

AUTOMATIC TRANSMISSION

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WARNING REGARDING SERVICING OF SUPPLEMENTAL RESTRAINT SYSTEM (SRS) EQUIPPED VEHICLES

WARNING!

- (1) Improper service or maintenance of any component of the SRS, or any SRS-related component, can lead to personal injury or death to service personnel (from inadvertent firing of the air bag) or to driver and passenger (from rendering the SRS inoperative).
- (2) Service or maintenance of any SRS component or SRS-related component must be performed only at an authorized MITSUBISHI dealer.
- (3) MITSUBISHI dealer personnel must thoroughly review this manual, and especially its GROUP 52B – Supplemental Restraint System (SRS) before beginning any service or maintenance of any component of the SRS or any SRS-related component.

NOTE

The SRS includes the following components: SRS-ECU, SRS warning lamp, air bag module, clock spring, side impact sensors and interconnecting wiring. Other SRS-related components (that may have to be removed/installed in connection with SRS service or maintenance) are indicated in the table of contents by an asterisk (*).

GENERAL

OUTLINE OF CHANGES

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

- Addition of vehicles with Sports mode
- Abolition of the A/T-ECU idle position switch terminal
- Changes to the shift pattern
- Addition of A/T key interlock and shift lock mechanisms

TROUBLESHOOTING <A/T>

ROAD TEST

Check by the following procedure.

No.	State prior to test and operation	Test and operation	Judgement value	Check item	Diagnosis code No.	Inspection procedure page if there is an abnormality
1	Ignition switch: OFF	Ignition switch (1) ON	Data list No. 54 Battery voltage [V]	Control relay	54	A/T Control relay system (23-21)
2	Ignition switch: ON Engine: Stopped Selector lever position: P	Selector lever position (1) P, (2) R, (3) N, (4) D	Data list No. 61 (1) P, (2) R, (3) N, (4) D	Inhibitor switch	–	Inhibitor switch system (23-32)
		Selector lever position (1) D (1st gear) (2) Selector sports mode (1st gear) (3) Upshift and hold the selector lever (2nd gear) (4) Downshift and hold the selector lever (1st gear)	Data list No.67 No.68 No.69 (1) OFF OFF OFF (2) ON OFF OFF (3) ON ON OFF (4) ON OFF ON Shift indicator lamp (1) D and 1 illuminate (2) Only 1 illuminates (3) Only 2 illuminates (4) Only 1 illuminates	Select switch Upshift switch Downshift switch	–	Shift switch assembly system (23-33)
		Accelerator pedal (1) Released (2) Half depressed (3) Depressed	Data list No. 11 (1) 400 – 1,000 mV (2) Gradually rises from (1) (3) 4,500 – 5,000 mV	Throttle position sensor <6A13-Vehicles without TCL, 4G63> Accelerator pedal position sensor <6A13-Vehicles with TCL, 4G64>	11 12 14	Throttle position sensor system (23-10) Accelerator pedal position sensor system (23-10)
			Data list No. 25 (1) OFF (2) ON	Wide open throttle switch	25	Wide open throttle switch system (23-12)
		Brake pedal (1) Depressed (2) Released	Data list No. 26 (1) ON (2) OFF	Stop lamp switch	26	Stop lamp switch system (23-13)

No.	State prior to test and operation	Test and operation	Judgement value	Check item	Diagnosis code No.	Inspection procedure page if there is an abnormality
3	Ignition switch: ST Engine: Stopped	Starting test with lever P or N range	Starting should be possible	Starting possible or impossible	–	Starting impossible (23-24)
4	Warming up	Drive for 15 minutes or more so that the automatic fluid temperature becomes 70 – 90°C.	Data list No. 15 Gradually rises to 70 – 90°C	Oil temperature sensor	15	Oil temperature sensor system (23-10)
5	Engine: Idling Selector lever position: N	Brake pedal (Retest) (1) Depressed (2) Released	Data list No. 26 (1) ON (2) OFF	Stop lamp switch	26	Stop lamp switch system (23-13)
		A/C switch (1) ON (2) OFF	Data list No. 65 (1) ON (2) OFF	Dual pressure switch	–	Dual pressure switch system (23-33)
		Accelerator pedal (1) Released (2) Half depressed	Data list No. 21 (1) 550 – 850 r/min Gradually rises from (1)	Crank angle sensor	21	Crank angle sensor system (23-11)
			Data list No. 57 (2) Data changes	Communication with engine-ECU <Vehicles without TCL> Communication with TCL-ECU <Vehicles with TCL>	51	Serial communication system (23-20)
		Selector lever position (1) N → D (2) N → R	Should be no abnormal shifting shocks Time lag should be within 2 seconds	Malfunction when starting	–	Engine stalling during shifting (23-26)
					–	Shocks when changing from N to D and large time lag (23-26)
					–	Shocks when changing from N to R and large time lag (23-27)
					–	Shocks when changing from N to D, N to R and large time lag (23-28)
				Driving impossible	–	Does not move forward (23-24)
					–	Does not reverse (23-25)
					–	Does not move (forward or reverse) (23-25)

No.	State prior to test and operation	Test and operation	Judgement value	Check item	Diagnosis code No.	Inspection procedure page if there is an abnormality
6	Selector lever position: Sports mode (Carry out on a flat and straight road.)	Selector lever position and vehicle speed	Data list No. 63 (2) 1st, (4) 3rd, (3) 2nd, (5) 4th	Shift condition	–	–
		(1) Idling in 1st (Vehicle stopped)	Data list No. 31 (2) 0 %, (4) 100 %, (3) 100 %, (5) 100 %	Low and reverse solenoid valve	31	Low and reverse solenoid valve system (23-13)
		(2) Driving at constant speed of 10 km/h in 1st	Data list No. 32 (2) 0 %, (4) 0 %, (3) 0 %, (5) 100 %	Underdrive solenoid valve	32	Underdrive solenoid valve system (23-13)
		(3) Driving at constant speed of 30 km/h in 2nd	Data list No. 33 (2) 100 %, (4) 100 %, (3) 0 %, (5) 0 %	Second solenoid valve	33	Second solenoid valve system (23-13)
		(4) Driving at 50 km/h in 3rd with accelerator fully closed	Data list No. 34 (2) 100 %, (4) 0 %, (3) 100 %, (5) 0 %	Overdrive solenoid valve	34	Overdrive solenoid valve system (23-13)
		(5) Driving at constant speed of 50 km/h in 4th	Data list No. 29 (1) 0 km/h (4) 50 km/h	Vehicle speed sensor	–	Vehicle speed sensor system (23-34)
		(Each condition should be maintained for 10 seconds or more.)	Data list No. 22 (4) 1,800 – 2,100 r/min	Input shaft speed sensor	22	Input shaft speed sensor system (23-11)
			Data list No. 23 (4) 1,800 – 2,100 r/min	Output shaft speed sensor	23	Output shaft speed sensor system (23-12)
7	Selector lever position: Sports mode (Carry out on a flat and straight road.)	Selector lever position and vehicle speed	Data list No. 36 (1) 0 % (2) Approx. 70 – 90 %	Damper clutch control solenoid valve	36 52	Damper clutch control solenoid valve system (23-14)
		(1) Release the accelerator pedal fully while driving at 50 km/h in 3rd gear. (2) Driving at constant speed of 50 km/h in 3rd gear.	Data list No. 52 (1) Approx. 100 – 300 r/min (2) Approx. 0 – 10 r/min			

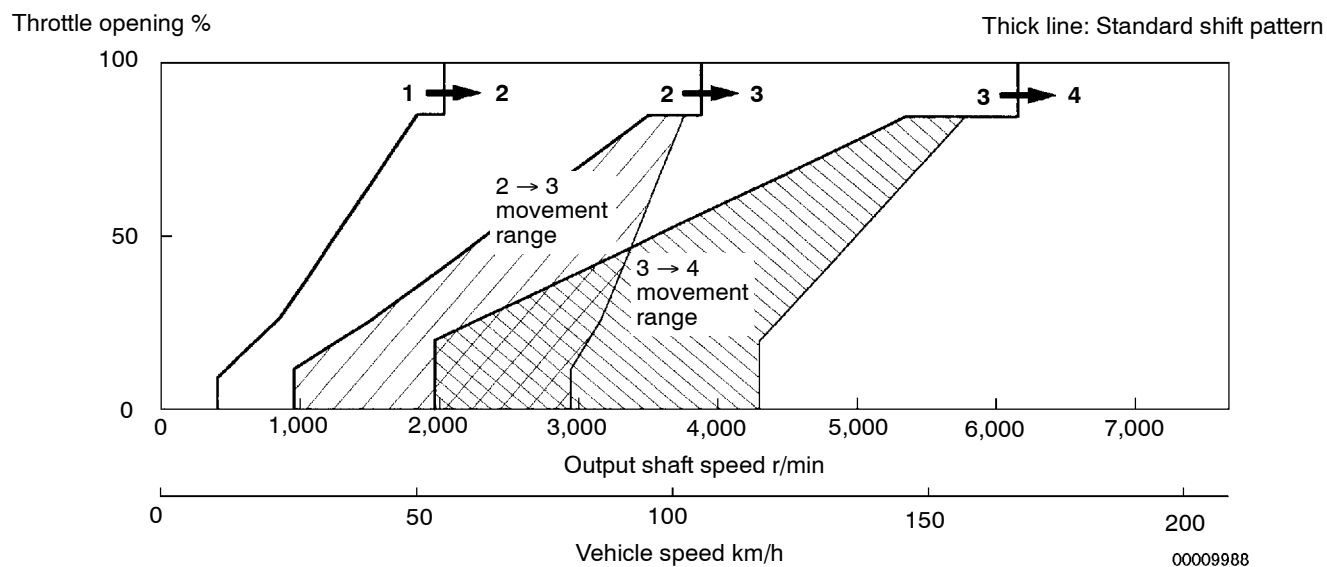
No.	State prior to test and operation	Test and operation	Judgement value	Check item	Diagnosis code No.	Inspection procedure page if there is an abnormality
8	Use the MUT-II to stop the INVECS-II function. Selector lever position: D (Carry out on a flat and straight road.)	Monitor data list No. 11, 23, and 63 with the MUT-II. (1) Accelerate to 4th gear at a throttle position sensor output of 1.5V (accelerator opening angle of 30 %). (2) Gently decelerate to a standstill. (3) Accelerate to 4th gear at a throttle position sensor output of 2.5 V (accelerator opening angle of 50%). (4) While driving at 60 km/h in 4th gear, shift down to 3rd (5) While driving at 40 km/h in 3rd gear, shift down to 2nd (6) While driving at 20 km/h in 2nd gear, shift down to 1st	For (1), (2) and (3), the reading should be the same as the specified output shaft speed and no abnormal shocks should occur. For (4), (5) and (6), downshifting should occur immediately after the shifting operation is made.	Malfunction when shifting	–	Shocks and running up (23-28)
				Displaced shifting points	–	All points (23-29)
					–	Some points (23-30)
				Does not shift	–	No diagnosis code (23-30)
					22	Input shaft speed sensor system (23-11)
					23	Output shaft speed sensor system (23-12)
				Does not shift from 1 to 2 or 2 to 1	31	Low and reverse solenoid valve system (23-13)
					33	Second solenoid valve system (23-13)
					41	1st gear ratio is not specified (23-15)
					42	2nd gear ratio is not specified (23-16)
				Does not shift from 2 to 3 or 3 to 2	33	Second solenoid valve system (23-13)
					34	Overdrive solenoid valve system (23-13)
					42	2nd gear ratio is not specified (23-16)
					43	3rd gear ratio is not specified (23-17)
				Does not shift from 3 to 4 or 4 to 3	32	Underdrive solenoid valve system (23-13)
					33	Second solenoid valve system (23-13)
					43	3rd gear ratio is not specified (23-17)
					44	4th gear ratio is not specified (23-18)

No.	State prior to test and operation	Test and operation	Judgement value	Check item	Diagnosis code No.	Inspection procedure page if there is an abnormality
9	Selector lever position: N (Carry out on a flat and straight road.)	Monitor data list No. 22 and No. 23 with the MUT-II. (1) Move selector lever to R range, drive at constant speed of 10 km/h.	The ratio between data list No. 22 and No. 23 should be the same as the gear ratio when reversing.	Does not shift	22	Input shaft speed sensor system (23-11)
					23	Output shaft speed sensor system (23-12)
					46	Reverse gear ratio is not specified (23-19)

