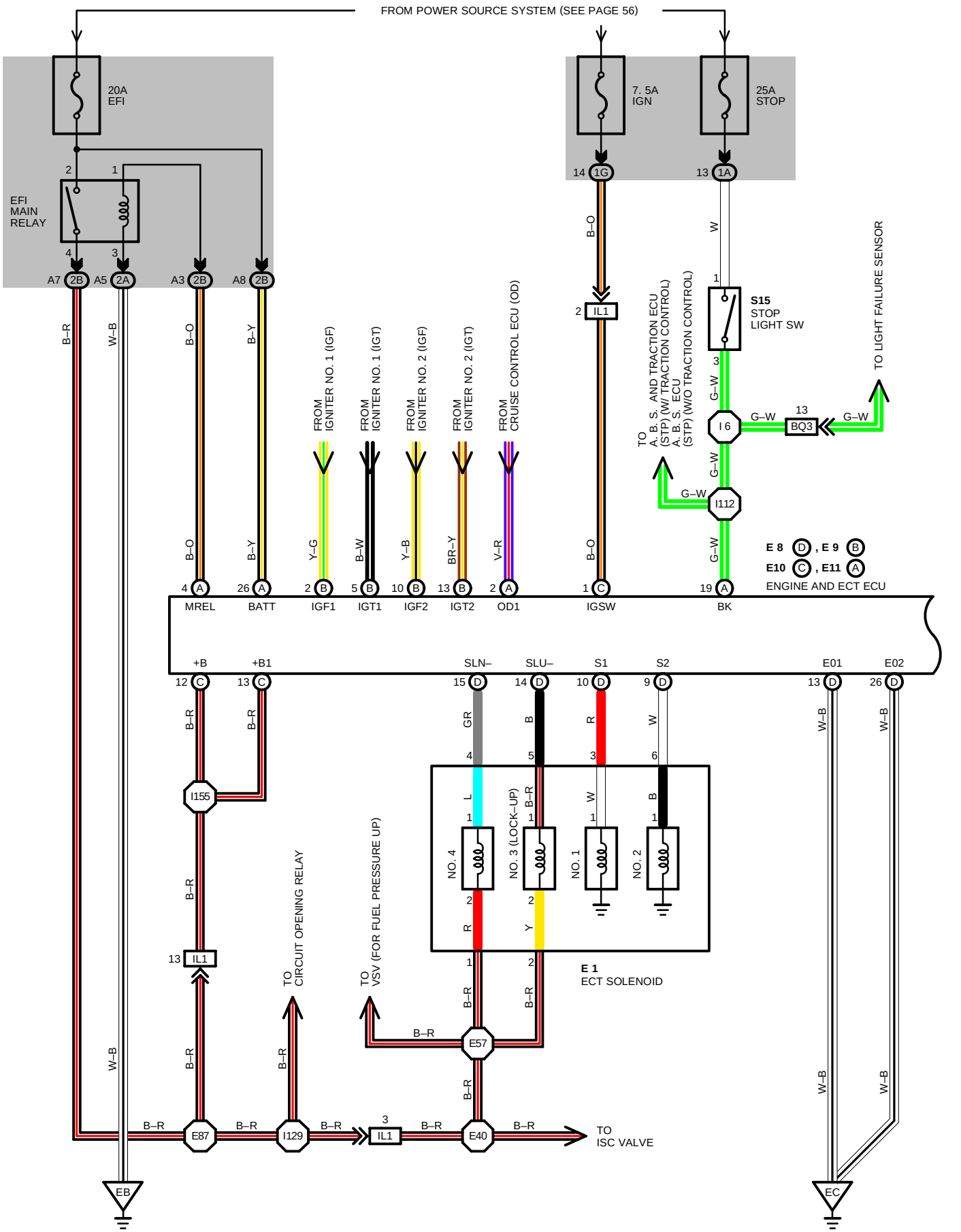
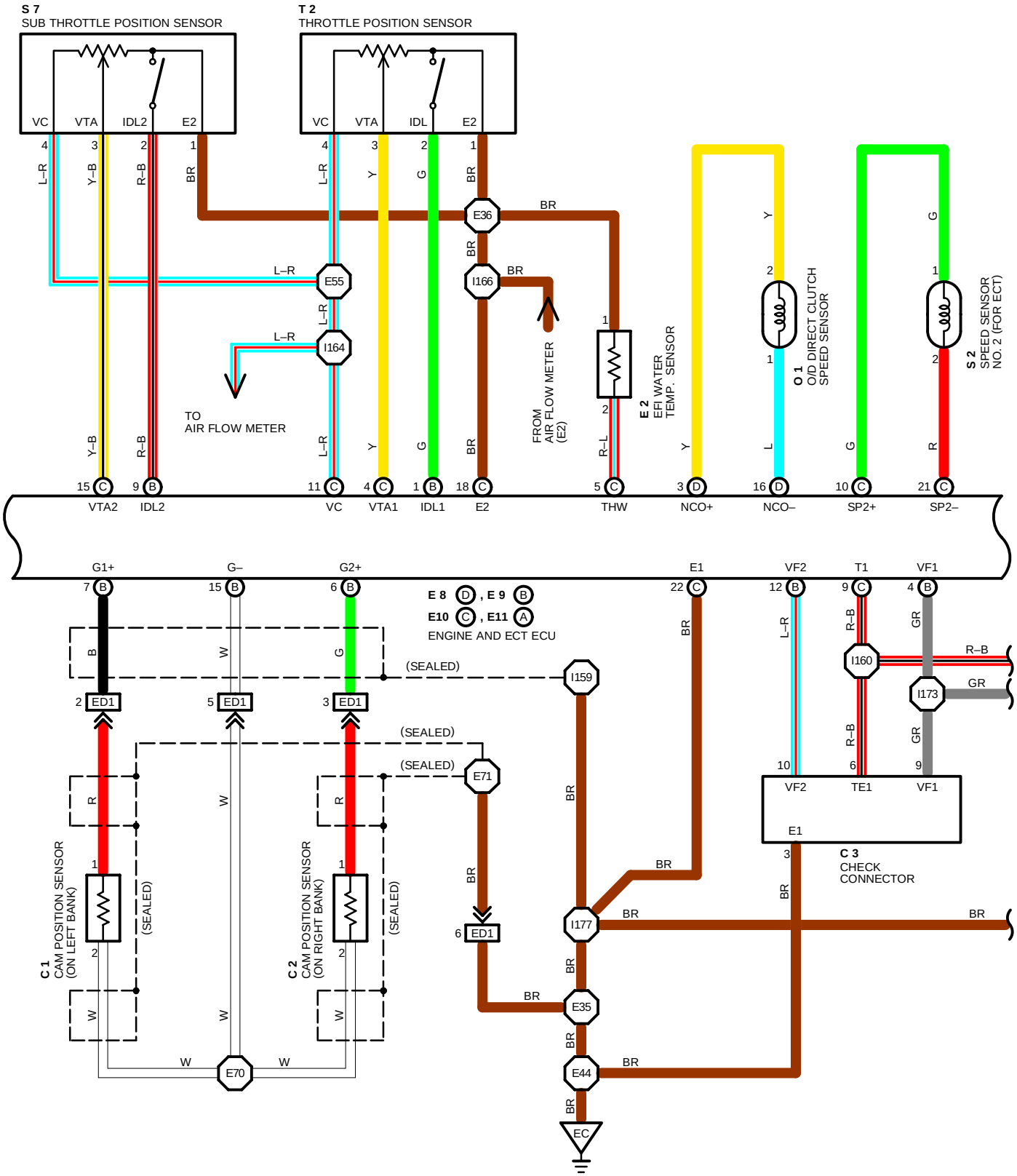
