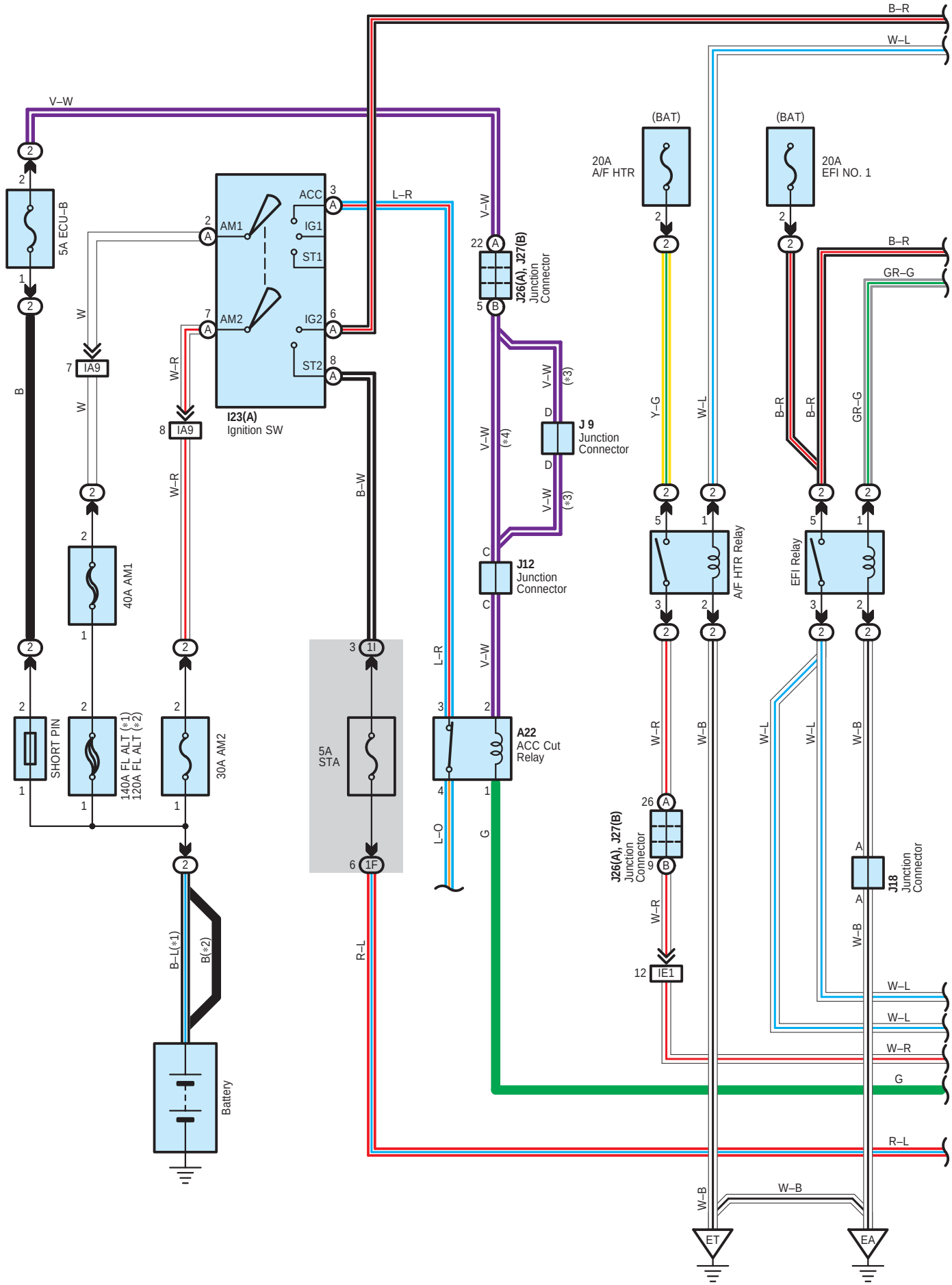
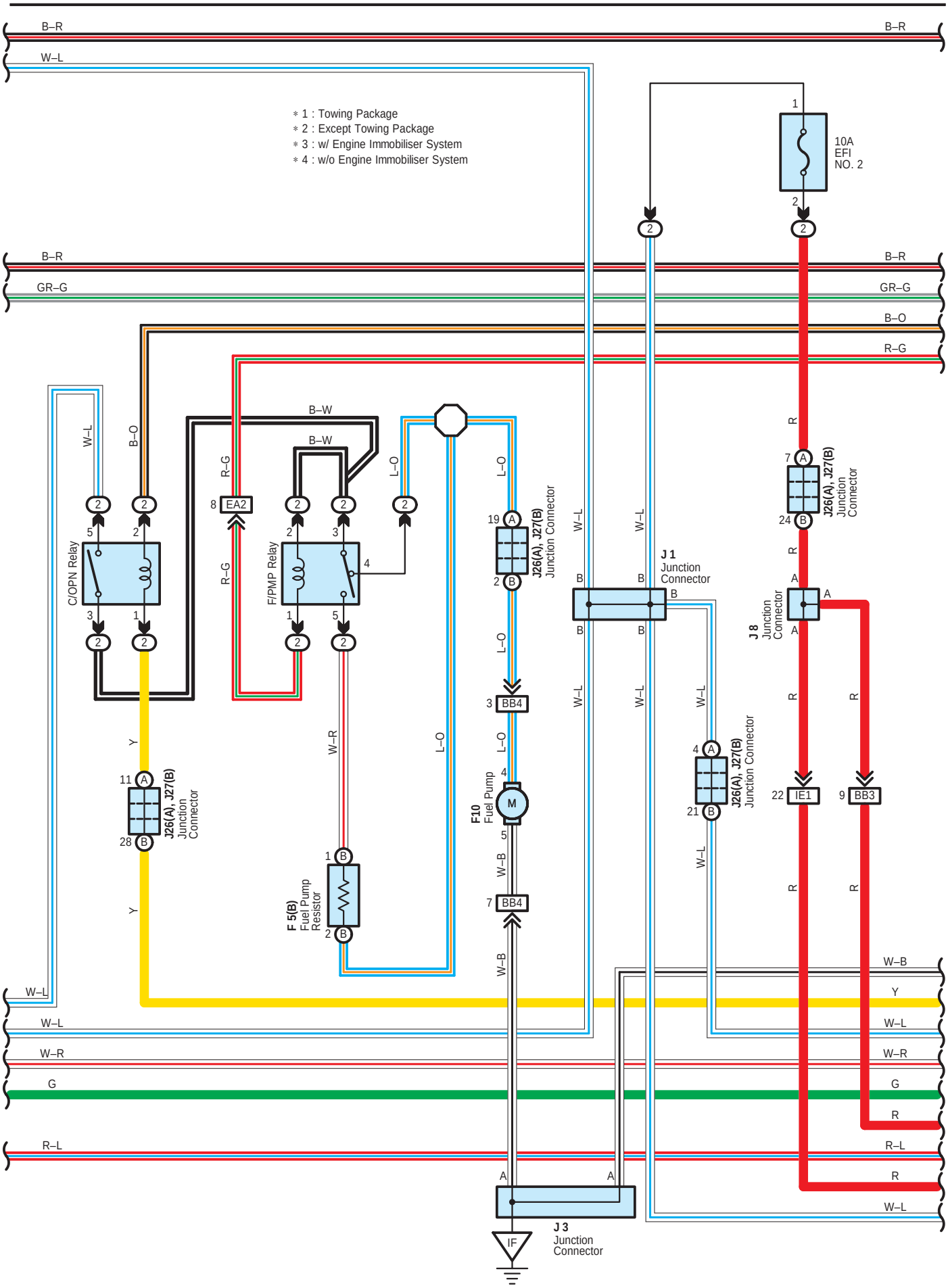
