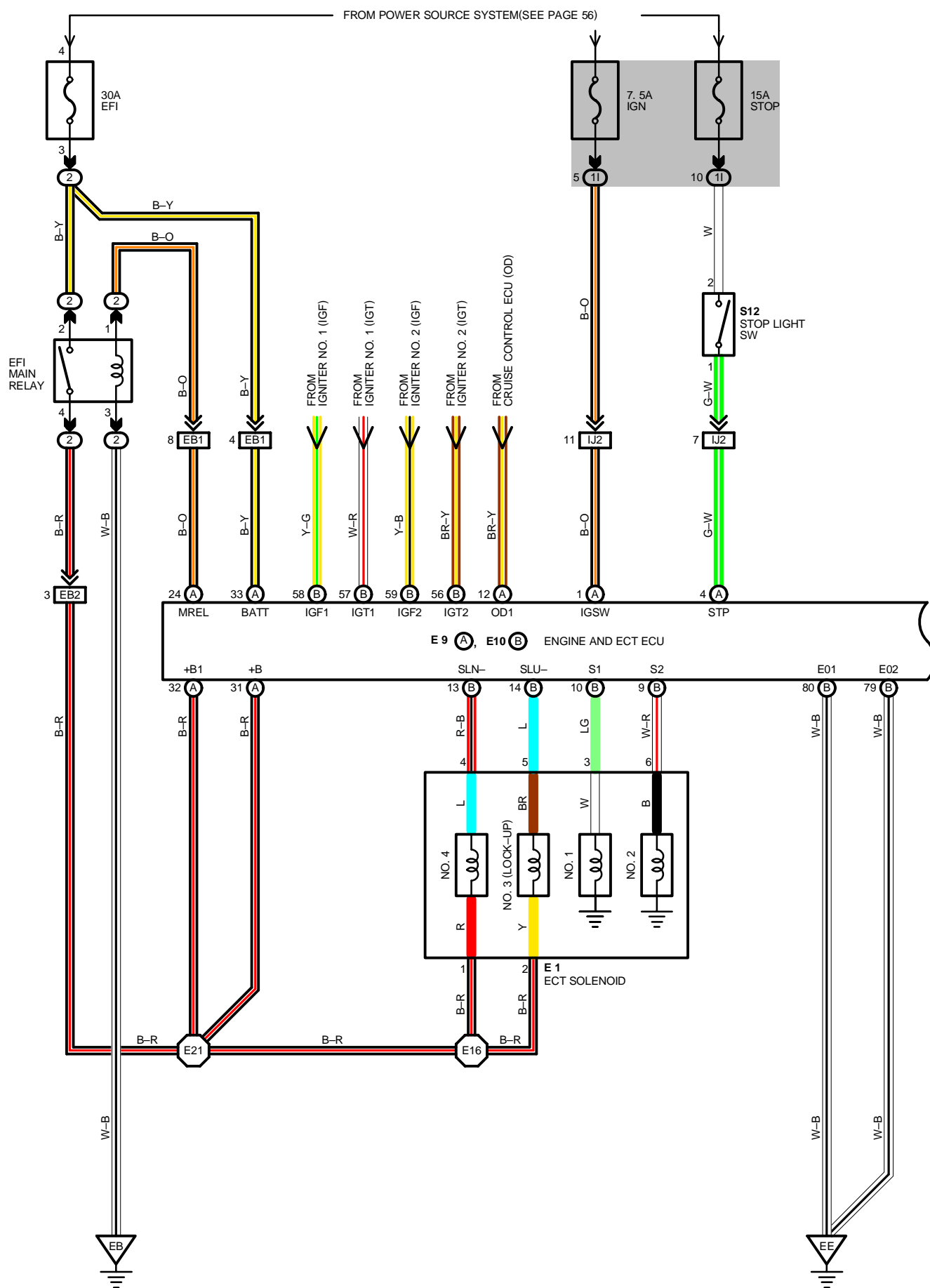
