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LAN SYSTEM

PRECAUTIONS

BELT PRE-TENSIONER"

Precautions for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT

AKS003EX

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

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 CAN SYSTEM

- Do not apply voltage of 7.0V or higher to the measurement terminals.
- Use the tester with its open terminal voltage being 7.0V or less.
- Be sure to turn ignition switch off and disconnect negative battery terminal before checking the circuit.

Precautions For Harness Repair CAN SYSTEM

 Solder the repaired parts, and wrap with tape. [Frays of twisted line must be within 110 mm (4.33 in)]



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• Do not perform bypass wire connections for the repair parts. (The spliced wire will become separated and the characteristics of twisted line will be lost.)



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Revision; 2004 April

CAN COMMUNICATION

System Description

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

CAN Communication Unit

Go to CAN system, when selecting your CAN system type from the following table.

Body type	Co	upe
Axle	2\	VD
Engine	VQ	35DE
Transmission	M/T	A/T
Brake control	V	DC
CAN system type	1	2
CAN system trouble diagnosis	LAN-8	LAN-30

TYPE 1 System diagram



Input/output signal chart

Signals	ECM	Combina- tion meter	BCM	Steering angle sensor	VDC/TCS/ ABS control unit	IPDM E/R
Engine speed signal	Т	R			R	
Engine coolant temperature signal	Т	R				
Accelerator pedal position signal	Т				R	
Fuel consumption monitor signal	Т	R				
Air conditioner switch signal	R		Т			
A/C compressor request signal	Т					R
A/C compressor feedback signal	Т	R				
Blower fan motor switch signal	R		Т			
Cooling fan motor operation signal	Т					R

Revision; 2004 April



T: Transmit R: Receive

[CAN]

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Steering VDC/TCS/ Combina-А ECM BCM ABS Signals angle IPDM E/R tion meter sensor control unit R Т R Position lights request signal В Т R Low beam request signal Low beam status signal R R т High beam request signal R т R High beam status signal R R Т Front fog lights request signal Т R Т D R Vehicle speed signal Т R R R Т Sleep request 1 signal F Т Sleep request 2 signal R Wake up request 1 signal R т Wake up request 2 signal R т F Door switch signal (without navigation system) R Т R Door switch signal (with navigation system) Т R т Turn indicator signal R R Seat belt buckle switch signal Т R т Oil pressure switch signal Н т Buzzer output signal R Trunk switch signal R Т Malfunction indicator lamp signal Т R Т ASCD SET lamp signal R ASCD CRUISE lamp signal т R Fuel level sensor signal R Т т R Front wiper request signal LAN R Т Front wiper stop position signal Rear window defogger switch signal т R Rear window defogger control signal R R т Hood switch signal R Т Т Theft warning horn request signal R т R Horn chirp signal Μ т R Steering angle sensor signal

[CAN]

TYPE 2 System diagram



Input/output signal chart

T: Transmit R: Receive

Signals	ECM	ТСМ	Combina- tion meter	BCM	Steering angle sensor	VDC/TCS/ ABS control unit	IPDM E/R
Engine speed signal	Т	R	R			R	
Engine coolant temperature signal	Т	R	R				
Accelerator pedal position signal	Т	R				R	
Closed throttle position signal	Т	R					
Wide open throttle position signal	Т	R					
Battery voltage signal	Т	R					
Stop lamp switch		R	Т				
Fuel consumption monitor signal	Т		R				
A/T self-diagnosis signal	R	Т					
A/T CHECK indicator lamp signal		Т	R				
A/T position indicator signal		Т	R			R	
ABS operation signal		R				Т	
A/T shift schedule change demand signal		R				Т	
Air conditioner switch signal	R			Т			
A/C compressor request signal	Т						R
A/C compressor feedback signal	Т		R				
Blower fan motor switch signal	R			Т			
Cooling fan motor operation signal	Т						R
Position lights request signal			R	Т			R
Low beam request signal				Т			R
Low beam status signal	R			R			Т
High beam request signal			R	Т			R
High beam status signal	R			R			Т
Front fog lights request signal				Т			R

Signals	ECM	ТСМ	Combina- tion meter	BCM	Steering angle sensor	VDC/TCS/ ABS control unit	IPDM E/R	А
Vehicle speed signal			R			Т		
venicie speed signal	R	R	Т	R				В
Sleep request 1 signal			R	Т				
Sleep request 2 signal				Т			R	С
Wake up request 1 signal			R	Т				
Wake up request 2 signal			R	Т				
Door switch signal (without navigation system)			R	Т			R	D
Door switch signal (with navigation system)			Т	R				E
Turn indicator signal			R	Т				
Seat belt buckle switch signal			Т	R				
Oil pressure switch signal			R				Т	F
Buzzer output signal			R	Т				
Trunk switch signal			R	Т				G
Malfunction indicator lamp signal	Т		R					0
ASCD SET lamp signal	Т		R					
ASCD CRUISE lamp signal	Т		R					Н
Fuel level sensor signal	R		Т					
Output shaft revolution signal	R	Т						1
Turbine revolution signal	R	Т						
Front wiper request signal				Т			R	
Front wiper stop position signal				R			Т	J
Rear window defogger switch signal				Т			R	
Rear window defogger control sig- nal	R			R			Т	LA
Manual mode signal		R	Т					
Not manual mode signal		R	Т					1
Manual mode shift up signal		R	Т					
Manual mode shift down signal		R	Т					
Manual mode indicator signal		Т	R					M
Hood switch signal				R			Т	
Theft warning horn request signal				Т			R	
Horn chirp signal				Т			R	
Steering angle sensor signal					Т	R		

System Description

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

Component Parts and Harness Connector Location



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Schematic



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LAN-CAN-01

DATA LINE



REFER TO THE FOLLOWING. (F102) -SUPER MULTIPLE JUNCTION (SMJ) (F108) -ELECTRICAL UNITS

TKWT0573E

[CAN]



TKWT0574E

LAN-CAN-03

DATA LINE





REFER TO THE FOLLOWING. (E108) -SUPER MULTIPLE JUNCTION (SMJ) (E118) -ELECTRICAL UNITS

TKWT0575E

[CAN]

