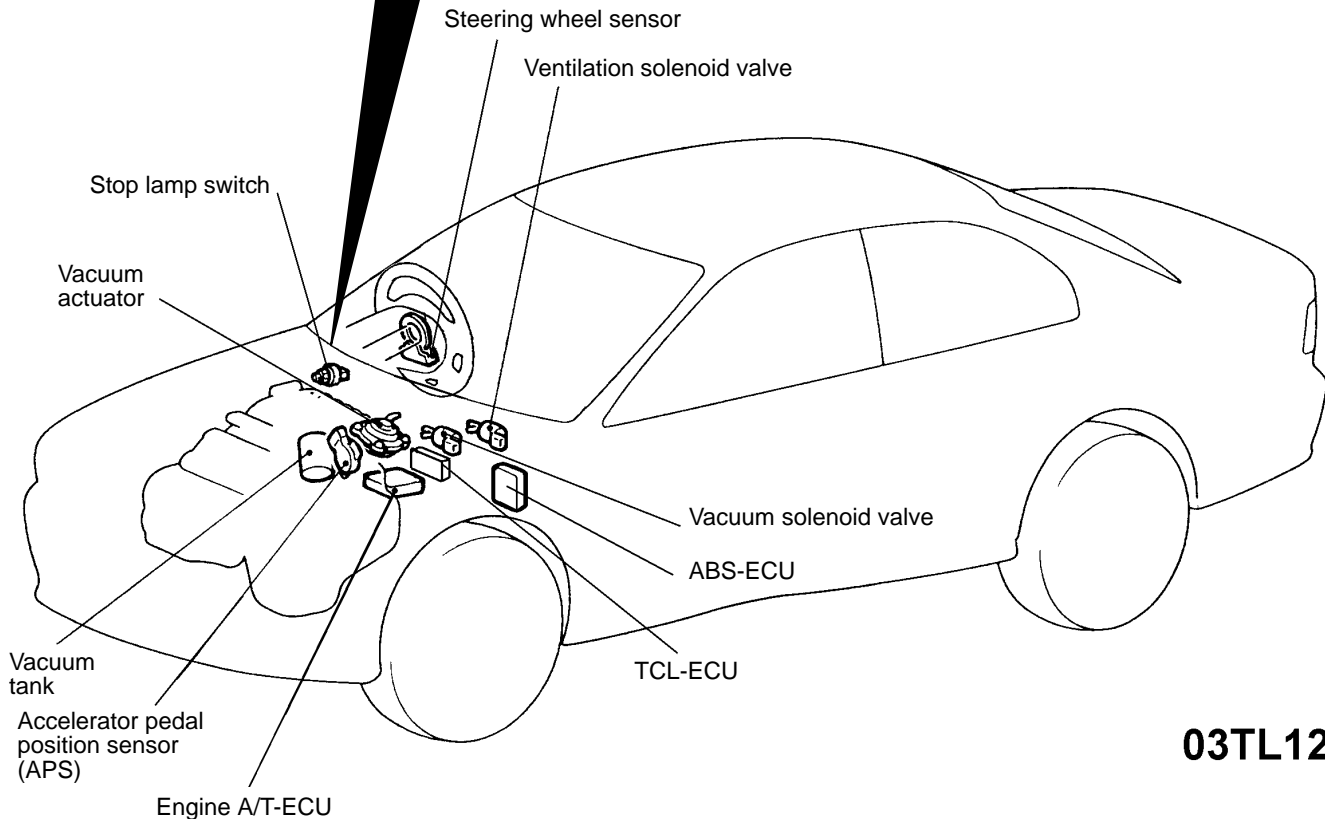
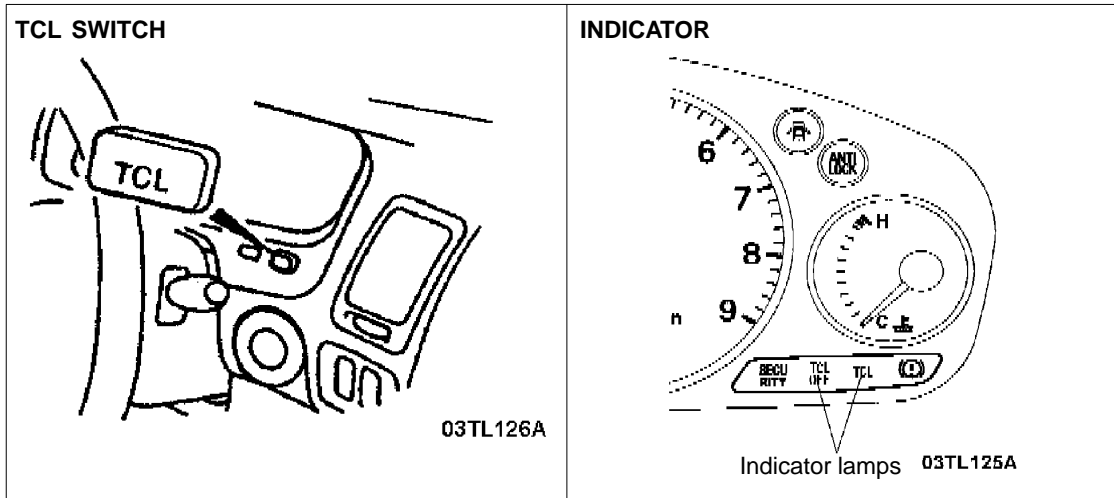


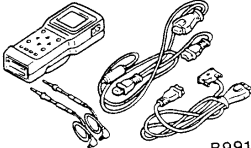
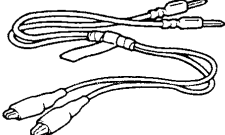
## GENERAL DESCRIPTION

The TCL system (slip control and trace control) is available as an option. This system facilitates starting, accelerating, and cornering on slippery

roads such as snowy roads. In addition, this system improves driveability while cornering on normal roads and contributes to easier driving.

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## SPECIAL TOOLS

Tool	Tool number and name	Supersession	Application
 B991502	MB991502 MUT-II sub assembly	—	For checking of TCL (Diagnosis code display when using the MUT-II)
 B991529	MB991529 Diagnosis code check harness	MB991529-01	For checking of TCL (Diagnosis code display when using the TCL-OFF warning lamp)

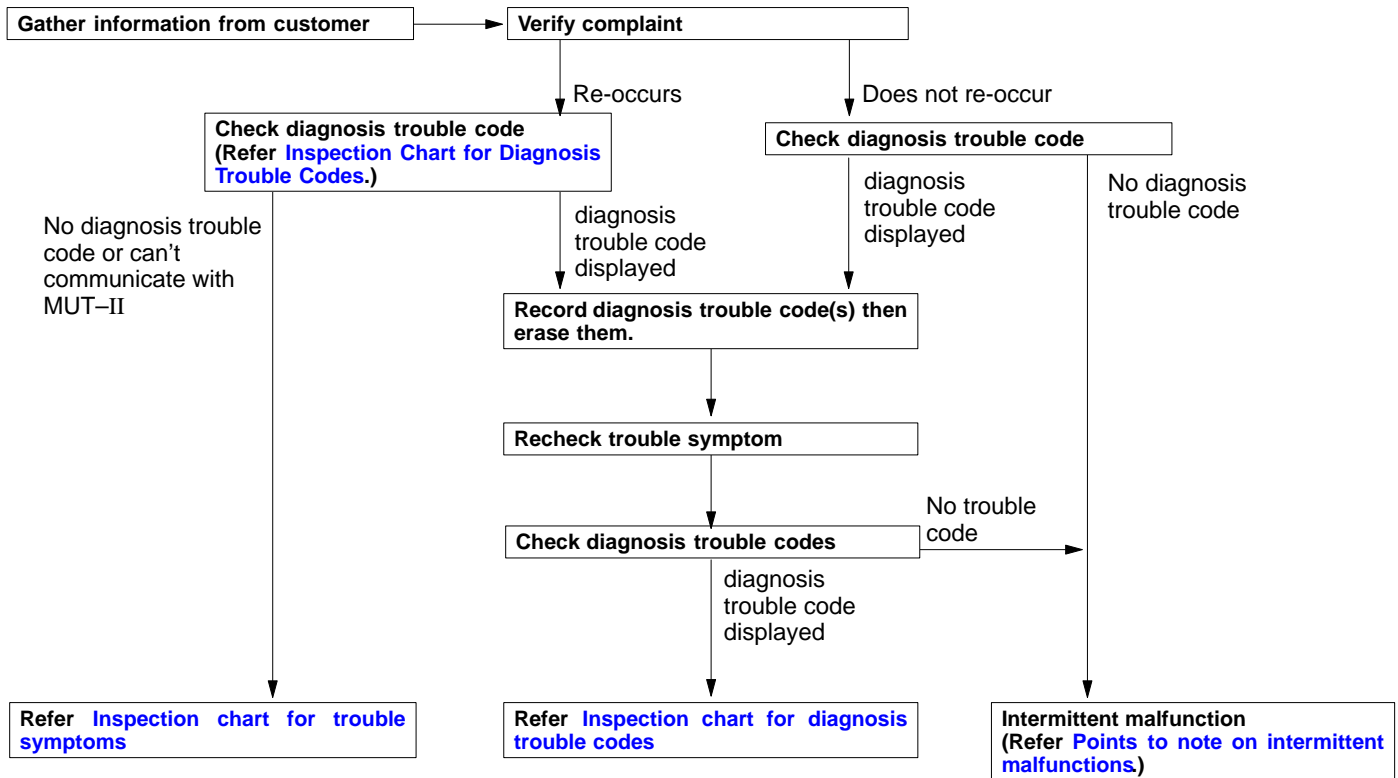
## SERVICE SPECIFICATIONS

ITEM	STANDARD VALUE
Accelerator pedal position sensor resistance $k\Omega$	3.5–6.5

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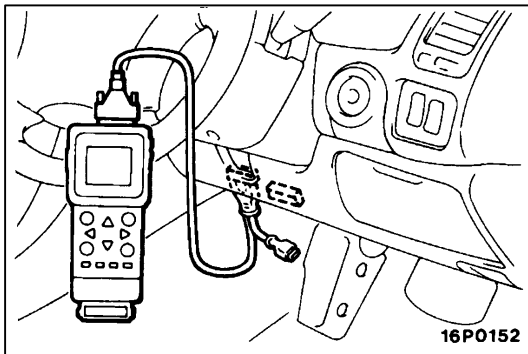
# DIAGNOSIS

## DIAGNOSTIC TROUBLESHOOTING FLOW



NOTE: Before carrying out trouble diagnosis, check to be sure that all of the following items are normal.

- Is the standard steering wheel being used, and has it been correctly installed to the straight-ahead position on the steering shaft?
- Are the size, specifications, air pressure, balance and wear conditions of the tyres and wheels normal?
- Is the wheel alignment normal?
- Have any other modifications been made to the engine or suspension which could conceivably have an effect on the TCL system?



## DIAGNOSIS FUNCTION

### DIAGNOSIS TROUBLE CODE CHECK

Connect the MUT-II to the data link connector then check diagnosis trouble codes.

**CAUTION:** Make certain that the ignition switch is OFF when the MUT-II is connected or disconnected.

### ERASING DIAGNOSIS TROUBLE CODES

Connect the MUT-II to the data link connector then erase the diagnosis trouble codes.

