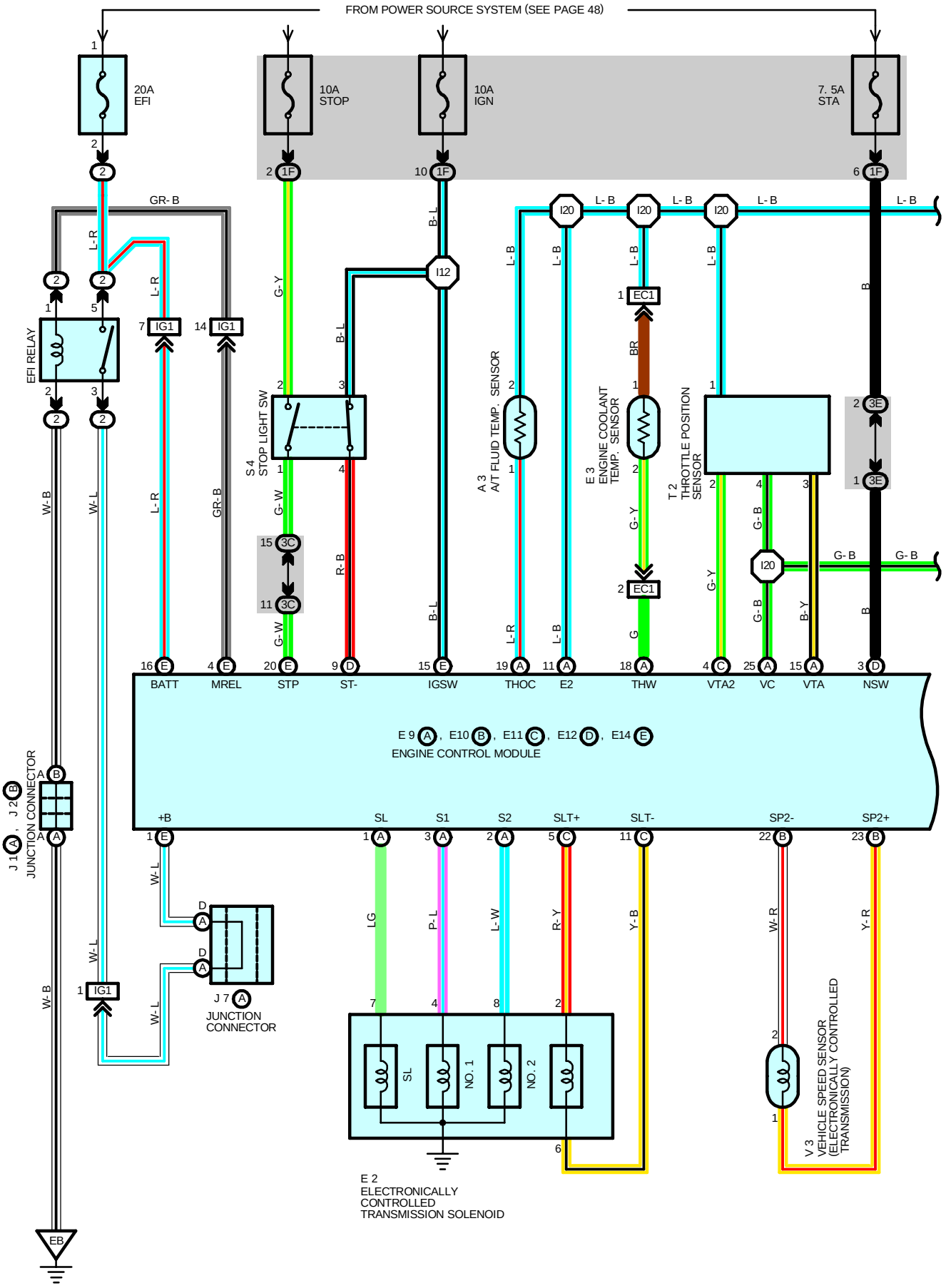
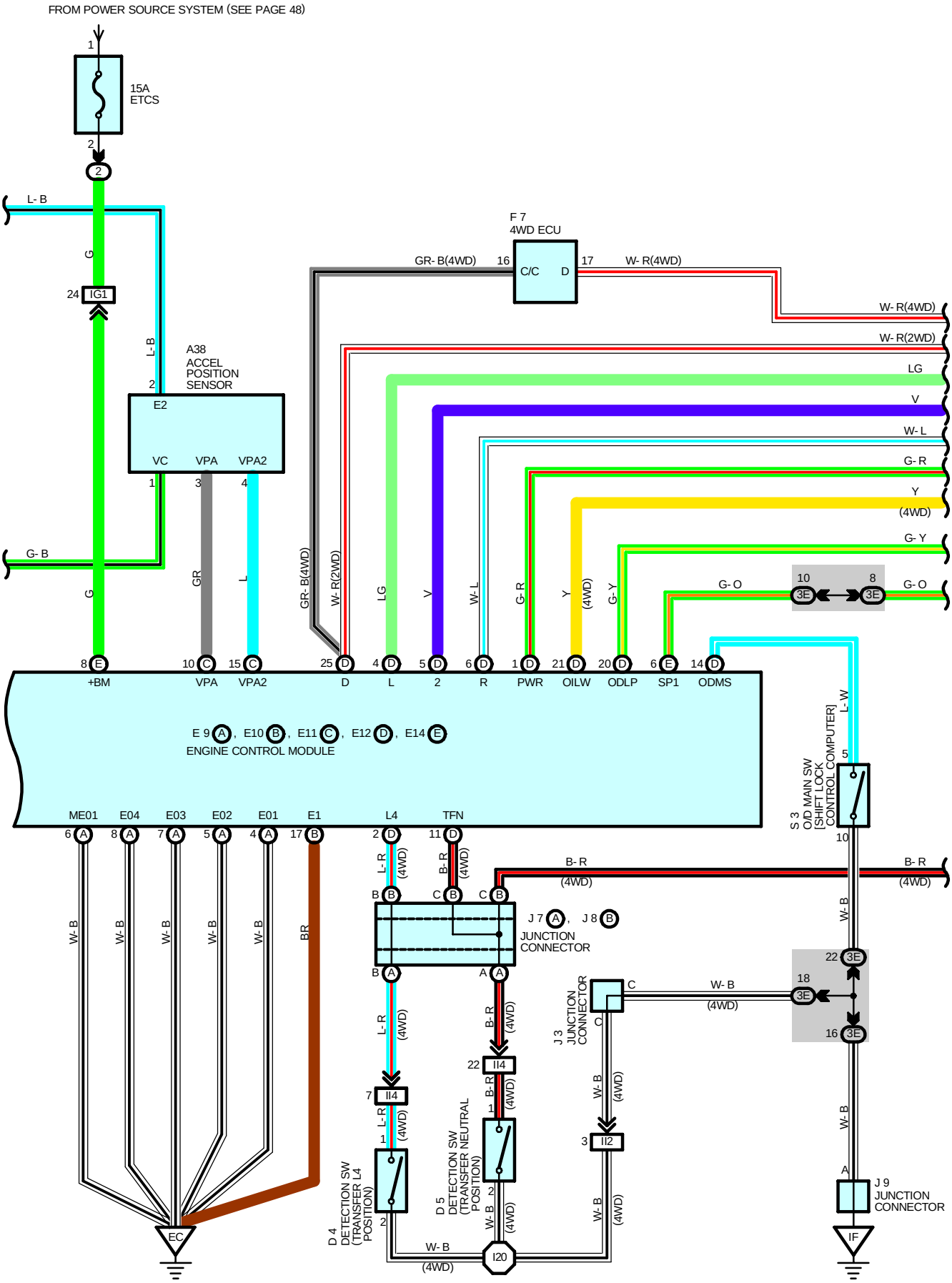
