
SMART WIRING SYSTEM (SWS)

Click on the applicable bookmark to selected the required model year.

SMART WIRING SYSTEM (SWS)

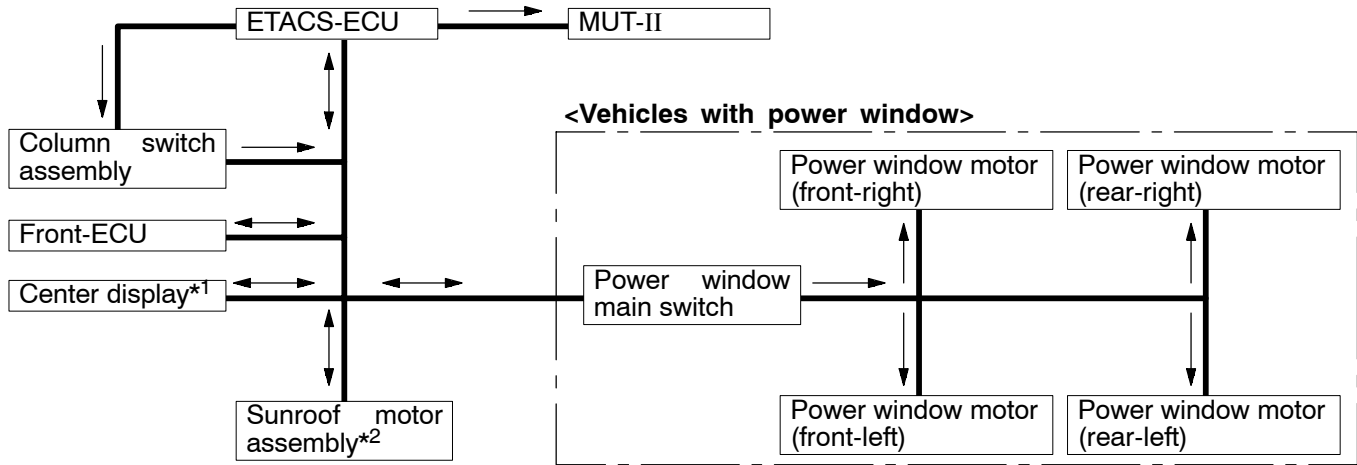
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GENERAL INFORMATION

COMMUNICATION LINE

Data lines for multiplex communication are connected between the front-ECU, ETACS-ECU, column switch assembly, sunroof motor assembly, center display, power window main switch, and power window motors as illustrated below.



NOTE

→ : Uni-directional communication line

↔ : Bi-directional communication line

*1: Vehicles with center display

*2: Vehicles with sunroof

OPERATION

BUZZER

Light Reminder Warning Buzzer Function

When the driver's door is opened with lighting switch in the ON (tail lamp switch or headlamp switch) position and ignition switch in the LOCK (OFF) or ACC position, the buzzer will sound continuously to remind the driver that the lamps (tail lamps or headlamps) are ON.

This function does not work if the lighting switched off through the headlamp automatic shutdown

function. In addition, the ignition key reminder warning buzzer function has a priority over this function.

Center Display Operation Annunciation Function <Vehicles with Center Display>

On vehicles with center display, the buzzer (peeps) sounds when the operation switch of the audio and navigation system is pressed.

CENTRAL DOOR LOCKING SYSTEM <Vehicles with Central Door Locking System>

Central Door Locking System Operation

When the lock switch is turned ON after the unlock switch on the driver's door lock actuator switch is OFF, the ETACS-ECU gives a lock output for 0.5 second. When the unlock switch is turned ON after the lock switch on the driver's door lock actuator switch is OFF, the ETACS-ECU gives an unlock output for 0.5 second.

When the front passenger's door key or back door key is operated, the ETACS-ECU gives a lock or unlock output for 0.5 second.

Forgotten Key Prevention Function

If, with the key reminder switch OFF and the driver's door switch ON, the driver's door lock switch is turned ON after the door unlock switch in the front door lock actuator is turned OFF, the ETACS-ECU waits 0.3 second then give an unlock relay output for 0.5 second, there by preventing the doors from being locked. This operation prevents the ignition key from being locked inside the vehicle. This function takes precedence over the central door locking control function.

POWER WINDOWS

Power Windows Operation

A signal line dedicated for transmission of multiplex communication data is connected between the power window main switches and the power window motor-ECU.

Communication is uni-directional. The power window main switches have a transmitting circuit only, whereas the power window sub switches have a receiving circuit only.

Power Window Timer Function

With the ignition switch in the ON position, the power window relay and power window switch receipt permission signal (a SWS signal transmitted from the ETACS-ECU) are turned ON [the power window

switch receipt permission signal remains ON for 30 seconds after the ignition switch is turned LOCK (OFF)], enabling opening and closing of the windows. The power window relay goes ON for additional 30 seconds. If the driver's door is subsequently closed during this period, the receipt permission signal goes OFF. The power window relay goes OFF 10 seconds after the receipt permission signal goes OFF.

If the driver's door is opened during timer operation, the receipt permission signal goes ON for additional 30 seconds. If the driver's door is subsequently closed during this period, the receipt permission signal goes OFF ten seconds after the receipt permission signal goes OFF.

KEYLESS ENTRY SYSTEM <Vehicles with Keyless Entry System>

Keyless Entry System Operation

If the transmitter LOCK or UNLOCK switch is pressed while the ignition key is removed and all of the doors are closed, the doors can be locked or unlocked.

Keyless Entry Answerback Function

The keyless entry hazard answerable function facilitates confirmation of door locking and unlocking operations even in daylight. When a LOCK

signal from the keyless entry transmitter is applied to the ETACS-ECU, all of the turn-signal lamps flash twice. When an UNLOCK signal from the keyless entry transmitter is applied to the ETACS-ECU, all of the turn-signal lamps flash four times. Note that an unlock switch has change from OFF to ON.

NOTE

The hazard answer back is enabled or disabled by the configuration function.

SUNROOF <Vehicles with Sunroof>

Sunroof Operation

All of the slide open/close, tilt up/down, and stop operations can be performed by a single switch. When the roof lid glass is tilted up, the sunshade opens approximately 98 mm in combined operation with the roof lid glass for better ventilation.

A jam preventing mechanism has been adopted. When a slide-close or tilt-down operation is blocked by an external force, the roof lid glass moves back and stops.

Sunroof Timer Function

When the ignition switch is turned from ON position to LOCK (OFF) or ACC position, the sunroof will be ready to work for 30 seconds.

If the driver's door is opened during the timer operation, the timer operates for another 30 seconds starting from that point. However, the timer operation discontinues if the door is closed during that period.

WINDSHIELD WIPER AND WASHER

Windshield Low-speed/High-speed Wiper Operation

- If the windshield low-speed wiper switch is turned to the ON position with the ignition switch at the ACC or ON position, the column switch sends a low-speed wiper ON and high-speed wiper OFF signals to the front-ECU. This turns the wiper signal on and the wiper speed switching relay off (low-speed), causing the wipers to operate at low-speed.
- If the windshield high-speed wiper switch is turned to the ON position, the column switch sends a low-speed wiper OFF and high-speed wiper ON signals to the front-ECU. This turns both the wiper signal and the wiper speed switching relay on (high-speed), causing the wipers to operate at high-speed.

Windshield Intermittent Wiper Operation

The ETACS-ECU calculates the wiper operation interval according to the voltage signal sent from the column switch. Then the ETACS-ECU sends a signal to the front-ECU. The front-ECU determines the wiper operation interval and turns on the wiper signal relay. This causes the wiper auto stop relay to turn on. Then the wiper auto stop relay will turn off after the wipers reach the park position. This causes the wiper signal relay and then the wipers to turn off. If the wiper signal relay remains off for the wiper operation interval, the relay turns on again, causing the wipers to operate in intermittent mode.

REAR WIPER AND WASHER <Vehicles with Rear Wiper and Washer>

Rear Wiper Operation

If the rear wiper switch is turned to the ON position with the ignition switch at ACC or ON position, the ETACS-ECU turns ON the rear wiper drive signal for three seconds (approx. two operations). 7.4 seconds later, the wiper begins the intermittent operation with 8 seconds' cycle.

If the shift lever <M/T> or selector lever <A/T> is moved to the R position when the rear wiper switch is turned to the ON position and the ignition switch at ACC or ON position, back-up lamp switch <M/T> or inhibitor switch R <A/T> turns ON. One second later, the ETACS-ECU turns ON the rear wiper drive signal for three seconds (approx. two operations) to clear the rear field of view. 7.4 seconds later, the wiper returns to the intermittent operation with 8 seconds' cycle.

Windshield Mist Wiper Operation

- If the windshield mist wiper switch of the column switch is turned to the ON position with the ignition switch at ACC or ON position, the mist wiper high-speed operation signal is sent to the front-ECU. This signal turns on the wiper speed switching relay, causing the wipers to work at high-speed while the mist switch is on.
- While the windshield mist wiper switch remains turned on when the intermittent mode is still working, the wipers work as the mist wiper. However, the wipers return to the intermittent mode again when the wiper auto stop signal turns on after the mist wiper switch is turned off.

Windshield Washer Operation

If the windshield washer switch of the column switch is turned to the ON position with the ignition switch at ACC or ON position, the windshield washer ON signal is sent to the front-ECU, causing the windshield wiper signal to turn on after 0.3 seconds. After the windshield washer switch signal turns off, the windshield wiper signal turns off in three seconds.

If the windshield wiper switch is turned to the ON position while the windshield wiper is at intermittent mode, the windshield washer works for that period when the windshield washer switch remains on. Then the wipers return to the intermittent mode.

Rear Washer Operation

If the rear washer switch is turned to the ON position with the ignition switch at ACC or ON position, the rear washer ON signal is sent to the ETACS-ECU, causing the rear wiper signal to turn on after 0.3 seconds. After the rear washer switch signal turns off, the rear wiper signal turns off in three seconds.

If the rear wiper is in intermittent operation when the rear washer switch is turned ON, the rear wiper again continues the intermittent operation with 8 seconds' cycle from 7.4 seconds later since the rear drive signal is turned OFF.

HEADLAMP WASHER <Vehicles with Headlamp Washer>

If the headlamp washer switch at the steering column is placed in the ON position when the ignition switch is in the ACC or ON position and the

headlamp switch is in the ON position, the headlamp washer drive signal is turned ON for 0.5 second.

IGNITION KEY HOLE ILLUMINATION LAMP

When the ignition switch is turned to LOCK (OFF) or ACC position with the driver's door opened, the ignition key hole illumination lamp is illuminated.

If the door is closed in that state, the lamp goes out after 30 seconds. Vehicles with keyless entry

system, it illuminates for 30 seconds after the ignition key is removed. In either case the lamp goes out when the ignition switch is turned to ON position.

HEADLAMP**Headlamp Automatic Shutdown Function**

If the ignition switch is turned to LOCK (OFF) or ACC position, when the headlamps are on, the headlamps will be switched off in three minutes. If the driver's door is opened within that three-minute period, the headlamps will be switched off automatically. This prevents the battery from discharged.

In addition, if the headlamps are turned on when the ignition switch is at LOCK (OFF) or ACC position, the headlamps will not be switched off.

Headlamp Dimmer Switch Automatic Reset Function

This function allows the dimmer switch to be reset to the low-beam position whenever the headlamp switch is turned ON.

Daytime Running Lamp (DRL) Function <Vehicles with DRL>

If the ignition switch is turned to ON when the headlamps and tail lamps are off, the headlamps (low-beam) and tail lamps turn on.

FLASHER TIMER**Turn-signal Lamp**

When the ignition switch is turned to ON position and turn-signal lamp switch is placed in the ON position for right or left turn signaling, the system generates turn-signal lamp drive signals (flashing signals).

The system also notifies of a blown turn-signal lamp bulb by shortening the flashing intervals of the corresponding indicator lamp.

Hazard Warning Lamp

The system detects a change from ON to OFF of the hazard lamp input signal and activates the hazard lamps if they are not in operation or deactivates the lamps if they are operating (reversal of state between activation and deactivation).

FRONT FOG LAMP <Vehicles with Front Fog Lamp>

If the front fog lamp switch is turned ON at the condition that the headlamp or the tail lamp is turned ON (including the illumination by the automatic lighting function), the front fog lamp is turned ON.

Whenever the tail lamps are turned on at the next time, the front fog lamps will always be off regardless of the switch positions. In addition, if the tail lamp is switched off by the automatic lighting system, the front fog lamp will also be switched off. However, the front fog lamp will be illuminated when the tail lamp is switched on.

REAR FOG LAMP

If the fog lamp switch is turned ON when the headlamp or the front fog lamp is turned On, the rear fog lamp is switched ON and OFF alternatively.

If the headlamp and the front fog lamp are turned OFF during lighting of the rear fog lamp, the rear fog lamp is turned OFF at the same time.

ROOM LAMP <Vehicles with Keyless Entry System>

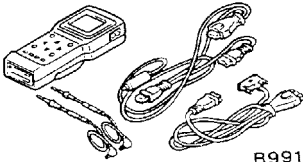
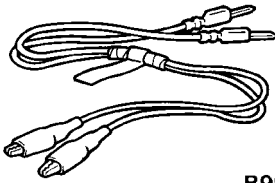

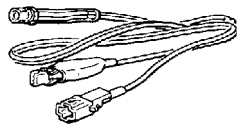
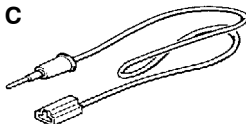

With the room lamp switch in the DOOR position, the ETACS-ECU controls the room lamp operation as follows:

- When a door is opened from outside or inside [with the ignition switch turned to LOCK (OFF) position]:
When a door is opened, the ETACS-ECU causes the room lamp to be illuminated at the 100% intensity. When the door is closed, it dims out the room lamp to 65% intensity and approx. 30 seconds later, turns out the lamp completely. During this period (timer controlled period), the room lamp goes out if the ignition switch is turned to ON position or the doors are locked.
- When a door is opened or closed with the ignition switch in the ON position:
The room lamp illuminates at 100% intensity when a door is opened and turned out when it is closed.
- When no door is opened and the ignition key is removed:

When the ignition key is removed with all the doors closed, the room lamp is illuminated at an intensity of 100% and turned out approx. 30 seconds later. During that time (timer-controlled period), the room lamp goes out if the ignition key is inserted and turned to ON position or the door locking system is activated.

- Room lamp's answerback operation in response to door lock control by keyless entry system:
To allow the driver to ascertain the result of the door locking/unlocking control action by the use of the keyless entry system, the ETACS-ECU causes the room lamp to blink twice when the doors are locked through the system and to illuminate for approx. 15 seconds when the doors are locked.
The room lamp's answerback operation in response to a keyless entry system control action is accompanied by operation of the hazard warning lamps.

SPECIAL TOOLS

Tool	Number	Name	Use
 <p>B991502</p>	MB991502	MUT-II sub assembly	Checking of the SWS (Diagnosis code display and input check with the MUT-II)
 <p>B991529</p>	MB991529	Diagnosis code check harness	Simple diagnosis
<p>A</p>  <p>B</p>  <p>C</p>  <p>D</p>  <p>C991223</p>	MB991223 A: MB991219 B: MB991220 C: MB991221 D: MB991222	Harness set A: Test harness B: LED harness C: LED harness adapter D: Probe	Measurement of terminal voltage at ECUs A: Connector pin contact pressure inspection B: Power circuit inspection C: Power circuit inspection D: Commercial tester connection

TROUBLESHOOTING

STANDARD FLOW OF DIAGNOSTIC TROUBLESHOOTING

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

DIAGNOSTIC FUNCTION

DIAGNOSIS CODES CHECK

Use the MUT-II to check a diagnosis code.

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

NOTE

Connect the MUT-II to the 16-pin diagnosis connector (black).

INPUT SIGNAL CHECK

1. Use the MUT-II to check a input signal.
(Refer to GROUP 00 – How to Use Troubleshooting/Inspection Service Points.)
2. In this condition, the following input switches can be checked.
3. If an abnormality is found during the input signal check, carry out troubleshooting while referring to the Trouble Symptom Check page.

Input Signal Check Function

Input signal	Buzzer operation condition
Ignition switch (ACC)	Turned from LOCK (OFF) to ACC
Ignition switch (IG1)	Turned from ACC to ON
Key reminder switch <Vehicles with keyless entry system>	Ignition key removed from ignition key cylinder (from inserted position)
Hazard warning lamp switch	Turned from OFF to ON
Front fog lamp switch <Vehicles with front fog lamp>	
Rear fog lamp switch	
Back-up lamp switch <M/T, vehicles with rear wiper and washer>	Shift lever moved to R position
Inhibitor switch (reverse) <A/T, vehicles with rear wiper and washer>	Selector lever moved to R position
Rear wiper motor auto-stop signal <Vehicles with rear wiper and washer>	Rear wiper begins to operate (The input signal is sent before the rear wiper begins to operate)
Driver's door switch	Driver's door opened from closed condition
Door switches	All doors closed to any door opened
Front passenger's or back door lock key cylinder switch <Vehicles with central door locking system>	Turn the key to the locked or unlock
Driver's door lock actuator switch <Vehicles with central door locking system>	Driver's door lock knob moved from lock position to unlock position or vice versa

Input signal		Buzzer operation condition
Column switch	Tail lamp switch	Turned the lighting switch from OFF to tail lamp position
	Headlamp switch	Turn the lighting switch from tail lamp position to headlamp position
	Dimmer switch	Turned from OFF to ON
	Passing switch	
	Turn-signal lamp switch	
	Windshield mist wiper switch	
	Windshield intermittent wiper switch	
	Windshield low-speed wiper switch	
	Windshield high-speed wiper switch	
	Windshield intermittent wiper interval adjusting knob	Rotate the windshield intermittent wiper interval adjusting knob from FAST to SLOW when the ignition switch is in ON position (The ETACS-ECU sends a signal around the medium knob position)
	Windshield washer switch	Turned from OFF to ON
	Rear wiper switch <Vehicles with rear wiper and washer>	
	Rear washer switch <Vehicles with rear wiper and washer>	
	Headlamp washer switch <Vehicles with headlamp washer>	
Power window main switch	Any switch <Vehicles with power window>	Turned from OFF to ON
Transmitter	Any switch <Vehicles with keyless entry system>	Turned from OFF to ON
Sunroof switch	Any switch <Vehicles with sunroof>	Turned from OFF to ON
Center display	Any switch <Vehicles with center display>	Turned from OFF to ON

DIAGNOSIS CODE CHART

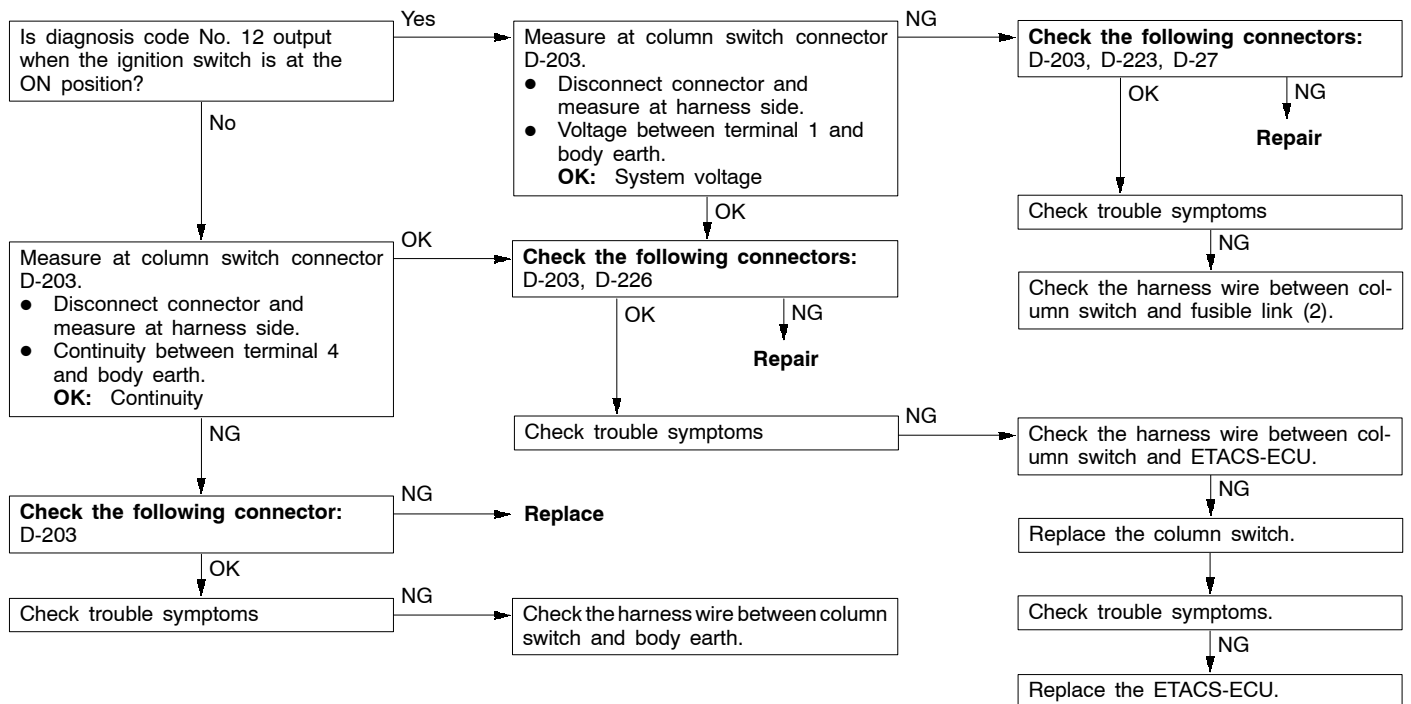
Code No.	Diagnosis item	Reference page
11	Failure concerning the ETACS-ECU	54B-10
12	Failure concerning the column switch or improper connecting with the ETACS-ECU	54B-10
13	Failure concerning the front-ECU	54B-11
21	Short circuit in communication line	54B-12

DIAGNOSIS CODE INSPECTION PROCEDURES

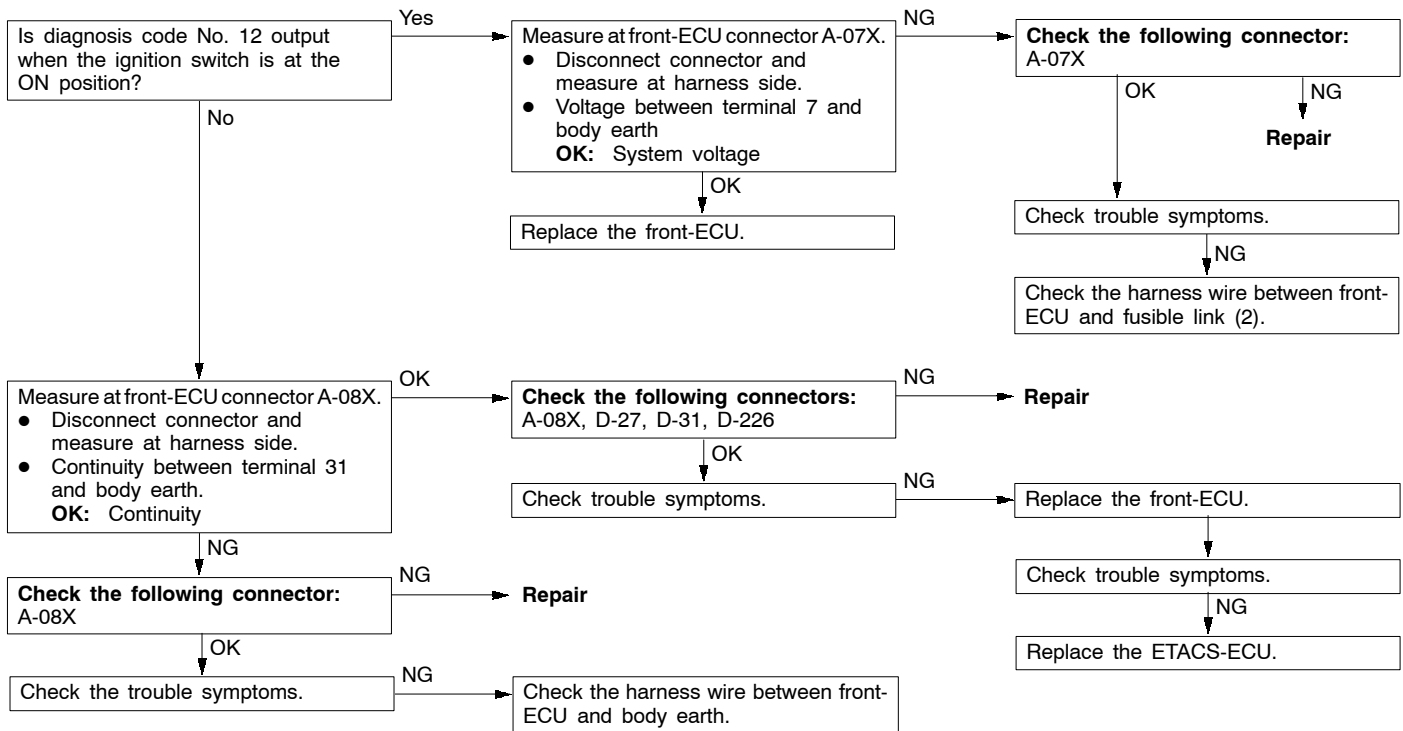
Code No.11 Failure concerning the ETACS-ECU	Probable cause
The ETACS-ECU monitors its own communication data, and sends a diagnosis code when an error takes place consecutive fifteen times in 0.6 second. The diagnosis code will be erased when the ETACS-ECU determines that its own communication data is sent consecutive 15 times in 0.6 second.	<ul style="list-style-type: none"> Malfunction of ETACS-ECU

Replace the ETACS-ECU.

