SECTION 7B1

AUTOMATIC TRANSMISSION (4 A/T)

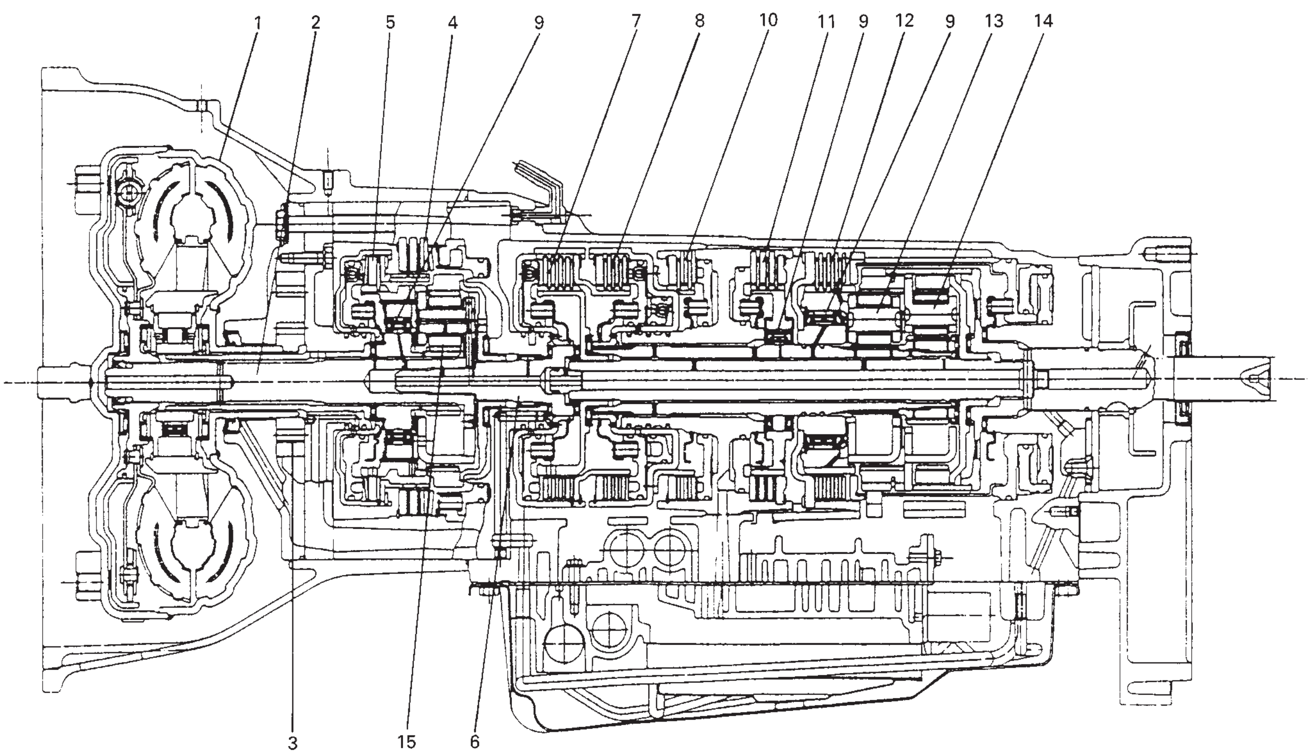
WARNING:
For vehicles equipped with Supplemental Restraint (Air Bag) System:

- **Service on and around the air bag system components or wiring must be performed only by an authorized SUZUKI dealer. Refer to “Air Bag System Components and Wiring Location View” under “General Description” in air bag system section in order to confirm whether you are performing service on or near the air bag system components or wiring. Please observe all WARNINGS and “Service Precautions” under “On-Vehicle Service” in air bag system section before performing service on or around the air bag system components or wiring. Failure to follow WARNINGS could result in unintentional activation of the system or could render the system inoperative. Either of these two conditions may result in severe injury.**
- **Technical service work must be started at least 90 seconds after the ignition switch is turned to the “LOCK” position and the negative cable is disconnected from the battery. Otherwise, the system may be activated by reserve energy in the Sensing and Diagnostic Module (SDM).**

CONTENTS

GENERAL DESCRIPTION

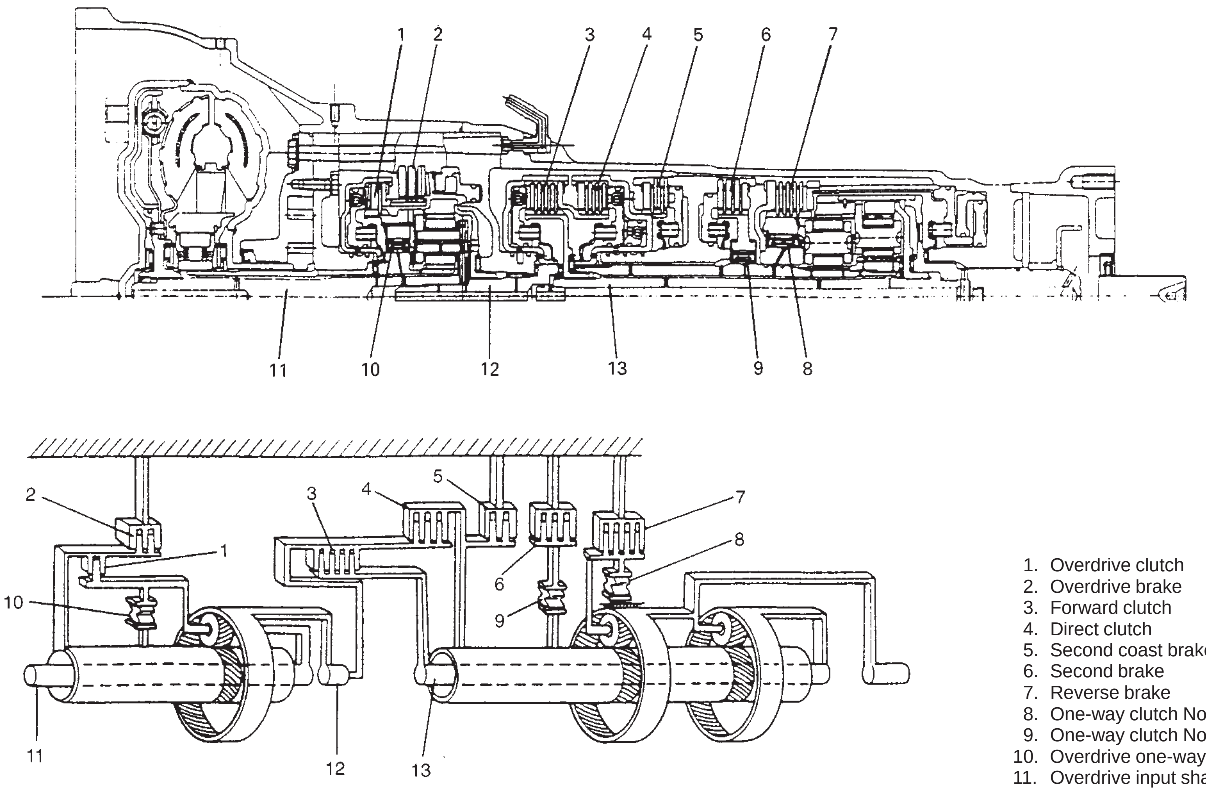
This automatic transmission is a full automatic type with 3-speed plus overdrive (O/D).
The torque converter is a 3-element, 1-step and 2-phase type and is equipped with an electronically controlled lock-up mechanism. The gear shift device consists of 3 sets of planetary gear units, 3 disc type clutches, 4 disc type brakes and 3 one-way clutches. The gear shift is done by selecting one of 6 positions (“P”, “R”, “N”, “D”, “2” and “L”) by means of the select lever installed on the floor. On the shift knob, there is an overdrive (O/D) cut switch which allows shift-up to the overdrive mode (except at 4L) and shift-down from the overdrive mode. Also, by using the P/N change switch located on the console box, it is possible to select the gear change timing of 2 modes, normal and power.



1. Torque converter
2. Overdrive input shaft
3. Oil pump
4. Overdrive brake
5. Overdrive clutch
6. Forward clutch input shaft
7. Forward clutch
8. Direct clutch
9. One-way clutch
10. Second coast brake
11. Second brake
12. Reverse brake
13. Front planetary gear
14. Rear planetary gear
15. Overdrive planetary gear

Item			Specifications	
Torque converter	Type		3-element, 1-step, 2-phase type (with TCC (lock-up) mechanism)	
	Stall torque ratio		2.4 (G16 engine) 2.0 (J20 engine) 1.9 (H25 engine)	
Oil pump	Type		Trochoid type oil pump	
	Drive system		Engine driven	
Gear change device	Type		Forward 4-step, reverse 1-step planetary gear type	
	Shift position		“P” range: Gear in neutral, output shaft fixed,engine start “R” range: Reverse “N” range: Gear in neutral, engine start “D” range (O/D ON): Forward 1st ↔ 2nd ↔ 3rd ↔ 4th (O/D) automatic gear change “D” range (O/D OFF): Forward 1st ↔ 2nd ↔ 3rd automatic gear change “2” range: (Normal mode) Forward 1st ↔ 2nd ← 3rd automatic gear change (Power mode) Forward 2nd ← 3rd automatic gear change and fixed at 2nd gear “L” range: Forward 1st ← 2nd ← 3rd reduction, and fixed at 1st gear	
	Engine type		G16 engine	J20/H25 engines
	Gear ratio	1st (low gear)	2.826	2.826
		2nd (second gear)	1.493	1.493
		3rd (top gear)	1.000	1.000
		4th (overdrive gear)	0.730	0.689
		Reverse (reverse gear)	2.703	2.703
	Control elements		Wet type multi-disc clutch .... 3 sets Wet type multi-disc brake .... 4 sets One-way clutch .... 3 sets	
	Transfer		Hi: 1.000 Lo: 1.816 (4WD model only)	
	Final gear reduction ratio (Differential)		5.125 (G16 engine) 4.875 (J20/H25 engines)	
Lubrication	Lubrication system		Force feed system by oil pump	
Cooling	Cooling system		Radiator assisted cooling (water-cooled)	
Fluid used			An equivalent of DEXRON®III	

CLUTCH/BRAKE FUNCTIONS



1. Overdrive clutch
2. Overdrive brake
3. Forward clutch
4. Direct clutch
5. Second coast brake
6. Second brake
7. Reverse brake
8. One-way clutch No.2
9. One-way clutch No.1
10. Overdrive one-way clutch
11. Overdrive input shaft
12. Forward clutch input shaft
13. Intermediate shaft

Part Name	Function
Overdrive clutch	Meshes overdrive carrier and overdrive sun gear.
Overdrive brake	Fixes overdrive sun gear.
Overdrive one-way clutch	Meshes overdrive carrier and overdrive sun gear only when driven by engine.
Forward clutch	Meshes input shaft and intermediate shaft.
Direct clutch	Meshes input shaft with front sun gear and rear sun gear.
Second coast brake	Fixes front sun gear and rear sun gear.
Second brake	Fixes outer race of one-way clutch No.1, to prevent front sun gear and rear sun gear from turning counterclockwise (reverse direction of engine input rotation direction).
Reverse brake	Fixes front planetary carrier.
One-way clutch No.1	Prevents front sun gear and rear sun gear from turning counterclockwise only when second brake is at work.
One-way clutch No.2	Prevents front planetary carrier from turning counterclockwise.

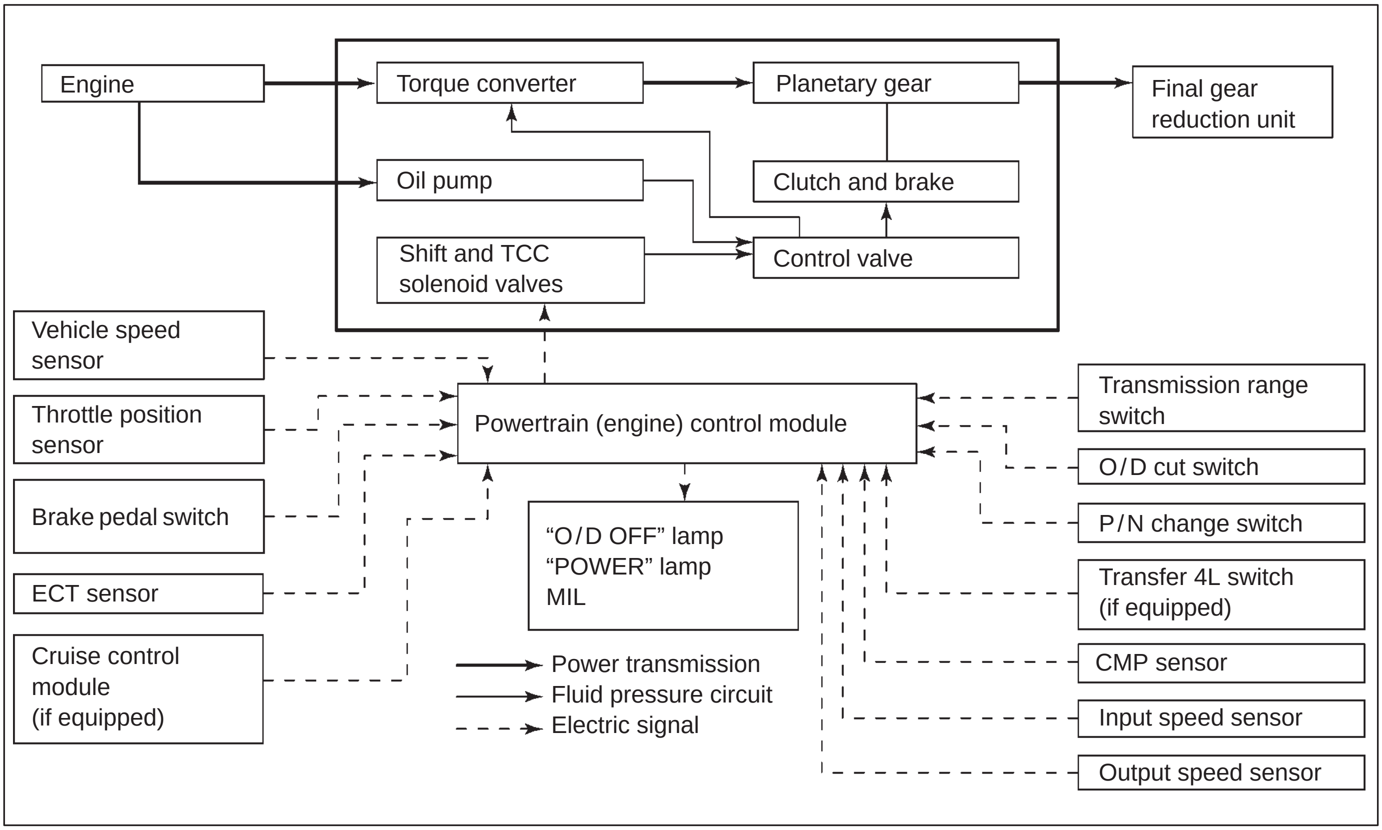
TABLE OF COMPONENT OPERATION

Shift position \ Element		Solenoid valve No. 1–A	Solenoid valve No. 1–B	O/D clutch	Forward clutch	Direct clutch		O/D brake	Second coast brake	Second brake	Reverse brake		O/D one-way clutch	One-way clutch No. 1	One-way clutch No. 2
						Inner piston	Outer piston				Inner piston	Outer piston			
P		○	X	○	–	–	–	–	–	–	–	–	○	–	–
R		○	X	○	–	○	○	–	–	–	○	○	○	–	–
N		○	X	○	–	–	–	–	–	–	–	–	○	–	–
D	1st gear	○	X	○	○	–	–	–	–	–	–	–	○	–	○
	2nd gear	○	○	○	○	–	–	–	–	○	–	–	○	○	–
	3rd gear	X	○	○	○	–	○	–	–	○	–	–	○	–	–
	O/D	X	X	–	○	–	○	○	–	○	–	–	–	–	–
2	1st gear	○	X	○	○	–	–	–	–	–	–	–	○	–	○
	2nd gear	○	○	○	○	–	–	–	○	○	–	–	○	–	–
	3rd gear (Fail safe)	X	○	○	○	–	○	–	–	○	–	–	○	–	–
L	1st gear	○	X	○	○	–	–	–	–	–	○	○	○	–	–
	2nd gear (Fail safe)	○	○	○	○	–	–	–	○	○	–	–	○	–	–

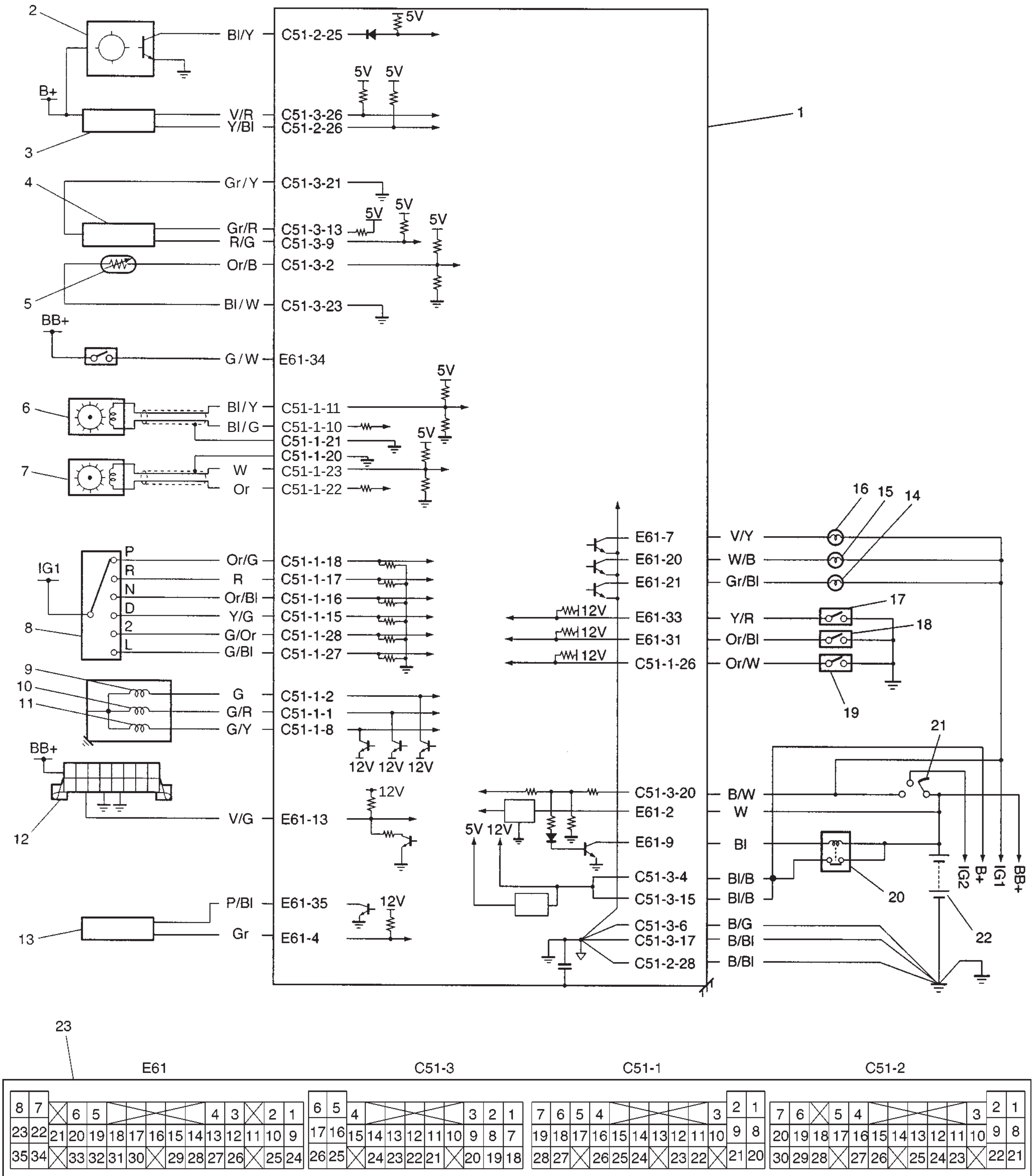
○: ON, X: OFF

ELECTRONIC SHIFT CONTROL SYSTEM

The gear ratio change in “D” or “2” range and torque converter clutch operation are controlled by Powertrain (Engine) Control Module.

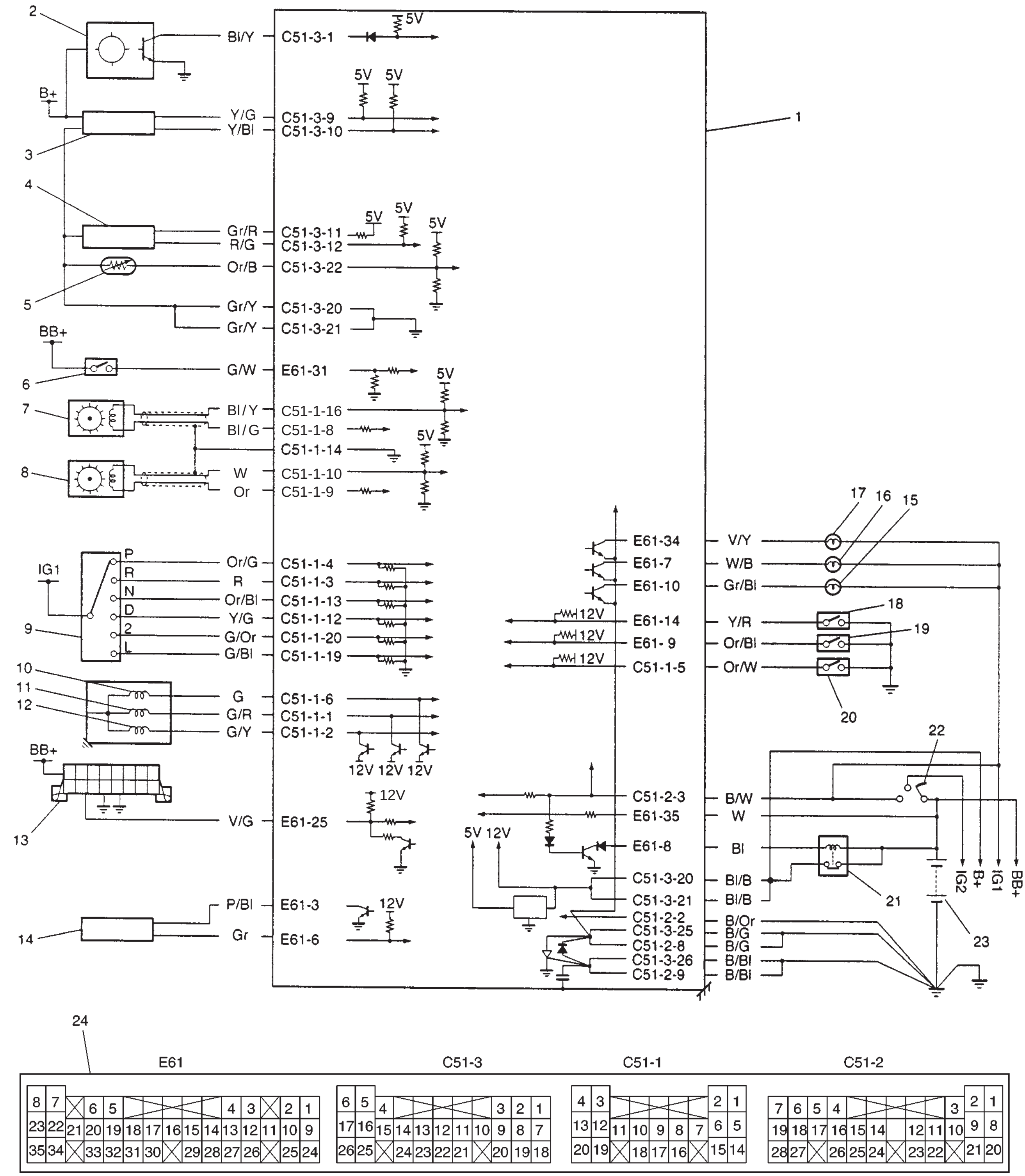


G16 / J20 Engines



1. PCM (ECM)
2. VSS
3. CMP sensor
4. TP sensor
5. ECT sensor
6. A / T input speed sensor
7. A / T output speed sensor
8. Transmission range switch
9. Shift solenoid-A
10. Shift solenoid-B
11. TCC solenoid
12. Data link connector
13. Cruise control module
14. "POWER" lamp
15. "O / D OFF" lamp
16. MIL
17. O / D cut switch
18. P / N change switch
19. 4WD low switch
20. Main relay
21. Ignition switch
22. Battery
23. PCM (ECM) connector terminal (viewed from harness side)

H25 Engine

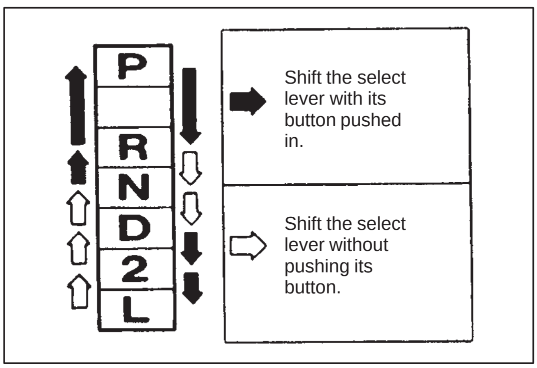


1. PCM (ECM)
2. VSS
3. CMP sensor
4. TP sensor
5. ECT sensor
6. Brake pedal switch
7. A/T input speed sensor
8. A/T output speed sensor
9. Transmission range switch
10. Shift solenoid-A
11. Shift solenoid-B
12. TCC solenoid
13. Data link connector
14. Cruise control module
15. "POWER" lamp
16. "O/D OFF" lamp
17. MIL
18. O/D cut switch
19. P/N change switch
20. 4WD low switch
21. Main relay
22. Ignition switch
23. Battery
24. PCM (ECM) connector terminal (viewed from harness side)

Fail Safe Function

This function is provided by the safe mechanism that assures safe driveability even when the shift solenoid valve or speed sensor fails.
The table below shows the gear position in each shift under a normal/abnormal condition.

<table>
<tr><th>Condition / Shift position</th><th>Normal</th><th>Shift solenoid valve-A(#1) abnormal</th><th>Shift solenoid valve-B(#2) abnormal</th><th>Shift solenoid valves-A&B (#1 and #2) abnormal</th></tr>
<tr><td rowspan="4">D</td><td>1st</td><td rowspan="3">3rd</td><td>1st</td><td rowspan="4">O/D</td></tr>
<tr><td>2nd</td><td rowspan="3">O/D</td></tr>
<tr><td>3rd</td></tr>
<tr><td>O/D</td><td>O/D</td></tr>
<tr><td rowspan="3">2</td><td>1st</td><td rowspan="3">3rd</td><td>1st</td><td rowspan="3">3rd</td></tr>
<tr><td>2nd</td><td rowspan="2">3rd</td></tr>
<tr><td>(3rd)</td></tr>
<tr><td rowspan="2">L</td><td>1st</td><td>1st</td><td rowspan="2">1st</td><td rowspan="2">1st</td></tr>
<tr><td>(2nd)</td><td>(2nd)</td></tr>
</table>



Change Mechanism

The same select pattern shift lever is used as the floor type and frequently used “N” and “D” ranges are made selectable freely.

Operation of Shift Solenoids and TCC Solenoid

RANGE / GEAR / SOLENOIDS	D				2		L	P, N & R	
	1st	2nd	3rd	4th (O/D)	1st	2nd	1st	—	
Shift solenoid-A (#1, NO.1)	○	○	×	×	○	○	○	○	
Shift solenoid-B (#2, NO.2)	×	○	○	×	×	○	×	×	
TCC solenoid	×	×	○	○	×	×	×	×	

○: ON (valve is open) ×: OFF (valve is closed)

AUTOMATIC GEAR SHIFT DIAGRAM

Automatic shift schedule as a result of shift control is shown below. In case that select lever is shifted to L at a higher than 52 km/h or 33 mile/h speed for G16 engine (45 km/h or 28 mile/h for J20 engine, 55 km/h or 34 mile/h for H25 engine), 2nd or 3rd gear is operated and then down shifts to 1st at a speed lower than that. No up shift is available in L.