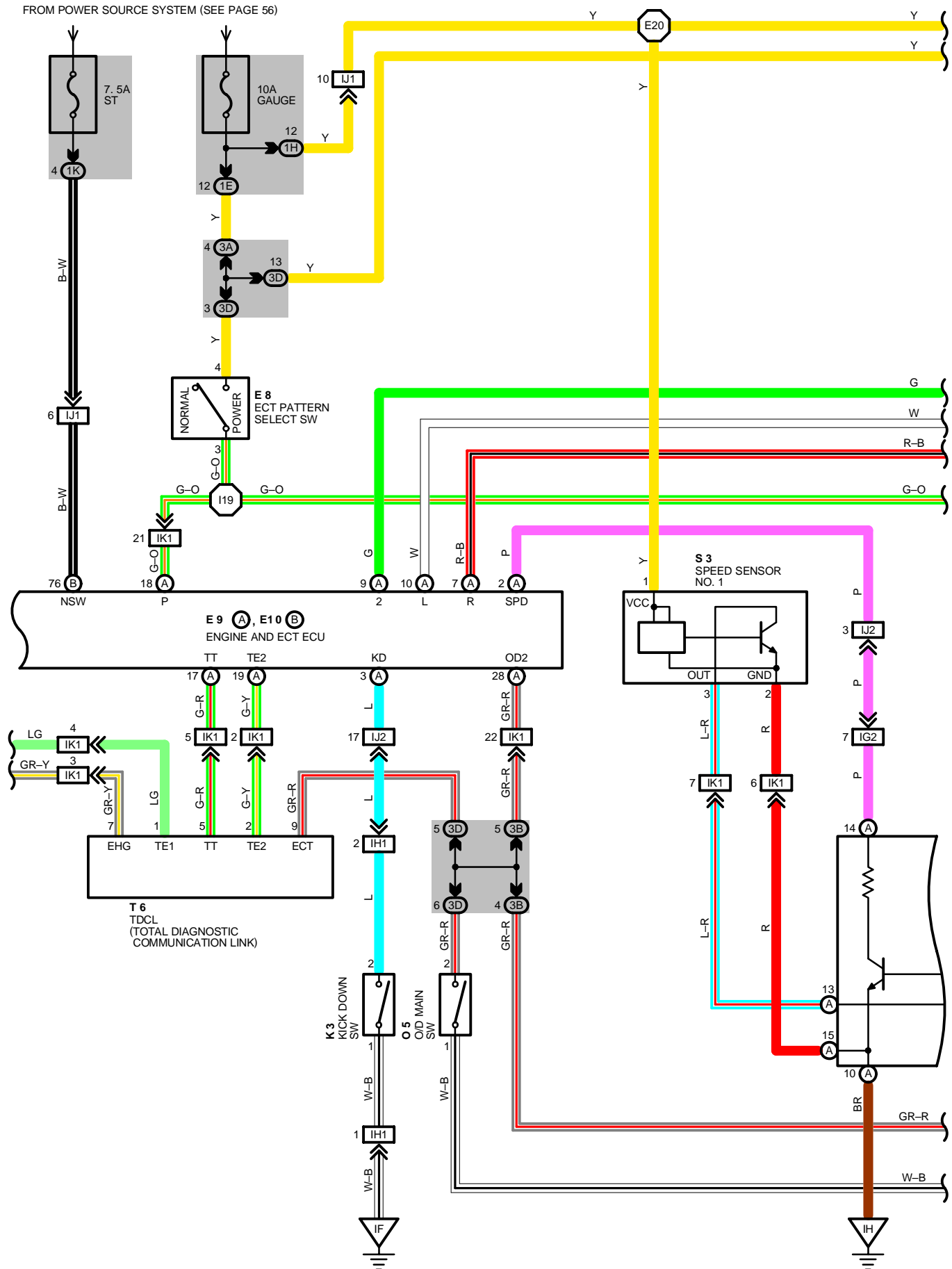


