

TRANSMISSION CONTROL MODULE (TCM) I/O SIGNAL

Automatic Transmission (DIAGNOSTICS)

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

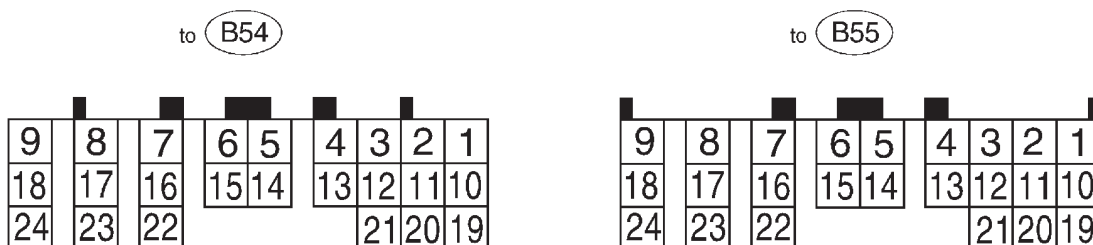
S004506

A: ELECTRICAL SPECIFICATION

S004506A08

1. WITHOUT VDC SYSTEM

S004506A0801



B2M2269A

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 — 16	—
Ignition power supply		B54	23	Ignition switch ON (with engine OFF)	10 — 16	—
		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	

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Automatic Transmission (DIAGNOSTICS)

Check with ignition switch ON.					
Content	Connector No.	Terminal No.	Measuring conditions	Voltage (V)	Resistance to body (ohms)
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	6.5 — 15	
AT OIL TEMP light	B54	3	Light ON	Less than 1	—
			Light OFF	More than 9	
Throttle position sensor	B55	2	Throttle fully closed.	0.3 — 0.7	—
			Throttle fully open.	4.3 — 4.9	
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)	2.9 — 4.0	2.1 — 2.9 k
			ATF temperature 80°C (176°F)	0.5 — 0.8	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) 4	
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)	More than 10.5	—
			Ignition switch ON (with engine ON)	8 — 11	
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 4.8	—
Torque control signal 2	B54	21	Ignition switch ON (with engine ON)	More than 4.8	—
Torque control cut signal	B54	2	Ignition switch ON	8	—
Intake manifold pressure signal	B55	20	Engine idling after warm-up.	1.2 — 1.8	—
Shift solenoid 1	B54	7	1st or 4th gear	More than 9	10 — 16
			2nd or 3rd gear	Less than 1	
Shift solenoid 2	B54	6	1st or 2nd gear	More than 9	10 — 16
			3rd or 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 0.5	
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	

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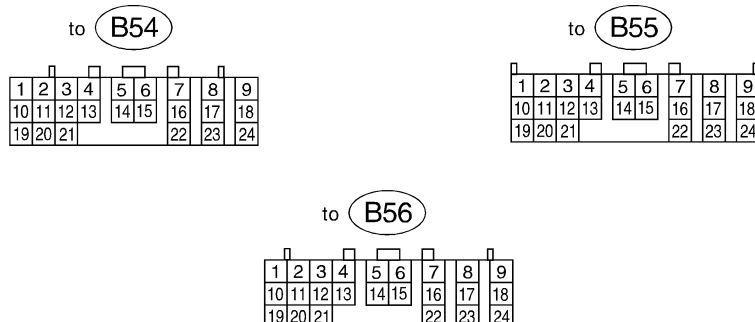
Automatic Transmission (DIAGNOSTICS)

Check with ignition switch ON.					
Content	Connector No.	Terminal No.	Measuring conditions	Voltage (V)	Resistance to body (ohms)
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 — 4.0	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	
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.	6 — 9.1	—
			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	B54	4	Ignition switch ON	Less than 1← →More than 4	—
Data link signal (Subaru Select Monitor)	B55	7	—	—	—
		16	—	—	

TRANSMISSION CONTROL MODULE (TCM) I/O SIGNAL

Automatic Transmission (DIAGNOSTICS)

2. WITH VDC SYSTEM S004506A0802



S3M0244A

Check with ignition switch ON.						
Content		Connec- tor No.	Terminal No.	Measuring conditions	Voltage (V)	Resistance to body (ohms)
Back-up power supply		B56	1	Ignition switch OFF	10 — 16	—
Ignition power supply		B54	23	Ignition switch ON (with engine OFF)	10 — 16	—
		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	(+) — (–) Plus signal	—
VDC communication signal –		B56	18		(+) — (–) Plus signal	—

