GROUP 35C

ACTIVE STABILITY CONTROL SYSTEM (ASC)

CONTENTS

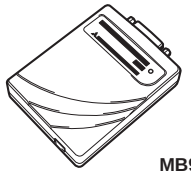
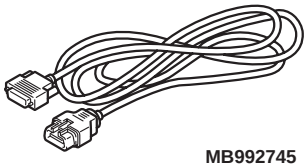
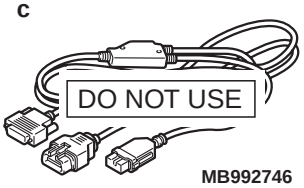
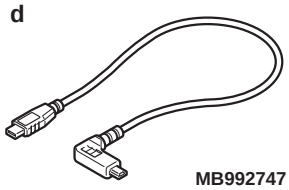
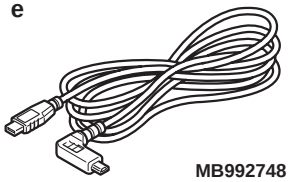
SERVICE SPECIFICATIONS

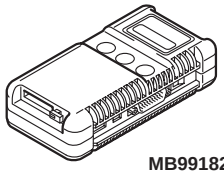
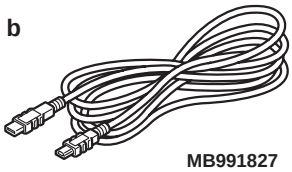
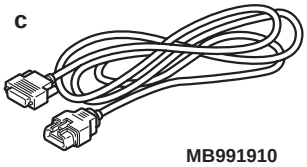
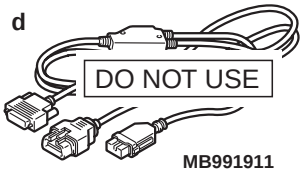
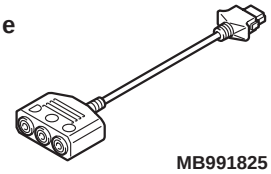
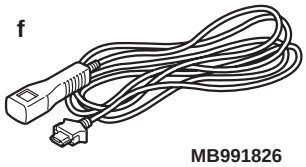
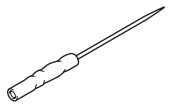
M1355008200089

Item	Standard value
Wheel speed sensor current mA	5.9 – 8.4 or 11.8 – 16.8
Wheel speed sensor insulation resistance MΩ	5 or more

SPECIAL TOOL

M1355005800372

Tool	Number	Name	Use
a  MB992744 b  MB992745 c  MB992746 d  MB992747 e  MB992748 ACB05421AB	a. MB992744 b. MB992745 c. MB992746 d. MB992747 e. MB992748	a. Vehicle communication interface-Lite (V.C.I.-Lite) b. V.C.I.-Lite main harness A (for vehicles with CAN communication) c. V.C.I.-Lite main harness B (for vehicles without CAN communication) d. V.C.I.-Lite USB cable short e. V.C.I.-Lite USB cable long	ASC check (Diagnosis code display, data list display and calibration by M.U.T.-III)

Tool	Number	Name	Use
a  MB991824 b  MB991827 c  MB991910 d  MB991911 e  MB991825 f  MB991826 MB991955	MB991955 a. MB991824 b. MB991827 c. MB991910 d. MB991911 e. MB991825 f. MB991826	M.U.T.-III sub-assembly a. Vehicle Communication Interface (V.C.I.) b. M.U.T.-III USB cable c. M.U.T.-III main harness A (Vehicles with CAN communication system) d. M.U.T.-III main harness B (Vehicles without CAN communication system) e. M.U.T.-III measurement adapter f. M.U.T.-III trigger harness	**⚠ CAUTION** **For vehicles with CAN communication, use M.U.T.-III main harness A to send the simulated vehicle speed. If you connect M.U.T.-III main harness B instead, CAN communication does not function correctly.** ASC check (Diagnosis code display, data list display and calibration by M.U.T.-III)
 MB992006	MB992006	Extra fine probe	Continuity check and voltage measurement at wiring harness or connector
	MB991709	Wiring harness set	Checking the ASC-ECU and output current measure at the wheel speed sensor

TROUBLESHOOTING

DIAGNOSIS TROUBLESHOOTING FLOW

M1355000900114

Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points .

PRECAUTIONS FOR DIAGNOSIS

M1355009500102

1. ASC controls brake pressure by the assistance of ECU. The symptoms described in the chart below may occur during the normal ASC operation, and they do not indicate any sign of malfunction.

Symptoms	Description of symptoms
• When the ASC operates, the operating noise is generated from the motor. (Squeak noise) • Noise is generated from the brake pedal together with the vibration. (Gride noise) • When ABS operates, the system repeats the activation and deactivation. At this time, the noise is generated from the chassis components. (Clonk: Suspension, Squeaky: Tyres)	These noises are generated when the system and brake pedal operate normally, and they do not indicate any sign of malfunction.
• A slight shock may be felt when depressing the brake pedal lightly during the low speed driving. • Small clicking noise may be heard from the engine compartment.	This noise is generated when the system operation check (startup check performed at the vehicle speed which is a few km/h higher than the predetermined vehicle speed) is performed, and it does not indicate malfunction.

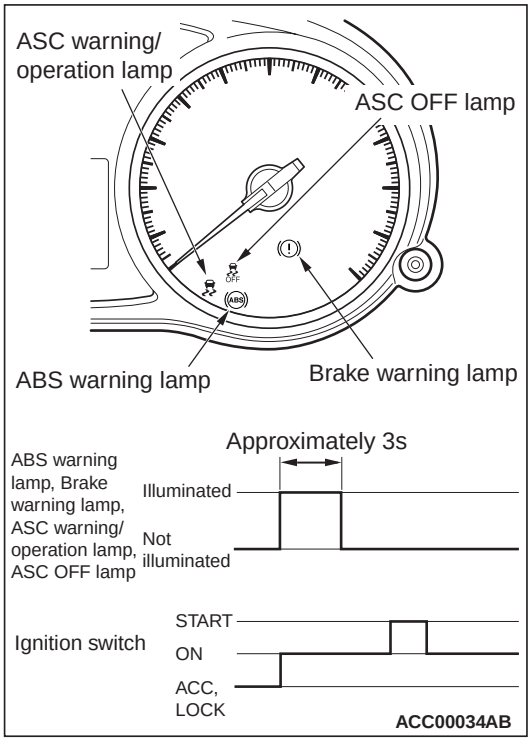
2. On the snowy or gravelled roads, a vehicle with ABS would have longer braking distance compared to the one without ABS. Considering this characteristics, advise the customer to drive the vehicle safely at lower speed and not to put too much confidence in the ABS system when driving on the above-mentioned roads.
3. The diagnosis code detection condition depends on each diagnosis code. When the trouble symptoms are rechecked, conditions described in the description for the diagnosis code procedures should be met.

ABS WARNING LAMP, ASC WARNING/OPERATION LAMP AND BRAKE WARNING LAMP CHECK

M1352012001327

Check that ABS and brake warning lamps, ASC warning/operation lamp illuminate as follows.

NOTE: The brake warning lamp is used as a warning lamp for parking brake, brake fluid level, and EBD control.



1. When the ignition switch is turned to the ON position, ABS and brake warning lamps, ASC warning/operation lamp, ASC OFF lamp illuminate.
2. The ABS and brake warning lamps, ASC warning/operation lamp, ASC OFF lamp illuminate for three seconds[*1] and then turn OFF[*2].

3. Otherwise, check the diagnosis code.

NOTE:

- **1: The ABS warning lamp, ASC warning/operation lamp, ASC OFF lamp may stay ON until the vehicle speed reaches 10 km/h. As far as ASC-ECU stores any diagnosis code related to the wheel speed sensor malfunction or the motor malfunction as past trouble, ASC-ECU continues illuminating the ABS warning lamp until it verifies that the malfunction for that code is resolved (startup check).*

If the steering wheel sensor or the G and yaw rate sensor system was detected to be defective during ignition switch being ON at the last time, the ASC warning/operation lamp and the ASC OFF lamp will illuminate until the vehicle speed reaches approx. 10 km/h, then the steering wheel is turned to either right or left and then the ECU determines that the system is normal.

- **2: The brake warning lamp does not turn OFF when the parking brake is applied or the brake fluid level is lowered.*

DIAGNOSTIC FUNCTION

M1355001000880

ASC-ECU has the following functions for easier system checks.

- Diagnosis code set (Refer to P.35C-15).
- Service data output (Refer to P.35C-85).
- Actuator test (Refer to P.35C-87).
- Freeze frame data output (Refer to).

All the above items can be diagnosed using M.U.T.-III.

CHECK OF FREEZE FRAME DATA

The freeze frame data can be checked by using the M.U.T.-III.

When detecting fault and storing the diagnosis code, the ECU connected to CAN bus line obtains the data before the determination of the diagnosis code and the data when the diagnosis code is determined, and then stores the ECU status of that time. By analysing each data from M.U.T.-III, the troubleshooting can be performed more efficiently. The displayed items are as the table below.

Display item list

Item No.	Item name	Data item	Unit
1	Odometer	Total driving distance after the diagnosis code is generated	km
2	Ignition cycle	Number of times the ignition switch is turned "ON" or "LOCK (OFF)" after the past failure transition	Number of counts is displayed.
5	Power supply voltage	Voltage of power supply when the diagnosis code is generated	V
8	Lateral G sensor	Lateral G of G and yaw rate sensor when the diagnosis code is generated	G
9	G sensor	Longitudinal G of G and yaw rate sensor when the diagnosis code is generated	G

Item No.	Item name	Data item	Unit
10	Master cylinder pressure	Master cylinder pressure of Master cylinder pressure sensor when the diagnosis code is generated	bar
11	Steering angle	Steering angle of steering wheel sensor when the diagnosis code is generated	deg
12	Yaw rate sensor	Yaw rate of G and yaw rate sensor when the diagnosis code is generated	deg/s
13	Stop lamp switch	Stop lamp switch condition when the diagnosis code is generated: OFF/ON	–
21	Pump motor	Pump motor condition when the diagnosis code is generated: OFF/ON	–
28	ASC/TCL off switch	ASC OFF switch condition when the diagnosis code is generated: OFF/ON	–
301	ABS control	ABS control when the diagnosis code is generated: OFF/ON	–
302	Brake TCL control	Traction control operation status (brake control) when the diagnosis code is generated: OFF/ON	–
303	Engine TCL control	Traction control operation status (engine control) when the diagnosis code is generated: OFF/ON	–
304	ASC control	ASC control when the diagnosis code is generated: OFF/ON	–
305	Brake TCL operation	Traction control operation status (brake control) status when the diagnosis code is generated: Permission/Prohibition	–
306	Brake assist control	Brake assist control when the diagnosis code is generated: OFF/ON	–
401	FL wheel speed sensor	Wheel speed (FL) when the diagnosis code is generated	km/h
402	FR wheel speed sensor	Wheel speed (FR) when the diagnosis code is generated	km/h
403	RL wheel speed sensor	Wheel speed (RL) when the diagnosis code is generated	km/h
404	RR wheel speed sensor	Wheel speed (RR) when the diagnosis code is generated	km/h

FAIL-SAFE FUNCTIONS

- When a malfunction is determined by the diagnostic function, ASC-ECU illuminates the brake warning lamp, brake warning display, ABS warning lamp, ABS warning display, ASC warning lamp, ASC warning display, and ASC OFF lamp. At the same time, ASC-ECU prohibits the EBD, ABS, stability control, TCL, brake assist, and HSA.

NOTE: The brake warning lamp and brake warning display are used as the EBD control warning lamp.

- When the brake pad temperature (assumed) exceeds the specified value, the ASC OFF lamp flashes (2 Hz).

Illumination condition of warning lamp and display in case of failure

Diagnosis code No.	Item	Brake warning lamp, brake warning display	ABS warning lamp, ABS warning display	ASC warning lamp ASC warning display	ASC OFF lamp
C100A	FL wheel speed sensor circuit	OFF*1	ON	ON	ON
C1015	FR wheel speed sensor circuit				
C1020	RL wheel speed sensor circuit				
C102B	RR wheel speed sensor circuit				
C1011	FL wheel speed sensor signal	OFF*1	ON *2	ON*2	ON*2
C101C	FR wheel speed sensor signal				
C1027	RL wheel speed sensor signal				
C1032	RR wheel speed sensor signal				
C1014	FL wheel speed sensor performance	OFF*1	ON *2	ON*2	ON*2
C101F	FR wheel speed sensor performance				
C102A	RL wheel speed sensor performance				
C1035	RR wheel speed sensor performance				
C1041	FL wheel speed tone performance	OFF*1	ON *2	ON*2	ON*2
C1042	FR wheel speed tone performance				
C1043	RL wheel speed tone performance				
C1044	RR wheel speed tone performance				
C1046	FL wheel speed sensor phase	OFF*1	ON *2	ON*2	ON*2
C1047	FR wheel speed sensor phase				
C1048	RL wheel speed sensor phase				
C1049	RR wheel speed sensor phase				
C104B	FL inlet valve	ON	ON	ON	ON
C104F	FR inlet valve				
C1053	RL inlet valve				
C1057	RR inlet valve				
C105F	FL outlet valve	ON	ON	ON	ON
C1063	FR outlet valve				
C1067	RL outlet valve				
C105B	RR outlet valve				

Diagnosis code No.	Item		Brake warning lamp, brake warning display	ABS warning lamp, ABS warning display	ASC warning lamp ASC warning display	ASC OFF lamp
C1200	FL-RR cut valve		ON	ON	ON	ON
C1204	FR-RL cut valve					
C1208	FL-RR suction valve					
C120C	FR-RL suction valve					
C2104	Valve power supply circuit		ON	ON	ON	ON
C1073	Motor drive circuit		OFF	ON *2	ON*2	ON*2
C2116	Pump motor voltage low		OFF	ON *2	ON*2	ON*2
C121D	Brake fluid pressure sensor circuit	Only the hydraulic brake assist system is defective.	OFF	OFF	ON	OFF
		Other than above	OFF	ON	ON	ON
C121E	Brake fluid pressure sensor		OFF	ON	ON	ON
C1000	Brake SW (stuck)		OFF	OFF	ON	ON
C123B	System control too long		OFF	OFF	ON*8	ON*8
C2200	ECU internal error		ON*5	ON*6	ON	ON
C2101	Power supply high voltage	18.0 ± 1.0 V or more	ON	ON	ON	ON
C1395	Incomplete Brake fluid filling		OFF	ABS warning lamp: Flashing (2 Hz) ABS warning display: ON	OFF	OFF
C121C	Torque request signal rejection		OFF	OFF	ON	ON
C2206	Re-execution of variant coding		OFF	ON	ON	ON
C1210	Longitudinal G sensor input circuit	Abnormality in longitudinal G-sensor output voltage	OFF	OFF*3, ON*4	ON	OFF*3, ON*4
C1242	Longitudinal G sensor signal	Abnormality in longitudinal G-sensor output signal	OFF	OFF*3, ON*2*4	ON*2	OFF*3, ON*2*4
C123C	Sensor cluster malfunction	Abnormality in lateral G & yaw rate output value	OFF	OFF	ON*8	ON*8

Diagnosis code No.	Item		Brake warning lamp, brake warning display	ABS warning lamp, ABS warning display	ASC warning lamp ASC warning display	ASC OFF lamp
C1392	Incomplete learn (Longitudinal G)		ON	ON	ON	ON
C1393	Incomplete learn neutral(Lateral G)		ON	ON	ON	ON
C2204	Sensor cluster internal error		OFF	OFF*3 ON*4, 6	ON*8	ON*8
C1219	Steering angle sensor signal		OFF	OFF	ON*8	ON*8
C121A	SAS initialization	Steering wheel sensor neutral point not learned	ON	ON	ON	ON
C2205	SAS internal error		OFF	OFF	ON	ON
C2002	Valve calibration not completed		OFF	ON	ON	ON
C1608	EEPROM fail		OFF	OFF	OFF	OFF
C1707	Implausible coding data		OFF	ON*7	ON	ON*7
U0100	Engine CAN timeout		OFF	OFF	ON	ON
U0101	T/M CAN timeout		OFF	OFF	ON	ON
U0114*4	4WD CAN timeout		OFF	OFF	ON	ON
U0126	SAS CAN timeout		OFF	OFF	ON	ON
U0141	ETACS CAN timeout		OFF	OFF	ON *7	ON
U0401	Engine (CAN message)		OFF	OFF	ON	ON
U0428	SAS (CAN message)		OFF	OFF	ON	ON
U1073	Bus-off		OFF	OFF	ON	ON
U1195	Coding not completed		OFF	ON	ON	ON
U1197	Coding data unavailable		OFF	ON	ON	ON

NOTE:

- **1: Turns on when two or more wheels are faulty.*
- **2: Stays on until the vehicle speed reaches 10 km/h when the ignition switch is turned to ON next time.*
- **3: 2WD.*
- **4: 4WD.*
- **5: Does not illuminate when there is no effect to the EBD function.*
- **6: Does not illuminate when there is no effect to the ABS function.*
- **7: May not illuminate in some trouble causes.*
- **8: Stays on until the vehicle speed 20 km/h or higher and turn left or right when the ignition switch is turned to on next time.*

Under EBD, ABS, stability control, TCL, brake assist, HSA in case of failure

Diagnosis code No.	Item	EBD	ABS	Stability control	TCL	Brake assist	HSA
C100A	FL wheel speed sensor circuit	Enabled*1	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited
C1015	FR wheel speed sensor circuit						
C1020	RL wheel speed sensor circuit						
C102B	RR wheel speed sensor circuit						
C1011	FL wheel speed sensor signal	Enabled*1	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited
C101C	FR wheel speed sensor signal						
C1027	RL wheel speed sensor signal						
C1032	RR wheel speed sensor signal						
C1014	FL wheel speed sensor performance	Enabled*1	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited
C101F	FR wheel speed sensor performance						
C102A	RL wheel speed sensor performance						
C1035	RR wheel speed sensor performance						
C1041	FL wheel speed tone performance	Enabled*1	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited
C1042	FR wheel speed tone performance						
C1043	RL wheel speed tone performance						
C1044	RR wheel speed tone performance						
C1046	FL wheel speed sensor phase	Enabled*1	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited
C1047	FR wheel speed sensor phase						
C1048	RL wheel speed sensor phase						
C1049	RR wheel speed sensor phase						

Diagnosis code No.	Item		EBD	ABS	Stability control	TCL	Brake assist	HSA
C104B	FL inlet valve		Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited
C104F	FR inlet valve							
C1053	RL inlet valve							
C1057	RR inlet valve							
C105F	FL outlet valve		Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited
C1063	FR outlet valve							
C1067	RL outlet valve							
C105B	RR outlet valve							
C1200	FL-RR cut valve		Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited
C1204	FR-RL cut valve							
C1208	FL-RR suction valve							
C120C	FR-RL suction valve							
C2104	Valve power supply circuit		Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited
C1073	Motor drive circuit		Enabled	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited
C2116	Pump motor voltage low		Enabled	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited
C121D	Brake fluid pressure sensor circuit	Only the brake assist is defectiv e.	Enabled	Enabled	Enabled	Enabled	Prohibited	Enabled
		Other than above	Enabled	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited
C121E	Brake fluid pressure sensor		Enabled	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited
C1000	Brake SW (stuck)		Enabled	Enabled	Prohibited	Prohibited	Prohibited	Prohibited
C123B	System control too long		Enabled	Enabled	Prohibited	Prohibited	Enabled	Prohibited
C2200	ECU internal error		Prohibited* 4	Prohibited* 5	Prohibited	Prohibited	Prohibited* 5	Prohibited
C2101	Power supply high voltage	18.0 ± 1.0 V or more	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited
C1395	Incomplete Brake fluid filling		Enabled	Enabled	Enabled	Enabled	Enabled	Enabled
C121C	Torque request signal denied		Enabled	Enabled	Prohibited	Prohibited	Enabled	Prohibited
C2206	Re-execution of variant coding		Enabled	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited

Diagnosis code No.	Item		EBD	ABS	Stability control	TCL	Brake assist	HSA
C1210	Longitudinal G sensor input circuit	Abnormality in longitudinal G-sensor output voltage	Enabled	Enabled*2, Prohibited*3	Enabled*2, Prohibited*3	Enabled*2, Prohibited*3	Enabled*2, Prohibited*3	Prohibited
C1242	Longitudinal G sensor signal	Abnormality in longitudinal G-sensor output signal	Enabled	Enabled*2, Prohibited*3	Enabled*2, Prohibited*3	Enabled*2, Prohibited*3	Enabled*2, Prohibited*3	Prohibited
C123C	Sensor cluster malfunction	Abnormality in lateral G & yaw rate output value	Enabled	Enabled	Prohibited	Prohibited	Enabled	Prohibited
C1392	Incomplete learn (Longitudinal G)		Enabled	Enabled*2, Prohibited*3	Enabled*2, Prohibited*3	Enabled*2, Prohibited*3	Enabled*2, Prohibited*3	Prohibited
C1393	Incomplete learn neutral(Lateral G)		Enabled	Enabled	Prohibited	Prohibited	Enabled	Prohibited
C2204	Sensor cluster internal error		Enabled	Enabled*2, Prohibited*3, 6	Enabled*2, Prohibited*3	Enabled*2, Prohibited*3	Enabled*2, Prohibited*3	Prohibited
C1219	Steering angle sensor signal		Enabled	Enabled	Prohibited	Prohibited	Enabled	Prohibited
C121A	SAS initialization	Steering wheel sensor neutral point not learned	Enabled	Enabled	Prohibited	Prohibited	Enabled	Prohibited
C2205	SAS internal error		Enabled	Enabled	Prohibited	Prohibited	Enabled	Prohibited
C2002	Valve calibration not completed		Enabled	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited
C1608	EEPROM fail		Enabled	Enabled	Enabled	Enabled	Enabled	Enabled
C1707	Implausible coding data		Enabled	Prohibited*6	Prohibited*6	Prohibited*6	Prohibited*6	Prohibited
U0100	Engine CAN timeout		Enabled	Enabled	Prohibited	Prohibited	Enabled	Prohibited

Diagnosis code No.	Item	EBD	ABS	Stability control	TCL	Brake assist	HSA
U0101	T/M CAN timeout	Enabled	Enabled	Prohibited	Prohibited	Enabled	Prohibited
U0114*3	4WD CAN timeout	Enabled	Enabled	Prohibited	Prohibited	Enabled	Prohibited
U0126	SAS CAN timeout	Enabled	Enabled	Prohibited	Prohibited	Enabled	Prohibited
U0141	ETACS CAN timeout	Enabled	Enabled	Prohibited* 6	Prohibited* 6	Prohibited* 6	Prohibited* 6
U0401	Engine (CAN message)	Enabled	Enabled	Prohibited	Prohibited	Enabled	Prohibited
U0428	SAS (CAN message)	Enabled	Enabled	Prohibited	Prohibited	Enabled	Prohibited
U1073	Bus-off	Enabled	Enabled	Prohibited	Prohibited	Enabled	Prohibited
U1195	Coding not completed	Enabled	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited
U1197	Coding data unavailable	Enabled	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited

NOTE:

- **1: Prohibited when two or more wheels are faulty.*
- **2: 2WD.*
- **3: 4WD.*
- **4: Not prohibited when the brake warning lamp is not illuminated.*
- **5: Not prohibited when the ABS warning lamp is not illuminated.*
- **6: Enabled in some cases.*

DIAGNOSIS CODE CHART

M1355001101385

⚠ CAUTION

During diagnosis, a diagnosis code associated with other system may be set when the ignition switch is turned on with connector(s) disconnected. On completion, confirm all systems for diagnosis code(s). If diagnosis code(s) are set, erase them all.

Diagnosis code No.	Item	Reference page
C100A	FL wheel speed sensor circuit	P.35C-18
C1015	FR wheel speed sensor circuit	
C1020	RL wheel speed sensor circuit	
C102B	RR wheel speed sensor circuit	
C1011	FL wheel speed sensor signal	P.35C-21
C101C	FR wheel speed sensor signal	
C1027	RL wheel speed sensor signal	
C1032	RR wheel speed sensor signal	

Diagnosis code No.	Item		Reference page
C1014	FL wheel speed sensor performance		P.35C-24
C101F	FR wheel speed sensor performance		
C102A	RL wheel speed sensor performance		
C1035	RR wheel speed sensor performance		
C1041	FL wheel speed tone performance		P.35C-27
C1042	FR wheel speed tone performance		
C1043	RL wheel speed tone performance		
C1044	RR wheel speed tone performance		
C1046	FL wheel speed sensor phase		P.35C-29
C1047	FR wheel speed sensor phase		
C1048	RL wheel speed sensor phase		
C1049	RR wheel speed sensor phase		
C104B	FL inlet valve		P.35C-32
C104F	FR inlet valve		
C1053	RL inlet valve		
C1057	RR inlet valve		
C105F	FL outlet valve		
C1063	FR outlet valve		
C1067	RL outlet valve		
C105B	RR outlet valve		
C1200	FL-RR cut valve		
C1204	FR-RL cut valve		
C1208	FL-RR suction valve		
C120C	FR-RL suction valve		
C2104	Valve power supply circuit		P.35C-33
C1073	Motor drive circuit		P.35C-35
C2116	Pump motor voltage low		P.35C-37
C121D	Brake fluid pressure sensor circuit		P.35C-38
C121E	Brake fluid pressure sensor		P.35C-39
C1000	Brake SW (stuck)		P.35C-41
C123B	System control too long		P.35C-42
C2200	ECU internal error		P.35C-43
C2101	Power supply high voltage	18.0 ± 1.0 V or more	P.35C-44
C1395	Incomplete Brake fluid filling		P.35C-45
C121C	Torque request signal denied		P.35C-45
C2206	Re-execution of variant coding		P.35C-46
C1210	Longitudinal G sensor input circuit	Abnormality in longitudinal G-sensor output voltage	P.35C-47

Diagnosis code No.	Item		Reference page
C1242	Longitudinal G sensor signal	Abnormality in longitudinal G-sensor output signal	P.35C-48
C123C	Sensor cluster malfunction	Abnormality in lateral G and yaw rate output value	P.35C-49
C1392	Incomplete learn neutral((Longitudinal G)		P.35C-51
C1393	Incomplete learn neutral(Lateral G)		
C2204	Sensor cluster internal error	Communication error	P.35C-52
		Abnormality in lateral G-sensor output voltage	
		Abnormality in yaw rate sensor output voltage	
C1219	Steering angle sensor signal		P.35C-53
C121A	SAS initialization	Steering wheel sensor neutral point not learned	P.35C-55
C2205	SAS internal error		P.35C-56
C2002	Valve calibration not completed		P.35C-56
C1608	EEPROM fail		P.35C-57
C1707	Implausible coding data		P.35C-59
U0100	Engine CAN timeout		P.35C-60
U0101	T/M CAN timeout		
U0114*	4WD CAN timeout		
U0126	SAS CAN timeout		
U0141	ETACS CAN timeout		
U0401	Engine (CAN message)		P.35C-61
U0428	SAS (CAN message)		P.35C-62
U1073	Bus-off		P.35C-63
U1195	Coding not completed		P.35C-64
U1197	Coding data unavailable		

*NOTE: *: When the diagnosis codes relating to the CAN communication error are output, make sure of the vehicle equipment. When the vehicle is not equipped with the system the ASC-ECU communicates to the diagnosis code is always output. This is not abnormal.*

DIAGNOSIS CODE PROCEDURES

Code No. C100A FL wheel speed sensor circuit
Code No. C1015 FR wheel speed sensor circuit
Code No. C1020 RL wheel speed sensor circuit
Code No. C102B RR wheel speed sensor circuit

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-93, P.35C-94 and P.35C-94).**

OPERATION

- The wheel speed sensor is a kind of a pulse generator. It consists of encoders (a plate on which north and south pole sides of the magnets are arranged alternately) for detecting the wheel speed which rotates at the same speed of the wheels and wheel speed sensors. This sensor outputs frequency pulse signals in proportion to the wheel speed.
- The pulse signals, which the wheel speed sensor creates, are sent to ASC-ECU. ASC-ECU uses the frequency of the pulse signals to determine the wheel speed.

DIAGNOSIS CODE SET CONDITIONS

ASC-ECU monitors the voltage fluctuation in each wheel speed sensor circuit. If ASC-ECU detects the open or short circuit in the circuit, it will set a diagnosis code.

PROBABLE CAUSES

Current trouble

- Damaged wiring harness and connectors
- Noise interference
- Malfunction of wheel speed sensor
- Malfunction of ASC-ECU

Past trouble

- Carry out diagnosis with particular emphasis on wiring harness and connector failures between ASC-ECU and the wheel speed sensor. For diagnosis procedures, refer to How to treat past trouble (GROUP 00 – How to Use Troubleshooting/How to Treat Past Trouble).

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics
Use M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?
YES : Go to Step 3.
NO : Repair the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table). On completion, go to Step 2.

STEP 2. Diagnosis code recheck after resetting CAN bus lines

Q: Is diagnosis code No. C100A, 1015, 1020 or 102B set?
YES : Go to Step 3.
NO : This diagnosis is complete.

STEP 3. M.U.T.-III data list
Check the following data list (Refer to P.35C-85).

- Item No.01: FL wheel speed sensor
- Item No.02: FR wheel speed sensor
- Item No.03: RL wheel speed sensor
- Item No.04: RR wheel speed sensor

Q: Is the check result normal?
YES : Go to Step 10.
NO : Go to Step 4.