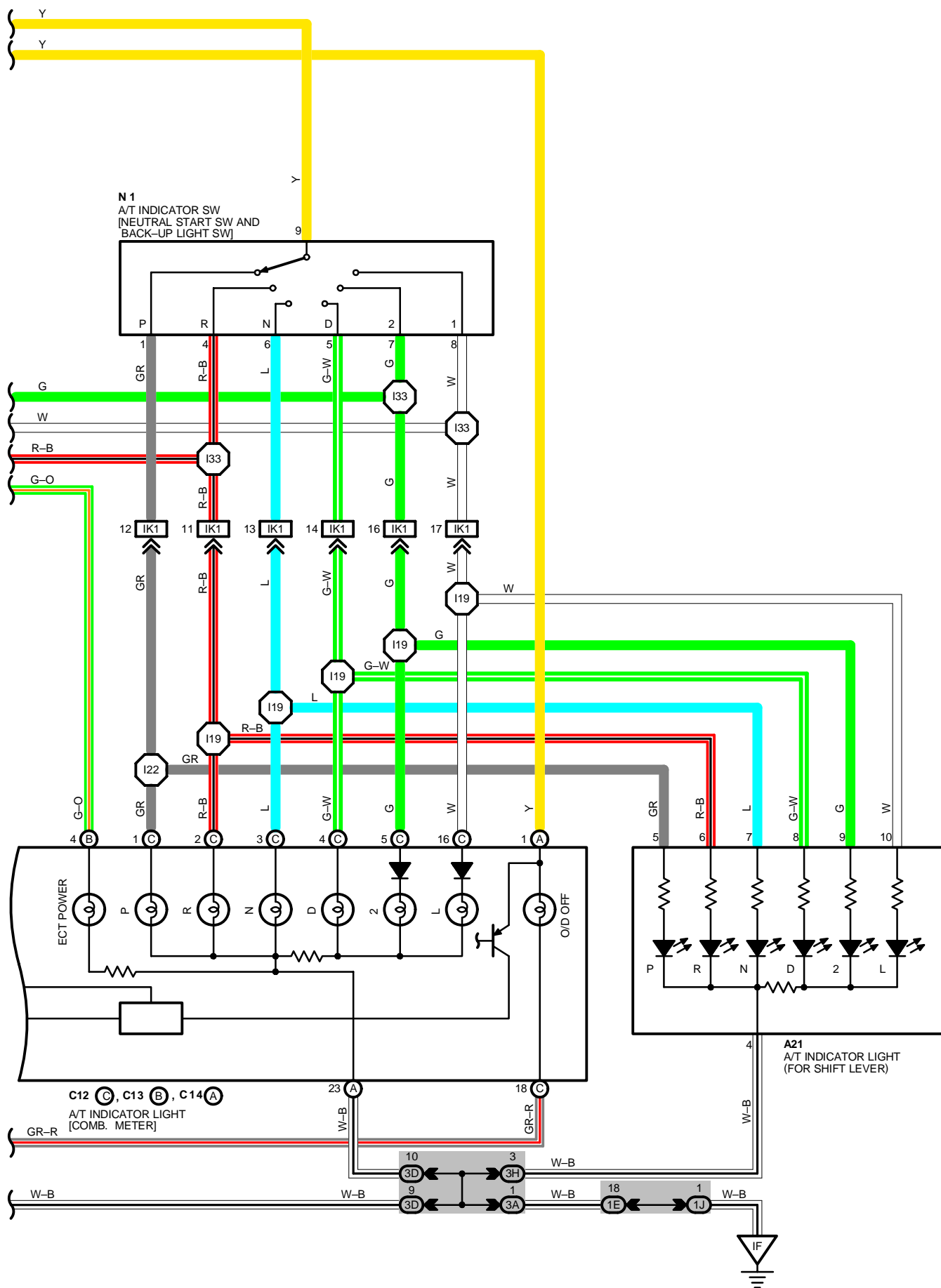
# ECT AND A/T INDICATOR





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### 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 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, MAKING SMOOTH DRIVING POSSIBLE BY SHIFT SELECTION FOR EACH GEAR WHICH IS THE MOST APPROPRIATE TO THE DRIVING CONDITIONS AT THAT TIME, AND BY PREVENTING VEHICLE 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 (B)44** OF THE ECU FROM THE EFI WATER TEMP. SENSOR AND THE VEHICLE SPEED SIGNAL FROM SPEED SENSOR NO.2 IS INPUT TO **TERMINAL (B)23** OF THE ECU. AT THE SAME TIME, THE THROTTLE VALVE OPENING SIGNAL FROM THE THROTTLE POSITION SENSOR (MAIN) IS INPUT TO **TERMINAL (B)43** OF THE ECU AS ENGINE RPM CONDITION (IDLING, HIGH LOAD AND ACCELERATION CONDITIONS) SIGNAL.

BASED ON THESE SIGNALS, THE ECU SELECTS THE BEST SHIFT POSITION FOR DRIVING CONDITIONS AND SENDS CURRENT TO THE ECT SOLENOIDS.

WHEN SHIFTING TO 1ST SPEED, THE CURRENT FLOWS FROM **TERMINAL (B)10** OF THE ECU → **TERMINAL 3** OF ECT SOLENOIDS → **GROUND** AND CONTINUITY TO NO.1 SOLENOID CAUSES THE SHIFT (NO.2 SOLENOID DOES NOT HAVE CONTINUITY AT THIS TIME).