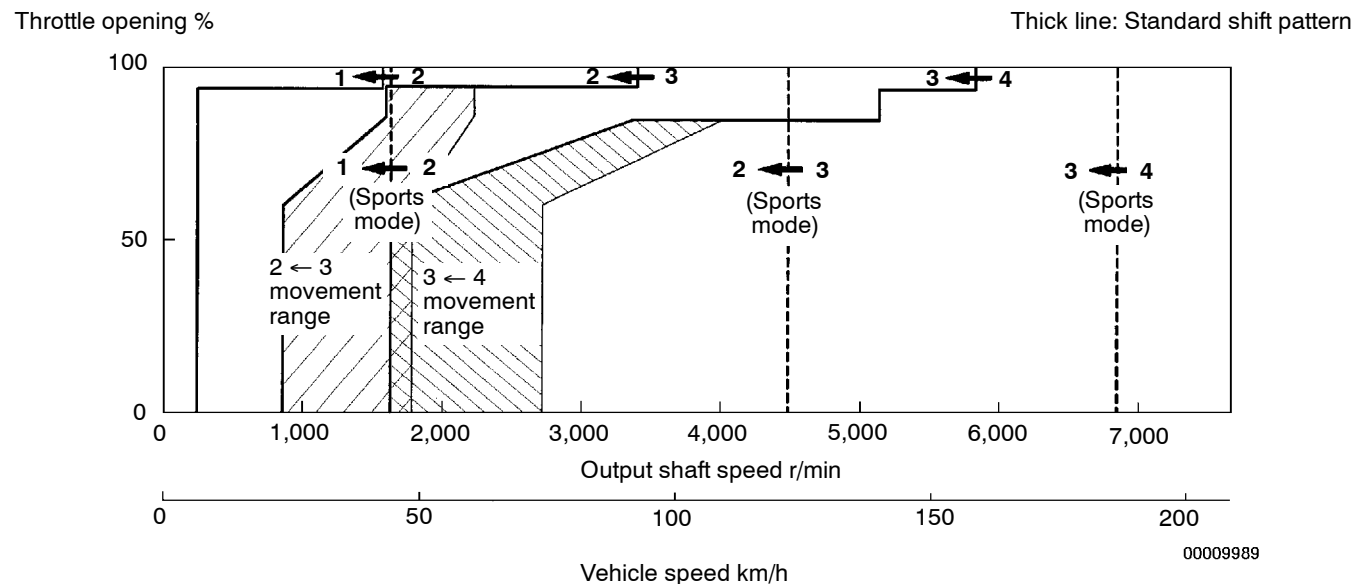
SHIFT PATTERN

<4G63 engine>

UPSHIFT PATTERN

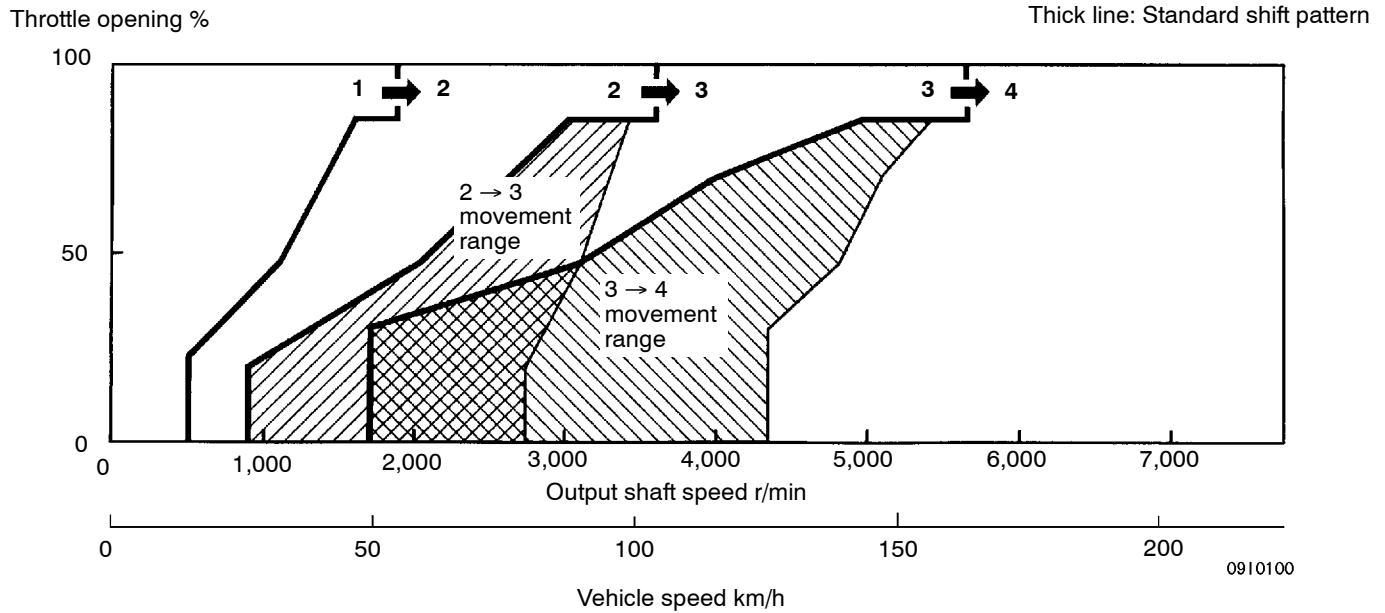


DOWNSHIFT PATTERN

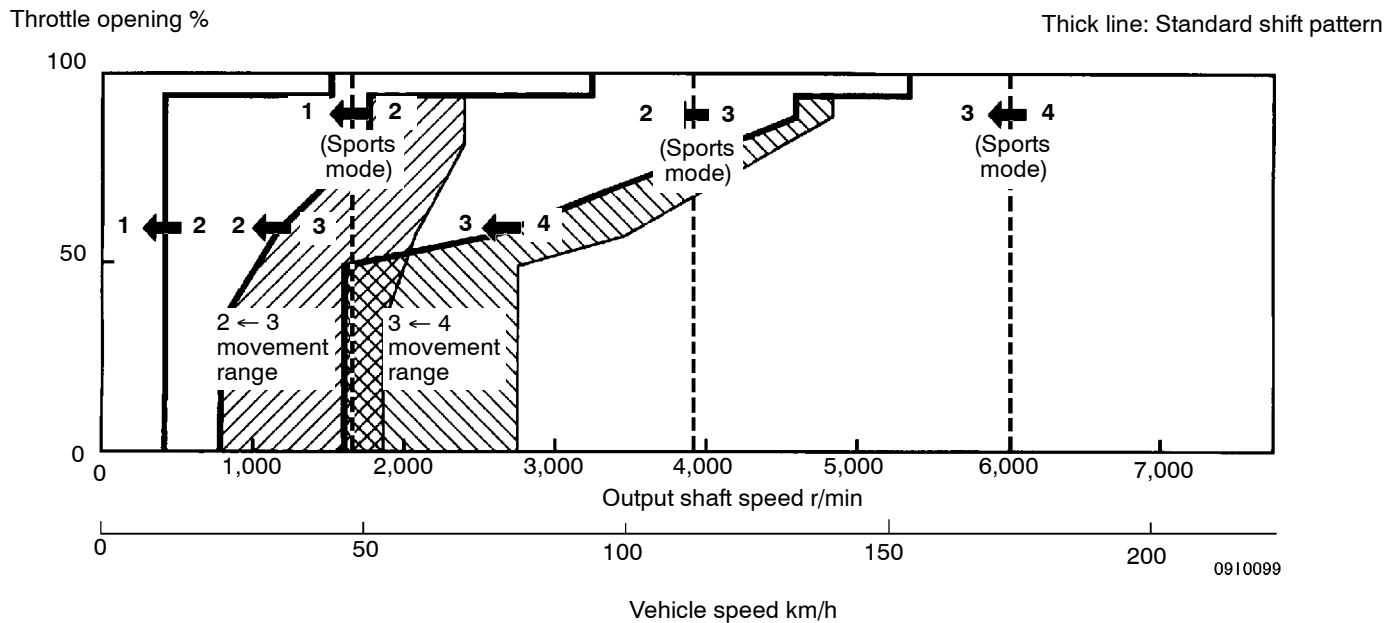


<4G64 engine>

UPSHIFT PATTERN



DOWNSHIFT PATTERN

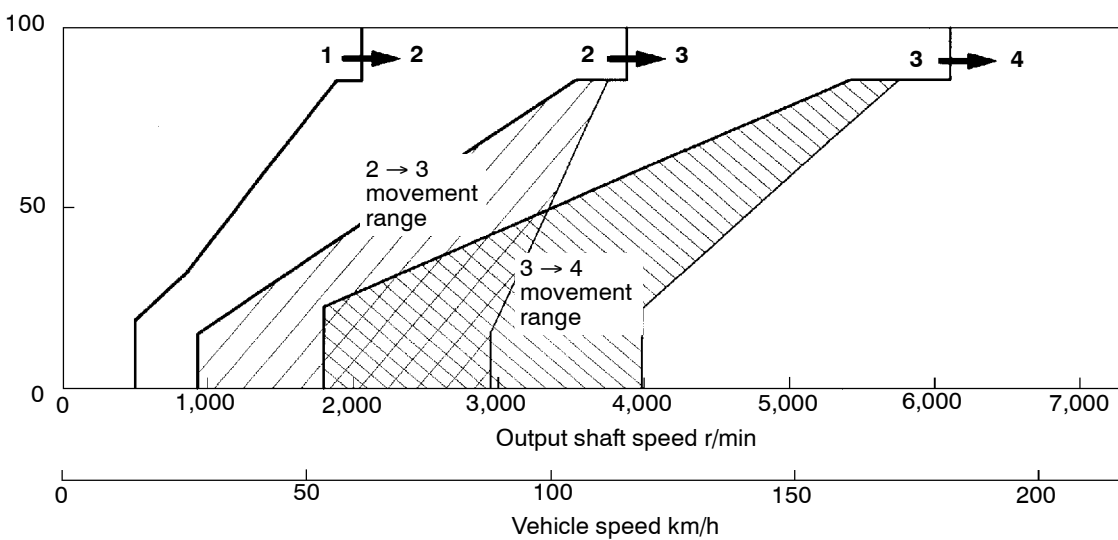


<6A13 engine>

UPSHIFT PATTERN

Throttle opening %

Thick line: Standard shift pattern

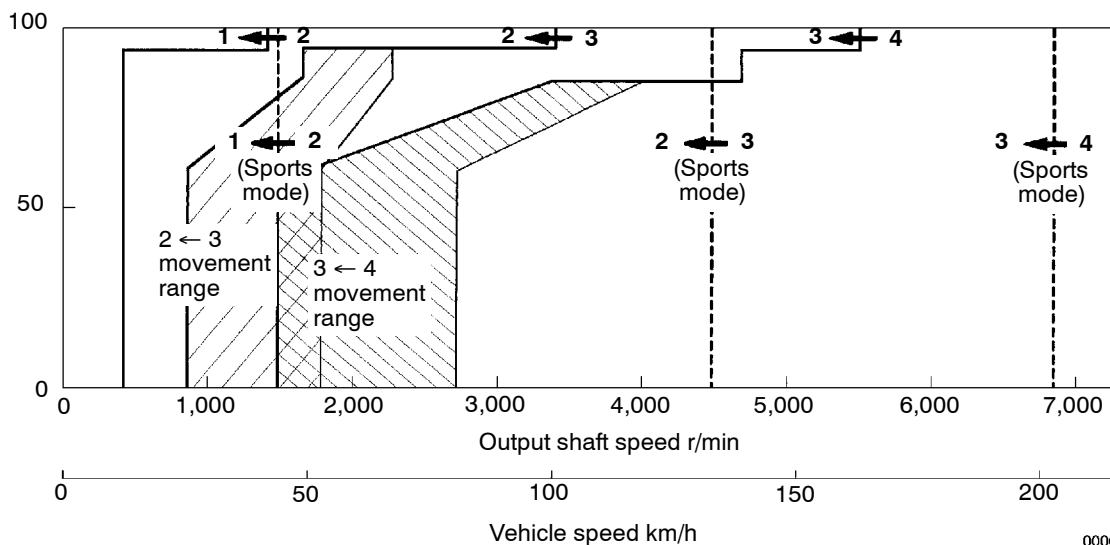


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DOWNSHIFT PATTERN

Throttle opening %

Thick line: Standard shift pattern



00009991

INSPECTION CHART FOR DIAGNOSIS CODE

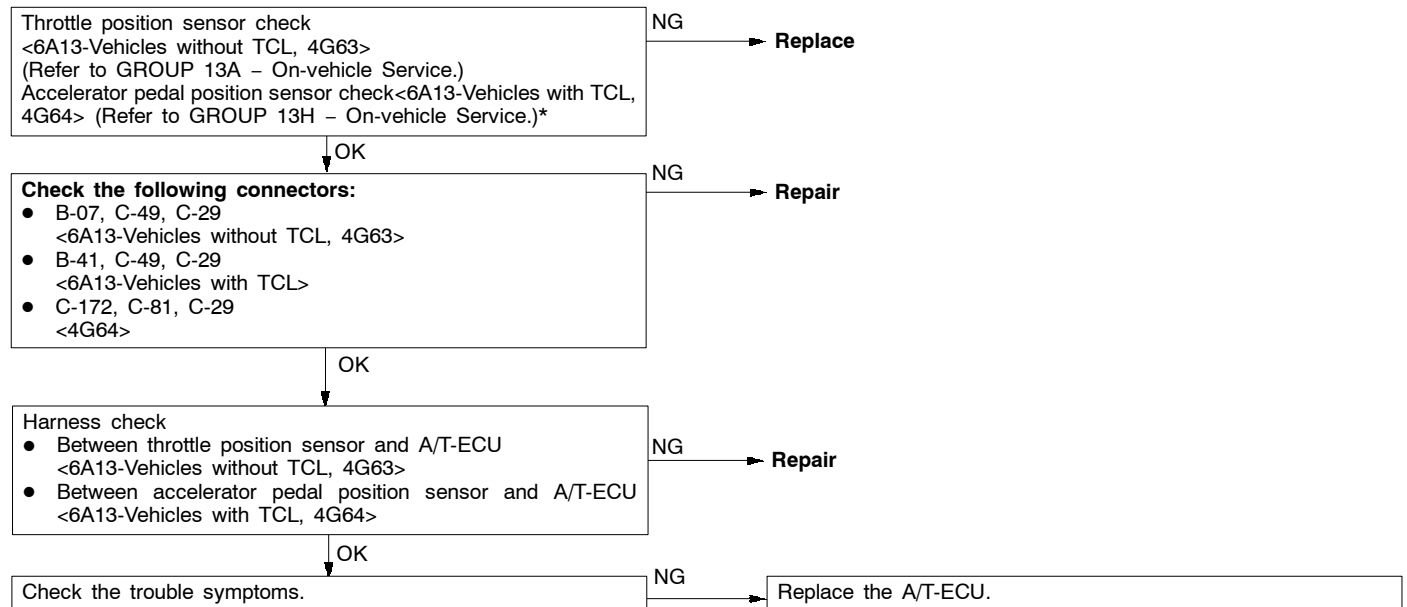
Code	Diagnosis item		Reference page
11	Throttle position sensor system	Short circuit	23-10
12	<6A13-Vehicles without TCL, 4G63> Accelerator pedal position sensor system <6A13-Vehicles with TCL, 4G64>	Open circuit	23-10
14		Sensor maladjustment	23-10
15	Oil temperature sensor system	Open circuit	23-10
21	Crank angle sensor system	Open circuit	23-11
22	Input shaft speed sensor system	Short circuit/open circuit	23-11
23	Output shaft speed sensor system	Short circuit/open circuit	23-12
25	Wide open throttle switch system	Short circuit	23-12
26	Stop lamp switch system	Short circuit/open circuit	23-13
31	Low and reverse solenoid valve system	Short circuit/open circuit	23-13
32	Underdrive solenoid valve system	Short circuit/open circuit	23-13
33	Second solenoid valve system	Short circuit/open circuit	23-13
34	Overdrive solenoid valve system	Short circuit/open circuit	23-13
36	Damper clutch control solenoid valve system	Short circuit/open circuit	23-14
41	1st gear ratio does not meet the specification		23-15
42	2st gear ratio does not meet the specification		23-16
43	3rd gear ratio does not meet the specification		23-17
44	4th gear ratio does not meet the specification		23-18
46	Reverse gear ratio does not meet the specification		23-19
51	Abnormal communication with engine-ECU <Vehicles without TCL> Abnormal communication with TCL-ECU <Vehicles with TCL>		23-20
52	Damper clutch control solenoid valve system	Defective system	23-14
54	A/T Control relay system	Short circuit to earth/ open circuit	23-21
56	N range lamp system	Short circuit to earth	23-22
71	Malfunction of A/T-ECU		23-22

INSPECTION PROCEDURES FOR DIAGNOSIS CODES

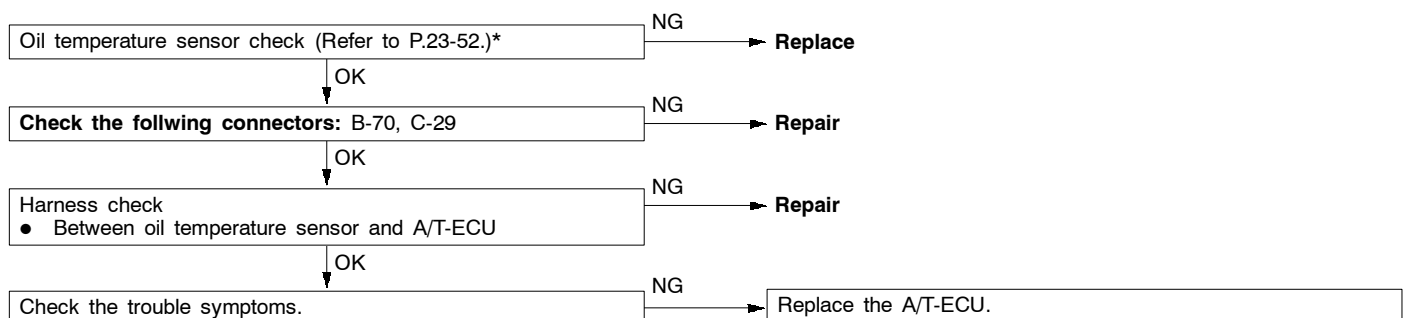
NOTE

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

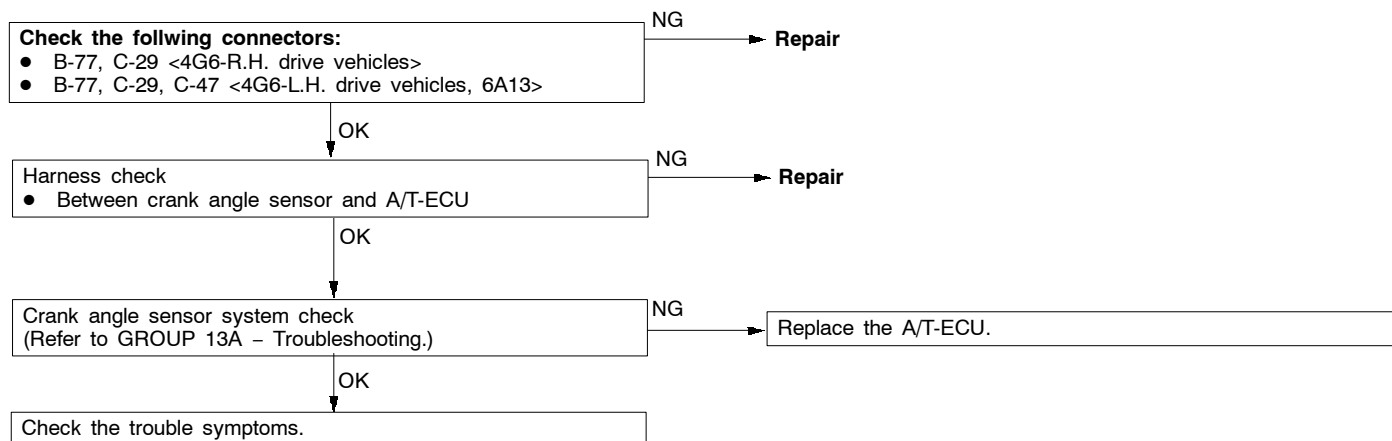
Code No. 11, 12, 14 Throttle position sensor system <6A13-Vehicles without TCL, 4G63>, accelerator pedal position sensor <6A13-Vehicles with TCL, 4G64>	Probable cause
<p>If the TPS or APS output voltage is 4.8 V or higher when the engine is idling, the output is judged to be too high and diagnosis code No. 11 is output. Code No. 11 is also output if there is a problem with the APS and an APS fail-safe signal is received from the TCL-ECU. 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 <6A13-Vehicles without TCL, 4G63> • Malfunction of the accelerator pedal position sensor <6A13-Vehicles with TCL, 4G64> • Malfunction of connector • Malfunction of the A/T-ECU



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

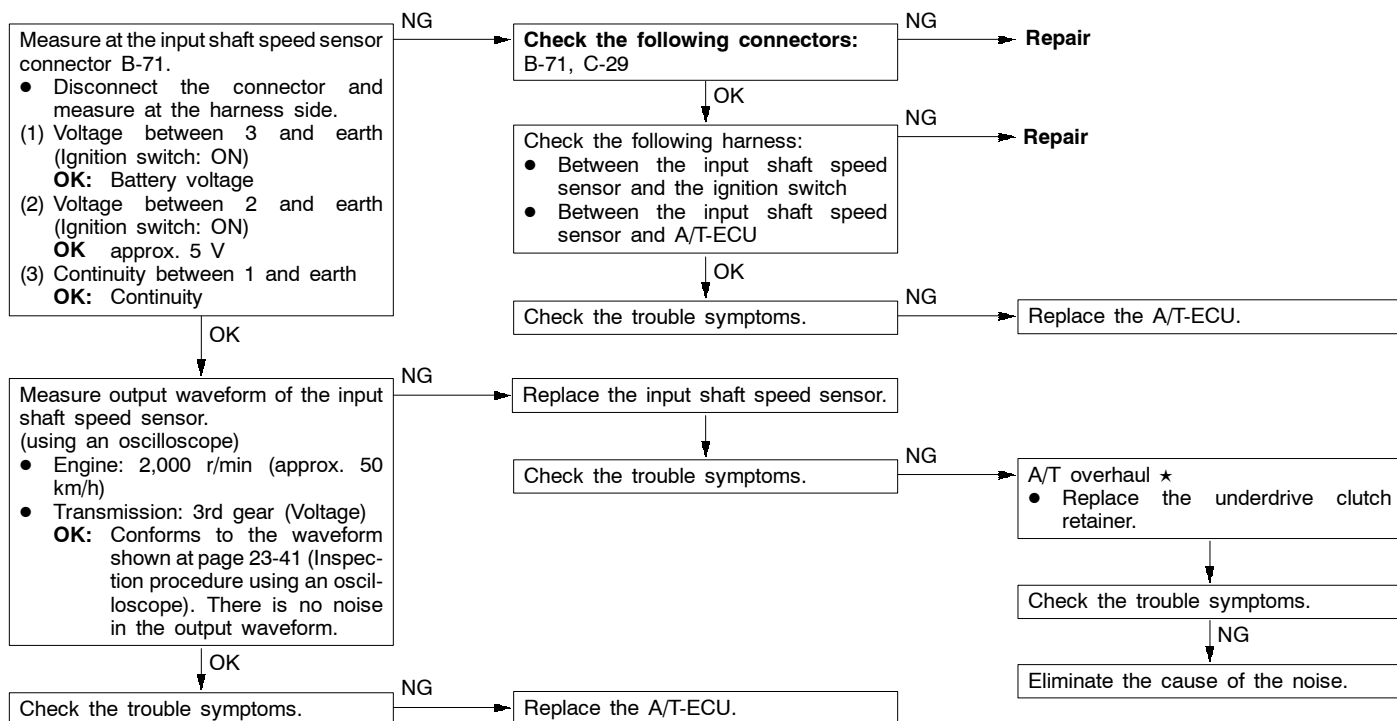


Code No. 21 Crank angle sensor system	Probable cause
If no output pulse is detected from the crank angle sensor for 5 seconds or more while driving at 25 km/h or more, it is judged that there is an open circuit in the crank angle sensor and diagnosis code No. 21 is output.	<ul style="list-style-type: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



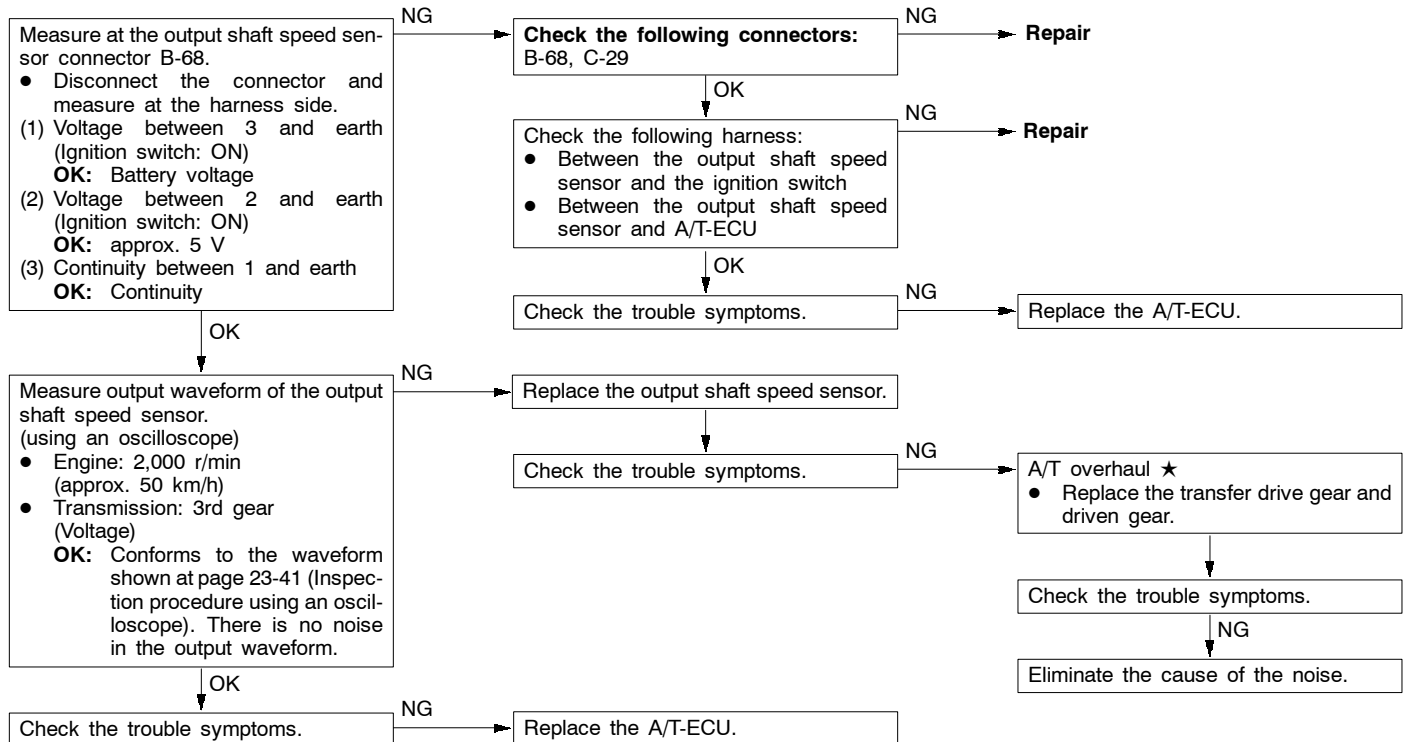
Code No. 22 Input shaft speed sensor system	Probable cause
If no output pulse is detected from the input shaft speed sensor for 1 second or more while driving in 3rd or 4th gear at a speed of 30 km/h or more, there is judged to be an open circuit or short-circuit in the input shaft speed sensor and diagnosis 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 Sports 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 A/T-ECU

★: Refer to the Transmission Workshop Manual.

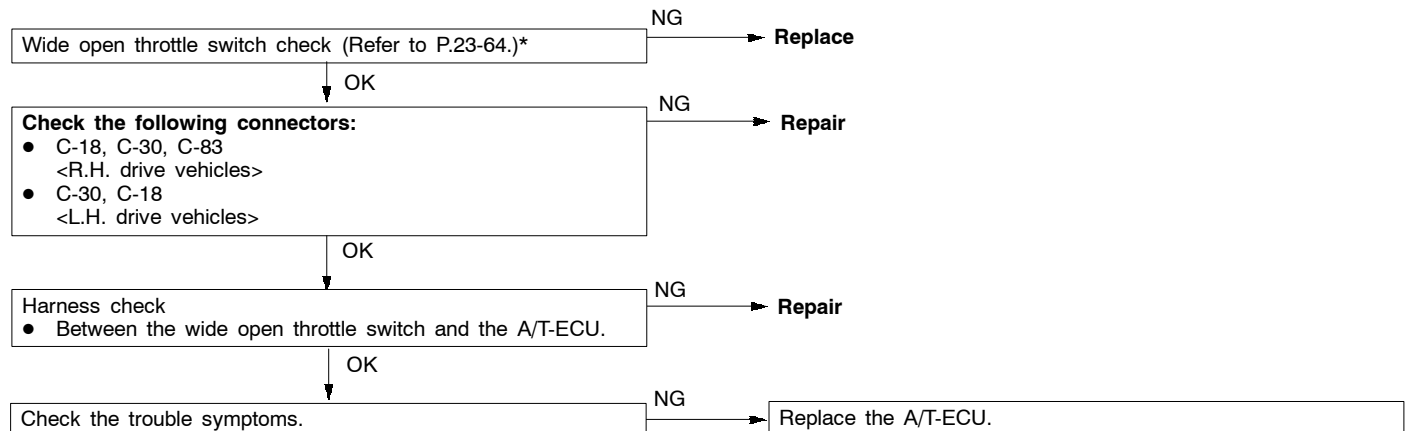


Code No. 23 Output shaft speed sensor system	Probable cause
<p>If the output from the output shaft speed sensor is continuously 50% lower than the vehicle speed for 1 second or more while driving in 3rd or 4th gear at a speed of 30 km/h or more, there is judged to be an open circuit or short-circuit 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 Sports 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 A/T-ECU

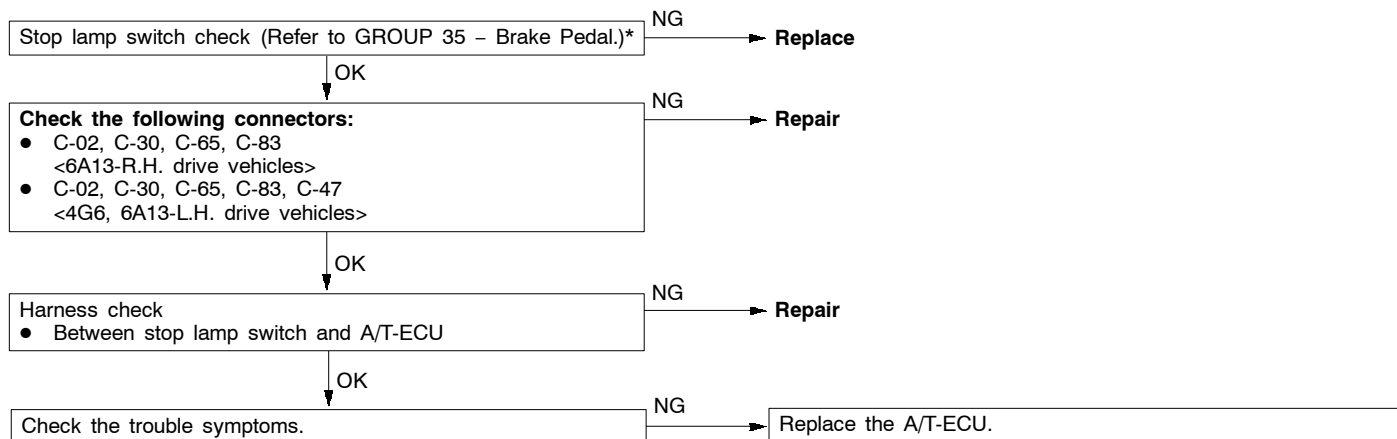
★: Refer to the Transmission Workshop Manual.



