SECTION **LAN**

LAN SYSTEM

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## PRECAUTIONS
PFP:00001

## Precautions for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"
*UKS0017I*

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 When Using CONSULT-II
*UKS0017J*

When connecting CONSULT-II to data link connector, connect them through CONSULT-II CONVERTER.

**CAUTION:**
**If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.**

### CHECK POINTS FOR USING CONSULT-II

1. Has CONSULT-II been used without connecting CONSULT-II CONVERTER on this vehicle?
   - If YES, GO TO 2.
   - If NO, GO TO 5.
2. Is there any indication other than indications relating to CAN communication system in the self-diagnosis results?
   - If YES, GO TO 3.
   - If NO, GO TO 4.
3. Based on self-diagnosis results unrelated to CAN communication, carry out the inspection.
4. Malfunctions may be detected in self-diagnosis depending on control units carrying out CAN communication. Therefore, erase the self-diagnosis results.
5. Diagnose CAN communication system. Refer to .

## Precautions For Trouble Diagnosis
*UKS0017K*
### CAN SYSTEM

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

# PRECAUTIONS

## Precautions For Harness Repair
UKS0017L
### CAN SYSTEM

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

OK: Soldered and wound with tape

PKIA0306E

- 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.)

NG: Bypass wire connection

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## TROUBLE DIAGNOSES WORK FLOW

### When Displaying CAN Communication System Errors
#### WHEN A MALFUNCTION IS DETECTED BY CAN COMMUNICATION SYSTEM

● CAN communication line is open. (CAN H, CAN L, or both)
● CAN communication line is shorted. (Ground, between CAN lines, or other harnesses)
● The areas related to CAN communication of unit is malfunctioning.

#### WHEN A MALFUNCTION IS DETECTED EXCEPT CAN COMMUNICATION SYSTEM

● Removal and installation of parts : When the units that perform CAN communication or the sensors related to CAN communication are removed and installed, malfunction may be detected (or DTC other than CAN communication may be detected).
● Fuse blown out (removed): CAN communication of the unit may be stopped at such time.
● Low voltage : If the voltage decreases because of battery discharge when IGN is ON, malfunction may be detected by self-diagnosis according to the units.

# TROUBLE DIAGNOSES WORK FLOW

## TROUBLE DIAGNOSIS FLOW CHART



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- Step 1 : Refer to LAN-8, "SELECTING CAN SYSTEM TYPE (HOW TO USE SPECIFICATION TABLE)" .
- Step 2 : Refer to LAN-9, "ACQUISITION OF DATA BY CONSULT-II" .
- Step 3 : Refer to LAN-10, "HOW TO USE CHECK SHEET TABLE" .
- Step 4 : Refer to LAN-11, "Example of Filling in Check Sheet When Initial Conditions Are Reproduced" .
- Step 5 : Check and repair according to system diagnosis.

## Diagnosis Procedure

*UKS0046H*

### SELECTING CAN SYSTEM TYPE (HOW TO USE SPECIFICATION TABLE)

Determine CAN system type from the equipment of the vehicle to select applicable check sheet.

(Example) Wagon/4WD/VQ40DE/AT/VDC/Without electronic locking rear differential

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

| Body type | Wagon | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Axle | 2WD | | | | | 4WD | | | | | | |
| Engine | VQ40DE | | | | | | | | | | | |
| Transmission | M/T | | | A/T | | M/T | | | | A/T | | |
| Brake control | ABS | ABLS | VDC | ABS | VDC | ABLS | | VDC | | ABLS | VDC | |
| Electronic locking rear differential | | | | | | | × | | × | | | × |
| CAN system type | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| CAN system trouble diagnosis | | | | | | | | | | | | |

×: Applicable

Check basic specification of the vehicle.

Select "×" if it is model with electronic locking rear differential.

Which number is selected when sequentially selecting from the top of the specification table?
The number is "CAN system type" of the applicable vehicle.

In the case of this example:
It corresponds to type 11.

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## ACQUISITION OF DATA BY CONSULT-II

Attach the data acquired by CONSULT-II on the check sheet determined according to CAN system type.

Copy "SELECT SYSTEM" screen of CONSULT-II.

| SELECT SYSTEM |
|---|
| ENGINE |
| A/T |
| ABS |
| AIR BAG |
| IPDM E/R |
| METER |
| Page Down |
| BACK | LIGHT | COPY |

| SELECT SYSTEM |
|---|
| A/T |
| ABS |
| AIR BAG |
| IPDM E/R |
| METER |
| ALL MODE AWD/4WD |
| Page Up |
| BACK | LIGHT | COPY |

Check sheet table

| SELECT SYSTEM screen | Initial diagnosis | Transmit diagnosis | ECM | TCM | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Receive diagnosis | | | | | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | — | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | — | NG | UNKWN | UNKWN | — | — | — | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | UNKWN | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

Symptoms :

Attach copy of SELECT SYSTEM

Attach copy of SELECT SYSTEM

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Copy "SELF-DIAG RESULTS" screen of CONSULT-II.

| SELF-DIAG RESULTS |
|---|
| DTC RESULTS TIME |
| CAN COMM CIRCUIT [U1000] |
| ERASE | PRINT |
| MODE | BACK | LIGHT | COPY |

| SELF-DIAG RESULTS |
|---|
| DTC RESULTS |
| NO DTC IS DETECTED. FURTHER TESTING MAY BE REQUIRED. |
| ERASE | PRINT |
| MODE | BACK | LIGHT | COPY |

Attach copy of ENGINE SELF-DIAG RESULTS

Attach copy of A/T SELF-DIAG RESULTS

Attach copy of BCM SELF-DIAG RESULTS

Attach copy of METER SELF-DIAG RESULTS

Attach copy of ALL MODE AWD/4WD SELF-DIAG RESULTS

Attach copy of ABS SELF-DIAG RESULTS

Attach copy of IPDM E/R SELF-DIAG RESULTS

Copy "CAN DIAG SUPPORT MNTR" screen of CONSULT-II.

| CAN DIAG SUPPORT MNTR ENGINE | PRSNT |
|---|---|
| INITIAL DIAG | OK |
| TRANSMIT DIAG | OK |
| TCM | OK |
| VDC/TCS/ABS | OK |
| METER/M&A | OK |
| ICC | UNKWN |
| BCM/SEC | UNKWN |
| IPDM E/R | OK |
| AWD/4WD/e4WD | OK |
| PRINT | Scroll Down |
| MODE | BACK | LIGHT | COPY |

| CAN DIAG SUPPORT MNTR ABS | PRSNT |
|---|---|
| INITIAL DIAG | OK |
| TRANSMIT DIAG | OK |
| ECM | OK |
| TCM | OK |
| METER/M&A | UNKWN |
| STRG | OK |
| ICC | UNKWN |
| AWD/4WD | OK |
| PRINT | |
| MODE | BACK | LIGHT | COPY |

Attach copy of ENGINE CAN DIAG SUPPORT MNTR

Attach copy of A/T CAN DIAG SUPPORT MNTR

Attach copy of BCM CAN DIAG SUPPORT MNTR

Attach copy of ALL MODE AWD/4WD CAN DIAG SUPPORT MNTR

Attach copy of ABS CAN DIAG SUPPORT MNTR

| CAN DIAG SUPPORT MNTR IPDM E/R | PRSNT | PAST |
|---|---|---|
| TRANSMIT DIAG | OK | OK |
| ECM | OK | OK |
| BCM/SEC | UNKWN | 0 |
| PRINT | | |
| MODE | BACK | LIGHT | COPY |

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## HOW TO USE CHECK SHEET TABLE



Check sheet table / Unit that performs CAN communication diagnosis

Use when the initial conditions are reproduced — Use when the initial conditions are not reproduced

| SELECT SYSTEM screen | Initial diagnosis | Transmit diagnosis | ECM | TCM | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Receive diagnosis | | | | | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | — | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | — | NG | UNKWN | UNKWN | — | — | — | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | — | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) | — |

① ② ③ ④ ⑤

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1. Unit names displayed on CONSULT-II.

2. "No indication" : Put a check mark to it if the unit name described in step 1 is not displayed on "SELECT SYSTEM" screen of CONSULT-II. (Unit communicating with CONSULT-II via CAN communication line)
   "–" : Column not used (Unit communicating with CONSULT-II excluding CAN communication line)

3. "NG" : Display "NG" when malfunction is detected in the initial diagnosis of the diagnosed unit. Replace the unit if "NG" is displayed.
   "–" : Column not used (Initial diagnosis is not performed.)

4. "UNKWN" : Display "UNKWN" when the diagnosed unit does not transmit the data normally. Put a check mark to it if "UNKWN" is displayed on CONSULT-II.
   "–" : Column not used (Transmit diagnosis is not performed.)

5. "UNKWN" : Display "UNKWN" when the diagnosed unit does not receive the data normally. Put a check mark to it if "UNKWN" is displayed on CONSULT-II.
   "–" : Column not used (It is not necessary for CAN communication trouble diagnosis.)

**NOTE:**
CAN communication diagnosis checks if CAN communication works normally. (Contents of data are not diagnosed.)

- When the initial conditions are reproduced. Refer to .

- When the initial conditions are not reproduced. Refer to .

## Example of Filling in Check Sheet When Initial Conditions Are Reproduced



| CAN DIAG SUPPORT MNTR | |
| --- | --- |
| ENGINE | |
| | PRSNT |
| INITIAL DIAG | OK |
| TRANSMIT DIAG | OK |
| TCM | OK |
| VDC/TCS/ABS | OK |
| METER/M&A | OK |
| ICC | UNKWN |
| BCM/SEC | UNKWN |
| IPDM E/R | OK |
| AWD/4WD/e4WD | OK |
| PRINT | Scroll Down |
| MODE | BACK | LIGHT | COPY |

| CAN DIAG SUPPORT MNTR | |
| --- | --- |
| ENGINE | |
| | PRSNT |
| TRANSMIT DIAG | OK |
| TCM | OK |
| VDC/TCS/ABS | OK |
| METER/M&A | OK |
| ICC | UNKWN |
| BCM/SEC | UNKWN |
| IPDM E/R | OK |
| AWD/4WD/e4WD | OK |
| EPS | UNKWN |
| PRINT | Scroll Up |
| MODE | BACK | LIGHT | COPY |

Check sheet table

| SELECT SYSTEM screen | CAN DIAG SUPPORT MNTR | | | | | | | | | | SELF-DIAG RESULTS | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | | |
| | | | ECM | TCM | STRG | BCM/SEC | METER/M&A | AWD/4WD/e4WD | VDC/TCS/ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | — | UNKWN✓ | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | — | NG | UNKWN | UNKWN | — | — | — | UNKWN | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication✓ | NG | UNKWN | UNKWN | — | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

| SELECT SYSTEM |
| --- |
| ENGINE |
| A/T |
| ABS |
| AIR BAG |
| IPDM E/R |
| METER |
| Page Down |
| BACK | LIGHT | COPY |

| SELECT SYSTEM |
| --- |
| A/T |
| ABS |
| AIR BAG |
| IPDM E/R |
| METER |
| ALL MODE AWD/4WD |
| Page Up |
| BACK | LIGHT | COPY |

PKIB7198E

1. Put a check mark to "No indication" if some of unit names listed on the column of diagnosis system selection screen of a check sheet table are not displayed on "SELECT SYSTEM" screen attached to the check sheet.

   **NOTE:**
   Put a check mark to "No indication" of BCM because BCM is not displayed on "SELECT SYSTEM" screen.

2. Confirm the unit name that "UNKWN" is displayed from the copy of "CAN DIAG SUPPORT MNTR" screen of "ENGINE" attached to the check sheet, and then put a check mark to the check sheet table.

   **NOTE:**
   In "CAN DIAG SUPPORT MNTR" screen, "UNKWN" is displayed on "ICC", "BCM/SEC" and "EPS". But put a check mark to "BCM/SEC" because "UNKWN" is listed on the column of reception diagnosis of the check sheet table.

**CAN DIAG SUPPORT MNTR — A/T**

| | PRSNT |
|---|---|
| INITIAL DIAG | OK |
| TRANSMIT DIAG | OK |
| ECM | OK |
| VDC/TCS/ABS | OK |
| METER/M&A | OK |
| ICC/e4WD | UNKWN |
| AWD/4WD | OK |

PRINT — MODE | BACK | LIGHT | COPY

**CAN DIAG SUPPORT MNTR — ALL MODE AWD/4WD**

| | PRSNT |
|---|---|
| INITIAL DIAG | OK |
| TRANSMIT DIAG | OK |
| ECM | OK |
| VDC/TCS/ABS | OK |
| TCM | OK |
| METER/M&A | OK |

PRINT — MODE | BACK | LIGHT | COPY

**CAN DIAG SUPPORT MNTR — ABS**

| | PRSNT |
|---|---|
| INITIAL DIAG | OK |
| TRANSMIT DIAG | OK |
| ECM | OK |
| TCM | OK |
| METER/M&A | OK |
| STRG | OK |
| ICC | UNKWN |
| AWD/4WD | OK |

PRINT — MODE | BACK | LIGHT | COPY

**CAN DIAG SUPPORT MNTR — IPDM E/R**

| | PRSNT | PAST |
|---|---|---|
| TRANSMIT DIAG | OK | OK |
| ECM | OK | OK |
| BCM/SEC | UNKWN | 0 |

PRINT — MODE | BACK | LIGHT | COPY

**Check sheet table**

| SELECT SYSTEM screen | Initial diagnosis | Transmit diagnosis | Receive diagnosis ECM | TCM | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ENGINE | — | NG | UNKWN | — | UNKWN | — | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | — | NG | UNKWN | UNKWN | — | — | — | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | — | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

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3. Confirm the unit name that "UNKWN" is displayed on the copy of "CAN DIAG SUPPORT MNTR" screen of "A/T", "ALL MODE AWD/4WD", "ABS" and "IPDM E/R" as well as "ENGINE". And then, put a check mark to the check sheet table.

**NOTE:**
- For "A/T", "UNKWN" is displayed on "ICC/e4WD". But, do not put a check mark to their columns of reception diagnosis of the check sheet table because "UNKWN" is not listed.
- For "ALL MODE AWD/4WD", "UNKWN" is not displayed". Do not put a check mark to it.
- For "ABS", "UNKWN" is displayed on "ICC". But, do not put a check mark to their columns of reception diagnosis of the check sheet table because "UNKWN" is not listed.
- For "IPDM E/R", "UNKWN" is displayed on "BCM/SEC". Put a check mark to it.

# TROUBLE DIAGNOSES WORK FLOW

**Check sheet table**

The arranged results of CAN diagnosis support monitor

| SELECT SYSTEM screen | Initial diagnosis | Transmit diagnosis | CAN DIAG SUPPORT MNTR | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Receive diagnosis | | | | | | | | | |
| | | | ECM | TCM | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | — | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | — | NG | UNKWN | UNKWN | — | — | — | UNKWN | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

Choose similar indications between the results of CAN diagnosis support monitor and the results of the check sheet. Malfunctioning parts are found.

Case 7
Check BCM circuit.

Check sheet results (example)

| SELECT SYSTEM screen | Initial diagnosis | Transmit diagnosis | CAN DIAG SUPPORT MNTR | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Receive diagnosis | | | | | | | | | |
| | | | ECM | TCM | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | — | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | — | NG | UNKWN | UNKWN | — | — | — | UNKWN | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

///// : Malfunctioning part

BCM — Combination meter — Transfer control unit

CAN H
CAN L

ECM — TCM — Steering angle sensor — Data link connector — ABS actuator and electric unit(control unit) — IPDM E/R

PKIB7200E

**NOTE:**
There is a case that some of "CAN DIAG SUPPORT MNTR" and "SELF-DIAG RESULTS" are not needed for diagnosis. In the case, "UNKWN" and "CAN COMM CIRCUIT [U1000]" in "Check sheet results (example)" change to "–". Then, ignore check marks on the check sheet table.

4. Perform system diagnosis for possible causes identified.

5. Perform diagnosis again after inspection and repair. Make sure that repair is completely performed, and then end the procedure.

Start CAN system trouble diagnosis if this procedure can be confirmed. Refer to .

## Example of Filling in Check Sheet When Initial Conditions Are Not Reproduced

Check sheet table

| SELECT SYSTEM screen | Initial diagnosis | Transmit diagnosis | ECM | TCM | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ENGINE | — | NG | UNKWN | — | UNKWN | — | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) ✓ |
| A/T | — | NG | UNKWN | UNKWN | — | — | — | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) ✓ | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | — | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) ✓ | — |

(CAN DIAG SUPPORT MNTR — Receive diagnosis columns: ECM, TCM, STRG, BCM/SEC, METER/M&A, AWD/4WD/e4WD, VDC/TCS/ABS, IPDM E/R)

---

SYSTEM   ENGINE
| SELF-DIAG RESULTS |
DTC RESULTS                    TIME
CAN COMM CIRCUIT        1t
[U1001]

SYSTEM   A/T
| SELF-DIAG RESULTS |
DTC RESULTS
NO DTC IS DETECTED.
FURTHER TESTING
MAY BE REQUIRED.

SYSTEM   BCM
| SELF-DIAG RESULTS |
DTC RESULTS                    TIME
NO DTC IS DETECTED.
FURTHER TESTING
MAY BE REQUIRED.

SYSTEM   METER
| SELF-DIAG RESULTS |
DTC RESULTS                    TIME
CAN COMM CIRCUIT        2
[U1000]

SYSTEM   ALL MODE AWD/4WD
| SELF-DIAG RESULTS |
DTC RESULTS
NO DTC IS DETECTED.
FURTHER TESTING
MAY BE REQUIRED.

SYSTEM   ABS
| SELF-DIAG RESULTS |
DTC RESULTS                    TIME
NO DTC IS DETECTED.
FURTHER TESTING
MAY BE REQUIRED.

SYSTEM   IPDM E/R
| SELF-DIAG RESULTS |
DTC RESULTS                    TIME
CAN COMM CIRCUIT        PAST
[U1000]

PKIB7201E

1. See "SELF-DIAG RESULTS" of all units attached to the check sheet. If "CAN COMM CIRCUIT", "CAN COMM CIRCUIT [U1000]" or "CAN COMM CIRCUIT [U1001]" is displayed, put a check mark to the applicable column of self-diagnostic results of the check sheet table.

    **NOTE:**
    - For "ENGINE", "CAN COMM CIRCUIT [U1001]" are displayed. Put a check mark to it.
    - For "A/T", "NO DTC IS DETECTED" is displayed. Do not put a check mark to it.
    - For "BCM", "NO DTC IS DETECTED" is displayed. Do not put a check mark to it.
    - For "METER", "CAN COMM CIRCUIT [U1000]" is displayed. Put a check mark to it.
    - For "ALL MODE AWD/4WD", "NO DTC IS DETECTED" is displayed. Do not put a check mark to it.
    - For "ABS", "NO DTC IS DETECTED" is displayed. Do not put a check mark to it.
    - For "IPDM E/R", "CAN COMM CIRCUIT [U1000]" is displayed. Put a check mark to it.

The arranged results of self-diagnosis

Check sheet table



When the arranged results of self-diagnosis and check sheet results (example) are corresponding, possible causes can be selected.

Case 7
Check BCM circuit.

Case 11
Check IPDM E/R circuit.

`////` : Malfunctioning part

PKIB7202E

**NOTE:**
There is a case that some of "CAN DIAG SUPPORT MNTR" and "SELF-DIAG RESULTS" are not needed for diagnosis. In the case, "UNKWN" and "CAN COMM CIRCUIT [U1000]" in "Check sheet results (example)" change to "–". Then, ignore check marks on the check sheet table.

2.  For the selected possible causes, it is expected that malfunctions have been found in the past.

## CAN Diagnostic Support Monitor

UKS0046I

### DESCRIPTION OF "CAN DIAG SUPPORT MNTR" SCREEN FOR ECM

(Example)

| CAN DIAG SUPPORT MNTR | |
|---|---|
| ENGINE | |
| | PRSNT |
| INITIAL DIAG | OK |
| TRANSMIT DIAG | OK |
| TCM | OK |
| VDC/TCS/ABS | OK |
| METER/M&A | OK |
| ICC | UNKWN |
| BCM/SEC | OK |
| IPDM E/R | OK |
| AWD/4WD/e4WD | UNKWN |
| PRINT | Scroll Down |
| MODE | BACK | LIGHT | COPY |

| CAN DIAG SUPPORT MNTR | |
|---|---|
| ENGINE | |
| | PRSNT |
| TRANSMIT DIAG | OK |
| TCM | OK |
| VDC/TCS/ABS | OK |
| METER/M&A | OK |
| ICC | UNKWN |
| BCM/SEC | OK |
| IPDM E/R | OK |
| AWD/4WD/e4WD | UNKWN |
| EPS | UNKWN |
| PRINT | Scroll Up |
| MODE | BACK | LIGHT | COPY |

SKIB0591E

| "SELECT SYSTEM" screen | "CAN DIAG SUPPORT MNTR" screen | Description | Present |
|---|---|---|---|
| ENGINE | INITIAL DIAG | Make sure that microcomputer in ECU works normally. | OK/NG |
| | TRANSMIT DIAG | Make sure of normal transmission. | OK/UNKWN |
| | TCM | Make sure of normal reception from TCM. | OK/UNKWN |
| | VDC/TCS/ABS | Make sure of normal reception from ABS actuator and electric unit (control unit). | OK/UNKWN |
| | METER/M&A | Make sure of normal reception from combination meter. | OK/UNKWN |
| | ICC | ICC is not diagnosed. | UNKWN |
| | BCM/SEC | Make sure of normal reception from BCM. | OK/UNKWN |
| | IPDM E/R | Make sure of normal reception from IPDM E/R. | OK/UNKWN |
| | AWD/4WD/e4WD | Make sure of normal reception from transfer control unit. | OK/UNKWN |
| | EPS | EPS is not diagnosed. | UNKWN |

Display Results (Present)

● OK : Normal

● NG : Malfunction

● UNKWN : The diagnosed unit does not transmit or receive the applicable data normally.

# TROUBLE DIAGNOSES WORK FLOW

## DESCRIPTION OF "CAN DIAG SUPPORT MNTR" SCREEN FOR TCM

(Example)

```
CAN DIAG SUPPORT MNTR
          A/T
                        PRSNT
INITIAL DIAG            OK
TRANSMIT DIAG          OK
ECM                     OK
VDC/TCS/ABS            OK
METER/M&A              OK
ICC/e4WD              UNKWN
AWD/4WD                OK


       PRINT
MODE  BACK  LIGHT  COPY
                        SKIB2335E
```

| "SELECT SYSTEM" screen | "CAN DIAG SUPPORT MNTR" screen | Description | Present |
|---|---|---|---|
| A/T | INITIAL DIAG | Make sure that microcomputer in ECU works normally. | OK/NG |
| | TRANSMIT DIAG | Make sure of normal transmission. | OK/UNKWN |
| | ECM | Make sure of normal reception from ECM. | OK/UNKWN |
| | VDC/TCS/ABS | Make sure of normal reception from ABS actuator and electric unit (control unit). | OK/UNKWN |
| | METER/M&A | Make sure of normal reception from combination meter. | OK/UNKWN |
| | ICC/e4WD | ICC/e4WD is not diagnosed. | UNKWN |
| | AWD/4WD | Make sure of normal reception from transfer control unit. | OK/UNKWN |

Display Results (Present)

- OK : Normal
- NG : Malfunction
- UNKWN : The diagnosed unit does not transmit or receive the applicable data normally.

## DESCRIPTION OF "CAN DIAG SUPPORT MNTR" SCREEN FOR DIFFERENTIAL LOCK CONTROL UNIT

(Example)

```
CAN DIAG SUPPORT MNTR
        DIFF LOCK
                        PRSNT
INITIAL DIAG           OK
TRANSMIT DIAG         OK
ECM                    OK
VDC/TCS/ABS           OK
AWD/4WD               OK




       PRINT
MODE  BACK  LIGHT  COPY
                        PKIB7196E
```

| "SELECT SYSTEM" screen | "CAN DIAG SUPPORT MNTR" screen | Description | Present |
|---|---|---|---|
| DIFF LOCK | INITIAL DIAG | Make sure that microcomputer in ECU works normally. | OK/NG |
| | TRANSMIT DIAG | Make sure of normal transmission. | OK/UNKWN |
| | ECM | Make sure of normal reception from ECM. | OK/UNKWN |
| | VDC/TCS/ABS | Make sure of normal reception from ABS actuator and electric unit (control unit). | OK/UNKWN |
| | AWD/4WD | Make sure of normal reception from transfer control unit. | OK/UNKWN |

Display Results (Present)

- OK : Normal
- NG : Malfunction
- UNKWN : The diagnosed unit does not transmit or receive the applicable data normally.

# TROUBLE DIAGNOSES WORK FLOW

## DESCRIPTION OF "CAN DIAG SUPPORT MNTR" SCREEN FOR BCM

(Example)

```
CAN DIAG SUPPORT MNTR
         BCM
                    PRSNT
INITIAL DIAG        OK
TRANSMIT DIAG       OK
ECM                 OK
IPDM E/R            OK
METER/M&A           UNKWN
I-KEY               OK



        PRINT
MODE  BACK  LIGHT  COPY     SKIB0593E
```

| "SELECT SYSTEM" screen | "CAN DIAG SUPPORT MNTR" screen | Description | Present |
|---|---|---|---|
| BCM | INITIAL DIAG | Make sure that microcomputer in ECU works normally. | OK/NG |
| | TRANSMIT DIAG | Make sure of normal transmission. | OK/UNKWN |
| | ECM | Make sure of normal reception from ECM. | OK/UNKWN |
| | IPDM E/R | Make sure of normal reception from IPDM E/R. | OK/UNKWN |
| | METER/M&A | Make sure of normal reception from combination meter. | OK/UNKWN |
| | I-KEY | I-KEY is not diagnosed. | OK |

Display Results (Present)

● OK : Normal

● NG : Malfunction

● UNKWN : The diagnosed unit does not transmit or receive the applicable data normally.

## DESCRIPTION OF "CAN DIAG SUPPORT MNTR" SCREEN FOR TRANSFER CONTROL UNIT

(Example)

```
CAN DIAG SUPPORT MNTR
    ALL MODE AWD/4WD
                    PRSNT
INITIAL DIAG        OK
TRANSMIT DIAG       OK
ECM                 OK
VDC/TCS/ABS         OK
TCM                 UNKWN
METER/M&A           OK



        PRINT
MODE  BACK  LIGHT  COPY     PKIB5232E
```

| "SELECT SYSTEM" screen | "CAN DIAG SUPPORT MNTR" screen | Description | Present |
|---|---|---|---|
| ALL MODE AWD/ 4WD | INITIAL DIAG | Make sure that microcomputer in ECU works normally. | OK/NG |
| | TRANSMIT DIAG | Make sure of normal transmission. | OK/UNKWN |
| | ECM | Make sure of normal reception from ECM. | OK/UNKWN |
| | VDC/TCS/ABS | Make sure of normal reception from ABS actuator and electric unit (control unit). | OK/UNKWN |
| | TCM | Make sure of normal reception from TCM. | OK/UNKWN |
| | METER/M&A | Make sure of normal reception from combination meter. | OK/UNKWN |

Display Results (Present)

● OK : Normal

● NG : Malfunction

● UNKWN : The diagnosed unit does not transmit or receive the applicable data normally.

## DESCRIPTION OF "CAN DIAG SUPPORT MNTR" SCREEN FOR ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

(Example)

```
CAN DIAG SUPPORT MNTR
          ABS
                        PRSNT
INITIAL DIAG            OK
TRANSMIT DIAG          OK
ECM                    OK
TCM                    OK
METER/M&A              UNKWN
STRG                   OK
ICC                    UNKWN
AWD/4WD                OK
DIFF LOCK              OK
        PRINT
MODE   BACK   LIGHT   COPY
                              PKIB7433E
```

| "SELECT SYSTEM" screen | "CAN DIAG SUPPORT MNTR" screen | Description | Present |
|---|---|---|---|
| ABS | INITIAL DIAG | Make sure that microcomputer in ECU works normally. | OK/NG |
| | TRANSMIT DIAG | Make sure of normal transmission. | OK/UNKWN |
| | ECM | Make sure of normal reception from ECM. | OK/UNKWN |
| | TCM | Make sure of normal reception from TCM. | OK/UNKWN |
| | METER/M&A | METER/M&A is not diagnosed. | UNKWN |
| | STRG | Make sure of normal reception from steering angle sensor. | OK/UNKWN |
| | ICC | ICC is not diagnosed. | UNKWN |
| | AWD/4WD | Make sure of normal reception from transfer control unit. | OK/UNKWN |
| | DIFF LOCK | Make sure of normal reception from differential lock control unit. | OK/UNKWN |

Display Results (Present)

● OK : Normal

● NG : Malfunction

● UNKWN : The diagnosed unit does not transmit or receive the applicable data normally.

# TROUBLE DIAGNOSES WORK FLOW

**[CAN]**

## DESCRIPTION OF "CAN DIAG SUPPORT MNTR" SCREEN FOR IPDM E/R

(Example)

```
CAN DIAG SUPPORT MNTR
        IPDM E/R

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




        PRINT

MODE  BACK  LIGHT  COPY
```
SKIB0595E

| "SELECT SYSTEM" screen | "CAN DIAG SUPPORT MNTR" screen | Description | Present | Past |
|---|---|---|---|---|
| IPDM E/R | TRANSMIT DIAG | Make sure of normal transmission. | OK/UNKWN/– | OK/0/1~39/– |
| | ECM | Make sure of normal reception from ECM. | OK/UNKWN/– | |
| | BCM/SEC | Make sure of normal reception from BCM. | OK/UNKWN/– | |

### Display Results (Present)

- OK : Normal

- UNKWN : The diagnosed unit does not transmit or receive the applicable data normally.

- – : There is no received unit or the unit is not in the condition that reception diagnosis is performed.

### Display Results (Past)

- OK : Normal

- 0 : There is malfunction now.

- 1 ~ 39 : Displays when it is normal at present and finds malfunction in the past. It increases like 0→1→2...38→39 after returning to the normal condition whenever IGN OFF→ON. If it is over 39, it is fixed to 39 until the self-diagnostic results are erased. It returns to 0 when malfunction is detected again in the process.

- – : Undiagnosed

## CAN COMMUNICATION
PFP:23710

### System Description
UKS0046J

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
UKS0046K

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

| Body type | Wagon | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Axle | 2WD | | | | | 4WD | | | | | | |
| Engine | VQ40DE | | | | | | | | | | | |
| Transmission | M/T | | | A/T | | M/T | | | | A/T | | |
| Brake control | ABS | ABLS | VDC | ABS | VDC | ABLS | | VDC | | ABLS | VDC | |
| Electronic locking rear differential | | | | | | | × | | × | | | × |
| CAN system type | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| CAN system trouble diagnosis | LAN-39 | LAN-62 | LAN-85 | LAN-109 | LAN-136 | LAN-165 | LAN-189 | LAN-215 | LAN-241 | LAN-268 | LAN-297 | LAN-327 |

×: Applicable

**NOTE:**
Confirming the presence of the following items helps to identify CAN system type.
- Models with 4WD



4WD shift switch

BKIA0154E

- Models with VDC



VDC OFF switch

BKIA0153E

● Models with ABLS

**Models with ABLS***

ABS: ⬭ U

⚫(ABS) : ⬭ N

SLIP*

⬭ N : CANADA

⬭ U : USA

*: Confirm VDC OFF indicator is not present.

BKIA0174E

● Models with electronic locking rear differential

Differential lock mode switch

BKIA0156E

## TYPE 1
## System diagram

● Type 1

BCM

Combination meter

CAN H

CAN L

ECM

Data link connector

ABS actuator and electric unit(control unit)

IPDM E/R

PKIB6503E

## Input/output signal chart

T: Transmit   R: Receive

| Signals | ECM | BCM | Combination meter | ABS actuator and electric unit (control unit) | IPDM E/R |
|---|---|---|---|---|---|
| Engine speed signal | T | | R | | |
| Engine status signal | T | R | | | |
| Engine coolant temperature signal | T | | R | | |
| Accelerator pedal position signal | T | | | | |
| A/C switch signal | R | T | | | |
| A/C compressor request signal | T | | | | R |

| Signals | ECM | BCM | Combination meter | ABS actuator and electric unit (control unit) | IPDM E/R |
|---|---|---|---|---|---|
| Blower fan motor switch signal | R | T | | | |
| Cooling fan speed request signal | T | | | | R |
| Low beam request signal | | T | | | R |
| Low beam status signal | R | | | | T |
| High beam request signal | | T | R | | R |
| High beam status signal | R | | | | T |
| Position light request signal | | T | | | R |
| Front fog light request signal | | T | R | | R |
| Day time running light request signal | | T | | | R |
| Sleep wake up signal | | T | R | | R |
| Door switch signal | | T | R | | R |
| Seat belt buckle switch signal | | R | T | | |
| Ignition switch signal | | T | | | R |
| Theft warning horn request signal | | T | | | R |
| Horn chirp signal | | T | | | R |
| Front wiper request signal | | T | | | R |
| Front wiper stop position signal | | R | | | T |
| Rear window defogger switch signal | | T | | | R |
| Rear window defogger control signal | R | | | | T |
| Buzzer output signal | | T | R | | |
| Fuel consumption monitor signal | T | | R | | |
| Fuel level sensor signal | R | | T | | |
| Turn indicator signal | | T | R | | |
| Brake warning lamp signal | | | R | T | |
| ABS warning lamp signal | | | R | T | |
| Malfunction indicator lamp signal | T | | R | | |
| ASCD CRUISE lamp signal | T | | R | | |
| ASCD SET lamp signal | T | | R | | |
| Vehicle speed signal | R | | R | T | |
| | R | R | T | | |
| Power generation command value signal | T | | | | R |

## TYPE 2
## System diagram
- Type 2



PKIB6503E

## Input/output signal chart

T: Transmit   R: Receive

| Signals | ECM | BCM | Combination meter | ABS actuator and electric unit (control unit) | IPDM E/R |
|---|---|---|---|---|---|
| Engine speed signal | T | | R | R | |
| Engine status signal | T | R | | | |
| Engine coolant temperature signal | T | | R | | |
| Accelerator pedal position signal | T | | | R | |
| A/C switch signal | R | T | | | |
| A/C compressor request signal | T | | | | R |
| Blower fan motor switch signal | R | T | | | |
| Cooling fan speed request signal | T | | | | R |
| Low beam request signal | | T | | | R |
| Low beam status signal | R | | | | T |
| High beam request signal | | T | R | | R |
| High beam status signal | R | | | | T |
| Position light request signal | | T | | | R |
| Front fog light request signal | | T | R | | R |
| Day time running light request signal | | T | | | R |
| Sleep wake up signal | | T | R | | R |
| Door switch signal | | T | R | | R |
| Seat belt buckle switch signal | | R | T | | |
| Ignition switch signal | | T | | | R |
| Theft warning horn request signal | | T | | | R |
| Horn chirp signal | | T | | | R |
| Front wiper request signal | | T | | | R |
| Front wiper stop position signal | | R | | | T |
| Rear window defogger switch signal | | T | | | R |
| Rear window defogger control signal | R | | | | T |

# CAN COMMUNICATION

| Signals | ECM | BCM | Combination meter | ABS actuator and electric unit (control unit) | IPDM E/R |
|---|---|---|---|---|---|
| Buzzer output signal | | T | R | | |
| Fuel consumption monitor signal | T | | R | | |
| Fuel level sensor signal | R | | T | | |
| Turn indicator signal | | T | R | | |
| Brake warning lamp signal | | | R | T | |
| ABS warning lamp signal | | | R | T | |
| SLIP indicator lamp signal | | | R | T | |
| Malfunction indicator lamp signal | T | | R | | |
| ASCD CRUISE lamp signal | T | | R | | |
| ASCD SET lamp signal | T | | R | | |
| Vehicle speed signal | R | | R | T | |
| | R | R | T | | |
| Power generation command value signal | T | | | | R |

## TYPE 3
## System diagram
- Type 3



PKIB9503E

# CAN COMMUNICATION

## TYPE 4
## System diagram

● Type 4



PKIB6504E

## Input/output signal chart

T: Transmit   R: Receive

| Signals | ECM | TCM | BCM | Combination meter | ABS actuator and electric unit (control unit) | IPDM E/R |
|---|---|---|---|---|---|---|
| Engine speed signal | T | R | | R | | |
| Engine status signal | T | | R | | | |
| Engine coolant temperature signal | T | | | R | | |
| Accelerator pedal position signal | T | R | | | | |
| Closed throttle position signal | T | R | | | | |
| Wide open throttle position signal | T | R | | | | |
| Battery voltage signal | T | R | | | | |
| A/T self-diagnosis signal | R | T | | | | |
| Turbine revolution signal | R | T | | | | |
| Output shaft revolution signal | R | T | | | | |
| A/C switch signal | R | | T | | | |
| A/C compressor request signal | T | R | | | | R |
| Blower fan motor switch signal | R | | T | | | |
| Cooling fan speed request signal | T | | | | | R |
| Low beam request signal | | | T | | | R |
| Low beam status signal | R | | | | | T |
| High beam request signal | | | T | R | | R |
| High beam status signal | R | | | | | T |
| Position light request signal | | | T | | | R |
| Front fog light request signal | | | T | R | | R |
| Day time running light request signal | | | T | | | R |
| Sleep wake up signal | | | T | R | | R |
| Door switch signal | | | T | R | | R |
| Seat belt buckle switch signal | | | R | T | | |

# CAN COMMUNICATION

## [CAN]

| Signals | ECM | TCM | BCM | Combination meter | ABS actuator and electric unit (control unit) | IPDM E/R |
|---|---|---|---|---|---|---|
| Ignition switch signal | | | T | | | R |
| Theft warning horn request signal | | | T | | | R |
| Horn chirp signal | | | T | | | R |
| Front wiper request signal | | | T | | | R |
| Front wiper stop position signal | | | R | | | T |
| Rear window defogger switch signal | | | T | | | R |
| Rear window defogger control signal | R | | | | | T |
| Buzzer output signal | | | T | R | | |
| Fuel consumption monitor signal | T | | | R | | |
| Fuel level sensor signal | R | | | T | | |
| Turn indicator signal | | | T | R | | |
| Brake warning lamp signal | | | | R | T | |
| ABS warning lamp signal | | | | R | T | |
| Malfunction indicator lamp signal | T | | | R | | |
| ASCD CRUISE lamp signal | T | | | R | | |
| ASCD SET lamp signal | T | | | R | | |
| ASCD operation signal | T | R | | | | |
| ASCD OD cancel request | T | R | | | | |
| A/T fluid temperature sensor signal | R | T | | R | | |
| A/T position indicator lamp signal | R | T | | R | | |
| O/D OFF indicator signal | | T | | R | | |
| Overdrive control switch signal | | R | | T | | |
| 1st position switch signal | | R | | T | | |
| Stop lamp switch signal | | R | | T | | |
| Vehicle speed signal | R | | | R | T | |
| | R | R | R | T | | |
| Power generation command value signal | T | | | | | R |

## TYPE 5
## System diagram

● Type 5



SKIB4517E

## Input/output signal chart

T: Transmit   R: Receive

| Signals | ECM | TCM | Steering angle sensor | BCM | Combination meter | ABS actuator and electric unit (control unit) | IPDM E/R |
|---|---|---|---|---|---|---|---|
| Engine speed signal | T | R | | | R | R | |
| Engine status signal | T | | | R | | | |
| Engine coolant temperature signal | T | | | | R | | |
| Accelerator pedal position signal | T | R | | | | R | |
| Closed throttle position signal | T | R | | | | | |
| Wide open throttle position signal | T | R | | | | | |
| Battery voltage signal | T | R | | | | | |
| A/T self-diagnosis signal | R | T | | | | | |
| Turbine revolution signal | R | T | | | | | |
| Output shaft revolution signal | R | T | | | | | |
| A/C switch signal | R | | | T | | | |
| A/C compressor request signal | T | R | | | | | R |
| Blower fan motor switch signal | R | | | T | | | |
| Cooling fan speed request signal | T | | | | | | R |
| Low beam request signal | | | | T | | | R |
| Low beam status signal | R | | | | | | T |
| High beam request signal | | | | T | R | | R |
| High beam status signal | R | | | | | | T |
| Position light request signal | | | | T | | | R |
| Front fog light request signal | | | | T | R | | R |
| Day time running light request signal | | | | T | | | R |
| Sleep wake up signal | | | | T | R | | R |
| Door switch signal | | | | T | R | | R |
| Seat belt buckle switch signal | | | | R | T | | |

| Signals | ECM | TCM | Steering angle sensor | BCM | Combination meter | ABS actuator and electric unit (control unit) | IPDM E/R |
|---|---|---|---|---|---|---|---|
| Ignition switch signal | | | | T | | | R |
| Theft warning horn request signal | | | | T | | | R |
| Horn chirp signal | | | | T | | | R |
| Front wiper request signal | | | | T | | | R |
| Front wiper stop position signal | | | | R | | | T |
| Rear window defogger switch signal | | | | T | | | R |
| Rear window defogger control signal | R | | | | | | T |
| Buzzer output signal | | | | T | R | | |
| Fuel consumption monitor signal | T | | | | R | | |
| Fuel level sensor signal | R | | | | T | | |
| Turn indicator signal | | | | T | R | | |
| Brake warning lamp signal | | | | | R | T | |
| ABS warning lamp signal | | | | | R | T | |
| VDC OFF indicator lamp signal | | | | | R | T | |
| SLIP indicator lamp signal | | | | | R | T | |
| HDC indicator lamp signal* | | | | | R | T | |
| Malfunction indicator lamp signal | T | | | | R | | |
| ASCD CRUISE lamp signal | T | | | | R | | |
| ASCD SET lamp signal | T | | | | R | | |
| ASCD operation signal | T | R | | | | | |
| ASCD OD cancel request | T | R | | | | | |
| A/T fluid temperature sensor signal | R | T | | | R | | |
| A/T position indicator lamp signal | R | T | | | R | R | |
| O/D OFF indicator signal | | T | | | R | | |
| Overdrive control switch signal | | R | | | T | R | |
| 1st position switch signal | | R | | | T | | |
| Stop lamp switch signal | | R | | R | T | | |
| Vehicle speed signal | R | | | | R | T | |
| | R | R | | R | T | | |
| Steering angle sensor signal | | | T | | | R | |
| Power generation command value signal | T | | | | | | R |

**NOTE:**
*: HDC model only

## TYPE 6/ TYPE 7
## System diagram

● Type 6



PKIB6506E

● Type 7



PKIB6507E

## Input/output signal chart

T: Transmit   R: Receive

| Signals | ECM | Differential lock con-trol unit | BCM | Combina-tion meter | Transfer control unit | ABS actua-tor and electric unit (control unit) | IPDM E/R |
|---|---|---|---|---|---|---|---|
| Engine speed signal | T | | | R | R | R | |
| Engine status signal | T | | R | | | | |
| Engine coolant temperature signal | T | | | R | | | |
| Accelerator pedal position signal | T | | | | | R | |
| A/C switch signal | R | | T | | | | |
| A/C compressor request signal | T | | | | | | R |
| Blower fan motor switch signal | R | | T | | | | |
| Cooling fan speed request signal | T | | | | | | R |
| Low beam request signal | | | T | | | | R |

| Signals | ECM | Differential lock control unit | BCM | Combination meter | Transfer control unit | ABS actuator and electric unit (control unit) | IPDM E/R |
|---|---|---|---|---|---|---|---|
| Low beam status signal | R | | | | | | T |
| High beam request signal | | | T | R | | | R |
| High beam status signal | R | | | | | | T |
| Position light request signal | | | T | | | | R |
| Front fog light request signal | | | T | R | | | R |
| Day time running light request signal | | | T | | | | R |
| Sleep wake up signal | | | T | R | | | R |
| Door switch signal | | | T | R | | | R |
| Seat belt buckle switch signal | | | R | T | | | |
| Ignition switch signal | | | T | | | | R |
| Theft warning horn request signal | | | T | | | | R |
| Horn chirp signal | | | T | | | | R |
| Front wiper request signal | | | T | | | | R |
| Front wiper stop position signal | | | R | | | | T |
| Rear window defogger switch signal | | | T | | | | R |
| Rear window defogger control signal | R | | | | | | T |
| Buzzer output signal | | | T | R | | | |
| Fuel consumption monitor signal | T | | | R | | | |
| Fuel level sensor signal | R | | | T | | | |
| Turn indicator signal | | | T | R | | | |
| Brake warning lamp signal | | | | R | | T | |
| ABS warning lamp signal | | | | R | | T | |
| SLIP indicator lamp signal | | | | R | | T | |
| Malfunction indicator lamp signal | T | | | R | | | |
| ASCD CRUISE lamp signal | T | | | R | | | |
| ASCD SET lamp signal | T | | | R | | | |
| Stop lamp switch signal | | | | | R | T | |
| | | | R | T | | | |
| Vehicle speed signal | R | | | R | | T | |
| | R | | R | T | R | | |
| Differential lock switch signal | | T | | | | R | |
| Differential lock indicator signal | | T | | | | R | |
| 4WD shift switch signal | R | R | | | T | R | |
| Power generation command value signal | T | | | | | | R |

## TYPE 8/ TYPE 9

## System diagram

- Type 8



SKIB4518E

- Type 9



SKIB4519E

## Input/output signal chart

T: Transmit  R: Receive

| Signals | ECM | Differential lock control unit | Steering angle sensor | BCM | Combination meter | Transfer control unit | ABS actuator and electric unit (control unit) | IPDM E/R |
|---|---|---|---|---|---|---|---|---|
| Engine speed signal | T | | | | R | R | R | |
| Engine status signal | T | | | R | | | | |
| Engine coolant temperature signal | T | | | | R | | | |
| Accelerator pedal position signal | T | | | | | | R | |
| A/C switch signal | R | | | T | | | | |
| A/C compressor request signal | T | | | | | | | R |
| Blower fan motor switch signal | R | | | T | | | | |
| Cooling fan speed request signal | T | | | | | | | R |
| Low beam request signal | | | | T | | | | R |

| Signals | ECM | Differential lock control unit | Steering angle sensor | BCM | Combination meter | Transfer control unit | ABS actuator and electric unit (control unit) | IPDM E/R |
|---|---|---|---|---|---|---|---|---|
| Low beam status signal | R | | | | | | | T |
| High beam request signal | | | | T | R | | | R |
| High beam status signal | R | | | | | | | T |
| Position light request signal | | | | T | | | | R |
| Front fog light request signal | | | | T | R | | | R |
| Day time running light request signal | | | | T | | | | R |
| Sleep wake up signal | | | | T | R | | | R |
| Door switch signal | | | | T | R | | | R |
| Seat belt buckle switch signal | | | | R | T | | | |
| Ignition switch signal | | | | T | | | | R |
| Theft warning horn request signal | | | | T | | | | R |
| Horn chirp signal | | | | T | | | | R |
| Front wiper request signal | | | | T | | | | R |
| Front wiper stop position signal | | | | R | | | | T |
| Rear window defogger switch signal | | | | T | | | | R |
| Rear window defogger control signal | R | | | | | | | T |
| Buzzer output signal | | | | T | R | | | |
| Fuel consumption monitor signal | T | | | | R | | | |
| Fuel level sensor signal | R | | | | T | | | |
| Turn indicator signal | | | | T | R | | | |
| Brake warning lamp signal | | | | | R | | T | |
| ABS warning lamp signal | | | | | R | | T | |
| VDC OFF indicator lamp signal | | | | | R | | T | |
| SLIP indicator lamp signal | | | | | R | | T | |
| HDC indicator lamp signal | | | | | R | | T | |
| Malfunction indicator lamp signal | T | | | | R | | | |
| ASCD CRUISE lamp signal | T | | | | R | | | |
| ASCD SET lamp signal | T | | | | R | | | |
| Stop lamp switch signal | | | | | | R | T | |
| Vehicle speed signal | R | | | | R | | T | |
| Vehicle speed signal | R | | | R | T | R | | |
| Steering angle sensor signal | | | T | | | R | R | |
| Differential lock switch signal | | T | | | | | R | |
| Differential lock indicator signal | | T | | | | | R | |
| 4WD shift switch signal | R | R | | | | T | R | |
| Power generation command value signal | T | | | | | | | R |

**NOTE:**
*: HDC model only

## TYPE 10
## System diagram

● Type 10



PKIB6508E

## Input/output signal chart

T: Transmit   R: Receive

| Signals | ECM | TCM | BCM | Combina-tion meter | Transfer control unit | ABS actua-tor and electric unit (control unit) | IPDM E/R |
|---|---|---|---|---|---|---|---|
| Engine speed signal | T | R | | R | R | R | |
| Engine status signal | T | | R | | | | |
| Engine coolant temperature signal | T | | | R | | | |
| Accelerator pedal position signal | T | R | | | | R | |
| Closed throttle position signal | T | R | | | | | |
| Wide open throttle position signal | T | R | | | | | |
| Battery voltage signal | T | R | | | | | |
| A/T self-diagnosis signal | R | T | | | | | |
| Turbine revolution signal | R | T | | | | | |
| Output shaft revolution signal | R | T | | | R | | |
| A/C switch signal | R | | T | | | | |
| A/C compressor request signal | T | R | | | | | R |
| Blower fan motor switch signal | R | | T | | | | |
| Cooling fan speed request signal | T | | | | | | R |
| Low beam request signal | | | T | | | | R |
| Low beam status signal | R | | | | | | T |
| High beam request signal | | | T | R | | | R |
| High beam status signal | R | | | | | | T |
| Position light request signal | | | T | | | | R |
| Front fog light request signal | | | T | R | | | R |
| Day time running light request signal | | | T | | | | R |
| Sleep wake up signal | | | T | R | | | R |
| Door switch signal | | | T | R | | | R |
| Seat belt buckle switch signal | | | R | T | | | |

| Signals | ECM | TCM | BCM | Combination meter | Transfer control unit | ABS actuator and electric unit (control unit) | IPDM E/R |
|---|---|---|---|---|---|---|---|
| Ignition switch signal | | | T | | | | R |
| Theft warning horn request signal | | | T | | | | R |
| Horn chirp signal | | | T | | | | R |
| Front wiper request signal | | | T | | | | R |
| Front wiper stop position signal | | | R | | | | T |
| Rear window defogger switch signal | | | T | | | | R |
| Rear window defogger control signal | R | | | | | | T |
| Buzzer output signal | | | T | R | | | |
| Fuel consumption monitor signal | T | | | R | | | |
| Fuel level sensor signal | R | | | T | | | |
| Turn indicator signal | | | T | R | | | |
| Brake warning lamp signal | | | | R | | T | |
| ABS warning lamp signal | | | | R | | T | |
| SLIP indicator lamp signal | | | | R | | T | |
| Malfunction indicator lamp signal | T | | | R | | | |
| ASCD CRUISE lamp signal | T | | | R | | | |
| ASCD SET lamp signal | T | | | R | | | |
| ASCD operation signal | T | R | | | | | |
| ASCD OD cancel request | T | R | | | | | |
| A/T fluid temperature sensor signal | R | T | | R | | | |
| A/T position indicator lamp signal | R | T | | R | R | R | |
| O/D OFF indicator signal | | T | | R | | | |
| Overdrive control switch signal | | R | | T | | R | |
| 1st position switch signal | | R | | T | | | |
| Stop lamp switch signal | R | R | R | T | | | |
| | | | | | R | T | |
| Vehicle speed signal | R | | | R | | T | |
| | R | R | R | T | R | | |
| 4WD shift switch signal | R | R | | | T | R | |
| Power generation command value signal | T | | | | | | R |

## TYPE 11/ TYPE 12
## System diagram
● Type 11



PKIB6510E

● Type 12



PKIB6511E

## Input/output signal chart

T: Transmit   R: Receive

| Signals | ECM | TCM | Differential lock control unit | Steering angle sensor | BCM | Combination meter | Transfer control unit | ABS actuator and electric unit (control unit) | IPDM E/R |
|---|---|---|---|---|---|---|---|---|---|
| Engine speed signal | T | R | | | | R | R | R | |
| Engine status signal | T | | | | R | | | | |
| Engine coolant temperature signal | T | | | | | R | | | |
| Accelerator pedal position signal | T | R | | | | | | R | |
| Closed throttle position signal | T | R | | | | | | | |
| Wide open throttle position signal | T | R | | | | | | | |
| Battery voltage signal | T | R | | | | | | | |
| A/T self-diagnosis signal | R | T | | | | | | | |

| Signals | ECM | TCM | Differential lock control unit | Steering angle sensor | BCM | Combination meter | Transfer control unit | ABS actuator and electric unit (control unit) | IPDM E/R |
|---|---|---|---|---|---|---|---|---|---|
| Turbine revolution signal | R | T | | | | | | | |
| Output shaft revolution signal | R | T | | | | | R | | |
| A/C switch signal | R | | | | T | | | | |
| A/C compressor request signal | T | R | | | | | | | R |
| Blower fan motor switch signal | R | | | | T | | | | |
| Cooling fan speed request signal | T | | | | | | | | R |
| Low beam request signal | | | | | T | | | | R |
| Low beam status signal | R | | | | | | | | T |
| High beam request signal | | | | | T | R | | | R |
| High beam status signal | R | | | | | | | | T |
| Position light request signal | | | | | T | | | | R |
| Front fog light request signal | | | | | T | R | | | R |
| Day time running light request signal | | | | | T | | | | R |
| Sleep wake up signal | | | | | T | R | | | R |
| Door switch signal | | | | | T | R | | | R |
| Seat belt buckle switch signal | | | | | R | T | | | |
| Ignition switch signal | | | | | T | | | | R |
| Theft warning horn request signal | | | | | T | | | | R |
| Horn chirp signal | | | | | T | | | | R |
| Front wiper request signal | | | | | T | | | | R |
| Front wiper stop position signal | | | | | R | | | | T |
| Rear window defogger switch signal | | | | | T | | | | R |
| Rear window defogger control signal | R | | | | | | | | T |
| Buzzer output signal | | | | | T | R | | | |
| Fuel consumption monitor signal | T | | | | | R | | | |
| Fuel level sensor signal | R | | | | | T | | | |
| Turn indicator signal | | | | | T | R | | | |
| Brake warning lamp signal | | | | | | R | | T | |
| ABS warning lamp signal | | | | | | R | | T | |
| VDC OFF indicator lamp signal | | | | | | R | | T | |
| SLIP indicator lamp signal | | | | | | R | | T | |
| HDC indicator lamp signal | | | | | | R | | T | |
| Malfunction indicator lamp signal | T | | | | | R | | | |
| ASCD CRUISE lamp signal | T | | | | | R | | | |
| ASCD SET lamp signal | T | | | | | R | | | |
| ASCD operation signal | T | R | | | | | | | |
| ASCD OD cancel request | T | R | | | | | | | |
| A/T fluid temperature sensor signal | R | T | | | | R | | | |
| A/T position indicator lamp signal | R | T | | | | R | R | R | |
| O/D OFF indicator signal | | T | | | | R | | | |

| Signals | ECM | TCM | Differential lock control unit | Steering angle sensor | BCM | Combination meter | Transfer control unit | ABS actuator and electric unit (control unit) | IPDM E/R |
|---|---|---|---|---|---|---|---|---|---|
| Overdrive control switch signal | | R | | | | T | | R | |
| 1st position switch signal | | R | | | | T | | | |
| Stop lamp switch signal | | R | | | R | T | | | |
| | | | | | | | R | T | |
| Vehicle speed signal | R | | | | | R | | T | |
| | R | R | | | R | T | R | | |
| Steering angle sensor signal | | | | T | | | R | R | |
| Differential lock switch signal | | | T | | | | | R | |
| Differential lock indicator signal | | | T | | | | | R | |
| 4WD shift switch signal | R | R | R | | | | T | R | |
| Power generation command value signal | T | | | | | | | | R |

## CAN SYSTEM (TYPE 1)

PFP:23710

### System Description

UKS0046L

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

UKS0046M



BKIA0175E

## Schematic

BKWA0571E

## Wiring Diagram — CAN —

UKS0046O

LAN-CAN-01

■□■ : DATA LINE

A

B

C

D

E

F

G

H

I

J

LAN

L

M

```
                    L ■▶ A ⟩
                                  } NEXT
                                    PAGE
                    P ■▶ B ⟩

                    L              P
                  (M31)
              [52G]  -----  [51G]
              (E152)
                    L              P

                    L              P
                  [94]           [86]
                CAN-H          CAN-L   ECM
                                      (E16)
```

REFER TO THE FOLLOWING.
(M31) - SUPER MULTIPLE
JUNCTION (SMJ)

```
┌──────────────────────────────┐
│106│107│108│109│110│111│112│113│ │119│120│121│
│ 98│ 99│100│101│102│103│104│105│ │   117│118   │
│ 90│ 91│ 92│ 93│ 94│ 95│ 96│ 97│ │114│115│116│
│ 82│ 83│ 84│ 85│ 86│ 87│ 88│ 89│
└──────────────────────────────┘
                              (E16)
                               B      H.S.
```

BKWA0572E

## LAN-CAN-02

▬▬ : DATA LINE

DATA
LINK
CONNECTOR
(M22)

| 6 | 14 |

L     P

◁A L

L C▷

PRECEDING
PAGE

NEXT
PAGE

◁B P

P D▷

| 12 | 11 |
CAN-H  CAN-L
COMBINATION
METER
(M24)

| 39 | 40 |
CAN-H  CAN-L
BCM
(BODY
CONTROL
MODULE)
(M18)

(M18) W  H.S.