FOR 2ND SPEED, THE CURRENT FLOWS SIMULTANEOUSLY FROM **TERMINAL (B)9** OF THE ECU → **TERMINAL 6** OF ECT SOLENOIDS → **GROUND**, AND FROM **TERMINAL (B)10** OF THE ECU → **TERMINAL 3** OF ECT SOLENOIDS → **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 SOLENOID, CAUSING THE SHIFT.

SHIFTING INTO THE 4TH SPEED (OVERDRIVE) OCCURS WHEN NO CURRENT FLOWS TO NO.1 AND NO.2 SOLENOIDS. THE NO.4 SOLENOID (FOR ACCUMULATOR BACK PRESSURE MODULATION) IS INSTALLED TO ADJUST THE BACK PRESSURE ON THE ACCUMULATOR AND CONTROL THE HYDRAULIC PRESSURE DURING SHIFTING AND LOCK-UP IN ORDER TO PROVIDE SMOOTH SHIFTING WITH LITTLE SHIFT SHOCK.

#### 2. LOCK-UP OPERATION

WHEN THE ECT ECU DECIDES, BASED ON EACH SIGNAL, THAT THE LOCK-UP CONDITION HAS BEEN MET, THE CURRENT THROUGH FUSE FLOWS FROM THE EFI MAIN RELAY → **TERMINAL 2** OF ECT SOLENOIDS → **TERMINAL 5** → **TERMINAL (B) 14** OF THE ECU → **GROUND**, SO CONTINUITY TO NO.3 SOLENOID (FOR LOCK-UP) CAUSES LOCK-UP.

#### 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 (A)4** OF THE ECU. THE 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 (SW POINT IS OPEN), A SIGNAL IS INPUT TO **TERMINAL (A)28** OF THE ECU AND THE ECT CAUSES SHIFT TO OVERDRIVE 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 FLOWING THROUGH THE O/D OFF INDICATOR LIGHT FLOWS TO **GROUND** BY WAY OF THE O/D MAIN SW AND CAUSES THE O/D OFF INDICATOR LIGHT TO LIGHT UP. AT THE SAME TIME, A SIGNAL IS INPUT TO **TERMINAL (A)28** OF THE ECU AND THE ECT PREVENTS SHIFT INTO OVERDRIVE.

#### 5. ECT PATTERN SELECT SW CIRCUIT

WHEN THE ECT PATTERN SELECT SW IS CHANGED FROM "NORMAL" TO "POWER", THE CURRENT THROUGH THE **GAUGE** FUSE FLOWS TO **TERMINAL 4** OF ECT PATTERN SELECT SW → **TERMINAL 3** → **TERMINAL (B)4** OF A/T INDICATOR → **TERMINAL (C)23** → **GROUND** AND CAUSES THE INDICATOR LIGHT TO LIGHT UP. AT THE SAME TIME, THE CURRENT FLOWS TO **TERMINAL (A)18** OF THE ECU AND THE ECU PERFORMS SHIFT UP AND SHIFT DOWN AT A HIGHER VEHICLE SPEED RANGE COMPARED WITH "NORMAL" POSITION.

#### 6. KICK DOWN OPERATION

WHEN THE ACCELERATOR IS DEPRESSED FURTHER THAN THE FULL THROTTLE POSITION WHILE DRIVING, THE KICK DOWN SW TURNS ON AND ITS SIGNAL IS INPUT TO **TERMINAL (A)3** OF THE ECU. THEN, THE ECU CONTROLS THE CURRENT WHICH FLOWS FROM **TERMINALS (B)10** AND **(B)9** OF THE ECU TO THE NO. 1 AND NO. 2 SOLENOIDS AND SHIFTS DOWN BY TURNING THE SOLENOIDS ON AND OFF.

#### 7. CRUISE CONTROL

WHEN CRUISE CONTROL OPERATION IS SELECTED A SIGNAL IS INPUT TO **TERMINAL (A)12** OF THE ECU FROM CRUISE CONTROL ECU. AS A RESULT, THE ECU OPERATES AND CONTROLS OVERDRIVE, LOCK-UP AND SO ON FOR SMOOTH DRIVING.

