

AUTOMATIC TRANSMISSION

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GENERAL

OUTLINE OF CHANGES

The following service procedures for items which are different from before have been established to correspond to the following changes:

- The 6A13 engine vehicle with ASC has been added.
- The downshift pattern of 4G63, 4G64 engine vehicles has been changed.
- The ECU of 4G63, 4G64 engine vehicles has been changed from the A/T-ECU to the engine-A/T-ECU.

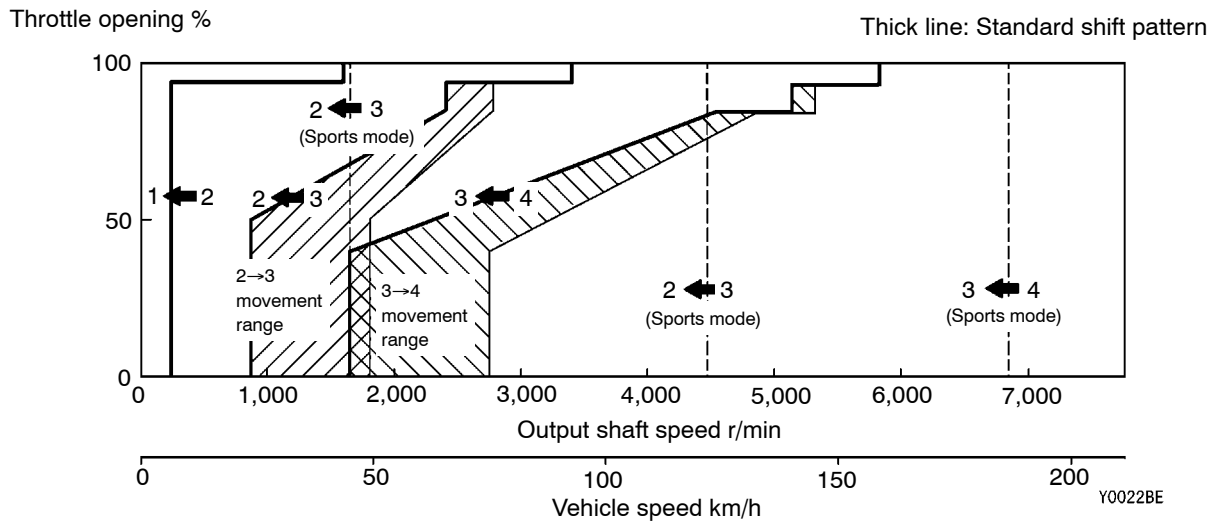
TROUBLESHOOTING

SHIFT PATTERN

The downshift pattern of 4G63, 4G64 engine vehicles has been changed.

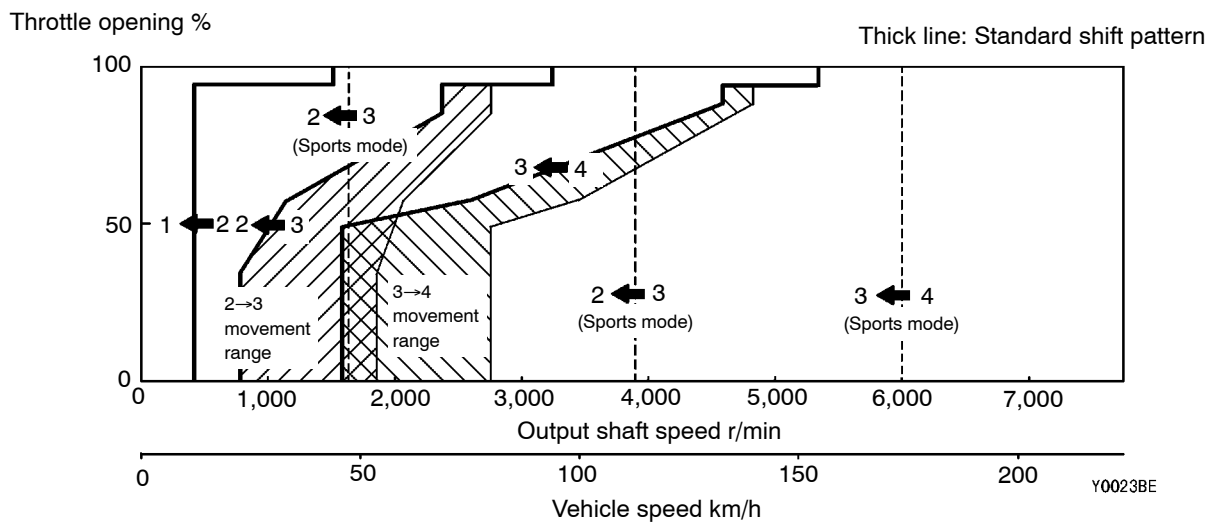
<4G63>

DOWNSHIFT PATTERN



<4G64>

DOWNSHIFT PATTERN



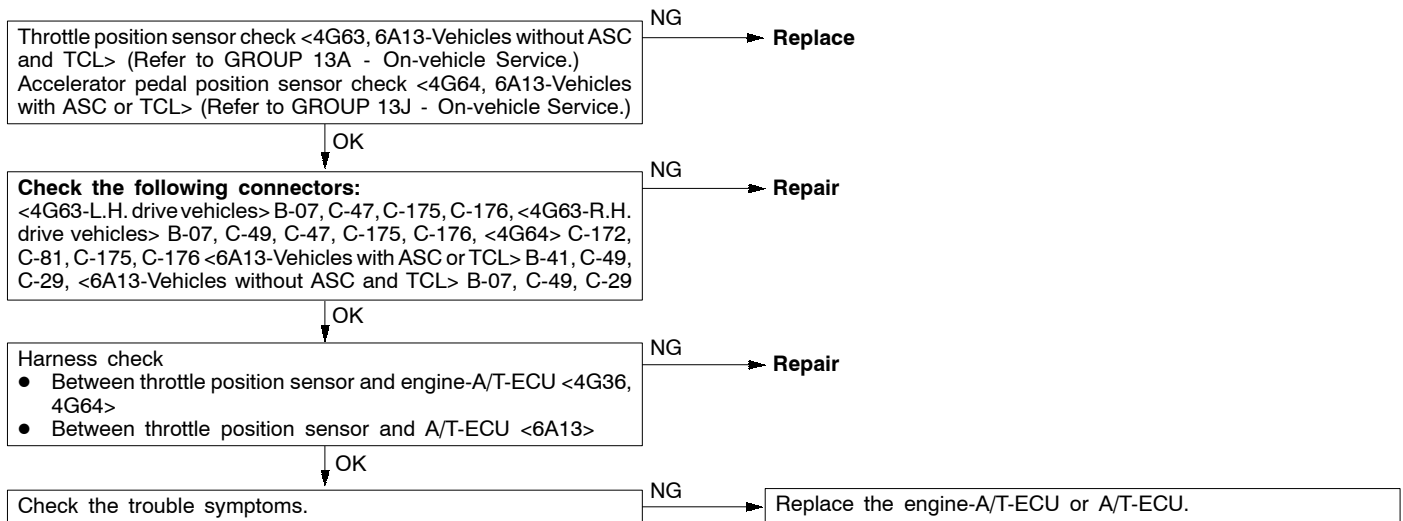
INSPECTION CHART FOR DIAGNOSIS CODE

Code	Diagnosis item	Reference page	
11	Throttle position sensor system (TPS) <4G63, 6A13-Vehicles without ASC and TCL> Accelerator pedal position sensor system (APS) <4G64, 6A13-Vehicles with ASC or TCL>	Short circuit	23-4
12		Open circuit	23-4
14		Sensor maladjustment	23-4
15	A/T fluid temperature sensor system	Open circuit	23-4
21	Crank angle sensor system	Open circuit	23-5
22	Input shaft speed sensor system	Short circuit/open circuit	23-5
23	Output shaft speed sensor system	Short circuit/open circuit	23-6
25	Wide open throttle switch system	Short circuit	23-6
26	Stop lamp switch system	Short circuit/open circuit	23-7
31	Low and reverse solenoid valve system	Short circuit/open circuit	23-7
32	Underdrive solenoid valve system	Short circuit/open circuit	23-7
33	Second solenoid valve system	Short circuit/open circuit	23-7
34	Overdrive solenoid valve system	Short circuit/open circuit	23-7
36	Damper control clutch solenoid valve system	Short circuit/open circuit	23-8
41	1st gear ratio does not meet the specification		23-9
42	2st gear ratio does not meet the specification		23-9
43	3rd gear ratio does not meet the specification		23-9
44	4th gear ratio does not meet the specification		23-9
46	Reverse gear ratio does not meet the specification		23-9
51	Abnormal communication with engine-A/T-ECU <4G63, 4G64> Abnormal communication with engine-ECU <6A13-Vehicles without ASC and TCL> Abnormal communication with TCL-ECU and engine-ECU <6A13-Vehicles with TCL> Abnormal communication with ASC-ECU and engine-ECU <6A13-Vehicles with ASC>		23-10
52	Damper clutch control solenoid valve system	Defective system	23-8
54	A/T Control relay system	Short circuit to earth/ open circuit	23-10
56	N range lamp system	Short circuit to earth	23-11

