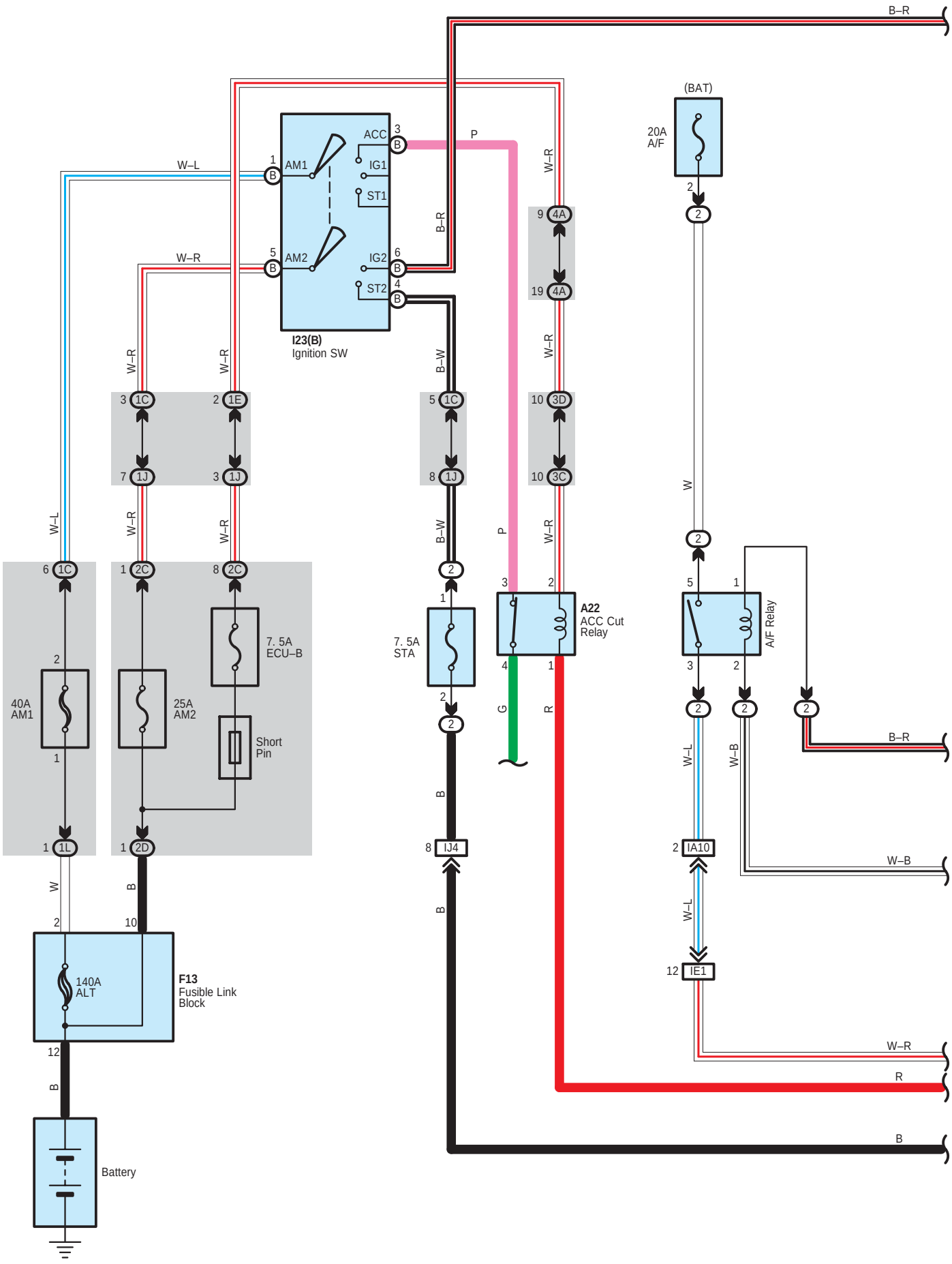
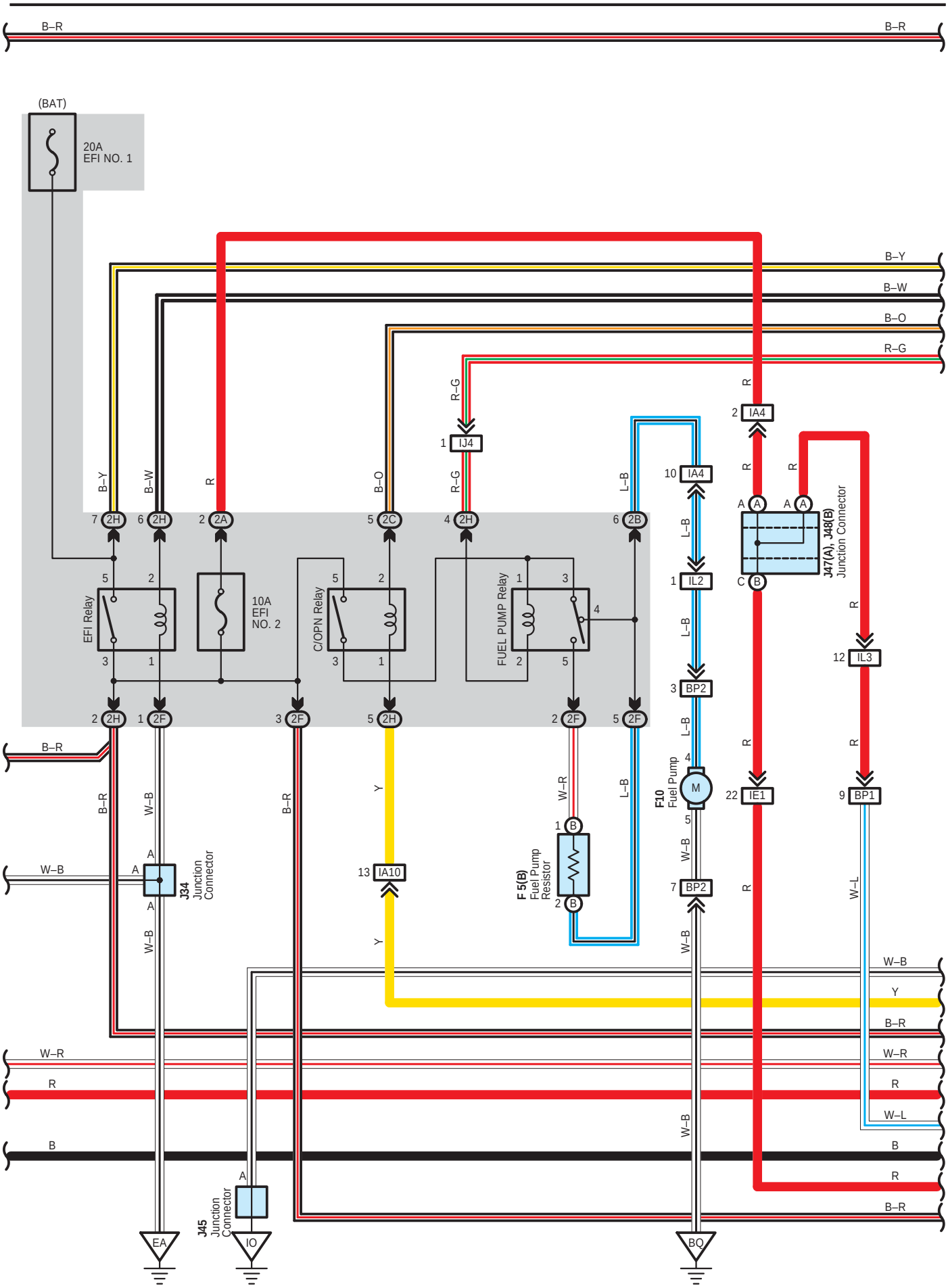