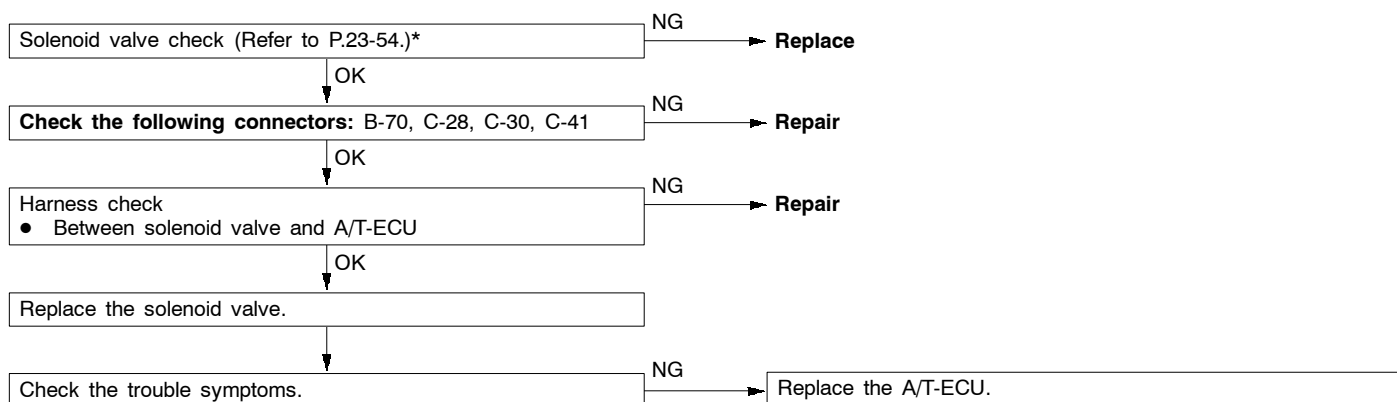
Code No. 25 Wide open throttle switch system	Probable cause
<p>If the wide open throttle switch is on for 1 second or more with the throttle valve opening angle at 70% or less, it is judged that there is a short circuit in the wide open throttle switch and diagnosis code No. 25 is output.</p>	<ul style="list-style-type: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



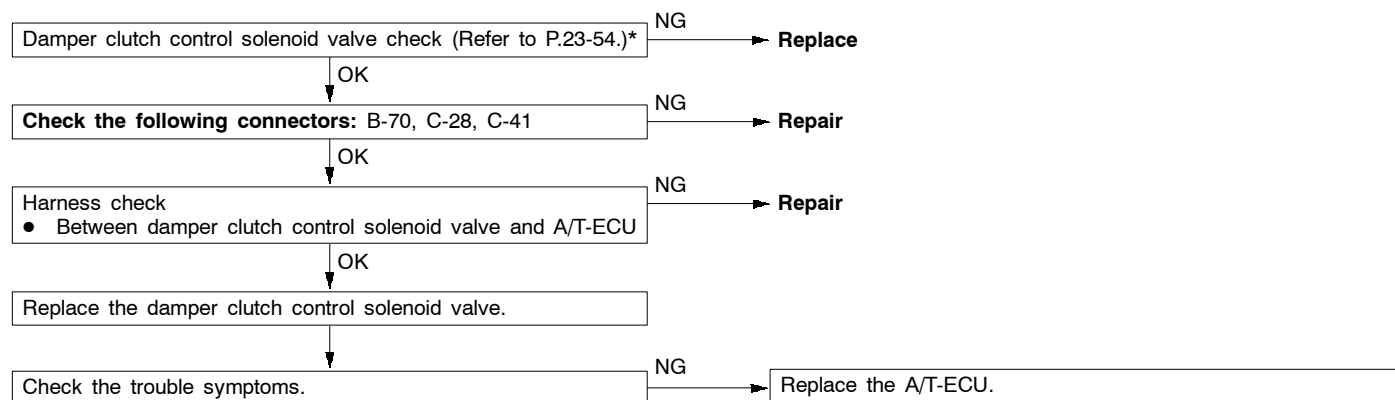
Code No. 26 Stop lamp switch system	Probable cause
If the stop lamp switch is on for 5 minutes or more while driving, it is judged that there is a short circuit in the stop lamp switch and diagnosis code No. 26 is output.	<ul style="list-style-type: none"> • Malfunction of the stop lamp switch • Malfunction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



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 A/T-ECU

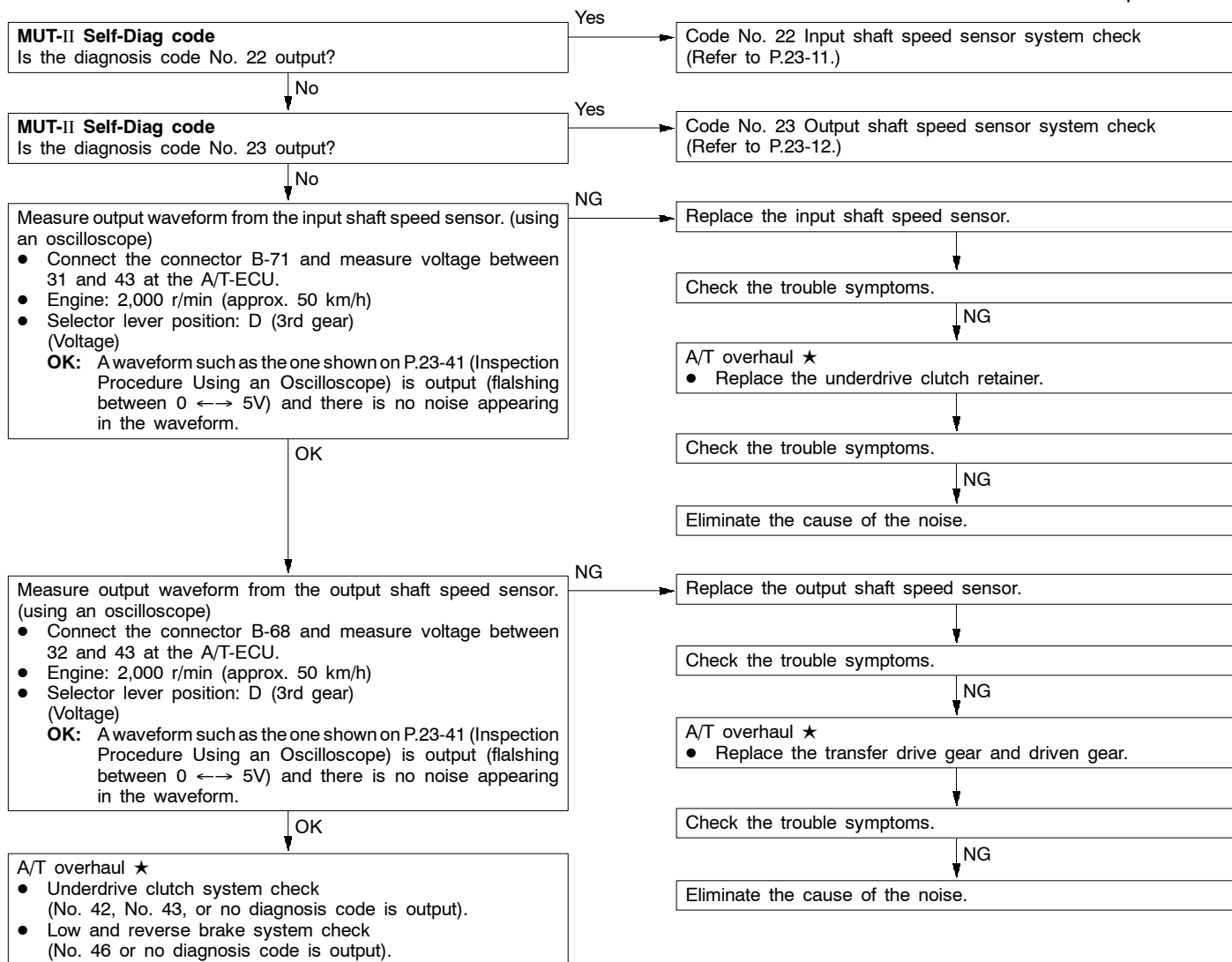


Code No. 36, 52 Damper clutch control solenoid valve system	Probable cause
<p>If the resistance value for the damper clutch control solenoid valve is too large or too small, it is judged that there is a short-circuit or an open circuit in the damper clutch control solenoid valve and diagnosis code No. 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 A/T-ECU



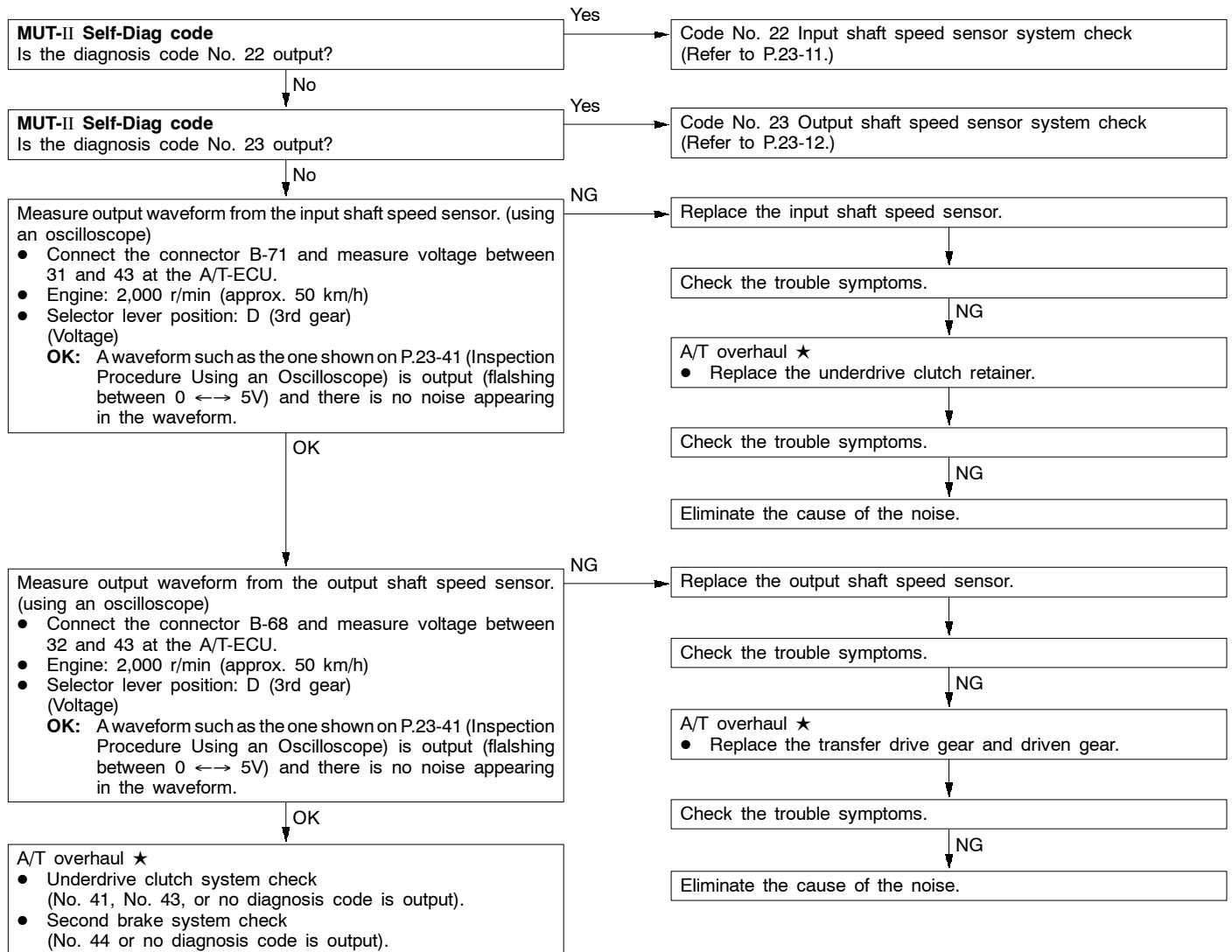
Code No. 41 1st gear ratio does not meet the specification	Probable cause
<p>If the output from the output shaft speed sensor multiplied by the 1st gear ratio is not the same as the output from the input shaft speed sensor after shifting to 1st gear has been completed, diagnosis code No. 41 is output. If diagnosis code No. 41 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 • Malfunction of the underdrive clutch system • Noise generated

★: Refer to the Transmission Workshop Manual.



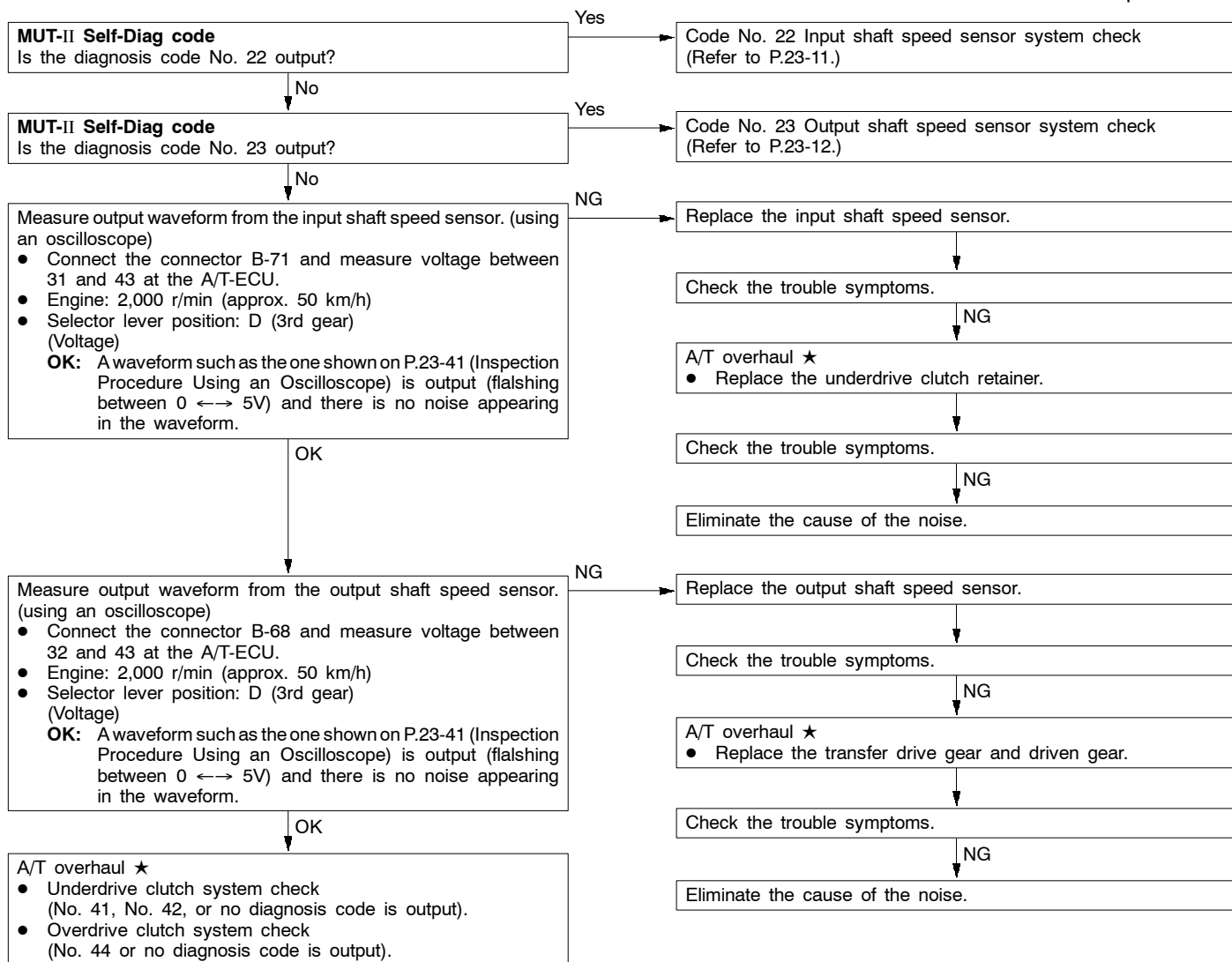
Code No. 42 2nd gear ratio does not meet the specification	Probable cause
<p>If the output from the output shaft speed sensor multiplied by the 2nd gear ratio is not the same as the output from the input shaft speed sensor after shifting to 2nd gear has been completed, diagnosis code No. 42 is output. If diagnosis code No. 42 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 second brake system • Malfunction of the underdrive clutch system • Noise generated

★: Refer to the Transmission Workshop Manual.



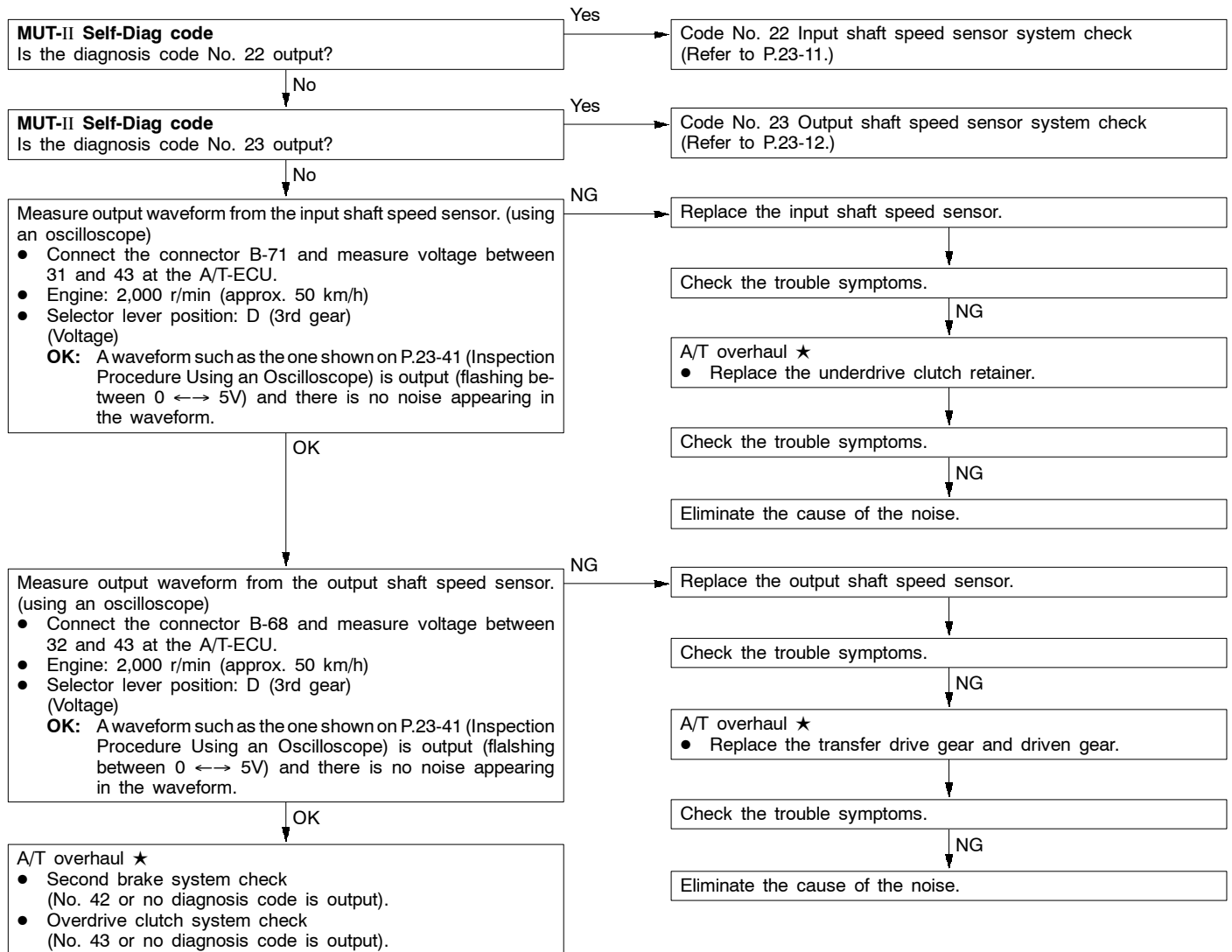
Code No. 43 3rd gear ratio does not meet the specification	Probable cause
<p>If the output from the output shaft speed sensor multiplied by the 3rd gear ratio is not the same as the output from the input shaft speed sensor after shifting to 3rd gear has been completed, diagnosis code No. 43 is output. If diagnosis code No. 43 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 underdrive clutch system • Malfunction of the overdrive clutch system • Noise generated

★: Refer to the Transmission Workshop Manual.



