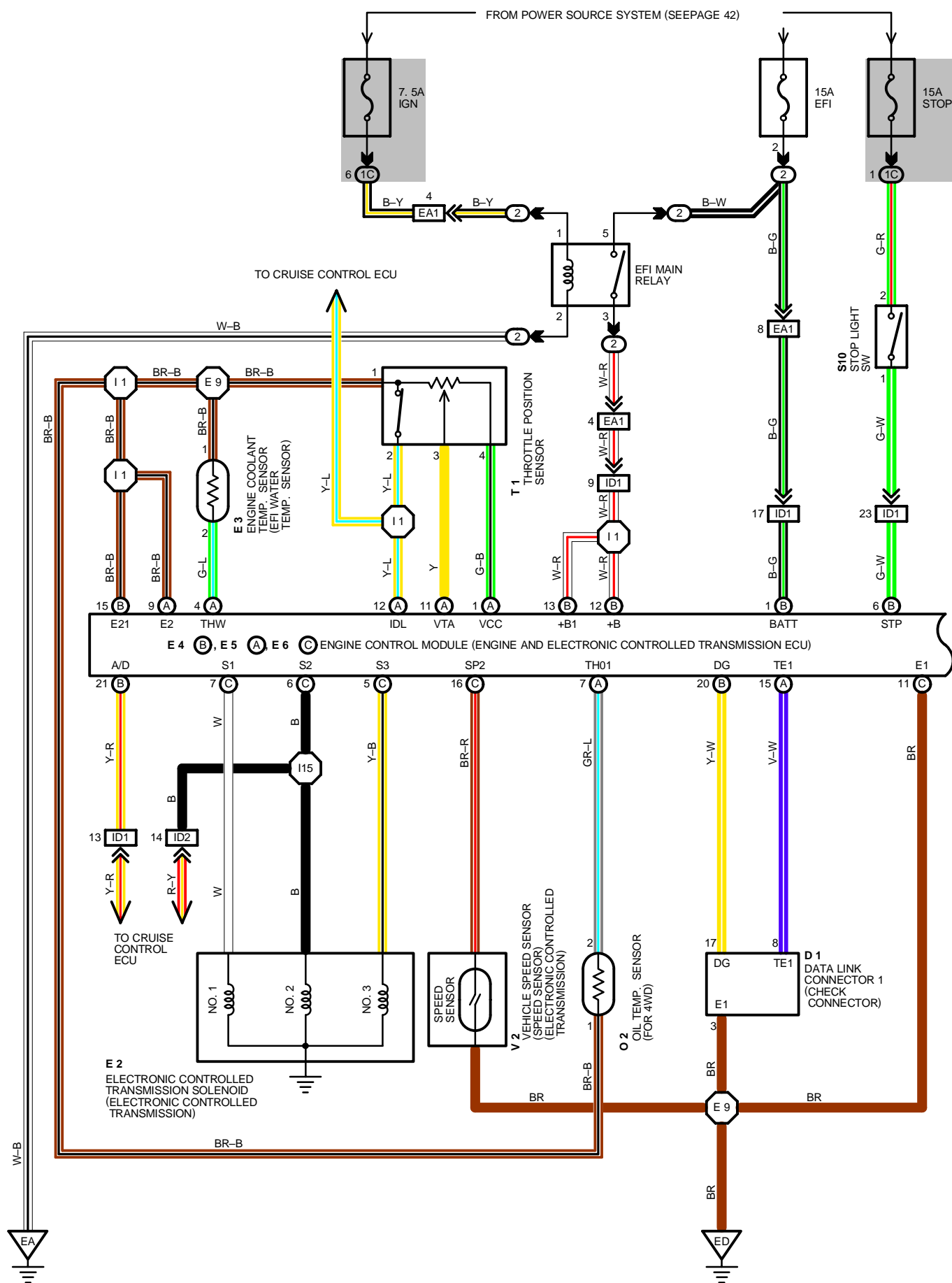
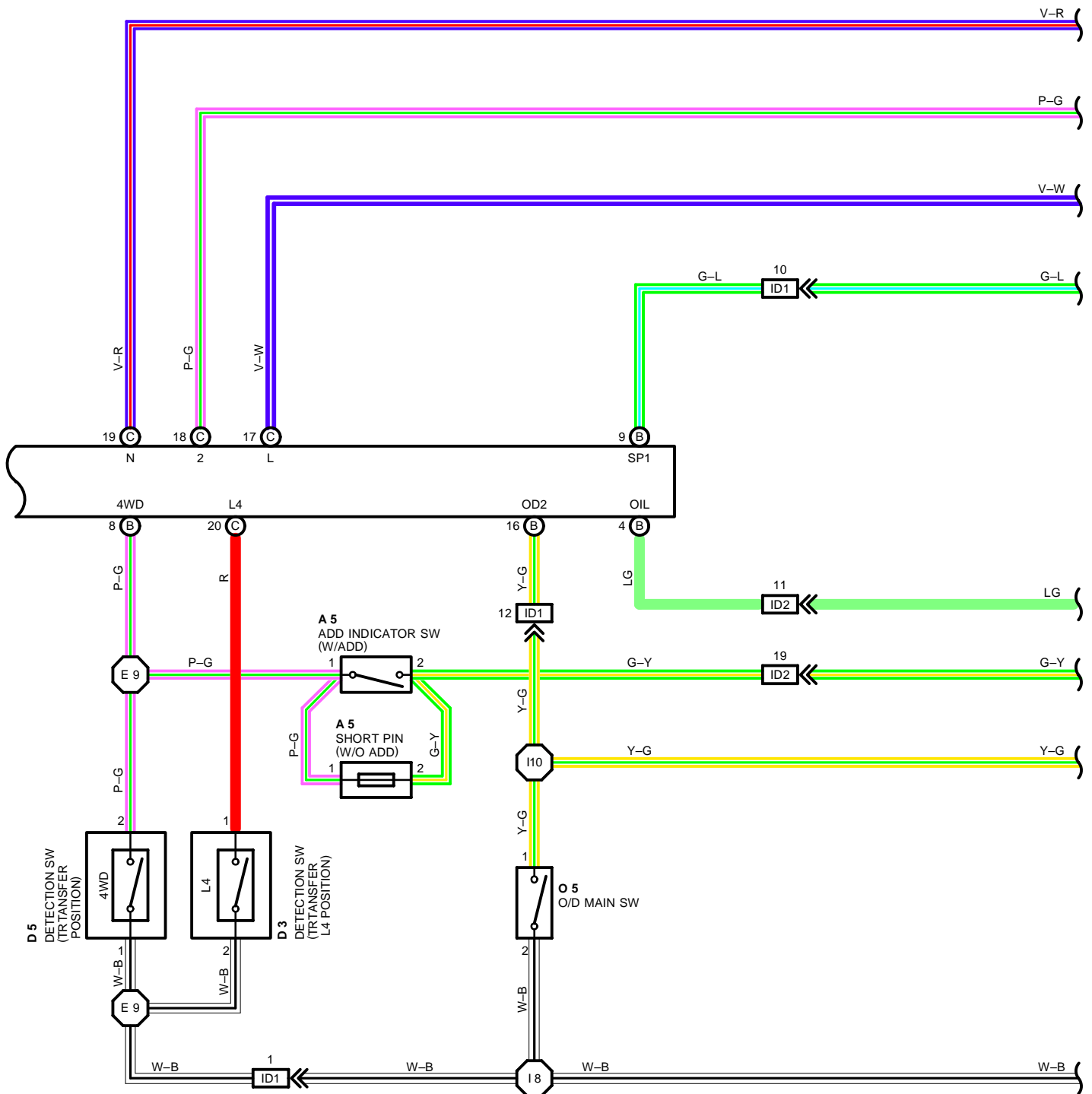