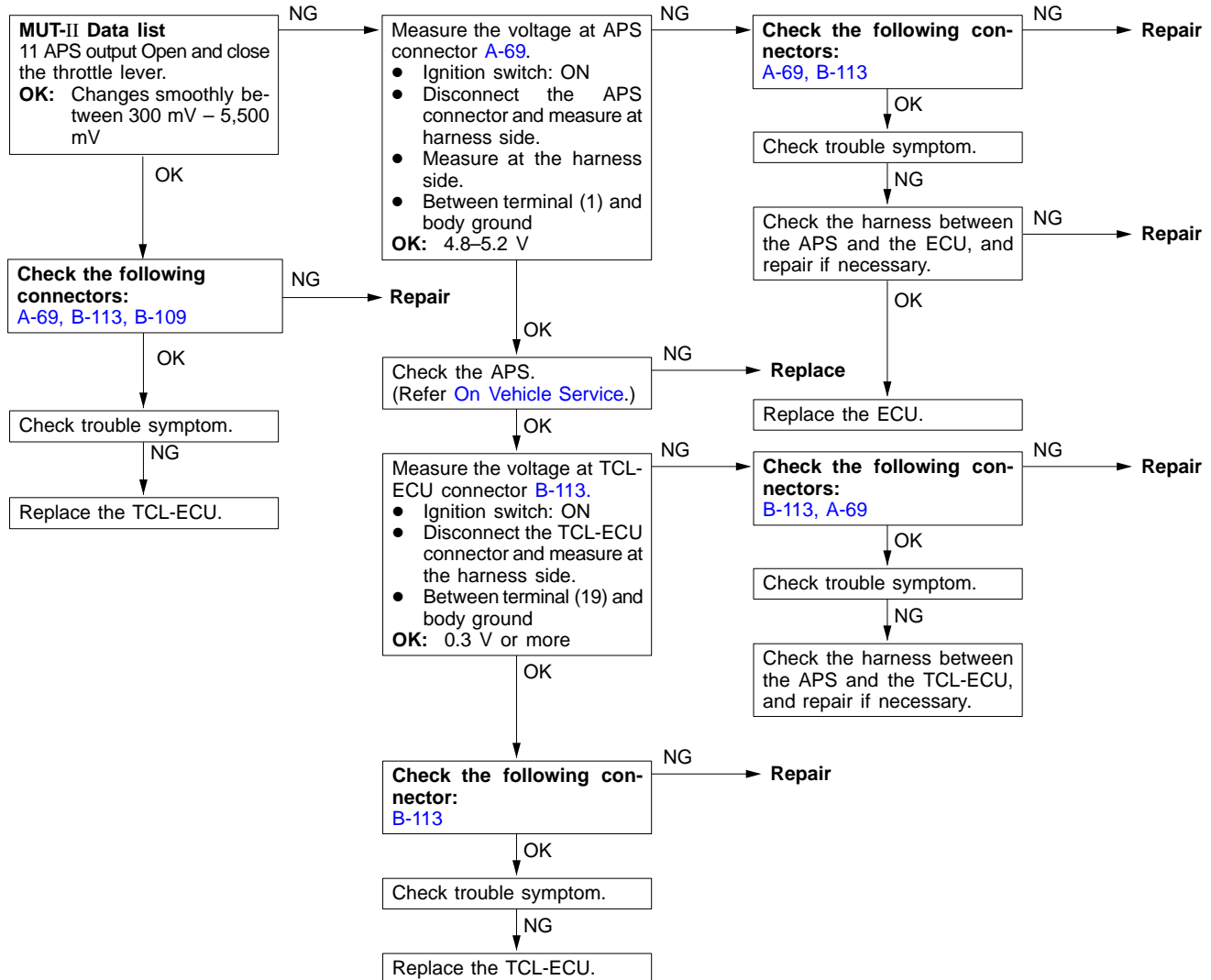
## INSPECTION CHART FOR DIAGNOSIS TROUBLE CODES

CODE No.	DIAGNOSIS ITEM
11	APS circuit system
12	APS or TPS circuit system
13	TPS circuit system
23	Stop lamp switch circuit system
24	TCL switch circuit system
26	Ignition switch (IG2) circuit system
27	TCL-ECU power supply voltage circuit (engine control relay circuit) system
31	Front right wheel speed sensor circuit system
32	Front left wheel speed sensor circuit system
33	Rear right wheel speed sensor circuit system
34	Rear left wheel speed sensor circuit system
35	Rear wheel speed sensor circuit system (1)
36	Rear wheel speed sensor circuit system (2)
41	Steering wheel sensor (ST-1) circuit system (open circuit)
42	Steering wheel sensor (ST-2) circuit system (open circuit)
43	Steering wheel sensor (ST-N) circuit system (open circuit)
44	Steering wheel sensor circuit system (short circuit)
45	Steering wheel sensor (ST-N) circuit system (short circuit)
71	ECU communication circuit system
72	ECU circuit system
73	ECU circuit system
74	Engine A/T ECU communication circuit system
76	ABS circuit system

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## INSPECTION PROCEDURES FOR DIAGNOSIS CODES

Code No. 11 APS circuit system	Probable cause
This DTC is output if the APS output voltage is less than 0.2 V due to an open circuit or other malfunction in the APS circuit. The APS power supply and ground are supplied from the ECU, and the output signal is used by the Engine A/T-ECU and auto-cruise control-ECU as well as by the TCL-ECU.	<ul style="list-style-type: none"> <li>• Malfunction of APS</li> <li>• Malfunction of TCL-ECU</li> <li>• Malfunction of ECU</li> <li>• Malfunction of harness or connector</li> </ul>



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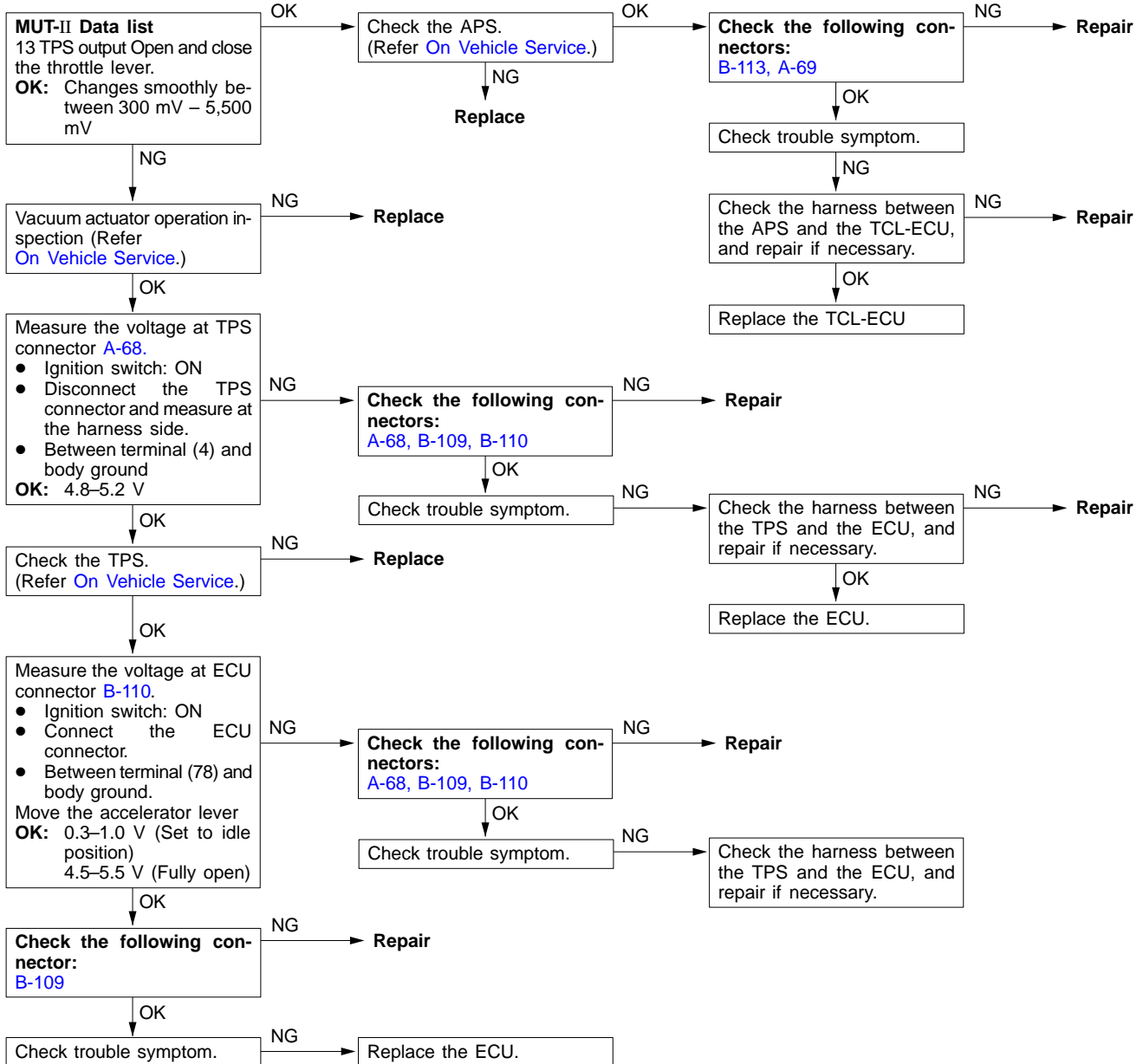
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## Code No. 12 APS or TPS circuit system

## Probable cause

This DTC is output if the APS opening angle is 20° or greater than the TPS opening angle because of a short in the APS, an open circuit in the TPS or sticking of the vacuum actuator. As this detection condition can be applicable during throttle control, trouble diagnosis is invalid at this time.

- Malfunction of APS
- Malfunction of TPS
- Malfunction of TCL-ECU
- Malfunction of ECU
- Malfunction of harness or connector
- Malfunction of vacuum actuator



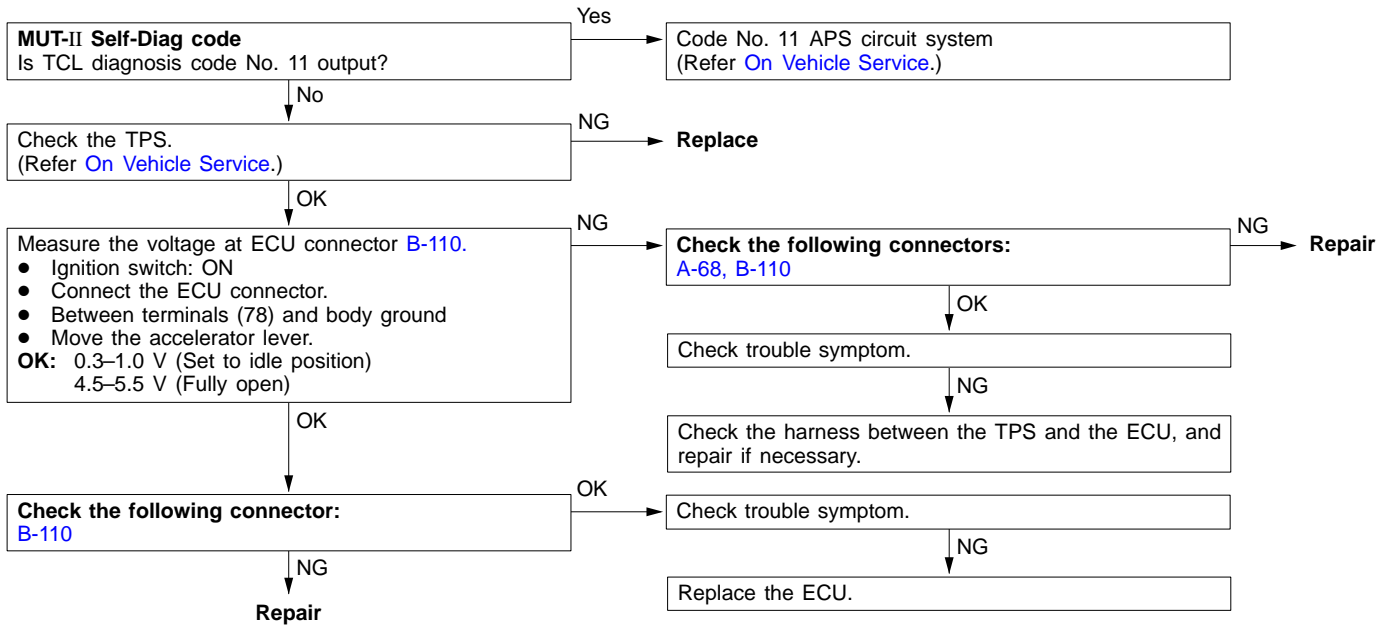
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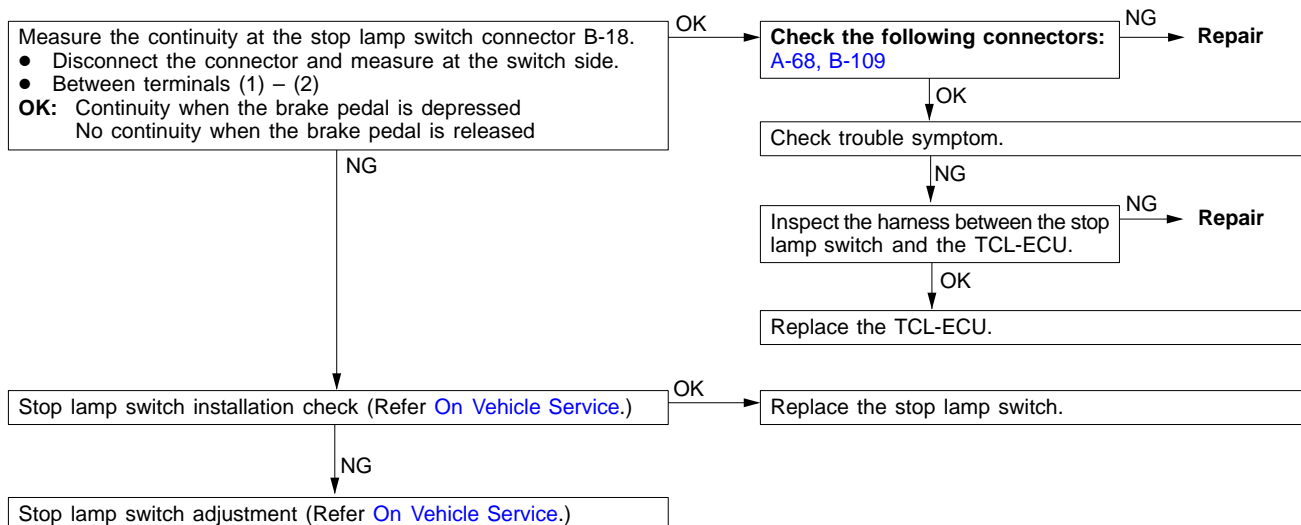
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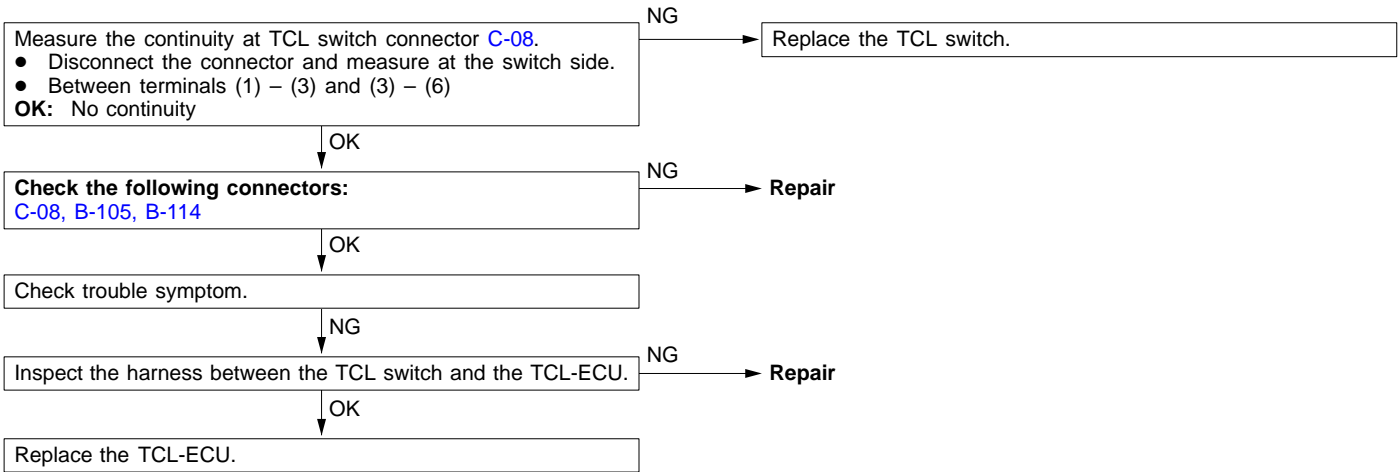
Code No.13 TPS circuit system	Probable cause
<p>This DTC is output if the TPS opening angle is 20° or greater than the APS opening angle because of a short in the TPS or an open circuit in the APS. If there is an open circuit in the APS, diagnosis code No. 11 is output at the same time. Accordingly, if only DTC No. 13 is output, the cause is probably an abnormality in the TPS circuit system.</p>	<ul style="list-style-type: none"> <li>• Malfunction of APS</li> <li>• Malfunction of TPS</li> <li>• Malfunction of harness or connector</li> <li>• Malfunction of ECU</li> </ul>