INSPECTION PROCEDURES FOR DIAGNOSIS CODES

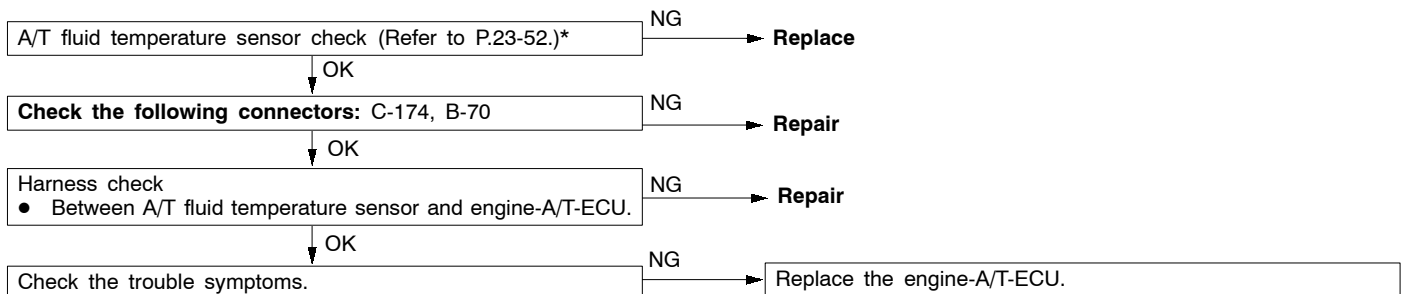
Since the ECU of 4G63, 4G64 engine vehicles has been changed from the A/T-ECU to the engine A/T-ECU, INSPECTION PROCEDURES FOR DIAGNOSIS CODES have been changed. Due to the addition of the 6A13 engine vehicle with ASC, only code Nos.11, 12, 14, 51 have been changed.

Code No. 11, 12, 14 Throttle position sensor system (TPS) <4G63, 6A13-Vehicles without ASC and TCL>, Accelerator pedal position sensor (APS) <4G64, 6A13-Vehicles with ASC or TCL>	Probable cause
<p>If the TPS or APS output voltage is 4.8 V or higher when the engine is idling, the output is judged to be too high and diagnosis code No. 11 is output. If the TPS or APS output voltage is 0.2 V or lower at times other than when the engine is idling, the output is judged to be too low and diagnosis code No. 12 is output. If the TPS or APS output voltage is 0.2 V or lower or if it is 1.2 V or higher when the engine is idling, the TPS or APS adjustment is judged to be incorrect and diagnosis code No. 14 is output.</p>	<ul style="list-style-type: none"> ● Malfunction of the throttle position sensor <4G63, 6A13-Vehicles without ASC and TCL > ● Malfunction of the accelerator pedal position sensor <4G64, 6A13-Vehicles with ASC or TCL> ● Malfunction of connector ● Malfunction of the engine-A/T-ECU <4G63, 4G64> ● Malfunction of the A/T-ECU <6A13>



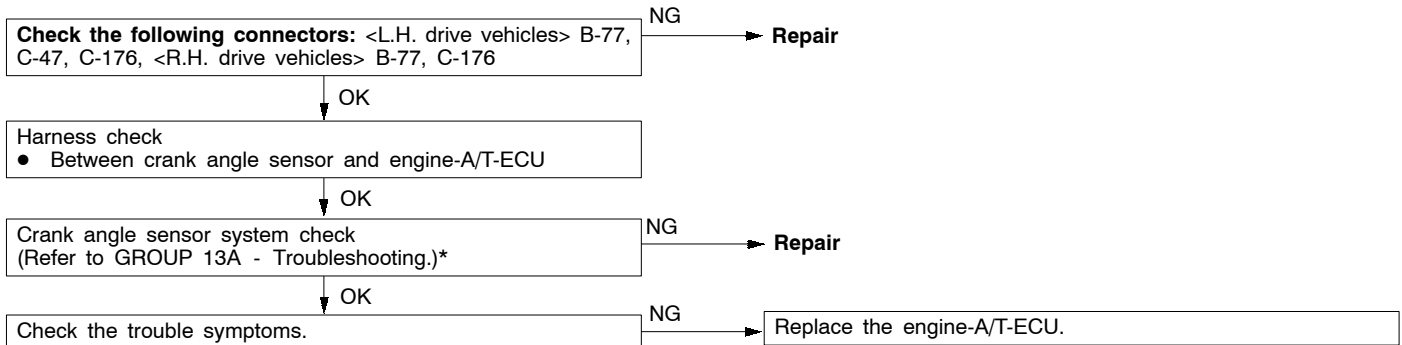
Code No. 15 A/T fluid temperature sensor system	Probable cause
<p>If the A/T fluid temperature sensor output voltage is 2.6 V or more even after driving for 10 minutes or more (if the A/T fluid temperature does not increase), it is judged that there is an open circuit in the A/T fluid temperature sensor and diagnosis code No. 15 is output.</p>	<ul style="list-style-type: none"> ● Malfunction of the A/T fluid temperature sensor ● Malfunction of connector ● Malfunction of the engine-A/T-ECU

*: Refer to '97 GALANT Workshop Manual (Pub. No. PWDE9611).



Code No. 21 Crank angle sensor system	Probable cause
If no output pulse is detected from the crank angle sensor for 5 seconds or more while driving at 25 km/h or more, it is judged that there is an open circuit in the crank angle sensor and diagnosis code No. 21 is output.	<ul style="list-style-type: none"> ● Malfunction of the crank angle sensor ● Malfunction of connector ● Malfunction of the engine-A/T-ECU

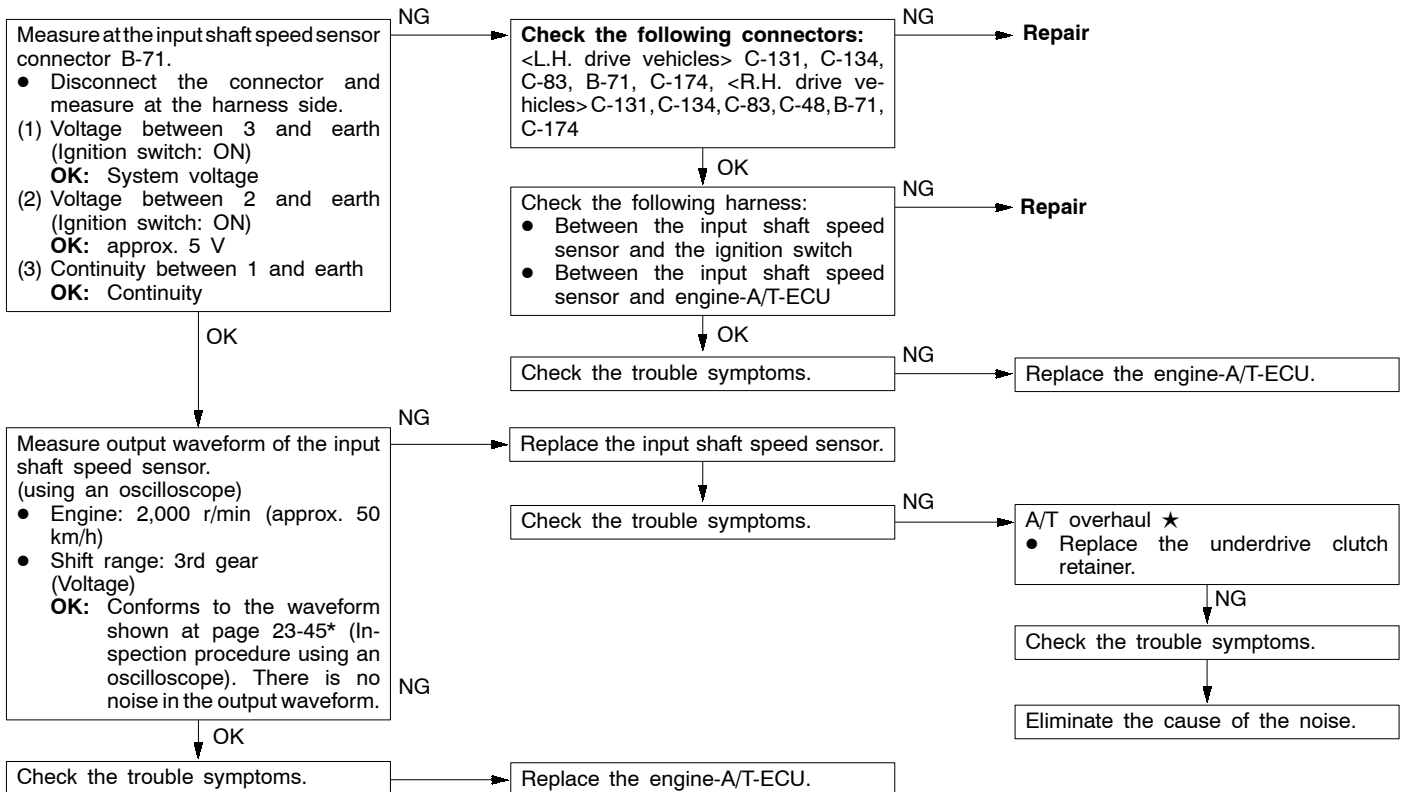
*: Refer to '97 GALANT Workshop Manual (Pub. No. PWDE9611).