STEP 4. Voltage measurement at the ASC-ECU connector (FL+, FL-, FR+, FR-, RL+, RL-, RR+, RR- terminal)
(1) Disconnect the connector, and measure at the wiring harness side.
(2) Turn the ignition switch to the ON position.

Code No.C100A is set

- Measure the voltage between the ASC-ECU connector (FL+ terminal) and the body earth, and between the ASC-ECU connector (FL- terminal) and the body earth.

  OK: 1 V or less

Code No.C1015 is set

- Measure the voltage between the ASC-ECU connector (FR+ terminal) and the body earth, and between the ASC-ECU connector (FR- terminal) and the body earth.

  OK: 1 V or less

Code No.C1020 is set

- Measure the voltage between the ASC-ECU connector (RL+ terminal) and the body earth, and between the ASC-ECU connector (RL- terminal) and the body earth.

  OK: 1 V or less

Code No.C102B is set

- Measure the voltage between the ASC-ECU connector (RR+ terminal) and the body earth, and between the ASC-ECU connector (RR- terminal) and the body earth.

  OK: 1 V or less

Q: Is the check result normal?
YES : Go to Step 5.
NO : Go to Step 6.

STEP 5. Resistance measurement at ASC-ECU connector (FL+, FL-, FR+, FR-, RL+, RL-, RR+, RR- terminal)

Disconnect the connector, and measure at the wiring harness side.

Code No.C100A is set

- Measure the resistance between the ASC-ECU connector (FL+ terminal) and the body earth, and between the ASC-ECU connector (FL- terminal) and the body earth.

  OK: No continuity

Code No.C1015 is set

- Measure the resistance between the ASC-ECU connector (FR+ terminal) and the body earth, and between the ASC-ECU connector (FR- terminal) and the body earth.

  OK: No continuity

Code No.C1020 is set

- Measure the resistance between the ASC-ECU connector (RL+ terminal) and the body earth, and between the ASC-ECU connector (RL- terminal) and the body earth.

  OK: No continuity

Code No.C102B is set

- Measure the resistance between the ASC-ECU connector (RR+ terminal) and the body earth, and between the ASC-ECU connector (RR- terminal) and the body earth.

  OK: No continuity

Q: Is the check result normal?
YES : Go to Step 7.
NO : Go to Step 6.

STEP 6. Check the wiring harness between the ASC-ECU connector terminal and the wheel speed sensor connector terminal.

Code No.C100A is set

- Check of short circuit in FL+, FL- line between ASC-ECU connector and front wheel speed sensor (LH) connector.

Code No.C1015 is set

- Check of short circuit in FR+, FR- line between ASC-ECU connector and front wheel speed sensor (RH) connector.

Code No.C1020 is set

- Check of short circuit in RL+, RL- line between ASC-ECU connector and rear wheel speed sensor (LH) connector.

Code No.C102B is set

- Check of short circuit in RR+, RR- line between ASC-ECU connector and rear wheel speed sensor (LH) connector.

Q: Is the check result normal?
YES : Replace the wheel speed sensor (Refer to P.35C-97 <front> or P.35C-97 <rear>). Then go to Step 11.
NO : Repair the connector(s) or wiring harness. Then go to Step 11.

STEP 7. Resistance measurement at the ASC-ECU connector (FL+, FL-, FR+, FR-, RL+, RL-, RR+, RR- terminal)

Disconnect the connector, and measure at the wiring harness side.

Code No.C100A is set

- Measure the resistance between the ASC-ECU connector (FL+ terminal) and the ASC-ECU connector (FL- terminal).

  OK: Continuity

Code No.C1015 is set

- Measure the resistance between the ASC-ECU connector (FR+ terminal) and the ASC-ECU connector (FR- terminal).

  OK: Continuity

Code No.C1020 is set

- Measure the resistance between the ASC-ECU connector (RL+ terminal) and the ASC-ECU connector (RL- terminal).

  OK: Continuity

Code No.C102B is set

- Measure the resistance between the ASC-ECU connector (RR+ terminal) and the ASC-ECU connector (RR- terminal).

  OK: Continuity

Q: Is the check result normal?

YES : Go to Step 8.
NO : Go to Step 10.

STEP 8. Check the wiring harness between the ASC-ECU connector terminal and the wheel speed sensor connector terminal

Code No.C100A is set

- Check of open circuit in FL+, FL- line between ASC-ECU connector and front wheel speed sensor (LH) connector.

Code No.C1015 is set

- Check of open circuit in FR+, FR- line between ASC-ECU connector and front wheel speed sensor (RH) connector.

Code No.C1020 is set

- Check of open circuit in RL+, RL- line between ASC-ECU connector and rear wheel speed sensor (LH) connector.

Code No.C102B is set

- Check of open circuit in RR+, RR- line between ASC-ECU connector and rear wheel speed sensor (RH) connector.

Q: Is the check result normal?

YES : Go to Step 9.
NO : Repair the connector(s) or wiring harness. Then go to Step 11.

STEP 9. Check for wheel speed sensor as a single unit

Refer to P.35C-97.

Q: Is the check result normal?

YES : Go to Step 10.
NO : Replace the wheel speed sensor (Refer to P.35C-97 <front> or P.35C-97 <rear>). Then go to Step 11.

STEP 10. Check whether the diagnosis code is reset.

(1) Erase the diagnosis code.
(2) Drive the vehicle at 20 km/h or higher.

NOTE: The ABS warning lamp does not turn OFF in some cases unless the vehicle runs at 20 km/h or higher.

Q: Is diagnosis code No. C100A, 1015, 1020 or 102B set?

YES : Replace the hydraulic unit (integrated with ASC-ECU) (Refer to P.35C-95). Then go to Step 11.
NO : Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/How to Cope with Intermittent Malfunctions).

STEP 11. Check whether the diagnosis code is reset.
(1) Erase the diagnosis code.
(2) Drive the vehicle at 20 km/h or higher.

NOTE: The ABS warning lamp does not turn OFF in some cases unless the vehicle runs at 20 km/h or higher.

Q: Is diagnosis code No. C100A, 1015, 1020 or 102B set?
YES : Return to Step 1.
NO : This diagnosis is complete.

Code No. C1011 FL wheel speed sensor signal
Code No. C101C FR wheel speed sensor signal
Code No. C1027 RL wheel speed sensor signal
Code No. C1032 RR wheel speed sensor signal

⚠ CAUTION
- **If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-93, P.35C-94 and P.35C-94).**

OPERATION
- The wheel speed sensor is a kind of a pulse generator. It consists of encoders (a plate on which north and south pole sides of the magnets are arranged alternately) for detecting the wheel speed which rotates at the same speed of the wheels and wheel speed sensors. This sensor outputs frequency pulse signals in proportion to the wheel speed.
- The pulse signals, which the wheel speed sensor creates, are sent to ASC-ECU. ASC-ECU uses the frequency of the pulse signals to determine the wheel speed.

DIAGNOSIS CODE SET CONDITIONS
ASC-ECU monitors the signals from each wheel speed sensor while the vehicle is being driven. If any fault below is found in these sensor signals, ASC-ECU will set the relevant diagnosis code.
- Irregular change in the wheel speed sensor signal
- Wheel speed sensor signal continuously indicates high value.

PROBABLE CAUSES
Current trouble
- Excessive gap between the wheel speed sensor and the wheel speed detection encoder
- Adhesion of foreign materials on the wheel speed sensor
- Adhesion of foreign materials on the wheel speed detection encoder
- Wheel bearing malfunction
- Malfunction of wheel speed sensor
- Damaged wiring harness and connectors
- External noise interference
- Improper installation of the wheel speed sensor
- Deformation of the wheel speed detection encoder
- ASC-ECU malfunction
- Disturbance of magnetisation pattern for wheel speed detection encoder
- The number of poles on the Magnetic encoder for wheel speed detection (N-pole and S-pole) is changed

Past trouble
- When diagnosis code No.C100A, C1015, C1020 or C102B is also set, carry out diagnosis with particular emphasis on wiring harness and connector failures between ASC-ECU and the wheel speed sensor. For diagnosis procedures, refer to How to treat past trouble (GROUP 00 – How to Use Troubleshooting/How to Treat Past Trouble).
- When diagnosis code No.C100A, C1015, C1020 or C102B is not set, the following conditions may be present:
  - Some wheels slip
  - Unstable vehicle attitude
  - External noise interference
  - Vehicle ran with the parking brake applied

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnosis
Use M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?
YES : Go to Step 3.
NO : Repair the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table). On completion, go to Step 2.

STEP 2. Diagnosis code recheck after resetting CAN bus lines

Q: Is the diagnosis code No.C1011, C101C, C1027 or C1032 set?
YES : Go to Step 3.
NO : This diagnosis is complete.

STEP 3. M.U.T.-III diagnosis code
Check that diagnosis code No.C100A, C1015, C1020 or C102B is also set.

Q: Is diagnosis code No.C100A, C1015, C1020 or C102B also set?
YES : Perform the diagnosis for diagnosis code No.C100A, C1015, C1020 or C102B (Refer to P.35C-18).
NO : Go to Step 4.

STEP 4. Check the wiring harness between the ASC-ECU connector terminal and the wheel speed sensor connector terminal

Code No.C1011 is set
- Check of short to power supply, short to earth, and open circuit in FL+, FL– line between ASC-ECU connector and front wheel speed sensor (LH) connector.

Code No.C101C is set
- Check of short to power supply, short to earth, and open circuit in FR+, FR– line between ASC-ECU connector and front wheel speed sensor (RH) connector.

Code No.C1027 is set
- Check of short to power supply, short to earth, and open circuit in RL+, RL– line between ASC-ECU connector and rear wheel speed sensor (LH) connector.

Code No.C1032 is set
- Check of short to power supply, short to earth, and open circuit in RR+, RR– line between ASC-ECU connector and rear wheel speed sensor (RH) connector.

Q: Is the check result normal?
YES : Go to Step 5.
NO : Repair the connector(s) or wiring harness. Then go to Step 11.

STEP 5. Check for wheel speed sensor installation
Check how the wheel speed sensor is installed (Disconnection of wheel speed sensor, loose mounting bolt, etc.).

Q: Is the check result normal?
YES : Go to Step 6.
NO : Reinstall the wheel speed sensor correctly (Refer to P.35C-97 <front> or P.35C-97 <rear>). Then go to Step 6.

STEP 6. Check for wheel speed sensor output current
Refer to P.35C-90.

Q: Is the check result normal?
YES : Go to Step 7.
NO : Replace the wheel speed sensor (Refer to P.35C-97 <front> or P.35C-97 <rear>). Then go to Step 10.

STEP 7. Check for wheel bearing looseness

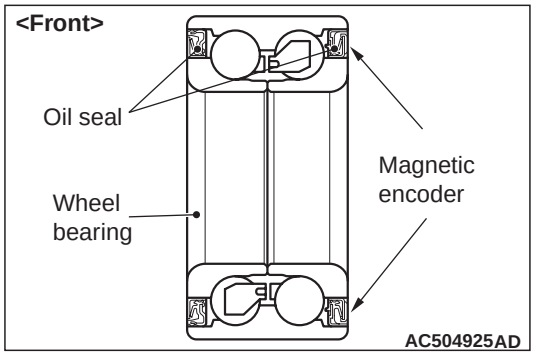
NOTE: Loose wheel bearing may increase the gap between the wheel speed sensor and the wheel speed detection magnet encoder. Check the wheel bearing for looseness. <Refer to GROUP 26 – Wheel Bearing Axial Play Check . (front), GROUP 27A – Wheel Bearing Axial Play Check (rear-2WD) or GROUP 27B – Wheel Bearing Axial Play Check (rear-4WD)>

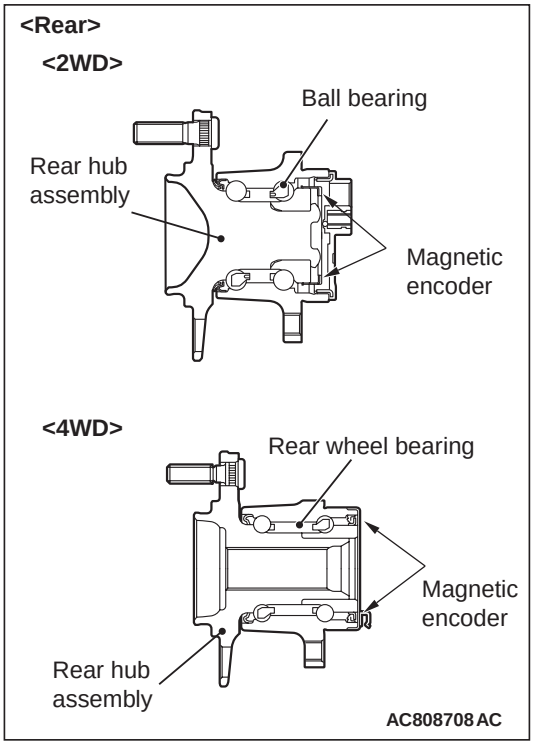
Q: Is the check result normal?

YES : Go to Step 8.

NO : Replace the wheel bearing <front> or rear wheel hub assembly <rear>. <Refer to GROUP 26 – Front Axle Hub Assembly (front), GROUP 27A – Rear Axle Hub Assembly (rear-2WD) or GROUP 27B – Rear Axle Hub Assembly (rear-4WD)> Then go to Step 11.

STEP 8. Check of wheel speed detection encoder





Check the encoder for adhesion of foreign materials or deformation.

Q: Is the check result normal?

YES : Go to Step 9.

NO (Adhesion of foreign materials) : Remove the foreign materials and clean the encoder so as not to disturb the magnetization pattern on it while taking care of the magnet, magnetic substance, and magnetic attraction. Then go to Step 11.

NO (Deformation) : Replace the wheel bearing <front> or rear wheel hub assembly <rear>. <Refer to GROUP 26 – Front Axle Hub Assembly (front), GROUP 27A – Rear Axle Hub Assembly (rear-2WD) or GROUP 27B – Rear Axle Hub Assembly (rear-4WD)> Then go to Step 11.

STEP 9. Check whether the diagnosis code is reset.

(1) Erase the diagnosis code.

(2) Drive the vehicle at 20 km/h or higher.

NOTE: The ABS warning lamp does not turn OFF in some cases unless the vehicle runs at 20 km/h or higher.

Q: Is the diagnosis code No.C1011, C101C, C1027 or C1032 set?

YES : Replace the wheel speed sensor (Refer to P.35C-97 <front> or P.35C-97 <rear>). Then go to Step 10.

NO : Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/How to Cope with Intermittent Malfunctions).

STEP 10. Check whether the diagnosis code is reset.

(1) Erase the diagnosis code.

(2) Drive the vehicle at 20 km/h or higher.

NOTE: The ABS warning lamp does not turn OFF in some cases unless the vehicle runs at 20 km/h or higher.

Q: Is the diagnosis code No.C1011, C101C, C1027 or C1032 set?

YES : Replace the hydraulic unit (integrated with ASC-ECU) (Refer to P.35C-95). Then go to Step 11.

NO : This diagnosis is complete.

STEP 11. Check whether the diagnosis code is reset.

(1) Erase the diagnosis code.

(2) Drive the vehicle at 20 km/h or higher.

NOTE: The ABS warning lamp does not turn OFF in some cases unless the vehicle runs at 20 km/h or higher.

Q: Is the diagnosis code No.C1011, C101C, C1027 or C1032 set?

YES : Return to Step 1.

NO : This diagnosis is complete.

Code No. C1014 FL wheel speed sensor performance
Code No. C101F FR wheel speed sensor performance
Code No. C102A RL wheel speed sensor performance
Code No. C1035 RR wheel speed sensor performance

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-93, P.35C-94 and P.35C-94).**

OPERATION

- The wheel speed sensor is a kind of a pulse generator. It consists of encoders (a plate on which north and south pole sides of the magnets are arranged alternately) for detecting the wheel speed which rotates at the same speed of the wheels and wheel speed sensors. This sensor outputs frequency pulse signals in proportion to the wheel speed.
- The pulse signals, which the wheel speed sensor creates, are sent to ASC-ECU. ASC-ECU uses the frequency of the pulse signals to determine the wheel speed.

DIAGNOSIS CODE SET CONDITIONS

ASC-ECU monitors the signals from each wheel speed sensor while the vehicle is being driven. If any fault below is found in these sensor signals, ASC-ECU will set the relevant diagnosis code.

- Missing wheel speed sensor signal
- Wheel speed sensor signal continuously indicates low value.

PROBABLE CAUSES

Current trouble

- Excessive gap between the wheel speed sensor and the wheel speed detection encoder
- Wheel bearing malfunction
- Deformation of the wheel speed detection encoder
- Adhesion of foreign materials on the wheel speed sensor
- Adhesion of foreign materials on the wheel speed detection encoder

- Malfunction of wheel speed sensor
- Improper installation of the wheel speed sensor
- ASC-ECU malfunction
- The number of poles on the Magnetic encoder for wheel speed detection (N-pole and S-pole) is changed

Past trouble

- When diagnosis code No.C100A, C1015, C1020 or C102B is also set, carry out diagnosis with particular emphasis on wiring harness and connector failures between ASC-ECU and the wheel speed sensor. For diagnosis procedures, refer to How to treat past trouble (GROUP 00 – How to Use Troubleshooting/How to Treat Past Trouble).
- When diagnosis code No.C100A, C1015, C1020 or C102B is not set, the following conditions may be present:
  - Some wheels slip
  - Unstable vehicle attitude
  - External noise interference
  - Vehicle ran with the parking brake applied.
  - Rotate only two wheels with drum tester

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnosis

Use M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?
YES : Go to Step 3.
NO : Repair the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table). On completion, go to Step 2.

STEP 2. Diagnosis code recheck after resetting CAN bus lines

Q: Is the diagnosis code No.C1014, C101F, C102A or C1035 set?
YES : Go to Step 3.
NO : This diagnosis is complete.

STEP 3. M.U.T.-III diagnosis code

Check that diagnosis code No.C100A, C1015, C1020 or C102B is also set.

Q: Is diagnosis code No.C100A, C1015, C1020 or C102B also set?
YES : Perform the diagnosis for diagnosis code No.C100A, C1015, C1020 or C102B (Refer to P.35C-18).
NO : Go to Step 4.

STEP 4. Check the wiring harness between the ASC-ECU connector terminal and the wheel speed sensor connector terminal

Code No.C1014 is set

- Check of short to power supply, short to earth, and open circuit in FL+, FL– line between ASC-ECU connector and front wheel speed sensor (LH) connector.

Code No.C101F is set

- Check of short to power supply, short to earth, and open circuit in FR+, FR– line between ASC-ECU connector and front wheel speed sensor (RH) connector.

Code No.C102A is set

- Check of short to power supply, short to earth, and open circuit in RL+, RL– line between ASC-ECU connector and rear wheel speed sensor (LH) connector.

Code No.C1035 is set

- Check of short to power supply, short to earth, and open circuit in RR+, RR– line between ASC-ECU connector and rear wheel speed sensor (RH) connector.

Q: Is the check result normal?
YES : Go to Step 5.
NO : Repair the connector(s) or wiring harness. Then go to Step 11.

STEP 5. Check for wheel speed sensor installation

Check how the wheel speed sensor is installed (Disconnection of wheel speed sensor, loose mounting bolt, etc.).

Q: Is the check result normal?
YES : Go to Step 6.
NO : Reinstall the wheel speed sensor correctly (Refer to P.35C-97 <front> or P.35C-97 <rear>). Then go to Step 6.

STEP 6. Check for wheel speed sensor output current

Refer to P.35C-90.

Q: Is the check result normal?
YES : Go to Step 7.
NO : Replace the wheel speed sensor (Refer to P.35C-97 <front> or P.35C-97 <rear>). Then go to Step 10.

STEP 7. Check for wheel bearing looseness

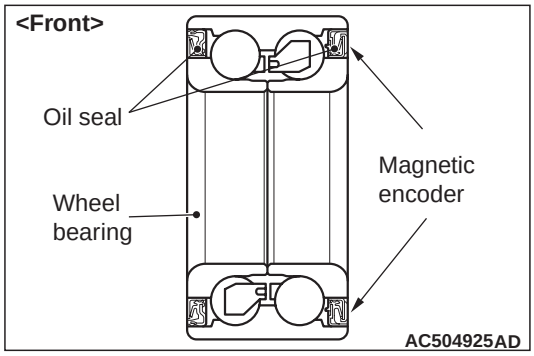
NOTE: Loose wheel bearing may increase the gap between the wheel speed sensor and the wheel speed detection magnet encoder. Check the wheel bearing for looseness. <Refer to GROUP 26 – Wheel Bearing Axial Play Check . (front), GROUP 27A – Wheel Bearing Axial Play Check (rear-2WD) or GROUP 27B – Wheel Bearing Axial Play Check (rear-4WD)>

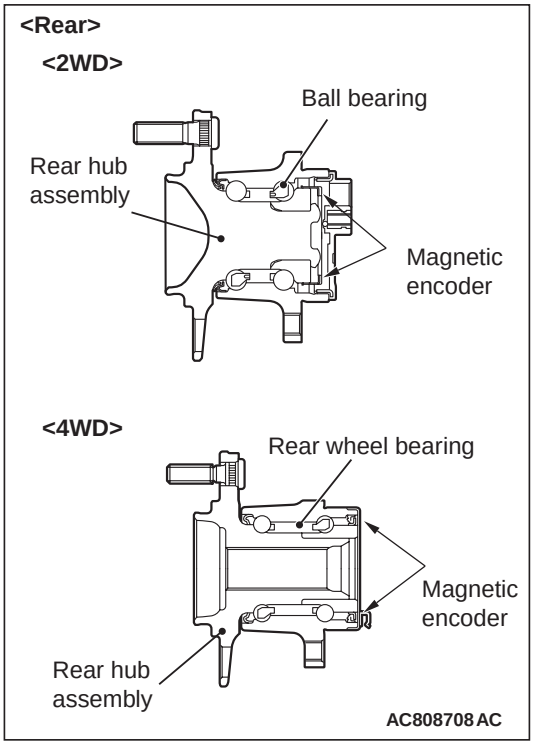
Q: Is the check result normal?

YES : Go to Step 8.

NO : Replace the wheel bearing <front> or rear wheel hub assembly <rear>. <Refer to GROUP 26 – Front Axle Hub Assembly (front), GROUP 27A – Rear Axle Hub Assembly (rear-2WD) or GROUP 27B – Rear Axle Hub Assembly (rear-4WD)> Then go to Step 11.

STEP 8. Check of wheel speed detection encoder





Check the encoder for adhesion of foreign materials or deformation.

Q: Is the check result normal?

YES : Go to Step 9.

NO (Adhesion of foreign materials) : Remove the foreign materials and clean the encoder so as not to disturb the magnetisation pattern on it while taking care of the magnet, magnetic substance, and magnetic attraction. Then go to Step 9.

NO (Deformation) : Replace the wheel bearing <front> or rear wheel hub assembly <rear>. <Refer to GROUP 26 – Front Axle Hub Assembly (front), GROUP 27A – Rear Axle Hub Assembly (rear-2WD) or GROUP 27B – Rear Axle Hub Assembly (rear-4WD)> Then go to Step 9.

STEP 9. Check whether the diagnosis code is reset.
(1) Erase the diagnosis code.
(2) Drive the vehicle at 20 km/h or higher.

NOTE: The ABS warning lamp does not turn OFF in some cases unless the vehicle runs at 20 km/h or higher.

Q: Is diagnosis code No. C1014, C101F, C102A or C1035 set?
YES : Replace the wheel speed sensor (Refer to P.35C-97 <front> or P.35C-97 <rear>). Then go to Step 10.
NO : Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/How to Cope with Intermittent Malfunctions).

STEP 10. Check whether the diagnosis code is reset.
(1) Erase the diagnosis code.
(2) Drive the vehicle at 20 km/h or higher.

NOTE: The ABS warning lamp does not turn OFF in some cases unless the vehicle runs at 20 km/h or higher.

Q: Is diagnosis code No. C1014, C101F, C102A or C1035 set?
YES : Replace the hydraulic unit (integrated with ASC-ECU) (Refer to P.35C-95). Then go to Step 11.
NO : This diagnosis is complete.

STEP 11. Check whether the diagnosis code is reset.
(1) Erase the diagnosis code.
(2) Drive the vehicle at 20 km/h or higher.

NOTE: The ABS warning lamp does not turn OFF in some cases unless the vehicle runs at 20 km/h or higher.

Q: Is diagnosis code No. C1014, C101F, C102A or C1035 set?
YES : Return to Step 1.
NO : This diagnosis is complete.

Code No. C1041 FL wheel speed tone performance
Code No. C1042 FR wheel speed tone performance
Code No. C1043 RL wheel speed tone performance
Code No. C1044 RR wheel speed tone performance

⚠ CAUTION
- **If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-93, P.35C-94 and P.35C-94).**

OPERATION
- The wheel speed sensor is a kind of a pulse generator. It consists of encoders (a plate on which north and south pole sides of the magnets are arranged alternately) for detecting the wheel speed which rotates at the same speed of the wheels and wheel speed sensors. This sensor outputs frequency pulse signals in proportion to the wheel speed.
- The pulse signals, which the wheel speed sensor creates, are sent to ASC-ECU. ASC-ECU uses the frequency of the pulse signals to determine the wheel speed.

DIAGNOSIS CODE SET CONDITIONS
ASC-ECU monitors the signals from each wheel speed sensor while the vehicle is being driven. If any periodical drop is found in these sensor signals, ASC-ECU will set the relevant diagnosis code.

PROBABLE CAUSES
- Wheel bearing malfunction
- Deformation of the wheel speed detection encoder
- Adhesion of foreign materials on the wheel speed detection encoder
- ASC-ECU malfunction
- The number of poles on the Magnetic encoder for wheel speed detection (N-pole and S-pole) is changed

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnosis

Use M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Repair the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table). On completion, go to Step 2.

STEP 2. Diagnosis code recheck after resetting CAN bus lines

Q: Is the diagnosis code No.C1041, 1042, 1043 or 1044 set?

YES : Go to Step 3.

NO : This diagnosis is complete.

STEP 3. Check for wheel bearing looseness

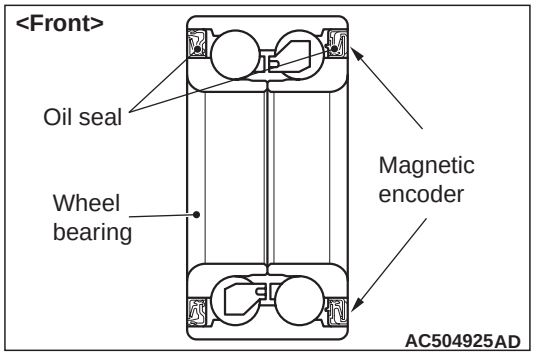
NOTE: Loose wheel bearing may increase the gap between the wheel speed sensor and the wheel speed detection magnet encoder. Check the wheel bearing for looseness. <Refer to GROUP 26 – Wheel Bearing Axial Play Check . (front), GROUP 27A – Wheel Bearing Axial Play Check (rear-2WD) or GROUP 27B – Wheel Bearing Axial Play Check (rear-4WD)>

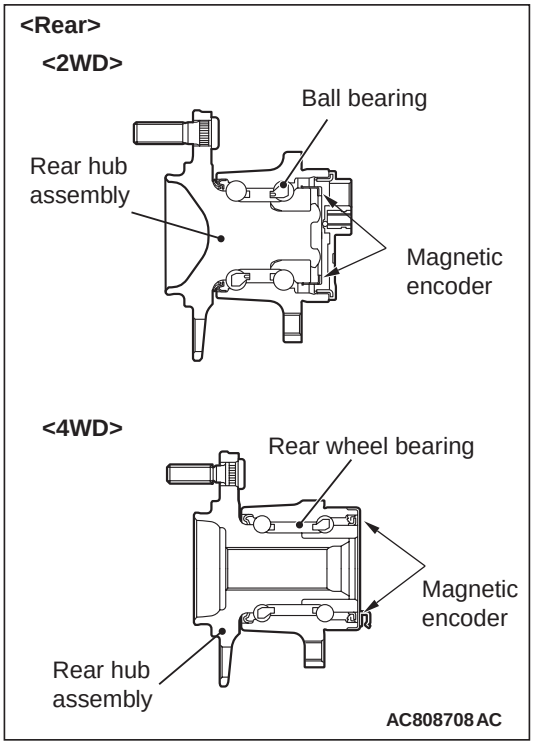
Q: Is the check result normal?

YES : Go to Step 4.

NO : Replace the wheel bearing <front> or rear wheel hub assembly <rear>. <Refer to GROUP 26 – Front Axle Hub Assembly (front), GROUP 27A – Rear Axle Hub Assembly (rear-2WD) or GROUP 27B – Rear Axle Hub Assembly (rear-4WD)> Then go to Step 6.

STEP 4. Check of wheel speed detection encoder





Check the encoder for adhesion of foreign materials or deformation.

Q: Is the check result normal?

YES : Go to Step 5.

NO (Adhesion of foreign materials) : Remove the foreign materials and clean the encoder so as not to disturb the magnetisation pattern on it while taking care of the magnet, magnetic substance, and magnetic attraction. Then go to Step 6.

NO (Deformation) : Replace the wheel bearing <front> or rear wheel hub assembly <rear>. <Refer to GROUP 26 – Front Axle Hub Assembly (front), GROUP 27A – Rear Axle Hub Assembly (rear-2WD) or GROUP 27B – Rear Axle Hub Assembly (rear-4WD)> Then go to Step 6.