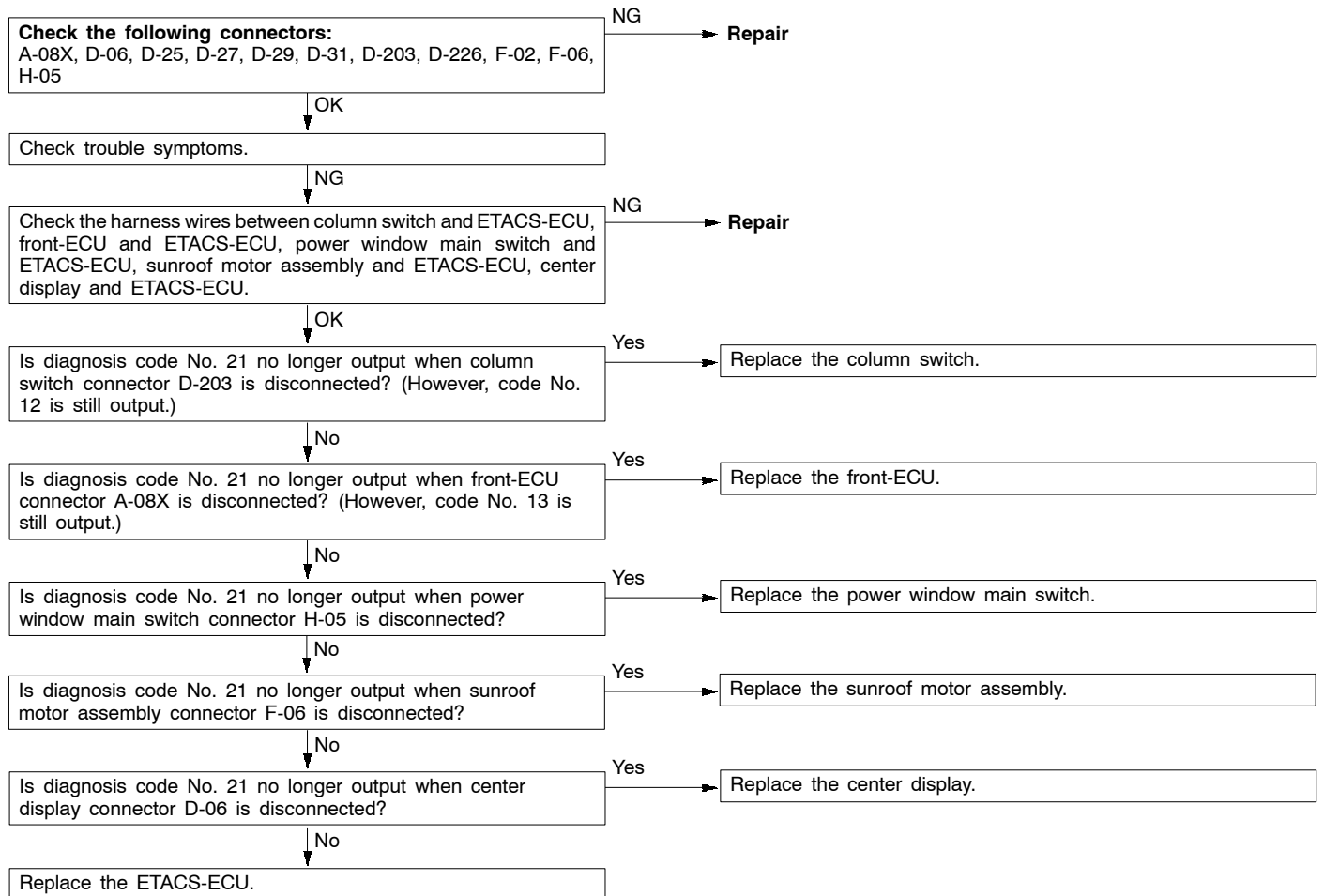
Code No.12 Failure concerning the column switch or improper connection with the ETACS-ECU	Probable cause
This diagnosis code is displayed when the column switch sends a signal regardless of the transmission request signal from the ETACS-ECU (three times or more in one second). The diagnosis code is erased when the column switch continues to send a signal according to the transmission request signal from the ETACS-ECU for one second.	<ul style="list-style-type: none"> Malfunction of column switch Malfunction of ETACS-ECU Malfunction of wiring harness or connector



Code No.13 Failure concerning the front-ECU	Probable cause
<p>This diagnosis code is displayed when the signals that the front-ECU sends to the ETACS-ECU are errors consecutive fifteen times in 0.6 second.</p> <p>The diagnosis code will be erased when the front-ECU sends normal signals to the ETACS-ECU consecutive 15 times in 0.6 second.</p>	<ul style="list-style-type: none"> ● Malfunction of front-ECU ● Malfunction of ETACS-ECU ● Malfunction of wiring harness or connector



Code No.21 Short circuit in communication lines	Probable cause
This diagnosis code is displayed when the SWS communication line voltage reaches the LO level for 0.3 second. The diagnosis code is erased when voltage in the ETACS-ECU data line reaches the HI level for 0.3 second, or the ETACS-ECU receives a normal signal from other ECUs or switches. While this code is displayed, other codes are not displayed.	<ul style="list-style-type: none"> • Malfunction of column switch • Malfunction of front-ECU • Malfunction of power window main switch <vehicles with power window> • Malfunction of sunroof motor assembly <vehicles with sunroof> • Malfunction of center display <vehicles with center display> • Malfunction of ETACS-ECU • Malfunction of wiring harness or connector



TROUBLE SYMPTOM CHART

Trouble symptom		Inspection procedure	Reference page
Communication with the MUT-II is impossible.		A-1	54B-17
Buzzer	Light reminder warning buzzer function does not work normally.	B-1	54B-17
	Center display operation annunciation function does not work normally.	B-2	54B-18
Central door locking system	Central door locking system does not work normally.	C-1	54B-18
	Some doors does not lock or unlock.	C-2	54B-19
	Some functions of central locking system do not work.	C-3	54B-19
	Forgotten key prevention function does not work.	C-4	54B-20
Power window	Power window does not work at all.	D-1	54B-20
	Power window main switch can not operate driver's window.	D-2	54B-21
	Power window sub switch can not operate front passenger's or rear window.	D-3	54B-22
	Power window main switch can not operate front passenger's or rear window.	D-4	54B-23
	Power window timer function does not work normally.	D-5	54B-23
	When the glass is raised, it then lowers automatically.	D-6	54B-24
	The glass is not lowered when something is jammed in the window.	D-7	54B-24
	When the glass is fully raised, it then lowers automatically.	D-8	54B-24
Keyless entry system	Keyless entry system does not operate.	E-1	54B-24
	The room lamp and hazard warning lamps do not operate through the answerback function.	E-2	54B-25
	The encrypted code cannot be registered.	E-3	54B-25
Sunroof	Sunroof does not work at all.	F-1	54B-26
	Sunroof timer function does not work normally.	F-2	54B-27
	Safety mechanism does not function.	F-3	54B-27

Trouble symptom		Inspection procedure	Reference page
Windshield wiper and washer	Windshield wiper does not operate.	G-1	54B-28
	Windshield wiper does not stop at the predetermined park position.	G-2	54B-29
	Any of the windshield wiper switch positions is defective.	G-3	54B-29
	Windshield intermittent wiper interval cannot be adjusted.	G-4	54B-30
	Windshield washer does not work.	G-5	54B-30
Rear wiper and washer	Rear wiper does not work at all.	H-1	54B-31
	Rear wiper does not stop at the predetermined park position.	H-2	54B-31
	When the shift lever <M/T> or selector lever <A/T> is moved to R position during the rear wiper operation, the rear wiper does not operate at the continuous mode.	H-3	54B-32
	Rear washer does not work.	H-4	54B-32
Headlamp washer	Headlamp washer does not work.	I-1	54B-33
Ignition key hole illumination lamp	Ignition key hole illumination lamp does not work normally.	J-1	54B-34
Headlamp, tail lamp	Tail lamp do not illuminate.	K-1	54B-34
	Headlamps (low-beam) do not illuminate.	K-2	54B-35
	Headlamps (high-beam) do not illuminate.	K-3	54B-35
	Headlamps do not illuminate when the passing switch is operated.	K-4	54B-36
	The headlamp automatic shutdown function does not work normally.	K-5	54B-36
	Headlamp dimmer switch automatic reset function does not work normally.	K-6	54B-37
	Daytime running lamp (DRL) function does not work.	K-7	54B-37
Flasher timer	Turn-signal lamp do not flash when the turn-signal lamp switch is turned on.	L-1	54B-37
	Hazard warning lamps do not flash when the hazard warning lamp switch is turned on.	L-2	54B-38
Front fog lamp	Front fog lamps do not illuminate when the front fog lamp switch is turned on.	M-1	54B-39
	Front fog lamp do not go out when the tail lamps are turned off while the front fog lamps are on.	M-2	54B-39

Trouble symptom		Inspection procedure	Reference page
Rear fog lamp	Rear fog lamp do not illuminate when the rear fog lamp switch is turned on.	N-1	54B-40
	Rear fog lamp do not go out when the headlamps and front fog lamps are turned off while the rear fog lamp is on.	N-2	54B-40
Room lamp	Room lamp does not illuminate.	O-1	54B-41
	Room lamp dimming function does not work normally.	O-2	54B-41
Center display	Center display does not work normally.	—	GROUP 54A – Center Display.

DEFECTS FOUND BY INPUT SIGNAL CHECK

If the input signal check finds a defect, follow the table below to check.

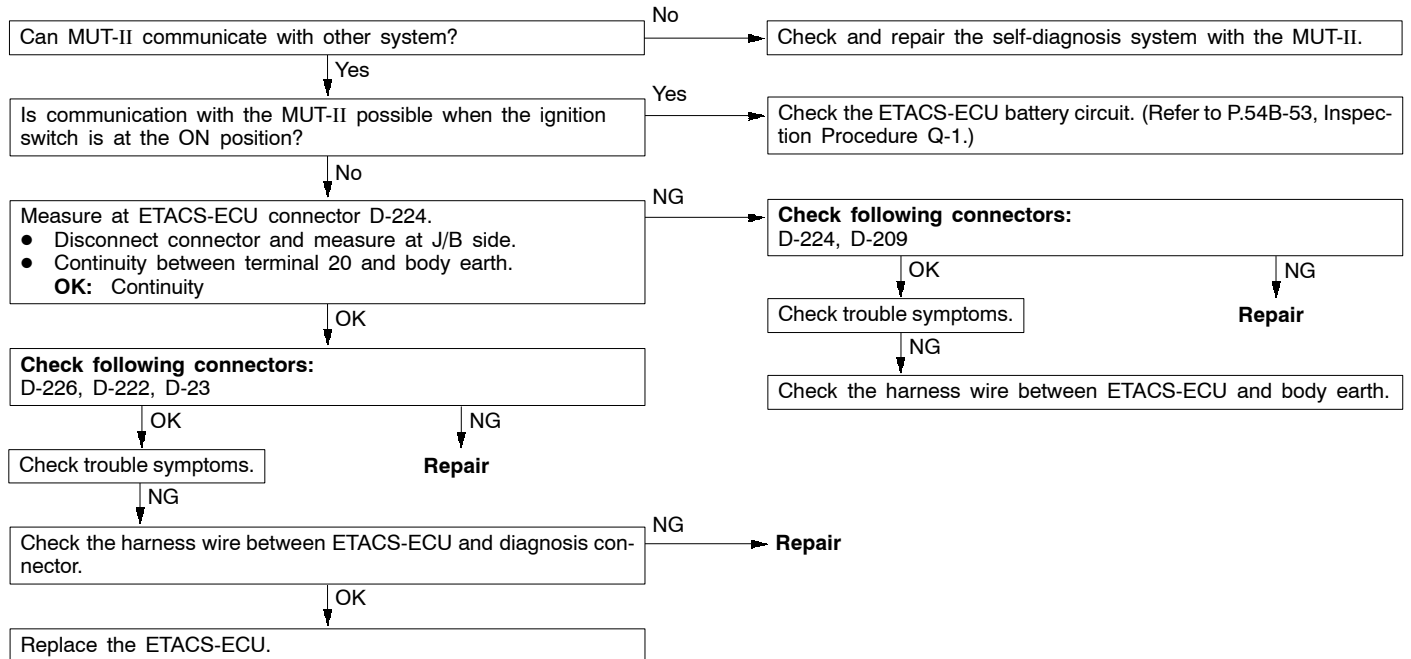
Trouble symptom	Inspection procedure	Reference page
Ignition switch (ACC) signal is not sent to the ETACS-ECU.	P-1	54B-42
Ignition switch (IG1) signal is not sent to the ETACS-ECU.	P-2	54B-42
Key reminder switch signal is not sent to the ETACS-ECU.	P-3	54B-43
Hazard warning lamp switch signal is not sent to the ETACS-ECU.	P-4	54B-43
Front fog lamp switch signal is not sent to the ETACS-ECU.	P-5	54B-44
Rear fog lamp switch signal is not sent to the ETACS-ECU.	P-6	54B-45
Back-up lamp switch signal is not sent to the ETACS-ECU. <M/T>	P-7	54B-45
Inhibitor switch (reverse) signal is not sent to the ETACS-ECU. <A/T>	P-8	54B-46
Rear wiper motor auto-stop signal is not sent to the ETACS-ECU.	P-9	54B-46
Driver's door switch signal is not sent to the ETACS-ECU.	P-10	54B-47
Door switches signal is not sent to the ETACS-ECU.		
Front passenger's or back door lock key cylinder switch signal is not sent to the ETACS-ECU.	P-11	54B-48
Driver's door lock actuator switch signal is not sent to the ETACS-ECU.	P-12	54B-48

Trouble symptom		Inspection procedure	Reference page
Column switch	Tail lamp switch signal is not sent to the ETACS-ECU.	P-13	54B-49
	Headlamp switch signal is not sent to the ETACS-ECU.		
	Dimmer switch signal is not sent to the ETACS-ECU.		
	Passing switch signal is not sent to the ETACS-ECU.		
	Turn-signal lamp switch signal is not sent to the ETACS-ECU.		
	Windshield mist wiper switch signal is not sent to the ETACS-ECU.	P-14	54B-50
	Windshield intermittent wiper switch signal is not sent to the ETACS-ECU.		
	Windshield low-speed wiper switch signal is not sent to the ETACS-ECU.		
	Windshield high-speed wiper switch signal is not sent to the ETACS-ECU.		
	Windshield intermittent wiper interval adjusting knob signal is not sent to the ETACS-ECU.	P-15	54B-50
	Windshield washer switch signal is not sent to the ETACS-ECU.	P-14	54B-50
	Rear wiper switch signal is not sent to the ETACS-ECU.		
	Rear washer switch signal is not sent to the ETACS-ECU.		
	Headlamp washer switch signal is not sent to the ETACS-ECU.	P-13	54B-49
Power window main switch	Any switch signal is not sent to the ETACS-ECU.	P-16	54B-51
Transmitter	Any switch signal is not sent to the ETACS-ECU.	P-17	54B-52
Sunroof switch	Any switch signal is not sent to the ETACS-ECU.	P-18	54B-52
Center display	Any switch signal is not sent to the ETACS-ECU.	P-19	54B-53

INSPECTION PROCEDURE FOR TROUBLE SYMPTOMS

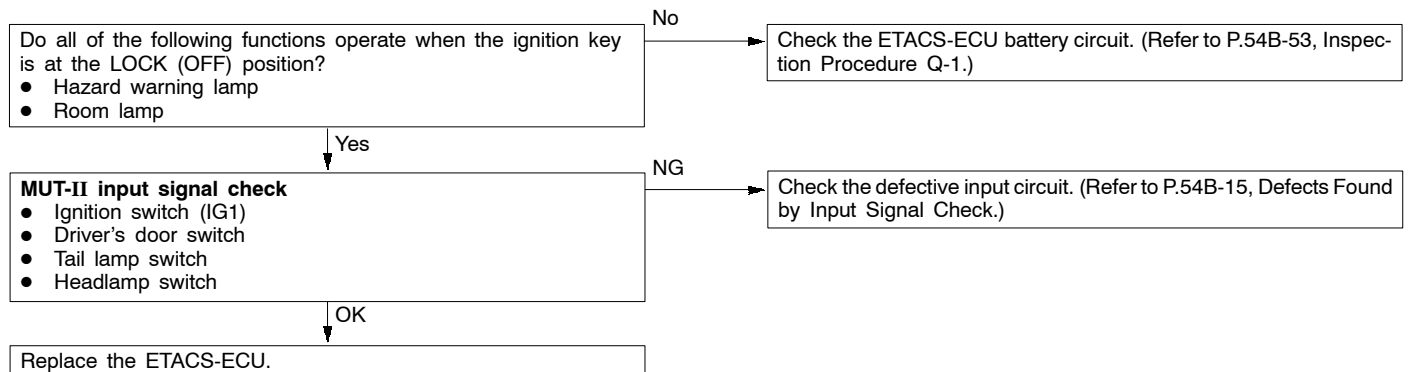
Inspection Procedure A-1

Communication with the MUT-II is impossible.	Probable cause
The harness wires between the ETACS-ECU power supply line or the ETACS-ECU and the diagnosis connector may be defective.	<ul style="list-style-type: none"> • Malfunction of ETACS-ECU • Malfunction of harness wire or connector



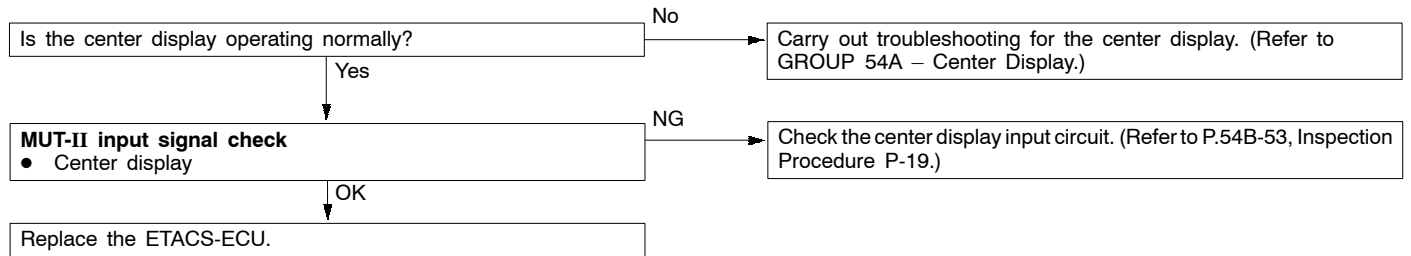
Inspection Procedure B-1

Buzzer: Light reminder warning buzzer function does not work normally.	Probable cause
<p>The ETACS-ECU operates the light reminder warning buzzer function, based on input signals from the following switches:</p> <ul style="list-style-type: none"> • Ignition switch (IG1) • Driver's door switch • Tail lamp switch • Headlamp switch <p>If the function does not work normally, a defect on the relevant circuit or the ETACS-ECU may be suspected.</p>	<ul style="list-style-type: none"> • Malfunction of driver's door switch • Malfunction of column switch • Malfunction of ETACS-ECU • Malfunction of harness wire or connector



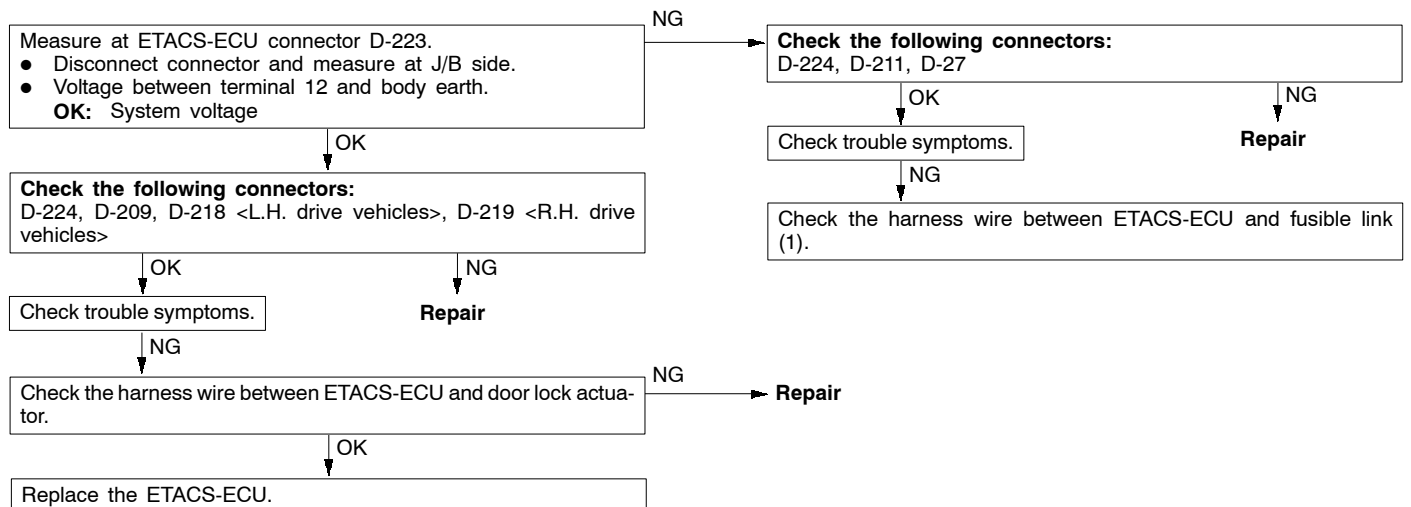
Inspection Procedure B-2

Buzzer: Center display operation annunciation function does not work normally.	Probable cause
If the center display is operating normally, the cause is probably a malfunction in the harness between the center display and the ETACS-ECU or in the ETACS-ECU itself.	<ul style="list-style-type: none"> • Malfunction of center display • Malfunction of ETACS-ECU • Malfunction of harness wire or connector



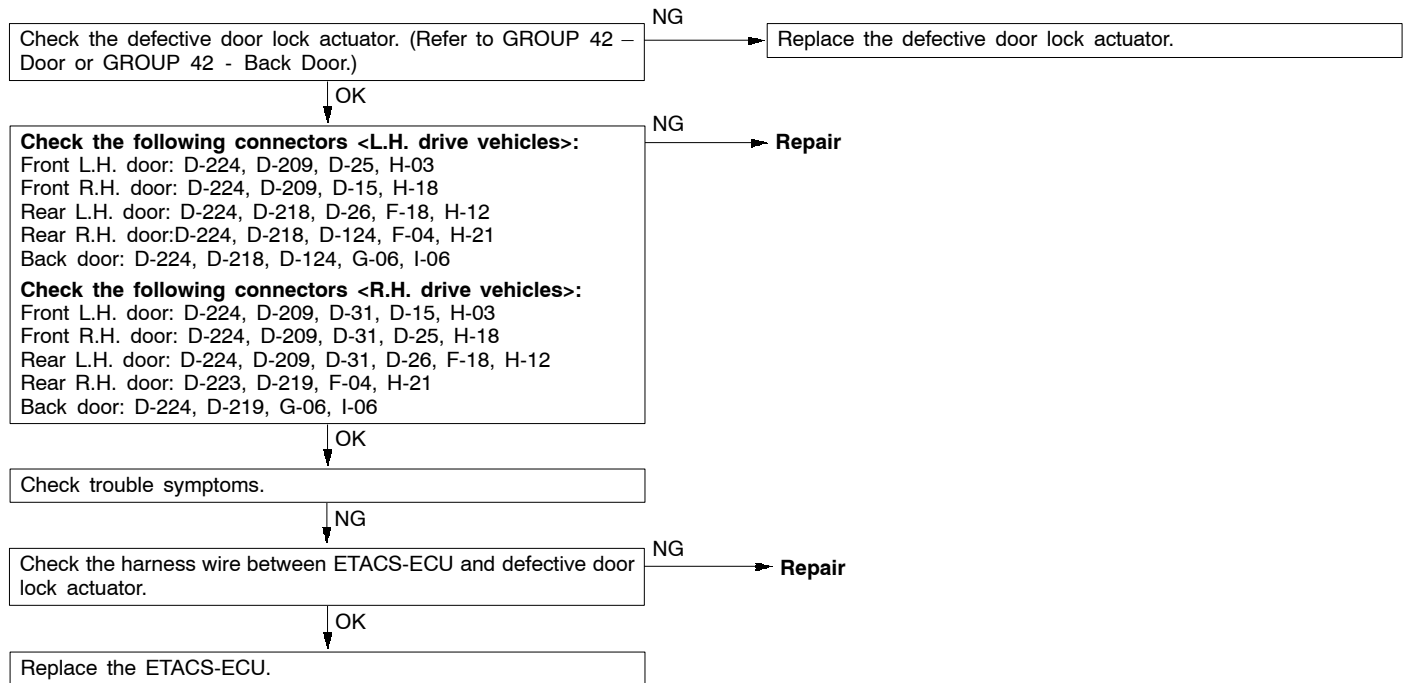
Inspection Procedure C-1

Central door locking system: Central door locking system does not work normally.	Probable cause
The power supply circuit, the circuit shared by door lock actuators, or the ETACS-ECU may be defective.	<ul style="list-style-type: none"> • Malfunction of ETACS-ECU • Malfunction of harness wire or connector



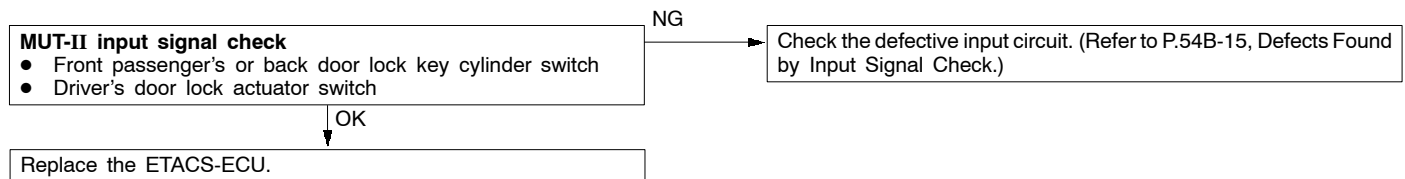
Inspection Procedure C-2

Central door locking system: Some doors do not lock or unlock.	Probable cause
The door lock actuator, or the harness wire between ETACS-ECU and the door lock actuator may be defective.	<ul style="list-style-type: none"> • Malfunction of driver's, front passenger's, rear or back door lock actuator • Malfunction of ETACS-ECU • Malfunction of harness wire or connector



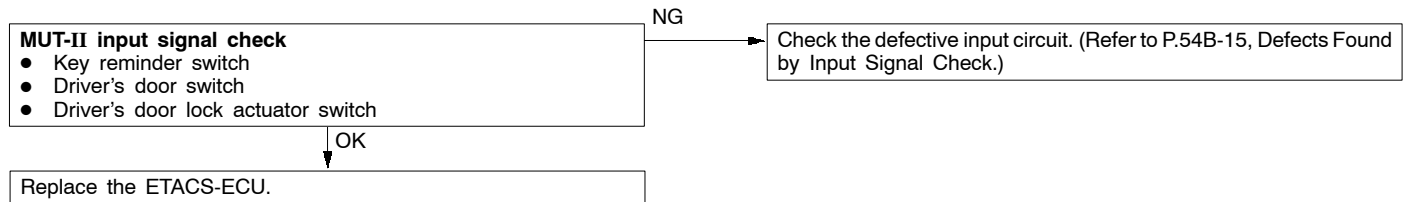
Inspection Procedure C-3

Central door locking system: Some functions of central locking system do not work.	Probable cause
<p>The ETACS-ECU operates the central door locking system, based on input signals from the following switches:</p> <ul style="list-style-type: none"> • Front passenger's or back door lock key cylinder switch • Driver's door lock actuator switch <p>If the system does not work normally, a defect on the relevant circuit or the ETACS-ECU may be suspected.</p>	<ul style="list-style-type: none"> • Malfunction of front passenger's or back door lock key cylinder switch • Malfunction of driver's door lock actuator switch • Malfunction of ETACS-ECU • Malfunction of harness wire or connector



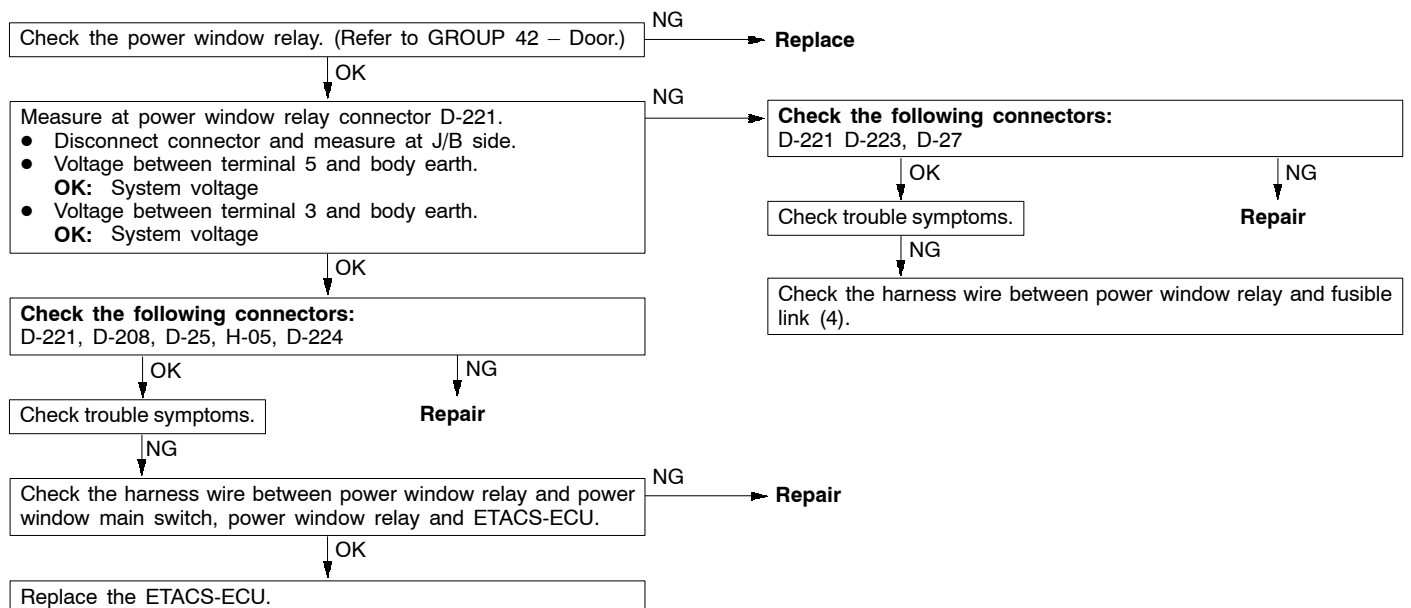
Inspection Procedure C-4

Central door locking system: Forgotten key prevention function does not work.	Probable cause
<p>The ETACS-ECU operates the forgotten key prevention function, based on the input signals from the following switches:</p> <ul style="list-style-type: none"> • Key reminder switch • Driver's door switch • Driver's door lock actuator switch <p>If the function does not work normally, a defect on the relevant circuit or the ETACS-ECU may be suspected.</p>	<ul style="list-style-type: none"> • Malfunction of key reminder switch • Malfunction of driver's door switch • Malfunction of driver's door lock actuator • Malfunction of ETACS-ECU • Malfunction of harness wire or connector



