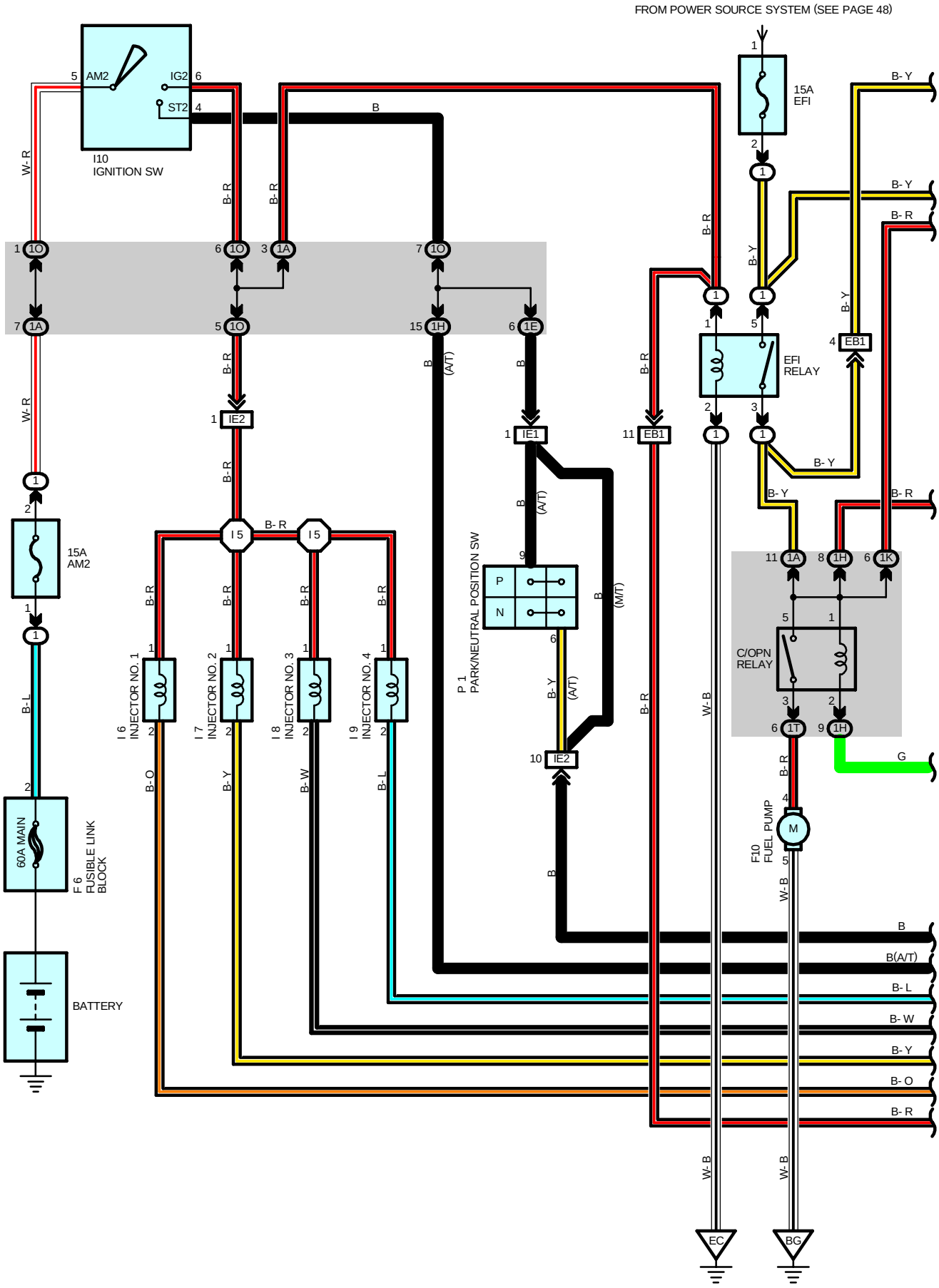