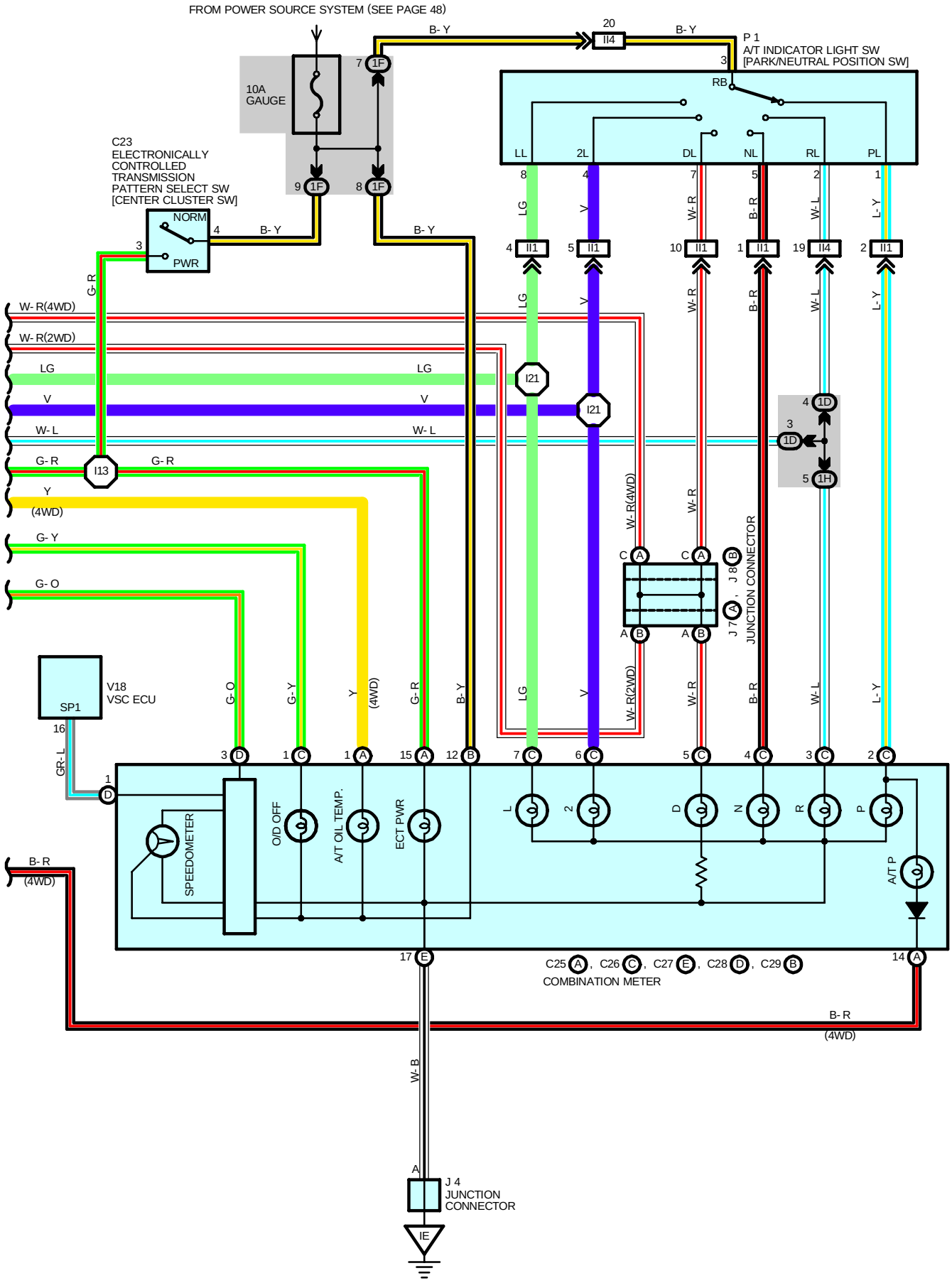
ELECTRONICALLY CONTROLLED TRANSMISSION AND A/T INDICATOR