STEP 5. Check whether the diagnosis code is reset.
(1) Erase the diagnosis code.
(2) Drive the vehicle at 20 km/h or higher.

NOTE: The ABS warning lamp does not turn OFF in some cases unless the vehicle runs at 20 km/h or higher.

Q: Is diagnosis code No. C1041, 1042, 1043 or 1044 set?
YES : Replace the hydraulic unit (integrated with ASC-ECU) (Refer to P.35C-95). Then go to Step 6.
NO : This diagnosis is complete.

STEP 6. Check whether the diagnosis code is reset.
(1) Erase the diagnosis code.
(2) Drive the vehicle at 20 km/h or higher.

NOTE: The ABS warning lamp does not turn OFF in some cases unless the vehicle runs at 20 km/h or higher.

Q: Is diagnosis code No. C1041, 1042, 1043 or 1044 set?
YES : Return to Step 1.
NO : This diagnosis is complete.

Code No. C1046 FL wheel speed sensor phase
Code No. C1047 FR wheel speed sensor phase
Code No. C1048 RL wheel speed sensor phase
Code No. C1049 RR wheel speed sensor phase

⚠ CAUTION
- **If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-93, P.35C-94 and P.35C-94).**

OPERATION
- The wheel speed sensor is a kind of a pulse generator. It consists of encoders (a plate on which north and south pole sides of the magnets are arranged alternately) for detecting the wheel speed which rotates at the same speed of the wheels and wheel speed sensors. This sensor outputs frequency pulse signals in proportion to the wheel speed.
- The pulse signals, which the wheel speed sensor creates, are sent to ASC-ECU. ASC-ECU uses the frequency of the pulse signals to determine the wheel speed.

DIAGNOSIS CODE SET CONDITIONS
This diagnosis code is set if any malfunction below is found:
- When the brake fluid pressure is decreased for a long time.
- When the brake fluid pressure is held for a long time.

PROBABLE CAUSES
- Damaged wiring harness and connectors
- External noise interference
- Malfunction of wheel speed sensor
- ASC-ECU malfunction
- Excessive gap between the wheel speed sensor and the magnetic encoder for wheel speed detection
- Adhesion of foreign materials on the wheel speed sensor
- Adhesion of foreign materials on the magnetic encoder for wheel speed detection
- Wheel bearing malfunction
- Improper installation of the wheel speed sensor
- Deformation of the magnetic encoder for wheel speed detection
- Disturbance of magnetization pattern for magnetic encoder for wheel speed detection
- Missing teeth of the magnetic encoder for wheel speed detection

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnosis
Use M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table). On completion, go to Step 2.

STEP 2. Diagnosis code recheck after resetting CAN bus lines

Q: Is the diagnosis code No.C1046, C1047, C1048 or C1049 set?
YES : Go to Step 3.
NO : This diagnosis is complete.

STEP 3. M.U.T.-III diagnosis code

Code No.C1046 is set
- Check that the diagnosis codes No.C100A, C1011, C1014, and C1041 are also set.

Code No.C1047 is set
- Check that the diagnosis codes No.C1015, C101C, C101F, and C1042 are also set.

Code No.C1048 is set
- Check that the diagnosis codes No.C1020, C1027, C102A, and C1043 are also set.

Code No.C1049 is set
- Check that the diagnosis codes No.C102B, C1032, C1035, and C1044 are also set.

Q: Are the diagnosis codes set?
YES : Carry out the diagnosis for the relevant diagnosis codes.
NO : Go to Step 4.

STEP 4. M.U.T.-III data list

Check the following data list (Refer to P.35C-85).
- Item No.01: FL wheel speed sensor
- Item No.02: FR wheel speed sensor
- Item No.03: RL wheel speed sensor
- Item No.04: RR wheel speed sensor

Q: Is the check result normal?
YES : Go to Step 10.
NO : Go to Step 5.

STEP 5. Check the wiring harness between the ASC-ECU connector terminal and the wheel speed sensor connector terminal

Code No.C1046 is set
- Check of short to power supply, short to earth, and open circuit in FL+, FL– line between ASC-ECU connector and front wheel speed sensor (LH) connector.

Code No.C1047 is set
- Check of short to power supply, short to earth, and open circuit in FR+, FR– line between ASC-ECU connector and front wheel speed sensor (RH) connector.

Code No.C1048 is set
- Check of short to power supply, short to earth, and open circuit in RL+, RL– line between ASC-ECU connector and rear wheel speed sensor (LH) connector.

Code No.C1049 is set
- Check of short to power supply, short to earth, and open circuit in RR+, RR– line between ASC-ECU connector and rear wheel speed sensor (RH) connector.

Q: Is the check result normal?
YES : Go to Step 6.
NO : Repair the connector(s) or wiring harness. Then go to Step 12.

STEP 6. Check for wheel speed sensor installation

Check how the wheel speed sensor is installed (Disconnection of wheel speed sensor, loose mounting bolt, etc.).

Q: Is the check result normal?
YES : Go to Step 7.
NO : Reinstall the wheel speed sensor correctly (Refer to P.35C-97 <front> or P.35C-97 <rear>). Then go to Step 7.

STEP 7. Check for wheel speed sensor output current

Refer to P.35C-90.

Q: Is the check result normal?
YES : Go to Step 8.
NO : Replace the wheel speed sensor (Refer to P.35C-97 <front> or P.35C-97 <rear>). Then go to Step 11.

STEP 8. Check for wheel bearing looseness

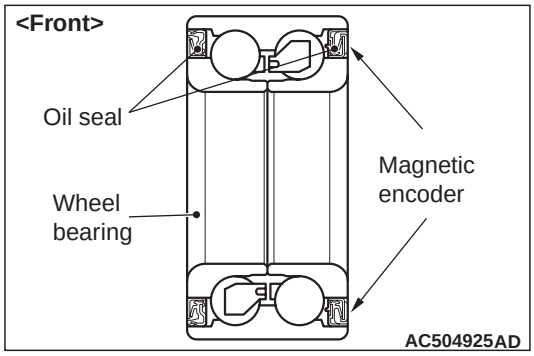
NOTE: Loose wheel bearing may increase the gap between the wheel speed sensor and the wheel speed detection magnet encoder. Check the wheel bearing for looseness. <Refer to GROUP 26 – Wheel Bearing Axial Play Check . (front), GROUP 27A – Wheel Bearing Axial Play Check (rear-2WD) or GROUP 27B – Wheel Bearing Axial Play Check (rear-4WD)>

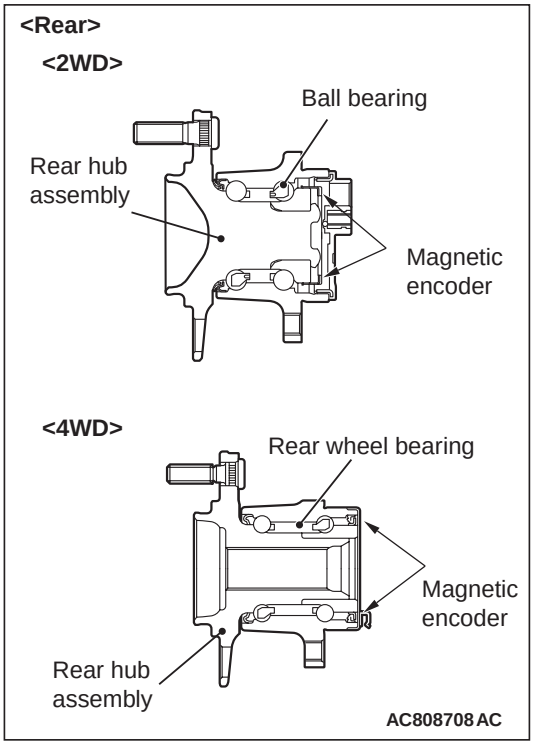
Q: Is the check result normal?

YES : Go to Step 9.

NO : Replace the wheel bearing <front> or rear wheel hub assembly <rear>. <Refer to GROUP 26 – Front Axle Hub Assembly (front), GROUP 27A – Rear Axle Hub Assembly (rear-2WD) or GROUP 27B – Rear Axle Hub Assembly (rear-4WD)> Then go to Step 12.

STEP 9. Check of wheel speed detection encoder





Check the encoder for adhesion of foreign materials or deformation.

Q: Is the check result normal?

YES : Go to Step 10.

NO (Adhesion of foreign materials) : Remove the foreign materials and clean the encoder so as not to disturb the magnetization pattern on it while taking care of the magnet, magnetic substance, and magnetic attraction. Then go to Step 12.

NO (Deformation) : Replace the wheel bearing <front> or rear wheel hub assembly <rear>. <Refer to GROUP 26 – Front Axle Hub Assembly (front), GROUP 27A – Rear Axle Hub Assembly (rear-2WD) or GROUP 27B – Rear Axle Hub Assembly (rear-4WD)> Then go to Step 12.

STEP 10. Check whether the diagnosis code is reset.
(1) Erase the diagnosis code.
(2) Drive the vehicle at 20 km/h or higher.

NOTE: The ABS warning lamp does not turn OFF in some cases unless the vehicle runs at 20 km/h or higher.

Q: Is the diagnosis code No.C1046, C1047, C1048 or C1049 set?
YES : Replace the wheel speed sensor (Refer to P.35C-97 <front> or P.35C-97 <rear>). Then go to Step 11.
NO : Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/How to Cope with Intermittent Malfunctions).

STEP 11. Check whether the diagnosis code is reset.
(1) Erase the diagnosis code.
(2) Drive the vehicle at 20 km/h or higher.

NOTE: The ABS warning lamp does not turn OFF in some cases unless the vehicle runs at 20 km/h or higher.

Q: Is the diagnosis code No.C1046, C1047, C1048 or C1049 set?
YES : Replace the hydraulic unit (integrated with ASC-ECU) (Refer to P.35C-95). Then go to Step 12.
NO : This diagnosis is complete.

STEP 12. Check whether the diagnosis code is reset.
(1) Erase the diagnosis code.
(2) Drive the vehicle at 20 km/h or higher.

NOTE: The ABS warning lamp does not turn OFF in some cases unless the vehicle runs at 20 km/h or higher.

Q: Is the diagnosis code No.C1046, C1047, C1048 or C1049 set?
YES : Return to Step 1.
NO : This diagnosis is complete.

Code No. C104B FL inlet valve
Code No. C104F FR inlet valve
Code No. C1053 RL inlet valve
Code No. C1057 RR inlet valve
Code No. C105F FL outlet valve
Code No. C1063 FR outlet valve
Code No. C1067 RL outlet valve
Code No. C105B RR outlet valve
Code No. C1200 FL-RR cut valve
Code No. C1204 FR-RL cut valve
Code No. C1208 FL-RR suction valve
Code No. C120C FR-RL suction valve

⚠ CAUTION
- **If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-93, P.35C-94 and P.35C-94).**

OPERATION
- ASC-ECU contains the power supply circuit (+BV terminal) for the solenoid valve. The solenoid valve is energised by the valve relay, which is incorporated in ASC-ECU.
- The valve relay, which is incorporated in ASC-ECU, is always energising the solenoid valve unless the initial check is in progress when the ignition switch is turned on, and the recurrent system check is in progress.
- ASC-ECU activates the solenoid valve by turning on its driving transistor.

DIAGNOSIS CODE SET CONDITIONS
These diagnosis codes will be set under the cases below:

- The solenoid valve is not energized even after ASC-ECU has turned on the driving transistor (Open circuit is present in the power supply circuit to the ASC-ECU solenoid valve, or the valve relay has failed).
- After ASC-ECU has turned off the driving transistor, the solenoid valve still remains energized (short in the solenoid valve circuit).
- When a solenoid valve failure is detected

PROBABLE CAUSES

- ASC-ECU malfunction

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnosis
Use M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?
YES : Go to Step 3.
NO : Repair the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table). On completion, go to Step 2.

STEP 2. Diagnosis code recheck after resetting CAN bus lines

Q: Is the relevant diagnosis code set?
YES : Go to Step 3.
NO : This diagnosis is complete.

STEP 3. Check whether the diagnosis code is reset.
Erase the diagnosis code.

Q: Is the relevant diagnosis code set?
YES : Replace the hydraulic unit (integrated with ASC-ECU) (Refer to P.35C-95). Then go to Step 4.
NO : Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/How to Cope with Intermittent Malfunctions).

STEP 4. Check whether the diagnosis code is reset.
Erase the diagnosis code.

Q: Is the relevant diagnosis code set?
YES : Return to Step 1.
NO : This diagnosis is complete.

Code No. C2104 Valve power supply circuit

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-93, P.35C-94 and P.35C-94).**

OPERATION

- ASC-ECU contains the power supply circuit (+BV terminal) for the solenoid valve. The solenoid valve is energised by the valve relay, which is incorporated in ASC-ECU.
- The valve relay, which is incorporated in ASC-ECU, is always energising the solenoid valve unless the initial check is in progress when the ignition switch is turned on, and the recurrent system check is in progress.

DIAGNOSIS CODE SET CONDITIONS

This diagnostic trouble codes will be set when the solenoid valve supply voltage is not within the standard value.

PROBABLE CAUSES

Current trouble

- Fusible link malfunction
- Damaged wiring harness and connectors
- Abnormality in battery or alternator
- ASC-ECU malfunction

Past trouble

- Carry out diagnosis with particular emphasis on wiring harness and connector failures between the power supply circuit (+BV terminal) to ASC-ECU solenoid valve or earth circuit (GND1, GND2 terminal). For diagnosis procedures, refer to How to treat past trouble (GROUP 00 – How to Use Troubleshooting/How to Treat Past Trouble).

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnosis

Use M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Repair the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table). On completion, go to Step 2.

STEP 2. Diagnosis code recheck after resetting CAN bus lines

Q: Is the diagnosis code No. C2104 set?

YES : Go to Step 3.

NO : This diagnosis is complete.

STEP 3. Battery check

Refer to GROUP 54A – Battery Test .

Q: Is the battery in good condition?

YES : Go to Step 4.

NO : Replace the battery. Then go to Step 10.

STEP 4. Charging system check

Refer to GROUP 16 – On–vehicle Service/Alternator Output Line Voltage Drop Test .

Q: Is the charging system in good condition?

YES : Go to Step 5.

NO : Repair or replace the charging system component(s). Then go to Step 10.

STEP 5. Fusible link check: Check the fusible link No.4 and SBF7.

Visually check for open circuit in the fusible link No.4 and SBF7.

Q: Is the check result normal?

YES : Go to Step 7.

NO : Go to Step 6.

STEP 6. Resistance measurement at ASC-ECU connector

(1) Disconnect the connector, and measure at the wiring harness side.
(2) Disconnect the fusible link No.SBF7.
(3) Resistance between the +BV terminal and the body earth.

OK: No continuity

Q: Is the check result normal?

YES : Replace the fusible link No.4 or SBF7. Then go to Step 10.

NO : The short circuit may be present in the power supply circuit. Repair the wiring harness between the ASC-ECU connector +BV terminal and the fusible link, and then replace the fusible link No.4 or SBF7. Then go to Step 10.

STEP 7. Voltage measurement at the ASC-ECU connector

(1) Disconnect the connector, and measure at the wiring harness side.
(2) Measure the voltage between the +BV terminal and the body earth.

OK: Approximately system voltage

Q: Is the check result normal?

YES : Go to Step 8.

NO : The open circuit may be present in the power supply circuit. Repair the wiring harness between the ASC-ECU connector +BV terminal and the fusible link. Then go to Step 10.

STEP 8. Resistance measurement at ASC-ECU connector

(1) Disconnect the connector, and measure at the wiring harness side.
(2) Resistance between the GND1 terminal and the body earth, and between the GND2 terminal and the body earth

OK: Continuity exists (2 Ω or less)

Q: Is the check result normal?

YES : Go to Step 9.

NO : An open circuit may be present in the earth circuit. Repair the wiring harness between the ASC-ECU connector GND1 terminal and the body earth, and between the ASC-ECU connector GND2 terminal and the body earth. Then go to Step 10.

STEP 9. Check whether the diagnosis code is reset.

Erase the diagnosis code.

Q: Is the diagnosis code No.C2104 set?

YES : Replace the hydraulic unit (integrated with ASC-ECU) (Refer to P.35C-95). Then go to Step 10.
NO : Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/How to Cope with Intermittent Malfunctions).

STEP 10. Check whether the diagnosis code is reset.
Erase the diagnosis code.

Q: Is diagnosis code No.C2104 set?
YES : Return to Step 1.
NO : This diagnosis is complete.

Code No. C1073 Motor drive circuit

⚠ CAUTION
- **If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-93, P.35C-94 and P.35C-94).**

OPERATION
- ASC-ECU contains the power supply circuit (+BM terminal) for the pump motor. The pump motor is energised by the motor switch, which is incorporated in ASC-ECU.
- The pump motor switch, which is incorporated in ASC-ECU, is always off unless the motor solenoid valve check is activated when the vehicle is started.
- ASC-ECU activates the pump motor by turning on the ECU built-in pump motor switch.

DIAGNOSIS CODE SET CONDITIONS
If the pump motor switch voltage drop indicates high value when the pump motor operates or after the operation, the pump motor operation is stopped and this diagnosis code is set.

PROBABLE CAUSES
Current trouble
- Fusible link malfunction
- Damaged wiring harness and connectors
- Abnormality in battery or alternator
- ASC-ECU malfunction

Past trouble
- Carry out diagnosis with particular emphasis on wiring harness and connector failures between the power supply circuit (+BM terminal) to the ASC-ECU motor and the earth circuit (GND1, GND2 terminal). For diagnosis procedures, refer to How to treat past trouble (GROUP 00 – How to Use Troubleshooting/How to Treat Past Trouble).

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnosis
Use M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?
YES : Go to Step 3.
NO : Repair the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table). On completion, go to Step 2.

STEP 2. Diagnosis code recheck after resetting CAN bus lines

Q: Is the diagnosis code No. C1073 set?
YES : Go to Step 3.
NO : This diagnosis is complete.

STEP 3. Battery check
Refer to GROUP 54A – Battery Test .

Q: Is the battery in good condition?
YES : Go to Step 4.
NO : Replace the battery. Then go to Step 10.

STEP 4. Charging system check
Refer to GROUP 16 – On–vehicle Service/Alternator Output Line Voltage Drop Test .

Q: Is the charging system in good condition?
YES : Go to Step 5.
NO : Repair or replace the charging system component(s). Then go to Step 10.

STEP 5. Fusible link check: Check the fusible link No.4 and SBF5.

Visually check for open circuit in the fusible link No.4 and SBF5.

Q: Is the check result normal?

YES : Go to Step 7.

NO : Go to Step 6.

STEP 6. Resistance measurement at ASC-ECU connector

(1) Disconnect the connector, and measure at the wiring harness side.

(2) Resistance between the +BM terminal and the body earth.

OK: No continuity

Q: Is the check result normal?

YES : Replace the fusible link No.4 or SBF5. Then go to Step 10.

NO : The short circuit may be present in the power supply circuit. Repair the wiring harness between the ASC-ECU connector +BM terminal and the fusible link, and then replace the fusible link No.4 or SBF5. Then go to Step 10.

STEP 7. Voltage measurement at the ASC-ECU connector

(1) Disconnect the connector, and measure at the wiring harness side.

(2) Measure the voltage between the +BM terminal and the body earth.

OK: Approximately system voltage

Q: Is the check result normal?

YES : Go to Step 8.

NO : The open circuit may be present in the power supply circuit. Repair the wiring harness between the ASC-ECU connector +BM terminal and the fusible link. Then go to Step 10.

STEP 8. Resistance measurement at ASC-ECU connector

(1) Disconnect the connector, and measure at the wiring harness side.

(2) Resistance between the GND1 terminal and the body earth, and between the GND2 terminal and the body earth

OK: Continuity exists (2 Ω or less)

Q: Is the check result normal?

YES : Go to Step 9.

NO : An open circuit may be present in the earth circuit. Repair the wiring harness between the ASC-ECU connector GND1 terminal and the body earth, and between the ASC-ECU connector GND2 terminal and the body earth. Then go to Step 10.

STEP 9. Check whether the diagnosis code is reset.

(1) Erase the diagnosis code.

(2) Drive the vehicle at 20 km/h or higher.

NOTE: The ABS warning lamp does not turn OFF in some cases unless the vehicle runs at 20 km/h or higher.

Q: Is the diagnosis code No. C1073 set?

YES : Replace the hydraulic unit (integrated with ASC-ECU) (Refer to P.35C-95). Then go to Step 10.

NO : Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/How to Cope with Intermittent Malfunctions).

STEP 10. Check whether the diagnosis code is reset.

(1) Erase the diagnosis code.

(2) Drive the vehicle at 20 km/h or higher.

NOTE: The ABS warning lamp does not turn OFF in some cases unless the vehicle runs at 20 km/h or higher.

Q: Is the diagnosis code No. C1073 set?

YES : Return to Step 1.

NO : This diagnosis is complete.

Code No. C2116 Pump motor voltage low

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-93, P.35C-94 and P.35C-94).**

OPERATION

- ASC-ECU contains the power supply circuit (+BM terminal) for the pump motor. The pump motor is energised by the motor switch, which is incorporated in ASC-ECU.
- The pump motor switch, which is incorporated in ASC-ECU, is always off unless the motor solenoid valve check is activated when the vehicle is started.
- ASC-ECU activates the pump motor by turning on the ECU built-in pump motor switch.

DIAGNOSIS CODE SET CONDITIONS

This diagnosis codes will be set under the cases below:

- When the power supply voltage of the pump motor, which is not in operation, is abnormally low for a prolonged period
- When the power supply voltage of the pump motor, which is not in operation, is abnormally high for a prolonged period

PROBABLE CAUSES

Current trouble

- Fusible link malfunction
- Damaged wiring harness and connectors
- Abnormality in battery or alternator
- ASC-ECU malfunction

Past trouble

- Carry out diagnosis with particular emphasis on wiring harness and connector failures between the power supply circuit (+BM terminal) to the ASC-ECU motor and the earth circuit (GND1, GND2 terminal). For diagnosis procedures, refer to How to treat past trouble (GROUP 00 – How to Use Troubleshooting/How to Treat Past Trouble).

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnosis

Use M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Repair the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table). On completion, go to Step 2.

STEP 2. Diagnosis code recheck after resetting CAN bus lines

Q: Is the diagnosis code No. C2116 set?

YES : Go to Step 3.

NO : This diagnosis is complete.

STEP 3. Battery check

Refer to GROUP 54A – Battery Test .

Q: Is the battery in good condition?

YES : Go to Step 4.

NO : Replace the battery. Then go to Step 10.

STEP 4. Charging system check

Refer to GROUP 16 – – On–vehicle Service/Alternator Output Line Voltage Drop Test .

Q: Is the charging system in good condition?

YES : Go to Step 5.

NO : Repair or replace the charging system component(s). Then go to Step 10.

STEP 5. Fusible link check: Check the fusible link No.4 and SFB5.

Visually check for open circuit in the fusible link No.4 and SFB5.

Q: Is the check result normal?

YES : Go to Step 7.

NO : Go to Step 6.

STEP 6. Resistance measurement at ASC-ECU connector

(1) Disconnect the connector, and measure at the wiring harness side.
(2) Disconnect the fusible link No.4 or SFB5.
(3) Resistance between the +BM terminal and the body earth.

OK: No continuity

Q: Is the check result normal?

YES : Replace the fusible link No.4 or SFB5. Then go to Step 10.
NO : The short circuit may be present in the power supply circuit. Repair the wiring harness between the ASC-ECU connector +BM terminal and the fusible link, and then replace the fusible link No.4 or SFB5. Then go to Step 10.

STEP 7. Voltage measurement at the ASC-ECU connector
(1) Disconnect the connector, and measure at the wiring harness side.
(2) Measure the voltage between the +BM terminal and the body earth.

OK: Approximately system voltage

Q: Is the check result normal?
YES : Go to Step 8.
NO : The open circuit may be present in the power supply circuit. Repair the wiring harness between the ASC-ECU connector +BM terminal and the fusible link. Then go to Step 10.

STEP 8. Resistance measurement at ASC-ECU connector
(1) Disconnect the connector, and measure at the wiring harness side.
(2) Resistance between the GND1 terminal and the body earth, and between the GND2 terminal and the body earth.

OK: Continuity exists (2 Ω or less)

Q: Is the check result normal?
YES : Go to Step 9.
NO : An open circuit may be present in the earth circuit. Repair the wiring harness between the ASC-ECU connector GND1 terminal and the body earth, and between the ASC-ECU connector GND2 terminal and the body earth. Then go to Step 10.

STEP 9. Check whether the diagnosis code is reset.
(1) Erase the diagnosis code.
(2) Drive the vehicle at 20 km/h or higher.

NOTE: The ABS warning lamp does not turn OFF in some cases unless the vehicle runs at 20 km/h or higher.

Q: Is the diagnosis code No. C2116 set?
YES : Replace the hydraulic unit (integrated with ASC-ECU) (Refer to P.35C-95). Then go to Step 10.
NO : Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/How to Cope with Intermittent Malfunctions).

STEP 10. Check whether the diagnosis code is reset.
(1) Erase the diagnosis code.
(2) Drive the vehicle at 20 km/h or higher.

NOTE: The ABS warning lamp does not turn OFF in some cases unless the vehicle runs at 20 km/h or higher.

Q: Is the diagnosis code No. C2116 set?
YES : Return to Step 1.
NO : This diagnosis is complete.

Code No. C121D Brake fluid pressure sensor circuit

⚠ CAUTION
- **If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table).**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-93, P.35C-94 and P.35C-94).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**

OPERATION
The hydraulic sensor is incorporated in the hydraulic unit. When the brake pedal is depressed, the pressure sensor detects the brake pressure applied from the master cylinder, converts this pressure into the voltage signal, and outputs it.

DIAGNOSIS CODE SET CONDITIONS
When the pressure sensor output signal is not within the standard value range, ASC-ECU outputs this diagnosis code.

PROBABLE CAUSES
- Incorrect brake pedal height

- Incorrect adjustment of the stop lamp switch
- Master cylinder malfunction
- Brake booster malfunction
- ASC-ECU malfunction

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics
Use M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?
YES : Go to Step 3.
NO : Repair the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table). On completion, go to Step 2.

STEP 2. Diagnosis code recheck after resetting CAN bus lines

Q: Is diagnosis code No. C121D set?
YES : Go to Step 3.
NO : This diagnosis is complete.

STEP 3. Brake pedal check
Refer to GROUP 35A – On-vehicle Service/Brake Pedal Check .

Q: Is the check result normal?
YES : Go to Step 4.
NO : Go to GROUP 35A – On-vehicle Service/Brake Pedal Check . Then go to Step 7.

STEP 4. Check the installation condition of the stop lamp switch.
Refer to GROUP 35A – On-vehicle Service/Brake Pedal Check .

Q: Is the check result normal?
YES : Go to Step 5.
NO : Install the stop lamp switch correctly, and then go to Step 7.

STEP 5. Brake booster check
Refer to GROUP 35A – On-vehicle Service/Brake Booster Operation Check .

Q: Is the check result normal?
YES : Go to Step 6.
NO : After replacing the brake booster, go to Step 7.

STEP 6. Check whether the diagnosis code is reset.
Erase the diagnosis code.

Q: Is diagnosis code No.C121D set?
YES : Replace the hydraulic unit (integrated with ASC-ECU) (Refer to P.35C-95). Then go to Step 7.
NO : The trouble can be an intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/How to Cope with Intermittent Malfunctions).

STEP 7. Check whether the diagnosis code is reset.
Erase the diagnosis code.

Q: Is diagnosis code No.C121D set?
YES : Return to Step 1.
NO : This diagnosis is complete.

Code No. C121E Brake fluid pressure sensor

⚠ CAUTION
- **If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-93, P.35C-94 and P.35C-94).**

OPERATION
The hydraulic sensor is incorporated in the hydraulic unit. When the brake pedal is depressed, the pressure sensor detects the brake pressure applied from the master cylinder, converts this pressure into the voltage signal, and outputs it.

DIAGNOSIS CODE SET CONDITIONS

This diagnosis codes will be set under the cases below:

- When the pressure sensor offset is not within the standard value range
- When the estimated pressure sensor temperature is not normal

PROBABLE CAUSES

- Incorrect adjustment of brake pedal height
- Master cylinder malfunction
- Brake booster malfunction
- Incorrect installation position of stop lamp switch
- Malfunction of the stop lamp switch
- Brake drag
- ASC-ECU malfunction

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnosis

Use M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Repair the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table). On completion, go to Step 2.

STEP 2. Diagnosis code recheck after resetting CAN bus lines

Q: Is diagnosis code No. C121E set?

YES : Go to Step 3.

NO : This diagnosis is complete.

STEP 3. Brake pedal check

Refer to GROUP 35A – On-vehicle Service/Brake Pedal Check .

Q: Is the check result normal?

YES : Go to Step 4.

NO : Go to GROUP 35A – On-vehicle Service/Brake Pedal Check . Then go to Step 9.

STEP 4. Check for stop lamp switch installation

Refer to GROUP 35A – On-vehicle Service/Brake Pedal Check .

Q: Is the check result normal?

YES : Go to Step 5.

NO : Install the stop lamp switch correctly (Refer to GROUP 35A – On-vehicle Service/Brake Pedal Check), and then go to Step 9 .

STEP 5. Stop lamp switch continuity check

Refer to GROUP 35A – Brake Pedal .

Q: Is the check result normal?

YES : Go to Step 6.