Code No. 22 Input shaft speed sensor system	Probable cause
If no output pulse is detected from the input shaft speed sensor for 1 second or more while driving in 3rd or 4th gear at a speed of 30 km/h or more, there is judged to be an open circuit or short-circuit in the input shaft speed sensor and diagnosis code No. 22 is output. If diagnosis code No. 22 is output four times, the transmission is locked into 3rd gear (D range) or 2nd gear (downshifting at Sport mode) as a fail-safe measure, and the N range lamp flashes at a frequency of 1 Hz.	<ul style="list-style-type: none"> ● Malfunction of the input shaft speed sensor ● Malfunction of the underdrive clutch retainer ● Malfunction of connector ● Malfunction of the engine-A/T-ECU

*: Refer to '97 GALANT Workshop Manual (Pub. No. PWDE9611).

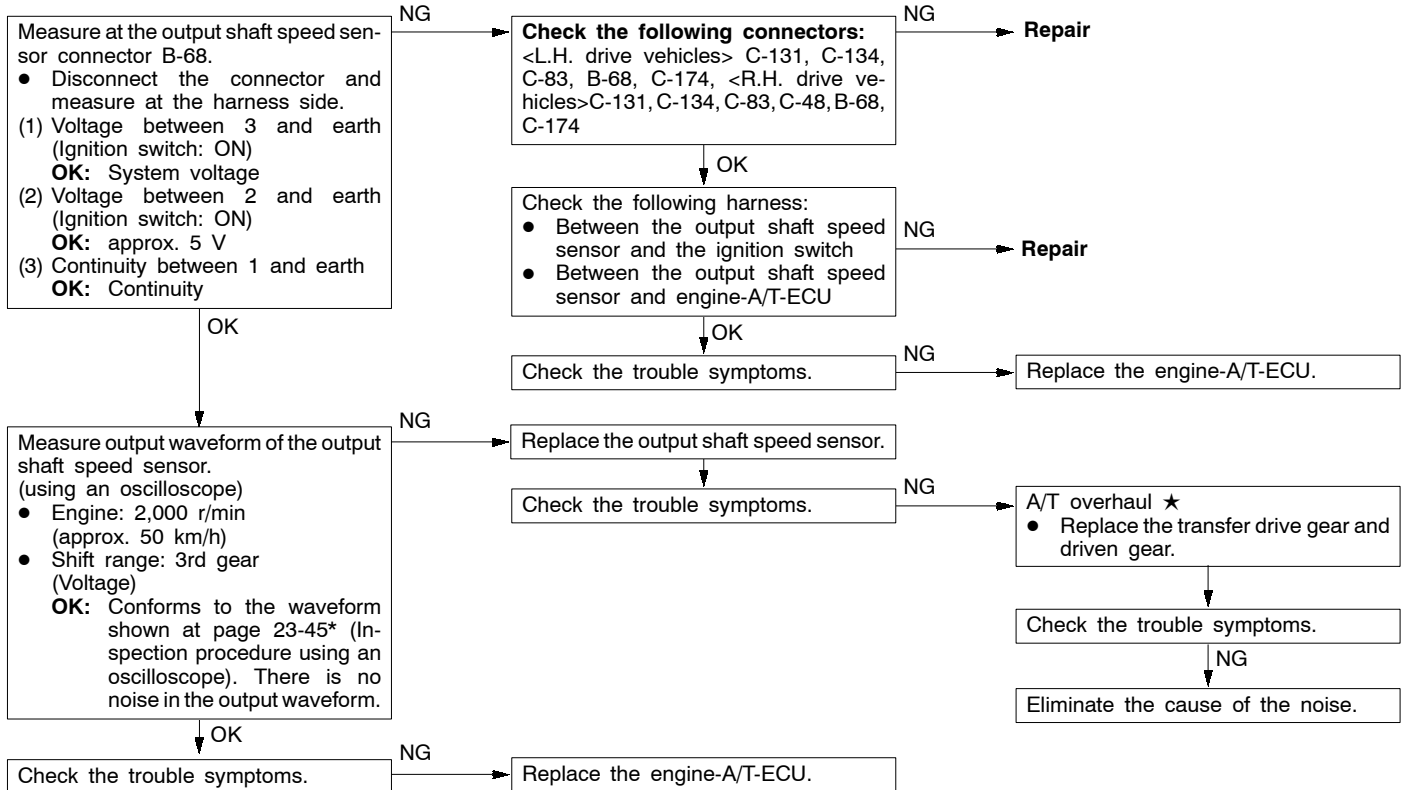
★: Refer to the Transmission Workshop Manual.



Code No. 23 Output shaft speed sensor system	Probable cause
<p>If the output from the output shaft speed sensor is continuously 50% lower than the vehicle speed for 1 second or more while driving in 3rd or 4th gear at a speed of 30 km/h or more, there is judged to be an open circuit or short-circuit in the output shaft speed sensor and diagnosis code No. 23 is output.</p> <p>If diagnosis code No. 23 is output four times, the transmission is locked into 3rd gear (D range) or 2nd gear (downshifting at Sport mode) as a fail-safe measure, and the N range lamp flashes at a frequency of 1 Hz.</p>	<ul style="list-style-type: none"> ● Malfunction of the output shaft speed sensor ● Malfunction of the transfer drive gear or driven gear ● Malfunction of connector ● Malfunction of the engine-A/T-ECU

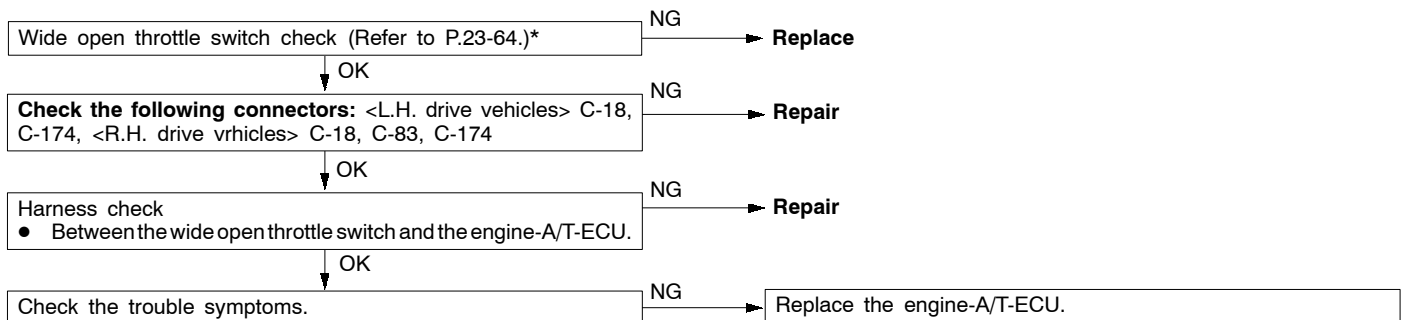
*: Refer to '97 GALANT Workshop Manual (Pub. No. PWDE9611).

★: Refer to the Transmission Workshop Manual.



