

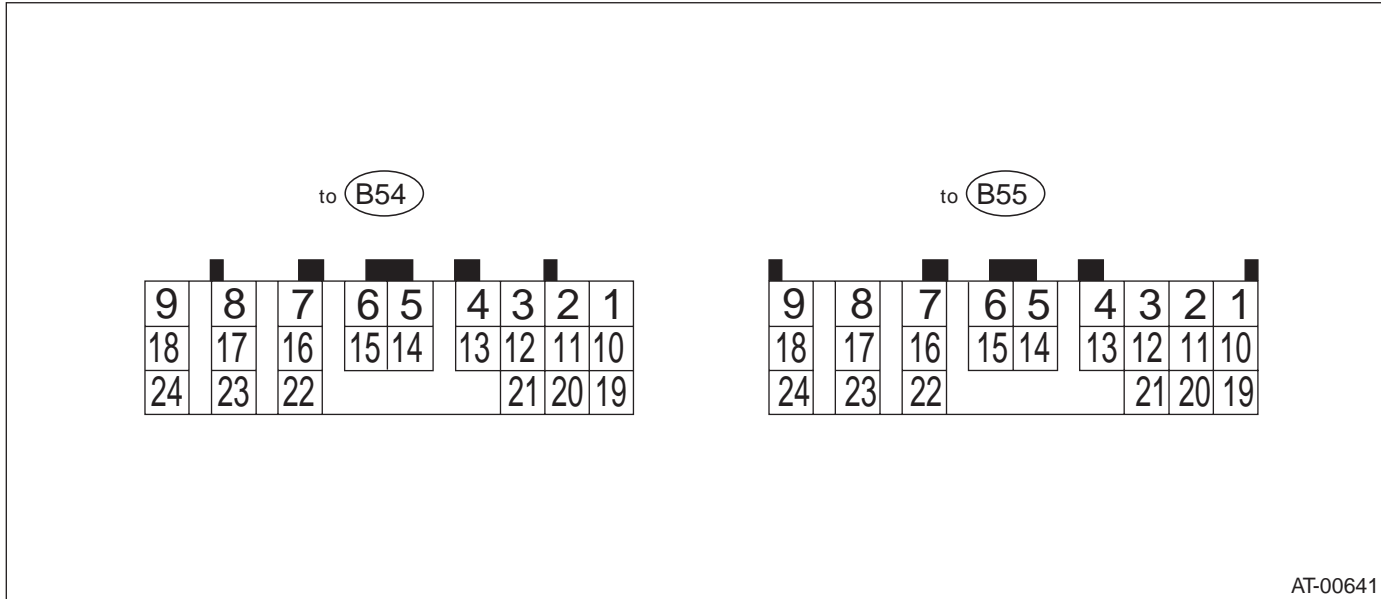
TRANSMISSION CONTROL MODULE (TCM) I/O SIGNAL

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

5. Transmission Control Module (TCM) I/O Signal

A: ELECTRICAL SPECIFICATION

1. WITHOUT VDC SYSTEM AND SPORT SHIFT



Check with ignition switch ON.					
Content	Connector No.	Terminal No.	Measuring conditions	Voltage (V)	Resistance to body (ohms)
Back-up power supply	B55	6	Ignition switch OFF	10 — 13	—
Ignition power supply	B54	23	Ignition switch ON (with engine OFF)	10 — 13	—
	B54	24			
Inhibitor switch	"P" range switch	B55	23	Select lever in "P" range	Less than 1
				Select lever in any other than "P" range (except "N" range)	More than 8
	"N" range switch	B55	22	Select lever in "N" range	Less than 1
				Select lever in any other than "N" range (except "P" range)	More than 8
	"R" range switch	B55	17	Select lever in "R" range	Less than 1
				Select lever in any other than "R" range	More than 8
	"D" range switch	B55	8	Select lever in "D" range	Less than 1
				Select lever in any other than "D" range	More than 8
	"3" range switch	B55	18	Select lever in "3" range	Less than 1
				Select lever in any other than "3" range	More than 8
	"2" range switch	B54	10	Select lever in "2" range	Less than 1
				Select lever in any other than "2" range	More than 8
	"1" range switch	B54	1	Select lever in "1" range	Less than 1
				Select lever in any other than "1" range	More than 8
Brake switch	B55	24	Brake pedal depressed.	More than 10.5	
			Brake pedal released.	Less than 1	
ABS signal	B54	19	ABS switch ON	Less than 1	
			ABS switch OFF	More than 6.5	
"AT OIL TEMP" warning light	B54	3	Light ON	Less than 1	
			Light OFF	More than 9	
Throttle position sensor	B55	2	Throttle fully closed.	0.2 — 1.0	
			Throttle fully open.	4.2 — 4.7	