NO : Replace the stop lamp switch (Refer to GROUP 35A –Brake Pedal), and then go to Step 9.

STEP 6. Brake drag check

Check the brake system for drag.

Q: Is the check result normal?

YES : Go to Step 7.

NO : Repair the brake drag, and then go to Step 9.

STEP 7. Brake booster check

Refer to GROUP 35A – On-vehicle Service/Brake Booster Operation Check .

Q: Is the check result normal?

YES : Go to Step 8.

NO : Replace the brake booster <Refer to GROUP 35A – Master Cylinder Assembly and Brake Booster >, and then go to Step 9.

STEP 8. Check whether the diagnosis code is reset.

Erase the diagnosis code.

Q: Is diagnosis code No. C121E set?

YES : Replace the hydraulic unit (integrated with ASC-ECU) (Refer to P.35C-95). Then go to Step 9.

NO : The trouble can be an intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/How to Cope with Intermittent Malfunctions).

STEP 9. Check whether the diagnosis code is reset.

Erase the diagnosis code.

Q: Is diagnosis code No.C121E set?

YES : Return to Step 1.

NO : This diagnosis is complete.

Code No. C1000 Brake SW (stuck)

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-93, P.35C-94 and P.35C-94).**

OPERATION

ETACS-ECU sends the ON signal generated when the brake pedal is depressed and OFF signal generated when it is released to ASC-ECU via the CAN bus lines.

DIAGNOSIS CODE SET CONDITIONS

This diagnosis code is set in the following case.

- When the vehicle has run for a long time with the stop lamp switch turned ON.
- When the OFF status of the stop lamp switch does not match the vehicle attitude

PROBABLE CAUSES

- Damaged wiring harness and connectors
- Improper adjustment of stop lamp switch installation position
- Malfunction of the stop lamp switch
- ETACS-ECU malfunction
- ASC-ECU malfunction

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics

Use M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Repair the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table). On completion, go to Step 2.

STEP 2. Diagnosis code recheck after resetting CAN bus lines

Q: Is diagnosis code No.C1000 set?

YES : Go to Step 3.

NO : This diagnosis is complete.

STEP 3. Brake pedal check

Refer to GROUP 35A – On-vehicle Service/Brake Pedal Check .

Q: Is the check result normal?

YES : Go to Step 4.

NO : Go to GROUP 35A – On-vehicle Service/Brake Pedal Check . Then go to Step 10.

STEP 4. Check for stop lamp switch installation

Refer to GROUP 35A – On-vehicle Service/Brake Pedal Check .

Q: Is the check result normal?

YES : Go to Step 5.

NO : Install the stop lamp switch correctly (Refer to GROUP 35A – On-vehicle Service/Brake Pedal Check), and then go to Step 10.

STEP 5. Stop lamp switch continuity check

Refer to GROUP 35A – Brake Pedal .

Q: Is the check result normal?

YES : Go to Step 6.

NO : Replace the stop lamp switch (Refer to GROUP 35A –Brake Pedal), and then go to Step 10.

STEP 6. Brake drag check

Check the brake system for drag.

Q: Is the check result normal?

YES : Go to Step 7.

NO : Repair the brake drag, and then go to Step 10.

STEP 7. Brake booster check

Refer to GROUP 35A – On-vehicle Service/Brake Booster Operation Check .

Q: Is the check result normal?

YES : Go to Step 8.

NO : Replace the brake booster <Refer to GROUP 35A – Master Cylinder Assembly and Brake Booster >, and then go to Step 10.

STEP 8. M.U.T.-III other system's data list

Check the ETACS-ECU system data list.

- The brake pedal is depressed.

Item No.	Item name	Normal condition
290	Stop lamp switch	OFF to ON

Q: Is the check result normal?

YES : Go to Step 9.

NO : Refer to GROUP 54A – ETACS, Inspection Procedure 12 "The stop lamp switch signal is not received."

STEP 9. Diagnosis code recheck

Erase the diagnosis code.

Q: Is diagnosis code No.C1000 set?

YES : Replace the hydraulic unit (integrated with ASC-ECU) (Refer to P.35C-95). Then go to Step 10.

NO : Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/How to Cope with Intermittent Malfunctions .)

STEP 10. Diagnosis code recheck

Erase the diagnosis code.

Q: Is diagnosis code No.C1000 set?

YES : Return to Step 1.

NO : This diagnosis is complete.

Code No.C123B: System control too long

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-93, P.35C-94 and P.35C-94).**

OPERATION

ASC-ECU controls ASC by calculating the data sent from the wheel speed sensor, the steering wheel sensor, and the G and yaw rate sensor.

DIAGNOSIS CODE SET CONDITIONS

This diagnosis code is set when ASC operates for a prolonged period.

NOTE: This diagnosis code may be set when the vehicle runs on a slippery or rough road.

PROBABLE CAUSES

- Steering wheel sensor malfunction
- Improper installation of steering wheel sensor
- ASC-ECU malfunction
- Different steering wheel
- Wheel alignment not performed

DIAGNOSTIC PROCEDURE

STEP 1. Using M.U.T.-III, diagnose the CAN bus lines.

Using M.U.T.-III, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3

NO : Repair the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table). After repairing the CAN bus line, go to Step 2.

STEP 2. Diagnosis code recheck after repairing the CAN bus line

Q: Is diagnosis code No.C123B set?

YES : Go to Step 3

NO : This diagnosis is complete.

STEP 3. M.U.T.-III diagnosis code

Check that diagnosis codes No.C100A, C1015, C1020, C102B, C1011, C101C, C1027, C1032, C1014, C101F, C102A, C1035, C1041, C1042, C1043, C1044, C1219, C2205, C123C, and C2204 are also set.

Q: Are diagnosis codes No.C100A, C1015, C1020, C102B, C1011, C101C, C1027, C1032, C1014, C101F, C102A, C1035, C1041, C1042, C1043, C1044, C1219, C2205, C123C, and C2204 also set?

YES : Carry out the diagnosis for the diagnosis code that is set (Refer to P.35C-15). Then go to Step 9.

NO : Go to Step 4

STEP 4. M.U.T.-III service data

Check the following data list. (Refer to P.35C-85).

- Item 08: Lateral G sensor
- Item 09: G sensor
- Item 12: Yaw rate sensor

Q: Is the check result normal?

YES : Go to Step 5

NO : Replace the hydraulic unit (integrated with ASC-ECU) (Refer to P.35C-95). Then go to Step 9.

STEP 5. Check of steering wheel sensor installation status

Check that the steering wheel sensor is installed correctly.

Q: Is the check result normal?

YES : Go to Step 6

NO : Install the steering wheel sensor correctly (Refer to P.35C-98). Then go to Step 6.

STEP 6. Wheel alignment check

Refer to GROUP 33 – On-vehicles service/Front Wheel Alignment Check and Adjustment .

Q: Is the check result normal?

YES : After checking the wheel alignment, perform the calibration of steering wheel sensor to make ASC-ECU relearn the neutral point (Refer to P.35C-94). Then go to Step 7.

NO : After adjusting the wheel alignment, perform the calibration of steering wheel sensor to make ASC-ECU relearn the neutral point (Refer to P.35C-94). Then go to Step 7.

STEP 7. M.U.T.-III service data

Check the following data list (Refer to P.35C-85).

- Item 11: Steering angle

Q: Is the check result normal?

YES : Go to Step 8

NO : Replace the steering wheel sensor (Refer to P.35C-98). Then go to Step 9.

STEP 8. Check whether the diagnosis code is reset.

(1) Erase the diagnosis code.
(2) Turn the steering wheel to either right or left at 20 km/h or more.

NOTE: The ASC warning/operation lamp and the ASC OFF lamp may remain on until the vehicle speed reaches approx. 10 km/h, then the steering wheel is turned to either right or left.

Q: Is diagnosis code No.C123B set?

YES : Replace the hydraulic unit (integrated with ASC-ECU) (Refer to P.35C-95). Then go to Step 9.

NO : Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/How to Cope with Intermittent Malfunctions).

STEP 9. Check whether the diagnosis code is reset.

(1) Erase the diagnosis code.
(2) Turn the steering wheel to either right or left at 20 km/h or more.

NOTE: The ASC warning/operation lamp and the ASC OFF lamp may remain on until the vehicle speed reaches approx. 10 km/h, then the steering wheel is turned to either right or left.

Q: Is diagnosis code No.C123B set?

YES : Return to Step 1.

NO : The procedure is complete.

Code No. C2200 ECU internal error

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-93, P.35C-94 and P.35C-94).**

OPERATION

ASC-ECU controls ASC by calculating the data sent from the wheel speed sensor, the steering wheel sensor, and the G and yaw rate sensor.

DIAGNOSIS CODE SET CONDITIONS
This diagnosis code is set when ASC-ECU has malfunction.

PROBABLE CAUSES
ASC-ECU malfunction

DIAGNOSTIC PROCEDURE

Check whether the diagnosis code is reset.
Erase the diagnosis code.

Q: Is the diagnosis code No. C2200 set?
YES : Replace the hydraulic unit (integrated with ASC-ECU) (Refer to P.35C-95).
NO : This diagnosis is complete.

Code No. C2101 Power supply high voltage

⚠ CAUTION
- **If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-93, P.35C-94 and P.35C-94).**

OPERATION
The ASC-ECU is energized by the valve power supply circuit (+BV terminal). When the power is supplied from the ignition switch (IG1) to the IG1 relay in ETACS-ECU, IG1 relay is turned on. At this time, the valve power supply circuit (IG1 terminal) energizes the ASC-ECU.

DIAGNOSIS CODE SET CONDITIONS
This diagnosis code is set when the ASC-ECU power supply voltage is more than 18.0 ± 1.0 V.

PROBABLE CAUSES
- Battery failure
- ASC-ECU malfunction
- Charging system failed

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnosis
Use M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?
YES : Go to Step 3.
NO : Repair the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table). On completion, go to Step 2.

STEP 2. Diagnosis code recheck after resetting CAN bus lines

Q: Is the diagnosis code No. C2101 set?
YES : Go to Step 3.
NO : This diagnosis is complete.

STEP 3. Battery check
Refer to GROUP 54A – Battery Test .

Q: Is the battery in good condition?
YES : Go to Step 5.
NO : Charge or replace the battery. Then go to Step 4.

STEP 4. Charging system check
Refer to GROUP 16 – On–vehicle Service/Alternator Output Line Voltage Drop Test .

Q: Is the check result normal?
YES : Go to Step 5.
NO : Repair or replace the charging system component(s).

STEP 5. Check whether the diagnosis code is reset.
Erase the diagnosis code.

Q: Is the diagnosis code No. C2101 set?
YES : Replace the hydraulic unit (integrated with ASC-ECU) (Refer to P.35C-95). Then go to Step 6.
NO : The trouble can be an intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/How to Cope with Intermittent Malfunctions).

STEP 6. Check whether the diagnosis code is reset.
Erase the diagnosis code.

Q: Is the diagnosis code No. C2101 set?

YES : Return to Step 1.
NO : This diagnosis is complete.

Code No. C1395 Incomplete Brake fluid filling

⚠ CAUTION
- **If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-93, P.35C-94 and P.35C-94).**

DIAGNOSIS CODE SET CONDITIONS
This diagnosis code is set when the brake fluid is not filled in the hydraulic unit.

PROBABLE CAUSES
- Different hydraulic unit (For delivery to factory)
- ASC-ECU malfunction

DIAGNOSIS PROCEDURE

Check whether the diagnosis code is reset.
Erase the diagnosis code.

Q: Is the diagnosis code No. C1395 set?
YES : Replace the hydraulic unit (integrated with ASC-ECU) (Refer to P.35C-95).
NO : This diagnosis is complete.

Code No. C121C Torque request signal denied

⚠ CAUTION
- **If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-93, P.35C-94 and P.35C-94).**

OPERATION
ASC-ECU sends the signal to the engine ECU as necessary to decrease the engine output for the ASC system operation.

DIAGNOSIS CODE SET CONDITIONS
This diagnosis code is set when the request for the decrease of output is rejected by the engine ECU.

PROBABLE CAUSES
- Wrong coding of engine ECU
- Engine ECU malfunction
- ASC-ECU malfunction
- External noise interference

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnosis
Use M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?
YES : Go to Step 3.
NO : Repair the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table). On completion, go to Step 2.

STEP 2. Diagnosis code recheck after resetting CAN bus lines

Q: Is diagnosis code No.C121C set?
YES : Go to Step 3.
NO : This diagnosis is complete.

STEP 3. M.U.T.-III other system diagnosis code
Use M.U.T.-III to check that the diagnosis code is set in the engine ECU.

Q: Is the diagnosis code set?
YES : Troubleshoot the engine ECU diagnosis code (Refer to GROUP 13A – Troubleshooting/Diagnosis function), and then go to Step 7.
NO : Go to Step 4.

STEP 4. M.U.T.-III diagnosis code
Check that diagnosis code No.C1707 is set in ASC-ECU.

Q: Is diagnosis code No.C1707 set?
YES : Troubleshoot for diagnosis code No.C1707 (Refer to P.35C-59). Then go to Step 5.
NO : Replace the hydraulic unit (integrated with ASC-ECU) (Refer to P.35C-95). Then go to Step 7.

STEP 5. M.U.T.-III data list
Check the following service data (Refer to P.35C-85).
- Item 68: Allow ESP torque request

Q: Is the check result normal?
YES : Go to Step 6.
NO : Replace the engine ECU (Refer to GROUP 13A – engine ECU), and then go to Step 7.

STEP 6. Check whether the diagnosis code is reset.
Erase the diagnosis code.

Q: Is diagnosis code No.C121C set?
YES : Replace the hydraulic unit (integrated with ASC-ECU) (Refer to P.35C-95). Then go to Step 7.
NO : If the trouble symptom is resolved, an intermittent malfunction such as poorly engaged connector(s) or wiring harness is suspected (Refer to GROUP 00 – How to Use Troubleshooting/How to Cope with Intermittent Malfunctions).

STEP 7. Diagnosis code recheck
Erase the diagnosis code.

Q: Is diagnosis code No.C121C set?
YES : Return to Step 1.
NO : This diagnosis is complete.

Code No.C2206 Re-execution of variant coding

⚠ CAUTION
- **If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table).**
- **If diagnosis code No.C2206 is set in ASC-ECU, always diagnose the CAN bus line. If there is any fault in the CAN bus lines, an incorrect diagnosis code may be set. In this case, the set diagnosis code is not highly reliable.**
- **Before replacing the ECU, ensure that the communication circuit is normal.**
- **When diagnosis code No.C2206 is set in ASC-ECU, the diagnosis code may also be set in ETACS-ECU. When the diagnosis code is set in ETACS-ECU, carry out the diagnosis of the diagnosis code for ETACS-ECU first.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-93, P.35C-94 and P.35C-94).**

OPERATION
ASC-ECU receives the vehicle information stored in the ETACS-ECU via CAN bus lines.

DIAGNOSIS CODE SET CONDITIONS
ASC-ECU communicates with ETACS-ECU via CAN bus lines. This diagnosis code is set if the vehicle information stored in ETACS-ECU varies from the one stored when the ignition switch was last turned on.

PROBABLE CAUSES

- ETACS-ECU or ASC-ECU which was equipped with other vehicle is used.
- Malfunction of ETACS-ECU
- ASC-ECU malfunction
- External noise interference

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics
Use M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?
YES : Go to Step 2.
NO : Repair the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table). On completion, go to Step 6.

STEP 2. M.U.T.-III Diagnosis code of other system
Use M.U.T.-III to check that the vehicles information-related diagnosis code is set by the ETACS-ECU.

Q: Is the diagnosis code set?
YES : Troubleshoot the relevant diagnosis code, and then go to Step 3.
NO : Go to Step 5.

STEP 3. ETACS-ECU coding data check
Refer to GROUP 00 – Precautions before Service/Coding List .

Q: Is the check result normal?
YES : Go to Step 5.
NO : Go to Step 4.

STEP 4. ETACS-ECU variant coding
Perform the variant coding to the ETACS-ECU.

Q: Dose variant coding succeed?
YES : Go to Step 6.
NO : Replace the ETACS-ECU (Refer to GROUP 54A – ETACS-ECU), and then go to Step 6.

STEP 5. Check whether the diagnosis code is reset.
(1) Erase the diagnosis code.
(2) Ignition switch "LOCK" (OFF)
(3) Ignition switch "ON"

Q: Is diagnosis code No.C2206 set?
YES : Replace the hydraulic unit (integrated with ASC-ECU) (Refer to P.35C-95). Then go to Step 6.
NO : This diagnosis is complete.

STEP 6. Check whether the diagnosis code is reset.
(1) Erase the diagnosis code.
(2) Ignition switch "LOCK" (OFF)
(3) Ignition switch "ON"

Q: Is diagnosis code No.C2206 set?
YES : Return to Step 1.
NO : This diagnosis is complete.

Code No. C1210 Longitudinal G sensor input circuit

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-93, P.35C-94 and P.35C-94).**

OPERATION

- ASC-ECU monitors if the output of G and yaw rate sensor is normal or not.

DIAGNOSIS CODE SET CONDITIONS

This diagnosis code is set if any malfunction below is found:

- When the output value of the longitudinal G-sensor is abnormal

PROBABLE CAUSES

- ASC-ECU malfunction
- External noise interference

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnosis
Use M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?
YES : Go to Step 3.
NO : Repair the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table). On completion, go to Step 2.

STEP 2. Diagnosis code recheck after resetting CAN bus lines

Q: Is diagnosis code No.C1210 set?
YES : Go to Step 3.
NO : This diagnosis is complete.

STEP 3. M.U.T.-III data list
Check the following data list (Refer to P.35C-85).
- Item 09: G sensor

Q: Is the check result normal?
YES : Go to Step 4.
NO : Replace the hydraulic unit (integrated with ASC-ECU) (Refer to P.35C-95). Then go to Step 5.

STEP 4. Check whether the diagnosis code is reset.
Erase the diagnosis code.

Q: Is diagnosis code No.C1210 set?
YES : Replace the hydraulic unit (integrated with ASC-ECU) (Refer to P.35C-95), and then go to Step 5.
NO : Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/How to Cope with Intermittent Malfunctions).

STEP 5. Check whether the diagnosis code is reset.
Erase the diagnosis code.

Q: Is diagnosis code No.C1210 set?
YES : Return to Step 1.
NO : This diagnosis is complete.

Code No. C1242 Longitudinal G sensor signal

⚠ CAUTION
- **If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C, Trouble code diagnosis).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-93, P.35C-94 and P.35C-94).**

OPERATION
ASC-ECU monitors if the output of G and yaw rate sensor is normal or not.

DIAGNOSIS CODE SET CONDITIONS
This diagnosis code is set when the abnormality is detected by comparing the longitudinal G-sensor value output from the G and yaw rate sensor with the value output from the wheel speed sensor.

PROBABLE CAUSES
- Malfunction of wheel speed sensor
- ASC-ECU malfunction
- External noise interference

NOTE: When rotated on the four-wheel drum tester, this diagnosis code may be set.

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnosis
Use M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?
YES : Go to Step 3
NO : Repair the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table). On completion, go to Step 2.

STEP 2. Diagnosis code recheck after resetting CAN bus lines

Q: Is the diagnosis code No.C1242 set?
YES : Go to Step 3
NO : This diagnosis is complete.

STEP 3. Check the wheel speed sensor-related diagnosis code.
Use the M.U.T.-III to check whether the wheel speed sensor-related diagnosis code is set or not.

Q: Is the diagnosis code set?
YES : Troubleshoot for the relevant diagnosis code (Refer to P.35C-15).
NO : Go to Step 4

STEP 4. Check whether the ASC-ECU is installed properly.
Check whether the ASC-ECU is installed correctly. Refer to P.35C-95.

Q: Is the check result normal?
YES : Execute "G sensor calibration" on "Special function". After the calibration is performed (Refer to P.35C-93) , turn the ignition switch from "OFF" to "ON".Then go to Step 5.
NO : Install the ASC-ECU properly, and execute "G sensor calibration" on "Special function". After the calibration is performed (Refer to P.35C-93) , turn the ignition switch from "OFF" to "ON".Then go to Step 5.

STEP 5. M.U.T.-III data list
Check the following data list under curb weight condition or one occupant (driver) only in the vehicle, on a flat road (Refer to P.35C-85).
- Item 09: G sensor
- Item 96: G sensor offset

Q: Is the check result normal?
YES : Turn the ignition switch to the "ON" from "OFF" position. Then go to Step 6.
NO : Replace the hydraulic unit (integrated with ASC-ECU) (Refer to P.35C-95), and then go to Step 7.

STEP 6. Check whether the diagnosis code is reset.
(1) Erase the diagnosis code.
(2) Drive the vehicle at 20 km/h or higher.

NOTE: The ABS warning lamp does not turn OFF in some cases unless the vehicle runs at 20 km/h or higher.

Q: Is the diagnosis code No.C1242 set?
YES : Replace the hydraulic unit (integrated with ASC-ECU) (Refer to P.35C-95), and then go to Step 7.
NO : Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/How to Cope with Intermittent Malfunctions).

STEP 7. Check whether the diagnosis code is reset.
(1) Erase the diagnosis code.
(2) Drive the vehicle at 20 km/h or higher.

NOTE: The ABS warning lamp does not turn OFF in some cases unless the vehicle runs at 20 km/h or higher.

Q: Is the diagnosis code No.C1242 set?
YES : Return to Step 1.
NO : This diagnosis is complete.

Code No. C123C Sensor cluster malfunction

⚠ CAUTION
- **If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the steering wheel sensor is replaced, always carry out calibration to make ASC-ECU learn the neutral point (Refer to P.35C-94).**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-93, P.35C-94 and P.35C-94).**

OPERATION
ASC-ECU monitors if the output of G and yaw rate sensor is normal or not.

DIAGNOSIS CODE SET CONDITIONS
This diagnosis code is set if any malfunction below is found:
- The output value of lateral G and yaw rate is abnormal.
- When abnormality is detected by comparing the value output from the lateral G and yaw rate with the one from the steering wheel sensor and wheel speed sensor

PROBABLE CAUSES

- Steering wheel sensor malfunction
- Improperly installed steering wheel sensor
- Malfunction of wheel speed sensor
- ASC-ECU malfunction
- External noise interference

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnosis
Use M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?
YES : Go to Step 3
NO : Repair the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table). On completion, go to Step 2.

STEP 2. Diagnosis code recheck after resetting CAN bus lines

Q: Is the diagnosis code No.C123C set?
YES : Go to Step 3
NO : This diagnosis is complete.

STEP 3. Check the other sensor-related diagnosis code.
Use M.U.T.-III to check whether the wheel speed sensor-related or steering wheel sensor-related diagnosis code is set or not.

Q: Is the diagnosis code set?
YES : Troubleshoot for the relevant diagnosis code (Refer to P.35C-15).
NO : Go to Step 4

STEP 4. Check whether the ASC-ECU is installed properly.
Check whether the ASC-ECU is installed correctly. Refer to P.35C-95.

Q: Is the check result normal?
YES : Execute "Lateral G sensor calibration" on "Special function". After the calibration is performed (Refer to P.35C-93) , turn the ignition switch from "OFF" to "ON".Then go to Step 5.
NO : Install the ASC-ECU properly, and execute "Lateral G sensor calibration" on "Special function". After the calibration is performed (Refer to P.35C-93) , turn the ignition switch from "OFF" to "ON".Then go to Step 5.

STEP 5. M.U.T.-III data list
Check the following data list (Refer to P.35C-85).
- Item 08: Lateral G sensor
- Item 12: Yaw rate sensor

Q: Is the check result normal?
YES : Go to Step 6
NO : Replace the hydraulic unit (integrated with ASC-ECU) (Refer to P.35C-95), and then go to Step 10.

STEP 6. Steering wheel sensor installation check
Check that the steering wheel sensor is installed correctly.

Q: Is the check result normal?
YES : Go to Step 7
NO : Reinstall the steering wheel sensor correctly (Refer to P.35C-98), and then go to Step 7.

STEP 7. Wheel alignment check
Refer to .

Q: Is the check result normal?
YES : After checking the wheel alignment, carry out calibration of steering wheel sensor to make ASC-ECU relearn the neutral point (Refer to P.35C-94). Then go to Step 8.
NO : After adjusting the wheel alignment, carry out calibration of steering wheel sensor to make ASC-ECU relearn the neutral point (Refer to P.35C-94). Then go to Step 8.

STEP 8. M.U.T.-III data list
Check the following data list (Refer to P.35C-85).
- Item 11: Steering angle sensor

Q: Is the check result normal?
YES : Go to Step 9
NO : Replace the steering wheel sensor (Refer to P.35C-98), and then go to Step 9.

STEP 9. Check whether the diagnosis code is reset.
(1) Erase the diagnosis code.
(2) Turn the steering wheel to either right or left at 20 km/h or more.

NOTE: The ASC warning/operation lamp and the ASC OFF lamp may remain on until the vehicle speed reaches approx. 10 km/h, then the steering wheel is turned to either right or left.

Q: Is the diagnosis code No.C123C set?

YES : Replace the hydraulic unit (integrated with ASC-ECU) (Refer to P.35C-95), and then go to Step 10.
NO : Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/How to Cope with Intermittent Malfunctions).

STEP 10. Check whether the diagnosis code is reset.
(1) Erase the diagnosis code.
(2) Turn the steering wheel to either right or left at 20 km/h or more.

NOTE: The ASC warning/operation lamp and the ASC OFF lamp may remain on until the vehicle speed reaches approx. 10 km/h, then the steering wheel is turned to either right or left.

Q: Is the diagnosis code No.C123C set?
YES : Return to Step 1.
NO : This diagnosis is complete.

Code No. C1392 Incomplete learn (Longitudinal G)
Code No. C1393 Incomplete learn neutral(Lateral G)

⚠ CAUTION
- **If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-93, P.35C-94 and P.35C-94).**

OPERATION
When the M.U.T.-III is operated, the ASC-ECU will learn the neutral position of the G sensor and then store it in its memory.

DIAGNOSIS CODE SET CONDITIONS
The ASC-ECU will store this diagnosis code when it has not learned the neutral position of the G sensor.

PROBABLE CAUSES
- The neutral position of the G sensor has not been learned.
- ASC-ECU malfunction

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics
Use M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?
YES : Go to Step 3
NO : Repair the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table). On completion, go to Step 2.

STEP 2. Diagnosis code recheck after resetting CAN bus lines

Q: Is diagnosis code No.C1392 or C1393 set?
YES : Go to Step 3
NO : This diagnosis is complete.

STEP 3. Check the G sensor-related diagnosis code.
Use the M.U.T.-III to check whether the G sensor-related diagnosis code is set or not.

Q: Is the diagnosis code set?
YES : Troubleshoot for the relevant diagnosis code (Refer to P.35C-15).
NO : Go to Step 4

STEP 4. Check whether the ASC-ECU is installed properly.
Check whether the ASC-ECU is installed correctly. Refer to P.35C-95.

Q: Is the check result normal?
YES : Execute "Lateral G sensor calibration" and "G sensor calibration" on "Special function". After the calibration is performed (Refer to P.35C-93) , turn the ignition switch from "OFF" to "ON".Then go to Step 5.
NO : Install the ASC-ECU properly, and execute "Lateral G sensor calibration" and "G sensor calibration" on "Special function". After the calibration is performed (Refer to P.35C-93) , turn the ignition switch from "OFF" to "ON".Then go to Step 5.

STEP 5. M.U.T.-III data list

Check the following data list (Refer to P.35C-85).

- Item 08: Lateral G sensor
- Item 09: G sensor
- Item 73: Lateral G sensor offset
- Item 96: G sensor offset

Q: Is the check result normal?

YES : Go to Step 6

NO : Replace the hydraulic unit (integrated with ASC-ECU) (Refer to P.35C-95), and then go to Step 7.

STEP 6. Check whether the diagnosis code is reset.

Q: Is diagnosis code No.C1392 or C1393 set?

YES : Replace the hydraulic unit (integrated with ASC-ECU) (Refer to P.35C-95), and then go to Step 7.

NO : This diagnosis is complete.

STEP 7. Check whether the diagnosis code is reset.

Q: Is diagnosis code No.C1392 or C1393 set?

YES : Return to Step 1.

NO : This diagnosis is complete.

Code No. C2204 Sensor cluster internal error

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-93, P.35C-94 and P.35C-94).**

OPERATION

The ASC-ECU communicates with its integrated G and yaw rate sensor.

DIAGNOSIS CODE SET CONDITIONS

This diagnosis code will be set when the ASC-ECU detects an defective G and yaw rate sensor.

NOTE: This diagnosis code may be set when G and yaw rate sensor is put on the turntable turning at high speed.

PROBABLE CAUSES

- ASC-ECU malfunction

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnosis

Use M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3

NO : Repair the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table). On completion, go to Step 2.

STEP 2. Diagnosis code recheck after resetting CAN bus lines

Q: Is the diagnosis code No.C2204 set?

YES : Go to Step 3

NO : This diagnosis is complete.

STEP 3. Check whether the ASC-ECU is installed properly.

Check whether the ASC-ECU is installed correctly. Refer to .P.35C-95

Q: Is the check result normal?

YES : Execute "Lateral G sensor calibration" on "Special function". After the calibration is performed (Refer to P.35C-93) , turn the ignition switch from "OFF" to "ON".Then go to Step 4.

NO : Install the ASC-ECU properly, and execute "Lateral G sensor calibration" on "Special function". After the calibration is performed (Refer to P.35C-93) , turn the ignition switch from "OFF" to "ON".Then go to Step 4.

