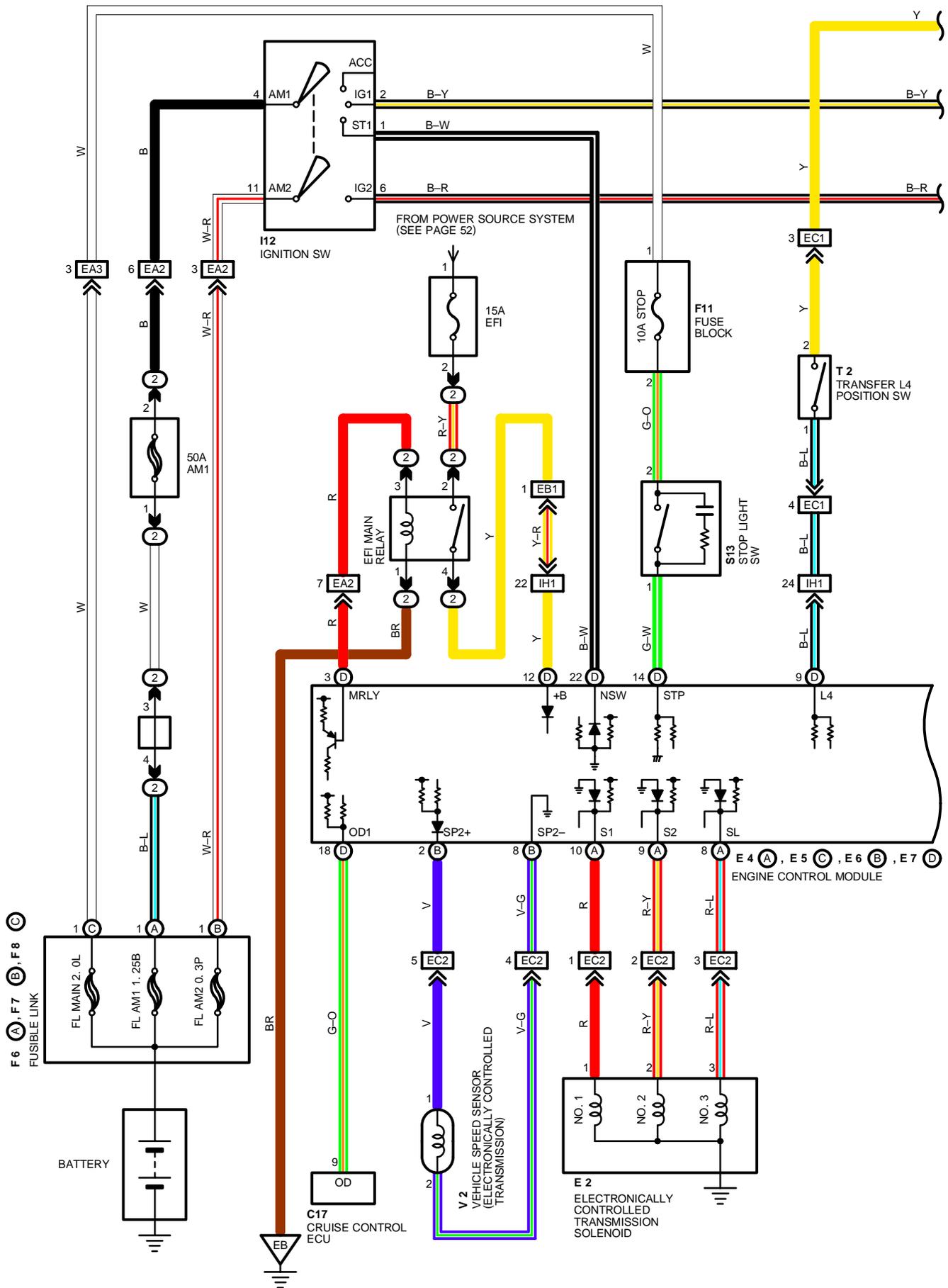