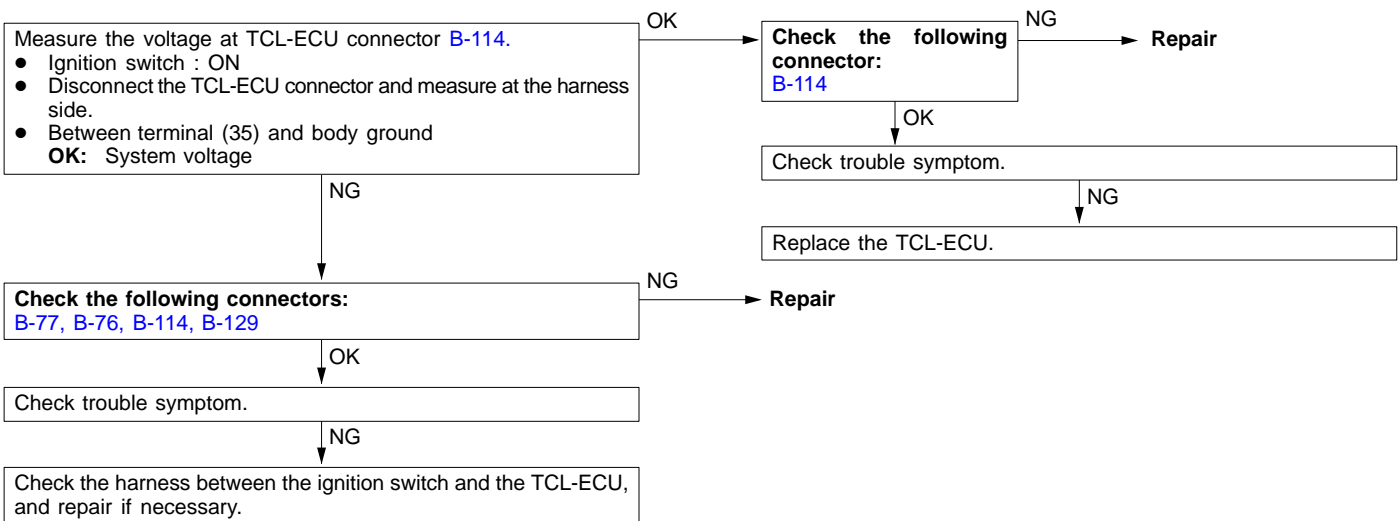
Code No. 23 Stop lamp switch circuit system	Probable cause
<p>This DTC is output if the stop lamp switch remains ON for a continuous period of 15 minutes or more, or for a continuous period of 1 minute or more when driving at a speed of 10 km/h or more, because of a short circuit or defective adjustment of the stop lamp switch. This DTC No. may also occur while driving in traffic jams or if the foot is resting on the brake pedal with driving.</p>	<ul style="list-style-type: none"> <li>• Malfunction of stop lamp switch</li> <li>• Malfunction of harness or connector</li> <li>• Malfunction of TCL-ECU</li> </ul>



Code No. 24 TCL switch circuit system	Probable cause
This DTC is output if signals are input simultaneously from both the TCL-OFF and TCL-ON positions because of a short circuit in the TCL switch circuit.	<ul style="list-style-type: none"> <li>• Malfunction of the TCL switch</li> <li>• Malfunction of harness or connector</li> <li>• Malfunction of TCL-ECU</li> </ul>

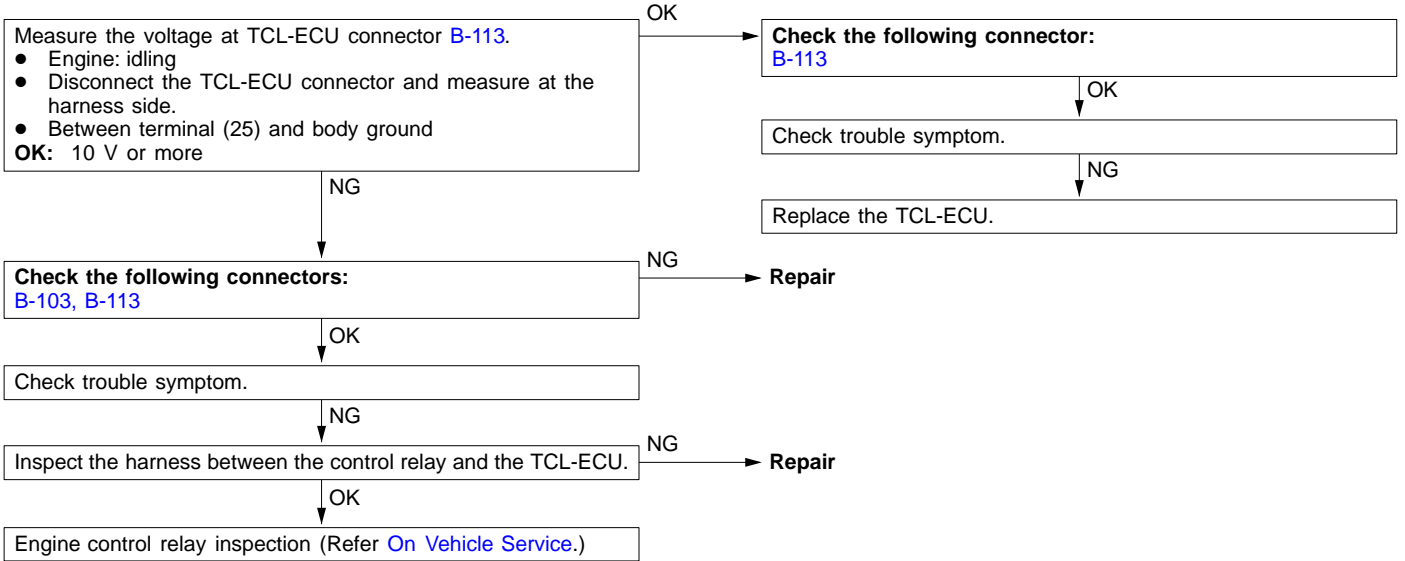


Code No. 26 Ignition switch (IG2) circuit system	Probable cause
This DTC is output if the IG2 power supply is not distributed, even though the engine speed is 450 r/min or more.	<ul style="list-style-type: none"> <li>• Malfunction of harness or connector</li> <li>• Malfunction of TCL-ECU</li> </ul>





Code No. 27 TCL-ECU power supply voltage circuit (engine control relay circuit) system	Probable cause
<p>This DTC is output if the TCL-ECU power supply voltage (engine control relay supply voltage) is lower than the specified value. If the voltage returns to the specified value or greater, the DTC is erased.</p>	<ul style="list-style-type: none"> <li>• Malfunction of control relay</li> <li>• Malfunction of harness or connector</li> <li>• Malfunction of TCL-ECU</li> </ul>



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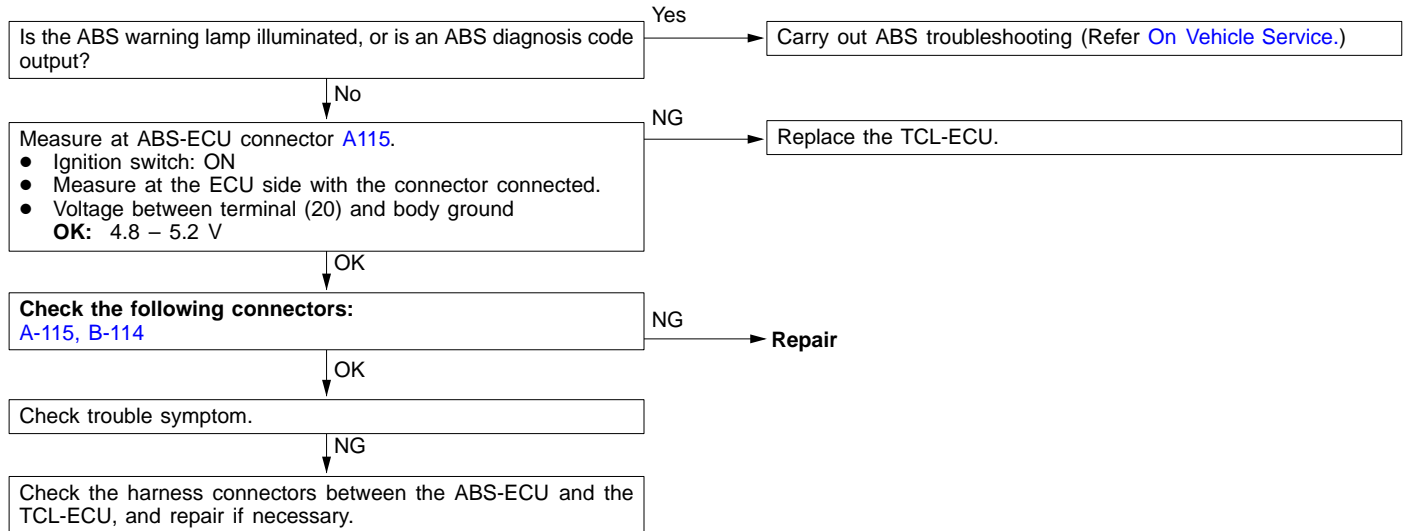
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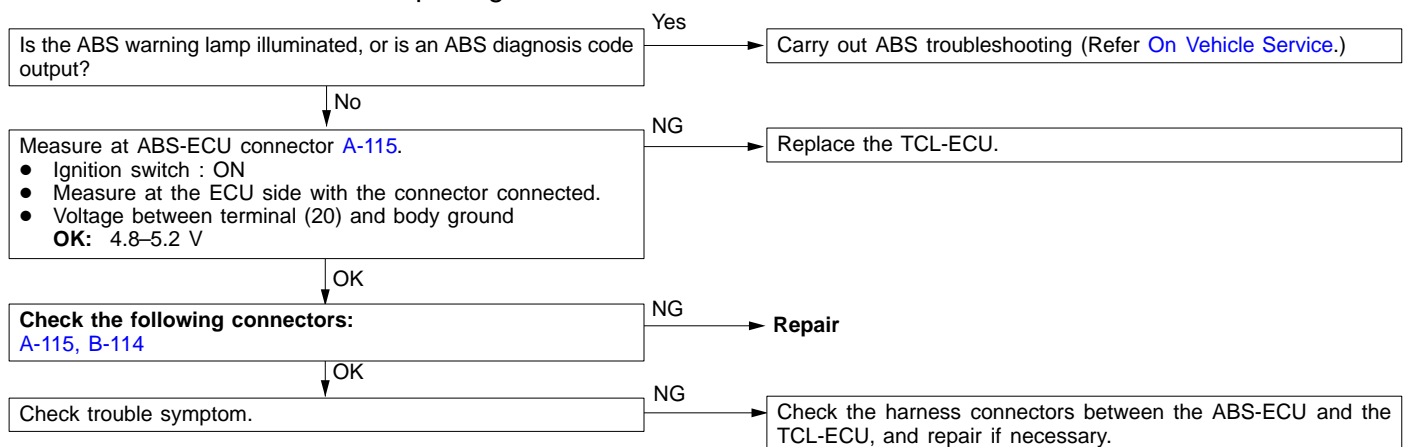
<b>Code No. 31 Front right wheel speed sensor circuit system</b>	<b>Probable cause</b>
<b>Code No. 32 Front left wheel speed sensor circuit system</b>	
These DTC are output if a pulse (from the front wheels) indicates that the difference between the front wheels and the rear wheels is 8 km/h or more because of an open or short circuit in a wheel speed sensor or a malfunction of sensor.	<ul style="list-style-type: none"> <li>• Malfunction of front wheel speed sensor</li> <li>• Malfunction of harness or connector</li> <li>• Malfunction of TCL-ECU</li> <li>• Malfunction of ABS-ECU</li> </ul>

**NOTE:** When these diagnosis trouble codes are output, erase the diagnosis trouble code memory after carrying out repairs, and then carry out a road test at 20 km/h or more and check to be sure that the diagnosis trouble codes are not output again.



