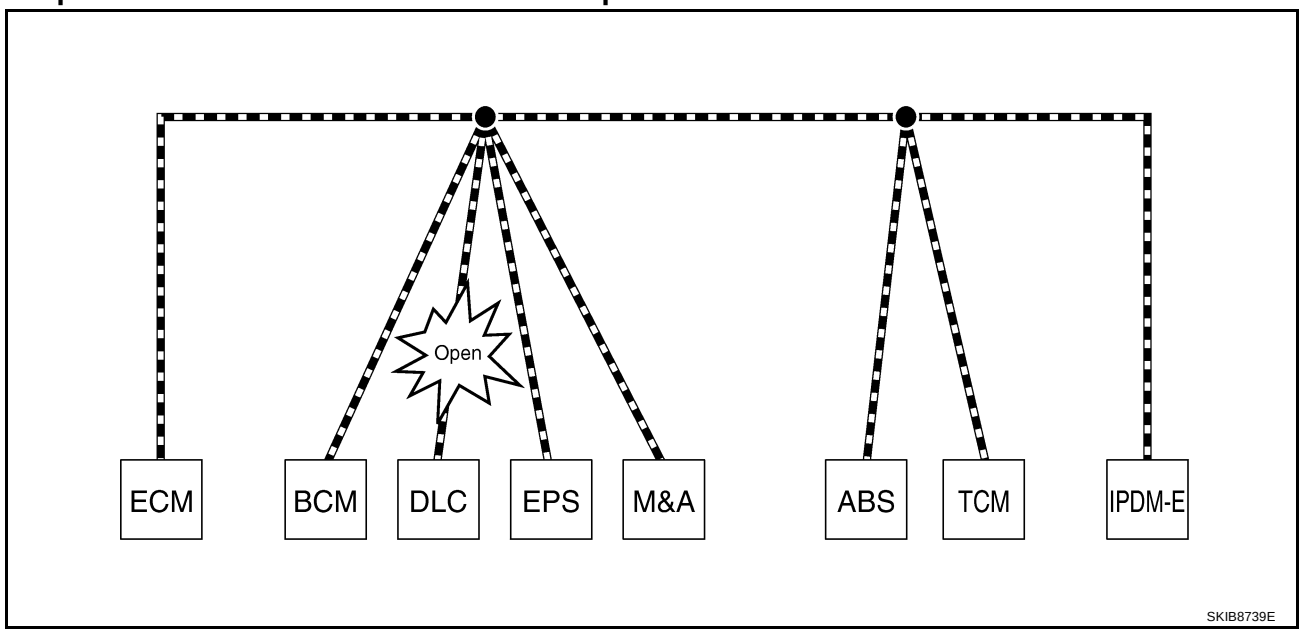
- Each vehicle differs in symptom of each unit under fail-safe mode and CAN communication line wiring.
- Refer to LAN-41, "Abbreviation List" for the unit abbreviation.

Example: TCM branch line open circuit



Unit name	Symptom
ECM	Engine torque limiting is affected, and shift harshness increases.
BCM	Reverse warning chime does not sound.
EPS control unit	Normal operation.
Combination meter	● 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



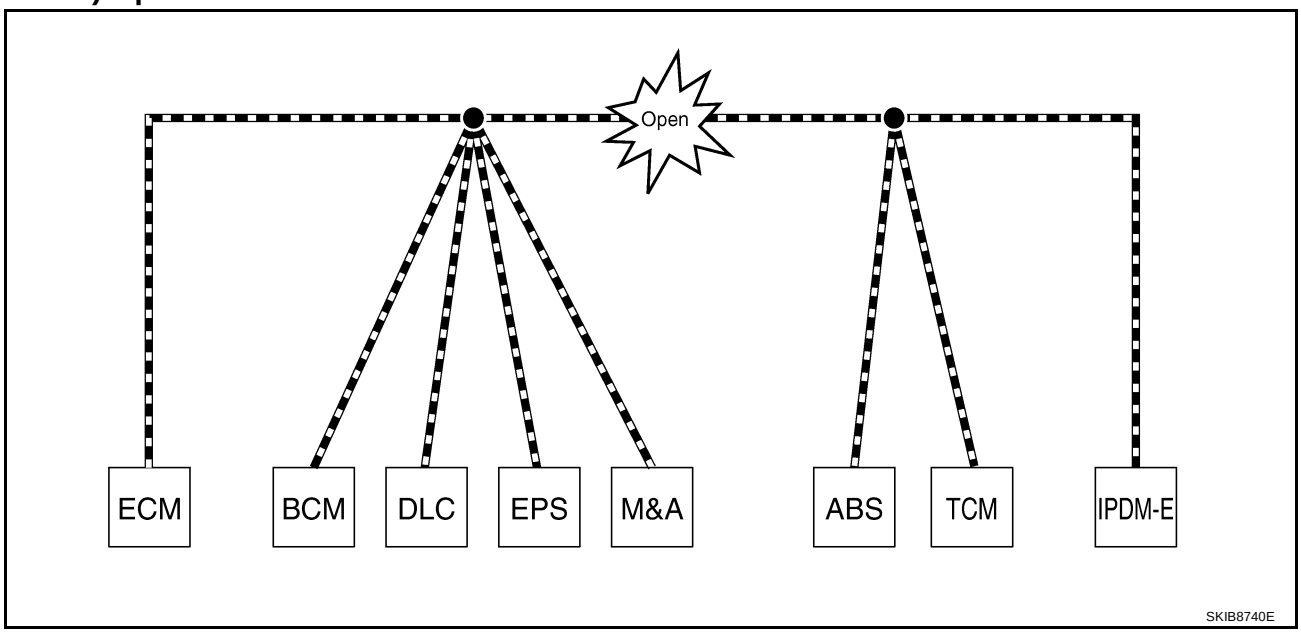
Unit name	Symptom
ECM	Normal operation.
BCM	
EPS control unit	
Combination meter	
ABS actuator and electric unit (control unit)	
TCM	
IPDM E/R	

NOTE:

- When data link connector branch line is open, transmission and reception of CAN communication signals is 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.

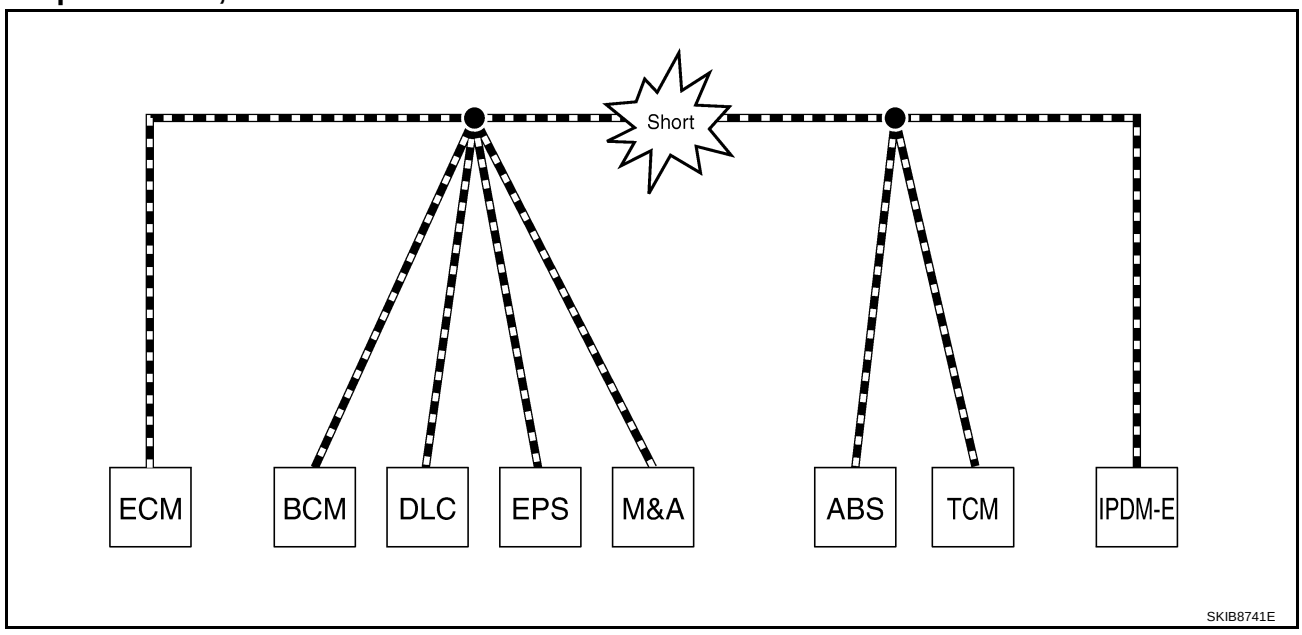
	“ECU list” on the “CAN DIAG SUPPORT MNTR” (CONSULT-III)	Difference of symptom
Data link connector branch line open circuit	All Diag on CAN units are not indicated.	Normal operation.
CAN-H, CAN-L harness short-circuit		Most the units which are connected to the CAN communication system enter fail-safe 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	● 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	● 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.
TCM	No impact on operation.
IPDM E/R	When the ignition switch is ON, ● The headlamps (Lo) turn ON. ● The cooling fan continues to rotate.

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



Unit name	Symptom
ECM	● Engine torque limiting is affected, and shift harshness increases. ● Engine speed drops.
BCM	● 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 is OFF.) ● The steering lock does not release (if an error or malfunction occurs while turning the ignition switch is OFF.)
EPS control unit	The steering effort increases.
Combination meter	● 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, ● The headlamps (Lo) turn ON. ● The cooling fan continues to rotate.

Self-Diagnosis

NKS004PG

DTC	Self-diagnosis item (CONSULT-III indication)	DTC detection condition	Inspection/Action
U1000	CAN COMM CIRCUIT	When ECM is not transmitting or receiving CAN communication signal of OBD (emission-related diagnosis) for 2 seconds or more.	Refer to LAN-15, "TROUBLE DIAGNOSES WORK FLOW" .
		When a control unit (except for ECM) is not transmitting or receiving CAN communication signal for 2 seconds or more.	
U1001	CAN COMM CIRCUIT	When ECM is not transmitting or receiving CAN communication signal other than OBD (emission-related diagnosis) for 2 seconds or more.	
U1002	SYSTEM COMM	When a control unit is not transmitting or receiving CAN communication signal for 2 seconds or less.	Start the inspection. Refer to the applicable section of the indicated control unit.
U1010	CONTROL UNIT [CAN]	When an error is detected during the initial diagnosis for CAN controller of each control unit.	Replace the control unit indicating “U1010”.

CAN Diagnostic Support Monitor

NKS004PH

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

ECM		
	PRSNT	PAST
INITIAL DIAG	OK	
TRANSMIT DIAG	OK	
TCM	OK	
VDC/TCS/ABS	UNKWN	
METER/M&A	OK	
ICC	UNKWN	
BCM/SEC	OK	
IPDM E/R	OK	

With PAST

ECM		
	PRSNT	PAST
TRANSMIT DIAG	OK	OK
VDC/TCS/ABS	-	-
METER/M&A	OK	OK
BCM/SEC	OK	OK
ICC	-	-
HVAC	-	-
TCM	OK	OK
EPS	-	-
IPDM E/R	OK	OK
e4WD	-	-
AWD/4WD	OK	OK

PKID1075E

Without PAST

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)

TROUBLE DIAGNOSES WORK FLOW

PFP:00004

Information Needed for Trouble Diagnosis

NKS004PI

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

NKS004PJ

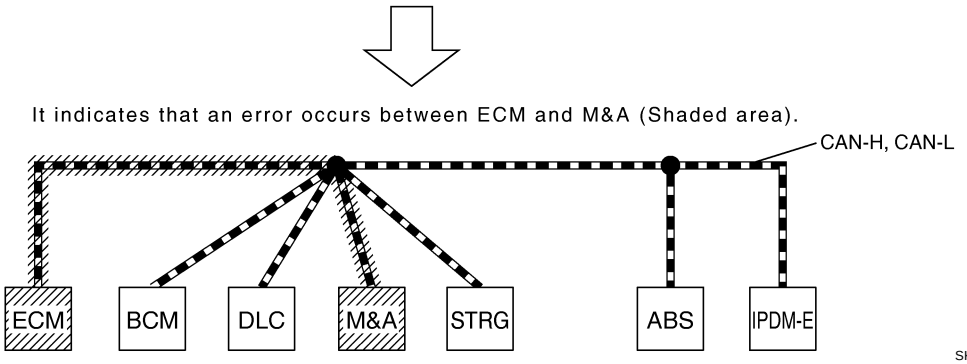
The CAN communication signal chart lists the signals needed for trouble diagnosis. It is useful for detecting the root cause by finding a signal related to the symptom, and by checking transmission and reception unit.

Example: Tachometer does not move even though the engine rotates.

T: Transmit R: Receive

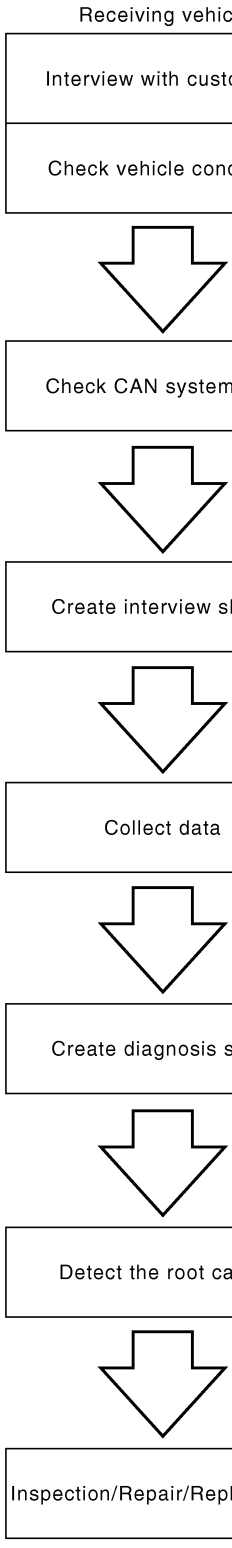
Signal name/Connecting unit	ECM	BCM	M&A	STRG	ABS	IPDM-E
A/C compressor feedback signal	T		R			
A/C compressor request signal	T					R
Accelerator pedal position signal	T				R	
Cooling fan motor operation signal	T					R
Engine coolant temperature signal	T		R			
Engine speed signal	T		R		R	
Fuel consumption monitor signal	T		R			
Malfunction indicator lamp signal	T		R			
A/C switch signal	R	T				
Ignition switch signal		T				R
Sleep/wake up signal		T	R			R

No communication between ECM and M&A.



Trouble Diagnosis Flow Chart

NKS004PK



- Interview with customer. (Since when? In which condition? What symptoms? etc.)
- Check whether or not “U1000” or “U1001” is indicated on self-diagnosis results.
- Check whether or not it is reproduced error.
- Check CAN system type with CAN system type specification chart.
- Fill in interviewed items from customer on the interview sheet.
- Print out or save CONSULT-III data (SELF-DIAG RESULTS and CAN DIAG SUPPORT MNTR).
- Check the diagnosis result of CAN communication with on-board diagnosis function, and copy the item on on-board diagnosis copy sheet.
- Print out applicable CAN system type diagnosis sheet.
- Make sure that all ECUs are received, referring to “ECU list” on the CAN DIAG SUPPORT MNTR.
- Detect the root cause with diagnosis sheet.
- Inspect the root cause and repair or replace the applicable parts.

PKID1210E

Trouble Diagnosis Procedure

NKS004PL

INTERVIEW WITH CUSTOMER

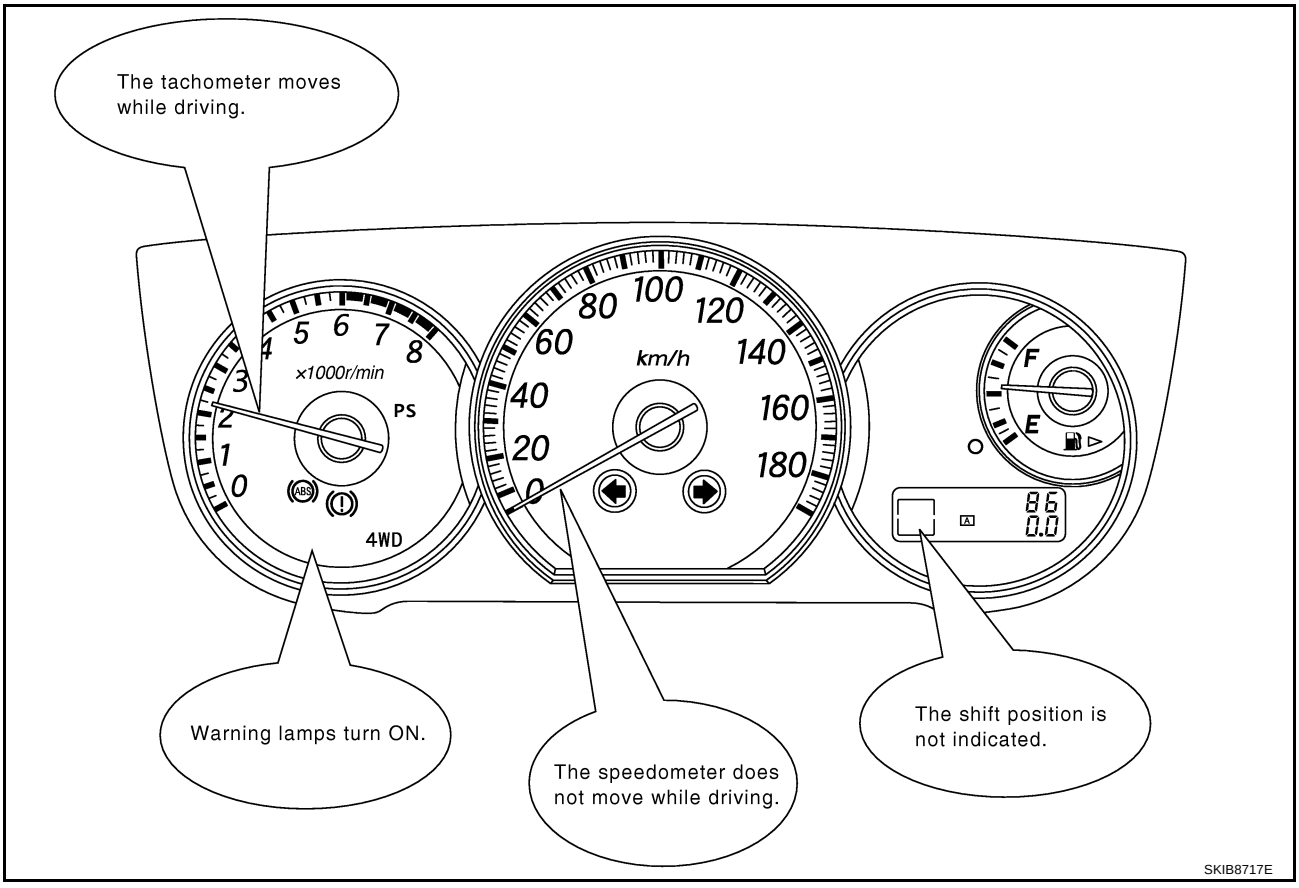
Interview with the customer is important to detect the root cause of CAN communication system errors and to understand vehicle condition and symptoms for proper trouble diagnosis.