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)
Kick-down switch	B55	11	Throttle fully opened.	Less than 1	—
			Throttle fully closed.	More than 6.5	
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.	0.3 — 0.7	—
			Throttle fully open.	4.3 — 4.9	
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)	2.9 — 4.0	2.1 — 2.9 k
			ATF temperature 80°C (176°F)	0.5 — 0.8	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) 4	
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)	More than 10.5	—
			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 4.8	—
Torque control signal 2	B56	14	Ignition switch ON (with engine ON)	More than 4.8	—
Torque control cut signal	B55	10	Ignition switch ON	8	—
Intake manifold pressure signal	B54	10	Engine idling after warm-up.	1.2 — 1.8	—
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	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	
Dropping resistor	B54	8	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	7	When lock up occurs.	More than 8.5	10 — 17
			When lock up is released.	Less than 0.5	

AT-16

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)
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 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	
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	
Sensor ground line 1	B54	19	—	0	Less than 1
Sensor ground line 2	B55	9	—	0	Less than 1
System ground line	B56	19	—	0	Less than 1
	B54	20			
AT diagnosis signal	B56	21	Ignition switch ON	Less than 1 ← → More than 4	—
Data link signal (Subaru Select Monitor)	B56	15	—	—	—
		6	—	—	

TRANSMISSION CONTROL MODULE (TCM) I/O SIGNAL

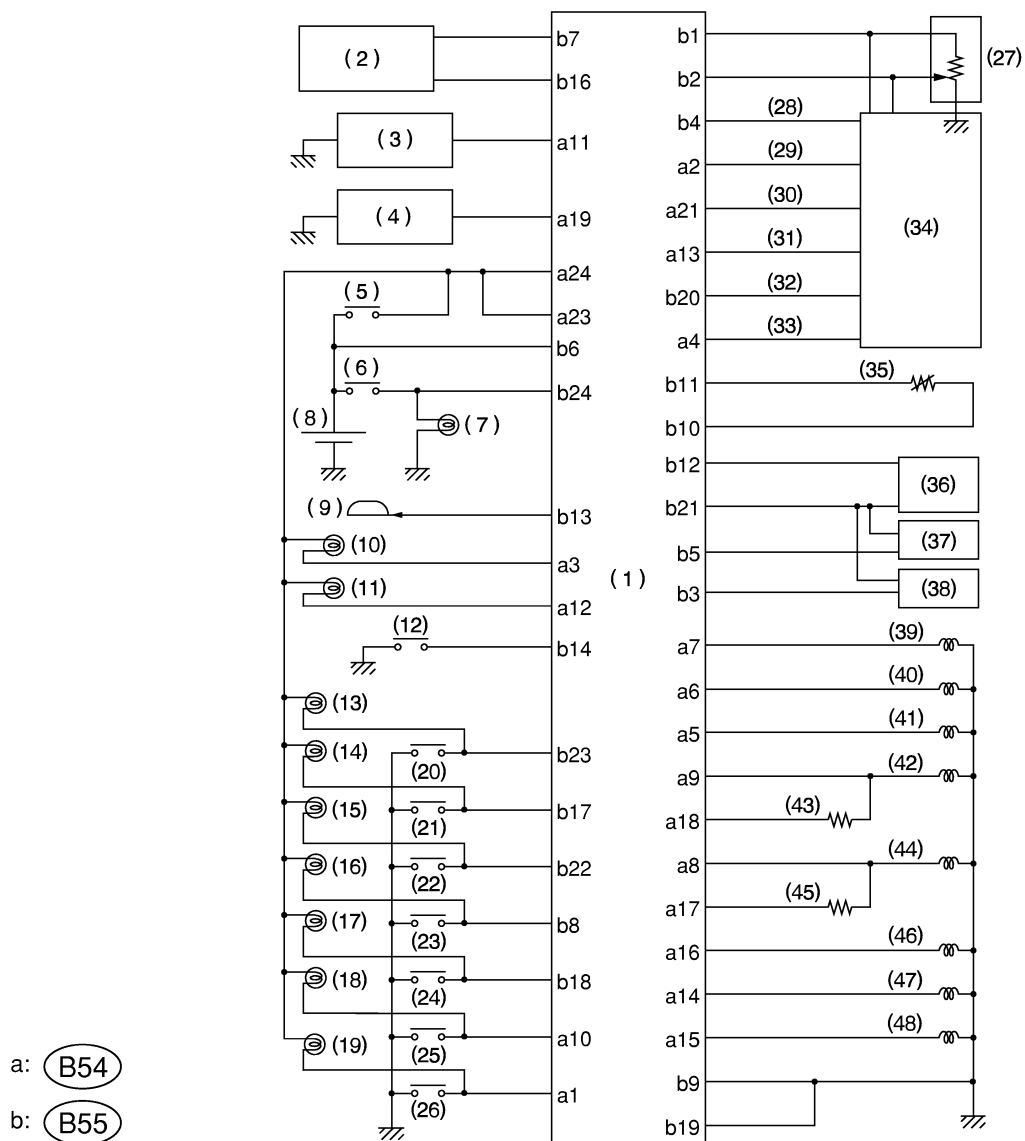
Automatic Transmission (DIAGNOSTICS)