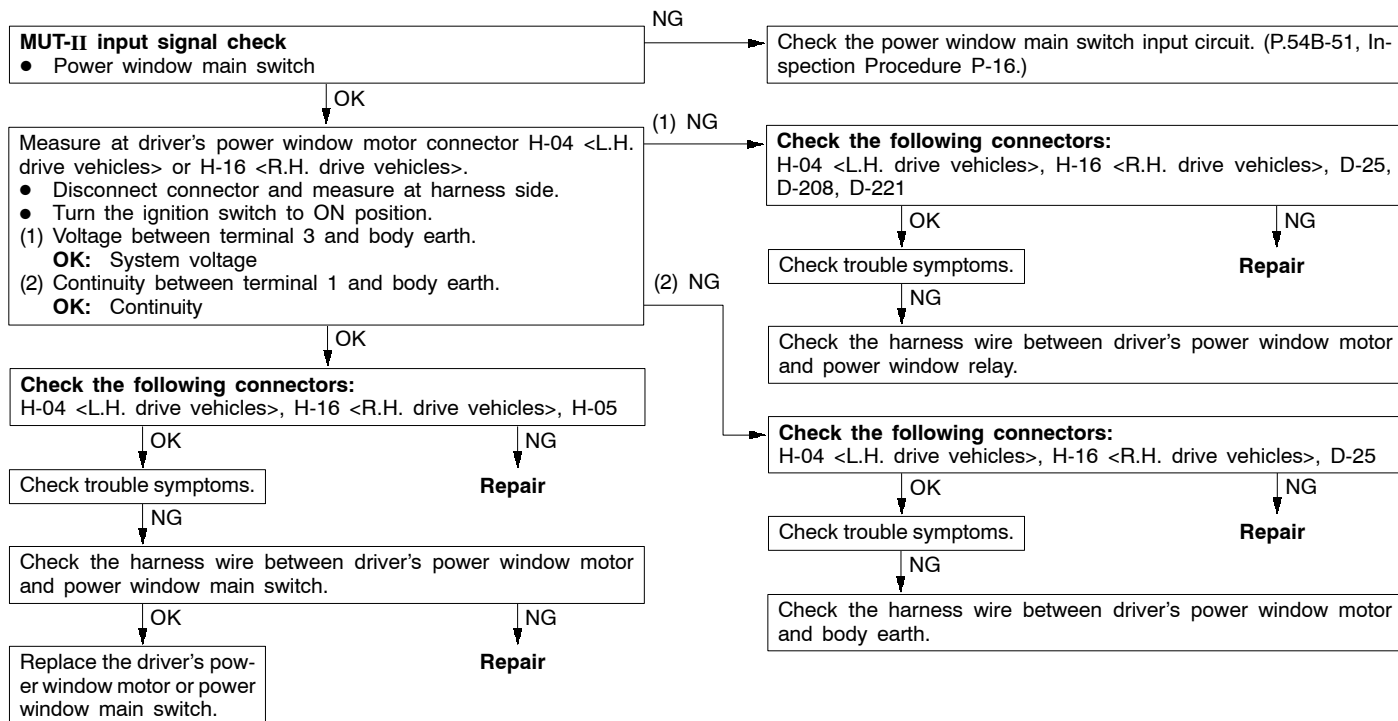
Inspection Procedure D-1

Power window: Power window do not work at all.	Probable cause
The power window relay or the ETACS-ECU may be defective.	<ul style="list-style-type: none"> • Malfunction of power window relay • Malfunction of ETACS-ECU • Malfunction of harness wire or connector



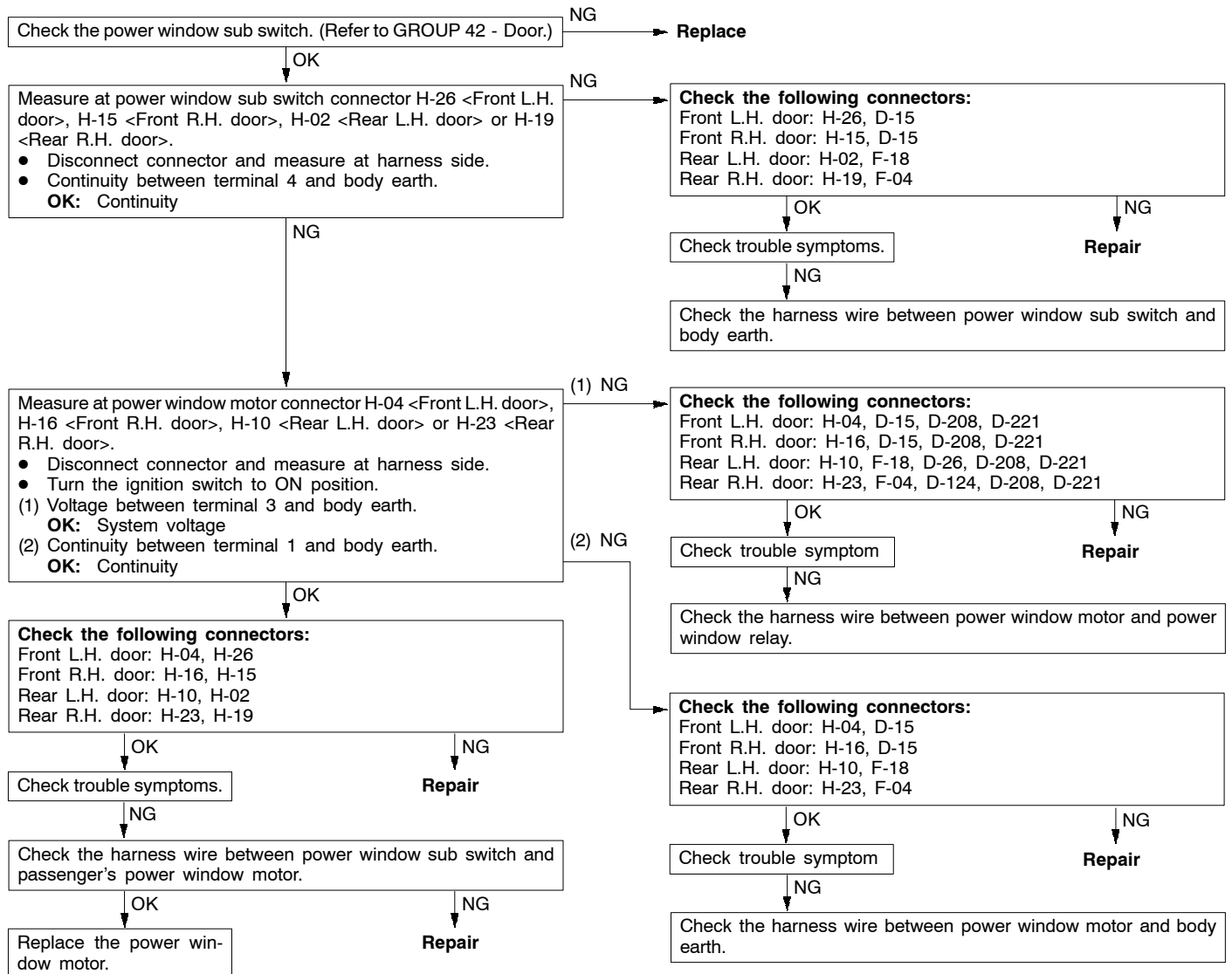
Inspection Procedure D-2

Power window: Power window main switch can not operate driver's window.	Probable cause
The cause is probably a malfunction of the power window main switch or driver's side power window motor, or an abnormality in the power supply circuit.	<ul style="list-style-type: none"> • Malfunction of power window main switch • Malfunction of driver's power window motor • Malfunction of harness wire or connector

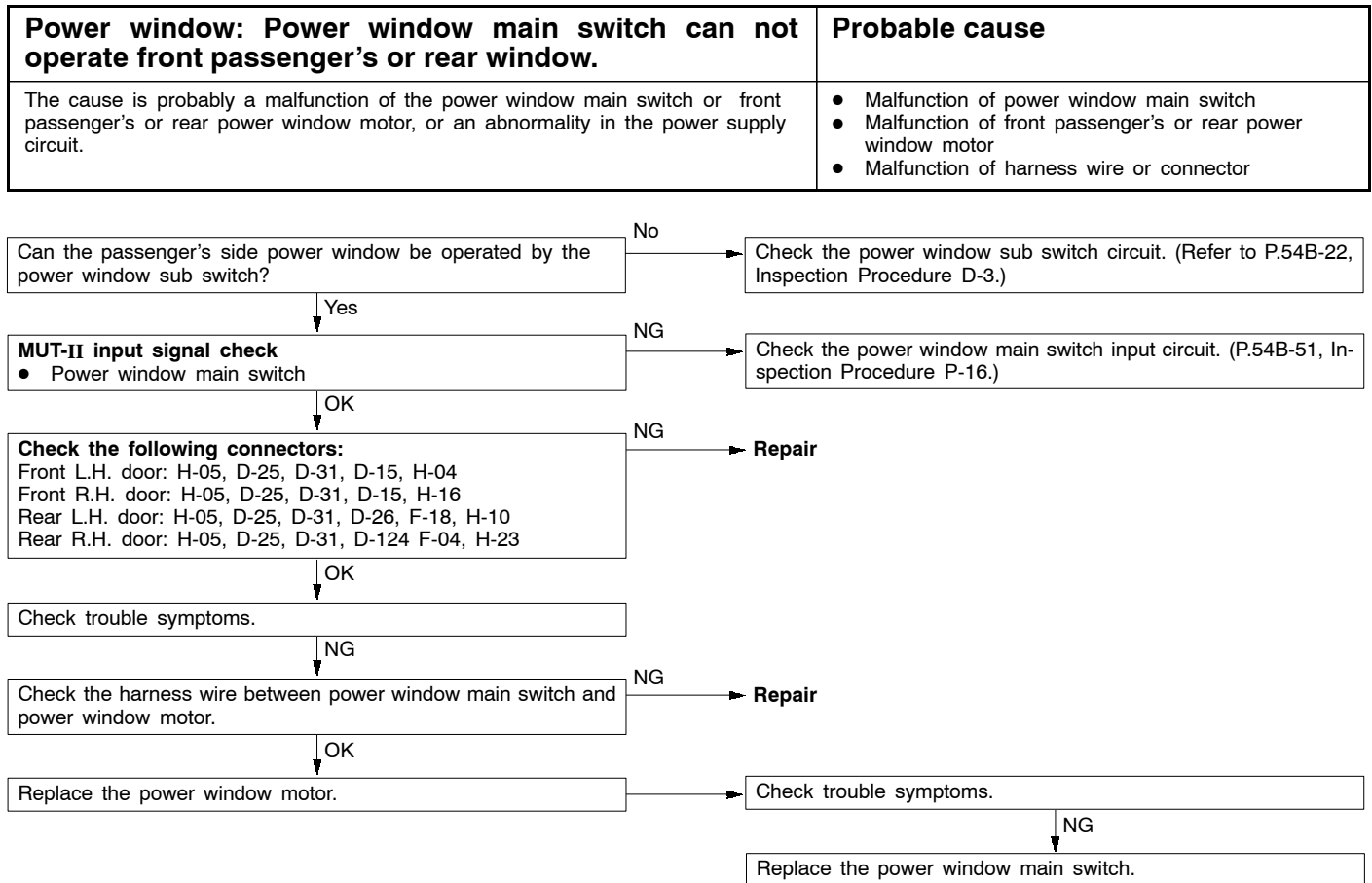


Inspection Procedure D-3

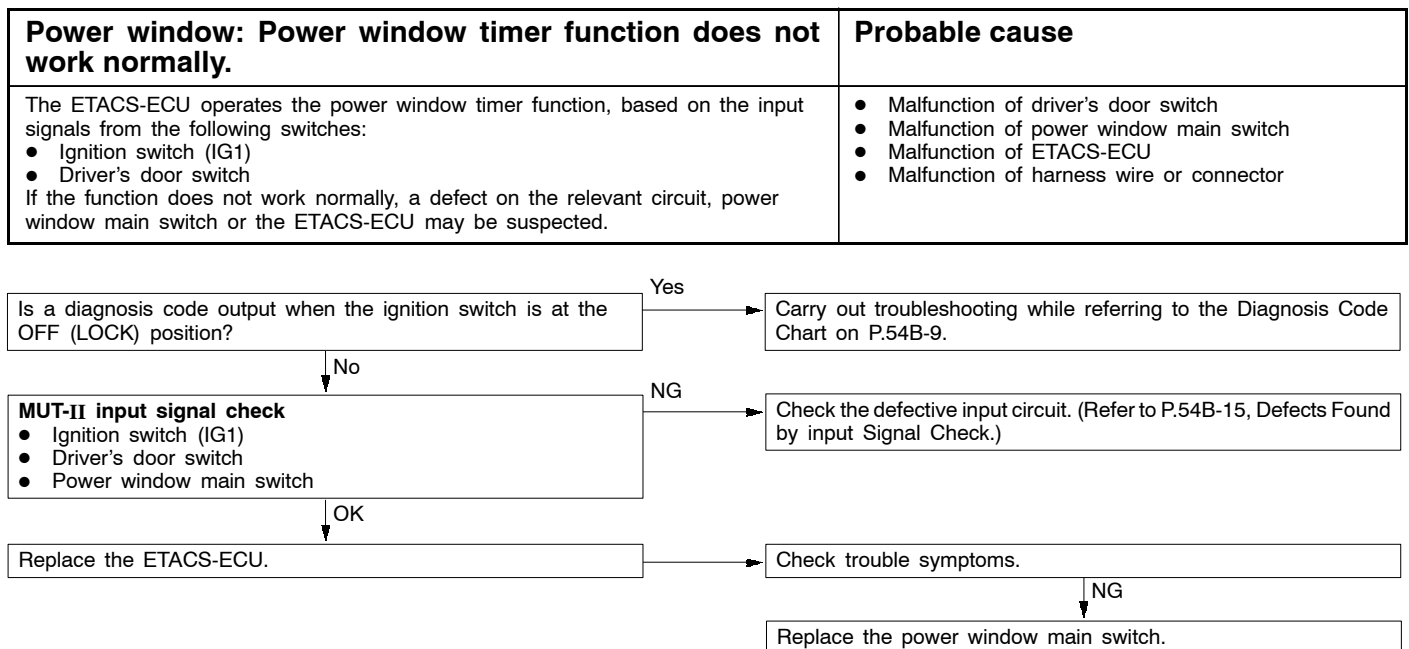
Power window: Power window sub switch can not operate front passenger's or rear window.	Probable cause
The cause is probably a malfunction of the power window sub switch or front passenger's or rear power window motor, or an abnormality in the power supply circuit.	<ul style="list-style-type: none"> Malfunction of power window sub switch Malfunction of front passenger's or rear power window motor Malfunction of harness wire or connector



Inspection Procedure D-4

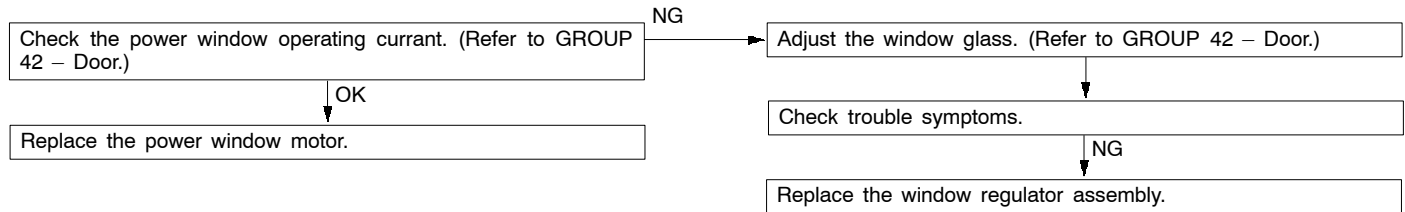


Inspection Procedure D-5



Inspection Procedure D-6

Power window: When the glass is raised, it then lowers automatically.	Probable cause
If the sliding resistance is too large when the glass is being raised, it is judged that something is jammed in the window, and the window is lowered by approximately 150 mm.	<ul style="list-style-type: none"> • Incorrect window glass adjustment • Glass slider is incorrectly installed or warped • Malfunction of power window motor



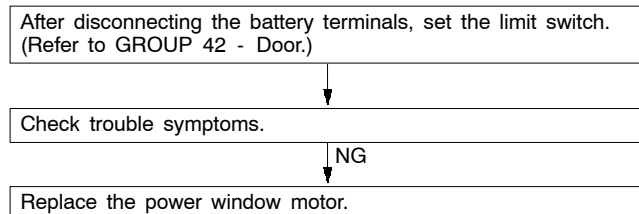
Inspection Procedure D-7

Power window: The glass is jammed in the window.	Probable cause
The cause may be a malfunction of the revolution detection sensor in the power window motor.	<ul style="list-style-type: none"> • Malfunction of power window motor

Replace the power window motor.

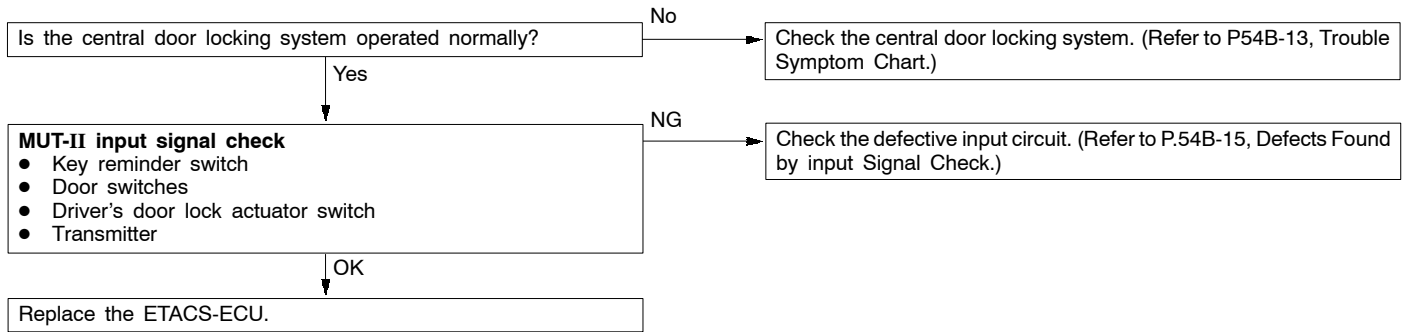
Inspection Procedure D-8

Power window: When the glass is fully raised, it then lowers automatically.	Probable cause
The cause may be a malfunction of the revolution detection sensor in the power window motor.	<ul style="list-style-type: none"> • Malfunction of power window motor



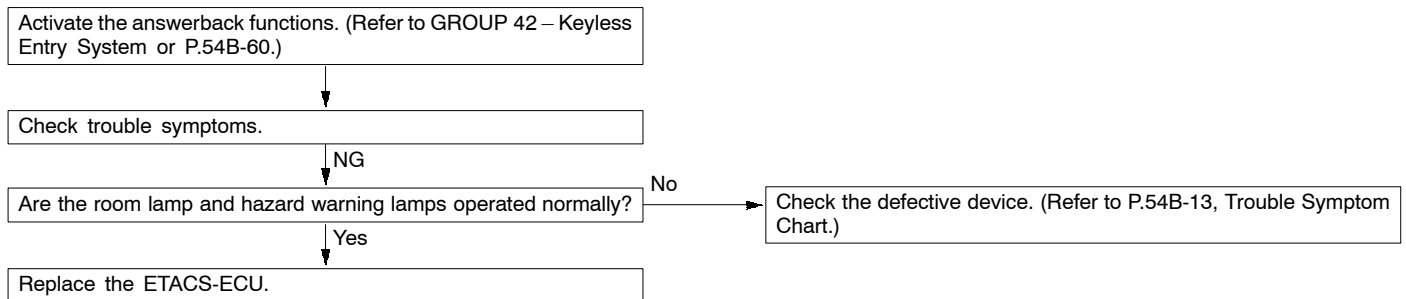
Inspection Procedure E-1

Keyless entry system: Keyless entry system does not operate.	Probable cause
<p>The ETACS-ECU operates the keyless entry system, based on the input signals from the following switches:</p> <ul style="list-style-type: none"> • Key reminder switch • Door switches • Driver's door lock actuator switch • Transmitter <p>If the function does not work normally, a defect on the relevant circuit or the ETACS-ECU may be suspected.</p>	<ul style="list-style-type: none"> • Malfunction of key reminder switch • Malfunction of door switches • Malfunction of driver's door lock actuator switch • Malfunction of transmitter • Malfunction of ETACS-ECU



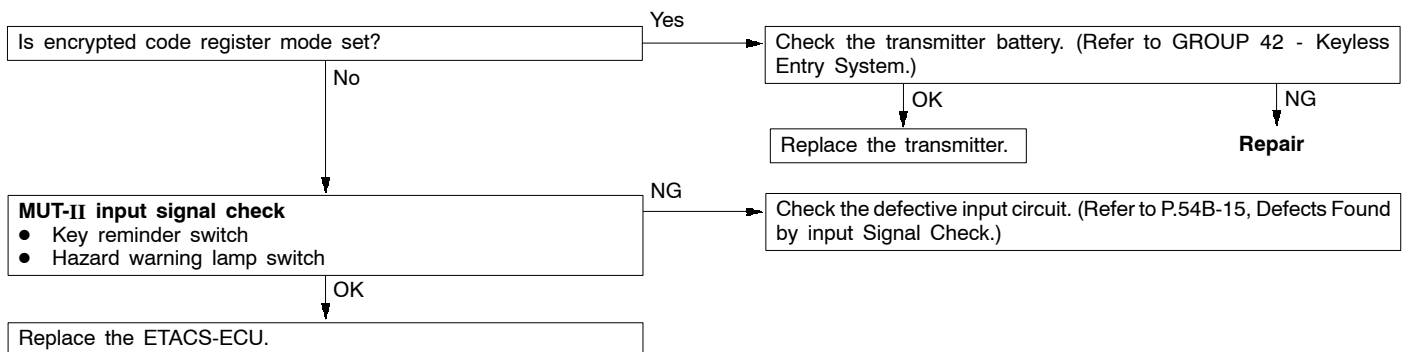
Inspection Procedure E-2

Keyless entry system: The room lamp and hazard warning lamps do not operate through the answerback function.	Probable cause
The hazard warning lamp answerback function can be selected by the driver's desire (can be deactivated). However, the room lamp answerback function can not be deactivated. If all of these device do not operate through the answerback function, the ETACS-ECU may be defective.	<ul style="list-style-type: none"> • Malfunction of turn-signal lamp • Malfunction of room lamp • Malfunction of ETACS-ECU • Malfunction of harness wire or connector



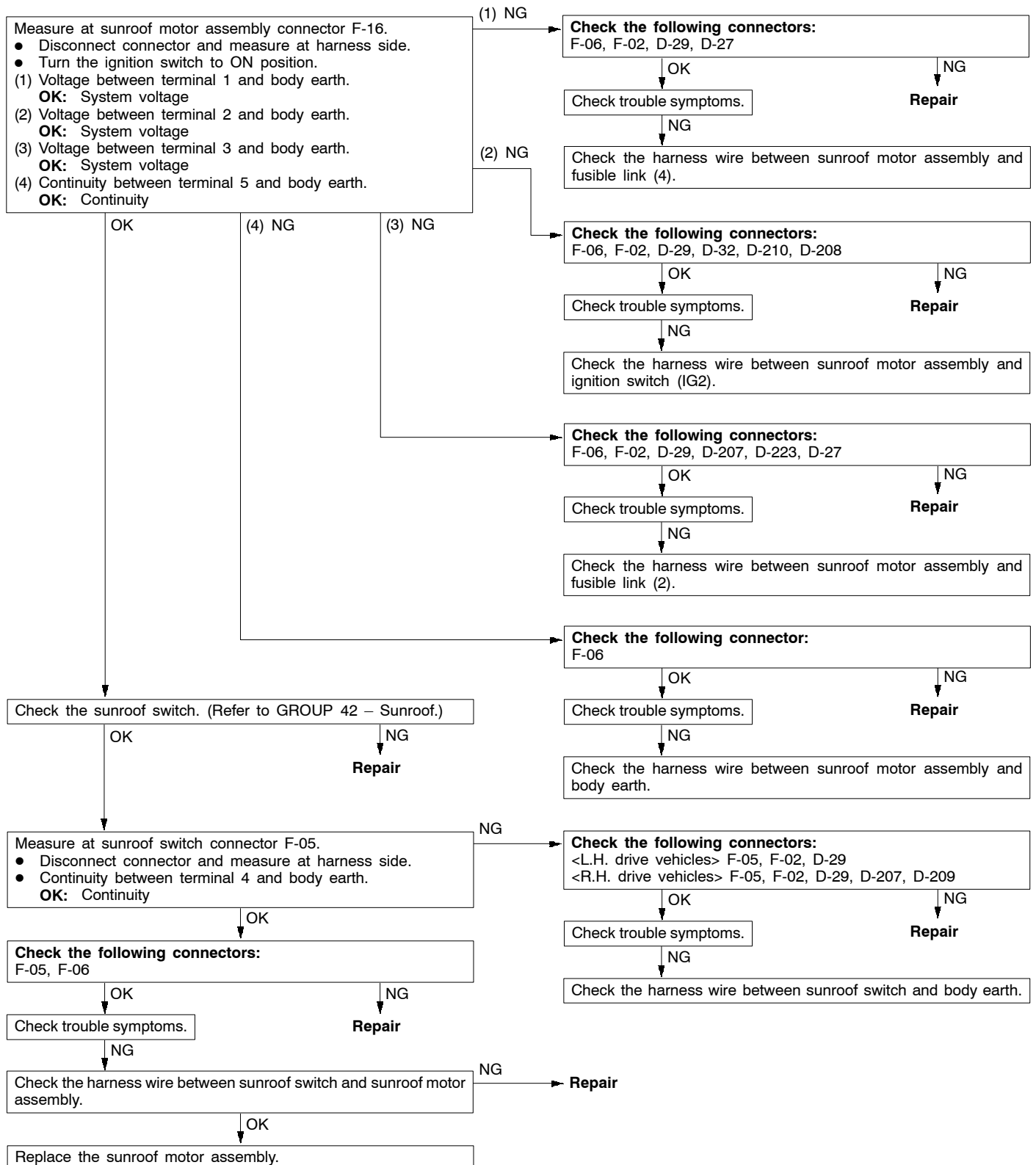
Inspection Procedure E-3

Keyless entry system: The encrypted code cannot be registered.	Probable cause
<p>The ETACS-ECU activates the encrypted code register mode according to the following switch signals.</p> <ul style="list-style-type: none"> • Key reminder switch • Hazard warning lamp switch <p>If the encrypted code register mode is not set, the relevant input signal circuit or the ETACS-ECU may be defective.</p> <p>If a transmitter can not be registered although the encrypted code register mode is set, the transmitter or the ETACS-ECU may be defective.</p>	<ul style="list-style-type: none"> • Malfunction of key reminder switch • Malfunction of hazard warning lamp switch • Malfunction of transmitter • Malfunction of ETACS-ECU • Malfunction of harness wire or connector



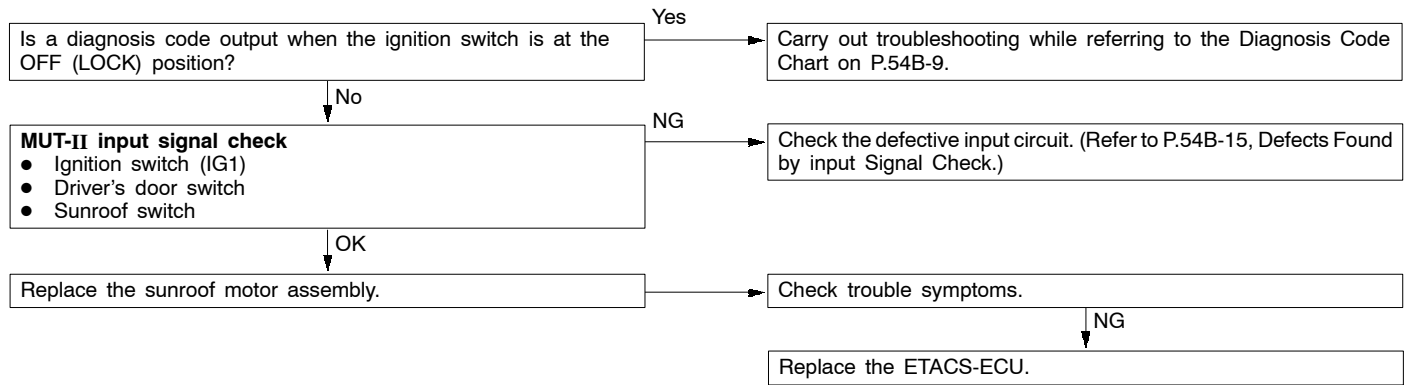
Inspection Procedure F-1

Sunroof: Sunroof does not work at all.	Probable cause
The power supply circuit of the sunroof motor assembly, the sunroof switch ground circuit, or the sunroof motor assembly may be defective.	<ul style="list-style-type: none"> • Malfunction of sunroof switch • Malfunction of sunroof motor assembly • Malfunction of harness wire or connector



Inspection Procedure F-2

Sunroof: Sunroof timer function does not work normally.	Probable cause
<p>The sunroof motor assembly operates the sunroof timer function, based on the input signals from the following switches:</p> <ul style="list-style-type: none"> • Ignition switch (IG1) • Driver's door switch <p>If the function does not work normally, a defect on the relevant circuit, sunroof motor assembly or the ETACS-ECU may be suspected.</p>	<ul style="list-style-type: none"> • Malfunction of driver's door switch • Malfunction of sunroof motor assembly • Malfunction of ETACS-ECU • Malfunction of harness wire or connector



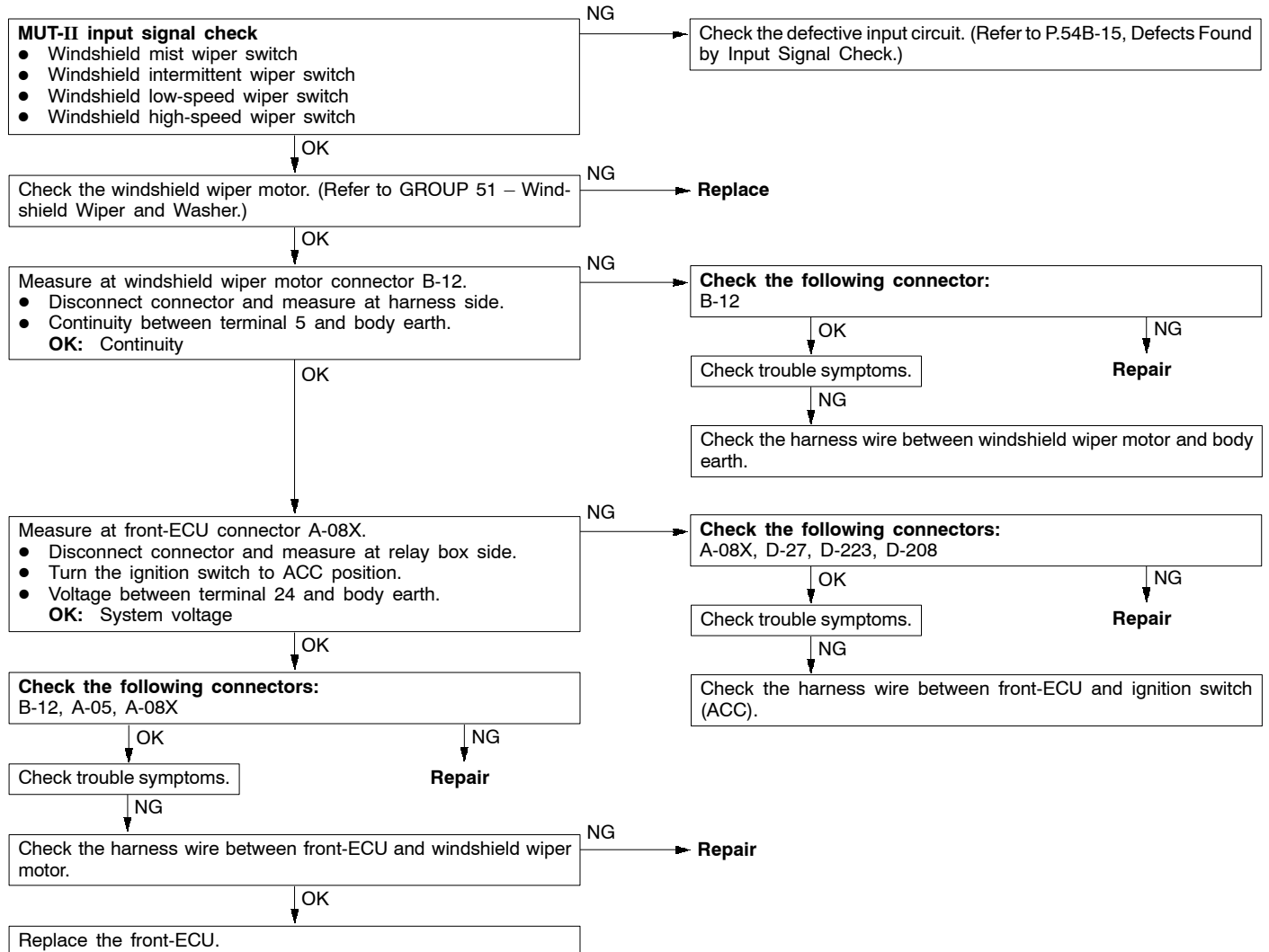
Inspection Procedure F-3

Sunroof: Safety mechanism does not work normally.	Probable cause
<p>The sunroof motor assembly monitors load condition according to the current, which runs in the motor. If a predetermined current is exceeded, the sunroof motor reverses due to safety mechanism. If the sunroof motor does not reverse when an excessive load is applied, the sunroof motor assembly may be defective.</p>	<ul style="list-style-type: none"> • Malfunction of sunroof motor assembly

Replace the sunroof motor assembly.

