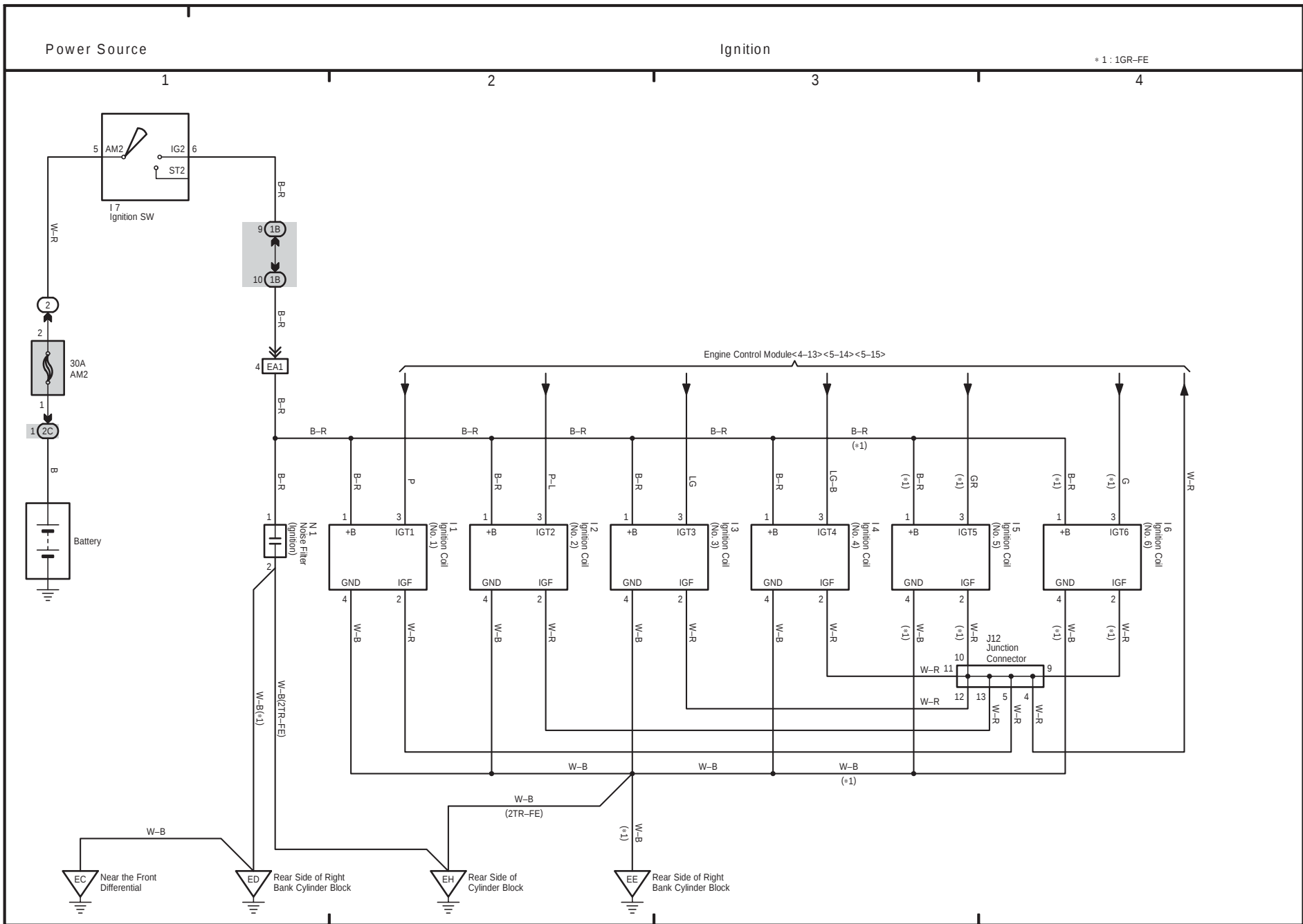


TOYOTA TACOMA (EM03N0U)



TOYOTA TACOMA (EM03N0U)

2 TOYOTA TACOMA

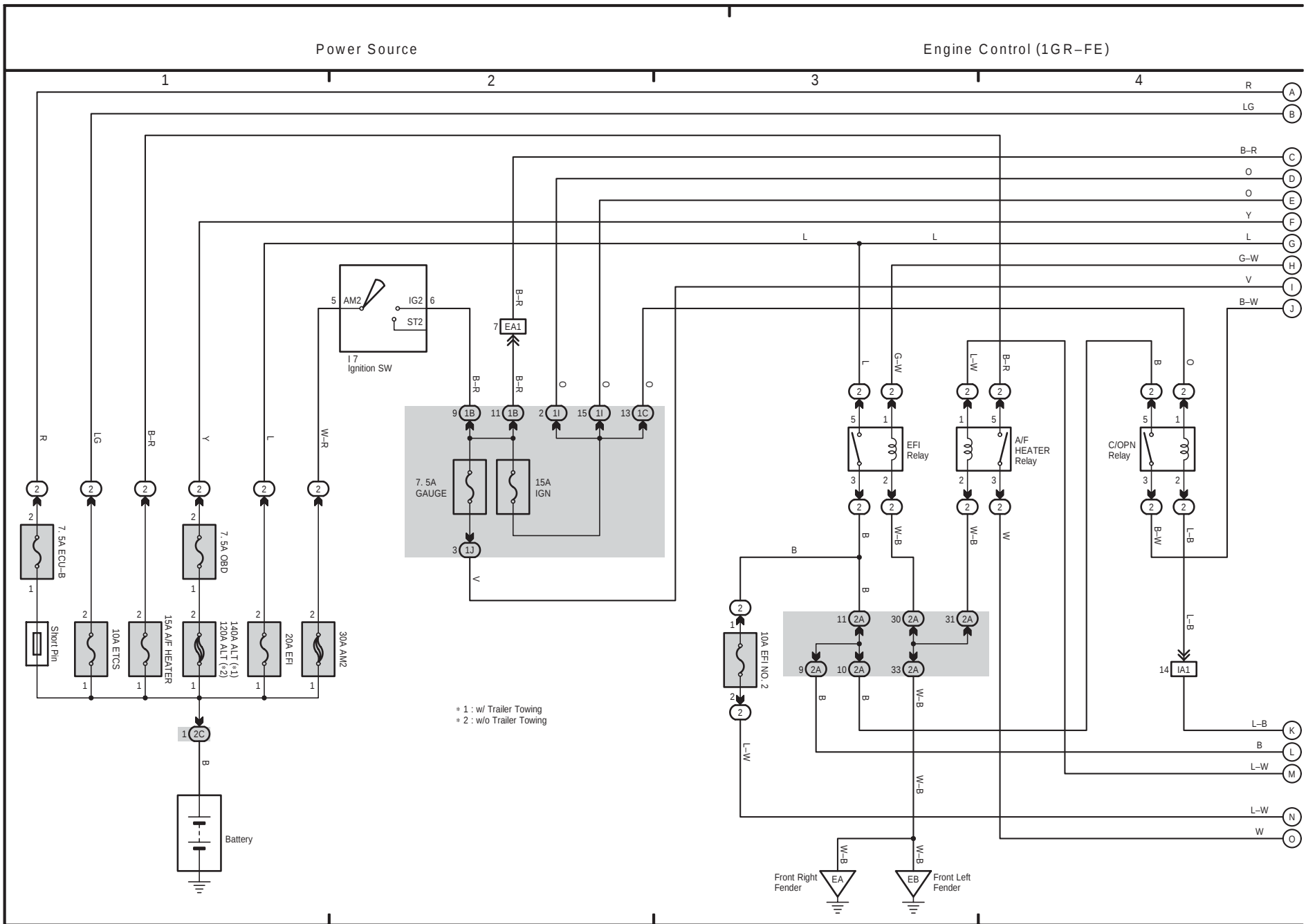


TOYOTA TACOMA (EM03NOU)



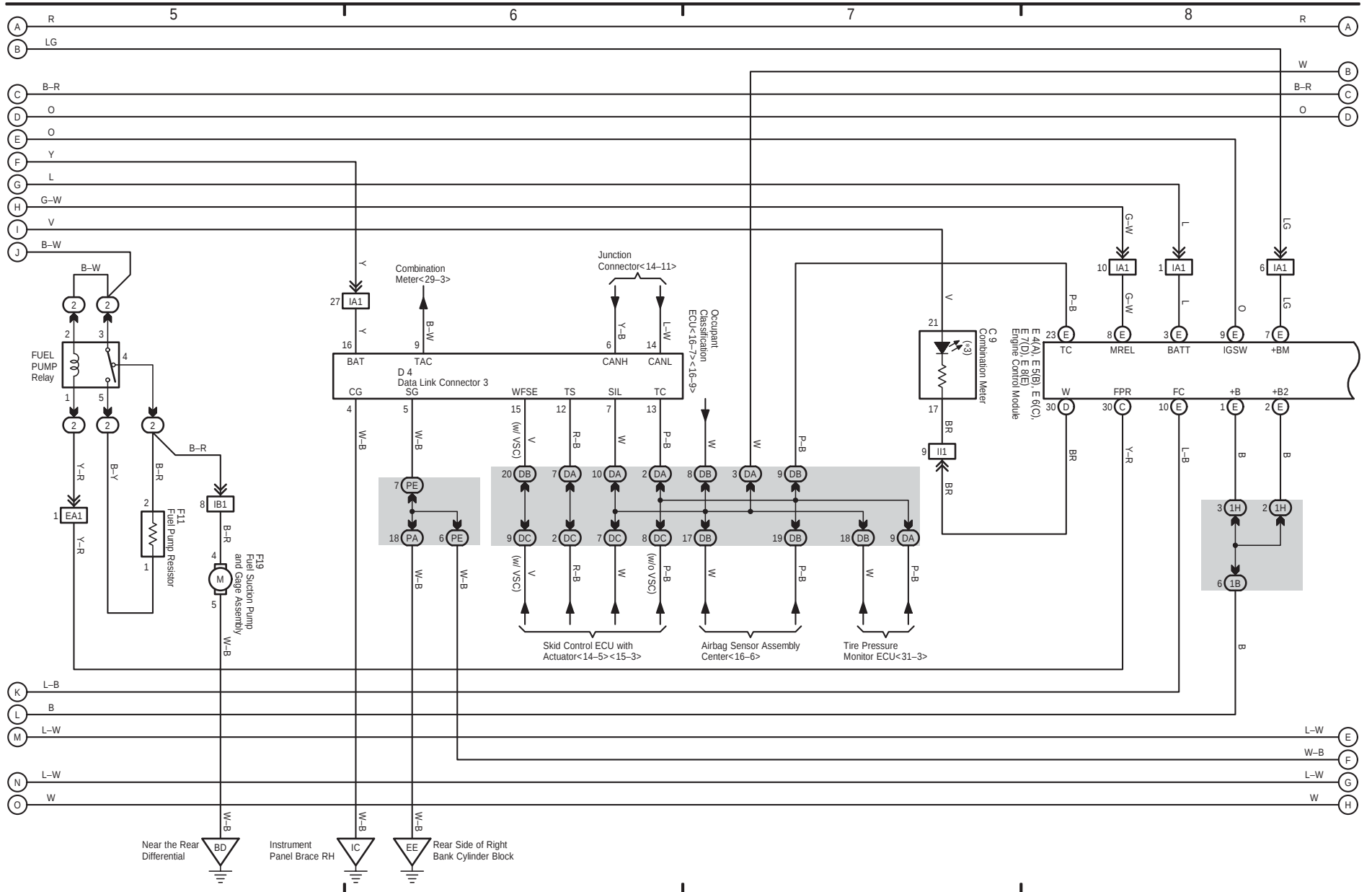
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4 TOYOTA TACOMA



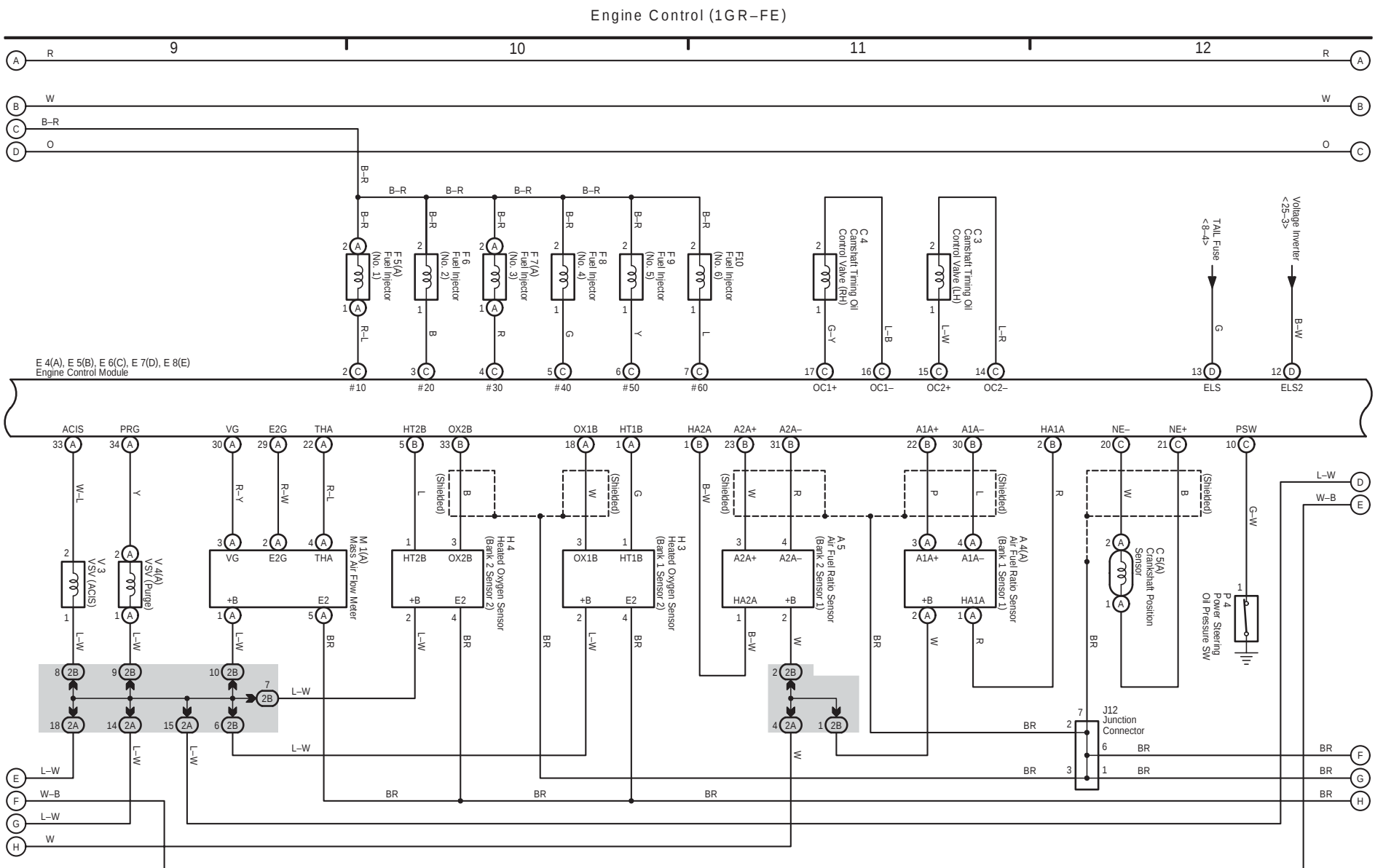
Engine Control (1GR-FE)

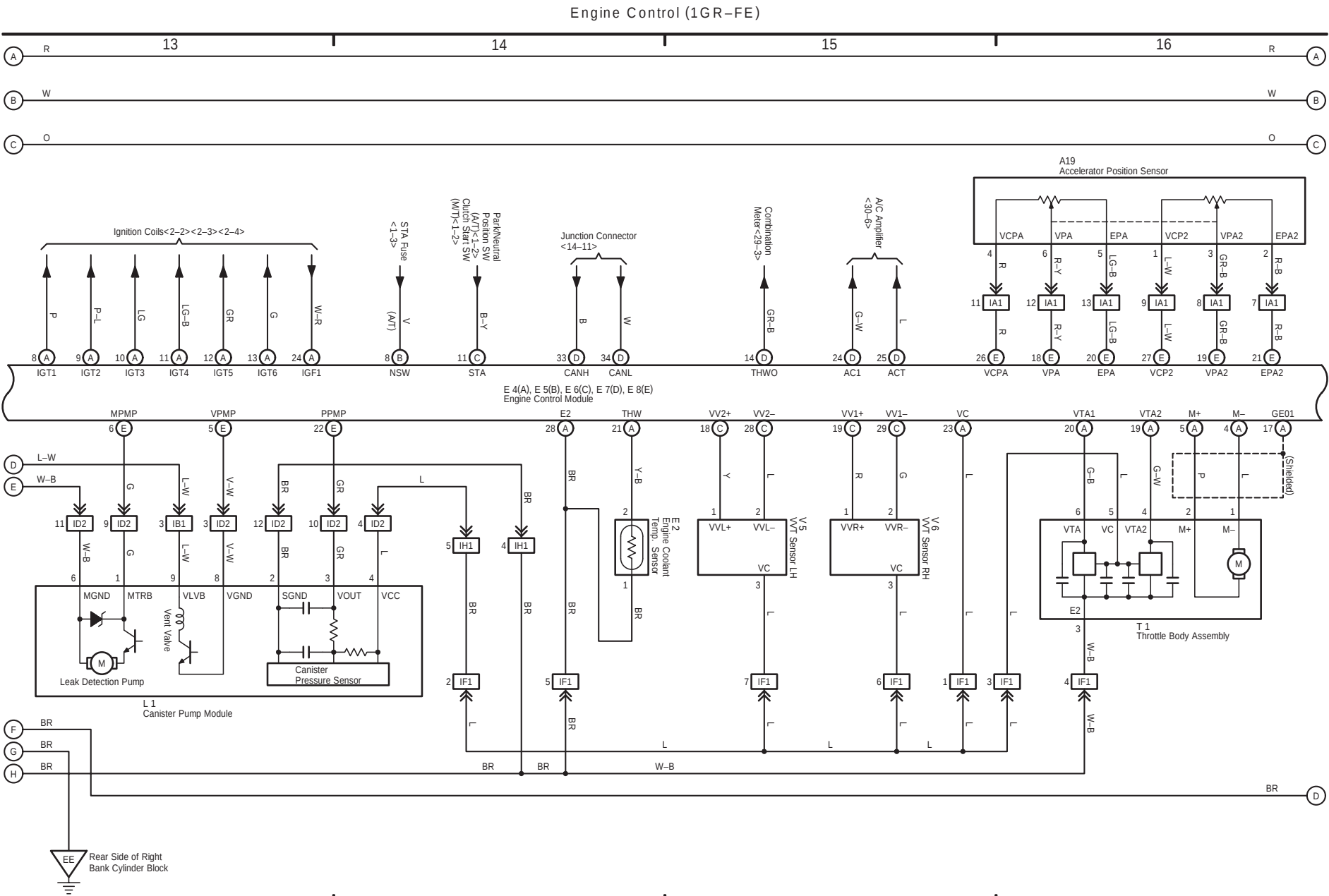
* 3 : Malfunction Indicator Lamp



(Cont. next page)

4 TOYOTA TACOMA (Cont' d)

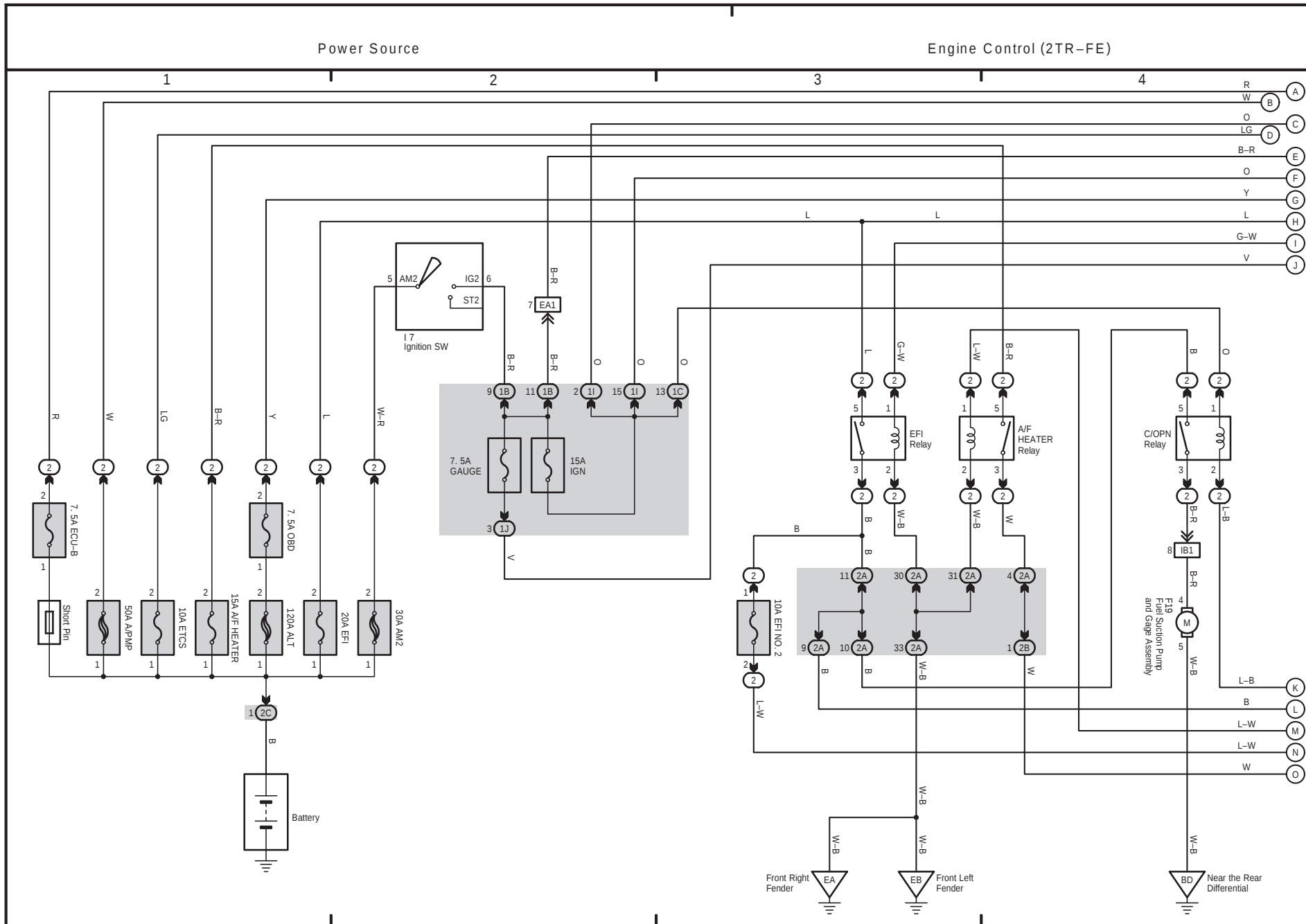




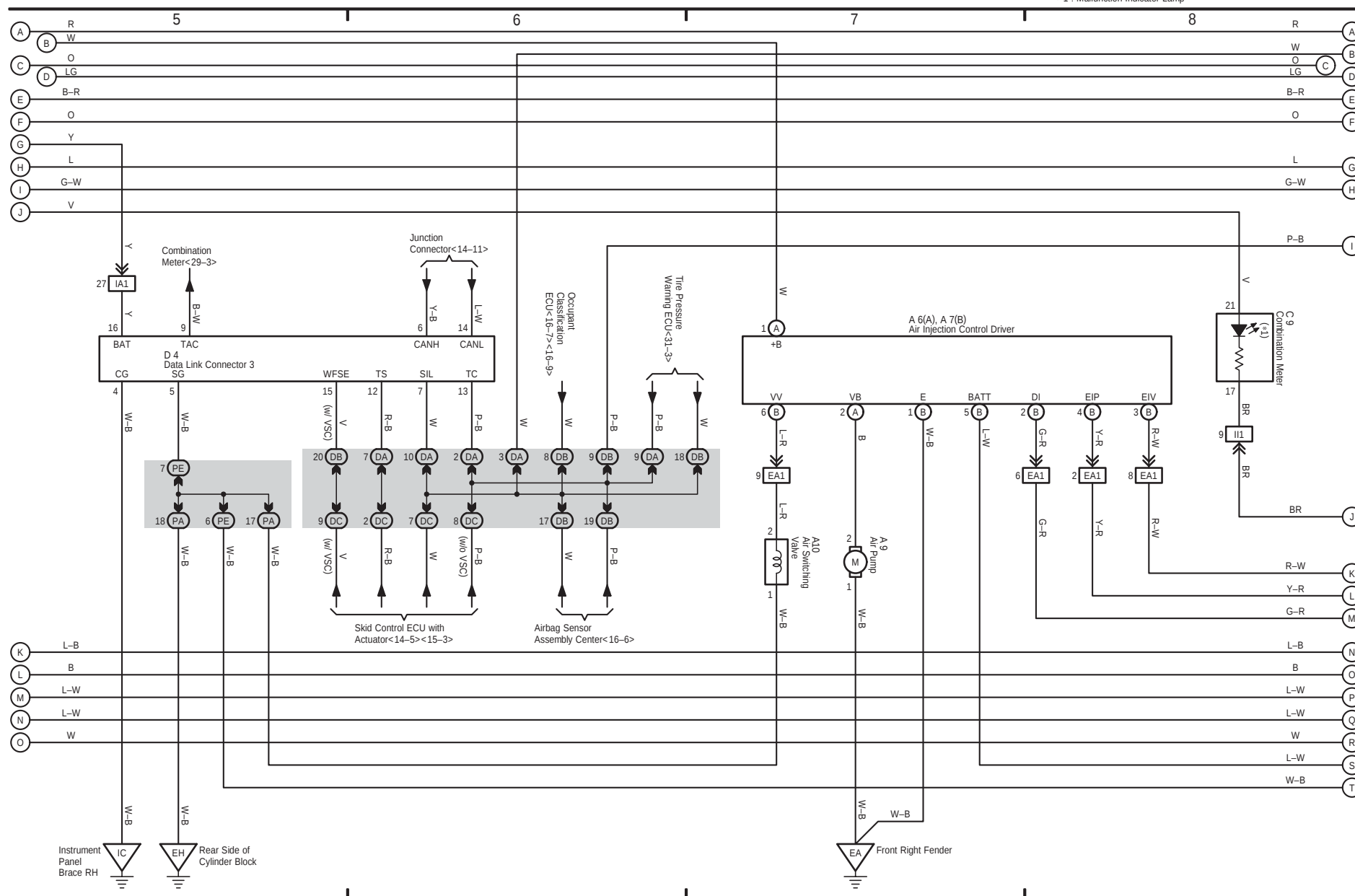
TOYOTA TACOMA (EM03N0U)

[illegible]

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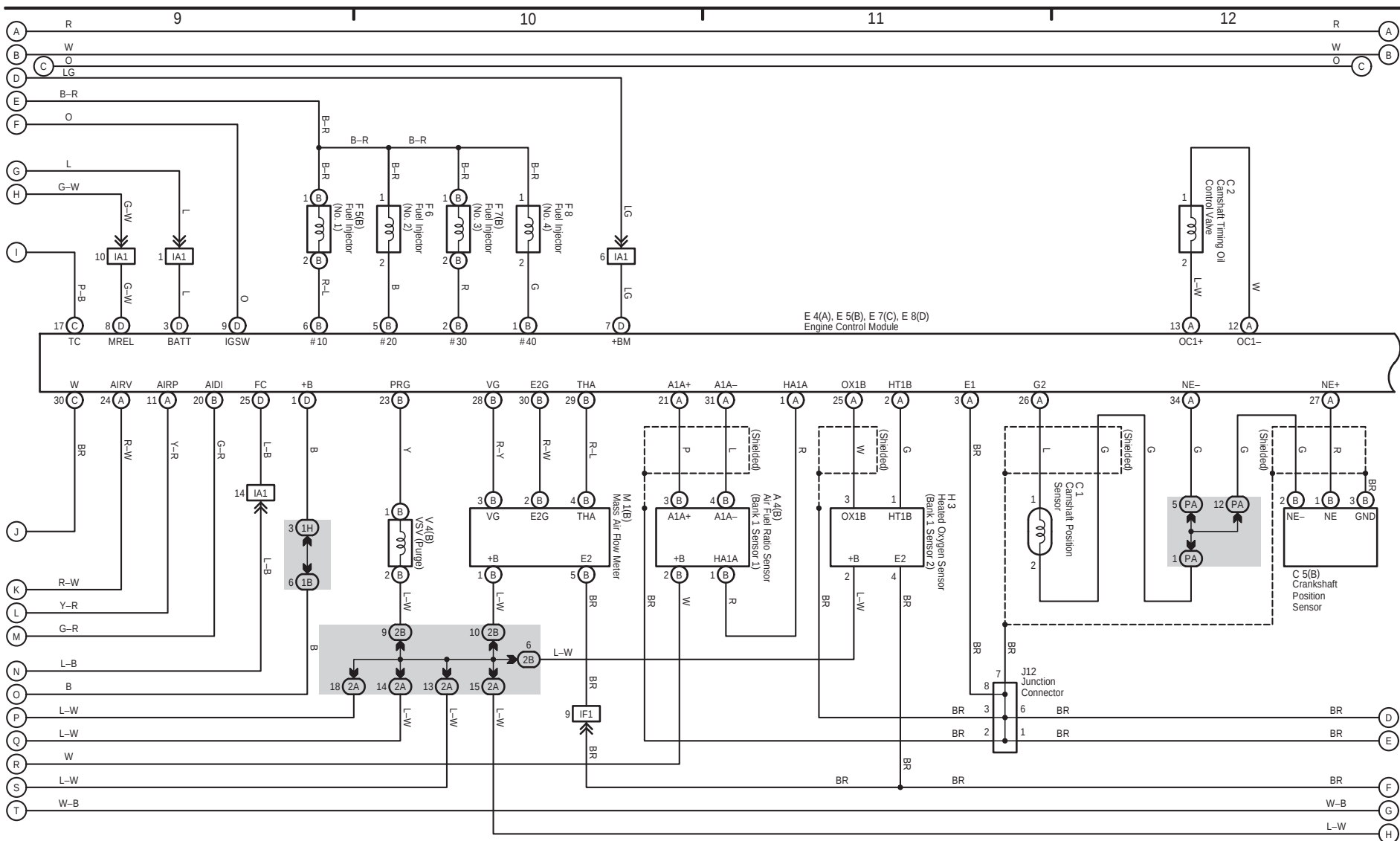
* 1 : Malfunction Indicator Lamp



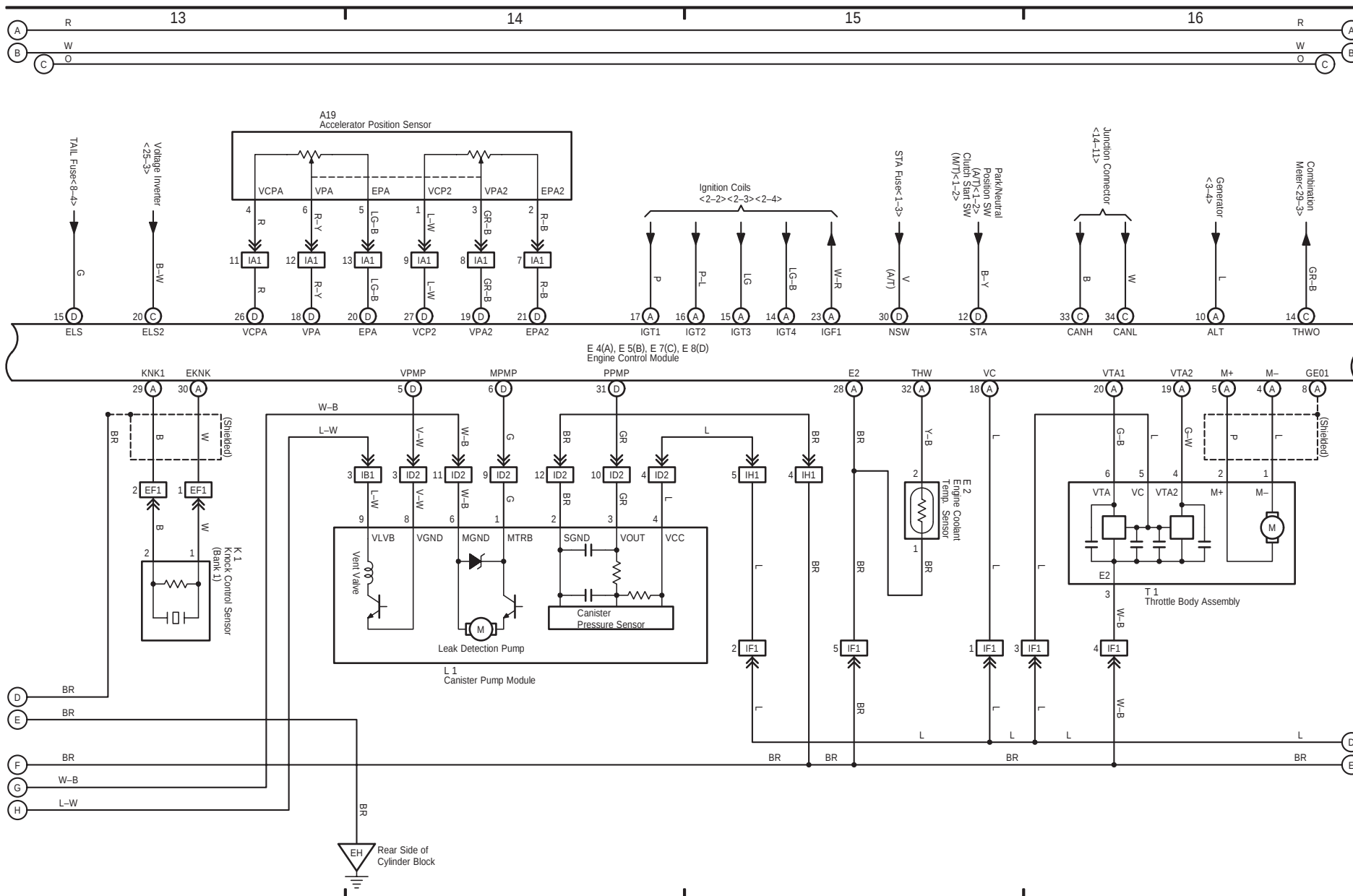
(Cont. next page)

5 TOYOTA TACOMA (Cont' d)

Engine Control (2TR-FE)



Engine Control (2TR-FE)



TOYOTA TACOMA (Cont'd)

Engine Control (2TR-FE)

Engine Immobiliser System (2TR-FE)

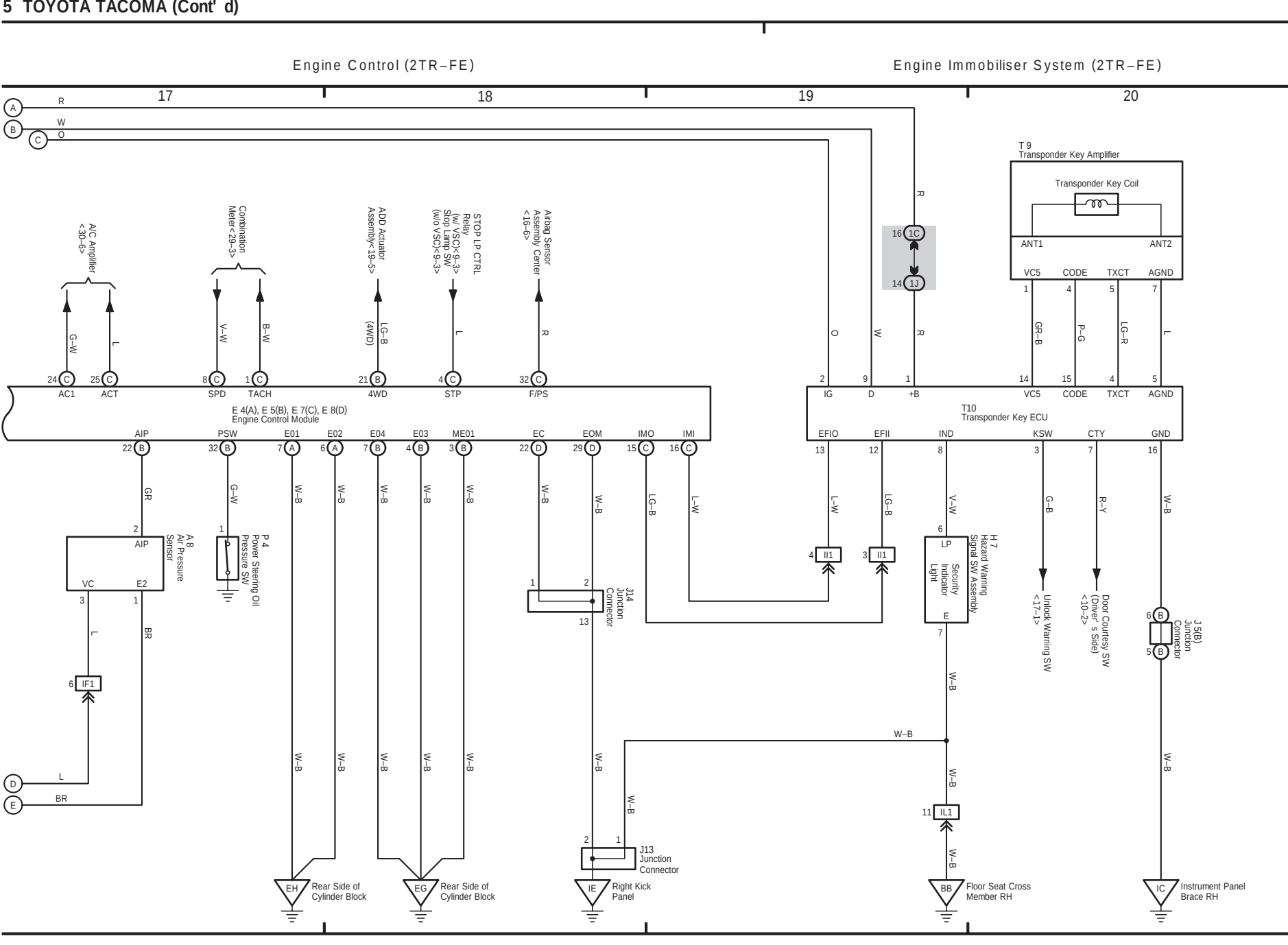
Diagram illustrating the wiring for the Engine Control (2TR-FE) and Engine Immobiliser System (2TR-FE) for the Toyota Tacoma.