<b>Code No. 33 Rear right wheel speed sensor circuit system</b>	<b>Probable cause</b>
<b>Code No. 34 Rear left wheel speed sensor circuit system</b>	
These diagnosis trouble codes are output if a pulse (from the wheels on one side of rear) indicates that the difference between the left wheel and the right wheel is 8km/h or more because of an open or short circuit in a wheel speed sensor or a defective sensor.	<ul style="list-style-type: none"> <li>• Malfunction of rear wheel speed sensor</li> <li>• Malfunction of harness or connector</li> <li>• Malfunction of TCL-ECU</li> <li>• Malfunction of ABS-ECU</li> </ul>

**NOTE:** When these diagnosis trouble codes are output, erase the diagnosis code memory after carrying out repairs, and then carry out a road test at 20 km/h or more and check to be sure that the diagnosis trouble codes are not output again.



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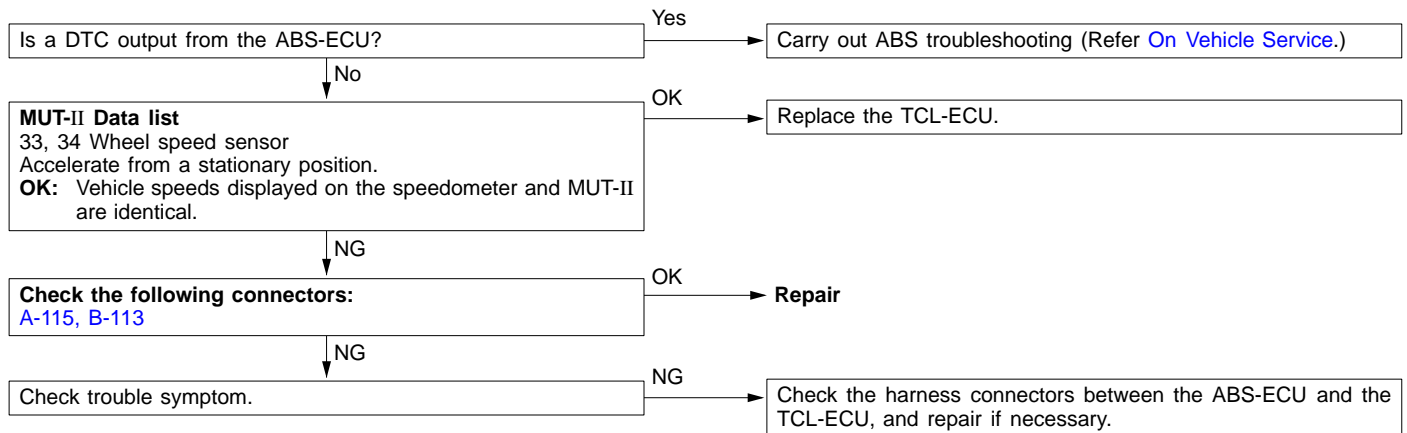
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Code No. 35 Rear wheel speed sensor circuit system (1)	Probable cause
Code No. 36 Rear wheel speed sensor circuit system (2)	
<p>DTC code No. 35 is output if the pulse signal from a rear wheel sensor is momentarily interrupted (0.02 sec.) because of a transient open circuit in a rear wheel speed sensor.</p> <p>DTC No. 36 is output if a rear wheel speed sensor abnormality is judged when the turning speed of both rear wheels is 0 km/h for 20 seconds or more while TCL is operating.</p>	<ul style="list-style-type: none"> <li>• Malfunction of rear wheel speed sensor</li> <li>• Malfunction of harness or connector</li> <li>• Malfunction of ABS-ECU</li> <li>• Malfunction of TCL-ECU</li> </ul>

NOTE: If the front wheels only are turning while the rear wheels are stationary (wheel slip), the TCL-OFF indicator will start flashing after 20 seconds, and the system will be isolated.

NOTE: When these diagnosis trouble codes are output, erase the diagnosis trouble code memory after carrying out repairs, and then carry out a road test at 20 km/h or more and check to be sure that the diagnosis trouble codes are not output again.



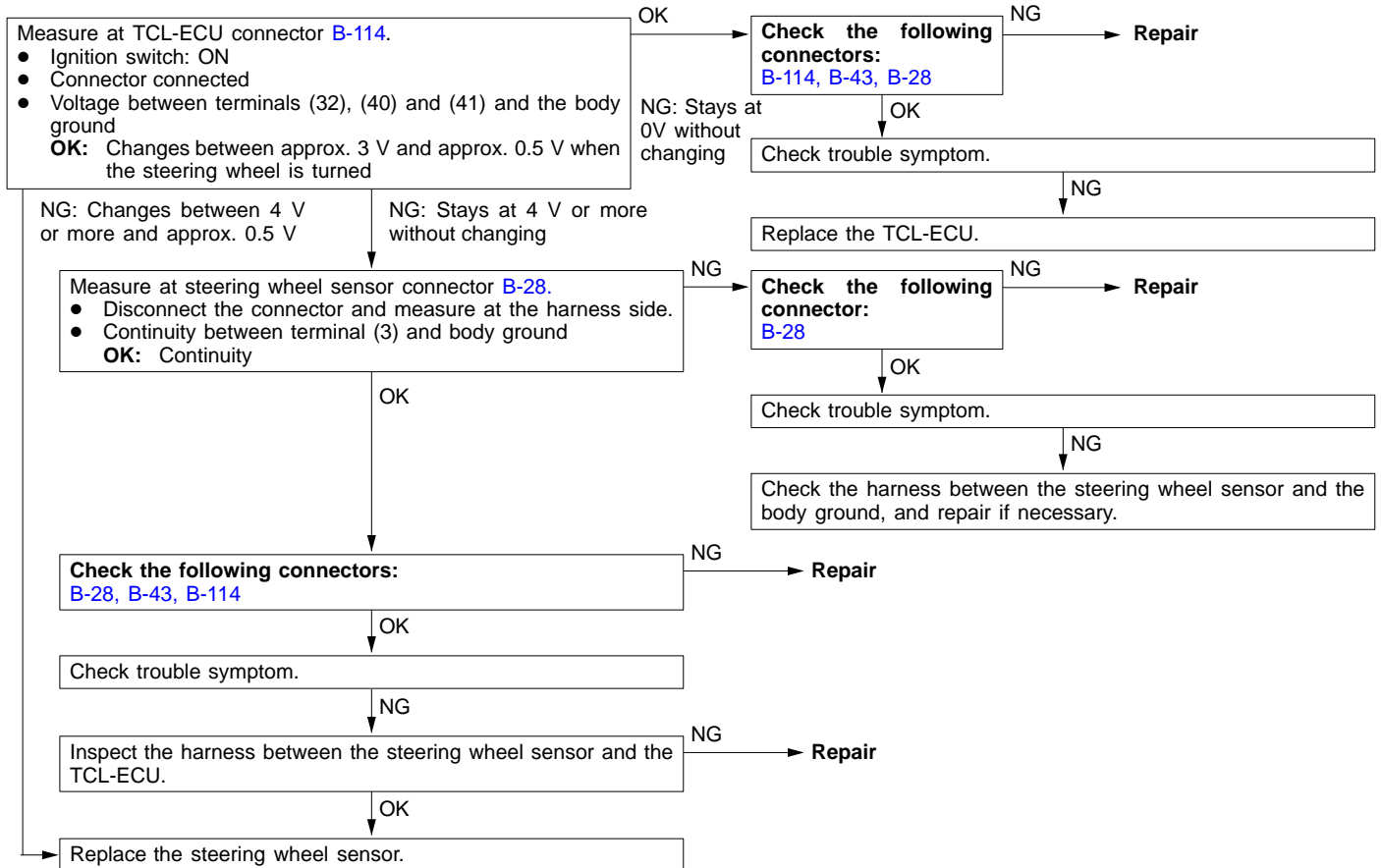
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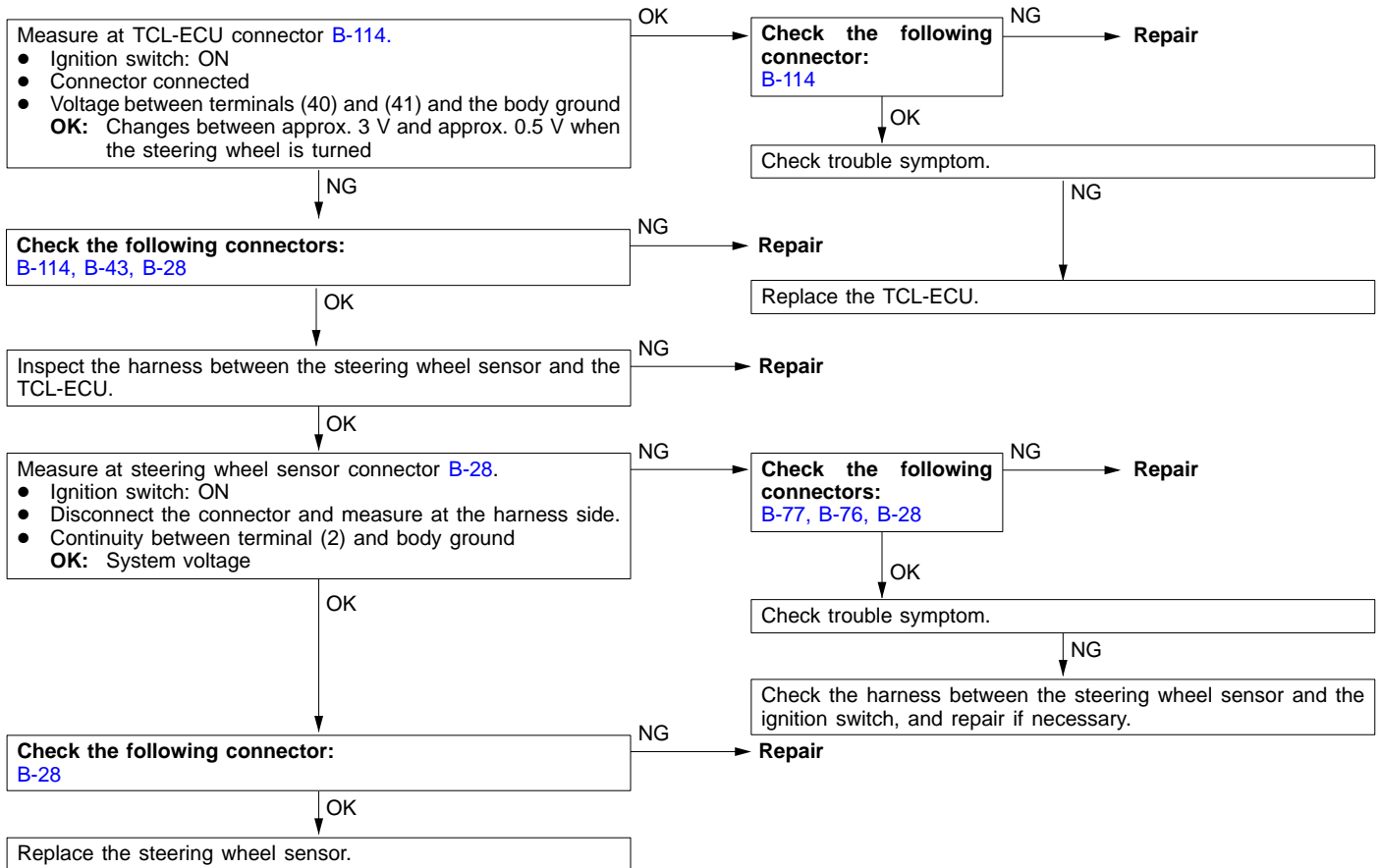
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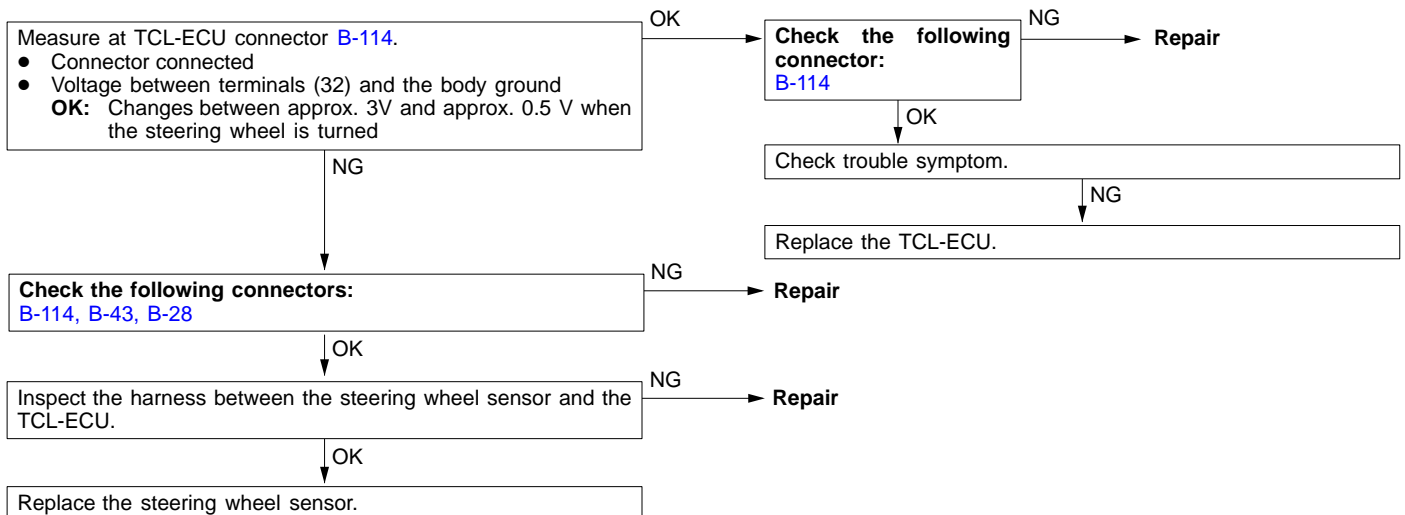
<b>Code No. 41 Steering wheel sensor (ST-1) circuit system (open circuit)</b>	<b>Probable cause</b>
<b>Code No. 42 Steering wheel sensor (ST-2) circuit system (open circuit)</b>	
<b>Code No. 43 Steering wheel sensor (ST-N) circuit system (open circuit)</b>	
These diagnosis trouble codes are output if there is an open circuit in the output wire of the steering wheel sensor circuit.	<ul style="list-style-type: none"> <li>• Malfunction of harness or connector</li> <li>• Malfunction of steering wheel sensor</li> <li>• Malfunction of TCL-ECU</li> </ul>