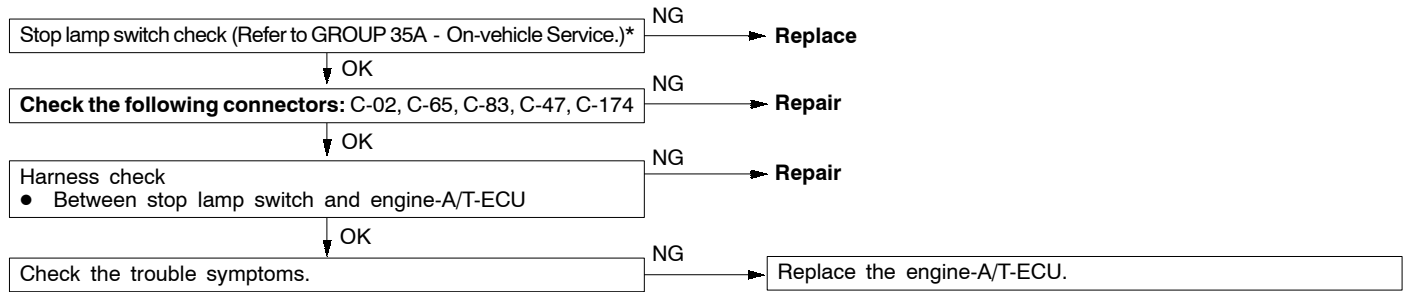
Code No. 25 Wide open throttle switch system	Probable cause
<p>If the wide open throttle switch is on for 1 second or more with the throttle valve opening angle at 70% or less, it is judged that there is a short circuit in the wide open throttle switch and diagnosis code No. 25 is output.</p>	<ul style="list-style-type: none"> ● Malfunction of the wide open throttle switch ● Malfunction of connector ● Malfunction of the engine-A/T-ECU

*: Refer to '97 GALANT Workshop Manual (Pub. No. PWDE9611).



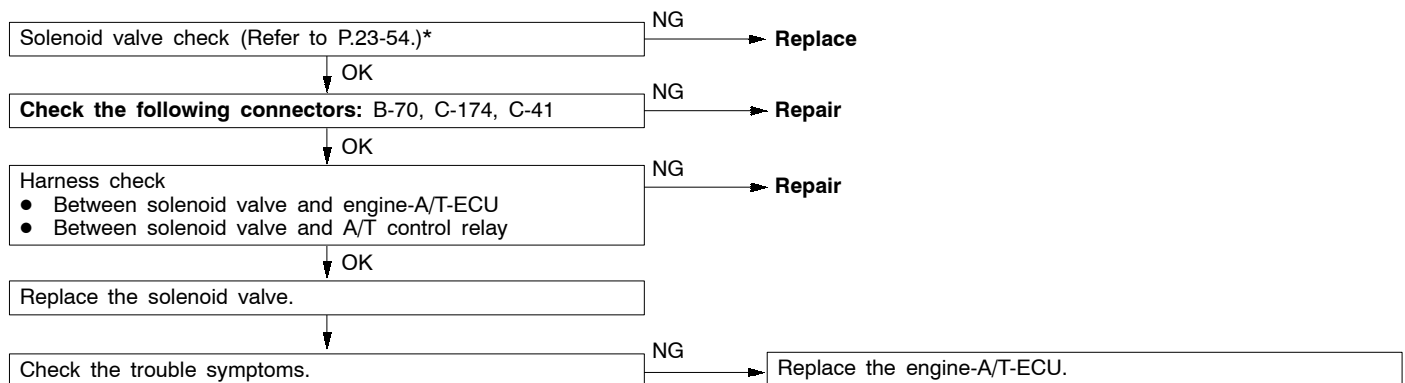
Code No. 26 Stop lamp switch system	Probable cause
If the stop lamp switch is on for 5 minutes or more while driving, it is judged that there is a short circuit in the stop lamp switch and diagnosis code No. 26 is output.	<ul style="list-style-type: none"> ● Malfunction of the stop lamp switch ● Malfunction of connector ● Malfunction of the engine-A/T-ECU

*: Refer to '97 GALANT Workshop Manual (Pub. No. PWDE9611).



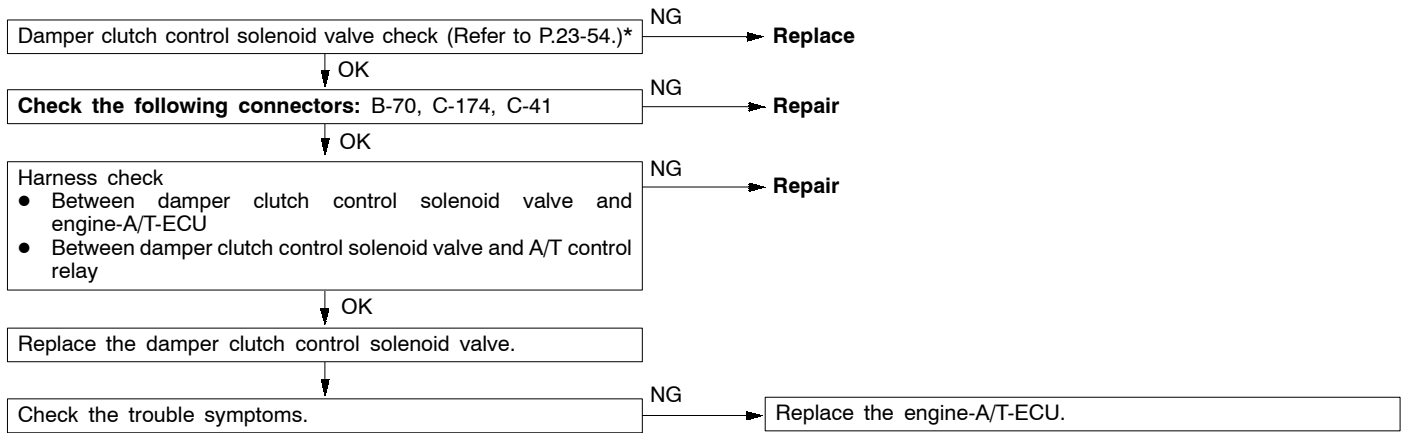
Code No. 31 Low and reverse solenoid valve system	Probable cause
Code No. 32 Underdrive solenoid valve system	
Code No. 33 Second solenoid valve system	
Code No. 34 Overdrive solenoid valve system	
If the resistance value for a solenoid valve is too large or too small, it is judged that there is a short-circuit or an open circuit in the solenoid valve and the respective diagnosis code is output. The transmission is locked into 3rd gear as a fail-safe measure, and the N range lamp flashes at a frequency of 1 Hz.	<ul style="list-style-type: none"> ● Malfunction of solenoid valve ● Malfunction of connector ● Malfunction of the engine-A/T-ECU

*: Refer to '97 GALANT Workshop Manual (Pub. No. PWDE9611).



Code No. 36, 52 Damper clutch control solenoid valve system	Probable cause
<p>If the resistance value for the damper clutch control solenoid valve is too large or too small, it is judged that there is a short-circuit or an open circuit in the damper clutch control solenoid valve and diagnosis code No. 36 is output. If the drive duty rate for the damper clutch control solenoid valve is 100 % for a continuous period of 4 seconds or more, it is judged that there is an abnormality in the damper clutch control system and diagnosis code No. 52 is output. When diagnosis code No. 36 is output, the transmission is locked into 3rd gear as a fail-safe measure, and the N range lamp flashes at a frequency of 1 Hz.</p>	<ul style="list-style-type: none"> ● Malfunction of the damper clutch control solenoid valve ● Malfunction of connector ● Malfunction of the engine-A/T-ECU

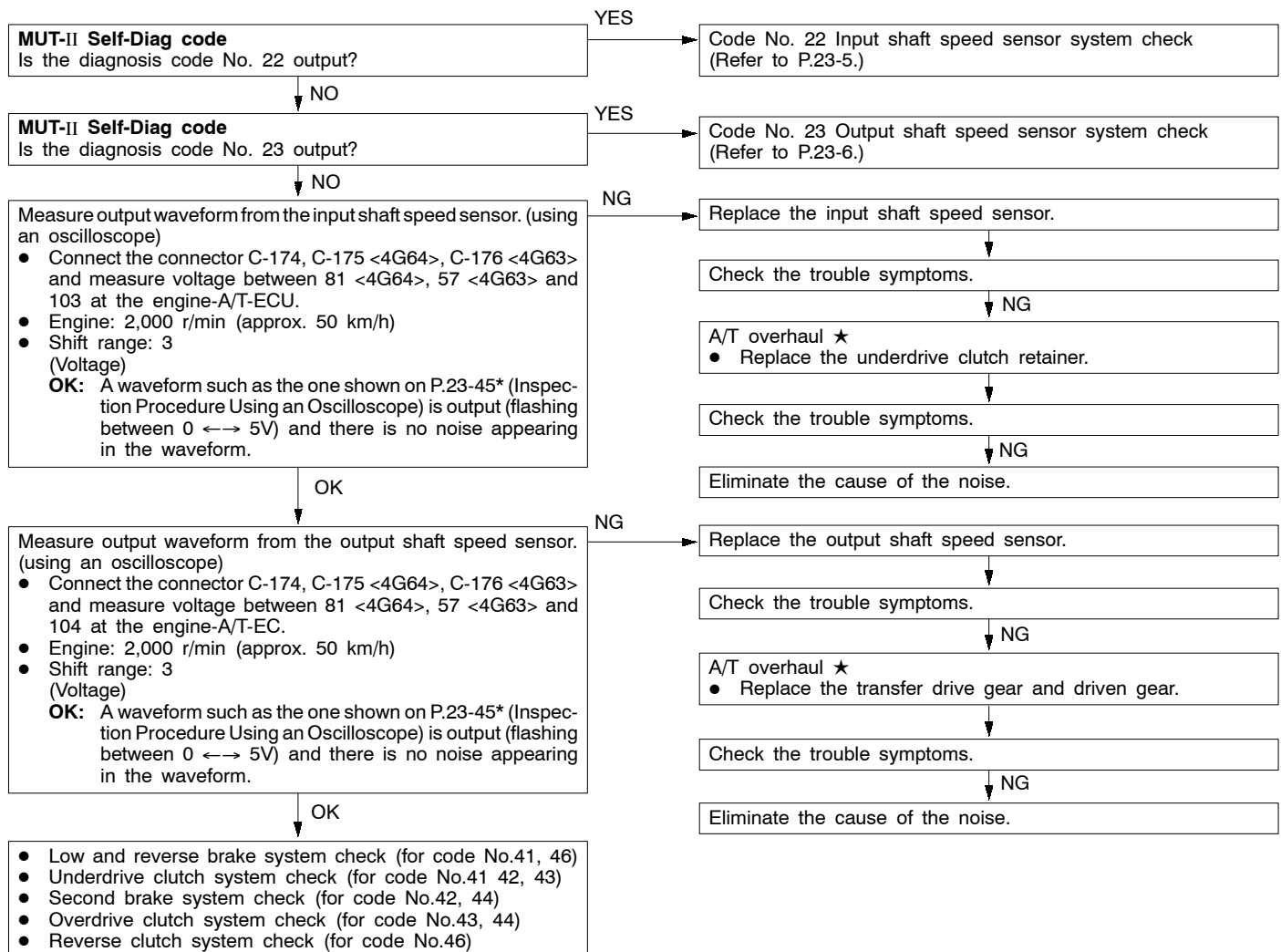
*: Refer to '97 GALANT Workshop Manual (Pub. No. PWDE9611).