STEP 4. M.U.T.-III data list

Check the following data list (Refer to P.35C-85).

- Item 08: Lateral G sensor
- Item 12: Yaw rate sensor
- Item 73: Lateral G sensor offset
- Item 97: Yaw rate sensor offset

Q: Is the check result normal?

YES : Go to Step 5

NO : Replace the hydraulic unit (integrated with ASC-ECU) (Refer to P.35C-95), and then go to Step 6.

STEP 5. Check whether the diagnosis code is reset.

(1) Erase the diagnosis code.

(2) Turn the steering wheel to either right or left at 20 km/h or more.

NOTE: The ASC warning/operation lamp and the ASC OFF lamp may remain on until the vehicle speed reaches approx. 10 km/h, then the steering wheel is turned to either right or left.

Q: Is the diagnosis code No.2204 set?

YES : Replace the hydraulic unit (integrated with ASC-ECU) (Refer to P.35C-95), and then go to Step 6.

NO : Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/How to Cope with Intermittent Malfunctions).

STEP 6. Check whether the diagnosis code is reset.

(1) Erase the diagnosis code.

(2) Turn the steering wheel to either right or left at 20 km/h or more.

NOTE: The ASC warning/operation lamp and the ASC OFF lamp may remain on until the vehicle speed reaches approx. 10 km/h, then the steering wheel is turned to either right or left.

Q: Is the diagnosis code No.2204 set?

YES : Return to Step 1.

NO : This diagnosis is complete.

Code No. C1219 Steering angle sensor signal

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the steering wheel sensor is replaced, always carry out calibration to make ASC-ECU learn the neutral point (Refer to P.35C-94).**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-93, P.35C-94 and P.35C-94).**

OPERATION

Steering wheel sensor outputs the signal to ASC-ECU via the CAN bus lines.

DIAGNOSIS CODE SET CONDITIONS

This diagnosis code is set if any malfunction below is found:

- The tolerance of neutral position of steering wheel sensor exceeds the specified range.
- Abnormality in steering wheel sensor output value
- When abnormality is detected by comparing the value output from the steering wheel sensor with the one from the wheel speed sensor and the G and yaw rate sensor.

PROBABLE CAUSES

- Improper installation of steering wheel sensor
- Wheel alignment not performed
- Steering wheel sensor malfunction
- Different steering wheel
- Malfunction of wheel speed sensor
- ASC-ECU malfunction
- External noise interference
- Wrong steering wheel is attached

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics

Use M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3
NO : Repair the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table). On completion, go to Step 2.

STEP 2. Diagnosis code recheck after resetting CAN bus lines

Q: Is diagnosis code No.C1219 set?
YES : Go to Step 3
NO : This diagnosis is complete.

STEP 3. M.U.T.-III diagnosis code
Check that the wheel speed sensor-related, G and yaw rate sensor-related, or steering wheel sensor-related diagnosis code is set.

Q: Is the diagnosis code set?
YES : Troubleshoot the relevant diagnosis code, and then go to Step 8.
NO : Go to Step 4

STEP 4. Check how steering wheel sensor is installed.
Check that the steering wheel sensor is installed correctly (Refer to P.35C-98).

Q: Is the check result normal?
YES : Go to Step 5
NO : Install the steering wheel sensor correctly (Refer to P.35C-98), and then go to Step 5.

STEP 5. Wheel alignment check

Q: Is the check result normal?
YES : After the wheel alignment check, perform the steering wheel sensor calibration to make ASC-ECU learn the neutral point again (Refer to P.35C-94). Then go to Step 6.
NO : After the adjustment of the wheel alignment, perform the steering wheel sensor calibration to make ASC-ECU learn the neutral position again (Refer to P.35C-94). Then go to Step 6.

STEP 6. M.U.T.-III data list
Check the following data list (Refer to P.35C-85).
- Item 11: Steering angle

Q: Is the check result normal?
YES : Go to Step 7
NO : After the steering wheel sensor is replaced, perform the steering wheel sensor calibration to make ASC-ECU learn the neutral point again (Refer to P.35C-94). Then go to Step 8.

STEP 7. Check whether the diagnosis code is reset.
(1) Erase the diagnosis code.
(2) Turn the steering wheel to either right or left at 20 km/h or more.

NOTE: The ASC warning/operation lamp and the ASC OFF lamp may remain on until the vehicle speed reaches approx. 10 km/h, then the steering wheel is turned to either right or left.

Q: Is diagnosis code No.C1219 set?
YES : Replace the hydraulic unit (integrated with ASC-ECU) (Refer to P.35C-95), and then go to Step 8.
NO : This diagnosis is complete.

STEP 8. Check whether the diagnosis code is reset.
(1) Erase the diagnosis code.
(2) Turn the steering wheel to either right or left at 20 km/h or more.

NOTE: The ASC warning/operation lamp and the ASC OFF lamp may remain on until the vehicle speed reaches approx. 10 km/h, then the steering wheel is turned to either right or left.

Q: Is diagnosis code No.C1219 set?
YES : Return to Step 1.
NO : This diagnosis is complete.

Code No. C121A SAS initialization

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the steering wheel sensor is replaced, always carry out calibration to make ASC-ECU learn the neutral point (Refer to P.35C-94).**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-93, P.35C-94 and P.35C-94).**

OPERATION

Steering wheel sensor stores the neutral position learned by M.U.T.-III. When the neutral position has not been stored in the steering wheel sensor yet, the steering wheel sensor outputs the signal indicating that it does not have neutral position.

DIAGNOSIS CODE SET CONDITIONS

This diagnosis code is set when ASC-ECU detects that the steering wheel sensor has not learned the neutral position yet.

PROBABLE CAUSES

- Neutral position of steering wheel sensor not learned
- Steering wheel sensor malfunction
- ASC-ECU malfunction

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics

Use M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Repair the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table). On completion, go to Step 2.

STEP 2. Diagnosis code recheck after resetting CAN bus lines

Q: Is diagnosis code No.C121A set?

YES : Go to Step 3.

NO : This diagnosis is complete.

STEP 3. Check how steering wheel sensor is installed.

Check that the steering wheel sensor is installed correctly (Refer to P.35C-98).

Q: Is the check result normal?

YES : Go to Step 4.

NO : Install the steering wheel sensor correctly (Refer to P.35C-98), and then go to Step 4.

STEP 4. Steering wheel sensor calibration

Perform calibration of steering wheel sensor (Refer to P.35C-94).

Q: Has the calibration succeeded?

YES : Go to Step 5.

NO : After the steering wheel sensor is replaced, perform the steering wheel sensor calibration to make ASC-ECU learn the neutral point again (Refer to P.35C-94). Then go to Step 5.

STEP 5. Check whether the diagnosis code is reset.

Erase the diagnosis code.

Q: Is diagnosis code No.C121A set?

YES : Replace the hydraulic unit (integrated with ASC-ECU) (Refer to P.35C-95), and then go to Step 6.

NO : This diagnosis is complete.

STEP 6. Check whether the diagnosis code is reset.

Erase the diagnosis code.

Q: Is diagnosis code No.C121A set?

YES : Return to Step 1.

NO : This diagnosis is complete.

Code No. C2205: SAS internal error

⚠ CAUTION
- **If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the steering wheel sensor is replaced, always carry out calibration to make ASC-ECU learn the neutral point (Refer to P.35C-94).**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-93, P.35C-94 and P.35C-94).**

OPERATION
Steering wheel sensor sends its status signal to ASC-ECU.

DIAGNOSIS CODE SET CONDITIONS
This diagnosis code is set when ASC-ECU detects that the steering wheel sensor has malfunction.

PROBABLE CAUSES
- Steering wheel sensor malfunction
- ASC-ECU malfunction
- External noise interference

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics
Use M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?
YES : Go to Step 2.
NO : Repair the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table). On completion, go to Step 4.

STEP 2. Check whether the diagnosis code is reset.
Erase the diagnosis code.

Q: Is diagnosis code No.C2205 set?
YES : Replace the steering wheel sensor (Refer to P.35C-98), and then go to Step 3.
NO : This diagnosis is complete.

STEP 3. Check whether the diagnosis code is reset.
Erase the diagnosis code.

Q: Is diagnosis code No.C2205 set?
YES : Replace the hydraulic unit (integrated with ASC-ECU) (Refer to P.35C-95), and then go to Step 4.
NO : This diagnosis is complete.

STEP 4. Check whether the diagnosis code is reset.

Q: Is diagnosis code No.C2205 set?
YES : Return to Step 1.
NO : This diagnosis is complete.

Code No.C2002: Valve calibration not completed

⚠ CAUTION
- **If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-93, P.35C-94 and P.35C-94).**

OPERATION
Perform the master cylinder pressure sensor calibration to store the calibrated value in the ASC-ECU. At the same time, the calibrated value of cut valve and inlet valve are stored.

DIAGNOSIS CODE SET CONDITIONS

This diagnosis code is set when the calibrated values for cut valve and inlet valve stored in ASC-ECU are not within the predetermined range.

PROBABLE CAUSES

- ASC-ECU malfunction
- Noise interference

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics
Use M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?
YES : Go to Step 2.
NO : Repair the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table). On completion, go to Step 2.

STEP 2. Brake fluid pressure sensor calibration
Perform calibration of brake fluid pressure sensor calibration (Refer to P.35C-94).

Q: Has the calibration succeeded?
YES : Go to Step 3.
NO : Replace the hydraulic unit (integrated with ASC-ECU) (Refer to P.35C-95), and then go to Step 4.

STEP 3. diagnosis code recheck after resetting CAN bus lines
Erase the diagnosis code.

Q: Is diagnosis code C2002 set?
YES : Replace the hydraulic unit (integrated with ASC-ECU) (Refer to P.35C-95). Then go to Step 4.
NO : The procedure is complete.

STEP 4. Check whether the diagnosis code is reset.
Erase the diagnosis code.

Q: Is diagnosis code C2002 set?
YES : Return to Step 1.
NO : The procedure is complete.

Code No. C1608 EEPROM fail

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-93, P.35C-94 and P.35C-94).**

OPERATION

The ASC-ECU stores diagnosis codes and failure information in the EEPROM*.

*NOTE: *:EEPROM (Electrical Erasable and Programmable ROM)*

DIAGNOSIS CODE SET CONDITIONS

- This diagnosis code is set when the failure information stored in the EEPROM is not reliable. The failure information stored in the past is not output, and only this diagnosis code is set.
- This diagnosis code may occur when ASC-ECU power supply shutdown or drop between ASC-ECU is writing a data to the EEPROM.

PROBABLE CAUSES

- Disconnection of the ASC-ECU connector or the battery terminal when the ignition switch is ON
- Loose battery terminal
- Abnormality in battery
- Damaged wiring harness and connectors
- ASC-ECU malfunction

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnosis
Use M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table). On completion, go to Step 2.

STEP 2. Diagnosis code recheck after resetting CAN bus lines

Q: Is diagnosis code No. C1608 set?
YES : Go to Step 3.
NO : The procedure is complete.

STEP 3. Battery check
Refer to GROUP 54A – Battery Test .

Q: Is the battery in good condition?
YES : Go to Step 5.
NO : Go to Step 4.

STEP 4. Charging system check
Refer to GROUP 16 – On–vehicle Service/Alternator Output Line Voltage Drop Test .

Q: Is the charging system in good condition?
YES : Replace the battery. Then go to Step 9.
NO : Repair or replace the charging system component(s).

STEP 5. Voltage measurement at the ASC-ECU connector
(1) Disconnect the connector, and measure at the wiring harness side.
(2) Measure the voltage between the +BV terminal and the body earth.

OK: Approximately system voltage

Q: Is the check result normal?
YES : Go to Step 7.
NO : Go to Step 6.

STEP 6. Check of short to power supply, short to earth, and open circuit in +BV line between fusible link and ASC-ECU connector

Q: Is the check result normal?
YES : Go to Step 7.
NO : Repair the fusible link, connector(s) or wiring harness.

STEP 7. Resistance measurement at ASC-ECU connector
(1) Disconnect the connector, and measure at the wiring harness side.
(2) Resistance between the GND1 terminal and the body earth, and between the GND2 terminal and the body earth.

OK: Continuity exists (2 Ω or less)

Q: Is the check result normal?
YES : Go to Step 9.
NO : Go to Step 8.

STEP 8. Check of open circuit in GND1, GND2 line between ASC-ECU connector and body earth

Q: Is the check result normal?
YES : Go to Step 9.
NO : Repair the connector(s) or wiring harness.

STEP 9. Check whether the diagnosis code is reset.
(1) Erase the diagnosis code.
(2) Drive the vehicle at 20 km/h or higher.

NOTE: The ABS warning lamp does not turn OFF in some cases unless the vehicle runs at 20 km/h or higher.

Q: Is diagnosis code No. C1608 set?
YES : Replace the hydraulic unit (integrated with ASC-ECU) (Refer to P.35C-95). Then go to step 10.
NO : Go to step 11.

STEP 10. Check whether the diagnosis code is reset.
(1) Erase the diagnosis code.
(2) Drive the vehicle at 20 km/h or higher.

NOTE: The ABS warning lamp does not turn OFF in some cases unless the vehicle runs at 20 km/h or higher.

Q: Is diagnosis code No. C1608 set?
YES : Return to Step 1.
NO : Go to step 11.

STEP 11. Check the other diagnosis code.
(1) Erase the diagnosis code.
(2) Drive the vehicle at 20 km/h or higher.

NOTE: The ABS warning lamp does not turn OFF in some cases unless the vehicle runs at 20 km/h or higher.

Q: Is any diagnosis code set?
YES : Carry out the applicable troubleshooting for the diagnosis code (Refer to).
NO : The procedure is complete.

Code No.C1707: Implausible coding data

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When diagnosis code No.C1707 is set in ASC-ECU, the diagnosis code may also be set in ETACS-ECU. When the diagnosis code is set in ETACS-ECU, carry out the diagnosis of the diagnosis code for ETACS-ECU first.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-93, P.35C-94 and P.35C-94).**

OPERATION

ASC-ECU receives the vehicle information stored in the ETACS-ECU via CAN bus lines.

DIAGNOSIS CODE SET CONDITIONS

When received invalid coding data from the ETACS-ECU, this diagnosis code is set.

PROBABLE CAUSES

- Malfunction of ETACS-ECU
- ETACS-ECUs have been interchanged between two vehicles.
- ASC-ECU malfunction
- ASC-ECUs have been interchanged between two vehicles.
- Malfunction of ETACS-ECU coding data
- Engine-ECU malfunction

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics

Use M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Repair the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table). On completion, go to Step 2.

STEP 2. Diagnosis code recheck after resetting CAN bus lines

Q: Is diagnosis code No.C1707 set?

YES : Go to Step 3.

NO : This diagnosis is complete.

STEP 3. M.U.T.-III other system diagnosis code

Use M.U.T.-III to check whether any coding-related diagnosis code is set by ETACS-ECU or engine-ECU.

Q: Is the diagnosis code set?

YES : Troubleshoot for the relevant diagnosis code.

NO : Go to Step 4.

STEP 4. Check part number of ASC-ECU

Check the part number of ASC-ECU.

Q: Is the check result normal?

YES : Go to Step 5.

NO : Replace the hydraulic unit (integrated with ASC-ECU) (Refer to P.35C-95). Then go to Step 9.

STEP 5. ETACS-ECU coding data check

Refer to GROUP 00 – Coding List .

Q: Is the check result normal?

YES : Go to Step 6.

NO : Replace the ETACS-ECU (Refer to GROUP 54A – ETACS-ECU).

STEP 6. Check part number of ETACS-ECU

Check the part number of ETACS-ECU.

Q: Is the check result normal?

YES : Go to Step 7.

NO : Replace the ETACS-ECU (Refer to GROUP 54A – ETACS-ECU).

STEP 7. Engine-ECU coding data check

Refer to GROUP 00 – Coding List .

Q: Is the check result normal?

YES : Go to Step 8.

NO : Replace the engine-ECU (Refer to GROUP 13A – Engine-ECU).

STEP 8. Check whether the diagnosis code is reset.

Erase the diagnosis code.

Q: Is diagnosis code No.C1707 set?

YES : Replace the hydraulic unit (integrated with ASC-ECU) (Refer to P.35C-95). Then go to Step 9.
NO : The trouble can be an intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/How to Cope with Intermittent Malfunctions).

STEP 9. Check whether the diagnosis code is reset.
Erase the diagnosis code.

Q: Is diagnosis code No.C1707 set?
YES : Return to Step 1.
NO : This diagnosis is complete.

Code No. U0100 Engine CAN timeout
Code No. U0101 T/M CAN timeout
Code No. U0114 4WD CAN timeout
Code No. U0126 SAS CAN timeout
Code No. U0141 ETACS CAN timeout

⚠ CAUTION
- **If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table).**
- **If diagnosis codes U0100, U0101, U0114, U0126, and U0141 are set in ASC-ECU, always diagnose the CAN bus line. If there is any fault in the CAN bus lines, an incorrect diagnosis code may be set. In this case, the set diagnosis code is not highly reliable.**
- **Before replacing the ECU, ensure that the communication circuit is normal.**
- **When the steering wheel sensor is replaced, always carry out calibration to make ASC-ECU learn the neutral point (Refer to P.35C-94).**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-93, P.35C-94 and P.35C-94).**
- **When the ETACS-ECU of vehicles without KOS is replaced, the encrypted code of the ignition key needs to be registered to the ETACS-ECU. (If the encrypted code is not registered, the engine cannot be started. Register the encrypted code as described in GROUP 54A, Immobilizer System – How to Register Key ID .)**

DIAGNOSIS CODE SET CONDITIONS
This diagnosis code is set if ASC-ECU cannot receive the signal sent from other ECU for a certain period.

OPERATION
ASC-ECU communicates with the engine-ECU, CVT-ECU, 4WD-ECU, steering wheel sensor, and ETACS-ECU via the CAN bus lines.

PROBABLE CAUSES
Code No. U0100
- Wiring harness or connector failure of CAN bus line
- Engine-ECU malfunction
- ASC-ECU malfunction

Code No. U0101
- Wiring harness or connector failure of CAN bus line
- CVT-ECU malfunction
- ASC-ECU malfunction

Code No. U0114
- Wiring harness or connector failure of CAN bus line
- 4WD-ECU malfunction
- ASC-ECU malfunction

Code No. U0126
- Wiring harness or connector failure of CAN bus line
- Steering wheel sensor malfunction
- ASC-ECU malfunction

Code No. U0141
- Wiring harness or connector failure of CAN bus line
- Malfunction of ETACS-ECU
- ASC-ECU malfunction

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnosis
Use M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?
YES : Go to Step 2.
NO : Repair the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table). On completion, go to Step 4.

STEP 2. Check whether the diagnosis code is reset.

Q: Is Code No. U0100, U0101, U0114, U0126 or U0141 set?
YES : Go to Step 3.
NO : The procedure is complete.

STEP 3. M.U.T.-III other system diagnosis code
Use M.U.T.-III to check that other diagnosis code is set in the ECU corresponding to the relevant diagnosis.

Q: Is other diagnosis code set?
YES : Troubleshoot for the relevant diagnosis code.
NO : Go to Step 4.

STEP 4. M.U.T.-III diagnosis code
Use M.U.T.-III to check if the same diagnosis code (time-out) is set in the other ECU.

Q: Is any diagnosis code set?
YES (Code No. U0100 is set) : Replace the engine-ECU, and then go to Step 5.
YES (Code No. U0101 is set) : Replace the CVT-ECU, and then go to Step 5.
YES (Code No. U0114 is set) : Replace 4WD-ECU, and then go to Step 5.
YES (Code No. U0126 is set) : Replace steering wheel sensor, and then go to Step 5.
YES (Code No. U0141 is set) : Replace the ETACS-ECU, and then go to Step 5.
NO (No diagnosis code is set.) : The procedure is complete.

STEP 5. Check whether the diagnosis code is reset.
Erase the diagnosis code.

Q: Is Code No. U0100, U0101, U0114, U0126 or U0141 set?
YES : Replace the hydraulic unit (integrated with ASC-ECU) (Refer to P.35C-95).
NO : The procedure is complete.

Code No. U0401 Engine (CAN message)

⚠ CAUTION
- **If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table).**
- **If diagnosis code No.U0401 is set in ASC-ECU, always diagnose the CAN bus line. If there is any fault in the CAN bus lines, an incorrect diagnosis code may be set. In this case, the set diagnosis code is not highly reliable.**
- **Before replacing the ECU, ensure that the communication circuit is normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-93, P.35C-94 and P.35C-94).**

OPERATION
Engine-related signals are sent or received to and from between ASC-ECU and engine-ECU via CAN bus lines.

DIAGNOSIS CODE SET CONDITIONS
This diagnosis code is set when the engine-ECU malfunction has been detected.

PROBABLE CAUSES
- Malfunction of engine system
- Malfunction of engine-ECU
- Malfunction of ASC-ECU
- External noise interference

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnosis
Use M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.
NO : Repair the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table). On completion, go to Step 5.

STEP 2. M.U.T.-III diagnosis code
Use M.U.T.-III to check that any diagnosis code other than the code No.U0401 is set in ASC-ECU.

Q: Is the diagnosis code set?
YES : Troubleshoot the relevant diagnosis code, and then go to Step 5.
NO : Go to Step 3.

STEP 3. M.U.T.-III other system diagnosis code
Use M.U.T.-III to check that the diagnosis code is set by the engine-ECU.

Q: Is the diagnosis code set?
YES : Troubleshoot the relevant diagnosis code, and then go to Step 5.
NO : Go to Step 4.

STEP 4. Check whether the diagnosis code is reset.
Erase the diagnosis code.

Q: Is diagnosis code No.U0401 set?
YES : Replace the hydraulic unit (integrated with ASC-ECU) (Refer to P.35C-95), and then go to Step 5.
NO : Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/How to Cope with Intermittent Malfunctions).

STEP 5. Check whether the diagnosis code is reset.
Erase the diagnosis code.

Q: Is diagnosis code No.U0401 set?
YES : Return to Step 1.
NO : This diagnosis is complete.

Code No. U0428 SAS (CAN message)

⚠ CAUTION
- **If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table).**
- **If diagnosis code U0428 is set in ASC-ECU, always diagnose the CAN bus line. If there is any fault in the CAN bus lines, an incorrect diagnosis code may be set. In this case, the set diagnosis code is not highly reliable.**
- **Before replacing the ECU, ensure that the communication circuit is normal.**
- **When the steering wheel sensor is replaced, always carry out calibration to make ASC-ECU learn the neutral point (Refer to P.35C-94).**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-93, P.35C-94 and P.35C-94).**

OPERATION
The steering wheel sensor outputs the steering wheel status to ASC-ECU via the CAN bus lines.

DIAGNOSIS CODE SET CONDITIONS
This diagnosis code is set when ASC-ECU has detected the communication error in the steering wheel sensor.

PROBABLE CAUSES
- Steering wheel sensor malfunction
- ASC-ECU malfunction
- External noise interference

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics
Use M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?
YES : Replace the steering wheel sensor (Refer to P.35C-98). Then go to Step 2.
NO : Repair the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table). On completion, go to Step 3.

STEP 2. Check whether the diagnosis code is reset.
Erase the diagnosis code.

Q: Is diagnosis code No.U0428 set?

YES : Replace the hydraulic unit (integrated with ASC-ECU) (Refer to P.35C-95).
NO : This diagnosis is complete.

STEP 3. Check whether the diagnosis code is reset.
Erase the diagnosis code.

Q: Is diagnosis code No.U0428 set?
YES : Return to Step 1.
NO : This diagnosis is complete.

Code No. U1073 Bus-off

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table).**
- **If diagnosis code U1073 is set in ASC-ECU, always diagnose the CAN bus line. If there is any fault in the CAN bus lines, an incorrect diagnosis code may be set. In this case, the set diagnosis code is not highly reliable.**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-93, P.35C-94 and P.35C-94).**

DIAGNOSIS CODE SET CONDITIONS

This diagnosis code is set when ASC-ECU has ceased the CAN communication (bus off).

COMMENTS ON TROUBLE SYMPTOM

Malfunction of wiring harness, connector (s), or ASC-ECU may be present.

PROBABLE CAUSES

- Wiring harness or connector failure of CAN bus line
- ASC-ECU malfunction
- Other ECU malfunction

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnosis
Use M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?
YES : Go to Step 2.
NO : Repair the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table). On completion, go to Step 3.

STEP 2. Check whether the diagnosis code is reset.
Erase the diagnosis code.

Q: Is diagnosis code No. U1073 set?
YES : Replace the hydraulic unit (integrated with ASC-ECU) (Refer to P.35C-95), and then go to Step 3.
NO : If the trouble symptom is resolved, an intermittent malfunction such as poorly engaged connector(s) or wiring harness is suspected (Refer to GROUP 00 – How to Use Troubleshooting/How to Cope with Intermittent Malfunctions).

STEP 3. Check whether the diagnosis code is reset.
Erase the diagnosis code.

Q: Is diagnosis code No. U1073 set?
YES : Return to Step 1.
NO : This diagnosis is complete.

Code No. U1195 Coding not completed
Code No. U1197 Coding data unavailable

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the diagnosis code U1195 or U1197 is set in ASC-ECU, the diagnosis code may also be set in ETACS-ECU. When the diagnosis code is set in ETACS-ECU, carry out the diagnosis of the diagnosis code for ETACS-ECU first.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-93, P.35C-94 and P.35C-94).**

OPERATION

ASC-ECU receives the vehicle information stored in the ETACS-ECU via CAN bus lines.

DIAGNOSIS CODE SET CONDITIONS

ASC-ECU communicates with ETACS-ECU via CAN bus lines.
This diagnosis code No.U1195 is set when the variant coding for ETACS-ECU has not been implemented.
This diagnosis code No.U1197 is set when there is difference between the vehicle information from the ETACS-ECU and the vehicle information stored in the ASC-ECU.

PROBABLE CAUSES

Code No.C1195 is set

- Variant coding for ETACS-ECU has not been implemented.
- ASC-ECU malfunction

Code No.C1197 is set

- Malfunction of ETACS-ECU
- ETACS-ECU have been interchanged between two vehicles.
- ASC-ECU malfunction
- External noise interference
- ASC-ECU have been interchanged between two vehicles.

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics
Use M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?
YES : Go to Step 3.
NO : Repair the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table). On completion, go to Step 2.

STEP 2. Diagnosis code recheck after resetting CAN bus lines

Q: Is the diagnosis code No. U1195 or U1197 set?
YES : Go to Step 3.
NO : The procedure is complete.

STEP 3. M.U.T.-III other system diagnosis code
Use M.U.T.-III to check whether the ETACS-ECU-related or engine ECU-related diagnosis code is set or not.

Q: Is any diagnosis code set?
YES : Troubleshoot for the relevant diagnosis code.
NO : Go to Step 4.

STEP 4. Check ETACS coding data
Refer to GROUP 00 – Coding List .

Q: Is the check result normal?
YES : Go to Step 6.
NO : Go to Step 5.

STEP 5. ETACS-ECU variant coding
Perform the variant coding to the ETACS-ECU.

Q: Dose variant coding succeed?
YES : Go to Step 7.
NO : Replace the hydraulic unit (integrated with ASC-ECU) (Refer to P.35C-95), and then go to Step 7.

STEP 6. Check part number of ASC-ECU
Check the part number of ASC-ECU.

Q: Is the check result normal?
YES : Go to Step 7.
NO : Replace the hydraulic unit (integrated with ASC-ECU) (Refer to P.35C-95). Then go to Step 8.

STEP 7. Check whether the diagnosis code is reset.

(1) Erase the diagnosis code.
(2) Turn the ignition switch to the "OFF" position.
(3) Turn the ignition switch to the "ON" position.
(4) Turn the ignition switch to the "OFF" position.
(5) Turn the ignition switch to the "ON" position.
(6) Check that the ABS warning lamp goes out.

Q: Is the diagnosis code No.U1195 or U1197 set?
YES : Replace the hydraulic unit (ASC-ECU) (Refer to). Then go to Step 8.
NO : The trouble can be an intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/How to Cope with Intermittent Malfunctions).

STEP 8. Check whether the diagnosis code is reset.

(1) Erase the diagnosis code.
(2) Turn the ignition switch to the "OFF" position.
(3) Turn the ignition switch to the "ON" position.
(4) Turn the ignition switch to the "OFF" position.
(5) Turn the ignition switch to the "ON" position.
(6) Check that the ABS warning lamp goes out.

Q: Is the diagnosis code No.U1195 or U1197 set?
YES : Return to Step 1.
NO : This diagnosis is complete.

