

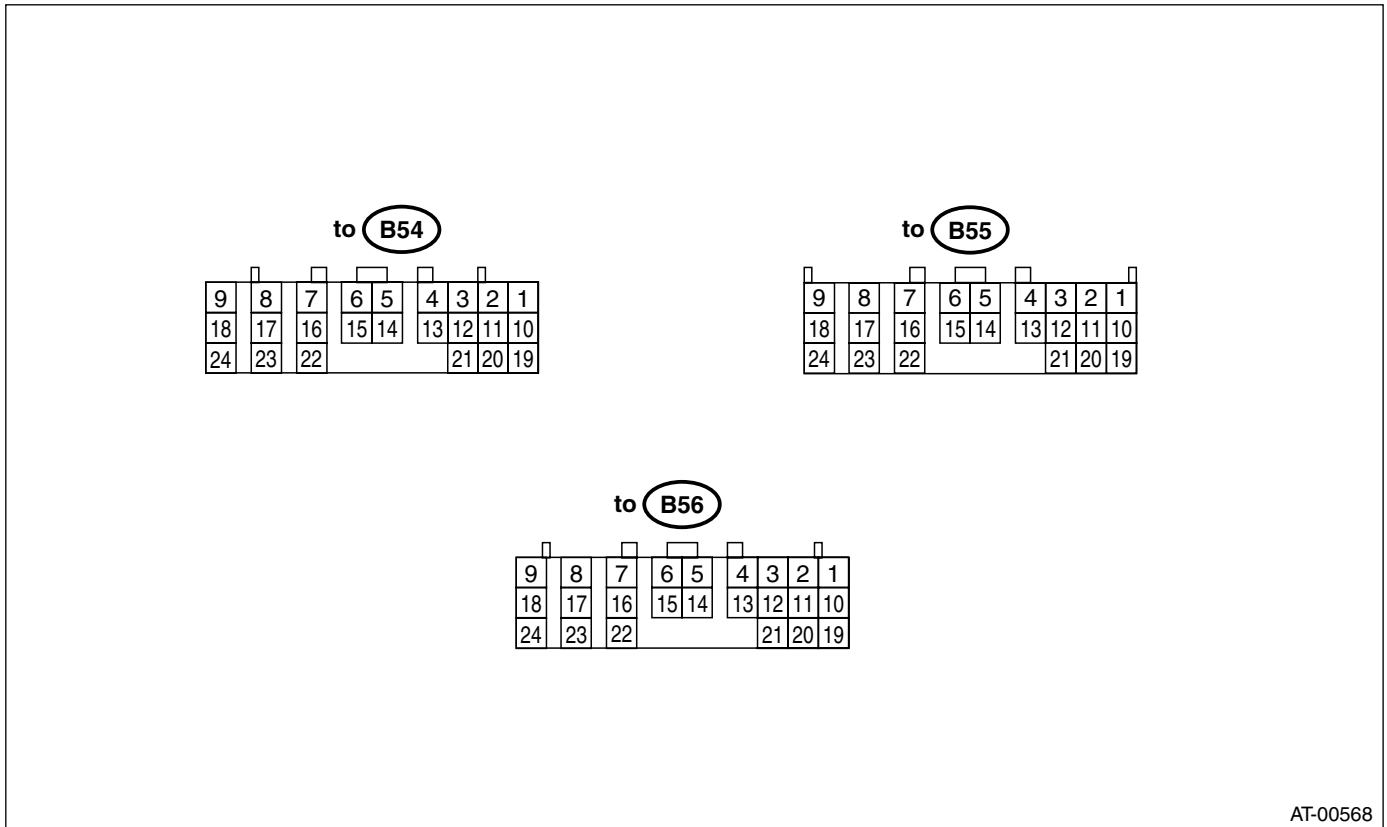
# TRANSMISSION CONTROL MODULE (TCM) I/O SIGNAL

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

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

### A: ELECTRICAL SPECIFICATION

#### 1. TURBO MODEL



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

# 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)
Inhibitor switch	"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	
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	
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)	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	—
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	—
Mass air flow signal		B54	1	Engine idling after warm-up.	0.9 — 1.4	—
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	