FROM POWER SOURCE SYSTEM (SEE PAGE 48)
15A
ETCS
L- B
G
IG1
A38
ACCEL
POSITION
SENSOR
E2
VC
VPA
VPA2
G- B
GR
L
F 7
4WD ECU
C/C
GR- B(4WD)
W- R(4WD)
W- R(2WD)
LG
V
W- L
G- R
Y
(4WD)
G- Y
G- O
+BM
D
L
2
R
PWR
OILW
ODLP
SP1
ODMS
E 9 A , E10 B , E11 C , E12 D , E14 E
ENGINE CONTROL MODULE
S 3
O/D MAIN SW
[SHIFT LOCK
CONTROL COMPUTER]
ME01
E04
E03
E02
E01
E1
L4
TFN
W- B
BR
L- R
B- R
J 7 A , J 8 B
JUNCTION
CONNECTOR
J 3
JUNCTION
CONNECTOR
II4
II2
I20
D 4
DETECTION SW
(TRANSFER L4
POSITION)
D 5
DETECTION SW
(TRANSFER NEUTRAL
POSITION)
J 9
JUNCTION
CONNECTOR
EC
IF

ELECTRONICALLY CONTROLLED TRANSMISSION AND A/T INDICATOR



SYSTEM OUTLINE

Previous automatic transmissions have selected each gear shift using mechanically controlled throttle hydraulic pressure, governor hydraulic pressure and lock-up hydraulic pressure. The electronically controlled transmission, however, electrically controls the governor pressure and lock-up through the solenoid valve. Control of the solenoid valve by the engine control module based on the input signals from each sensor makes smooth driving possible by shift selection for each is most appropriate to the driving conditions at that time.

1. GEAR SHIFT OPERATION

During driving, the engine control module selects the shift for each gear which is most appropriate to the driving conditions, based on input signals from the engine coolant temp. sensor to TERMINAL THW of the engine control module and also the input signals to TERMINAL SP2+ of the engine control module from the vehicle speed sensor devoted to the electronically controlled transmission. Current is then output to the electronically controlled transmission solenoid.

When shifting to 1st speed, current flows from TERMINAL S1 of the engine control module to TERMINAL 4 of the electronically controlled transmission solenoid to GROUND, and continuity to the no. 1 solenoid causes the shift.

For 2nd speed, current flows from TERMINAL S1 of the engine control module to TERMINAL 4 of the electronically controlled transmission solenoid to GROUND, and from TERMINAL S2 of the engine control module to TERMINAL 8 of the electronically controlled transmission solenoid to GROUND. And continuity to solenoid no.1 and no.2 causes the shift.