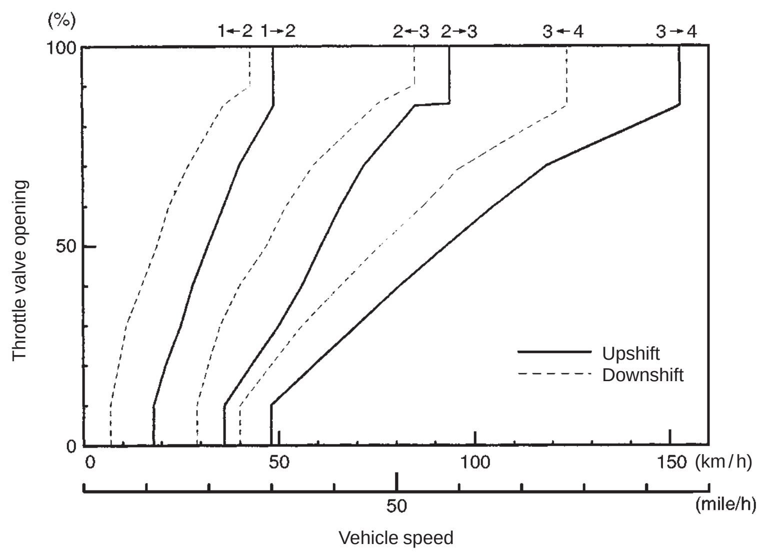
The same as, the select lever is shifted to 2 at a higher than 102 km/h (64 mile/h) speed for G16/J20 engines (105 km/h or 65 mile/h for H25 engine), 3rd gear is operated and then down shifts to 2nd at a speed lower than that.

Power Mode For G16 Engine

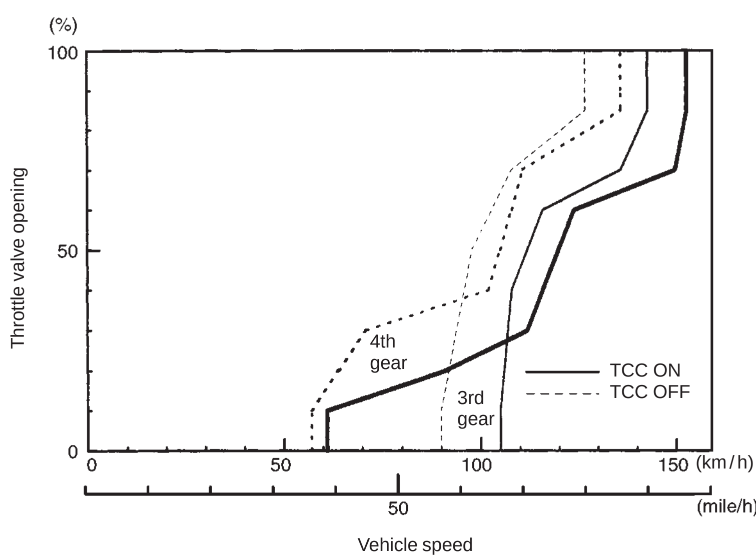
Unit: km/h (mile/h)

Shift / Throttle opening	1→2	2→3	3→4	4→3	3→2	2→1
Full throttle	49 (30)	94 (58)	153 (95)	124 (77)	85 (53)	43 (27)
Closed throttle	18 (11)	36 (23)	48 (30)	40 (25)	29 (18)	7 (4)

Gear Shift Diagram



TCC Lock-up Diagram

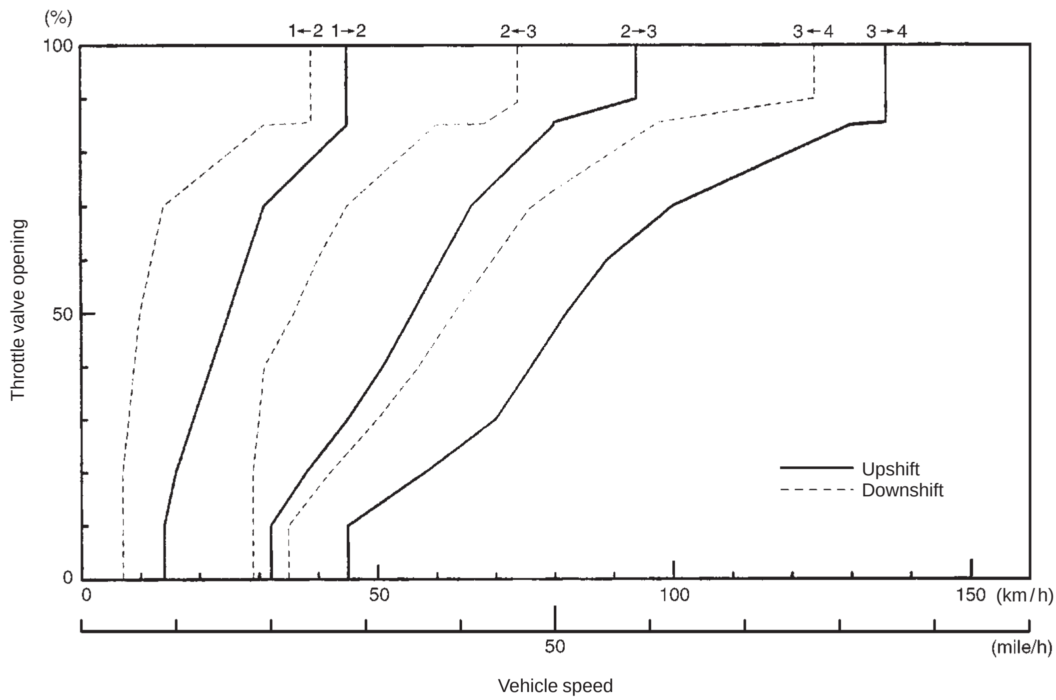


Normal Mode For G16 Engine

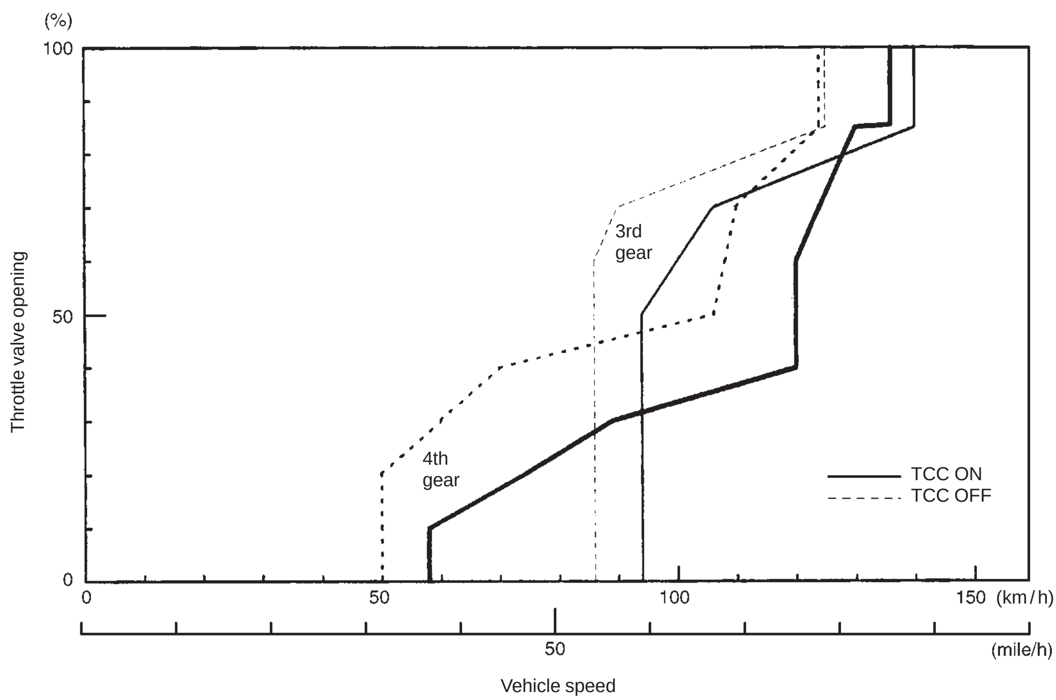
Unit: km/h (mile/h)

Throttle opening \ Shift	1→2	2→3	3→4	4→3	3→2	2→1
Full throttle	45 (28)	94 (58)	136 (85)	124 (77)	74 (46)	39 (24)
Closed throttle	14 (9)	32 (20)	45 (28)	35 (22)	29 (18)	7 (4)

Gear Shift Diagram



TCC Lock-up Diagram

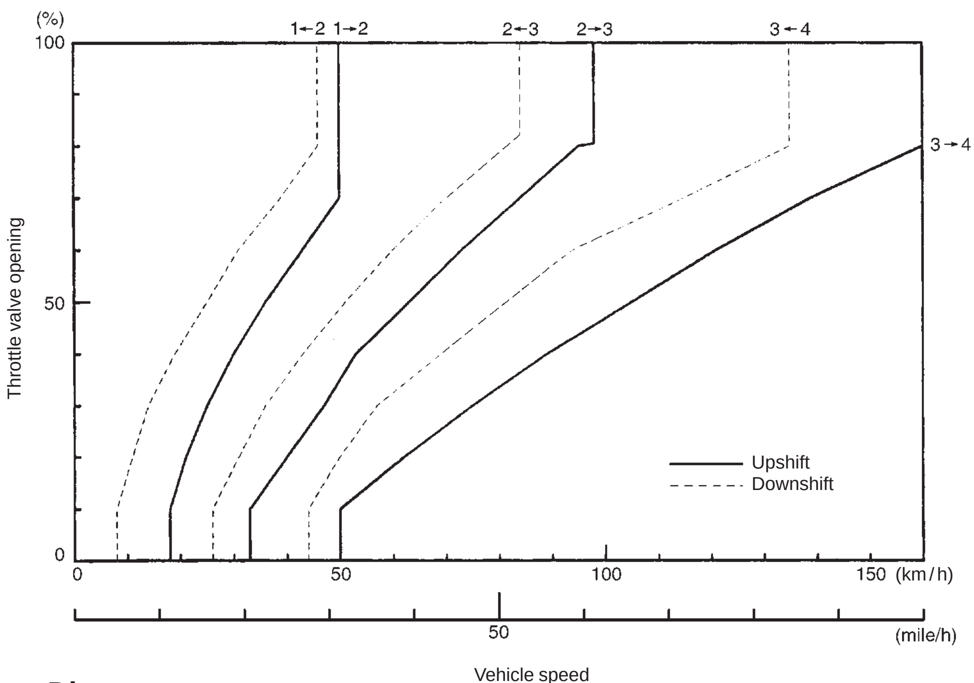


Power Mode For J20 Engine

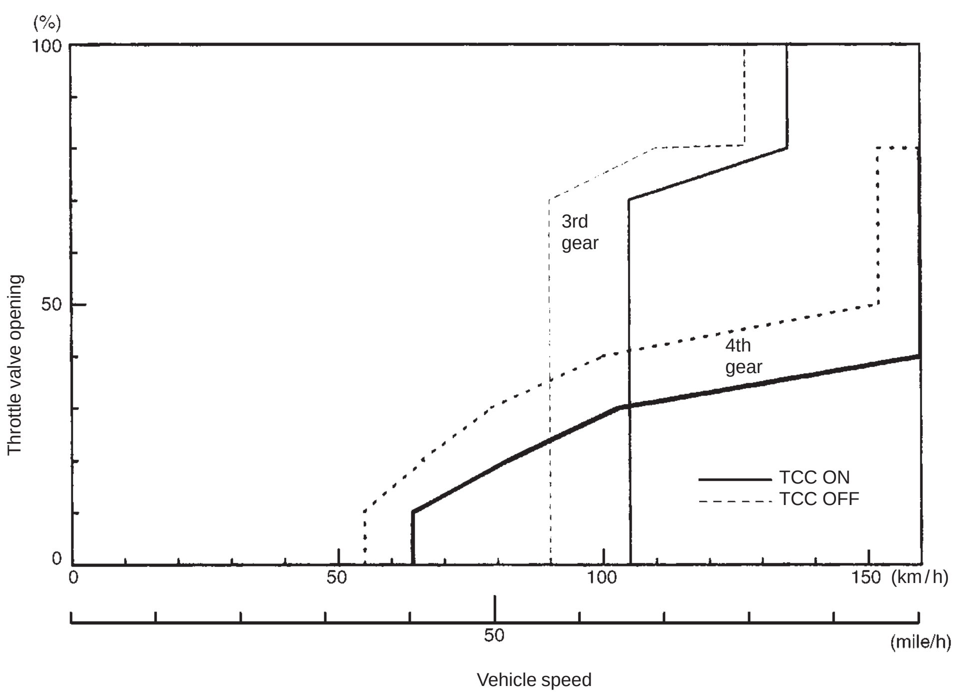
Unit: km/h (mile/h)

Throttle opening \ Shift	1→2	2→3	3→4	4→3	3→2	2→1
Full throttle	50 (31)	98 (61)	—	135 (84)	84 (52)	46 (29)
Closed throttle	18 (11)	33 (21)	50 (31)	44 (27)	26 (16)	8 (5)

Gear Shift Diagram



TCC Lock-up Diagram

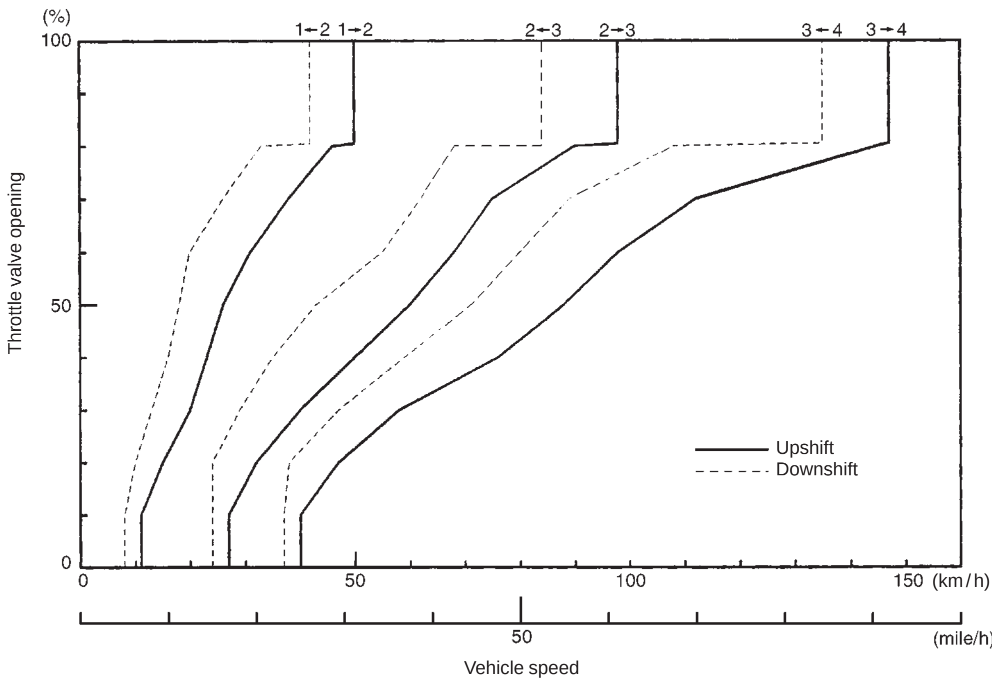


Normal Mode For J20 Engine

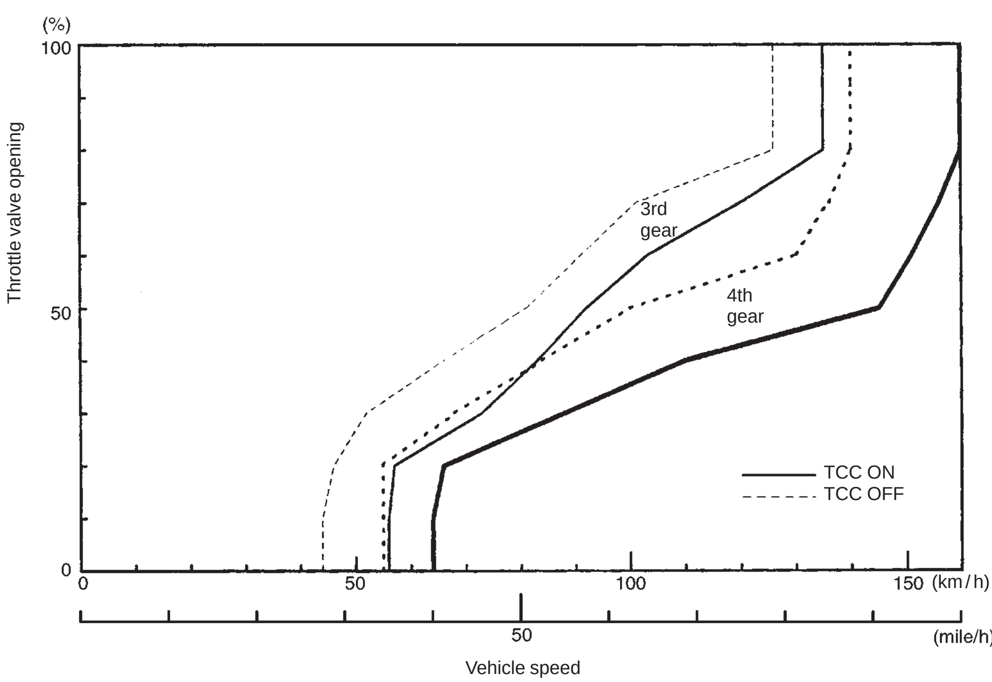
Unit: km / h
(mile/h)

Throttle opening \ Shift	1→2	2→3	3→4	4→3	3→2	2→1
Full throttle	50 (31)	98 (61)	147 (91)	135 (84)	84 (52)	42 (26)
Closed throttle	11 (7)	27 (17)	40 (25)	37 (23)	24 (15)	8 (5)

Gear Shift Diagram



TCC Lock-up Diagram

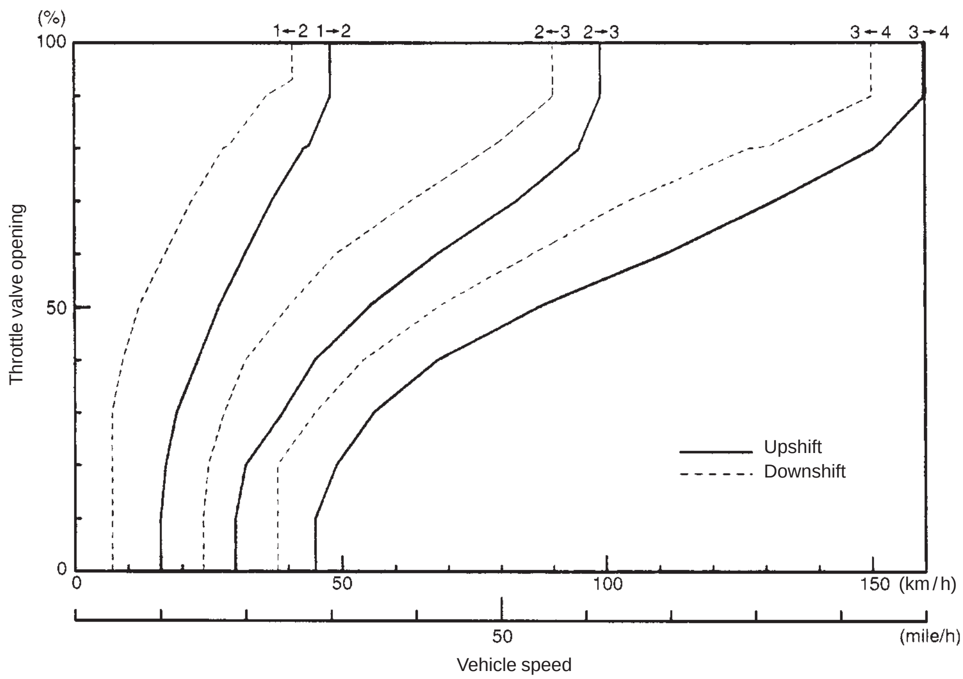


Power Mode For H25 Engine

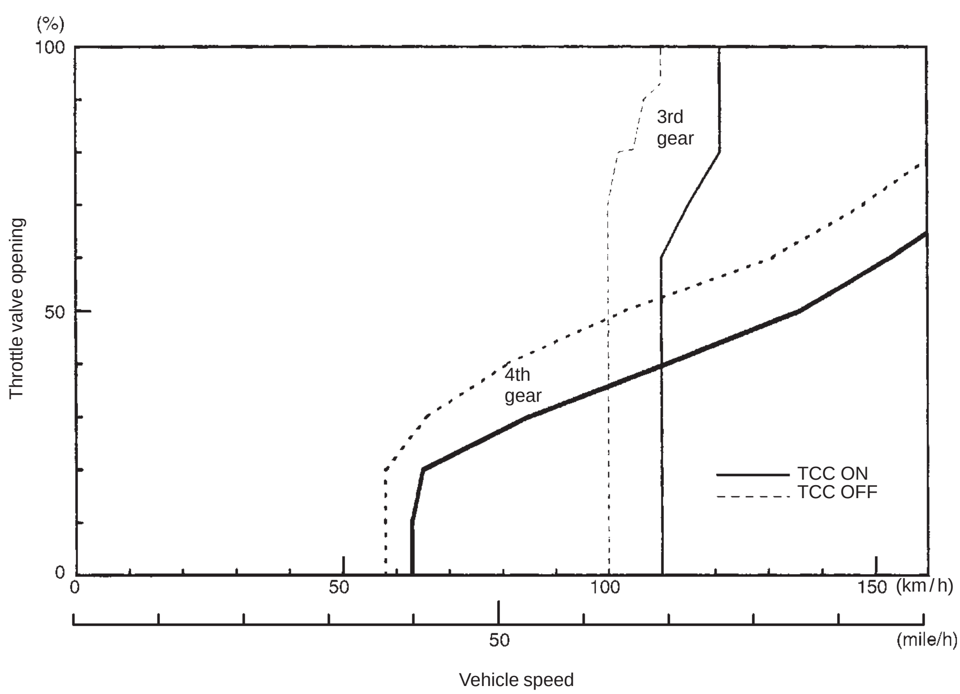
Unit: km/h (mile/h)

Throttle opening \ Shift	1→2	2→3	3→4	4→3	3→2	2→1
Full throttle	48 (30)	99 (62)	160 (99)	150 (93)	90 (56)	41 (25)
Closed throttle	16 (10)	30 (19)	45 (28)	38 (24)	24 (15)	7 (4)

Gear Shift Diagram



TCC Lock-up Diagram

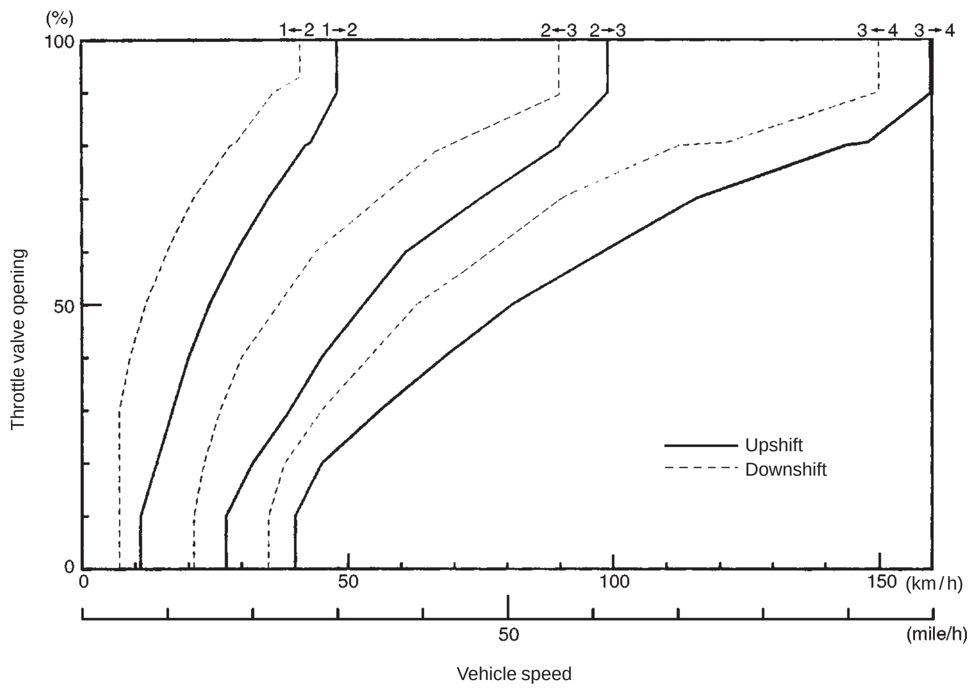


Normal Mode For H25 Engine

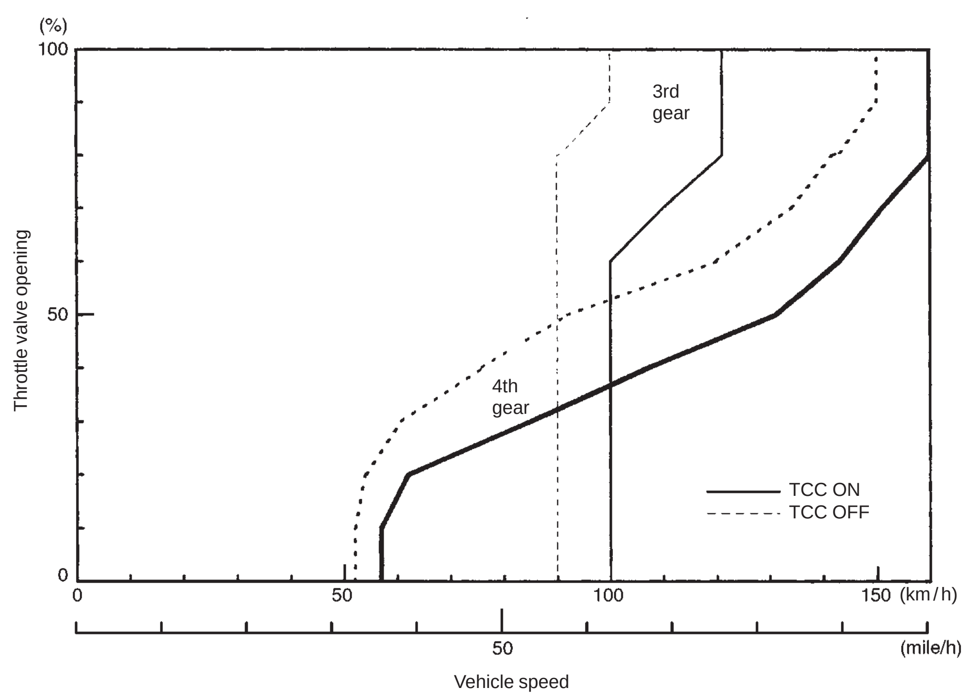
Unit: km/h
(mile/h)

Shift / Throttle opening	1→2	2→3	3→4	4→3	3→2	2→1
Full throttle	48 (30)	99 (62)	160 (99)	150 (93)	90 (56)	41 (25)
Closed throttle	11 (7)	27 (17)	40 (25)	35 (22)	21 (13)	7 (4)

Gear Shift Diagram

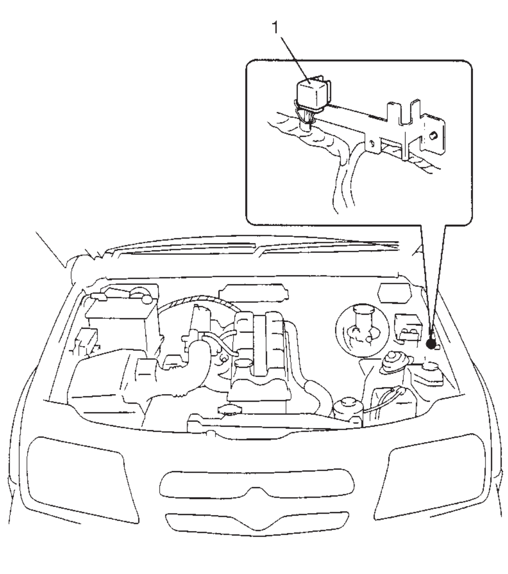


TCC Lock-up Diagram



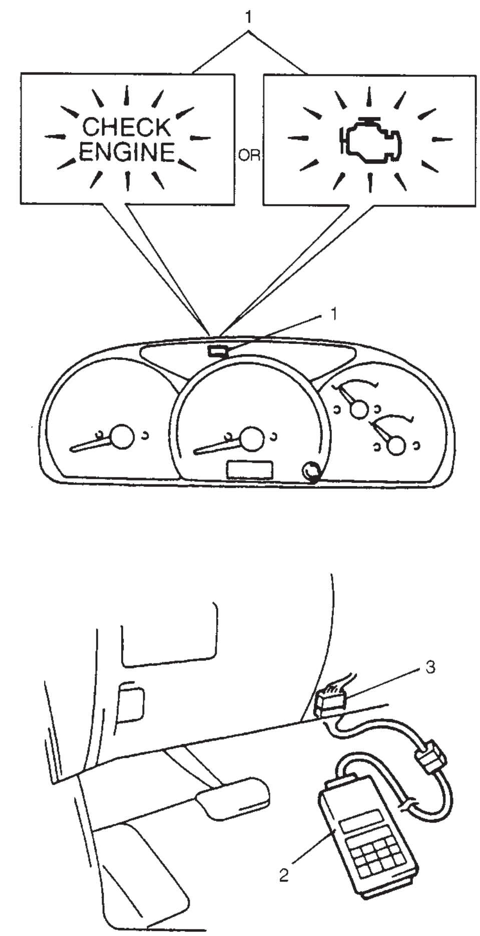
AUTOMATIC TRANSMISSION DIAGNOSIS

This vehicle is equipped with an electronic transmission control system, which control the automatic shift up and shift down timing, TCC operation, etc. suitably to vehicle driving conditions.
PCM (ECM) has an On-Board Diagnosis system which detects a malfunction in this system and abnormality of those parts that influence the engine exhaust emission.
When diagnosing a trouble in transmission including this system, be sure to have full understanding of the outline of “On-board Diagnostic System” and each item in “Precaution in Diagnosing Trouble” and execute diagnosis according to “AUTOMATIC TRANSMISSION DIAGNOSTIC FLOW TABLE” given below to obtain correct result smoothly.