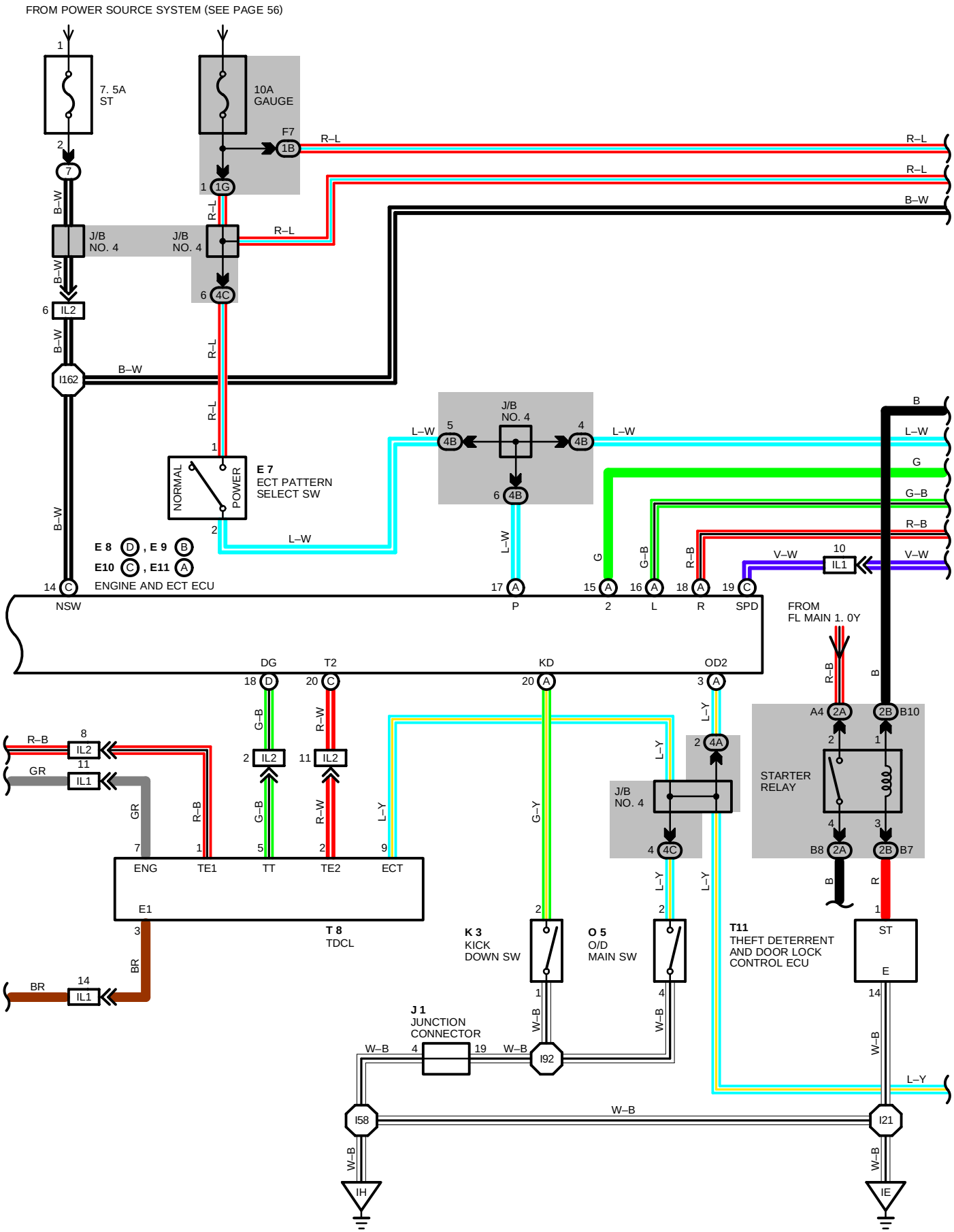