## SERVICE HINTS

### E 1 ECT SOLENOID

- 1-4 : APPROX. **5.3Ω**
- 2-5 : APPROX. **3.7Ω**
- 3-GROUND : APPROX. **13.2Ω**
- 6-GROUND : APPROX. **13.2Ω**

### E 2 EFI WATER TEMP. SENSOR

- 1-2 : APPROX. **16.2KΩ (-20°C -4°F)**  
APPROX. **2.5KΩ (20°C 68°F)**  
APPROX. **0.32KΩ (80°C 176°F)**

### E 8 ECT PATTERN SELECT SW

- 4-3 : CLOSED WITH ECT PATTERN SELECT SW AT **POWER** POSITION

### E 9(A), E10(B) ENGINE AND ECT ECU

- BATT - E1: ALWAYS APPROX. **12 VOLTS**
- IGSW - E1: APPROX. **12 VOLTS** WITH IGNITION SW ON
- BK - E1: APPROX. **12 VOLTS** WITH BRAKE PEDAL DEPRESSED
- P - E1: APPROX. **12 VOLTS** WITH IGNITION SW **ON** POSITION AND ECT PATTERN SELECT SW AT **POWER** POSITION
- KD-GROUND : CONTINUITY WITH KICK DOWN SW ON
- OD2 - E1: APPROX. **12 VOLTS** WITH O/D MAIN SW ON  
**0 VOLTS** WITH O/D MAIN SW ON
- +B-GROUND : APPROX. **12 VOLTS** WITH IGNITION SW AT **ON** POSITION
- +B1-GROUND : APPROX. **12 VOLTS** WITH IGNITION SW AT **ON** POSITION
- MREL-GROUND: APPROX. **12 VOLTS** WITH IGNITION SW AT **ON** POSITION
- E01-GROUND : ALWAYS CONTINUITY
- E02-GROUND : ALWAYS CONTINUITY
- L-GROUND : APPROX. **12 VOLTS** WITH SHIFT LEVER AT "L" RANGE
- 2-GROUND : APPROX. **12 VOLTS** WITH SHIFT LEVER AT "2" RANGE
- R-GROUND : APPROX. **12 VOLTS** WITH SHIFT LEVER AT "R" RANGE
- E1-GROUND : ALWAYS CONTINUITY
- VC-VTA1 : LESS THAN **1 VOLTS** WITH THROTTLE VALVE FULLY CLOSED  
MORE THAN **3 VOLTS** WITH THROTTLE VALVE OPEN
- VTA1 - E2: CONTINUITY WITH THROTTLE VALVE FULLY CLOSED  
APPROX. **4KΩ** WITH THROTTLE VALVE FULLY OPEN
- VC - E2: APPROX. **5 VOLTS**

### O 1 O/D DIRECT CLUTCH SPEED SENSOR

- 1-2 : APPROX. **620Ω**

### S 4 SPEED SENSOR NO.2 (FOR ECT)

- 1-2 : APPROX. **620Ω**

### S12 STOP LIGHT SW

- 2-1 : CLOSED WITH BRAKE PEDAL DEPRESSED

## ECT AND A/T INDICATOR

### : PARTS LOCATION

CODE	SEE PAGE	CODE	SEE PAGE	CODE	SEE PAGE
A21	28	E 2	26	O 5	29
C 1	26	E 7	26	S 3	27
C 2	26	E 8	28	S 4	27
C 3	26	E 9	A 28	S 9	27
C12	C 28	E10	B 28	S12	29
C13	B 28	K 3	29	T 2	27
C14	A 28	N 1	27	T 6	29
E 1	26	O 1	27		

### : RELAY BLOCKS

CODE	SEE PAGE	RELAY BLOCKS (RELAY BLOCK LOCATION)
2	19	ENGINE COMPARTMENT LEFT

### : JUNCTION BLOCK AND WIRE HARNESS CONNECTOR

CODE	SEE PAGE	JUNCTION BLOCK AND WIRE HARNESS (CONNECTOR LOCATION)
1E	20	INSTRUMENT PANEL WIRE
1H	20	COWL WIRE
1I		
1J		
1K		
3A	23	INSTRUMENT PANEL WIRE
3B		
3D		
3H		