1. Monitor connector

NOTE:
There are two types of ON-BOARD DIAGNOSTIC SYSTEM depending on vehicle specifications. The type of system for vehicle being serviced can be identified by whether equipped with monitor connector or not.



1. Malfunction indicator lamp (MIL)
2. Scan tool
3. DLC

[For Vehicle without Monitor Connector]

ON-BOARD DIAGNOSTIC SYSTEM

For automatic transmission control system, PCM (ECM) has following functions. Refer to Section 6/6-1 for details.

- When the ignition switch is turned ON with the engine at a stop, malfunction indicator lamp (MIL) turns ON to check the bulb of the MIL.
- When PCM detects a malfunction in A/T control system (and/or a malfunction which gives an adverse effect to vehicle emission) while the engine is running, it makes the malfunction indicator lamp in the meter cluster of the instrument panel turn ON and stores the malfunction area in its memory. (If it detects that continuously 3 driving cycles are normal after detecting a malfunction, however, it makes MIL turn OFF although DTC stored in its memory will remain.)
- It is possible to communicate through DLC by using not only SUZUKI scan tool (Tech-1) but also generic scan tool. (Diagnostic information can be accessed by using a scan tool.)

2 Driving Cycle Detection Logic

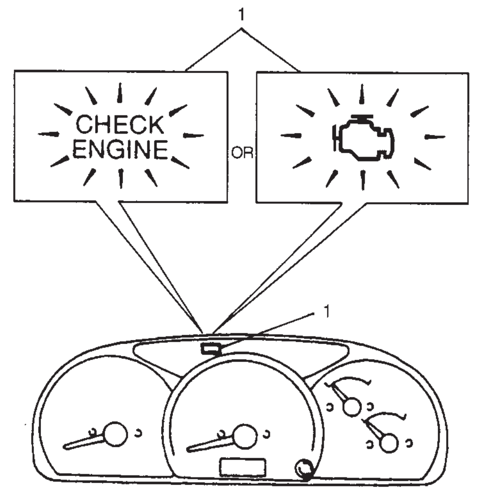
Refer to section 6/6-1 for details.

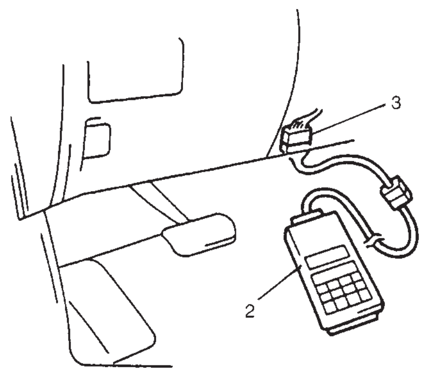
Pending DTC

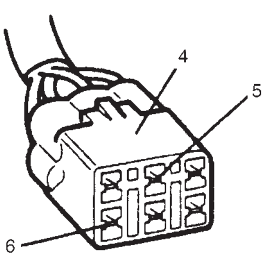
Refer to section 6/6-1 for details.

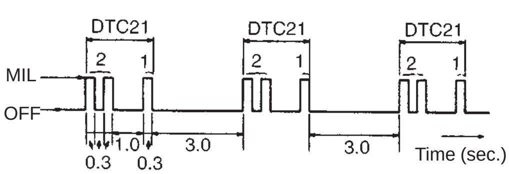
Freeze Frame Data

Refer to section 6/6-1 for details.









1. Malfunction indicator lamp (MIL)
2. Scan tool
3. DLC
4. Monitor connector
5. Diagnosis switch terminal
6. Ground terminal

[For Vehicle with Monitor Connector]

ON-BOARD DIAGNOSTIC SYSTEM

For automatic transmission control system, PCM (ECM) has following functions. Refer to Section 6/6-1 for details.

- When the ignition switch is turned ON with the engine at a stop, malfunction indicator lamp (MIL) turns ON to check the bulb of the MIL.
- When PCM detects a trouble in electronic shift control system, it stores its trouble code in back-up memory in itself. (The memory is kept as it is even if the trouble was only temporary and disappeared immediately. And it is not erased unless the power to PCM is shut off for 30 seconds or longer.)
- It is possible to communicate through DLC by using not only SUZUKI scan tool (Tech-1) but also generic scan tool. (Diagnostic information can be accessed by using a scan tool.)
- It is also possible to communicate by not using scan tool. PCM indicates trouble area in memory by means of flashing of malfunction indicator lamp at the time of inspection (i.e. when diagnosis switch terminal is grounded and ignition switch is turned ON).

PRECAUTION IN DIAGNOSING TROUBLE

- Don’t disconnect couplers from PCM (ECM), battery cable from battery, PCM ground wire harness from engine or main fuse before checking the diagnosis information (DTC, freeze frame data, etc.) stored in PCM memory. Such disconnection will clear memorized information in PCM memory.
- Using SUZUKI scan tool (Tech-1), or also generic scan tool for vehicle without monitor connector, the diagnostic information stored in PCM memory can be checked and cleared as well. Before its use, be sure to read Operator’s (instruction) Manual supplied with it carefully to have good understanding of its functions and usage.
- Priorities for diagnosing troubles (Only for vehicle without monitor connector)
  If two or more diagnostic trouble codes (DTCs) are stored, proceed to the flow table of the DTC which was detected earliest in the order and follow the instruction in that table.
  If no instructions are given, troubleshoot diagnostic trouble codes according to the following priorities.
  1. Diagnostic trouble codes (DTCs) other than DTC P0171/P0172 (Fuel system too lean/too rich) and DTC P0400 (EGR flow malfunction)
  2. DTC P0171/P0172 (Fuel system too lean/too rich) and DTC P0400 (EGR flow malfunction)
- Be sure to read “Precautions for Electrical Circuit Service” in Section 0A before inspection and observe what is written there.
- PCM replacement
  When substituting a known-good PCM, check for following conditions.
  Neglecting this check may result in damage to good PCM.
  – All relays and actuators have resistance of specified value.
  – MAF sensor, MDP sensor, TP sensor and fuel tank pressure sensor are in good condition. Also, the power circuit of these sensors is not shorted to the ground.

AUTOMATIC TRANSMISSION DIAGNOSTIC FLOW TABLE

Refer to the following pages for the details of each step.

STEP	ACTION	YES	NO
1	Customer Complaint Analysis 1) Perform customer complaint analysis referring to the next page. Was customer complaint analysis performed according to instruction on the next page?	Go to Step 2.	Perform customer complaint analysis.
2	Diagnostic Trouble Code (DTC) and Freeze Frame Data Check, Record and Clearance 1) Check for DTC (including pending DTC) referring to the next page. Is there any DTC(s)?	1) Print DTC and freeze frame data or write them down and clear them by referring to "DTC Clearance" in this section. 2) Go to Step 3.	Go to Step 4.
3	Visual Inspection 1) Perform visual inspection referring to the next page. Is there any faulty condition?	1) Repair or replace malfunction part. 2) Go to Step 11.	Go to Step 5.
4	Visual Inspection 1) Perform visual inspection referring to the next page. Is there any faulty condition?		Go to Step 8.
5	Trouble Symptom Confirmation 1) Confirm trouble symptom referring to the next page. Is trouble symptom identified?	Go to Step 6.	Go to Step 7.
6	Rechecking and Record of DTC/Freeze Frame Data 1) Recheck for DTC and freeze frame data referring to "DTC Check" in this section. Is there any DTC(s)?	Go to Step 9.	Go to Step 8.
7	Rechecking and Record of DTC/Freeze Frame Data 1) Recheck for DTC and freeze frame data referring to "DTC Check" in this section. Is there any DTC(s)?	Go to Step 9.	Go to Step 10.
8	Automatic Transmission Basic Inspection and Trouble Diagnosis Table 1) Check and repair according to "A/T Basic Check" and "Trouble Diagnosis Table" in this section. Are check and repair complete?	Go to Step 11.	1) Check and repair malfunction part(s). 2) Go to Step 11.
9	Troubleshooting for DTC 1) Check and repair according to applicable DTC diag. flow Table. Are check and repair complete?		
10	Check for Intermittent Problems 1) Check for intermittent problems referring to the next page. Is there any faulty condition?	1) Repair or replace malfunction part(s). 2) Go to Step 11.	Go to Step 11.
11	Final Confirmation Test 1) Clear DTC if any. 2) Perform final confirmation test referring to the next page. Is there any problem symptom, DTC or abnormal condition?	Go to Step 6.	End.

1. CUSTOMER COMPLAINT ANALYSIS

Record details of the problem (failure, complaint) and how it occurred as described by the customer.
For this purpose, use of such a inspection form will facilitate collecting information to the point required for proper analysis and diagnosis.

2. DIAGNOSTIC TROUBLE CODE (DTC)/FREEZE FRAME DATA CHECK, RECORD AND CLEARANCE

First, referring to DTC check section, check DTC (including pending DTC). If DTC exists, print or write down DTC and freeze frame data and then clear them by referring to DTC clearance section. DTC indicates malfunction in the system but it is not possible to know from it whether the malfunction is occurring now or it occurred in the past and normal condition has been restored. In order to know that, check symptom in question according to Step 5 and then recheck DTC according to Step 6.
Diagnosing a trouble based on the DTC in this step only or failure to clear the DTC in this step may result in an faulty diagnosis, trouble diagnosis of a normal circuit or difficulty in troubleshooting which is otherwise unnecessary.

3 and 4. VISUAL INSPECTION

As a preliminary step, be sure to perform visual check of the items that support proper function of the A/T and engine referring to Visual Inspection section.

5. TROUBLE SYMPTOM CONFIRMATION

Check trouble symptoms based on information obtained in Step 1 “CUSTOMER COMPLAINT ANALYSIS” and Step 2 “DTC/FREEZE FRAME DATA CHECK”.
Also, recheck DTC according to “DTC Confirmation Procedure” described in each “DTC FLOW TABLE”.

6 and 7. RECHECKING AND RECORD OF DTC/FREEZE FRAME DATA

Refer to “DTC Check” section for checking procedure.

8. A/T BASIC CHECK AND TROUBLE DIAGNOSIS TABLE

Perform A/T basic check according to the “A/T Basic Check Flow Table” first. When the end of the flow table has been reached, check the parts of the system suspected as a possible cause referring to TROUBLE DIAGNOSIS TABLE and based on symptoms appearing on the vehicle (symptoms obtained through steps of customer complaint analysis, trouble symptom confirmation and/or A/T basic check) and repair or replace faulty parts, if any.

9. DIAGNOSTIC TROUBLE CODE FLOW TABLE

Based on the DTC indicated in Step 6 and 7 and referring to “DIAGNOSTIC TROUBLE CODE FLOW TABLE” in this section, locate the cause of the trouble, namely in a sensor, switch, wire harness, connector, actuator, PCM or other part and repair or replace faulty parts.

10. CHECK FOR INTERMITTENT PROBLEM

Check parts where an intermittent trouble is easy to occur (e.g., wire harness, connector, etc.), referring to “INTERMITTENT AND POOR CONNECTION” in Section 0A and related circuit of DTC recorded in Step 2.

11. FINAL CONFIRMATION TEST

Confirm that the problem symptom has gone and the A/T is free from any abnormal conditions.
If what has been repaired is related to the malfunction DTC, clear the DTC once, set conditions under which DTC was detected and A/T and/or vehicle was repaired and confirm that no DTC is indicated.

CUSTOMER PROBLEM INSPECTION FORM (EXAMPLE)

User name:	Model:	VIN:	
Date of issue:	Date of Reg:	Date of problem:	Mileage:

PROBLEM SYMPTOMS	
☐Engine does not start	☐Engine stops
☐Vehicle does not move (forward, rearward)	☐Transmission does not shift (1st, 2nd, 3rd, 4th, Rev) gear
☐No lock-up (TCC clutch operation)	☐Automatic shift does not occur
☐Shift point too high or too low	☐Transmission slipping in (1st, 2nd, 3rd, 4th, Rev) gear
☐Excessive gear change shock	☐Other:

VEHICLE/ ENVIRONMENTAL CONDITION WHEN PROBLEM OCCURS

Environmental Condition	
Weather	☐Fair/☐Cloudy/☐Rain/☐Snow/☐Always/☐Other ( )
Temperature	☐Hot/☐Warm/☐Cool/☐Cold/☐(°C °F)/☐Always
Frequency	☐Always/☐Sometimes/☐(times/ day, month)/☐Only Once
Road	☐Urban/☐Suburb/☐Highway/☐Mountainous (uphill/downhill)/☐Paved road/☐Gravel/ ☐Other( )

Vehicle Condition	
Transmission range	☐(P,R,N,D,2,L) range/☐(→) range
Transmission temp.	☐Cold/☐Warming up phase/☐Warmed up
Vehicle	☐At stop/☐During driving (constant speed/accelerating/decelerating/ right hand corner/left hand corner)/☐Other ( )/☐Speed (km/h mile/h)
Engine	☐Speed(r/min)/☐Throttle opening(idle/about %/full)
Brake	☐Apply/☐Not apply
O/D cut switch	☐ON/☐OFF
P/N change switch	☐Power/☐Normal

Malfunction indicator lamp condition

☐Always ON ☐Sometimes ON ☐Always OFF ☐Good condition

Diagnostic trouble code			
	First check	: ☐No code	☐Malfunction code( )
	Second check	: ☐No code	☐Malfunction code( )

NOTE:
The above form is a standard sample. It should be modified according to conditions characteristic of each market.

MALFUNCTION INDICATOR LAMP (MIL) CHECK

Refer to the same item in Section 6/6-1 for checking procedure.

“O/D OFF” LAMP CHECK

1) Check that O/D cut switch button is at OFF position (pushed).
2) Turn ignition switch ON.
3) Check that “O/D OFF” lamp lights for about 2 – 4 sec. and then goes OFF.
   If anything faulty is found, advance “Diagnostic flow table B-1 or B-2” O/D OFF “LAMP CIRCUIT CHECK”.

“POWER” LAMP CHECK

1) Check that Power/Normal change switch button is at Normal position.
2) Turn ignition switch ON.
3) Check that “Power” Lamp light for 2 – 4 sec. and then goes OFF.
   If anything faulty is found, advance “Diagnostic flow table B-3 or B-4 “POWER” LAMP CIRCUIT CHECK 2.

DIAGNOSTIC TROUBLE CODE (DTC) CHECK

Refer to the same item in Section 6/6-1 for checking procedure.

DIAGNOSTIC TROUBLE CODE (DTC) CLEARANCE

Refer to the same item in Section 6/6-1 for clearance procedure.

DIAGNOSTIC TROUBLE CODE (DTC) TABLE (A/T RELATED CODE)

DTC NO.		DETECTED ITEM	DETECTING CONDITION	MIL	
Using scan tool	Not using scan tool			Vehicle without monitor connector	Vehicle with monitor connector
–	12	–	No trouble.	–	–
P0705	72	Transmission range sensor circuit malfunction	Multiple signals inputted simultaneously or no signal inputted while running at 60 km/h or more.	2 driving cycles	Not applicable
P0715	76	Input/Turbine speed sensor circuit malfunction	Input shaft revolution speed is lower than specified value while vehicle is running with “D” range and specified engine speed or higher.	2 driving cycles	Not applicable
P0720	75	Output speed sensor circuit malfunction	Output speed sensor signal not inputted while VSS signal being inputted.	2 driving cycles	Not applicable
*1 P0741	Not applicable	TCC (lock-up) solenoid performance or stack off	Actual TCC operation does not agree with ON/OFF control from PCM to TCC.	2 driving cycles	Not applicable
P0743	65 66	TCC (lock-up) solenoid electrical	Monitor signal OFF is detected When TCC control solenoid is ON or monitor signal ON is detected when it is OFF.	1 driving cycle	Not applicable
*1 P0751	Not applicable	Shift solenoid A (#1) performance or stuck off	Gear change control from PCM to A/T does not agree with actual gear position of A/T.	2 driving cycles	Not applicable
P0753	61 62	Shift solenoid A (#1) electrical	Monitor signal OFF is detected when shift solenoid A (#1) is ON or monitor signal ON is detected when it is OFF.	1 driving cycle	Not applicable

DIAGNOSTIC TROUBLE CODE (DTC) TABLE (A/T RELATED CODE) (cont'd)

DTC NO.		DETECTED ITEM	DETECTING CONDITION	MIL	
Using scan tool	Not using scan tool			Vehicle without monitor connector	Vehicle with monitor connector
*1 P0756	Not applicable	Shift solenoid B (#2) performance or stuck off	Gear change control from PCM to A/T does not agree with actual gear position of A/T.	2 driving cycles	Not applicable
P0758	63 64	Shift solenoid B (#2) electrical	Monitor signal OFF is detected when shift solenoid B (#2) is ON or monitor signal ON is detected when it is OFF.	1 driving cycle	Not applicable
*1 P1875	Not applicable	4WD low switch circuit malfunction	Difference between vehicle speed detected by VSS and vehicle speed detected by output speed sensor and compensated by 4WD low switch is larger than specification.	2 driving cycles	Not applicable

NOTE:
***1: Applicable to vehicle without monitor connector only.**

FAIL-SAFE TABLE

When any of the following DTC is detected, ECM (PCM) enters fail-safe mode as long as malfunction continues to exist but that mode is canceled when ECM detects normal condition after that.

DTC NO.		TROUBLE AREA	FAIL SAFE OPERATION
Using scan tool	Not using scan tool		
P0177 P0118	14 15	ECT SENSOR	● Each control except 4-A/T is permitted on the basis of 30.1°C engine coolant temp. ● 4-A/T control is performed assuming 31°C (engine warmed up) or higher after 15 min. from engine start.
P0122 P0123	21 22	TP SENSOR	● Each control except 4-A/T is performed on the basis of 124° throttle valve opening. ● 4-A/T control is performed on the basis of 0° throttle valve opening.
P0705	72	TR SWITCH	A/T control is performed in priority order of L, 2, N, D, R and P.
P0720	75	OUTPUT SPEED SENSOR CIRCUIT MALFUNCTION	A/T control is performed by using signal from VSS.
P0753	61 62	SHIFT SOLENOID A (#1)	● A/T control using 3rd gear is performed when D range, 1st or 2nd gear is used. ● TCC solenoid OFF.
P0758	63 64	SHIFT SOLENOID B (#2)	● A/T control using 4th gear is performed when D range 2nd or 3rd gear is used. ● When both shift solenoid A (#1) and B (#2) failed simultaneously, A/T control using 4th gear is always performed in D range. ● TCC solenoid OFF.
P0743	65 66	TCC (Lock-up) SOLENOID	TCC (lock-up) solenoid OFF.

VISUAL INSPECTION

Visually check following parts and systems.

INSPECTION ITEM	REFERRING SECTION
● A/T fluid – – – – – level, leakage, color	Section 0B
● A/T fluid hoses – – – – – disconnection, looseness, deterioration	Section 7B1
● Throttle (accelerator) cable – – – – – play, installation	Section 6E1/6E2
● A/T throttle cable – – – – – play, installation	Section 7B1
● A/T select cable – – – – – installation, operation	Section 7B1
● Engine oil – – – – – level, leakage	Section 0B
● Engine coolant – – – – – level, leakage	Section 0B
● Battery – – – – – fluid level, corrosion of terminal	
● Connectors of electric wire harness – – – – – disconnection, friction	Section 6/6-1/7B1
● Fuses – – – – – burning	Section 8
● Parts – – – – – installation, damage	
● Bolt – – – – – looseness	
● Other parts that can be checked visually	
Also check following items at engine start, if possible.	
● "O/D OFF" lamp — Operation	Section 7B1
● "POWER" lamp — Operation	Section 7B1
● Malfunction indicator lamp — Operation	Section 6/6-1
● Charge warning lamp — Operation	Section 6H
● Engine oil pressure warning lamp — Operation	Section 8 (Section 6A1/6A2/6A4 for pressure check)
● Engine coolant temp. meter — Operation	
● Other parts that can be checked visually	

A/T BASIC CHECK

This inspection is important for troubleshooting when PCM (ECM) has detected no DTC and no abnormality has been noted in visual inspection.
Follow flow table carefully.

STEP	ACTION	YES	NO
1	Was “A/T DIAG. FLOW TABLE” performed?	Go to Step 2.	Go to “A/T DIAG. FLOW TABLE”.
2	Perform MANUAL ROAD TEST in this section. Is it OK?	Go to Step 3.	Go to Step 4.
3	Proceed to TROUBLE DIAGNOSIS TABLE 1 in this section. Is trouble identified?	Repair or replace defective parts.	Go to Step 5.
4	Perform stall test, time rag test, line pressure test, engine brake test and “P” range test referring to STALL TEST, LINE PRESSURE TEST, ENGINE BRAKE TEST and “P” RANGE TEST in this section. Are the test results satisfactory?	Go to Step 5.	Proceed to TROUBLE DIAGNOSIS TABLE 3 in this section.
5	Proceed to TROUBLE DIAGNOSIS TABLE 2 in this section. Is trouble identified?	Repair or replace defective parts.	Proceed to TROUBLE DIAGNOSIS TABLE 3 in this section.

TROUBLE DIAGNOSIS TABLE 1

Condition	Possible Cause	Correction
TCC does not operate	● Brake pedal (stop lamp) switch or its circuit faulty (H25 engine only) ● 4WD low switch or its circuit faulty ● Engine coolant temp. sensor or its circuit faulty ● Cruise control signal circuit faulty (if equipped)	DIAGNOSTIC FLOW TABLE A-1
Gear does not change to 4th	● O / D cut switch or its circuit faulty ● 4WD low switch or its circuit faulty ● Engine coolant temp. sensor or its circuit faulty ● Cruise control signal circuit faulty (if equipped)	DIAGNOSTIC FLOW TABLE A-2

TROUBLE DIAGNOSIS TABLE 2

Condition		Possible Cause	Correction
Transmission fluid	Low fluid pressure	● Clogged oil pump strainer	Wash strainer.
		● Malfunction of pressure regulator valve	Overhaul valve body.
	High fluid pressure	● Pressure regulator valve	Overhaul valve body.
Running condition	Unable to run in all range	● Regulator valve stick	Replace.
		● Clogged oil strainer	Wash strainer.
		● Seized or broken planetary gear	Repair or replace.
		● Faulty manual valve	Replace.
Running condition	Poor 1st speed running or excessive slippage in “D” or “2”	● Faulty 1–2 shift valve	Replace.
Gear shift	Poor 1–2 shift, excessive slippage	● Regulator valve sticking	Replace.
		● 1–2 shift valve sticking	Replace.
		● Shift solenoid valve-B sticking	Replace.
		● Intermediate coast modulator valve sticking	Replace.
	Poor 2–3 shift, excessive slippage	● 2–3 shift valve sticking	Replace.
		● Shift solenoid valve-A sticking	Replace.
	Poor start or surging in “D” range	● Regulator valve sticking	Replace.

Condition		Possible Cause	Correction
Gear shift	Poor 3–4 shift, excessive slippage	● 3–4 shift valve sticking ● Shift solenoid valve-B sticking	Replace. Replace.
	Excessive shock on 1–2 shift	● Regulator valve sticking ● Faulty accumulator, second brake piston	Replace. Replace.
	Excessive shock on 2–3 shift	● Regulator valve sticking ● Faulty accumulator, direct clutch piston	Replace. Replace.
	Excessive shock on 3–4 shift	● Regulator valve sticking	Replace.
	Non operate lock-up system	● TCC (Lock-up) control valve sticking ● Solenoid valve No.2 (TCC solenoid valve) sticking	Replace. Replace.

TROUBLE DIAGNOSIS TABLE 3

Condition		Possible Cause	Correction
Transmission fluid	Low fluid pressure	● Leakage from oil pressure circuit	Overhaul.
Running condition	Unable to run in all range	● Wear in oil pump ● Seizure in oil pump ● Fluid pressure leakage to over drive clutch due to wear of oil pump bushing ● Faulty in torque converter	Replace. Replace. Replace. Replace.

Condition		Possible Cause	Correction
Running condition	Poor 1st speed running or excessive slippage in “D” or “2”	● Fluid pressure leakage from forward clutch due to wear or breakage of O/D case seal ring	Replace.
		● Overdrive clutch slipping	Replace.
	Unable to run or excessive slippage in “L” range	● Fluid pressure leakage of forward clutch due to wear or breakage of O/D case seal ring	Replace.
		● Reverse brake disc slipping	Replace.
		● Broken brake piston O-ring	Replace.
	Unable to run or excessive slippage in “R” range	● Fluid pressure leakage to direct clutch due to wear or breakage of center support seal ring	Replace.
		● Worn direct clutch	Replace.
Gear shift	Poor 1–2 shift, excessive slippage	● Fluid pressure leakage to overdrive clutch due to wear or breakage of O/D case seal ring	Replace.
		● Faulty second brake	Replace.
		● Broken O-ring of second brake piston	Replace.
		● Faulty second coast brake (in “2” range)	Replace.
	Poor 2–3 shift, excessive slippage	● Fluid pressure leakage to overdrive clutch due to wear or breakage of O/D case seal ring	Replace.
		● Worn direct clutch bushing	Replace.
		● Direct clutch slipping	Replace.
		● Foreign material caught in direct clutch piston check ball	Replace.
	Poor start or surging in “D” range	● Fluid pressure leakage of forward clutch due to wear or breakage of O/D case seal ring	Replace.
		● Malfunction of forward clutch	Replace.
	Poor 3–4 shift, excessive slippage	● Faulty overdrive brake	Replace.
		● Faulty overdrive clutch	Replace.
	Poor start or juddering in “R” range	● Fluid pressure leakage of direct clutch due to wear or breakage of oil center support seal ring	Replace.
		● Worn direct clutch	Replace.
	Excessive shock on 1– 2 shift	● Faulty one-way clutch	Replace.
	Non operate lock-up system	● Faulty torque converter	Replace.
Abnormal noise	Abnormal noise in “P” or “N” range	● Worn oil pump	Replace.

SCAN TOOL DATA-Refer to SECTION 6/6-1.

INSPECTION OF PCM AND ITS CIRCUIT-Refer to SECTION 6/6-1.

WIRE HARNESS AND CONNECTORS-Refer to SECTION 6/6-1.

DIAGNOSTIC FLOW TABLE A-1 (NO TCC LOCK-UP OCCURS)

SYSTEM DESCRIPTION

PCM turns TCC solenoid OFF under any of the following conditions.

- Brake pedal switch: ON
- 4WD LOW switch: ON
- Cruise control module: TCC OFF command signal is output (if equipped).
- ECT: ECT < 30°C (86°F)

TROUBLESHOOTING

WARNING:

- **When performing a road test, select a place where there is no traffic or possibility of a traffic accident and very careful during testing to avoid occurrence of an accident.**
- **Road test should be carried out with 2 person, a driver and tester, on a level road.**

<table>
<tr><th>STEP</th><th>ACTION</th><th>YES</th><th>NO</th></tr>
<tr><td>1</td><td>Was “AUTOMATIC TRANSMISSION DIAGNOSTIC FLOW TABLE” performed?</td><td>Go to Step 2.</td><td>Go to “AUTOMATIC TRANSMISSION DIAGNOSTIC FLOW TABLE”.</td></tr>
<tr><td>2</td><td>ECT check:
(1) Warm up engine to normal operating temperature.
(2) Check ECT using scan tool.
Is ECT more than 30°C (86°F)?</td><td>Go to Step 3.</td><td>Faulty ECT sensor, its circuit or engine cooling system.
If OK, substitute a known-good PCM and recheck.</td></tr>
<tr><td>3</td><td>Perform running test under the following conditions and check voltage between C51-1-8 (G16/J20 engines) or C51-1-2 (H25 engine) terminal of PCM coupler and ground.
● Normal mode in “D” range.
● Transfer “2H” position.
● Cruise control is not operated (if equipped).
● Brake pedal released.
● Drive vehicle with TCC ON condition referring to “TCC lock-up diagram” in this section.
Is it battery voltage?</td><td>Faulty TCC solenoid valve, its circuit or transmission.</td><td>Go to Step 4.</td></tr>
<tr><td>4</td><td>Is vehicle equipped with H25 engine?</td><td>Go to Step 5.</td><td>Go to Step 6.</td></tr>
<tr><td>5</td><td>Brake switch signal inspection:
(1) With ignition switch ON, check voltage between E61-31 terminal of PCM coupler terminal and ground.
<table><tr><td>Brake pedal</td><td>Released</td><td>Depressed</td></tr><tr><td>Voltage</td><td>0 V</td><td>Battery voltage</td></tr></table>Is the result as specified?</td><td>Go to Step 6.</td><td>Faulty brake pedal switch or its circuit.
If OK, substitute a known-good PCM and recheck.</td></tr>
</table>

<table>
<tr><th>STEP</th><th>ACTION</th><th>YES</th><th>NO</th></tr>
<tr><td>6</td><td>“4WD LOW” switch signal inspection:
(1) With ignition switch ON, check voltage between C51-1-26 (G16 / J20 engines) or C51-1-5 (H25 engine) terminal of PCM coupler and ground.
<table><tr><td>Transfer gear position</td><td>“4L” or “N”</td><td>“4H” or “2H”</td></tr><tr><td>Voltage</td><td>0 V</td><td>Battery voltage</td></tr></table>
Is the result as specified?</td><td>Go to Step 7.</td><td>Faulty “4WD LOW” switch or its circuit.
If OK, substitute a known-good PCM and recheck.</td></tr>
<tr><td>7</td><td>Is vehicle equipped with cruise control system?</td><td>Go to Step 8.</td><td>Substitute a known-good PCM and recheck.</td></tr>
<tr><td>8</td><td>Cruise control signal inspection:
(1) With ignition switch ON, check voltage between E61-35 (G16 / J20 engines) or E61-3 (H25 engine) terminal of PCM coupler and ground.
Is it battery voltage?</td><td>Substitute a known-good PCM and recheck.</td><td>Faulty cruise control module or its circuit.
If OK, substitute a known-good PCM and recheck.</td></tr>
</table>

DIAGNOSTIC FLOW TABLE A-2 (NO GEAR SHIFT TO O/D)

SYSTEM DESCRIPTION

PCM does not shift to O/D gear under any of the following conditions.