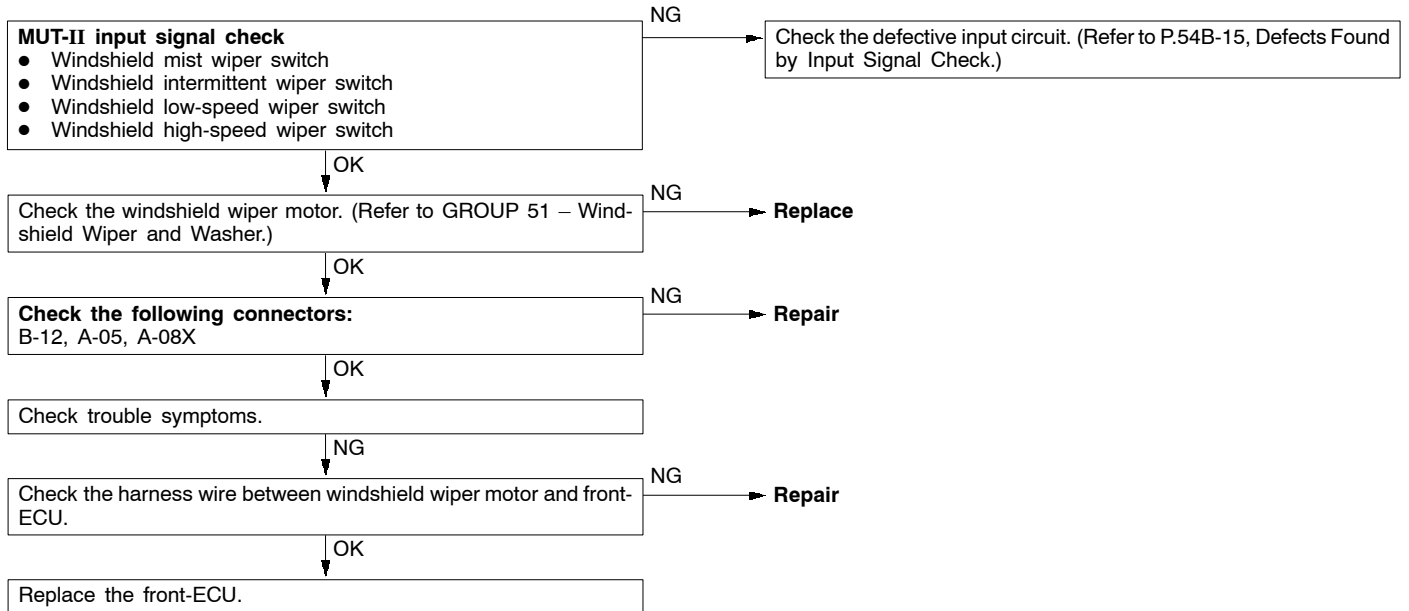
Inspection Procedure G-1

Windshield wiper and washer: Windshield wiper does not operate.	Probable cause
If the windshield wiper does not work at all, the windshield wiper motor, column switch or the front-ECU may be defective.	<ul style="list-style-type: none"> • Malfunction of windshield wiper motor • Malfunction of column switch • Malfunction of front-ECU • Malfunction of harness wire or connector



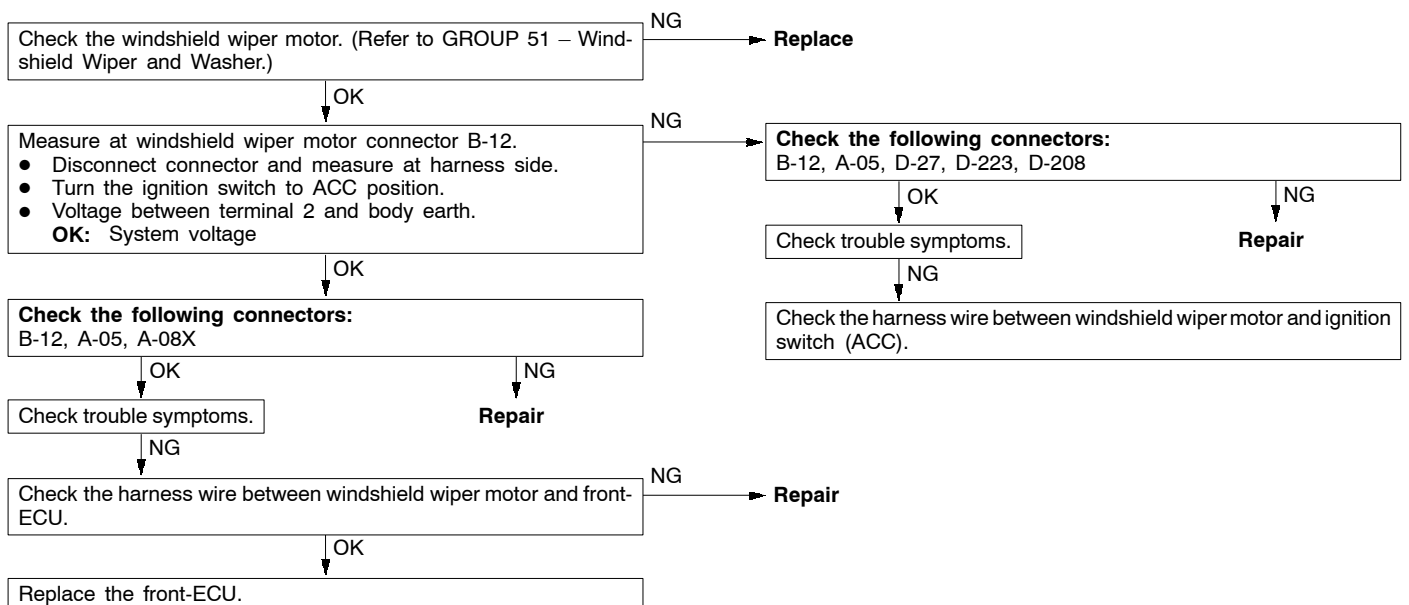
Inspection Procedure G-2

Windshield wiper and washer: Any of the windshield wiper switch positions is defective.	Probable cause
The windshield wiper motor, column switch or the front-ECU may be defective.	<ul style="list-style-type: none"> • Malfunction of windshield wiper motor • Malfunction of column switch • Malfunction of front-ECU • Malfunction of harness wire or connector



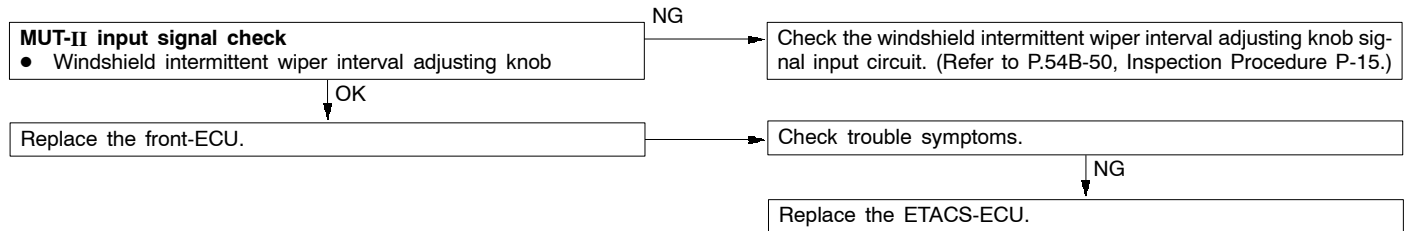
Inspection Procedure G-3

Windshield wiper and washer: Windshield wiper does not stop at the predetermined park position.	Probable cause
The windshield wiper motor or the front-ECU may be defective.	<ul style="list-style-type: none"> • Malfunction of windshield wiper motor • Malfunction of front-ECU • Malfunction of harness wire or connector



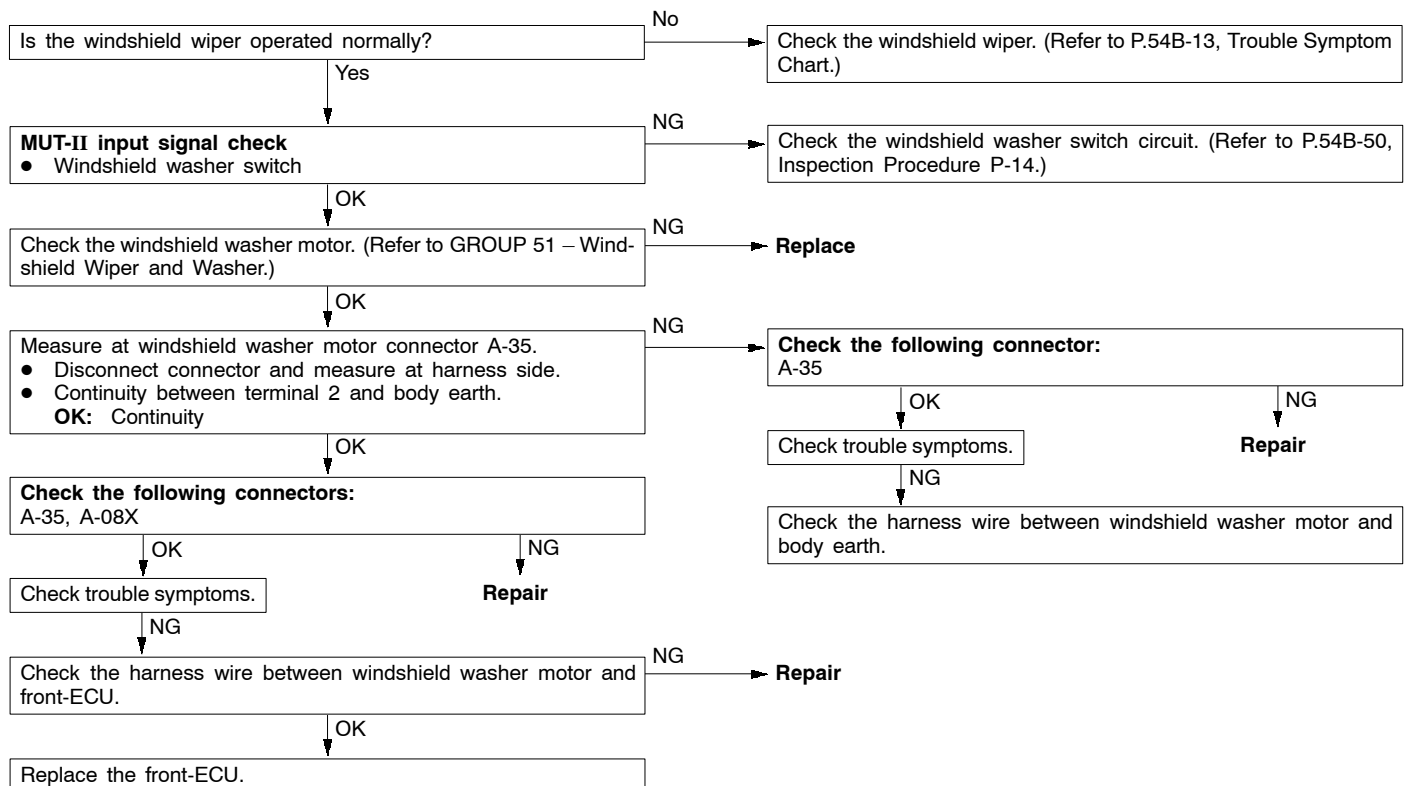
Inspection Procedure G-4

Windshield wiper and washer: Windshield intermittent wiper interval cannot be adjusted.	Probable cause
The ETACS-ECU calculates the intermittent wiper interval, and sends a signal to the front-ECU through the SWS communication line. If the signal is defective, the front-ECU will ignore the signal and set the intermittent wiper interval to 4 seconds.	<ul style="list-style-type: none"> • Malfunction of column switch • Malfunction of front-ECU • Malfunction of ETACS-ECU • Malfunction of harness wire or connector



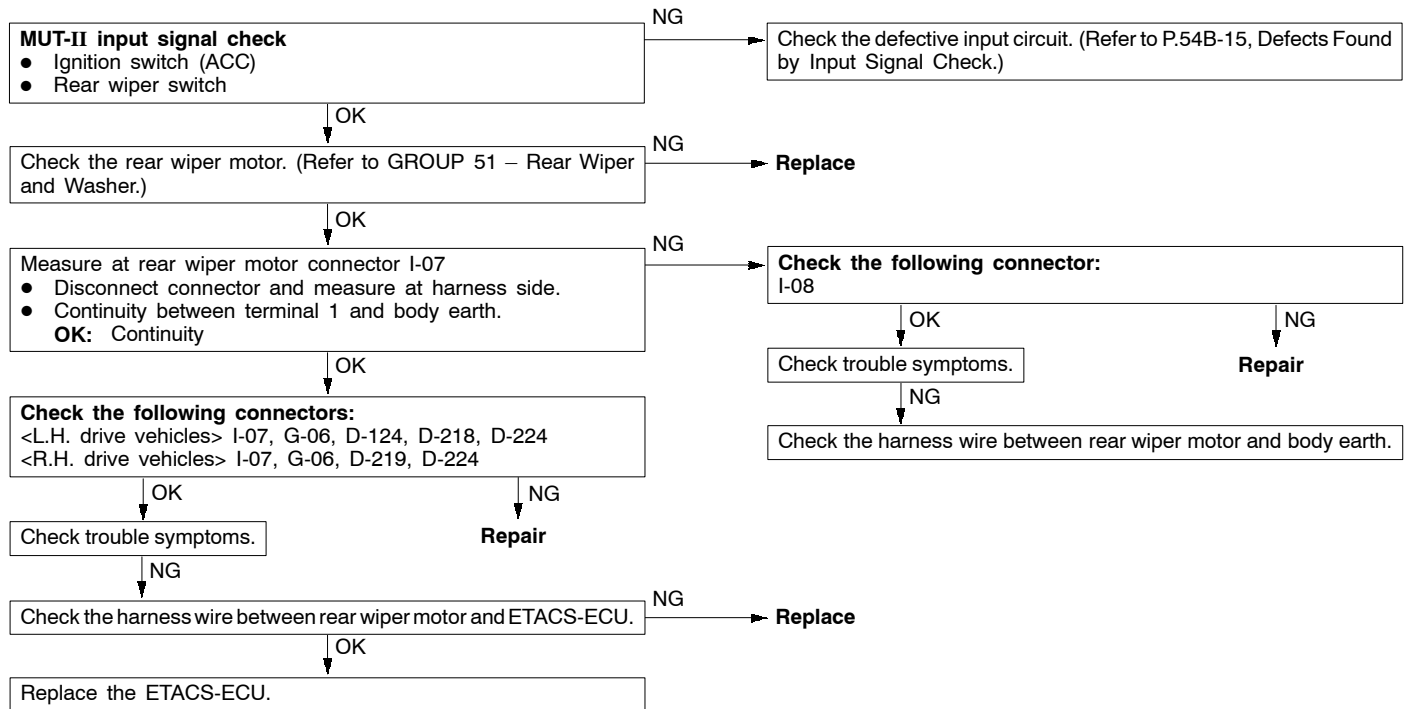
Inspection Procedure G-5

Windshield wiper and washer: Windshield washer does not work.	Probable cause
The windshield washer motor, the column switch or the front-ECU may be defective.	<ul style="list-style-type: none"> • Malfunction of windshield washer motor • Malfunction of column switch • Malfunction of front-ECU • Malfunction of harness wire or connector



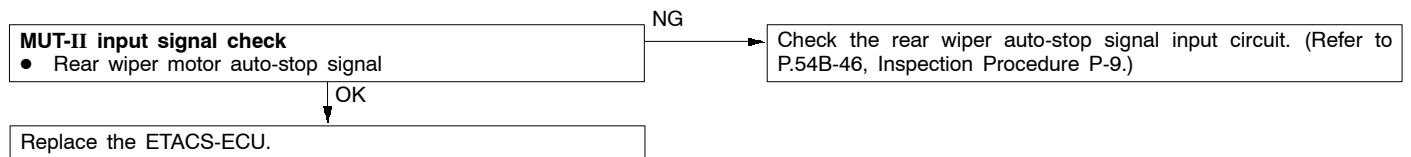
Inspection Procedure H-1

Rear wiper and washer: Rear wiper does not work normally.	Probable cause
<p>The ETACS-ECU operates the rear wiper according to the input signals from the following switches:</p> <ul style="list-style-type: none"> • Ignition switch (ACC) • Rear wiper switch <p>If the rear wiper does not work normally, the relevant input signal circuit, the rear wiper motor, the column switch or the ETACS-ECU may be defective.</p>	<ul style="list-style-type: none"> • Malfunction of rear wiper motor • Malfunction of column switch • Malfunction of front-ECU • Malfunction of harness wire or connector



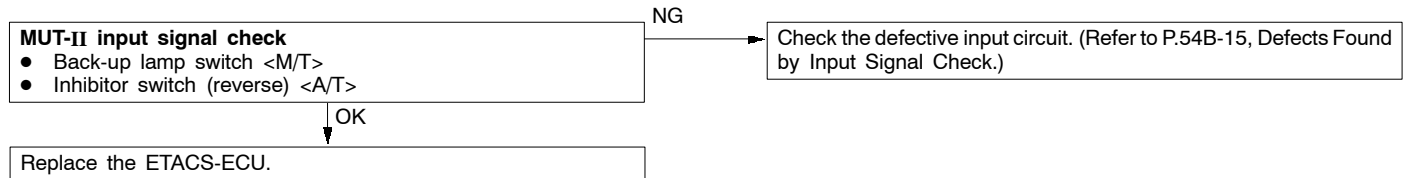
Inspection Procedure H-2

Rear wiper and washer: Rear wiper does not stop at the predetermined park position.	Probable cause
<p>The rear wiper motor or the ETACS-ECU may be defective.</p>	<ul style="list-style-type: none"> • Malfunction of rear wiper motor • Malfunction of front-ECU • Malfunction of harness wire or connector



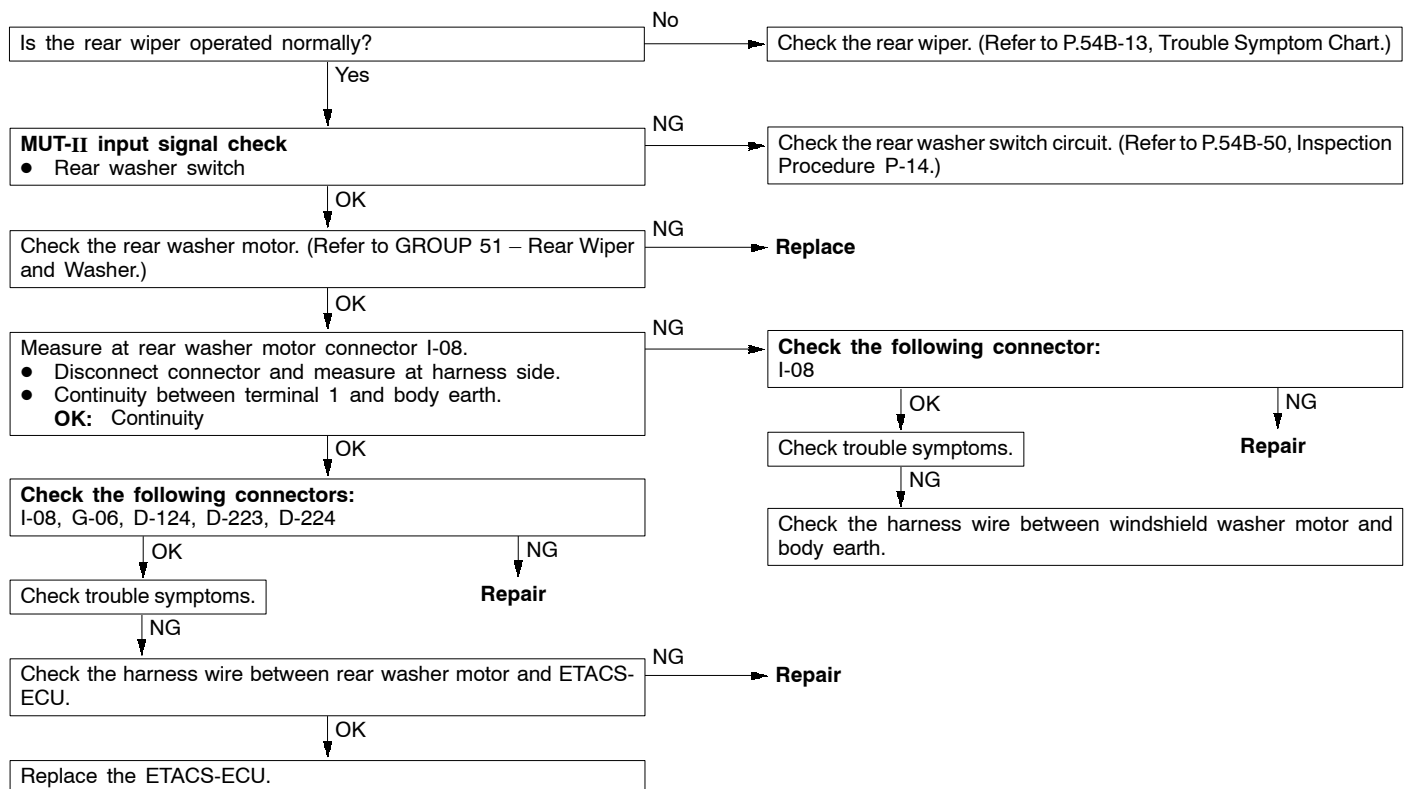
Inspection Procedure H-3

Rear wiper and washer: When the shift lever <M/T> or selector lever <A/T> is moved to R position during the rear wiper operation, the rear wiper does not operate at the continuous mode.	Probable cause
The ETACS-ECU operates the rear wiper consecutively twice when the shift lever <M/T> or selector lever <A/T> is moved to R position while the rear wiper is turned on. If the rear wiper does not work consecutively twice, the back-up lamp switch <M/T> or the inhibitor switch (reverse) <A/T> may be defective.	<ul style="list-style-type: none"> • Malfunction of back-up lamp switch • Malfunction of inhibitor switch • Malfunction of ETACS-ECU • Malfunction of harness wire or connector



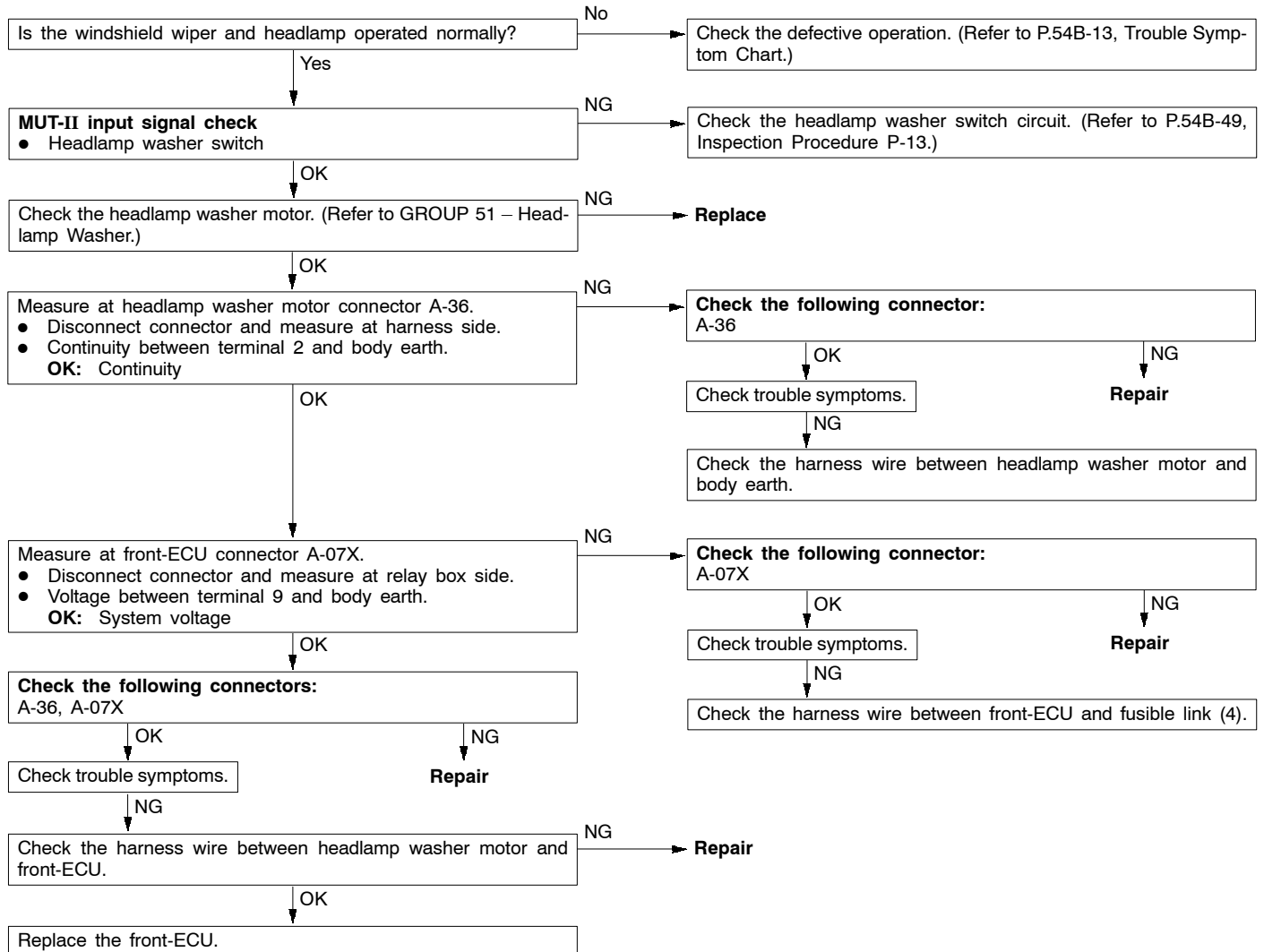
Inspection Procedure H-4

Rear wiper and washer: Rear washer does not work.	Probable cause
The rear washer motor, the column switch or the ETACS-ECU may be defective.	<ul style="list-style-type: none"> • Malfunction of rear washer motor • Malfunction of column switch • Malfunction of ETACS-ECU • Malfunction of harness wire or connector