Engine Control (2TR-FE) Components and Connections:

- Engine Control Module (ECM):** E 4(A), E 5(B), E 7(C), E 8(D)
- Wiring:**
 - AC1 (24) to A/C Amplifier (<30-6>)
 - ACT (25) to A/C Amplifier (<30-6>)
 - SPD (8) to Combination Meter (<29-3>)
 - TACH (1) to Combination Meter (<29-3>)
 - 4WD (21) to ADD Actuator Assembly (<19-5>)
 - STP (4) to STOP LP CTRL Relay (w/ VSC) (<9-3>)
 - STP (4) to STOP Lamp SV (w/o VSC) (<9-3>)
 - F/PS (32) to Airbag Sensor Assembly Center (<16-6>)
- Other Components:**
 - AIP (22) to AIP (2) and AIP (3) to IF1 (6)
 - PSW (32) to P 4 Power Steering Oil Pressure SW (1)
 - E01 (7) to EH (Rear Side of Cylinder Block)
 - E02 (6) to EG (Rear Side of Cylinder Block)
 - E04 (7) to EG (Rear Side of Cylinder Block)
 - E03 (4) to EG (Rear Side of Cylinder Block)
 - ME01 (3) to EG (Rear Side of Cylinder Block)
 - EC (22) to J14 Junction Connector (1, 2, 13)
 - EOM (29) to J14 Junction Connector (1, 2, 13)
 - IMO (15) to J14 Junction Connector (1, 2, 13)
 - IMI (16) to J14 Junction Connector (1, 2, 13)
 - IE (Right Kick Panel) to J13 Junction Connector (1, 2)

Engine Immobiliser System (2TR-FE) Components and Connections:

- Transponder Key Amplifier (T9):** Transponder Key Coil, ANT1, ANT2, VC5, CODE, TXCT, AGND
- Transponder Key ECU (T10):** IG, D, +B, EFIO, EFII, IND, KSW, CTY, GND
- Wiring:**
 - IG (2) to IG (13)
 - D (9) to D (12)
 - +B (1) to +B (16)
 - EFIO (13) to I11 (4)
 - EFII (12) to I11 (5)
 - IND (8) to H 7 Hazard Warning Signal SW Assembly (1)
 - KSW (3) to G-B (<17-1>)
 - CTY (7) to R-Y (<10-2>)
 - GND (16) to W-B (16)
- Other Components:**
 - J5(B) Junction Connector (9, 10, 11) to W-B (16)
 - BB (Floor Seat Cross Member RH) to W-B (11)
 - IC (Instrument Panel Brace RH) to W-B (16)



TOYOTA TACOMA (EM03N0U)

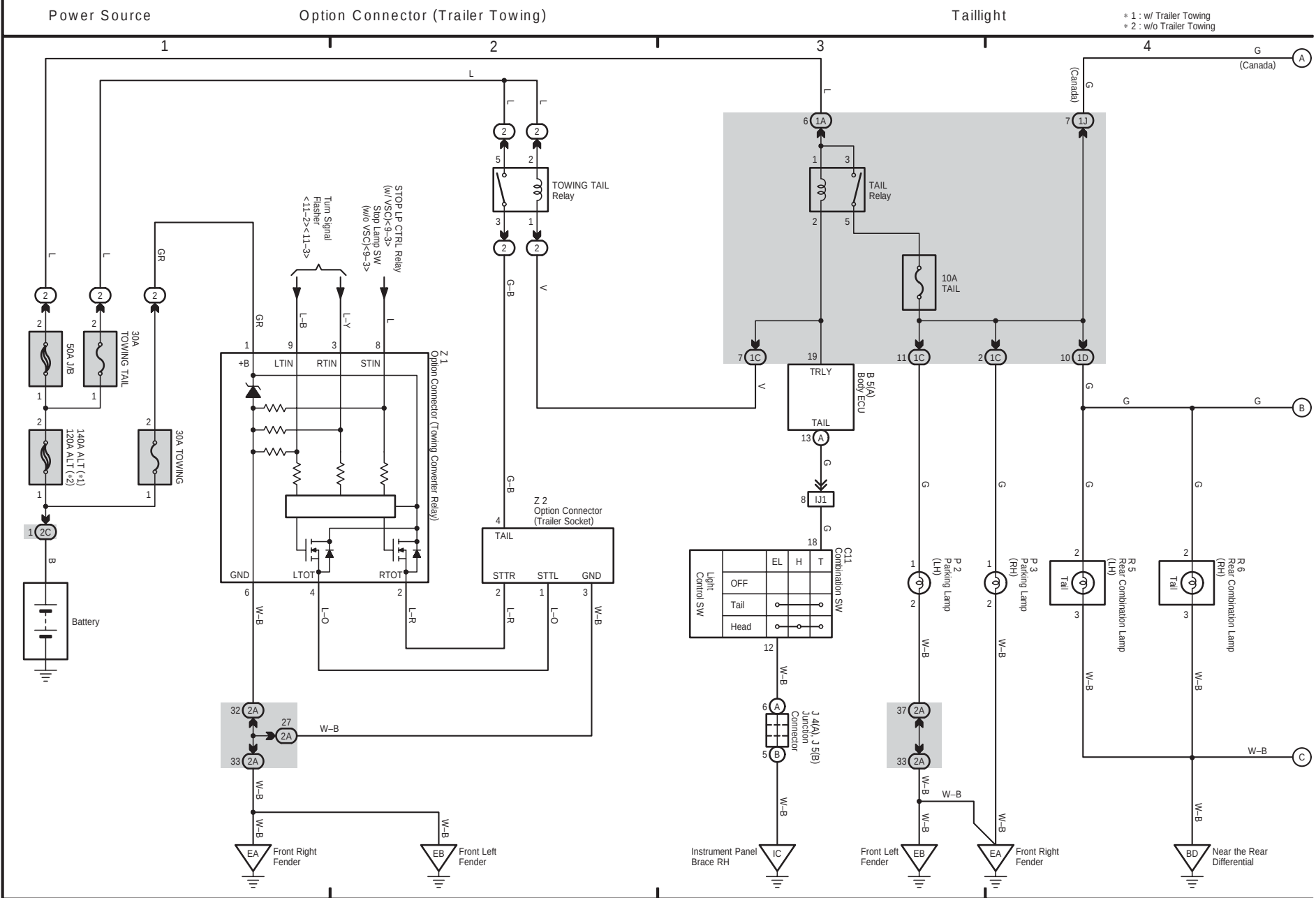


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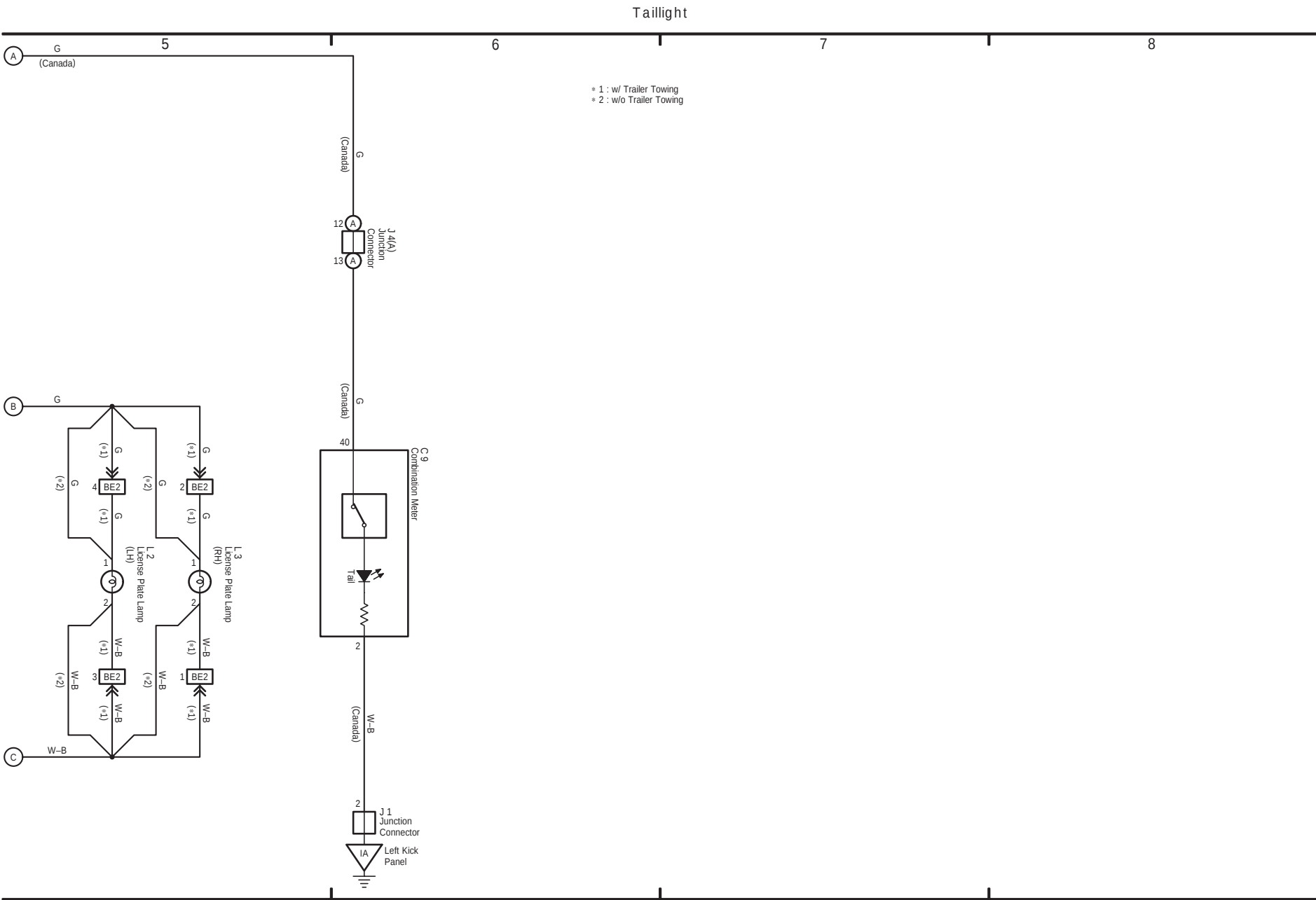
7 TOYOTA TACOMA

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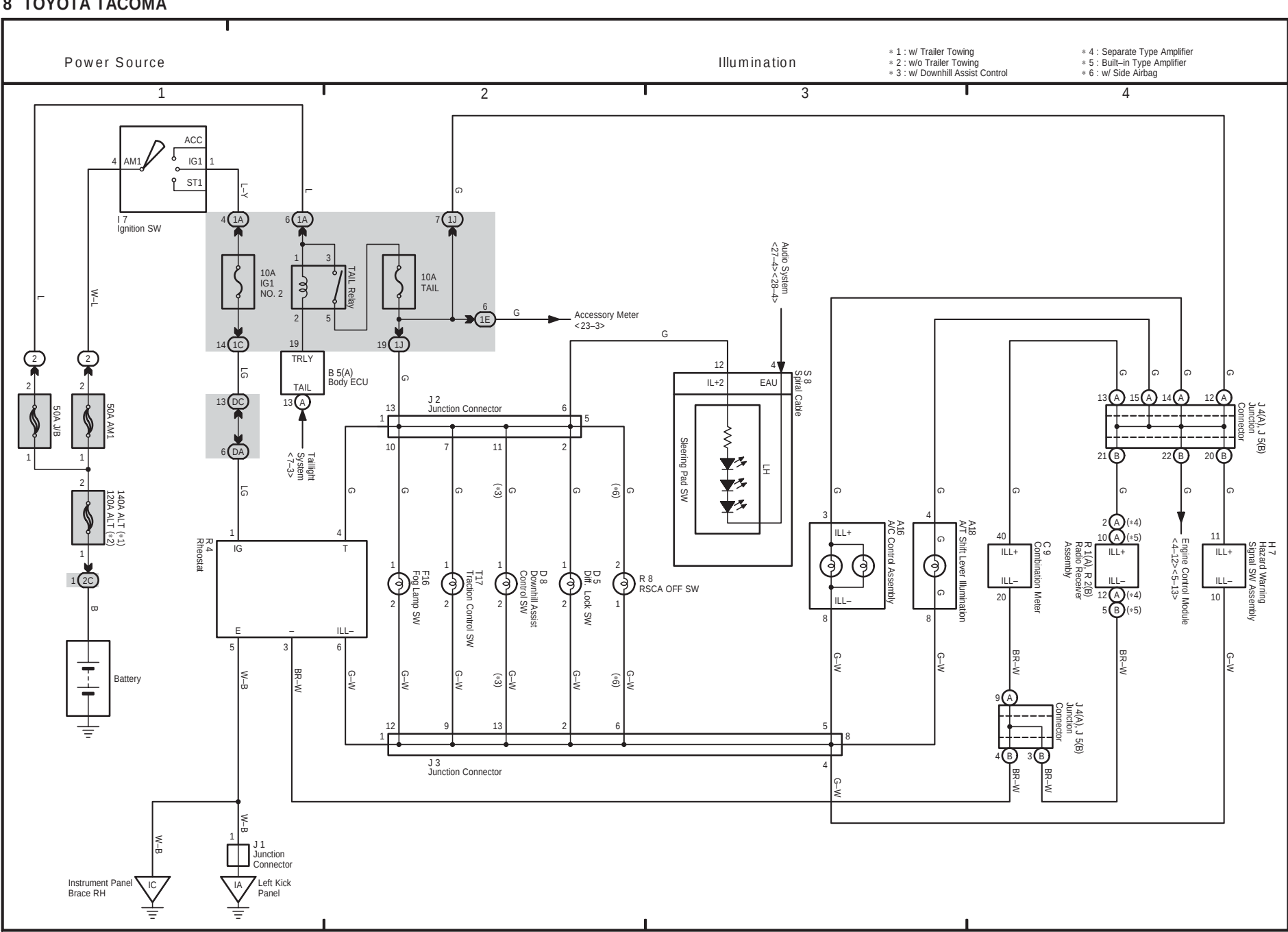
TOYOTA TACOMA (EM03N0U)



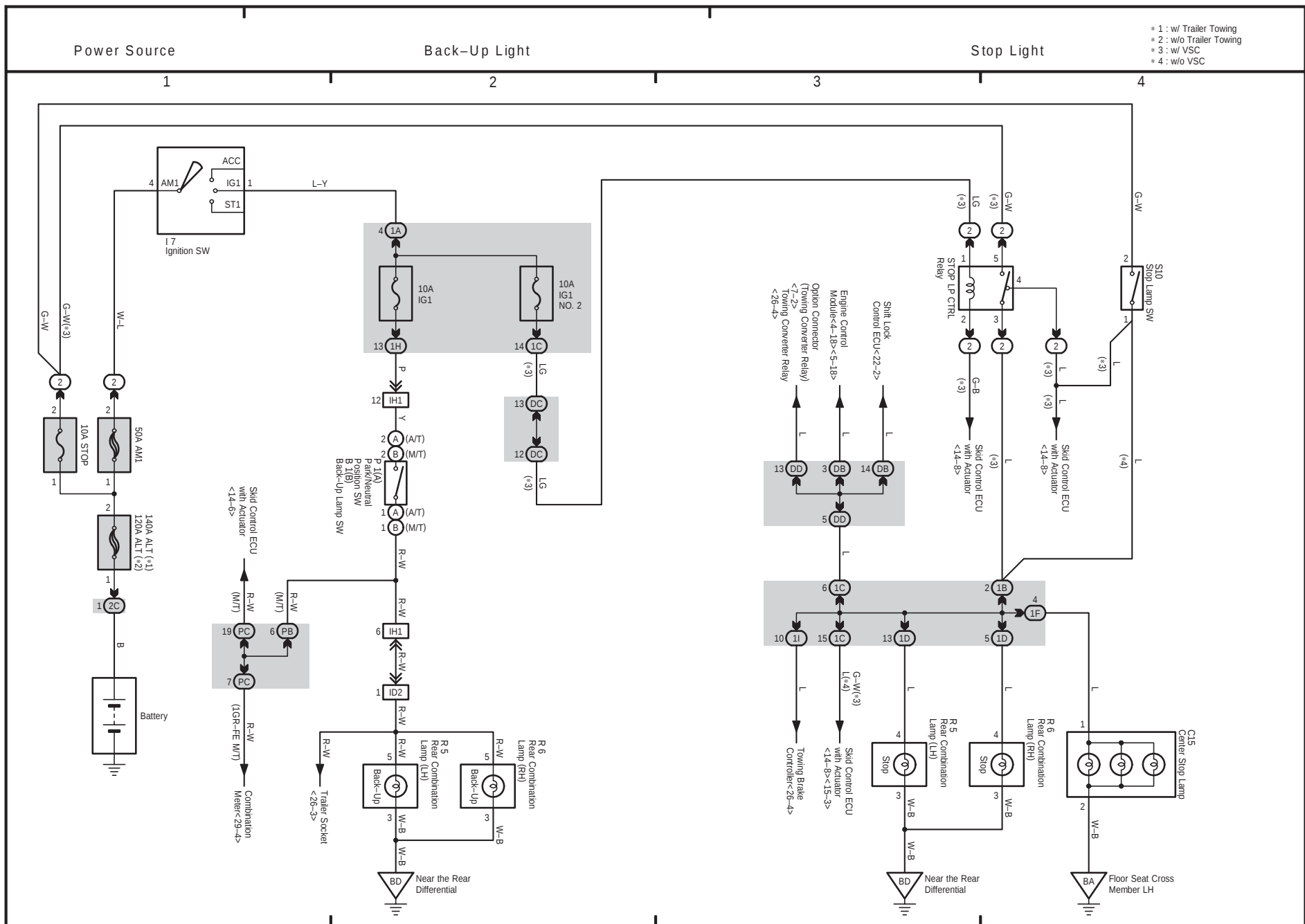
7 TOYOTA TACOMA (Cont' d)



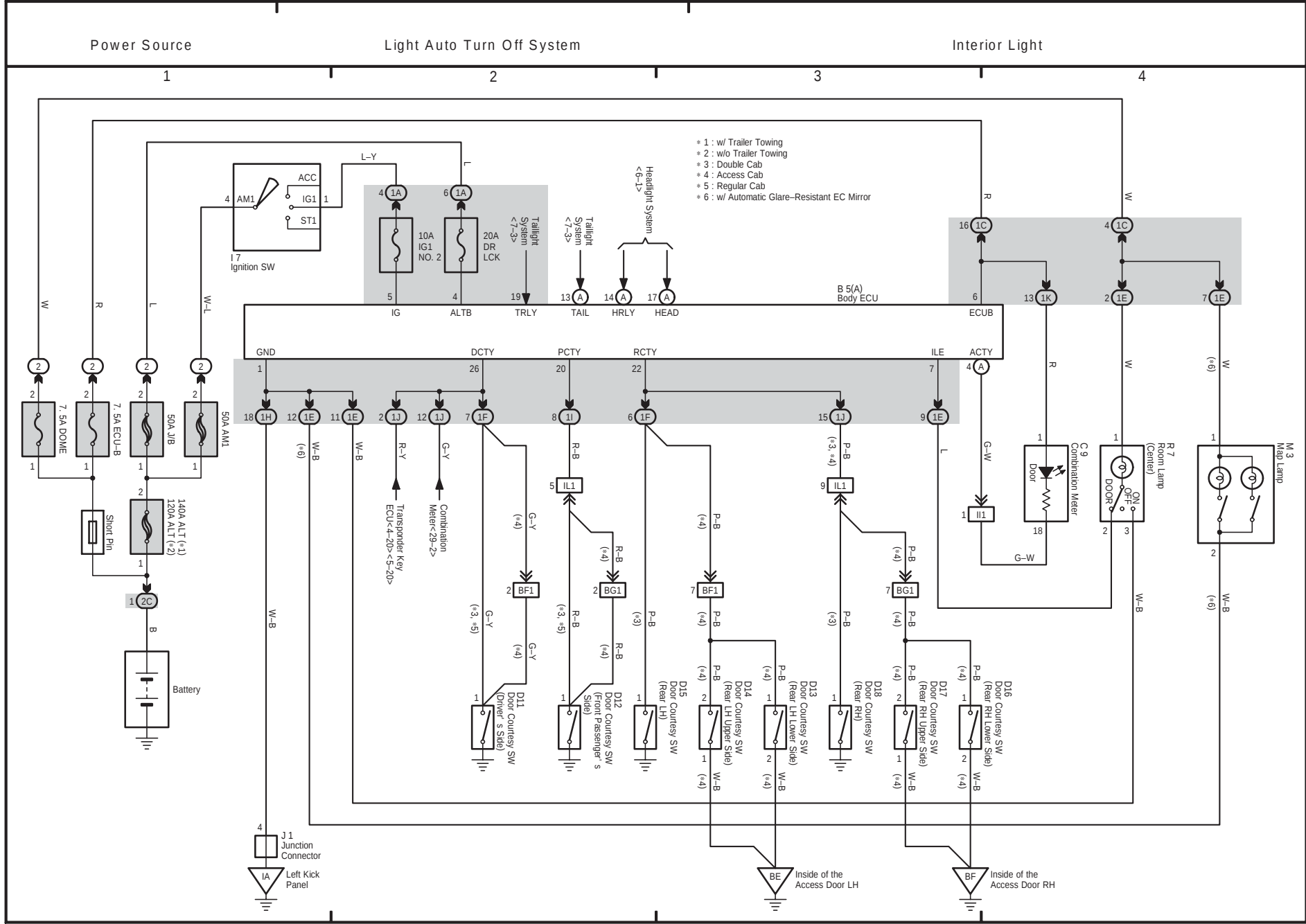
M OVERALL ELECTRICAL WIRING DIAGRAM



329

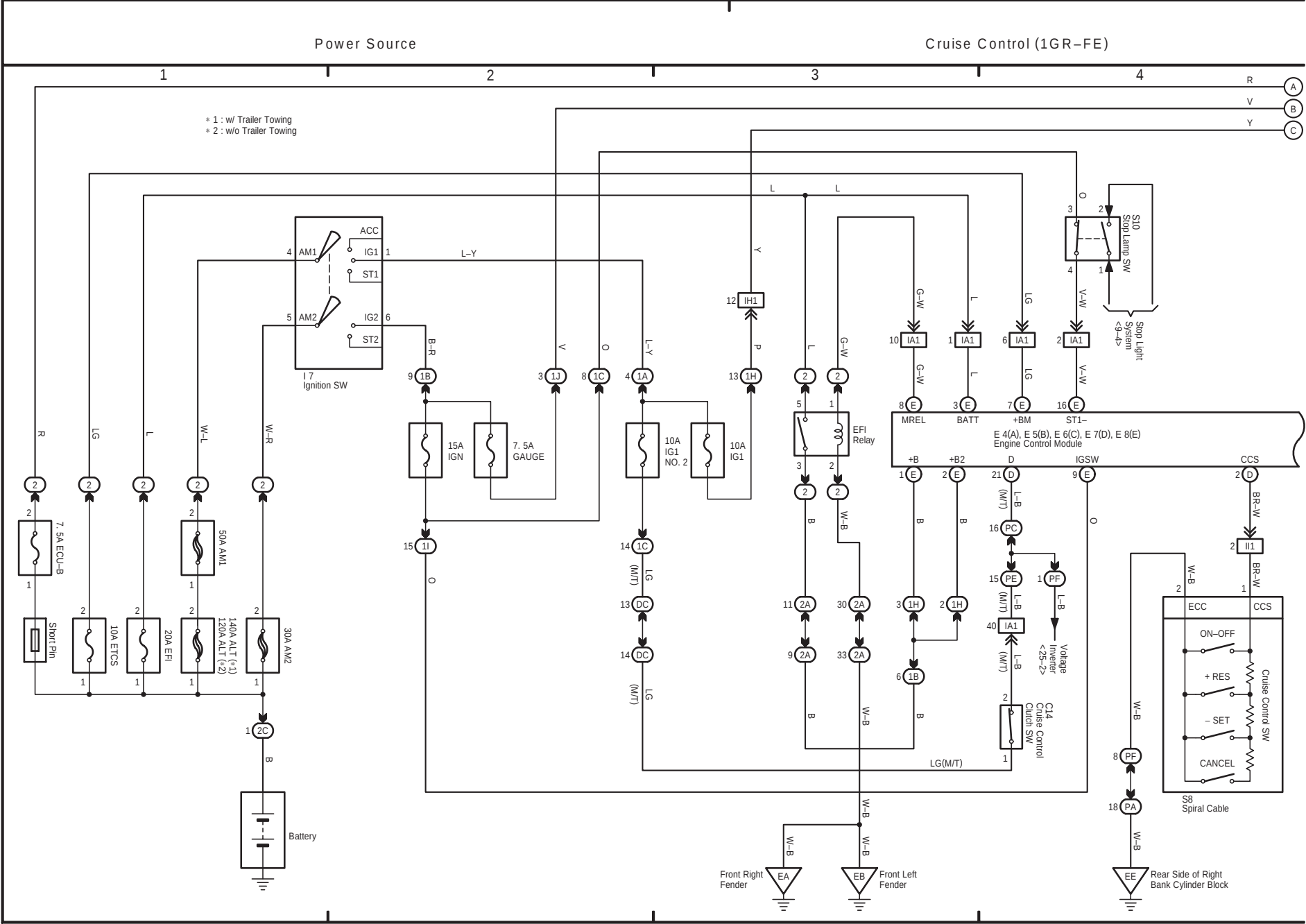


10 TOYOTA TACOMA

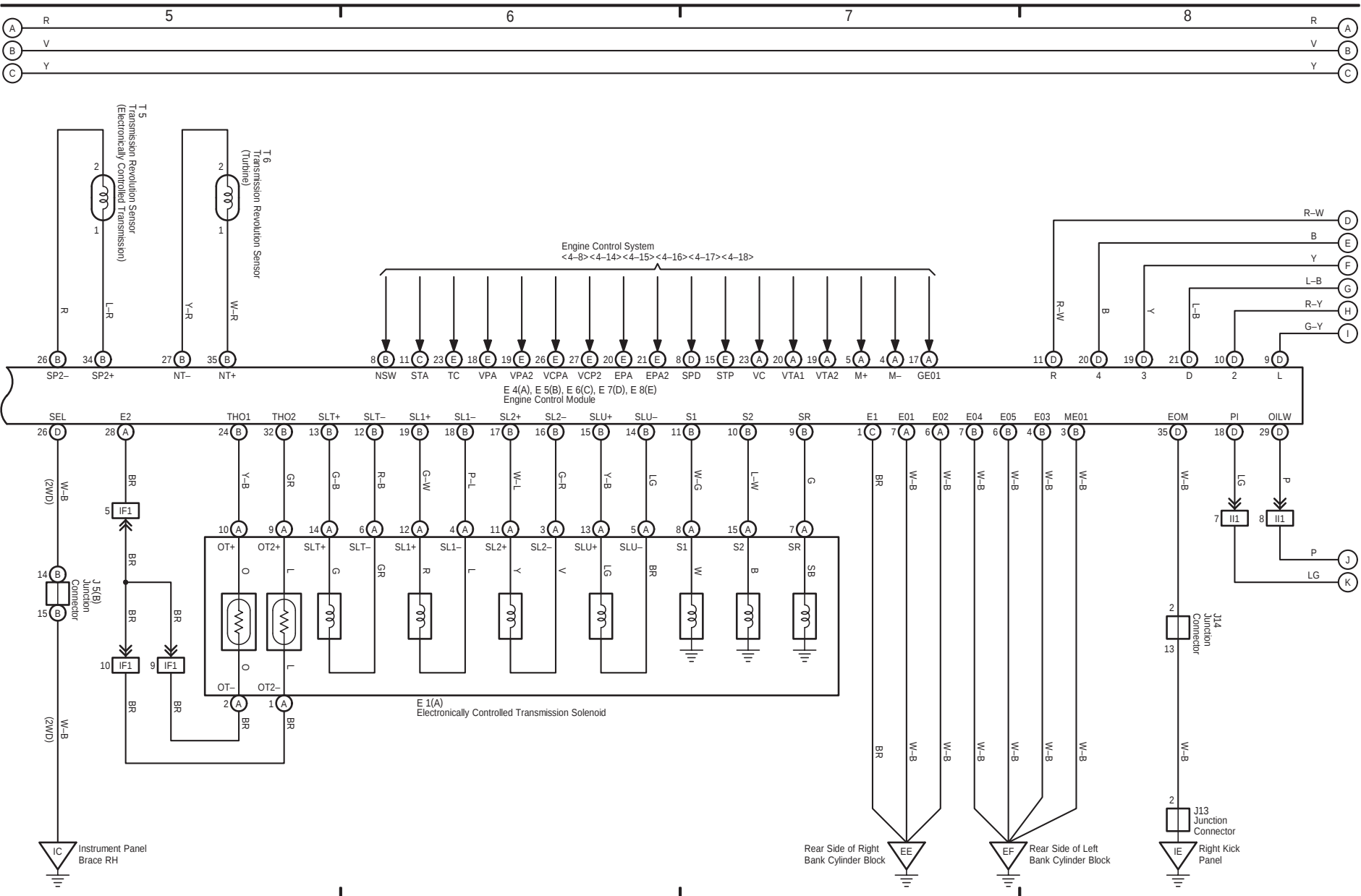


TOYOTA TACOMA (EM03N0U)

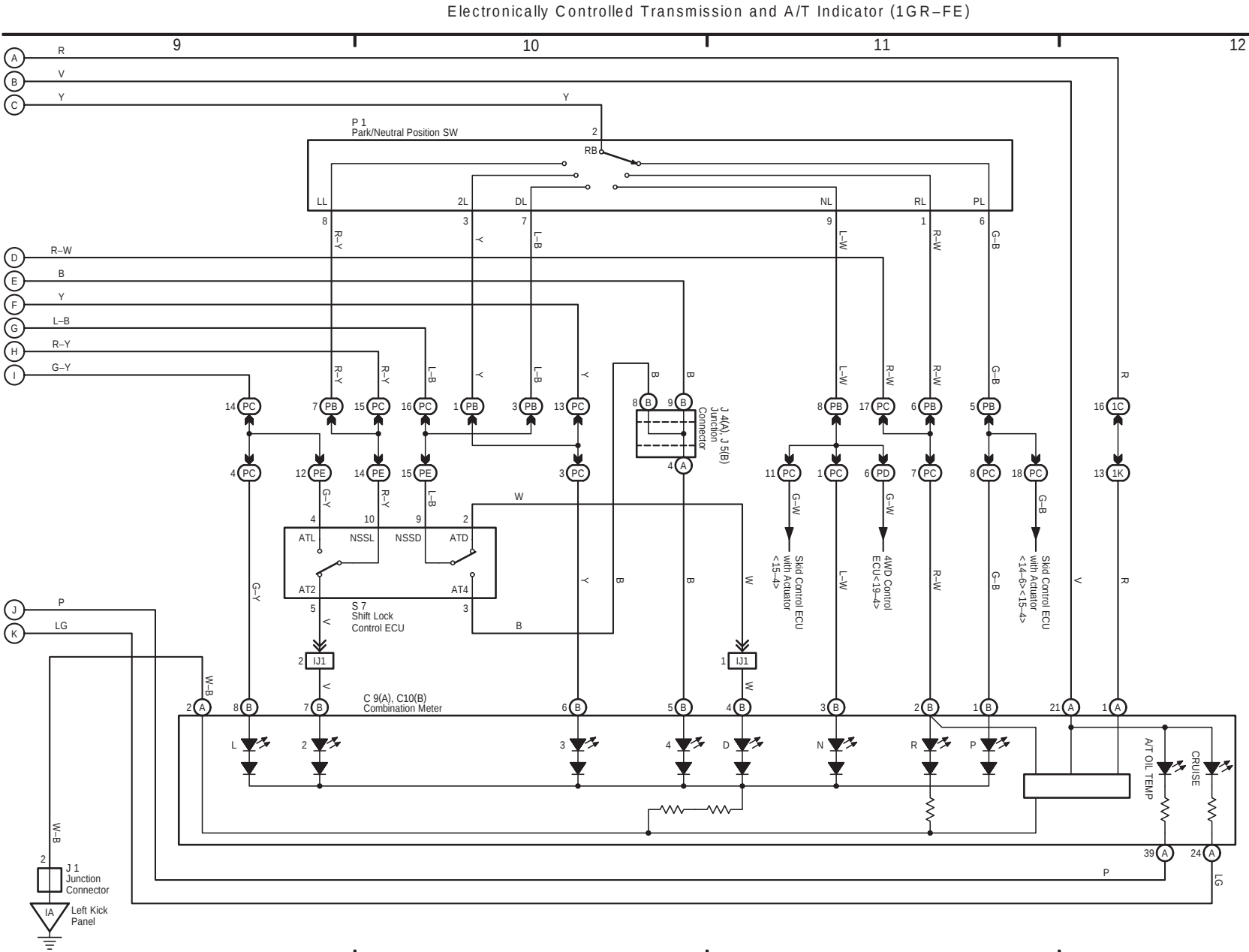


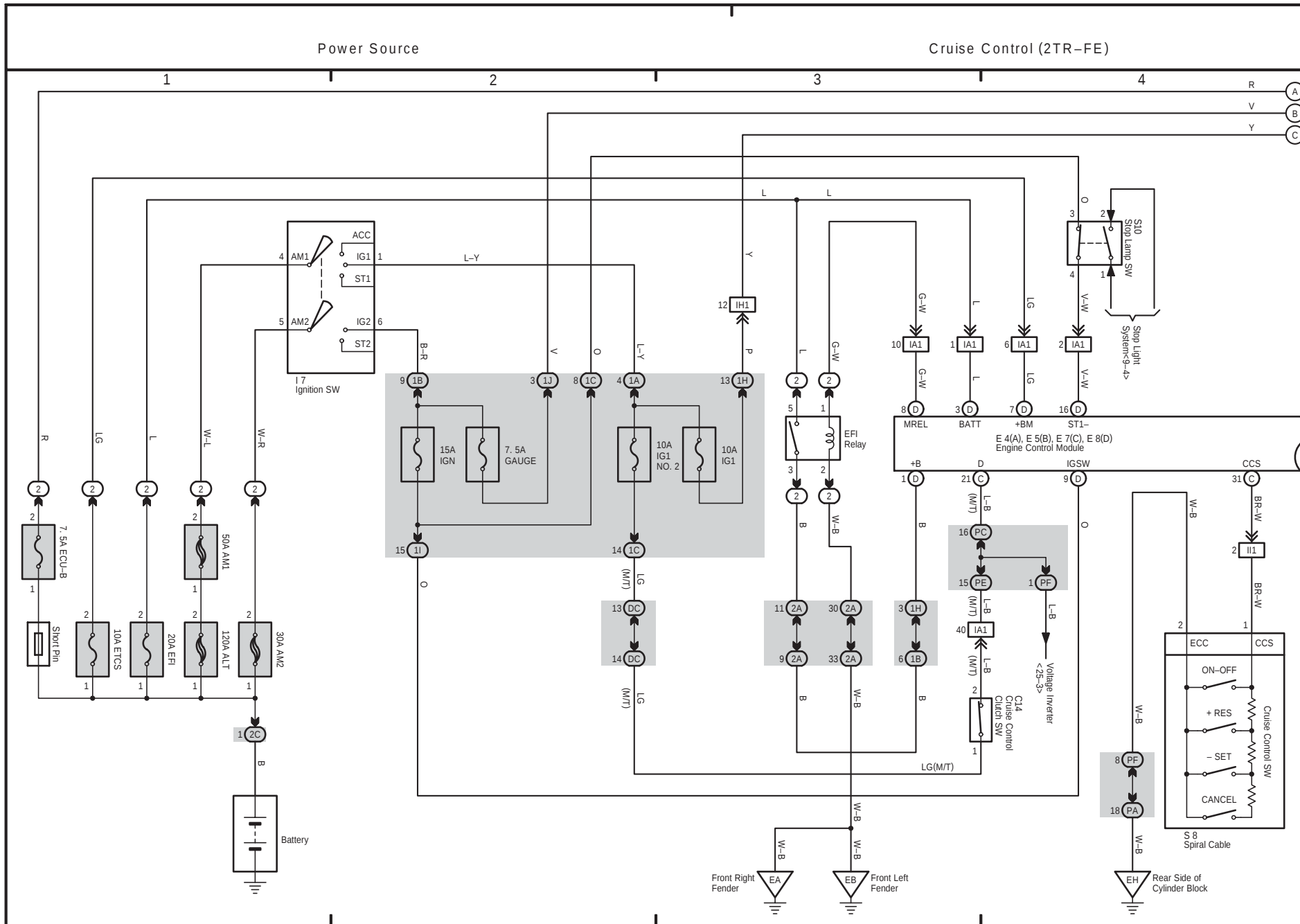


Electronically Controlled Transmission and A/T Indicator (1GR-FE)