Points in interview

- What: Parts name, system name
- When: Date, Frequency
- Where: Road condition, Place
- In what condition: Driving condition/environment
- 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 from 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:
  - Never turn the ignition switch OFF or disconnect the battery cable while the 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 LAN-25, "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:

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. (oval 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		×		×		×
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"	

Check the vehicle equipment with the vehicle identification number plate.

Check the vehicle equipment.

The number indicates the CAN system type of the vehicle.

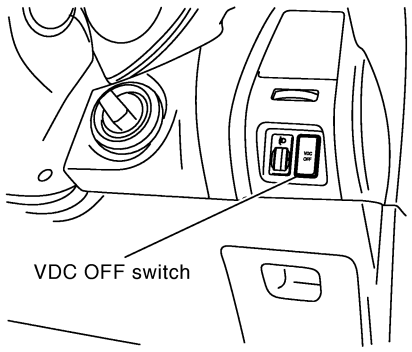
×: Applicable

VEHICLE EQUIPMENT IDENTIFICATION INFORMATION

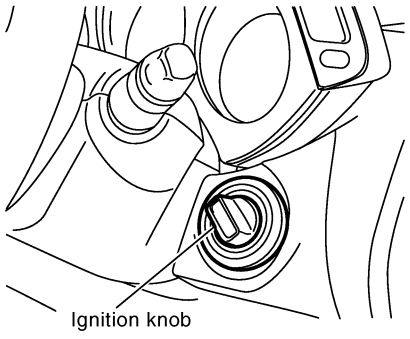
NOTE:

Check CAN system type from the vehicle shape and equipment.

With VDC



With Intelligent Key system



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

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

CAN System Specification Chart

Refer to the specification as shown in the chart.

Body type	Sedan		
Axle	2WD		AWD
Engine	HR15DE	MR20DE	HR15DE
Transmission	A/T	CVT	A/T
Brake control	ABS		
Specification chart	XX.XX "SPECIFICATION CHART A"	YY.YY "SPECIFICATION CHART B"	XX.XX "SPECIFICATION CHART C"

Check the vehicle equipment with the vehicle identification number plate.
Check the vehicle equipment.
Select the applicable vehicle equipment. Refer to the specification chart.

×: Applicable

SPECIFICATION CHART B

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

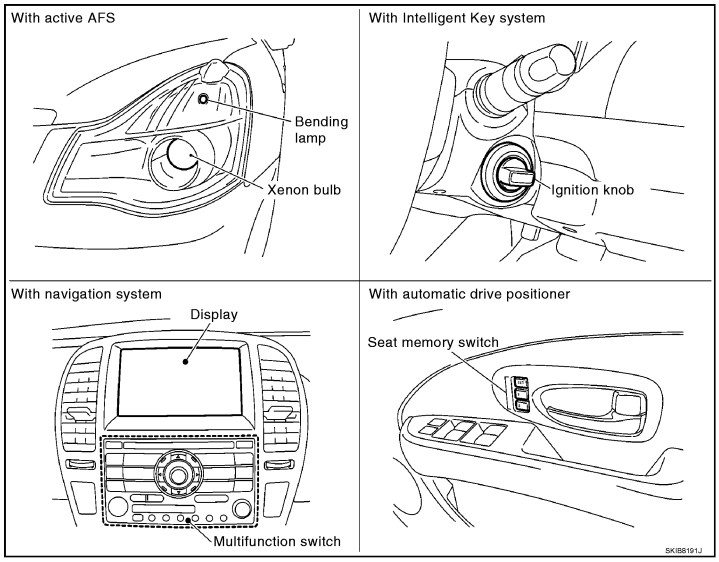
Body type	Sedan											
Axle	2WD											
Engine	MR20DE											
Transmission	CVT											
Brake control	ABS											
Active AFS		×			×	×			×	×		×
Intelligent Key system			×		×		×	×	×	×	×	×
Navigation system				×		×	×		×		×	×
Automatic drive positioner								×		×	×	×
CAN system type	9	10	11	12	13	14	15	16	17	18	19	20
Diagnosis sheet	XX: XX	XX: XX	XX: XX	XX: XX	XX: XX	XX: XX	XX: XX	XX: XX	XX: XX	XX: XX	XX: XX	XX: XX
CAN communication signal chart	XX.XX "TYPE 9/TYPE 10/TYPE 11/TYPE 12/TYPE 13/TYPE 14/TYPE 15/TYPE 16/TYPE 17/TYPE 18/TYPE 19/TYPE 20"											

Check the vehicle equipment.
The number indicates the CAN system type of the vehicle.

×: Applicable

VEHICLE EQUIPMENT IDENTIFICATION INFORMATION

NOTE:
Check CAN system type from the vehicle shape and equipment.



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

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

SKIB8889E

CREATE INTERVIEW SHEET

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

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)

- 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

The engine does not start.
While turning the ignition switch ON,
- The headlamps (Lo) turn ON, and the cooling fan continues rotating.
- The interior lamp does not turn ON.

On CONSULT-III screen,
- IPDM E/R is not indicated on SELECT SYSTEM.
- ENGINE: U1001
- BCM, ADAPTIVE LIGHT: U1000

PKID1211E

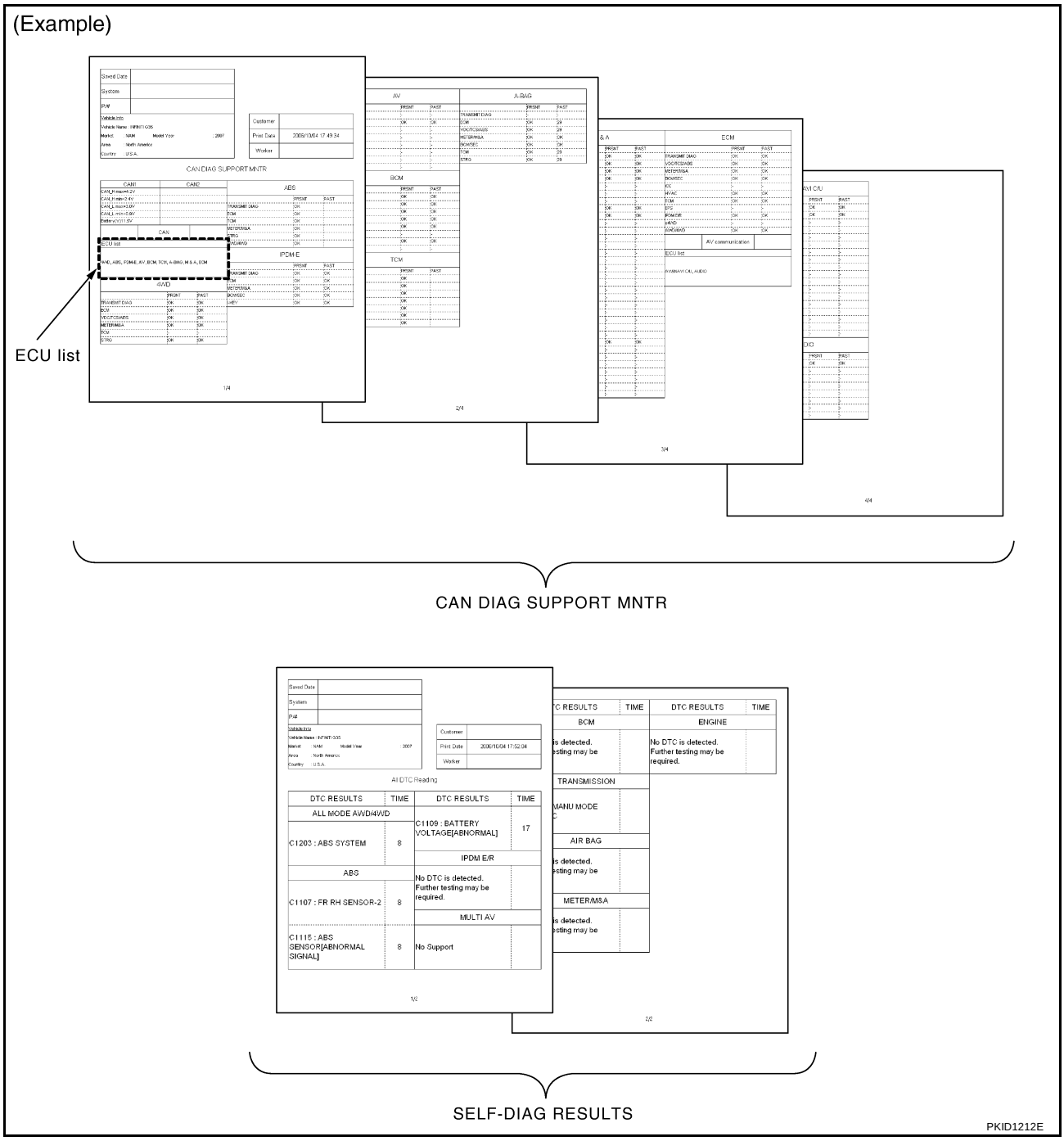
COLLECT DATA

Collect CONSULT-III Data

Print out or save the following CONSULT-III data.

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

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



Create On-board Diagnosis Copy Sheet

Display the trouble diagnosis result of CAN communication with the on-board diagnosis function on the vehicle monitor, etc. Copy them on the on-board diagnosis copy sheet.

NOTE:
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.

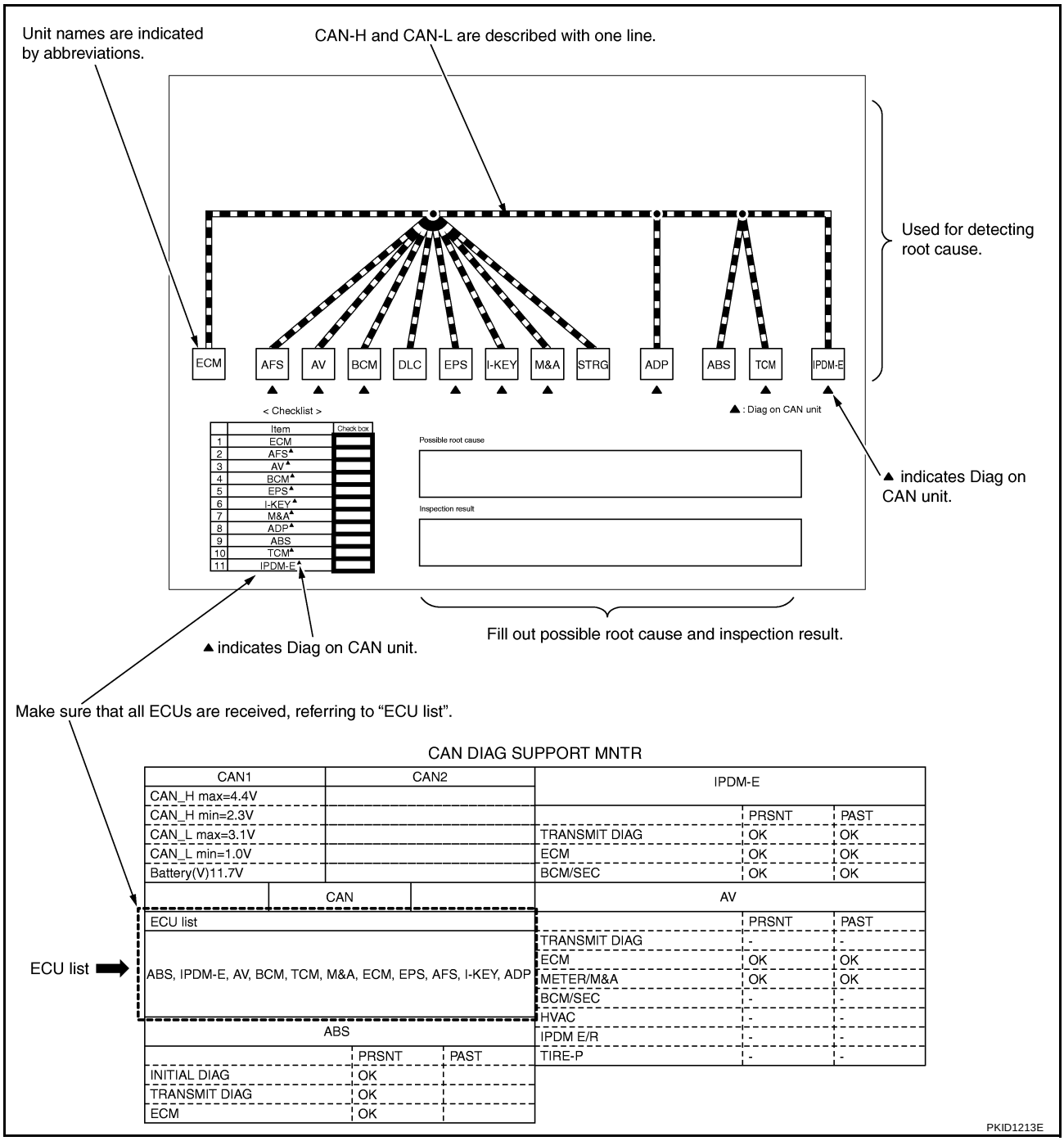
Print Diagnosis Sheet

Print the diagnosis sheet for the applicable CAN system type.

Check Collected Data

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

- For abbreviations, refer to LAN-41, "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 LAN-32, "Present Error — Short Circuit —" , LAN-39, "Past Error — Short Circuit —" .

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

- LAN-26, "Present Error — Open Circuit —"
- LAN-32, "Present Error — Short Circuit —"
- LAN-33, "Past Error — Open Circuit —"
- LAN-39, "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 —

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

1. ECU list: Check the items indicated in “ECU list”. Draw a line on the diagnosis sheet to indicate the error circuit.

   NOTE:
   CAN communication line has no error if units other than Diag on CAN units are indicated. An error may be on the power supply of the control unit, DDL1 line or DDL2 line.

a. “TCM” which is Diag on CAN unit, is not indicated on “ECU list”. This indicates that DLC is not receiving a signal from TCM. Draw a line to indicate an error between DLC and TCM (line 1-a in the figure).

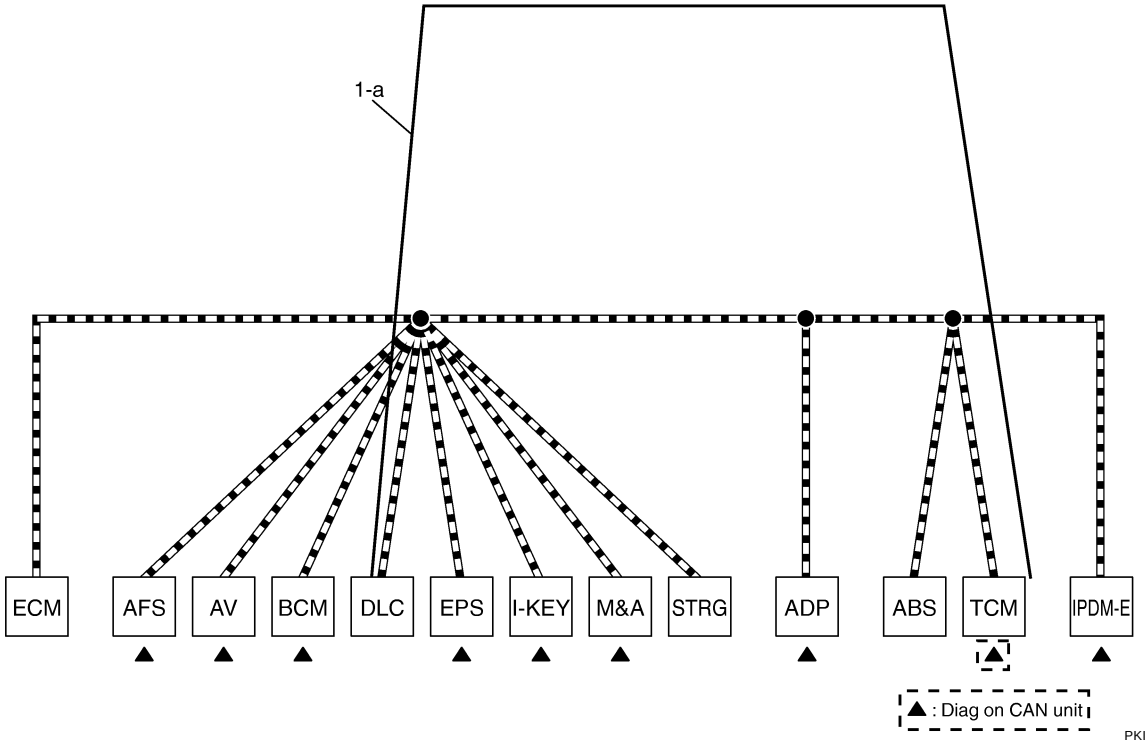
   NOTE:
   - Diag on CAN units are not indicated on the “ECU list” when the CAN line between Diag on CAN unit and the data link connector is open.
   - For a description of Diag on CAN, refer to LAN-6, "Diag on CAN" .