Code No. 44 Steering wheel sensor circuit system (short circuit)	Probable cause
This DTC is output when no steering angle signal is output because there is a short-circuit in either steering wheel sensor ST-1 or steering wheel sensor ST-2 when the speed averages output by the left and right rear wheel speed sensors are 15 km/h or more.	<ul style="list-style-type: none"> <li>• Malfunction of harness or connector</li> <li>• Malfunction of steering wheel sensor</li> <li>• Malfunction of TCL-ECU</li> </ul>



Code No. 45 Steering wheel sensor (ST-N) circuit system (short circuit)	Probable cause
This DTC is output if it is considered that there is an abnormality in the steering wheel sensor (ST-N) circuit system when the straight-ahead position is continuously detected even though the steering wheel is turned 20° or more.	<ul style="list-style-type: none"> <li>• Malfunction of steering wheel sensor</li> <li>• Malfunction of harness or connector</li> <li>• Malfunction of TCL-ECU</li> </ul>



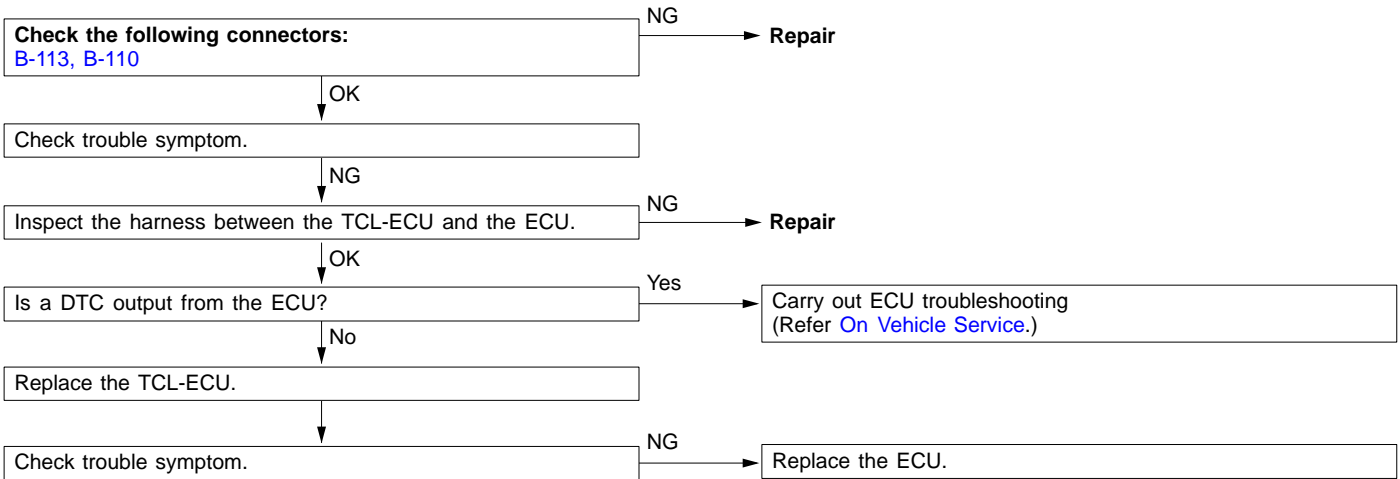
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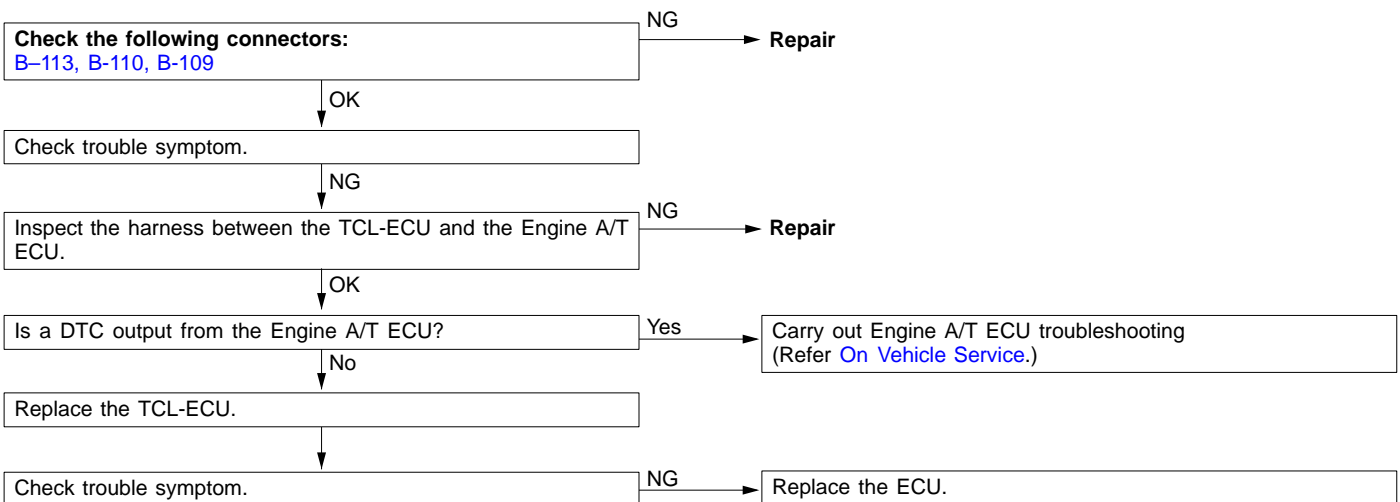
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Code No. 71 ECU communication circuit system	Probable cause
This DTC is output if an error is detected in the communication contents because of an open or short circuit in the serial communication circuit between the TCL-ECU and the ECU, a malfunction of ECU and a defective shielding of the shield wire.	<ul style="list-style-type: none"> <li>• Malfunction of harness or connector</li> <li>• Malfunction of TCL-ECU</li> <li>• Malfunction of ECU</li> </ul>



Code No. 74 Engine A/T ECU communication circuit system	Probable cause
This DTC is output if an error is detected in the communication contents because of an open or short circuit in the serial communication circuit between the TCL-ECU and the A/T-ECU, a malfunction of ECU and a defective shielding of the shield wire.	<ul style="list-style-type: none"> <li>• Malfunction of harness or connector</li> <li>• Malfunction of TCL-ECU</li> <li>• Malfunction of Engine A/T ECU</li> </ul>



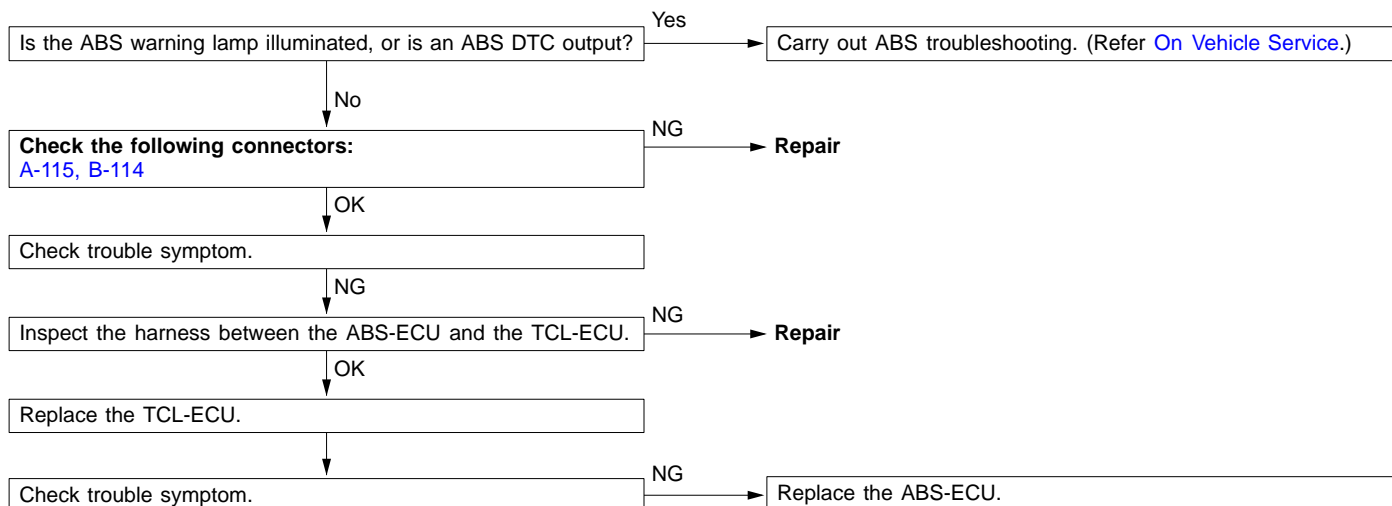
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Code No. 76 ABS circuit system	Probable cause
This diagnosis code is output if the ABS-ECU detects the system abnormality (when ABS warning lamp illumination is controlled).	<ul style="list-style-type: none"> <li>Malfunction of harness or connector</li> <li>Malfunction of TCL-ECU</li> <li>Malfunction of ABS-ECU</li> </ul>