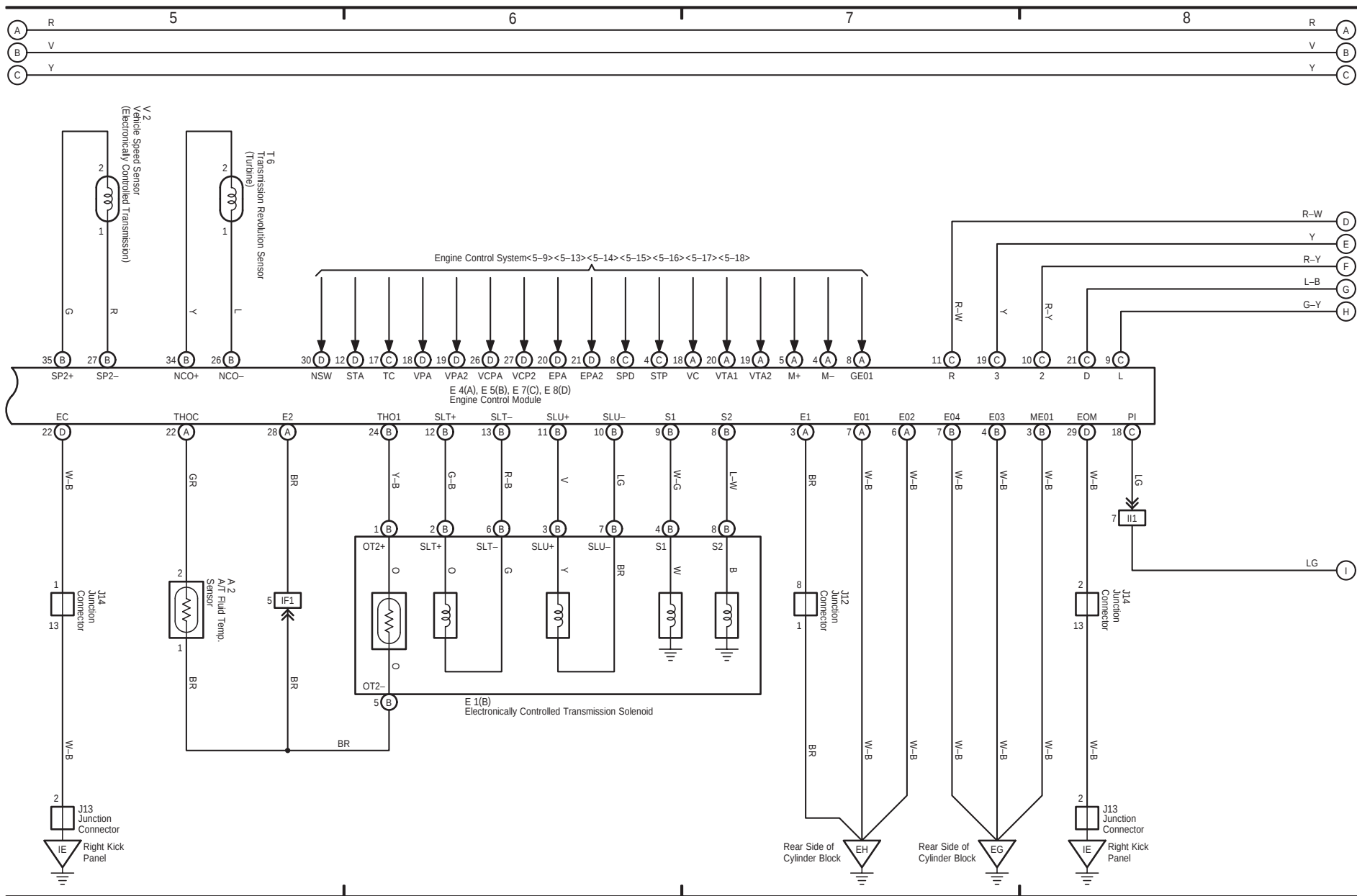


12 TOYOTA TACOMA (Cont' d)

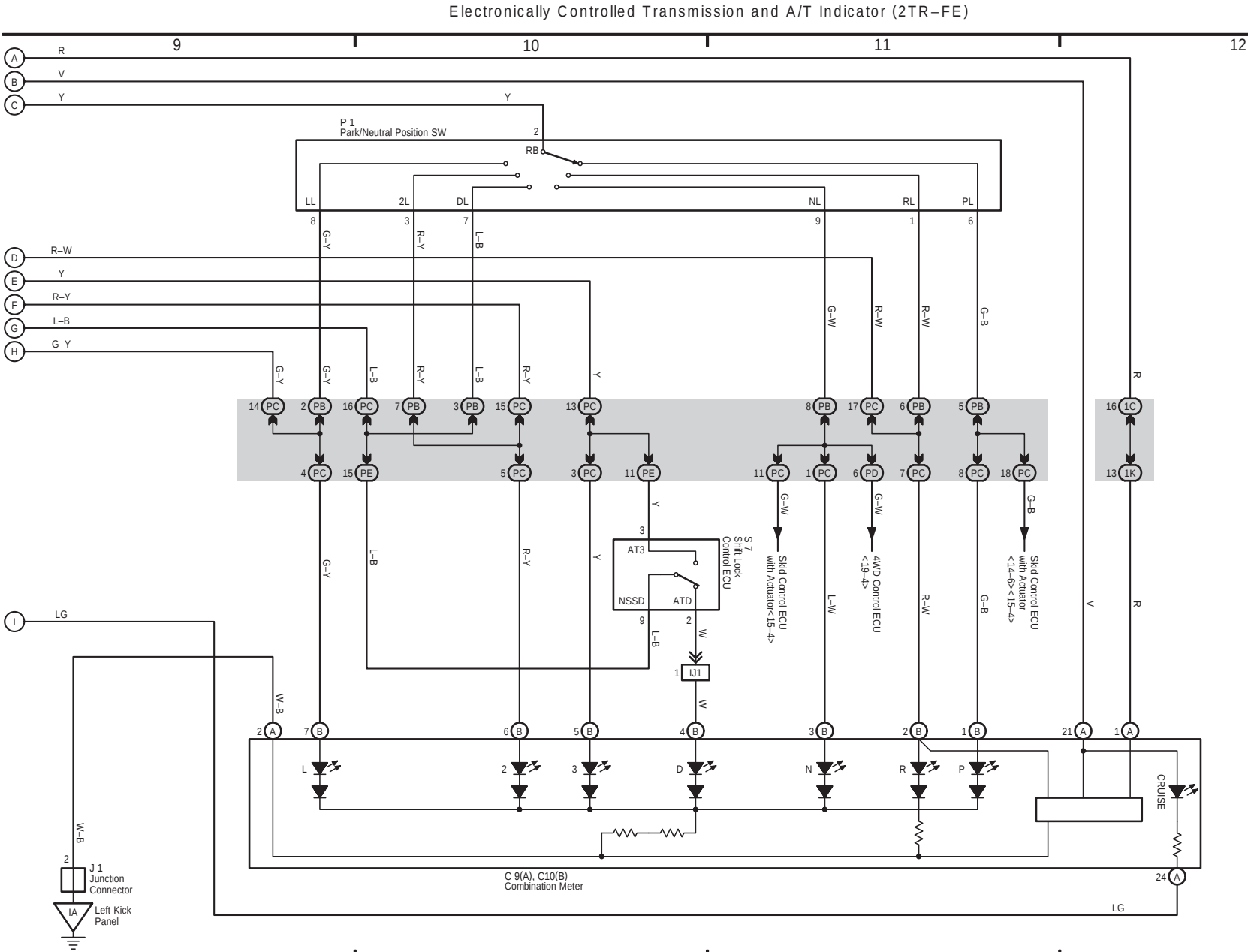


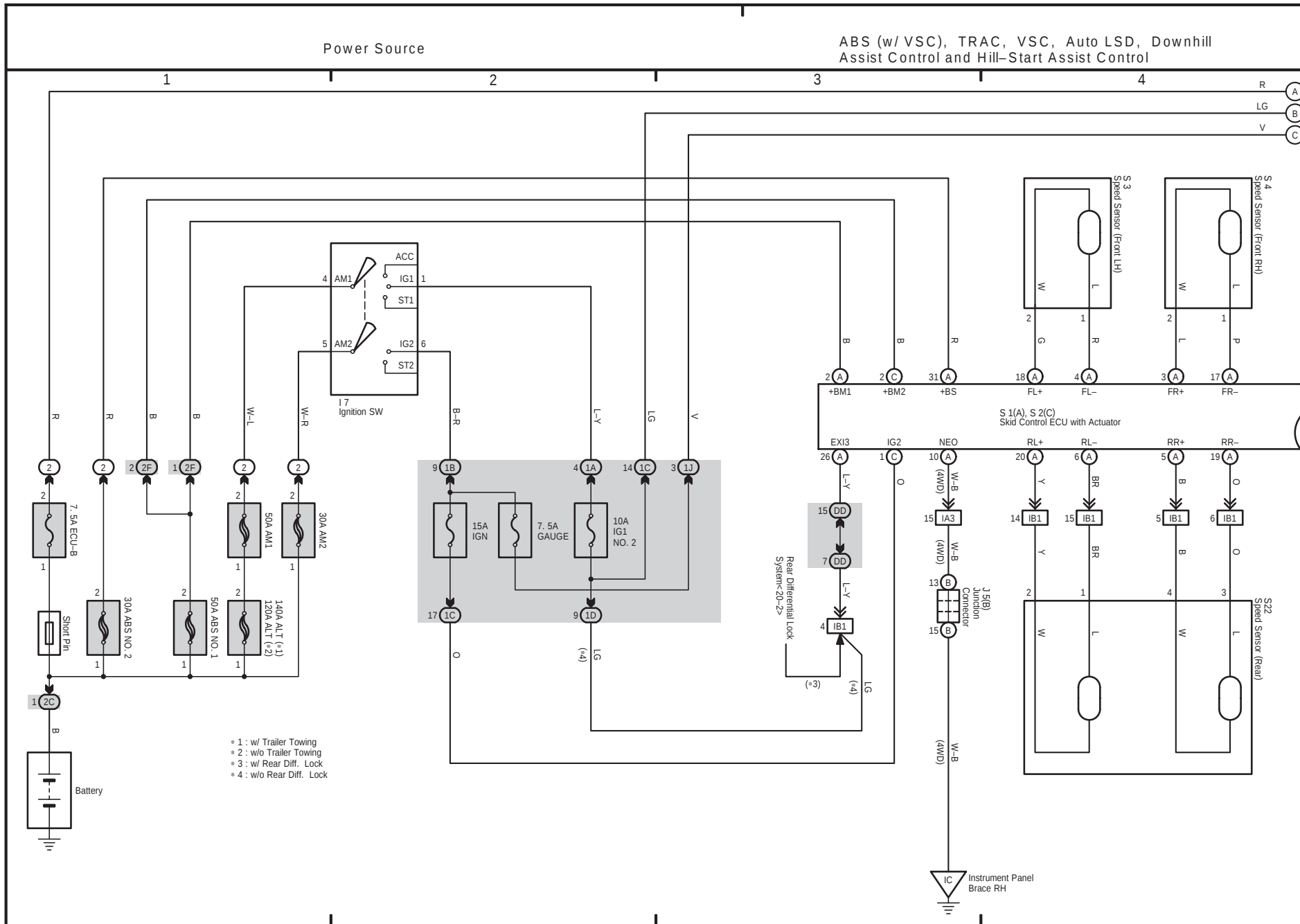


Electronically Controlled Transmission and A/T Indicator (2TR-FE)

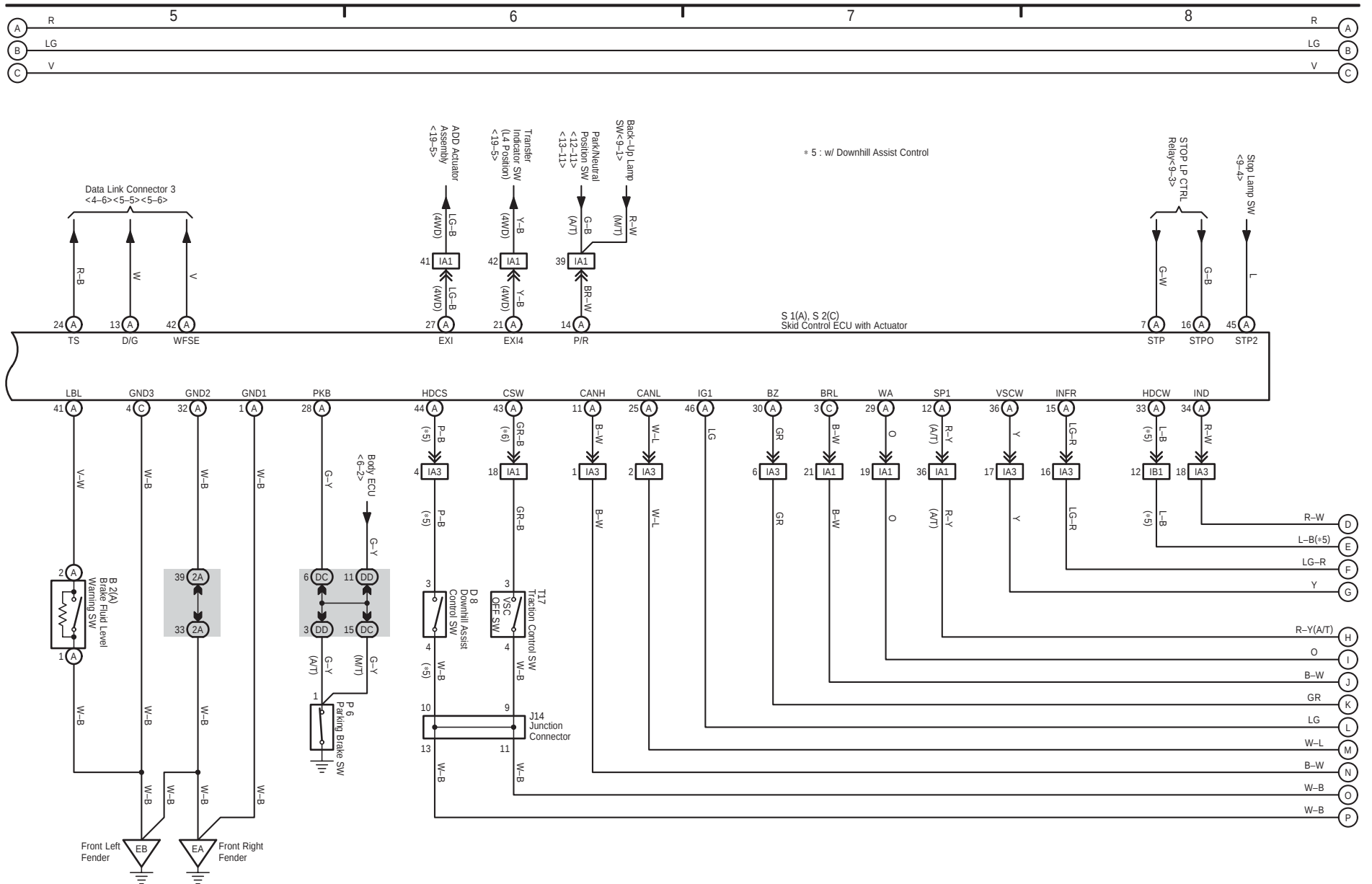


13 TOYOTA TACOMA (Cont' d)

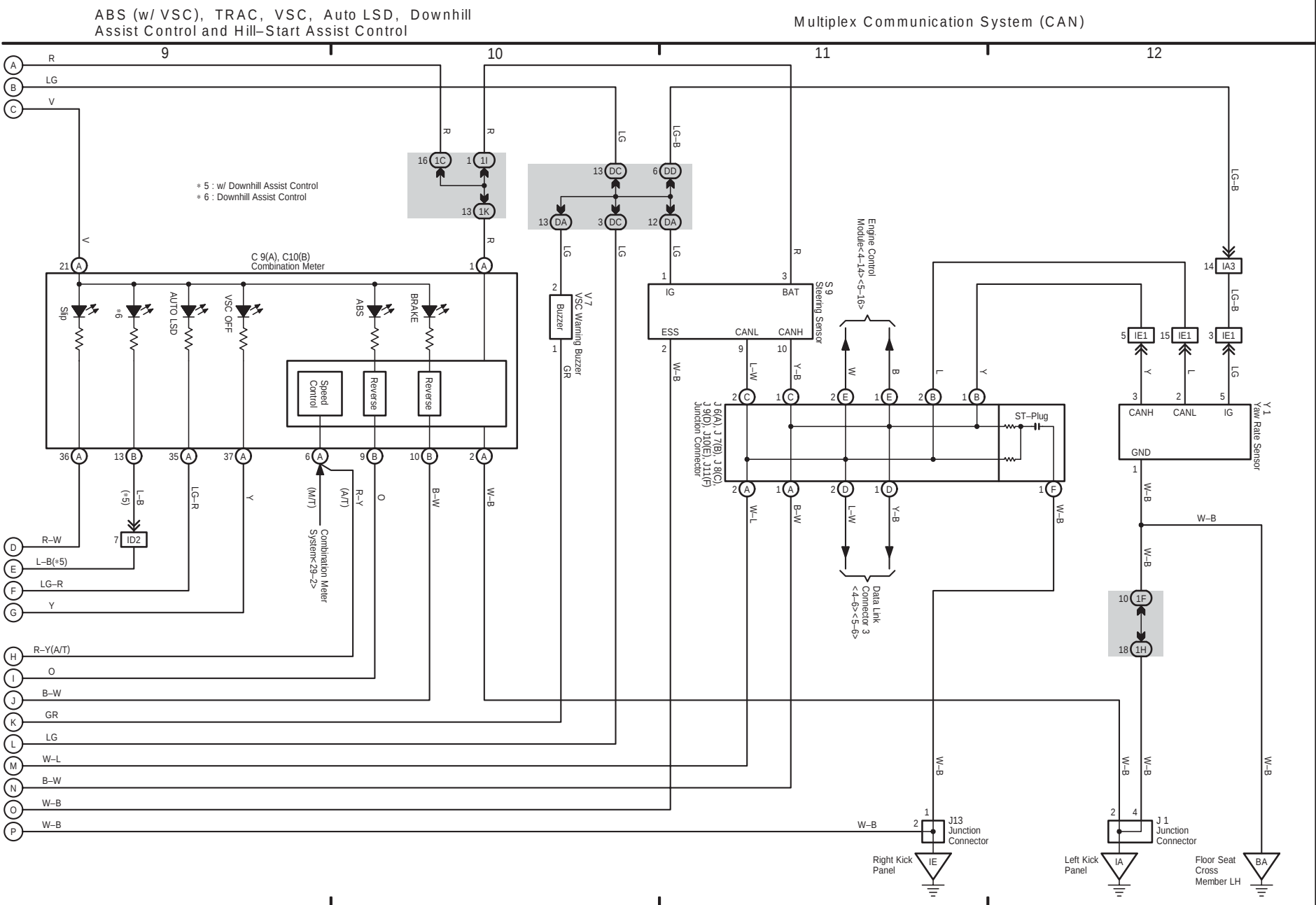




ABS (w/ VSC), TRAC, VSC, Auto LSD, Downhill Assist Control and Hill-Start Assist Control

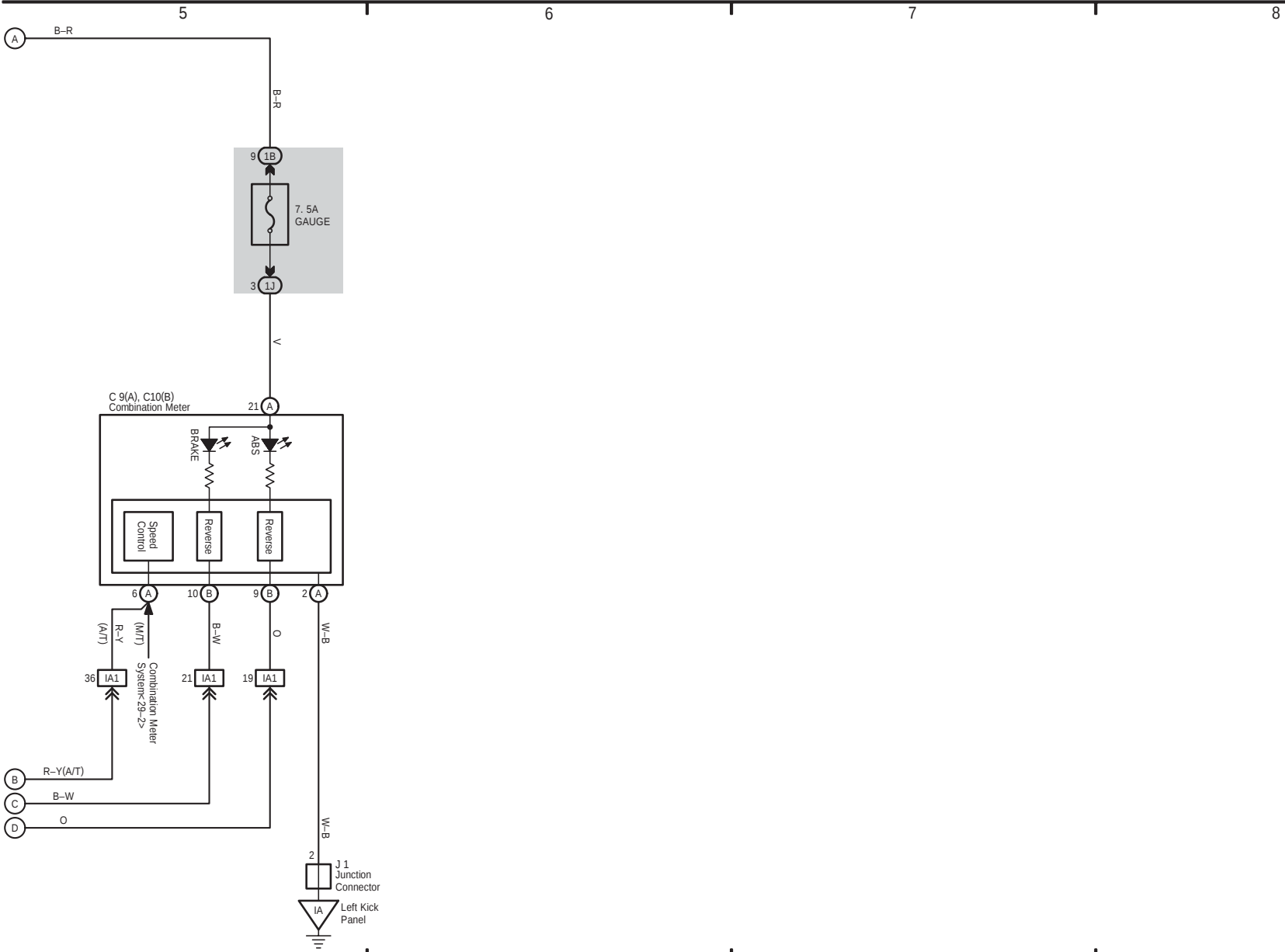


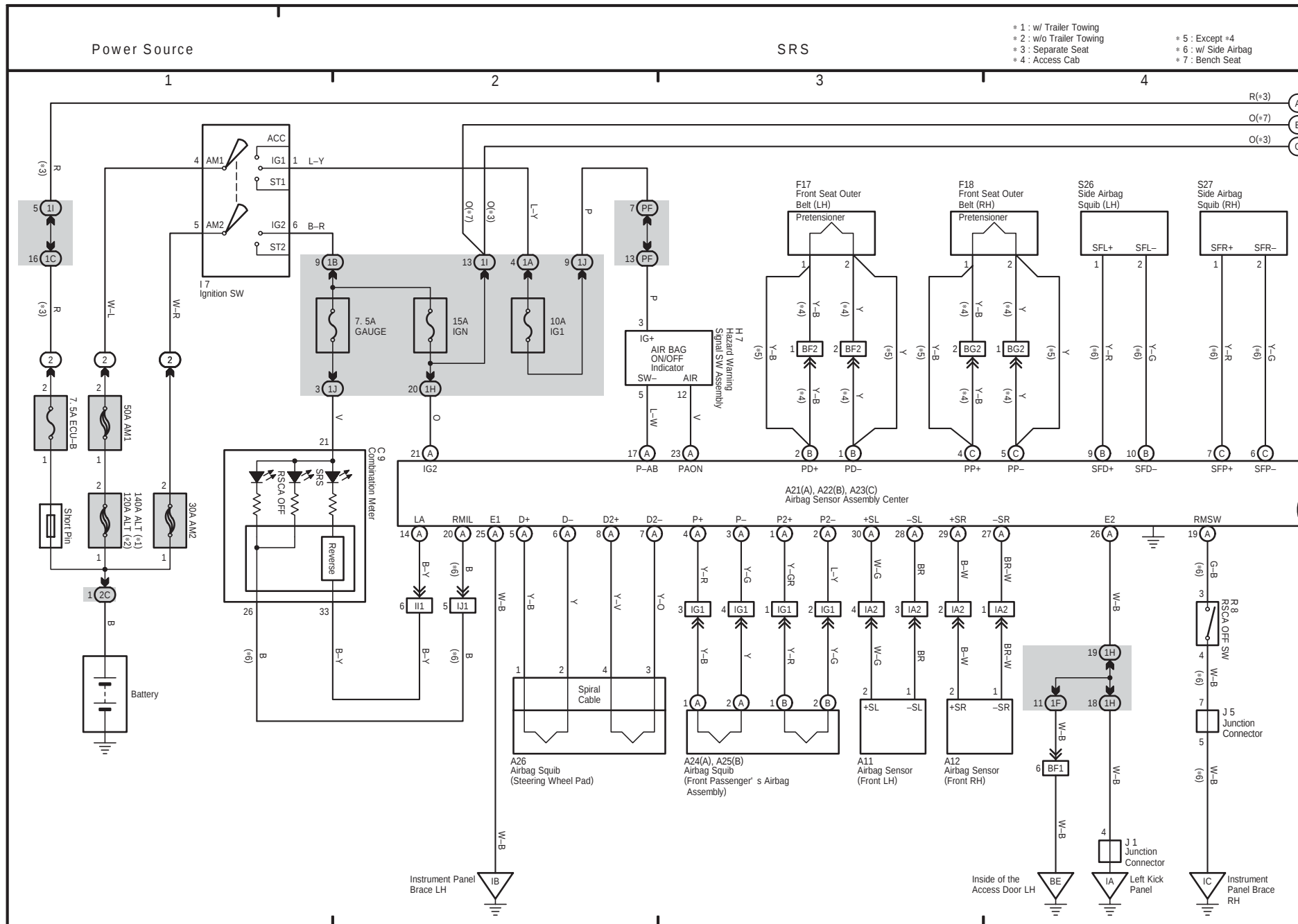
14 TOYOTA TACOMA (Cont' d)



15 TOYOTA TACOMA (Cont' d)

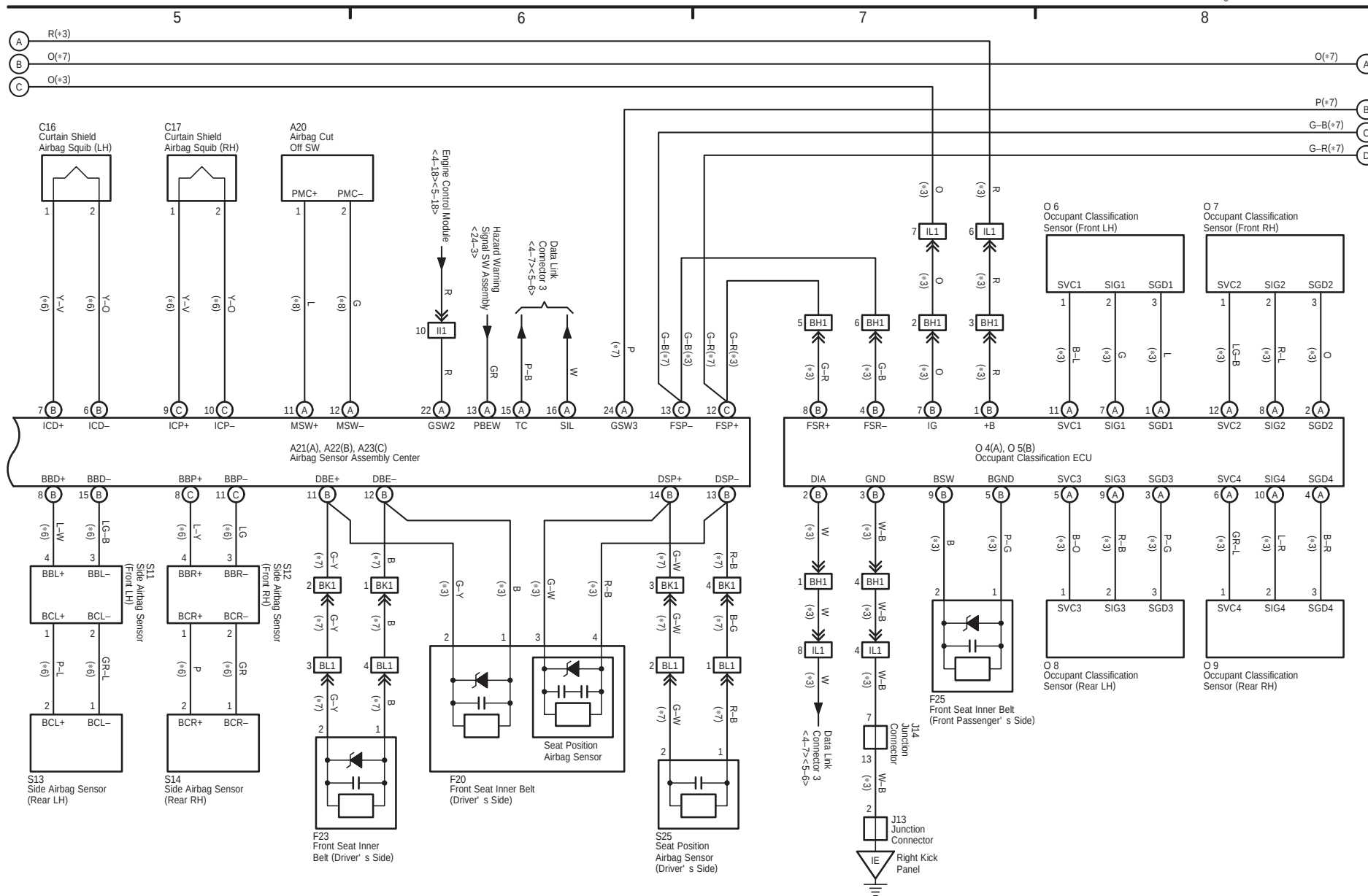
ABS (w/o VSC)



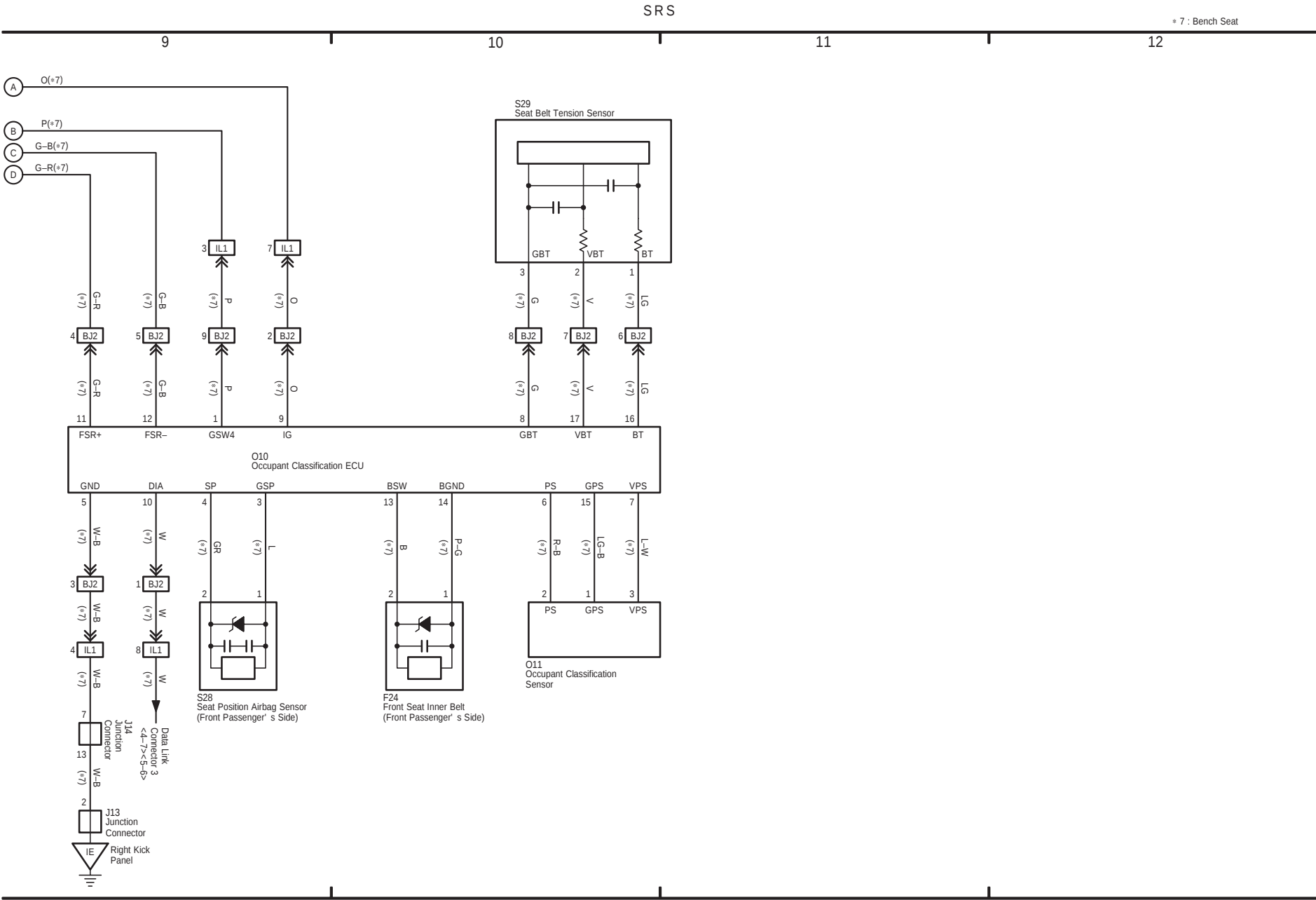


SRS

- * 3 : Separate Seat
- * 6 : w/ Side Airbag
- * 7 : Bench Seat
- * 8 : w/ Airbag Cut Off SW



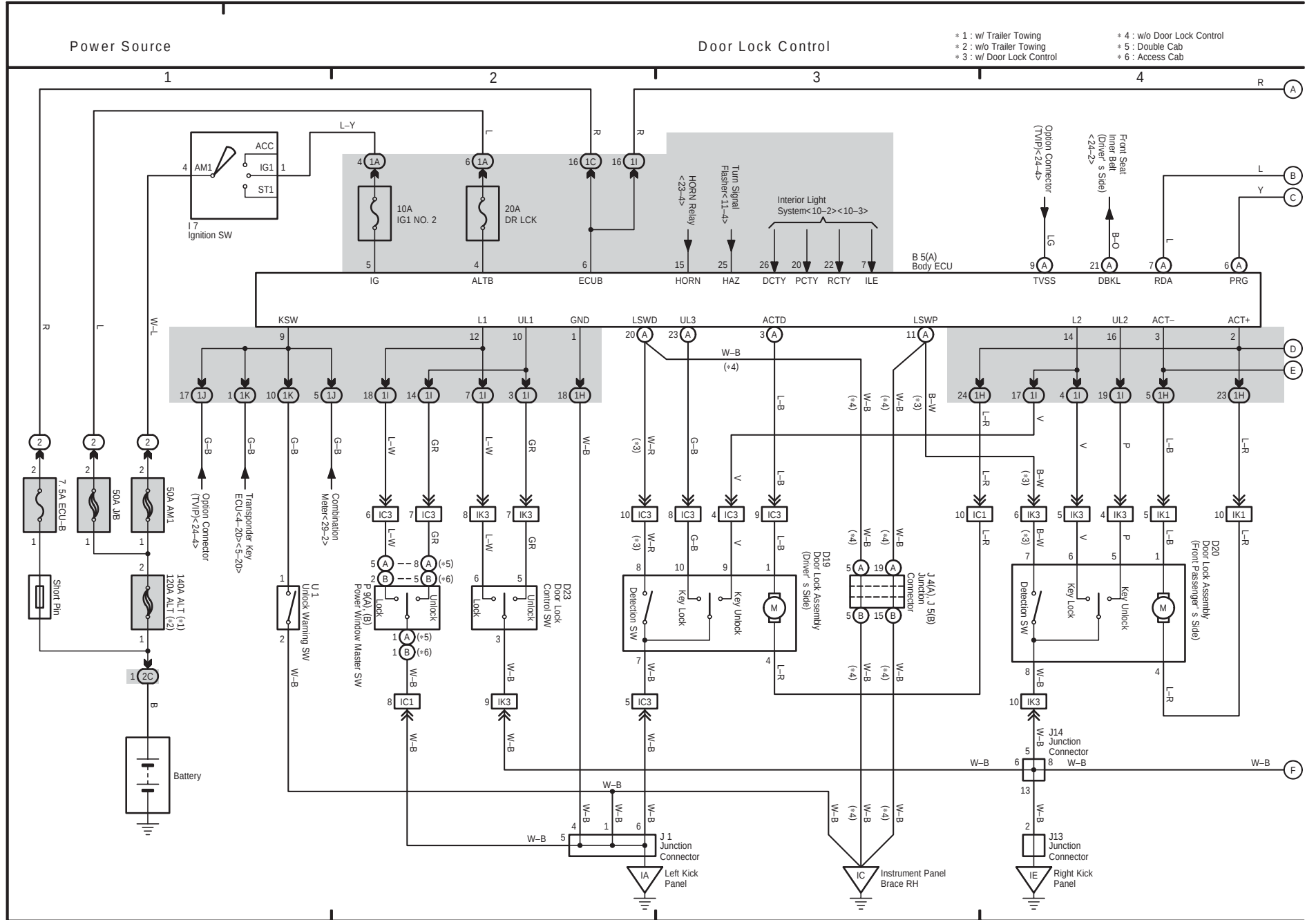
16 TOYOTA TACOMA(Cont' d)



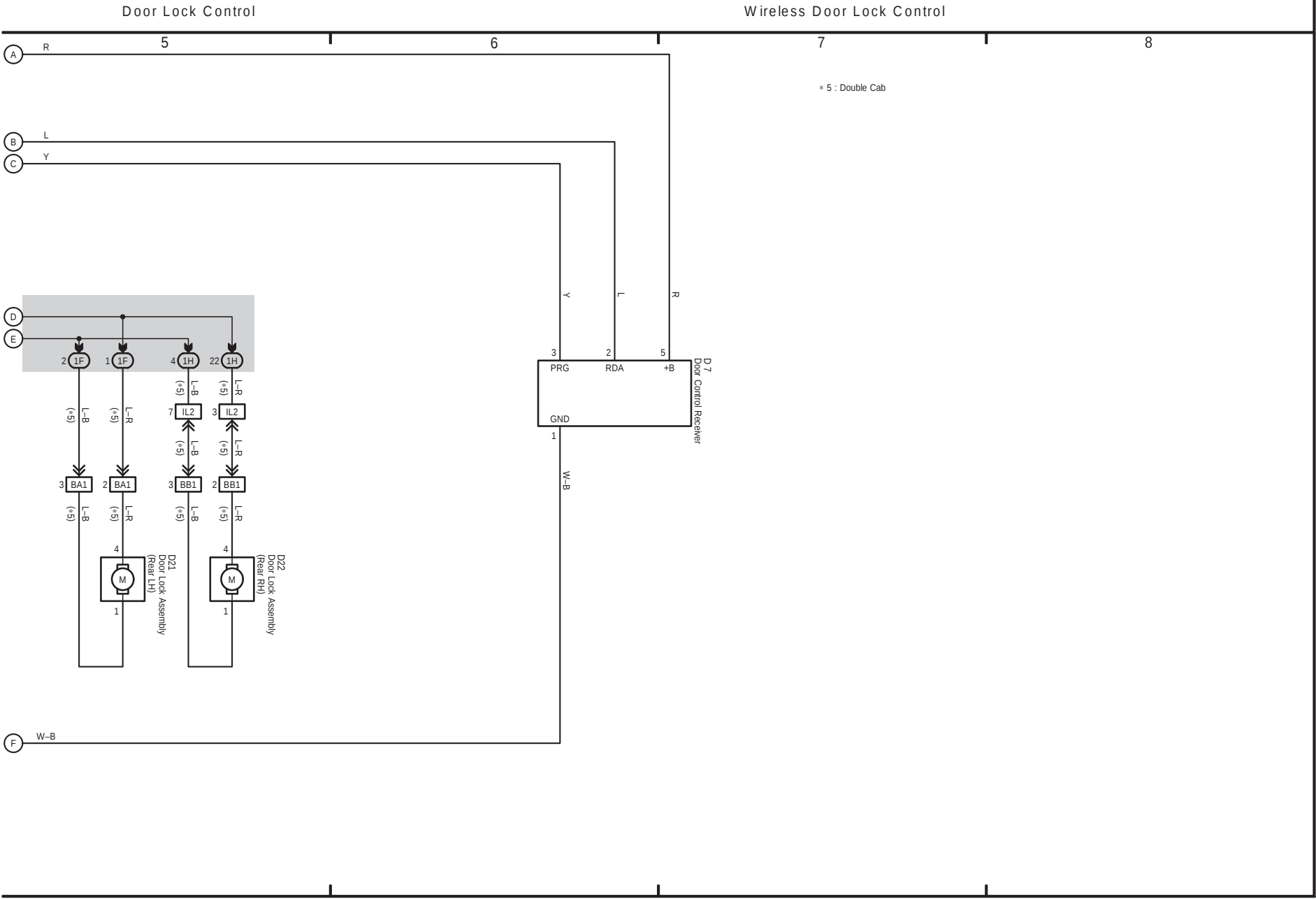
17 TOYOTA TACOMA

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M OVERALL ELECTRICAL WIRING DIAGRAM