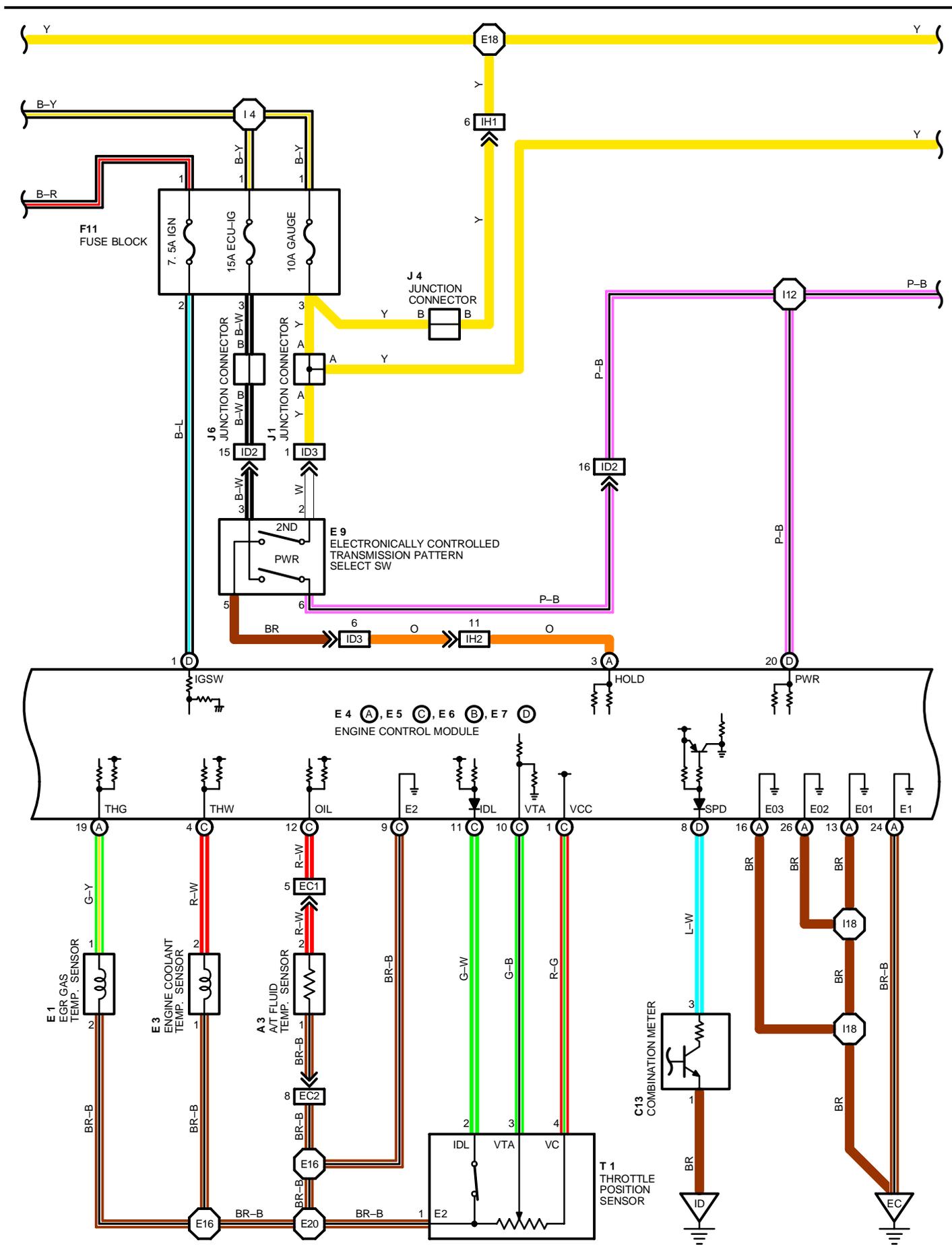