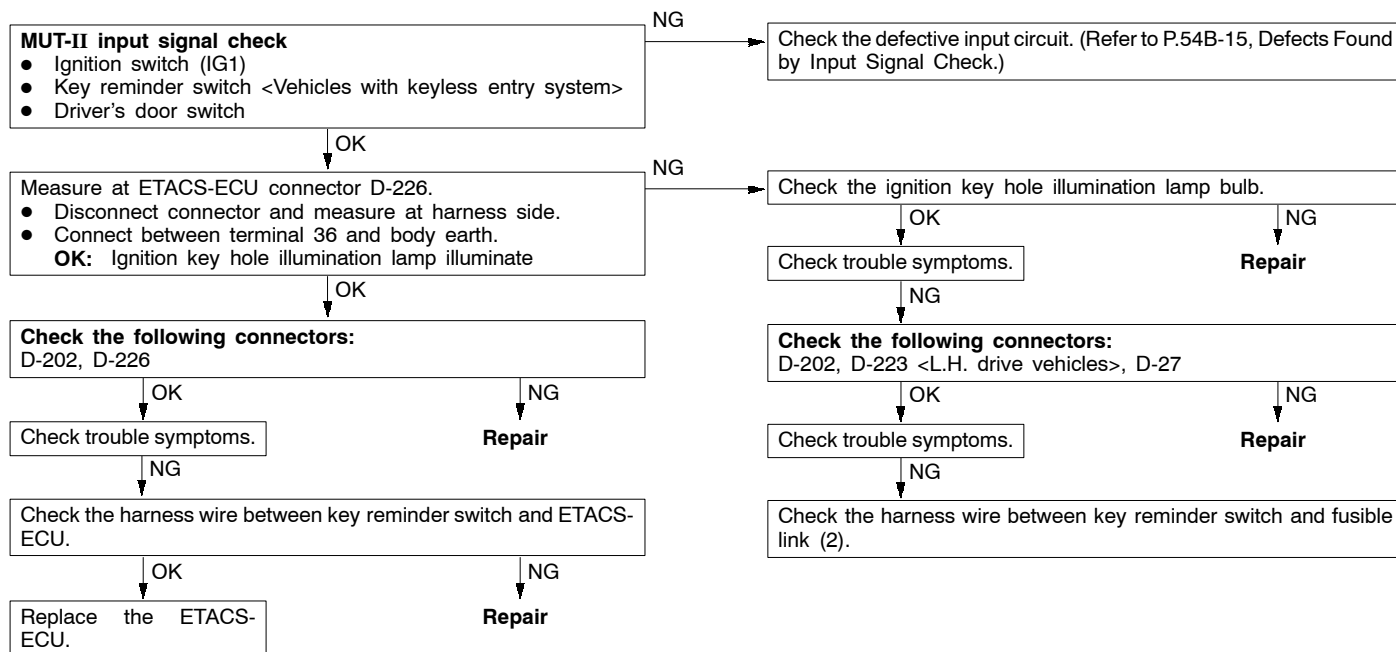
Inspection Procedure I-1

Headlamp washer: Headlamp washer does not work.	Probable cause
<p>The front-ECU operates the headlamp washers if the headlamp washer switch is turned to ON while the headlamp relays (low and high) are ON and the ignition switch is at the ACC or ON position.</p> <p>If the headlamp washer does not work normally, the headlamp washer motor, the column switch or the front-ECU may be defective.</p>	<ul style="list-style-type: none"> • Malfunction of headlamp washer motor • Malfunction of column switch • Malfunction of front-ECU • Malfunction of harness wire or connector



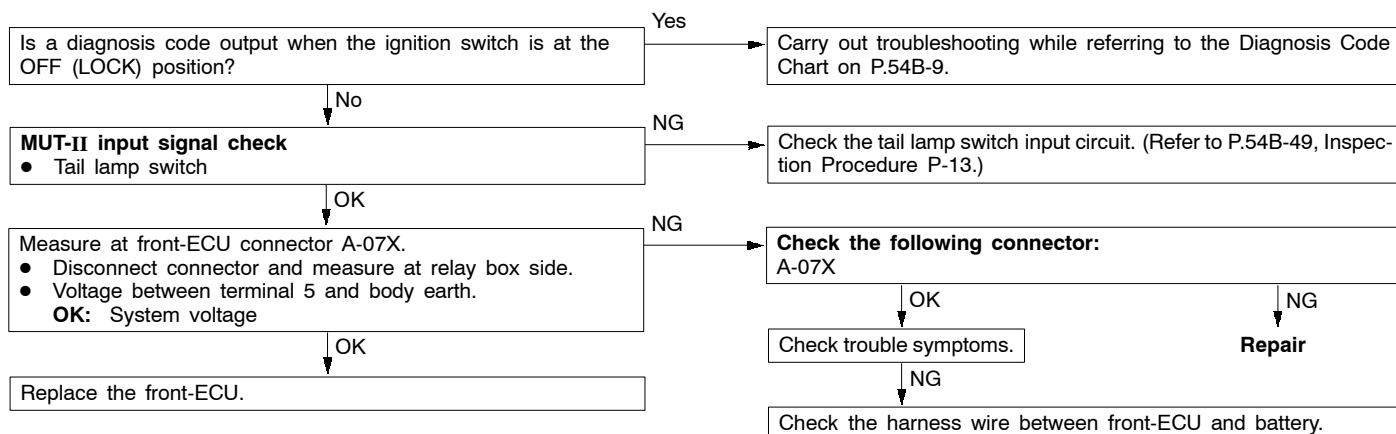
Inspection Procedure J-1

Ignition key hole illumination lamp: Ignition key hole illumination lamp does not work normally.	Probable cause
<p>The ETACS-ECU operates the ignition key hole illumination lamp operation, based on input signals from the following switches:</p> <ul style="list-style-type: none"> • Ignition switch (IG1) • Key reminder switch <Vehicles with keyless entry system> • Driver's door switch <p>If the ignition key hole illumination lamp does not work normally, the relevant input signal circuit, the combination meter or the ETACS-ECU may be defective.</p>	<ul style="list-style-type: none"> • Malfunction of key reminder switch <Vehicles with keyless entry system> • Malfunction of driver's door switch • Malfunction of combination meter • Malfunction of ETACS-ECU • Malfunction of harness wire or connector



Inspection Procedure K-1

Headlamp, tail lamp: Tail lamp do not illuminate.	Probable cause
The column switch or the front-ECU may be defective.	<ul style="list-style-type: none"> • Malfunction of column switch • Malfunction of front-ECU • Malfunction of harness wire or connector

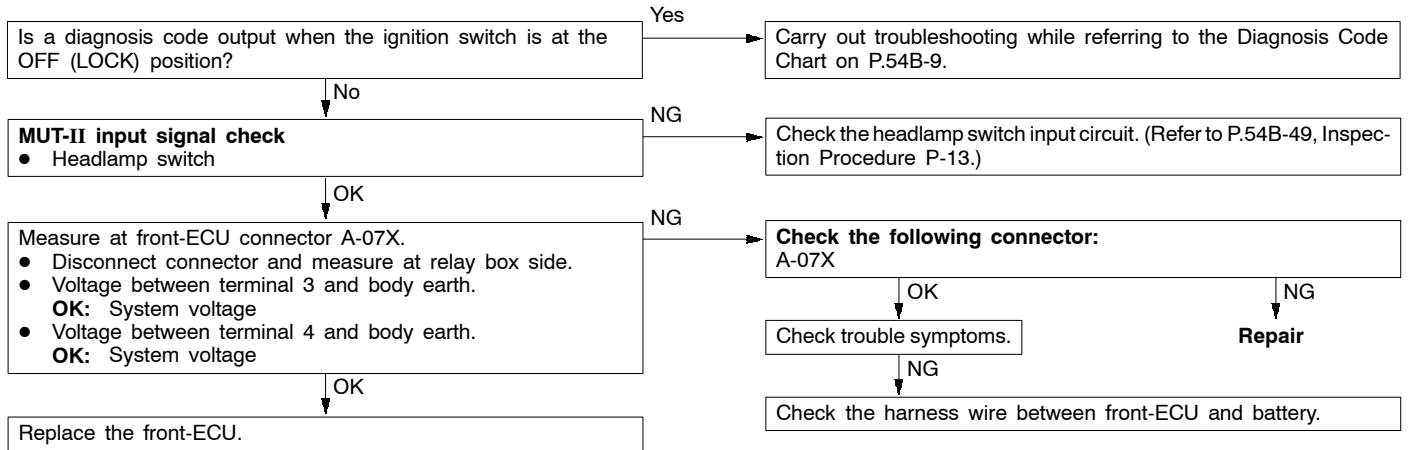


NOTE

If only one lamp does not illuminate, the harness wire between the lamp and front-ECU may be defective or the light bulb may be burned out. In this case, check the tail lamp circuit

Inspection Procedure K-2

Headlamp, tail lamp: Headlamps (low-beam) do not illuminate.	Probable cause
The column switch or the front-ECU may be defective.	<ul style="list-style-type: none"> • Malfunction of column switch • Malfunction of front-ECU • Malfunction of harness wire or connector

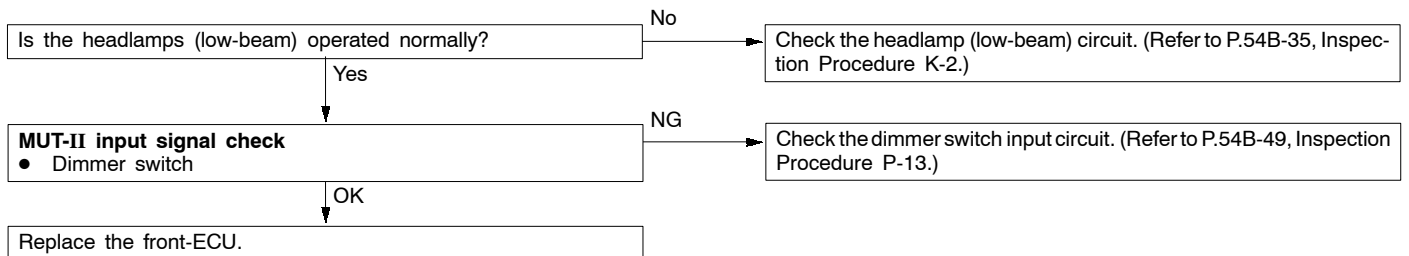


NOTE

If only one of the headlamps (low-beam) does not illuminate, the harness wire between the headlamp and front-ECU may be defective or the headlamp bulb may be burned out. In this case, check the headlamp circuit.

Inspection Procedure K-3

Headlamp, tail lamp: Headlamps (high-beam) do not illuminate.	Probable cause
The column switch or the front-ECU is suspected to be defective.	<ul style="list-style-type: none"> • Malfunction of column switch • Malfunction of front-ECU • Malfunction of harness wire or connector

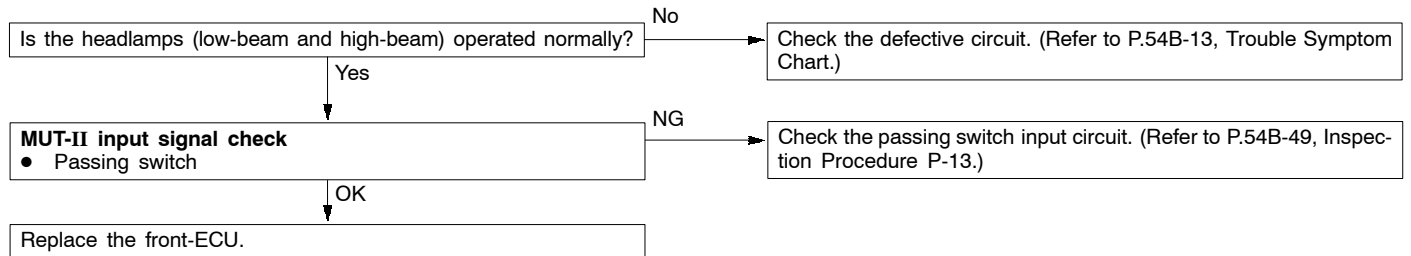


NOTE

If only one of the headlamps (high-beam) does not illuminate, the harness wire between the headlamp and front-ECU may be defective or the headlamp bulb may be burned out. In this case, check the headlamp circuit.

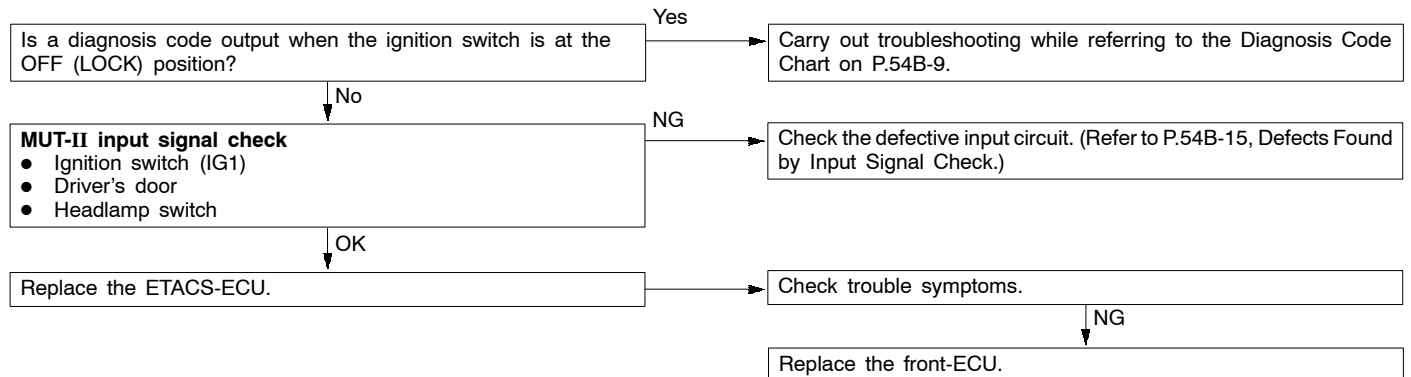
Inspection Procedure K-4

Headlamp, tail lamp: Headlamps do not illuminate when the passing switch is operated.	Probable cause
If the headlamps (low-beam and high-beam) are defective, the column switch or the front-ECU is suspected to be defective.	<ul style="list-style-type: none"> ● Malfunction of column switch ● Malfunction of front-ECU ● Malfunction of harness wire or connector



Inspection Procedure K-5

Headlamp, tail lamp: The headlamp automatic shutdown function does not work normally.	Probable cause
<p>The ETACS-ECU operates the headlamp automatic shutdown function, based on the signals from the following switches</p> <ul style="list-style-type: none"> ● Ignition switch (IG1) ● Driver's door switch ● Headlamp switch <p>If the head lamp automatic shutdown function does work normally, a defect on relevant input circuits, the ETACS-ECU or the front-ECU is suspected.</p>	<ul style="list-style-type: none"> ● Malfunction of driver's door switch ● Malfunction of column switch. ● Malfunction of front-ECU ● Malfunction of harness wire or connector



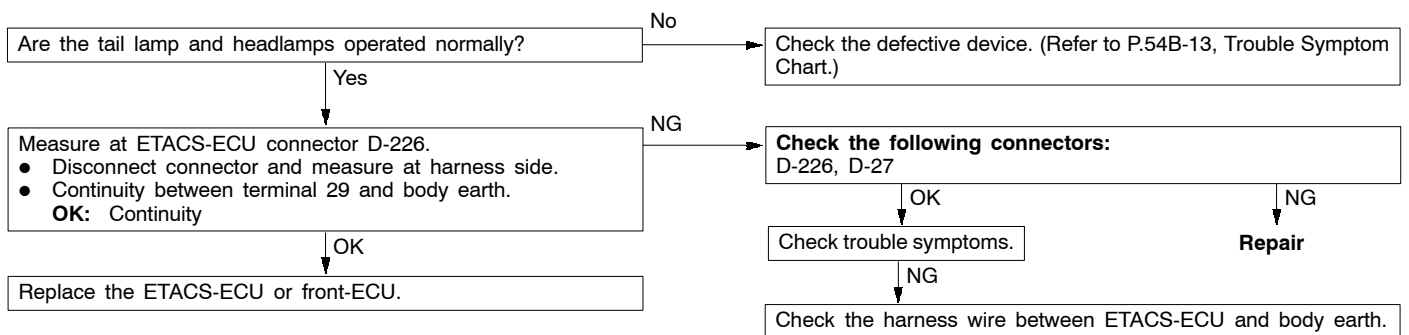
Inspection Procedure K-6

Headlamp, tail lamp: Headlamps dimmer switch automatic reset function does not work normally.	Probable cause
The headlamp dimmer switch automatic reset function is controlled by the front-ECU. If a defect appears, the front-ECU may be defective.	<ul style="list-style-type: none"> Malfunction of front-ECU

Replace the front-ECU.

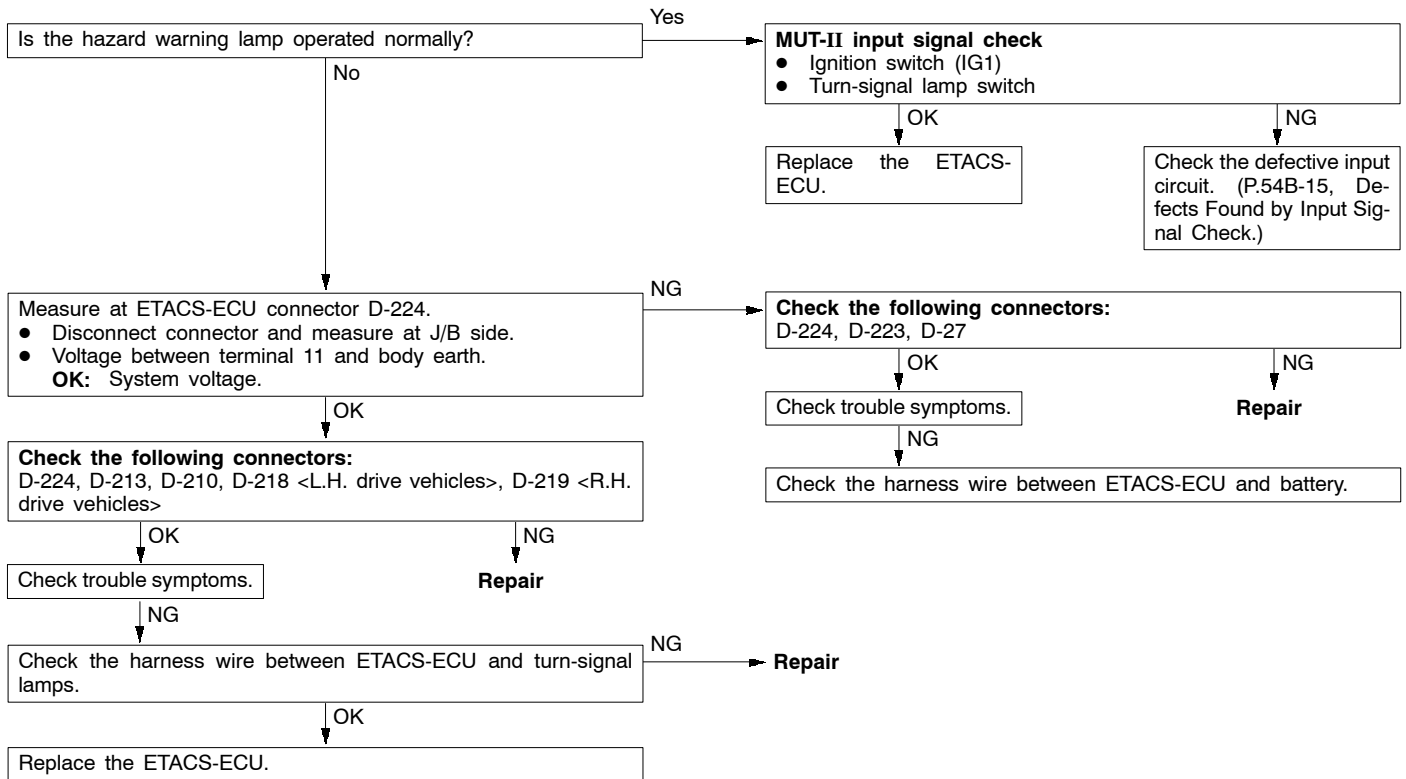
Inspection Procedure K-7

Headlamp, tail lamp: Daytime running lamp (DRL) function does not work.	Probable cause
The headlamp dimmer switch auto-reset function is controlled by the front-ECU. If a defect appears, the front-ECU may be defective.	<ul style="list-style-type: none"> Malfunction of ETACS-ECU Malfunction of front-ECU Malfunction of harness wire or connector.



Inspection Procedure L-1

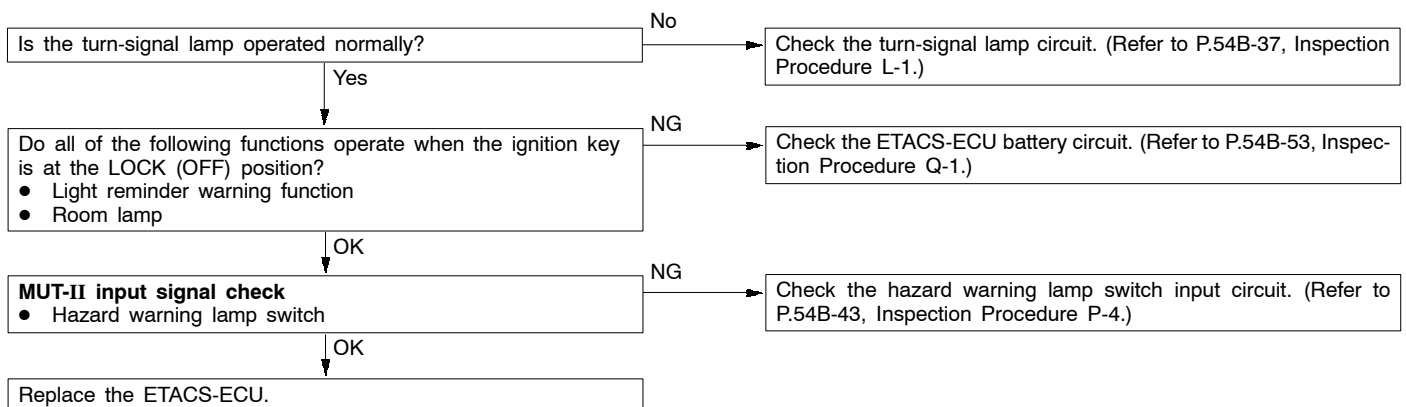
Flasher timer: Turn-signal lamp do not flash when the turn-signal lamp switch is turned on.	Probable cause
<p>The ETACS-ECU makes the turn-signal lamps flash, based on the input signals from the following switches:</p> <ul style="list-style-type: none"> Ignition switch (IG1) Turn-signal lamp switch <p>If the turn-signal lamps do not flash normally, a defect on the relevant circuits or the ETACS-ECU may be suspected.</p> <p>If the hazard warning lamps also do not flash, a defect in the ETACS-ECU power supply line specific to the turn-signal lamps is suspected.</p>	<ul style="list-style-type: none"> Malfunction of column switch Malfunction of ETACS-ECU Malfunction of harness wire or connector.

**NOTE**

If only one of the turn-signal lamp does not flash, the harness wire between the lamp and ETACS-ECU may be defective or the lamp bulb may be burned out. In this case, check the turn-signal lamp and hazard warning lamp circuit.

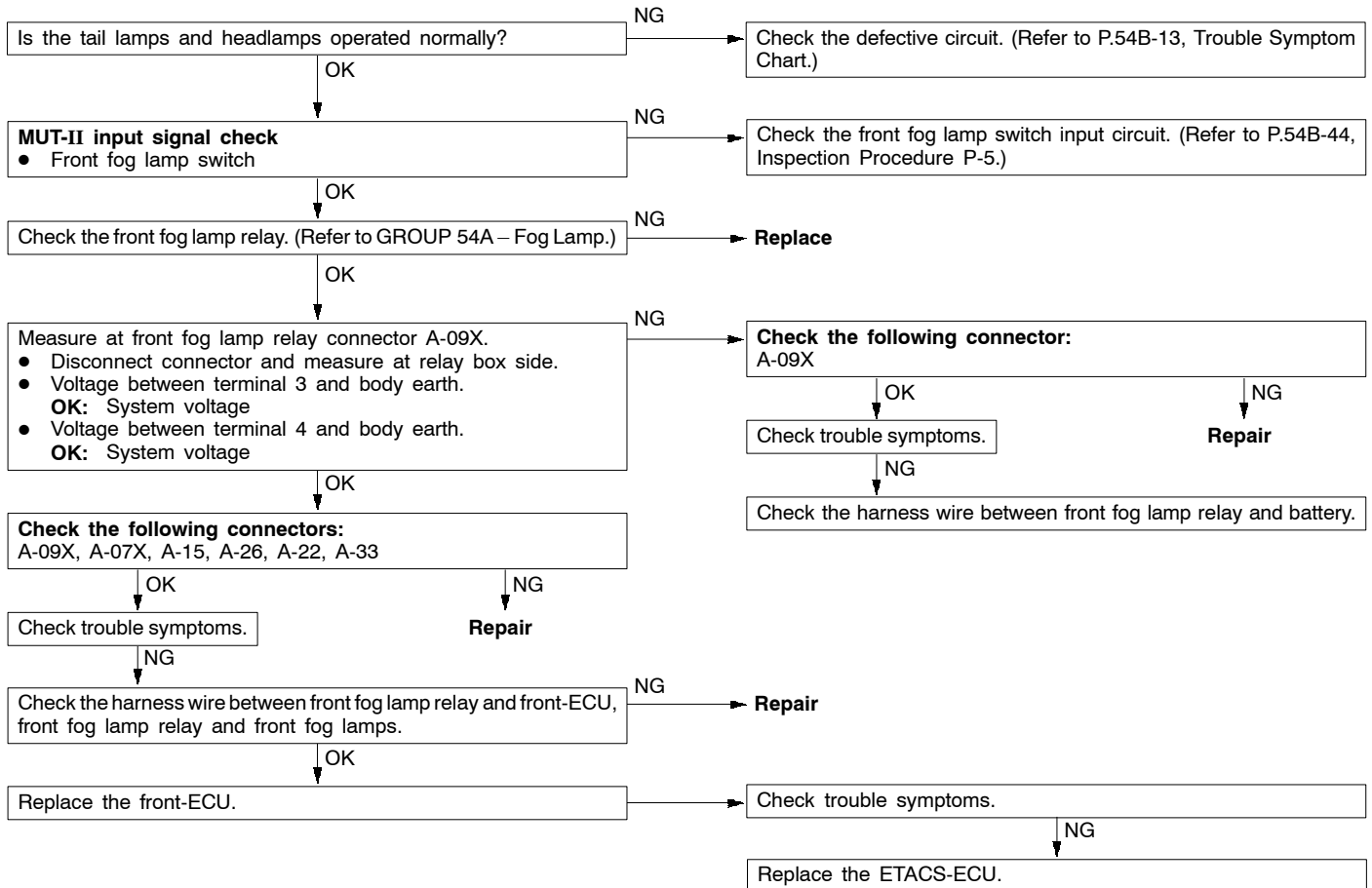
Inspection Procedure L-2

Flasher timer: Hazard warning lamp do not flash when the hazard warning lamp switch is turned on.	Probable cause
The ETACS-ECU makes the turn-signal lamps flash, base on the input signals from the hazard warning lamp switch. If the turn-signal lamps do not flash normally, the hazard warning lamp switch input circuit or the ETACS-ECU may be defective.	<ul style="list-style-type: none"> • Malfunction of hazard warning lamp switch • Malfunction of ETACS-ECU • Malfunction of harness wire or connector.



Inspection Procedure M-1

Front fog lamp: Front fog lamps do not illuminate when the front fog lamp switch is turned on.	Probable cause
If the tail lamps and headlamps illuminate normally, the front fog lamp switch, the front fog lamp relay, the front-ECU or the ETACS-ECU may be defective.	<ul style="list-style-type: none"> • Malfunction of front fog lamp switch • Malfunction of front fog lamp relay • Malfunction of front-ECU • Malfunction of ETACS-ECU • Malfunction of harness wire or connector.



NOTE

If only one of the front fog lamp or front fog lamp indicator lamp does not illuminate, the harness wire between the lamp and front fog lamp relay may be defective or the lamp bulb may be burned out. In this case, check the front fog lamp circuit.