17 TOYOTA TACOMA (Cont' d)

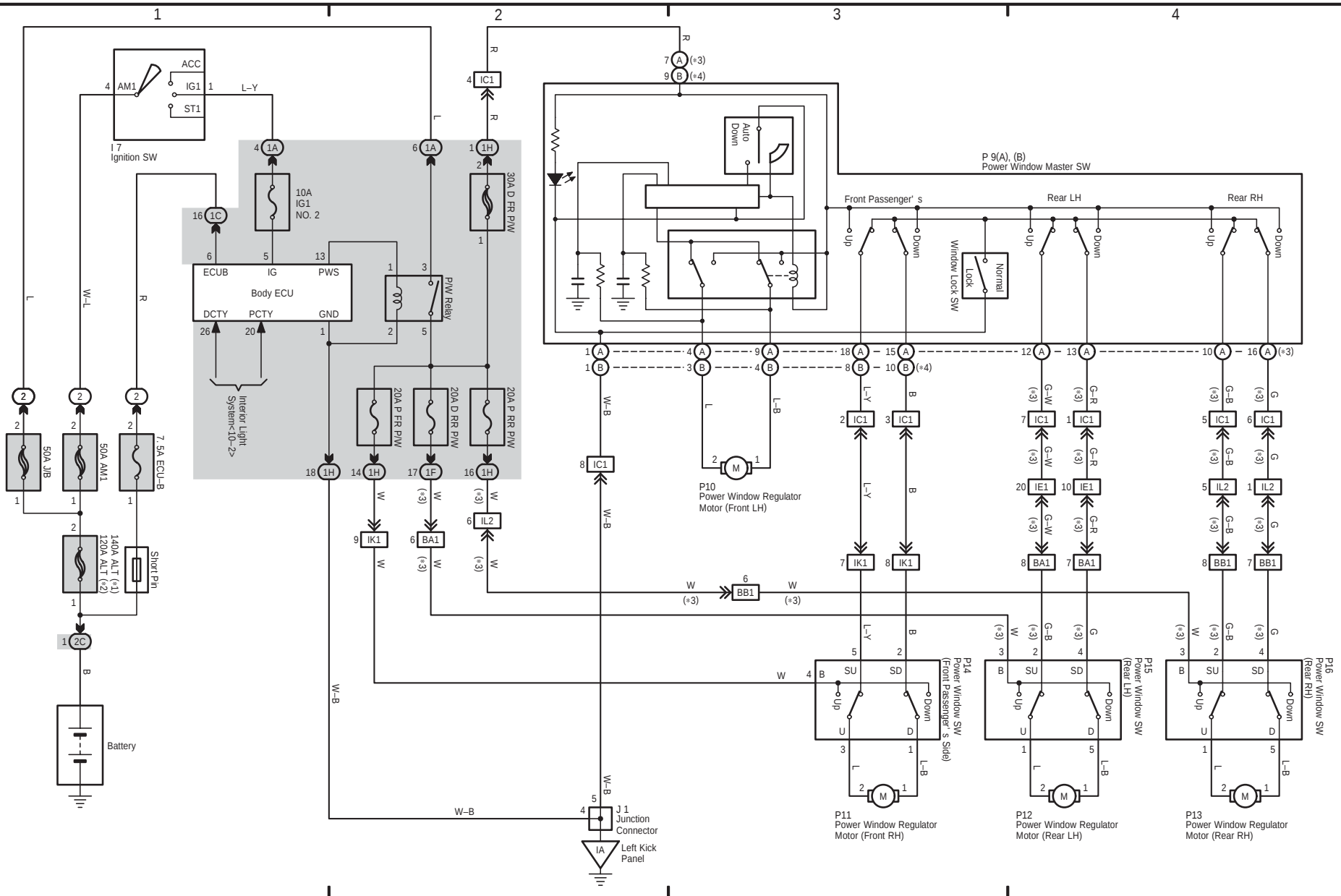


TOYOTA TACOMA (EM03N0U)

- * 1 : w/ Trailer Towing
- * 2 : w/o Trailer Towing
- * 3 : Double Cab
- * 4 : Access Cab

Power Source

Power Window



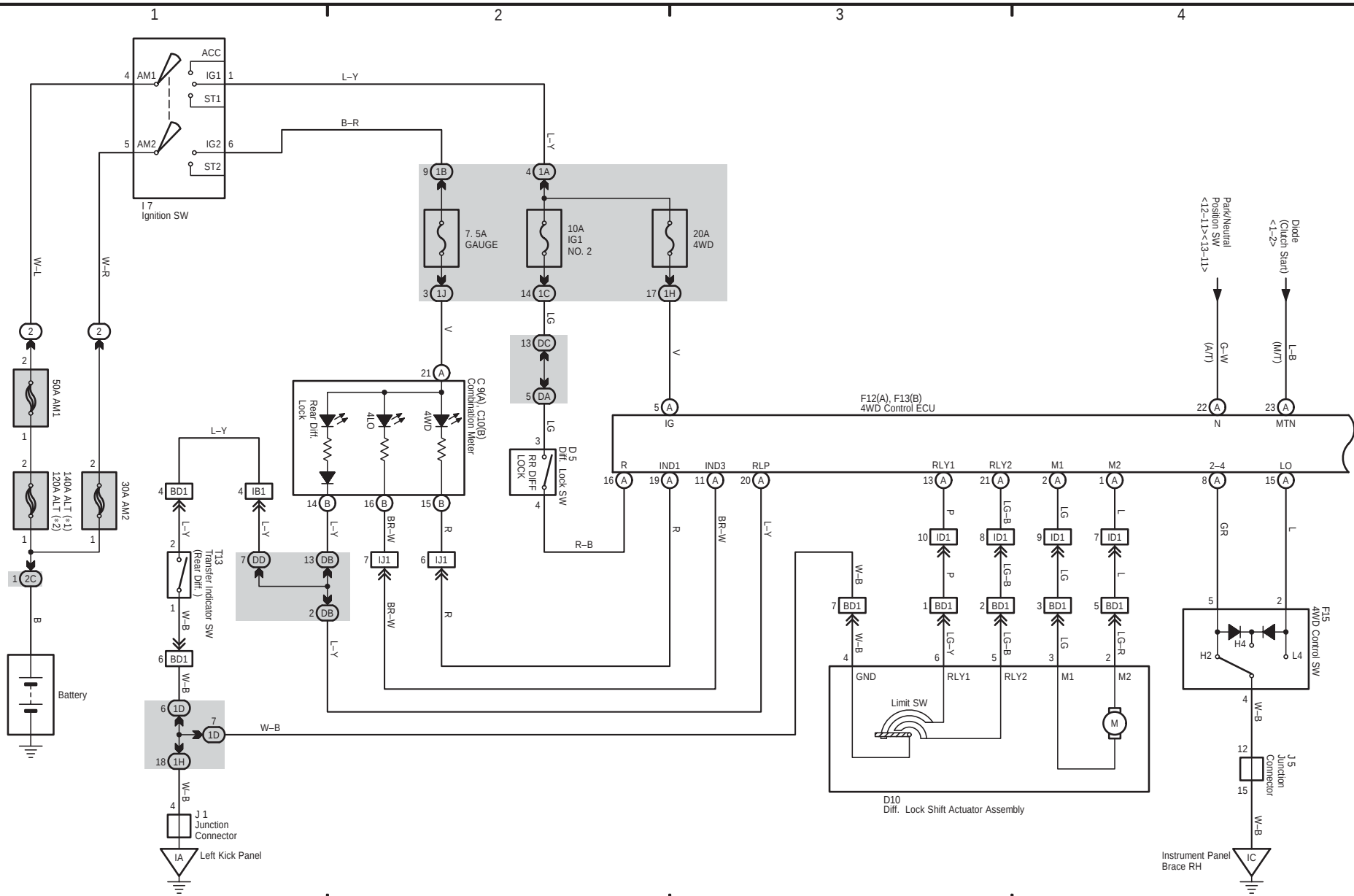
(Cont. next page)

19 TOYOTA TACOMA

Power Source

Multi Mode 4WD and Rear Differential Lock (4WD)

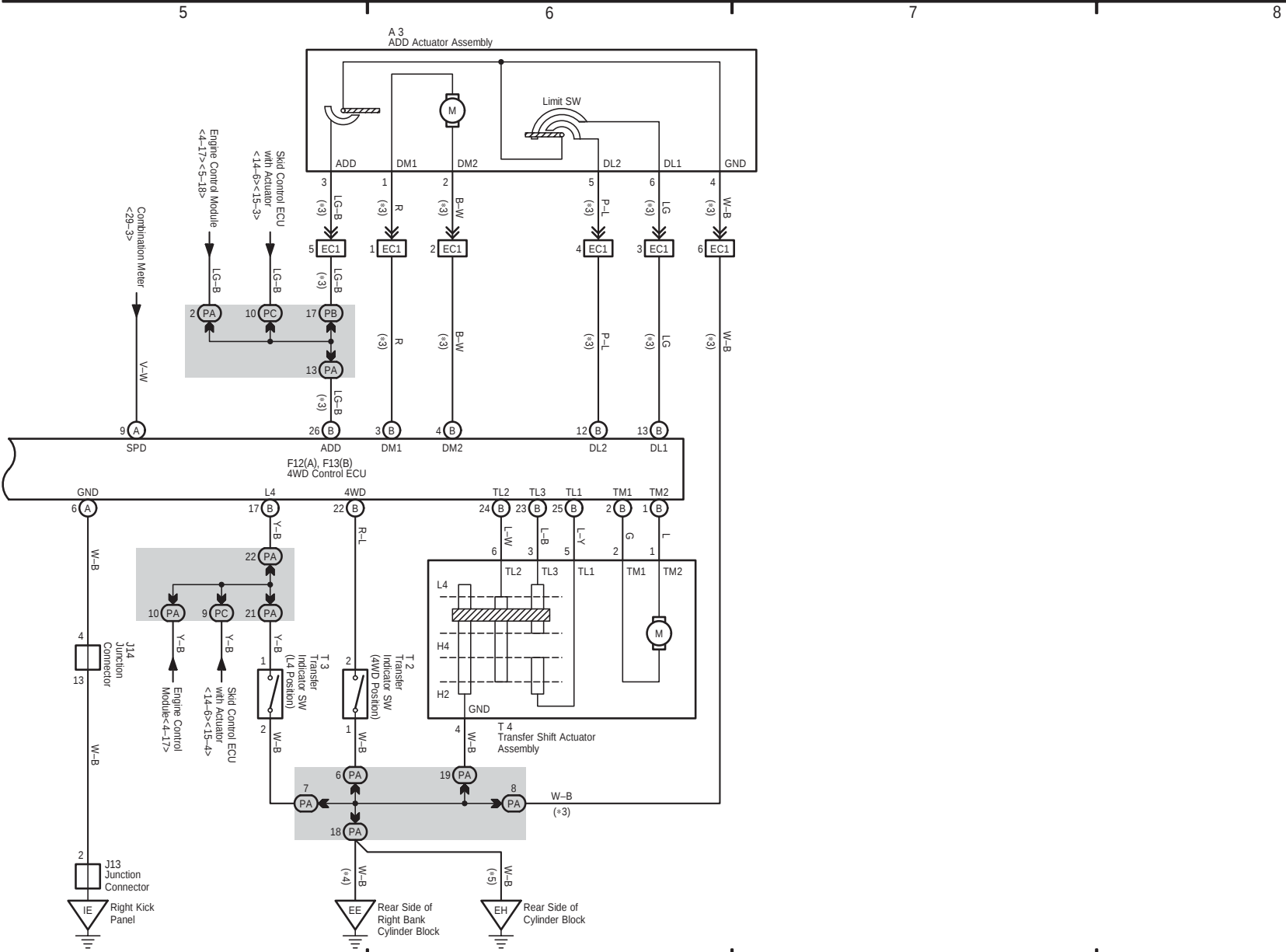
* 1 : w/ Trailer Towing
* 2 : w/o Trailer Towing



19 TOYOTA TACOMA (Cont' d)

Multi Mode 4WD and Rear Differential Lock (4WD)

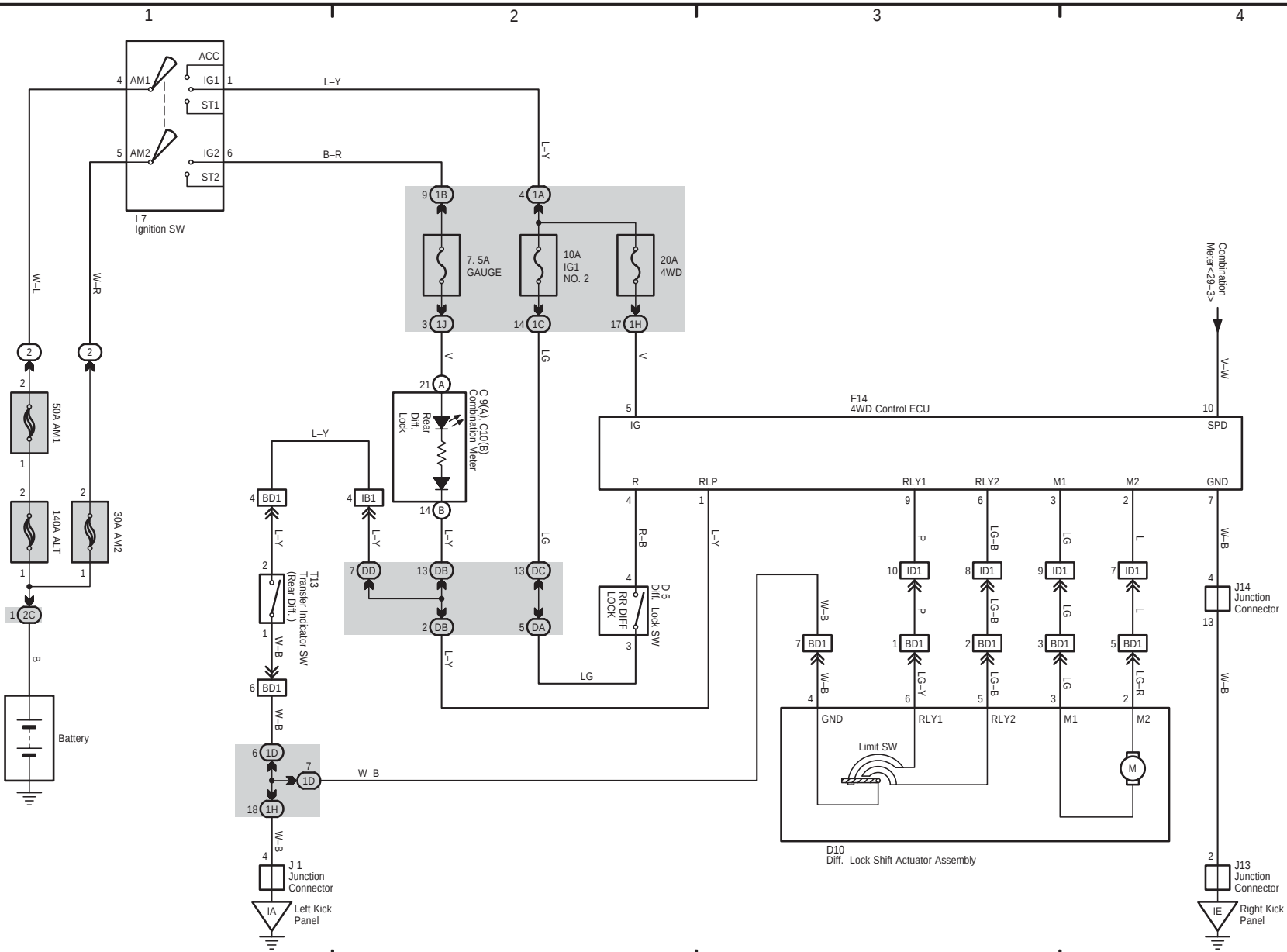
* 3 : w/ ADD
 * 4 : 1GR-FE
 * 5 : 2TR-FE



20 TOYOTA TACOMA

Power Source

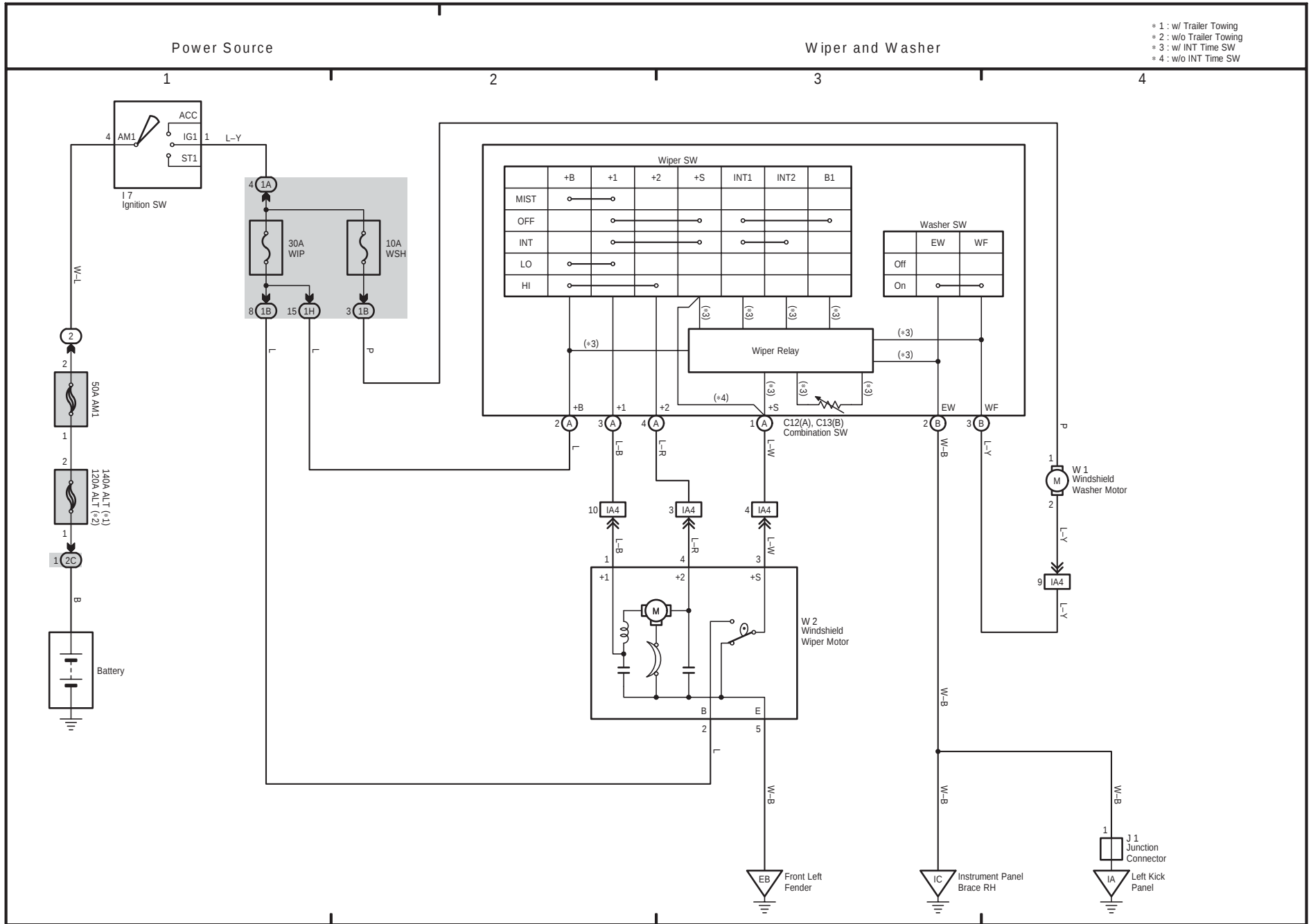
Rear Differential Lock (2WD)



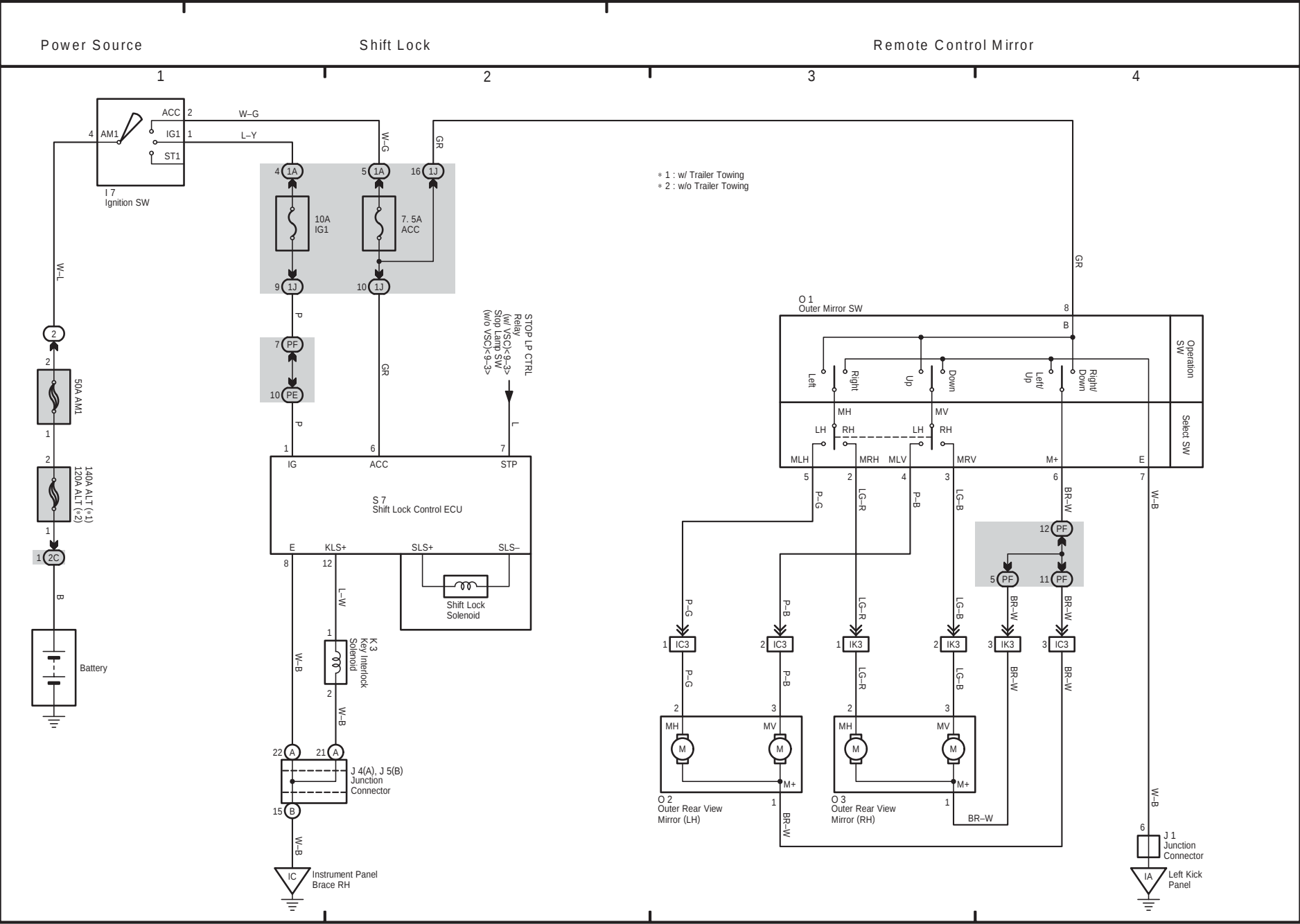
21 TOYOTA TACOMA

TOYOTA TACOMA (EM03N0U)

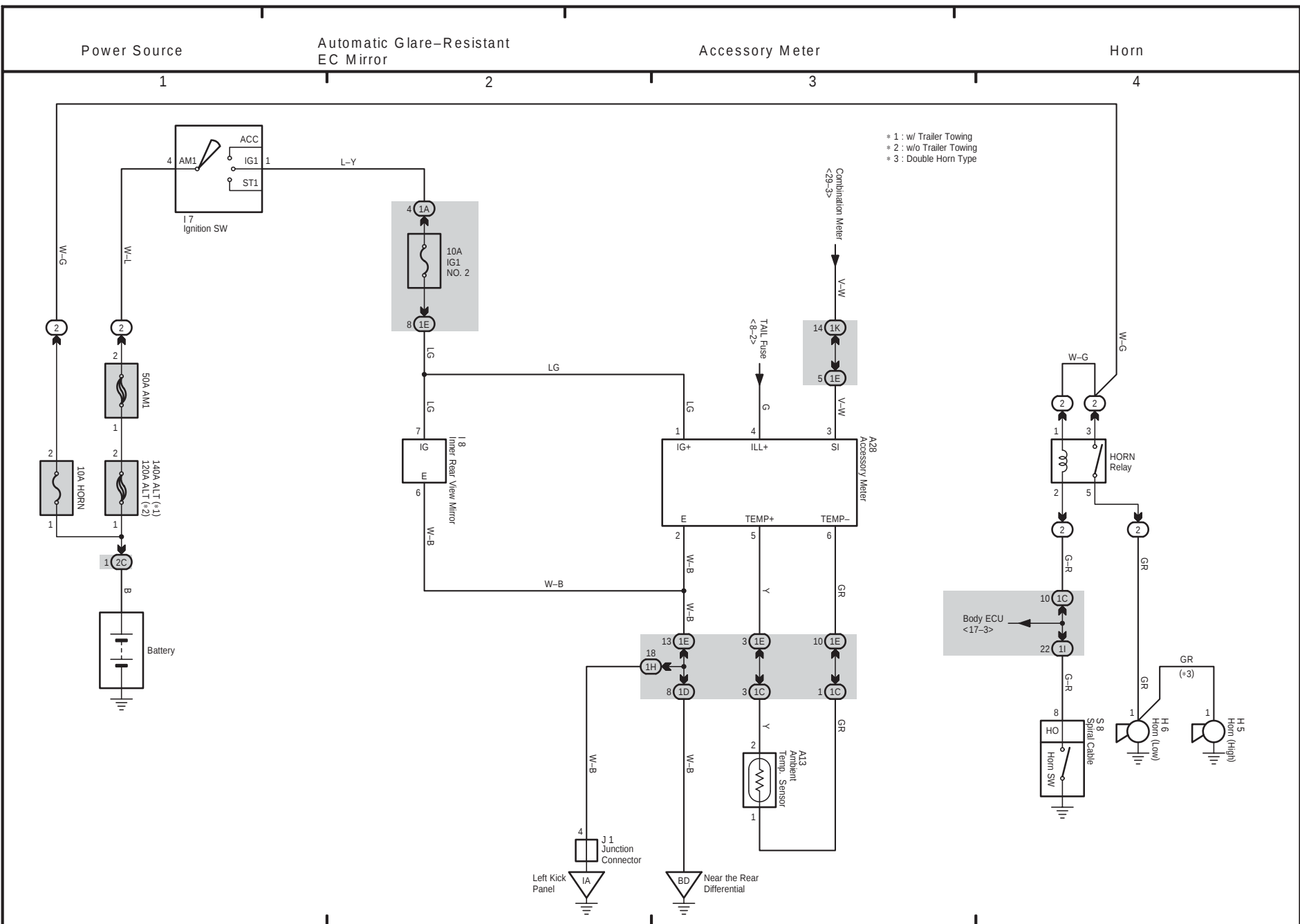
357



22 TOYOTA TACOMA

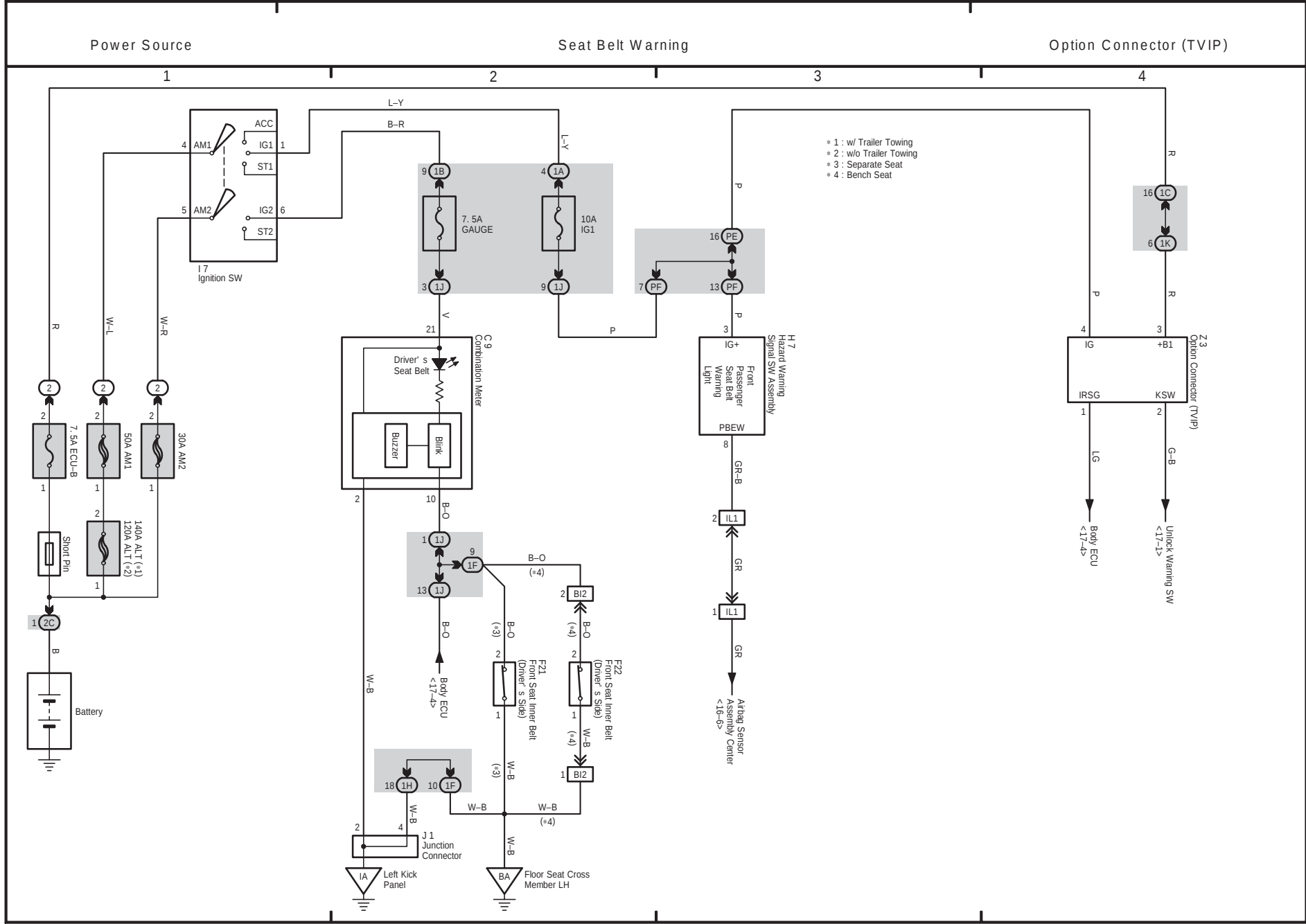


23 TOYOTA TACOMA



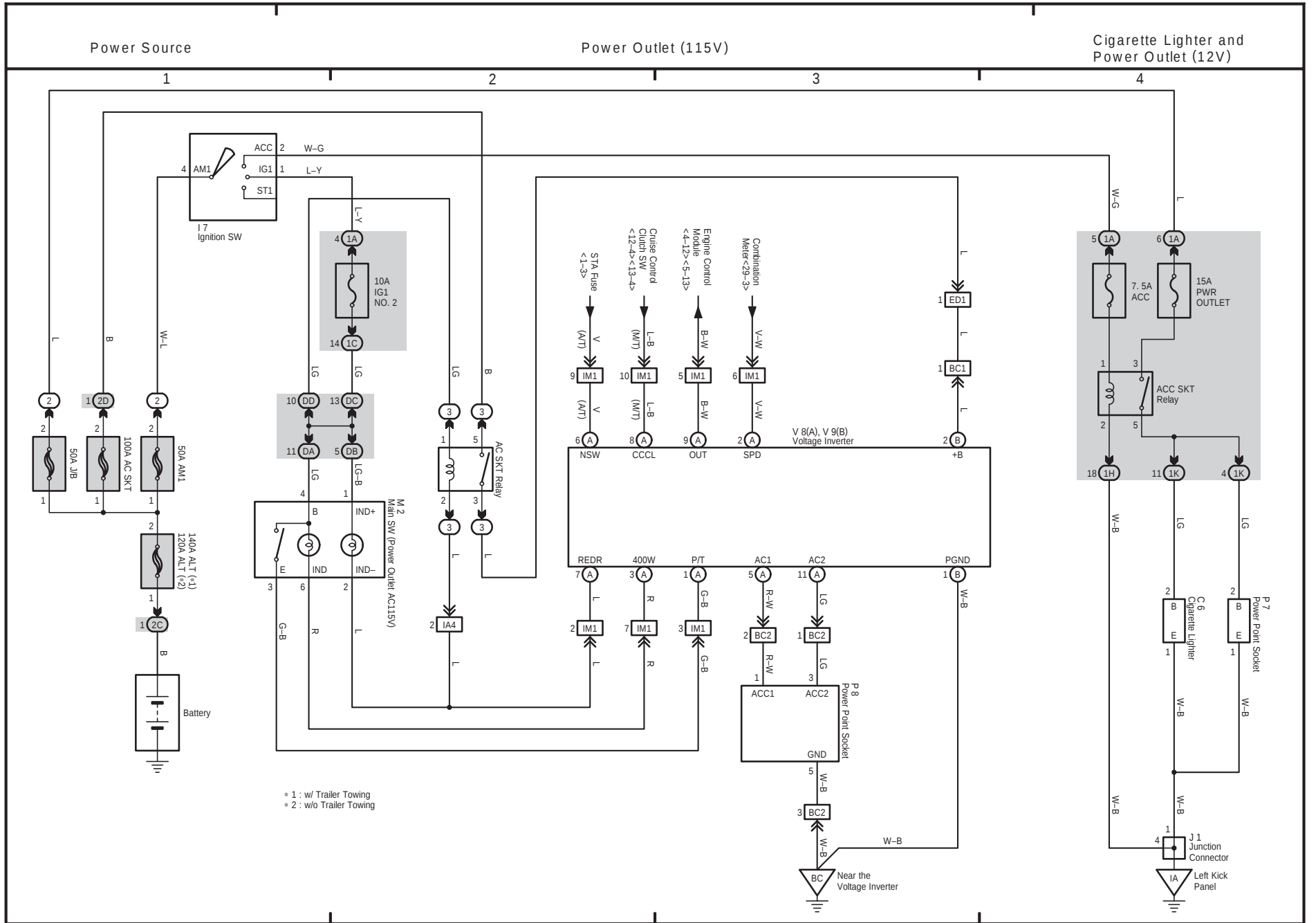
M OVERALL ELECTRICAL WIRING DIAGRAM

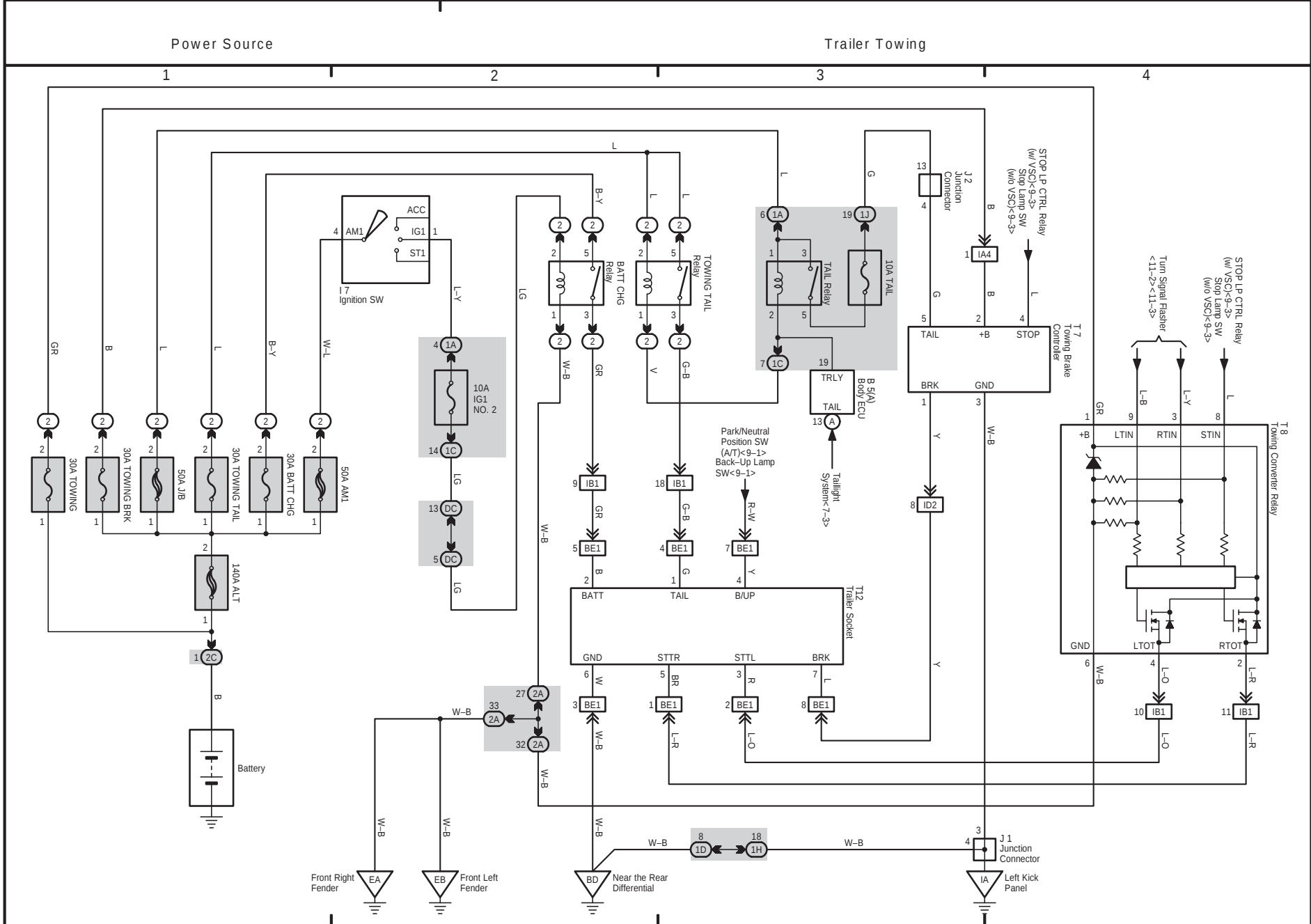
24 TOYOTA TACOMA

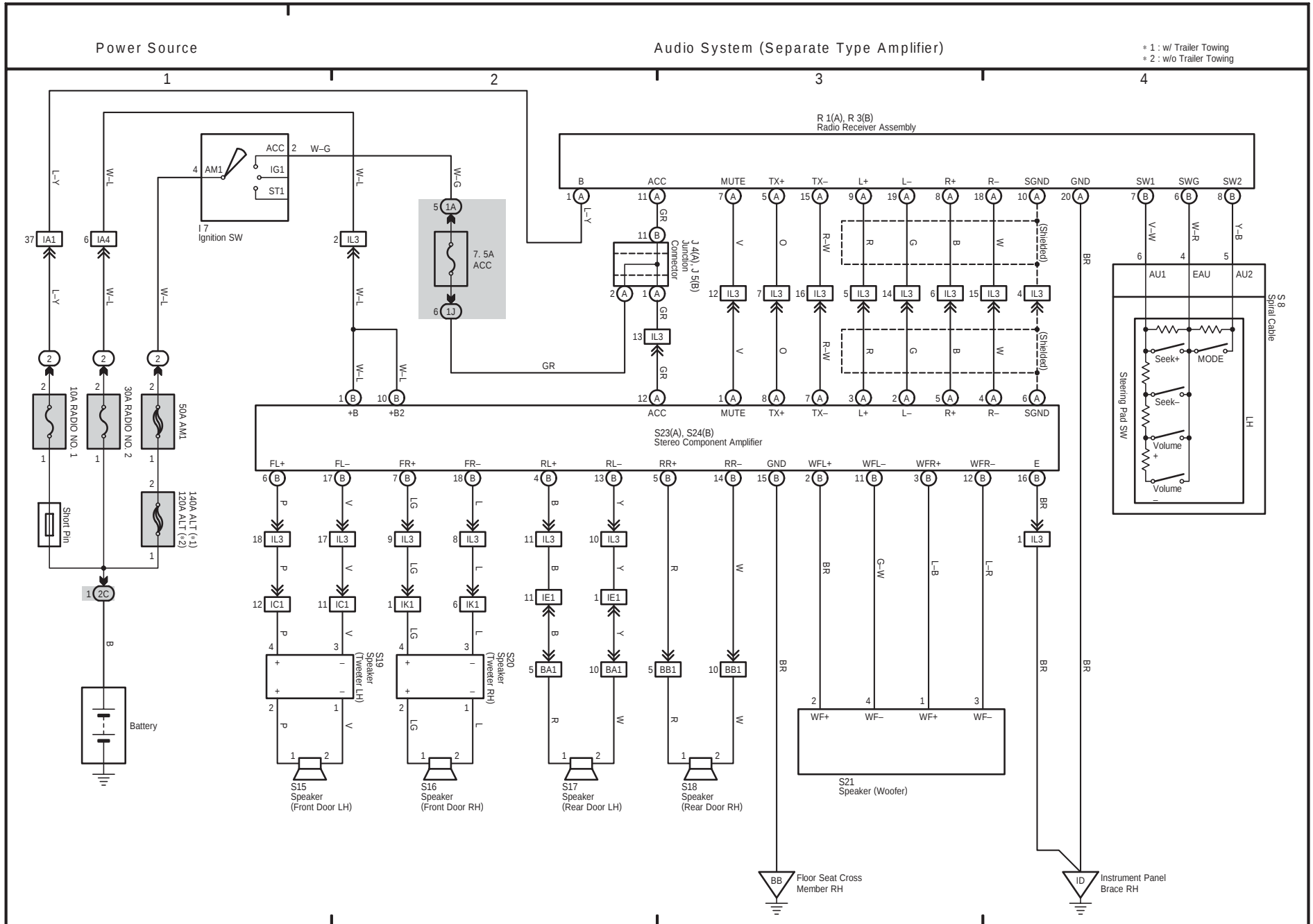


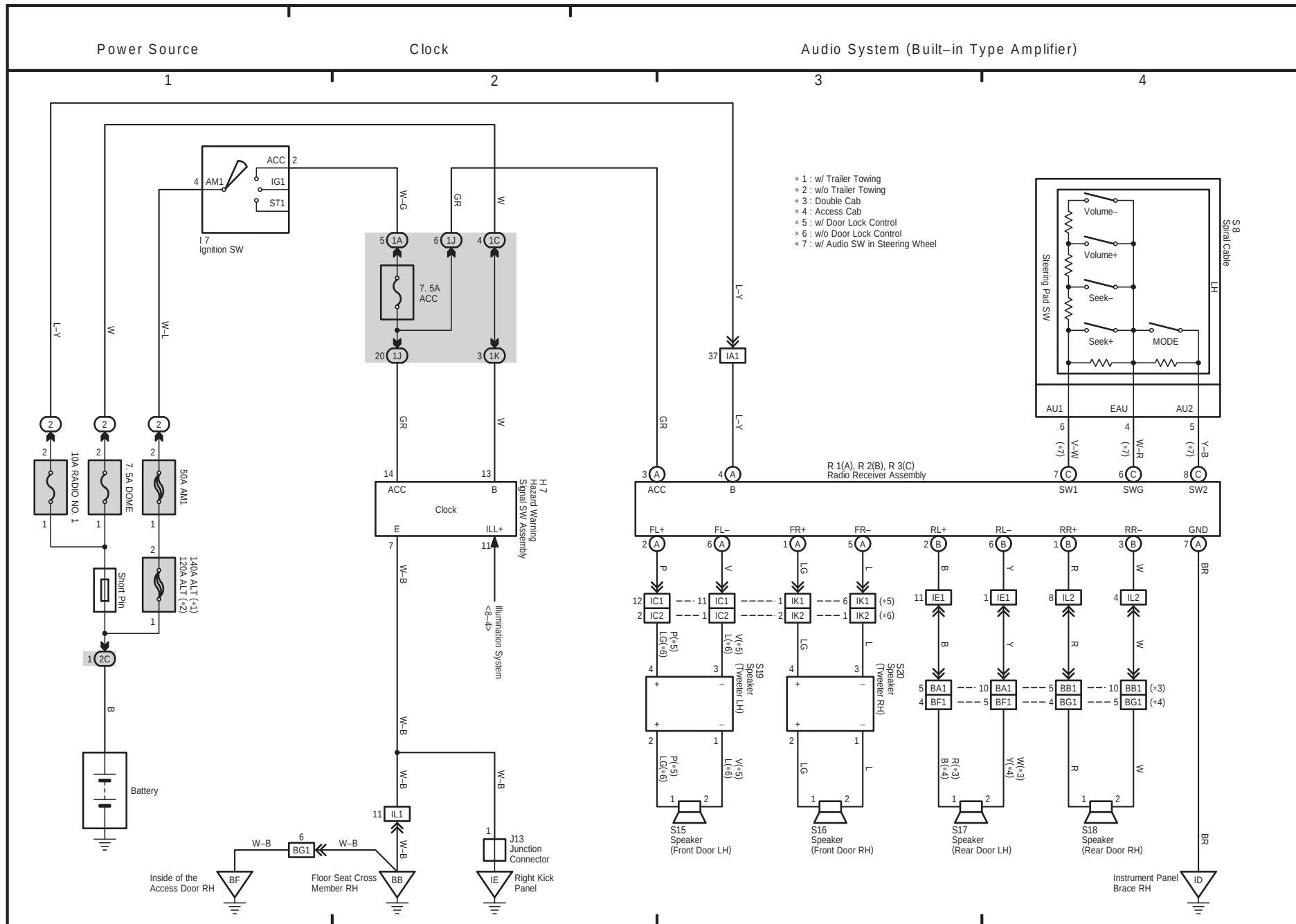
25 TOYOTA TACOMA

TOYOTA TACOMA (EM03N0U)