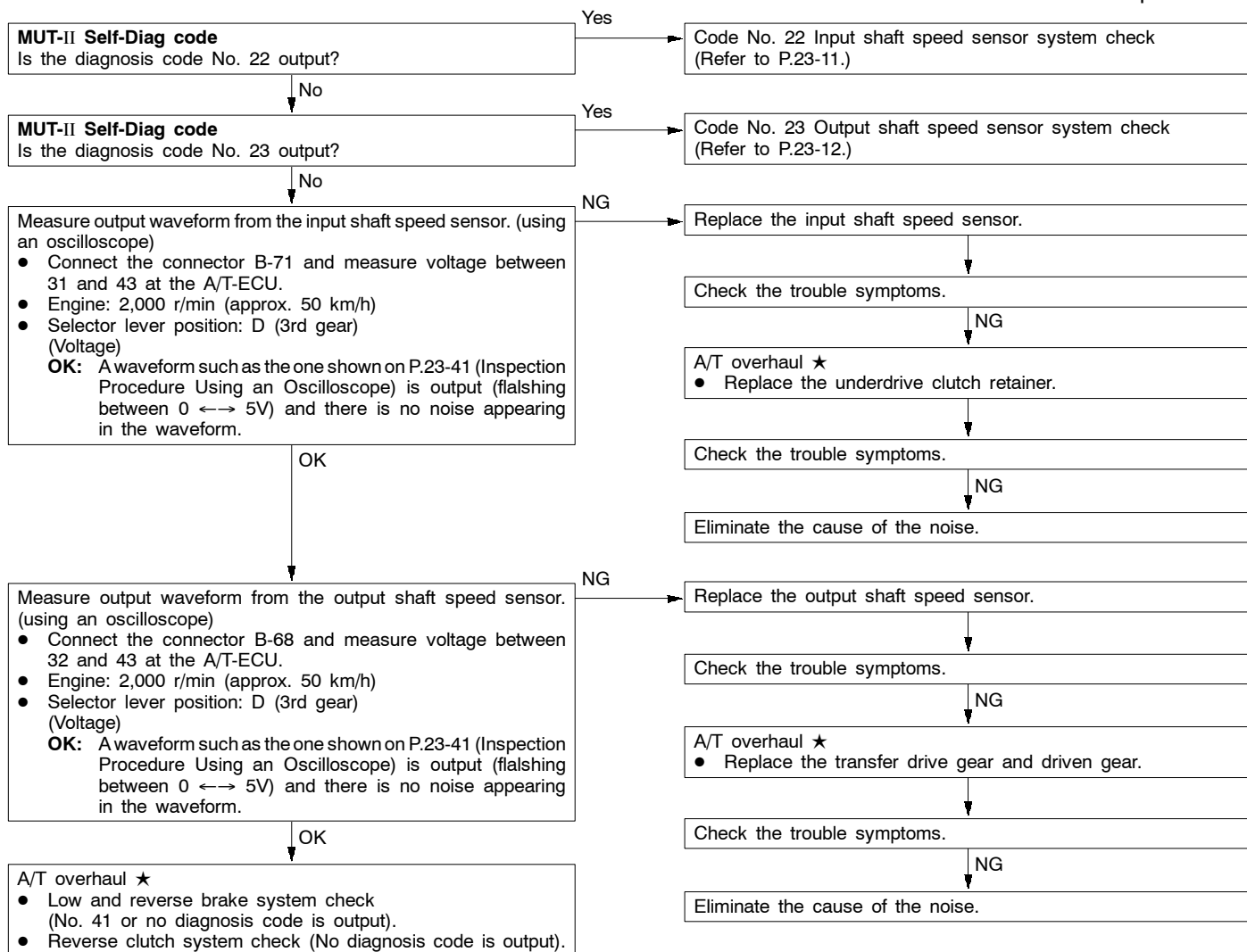
Code No. 44 4th gear ratio does not meet the specification	Probable cause
<p>If the output from the output shaft speed sensor multiplied by the 4th gear ratio is not the same as the output from the input shaft speed sensor after shifting to 4th gear has been completed, diagnosis code No. 44 is output. If diagnosis code No. 44 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 second brake system • Malfunction of the overdrive clutch system • Noise generated

★: Refer to the Transmission Workshop Manual.

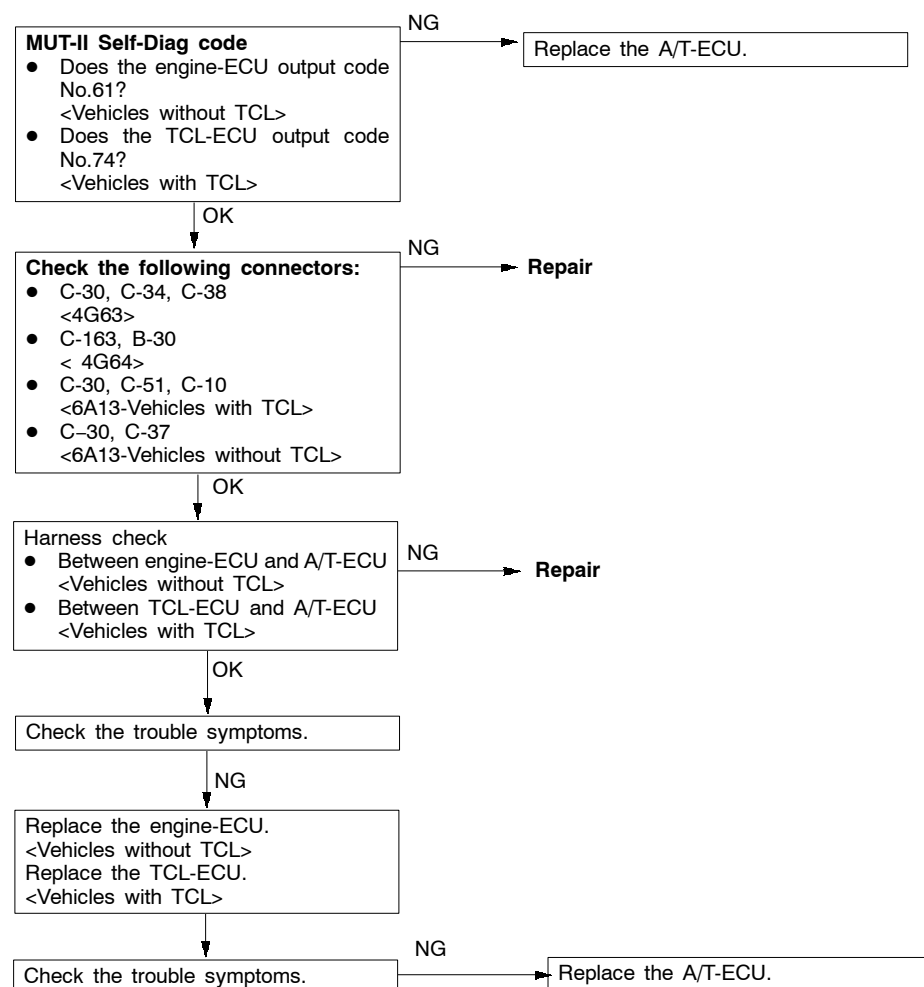


Code No. 46 Reverse gear ratio does not meet the specification	Probable cause
<p>If the output from the output shaft speed sensor multiplied by the reverse gear ratio is not the same as the output from the input shaft speed sensor after shifting to reverse gear has been completed, diagnosis code No. 46 is output. If diagnosis code No. 46 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 • Malfunction of the reverse clutch system • Noise generated

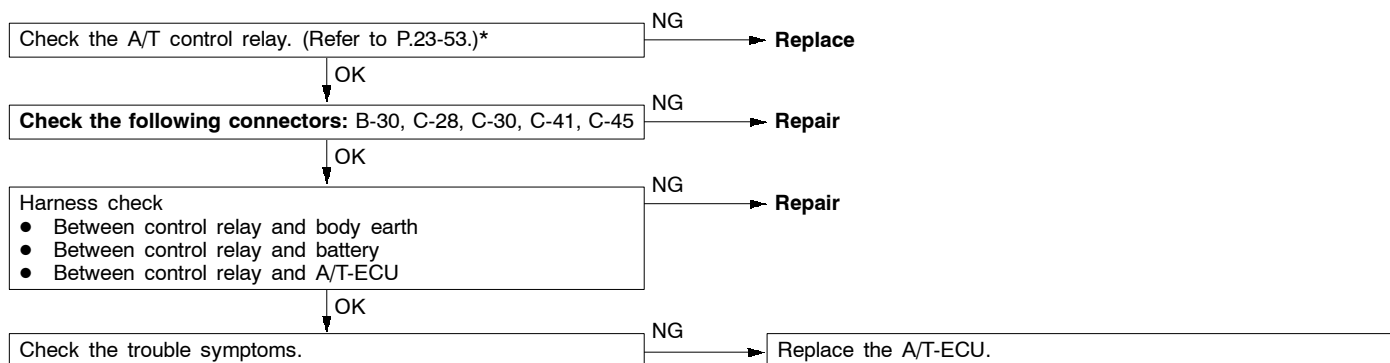
★: Refer to the Transmission Workshop Manual.



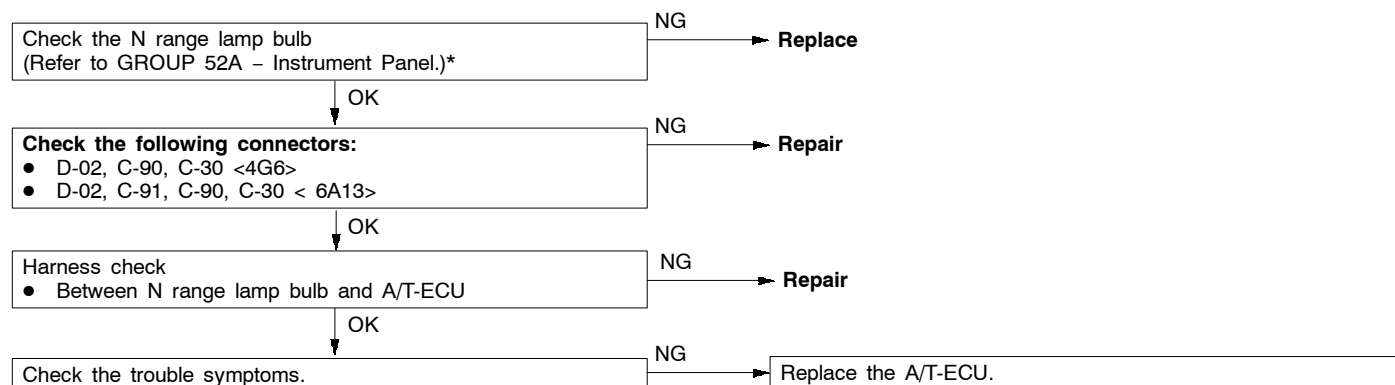
Code No. 51 Abnormal communication with engine-ECU <Vehicles without TCL> Abnormal communication with TCL-ECU <Vehicles with TCL>	Probable cause
<p>If normal communication is not possible for a continuous period of 1 second or more when the ignition switch is at the ON position, the battery voltage is 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.</p>	<ul style="list-style-type: none"> • Malfunction of connector • Malfunction of the engine-ECU <Vehicles without TCL> • Malfunction of the TCL-ECU <Vehicles with TCL> • Malfunction of the A/T-ECU



Code No. 54 A/T control relay system	Probable cause
<p>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.</p> <p>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.</p>	<ul style="list-style-type: none"> • Malfunction of the A/T control relay • Malfunction of connector • Malfunction of the A/T-ECU



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 A/T-ECU



Code No. 71 Malfunction of A/T-ECU	Probable cause
There is an abnormality in the A/T-ECU. The transmission is locked into 3rd gear as a fail-safe measure.	<ul style="list-style-type: none"> • Malfunction of the A/T-ECU

Replace the A/T-ECU.

INSPECTION CHART FOR TROUBLE SYMPTOMS

23100800267

Trouble symptom		Inspection procedure No.	Reference page
Communication with MUT-II is not possible		1	23-23
Driving impossible	Starting impossible	2	23-24
	Does not move forward	3	23-24
	Does not reverse	4	23-25
	Does not move (forward or reverse)	5	23-25
Malfunction when starting	Engine stalling when shifting	6	23-26
	Shocks when changing from N to D and large time lag	7	23-26
	Shocks when changing from N to R and large time lag	8	23-27
	Shocks when changing from N to D, N to R and large time lag	9	23-28
Malfunction when shifting	Shocks and running up	10	23-28

Trouble symptom		Inspection procedure No.	Reference page
Displaced shifting points	All points	11	23-29
	Some points	12	23-30
Does not shift	No diagnosis codes	13	23-30
Malfunction while driving	Poor acceleration	14	23-31
	Vibration	15	23-31
Inhibitor switch system		16	23-32
Shift switch assembly system		17	23-33
Dual pressure switch system		18	23-33
Vehicle speed sensor system		19	23-34
Auto-cruse-ECU signal system <MPI>		20	23-34

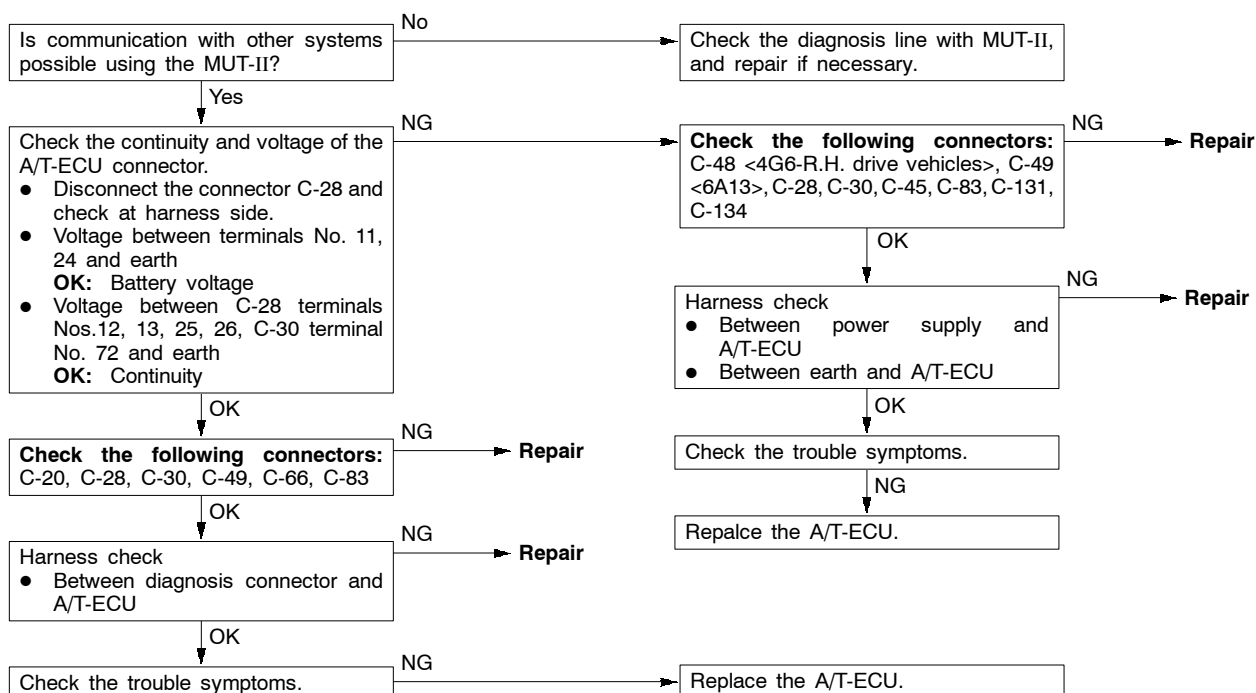
INSPECTION PROCEDURE FOR TROUBLE SYMPTOMS

NOTE

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

INSPECTION PROCEDURE 1

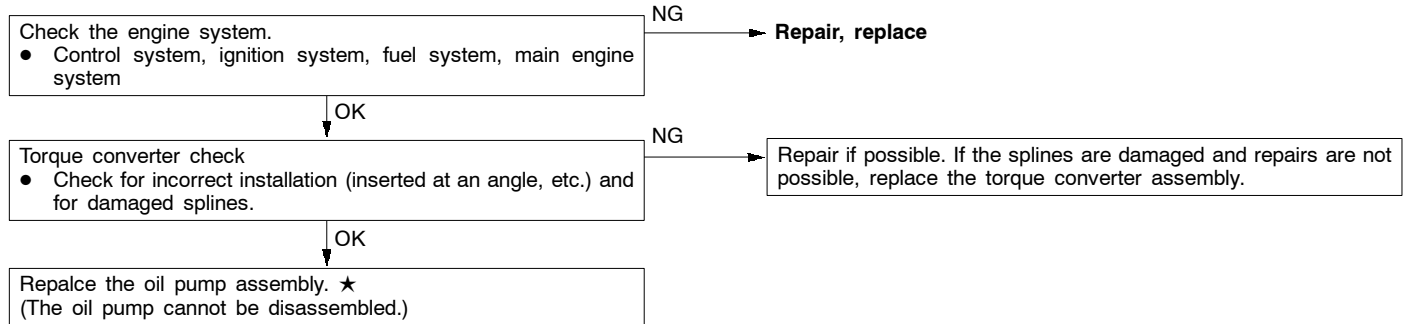
Communication with MUT-II is not possible	Probable cause
If communication with the MUT-II is not possible, the cause is probably a defective diagnosis line or the A/T-ECU is not functioning.	<ul style="list-style-type: none"> • Malfunction of diagnosis line • Malfunction of connector • Malfunction of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



INSPECTION PROCEDURE 2

Starting impossible	Probable cause
Starting is not possible when the selector lever is in P or N range. In such cases, the cause is probably a defective engine system, torque converter or oil pump.	<ul style="list-style-type: none"> • Malfunction of the engine system • Malfunction of the torque converter • Malfunction of the oil pump

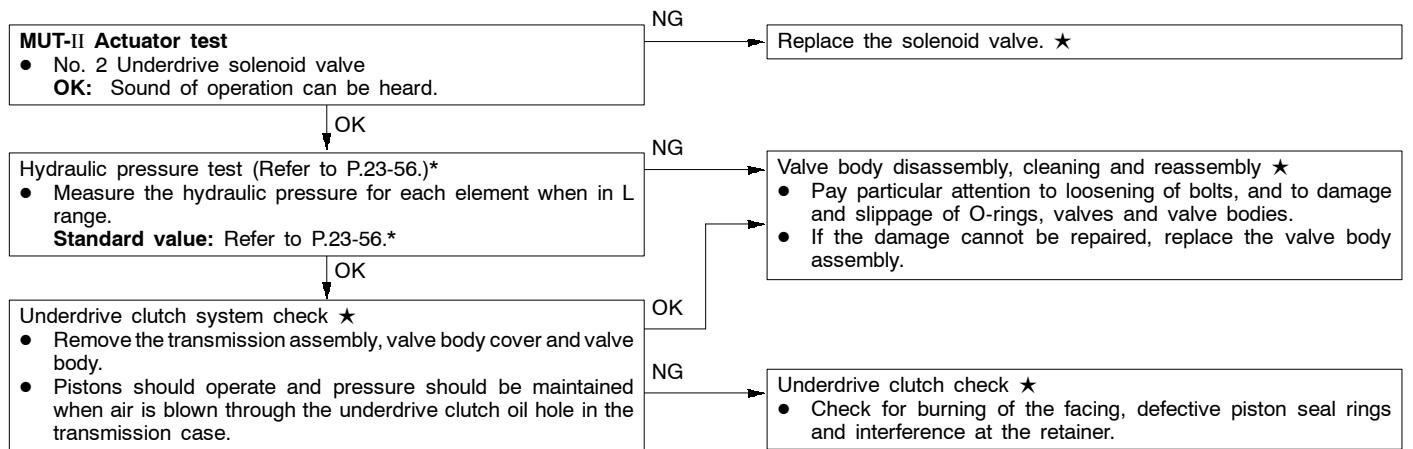
★: Refer to the Transmission Workshop Manual.