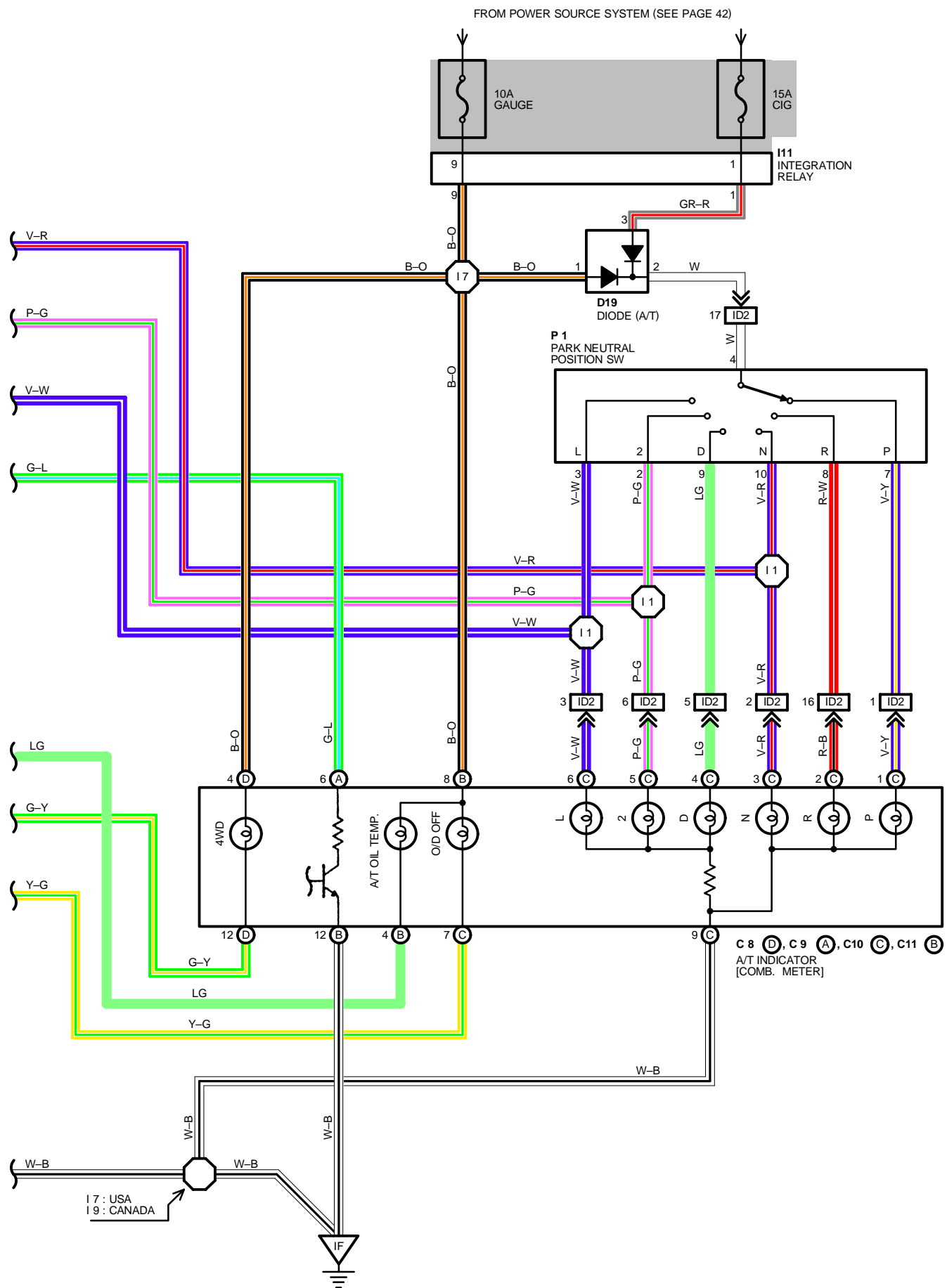