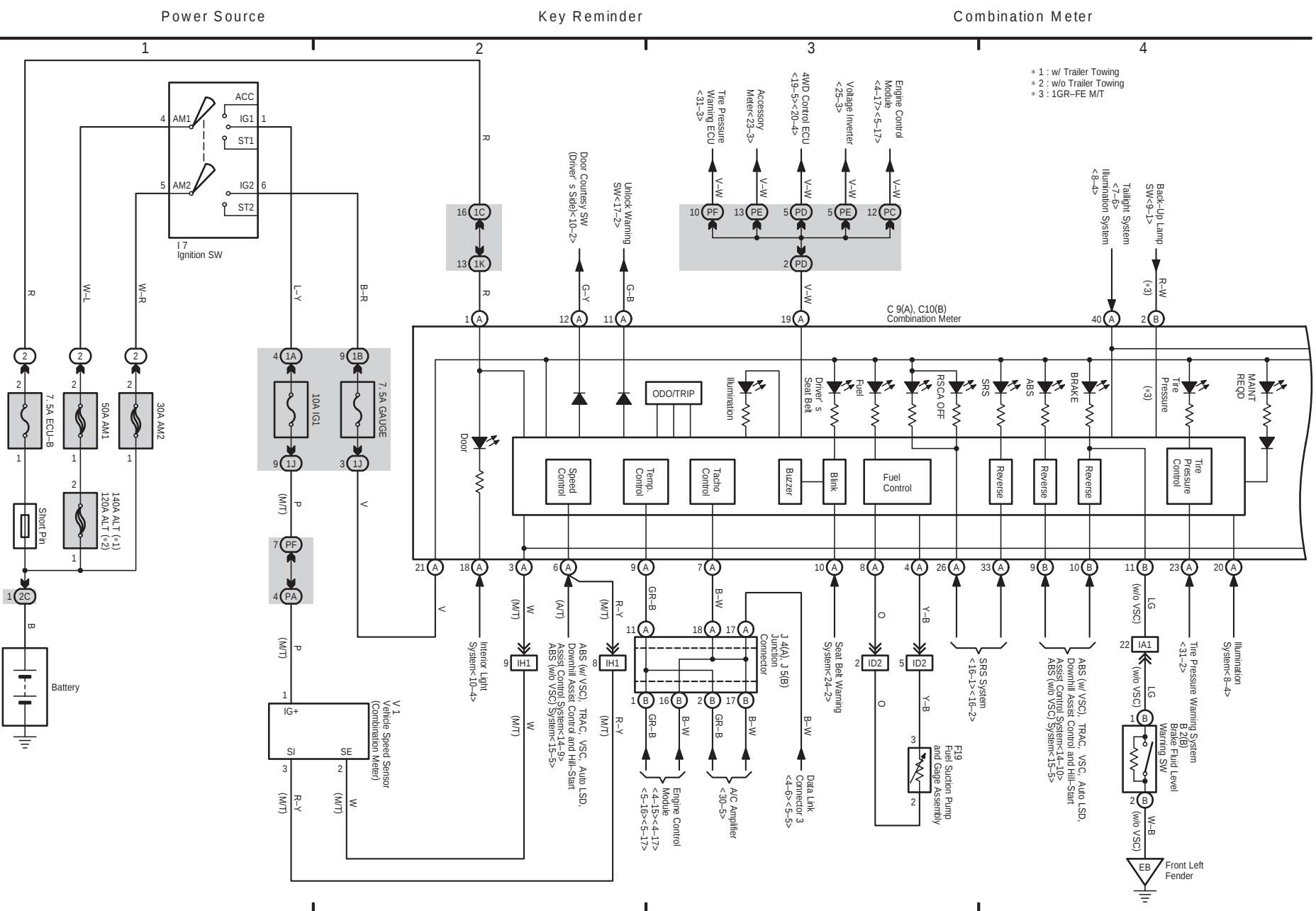




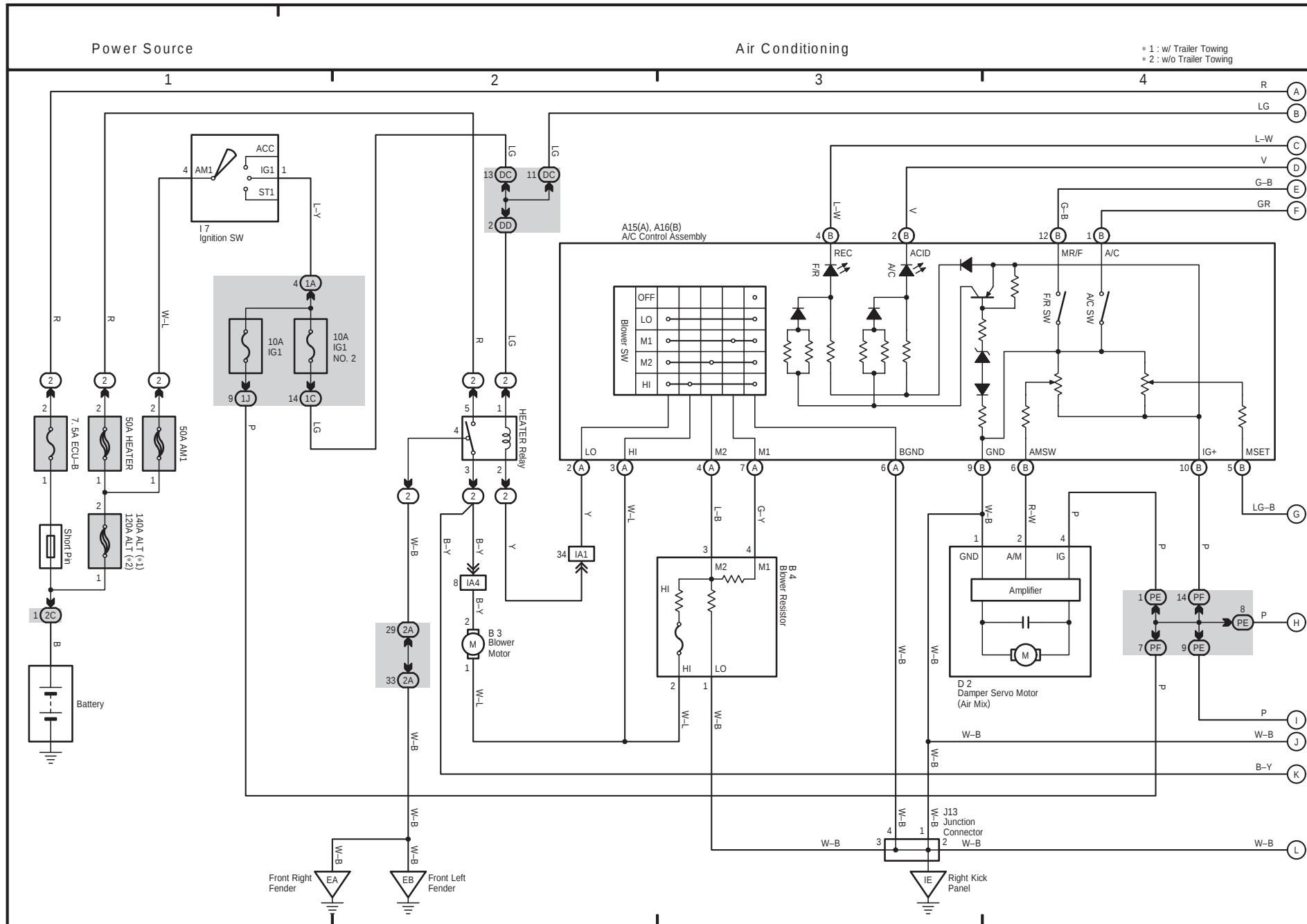


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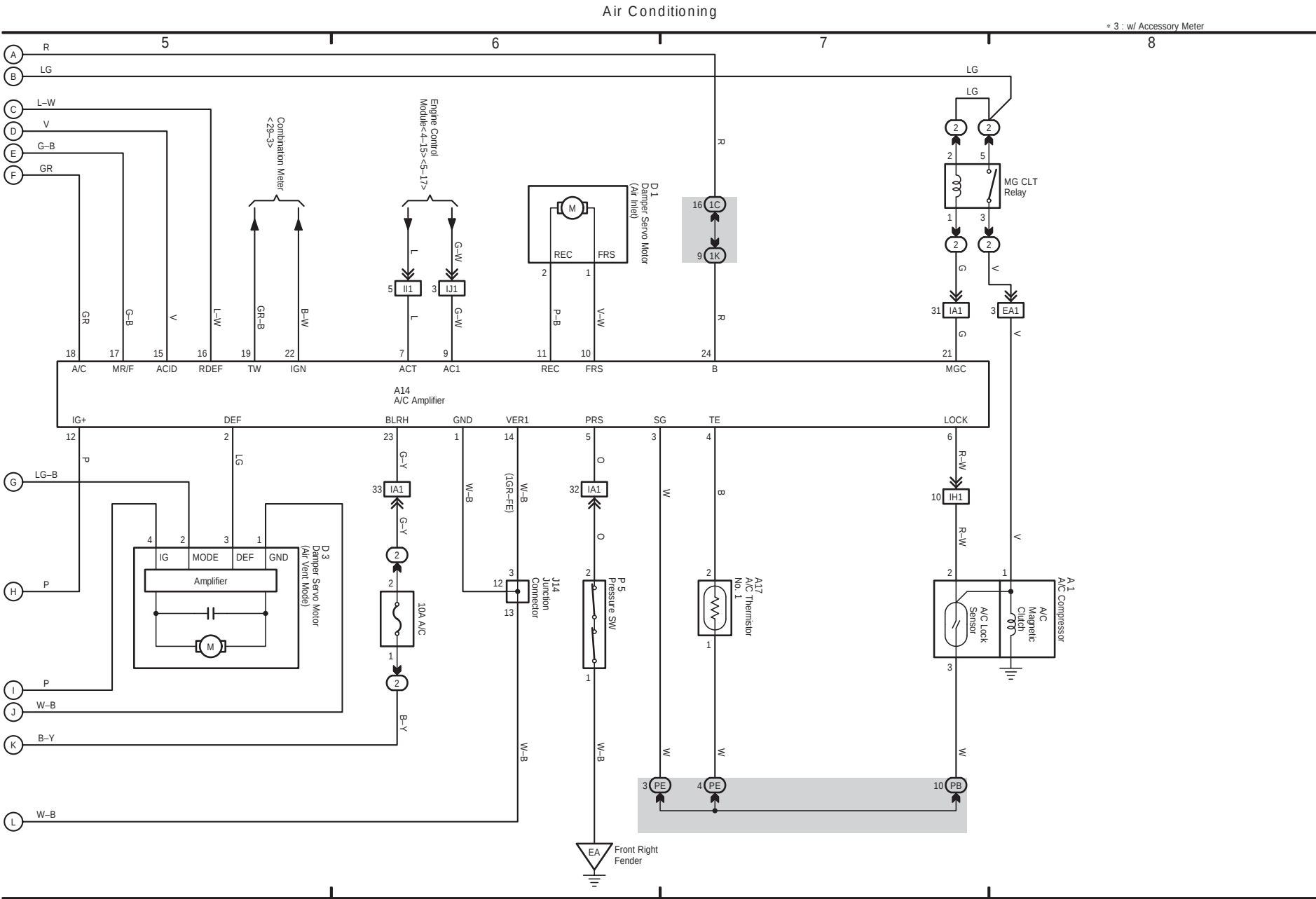
29 TOYOTA TACOMA







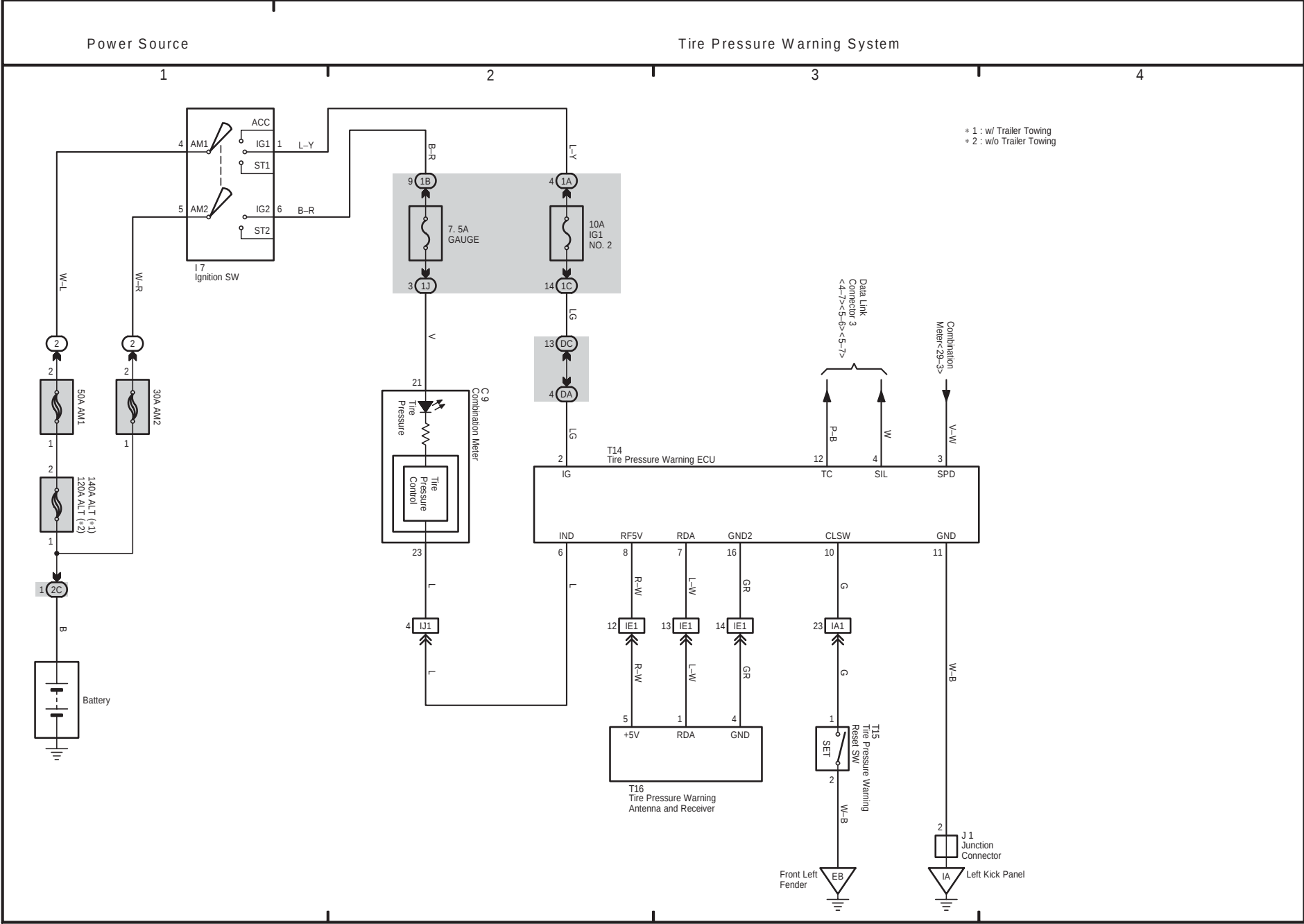
30 TOYOTA TACOMA (Cont' d)



31 TOYOTA TACOMA

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TOYOTA TACOMA (EM03N0U)



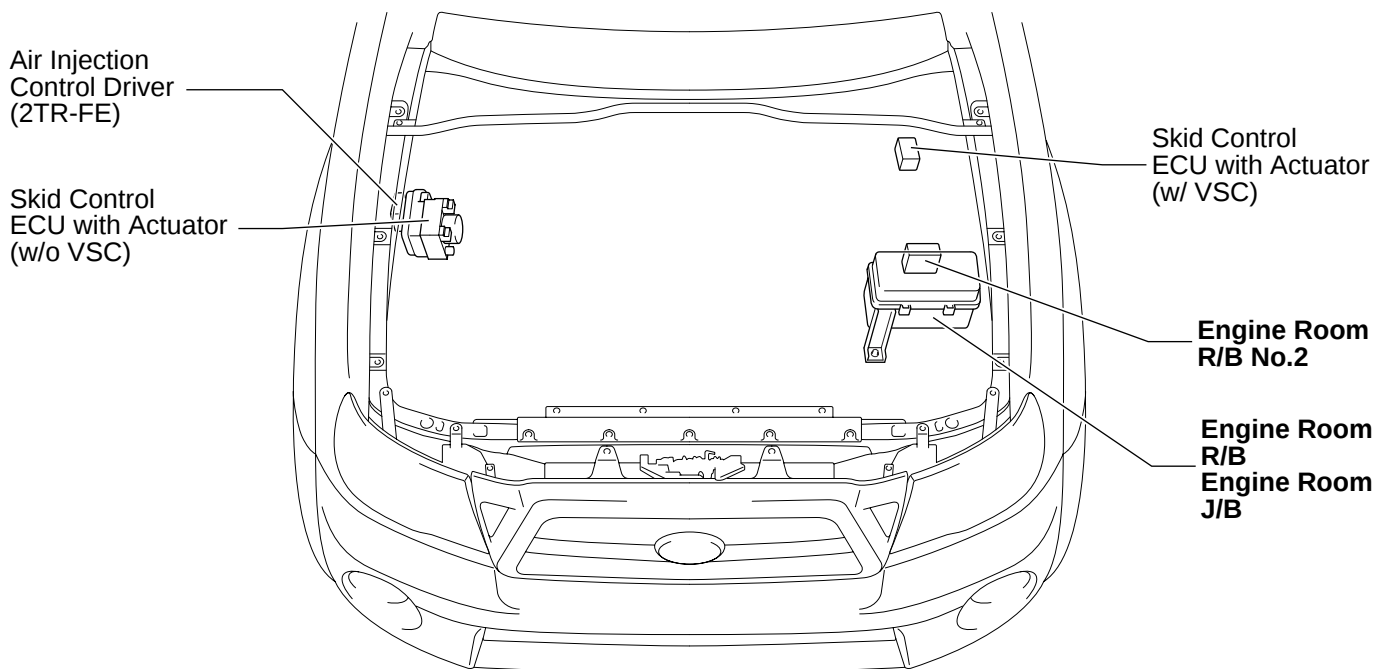
2007 TOYOTA TACOMA ELECTRICAL WIRING DIAGRAM SYSTEM CIRCUITS

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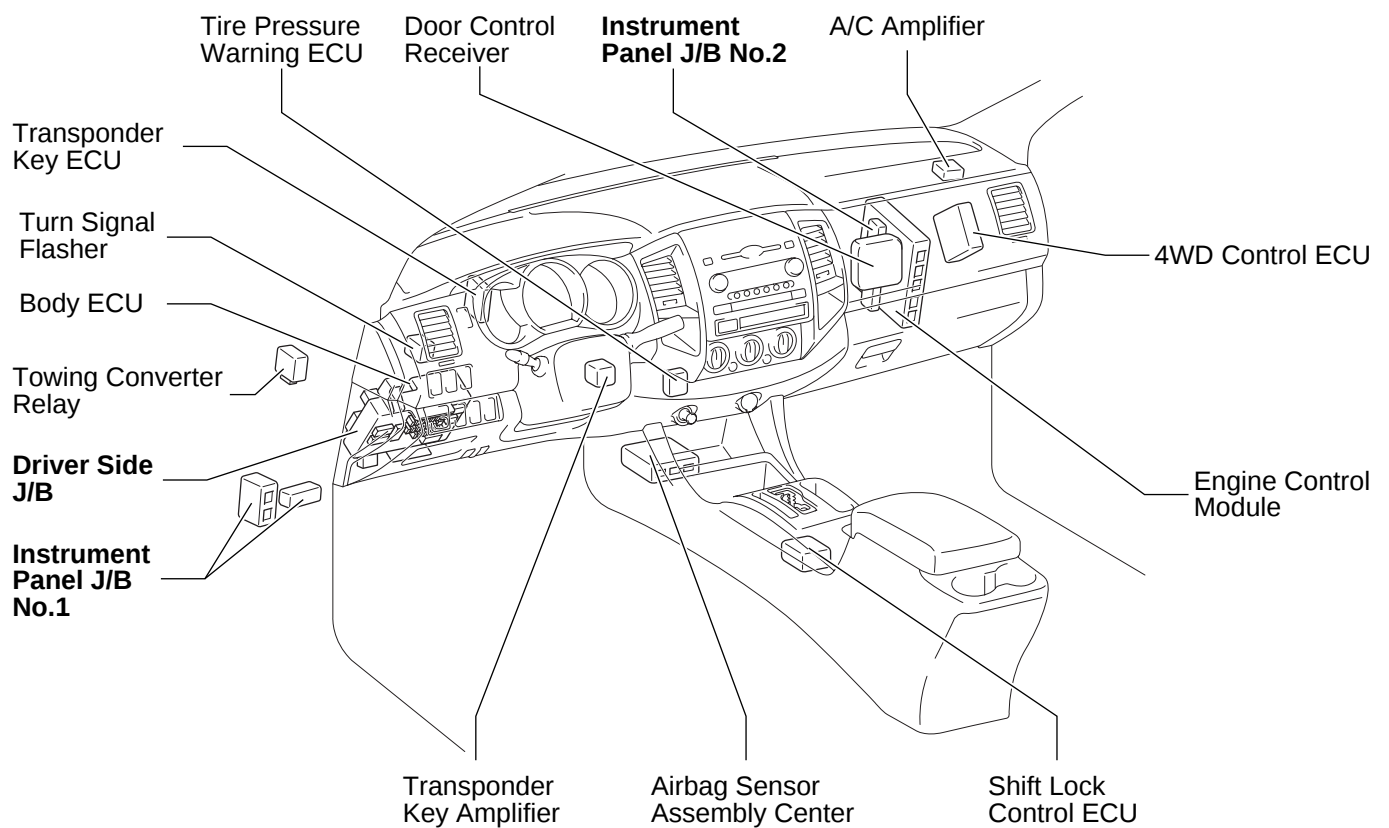
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F RELAY LOCATIONS

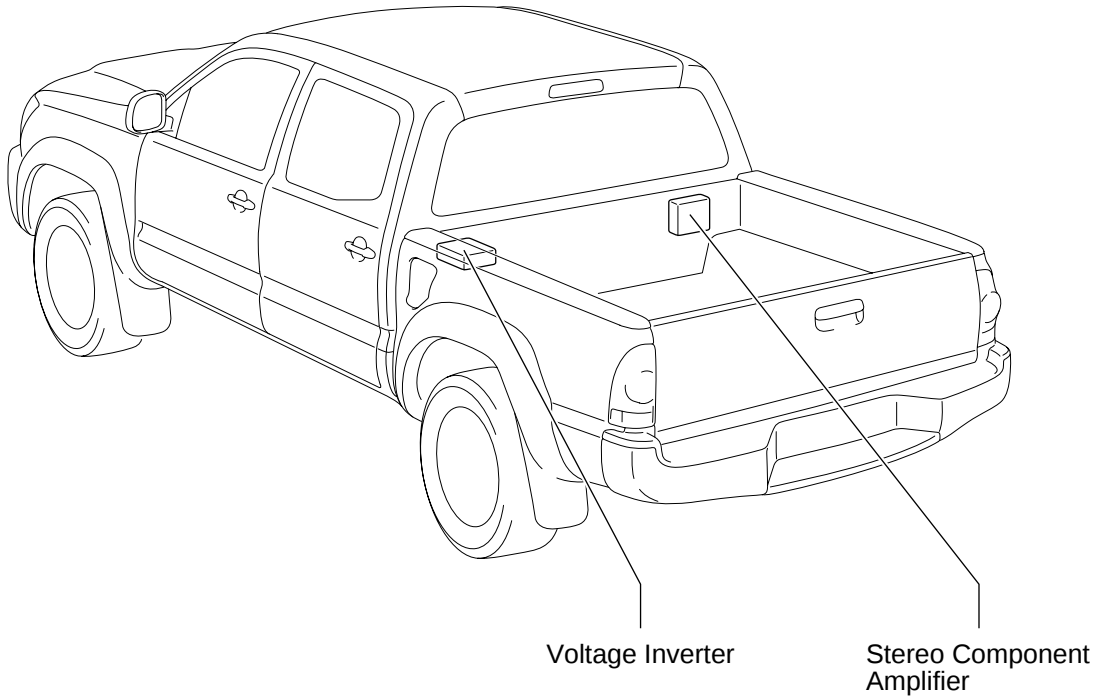
[Engine Compartment]



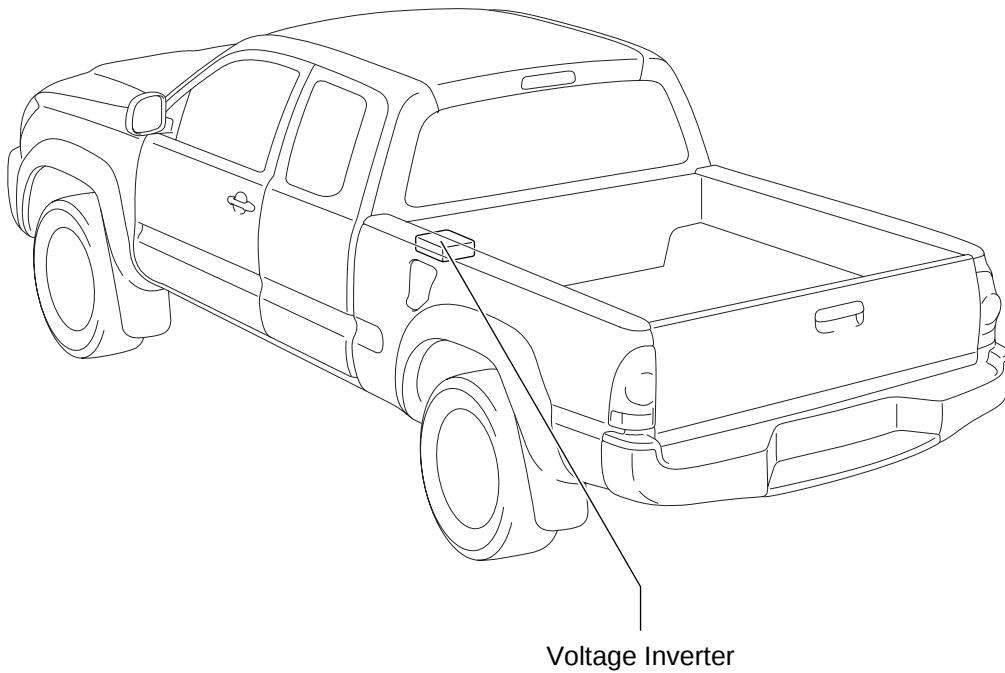
[Instrument Panel]



**[Body]
(Double Cab)**

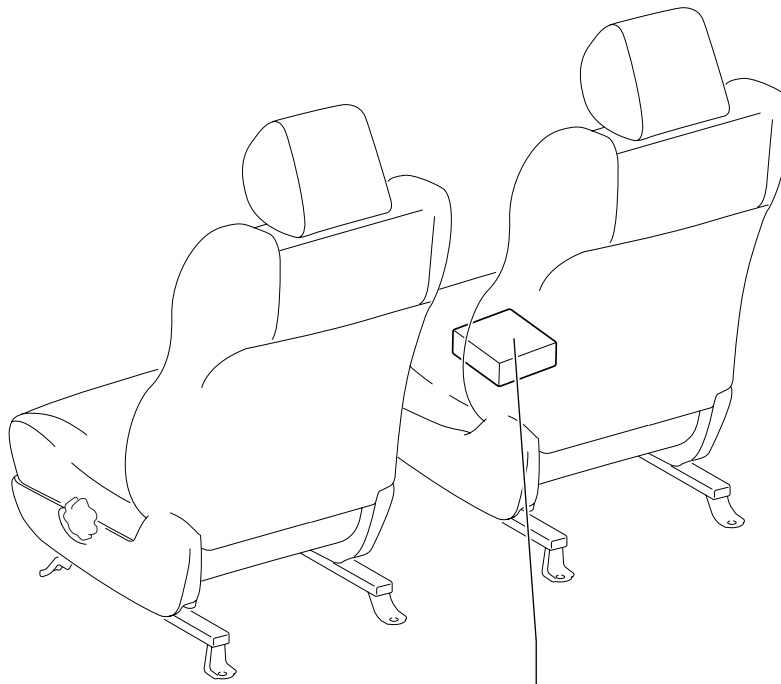


(Access Cab)



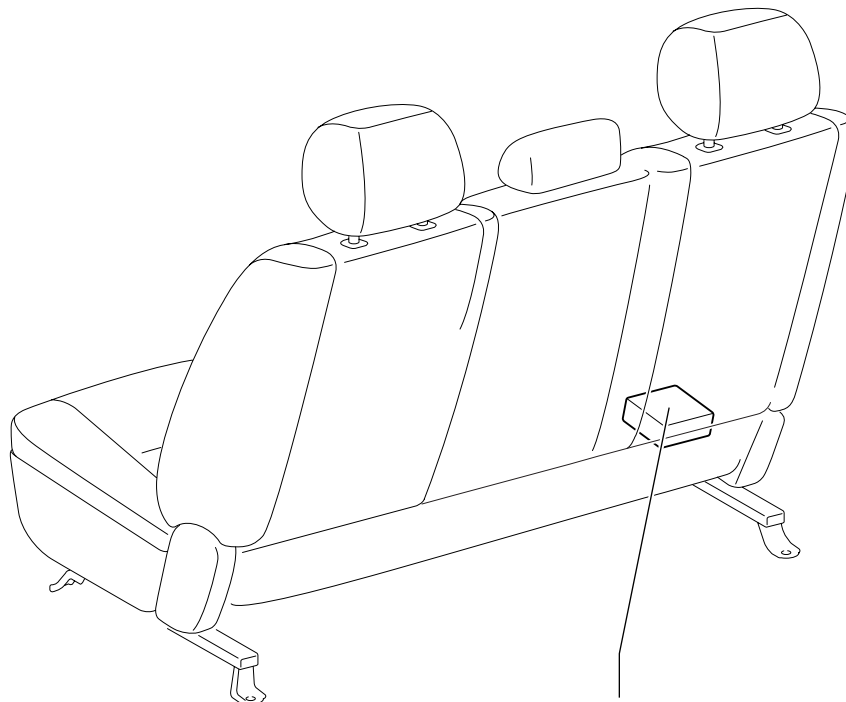
F RELAY LOCATIONS

[Seat]
(Separate Seat)



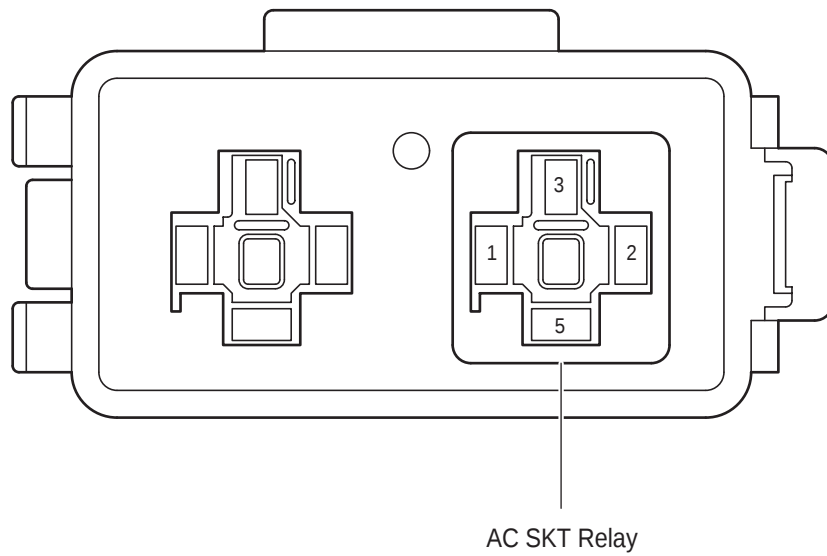
Occupant Classification ECU

(Bench Seat)