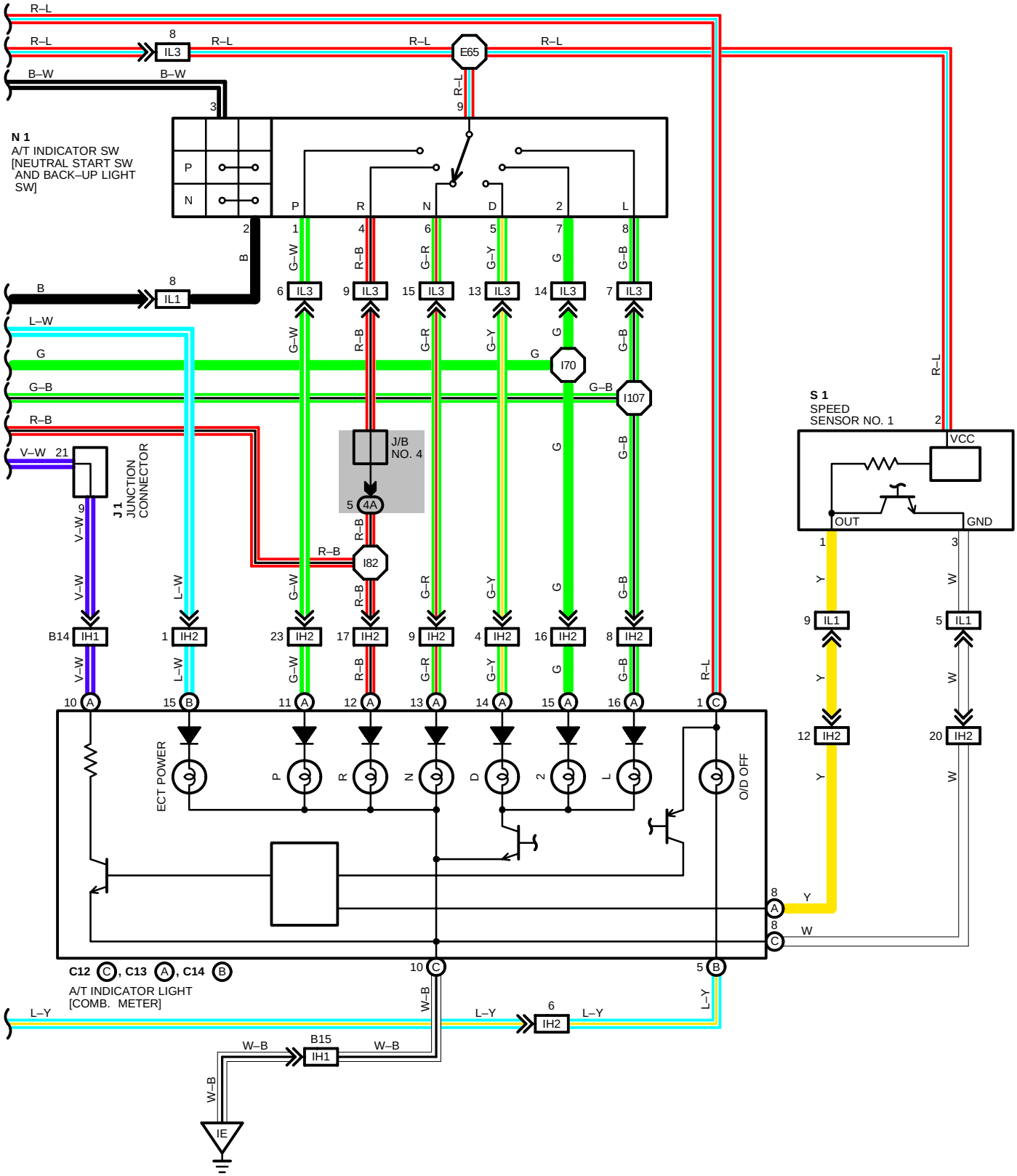
ECT AND A/T INDICATOR