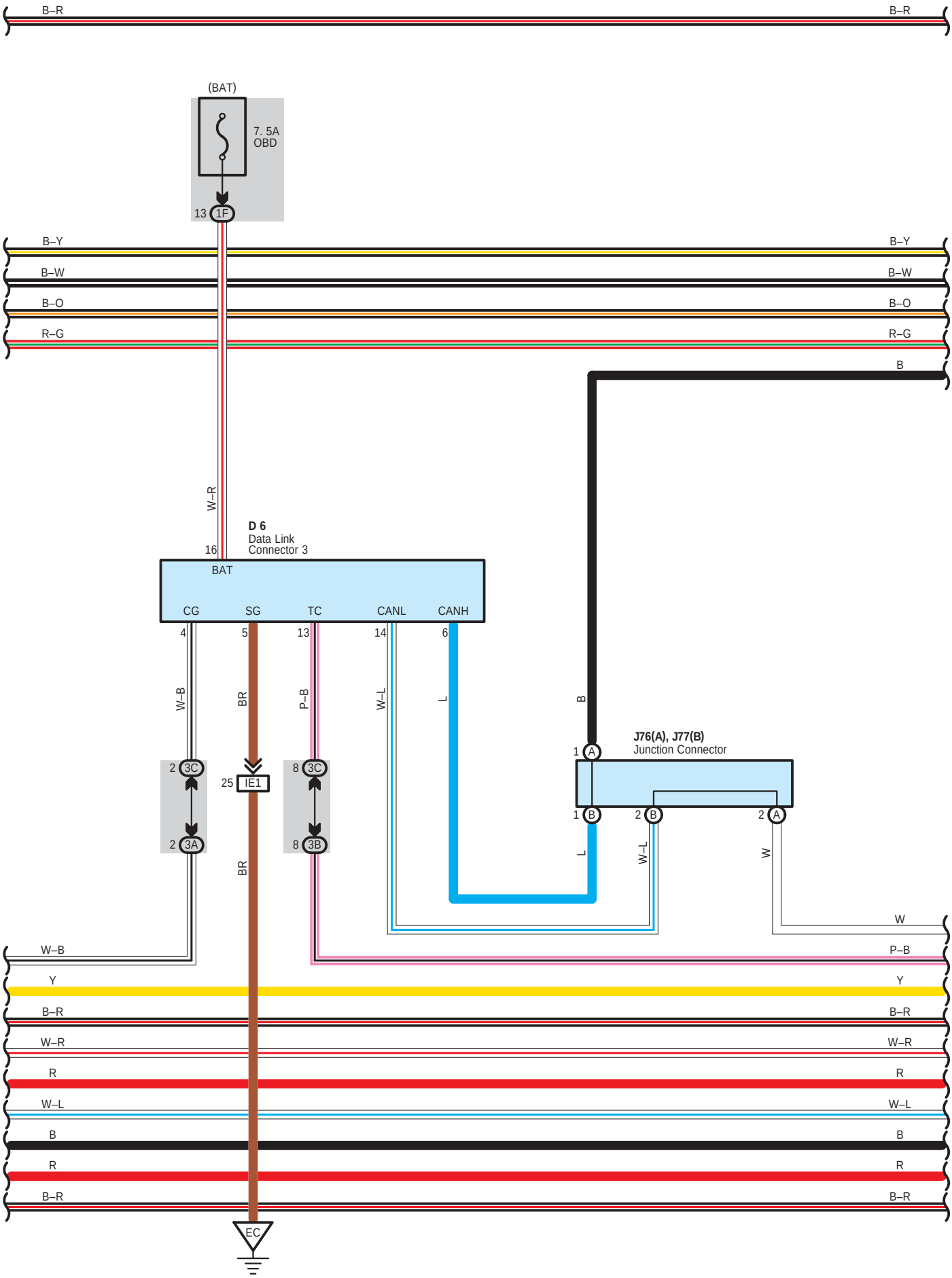
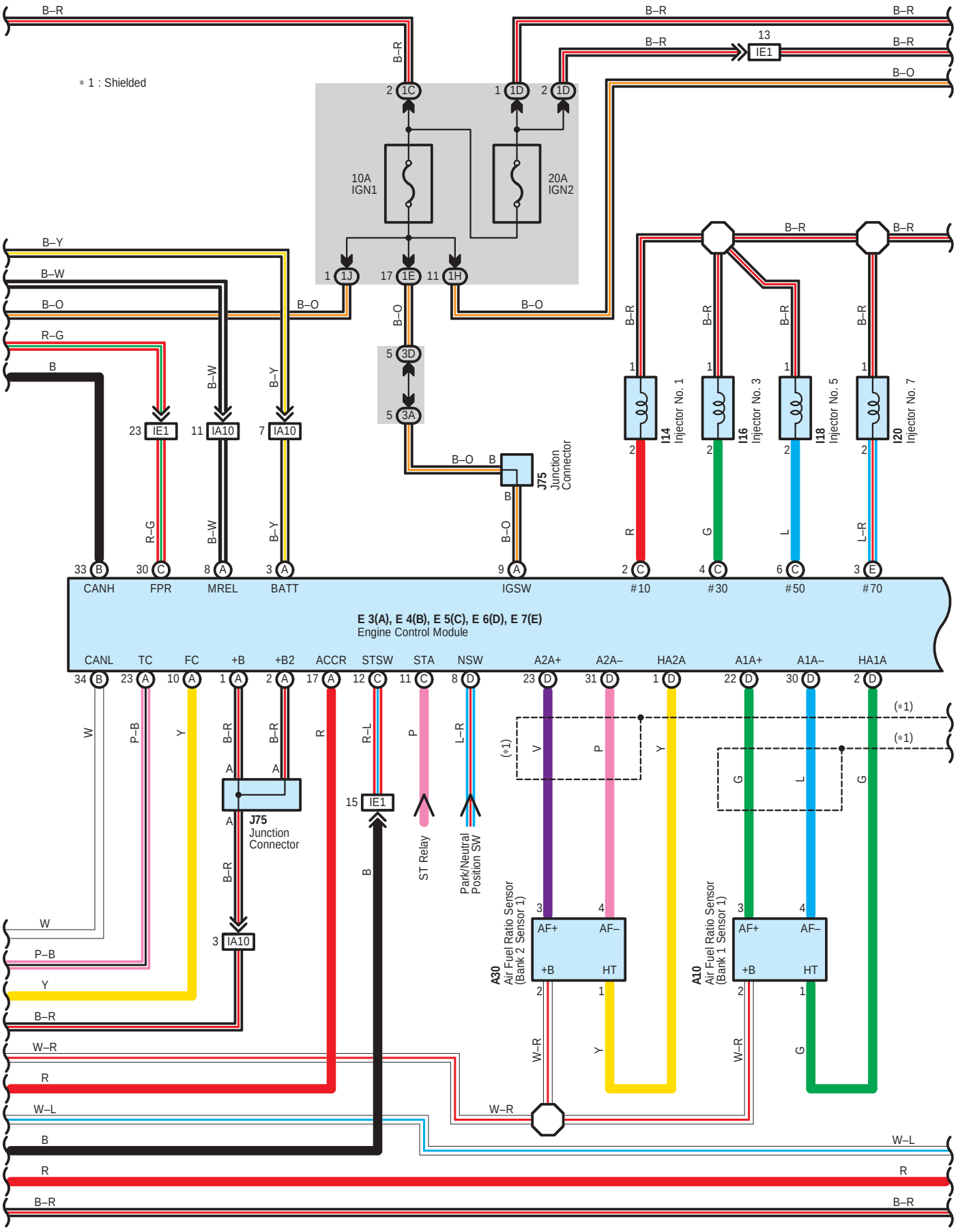