- O/D cut switch: ON
- 4WD LOW switch: ON
- Cruise control module: O/D OFF command signal is output (if equipped).
- ECT: ECT < 30°C (86°F)

TROUBLESHOOTING

WARNING:
- **When performing a road test, select a place where there is no traffic or possibility of a traffic accident and very careful during testing to avoid occurrence of an accident.**
- **Road test should be carried out with 2 person, a driver and tester, on a level road.**

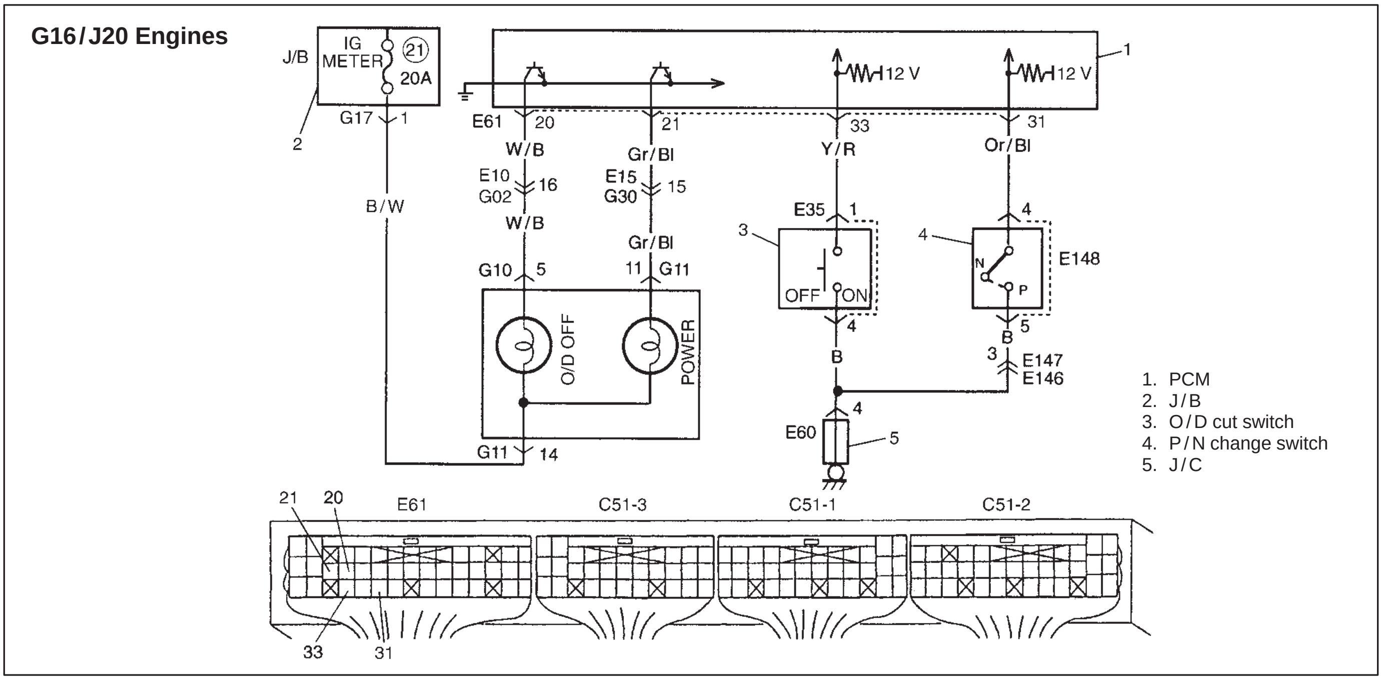
<table>
<tr><th>STEP</th><th>ACTION</th><th>YES</th><th>NO</th></tr>
<tr><td>1</td><td>Was “AUTOMATIC TRANSMISSION DIAGNOSTIC FLOW TABLE” performed?</td><td>Go to Step 2.</td><td>Go to “AUTOMATIC TRANSMISSION DIAGNOSTIC FLOW TABLE”.</td></tr>
<tr><td>2</td><td>ECT check:
(1) Warm up engine to normal operating temperature.
(2) Check ECT using scan tool.
Is ECT more than 30°C (86°F)?</td><td>Go to Step 3.</td><td>Faulty ECT sensor, its circuit or engine cooling system.
If OK, substitute a known-good PCM and recheck.</td></tr>
<tr><td>3</td><td>Perform running test under the following conditions and check voltage between C51-1-2 (G16/J20 engines) or C51-1-6 (H25 engine) terminal of PCM coupler and ground, C51-1-1 terminal of PCM coupler and ground.
● O/D cut switch OFF (“O/D OFF” lamp OFF).
● Normal mode in “D” range.
● Transfer “2H” position.
● Cruise control is not operated (if equipped).
● Drive vehicle with 4th gear condition referring to “Gear shift diagram” in this section.
Is each voltage about 0 V?</td><td>Faulty shift solenoid valve, its circuit or transmission.</td><td>“G” wire or “G/R” wire shorted to power circuit.
If OK, go to Step 4.</td></tr>
<tr><td>4</td><td>O/D cut switch signal inspection:
(1) With ignition switch ON, check voltage between E61-33 (G16/J20 engines) or E61-14 (H25 engine) terminal of PCM coupler and ground.
<table><tr><td>O/D cut switch</td><td>OFF</td><td>ON</td></tr><tr><td>Voltage</td><td>Battery voltage</td><td>0 V</td></tr></table>Is the result as specified?</td><td>Go to Step 5.</td><td>Faulty O/D cut switch or its circuit.
If OK, substitute a known-good PCM and recheck.</td></tr>
</table>

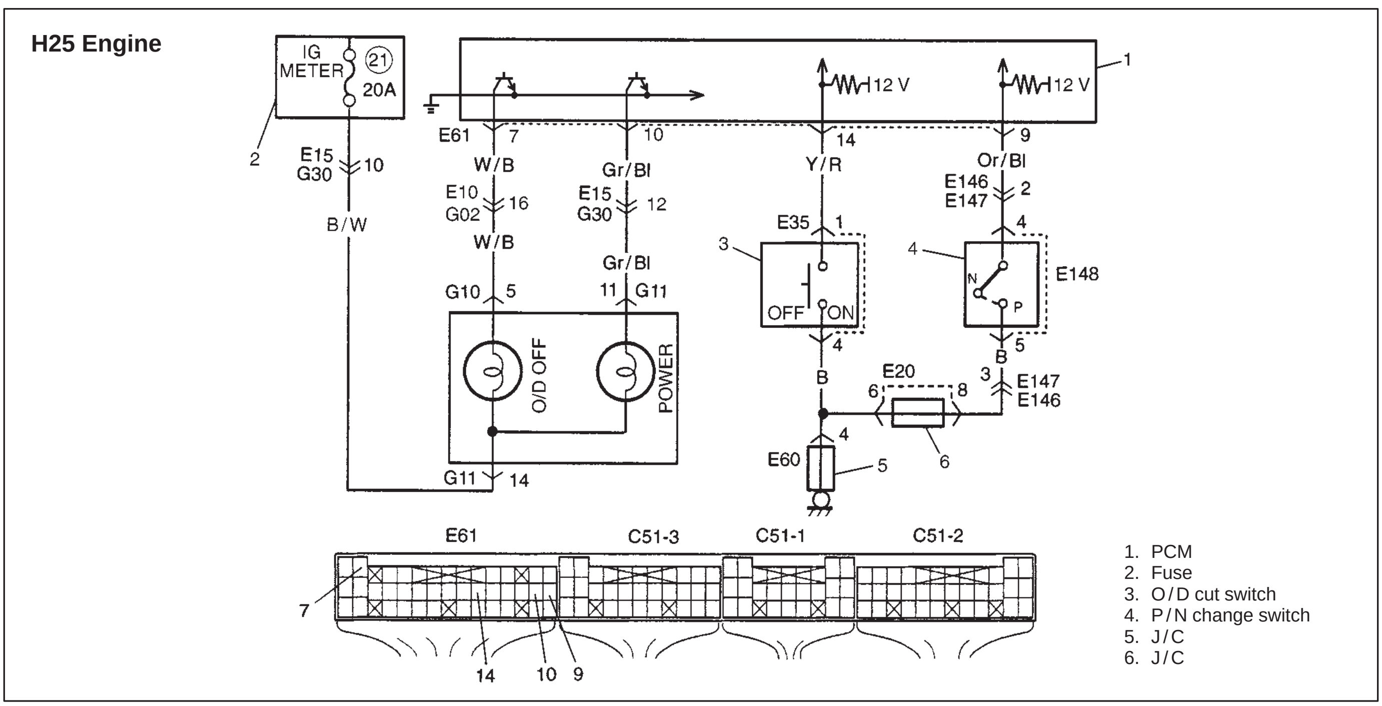
<table>
<tr><th>STEP</th><th>ACTION</th><th>YES</th><th>NO</th></tr>
<tr><td>5</td><td>4WD LOW switch signal inspection:
(1) With ignition switch ON, check voltage between C51-1-26 (G16/J20 engines) or C51-1-5 (H25 engine) terminal of PCM coupler and ground.
<table>
<tr><td>Transfer gear position</td><td>“4L” or “N”</td><td>“4H” or “2H”</td></tr>
<tr><td>Voltage</td><td>0 V</td><td>Battery voltage</td></tr>
</table>
Is the result as specified?</td><td>Go to Step 6.</td><td>Faulty 4WD LOW switch or its circuit.
If OK, substitute a known-good PCM and recheck.</td></tr>
<tr><td>6</td><td>Is vehicle equipped with cruise control system?</td><td>Go to Step 7.</td><td>Substitute a known-good PCM and recheck.</td></tr>
<tr><td>7</td><td>Cruise control signal inspection:
(1) With ignition switch ON, check voltage between E61-35 (G16/J20 engines) or E61-3 (H25 engine) terminal of PCM coupler and ground.
Is it battery voltage?</td><td>Substitute a known-good PCM and recheck.</td><td>Faulty cruise control module or its circuit.
If OK, substitute a known-good PCM and recheck.</td></tr>
</table>

DIAGNOSTIC FLOW TABLE B-1 "O/D OFF" LIGHT CIRCUIT CHECK

("O/D OFF" LIGHT DOESN'T LIGHT AT IGNITION SWITCH ON BUT ENGINE STARTS UP)

WIRING DIAGRAM





TROUBLESHOOTING

STEP	ACTION	YES	NO
1	"O/D OFF" light circuit check: (1) With ignition switch OFF, disconnect couplers from PCM. (2) Using service wire, connect E61-20 (G16/J20 engines) or E61-7 (H25 engine) terminal of disconnected PCM coupler and ground. Does "O/D OFF" light turn ON at ignition switch ON?	Poor E61-20 (G16/J20 engines) or E61-7 (H25 engine) terminal connection. If OK, substitute a known-good PCM and recheck.	Bulb burned out or faulty "W/B", "B/W" wire.

DIAGNOSTIC FLOW TABLE B-2 "O/D OFF" LIGHT CIRCUIT CHECK
("O/D OFF" LIGHT COMES ON STEADILY)

WIRING DIAGRAM – Refer to Table B-1 in this section.

TROUBLESHOOTING

STEP	ACTION	YES	NO
1	Check O/D cut Switch Position. Is O/D cut switch turned OFF (Is switch button at OFF position)?	Go to Step 2.	Turn O/D cut switch OFF.
2	Check Lamp Circuit for Short. 1) Turn ignition switch OFF and disconnect PCM connectors. 2) Turn ignition switch ON. Does "O/D OFF" lamp come ON steadily?	"W/B" circuit shorted to ground.	Go to Step 3.
3	Check O/D cut Switch Circuit. 1) Check resistance between terminal E61-33 (G16/J20 engines) or E61-14 (H25 engine) of disconnected PCM connector and body ground with O/D cut switch OFF. Is continuity indicated?	Go to Step 4.	Check PCM ground circuit for open. If ground circuit is OK, substitute a known-good PCM and recheck.
4	Check O/D cut Switch for Operation. 1) Remove console box. 2) Disconnect O/D cut switch connector. 3) Check continuity between switch terminals under each condition below. Switch OFF position: No continuity Switch ON position: Continuity Is check result satisfactory?	"Y/R" circuit shorted to ground.	Replace O/D cut switch.

Fig. for Step 1.

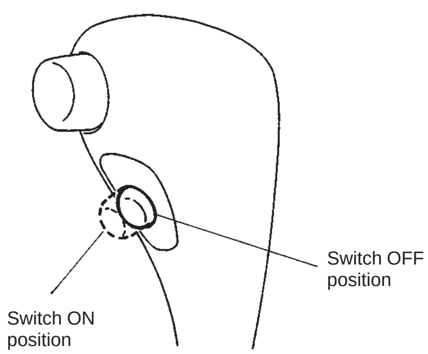
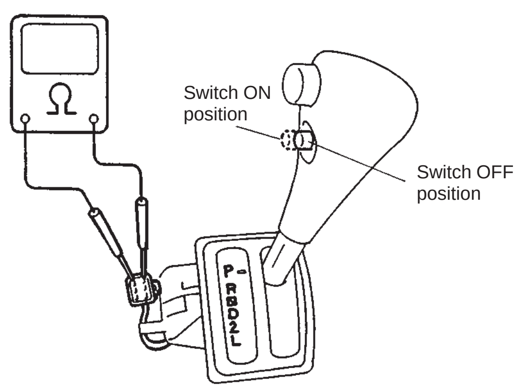


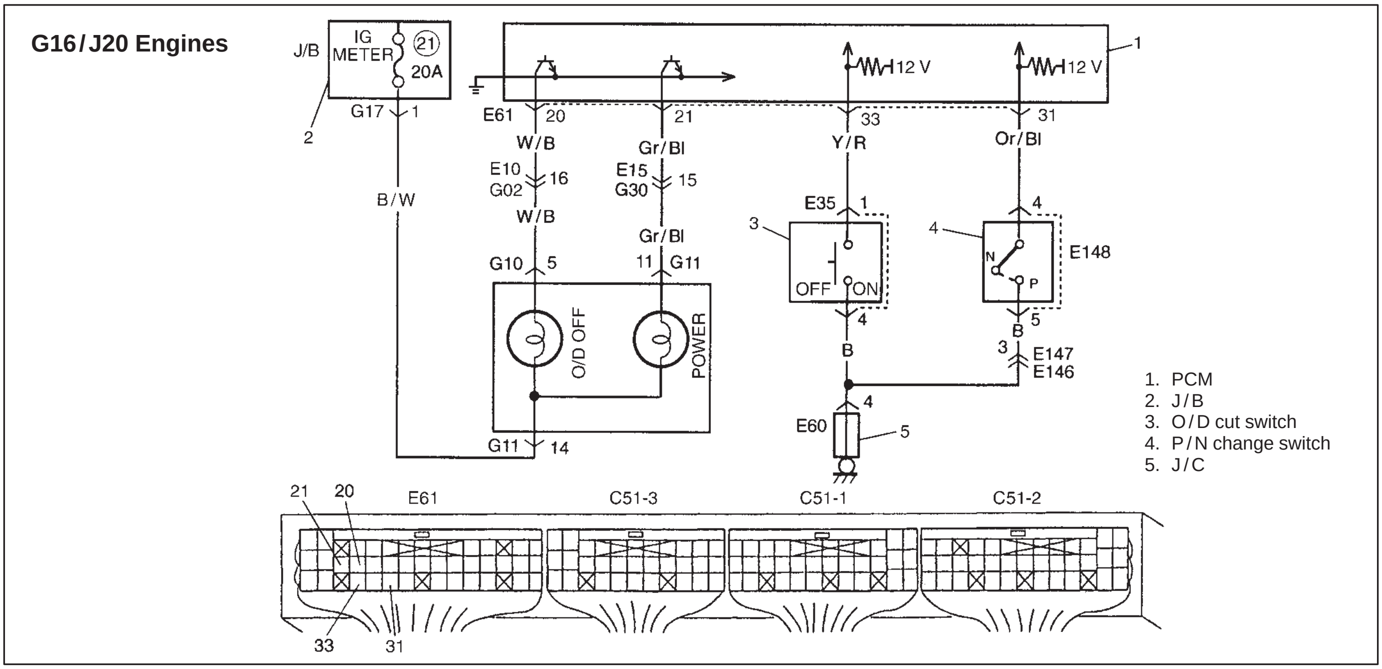
Fig. for Step 4.

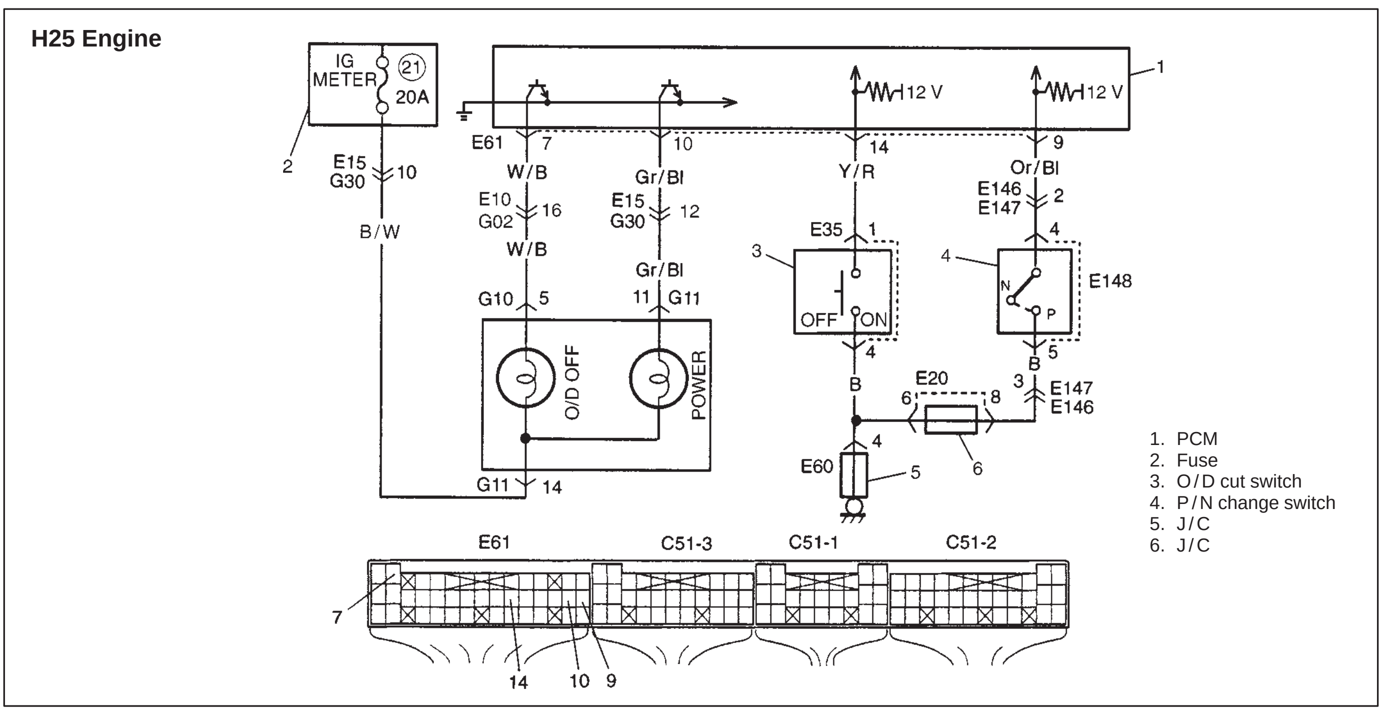


DIAGNOSTIC FLOW TABLE B-3 "POWER" LIGHT CIRCUIT CHECK

("POWER" LIGHT DOESN'T LIGHT AT IGNITION SWITCH ON BUT ENGINE STARTS UP)

WIRING DIAGRAM





TROUBLESHOOTING

STEP	ACTION	YES	NO
1	"POWER" light circuit check: (1) With ignition switch OFF, disconnect couplers from PCM. (2) Using service wire, connect E61-21 (G16/J20 engines) or E61-10 (H25 engine) terminal of disconnected PCM coupler and ground. Does "POWER" light turn ON at ignition switch ON?	Poor E61-21 (G16/J20 engines) or E61-10 (H25 engine) terminal connection. If OK, substitute a known-good PCM and recheck.	Bulb burned out or faulty "Gr/Bl", "B/W" wire.

DIAGNOSTIC FLOW TABLE B-4 "POWER" LIGHT CIRCUIT CHECK
("POWER" LIGHT COMES ON STEADILY)

WIRING DIAGRAM – Refer to Table B-3 in this section.

TROUBLESHOOTING

STEP	ACTION	YES	NO
1	Check Power/Normal Change Switch Position. Is switch button at Normal position?	Go to Step 2.	Set Power/Normal change switch at Normal position.
2	Check Lamp Circuit for Short. 1) Turn ignition switch OFF and disconnect PCM connectors. 2) Turn ignition switch ON. Does "POWER" lamp come ON steadily?	"Gr/Bl" circuit shorted to ground.	Go to Step 3.
3	Check Power/Normal Change Switch Circuit. 1) Check resistance between terminal E61-31 (G16/J20 engines) or E61-9 (H25 engine) of disconnected PCM connector and body ground with P/N change switch OFF. Is continuity indicated?	Go to Step 4.	Check PCM ground circuit for open. If ground circuit is OK, substitute a known-good PCM and recheck.
4	Check Power/Normal Change Switch for Operation. 1) Remove Power/Normal change switch. 2) Check continuity between switch terminals "4" and "5" under each condition below. Normal position: No continuity Power position: Continuity. Is check result satisfactory?	"Or/Bl" circuit shorted to ground.	Replace Power/Normal change switch.

Fig. for Step 1.

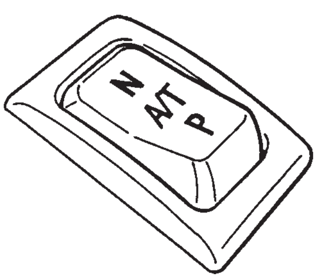
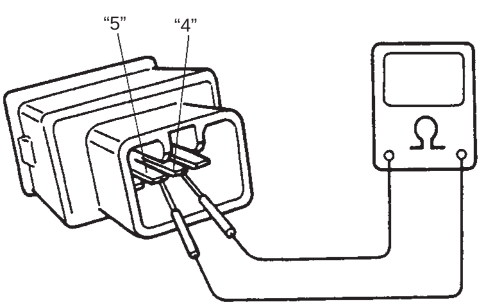


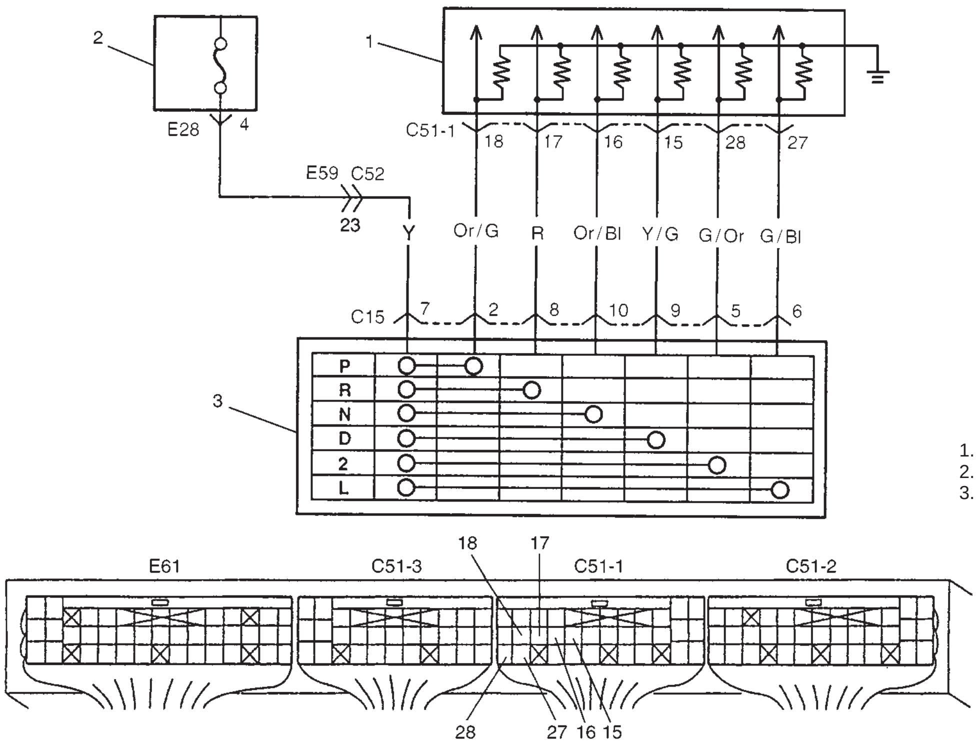
Fig. for Step 4.



DTC P0705 (DTC NO.72) TRANSMISSION RANGE SENSOR (SWITCH) CIRCUIT MALFUNCTION

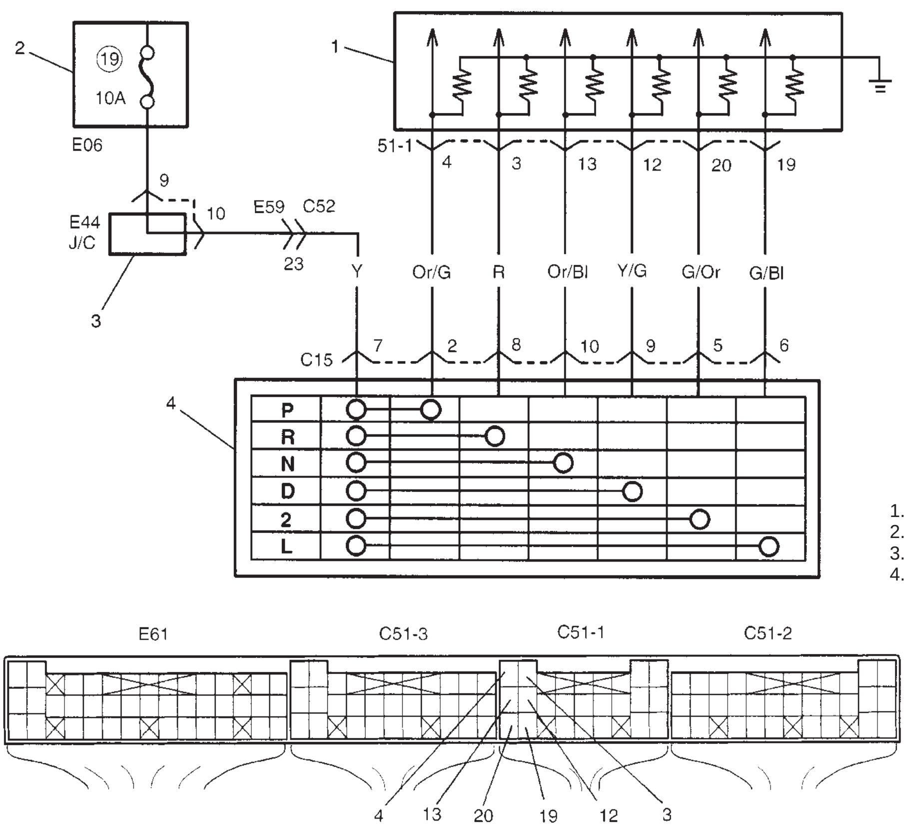
WIRING DIAGRAM

G16/J20 Engines



1. PCM
2. J/B
3. Transmission range sensor (switch)

H25 Engine



1. PCM
2. Fuse
3. J/C
4. Transmission range sensor (switch)

DTC DETECTING CONDITION AND TROUBLE AREA

DTC DETECTING CONDITION	TROUBLE AREA
• Transmission range switch signal (P, R, N, D, 2 or L) is not inputted for 25 sec. at 60 km/h (38 mph) or higher vehicle speed. or • Multiple signals are inputted simultaneously for 25 sec. (2 driving cycles detection logic)	• Transmission range sensor (switch) maladjusted. • Transmission range sensor (switch) or its circuit malfunction. • PCM

DTC CONFIRMATION PROCEDURE

WARNING:
- **When performing a road test, select a place where there is no traffic or possibility of a traffic accident and be very careful during testing to avoid occurrence of an accident.**
- **Road test should be carried out with 2 persons, a driver and a tester, on a level road.**

1) Connect scan tool to DLC with ignition switch OFF, if available.
2) Clear DTC and start engine.
3) Shift A/T selector lever to each of L, 2, D, N, R and P ranges for 30 seconds each.
4) Increase vehicle speed to about 70 km/h (45 mph) in D range.
5) Keep driving above vehicle speed for 30 seconds.
6) Release accelerator pedal, decrease vehicle speed and stop vehicle.
7) Check DTC and/or pending DTC.