B: SCHEMATIC

S004506A21

1. WITHOUT VDC SYSTEM

S004506A2101



B3M1756A

TRANSMISSION CONTROL MODULE (TCM) I/O SIGNAL

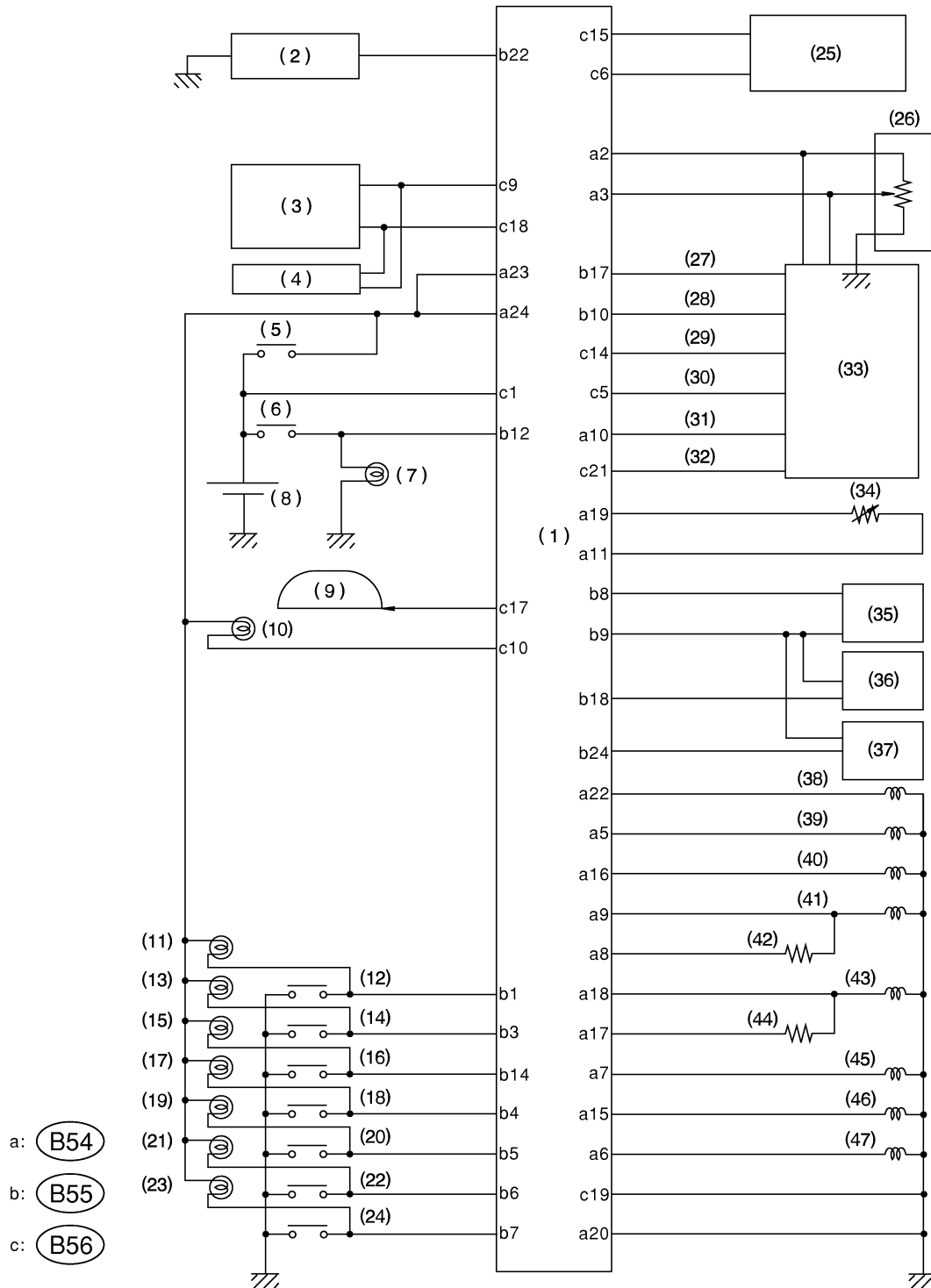
Automatic Transmission (DIAGNOSTICS)