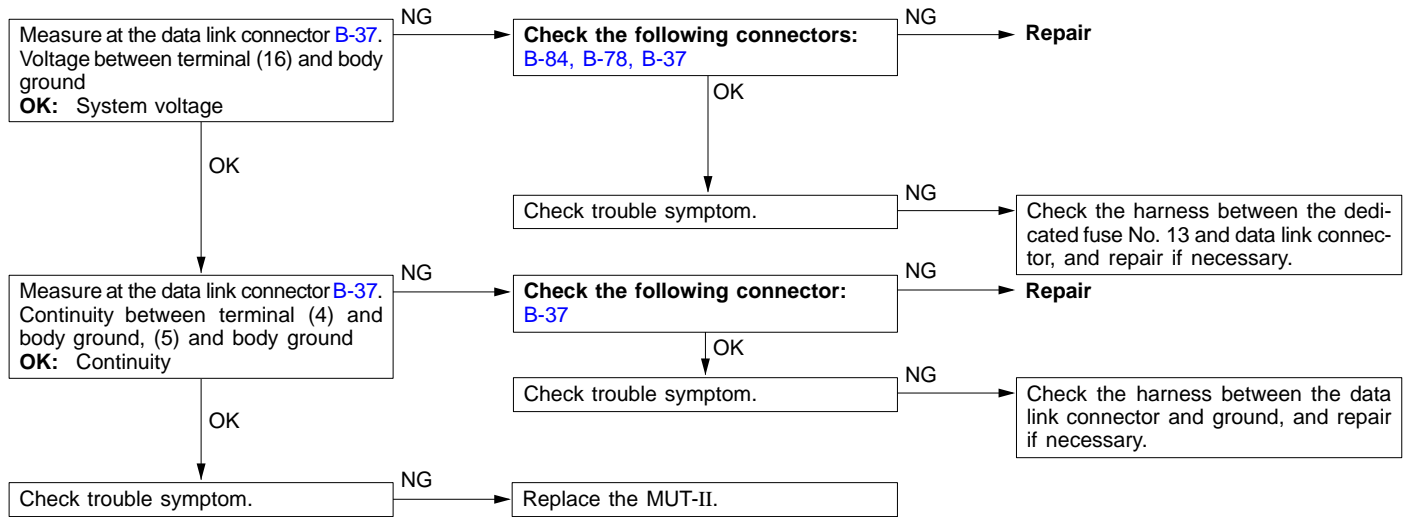
### INSPECTION CHART FOR TROUBLE SYMPTOMS

Trouble symptom		Inspection procedure No.
Communication with the MUT-II is not possible.	Communication with all systems is not possible.	1
	Communication with TCL-ECU only is not possible.	2
Malfunction of TCL indicator lamp display	None of the TCL indicator lamps (TCL OFF, TCL) illuminate when the ignition switch is ON.	3
	One of the TCL indicator lamps does not illuminate when the ignition switch is ON (Another lamp does illuminate).	4
	TCL OFF indicator lamp remains illuminated even after the engine is started.	5
	TCL OFF indicator lamp flashes after the engine is started.	
	TCL remains illuminated even after the engine is started.	6
	TCL OFF indicator lamp does not illuminate even if the TCL switch is continuously pressed to the OFF side while the engine is idling.	7
Malfunction of TCL operation	TCL illuminates in the TCL operation range, but torque is not reduced.	8
Poor starting Poor acceleration	Engine output is reduced in the TCL non-operation range (TCL indicator lamp does not illuminate) and starting and acceleration performance is poor.	

## INSPECTION PROCEDURES FOR EACH TROUBLE SYMPTOM

### Inspection Procedure 1

<b>Communication with the MUT-II is not possible. (Communication with all systems is not possible.)</b>	<b>Probable cause</b>
The cause is probably a defective power supply system (including ground) for the diagnosis line.	<ul style="list-style-type: none"> <li>• Malfunction of connector</li> <li>• Malfunction of harness</li> </ul>



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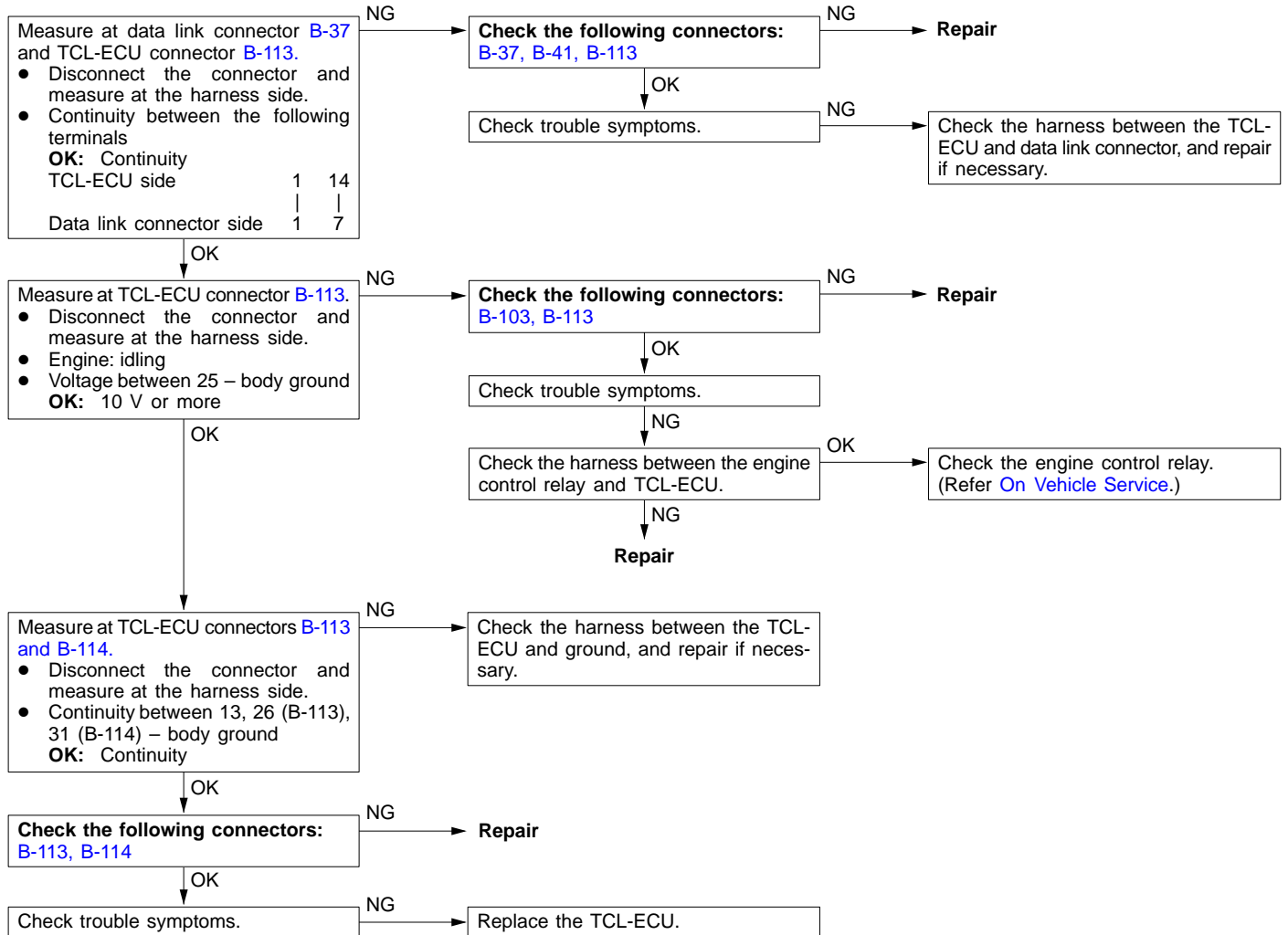
## Inspection Procedure 2

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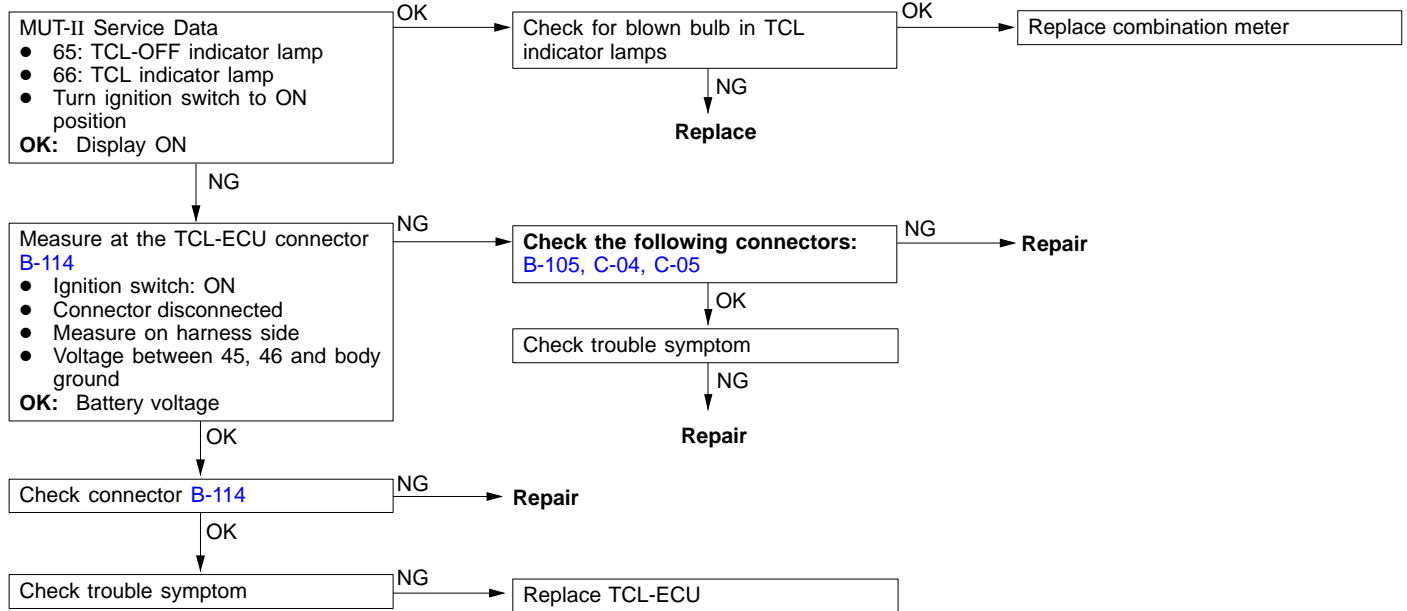
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Communication with the MUT-II is not possible. (Communication with TCL-ECU only is not possible.)	Probable cause
If the MUT-II cannot communicate with the TCL-ECU only, the cause is probably an abnormality in the TCL diagnosis line or in the TCL-ECU power supply line or ground line.	<ul style="list-style-type: none"> <li>• Malfunction of harness or connector</li> <li>• Malfunction of engine control relay</li> <li>• Malfunction of TCL-ECU</li> </ul>



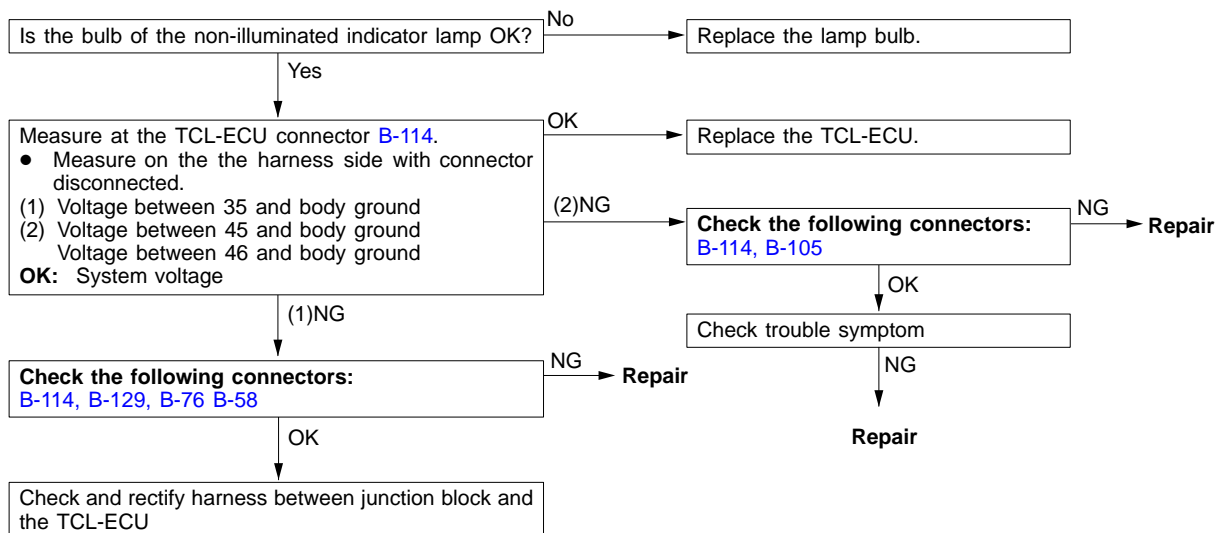
## Inspection Procedure 3

None of the TCL indicator lamps (TCL OFF, TCL) illuminate when the ignition switch is ON.	Probable cause
The main cause is an open circuit in the indicator circuit because of a burnt-out indicator lamp bulb.	<ul style="list-style-type: none"> <li>• Malfunction of harness or connector</li> <li>• Malfunction of TCL-ECU</li> <li>• Malfunction of indicator lamp bulb</li> </ul>