<p>Code No. 41 1st gear ratio does not meet the specification</p> <p>Code No. 42 2nd gear ratio does not meet the specification</p> <p>Code No. 43 3rd gear ratio does not meet the specification</p> <p>Code No. 44 4th gear ratio does not meet the specification</p> <p>Code No. 46 Reverse gear ratio does not meet the specification</p>	<p>Probable cause</p>
<p>If the output from the output shaft speed sensor multiplied by each gear ratio is not the same as the output from the input shaft speed sensor after shifting to each gear has been completed, each diagnosis code is output. If each diagnosis code is output four times, the transmission is locked into 3rd gear as a fail-safe measure, and the N range lamp flashes at a frequency of 1 Hz.</p>	<ul style="list-style-type: none"> ● Malfunction of the input shaft speed sensor ● Malfunction of the output shaft speed sensor ● Malfunction of the underdrive clutch retainer ● Malfunction of the transfer drive gear or driven gear ● Malfunction of the low and reverse brake system (for code No.41, 46) ● Malfunction of the underdrive clutch system (for code No.41 42, 43) ● Malfunction of the second brake system (for code No.42, 44) ● Malfunction of the overdrive clutch system (for code No.43, 44) ● Malfunction of the reverse clutch system (for code No.46) ● Noise generated

*: Refer to '97 GALANT Workshop Manual (Pub. No. PWDE9611).

★: Refer to the Transmission Workshop Manual.

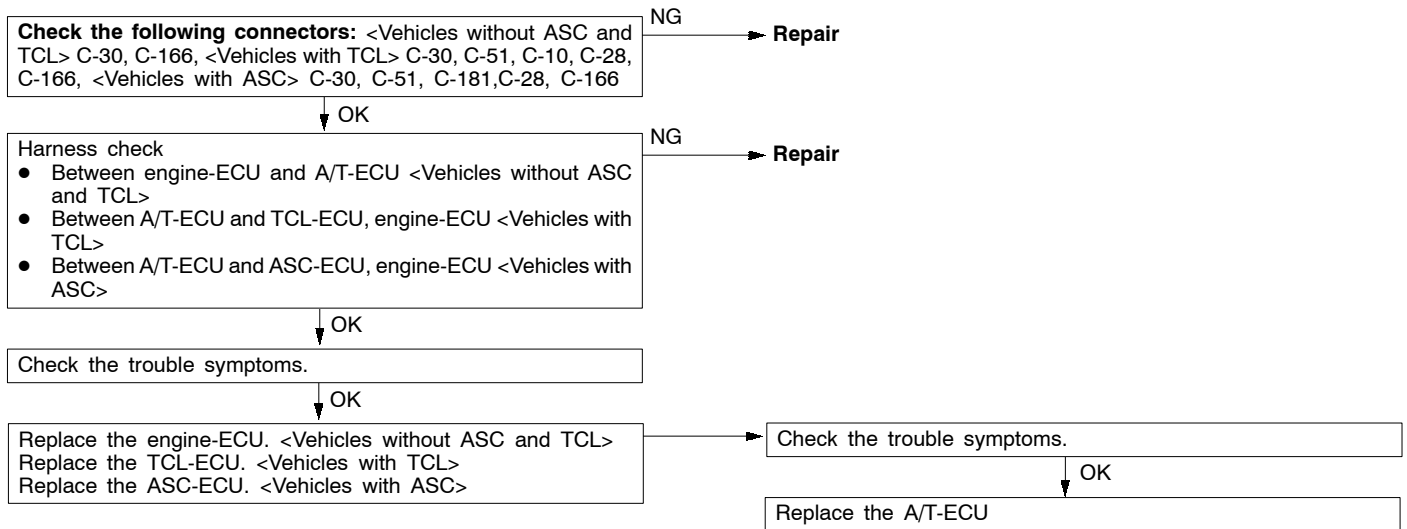


Code No. 51 Abnormal communication with engine-A/T-ECU <4G63, 4G64>, Abnormal communication with engine-ECU <6A13-Vehicles without ASC and TCL>, Abnormal communication with TCL-ECU and engine-ECU <6A13-Vehicles with TCL>, Abnormal communication with ASC-ECU and engine-ECU<6A13-Vehicles with ASC>	Probable cause
If normal communication is not possible for a continuous period of 1 second or more when the ignition switch is at the ON position, the battery voltage is 10 V or more and the engine speed is 450 r/min or more, diagnosis code No. 51 is output. Diagnosis code No. 51 is also output if the data being received is abnormal for a continuous period of 4 seconds under the same conditions.	<ul style="list-style-type: none"> ● Malfunction of connector ● Malfunction of the engine-A/T-ECU <4G63, 4G64> ● Malfunction of the A/T-ECU <6A13> ● Malfunction of the engine-ECU <6A13> ● Malfunction of the TCL-ECU <6A13-Vehicles with TCL> ● Malfunction of the ASC-ECU <6A13-Vehicles with ASC>