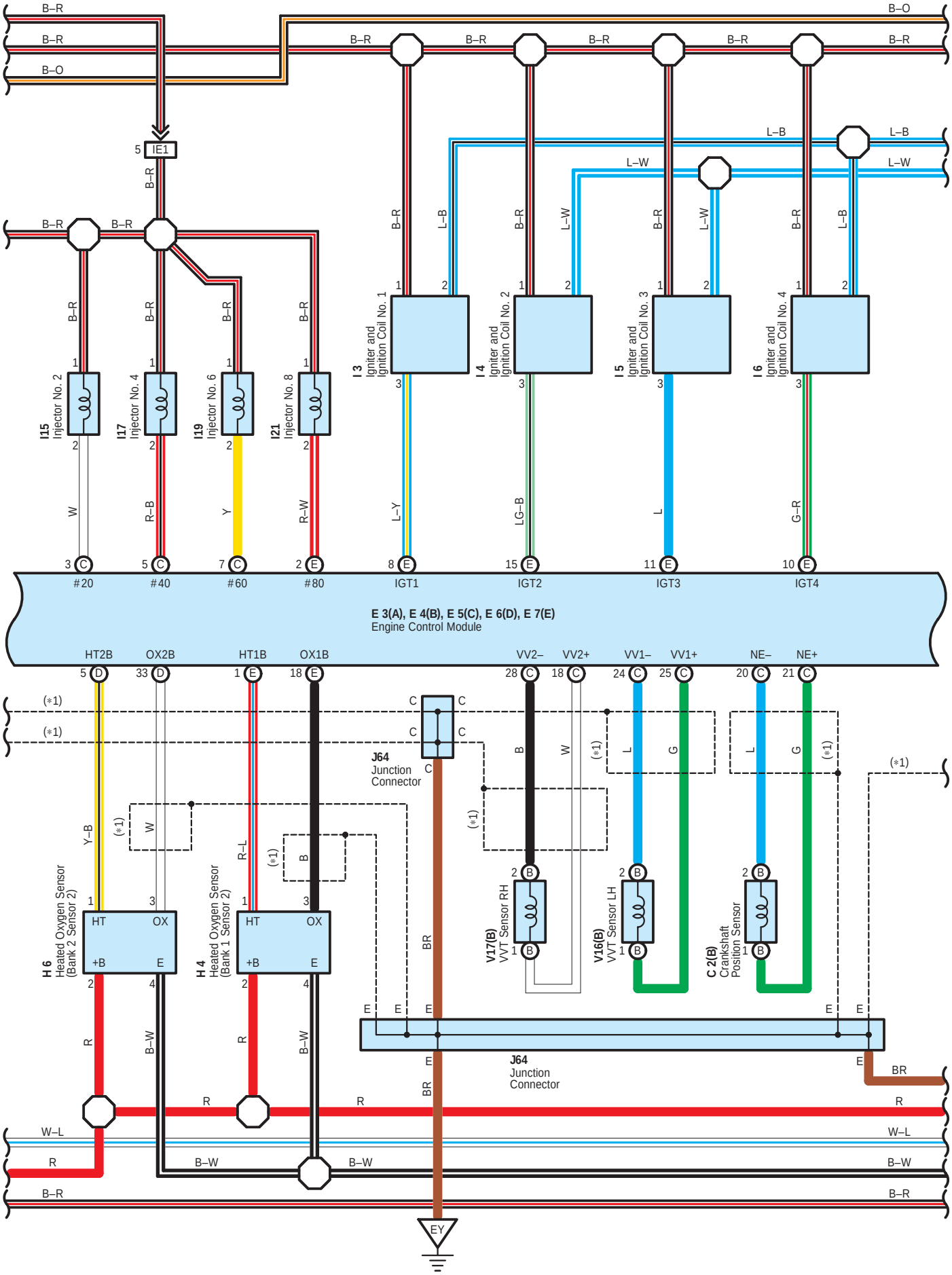
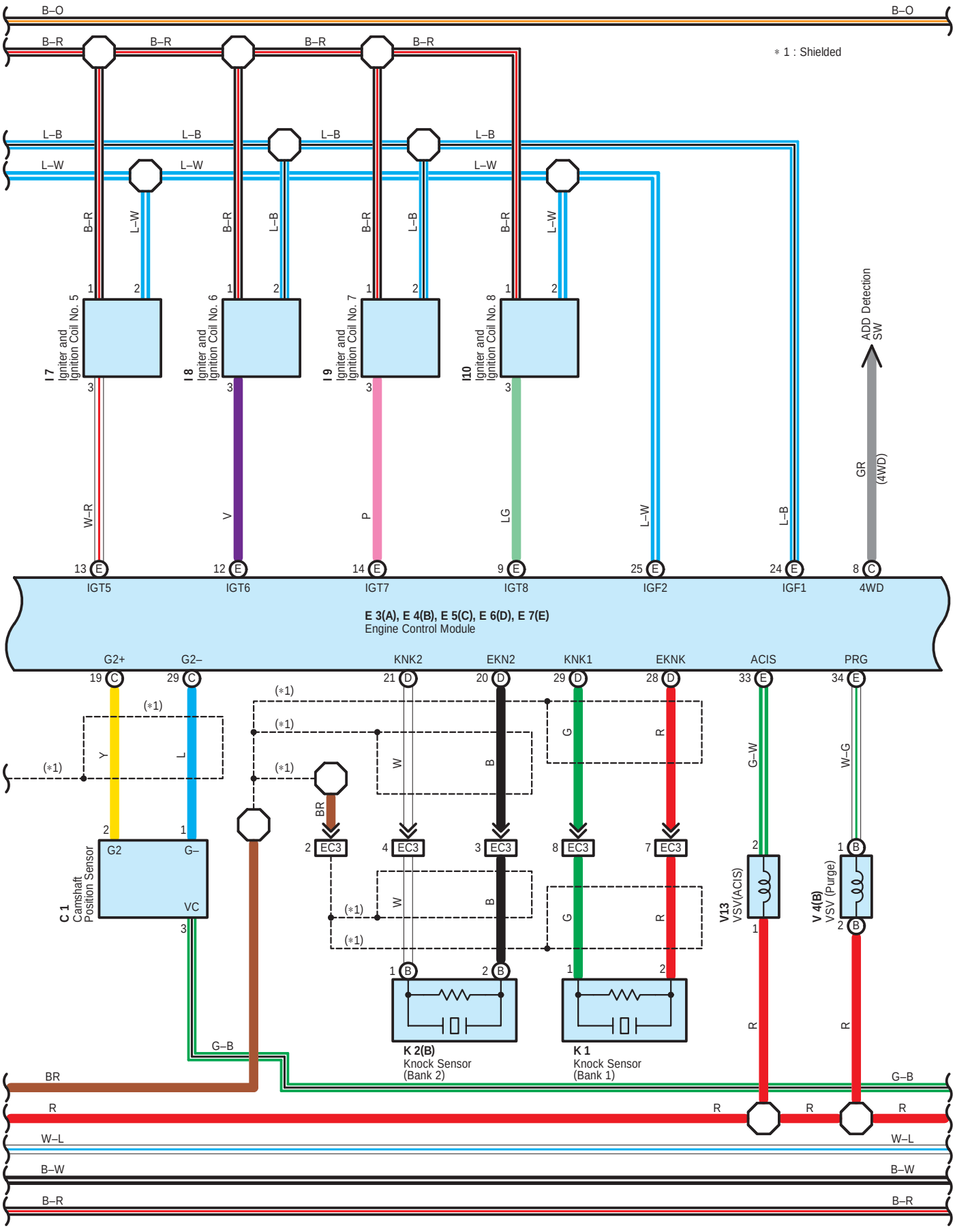