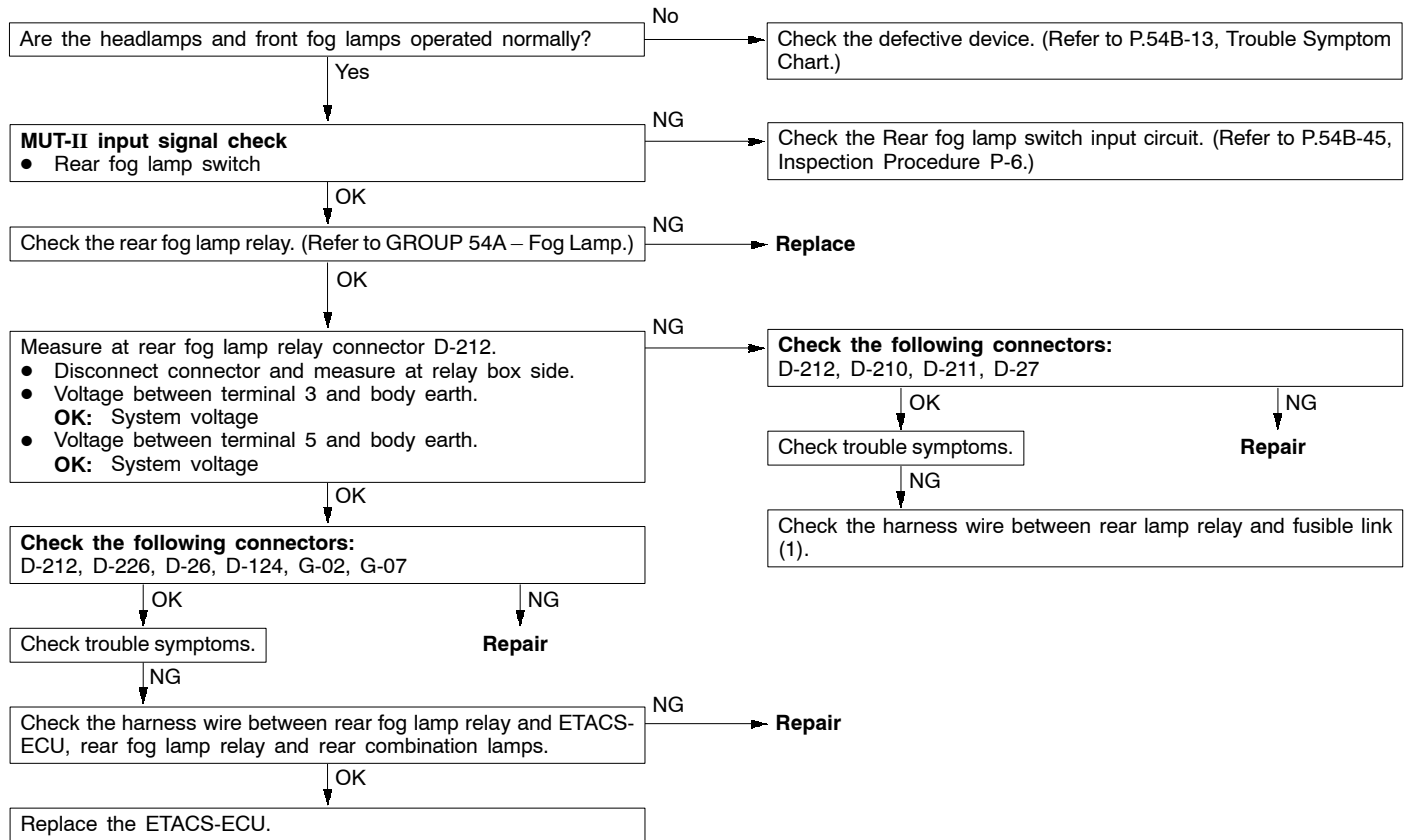
Inspection Procedure M-2

Front fog lamp: Front fog lamp do not go out when the tail lamps are turned off while the fog lamps are on.	Probable cause
If the malfunction above occurs, the ETACS-ECU may be defective.	<ul style="list-style-type: none"> • Malfunction of ETACS-ECU

Replace the ETACS-ECU.

Inspection Procedure N-1

Rear fog lamp: Rear fog lamps do not illuminate when the rear fog lamp switch is turned on.	Probable cause
If the headlamps and rear fog lamps illuminate normally, the rear fog lamp switch, the rear fog lamp relay or the ETACS-ECU may be defective.	<ul style="list-style-type: none"> • Malfunction of rear fog lamp switch • Malfunction of rear fog lamp relay • Malfunction of ETACS-ECU • Malfunction of harness wire or connector.



NOTE

If only one of the rear fog lamp or rear fog lamp indicator lamp does not illuminate, the harness wire between the lamp and rear fog lamp relay may be defective or the lamp bulb may be burned out. In this case, check the rear fog lamp circuit.

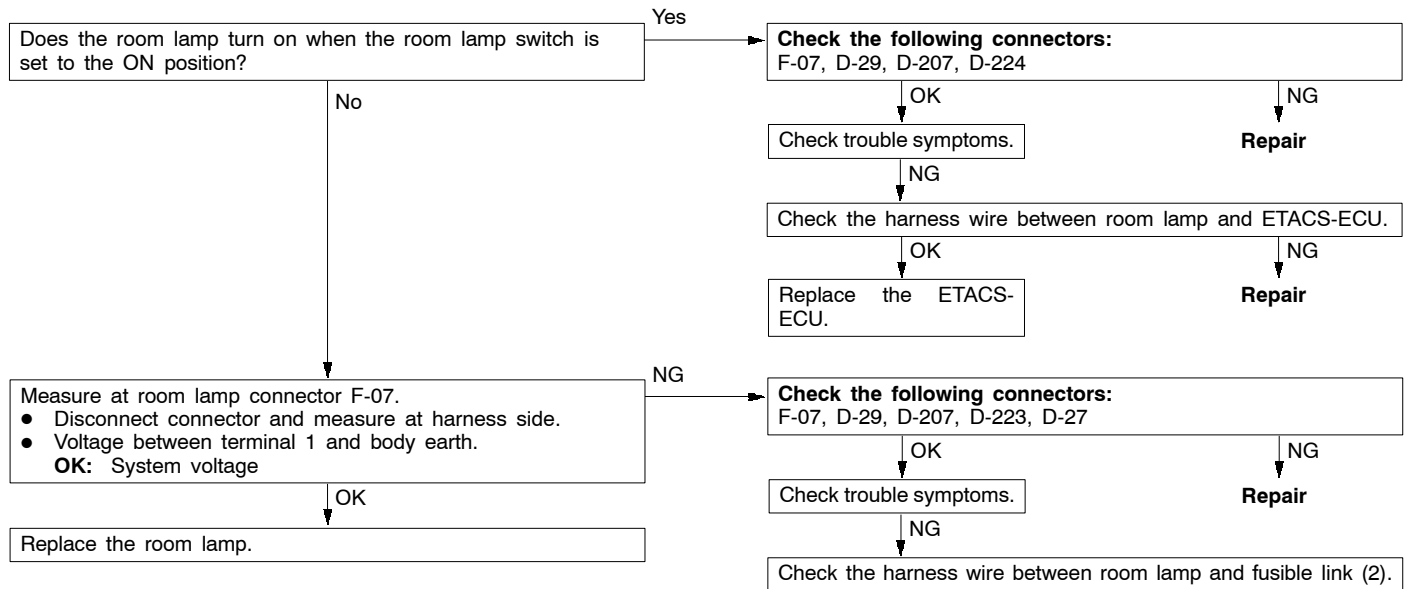
Inspection Procedure N-2

Rear fog lamp: Rear fog lamp do not go out when the headlamps and front fog lamps are turned off while the fog lamps are on.	Probable cause
If the malfunction above occurs, the ETACS-ECU may be defective.	<ul style="list-style-type: none"> • Malfunction of ETACS-ECU

Replace the ETACS-ECU.

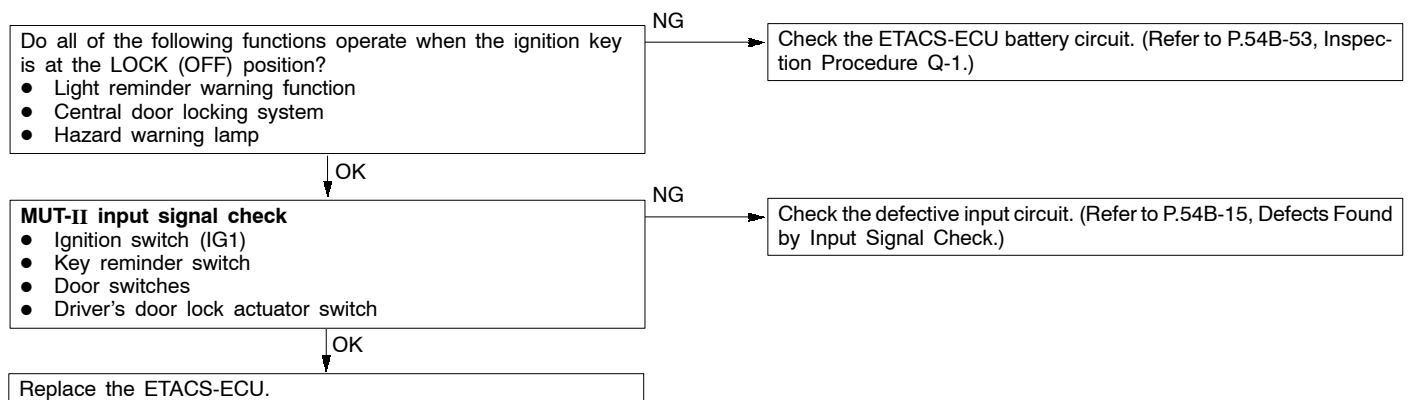
Inspection Procedure O-1

Room lamp: Room lamp does not illuminate.	Probable cause
If the room lamp does not illuminate at all, the room lamp bulb may be burned out, or the power supply circuit or the ETACS-ECU may be defective.	<ul style="list-style-type: none"> ● Malfunction of room lamp ● Malfunction of ETACS-ECU ● Malfunction of harness wire or connector



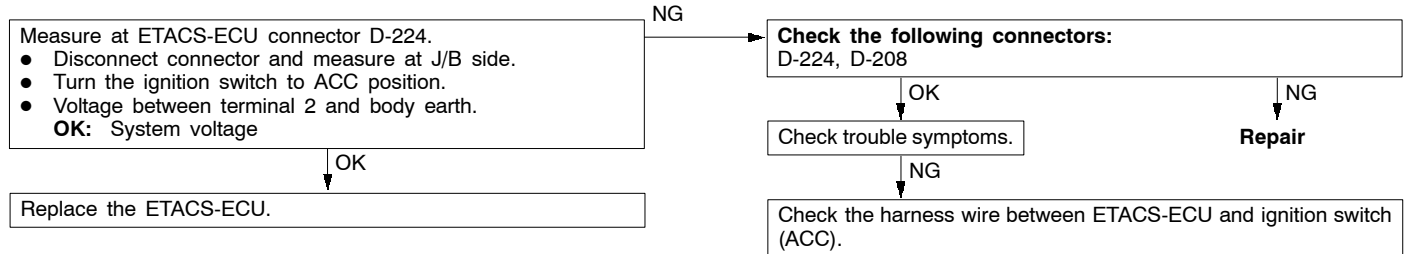
Inspection Procedure O-2

Room lamp: Room lamp dimming function does not work normally.	Probable cause
<p>The ETACS-ECU dims the room lamp according to the input signals from the following switches:</p> <ul style="list-style-type: none"> ● Ignition switch (IG1) ● Key reminder switch ● Door switches ● Driver's door lock actuator switch <p>If the room lamp does not be dimmed normally, the relevant input signal circuit or the ETACS-ECU may be defective.</p>	<ul style="list-style-type: none"> ● Malfunction of key reminder switch ● Malfunction of driver's door switch ● Malfunction of door switches ● Malfunction of driver's door lock actuator switch ● Malfunction of ETACS-ECU ● Malfunction of harness wire or connector



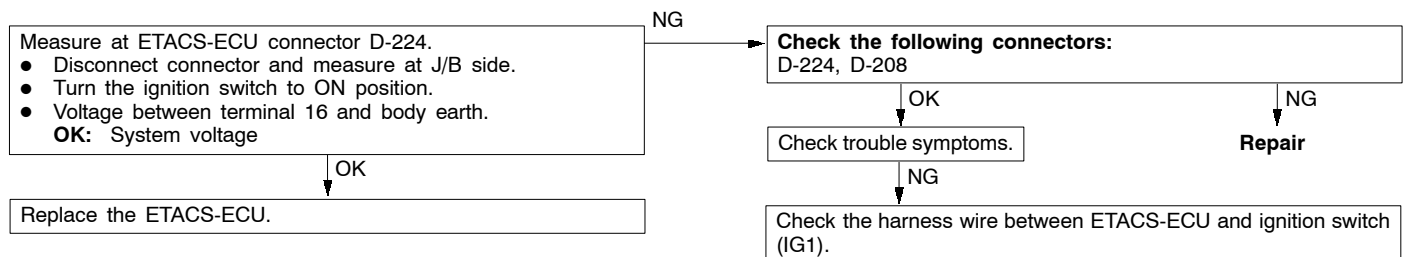
Inspection Procedure P-1

Ignition switch (ACC) signal is not sent to the ETACS-ECU.	Probable cause
<p>The ignition switch (ACC) input signal is used to operate the following devices. If the signal fails, these devices will not work normally.</p> <ul style="list-style-type: none"> • Windshield wiper and washer • Rear wiper and washer • Headlamp washer <p>OK: System voltage</p>	<ul style="list-style-type: none"> • Malfunction of ETACS-ECU • Malfunction of harness wire or connector



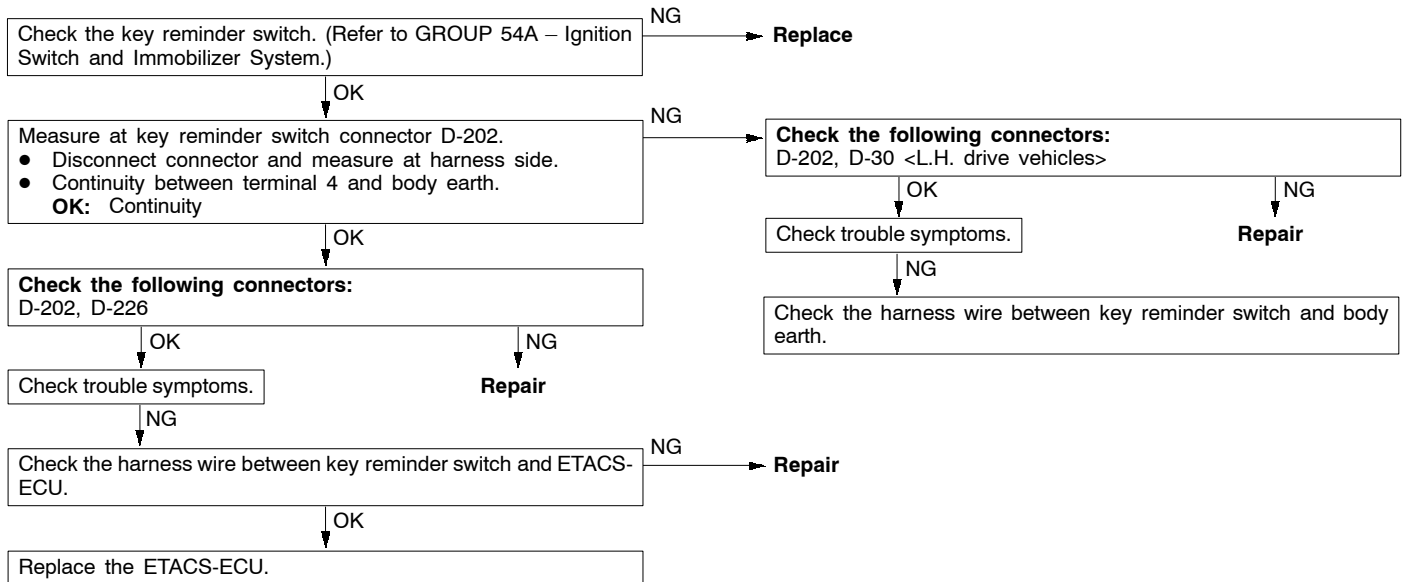
Inspection Procedure P-2

Ignition switch (IG1) signal is not sent to the ETACS-ECU.	Probable cause
<p>The ignition switch (IG1) input signal is used to operate the following devices. If the signal fails, these devices will not work normally.</p> <ul style="list-style-type: none"> • Light reminder warning buzzer function • Power window timer function • Sunroof timer function • Ignition key hole illumination lamp • Headlamp automatic shutdown function • Turn-signal lamp • Room lamp dimming function <p>OK: System voltage</p>	<ul style="list-style-type: none"> • Malfunction of ETACS-ECU • Malfunction of harness wire or connector



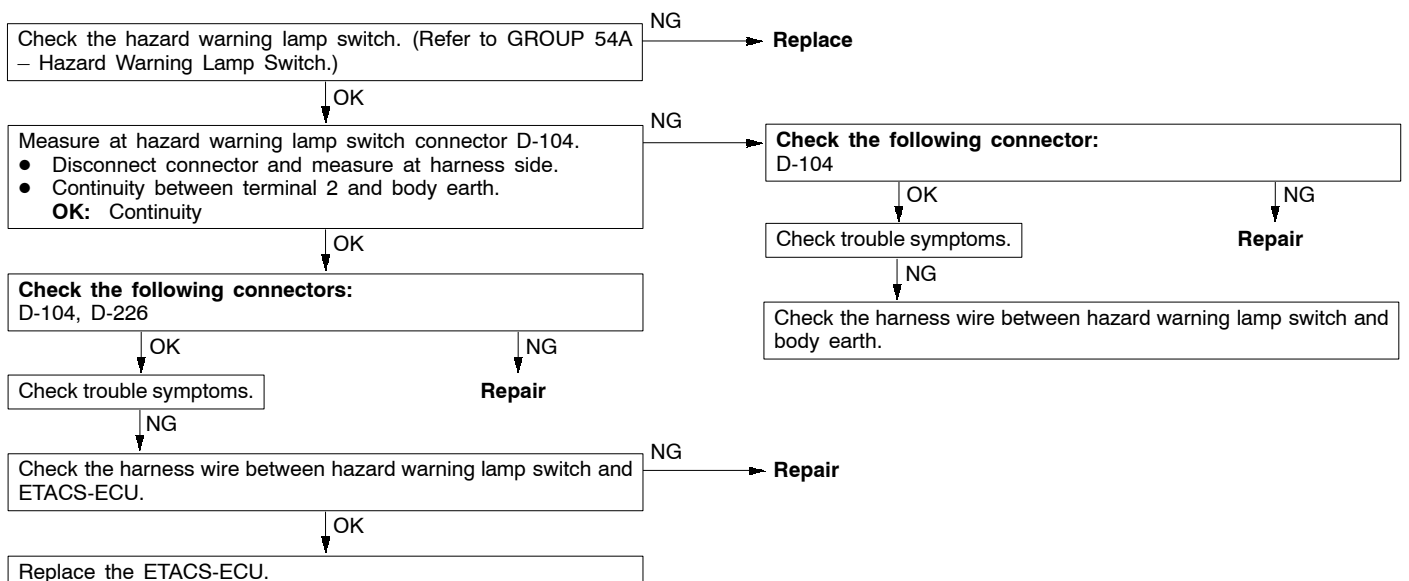
Inspection Procedure P-3

Key reminder switch signal is not sent to the ETACS-ECU.	Probable cause
<p>The key reminder switch input signal is used to operate the following devices. If the signal fails, these devices will not work normally.</p> <ul style="list-style-type: none"> • Forgotten key prevention function • Keyless entry system • Ignition key hole illuminaiton lamp • Room lamp dimming function 	<ul style="list-style-type: none"> • Malfunction of key reminder switch • Malfunction of ETACS-ECU • Malfunction of harness wire or connector



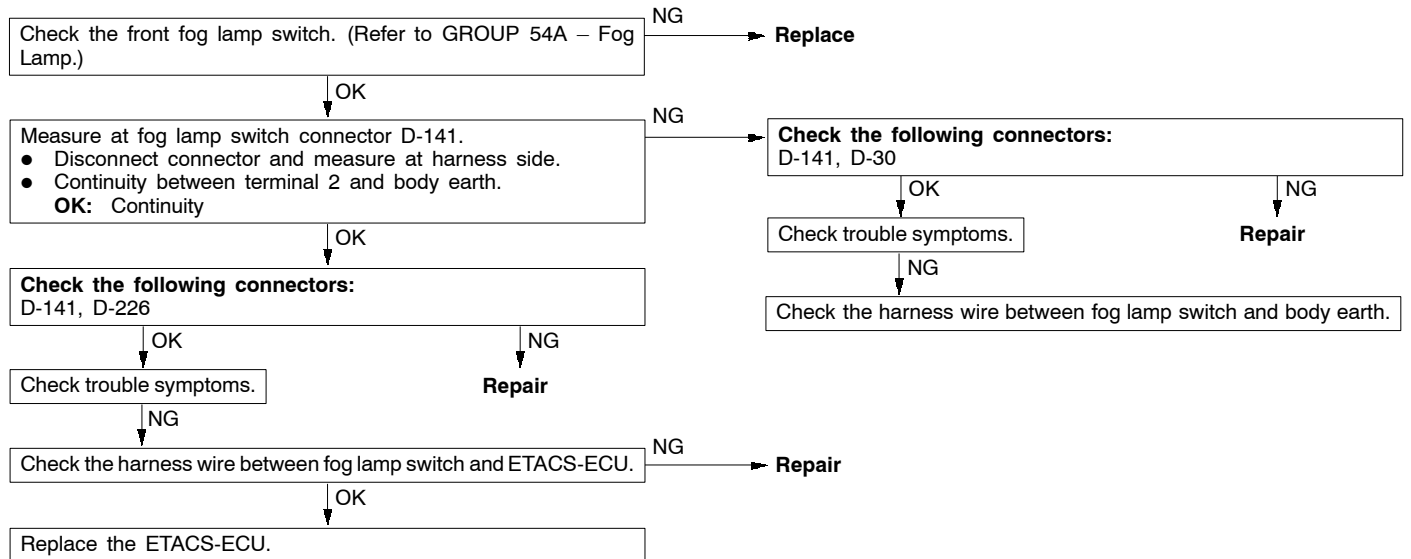
Inspection Procedure P-4

Hazard warning lamp switch signal is not sent to the ETACS-ECU.	Probable cause
<p>The hazard warning lamp switch input signal is used to operate the following devices. If the signal fails, these devices will not work normally.</p> <ul style="list-style-type: none"> • Hazard warning lamp • Keyless entry system (Registering the encrypted code) 	<ul style="list-style-type: none"> • Malfunction of hazard warning lamp switch • Malfunction of ETACS-ECU • Malfunction of harness wire or connector



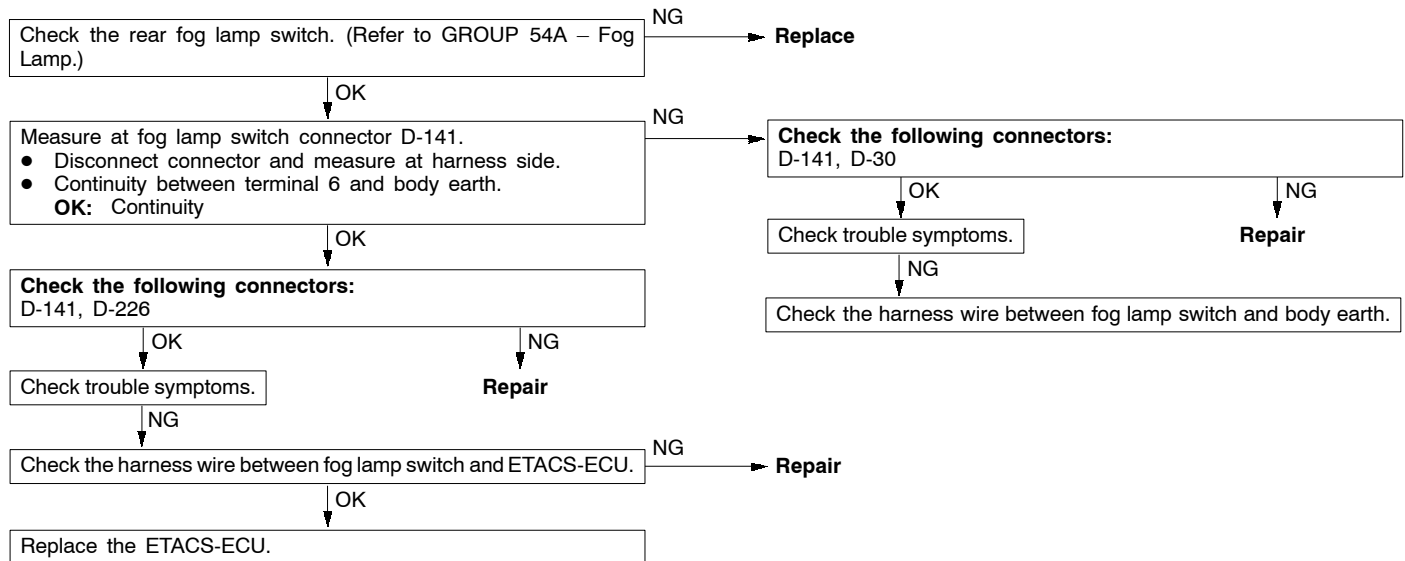
Inspection Procedure P-5

Front fog lamp switch signal is not sent to the ETACS-ECU.	Probable cause
The front fog lamp switch input signal is used to operate the front fog lamp. If the signal fails, front fog lamp will not work normally.	<ul style="list-style-type: none"> ● Malfunction of fog lamp switch ● Malfunction of ETACS-ECU ● Malfunction of harness wire or connector



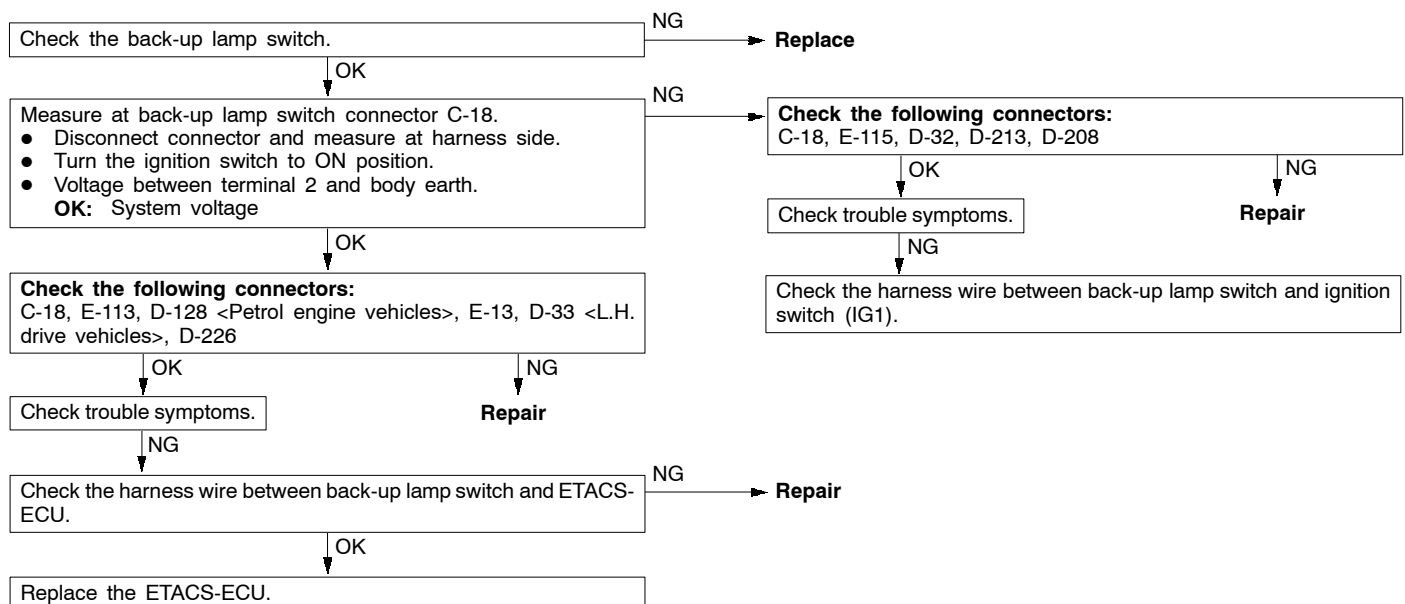
Inspection Procedure P-6

Rear fog lamp switch signal is not sent to the ETACS-ECU.	Probable cause
The rear fog lamp switch input signal is used to operate the rear fog lamp. If the signal fails, rear fog lamp will not work normally.	<ul style="list-style-type: none"> • Malfunction of fog lamp switch • Malfunction of ETACS-ECU • Malfunction of harness wire or connector