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TRANSMISSION CONTROL MODULE (TCM) I/O SIGNAL

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

Check with ignition switch ON.					
Content	Connector No.	Terminal No.	Measuring conditions	Voltage (V)	Resistance to body (ohms)
Throttle position sensor power supply	B55	1	Ignition switch ON (With engine OFF)	4.8 — 5.3	—
ATF temperature sensor	B55	11	ATF temperature 20°C (68°F)	1.6 — 2.0	2.1 — 2.9 k
			ATF temperature 80°C (176°F)	0.4 — 0.9	275 — 375
Rear vehicle speed sensor	B55	3	Vehicle stopped.	0	450 — 650
			Vehicle speed at least 20 km/h (12 MPH)	More than 1 (AC range)	
Front vehicle speed sensor	B55	5	Vehicle stopped	0	450 — 650
			Vehicle speed at least 20 km/h (12 MPH)	More than 1 (AC range)	
Torque converter turbine speed sensor	B55	12	Engine idling after warm-up (D range)	0	450 — 650
			Engine idling after warm-up (N range)	More than 1 (AC range)	
Vehicle speed output signal	B55	13	Vehicle speed at most 10 km/h (6 MPH)	Less than 1 ← → More than 4	—
Engine speed signal	B55	4	Ignition switch ON (with engine OFF)	0	—
			Ignition switch ON (with engine ON)	0 — 13 or more	
Cruise set signal	B54	11	When cruise control is set (SET light ON)	Less than 1	—
			When cruise control is not set (SET light OFF)	More than 6.5	
Torque control signal 1	B54	13	Ignition switch ON (with engine ON)	More than 4.0	—
Torque control signal 2	B54	21	Ignition switch ON (with engine ON)	More than 4.0	—
Torque control cut signal	B54	2	Ignition switch ON	8	—
Intake manifold pressure signal	B55	20	Engine idling after warm-up.	0.4 — 1.6	—
Shift solenoid 1	B54	7	1st gear	More than 9	10 — 16
			3rd gear	Less than 1	
Shift solenoid 2	B54	6	2nd gear	More than 9	10 — 16
			4th gear	Less than 1	
Line pressure duty solenoid	B54	9	Throttle fully closed (with engine OFF) after warm-up.	1.5 — 4.0	2.0 — 4.5
			Throttle fully open (with engine OFF) after warm-up.	Less than 1	
Line pressure dropping resistor	B54	18	Throttle fully closed (with engine OFF) after warm-up.	More than 8.5	9 — 15
			Throttle fully open (with engine OFF) after warm-up.	Less than 0.5	
Lock-up duty solenoid	B54	16	When lock up occurs.	More than 8.5	10 — 17
			When lock up is released.	Less than 0.5	
Transfer duty solenoid	B54	15	Fuse on FWD switch	More than 8.5	10 — 17
			Fuse removed from FWD switch (with throttle fully open and with select lever in 1st gear).	Less than 0.5	
2-4 brake duty solenoid	B54	8	Throttle fully closed (with engine OFF) after warm-up.	1.5 — 5.0	2.0 — 4.5
			Throttle fully open (with engine OFF) after warm-up.	Less than 0.5	
2-4 brake dropping resistor	B54	17	Throttle fully closed (with engine OFF) after warm-up.	More than 8.5	9 — 15
			Throttle fully open (with engine OFF) after warm-up.	Less than 0.5	

