# ECT and A/T Indicator (2AZ-FE, 1AZ-FE)

#### **System Outline**

Previous automatic transaxle have selected each gear shift using mechanically controlled throttle hydraulic pressure, governor hydraulic pressure and lock—up hydraulic pressure. The ECT, however, electrically controls the line pressure, throttle pressure, lock—up pressure and accumulator pressure etc. through the solenoid valve. The ECT is a system which precisely controls gear shift timing and lock—up timing in response to the vehicle's driving conditions and the engine condition detected by various sensors. It makes smooth driving possible by shift selection for each gear which is the most appropriate to the driving conditions at that time, and by preventing downing, squat and gear shift shock when starting off.

#### 1. Gear Shift Operation

When driving, the engine warm up condition is input as a signal to TERMINAL THW of the engine and ECT ECU from the EFI water temp. sensor and the vehicle speed signal is input to TERMINAL SPD of the engine and ECT ECU. At the same time, the throttle valve opening signal from the throttle position sensor is input to TERMINAL VTA of the engine and ECT ECU as throttle angle signal.

Based on these signals, the engine and ECT ECU selects the best shift position for the driving conditions and sends current to the ECT solenoid.

#### 2. Lock-Up Operation

When each signal makes engine and ECT ECU recognize that LOCK-UP condition is satisfied, the current flows from engine and ECT ECU TERMINAL DSL to ECT solenoid TERMINAL DSL. At the same time, the current flows engine and ECT ECU TERMINAL SL1+ to ECT solenoid TERMINAL SL1+ and from TERMINAL SL1- to engine and ECT ECU TERMINAL SL1-. This works LOCK-UP solenoid to perform LOCK-UP operation.

#### 3. Stop Light SW Circuit

If the brake pedal is depressed (Stop light SW on) when driving in lock-up condition, a signal is input to TERMINAL STP of the engine and ECT ECU. The engine and ECT ECU operates and cuts the current to the solenoid to release lock-up.

#### 4. Overdrive Circuit

\* O/D main SW on

When the O/D main SW is turned on, a signal is input to TERMINAL ODMS of the engine and ECT ECU and engine and ECT ECU operation causes gear shift when the conditions for overdrive are met.

\* O/D main SW off

When the O/D main SW is turned off, a signal is input into TERMINAL ODMS of the engine and ECT ECU, and turns on the O/D off indicator light. This activates the ECU, and the transmission system is controlled not to shift to overdrive.

### **Service Hints**

#### E6 (A), E7 (B), E8 (C), E9 (D), E10 (E) Engine and ECT ECU

L-E1: 10.0-14.0 volts (Ignition SW on and shift lever at L position)

2–E1: 10.0–14.0 volts (Ignition SW on and shift lever at 2 position)

R-E1: 10.0-14.0 volts (Ignition SW on and shift lever at R position)

D-E1: 10.0-14.0 volts (Ignition SW on and shift lever at D position)

ODMS-E1: 10.0-14.0 volts (O/D main SW on)

Below 1.0 volts (O/D main SW off)

THO-E2: Below 1.0 volts (Ignition SW on and AFT temperature 110 °C (230 °F)

SLT+ -SLT-: 10.0-14.0 volts (Ignition SW on)

#### A4 A/T Indicator Light SW

3-1: Closed with shift lever in P position

3-2: Closed with shift lever in R position

3-5: Closed with shift lever in N position

3-7: Closed with shift lever in D position

3-8: Closed with shift lever in L position

3-4: Closed with shift lever in 2 position

#### A21 O/D Main SW

2-4 : Closed with the O/D main SW off, open with the O/D main SW on

# : Parts Location

Code		See Page	Code		See Page	Code	See Page
A4		38 (*1)	- E2		38 (*1)	l15	41 (LHD)
		48 (*2)			48 (*2)		51 (RHD)
	21	40 (LHD)	E6	А	40 (LHD)	J1	41 (LHD)
^	<b>2</b> I	50 (RHD)			50 (RHD)		51 (RHD)
	2	38 (*1)	E7	В	40 (LHD)	J2	41 (LHD)
`	, _	48 (*2)	L'		50 (RHD)	K4	41 (LHD)
C7	А	40 (LHD)	- E8	С	40 (LHD)	S14	41 (LHD)
"		50 (RHD)			50 (RHD)		51 (RHD)
C8	В	40 (LHD)	E9	D	40 (LHD)	T2	39 (*1)
0		50 (RHD)			50 (RHD)		49 (*2)
	:1	38 (*1)	E10	Е	40 (LHD)	Т3	39 (*1)
E1		48 (*2)			50 (RHD)	] 13	49 (*2)