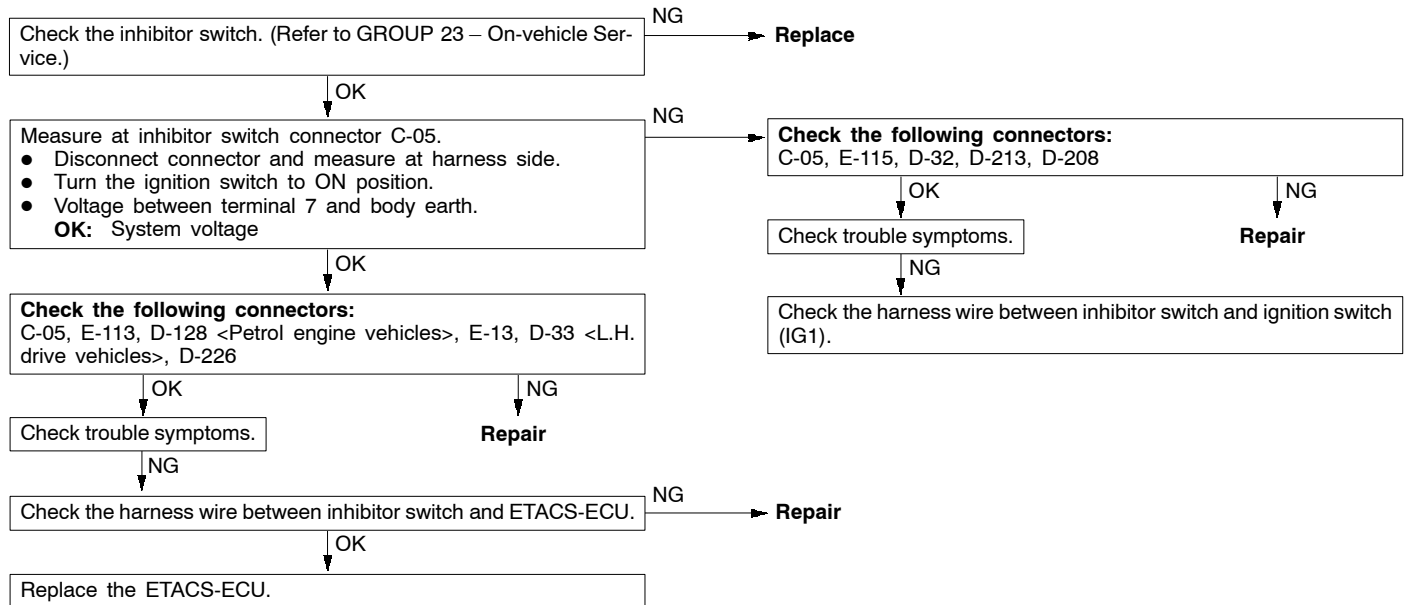
Inspection Procedure P-7

Back-up lamp switch signal is not sent to the ETACS-ECU. <M/T>	Probable cause
The back-up lamp switch input signal is used to operate the rear wiper. If the signal is an error, the rear wiper will not operate consecutively twice when the rear wiper is on and the shift lever is moved to R position.	<ul style="list-style-type: none"> • Malfunction of back-up lamp switch • Malfunction of ETACS-ECU • Malfunction of harness wire or connector



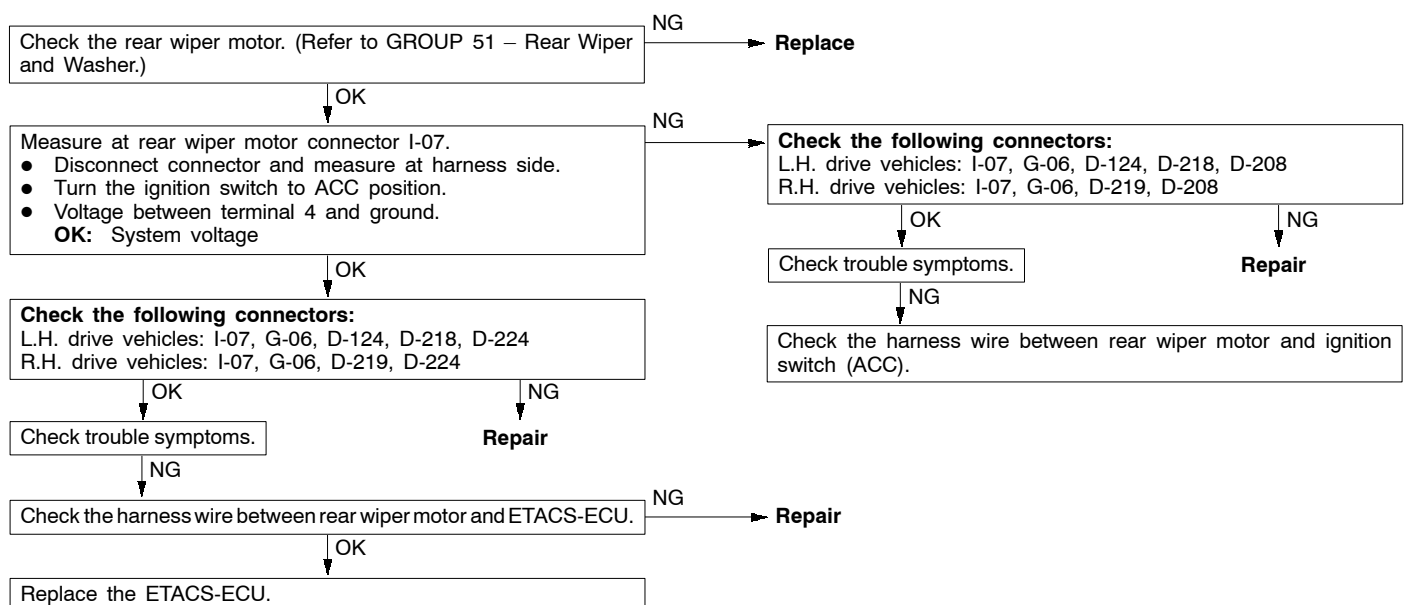
Inspection Procedure P-8

Inhibitor switch (reverse) signal is not sent to the ETACS-ECU. <A/T>	Probable cause
The inhibitor switch (reverse) input signal is used to operate the rear wiper. If the signal is an error, the rear wiper will not operate consecutively twice when the rear wiper is on and the selector lever is moved to R position.	<ul style="list-style-type: none"> • Malfunction of inhibitor switch • Malfunction of ETACS-ECU • Malfunction of harness wire or connector



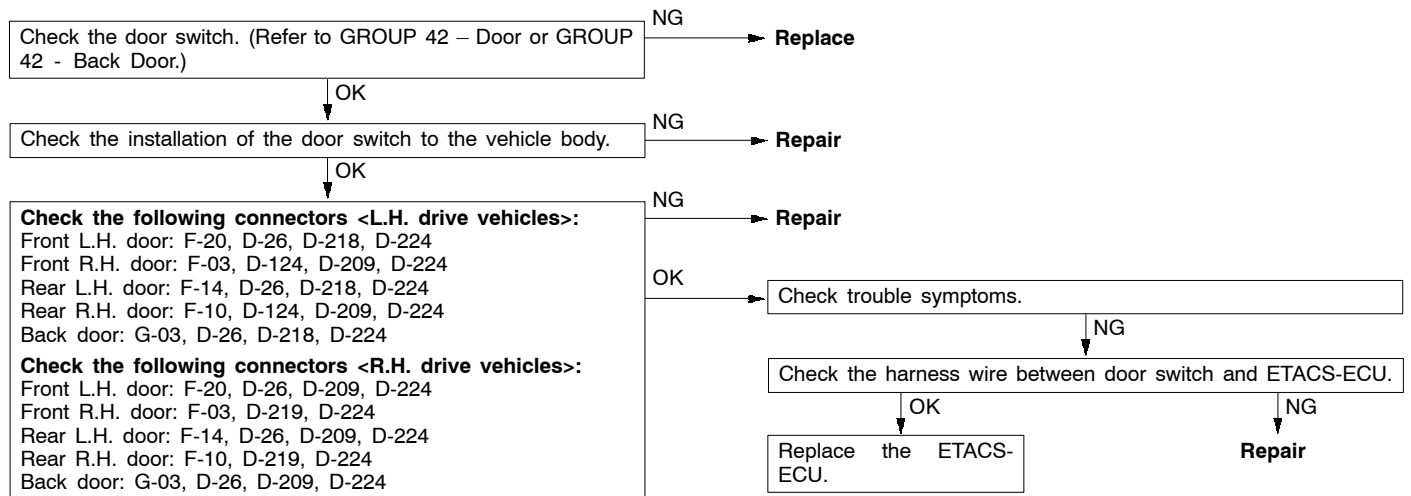
Inspection Procedure P-9

Rear wiper motor auto-stop signal is not sent to the ETACS-ECU.	Probable cause
Rear wiper motor auto-stop signal is used to operate the rear wiper. If the signal is an error, the rear wiper will not stop at the predetermined park position.	<ul style="list-style-type: none"> • Malfunction of rear wiper motor • Malfunction of ETACS-ECU • Malfunction of harness wire or connector



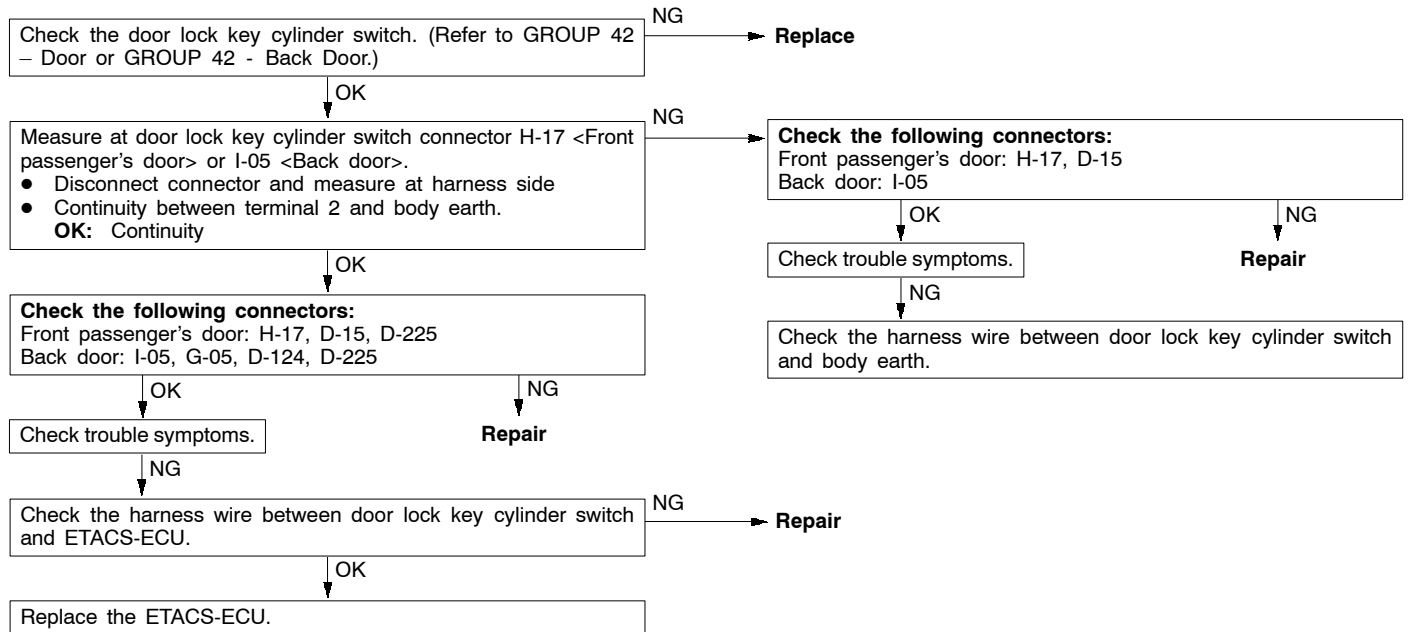
Inspection Procedure P-10

Driver's door switch signal is not sent to the ETACS-ECU.	Probable cause
Door switches signal is not sent to the ETACS-ECU.	
<p><Driver's door switch> The driver's door switch is used to operate the following functions. If the signal fails, these devices will not work normally.</p> <ul style="list-style-type: none"> ● Light reminder warning buzzer function ● Forgotten key prevention function ● Power window timer function ● Ignition key hole illumination lamp ● Headlamp automatic shutdown function <p><Door switches> The door switches is used to operate the following devices. If the signal fails, these devices will not work normally.</p> <ul style="list-style-type: none"> ● Keyless entry system ● Room lamp dimming function 	<ul style="list-style-type: none"> ● Malfunction of driver's, front passenger's, rear or back door switch ● Malfunction of ETACS-ECU ● Malfunction of harness wire or connector



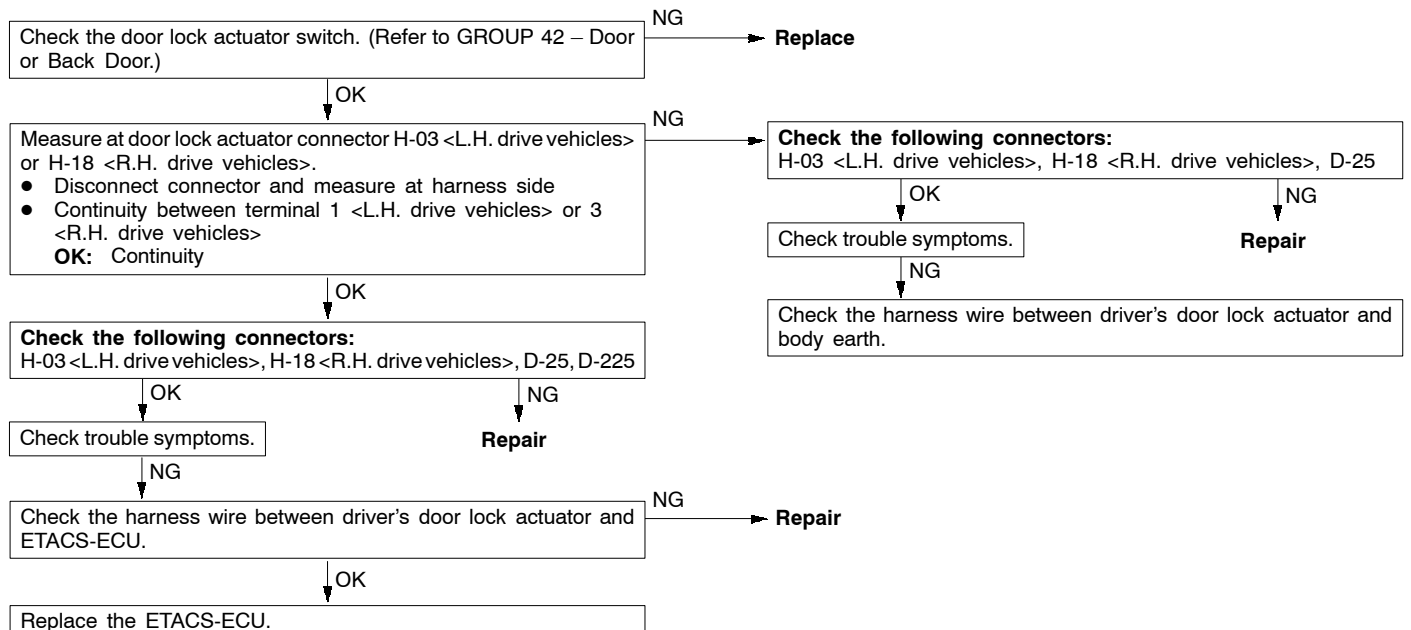
Inspection Procedure P-11

Front passenger's or back door lock key cylinder switch signal is not sent to the ETACS-ECU.	Probable cause
The front passenger's and back door lock key cylinder switch input signal is used to operate the central door locking system. If the signal fails, central door locking system will not work normally.	<ul style="list-style-type: none"> • Malfunction of front passenger's or back door lock key cylinder switch • Malfunction of ETACS-ECU • Malfunction of harness wire or connector



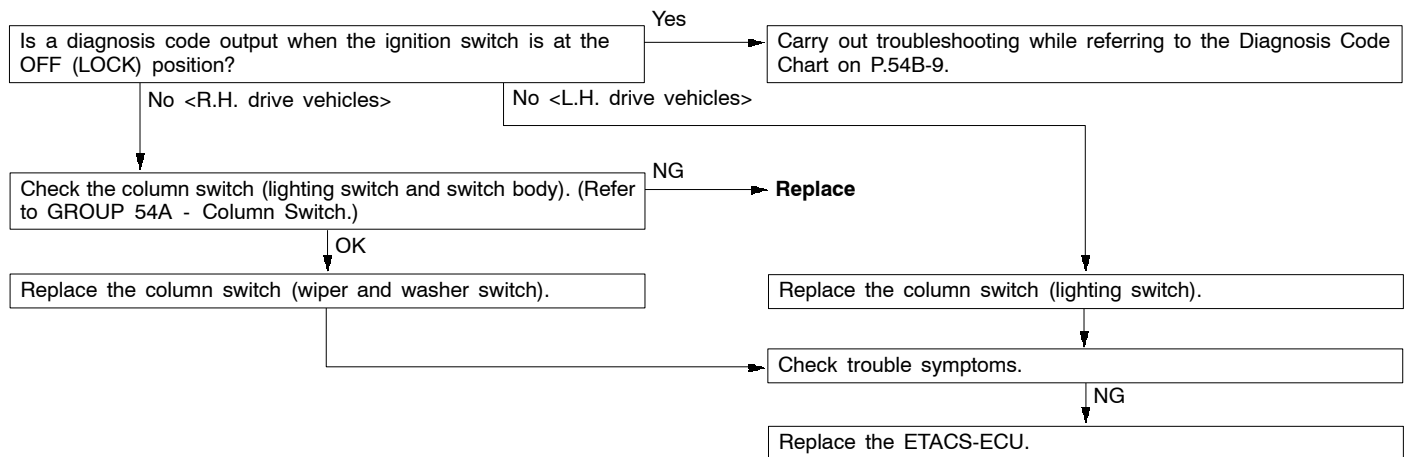
Inspection Procedure P-12

Driver's door lock actuator switch signal is not sent to the ETACS-ECU.	Probable cause
The driver's door lock actuator switch is used to operate the following systems or functions. If the signal fails, these systems or function will not work normally. <ul style="list-style-type: none"> • Central door locking system • Forgotten key prevention function • Keyless entry system 	<ul style="list-style-type: none"> • Malfunction of driver's door lock actuator • Malfunction of ETACS-ECU • Malfunction of harness wire or connector



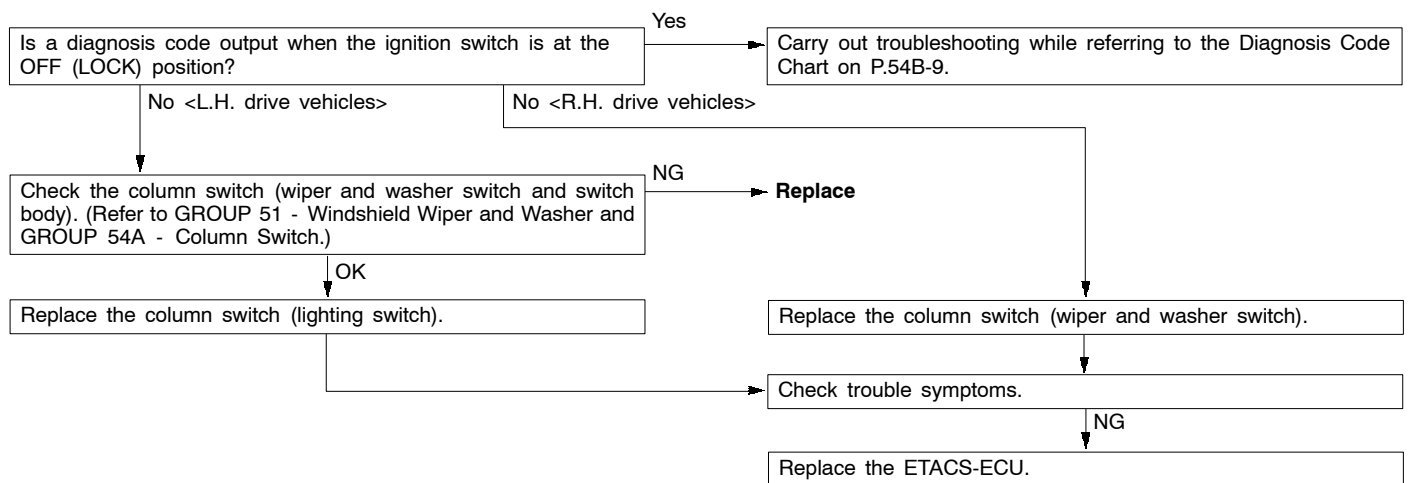
Inspection Procedure P-13

Column switch: <ul style="list-style-type: none"> • Tail lamp switch signal is not sent to the ETACS-ECU. • Headlamp switch signal is not sent to the ETACS-ECU. • Dimmer switch signal is not sent to the ETACS-ECU. • Passing switch signal is not sent to the ETACS-ECU. • Turn-signal lamp switch signal is not sent to the ETACS-ECU. • Headlamp washer switch is not sent to the ETACS-ECU. 	Probable cause
<p>The column switch (lighting switch) is used to operate the following systems or functions. If the signal fails, these systems or function will not work normally.</p> <ul style="list-style-type: none"> • Headlamp washer • Headlamp, tail lamp • Turn-signal lamp • Front fog lamp • Rear fog lamp 	<ul style="list-style-type: none"> • Malfunction of column switch • Malfunction of ETACS-ECU



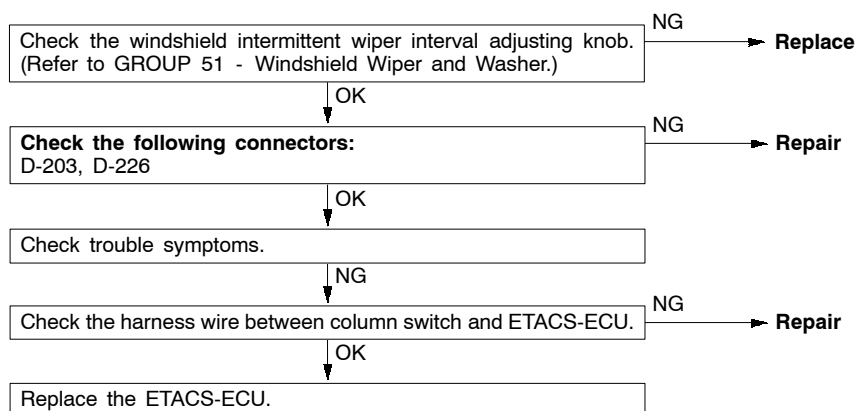
Inspection Procedure P-14

Column switch: <ul style="list-style-type: none"> • Windshield mist wiper switch signal is not sent to the ETACS-ECU. • Windshield intermittent wiper switch signal is not sent to the ETACS-ECU. • Windshield low-speed wiper switch signal is not sent to the ETACS-ECU. • Windshield high-speed wiper switch signal is not sent to the ETACS-ECU. • Windshield washer switch is not sent to the ETACS-ECU. • Rear wiper switch is not sent to the ETACS-ECU. • Rear washer is not sent to the ETACS-ECU. 	Probable cause
<p>The column switch (wiper and washer switch) is used to operate the following systems or functions. If the signal fails, these systems or function will not work normally.</p> <ul style="list-style-type: none"> • Windshield wiper and washer • Rear wiper and washer 	<ul style="list-style-type: none"> • Malfunction of column switch • Malfunction of ETACS-ECU



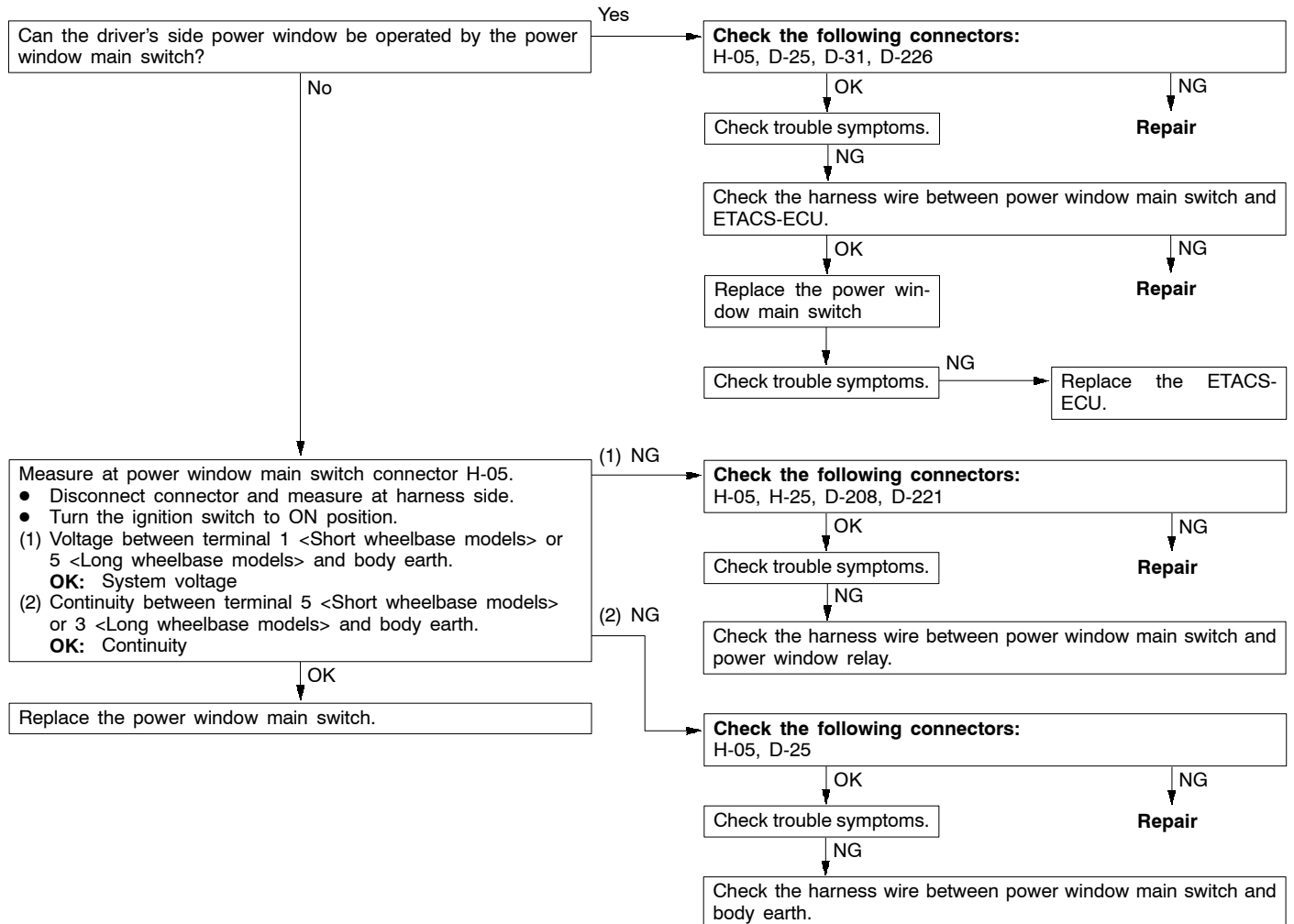
Inspection Procedure P-15

Column switch: Windshield intermittent wiper interval adjusting knob signal is not sent to the ETACS-ECU.	Probable cause
<p>If the windshield intermittent wiper interval adjusting knob is defective the windshield intermittent wiper interval can not be adjusted.</p>	<ul style="list-style-type: none"> • Malfunction of column switch • Malfunction of ETACS-ECU • Malfunction of harness wire or connector



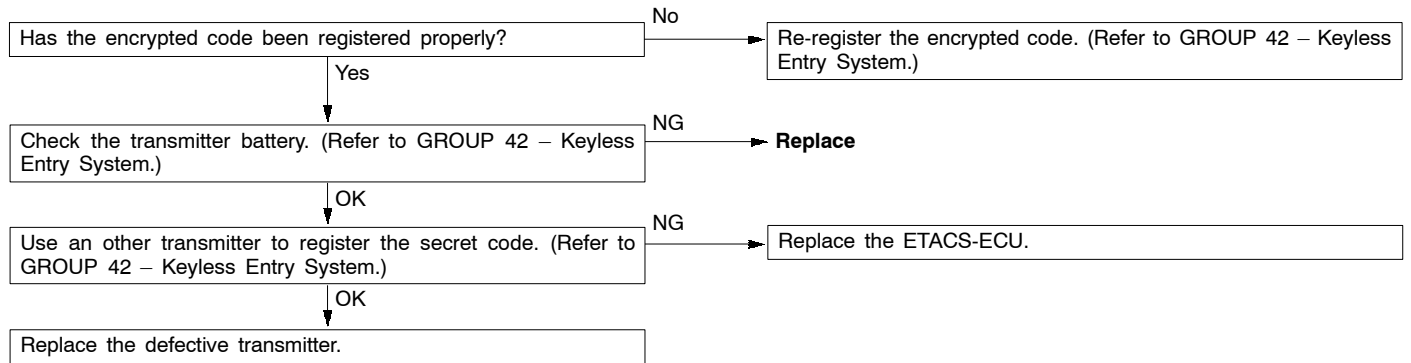
Inspection Procedure P-16

Power window main switch: Any switch signal is not sent to the ETACS-ECU.	Probable cause
If there is a problem with communication between the power window main switch and the ETACS-ECU, the input signal check for the power window main switch can no longer be carried out. In addition, the power window timer function will also stop working.	<ul style="list-style-type: none"> ● Malfunction of power window main switch ● Malfunction of ETACS-ECU ● Malfunction of harness wire or connector