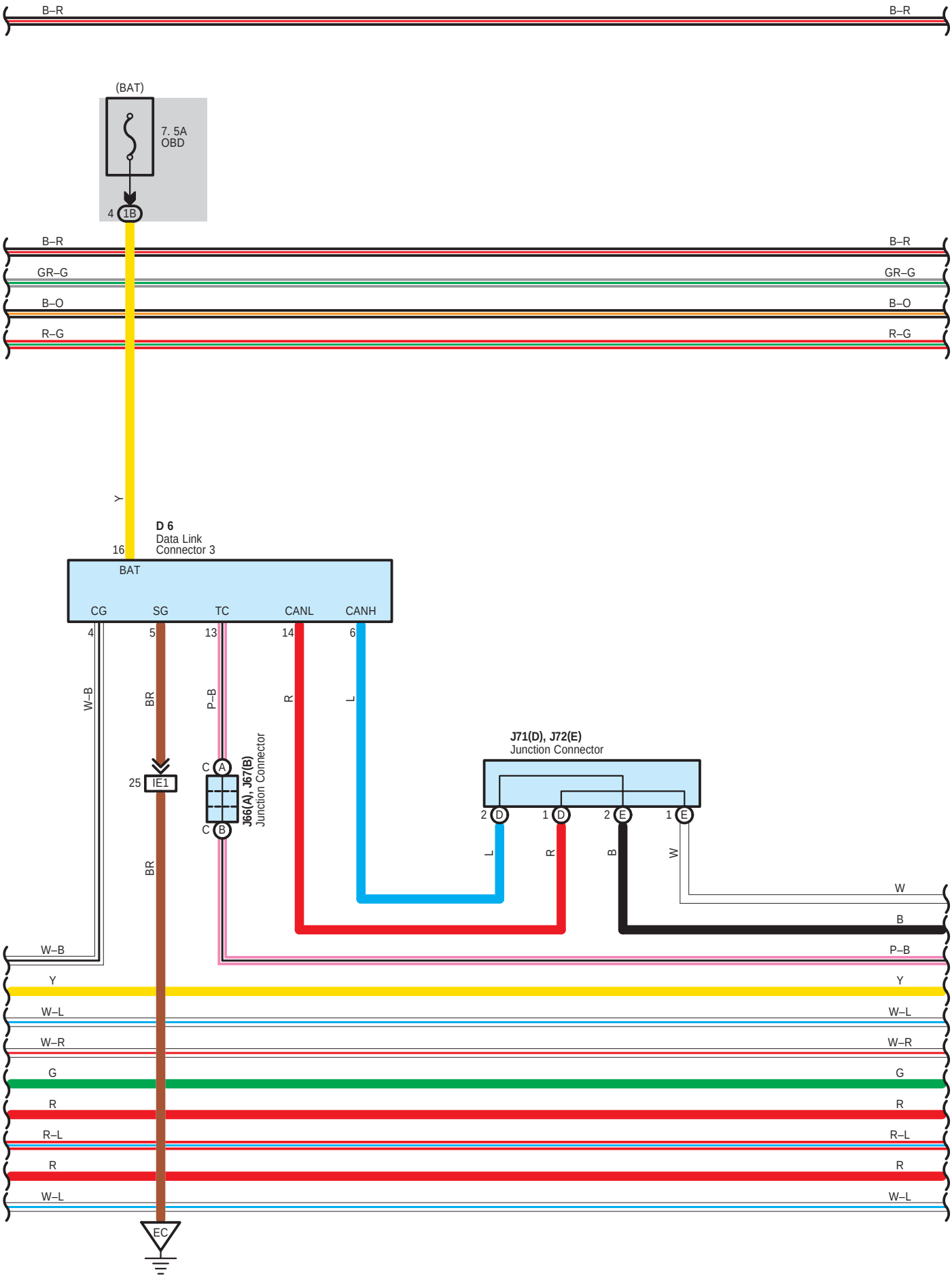