(M22) W

(M24) W

BKWA0573E

## LAN-CAN-03

A

B

C

D

E

F

G

H

I

J

LAN

L

M

■■■ : DATA LINE

PRECEDING PAGE

C — L

D — P

L    M91    P
11   E26   10
L          P

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)
CAN-H  CAN-L
11     15
E125

IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) (CPU)
CAN-H  CAN-L
39     40
E122

| 1 | 2 | 3 | ☐ | 4 | 5 | 6 | 7 | M91 |
|---|---|---|---|---|---|---|---|-----|
| 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | W |

| 37 | 38 | 39 | 40 | 41 | 42 | E122 |
|----|----|----|----|----|----|------|
| 43 | 44 | 45 | 46 | 47 | 48 | W |

| 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | E125 |
| 47 | 31 | 30 | 29 | 28 | 27 | 26 | 25 | 24 | 23 | 22 | 21 | 20 | 19 | 18 | 17 | 32 | B |
|    | 46 | 45 | 44 | 43 | 42 | 41 | 40 | 39 | 38 | 37 | 36 | 35 | 34 | 33 | | |

BKWA0574E

# CHECK SHEET

UKS0046P

**NOTE:**
If a check mark is put on "NG" on "INITIAL DIAG (Initial diagnosis)", replace the control unit.

Check sheet table

| SELECT SYSTEM screen | | CAN DIAG SUPPORT MNTR | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|
| | | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | |
| | | | | ECM | BCM /SEC | METER /M&A | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| BCM | No indication | NG | UNKWN | UNKWN | — | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |

Symptoms :

Attach copy of
SELECT SYSTEM

Attach copy of
SELECT SYSTEM

PKIB6516E

A

B

C

D

E

F

G

H

I

J

LAN

L

M

Attach copy of
ENGINE
SELF-DIAG RESULTS

Attach copy of
BCM
SELF-DIAG RESULTS

Attach copy of
METER
SELF-DIAG RESULTS

Attach copy of
ABS
SELF-DIAG RESULTS

Attach copy of
IPDM E/R
SELF-DIAG RESULTS

Attach copy of
ENGINE
CAN DIAG SUPPORT
MNTR

Attach copy of
BCM
CAN DIAG SUPPORT
MNTR

Attach copy of
ABS
CAN DIAG SUPPORT
MNTR

Attach copy of
IPDM E/R
CAN DIAG SUPPORT
MNTR

PKIB6517E

# CAN SYSTEM (TYPE 1)

[CAN]

## CHECK SHEET RESULTS (EXAMPLE)

**NOTE:**

If a check mark is put on "NG" on "INITIAL DIAG (Initial diagnosis)", replace the control unit.

### Case 1

Check harness between data link connector and ABS actuator and electric unit (control unit) circuit. Refer to LAN-53, "Inspection Between Data Link Connector and ABS Actuator and Electric Unit (Control Unit) Circuit" .

| SELECT SYSTEM screen | | CAN DIAG SUPPORT MNTR | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|
| | | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | |
| | | | | ECM | BCM /SEC | METER /M&A | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| BCM | No indication | NG | UNKWN | UNKWN | — | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB7252E



////// : Malfunctioning part

PKIB7058E

Revision: February 2006 **LAN-46** 2005 Xterra

## Case 2

Check ECM circuit. Refer to LAN-54, "ECM Circuit Inspection" .

| SELECT SYSTEM screen | | Initial diagnosis | Transmit diagnosis | CAN DIAG SUPPORT MNTR | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Receive diagnosis | | | | | |
| | | | | ECM | BCM /SEC | METER /M&A | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| BCM | No indication | NG | UNKWN | UNKWN | — | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB7253E



PKIB7059E

## Case 3

Check data link connector circuit. Refer to LAN-55, "Data Link Connector Circuit Inspection" .

| SELECT SYSTEM screen | | CAN DIAG SUPPORT MNTR | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|
| | | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | |
| | | | | ECM | BCM /SEC | METER /M&A | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| BCM | No indication | NG | UNKWN | UNKWN | — | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB7254E

//// : Malfunctioning part

PKIB7060E

## Case 4

Check BCM circuit. Refer to LAN-55, "BCM Circuit Inspection" .

| SELECT SYSTEM screen | | CAN DIAG SUPPORT MNTR | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|
| | | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | |
| | | | | ECM | BCM /SEC | METER /M&A | IPDM E/R | | |
| ENGINE | — | | NG | UNKWN | — | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| BCM | No indication | | NG | UNKWN | UNKWN | — | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | | NG | UNKWN | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | | — | UNKWN | UNKWN | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB7255E



/////// : Malfunctioning part

BCM
Combination meter
CAN H
CAN L
ECM
Data link connector
ABS actuator and electric unit(control unit)
IPDM E/R

PKIB7061E

## Case 5

Check combination meter circuit. Refer to LAN-56, "Combination Meter Circuit Inspection" .

| SELECT SYSTEM screen | | CAN DIAG SUPPORT MNTR | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|
| | | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | |
| | | | | ECM | BCM /SEC | METER /M&A | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| BCM | No indication | NG | UNKWN | UNKWN | — | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB7256E



: Malfunctioning part

PKIB7062E

## Case 6

Check ABS actuator and electric unit (control unit) circuit. Refer to LAN-56, "ABS Actuator and Electric Unit (Control Unit) Circuit Inspection" .

| SELECT SYSTEM screen | | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | ECM | BCM /SEC | METER /M&A | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| BCM | No indication | NG | UNKWN | UNKWN | — | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |

Note: CAN DIAG SUPPORT MNTR spans Initial diagnosis, Transmit diagnosis, and Receive diagnosis columns.

PKIB7257E

/////// : Malfunctioning part

BCM

Combination meter

CAN H

CAN L

ECM

Data link connector

ABS actuator and electric unit(control unit)

IPDM E/R

PKIB7126E

## Case 7

Check IPDM E/R circuit. Refer to LAN-57, "IPDM E/R Circuit Inspection" .

| SELECT SYSTEM screen | | CAN DIAG SUPPORT MNTR | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|
| | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | |
| | | | ECM | BCM /SEC | METER /M&A | IPDM E/R | | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) | |
| BCM | No indication | NG | UNKWN | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — | |
| METER | No indication | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — | |
| ABS | — | NG | UNKWN | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — | |
| IPDM E/R | No indication | — | UNKWN | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — | |

PKIB7258E



/////// : Malfunctioning part

PKIB7127E

## Case 8

Check CAN communication circuit. Refer to LAN-58, "CAN Communication Circuit Inspection" .

| SELECT SYSTEM screen | | CAN DIAG SUPPORT MNTR | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|
| | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | |
| | | | ECM | BCM /SEC | METER /M&A | IPDM E/R | | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) | |
| BCM | No indication | NG | UNKWN | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — | |
| METER | No indication | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — | |
| ABS | — | NG | UNKWN | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — | |
| IPDM E/R | No indication | — | UNKWN | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — | |

PKIB7259E

## Case 9

Check IPDM E/R ignition relay circuit continuously sticks "OFF". Refer to LAN-61, "IPDM E/R Ignition Relay Circuit Inspection" .

| SELECT SYSTEM screen | | CAN DIAG SUPPORT MNTR | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|
| | | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | |
| | | | | ECM | BCM /SEC | METER /M&A | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| BCM | No indication | NG | UNKWN | UNKWN | — | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) ✓ | — |
| ABS | — | NG | UNKWN | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB7260E

## Case 10

Check IPDM E/R ignition relay circuit continuously sticks "ON". Refer to LAN-61, "IPDM E/R Ignition Relay Circuit Inspection" .

| SELECT SYSTEM screen | | CAN DIAG SUPPORT MNTR | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|
| | | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | |
| | | | | ECM | BCM /SEC | METER /M&A | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| BCM | No indication | NG | UNKWN | UNKWN | — | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) ✓ | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB7261E

# Inspection Between Data Link Connector and ABS Actuator and Electric Unit (Control Unit) Circuit

UKS0046Q

## 1. CHECK CONNECTOR

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

– Harness connector M91

– Harness connector E26

OK or NG

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

# CAN SYSTEM (TYPE 1)

## 2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect harness connector M91.
2. Check continuity between data link connector M22 terminals 6 (L), 14 (P) and harness connector M91 terminals 11 (L), 10 (P).

   **6 (L) – 11 (L)**        **: Continuity should exist.**
   **14 (P) – 10 (P)**       **: Continuity should exist.**

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



SKIB2812E

## 3. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect ABS actuator and electric unit (control unit) connector.
2. Check continuity between harness connector E26 terminals 11 (L), 10 (P) and ABS actuator and electric unit (control unit) harness connector E125 terminals 11 (L), 15 (P).

   **11 (L) – 11 (L)**       **: Continuity should exist.**
   **10 (P) – 15 (P)**       **: Continuity should exist.**

OK or NG
  OK     >> Connect all the connectors and diagnose again. Refer to LAN-6, "TROUBLE DIAGNOSES WORK FLOW" .
  NG     >> Repair harness.



SKIB2813E

## ECM Circuit Inspection

UKS0046R

### 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check following terminals and connectors for damage, bend and loose connection (control module side and harness side).
– ECM connector
– Harness connector E152
– Harness connector M31

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

## 2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect ECM connector.
2. Check resistance between ECM harness connector E16 terminals 94 (L) and 86 (P).

   **94 (L) – 86 (P)**      **: Approx. 108 – 132 Ω**

OK or NG

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

PKIA9592E

## Data Link Connector Circuit Inspection
UKS0046S

## 1. CHECK CONNECTOR

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

OK or NG

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

## 2. CHECK HARNESS FOR OPEN CIRCUIT

Check resistance between data link connector M22 terminals 6 (L) and 14 (P).

    **6 (L) – 14 (P)**      **: Approx. 54 – 66 Ω**

OK or NG

  OK     >> Diagnose again. Refer to LAN-6, "TROUBLE DIAGNOSES WORK FLOW" .
  NG     >> Repair harness between data link connector and BCM.

SKIA6868E

## BCM Circuit Inspection
UKS0046T

## 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check 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 M18 terminals 39 (L) and 40 (P).

   **39 (L) – 40 (P)**          **: Approx. 54 – 66 Ω**

OK or NG

  OK      >> Replace BCM. Refer to <u>BCS-19, "Removal and Installation of BCM"</u> .
  NG      >> Repair harness between BCM and data link connector.



SKIA6869E

## Combination Meter Circuit Inspection

*UKS0046U*

## 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative 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.
2. Check resistance between combination meter harness connector M24 terminals 12 (L) and 11 (P).

   **12 (L) – 11 (P)**          **: Approx. 54 – 66 Ω**

OK or NG

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



PKIA6837E

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

*UKS0046V*

## 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check terminals and connector of ABS actuator and electric unit (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.

# CAN SYSTEM (TYPE 1)

## 2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect ABS actuator and electric unit (control unit) connector.
2. Check resistance between ABS actuator and electric unit (control unit) harness connector E125 terminals 11 (L) and 15 (P).

    **11 (L) – 15 (P)**      **: Approx. 54 – 66 Ω**

OK or NG

  OK      >> Replace ABS actuator and electric unit (control unit).
  NG      >> Repair harness between ABS actuator and electric unit (control unit) and IPDM E/R.

ABS actuator and electric unit (control unit) connector

SKIA6872E

## IPDM E/R Circuit Inspection

UKS0046W

## 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check terminals and connector of IPDM E/R 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 IPDM E/R connector.
2. Check resistance between IPDM E/R harness connector E122 terminals 39 (L) and 40 (P).

    **39 (L) – 40 (P)**      **: Approx. 108 – 132 Ω**

OK or NG

  OK      >> Replace IPDM E/R.
  NG      >> Repair harness between IPDM E/R and ABS actuator and electric unit (control unit).

IPDM E/R connector

PKIA8141E

# CAN SYSTEM (TYPE 1)

## CAN Communication Circuit Inspection

UKS0046X

## 1. CHECK CONNECTOR

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

– ECM
– BCM
– Combination meter
– ABS actuator and electric unit (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 ECM connector and harness connector E152.
2. Check continuity between ECM harness connector E16 terminals 94 (L) and 86 (P).

    **94 (L) – 86 (P)**      **: Continuity should not exist.**

OK or NG

OK     >> GO TO 3.
NG     >> Repair harness between ECM and harness connector E152.



SKIA6865E

## 3. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between ECM harness connector E16 terminals 94 (L), 86 (P) and ground.

    **94 (L) – Ground**      **: Continuity should not exist.**

    **86 (P) – Ground**      **: Continuity should not exist.**

OK or NG

OK     >> GO TO 4.
NG     >> Repair harness between ECM and harness connector E152.



SKIB0571E

A

B

C

## 4. CHECK HARNESS FOR SHORT CIRCUIT

1. Disconnect following connectors.
- BCM connector
- Combination meter connector
- Harness connector M91
2. Check continuity between data link connector M22 terminals 6 (L) and 14 (P).

   **6 (L) – 14 (P)**      **: Continuity should not exist.**

D

Data link connector

E

F

<u>OK or NG</u>

OK    >> GO TO 5.
NG    >> Check the following harnesses. If any harness is damaged, repair the harness.
- Harness between data link connector and harness connector M31
- Harness between data link connector and BCM
- Harness between data link connector and combination meter
- Harness between data link connector and harness connector M91

SKIA6868E

G

## 5. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between data link connector M22 terminals 6 (L), 14 (P) and ground.

   **6 (L) – Ground**      **: Continuity should not exist.**
   **14 (P) – Ground**      **: Continuity should not exist.**

H

Data link connector

I

<u>OK or NG</u>

OK    >> GO TO 6.
NG    >> Check the following harnesses. If any harness is damaged, repair the harness.
- Harness between data link connector and harness connector M31
- Harness between data link connector and BCM
- Harness between data link connector and combination meter
- Harness between data link connector and harness connector M91

J

PKIA9872E

LAN

L

## 6. CHECK HARNESS FOR SHORT CIRCUIT

M

1. Disconnect ABS actuator and electric unit (control unit) connector and IPDM E/R connector.
2. Check continuity between IPDM E/R harness connector E122 terminals 39 (L) and 40 (P).

   **39 (L) – 40 (P)**      **: Continuity should not exist.**

IPDM E/R connector

<u>OK or NG</u>

OK    >> GO TO 7.
NG    >> Check the following harnesses. If any harness is damaged, repair the harness.
- Harness between IPDM E/R and ABS actuator and electric unit (control unit)
- Harness between IPDM E/R and harness connector E26

PKIA8141E

## 7. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between IPDM E/R harness connector E122 terminals 39 (L), 40 (P) and ground.

**39 (L) – Ground** : **Continuity should not exist.**

**40 (P) – Ground** : **Continuity should not exist.**

OK or NG

OK >> GO TO 8.
NG >> Check the following harnesses. If any harness is damaged, repair the harness.
- Harness between IPDM E/R and ABS actuator and electric unit (control unit)
- Harness between IPDM E/R and harness connector E26

IPDM E/R connector

40 39

Ω

SKIB2821E

## 8. CHECK ECM AND IPDM E/R INTERNAL CIRCUIT

1. Remove ECM and IPDM E/R from vehicle.
2. Check resistance between ECM terminals 94 and 86.

**94 – 86** : **Approx. 108 – 132 Ω**

3. Check resistance between IPDM E/R terminals 39 and 40.

**39 – 40** : **Approx. 108 – 132 Ω**

OK or NG

OK >> GO TO 9.
NG >> Replace ECM and/or IPDM E/R.

**ECM and IPDM E/R**

LKIA0037E

## 9. CHECK SYMPTOM

1. Fill in described symptoms on the column "Symptom" in the check sheet.
2. Connect all connectors, and then make sure that the symptom is reproduced.

OK or NG

OK >> GO TO 10.
NG >> Refer to LAN-14, "Example of Filling in Check Sheet When Initial Conditions Are Not Reproduced".

## 10. CHECK UNIT REPRODUCIBILITY

Perform the following procedure for each unit, and then perform reproducibility test.

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Disconnect the unit connector.
4. Connect the battery cable to the negative terminal.
5. Make sure that the symptom filled in the "Symptom" of the check sheet is reproduced. (Do not confuse it with the symptom related to removed unit.)
6. Make sure that the same symptom is reproduced.
– BCM
– Combination meter
– ABS actuator and electric unit (control unit)
– ECM
– IPDM E/R

Inspection results

Reproduced>>Install removed unit, and then check the other unit.
Not reproduced>>Replace removed unit.

## IPDM E/R Ignition Relay Circuit Inspection

*UKS0046Y*

Check the following. If no malfunction is found, replace the IPDM E/R.

- IPDM E/R power supply circuit. Refer to PG-27, "IPDM E/R Power/Ground Circuit Inspection" .
- Ignition power supply circuit. Refer to PG-14, "IGNITION POWER SUPPLY — IGNITION SW. IN ON AND/OR START" .

A

B

C

D

E

F

G

H

I

J

LAN

L

M

## CAN SYSTEM (TYPE 2)

PFP:23710

### System Description

*UKS0046Z*

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

*UKS00470*

IPDM E/R (intelligent power distribution module engine room) (E122)

ECM (E16)

Combination meter (M24)

BCM (body control module) (M18)

ABS actuator and electric unit (control unit) (E125)

Data link connector (M22)

BKIA0175E

## Schematic

A

B

C

D

E

F

G

H

I

J

LAN

L

M

| | | |
|---|---|---|
| 40 | 39 | IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) |
| 15 | 11 | ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) |
| 40 | 39 | BCM (BODY CONTROL MODULE) |
| 14 | 6 | DATA LINK CONNECTOR |
| 11 | 12 | COMBINATION METER |
| 86 | 94 | ECM |

BKWA0571E

## Wiring Diagram — CAN —

UKS00472

### LAN-CAN-04

■■ : DATA LINE

L [A] ⟩
P [B] ⟩ } NEXT PAGE

L                          P
[52G] (M31)----- [51G]
      (E152)
L                          P

L                          P

[94]                      [86]
CAN-H        CAN-L   ECM
                      (E16)

```
106 107 108 109 110 111 112 113      119 120 121
 98  99 100 101 102 103 104 105
                                    117 118
 90  91  92  93  94  95  96  97
 82  83  84  85  86  87  88  89     114 115 116
```
(E16)
  B          H.S.

REFER TO THE FOLLOWING.
(M31) - SUPER MULTIPLE
JUNCTION (SMJ)

BKWA0538E

LAN-CAN-05

A

──── : DATA LINE

B

C

DATA LINK CONNECTOR (M22)

6    14

L    P

D

E

A L ──── L C

PRECEDING PAGE

NEXT PAGE

F

G

B P ──── P D

H

I

J

LAN

L    P          L    P

L

12   11         39   40

CAN-H  CAN-L   CAN-H  CAN-L

COMBINATION METER (M24)

BCM (BODY CONTROL MODULE) (M18)

M

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

(M18) W

H.S.

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

(M22) W

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

(M24) W

BKWA0539E

◼◻◼ : DATA LINE

PRECEDING
PAGE

C◀ L

D◀ P

L                    P

11  (M91)  10
    (E26)

L          P

L          P

L          P          L          P

11         15         39         40

CAN-H     CAN-L      CAN-H     CAN-L

ABS
ACTUATOR
AND
ELECTRIC
UNIT
(CONTROL
UNIT)

IPDM E/R
(INTELLIGENT
POWER
DISTRIBUTION
MODULE
ENGINE ROOM)
(CPU)

(E125)              (E122)

| 1 | 2 | 3 |  | 4 | 5 | 6 | 7 | (M91) |
|---|---|---|---|---|---|---|---|---|
| 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |

W

| 37 | 38 | 39 | 40 | 41 | 42 | (E122) |
|----|----|----|----|----|----|---|
| 43 | 44 | 45 | 46 | 47 | 48 | |

W

| 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | | 1 | (E125) |
|----|----|----|----|----|----|----|---|---|---|---|---|---|---|---|---|---|---|
| | 31 | 30 | 29 | 28 | 27 | 26 | 25 | 24 | 23 | 22 | 21 | 20 | 19 | 18 | 17 | | |
| 47 | | 46 | 45 | 44 | 43 | 42 | 41 | 40 | 39 | 38 | 37 | 36 | 35 | 34 | 33 | 32 | B |

BKWA0540E

## CHECK SHEET

UKS00473

**NOTE:**
If a check mark is put on "NG" on "INITIAL DIAG (Initial diagnosis)", replace the control unit.

Check sheet table

| SELECT SYSTEM screen | | CAN DIAG SUPPORT MNTR | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | |
| | | | | ECM | BCM /SEC | METER /M&A | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| BCM | No indication | NG | UNKWN | UNKWN | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) | — |

Symptoms :

Attach copy of
SELECT SYSTEM

Attach copy of
SELECT SYSTEM

PKIB6520E

Attach copy of
ENGINE
SELF-DIAG RESULTS

Attach copy of
BCM
SELF-DIAG RESULTS

Attach copy of
METER
SELF-DIAG RESULTS

Attach copy of
ABS
SELF-DIAG RESULTS

Attach copy of
IPDM E/R
SELF-DIAG RESULTS

Attach copy of
ENGINE
CAN DIAG SUPPORT
MNTR

Attach copy of
BCM
CAN DIAG SUPPORT
MNTR

Attach copy of
ABS
CAN DIAG SUPPORT
MNTR

Attach copy of
IPDM E/R
CAN DIAG SUPPORT
MNTR

PKIB6517E

## CHECK SHEET RESULTS (EXAMPLE)

**NOTE:**

If a check mark is put on "NG" on "INITIAL DIAG (Initial diagnosis)", replace the control unit.

### Case 1

Check harness between data link connector and ABS actuator and electric unit (control unit) circuit. Refer to LAN-76, "Inspection Between Data Link Connector and ABS Actuator and Electric Unit (Control Unit) Circuit" .

| SELECT SYSTEM screen | | CAN DIAG SUPPORT MNTR | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | |
| | | | | ECM | BCM /SEC | METER /M&A | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | UNKWN | UNKWN ✓ | UNKWN ✓ | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) ✓ |
| BCM | No indication | NG | UNKWN | UNKWN | — | UNKWN | — | UNKWN ✓ | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) ✓ | — |
| ABS | — | NG | UNKWN | UNKWN ✓ | — | — | — | — | CAN COMM CIRCUIT (U1000) ✓ | — |
| IPDM E/R | No indication ✓ | — | UNKWN | UNKWN | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) ✓ | — |

PKIB7262E

///// : Malfunctioning part

BCM — Combination meter

CAN H

CAN L

ECM

Data link connector

ABS actuator and electric unit(control unit)

IPDM E/R

PKIB7058E

## Case 2

Check ECM circuit. Refer to LAN-77, "ECM Circuit Inspection" .

| SELECT SYSTEM screen | | CAN DIAG SUPPORT MNTR | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | |
| | | | | ECM | BCM /SEC | METER /M&A | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| BCM | No indication | NG | UNKWN | UNKWN | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB7263E



//////// : Malfunctioning part

PKIB7059E

## Case 3

Check data link connector circuit. Refer to LAN-78, "Data Link Connector Circuit Inspection" .

| SELECT SYSTEM screen | CAN DIAG SUPPORT MNTR | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|
| | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | |
| | | | ECM | BCM /SEC | METER /M&A | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| BCM | No indication ✓ | NG | UNKWN | UNKWN | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication ✓ | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication ✓ | — | UNKWN | UNKWN | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB7264E



▨ : Malfunctioning part

BCM

Combination meter

CAN H

CAN L

ECM

Data link connector

ABS actuator and electric unit(control unit)

IPDM E/R

PKIB7060E

## Case 4

Check BCM circuit. Refer to LAN-78, "BCM Circuit Inspection" .

| SELECT SYSTEM screen | | CAN DIAG SUPPORT MNTR | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | |
| | | | | ECM | BCM /SEC | METER /M&A | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN ✓ | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) ✓ |
| BCM | No indication ✓ | NG | UNKWN | UNKWN | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) ✓ | — |
| ABS | — | NG | UNKWN | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | UNKWN ✓ | — | — | — | CAN COMM CIRCUIT (U1000) ✓ | — |

PKIB7265E



//// : Malfunctioning part

PKIB7061E

## Case 5

Check combination meter circuit. Refer to LAN-79, "Combination Meter Circuit Inspection" .

| SELECT SYSTEM screen | CAN DIAG SUPPORT MNTR | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|
| | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | |
| | | | ECM | BCM /SEC | METER /M&A | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | UNKWN✔ | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001)✔ |
| BCM | No indication | NG | UNKWN | UNKWN | — | UNKWN✔ | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication✔ | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000)✔ | — |
| ABS | — | NG | UNKWN | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB7266E



PKIB7062E

## Case 6

Check ABS actuator and electric unit (control unit) circuit. Refer to LAN-79, "ABS Actuator and Electric Unit (Control Unit) Circuit Inspection" .

| SELECT SYSTEM screen | | CAN DIAG SUPPORT MNTR | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | |
| | | | | ECM | BCM /SEC | METER /M&A | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | UNKWN | UNKWN ✔ | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) ✔ |
| BCM | No indication | NG | UNKWN | UNKWN | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) ✔ | — |
| ABS | — | NG ✔ | UNKWN ✔ | UNKWN ✔ | — | — | — | — | CAN COMM CIRCUIT (U1000) ✔ | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB7267E

//////// : Malfunctioning part

BCM

Combination meter

CAN H

CAN L

ECM

Data link connector

ABS actuator and electric unit(control unit)

IPDM E/R

PKIB7126E

## Case 7

Check IPDM E/R circuit. Refer to LAN-80, "IPDM E/R Circuit Inspection" .

| SELECT SYSTEM screen | CAN DIAG SUPPORT MNTR | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|
| | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | |
| | | | ECM | BCM /SEC | METER /M&A | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | UNKWN | UNKWN | UNKWN (✓) | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) (✓) |
| BCM | No indication | NG | UNKWN | UNKWN | — | UNKWN | — | UNKWN (✓) | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) (✓) | — |
| ABS | — | NG | UNKWN | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication (✓) | — | UNKWN | UNKWN | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) (✓) | — |

PKIB7268E



: Malfunctioning part

BCM — Combination meter — ECM — Data link connector — ABS actuator and electric unit(control unit) — IPDM E/R — CAN H — CAN L

PKIB7127E

## Case 8

Check CAN communication circuit. Refer to LAN-81, "CAN Communication Circuit Inspection" .

| SELECT SYSTEM screen | CAN DIAG SUPPORT MNTR | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|
| | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | |
| | | | ECM | BCM /SEC | METER /M&A | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN (✓) | — | UNKWN (✓) | UNKWN (✓) | UNKWN (✓) | UNKWN (✓) | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) (✓) |
| BCM | No indication (✓) | NG | UNKWN | UNKWN | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication (✓) | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) (✓) | — |
| ABS | — | NG (✓) | UNKWN (✓) | UNKWN (✓) | — | — | — | — | CAN COMM CIRCUIT (U1000) (✓) | — |
| IPDM E/R | No indication (✓) | — | UNKWN | UNKWN | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) (✓) | — |

PKIB7269E

LAN

## Case 9

Check IPDM E/R ignition relay circuit continuously sticks "OFF". Refer to LAN-84, "IPDM E/R Ignition Relay Circuit Inspection" .

| SELECT SYSTEM screen | | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | ECM | BCM /SEC | METER /M&A | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| BCM | No indication | NG | UNKWN | UNKWN | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) | — |

Note: CAN DIAG SUPPORT MNTR

PKIB7270E

## Case 10

Check IPDM E/R ignition relay circuit continuously sticks "ON". Refer to LAN-84, "IPDM E/R Ignition Relay Circuit Inspection" .

| SELECT SYSTEM screen | | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | ECM | BCM /SEC | METER /M&A | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| BCM | No indication | NG | UNKWN | UNKWN | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) | — |

Note: CAN DIAG SUPPORT MNTR

PKIB7271E

# Inspection Between Data Link Connector and ABS Actuator and Electric Unit (Control Unit) Circuit

UKS00474

## 1. CHECK CONNECTOR

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

– Harness connector M91

– Harness connector E26

OK or NG

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

A

## 2. CHECK HARNESS FOR OPEN CIRCUIT

B

1. Disconnect harness connector M91.
2. Check continuity between data link connector M22 terminals 6 (L), 14 (P) and harness connector M91 terminals 11 (L), 10 (P).

C

**6 (L) – 11 (L)** : **Continuity should exist.**

**14 (P) – 10 (P)** : **Continuity should exist.**

OK or NG

D

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

E



SKIB2812E

## 3. CHECK HARNESS FOR OPEN CIRCUIT

F

1. Disconnect ABS actuator and electric unit (control unit) connector.
2. Check continuity between harness connector E26 terminals 11 (L), 10 (P) and ABS actuator and electric unit (control unit) harness connector E125 terminals 11 (L), 15 (P).

G

**11 (L) – 11 (L)** : **Continuity should exist.**

**10 (P) – 15 (P)** : **Continuity should exist.**

H

OK or NG

OK   >> Connect all the connectors and diagnose again. Refer to LAN-6, "TROUBLE DIAGNOSES WORK FLOW" .
NG   >> Repair harness.

I



SKIB2813E

## ECM Circuit Inspection

UKS00475

J

## 1. CHECK CONNECTOR

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

LAN

– ECM connector
– Harness connector E152
– Harness connector M31

L

OK or NG

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

M

## 2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect ECM connector.
2. Check resistance between ECM harness connector E16 terminals 94 (L) and 86 (P).

   **94 (L) – 86 (P)**        **: Approx. 108 – 132** Ω

OK or NG

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

PKIA9592E

## Data Link Connector Circuit Inspection

*UKS00476*

## 1. CHECK CONNECTOR

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

OK or NG

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

## 2. CHECK HARNESS FOR OPEN CIRCUIT

Check resistance between data link connector M22 terminals 6 (L) and 14 (P).

   **6 (L) – 14 (P)**        **: Approx. 54 – 66** Ω

OK or NG

  OK      >> Diagnose again. Refer to <u>LAN-6, "TROUBLE DIAGNOSES WORK FLOW"</u> .
  NG      >> Repair harness between data link connector and BCM.

SKIA6868E

## BCM Circuit Inspection

*UKS00477*

## 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check 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 M18 terminals 39 (L) and 40 (P).

> **39 (L) – 40 (P)**      **: Approx. 54 – 66 Ω**

OK or NG

  OK      >> Replace BCM. Refer to <u>BCS-19, "Removal and Installation of BCM"</u> .
  NG      >> Repair harness between BCM and data link connector.

SKIA6869E

## Combination Meter Circuit Inspection

UKS00478

## 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative 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.
2. Check resistance between combination meter harness connector M24 terminals 12 (L) and 11 (P).

> **12 (L) – 11 (P)**      **: Approx. 54 – 66 Ω**

OK or NG

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

PKIA6837E

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

UKS00479

## 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check terminals and connector of ABS actuator and electric unit (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 ABS actuator and electric unit (control unit) connector.
2. Check resistance between ABS actuator and electric unit (control unit) harness connector E125 terminals 11 (L) and 15 (P).

    **11 (L) – 15 (P)**           **: Approx. 54 – 66** $\Omega$

OK or NG

  OK     >> Replace ABS actuator and electric unit (control unit).
  NG     >> Repair harness between ABS actuator and electric unit (control unit) and IPDM E/R.



ABS actuator and electric unit (control unit) connector

SKIA6872E

# IPDM E/R Circuit Inspection

*UKS0047A*

## 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check terminals and connector of IPDM E/R 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 IPDM E/R connector.
2. Check resistance between IPDM E/R harness connector E122 terminals 39 (L) and 40 (P).

    **39 (L) – 40 (P)**           **: Approx. 108 – 132** $\Omega$

OK or NG

  OK     >> Replace IPDM E/R.
  NG     >> Repair harness between IPDM E/R and ABS actuator and electric unit (control unit).



IPDM E/R connector

PKIA8141E

# CAN SYSTEM (TYPE 2)

## CAN Communication Circuit Inspection
UKS0047B

### 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check following terminals and connectors for damage, bend and loose connection (control module side, control unit side, meter side, and harness side).
  – ECM
  – BCM
  – Combination meter
  – ABS actuator and electric unit (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 ECM connector and harness connector E152.
2. Check continuity between ECM harness connector E16 terminals 94 (L) and 86 (P).

**94 (L) – 86 (P)** : **Continuity should not exist.**

OK or NG

  OK    >> GO TO 3.
  NG    >> Repair harness between ECM and harness connector E152.



ECM connector

SKIA6865E

### 3. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between ECM harness connector E16 terminals 94 (L), 86 (P) and ground.

**94 (L) – Ground** : **Continuity should not exist.**

**86 (P) – Ground** : **Continuity should not exist.**

OK or NG

  OK    >> GO TO 4.
  NG    >> Repair harness between ECM and harness connector E152.



ECM connector

SKIB0571E

## 4. CHECK HARNESS FOR SHORT CIRCUIT

1. Disconnect following connectors.
- BCM connector
- Combination meter connector
- Harness connector M91
2. Check continuity between data link connector M22 terminals 6 (L) and 14 (P).

      **6 (L) – 14 (P)**       **: Continuity should not exist.**

Data link connector

SKIA6868E

OK or NG

  OK     >> GO TO 5.
  NG     >> Check the following harnesses. If any harness is damaged, repair the harness.
- Harness between data link connector and harness connector M31
- Harness between data link connector and BCM
- Harness between data link connector and combination meter
- Harness between data link connector and harness connector M91

## 5. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between data link connector M22 terminals 6 (L), 14 (P) and ground.

      **6 (L) – Ground**       **: Continuity should not exist.**

      **14 (P) – Ground**       **: Continuity should not exist.**

Data link connector

PKIA9872E

OK or NG

  OK     >> GO TO 6.
  NG     >> Check the following harnesses. If any harness is damaged, repair the harness.
- Harness between data link connector and harness connector M31
- Harness between data link connector and BCM
- Harness between data link connector and combination meter
- Harness between data link connector and harness connector M91

## 6. CHECK HARNESS FOR SHORT CIRCUIT

1. Disconnect ABS actuator and electric unit (control unit) connector and IPDM E/R connector.
2. Check continuity between IPDM E/R harness connector E122 terminals 39 (L) and 40 (P).

      **39 (L) – 40 (P)**       **: Continuity should not exist.**

IPDM E/R connector

PKIA8141E

OK or NG

  OK     >> GO TO 7.
  NG     >> Check the following harnesses. If any harness is damaged, repair the harness.
- Harness between IPDM E/R and ABS actuator and electric unit (control unit)
- Harness between IPDM E/R and harness connector E26

## 7. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between IPDM E/R harness connector E122 terminals 39 (L), 40 (P) and ground.

**39 (L) – Ground** : **Continuity should not exist.**

**40 (P) – Ground** : **Continuity should not exist.**

OK or NG

OK    >> GO TO 8.
NG    >> Check the following harnesses. If any harness is damaged, repair the harness.
- Harness between IPDM E/R and ABS actuator and electric unit (control unit)
- Harness between IPDM E/R and harness connector E26

SKIB2821E

## 8. CHECK ECM AND IPDM E/R INTERNAL CIRCUIT

1. Remove ECM and IPDM E/R from vehicle.
2. Check resistance between ECM terminals 94 and 86.

**94 – 86** : **Approx. 108 – 132** $\Omega$

3. Check resistance between IPDM E/R terminals 39 and 40.

**39 – 40** : **Approx. 108 – 132** $\Omega$

OK or NG

OK    >> GO TO 9.
NG    >> Replace ECM and/or IPDM E/R.

ECM and IPDM E/R

LKIA0037E

## 9. CHECK SYMPTOM

1. Fill in described symptoms on the column "Symptom" in the check sheet.
2. Connect all connectors, and then make sure that the symptom is reproduced.

OK or NG

OK    >> GO TO 10.
NG    >> Refer to LAN-14, "Example of Filling in Check Sheet When Initial Conditions Are Not Reproduced" .

## 10. CHECK UNIT REPRODUCIBILITY

Perform the following procedure for each unit, and then perform reproducibility test.

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Disconnect the unit connector.
4. Connect the battery cable to the negative terminal.
5. Make sure that the symptom filled in the "Symptom" of the check sheet is reproduced. (Do not confuse it with the symptom related to removed unit.)
6. Make sure that the same symptom is reproduced.
- BCM
- Combination meter
- ABS actuator and electric unit (control unit)
- ECM
- IPDM E/R

Inspection results

Reproduced>>Install removed unit, and then check the other unit.
Not reproduced>>Replace removed unit.

## IPDM E/R Ignition Relay Circuit Inspection

*UKS0047C*

Check the following. If no malfunction is found, replace the IPDM E/R.

- IPDM E/R power supply circuit. Refer to PG-27, "IPDM E/R Power/Ground Circuit Inspection" .
- Ignition power supply circuit. Refer to PG-14, "IGNITION POWER SUPPLY — IGNITION SW. IN ON AND/OR START" .

## CAN SYSTEM (TYPE 3)

PFP:23710

### System Description

*UKS004JF*

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

*UKS004JG*



BKIA0185E

## Schematic

| | | |
|---|---|---|
| 40 | 39 | IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) |
| 15 | 11 | ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) |
| 5 | 4 | STEERING ANGLE SENSOR |
| 40 | 39 | BCM (BODY CONTROL MODULE) |
| 14 | 6 | DATA LINK CONNECTOR |
| 11 | 12 | COMBINATION METER |
| 86 | 94 | ECM |

BKWA0597E

## Wiring Diagram — CAN —

UKS004JI

LAN-CAN-07

A

B

C

D

E

F

G

H

I

J

LAN

L

M

■■■ : DATA LINE

NEXT PAGE

M31
E152

52G    51G

94    86

CAN-H    CAN-L    ECM
E16

| 106 | 107 | 108 | 109 | 110 | 111 | 112 | 113 |  | 119 | 120 | 121 |
| 98 | 99 | 100 | 101 | 102 | 103 | 104 | 105 |  |  | 117 | 118 |
| 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 |  |  |  |  |
| 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 |  | 114 | 115 | 116 |

E16
B    H.S.

REFER TO THE FOLLOWING.
M31 - SUPER MULTIPLE
JUNCTION (SMJ)

BKWA0598E

LAN-CAN-08

■■ : DATA LINE

STEERING ANGLE SENSOR (M47)

CAN-H 4  CAN-L 5
L        P

DATA LINK CONNECTOR (M22)

6   14
L   P

PRECEDING PAGE ◁A◁ L

L ▷C▷

NEXT PAGE

PRECEDING PAGE ◁B◁ P

P ▷D▷

L        P
12       11
CAN-H  CAN-L
COMBINATION METER (M24)

L        P
39       40
CAN-H  CAN-L
BCM (BODY CONTROL MODULE) (M18)

(M18) W   H.S.   (M22) W

(M24) W         (M47) W

BKWA0599E

## LAN-CAN-09

▆◻▆ : DATA LINE

PRECEDING
PAGE

C — L

D — P

L          P

M91
11   E26   10

L          P

L          P          L          P

11        15              39        40

CAN-H    CAN-L          CAN-H    CAN-L

ABS
ACTUATOR
AND
ELECTRIC
UNIT
(CONTROL
UNIT)

IPDM E/R
(INTELLIGENT
POWER
DISTRIBUTION
MODULE
ENGINE ROOM)
(CPU)

E125                     E122

| 1 | 2 | 3 |  | 4 | 5 | 6 | 7 | M91 |
|---|---|---|---|---|---|---|---|-----|
| 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |

W

| 37 | 38 | 39 | 40 | 41 | 42 | E122 |
|----|----|----|----|----|----|------|
| 43 | 44 | 45 | 46 | 47 | 48 | |

W

| 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | E125 |
|----|----|----|----|----|----|----|---|---|---|---|---|---|---|---|---|------|
| | 31 | 30 | 29 | 28 | 27 | 26 | 25 | 24 | 23 | 22 | 21 | 20 | 19 | 18 | 17 | |
| 47 | 46 | 45 | 44 | 43 | 42 | 41 | 40 | 39 | 38 | 37 | 36 | 35 | 34 | 33 | 32 | |

B

BKWA0600E

# CHECK SHEET

UKS004JJ

**NOTE:**
If a check mark is put on "NG" on "INITIAL DIAG (Initial diagnosis)", replace the control unit.

Check sheet table

| SELECT SYSTEM screen | | CAN DIAG SUPPORT MNTR | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | |
| | | | | ECM | STRG | BCM /SEC | METER /M&A | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | — | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) | — |

Symptoms :

Attach copy of
SELECT SYSTEM

Attach copy of
SELECT SYSTEM

SKIB4914E

A

B

C

Attach copy of
ENGINE
SELF-DIAG RESULTS

Attach copy of
BCM
SELF-DIAG RESULTS

Attach copy of
METER
SELF-DIAG RESULTS

D

E

F

Attach copy of
ABS
SELF-DIAG RESULTS

Attach copy of
IPDM E/R
SELF-DIAG RESULTS

G

H

I

J

Attach copy of
ENGINE
CAN DIAG SUPPORT
MNTR

Attach copy of
BCM
CAN DIAG SUPPORT
MNTR

LAN

L

M

Attach copy of
ABS
CAN DIAG SUPPORT
MNTR

Attach copy of
IPDM E/R
CAN DIAG SUPPORT
MNTR

PKIB6517E

## CHECK SHEET RESULTS (EXAMPLE)

**NOTE:**
If a check mark is put on "NG" on "INITIAL DIAG (Initial diagnosis)", replace the control unit.

### Case 1

Check harness between data link connector and ABS actuator and electric unit (control unit) circuit. Refer to LAN-100, "Inspection Between Data Link Connector and ABS Actuator and Electric Unit (Control Unit) Circuit" .

| SELECT SYSTEM screen | | CAN DIAG SUPPORT MNTR | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | |
| | | | | ECM | STRG | BCM /SEC | METER /M&A | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | — | UNKWN | UNKWN | UNKWN✓ | UNKWN✓ | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001)✓ |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN✓ | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000)✓ | — |
| ABS | — | NG | UNKWN | UNKWN✓ | UNKWN✓ | — | — | — | — | CAN COMM CIRCUIT (U1000)✓ | — |
| IPDM E/R | No indication✓ | — | UNKWN | UNKWN | — | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000)✓ | — |

SKIB4915E



///// : Malfunctioning part

BCM — Combination meter — CAN H — CAN L — ECM — Steering angle sensor — Data link connector — ABS actuator and electric unit(control unit) — IPDM E/R

SKIB4926E

## Case 2

Check ECM circuit. Refer to LAN-101, "ECM Circuit Inspection" .

| SELECT SYSTEM screen | CAN DIAG SUPPORT MNTR | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | |
| | | | ECM | STRG | BCM /SEC | METER /M&A | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | — | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| BCM | No indication | NG | UNKWN | — | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) | — |

SKIB4916E



///// : Malfunctioning part

BCM — Combination meter — Steering angle sensor — Data link connector — ABS actuator and electric unit(control unit) — IPDM E/R — ECM

CAN H
CAN L

SKIB4927E

## Case 3

Check steering angle sensor circuit. Refer to LAN-102, "Steering Angle Sensor Circuit Inspection" .

| SELECT SYSTEM screen | | CAN DIAG SUPPORT MNTR | | | | | | | | SELF-DIAG RESULTS | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | |
| | | | | ECM | STRG | BCM /SEC | METER /M&A | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | — | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) | — |

SKIB4917E



SKIB4928E

## Case 4

Check data link connector circuit. Refer to LAN-102, "Data Link Connector Circuit Inspection" .

| SELECT SYSTEM screen | CAN DIAG SUPPORT MNTR | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | |
| | | | ECM | STRG | BCM /SEC | METER /M&A | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | — | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |

SKIB4918E



//// : Malfunctioning part

SKIB4929E

## Case 5

Check BCM circuit. Refer to LAN-103, "BCM Circuit Inspection" .

| SELECT SYSTEM screen | Initial diagnosis | Transmit diagnosis | CAN DIAG SUPPORT MNTR | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Receive diagnosis | | | | | | | |
| | | | ECM | STRG | BCM/SEC | METER/M&A | VDC/TCS/ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | — | UNKWN (✓) | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) (✓) |
| BCM | No indication (✓) | NG | UNKWN | UNKWN | — | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) (✓) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) (✓) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | UNKWN (✓) | — | — | CAN COMM CIRCUIT (U1000) (✓) | — |

SKIB4919E

//////  : Malfunctioning part

- BCM
- Combination meter
- CAN H
- CAN L
- ECM
- Steering angle sensor
- Data link connector
- ABS actuator and electric unit(control unit)
- IPDM E/R

SKIB4930E

## Case 6

Check combination meter circuit. Refer to LAN-103, "Combination Meter Circuit Inspection" .

| SELECT SYSTEM screen | CAN DIAG SUPPORT MNTR | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | |
| | | | ECM | STRG | BCM /SEC | METER /M&A | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | — | — | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| BCM | No indication | NG | UNKWN | — | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |

SKIB4920E



SKIB4931E

## Case 7

Check ABS actuator and electric unit (control unit) circuit. Refer to LAN-104, "ABS Actuator and Electric Unit (Control Unit) Circuit Inspection" .

| SELECT SYSTEM screen | | CAN DIAG SUPPORT MNTR | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | |
| | | | | ECM | STRG | BCM /SEC | METER /M&A | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | — | UNKWN | UNKWN | UNKWN✓ | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG✓ | UNKWN✓ | UNKWN✓ | UNKWN✓ | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) | — |

SKIB4921E



////// : Malfunctioning part

SKIB4932E

## Case 8

Check IPDM E/R circuit. Refer to LAN-104, "IPDM E/R Circuit Inspection" .

| SELECT SYSTEM screen | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | ECM | STRG | BCM /SEC | METER /M&A | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | — | UNKWN | UNKWN | UNKWN | UNKWN✓ | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001)✓ |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN✓ | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000)✓ | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No✓ indication | — | UNKWN | UNKWN | — | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000)✓ | — |

SKIB4922E

//////  : Malfunctioning part

(Diagram: BCM, Combination meter, ECM, Steering angle sensor, Data link connector, ABS actuator and electric unit(control unit), IPDM E/R, CAN H, CAN L)

SKIB4933E

## Case 9

Check CAN communication circuit. Refer to LAN-105, "CAN Communication Circuit Inspection" .

| SELECT SYSTEM screen | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | ECM | STRG | BCM /SEC | METER /M&A | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN✓ | — | — | UNKWN✓ | UNKWN✓ | UNKWN✓ | UNKWN✓ | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001)✓ |
| BCM | No✓ indication | NG | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No✓ indication | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000)✓ | — |
| ABS | — | NG✓ | UNKWN✓ | UNKWN✓ | UNKWN✓ | — | — | — | — | CAN COMM CIRCUIT (U1000)✓ | — |
| IPDM E/R | No✓ indication | — | UNKWN | UNKWN | — | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000)✓ | — |

SKIB4923E

## Case 10

Check IPDM E/R ignition relay circuit continuously sticks "OFF". Refer to LAN-108, "IPDM E/R Ignition Relay Circuit Inspection" .

| SELECT SYSTEM screen | CAN DIAG SUPPORT MNTR | | | | | | | | | SELF-DIAG RESULTS | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | |
| | | | ECM | STRG | BCM /SEC | METER /M&A | VDC/TCS /ABS | IPDM E/R | | | |
| ENGINE | — | NG | UNKWN | — | — | UNKWN | UNKWN | UNKWN ✔ | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) ✔ |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) ✔ | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) | — |

SKIB4924E

## Case 11

Check IPDM E/R ignition relay circuit continuously sticks "ON". Refer to LAN-108, "IPDM E/R Ignition Relay Circuit Inspection" .

| SELECT SYSTEM screen | CAN DIAG SUPPORT MNTR | | | | | | | | | SELF-DIAG RESULTS | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | |
| | | | ECM | STRG | BCM /SEC | METER /M&A | VDC/TCS /ABS | IPDM E/R | | | |
| ENGINE | — | NG | UNKWN | — | — | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) ✔ | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) | — |

SKIB4925E

# Inspection Between Data Link Connector and ABS Actuator and Electric Unit (Control Unit) Circuit

UKS004JK

## 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check following terminals and connectors for damage, bend and loose connection (connector side and harness side).
– Harness connector M91
– Harness connector E26

OK or NG

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

## 2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect harness connector M91.
2. Check continuity between data link connector M22 terminals 6 (L), 14 (P) and harness connector M91 terminals 11 (L), 10 (P).