B–R
(BAT)
20A
A/F
ACC
IG1
ST1
IG2
ST2
AM1
AM2
I23(B)
Ignition SW
W–L
W–R
B–R
P
B–W
W
9 4A
19 4A
10 3D
10 3C
3 1C
7 1J
2 1E
3 1J
5 1C
8 1J
6 1C
1 2C
8 2C
1 2D
1 1L
40A
AM1
25A
AM2
7. 5A
ECU–B
Short
Pin
7. 5A
STA
A22
ACC Cut
Relay
A/F Relay
8 IJ4
2 IA10
12 IE1
W–B
G
R
B
140A
ALT
F13
Fusible Link
Block
Battery

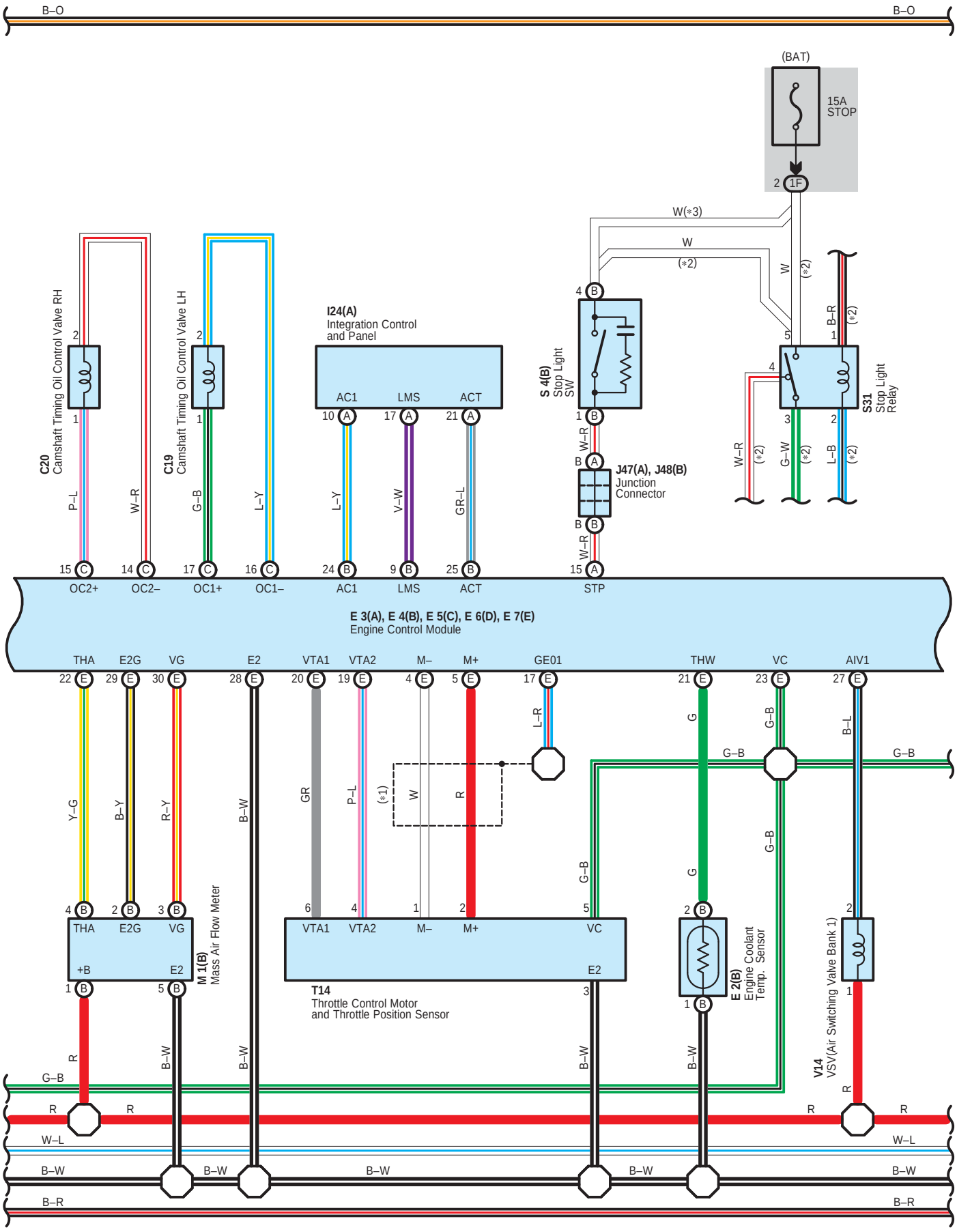

B–R
B–R
(BAT)
20A
EFI NO. 1
B–Y
B–W
B–O
R–G
R
L–B
EFI Relay
10A
EFI
NO. 2
C/OPN Relay
FUEL PUMP Relay
J47(A), J48(B)
Junction Connector
IJ4
IA4
IL2
IL3
BP2
BP1
IA10
IE1
2H
2A
2C
2B
2F
F10
Fuel Pump
M
F 5(B)
Fuel Pump
Resistor
W–R
Y
W–B
W–L
J34
Junction
Connector
J45
Junction
Connector
EA
IO
BQ