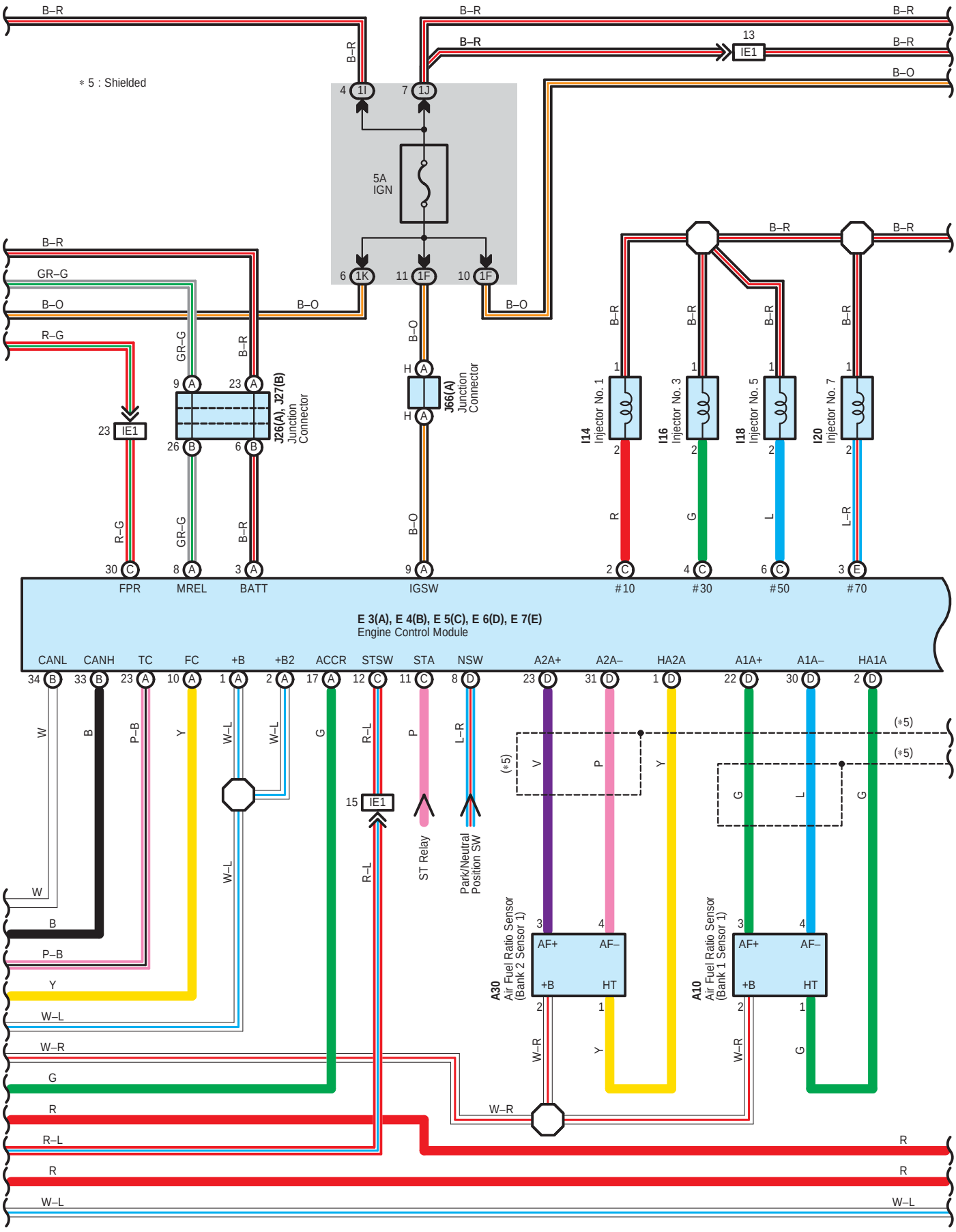
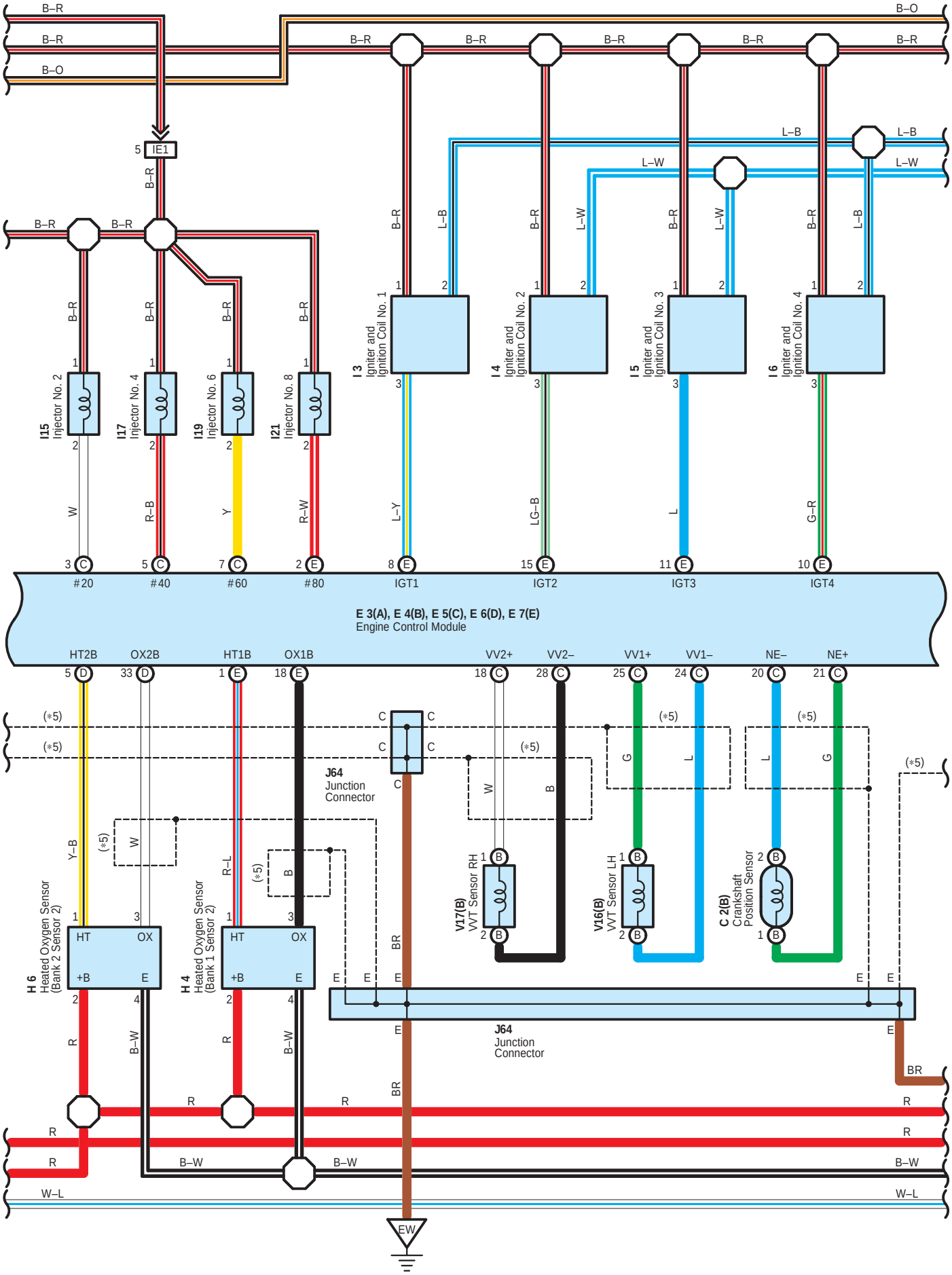