INSPECTION PROCEDURE 3

Does not move (forward)	Probable cause
If the vehicle does not move forward when the selector lever is shifted from N to D, Sports mode 1st or 2nd range while the engine is idling, the cause is probably abnormal line pressure or a malfunction of the underdrive clutch or valve body.	<ul style="list-style-type: none"> • Abnormal line pressure • Malfunction of the underdrive solenoid valve • Malfunction of the underdrive clutch • Malfunction of the valve body

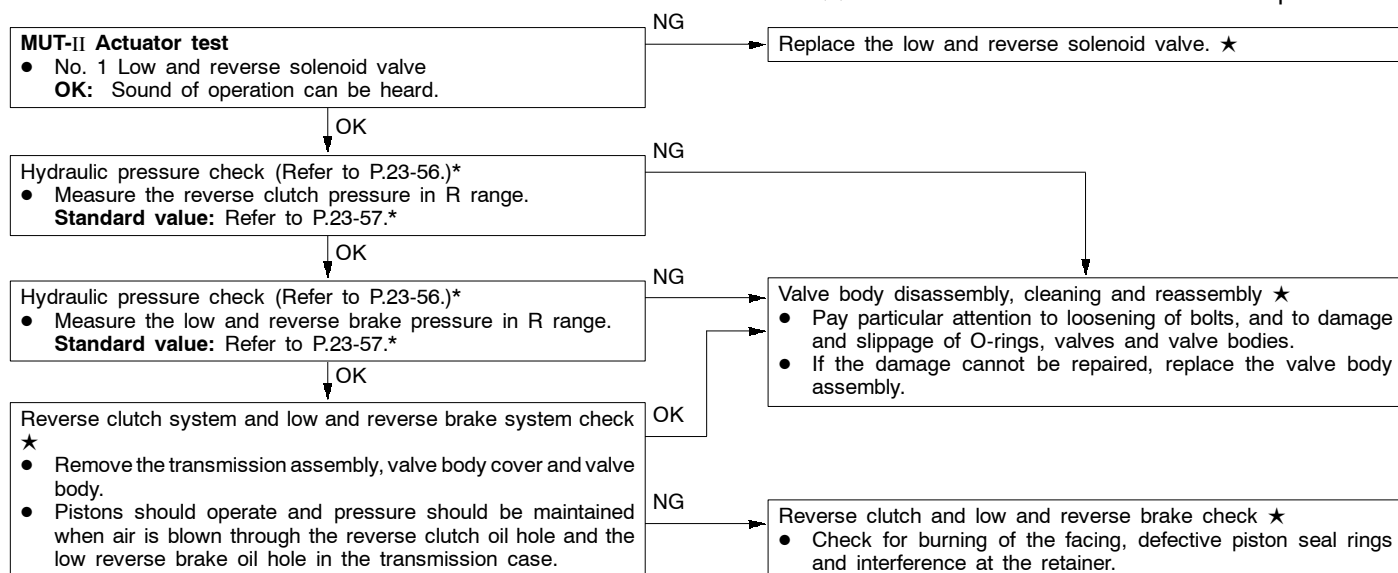
★: Refer to the Transmission Workshop Manual.



INSPECTION PROCEDURE 4

Does not reverse	Probable cause
If the vehicle does not reverse when the selector lever is shifted from N to R range while the engine is idling, the cause is probably abnormal pressure in the reverse clutch or low and reverse brake or a malfunction of the reverse clutch, low and reverse brake or valve body.	<ul style="list-style-type: none"> Abnormal reverse clutch pressure Abnormal low and reverse brake pressure Malfunction of the low and reverse solenoid valve Malfunction of the reverse clutch Malfunction of the low and reverse brake Malfunction of the valve body

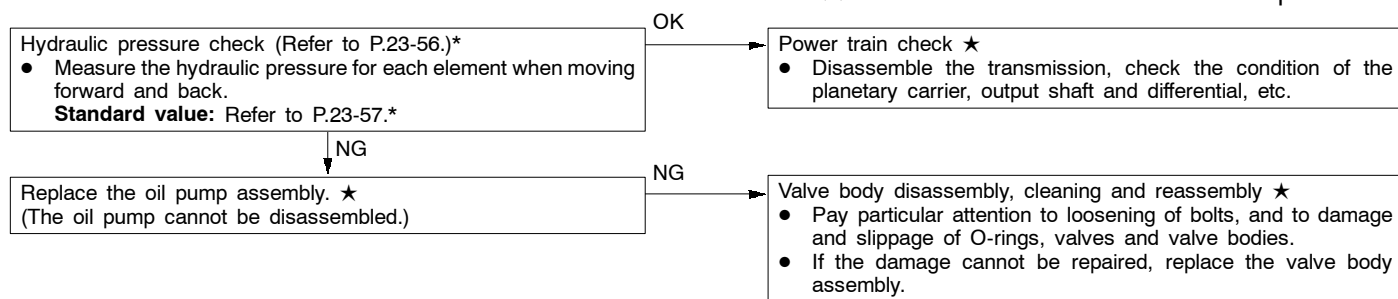
★: Refer to the Transmission Workshop Manual.



INSPECTION PROCEDURE 5

Does not move (forward or reverse)	Probable cause
If the vehicle does not move forward or reverse when the selector lever is shifted to any position while the engine is idling, the cause is probably abnormal line pressure, or a malfunction of the power train, oil pump or valve body.	<ul style="list-style-type: none"> Abnormal line pressure Malfunction of power train Malfunction of the oil pump Malfunction of the valve body

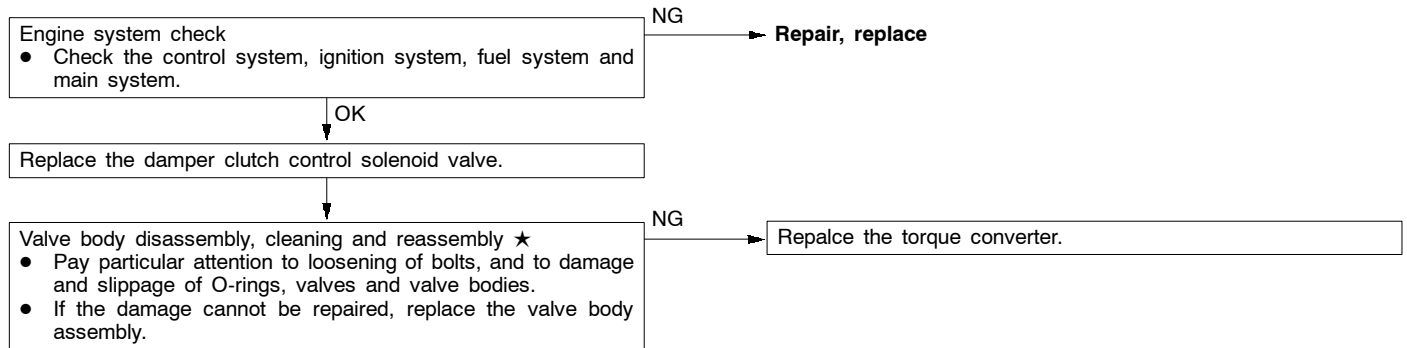
★: Refer to the Transmission Workshop Manual.



INSPECTION PROCEDURE 6

Engine stalling when shifting	Probable cause
If the engine stalls when the selector lever is shifted from N to D or R range while the engine is idling, the cause is probably a malfunction of the engine system, damper clutch solenoid valve, valve body or torque converter (damper clutch malfunction).	<ul style="list-style-type: none"> • Malfunction of the engine system • Malfunction of the damper clutch control solenoid valve • Malfunction of the valve body • Malfunction of the torque converter (Malfunction of the damper clutch)

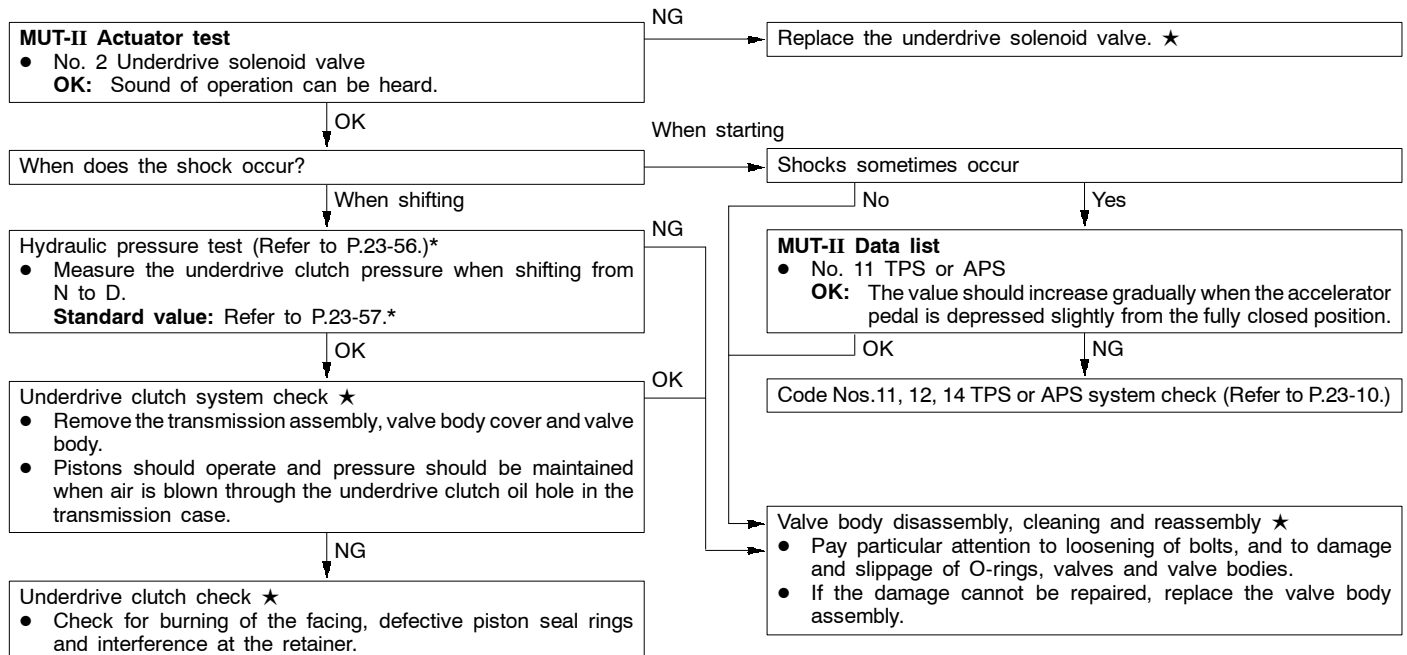
★: Refer to the Transmission Workshop Manual.



INSPECTION PROCEDURE 7

Shocks when changing from N to D and large time lag	Probable cause
If abnormal shocks or a time lag of 2 seconds or more occur when the selector lever is shifted from N to D range while the engine is idling, the cause is probably abnormal underdrive clutch pressure or a malfunction of the underdrive clutch, valve body, APS or TPS.	<ul style="list-style-type: none"> • Abnormal underdrive clutch pressure • Malfunction of the underdrive solenoid valve • Malfunction of the underdrive clutch • Malfunction of the valve body • Malfunction of the TPS or APS

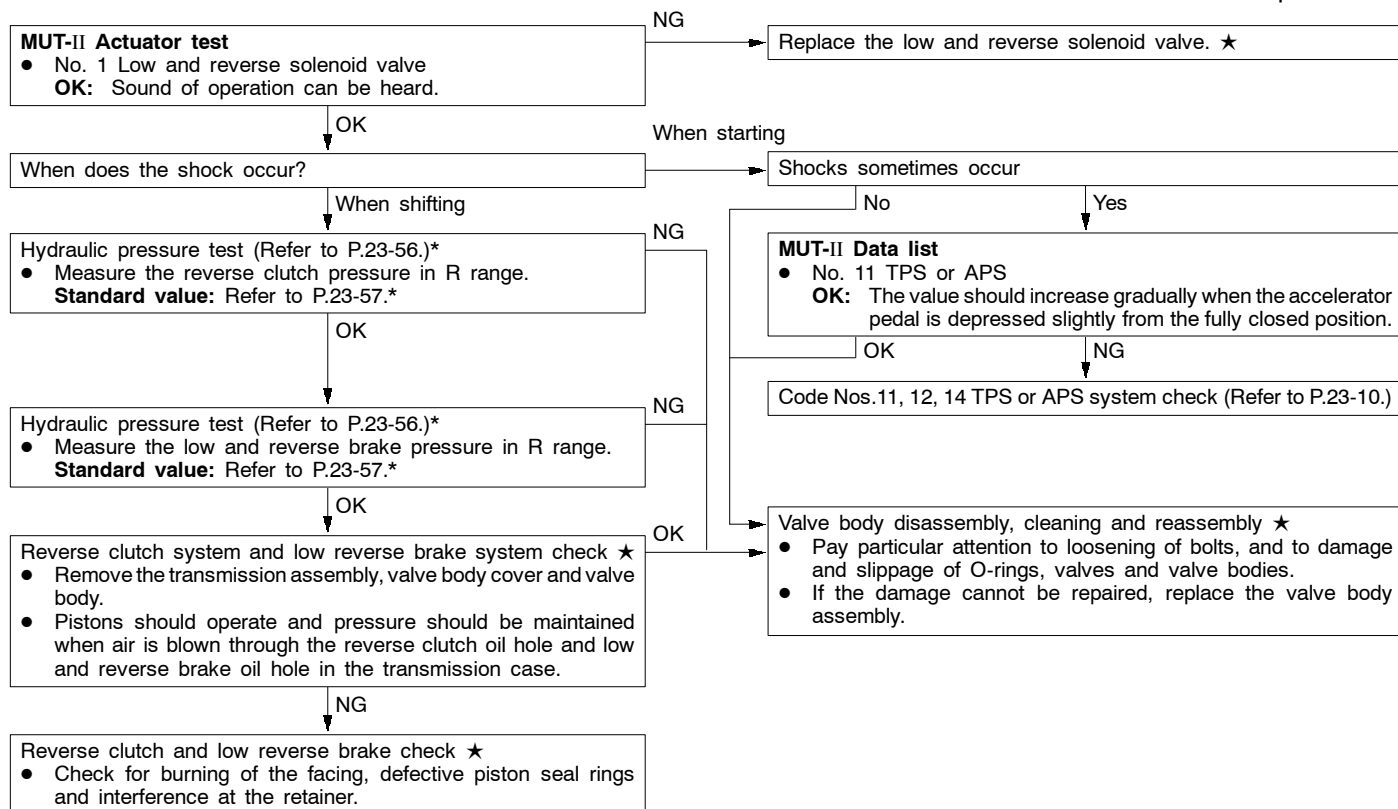
★: Refer to the Transmission Workshop Manual.



INSPECTION PROCEDURE 8

Shocks when changing from N to R and large time lag	Probable cause
If abnormal shocks or a time lag of 2 seconds or more occurs when the selector lever is shifted from N to R range while the engine is idling, the cause is probably abnormal reverse clutch pressure or low and reverse brake pressure, or a malfunction of the reverse clutch, low and reverse brake, valve body, TPS or APS.	<ul style="list-style-type: none"> Abnormal reverse clutch pressure Abnormal low and reverse brake pressure Malfunction of the low and reverse solenoid valve Malfunction of the reverse clutch Malfunction of the low and reverse brake Malfunction of the valve body Malfunction of the TPS or APS

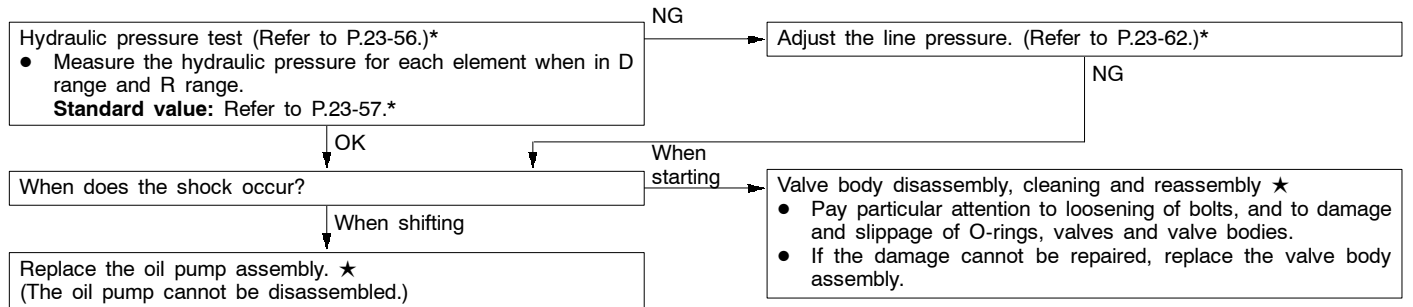
★: Refer to the Transmission Workshop Manual.



INSPECTION PROCEDURE 9

Shocks when changing from N to D, N to R and large time lag	Probable cause
If abnormal shocks or a time lag of 2 seconds or more occur when the selector lever is shifted from N to D range and from N to R range while the engine is idling, the cause is probably abnormal line pressure or a malfunction of the oil pump or valve body.	<ul style="list-style-type: none"> Abnormal line pressure Malfunction of the oil pump Malfunction of the valve body

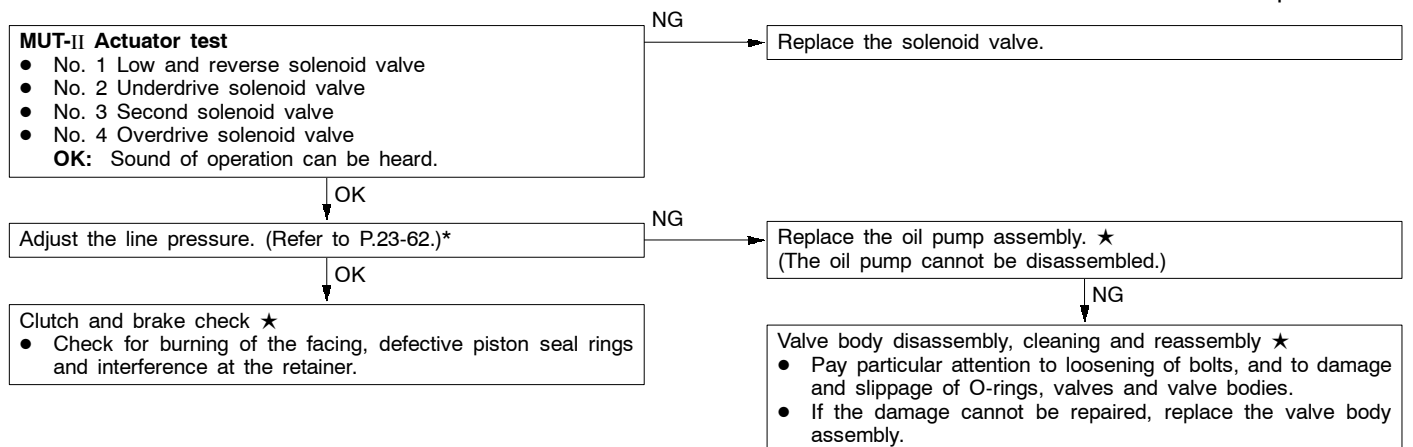
★: Refer to the Transmission Workshop Manual.



INSPECTION PROCEDURE 10

Shocks and running up	Probable cause
If shocks occur when driving due to upshifting or downshifting and the transmission speed becomes higher than the engine speed, the cause is probably abnormal line pressure or a malfunction of a solenoid valve, oil pump, valve body or of a brake or clutch.	<ul style="list-style-type: none"> Abnormal line pressure Malfunction of each solenoid valve Malfunction of the oil pump Malfunction of the valve body Malfunction of each brake or each clutch

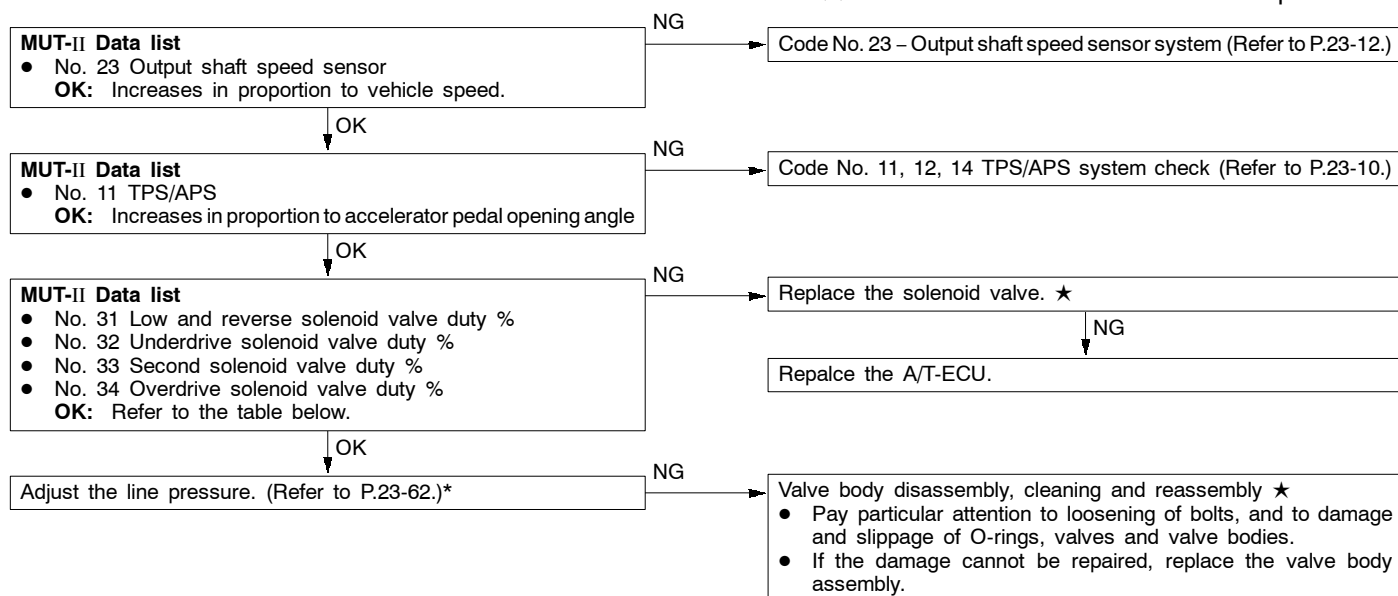
★: Refer to the Transmission Workshop Manual.