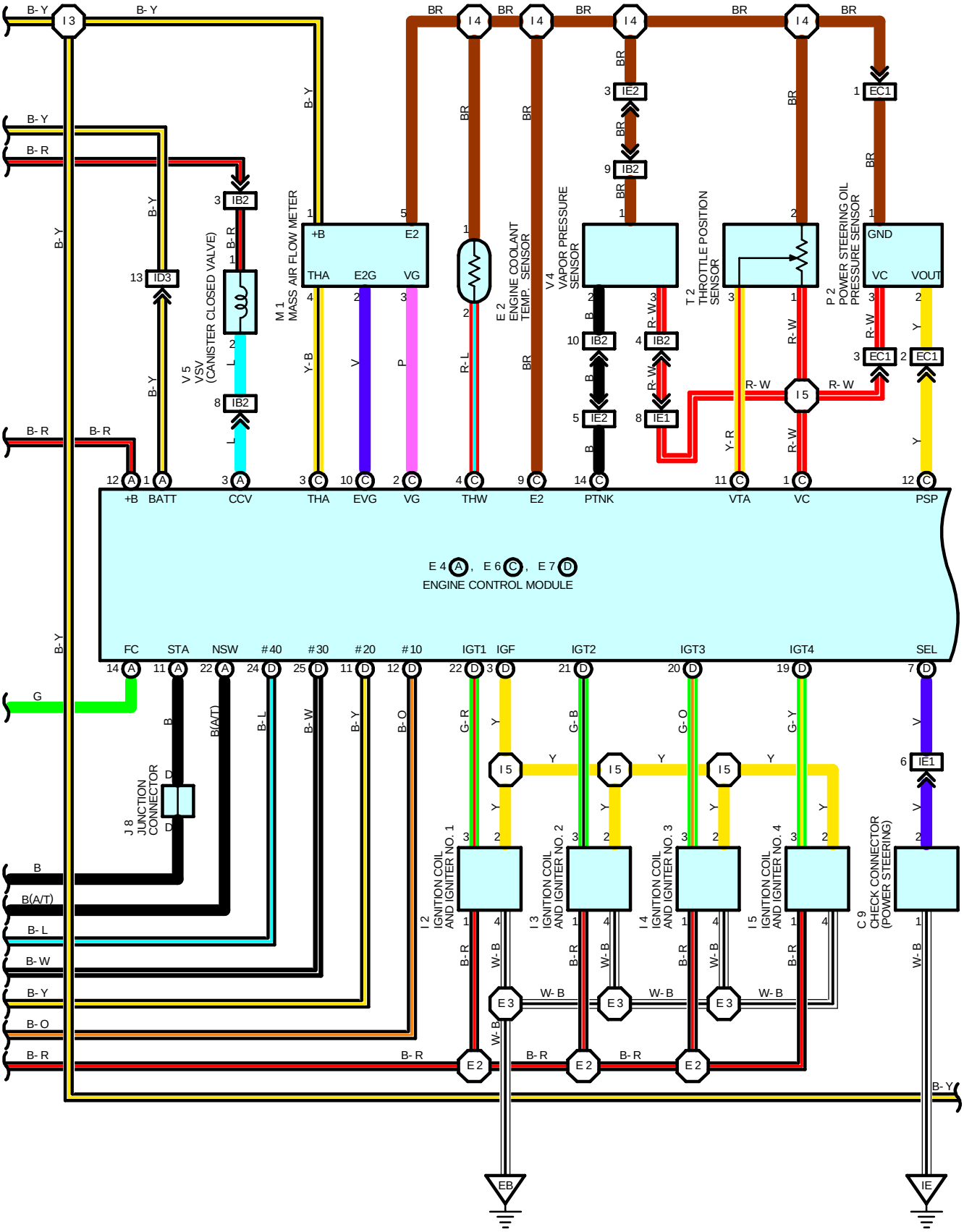
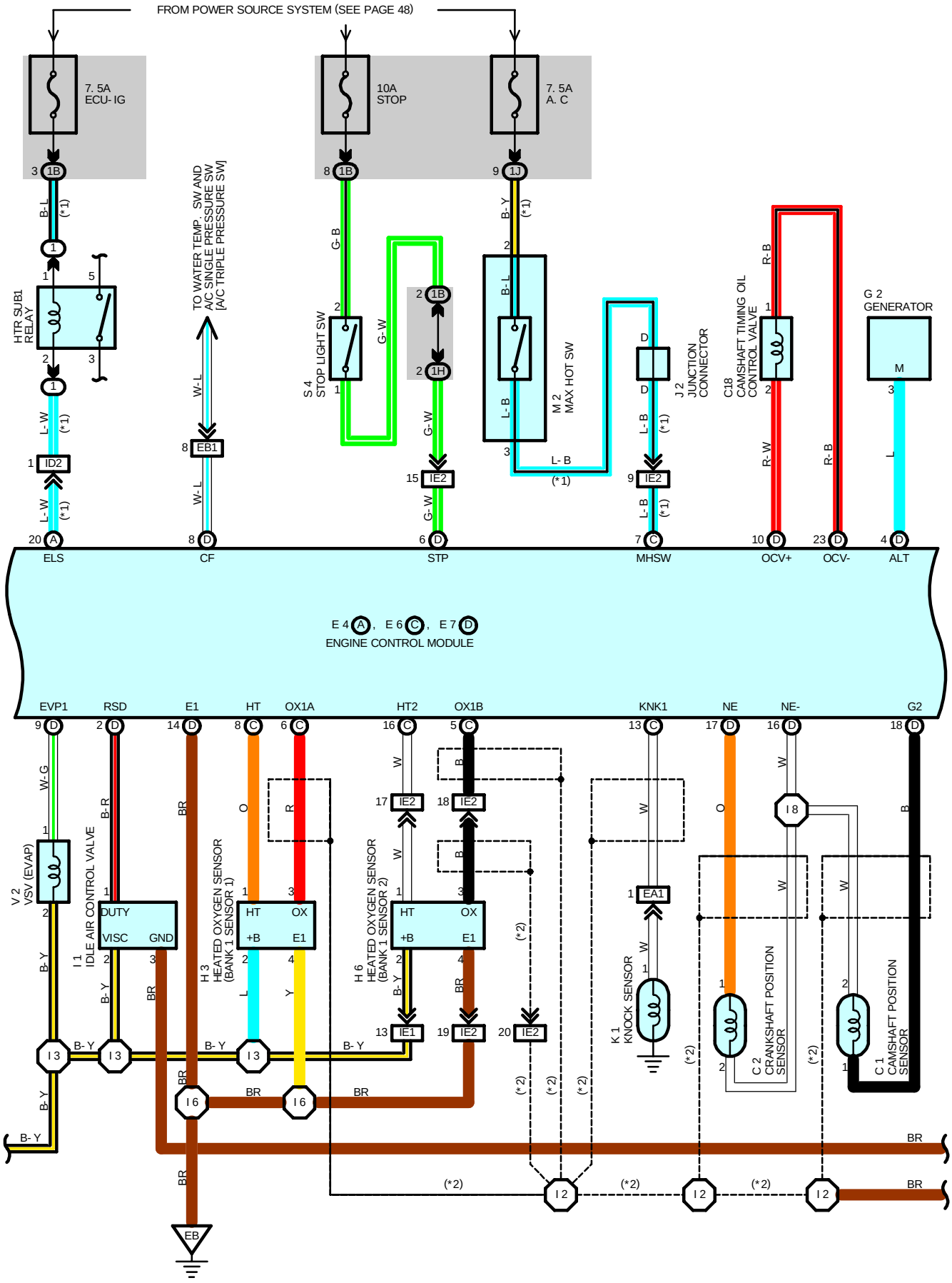