# TRANSMISSION CONTROL MODULE (TCM) I/O SIGNAL

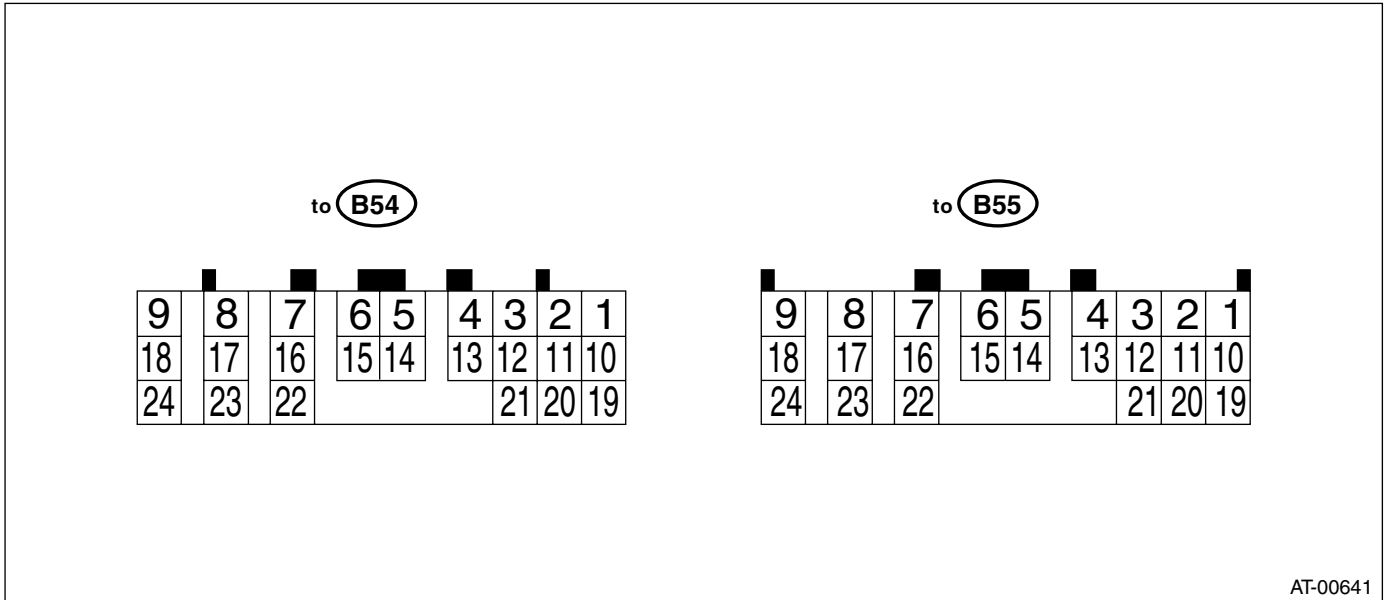
AUTOMATIC TRANSMISSION (DIAGNOSTICS)

Check with ignition switch ON.					
Content	Connector No.	Terminal No.	Measuring conditions	Voltage (V)	Resistance to body (ohms)
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	Throttle fully closed.	More than 8.5	10 — 17
			Throttle fully open.	Less than 0.5	
2-4 brake duty solenoid	B54	18	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 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	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
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	B56	21	Ignition switch ON	Less than 1 ← → More than 4	—
Data link signal (Subaru Select Monitor)	B56	15	—	—	—

# TRANSMISSION CONTROL MODULE (TCM) I/O SIGNAL

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

## 2. NON-TURBO MODEL



AT-00641

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		

# 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)
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	
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 k — 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 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	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 1	