INSPECTION PROCEDURE 11

All points (Displaced shifting points)	Probable cause
If all shift points are displaced while driving, the cause is probably a malfunction of the output shaft speed sensor, TPS or APS of a solenoid valve.	<ul style="list-style-type: none"> Malfunction of the output shaft speed sensor Malfunction of the TPS or APS Malfunction of each solenoid valve Abnormal line pressure Malfunction of the valve body Malfunction of the A/T-ECU

★: Refer to the Transmission Workshop Manual.

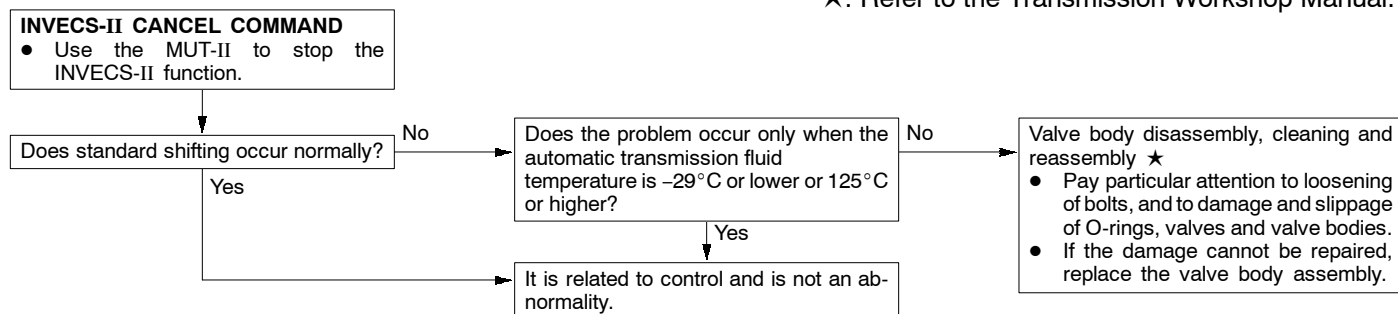


	No. 31	No. 32	No. 33	No. 34
Driving at constant speed in 1st gear	0 %	0 %	100 %	100 %
Driving at constant speed in 2nd gear	100 %	0 %	0 %	100 %
Driving at constant speed in 3rd gear	100 %	0 %	100 %	0 %
Driving at constant speed in 4th gear	100 %	100 %	0 %	0 %

INSPECTION PROCEDURE 12

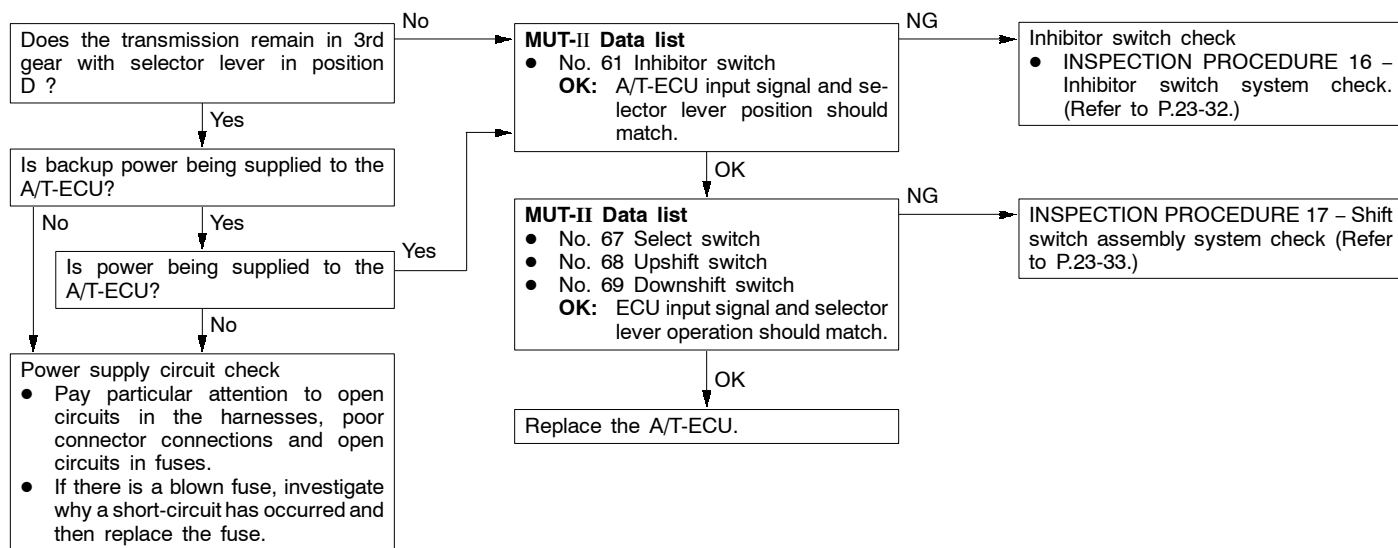
Some points (Displaced shifting points)	Probable cause
If some of the shift points are displaced while driving, the cause is probably a malfunction of the valve body, or it is related to control and is not an abnormality.	<ul style="list-style-type: none"> Malfunction of the valve body

★: Refer to the Transmission Workshop Manual.



INSPECTION PROCEDURE 13

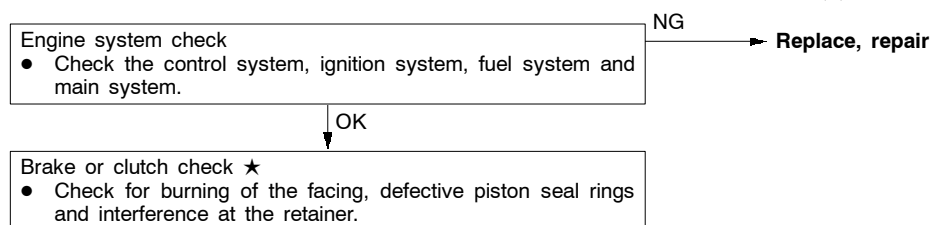
No diagnosis codes (Does not shift)	Probable cause
If shifting does not occur while driving and no diagnosis codes are output, the cause is probably a malfunction of the inhibitor switch, or A/T-ECU.	<ul style="list-style-type: none"> Malfunction of the inhibitor switch Malfunction of shift switch assembly Malfunction of the A/T-ECU



INSPECTION PROCEDURE 14

Poor acceleration	Probable cause
If acceleration is poor even if downshifting occurs while driving, the cause is probably a malfunction of the engine system or of a brake or clutch.	<ul style="list-style-type: none"> Malfunction of the engine system Malfunction of the brake or clutch

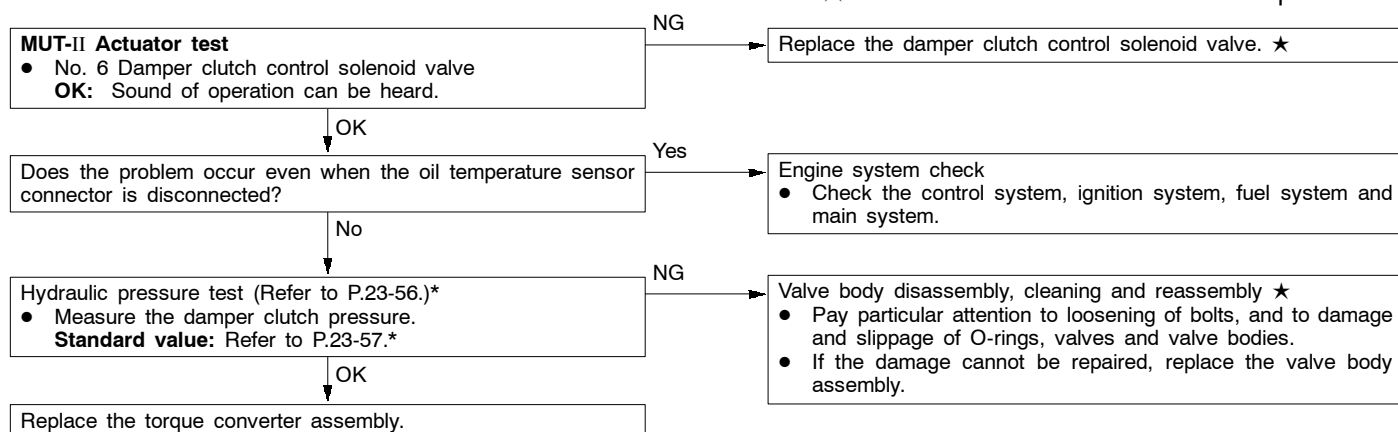
★: Refer to the Transmission Workshop Manual.



INSPECTION PROCEDURE 15

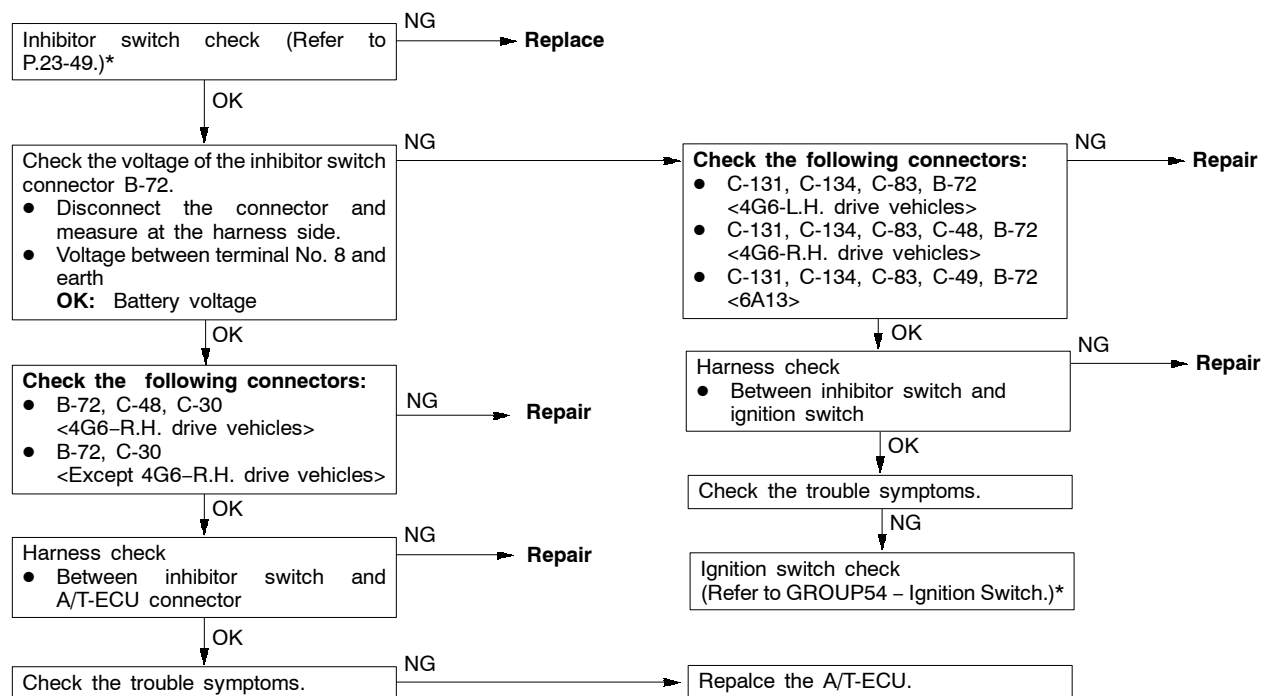
Vibration	Probable cause
If vibration occurs when driving at constant speed or when accelerating and deceleration in top range, the cause is probably abnormal damper clutch pressure or a malfunction of the engine system, damper clutch control solenoid valve, torque converter or valve body.	<ul style="list-style-type: none"> Abnormal damper clutch pressure Malfunction of the engine system Malfunction of the damper clutch control solenoid valve Malfunction of the torque converter Malfunction of the valve body

★: Refer to the Transmission Workshop Manual.



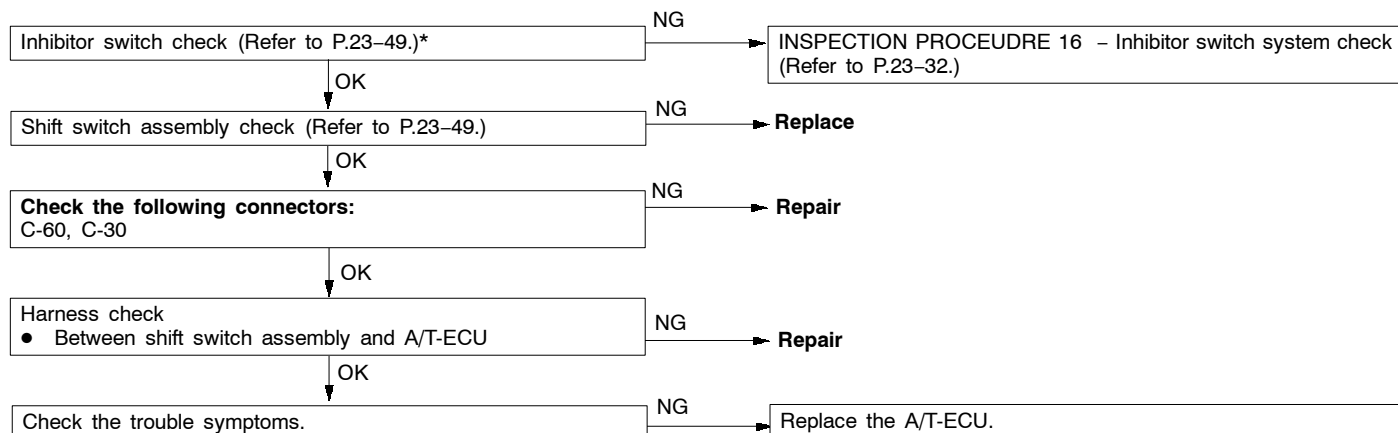
INSPECTION PROCEDURE 16

Inhibitor switch system	Probable cause
The cause is probably a malfunction of the inhibitor switch circuit, ignition switch circuit or a defective 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 A/T-ECU



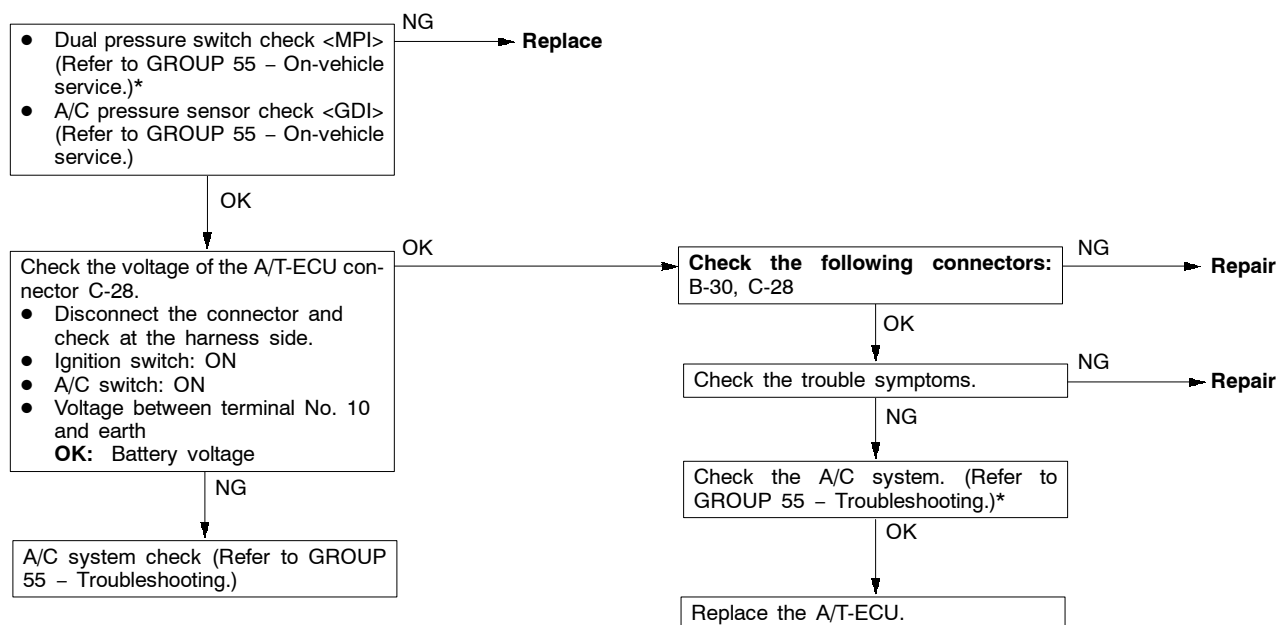
INSPECTION PROCEDURE 17

Shift switch assembly system	Probable cause
The cause is probably a malfunction of the inhibitor switch circuit, shift switch assembly circuit or a 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 A/T-ECU