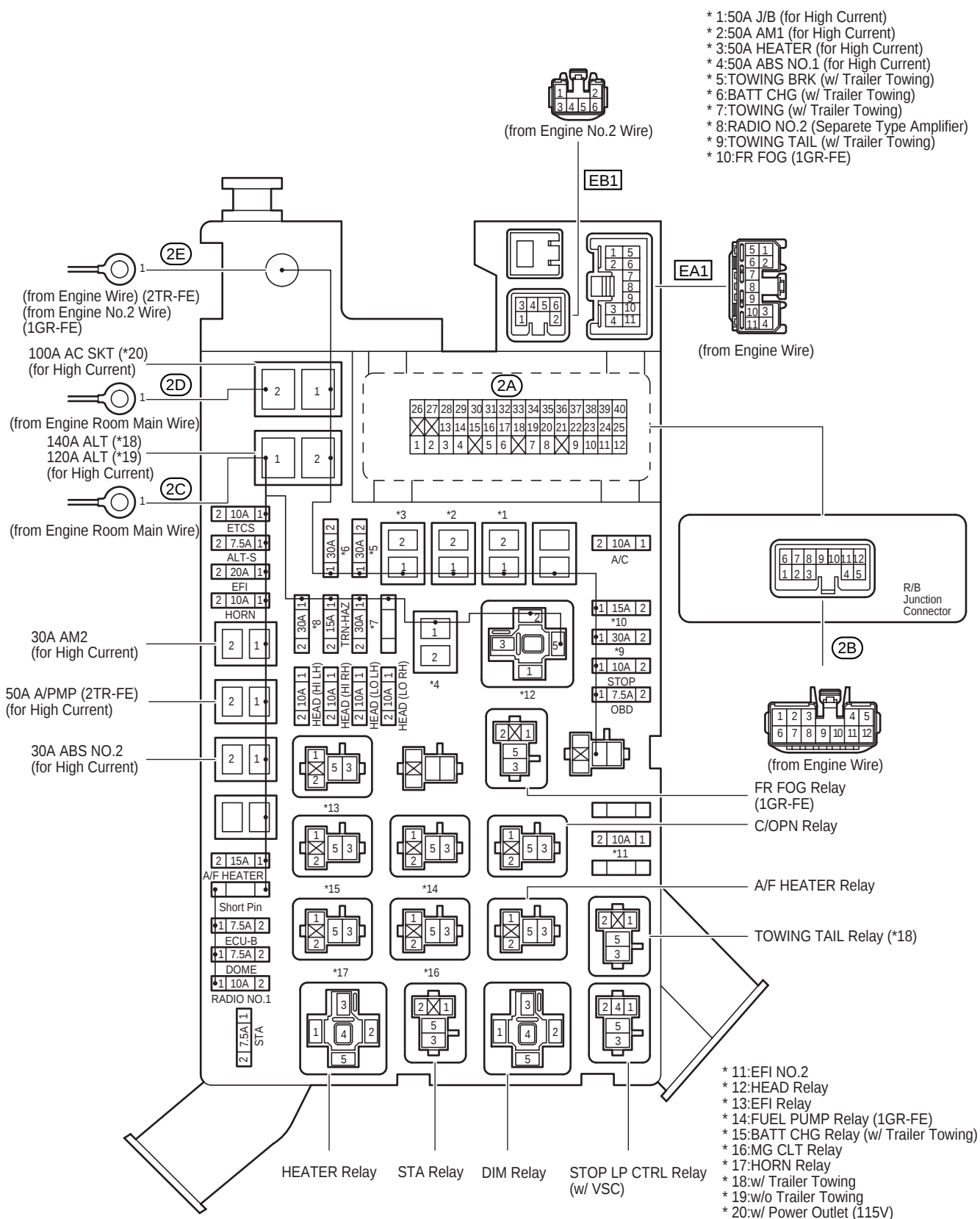
Occupant Classification ECU

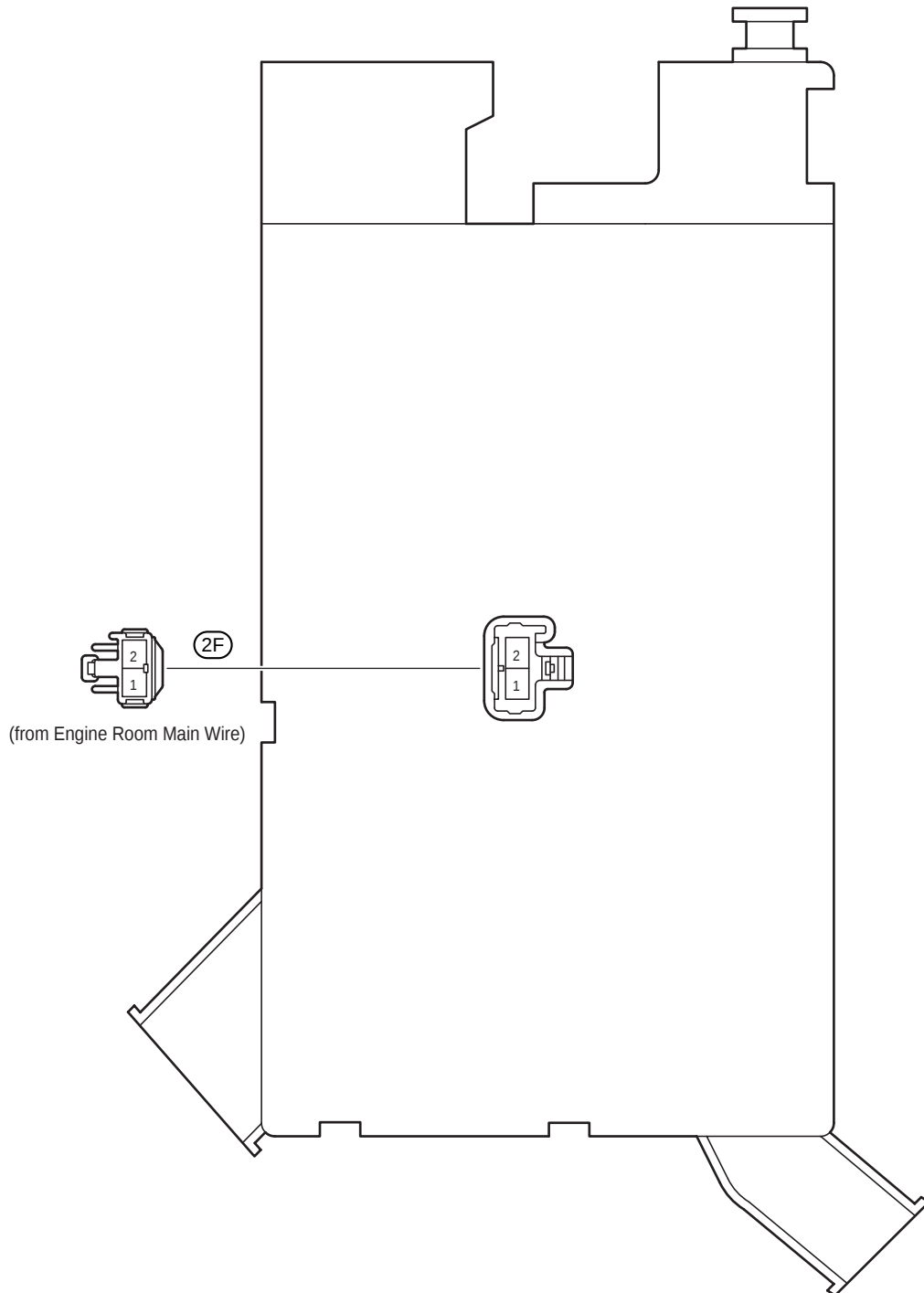
③ : Engine Room R/B No.2	Engine Compartment Left (See Page 20)
--------------------------	---------------------------------------



F RELAY LOCATIONS

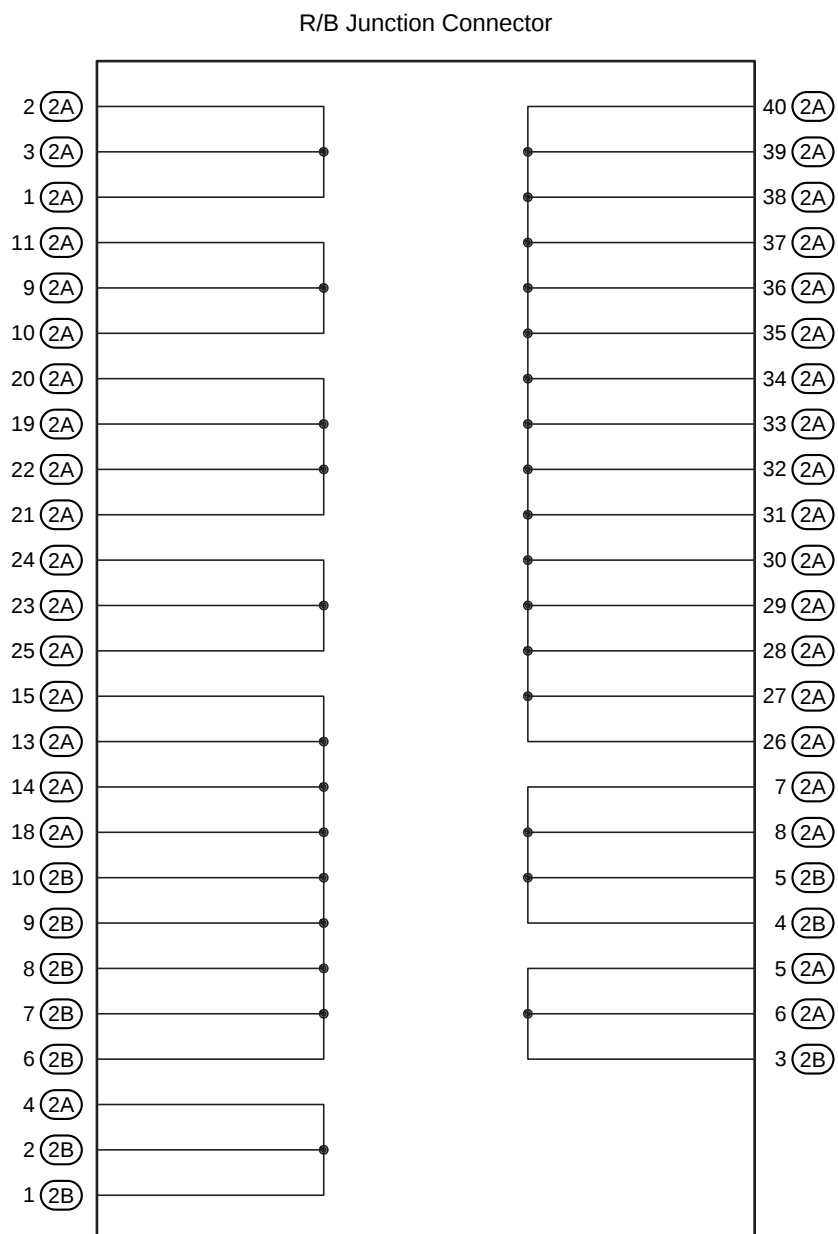
② : Engine Room R/B	Engine Compartment Left (See Page 20)
○ : Engine Room J/B	





F RELAY LOCATIONS

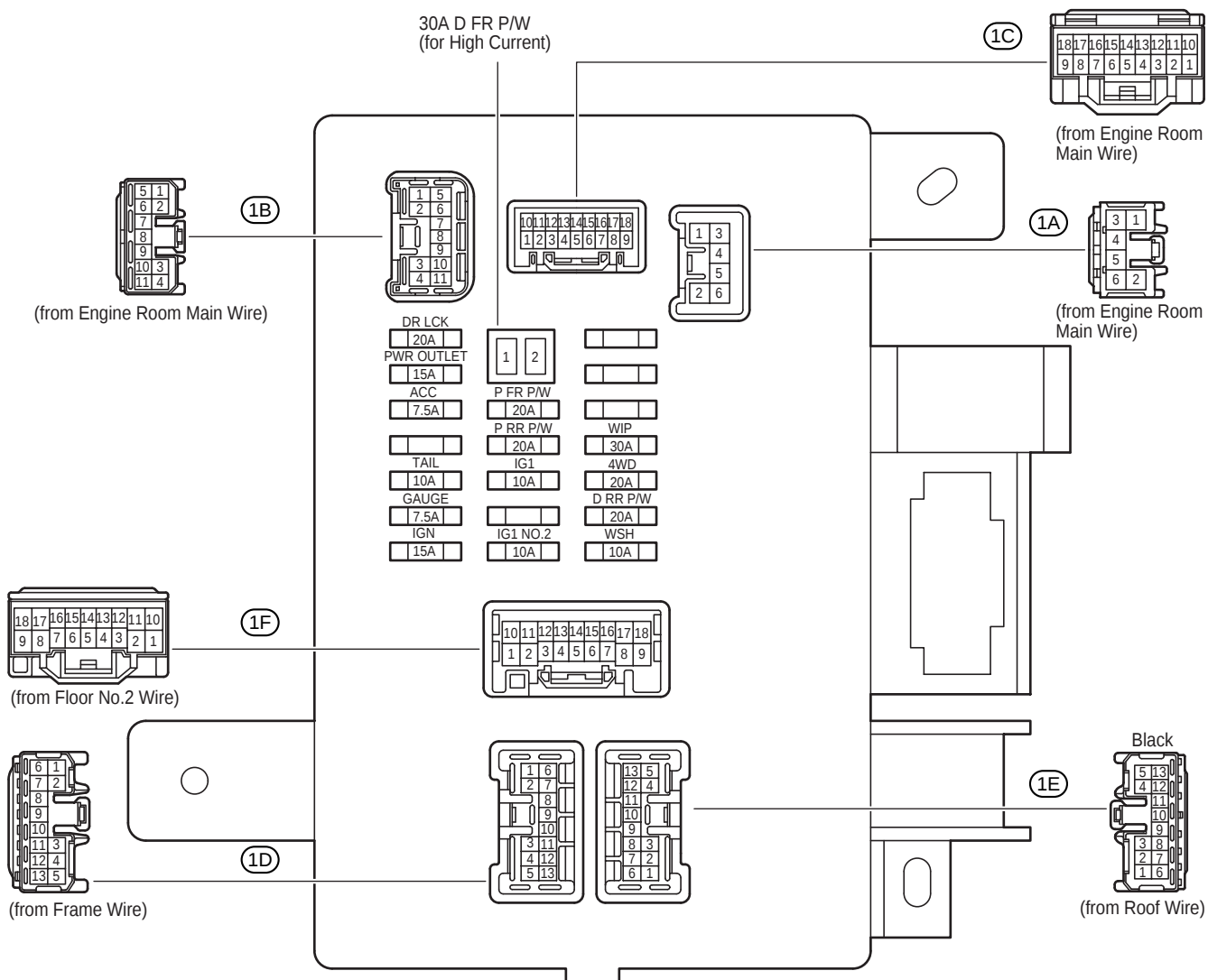
[Engine Room R/B Junction Connector Inner Circuit]

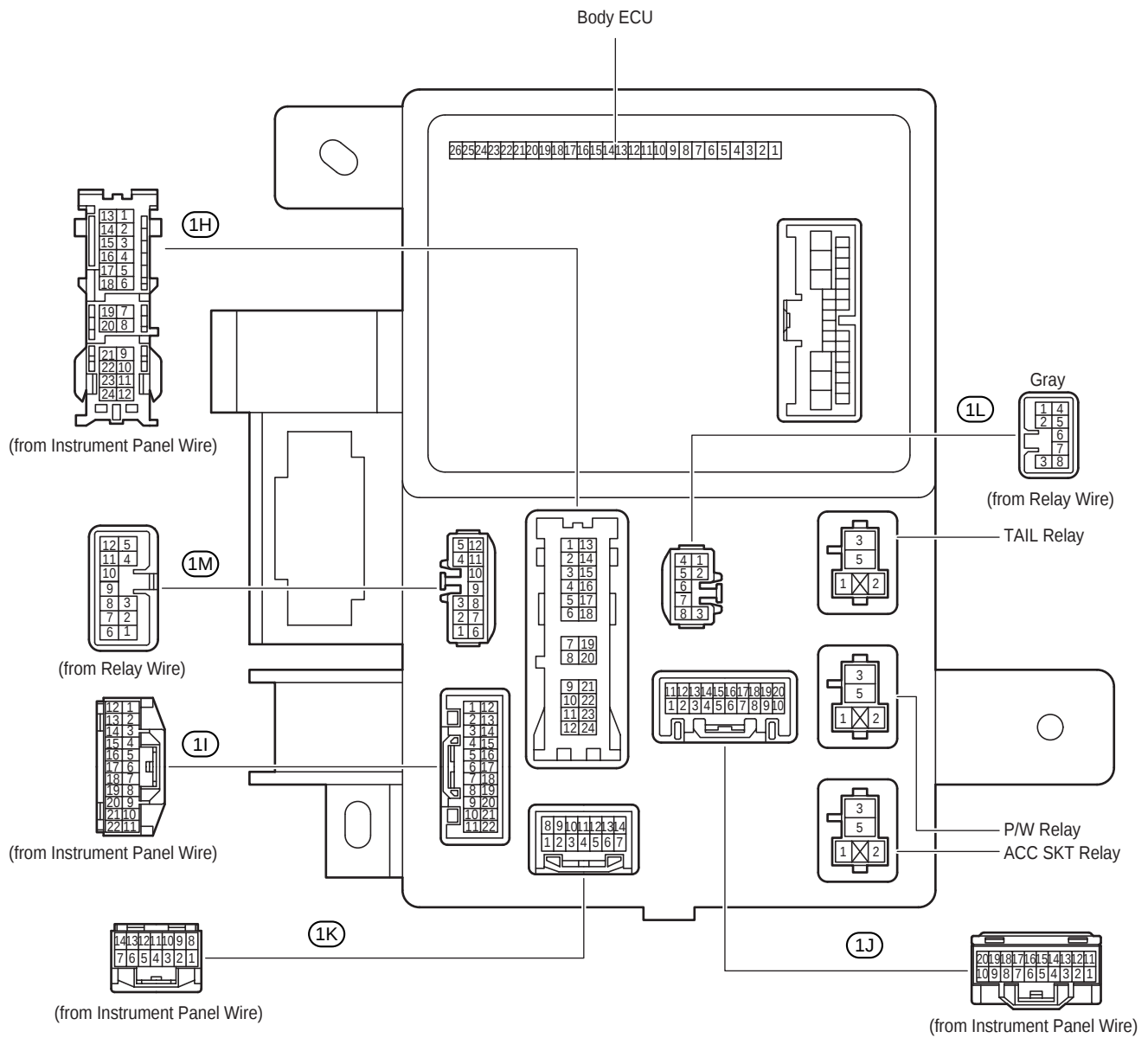


F RELAY LOCATIONS

○ : Driver Side J/B

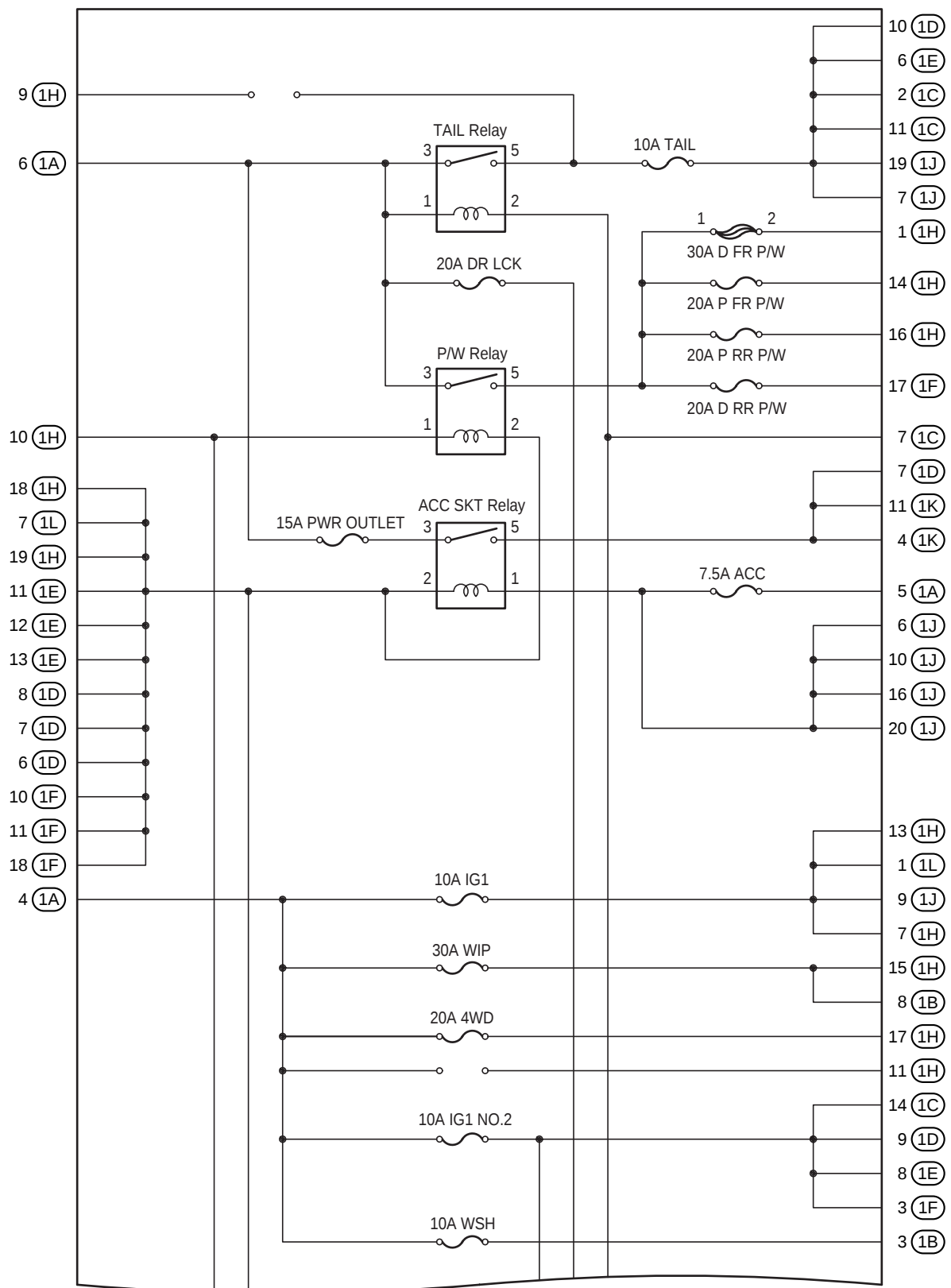
Lower Finish Panel (See Page 20)





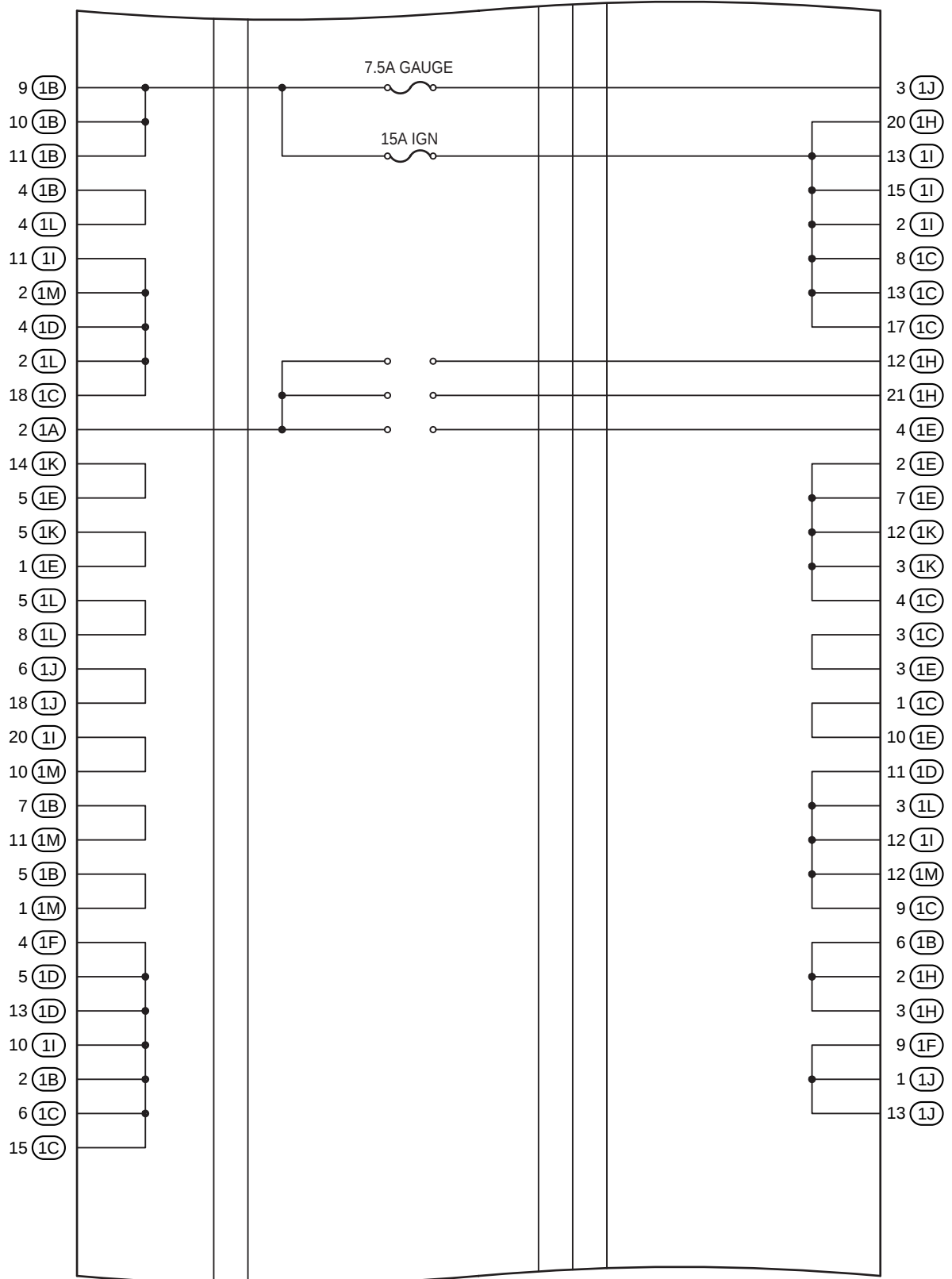
F RELAY LOCATIONS

[Driver Side J/B Inner Circuit]



(Cont. Next Page)

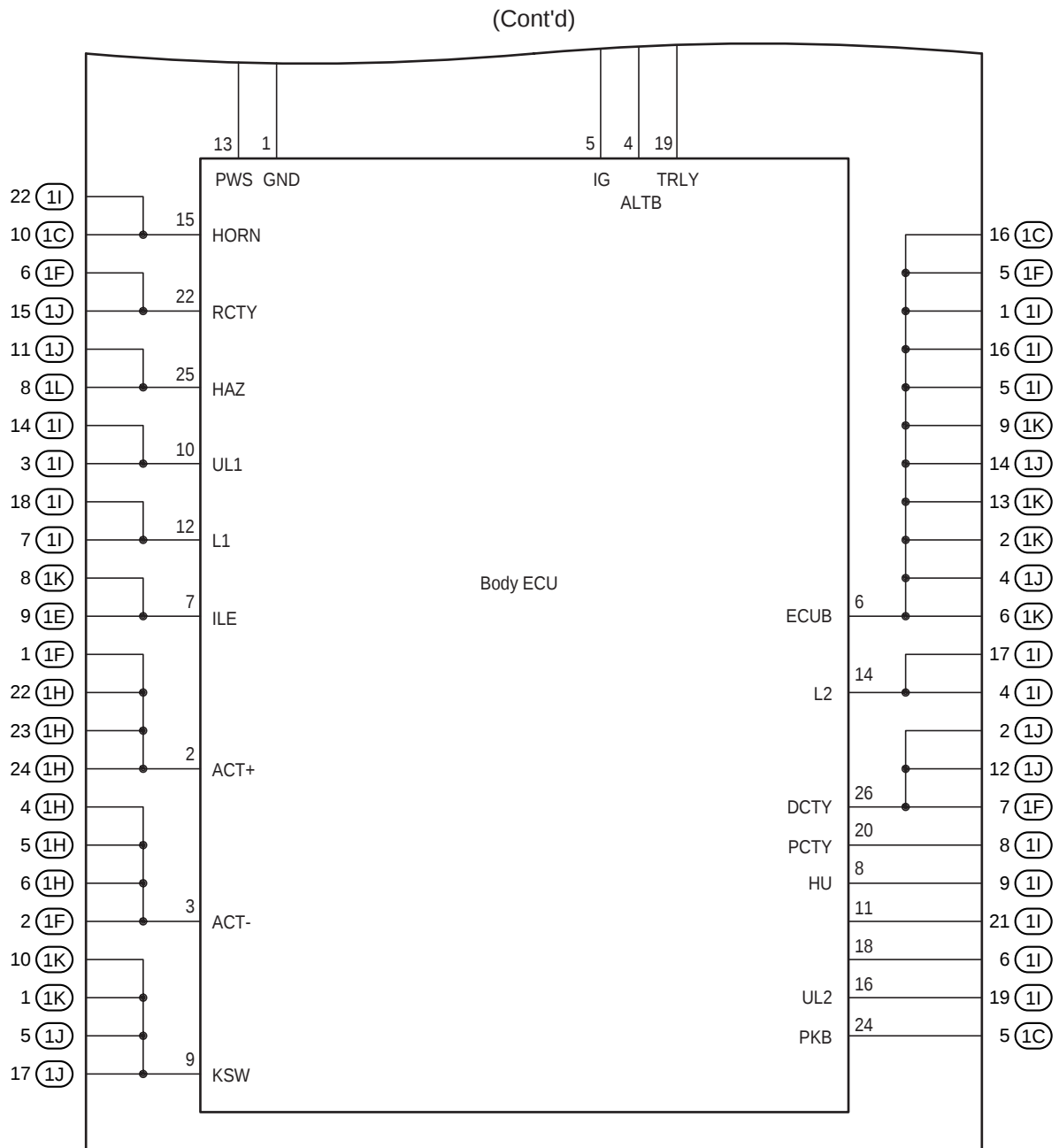
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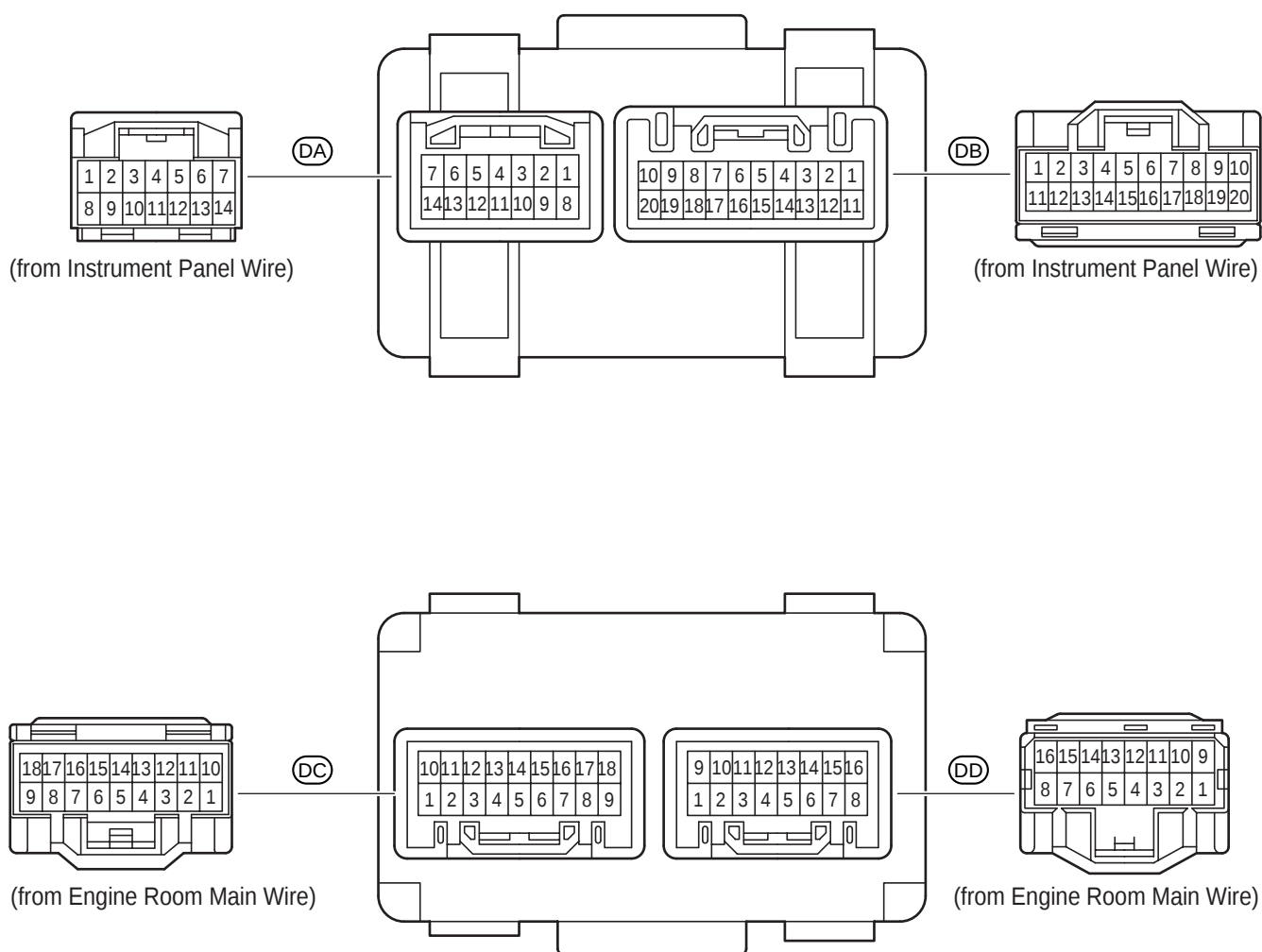
F RELAY LOCATIONS

[Driver Side J/B Inner Circuit]

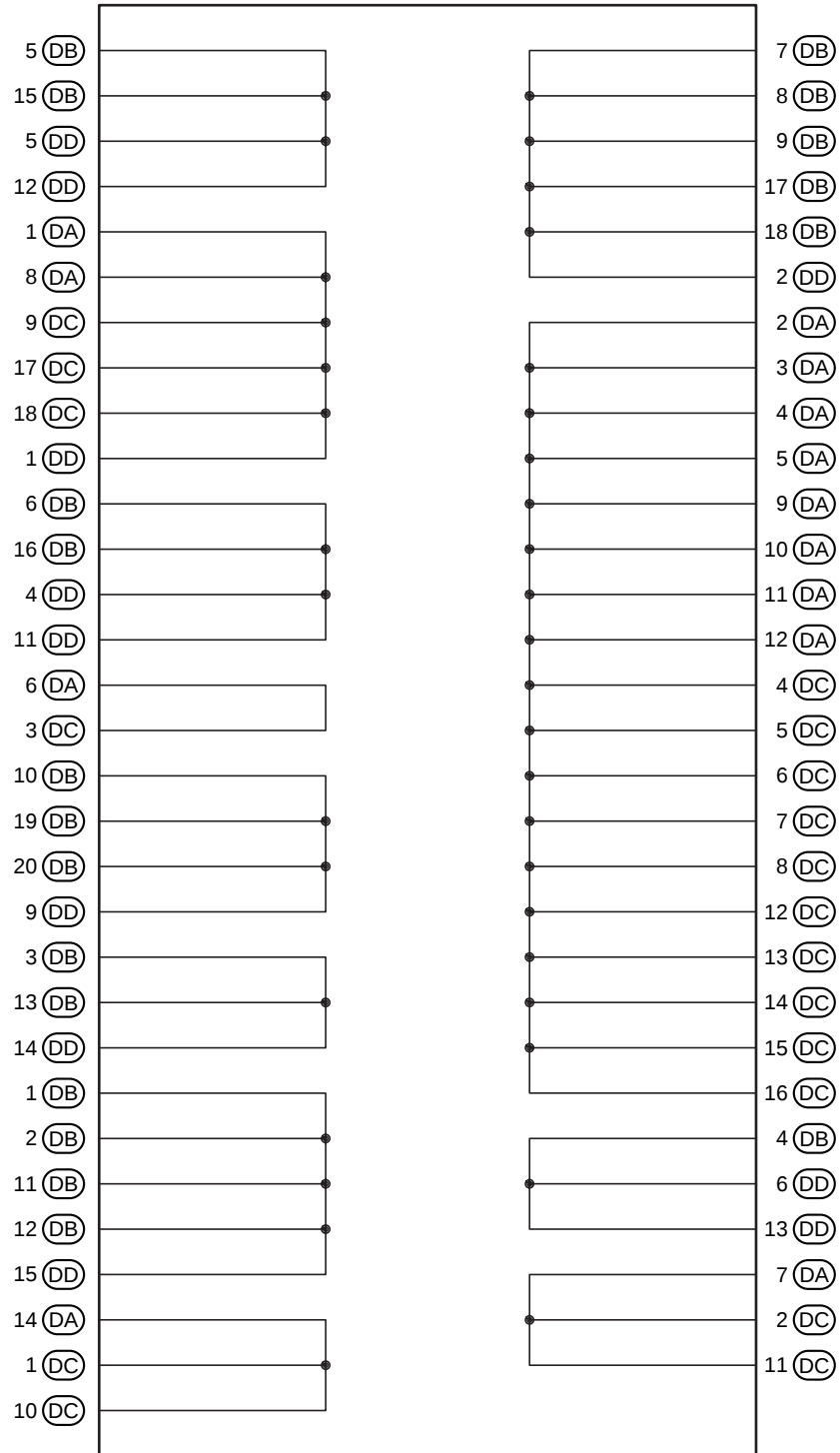


F RELAY LOCATIONS

 : Instrument Panel J/B No.1 Left Kick Panel (See Page 20)

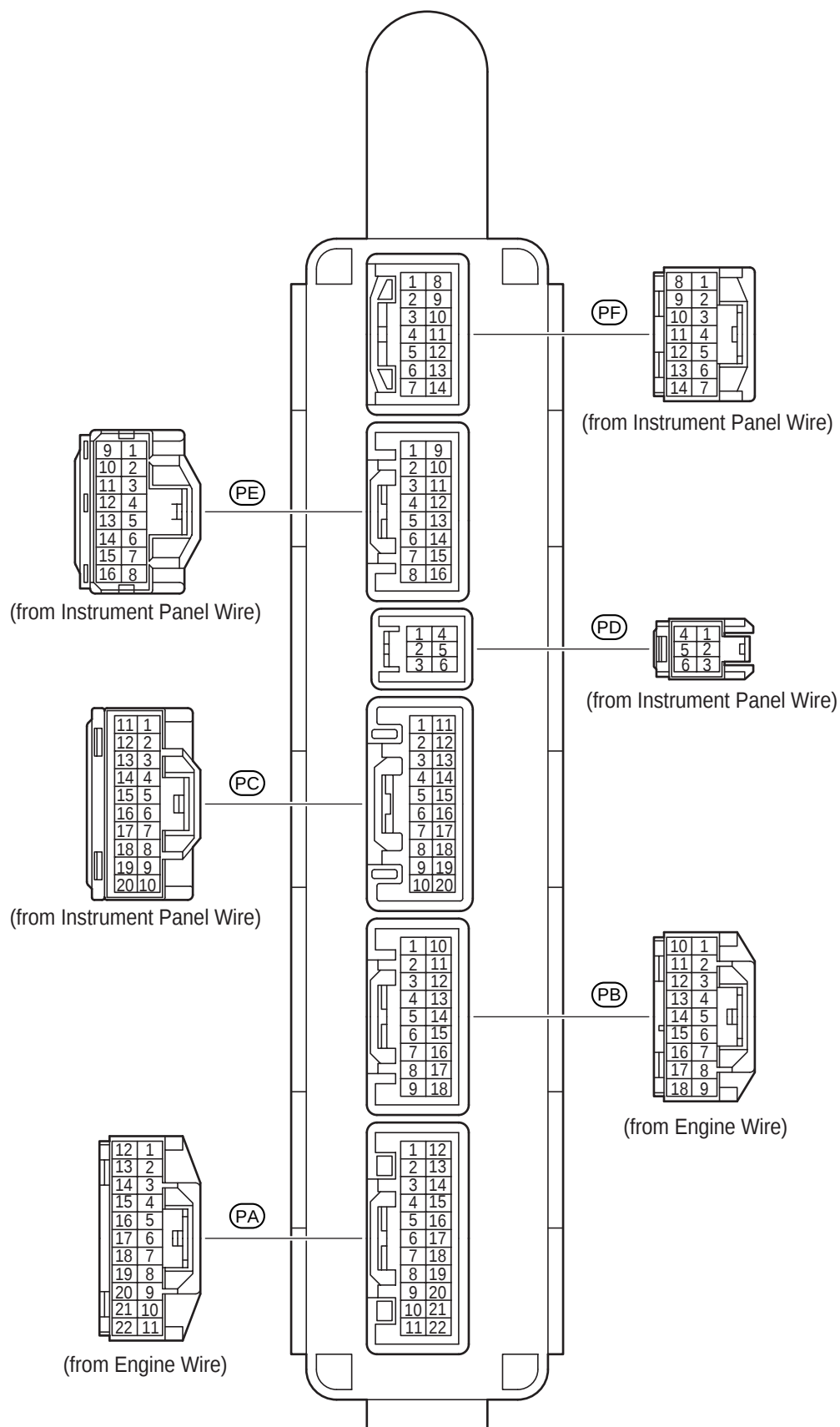


[Instrument Panel J/B No.1 Inner Circuit]