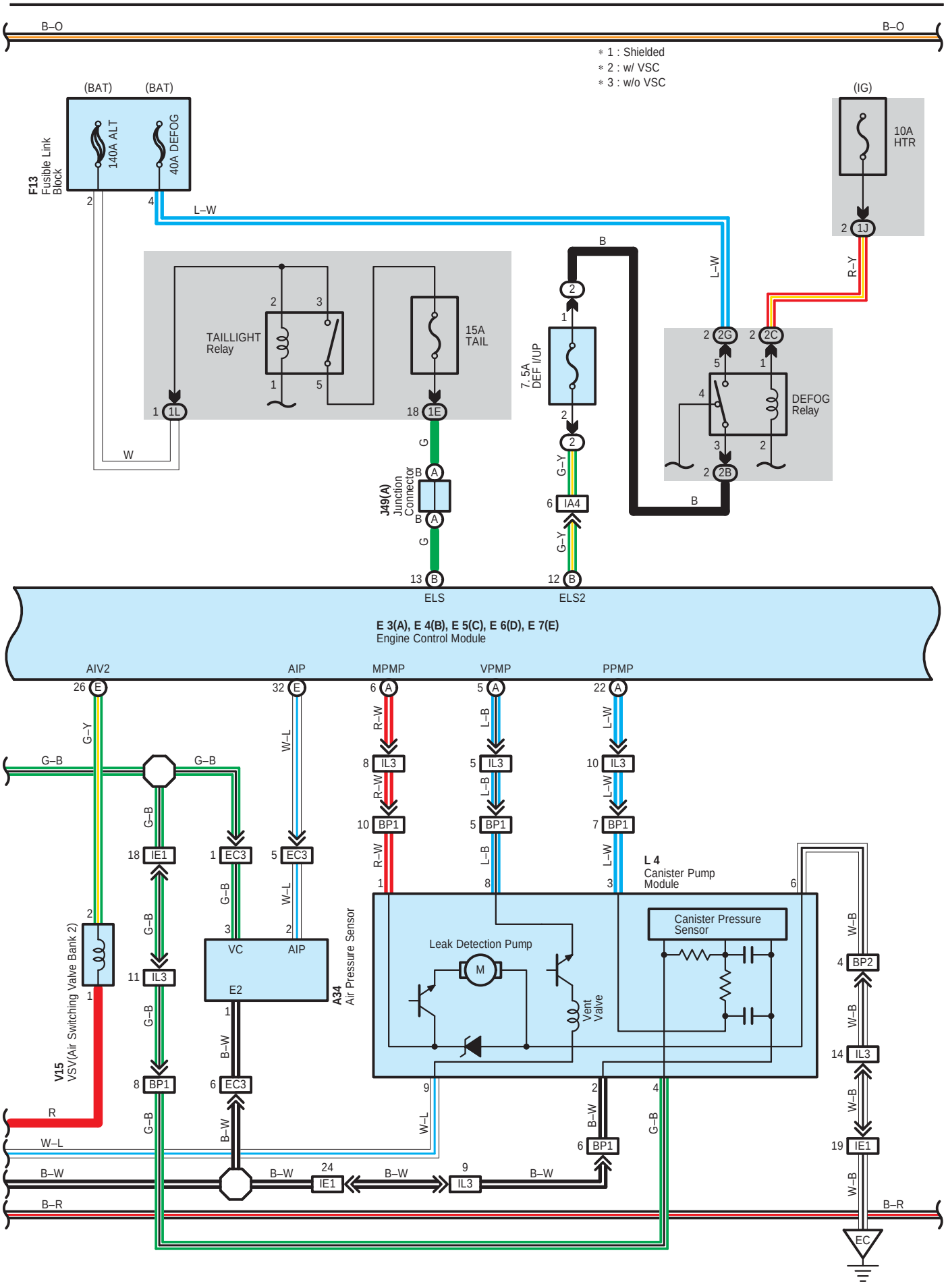

B–R
B–R
(BAT)
7. 5A
OBD
13 1F
B–Y
B–W
B–O
R–G
B–Y
B–W
B–O
R–G
B
W–R
D 6
Data Link
Connector 3
16
BAT
CG
SG
TC
CANL
CANH
4
5
13
14
6
W–B
BR
P–B
W–L
L
B
J76(A), J77(B)
Junction Connector
1 A
2 3C
25 IE1
8 3C
2 3A
8 3B
1 B
2 B
2 A
L
W–L
W
W
W–B
P–B
Y
Y
B–R
B–R
W–R
W–R
R
R
W–L
W–L
B
B
R
R
B–R
B–R
EC