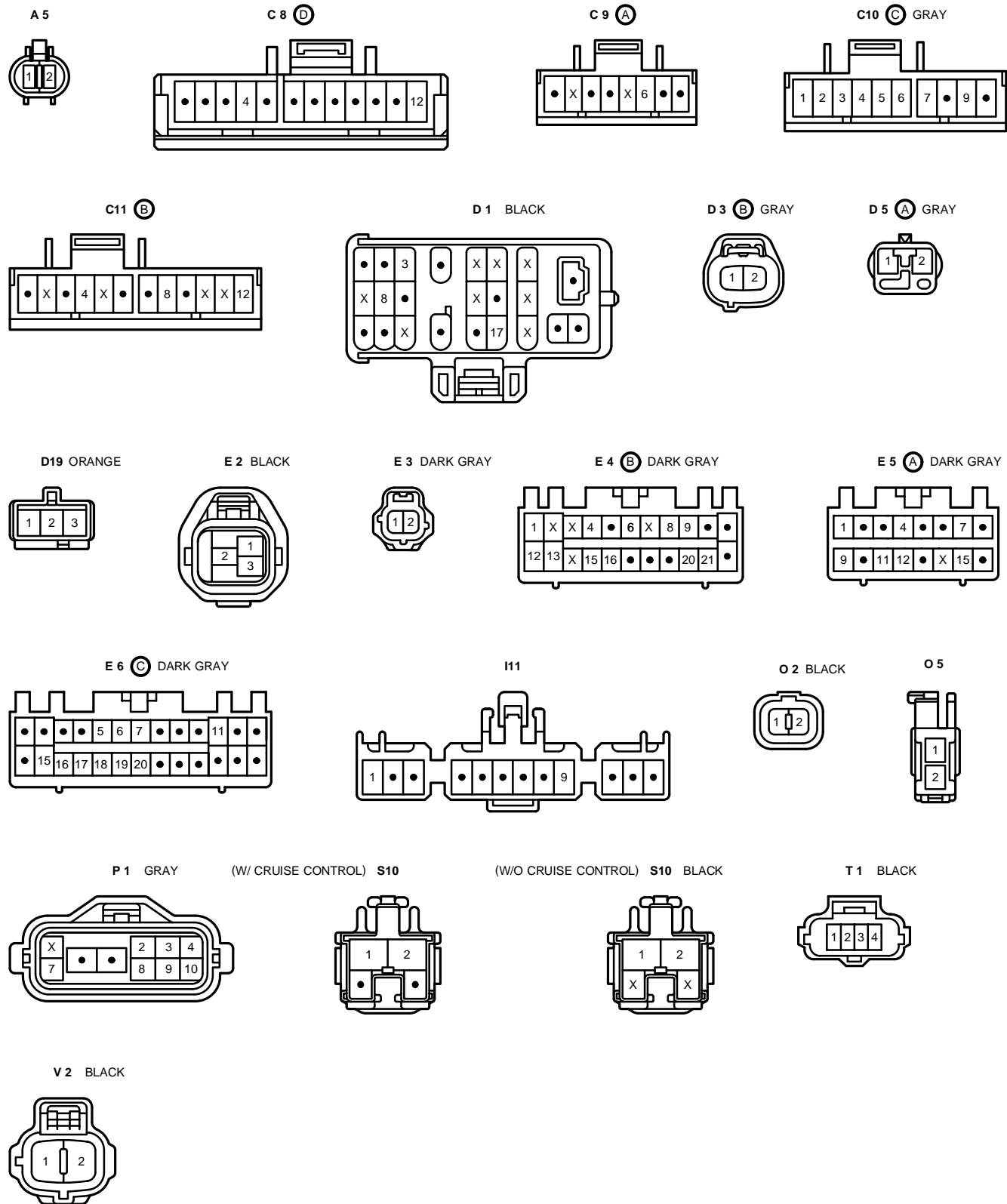
# ELECTRONIC CONTROLLED TRANSMISSION AND A/T INDICATOR