(Example)

CAN DIAG SUPPORT MNTR

CAN1	CAN2	IPDM-E		
CAN_H max=4.3V				
CAN_H min=1.0V			PRSNT	PAST
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		PRSNT	PAST
	TRANSMIT DIAG	-	-
ABS, IPDM-E, AV, BCM, M&A, ECM, EPS, AFS, I-KEY, ADP	ECM	OK	OK
	METER/M&A	OK	OK
	BCM/SEC	-	-
	HVAC	-	-
	[illegible]	-	



2. CAN DIAG SUPPORT MNTR: Check each item on “CAN DIAG SUPPORT MNTR”. Draw a line on the diagnosis sheet to indicate the error circuit.

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

NOTE:
If “UNKWN” is indicated on “TRANSMIT DIAG”, then the control unit cannot transmit CAN communication signal to each unit. Draw a line between the control unit and the splice.

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).

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

(Example)

ECM

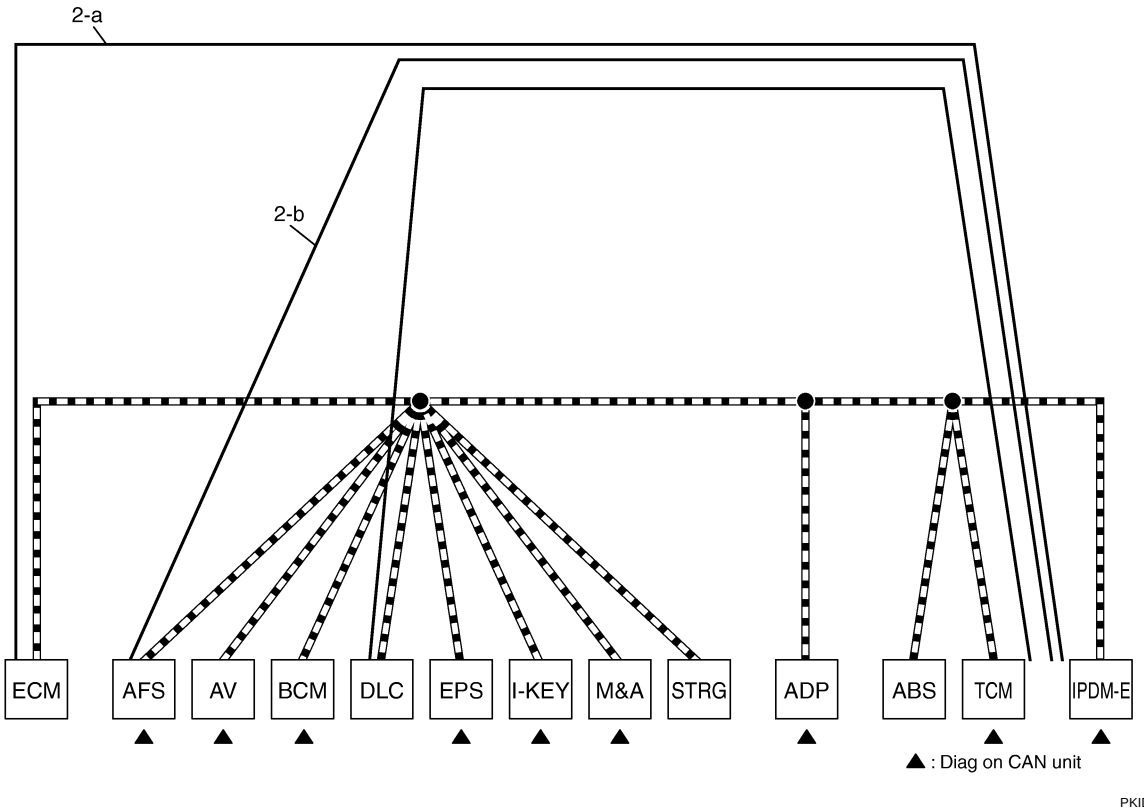
	PRSNT	PAST
TRANSMIT DIAG	OK	OK
VDC/TCS/ABS	OK	OK
METER/M&A	-	-
BCM/SEC	OK	OK
ICC	-	-
HVAC	-	-
TCM	UNKWN	0
EPS	OK	OK
IPDM E/R	OK	OK
e4WD	-	-
AWD/4WD	-	-

AFS

	PRSNT	PAST
TRANSMIT DIAG	-	-
ECM	OK	OK
METER/M&A	OK	OK
TCM	UNKWN	0
STRG	OK	OK
EPS	-	-
IPDM E/R	OK	OK

AV

	PRSNT	PAST
TRANSMIT DIAG	-	-
ECM	OK	OK
METER/M&A	OK	OK
BCM/SEC	-	-
HVAC	-	-
IPDM E/R	-	-
TIRE-P	-	-



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).

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:
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-44, "CAN Diagnostic Support Monitor" .

(Example)

BCM

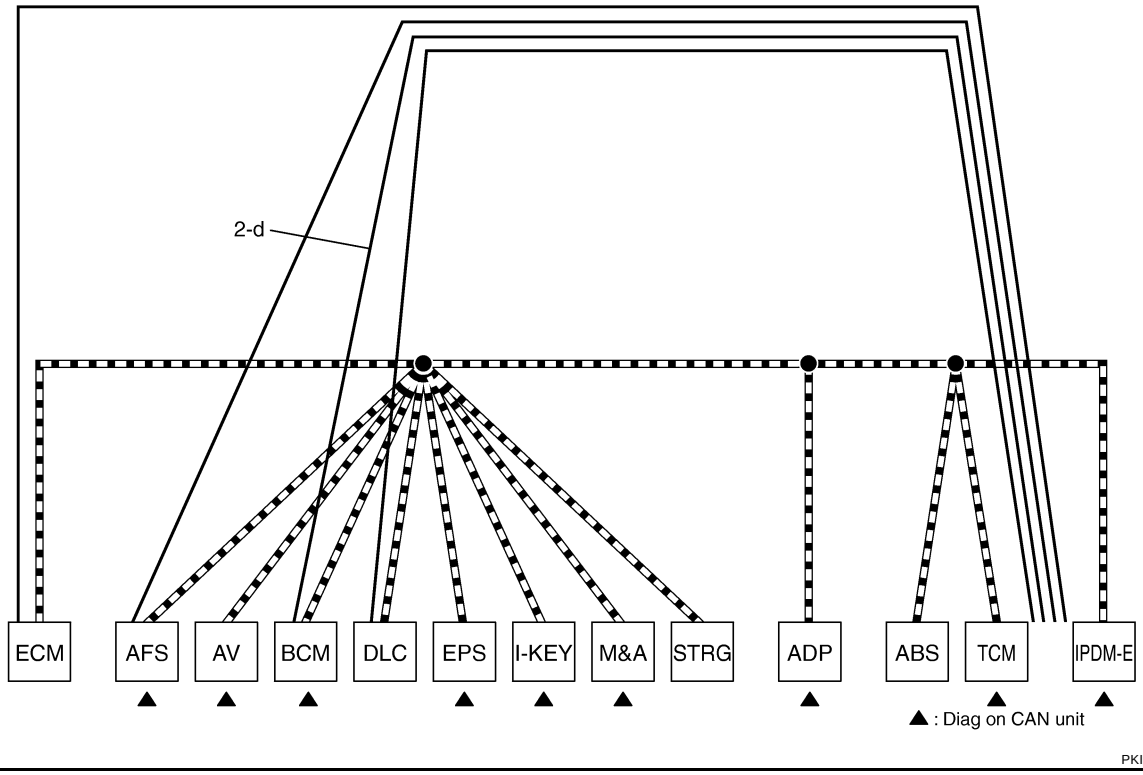
	PRSNT	PAST
TRANSMIT DIAG	OK	OK
ECM	OK	OK
METER/M&A	OK	OK
TCM	UNKWN	0
MULTI AV	-	-
IPDM E/R	OK	OK
I-KEY	OK	OK

EPS

	PRSNT	PAST
TRANSMIT DIAG	OK	
ECM	OK	
VDC/TCS/ABS	OK	
METER/M&A	OK	

I-KEY

	PRSNT	PAST
TRANSMIT DIAG	OK	OK
ECM	OK	OK
METER/M&A	OK	OK
BCM/SEC	OK	OK



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

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

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

(Example)

M&A

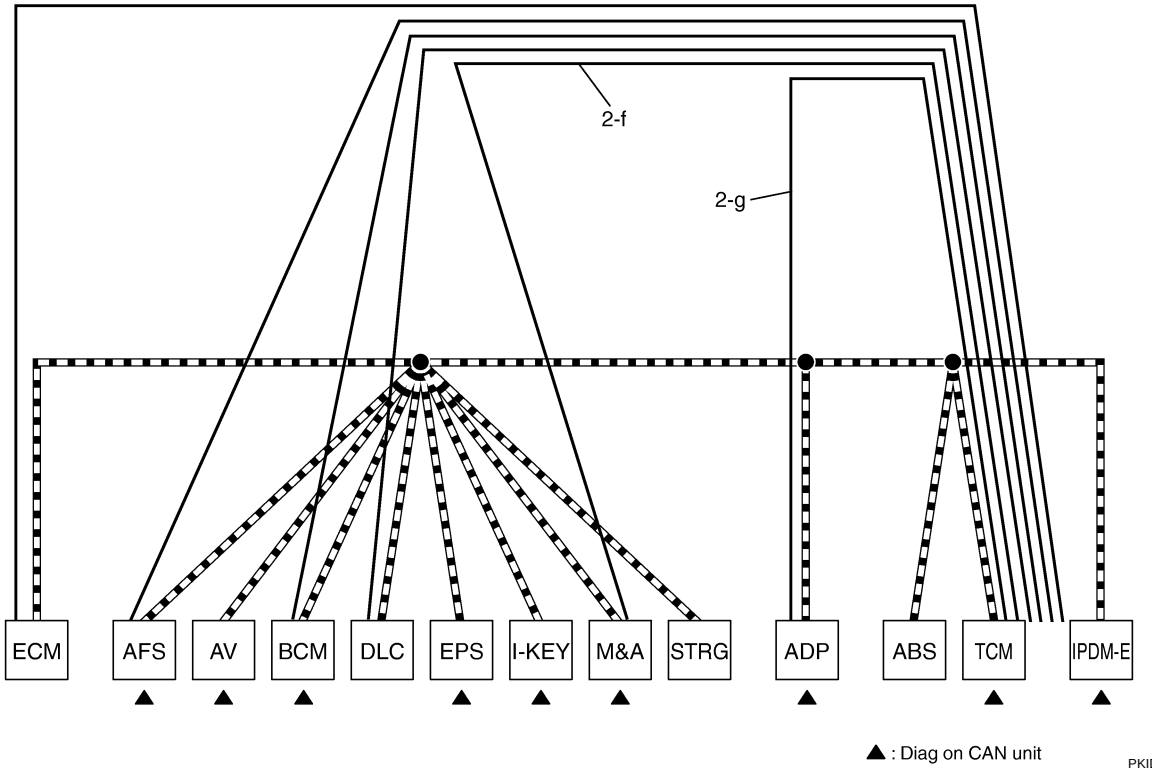
	PRSNT	PAST
TRANSMIT DIAG	OK	OK
ECM	OK	OK
TCM	UNKWN	0
BCM/SEC	OK	OK
VDC/TCS/ABS	OK	OK
IPDM E/R	-	-
DISPLAY	-	-
I-KEY	OK	OK
EPS	OK	OK
AWD/4WD	-	-
e4WD	-	-
ICC	-	-
LANE KEEP	-	-
TIRE-P	-	-

ADP

	PRSNT	PAST
TRANSMIT DIAG	-	-
METER/M&A	OK	OK
BCM/SEC	OK	OK
TCM	UNKWN	0

ABS

	PRSNT	PAST
INITIAL DIAG	OK	
TRANSMIT DIAG	OK	
ECM	OK	



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.

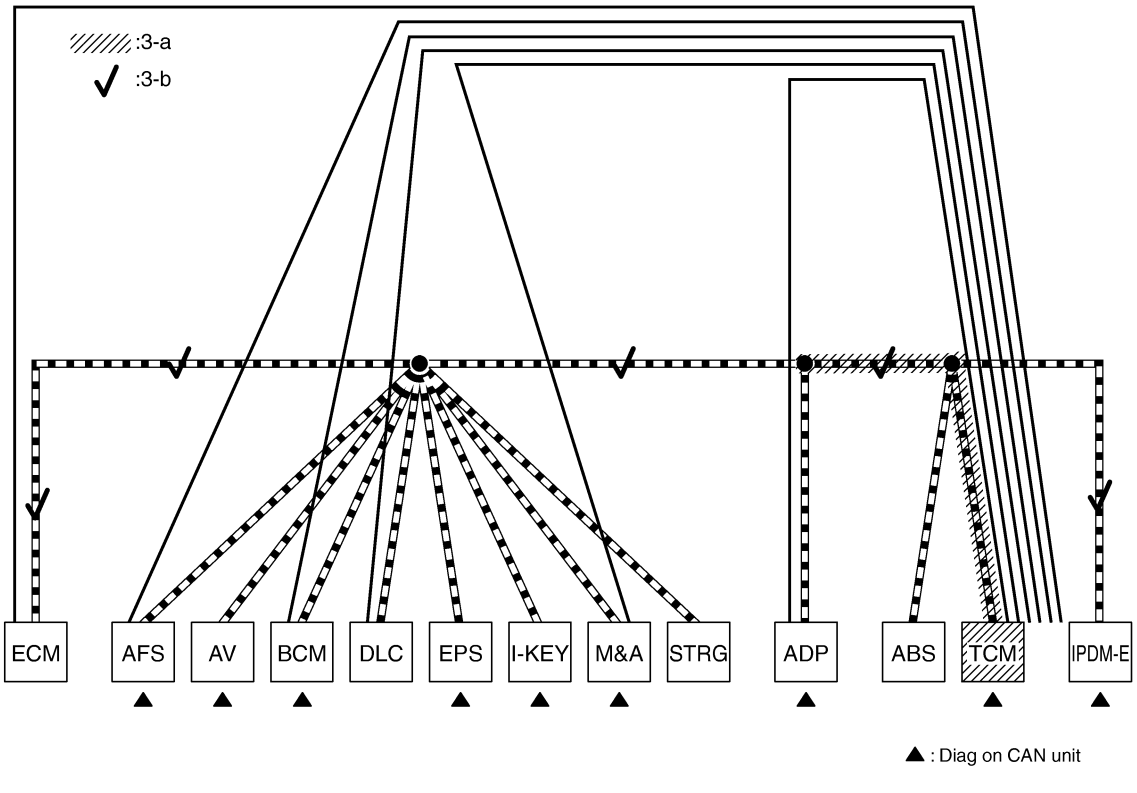
a. Through the previous procedure, the circuit between ADP splice and TCM has the most amount of lines (shade 3-a in the figure).

b. Place a check mark on the known good lines to establish the error circuit.
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).