B–R
W–L
V–W
5A ECU–B
ACC
IG1
ST1
IG2
ST2
AM1
AM2
I23(A)
Ignition SW
L–R
V–W
J26(A), J27(B)
Junction Connector
J 9
Junction Connector
J12
Junction Connector
A22
ACC Cut Relay
5A STA
IA9
W
W–R
B–W
B
40A AM1
140A FL ALT (*1)
120A FL ALT (*2)
SHORT PIN
30A AM2
B–L(*1)
B(*2)
Battery
R–L
L–O
G
(BAT)
20A A/F HTR
20A EFI NO. 1
A/F HTR Relay
EFI Relay
Y–G
GR–G
W–B
IE1
J18
Junction Connector
ET
EA

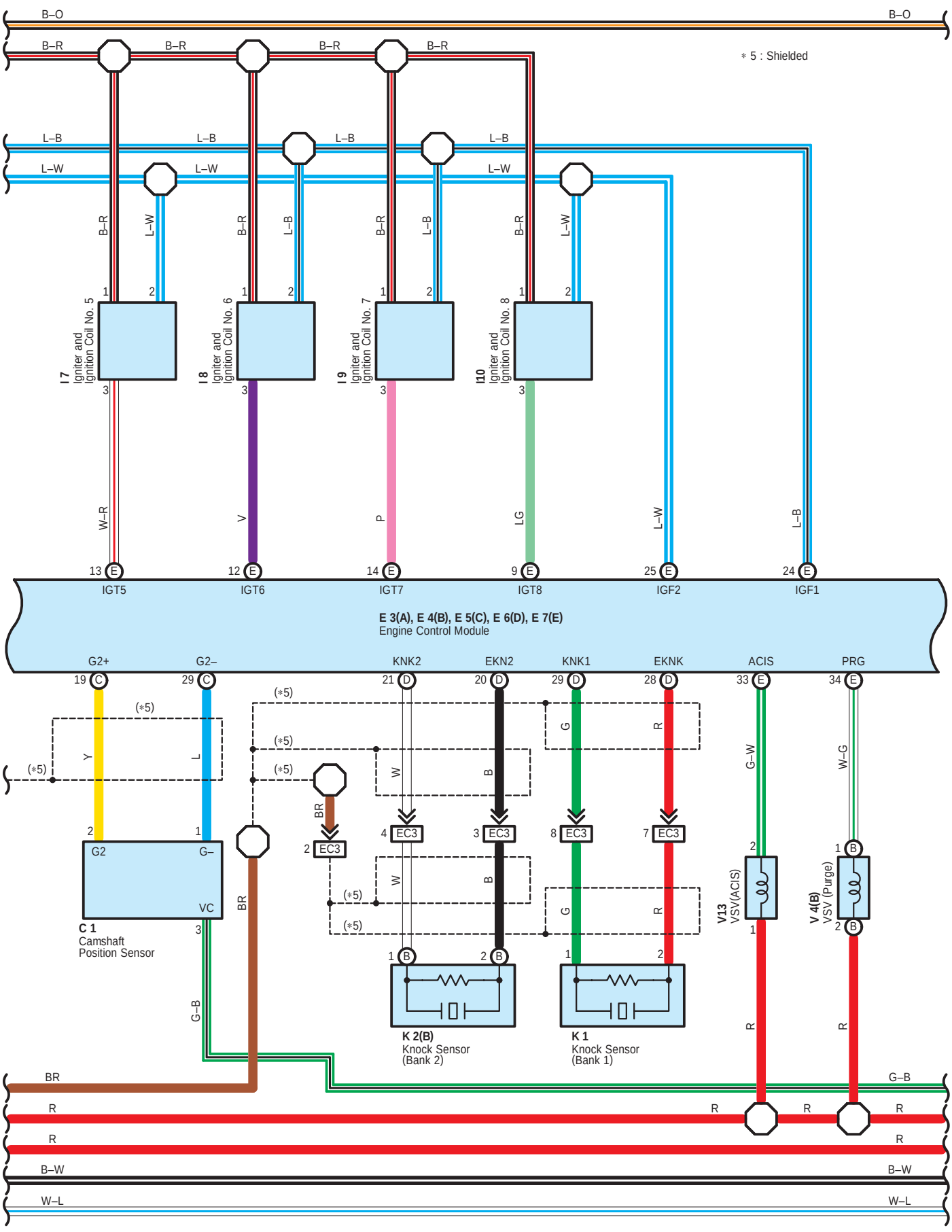

* 1 : Towing Package
* 2 : Except Towing Package
* 3 : w/ Engine Immobiliser System
* 4 : w/o Engine Immobiliser System
10A EFI NO. 2
C/OPN Relay
F/PMP Relay
J26(A), J27(B) Junction Connector
J 1 Junction Connector
J 8 Junction Connector
F10 Fuel Pump
F 5(B) Fuel Pump Resistor
J 3 Junction Connector
EA2
IE1
BB3
BB4
IF