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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 ELECTRONIC CONTROLLED TRANSMISSION, HOWEVER, ELECTRICALLY CONTROLS THE GOVERNOR PRESSURE AND LOCK-UP PRESSURE THROUGH THE SOLENOID VALVE. ENGINE CONTROL MODULE (ENGINE AND ELECTRONIC CONTROLLED TRANSMISSION ECU) CONTROL 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 (ECU) SELECTS THE SHIFT FOR EACH GEAR WHICH IS MOST APPROPRIATE TO THE DRIVING CONDITIONS, BASED ON INPUT SIGNALS FROM THE ENGINE COOLANT TEMP. (EFI WATER TEMP.) SENSOR TO **TERMINAL THW** OF THE ENGINE CONTROL MODULE (ENGINE AND ELECTRONIC CONTROLLED TRANSMISSION ECU), AND ALSO THE INPUT SIGNALS TO **TERMINAL SP2** OF THE ENGINE CONTROL MODULE (ECU) FROM THE VEHICLE SPEED SENSOR (SPEED SENSOR) DEVOTED TO THE ELECTRONIC CONTROLLED TRANSMISSION. CURRENT IS THEN OUTPUT TO THE ELECTRONIC CONTROLLED TRANSMISSION SOLENOIDS. WHEN SHIFTING TO 1ST SPEED, CURRENT FLOWS FROM **TERMINAL S1** OF THE ENGINE CONTROL MODULE (ECU) → **TERMINAL 1** OF THE ELECTRONIC CONTROLLED TRANSMISSION SOLENOIDS → **GROUND**, AND CONTINUITY TO THE NO. 1 SOLENOID CAUSES THE SHIFT.