    **6 (L) – 11 (L)**            **: Continuity should exist.**

    **14 (P) – 10 (P)**           **: Continuity should exist.**

<u>OK or NG</u>

  OK     &gt;&gt; GO TO 3.
  NG     &gt;&gt; Repair harness.

SKIB2812E

## 3. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect ABS actuator and electric unit (control unit) connector.
2. Check continuity between harness connector E26 terminals 11 (L), 10 (P) and ABS actuator and electric unit (control unit) harness connector E125 terminals 11 (L), 15 (P).

    **11 (L) – 11 (L)**           **: Continuity should exist.**

    **10 (P) – 15 (P)**           **: Continuity should exist.**

<u>OK or NG</u>

  OK     &gt;&gt; Connect all the connectors and diagnose again. Refer to LAN-6, "TROUBLE DIAGNOSES WORK FLOW" .
  NG     &gt;&gt; Repair harness.

SKIB2813E

## ECM Circuit Inspection

UKS004JL

## 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check following terminals and connectors for damage, bend and loose connection (control module side and harness side).
– ECM connector
– Harness connector E152
– Harness connector M31

<u>OK or NG</u>

  OK     &gt;&gt; GO TO 2.
  NG     &gt;&gt; Repair terminal or connector.

## 2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect ECM connector.
2. Check resistance between ECM harness connector E16 terminals 94 (L) and 86 (P).

   **94 (L) – 86 (P)**        **: Approx. 108 – 132 $\Omega$**

OK or NG

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



PKIA9592E

## Steering Angle Sensor Circuit Inspection

*UKS004JM*

## 1. CHECK CONNECTOR

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

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 M47 terminals 4 (L) and 5 (P).

   **4 (L) – 5 (P)**        **: Approx. 54 – 66 $\Omega$**

OK or NG

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



PKIA9864E

## Data Link Connector Circuit Inspection

*UKS004JN*

## 1. CHECK CONNECTOR

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

OK or NG

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

## 2. CHECK HARNESS FOR OPEN CIRCUIT

Check resistance between data link connector M22 terminals 6 (L) and 14 (P).

**6 (L) – 14 (P)** : **Approx. 54 – 66** $\Omega$

OK or NG

OK >> Diagnose again. Refer to <u>LAN-6, "TROUBLE DIAG-NOSES WORK FLOW"</u> .

NG >> Repair harness between data link connector and BCM.

Data link connector

SKIA6868E

## BCM Circuit Inspection

*UKS004JO*

## 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check 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 M18 terminals 39 (L) and 40 (P).

**39 (L) – 40 (P)** : **Approx. 54 – 66** $\Omega$

OK or NG

OK >> Replace BCM. Refer to <u>BCS-19, "Removal and Installation of BCM"</u> .

NG >> Repair harness between BCM and data link connector.

BCM connector

SKIA6869E

## Combination Meter Circuit Inspection

*UKS004JP*

## 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative 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.
2. Check resistance between combination meter harness connector M24 terminals 12 (L) and 11 (P).

**12 (L) – 11 (P)**      **: Approx. 54 – 66 Ω**

OK or NG

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

Combination meter connector

PKIA6837E

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

UKS004JQ

## 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check terminals and connector of ABS actuator and electric unit (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 ABS actuator and electric unit (control unit) connector.
2. Check resistance between ABS actuator and electric unit (control unit) harness connector E125 terminals 11 (L) and 15 (P).

**11 (L) – 15 (P)**      **: Approx. 54 – 66 Ω**

OK or NG

  OK      >> Replace ABS actuator and electric unit (control unit).
  NG      >> Repair harness between ABS actuator and electric unit (control unit) and IPDM E/R.

ABS actuator and electric unit (control unit) connector

C/UNIT   CONNECTOR   11   15

SKIA6872E

# IPDM E/R Circuit Inspection

UKS004JR

## 1. CHECK CONNECTOR

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

OK or NG

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

# CAN SYSTEM (TYPE 3)

## 2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect IPDM E/R connector.
2. Check resistance between IPDM E/R harness connector E122 terminals 39 (L) and 40 (P).

   **39 (L) – 40 (P)**        **: Approx. 108 – 132** $\Omega$

OK or NG

  OK      >> Replace IPDM E/R.
  NG      >> Repair harness between IPDM E/R and ABS actuator and electric unit (control unit).

IPDM E/R connector

40 39

PKIA8141E

## CAN Communication Circuit Inspection

*UKS004JS*

## 1. CHECK CONNECTOR

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

– ECM
– Steering angle sensor
– BCM
– Combination meter
– ABS actuator and electric unit (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 ECM connector and harness connector E152.
2. Check continuity between ECM harness connector E16 terminals 94 (L) and 86 (P).

   **94 (L) – 86 (P)**        **: Continuity should not exist.**

OK or NG

  OK      >> GO TO 3.
  NG      >> Repair harness between ECM and harness connector E152.

ECM connector

ECM | CONNECTOR

86      94

SKIA6865E

# CAN SYSTEM (TYPE 3)

## 3. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between ECM harness connector E16 terminals 94 (L), 86 (P) and ground.

> **94 (L) – Ground**      **: Continuity should not exist.**
>
> **86 (P) – Ground**      **: Continuity should not exist.**

OK or NG

  OK      >> GO TO 4.
  NG      >> Repair harness between ECM and harness connector E152.



ECM connector

SKIB0571E

## 4. CHECK HARNESS FOR SHORT CIRCUIT

1. Disconnect following connectors.
– Steering angle sensor connector
– BCM connector
– Combination meter connector
– Harness connector M91
2. Check continuity between data link connector M22 terminals 6 (L) and 14 (P).

> **6 (L) – 14 (P)**      **: Continuity should not exist.**

OK or NG

  OK      >> GO TO 5.
  NG      >> Check the following harnesses. If any harness is damaged, repair the harness.

- Harness between data link connector and harness connector M31
- Harness between data link connector and steering angle sensor
- Harness between data link connector and BCM
- Harness between data link connector and combination meter
- Harness between data link connector and harness connector M91



Data link connector

SKIA6868E

## 5. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between data link connector M22 terminals 6 (L), 14 (P) and ground.

> **6 (L) – Ground**      **: Continuity should not exist.**
>
> **14 (P) – Ground**      **: Continuity should not exist.**

OK or NG

  OK      >> GO TO 6.
  NG      >> Check the following harnesses. If any harness is damaged, repair the harness.

- Harness between data link connector and harness connector M31
- Harness between data link connector and steering angle sensor
- Harness between data link connector and BCM
- Harness between data link connector and combination meter
- Harness between data link connector and harness connector M91



Data link connector

PKIA9872E

## 6. CHECK HARNESS FOR SHORT CIRCUIT

1. Disconnect ABS actuator and electric unit (control unit) connector and IPDM E/R connector.
2. Check continuity between IPDM E/R harness connector E122 terminals 39 (L) and 40 (P).

**39 (L) – 40 (P)**     **: Continuity should not exist.**

OK or NG

OK     >> GO TO 7.
NG     >> Check the following harnesses. If any harness is damaged, repair the harness.
- Harness between IPDM E/R and ABS actuator and electric unit (control unit)
- Harness between IPDM E/R and harness connector E26

IPDM E/R connector

40 39

PKIA8141E

## 7. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between IPDM E/R harness connector E122 terminals 39 (L), 40 (P) and ground.

**39 (L) – Ground**     **: Continuity should not exist.**

**40 (P) – Ground**     **: Continuity should not exist.**

OK or NG

OK     >> GO TO 8.
NG     >> Check the following harnesses. If any harness is damaged, repair the harness.
- Harness between IPDM E/R and ABS actuator and electric unit (control unit)
- Harness between IPDM E/R and harness connector E26

IPDM E/R connector

40 39

SKIB2821E

## 8. CHECK ECM AND IPDM E/R INTERNAL CIRCUIT

1. Remove ECM and IPDM E/R from vehicle.
2. Check resistance between ECM terminals 94 and 86.

**94 – 86**     **: Approx. 108 – 132 Ω**

3. Check resistance between IPDM E/R terminals 39 and 40.

**39 – 40**     **: Approx. 108 – 132 Ω**

OK or NG

OK     >> GO TO 9.
NG     >> Replace ECM and/or IPDM E/R.

**ECM and IPDM E/R**

LKIA0037E

## 9. CHECK SYMPTOM

1. Fill in described symptoms on the column "Symptom" in the check sheet.
2. Connect all connectors, and then make sure that the symptom is reproduced.

OK or NG

OK     >> GO TO 10.
NG     >> Refer to LAN-14, "Example of Filling in Check Sheet When Initial Conditions Are Not Reproduced" .

## 10. CHECK UNIT REPRODUCIBILITY

Perform the following procedure for each unit, and then perform reproducibility test.

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Disconnect the unit connector.
4. Connect the battery cable to the negative terminal.
5. Make sure that the symptom filled in the "Symptom" of the check sheet is reproduced. (Do not confuse it with the symptom related to removed unit.)
6. Make sure that the same symptom is reproduced.

- Steering angle sensor
- BCM
- Combination meter
- ABS actuator and electric unit (control unit)
- ECM
- IPDM E/R

Inspection results

  Reproduced>>Install removed unit, and then check the other unit.
  Not reproduced>>Replace removed unit.

## IPDM E/R Ignition Relay Circuit Inspection
UKS004JT

Check the following. If no malfunction is found, replace the IPDM E/R.

- IPDM E/R power supply circuit. Refer to PG-27, "IPDM E/R Power/Ground Circuit Inspection" .
- Ignition power supply circuit. Refer to PG-14, "IGNITION POWER SUPPLY — IGNITION SW. IN ON AND/OR START" .

## CAN SYSTEM (TYPE 4)
PFP:23710

### System Description
UKS004IZ

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
UKS004J0



BKIA0176E

# CAN SYSTEM (TYPE 4)

## Schematic

BKWA0575E

## Wiring Diagram — CAN —

UKS004J2

LAN-CAN-10

■□■ : DATA LINE

A/T
ASSEMBLY
(F9)

CAN-H    CAN-L
  3        8

L         P

L    (F32)   P
 2    (E2)    3
L             P

L    (F14)   P
 2    (E5)    3
              P

52G  (E152)  51G
     (M31)
 L            P

                    L  ▷ A
                          } NEXT
                            PAGE
                    P  ▷ B

L         P
94        86
CAN-H    CAN-L   ECM
                  (E16)

REFER TO THE FOLLOWING.
(M31) - SUPER MULTIPLE
JUNCTION (SMJ)

| 106 | 107 | 108 | 109 | 110 | 111 | 112 | 113 |   | 119 | 120 | 121 |
| 98 | 99 | 100 | 101 | 102 | 103 | 104 | 105 |   |   | 117 | 118 |   |
| 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 |   | 114 | 115 | 116 |
| 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 |   |   |   |   |

(E16)
B

H.S.

| 1 | 2 | 3 | 4 | 5 |
| 6 | 7 | 8 | 9 | 10 |
(F9)
G

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 20 | 22 | 23 | 24 |
(F14)
W

| 1 | 2 | 3 |   | 4 | 5 | 6 | 7 |
| 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
(F32)
W

BKWA0541E

■■■ : DATA LINE

DATA
LINK
CONNECTOR
M22

6    14

L    P

A  L                         L  C

PRECEDING
PAGE

NEXT
PAGE

B  P                         P  D

L    P        L    P

12   11       39   40

CAN-H  CAN-L  COMBINATION    CAN-H  CAN-L  BCM
METER                              (BODY
M24                                CONTROL
                                   MODULE)
                                   M18

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

M18
W

H.S.

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

M22
W

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

M24
W

BKWA0542E

A

B

C

D

E

F

G

H

I

J

LAN

L

M

■■■ : DATA LINE

PRECEDING
PAGE

C  L

D  P

M91
E26

11    10

L    P

L    P

11    15

CAN-H    CAN-L

ABS
ACTUATOR
AND
ELECTRIC
UNIT
(CONTROL
UNIT)

E125

39    40

CAN-H    CAN-L

IPDM E/R
(INTELLIGENT
POWER
DISTRIBUTION
MODULE
ENGINE ROOM)
(CPU)

E122

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

M91
W

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

E122
W

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

E125
B

BKWA0543E

# CHECK SHEET

UKS004J3

**NOTE:**
If a check mark is put on "NG" on "INITIAL DIAG (Initial diagnosis)", replace the control unit.

Check sheet table

| SELECT SYSTEM screen | | CAN DIAG SUPPORT MNTR | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | |
| | | | | ECM | TCM | BCM /SEC | METER /M&A | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | — | NG | UNKWN | UNKWN | — | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |

Symptoms :

Attach copy of SELECT SYSTEM

Attach copy of SELECT SYSTEM

PKIB6518E

Attach copy of
ENGINE
SELF-DIAG RESULTS

Attach copy of
A/T
SELF-DIAG RESULTS

Attach copy of
BCM
SELF-DIAG RESULTS

Attach copy of
METER
SELF-DIAG RESULTS

Attach copy of
ABS
SELF-DIAG RESULTS

Attach copy of
IPDM E/R
SELF-DIAG RESULTS

Attach copy of
ENGINE
CAN DIAG SUPPORT
MNTR

Attach copy of
A/T
CAN DIAG SUPPORT
MNTR

Attach copy of
BCM
CAN DIAG SUPPORT
MNTR

Attach copy of
ABS
CAN DIAG SUPPORT
MNTR

Attach copy of
IPDM E/R
CAN DIAG SUPPORT
MNTR

PKIB5017E

## CHECK SHEET RESULTS (EXAMPLE)

**NOTE:**
If a check mark is put on "NG" on "INITIAL DIAG (Initial diagnosis)", replace the control unit.

### Case 1

Check harness between TCM and data link connector circuit. Refer to .

| SELECT SYSTEM screen | | CAN DIAG SUPPORT MNTR | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | |
| | | | | ECM | TCM | BCM /SEC | METER /M&A | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | UNKWN (✓) | UNKWN (✓) | UNKWN (✓) | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) (✓) |
| A/T | — | NG | UNKWN | UNKWN | — | — | UNKWN (✓) | — | CAN COMM CIRCUIT (U1000) (✓) | — |
| BCM | No indication | NG | UNKWN | UNKWN (✓) | — | — | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) (✓) | — |
| ABS | — | NG | UNKWN | UNKWN (✓) | — | — | — | — | CAN COMM CIRCUIT (U1000) (✓) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN (✓) | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) (✓) | — |

PKIB7272E

////// : Malfunctioning part

BCM — Combination meter — ECM — TCM — CAN H — CAN L — Data link connector — ABS actuator and electric unit (control unit) — IPDM E/R

PKIB7128E

## Case 2

Check harness between data link connector and ABS actuator and electric unit (control unit) circuit. Refer to LAN-126, "Inspection Between Data Link Connector and ABS Actuator and Electric Unit (Control Unit) Circuit" .

| SELECT SYSTEM screen | | CAN DIAG SUPPORT MNTR | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | |
| | | | | ECM | TCM | BCM /SEC | METER /M&A | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | — | NG | UNKWN | UNKWN | — | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB7273E



/////// : Malfunctioning part

CAN H

CAN L

BCM

Combination meter

ECM

TCM

Data link connector

ABS actuator and electric unit(control unit)

IPDM E/R

PKIB7129E

## Case 3

Check ECM circuit. Refer to LAN-127, "ECM Circuit Inspection" .

| SELECT SYSTEM screen | | CAN DIAG SUPPORT MNTR | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | |
| | | | | ECM | TCM | BCM /SEC | METER /M&A | IPDM E/R | | |
| ENGINE | — | NG | UNKWN✓ | — | UNKWN✓ | UNKWN✓ | UNKWN✓ | UNKWN✓ | CAN COMM CIRCUIT (U1000)✓ | CAN COMM CIRCUIT (U1001)✓ |
| A/T | — | NG | UNKWN | UNKWN✓ | — | — | UNKWN | — | CAN COMM CIRCUIT (U1000)✓ | — |
| BCM | No indication | NG | UNKWN | UNKWN✓ | — | — | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000)✓ | — |
| ABS | — | NG | UNKWN | UNKWN✓ | — | — | — | — | CAN COMM CIRCUIT (U1000)✓ | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN✓ | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000)✓ | — |

PKIB7274E



//////// : Malfunctioning part

PKIB7130E

# CAN SYSTEM (TYPE 4)

## Case 4

Check TCM circuit. Refer to LAN-128, "TCM Circuit Inspection" .

| SELECT SYSTEM screen | Initial diagnosis | Transmit diagnosis | CAN DIAG SUPPORT MNTR | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Receive diagnosis | | | | | | |
| | | | ECM | TCM | BCM /SEC | METER /M&A | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | — | NG | UNKWN | UNKWN | — | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB7275E



/////// : Malfunctioning part

PKIB7131E

## Case 5

Check data link connector circuit. Refer to LAN-128, "Data Link Connector Circuit Inspection" .

| SELECT SYSTEM screen | | CAN DIAG SUPPORT MNTR | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | |
| | | | | ECM | TCM | BCM /SEC | METER /M&A | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | — | NG | UNKWN | UNKWN | — | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication ✓ | NG | UNKWN | UNKWN | — | — | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication ✓ | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication ✓ | — | UNKWN | UNKWN | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB7276E



////// : Malfunctioning part

PKIB7132E

## Case 6

Check BCM circuit. Refer to LAN-129, "BCM Circuit Inspection" .

| SELECT SYSTEM screen | CAN DIAG SUPPORT MNTR | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|
| | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | |
| | | | ECM | TCM | BCM /SEC | METER /M&A | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | UNKWN✓ | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001)✓ |
| A/T | — | NG | UNKWN | UNKWN | — | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication✓ | NG | UNKWN | UNKWN | — | — | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000)✓ | — |
| ABS | — | NG | UNKWN | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | UNKWN✓ | — | — | CAN COMM CIRCUIT (U1000)✓ | — |

PKIB7277E



/////// : Malfunctioning part

PKIB7133E

## Case 7

Check combination meter circuit. Refer to LAN-129, "Combination Meter Circuit Inspection" .

| SELECT SYSTEM screen | | CAN DIAG SUPPORT MNTR | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | |
| | | | | ECM | TCM | BCM /SEC | METER /M&A | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | — | NG | UNKWN | UNKWN | — | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB7278E



PKIB7134E

## Case 8

Check ABS actuator and electric unit (control unit) circuit. Refer to LAN-130, "ABS Actuator and Electric Unit (Control Unit) Circuit Inspection" .

| SELECT SYSTEM screen | | CAN DIAG SUPPORT MNTR | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | |
| | | | | ECM | TCM | BCM /SEC | METER /M&A | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | — | NG | UNKWN | UNKWN | — | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB7279E



///// : Malfunctioning part

BCM

Combination meter

CAN H

CAN L

ECM

TCM

Data link connector

ABS actuator and electric unit(control unit)

IPDM E/R

PKIB7135E

## Case 9

Check IPDM E/R circuit. Refer to LAN-130, "IPDM E/R Circuit Inspection" .

| SELECT SYSTEM screen | | CAN DIAG SUPPORT MNTR | | | | | | | SELF-DIAG RESULTS | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | |
| | | | | ECM | TCM | BCM /SEC | METER /M&A | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | UNKWN | UNKWN | UNKWN✔ | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001)✔ |
| A/T | — | NG | UNKWN | UNKWN | — | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | UNKWN | UNKWN✔ | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000)✔ | — |
| ABS | — | NG | UNKWN | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication✔ | — | UNKWN | UNKWN | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000)✔ | — |

PKIB7280E



: Malfunctioning part

BCM · Combination meter · CAN H · CAN L · ECM · TCM · Data link connector · ABS actuator and electric unit(control unit) · IPDM E/R

PKIB7136E

## Case 10

Check CAN communication circuit. Refer to LAN-131, "CAN Communication Circuit Inspection" .

| SELECT SYSTEM screen | | CAN DIAG SUPPORT MNTR | | | | | | | SELF-DIAG RESULTS | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | |
| | | | | ECM | TCM | BCM /SEC | METER /M&A | IPDM E/R | | |
| ENGINE | — | NG | UNKWN✔ | — | UNKWN✔ | UNKWN✔ | UNKWN✔ | UNKWN✔ | CAN COMM CIRCUIT (U1000)✔ | CAN COMM CIRCUIT (U1001)✔ |
| A/T | — | NG | UNKWN | UNKWN✔ | — | — | UNKWN✔ | — | CAN COMM CIRCUIT (U1000)✔ | — |
| BCM | No indication✔ | NG | UNKWN | UNKWN | — | — | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication✔ | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000)✔ | — |
| ABS | — | NG✔ | UNKWN✔ | UNKWN✔ | — | — | — | — | CAN COMM CIRCUIT (U1000)✔ | — |
| IPDM E/R | No indication✔ | — | UNKWN | UNKWN | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000)✔ | — |

PKIB7281E

## Case 11

Check IPDM E/R ignition relay circuit continuously sticks "OFF". Refer to LAN-135, "IPDM E/R Ignition Relay Circuit Inspection" .

| SELECT SYSTEM screen | CAN DIAG SUPPORT MNTR | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|
| | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | |
| | | | ECM | TCM | BCM/SEC | METER/M&A | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — ✓ | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) ✓ | CAN COMM CIRCUIT (U1001) ✓ |
| A/T | — | NG | UNKWN | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) ✓ | — |
| ABS | — | NG | UNKWN | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |

PKIB7282E

## Case 12

Check IPDM E/R ignition relay circuit continuously sticks "ON". Refer to LAN-135, "IPDM E/R Ignition Relay Circuit Inspection" .

| SELECT SYSTEM screen | CAN DIAG SUPPORT MNTR | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|
| | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | |
| | | | ECM | TCM | BCM/SEC | METER/M&A | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | — | NG | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) ✓ | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) ✓ | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |

PKIB7283E

# Inspection Between TCM and Data Link Connector Circuit

UKS004J4

## 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check following terminals and connectors for damage, bend and loose connection (connector side and harness side).
   – Harness connector F14
   – Harness connector E5
   – Harness connector E152
   – Harness connector M31

OK or NG

OK   &gt;&gt; GO TO 2.
NG   &gt;&gt; Repair terminal or connector.

## 2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect A/T assembly connector and harness connector F14.
2. Check continuity between A/T assembly harness connector F9 terminals 3 (L), 8 (P) and harness connector F14 terminals 2 (L), 3 (P).

| | |
|---|---|
| **3 (L) – 2 (L)** | **: Continuity should exist.** |
| **8 (P) – 3 (P)** | **: Continuity should exist.** |

OK or NG

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

SKIB2808E

## 3. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect harness connector E152.
2. Check continuity between harness connector E5 terminals 2 (L), 3 (P) and harness connector E152 terminals 52G (L), 51G (P).

| | |
|---|---|
| **2 (L) – 52G (L)** | **: Continuity should exist.** |
| **3 (P) – 51G (P)** | **: Continuity should exist.** |

OK or NG

  OK      >> GO TO 4.
  NG      >> Repair harness.

SKIB2809E

## 4. CHECK HARNESS FOR OPEN CIRCUIT

Check continuity between harness connector M31 terminals 52G (L), 51G (P) and data link connector M22 terminals 6 (L), 14 (P).

| | |
|---|---|
| **52G (L) – 6 (L)** | **: Continuity should exist.** |
| **51G (P) – 14 (P)** | **: Continuity should exist.** |

OK or NG

  OK      >> Connect all the connectors and diagnose again. Refer to LAN-6, "TROUBLE DIAGNOSES WORK FLOW" .
  NG      >> Repair harness.

SKIB2834E

## Inspection Between Data Link Connector and ABS Actuator and Electric Unit (Control Unit) Circuit

UKS004J5

## 1. CHECK CONNECTOR

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

– Harness connector M91
– Harness connector E26

OK or NG

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

A

## 2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect harness connector M91.
2. Check continuity between data link connector M22 terminals 6 (L), 14 (P) and harness connector M91 terminals 11 (L), 10 (P).

B

   **6 (L) – 11 (L)**              **: Continuity should exist.**

   **14 (P) – 10 (P)**             **: Continuity should exist.**

C

OK or NG

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

D

E

## 3. CHECK HARNESS FOR OPEN CIRCUIT

F

1. Disconnect ABS actuator and electric unit (control unit) connector.
2. Check continuity between harness connector E26 terminals 11 (L), 10 (P) and ABS actuator and electric unit (control unit) harness connector E125 terminals 11 (L), 15 (P).

G

   **11 (L) – 11 (L)**            **: Continuity should exist.**

   **10 (P) – 15 (P)**            **: Continuity should exist.**

H

OK or NG

  OK    >> Connect all the connectors and diagnose again. Refer to LAN-6, "TROUBLE DIAGNOSES WORK FLOW" .
  NG    >> Repair harness.

I

## ECM Circuit Inspection

UKS004J6

## 1. CHECK CONNECTOR

J

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

LAN

– ECM connector
– Harness connector E2
– Harness connector F32

L

OK or NG

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

M

## 2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect ECM connector.
2. Check resistance between ECM harness connector E16 terminals 94 (L) and 86 (P).

   **94 (L) – 86 (P)**          **: Approx. 108 – 132 Ω**

OK or NG

  OK     >> Replace ECM.
  NG     >> Repair harness between ECM and A/T assembly.



PKIA9592E

## TCM Circuit Inspection

UKS004J7

## 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check terminals and connector of A/T assembly 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 A/T assembly connector.
2. Check resistance between A/T assembly harness connector F9 terminals 3 (L) and 8 (P).

   **3 (L) – 8 (P)**          **: Approx. 54 – 66 Ω**

OK or NG

  OK     >> Replace control valve with TCM.
  NG     >> Repair harness between A/T assembly and harness connector F14.



SKIA6866E

## Data Link Connector Circuit Inspection

UKS004J8

## 1. CHECK CONNECTOR

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

OK or NG

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

## 2. CHECK HARNESS FOR OPEN CIRCUIT

Check resistance between data link connector M22 terminals 6 (L) and 14 (P).

**6 (L) – 14 (P)** : **Approx. 54 – 66** Ω

OK or NG

OK >> Diagnose again. Refer to <u>LAN-6, "TROUBLE DIAG-NOSES WORK FLOW"</u> .

NG >> Repair harness between data link connector and BCM.

Data link connector

SKIA6868E

## BCM Circuit Inspection

UKS004J9

## 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check 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 M18 terminals 39 (L) and 40 (P).

**39 (L) – 40 (P)** : **Approx. 54 – 66** Ω

OK or NG

OK >> Replace BCM. Refer to <u>BCS-19, "Removal and Installation of BCM"</u> .

NG >> Repair harness between BCM and data link connector.

BCM connector

SKIA6869E

## Combination Meter Circuit Inspection

UKS004JA

## 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative 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.
2. Check resistance between combination meter harness connector M24 terminals 12 (L) and 11 (P).

**12 (L) – 11 (P)** : **Approx. 54 – 66** $\Omega$

OK or NG

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

Combination meter connector

PKIA6837E

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

UKS004JB

### 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check terminals and connector of ABS actuator and electric unit (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 ABS actuator and electric unit (control unit) connector.
2. Check resistance between ABS actuator and electric unit (control unit) harness connector E125 terminals 11 (L) and 15 (P).

**11 (L) – 15 (P)** : **Approx. 54 – 66** $\Omega$

OK or NG

OK      >> Replace ABS actuator and electric unit (control unit).
NG      >> Repair harness between ABS actuator and electric unit (control unit) and IPDM E/R.

ABS actuator and electric unit
(control unit) connector

C/UNIT CONNECTOR
11     15

SKIA6872E

## IPDM E/R Circuit Inspection

UKS004JC

### 1. CHECK CONNECTOR

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

OK or NG

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

# CAN SYSTEM (TYPE 4)

## 2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect IPDM E/R connector.
2. Check resistance between IPDM E/R harness connector E122 terminals 39 (L) and 40 (P).

   **39 (L) – 40 (P)          : Approx. 108 – 132 Ω**

OK or NG

   OK      >> Replace IPDM E/R.
   NG      >> Repair harness between IPDM E/R and ABS actuator and electric unit (control unit).

IPDM E/R connector

PKIA8141E

## CAN Communication Circuit Inspection

UKS004JD

## 1. CHECK CONNECTOR

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

– ECM
– TCM
– BCM
– Combination meter
– ABS actuator and electric unit (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 ECM connector and harness connector E2.
2. Check continuity between ECM harness connector E16 terminals 94 (L) and 86 (P).

   **94 (L) – 86 (P)          : Continuity should not exist.**

OK or NG

   OK      >> GO TO 3.
   NG      >> Repair harness between ECM and harness connector E2.

ECM connector

ECM | CONNECTOR
86        94

SKIA6865E

# CAN SYSTEM (TYPE 4)

**[CAN]**

## 3. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between ECM harness connector E16 terminals 94 (L), 86 (P) and ground.

**94 (L) – Ground**     **: Continuity should not exist.**

**86 (P) – Ground**     **: Continuity should not exist.**

OK or NG

OK     >> GO TO 4.
NG     >> Repair harness between ECM and harness connector E2.

## 4. CHECK HARNESS FOR SHORT CIRCUIT

1. Disconnect A/T assembly connector and harness connector F14.
2. Check continuity between A/T assembly harness connector F9 terminals 3 (L) and 8 (P).

**3 (L) – 8 (P)**     **: Continuity should not exist.**

OK or NG

OK     >> GO TO 5.
NG     >> Check the following harnesses. If any harness is damaged, repair the harness.
- Harness between A/T assembly and harness connector F32
- Harness between A/T assembly and harness connector F14

## 5. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between A/T assembly harness connector F9 terminals 3 (L), 8 (P) and ground.

**3 (L) – Ground**     **: Continuity should not exist.**

**8 (P) – Ground**     **: Continuity should not exist.**

OK or NG

OK     >> GO TO 6.
NG     >> Check the following harnesses. If any harness is damaged, repair the harness.
- Harness between A/T assembly and harness connector F32
- Harness between A/T assembly and harness connector F14

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# CAN SYSTEM (TYPE 4)

## 6. CHECK HARNESS FOR SHORT CIRCUIT

1. Disconnect harness connector E152.
2. Check continuity between harness connector E5 terminals 2 (L) and 3 (P).

**2 (L) – 3 (P)          : Continuity should not exist.**

OK or NG

OK    >> GO TO 7.
NG    >> Repair harness between harness connector E5 and harness connector E152.



Harness connector

SKIB2816E

## 7. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between harness connector E5 terminals 2 (L), 3 (P) and ground.

**2 (L) – Ground          : Continuity should not exist.**

**3 (P) – Ground          : Continuity should not exist.**

OK or NG

OK    >> GO TO 8.
NG    >> Repair harness between harness connector E5 and harness connector E152.



Harness connector

SKIB2817E

## 8. CHECK HARNESS FOR SHORT CIRCUIT

1. Disconnect following connectors.
– BCM connector
– Combination meter connector
– Harness connector M91
2. Check continuity between data link connector M22 terminals 6 (L) and 14 (P).

**6 (L) – 14 (P)          : Continuity should not exist.**

OK or NG

OK    >> GO TO 9.
NG    >> Check the following harnesses. If any harness is damaged, repair the harness.
   ● Harness between data link connector and harness connector M31
   ● Harness between data link connector and BCM
   ● Harness between data link connector and combination meter
   ● Harness between data link connector and harness connector M91



Data link connector

SKIA6868E

## 9. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between data link connector M22 terminals 6 (L), 14 (P) and ground.

      **6 (L) – Ground**        **: Continuity should not exist.**

      **14 (P) – Ground**      **: Continuity should not exist.**

OK or NG

OK      >> GO TO 10.
NG      >> Check the following harnesses. If any harness is damaged, repair the harness.

- Harness between data link connector and harness connector M31
- Harness between data link connector and BCM
- Harness between data link connector and combination meter
- Harness between data link connector and harness connector M91



PKIA9872E

## 10. CHECK HARNESS FOR SHORT CIRCUIT

1. Disconnect ABS actuator and electric unit (control unit) connector and IPDM E/R connector.
2. Check continuity between IPDM E/R harness connector E122 terminals 39 (L) and 40 (P).

      **39 (L) – 40 (P)**      **: Continuity should not exist.**

OK or NG

OK      >> GO TO 11.
NG      >> Check the following harnesses. If any harness is damaged, repair the harness.

- Harness between IPDM E/R and ABS actuator and electric unit (control unit)
- Harness between IPDM E/R and harness connector E26



PKIA8141E

## 11. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between IPDM E/R harness connector E122 terminals 39 (L), 40 (P) and ground.

      **39 (L) – Ground**      **: Continuity should not exist.**

      **40 (P) – Ground**      **: Continuity should not exist.**

OK or NG

OK      >> GO TO 12.
NG      >> Check the following harnesses. If any harness is damaged, repair the harness.

- Harness between IPDM E/R and ABS actuator and electric unit (control unit)
- Harness between IPDM E/R and harness connector E26



SKIB2821E

# CAN SYSTEM (TYPE 4)

## 12. CHECK ECM AND IPDM E/R INTERNAL CIRCUIT

1. Remove ECM and IPDM E/R from vehicle.
2. Check resistance between ECM terminals 94 and 86.

**94 – 86**           **: Approx. 108 – 132 Ω**

3. Check resistance between IPDM E/R terminals 39 and 40.

**39 – 40**           **: Approx. 108 – 132 Ω**

OK or NG

OK >> GO TO 13.
NG >> Replace ECM and/or IPDM E/R.



ECM and IPDM E/R

LKIA0037E

## 13. CHECK SYMPTOM

1. Fill in described symptoms on the column "Symptom" in the check sheet.
2. Connect all connectors, and then make sure that the symptom is reproduced.

OK or NG

OK >> GO TO 14.
NG >> Refer to LAN-14, "Example of Filling in Check Sheet When Initial Conditions Are Not Reproduced" .

## 14. CHECK UNIT REPRODUCIBILITY

Perform the following procedure for each unit, and then perform reproducibility test.
1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Disconnect the unit connector.
4. Connect the battery cable to the negative terminal.
5. Make sure that the symptom filled in the "Symptom" of the check sheet is reproduced. (Do not confuse it with the symptom related to removed unit.)
6. Make sure that the same symptom is reproduced.
– TCM
– BCM
– Combination meter
– ABS actuator and electric unit (control unit)
– ECM
– IPDM E/R

Inspection results

Reproduced>>Install removed unit, and then check the other unit.
Not reproduced>>Replace removed unit.

## IPDM E/R Ignition Relay Circuit Inspection

UKS004JE

Check the following. If no malfunction is found, replace the IPDM E/R.
● IPDM E/R power supply circuit. Refer to PG-27, "IPDM E/R Power/Ground Circuit Inspection" .
● Ignition power supply circuit. Refer to PG-14, "IGNITION POWER SUPPLY — IGNITION SW. IN ON AND/OR START" .

## CAN SYSTEM (TYPE 5)

PFP:23710

### System Description

UKS004II

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

UKS004IJ



BKIA0177E

## Schematic

A

B

C

D

E

F

G

H

I

J

LAN

L

M

IPDM E/R
(INTELLIGENT POWER
DISTRIBUTION MODULE
ENGINE ROOM)

40 | 39

ABS ACTUATOR
AND ELECTRIC
UNIT (CONTROL
UNIT)

15 | 11

STEERING
ANGLE SENSOR

5 | 4

BCM
(BODY CONTROL
MODULE)

40 | 39

DATA LINK
CONNECTOR

14 | 6

COMBINATION
METER

11 | 12

A/T ASSEMBLY

8 | 3

ECM

86 | 94

BKWA0544E

## Wiring Diagram — CAN —

UKS004IL

LAN-CAN-13

◼️◼️ : DATA LINE

A/T ASSEMBLY
(F9)

CAN-H 3   CAN-L 8

L   P

2 (F32)(E2)   3   2 (F14)(E5)   3

L   P   L   P

52G (E152)(M31)   51G

L   P

L ▷ A

P ▷ B

NEXT PAGE

94   86

L   P

CAN-H   CAN-L   ECM (E16)

REFER TO THE FOLLOWING.
(M31) - SUPER MULTIPLE JUNCTION (SMJ)

| 106 | 107 | 108 | 109 | 110 | 111 | 112 | 113 | | 119 | 120 | 121 |
| 98 | 99 | 100 | 101 | 102 | 103 | 104 | 105 | | | | |

| 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | | 117 | 118 |
| 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | | 114 | 115 | 116 |

(E16) B   H.S.   

1 2 3 4 5 / 6 7 8 9 10 (F9) G

1 2 3 4 5 6 7 8 9 10 11 12 / 13 14 15 16 17 18 19 20 20 22 23 24 (F14) W

1 2 3 4 5 6 7 / 8 9 10 11 12 13 14 15 16 (F32) W

BKWA0545E

LAN-CAN-14

A

◼▭◼ : DATA LINE

B

C

STEERING ANGLE SENSOR (M47)

DATA LINK CONNECTOR (M22)

CAN-H  CAN-L
4      5
L      P

6      14
L      P

D

E

PRECEDING PAGE ◁A L

L ◁C

F

NEXT PAGE

G

PRECEDING PAGE ◁B P

P ◁D

H

I

J

LAN

L

CAN-H  CAN-L
12     11
L      P

CAN-H  CAN-L
39     40
L      P

COMBINATION METER (M24)

BCM (BODY CONTROL MODULE) (M18)

M

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

(M18) W

H.S.

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

(M22) W

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

(M24) W

| 3 | 2 | | 1 |
| 8 | 7 | 6 | 5 | 4 |

(M47) W

BKWA0546E

■■■ : DATA LINE

PRECEDING PAGE

C L

D P

M91
E26

11  10

L  P

L  P

L  P

CAN-H  CAN-L
11  15

ABS
ACTUATOR
AND
ELECTRIC
UNIT
(CONTROL
UNIT)
E125

CAN-H  CAN-L
39  40

IPDM E/R
(INTELLIGENT
POWER
DISTRIBUTION
MODULE
ENGINE ROOM)
(CPU)
E122

| 1 | 2 | 3 |  | 4 | 5 | 6 | 7 | M91 |
|---|---|---|---|---|---|---|---|---|
| 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |

W

| 37 | 38 | 39 | 40 | 41 | 42 | E122 |
|----|----|----|----|----|----|------|
| 43 | 44 | 45 | 46 | 47 | 48 | |

W

| 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | E125 |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|------|
| | 31 | 30 | 29 | 28 | 27 | 26 | 25 | 24 | 23 | 22 | 21 | 20 | 19 | 18 | 17 | |
| 47 | 46 | 45 | 44 | 43 | 42 | 41 | 40 | 39 | 38 | 37 | 36 | 35 | 34 | 33 | 32 | B |

BKWA0547E

## CHECK SHEET

UKS004IM

**NOTE:**
If a check mark is put on "NG" on "INITIAL DIAG (Initial diagnosis)", replace the control unit.

Check sheet table

| SELECT SYSTEM screen | | CAN DIAG SUPPORT MNTR | | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | |
| | | | | ECM | TCM | STRG | BCM/SEC | METER/M&A | VDC/TCS/ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | — | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | — | NG | UNKWN | UNKWN | — | — | — | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | — | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) | — |

Symptoms :

Attach copy of
SELECT SYSTEM

Attach copy of
SELECT SYSTEM

PKIB9502E

Attach copy of
ENGINE
SELF-DIAG RESULTS

Attach copy of
A/T
SELF-DIAG RESULTS

Attach copy of
BCM
SELF-DIAG RESULTS

Attach copy of
METER
SELF-DIAG RESULTS

Attach copy of
ABS
SELF-DIAG RESULTS

Attach copy of
IPDM E/R
SELF-DIAG RESULTS

Attach copy of
ENGINE
CAN DIAG SUPPORT
MNTR

Attach copy of
A/T
CAN DIAG SUPPORT
MNTR

Attach copy of
BCM
CAN DIAG SUPPORT
MNTR

Attach copy of
ABS
CAN DIAG SUPPORT
MNTR

Attach copy of
IPDM E/R
CAN DIAG SUPPORT
MNTR

PKIB5017E

## CHECK SHEET RESULTS (EXAMPLE)

**NOTE:**

If a check mark is put on "NG" on "INITIAL DIAG (Initial diagnosis)", replace the control unit.

### Case 1

Check harness between TCM and data link connector circuit. Refer to <u>LAN-153, "Inspection Between TCM and Data Link Connector Circuit"</u> .

| SELECT SYSTEM screen | | CAN DIAG SUPPORT MNTR | | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | |
| | | | | ECM | TCM | STRG | BCM /SEC | METER /M&A | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | | — | NG | UNKWN | — | UNKWN | — | UNKWN✓ | UNKWN✓ | UNKWN✓ | UNKWN✓ | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001✓) |
| A/T | | — | NG | UNKWN | UNKWN | — | — | — | UNKWN✓ | UNKWN✓ | — | CAN COMM CIRCUIT (U1000✓) | — |
| BCM | | No indication | NG | UNKWN | UNKWN✓ | — | — | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | | No indication | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000✓) | — |
| ABS | | — | NG | UNKWN | UNKWN✓ | UNKWN✓ | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000✓) | — |
| IPDM E/R | | No indication | — | UNKWN | UNKWN✓ | — | — | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000✓) | — |

PKIB9504E



////// : Malfunctioning part

BCM — Combination meter — CAN H — CAN L — ECM — TCM — Steering angle sensor — Data link connector — ABS actuator and electric unit(control unit) — IPDM E/R

PKIB9471E

## Case 2

Check harness between data link connector and ABS actuator and electric unit (control unit) circuit. Refer to LAN-154, "Inspection Between Data Link Connector and ABS Actuator and Electric Unit (Control Unit) Circuit" .

| SELECT SYSTEM screen | | CAN DIAG SUPPORT MNTR | | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | |
| | | | | ECM | TCM | STRG | BCM /SEC | METER /M&A | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | | — | NG | UNKWN | — | UNKWN | — | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | | — | NG | UNKWN | UNKWN | — | — | — | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | | — | NG | UNKWN | UNKWN | UNKWN | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | — | UNKWN | UNKWN | — | — | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB9505E

///// : Malfunctioning part

BCM

Combination meter

CAN H

CAN L

ECM

TCM

Steering angle sensor

Data link connector

ABS actuator and electric unit(control unit)

IPDM E/R

PKIB9472E

## Case 3

Check ECM circuit. Refer to LAN-155, "ECM Circuit Inspection" .

| SELECT SYSTEM screen | | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | ECM | TCM | STRG | BCM /SEC | METER /M&A | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | — | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | — | NG | UNKWN | UNKWN | — | — | — | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | — | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB9506E



////// : Malfunctioning part

BCM

Combination meter

CAN H

CAN L

ECM

TCM

Steering angle sensor

Data link connector

ABS actuator and electric unit(control unit)

IPDM E/R

PKIB9473E

## Case 4

Check TCM circuit. Refer to LAN-156, "TCM Circuit Inspection" .

| SELECT SYSTEM screen | CAN DIAG SUPPORT MNTR | | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | |
| | | | ECM | TCM | STRG | BCM /SEC | METER /M&A | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | — | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | — | NG | UNKWN | UNKWN | — | — | — | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | — | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB9507E



: Malfunctioning part

PKIB9474E

## Case 5

Check steering angle sensor circuit. Refer to .

| SELECT SYSTEM screen | CAN DIAG SUPPORT MNTR | | | | | | | | | SELF-DIAG RESULTS | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | |
| | | | ECM | TCM | STRG | BCM /SEC | METER /M&A | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | — | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | — | NG | UNKWN | UNKWN | — | — | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | — | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN ✓ | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB9508E

////// : Malfunctioning part

BCM — Combination meter — CAN H — CAN L

ECM — TCM — Steering angle sensor — Data link connector — ABS actuator and electric unit(control unit) — IPDM E/R

PKIB9475E

## Case 6

Check data link connector circuit. Refer to LAN-157, "Data Link Connector Circuit Inspection" .

| SELECT SYSTEM screen | CAN DIAG SUPPORT MNTR | | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | |
| | | | ECM | TCM | STRG | BCM /SEC | METER /M&A | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | — | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | — | NG | UNKWN | UNKWN | — | — | — | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | — | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB9509E



///// : Malfunctioning part

BCM
Combination meter
CAN H
CAN L
ECM
TCM
Steering angle sensor
Data link connector
ABS actuator and electric unit(control unit)
IPDM E/R

PKIB9476E

## Case 7

Check BCM circuit. Refer to LAN-157, "BCM Circuit Inspection" .

| SELECT SYSTEM screen | CAN DIAG SUPPORT MNTR | | | | | | | | | | SELF-DIAG RESULTS | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | | |
| | | | ECM | TCM | STRG | BCM /SEC | METER /M&A | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | — | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | — | NG | UNKWN | UNKWN | — | — | — | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | — | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB9510E



PKIB9477E

## Case 8

Check combination meter circuit. Refer to LAN-158, "Combination Meter Circuit Inspection" .

| SELECT SYSTEM screen | CAN DIAG SUPPORT MNTR | | | | | | | | | | SELF-DIAG RESULTS | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | | |
| | | | ECM | TCM | STRG | BCM /SEC | METER /M&A | VDC/TCS /ABS | IPDM E/R | | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | — | UNKWN | UNKWN✓ | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001)✓ |
| A/T | — | NG | UNKWN | UNKWN | — | — | — | UNKWN✓ | UNKWN | — | CAN COMM CIRCUIT (U1000)✓ | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | — | UNKWN✓ | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication✓ | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000)✓ | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | — | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB9511E



PKIB9478E

## Case 9

Check ABS actuator and electric unit (control unit) circuit. Refer to <u>LAN-158, "ABS Actuator and Electric Unit (Control Unit) Circuit Inspection"</u> .

| SELECT SYSTEM screen | | CAN DIAG SUPPORT MNTR | | | | | | | | | SELF-DIAG RESULTS | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | |
| | | | | ECM | TCM | STRG | BCM /SEC | METER /M&A | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | — | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | — | NG | UNKWN | UNKWN | — | — | — | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | — | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB9512E



//////// : Malfunctioning part

PKIB9479E

## Case 10

Check IPDM E/R circuit. Refer to LAN-159, "IPDM E/R Circuit Inspection" .

| SELECT SYSTEM screen | CAN DIAG SUPPORT MNTR | | | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | | |
| | | | ECM | TCM | STRG | BCM /SEC | METER /M&A | VDC/TCS /ABS | IPDM E/R | | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | — | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | — | NG | UNKWN | UNKWN | — | — | — | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | — | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB9513E



////// : Malfunctioning part

PKIB9480E

## Case 11

Check CAN communication circuit. Refer to LAN-160, "CAN Communication Circuit Inspection" .

| SELECT SYSTEM screen | CAN DIAG SUPPORT MNTR | | | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | | |
| | | | ECM | TCM | STRG | BCM /SEC | METER /M&A | VDC/TCS /ABS | IPDM E/R | | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | — | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | — | NG | UNKWN | UNKWN | — | — | — | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | — | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB9514E

# CAN SYSTEM (TYPE 5)

## Case 12

Check IPDM E/R ignition relay circuit continuously sticks "OFF". Refer to LAN-164, "IPDM E/R Ignition Relay Circuit Inspection" .

| SELECT SYSTEM screen | Initial diagnosis | Transmit diagnosis | ECM | TCM | STRG | BCM/SEC | METER/M&A | VDC/TCS/ABS | IPDM E/R | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ENGINE | — | NG | UNKWN | — | UNKWN | — | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | — | NG | UNKWN | UNKWN | — | — | — | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB9515E

## Case 13

Check IPDM E/R ignition relay circuit continuously sticks "ON". Refer to LAN-164, "IPDM E/R Ignition Relay Circuit Inspection" .

| SELECT SYSTEM screen | Initial diagnosis | Transmit diagnosis | ECM | TCM | STRG | BCM/SEC | METER/M&A | VDC/TCS/ABS | IPDM E/R | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ENGINE | — | NG | UNKWN | — | UNKWN | — | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | — | NG | UNKWN | — | — | — | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB9516E

# Inspection Between TCM and Data Link Connector Circuit

UKS004IN

## 1. CHECK CONNECTOR

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

– Harness connector F14
– Harness connector E5
– Harness connector E152
– Harness connector M31

OK or NG

OK &gt;&gt; GO TO 2.
NG &gt;&gt; Repair terminal or connector.