TROUBLE SYMPTOM CHART

M1355006900996

⚠ CAUTION

- **ABS may operate in the following conditions without hard braking: Low mu road surface, high-speed turn, and bumpy road surface. When asking the customers, confirm that they have/have not encountered ABS operation in corresponding conditions.**
- **During ABS operation, the brake pedal is pulled forward gradually, and the noise occurs at the same time. This is because the brake line pressure varies intermittently to prevent the wheel lock, and not a system malfunction.**
- **During diagnosis, a diagnosis code associated with other system may be set when the ignition switch is turned on with connector(s) disconnected. On completion, confirm all systems for diagnosis code(s). If diagnosis code(s) are set, erase them all.**

Trouble symptom		Inspection procedure number	Reference page
M.U.T.-III cannot communicate with the ABS/ASC system is impossible.	M.U.T.-III cannot communicate with all systems.	–	Refer to GROUP 54C – Troubleshooting .
	M.U.T.-III cannot communicate only with ASC-ECU.	1	P.35C-66
ASC OFF lamp flashes at a rate of 2Hz.		2	P.35C-66
Brake warning lamp stays ON with the parking brake lever released (ABS warning lamp is OFF).		3	P.35C-67
ABS warning lamp does not illuminate when ignition switch is turned to the ON position (Engine stopped).		4	P.35C-69
Brake warning lamp does not illuminate when the ignition switch is turned to ON position (Engine stopped).		5	P.35C-70
ABS warning lamp stays ON after the engine is started.		6	P.35C-71
ASC warning lamp stays ON after the engine is started.		7	P.35C-72
ASC OFF lamp stays ON after the engine is started.		8	P.35C-73
The stability control/TCL system cannot be disabled when ASC OFF switch is pressed for 3 seconds or more to turn the system OFF.		9	P.35C-75
Abnormality in brake operation.		10	P.35C-75

Trouble symptom	Inspection procedure number	Reference page
ASC does not operate or faulty ASC operate.	11	P.35C-76
ASC-ECU power supply circuit system.	12	P.35C-77
Steering wheel sensor power supply circuit system	13	P.35C-79
ABS/stability control/TCL operates too frequently.	14	P.35C-80
HSA (Hill Start Assist) does not work.	15	P.35C-82
HSA (Hill Start Assist) works on a flat road.	16	P.35C-84
The initial check sound of hydraulic unit is loud	17	P.35C-84

SYMPTOM PROCEDURES

Inspection Procedure 1: M.U.T.-III communication with ABS/ASC system is impossible.

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **If the power is supplied with the earth circuit of CAN communication device open circuited, an electric potential abnormality may occur to the CAN bus lines.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-93, P.35C-94 and P.35C-94).**

COMMENTS ON TROUBLE SYMPTOM

When M.U.T.-III cannot communicate with the ABS/ASC system, the CAN bus lines, ASC-ECU power supply circuit system, earth, or ASC-ECU may be faulty.

PROBABLE CAUSES

- Damaged wiring harness and connectors
- ASC-ECU malfunction
- Wrong routing of M.U.T.-III harness
- Abnormality in battery or alternator
- Abnormality in power supply voltage to ASC-ECU
- ECU malfunction of other system

M.U.T.-III CAN bus diagnosis

Use M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Check the power supply circuit, and repair if necessary (Refer to P.35C-77).

NO : Repair the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table).

Inspection Procedure 2: ASC OFF lamp flashes at a rate of 2Hz.

OPERATION

When the ASC OFF lamp flashes at a rate of 2 Hz, the TCL control (brake control only) is prohibited.

COMMENTS ON TROUBLE SYMPTOM

This operation is performed for the following reasons and is not a malfunction.

- ASC-ECU calculates the estimated temperature of the brake pad. In general, as the brake pad temperature increases, the coefficient of friction for the brake pad becomes smaller, resulting in the reduced braking force. When the estimated temperature of the brake pad reaches the specified value or more, ASC-ECU flashes the ASC OFF lamp at a rate of 2 Hz to warn the driver that the brake controllability by TCL is decreased by the reduced braking force. Consequently, ASC-ECU prohibits the TCL control (brake control only) until it determines that the estimated temperature of the brake pad is normal.

PROBABLE CAUSES

- Overheat of brake pad

Inspection Procedure 3: Brake warning lamp stays ON with the parking brake lever released (ABS warning lamp is OFF).

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**

OPERATION

- When the parking brake switch is turned ON, the combination meter (BRK terminal) is earthed, and the brake warning lamp illuminates.
- When reduction of the brake fluid amount is detected, the brake fluid level switch is turned from ON to OFF. ETACS-ECU monitors the brake fluid level switch, and instructs the combination meter via the CAN bus line to illuminate the brake warning lamp.

PROBABLE CAUSES

- The brake pad thickness is at the limit value or less.
- The brake fluid amount is at the "LOWER" level or lower.
- Poor adjustment of the parking brake lever
- Damaged wiring harness and connectors
- Parking brake switch malfunction
- Malfunction of brake fluid level switch
- Combination meter malfunction
- Malfunction of ETACS-ECU

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics

Use M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

NO : Repair the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table).

STEP 2. M.U.T.-III diagnosis code for other systems.

Use M.U.T.-III to check that the diagnosis code is set in the combination meter and ETACS-ECU.

Q: Is the diagnosis code set?

YES : Carry out the diagnosis for the diagnosis code.

NO : Go to Step 3.

STEP 3. Brake fluid level check

Check that the brake fluid is filled up to the "MIN" level or higher.

Q: Is the check result normal?

YES : Go to Step 5.

NO : Go to Step 4.

STEP 4. Brake pad check

Refer to GROUP 35A – On-vehicle Service/Brake Pad Check .

Q: Is the check result normal?

YES : Fill the brake fluid up to the "MAX" level. Then go to Step 5.

NO : Replace the brake pad (Refer to GROUP 35A – On-vehicle Service/Brake Pad Replacement). Then go to Step 14.

STEP 5. M.U.T.-III data list for other system

Check the ETACS-ECU system data list.

Item No.	Item name	Normal condition
279	Brake fluid switch	ON

Q: Is the check result normal?

YES : Go to Step 10.

NO : Go to Step 6.

STEP 6. Brake fluid level switch check
Refer to GROUP 35A – On-vehicle Service/Brake Fluid Level Switch Check .

Q: Is the check result normal?
YES : Go to Step 7.
NO : Replace the reservoir tank assembly (Refer to GROUP 35A – Master Cylinder Assembly and Brake Booster). Then go to Step 14.

STEP 7. Resistance measurement at brake fluid level switch connector.
(1) Disconnect the connector, and measure at the wiring harness side.
(2) Measure the resistance between the brake fluid level switch connector (earth terminal) and the body earth.

OK: Continuity exists (2 Ω or less)

Q: Is the check result normal?
YES : Go to Step 9.
NO : Go to Step 8.

STEP 8. Check of open circuit in earth line between brake fluid level switch connector and the body earth

Q: Is the check result normal?
YES : Go to Step 9.
NO : Repair the connector(s) or wiring harness.

STEP 9. Check of short to power supply, short to earth, and open circuit in HL1+ line between ETACS-ECU connector and brake fluid level switch connector

Q: Is the check result normal?
YES : Replace the ETACS-ECU (Refer to GROUP 54A – ETACS-ECU). Then go to Step 14.
NO : Repair the connector(s) or wiring harness.

STEP 10. Parking brake lever stroke check
Refer to GROUP 36 – On-vehicle Service/Parking Brake Lever Stroke Check and Adjustment .

Q: Is the check result normal?
YES : Go to Step 11.
NO : Adjust the parking brake lever stroke (Refer to GROUP 36 – On-vehicle Service/Parking Brake Lever Stroke Check and Adjustment). Then go to Step 14.

STEP 11. Parking brake switch check
Refer to GROUP 36 – On-vehicle Service/Parking Brake Switch Check .

Q: Is the check result normal?
YES : Go to Step 12.
NO : Replace the parking brake switch (Refer to GROUP 36 – Parking Brake Lever). Then go to Step 14.

STEP 12. Check of short to power supply, short to earth, and open circuit in BRK line between combination meter connector and parking brake switch connector

Q: Is the check result normal?
YES : Go to Step 13.
NO : Repair the connector(s) or wiring harness.

STEP 13. Retest the system.

Q: Does the brake warning lamp turn ON and OFF normally according to the parking brake lever operation?
YES : Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/How to Cope with Intermittent Malfunctions).
NO : Replace the combination meter assembly (Refer to GROUP 54A – Combination Meter). Then go to Step 14.

STEP 14. Retest the system.

Q: Does the brake warning lamp turn ON and OFF normally according to the parking brake lever operation?
YES : This diagnosis is complete.
NO : Return to Step 1.

Inspection Procedure 4: ABS warning lamp does not illuminate when ignition switch is turned to the ON position (engine stopped).

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table).**
- **Before replacing the ECU, ensure that the communication circuit is normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-93, P.35C-94 and P.35C-94).**

OPERATION

- ASC-ECU sends the illumination request signal of the ABS warning lamp to the combination meter through ETACS-ECU via CAN communication.
- ASC-ECU illuminates the ABS warning lamp via ETACS-ECU for approximately 3 seconds for valve check with the ignition switch turned to the ON position.

COMMENTS ON TROUBLE SYMPTOM

This may be caused by faults in the CAN bus line, ETACS-ECU, combination meter or ASC-ECU.

PROBABLE CAUSES

- Damaged wiring harness and connectors
- Malfunction of ETACS-ECU
- Combination meter malfunction
- ASC-ECU malfunction
- Malfunction of coding data for ETACS-ECU

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics

Use M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

NO : Repair the CAN bus lines. (Refer to GROUP 54C – CAN Bus Diagnostics Table .)

STEP 2. M.U.T.-III diagnosis code

Use M.U.T.-III to check the diagnosis code for the ASC system (Refer to P.35C-15).

Q: Is the diagnosis code set?

YES : Carry out the diagnosis for the diagnosis code (Refer to P.35C-15).

NO : Go to Step 3.

STEP 3. M.U.T.-III Special Function for other system

Perform the following special function by the combination meter system, and check if the ABS warning lamp illuminates (Refer to GROUP 54A – Combination Meter).

- Item 6: Indicator (AUTO)

Q: Is the check result normal?

YES : Go to Step 4.

NO : Replace the combination meter.

STEP 4. ETACS-ECU coding data check

Use M.U.T.-III to check if coding data stored in ETACS-ECU is normal (Refer to GROUP 00 – Precautions before Service/Coding List).

Q: Is the check result normal?

YES : Go to Step 6.

NO : Go to Step 5.

STEP 5. ETACS-ECU coding data check

Perform the variant coding to the ETACS-ECU.

Q: Is the check result normal?

YES : Go to Step 9.

NO : Replace the ETACS-ECU (Refer to GROUP 54A – ETACS-ECU), and then go to Step 9.

STEP 6. M.U.T.-III diagnosis code for other systems

Using M.U.T.-III, check that the diagnosis code No. U0141 is not set by the combination meter system.

Q: Is the diagnosis code set?

YES : Diagnose the combination meter (Refer to GROUP 54A – Combination Meter/Troubleshooting). Then go to Step 9.

NO : Go to Step 7.

STEP 7. M.U.T.-III diagnosis code for other systems

Using M.U.T.-III, check that the diagnosis code No.U0121 is not set by the ETACS system.

Q: Is the diagnosis code set?

YES : Troubleshoot the ETACS-ECU (Refer to GROUP 54A – ETACS-ECU/Troubleshooting), and then go to Step 9.
NO : Go to Step 8.

STEP 8. Retest the system.

Q: Does the ABS warning lamp turn ON and OFF normally?

YES : Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/How to Cope with Intermittent Malfunction).
NO : Replace the hydraulic unit (integrated with ASC-ECU) (Refer to P.35C-95), and then go to Step 9.

STEP 9. Retest the system.

Q: Does the ABS warning lamp turn ON and OFF normally?
YES : This diagnosis is complete.
NO : Return to Step 1.

Inspection Procedure 5: Brake warning lamp does not illuminate when the ignition switch is turned to ON position (engine stopped).

⚠ CAUTION
- **If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-93, P.35C-94 and P.35C-94).**

OPERATION
- ASC-ECU sends the illumination request signal of the break warning lamp to the combination meter through ETACS-ECU via the CAN communication.
- ASC-ECU illuminates brake warning lamp via ETACS-ECU for approximately 3 seconds for bulb check with the ignition switch turned to the ON position.

COMMENTS ON TROUBLE SYMPTOM
This may be caused by faults in the CAN bus line, ETACS-ECU, combination meter or ASC-ECU.

PROBABLE CAUSES
- Damaged wiring harness and connectors
- Malfunction of ETACS-ECU
- Malfunction of the combination meter
- ASC-ECU malfunction

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics
Use M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?
YES : Go to Step 2.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – CAN Bus Diagnostics Table .) Then go to Step 7.

STEP 2. M.U.T.-III diagnosis code
Use M.U.T.-III to check the diagnosis code for the ASC system.

Q: Is the diagnosis code set?
YES : Carry out the diagnosis for the diagnosis code (Refer to P.35C-15).
NO : Go to Step 3.

STEP 3. M.U.T.-III Special Function for other system
Perform the following special function by the combination meter system, and check if the ABS warning lamp illuminates (Refer to GROUP 54A – Combination Meter).
- Item 6: Indicator (AUTO)

Q: Is the check result normal?
YES : Go to Step 4.
NO : Replace the combination meter.

STEP 4. M.U.T.-III other system diagnosis code
Using M.U.T.-III, check that diagnosis code No.U0141 is not set by the combination meter system.

Q: Is the diagnosis code set?
YES : Diagnose the combination meter (Refer to GROUP 54A – Combination Meter/Diagnosis Code). Then go to Step 7.
NO : Go to Step 5.

STEP 5. M.U.T.-III other system diagnosis code
Using M.U.T.-III, check that diagnosis code No.U0121 is not set by the ETACS system.

Q: Is the diagnosis code set?
YES : Perform troubleshooting on ETACS-ECU (Refer to GROUP 54A – ETACS/Diagnosis Code). Then go to Step 7.
NO : Go to Step 6.

STEP 6. Retest the system.

Q: Does the brake warning lamp turn ON and OFF
YES : Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/How to Cope with Intermittent Malfunctions).
NO : Replace the hydraulic unit (ASC-ECU) (Refer to P.35C-95), and then go to Step 7.

STEP 7. Retest the system.

Q: Does the brake warning lamp turn ON and OFF normally?
YES : This diagnosis is complete.
NO : Return to Step 1.

Inspection Procedure 6: ABS warning lamp stays ON after the engine is started.

⚠ CAUTION
- **If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-93, P.35C-94 and P.35C-94).**

OPERATION
- ASC-ECU sends the illumination request signal of the ABS warning lamp to the combination meter through ETACS-ECU via CAN communication.
- ASC-ECU illuminates the ABS warning lamp via ETACS-ECU for approximately 3 seconds for valve check with the ignition switch turned to the ON position.

COMMENTS ON TROUBLE SYMPTOM
This may be caused by faults in the CAN bus line, ETACS-ECU, combination meter or ASC-ECU.

PROBABLE CAUSES
- Damaged wiring harness and connectors
- Malfunction of ETACS-ECU
- Combination meter malfunction
- ASC-ECU malfunction
- Control stop due to the low voltage

NOTE: Due to the abnormality in the supply voltage, the diagnosis code may not be set even when the ABS warning lamp is illuminated.

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnosis
Use M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?
YES : Go to Step 2.
NO : Repair the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table). Then go to Step 7.

STEP 2. M.U.T.-III diagnosis code
Use M.U.T.-III to check the diagnosis code for the ASC system.

Q: Is the diagnosis code set?
YES : Carry out the diagnosis for the diagnosis code (Refer to P.35C-15).
NO : Go to Step 3.

STEP 3. Check the ASC-ECU power supply circuit system.
Refer to P.35C-77 .

Q: Is the check result normal?
YES : Go to Step 4.
NO : Diagnose the power supply circuit of the ASC-ECU (Refer to P.35C-77).

STEP 4. M.U.T.-III other system diagnosis code
Using M.U.T.-III, check that diagnosis code No.U0141 is not set by the combination meter system.

Q: Is the diagnosis code set?
YES : Diagnose the combination meter (Refer to GROUP 54A – Combination Meter/Diagnosis Code). Then go to Step 7.
NO : Go to Step 5.

STEP 5. M.U.T.-III other system diagnosis code
Using M.U.T.-III, check that diagnosis code No.U0121 is not set by the ETACS system.

Q: Is the diagnosis code set?
YES : Perform troubleshooting on ETACS-ECU (Refer to GROUP 54A – ETACS/Diagnosis Code). Then go to Step 7.
NO : Go to Step 6.

STEP 6. Retest the system.
(1) Erase the diagnosis code.
(2) Drive the vehicle at 10 km/h or higher.

Q: Does the ABS warning lamp turn ON and OFF normally?
YES : Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/How to Cope with Intermittent Malfunctions).
NO : Replace the hydraulic unit (integrated with ASC-ECU) (Refer to P.35C-95), and then go to Step 7.

STEP 7. Retest the system.
(1) Erase the diagnosis code.
(2) Drive the vehicle at 10 km/h or higher.

Q: Does the ABS warning lamp turn ON and OFF normally?
YES : This diagnosis is complete.
NO : Return to Step 1.

Inspection Procedure 7: ASC warning lamp stays ON after the engine is started.

⚠ CAUTION
- **If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-93, P.35C-94 and P.35C-94).**

OPERATION
ASC-ECU sends the illumination request signal of the ASC warning lamp to the combination meter through ETACS-ECU via the CAN communication.

COMMENTS ON TROUBLE SYMPTOM
This may be caused by faults in the CAN bus line, ETACS-ECU, combination meter or ASC-ECU.

PROBABLE CAUSES
- Damaged wiring harness and connectors
- Malfunction of ETACS-ECU
- Combination meter malfunction
- ASC-ECU malfunction
- Control is disabled due to the low voltage

NOTE: Due to the abnormality in the supply voltage, the diagnosis code may not be set even when the ASC lamp illuminates.

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnosis
Use M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?
YES : Go to Step 2.
NO : Repair the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table). Then go to Step 8.

STEP 2. M.U.T.-III diagnosis code
Use M.U.T.-III to check the diagnosis code for the ASC system.

Q: Is the diagnosis code set?
YES : Carry out the diagnosis for the diagnosis code (Refer to P.35C-15).
NO : Go to Step 3.

STEP 3. M.U.T.-III Special Function for other system
Perform the following special function by the combination meter system, and check if the ASC warning lamp illuminates (Refer to GROUP 54A – Combination Meter).
- Item 2: LCD (AUTO)
- Item 6: Indicator (AUTO)

Q: Is the check result normal?
YES : Go to Step 4.
NO : Replace the combination meter. Then go to Step 8.

STEP 4. Check the ASC-ECU power supply circuit system.
Refer to P.35C-77.

Q: Is the check result normal?
YES : Go to Step 5.
NO : Diagnose the power supply circuit of the ASC-ECU (Refer to P.35C-77).

STEP 5. M.U.T.-III other system diagnosis code
Using M.U.T.-III, check that diagnosis code No.U0141 is not set by the combination meter system.

Q: Is the diagnosis code set?
YES : Diagnose the combination meter (Refer to GROUP 54A – Combination Meter/Diagnosis Code). Then go to Step 8.
NO : Go to Step 6.

STEP 6. M.U.T.-III other system diagnosis code
Using M.U.T.-III, check that diagnosis code No.U0121 is not set by the ETACS system.

Q: Is the diagnosis code set?
YES : Perform troubleshooting on ETACS-ECU (Refer to GROUP 54A – ETACS/Diagnosis Code). Then go to Step 8.
NO : Go to Step 7.

STEP 7. Retest the system.

Q: Does the ASC warning lamp turn ON and OFF normally?
YES : Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/How to Cope with Intermittent Malfunctions).
NO : Replace the hydraulic unit (integrated with ASC-ECU) (Refer to P.35C-95), and then go to Step 8.

STEP 8. Retest the system.

Q: Does the ASC lamp turn ON and OFF normally?
YES : This diagnosis is complete.
NO : Return to Step 1.

Inspection Procedure 8: ASC OFF lamp stays ON after the engine is started.

⚠ CAUTION
- **If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-93, P.35C-94 and P.35C-94).**

OPERATION
- ASC-ECU sends the illumination request signal of ASC OFF lamp to the combination meter through ETACS-ECU via CAN communication.
- By the operation of ASC OFF switch, the ASC OFF lamp illuminates when the ASC function is stopped.
- When the ASC OFF switch is pressed for 3 seconds or more, the ASC system turns OFF.

- When the ASC OFF switch is pressed for 15 seconds or more, the ASC is kept in ON state and the system cannot be turned OFF until the ignition switch is turned to the ON position next time.

COMMENTS ON TROUBLE SYMPTOM

This may be caused by faults in the CAN bus line, ETACS-ECU, combination meter or ASC-ECU.

PROBABLE CAUSES

- Damaged wiring harness and connectors
- Malfunction of ETACS-ECU
- Combination meter malfunction
- ASC-ECU malfunction

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics

Use M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

NO : Repair the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table). Then go to Step 8.

STEP 2. M.U.T.-III diagnosis code

Use M.U.T.-III to check the diagnosis code for the ASC system.

Q: Is the diagnosis code set?

YES : Carry out the diagnosis for the diagnosis code (Refer to P.35C-15).

NO : Go to Step 3.

STEP 3. M.U.T.-III Special Function for other system

Perform the following special function by the combination meter system, and check if the ABS warning lamp illuminates (Refer to GROUP 54A – Combination Meter).

- Item 2: LCD (AUTO)

Q: Is the check result normal?

YES : Go to Step 4.

NO : Replace the combination meter. Then go to Step 8.

STEP 4. M.U.T.-III data list for other system

Check the ETACS-ECU system data list.

- ASC OFF switch: During ON operation

Item No.	Item name	Normal condition
281	ASC/TCL OFF switch	ON

Q: Is the check result normal?

YES : Go to Step 5.

NO : Refer to GROUP 54A – ETACS, Inspection Procedure 15 "The ASC OFF switch signal is not received." .

STEP 5. M.U.T.-III diagnosis code for other systems

Using M.U.T.-III, check that diagnosis code No. U0141 is not set by the combination meter system.

Q: Is the diagnosis code set?

YES : Diagnose the combination meter (Refer to GROUP 54A – Combination Meter/Diagnosis Code). Then go to Step 8.

NO : Go to Step 6.

STEP 6. M.U.T.-III diagnosis code for other systems

Using M.U.T.-III, check that diagnosis code No. U0121 is not set by the ETACS system.

Q: Is the diagnosis code set?

YES : Perform troubleshooting on ETACS-ECU (Refer to GROUP 54A – ETACS/Diagnosis Code). Then go to Step 7.

NO : Go to Step 7.

STEP 7. Retest the system.

Q: Does ASC OFF lamp turn ON and OFF normally?

YES : Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/How to Cope with Intermittent Malfunctions).

NO : Replace the hydraulic unit (integrated with ASC-ECU) (Refer to P.35C-95). Then go to Step 8.

STEP 8. Retest the system.

Q: Does ASC OFF lamp turn ON and OFF normally?

YES : This diagnosis is complete.

NO : Return to Step 1.

Inspection Procedure 9: The stability control/TCL system cannot be disabled when ASC OFF switch is pressed for 3 seconds or more to turn the system OFF.

⚠ CAUTION
- **If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**

OPERATION
- ETACS-ECU (ASCS terminal) is earthed by pressing ASC OFF switch. The ON/OFF state of ASC OFF switch is transferred from ETACS-ECU to ASC-ECU via CAN bus line.
- When the ASC OFF switch is pressed for 3 seconds or more, the ASC system turns OFF.
- When the ASC OFF switch is pressed and held for 15 seconds or more, ASC turns ON.

COMMENTS ON TROUBLE SYMPTOM
This may be caused by the open and short circuit in the ASC OFF switch circuit.

PROBABLE CAUSES
- Damaged wiring harness and connectors
- ASC OFF switch malfunction
- Malfunction of ETACS-ECU

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnosis
Use M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?
YES : Go to step2.
NO : Repair the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table).

STEP 2. M.U.T.-III data list for other system
Check the ETACS-ECU system data list.
- ASC OFF switch: During ON operation

Item No.	Item name	Normal condition
281	ASC/TCL OFF switch	ON

Q: Is the check result normal?
YES : Go to Step 3.
NO : Refer to GROUP 54A – ETACS, Inspection Procedure 15 "The ASC OFF switch signal is not received." .

STEP 3. Retest the system.

Q: Does ASC turn ON and OFF normally using ASC OFF switch?
YES : Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/How to Cope with Intermittent Malfunction).
NO : Replace the ETACS-ECU (Refer to GROUP 54A – ETACS-ECU). Then go to Step 4.

STEP 4. Retest the system.

Q: Does ASC turn ON and OFF normally using ASC OFF switch?
YES : This diagnosis is complete.
NO : Return to Step 1.

Inspection Procedure 10: Abnormality in brake operation

⚠ CAUTION
- **If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-93, P.35C-94 and P.35C-94).**

COMMENTS ON TROUBLE SYMPTOM
Although the cause of the trouble cannot be clearly resolved since it depends on the running status and road surface condition, the malfunction of the hydraulic circuit may occur if any diagnosis code is not detected.

PROBABLE CAUSES
- Hydraulic unit (Integrated with ASC-ECU) malfunction

- Malfunction of hydraulic circuit
- Malfunction of brake assembly
- Malfunction of brake booster
- Malfunction of master cylinder assembly

DIAGNOSIS PROCEDURE

STEP 1. Diagnosis code check
Use M.U.T.-III to check the diagnosis code for the ASC system. (Refer to P.35C-15.)

Q: Is the check result normal?
YES : Go to Step 2.
NO : Troubleshoot for the relevant diagnosis code (Refer to P.35C-15).

STEP 2. Hydraulic unit (Integrated with ASC-ECU) check
Check that the brake tube is installed to the hydraulic unit (integrated with ASC-ECU) correctly (Refer to P.35C-90).

Q: Is the check result normal?
YES : Go to Step 3.
NO : Connect the brake tubes correctly, repair the external brake lines, or replace the hydraulic unit (integrated with ASC-ECU) (Refer to P.35C-95).

STEP 3. Brake operation check
Perform the following checks.
- Brake pedal check (Refer to GROUP 35A – On-vehicle Service/Brake Pedal Check).
- Brake booster check (Refer to GROUP 35A – On-vehicle Service/Brake Booster Operating Check).
- Check valve check (Refer to GROUP 35A – On-vehicle Service/Check Valve Operation Check).

Q: Can any fault be found with the brake operation?
YES : Check the brake-related parts, and repair if necessary. Then, go to Step 4.
NO : Go to Step 4.

STEP 4. Hydraulic unit check
Perform the following actuator tests (Refer to P.35C-87).
- Item No.01: FL wheel ABS drive
- Item No.02: FR wheel ABS drive
- Item No.03: RL wheel ABS drive
- Item No.04: RR wheel ABS drive
- Item No.05: FL wheel TCL drive
- Item No.06: FR wheel TCL drive
- Item No.07: RL wheel TCL drive
- Item No.08: RR wheel TCL drive

Q: Is the check result normal?
YES : This diagnosis is complete.
NO : Replace the hydraulic unit (integrated with ASC-ECU) (Refer to P.35C-95).

Inspection Procedure 11: ASC does not operate or faulty ASC operate.

⚠ CAUTION
- **If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-93, P.35C-94 and P.35C-94).**

COMMENTS ON TROUBLE SYMPTOM
In case of this trouble symptom, the stability control/TCL system operation may be disabled. Diagnosis code may be set by the stability control/TCL system using M.U.T.-III.

PROBABLE CAUSES
- Low battery output
- Wiring harness or connector failure of CAN bus line
- ASC-ECU malfunction
- Engine coding data problem

DIAGNOSIS PROCEDURE

STEP 1. Diagnosis code check
Use M.U.T.-III to check the diagnosis code for the ASC system (Refer to P.35C-15).

Q: Is the check result normal?

YES : Go to Step 2.
NO : Carry out the diagnosis for the diagnosis code (Refer to P.35C-15).

STEP 2. Engine ECU coding data check
Using M.U.T.-III, check if any abnormality is present to the coding data below which are stored in the engine-ECU (Refer to GROUP 00 – Precautions before Service/Coding List).

A.S.C.
OK: Available

Q: Is the check result normal?
YES : Go to Step 4.
NO : Go to Step 3 .

STEP 3. Engine ECU coding data check
Perform the variant coding to the Engine ECU.

Q: Is the check result normal?
YES : Go to Step 5.
NO : Replace the engine ECU (Refer to GROUP 13A – Engine-ECU). Then go to Step 5.

STEP 4. Hydraulic unit (integrated with ASC-ECU) check
Check that the brake tube is correctly mounted to the hydraulic unit (integrated with ASC-ECU) (Refer to P.35C-90).

Q: Is the check result normal?
YES : Replace the hydraulic unit (integrated with ASC-ECU) (Refer to P.35C-90). Then go to Step 5.
NO : Connect the brake tubes correctly, and repair or replace the external brake lines of the hydraulic unit (integrated with ASC-ECU).

STEP 5. Operation check

Q: Does stability control/TCL operate normally?
YES : This diagnosis is complete.
NO : Check the brake system related components other than the stability control/TCL system.

Inspection Procedure 12: ASC-ECU power supply circuit system.

⚠ CAUTION
- **When the ASC-ECU power supply voltage becomes 9.7 ± 0.3 V or less, the ABS warning lamp, ASC warning display, and ASC OFF display illuminate, and the ABS, stability control, and TCL controls are prohibited.**
- **If the battery terminal is not tightened properly, a dump surge may occur and the power supply voltage may become abnormally high for a short time.**
- **If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-93, P.35C-94 and P.35C-94).**

OPERATION
- ASC-ECU contains the power supply circuit (+BV terminal) for the solenoid valve. The solenoid valve is energized by the valve relay, which is incorporated in ASC-ECU.
- ASC-ECU contains the power supply circuit (IG1 terminal) for ASC-ECU. When the ignition switch (IG1) is turned ON, the voltage is applied to the relay incorporated in ETACS-ECU to turn ON the relay, and the power is supplied from the fusible link.
- ASC-ECU contains the power supply circuit (+BM terminal) for the pump motor. The pump motor is energised by the motor switch, which is incorporated in ASC-ECU.
- When malfunction occurs in ASC-ECU power supply, the communication with M.U.T.-III becomes unavailable.