Work Flow AKS00C53 А 1. Print all the data of "SELF-DIAG RESULTS" for "ENGINE", "BCM" and "ABS" displayed on CONSULT-II. SELF-DIAG RESULTS SELECT DIAG MODE (Example) DTC RESULTS тімғ WORK SUPPORT В CAN COMM CIBCUIT SELF-DIAG RESULTS 0 [11000] DATA MONITOR DATA MONITOR (SPEC) С CAN DIAG SUPPORT MNTR ACTIVE TEST F.F.DATA Scroll Down ERASE PRINT BACK LIGHT COPY MODE BACK LIGHT COPY PKIA8260E Print all the data of "CAN DIAG SUPPORT MNTR" for "ENGINE", "BCM" and "ABS" displayed on CON-2. F SULT-II. CAN DIAG SUPPORT MNTR SELECT DIAG MODE (Example) ENGINE WORK SUPPORT PRSNT F INITIAL DIAG ок SELF-DIAG RESULTS TRANSMIT DIAG ок DATA MONITOR тсм OK VDC/TCS/ABS OK DATA MONITOR (SPEC METER/M&A ОК CAN DIAG SUPPORT MNTR ICC UNKWN BCM/SEC OK ACTIVE TEST IPDM E/B OK AWD/4WD/e4WD LINKWN Н Scroll Down Scroll Down PRINT BACK LIGHT COPY MODE BACK LIGHT COPY PKIA8343E Attach the printed sheet of "SELECT SYSTEM", "SELF-DIAG RESULTS" and "CAN DIAG SUPPORT 3. MNTR" onto the check sheet. Refer to LAN-14, "CHECK SHEET" . Based on the "CAN DIAG SUPPORT MNTR" results, put marks "v" onto the items with "NG" or "UNKWN" 4. in the check sheet table. Refer to LAN-14, "CHECK SHEET" . J NOTE: If "NG" is displayed on "INITIAL DIAG (Initial diagnosis)" as "CAN DIAG SUPPORT MNTR" for the diagnosed control unit, replace the control unit. LAN • The "CAN DIAG SUPPORT MNTR" items, which are not in check sheet table, are not related to diag-

So it is not necessary to check the status of the "CAN DIAG SUPPORT MNTR" items not in check

According to the check sheet results (example), start inspection. Refer to LAN-15, "CHECK SHEET

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nostic procedure on service manual.

sheet table.

RESULTS (EXAMPLE)".

5.

CHECK SHEET

NOTE:

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If "NG" is displayed on "INITIAL DIAG (Initial diagnosis)" as "CAN DIAG SUPPORT MNTR" for the diagnosed control unit, replace the control unit.

		1	(CAN DIAG SU	PPORT MNT	۱		
SELECT SYSTEM screen	Initial diagnosis	Transmit diagnosis	ECM	METER /M&A	Receive BCM/SEC	diagnosis STRG	VDC/TCS	IPDM E
ENGINE	NG	UNKWN	_	UNKWN	UNKWN		UNKWN	UNKWI
BCM	NG	UNKWN	UNKWN	UNKWN	_		_	
ABS	NG	UNKWN	UNKWN	UNKWN	_	UNKWN	_	- 1
Symptoms :								
Attach cop ENGIN SELF-DIAG R	by of E ESULTS		Att SELF-I	ach copy of BCM DIAG RESUL	TS		Attach c AB SELF-DIAG	opy of S RESULT
Attach cop ENGIN CAN DIAG SU MNTR	by of E PPORT		Att CAN E	ach copy of BCM DIAG SUPPOI MNTR	श		Attach c AB CAN DIAG 3 MN	copy of S SUPPORT IR

CHECK SHEET RESULTS (EXAMPLE)

NOTE:

If "NG" is displayed on "INITIAL DIAG (Initial diagnosis)" as "CAN DIAG SUPPORT MNTR" for the diagnosed control unit, replace the control unit.

Case1

Check harness between data link connector and VDC/TCS/ABS control unit. Refer to <u>LAN-23</u>, "Circuit Check <u>Between Data Link Connector and VDC/TCS/ABS Control Unit"</u>.

	CAN DIAG SUPPORT MNTR									
SELECT SYSTEM	Initial	Troponit	Receive diagnosis							
screen di	diagnosis diagn	diagnosis	ECM	METER /M&A	BCM/SEC	STRG	VDC/TCS /ABS	IPDM E/R		
ENGINE	NG	UNKWN	_	UNKWN	UNKWN	_	UNKWN	UNKWN		
BCM	NG	UNKWN	UNKWN	UNKWN	-	-	-	UNKWN		
ABS	NG	UNKWN	UNKWN	UNKWN	_	UNKWN	_	_		



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Case2

Check ECM circuit. Refer to LAN-24, "ECM Circuit Check" .

	CAN DIAG SUPPORT MNTR									
SELECT SYSTEM	Initial	Tranamit	Receive diagnosis							
screen diagnosis	diagnosis	ECM	METER /M&A	BCM/SEC	STRG	VDC/TCS /ABS	IPDM E/R			
ENGINE	NG	UNKWN	_	UNKWN	UNKWN	_	UNKWN	UNKWN		
BCM	NG	UNKWN	UNKWN	UNKWN	-	-	-	UNKWN		
ABS	NG	UNKWN	UNKWN	UNKWN	_	UNKWN	_	_		



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Case3

Check combination meter circuit. Refer to LAN-24, "Combination Meter Circuit Check" .

	CAN DIAG SUPPORT MNTR									
SELECT SYSTEM	Initial	Transmit	Receive diagnosis							
screen diagnosis	diagnosis	ECM	METER /M&A	BCM/SEC	STRG	VDC/TCS /ABS	IPDM E/R			
ENGINE	NG	UNKWN	_	UNKWN	UNKWN	_	UNKWN	UNKWN		
BCM	NG	UNKWN	UNKWN	UNKWN	_	_	_	UNKWN		
ABS	NG	UNKWN	UNKWN	UNKWN	_	UNKWN	_	_		



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Case4

Check BCM circuit. Refer to LAN-25, "BCM Circuit Check" .

	CAN DIAG SUPPORT MNTR									
SELECT SYSTEM	Initial	Troponsit	Receive diagnosis							
screen diagnosis	diagnosis	ECM	METER /M&A	BCM/SEC	STRG	VDC/TCS /ABS	IPDM E/R			
ENGINE	NG	UNKWN	_	UNKWN	UNKWN	_	UNKWN	UNKWN		
BCM	NG	UNKWN	UNKWN	UNKWN	-	_	-	UNKWN		
ABS	NG	UNKWN	UNKWN	UNKWN	_	UNKWN	_	_		



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Case5

Check steering angle sensor circuit. Refer to LAN-25, "Steering Angle Sensor Circuit Check" .

			(CAN DIAG SU	PPORT MNTF	3				
SELECT SYSTEM	Initial	Tranamit		Receive diagnosis						
screen diagnosis	diagnosis	ECM	METER /M&A	BCM/SEC	STRG	VDC/TCS /ABS	IPDM E/R			
ENGINE	NG	UNKWN	_	UNKWN	UNKWN	_	UNKWN	UNKWN		
BCM	NG	UNKWN	UNKWN	UNKWN	-	_	_	UNKWN		
ABS	NG	UNKWN	UNKWN	UNKWN	-	UNKWN	_	-		



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Case6

Check VDC/TCS/ABS control unit circuit. Refer to LAN-26, "VDC/TCS/ABS Control Unit Circuit Check" .