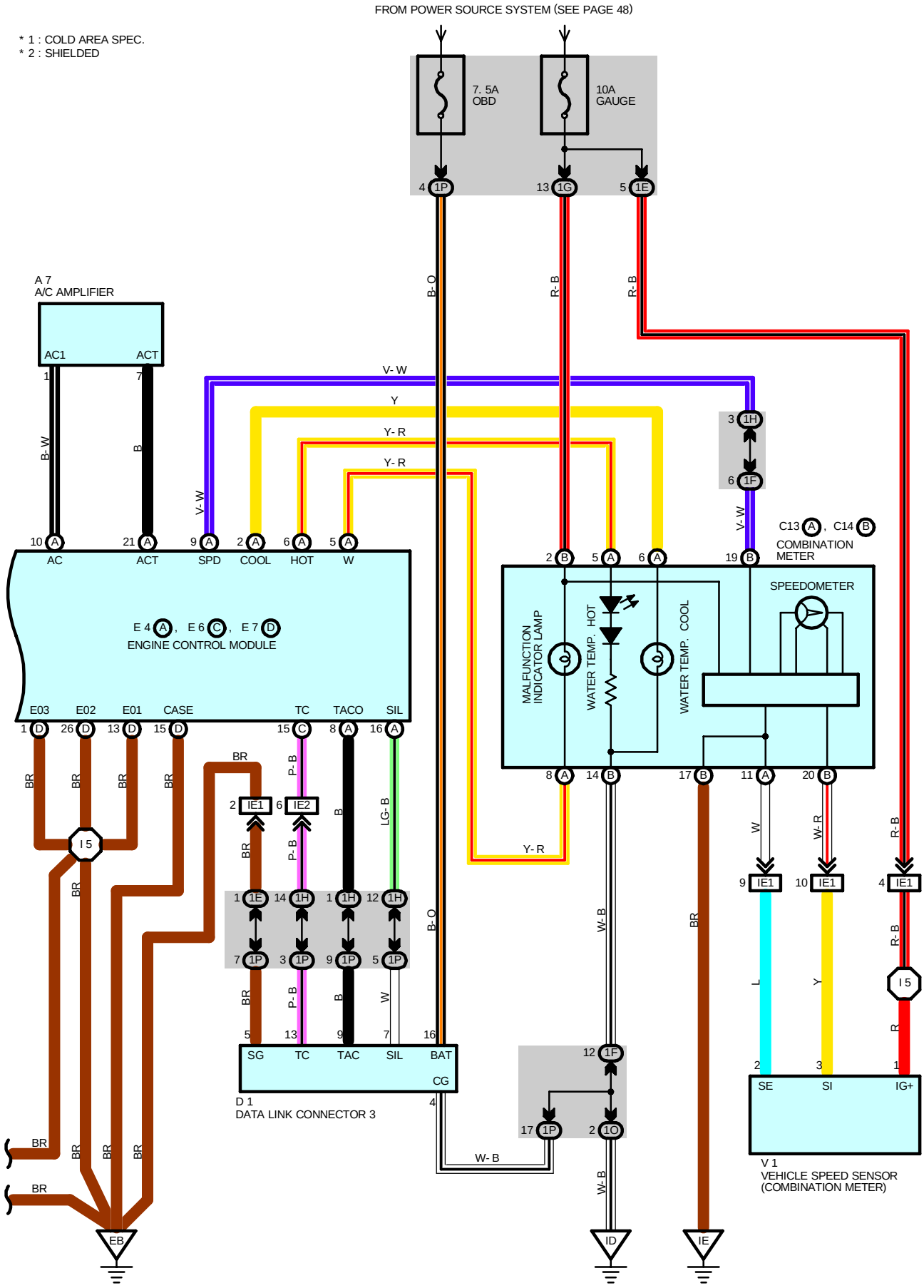