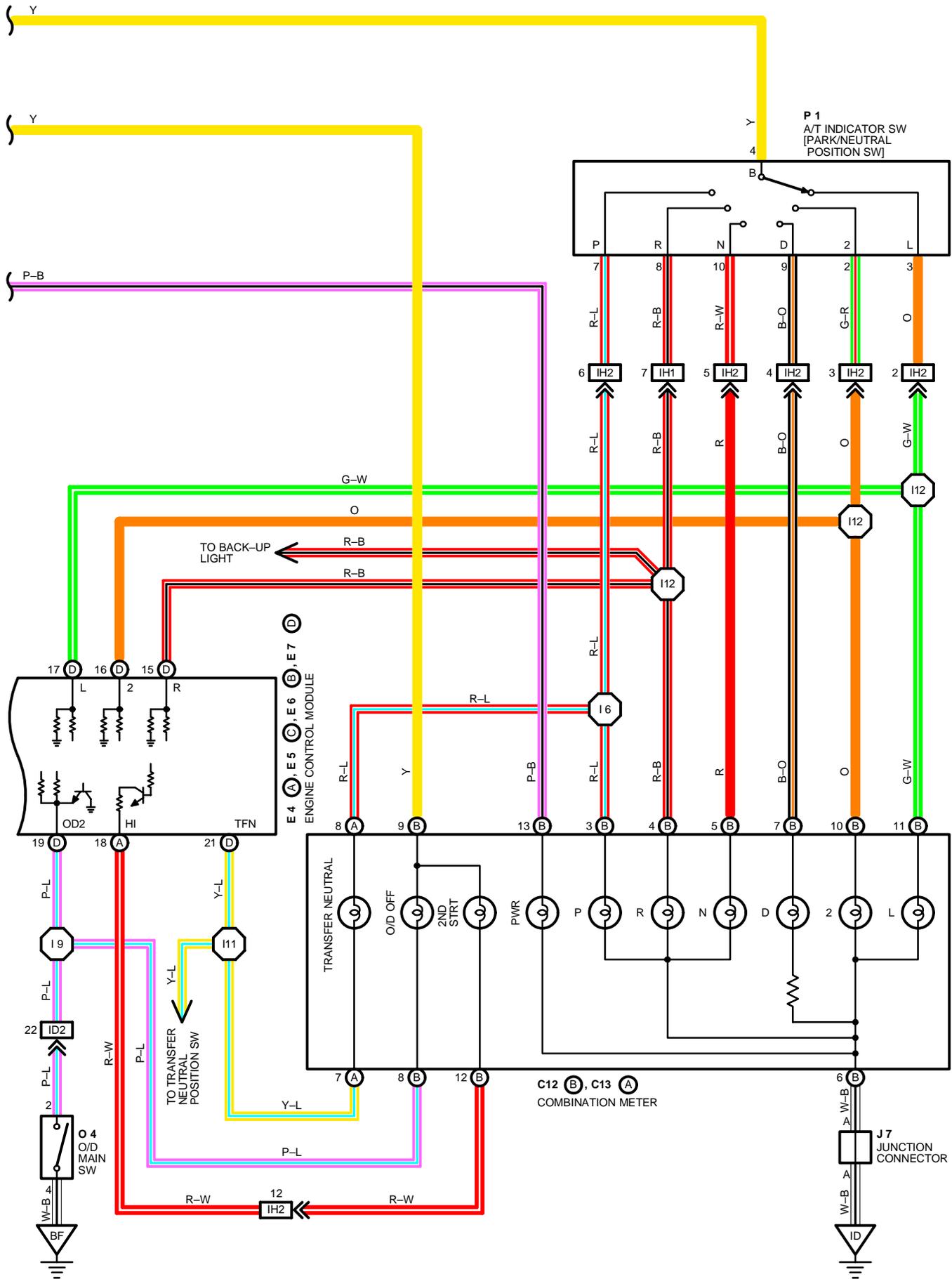