<4G63, 4G64>

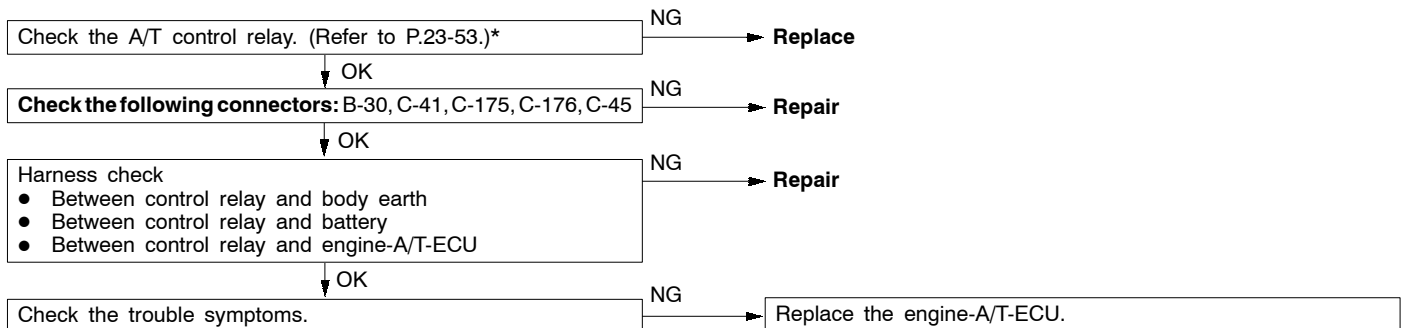
Replace the engine-A/T-ECU

<6A13>

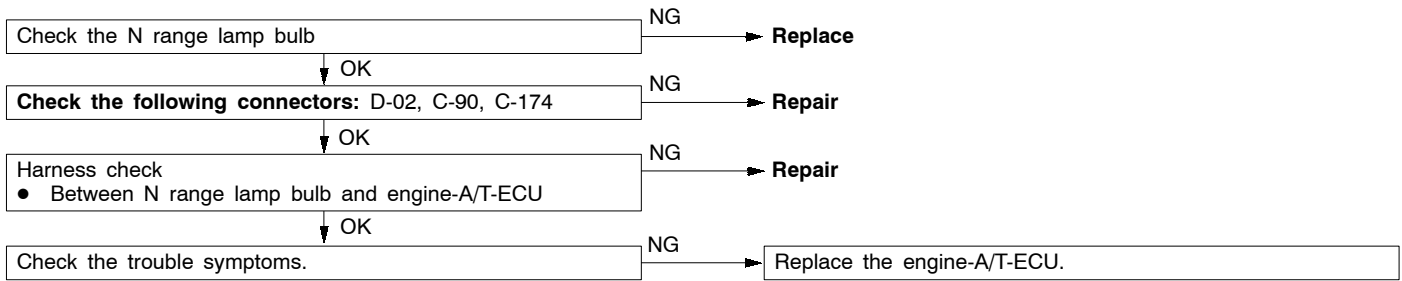


Code No. 54 A/T control relay system	Probable cause
If the A/T control relay voltage is less than 7 V after the ignition switch has been turned ON, it is judged that there is an open circuit or a short-circuit in the A/T control relay earth and diagnosis code No. 54 is output. Then the transmission is locked into 3rd gear as a fail-safe measure, and the N range lamp flashes at a frequency of 1 Hz.	<ul style="list-style-type: none"> ● Malfunction of the A/T control relay ● Malfunction of connector ● Malfunction of the engine-A/T-ECU

*: Refer to '97 GALANT Workshop Manual (Pub. No. PWDE9611).



Code No. 56 N range lamp system	Probable cause
If the N range signal is off after an N range lamp illumination instruction (ON instruction) has been given, it is judged that there is a short-circuit in the N range lamp earth and diagnosis code No. 56 is output.	<ul style="list-style-type: none"> ● Malfunction of the N range lamp bulb ● Malfunction of connector ● Malfunction of the engine-A/T-ECU



INSPECTION CHART FOR TROUBLE SYMPTOMS

*: Refer to '97 GALANT Workshop Manual (Pub. No. PWDE9611).

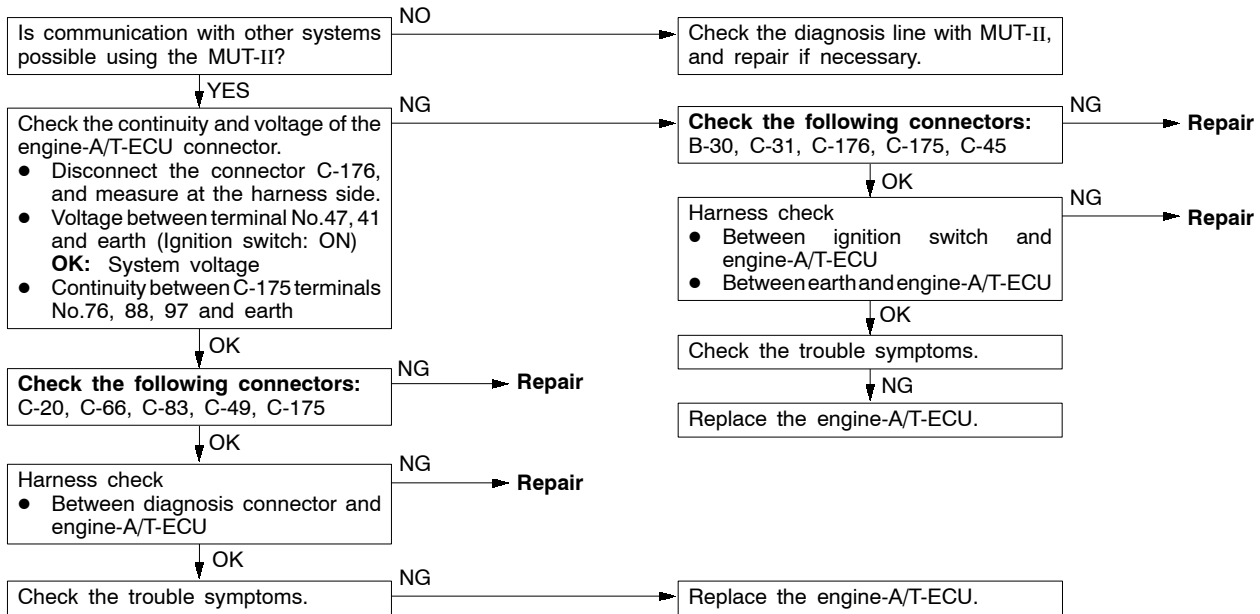
Trouble symptom		Inspection procedure No.	Reference page
Communication with MUT-II is not possible		1	23-12
Driving impossible	Starting impossible	2	23-27*
	Does not move forward	3	23-27*
	Does not reverse	4	23-28*
	Does not move (forward or reverse)	5	23-28*
Malfunction when starting	Engine stalling when shifting	6	23-29*
	Shocks when changing from N to D and large time lag	7	23-29*
	Shocks when changing from N to R and large time lag	8	23-30*
	Shocks when changing from N to D, N to R and large time lag	9	23-31*
Malfunction when shifting	Shocks and running up	10	23-31*
Displaced shifting points	All points	11	23-32*
	Some points	12	23-33*
Does not shift	No diagnosis codes	13	23-33*
Malfunction while driving	Poor acceleration	14	23-34*
	Vibration	15	23-35*
Inhibitor switch system		16	23-13
Shift switch assembly system		17	23-14
A/C system		18	23-14
Vehicle speed sensor system		19	23-15
Auto-cruse-ECU system <4G64>		20	23-15

INSPECTION PROCEDURE FOR TROUBLE SYMPTOMS

Since the ECU of 4G63, 4G64 engine vehicles has been changed from the A/T-ECU to the engine A/T-ECU, INSPECTION PROCEDURES FOR DIAGNOSIS CODES have been changed. INSPECTION PROCEDURES FOR DIAGNOSIS CODES of the 6A13 engine vehicle are the same as before.

INSPECTION PROCEDURE 1

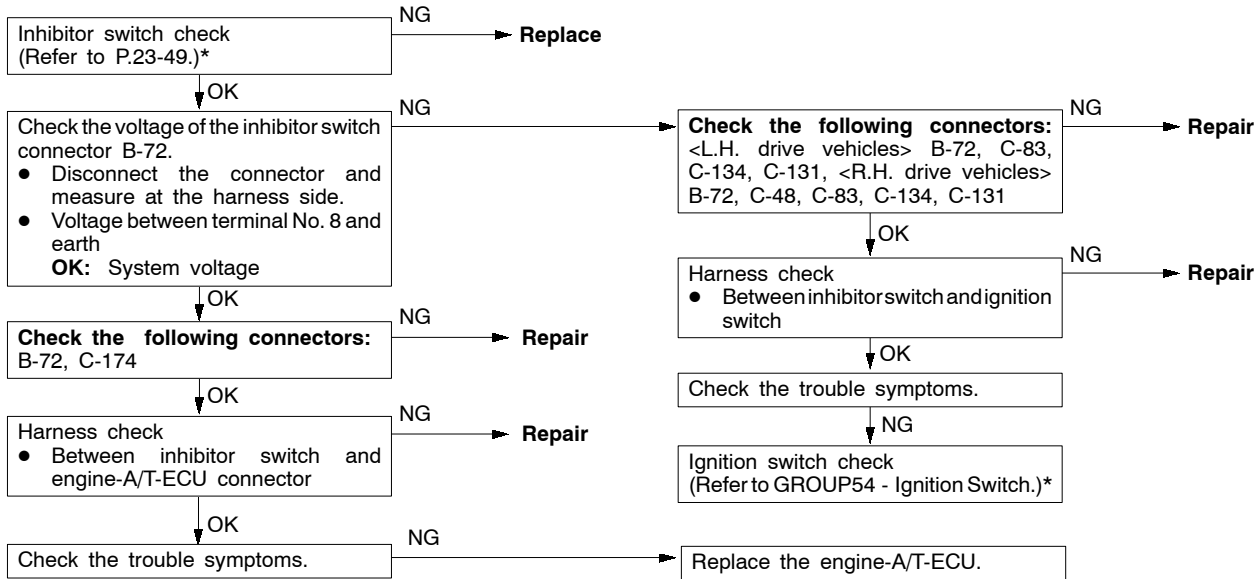
Communication with MUT-II is not possible	Probable cause
If communication with the MUT-II is not possible, the cause is probably a defective diagnosis line or the engine-A/T-ECU is not functioning.	<ul style="list-style-type: none"> ● Malfunction of diagnosis line ● Malfunction of connector ● Malfunction of the engine-A/T-ECU



INSPECTION PROCEDURE 16

Inhibitor switch system	Probable cause
The cause is probably a malfunction of the inhibitor switch circuit, ignition switch circuit or a defective engine-A/T-ECU.	<ul style="list-style-type: none"> ● Malfunction of the inhibitor switch ● Malfunction of the ignition switch ● Malfunction of connector ● Malfunction of the engine-A/T-ECU

*: Refer to '97 GALANT Workshop Manual (Pub. No. PWDE9611).