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TRANSMISSION CONTROL MODULE (TCM) I/O SIGNAL

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

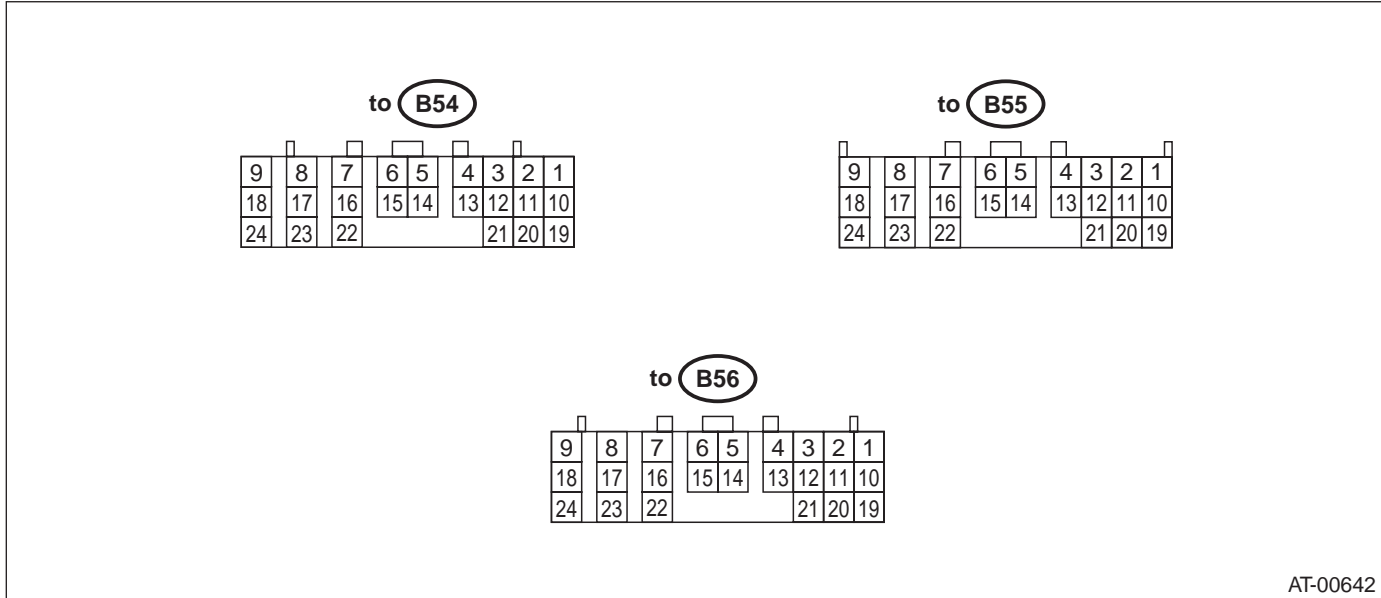
Check with ignition switch ON.					
Content	Con- nector No.	Termi- nal No.	Measuring conditions	Voltage (V)	Resistance to body (ohms)
2-4 brake timing solenoid	B54	5	1st gear	Less than 1	10 — 16
			3rd gear	More than 9	
Low clutch timing solenoid	B54	14	2nd gear	Less than 1	10 — 16
			4th gear	More than 9	
Sensor ground line 1	B55	10	—	0	Less than 1
Sensor ground line 2	B55	21	—	0	Less than 1
System ground line	B55	9	—	0	Less than 1
		19			
FWD switch	B55	14	Fuse removed.	More than 9	—
			Fuse installed.	Less than 1	
FWD indicator light	B54	12	Fuse on FWD switch	Less than 1	—
			Fuse removed from FWD switch	More than 9	
AT diagnosis signal (Wave- form)	B54	4	Ignition switch ON	Less than 1← →More than 4	—
Data link signal (Subaru Select Monitor)	B55	7	—	—	—