# TRANSMISSION CONTROL MODULE (TCM) I/O SIGNAL

## AUTOMATIC TRANSMISSION (DIAGNOSTICS)

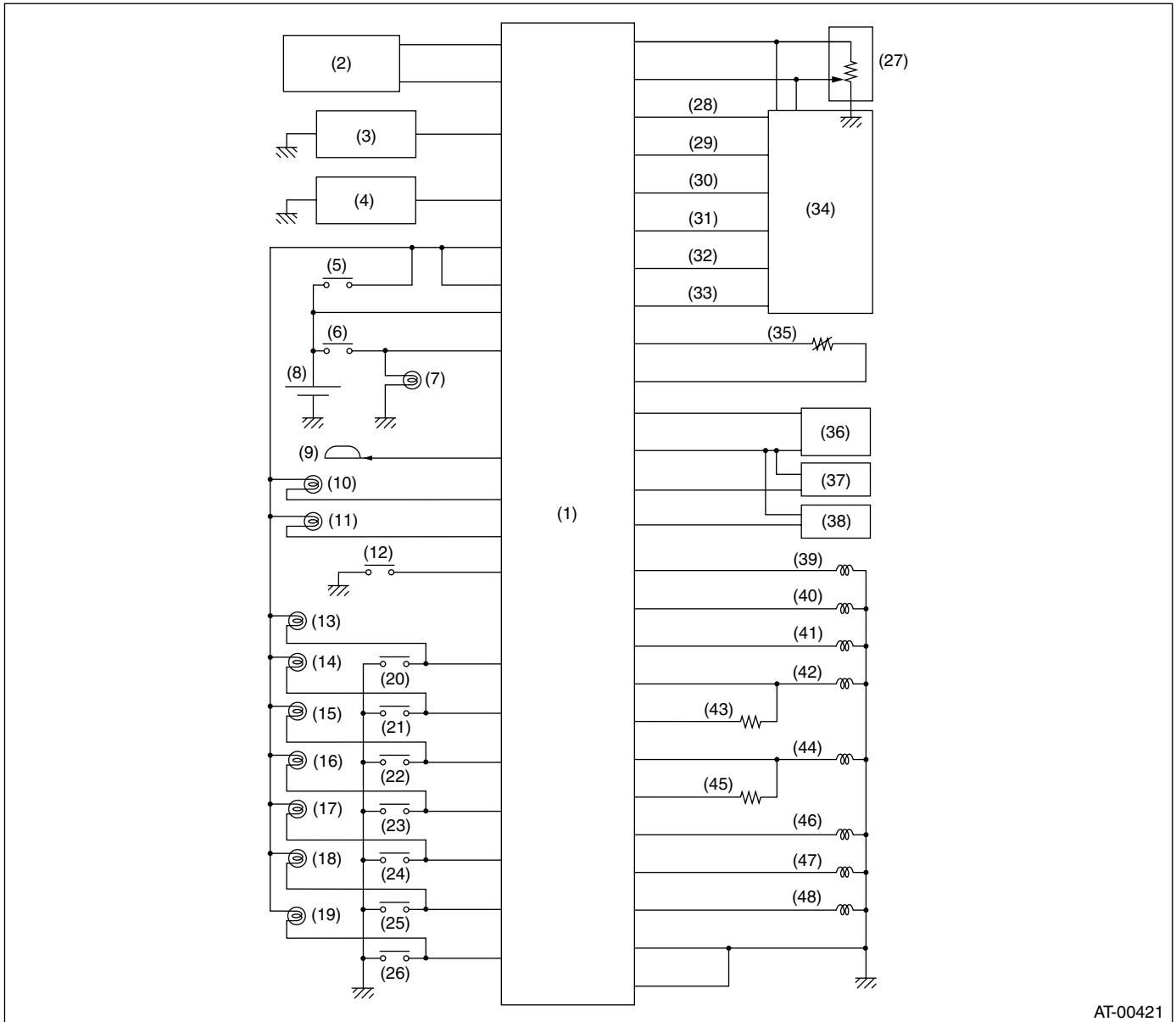
Check with ignition switch ON.					
Content	Con- nector No.	Termi- nal No.	Measuring conditions	Voltage (V)	Resistance to body (ohms)
Dropping resistor	B54	18	Throttle fully closed (with engine OFF) after warm-up.	More than 8.5	9 — 15
			Throttle fully open (with engine OFF) after warm-up.	Less than 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	
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 ONFWD 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	—	—	—