FROM POWER SOURCE SYSTEM (SEE PAGE 48)
I10
IGNITION SW
AM2
IG2
ST2
15A
AM2
15A
EFI
EFI
RELAY
C/OPN
RELAY
60A MAIN
F 6
FUSIBLE LINK
BLOCK
BATTERY
I 6
INJECTOR NO. 1
I 7
INJECTOR NO. 2
I 8
INJECTOR NO. 3
I 9
INJECTOR NO. 4
P 1
PARK/NEUTRAL POSITION SW
F10
FUEL PUMP
EC
BG
W- R
B- R
B- Y
B- L
B- O
B- W
W- B
B
B(A/T)
G


I 3
I 4
IB2
IE2
IE1
EC1
ID3
I 5
E 3
E 2
B- Y
B- R
BR
B- L
B- W
B- O
B(A/T)
G
Y
G- R
G- B
G- O
G- Y
R- W
R- L
Y- B
Y- R
V
P
M 1 MASS AIR FLOW METER
+B
E2
THA
E2G
VG
V 5 VSV (CANISTER CLOSED VALVE)
E 2 ENGINE COOLANT TEMP. SENSOR
V 4 VAPOR PRESSURE SENSOR
T 2 THROTTLE POSITION SENSOR
P 2 POWER STEERING OIL PRESSURE SENSOR
GND
VC
VOUT
+B
BATT
CCV
THA
EVG
VG
THW
E2
PTNK
VTA
VC
PSP
E 4 A , E 6 C , E 7 D
ENGINE CONTROL MODULE
FC
STA
NSW
#40
#30
#20
#10
IGT1
IGF
IGT2
IGT3
IGT4
SEL
J 8 JUNCTION CONNECTOR
I 2 IGNITION COIL AND IGNITER NO. 1
I 3 IGNITION COIL AND IGNITER NO. 2
I 4 IGNITION COIL AND IGNITER NO. 3
I 5 IGNITION COIL AND IGNITER NO. 4
C 9 CHECK CONNECTOR (POWER STEERING)
EB
IE