## 2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect A/T assembly connector and harness connector F14.
2. Check continuity between A/T assembly harness connector F9 terminals 3 (L), 8 (P) and harness connector F14 terminals 2 (L), 3 (P).

    **3 (L) – 2 (L)**               **: Continuity should exist.**

    **8 (P) – 3 (P)**               **: Continuity should exist.**

OK or NG

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



SKIB2808E

## 3. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect harness connector E152.
2. Check continuity between harness connector E5 terminals 2 (L), 3 (P) and harness connector E152 terminals 52G (L), 51G (P).

    **2 (L) – 52G (L)**           **: Continuity should exist.**

    **3 (P) – 51G (P)**           **: Continuity should exist.**

OK or NG

  OK       >> GO TO 4.
  NG       >> Repair harness.



SKIB2809E

## 4. CHECK HARNESS FOR OPEN CIRCUIT

Check continuity between harness connector M31 terminals 52G (L), 51G (P) and data link connector M22 terminals 6 (L), 14 (P).

    **52G (L) – 6 (L)**          **: Continuity should exist.**

    **51G (P) – 14 (P)**         **: Continuity should exist.**

OK or NG

  OK       >> Connect all the connectors and diagnose again. Refer to LAN-6, "TROUBLE DIAGNOSES WORK FLOW" .
  NG       >> Repair harness.



SKIB2834E

## Inspection Between Data Link Connector and ABS Actuator and Electric Unit (Control Unit) Circuit

UKS004IO

## 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check following terminals and connectors for damage, bend and loose connection (connector side and harness side).
– Harness connector M91
– Harness connector E26

OK or NG

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

## 2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect harness connector M91.
2. Check continuity between data link connector M22 terminals 6 (L), 14 (P) and harness connector M91 terminals 11 (L), 10 (P).

   **6 (L) – 11 (L)**        **: Continuity should exist.**

   **14 (P) – 10 (P)**       **: Continuity should exist.**

<u>OK or NG</u>

  OK      &gt;&gt; GO TO 3.
  NG      &gt;&gt; Repair harness.



SKIB2812E

## 3. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect ABS actuator and electric unit (control unit) connector.
2. Check continuity between harness connector E26 terminals 11 (L), 10 (P) and ABS actuator and electric unit (control unit) harness connector E125 terminals 11 (L), 15 (P).

   **11 (L) – 11 (L)**       **: Continuity should exist.**

   **10 (P) – 15 (P)**       **: Continuity should exist.**

<u>OK or NG</u>

  OK      &gt;&gt; Connect all the connectors and diagnose again. Refer to <u>LAN-6, "TROUBLE DIAGNOSES WORK FLOW"</u> .
  NG      &gt;&gt; Repair harness.



SKIB2813E

## ECM Circuit Inspection

UKS004IP

## 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check following terminals and connectors for damage, bend and loose connection (control module side and harness side).
– ECM connector
– Harness connector E2
– Harness connector F32

<u>OK or NG</u>

  OK      &gt;&gt; GO TO 2.
  NG      &gt;&gt; Repair terminal or connector.

## 2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect ECM connector.
2. Check resistance between ECM harness connector E16 terminals 94 (L) and 86 (P).

   **94 (L) – 86 (P)**        **: Approx. 108 – 132 Ω**

OK or NG

   OK      >> Replace ECM.
   NG      >> Repair harness between ECM and A/T assembly.



PKIA9592E

## TCM Circuit Inspection

UKS004IQ

## 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check terminals and connector of A/T assembly 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 A/T assembly connector.
2. Check resistance between A/T assembly harness connector F9 terminals 3 (L) and 8 (P).

   **3 (L) – 8 (P)**        **: Approx. 54 – 66 Ω**

OK or NG

   OK      >> Replace control valve with TCM.
   NG      >> Repair harness between A/T assembly and harness connector F14.



SKIA6866E

## Steering Angle Sensor Circuit Inspection

UKS004IR

## 1. CHECK CONNECTOR

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

OK or NG

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

# CAN SYSTEM (TYPE 5)

[CAN]

## 2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect steering angle sensor connector.
2. Check resistance between steering angle sensor harness connector M47 terminals 4 (L) and 5 (P).

**4 (L) – 5 (P)** : Approx. 54 – 66 Ω

OK or NG

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

Steering angle sensor connector

PKIA9864E

## Data Link Connector Circuit Inspection

UKS004IS

### 1. CHECK CONNECTOR

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

OK or NG

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

### 2. CHECK HARNESS FOR OPEN CIRCUIT

Check resistance between data link connector M22 terminals 6 (L) and 14 (P).

**6 (L) – 14 (P)** : Approx. 54 – 66 Ω

OK or NG

OK >> Diagnose again. Refer to LAN-6, "TROUBLE DIAGNOSES WORK FLOW".
NG >> Repair harness between data link connector and BCM.

Data link connector

SKIA6868E

## BCM Circuit Inspection

UKS004IT

### 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check 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.

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## 2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect BCM connector.
2. Check resistance between BCM harness connector M18 terminals 39 (L) and 40 (P).

   **39 (L) – 40 (P)**        **: Approx. 54 – 66 Ω**

OK or NG

   OK      >> Replace BCM. Refer to <u>BCS-19, "Removal and Installation of BCM"</u> .
   NG      >> Repair harness between BCM and data link connector.



SKIA6869E

## Combination Meter Circuit Inspection

UKS004IU

### 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative 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.
2. Check resistance between combination meter harness connector M24 terminals 12 (L) and 11 (P).

   **12 (L) – 11 (P)**        **: Approx. 54 – 66 Ω**

OK or NG

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



PKIA6837E

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

UKS004IV

### 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check terminals and connector of ABS actuator and electric unit (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 ABS actuator and electric unit (control unit) connector.
2. Check resistance between ABS actuator and electric unit (control unit) harness connector E125 terminals 11 (L) and 15 (P).

**11 (L) – 15 (P)**        **: Approx. 54 – 66** Ω

OK or NG

OK      >> Replace ABS actuator and electric unit (control unit).
NG      >> Repair harness between ABS actuator and electric unit (control unit) and IPDM E/R.

ABS actuator and electric unit
(control unit) connector

C/UNIT ☐ CONNECTOR
11            15

Ω

SKIA6872E

## IPDM E/R Circuit Inspection

*UKS004IW*

## 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check terminals and connector of IPDM E/R 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 IPDM E/R connector.
2. Check resistance between IPDM E/R harness connector E122 terminals 39 (L) and 40 (P).

**39 (L) – 40 (P)**        **: Approx. 108 – 132** Ω

OK or NG

OK      >> Replace IPDM E/R.
NG      >> Repair harness between IPDM E/R and ABS actuator and electric unit (control unit).

IPDM E/R connector

40 39

Ω

PKIA8141E

# CAN SYSTEM (TYPE 5)

## CAN Communication Circuit Inspection

## 1. CHECK CONNECTOR

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

- ECM
- TCM
- Steering angle sensor
- BCM
- Combination meter
- ABS actuator and electric unit (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 ECM connector and harness connector E2.
2. Check continuity between ECM harness connector E16 terminals 94 (L) and 86 (P).

**94 (L) – 86 (P)　　　: Continuity should not exist.**

OK or NG

OK　　>> GO TO 3.
NG　　>> Repair harness between ECM and harness connector E2.



SKIA6865E

## 3. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between ECM harness connector E16 terminals 94 (L), 86 (P) and ground.

**94 (L) – Ground　　: Continuity should not exist.**

**86 (P) – Ground　　: Continuity should not exist.**

OK or NG

OK　　>> GO TO 4.
NG　　>> Repair harness between ECM and harness connector E2.



SKIB0571E

## 4. CHECK HARNESS FOR SHORT CIRCUIT

1. Disconnect A/T assembly connector and harness connector F14.
2. Check continuity between A/T assembly harness connector F9 terminals 3 (L) and 8 (P).

   **3 (L) – 8 (P)          : Continuity should not exist.**

A/T assembly connector

SKIA6866E

OK or NG

   OK     >> GO TO 5.
   NG     >> Check the following harnesses. If any harness is damaged, repair the harness.
   - Harness between A/T assembly and harness connector F32
   - Harness between A/T assembly and harness connector F14

## 5. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between A/T assembly harness connector F9 terminals 3 (L), 8 (P) and ground.

   **3 (L) – Ground        : Continuity should not exist.**

   **8 (P) – Ground        : Continuity should not exist.**

A/T assembly connector

SKIA6875E

OK or NG

   OK     >> GO TO 6.
   NG     >> Check the following harnesses. If any harness is damaged, repair the harness.
   - Harness between A/T assembly and harness connector F32
   - Harness between A/T assembly and harness connector F14

## 6. CHECK HARNESS FOR SHORT CIRCUIT

1. Disconnect harness connector E152.
2. Check continuity between harness connector E5 terminals 2 (L) and 3 (P).

   **2 (L) – 3 (P)          : Continuity should not exist.**

Harness connector

SKIB2816E

OK or NG

   OK     >> GO TO 7.
   NG     >> Repair harness between harness connector E5 and harness connector E152.

## 7. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between harness connector E5 terminals 2 (L), 3 (P) and ground.

        **2 (L) – Ground**         **: Continuity should not exist.**

        **3 (P) – Ground**         **: Continuity should not exist.**

OK or NG

  OK     >> GO TO 8.

  NG     >> Repair harness between harness connector E5 and harness connector E152.



Harness connector

SKIB2817E

## 8. CHECK HARNESS FOR SHORT CIRCUIT

1. Disconnect following connectors.
– Steering angle sensor connector
– BCM connector
– Combination meter connector
– Harness connector M91
2. Check continuity between data link connector M22 terminals 6 (L) and 14 (P).

        **6 (L) – 14 (P)**         **: Continuity should not exist.**

OK or NG

  OK     >> GO TO 9.

  NG     >> Check the following harnesses. If any harness is damaged, repair the harness.

      ● Harness between data link connector and harness connector M31

      ● Harness between data link connector and steering angle sensor

      ● Harness between data link connector and BCM

      ● Harness between data link connector and combination meter

      ● Harness between data link connector and harness connector M91



Data link connector

SKIA6868E

## 9. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between data link connector M22 terminals 6 (L), 14 (P) and ground.

        **6 (L) – Ground**         **: Continuity should not exist.**

        **14 (P) – Ground**         **: Continuity should not exist.**

OK or NG

  OK     >> GO TO 10.

  NG     >> Check the following harnesses. If any harness is damaged, repair the harness.

      ● Harness between data link connector and harness connector M31

      ● Harness between data link connector and steering angle sensor

      ● Harness between data link connector and BCM

      ● Harness between data link connector and combination meter

      ● Harness between data link connector and harness connector M91



Data link connector

PKIA9872E

## 10. CHECK HARNESS FOR SHORT CIRCUIT

1. Disconnect ABS actuator and electric unit (control unit) connector and IPDM E/R connector.
2. Check continuity between IPDM E/R harness connector E122 terminals 39 (L) and 40 (P).

   **39 (L) – 40 (P)          : Continuity should not exist.**

OK or NG

OK       >> GO TO 11.
NG       >> Check the following harnesses. If any harness is damaged, repair the harness.
   - Harness between IPDM E/R and ABS actuator and electric unit (control unit)
   - Harness between IPDM E/R and harness connector E26

IPDM E/R connector

PKIA8141E

## 11. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between IPDM E/R harness connector E122 terminals 39 (L), 40 (P) and ground.

   **39 (L) – Ground       : Continuity should not exist.**

   **40 (P) – Ground       : Continuity should not exist.**

OK or NG

OK       >> GO TO 12.
NG       >> Check the following harnesses. If any harness is damaged, repair the harness.
   - Harness between IPDM E/R and ABS actuator and electric unit (control unit)
   - Harness between IPDM E/R and harness connector E26

IPDM E/R connector

SKIB2821E

## 12. CHECK ECM AND IPDM E/R INTERNAL CIRCUIT

1. Remove ECM and IPDM E/R from vehicle.
2. Check resistance between ECM terminals 94 and 86.

   **94 – 86          : Approx. 108 – 132 $\Omega$**

3. Check resistance between IPDM E/R terminals 39 and 40.

   **39 – 40          : Approx. 108 – 132 $\Omega$**

OK or NG

OK       >> GO TO 13.
NG       >> Replace ECM and/or IPDM E/R.

**ECM and IPDM E/R**

LKIA0037E

## 13. CHECK SYMPTOM

1. Fill in described symptoms on the column "Symptom" in the check sheet.
2. Connect all connectors, and then make sure that the symptom is reproduced.

OK or NG

OK       >> GO TO 14.
NG       >> Refer to LAN-14, "Example of Filling in Check Sheet When Initial Conditions Are Not Reproduced" .

## 14. CHECK UNIT REPRODUCIBILITY

Perform the following procedure for each unit, and then perform reproducibility test.

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Disconnect the unit connector.
4. Connect the battery cable to the negative terminal.
5. Make sure that the symptom filled in the "Symptom" of the check sheet is reproduced. (Do not confuse it with the symptom related to removed unit.)
6. Make sure that the same symptom is reproduced.

- TCM
- Steering angle sensor
- BCM
- Combination meter
- ABS actuator and electric unit (control unit)
- ECM
- IPDM E/R

Inspection results

Reproduced>>Install removed unit, and then check the other unit.
Not reproduced>>Replace removed unit.

## IPDM E/R Ignition Relay Circuit Inspection

*UKS004IY*

Check the following. If no malfunction is found, replace the IPDM E/R.

- IPDM E/R power supply circuit. Refer to PG-27, "IPDM E/R Power/Ground Circuit Inspection" .
- Ignition power supply circuit. Refer to PG-14, "IGNITION POWER SUPPLY — IGNITION SW. IN ON AND/OR START" .

## CAN SYSTEM (TYPE 6)
PFP:23710

### System Description
UKS004I3

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
UKS004I4



BKIA0178E

## Schematic

BKWA0576E

## Wiring Diagram — CAN —

UKS004I6

LAN-CAN-16

◼◻◼ : DATA LINE

A

B

C

D

E

F

G

H

I

J

LAN

L

M

L ▷ A ⎫
P ◼▷ B ⎬ NEXT
        ⎭ PAGE

L                    P

(M31)
52G ---- 51G
(E152)

L                    P

94                   86

CAN-H        CAN-L        ECM
                              (E16)

REFER TO THE FOLLOWING.
(M31) - SUPER MULTIPLE
JUNCTION (SMJ)

| 106 | 107 | 108 | 109 | 110 | 111 | 112 | 113 | | 119 | 120 | 121 |
| 98 | 99 | 100 | 101 | 102 | 103 | 104 | 105 | | | 117 | 118 | |
| 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | | | | |
| 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | | 114 | 115 | 116 |

(E16)
B

**H.S.**

BKWA0548E

LAN-CAN-17

■ ■ : DATA LINE

DATA LINK CONNECTOR (M22)

| 6 | 14 |
| L | P |

TRANSFER CONTROL UNIT (M152)

CAN-H    CAN-L
| 1 | 2 |
| L | P |

A ◁ L

C ▷ L

PRECEDING PAGE

NEXT PAGE

B ◁ P

D ▷ P

| 12 | 11 |
| L | P |

CAN-H    CAN-L
COMBINATION METER (M24)

| 39 | 40 |
| L | P |

CAN-H    CAN-L
BCM (BODY CONTROL MODULE) (M18)

M18 W H.S.

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

M22 W

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

M24 W

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

M152 W H.S.

| 6 | 5 | 4 | 3 | 2 | 1 |
| 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 |
| 26 | 25 | 24 | 23 | 22 | | 21 | 20 | 19 | 18 |

BKWA0549E

# CAN SYSTEM (TYPE 6)

## LAN-CAN-18

■□■ : DATA LINE

A

B

C

D

E

F

G

H

I

J

LAN

L

M

PRECEDING PAGE

C L

D P

L          P

M91
E26

11          10

L          P

L          P          L          P

11   15          39   40

CAN-H   CAN-L          CAN-H   CAN-L

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

E125

IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) (CPU)

E122

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

M91 W

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

E122 W

E125 B

BKWA0550E

# CHECK SHEET

UKS004I7

**NOTE:**
If a check mark is put on "NG" on "INITIAL DIAG (Initial diagnosis)", replace the control unit.

Check sheet table

| SELECT SYSTEM screen | | CAN DIAG SUPPORT MNTR | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | |
| | | | | ECM | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| BCM | No indication | NG | UNKWN | UNKWN | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | — | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

Symptoms :

Attach copy of
SELECT SYSTEM

Attach copy of
SELECT SYSTEM

PKIB6526E

Attach copy of
ENGINE
SELF-DIAG RESULTS

Attach copy of
BCM
SELF-DIAG RESULTS

Attach copy of
METER
SELF-DIAG RESULTS

Attach copy of
ALL MODE AWD/4WD
SELF-DIAG RESULTS

Attach copy of
ABS
SELF-DIAG RESULTS

Attach copy of
IPDM E/R
SELF-DIAG RESULTS

Attach copy of
ENGINE
CAN DIAG SUPPORT
MNTR

Attach copy of
BCM
CAN DIAG SUPPORT
MNTR

Attach copy of
ALL MODE AWD/4WD
CAN DIAG SUPPORT
MNTR

Attach copy of
ABS
CAN DIAG SUPPORT
MNTR

Attach copy of
IPDM E/R
CAN DIAG SUPPORT
MNTR

PKIB6525E

## CHECK SHEET RESULTS (EXAMPLE)

**NOTE:**
If a check mark is put on "NG" on "INITIAL DIAG (Initial diagnosis)", replace the control unit.

### Case 1

Check harness between data link connector and ABS actuator and electric unit (control unit) circuit. Refer to LAN-180, "Inspection Between Data Link Connector and ABS Actuator and Electric Unit (Control Unit) Circuit" .

| SELECT SYSTEM screen | CAN DIAG SUPPORT MNTR | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | |
| | | | ECM | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | UNKWN | UNKWN ✓ | UNKWN ✓ | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) ✓ |
| BCM | No indication | NG | UNKWN | UNKWN | — | UNKWN | — | UNKWN ✓ | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) ✓ | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | — | UNKWN | UNKWN ✓ | — | CAN COMM CIRCUIT (U1000) ✓ | — |
| ABS | — | NG | UNKWN | UNKWN ✓ | — | — | UNKWN ✓ | — | CAN COMM CIRCUIT (U1000) ✓ | — |
| IPDM E/R | No indication ✓ | — | UNKWN | UNKWN | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) ✓ | — |

PKIB7320E



//////// : Malfunctioning part

PKIB7147E

## Case 2

Check ECM circuit. Refer to LAN-181, "ECM Circuit Inspection" .

| SELECT SYSTEM screen | CAN DIAG SUPPORT MNTR | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | |
| | | | ECM | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| BCM | No indication | NG | UNKWN | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | — | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB7321E



///// : Malfunctioning part

BCM — Combination meter — Transfer control unit — CAN H — CAN L — ECM — Data link connector — ABS actuator and electric unit(control unit) — IPDM E/R

PKIB7148E

## Case 3

Check data link connector circuit. Refer to LAN-182, "Data Link Connector Circuit Inspection" .

| SELECT SYSTEM screen | Initial diagnosis | Transmit diagnosis | CAN DIAG SUPPORT MNTR | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Receive diagnosis | | | | | | | |
| | | | ECM | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| BCM | No indication | NG | UNKWN | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | — | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB7322E



: Malfunctioning part

BCM  Combination meter  Transfer control unit

CAN H

CAN L

ECM  Data link connector  ABS actuator and electric unit(control unit)  IPDM E/R

PKIB7149E

## Case 4

Check BCM circuit. Refer to LAN-182, "BCM Circuit Inspection" .

| SELECT SYSTEM screen | CAN DIAG SUPPORT MNTR | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | |
| | | | ECM | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) ✓ |
| BCM | No indication ✓ | NG | UNKWN | UNKWN | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) ✓ | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | — | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) ✓ | — |

PKIB7323E

////// : Malfunctioning part

BCM — Combination meter — Transfer control unit

CAN H

CAN L

ECM — Data link connector — ABS actuator and electric unit(control unit) — IPDM E/R

PKIB7150E

## Case 5

Check combination meter circuit. Refer to LAN-183, "Combination Meter Circuit Inspection" .

| SELECT SYSTEM screen | | CAN DIAG SUPPORT MNTR | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | |
| | | | | ECM | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | UNKWN ✓ | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) ✓ |
| BCM | No indication | NG | UNKWN | UNKWN | — | UNKWN ✓ | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication ✓ | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) ✓ | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | — | UNKWN ✓ | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB7324E



///// : Malfunctioning part

BCM

Combination meter

Transfer control unit

CAN H

CAN L

ECM

Data link connector

ABS actuator and electric unit(control unit)

IPDM E/R

PKIB7151E

## Case 6

Check transfer control unit circuit. Refer to LAN-183, "Transfer Control Unit Circuit Inspection" .

| SELECT SYSTEM screen | CAN DIAG SUPPORT MNTR | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | |
| | | | ECM | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| BCM | No indication | NG | UNKWN | UNKWN | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | — | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB7325E



PKIB7152E

## Case 7

Check ABS actuator and electric unit (control unit) circuit. Refer to LAN-184, "ABS Actuator and Electric Unit (Control Unit) Circuit Inspection" .

| SELECT SYSTEM screen | | CAN DIAG SUPPORT MNTR | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | |
| | | | | ECM | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | UNKWN | UNKWN | UNKWN✓ | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001)✓ |
| BCM | No indication | NG | UNKWN | UNKWN | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000)✓ | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | — | UNKWN | — | UNKWN✓ | — | CAN COMM CIRCUIT (U1000)✓ | — |
| ABS | — | NG✓ | UNKWN✓ | UNKWN✓ | — | — | UNKWN✓ | — | — | CAN COMM CIRCUIT (U1000)✓ | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB7326E



: Malfunctioning part

BCM    Combination meter    Transfer control unit

CAN H

CAN L

ECM    Data link connector    ABS actuator and electric unit(control unit)    IPDM E/R

PKIB7153E

## Case 8

Check IPDM E/R circuit. Refer to LAN-184, "IPDM E/R Circuit Inspection" .

| SELECT SYSTEM screen | Initial diagnosis | Transmit diagnosis | ECM | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | CAN DIAG SUPPORT MNTR — Receive diagnosis | | | | | | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN (✓) | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) (✓) |
| BCM | No indication | NG | UNKWN | UNKWN | — | UNKWN | — | — | UNKWN (✓) | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) (✓) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | — | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication (✓) | — | UNKWN | UNKWN | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) (✓) | — |

PKIB7327E



////// : Malfunctioning part

PKIB7154E

## Case 9

Check CAN communication circuit. Refer to LAN-185, "CAN Communication Circuit Inspection" .

| SELECT SYSTEM screen | Initial diagnosis | Transmit diagnosis | ECM | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | CAN DIAG SUPPORT MNTR — Receive diagnosis | | | | | | | |
| ENGINE | — | NG | UNKWN (✓) | — | UNKWN (✓) | UNKWN (✓) | UNKWN (✓) | UNKWN (✓) | UNKWN (✓) | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) (✓) |
| BCM | No indication (✓) | NG | UNKWN | UNKWN | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication (✓) | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) (✓) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN (✓) | UNKWN (✓) | — | UNKWN (✓) | — | UNKWN (✓) | — | CAN COMM CIRCUIT (U1000) (✓) | — |
| ABS | — | NG (✓) | UNKWN (✓) | UNKWN (✓) | — | — | UNKWN (✓) | — | — | CAN COMM CIRCUIT (U1000) (✓) | — |
| IPDM E/R | No indication (✓) | — | UNKWN | UNKWN | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) (✓) | — |

PKIB7328E

## Case 10

Check IPDM E/R ignition relay circuit continuously sticks "OFF". Refer to LAN-188, "IPDM E/R Ignition Relay Circuit Inspection" .

| SELECT SYSTEM screen | CAN DIAG SUPPORT MNTR | | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | |
| | | | ECM | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | UNKWN | UNKWN | UNKWN✓ | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001)✓ |
| BCM | No indication | NG | UNKWN | UNKWN | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000)✓ | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | — | UNKWN | — | UNKWN✓ | — | CAN COMM CIRCUIT (U1000)✓ | — |
| ABS | — | NG | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB7329E

## Case 11

Check IPDM E/R ignition relay circuit continuously sticks "ON". Refer to LAN-188, "IPDM E/R Ignition Relay Circuit Inspection" .

| SELECT SYSTEM screen | CAN DIAG SUPPORT MNTR | | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | |
| | | | ECM | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| BCM | No indication | NG | UNKWN | UNKWN | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | — | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000)✓ | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB7330E

# Inspection Between Data Link Connector and ABS Actuator and Electric Unit (Control Unit) Circuit

UKS004I8

## 1. CHECK CONNECTOR

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

– Harness connector M91

– Harness connector E26

OK or NG

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

## 2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect harness connector M91.
2. Check continuity between data link connector M22 terminals 6 (L), 14 (P) and harness connector M91 terminals 11 (L), 10 (P).

    **6 (L) – 11 (L)**          **: Continuity should exist.**

    **14 (P) – 10 (P)**        **: Continuity should exist.**

OK or NG

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



Data link connector

Harness connector

SKIB2812E

## 3. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect ABS actuator and electric unit (control unit) connector.
2. Check continuity between harness connector E26 terminals 11 (L), 10 (P) and ABS actuator and electric unit (control unit) harness connector E125 terminals 11 (L), 15 (P).

    **11 (L) – 11 (L)**       **: Continuity should exist.**

    **10 (P) – 15 (P)**       **: Continuity should exist.**

OK or NG

  OK      >> Connect all the connectors and diagnose again. Refer to LAN-6, "TROUBLE DIAGNOSES WORK FLOW" .
  NG      >> Repair harness.



Harness connector

ABS actuator and electric unit (control unit) connector

C/UNIT  CONNECTOR
11, 15

SKIB2813E

## ECM Circuit Inspection

UKS004I9

## 1. CHECK CONNECTOR

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

– ECM connector
– Harness connector E152
– Harness connector M31

OK or NG

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

## 2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect ECM connector.
2. Check resistance between ECM harness connector E16 terminals 94 (L) and 86 (P).

   **94 (L) – 86 (P)**          **: Approx. 108 – 132 Ω**

OK or NG

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



ECM connector

PKIA9592E

## Data Link Connector Circuit Inspection

UKS004IA

### 1. CHECK CONNECTOR

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

OK or NG

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

## 2. CHECK HARNESS FOR OPEN CIRCUIT

Check resistance between data link connector M22 terminals 6 (L) and 14 (P).

   **6 (L) – 14 (P)**          **: Approx. 54 – 66 Ω**

OK or NG

 OK   >> Diagnose again. Refer to <u>LAN-6, "TROUBLE DIAG-NOSES WORK FLOW"</u> .
 NG   >> Repair harness between data link connector and BCM.



Data link connector

SKIA6868E

## BCM Circuit Inspection

UKS004IB

### 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check 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 M18 terminals 39 (L) and 40 (P).

**39 (L) – 40 (P)**      **: Approx. 54 – 66 Ω**

OK or NG

OK     >> Replace BCM. Refer to <u>BCS-19, "Removal and Installation of BCM"</u> .
NG     >> Repair harness between BCM and data link connector.



SKIA6869E

## Combination Meter Circuit Inspection

*UKS004IC*

## 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative 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.
2. Check resistance between combination meter harness connector M24 terminals 12 (L) and 11 (P).

**12 (L) – 11 (P)**      **: Approx. 54 – 66 Ω**

OK or NG

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



PKIA6837E

## Transfer Control Unit Circuit Inspection

*UKS004ID*

## 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check terminals and connector of transfer 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 transfer control unit connector.
2. Check resistance between transfer control unit harness connector M152 terminals 1 (L) and 2 (P).

**1 (L) – 2 (P)** : **Approx. 54 – 66 $\Omega$**

OK or NG

OK >> Replace transfer control unit.
NG >> Repair harness between transfer control unit and data link connector.


PKIA9745E

Transfer control unit connector

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

UKS004IE

## 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check terminals and connector of ABS actuator and electric unit (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 ABS actuator and electric unit (control unit) connector.
2. Check resistance between ABS actuator and electric unit (control unit) harness connector E125 terminals 11 (L) and 15 (P).

**11 (L) – 15 (P)** : **Approx. 54 – 66 $\Omega$**

OK or NG

OK >> Replace ABS actuator and electric unit (control unit).
NG >> Repair harness between ABS actuator and electric unit (control unit) and IPDM E/R.


SKIA6872E

ABS actuator and electric unit (control unit) connector

# IPDM E/R Circuit Inspection

UKS004IF

## 1. CHECK CONNECTOR

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

OK or NG

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

# CAN SYSTEM (TYPE 6)

## 2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect IPDM E/R connector.
2. Check resistance between IPDM E/R harness connector E122 terminals 39 (L) and 40 (P).

   **39 (L) – 40 (P)**        **: Approx. 108 – 132 Ω**

OK or NG

  OK      >> Replace IPDM E/R.
  NG     >> Repair harness between IPDM E/R and ABS actuator and electric unit (control unit).



IPDM E/R connector

PKIA8141E

## CAN Communication Circuit Inspection

UKS004IG

### 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check following terminals and connectors for damage, bend and loose connection (control module side, control unit side, meter side, and harness side).
- ECM
- BCM
- Combination meter
- Transfer control unit
- ABS actuator and electric unit (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 ECM connector and harness connector E152.
2. Check continuity between ECM harness connector E16 terminals 94 (L) and 86 (P).

   **94 (L) – 86 (P)**        **: Continuity should not exist.**

OK or NG

  OK      >> GO TO 3.
  NG     >> Repair harness between ECM and harness connector E152.



ECM connector

SKIA6865E

## 3. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between ECM harness connector E16 terminals 94 (L), 86 (P) and ground.

**94 (L) – Ground** **: Continuity should not exist.**

**86 (P) – Ground** **: Continuity should not exist.**

OK or NG

OK >> GO TO 4.
NG >> Repair harness between ECM and harness connector E152.

ECM connector

SKIB0571E

## 4. CHECK HARNESS FOR SHORT CIRCUIT

1. Disconnect following connectors.
– BCM connector
– Combination meter connector
– Transfer control unit connector
– Harness connector M91
2. Check continuity between data link connector M22 terminals 6 (L) and 14 (P).

**6 (L) – 14 (P)** **: Continuity should not exist.**

OK or NG

OK >> GO TO 5.
NG >> Check the following harnesses. If any harness is damaged, repair the harness.
  ● Harness between data link connector and harness connector M31
  ● Harness between data link connector and BCM
  ● Harness between data link connector and combination meter
  ● Harness between data link connector and transfer control unit
  ● Harness between data link connector and harness connector M91

Data link connector

SKIA6868E

## 5. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between data link connector M22 terminals 6 (L), 14 (P) and ground.

**6 (L) – Ground** **: Continuity should not exist.**

**14 (P) – Ground** **: Continuity should not exist.**

OK or NG

OK >> GO TO 6.
NG >> Check the following harnesses. If any harness is damaged, repair the harness.
  ● Harness between data link connector and harness connector M31
  ● Harness between data link connector and BCM
  ● Harness between data link connector and combination meter
  ● Harness between data link connector and transfer control unit
  ● Harness between data link connector and harness connector M91

Data link connector

PKIA9872E

# CAN SYSTEM (TYPE 6)

## 6. CHECK HARNESS FOR SHORT CIRCUIT

1. Disconnect ABS actuator and electric unit (control unit) connector and IPDM E/R connector.
2. Check continuity between IPDM E/R harness connector E122 terminals 39 (L) and 40 (P).

   **39 (L) – 40 (P)**     **: Continuity should not exist.**

<u>OK or NG</u>

- OK     >> GO TO 7.
- NG     >> Check the following harnesses. If any harness is damaged, repair the harness.
  - Harness between IPDM E/R and ABS actuator and electric unit (control unit)
  - Harness between IPDM E/R and harness connector E26

IPDM E/R connector

PKIA8141E

## 7. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between IPDM E/R harness connector E122 terminals 39 (L), 40 (P) and ground.

   **39 (L) – Ground**     **: Continuity should not exist.**

   **40 (P) – Ground**     **: Continuity should not exist.**

<u>OK or NG</u>

- OK     >> GO TO 8.
- NG     >> Check the following harnesses. If any harness is damaged, repair the harness.
  - Harness between IPDM E/R and ABS actuator and electric unit (control unit)
  - Harness between IPDM E/R and harness connector E26

IPDM E/R connector

SKIB2821E

## 8. CHECK ECM AND IPDM E/R INTERNAL CIRCUIT

1. Remove ECM and IPDM E/R from vehicle.
2. Check resistance between ECM terminals 94 and 86.

   **94 – 86**     **: Approx. 108 – 132 $\Omega$**

3. Check resistance between IPDM E/R terminals 39 and 40.

   **39 – 40**     **: Approx. 108 – 132 $\Omega$**

<u>OK or NG</u>

- OK     >> GO TO 9.
- NG     >> Replace ECM and/or IPDM E/R.

**ECM and IPDM E/R**

LKIA0037E

## 9. CHECK SYMPTOM

1. Fill in described symptoms on the column "Symptom" in the check sheet.
2. Connect all connectors, and then make sure that the symptom is reproduced.

<u>OK or NG</u>

- OK     >> GO TO 10.
- NG     >> Refer to <u>LAN-14, "Example of Filling in Check Sheet When Initial Conditions Are Not Reproduced"</u>.

## 10. CHECK UNIT REPRODUCIBILITY

Perform the following procedure for each unit, and then perform reproducibility test.

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Disconnect the unit connector.
4. Connect the battery cable to the negative terminal.
5. Make sure that the symptom filled in the "Symptom" of the check sheet is reproduced. (Do not confuse it with the symptom related to removed unit.)
6. Make sure that the same symptom is reproduced.

– BCM
– Combination meter
– Transfer control unit
– ABS actuator and electric unit (control unit)
– ECM
– IPDM E/R

Inspection results

Reproduced>>Install removed unit, and then check the other unit.
Not reproduced>>Replace removed unit.

## IPDM E/R Ignition Relay Circuit Inspection

UKS004IH

Check the following. If no malfunction is found, replace the IPDM E/R.

● IPDM E/R power supply circuit. Refer to PG-27, "IPDM E/R Power/Ground Circuit Inspection" .
● Ignition power supply circuit. Refer to PG-14, "IGNITION POWER SUPPLY — IGNITION SW. IN ON AND/OR START" .

## CAN SYSTEM (TYPE 7)

PFP:23710

### System Description

UKS004HN

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

UKS004HO



BKIA0179E

## Schematic

BKWA0577E

## Wiring Diagram — CAN —

UKS004HQ

LAN-CAN-19

■□■ : DATA LINE

A

B

C

D

E

F

G

H

I

J

**LAN**

L

M

NEXT
PAGE

L ▷ A

P ▷ B

L    P

M31
52G   51G
E152

L   P

94   86

CAN-H   CAN-L   ECM
E16

| 106 | 107 | 108 | 109 | 110 | 111 | 112 | 113 | | 119 | 120 | 121 |
| 98 | 99 | 100 | 101 | 102 | 103 | 104 | 105 | | | 117 | 118 |
| 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | | | | |
| 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | | 114 | 115 | 116 |

E16
B

H.S.

REFER TO THE FOLLOWING.
M31 - SUPER MULTIPLE
JUNCTION (SMJ)

BKWA0551E

LAN-CAN-20

◼◻◼ : DATA LINE

DATA LINK CONNECTOR
(M22)
6    14
L    P

TRANSFER CONTROL UNIT
(M152)
CAN-H    CAN-L
1        2
L        P

PRECEDING PAGE ◁ A  L ───── L ▷ C

PRECEDING PAGE ◁ B  P ───── P ▷ D

NEXT PAGE

DIFFERENTIAL LOCK CONTROL UNIT
(M70)
5        4
CAN-H    CAN-L
L        P

COMBINATION METER
(M24)
12       11
CAN-H    CAN-L
L        P

BCM (BODY CONTROL MODULE)
(M18)
39       40
CAN-H    CAN-L
L        P

M18  W  H.S.
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40

M22  W  H.S.
16 15 14 13 12 11 10 9
8 7 6 5 4 3 2 1

M24  W
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40

M70  W  H.S.
12 11 10 9 8 7 6 5 4 3 2 1
26 25 24 23 22 21 20 19 18 17 16 15 14 13

M152  W  H.S.
6 5 4 3 2 1
17 16 15 14 13 12 11 10 9 8 7
26 25 24 23 22 21 20 19 18

BKWA0552E

A

B

C

D

E

F

G

H

I

J

LAN

L

M

■■■ : DATA LINE

PRECEDING
PAGE

C L

D P

L        P

M91
E26

11        10

L        P

L        P

CAN-H        CAN-L

11        15

ABS
ACTUATOR
AND
ELECTRIC
UNIT
(CONTROL
UNIT)

E125

CAN-H        CAN-L

39        40

IPDM E/R
(INTELLIGENT
POWER
DISTRIBUTION
MODULE
ENGINE ROOM)
(CPU)

E122

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

M91
W

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

E122
W

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

E125
B

BKWA0553E

## CHECK SHEET

UKS004HR

**NOTE:**
If a check mark is put on "NG" on "INITIAL DIAG (Initial diagnosis)", replace the control unit.

Check sheet table

| SELECT SYSTEM screen | | Initial diagnosis | Transmit diagnosis | ECM | DIFF LOCK | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | **CAN DIAG SUPPORT MNTR** (Receive diagnosis) | | | | | | | | |
| ENGINE | — | NG | UNKWN | UNKWN | — | — | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| DIFF LOCK | — | NG | UNKWN | UNKWN | UNKWN | — | — | — | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | UNKWN | — | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) | — |

Symptoms :

Attach copy of
SELECT SYSTEM

Attach copy of
SELECT SYSTEM

PKIB6527E

Attach copy of
ENGINE
SELF-DIAG RESULTS

Attach copy of
DIFF LOCK
SELF-DIAG RESULTS

Attach copy of
BCM
SELF-DIAG RESULTS

Attach copy of
METER
SELF-DIAG RESULTS

Attach copy of
ALL MODE AWD/4WD
SELF-DIAG RESULTS

Attach copy of
ABS
SELF-DIAG RESULTS

Attach copy of
IPDM E/R
SELF-DIAG RESULTS

Attach copy of
ENGINE
CAN DIAG SUPPORT
MNTR

Attach copy of
DIFF LOCK
CAN DIAG SUPPORT
MNTR

Attach copy of
BCM
CAN DIAG SUPPORT
MNTR

Attach copy of
ALL MODE AWD/4WD
CAN DIAG SUPPORT
MNTR

Attach copy of
ABS
CAN DIAG SUPPORT
MNTR

Attach copy of
IPDM E/R
CAN DIAG SUPPORT
MNTR

PKIB6528E

**LAN-195**

## CHECK SHEET RESULTS (EXAMPLE)

**NOTE:**
If a check mark is put on "NG" on "INITIAL DIAG (Initial diagnosis)", replace the control unit.

### Case 1

Check harness between data link connector and ABS actuator and electric unit (control unit) circuit. Refer to LAN-205, "Inspection Between Data Link Connector and ABS Actuator and Electric Unit (Control Unit) Circuit" .

| SELECT SYSTEM screen | | CAN DIAG SUPPORT MNTR | | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | |
| | | | | ECM | DIFF LOCK | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | — | UNKWN | UNKWN | UNKWN | UNKWN✓ | UNKWN✓ | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1✓01) |
| DIFF LOCK | — | NG | UNKWN | UNKWN | — | — | — | UNKWN | UNKWN✓ | — | CAN COMM CIRCUIT (U1✓00) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | UNKWN | — | — | UNKWN✓ | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1✓00) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN✓ | — | CAN COMM CIRCUIT (U1✓00) | — |
| ABS | — | NG | UNKWN | UNKWN✓ | UNKWN✓ | — | — | UNKWN✓ | — | — | CAN COMM CIRCUIT (U1✓00) | — |
| IPDM E/R | No indication✓ | — | UNKWN | UNKWN | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1✓00) | — |

PKIB7331E



////// : Malfunctioning part

BCM · Combination meter · Transfer control unit · CAN H · CAN L · ECM · Differential lock control unit · Data link connector · ABS actuator and electric unit(control unit) · IPDM E/R

PKIB7155E

# CAN SYSTEM (TYPE 7)

[CAN]

## Case 2

Check ECM circuit. Refer to LAN-206, "ECM Circuit Inspection" .

| SELECT SYSTEM screen | Initial diagnosis | Transmit diagnosis | CAN DIAG SUPPORT MNTR | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Receive diagnosis | | | | | | | | |
| | | | ECM | DIFF LOCK | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN✓ | — | — | UNKWN✓ | UNKWN✓ | UNKWN✓ | UNKWN✓ | UNKWN✓ | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001)✓ |
| DIFF LOCK | — | NG | UNKWN | UNKWN✓ | — | — | — | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000)✓ | — |
| BCM | No indication | NG | UNKWN | UNKWN✓ | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000)✓ | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN✓ | — | — | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000)✓ | — |
| ABS | — | NG | UNKWN | UNKWN✓ | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000)✓ | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN✓ | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000)✓ | — |

PKIB7332E

⬜ : Malfunctioning part

BCM — Combination meter — Transfer control unit

CAN H

CAN L

ECM — Differential lock control unit — Data link connector — ABS actuator and electric unit(control unit) — IPDM E/R

PKIB7156E

## Case 3

Check differential lock control unit circuit. Refer to .

| SELECT SYSTEM screen | CAN DIAG SUPPORT MNTR | | | | | | | | | SELF-DIAG RESULTS | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | |
| | | | ECM | DIFF LOCK | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | — | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| DIFF LOCK | — | NG | UNKWN ✓ | UNKWN ✓ | — | — | — | UNKWN ✓ | UNKWN ✓ | — | CAN COMM CIRCUIT (U1000) ✓ | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN ✓ | — | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) ✓ | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB7333E



///// : Malfunctioning part

BCM · Combination meter · Transfer control unit · CAN H · CAN L · ECM · Differential lock control unit · Data link connector · ABS actuator and electric unit(control unit) · IPDM E/R

PKIB7157E

## Case 4

Check data link connector circuit. Refer to LAN-207, "Data Link Connector Circuit Inspection" .

| SELECT SYSTEM screen | Initial diagnosis | Transmit diagnosis | CAN DIAG SUPPORT MNTR — Receive diagnosis — ECM | DIFF LOCK | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ENGINE | — | NG | UNKWN | — | — | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| DIFF LOCK | — | NG | UNKWN | UNKWN | — | — | — | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication ✓ | NG | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication ✓ | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication ✓ | — | UNKWN | UNKWN | — | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB7334E

////// : Malfunctioning part

BCM    Combination meter    Transfer control unit

CAN H

CAN L

ECM    Differential lock control unit    Data link connector    ABS actuator and electric unit(control unit)    IPDM E/R

PKIB7158E

## Case 5

Check BCM circuit. Refer to LAN-208, "BCM Circuit Inspection" .

| SELECT SYSTEM screen | | CAN DIAG SUPPORT MNTR | | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | |
| | | | | ECM | DIFF LOCK | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | — | UNKWN✓ | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT✓ (U1001) |
| DIFF LOCK | — | NG | UNKWN | UNKWN | — | — | — | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication✓ | NG | UNKWN | UNKWN | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT✓ (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | UNKWN✓ | — | — | — | — | CAN COMM CIRCUIT✓ (U1000) | — |

PKIB7335E



///// : Malfunctioning part

BCM
Combination meter
Transfer control unit
CAN H
CAN L
ECM
Differential lock control unit
Data link connector
ABS actuator and electric unit(control unit)
IPDM E/R

PKIB7159E

## Case 6

Check combination meter circuit. Refer to LAN-208, "Combination Meter Circuit Inspection" .

| SELECT SYSTEM screen | Initial diagnosis | Transmit diagnosis | CAN DIAG SUPPORT MNTR | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Receive diagnosis | | | | | | | |
| | | | ECM | DIFF LOCK | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | — | UNKWN | UNKWN ✓ | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) ✓ |
| DIFF LOCK | — | NG | UNKWN | UNKWN | — | — | — | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | UNKWN ✓ | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication ✓ | — | — | — | — | — | — ✓ | — | — | — | CAN COMM CIRCUIT (U1000) ✓ | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | — | — | UNKWN ✓ | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB7336E

: Malfunctioning part

BCM — Combination meter — Transfer control unit

CAN H

CAN L

ECM — Differential lock control unit — Data link connector — ABS actuator and electric unit(control unit) — IPDM E/R

PKIB7160E

## Case 7

Check transfer control unit circuit. Refer to LAN-209, "Transfer Control Unit Circuit Inspection" .

| SELECT SYSTEM screen | CAN DIAG SUPPORT MNTR | | | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | | |
| | | | ECM | DIFF LOCK | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | — | UNKWN | UNKWN | UNKWN ✓ | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) ✓ |
| DIFF LOCK | — | NG | UNKWN | UNKWN | — | — | — | UNKWN ✓ | UNKWN | — | CAN COMM CIRCUIT (U1000) ✓ | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN ✓ | UNKWN ✓ | — | — | UNKWN ✓ | — | UNKWN ✓ | — | CAN COMM CIRCUIT (U1000) ✓ | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | — | — | UNKWN ✓ | — | — | CAN COMM CIRCUIT (U1000) ✓ | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB7337E

///// : Malfunctioning part

BCM

Combination meter

Transfer control unit

CAN H

CAN L

ECM

Differential lock control unit

Data link connector

ABS actuator and electric unit(control unit)

IPDM E/R

PKIB7161E

## Case 8

Check ABS actuator and electric unit (control unit) circuit. Refer to LAN-209, "ABS Actuator and Electric Unit (Control Unit) Circuit Inspection" .

| SELECT SYSTEM screen | | Initial diagnosis | Transmit diagnosis | ECM | DIFF LOCK | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Receive diagnosis | | | | | | | | |
| ENGINE | — | NG | UNKWN | — | — | UNKWN | UNKWN | UNKWN | UNKWN✓ | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001)✓ |
| DIFF LOCK | — | NG | UNKWN | UNKWN | — | — | — | UNKWN | UNKWN✓ | — | CAN COMM CIRCUIT (U1000)✓ | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000)✓ | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000)✓ | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN✓ | — | CAN COMM CIRCUIT (U1000)✓ | — |
| ABS | — | NG✓ | UNKWN✓ | UNKWN✓ | UNKWN✓ | — | — | UNKWN✓ | — | — | CAN COMM CIRCUIT (U1000)✓ | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

Header: CAN DIAG SUPPORT MNTR

PKIB7338E

: Malfunctioning part

BCM
Combination meter
Transfer control unit

CAN H
CAN L

ECM
Differential lock control unit
Data link connector
ABS actuator and electric unit(control unit)
IPDM E/R

PKIB7162E

## Case 9

Check IPDM E/R circuit. Refer to LAN-210, "IPDM E/R Circuit Inspection" .

| SELECT SYSTEM screen | CAN DIAG SUPPORT MNTR | | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | |
| | | | ECM | DIFF LOCK | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | — | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| DIFF LOCK | — | NG | UNKWN | UNKWN | — | — | — | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB7339E



////// : Malfunctioning part

BCM　　Combination meter　　Transfer control unit

CAN H

CAN L

ECM　　Differential lock control unit　　Data link connector　　ABS actuator and electric unit(control unit)　　IPDM E/R

PKIB7163E

## Case 10

Check CAN communication circuit. Refer to LAN-211, "CAN Communication Circuit Inspection" .

| SELECT SYSTEM screen | CAN DIAG SUPPORT MNTR | | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | |
| | | | ECM | DIFF LOCK | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | — | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| DIFF LOCK | — | NG | UNKWN | UNKWN | — | — | — | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB7340E

## Case 11

Check IPDM E/R ignition relay circuit continuously sticks "OFF". Refer to LAN-214, "IPDM E/R Ignition Relay Circuit Inspection" .

| SELECT SYSTEM screen | CAN DIAG SUPPORT MNTR | | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | |
| | | | ECM | DIFF LOCK | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | — | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| DIFF LOCK | — | NG | UNKWN | UNKWN | — | — | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB7341E

## Case 12

Check IPDM E/R ignition relay circuit continuously sticks "ON". Refer to LAN-214, "IPDM E/R Ignition Relay Circuit Inspection" .

| SELECT SYSTEM screen | CAN DIAG SUPPORT MNTR | | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | |
| | | | ECM | DIFF LOCK | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | — | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| DIFF LOCK | — | NG | UNKWN | UNKWN | — | — | — | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB7342E

# Inspection Between Data Link Connector and ABS Actuator and Electric Unit (Control Unit) Circuit

UKS004HS

## 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check following terminals and connectors for damage, bend and loose connection (connector side and harness side).
– Harness connector M91
– Harness connector E26

OK or NG

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

## 2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect harness connector M91.
2. Check continuity between data link connector M22 terminals 6 (L), 14 (P) and harness connector M91 terminals 11 (L), 10 (P).

    **6 (L) – 11 (L)**            **: Continuity should exist.**

    **14 (P) – 10 (P)**           **: Continuity should exist.**

OK or NG

  OK     &gt;&gt; GO TO 3.
  NG     &gt;&gt; Repair harness.

## 3. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect ABS actuator and electric unit (control unit) connector.
2. Check continuity between harness connector E26 terminals 11 (L), 10 (P) and ABS actuator and electric unit (control unit) harness connector E125 terminals 11 (L), 15 (P).

    **11 (L) – 11 (L)**           **: Continuity should exist.**

    **10 (P) – 15 (P)**           **: Continuity should exist.**

OK or NG

  OK     &gt;&gt; Connect all the connectors and diagnose again. Refer to LAN-6, "TROUBLE DIAGNOSES WORK FLOW" .
  NG     &gt;&gt; Repair harness.

# ECM Circuit Inspection

*UKS004HT*

## 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check following terminals and connectors for damage, bend and loose connection (control module side and harness side).
– ECM connector
– Harness connector E152
– Harness connector M31

OK or NG

  OK     &gt;&gt; GO TO 2.
  NG     &gt;&gt; Repair terminal or connector.

# CAN SYSTEM (TYPE 7)

## 2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect ECM connector.
2. Check resistance between ECM harness connector E16 terminals 94 (L) and 86 (P).

**94 (L) – 86 (P)**        **: Approx. 108 – 132 $\Omega$**

OK or NG

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

PKIA9592E

## Differential Lock Control Unit Circuit Inspection

UKS004HU

## 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check terminals and connector of differential lock 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 differential lock control unit connector.
2. Check resistance between differential lock control unit harness connector M70 terminals 5 (L) and 4 (P).