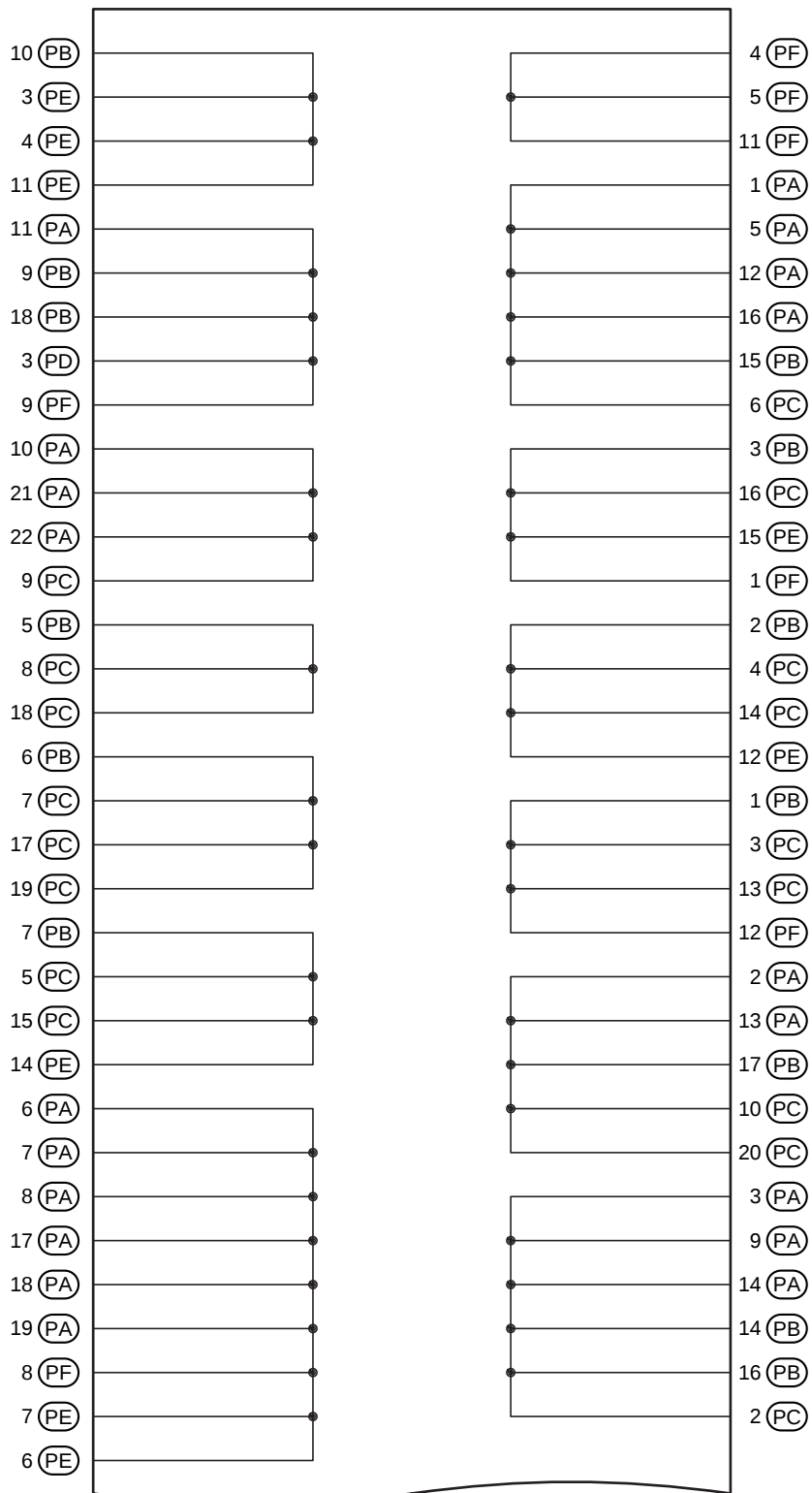
F RELAY LOCATIONS

 : Instrument Panel J/B No.2 Right Side of Glove Box (See Page 20)



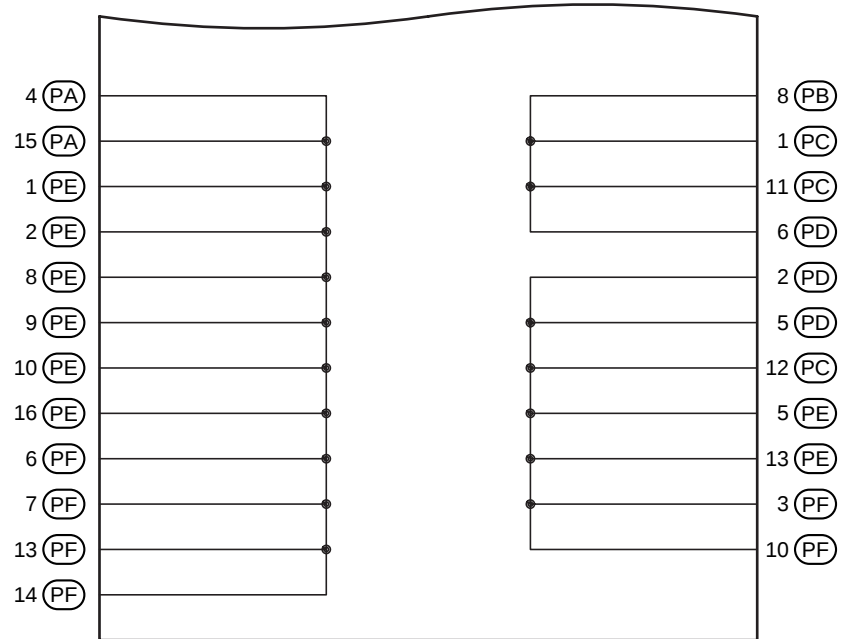
F RELAY LOCATIONS

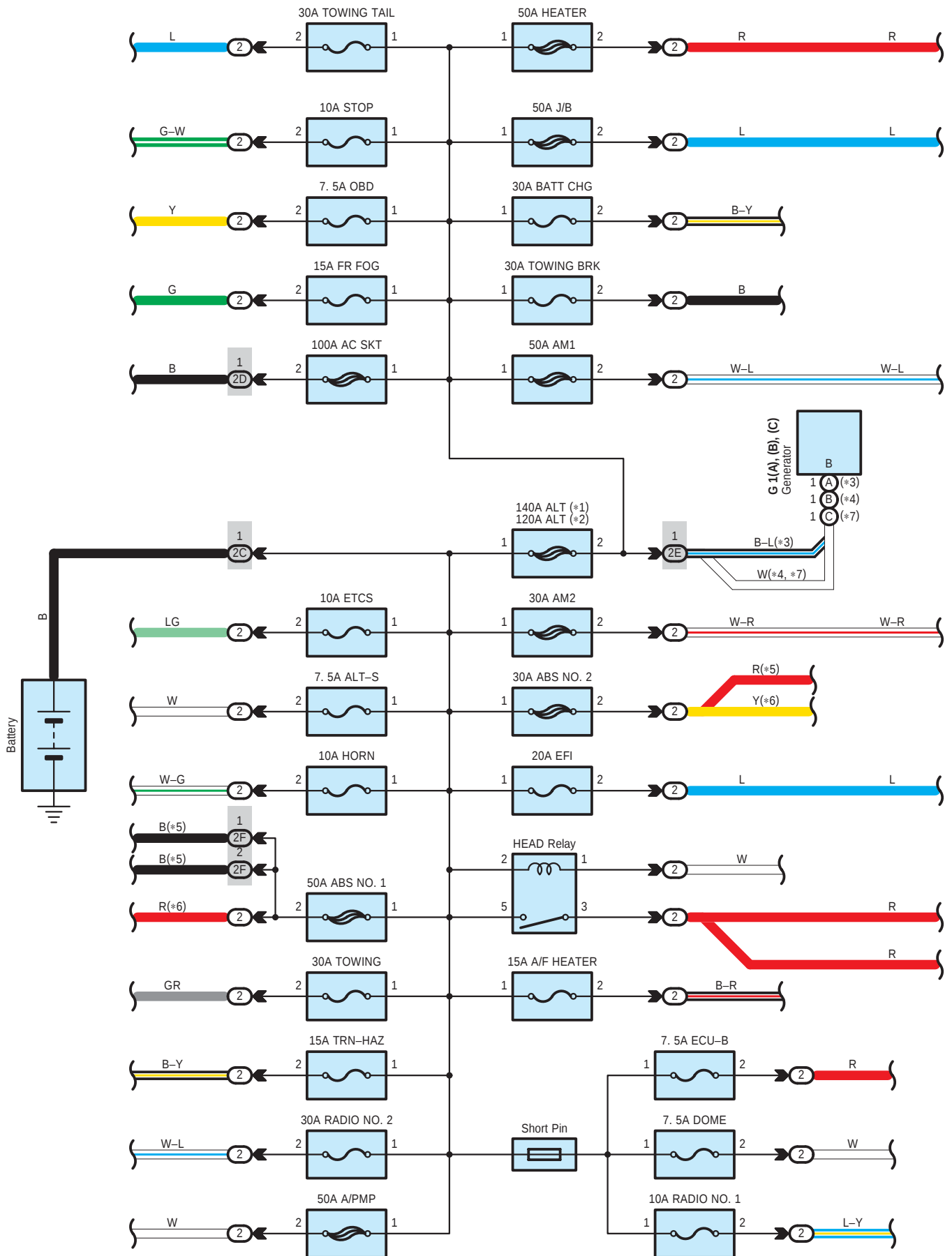
[Instrument Panel J/B No.2 Inner Circuit]

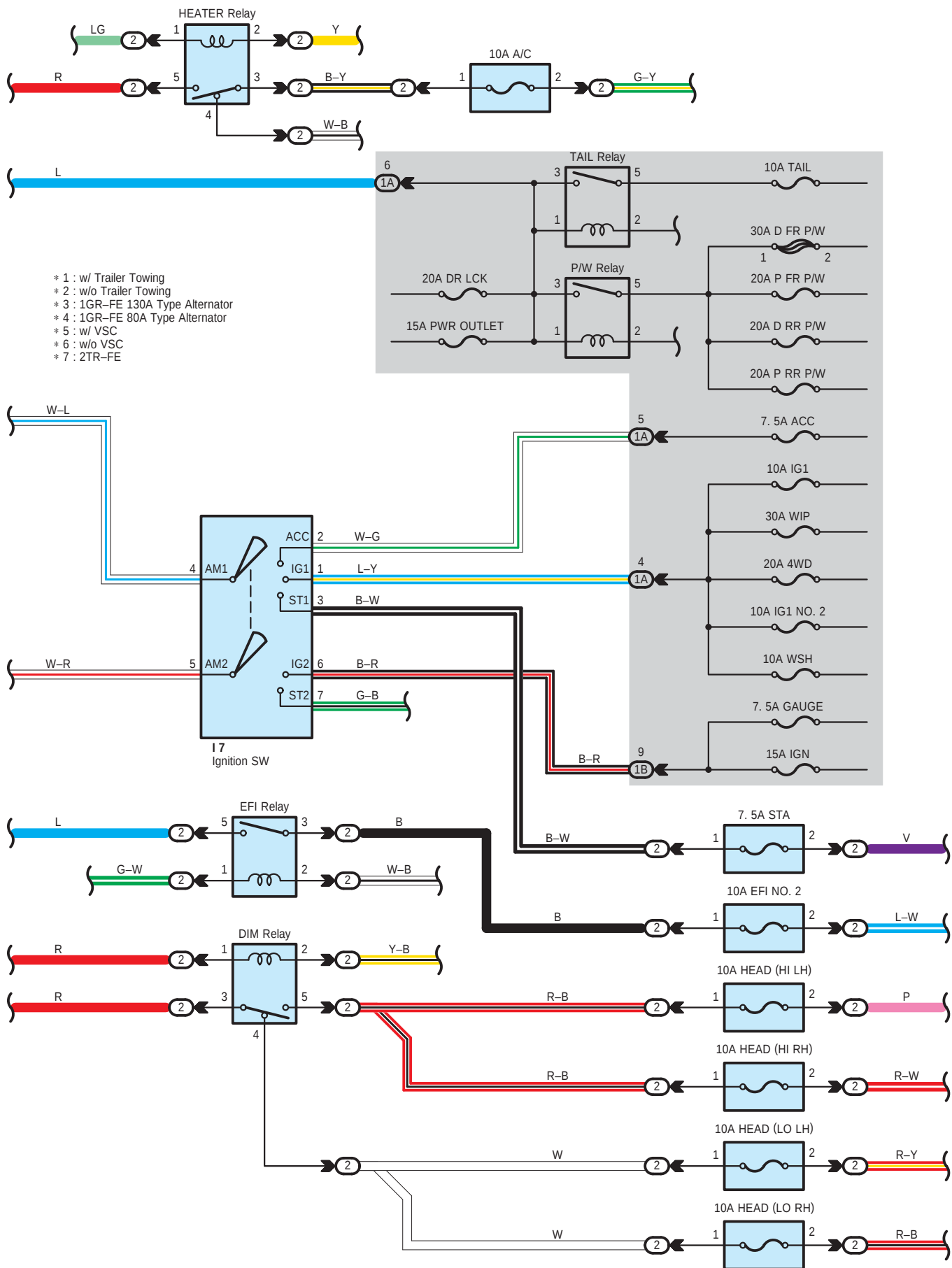


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Power Source

: Parts Location

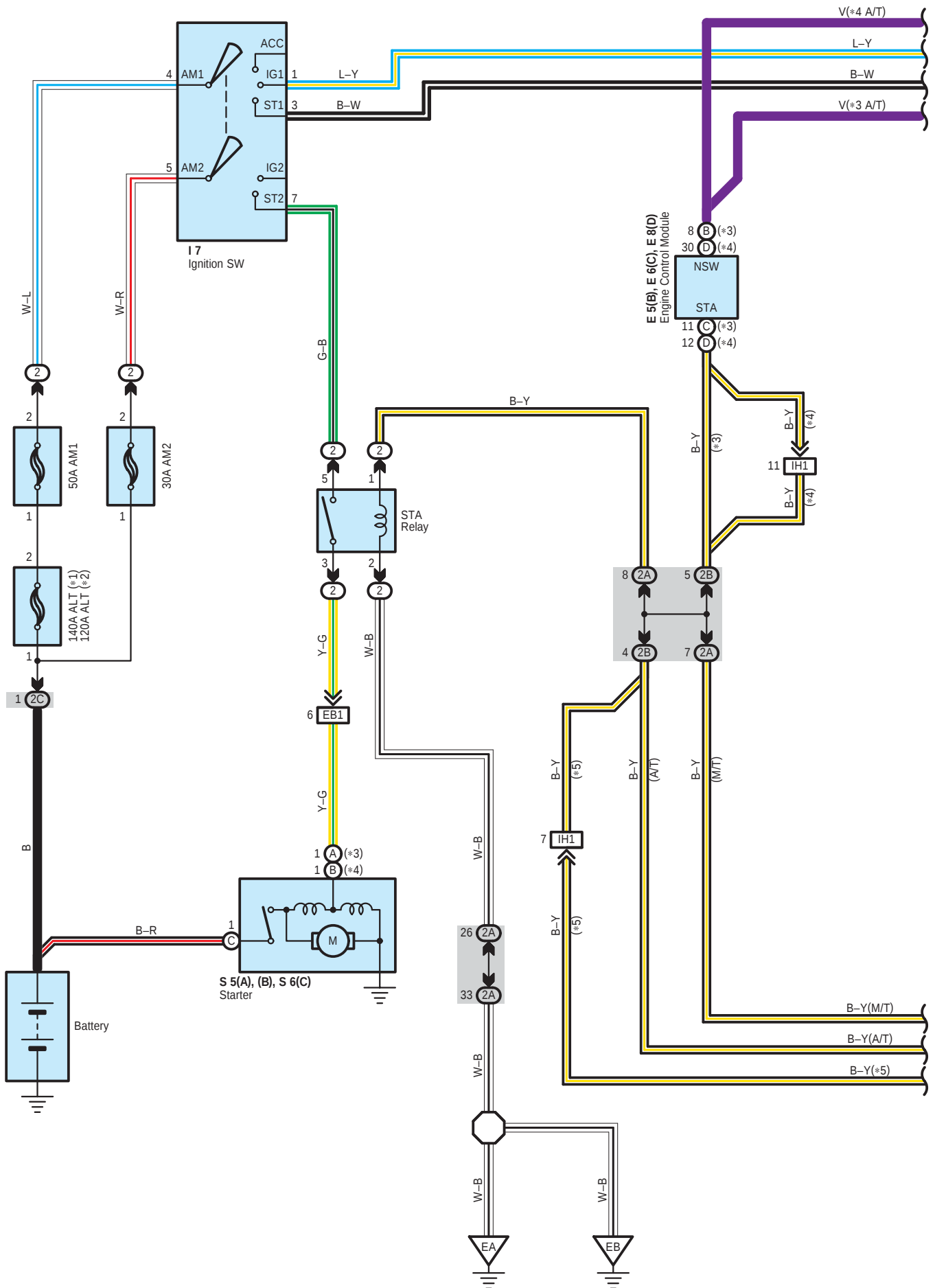
Code		See Page	Code		See Page	Code	See Page
G1	A	40 (1GR-FE)	G1	C	42 (2TR-FE)		
	B	40 (1GR-FE)	I7		45		

: 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)
1A	28	Engine Room Main Wire and Driver Side J/B (Lower Finish Panel)
1B		
2C	24	Engine Room Main Wire and Engine Room J/B (Engine Compartment Left)
2D		
2E	24 (1GR-FE)	Engine No.2 Wire and Engine Room J/B (Engine Compartment Left)
	24 (2TR-FE)	Engine Wire and Engine Room J/B (Engine Compartment Left)
2F	25	Engine Room Main Wire and Engine Room J/B (Engine Compartment Left)



Starting

: Parts Location

Code	See Page	Code	See Page	Code	See Page
C7	44	E8	D	44	P1
C8	44	I7	45	S5	A
D6	44	J4	A	45	B
E5	B	J5	B	45	S6
E6	C	P1	41 (1GR-FE)	C	41 (1GR-FE)
					43 (2TR-FE)

: 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

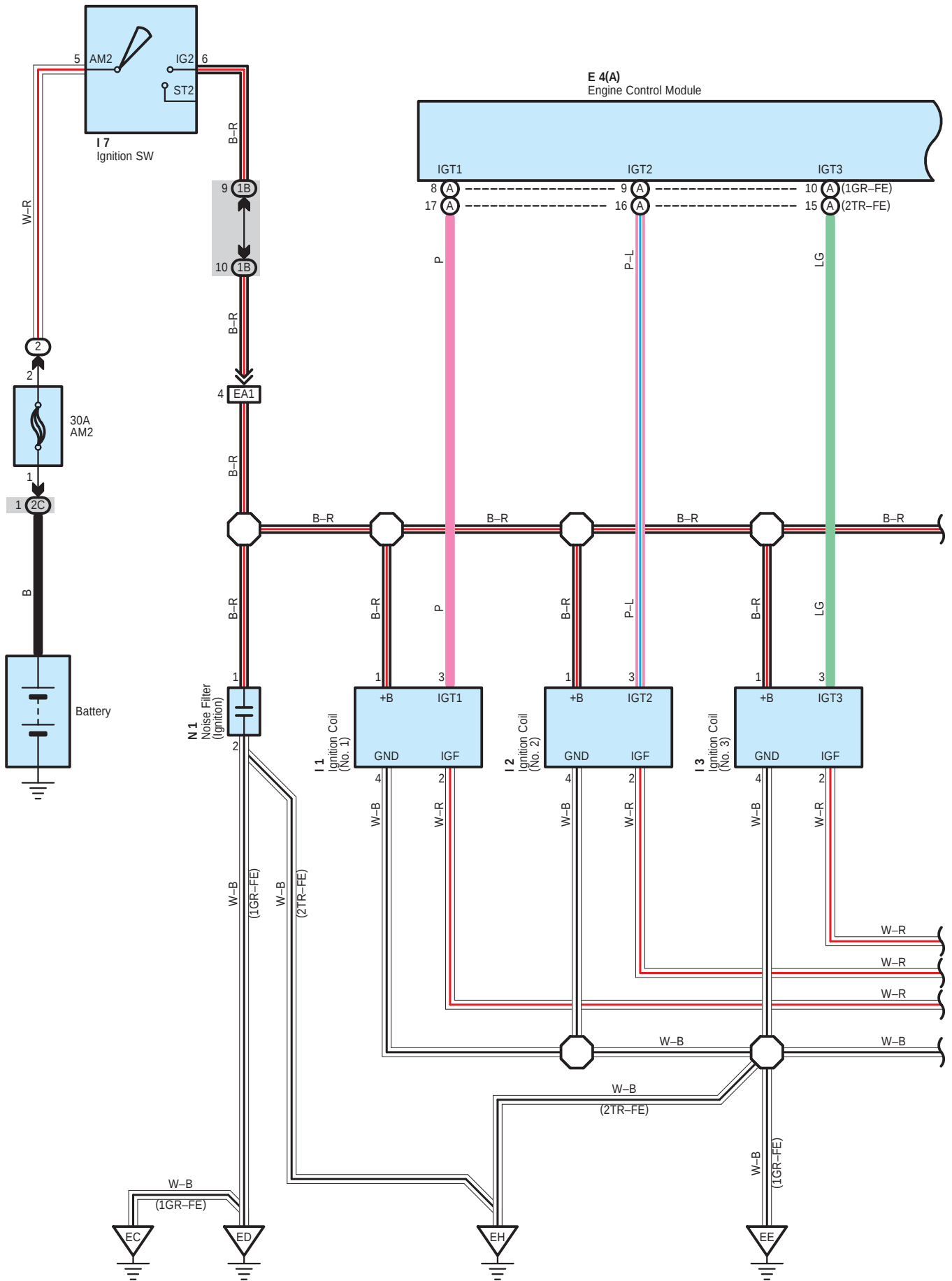
Code	See Page	Junction Block and Wire Harness (Connector Location)
1A	28	Engine Room Main Wire and Driver Side J/B (Lower Finish Panel)
1C		
2A	24	Engine Room J/B and
2B	24	Engine Wire and Engine Room J/B (Engine Compartment Left)
2C	24	Engine Room Main Wire and Engine Room J/B (Engine Compartment Left)
DB	34	Instrument Panel Wire and Instrument Panel J/B No.1 (Left Kick Panel)
DC	34	Engine Room Main Wire and Instrument Panel J/B No.1 (Left Kick Panel)
DD		
PA	36	Engine Wire and Instrument Panel J/B No.2 (Right Side of Glove Box)
PB		
PD	36	Instrument Panel Wire and Instrument Panel J/B No.2 (Right Side of Glove Box)

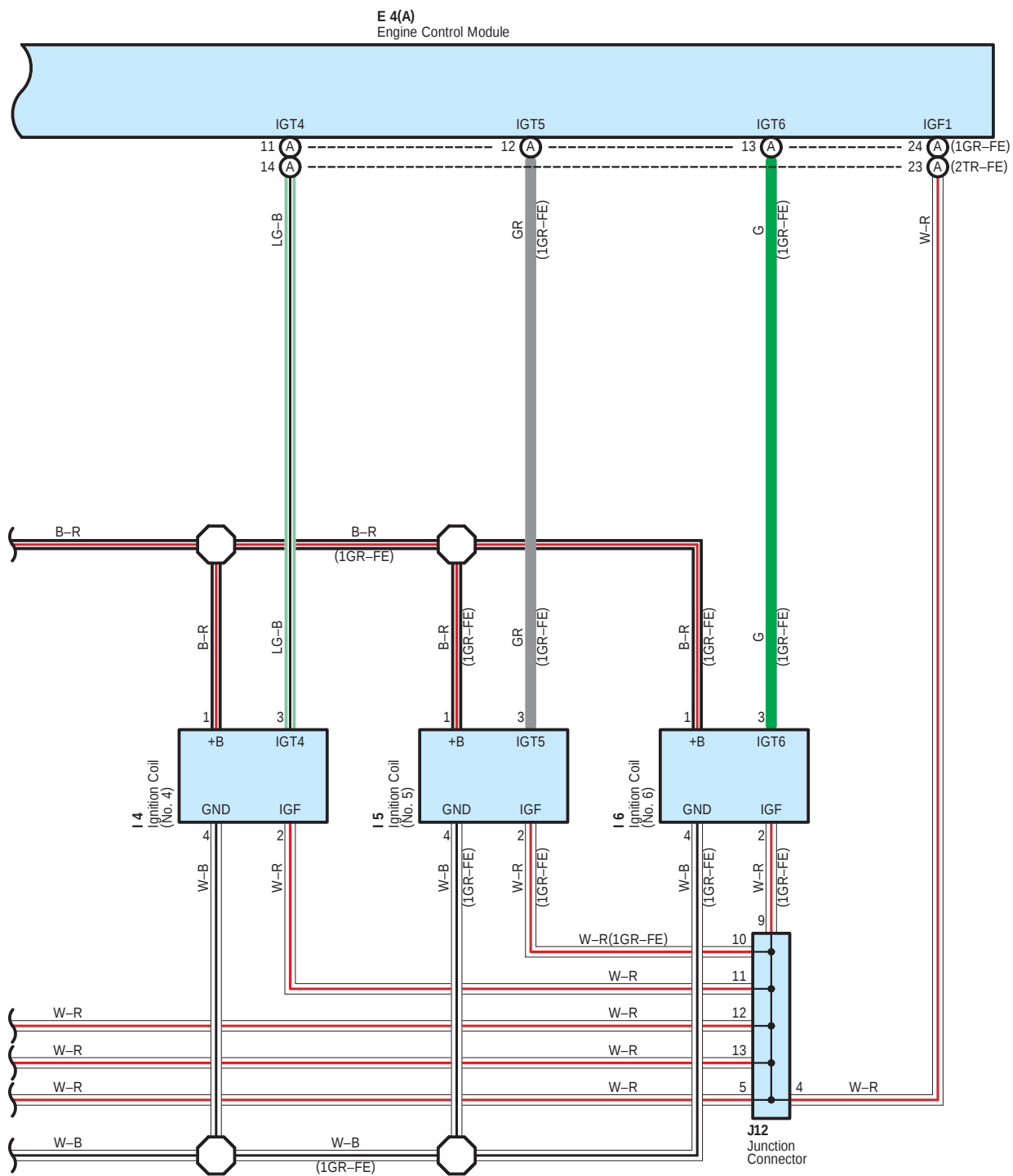
: Connector Joining Wire Harness and Wire Harness

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
EB1	52 (1GR-FE)	Engine No.2 Wire and Engine Room Main Wire (Inside of Engine Room R/B)
	53 (2TR-FE)	
IH1	55	Engine Wire and Instrument Panel Wire (Right Side of Glove Box)

: Ground Points

Code	See Page	Ground Points Location
EA	52 (1GR-FE)	Front Right Fender
	53 (2TR-FE)	
EB	52 (1GR-FE)	Front Left Fender
	53 (2TR-FE)	
IC	54	Instrument Panel Brace RH





Ignition

: Parts Location

Code		See Page	Code	See Page	Code	See Page
E4	A	44	I3	41 (1GR-FE)	I6	41 (1GR-FE)
I1		41 (1GR-FE)		43 (2TR-FE)	I7	45
		43 (2TR-FE)	I4	41 (1GR-FE)	J12	45
I2		41 (1GR-FE)		43 (2TR-FE)	N1	41 (1GR-FE)
		43 (2TR-FE)	I5	41 (1GR-FE)		43 (2TR-FE)

: 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

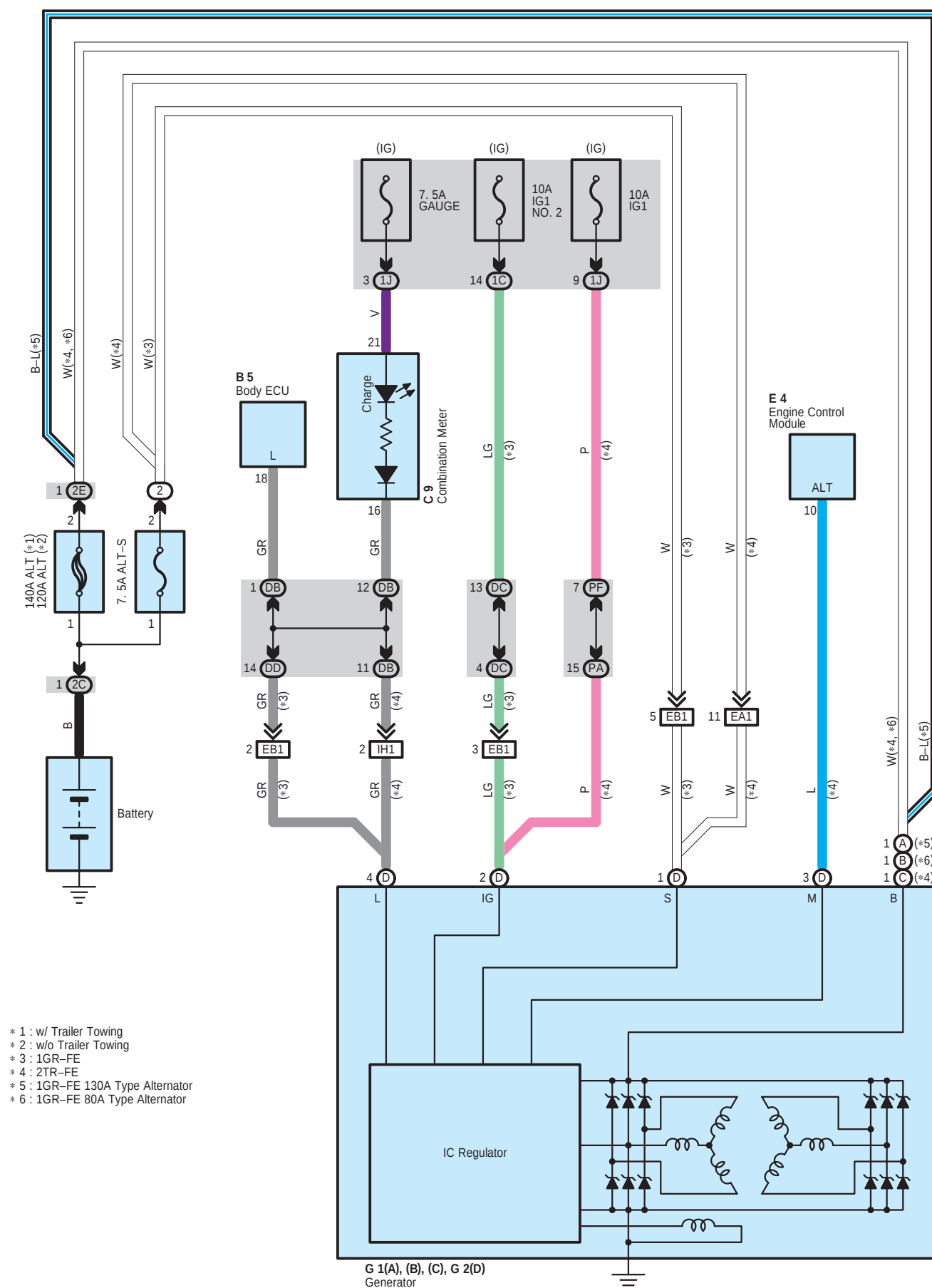
Code	See Page	Junction Block and Wire Harness (Connector Location)
1B	28	Engine Room Main Wire and Driver Side J/B (Lower Finish Panel)
2C	24	Engine Room Main Wire and Engine Room J/B (Engine Compartment Left)

: Connector Joining Wire Harness and Wire Harness

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
EA1	52 (1GR-FE)	Engine Wire and Engine Room Main Wire (Inside of Engine Room R/B)
	53 (2TR-FE)	

: Ground Points

Code	See Page	Ground Points Location
EC	52 (1GR-FE)	Near the Front Differential
ED	52 (1GR-FE)	Rear Side of Right Bank Cylinder Block
EE		
EH	53 (2TR-FE)	Rear Side of Cylinder Block



☐ : Parts Location

Code	See Page	Code	See Page	Code	See Page
B5	44	G1	A	40 (1GR-FE)	G2
C9	44		B	40 (1GR-FE)	
E4	44		C	42 (2TR-FE)	D

☐ : Relay Blocks

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

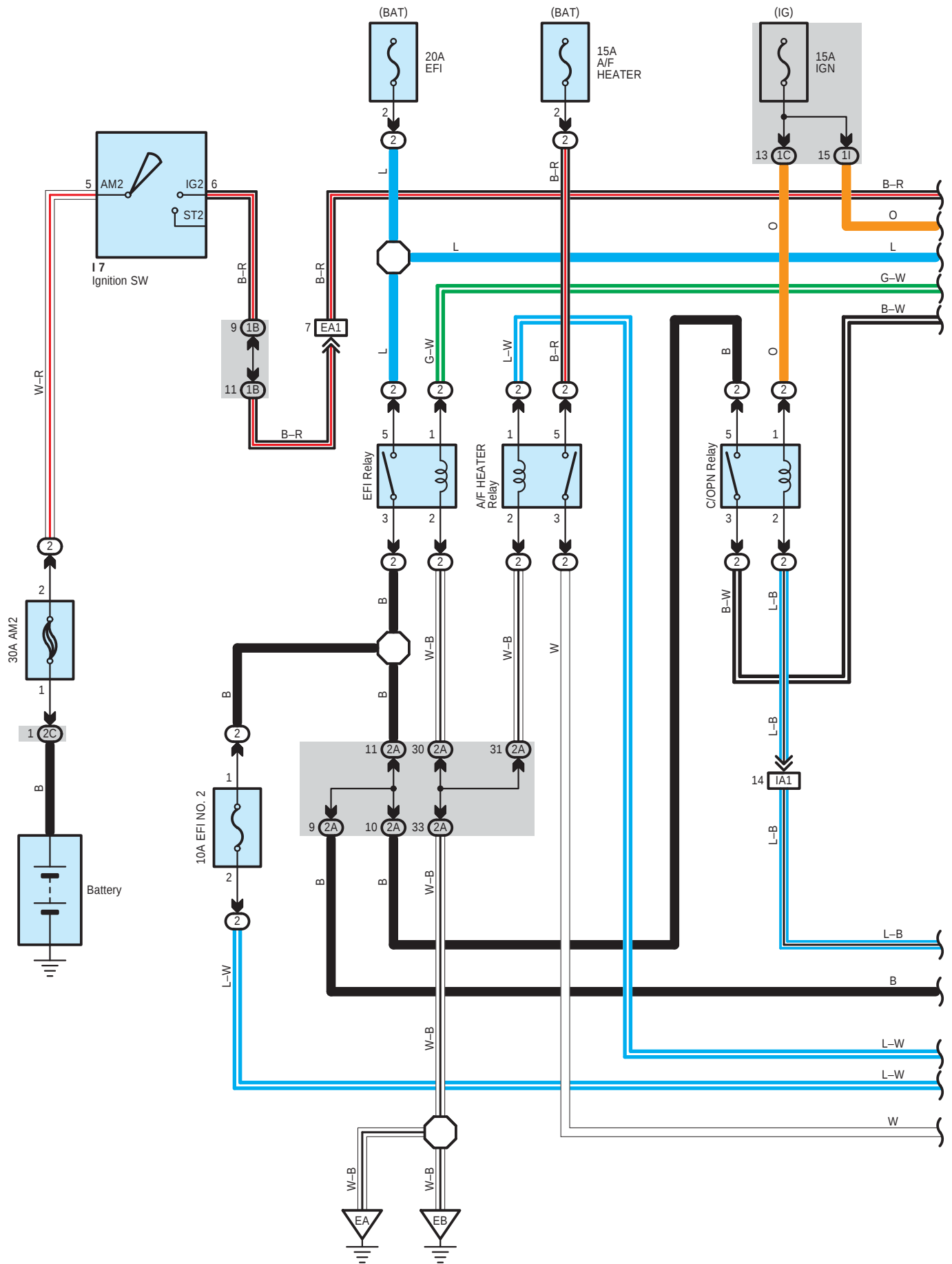
☐ : Junction Block and Wire Harness Connector

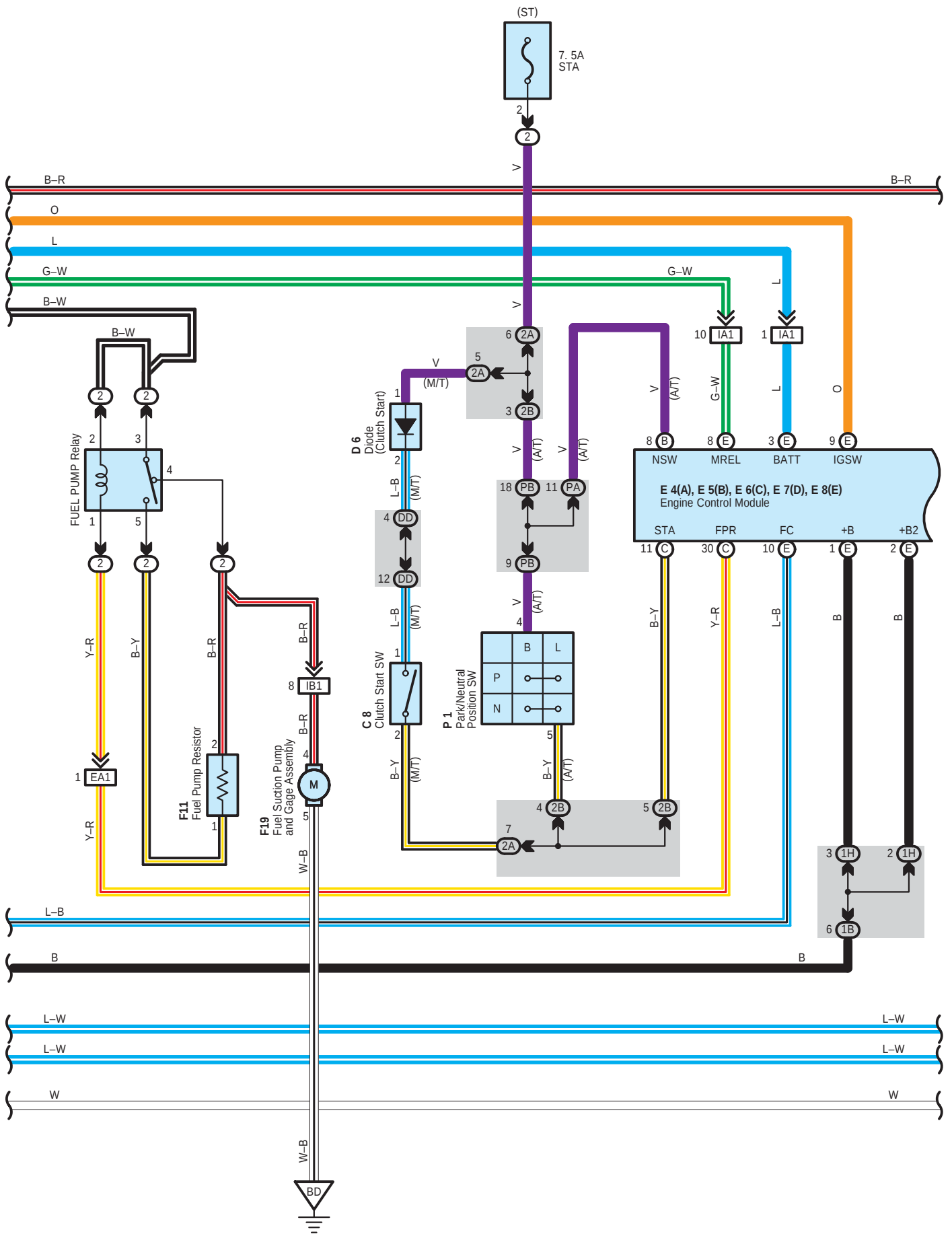
Code	See Page	Junction Block and Wire Harness (Connector Location)
1C	28	Engine Room Main Wire and Driver Side J/B (Lower Finish Panel)
1J	29	Instrument Panel Wire and Driver Side J/B (Lower Finish Panel)
2C	24	Engine Room Main Wire and Engine Room J/B (Engine Compartment Left)
2E	24 (1GR-FE)	Engine No.2 Wire and Engine Room J/B (Engine Compartment Left)
	24 (2TR-FE)	Engine Wire and Engine Room J/B (Engine Compartment Left)
DB	34	Instrument Panel Wire and Instrument Panel J/B No.1 (Left Kick Panel)
DC	34	Engine Room Main Wire and Instrument Panel J/B No.1 (Left Kick Panel)
DD		
PA	36	Engine Wire and Instrument Panel J/B No.2 (Right Side of Glove Box)
PF	36	Instrument Panel Wire and Instrument Panel J/B No.2 (Right Side of Glove Box)

☐ : Connector Joining Wire Harness and Wire Harness

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
EA1	53 (2TR-FE)	Engine Wire and Engine Room Main Wire (Inside of Engine Room R/B)
EB1	52 (1GR-FE)	Engine No.2 Wire and Engine Room Main Wire (Inside of Engine Room R/B)
IH1	55	Engine Wire and Instrument Panel Wire (Right Side of Glove Box)