TROUBLESHOOTING (DTC P0705)

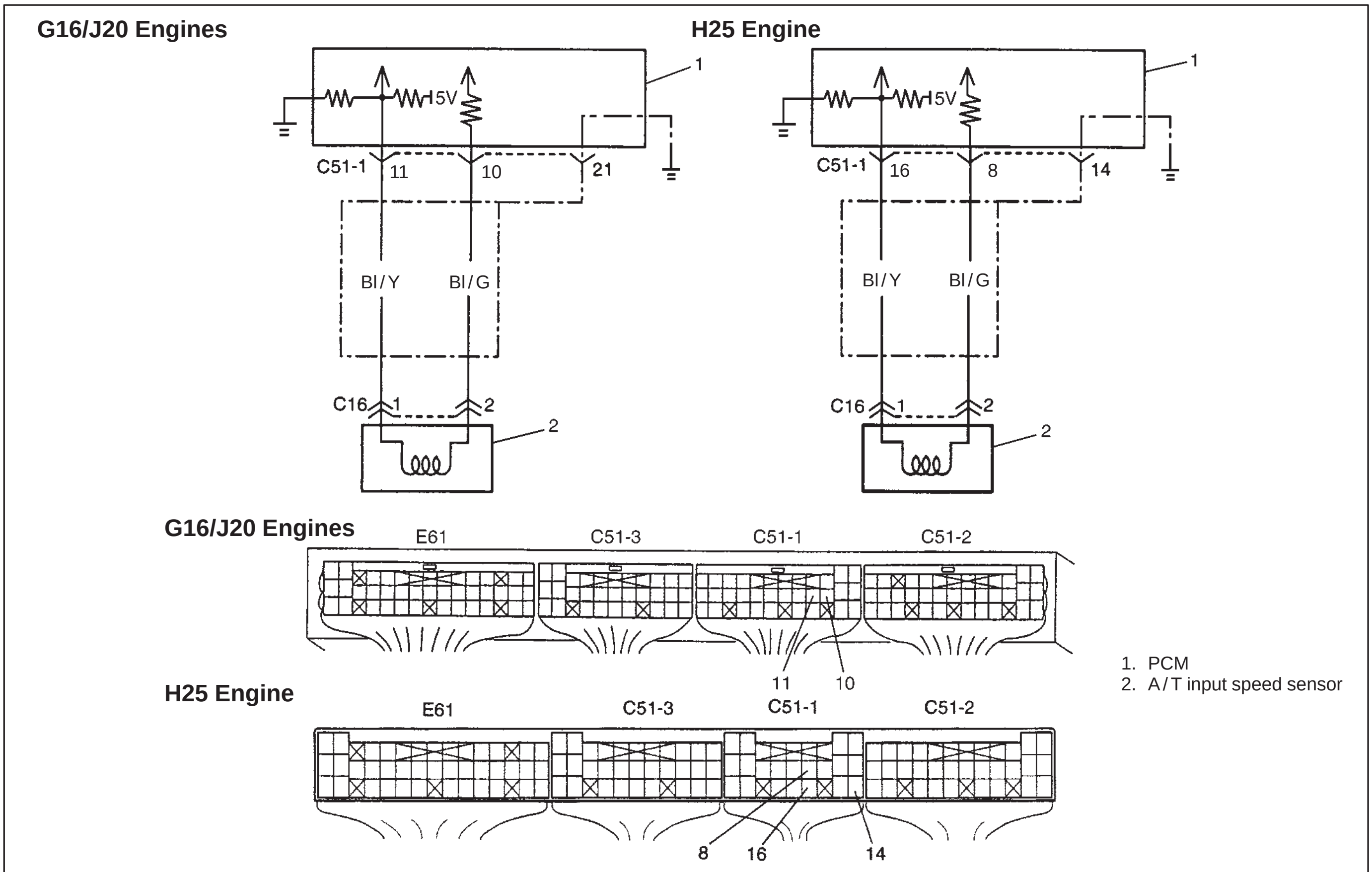
STEP	ACTION	YES	NO
1	Was “A/T DIAG. FLOW TABLE” performed?	Go to Step 2.	Go to “A/T DIAG. FLOW TABLE”.
2	Check Transmission Range Switch (Sensor) Circuit for Operation. When using SUZUKI scan tool: 1) Connect SUZUKI scan tool to DLC with ignition switch OFF. 2) Turn ignition switch ON and check transmission range signal (P, R, N, D, 2 or L) on display when shifting select lever to each range. Is applicable range indicated? When not using SUZUKI scan tool: 1) Turn ignition switch ON. 2) Check voltage at terminals C51-1-15, C51-1-16, C51-1-17, C51-1-18, C51-1-27 and C51-1-28 for G16/J20 (C51-1-4, C51-1-3, C51-1-13, C51-1-12, C51-1-20 and C51-1-19 for H25) respectively with select lever shifted to each range. Taking terminal C51-1-28 for G16/J20 (C51-1-20 for H25) as an example, is battery voltage indicated only when select lever is shifted to “2” range and 0 V for other ranges as shown in figure? Check voltage at other terminals likewise, referring to figure. Are check results satisfactory?	Intermittent trouble. Check for intermittent referring to “Intermittent and Poor Connection” in section 0A.	Go to Step 3.
3	Check Select Cable for Adjustment referring to “Select Cable Adjustment” in this section. Is it adjusted correctly?	Go to Step 4.	Adjust.
4	Check Transmission Range Switch for Installation Position. 1) Shift select lever to “N” range. 2) Check that “N” reference line on switch and center line on shaft are aligned. Are they aligned?	Go to Step 5.	Adjust.
5	Check Transmission Range Switch (Sensor) referring to “Transmission Range Switch” in this section. Are check results satisfactory?	“Y”, “Or/G”, “R”, “Or/Bl”, “Y/G”, “G/Or” or “G/Bl” circuit open or short. If wires and connections are OK, substitute a known-good PCM and recheck.	Replace TR switch.

Fig. for Step 2.

Terminal / Select lever position		C51-1-18	C51-1-17	C51-1-16	C51-1-15	C51-1-28	C51-1-27
	G16/J20	C51-1-18	C51-1-17	C51-1-16	C51-1-15	C51-1-28	C51-1-27
	H25	C51-1-4	C51-1-3	C51-1-13	C51-1-12	C51-1-20	C51-1-19
P		B + V	0 V	0 V	0 V	0 V	0 V
R		0 V	B + V	0 V	0 V	0 V	0 V
N		0 V	0 V	B + V	0 V	0 V	0 V
D		0 V	0 V	0 V	B + V	0 V	0 V
2		0 V	0 V	0 V	0 V	B + V	0 V
L		0 V	0 V	0 V	0 V	0 V	B + V

DTC P0715 (DTC NO.76) INPUT/TURBINE SPEED SENSOR CIRCUIT MALFUNCTION

WIRING DIAGRAM



DTC DETECTING CONDITION AND TROUBLE AREA

DTC DETECTING CONDITION	TROUBLE AREA
Input speed sensor detected speed is lower than specification while vehicle running under all of the following conditions: ● at higher than 10 km/h (7 mph) with 1st gear in D range for 1 sec. or more. ● at higher than 20 km/h (13 mph) with 2nd gear in D range for 2 sec. or more. ● at higher than 30 km/h (20 mph) with 3rd gear in D range for 2 sec. or more. (2 driving cycles detection logic)	● Input speed sensor and its circuit ● PCM

DTC CONFIRMATION PROCEDURE

WARNING:

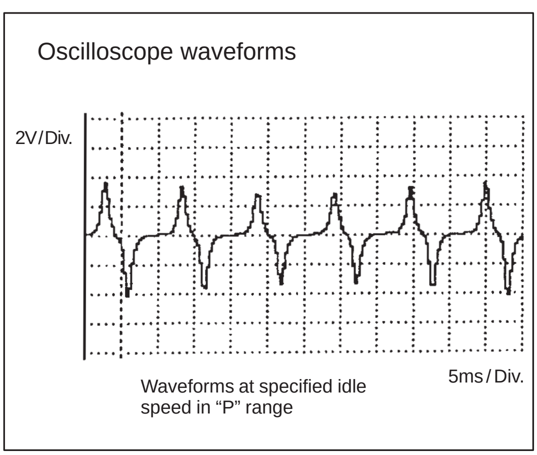
- **When performing a road test, select a place where there is no traffic or possibility of a traffic accident and be very careful during testing to avoid occurrence of an accident.**
- **Road test should be carried out with 2 persons, a driver and a tester, on a level road.**

1) Connect scan tool to DLC with ignition switch OFF, if available.
2) Clear DTC.
3) Start engine and turn O/D cut switch ON.
4) Shift select lever to D range and start vehicle.
5) Keep vehicle speed at higher than 10 km/h (7 mph) with 1st gear in D range for 2 sec. or more.
6) Increase vehicle speed and keep it at higher than 20 km/h (13 mph) with 2nd gear in D range for 2 sec. or more.
7) Increase vehicle speed and keep it at higher than 30 km/h (20 mph) with 3rd gear in D range for 2 sec. or more.
8) Stop vehicle.
9) Check DTC and/or pending DTC.

TROUBLESHOOTING (DTC P0715)

STEP	ACTION	YES	NO
1	Was “A/T DIAG. FLOW TABLE” performed?	Go to Step 2.	Go to “A/T DIAG. FLOW TABLE”.
2	Input speed sensor circuit check: 1) Remove PCM cover. 2) With ignition switch OFF, disconnect PCM connectors. 3) Check for proper connection to input speed sensor at C51-1-10 and C51-1-11 terminals for G16/J20 (at C51-1-8 and C51-1-16 terminals for H25) 4) If OK, check resistance of sensor circuit. Resistance between C51-1-10 and C51-1-11 for G16/J20 (C51-1-8 and C51-1-16 for H25): 530 – 650 Ω at 20°C, 68°F Resistance between C51-1-10/C51-1-11 for G16/J20 (C51-1-8/C51-1-16 for H25) and ground: 1 MΩ or more Are check results satisfactory?	Go to Step 4.	Go to Step 3.
3	Input speed sensor check: 1) With ignition switch OFF, disconnect input speed sensor connector. 2) Check for proper connection to input speed sensor at each terminals. 3) If OK, then check resistance of input speed sensor. Are measured values as specified in Step 2?	“Bl/G” or “Bl/Y” wire open or shorted to ground.	Replace input speed sensor.
4	Check visually input speed sensor and overdrive clutch drum for the followings. ● No damage ● No foreign material attached ● Correct installation Are they in good condition?	Intermittent trouble or faulty PCM. Check for intermittent referring to “Intermittent and Poor Connection” in Section 0A.	Clean, repair or replace.

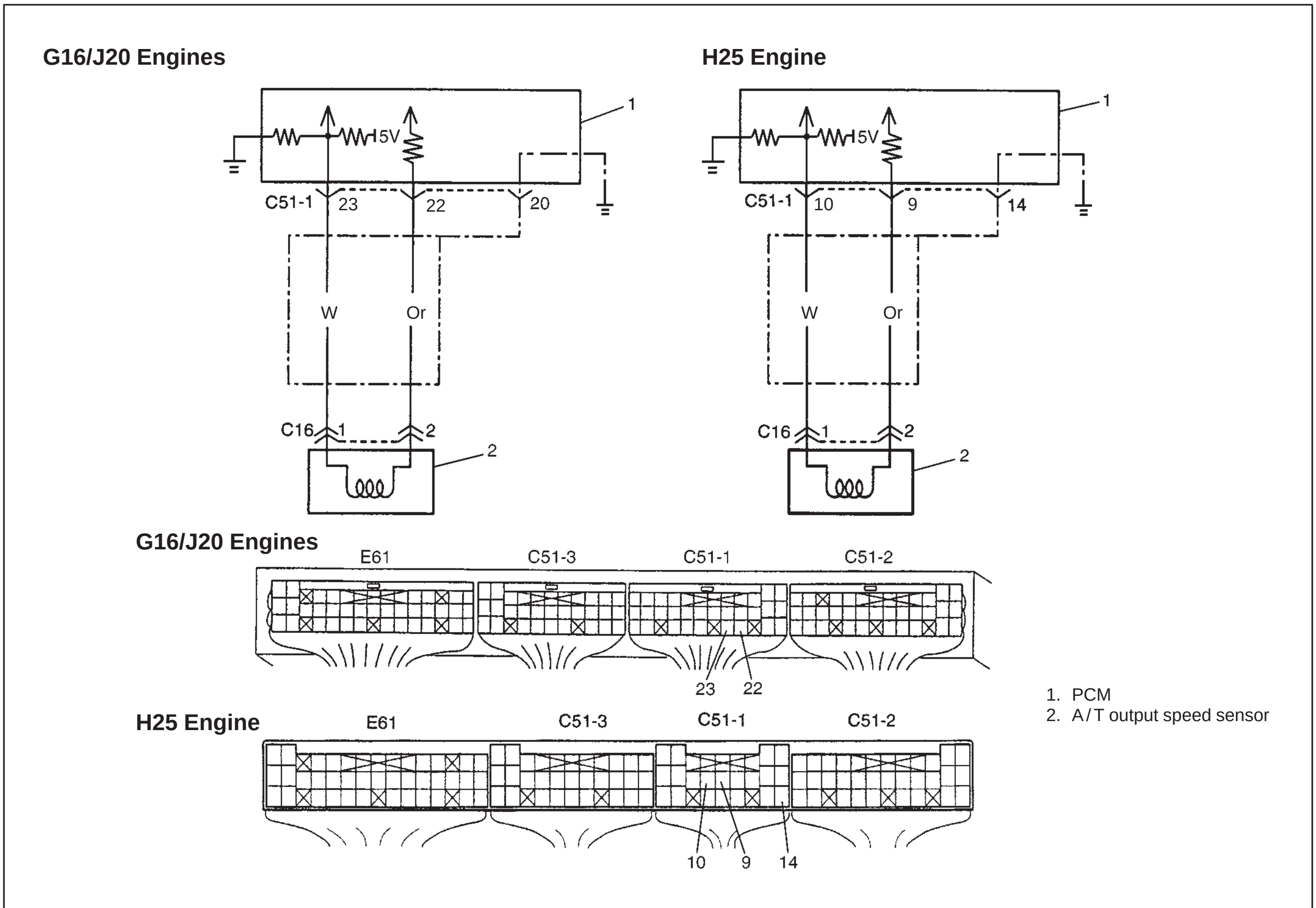
Reference



Connect oscilloscope between C51-1-11 (+) and C51-1-10 (–) for G16/J20 (C51-1-16 (+) and C51-1-8 (–) for H25) of PCM connector connected to PCM and check input speed sensor signal.

DTC P0720 (DTC NO.75) OUTPUT SPEED SENSOR CIRCUIT MALFUNCTION

WIRING DIAGRAM



DTC DETECTING CONDITION AND TROUBLE AREA

DTC DETECTING CONDITION	TROUBLE AREA
• With 4WD LOW switch OFF, no output speed sensor signal is inputted while vehicle speed sensor signal are inputted. or • With 4WD LOW switch OFF, no output speed sensor signal is inputted while engine running at higher than specified engine speed with "D" range. (2 driving cycles detection logic)	• A/T output speed sensor or its circuit • PCM

DTC CONFIRMATION PROCEDURE

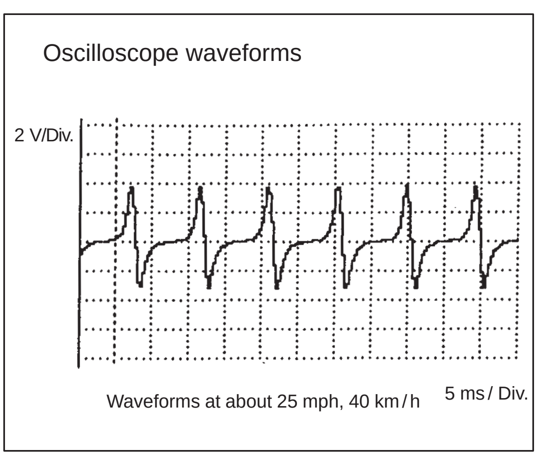
WARNING:
- **When performing a road test, select a place where there is no traffic or possibility of a traffic accident and be very careful during testing to avoid occurrence of an accident.**
- **Road test should be carried out with 2 persons, a driver and a tester, on a level road.**

1) Connect scan tool to DLC with ignition switch OFF, if available.
2) Clear DTC.
3) Start engine and shift transfer lever to "2H" or "4H" range.
4) Drive vehicle at 40 km/h (25 mph) or more for longer than 10 sec. (or higher than 3500 rpm engine speed with D range for longer than 10 sec.)
5) Stop vehicle and check DTC and/or pending DTC.

TROUBLESHOOTING (DTC P0720)

STEP	ACTION	YES	NO
1	Was "A/T DIAG. FLOW TABLE" performed?	Go to Step 2.	Go to "A/T DIAG. FLOW TABLE".
2	Output speed sensor circuit check: 1) Remove PCM cover. 2) With ignition switch OFF, disconnect PCM connectors. 3) Check for proper connection to output speed sensor at C51-1-22 and C51-1-23 terminals for G16/J20 (at C51-1-9 and C51-1-10 terminals for H25). 4) If OK, check resistance of sensor circuit. Resistance between C51-1-22 and C51-1-23 for G16/J20 (C51-1-9 and C51-1-10 for H25): 387 – 473 Ω at 20 °C, 68 °F Resistance between C51-1-22/C51-1-23 for G16/J20 (C51-1-9/C51-1-10 for H25) and ground: 1 MΩ or more Are check results satisfactory?	Go to Step 4.	Go to Step 3.
3	Output speed sensor check: 1) With ignition switch OFF, disconnect output speed sensor connector. 2) Check for proper connection to output speed sensor at each terminals. 3) If OK, then check resistance of output speed sensor. Are measured values as specified in Step 2?	"Or" or "W" wire open or shorted to ground.	Replace output speed sensor.
4	Check visually output speed sensor and sensor rotor for the followings. ● No damage ● No foreign material attached ● Correct installation Are they in good condition?	Intermittent trouble or faulty PCM. Check for intermittent referring to "Intermittent and Poor Connection" in Section 0A.	Clean, repair or replace.

Reference



Connect oscilloscope between C51-1-23 (+) and C51-1-22 (–) for G16/J20 (C51-1-10 (+) and C51-1-9 (–) for H25) of PCM connector connected to PCM and check output speed sensor signal.

DTC P0741 TCC (LOCK-UP) SOLENOID VALVE PERFORMANCE OR STUCK OFF

DTC DETECTING CONDITION AND TROUBLE AREA

DTC DETECTING CONDITION	TROUBLE AREA
While running in 2nd or 4th gear, D range, TCC control of PCM does not agree with actual operation of transmission TCC even though solenoid valve is electrically in good condition. (2 driving cycles detection logic)	● TCC (lock-up) solenoid valve stuck ● TCC control valve stuck ● Valve body fluid passage clogged ● TCC faulty

DTC CONFIRMATION PROCEDURE

WARNING:
- **When performing a road test, select a place where there is no traffic or possibility of a traffic accident and be very careful during testing to avoid occurrence of an accident.**
- **Road test should be carried out with 2 persons, a driver and a tester, on a level road.**

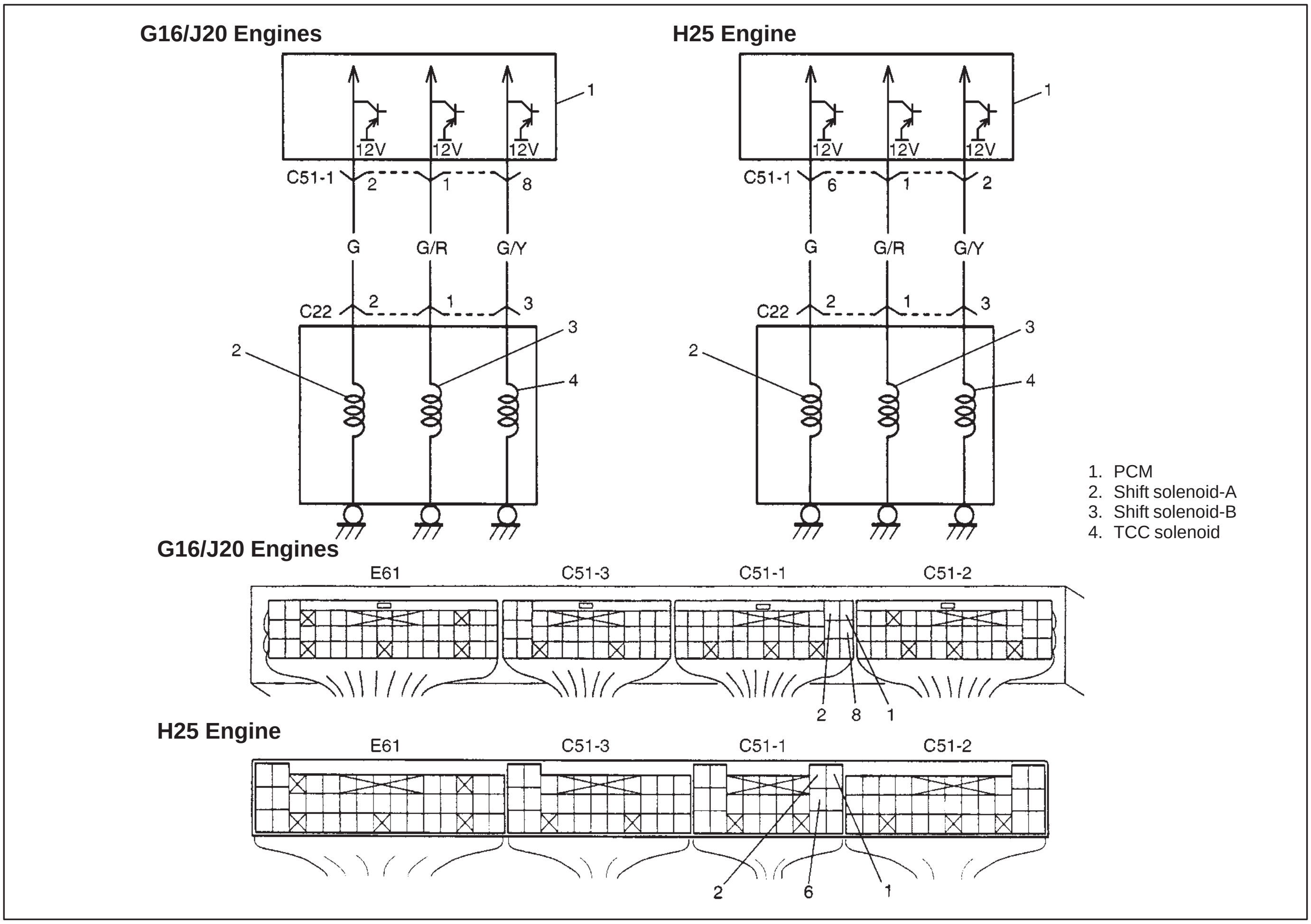
1) Connect scan tool to DLC with ignition switch OFF.
2) Clear DTC, pending DTC and freeze frame data in PCM memory by using scan tool and check fuel level meter indication is 1/4 or more.
3) Start engine, warm it up to normal operating temperature and shift transfer lever to “2H” or “4H” range.
4) Increase vehicle speed with D range, and check that gear position changes from 1st to 2nd and keep driving about 20 mph, 30 km/h in 2nd of “D” range for 10 seconds. (Throttle valve should be not at idle position and the opening should be kept constant in this step.)
5) Keep driving about 50 mph, 80 km/h in 4th of “D” range for 10 seconds.
6) Release accelerator pedal, decrease vehicle speed and stop vehicle.
7) Check pending DTC and DTC by using scan tool.

TROUBLESHOOTING

STEP	ACTION	YES	NO
1	Was “A/T DIAG. FLOW TABLE” performed?	Go to Step 2.	Go to “A/T DIAG. FLOW TABLE”.
2	TCC solenoid valve operation check: 1) Check TCC solenoid valve operation referring to “Solenoid Valves Operation Check” in this section. Is it in good condition?	Go to Step 3.	Faulty TCC solenoid valve.
3	Valve body check: 1) Check valve body referring to “Unit Repair” in this section. Is it in good condition?	Faulty torque converter.	Faulty valve body.

DTC P0743 (DTC NO.65/66) TCC (LOCK-UP) SOLENOID ELECTRICAL

WIRING DIAGRAM



DTC DETECTING CONDITION AND TROUBLE AREA

DTC DETECTING CONDITION	TROUBLE AREA
Voltage at terminal C51-1-8 for G16/J20 (C51-1-2 for H25) of PCM is high while TCC solenoid OFF is commanded or low while TCC solenoid ON is commanded.	• TCC (lock-up) solenoid valve • TCC (lock-up) solenoid valve circuit • PCM

DTC CONFIRMATION PROCEDURE

WARNING:
- **When performing a road test, select a place where there is no traffic or possibility of a traffic accident and be very careful during testing to avoid occurrence of an accident.**
- **Road test should be carried out with 2 persons, a driver and a tester, on a level road.**

1) Connect scan tool to DLC with ignition switch OFF, if available.
2) Clear DTC.
3) Start engine, warm it up to normal operating temperature and shift transfer lever to “2H” or “4H” range.
4) Shift selector lever in D range and keep it there for 10 seconds.
5) Increase vehicle speed to about 80 km/h (50 mph) in 4th gear and in D range.
6) Keep driving at above speed for 20 seconds.
7) Release accelerator pedal, decrease vehicle speed and stop vehicle.
8) Check DTC and/or pending DTC.

TROUBLESHOOTING

STEP	ACTION	YES	NO
1	Was “A / T DIAG. FLOW TABLE” performed?	Go to Step 2.	Go to “A / T DIAG. FLOW TABLE”.
2	Is the vehicle equipped with monitor connector?	Go to Step 3.	Go to Step 4.
3	Is DTC NO.65?	G to Step 4.	Go to Step 6.
4	Check TCC Solenoid Circuit for Open or Short. 1) Turn ignition switch OFF and disconnect PCM connectors. 2) Check for proper connection to PCM at terminals C51-1-8 for G16 / J20 (C51-1-2 for H25). 3) If OK, then measure resistance between terminal C51-1-8 for G16 / J20 (C51-1-2 for H25) of disconnected PCM connector and ground. Is it 11 – 15 Ω at 20°C, 68°F?	Go to Step 5.	“G / Y” circuit open or shorted to ground. If wire and connections are OK, replace malfunction shift solenoid.
5	Check TCC Solenoid Circuit for Short. 1) Turn ignition switch ON. 2) Measure voltage between terminal C51-1-8 for G16 / J20 (C51-1-2 for H25) of disconnected PCM connector and ground. Is it about 0 V?	Intermittent trouble or faulty PCM. Check for “Intermittent and Poor Connection” in Section 0A.	“G / Y” circuit shorted to power circuit.
6	Check TCC Solenoid Circuit for Short. 1) Turn ignition switch OFF and disconnect PCM connectors. 2) Check for proper connection to PCM at terminals C51-1-8 for G16 / J20 (C51-1-2 for H25) or C51-1-1. 3) If OK, then measure resistance between terminal C51-1-8 for G16 / J20 (C51-1-2 for H25) of disconnected PCM connector and ground. Is it 11 – 15 Ω at 20°C, 68°F?	Intermittent trouble or faulty PCM. Check for “Intermittent and Poor Connection” in Section 0A.	“G / Y” circuit shorted to ground. If wire and connections are OK, replace malfunction shift solenoid.