FROM POWER SOURCE SYSTEM (SEE PAGE 48)
7. 5A ECU- IG
10A STOP
7. 5A A. C
HTR SUB1 RELAY
TO WATER TEMP. SW AND A/C SINGLE PRESSURE SW [A/C TRIPLE PRESSURE SW]
S 4 STOP LIGHT SW
M 2 MAX HOT SW
J 2 JUNCTION CONNECTOR
C18 CAMSHAFT TIMING OIL CONTROL VALVE
G 2 GENERATOR
ELS
CF
STP
MHSW
OCV+
OCV-
ALT
E 4 (A), E 6 (C), E 7 (D)
ENGINE CONTROL MODULE
EVP1
RSD
E1
HT
OX1A
HT2
OX1B
KNK1
NE
NE-
G2
V 2 VSV (EVAP)
I 1 IDLE AIR CONTROL VALVE
H 3 HEATED OXYGEN SENSOR (BANK 1 SENSOR 1)
H 6 HEATED OXYGEN SENSOR (BANK 1 SENSOR 2)
K 1 KNOCK SENSOR
C 2 CRANKSHAFT POSITION SENSOR
C 1 CAMSHAFT POSITION SENSOR
DUTY
VISC
GND
HT
OX
+B
E1
EB


FROM POWER SOURCE SYSTEM (SEE PAGE 48)
* 1 : COLD AREA SPEC.
* 2 : SHIELDED
7. 5A
OBD
10A
GAUGE
A 7
A/C AMPLIFIER
AC1
ACT
B- W
B
V- W
Y
Y- R
Y- R
B- O
R- B
R- B
AC
ACT
SPD
COOL
HOT
W
E 4 A , E 6 C , E 7 D
ENGINE CONTROL MODULE
C13 A , C14 B
COMBINATION
METER
SPEEDOMETER
MALFUNCTION
INDICATOR LAMP
WATER TEMP. HOT
WATER TEMP. COOL
E03
E02
E01
CASE
TC
TACO
SIL
I 5
BR
P- B
B
LG- B
W- B
W
W- R
L
Y
R
SG
TC
TAC
SIL
BAT
CG
D 1
DATA LINK CONNECTOR 3
V 1
VEHICLE SPEED SENSOR
(COMBINATION METER)
SE
SI
IG+
EB
ID
IE

SYSTEM OUTLINE

This system utilizes an engine control module and maintains overall control of the engine, transmission and so on. An outline of the engine control is explained here.

1. INPUT SIGNALS

(1) Engine coolant temp. signal circuit

The engine coolant temp. sensor detects the engine coolant temp. and has a built-in thermistor with a resistance which varies according to the engine coolant temp. thus the engine coolant temp. is input in the form of a control signal into TERMINAL THW of the engine control module.

(2) Intake air temp. signal circuit

The intake air temp. sensor is installed in the mass air flow meter and detects the intake air temp., which is input as a control signal into TERMINAL THA of the engine control module.