B–R
B–R
(BAT)
7. 5A
OBD
4
1B
B–R
B–R
GR–G
GR–G
B–O
B–O
R–G
R–G
Y
D 6
Data Link
Connector 3
16
BAT
CG
SG
TC
CANL
CANH
4
5
13
14
6
W–B
BR
P–B
R
L
25
IE1
C
A
C
B
J66(A), J67(B)
Junction Connector
J71(D), J72(E)
Junction Connector
2
D
1
D
2
E
1
E
L
R
B
W
W
B
W–B
P–B
Y
Y
W–L
W–L
W–R
W–R
G
G
R
R
R–L
R–L
R
R
W–L
W–L
EC

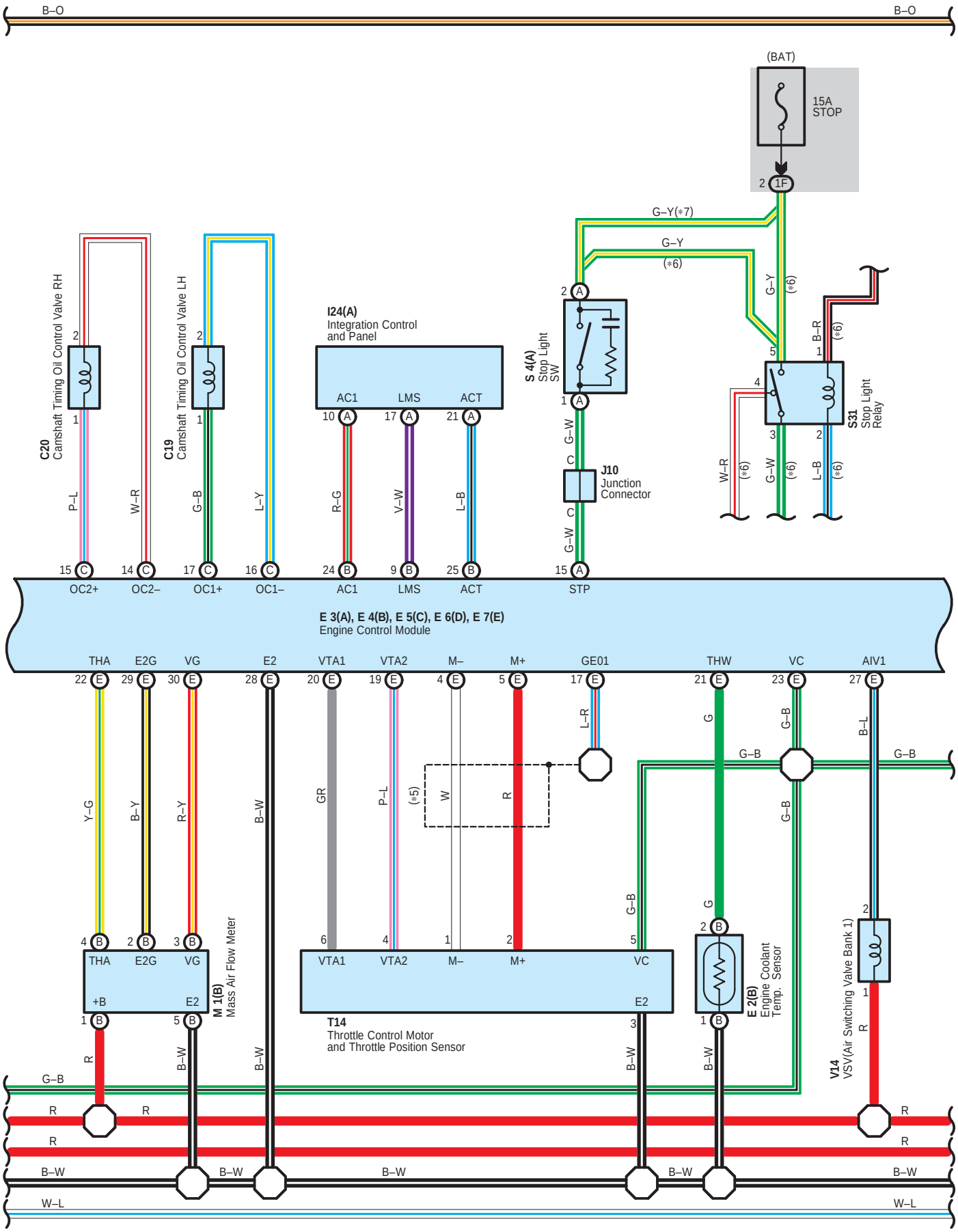

* 5 : Shielded
5A IGN
J26(A), J27(B) Junction Connector
J66(A) Junction Connector
I14 Injector No. 1
I16 Injector No. 3
I18 Injector No. 5
I20 Injector No. 7
FPR
MREL
BATT
IGSW
#10
#30
#50
#70
E 3(A), E 4(B), E 5(C), E 6(D), E 7(E)
Engine Control Module
CANL
CANH
TC
FC
+B
+B2
ACCR
STSW
STA
NSW
A2A+
A2A–
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