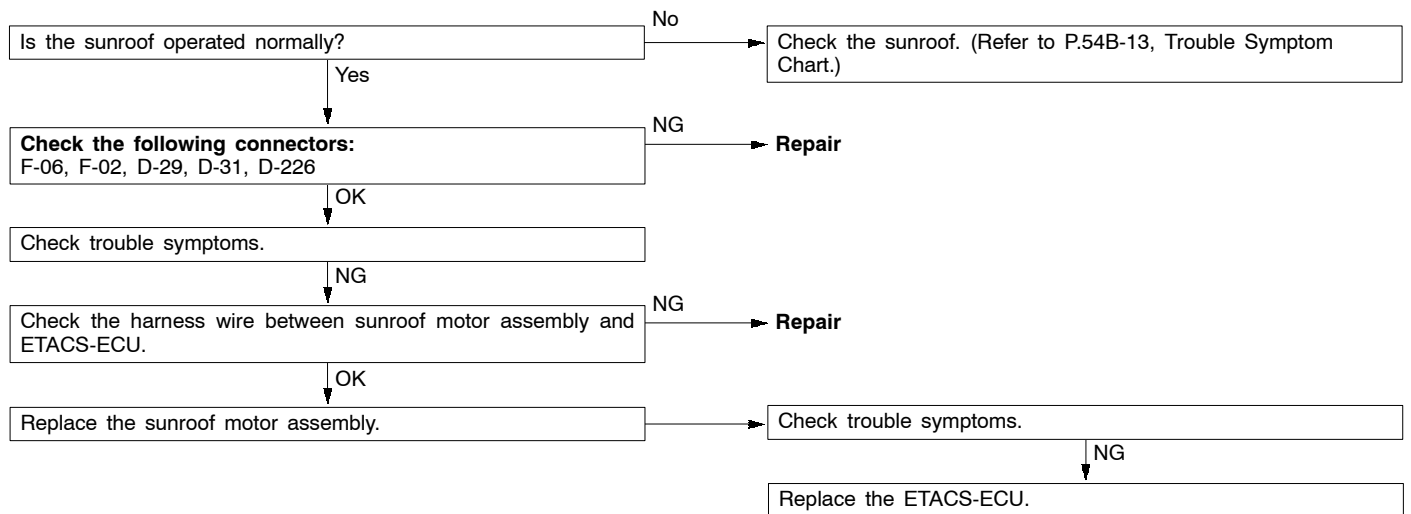
Inspection Procedure P-17

Transmitter: Any switch signal is not sent to the ETACS-ECU.	Probable cause
The transmitter input signal is used to operate the keyless entry system. If the signal fails, keyless entry will not work normally.	<ul style="list-style-type: none"> • Malfunction of transmitter • Malfunction of ETACS-ECU



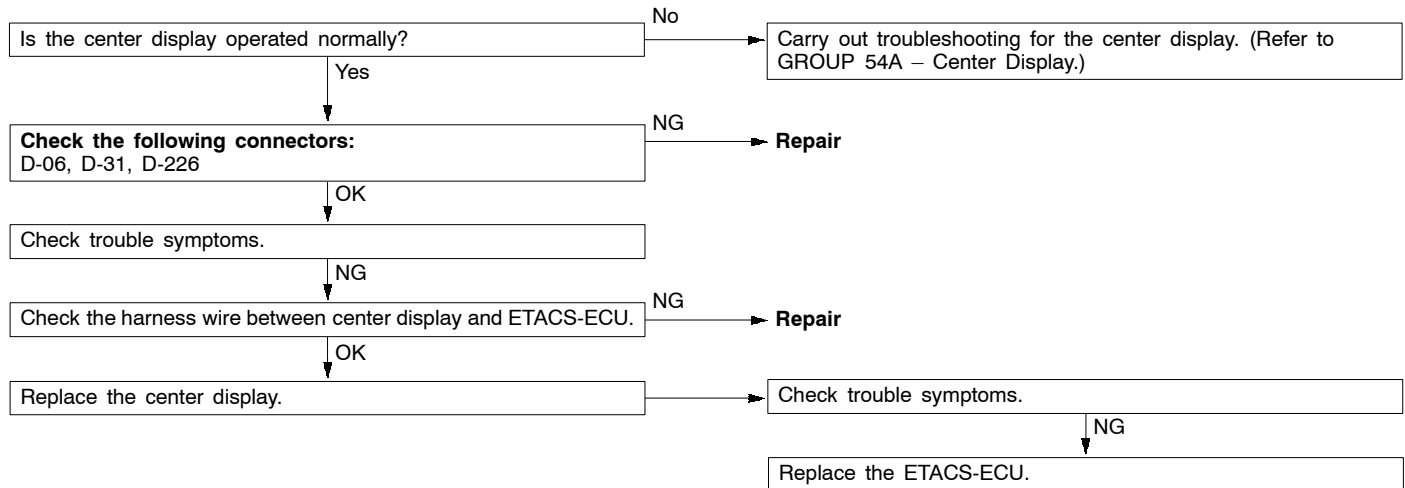
Inspection Procedure P-18

Sunroof switch: Any switch signal is not sent to the ETACS-ECU.	Probable cause
If there is a problem with communication between the sunroof motor assembly and the ETACS-ECU, the input signal check for the sunroof switch can no longer be carried out. In addition, the sunroof timer function will also stop working.	<ul style="list-style-type: none"> • Malfunction of sunroof switch • Malfunction of sunroof motor assembly • Malfunction of ETACS-ECU • Malfunction of harness wire or connector.



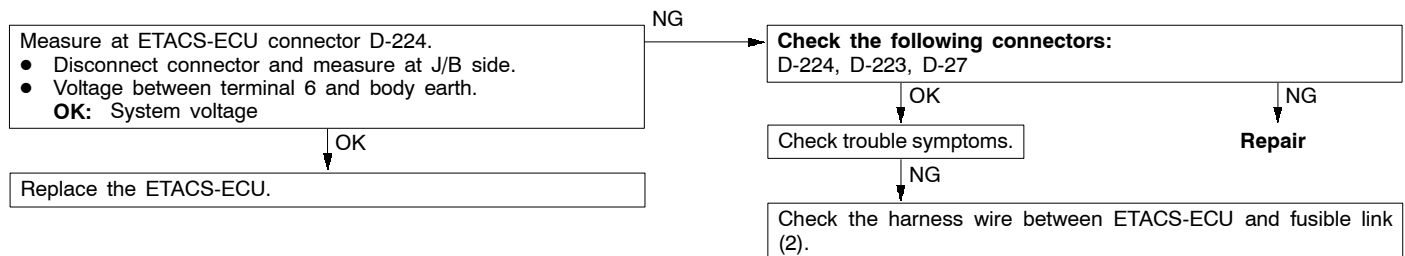
Inspection Procedure P-19

Center display: Any switch signal is not sent to the ETACS-ECU.	Probable cause
The cause is probably a malfunction of the center display or the ETACS-ECU.	<ul style="list-style-type: none"> • Malfunction of center display • Malfunction of ETACS-ECU • Malfunction of harness wire or connector.



Inspection Procedure Q-1

Check the circuit (power supply line) from the battery to the ETACS-ECU.	Probable cause
<p>If that power supply circuit is defective, the circuit flowing through the ignition switch (IG1) will function as a back-up circuit. In this case, the following functions will not work when the ignition switch is at LOCK (OFF) position.</p> <ul style="list-style-type: none"> • Ignition key reminder warning buzzer function • Central door lock ing system • Ignition key hole illumination lamp • Hazard warning lamp • Room lamp 	<ul style="list-style-type: none"> • Malfunction of ETACS-ECU • Malfunction of harness wire or connector.



CHECK AT ECU TERMINALS

1. ETACS-ECU

*

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

41	42	43	44	45	46	47	48
49	50	51	52	53	54	55	56

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NOTE

*: Since the ETACS-ECU is directly mounted on the junction block and the measurement for connector of terminals No.1 to 20 is impossible, the values concerning these terminals are shown for reference only.

Terminal No.	Check items	Checking requirements	Normal condition
1	Rear wiper output	When rear wiper is operated	System voltage
2	Ignition switch (ACC) power supply	Ignition switch: ACC	System voltage
3	Rear washer output	When rear washer is operated	System voltage
4	Door lock output	When the door lock actuators are working to lock	System voltage
5	Rear wiper auto-stop signal input	When rear wiper is operated	System voltage
6	Battery power supply (for ECU)	Always	System voltage
7	Door switches signal input	Either door switch: ON (Door open)	0 V
8	Power window relay output	When power window can be operated	2 V or less
9	Driver's door switch signal input	Driver's door switch: ON (Driver's door open)	0 V
11	Battery power supply (for turn-signal lamp)	Always	System voltage
12	Battery power supply (for central door lock)	Always	System voltage
14	Turn-signal lamp (R.H.) output	When turn-signal lamp (L.H.) is lighted	System voltage
15	Turn-signal lamp (L.H.) output	When turn-signal lamp (R.H.) is lighted	System voltage
16	Ignition switch (IG1) power supply	Ignition switch: ON	System voltage
17	Door unlock output	When door lock actuators are working to unlock	System voltage
18	Room lamp output	When room lamp is lighted	2 V or less
20	Ground (for ECU)	Always	0 V
21	SWS communication line	Always	0 - 12 V (pulse signal)
22	Diagnosis indication selection input	When MUT-II is connected	0 V
23	Ground (for sensor)	Always	0 V
24	Front fog lamp switch signal input	Front fog lamp switch: ON	0 V
25	Rear fog lamp switch signal input	Rear fog lamp switch: ON	0 V

Terminal No.	Check items	Checking requirements	Normal condition
26	Key reminder switch signal input	Key reminder switch: ON (Ignition key removed)	0 V
27	Hazard warning lamp switch signal input	Hazard warning lamp switch: ON	0 V
29	Recognition line of daytime running lamp (DRL) <Vehicles with DRL>	Always	0 V
31	Data request signal output	Always	0 - 5 V (pulse signal)
34	Windshield intermittent wiper interval adjusting knob signal input	Ignition switch: ACC, Windshield intermittent wiper interval adjusting knob: FAST → SLOW	0 → 2.5 V
35	Back-up lamp switch signal input <M/T>	Ignition switch: ON, Shift lever: R	System voltage
	Inhibitor switch (reverse) signal input <A/T>	Ignition switch: ON, Selector lever: R	System voltage
36	Ignition key hole illumination lamp output	When ignition key hole illumination lamp is lighted	2 V or less
37	Diagnosis code or input signal check output	When diagnosis code is output	0 - 12 V (pulse signal)
		When input signal check is output	0, 12 V (When input pulse signal is changed)
40	Rear fog lamp relay output	When rear fog lamp is lighted	2 V or less
53	Front passenger's and back door lock key cylinder switch (LOCK) signal input	Front passenger's or back door lock key cylinder switch: LOCK	0 V
54	Front passenger's and back door lock key cylinder switch (UNLOCK) signal input	Front passenger's or back door lock switch: UNLOCK	0 V
55	Driver's door lock actuator switch (LOCK) signal input	Driver's door lock actuator switch: LOCK	0 V
56	Driver's door lock actuator switch (UNLOCK) signal input	Driver's door lock actuator switch: UNLCOK	0 V

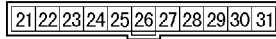
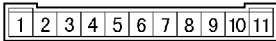
2. COLUMN SWITCH



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Terminal No.	Check items	Checking requirements	Normal condition
1	Battery power supply	Always	System voltage
2	Data request signal input	Always	0 - 12 V (pulse signal)
3	SWS communication line	Always	0 - 5 V (pulse signal)
4	Ground	Always	0 V
6	Windshield intermittent wiper interval adjusting knob signal output	Ignition switch: ACC, Windshield intermittent wiper interval adjusting knob: FAST → SLOW	0 → 2.5 V
8	Windshield wiper switch backup output	Windshield low-speed wiper switch or windshield high-speed wiper switch: ON	0 V
9	Ignition switch (IG1) power supply	Ignition switch: ON	System voltage
10	Headlamp switch backup output	Headlamp switch: ON	0 V

3. FRONT-ECU



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NOTE

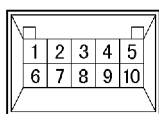
Since the front-ECU is directly mounted on the relay box and measurement is impossible, these values are shown for reference.

Terminal No.	Check items	Checking requirements	Normal condition
1	Front fog lamp relay output	When front fog lamp is lighted	2 V or less
2	Headlamp (high-beam) output	When headlamp (high-beam) is lighted	System voltage
3, 4	Battery power supply (for headlamp)	Always	System voltage
5	Battery power supply (for tail lamp)	Always	System voltage
6	Headlamp (low-beam) output	When headlamp (low-beam) is lighted	System voltage
7	Battery power supply (for ECU)	Always	System voltage
8	Tail lamp output	When tail lamp is lighted	System voltage
9	Battery power supply (for headlamp washer)	Always	System voltage
11	Headlamp washer output	When headlamp washer is operated	System voltage
21	Windshield washer output	When windshield washer is operated	System voltage

Terminal No.	Check items	Checking requirements	Normal condition
22	SWS communication line	Always	0 - 12 V (pulse signal)
23	Windshield wiper auto-stop signal input	When windshield wiper is operated	System voltage
24	Ignition switch (ACC) power supply	Ignition switch: ACC	System voltage
25	Headlamp switch backup input	Headlamp switch: ON	0 V
26	Windshield wiper backup input	Windshield low-speed wiper switch or windshield high-speed wiper switch: ON	0 V
27	Windshield wiper (low-speed) output	When windshield wiper is operated (at low-speed)	System voltage
28	Windshield wiper (high-speed) output	When windshield wiper is operated (at high-speed)	System voltage
30	Ignition switch (IG2) power supply	Ignition switch: ON	System voltage
31	Ground	Always	0 V

4. POWER WINDOW MAIN SWITCH

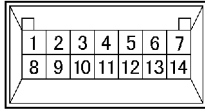
<Short wheelbase models>



X1211CA

Terminal No.	Check items	Checking requirements	Normal condition
1	Power supply	Power window relay: ON	System voltage
3	SWS communication line (between the main switch and the power window motor)	Power window relay: ON	0 - 12 V (pulse signal)
4	SWS communication line (between the main switch and the ETACS-ECU)	Always	0 - 12 V (pulse signal)
5	Ground	Always	0 V

<Long Wheelbase Models>



X1212CA

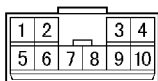
Terminal No.	Check items	Checking requirements	Normal condition
1	SWS communication line (between the main switch and the power window motor)	Power window relay: ON	0 - 12 V (pulse signal)
3	Ground	Always	0 V
5	Power supply	Power window relay: ON	System voltage
7	SWS communication line (between the main switch and the ETACS-ECU)	Always	0 - 12 V (pulse signal)

5. POWER WINDOW MOTOR



X1213CA

Terminal No.	Check items	Checking requirements	Normal condition
1	Ground	Always	0 V
2	Power window sub switch (DOWN) signal input <Except driver's door>	Power window sub switch: DOWN	0 V
3	Power supply	Power window relay: ON	System voltage
4	Power window sub switch (UP) signal input <Except driver's door>	Power window sub switch: UP	0 V
6	SWS communication line (between the power main switch and the power window motor)	Power window relay: ON	0 - 12 V (pulse signal)

6. SUNROOF MOTOR ASSEMBLY

X1214CA

Terminal No.	Check items	Checking requirements	Normal condition
1	Battery power supply (for motor)	Always	System voltage
2	Ignition switch (IG2) power supply	Ignition switch: ON	System voltage
3	Battery power supply (for ECU)	Always	System voltage
5	Ground	Always	0 V
6	Sunroof switch (CLOSE/DOWN) signal input	Sunroof switch: CLOSE/DOWN	0 V
7	Sunroof switch (UP) signal input	Sunroof switch: UP	0 V
8	Sunroof switch (OPEN) signal input	Sunroof switch: OPEN	0 V
6	SWS communication line	Always	0 - 12 V (pulse signal)

7. CENTER DISPLAY

Refer to GROUP 54A - Center Display.

ON-VEHICLE SERVICE

ADJUSTMENT PROCEDURES OF SWS FUNCTION

Through special operation of input switches, it is possible to disable and enable the functions listed below. Settings are retained even if the battery is disconnected.

- Keyless entry hazard answerback function
- Initialization of above mentioned functions

Configuration Mode Entry Conditions

1. Set each switch at the following condition.
 - Hazard warning lamp switch: OFF
 - Diagnosis control: ON (MUT-II connected or terminal 1 of diagnosis connector connected to earth)
 - Key reminder switch: OFF (ignition key inserted)
 - Ignition switch: LOCK (OFF)
 - Driver's door switch: OFF (driver's door closed)
2. When the windshield washer switch is continuously turned ON for more than 10 seconds, the buzzer integrated in the ETACS-ECU sounds once and the mode is switched to the configuration mode.

Configuration Mode Cancellation Conditions

The ETACS-ECU cancels the configuration mode when any of the conditions listed below is satisfied.

- Diagnosis control: OFF (MUT-II disconnected or terminal 1 of diagnosis connector disconnected from earth)
- Key reminder switch: ON (ignition key removed)
- Ignition switch: any position other than LOCK (OFF)
- Driver's door switch: ON (driver's door open)
- No configuration performed within three minutes of entry to configuration mode (If configuration is performed within first three minutes, monitoring continues for three minutes from that point.)

Configuration of Functions

Function	Configuration procedure
Keyless entry hazard answerback	<p>If the transmitter's LOCK switch is turned ON twice within two seconds, the lock answerback function's enabled/disabled status is inverted.</p> <ul style="list-style-type: none"> • When function is enabled, buzzer sounds once (initial status). • When function is disabled, buzzer sounds twice. <p>If the transmitter's UNLOCK switch is turned ON twice within two seconds, the unlock answerback function's enabled/disabled status is inverted.</p> <ul style="list-style-type: none"> • When function is enabled, buzzer sounds once (initial status). • When function is disabled, buzzer sounds twice.
Initialization of above mentioned functions	<p>If the windshield washer switch is turned ON for more than 20 seconds, the buzzer sounds twice and all functions are initialized. (The configuration mode entry buzzer sounds after 10 seconds, but the switch must be kept ON for 20 seconds to achieve initialization.)</p> <p>IF the windshield washer switch is kept ON for more than 20 seconds without prior entry of the configuration mode, the configuration mode is entered after 10 seconds and initialization does not take place.</p>

GROUP 54B

SMART WIRING SYSTEM (SWS)

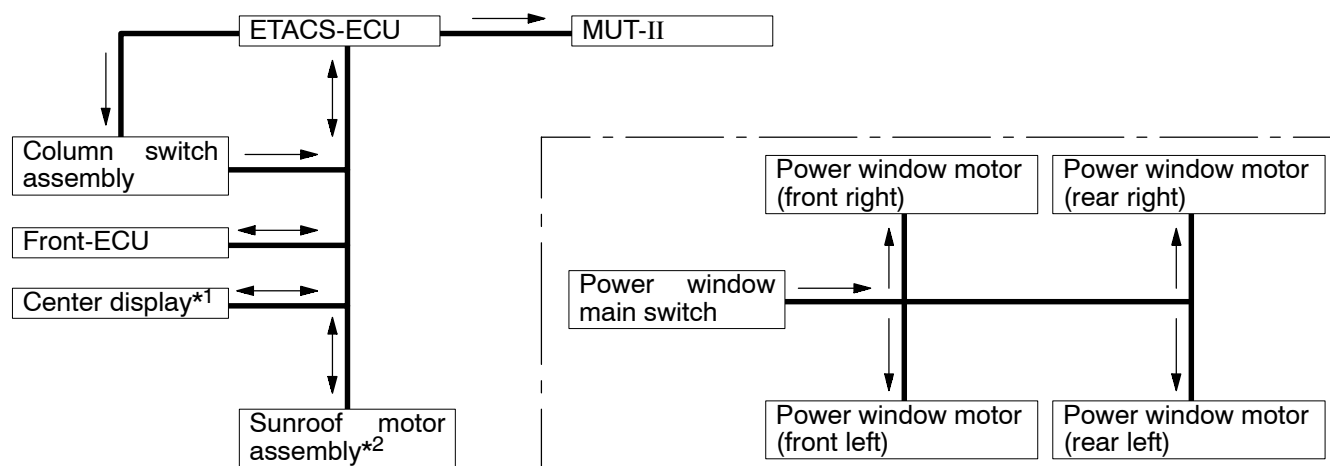
GENERAL INFORMATION

OUTLINE OF CHANGE

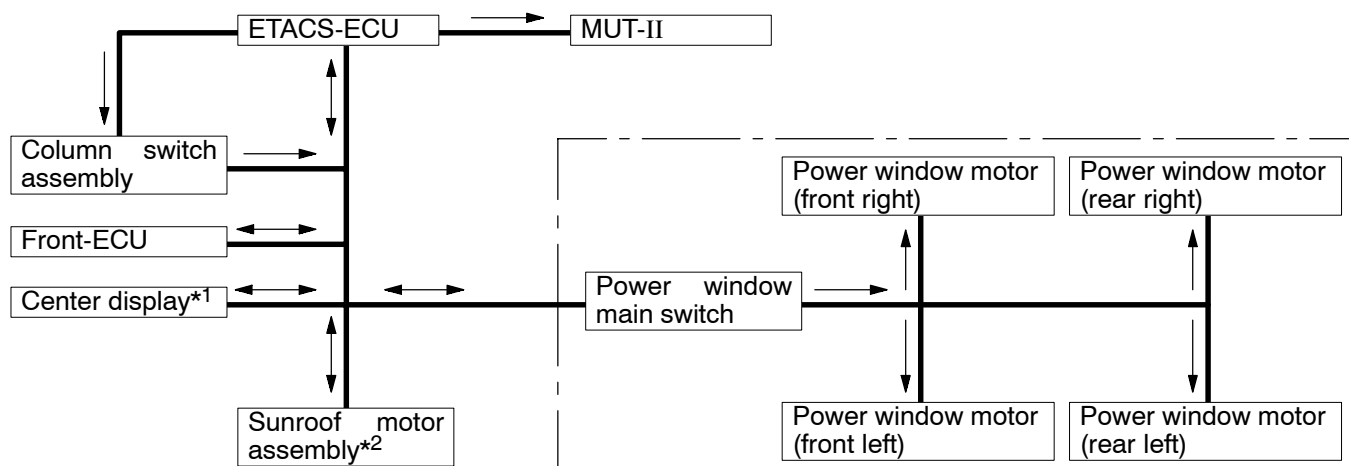
Due to the removal of communication line between the power window and each ECU (abolition of power window timer function) and the abolition of sunroof timer function, the following changes have been made. The other procedures except for the items described below are the same as before.

- Removal of the driver's power window switch in the input signal inspection function
- Change of troubleshooting, including confirmation of input signal to the power window (D-2, D-4)
- Removal of timer function troubleshooting of the power window (D-5)
- Removal of timer function troubleshooting of the sunroof (F-2)
- Removal of input signal inspection troubleshooting of the driver's power window switch (P-16)

<NEW>



<OLD>



NOTE

→ : Uni-directional communication line

↔ : Bi-directional communication line

*1: Vehicles with center display

*2: Vehicles with sunroof

TROUBLESHOOTING

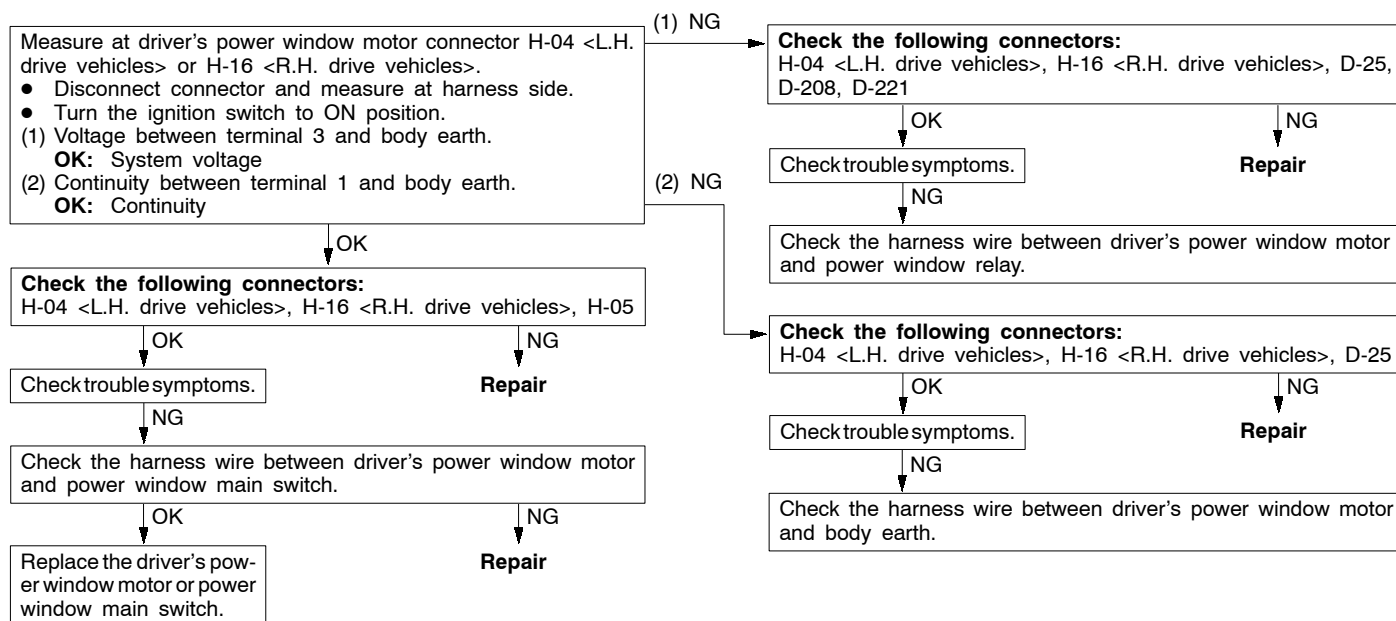
INSPECTION CHART FOR TROUBLE SYMPTOMS

Symptom	Inspection procedure	Reference page
Power window main switch can not operate driver's window.	D-2	54B-2
Power window main switch can not operate front passenger's or rear window.	D-4	54B-3

INSPECTION PROCEDURE FOR TROUBLE SYMPTOMS

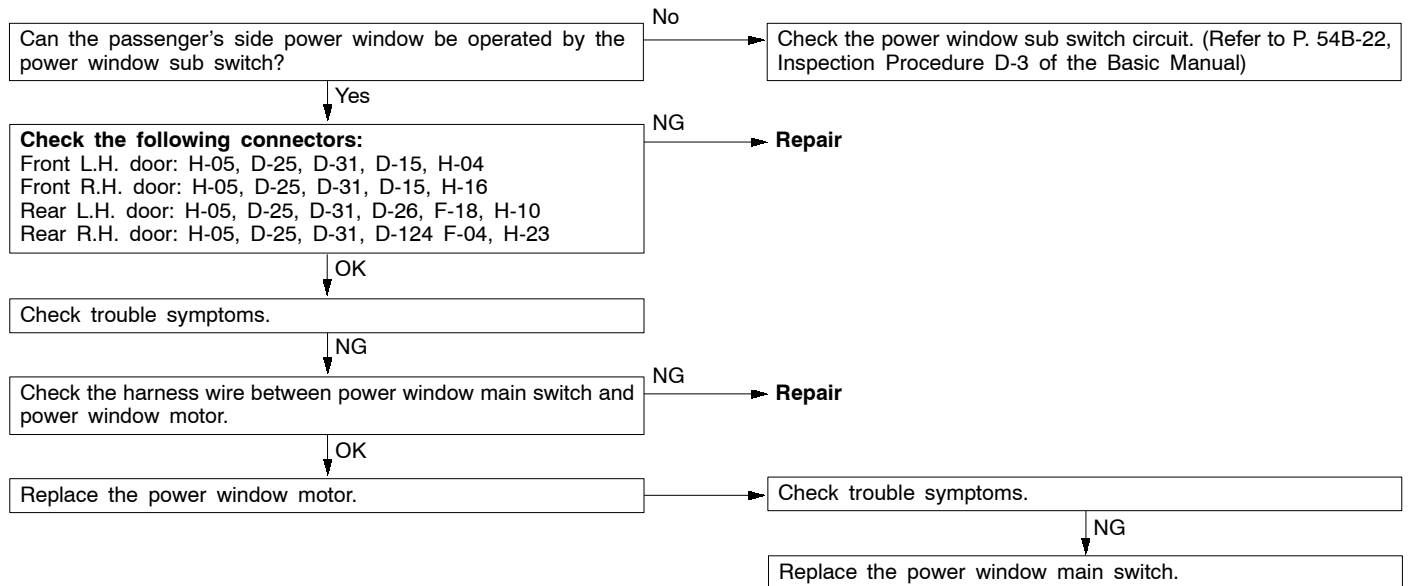
Inspection Procedure D-2

Power window: Power window main switch can not operate driver's window.	Probable cause
The cause is probably a malfunction of the power window main switch or driver's side power window motor, or an abnormality in the power supply circuit.	<ul style="list-style-type: none"> • Malfunction of power window main switch • Malfunction of driver's power window motor • Malfunction of harness wire or connector



Inspection Procedure D-4

Power window: Power window main switch can not operate front passenger's or rear window.	Probable cause
The cause is probably a malfunction of the power window main switch or front passenger's or rear power window motor, or an abnormality in the power supply circuit.	<ul style="list-style-type: none"> • Malfunction of power window main switch • Malfunction of front passenger's or rear power window motor • Malfunction of harness wire or connector



NOTES