			(CAN DIAG SU	IPPORT MNTF	{		
SELECT SYSTEM	Initial	Tranomit			Receive	diagnosis		
screen	diagnosis	diagnosis	ECM	METER /M&A	BCM/SEC	STRG	VDC/TCS /ABS	IPDM E/R
ENGINE	NG	UNKWN	_	UNKWN	UNKWN	_	UNKWN	UNKWN
BCM	NG	UNKWN	UNKWN	UNKWN	-	_	-	UNKWN
ABS	NG	UNKWN	UNKWN	UNKWN	-	UNKWN	-	-



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Case7

Check IPDM E/R circuit. Refer to LAN-26, "IPDM E/R Circuit Check" .

			(CAN DIAG SU	PPORT MNTF	3		
SELECT SYSTEM	Initial	Transmit			Receive	diagnosis		
screen	diagnosis	diagnosis	ECM	METER /M&A	BCM/SEC	STRG	VDC/TCS /ABS	IPDM E/R
ENGINE	NG	UNKWN	_	UNKWN	UNKWN	_	UNKWN	UNKWN
BCM	NG	UNKWN	UNKWN	UNKWN	-	_	-	UNKWN
ABS	NG	UNKWN	UNKWN	UNKWN	_	UNKWN	_	_



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Case8

Check CAN communication circuit. Refer to LAN-27, "CAN Communication Circuit Check" .

			(CAN DIAG SU	IPPORT MNTF	1		
SELECT SYSTEM	Initial	Tranomit			Receive	diagnosis		
screen diagr	diagnosis	diagnosis	ECM	METER /M&A	BCM/SEC	STRG	VDC/TCS /ABS	IPDM E/R
ENGINE	NG	UNKWN	_	UNKWN	UNKWN	_	UNKWN	UNKWN
BCM	NG	UNKWN	UNKWN	UNKWN	-	_	-	UNKWN
ABS	NG	UNKWN	UNKWN	UNKWN	-	UNKWN	_	-

Case9

Check IPDM E/R ignition relay circuit continuously sticks "OFF". Refer to <u>LAN-29</u>, "IPDM E/R Ignition Relay <u>Circuit Check"</u>.

	CAN DIAG SUPPORT MNTR											
SELECT SYSTEM	Initial	Transmit diagnosis		Receive diagnosis								
screen	Initial diagnosis		ECM	METER /M&A	BCM/SEC	STRG	VDC/TCS /ABS	IPDM E/R				
ENGINE	NG	UNKWN	-	UNKWN	UNKWN	-	UNKWN	UNKWN				
BCM	NG	UNKWN	UNKWN	UNKWN	_	-	_	UNKWN				
ABS	NG	UNKWN	UNKWN	UNKWN	_	UNKWN	_	_				

Case10

Check IPDM E/R ignition relay circuit continuously sticks "ON". Refer to <u>LAN-29</u>, "IPDM E/R Ignition Relay Circuit Check".

		CAN DIAG SUPPORT MNTR										
SELECT SYSTEM	Initial	Tranamit		Receive diagnosis								
screen	diagnosis	diagnosis	ECM	METER /M&A	BCM/SEC	STRG	VDC/TCS /ABS	IPDM E/R				
ENGINE	NG	UNKWN	_	UNKWN	UNKWN	_	UNKWN	UNKWN				
BCM	NG	UNKWN	UNKWN	UNKWN	-	_	_	UNKWN				
ABS	NG	UNKWN	UNKWN	UNKWN	_	UNKWN	_	_				

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Circuit Check Between Data Link Connector and VDC/TCS/ABS Control Unit AKS00504

1. CHECK CONNECTOR

- 1. Turn ignition switch OFF.
- 2. Disconnect the negative battery terminal.
- Check following terminals and connector for damage, bend and loose connection (meter-side, control 3 module-side, sensor-side, control unit-side and harness-side).
- Combination meter.
- BCM
- Steering angle sensor.
- VDC/TCS/ABS control unit.
- Between data link connector and VDC/TCS/ABS control unit.

OK or NG

OK >> GO TO 2.

NG >> Repair terminal or connector.

2. CHECK HARNESS FOR OPEN CIRCUIT

- 1. Disconnect harness connector M15.
- 2. Check continuity between data link connector M8 terminals 6 (L), 3 (R) and harness connector M15 terminals 58G (L), 59G (R).
 - 6 (L) 58G (L)
 - 3 (R) 59G (R)

OK or NG

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

3. CHECK HARNESS FOR OPEN CIRCUIT

- Disconnect VDC/TCS/ABS control unit connector. 1.
- Check continuity between harness connector E108 terminals 2 58G (L), 59G (R) and VDC/TCS/ABS control unit harness connector E118 terminals 61 (L), 63 (R).
 - 58G (L) 61 (L)
 - 59G (R) 63 (R)
- : Continuity should exist.

: Continuity should exist.

: Continuity should exist.

: Continuity should exist.

OK or NG

- OK >> Connect all the connectors and diagnose again. Refer to LAN-13, "Work Flow" .
- NG >> Repair harness.



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Data link connector

6 3

6, 3

F

SMJ

SMJ harness connector

58G, 59G

SKIA4478E

ECM Circuit Check

1. CHECK CONNECTOR

- 1. Turn ignition switch OFF.
- 2. Disconnect the negative battery terminal.
- 3. Check following terminals and connector for damage, bend and loose connection (control module-side and harness-side).
- ECM connector
- Harness connector F102
- Harness connector M72

OK or NG

- OK >> GO TO 2.
- NG >> Repair terminal or connector.

2. CHECK HARNESS FOR OPEN CIRCUIT

- 1. Disconnect ECM connector.
- Check resistance between ECM harness connector F108 terminals 94 (L) and 86 (R).
 - 94 (L) 86 (R)

: Approx. 108 – 132Ω

OK or NG

- OK >> Replace ECM.
- NG >> Repair harness between data link connector and ECM.



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Combination Meter Circuit Check

1. CHECK CONNECTOR

- 1. Turn ignition switch OFF.
- 2. Disconnect the negative battery terminal.
- 3. Check terminals and connector of combination meter for damage, bend and loose connection (meter-side and harness-side).

OK or NG

- OK >> GO TO 2.
- NG >> Repair terminal or connector.

2. CHECK HARNESS FOR OPEN CIRCUIT

- 1. Disconnect combination meter connector.
- Check resistance between combination meter harness connector M20 terminals 28 (L) and 27 (R).

28 (L) – 27 (R)

: Approx. 54 – 66 Ω

OK or NG

- OK >> Replace combination meter.
- NG >> Repair harness between data link connector and combination meter.



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[CAN]

BCM Circuit Check

1. CHECK CONNECTOR

- 1. Turn ignition switch OFF.
- 2. Disconnect the negative battery terminal.
- 3. Check the terminals and connector of BCM for damage, bend and loose connection (control module-side and harness-side).

OK or NG

- OK >> GO TO 2.
- NG >> Repair terminal or connector.

2. CHECK HARNESS FOR OPEN CIRCUIT

- 1. Disconnect BCM connector.
- 2. Check resistance between BCM harness connector M3 terminals 70 (L) and 71 (R).