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TRANSMISSION CONTROL MODULE (TCM) I/O SIGNAL

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

2. WITH VDC SYSTEM OR SPORT SHIFT



Check with ignition switch ON.						
Content	Connector No.	Terminal No.	Measuring conditions	Voltage (V)	Resistance to body (ohms)	
Back-up power supply	B56	1	Ignition switch OFF	10 — 13	—	
Ignition power supply	B54	23	Ignition switch ON (with engine OFF)	10 — 13	—	
	B54	24				
Inhibitor switch	"P" range switch	B55	1	Select lever in "P" range	Less than 1	—
				Select lever in any other than "P" range (except "N" range)	More than 8	
	"N" range switch	B55	14	Select lever in "N" range	Less than 1	—
				Select lever in any other than "N" range (except "P" range)	More than 8	
	"R" range switch	B55	3	Select lever in "R" range	Less than 1	—
				Select lever in any other than "R" range	More than 8	
	"D" range switch	B55	4	Select lever in "D" range	Less than 1	—
				Select lever in any other than "D" range	More than 8	
	"3" range switch	B55	5	Select lever in "3" range	Less than 1	—
				Select lever in any other than "3" range	More than 8	
	"2" range switch	B55	6	Select lever in "2" range	Less than 1	—
				Select lever in any other than "2" range	More than 8	
	"1" range switch	B55	7	Select lever in "1" range	Less than 1	—
				Select lever in any other than "1" range	More than 8	
Brake switch	B55	12	Brake pedal depressed.	More than 10.5	—	
			Brake pedal released.	Less than 1		
VDC communication signal +	B56	9	Ignition ON	(+) — (-) Pulse signal	—	
VDC communication signal -	B56	18		(+) — (-) Pulse signal	—	
AT OIL TEMP warning light	B56	10	Light ON	Less than 1	—	
			Light OFF	More than 9		
Throttle position sensor	B54	3	Throttle fully closed.	0.2 — 1.0	—	
			Throttle fully open.	4.2 — 4.7		

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TRANSMISSION CONTROL MODULE (TCM) I/O SIGNAL**AUTOMATIC TRANSMISSION (DIAGNOSTICS)**

Check with ignition switch ON.					
Content	Connector No.	Terminal No.	Measuring conditions	Voltage (V)	Resistance to body (ohms)
Throttle position sensor power supply	B54	2	Ignition switch ON (With engine OFF)	4.8 — 5.3	—
ATF temperature sensor	B54	11	ATF temperature 20°C (68°F)	1.6 — 2.0	2.1 k — 2.9 k
			ATF temperature 80°C (176°F)	0.4 — 0.9	275 — 375
Rear vehicle speed sensor	B55	24	Vehicle stopped.	0	450 — 650
			Vehicle speed at least 20 km/h (12 MPH)	More than 1 (AC range)	
Front vehicle speed sensor	B55	18	Vehicle stopped.	0	450 — 650
			Vehicle speed at least 20 km/h (12 MPH)	More than 1 (AC range)	
Torque converter turbine speed sensor	B55	8	Engine idling after warm-up. (D range)	0	450 — 650
			Engine idling after warm-up. (N range)	More than 1 (AC range)	
Vehicle speed output signal	B56	17	Vehicle speed at most 10 km/h (6 MPH)	Less than 1 ← → More than 4	—
Engine speed signal	B55	17	Ignition switch ON (with engine OFF)	0	—
			Ignition switch ON (with engine ON)	8 — 11	
Cruise set signal	B55	22	When cruise control is set (SET lamp ON)	Less than 1	—
			When cruise control is not set (SET lamp OFF)	More than 6.5	
Torque control signal 1	B56	5	Ignition switch ON (with engine ON)	More than 4	—
Torque control signal 2	B56	14	Ignition switch ON (with engine ON)	More than 4	—
Torque control cut signal	B55	10	Ignition switch ON	8	—
Intake manifold pressure signal	B54	1	Engine idling after warm-up.	0.4 — 1.6	—
Shift solenoid 1	B54	22	1st or 4th gear	More than 9	10 — 16
			2nd or 3rd gear	Less than 1	
Shift solenoid 2	B54	5	1st or 2nd gear	More than 9	10 — 16
			3rd or 4th gear	Less than 1	
Line pressure duty solenoid	B54	9	Ignition switch ON (with engine OFF) Throttle fully closed after warm-up.	1.5 — 4.0	2.0 — 4.5
			Ignition switch ON (with engine OFF) Throttle fully open after warm-up.	Less than 0.5	
Lock-up duty solenoid	B54	7	When lock up occurs.	More than 8.5	10 — 17
			When lock up is released.	Less than 0.5	
Transfer duty solenoid	B54	6	Fuse on FWD switch	More than 8.5	10 — 17
			Fuse removed from FWD switch (with throttle fully open and with select lever in 1st gear).	Less than 0.5	
2-4 brake duty solenoid	B54	18	Throttle fully closed (with engine OFF) after warm-up.	1.5 — 4.0	2.0 — 4.5
			Throttle fully open (with engine OFF) after warm-up.	Less than 0.5	
2-4 brake timing solenoid	B54	16	1st gear	Less than 1	10 — 16
			3rd gear	More than 9	
Low clutch timing solenoid	B54	15	2nd gear	Less than 1	10 — 16
			4th gear	More than 9	
ABS signal (Without VDC system)	B55	21	ABS switch ON	Less than 1	—
			ABS switch OFF	6.5 — 15	—
Sensor ground line 1	B54	20	—	0	Less than 1
Sensor ground line 2	B55	9	—	0	Less than 1