# ELECTRONICALLY CONTROLLED TRANSMISSION AND AT INDICATOR





# ELECTRONICALLY CONTROLLED TRANSMISSION AND A/T INDICATOR



## SYSTEM OUTLINE

PREVIOUS AUTOMATIC TRANSMISSION 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 PRESSURE THROUGH THE SOLENOID VALVE. THE ENGINE CONTROL MODULE OF THE SOLENOID VALVE BASED ON THE INPUT SIGNALS FROM EACH SENSOR MAKES SMOOTH DRIVING POSSIBLE BY SHIFT SELECTION FOR EACH GEAR WHICH 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. THE CURRENT IS THEN OUTPUT TO THE ELECTRONICALLY CONTROLLED TRANSMISSION SOLENOIDS. WHEN SHIFTING TO 1ST SPEED, THE CURRENT FLOWS FROM **TERMINAL S1** OF THE ENGINE CONTROL MODULE TO → **TERMINAL 1** OF THE ELECTRONICALLY CONTROLLED TRANSMISSION SOLENOID → **GROUND**, AND CONTINUITY TO THE NO.1 SOLENOID CAUSES THE SHIFT. FOR 2ND SPEED, THE CURRENT FLOWS FROM **TERMINAL S1** OF THE ENGINE CONTROL MODULE TO **TERMINAL 1** OF THE ELECTRONICALLY CONTROLLED TRANSMISSION SOLENOIDS → **GROUND**, AND FROM **TERMINAL S2** OF THE ENGINE CONTROL MODULE TO → **TERMINAL 2** OF THE ELECTRONICALLY CONTROLLED TRANSMISSION SOLENOID → **GROUND**, AND CONTINUITY TO NO.1 AND NO. 2 SOLENOIDS 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 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, THE CURRENT FLOWS FROM **TERMINAL SL** OF THE ENGINE CONTROL MODULE TO **TERMINAL 3** OF THE ELECTRONICALLY CONTROLLED TRANSMISSION SOLENOID → **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, AND 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 (SW POINT IS OPEN), A SIGNAL IS INPUT TO **TERMINAL OD2** 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 (SW POINT IS CLOSED), THE CURRENT FROM THE O/D OFF INDICATOR LIGHT FLOWS THROUGH THE O/D MAIN SW TO **GROUND**, CAUSING THE INDICATOR LIGHT TO LIGHT UP. AT THE SAME TIME, A SIGNAL IS INPUT TO **TERMINAL OD2** OF THE ENGINE CONTROL MODULE, AND THE ENGINE CONTROL MODULE OPERATION PREVENTS SHIFT INTO OVERDRIVE.

### 5. ELECTRONICALLY CONTROLLED TRANSMISSION PATTERN SELECT SW CIRCUIT

IF THE ELECTRONICALLY CONTROLLED TRANSMISSION PATTERN SELECT SW IS CHANGED FROM NORMAL TO POWER, THE CURRENT THROUGH THE POWER INDICATOR FLOWS TO **GROUND**, AND FLOWS TO **TERMINAL PWR** OF THE ENGINE CONTROL MODULE, THE ENGINE CONTROL MODULE OPERATES, AND SHIFT UP AND SHIFT DOWN OCCUR AT HIGHER VEHICLE SPEEDS THAN WHEN THE SW IS IN NORMAL POSITION.

### 6. TRANSFER SHIFT OPERATION

WHEN THE TRANSFER SHIFT LEVER IS MOVED TO **L4** POSITION, A SIGNAL FROM TRANSFER **L4** POSITION SW IS INPUT TO THE **TERMINAL L4** OF THE ENGINE CONTROL MODULE, THAN SHIFT TO L4 OCCURS.