# TRANSMISSION CONTROL MODULE (TCM) I/O SIGNAL

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

## B: SCHEMATIC

### 1. NON-TURBO MODEL



AT-00421

# TRANSMISSION CONTROL MODULE (TCM) I/O SIGNAL

## AUTOMATIC TRANSMISSION (DIAGNOSTICS)

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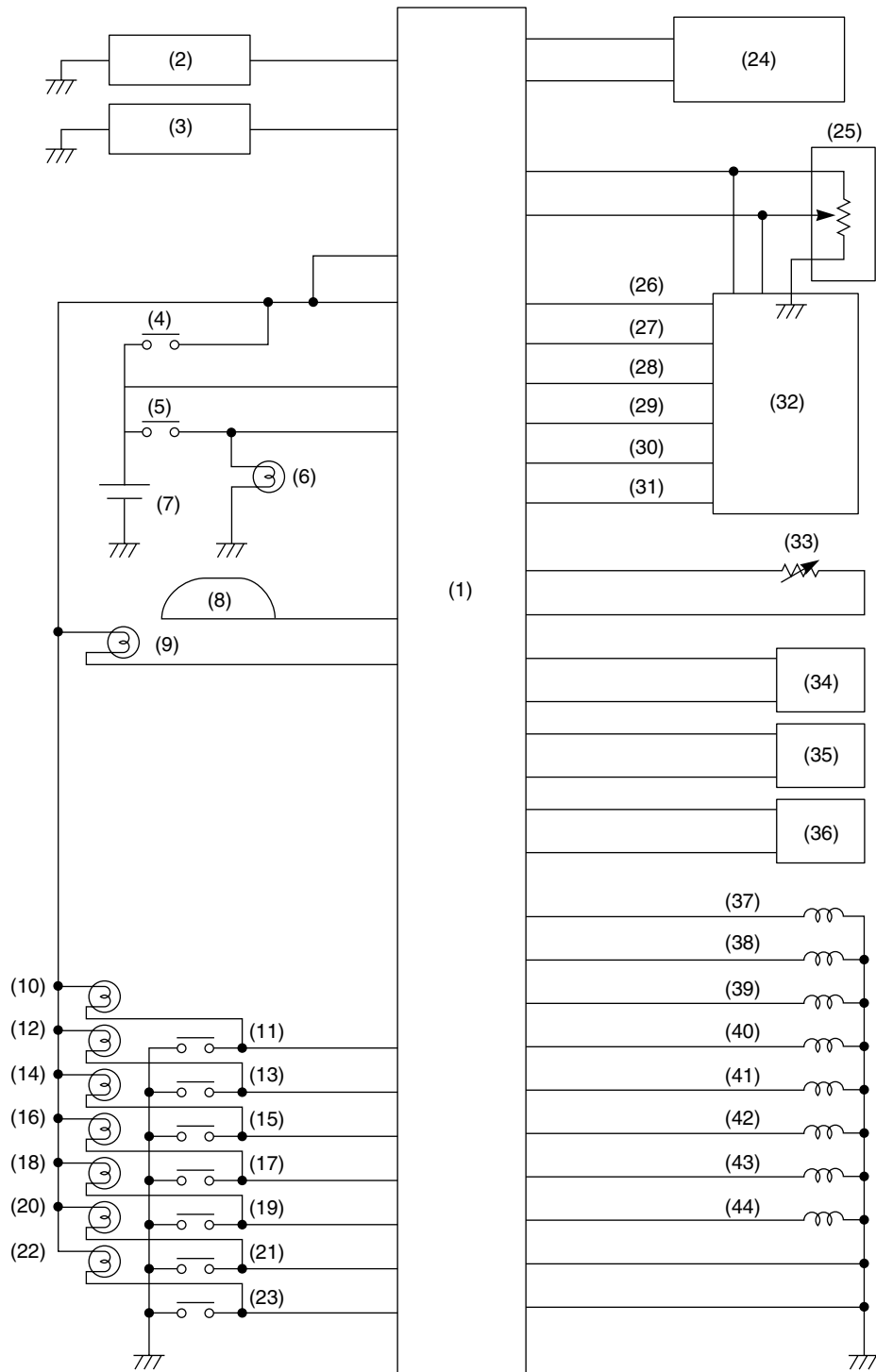
(1) Transmission control module (TCM)	(17) "3" range indicator light	(34) Engine control module (ECM)
(2) Data link connector	(18) "2" range indicator light	(35) ATF temperature sensor
(3) Cruise control module	(19) "1" range indicator light	(36) Torque converter turbine speed sensor
(4) ABS control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



# TRANSMISSION CONTROL MODULE (TCM) I/O SIGNAL

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

## 2. TURBO MODEL



AT-00821

# TRANSMISSION CONTROL MODULE (TCM) I/O SIGNAL

## AUTOMATIC TRANSMISSION (DIAGNOSTICS)

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