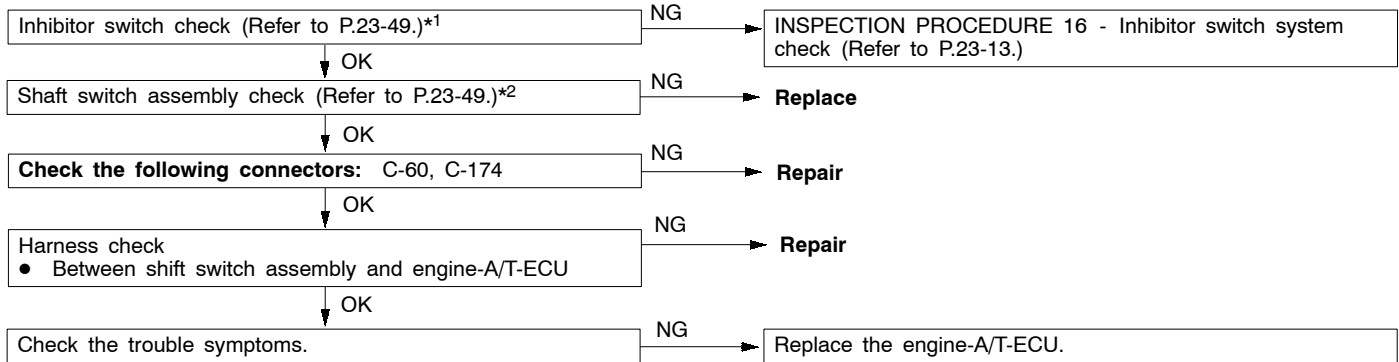


INSPECTION PROCEDURE 17

Shift switch assembly system	Probable cause
The cause is probably a malfunction of the inhibitor switch circuit, shift switch assembly circuit or a engine-A/T-ECU.	<ul style="list-style-type: none"> ● Malfunction of the inhibitor switch ● Malfunction of the shift switch assembly ● Malfunction of connector ● Malfunction of the engine-A/T-ECU

*1: Refer to '97 GALANT Workshop Manual (Pub. No. PWDE9611).

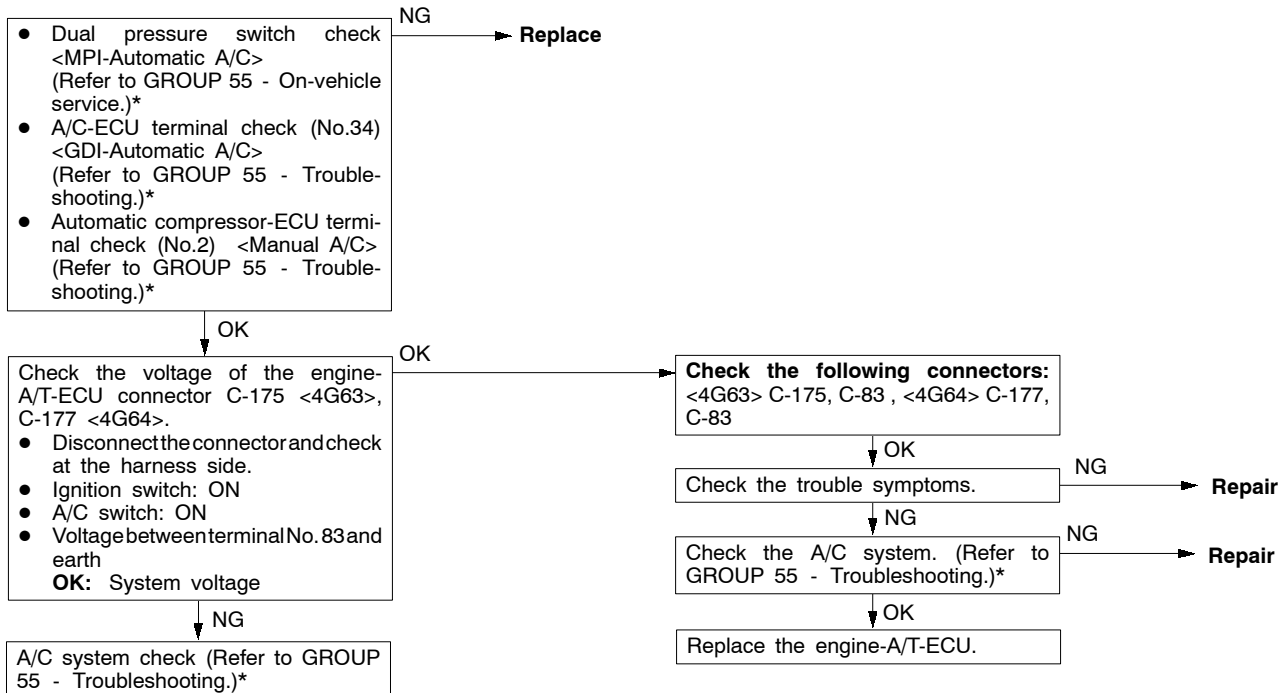
*2: Refer to '99 GALANT Workshop Manual (Pub. No. PWDE9611-A).



INSPECTION PROCEDURE 18

A/C system	Probable cause
The cause is probably a defective A/C system circuit or a defective engine-A/T-ECU.	<ul style="list-style-type: none"> ● Malfunction of the dual pressure switch <MPI-Automatic A/C> ● Malfunction of A/C-ECU <GDI-Automatic A/C> ● Malfunction of Automatic compressor-ECU <Manual A/C> ● Malfunction of connector ● Malfunction of A/C system ● Malfunction of the engine-A/T-ECU

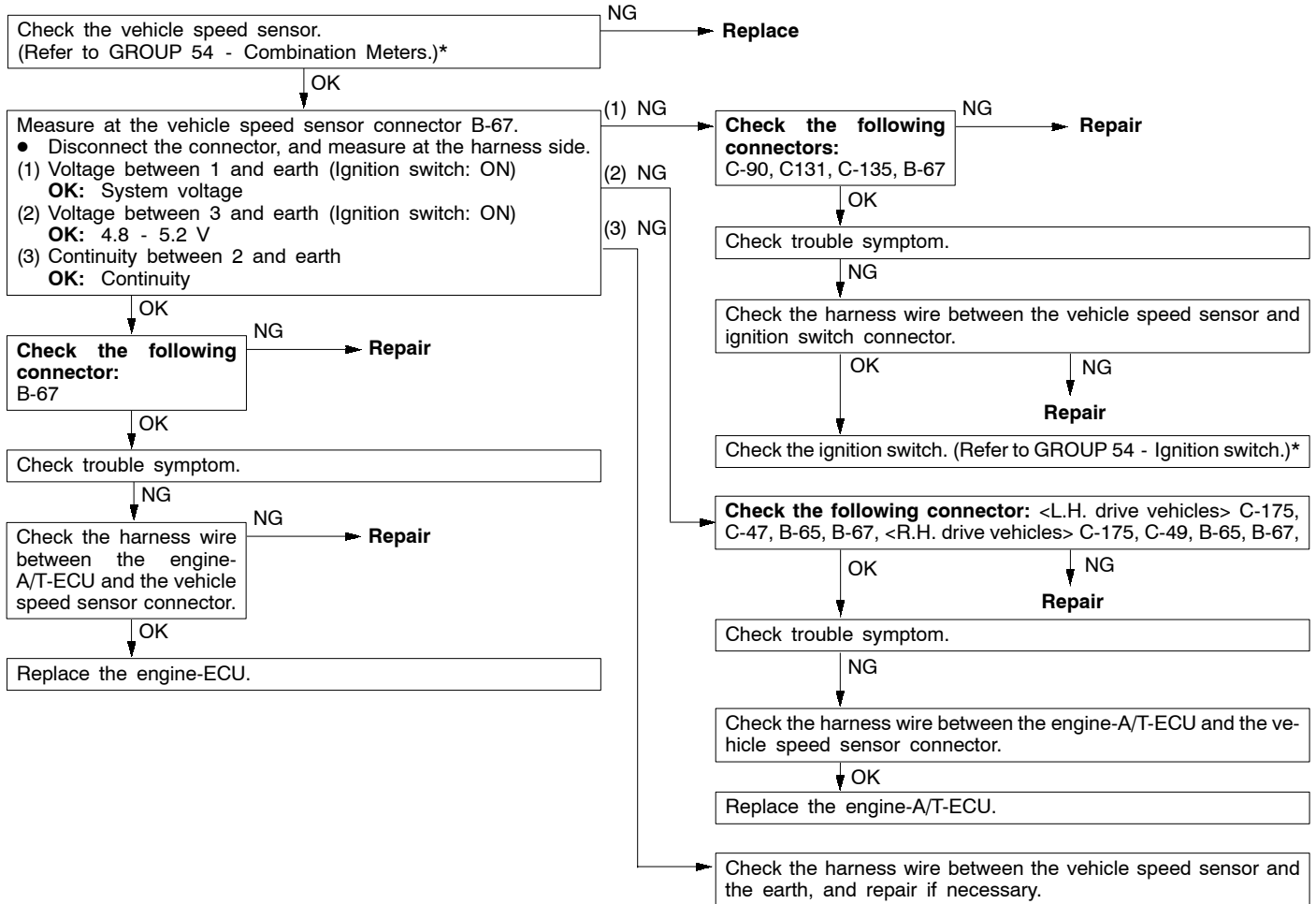
*: Refer to '97 GALANT Workshop Manual (Pub. No. PWDE9611).