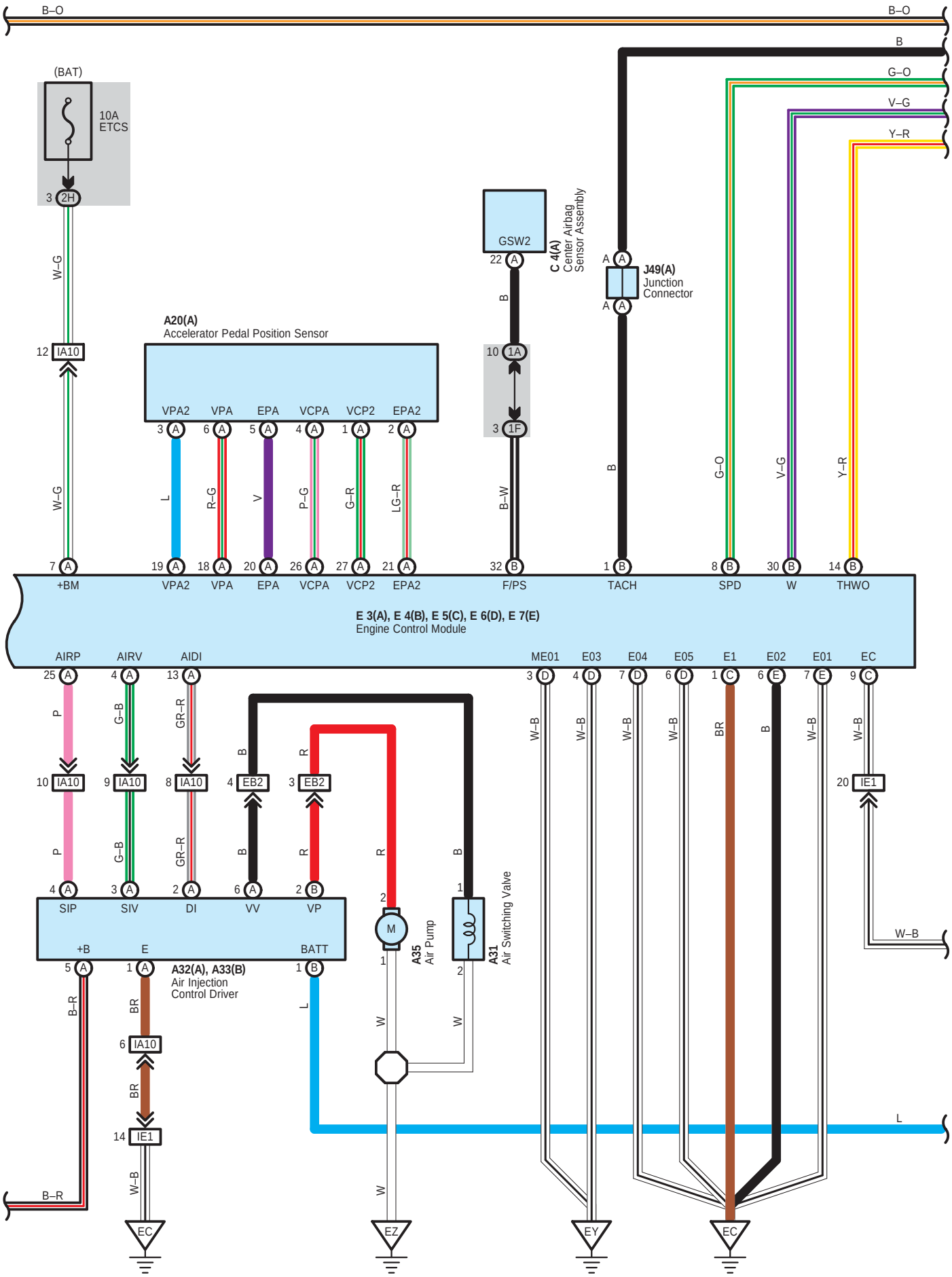

* 1 : Shielded
10A IGN1
20A IGN2
J75 Junction Connector
Injector No. 1
Injector No. 3
Injector No. 5
Injector No. 7
CANH
FPR
MREL
BATT
IGSW
#10
#30
#50
#70
E 3(A), E 4(B), E 5(C), E 6(D), E 7(E)
Engine Control Module
CANL
TC
FC
+B
+B2
ACCR
STSW
STA
NSW
A2A+
A2A–
HA2A
A1A+
A1A–
HA1A
ST Relay
Park/Neutral Position SW
A30 Air Fuel Ratio Sensor (Bank 2 Sensor 1)
A10 Air Fuel Ratio Sensor (Bank 1 Sensor 1)
AF+
AF–
+B
HT

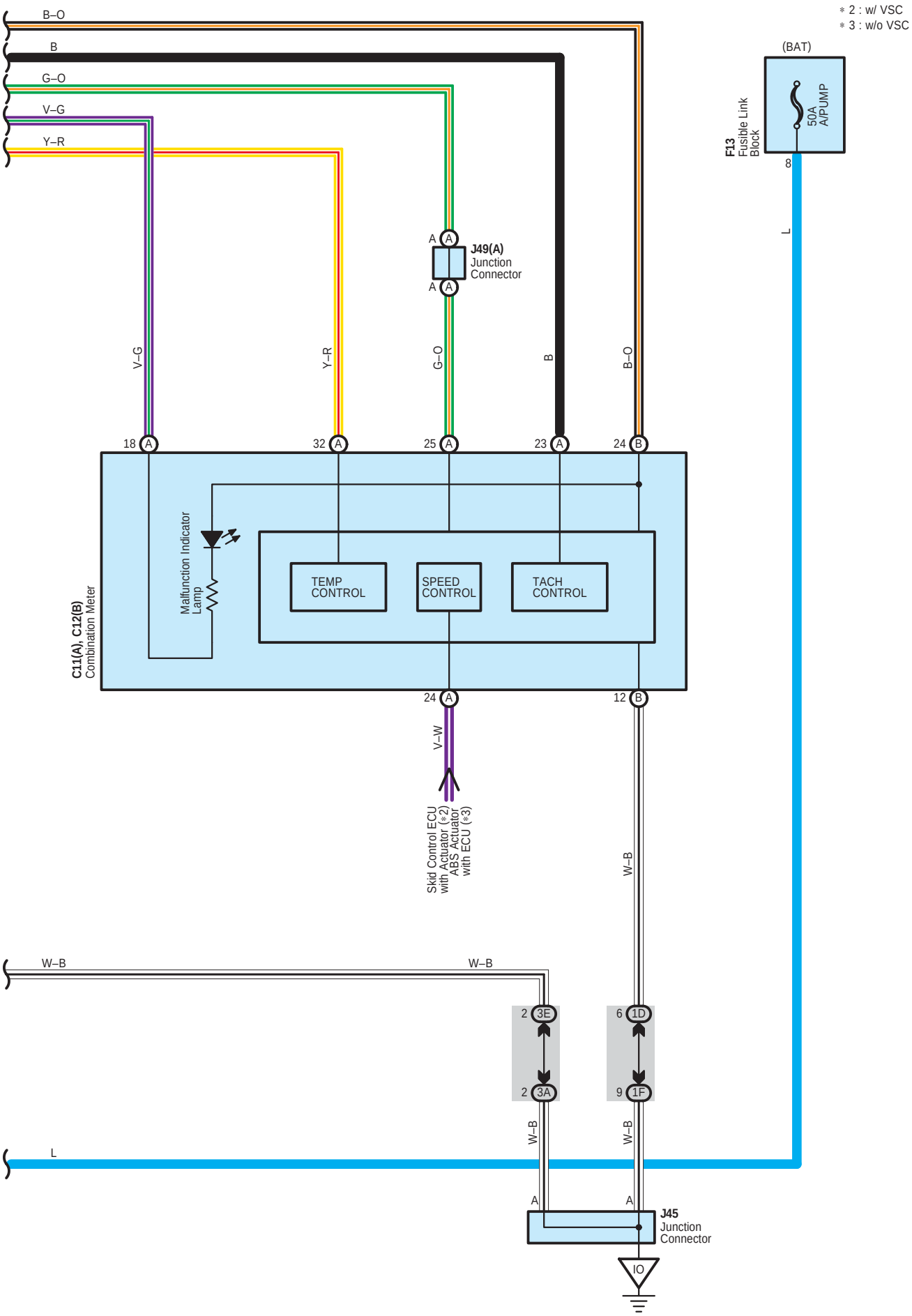

B–R
B–O
IE1
I15 Injector No. 2
I17 Injector No. 4
I19 Injector No. 6
I21 Injector No. 8
I3 Igniter and Ignition Coil No. 1
I4 Igniter and Ignition Coil No. 2
I5 Igniter and Ignition Coil No. 3
I6 Igniter and Ignition Coil No. 4
#20
#40
#60
#80
IGT1
IGT2
IGT3
IGT4
E 3(A), E 4(B), E 5(C), E 6(D), E 7(E)
Engine Control Module
HT2B
OX2B
HT1B
OX1B
VV2–
VV2+
VV1–
VV1+
NE–
NE+
J64
Junction Connector
H 6 Heated Oxygen Sensor (Bank 2 Sensor 2)
H 4 Heated Oxygen Sensor (Bank 1 Sensor 2)
V17(B) VVT Sensor RH
V16(B) VVT Sensor LH
C 2(B) Crankshaft Position Sensor
HT
OX
+B
E
EY