(Example)

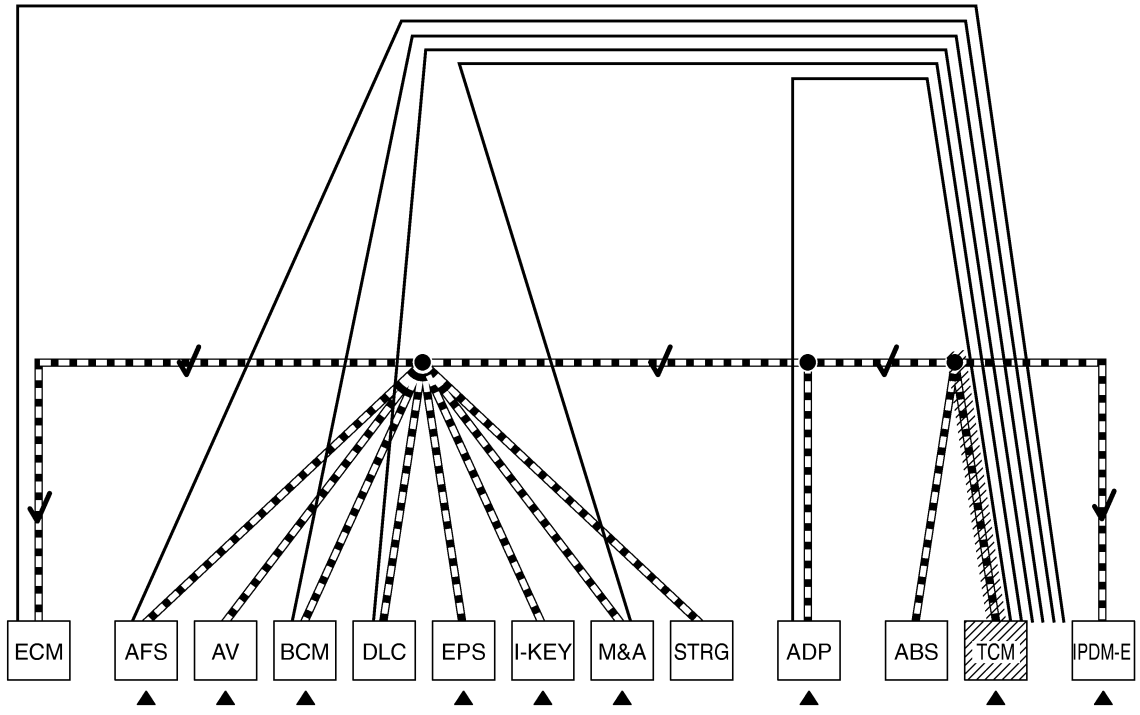
IPDM-E

	PRSNT	PAST
TRANSMIT DIAG	OK	OK
ECM	OK	OK
BCM/SEC	OK	OK



4. Through the above procedure, the error is detected in the TCM branch line (shaded in the figure).
   NOTE:
   For abbreviations, refer to LAN-41, "Abbreviation List" .
5. Perform the inspection for the detected error circuit. For the inspection procedure, refer to LAN-65, "Malfunction Area Chart" .

(Example)



< Checklist >

	Item	Check box
1	ECM	✓
2	AFS▲	✓
3	AV▲	✓
4	BCM▲	✓
5	EPS▲	✓
6	I-KEY▲	✓
7	M&A▲	✓
8	ADP▲	✓
9	ABS	✓
10	TCM▲	N-IDC
11	IPDM-E▲	✓

Possible root cause

· Error between TCM and splice.
· Error in TCM.

Inspection result

PKID1219E

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.

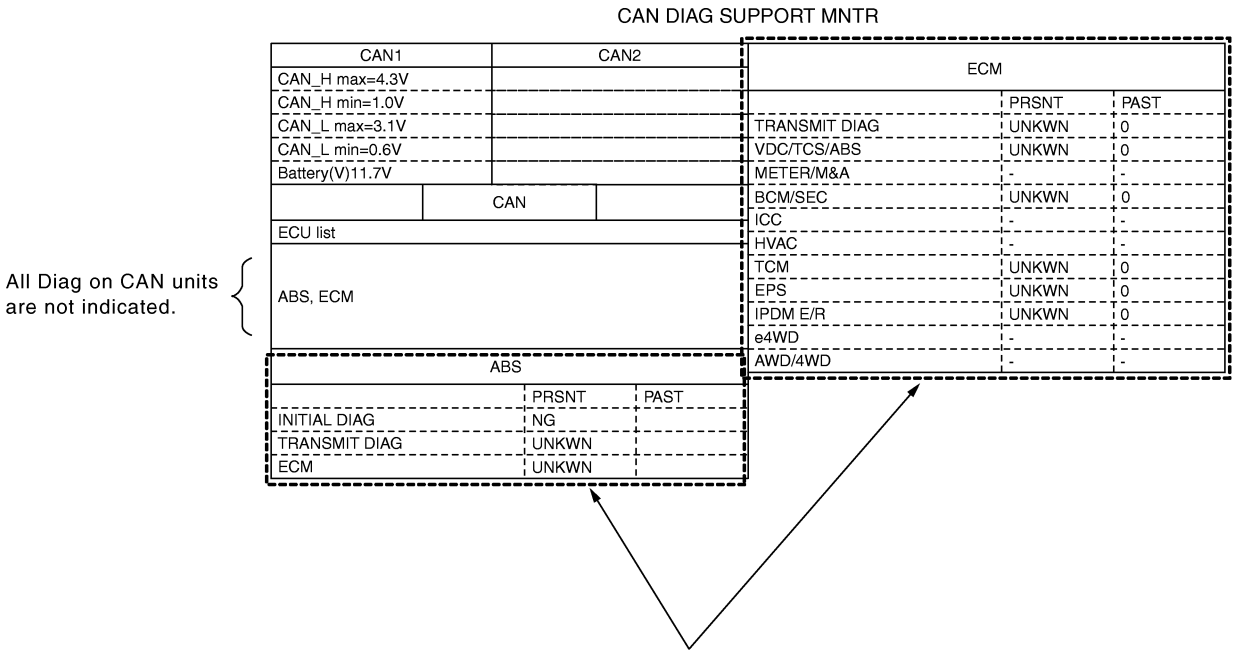
Error symptom

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

Inspection procedure

- Refer to LAN-65, "Malfunction Area Chart" .

(Example)



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.

1. 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.			

PKID1221E

2. 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-44, "CAN Diagnostic Support Monitor" .

a. 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).

b. 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).

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).

(Example)

ECM

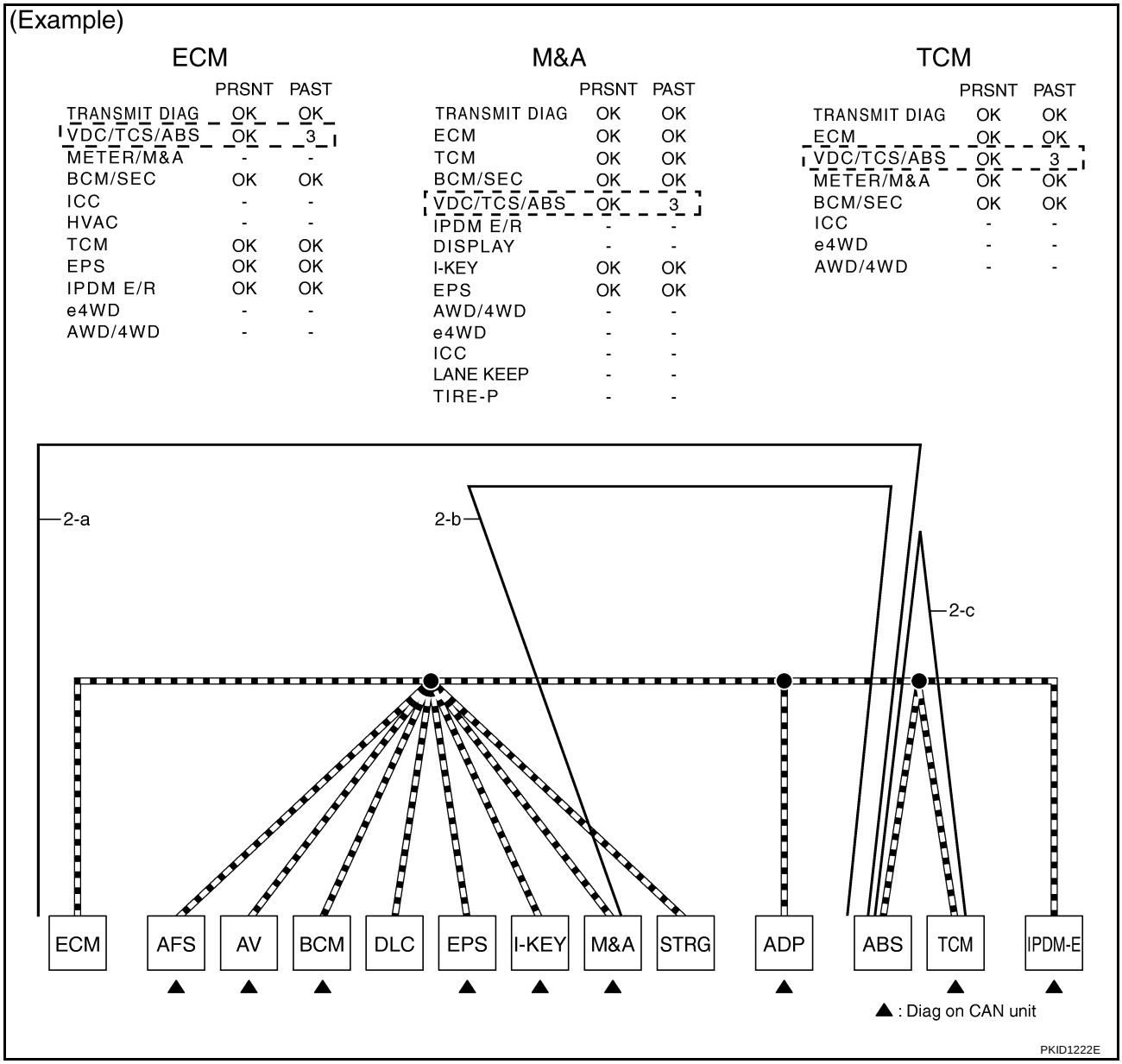
	PRSNT	PAST
TRANSMIT DIAG	OK	OK
VDC/TCS/ABS	OK	3
METER/M&A	-	-
BCM/SEC	OK	OK
ICC	-	-
HVAC	-	-
TCM	OK	OK
EPS	OK	OK
IPDM E/R	OK	OK
e4WD	-	-
AWD/4WD	-	-

M&A

	PRSNT	PAST
TRANSMIT DIAG	OK	OK
ECM	OK	OK
TCM	OK	OK
BCM/SEC	OK	OK
VDC/TCS/ABS	OK	3
IPDM E/R	-	-
DISPLAY	-	-
I-KEY	OK	OK
EPS	OK	OK
AWD/4WD	-	-
e4WD	-	-
ICC	-	-
LANE KEEP	-	-
TIRE-P	-	-

TCM

	PRSNT	PAST
TRANSMIT DIAG	OK	OK
ECM	OK	OK
VDC/TCS/ABS	OK	3
METER/M&A	OK	OK
BCM/SEC	OK	OK
ICC	-	-
e4WD	-	-
AWD/4WD	-	-



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.

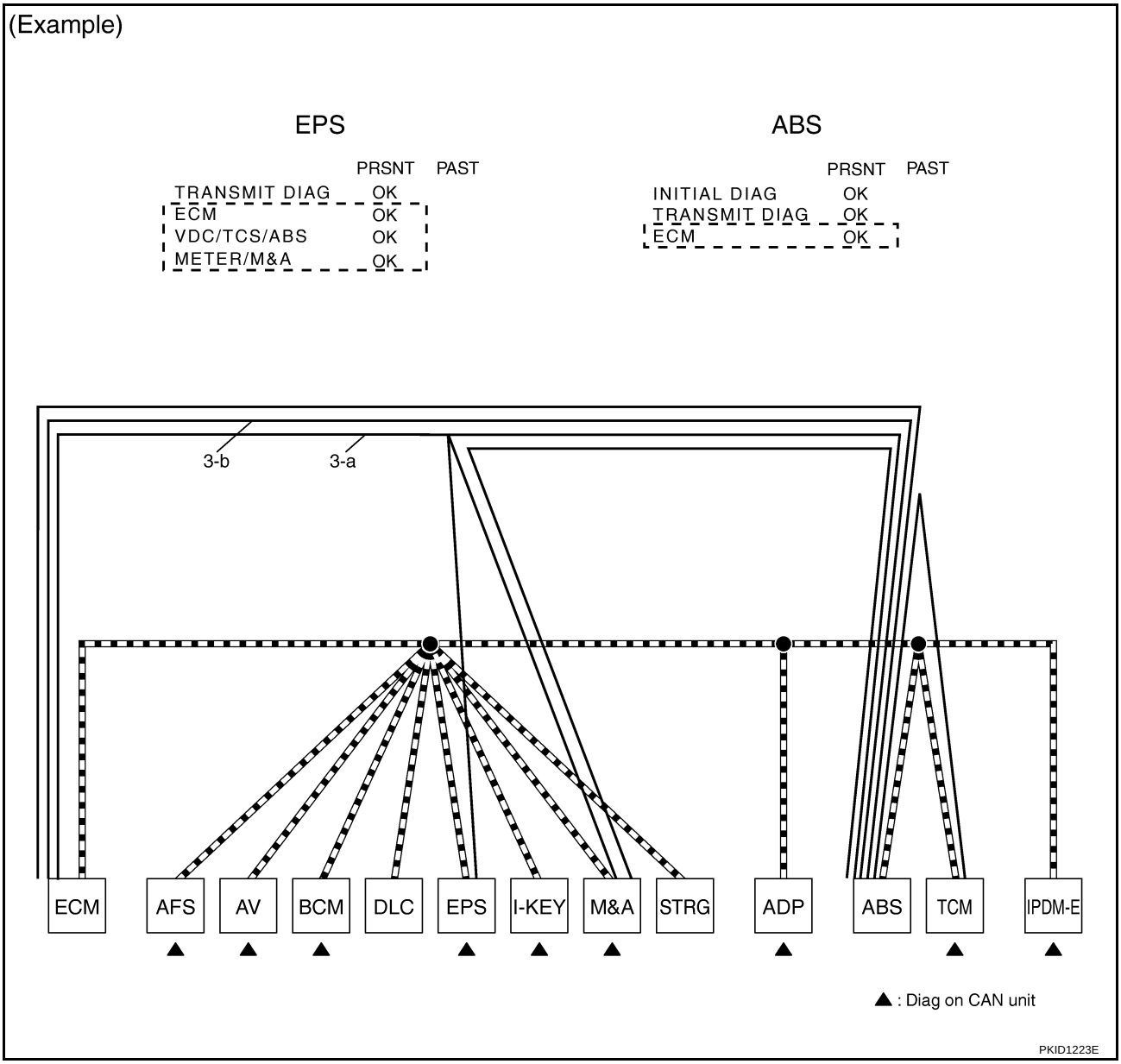
NOTE:

- 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).

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).

(Example)



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-49, "CAN Communication Signal Chart" .

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

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

(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	IPDM-E
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	
ABS warning lamp signal							R			T		
Brake warning lamp signal							R			T		
4-a Steering angle sensor signal		R						T				
Vehicle speed signal	R				R		R			T	R	
		R		R	R	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

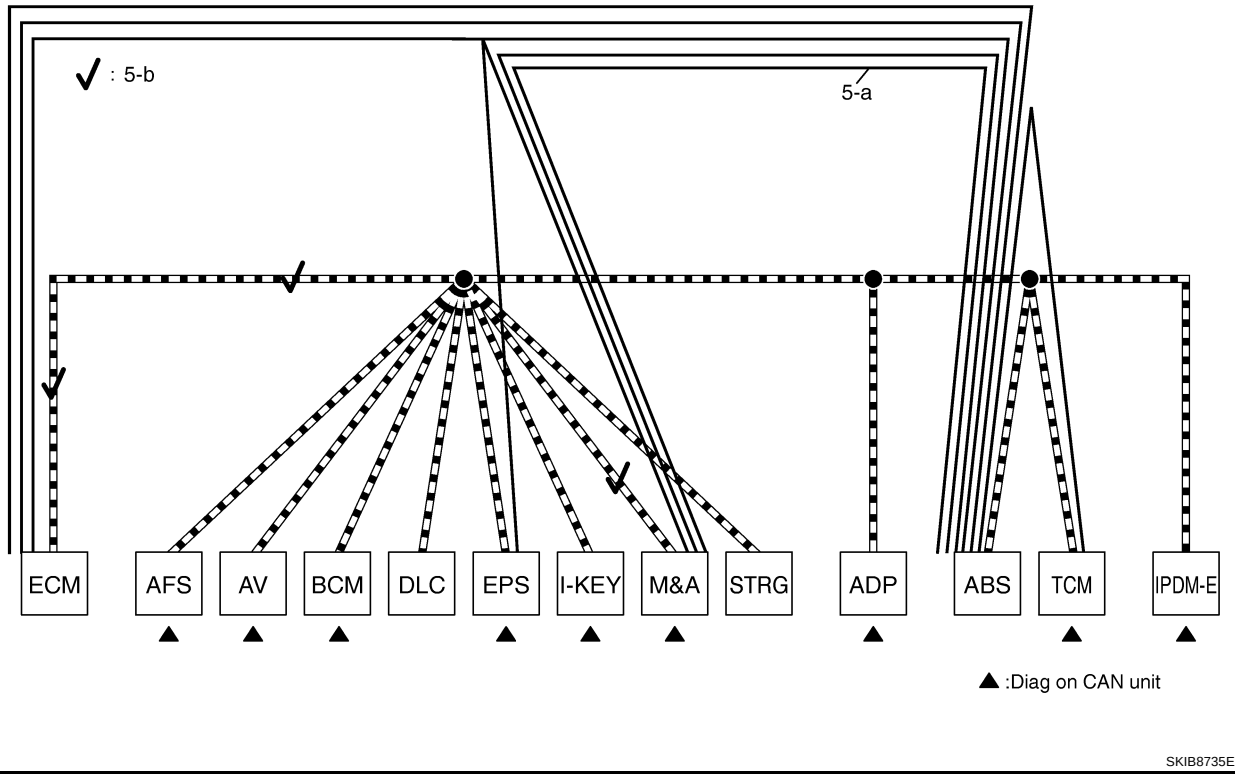
SKIB8895E

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).

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).