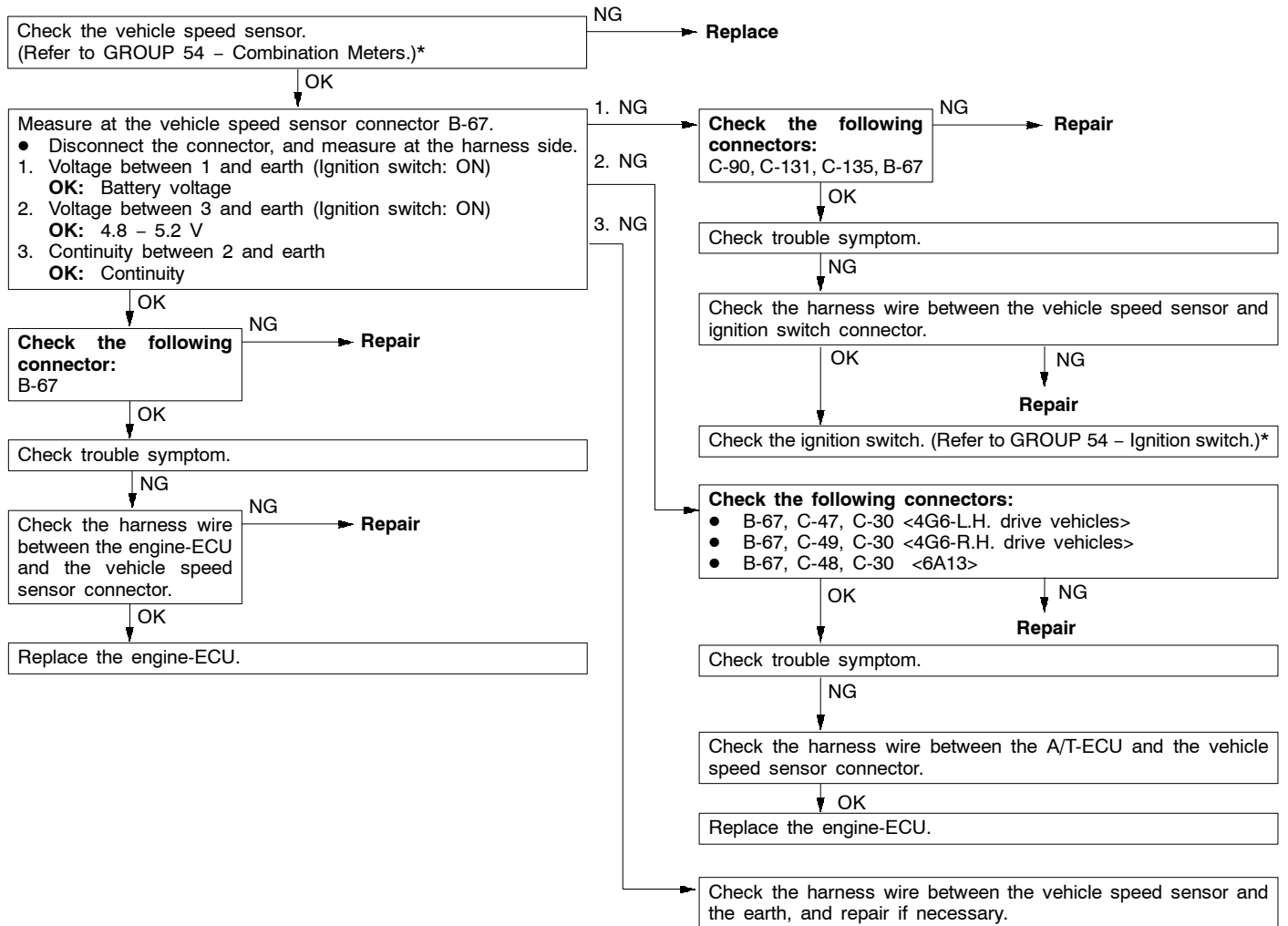
INSPECTION PROCEDURE 18

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



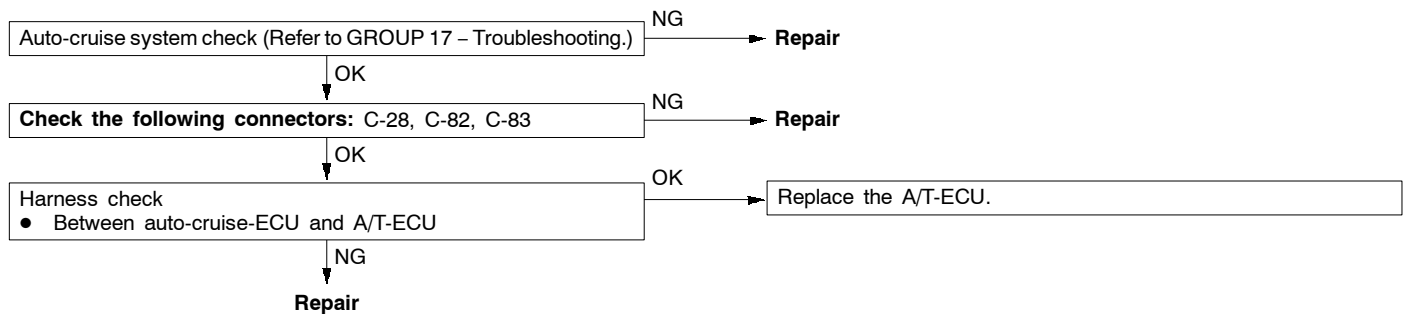
INSPECTION PROCEDURE 19

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



INSPECTION PROCEDURE 20

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



DATA LIST REFERENCE TABLE

Item No.	Check item	Check requirement		Normal value
11	Throttle position sensor <6A13–Vehicles without TCL, 4G63> Accelerator pedal position sensor <6A13–Vehicles with TCL, 4G64>	Engine: Stopped Selector lever position: P	Accelerator pedal: Released	400 – 1,000 mV
			Accelerator pedal: Halfly depressed	Gradually rises from the above value
			Accelerator pedal: Depressed	4,500 – 5,000 mV
15	Oil temperature sensor	Warming up	Drive for 15 minutes or more so that the automatic transmission fluid temperature becomes 70 – 90 °C.	Gradually rises to 70 – 90 °C
21	Crank angle sensor	Engine: Idling Selector lever position: P	Accelerator pedal: Released	550 – 900 r/min
			Accelerator pedal: Halfly depressed	Gradually rises from the above value
22	Input shaft speed sensor	Selector lever position: Sports mode	Driving at constant speed of 50 km/h in 3rd gear	1,800 – 2,100 r/min
23	Output shaft speed sensor	Selector lever position: Sports mode	Driving at constant speed of 50 km/h in 3rd gear	1,800 – 2,100 r/min
25	Wide open throttle switch	Accelerator pedal position	Released	OFF
			Depressed	ON
26	Stop lamp switch	Ignition switch: ON Engine: Stopped	Brake pedal: Depressed	ON
			Brake pedal: Released	OFF
29	Vehicle speed sensor	Selector lever position: Sports mode	Idling with 1st gear (Vehicle stopped)	0 km/h
			Driving at constant speed of 50 km/h in 3rd gear	50 km/h
31	Low and reverse solenoid valve duty %	Selector lever position: Sports mode	10 km/h in 1st gear	No. 31: 0 %, No. 32: 0 %, No. 33: 100 %, No. 34: 100%
32	Underdrive solenoid valve duty %		30 km/h in 2nd gear	No. 31: 100 %, No. 32: 0 %, No. 33: 0 %, No. 34: 100%
33	Second solenoid valve duty %		50 km/h in 3rd gear	No. 31: 100 %, No. 32: 0 %, No. 33: 100 %, No. 34: 0%
34	Overdrive solenoid valve duty %		70 km/h in 4th gear	No. 31: 100 %, No. 32: 100 %, No. 33: 0 %, No. 34: 0%

Item No.	Check item	Check requirement		Normal value
36	Damper clutch control solenoid valve duty %	Selector lever position: Sports mode	Driving at 50 km/h in 3rd gear with accelerator released	0 %
			Driving at constant speed of 70 km/h in 3rd gear	Approx. 70 – 90 %
52	Amount of damper clutch slippage	Selector lever position: Sports mode	Driving at 50 km/h in 3rd gear with accelerator fully closed	Approx. 100 – 300 r/min
			Driving at constant speed of 70 km/h in 3rd gear	Approx. 0 – 10 r/min
54	Control relay output voltage	Ignition switch : OFF	Ignition switch: ON → OFF	Battery voltage (mV) → 0 mV
57	Engine volumetric efficiency <MPI>	Selector lever position: N	N range with accelerator pedal released → depressed.	Data changes
61	Inhibitor switch	Ignition switch: ON Engine: Stopped	Selector lever position: P	P
			Selector lever position: R	R
			Selector lever position: N	N
			Selector lever position: D	D
63	Shift position	Selector lever position: Sports mode	Driving at constant speed of 10 km/h in 1st gear	1st
			Driving at constant speed of 30 km/h in 2nd gear	2nd
			Driving at constant speed of 50 km/h in 3rd gear	3rd
			Driving at constant speed of 70 km/h in 4th gear	4th
65	Dual pressure switch	Engine: Idling Selector lever position: N	A/C switch: ON	ON
			A/C switch: OFF	OFF
66	Auto-cruise-ECU signal <MPI>	While auto-cruise operating	Plain road	OFF
			Sloping road	ON

Item No.	Check item	Check requirement		Normal value
67	Select switch	Ignition switch: ON Engine: Stopped		Selector lever position: D Data list No.67: OFF, Data list No.68: OFF, Data list No.69: OFF Selector lever operation: Select sports mode Data list No.67: ON, Data list No.68: OFF, Data list No.69: OFF
68	Upshift switch			Selector lever operation: Upshift and hold the selector lever Data list No.67: ON, Data list No.68: ON, Data list No.69: OFF
69	Downshift switch			Selector lever operation: Downshift and hold the selector lever Data list No.67: ON, Data list No.68: OFF, Data list No.69: ON
73	Engine target effective pressure <GDI>	Selector lever position: N	N range with accelerator pedal released to depressed	Data changes

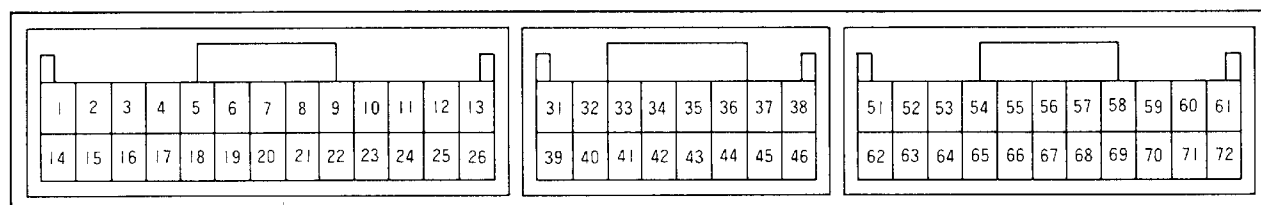
ACTUATOR TEST JUDGEMENT VALUE

Item No.	Check item	Test content	Check requirement	Normal value
1	Low reverse solenoid valve	Drive the solenoid valve specified by the MUT-II at 50 % duty for 5 seconds. No other solenoid valve should be energised.	Ignition switch: ON Selector lever position: P Engine: 0 r/min Vehicle speed: 0 km/h (Vehicle stopped) Throttle (Accelerator) opening voltage: Less than 0 V	The operation sound should be audible when the solenoid valve is driven.
2	Underdrive solenoid valve			
3	Second solenoid valve			
4	Overdrive solenoid valve			
6	Damper clutch control solenoid valve			
7	1st indicator lamp	Illuminate each indicator lamp for three seconds according to the signal from the MUT-II.		Shift indicator lamp illuminates.
8	2nd indicator lamp			
9	3rd indicator lamp			
10	4th indicator lamp			
12	A/T control relay	Control relay is OFF for 3 seconds.		Data list No. 54 (1) During test: 0 mV (2) Normal: Battery voltage [mV]

INVECS-II CANCEL COMMAND

Item No.	Item	Content	Remarks
14	INVECS-II	Stop the INVECS-II control and change gears according to the standard shift pattern.	Use this function when carrying out procedure 8 in the road tests.

CHECK AT A/T-ECU TERMINALS



A9FA0133

Terminal No.	Check item	Check requirement	Standard value
1	Underdrive solenoid valve	Selector lever position: Sports mode (1st gear)	Battery voltage
		Selector lever position: P	Approx.7 – 9 V
2	Solenoid valve power supply	Ignition switch: OFF	0 V
		Ignition switch: ON	Battery voltage
3	Solenoid valve power supply	Ignition switch: OFF	0 V
		Ignition switch: ON	Battery voltage
4	1st gear shift indicator lamp	Gear: 1st gear	Battery voltage
		Gear: Other than above	0 V
5	3rd gear shift indicator lamp	Gear: 3rd gear	Battery voltage
		Gear: Other than above	0 V
8	Auto-cruse control unit (MPI)	No OD-OFF request	Battery voltage
		OD-OFF request	0 V
10	A/C compressor load signal	A/C switch: OFF	0 V
		A/C switch: ON	Battery voltage
11	Power supply	Ignition switch: OFF	0 V
		Ignition switch: ON	Battery voltage
12	Earth	Always	0 V
13	Earth	Always	0 V

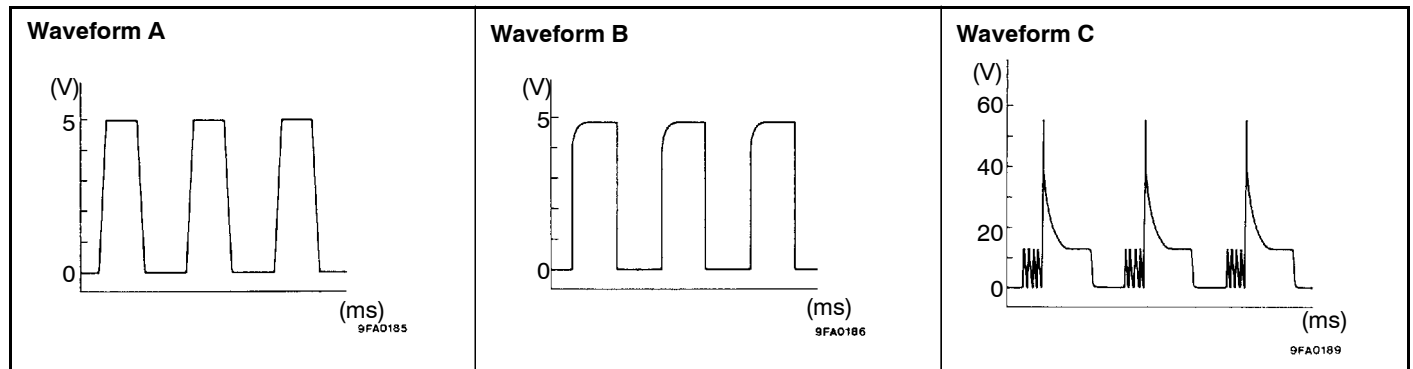
Terminal No.	Check item	Check requirement	Standard value
14	Overdrive solenoid valve	Selector lever position: Sports mode (3rd gear)	Battery voltage
		Selector lever position: P	Approx. 7 – 9 V
15	Damper clutch control solenoid valve	Selector lever position: Sports mode (1st gear)	Battery voltage
		Selector lever position: Sports mode (50 km/h in 3rd gear)	Other than battery voltage
16	Second solenoid valve	Selector lever position: Sports mode (2nd gear)	Battery voltage
		Selector lever position: P	Approx. 7 – 9 V
17	2nd gear shift indicator lamp	Gear: 2nd gear	Battery voltage
		Gear: Other than above	0 V
18	4th gear shift indicator lamp	Gear: 4th gear	Battery voltage
		Gear: Other than above	0 V
21	Engine-ECU torque reduction request signal <Vehicles with TCL>	Ignition switch: ON (except during shifting)	4 – 5 V
23	Diagnosis control	–	–
24	Power supply	Ignition switch: OFF	0 V
		Ignition switch: ON	Battery voltage
25	Earth	Always	0 V
26	Earth	Always	0 V
31	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.23-41, Oscilloscope inspection procedure.
32	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.23-41, Oscilloscope inspection procedure.
33	Crank angle sensor	Engine: Idling	2.0 – 2.4 V
38	Back up power supply	Ignition switch: OFF	Battery voltage
43	Sensor earth	Always	0 V
44	Oil temperature sensor	ATF temperature: 25 °C	3.8 – 4.0 V
		ATF temperature: 80 °C	2.3 – 2.5 V
45	Throttle position sensor (TPS) <6A13–Vehicles without TCL, 4G63>	Accelerator pedal: Released (Engine stopped)	0.5 – 1.0 V
	Accelerator pedal position sensor (APS) <6A13–Vehicles with TCL, 4G64>	Accelerator pedal: Depressed (Engine stopped)	4.5 – 5.0 V

Terminal No.	Check item	Check requirement	Standard value
53	Communication with engine-ECU <Vehicles without TCL> Communication with TCL-ECU <Vehicles with TCL>	Engine: Idling Selector lever position: D	Other than 0 V
54	Communication with engine-ECU <Vehicles without TCL> Communication with TCL-ECU <Vehicles with TCL>	Engine: Idling Selector lever position: D	Other than 0 V
55	Inhibitor switch P	Selector lever position: P	Battery voltage
		Selector lever position: Other than above	0 V
56	Inhibitor switch N	Selector lever position: N	Battery voltage
		Selector lever position: Other than above	0 V
57	Select switch	Selector lever position: Sports mode	Battery voltage
		Selector lever position: Other than above	0 V
58	Down shift switch	Selector lever position: Downshift and lever held	Battery voltage
		Selector lever position: Other than above	0 V
59	Stop lamp switch	Brake pedal: Depressed	Battery voltage
		Brake pedal: Released	0 V
62	Low and reverse solenoid valve	Selector lever position: D (1st gear)	Battery voltage
		Selector lever position: D (2nd gear)	Approx. 7 – 9 V
63	Diagnosis output	Normal (No diagnosis code output)	0 → 5 V flashing
65	Wide open throttle switch	Accelerator pedal: Released	4.5 – 5.5 V
		Accelerator pedal: Depressed	Less than 0.4 V
66	Inhibitor switch R	Selector lever position: R	Battery voltage
		Selector lever position: Other than above	0 V
67	Inhibitor switch D	Selector lever position: D	Battery voltage
		Selector lever position: Other than above	0 V
68	Upshift switch	Selector lever position: Upshift and lever held	Battery voltage
		Selector lever position: Other than above	0 V
69	Vehicle speed sensor	When stopped	0 V
		Move forward slowly	0 → 5 V flashing
71	A/T control relay	Ignition switch: OFF	0 V
		Ignition switch: ON	Battery voltage
72	Earth	Ignition switch: ON	0 V

OSCILLOSCOPE INSPECTION PROCEDURE

Check item	Check requirement		Normal condition (Waveform sample)
Crank angle sensor	Selector lever position: N	Idling (Vehicle stopped)	Waveform A
Input shaft speed sensor	Selector lever position: Sports mode	Driving at constant speed of 50 km/h in 3rd gear (Engine: 1,800 – 2,100 r/min)	Waveform B
Output shaft speed sensor			
Vehicle speed sensor			
Low reverse solenoid valve	Ignition switch: ON Selector lever position: P Engine: 0 r/min Vehicle speed: 0 km/h (Vehicle stopped) Throttle (Accelerator) opening angle: Less than 1 V	Force drive each solenoid valve (Actuator test)	Waveform C
Underdrive solenoid valve			
Second solenoid valve			
Overdrive solenoid valve			
Damper clutch control solenoid valve			

Waveform sample



TROUBLESHOOTING <A/T KEY INTERLOCK AND SHIFT LOCK MECHANISMS>

TROUBLE SYMPTOM TABLE

Symptom	Inspection procedure No.	Reference page
Can move selector lever from P to R without depressing brake pedal when ignition key is at positions other than LOCK	1	23-42
Cannot move selector lever from P to R with brake pedal depressed when ignition key is at positions other than LOCK	2	23-42
Can move selector lever from P to R with brake pedal depressed when ignition key is at LOCK	3	23-43
Cannot move selector lever from P to R smoothly	4	23-43
Cannot move selector lever from R to P	5	23-43
Cannot turn ignition key to LOCK when selector lever is at P	6	23-43
Can turn ignition key to LOCK when selector lever is at positions other than P	7	23-43

INSPECTION PROCEDURE FOR TROUBLE SYMPTOMS

INSPECTION PROCEDURE 1

Can shift selector lever from P to R without depressing brake pedal when ignition key is at positions other than LOCK	Probable cause
Lock cam or lock cable is suspected to be faulty.	<ul style="list-style-type: none"> • Malfunction of lock cam • Defective shift lock cable

Check the following as parts related to the shift lock are suspected to be faulty:

- Lock cam
- Shift lock cable

INSPECTION PROCEDURE 2

Cannot shift selector lever from P to R with brake pedal depressed when ignition key is at positions other than LOCK	Probable cause
Selector lever assembly, shift lock cable, key interlock cable transmission control cable or lock cam is suspected to be faulty.	<ul style="list-style-type: none"> • Malfunction of selector lever assembly • Malfunction of shift lock cable • Defective key interlock cable • Defective transmission control cable • Malfunction of lock cam

Check the following as parts related to the selector lever are suspected to be faulty:

- Selector lever assembly
- Shift lock cable
- Key interlock cable
- Transmission control cable
- Lock cam

INSPECTION PROCEDURE 3

Can move selector lever from P to R with brake pedal depressed when ignition key is at LOCK	Probable cause
Lock cam or key interlock cable is suspected to be faulty.	<ul style="list-style-type: none"> • Malfunction of lock cam • Defective key interlock cable

Check the following as parts related to the key interlock are suspected to be faulty:

- Key interlock cable
- Lock cam

INSPECTION PROCEDURE 4

Cannot move selector lever from P to R smoothly	Probable cause
Key interlock cable, shift lock cable, lock cam or selector lever assembly is suspected to be faulty.	<ul style="list-style-type: none"> • Defective key interlock cable • Defective shift lock cable • Malfunction of lock cam • Malfunction of selector lever assembly

Check the following as parts related to the key interlock are suspected to be faulty:

- Key interlock cable
- Shift lock cable
- Lock cam
- Selector lever assembly

INSPECTION PROCEDURE 5

Cannot move selector lever from R to P	Probable cause
Selector lever assembly or transmission control cable is suspected to be faulty.	<ul style="list-style-type: none"> • Malfunction of selector lever assembly • Defective transmission control cable

Check the following as parts related to the selector lever are suspected to be faulty:

- Selector lever assembly
- Transmission control cable

INSPECTION PROCEDURE 6

Cannot turn ignition key to LOCK when selector lever is at P	Probable cause
Lock cam key interlock cable or key cylinder slider is suspected to be faulty.	<ul style="list-style-type: none"> • Malfunction of lock cam • Defective key interlock cable • Malfunction of slider

Check the following as parts related to the key interlock are suspected to be faulty:

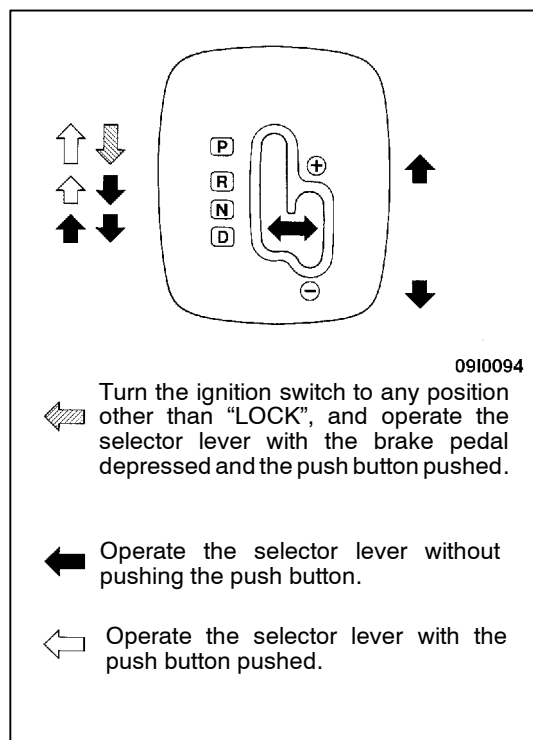
- Lock cam
- Key interlock cable
- Slider

INSPECTION PROCEDURE 7

Can turn ignition key to LOCK when selector lever is at positions other than P	Probable cause
Lock cam, key cylinder cover or key interlock cable is suspected to be faulty.	<ul style="list-style-type: none"> • Malfunction of lock cam • Defective cover • Malfunction of key inter lock cable

Check the following as parts related to the key interlock are suspected to be faulty:

- Lock cam
- Key cylinder cover
- Key interlock cable



ON-VEHICLE SERVICE

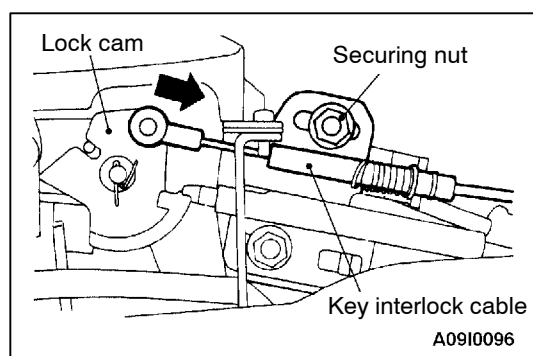
SELECTOR LEVER OPERATION CHECK

1. Apply parking brake. Shift the selector lever to every range to check that the movement is smooth.
2. Check that the engine starts with the selector lever at N or P and does not start at the other positions.
3. Start the engine and release the parking brake. Check that the vehicle moves forwards when the selector lever is at D or 1st (or 2nd) range in Sports Mode, and also reverses at R.