INSPECTION PROCEDURE 19

Vehicle speed sensor system	Probable cause
The cause is probably a defective vehicle speed sensor circuit or a defective engine-A/T-ECU.	<ul style="list-style-type: none"> ● Malfunction of the vehicle speed sensor ● Malfunction of connector ● Malfunction of the engine-A/T-ECU

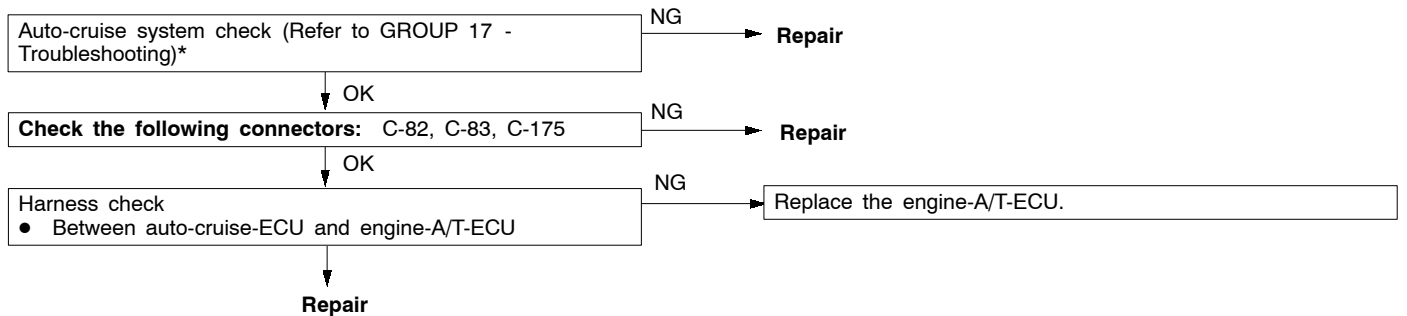
*: Refer to '97 GALANT Workshop Manual (Pub. No. PWDE9611).



INSPECTION PROCEDURE 20

Auto-cruise-ECU signal system <4G64>	Probable cause
The cause is probably a defective auto-cruise signal line circuit or a defective engine-A/T-ECU.	<ul style="list-style-type: none"> ● Malfunction of the auto-cruise-ECU ● Malfunction of connector ● Malfunction of the engine-A/T-ECU

*: Refer to '99 GALANT Workshop Manual (Pub. No. PWDE9611-A).



CHECK AT ENGINE-A/T-ECU TERMINALS

*: Refer to '97 GALANT Workshop Manual (Pub. No. PWDE9611).

<4G63, 4G64>

1	2	3	4		5	6	7	8	41	42	43		44	45	46	71	72	73	74		75	76	77	101	102	103	104		105	106	107																			
9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	47	48	49	50	51	52	53	54	55	56	57	78	79	80	81	82	83	84	85	86	87	88	89	108	109	110	111	112	113	114	115	116	117	118	119	120
24	25	26	27	28	29	30	31	32	33	34	35	58	59	60	61	62	63	64	65	66	90	91	92	93	94	95	96	97	98	121	122	123	124	125	126	127	128	129	130											

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Terminal No.	Check item	Check requirement	Standard value
45	Crank angle sensor	Engine: Idling	2.0 - 2.4 V
50	A/T control relay	Ignition switch: OFF	0 V
		Ignition switch: ON	System voltage
57	Sensor earth	Always	0 V
66	Backup power supply	Ignition switch: OFF	System voltage
76	Earth	Always	0 V
77	Solenoid valve power supply	Ignition switch: OFF	0 V
		Ignition switch: ON	System voltage
78	Throttle position sensor (TPS) <4G63>	Accelerator pedal: Released (Engine stopped)	0.5 - 1.0 V
		Accelerator pedal: Depressed (Engine stopped)	4.5 - 5.0 V
80	Vehicle speed sensor	When stopped	0 V
		Move forward slowly	0 → 5 V flashing
83	A/C compressor load signal	A/C switch: OFF	0 V
		A/C switch: ON	0 V
84	Diagnosis control	-	-
85	Diagnosis output	Normal (No diagnosis code output)	0 → 5 V flashing
88	Earth	Always	0 V
89	Solenoid valve power supply	Ignition switch: OFF	0 V
		Ignition switch: ON	System voltage
95	Accelerator pedal position sensor (APS) <4G64>	Accelerator pedal: Released (Engine stopped)	0.5 - 1.0 V
		Accelerator pedal: Depressed (Engine stopped)	4.5 - 5.0 V
97	Earth	Always	0 V
101	Inhibitor switch P	Selector lever position: P	System voltage
		Selector lever position: Other than above	0 V

Terminal No.	Check item	Check requirement	Standard value
102	Inhibitor switch D	Selector lever position: D	System voltage
		Selector lever position: Other than above	0 V
103	Input shaft speed sensor	Measure between terminal No. 31 and No.43 by an oscilloscope. Engine: 2,000 r/min Selector lever position: Sports mode (3rd gear)	Refer to P.23-45*, Oscilloscope inspection procedure.
104	Output shaft speed sensor	Measure between terminal No. 32 and No.43 by an oscilloscope. Engine: 2,000 r/min Selector lever position: Sports mode (3rd gear)	Refer to P.23-45*, Oscilloscope inspection procedure.
105	1st gear shift indicator lamp	Gear: 1st gear	System voltage
		Gear: Other than above	0 V
106	Second solenoid valve	Selector lever position: Sports mode (2nd gear)	System voltage
		Selector lever position: P	Approx. 7 - 9 V
107	Damper clutch control solenoid valve	Selector lever position: Sports mode (1st gear)	System voltage
		Selector lever position: Sports mode (50 km/h in 3rd gear)	Other than battery voltage
108	Inhibitor switch R	Selector lever position: R	System voltage
		Selector lever position: Other than above	0 V
109	Select switch	Selector lever position: Sports mode	System voltage
		Selector lever position: Other than above	0 V
110	Down shift switch	Selector lever position: Downshift and lever held	System voltage
		Selector lever position: Other than above	0 V
115	Wide-open throttle switch	Accelerator pedal: Released	4.5 - 5.5 V
		Accelerator pedal: Depressed	Less than 0.4 V
117	3rd gear shift indicator lamp	Gear: 3rd gear	System voltage
		Gear: Other than above	0 V
118	2nd gear shift indicator lamp	Gear: 2nd gear	System voltage
		Gear: Other than above	0 V
120	Underdrive solenoid valve	Selector lever position: Sports mode (1st gear)	System voltage
		Selector lever position: P	Approx. 7 - 9 V
121	Inhibitor switch N	Selector lever position: N	System voltage
		Selector lever position: Other than above	0 V

Terminal No.	Check item	Check requirement	Standard value
122	Upshift switch	Selector lever position: Upshift and lever held	System voltage
		Selector lever position: Other than above	0 V
123	Stop lamp switch	Brake pedal: Depressed	System voltage
		Brake pedal: Released	0 V
124	A/T fluid temperature sensor	A/T fluid temperature: 20°C (68°F)	3.8 - 4.0 V
		A/T fluid temperature: 40°C (104°F)	3.2 - 3.4 V
		A/T fluid temperature: 80°C (176°F)	1.7 - 1.9 V
126	Mode control switch	Select HOLD mode	System voltage
		Select AUTO mode	0 V
128	4th gear shift indicator lamp	Gear: 4th gear	System voltage
		Gear: Other than above	0 V
129	Low-reverse solenoid valve	Selector lever position: D (1st gear)	System voltage
		Selector lever position: D (2nd gear)	Approx. 7 - 9 V
130	Overdrive solenoid valve	Selector lever position: Sports mode (3rd gear)	System voltage
		Selector lever position: P	Approx. 7 - 9 V