B–O
B–R
L–B
L–W
∗1 : Shielded
I 7 Igniter and Ignition Coil No. 5
I 8 Igniter and Ignition Coil No. 6
I 9 Igniter and Ignition Coil No. 7
I10 Igniter and Ignition Coil No. 8
ADD Detection SW
GR
(4WD)
W–R
V
P
LG
L–W
L–B
13 E IGT5
12 E IGT6
14 E IGT7
9 E IGT8
25 E IGF2
24 E IGF1
8 C 4WD
E 3(A), E 4(B), E 5(C), E 6(D), E 7(E)
Engine Control Module
G2+
G2–
KNK2
EKN2
KNK1
EKNK
ACIS
PRG
19 C
29 C
21 D
20 D
29 D
28 D
33 E
34 E
(∗1)
Y
L
W
B
G
R
G–W
W–G
BR
2 EC3
4 EC3
3 EC3
8 EC3
7 EC3
C 1 Camshaft Position Sensor
G2
G–
VC
V13 VSV(ACIS)
V 4(B) VSV (Purge)
K 2(B) Knock Sensor (Bank 2)
K 1 Knock Sensor (Bank 1)
G–B
R
W–L
B–W
B–R


B–O
B–O
(BAT)
15A
STOP
2 1F
W(*3)
W
(*2)
W
(*2)
B–R
(*2)
4 B
1 B
S 4(B)
Stop Light
SW
W–R
B A
J47(A), J48(B)
Junction
Connector
B B
W–R
15 A
STP
5
4
1
3
2
S31
Stop Light
Relay
W–R
(*2)
G–W
(*2)
L–B
(*2)
C20
Camshaft Timing Oil Control Valve RH
2
1
P–L
W–R
15 C
14 C
OC2+
OC2–
C19
Camshaft Timing Oil Control Valve LH
2
1
G–B
L–Y
17 C
16 C
OC1+
OC1–
I24(A)
Integration Control
and Panel
AC1
LMS
ACT
10 A
17 A
21 A
L–Y
V–W
GR–L
24 B
9 B
25 B
AC1
LMS
ACT
E 3(A), E 4(B), E 5(C), E 6(D), E 7(E)
Engine Control Module
THA
E2G
VG
E2
VTA1
VTA2
M–
M+
GE01
THW
VC
AIV1
22 E
29 E
30 E
28 E
20 E
19 E
4 E
5 E
17 E
21 E
23 E
27 E
Y–G
B–Y
R–Y
B–W
GR
P–L
(*1)
W
R
L–R
G
G–B
B–L
4 B
2 B
3 B
THA
E2G
VG
+B
E2
M 1(B)
Mass Air Flow Meter
1 B
5 B
R
B–W
B–W
6
4
1
2
5
VTA1
VTA2
M–
M+
VC
E2
T14
Throttle Control Motor
and Throttle Position Sensor
3
B–W
2 B
1 B
E 2(B)
Engine Coolant
Temp. Sensor
B–W
2
1
V14
VSV(Air Switching Valve Bank 1)
R
G–B
R
R
R
R
W–L
W–L
B–W
B–W
B–W
B–W
B–W
B–R
B–R


B–O
B–O
* 1 : Shielded
* 2 : w/ VSC
* 3 : w/o VSC
(BAT)
(BAT)
F13
Fusible Link Block
140A ALT
40A DEFOG
(IG)
10A HTR
L–W
R–Y
TAILLIGHT Relay
15A TAIL
7.5A DEF I/UP
DEFOG Relay
J49(A)
Junction Connector
ELS
ELS2
E 3(A), E 4(B), E 5(C), E 6(D), E 7(E)
Engine Control Module
AIV2
AIP
MPMP
VPMP
PPMP
V15
VSV(Air Switching Valve Bank 2)
A34
Air Pressure Sensor
L 4
Canister Pump Module
Leak Detection Pump
Vent Valve
Canister Pressure Sensor
G–Y
G–B
W–L
R–W
L–B
L–W
B–W
B–R
R
W
G
B
IE1
IL3
EC3
BP1
BP2
IA4
1L
1E
1J
2G
2C
2B
VC
E2
AIP
EC


B–O
B–O
B
G–O
V–G
Y–R
(BAT)
10A
ETCS
3 2H
W–G
12 IA10
W–G
7 A
+BM
A20(A)
Accelerator Pedal Position Sensor
VPA2 VPA EPA VCPA VCP2 EPA2
3 A 6 A 5 A 4 A 1 A 2 A
L R–G V P–G G–R LG–R
19 A 18 A 20 A 26 A 27 A 21 A
VPA2 VPA EPA VCPA VCP2 EPA2
GSW2
22 A
B
10 1A
3 1F
B–W
32 B
F/PS
C 4(A)
Center Airbag
Sensor Assembly
A A
J49(A)
Junction
Connector
A A
B
1 B
TACH
G–O
8 B
SPD
V–G
30 B
W
Y–R
14 B
THWO
E 3(A), E 4(B), E 5(C), E 6(D), E 7(E)
Engine Control Module
AIRP AIRV AIDI
25 A 4 A 13 A
P G–B GR–R
10 IA10 9 IA10 8 IA10
P G–B GR–R
4 A 3 A 2 A
SIP SIV DI
B B R R
4 EB2 3 EB2
6 A 2 B
VV VP
+B E BATT
5 A 1 A 1 B
B–R BR L
A32(A), A33(B)
Air Injection
Control Driver
6 IA10
BR
14 IE1
W–B
B–R
EC
R R
2 2
M
1 W
A35
Air Pump
B
1
2 W
A31
Air Switching Valve
W
EZ
ME01 E03 E04 E05 E1 E02 E01 EC
3 D 4 D 7 D 6 D 1 C 6 E 7 E 9 C
W–B W–B W–B W–B BR B W–B W–B
20 IE1
W–B
L
EY
EC


* 2 : w/ VSC
* 3 : w/o VSC
B–O
B
G–O
V–G
Y–R
(BAT)
F13
Fusible Link Block
50A A/PUMP
8
L
A
A
J49(A)
Junction Connector
A
A
V–G
Y–R
G–O
B
B–O
18 A
32 A
25 A
23 A
24 B
C11(A), C12(B)
Combination Meter
Malfunction Indicator Lamp
TEMP CONTROL
SPEED CONTROL
TACH CONTROL
24 A
12 B
V–W
Skid Control ECU with Actuator (*2)
ABS Actuator with ECU (*3)
W–B
W–B
W–B
2 3E
2 3A
6 1D
9 1F
W–B
W–B
L
A
A
J45
Junction Connector
IO

System Outline

The engine control system utilizes a microcomputer and maintains overall control of the engine, transmission etc. An outline of the engine control is given 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. The engine coolant temp. is input into TERMINAL THW of the engine control module as a control signal.