For 3rd speed, there is no continuity to no.1 solenoid, only to no.2 causing the shift. Shifting into 4th speed (Overdrive) takes place when there is no continuity to the either no. 1 or no.2 solenoid.

2. LOCK-UP OPERATION

When the engine control module judges from each signal that lock-up operation conditions have been met, current flows from TERMINAL SL of the engine control module to TERMINAL 7 of the electronically controlled transmission solenoid to GROUND, causing continuity to the lock-up solenoid and causing 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 control module, the engine control module operates and continuity to the lock-up solenoid is cut.

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 control module and engine control module 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 control module, and turns on the O/D off indicator light. This activates the ECU, and the transmission system is controlled not to shift to overdrive.

5. A/T OIL TEMP. WARNING

When the A/T fluid temp. sensor affixed to the transmission case detects that the fluid temp. is 150°C (302°F) or more, the engine control module operates and the current flowing through the GAUGE fuse flows to the A/T oil temp. warning light to TERMINAL OILW of the engine control module to GROUND, so that warning light lights up, informing that the A/T oil temp. is high. When the A/T oil temp. drops to 120°C (248°F) or less, the engine control module stops operating and the warning light goes out.

ELECTRONICALLY CONTROLLED TRANSMISSION AND A/T INDICATOR

SERVICE HINTS

P1 A/T INDICATOR LIGHT SW [PARK/NEUTRAL POSITION SW]

3-GROUND : Approx. **12** volts with ignition SW at **ON** position

S4 STOP LIGHT SW

1-2 : Closed with brake pedal depressed

E9 (A), E10 (B), E11 (C), E12 (D), E14 (E) ENGINE CONTROL MODULE

S1-E1 : **9**- **14** volts
S2-E1 : **9**- **14** volts
SL-E1 : **9**- **14** volts
STP-E1 : **7.5**- **14** volts with brake pedal depressed
: **0**- **1.5** volts with brake pedal released
THW-E2 : **0.2**- **1.0** volts with coolant temp. **80**˚C (**176**˚F)
THO-E2 : **4**- **5** volts with fluid temp. **20**˚C (**68**˚F)
VTA-E2 : Approx. **4** volts with throttle valve fully closed
: Approx. **0.6** volts with throttle valve fully open
VC-E2 : **4.5**- **5.5** volts
ODMS-E1 : **9**- **14** volts O/D main SW turned on
: **0** volts O/D main SW turned off
SP1-E1 : Pulse generation with vehicle moving
2-E1 : **10**- **14** volts with shift lever at **2** position
: **0**- **2** volts with shift lever at except **2** position
L-E1 : **10**- **14** volts with shift lever at **L** position
: **0**- **2** volts with shift lever at except **L** position
OILW-E1 : **0.1**- **4.9** volts
+B-E1 :**9**- **14** volts
BATT-E1 : **9**- **14** volts

: PARTS LOCATION

Code	See Page	Code	See Page	Code	See Page
A3	28	E3	28	J7 A	31
A38	28	E9 A	31	J8 B	31
C23	30	E10 B	31	J9	31
C25 A	30	E11 C	31	P1	29
C26 C	30	E12 D	31	S3	31
C27 E	30	E14 E	31	S4	31
C28 D	30	F7	31	T2	29
C29 B	30	J1 A	29	V3	29
D4	28	J2 B	29	V18	31
D5	28	J3	31		
E2	28	J4	31		

: RELAY BLOCKS

Code	See Page	Relay Blocks (Relay Block Location)
2	22	Engine Room R/B (Engine Compartment Left)

: JUNCTION BLOCK AND WIRE HARNESS CONNECTOR

Code	See Page	Junction Block and Wire Harness (Connector Location)
1D	24	Cowl Wire and Driver Side J/B (Lower Finish Panel)
1F		
1H		
3C	26	Cowl Wire and Center J/B (Near the Steering Column Tube)
3E		

: CONNECTOR JOINING WIRE HARNESS AND WIRE HARNESS

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
EC1	36	Engine Wire and Water Temp. Sensor Wire (Front Side of Cylinder Head Cover Right)
IG1	38	Engine Room Main Wire and Cowl Wire (Left Kick Panel)
II1	40	Engine Wire and Cowl Wire (On the Glove Box)
II2		
II4		

: GROUND POINTS

Code	See Page	Ground Points Location
EB	36	Front Left Fender
EC	36	Intake Manifold Left
IE	38	Cowl Side Panel LH
IF	38	Cowl Side Panel RH

: SPLICE POINTS

Code	See Page	Wire Harness with Splice Points	Code	See Page	Wire Harness with Splice Points
I12	40	Cowl Wire	I20	40	Engine Wire
I13			I21	40	Cowl Wire