(Example)

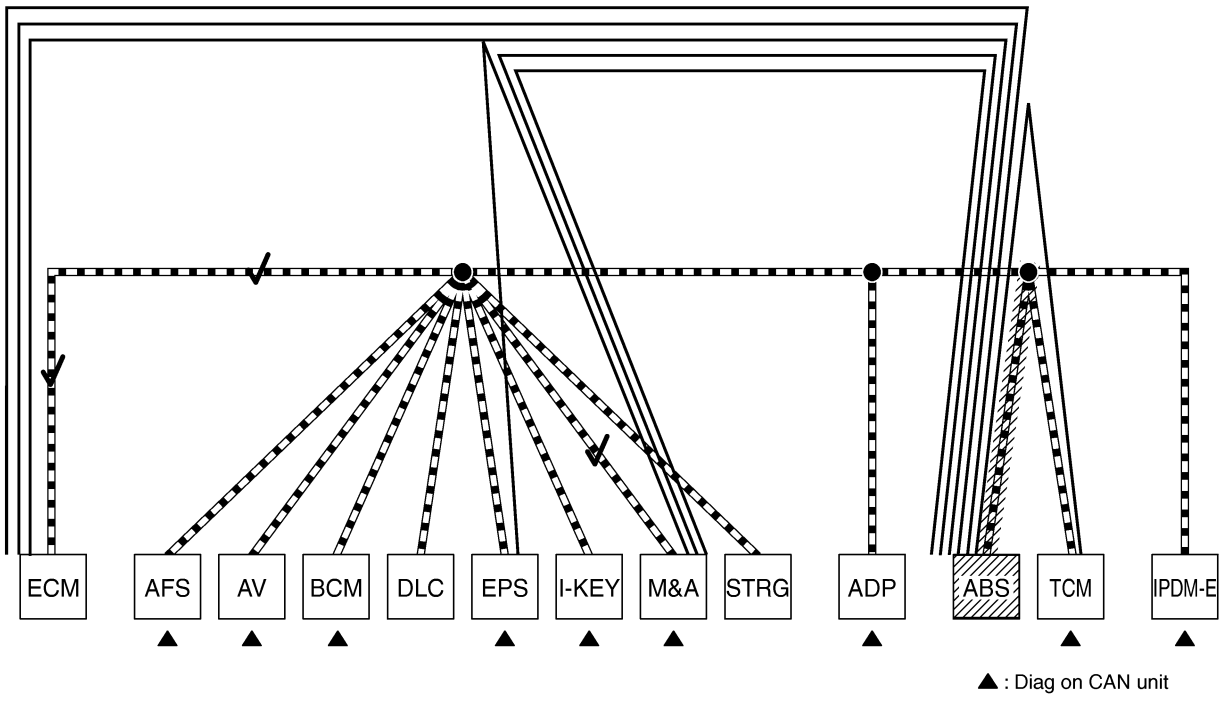


6. The circuit which has the most amount of lines are the possible cause. Error is detected from ABS actuator and electric unit (control unit) branch line (shaded in the figure).

   NOTE:
   For abbreviations, refer to LAN-41, "Abbreviation List" .

7. Perform the inspection procedure for the possible cause. Refer to LAN-65, "Malfunction Area Chart" .

(Example)



< Checklist >

	Item	Check box
1	ECM	✓
2	AFS▲	✓
3	AV▲	✓
4	BCM▲	✓
5	EPS▲	✓
6	I-KEY▲	✓
7	M&A▲	✓
8	ADP▲	✓
9	ABS	✓
10	TCM▲	✓
11	IPDM-E▲	✓

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 LAN-65, "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.	

(Example)

DTC RESULTS	TIME
ENGINE	
U1000 : CAN COMM CIRCUIT	1t
U1001 : CAN COMM CIRCUIT	1t

DTC RESULTS	TIME
ADAPTIVE LIGHT	
U1000 : CAN COMM CIRCUIT	5

DTC RESULTS	TIME
MULTI AV	
U1000 : CAN COMM CIRCUIT	5

DTC RESULTS	TIME
BCM	
U1000 : CAN COMM CIRCUIT	5

DTC RESULTS	TIME
EPS	
U1000 : CAN COMM CIRCUIT	5

DTC RESULTS	TIME
INTELLIGENT KEY	
U1000 : CAN COMM CIRCUIT	5

DTC RESULTS	TIME
METER	
U1000 : CAN COMM CIRCUIT	5

DTC RESULTS	TIME
AUTO DRIVE POS.	
U1000 : CAN COMM CIRCUIT	PAST

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

ECM

	PRSNT	PAST
TRANSMIT DIAG	OK	5
VDC/TCS/ABS	OK	5
METER/M&A	-	-
BCM/SEC	OK	5
ICC	-	-
HVAC	-	-
TCM	OK	5
EPS	OK	5
IPDM E/R	OK	5
e4WD	-	-
AWD/4WD	-	-

AFS

	PRSNT	PAST
TRANSMIT DIAG	-	-
ECM	OK	5
METER/M&A	OK	5
TCM	OK	5
STRG	OK	5
EPS	-	-
IPDM E/R	OK	5

AV

	PRSNT	PAST
TRANSMIT DIAG	-	-
ECM	OK	5
METER/M&A	OK	5
BCM/SEC	-	-
HVAC	-	-
IPDM E/R	-	-
TIRE-P	-	-

BCM

	PRSNT	PAST
TRANSMIT DIAG	OK	5
ECM	OK	5
METER/M&A	OK	5
TCM	OK	5
MULTI AV	-	-
IPDM E/R	OK	5
I-KEY	OK	5

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

EPS

	PRSNT	PAST
TRANSMIT DIAG	OK	
ECM	OK	
VDC/TCS/ABS	OK	
METER/M&A		

I-KEY

	PRSNT	PAST
TRANSMIT DIAG	OK	5
ECM	OK	5
METER/M&A	OK	5
	OK	5

M&A

	PRSNT	PAST
TRANSMIT DIAG	OK	5
ECM	OK	5
TCM	OK	5
BCM/SEC	OK	5
VDC/TCS/ABS	OK	5
IPDM E/R	-	-
	-	-
	OK	5
		5

ADP

	PRSNT	PAST
TRANSMIT DIAG	-	-
METER/M&A	OK	5
BCM/SEC	OK	5
TCM	OK	5

PKID1225E

INDEX FOR DTC

PFP:00004

DTC No. Index

NKS004PM

DTC	Self-diagnosis item (CONSULT-III indication)	DTC detection condition	Inspection
U1000	CAN COMM CIRCUIT	When ECM is not transmitting or receiving CAN communication signal of OBD (emission-related diagnosis) for 2 seconds or more.	Refer to LAN-41, "HOW TO USE THIS SECTION" .
		When a control unit (except for ECM) is not transmitting or receiving CAN communication signal for 2 seconds or more.	
U1001	CAN COMM CIRCUIT	When ECM is not transmitting or receiving CAN communication signal other than OBD (emission-related diagnosis) for 2 seconds or more.	
U1002	SYSTEM COMM	When a control unit is not transmitting or receiving CAN communication signal for 2 seconds or less.	Start the inspection. Refer to the applicable section of the indicated control unit.
U1010	CONTROL UNIT [CAN]	When an error is detected during the initial diagnosis for CAN controller of each control unit.	Replace the control unit indicating “U1010”.

HOW TO USE THIS SECTION

PFP:00008

Caution

NKS004PN

- This section describes information peculiar to a vehicle, sheets for trouble diagnosis, and inspection procedures.
- For trouble diagnosis procedure, refer to LAN-17, "Trouble Diagnosis Procedure" .

Abbreviation List

NKS004PO

Abbreviations 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)
A-BAG	Air bag diagnosis sensor unit	AIR BAG	—
ABS	ABS actuator and electric unit (control unit)	ABS	VDC/TCS/ABS
	VDC/TCS/ABS control unit		
BCM	BCM	BCM	BCM/SEC
DLC	Data link connector	—	—
ECM	ECM	ENGINE	ECM
IPDM-E	IPDM E/R	IPDM E/R	IPDM E/R
M&A	Unified meter and A/C amp.	METER/M&A	METER/M&A
STRG	Steering angle sensor	—	STRG
TCM	TCM	A/T	TCM

PRECAUTIONS

PFP:00001

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

NKS004PP

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

WARNING:

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

Precautions for Battery Service

NKS0053P

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

Precautions for Trouble Diagnosis

NKS004PR

CAUTION:

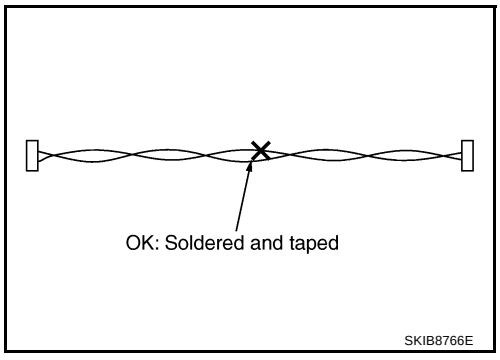
- **Never apply 7.0 V or more to the measurement terminal.**
- **Use a tester with open terminal voltage of 7.0 V or less.**
- **Turn the ignition switch OFF and disconnect the battery cable from the negative terminal when checking the harness.**

Precautions for Harness Repair

NKS004PS

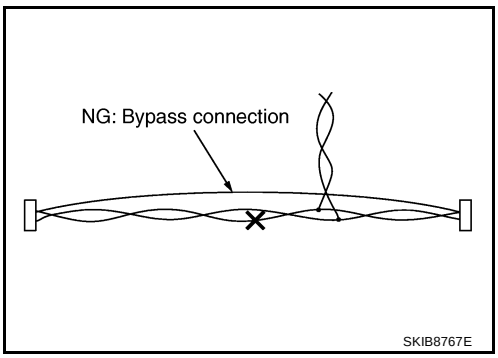
- Solder the repaired area and wrap tape around the soldered area.

  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.

TROUBLE DIAGNOSIS

PFP:00004

CAN Diagnostic Support Monitor

NKS004PT

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 SUPPORT 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 VDC/TCS/ABS control unit				
		With TCS: Signal receiving status from the ABS actuator and electric unit (control unit)				
		With ABS: Not used even though indicated				
	METER/M&A	Signal receiving status from the unified meter and A/C amp.	OK	OK 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
	EPS	Not used even though indicated				
	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					

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

VDC/TCS/ABS Control Unit

ITEM	CAN DIAG SUPPORT 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	Signal receiving status from the unified meter and A/C amp.		
	STRG	Signal receiving status from the steering angle sensor		

CAUTION:

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

TCM

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

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

BCM

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

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

Unified Meter and A/C Amp.

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

ITEM	CAN DIAG SUPPORT 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	With VDC: Signal receiving status from the VDC/TCS/ABS control unit				
		Without VDC: Signal receiving status from the ABS actuator and electric unit (control unit)				
	IPDM E/R	Not used even though indicated				
	DISPLAY					
	I-KEY					
	EPS					
	AWD/4WD					
	e4WD					
	ICC					
	LANE KEEP					
	TIRE-P					

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

ABS Actuator and Electric Unit (Control Unit)

Models with ABS

ITEM	CAN DIAG SUPPORT 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.

Models with TCS

ITEM	CAN DIAG SUPPORT 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		

CAUTION:

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

IPDM E/R

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

ITEM	CAN DIAG SUPPORT 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.

CAN System Specification Chart

NKS004PU

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

NOTE:

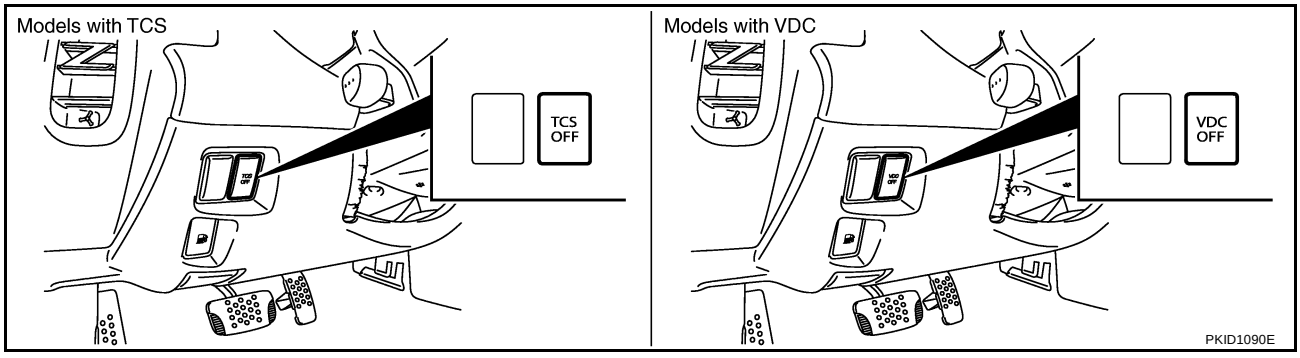
Refer to LAN-19, "CHECK OF CAN SYSTEM TYPE (HOW TO USE CAN SYSTEM TYPE SPECIFICATION CHART)" for how to use CAN system specification chart.

Body type	Coupe/Roadster				
Axle	2WD				
Engine	VQ35HR				
Transmission	M/T		A/T	M/T	A/T
Brake control	ABS	TCS		VDC	
CAN system type	1	2	3	4	5
Diagnosis sheet	LAN-59	LAN-60	LAN-61	LAN-62	LAN-63
CAN communication signal chart	LAN-49, "TYPE 1"	LAN-50, "TYPE 2/TYPE 3"		LAN-51, "TYPE 4/TYPE 5"	

VEHICLE EQUIPMENT IDENTIFICATION INFORMATION

NOTE:

Check CAN system type from the vehicle shape and equipment.



CAN Communication Signal Chart

NKS004PV

Refer to LAN-15, "How to Use CAN Communication Signal Chart" for how to use CAN communication signal chart.

TYPE 1

NOTE:
Refer to LAN-41, "Abbreviation List" for the abbreviations of the connecting units.

T: Transmit R: Receive

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

Signal name/Connecting unit	ECM	BCM	M&A	ABS	IPDM-E
Low beam status signal	R				T
Rear window defogger control signal	R				T

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

TYPE 2/TYPE 3

NOTE:
Refer to LAN-41, "Abbreviation List" for the abbreviations of the connecting units.

T: Transmit R: Receive

Signal name/Connecting unit	ECM	TCM	BCM	M&A	ABS	IPDM-E
A/C compressor feedback signal	T			R		
A/C compressor request signal	T					R
Accelerator pedal position signal	T	R			R	
ASCD CRUISE lamp signal	T			R		
ASCD OD cancel request signal	T	R				
ASCD operation signal	T	R				
ASCD SET lamp signal	T			R		
Battery voltage signal	T	R				
Closed throttle position signal	T	R				
Cooling fan speed request signal	T					R
Engine coolant temperature signal	T			R		
Engine speed signal	T	R		R	R	
Fuel consumption monitor signal	T			R		
Malfunction indicator lamp signal	T			R		
Wide open throttle position signal	T	R				
A/T CHECK indicator lamp signal		T		R		
A/T position indicator signal		T		R	R	
A/T self-diagnosis signal	R	T				
Manual mode gear position signal		T		R		
Manual mode indicator signal		T		R		
Output shaft revolution signal	R	T				
Turbine revolution signal	R	T				
A/C switch signal	R		T			
Blower fan motor switch signal	R		T			
Buzzer output signal			T	R		
Day time running light request signal			T			R
Door switch signal			T	R		R
Front wiper request signal			T			R
High beam request signal			T	R		R
Horn chirp signal			T			R
Ignition switch signal			T			R
Low beam request signal			T			R
Position lights request signal			T	R		R

Signal name/Connecting unit	ECM	TCM	BCM	M&A	ABS	IPDM-E
Rear window defogger switch signal			T			R
Sleep request 1 signal			T	R		
Sleep request 2 signal			T			R
Theft warning horn request signal			T			R
Tire pressure signal			T	R		
Turn indicator signal			T	R		
Wake up request 1 signal			T	R		
Fuel level sensor signal	R			T		
Manual mode shift down signal		R		T		
Manual mode shift up signal		R		T		
Manual mode signal		R		T		
Not manual mode signal		R		T		
Seat belt buckle switch signal			R	T		
Stop lamp switch signal		R		T		
Vehicle speed signal	R	R	R	T		
				R	T	
A/T shift schedule change demand signal		R			T	
ABS operation signal		R			T	
ABS warning lamp signal				R	T	
Brake warning lamp signal				R	T	
SLIP indicator lamp signal				R	T	
TCS OFF indicator lamp signal				R	T	
Front wiper stop position signal			R			T
High beam status signal	R					T
Hood switch signal			R			T
Low beam status signal	R					T
Rear window defogger control signal	R					T

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

TYPE 4/TYPE 5

NOTE:
Refer to LAN-41, "Abbreviation List" for the abbreviations of the connecting units.