FOR 2ND SPEED, CURRENT FLOWS FROM **TERMINAL S1** OF THE ENGINE CONTROL MODULE (ECU) → **TERMINAL 1** OF THE ELECTRONIC CONTROLLED TRANSMISSION SOLENOIDS → **GROUND**, AND FROM **TERMINAL S2** OF THE ENGINE CONTROL MODULE (ECU) → **TERMINAL 2** OF THE ELECTRONIC CONTROLLED TRANSMISSION SOLENOIDS → **GROUND**. AND CONTINUITY TO SOLENOIDS 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 EITHER NO. 1 OR NO. 2 SOLENOID.

### 2. LOCK-UP OPERATION

WHEN THE ENGINE CONTROL MODULE (ENGINE AND ELECTRONIC CONTROLLED TRANSMISSION ECU) JUDGES FROM EACH SIGNAL THAT LOCK-UP OPERATION CONDITIONS HAVE BEEN MET, CURRENT FLOWS FROM **TERMINAL S3** OF THE ENGINE CONTROL MODULE (ECU) → **TERMINAL 3** OF THE ENGINE 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 (ECU), THE ENGINE CONTROL MODULE (ECU) 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 OD2** OF THE ENGINE CONTROL MODULE (ECU) AND ENGINE CONTROL MODULE (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 TO OFF, THE CURRENT FLOWING THROUGH 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 (ECU) AND ENGINE CONTROL MODULE (ECU) OPERATION PREVENTS SHIFT INTO OVERDRIVE.

### 5. A/T OIL TEMP. WARNING

WHEN THE A/T OIL TEMP. SENSOR AFFIXED TO THE TRANSMISSION CASE DETECTS THAT THE FLUID TEMP. IS **150°C (302°F)** OR MORE, THE ENGINE CONTROL MODULE (ENGINE AND ELECTRONIC CONTROLLED TRANSMISSION ECU) OPERATES AND THE CURRENT FLOWING THROUGH THE **GAUGE** FUSE FLOWS TO THE A/T OIL TEMP. WARNING LIGHT → **TERMINAL OIL** OF THE ENGINE CONTROL MODULE (ENGINE AND ELECTRONIC CONTROLLED TRANSMISSION ECU) → **GROUND**, SO THAT THE WARNING LIGHT LIGHTS UP, INFORMING THAT THE OIL TEMP. IS HIGH. WHEN THE OIL TEMP. DROPS TO **120°C (248°F)** OR LESS, THE ENGINE CONTROL MODULE (ENGINE AND ELECTRONIC CONTROLLED TRANSMISSION ECU) STOPS OPERATING AND THE WARNING LIGHT GOES OUT.

## SERVICE HINTS

### E 2 ELECTRONIC CONTROLLED TRANSMISSION SOLENOID

1, 2, 3-GROUND : APPROX. 13  $\Omega$

### P 1 PARK/NEUTRAL POSITION SW (NEUTRAL START SW)

4-GROUND : APPROX. 12 VOLTS WITH IGNITION SW **ON** POSITION

### O 5 O/D MAIN SW

1-2 : OPEN WITH O/D MAIN SW AT **ON** POSITION

OPEN WITH O/D MAIN SW AT **OFF** POSITION

### S10 STOP LIGHT SW

1-2 : CLOSED WITH BRAKE PEDAL DEPRESSED

### E 4, E 5, E 6 ENGINE CONTROL MODULE (ELECTRONIC CONTROLLED TRANSMISSION ECU)

S1-E1 : 9-14 VOLTS

S2, S3-E1 : 0-1.5 VOLTS

PWR-E1 : 9-14 VOLTS WITH PATTERN SELECT SW AT **PWR** POSITION

: 0-1.5 VOLTS WITH PATTERN SELECT SW AT **NORM** POSITION

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)