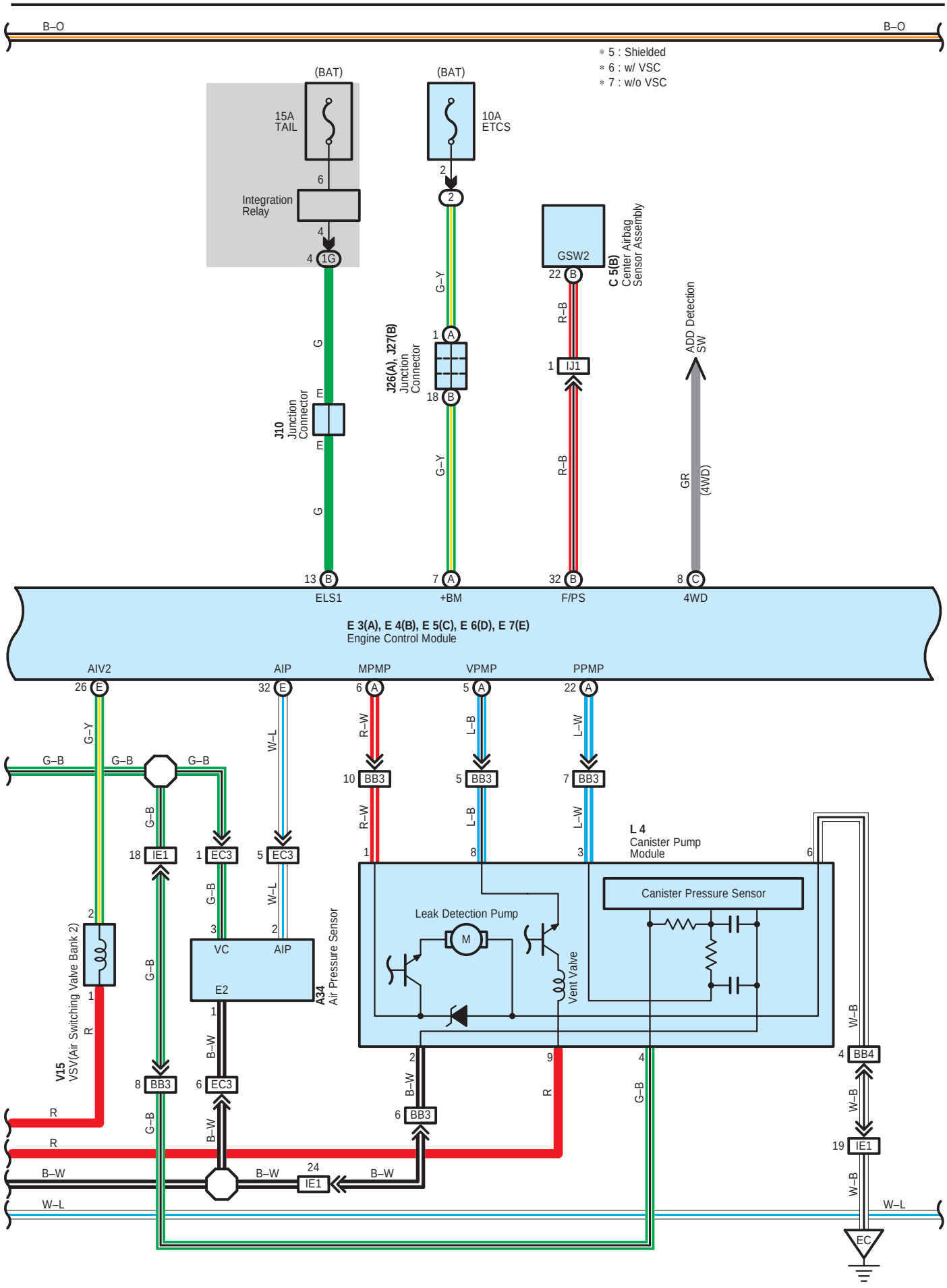
Engine Control for 2UZ–FE (Access/Standard Cab)