S 7
SUB THROTTLE POSITION SENSOR
VC
VTA
IDL2
E2
T 2
THROTTLE POSITION SENSOR
VC
VTA
IDL
E2
E36
I166
E55
I164
TO
AIR FLOW METER
FROM
AIR FLOW METER
(E2)
E 2
EFI WATER
TEMP. SENSOR
O 1
O/D DIRECT CLUTCH
SPEED SENSOR
S 2
SPEED SENSOR
NO. 2 (FOR ECT)
VTA2
IDL2
VC
VTA1
IDL1
E2
THW
NCO+
NCO–
SP2+
SP2–
G1+
G–
G2+
E1
VF2
T1
VF1
E 8 , E 9
E10 , E11
ENGINE AND ECT ECU
(SEALED)
I159
E71
ED1
C 1
CAM POSITION SENSOR
(ON LEFT BANK)
C 2
CAM POSITION SENSOR
(ON RIGHT BANK)
E70
I177
E35
E44
EC
I160
I173
VF2
TE1
VF1
C 3
CHECK
CONNECTOR

ECT AND A/T INDICATOR




N 1
A/T INDICATOR SW
[NEUTRAL START SW
AND BACK–UP LIGHT
SW]
P
N
P
R
N
D
2
L
J 1
JUNCTION
CONNECTOR
J/B
NO. 4
S 1
SPEED
SENSOR NO. 1
VCC
OUT
GND
ECT POWER
O/D OFF
C12 C, C13 A, C14 B
A/T INDICATOR LIGHT
[COMB. METER]
IE
R–L
B–W
L–W
G
G–B
R–B
V–W
L–Y
W–B
G–W
G–R
G–Y
Y
W

ECT 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 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 (C) 5** OF THE ECU FROM THE EFI WATER TEMP. SENSOR AND THE VEHICLE SPEED SIGNAL FROM SPEED SENSOR NO.2 IS INPUT TO **TERMINAL (C) 10** OF THE ECU. AT THE SAME TIME, THE THROTTLE VALVE OPENING SIGNAL FROM THE THROTTLE POSITION SENSOR (MAIN) IS INPUT TO **TERMINAL (C) 4** OF THE ECU AS ENGINE RPM CONDITION (IDLING, HIGH LOAD AND ACCELERATION CONDITIONS) SIGNAL.