**5 (L) – 4 (P)**        **: Approx. 54 – 66 $\Omega$**

OK or NG

  OK     >> Replace differential lock control unit.
  NG     >> Repair harness between differential lock control unit and data link connector.

PKIA9748E

## Data Link Connector Circuit Inspection

UKS004HV

## 1. CHECK CONNECTOR

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

OK or NG

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

## 2. CHECK HARNESS FOR OPEN CIRCUIT

Check resistance between data link connector M22 terminals 6 (L) and 14 (P).

    **6 (L) – 14 (P)**         **: Approx. 54 – 66 $\Omega$**

OK or NG

OK     >> Diagnose again. Refer to <u>LAN-6, "TROUBLE DIAG-NOSES WORK FLOW"</u> .

NG     >> Repair harness between data link connector and BCM.



Data link connector

SKIA6868E

## BCM Circuit Inspection

UKS004HW

### 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check 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 M18 terminals 39 (L) and 40 (P).

    **39 (L) – 40 (P)**         **: Approx. 54 – 66 $\Omega$**

OK or NG

OK     >> Replace BCM. Refer to <u>BCS-19, "Removal and Installation of BCM"</u> .

NG     >> Repair harness between BCM and data link connector.



BCM connector

SKIA6869E

## Combination Meter Circuit Inspection

UKS004HX

### 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative 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.
2. Check resistance between combination meter harness connector M24 terminals 12 (L) and 11 (P).

**12 (L) – 11 (P)**      **: Approx. 54 – 66 Ω**

OK or NG

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

Combination meter connector

PKIA6837E

## Transfer Control Unit Circuit Inspection

*UKS004HY*

## 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check terminals and connector of transfer 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 transfer control unit connector.
2. Check resistance between transfer control unit harness connector M152 terminals 1 (L) and 2 (P).

**1 (L) – 2 (P)**      **: Approx. 54 – 66 Ω**

OK or NG

OK     >> Replace transfer control unit.
NG     >> Repair harness between transfer control unit and data link connector.

Transfer control unit connector

PKIA9745E

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

*UKS004HZ*

## 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check terminals and connector of ABS actuator and electric unit (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 ABS actuator and electric unit (control unit) connector.
2. Check resistance between ABS actuator and electric unit (control unit) harness connector E125 terminals 11 (L) and 15 (P).

   **11 (L) – 15 (P)**     **: Approx. 54 – 66** $\Omega$

OK or NG

  OK    >> Replace ABS actuator and electric unit (control unit).
  NG    >> Repair harness between ABS actuator and electric unit (control unit) and IPDM E/R.

ABS actuator and electric unit
(control unit) connector

SKIA6872E

## IPDM E/R Circuit Inspection

UKS004I0

## 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check terminals and connector of IPDM E/R 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 IPDM E/R connector.
2. Check resistance between IPDM E/R harness connector E122 terminals 39 (L) and 40 (P).

   **39 (L) – 40 (P)**     **: Approx. 108 – 132** $\Omega$

OK or NG

  OK    >> Replace IPDM E/R.
  NG    >> Repair harness between IPDM E/R and ABS actuator and electric unit (control unit).

IPDM E/R connector

PKIA8141E

## CAN Communication Circuit Inspection

*UKS004I1*

## 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check following terminals and connectors for damage, bend and loose connection (control module side, control unit side, meter side, and harness side).
− ECM
− Differential lock control unit
− BCM
− Combination meter
− Transfer control unit
− ABS actuator and electric unit (control unit)
− IPDM E/R
− Between ECM and IPDM E/R

<u>OK or NG</u>

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

## 2. CHECK HARNESS FOR SHORT CIRCUIT

1. Disconnect ECM connector and harness connector E152.
2. Check continuity between ECM harness connector E16 terminals 94 (L) and 86 (P).

    **94 (L) – 86 (P)**     **: Continuity should not exist.**

<u>OK or NG</u>

OK       >> GO TO 3.
NG      >> Repair harness between ECM and harness connector E152.



ECM connector

SKIA6865E

## 3. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between ECM harness connector E16 terminals 94 (L), 86 (P) and ground.

    **94 (L) – Ground**     **: Continuity should not exist.**

    **86 (P) – Ground**     **: Continuity should not exist.**

<u>OK or NG</u>

OK       >> GO TO 4.
NG      >> Repair harness between ECM and harness connector E152.



ECM connector

SKIB0571E

## 4. CHECK HARNESS FOR SHORT CIRCUIT

1. Disconnect following connectors.
– Differential lock control unit connector
– BCM connector
– Combination meter connector
– Transfer control unit connector
– Harness connector M91
2. Check continuity between data link connector M22 terminals 6 (L) and 14 (P).

     **6 (L) – 14 (P)**      **: Continuity should not exist.**

OK or NG

  OK     >> GO TO 5.
  NG     >> Check the following harnesses. If any harness is damaged, repair the harness.
- Harness between data link connector and harness connector M31
- Harness between data link connector and differential lock control unit
- Harness between data link connector and BCM
- Harness between data link connector and combination meter
- Harness between data link connector and transfer control unit
- Harness between data link connector and harness connector M91

Data link connector

SKIA6868E

## 5. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between data link connector M22 terminals 6 (L), 14 (P) and ground.

     **6 (L) – Ground**      **: Continuity should not exist.**
     **14 (P) – Ground**      **: Continuity should not exist.**

OK or NG

  OK     >> GO TO 6.
  NG     >> Check the following harnesses. If any harness is damaged, repair the harness.
- Harness between data link connector and harness connector M31
- Harness between data link connector and differential lock control unit
- Harness between data link connector and BCM
- Harness between data link connector and combination meter
- Harness between data link connector and transfer control unit
- Harness between data link connector and harness connector M91

Data link connector

PKIA9872E

A

## 6. CHECK HARNESS FOR SHORT CIRCUIT

1. Disconnect ABS actuator and electric unit (control unit) connector and IPDM E/R connector.
2. Check continuity between IPDM E/R harness connector E122 terminals 39 (L) and 40 (P).

B

    **39 (L) – 40 (P)**     **: Continuity should not exist.**

C

OK or NG
  OK     >> GO TO 7.
  NG    >> Check the following harnesses. If any harness is damaged, repair the harness.
      ● Harness between IPDM E/R and ABS actuator and electric unit (control unit)
      ● Harness between IPDM E/R and harness connector E26

D

E

## 7. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between IPDM E/R harness connector E122 terminals 39 (L), 40 (P) and ground.

F

    **39 (L) – Ground**     **: Continuity should not exist.**

    **40 (P) – Ground**     **: Continuity should not exist.**

G

OK or NG
  OK     >> GO TO 8.
  NG    >> Check the following harnesses. If any harness is damaged, repair the harness.
      ● Harness between IPDM E/R and ABS actuator and electric unit (control unit)
      ● Harness between IPDM E/R and harness connector E26

H

I

J

## 8. CHECK ECM AND IPDM E/R INTERNAL CIRCUIT

1. Remove ECM and IPDM E/R from vehicle.
2. Check resistance between ECM terminals 94 and 86.

    **94 – 86**     **: Approx. 108 – 132 Ω**

3. Check resistance between IPDM E/R terminals 39 and 40.

    **39 – 40**     **: Approx. 108 – 132 Ω**

LAN

OK or NG
  OK     >> GO TO 9.
  NG    >> Replace ECM and/or IPDM E/R.

L

M

## 9. CHECK SYMPTOM

1. Fill in described symptoms on the column "Symptom" in the check sheet.
2. Connect all connectors, and then make sure that the symptom is reproduced.

OK or NG
  OK     >> GO TO 10.
  NG    >> Refer to LAN-14, "Example of Filling in Check Sheet When Initial Conditions Are Not Reproduced" .

## 10. CHECK UNIT REPRODUCIBILITY

Perform the following procedure for each unit, and then perform reproducibility test.

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Disconnect the unit connector.
4. Connect the battery cable to the negative terminal.
5. Make sure that the symptom filled in the "Symptom" of the check sheet is reproduced. (Do not confuse it with the symptom related to removed unit.)
6. Make sure that the same symptom is reproduced.

- Differential lock control unit
- BCM
- Combination meter
- Transfer control unit
- ABS actuator and electric unit (control unit)
- ECM
- IPDM E/R

Inspection results

Reproduced>>Install removed unit, and then check the other unit.
Not reproduced>>Replace removed unit.

## IPDM E/R Ignition Relay Circuit Inspection                                    UKS004I2

Check the following. If no malfunction is found, replace the IPDM E/R.

- IPDM E/R power supply circuit. Refer to PG-27, "IPDM E/R Power/Ground Circuit Inspection" .
- Ignition power supply circuit. Refer to PG-14, "IGNITION POWER SUPPLY — IGNITION SW. IN ON AND/OR START" .

## CAN SYSTEM (TYPE 8)

PFP:23710

### System Description

UKS004H7

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

UKS004H8



BKIA0180E

## Schematic

| | | |
|---|---|---|
| 40 | 39 | IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) |
| 15 | 11 | ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) |
| 2 | 1 | TRANSFER CONTROL UNIT |
| 5 | 4 | STEERING ANGLE SENSOR |
| 40 | 39 | BCM (BODY CONTROL MODULE) |
| 14 | 6 | DATA LINK CONNECTOR |
| 11 | 12 | COMBINATION METER |
| 86 | 94 | ECM |

BKWA0554E

## Wiring Diagram — CAN —

UKS004HA

LAN-CAN-22

■■■ : DATA LINE

NEXT PAGE

L [A]

P [B]

L                P

(M31)
52G          51G
(E152)

L                P

L                P

94               86

CAN-H        CAN-L    ECM
(E16)

| 106 | 107 | 108 | 109 | 110 | 111 | 112 | 113 | | 119 | 120 | 121 |
| 98 | 99 | 100 | 101 | 102 | 103 | 104 | 105 | | | 117 | 118 | |
| 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | | | | |
| 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | | 114 | 115 | 116 |

E16
B

**H.S.**

REFER TO THE FOLLOWING.
(M31) - SUPER MULTIPLE JUNCTION (SMJ)

BKWA0555E

LAN-CAN-23

■■■ : DATA LINE

STEERING
ANGLE
SENSOR
(M47)

CAN-H   CAN-L

4    5

L    P

DATA
LINK
CONNECTOR
(M22)

6    14

L    P

TRANSFER
CONTROL UNIT
(M152)

CAN-H   CAN-L

1    2

L    P

PRECEDING
PAGE  ◁A  L

L  ▷C

NEXT
PAGE

PRECEDING
PAGE  ◁B  P

P  ▷D

L    P

12   11

CAN-H   CAN-L

COMBINATION
METER
(M24)

L    P

39   40

CAN-H   CAN-L

BCM
(BODY
CONTROL
MODULE)
(M18)

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

(M18)
W   H.S.

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

(M22)
W

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

(M24)
W

| 3 | 2 | | 1 |
|---|---|---|---|
| 8 | 7 | 6 5 | 4 |

(M47)
W

| 6 | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|
| 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 |
| 26 | 25 | 24 | 23 | 22 | | 21 | 20 | 19 | 18 |

(M152)
W   H.S.

BKWA0556E

A

B

C

D

E

F

G

H

I

J

LAN

L

M

◼◻◼ : DATA LINE

PRECEDING PAGE

C  L

D  P

M91
E26

11  L

10  P

CAN-H  CAN-L
11     15
ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)
E125

CAN-H  CAN-L
39     40
IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) (CPU)
E122

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

M91
W

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

E122
W

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

E125
B

BKWA0557E

## CHECK SHEET

<div align="right">UKS004HB</div>

**NOTE:**
If a check mark is put on "NG" on "INITIAL DIAG (Initial diagnosis)", replace the control unit.

Check sheet table

| SELECT SYSTEM screen | | CAN DIAG SUPPORT MNTR | | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | |
| | | | | ECM | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | — | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

Symptoms :

Attach copy of SELECT SYSTEM

Attach copy of SELECT SYSTEM

PKIB9517E

A

B

C

D

E

F

G

H

I

J

**LAN**

L

M

Attach copy of
ENGINE
SELF-DIAG RESULTS

Attach copy of
BCM
SELF-DIAG RESULTS

Attach copy of
METER
SELF-DIAG RESULTS

Attach copy of
ALL MODE AWD/4WD
SELF-DIAG RESULTS

Attach copy of
ABS
SELF-DIAG RESULTS

Attach copy of
IPDM E/R
SELF-DIAG RESULTS

Attach copy of
ENGINE
CAN DIAG SUPPORT
MNTR

Attach copy of
BCM
CAN DIAG SUPPORT
MNTR

Attach copy of
ALL MODE AWD/4WD
CAN DIAG SUPPORT
MNTR

Attach copy of
ABS
CAN DIAG SUPPORT
MNTR

Attach copy of
IPDM E/R
CAN DIAG SUPPORT
MNTR

PKIB6525E

## CHECK SHEET RESULTS (EXAMPLE)

**NOTE:**
If a check mark is put on "NG" on "INITIAL DIAG (Initial diagnosis)", replace the control unit.

### Case 1

Check harness between data link connector and ABS actuator and electric unit (control unit) circuit. Refer to LAN-231, "Inspection Between Data Link Connector and ABS Actuator and Electric Unit (Control Unit) Circuit" .

| SELECT SYSTEM screen | | CAN DIAG SUPPORT MNTR | | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | |
| | | | | ECM | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | | — | NG | UNKWN | — | — | UNKWN | UNKWN | UNKWN | UNKWN ✓ | UNKWN ✓ | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) ✓ |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | UNKWN | — | — | UNKWN ✓ | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) ✓ | — |
| ALL MODE AWD/4WD | | — | NG | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN ✓ | — | CAN COMM CIRCUIT (U1000) ✓ | — |
| ABS | | — | NG | UNKWN | UNKWN ✓ | UNKWN ✓ | — | — | UNKWN ✓ | — | — | CAN COMM CIRCUIT (U1000) ✓ | — |
| IPDM E/R | No indication ✓ | — | UNKWN | UNKWN | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) ✓ | — |

PKIB9520E



///// : Malfunctioning part

BCM   Combination meter   Transfer control unit

CAN H

CAN L

ECM   Steering angle sensor   Data link connector   ABS actuator and electric unit(control unit)   IPDM E/R

PKIB9482E

## Case 2

Check ECM circuit. Refer to LAN-232, "ECM Circuit Inspection" .

| SELECT SYSTEM screen | CAN DIAG SUPPORT MNTR | | | | | | | | | SELF-DIAG RESULTS | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | |
| | | | ECM | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | — | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB9521E



///// : Malfunctioning part

BCM — Combination meter — Transfer control unit

CAN H

CAN L

ECM — Steering angle sensor — Data link connector — ABS actuator and electric unit(control unit) — IPDM E/R

PKIB9483E

## Case 3

Check steering angle sensor circuit. Refer to LAN-233, "Steering Angle Sensor Circuit Inspection" .

| SELECT SYSTEM screen | | CAN DIAG SUPPORT MNTR | | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | |
| | | | | ECM | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | — | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB9522E

//////// : Malfunctioning part

BCM — Combination meter — Transfer control unit

CAN H

CAN L

ECM — Steering angle sensor — Data link connector — ABS actuator and electric unit(control unit) — IPDM E/R

PKIB9484E

## Case 4

Check data link connector circuit. Refer to LAN-233, "Data Link Connector Circuit Inspection" .

| SELECT SYSTEM screen | | CAN DIAG SUPPORT MNTR | | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | |
| | | | | ECM | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | — | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB9523E



PKIB9485E

## Case 5

Check BCM circuit. Refer to LAN-234, "BCM Circuit Inspection" .

| SELECT SYSTEM screen | CAN DIAG SUPPORT MNTR | | | | | | | | | SELF-DIAG RESULTS | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | |
| | | | ECM | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | — | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB9524E

//////  : Malfunctioning part

BCM
Combination meter
Transfer control unit
CAN H
CAN L
ECM
Steering angle sensor
Data link connector
ABS actuator and electric unit(control unit)
IPDM E/R

PKIB9486E

## Case 6

Check combination meter circuit. Refer to LAN-234, "Combination Meter Circuit Inspection" .

| SELECT SYSTEM screen | CAN DIAG SUPPORT MNTR | | | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | | |
| | | | ECM | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | — | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB9525E

////// : Malfunctioning part

BCM    Combination meter    Transfer control unit

CAN H

CAN L

ECM    Steering angle sensor    Data link connector    ABS actuator and electric unit(control unit)    IPDM E/R

PKIB9487E

## Case 7

Check transfer control unit circuit. Refer to .

| SELECT SYSTEM screen | CAN DIAG SUPPORT MNTR | | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | |
| | | | ECM | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | — | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB9526E



//// : Malfunctioning part

BCM · Combination meter · Transfer control unit · CAN H · CAN L · ECM · Steering angle sensor · Data link connector · ABS actuator and electric unit(control unit) · IPDM E/R

PKIB9488E

## Case 8

Check ABS actuator and electric unit (control unit) circuit. Refer to LAN-235, "ABS Actuator and Electric Unit (Control Unit) Circuit Inspection" .

| SELECT SYSTEM screen | | CAN DIAG SUPPORT MNTR | | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | |
| | | | | ECM | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | | — | NG | UNKWN | — | — | UNKWN | UNKWN | UNKWN | UNKWN✓ | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001)✓ |
| BCM | | No indication | NG | UNKWN | UNKWN | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000)✓ | — |
| METER | | No indication | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000)✓ | — |
| ALL MODE AWD/4WD | | — | NG | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN✓ | — | CAN COMM CIRCUIT (U1000)✓ | — |
| ABS | | — | NG✓ | UNKWN✓ | UNKWN✓ | UNKWN✓ | — | — | UNKWN✓ | — | — | CAN COMM CIRCUIT (U1000)✓ | — |
| IPDM E/R | | No indication | — | UNKWN | UNKWN | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB9527E



: Malfunctioning part

BCM — Combination meter — Transfer control unit

CAN H
CAN L

ECM — Steering angle sensor — Data link connector — ABS actuator and electric unit(control unit) — IPDM E/R

PKIB9489E

## Case 9

Check IPDM E/R circuit. Refer to LAN-236, "IPDM E/R Circuit Inspection" .

| SELECT SYSTEM screen | Initial diagnosis | Transmit diagnosis | CAN DIAG SUPPORT MNTR | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Receive diagnosis | | | | | | | | |
| | | | ECM | STRG | BCM/SEC | METER/M&A | AWD/4WD/e4WD | VDC/TCS/ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | — | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB9528E

/////// : Malfunctioning part

BCM — Combination meter — Transfer control unit

CAN H

CAN L

ECM — Steering angle sensor — Data link connector — ABS actuator and electric unit(control unit) — IPDM E/R

PKIB9490E

## Case 10

Check CAN communication circuit. Refer to LAN-237, "CAN Communication Circuit Inspection" .

| SELECT SYSTEM screen | Initial diagnosis | Transmit diagnosis | CAN DIAG SUPPORT MNTR | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Receive diagnosis | | | | | | | | |
| | | | ECM | STRG | BCM/SEC | METER/M&A | AWD/4WD/e4WD | VDC/TCS/ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | — | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB9529E

## Case 11

Check IPDM E/R ignition relay circuit continuously sticks "OFF". Refer to LAN-240, "IPDM E/R Ignition Relay Circuit Inspection" .

| SELECT SYSTEM screen | CAN DIAG SUPPORT MNTR | | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | |
| | | | ECM | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | — | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | — | — | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB9530E

## Case 12

Check IPDM E/R ignition relay circuit continuously sticks "ON". Refer to LAN-240, "IPDM E/R Ignition Relay Circuit Inspection" .

| SELECT SYSTEM screen | CAN DIAG SUPPORT MNTR | | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | |
| | | | ECM | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | — | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | — | — | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB9531E

# Inspection Between Data Link Connector and ABS Actuator and Electric Unit (Control Unit) Circuit

UKS004HC

## 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check following terminals and connectors for damage, bend and loose connection (connector side and harness side).
– Harness connector M91
– Harness connector E26

OK or NG

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

## 2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect harness connector M91.
2. Check continuity between data link connector M22 terminals 6 (L), 14 (P) and harness connector M91 terminals 11 (L), 10 (P).

    **6 (L) – 11 (L)**           **: Continuity should exist.**

    **14 (P) – 10 (P)**           **: Continuity should exist.**

OK or NG

  OK     &gt;&gt; GO TO 3.
  NG     &gt;&gt; Repair harness.

SKIB2812E

## 3. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect ABS actuator and electric unit (control unit) connector.
2. Check continuity between harness connector E26 terminals 11 (L), 10 (P) and ABS actuator and electric unit (control unit) harness connector E125 terminals 11 (L), 15 (P).

    **11 (L) – 11 (L)**           **: Continuity should exist.**

    **10 (P) – 15 (P)**           **: Continuity should exist.**

OK or NG

  OK     &gt;&gt; Connect all the connectors and diagnose again. Refer to LAN-6, "TROUBLE DIAGNOSES WORK FLOW" .
  NG     &gt;&gt; Repair harness.

SKIB2813E

## ECM Circuit Inspection

*UKS004HD*

## 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check following terminals and connectors for damage, bend and loose connection (control module side and harness side).
– ECM connector
– Harness connector E152
– Harness connector M31

OK or NG

  OK     &gt;&gt; GO TO 2.
  NG     &gt;&gt; Repair terminal or connector.

# CAN SYSTEM (TYPE 8)

A

## 2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect ECM connector.
2. Check resistance between ECM harness connector E16 termi-
   nals 94 (L) and 86 (P).

   **94 (L) – 86 (P)              : Approx. 108 – 132 Ω**

B

C

OK or NG

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

D

ECM connector

ECM CONNECTOR
94                86

PKIA9592E

E

## Steering Angle Sensor Circuit Inspection

*UKS004HE*

## 1. CHECK CONNECTOR

F

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

G

OK or NG

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

H

## 2. CHECK HARNESS FOR OPEN CIRCUIT

I

1. Disconnect steering angle sensor connector.
2. Check resistance between steering angle sensor harness con-
   nector M47 terminals 4 (L) and 5 (P).

   **4 (L) – 5 (P)              : Approx. 54 – 66 Ω**

J

OK or NG

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

LAN

Steering angle sensor connector

4 5

PKIA9864E

L

## Data Link Connector Circuit Inspection

*UKS004HF*

M

## 1. CHECK CONNECTOR

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

OK or NG

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

## 2. CHECK HARNESS FOR OPEN CIRCUIT

Check resistance between data link connector M22 terminals 6 (L) and 14 (P).

    **6 (L) – 14 (P)**        **: Approx. 54 – 66 $\Omega$**

OK or NG

  OK    >> Diagnose again. Refer to <u>LAN-6, "TROUBLE DIAG-NOSES WORK FLOW"</u> .

  NG    >> Repair harness between data link connector and BCM.



Data link connector

SKIA6868E

## BCM Circuit Inspection

*UKS004HG*

## 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check 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 M18 terminals 39 (L) and 40 (P).

    **39 (L) – 40 (P)**        **: Approx. 54 – 66 $\Omega$**

OK or NG

  OK    >> Replace BCM. Refer to <u>BCS-19, "Removal and Installation of BCM"</u> .

  NG    >> Repair harness between BCM and data link connector.



BCM connector

SKIA6869E

## Combination Meter Circuit Inspection

*UKS004HH*

## 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative 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.

# CAN SYSTEM (TYPE 8)

**[CAN]**

A

B

C

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F

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H

I

J

LAN

L

M

## 2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect combination meter connector.
2. Check resistance between combination meter harness connector M24 terminals 12 (L) and 11 (P).

**12 (L) – 11 (P)　　　　: Approx. 54 – 66 Ω**

OK or NG

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

Combination meter connector

PKIA6837E

## Transfer Control Unit Circuit Inspection

UKS004HI

### 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check terminals and connector of transfer 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 transfer control unit connector.
2. Check resistance between transfer control unit harness connector M152 terminals 1 (L) and 2 (P).

**1 (L) – 2 (P)　　　　: Approx. 54 – 66 Ω**

OK or NG

OK　　>> Replace transfer control unit.
NG　　>> Repair harness between transfer control unit and data link connector.

Transfer control unit connector

PKIA9745E

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

UKS004HJ

### 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check terminals and connector of ABS actuator and electric unit (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.

4

## 2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect ABS actuator and electric unit (control unit) connector.
2. Check resistance between ABS actuator and electric unit (control unit) harness connector E125 terminals 11 (L) and 15 (P).

**11 (L) – 15 (P)**        **: Approx. 54 – 66** $\Omega$

OK or NG

OK      >> Replace ABS actuator and electric unit (control unit).
NG      >> Repair harness between ABS actuator and electric unit (control unit) and IPDM E/R.



ABS actuator and electric unit (control unit) connector

SKIA6872E

## IPDM E/R Circuit Inspection

*UKS004HK*

## 1. CHECK CONNECTOR

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

OK or NG

OK      >> GO TO 2.
NG      >> Repair terminal or connector.
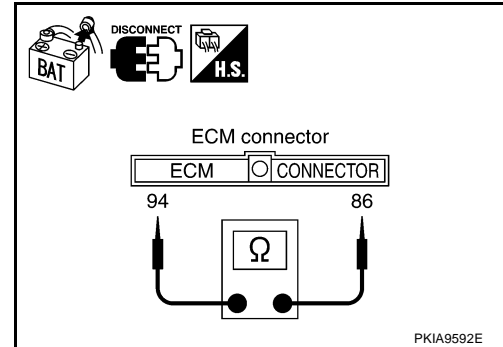
## 2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect IPDM E/R connector.
2. Check resistance between IPDM E/R harness connector E122 terminals 39 (L) and 40 (P).

**39 (L) – 40 (P)**        **: Approx. 108 – 132** $\Omega$

OK or NG

OK      >> Replace IPDM E/R.
NG      >> Repair harness between IPDM E/R and ABS actuator and electric unit (control unit).



IPDM E/R connector

PKIA8141E

# CAN SYSTEM (TYPE 8)

## CAN Communication Circuit Inspection

*UKS004HL*

### 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check following terminals and connectors for damage, bend and loose connection (control module side, control unit side, sensor side, meter side, and harness side).
- ECM
- Steering angle sensor
- BCM
- Combination meter
- Transfer control unit
- ABS actuator and electric unit (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 ECM connector and harness connector E152.
2. Check continuity between ECM harness connector E16 terminals 94 (L) and 86 (P).

**94 (L) – 86 (P)** : **Continuity should not exist.**

OK or NG

OK >> GO TO 3.
NG >> Repair harness between ECM and harness connector E152.



SKIA6865E

### 3. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between ECM harness connector E16 terminals 94 (L), 86 (P) and ground.

**94 (L) – Ground** : **Continuity should not exist.**
**86 (P) – Ground** : **Continuity should not exist.**

OK or NG

OK >> GO TO 4.
NG >> Repair harness between ECM and harness connector E152.



SKIB0571E

## 4. CHECK HARNESS FOR SHORT CIRCUIT

1. Disconnect following connectors.
– Steering angle sensor connector
– BCM connector
– Combination meter connector
– Transfer control unit connector
– Harness connector M91
2. Check continuity between data link connector M22 terminals 6 (L) and 14 (P).

**6 (L) – 14 (P)** : **Continuity should not exist.**

<u>OK or NG</u>

OK     >> GO TO 5.
NG     >> Check the following harnesses. If any harness is damaged, repair the harness.
- Harness between data link connector and harness connector M31
- Harness between data link connector and steering angle sensor
- Harness between data link connector and BCM
- Harness between data link connector and combination meter
- Harness between data link connector and transfer control unit
- Harness between data link connector and harness connector M91



Data link connector

SKIA6868E

## 5. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between data link connector M22 terminals 6 (L), 14 (P) and ground.

**6 (L) – Ground** : **Continuity should not exist.**
**14 (P) – Ground** : **Continuity should not exist.**

<u>OK or NG</u>

OK     >> GO TO 6.
NG     >> Check the following harnesses. If any harness is damaged, repair the harness.
- Harness between data link connector and harness connector M31
- Harness between data link connector and steering angle sensor
- Harness between data link connector and BCM
- Harness between data link connector and combination meter
- Harness between data link connector and transfer control unit
- Harness between data link connector and harness connector M91



Data link connector

PKIA9872E

# CAN SYSTEM (TYPE 8)

A

## 6. CHECK HARNESS FOR SHORT CIRCUIT

1. Disconnect ABS actuator and electric unit (control unit) connector and IPDM E/R connector.
2. Check continuity between IPDM E/R harness connector E122 terminals 39 (L) and 40 (P).

B

**39 (L) – 40 (P)**     **: Continuity should not exist.**

C

OK or NG
- OK >> GO TO 7.
- NG >> Check the following harnesses. If any harness is damaged, repair the harness.
  - Harness between IPDM E/R and ABS actuator and electric unit (control unit)
  - Harness between IPDM E/R and harness connector E26

D

E

## 7. CHECK HARNESS FOR SHORT CIRCUIT

F

Check continuity between IPDM E/R harness connector E122 terminals 39 (L), 40 (P) and ground.

**39 (L) – Ground**    **: Continuity should not exist.**
**40 (P) – Ground**    **: Continuity should not exist.**

G

OK or NG
- OK >> GO TO 8.
- NG >> Check the following harnesses. If any harness is damaged, repair the harness.
  - Harness between IPDM E/R and ABS actuator and electric unit (control unit)
  - Harness between IPDM E/R and harness connector E26

H

I

J

## 8. CHECK ECM AND IPDM E/R INTERNAL CIRCUIT

1. Remove ECM and IPDM E/R from vehicle.
2. Check resistance between ECM terminals 94 and 86.

**94 – 86**    **: Approx. 108 – 132 $\Omega$**

LAN

3. Check resistance between IPDM E/R terminals 39 and 40.

**39 – 40**    **: Approx. 108 – 132 $\Omega$**

L

OK or NG
- OK >> GO TO 9.
- NG >> Replace ECM and/or IPDM E/R.

M

## 9. CHECK SYMPTOM

1. Fill in described symptoms on the column "Symptom" in the check sheet.
2. Connect all connectors, and then make sure that the symptom is reproduced.

OK or NG
- OK >> GO TO 10.
- NG >> Refer to LAN-14, "Example of Filling in Check Sheet When Initial Conditions Are Not Reproduced".

## 10. CHECK UNIT REPRODUCIBILITY

Perform the following procedure for each unit, and then perform reproducibility test.

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Disconnect the unit connector.
4. Connect the battery cable to the negative terminal.
5. Make sure that the symptom filled in the "Symptom" of the check sheet is reproduced. (Do not confuse it with the symptom related to removed unit.)
6. Make sure that the same symptom is reproduced.

– Steering angle sensor
– BCM
– Combination meter
– Transfer control unit
– ABS actuator and electric unit (control unit)
– ECM
– IPDM E/R

Inspection results

Reproduced>>Install removed unit, and then check the other unit.
Not reproduced>>Replace removed unit.

## IPDM E/R Ignition Relay Circuit Inspection

UKS004HM

Check the following. If no malfunction is found, replace the IPDM E/R.

● IPDM E/R power supply circuit. Refer to PG-27, "IPDM E/R Power/Ground Circuit Inspection" .
● Ignition power supply circuit. Refer to PG-14, "IGNITION POWER SUPPLY — IGNITION SW. IN ON AND/OR START" .

## CAN SYSTEM (TYPE 9)

PFP:23710

### System Description

UKS004GQ

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

UKS004GR



IPDM E/R (intelligent power distribution module engine room) (E122)

ECM (E16)

Combination meter (M24)

BCM (body control module) (M18)

ABS actuator and electric unit (control unit) (E125)

Transfer control unit (M152)

Steering angle sensor (M47)

Data link connector (M22)

Differential lock control unit (M70)

BKIA0181E

## Schematic

| Pin | Unit |
|-----|------|
| 40 39 | IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) |
| 15 11 | ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) |
| 4 5 | DIFFERENTIAL LOCK CONTROL UNIT |
| 2 1 | TRANSFER CONTROL UNIT |
| 5 4 | STEERING ANGLE SENSOR |
| 40 39 | BCM (BODY CONTROL MODULE) |
| 14 6 | DATA LINK CONNECTOR |
| 11 12 | COMBINATION METER |
| 86 94 | ECM |

BKWA0558E

## Wiring Diagram — CAN —

UKS004GT

LAN-CAN-25

■━■ : DATA LINE

NEXT
PAGE

L ◀ A

P ◀ B

52G  (M31)  51G
     (E152)

94          86
CAN-H    CAN-L    ECM
                  (E16)

REFER TO THE FOLLOWING.
(M31) - SUPER MULTIPLE
JUNCTION (SMJ)

| 106 | 107 | 108 | 109 | 110 | 111 | 112 | 113 |
|-----|-----|-----|-----|-----|-----|-----|-----|
| 98  | 99  | 100 | 101 | 102 | 103 | 104 | 105 |

| 119 | 120 | 121 |
|-----|-----|-----|
|     | 117 | 118 |

| 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 |
|----|----|----|----|----|----|----|----|
| 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 |

| 114 | 115 | 116 |

(E16)
B

H.S.

BKWA0559E

LAN-CAN-26

◼◻◼ : DATA LINE

STEERING ANGLE SENSOR (M47)

CAN-H 4   CAN-L 5
L          P

DATA LINK CONNECTOR (M22)

6   14
L    P

TRANSFER CONTROL UNIT (M152)

CAN-H 1   CAN-L 2
L          P

PRECEDING PAGE ◁A L

PRECEDING PAGE ◁B P

L ▷C
P ▷D

NEXT PAGE

CAN-H 5   CAN-L 4
L          P
DIFFERENTIAL LOCK CONTROL UNIT (M70)

CAN-H 12   CAN-L 11
L           P
COMBINATION METER (M24)

CAN-H 39   CAN-L 40
L           P
BCM (BODY CONTROL MODULE) (M18)

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

(M18) W   H.S.

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

(M22) W

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

(M24) W

| 3 | 2 | | 1 |
| 8 | 7 | 6 | 5 | 4 |

(M47) W

| 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
| 26 | 25 | 24 | 23 | 22 | 21 | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 |

(M70) W   H.S.

| 6 | 5 | 4 | 3 | 2 | 1 |
| 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 |
| 26 | 25 | 24 | 23 | 22 | | 21 | 20 | 19 | 18 |

(M152) W   H.S.

BKWA0560E

A

B

C

D

E

F

G

H

I

J

**LAN**

L

M

:  : DATA LINE

PRECEDING PAGE

C L

D P

M91
E26

11 L

10 P

11 L   CAN-H
15 P   CAN-L

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)
E125

39 L   CAN-H
40 P   CAN-L

IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) (CPU)
E122

| 1 | 2 | 3 | | 4 | 5 | 6 | 7 | M91 |
|---|---|---|---|---|---|---|---|---|
| 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | W |

| 37 | 38 | 39 | 40 | 41 | 42 | E122 |
|----|----|----|----|----|----|----|
| 43 | 44 | 45 | 46 | 47 | 48 | W |

BKWA0561E

## CHECK SHEET

UKS004GU

**NOTE:**
If a check mark is put on "NG" on "INITIAL DIAG (Initial diagnosis)", replace the control unit.

Check sheet table

| SELECT SYSTEM screen | | CAN DIAG SUPPORT MNTR | | | | | | | | | | SELF-DIAG RESULTS | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | | |
| | | | | ECM | DIFF LOCK | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | — | — | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| DIFF LOCK | — | NG | UNKWN | UNKWN | — | — | — | — | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | — | — | — | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

Symptoms :

Attach copy of
SELECT SYSTEM

Attach copy of
SELECT SYSTEM

PKIB9532E

Attach copy of
ENGINE
SELF-DIAG RESULTS

Attach copy of
DIFF LOCK
SELF-DIAG RESULTS

Attach copy of
BCM
SELF-DIAG RESULTS

Attach copy of
METER
SELF-DIAG RESULTS

Attach copy of
ALL MODE AWD/4WD
SELF-DIAG RESULTS

Attach copy of
ABS
SELF-DIAG RESULTS

Attach copy of
IPDM E/R
SELF-DIAG RESULTS

Attach copy of
ENGINE
CAN DIAG SUPPORT
MNTR

Attach copy of
DIFF LOCK
CAN DIAG SUPPORT
MNTR

Attach copy of
BCM
CAN DIAG SUPPORT
MNTR

Attach copy of
ALL MODE AWD/4WD
CAN DIAG SUPPORT
MNTR

Attach copy of
ABS
CAN DIAG SUPPORT
MNTR

Attach copy of
IPDM E/R
CAN DIAG SUPPORT
MNTR

PKIB6528E

## CHECK SHEET RESULTS (EXAMPLE)

**NOTE:**
If a check mark is put on "NG" on "INITIAL DIAG (Initial diagnosis)", replace the control unit.

### Case 1

Check harness between data link connector and ABS actuator and electric unit (control unit) circuit. Refer to LAN-258, "Inspection Between Data Link Connector and ABS Actuator and Electric Unit (Control Unit) Circuit" .

| SELECT SYSTEM screen | CAN DIAG SUPPORT MNTR | | | | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | | | |
| | | | ECM | DIFF LOCK | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | — | — | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| DIFF LOCK | — | NG | UNKWN | UNKWN | — | — | — | — | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | — | — | — | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB9535E



: Malfunctioning part

BCM — Combination meter — Transfer control unit — CAN H — CAN L — ECM — Differential lock control unit — Steering angle sensor — Data link connector — ABS actuator and electric unit(control unit) — IPDM E/R

PKIB9492E

## Case 2

Check ECM circuit. Refer to LAN-259, "ECM Circuit Inspection" .

| SELECT SYSTEM screen | Initial diagnosis | Transmit diagnosis | CAN DIAG SUPPORT MNTR | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Receive diagnosis | | | | | | | | | |
| | | | ECM | DIFF LOCK | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | — | — | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| DIFF LOCK | — | NG | UNKWN | UNKWN | — | — | — | — | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | — | — | — | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB9536E



//// : Malfunctioning part

PKIB9493E

## Case 3

Check differential lock control unit circuit. Refer to .

| SELECT SYSTEM screen | Initial diagnosis | Transmit diagnosis | CAN DIAG SUPPORT MNTR | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Receive diagnosis | | | | | | | | | |
| | | | ECM | DIFF LOCK | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | — | — | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| DIFF LOCK | — | NG | UNKWN | UNKWN | — | — | — | — | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | — | — | — | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB9537E



////// : Malfunctioning part

PKIB9494E

## Case 4

Check steering angle sensor circuit. Refer to LAN-260, "Steering Angle Sensor Circuit Inspection" .

| SELECT SYSTEM screen | Initial diagnosis | Transmit diagnosis | CAN DIAG SUPPORT MNTR | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Receive diagnosis | | | | | | | | | |
| | | | ECM | DIFF LOCK | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | — | — | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| DIFF LOCK | — | NG | UNKWN | UNKWN | — | — | — | — | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | — | — | — | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | UNKWN✓ | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB9538E



//////  : Malfunctioning part

PKIB9495E

## Case 5

Check data link connector circuit. Refer to LAN-261, "Data Link Connector Circuit Inspection" .

| SELECT SYSTEM screen | Initial diagnosis | Transmit diagnosis | ECM | DIFF LOCK | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ENGINE | — | NG | UNKWN | — | — | — | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| DIFF LOCK | — | NG | UNKWN | UNKWN | — | — | — | — | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication ✓ | NG | UNKWN | UNKWN | — | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication ✓ | — | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | — | — | — | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication ✓ | — | UNKWN | UNKWN | — | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

Note: The header "CAN DIAG SUPPORT MNTR" spans Initial diagnosis, Transmit diagnosis, and Receive diagnosis (ECM, DIFF LOCK, STRG, BCM/SEC, METER/M&A, AWD/4WD/e4WD, VDC/TCS/ABS, IPDM E/R). "Receive diagnosis" spans the ECM through IPDM E/R columns.

PKIB9539E



////// : Malfunctioning part

PKIB9496E

## Case 6

Check BCM circuit. Refer to LAN-261, "BCM Circuit Inspection" .

| SELECT SYSTEM screen | Initial diagnosis | Transmit diagnosis | CAN DIAG SUPPORT MNTR Receive diagnosis | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | ECM | DIFF LOCK | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | — | — | UNKWN ✓ | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) ✓ |
| DIFF LOCK | — | NG | UNKWN | UNKWN | — | — | — | — | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication ✓ | NG | UNKWN | UNKWN | — | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) ✓ | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | — | — | — | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | — | UNKWN ✓ | — | — | — | — | CAN COMM CIRCUIT (U1000) ✓ | — |

PKIB9540E

///// : Malfunctioning part

BCM
Combination meter
Transfer control unit

CAN H

CAN L

ECM
Differential lock control unit
Steering angle sensor
Data link connector
ABS actuator and electric unit(control unit)
IPDM E/R

PKIB9497E

## Case 7

Check combination meter circuit. Refer to LAN-262, "Combination Meter Circuit Inspection" .

| SELECT SYSTEM screen | CAN DIAG SUPPORT MNTR | | | | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | | | |
| | | | ECM | DIFF LOCK | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | | |
| ENGINE | — | NG | UNKWN | — | — | — | UNKWN | UNKWN ✓ | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| DIFF LOCK | — | NG | UNKWN | UNKWN | — | — | — | — | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | — | UNKWN ✓ | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication ✓ | — | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) ✓ | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | — | — | — | UNKWN ✓ | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB9541E

///// : Malfunctioning part

BCM

Combination meter

Transfer control unit

CAN H

CAN L

ECM

Differential lock control unit

Steering angle sensor

Data link connector

ABS actuator and electric unit(control unit)

IPDM E/R

PKIB9498E

## Case 8

Check transfer control unit circuit. Refer to LAN-262, "Transfer Control Unit Circuit Inspection" .

| SELECT SYSTEM screen | CAN DIAG SUPPORT MNTR | | | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | | |
| | | | ECM | DIFF LOCK | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | — | — | UNKWN | UNKWN | UNKWN ✓ | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| DIFF LOCK | — | NG | UNKWN | UNKWN | — | — | — | — | UNKWN ✓ | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN ✓ | UNKWN ✓ | — | — | — | UNKWN ✓ | — | UNKWN ✓ | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | UNKWN | — | — | UNKWN ✓ | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB9542E

///// : Malfunctioning part

BCM — Combination meter — Transfer control unit

CAN H
CAN L

ECM — Differential lock control unit — Steering angle sensor — Data link connector — ABS actuator and electric unit(control unit) — IPDM E/R

PKIB9499E

## Case 9

Check ABS actuator and electric unit (control unit) circuit. Refer to LAN-263, "ABS Actuator and Electric Unit (Control Unit) Circuit Inspection" .

| SELECT SYSTEM screen | Initial diagnosis | Transmit diagnosis | CAN DIAG SUPPORT MNTR | | | | | | | | SELF-DIAG RESULTS | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | | | Receive diagnosis | | | | | | | | | |
| | | | ECM | DIFF LOCK | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | — | — | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| DIFF LOCK | — | NG | UNKWN | — | — | — | — | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | — | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | — | — | — | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | — | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB9543E



: Malfunctioning part

PKIB9500E

## Case 10

Check IPDM E/R circuit. Refer to LAN-263, "IPDM E/R Circuit Inspection" .

| SELECT SYSTEM screen | Initial diagnosis | Transmit diagnosis | CAN DIAG SUPPORT MNTR | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Receive diagnosis | | | | | | | | | |
| | | | ECM | DIFF LOCK | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | — | — | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| DIFF LOCK | — | NG | UNKWN | UNKWN | — | — | — | — | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | — | — | — | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB9544E

//////// : Malfunctioning part

BCM — Combination meter — Transfer control unit — CAN H — CAN L — ECM — Differential lock control unit — Steering angle sensor — Data link connector — ABS actuator and electric unit(control unit) — IPDM E/R

PKIB9501E

## Case 11

Check CAN communication circuit. Refer to LAN-264, "CAN Communication Circuit Inspection" .

| SELECT SYSTEM screen | Initial diagnosis | Transmit diagnosis | CAN DIAG SUPPORT MNTR | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Receive diagnosis | | | | | | | | | |
| | | | ECM | DIFF LOCK | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | — | — | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| DIFF LOCK | — | NG | UNKWN | UNKWN | — | — | — | — | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | — | — | — | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB9545E

## Case 12

Check IPDM E/R ignition relay circuit continuously sticks "OFF". Refer to .

| SELECT SYSTEM screen | Initial diagnosis | Transmit diagnosis | ECM | DIFF LOCK | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | ECM | DIFF LOCK | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | — | — | UNKWN | UNKWN | UNKWN | UNKWN ✓ | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001 ✓) |
| DIFF LOCK | — | NG | UNKWN | UNKWN | — | — | — | UNKWN | UNKWN ✓ | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000 ✓) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | — | — | — | UNKWN | — | UNKWN ✓ | — | CAN COMM CIRCUIT (U1000 ✓) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB9546E

## Case 13

Check IPDM E/R ignition relay circuit continuously sticks "ON". Refer to .

| SELECT SYSTEM screen | Initial diagnosis | Transmit diagnosis | ECM | DIFF LOCK | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | ECM | DIFF LOCK | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | — | — | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| DIFF LOCK | — | NG | UNKWN | UNKWN | — | — | — | — | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | — | — | — | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000 ✓) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB9547E

# Inspection Between Data Link Connector and ABS Actuator and Electric Unit (Control Unit) Circuit
UKS004GV

## 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check following terminals and connectors for damage, bend and loose connection (connector side and harness side).
– Harness connector M91
– Harness connector E26

OK or NG

  OK    &gt;&gt; GO TO 2.
  NG    &gt;&gt; Repair terminal or connector.

A

## 2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect harness connector M91.
2. Check continuity between data link connector M22 terminals 6 (L), 14 (P) and harness connector M91 terminals 11 (L), 10 (P).

**6 (L) – 11 (L)**      **: Continuity should exist.**

**14 (P) – 10 (P)**      **: Continuity should exist.**

B

C

OK or NG

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

D

E

## 3. CHECK HARNESS FOR OPEN CIRCUIT

F

1. Disconnect ABS actuator and electric unit (control unit) connector.
2. Check continuity between harness connector E26 terminals 11 (L), 10 (P) and ABS actuator and electric unit (control unit) harness connector E125 terminals 11 (L), 15 (P).

G

**11 (L) – 11 (L)**      **: Continuity should exist.**

**10 (P) – 15 (P)**      **: Continuity should exist.**

H

OK or NG

  OK     >> Connect all the connectors and diagnose again. Refer to LAN-6, "TROUBLE DIAGNOSES WORK FLOW" .
  NG     >> Repair harness.

I

## ECM Circuit Inspection

*UKS004GW*

J

## 1. CHECK CONNECTOR

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

LAN

– ECM connector
– Harness connector E152
– Harness connector M31

L

OK or NG

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

M

## 2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect ECM connector.
2. Check resistance between ECM harness connector E16 terminals 94 (L) and 86 (P).

   **94 (L) – 86 (P)**      **: Approx. 108 – 132 Ω**

OK or NG

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

## Differential Lock Control Unit Circuit Inspection

*UKS004GX*

## 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check terminals and connector of differential lock 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 differential lock control unit connector.
2. Check resistance between differential lock control unit harness connector M70 terminals 5 (L) and 4 (P).

   **5 (L) – 4 (P)**      **: Approx. 54 – 66 Ω**

OK or NG

  OK      >> Replace differential lock control unit.
  NG      >> Repair harness between differential lock control unit and data link connector.

## Steering Angle Sensor Circuit Inspection

*UKS004GY*

## 1. CHECK CONNECTOR

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

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 M47 terminals 4 (L) and 5 (P).

**4 (L) – 5 (P)**         **: Approx. 54 – 66 Ω**

OK or NG

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



Steering angle sensor connector

PKIA9864E

## Data Link Connector Circuit Inspection

UKS004GZ

## 1. CHECK CONNECTOR

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

OK or NG

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

## 2. CHECK HARNESS FOR OPEN CIRCUIT

Check resistance between data link connector M22 terminals 6 (L) and 14 (P).

**6 (L) – 14 (P)**         **: Approx. 54 – 66 Ω**

OK or NG

OK    >> Diagnose again. Refer to <u>LAN-6, "TROUBLE DIAGNOSES WORK FLOW"</u> .
NG    >> Repair harness between data link connector and BCM.



Data link connector

SKIA6868E

## BCM Circuit Inspection

UKS004H0

## 1. CHECK CONNECTOR

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

OK or NG

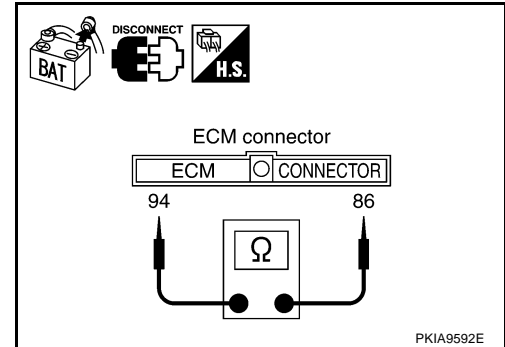OK    >> GO TO 2.
NG    >> Repair terminal or connector.

## 2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect BCM connector.
2. Check resistance between BCM harness connector M18 terminals 39 (L) and 40 (P).

    **39 (L) – 40 (P)**         **: Approx. 54 – 66 Ω**

OK or NG

  OK       >> Replace BCM. Refer to <u>BCS-19, "Removal and Installation of BCM"</u> .
  NG       >> Repair harness between BCM and data link connector.



SKIA6869E

## Combination Meter Circuit Inspection

UKS004H1

## 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative 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.
2. Check resistance between combination meter harness connector M24 terminals 12 (L) and 11 (P).

    **12 (L) – 11 (P)**         **: Approx. 54 – 66 Ω**

OK or NG

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



PKIA6837E

## Transfer Control Unit Circuit Inspection

UKS004H2

## 1. CHECK CONNECTOR

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

OK or NG

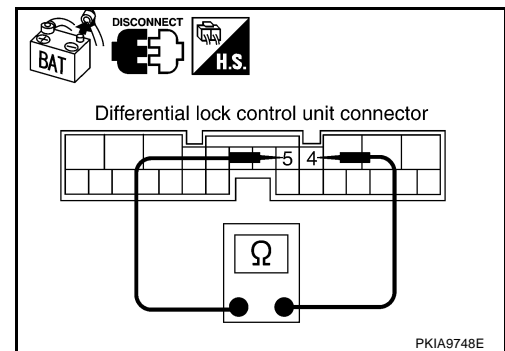  OK       >> GO TO 2.
  NG       >> Repair terminal or connector.

A

## 2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect transfer control unit connector.
2. Check resistance between transfer control unit harness connector M152 terminals 1 (L) and 2 (P).

B

      **1 (L) – 2 (P)**            **: Approx. 54 – 66 Ω**

C

OK or NG

  OK      >> Replace transfer control unit.
  NG      >> Repair harness between transfer control unit and data link connector.