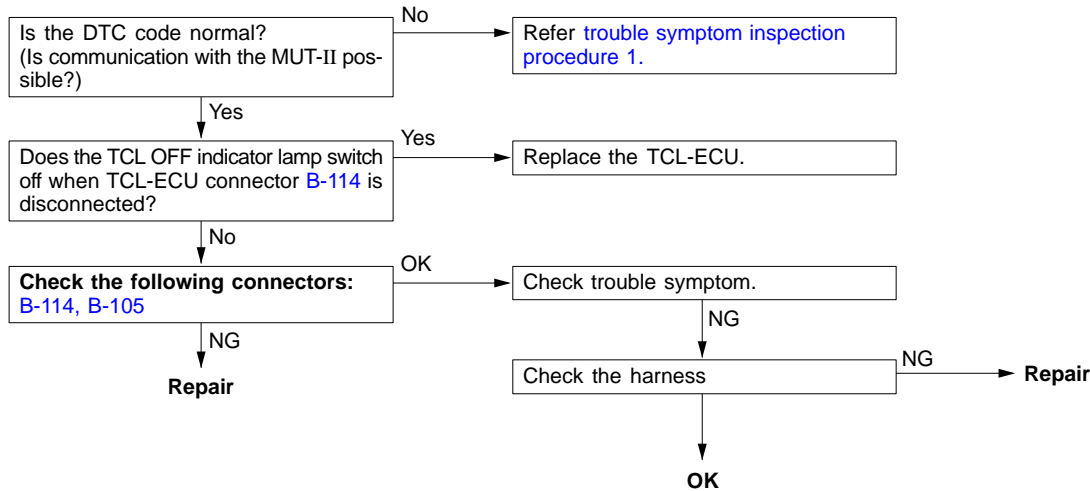
## Inspection Procedure 4

One of the TCL indicator lamps does not illuminate when the ignition switch is ON.	Probable cause
Because the TCL indicators utilise shared power supply circuits, if one of the indicator lamps is illuminated, the power supply circuit can be judged to be normal.	<ul style="list-style-type: none"> <li>• Burnt-out indicator lamp bulb</li> <li>• Harness or connector fault</li> <li>• TCL-ECU fault</li> </ul>



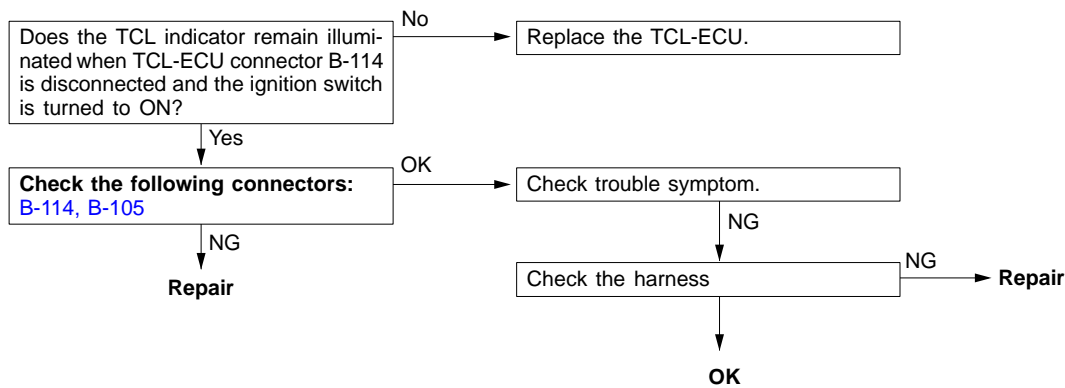
## Inspection Procedure 5

<ul style="list-style-type: none"> <li>TCL OFF indicator lamp remains illuminated even after the engine is started.</li> <li>TCL OFF indicator lamp flashes after the engine is started.</li> </ul>	Probable cause
The TCL-OFF indicator is also used as a system warning indicator. If there is a system abnormality, this indicator will illuminate or flash.	<ul style="list-style-type: none"> <li>Other system related to the TCL</li> <li>Malfunction of harness or connector</li> </ul>



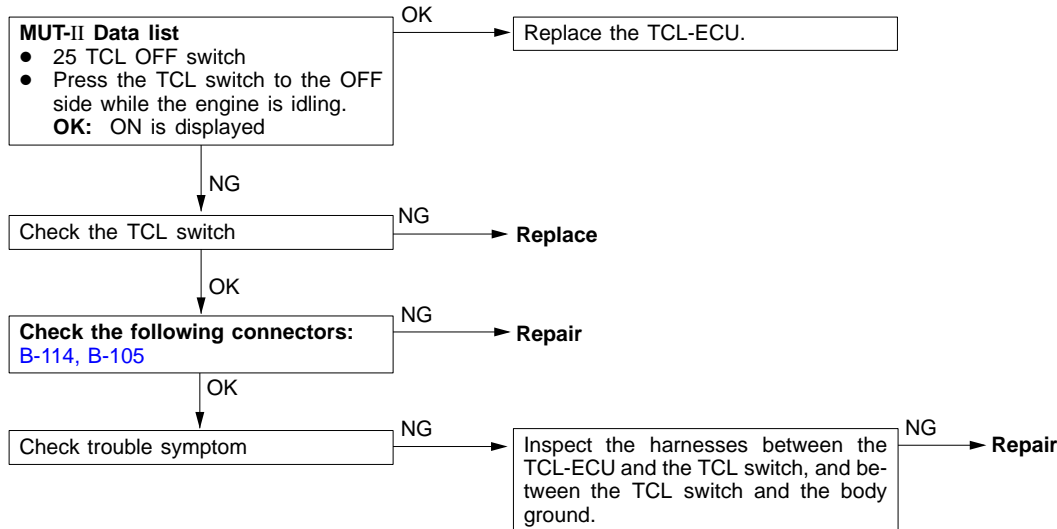
## Inspection Procedure 6

<b>TCL indicator lamp remains illuminated even after the engine is started.</b>	Probable cause
The TCL indicator lamp only illuminates while the engine is running if the TCL is operating.	<ul style="list-style-type: none"> <li>Malfunction of TCL indicator power supply circuit</li> <li>Malfunction of TCL-ECU</li> <li>Malfunction of harness or connector</li> </ul>



## Inspection Procedure 7

<b>TCL OFF indicator lamp does not illuminate even if the TCL switch is continuously pressed to the OFF side while the engine is idling.</b>	<b>Probable cause</b>
If the indicator lamp does not illuminate when the switch is operated, there is a malfunction in the switch, switch circuit or in the TCL-ECU.	<ul style="list-style-type: none"> <li>• Malfunction of harness or connector</li> <li>• Malfunction of TCL switch</li> <li>• Malfunction of TCL-ECU</li> </ul>



## Inspection Procedure 8

<ul style="list-style-type: none"> <li>• <b>TCL illuminates in the TCL operation range, but torque is not reduced.</b></li> <li>• <b>Engine output is reduced in the TCL non-operation range (TCL indicator lamp does not illuminate) and starting and acceleration performance is poor.</b></li> </ul>	<b>Probable cause</b>
In cases such as the above, the electrical system is normal, and the cause is probably an abnormality in the mechanical system (vacuum actuator).	<ul style="list-style-type: none"> <li>• Malfunction of vacuum solenoid valve</li> <li>• Malfunction of ventilation solenoid valve</li> <li>• Malfunction of vacuum actuator</li> <li>• Incorrect vacuum hose connector</li> <li>• Malfunction of throttle link</li> <li>• Malfunction of vacuum tank</li> <li>• Blocked air cleaner element</li> </ul>

As the cause is probably a malfunction of the vacuum actuator system, carry out inspection of the following items in order.

- Vacuum solenoid valve operation inspection (Refer [Group 13A On Vehicle Service.](#))
- Ventilation solenoid valve operation inspection (Refer [Group 13A On Vehicle Service.](#))
- Disconnected or mis-connected vacuum hose inspection (Refer [Group 17 On Vehicle Service.](#))
- Throttle link operation inspection (Refer [Group 13A On Vehicle Service.](#))
- Vacuum tank inspection (Refer [Group 13A On Vehicle Service.](#))
- Air cleaner element blockage inspection

# DATA LIST REFERENCE TABLE

No.	Check item	Check condition		Normal condition
11	APS	Accelerator pedal position Engine stop Selector lever position: P	Fully closed	300–1,000 mV
			Depressed	Gradually rises from the above value
			Fully open	4,500–5,500 mV
13	TPS	Accelerator pedal position Engine stop Selector lever position: P	Fully closed	300–1,000 mV
			Depressed	Gradually rises from the above value
			Fully open	4,500–5,500 mV
15	PNP	Ignition switch: ON Engine stop	Selector lever: P position	P
			Selector lever: R position	R
			Selector lever: N position	N
			Selector lever: D position	D
			Selector lever: 3 position	3
			Selector lever: 2 position	2
			Selector lever: L position	L
16	Shift position	Shift lever position: D	Driving at constant speed of 10 km/h in 1 range	1st
			Driving at constant speed of 30 km/h in 2 range	2nd
			Driving at constant speed of 50 km/h in 3 range	3rd
			Driving at constant speed of 70 km/h in 4 range	4th
21	Closed throttle position switch	Accelerator pedal position Ignition switch: ON	Depressed	OFF
			Released	ON
22	Ignition switch	Ignition switch: ON		ON
		Ignition switch: OFF		OFF
23	Stop lamp switch	Brake pedal position Ignition switch: ON	Depressed	ON
			Released	OFF
24	TCL ON switch	TCL ON switch operation Ignition switch : ON	Pressed	ON
			Released	OFF
25	TCL OFF switch	TCL OFF switch operation Ignition switch: ON	Pressed	ON
			Released	OFF

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# 13H TCL – Diagnosis

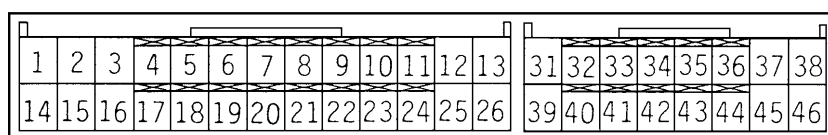
No.	Check item	Check condition		Normal condition
27	ECU power supply voltage	Ignition switch: ON		System voltage
31	Front right wheel speed sensor	Engine running Selector lever position: D	Vehicle stopped	0 km/h
			Driving at 40 km/h	40 km/h
32	Front left wheel speed sensor	Engine running Selector lever position: D	Vehicle stopped	0 km/h
			Driving at 40 km/h	40 km/h
33	Rear right wheel speed sensor	Engine running Selector lever position: D	Vehicle stopped	0 km/h
			Driving at 40 km/h	40 km/h
34	Rear left wheel speed sensor	Engine running Selector lever position: D	Vehicle stopped	0 km/h
			Driving at 40 km/h	40 km/h
40	Engine speed	Ignition switch: ON	Engine: idling	Engine speeds displayed on the MUT-II and tachometer are identical.
44	Steering angle	Steering wheel position Ignition switch: ON	Turned 90° to the right	R 88 deg or R 92 deg
			Turned 90° to the left	L 88 deg or L 92 deg
45	Steering straight-ahead point learning	Steering wheel position Ignition switch: ON	Immediately after ignition switch is ON	OFF
			Immediately after city driving	ON
51	Slip control	TCL switch: ON Driving on low frictional resistance road	TCL indicator lamp illuminated	ON
			TCL indicator lamp switched off	OFF
52	Trace control	TCL switch: ON Driving on winding road	TCL indicator lamp illuminated	ON
			TCL indicator lamp switched off	OFF
74	Steering wheel sensor (ST-N)	Steering wheel position Engine idling	Neutral position	LOW
			Steering wheel turned 90° from neutral position	HIGH
75	Steering wheel sensor (ST-1)	Steering wheel position Ignition switch: ON	Steering wheel turned slowly to left	HIGH and LOW display alternately
76	Steering wheel sensor (ST-2)	Steering wheel position Ignition switch: ON	Steering wheel turned slowly to right	HIGH and LOW display alternately
81	Engine model	Ignition switch: ON		6G74
82	Valve type	Ignition switch: ON		SOHC
83	Aspiration type	Ignition switch: ON		N/A
84	Engine classification	Ignition switch: ON		NORMAL
85	Destination	Ignition switch: ON		OTHER

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## CHECK AT ECU TERMINALS



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Terminal No.	Check item	Measurement condition	Normal condition
1	Diagnosis control	When MUT-II is not connected	Approx. 5 V
		When MUT-II is connected	0 V
13	Ground	Ignition switch: ON	0 V
14	Diagnosis data input	When MUT-II is connected	Serial communication with MUT-II
		When MUT-II is not connected	1 V or less
17	Engine A/T-ECU data communication	Engine: Idling	Other than 0 V
18			
19	APS output	Ignition switch: ON Accelerator pedal fully depressed	4.5 – 5.5 V
		Ignition switch: ON Accelerator pedal released	0.4 – 1.0 V
20	Wheel speed sensor input (rear left wheel)	Engine: Idling, Vehicle slowly moving forward	Flashes between 0 V and approx. 5 V
21	Wheel speed sensor input (front right wheel)	Engine: Idling, Vehicle slowly moving forward	Flashes between 0 V and approx. 5 V
22	Wheel speed sensor input (front left wheel)	Engine: Idling, Vehicle slowly moving forward	Flashes between 0 V and approx. 5 V
23	Wheel speed sensor input (rear right wheel)	Engine: Idling, Vehicle slowly moving forward	Flashes between 0 V and approx. 5 V
25	ECU power supply	Ignition switch: ON	Battery voltage
26	Ground	Ignition switch: ON	0 V
31	Ground	Ignition switch: ON	0 V
32	Steering wheel sensor (ST-N) input	Engine: Idling Steering wheel in straight-ahead position	0.5 V or less
		Engine: Idling Steering wheel turned 90° from straight-ahead position	2.5 – 3.5 V
34	TCL ON switch	Ignition switch: ON TCL switch: Released	Battery voltage