PROBABLE CAUSES
- Damaged wiring harness and connectors
- Fusible link malfunction
- Improper tightening of battery terminal
- Improper tightening of earth bolt
- Battery failure
- Charging system failed
- ASC-ECU malfunction

DIAGNOSIS PROCEDURE

STEP 1. Battery check
Refer to GROUP 54A – Battery Test .

Q: Is the battery in good condition?
YES : Go to Step 3.
NO : Charge or replace the battery. Then go to Step 2.

STEP 2. Charging system check
Refer to GROUP 16 – On–vehicle Service/Alternator Output Line Voltage Drop Test .

Q: Is the charging system in good condition?
YES : Go to Step 3.
NO : Repair or replace the charging system component(s).

STEP 3. M.U.T.-III other system diagnosis code
Check if diagnosis code is set to the ETACS-ECU.

Q: Is the diagnosis code set?
YES : Troubleshoot the ETACS. Refer to GROUP 54A - ETACS .
NO : Go to Step 4.

STEP 4. Voltage measurement at the ASC-ECU connector
(1) Disconnect the connector, and measure at the wiring harness side.
(2) Measure the voltage between ASC-ECU connector (+BV terminal) and body earth.

OK: Approximately system voltage

Q: Is the check result normal?
YES : Go to Step 6.
NO : Go to Step 5.

STEP 5. Check of short to power supply, short to earth, and open circuit in +BV line between fusible link and ASC-ECU connector

Q: Is the check result normal?
YES : Intermittent malfunction is suspected (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction).
NO : Repair the fusible link, connector(s) or wiring harness. Then go to Step 13.

STEP 6. Voltage measurement at the ASC-ECU connector
(1) Disconnect the connector, and measure at the wiring harness side.
(2) Measure the voltage between ASC-ECU connector (+BM terminal) and body earth.

OK: Approximately system voltage

Q: Is the check result normal?
YES : Go to Step 8.
NO : Go to Step 7.

STEP 7. Check of short to power supply, short to earth, and open circuit in +BM line between fusible link and ASC-ECU connector

Q: Is the check result normal?
YES : Intermittent malfunction is suspected (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction).
NO : Repair the fusible link, connector(s) or wiring harness. Then go to Step 13.

STEP 8. Voltage measurement at the ASC-ECU connector.
(1) Disconnect the connector, and measure at the wiring harness side.
(2) Turn the ignition switch to the ON position.
(3) Measure the voltage between ASC-ECU connector (IG1 terminal) and body earth.

OK: Approximately system voltage

Q: Is the check result normal?
YES : Go to Step 10.
NO : Go to Step 9.

STEP 9. Check of short to power supply, short to earth, and open circuit in IG1 line between ETACS-ECU and ASC-ECU connector

Q: Is the check result normal?
YES : Intermittent malfunction is suspected (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction).
NO : Repair the connector(s) or wiring harness. Then go to Step 13.

STEP 10. Resistance measurement at ASC-ECU connector
(1) Disconnect the connector, and measure at the wiring harness side.
(2) Resistance between the ASC-ECU connector (GND1 terminal) and the body earth, and between the ASC-ECU connector (GND2

terminal) and the body earth

OK: Continuity exists (2 Ω or less)

Q: Is the check result normal?
YES : Go to Step 12.
NO : Go to Step 11.

STEP 11. Check of open circuit in GND1, GND2 line between ASC-ECU connector and body earth

Q: Is the check result normal?
YES : Intermittent malfunction is suspected (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction).
NO : Repair the connector(s) or wiring harness. Then go to Step 13.

STEP 12. Retest the system.

Q: Is the communication with M.U.T.-III possible?
YES : Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/How to Cope with Intermittent Malfunctions).
NO : Replace the hydraulic unit (integrated with ASC-ECU) (Refer to P.35C-95). Then go to Step 13.

STEP 13. Retest the system.

Q: Is the communication with M.U.T.-III possible?
YES : Return to Step 1.
NO : This diagnosis is complete.

Inspection Procedure 13: Steering wheel sensor power supply circuit system

⚠ CAUTION
- **If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the steering wheel sensor is replaced, always carry out calibration to make ASC-ECU learn the neutral point (Refer to P.35C-94).**

OPERATION
- Steering wheel sensor contains the power supply circuit for Steering wheel sensor. The power is supplied from the ETACS-ECU (IG11 terminal). The power is supplied from the fusible link.
- When malfunction occurs in steering wheel sensor power supply, the communication with M.U.T.-III becomes unavailable.

PROBABLE CAUSES
- Damaged wiring harness and connectors
- Fusible link malfunction
- Improper tightening of battery terminal
- Battery failure
- Charging system failed
- Steering wheel sensor malfunction

DIAGNOSIS PROCEDURE

STEP 1. M.U.T.-III other system diagnosis code
Check if diagnosis code is set to the ETACS-ECU.

Q: Is the diagnosis code set?
YES : Troubleshoot the ETACS. Refer to GROUP 54A - ETACS .
NO : Go to Step 2.

STEP 2. Resistance measurement at steering wheel sensor connector
(1) Disconnect the connector, and measure at the wiring harness side.
(2) Resistance between the steering wheel sensor connector (earth terminal) and the body earth

OK: Continuity exists (2 Ω or less)

Q: Is the check result normal?
YES : Go to Step 4.
NO : Go to Step 3.

STEP 3. Check of open circuit in earth line between steering wheel sensor connector and body earth

Q: Is the check result normal?
YES : Intermittent malfunction is suspected (Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction).
NO : Repair the connector(s) or wiring harness. Then go to Step 6.

STEP 4. Check of short to power supply, short to earth, and open circuit in IG11 line between steering wheel sensor connector and ETACS-ECU connector

Q: Is the check result normal?
YES : Go to Step 5.
NO : Repair the connector(s) or wiring harness. Then go to Step 6.

STEP 5. Retest the system.

Q: Is the communication with M.U.T.-III possible?
YES : Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/How to Cope with Intermittent Malfunctions).
NO : Replace the steering wheel sensor (Refer to P.35C-98). Then go to Step 6.

STEP 6. Retest the system.

Q: Is the communication with M.U.T.-III possible?
YES : Return to Step 1.
NO : This diagnosis is complete.

Inspection Procedure 14: ABS/stability control/TCL operates too frequently.

⚠ CAUTION
- **If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, always diagnose the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-93, P.35C-94 and P.35C-94).**

COMMENTS ON TROUBLE SYMPTOM
- Although the cause of the trouble cannot be clearly resolved since it depends on the running status and road surface condition, the malfunction of the hydraulic circuit may occur if any diagnosis code is not detected.
- If wheels and tyres other than the ones with genuine specified size are mounted, the ABS/stability control/TCL may be activated prematurely.
- If a non-genuine braking device or non-genuine impact reduction device is mounted, the ABS/stability control/TCL may be activated prematurely.

PROBABLE CAUSES
- Mounting of wheels and tyres other than with genuine specified size
- Tyre pressure abnormality
- Tyre wear and deterioration
- Mounting of non-genuine braking device or impact reduction device
- Wheel alignment abnormality
- Malfunction of brake related parts
- Malfunction of the wheel speed sensor
- Steering wheel sensor malfunction
- Malfunction of hydraulic unit (integrated with ASC-ECU)
- Malfunction of hydraulic circuit
- External radio wave noise interference

DIAGNOSIS PROCEDURE

STEP 1. Check the wheels and the tyres.
Carry out the following check.
- Size check of wheels and tyres
- Tyre wear and deterioration statuses
- Check the tyre pressure.

NOTE: For the tyre pressure, refer to the tyre pressure label attached to the lower section of driver's side door striker.

Q: Is the check result normal?
YES : Go to Step 2.
NO : Correct the wheels and tyres in good condition. Then go to Step 9.

STEP 2. Diagnosis code check
Use M.U.T.-III to check the diagnosis code for the ASC system (Refer to P.35C-15).

Q: Is the check result normal?
YES : Go to Step 3.
NO : Carry out the diagnosis for the diagnosis code (Refer to P.35C-15). Then go to Step 9.

STEP 3. Check of brake system related components other than hydraulic unit (integrated with ASC-ECU)

At the same time with the following checks, also check that no parts other than the genuine parts are mounted.

- Brake pad check (Refer to GROUP 35A – On-vehicle Service/Brake Pad Check).
- Brake disc runout check (Refer to GROUP 35A – On-vehicle Service/Brake Disk Check).
- Brake drag force check <Refer to GROUP 35A – Front Disc Brake Assembly (Front: Standard), (Front: Option) or GROUP 35A – Rear Disc Brake Assembly (Rear: Vehicles with alloy made trailing arm), (Rear: Vehicles with sheet metal made trailing arm)>

Q: Is the check result normal?

YES : Go to Step 4.

NO : Repair or replace the part(s) having damage or other problems. Then go to Step 9.

STEP 4. Wheel alignment check

At the same time with the following checks, also check that no parts other than the genuine parts are mounted.

- Front wheel alignment check (Refer to GROUP 33 – On-vehicle Service/Front Wheel Alignment Check and Adjustment).
- Rear wheel alignment check (Refer to GROUP 34 – On-vehicle Service/Rear Wheel Alignment Check and Adjustment).

Q: Is the check result normal?

YES : Go to Step 5.

NO : Repair or replace the part(s) having damage or other problems. Then go to Step 9.

STEP 5. Wheel speed sensor check

Check that no non-genuine electronic device or no wiring harness of other than genuine electronic device is mounted near the wheel speed sensor (at wheel speed detection section and wiring harness section) (Refer to P.35C-97 <Front> or P.35C-97 <Rear>.)

Q: Is the check result normal?

YES : Go to Step 6.

NO : Remove the non-genuine electronic device or the wiring harness of non-genuine electronic device. Then go to Step 9.

STEP 6. M.U.T.-III data list

Check the following data list (Refer to P.35C-85).

- Item 01: FL wheel speed sensor
- Item 02: FR wheel speed sensor
- Item 03: RL wheel speed sensor
- Item 04: RR wheel speed sensor
- Item 08: Lateral G-sensor
- Item 11: Steering angle sensor
- Item 12: Yaw rate sensor

Q: Is the check result normal?

YES : Go to Step 7.

NO (Abnormality with items 01 to 04) : Check the installation status of corresponding wheel speed sensor (Refer to P.35C-97 <Front> or P.35C-97 <Rear>).

NO (Abnormality with items 08, 12) : Check the installation status of hydraulic unit (integrated with ASC-ECU) (Refer to P.35C-95).

NO (Abnormality with item 11) : Check the installation status of steering wheel sensor (Refer to P.35C-98).

STEP 7. Hydraulic unit check

Carry out the following actuator tests, and check if they work normally (Refer to P.35C-87).

- Item No. 01: FL wheel ABS
- Item No.02: FR wheel ABS
- Item No.03: RL wheel ABS
- Item No.04: RR wheel ABS
- Item No.05: FL wheel TCL
- Item No.06: FR wheel TCL
- Item No.07: RL wheel TCL
- Item No.08: RR wheel TCL

Q: Is the check result normal?

YES : Go to Step 8.

NO : Replace the hydraulic unit (integrated with ASC-ECU) (Refer to P.35C-95). Then go to Step 9.

STEP 8. ABS/stability control/TCL operation check

Q: Is the check result normal?

YES : Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/How to Cope with Intermittent Malfunctions).

NO : Replace the hydraulic unit (integrated with ASC-ECU) (Refer to P.35C-95). Then go to Step 9.

STEP 9. ABS/stability control/TCL operation check

Q: Is the check result normal?

YES : This diagnosis is complete.
NO : Return to Step 1.

Inspection Procedure 15: HSA (Hill Start Assist) does not work.

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-93, P.35C-94 and P.35C-94).**

COMMENTS ON TROUBLE SYMPTOM

- The slope gradient may be low.
- The vehicle is not completely stationary.
- A failure may have occurred in the calibration of the G and yaw rate sensor or brake fluid pressure sensor.
- The parking brake switch may be seized, which causes the HSA to fail to start the operation.
- A problem (noise interference) may have occurred in the CAN bus line, resulting in an improper communication with ASC-ECU or each ECU.

NOTE:

- *The HSA does not work even when the wheel speed sensor output pulse (vehicle moved) while the vehicle is parked.*
- *The HSA is affected by the loading conditions and vehicle posture at the occurrence of phenomenon. When checking the HSA operation in actual driving, carry out the check on the vehicle with one occupant (driver) only.*

PROBABLE CAUSES

- Calibration failure of the G and yaw rate sensor
- Calibration failure of the brake fluid pressure sensor
- Seizure of the parking brake switch
- Malfunction of wheel speed sensor
- Malfunction of ETACS-ECU
- Malfunction of hydraulic unit (integrated with ASC-ECU)
- Wiring harness or connector failure of CAN bus line
- Damaged wiring harness and connectors

DIAGNOSIS PROCEDURE

STEP 1. HSA operation check

Check if the HSA works with one occupant (driver) only in the vehicle.

Q: Is the check result normal?
YES : This diagnosis is complete.
NO : Go to Step 2.

STEP 2. Parking brake check

With the parking brake not pulled, check if the brake warning lamp is off.

Q: Is the check result normal?
YES : Go to Step 3.
NO : Carry out Inspection procedure 3 "Brake warning lamp stays ON with the parking brake lever released (ABS warning lamp is OFF)" (Refer to P.35C-67).

STEP 3. M.U.T.-III CAN bus diagnostics

Use M.U.T.-III to diagnose the CAN bus lines.

Q: Is the check result normal?
YES : Go to Step 4.
NO : Repair the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table). Then go to Step 9.

STEP 4. M.U.T.-III diagnosis code

Use M.U.T.-III to check the diagnosis code for the ASC system.

Q: Is the diagnosis code set?
YES : Carry out the diagnosis for the diagnosis code (Refer to P.35C-15).
NO : Go to Step 5.

STEP 5. M.U.T.-III data list

Check the following data list (Refer to P.35C-85).

- Pulled up parking brake lever.

Item No.	Item name	Normal condition
120	Parking brake switch (Input)	ON

- The selector lever is in the "R", "D", "N" and "P" position. <Except M/T>

Item No.	Item name	Normal condition

70	Target gear	• "R"
		  • Selector lever:"R" position
		• "D"
		  • Selector lever:"D" position
		• "P"
		  • Selector lever:"P" position
		• "N"
		  • Selector lever:"N" position

71	Actual gear	

Q: Is the check result normal?

YES : Go to Step 6.

NO <Item No. 120> : Carry out the Inspection procedure 3 "Brake warning lamp stays ON with the parking brake lever released (ABS warning lamp is OFF)" (Refer to P.35C-67), and then go to Step 10.

NO <Item No. 70, 71> : Go to Step 9.

STEP 6. M.U.T.-III data list

Check the following data list under curb weight condition or one occupant (driver) only in the vehicle, on a flat road.(Refer to P.35C-85)

- Item 09: G sensor
- Item 12: Yaw rate sensor

Q: Is the check result normal?

YES : Go to Step 7.

NO : Carry out the calibration of the G and yaw rate sensor (Refer to P.35C-93). Then go to Step 9.

STEP 7. M.U.T.-III data list

Check the following data list (Refer to P.35C-85).

- Item 10: Master cylinder pressure

Q: Is the check result normal?

YES : Go to Step 8.

NO : Carry out the calibration of the brake fluid pressure sensor (Refer to P.35C-93). Then go to Step 10.

STEP 8. M.U.T.-III diagnosis code

Use M.U.T.-III to check that the diagnosis code is set in the CVT-ECU.

Q: Is the diagnosis code set?

YES : Carry out the diagnosis for the diagnosis code (Refer to GROUP - 23A – Troubleshooting/Diagnosis Code Chart).

NO : Go to Step 9.

STEP 9. Retest the system.

Check if the HSA works with one occupant (driver) only in the vehicle.

Q: Is the check result normal?

YES : Intermittent malfunction (Refer to GROUP 00 – How to Use Troubleshooting/How to Cope with Intermittent Malfunctions).

NO : Replace the hydraulic unit (integrated with ASC-ECU) (Refer to P.35C-95).

STEP 10. Retest the system.

Check if the HSA works with one occupant (driver) only in the vehicle.

Q: Is the check result normal?

YES : This diagnosis is complete.

NO : Return to Step 1.

Inspection Procedure 16: HSA (Hill Start Assist) works on a flat road.

⚠ CAUTION
- **If there is any problem in the CAN bus lines, an incorrect diagnosis code may be set. Prior to this diagnosis, diagnose the CAN bus lines (Refer to GROUP 54C – CAN Bus Diagnostics Table).**
- **Whenever ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the hydraulic unit (integrated with ASC-ECU) is replaced, always carry out the calibration of the steering wheel sensor, the G and yaw rate sensor and brake fluid pressure sensor (Refer to P.35C-93, P.35C-94 and P.35C-94).**

COMMENTS ON TROUBLE SYMPTOM
- A failure may have occurred in the calibration of the G & yaw rate sensor.
- Some drivers mistake a brake dragging for HSA operation.
- If the suspension is modified, the vehicle posture changes, and the ASC-ECU judges that the vehicle is on a steep slope and may activate HSA.

PROBABLE CAUSES
- ASC-ECU malfunction
- Brake drag
- Damaged wiring harness and connectors

DIAGNOSIS PROCEDURE

STEP 1. HSA operation check
Check if the HSA works on a flat road with one occupant (driver) only in the vehicle.

Q: Does the HSA work on a flat road?
YES : Go to Step 2.
NO : This diagnosis is complete.

STEP 2. M.U.T.-III data list
Check the following data list (Refer to P.35C-85).
- Item 09: G sensor

Q: Is the check result normal?
YES : Go to Step 3.
NO : Carry out the calibration of the G and yaw rate sensor (Refer to P.35C-93). Then go to Step 4.

STEP 3. Brake drag check
Check the brake system for drag.

Q: Is the check result normal?
YES : Go to Step 4.
NO : Repair the brake drag, and then go to Step 4.

STEP 4. Retest the system.
Check if the HSA works on a flat road with one occupant (driver) only in the vehicle.

Q: Does the HSA work on a flat road?
YES : Replace the hydraulic unit (integrated with ASC-ECU) (Refer to P.35C-95).
NO : This diagnosis is complete.

Inspection Procedure 17: The initial check sound of hydraulic unit is loud.

⚠ CAUTION
When installing brake tube, match the axial centre of flare nut and brake tube with the centre of hole at the hydraulic unit side, and check that the fluid does not leak.

COMMENT ON TROUBLE SYMPTOM
The operation sound may be decreased by reducing the load at the rubber mount portion of the brake tube and hydraulic unit.

PROBABLE CAUSES
- Improper installation of the hydraulic unit
- Improper installation of the brake tube

DIAGNOSIS PROCEDURE

DRIVING CHECK
(1) Turn the ignition switch from the "LOCK" (OFF) position to the "ON" position.
(2) When vehicle speed reaches 10 km/h, check the operating sound volume and compare it with that

of the same model.

OK: The operating sound is the same volume or less by comparing with that of the same model.

Q: Is the check result normal?

YES : This diagnosis is complete.
NO : Carry out adjustment for hydraulic unit installation. (Refer to P.35C-90).

DATA LIST REFERENCE TABLE

M1355001500993

The following items of ECU input data can be read using M.U.T.-III.

The system is normal.

Item No.	Check item	Check condition	Normal condition
01	FL wheel speed sensor	Perform a test run of the vehicle.	The speedometer display and the M.U.T.-III display almost agree with each other. (During stop: approximately 0.7km/h)
02	FR wheel speed sensor		
03	RL wheel speed sensor		
04	RR wheel speed sensor		
05	Power supply voltage		System voltage (10 to 18 V ASC operable range)
07	Brake switch (input)	The brake pedal is depressed.	ON
		The brake pedal is released.	OFF
08	Lateral G sensor (+: left turn, -: right turn)	Vehicle stopped (level)	-0.11 to 0.11 G
		Running	-1 to 1 G
09	G sensor (+: deceleration, -: acceleration)	Vehicle stopped (level)	-0.04 to 0.04 G
		Running	-1 to 1 G
10	Master cylinder pressure (+: pressure increase, -: pressure decrease)	The brake pedal is depressed.	Increases by the amount of the brake pedal depression.
		The brake pedal is released.	-3 to 3 bar
11	Steering angle (+: left turn, -: right turn)	Vehicle stopped (the steering wheel is in the neutral position)	-6 to 6 deg
		Running	Nearly the same as the steering wheel operation angle <-720 to 720 deg (ASC-ECU normal detection value)>
			Nearly the same as the steering wheel operation angle <-850 to 850 deg (Sensor normal value as a single unit)>
12	Yaw rate sensor (+: left turn, -: right turn)	Vehicle stopped (level)	-3.6 to 3.6 deg/s
		Running	-100 to 100 deg/s
14	Brake switch	The brake pedal is depressed.	ON
		The brake pedal is released.	OFF
15	Emission test mode	Emission test mode: ON	ON
		Emission test mode: OFF	OFF

Item No.	Check item	Check condition	Normal condition
45	SAS OK flag	When the steering wheel sensor neutral point is learned	Comp
		When the steering wheel sensor neutral point is not learned	Not Comp
		When the steering wheel sensor is defective	SAS fail
			SAS fail&No Comp
65	Engine Speed	When the accelerator pedal is depressed (engine started)	The tachometer display and the M.U.T.-III display almost agree with each other.
66	Engine torque		Displays the engine torque.
67	APS		Displays the accelerator pedal opening angle.
68	Allow ESP torque request		Allow
70	Target gear	When the selector lever is operated	Displays the selector lever position.
71	Actual gear		
72	Master cylinder pressure offset	The difference between the neutral position that was input to the ASC-ECU before the master cylinder pressure sensor calibration and the neutral position after the calibration.	-8 to 8 bar
73	Lateral G sensor offset	The difference between the neutral position that was input to the ASC-ECU before the G and yaw rate sensor calibration and the neutral position after the calibration.	-0.15 to 0.15 G
74	Steering angle offset	The difference between the neutral position that was input to the ASC-ECU before the steering wheel sensor calibration and the neutral position after the calibration.	-10 to 10 deg
86	Ignition switch	Ignition switch: ON	ON
87	Ignition switch (input)	Ignition switch: ON	ON
88	Vehicle speed	Perform a test run of the vehicle.	The speedometer display and the M.U.T.-III display almost agree with each other.
91	Brake pressure sensor	The brake pedal is depressed.	ON
		The brake pedal is released.	OFF
96	G sensor offset	The difference between the neutral position that was input to the ASC-ECU before the G and yaw rate sensor calibration and the neutral position after the calibration.	-0.1 to 0.1 G
97	Yaw rate sensor offset	The difference between the neutral position that was input to the ASC-ECU before the G and yaw rate sensor calibration and the neutral position after the calibration.	-6.0 to 6.0 deg/s

Item No.	Check item	Check condition	Normal condition
105	Power supply voltage (input)		System voltage (10 to 18 V ASC operable range)
120	Parking brake switch (Input)	When the parking brake lever is pulled up:	ON
		When the parking brake lever is released:	OFF
128	A.S.C./TCL off switch (input)	The ASC OFF switch is pressed.	ON
		The ASC OFF switch is not operated.	OFF
138	ESS request	Not used.	
139	Idle stop	Not used.	
140	A.S.C./TCL mode (S-AWC)	When the ASC is activated	ASC ON
		When the ASC is deactivated by the ASC OFF switch.	ASC OFF
		When the ASC fails	N/A

NOTE: While ASC-ECU is disabled by the diagnostic function, the M.U.T.-III displayed data is different from the actual measurement.

ACTUATOR TEST TABLE

M1355001600558

Using M.U.T.-III, the following actuators can be forcibly operated:

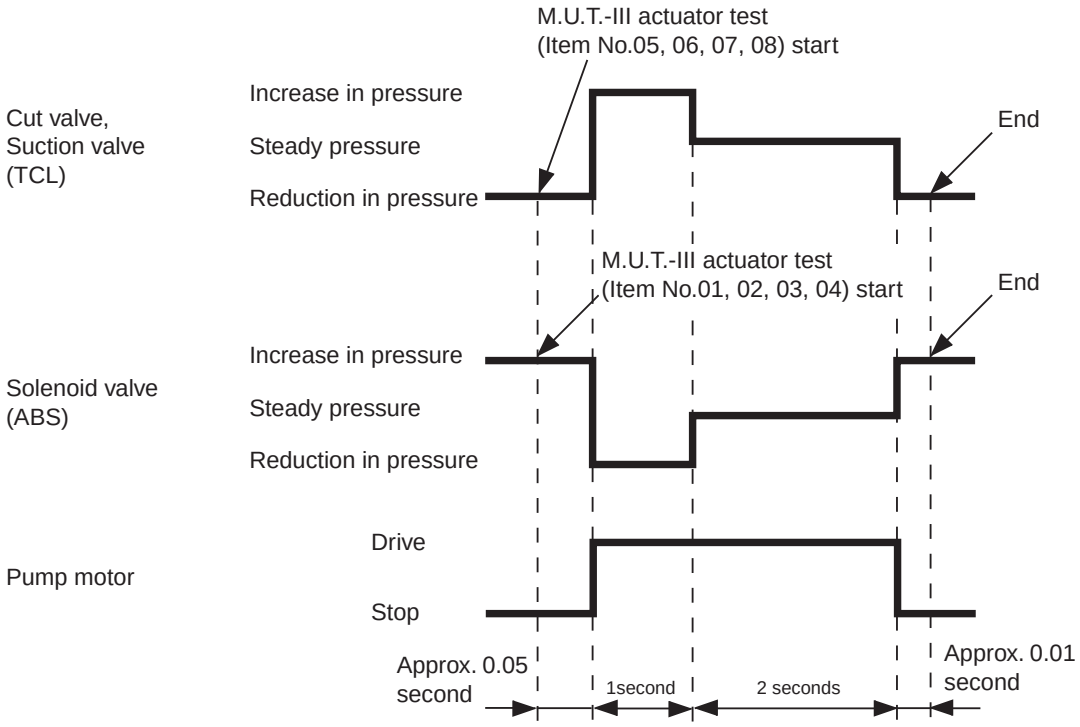
NOTE:
- *ABS and ASC are operated by ASC-ECU.*
- *When ASC-ECU is disabled due to the fail-safe function, the actuator test cannot be performed.*
- *The actuator test can be performed only when the vehicle is stationary.*
- *While the actuator test is performed, the ABS warning lamp flashes at a rate of 2 Hz.*
- *While the actuator test is performed, the ASC warning display and ASC OFF display illuminate.*
- *After the actuator test has been performed, the brake warning lamp, ABS warning lamp, ASC operation display, and ASC OFF display illuminate until the ignition switch is turned to ON again or the communication between M.U.T.-III and ASC-ECU is terminated.*

Actuator test specifications

Item No.	Check item	Driven component
01	FL wheel ABS drive	Solenoid valve for the corresponding channel of the hydraulic unit and pump motor (simplified inspection mode)
02	FR wheel ABS drive	
03	RL wheel ABS drive	
04	RR wheel ABS drive	
05	FL wheel TCL drive	
06	FR wheel TCL drive	
07	RL wheel TCL drive	
08	RR wheel TCL drive	

Item No.	Check item	Driven component
09	Engine TCL drive	Outputs the engine torque control signal (engine torque = 0 N·m) to the engine ECU for three seconds.
10	ESS test mode	Not used.

Operation pattern of items 01 to 08

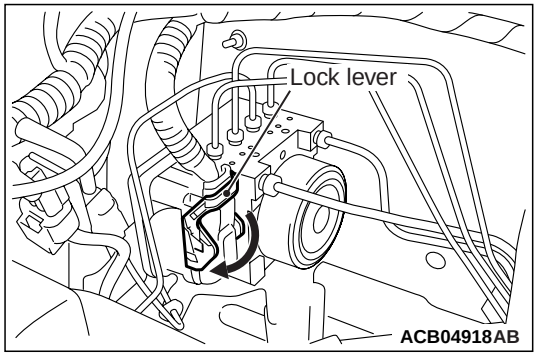


AC400776AJ

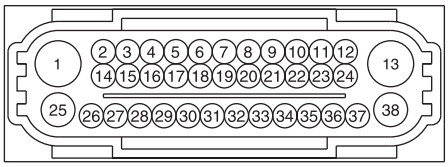
CHECK AT ECU TERMINALS

M1355001700748

TERMINAL VOLTAGE CHECK



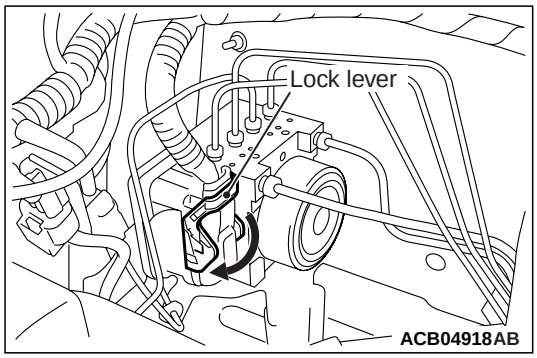
1. Operate the lock lever to disconnect the ASC-ECU harness connector as shown in the figure.
2. Disconnect the ASC-ECU connector, and measure the voltages between earth terminal No.13 or No.38 and each respective terminal.
3. The terminal layout is shown in the illustration.