(1) Transmission control module	(18) "2" range indicator light	(35) ATF temperature sensor
(2) Data link connector	(19) "1" range indicator light	(36) Torque converter turbine speed sensor
(3) Cruise set switch	(20) "P" range switch	(37) Front vehicle speed sensor
(4) ABS control module	(21) "R" range switch	(38) Rear vehicle speed sensor
(5) Ignition switch	(22) "N" range switch	(39) Shift solenoid 1
(6) Brake switch	(23) "D" range switch	(40) Shift solenoid 2
(7) Brake light	(24) "3" range switch	(41) 2-4 brake timing solenoid
(8) Battery	(25) "2" range switch	(42) Line pressure duty solenoid
(9) Combination meter	(26) "1" range switch	(43) Line pressure dropping resistor
(10) AT OIL TEMP warning light	(27) Throttle position sensor	(44) 2-4 brake duty solenoid
(11) FWD indicator light	(28) Engine speed signal	(45) 2-4 brake dropping resistor
(12) FWD switch	(29) Torque control cut signal	(46) Lock-up duty solenoid
(13) "P" range indicator light	(30) Torque control signal 2	(47) Low clutch timing solenoid
(14) "R" range indicator light	(31) Torque control signal 1	(48) Transfer duty solenoid
(15) "N" range indicator light	(32) AT load signal	
(16) "D" range indicator light	(33) AT diagnostics signal	
(17) "3" range indicator light	(34) Engine control module	

TRANSMISSION CONTROL MODULE (TCM) I/O SIGNAL

Automatic Transmission (DIAGNOSTICS)

2. WITH VDC SYSTEM S004506A2102



B3M1867A

TRANSMISSION CONTROL MODULE (TCM) I/O SIGNAL

Automatic Transmission (DIAGNOSTICS)

(1) Transmission control module	(17) "D" range indicator light	(34) ATF temperature sensor
(2) Cruise control module	(18) "D" range switch	(35) Torque converter turbine speed sensor
(3) Vehicle dynamic control module	(19) "3" range indicator light	(36) Rear vehicle speed sensor
(4) Steering angle sensor	(20) "3" range switch	(37) Front vehicle speed sensor
(5) Ignition switch	(21) "2" range indicator light	(38) Shift solenoid 1
(6) Brake switch	(22) "2" range switch	(39) Shift solenoid 2
(7) Brake light	(23) "1" range indicator light	(40) 2-4 brake timing solenoid
(8) Battery	(24) "1" range switch	(41) Line pressure duty solenoid
(9) Combination meter (Speedometer circuit)	(25) Data link connector	(42) Line pressure dropping resistor
(10) AT OIL TEMP warning light	(26) Throttle position sensor	(43) 2-4 brake duty solenoid
(11) "P" range indicator light	(27) Engine speed signal	(44) 2-4 brake dropping resistor
(12) "P" range switch	(28) Torque control cut signal	(45) Lock-up duty solenoid
(13) "R" range indicator light	(29) Torque control signal 2	(46) Low clutch timing solenoid
(14) "R" range switch	(30) Torque control signal 1	(47) Transfer duty solenoid
(15) "N" range indicator light	(31) Intake manifold pressure signal	
(16) "N" range switch	(32) AT diagnostics signal	
	(33) Engine control module	

C: MEASUREMENT

S004506A14

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

1. WAVEFORM

S004506A1401