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TRANSMISSION CONTROL MODULE (TCM) I/O SIGNAL

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

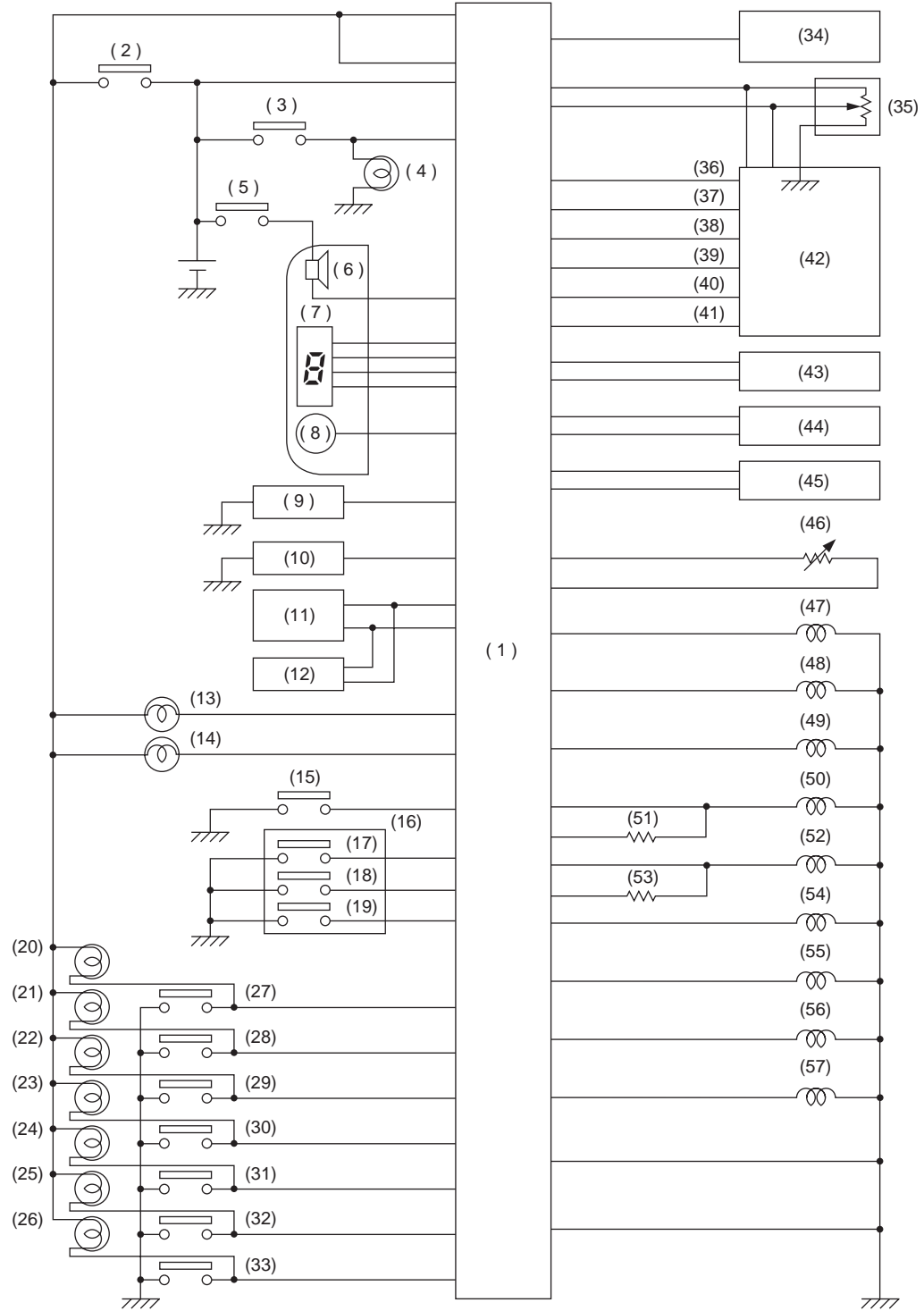
Check with ignition switch ON.					
Content	Connector No.	Terminal No.	Measuring conditions	Voltage (V)	Resistance to body (ohms)
System ground line	B56	19	—	0	Less than 1
	B54	21			
Sensor ground line 3	B54	10	—	0	Less than 1
Sensor ground line 4	B54	19	—	0	Less than 1
AT diagnosis signal (Waveform)	B56	21	Ignition switch ON	Less than 1 ← → More than 4	—
Data link signal (Subaru Select Monitor)	B56	15	—	—	—
SPORT shift solenoid (with SPORT shift)	B54	14	SPORT shift activated	More than 8	10 — 17
			SPORT shift deactivated	Less than 1	
SPORT shift mode switch (with SPORT shift)	B55	15	SPORT shift mode switch ON	Less than 1	—
			SPORT shift mode switch OFF	More than 8	
Shift up switch (with SPORT shift)	B55	13	Shift up switch ON	Less than 1	—
			Shift up switch OFF	More than 8	
Shift down switch (with SPORT shift)	B55	12	Shift down switch ON	Less than 1	—
			Shift down switch OFF	More than 8	
Buzzer (with SPORT shift)	B56	21	ON	Less than 1	—
			OFF	More than 8	
SPORT shift indicator (with SPORT shift)	B56	12	SPORT shift mode OFF	More than 4	—
			Shift down indicator ON	Less than 1	
SPORT shift indicator (with SPORT shift)	B56	13	SPORT shift mode OFF	More than 4	—
			SPORT shift mode with 4th gear	Less than 1	
SPORT shift indicator (with SPORT shift)	B56	3	SPORT shift mode OFF	More than 4	—
			SPORT shift mode with 2nd and 3rd gear	Less than 1	
SPORT shift indicator (with SPORT shift)	B56	4	SPORT shift mode OFF	More than 4	—
			SPORT shift mode with 1st and 3rd gear	Less than 1	