## 13H TCL – Diagnosis

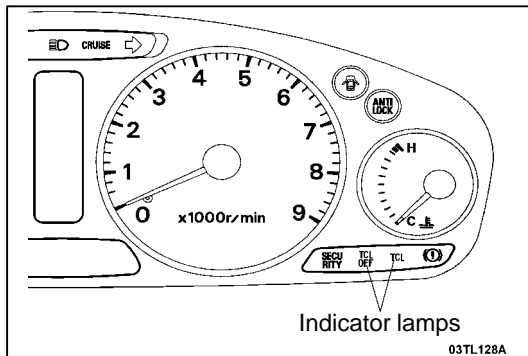
Terminal No.	Check item	Measurement condition	Normal condition
35	Ignition switch IG2	Ignition switch: ON	Battery voltage
39	ECU back-up power supply	Ignition switch: OFF	Battery voltage
40	Steering wheel sensor (ST-1) input	Ignition switch: ON Steering wheel turned slowly	Flashes between 0 V and approx. 3 V
41	Steering wheel sensor (ST-2) input	Ignition switch: ON Steering wheel turned slowly.	Flashes between 0 V and approx. 3 V
42	TCL OFF switch	Ignition switch: ON TCL switch: Pressed to OFF side	0 – 2 V
		Ignition switch: ON TCL switch: Released	Battery voltage
43	Stop lamp switch input	Ignition switch: ON Brake pedal depressed	Battery voltage
		Ignition switch: ON Brake pedal released	0 – 2 V
44	ABS fail signal	During ABS fail	0 – 2 V
		When ABS is normal	Battery voltage
45	TCL-OFF indicator	Ignition switch: ON Indicator: Extinguished	Battery voltage
		Ignition switch: ON Indicator: Illuminated	0 – 2 V
46	TCL indicator	Ignition switch: ON Indicator: Illuminated	0 – 2 V
		Ignition switch: ON Indicator: Extinguished	Battery voltage

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## ON-VEHICLE SERVICE

### INDICATOR LAMP CHECK

Press the TCL switch and check if each TCL indicator lamp illuminates or switches off.

TCL switch mode	Inspection conditions	TCL OFF indicator (A)	TCL indicator (B)
Switch does not operate	Turn the ignition switch to the ON position.	○	○
	Start the engine.	×	×
TCL OFF mode	Engine is idling.	○	—
TCL ON mode	Drive the vehicle at 30 km/h for 2 minutes or more.	No illumination	—

#### NOTE

O: illuminated, X: extinguished, — : not relevant

**CAUTION:** If a different result is obtained when checking, refer to the [Troubleshooting section](#) for remedy.

### TCL SYSTEM OPERATION CHECK

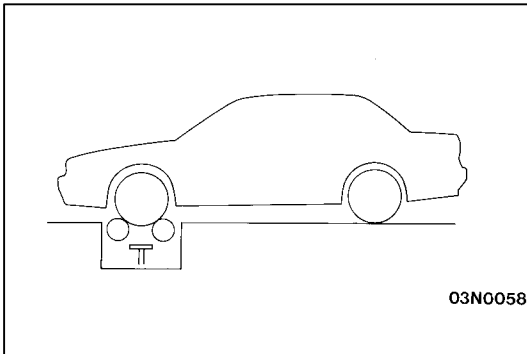
#### <When using the MUT-II>

1. Connect the MUT-II to the data link connector.
2. Move the selector lever to P range.
3. Start the engine.
4. Turn the TCL switch to ON.
5. Operate the MUT-II to start the actuator test (item No. 05) and fully depress the accelerator pedal at the same time. Check that the engine speed is kept down to 3,000 r/min at this time.

**CAUTION:** The actuator test should only be carried out for 3 seconds.

Because the engine speed will increase once the actuator test is stopped, the accelerator pedal should be released quickly after it has been depressed.

NOTE: The TCL-ECU will output a “request torque: 0” signal to the engine-ECU for 3 seconds while the actuator test is being carried out, and the TCL OFF indicator will illuminate during this time.



### <When not using the MUT-II>

1. Turn the TCL switch to ON.
2. Place the front wheels onto a speedometer tester or a chassis dynamo and start the engine. (The front wheels may also be jacked up.)
3. Move the selector lever to D range.
4. Check to be sure that the engine speed is restrained when the accelerator pedal is depressed.

NOTE: If the following symptoms occur when the accelerator pedal is depressed, refer to [Troubleshooting](#).

- (1) If the TCL indicator lamp does not illuminate.
- (2) If the TCL indicator lamp illuminates but the engine is not restrained.

**CAUTION:** Inspection should be completed within 20 seconds after the accelerator pedal was depressed. If it takes longer than 20 seconds, the TCL system function will stop and the engine speed will gradually increase.

**CAUTION:** Because the TCL OFF indicator will flash when the TCL system operation is stopped, the diagnosis codes should be erased if you notice that the indicator is flashing. (Refer [Erasing Diagnosis Codes](#).)

**STOP LAMP SWITCH CHECK**

Refer [Group 35A On Vehicle Service](#).

**WHEEL SPEED SENSOR CHECK**

Refer [Group 35B On Vehicle Service](#).

**VACUUM SOLENOID VALVE CHECK**

Refer [Group 13A On Vehicle Service](#).

**VENTILATION SOLENOID VALVE CHECK**

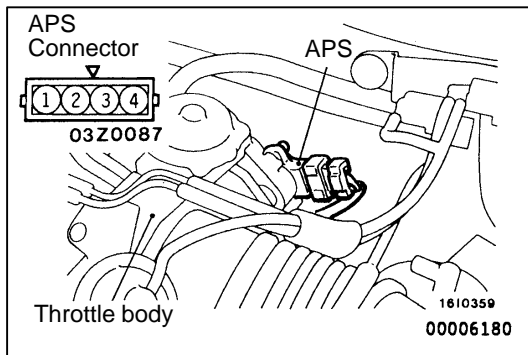
Refer [Group 13A On Vehicle Service](#).

**VACUUM TANK CHECK**

Refer [Group 13A On Vehicle Service](#).

**VACUUM ACTUATOR CHECK**

Refer [Group 13A On Vehicle Service](#).

**ACCELERATOR PEDAL POSITION SENSOR (APS) CHECK**

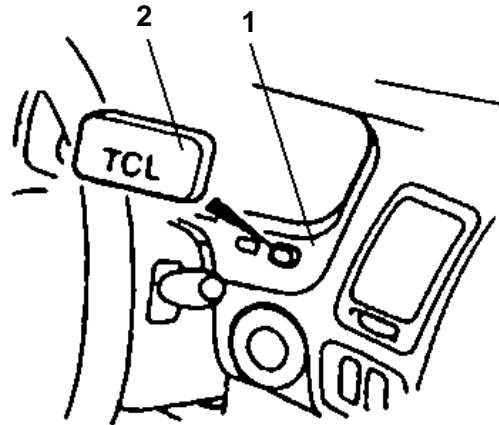
1. Disconnect the APS connector.
2. Measure the resistance between terminals (1) and (4) of the APS connector.

**Standard value: 3.5–6.5 k $\Omega$**

3. When the accelerator pedal is gradually depressed, check that the resistance between terminals (1) and (2) of the APS connector changes smoothly in proportion to the pedal opening amount.
4. If the resistance is outside the standard value, or if the resistance does not change smoothly, replace the APS. Adjust the APS after it has been replaced.  
(Refer [On Vehicle Service](#).)

# TCL SWITCH

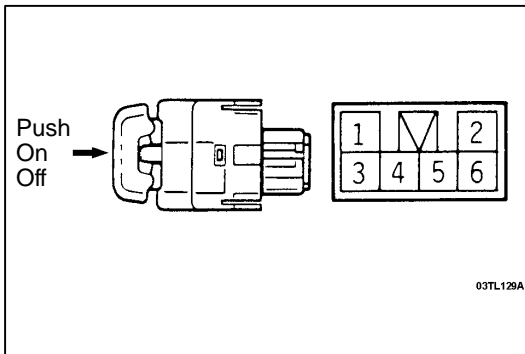
## REMOVAL AND INSTALLATION



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### REMOVAL STEPS

1. Switch bezel
2. TCL switch



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### INSPECTION

#### TCL SWITCH CONTINUITY CHECK

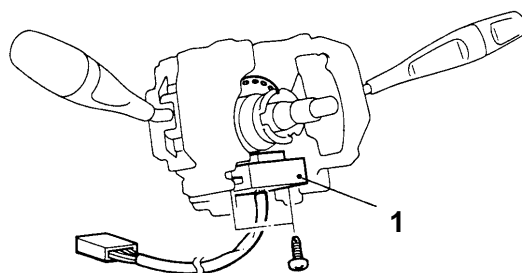
SWITCH POSITION	TERMINAL No.						
	1	2	3	–	4	5	6
ON	○	○					
ILLUMINATION			○	○	○		
OFF							

# STEERING WHEEL SENSOR

## REMOVAL AND INSTALLATION

### CAUTION: SRS

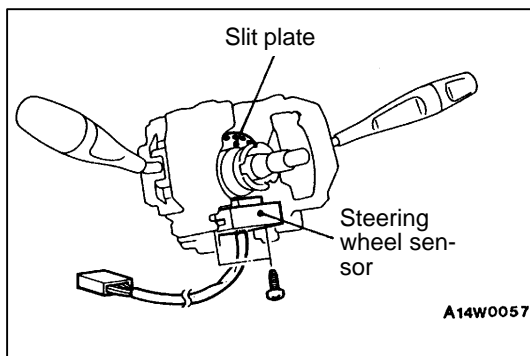
Before removal of air bag module and clock spring, refer to [Group 52B – Service Precautions](#) and [Air Bag Module and Clock Spring](#).



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### REMOVAL STEPS

- Steering wheel and column cover  
(Refer [Group 37A On Vehicle Service](#).)
- 1. Steering wheel sensor



### REMOVAL SERVICE POINT

#### ◀A▶ STEERING WHEEL SENSOR REMOVAL

**CAUTION:** Do not adhere any dust or grease, etc. to the steering wheel sensor, which has a photo coupler in it.

**CAUTION:** Do not bend the slit plate of the column switch nor adhere any grease etc. to it.

### INSPECTION

#### STEERING WHEEL SENSOR CHECK

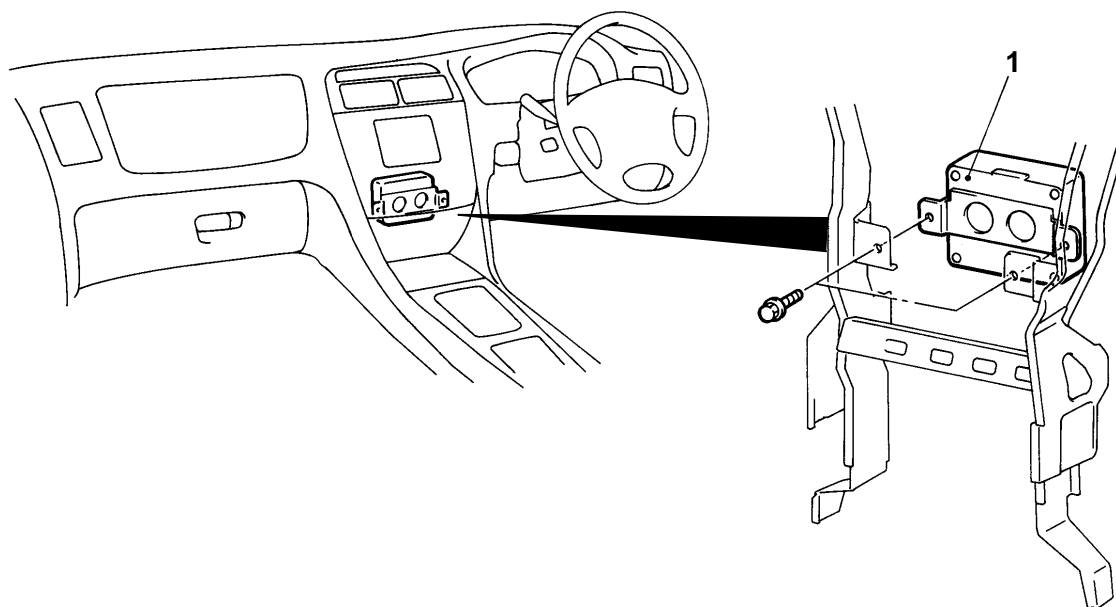
Refer [Data List](#).

## TCL-ECU

### REMOVAL AND INSTALLATION

#### Pre-removal and Post-installation Operation

Floor console assembly, Centre air outlet assembly, Ashtray, Air control panel assembly and Radio/ tape player Removal and Installation (Refer [Group 52A – Instrument panel.](#))



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#### Removal

1. TCL-ECU

### INSPECTION

#### TCL-ECU CHECK

Refer [Check At ECU Terminals.](#)