(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 to TERMINAL THA of the engine control module.

(3) Oxygen sensor signal circuit

The oxygen density in the exhaust emission is detected and is input as a control signal from the heated oxygen sensors to TERMINALS OX1B, OX2B of the engine control module.

(4) RPM signal circuit

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

(5) Throttle position sensor signal circuit

The throttle position sensor detects the throttle valve opening angle as a control signal, which is input into TERMINALS VTA1, VTA2 of the engine control module.

(6) Vehicle speed circuit

The vehicle speed sensor, detects the vehicle speed and input to the speed sensor of the skid control ECU with actuator, from skid control ECU to TERMINAL SPD of the engine control module, via combination meter.

(7) 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 through the EFI relay, to TERMINALS +B, +B2 of the engine control module. The current from the IGN fuse flows to TERMINAL IGSW of the engine control module, and voltage is constantly applied to TERMINAL +BM.

(8) Intake air volume signal circuit

The intake air volume is detected by the mass air flow meter, and is input as a control signal to TERMINAL VG of the engine control module.

(9) Stop light SW signal circuit

The stop light SW is used to detect whether the vehicle is braking or not, and the signal is input into TERMINAL STP of the engine control module as a control signal.

(10) Starter signal circuit

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

(11) Engine knock signal circuit

Engine knocking is detected by the knock sensors, and is input into TERMINALS KNK1, KNK2 of the engine control module as a control signal.

2. Control System

* SFI system
  The SFI system monitors the engine condition through the signals input from each sensors to the engine control module. The control signal is sent to the engine control module TERMINALS #10, #20, #30, #40, #50, #60, #70, #80 to operate the injector (Fuel injection). The SFI system controls the fuel injection by the engine control module in response to the driving conditions.
* ESA system
  The ESA system monitors the engine condition through the signals input from each sensors to the engine control module. The best ignition timing is decided according to this data and the data memorized in the engine control module. The control signal is output to TERMINALS IGT1, IGT2, IGT3, IGT4, IGT5, IGT6, IGT7, IGT8, and these signals control the igniter to provide the best ignition timing.
* Heated oxygen sensor heater control system
  The heated oxygen sensor heater control system turns the heater on when the intake air volume is low (Temp. of exhaust emission is low), and warms up the heated oxygen sensors to improve their detection performance. The engine control module evaluates the signals from each sensors, and outputs current to TERMINALS HT1B and HT2B to control the heater.
* Air fuel ratio sensor heater control system
  The air fuel ratio sensor heater control system turns the heater on when the intake air volume is low (Temp. of exhaust emission is low) and warms up the air fuel ratio sensor to improve detection performance of the sensor.
  The engine control module evaluates the signals from each sensor, current is output to TERMINALS A1A+ and A2A+ controlling the heater.
* Fuel pump control system
  The engine control module supplies current to TERMINAL FPR, and controls the operation speed of the fuel pump with the F/PMP relay.
* ETCS–i
  The ETCS–i controls the engine output at its optimal level in accordance with the opening of the accelerator pedal, under all driving conditions.

3. Diagnosis System

When there is a malfunction in the engine control module signal system, the malfunctioning system is recorded in the memory. The malfunctioning system can be found by reading the code displayed on the malfunction indicator lamp.

4. Fail–Safe System

When a malfunction has occurred in any system, there is a possibility of causing engine trouble due to continued control based on that system. In that case, the fail–safe system either controls the system using the data (Standard values) recorded in the engine control module memory, or else stops the engine.

Engine Control (Double Cab)

: Parts Location

Code	See Page	Code	See Page	Code	See Page
A10	70	F5 B	70	J34	71
A20 A	72	F10	76	J45	74
A22	72	F13	70	J47 A	74
A30	70	H4	70	J48 B	74
A31	70	H6	70	J49 A	74
A32 A	70	I3	71	J64	74
A33 B	70	I4	71	J75	74
A34	70	I5	71	J76 A	74
A35	70	I6	71	J77 B	74
C1	70	I7	71	K1	71
C2 B	70	I8	71	K2 B	71
C4 A	72	I9	71	L4	76
C11 A	72	I10	71	M1 B	71
C12 B	72	I14	71	S4 B	75
C19	70	I15	71	S31	75
C20	70	I16	71	T14	71
D6	73	I17	71	V4 B	71
E2 B	70	I18	71	V13	71
E3 A	73	I19	71	V14	71
E4 B	73	I20	71	V15	71
E5 C	73	I21	71	V16 B	71
E6 D	73	I23 B	73	V17 B	71
E7 E	73	I24 A	73		

: Relay Blocks

Code	See Page	Relay Blocks (Relay Block Location)
2	42	Engine Room R/B No.2 (Engine Compartment Left)

: Junction Block and Wire Harness Connector

Code	See Page	Junction Block and Wire Harness (Connector Location)
1A	49	Cowl Wire and Driver Side J/B (Lower Finish Panel)
1C		
1D		
1E		
1F		
1H		
1J	49	Engine Room Main Wire and Driver Side J/B (Lower Finish Panel)
1L		
2A	45	Engine Room Main Wire and Engine Room J/B (Engine Compartment Left)
2B		
2C		
2D		
2F		
2G		
2H		
3A	52	Cowl Wire and Sub J/B No.3 (Upper the Accelerator Pedal)
3B		
3C		
3D		
3E		
4A	54	Cowl Wire and Sub J/B No.4 (Upper the Accelerator Pedal)

: **Connector Joining Wire Harness and Wire Harness**

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
EB2	90	Engine No.2 Wire and Engine Room Main Wire (Under the Engine Room R/B)
EC3	90	Engine No.2 Wire and Engine Wire (Near the Starter)
IA4	92	Engine Room Main Wire and Cowl Wire (Left Kick Panel)
IA10		
IE1	93	Engine Wire and Cowl Wire (Right Side of Instrument Panel)
IJ4	93	Engine Room Main Wire and Cowl Wire (Cowl Side Panel RH)
IL2	92	Floor No.2 Wire and Cowl Wire (Right Kick Panel)
IL3	93	Floor No.2 Wire and Cowl Wire (Instrument Panel Brace RH)
BP1	94	Frame Wire and Floor No.2 Wire (Under the Driver's Seat)
BP2		

: **Ground Points**

Code	See Page	Ground Points Location
EA	90	Front Left Fender Apron
EC	90	Rear Bank of Left Cylinder Head
EY	90	Front Left Side of Cylinder Head
EZ	90	Left Side of Cylinder Block
IO	92	Left Kick Panel
BQ	94	Left Side of Center Pillar