<sup>\* 1 :</sup> LHD 2AZ-FE, 1AZ-FE

# : Relay Blocks

Code	See Page	Relay Blocks (Relay Block Location)	
1	22	Engine Room R/B (Engine Compartment Left)	

# : Junction Block and Wire Harness Connector

Code	See Page	Junction Block and Wire Harness (Connector Location)			
1B					
1C	25	Engine Room Main Wire and Engine Room J/B (Engine Compartment Left)			
1H	1				
1K	25	Engine Wire and Engine Room J/B (Engine Compartment Left)			
2A	- 28	Instrument Panel Wire and Driver Side J/B (Lower Finish Panel)			
2B		Institution ratio vite and briver side 3/b (Lower Fillish Faller)			
2E	- 28	Engine Room Main Wire and Driver Side J/B (Lower Finish Panel)			
2G	720	Lingine Room Main Wire and Driver Side 3/B (Lower Fillish Faller)			
2L					
2M	29	Instrument Panel Wire and Driver Side J/B (Lower Finish Panel)			
20	] 23				
2R					
3A	34 (LHD)	Instrument Panel Wire and Passenger Side J/B (Instrument Panel Brace RH)			
JA	35 (RHD)	Instrument Panel Wire and Passenger Side J/B (Instrument Panel Brace LH)			
3B	34 (LHD)	Instrument Panel Wire and Passenger Side J/B (Instrument Panel Brace RH)			
JD	35 (RHD)	Instrument Panel Wire and Passenger Side J/B (Instrument Panel Brace LH)			

# : Connector Joining Wire Harness and Wire Harness

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)			
IF1	60 (LHD)	(LHD) Engine Room Main Wire and Instrument Panel Wire (Right Side of Steering Column Tube)			
IF3	72 (RHD)	Engine Room Main Wire and Instrument Panel Wire (Left Side of Steering Column Tube)			
II1	62 (LHD)	Instrument Panel Wire and Instrument Panel Wire (Instrument Panel Reinforcement RH)			
""	74 (RHD)	Instrument Panel Wire and Instrument Panel Wire (Instrument Panel Reinforcement LH)			
IK1	62 (LHD)				
"\	74 (RHD)	Engine Wire and Instrument Panel Wire (Behind the Glove Box)			
IK2	62 (LHD)	Lingine while and institution ratio while (behind the Glove Box)			
IINZ	74 (RHD)				

<sup>\* 2 :</sup> RHD 2AZ-FE, 1AZ-FE

# ECT and A/T Indicator (2AZ-FE, 1AZ-FE)

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# : Ground Points

Code	See Page	Ground Points Location				
ED	58 (*1)	Left Fender				
	70 (*2)	.ett ender				
EG	58 (*1)	Left Side of Cylinder Head				
	70 (*2)					
EH	58 (*1)	Intake Side of Cylinder Block				
	70 (*2)	Thake Side of Cylinder Block				
II	60 (LHD)	Cowl Side Panel LH				
IJ	60 (LHD)	Instrument Panel Brace LH				
IK	72 (RHD)	Institutional and Diace Lit				
IN	72 (RHD)	Instrument Panel Reinforcement RH				

<sup>\* 1 :</sup> LHD 2AZ–FE, 1AZ–FE



# : Splice Points

Code	See Page	Wire Harness with Splice Points	Code	See Page	Wire Harness with Splice Points
16	62 (LHD)	Engine Wire	16	74 (RHD)	Engine Wire

<sup>\* 2 :</sup> RHD 2AZ-FE, 1AZ-FE