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TRANSMISSION CONTROL MODULE (TCM) I/O SIGNAL

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

B: SCHEMATIC



AT-00643

AT-20

TRANSMISSION CONTROL MODULE (TCM) I/O SIGNAL

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

- | | | |
|---|--------------------------------------|---|
| (1) Transmission control module | (20) "P" range indicator light | (45) Torque converter turbine speed sensor |
| (2) Ignition switch | (21) "R" range indicator light | (46) ATF temperature sensor |
| (3) Brake switch | (22) "N" range indicator light | (47) Shift solenoid 1 |
| (4) Brake light | (23) "D" range indicator light | (48) Shift solenoid 2 |
| (5) Ignition relay | (24) "3" range indicator light | (49) 2-4 brake timing solenoid |
| (6) Buzzer (with SPORT shift) | (25) "2" range indicator light | (50) 2-4 brake duty solenoid |
| (7) SPORT shift indicator (with SPORT shift) | (26) "1" range indicator light | (51) 2-4 brake dropping resistor (without VDC system and SPORT shift) |
| (8) Speedometer | (27) "P" range switch | (52) Line pressure duty solenoid |
| (9) Cruise control module | (28) "R" range switch | (53) Line pressure dropping resistor (without VDC system and SPORT shift) |
| (10) ABS control module (without VDC system) | (29) "N" range switch | (54) Lock-up duty solenoid |
| (11) VDC control module (with VDC system) | (30) "D" range switch | (55) Low clutch timing solenoid |
| (12) Steering angle sensor (with VDC system) | (31) "3" range switch | (56) Transfer duty solenoid |
| (13) FWD indicator light (without VDC system and SPORT shift) | (32) "2" range switch | (57) SPORT shift solenoid (with SPORT shift) |
| (14) "AT OIL TEMP" warning light | (33) "1" range switch | |
| (15) FWD switch (without VDC system and SPORT shift) | (34) Data link connector | |
| (16) SPORT shift (with SPORT shift) | (35) Throttle position sensor | |
| (17) SPORT shift mode switch | (36) Engine speed signal | |
| (18) Up switch | (37) Torque control cut signal | |
| (19) Down switch | (38) Torque control signal 2 | |
| | (39) Torque control signal 1 | |
| | (40) Intake manifold pressure signal | |
| | (41) AT diagnosis signal | |
| | (42) Engine control module | |
| | (43) Front vehicle speed sensor | |
| | (44) Rear vehicle speed sensor | |