D

Transfer control unit connector

PKIA9745E

E

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

*UKS004H3*

### 1. CHECK CONNECTOR

F

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

G

OK or NG

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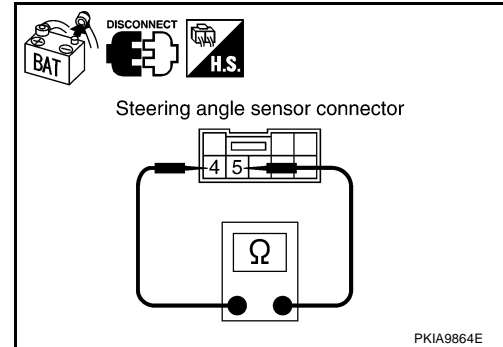
H

## 2. CHECK HARNESS FOR OPEN CIRCUIT

I

1. Disconnect ABS actuator and electric unit (control unit) connector.
2. Check resistance between ABS actuator and electric unit (control unit) harness connector E125 terminals 11 (L) and 15 (P).

J

      **11 (L) – 15 (P)**         **: Approx. 54 – 66 Ω**

LAN

OK or NG

  OK      >> Replace ABS actuator and electric unit (control unit).
  NG      >> Repair harness between ABS actuator and electric unit (control unit) and IPDM E/R.

ABS actuator and electric unit (control unit) connector

| C/UNIT | O | CONNECTOR |

11         15

SKIA6872E

L

## IPDM E/R Circuit Inspection

*UKS004H4*

### 1. CHECK CONNECTOR

M

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

OK or NG

  OK      >> GO TO 2.
  NG      >> Repair terminal or connector.
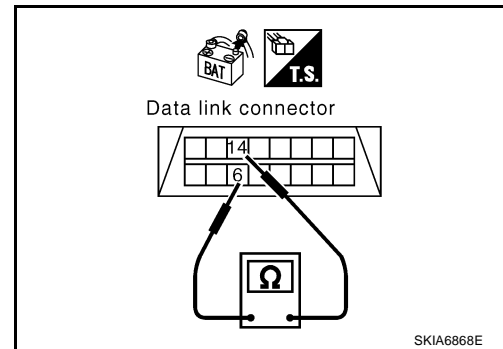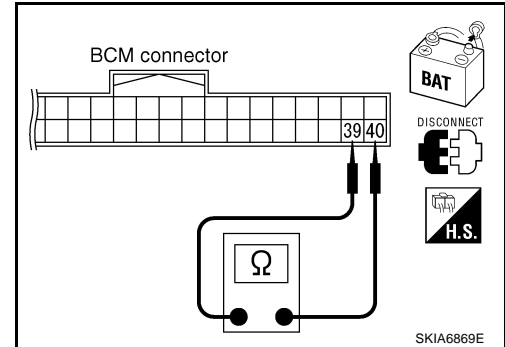
## 2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect IPDM E/R connector.
2. Check resistance between IPDM E/R harness connector E122 terminals 39 (L) and 40 (P).

   **39 (L) – 40 (P)**       **: Approx. 108 – 132 Ω**

OK or NG

OK     >> Replace IPDM E/R.
NG     >> Repair harness between IPDM E/R and ABS actuator and electric unit (control unit).



IPDM E/R connector

PKIA8141E

# CAN Communication Circuit Inspection

*UKS004H5*

## 1. CHECK CONNECTOR

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

– ECM
– Differential lock control unit
– Steering angle sensor
– BCM
– Combination meter
– Transfer control unit
– ABS actuator and electric unit (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 ECM connector and harness connector E152.
2. Check continuity between ECM harness connector E16 terminals 94 (L) and 86 (P).

   **94 (L) – 86 (P)**       **: Continuity should not exist.**

OK or NG

OK     >> GO TO 3.
NG     >> Repair harness between ECM and harness connector E152.



ECM connector

| ECM | CONNECTOR |

86      94

SKIA6865E

A

## 3. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between ECM harness connector E16 terminals 94 (L), 86 (P) and ground.

B

> **94 (L) – Ground**      **: Continuity should not exist.**
>
> **86 (P) – Ground**      **: Continuity should not exist.**

<u>OK or NG</u>

C

OK      >> GO TO 4.
NG      >> Repair harness between ECM and harness connector E152.

D



SKIB0571E

## 4. CHECK HARNESS FOR SHORT CIRCUIT

E

1. Disconnect following connectors.
– Differential lock control unit connector

F

– Steering angle sensor connector
– BCM connector
– Combination meter connector

G

– Transfer control unit connector
– Harness connector M91

2. Check continuity between data link connector M22 terminals 6 (L) and 14 (P).

H

> **6 (L) – 14 (P)**      **: Continuity should not exist.**

<u>OK or NG</u>

I

OK      >> GO TO 5.
NG      >> Check the following harnesses. If any harness is damaged, repair the harness.

J

- Harness between data link connector and harness connector M31
- Harness between data link connector and differential lock control unit
- Harness between data link connector and steering angle sensor

LAN

- Harness between data link connector and BCM

L

- Harness between data link connector and combination meter
- Harness between data link connector and transfer control unit

M

- Harness between data link connector and harness connector M91



Data link connector

SKIA6868E

## 5. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between data link connector M22 terminals 6 (L), 14 (P) and ground.

**6 (L) – Ground** : **Continuity should not exist.**

**14 (P) – Ground** : **Continuity should not exist.**

OK or NG

OK >> GO TO 6.
NG >> Check the following harnesses. If any harness is damaged, repair the harness.
- Harness between data link connector and harness connector M31
- Harness between data link connector and differential lock control unit
- Harness between data link connector and steering angle sensor
- Harness between data link connector and BCM
- Harness between data link connector and combination meter
- Harness between data link connector and transfer control unit
- Harness between data link connector and harness connector M91

## 6. CHECK HARNESS FOR SHORT CIRCUIT

1. Disconnect ABS actuator and electric unit (control unit) connector and IPDM E/R connector.
2. Check continuity between IPDM E/R harness connector E122 terminals 39 (L) and 40 (P).

**39 (L) – 40 (P)** : **Continuity should not exist.**

OK or NG

OK >> GO TO 7.
NG >> Check the following harnesses. If any harness is damaged, repair the harness.
- Harness between IPDM E/R and ABS actuator and electric unit (control unit)
- Harness between IPDM E/R and harness connector E26

## 7. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between IPDM E/R harness connector E122 terminals 39 (L), 40 (P) and ground.

**39 (L) – Ground** : **Continuity should not exist.**

**40 (P) – Ground** : **Continuity should not exist.**

OK or NG

OK >> GO TO 8.
NG >> Check the following harnesses. If any harness is damaged, repair the harness.
- Harness between IPDM E/R and ABS actuator and electric unit (control unit)
- Harness between IPDM E/R and harness connector E26

# CAN SYSTEM (TYPE 9)

## 8. CHECK ECM AND IPDM E/R INTERNAL CIRCUIT

1. Remove ECM and IPDM E/R from vehicle.
2. Check resistance between ECM terminals 94 and 86.

    **94 – 86**            **: Approx. 108 – 132 Ω**

3. Check resistance between IPDM E/R terminals 39 and 40.

    **39 – 40**            **: Approx. 108 – 132 Ω**

OK or NG

  OK      &gt;&gt; GO TO 9.
  NG      &gt;&gt; Replace ECM and/or IPDM E/R.



ECM and IPDM E/R

LKIA0037E

## 9. CHECK SYMPTOM

1. Fill in described symptoms on the column "Symptom" in the check sheet.
2. Connect all connectors, and then make sure that the symptom is reproduced.

OK or NG

  OK      &gt;&gt; GO TO 10.
  NG      &gt;&gt; Refer to LAN-14, "Example of Filling in Check Sheet When Initial Conditions Are Not Reproduced"
             .

## 10. CHECK UNIT REPRODUCIBILITY

Perform the following procedure for each unit, and then perform reproducibility test.

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Disconnect the unit connector.
4. Connect the battery cable to the negative terminal.
5. Make sure that the symptom filled in the "Symptom" of the check sheet is reproduced. (Do not confuse it with the symptom related to removed unit.)
6. Make sure that the same symptom is reproduced.

– Differential lock control unit
– Steering angle sensor
– BCM
– Combination meter
– Transfer control unit
– ABS actuator and electric unit (control unit)
– ECM
– IPDM E/R

Inspection results

  Reproduced>>Install removed unit, and then check the other unit.
  Not reproduced>>Replace removed unit.

## IPDM E/R Ignition Relay Circuit Inspection

UKS004H6

Check the following. If no malfunction is found, replace the IPDM E/R.

● IPDM E/R power supply circuit. Refer to PG-27, "IPDM E/R Power/Ground Circuit Inspection" .
● Ignition power supply circuit. Refer to PG-14, "IGNITION POWER SUPPLY — IGNITION SW. IN ON AND/OR START" .

## CAN SYSTEM (TYPE 10)

PFP:23710

## System Description

UKS004G9

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

UKS004GA



IPDM E/R (intelligent power distribution module engine room) (E122)

ECM (E16)

A/T assembly (F9)

Combination meter (M24)

BCM (body control module) (M18)

ABS actuator and electric unit (control unit) (E125)

Transfer control unit (M152)

Data link connector (M22)

BKIA0182E

# CAN SYSTEM (TYPE 10)

## Schematic

*UKS004GB*

**[CAN]**



BKWA0578E

## Wiring Diagram — CAN —

UKS004GC

LAN-CAN-28

■-■ : DATA LINE

A/T ASSEMBLY
(F9)

CAN-H  CAN-L
[3]    [8]
L      P

L      P
[2] (F32) [3]
   (E2)
L      P

L      P
[2] (F14) [3]
   (E5)
L      P

52G (E152) 51G
   (M31)
L      P

L ▷A⟩
NEXT PAGE
P ▷B⟩

L      P
[94]   [86]
CAN-H  CAN-L  ECM
(E16)

REFER TO THE FOLLOWING.
(M31) - SUPER MULTIPLE JUNCTION (SMJ)

| 106 | 107 | 108 | 109 | 110 | 111 | 112 | 113 | | 119 | 120 | 121 |
| 98 | 99 | 100 | 101 | 102 | 103 | 104 | 105 | | | 117 | 118 | |
| 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | | | | | |
| 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | | 114 | 115 | 116 |

E16
B

H.S.

| 1 | 2 | 3 | 4 | 5 |
| 6 | 7 | 8 | 9 | 10 |
F9
G

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 20 | 22 | 23 | 24 |
F14
W

| 1 | 2 | 3 | | 4 | 5 | 6 | 7 |
| 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
F32
W

BKWA0562E

◼◻◼ : DATA LINE

DATA LINK CONNECTOR
(M22)

6    14
L    P

TRANSFER CONTROL UNIT
(M152)

CAN-H    CAN-L
1    2
L    P

PRECEDING PAGE

A  L

B  P

NEXT PAGE

L  C

P  D

CAN-H    CAN-L
12    11
L    P

COMBINATION METER
(M24)

CAN-H    CAN-L
39    40
L    P

BCM (BODY CONTROL MODULE)
(M18)

M18
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |

W   H.S.

M22
| 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 |
|----|----|----|----|----|----|----|---|
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |

W

M24
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |

W

M152
| 6 | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|
| 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 |
| 26 | 25 | 24 | 23 | 22 | | 21 | 20 | 19 | 18 |

W   H.S.

BKWA0563E

LAN-CAN-30

▬ : DATA LINE

PRECEDING
PAGE

C L

D P

L P

M91
E26
11    10

L P

L P

L    P    ABS
ACTUATOR
AND
CAN-H  CAN-L  ELECTRIC
UNIT
(CONTROL
UNIT)
E125

L    P    IPDM E/R
(INTELLIGENT
POWER
CAN-H  CAN-L  DISTRIBUTION
MODULE
ENGINE ROOM)
(CPU)
E122

11   15

39   40

| 1 | 2 | 3 | | 4 | 5 | 6 | 7 | M91 |
|---|---|---|---|---|---|---|---|---|
| 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | W |

| 37 | 38 | 39 | 40 | 41 | 42 | E122 |
|----|----|----|----|----|----|------|
| 43 | 44 | 45 | 46 | 47 | 48 | W |

| 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | | 1 | E125 |
|----|----|----|----|----|----|----|---|---|---|---|---|---|---|---|---|---|------|
| | 31 | 30 | 29 | 28 | 27 | 26 | 25 | 24 | 23 | 22 | 21 | 20 | 19 | 18 | 17 | | |
| 47 | | 46 | 45 | 44 | 43 | 42 | 41 | 40 | 39 | 38 | 37 | 36 | 35 | 34 | 33 | 32 | B |

BKWA0564E

## CHECK SHEET

UKS004GD

**NOTE:**
If a check mark is put on "NG" on "INITIAL DIAG (Initial diagnosis)", replace the control unit.

Check sheet table

| SELECT SYSTEM screen | CAN DIAG SUPPORT MNTR | | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | |
| | | | ECM | TCM | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | — | NG | UNKWN | UNKWN | — | — | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | UNKWN | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) | — |

Symptoms :

Attach copy of
SELECT SYSTEM

Attach copy of
SELECT SYSTEM

PKIB6531E

Attach copy of
ENGINE
SELF-DIAG RESULTS

Attach copy of
A/T
SELF-DIAG RESULTS

Attach copy of
BCM
SELF-DIAG RESULTS

Attach copy of
METER
SELF-DIAG RESULTS

Attach copy of
ALL MODE AWD/4WD
SELF-DIAG RESULTS

Attach copy of
ABS
SELF-DIAG RESULTS

Attach copy of
IPDM E/R
SELF-DIAG RESULTS

Attach copy of
ENGINE
CAN DIAG SUPPORT
MNTR

Attach copy of
A/T
CAN DIAG SUPPORT
MNTR

Attach copy of
BCM
CAN DIAG SUPPORT
MNTR

Attach copy of
ALL MODE AWD/4WD
CAN DIAG SUPPORT
MNTR

Attach copy of
ABS
CAN DIAG SUPPORT
MNTR

Attach copy of
IPDM E/R
CAN DIAG SUPPORT
MNTR

PKIB5022E

A

B

C

D

E

F

G

H

I

J

LAN

L

M

## CHECK SHEET RESULTS (EXAMPLE)

**NOTE:**
If a check mark is put on "NG" on "INITIAL DIAG (Initial diagnosis)", replace the control unit.

### Case 1

Check harness between TCM and data link connector circuit. Refer to LAN-285, "Inspection Between TCM and Data Link Connector Circuit" .

| SELECT SYSTEM screen | CAN DIAG SUPPORT MNTR | | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | |
| | | | ECM | TCM | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | — | NG | UNKWN | UNKWN | — | — | UNKWN | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | UNKWN | — | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB7032E

//////// : Malfunctioning part

BCM — Combination meter — Transfer control unit

CAN H

CAN L

ECM — TCM — Data link connector — ABS actuator and electric unit(control unit) — IPDM E/R

PKIB7164E

## Case 2

Check harness between data link connector and ABS actuator and electric unit (control unit) circuit. Refer to LAN-286, "Inspection Between Data Link Connector and ABS Actuator and Electric Unit (Control Unit) Circuit".

| SELECT SYSTEM screen | | CAN DIAG SUPPORT MNTR | | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | |
| | | | | ECM | TCM | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | — | NG | UNKWN | UNKWN | — | — | UNKWN | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | UNKWN | — | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB7033E



////// : Malfunctioning part

BCM | Combination meter | Transfer control unit

CAN H

CAN L

ECM | TCM | Data link connector | ABS actuator and electric unit(control unit) | IPDM E/R

PKIB7165E

# CAN SYSTEM (TYPE 10)

## [CAN]

## Case 3

Check ECM circuit. Refer to LAN-287, "ECM Circuit Inspection" .

| SELECT SYSTEM screen | | CAN DIAG SUPPORT MNTR | | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | |
| | | | | ECM | TCM | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | | — | NG | UNKWN | — | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | | — | NG | UNKWN | — | — | UNKWN | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | | — | NG | UNKWN | UNKWN | UNKWN | — | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | | — | NG | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB7034E



///// : Malfunctioning part

PKIB7166E

## Case 4

Check TCM circuit. Refer to LAN-288, "TCM Circuit Inspection" .

| SELECT SYSTEM screen | CAN DIAG SUPPORT MNTR | | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | |
| | | | ECM | TCM | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | — | NG | UNKWN | UNKWN | — | — | UNKWN | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | UNKWN | — | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB7035E



///// : Malfunctioning part

BCM — Combination meter — Transfer control unit — CAN H — CAN L — ECM — TCM — Data link connector — ABS actuator and electric unit(control unit) — IPDM E/R

PKIB7167E

## Case 5

Check data link connector circuit. Refer to LAN-288, "Data Link Connector Circuit Inspection" .

| SELECT SYSTEM screen | Initial diagnosis | Transmit diagnosis | CAN DIAG SUPPORT MNTR Receive diagnosis | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | ECM | TCM | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | — | NG | UNKWN | UNKWN | — | — | UNKWN | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | UNKWN | — | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB7036E



//// : Malfunctioning part

BCM   Combination meter   Transfer control unit

CAN H

CAN L

ECM   TCM   Data link connector   ABS actuator and electric unit(control unit)   IPDM E/R

PKIB7168E

## Case 6

Check BCM circuit. Refer to LAN-289, "BCM Circuit Inspection" .

| SELECT SYSTEM screen | | CAN DIAG SUPPORT MNTR | | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | |
| | | | | ECM | TCM | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | | — | NG | UNKWN | — | UNKWN ✓ | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | | — | NG | UNKWN | UNKWN | — | — | UNKWN | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | | No indication ✓ | NG | UNKWN | UNKWN | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | | No indication | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) ✓ | — |
| ALL MODE AWD/4WD | | — | NG | UNKWN | UNKWN | UNKWN | — | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | | — | NG | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | | No indication | — | UNKWN | UNKWN | — | UNKWN ✓ | — | — | — | — | CAN COMM CIRCUIT (U1000) ✓ | — |

PKIB7037E



///// : Malfunctioning part

PKIB7169E

## Case 7

Check combination meter circuit. Refer to LAN-289, "Combination Meter Circuit Inspection" .

| SELECT SYSTEM screen | CAN DIAG SUPPORT MNTR | | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | |
| | | | ECM | TCM | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | UNKWN | UNKWN ✓ | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) ✓ |
| A/T | — | NG | UNKWN | UNKWN | — | — | UNKWN ✓ | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) ✓ | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | UNKWN ✓ | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication ✓ | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) ✓ | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | UNKWN | — | UNKWN ✓ | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB7038E

////// : Malfunctioning part

BCM

Combination meter

Transfer control unit

CAN H

CAN L

ECM

TCM

Data link connector

ABS actuator and electric unit(control unit)

IPDM E/R

PKIB7170E

## Case 8

Check transfer control unit circuit. Refer to LAN-290, "Transfer Control Unit Circuit Inspection" .

| SELECT SYSTEM screen | | CAN DIAG SUPPORT MNTR | | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | |
| | | | | ECM | TCM | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | | — | NG | UNKWN | — | UNKWN | UNKWN | UNKWN ✓ | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | | — | NG | UNKWN | UNKWN | — | — | UNKWN ✓ | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | | No indication | NG | UNKWN | UNKWN | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | | No indication | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | | — | NG | UNKWN ✓ | UNKWN ✓ | UNKWN ✓ | — | UNKWN ✓ | — | UNKWN ✓ | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | | — | NG | UNKWN | UNKWN | UNKWN | — | — | UNKWN ✓ | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | | No indication | — | UNKWN | UNKWN | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB7039E



/////// : Malfunctioning part

PKIB7171E

## Case 9

Check ABS actuator and electric unit (control unit) circuit. Refer to .

| SELECT SYSTEM screen | | Initial diagnosis | Transmit diagnosis | CAN DIAG SUPPORT MNTR | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Receive diagnosis | | | | | | | | |
| | | | | ECM | TCM | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN ✓ | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | — | NG | UNKWN | UNKWN | — | — | UNKWN | UNKWN | UNKWN ✓ | — | CAN COMM CIRCUIT (U1000) ✓ | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) ✓ | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | UNKWN | — | UNKWN | — | UNKWN ✓ | — | CAN COMM CIRCUIT (U1000) ✓ | — |
| ABS | — | NG ✓ | UNKWN ✓ | UNKWN ✓ | UNKWN ✓ | — | — | UNKWN ✓ | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB7040E



///// : Malfunctioning part

PKIB7172E

## Case 10

Check IPDM E/R circuit. Refer to LAN-291, "IPDM E/R Circuit Inspection" .

| SELECT SYSTEM screen | Initial diagnosis | Transmit diagnosis | CAN DIAG SUPPORT MNTR Receive diagnosis ECM | TCM | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ENGINE | — | NG | UNKWN | — | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN ✓ | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) ✓ |
| A/T | — | NG | UNKWN | UNKWN | — | — | UNKWN | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | UNKWN | — | — | UNKWN ✓ | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) ✓ | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | UNKWN | — | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication ✓ | — | UNKWN | UNKWN | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB7041E

/////// : Malfunctioning part

BCM — Combination meter — Transfer control unit

CAN H
CAN L

ECM — TCM — Data link connector — ABS actuator and electric unit(control unit) — IPDM E/R

PKIB7173E

## Case 11

Check CAN communication circuit. Refer to LAN-292, "CAN Communication Circuit Inspection" .

| SELECT SYSTEM screen | Initial diagnosis | Transmit diagnosis | CAN DIAG SUPPORT MNTR Receive diagnosis ECM | TCM | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ENGINE | — | NG | UNKWN ✓ | — | UNKWN ✓ | UNKWN ✓ | UNKWN ✓ | UNKWN ✓ | UNKWN ✓ | CAN COMM CIRCUIT (U1000) ✓ | CAN COMM CIRCUIT (U1001) ✓ |
| A/T | — | NG | UNKWN | UNKWN ✓ | — | — | UNKWN ✓ | UNKWN ✓ | UNKWN ✓ | — | CAN COMM CIRCUIT (U1000) ✓ | — |
| BCM | No indication ✓ | NG | UNKWN | UNKWN | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication ✓ | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) ✓ | — |
| ALL MODE AWD/4WD | — | NG | UNKWN ✓ | UNKWN ✓ | UNKWN ✓ | — | UNKWN ✓ | — | UNKWN ✓ | — | CAN COMM CIRCUIT (U1000) ✓ | — |
| ABS | — | NG ✓ | UNKWN ✓ | UNKWN ✓ | UNKWN ✓ | — | — | UNKWN ✓ | — | — | CAN COMM CIRCUIT (U1000) ✓ | — |
| IPDM E/R | No indication ✓ | — | UNKWN | UNKWN | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) ✓ | — |

PKIB7042E

## Case 12

Check IPDM E/R ignition relay circuit continuously sticks "OFF". Refer to LAN-296, "IPDM E/R Ignition Relay Circuit Inspection" .

| SELECT SYSTEM screen | Initial diagnosis | Transmit diagnosis | CAN DIAG SUPPORT MNTR | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Receive diagnosis | | | | | | | | |
| | | | ECM | TCM | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | — | NG | UNKWN | UNKWN | — | — | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | UNKWN | — | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB7043E

## Case 13

Check IPDM E/R ignition relay circuit continuously sticks "ON". Refer to LAN-296, "IPDM E/R Ignition Relay Circuit Inspection" .

| SELECT SYSTEM screen | Initial diagnosis | Transmit diagnosis | CAN DIAG SUPPORT MNTR | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Receive diagnosis | | | | | | | | |
| | | | ECM | TCM | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | — | NG | UNKWN | — | — | — | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | UNKWN | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB7044E

## Inspection Between TCM and Data Link Connector Circuit

UKS004GE

## 1. CHECK CONNECTOR

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

– Harness connector F14

– Harness connector E5

– Harness connector E152

– Harness connector M31

OK or NG

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

## 2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect A/T assembly connector and harness connector F14.
2. Check continuity between A/T assembly harness connector F9 terminals 3 (L), 8 (P) and harness connector F14 terminals 2 (L), 3 (P).

    **3 (L) – 2 (L)**           **: Continuity should exist.**

    **8 (P) – 3 (P)**           **: Continuity should exist.**

OK or NG

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

## 3. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect harness connector E152.
2. Check continuity between harness connector E5 terminals 2 (L), 3 (P) and harness connector E152 terminals 52G (L), 51G (P).

    **2 (L) – 52G (L)**       **: Continuity should exist.**

    **3 (P) – 51G (P)**       **: Continuity should exist.**

OK or NG

  OK     >> GO TO 4.
  NG     >> Repair harness.

## 4. CHECK HARNESS FOR OPEN CIRCUIT

Check continuity between harness connector M31 terminals 52G (L), 51G (P) and data link connector M22 terminals 6 (L), 14 (P).

    **52G (L) – 6 (L)**       **: Continuity should exist.**

    **51G (P) – 14 (P)**      **: Continuity should exist.**

OK or NG

  OK     >> Connect all the connectors and diagnose again. Refer to LAN-6, "TROUBLE DIAGNOSES WORK FLOW" .
  NG     >> Repair harness.

## Inspection Between Data Link Connector and ABS Actuator and Electric Unit (Control Unit) Circuit

*UKS004GF*

## 1. CHECK CONNECTOR

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

– Harness connector M91
– Harness connector E26

OK or NG

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

## 2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect harness connector M91.
2. Check continuity between data link connector M22 terminals 6 (L), 14 (P) and harness connector M91 terminals 11 (L), 10 (P).
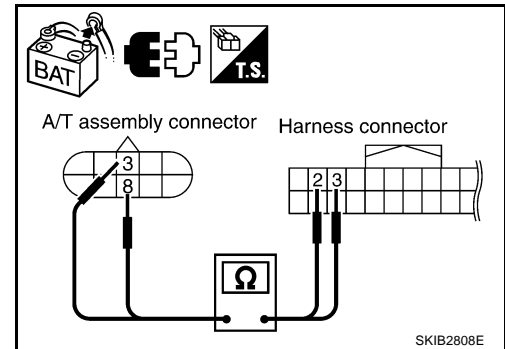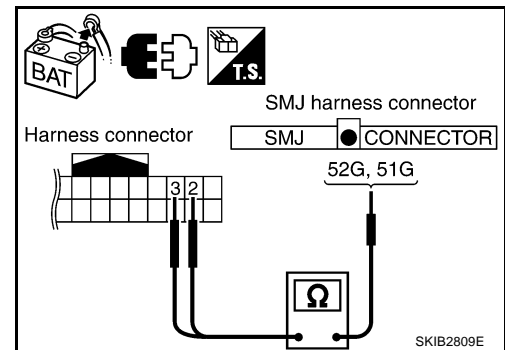
   **6 (L) – 11 (L)**          **: Continuity should exist.**

   **14 (P) – 10 (P)**        **: Continuity should exist.**

<u>OK or NG</u>

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



Data link connector

Harness connector

SKIB2812E

## 3. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect ABS actuator and electric unit (control unit) connector.
2. Check continuity between harness connector E26 terminals 11 (L), 10 (P) and ABS actuator and electric unit (control unit) harness connector E125 terminals 11 (L), 15 (P).

   **11 (L) – 11 (L)**        **: Continuity should exist.**

   **10 (P) – 15 (P)**        **: Continuity should exist.**

<u>OK or NG</u>

  OK      >> Connect all the connectors and diagnose again. Refer to LAN-6, "TROUBLE DIAGNOSES WORK FLOW" .
  NG      >> Repair harness.



Harness connector

ABS actuator and electric unit (control unit) connector

C/UNIT   O   CONNECTOR
11, 15

SKIB2813E

## ECM Circuit Inspection

UKS004GG

## 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check following terminals and connectors for damage, bend and loose connection (control module side and harness side).
– ECM connector
– Harness connector E2
– Harness connector F32

<u>OK or NG</u>

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

## 2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect ECM connector.
2. Check resistance between ECM harness connector E16 terminals 94 (L) and 86 (P).

    **94 (L) – 86 (P)**         **: Approx. 108 – 132 $\Omega$**

OK or NG

  OK     >> Replace ECM.
  NG     >> Repair harness between ECM and A/T assembly.



PKIA9592E

## TCM Circuit Inspection

*UKS004GH*

## 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check terminals and connector of A/T assembly 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 A/T assembly connector.
2. Check resistance between A/T assembly harness connector F9 terminals 3 (L) and 8 (P).

    **3 (L) – 8 (P)**         **: Approx. 54 – 66 $\Omega$**

OK or NG

  OK     >> Replace control valve with TCM.
  NG     >> Repair harness between A/T assembly and harness connector F14.



SKIA6866E

## Data Link Connector Circuit Inspection

*UKS004GI*

## 1. CHECK CONNECTOR

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

OK or NG

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

## 2. CHECK HARNESS FOR OPEN CIRCUIT

Check resistance between data link connector M22 terminals 6 (L) and 14 (P).

> **6 (L) – 14 (P)**         : **Approx. 54 – 66** $\Omega$

OK or NG

OK      >> Diagnose again. Refer to <u>LAN-6, "TROUBLE DIAG-</u> <u>NOSES WORK FLOW"</u> .

NG      >> Repair harness between data link connector and BCM.

SKIA6868E

## BCM Circuit Inspection

*UKS004GJ*

## 1. CHECK CONNECTOR

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

OK or NG

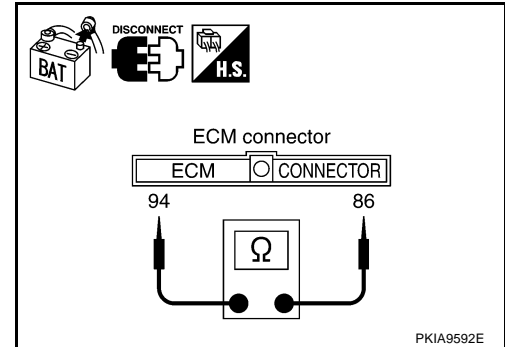OK      >> GO TO 2.

NG      >> Repair terminal or connector.

## 2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect BCM connector.
2. Check resistance between BCM harness connector M18 terminals 39 (L) and 40 (P).

> **39 (L) – 40 (P)**         : **Approx. 54 – 66** $\Omega$

OK or NG

OK      >> Replace BCM. Refer to <u>BCS-19, "Removal and Installa-</u> <u>tion of BCM"</u> .

NG      >> Repair harness between BCM and data link connector.

SKIA6869E

## Combination Meter Circuit Inspection

*UKS004GK*

## 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative 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.
2. Check resistance between combination meter harness connector M24 terminals 12 (L) and 11 (P).

   **12 (L) – 11 (P)**          **: Approx. 54 – 66 Ω**

OK or NG

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

Combination meter connector

PKIA6837E

## Transfer Control Unit Circuit Inspection

UKS004GL

## 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check terminals and connector of transfer 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.
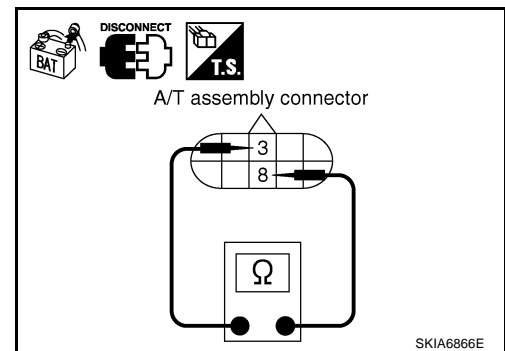
## 2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect transfer control unit connector.
2. Check resistance between transfer control unit harness connector M152 terminals 1 (L) and 2 (P).

   **1 (L) – 2 (P)**          **: Approx. 54 – 66 Ω**

OK or NG

  OK     >> Replace transfer control unit.
  NG     >> Repair harness between transfer control unit and data link connector.

Transfer control unit connector

PKIA9745E

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

UKS004GM

## 1. CHECK CONNECTOR

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

OK or NG

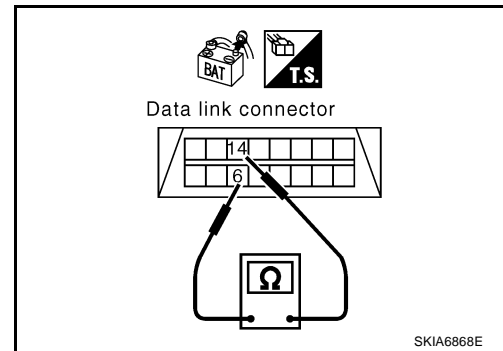  OK     >> GO TO 2.
  NG     >> Repair terminal or connector.

# CAN SYSTEM (TYPE 10)

## 2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect ABS actuator and electric unit (control unit) connector.
2. Check resistance between ABS actuator and electric unit (control unit) harness connector E125 terminals 11 (L) and 15 (P).

   **11 (L) – 15 (P)**        **: Approx. 54 – 66 Ω**

OK or NG

  OK       >> Replace ABS actuator and electric unit (control unit).
  NG       >> Repair harness between ABS actuator and electric unit (control unit) and IPDM E/R.



ABS actuator and electric unit (control unit) connector

SKIA6872E

## IPDM E/R Circuit Inspection

*UKS004GN*

## 1. CHECK CONNECTOR

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

OK or NG

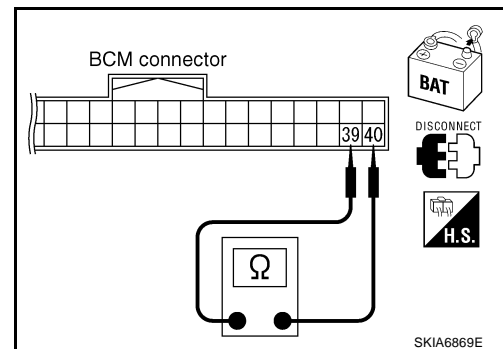  OK       >> GO TO 2.
  NG       >> Repair terminal or connector.

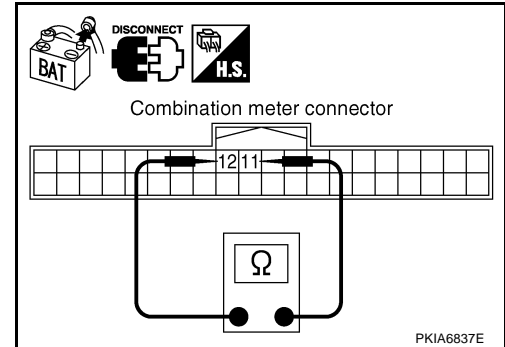## 2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect IPDM E/R connector.
2. Check resistance between IPDM E/R harness connector E122 terminals 39 (L) and 40 (P).

   **39 (L) – 40 (P)**        **: Approx. 108 – 132 Ω**

OK or NG

  OK       >> Replace IPDM E/R.
  NG       >> Repair harness between IPDM E/R and ABS actuator and electric unit (control unit).



IPDM E/R connector

PKIA8141E

# CAN SYSTEM (TYPE 10)

## CAN Communication Circuit Inspection

UKS004GO

## 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check following terminals and connectors for damage, bend and loose connection (control module side, control unit side, meter side, and harness side).
   − ECM
   − TCM
   − BCM
   − Combination meter
   − Transfer control unit
   − ABS actuator and electric unit (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 ECM connector and harness connector E2.
2. Check continuity between ECM harness connector E16 terminals 94 (L) and 86 (P).

   **94 (L) – 86 (P)**      **: Continuity should not exist.**

OK or NG

OK      >> GO TO 3.
NG      >> Repair harness between ECM and harness connector E2.



SKIA6865E

## 3. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between ECM harness connector E16 terminals 94 (L), 86 (P) and ground.

   **94 (L) – Ground**      **: Continuity should not exist.**

   **86 (P) – Ground**      **: Continuity should not exist.**

OK or NG

OK      >> GO TO 4.
NG      >> Repair harness between ECM and harness connector E2.



SKIB0571E

## 4. CHECK HARNESS FOR SHORT CIRCUIT

1. Disconnect A/T assembly connector and harness connector F14.
2. Check continuity between A/T assembly harness connector F9 terminals 3 (L) and 8 (P).

**3 (L) – 8 (P)** : **Continuity should not exist.**

OK or NG

OK >> GO TO 5.
NG >> Check the following harnesses. If any harness is damaged, repair the harness.
- Harness between A/T assembly and harness connector F32
- Harness between A/T assembly and harness connector F14



A/T assembly connector

SKIA6866E

## 5. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between A/T assembly harness connector F9 terminals 3 (L), 8 (P) and ground.

**3 (L) – Ground** : **Continuity should not exist.**
**8 (P) – Ground** : **Continuity should not exist.**

OK or NG

OK >> GO TO 6.
NG >> Check the following harnesses. If any harness is damaged, repair the harness.
- Harness between A/T assembly and harness connector F32
- Harness between A/T assembly and harness connector F14



A/T assembly connector

SKIA6875E

## 6. CHECK HARNESS FOR SHORT CIRCUIT

1. Disconnect harness connector E152.
2. Check continuity between harness connector E5 terminals 2 (L) and 3 (P).

**2 (L) – 3 (P)** : **Continuity should not exist.**

OK or NG

OK >> GO TO 7.
NG >> Repair harness between harness connector E5 and harness connector E152.



Harness connector

SKIB2816E

## 7. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between harness connector E5 terminals 2 (L), 3 (P) and ground.

>    **2 (L) – Ground**      **: Continuity should not exist.**
>    **3 (P) – Ground**      **: Continuity should not exist.**

OK or NG

  OK    >> GO TO 8.
  NG    >> Repair harness between harness connector E5 and harness connector E152.



Harness connector

SKIB2817E

## 8. CHECK HARNESS FOR SHORT CIRCUIT

1. Disconnect following connectors.
– BCM connector
– Combination meter connector
– Transfer control unit connector
– Harness connector M91

2. Check continuity between data link connector M22 terminals 6 (L) and 14 (P).

>    **6 (L) – 14 (P)**      **: Continuity should not exist.**

OK or NG

  OK    >> GO TO 9.
  NG    >> Check the following harnesses. If any harness is damaged, repair the harness.

- Harness between data link connector and harness connector M31
- Harness between data link connector and BCM
- Harness between data link connector and combination meter
- Harness between data link connector and transfer control unit
- Harness between data link connector and harness connector M91



Data link connector

SKIA6868E

## 9. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between data link connector M22 terminals 6 (L), 14 (P) and ground.

>    **6 (L) – Ground**      **: Continuity should not exist.**
>    **14 (P) – Ground**      **: Continuity should not exist.**

OK or NG

  OK    >> GO TO 10.
  NG    >> Check the following harnesses. If any harness is damaged, repair the harness.

- Harness between data link connector and harness connector M31
- Harness between data link connector and BCM
- Harness between data link connector and combination meter
- Harness between data link connector and transfer control unit
- Harness between data link connector and harness connector M91



Data link connector

PKIA9872E

## 10. CHECK HARNESS FOR SHORT CIRCUIT

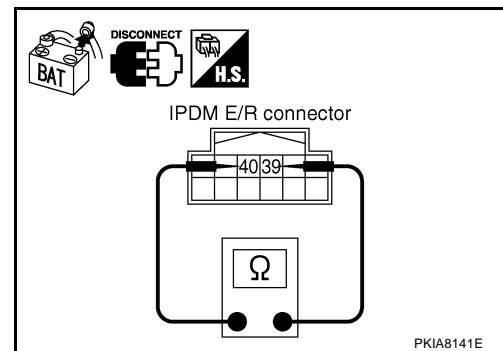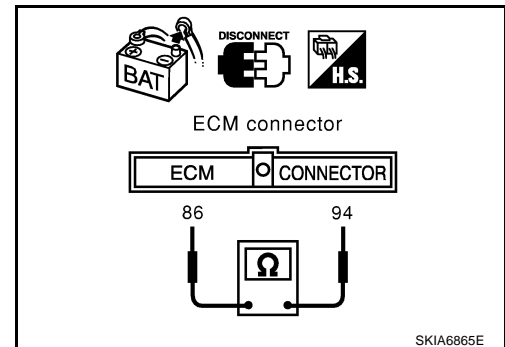1. Disconnect ABS actuator and electric unit (control unit) connector and IPDM E/R connector.
2. Check continuity between IPDM E/R harness connector E122 terminals 39 (L) and 40 (P).

   **39 (L) – 40 (P)          : Continuity should not exist.**

OK or NG

  OK    >> GO TO 11.
  NG    >> Check the following harnesses. If any harness is damaged, repair the harness.
   - Harness between IPDM E/R and ABS actuator and electric unit (control unit)
   - Harness between IPDM E/R and harness connector E26



IPDM E/R connector

40 39

Ω

PKIA8141E

## 11. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between IPDM E/R harness connector E122 terminals 39 (L), 40 (P) and ground.

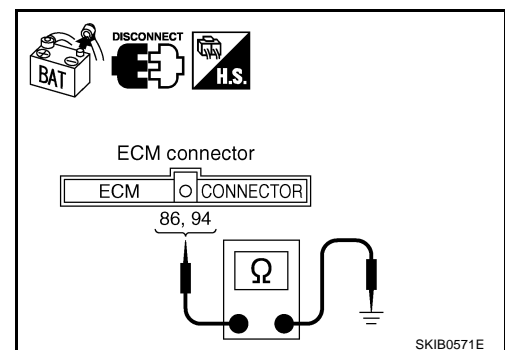    **39 (L) – Ground          : Continuity should not exist.**
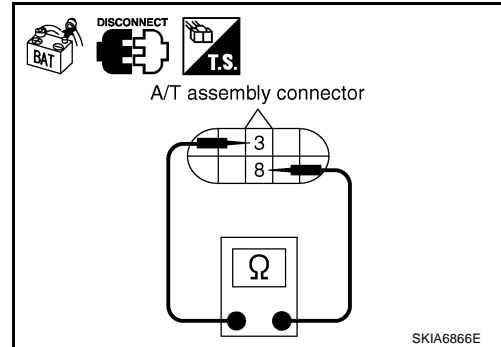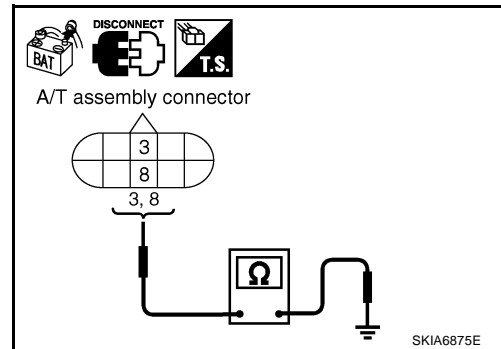
    **40 (P) – Ground          : Continuity should not exist.**

OK or NG

  OK    >> GO TO 12.
  NG    >> Check the following harnesses. If any harness is damaged, repair the harness.
   - Harness between IPDM E/R and ABS actuator and electric unit (control unit)
   - Harness between IPDM E/R and harness connector E26



IPDM E/R connector

40 39

Ω

SKIB2821E

## 12. CHECK ECM AND IPDM E/R INTERNAL CIRCUIT

1. Remove ECM and IPDM E/R from vehicle.
2. Check resistance between ECM terminals 94 and 86.

   **94 – 86          : Approx. 108 – 132 Ω**

3. Check resistance between IPDM E/R terminals 39 and 40.

   **39 – 40          : Approx. 108 – 132 Ω**

OK or NG

  OK    >> GO TO 13.
  NG    >> Replace ECM and/or IPDM E/R.



**ECM and IPDM E/R**

LKIA0037E

## 13. CHECK SYMPTOM

1. Fill in described symptoms on the column "Symptom" in the check sheet.
2. Connect all connectors, and then make sure that the symptom is reproduced.

OK or NG

  OK    >> GO TO 14.
  NG    >> Refer to LAN-14, "Example of Filling in Check Sheet When Initial Conditions Are Not Reproduced" .

## 14. CHECK UNIT REPRODUCIBILITY

Perform the following procedure for each unit, and then perform reproducibility test.

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Disconnect the unit connector.
4. Connect the battery cable to the negative terminal.
5. Make sure that the symptom filled in the "Symptom" of the check sheet is reproduced. (Do not confuse it with the symptom related to removed unit.)
6. Make sure that the same symptom is reproduced.

- TCM
- BCM
- Combination meter
- Transfer control unit
- ABS actuator and electric unit (control unit)
- ECM
- IPDM E/R

Inspection results

Reproduced>>Install removed unit, and then check the other unit.
Not reproduced>>Replace removed unit.

## IPDM E/R Ignition Relay Circuit Inspection

UKS004GP

Check the following. If no malfunction is found, replace the IPDM E/R.

- IPDM E/R power supply circuit. Refer to PG-27, "IPDM E/R Power/Ground Circuit Inspection" .
- Ignition power supply circuit. Refer to PG-14, "IGNITION POWER SUPPLY — IGNITION SW. IN ON AND/OR START" .

## CAN SYSTEM (TYPE 11)

PFP:23710

### System Description

UKS004FR

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle mul-
tiplex communication line with high data communication speed and excellent error detection ability. Many elec-
tronic 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

UKS004FS



BKIA0183E

## Schematic

IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)

40

39

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

15

11

TRANSFER CONTROL UNIT

2

1

STEERING ANGLE SENSOR

5

4

BCM (BODY CONTROL MODULE)

40

39

DATA LINK CONNECTOR

14

6

COMBINATION METER

11

12

A/T ASSEMBLY

8

3

ECM

86

94

BKWA0579E

## Wiring Diagram — CAN —

UKS004FU

LAN-CAN-31

■▬■ : DATA LINE

A/T
ASSEMBLY
(F9)

CAN-H  CAN-L
[3]   [8]
L     P

L     P
[2]  (F32)  [3]
     (E2)
L     P

[2]  (F14)  [3]
     (E5)
L     P

52G  (E152)  51G
     (M31)
L     P

L ▷ A

P ▷ B

NEXT
PAGE

[94]   [86]
CAN-H  CAN-L  ECM
              (E16)

REFER TO THE FOLLOWING.
(M31) - SUPER MULTIPLE
JUNCTION (SMJ)

| 106 | 107 | 108 | 109 | 110 | 111 | 112 | 113 |
|-----|-----|-----|-----|-----|-----|-----|-----|
| 98  | 99  | 100 | 101 | 102 | 103 | 104 | 105 |

| 119 | 120 | 121 |
|-----|-----|-----|

| 117 | 118 |

| 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 |
|----|----|----|----|----|----|----|----|
| 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 |

| 114 | 115 | 116 |

(E16)
B

H.S.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| 6 | 7 | 8 | 9 | 10 |

(F9)
G

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|----|----|----|
| 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 20 | 22 | 23 | 24 |

(F14)
W

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

(F32)
W

BKWA0565E

LAN-CAN-32

■■ : DATA LINE

STEERING ANGLE SENSOR (M47)

CAN-H | CAN-L
4 | 5
L | P

DATA LINK CONNECTOR (M22)

6 | 14
L | P

TRANSFER CONTROL UNIT (M152)

CAN-H | CAN-L
1 | 2
L | P

PRECEDING PAGE ◁A L

L C▷

NEXT PAGE

PRECEDING PAGE ◁B P

P D▷

COMBINATION METER (M24)

12 | 11
L | P
CAN-H | CAN-L

BCM (BODY CONTROL MODULE) (M18)

39 | 40
L | P
CAN-H | CAN-L

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

(M18) W H.S.

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

(M22) W

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

(M24) W

| 3 | 2 | | 1 |
| 8 | 7 | 6 | 5 | 4 |

(M47) W

| 6 | 5 | 4 | 3 | 2 | 1 |
| 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 |
| 26 | 25 | 24 | 23 | 22 | | 21 | 20 | 19 | 18 |

(M152) W H.S.

BKWA0566E

LAN-CAN-33

▮▭▮ : DATA LINE

PRECEDING
PAGE

C ◁ L

D ◁ P

L

(M91)
[11] -- (E26) -- [10]

L          P

L          P

| 11 | 15 |
| CAN-H | CAN-L |

ABS
ACTUATOR
AND
ELECTRIC
UNIT
(CONTROL
UNIT)
(E125)

| 39 | 40 |
| CAN-H | CAN-L |

IPDM E/R
(INTELLIGENT
POWER
DISTRIBUTION
MODULE
ENGINE ROOM)
(CPU)
(E122)

| 1 | 2 | 3 | ▭ | 4 | 5 | 6 | 7 | (M91) |
| 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | W |

| 37 | 38 | 39 | 40 | 41 | 42 | (E122) |
| 43 | 44 | 45 | 46 | 47 | 48 | W |

| 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | (E125) |
| | 31 | 30 | 29 | 28 | 27 | 26 | 25 | 24 | 23 | 22 | 21 | 20 | 19 | 18 | 17 | | |
| 47 | 46 | 45 | 44 | 43 | 42 | 41 | 40 | 39 | 38 | 37 | 36 | 35 | 34 | 33 | 32 | B |

BKWA0567E

## CHECK SHEET

**NOTE:**
If a check mark is put on "NG" on "INITIAL DIAG (Initial diagnosis)", replace the control unit.

Check sheet table

| SELECT SYSTEM screen | Initial diagnosis | Transmit diagnosis | ECM | TCM | STRG | BCM/SEC | METER/M&A | AWD/4WD/e4WD | VDC/TCS/ABS | IPDM E/R | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | ECM | TCM | STRG | BCM/SEC | METER/M&A | AWD/4WD/e4WD | VDC/TCS/ABS | IPDM E/R | | |
| ENGINE | — | NG | — | UNKWN | — | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | — | NG | UNKWN | — | — | — | UNKWN | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | — | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | — | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

Note: The column group "CAN DIAG SUPPORT MNTR" spans the Initial diagnosis, Transmit diagnosis and Receive diagnosis (ECM, TCM, STRG, BCM/SEC, METER/M&A, AWD/4WD/e4WD, VDC/TCS/ABS, IPDM E/R) columns.

Symptoms :

Attach copy of
SELECT SYSTEM

Attach copy of
SELECT SYSTEM

PKIB5021E

Attach copy of
ENGINE
SELF-DIAG RESULTS

Attach copy of
A/T
SELF-DIAG RESULTS

Attach copy of
BCM
SELF-DIAG RESULTS

Attach copy of
METER
SELF-DIAG RESULTS

Attach copy of
ALL MODE AWD/4WD
SELF-DIAG RESULTS

Attach copy of
ABS
SELF-DIAG RESULTS

Attach copy of
IPDM E/R
SELF-DIAG RESULTS

Attach copy of
ENGINE
CAN DIAG SUPPORT
MNTR

Attach copy of
A/T
CAN DIAG SUPPORT
MNTR

Attach copy of
BCM
CAN DIAG SUPPORT
MNTR

Attach copy of
ALL MODE AWD/4WD
CAN DIAG SUPPORT
MNTR

Attach copy of
ABS
CAN DIAG SUPPORT
MNTR

Attach copy of
IPDM E/R
CAN DIAG SUPPORT
MNTR

PKIB5022E

## CHECK SHEET RESULTS (EXAMPLE)

**NOTE:**

If a check mark is put on "NG" on "INITIAL DIAG (Initial diagnosis)", replace the control unit.