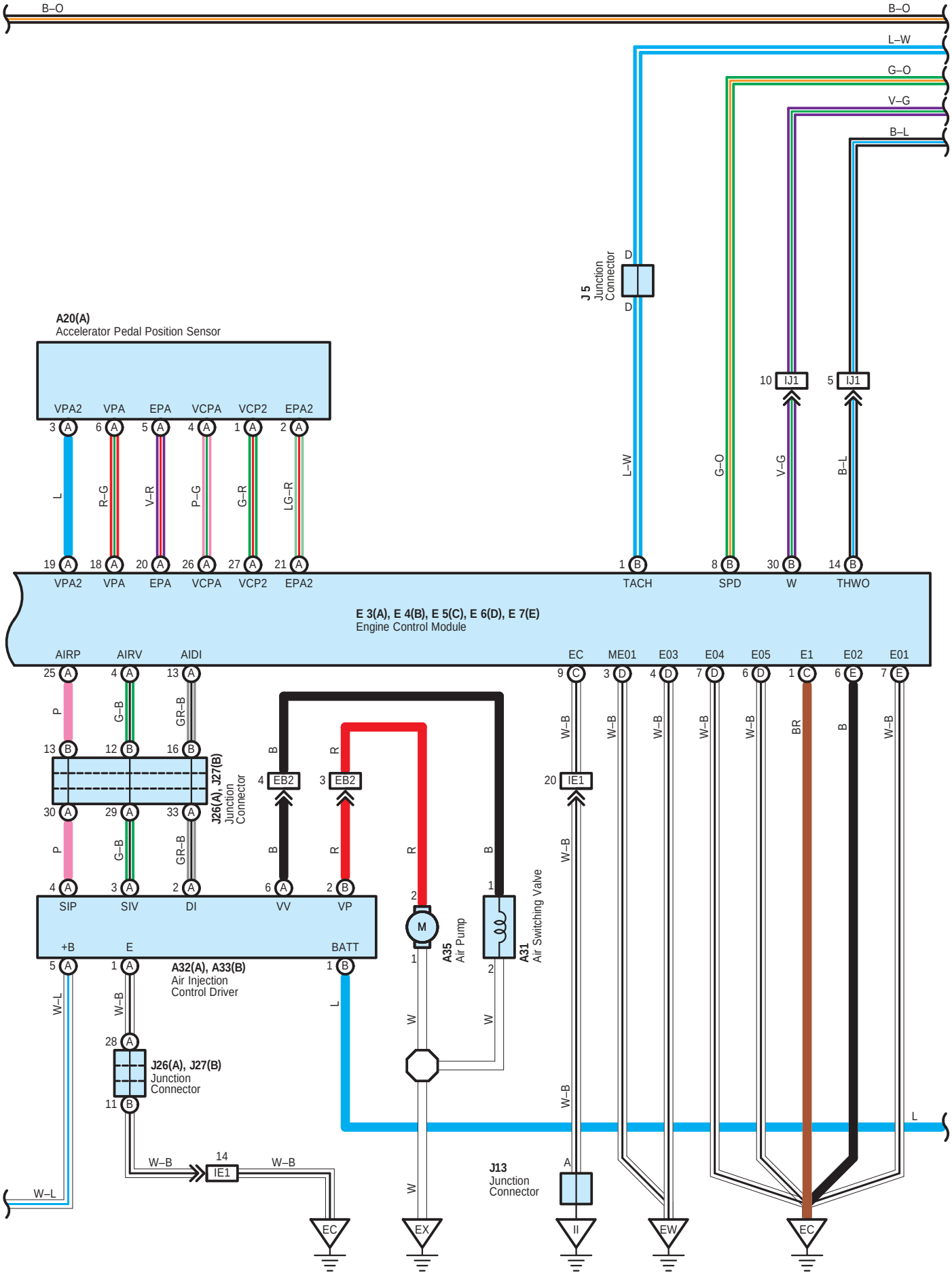

B–O
B–R
L–B
L–W
W–R
V
P
LG
L–W
L–B
∗ 5 : Shielded
I 7 Igniter and Ignition Coil No. 5
I 8 Igniter and Ignition Coil No. 6
I 9 Igniter and Ignition Coil No. 7
I10 Igniter and Ignition Coil No. 8
13 E IGT5
12 E IGT6
14 E IGT7
9 E IGT8
25 E IGF2
24 E IGF1
E 3(A), E 4(B), E 5(C), E 6(D), E 7(E)
Engine Control 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
(∗5)
Y
L
W
B
G
R
G–W
W–G
BR
EC3
G2
G–
VC
C 1
Camshaft
Position Sensor
G–B
K 2(B)
Knock Sensor
(Bank 2)
K 1
Knock Sensor
(Bank 1)
V13
VSV(ACIS)
V 4(B)
VSV (Purge)
R
B–W
W–L

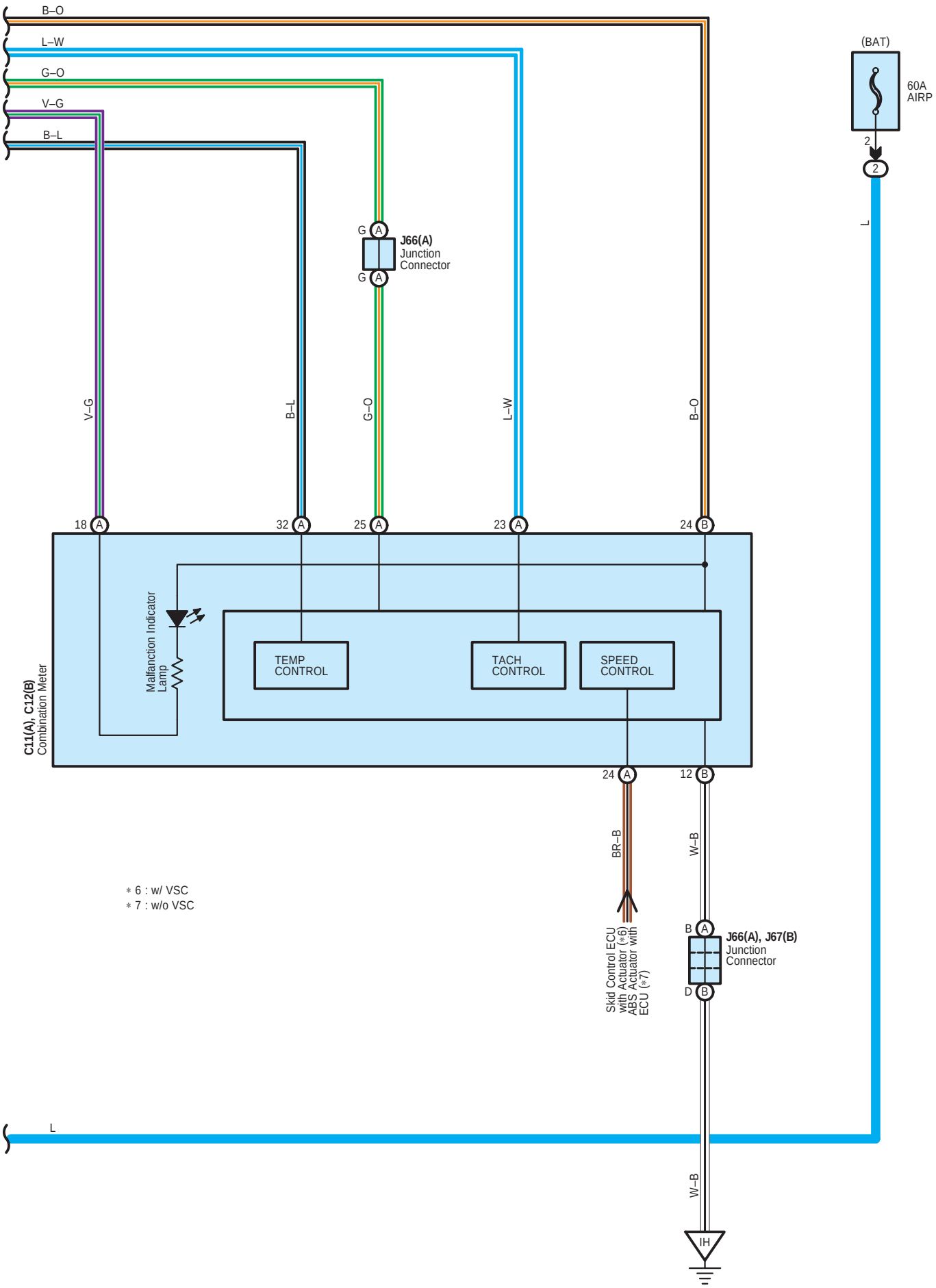
Engine Control for 2UZ–FE (Access/Standard Cab)




B–O
B–O
* 5 : Shielded
* 6 : w/ VSC
* 7 : w/o VSC
(BAT)
15A
TAIL
Integration
Relay
(BAT)
10A
ETCS
GSW2
C 5(B)
Center Airbag
Sensor Assembly
ADD Detection
SW
J10
Junction
Connector
J26(A), J27(B)
Junction
Connector
ELS1
+BM
F/PS
4WD
E 3(A), E 4(B), E 5(C), E 6(D), E 7(E)
Engine Control Module
AIV2
AIP
MPMP
VPMP
PPMP
BB3
EC3
IE1
BB4
EC
L 4
Canister Pump
Module
Canister Pressure Sensor
Leak Detection Pump
Vent Valve
V15
VSV(Air Switching Valve Bank 2)
A34
Air Pressure Sensor
VC
AIP
E2
G–Y
G–B
W–L
R–W
L–B
L–W
B–W
R
W–B
GR
(4WD)