70 (L) - 71 (R)

: Approx. 54 – 66Ω

OK or NG

- OK >> Replace BCM. Refer to <u>BCS-20, "Removal and Installa-</u> tion of <u>BCM"</u>.
- NG >> Repair harness between data link connector and BCM.



Steering Angle Sensor Circuit Check

1. CHECK CONNECTOR

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

LAN-25

OK or NG

OK >> GO TO 2.

NG >> Repair terminal or connector.

2. CHECK HARNESS FOR OPEN CIRCUIT

- 1. Disconnect steering angle sensor connector.
- 2. Check resistance between steering angle sensor harness connector M22 terminals 4 (L) and 5 (R).

: Approx. 54 – 66Ω

OK or NG

- OK >> Replace steering angle sensor.
- NG >> Repair harness between data link connector and steering angle sensor.





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VDC/TCS/ABS Control Unit Circuit Check

1. CHECK CONNECTOR

- 1. Turn ignition switch OFF.
- 2. Disconnect the negative battery terminal.
- 3. Check the terminals and connector of VDC/TCS/ABS control unit for damage, bend and loose connection (control unit-side and harness-side).

OK or NG

OK >> GO TO 2.

NG >> Repair terminal or connector.

2. CHECK HARNESS FOR OPEN CIRCUIT

- 1. Disconnect VDC/TCS/ABS control unit connector.
- Check resistance between VDC/TCS/ABS control unit harness connector E118 terminals 61 (L) and 63 (R).

61 (L) – 63 (R)

OK or NG

- OK >> Replace VDC/TCS/ABS control unit.
- NG >> Repair harness between harness connector E108 and VDC/TCS/ABS control unit.

: Approx. 54 – 66 Ω



IPDM E/R Circuit Check

1. CHECK CONNECTOR

- 1. Turn ignition switch OFF.
- 2. Disconnect the negative battery terminal.
- Check the terminals and connector of IPDM E/R for damage, bend and loose connection (control moduleside and harness-side).

OK or NG

OK >> GO TO 2.

NG >> Repair terminal or connector.

2. CHECK HARNESS FOR OPEN CIRCUIT

- 1. Disconnect IPDM E/R connector.
- 2. Check resistance between IPDM E/R harness connector E9 terminals 48 (L) and 49 (R).

48 (L) – 49 (R)

: **Approx. 108 – 132**Ω

OK or NG

- OK >> Replace IPDM E/R.
- NG >> Repair harness between harness connector E108 and IPDM E/R.



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[CAN]

	[CAN]
AN Communication Circuit Check	AKS0050C
. CHECK CONNECTOR	
. Turn ignition switch OFF.	
Disconnect the negative battery terminal.	
 Check following terminals and connector for damage, bend and loose connection control unit-side, meter-side, sensor-side and harness-side). 	(control module-side,
ECM.	
Combination meter.	
BCM.	
Steering angle sensor.	
VDC/TCS/ABS control unit.	
IPDIM E/R. Between ECM and IPDM E/R	
CK or NG	
$OK \rightarrow GO TO 2$	
NG >> Repair terminal or connector.	
L. CHECK HARNESS FOR SHORT CIRCUIT	
 Disconnect following connectors. 	
ECM connector.	
Harness connector F102.	
 Check continuity between ECM harness connector F108 termi- nals 94 (L) and 86 (R). 	
94 (L) – 86 (R) : Continuity should not exist.	FJ' BAT
DK or NG	connector
OK >> GO TO 3.	
NG >> Repair harness between ECM and harness connector	94
F102.	
	PKIA0816E

Check continuity between ECM harness connector F108 terminals

94 (L), 86 (R) and ground.

- 94 (L) ground
- : Continuity should not exist.
- 86 (R) ground
- : Continuity should not exist.

OK or NG

- OK >> GO TO 4.
- NG >> Repair harness between ECM and harness connector F102.



4. CHECK HARNESS FOR SHORT CIRCUIT

- 1. Disconnect following connectors.
- Combination meter connector.
- BCM connector.
- Steering angle sensor connector.
- Harness connector M15.
- Check continuity between data link connector M8 terminals 6 (L) and 3 (R).

: Continuity should not exist.

OK or NG

NG

OK >> GO TO 5.

- Repair harness between harness connector M72 and harness connector M15.
 - Repair harness between harness connector M72 and combination meter.
 - Repair harness between harness connector M72 and data link connector.
 - Repair harness between harness connector M72 and BCM.
 - Repair harness between harness connector M72 and steering angle sensor.

5. CHECK HARNESS FOR SHORT CIRCUIT



- 6 (L) ground 3 (R) – ground
- : Continuity should not exist.

: Continuity should not exist.

OK or NG

- OK >> GO TO 6.
- NG >> Repair harness between harness connector M72 and harness connector M15.
 - Repair harness between harness connector M72 and combination meter.
 - Repair harness between harness connector M72 and data link connector.

: Continuity should not exist.

- Repair harness between harness connector M72 and BCM.
- Repair harness between harness connector M72 and steering angle sensor.

6. CHECK HARNESS FOR SHORT CIRCUIT

- 1. Disconnect VDC/TCS/ABS control unit connector and IPDM E/R connector.
- Check continuity between IPDM E/R harness connector E9 terminals 48 (L) and 49 (R).

48 (L) – 49 (R)

OK or NG

OK >> GO TO 7.

- NG >> Repair harness between harness connector E108 and VDC/TCS/ABS control unit.
 - Repair harness between harness connector E108 and IPDM E/R.







7. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between IPDM E/R harness connector E9 terminals 48 (L), 49 (R) and ground.

- 48 (L) ground
- 49 (R) ground

: Continuity should not exist.

: Continuity should not exist.

OK or NG

OK >> GO TO 8.

- NG >> Repair harness between harness connector E108 and VDC/TCS/ABS control unit.
 - Repair harness between harness connector E108 and IPDM E/R.

8. ECM/IPDM E/R INTERNAL CIRCUIT INSPECTION

Check components inspection. Refer to <u>LAN-29</u>, <u>"ECM/IPDM E/R INTERNAL CIRCUIT INSPECTION"</u> OK or NG

- OK >> Connect all the connectors and diagnose again. Refer to <u>LAN-13, "Work Flow"</u>.
- NG >> Replace ECM and/or IPDM E/R.

IPDM E/R Ignition Relay Circuit Check

Replace IPDM E/R if there is no malfunction after checking the following.

- IPDM E/R power circuit. Refer to <u>PG-27</u>, "IPDM E/R Power/Ground Circuit Inspection".
- Ignition power supply circuit. Refer to <u>PG-11, "IGNITION POWER SUPPLY IGNITION SW. IN "ON"</u> <u>AND/OR "START"</u>.

LAN-29

Component Inspection ECM/IPDM E/R INTERNAL CIRCUIT INSPECTION

- Remove ECM and IPDM E/R from vehicle.
- Check resistance between ECM terminals 94 and 86.
- Check resistance between IPDM E/R terminals 48 and 49.