(3) Oxygen sensor signal circuit

The oxygen density in the exhaust gases is detected and input as a control signal into TERMINALS OX1A and OX1B of the engine control module.

(4) RPM signal circuit

Camshaft position and crankshaft position are detected by the camshaft position sensor and crankshaft position sensor. Camshaft position is input as a control signal to TERMINAL G2 of the engine control module, and engine RPM is input into TERMINAL NE.

(5) Throttle signal circuit

The throttle position sensor detects the throttle valve opening angle, which is input as a control signal into TERMINAL VTA of the engine control module.

(6) Vehicle speed signal circuit

The vehicle speed sensor, installed inside the transmission, detects the vehicle speed and inputs a control signal into TERMINAL SPD of the engine control module via the combination meter.

(7) NSW signal circuit (A/T)

The Park/Nuetral position SW detects whether the shift position are in neutral, parking or not, and inputs a control signal into TERMINAL NSW of the engine control module.

(8) A/C SW signal circuit

The A/C amplifier inputs the A/C operations into TERMINAL AC of the engine control module as a control signal.

(9) Battery signal circuit

Voltage is constantly applied to TERMINAL BATT of the engine control module. When the ignition SW is turned on, the voltage for engine control module start-up power supply is applied to TERMINAL +B of the engine control module via EFI relay.

(10) Starter signal circuit

To confirm whether the engine is cranking, the voltage applied to the starter motor during cranking is detected and the signal is input into TERMINAL STA of the engine control module as a control signal.

(11) Engine knock signal circuit

Engine knocking is detected by knock sensor and the signal is input into TERMINAL KNK1 of the engine control module as a control signal.

2. CONTROL SYSTEM

* SFI system
  The SFI system monitors the engine condition through the signals, which are input from each sensor to the engine control module. The best fuel injection volume is decided based on this data and the program memorized by the engine control module, and the control signal is output to TERMINALS #10, #20, #30 and #40 of the engine control module to operate the injector. (Inject the fuel). The SFI system produces control of fuel injection operation by the engine control module in response to the driving conditions.
* ESA system
  The ESA system monitors the engine condition through the signals, which are input to the engine control module from each sensor. The best ignition timing is detected according to this data and the memorized data in the engine control module, and the control signal is output to TERMINALS IGT1, IGT2, IGT3 and IGT4. This signal controls the ignition coil and igniter to provide the best ignition timing for the driving conditions.
* IAC system
  The IAC system (Rotary solenoid type) increases the RPM and provides idling stability for fast idle-up when the engine is cold and when the idle speed has dropped due to electrical load, etc. The engine control module evaluates the signals from each sensor, outputs current to TERMINAL RSD, and controls the idle air control valve.
* Fuel pump control system
  The engine control module operation outputs to TERMINAL FC and controls the C/OPN relay. Thus controls the fuel pump drive speed in response to conditions.

3. DIAGNOSIS SYSTEM

With the diagnosis system, when there is a malfunctioning in the engine control module signal system, the malfunction system is recorded in the memory. The malfunctioning system can then be found by reading the display (Code) of the malfunction indicator lamp.

4. FAIL-SAFE SYSTEM

When a malfunction occurs in any system, if there is a possibility of engine trouble being caused by continued control based on the signals from that system, the fail-safe system either controls the system by using data (Standard values) recorded in the engine control module memory or else stops the engine.