### Case 1

Check harness between TCM and data link connector circuit. Refer to LAN-315, "Inspection Between TCM and Data Link Connector Circuit" .

| SELECT SYSTEM screen | Initial diagnosis | Transmit diagnosis | CAN DIAG SUPPORT MNTR | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Receive diagnosis | | | | | | |
| | | | ECM | TCM | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | — | UNKWN✓ | UNKWN✓ | UNKWN✓ | UNKWN✓ | UNKWN✓ | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001)✓ |
| A/T | — | NG | UNKWN | UNKWN | — | — | — | UNKWN✓ | UNKWN✓ | UNKWN✓ | — | CAN COMM CIRCUIT (U1000)✓ | — |
| BCM | No indication | NG | UNKWN | UNKWN✓ | — | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000)✓ | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN✓ | UNKWN✓ | — | — | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000)✓ | — |
| ABS | — | NG | UNKWN | UNKWN✓ | UNKWN✓ | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000)✓ | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN✓ | — | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000)✓ | — |

PKIB5127E



⫽⫽⫽⫽ : Malfunctioning part

PKIB7185E

## Case 2

Check harness between data link connector and ABS actuator and electric unit (control unit) circuit. Refer to
LAN-316, "Inspection Between Data Link Connector and ABS Actuator and Electric Unit (Control Unit) Circuit"
.

| SELECT SYSTEM screen | CAN DIAG SUPPORT MNTR | | | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | | |
| | | | ECM | TCM | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | — | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | — | NG | UNKWN | UNKWN | — | — | — | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | UNKWN | — | — | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | — | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB5128E



////// : Malfunctioning part

PKIB7186E

## Case 3

Check ECM circuit. Refer to LAN-317, "ECM Circuit Inspection" .

| SELECT SYSTEM screen | | Initial diagnosis | Transmit diagnosis | CAN DIAG SUPPORT MNTR | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Receive diagnosis | | | | | | | | | |
| | | | | ECM | TCM | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | — | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | — | NG | UNKWN | UNKWN | — | — | — | UNKWN | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB5129E



////// : Malfunctioning part

PKIB7187E

# CAN SYSTEM (TYPE 11)

**[CAN]**

## Case 4

Check TCM circuit. Refer to LAN-318, "TCM Circuit Inspection" .

| SELECT SYSTEM screen | | Initial diagnosis | Transmit diagnosis | CAN DIAG SUPPORT MNTR | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Receive diagnosis | | | | | | | | | |
| | | | | ECM | TCM | STRG | BCM/SEC | METER/M&A | AWD/4WD/e4WD | VDC/TCS/ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN✓ | — | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000)✓ | CAN COMM CIRCUIT (U1001)✓ |
| A/T | — | NG | UNKWN | UNKWN✓ | — | — | — | UNKWN✓ | UNKWN✓ | UNKWN✓ | — | CAN COMM CIRCUIT (U1000)✓ | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000)✓ | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | UNKWN✓ | — | — | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000)✓ | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN✓ | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000)✓ | — |
| IPDM E/R | No indication | — | — | UNKWN | UNKWN | — | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB5130E

/////// : Malfunctioning part

PKIB7188E

[Diagram: BCM, Combination meter, Transfer control unit, CAN H, CAN L, ECM, TCM, Steering angle sensor, Data link connector, ABS actuator and electric unit(control unit), IPDM E/R]

## Case 5

Check steering angle sensor circuit. Refer to LAN-318, "Steering Angle Sensor Circuit Inspection" .

| SELECT SYSTEM screen | CAN DIAG SUPPORT MNTR | | | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | | |
| | | | ECM | TCM | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | — | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | — | NG | UNKWN | UNKWN | — | — | — | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB5131E

////// : Malfunctioning part

BCM — Combination meter — Transfer control unit

CAN H

CAN L

ECM — TCM — Steering angle sensor — Data link connector — ABS actuator and electric unit(control unit) — IPDM E/R

PKIB7189E

## Case 6

Check data link connector circuit. Refer to .

| SELECT SYSTEM screen | CAN DIAG SUPPORT MNTR | | | | | | | | | | SELF-DIAG RESULTS | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | | |
| | | | ECM | TCM | STRG | BCM/SEC | METER/M&A | AWD/4WD/e4WD | VDC/TCS/ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | — | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | — | NG | UNKWN | UNKWN | — | — | — | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | — | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB5132E

/////// : Malfunctioning part

BCM  Combination meter  Transfer control unit

CAN H

CAN L

ECM  TCM  Steering angle sensor  Data link connector  ABS actuator and electric unit(control unit)  IPDM E/R

PKIB7190E

## Case 7

Check BCM circuit. Refer to LAN-319, "BCM Circuit Inspection" .

| SELECT SYSTEM screen | | Initial diagnosis | Transmit diagnosis | CAN DIAG SUPPORT MNTR | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Receive diagnosis | | | | | | | | | |
| | | | | ECM | TCM | STRG | BCM/SEC | METER/M&A | AWD/4WD/e4WD | VDC/TCS/ABS | IPDM E/R | | |
| ENGINE | | — | NG | UNKWN | — | UNKWN | UNKWN (✓) | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) (✓) |
| A/T | | — | NG | UNKWN | UNKWN | — | — | — | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| BCM | | No indication (✓) | NG | UNKWN | UNKWN | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | | No indication | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) (✓) | — |
| ALL MODE AWD/4WD | | — | NG | UNKWN | UNKWN | UNKWN | — | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | | — | NG | UNKWN | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | | No indication | — | UNKWN | UNKWN | — | UNKWN (✓) | — | — | — | — | CAN COMM CIRCUIT (U1000) (✓) | — |

PKIB5133E

⁄⁄⁄⁄⁄ : Malfunctioning part

BCM — Combination meter — Transfer control unit

CAN H

CAN L

ECM — TCM — Steering angle sensor — Data link connector — ABS actuator and electric unit(control unit) — IPDM E/R

PKIB7191E

## Case 8

Check combination meter circuit. Refer to LAN-320, "Combination Meter Circuit Inspection" .

| SELECT SYSTEM screen | CAN DIAG SUPPORT MNTR | | | | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | | | |
| | | | ECM | TCM | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | — | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | — | NG | UNKWN | UNKWN | — | — | — | UNKWN | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB5134E

: Malfunctioning part

BCM | Combination meter | Transfer control unit

CAN H

CAN L

ECM | TCM | Steering angle sensor | Data link connector | ABS actuator and electric unit(control unit) | IPDM E/R

PKIB7192E

## Case 9
Check transfer control unit circuit. Refer to LAN-320, "Transfer Control Unit Circuit Inspection" .

| SELECT SYSTEM screen | | CAN DIAG SUPPORT MNTR | | | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | | |
| | | | | ECM | TCM | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | | — | NG | UNKWN | — | UNKWN | — | UNKWN | UNKWN | UNKWN(✓) | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001✓) |
| A/T | | — | NG | UNKWN | UNKWN | — | — | — | UNKWN | UNKWN(✓) | UNKWN | — | CAN COMM CIRCUIT (U1000✓) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | | — | NG | UNKWN(✓) | UNKWN | UNKWN(✓) | — | — | UNKWN(✓) | — | UNKWN(✓) | — | CAN COMM CIRCUIT (U1000✓) | — |
| ABS | | — | NG | UNKWN | UNKWN | UNKWN | UNKWN | — | — | UNKWN(✓) | — | — | CAN COMM CIRCUIT (U1000✓) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB5135E

////// : Malfunctioning part

BCM  Combination meter  Transfer control unit

CAN H

CAN L

ECM  TCM  Steering angle sensor  Data link connector  ABS actuator and electric unit(control unit)  IPDM E/R

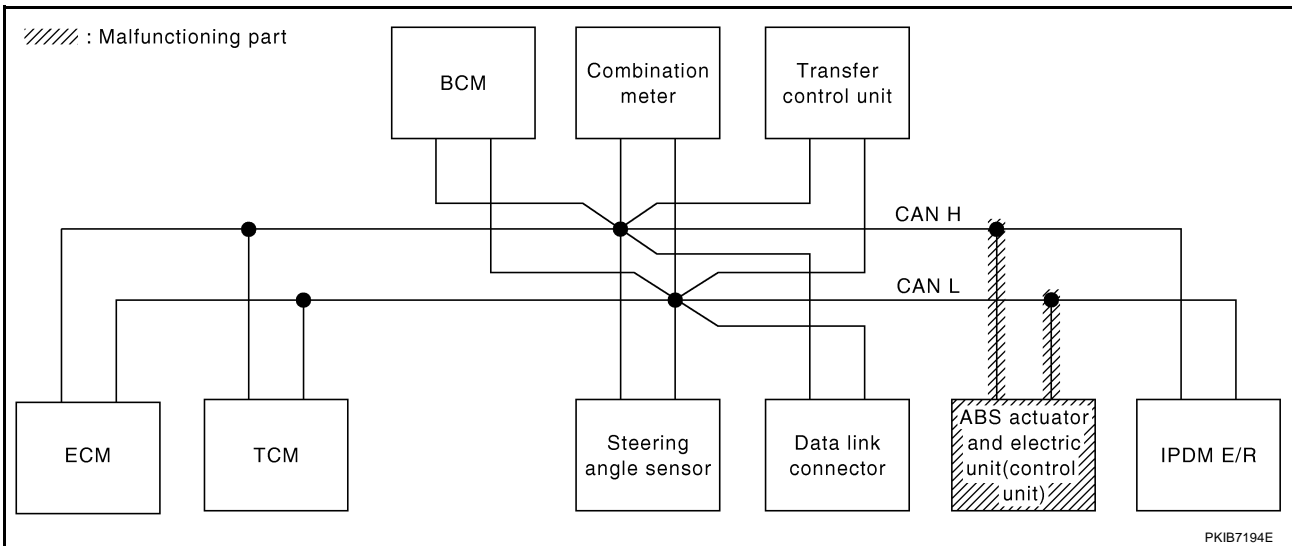PKIB7193E

## Case 10

Check ABS actuator and electric unit (control unit) circuit. Refer to LAN-321, "ABS Actuator and Electric Unit (Control Unit) Circuit Inspection" .

| SELECT SYSTEM screen | | CAN DIAG SUPPORT MNTR | | | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | | |
| | | | | ECM | TCM | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | — | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | — | NG | UNKWN | UNKWN | — | — | — | UNKWN | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | UNKWN | — | — | UNKWN | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB5136E



//// : Malfunctioning part

BCM — Combination meter — Transfer control unit

CAN H
CAN L

ECM — TCM — Steering angle sensor — Data link connector — ABS actuator and electric unit(control unit) — IPDM E/R
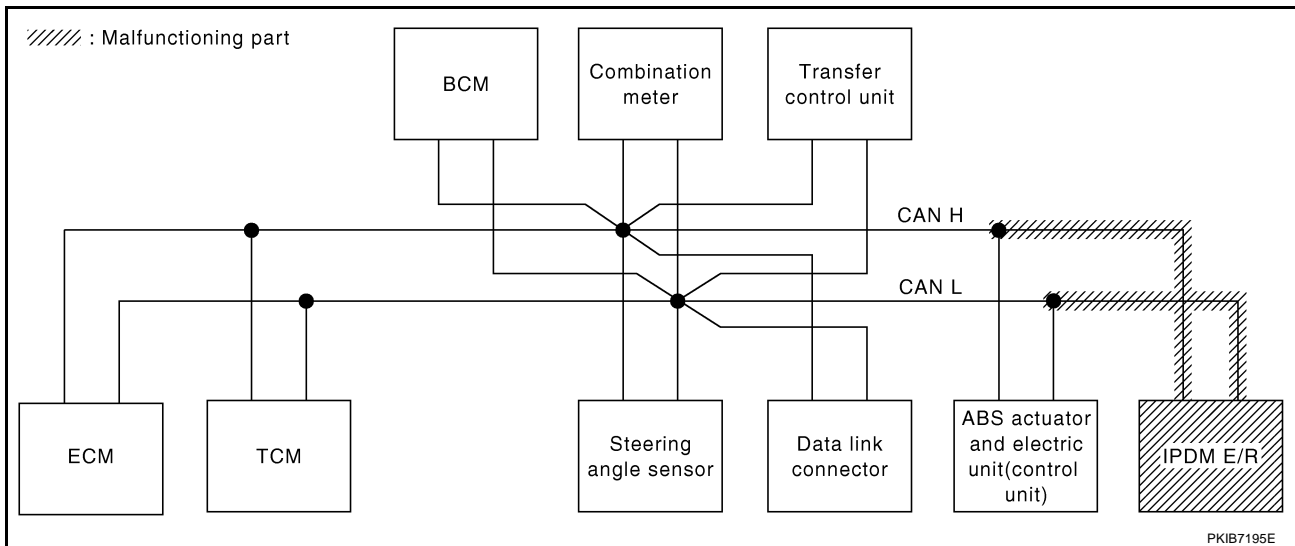
PKIB7194E

## Case 11

Check IPDM E/R circuit. Refer to LAN-321, "IPDM E/R Circuit Inspection" .

| SELECT SYSTEM screen | CAN DIAG SUPPORT MNTR | | | | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | | | |
| | | | ECM | TCM | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | — | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | — | NG | UNKWN | UNKWN | — | — | — | UNKWN | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB5137E



//////  : Malfunctioning part

PKIB7195E

## Case 12

Check CAN communication circuit. Refer to LAN-322, "CAN Communication Circuit Inspection" .

| SELECT SYSTEM screen | CAN DIAG SUPPORT MNTR | | | | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | | | |
| | | | ECM | TCM | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | — | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | — | NG | UNKWN | UNKWN | — | — | — | UNKWN | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB5138E

## Case 13

Check IPDM E/R ignition relay circuit continuously sticks "OFF". Refer to LAN-326, "IPDM E/R Ignition Relay Circuit Inspection" .

| SELECT SYSTEM screen | CAN DIAG SUPPORT MNTR | | | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | | |
| | | | ECM | TCM | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | — | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | — | NG | UNKWN | UNKWN | — | — | — | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | — | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB5139E

## Case 14

Check IPDM E/R ignition relay circuit continuously sticks "ON". Refer to LAN-326, "IPDM E/R Ignition Relay Circuit Inspection" .

| SELECT SYSTEM screen | CAN DIAG SUPPORT MNTR | | | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | | |
| | | | ECM | TCM | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | — | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | — | NG | UNKWN | — | — | — | — | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | — | UNKWN | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | — | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB5140E

# Inspection Between TCM and Data Link Connector Circuit

UKS004FW

## 1. CHECK CONNECTOR

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

– Harness connector F14
– Harness connector E5
– Harness connector E152
– Harness connector M31

OK or NG

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

## 2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect A/T assembly connector and harness connector F14.
2. Check continuity between A/T assembly harness connector F9 terminals 3 (L), 8 (P) and harness connector F14 terminals 2 (L), 3 (P).
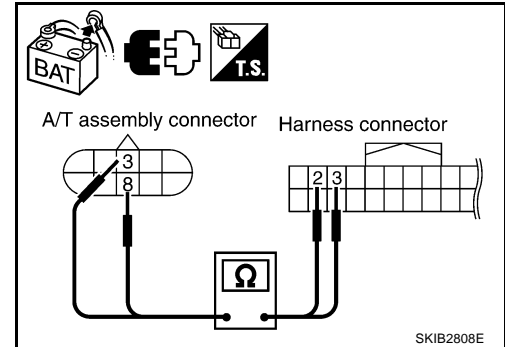
   **3 (L) – 2 (L)**          **: Continuity should exist.**

   **8 (P) – 3 (P)**          **: Continuity should exist.**

OK or NG

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

## 3. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect harness connector E152.
2. Check continuity between harness connector E5 terminals 2 (L), 3 (P) and harness connector E152 terminals 52G (L), 51G (P).
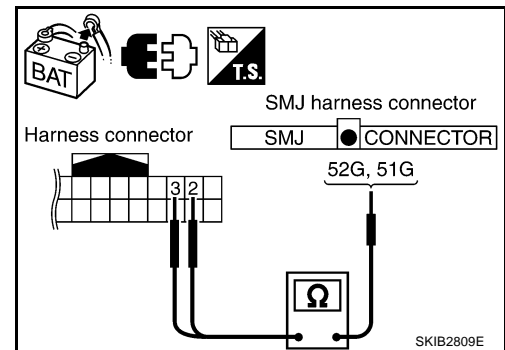
   **2 (L) – 52G (L)**          **: Continuity should exist.**

   **3 (P) – 51G (P)**          **: Continuity should exist.**

OK or NG

  OK      >> GO TO 4.
  NG      >> Repair harness.

## 4. CHECK HARNESS FOR OPEN CIRCUIT

Check continuity between harness connector M31 terminals 52G (L), 51G (P) and data link connector M22 terminals 6 (L), 14 (P).
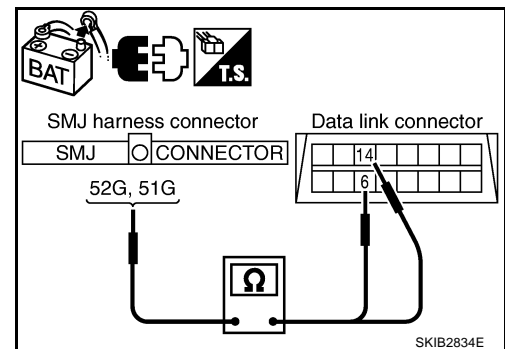
   **52G (L) – 6 (L)**          **: Continuity should exist.**

   **51G (P) – 14 (P)**          **: Continuity should exist.**

OK or NG

  OK      >> Connect all the connectors and diagnose again. Refer to LAN-6, "TROUBLE DIAGNOSES WORK FLOW" .
  NG      >> Repair harness.

# Inspection Between Data Link Connector and ABS Actuator and Electric Unit (Control Unit) Circuit

*UKS004FX*

## 1. CHECK CONNECTOR

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

– Harness connector M91
– Harness connector E26

OK or NG

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

A

## 2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect harness connector M91.
2. Check continuity between data link connector M22 terminals 6 (L), 14 (P) and harness connector M91 terminals 11 (L), 10 (P).
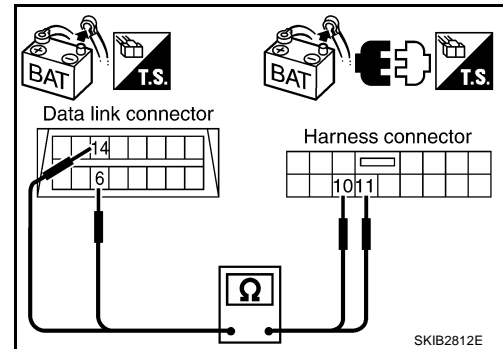
B

**6 (L) – 11 (L)**      **: Continuity should exist.**

**14 (P) – 10 (P)**      **: Continuity should exist.**

C

OK or NG

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

D

SKIB2812E

E

## 3. CHECK HARNESS FOR OPEN CIRCUIT

F

1. Disconnect ABS actuator and electric unit (control unit) connector.
2. Check continuity between harness connector E26 terminals 11 (L), 10 (P) and ABS actuator and electric unit (control unit) harness connector E125 terminals 11 (L), 15 (P).
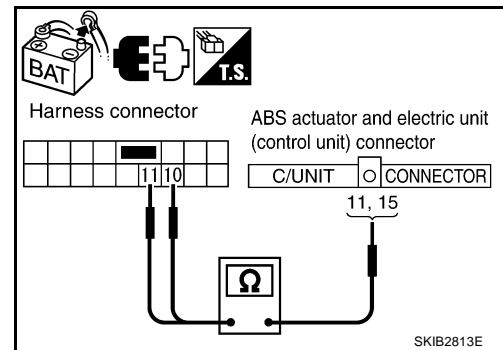
G

**11 (L) – 11 (L)**      **: Continuity should exist.**

**10 (P) – 15 (P)**      **: Continuity should exist.**

H

OK or NG

  OK      >> Connect all the connectors and diagnose again. Refer to LAN-6, "TROUBLE DIAGNOSES WORK FLOW" .
  NG      >> Repair harness.

I

SKIB2813E

## ECM Circuit Inspection

UKS004FY

J

## 1. CHECK CONNECTOR

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

LAN

– ECM connector
– Harness connector E2
– Harness connector F32

L

OK or NG

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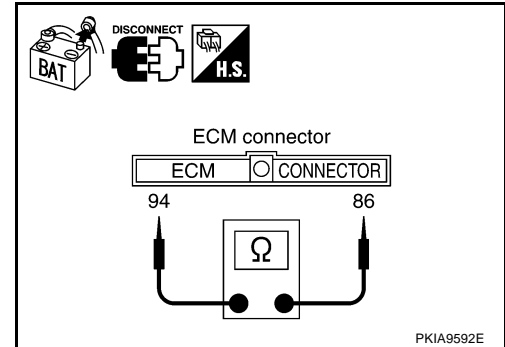  NG      >> Repair terminal or connector.

M

## 2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect ECM connector.
2. Check resistance between ECM harness connector E16 terminals 94 (L) and 86 (P).

   **94 (L) – 86 (P)**      **: Approx. 108 – 132 $\Omega$**

<u>OK or NG</u>

  OK    &gt;&gt; Replace ECM.
  NG    &gt;&gt; Repair harness between ECM and A/T assembly.



PKIA9592E

## TCM Circuit Inspection

UKS004FZ

## 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check terminals and connector of A/T assembly for damage, bend and loose connection (control module side and harness side).

<u>OK or NG</u>

  OK    &gt;&gt; GO TO 2.
  NG    &gt;&gt; Repair terminal or connector.

## 2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect A/T assembly connector.
2. Check resistance between A/T assembly harness connector F9 terminals 3 (L) and 8 (P).

   **3 (L) – 8 (P)**      **: Approx. 54 – 66 $\Omega$**

<u>OK or NG</u>

  OK    &gt;&gt; Replace control valve with TCM.
  NG    &gt;&gt; Repair harness between A/T assembly and harness connector F14.



SKIA6866E

## Steering Angle Sensor Circuit Inspection

UKS004G0

## 1. CHECK CONNECTOR

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

<u>OK or NG</u>

  OK    &gt;&gt; GO TO 2.
  NG    &gt;&gt; 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 M47 terminals 4 (L) and 5 (P).

**4 (L) – 5 (P)**       **: Approx. 54 – 66 Ω**

OK or NG

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

Steering angle sensor connector

PKIA9864E

## Data Link Connector Circuit Inspection
UKS004G1
## 1. CHECK CONNECTOR

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

OK or NG

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

## 2. CHECK HARNESS FOR OPEN CIRCUIT

Check resistance between data link connector M22 terminals 6 (L) and 14 (P).

**6 (L) – 14 (P)**       **: Approx. 54 – 66 Ω**

OK or NG

  OK        >> Diagnose again. Refer to LAN-6, "TROUBLE DIAGNOSES WORK FLOW" .
  NG        >> Repair harness between data link connector and BCM.

Data link connector

SKIA6868E

## BCM Circuit Inspection
UKS004G2
## 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check 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.
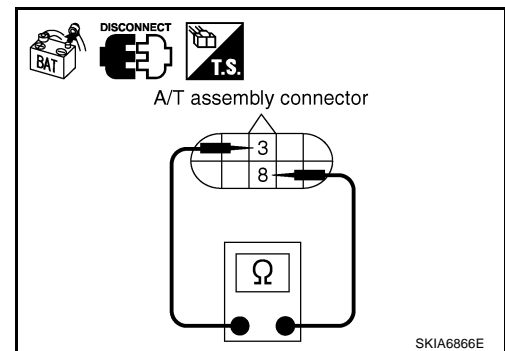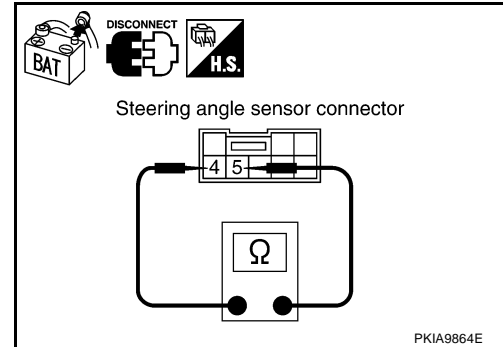
## 2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect BCM connector.
2. Check resistance between BCM harness connector M18 terminals 39 (L) and 40 (P).

   **39 (L) – 40 (P)**         **: Approx. 54 – 66 Ω**

OK or NG

  OK     >> Replace BCM. Refer to <u>BCS-19, "Removal and Installation of BCM"</u> .
  NG     >> Repair harness between BCM and data link connector.

SKIA6869E

## Combination Meter Circuit Inspection

*UKS004G3*

## 1. CHECK CONNECTOR

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

OK or NG

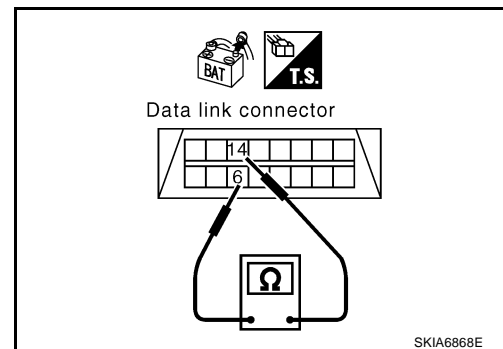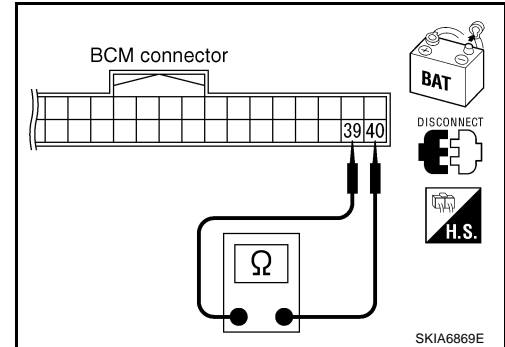  OK     >> GO TO 2.
  NG     >> Repair terminal or connector.

## 2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect combination meter connector.
2. Check resistance between combination meter harness connector M24 terminals 12 (L) and 11 (P).

   **12 (L) – 11 (P)**         **: Approx. 54 – 66 Ω**

OK or NG

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

PKIA6837E

## Transfer Control Unit Circuit Inspection

*UKS004G4*

## 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check terminals and connector of transfer 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 transfer control unit connector.
2. Check resistance between transfer control unit harness connector M152 terminals 1 (L) and 2 (P).

   **1 (L) – 2 (P)**         **: Approx. 54 – 66 $\Omega$**

OK or NG

  OK      >> Replace transfer control unit.
  NG      >> Repair harness between transfer control unit and data link connector.

Transfer control unit connector

PKIA9745E

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

UKS004G5

## 1. CHECK CONNECTOR

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

OK or NG

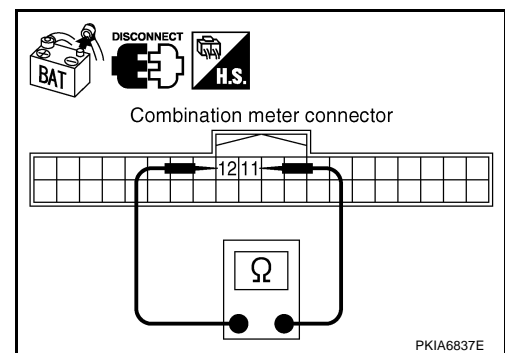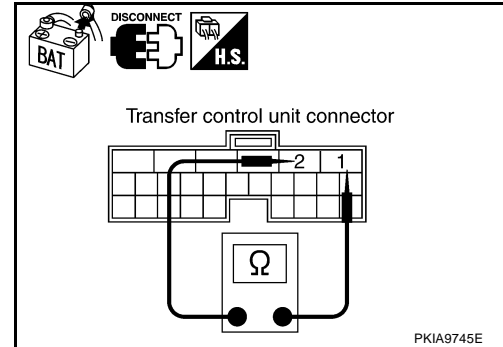  OK      >> GO TO 2.
  NG      >> Repair terminal or connector.

## 2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect ABS actuator and electric unit (control unit) connector.
2. Check resistance between ABS actuator and electric unit (control unit) harness connector E125 terminals 11 (L) and 15 (P).

   **11 (L) – 15 (P)**         **: Approx. 54 – 66 $\Omega$**

OK or NG

  OK      >> Replace ABS actuator and electric unit (control unit).
  NG      >> Repair harness between ABS actuator and electric unit (control unit) and IPDM E/R.

ABS actuator and electric unit (control unit) connector

C/UNIT   O  CONNECTOR
11           15

SKIA6872E

## IPDM E/R Circuit Inspection

UKS004G6

## 1. CHECK CONNECTOR

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

OK or NG

  OK      >> GO TO 2.
  NG      >> Repair terminal or connector.
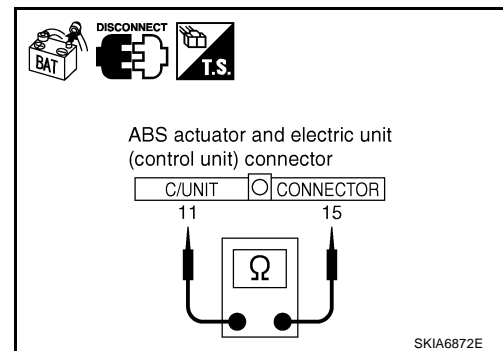
## 2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect IPDM E/R connector.
2. Check resistance between IPDM E/R harness connector E122 terminals 39 (L) and 40 (P).

   **39 (L) – 40 (P)**        **: Approx. 108 – 132 Ω**

<u>OK or NG</u>

  OK      >> Replace IPDM E/R.
  NG      >> Repair harness between IPDM E/R and ABS actuator and electric unit (control unit).



IPDM E/R connector

PKIA8141E

## CAN Communication Circuit Inspection

UKS004G7

## 1. CHECK CONNECTOR

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

– ECM
– TCM
– Steering angle sensor
– BCM
– Combination meter
– Transfer control unit
– ABS actuator and electric unit (control unit)
– IPDM E/R
– Between ECM and IPDM E/R

<u>OK or NG</u>

  OK      >> GO TO 2.
  NG      >> Repair terminal or connector.
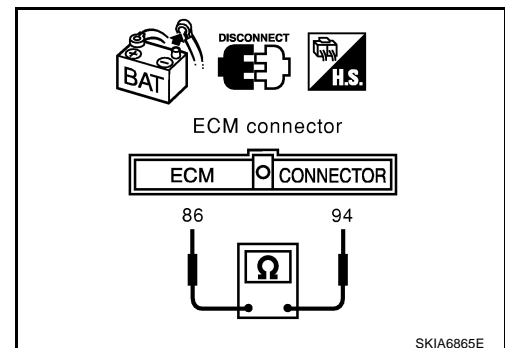
## 2. CHECK HARNESS FOR SHORT CIRCUIT

1. Disconnect ECM connector and harness connector E2.
2. Check continuity between ECM harness connector E16 terminals 94 (L) and 86 (P).

   **94 (L) – 86 (P)**        **: Continuity should not exist.**

<u>OK or NG</u>

  OK      >> GO TO 3.
  NG      >> Repair harness between ECM and harness connector E2.



ECM connector

SKIA6865E

A

## 3. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between ECM harness connector E16 terminals 94 (L), 86 (P) and ground.

B

> **94 (L) – Ground        : Continuity should not exist.**
>
> **86 (P) – Ground        : Continuity should not exist.**

C

OK or NG

OK      >> GO TO 4.
NG      >> Repair harness between ECM and harness connector E2.

D



ECM connector

SKIB0571E

E

## 4. CHECK HARNESS FOR SHORT CIRCUIT

1.  Disconnect A/T assembly connector and harness connector F14.
2.  Check continuity between A/T assembly harness connector F9 terminals 3 (L) and 8 (P).

F

> **3 (L) – 8 (P)        : Continuity should not exist.**

OK or NG

G

OK      >> GO TO 5.
NG      >> Check the following harnesses. If any harness is damaged, repair the harness.

H

- Harness between A/T assembly and harness connector F32
- Harness between A/T assembly and harness connector F14



A/T assembly connector

SKIA6866E

I

## 5. CHECK HARNESS FOR SHORT CIRCUIT

J

Check continuity between A/T assembly harness connector F9 terminals 3 (L), 8 (P) and ground.

> **3 (L) – Ground        : Continuity should not exist.**
>
> **8 (P) – Ground        : Continuity should not exist.**

LAN

OK or NG

OK      >> GO TO 6.
NG      >> Check the following harnesses. If any harness is damaged, repair the harness.

L

- Harness between A/T assembly and harness connector F32
- Harness between A/T assembly and harness connector F14

M



A/T assembly connector

SKIA6875E

## 6. CHECK HARNESS FOR SHORT CIRCUIT

1. Disconnect harness connector E152.
2. Check continuity between harness connector E5 terminals 2 (L) and 3 (P).

   **2 (L) – 3 (P)          : Continuity should not exist.**

OK or NG

  OK      >> GO TO 7.
  NG      >> Repair harness between harness connector E5 and harness connector E152.



Harness connector

SKIB2816E

## 7. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between harness connector E5 terminals 2 (L), 3 (P) and ground.
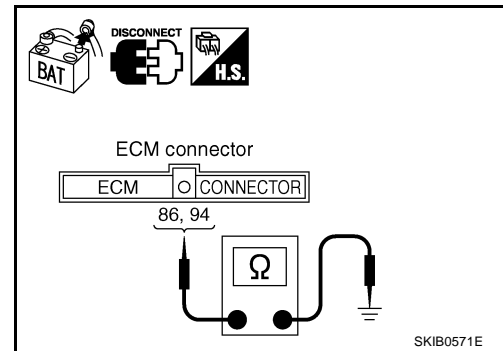
   **2 (L) – Ground        : Continuity should not exist.**

   **3 (P) – Ground        : Continuity should not exist.**

OK or NG

  OK      >> GO TO 8.
  NG      >> Repair harness between harness connector E5 and harness connector E152.



Harness connector

SKIB2817E

## 8. CHECK HARNESS FOR SHORT CIRCUIT

1. Disconnect following connectors.
– Steering angle sensor connector
– BCM connector
– Combination meter connector
– Transfer control unit connector
– Harness connector M91
2. Check continuity between data link connector M22 terminals 6 (L) and 14 (P).
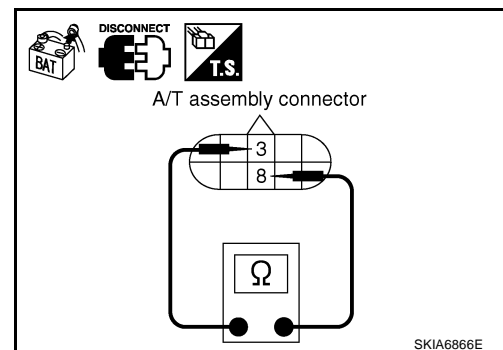
   **6 (L) – 14 (P)          : Continuity should not exist.**

OK or NG

  OK      >> GO TO 9.
  NG      >> Check the following harnesses. If any harness is damaged, repair the harness.
      ● Harness between data link connector and harness connector M31
      ● Harness between data link connector and steering angle sensor
      ● Harness between data link connector and BCM
      ● Harness between data link connector and combination meter
      ● Harness between data link connector and transfer control unit
      ● Harness between data link connector and harness connector M91



Data link connector

SKIA6868E

## 9. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between data link connector M22 terminals 6 (L), 14 (P) and ground.

**6 (L) – Ground          : Continuity should not exist.**
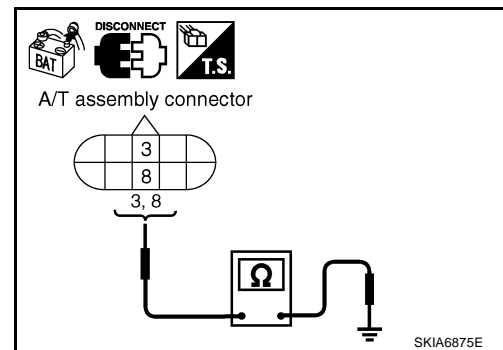
**14 (P) – Ground          : Continuity should not exist.**

OK or NG

  OK    >> GO TO 10.
  NG    >> Check the following harnesses. If any harness is damaged, repair the harness.

- Harness between data link connector and harness connector M31
- Harness between data link connector and steering angle sensor
- Harness between data link connector and BCM
- Harness between data link connector and combination meter
- Harness between data link connector and transfer control unit
- Harness between data link connector and harness connector M91

PKIA9872E

## 10. CHECK HARNESS FOR SHORT CIRCUIT

1. Disconnect ABS actuator and electric unit (control unit) connector and IPDM E/R connector.
2. Check continuity between IPDM E/R harness connector E122 terminals 39 (L) and 40 (P).

**39 (L) – 40 (P)          : Continuity should not exist.**

OK or NG

  OK    >> GO TO 11.
  NG    >> Check the following harnesses. If any harness is damaged, repair the harness.

- Harness between IPDM E/R and ABS actuator and electric unit (control unit)
- Harness between IPDM E/R and harness connector E26

PKIA8141E

## 11. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between IPDM E/R harness connector E122 terminals 39 (L), 40 (P) and ground.

**39 (L) – Ground          : Continuity should not exist.**

**40 (P) – Ground          : Continuity should not exist.**

OK or NG

  OK    >> GO TO 12.
  NG    >> Check the following harnesses. If any harness is damaged, repair the harness.
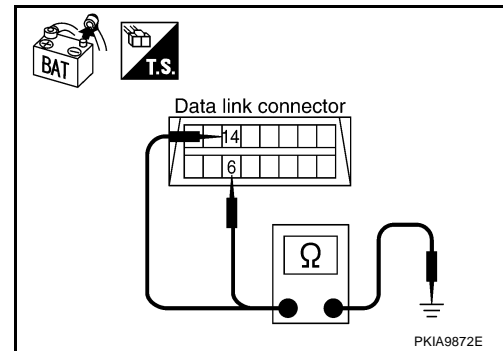
- Harness between IPDM E/R and ABS actuator and electric unit (control unit)
- Harness between IPDM E/R and harness connector E26

SKIB2821E

**LAN**

## 12. CHECK ECM AND IPDM E/R INTERNAL CIRCUIT

1. Remove ECM and IPDM E/R from vehicle.
2. Check resistance between ECM terminals 94 and 86.

   **94 – 86** : **Approx. 108 – 132** Ω

3. Check resistance between IPDM E/R terminals 39 and 40.

   **39 – 40** : **Approx. 108 – 132** Ω

OK or NG

OK     >> GO TO 13.
NG     >> Replace ECM and/or IPDM E/R.

ECM and IPDM E/R

LKIA0037E

## 13. CHECK SYMPTOM

1. Fill in described symptoms on the column "Symptom" in the check sheet.
2. Connect all connectors, and then make sure that the symptom is reproduced.

OK or NG

OK     >> GO TO 14.
NG     >> Refer to LAN-14, "Example of Filling in Check Sheet When Initial Conditions Are Not Reproduced" .

## 14. CHECK UNIT REPRODUCIBILITY

Perform the following procedure for each unit, and then perform reproducibility test.
1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Disconnect the unit connector.
4. Connect the battery cable to the negative terminal.
5. Make sure that the symptom filled in the "Symptom" of the check sheet is reproduced. (Do not confuse it with the symptom related to removed unit.)
6. Make sure that the same symptom is reproduced.
– TCM
– Steering angle sensor
– BCM
– Combination meter
– Transfer control unit
– ABS actuator and electric unit (control unit)
– ECM
– IPDM E/R

Inspection results

Reproduced>>Install removed unit, and then check the other unit.
Not reproduced>>Replace removed unit.

## IPDM E/R Ignition Relay Circuit Inspection                    UKS004G8

Check the following. If no malfunction is found, replace the IPDM E/R.
● IPDM E/R power supply circuit. Refer to PG-27, "IPDM E/R Power/Ground Circuit Inspection" .
● Ignition power supply circuit. Refer to PG-14, "IGNITION POWER SUPPLY — IGNITION SW. IN ON AND/OR START" .

## CAN SYSTEM (TYPE 12)

PFP:23710

### System Description

UKS004F8

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

UKS004F9



IPDM E/R (intelligent power distribution module engine room) (E122)

ECM (E16)

A/T assembly (F9)

Combination meter (M24)

BCM (body control module) (M18)

ABS actuator and electric unit (control unit) (E125)

Transfer control unit (M152)

Steering angle sensor (M47)

Data link connector (M22)

Differential lock control unit (M70)

BKIA0184E

## Schematic

BKWA0580E

## Wiring Diagram — CAN —

■■■ : DATA LINE

A/T ASSEMBLY
(F9)

CAN-H [3]  CAN-L [8]
L   P

F32
E2
[2]   [3]
L   P

F14
E5
[2]   [3]
L   P

E152
M31
[52G]   [51G]
L   P

L ▶ A
P ▶ B

NEXT PAGE

[94]   [86]   ECM
CAN-H   CAN-L   (E16)
L   P

REFER TO THE FOLLOWING.
(M31) - SUPER MULTIPLE JUNCTION (SMJ)

| 106 | 107 | 108 | 109 | 110 | 111 | 112 | 113 |
|-----|-----|-----|-----|-----|-----|-----|-----|
| 98 | 99 | 100 | 101 | 102 | 103 | 104 | 105 |

| 119 | 120 | 121 |
|-----|-----|-----|

| 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 |
|----|----|----|----|----|----|----|----|
| 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 |

| 117 | 118 |
|-----|-----|
| 114 | 115 | 116 |

(E16)
B

H.S.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| 6 | 7 | 8 | 9 | 10 |

(F9)
G

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|----|----|----|
| 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 20 | 22 | 23 | 24 |

(F14)
W

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

(F32)
W

BKWA0568E

LAN-CAN-35

■—■ : DATA LINE

STEERING ANGLE SENSOR (M47)
CAN-H 4 — L
CAN-L 5 — P

DATA LINK CONNECTOR (M22)
6 — L
14 — P

TRANSFER CONTROL UNIT (M152)
CAN-H 1 — L
CAN-L 2 — P

PRECEDING PAGE ◁ A ◄ L — C

PRECEDING PAGE ◁ B ◄ P — D

NEXT PAGE

DIFFERENTIAL LOCK CONTROL UNIT (M70)
5 — L — CAN-H
4 — P — CAN-L

COMBINATION METER (M24)
12 — L — CAN-H
11 — P — CAN-L

BCM (BODY CONTROL MODULE) (M18)
39 — L — CAN-H
40 — P — CAN-L

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

(M18) W  H.S.

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

(M22) W

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

(M24) W

| 3 | 2 | | 1 |
|---|---|---|---|
| 8 | 7 | 6 | 5 | 4 |

(M47) W

| 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
|----|----|----|---|---|---|---|---|---|---|---|---|
| 26 | 25 | 24 | 23 | 22 | 21 | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 |

(M70) W  H.S.

| 6 | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|
| 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 |
| 26 | 25 | 24 | 23 | 22 | | 21 | 20 | 19 | 18 |

(M152) W  H.S.

BKWA0569E

A

B

C

D

E

F

G

H

I

J

LAN

L

M

▭◼▭ : DATA LINE

PRECEDING PAGE

C  L

D  P

M91
E26

11  10

L  P

L  P

L  P

CAN-H  CAN-L  ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

11  15

E125

CAN-H  CAN-L  IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) (CPU)

39  40

E122

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

M91
W

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

E122
W

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

E125
B

BKWA0570E

## CHECK SHEET

UKS004FC

**NOTE:**
If a check mark is put on "NG" on "INITIAL DIAG (Initial diagnosis)", replace the control unit.

Check sheet table

| SELECT SYSTEM screen | | Initial diagnosis | Transmit diagnosis | ECM | TCM | DIFF LOCK | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | ECM | TCM | DIFF LOCK | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | — | — | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | — | NG | UNKWN | UNKWN | — | — | — | UNKWN | UNKWN | UNKWN | — | | CAN COMM CIRCUIT (U1000) | — |
| DIFF LOCK | — | NG | UNKWN | UNKWN | — | — | — | — | UNKWN | UNKWN | — | | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | — | UNKWN | — | — | UNKWN | | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | — | | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN | — | | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | — | UNKWN | — | — | — | — | | CAN COMM CIRCUIT (U1000) | — |

*CAN DIAG SUPPORT MNTR — Receive diagnosis*

Symptoms :

Attach copy of
SELECT SYSTEM

Attach copy of
SELECT SYSTEM

PKIB6535E

Attach copy of
ENGINE
SELF-DIAG RESULTS

Attach copy of
A/T
SELF-DIAG RESULTS

Attach copy of
DIFF LOCK
SELF-DIAG RESULTS

Attach copy of
BCM
SELF-DIAG RESULTS

Attach copy of
METER
SELF-DIAG RESULTS

Attach copy of
ALL MODE AWD/4WD
SELF-DIAG RESULTS

Attach copy of
ABS
SELF-DIAG RESULTS

Attach copy of
IPDM E/R
SELF-DIAG RESULTS

Attach copy of
ENGINE
CAN DIAG SUPPORT
MNTR

Attach copy of
A/T
CAN DIAG SUPPORT
MNTR

Attach copy of
DIFF LOCK
CAN DIAG SUPPORT
MNTR

Attach copy of
BCM
CAN DIAG SUPPORT
MNTR

Attach copy of
ALL MODE AWD/4WD
CAN DIAG SUPPORT
MNTR

Attach copy of
ABS
CAN DIAG SUPPORT
MNTR

Attach copy of
IPDM E/R
CAN DIAG SUPPORT
MNTR

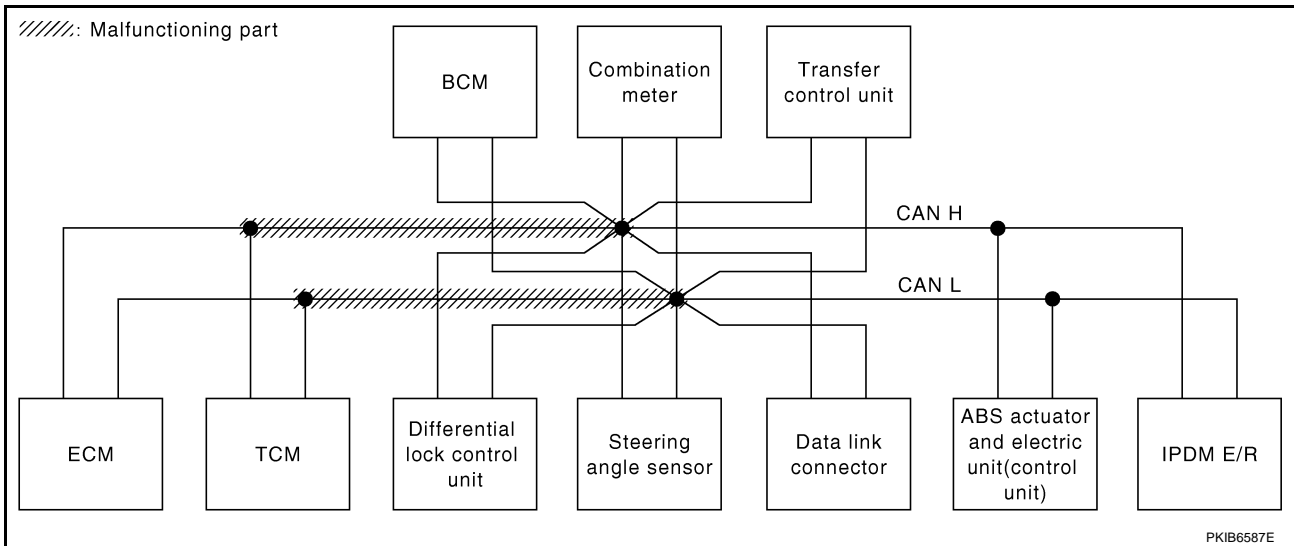PKIB6533E

## CHECK SHEET RESULTS (EXAMPLE)

**NOTE:**
If a check mark is put on "NG" on "INITIAL DIAG (Initial diagnosis)", replace the control unit.

### Case 1

Check harness between TCM and data link connector circuit. Refer to .

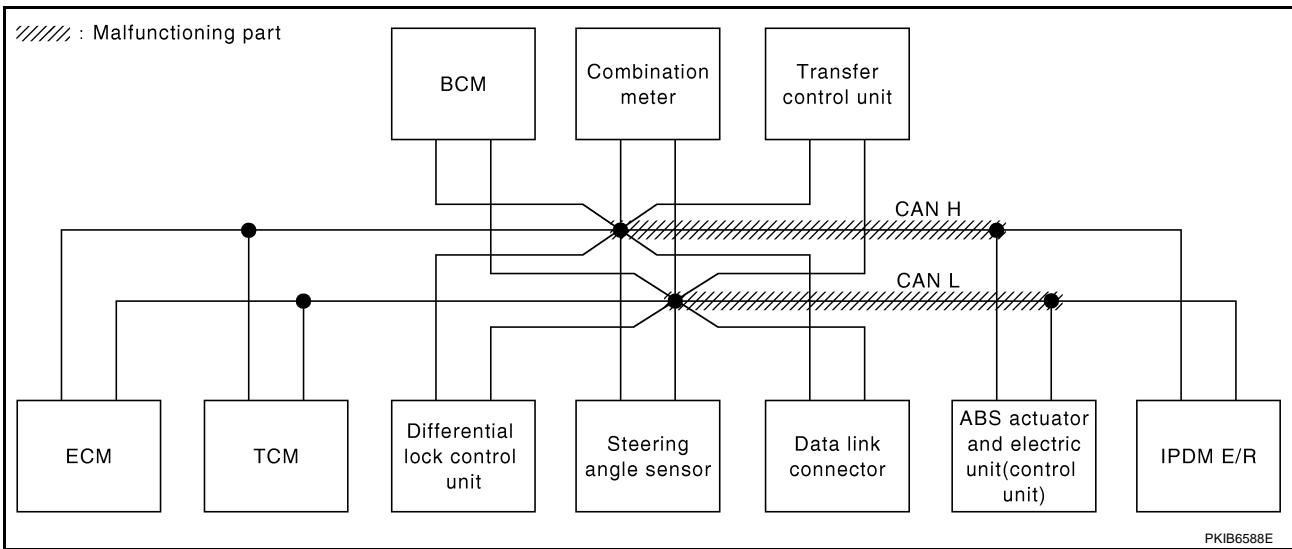| SELECT SYSTEM screen | CAN DIAG SUPPORT MNTR | | | | | | | | | | | SELF-DIAG RESULTS | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | | | |
| | | | ECM | TCM | DIFF LOCK | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | — | — | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | — | NG | UNKWN | UNKWN | — | — | — | UNKWN | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| DIFF LOCK | — | NG | UNKWN | UNKWN | — | — | — | — | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | — | — | — | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | — | — | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB7003E



///////: Malfunctioning part

PKIB6587E

## Case 2

Check harness between data link connector and ABS actuator and electric unit (control unit) circuit. Refer to LAN-347, "Inspection Between Data Link Connector and ABS Actuator and Electric Unit (Control Unit) Circuit" .

| SELECT SYSTEM screen | CAN DIAG SUPPORT MNTR | | | | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | | | |
| | | | ECM | TCM | DIFF LOCK | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | — | — | UNKWN | UNKWN | UNKWN✓ | UNKWN✓ | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | — | NG | UNKWN | UNKWN | — | — | — | — | UNKWN | UNKWN✓ | — | CAN COMM CIRCUIT (U1000) | — |
| DIFF LOCK | — | NG | UNKWN | UNKWN | — | — | — | — | UNKWN | UNKWN✓ | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | — | UNKWN | — | — | UNKWN✓ | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000)✓ | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN✓ | — | CAN COMM CIRCUIT (U1000)✓ | — |
| ABS | — | NG | UNKWN | UNKWN✓ | UNKWN✓ | UNKWN✓ | UNKWN✓ | — | — | UNKWN✓ | — | CAN COMM CIRCUIT (U1000)✓ | — |
| IPDM E/R | No indication✓ | — | UNKWN | UNKWN | — | — | — | UNKWN | — | — | — | CAN COMM CIRCUIT (U1000)✓ | — |

PKIB7004E



▨▨▨ : Malfunctioning part

BCM — Combination meter — Transfer control unit

CAN H

CAN L

ECM — TCM — Differential lock control unit — Steering angle sensor — Data link connector — ABS actuator and electric unit(control unit) — IPDM E/R

PKIB6588E

## Case 3

Check ECM circuit. Refer to LAN-348, "ECM Circuit Inspection" .

| SELECT SYSTEM screen | | Initial diagnosis | Transmit diagnosis | CAN DIAG SUPPORT MNTR — Receive diagnosis | | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | ECM | TCM | DIFF LOCK | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | — | NG | UNKWN | — | UNKWN | — | — | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | — | — | NG | UNKWN | UNKWN | — | — | — | — | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| DIFF LOCK | — | — | NG | UNKWN | UNKWN | — | — | — | — | — | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | | NG | UNKWN | UNKWN | — | — | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | | — | — | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | — | NG | UNKWN | UNKWN | UNKWN | — | — | — | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | — | NG | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | | — | UNKWN | UNKWN | — | — | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB7005E

////// : Malfunctioning part

BCM — Combination meter — Transfer control unit

CAN H

CAN L

ECM — TCM — Differential lock control unit — Steering angle sensor — Data link connector — ABS actuator and electric unit (control unit) — IPDM E/R

PKIB6589E

## Case 4

Check TCM circuit. Refer to LAN-349, "TCM Circuit Inspection" .