# ELECTRONICALLY CONTROLLED TRANSMISSION AND A/T INDICATOR

## SERVICE HINTS

### E 4(A), E 5(B), E 6(C), E 7(D) ENGINE CONTROL MODULE

- STP – GND: **7.5– 14.0** VOLTS WITH BRAKE PEDAL IS DEPRESSED  
**0– 1.5** VOLTS WITH THE BRAKE PEDAL IS RELEASED
- TFN – GND: **0– 3.0** VOLTS WITH THE TRANSFER POSITION AT **N** POSITION  
**9.0– 14.0** VOLTS WITH THE TRANSFER POSITION AT EXCEPT **N** POSITION
- OD2 – GND: **0– 3.0** VOLTS WITH O/D MAIN SW TURNED ON  
**9.0– 14.0** VOLTS WITH THE O/D MAIN SW TURNED OFF
- OD1 – GND: **9.0– 14.0** VOLTS WITH THE IGNITION SW ON
- SP2+ – SP2–: PULSE GENERATION WITH VEHICLE MOVING
- SPD – GND: PULSE GENERATION WITH VEHICLE MOVING
- IDL – GND: **0– 3.0** VOLTS WITH THE THROTTLE VALVE FULLY CLOSE  
**9.0– 14.0** VOLTS WITH THE THROTTLE VALVE FULLY OPEN
- VTA – GND: **3.5– 4.5** VOLTS WITH THE THROTTLE VALVE FULLY CLOSE  
**2.5– 3.5** VOLTS WITH THE THROTTLE VALVE FULLY OPEN
- 2 – GND: **7.5– 14.0** VOLTS WITH THE SHIFT LEVER AT **2** POSITION  
**0– 1.5** VOLTS WITH THE SHIFT LEVER AT EXCEPT **2** POSITION
- L – GND: **7.5– 14.0** VOLTS WITH THE SHIFT LEVER AT **L** POSITION  
**0– 1.5** VOLTS WITH THE SHIFT LEVER AT EXCEPT **L** POSITION
- R – GND: **7.5– 14.0** VOLTS WITH THE SHIFT LEVER AT **R** POSITION  
**0– 1.5** VOLTS WITH THE SHIFT LEVER AT EXCEPT **R** POSITION
- PWR – GND: **7.5– 14.0** VOLTS WITH THE PATTERN SELECT SW AT **PWR** POSITION  
**0– 1.5** VOLTS WITH THE PATTERN SELECT SW AT **NORMAL** POSITION
- L4 – GND: **7.5– 14.0** VOLTS WITH THE TRANSFER POSITION AT **L4** POSITION  
**0– 1.5** VOLTS WITH THE TRANSFER POSITION AT EXCEPT **L4** POSITION

### E 2 ELECTRONICALLY CONTROLLED TRANSMISSION SOLENOID

- 1, 2, 3–GROUND : **11–15** Ω

### E 9 ELECTRONICALLY CONTROLLED TRANSMISSION PATTERN SELECT SW

- 3–6 : CLOSED WITH THE ELECTRONICALLY CONTROLLED TRANSMISSION PATTERN SELECT SW AT **PWR** POSITION

### O 4 O/D MAIN SW

- 2–4 : OPEN WITH THE O/D MAIN SW AT **ON** POSITION  
CLOSE WITH THE O/D MAIN SW AT **OFF** POSITION

 : PARTS LOCATION

| CODE | SEE PAGE | CODE   | SEE PAGE | CODE | SEE PAGE |
|------|----------|--------|----------|------|----------|
| A 3  | 22       | E 7    | D 24     | J 7  | 25       |
| C12  | B 24     | E 9 26 |          | O 4  | 27       |
| C13  | A 24     | F 6    | A 22     | P 1  | 23       |
| C17  | 24       | F 7    | B 22     | S13  | 25       |
| E 1  | 22       | F 8    | C 22     | T 1  | 23       |
| E 2  | 22       | F11 25 |          | T 2  | 23       |
| E 3  | 22       | I12 25 |          | V 2  | 23       |
| E 4  | A 24     | J 1 25 |          |      |          |
| E 5  | C 24     | J 4 25 |          |      |          |
| E 6  | B 24     | J 6 25 |          |      |          |

 : RELAY BLOCKS

| CODE | SEE PAGE | RELAY BLOCKS (RELAY BLOCK LOCATION)   |
|------|----------|---------------------------------------|
| 2    | 18       | R/B NO. 2 (FRONT SIDE OF LEFT FENDER) |

 : CONNECTOR JOINING WIRE HARNESS AND WIRE HARNESS

| CODE | SEE PAGE | JOINING WIRE HARNESS AND WIRE HARNESS (CONNECTOR LOCATION)   |
|------|----------|--|
| EA2  | 30       | COWL WIRE AND ENGINE ROOM MAIN WIRE (LEFT FENDER)            |
| EA3  |          |  |
| EB1  | 30       | ENGINE ROOM MAIN WIRE AND ENGINE WIRE (NEAR THE DISTRIBUTOR) |
| EC1  | 30       | ENGINE WIRE AND TRANSMISSION WIRE (NEAR THE STARTER)         |
| EC2  |          |  |
| ID2  | 32       | COWL WIRE AND FLOOR NO. 1 WIRE (LEFT KICK PANEL)             |
| ID3  |          |  |
| IH1  | 32       | ENGINE WIRE AND COWL WIRE (BEHIND GLOVE BOX)                 |
| IH2  |          |  |