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System Description

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

Component Parts and Harness Connector Location



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LAN-CAN-04

DATA LINE



REFER TO THE FOLLOWING. (F102) -SUPER MULTIPLE JUNCTION (SMJ) (F103), (F108) -ELECTRICAL UNITS

TKWT0577E







TKWT0783E

LAN-CAN-06

: DATA LINE



(E108) -SUPER MULTIPLE JUNCTION (SMJ) (E118) -ELECTRICAL UNITS

TKWT0578E

Work Flow

1. Print all the data of "SELF-DIAG RESULTS" for "ENGINE", "A/T", "BCM" and "ABS" displayed on CON-SULT-II.

(Example)	SELECT DIAG MODE		SELF-DIAG RESUL	TS
(WORK SUPPORT		DTC RESULTS	TIME
	SELF-DIAG RESULTS			0
	DATA MONITOR			<u> </u>
	DATA MONITOR (SPEC)			
	CAN DIAG SUPPORT MNTR			
	ACTIVE TEST			
			E.	.F.DATA
	Scroll Down		ERASE PR	INT
	BACK LIGHT COPY	I	MODE BACK LIGHT	COPY PKIA8260E
	Scroll Down BACK LIGHT COPY		ERASE PRI MODE BACK LIGHT	F.DATA INT COPY PKIA8260E

2. Print all the data of "CAN DIAG SUPPORT MNTR" for "ENGINE", "A/T", "BCM" and "ABS" displayed on CONSULT-II.

(Example)	SELECT DIAG MODE	CAN DIAG SUPPORT MNTR
(Example)		ENGINE
	WORK SUPPORT	PRSNT
	SELF-DIAG BESULTS	INITIAL DIAG OK
		TRANSMIT DIAG OK
	DATA MONITOR	ТСМ ОК
	DATA MONITOR (SPEC)	VDC/TCS/ABS OK
	B/(I/(MONTON(OFEO)	METER/M&A OK
	CAN DIAG SUPPORT MNTR	ICC UNKWN
		BCM/SEC OK
	ACTIVE TEST	IPDM E/R OK
		AWD/4WD/e4WD UNKWN
	Scroll Down	PRINT Scroll Down
	BACK LIGHT COPY	MODE BACK LIGHT COPY
		PKIA8343E

- Attach the printed sheet of "SELECT SYSTEM", "SELF-DIAG RESULTS" and "CAN DIAG SUPPORT MNTR" onto the check sheet. Refer to <u>LAN-36, "CHECK SHEET"</u>.
- Based on the "CAN DIAG SUPPORT MNTR" results, put marks "v" onto the items with "NG" or "UNKWN" in the check sheet table. Refer to <u>LAN-36, "CHECK SHEET"</u>.
 NOTE:
 - If "NG" is displayed on "INITIAL DIAG (Initial diagnosis)" as "CAN DIAG SUPPORT MNTR" for the diagnosed control unit, replace the control unit.
 - The "CAN DIAG SUPPORT MNTR" items, which are not in check sheet table, are not related to diagnostic procedure on service manual.
 So it is not necessary to check the status of the "CAN DIAG SUPPORT MNTR" items not in check sheet table.
- 5. According to the check sheet results (example), start inspection. Refer to <u>LAN-37, "CHECK SHEET</u> <u>RESULTS (EXAMPLE)"</u>.

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CHECK SHEET

NOTE:

If "NG" is displayed on "INITIAL DIAG (Initial diagnosis)" as "CAN DIAG SUPPORT MNTR" for the diagnosed control unit, replace the control unit.

		1		CAN DI		RT MNTR			
SELECT SYSTEM screen	Initial diagnosis	Transmit diagnosis	ECM	тсм	METER /M&A	BCM/SEC	sis STRG	VDC/TCS /ABS	IPDM E/
ENGINE	NG	UNKWN	_	UNKWN	UNKWN	UNKWN	_	UNKWN	UNKWN
A/T	NG	UNKWN	UNKWN	-	UNKWN	_	_	UNKWN	_
BCM	NG	UNKWN	UNKWN	-	UNKWN	_	_	-	UNKWN
ABS	NG	UNKWN	UNKWN	UNKWN	UNKWN	-	UNKWN	-	-
Symptoms :									
Attach cop ENGINE SELF-DIAG R	y of ESULTS	Atta SELF-I	ach copy of A/T DIAG RESU	JLTS	Attach B(SELF-DIA	copy of CM G RESULTS	s s	Attach coq ABS ELF-DIAG R	by of ESULTS
Attach cop ENGIN CAN DIAG SU MNTR	by of E IPPORT	At CAN [tach copy of A/T DIAG SUPPO MNTR	DRT	Attach E CAN DIAC M	n copy of SCM G SUPPORT NTR	c	Attach co ABS CAN DIAG SU MNTF	by of JPPORT

CHECK SHEET RESULTS (EXAMPLE)

NOTE:

If "NG" is displayed on "INITIAL DIAG (Initial diagnosis)" as "CAN DIAG SUPPORT MNTR" for the diagnosed control unit, replace the control unit.

Case1

Check harness between TCM and data link connector. Refer to <u>LAN-47, "Circuit Check Between TCM and</u> <u>Data Link Connector"</u>.

				CAN DI	AG SUPPOF	RT MNTR			
SELECT SYSTEM	Initial	Transmit			Re	eceive diagno	osis		
screen	diagnosis	diagnosis	ECM	тсм	METER /M&A	BCM/SEC	STRG	VDC/TCS /ABS	IPDM E/R
ENGINE	NG	UNKWN	-	UNKWN	UNKWN	UNKWN	_	UNKWN	UNKWN
A/T	NG	UNKWN	UNKWN	_	UNKWN	-	_	UNKWN	_
ВСМ	NG	UNKWN	UNKWN	_	UNKWN	-	_	-	UNKWN
ABS	NG	UNKWN	UNKWN	UNKWN	UNKWN	-	UNKWN	_	_



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Case2

Check harness between data link connector and VDC/TCS/ABS control unit. Refer to <u>LAN-48, "Circuit Check</u> <u>Between Data Link Connector and VDC/TCS/ABS Control Unit"</u>.

				CAN DIA	AG SUPPOF	T MNTR			
SELECT SYSTEM	Initial	Transmit			Re	eceive diagno	sis		
screen	diagnosis	diagnosis	ECM	ТСМ	METER /M&A	BCM/SEC	STRG	VDC/TCS /ABS	IPDM E/R
ENGINE	NG	UNKWN	_	UNKWN	UNKWN	UNKWN	_	UNKWN	UNKWN
A/T	NG	UNKWN	UNKWN	_	UNKWN	-	_	UNKWN	_
всм	NG	UNKWN	UNKWN	_	UNKWN	-	_	-	UNKWN
ABS	NG	UNKWN	UNKWN	UNKWN	UNKWN	_	UNK	_	_



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Case3

Check ECM circuit. Refer to LAN-48, "ECM Circuit Check" .