KEY INTERLOCK MECHANISM CHECK

1. Carry out the following inspection:

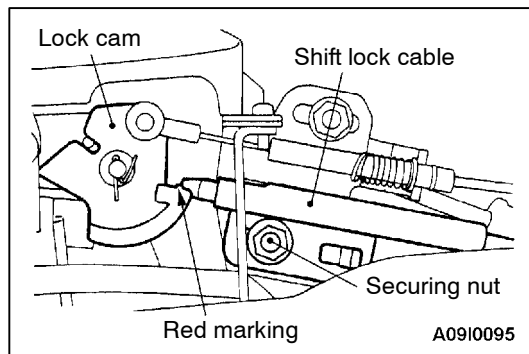
Inspection procedure	Requirements		When normal
1	Brake pedal: Depressed	Ignition key: LOCK or removed	Cannot push selector lever push button, so cannot shift the lever from P to other positions
2		Ignition key: ACC	Can shift the lever from P to other positions with push button pushed
3	Brake pedal: Not depressed	Selector lever: Other than P	Cannot turn ignition key to LOCK
4		Selector lever: P	Can turn ignition key to LOCK smoothly



2. If problem is present in the above operation, adjust the key interlock cable as follows:
 - (1) Remove the floor console box.
 - (2) Shift the selector lever to P.
 - (3) Turn the ignition key to LOCK.
 - (4) Loosen the key interlock cable securing nut.
 - (5) While lightly pushing the cable connected to the lock cam towards the arrow, tighten the securing nut.
 - (6) Install the floor console box.

SHIFT LOCK MECHANISMS INSPECTION

Inspection procedure	Requirements		When normal
1	Brake pedal: Not depressed	Ignition key: ACC	Cannot push selector lever bush button, so cannot shift the lever from P to other positions
2	Brake pedal: Depressed		Can shift the lever from P to other positions smoothly with selector lever push button pushed
3	Brake pedal: Not depressed		Can shift the lever from R to P smoothly with selector lever push button pushed



2. If problem is present in the above operation, adjust the shift lock cable as follows:
- (1) Remove the floor console box.
 - (2) Shift the selector lever to P.
 - (4) Loosen the shift lock cable securing nut.
 - (5) Tighten the securing nut when the shift lock cable end reaches the red marking on the lock cam.
 - (5) Install the floor console box.

TRANSMISSION CONTROL

Sport Mode 4A/T and A/T key interlock and shift lock mechanisms have been newly used. Accordingly, service procedures have been added for the selector lever assembly. Still, the other service procedures are the same as before.

REMOVAL AND INSTALLATION

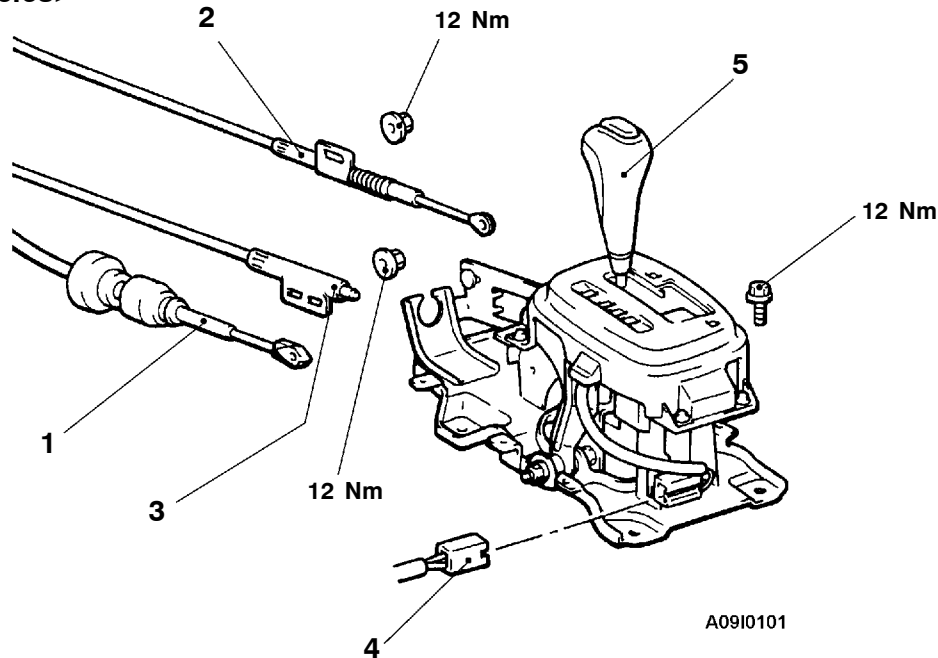
Pre-removal and Post-installation Operation

- Lower Cover and Side Cover Removal and Installation
- Floor Console Box Removal and Installation
- Selector Lever Operation Check
<Post-Installation only> (Refer to P.23-44)

Caution: SRS

Be careful not to give any impact to the SRS-ECU when removing or installing the selector lever.

<L.H. drive vehicles>

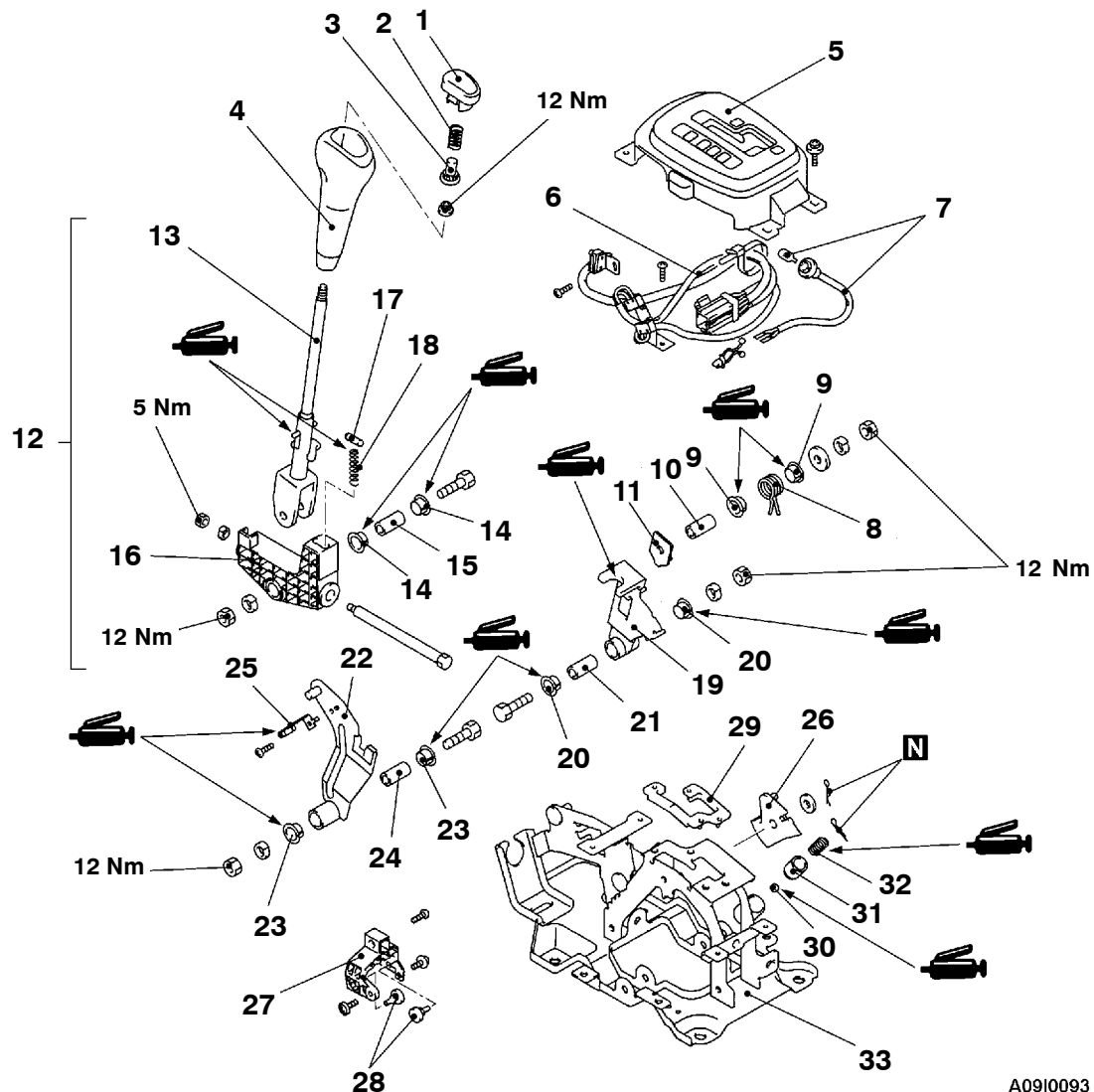


Selector lever assembly removal steps

1. Transmission control cable connection
2. Key interlock cable connection
3. Shift lock cable connection
4. Wiring harness connector
5. Selector lever assembly

SELECTOR LEVER ASSEMBLY DISASSEMBLY AND REASSEMBLY

<L.H. drive vehicles>

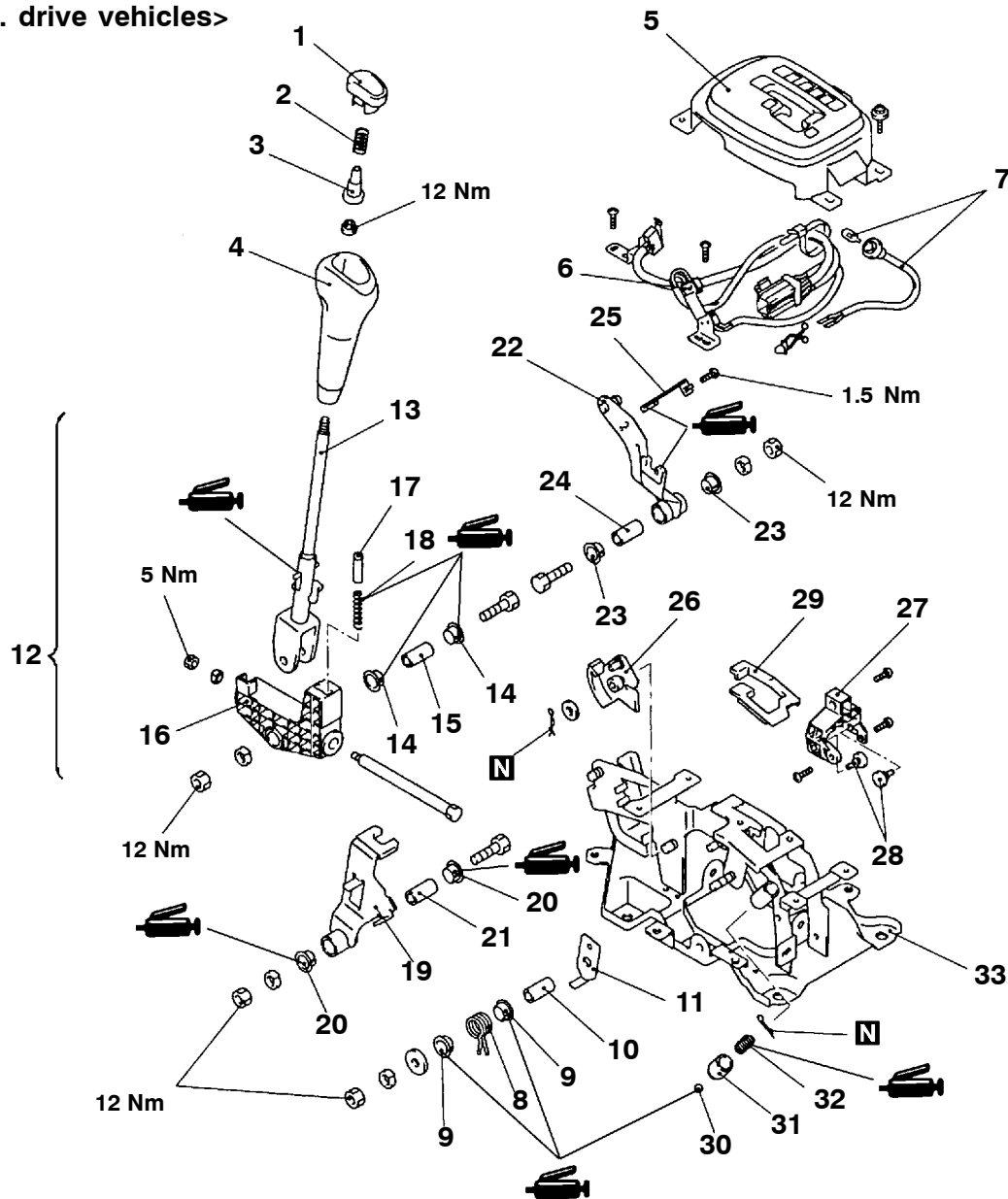


A0910093

Disassembly steps

1. Push button
2. Spring
3. Adjuster
4. Shift knob
5. Indicator panel assembly
6. Shift switch assembly
7. Position indicator lamp
8. Return spring
9. Bushing
10. Pipe
11. Bracket
12. Lever assembly
13. Lever
14. Shift bushing
15. Pipe
16. Select lever
17. Roller
18. Spring
19. Manual lever
20. Shift bushing
21. Pipe
22. Cable lever
23. Shift bushing
24. Pipe
25. Detent spring assembly
26. Lock cam
27. Guide block
28. Rubber stopper
29. Cushion
30. Steel ball
31. Ball support
32. Spring
33. Bracket assembly

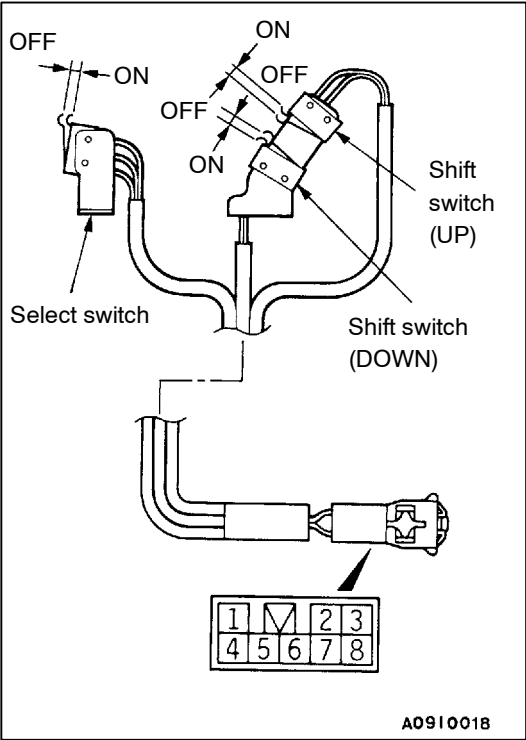
<R.H. drive vehicles>



A0910023

Disassembly steps

- | | |
|-------------------------------------|----------------------------|
| 1. Push button | 18. Spring |
| 2. Spring | 19. Manual lever |
| 3. Adjuster | 20. Shift bushing |
| 4. Shift knob | 21. Pipe |
| 5. Indicator panel assembly | 22. Cable lever |
| 6. Shift switch assembly | 23. Shift bushing |
| 7. Position indicator lamp assembly | 24. Pipe |
| 8. Return spring | 25. Detent spring assembly |
| 9. Bushing | 26. Lock cam |
| 10. Pipe | 27. Guide block |
| 11. Bracket | 28. Rubber stopper |
| 12. Lever assembly | 29. Cushion |
| 13. Lever | 30. Steel ball |
| 14. Shift bushing | 31. Ball support |
| 15. Pipe | 32. Spring |
| 16. Select lever | 33. Bracket assembly |
| 17. Roller | |



INSPECTION
SHIFT SWITCH ASSEMBLY CONTINUITY CHECK

Switch position		Terminal number					
		3	4	5	6	7	8
Shift switch (UP)	ON			○	○		
	OFF						
Shift switch (DOWN)	ON		○	○			
	OFF						
Select switch	ON	○					○
	OFF	○				○	

A/T KEY INTERLOCK AND SHIFT LOCK MECHANISMS

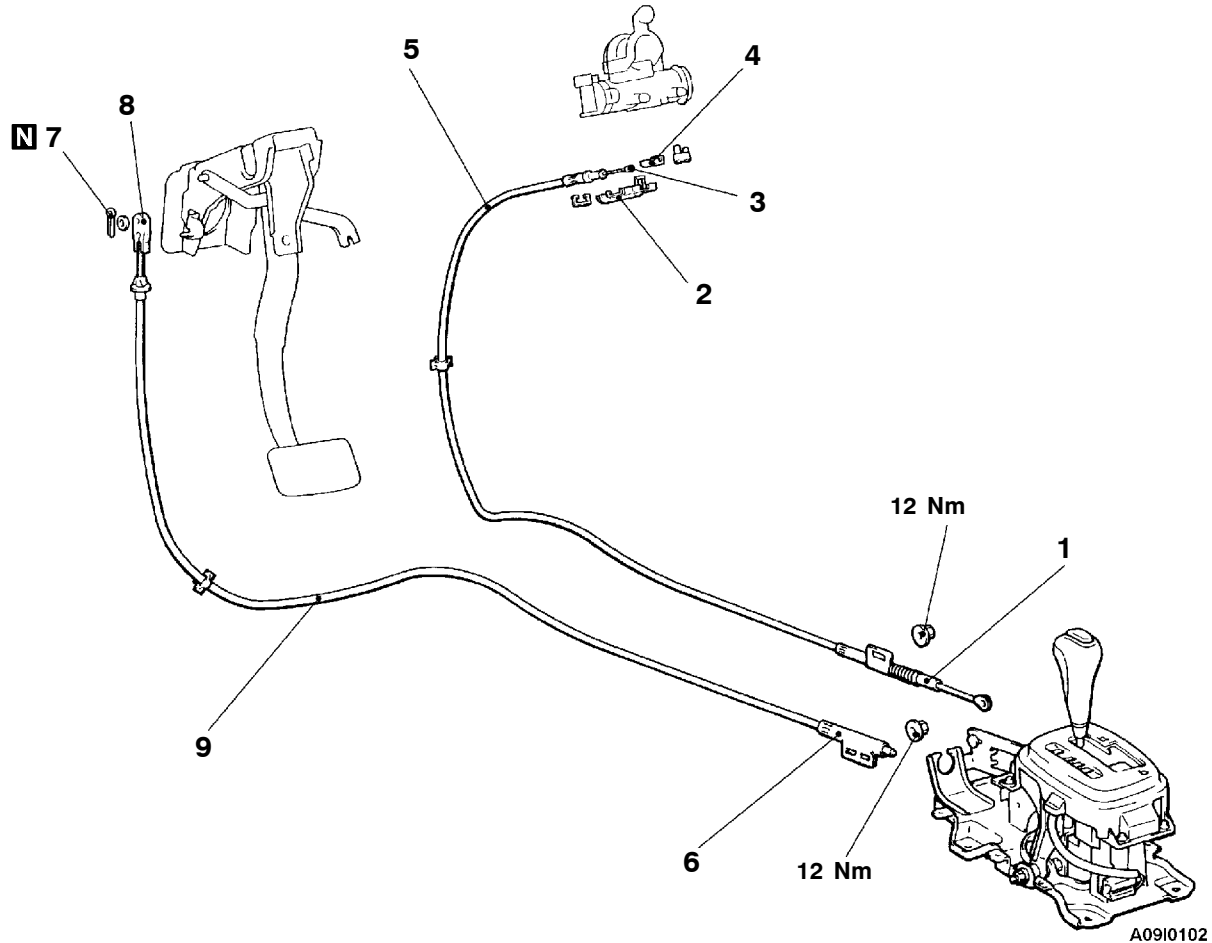
REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operation

- Lower Cover and Side Cover Removal and Installation
- Floor Cable Box Removal and Installation
- Selector Lever Operation Check
<Post-Installation only> (Refer to P.23-44)

Caution: SRS

Be careful not to give any impact to the SRS-ECU when removing or installing the key interlock cable and shift lock cable.



Key interlock cable removal steps

1. Key interlock cable connection (Selector lever side)
 - Lower column lever
2. Cover
3. Key interlock cable connection (Steering lock cylinder side)
4. Slider
5. Key interlock cable

Shift lock cable removal steps

6. Shift lock cable connection (Selector lever side)
7. Split pin
8. Shift lock cable connection (Brake pedal side)
9. Shift lock cable