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

WHEN SHIFTING TO 1ST SPEED, THE CURRENT FLOWS FROM **TERMINAL (D) 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 (D) 9** OF THE ECU → **TERMINAL 6** OF ECT SOLENOIDS → **GROUND**, AND FROM **TERMINAL (D) 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 (D) 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) 19** 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) 3** 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) 3** 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 1** OF ECT PATTERN SELECT SW → **TERMINAL 2** → **TERMINAL (B) 15** OF A/T INDICATOR → **TERMINAL (C) 10** → **GROUND** AND CAUSES THE INDICATOR LIGHT TO LIGHT UP. AT THE SAME TIME, THE CURRENT FLOWS TO **TERMINAL (A) 17** 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) 20** OF THE ECU. THEN, THE ECU CONTROLS THE CURRENT WHICH FLOWS FROM **TERMINALS (D) 10** AND **(D) 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) 2** 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. **13.2**Ω
2–5 : APPROX. **13.2**Ω
3–GROUND : APPROX. **13.2**Ω
6–GROUND : APPROX. **13.2**Ω

E 2 EFI WATER TEMP. SENSOR
1–2 : APPROX. **16.2**KΩ (**–20**˚C **–4**˚F)
APPROX. **2.5**KΩ (**20**˚C **68**˚F)
APPROX. **0.32**KΩ (**80**˚C **176**˚F)

E 7 ECT PATTERN SELECT SW
1–2 : CLOSED WITH ECT PATTERN SELECT SW AT **POWER** POSITION

E 8 (D), E 9 (B), E10 (C), E11 (A) 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 AT **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 OFF
+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. **4**KΩ WITH THROTTLE VALVE FULLY OPEN
VC–E2 : APPROX. **5** VOLTS

O 1 O/D DIRECT CLUTCH SPEED SENSOR
1–2 : APPROX. **650**Ω

S 2 SPEED SENSOR NO.2 (FOR ECT)
1–2 : APPROX. **650**Ω

S15 STOP LIGHT SW
1–3 : CLOSED WITH BRAKE PEDAL DEPRESSED

○ : PARTS LOCATION

CODE	SEE PAGE	CODE	SEE PAGE	CODE	SEE PAGE
C 1	24	**E 8** D	26	**S 1**	25
C 2	24	**E 9** B	26	**S 2**	25
C 3	24	**E10** C	26	**S 7**	25
C12 C	26	**E11** A	26	**S15**	27
C13 A	26	**J 1**	27	**T 2**	25
C14 B	26	**K 3**	27	**T 8**	27
E 1	24	**N 1**	25	**T11**	27
E 2	24	**O 1**	25		
E 7	26	**O 5**	27		

▭ : RELAY BLOCKS

CODE	SEE PAGE	RELAY BLOCKS (RELAY BLOCK LOCATION)
7	18	R/B NO.7 (RIGHT SIDE OF J/B NO.1)

ECT AND A/T INDICATOR

: JUNCTION BLOCK AND WIRE HARNESS CONNECTOR

CODE	SEE PAGE	JUNCTION BLOCK AND WIRE HARNESS (CONNECTOR LOCATION)
1A	18	COWL WIRE AND J/B NO.1 (LEFT SIDE OF STEERING COLUMN TUBE)
1B	18	INSTRUMENT PANEL WIRE AND J/B NO.1 (LEFT SIDE OF STEERING COLUMN TUBE)
1G	18	COWL WIRE AND J/B NO.1 (LEFT SIDE OF STEERING COLUMN TUBE)
2A	20	ENGINE ROOM MAIN WIRE AND J/B NO.2 (ENGINE COMPARTMENT LEFT)
2B	20	COWL WIRE AND J/B NO.2 (ENGINE COMPARTMENT LEFT)
4A	23	COWL WIRE AND J/B NO.4 (BEHIND THE COMBINATION METER)
4B		
4C		