				CAN DIA	AG SUPPOF	T MNTR					
SELECT SYSTEM	Initial	Transmit		Receive diagnosis							
screen di	diagnosis	diagnosis	ECM	тсм	METER /M&A	BCM/SEC	STRG	VDC/TCS /ABS	IPDM E/R		
ENGINE	NG	UNKWN	-	UNKWN	UNKWN	UNKWN	_	UNKWN	UNKWN		
A/T	NG	UNKWN	UNKWN	_	UNKWN	-	_	UNKWN	_		
всм	NG	UNKWN	UNKWN	_	UNKWN	-	_	-	UNKWN		
ABS	NG	UNKWN	UNKWN	UNKWN	UNKWN	_	UNKWN	_	_		



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Case4

Check TCM circuit. Refer to LAN-49, "TCM Circuit Check" .

				CAN DIAG SUPPORT MNTR							
SELECT SYSTEM	1	Transmit			Re	eceive diagno	sis				
screen	diagnosis	diagnosis	ECM	тсм	METER /M&A	BCM/SEC	STRG	VDC/TCS /ABS	IPDM E/R		
ENGINE	NG	UNKWN	_	UNKWN	UNKWN	UNKWN	_	UNKWN	UNKWN		
A/T	NG	UNKWN	UNKWN	_	UNKWN	-	_	UNKWN	_		
BCM	NG	UNKWN	UNKWN	_	UNKWN	-	_	-	UNKWN		
ABS	NG	UNKWN	UNKWN	UNKWN	UNKWN	-	UNKWN	-	_		



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Case5

Check combination meter circuit. Refer to LAN-49, "Combination Meter Circuit Check" .

				CAN DIAG SUPPORT MNTR							
SELECT SYSTEM	Initial	Transmit			Re	eceive diagno	osis				
screen	diagnosis	diagnosis	ECM	тсм	METER /M&A	BCM/SEC	STRG	VDC/TCS /ABS	IPDM E/R		
ENGINE	NG	UNKWN	_	UNKWN	UNKWN	UNKWN	Ι	UNKWN	UNKWN		
A/T	NG	UNKWN	UNKWN	_	UNKWN	-	_	UNKWN	_		
ВСМ	NG	UNKWN	UNKWN	_	UNKWN	-	_	-	UNKWN		
ABS	NG	UNKWN	UNKWN	UNKWN	UNKWN	_	UNKWN	_	_		



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Case6

Check BCM circuit. Refer to LAN-50, "BCM Circuit Check" .

				CAN DIA	AG SUPPOF	T MNTR			
SELECT SYSTEM	Initial	Transmit			Re	eceive diagno	sis		
screen	diagnosis	diagnosis	ECM	тсм	METER /M&A	BCM/SEC	STRG	VDC/TCS /ABS	IPDM E/R
ENGINE	NG	UNKWN	_	UNKWN	UNKWN	UNKWN	_	UNKWN	UNKWN
A/T	NG	UNKWN	UNKWN	_	UNKWN	_	_	UNKWN	-
ВСМ	NG	UNKWN	UNKWN	_	UNKWN	-	_	-	UNKWN
ABS	NG	UNKWN	UNKWN	UNKWN	UNKWN	_	UNKWN	-	_



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Case7

Check steering angle sensor circuit. Refer to LAN-50, "Steering Angle Sensor Circuit Check" .

		CAN DIAG SUPPORT MNTR									
SELECT SYSTEM	Initial	Transmit			Re	eceive diagno	sis				
screen	diagnosis	diagnosis	ECM	тсм	METER /M&A	BCM/SEC	STRG	VDC/TCS /ABS	IPDM E/R		
ENGINE	NG	UNKWN	_	UNKWN	UNKWN	UNKWN	_	UNKWN	UNKWN		
A/T	NG	UNKWN	UNKWN	_	UNKWN	—	_	UNKWN			
BCM	NG	UNKWN	UNKWN	_	UNKWN	-	_	_	UNKWN		
ABS	NG	UNKWN	UNKWN	UNKWN	UNKWN	_	UNKWN	_	_		



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Case8

Check VDC/TCS/ABS control unit circuit. Refer to LAN-51, "VDC/TCS/ABS Control Unit Circuit Check" .

				CAN DIA	AG SUPPOF	T MNTR			
SELECT SYSTEM	les lation 1	Transmit			Re	eceive diagno	sis		
screen	diagnosis	diagnosis	ECM	тсм	METER /M&A	BCM/SEC	STRG	VDC/TCS /ABS	IPDM E/R
ENGINE	NG	UNKWN	_	UNKWN	UNKWN	UNKWN	_	UNKWN	UNKWN
A/T	NG	UNKWN	UNKWN	_	UNKWN	_	—	UNYWN	—
ВСМ	NG	UNKWN	UNKWN	_	UNKWN	_	_	-	UNKWN
ABS	NG	UNKWN	UNKWN	UNKWN	UNKWN	_	UNKWN	_	_



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Case9

Check IPDM E/R circuit. Refer to LAN-51, "IPDM E/R Circuit Check" .

				CAN DIA	AG SUPPOR	T MNTR			
SELECT SYSTEM	Initial	Tronomit			Re	eceive diagno	sis		
screen	diagnosis	diagnosis	ECM	тсм	METER /M&A	BCM/SEC	STRG	VDC/TCS /ABS	IPDM E/R
ENGINE	NG	UNKWN	_	UNKWN	UNKWN	UNKWN	_	UNKWN	
A/T	NG	UNKWN	UNKWN	_	UNKWN	—	_	UNKWN	-
BCM	NG	UNKWN	UNKWN	_	UNKWN	-	_	_	UNKWN
ABS	NG	UNKWN	UNKWN	UNKWN	UNKWN	_	UNKWN	_	_



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Case10

Check CAN communication circuit. Refer to LAN-52, "CAN Communication Circuit Check" .

				CAN DIA	AG SUPPOF	RT MNTR			
SELECT SYSTEM	1	Transmit			Re	eceive diagno	osis		
screen	diagnosis	diagnosis	ECM	тсм	METER /M&A	BCM/SEC	STRG	VDC/TCS /ABS	IPDM E/R
ENGINE	NG	UNKWN	-	UNKWN	UNKWN	UNKWN	-	UNKWN	UNKWN
A/T	NG	UNKWN	UNKWN	_	UNKWN	-	_	UNKWN	_
ВСМ	NG	UNKWN	UNKWN	_	UNKWN	-	_	-	UNK
ABS	NG	UNKWN	UNKWN	UNKWN	UNKWN	-	UNKWN	_	_

Case11

Check IPDM E/R ignition relay circuit continuously sticks "OFF". Refer to <u>LAN-54, "IPDM E/R Ignition Relay</u> <u>Circuit Check"</u>.