SERVICE HINTS

E4 (A), E6 (C), E7 (D) ENGINE CONTROL MODULE

BATT-E1 : Always approx. **9**- **14** volts
+B-E1 : **9**- **14** volts with the ignition SW on and the engine stopping
VC-E1 : **4.5**- **5.5** volts with the ignition SW on and the engine stopping
IGF-E1 : Pulse generation with the engine idling
THA-E1 : **0.5**- **3.4** volts with the engine idling and the intake air temp. **0** ˚C (**32** ˚F) - **80** ˚C (**176** ˚F)
THW-E1 : **0.2**- **1.0** volts with the engine idling and the engine coolant temp. **60** ˚C (**140** ˚F) - **120** ˚C (**248** ˚F)
W-E1 : **9**- **14** volts with the engine idling
: **0**- **3** volts with the ignition SW on and the engine coolant temp. sensor connector disconnects
STA-E1 : **6.0** volts or more with the engine cranking
VTA-E1 : **0.3**- **1.0** volts with the ignition SW on and the throttle valve fully closed
: **3.2**- **4.9** volts with the ignition SW on and the throttle valve fully open
STP-E1 : **7.5**- **14** volts with the brake pedal depressed
EVP1-E1 : **9**- **14** volts with the ignition SW on and the engine stopping
FC-E1 : **9**- **14** volts with the ignition SW on and the engine stopping
: **0**- **3** volts with the engine idling
NE, G2-NE- : Pulse generation with the engine idling
OCV+ -OCV- : Pulse generation with the ignition SW on and the engine stopping
IGT1, IGT2, IGT3, IGT4-E1 : Pulse generation with the engine idling
#10, #20, #30, #40-E1 : Pulse generation with the engine idling
E01, E02, E03, E1, E2, CASE-GROUND : Always continuity

E2 ENGINE COOLANT TEMP. SENSOR

2-1 : Approx. **14.96** kΩ (**-20** ˚C, **-4** ˚F)
Approx. **2.44** kΩ (**20** ˚C, **68** ˚F)
Approx. **0.31** kΩ (**80** ˚C, **176** ˚F)
Approx. **0.14** kΩ (**110** ˚C, **230** ˚F)

ENGINE CONTROL

: PARTS LOCATION

Code	See Page	Code	See Page	Code	See Page
A7	30	G2	28	K1	29
C1	28	H3	28	M1	29
C2	28	H6	30	M2	31
C9	30	I1	29	P1	29
C13 A	30	I2	29	P2	29
C14 B	30	I3	29	S4	31
C18	29	I4	29	T2	29
D1	30	I5	29	V1	29
E2	28	I6	29	V2	29
E4 A	30	I7	29	V4	33 (4-Door)
E6 C	30	I8	29		35 (2-Door)
E7 D	30	I9	29	V5	33 (4-Door)
F6	28	I10	31		35 (2-Door)
F10	32 (4-Door)	J2	31		
	34 (2-Door)	J8	31		

: RELAY BLOCKS

Code	See Page	Relay Blocks (Relay Block Location)
1	22	Engine Room R/B (Engine Compartment Left)

: JUNCTION BLOCK AND WIRE HARNESS CONNECTOR

Code	See Page	Junction Block and Wire Harness (Connector Location)
1A	24	Engine Room Main Wire and Instrument Panel J/B (Lower Finish Panel)
1B		
1E	25	Instrument Panel Wire and Instrument Panel J/B (Lower Finish Panel)
1F		
1G		
1H		
1J		
1K		
1O		
1P		
1T	24	Floor Wire and Instrument Panel J/B (Lower Finish Panel)

: CONNECTOR JOINING WIRE HARNESS AND WIRE HARNESS

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
EA1	36	Engine Wire and Knock Sensor Wire (Near the Starter)
EB1	36	Engine Wire and Engine Room Main Wire (Inside of the Engine Room R/B)
EC1	36	Power Steering Sensor Wire and Engine Wire (Head Cover RH)
IB2	38	Floor Wire and Instrument Panel Wire (Behind the Reinforce LH)
ID2	40	Engine Room Main Wire and Instrument Panel Wire (Behind the Reinforce LH)
ID3		
IE1	40	Engine Wire and Instrument Panel Wire (Behind the Glove Box)
IE2		

: **GROUND POINTS**

Code	See Page	Ground Points Location
EB	36	Cylinder Head
EC	36	Front Fender Apron LH
ID	38	Left Kick Panel
IE	38	Instrument Panel Brace LH
BG	42 (4-Door)	Left Quarter Pillar
	44 (2-Door)	

: **SPLICE POINTS**

Code	See Page	Wire Harness with Splice Points	Code	See Page	Wire Harness with Splice Points
E2	36	Engine Wire	I4	40	Engine Wire
E3			I5		
I2	40		I6		
I3			I8		