TH01-E2 : 4-5 VOLTS WITH FLUID TEMP. 20°C (68°F)

IDL-E2 : 0-3 VOLTS WITH THROTTLE VALVE FULLY CLOSED

: 9-14 VOLTS WITH THROTTLE VALVE OPEN

VTA-E2 : 0.3-0.8 VOLTS WITH THROTTLE VALVE FULLY CLOSED

: 3.2-4.9 VOLTS WITH THROTTLE VALVE FULLY OPEN

VCC-E2 : 4.5-5.5 VOLTS

A/D-E1 : 4.5-5.5 VOLTS

OD2-E1 : 9-14 VOLTS O/D MAIN SW TURNED ON

: 0 VOLTS O/D MAIN SW TURNED OFF

SP1-E1 : PULSE GENERATION CRUISE CONTROL MAIN SW OFF AND VEHICLE MOVING

SP2-E1 : PULSE GENERATION WITH VEHICLE MOVING

N-E1 : 10-14 VOLTS WITH SHIFT LEVER AT **N** POSITION

: 0-2 VOLTS WITH SHIFT LEVER AT EXPECT **N** POSITION

2-E1 : 10-14 VOLTS WITH SHIFT LEVER AT **2** POSITION

: 0-2 VOLTS WITH SHIFT LEVER AT EXPECT **2** POSITION

L-E1 : 10-14 VOLTS WITH SHIFT LEVER AT **L** POSITION

: 0-2 VOLTS WITH SHIFT LEVER AT EXPECT **L** POSITION

L4-E1 : 10-14 VOLTS WITH TRANSFER SHIFT AT **H2** OR **H4** POSITION

: 0 VOLTS WITH TRANSFER SHIFT AT **L4** POSITION

OIL-E1 : 0.1-4.9 VOLTS

+B-E1 : 9-14 VOLTS

BATT-E1 : 9-14 VOLTS

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## ○ : PARTS LOCATION

CODE	SEE PAGE	CODE	SEE PAGE	CODE	SEE PAGE
A 5	22	D 4	A 22	I11	24
C 8	D 24	D19	24	O 2	23
C 9	A 24	E 2	22	O 5	24
C10	C 24	E 3	22	P 1	23
C11	B 24	E 4	B 24	S10	24
D 1	22	E 5	A 24	T 1	23
D 3	B 22	E 6	C 24	V 2	25

## ○ : RELAY BLOCKS

CODE	SEE PAGE	RELAY BLOCKS (RELAY BLOCK LOCATION)
2	19	R/B NO. 2 (ENGINE COMPARTMENT RIGHT)

## ○ : JUNCTION BLOCK AND WIRE HARNESS CONNECTOR

CODE	SEE PAGE	JUNCTION BLOCK AND WIRE HARNESS (CONNECTOR LOCATION)
1C	20	COWL WIRE AND J/B NO. 1 (LEFT KICK PANEL)

## □ : CONNECTOR JOINING WIRE HARNESS AND WIRE HARNESS

CODE	SEE PAGE	JOINING WIRE HARNESS AND WIRE HARNESS (CONNECTOR LOCATION)
EA1	26	COWL WIRE AND ENGINE ROOM MAIN WIRE (INNER THE R/B NO. 2)
ID1	28	ENGINE WIRE AND COWL WIRE (RIGHT KICK PANEL)
ID2		

## ▽ : GROUND POINTS

CODE	SEE PAGE	GROUND POINTS LOCATION
EA	26	LEFT FENDER
ED	26	CAMSHAFT BEARING CAP
IF	28	RIGHT KICK PANEL

## ○ : SPLICE POINTS

CODE	SEE PAGE	WIRE HARNESS WITH SPLICE POINTS	CODE	SEE PAGE	WIRE HARNESS WITH SPLICE POINTS
E 9	26	ENGINE WIRE	I 9	28	COWL WIRE
I 1	28		I10		
I 7	28	COWL WIRE	I15	28	ENGINE WIRE
I 8					