				CAN DI	AG SUPPOF	RT MNTR			
SELECT SYSTEM	Initial	Transmit			Re	eceive diagno	osis		
screen	diagnosis	diagnosis	ECM	тсм	METER /M&A	BCM/SEC	STRG	VDC/TCS /ABS	IPDM E/R
ENGINE	NG	UNKWN	-	UNKWN	UNKWN	UNKWN	_	UNKWN	UNKWN
A/T	NG	UNKWN	UNKWN	_	UNKWN	_	_	UNKWN	—
ВСМ	NG	UNKWN	UNKWN	_	UNKWN	-	_	-	UNKWN
ABS	NG	UNKWN	UNKWN	UNKWN	UNKWN	-	UNKWN	-	_

Case12

Check IPDM E/R ignition relay circuit continuously sticks "ON". Refer to <u>LAN-54</u>, "IPDM E/R Ignition Relay Circuit Check".

		CAN DIAG SUPPORT MNTR									
SELECT SYSTEM	Initial	Transmit			Re	eceive diagno	sis				
screen	diagnosis	diagnosis	ECM	тсм	METER /M&A	BCM/SEC	STRG	VDC/TCS /ABS	IPDM E/R		
ENGINE	NG	UNKWN	_	UNKWN	UNKWN	UNKWN	_	UNKWN	UNKWN		
A/T	NG	UNKWN	UNKWN	_	UNKWN	_	_	UNKWN	—		
ВСМ	NG	UNKWN	UNKWN	_	UNKWN	_	_	_	UNKWN		
ABS	NG	UNKWN	UNKWN	UNKWN	UNKWN	-	UNKWN	-	_		

- Check continuity between TCM harness connector F103 terminals 6 (L), 7 (R) and harness connector F102 terminals 24H (L), 25H (R).
 - 6 (L) 24H (L) 7 (R) – 25H (R)
- : Continuity should exist.

: Continuity should exist.

OK or NG

OK >> GO TO 3.

NG >> Repair harness.



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3. CHECK HARNESS FOR OPEN CIRCUIT

Check continuity between harness connector M72 terminals 24H (L), 25H (R) and data link connector M8 terminals 6 (L), 3 (R).

24H (L) – 6 (L) 25H (R) – 3 (R) : Continuity should exist.

: Continuity should exist.

OK or NG

OK >> Connect all the connectors and diagnose again. Refer to LAN-35, "Work Flow"

NG >> Repair harness.



Circuit Check Between Data Link Connector and VDC/TCS/ABS Control Unit

1. CHECK CONNECTOR

- 1. Turn ignition switch OFF.
- 2. Disconnect the negative battery terminal.
- 3. Check following terminals and connector for damage, bend and loose connection (meter-side, control module-side, sensor-side, control unit-side and harness-side).
- Combination meter.
- BCM.
- Steering angle sensor.
- VDC/TCS/ABS control unit.
- Between data link connector and VDC/TCS/ABS control unit.

OK or NG

OK >> GO TO 2.

NG >> Repair terminal or connector.

2. CHECK HARNESS FOR OPEN CIRCUIT

- 1. Disconnect harness connector M15.
- Check continuity between data link connector M8 terminals 6 (L), 3 (R) and harness connector M15 terminals 58G (L), 59G (R).
 - 6 (L) 58G (L)
 - 3 (R) 59G (R)

OK or NG

OK >> GO TO 3.

NG >> Repair harness.

3. CHECK HARNESS FOR OPEN CIRCUIT

- 1. Disconnect VDC/TCS/ABS control unit connector.
- Check continuity between harness connector E108 terminals 58G (L), 59G (R) and VDC/TCS/ABS control unit harness connector E118 terminals 61 (L), 63 (R).
 - 58G (L) 61 (L)
 - 59G (R) 63 (R)

: Continuity should exist. : Continuity should exist.

: Continuity should exist.

: Continuity should exist.

OK or NG

- OK >> Connect all the connectors and diagnose again. Refer to LAN-35, "Work Flow".
- NG >> Repair harness.

ECM Circuit Check

1. CHECK CONNECTOR

- 1. Turn ignition switch OFF.
- 2. Disconnect the negative battery terminal.
- 3. Check the terminals and connector of ECM for damage, bend and loose connection (control module-side and harness-side).

OK or NG

OK >> GO TO 2.

NG >> Repair terminal or connector.



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Data link connector

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6,3

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SMJ harness connector

58G, 59G

• CONNECTOR



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- 1. Disconnect ECM connector.
- 2. Check resistance between ECM harness connector F108 terminals 94 (L) and 86 (R).

94 (L) – 86 (R)

: Approx. 108 – 132Ω

OK or NG

- OK >> Replace ECM.
- NG >> Repair harness between TCM and ECM.



TCM Circuit Check

1. CHECK CONNECTOR

- 1. Turn ignition switch OFF.
- 2. Disconnect the negative battery terminal.
- 3. Check the terminals and connector of TCM for damage, bend and loose connection (control module-side $_{\rm G}$ and harness-side).

OK or NG

OK >> GO TO 2. NG >> Repair terr

S >> Repair terminal or connector.

2. CHECK HARNESS FOR OPEN CIRCUIT

- 1. Disconnect TCM connector.
- 2. Check resistance between TCM harness connector F103 terminals 6 (L) and 7 (R).
 - 6 (L) 7 (R)

: Approx. 54 – 66Ω

OK or NG

OK >> Replace TCM.

NG >> Repair harness between harness connector F102 and TCM.



Combination Meter Circuit Check

1. CHECK CONNECTOR

- 1. Turn ignition switch OFF.
- 2. Disconnect the negative battery terminal.
- 3. Check terminals and connector of combination meter for damage, bend and loose connection (meter-side and harness-side).

OK or NG

- OK >> GO TO 2.
- NG >> Repair terminal or connector.

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$\overline{2}$. CHECK HARNESS FOR OPEN CIRCUIT

- 1. Disconnect combination meter connector.
- 2. Check resistance between combination meter harness connector M20 terminals 28 (L) and 27 (R).

28 (L) – 27 (R)

: Approx. 54 – 66Ω

OK or NG

- OK >> Replace combination meter.
- NG >> Repair harness between data link connector and combination meter.



BCM Circuit Check

1. CHECK CONNECTOR

- 1. Turn ignition switch OFF.
- 2. Disconnect the negative battery terminal.
- 3. Check the terminals and connector of BCM for damage, bend and loose connection (control module-side and harness-side).

OK or NG

OK >> GO TO 2.

NG >> Repair terminal or connector.

2. CHECK HARNESS FOR OPEN CIRCUIT

- 1. Disconnect BCM connector.
- Check resistance between BCM harness connector M3 terminals 70 (L) and 71 (R).
 - 70 (L) 71 (R)

: Approx. 54 – 66Ω

OK or NG

- OK >> Replace BCM. Refer to <u>BCS-20, "Removal and Installa-</u> tion of <u>BCM"</u>.
- NG >> Repair harness between data link connector and BCM.



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Steering Angle Sensor Circuit Check

1. CHECK CONNECTOR

- 1. Turn ignition switch OFF.
- 2. Disconnect the negative battery terminal.
- Check terminals and connector of steering angle sensor for damage, bend and loose connection (sensorside and harness-side).