T: Transmit R: Receive

Signal name/Connecting unit	ECM	ABS	TCM	BCM	M&A	STRG	IPDM-E
A/C compressor feedback signal	T				R		
A/C compressor request signal	T						R
Accelerator pedal position signal	T	R	R				
ASCD CRUISE lamp signal	T				R		
ASCD OD cancel request signal	T		R				
ASCD operation signal	T		R				
ASCD SET lamp signal	T				R		
Battery voltage signal	T		R				

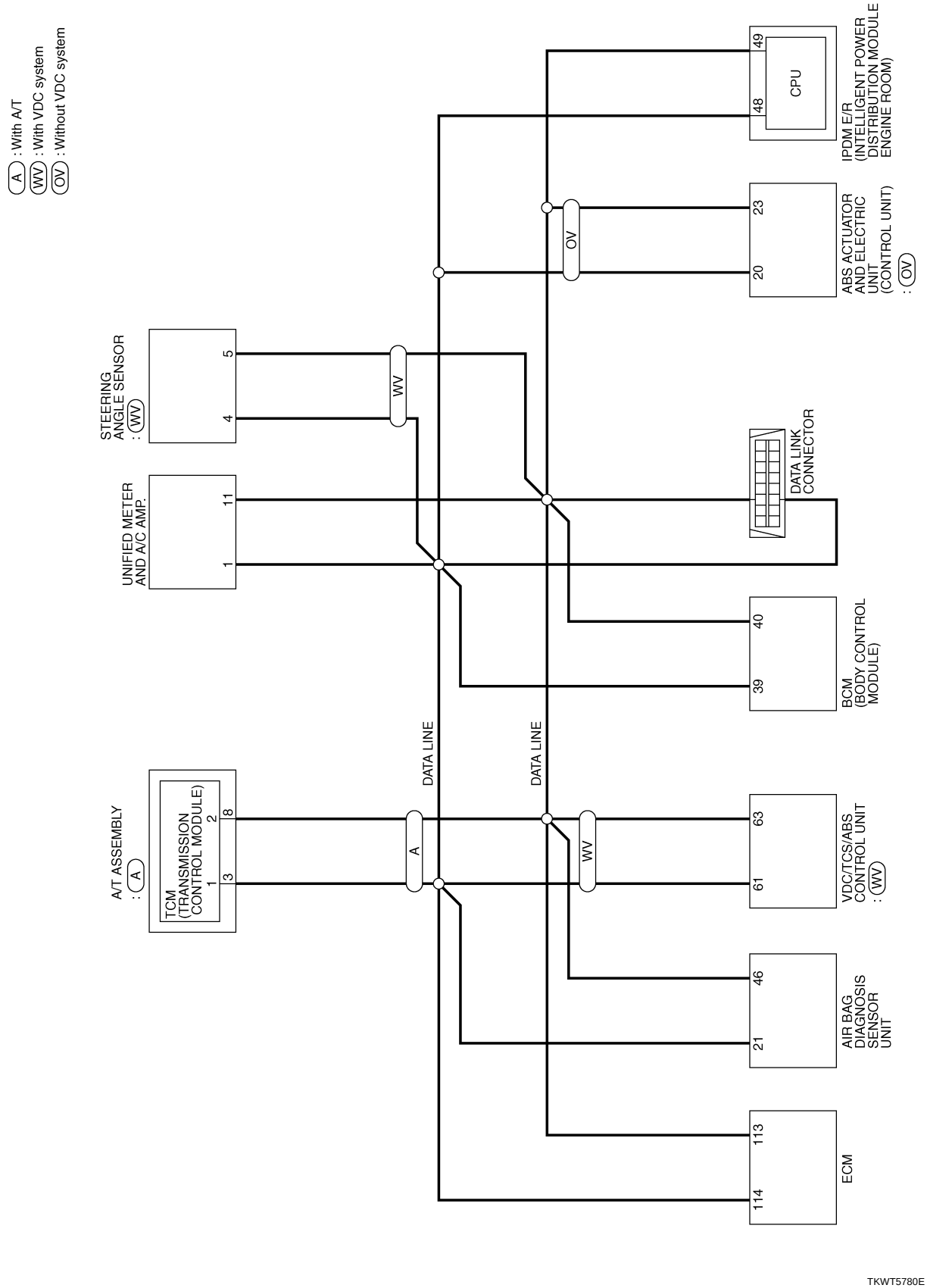
Signal name/Connecting unit	ECM	ABS	TCM	BCM	M&A	STRG	IPDM-E
Closed throttle position signal	T		R				
Cooling fan speed request signal	T						R
Engine coolant temperature signal	T				R		
Engine speed signal	T	R	R		R		
Fuel consumption monitor signal	T				R		
Malfunction indicator lamp signal	T				R		
Wide open throttle position signal	T		R				
A/T shift schedule change demand signal		T	R				
ABS operation signal		T	R				
ABS warning lamp signal		T			R		
Brake warning lamp signal		T			R		
SLIP indicator lamp signal		T			R		
VDC OFF indicator lamp signal		T			R		
Vehicle speed signal		T			R		
	R		R	R	T		
A/T CHECK indicator lamp signal			T		R		
A/T position indicator signal		R	T		R		
A/T self-diagnosis signal	R		T				
Manual mode gear position signal			T		R		
Manual mode indicator signal			T		R		
Output shaft revolution signal	R		T				
Turbine revolution signal	R		T				
A/C switch signal	R			T			
Blower fan motor switch signal	R			T			
Buzzer output signal				T	R		
Day time running light request signal				T			R
Door switch signal				T	R		R
Front wiper request signal				T			R
High beam request signal				T	R		R
Horn chirp signal				T			R
Ignition switch signal				T			R
Low beam request signal				T			R
Position lights request signal				T	R		R
Rear window defogger switch signal				T			R
Sleep request 1 signal				T	R		
Sleep request 2 signal				T			R
Theft warning horn request signal				T			R
Tire pressure signal				T	R		
Turn indicator signal				T	R		
Wake up request 1 signal				T	R		
Fuel level sensor signal	R				T		
Manual mode shift down signal			R		T		
Manual mode shift up signal			R		T		

Signal name/Connecting unit	ECM	ABS	TCM	BCM	M&A	STRG	IPDM-E
Manual mode signal			R		T		
Not manual mode signal			R		T		
Seat belt buckle switch signal				R	T		
Stop lamp switch signal			R		T		
Steering angle sensor signal		R				T	
Front wiper stop position signal				R			T
High beam status signal	R						T
Hood switch signal				R			T
Low beam status signal	R						T
Rear window defogger control signal	R						T

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

Schematic

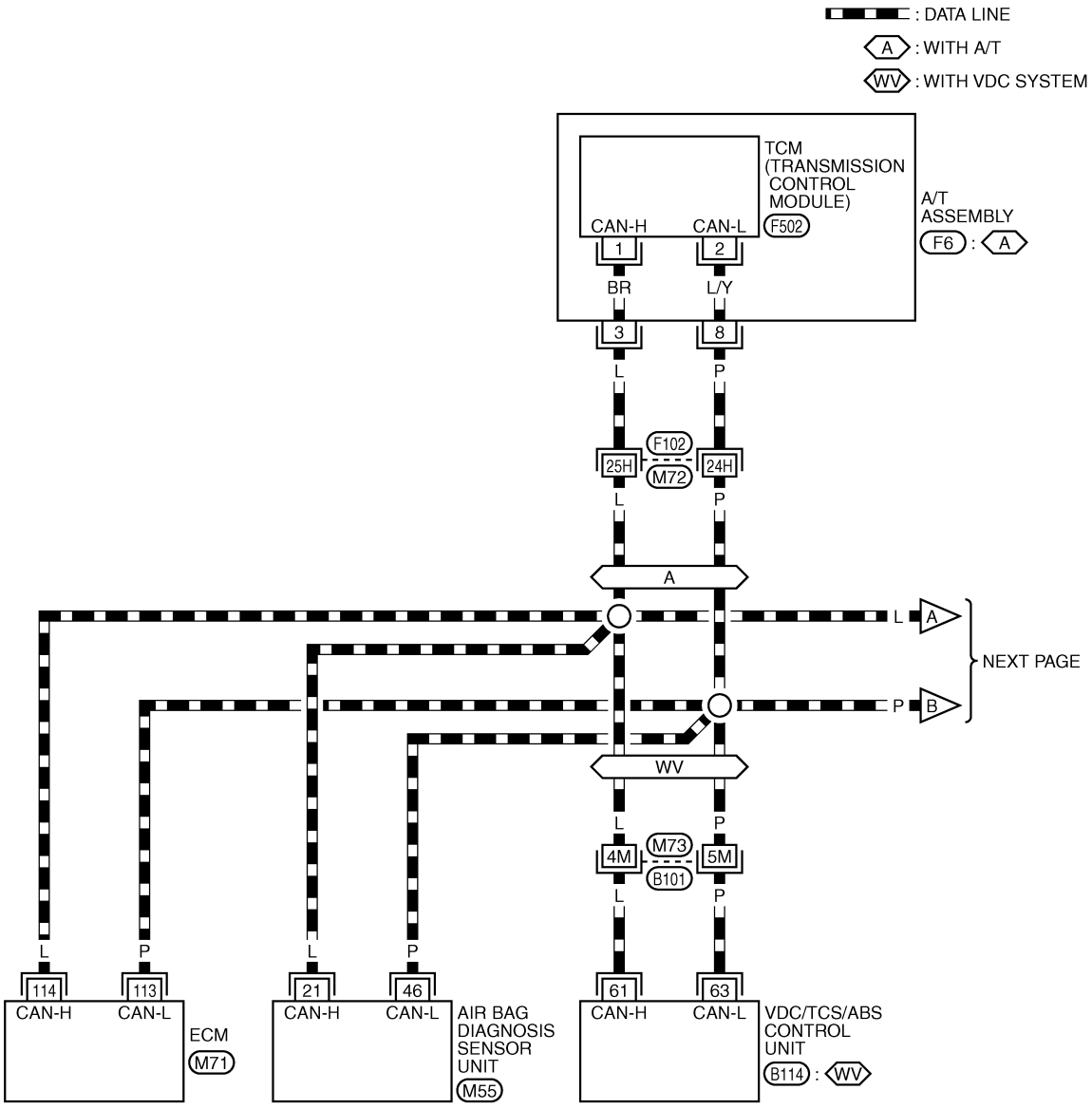
NKS004PW

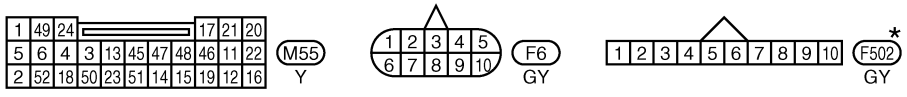


Wiring Diagram — CAN —

NKS004PX

LAN-CAN-01





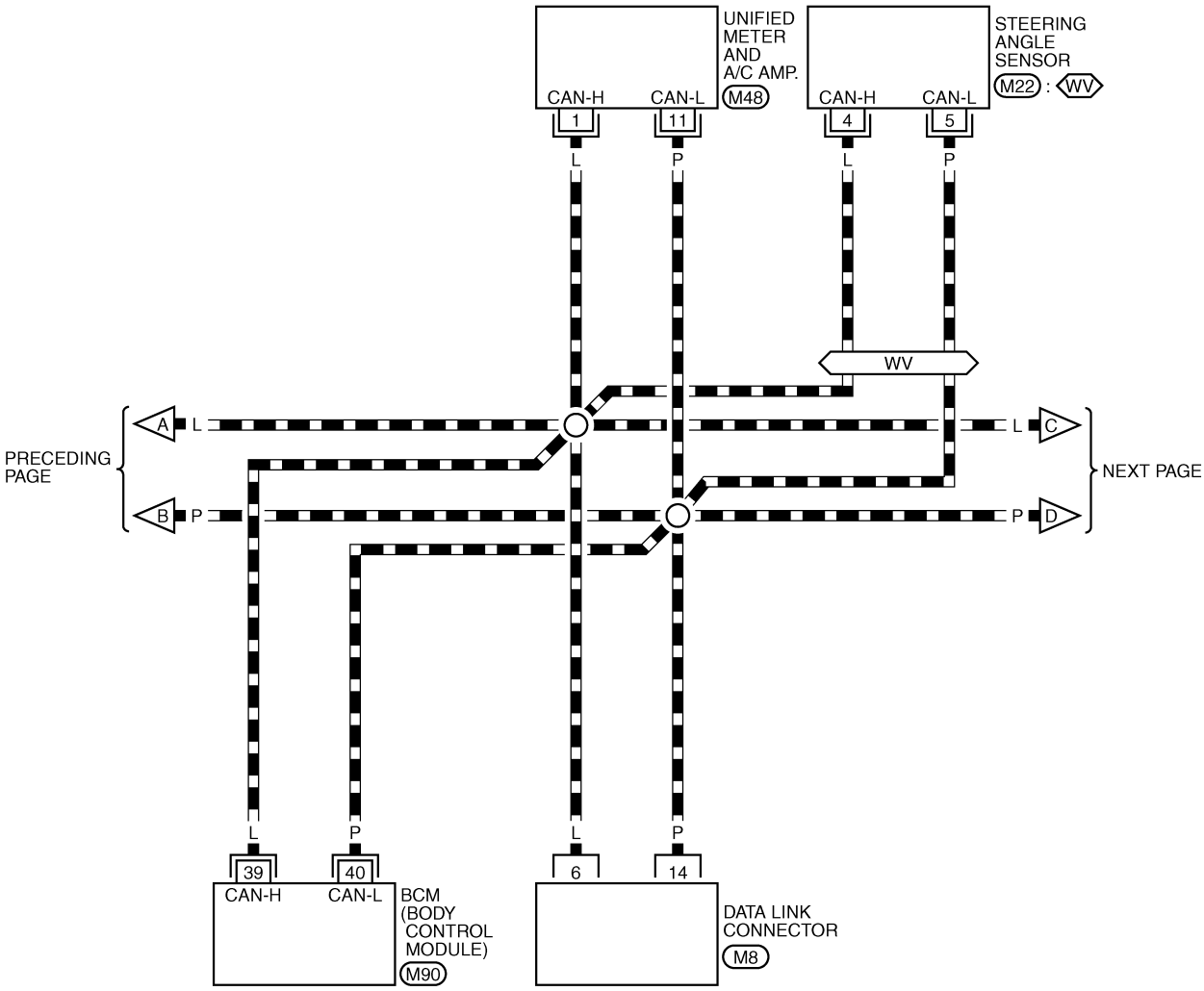
∗: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

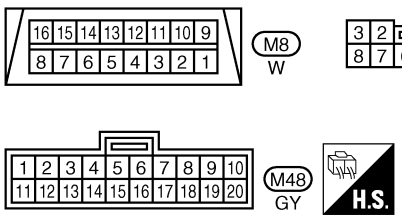
REFER TO THE FOLLOWING.
F102 , B101 -SUPER MULTIPLE JUNCTION (SMJ)
M71 , B114 -ELECTRICAL UNITS

TKWT5781E

LAN-CAN-02

: DATA LINE
WV : WITH VDC SYSTEM

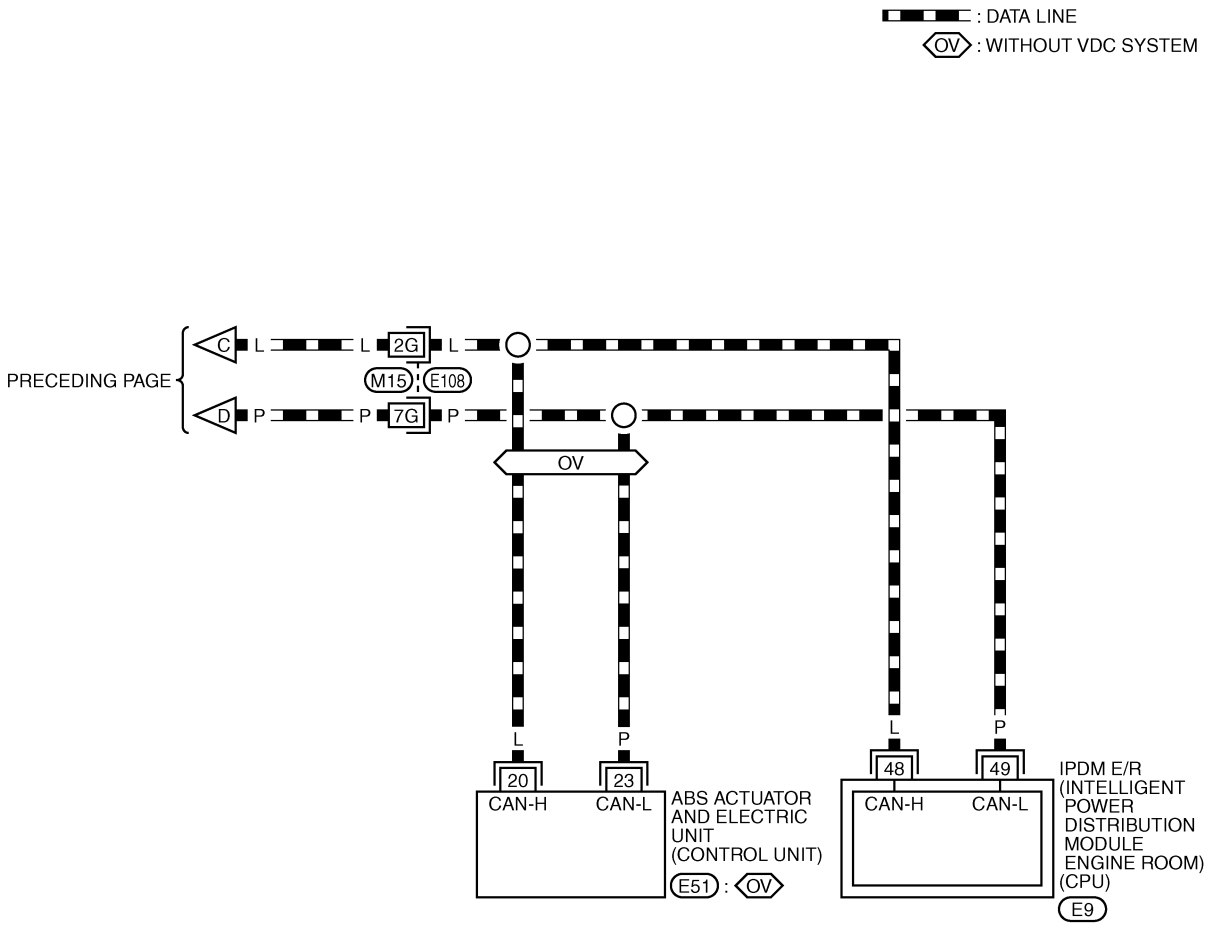


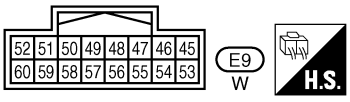


REFER TO THE FOLLOWING.
M90 -ELECTRICAL UNITS

TKWT5782E

LAN-CAN-03





REFER TO THE FOLLOWING.
E108 -SUPER MULTIPLE JUNCTION (SMJ)
E51 -ELECTRICAL UNITS

TKWB4321E

Interview Sheet

NKS004PY

CAN Communication System Diagnosis Interview Sheet

Date received:

Type: VIN No.:

Model:

First registration: Mileage:

CAN system type:

Symptom (Results from interview with customer)

Condition at inspection

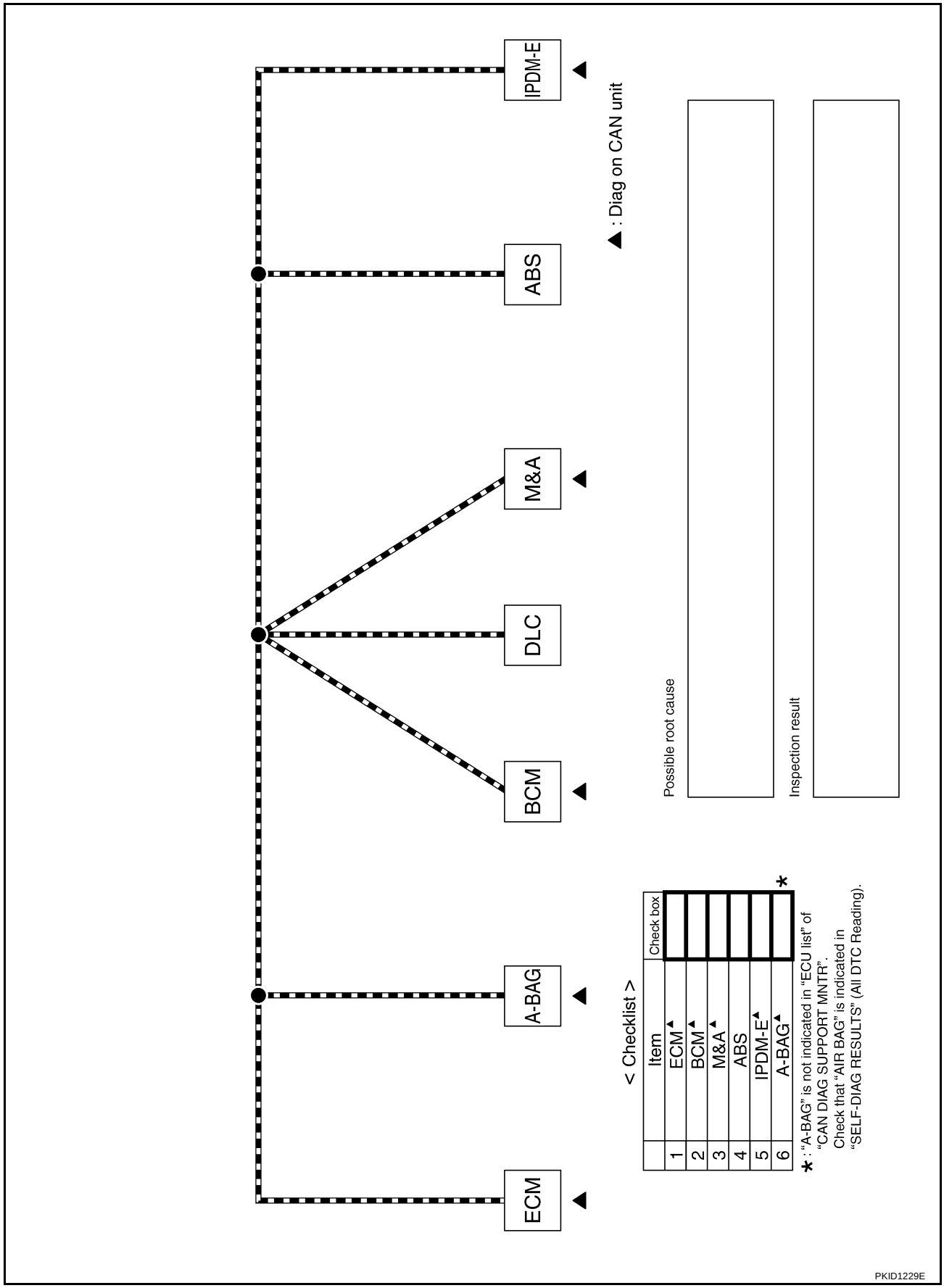
Error symptom : Present / Past

SKIB8898E

CAN System (Type 1)

NKS004Q0

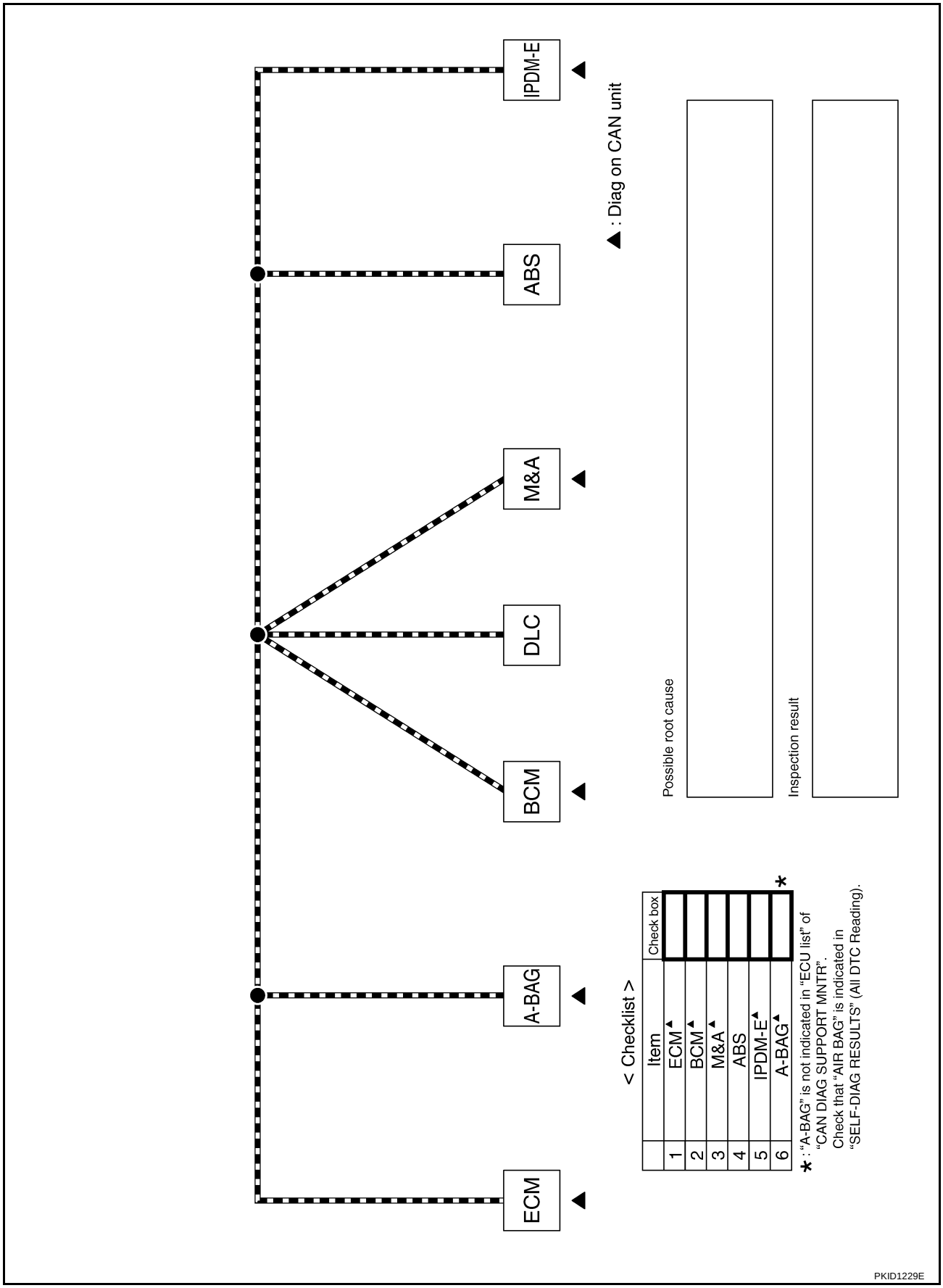
DIAGNOSIS SHEET



CAN System (Type 2)

NKS004Q1

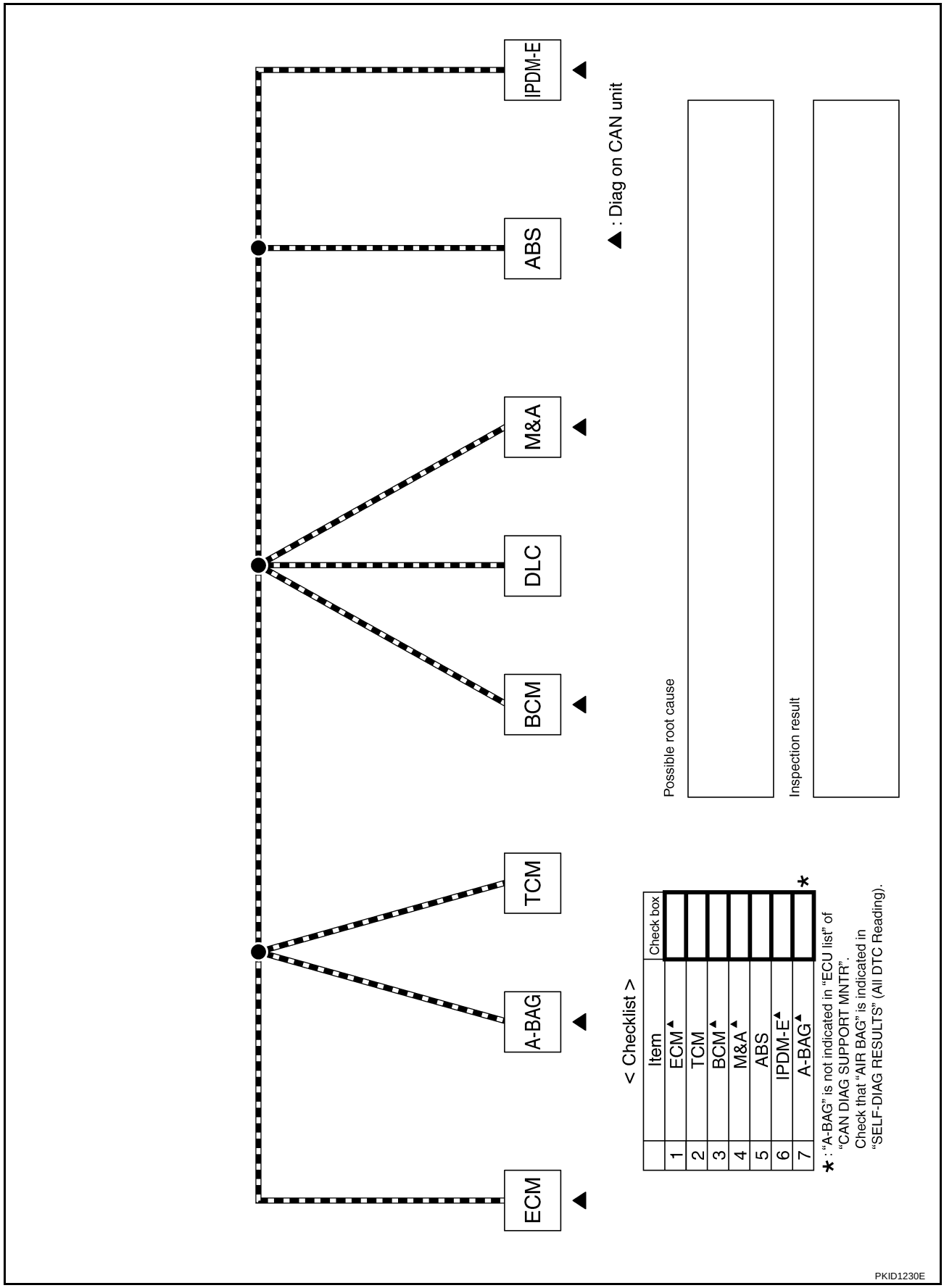
DIAGNOSIS SHEET



CAN System (Type 3)

NKS004S1

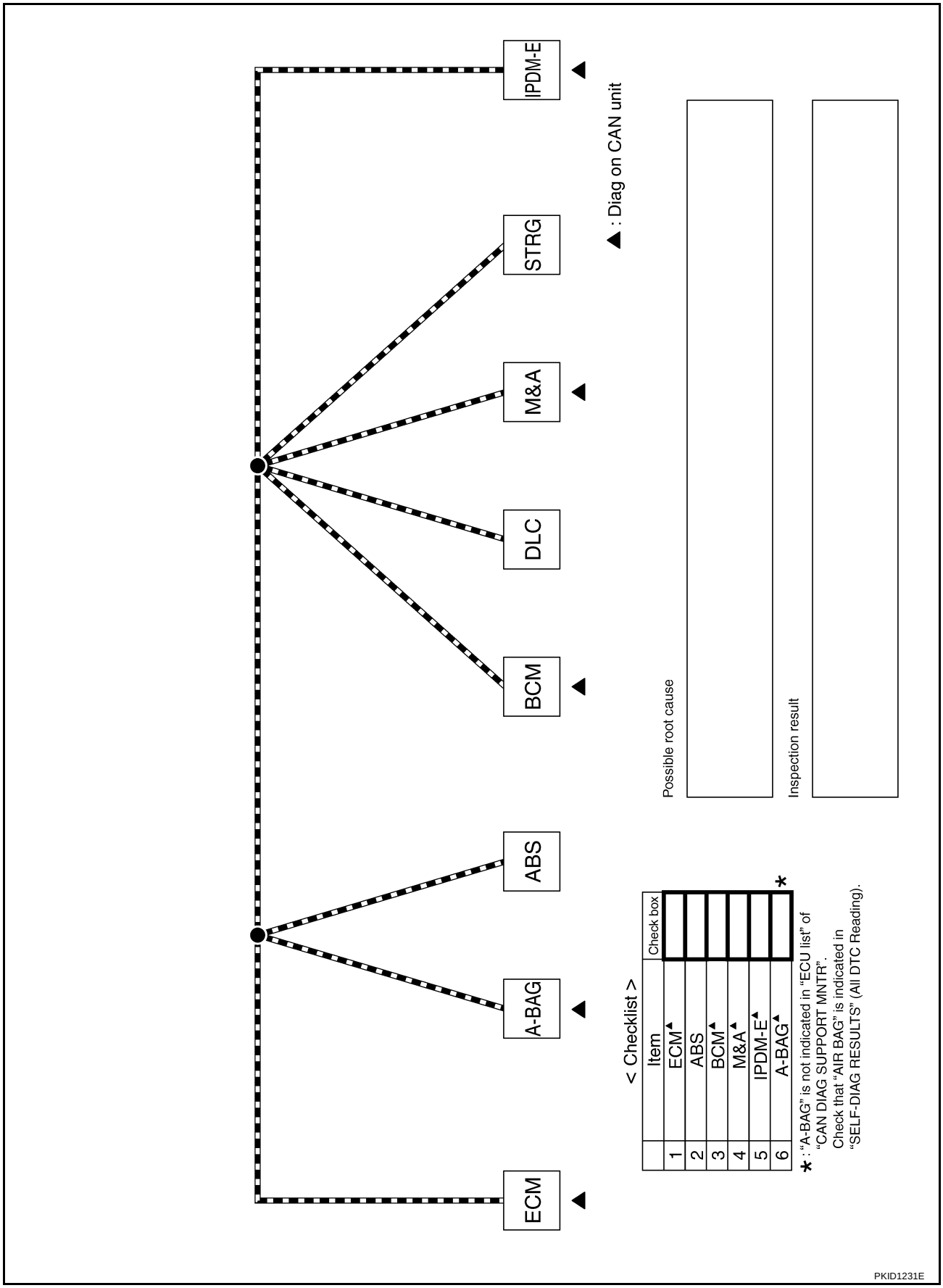
DIAGNOSIS SHEET



CAN System (Type 4)