: CONNECTOR JOINING WIRE HARNESS AND WIRE HARNESS

CODE	SEE PAGE	JOINING WIRE HARNESS AND WIRE HARNESS (CONNECTOR LOCATION)
ED1	32	ENGINE WIRE AND ENGINE NO.4 WIRE (FRONT SIDE OF CYLINDER HEAD COVER LH)
IH1	34	INSTRUMENT PANEL WIRE AND COWL WIRE (J/B NO.1)
IH2	34	INSTRUMENT PANEL WIRE AND COWL WIRE (BEHIND GLOVE BOX)
IL1	36	ENGINE WIRE AND COWL WIRE (UNDER THE GLOVE BOX)
IL2		
IL3		
BQ3	38	COWL WIRE AND FLOOR NO.2 WIRE (LEFT KICK PANEL)

: GROUND POINTS

CODE	SEE PAGE	GROUND POINTS LOCATION
EB	32	FRONT SIDE OF LEFT FENDER
EC	32	REAR SIDE OF CYLINDER HEAD RH
IE	34	LEFT KICK PANEL
IH	34	RIGHT KICK PANEL

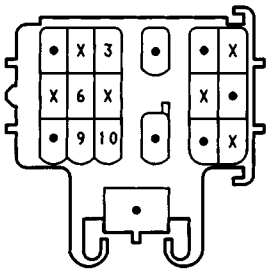
: SPLICE POINTS

CODE	SEE PAGE	WIRE HARNESS WITH SPLICE POINTS	CODE	SEE PAGE	WIRE HARNESS WITH SPLICE POINTS
E 35	32	ENGINE WIRE	**I 82**	36	COWL WIRE
E 36			**I 92**		
E 40			**I107**		
E 44			**I112**		
E 55			**I129**		
E 57			**I155**	36	ENGINE WIRE
E 65			**I159**		
E 70	32	ENGINE NO.4 WIRE	**I160**		
E 71			**I162**		
E 87	32	COWL WIRE	**I164**		
I 6	36		**I166**		
I 21			**I173**		
I 58			**I177**		
I 70					

C 1 DARK GRAY

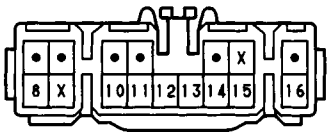
C 2 DARK GRAY

C 3 DARK GRAY

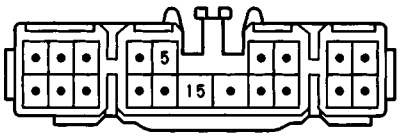


C12 (C)

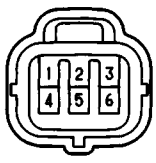
C13 (A) ORANGE



C14 (B)



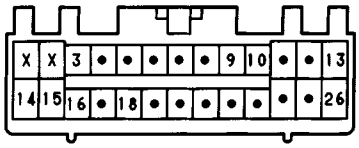
E 1 GRAY



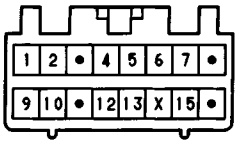
E 2 GREEN

E 7

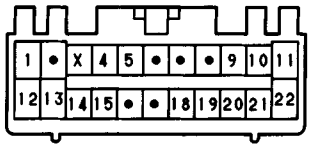
E 8 (D) DARK GRAY



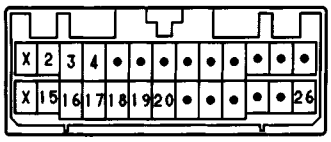
E 9 (B) DARK GRAY



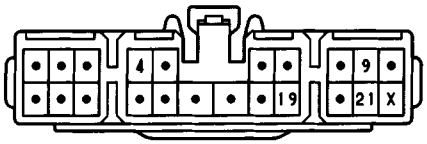
E10 (C) DARK GRAY



E11 (A) DARK GRAY



J 1



K 3 BLACK

N 1 GRAY

O 1 GRAY

O 5 BLUE

S 1 GRAY

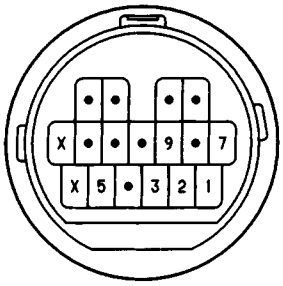
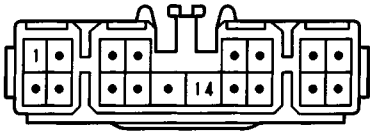
S 2 GRAY

S 7 BLACK

S15

T 2 BLACK

T 8 DARK GRAY



T11