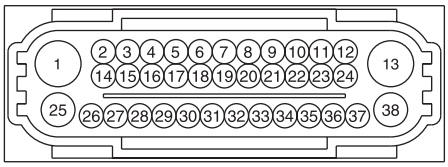
ACB05853

Terminal No.	Terminal code	Check item	Checking requirements	Normal condition
1	+BM	Motor power supply	Always	Battery voltage
2–5	–	–	–	–
6	IG1	ASC-ECU power supply(IG1)	Ignition switch: "ON"	Battery voltage
			Ignition switch: "OFF"	1 V or less
7–9	–	–	–	–
10	CANL	CAN bus line	–	–
11	CANH	CAN bus line	–	–
12	–	–	–	–
13	GND1	Earth	Always	1 V or less
14–24	–	–	–	–
25	+BV	Solenoid valve power supply	Always	Battery voltage
26	FR-	Wheel speed sensor (FR) signal	Drive vehicle	Approximately system voltage
27	FR+	Wheel speed sensor (FR) power supply	Ignition switch: "ON"	Approximately system voltage
28	–	–	–	–
29	RL+	Wheel speed sensor (RL) power supply	Ignition switch: "ON"	Approximately system voltage
30	RL-	Wheel speed sensor (RL) signal	Drive vehicle	Approximately system voltage
31, 32	–	–	–	–
33	RR-	Wheel speed sensor (RR) signal	Drive vehicle	Approximately system voltage
34	RR+	Wheel speed sensor (RR) power supply	Ignition switch: "ON"	Approximately system voltage
35	–	–	–	–
36	FL+	Wheel speed sensor (FL) power supply	Ignition switch: "ON"	Approximately system voltage
37	FL-	Wheel speed sensor (FL) signal	Drive vehicle	Approximately system voltage
38	GND2	Earth	Always	1 V or less

CONTINUITY CHECK AT WIRING HARNESS-SIDE CONNECTOR



1. Operate the lock lever to disconnect the ASC-ECU harness connector as shown in the figure.
2. Check the resistance and continuity between the terminals indicated in the table below.
3. The terminal layout is shown in the illustration.



ACB05853

Terminal No.	Signal	Normal condition
13 – body earth	Earth	Continuity exists (2 Ω or less)
38 – body earth	Earth	Continuity exists (2 Ω or less)

ON-VEHICLE SERVICE

WHEEL SPEED SENSOR OUTPUT CURRENT MEASUREMENT

M1355027300029

Refer to GROUP 35B – Wheel speed sensor output current measurement .

HYDRAULIC UNIT (HU) CHECK

M1355006100332

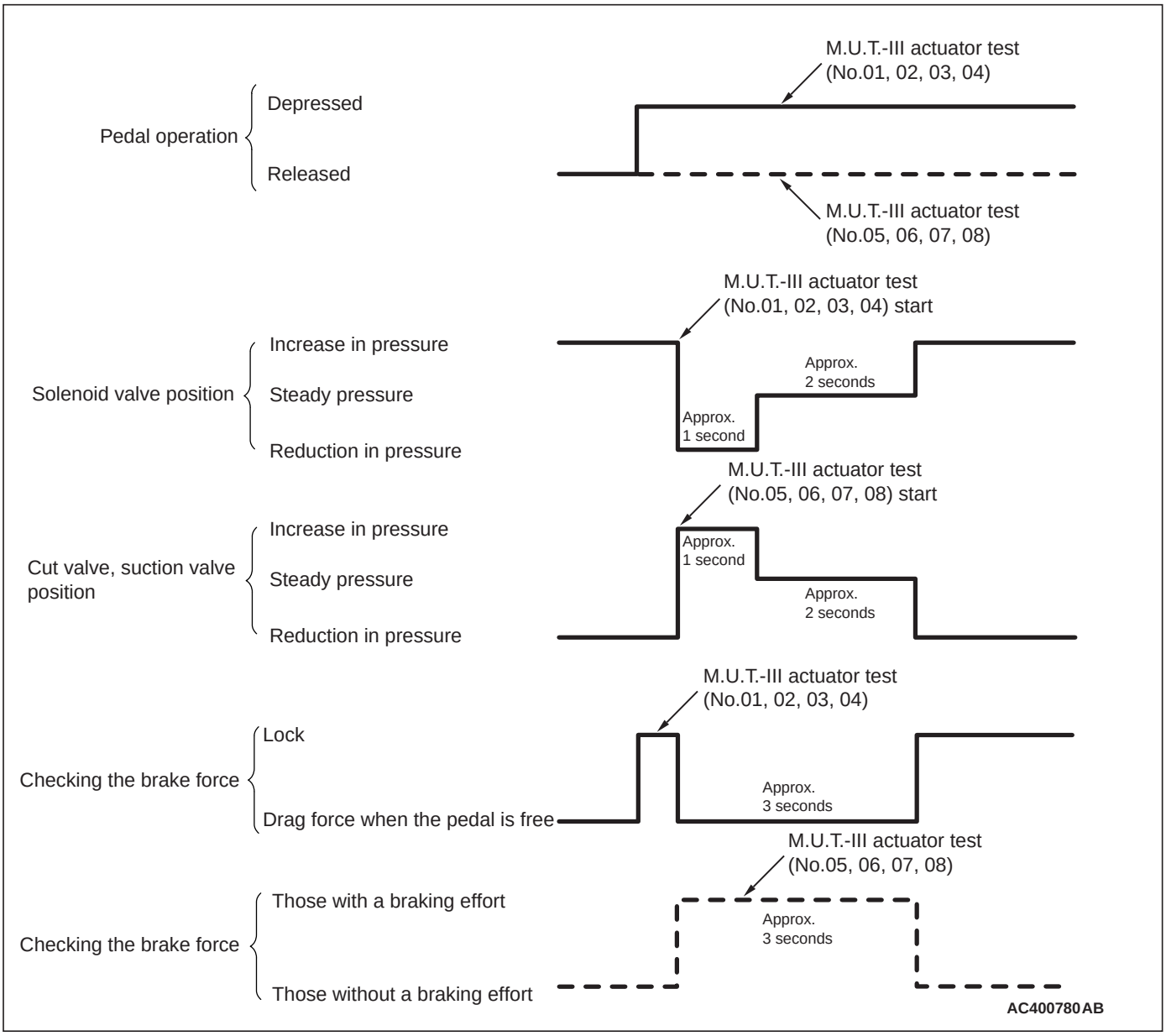
1. Raise the vehicle using a jack and support the specified points with a rigid rack.

⚠ CAUTION

Before connecting or disconnecting M.U.T.-III, always turn the ignition switch to the LOCK (OFF) position.

2. Before setting M.U.T.-III, turn the ignition key to the LOCK (OFF) position.
3. Confirm that the selector lever is in the "N" position, and then start the engine.
4. When carrying out the actuator tests No.01 to 04, perform the actuator tests using M.U.T.-III while depressing the brake pedal. When carrying out the actuator tests No.05 to 08, perform the actuator tests using M.U.T.-III without depressing the brake pedal. When carrying out the actuator tests, rotate the wheel by hands to confirm that the braking force changes.

   NOTE:
   - *While performing the actuator test, the ABS warning lamp flashes at a rate of 2 Hz.*
   - *When ASC-ECU is disabled due to the fail-safe function, the M.U.T.-III actuator test cannot be performed.*
   - *After the actuator test has been performed, the ABS warning lamp, brake waning lamp, ASC ON indicator lamp, and ASC OFF indicator lamp illuminate until the ignition switch is turned to ON again or the communication between M.U.T.-III and ASC-ECU is terminated.*



5. This is indicated as shown in the above.
6. When any malfunction has been found, take a necessary action according to the "Judgement Table."

Judgement Table

Display on M.U.T.-III	Operation	Test result	Judgement	Cause	Measure
01 FL wheel ABS 02 FR wheel ABS 03 RL wheel ABS 04 RR wheel ABS	• Depress the brake pedal to lock the wheel. • Select the vehicle to be inspected using M.U.T.-III, perform the actuator test. • Rotate the selected wheel by hands to confirm the braking force.	Braking force decreases for 3 seconds from the lock status.	Normal	–	–
		The wheel does not lock even if the brake pedal is depressed.	Error	Clogged brake line other than hydraulic unit	Check and clean the brake line.
				Clogged hydraulic circuit in the hydraulic unit	Replace the hydraulic unit assembly.
		Braking force does not decrease.		Faulty routing of hydraulic unit brake tube	Route the brake tube correctly.
				Malfunction of hydraulic unit solenoid valve operation	Replace the hydraulic unit assembly.
05 FL wheel TCL 06 FR wheel TCL 07 RL wheel TCL 08 RR wheel TCL	• Select the vehicle to be inspected using M.U.T.-III, perform the actuator test. • Rotate the selected wheel by hands to confirm the braking force.	Lock condition occurs for 3 seconds from the status without braking force.	Normal	–	–
		The wheel does not lock.	Error	• Faulty routing of hydraulic unit brake tube • Clogged brake line other than hydraulic unit	Check and clean the brake line.
				Clogged hydraulic circuit in the hydraulic unit	Replace the hydraulic unit assembly.

7. After the inspection, turn the ignition switch to the LOCK (OFF) position, and then disconnect M.U.T.-III.

Hydraulic unit installation adjustment

Operate the pre-removal steps for the hydraulic unit. (Refer to P.35C-95.)

1. Remove all brake tubes.
2. Loosen the mounting bolt and nut of the hydraulic unit bracket.
3. Install all brake tubes temporarily.
4. Shake hydraulic unit to all directions with both hands to make the hydraulic unit bracket insulator fit with the unit.
5. Install the hydraulic unit bracket with mounting bolt and nut not to load the brake tube.
6. Install all brake tubes securely.

   NOTE: Install the flare nut taking care not to let the brake tube turn together.
7. Operate the post-installation steps of the hydraulic unit. (Refer to P.35C-95.)

MEASURES FOR DISCHARGED BATTERY

M1355006200102

⚠ CAUTION

Because the vehicle posture when applying the brakes becomes unstable, do not leave ABS/ASC disabled (for example, ASC-ECU connector disconnection).

When starting the engine using a booster cable with the battery fully discharged, if you begin driving the vehicle before the battery is fully charged, the engine misfire may occur and you cannot start the vehicle. This is because ABS/ASC consumes more electric current to perform the self-check. In this case, charge the battery fully.

ALL SENSOR CALIBRATION (G AND YAW RATE SENSOR, STEERING WHEEL SENSOR, BRAKE FLUID PRESSURE SENSOR)

M1357003900034

⚠ CAUTION

Before carrying out the calibration, check that the diagnosis code related to the steering wheel sensor, G and yaw rate sensor, or brake fluid pressure sensor is not set.

⚠ CAUTION

When the next operation has been completed, carry out the calibration to make ASC-ECU learn the neutral point of the steering wheel sensor, G and yaw rate sensor, and brake fluid pressure sensor.

- **ASC-ECU replacement**

⚠ CAUTION

Carry out the calibration under the following conditions.

- **The vehicle has one occupant (driver) only.**
- **Turn the steering wheel to set the wheels in the straight-ahead positions.**
- **The brake pedal is not depressed. (The stop lamp switch is OFF.)**

1. Park the vehicle on a level surface.

⚠ CAUTION

Before connecting or disconnecting M.U.T.-III, always turn the ignition switch to the LOCK (OFF) position.

2. Before setting M.U.T.-III, turn the ignition key to the LOCK (OFF) position.
3. Turn the ignition switch to the ON position.
4. Select "ABS/ASC/ASTC/WSS."
5. Select "Special function."
6. Select "Sensor calibration."
7. Select "All sensor calibration."
8. Before removing M.U.T.-III from the vehicle, turn the ignition key to the LOCK (OFF) position.

G AND YAW RATE SENSOR CALIBRATION

M1355009300324

⚠ CAUTION

Before performing calibration, check that the G and yaw rate sensor-related diagnosis code is not set.

⚠ CAUTION

After the next operation has been completed, carry out the calibration to make ASC-ECU learn the neutral position of the G and yaw rate sensor.

- **ASC-ECU replacement**

1. Park the vehicle on a level surface.

⚠ CAUTION

Before connecting or disconnecting M.U.T.-III, always turn the ignition switch to the LOCK (OFF) position.

2. Before setting M.U.T.-III, turn the ignition key to the LOCK (OFF) position.
3. Turn the ignition switch to the ON position.
4. Select "ABS/ASC/ASTC/WSS."
5. Select "Special function."
6. Select "Sensor calibration."
7. Select "Lateral G sensor calibration."
8. Select "G sensor calibration."
9. Before removing M.U.T.-III from the vehicle, turn the ignition key to the LOCK (OFF) position.

STEERING WHEEL SENSOR CALIBRATION

M1355009200349

⚠ CAUTION

After the next operation has been completed, carry out the following two operations:

1. **Update the neutral position stored in the steering wheel sensor.**
2. **Reset the calibrated value of the steering angle stored in ASC-ECU.**

- **Alignment adjustment <Front>**
- **Steering wheel sensor (column switch assembly) replacement, removal, installation**
- **ASC-ECU replacement**

⚠ CAUTION

- **Before performing the calibration, check if the steering wheel sensor-related diagnosis code is set in ASC-ECU.**
- **When the diagnosis code other than C121A is set, carry out inspection according to each troubleshooting procedure.**

1. Park the vehicle on a level surface with tyres and steering wheel positioned in a straight ahead direction.

⚠ CAUTION

Before connecting or disconnecting M.U.T.-III, always turn the ignition switch to the LOCK (OFF) position.

2. Before setting M.U.T.-III, turn the ignition key to the LOCK (OFF) position.
3. Ignition switch: ON
4. Select "Steering angle sensor."
5. Select "Special function."
6. Select "SAS Calibration."
7. Select and run "SAS Initialization." (Reusable parts only)

   NOTE:
   - *Since the neutral position stored in the steering wheel sensor is no longer available, "SAS Initialization" is displayed.*
   - *Since a new steering wheel sensor has no neutral position, "SAS Calibration" is displayed.*
8. Select and run "SAS Calibration."
9. Exit "Steering angle sensor" menu, and then select "ABS/ASC/ASTC/WSS."
10. Select "Special function."
11. Select "Sensor calibration."
12. Select and run "SAS calibration."
13. Check whether the ASC-ECU-related diagnosis code is set.
14. Erase the diagnosis code.

    NOTE: Erase the diagnosis code C121A.
15. Before removing M.U.T.-III from the vehicle, turn the ignition key to the LOCK (OFF) position.

BRAKE FLUID PRESSURE SENSOR CALIBRATION

M1355024100189

⚠ CAUTION

Before performing calibration, check that the brake fluid pressure sensor-related diagnosis code is not set.

⚠ CAUTION

After the next operation has been completed, carry out the calibration to make ASC-ECU learn the neutral position of the brake fluid pressure sensor.

- **ASC-ECU replacement**

⚠ CAUTION

Always perform the calibration with the brake pedal released (stop lamp switch is turned off).

1. Park the vehicle on a level surface.

⚠ CAUTION

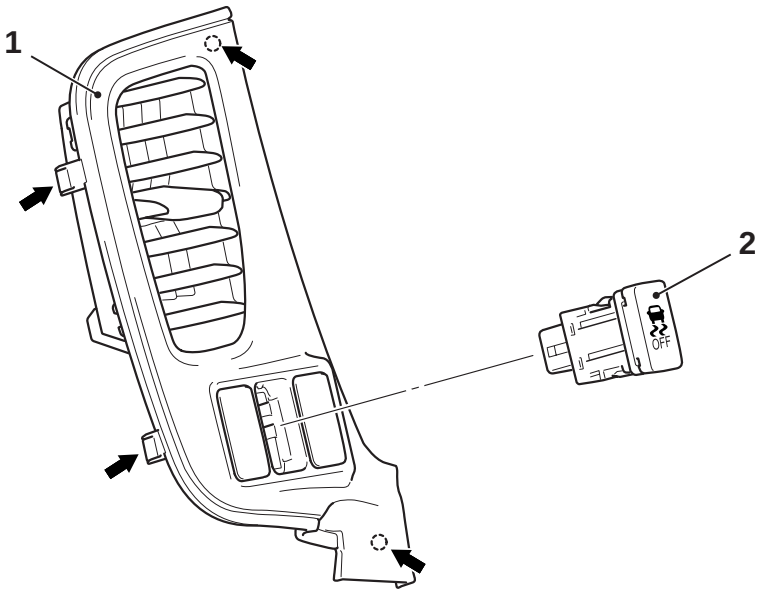
Before connecting or disconnecting M.U.T.-III, always turn the ignition switch to the LOCK (OFF) position.

2. Before setting M.U.T.-III, turn the ignition key to the LOCK (OFF) position.
3. Turn the ignition switch to the ON position.
4. Select "ABS/ASC/ASTC/WSS."
5. Select "Special function."
6. Select "Sensor calibration."
7. Select "M/C pressure calibration."
8. Before removing M.U.T.-III from the vehicle, turn the ignition key to the LOCK (OFF) position.

ASC OFF SWITCH

REMOVAL AND INSTALLATION

M1355020100314



NOTE:
⬅ :Clip positions

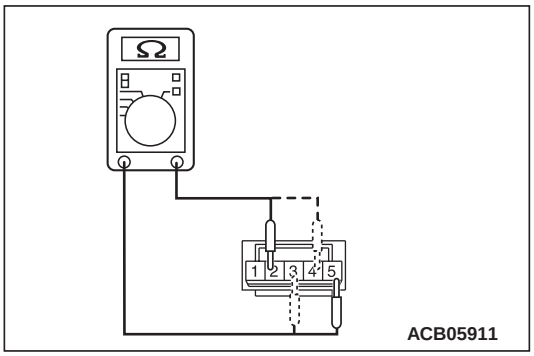
ACB05025AB

Removal steps
1. Side air outlet
- ASC OFF switch connector connection
5. ASC OFF switch

INSPECTION

M1355020200270

ASC OFF SWITCH CONTINUITY CHECK



1. As shown in the figure, connect the circuit tester to the ASC OFF switch as a single unit.
2. Check the continuity status when the ASC OFF switch is pressed and when the switch is released.

Item	When the ASC OFF switch is released (Not being operated)	When the ASC OFF switch is pressed
Continuity between terminal No. 2 and No. 5	No continuity	Continuity exists (2 Ω or less)
Continuity between terminal No. 3 and No. 4	Continuity exists	Continuity exists

HYDRAULIC UNIT

REMOVAL AND INSTALLATION

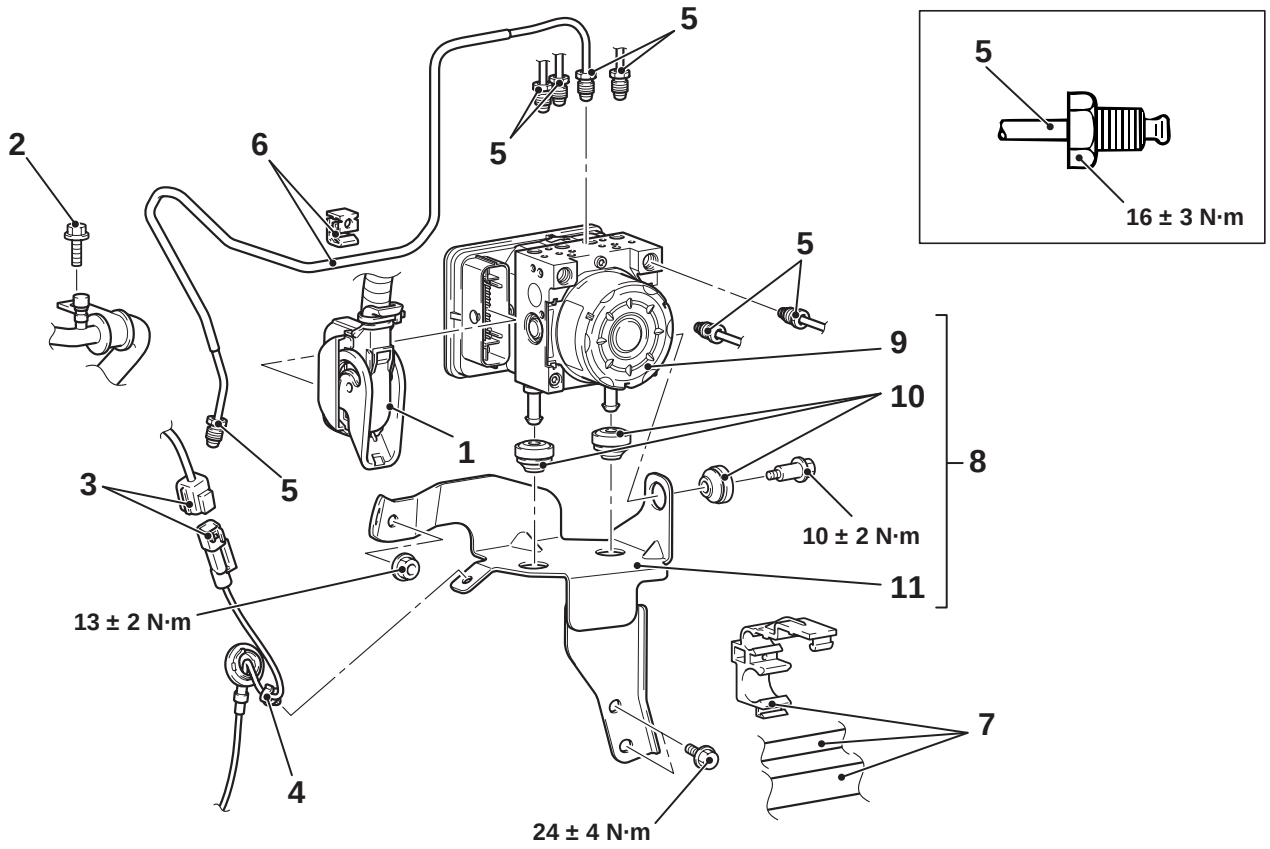
M1355005600903

NOTE: ASC-ECU is located in the hydraulic unit.

⚠ CAUTION

When the hydraulic unit (integrated with ASC-ECU) is replaced, after turning the ignition switch ON or OFF (vehicle information from ETACS-ECU is registered), always carry out the calibration of all sensors (steering wheel sensor, G and yaw rate sensor, and brake fluid pressure sensor) at one time.(Refer to P.35C-93.)

Pre-removal operation	Post-installation operation
• Brake fluid draining.	• Brake fluid refilling and air bleeding (Refer to GROUP 35A – On-vehicle Service, Bleeding). • Hydraulic unit check (Refer to P.35C-90).



ACB06014AB

Removal steps

1. ASC-ECU harness connector
2. Suction pipe installation bolt
3. Wheel speed sensor harness connector connection
4. Wheel speed sensor harness clip connection

>>A<< 5. Brake tube connection

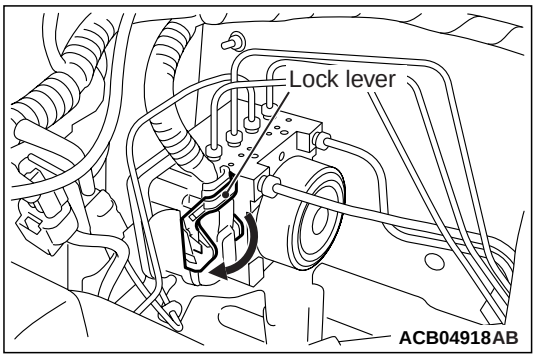
6. Brake tube and clip connection
7. Suction pipe, liquid pipe and clip connection
8. Hydraulic unit (ASC-ECU) and hydraulic unit bracket

<<B>> 9. Hydraulic unit (ASC-ECU)

10. Hydraulic unit bracket insulator
11. Hydraulic unit bracket B

REMOVAL SERVICE POINTS

<<A>> ASC-ECU HARNESS CONNECTOR DISCONNECTION



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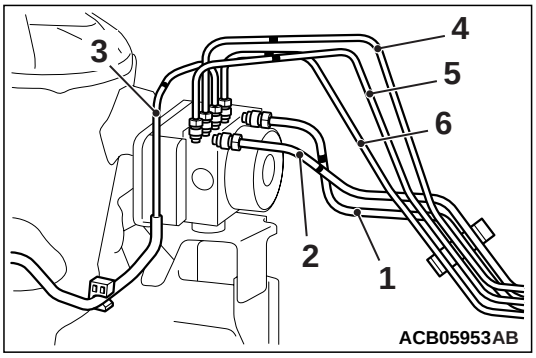
Operate the lock lever to disconnect the ASC-ECU harness connector as shown in the figure.

<<B>> HYDRAULIC UNIT (ASC-ECU) REMOVAL

⚠ CAUTION

- **Be careful when removing the hydraulic unit because it is heavy.**
- **Never loosen the nuts and the bolts because the hydraulic unit cannot be disassembled.**
- **Do not drop or shock the hydraulic unit.**
- **Do not turn the hydraulic unit upside down or lay down the unit because the inner air becomes difficult to be bled.**

INSTALLATION SERVICE POINT >>A<< BRAKE TUBE CONNECTION



Install the brake pipe to the hydraulic unit as shown in the figure.

1. From master cylinder (primary) <Marking colour: Blue>
2. From master cylinder (secondary) <Marking colour: Yellow>
3. To front brake (RH) <Marking colour: Orange>
4. To front brake (LH) <Marking colour: Red>
5. To rear brake (LH) <Marking colour: Pink>
6. To rear brake (RH) <Marking colour: White>

WHEEL SPEED SENSOR

REMOVAL AND INSTALLATION <FRONT>

M1355005300593

Refer to GROUP 35B, Wheel speed sensor removal and installation <FRONT> .

REMOVAL AND INSTALLATION <REAR>

Refer to GROUP 35B, Wheel speed sensor removal and installation <REAR> .

M1355005300601

INSPECTION

M1352008400761

Refer to GROUP 35B, Wheel speed sensor inspection .

STEERING WHEEL SENSOR

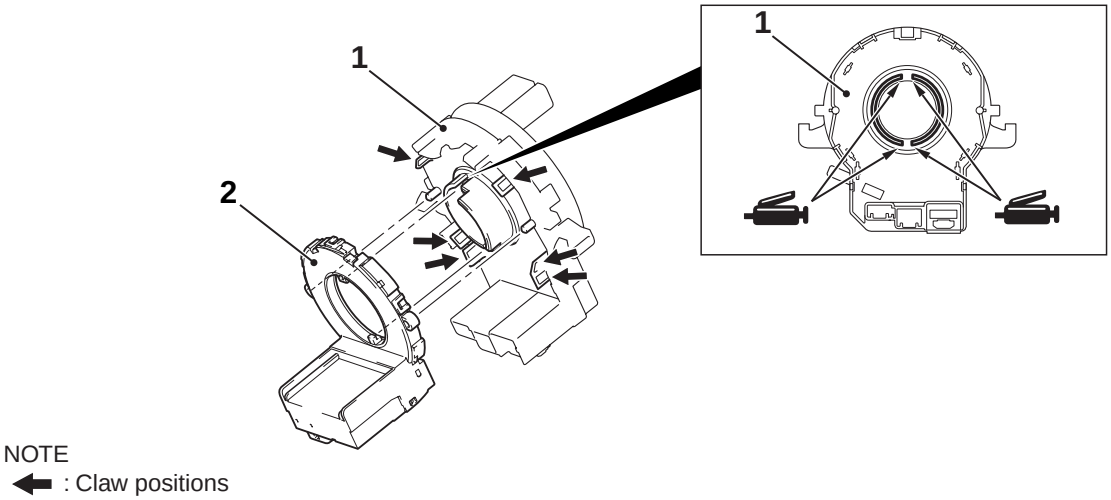
REMOVAL AND INSTALLATION

M1355005100726

⚠ CAUTION

- **Be sure to remove the clock spring from the column switch and centre the clock spring to prevent the damage of steering wheel sensor.**
- **If the centre of the clock spring is not correctly aligned, the steering wheel may not be turned fully or the cable inside the clock spring may be broken, causing the SRS air bag to be inoperative or operated incorrectly.**
- **Before removing the steering wheel/air bag module assembly, refer to GROUP 52B – Service Precautions and Air Bag Module Clock Spring .**
- **When the steering wheel sensor is replaced or installed, always carry out calibration to make ASC-ECU learn the neutral point (Refer to P.35C-94).**
- **After adjusting the wheel alignment, always carry out calibration of the steering wheel sensor to make ASC-ECU learn the neutral point. (Refer to P.35C-94.)**

Pre-removal operation	Post-installation operation
• Position the front wheels in a straight ahead direction.	• Perform steering wheel sensor calibration (Refer to P.35C-94).



NOTE
◀ : Claw positions

ACA00066AB

Removal steps

1. Clock spring (Refer to GROUP 52B – Driver's Air Bag Module and Clock Spring).
2. Steering wheel sensor

<<A>> >>A<<

REMOVAL SERVICE POINT

<<A>> STEERING WHEEL SENSOR REMOVAL

Disengage the claws of the clock spring one by one in a clockwise or anti-clockwise direction. Remove the steering wheel sensor from the clock spring.

INSTALLATION SERVICE POINT

>>A<< STEERING WHEEL SENSOR INSTALLATION

⚠ CAUTION

Install the steering wheel sensor with its rotating part removed. If the rotating part is rotated 360°, a failure occurs in calibration and ASC system.

Insert the protrusion of the clock spring into the hole of the steering wheel sensor. Securely fit the protrusion of the steering wheel sensor into the groove of the clock spring to install the steering sensor.

NOTE: A new steering wheel sensor has a pin for preventing the rotation of (fixing) the steering wheel sensor. After installing the column switch assembly, remove this pin.