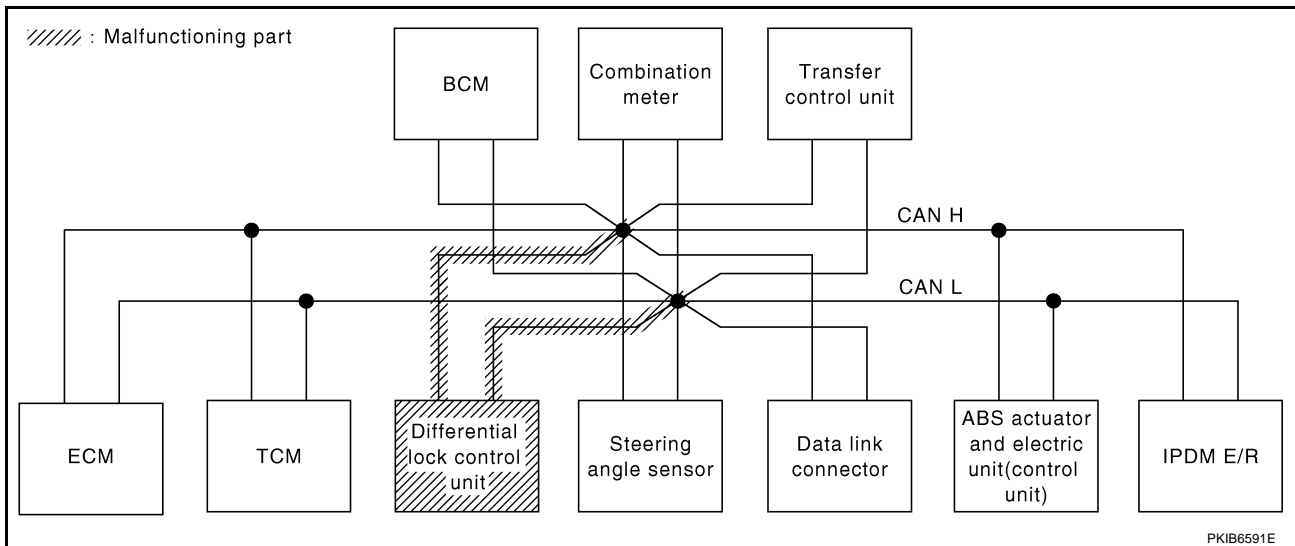| SELECT SYSTEM screen | | Initial diagnosis | Transmit diagnosis | CAN DIAG SUPPORT MNTR | | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Receive diagnosis | | | | | | | | | | |
| | | | | ECM | TCM | DIFF LOCK | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN ✓ | — | — | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) ✓ | CAN COMM CIRCUIT (U1001) ✓ |
| A/T | — | NG | UNKWN | UNKWN ✓ | — | — | — | — | UNKWN | UNKWN ✓ | UNKWN ✓ | — | CAN COMM CIRCUIT (U1000) ✓ | — |
| DIFF LOCK | — | NG | UNKWN | UNKWN | — | — | — | — | — | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) ✓ | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | UNKWN ✓ | — | — | — | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000) ✓ | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN ✓ | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) ✓ | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | — | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB9491E



///// : Malfunctioning part

PKIB6590E

## Case 5

Check differential lock control unit circuit. Refer to LAN-349, "Differential Lock Control Unit Circuit Inspection" .

| SELECT SYSTEM screen | | Initial diagnosis | Transmit diagnosis | CAN DIAG SUPPORT MNTR | | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Receive diagnosis | | | | | | | | | | |
| | | | | ECM | TCM | DIFF LOCK | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | — | — | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | — | NG | UNKWN | UNKWN | — | — | — | — | UNKWN | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| DIFF LOCK | — | NG | UNKWN✓ | UNKWN✓ | — | — | — | — | — | UNKWN✓ | UNKWN✓ | — | CAN COMM CIRCUIT (U1000)✓ | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | UNKWN | — | — | — | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | UNKWN✓ | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000)✓ | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | — | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB7007E



▨▨▨ : Malfunctioning part

BCM — Combination meter — Transfer control unit

CAN H

CAN L

ECM — TCM — Differential lock control unit — Steering angle sensor — Data link connector — ABS actuator and electric unit(control unit) — IPDM E/R
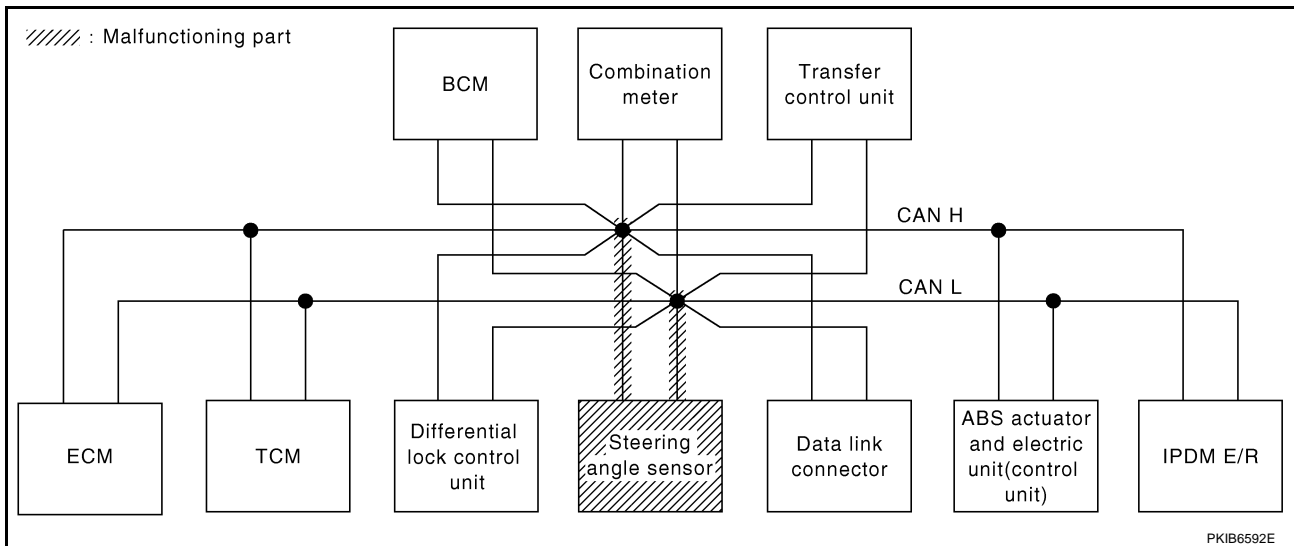
PKIB6591E

## Case 6

Check steering angle sensor circuit. Refer to LAN-350, "Steering Angle Sensor Circuit Inspection" .

| SELECT SYSTEM screen | Initial diagnosis | Transmit diagnosis | CAN DIAG SUPPORT MNTR Receive diagnosis | | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | ECM | TCM | DIFF LOCK | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | — | — | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | — | NG | UNKWN | UNKWN | — | — | — | — | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| DIFF LOCK | — | NG | UNKWN | UNKWN | — | — | — | — | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | UNKWN | — | — | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | UNKWN✓ | UNKWN | — | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB7008E

///// : Malfunctioning part

BCM — Combination meter — Transfer control unit

CAN H

CAN L

ECM — TCM — Differential lock control unit — Steering angle sensor (Malfunctioning part) — Data link connector — ABS actuator and electric unit(control unit) — IPDM E/R
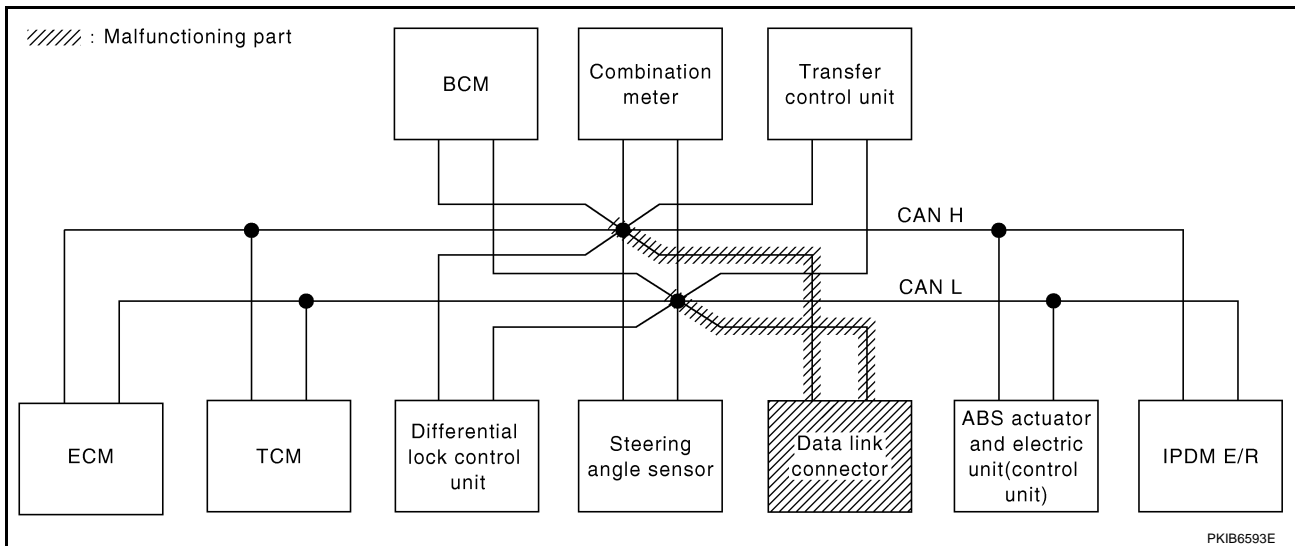
PKIB6592E

## Case 7

Check data link connector circuit. Refer to LAN-350, "Data Link Connector Circuit Inspection" .

| SELECT SYSTEM screen | Initial diagnosis | Transmit diagnosis | Receive diagnosis ||||||||| SELF-DIAG RESULTS ||
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | ECM | TCM | DIFF LOCK | STRG | BCM/SEC | METER/M&A | AWD/4WD/e4WD | VDC/TCS/ABS | IPDM E/R | (CAN DIAG SUPPORT MNTR) ||
| ENGINE | — | NG | UNKWN | — | UNKWN | — | — | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | — | NG | UNKWN | UNKWN | — | — | — | — | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| DIFF LOCK | — | NG | UNKWN | UNKWN | — | — | — | — | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication ✓ | NG | UNKWN | UNKWN | — | — | UNKWN | — | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication ✓ | — | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | UNKWN | — | — | — | UNKWN | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication ✓ | — | UNKWN | UNKWN | — | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB7009E



////// : Malfunctioning part

BCM, Combination meter, Transfer control unit, CAN H, CAN L, ECM, TCM, Differential lock control unit, Steering angle sensor, Data link connector, ABS actuator and electric unit(control unit), IPDM E/R

PKIB6593E

## Case 8

Check BCM circuit. Refer to LAN-351, "BCM Circuit Inspection" .

| SELECT SYSTEM screen | | Initial diagnosis | Transmit diagnosis | CAN DIAG SUPPORT MNTR — Receive diagnosis | | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | ECM | TCM | DIFF LOCK | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | — | — | UNKWN✓ | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001)✓ |
| A/T | — | NG | UNKWN | UNKWN | — | — | — | — | UNKWN | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| DIFF LOCK | — | NG | UNKWN | UNKWN | — | — | — | — | — | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication✓ | NG | UNKWN | UNKWN | — | — | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000)✓ | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | UNKWN | — | — | — | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | — | — | UNKWN✓ | — | — | — | — | CAN COMM CIRCUIT (U1000)✓ | — |

PKIB7010E

: Malfunctioning part

BCM — Combination meter — Transfer control unit

CAN H
CAN L

ECM — TCM — Differential lock control unit — Steering angle sensor — Data link connector — ABS actuator and electric unit (control unit) — IPDM E/R
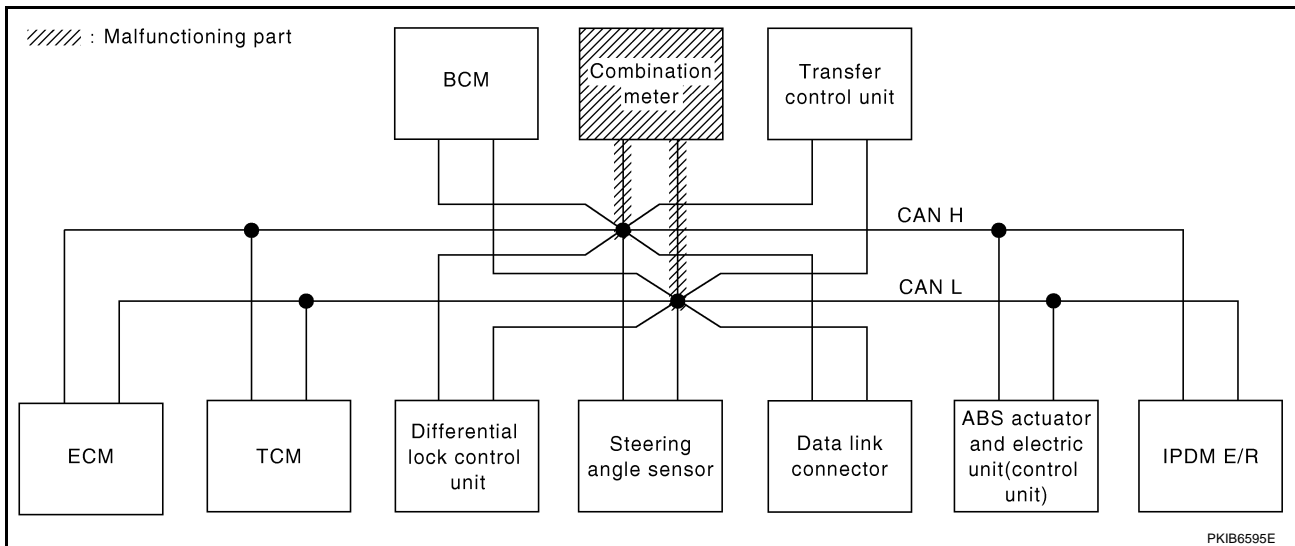
PKIB6594E

## Case 9

Check combination meter circuit. Refer to LAN-351, "Combination Meter Circuit Inspection" .

| SELECT SYSTEM screen | | Initial diagnosis | Transmit diagnosis | CAN DIAG SUPPORT MNTR Receive diagnosis | | | | | | | | | SELF-DIAG RESULTS | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | | | | ECM | TCM | DIFF LOCK | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | — | — | UNKWN | UNK✓WN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | — | NG | UNKWN | UNKWN | — | — | — | — | UNK✓WN | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| DIFF LOCK | — | NG | UNKWN | UNKWN | — | — | — | — | — | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | — | — | UNK✓WN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No✓ indication | — | — | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | UNKWN | — | — | — | UNK✓WN | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | — | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB7011E



////// : Malfunctioning part

BCM — Combination meter — Transfer control unit

CAN H

CAN L

ECM — TCM — Differential lock control unit — Steering angle sensor — Data link connector — ABS actuator and electric unit(control unit) — IPDM E/R

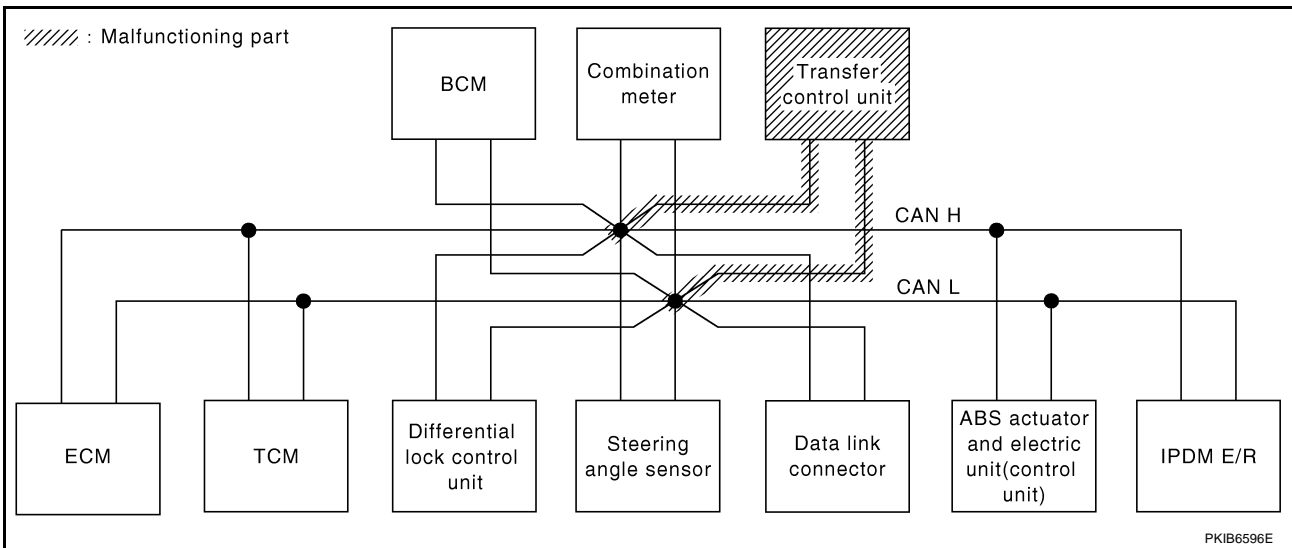PKIB6595E

## Case 10

Check transfer control unit circuit. Refer to LAN-352, "Transfer Control Unit Circuit Inspection" .

| SELECT SYSTEM screen | | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | ECM | TCM | DIFF LOCK | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | — | — | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | — | NG | UNKWN | UNKWN | — | — | — | — | UNKWN | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| DIFF LOCK | — | NG | UNKWN | UNKWN | — | — | — | — | — | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | UNKWN | — | — | — | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | — | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB7012E



///// : Malfunctioning part

BCM — Combination meter — Transfer control unit

CAN H

CAN L

ECM — TCM — Differential lock control unit — Steering angle sensor — Data link connector — ABS actuator and electric unit(control unit) — IPDM E/R

PKIB6596E

## Case 11

Check ABS actuator and electric unit (control unit) circuit. Refer to LAN-352, "ABS Actuator and Electric Unit (Control Unit) Circuit Inspection" .

| SELECT SYSTEM screen | | CAN DIAG SUPPORT MNTR | | | | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | | | |
| | | | | ECM | TCM | DIFF LOCK | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | — | NG | UNKWN | — | UNKWN | — | — | UNKWN | UNKWN | UNKWN ✓ | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | — | — | NG | UNKWN | UNKWN | — | — | — | — | UNKWN | UNKWN ✓ | — | CAN COMM CIRCUIT (U1000) | — |
| DIFF LOCK | — | — | NG | UNKWN | UNKWN | — | — | — | — | UNKWN | UNKWN ✓ | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | — | NG | UNKWN | UNKWN | UNKWN | — | — | — | UNKWN | UNKWN ✓ | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | — | NG | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN | — | — | UNKWN ✓ | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | — | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB7013E

//// : Malfunctioning part

BCM — Combination meter — Transfer control unit

CAN H

CAN L

ECM — TCM — Differential lock control unit — Steering angle sensor — Data link connector — ABS actuator and electric unit (control unit) — IPDM E/R

PKIB6597E

## Case 12

Check IPDM E/R circuit. Refer to LAN-353, "IPDM E/R Circuit Inspection" .

| SELECT SYSTEM screen | Initial diagnosis | Transmit diagnosis | ECM | TCM | DIFF LOCK | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | *CAN DIAG SUPPORT MNTR — Receive diagnosis* | | | | | | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | — | — | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | — | NG | UNKWN | UNKWN | — | — | — | UNKWN | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| DIFF LOCK | — | NG | UNKWN | UNKWN | — | — | — | — | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB7014E

//// : Malfunctioning part

BCM — Combination meter — Transfer control unit

CAN H

CAN L

ECM — TCM — Differential lock control unit — Steering angle sensor — Data link connector — ABS actuator and electric unit(control unit) — IPDM E/R

PKIB6598E

## Case 13

Check CAN communication circuit. Refer to LAN-354, "CAN Communication Circuit Inspection" .

| SELECT SYSTEM screen | Initial diagnosis | Transmit diagnosis | ECM | TCM | DIFF LOCK | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | *CAN DIAG SUPPORT MNTR — Receive diagnosis* | | | | | | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | — | — | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | — | NG | UNKWN | UNKWN | — | — | — | UNKWN | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| DIFF LOCK | — | NG | UNKWN | UNKWN | — | — | — | — | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB7015E

## Case 14

Check IPDM E/R ignition relay circuit continuously sticks "OFF". Refer to LAN-358, "IPDM E/R Ignition Relay Circuit Inspection" .

| SELECT SYSTEM screen | CAN DIAG SUPPORT MNTR | | | | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | | | |
| | | | ECM | TCM | DIFF LOCK | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | — | — | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | — | NG | UNKWN | UNKWN | — | — | — | — | UNKWN | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| DIFF LOCK | — | NG | UNKWN | UNKWN | — | — | — | — | — | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | UNKWN | — | — | — | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN | — | — | UNKWN | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | — | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB7016E

## Case 15

Check IPDM E/R ignition relay circuit continuously sticks "ON". Refer to LAN-358, "IPDM E/R Ignition Relay Circuit Inspection" .

| SELECT SYSTEM screen | CAN DIAG SUPPORT MNTR | | | | | | | | | | | SELF-DIAG RESULTS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Initial diagnosis | Transmit diagnosis | Receive diagnosis | | | | | | | | | | |
| | | | ECM | TCM | DIFF LOCK | STRG | BCM /SEC | METER /M&A | AWD/4WD /e4WD | VDC/TCS /ABS | IPDM E/R | | |
| ENGINE | — | NG | UNKWN | — | UNKWN | — | — | UNKWN | UNKWN | UNKWN | UNKWN | UNKWN | CAN COMM CIRCUIT (U1000) | CAN COMM CIRCUIT (U1001) |
| A/T | — | NG | UNKWN | — | — | — | — | — | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| DIFF LOCK | — | NG | UNKWN | UNKWN | — | — | — | — | — | UNKWN | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| BCM | No indication | NG | UNKWN | UNKWN | — | — | — | — | UNKWN | — | — | UNKWN | CAN COMM CIRCUIT (U1000) | — |
| METER | No indication | — | — | — | — | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| ALL MODE AWD/4WD | — | NG | UNKWN | UNKWN | UNKWN | — | — | — | UNKWN | — | UNKWN | — | CAN COMM CIRCUIT (U1000) | — |
| ABS | — | NG | UNKWN | — | UNKWN | — | — | — | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |
| IPDM E/R | No indication | — | UNKWN | UNKWN | — | — | — | UNKWN | — | — | — | — | CAN COMM CIRCUIT (U1000) | — |

PKIB7017E

# Inspection Between TCM and Data Link Connector Circuit

UKS004FD

## 1. CHECK CONNECTOR

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

– Harness connector F14

– Harness connector E5

– Harness connector E152

– Harness connector M31

OK or NG

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

A

## 2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect A/T assembly connector and harness connector F14.
2. Check continuity between A/T assembly harness connector F9 terminals 3 (L), 8 (P) and harness connector F14 terminals 2 (L), 3 (P).
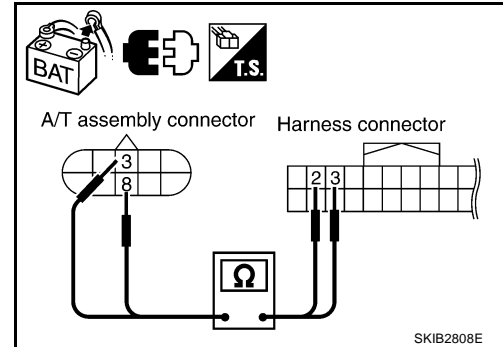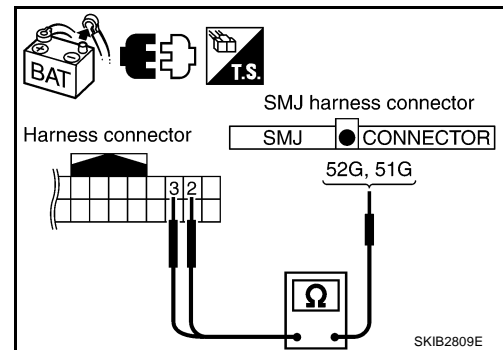
B

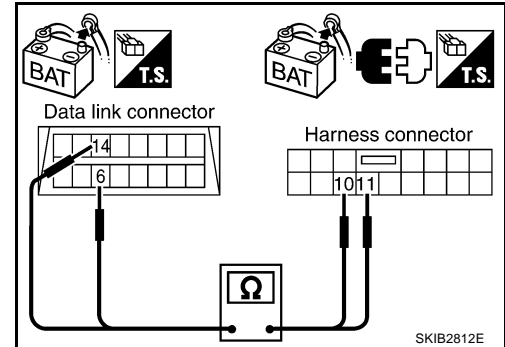C

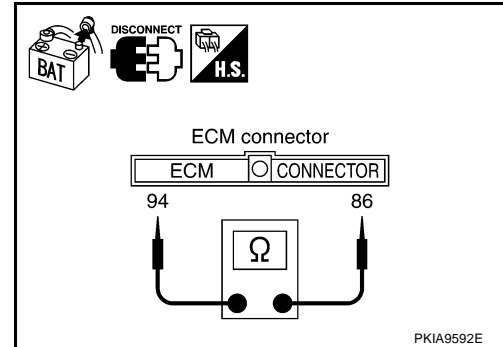**3 (L) – 2 (L)**        **: Continuity should exist.**

**8 (P) – 3 (P)**        **: Continuity should exist.**

D

OK or NG

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

E

SKIB2808E

## 3. CHECK HARNESS FOR OPEN CIRCUIT

F

1. Disconnect harness connector E152.
2. Check continuity between harness connector E5 terminals 2 (L), 3 (P) and harness connector E152 terminals 52G (L), 51G (P).

G

**2 (L) – 52G (L)**        **: Continuity should exist.**

**3 (P) – 51G (P)**        **: Continuity should exist.**

H

OK or NG

  OK     >> GO TO 4.
  NG     >> Repair harness.

I

SKIB2809E

## 4. CHECK HARNESS FOR OPEN CIRCUIT

J

Check continuity between harness connector M31 terminals 52G (L), 51G (P) and data link connector M22 terminals 6 (L), 14 (P).

LAN

**52G (L) – 6 (L)**        **: Continuity should exist.**

**51G (P) – 14 (P)**        **: Continuity should exist.**

OK or NG

  OK     >> Connect all the connectors and diagnose again. Refer to LAN-6, "TROUBLE DIAGNOSES WORK FLOW" .
  NG     >> Repair harness.

L

SKIB2834E

## Inspection Between Data Link Connector and ABS Actuator and Electric Unit (Control Unit) Circuit

UKS004FE

M

## 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check following terminals and connectors for damage, bend and loose connection (connector side and harness side).
– Harness connector M91
– Harness connector E26

OK or NG

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

## 2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect harness connector M91.
2. Check continuity between data link connector M22 terminals 6 (L), 14 (P) and harness connector M91 terminals 11 (L), 10 (P).

| | |
|---|---|
| **6 (L) – 11 (L)** | **: Continuity should exist.** |
| **14 (P) – 10 (P)** | **: Continuity should exist.** |

OK or NG

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

## 3. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect ABS actuator and electric unit (control unit) connector.
2. Check continuity between harness connector E26 terminals 11 (L), 10 (P) and ABS actuator and electric unit (control unit) harness connector E125 terminals 11 (L), 15 (P).

| | |
|---|---|
| **11 (L) – 11 (L)** | **: Continuity should exist.** |
| **10 (P) – 15 (P)** | **: Continuity should exist.** |

OK or NG

OK    >> Connect all the connectors and diagnose again. Refer to LAN-6, "TROUBLE DIAGNOSES WORK FLOW" .
NG    >> Repair harness.

## ECM Circuit Inspection

*UKS004FF*

## 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check following terminals and connectors for damage, bend and loose connection (control module side and harness side).
– ECM connector
– Harness connector E2
– Harness connector F32

OK or NG

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

# CAN SYSTEM (TYPE 12)

## 2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect ECM connector.
2. Check resistance between ECM harness connector E16 termi-
   nals 94 (L) and 86 (P).

   **94 (L) – 86 (P)**       **: Approx. 108 – 132** $\Omega$

OK or NG

  OK     >> Replace ECM.
  NG     >> Repair harness between ECM and A/T assembly.



PKIA9592E

## TCM Circuit Inspection

UKS004FG

### 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check terminals and connector of A/T assembly for damage, bend and loose connection (control module
   side and harness side).

OK or NG

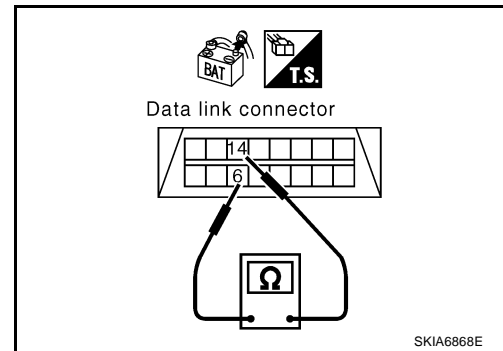  OK     >> GO TO 2.
  NG     >> Repair terminal or connector.

## 2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect A/T assembly connector.
2. Check resistance between A/T assembly harness connector F9
   terminals 3 (L) and 8 (P).

   **3 (L) – 8 (P)**       **: Approx. 54 – 66** $\Omega$

OK or NG

  OK     >> Replace control valve with TCM.
  NG     >> Repair harness between A/T assembly and harness
                   connector F14.



SKIA6866E

## Differential Lock Control Unit Circuit Inspection

UKS004FH

### 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check terminals and connector of differential lock 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.
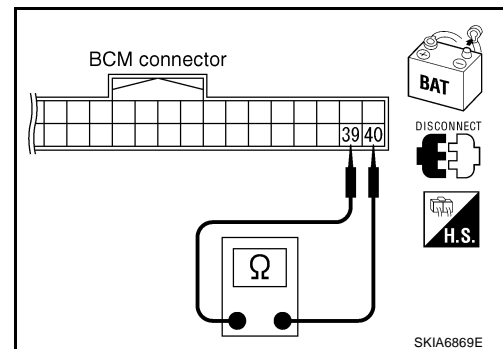
## 2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect differential lock control unit connector.
2. Check resistance between differential lock control unit harness connector M70 terminals 5 (L) and 4 (P).

   **5 (L) – 4 (P)**      **: Approx. 54 – 66** $\Omega$

OK or NG

  OK    >> Replace differential lock control unit.
  NG    >> Repair harness between differential lock control unit and data link connector.

Differential lock control unit connector

PKIA9748E

# Steering Angle Sensor Circuit Inspection

*UKS004FI*

## 1. CHECK CONNECTOR

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

OK or NG

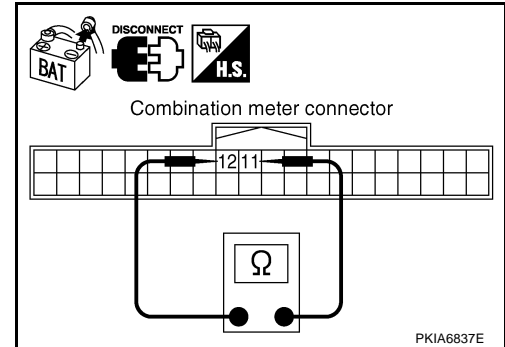  OK    >> GO TO 2.
  NG    >> Repair terminal or connector.

## 2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect steering angle sensor connector.
2. Check resistance between steering angle sensor harness connector M47 terminals 4 (L) and 5 (P).

   **4 (L) – 5 (P)**      **: Approx. 54 – 66** $\Omega$

OK or NG

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

Steering angle sensor connector

PKIA9864E

# Data Link Connector Circuit Inspection

*UKS004FJ*

## 1. CHECK CONNECTOR

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

OK or NG

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

## 2. CHECK HARNESS FOR OPEN CIRCUIT

Check resistance between data link connector M22 terminals 6 (L) and 14 (P).

      **6 (L) – 14 (P)**           **: Approx. 54 – 66 Ω**

OK or NG

  OK     >> Diagnose again. Refer to <u>LAN-6, "TROUBLE DIAG-NOSES WORK FLOW"</u> .

  NG     >> Repair harness between data link connector and BCM.

SKIA6868E

## BCM Circuit Inspection
*UKS004FK*

## 1. CHECK CONNECTOR

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

OK or NG

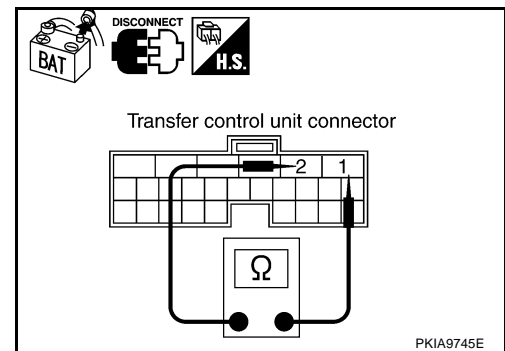  OK     >> GO TO 2.

  NG     >> Repair terminal or connector.

## 2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect BCM connector.
2. Check resistance between BCM harness connector M18 terminals 39 (L) and 40 (P).

      **39 (L) – 40 (P)**           **: Approx. 54 – 66 Ω**

OK or NG

  OK     >> Replace BCM. Refer to <u>BCS-19, "Removal and Installation of BCM"</u> .

  NG     >> Repair harness between BCM and data link connector.

SKIA6869E

## Combination Meter Circuit Inspection
*UKS004FL*

## 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative 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.

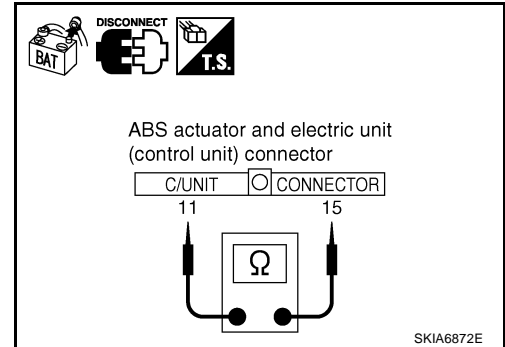## 2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect combination meter connector.
2. Check resistance between combination meter harness connector M24 terminals 12 (L) and 11 (P).

**12 (L) – 11 (P)** : **Approx. 54 – 66** Ω

OK or NG

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

Combination meter connector

PKIA6837E

## Transfer Control Unit Circuit Inspection
*UKS004FM*
## 1. CHECK CONNECTOR

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

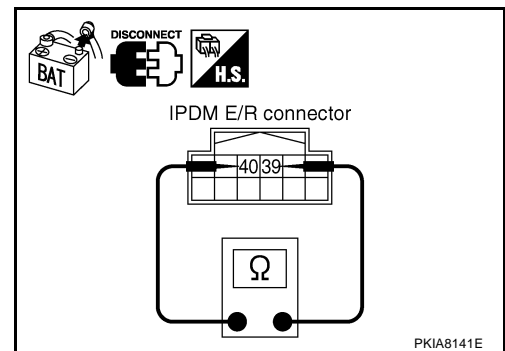OK or NG

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

## 2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect transfer control unit connector.
2. Check resistance between transfer control unit harness connector M152 terminals 1 (L) and 2 (P).

**1 (L) – 2 (P)** : **Approx. 54 – 66** Ω

OK or NG

OK >> Replace transfer control unit.
NG >> Repair harness between transfer control unit and data link connector.

Transfer control unit connector

PKIA9745E

## ABS Actuator and Electric Unit (Control Unit) Circuit Inspection
*UKS004FN*
## 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check terminals and connector of ABS actuator and electric unit (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.

# CAN SYSTEM (TYPE 12)

## 2. CHECK HARNESS FOR OPEN CIRCUIT

1. Disconnect ABS actuator and electric unit (control unit) connector.
2. Check resistance between ABS actuator and electric unit (control unit) harness connector E125 terminals 11 (L) and 15 (P).

   **11 (L) – 15 (P)          : Approx. 54 – 66 $\Omega$**

OK or NG

   OK      >> Replace ABS actuator and electric unit (control unit).
   NG      >> Repair harness between ABS actuator and electric unit (control unit) and IPDM E/R.



ABS actuator and electric unit (control unit) connector

SKIA6872E

## IPDM E/R Circuit Inspection

*UKS004FO*

## 1. CHECK CONNECTOR

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Check terminals and connector of IPDM E/R 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 IPDM E/R connector.
2. Check resistance between IPDM E/R harness connector E122 terminals 39 (L) and 40 (P).

   **39 (L) – 40 (P)          : Approx. 108 – 132 $\Omega$**

OK or NG

   OK      >> Replace IPDM E/R.
   NG      >> Repair harness between IPDM E/R and ABS actuator and electric unit (control unit).



IPDM E/R connector

PKIA8141E

## CAN Communication Circuit Inspection

## 1. CHECK CONNECTOR

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

− ECM
− TCM
− Differential lock control unit
− Steering angle sensor
− BCM
− Combination meter
− Transfer control unit
− ABS actuator and electric unit (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 ECM connector and harness connector E2.
2. Check continuity between ECM harness connector E16 terminals 94 (L) and 86 (P).

      **94 (L) – 86 (P)**      **: Continuity should not exist.**

OK or NG

  OK      >> GO TO 3.
  NG      >> Repair harness between ECM and harness connector E2.



SKIA6865E

## 3. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between ECM harness connector E16 terminals 94 (L), 86 (P) and ground.

      **94 (L) – Ground**      **: Continuity should not exist.**

      **86 (P) – Ground**      **: Continuity should not exist.**

OK or NG

  OK      >> GO TO 4.
  NG      >> Repair harness between ECM and harness connector E2.



SKIB0571E

## 4. CHECK HARNESS FOR SHORT CIRCUIT

1. Disconnect A/T assembly connector and harness connector F14.
2. Check continuity between A/T assembly harness connector F9 terminals 3 (L) and 8 (P).
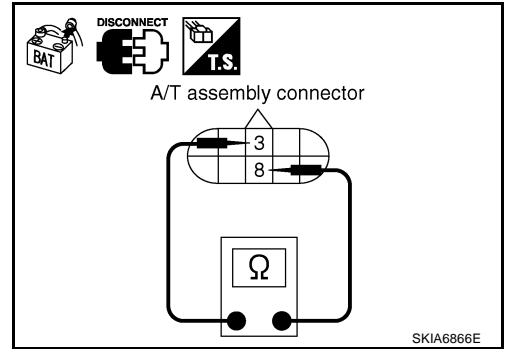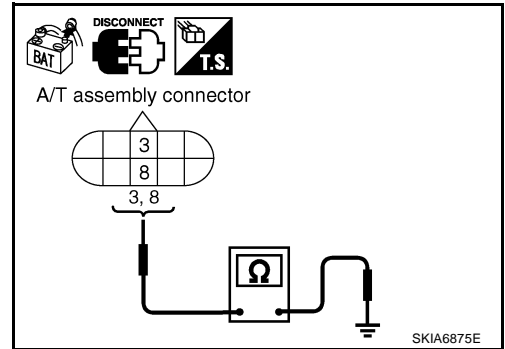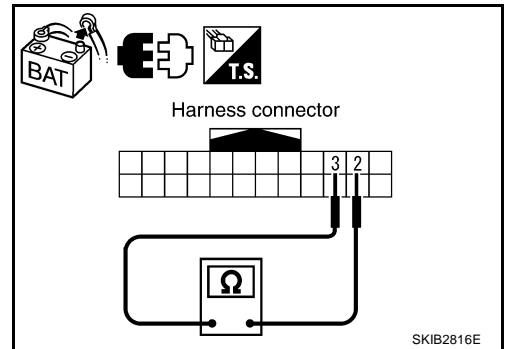
    **3 (L) – 8 (P)**          **: Continuity should not exist.**

OK or NG

  OK       >> GO TO 5.
  NG       >> Check the following harnesses. If any harness is damaged, repair the harness.
- Harness between A/T assembly and harness connector F32
- Harness between A/T assembly and harness connector F14

## 5. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between A/T assembly harness connector F9 terminals 3 (L), 8 (P) and ground.

    **3 (L) – Ground**       **: Continuity should not exist.**

    **8 (P) – Ground**       **: Continuity should not exist.**

OK or NG

  OK       >> GO TO 6.
  NG       >> Check the following harnesses. If any harness is damaged, repair the harness.
- Harness between A/T assembly and harness connector F32
- Harness between A/T assembly and harness connector F14

## 6. CHECK HARNESS FOR SHORT CIRCUIT

1. Disconnect harness connector E152.
2. Check continuity between harness connector E5 terminals 2 (L) and 3 (P).

    **2 (L) – 3 (P)**          **: Continuity should not exist.**

OK or NG

  OK       >> GO TO 7.
  NG       >> Repair harness between harness connector E5 and harness connector E152.

## 7. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between harness connector E5 terminals 2 (L), 3 (P) and ground.

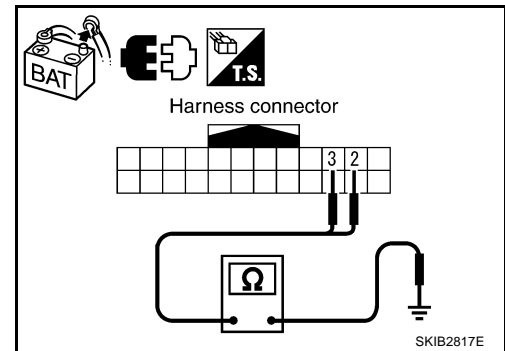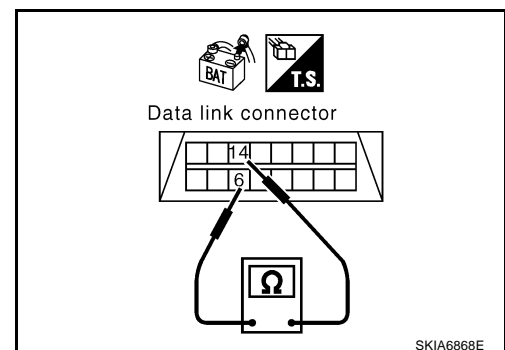**2 (L) – Ground**      **: Continuity should not exist.**

**3 (P) – Ground**      **: Continuity should not exist.**

Harness connector

SKIB2817E

OK or NG

  OK     >> GO TO 8.
  NG     >> Repair harness between harness connector E5 and harness connector E152.

## 8. CHECK HARNESS FOR SHORT CIRCUIT

1. Disconnect following connectors.
- Differential lock control unit connector
- Steering angle sensor connector
- BCM connector
- Combination meter connector
- Transfer control unit connector
- Harness connector M91

2. Check continuity between data link connector M22 terminals 6 (L) and 14 (P).

**6 (L) – 14 (P)**      **: Continuity should not exist.**

Data link connector

SKIA6868E

OK or NG

  OK     >> GO TO 9.
  NG     >> Check the following harnesses. If any harness is damaged, repair the harness.
- Harness between data link connector and harness connector M31
- Harness between data link connector and differential lock control unit
- Harness between data link connector and steering angle sensor
- Harness between data link connector and BCM
- Harness between data link connector and combination meter
- Harness between data link connector and transfer control unit
- Harness between data link connector and harness connector M91

## 9. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between data link connector M22 terminals 6 (L), 14 (P) and ground.

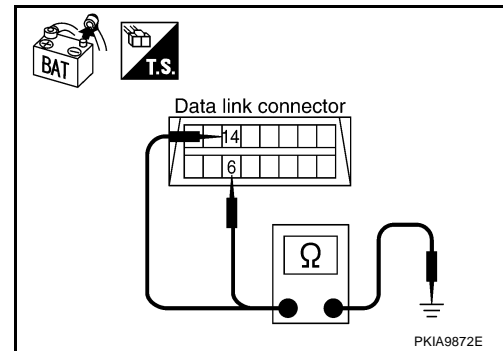**6 (L) – Ground** **: Continuity should not exist.**

**14 (P) – Ground** **: Continuity should not exist.**

OK or NG

OK >> GO TO 10.

NG >> Check the following harnesses. If any harness is damaged, repair the harness.
- Harness between data link connector and harness connector M31
- Harness between data link connector and differential lock control unit
- Harness between data link connector and steering angle sensor
- Harness between data link connector and BCM
- Harness between data link connector and combination meter
- Harness between data link connector and transfer control unit
- Harness between data link connector and harness connector M91



PKIA9872E

## 10. CHECK HARNESS FOR SHORT CIRCUIT

1. Disconnect ABS actuator and electric unit (control unit) connector and IPDM E/R connector.
2. Check continuity between IPDM E/R harness connector E122 terminals 39 (L) and 40 (P).
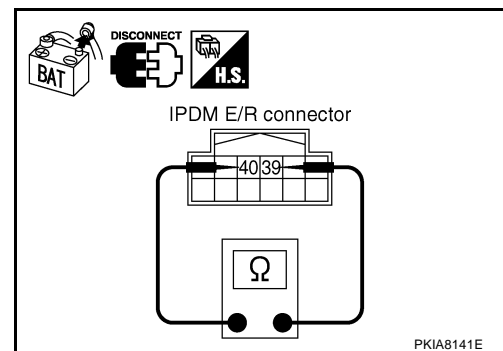
**39 (L) – 40 (P)** **: Continuity should not exist.**

OK or NG

OK >> GO TO 11.

NG >> Check the following harnesses. If any harness is damaged, repair the harness.
- Harness between IPDM E/R and ABS actuator and electric unit (control unit)
- Harness between IPDM E/R and harness connector E26



PKIA8141E

## 11. CHECK HARNESS FOR SHORT CIRCUIT

Check continuity between IPDM E/R harness connector E122 terminals 39 (L), 40 (P) and ground.
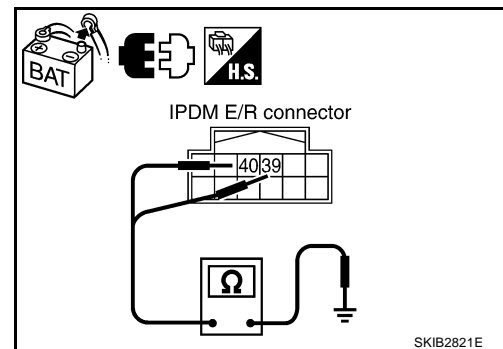
**39 (L) – Ground** **: Continuity should not exist.**

**40 (P) – Ground** **: Continuity should not exist.**

OK or NG

OK >> GO TO 12.

NG >> Check the following harnesses. If any harness is damaged, repair the harness.
- Harness between IPDM E/R and ABS actuator and electric unit (control unit)
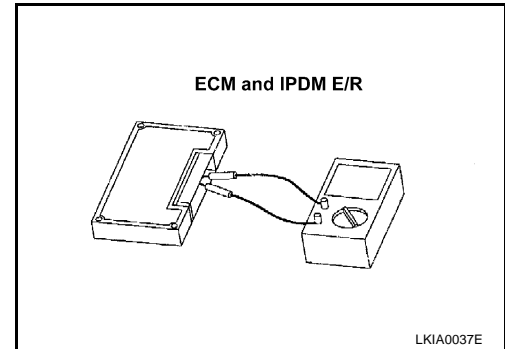- Harness between IPDM E/R and harness connector E26



SKIB2821E

## 12. CHECK ECM AND IPDM E/R INTERNAL CIRCUIT

1. Remove ECM and IPDM E/R from vehicle.
2. Check resistance between ECM terminals 94 and 86.

    **94 – 86**         **: Approx. 108 – 132 Ω**

3. Check resistance between IPDM E/R terminals 39 and 40.

    **39 – 40**         **: Approx. 108 – 132 Ω**

OK or NG

  OK     >> GO TO 13.
  NG     >> Replace ECM and/or IPDM E/R.



ECM and IPDM E/R

LKIA0037E

## 13. CHECK SYMPTOM

1. Fill in described symptoms on the column "Symptom" in the check sheet.
2. Connect all connectors, and then make sure that the symptom is reproduced.

OK or NG

  OK     >> GO TO 14.
  NG     >> Refer to LAN-14, "Example of Filling in Check Sheet When Initial Conditions Are Not Reproduced" .

## 14. CHECK UNIT REPRODUCIBILITY

Perform the following procedure for each unit, and then perform reproducibility test.

1. Turn ignition switch OFF.
2. Disconnect the battery cable from the negative terminal.
3. Disconnect the unit connector.
4. Connect the battery cable to the negative terminal.
5. Make sure that the symptom filled in the "Symptom" of the check sheet is reproduced. (Do not confuse it with the symptom related to removed unit.)
6. Make sure that the same symptom is reproduced.

– TCM
– Differential lock control unit
– Steering angle sensor
– BCM
– Combination meter
– Transfer control unit
– ABS actuator and electric unit (control unit)
– ECM
– IPDM E/R

Inspection results

  Reproduced>>Install removed unit, and then check the other unit.
  Not reproduced>>Replace removed unit.

## IPDM E/R Ignition Relay Circuit Inspection

UKS004FQ

Check the following. If no malfunction is found, replace the IPDM E/R.

● IPDM E/R power supply circuit. Refer to PG-27, "IPDM E/R Power/Ground Circuit Inspection" .
● Ignition power supply circuit. Refer to PG-14, "IGNITION POWER SUPPLY — IGNITION SW. IN ON AND/OR START" .