OK or NG

OK >> GO TO 2.

NG >> Repair terminal or connector.

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$\overline{2}$. CHECK HARNESS FOR OPEN CIRCUIT

- 1. Disconnect steering angle sensor connector.
- 2. Check resistance between steering angle sensor harness connector M22 terminals 4 (L) and 5 (R).

4 (L) – 5 (R)

: **Approx. 54 – 66**Ω

OK or NG

- OK >> Replace steering angle sensor.
- NG >> Repair harness between data link connector and steering angle sensor.



VDC/TCS/ABS Control Unit Circuit Check

1. CHECK CONNECTOR

1. Turn ignition switch OFF.

- 2. Disconnect the negative battery terminal.
- 3. Check the terminals and connector of VDC/TCS/ABS control unit for damage, bend and loose connection _G (control unit-side and harness-side).

OK or NG

OK >> GO TO 2.

NG >> Repair terminal or connector.

2. CHECK HARNESS FOR OPEN CIRCUIT

- 1. Disconnect VDC/TCS/ABS control unit connector.
- 2. Check resistance between VDC/TCS/ABS control unit harness connector E118 terminals 61 (L) and 63 (R).

61 (L) – 63 (R)

: **Approx. 54 – 66**Ω

OK or NG

- OK >> Replace VDC/TCS/ABS control unit.
- NG >> Repair harness between harness connector E108 and VDC/TCS/ABS control unit.

IPDM E/R Circuit Check

1. CHECK CONNECTOR

- 1. Turn ignition switch OFF.
- 2. Disconnect the negative battery terminal.
- Check the terminals and connector of IPDM E/R for damage, bend and loose connection (control moduleside and harness-side).

OK or NG

- OK >> GO TO 2.
- NG >> Repair terminal or connector.



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$\overline{2}$. CHECK HARNESS FOR OPEN CIRCUIT

- 1. Disconnect IPDM E/R connector.
- 2. Check resistance between IPDM E/R harness connector E9 terminals 48 (L) and 49 (R).
 - 48 (L) 49 (R)

: Approx. 108 – 132 Ω

OK or NG

- OK >> Replace IPDM E/R.
- NG >> Repair harness between harness connector E108 and IPDM E/R.



CAN Communication Circuit Check

1. CHECK CONNECTOR

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- 1. Turn ignition switch OFF.
- 2. Disconnect the negative battery terminal.
- 3. Check following terminals and connector for damage, bend and loose connection (control module-side, control unit-side, meter-side, sensor-side and harness-side).
- ECM.
- TCM.
- Combination meter.
- BCM.
- Steering angle sensor.
- VDC/TCS/ABS control unit.
- IPDM E/R.
- Between ECM and IPDM E/R.

OK or NG

- OK >> GO TO 2.
- NG >> Repair terminal or connector.

2. CHECK HARNESS FOR SHORT CIRCUIT

- 1. Disconnect following connectors.
- ECM connector.
- TCM connector.
- Harness connector F102.
- Check continuity between ECM harness connector F108 terminals 94 (L) and 86 (R).

94 (L) - 86 (R)

: Continuity should not exist.

OK or NG

NG

OK >> GO TO 3.

- >> Repair harness between ECM and harness connector F102.
 - Repair harness between TCM and harness connector F102.



: Continuity should not exist. : Continuity should not exist.

3. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between ECM harness connector F108 terminals 94 (L), 86 (R) and ground.

- 94 (L) ground
- 86 (R) ground

OK or NG

- OK >> GO TO 4.
- NG >> • Repair harness between ECM and harness connector F102.
 - Repair harness between TCM and harness connector F102.

4. CHECK HARNESS FOR SHORT CIRCUIT

- 1. Disconnect following connectors.
- Combination meter connector.
- BCM connector.
- Steering angle sensor connector.
- Harness connector M15.
- 2. Check continuity between data link connector M8 terminals 6 (L) and 3 (R).

6(L) - 3(R)

: Continuity should not exist.

OK or NG

OK >> GO TO 5. NG

- >> Repair harness between harness connector M72 and harness connector M15.
 - Repair harness between harness connector M72 and combination meter.
 - Repair harness between harness connector M72 and data link connector.
 - Repair harness between harness connector M72 and BCM.
 - Repair harness between harness connector M72 and steering angle sensor.

5. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between data link connector M8 terminals 6 (L), 3 (R) and ground.

- 6 (L) ground
- : Continuity should not exist. : Continuity should not exist.
- 3 (R) ground

OK or NG

NG

OK >> GO TO 6.

- >> Repair harness between harness connector M72 and harness connector M15.
 - Repair harness between harness connector M72 and combination meter.
 - Repair harness between harness connector M72 and data link connector.
 - Repair harness between harness connector M72 and BCM.
 - Repair harness between harness connector M72 and steering angle sensor.

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6. CHECK HARNESS FOR SHORT CIRCUIT

- 1. Disconnect VDC/TCS/ABS control unit connector and IPDM E/R connector.
- Check continuity between IPDM E/R harness connector E9 terminals 48 (L) and 49 (R).

48 (L) – 49 (R) : Continuity should not exist.

OK or NG

OK >> GO TO 7.

- NG >> Repair harness between harness connector E108 and VDC/TCS/ABS control unit.
 - Repair harness between harness connector E108 and IPDM E/R.

7. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between IPDM E/R harness connector E9 terminals 48 (L), 49 (R) and ground.

48 (L) – ground

49 (R) – ground

: Continuity should not exist. : Continuity should not exist.

OK or NG

NG

OK >> GO TO 8.

- > Repair harness between harness connector E108 and VDC/TCS/ABS control unit.
 - Repair harness between harness connector E108 and IPDM E/R.

8. ECM/IPDM E/R INTERNAL CIRCUIT INSPECTION

Check components inspection. Refer to <u>LAN-54</u>, <u>"ECM/IPDM E/R INTERNAL CIRCUIT INSPECTION"</u> OK or NG

OK >> Connect all the connectors and diagnose again. Refer to LAN-35, "Work Flow".

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

IPDM E/R Ignition Relay Circuit Check

Replace IPDM E/R if there is no malfunction after checking the following.

- IPDM E/R power circuit. refer to PG-27, "IPDM E/R Power/Ground Circuit Inspection".
- Ignition power supply circuit. Refer to <u>PG-11</u>, "IGNITION POWER SUPPLY IGNITION SW. IN "ON" <u>AND/OR "START"</u>.

Component Inspection ECM/IPDM E/R INTERNAL CIRCUIT INSPECTION

- Remove ECM and IPDM E/R from vehicle.
- Check resistance between ECM terminals 94 and 86.
- Check resistance between IPDM E/R terminals 48 and 49.

Unit	Terminal	Resistance value (Ω) (Approx.)
ECM	94 - 86	108 - 122
IPDM E/R	48 – 49	100 - 132







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