NKS004Q3

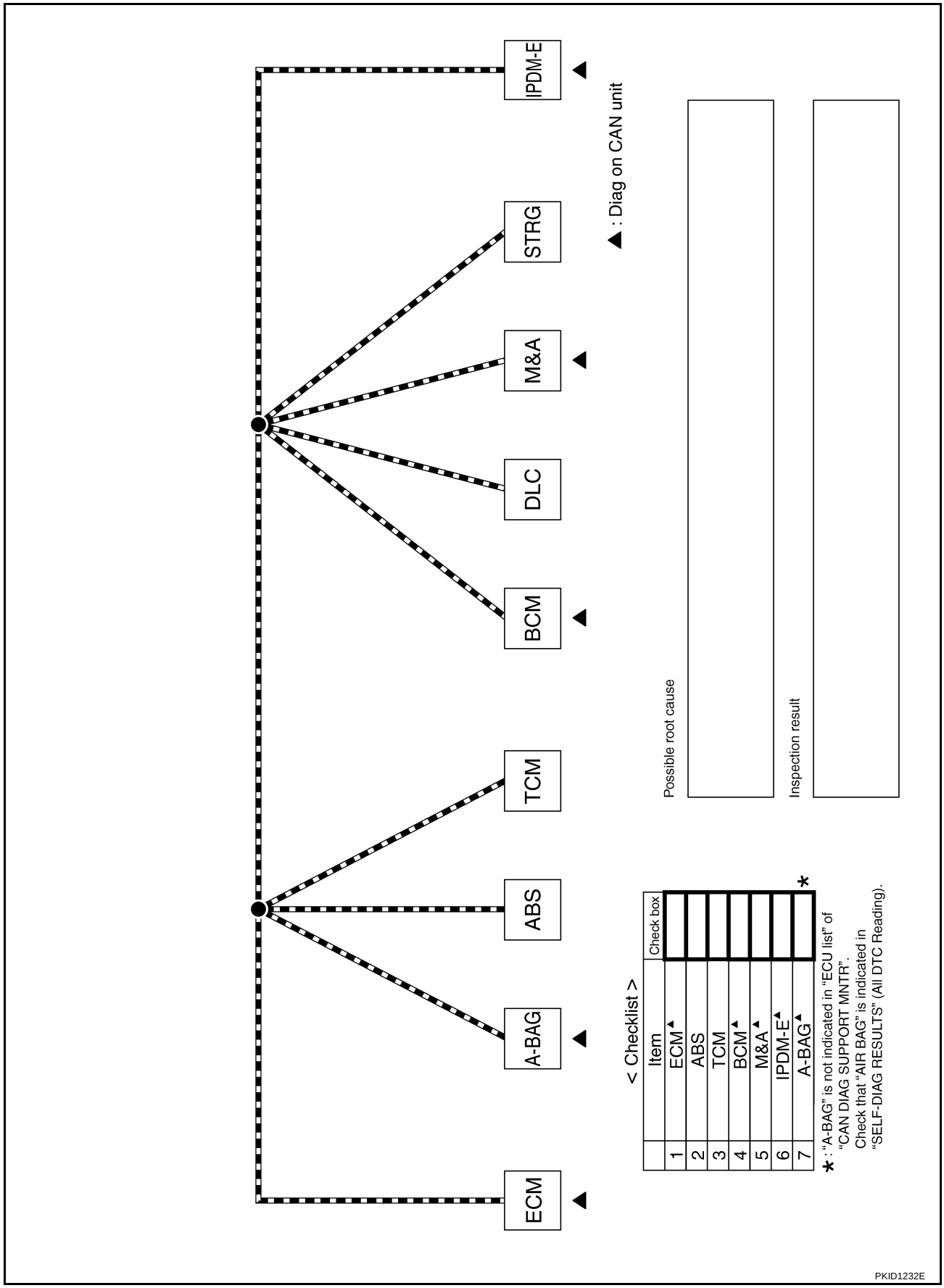
DIAGNOSIS SHEET



CAN System (Type 5)

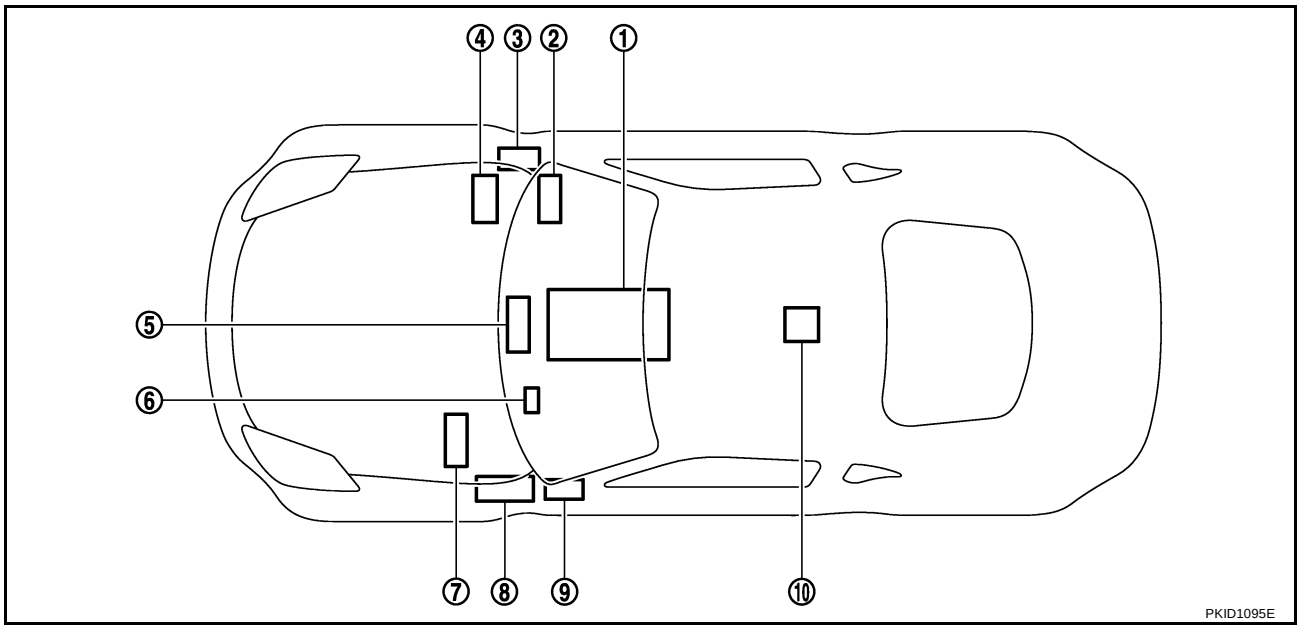
NKS004Q4

DIAGNOSIS SHEET



Component Parts Location

NKS004RJ



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

Harness Layout

NKS004RK

Refer to PG-41, "Harness Layout" .

Malfunction Area Chart

NKS004RL

MAIN LINE

Malfunction Area	Reference
Main line between VDC/TCS/ABS control unit and data link connector	LAN-66, "Main Line Between VDC/TCS/ABS Control Unit and Data Link Connector"
Main line between TCM and data link connector	LAN-66, "Main Line Between TCM and Data Link Connector"
Main line between data link connector and ABS actuator and electric unit (control unit)	LAN-67, "Main Line Between Data Link Connector and ABS Actuator and Electric Unit (Control Unit)"

BRANCH LINE

Malfunction Area	Reference
ECM branch line circuit	LAN-68, "ECM Branch Line Circuit"
Air bag diagnosis sensor unit branch line circuit	LAN-68, "Air Bag Diagnosis Sensor Unit Branch Line Circuit"
VDC/TCS/ABS control unit branch line circuit	LAN-69, "VDC/TCS/ABS Control Unit Branch Line Circuit"
TCM branch line circuit	LAN-69, "TCM Branch Line Circuit"
BCM branch line circuit	LAN-70, "BCM Branch Line Circuit"
Data link connector branch line circuit	LAN-71, "Data Link Connector Branch Line Circuit"
Unified meter and A/C amp. branch line circuit	LAN-71, "Unified Meter and A/C Amp. Branch Line Circuit"
Steering angle sensor branch line circuit	LAN-72, "Steering Angle Sensor Branch Line Circuit"
ABS actuator and electric unit (control unit) branch line circuit	LAN-72, "ABS Actuator and Electric Unit (Control Unit) Branch Line Circuit"
IPDM E/R branch line circuit	LAN-73, "IPDM E/R Branch Line Circuit"

SHORT CIRCUIT

Malfunction Area	Reference
CAN communication circuit	LAN-74, "CAN Communication Circuit"

Main Line Between VDC/TCS/ABS Control Unit and Data Link Connector

NKS0054K

INSPECTION PROCEDURE

1. CHECK HARNESS CONTINUITY (OPEN CIRCUIT)

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

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

OK or NG

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

● Past error: Error was detected in the main line between the VDC/TCS/ABS control unit and the data link connector.

NG >> Repair the main line between the harness connector M73 and the data link connector.

Main Line Between TCM and Data Link Connector

NKS0054L

INSPECTION PROCEDURE

1. CHECK HARNESS CONTINUITY (OPEN CIRCUIT)

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

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

OK or NG

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

● Past error: Error was detected in the main line between the TCM and the data link connector.

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

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

NKS0054M

INSPECTION PROCEDURE

1. CHECK CONNECTOR

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

- Harness connector M15
- Harness connector E108

OK or NG

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

2. CHECK HARNESS CONTINUITY (OPEN CIRCUIT)

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

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

OK or NG

OK >> GO TO 3.
NG >> Repair the main line between the data link connector and the harness connector M15.

3. CHECK HARNESS CONTINUITY (OPEN CIRCUIT)

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

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

OK or NG

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

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

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

ECM Branch Line Circuit

NKS0054N

INSPECTION PROCEDURE

1. CHECK CONNECTOR

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

OK or NG

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

2. CHECK HARNESS FOR OPEN CIRCUIT

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

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

OK or NG

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

3. CHECK POWER SUPPLY AND GROUND CIRCUIT

Check the power supply and the ground circuit of the ECM. Refer to EC-142, "POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >> ● Present error: Replace the ECM. Refer to EC-76, "Procedure After Replacing ECM" .
● Past error: Error was detected in the ECM branch line.
NG >> Repair the power supply and the ground circuit.

Air Bag Diagnosis Sensor Unit Branch Line Circuit

NKS0054O

INSPECTION PROCEDURE

1. CHECK AIR BAG DIAGNOSIS SENSOR UNIT

Check the air bag diagnosis sensor unit. Refer to SRS-9, "TROUBLE DIAGNOSIS" .

OK or NG

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

VDC/TCS/ABS Control Unit Branch Line Circuit

NKS0054P

INSPECTION PROCEDURE

1. CHECK CONNECTOR

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

- VDC/TCS/ABS control unit connector
- Harness connector B101
- Harness connector M73

OK or NG

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

2. CHECK HARNESS FOR OPEN CIRCUIT

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

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

OK or NG

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

3. CHECK POWER SUPPLY AND GROUND CIRCUIT

Check the power supply and the ground circuit of the VDC/TCS/ABS control unit. Refer to BRC-87, "Wiring Diagram — VDC —" .

OK or NG

OK >> ● Present error: Replace the VDC/TCS/ABS control unit. Refer to BRC-129, "Removal and Installation" .
● Past error: Error was detected in the VDC/TCS/ABS control unit branch line.
NG >> Repair the power supply and the ground circuit.

TCM Branch Line Circuit

NKS0054Q

INSPECTION PROCEDURE

1. CHECK CONNECTOR

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

- A/T assembly connector
- Harness connector F102
- Harness connector M72

OK or NG

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

2. CHECK HARNESS FOR OPEN CIRCUIT

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

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

OK or NG

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

3. CHECK POWER SUPPLY AND GROUND CIRCUIT

Check the power supply and the ground circuit of the TCM. Refer to AT-162, "MAIN POWER SUPPLY AND GROUND CIRCUIT" .

OK or NG

OK >>
- Present error: Replace the control valve with TCM. Refer to AT-242, "Removal and Installation" .
- Past error: Error was detected in the TCM branch line.

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

BCM Branch Line Circuit

NKS0054R

INSPECTION PROCEDURE

1. CHECK CONNECTOR

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

OK or NG

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

2. CHECK HARNESS FOR OPEN CIRCUIT

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

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

OK or NG

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

3. CHECK POWER SUPPLY AND GROUND CIRCUIT

Check the power supply and the ground circuit of the BCM. Refer to BCS-11, "Schematic" .

OK or NG

OK >>
- Present error: Replace the BCM. Refer to BCS-17, "Removal and Installation of BCM" .
- Past error: Error was detected in the BCM branch line.

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

Data Link Connector Branch Line Circuit

NKS0054S

INSPECTION PROCEDURE

1. CHECK CONNECTOR

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

OK or NG

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

2. CHECK HARNESS FOR OPEN CIRCUIT

Check the resistance between the data link connector terminals.

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

OK or NG

OK >>
- Present error: Check the following items again.
  - Decision of CAN system type.
  - Not received CONSULT-III data [SELF-DIAG RESULTS, CAN DIAG SUPPORT MNTR (“ECU list” included)].
  - Procedure for detecting root cause.
- Past error: Error was detected in the data link connector branch line circuit.

NG >> Repair the data link connector branch line.

Unified Meter and A/C Amp. Branch Line Circuit

NKS0054T

INSPECTION PROCEDURE

1. CHECK CONNECTOR

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

OK or NG

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

2. CHECK HARNESS FOR OPEN CIRCUIT

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

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

OK or NG

OK >> GO TO 3.
NG >> Repair the unified meter and A/C amp. branch line.

3. CHECK POWER SUPPLY AND GROUND CIRCUIT

Check the power supply and the ground circuit of the unified meter and A/C amp. Refer to DI-49, "Power Supply and Ground Circuit Inspection" .

OK or NG

OK >> ● Present error: Replace the unified meter and A/C amp. Refer to DI-55, "Removal and Installation of Unified Meter and A/C Amp." .
● Past error: Error was detected in the unified meter and A/C amp. branch line.

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

Steering Angle Sensor Branch Line Circuit

NKS0054U

INSPECTION PROCEDURE

1. CHECK CONNECTOR

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

OK or NG

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

2. CHECK HARNESS FOR OPEN CIRCUIT

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

Steering angle sensor harness connector			Resistance (Ω)
Connector No.	Terminal No.		
M22	4	5	Approx. 54 – 66

OK or NG

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

3. CHECK POWER SUPPLY AND GROUND CIRCUIT

Check the power supply and the ground circuit of the steering angle sensor. Refer to BRC-86, "Schematic" .

OK or NG

OK >> ● Present error: Replace the steering angle sensor. Refer to BRC-133, "Removal and Installation" .
● Past error: Error was detected in the steering angle sensor branch line.

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

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

NKS0054V

INSPECTION PROCEDURE

1. CHECK CONNECTOR

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

OK or NG

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

2. CHECK HARNESS FOR OPEN CIRCUIT

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

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

OK or NG

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

3. CHECK POWER SUPPLY AND GROUND CIRCUIT

Check the power supply and the ground circuit of the ABS actuator and electric unit (control unit). Refer to BRC-13, "Schematic" .

OK or NG

OK >>
- Present error: Replace the ABS actuator and electric unit (control unit). Refer to BRC-36, "Removal and Installation" .
- Past error: Error was detected in the ABS actuator and electric unit (control unit) branch line.

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

IPDM E/R Branch Line Circuit

NKS0054W

INSPECTION PROCEDURE

1. CHECK CONNECTOR

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

- IPDM E/R connector
- Harness connector E108 (Models with VDC)
- Harness connector M15 (Models with VDC)

OK or NG

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

2. CHECK HARNESS FOR OPEN CIRCUIT

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

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

OK or NG

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

3. CHECK POWER SUPPLY AND GROUND CIRCUIT

Check the power supply and the ground circuit of the IPDM E/R. Refer to PG-24, "IPDM E/R Power/Ground Circuit Inspection" .

OK or NG

OK >> ● Present error: Replace the IPDM E/R. Refer to PG-26, "Removal and Installation of IPDM E/R" .
● Past error: Error was detected in the IPDM E/R branch line.

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

CAN Communication Circuit

NKS0054X

INSPECTION PROCEDURE

1. CONNECTOR INSPECTION

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

OK or NG

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

2. CHECK HARNESS CONTINUITY (SHORT CIRCUIT)

Check the continuity between the data link connector terminals.

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

OK or NG

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

3. CHECK HARNESS CONTINUITY (SHORT CIRCUIT)

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

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

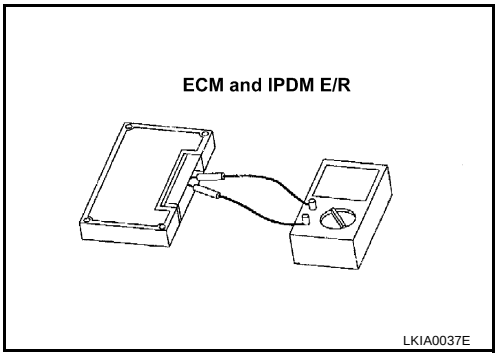
OK or NG

OK >> GO TO 4.
NG >> Check the harness and repair the root cause.

4. CHECK ECM AND IPDM E/R TERMINATION CIRCUIT

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

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



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

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

OK or NG

OK >> GO TO 5.
NG >> Replace the ECM and/or the IPDM E/R.

5. CHECK SYMPTOM

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

Inspection result

Reproduced>>GO TO 6.
Non-reproduced>>Start the diagnosis again. Follow the trouble diagnosis procedure when past error is detected.

6. CHECK UNIT REPRODUCTION

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

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

   NOTE:
   ECM and IPDM E/R have a termination circuit. Check other units first.
4. Connect the battery cable to the negative terminal. Check if the symptoms described in the “Symptom (Results from interview with customer)” are reproduced.

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

Inspection result

Reproduced>>Connect the connector. Check other units as per the above procedure.
Non-reproduced>>Replace the unit whose connector was disconnected.