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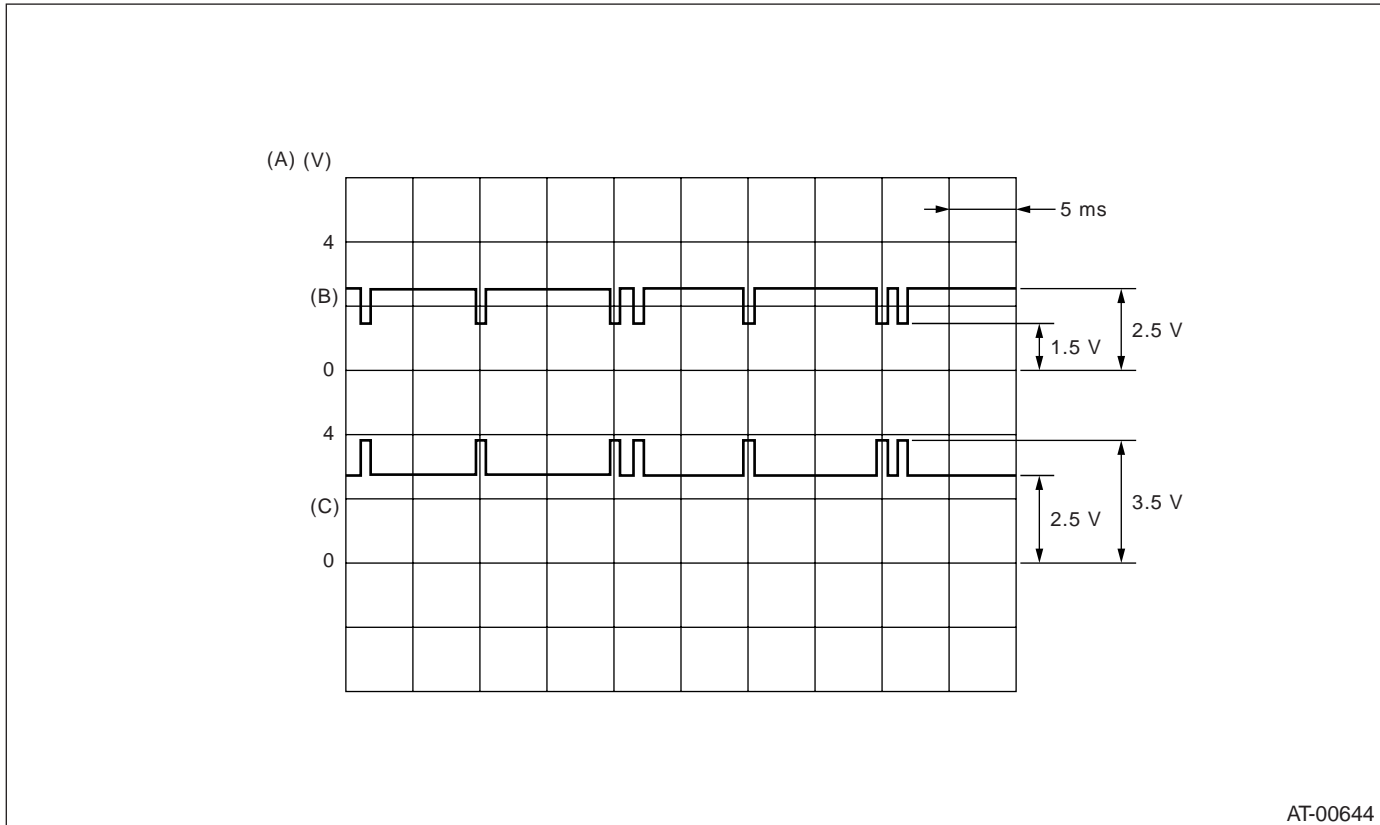
TRANSMISSION CONTROL MODULE (TCM) I/O SIGNAL

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

C: MEASUREMENT

Only for models with VDC system, measure input/output signal voltage.

1. WAVEFORM



- (A) Can communication line
- (B) Terminal No. :
(B56) No. 9 — (B55) No. 9
- (C) Terminal No. :
(B56) No. 18 — (B55) No. 9