### : CONNECTOR JOINING WIRE HARNESS AND WIRE HARNESS

CODE	SEE PAGE	JOINING WIRE HARNESS AND WIRE HARNESS (CONNECTOR LOCATION)
EB1	34	ENGINE WIRE AND ENGINE ROOM MAIN WIRE (FRONT SIDE OF R/B NO. 2)
EB2		
EC1	34	ENGINE WIRE AND ENGINE NO. 4 WIRE (FRONT SIDE OF CYLINDER HEAD COVER LH)
IG2	36	INSTRUMENT PANEL WIRE AND COWL WIRE (R/B NO. 5)
IH1	36	COWL NO. 2 WIRE AND COWL WIRE (BEHIND COMBINATION METER)
IJ1	36	ENGINE WIRE AND COWL WIRE (RIGHT KICK PANEL)
IJ2		
IK1	36	ENGINE WIRE AND INSTRUMENT PANEL WIRE (RIGHT KICK PANEL)

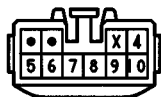
### : GROUND POINTS

CODE	SEE PAGE	GROUND POINTS LOCATION
EB	34	FRONT SIDE OF LEFT FENDER
ED	34	REAR SIDE OF CYLINDER HEAD RH
EE	34	REAR SIDE OF CYLINDER HEAD LH
IF	36	LEFT KICK PANEL
IH	36	UNDER THE ASHTRAY LH

### : SPLICE POINTS

CODE	SEE PAGE	WIRE HARNESS WITH SPLICE POINTS	CODE	SEE PAGE	WIRE HARNESS WITH SPLICE POINTS
E15	34	ENGINE WIRE	E23	34	ENGINE NO. 4 WIRE
E16			E24		
E17			I19	38	INSTRUMENT PANEL WIRE
E18			I22		
E19			I32	38	ENGINE WIRE
E20			I33		
E21			I34		

A21



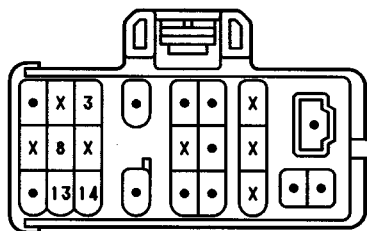
C 1 DARK GRAY



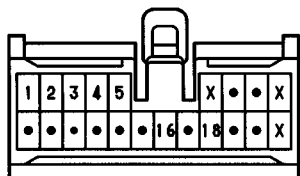
C 2 DARK GRAY



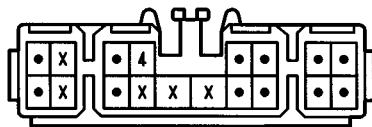
C 3 BLACK



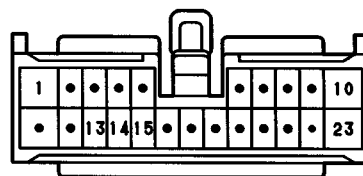
C12 ③



C13 ⑧



C14 ①



E 1 BLACK



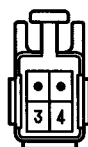
E 2 DARK GREEN



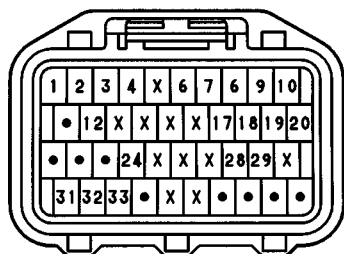
E 7 DARK GRAY



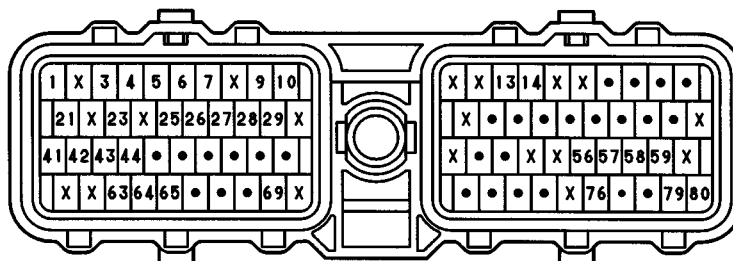
E 8



E 9 ① DARK GRAY



E10 ⑧ DARK GRAY



K 3, S 4 BLACK



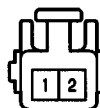
N 1 GRAY



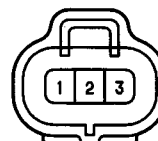
O 1 BLACK



O 5



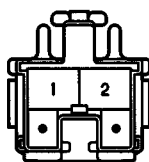
S 3 GRAY



S 9 BLACK



S12



T 2 BLACK



T 6 DARK GRAY