DTC P0751 SHIFT SOLENOID VALVE-A (#1) PERFORMANCE OR STUCK OFF
DTC P0756 SHIFT SOLENOID VALVE-B (#2) PERFORMANCE OR STUCK OFF

DTC DETECTING CONDITION AND TROUBLE AREA

DTC DETECTING CONDITION	TROUBLE AREA
While running in D range, gear change control from PCM to A/T does not agree with actual A/T gear position even though solenoid valve is electrically in good condition. (A/T gear position is calculated based on engine speed signal and vehicle speed sensor signal.) (2 driving cycles detection logic)	DTC P0751: ● Shift solenoid valve-A stuck or leakage. ● 2-3 shift valve stuck. ● Valve body fluid passage clogged. ● Mechanical malfunction in transmission. (Direct clutch malfunction) DTC P0756: ● Shift solenoid valve-B stuck or leakage. ● 1-2 shift valve stuck. ● 3-4 shift valve stuck. ● Valve body fluid passage clogged. ● Mechanical malfunction in transmission. (2nd brake malfunction)

DTC CONFIRMATION PROCEDURE

WARNING:
- **When performing a road test, select a place where there is no traffic or possibility of a traffic accident and be very careful during testing to avoid occurrence of an accident.**
- **Road test should be carried out with 2 persons, a driver and a tester, on a level road.**

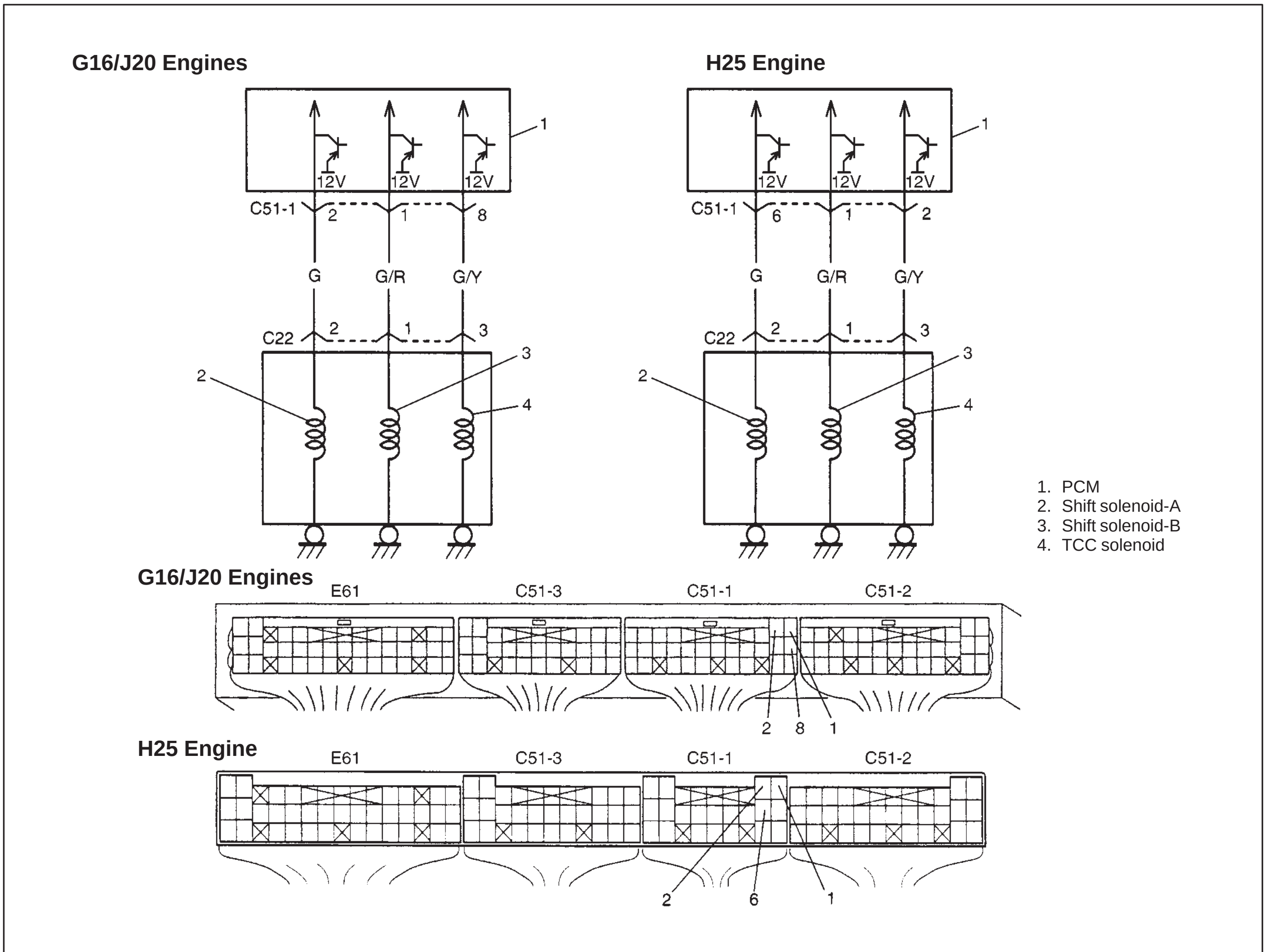
1) Connect scan tool to DLC with ignition switch OFF.
2) Clear DTC, pending DTC and freeze frame data in PCM memory by using scan tool and check fuel level meter indication is 1/4 or more.
3) Start engine, warm it up to normal operating temperature and shift transfer lever to “2H” or “4H” range.
4) Increase vehicle speed with D range, and check that gear position changes from 1st to 2nd, 3rd and 4th in that order as vehicle speed increases, referring to “Gear Shift Diagram” in this section.
5) Stop vehicle and check pending DTC and DTC by using scan tool.

TROUBLESHOOTING

STEP	ACTION	YES	NO
1	Was “A/T DIAG. FLOW TABLE” performed?	Go to Step 2.	Go to “A/T DIAG. FLOW TABLE”.
2	Shift solenoid valve-A or -B operation check: 1) Check shift solenoid valve-A or -B for operation referring to “Solenoid Valves Operation Check” section. Is it in good condition?	Go to Step 3.	Faulty shift solenoid valve-A or -B.
3	Valve body check: 1) Check valve body and its passage referring to “Unit Repair” section. Are they in good condition?	Overhaul and repair automatic transmission.	Faulty valve body.

DTC P0753 (DTC NO.61/62) SHIFT SOLENOID-A (#1) ELECTRICAL
DTC P0758 (DTC NO.63/64) SHIFT SOLENOID-B (#2) ELECTRICAL

WIRING DIAGRAM



DTC DETECTING CONDITION AND TROUBLE AREA

DTC DETECTING CONDITION	TROUBLE AREA
DTC P0753: Voltage detected at C51-1-2 for G16/J20 (C51-1-6 for H25) terminal is specified voltage or lower when shift solenoid valve-A is ON or specified voltage or higher when it is OFF.	● Shift solenoid valve-A ● Shift solenoid valve-A circuit ● PCM
DTC P0758: Voltage detected at C51-1-1 terminal is specified voltage or lower when shift solenoid valve-B is ON or specified voltage or higher when it is OFF.	● Shift solenoid valve-B ● Shift solenoid valve-B circuit ● PCM

DTC CONFIRMATION PROCEDURE

WARNING:
- **When performing a road test, select a place where there is no traffic or possibility of a traffic accident and be very careful during testing to avoid occurrence of an accident.**
- **Road test should be carried out with 2 persons, a driver and a tester, on a level road.**

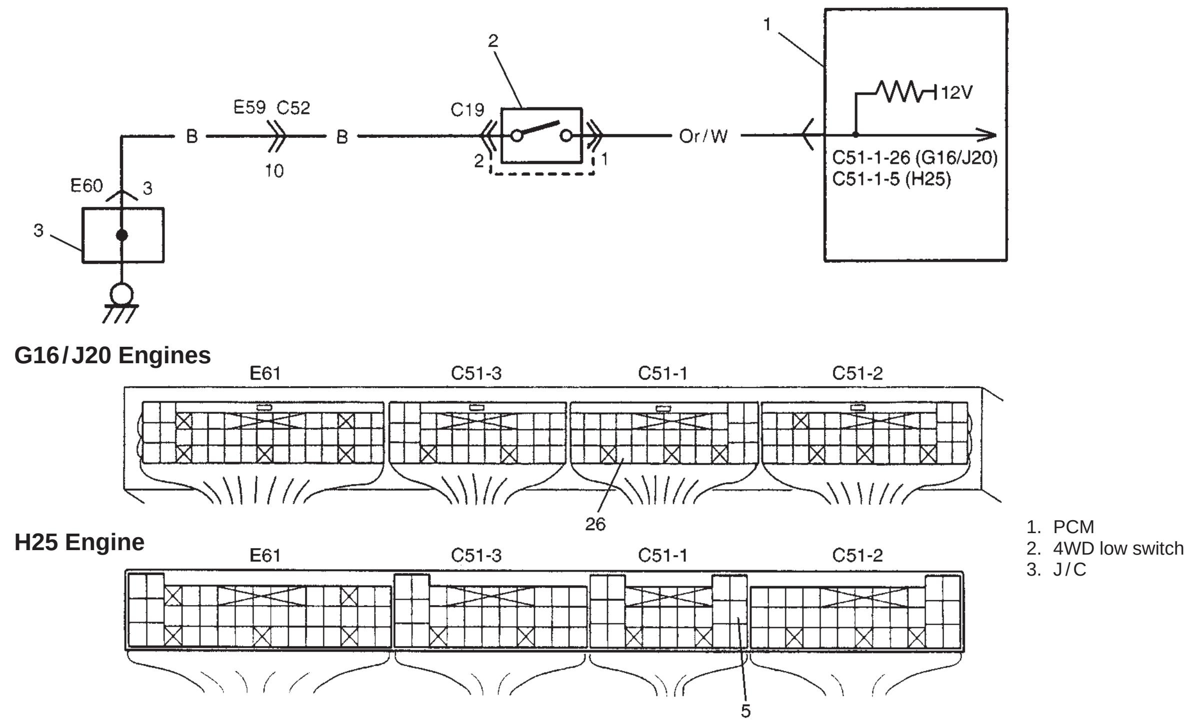
1) Connect scan tool to DLC with ignition switch OFF, if available.
2) Clear DTC.
3) Start engine and shift transfer lever to “2H” or “4H” range.
4) Shift selector lever in D range and keep it for 10 seconds.
5) Drive vehicle about 30 km/h (20 mph) with 2nd gear in D range for 10 seconds.
6) Increase vehicle speed to about 80 km/h (50 mph) with 4th gear in D range and keep it for 10 seconds.
7) Release accelerator pedal, decrease vehicle speed and stop vehicle.
8) Check DTC and/or pending DTC.

TROUBLESHOOTING (DTC P0753/P0758)

STEP	ACTION	YES	NO
1	Was “A/T DIAG. FLOW TABLE” performed?	Go to Step 2.	Go to “A/T DIAG. FLOW TABLE”.
2	Is the vehicle equipped with monitor connector?	Go to Step 3.	Go to Step 4.
3	Is DTC NO.61 or 63?	Go to Step 4.	Go to Step 6.
4	Check Shift Solenoid Circuit for Open or Short. 1) Turn ignition switch OFF and disconnect PCM connectors. 2) Check for proper connection to PCM at terminals C51-1-2 for G16/J20 (C51-1-6 for H25) or C51-1-1. 3) If OK, then measure resistance between terminal C51-1-2 for G16/J20 (C51-1-6 for H25) or C51-1-1 of disconnected PCM connector and ground. Is it 11 – 15 Ω at 20°C, 68°F?	Go to Step 5.	“G” or “G/R” circuit open or shorted to ground. If wire and connections are OK, replace malfunction shift solenoid.
5	Check Shift Solenoid Circuit for Short. 1) Turn ignition switch ON. 2) Measure voltage between terminal C51-1-2 for G16/J20 (C51-1-6 for H25) or C51-1-1 of disconnected PCM connector and ground. Is it about 0 V?	Intermittent trouble or faulty PCM. Check for “Intermittent and Poor Connection” in Section 0A.	“G” or “G/R” circuit shorted to power circuit.
6	Check Shift Solenoid Circuit for Short. 1) Turn ignition switch OFF and disconnect PCM connectors. 2) Check for proper connection to PCM at terminals C51-1-2 for G16/J20 (C51-1-6 for H25) or C51-1-1. 3) If OK, then measure resistance between terminal C51-1-2 for G16/J20 (C51-1-6 for H25) or C51-1-1 of disconnected PCM connector and ground. Is it 11 – 15 Ω at 20°C, 68°F?	Intermittent trouble or faulty PCM. Check for “Intermittent and Poor Connection” in Section 0A.	“G” or “G/R” circuit shorted to ground.

DTC P1875 4WD LOW SWITCH CIRCUIT MALFUNCTION (if equipped)

WIRING DIAGRAM



DTC DETECTING CONDITION AND TROUBLE AREA

DTC DETECTING CONDITION	TROUBLE AREA
While driving at higher than specified vehicle speed and with more than specified throttle valve opening, the following conditions are satisfied for specified time. ● Vehicle speed sensed by vehicle speed sensor is more than 10 km/h higher than that sensed by A/T output speed sensor. (2 driving cycles detection logic)	● 4WD LOW switch or its circuit ● PCM

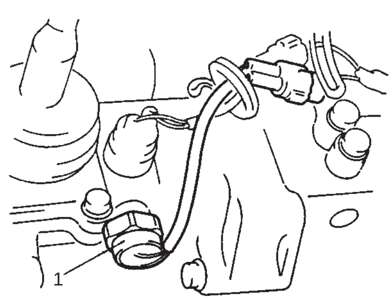
DTC CONFIRMATION PROCEDURE

WARNING:
- **When performing a road test, select a place where there is no traffic or possibility of a traffic accident and be very careful during testing to avoid occurrence of an accident.**
- **Road test should be carried out with 2 persons, a driver and a tester, on a level road.**

1) Connect scan tool to DLC with ignition switch OFF.
2) Clear DTC, pending DTC and freeze frame data in PCM memory by using scan tool.
3) Start engine.
4) Increase vehicle speed to about 30 km/h (19 mph) or more in D range and is in 2H position.
5) Keep driving at above vehicle speed for 30 seconds.
6) Stop vehicle and shift transfer lever to 4L position with A/T selector lever is in P range
7) Increase vehicle speed to about 25 km/h (15 mph) or more in D range and is in 4L position.
8) Keep driving at above vehicle speed for 30 seconds.
9) Stop vehicle and check pending DTC and DTC by using scan tool.

TROUBLESHOOTING (DTC P1875)

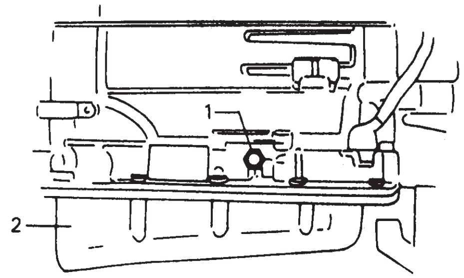
STEP	ACTION	YES	NO
1	Was “A/T DIAG. FLOW TABLE” performed?	Go to Step 2.	Go to “A/T DIAG. FLOW TABLE”.
2	4WD low switch and its circuit check: When using SUZUKI scan tool: 1) Connect SUZUKI scan tool to DLC with ignition switch OFF. 2) Turn ignition switch ON. 3) Select “Data list” mode on scan tool. 4) Check 4WD low switch signal (ON or OFF) on display when shifting transfer lever to each position. 4H or 2H position: OFF 4L position : ON Is OFF/ON displayed as described above? When not using SUZUKI scan tool: 1) Remove PCM cover. 2) Turn ignition switch ON. 3) Check voltage at terminal C51-1-26 for G16/J20 (C51-1-5 for H25) of PCM connector connected when shifting transfer lever to each position. 4H or 2H position: 10 – 14 V 4L position : 0 – 1 V Is voltage as specified?	Check for poor connection at the terminal of PCM if voltmeter is used in Step 2. If connection is OK, intermittent trouble or faulty PCM. Check for intermittent referring to “Intermittent and Poor Connection” in Section 0A.	Go to Step 3.
3	4WD low switch check: 1) Check 4WD low switch for operation referring to “4WD Low Switch Inspection” below. Is check result satisfactory?	“Or/W” or “B” circuit open or short. If wires and connections are OK, substitute a known-good PCM and recheck.	Replace 4WD low switch.



1. 4WD low switch

4WD Low Switch Inspection

1) Disconnect negative cable at battery.
2) Disconnect 4WD low switch coupler.
3) Check continuity between 4WD low switch terminals.
   There should be continuity when transfer lever shifted to 4L position and should be infinity when transfer lever shifted to 4H or 2H positions.
   If not, replace 4WD low switch.
4) Connect 4WD low switch coupler and battery negative cable.

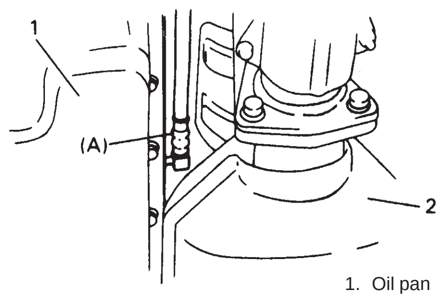


1. Fluid pressure check hole
2. Oil pan

LINE PRESSURE TEST

Purpose of this test is to check operating conditions of each part by measuring fluid pressure in fluid pressure line. Line pressure test requires following conditions.

- Automatic fluid is at normal operating temperature (70 to 80°C / 158 – 176°F).
- Fluid is filled to proper level (between FULL HOT and LOW HOT on dipstick).



1. Oil pan
2. Exhaust pipe

1) Apply parking brake securely and place checks against wheels.
2) Attach oil pressure gauge to fluid pressure check hole in transmission case.

Special Tool
(A): 09925-37810

CAUTION:
After attaching oil pressure gauge, check that not fluid leakage exists.

3) Depress foot brake fully, run engine at idle and stall and then check fluid pressure in "D" or "R" range.

CAUTION:
Do not continue running engine at stall speed longer than 5 seconds.

G16 Engine

Engine running mode	Line pressure	
	"D" range	"R" range
At idle speed	3.9 – 4.4 kg/cm^2 55 – 63 psi	5.1 – 5.7 kg/cm^2 73 – 81 psi
At stall speed	11.7 – 13.2 kg/cm^2 166 – 188 psi	14.2 – 16.7 kg/cm^2 202 – 237 psi

J20 Engine

Engine running mode	Line pressure	
	"D" range	"R" range
At idle speed	3.8 – 4.3 kg/cm^2 54 – 61 psi	5.3 – 5.9 kg/cm^2 75 – 84 psi
At stall speed	9.7 – 11.2 kg/cm^2 138 – 159 psi	12.9 – 15.5 kg/cm^2 183 – 220 psi

H25 Engine

Engine running mode	Line pressure	
	"D" range	"R" range
At idle speed	3.9 – 4.4 kg/cm^2 55 – 63 psi	6.6 – 7.2 kg/cm^2 94 – 102 psi
At stall speed	11.3 – 12.7 kg/cm^2 161 – 181 psi	14.7 – 22.7 kg/cm^2 209 – 323 psi

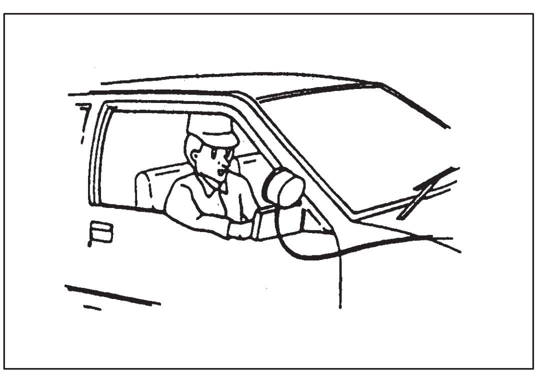
Check result	Possible cause
Line pressure higher than standard level in each range	● Malfunctioning regulator valve ● Malfunctioning throttle valve ● Maladjusted A/T throttle cable
Line pressure lower than standard level in each range	● Defective O/D clutch ● Defective oil pump ● Malfunctioning throttle valve ● Malfunctioning regulator value ● Maladjusted A/T throttle cable
Line pressure lower than standard level only in “D” range	● Fluid leakage from forward clutch ● Defective O/D clutch ● Leakage from “D” range fluid pressure circuit
Line pressure lower than standard level only in “R” range	● Fluid leakage from direct clutch ● Defective O/D clutch ● Fluid leakage from reverse brake ● Fluid leakage from “R” range fluid circuit

Tightening torque of transmission case plug:
17 N·m (1.7 kg-m, 12.0 lb-ft)

STALL TEST

This test is to check overall performance of automatic transmission and engine by measuring stall speed at “D” and “R” ranges. Be sure to perform this test only when transmission fluid is at normal operating temperature and its level is between FULL and LOW marks.

CAUTION:
- **Do not run engine at stall more than 5 seconds continuously, for fluid temperature may rise excessively high.**
- **After performing stall test, be sure to leave engine running at idle for longer than 30 seconds before another stall test.**



1) Apply parking brake and block wheels.
2) Install tachometer.
3) Start engine with select lever shifted to “P”.
4) Depress brake pedal fully.
5) Shift select lever to “D” and depress accelerator pedal fully while watching tachometer. Read engine rpm quickly when it has become constant (stall speed).
6) Release accelerator pedal immediately after stall speed is checked.
7) In the same way, check stall speed in “R” range.

8) Stall speed should be within the following specification.

Stall speed: 2,100 – 2,400 r/min. for G16 engine
2,300 – 2,600 r/min. for J20 engine
2,300 – 2,600 r/min. for H25 engine

Check result	Possible cause
Lower than standard level	● Faulty engine output ● Defective torque converter
Higher than standard level in “D” range	● Slippery O/D clutch ● Slippery forward clutch ● Malfunctioning O/D one-way clutch ● Malfunctioning one-way clutch No. 2 ● Low line pressure
Higher than standard level in “R” range	● Slippery direct clutch ● Slippery reverse brake ● Low fluid pressure ● Slippery O/D clutch ● Defective O/D one-way clutch

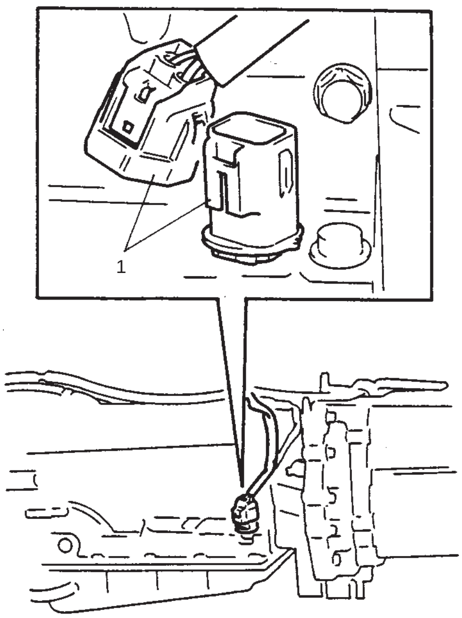
ROAD TEST

This test is to check if upshift and downshift take place at specified speed while actually driving vehicle on a level road.

WARNING:
- **Carry out test in very little traffic area to prevent an accident.**
- **Test requires 2 persons, a driver and a tester.**

1) Warm up engine.
2) With engine running at idle, shift select lever “D”.
3) Accelerate vehicle speed by depressing accelerator pedal gradually.
4) While driving in “D” range, check if gear shift occurs properly as shown in Gear Shift Diagram in this section.

Test result	Possible cause
When 1 → 2 upshift fails to occur	1–2 shift valve stuck
When 2 → 3 upshift fails to occur	2–3 shift valve stuck
When 3 → O/D upshift fails to occur	3–4 shift valve stuck
When gear shift point is incorrect	● Maladjusted throttle cable ● Defective shift solenoid valve -A or -B ● 1–2, 2–3 or 3–4 shift valve not operating properly



1. Shift solenoids connector

MANUAL ROAD TEST

This test check the gear being used in "L", "2" or "D" range when driven with unoperated gear shift control system. Test drive vehicle on a level road.

NOTE:
Before this test, check diagnostic trouble code (DTC).

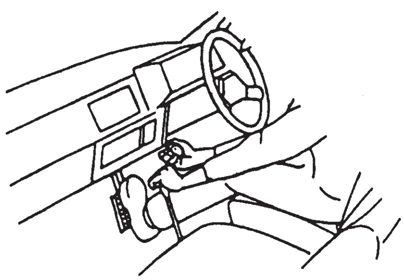
1) Disconnect coupler of shift solenoid valves on transmission.

> **WARNING:**
> **To avoid the danger of being burned, do not touch the hot exhaust system when disconnecting shift solenoid valves coupler.**

2) With select lever in "P", start engine and warm it up.
3) With select lever in "L" range, start vehicle and accelerate to 20 km/h (12.5 mile/h). Check in this state that 1st gear is being used.
4) At 20 km/h (12.5 mile/h), shift select lever to 2 range and accelerate to 40 km/h (25 mile/h). Check in this state that 3rd gear is being used.
5) At 40 km/h (25 mile/h), shift select lever to D range and check that O/D gear is used when speed is higher than 40 km/h (25 mile/h).
6) After above checks, stop vehicle then engine, and connect shift solenoids coupler with ignition switch OFF.

> **WARNING:**
> **To avoid the danger of being burned, do not touch the hot exhaust system when connecting shift solenoid valves coupler.**

7) Clear DTC with scan tool.



TIME LAG TEST

This test is to check conditions of clutch, reverse brake and fluid pressure. "Time lag" means time elapsed since select lever is shifted with engine idling till shock is felt.

1) With chocks placed before and behind front and rear wheels respectively, depress brake pedal.
2) Start engine.
3) With stop watch ready, shift select lever from "N" to "D" range and measure time from that moment till shock is felt.
4) Similarly measure time lag by shifting select lever from "N" to "R" range.

Specification for time lag	"N"→"D"	Less than 1.2 sec.
	"N"→"R"	Less than 1.5 sec.

NOTE:
- **When repeating this test, be sure to wait at least minute after select lever is shifted back to "N" range.**
- **Engine should be warmed up fully for this test.**

Test result	Possible causes
When "N"→"D" time lag exceeds specification	• Low line pressure • Worn forward clutch
When "N"→"R" time lag exceeds specification	• Low line pressure • Worn direct clutch • Worn reverse brake

ENGINE BRAKE TEST

WARNING:
Before test, make sure that there is no vehicle behind so as to prevent rear-end collision.

1) While driving vehicle in 3rd gear of “D” range, shift select lever down to “2” range and check if engine brake operates.
2) In the same way as in step 1, check engine brake for operation when select lever is shifted down to “L” range.
3) If engine brake fails to operate in above tests, possible causes for such failure are as follows. Check each part which is suspected to be the cause.

Condition	Possible cause
Fails to operate when shifted down to “2” range	Second coast brake defective
Fails to operate when shifted down to “L” range	Reverse brake defective

“P” RANGE TEST

1) Stop vehicle on a slope, shift select lever to “P” range and at the same time apply parking brake.
2) After stopping engine, depress brake pedal and release parking brake.
3) Then, release brake pedal gradually and check that vehicle remains stationary.
4) Depress brake pedal and shift select lever to “N” range.
5) Then, release brake pedal gradually and check that vehicle moves.

WARNING:
Before test, check to make sure no one is around vehicle or down on a slope and keep watchful for safety during test.

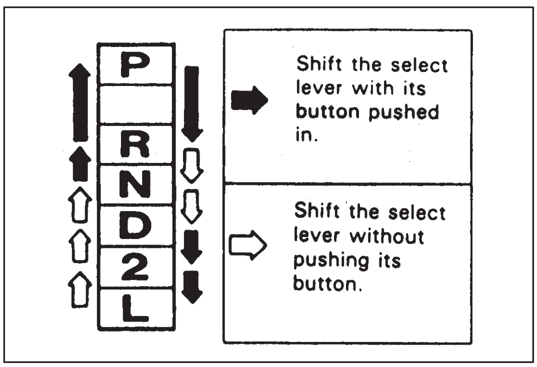
ON-VEHICLE SERVICE

MAINTENANCE SERVICE

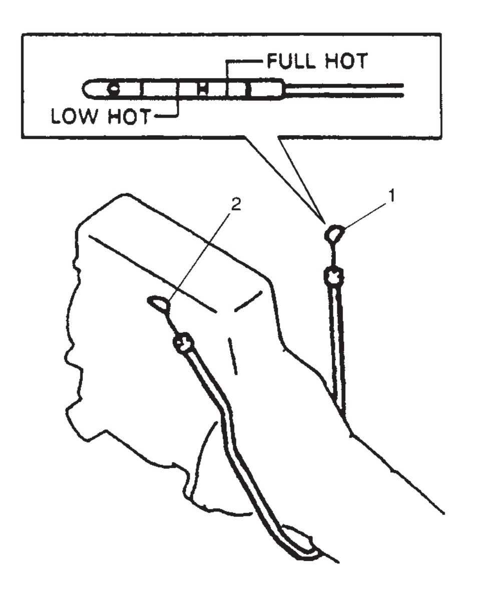
FLUID LEVEL

LEVEL CHECK AT NORMAL OPERATING TEMPERATURE

1) Stop vehicle and place it level.
2) Apply parking brake and place chocks against wheels.
3) With selector at P position, start engine.
4) Warm up engine till fluid temperature reaches normal operating temperature (70 – 80°C/158 – 176°F). As a guide to check fluid temperature, warm up engine till engine coolant temperature meter indicated around 1 unit above "C" point.