Engine Control for 2UZ–FE (Access/Standard Cab)




B–O
L–W
G–O
V–G
B–L
(BAT)
60A
AIRP
2
2
L
G
A
J66(A)
Junction
Connector
G
A
V–G
B–L
G–O
L–W
B–O
18 A
32 A
25 A
23 A
24 B
Malfanction Indicator
Lamp
TEMP
CONTROL
TACH
CONTROL
SPEED
CONTROL
C11(A), C12(B)
Combination Meter
24 A
12 B
BR–B
W–B
∗ 6 : w/ VSC
∗ 7 : w/o VSC
B
A
J66(A), J67(B)
Junction
Connector
D
B
Skid Control ECU
with Actuator (∗6)
ABS Actuator with
ECU (∗7)
L
W–B
IH

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 HA1A and HA2A 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 for 2UZ–FE (Access/Standard Cab)

○ : Parts Location

Code	See Page	Code	See Page	Code	See Page
A10	56 (2UZ–FE)	H4	56 (2UZ–FE)	J12	62
A20 A	60	H6	56 (2UZ–FE)	J13	62
A22	60	I3	57 (2UZ–FE)	J18	57 (2UZ–FE)
A30	56 (2UZ–FE)	I4	57 (2UZ–FE)	J26 A	62
A31	56 (2UZ–FE)	I5	57 (2UZ–FE)	J27 B	62
A32 A	56 (2UZ–FE)	I6	57 (2UZ–FE)	J64	62
A33 B	56 (2UZ–FE)	I7	57 (2UZ–FE)	J66 A	62
A34	56 (2UZ–FE)	I8	57 (2UZ–FE)	J67 B	62
A35	56 (2UZ–FE)	I9	57 (2UZ–FE)	J71 D	62
C1	56 (2UZ–FE)	I10	57 (2UZ–FE)	J72 E	62
C2 B	56 (2UZ–FE)	I14	57 (2UZ–FE)	K1	57 (2UZ–FE)
C5 B	60	I15	57 (2UZ–FE)	K2 B	57 (2UZ–FE)
C11 A	60	I16	57 (2UZ–FE)	L4	64 (*3)
C12 B	60	I17	57 (2UZ–FE)		65 (*4)
C19	56 (2UZ–FE)	I18	57 (2UZ–FE)	M1 B	57 (2UZ–FE)
C20	56 (2UZ–FE)	I19	57 (2UZ–FE)	S4 A	63
D6	61	I20	57 (2UZ–FE)	S31	63
E2 B	56 (2UZ–FE)	I21	57 (2UZ–FE)	T14	57 (2UZ–FE)
E3 A	61	I23 A	61	V4 B	57 (2UZ–FE)
E4 B	61	I24 A	61	V13	57 (2UZ–FE)
E5 C	61	J1	57 (2UZ–FE)	V14	57 (2UZ–FE)
E6 D	61	J3	62	V15	57 (2UZ–FE)
E7 E	61	J5	62	V16 B	57 (2UZ–FE)
F5 B	56 (2UZ–FE)	J8	62	V17 B	57 (2UZ–FE)
F10	64 (*3)	J9	62		
	65 (*4)	J10	62		

⬭ : Relay Blocks

Code	See Page	Relay Blocks (Relay Block Location)
2	24	Engine Room R/B (Engine Compartment Left)

⬭ : Junction Block and Wire Harness Connector

Code	See Page	Junction Block and Wire Harness (Connector Location)
1B	26 (*1)	Cowl Wire and Driver Side J/B (Lower Finish Panel)
	30 (*2)	
1F	26 (*1)	
	30 (*2)	
1G	26 (*1)	
	30 (*2)	
1I	26 (*1)	
	30 (*2)	
1J	26 (*1)	
	30 (*2)	
1K	26 (*1)	Engine Room Main Wire and Driver Side J/B (Lower Finish Panel)
	30 (*2)	

* 1 : w/o Daytime Running Light * 2 : w/ Daytime Running Light * 3 : Access Cab * 4 : Standard Cab * 5 : Access Cab Captain Seat
* 6 : Access Cab Separate Seat * 7 : Standard Cab Bench Seat

: Connector Joining Wire Harness and Wire Harness

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
EA2	80 (2UZ–FE)	Cowl Wire and Engine Room Main Wire (Right Fender)
EB2	80 (2UZ–FE)	Engine No.2 Wire and Engine Room Main Wire (Under the Engine Room R/B)
EC3	80 (2UZ–FE)	Engine No.2 Wire and Engine Wire (Near the Starter)
IA9	82	Engine Room Main Wire and Cowl Wire (Left Kick Panel)
IE1	83	Engine Wire and Cowl Wire (Right Side of Instrument Panel)
IJ1	83	Cowl Wire and Cowl Wire (Right Side of Instrument Panel)
BB3	84 (*3)	Frame Wire and Cowl Wire (Under the Driver's Seat)
	85 (*4)	
BB4	84 (*3)	
	85 (*4)	

: Ground Points

Code	See Page	Ground Points Location
EA	80 (2UZ–FE)	Front Left Fender
EC	80 (2UZ–FE)	Rear Bank of Left Cylinder Head
ET	80 (2UZ–FE)	Front Right Fender
EW	80 (2UZ–FE)	Front Left Side of Cylinder Head
EX	80 (2UZ–FE)	Left Side of Cylinder Block
IF	82	Left Kick Panel
IH	82	Right Kick Panel
II		

* 1 : w/o Daytime Running Light * 2 : w/ Daytime Running Light * 3 : Access Cab * 4 : Standard Cab * 5 : Access Cab Captain Seat
* 6 : Access Cab Separate Seat * 7 : Standard Cab Bench Seat