 : GROUND POINTS

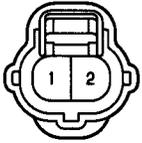
| CODE | SEE PAGE | GROUND POINTS LOCATION       |
|------|----------|------------------------------|
| EB   | 30       | FRONT SIDE OF LEFT FENDER    |
| EC   | 30       | AIR INTAKE CHAMBER           |
| ID   | 32       | LEFT KICK PANEL              |
| BF   | 34       | UNDER THE CENTER CONSOLE BOX |

 : SPLICE POINTS

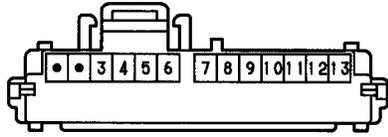
| CODE | SEE PAGE | WIRE HARNESS WITH SPLICE POINTS | CODE | SEE PAGE | WIRE HARNESS WITH SPLICE POINTS |
|------|----------|---------------------------------|------|----------|---------------------------------|
| E16  | 30       | ENGINE WIRE                     | I 9  | 32       | COWL WIRE                       |
| E18  |          |                                 | I11  |          |                                 |
| E20  |          |                                 | I12  |          |                                 |
| I 4  | 32       | COWL WIRE                       | I18  | 32       | ENGINE WIRE                     |
| I 6  |          |                                 |      |          |                                 |

# ELECTRONICALLY CONTROLLED TRANSMISSION AND A/T INDICATOR

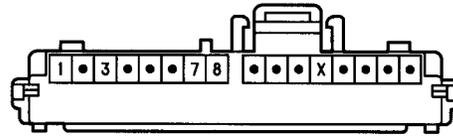
A 3



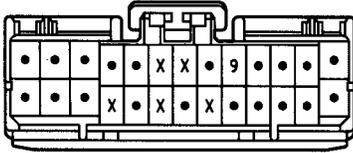
C12 (B) BROWN



C13 (A)



C17 GRAY



E 1 DARK GRAY



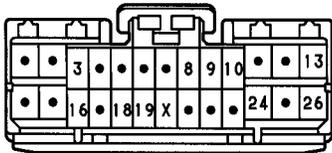
E 2 BLACK



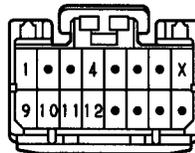
E 3 GREEN



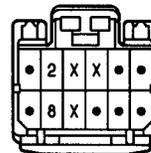
E 4 (A) DARK GRAY



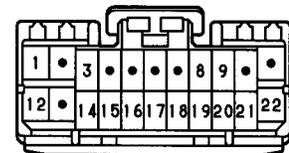
E 5 (C) DARK GRAY



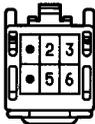
E 6 (B) DARK GRAY



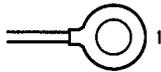
E 7 (D) DARK GRAY



E 9



F 6 (A), F 8 (C)



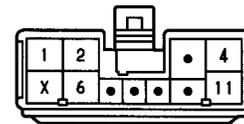
F 7 (B) GRAY



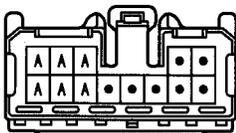
F11

(SEE PAGE 20)

I12 BLACK

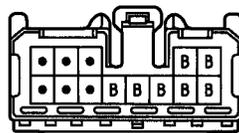


J 1 BLUE



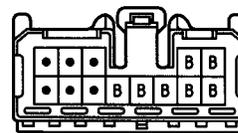
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J 4 BLUE



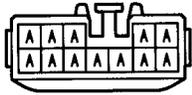
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J 6 BLUE



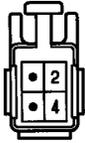
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J 7 BLUE

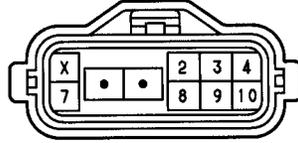


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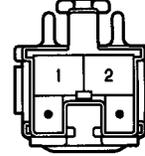
O 4 BLUE



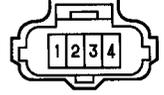
P 1 GRAY



S13 BLACK



T 1 BLACK



T 2 GRAY



V 2 BLACK