5) Keep engine idling and shift selector slowly to L and back to P position.
6) With engine idling, pull out dipstick, wipe it off with a clean cloth and put it back into place.



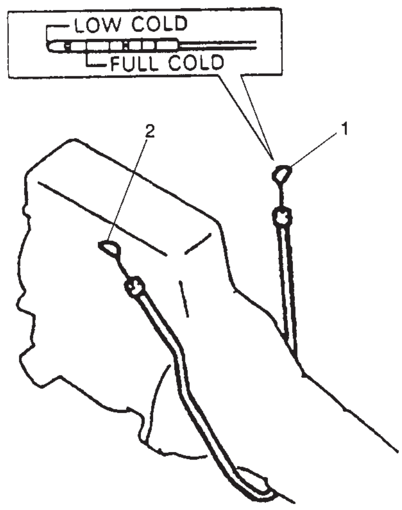
1. Dipstick (G16/J20)
2. Dipstick (H25)

7) Pull out dipstick again and check fluid level indicated on it. Fluid level should be between FULL HOT and LOW HOT. If it is below LOW HOT, add an equivalent of DEXRON®-III up to FULL HOT.

Fluid specification
An equivalent of DEXRON®-III

NOTE:

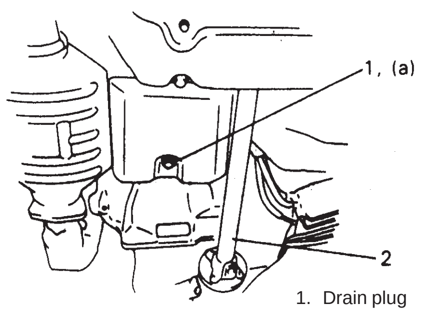
- **DO NOT RACE ENGINE while checking fluid level, even after the engine start.**
- **DO NOT OVERFILL. Overfilling can causes foaming and loss of fluid through breather. Then slippage and transmission failure can result.**
- **Bringing the level from LOW HOT to FULL HOT requires 0.3 liters (0.64/0.53 US/Imp.pt).**
- **If vehicle was driven under high load such as pulling a trailer, fluid level should be checked about half an hour after it is stopped.**



1. Dipstick (G16/J20)
2. Dipstick (H25)

LEVEL CHECK AT ROOM TEMPERATURE

The fluid level check at room temperature performed after repair or fluid change before test driving is just preparation for level check of normal operating temperature. The checking procedure itself is the same as that described previously. If the fluid level is between FULL COLD and LOW COLD, proceed to test drive. And when the fluid temperature has reached the normal operating temperature, check fluid level again and adjust it as necessary.

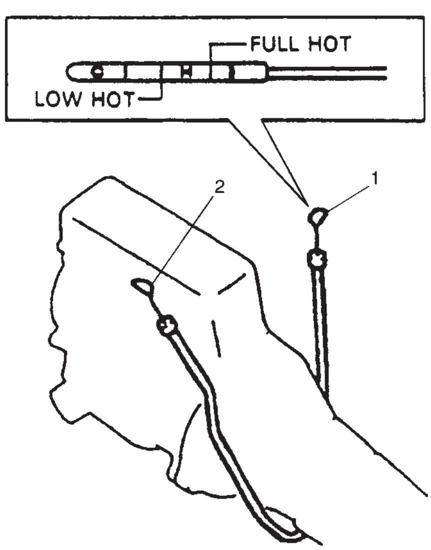


1. Drain plug
2. Propeller shaft

FLUID CHANGE

1) Lift up vehicle.
2) With engine is cool, remove drain plug from oil pan and drain A/T fluid.
3) Install drain plug.

Tightening Torque
(a): 23 N·m (2.3 kg-m, 17.0 lb-ft)

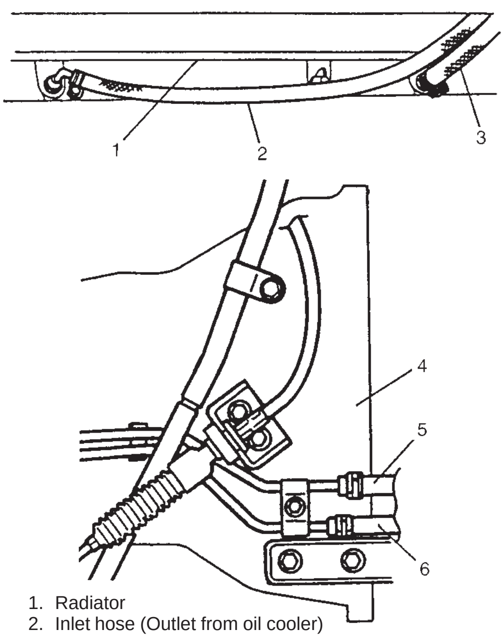


1. Dipstick (G16/J20)
2. Dipstick (H25)

4) Lower vehicle and fill proper amount of an equivalent of DEXRON®-III.
5) Check fluid level according to procedure described under LEVEL CHECK NORMAL OPERATING TEMPERATURE.

Fluid specification
An equivalent of DEXRON®-III

Fluid capacity	
When draining from drain plug hole	2.5 liters (5.28/4.40 US/lmp.pt.)
When overhauling	6.9 liters (14.58/12.14 US/lmp.pt.) for G16 7.1 liters (15.00/12.50 US/lmp.pt.) for J20/H25

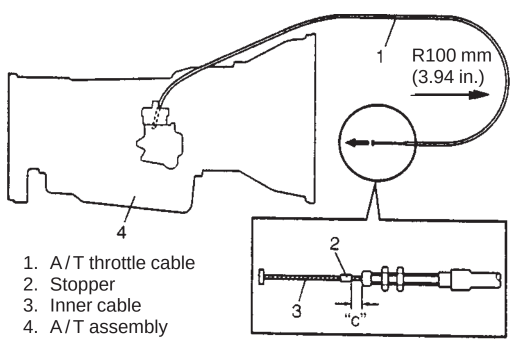


1. Radiator
2. Inlet hose (Outlet from oil cooler)
3. Outlet hose (Inlet to coil cooler)
4. Converter housing
5. Outlet hose
6. Inlet hose

OIL COOLER HOSES

When replacing them, be sure to note the followings.

- to replace clamps at the same time.
- to insert hose as far as its limit mark.
- to clamp hose securely.



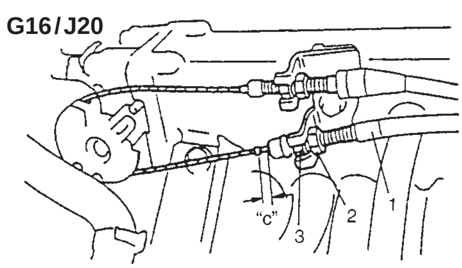
1. A/T throttle cable
2. Stopper
3. Inner cable
4. A/T assembly

A/T THROTTLE CABLE

ADJUSTMENT

1) Pull inner cable by force of 2 N (0.2 kg, 0.45 lb) or less to be no slack of inner cable with A/T throttle cable curved as shown in the figure.
2) Fix stopper to inner cable with clearance “c”.

   Clearance “c” : 0.8 – 1.5 mm (0.03 – 0.06 in.)

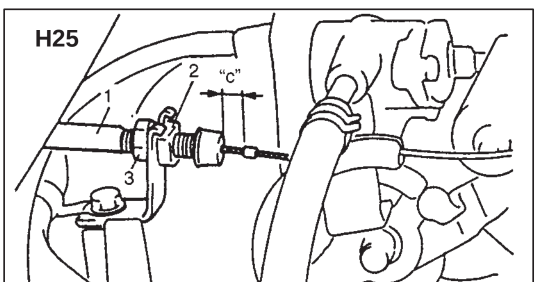


1. A/T throttle cable
2. Adjusting nut
3. Lock nut

3) **For G16/J20 engines**
   a) Check clearance “c”. If it is out of specifications, adjust it by turning cable adjusting nut.

      Clearance “c” : 0.8 – 1.5 mm (0.03 – 0.06 in.)

   b) Tighten lock nut securely.



1. A/T throttle cable
2. Adjusting nut
3. Lock nut

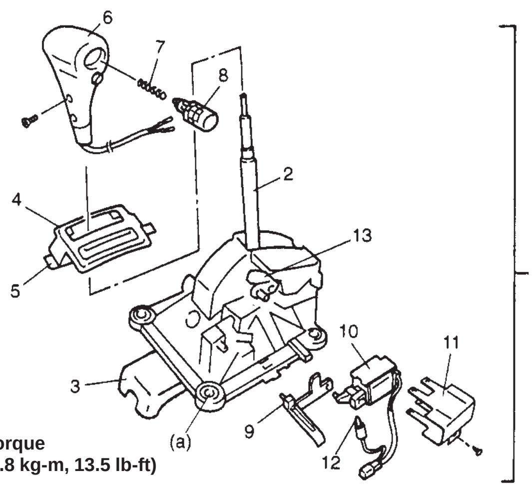
   For H25 engine
   a) Warm up engine and transmission to normal operating temperature.
   b) Make sure that accelerator cable is adjusted as specified.
   c) With throttle valve closed, check clearance “c” which should be within the following specification.

      Clearance “c” : 0.8 – 1.5 mm (0.03 – 0.06 in.)

      If it is out of specification, adjust it by turning cable adjusting nut.

MANUAL SELECTOR ASSEMBLY

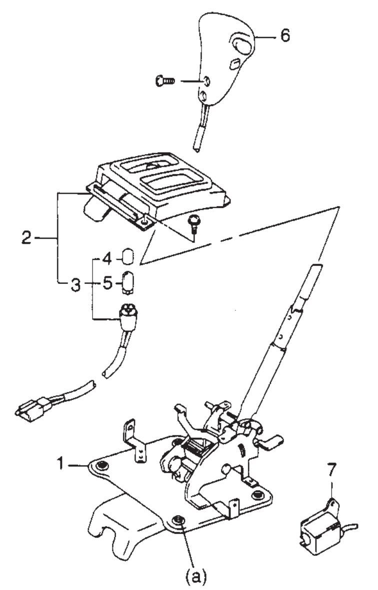
Type-1



Tightening Torque
(a): 18 N·m (1.8 kg-m, 13.5 lb-ft)

1. Manual selector assembly (Select lever assembly)
2. Manual lever assembly
3. Select cable bracket
4. Select indicator
5. Slide cover
6. Select lever knob
7. Spring
8. Knob button
9. Shift lock solenoid rod
10. Shift lock solenoid
11. Cover
12. Illumination lamp
13. Interlock cam

Type-2

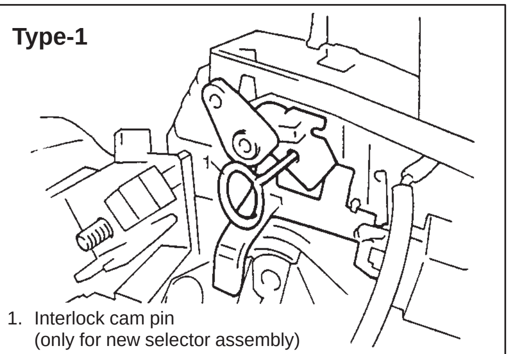


1. Manual lever assembly
2. Select indicator assembly
3. Illumination lamp assembly
4. Bulb filter
5. Bulb
6. Knob assembly
7. Shift lock solenoid

REMOVAL

1) Disconnect negative cable at battery.
2) Remove console box.
3) Disconnect connector for illumination lamp, shift lock solenoid and overdrive OFF switch.
4) Disconnect interlock cable from interlock cam of selector assembly.
5) Remove selector assembly mounting bolts.
6) Disconnect select cable from lever of selector assembly.

Type-1

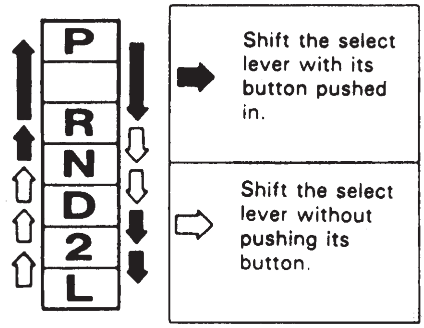


1. Interlock cam pin (only for new selector assembly)

INSTALLATION

NOTE:
New selector assembly of Type-1 is supplied with held interlock cam at interlock cable connecting position with pin. Remove this pin after connecting interlock cable to interlock cam and tightening cable nut.

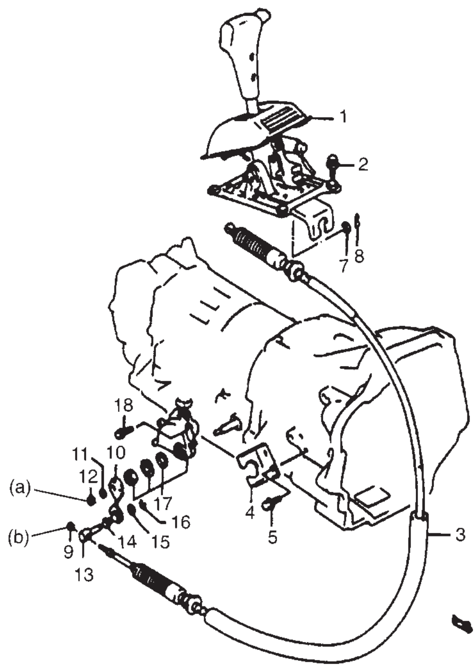
Reverse removal procedure to install noting the followings.
- Connect interlock cable end to cam referring to steps 2) to 8) of "Interlock Cable Installation" section.
- Upon completion of installation, confirm that brake (key) interlock system operates properly.



INSPECTION

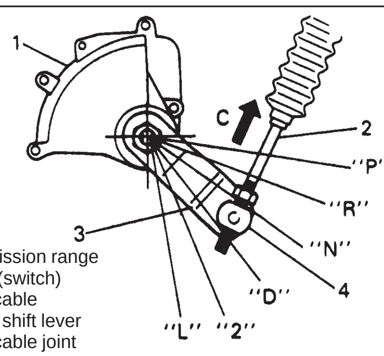
Check select lever for smooth and clear-cut movement and position indicator for correct indication.
For operation of select lever, refer to left figure.

SELECT CABLE



1. Select lever assembly
2. Bolt
3. Select cable
4. Cable bracket
5. Bolt
6. Blank
7. Washer
8. Clip
9. Nut
10. Manual select lever
11. Lock washer
12. Nut
13. Select cable joint
14. Bush
15. Washer
16. E-ring
17. Transmission range switch assembly
18. Bolt

Tightening Torque
(a): 13 N·m (1.3 kg-m, 9.5 lb-ft)
(b): 7 N·m (0.7 kg-m, 5.5 lb-ft)

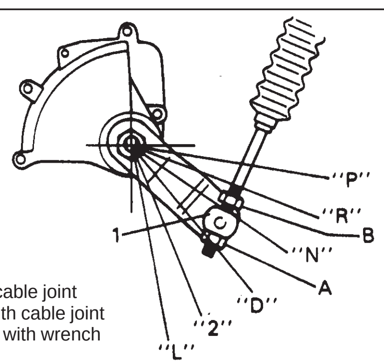


1. Transmission range sensor (switch)
2. Select cable
3. Manual shift lever
4. Select cable joint

ADJUSTMENT

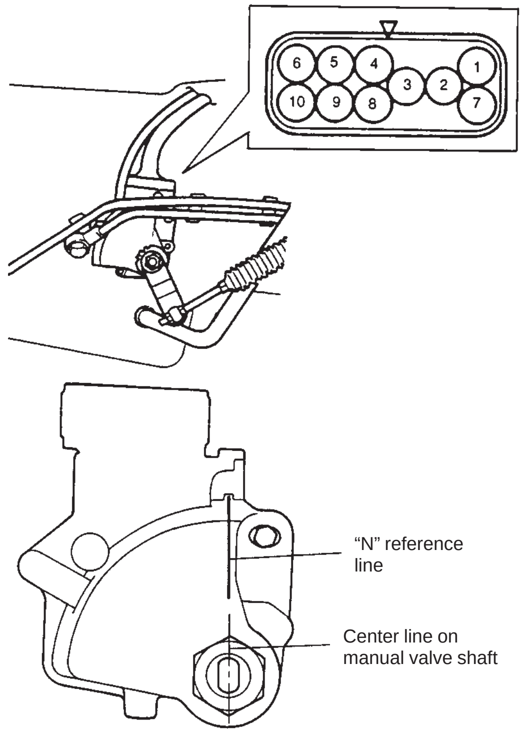
1) Before tightening cable end nut, shift select lever to “N”.
2) Also shift manual shift lever to “N”.

NOTE:
- **Make sure that nut and cable joint have clearance under above conditions.**
- **If select cable has been moved, push it in arrow C direction as shown in figure at the left till it stops and then confirm that select lever is in “N” position.**



1. Select cable joint
A. Align with cable joint
B. Tighten with wrench

3) Turn nut A by hand till it contacts manual select cable joint. Then tighten nut B with wrench.
4) After select cable was installed, check for the following.
   - Push vehicle with select lever shifted to “P”. Vehicle should not move.
   - Vehicle can not be driven in “N”.
   - Vehicle can be driven in “D”, “2”, and “L”.
   - Vehicle can be backed in “R”.

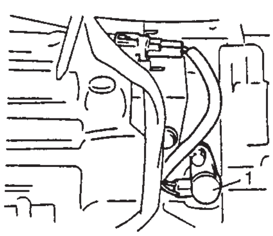


TRANSMISSION RANGE SWITCH (SENSOR)

INSPECTION & ADJUSTMENT

1) Shift select lever to “N” range.
2) Check that center line on manual valve shaft and “N” reference line on switch are aligned. If not, loosen switch bolt and align them.
3) Check that engine starts in “N” and “P” ranges but it doesn’t start in “D”, “2”, “L” or “R” range. Also, check that back-up lamp lights in “R” range.
4) If faulty condition cannot be corrected by adjustment, disconnect transmission range switch coupler and check that continuity exists as shown by moving select lever.

Switch position \ Terminal No.	5	4	9	8	2	3	10	7	6
P					O	O		O	O
R				O	—	—	—	—	O
N					O	O	O	—	O
D			O	—	—	—	—	—	O
2		O	—	—	—	—	—	—	O
L	O	—	—	—	—	—	—	—	O



1. A/T vehicle (output) speed sensor

A/T OUTPUT SPEED SENSOR

INSPECTION

Check A/T output speed sensor for resistance between terminals of sensor or PCM coupler.

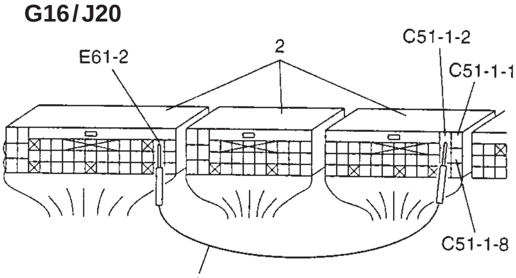
A/T output speed sensor resistance value : 387 – 473 Ω at 20°C, 68°F

O/D CUT SWITCH

INSPECTION

Check O/D cut switch for operation referring to step 4 of Diag. Flow Table B-2 in this section.
If malfunction is found, replace.

G16/J20



1. Service wire
2. PCM connectors disconnected

SOLENOID VALVES

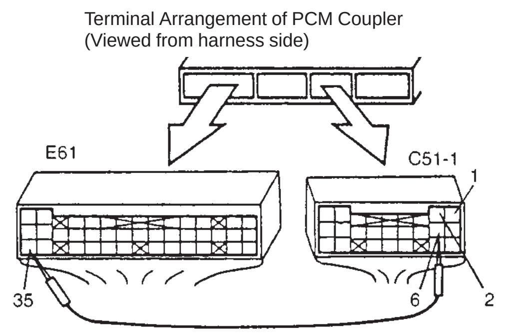
(Shift solenoid valves & TCC solenoid valve)

INSPECTION

With couplers of PCM disconnected and using service wire as shown at the left, check each solenoid valve for clicking sound.

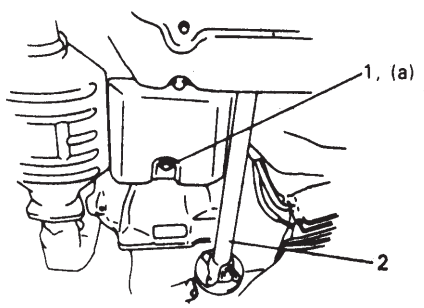
G16/J20 Engines

Shift solenoid valve - A (#1)	C51-1-2
Shift solenoid valve - B (#2)	C51-1-1
TCC (Lock-up) solenoid valve	C51-1-8



H25 Engine

Shift solenoid valve – A (#1)	C51-1-6
Shift solenoid valve – B (#2)	C51-1-1
TCC (Lock-up) solenoid valve	C51-1-2



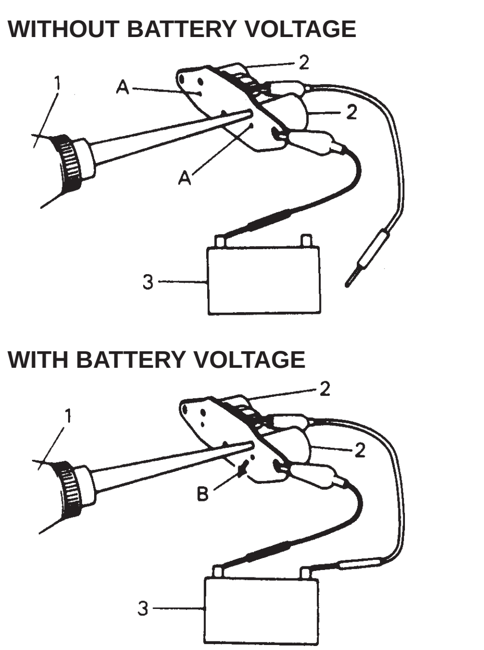
1. Drain plug
2. Propeller shaft

REMOVAL

1) Pull out dipstick and lift up vehicle.
2) With engine cooled, remove drain plug from oil pan and drain A/T fluid.
3) Install drain plug with gasket.

Tightening Torque
(a): 23 N·m (2.3 kg-m, 17.0 lb-ft)

4) Remove exhaust pipe bracket and disconnect front propeller shaft from front differential (if equipped).
5) Remove oil pan bolts.
6) Remove oil pan.
7) Remove oil tubes.
8) Remove solenoid valve No.1 (shift solenoid valve A and B) or solenoid valve No.2 (TCC solenoid valve).



1. Oiler (with transmission fluid)
2. Solenoid valve
3. Battery

A: Hole (Should be dry)
B: Exhausting fluid

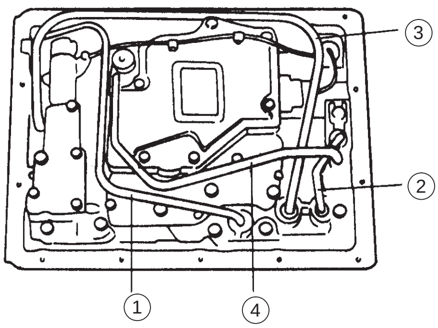
OPERATION CHECK

Whenever shift solenoid valves and TCC (lock-up) solenoid valve are removed from transmission, verify their valve function physically before they are reinstalled.

1) Apply oiler to solenoid valve and give compression by hands and then check to be sure that transmission fluid from oiler does not come out of holes in solenoid valve when battery voltage is not conducted.
2) Under the same conditions as above, conduct battery voltage and then make sure that fluid comes out with vigor.

NOTE:

- **If fluid does not come out with vigor in above step 2 inspection, do not re-use that solenoid valve.**
- **Figure at the left shows shift solenoid valve check. Check TCC solenoid valve also in the same way.**



INSTALLATION

Reverse removal procedure to install solenoid valves and noting the following points.

- For details of solenoid valve installation, refer to “Unit Repair” section. Use new gasket and O-ring.
- Install oil tubes in such order as shown in figure.
- For details of oil pan installation, refer to “Unit Repair” section. Use new oil pan gasket.
- Tighten universal joint flange bolts & nuts and exhaust pipe bracket bolts to specified torque.
- Fill A/T fluid and check fluid level according to procedure described in “CHANGING FLUID” previously.
- Check for fluid leakage after warming up A/T.

THROTTLE POSITION SENSOR

INSPECTION

Refer to SECTION 6E1/6E2 for inspection.

POWER/NORMAL CHANGE SWITCH

INSPECTION

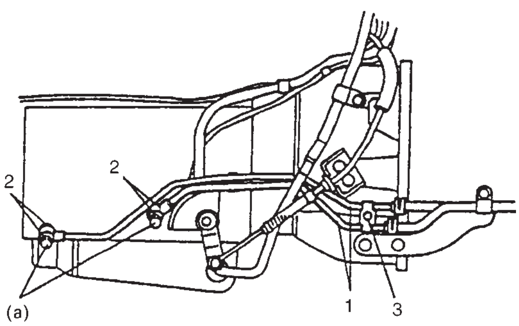
Check Power/Normal change switch for operation referring to Step 4 of Diag. Flow Table B-4 in this section.
If malfunction is found, replace.

OIL COOLER PIPES

REMOVAL

1) Lift up vehicle.
2) Make sure to wash dirt off from around pipe joints.
3) With engine is cool, loosen oil cooler pipe union bolts with oil outlet union locked and remove oil cooler pipes from oil outlet unions and hoses.

NOTE:
To avoid fluid leakage, plug open ends of oil outlet unions and hoses right after they are disconnected.



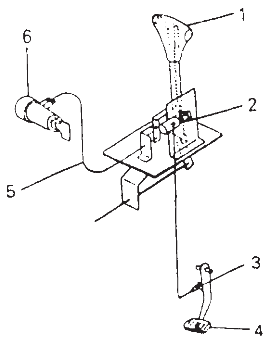
1. Oil cooler pipes
2. Union gaskets
3. Pipe bolt

INSTALLATION

1) Use new union gaskets and connect oil cooler pipes to oil outlet unions.
2) Connect hoses to pipes and clamp them securely.
3) Tighten union bolts to specified torque with oil outlet union locked.

Tightening Torque
(a): 35 N·m (3.5 kg-m, 25.5 lb-ft)

4) Tighten pipe bolt securely.
5) Check A/T fluid level according to procedure described in “Fluid Level” section.
   Add if necessary.
6) Check for fluid leakage after warming up A/T.



1. Select lever
2. Shift lock solenoid
3. Brake light switch
4. Brake pedal
5. Cable
6. Ignition switch

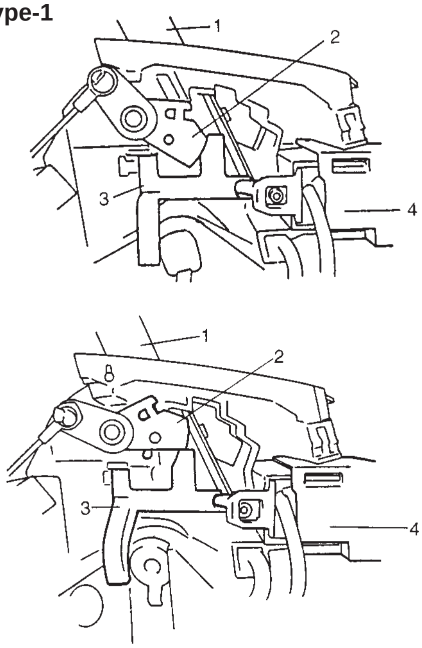
BRAKE INTERLOCK SYSTEM

SHIFT LOCK SOLENOID CONTROL

This system consists of shift lock solenoid control system and interlock cable control system.

The shift lock solenoid control system is so designed that the selector lever can not be shifted from “P” range position unless the ignition switch is turned ON and the brake pedal is depressed. And the interlock cable control system is so designed that the selector lever cannot be shifted from “P” range position unless the ignition switch is turned to “ACC” or “ON” position. Also, the ignition key cannot be pulled out of the key slot unless the selector lever is in “P” range.

Type-1



1. Select lever
2. Interlock cam
3. Shift lock solenoid rod
4. Shift lock solenoid

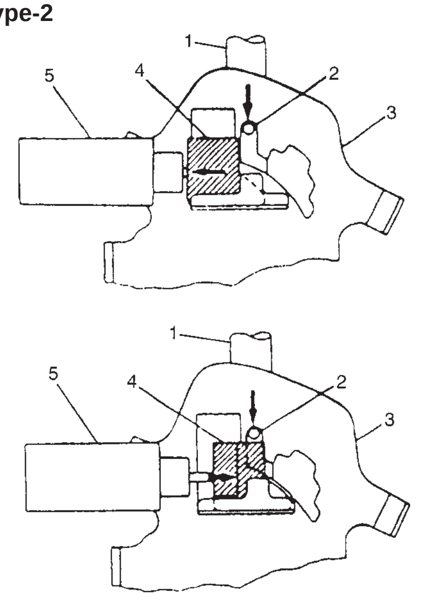
SHIFT LOCK SOLENOID CONTROL OPERATIONS

When the select lever is in “P” range, the ignition key position is “ON” and depressing the brake pedal cause the electric current to flow to the solenoid. As the shift lock solenoid rod (or the lock plate) is drawn toward the solenoid in this state, it frees the interlock cam (or the detent pin), which then allows the select lever to be shifted from “P” range to any other position.

Even when the select lever is in “P” range, if the ignition key position is “LOCK” or “ACC” or the brake pedal is not depressed, the electric current does not flow to the solenoid.

In this state, the shift lock solenoid rod (or the lock plate) is pushed away from the solenoid by spring force and it obstructs the interlock cam (or the detent pin) movement. Thus the select lever button does not work even when pressed and the select lever shift is prevented.

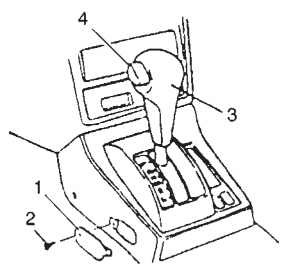
Type-2



1. Select lever
2. Detent pin
3. Detent plate
4. Lock plate
5. Shift lock solenoid

SHIFT LOCK (SOLENOID) MANUAL RELEASE

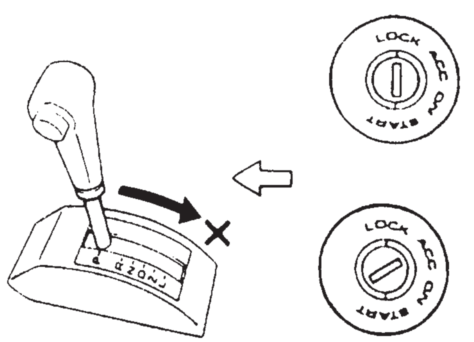
1. Cover
2. Screw
3. Select lever
4. Button



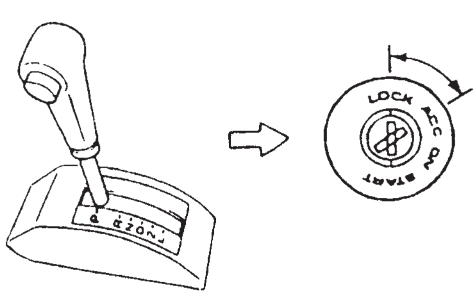
Shift lock can be manually released by following procedure.

1) Remove access hole cover by unfastening screw.
2) Turn ignition key to “ACC” position and move shift lock solenoid rod (or manual release plate) toward rear side of vehicle by using screw driver or the like.
3) In this state, select lever can be moved to any range or position.

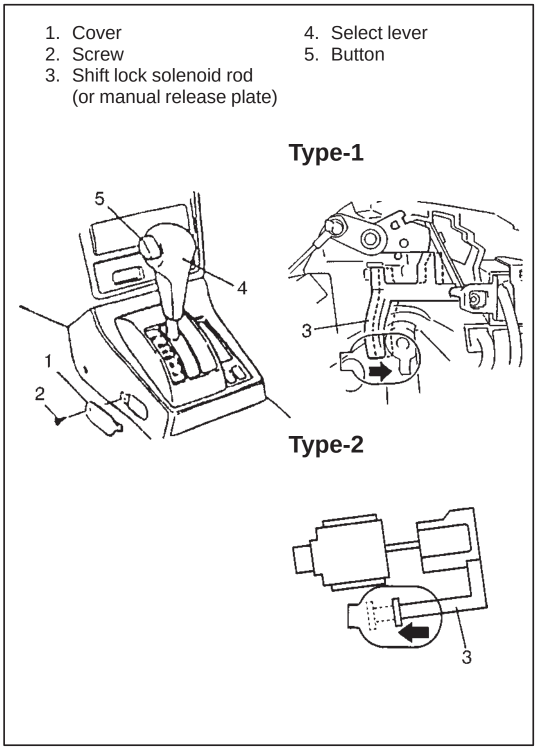
SYSTEM INSPECTION



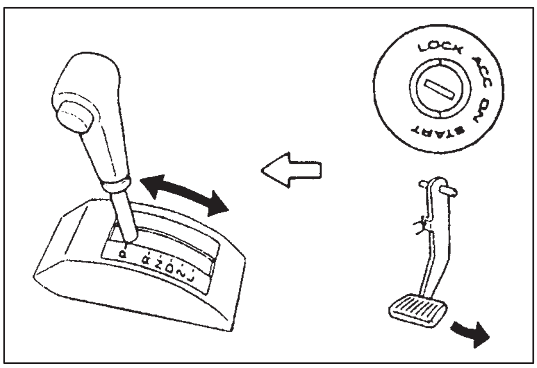
1) Check to make sure that select lever cannot be moved to any other range from “P” range position when ignition switch key is at “ACC” position, at “LOCK” position (or it is removed from keyhole of ignition switch) or brake pedal is not depressed.



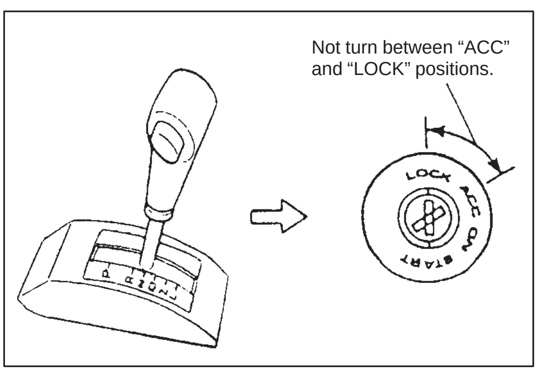
2) Shift select lever to “P” range position, release knob button and check for the following.
   - Ignition key can be turned between “LOCK” and “ACC” positions back and forth and also it can be removed from ignition switch.



- With shift lock solenoid rod (or manual release plate) moved in arrow direction and ignition key turned to “ACC” position, select lever can be shifted from “P” range position to any other range.
- With shift lock solenoid rod (or manual release plate) moved in arrow direction and ignition key turned to “LOCK” position, select lever can not be shifted from “P” range position to any other range.



- When ignition switch is turned “ON” and brake pedal is depressed, select lever can be shifted from “P” range position to any other range.



3) With select lever shifted to any position other than “P” range, check that ignition key cannot be turned “LOCK” position and it cannot be removed from ignition switch unless it is at “LOCK” position.

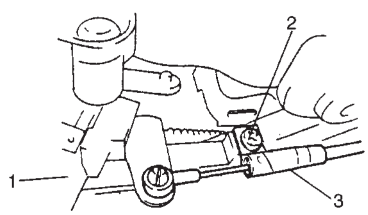
KEY INTERLOCK CABLE

NOTE:
Don’t bend interlock cable excessively when removing and installing it, or system will not operate correctly.

Removal

1) Disconnect negative (–) cable from battery.
2) If equipped with air bag system, disable air bag system. Refer to “Disabling Air bag System” in Section 10B.
3) Remove steering column hole cover.
4) Tilt steering column if steering column is adjustable. If no adjustable, loosen steering column bolts.
5) Remove steering column cover.

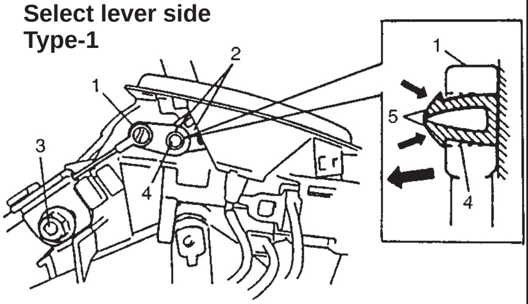
Ignition switch side



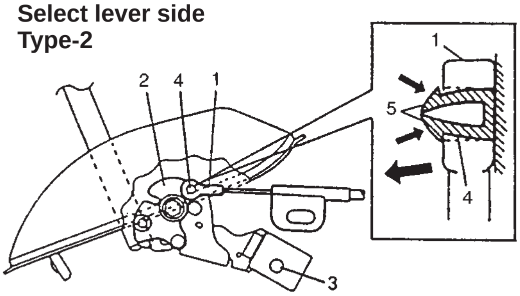
1. Ignition switch assembly
2. Clamp screw
3. Interlock cable

6) Remove interlock cable clamp screw located at ignition switch assembly.
7) Disconnect interlock cable inner end. (Ignition switch side.)

Select lever side
Type-1

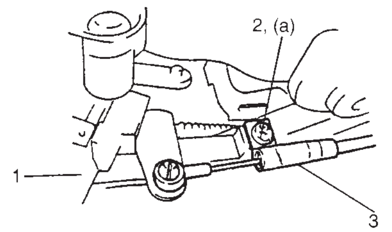


Select lever side
Type-2

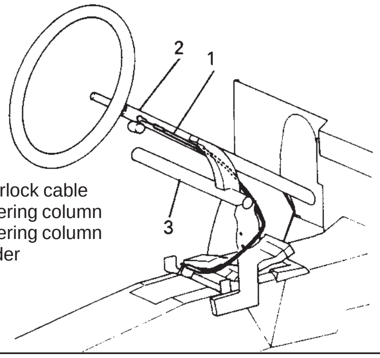


1. Inner end of interlock cable
2. Interlock cam (or key release cam)
3. Stud bolt
4. Cam boss
5. Claw

8) With console box removed, take out interlock cable by loosening lock nuts.
9) Detach cable end from interlock cam (or key release cam) while pressing claws of interlock cam boss. At this time, be careful not to cause damage to its claws.



1. Ignition switch assembly
2. Clamp screw
3. Outer end



1. Interlock cable
2. Steering column
3. Steering column holder

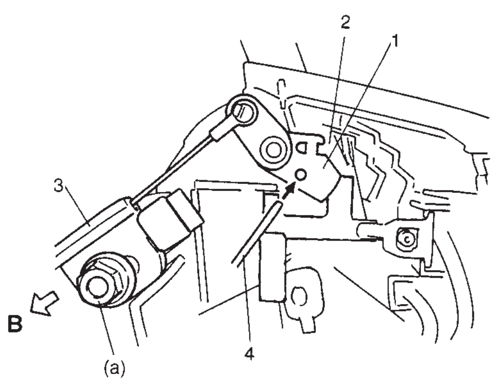
Installation

1) Shift select lever to "N" range and turn ignition key to "ACC" position.
2) Connect inner end of interlock cable to key interlock lever (Ignition switch side).
3) Install outer end bracket of interlock cable to ignition switch assembly, and tighten screw to specified torque.

   Tightening Torque
   (a): 2.2 N·m (0.22 kg-m, 1.5 lb-ft)

4) Pass and connect interlock cable as shown at the left figure.

Type-1



1. Interlock cam
2. Lever plate
3. Interlock cable
4. Pin with 4 mm (0.15 in.) dia.

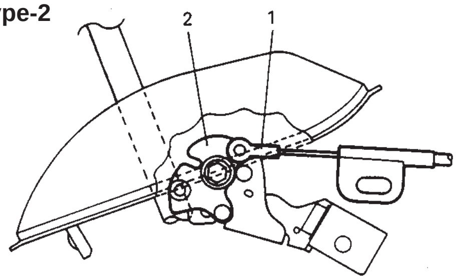
TYPE-1

5) Fix interlock cam by inserting pin with about 4 mm (0.15 in.) dia. into holes of cam and lever plate.
6) Install cable end to interlock cam and stud bolt and after making sure that cable outer is pushed in arrow direction B by leaf spring, tighten mounting nut to specified torque. Remove pin.

   Tightening Torque
   (a): 13 N·m (1.3 kg-m, 9.5 lb-ft)

7) Turn ignition key to "ACC" position and shift select lever to "N" range, and check for the followings.
   a. When select lever is shifted at "P" range with knob button depressed, ignition key can not be turned from "ACC" to "LOCK" position.
   b. When knob button is released, ignition key can be turned to "LOCK" position.
   c. When ignition key is at "LOCK" position, select lever can not be shifted from "P" to any other range.
8) Install console box.
9) Install steering column cover.
10) Adjust steering column or tighten steering column bolts.
11) Install steering column hole cover.
12) If equipped with air bag system, enable air bag system. Refer to "Enabling Air bag System" in Section 10B.

Type-2

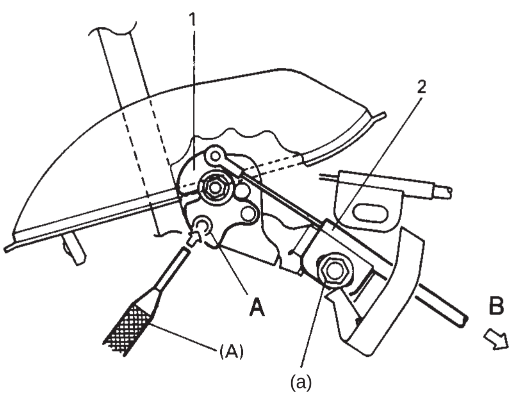


1. Inner end of interlock cable
2. Key release cam

TYPE-2

5) With key release cam set as shown at the left figure, connect inner end of interlock cable to key release cam. (Select lever side.)

Type-2



1. Key release cam
2. Cable outer

6) Move key release cam so that it is set at such angle as shown at the left figure and with special tool inserted in hole A , fix key release cam.

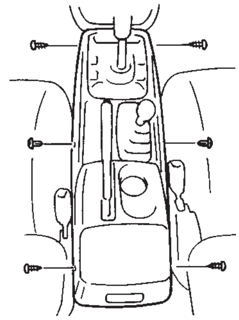
   Special Tool
   (A): 09925-78210 (6 mm)

7) With key release cam fixed with special tool, install cable outer to bracket and after making sure that cable outer is pushed in arrow direction B by leaf spring, tighten mounting nut to specified torque. Remove special tool.

   Tightening Torque
   (a): 13 N·m (1.3 kg-m, 9.5 lb-ft)

8) Turn ignition key to "ACC" position and shift select lever to "N" range, and check for the followings.
   a. When select lever is shifted at "P" range with knob button depressed, ignition key can not be turned from "ACC" to "LOCK" position.
   b. When knob button is released, ignition key can be turned to "LOCK" position.
   c. When ignition key is at "LOCK" position, select lever can not be shifted from "P" to any other range.
9) Install console box.
10) Install steering column cover.
11) Adjust steering column or tighten steering column bolts.
12) Install steering column hole cover.
13) If equipped with air bag system, enable air bag system. Refer to "Enabling Air bag System" in Section 10B.

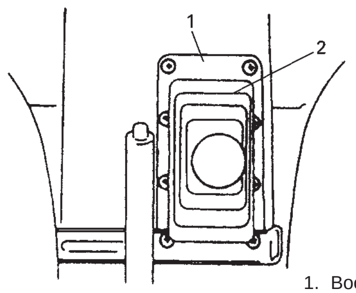
DISMOUNTING OF TRANSMISSION (WITH TRANSFER IF EQUIPPED)



IN CABIN

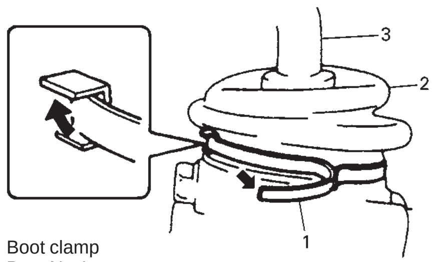
1) Remove console box.

   NOTE:
   To remove clip, push in its center pin first.



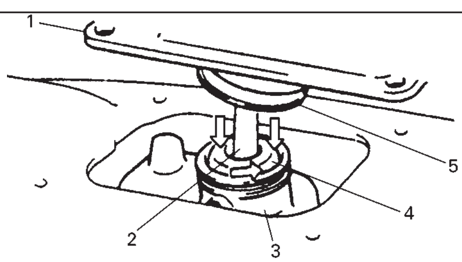
1. Boot No.2
2. Boot cover

2) Remove boot cover and boot No.2. (if equipped)



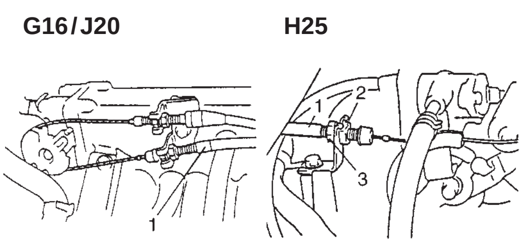
1. Boot clamp
2. Boot No.1
3. Gear shift control lever

3) Remove boot clamp and then remove boot No.1 from transfer gear shift lever case. (if equipped)



1. Boot No.2
2. Transfer shift control lever
3. Transfer shift lever case
4. Transfer shift control case cover
5. Boot No.1

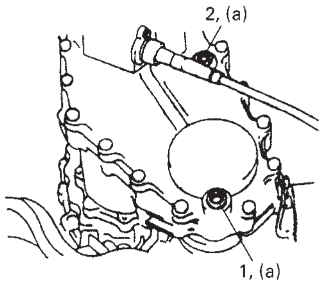
4) With transfer shift control case cover pushed down with fingers, turn it to counterclockwise and take out shift control lever. (if equipped)



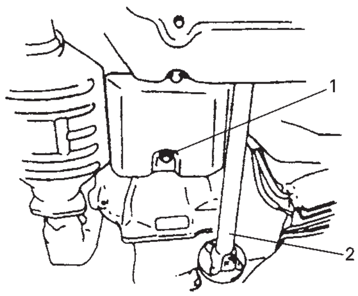
1. A / T throttle cable
2. Adjusting nut
3. Lock nut

IN ENGINE ROOM

1) Remove battery, dipstick and oil filler tube.
2) Disconnect A / T throttle cable from throttle cam and bracket.
3) Remove starter motor. But don’t disconnect its wiring harness.
4) Remove transmission to engine bolt and nut.



1. Drain plug
2. Filler and level plug



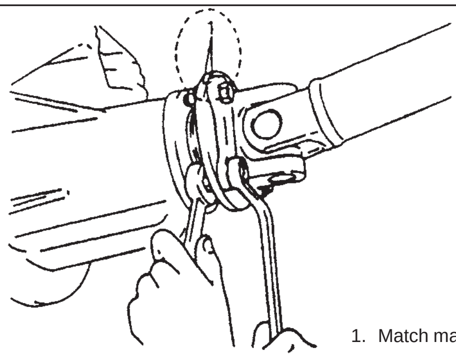
1. Drain plug
2. Front propeller shaft

ON LIFT

1) Drain transfer oil for 4WD vehicle or A/T fluid for 2WD vehicle.

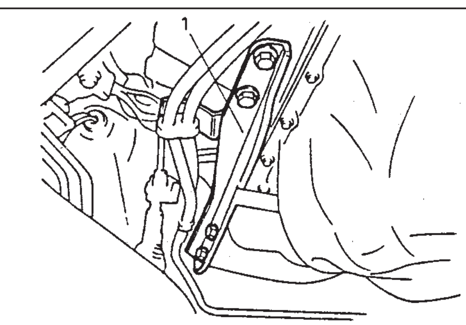
   NOTE:
   If 4WD automatic transmission is overhauled later on, draining A/T fluid at this point will facilitate work.

   Tightening Torque
   (a): 23 N·m (2.3 kg-m, 17.0 lb-ft)



1. Match marks

2) Before removing propeller shaft, give match marks on joint flange and propeller shaft as shown in left figure.
3) Remove universal joint flange bolts and take out rear propeller shaft.
4) Likewise, take out front propeller shaft. (if equipped)
5) Remove nut from the end of select cable and bracket to set cable free.
6) Remove select cable bracket by removing its 2 bolts.
7) Remove exhaust No.1 and No.2 pipe.

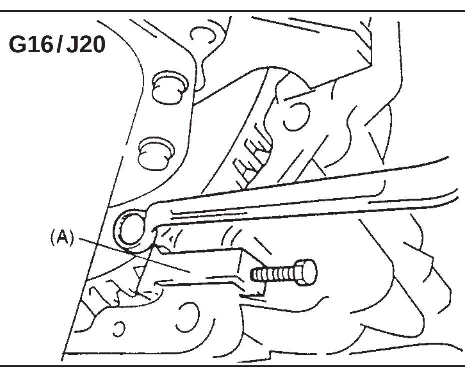


1. Right side transmission stiffener (if equipped)

8) Remove transmission stiffener (right side) if equipped.
9) Unclamp and disconnect oil cooler hoses from pipes.

   NOTE:
   To avoid leakage of transmission fluid, plug open ends of oil cooler pipes and hoses right after they are disconnected.

10) Remove torque converter housing lower plate.



11) Holding drive plate stationary with special tool or the like, remove torque converter mounting bolts with wrench.

    Special Tool (only for G16/J20)
    (A): 09927-56010

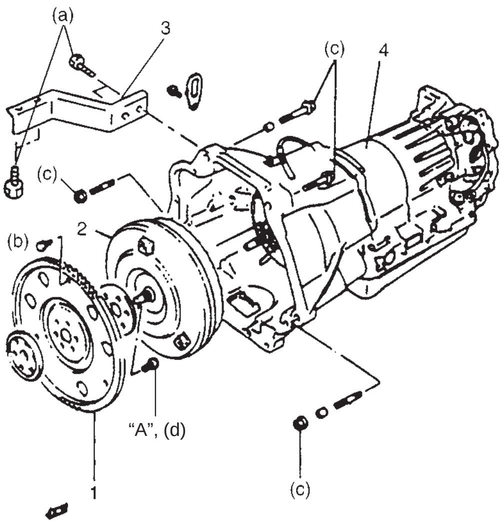
12) Remove engine to transmission nuts.
13) Disconnect connectors from VSS, output speed sensor, input speed sensor, TR switch, shift & TCC solenoid valves and other electrical parts, and release their wire harness from clamps.
14) Apply transmission jack and take off rear mounting member by removing its bolts.
15) With transmission (and transfer if equipped) assembly held up on jack, move them to the rear and lower them including torque converter.

WARNING:
Transmission (and transfer if equipped) assembly may tilt rearward on jack. It is recommended to use an auxiliary arm of jack for the purpose of safety.

AFTER DISMOUNTING

WARNING:
Be sure to keep transmission (and transfer if equipped) assembly horizontal throughout the work. Should they be tilted, torque converter may fall off and cause personal injury and A/T fluid may flow out.

1) Remove breather hoses.
2) Remove transfer by removing its bolts, if equipped.



"A": Sealant 99000-31110

Tightening torque
(a): 50 N·m
5.0 kg-m
36.5 lb-ft
(b): 65 N·m
6.5 kg-m
47.0 lb-ft
(c): 85 N·m
8.5 kg-m
61.5 lb-ft
(d): 78 N·m
7.8 kg-m
56.5 lb-ft

1. Drive plate
2. Torque converter
3. Case right stiffener (if equipped)
4. Automatic transmission

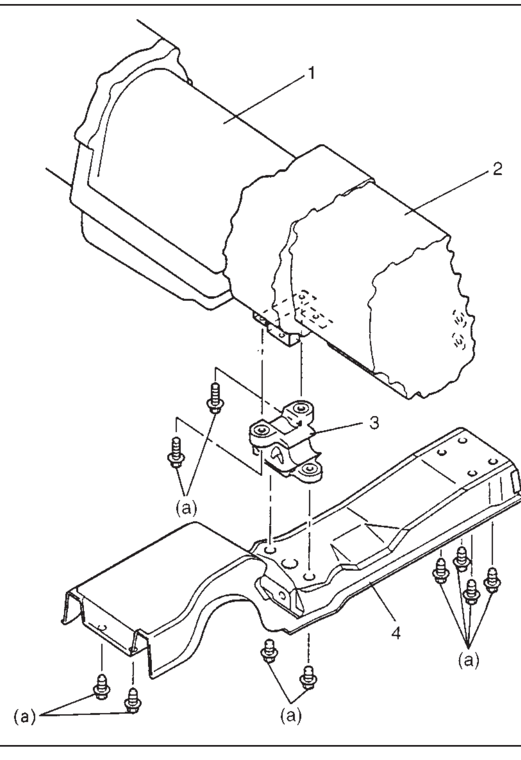
REMOUNTING

WARNING:
When moving transmission assembly with torque converter equipped in it, be sure to keep it horizontal. Tilting it with its front facing down may allow converter to fall off. Whereby an injury may result.

For remounting, reverse dismounting procedure. Use specified torque as given below and left.

Tightening torque	N·m	kg-m	lb-ft
Exhaust No.1 pipe to manifold bolts or nuts	50	5.0	36.5
Muffler to exhaust No.2 pipe nuts	60	6.0	43.5
Universal joint flange bolts and nuts	50	5.0	36.5
• Oil filler tube bolts • Select cable bracket bolts	23	2.3	17.0

- Clamp wiring harness and hoses securely.
- Refer to "Select Cable" section for adjusting procedure of select cable.
- Refer to "A/T Throttle Cable" section for tuning of A/T throttle cable.
- Follow fluid level check procedure for refilling automatic transmission fluid and its level adjusting.
- Connect battery, and confirm that engine and transmission function acceptably.
- When remounting drive plate, use specified bolts.



Tightening torque
(a): 50 N·m (5.0 kg-m, 36.5 lb-ft)

1. Automatic transmission
2. Transfer (4WD)
3. Engine rear mounting
4. Engine rear mounting member

UNIT REPAIR

Refer to the same section of UNIT REPAIR MANUAL mentioned in FOREWORD of this manual.

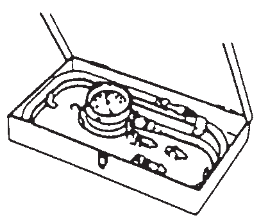
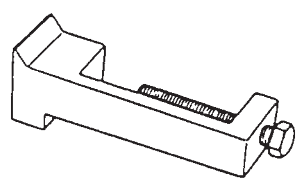
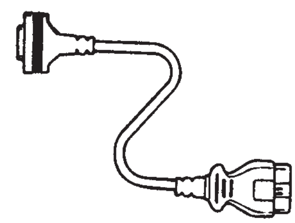
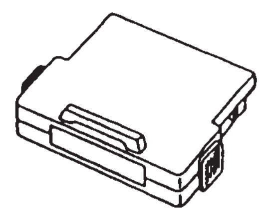
TIGHTENING TORQUE SPECIFICATIONS

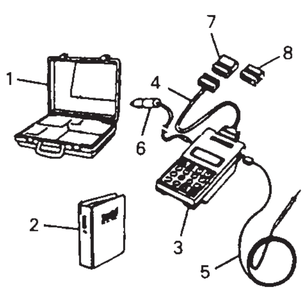
Fastening portion		Tightening torque		
		N·m	kg-m	lb-ft
ON-VEHICLE SERVICE	Automatic transmission fluid drain plug	23	2.3	17.0
	Transfer oil filler / level and drain plugs	23	2.3	17.0
	Transmission case plug	17	1.7	12.5
	Manual select lever nut	13	1.3	9.5
	Manual select cable nut	7	0.7	5.5
	Manual selector assembly bolts	18	1.8	13.5
MOUNTING	Transmission to engine bolts and nuts	85	8.5	61.5
	Engine rear mounting bolts Engine rear mounting member bolts Transmission case right stiffener bolts	50	5.0	36.5
	Universal joint flange bolts and nuts	50	5.0	36.5
	Torque converter mounting bolts	65	6.5	47.0
EXTERNAL	Adapter case or extension case bolts (G16 engine)	35	3.5	25.5
	Adapter case or extension case bolts (J20 / H25 engines)	42	4.2	30.0
	Transmission range switch lock bolt	5.5	0.55	4.0
	Oil pipe union bolts	35	3.5	22.5
	Drive plate bolts	78	7.8	56.5
	Interlock cable clamp screw	2.2	0.22	1.5
	Interlock cable outer mounting nut	13	1.3	9.5

REQUIRED SERVICE MATERIALS

MATERIAL	RECOMMENDED SUZUKI PRODUCT	USE
A/T fluid	An equivalent of DEXRON®-III	● Automatic transmission ● Parts lubrication when installing
Lithium grease	SUZUKI SUPER GREASE A (99000–25010)	● Cable ends
Sealant	SUZUKI BOND NO.1215 (99000-31110)	● Flywheel bolts

SPECIAL TOOLS

 09925-37810 Oil pressure gauge	 09927-56010 Gear stopper (only for G16/J20)	 09931-76030 16/14 pin DLC (OBD-II adapter) cable	 Mass storage cartridge



1. Storage case
2. Operator’s manual
3. Tech 1A
4. DLC cable
5. Test lead/probe
6. Power source cable
7. DLC cable adapter
8. Self–test adapter

09931-76011
SUZUKI scan tool (Tech 1A) kit