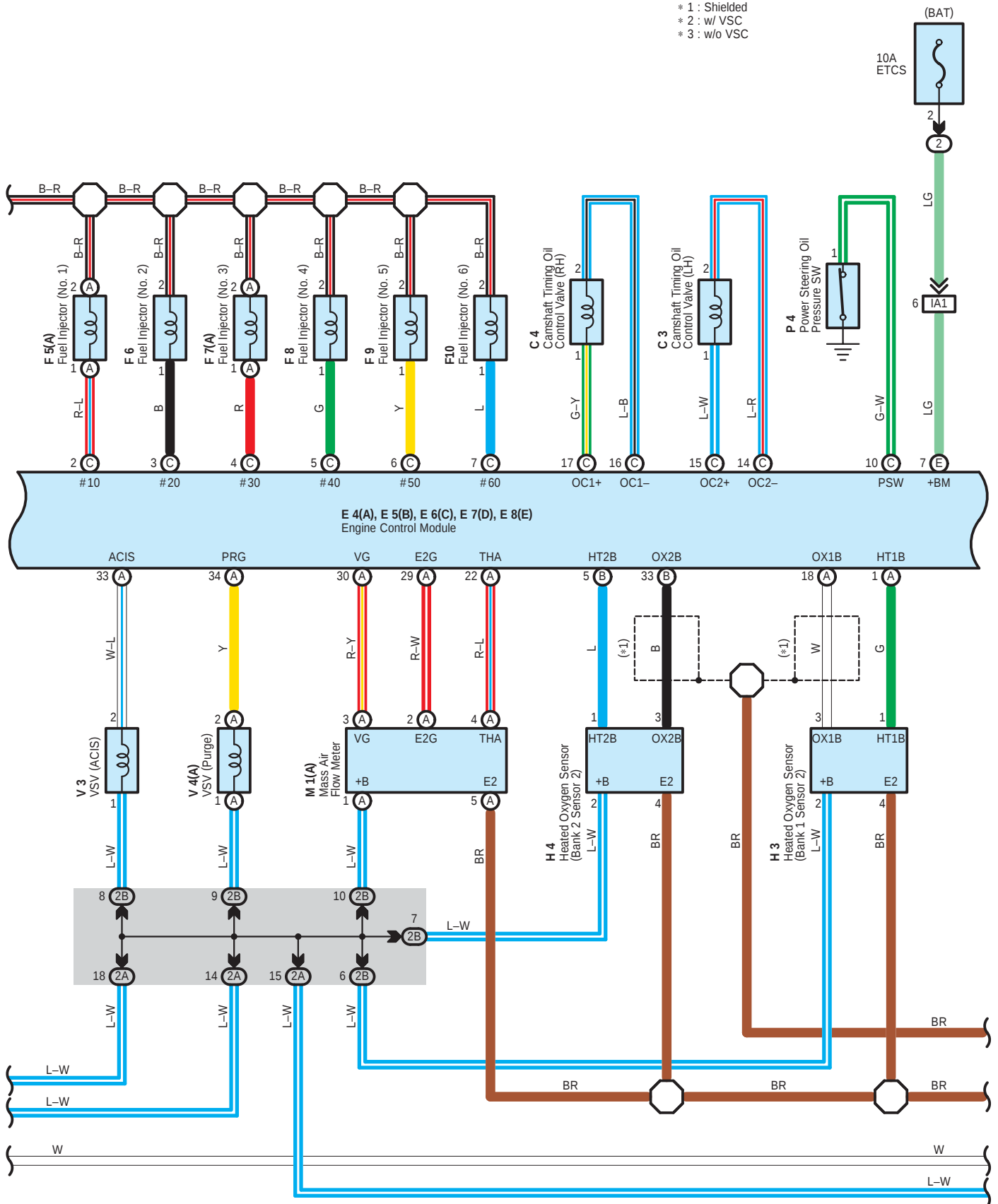
Engine Control for 1GR-FE

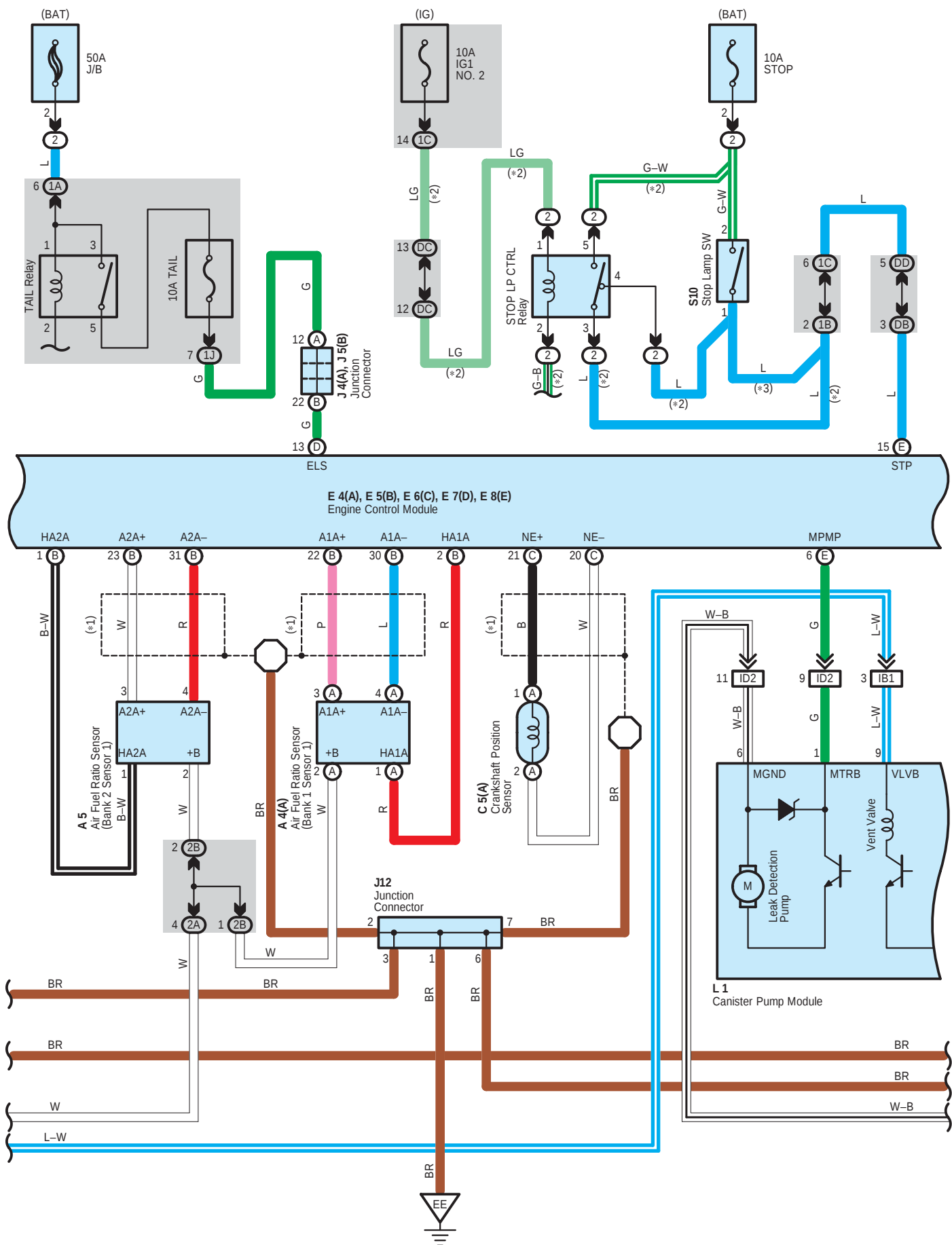




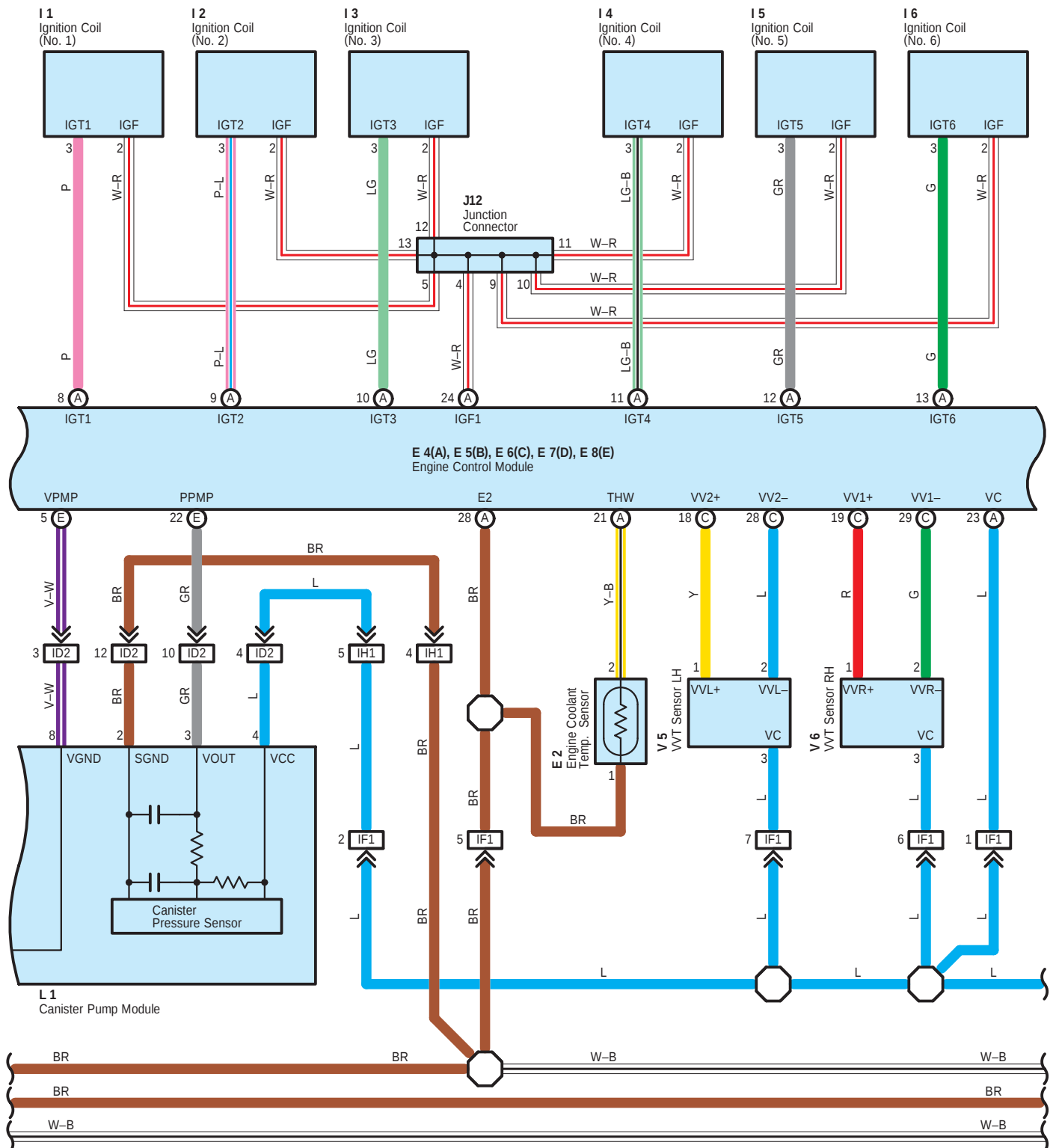
Engine Control for 1GR-FE

- * 1 : Shielded
- * 2 : w/ VSC
- * 3 : w/o VSC

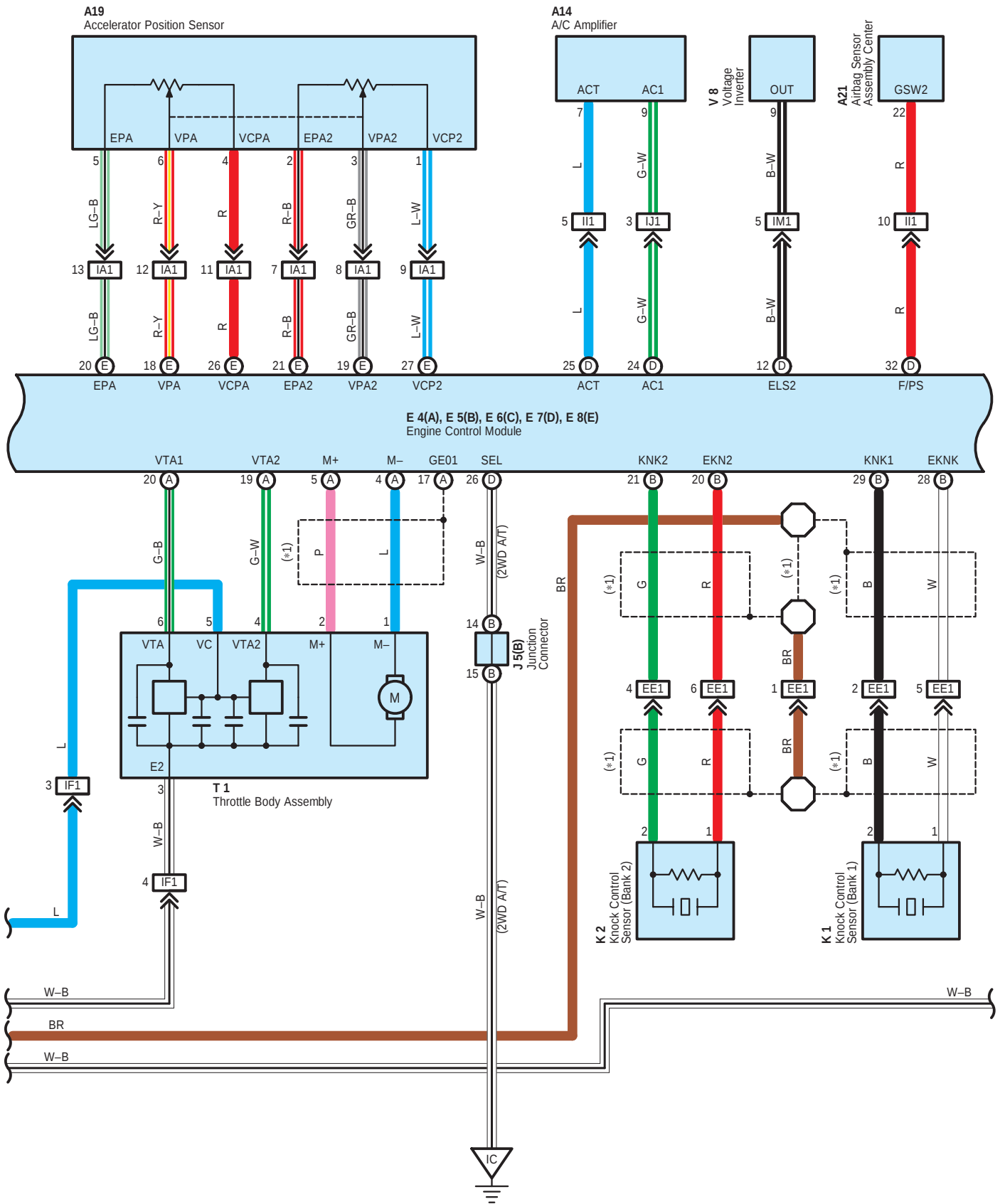




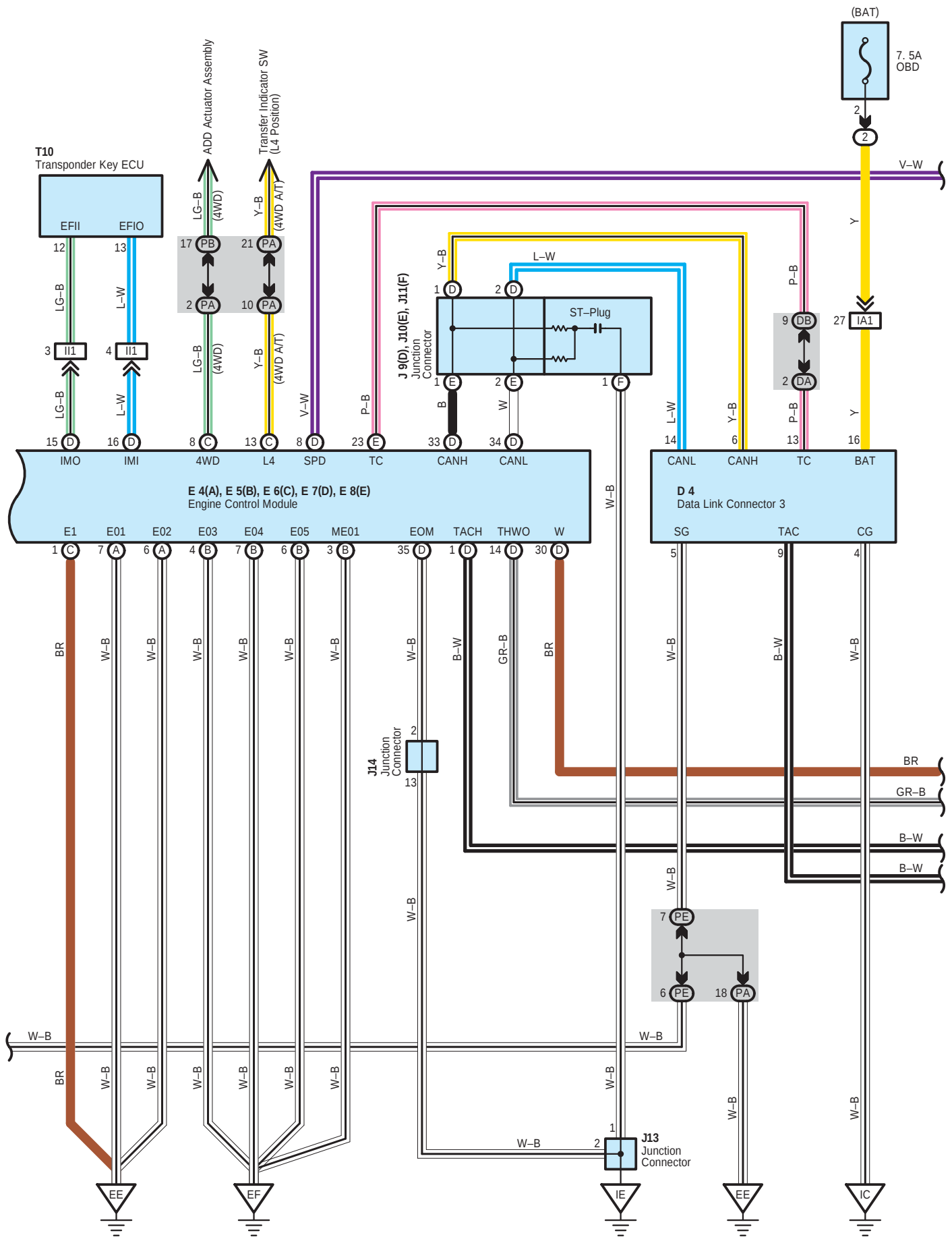
Engine Control for 1GR-FE

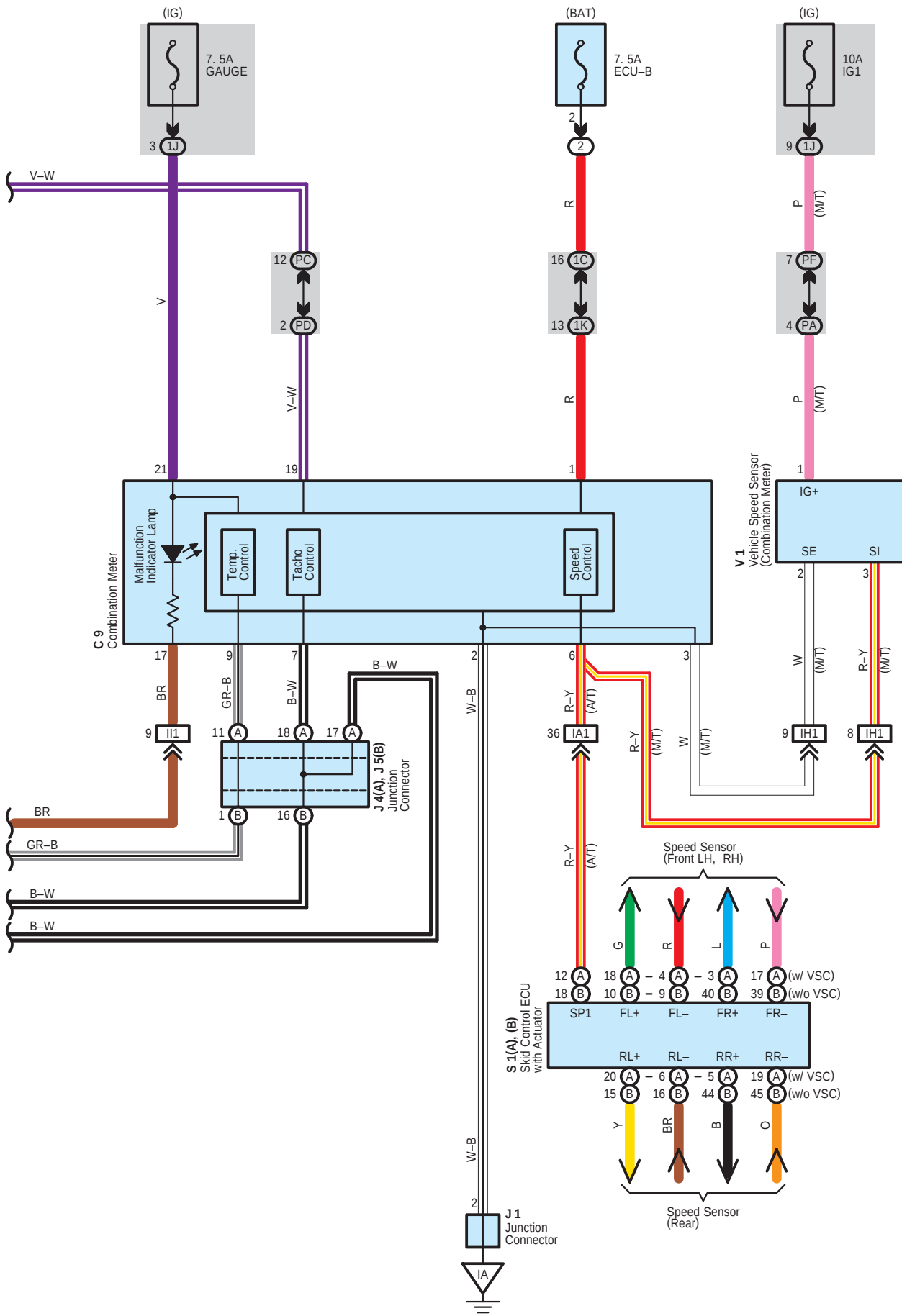


* 1 : Shielded



Engine Control for 1GR-FE





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 and OX2B of the engine control module.

(4) RPM signal circuit

The camshaft position is detected by the VVT sensor LH and RH, and is input into TERMINALS VV1+ and VV2+ 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 and VTA2 of the engine control module.

(6) Vehicle speed circuit

The vehicle speed sensor detects the vehicle speed, and the signal is input into TERMINAL SPD of the engine control module via the combination meter, from TERMINAL SP1 of the skid control ECU with actuator. (A/T)

The vehicle speed is detected by the vehicle speed sensor installed in the transaxle and the signal is input to TERMINAL SPD of the engine control module via the combination meter. (M/T)

(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 and +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 lamp SW signal circuit

The stop lamp 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 and KNK2 of the engine control module as a control signal.

(12) A/C SW signal system

The operating voltage of the A/C magnetic clutch is detected and input in the form of a control signal to TERMINAL AC1 of the engine control module.

(13) Air fuel ratio signal circuit

The air fuel ratio is detected and input as a control signal into TERMINALS A1A+, A2A+ of the engine control module.

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 and #60 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 and IGT6, 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 or 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 FUEL PUMP relay.

- * ACIS

The ACIS includes a valve in the bulkhead separating the surge tank into two parts. This valve is opened and closed in accordance with the driving conditions to control the intake manifold length in two stages, for increased engine output in all ranges from low to high speeds.

- * 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.

- * VVT-i

Controls the intake camshaft to an optimal valve timing in accordance with the engine condition.

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 1GR-FE

○ : Parts Location

Code		See Page	Code		See Page	Code	See Page	
A4	A	40 (1GR-FE)	F9		40 (1GR-FE)	J14	45	
A5		40 (1GR-FE)	F10		40 (1GR-FE)	K1	41 (1GR-FE)	
A14		44	F11		40 (1GR-FE)	K2	41 (1GR-FE)	
A19		44	F19	46 (*1)		L1	46 (*1)	
A21		44		48 (*2)			48 (*2)	
C3		40 (1GR-FE)	H3		41 (1GR-FE)	M1	A	41 (1GR-FE)
C4		40 (1GR-FE)	H4		41 (1GR-FE)	P1		41 (1GR-FE)
C5	A	40 (1GR-FE)	I1		41 (1GR-FE)	P4		41 (1GR-FE)
C8		44	I2		41 (1GR-FE)	S1	A	41 (1GR-FE)
C9		44	I3		41 (1GR-FE)		B	41 (1GR-FE)
D4		44	I4		41 (1GR-FE)	S10		45
D6		44	I5		41 (1GR-FE)	T1		41 (1GR-FE)
E2		40 (1GR-FE)	I6		41 (1GR-FE)	T10		45
E4	A	44	I7		45	V1		41 (1GR-FE)
E5	B	44	J1		45	V3		41 (1GR-FE)
E6	C	44	J4	A	45	V4	A	41 (1GR-FE)
E7	D	44	J5	B	45	V5		41 (1GR-FE)
E8	E	44	J9	D	45	V6		41 (1GR-FE)
F5	A	40 (1GR-FE)	J10	E	45	V8	47 (*1)	
F6		40 (1GR-FE)	J11	F	45		48 (*2)	
F7	A	40 (1GR-FE)	J12		45			
F8		40 (1GR-FE)	J13		45			

○ : 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)
1A	28	Engine Room Main Wire and Driver Side J/B (Lower Finish Panel)
1B		
1C		
1H	29	Instrument Panel Wire and Driver Side J/B (Lower Finish Panel)
1I		
1J		
1K		
2A	24	Engine Room J/B (Engine Compartment Left)
2B	24	Engine Wire and Engine Room J/B (Engine Compartment Left)
2C	24	Engine Room Main Wire and Engine Room J/B (Engine Compartment Left)
DA	34	Instrument Panel Wire and Instrument Panel J/B No.1 (Left Kick Panel)
DB		
DC	34	Engine Room Main Wire and Instrument Panel J/B No.1 (Left Kick Panel)
DD		
PA	36	Engine Wire and Instrument Panel J/B No.2 (Right Side of Glove Box)
PB		
PC	36	Instrument Panel Wire and Instrument Panel J/B No.2 (Right Side of Glove Box)
PD		
PE		
PF		

* 1 : Double Cab * 2 : Access Cab * 3 : Regular Cab * 4 : Separate Seat * 5 : Bench Seat

 : Connector Joining Wire Harness and Wire Harness

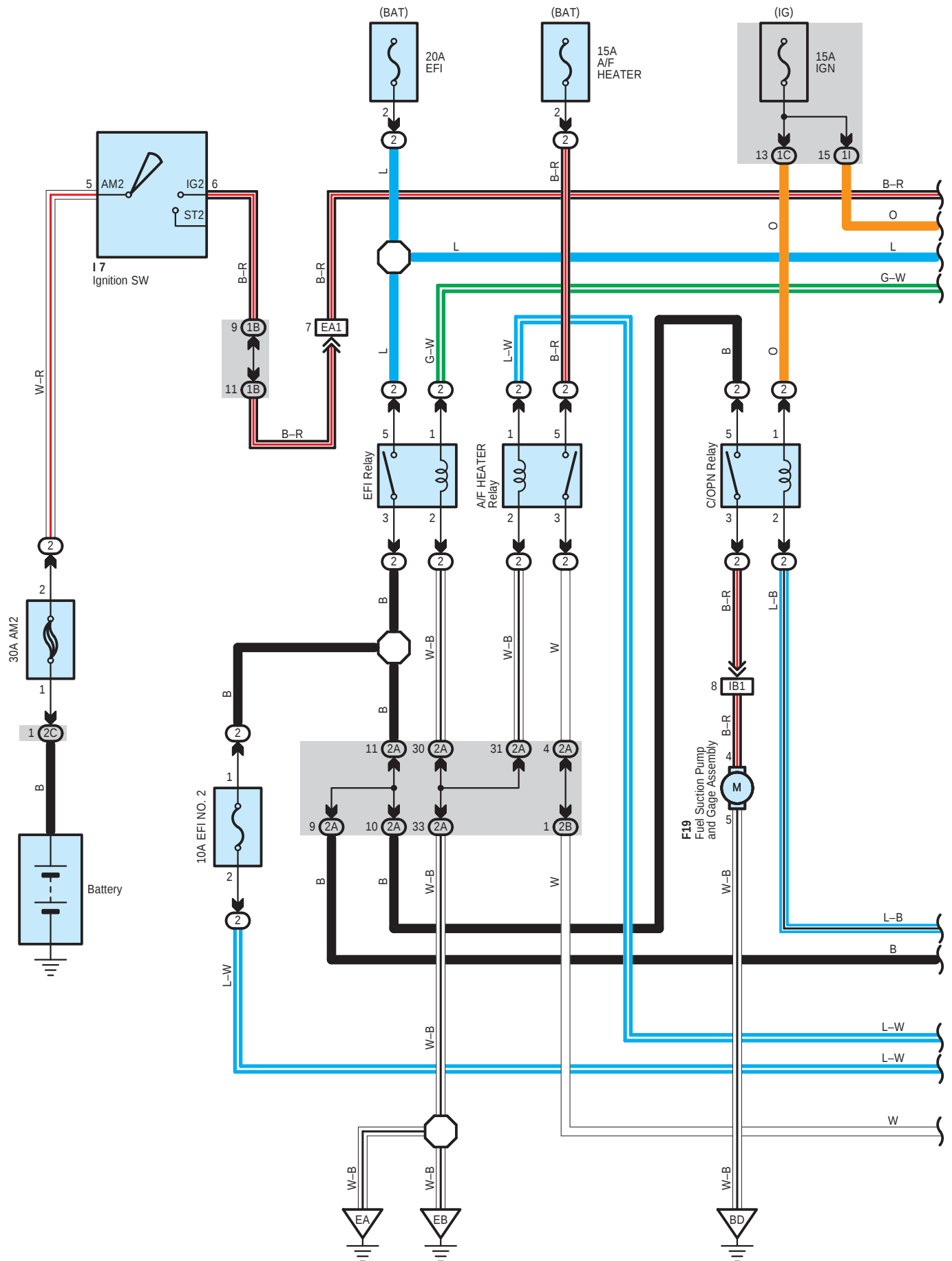
Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
EA1	52 (1GR-FE)	Engine Wire and Engine Room Main Wire (Inside of Engine Room R/B)
EE1	52 (1GR-FE)	Engine Wire and Sensor Wire (Rear Side of Right Bank Cylinder Block)
IA1	54	Instrument Panel Wire and Engine Room Main Wire (Left Kick Panel)
IB1	54	Frame Wire and Engine Room Main Wire (Left Kick Panel)
ID2	54	Frame Wire and Instrument Panel Wire (Left Kick Panel)
IF1	55	Engine Wire and Engine Wire (Behind the Glove Box)
IH1	55	Engine Wire and Instrument Panel Wire (Right Side of Glove Box)
II1	55	Instrument Panel Wire and Instrument Panel Wire (Instrument Panel Brace RH)
IJ1	55	Instrument Panel Wire and Instrument Panel Wire (Right Kick Panel)
IM1	55	Floor No.3 Wire and Instrument Panel Wire (Under the Console Box)

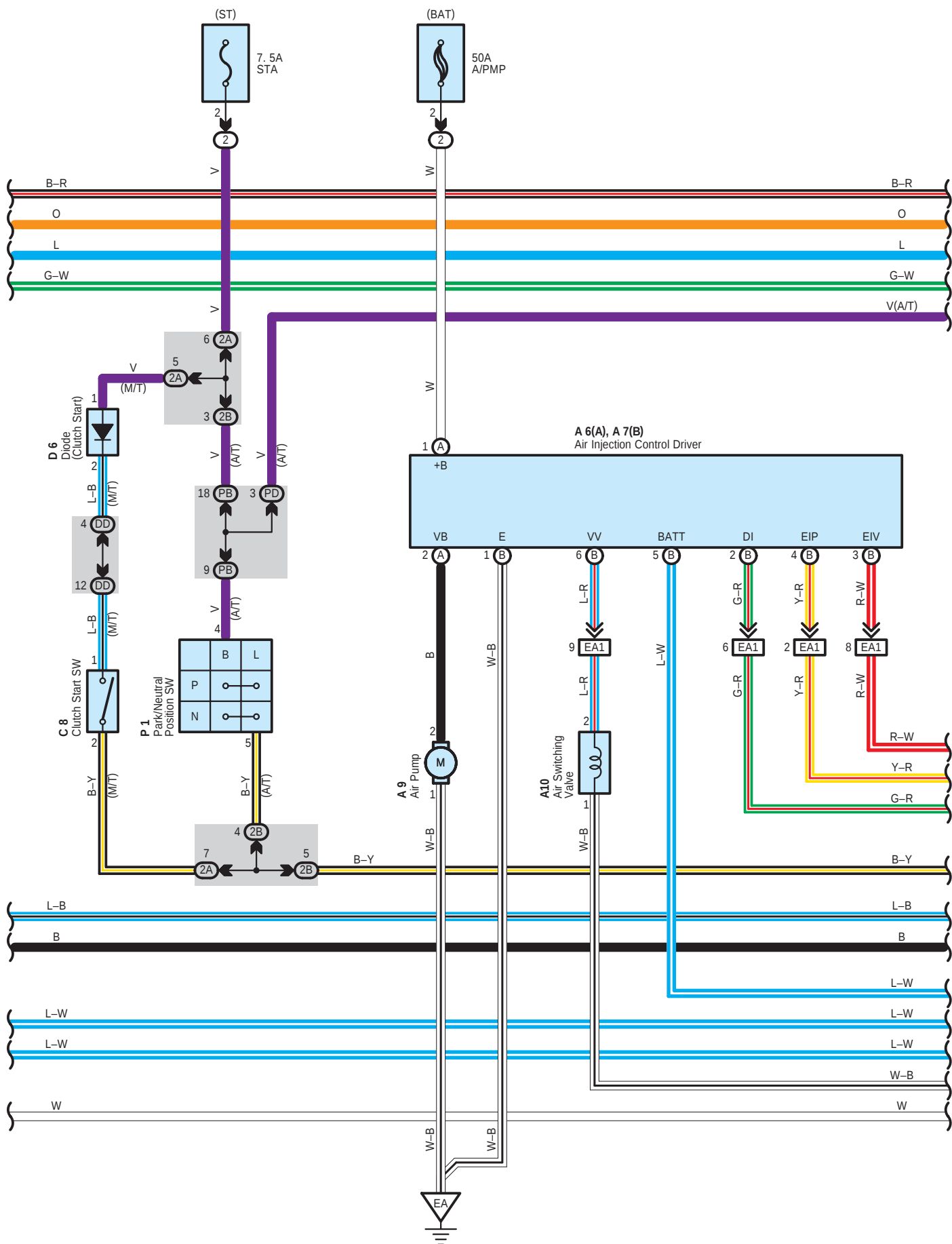
 : Ground Points

Code	See Page	Ground Points Location
EA	52 (1GR-FE)	Front Right Fender
EB	52 (1GR-FE)	Front Left Fender
EE	52 (1GR-FE)	Rear Side of Right Bank Cylinder Block
EF	52 (1GR-FE)	Rear Side of Left Bank Cylinder Block
IA	54	Left Kick Panel
IC	54	Instrument Panel Brace RH
IE	54	Right Kick Panel
BD	56 (*1)	Near the Rear Differential
	57 (*2)	

* 1 : Double Cab * 2 : Access Cab * 3 : Regular Cab * 4 : Separate Seat * 5 : Bench Seat

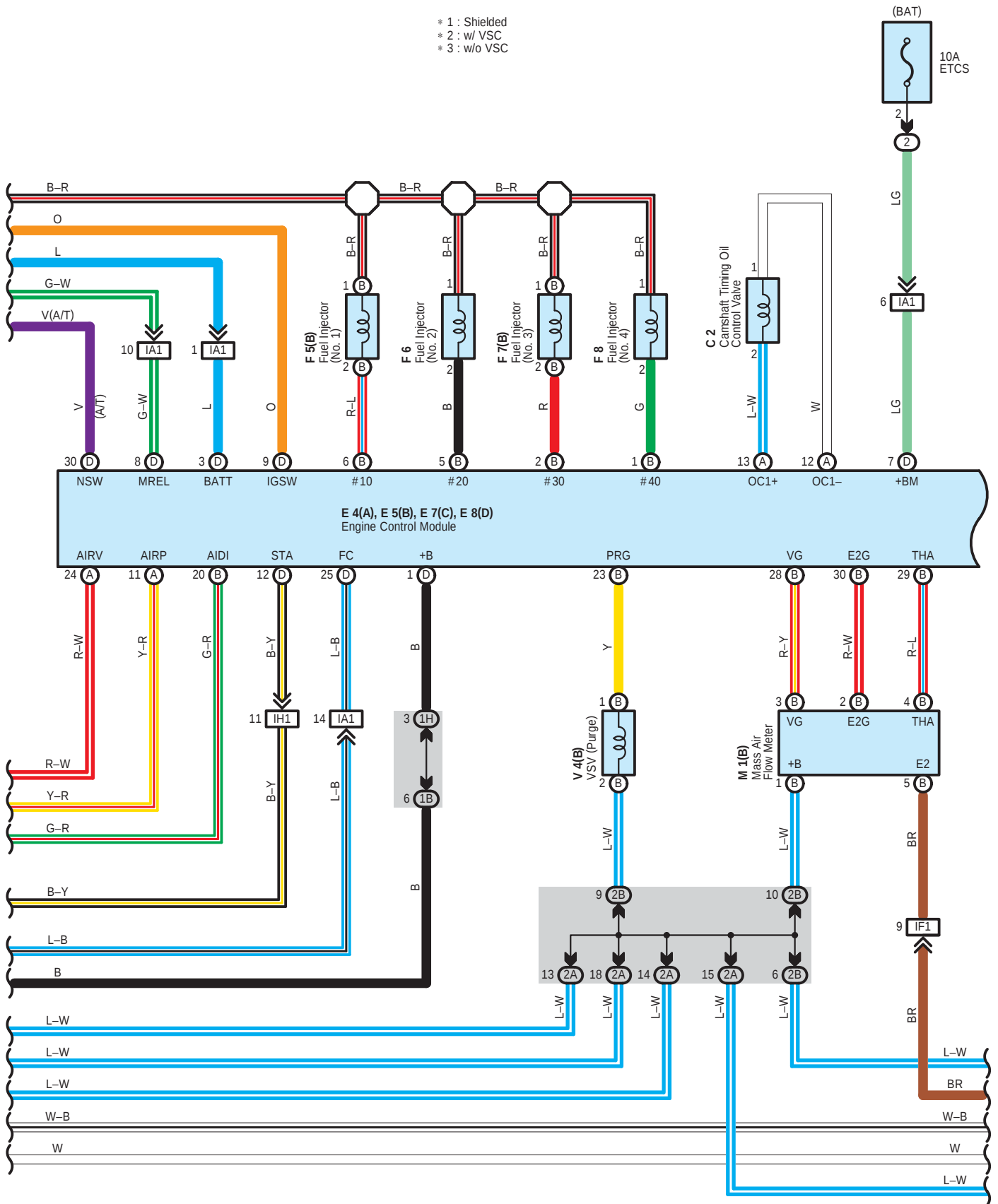
Engine Control for 2TR-FE

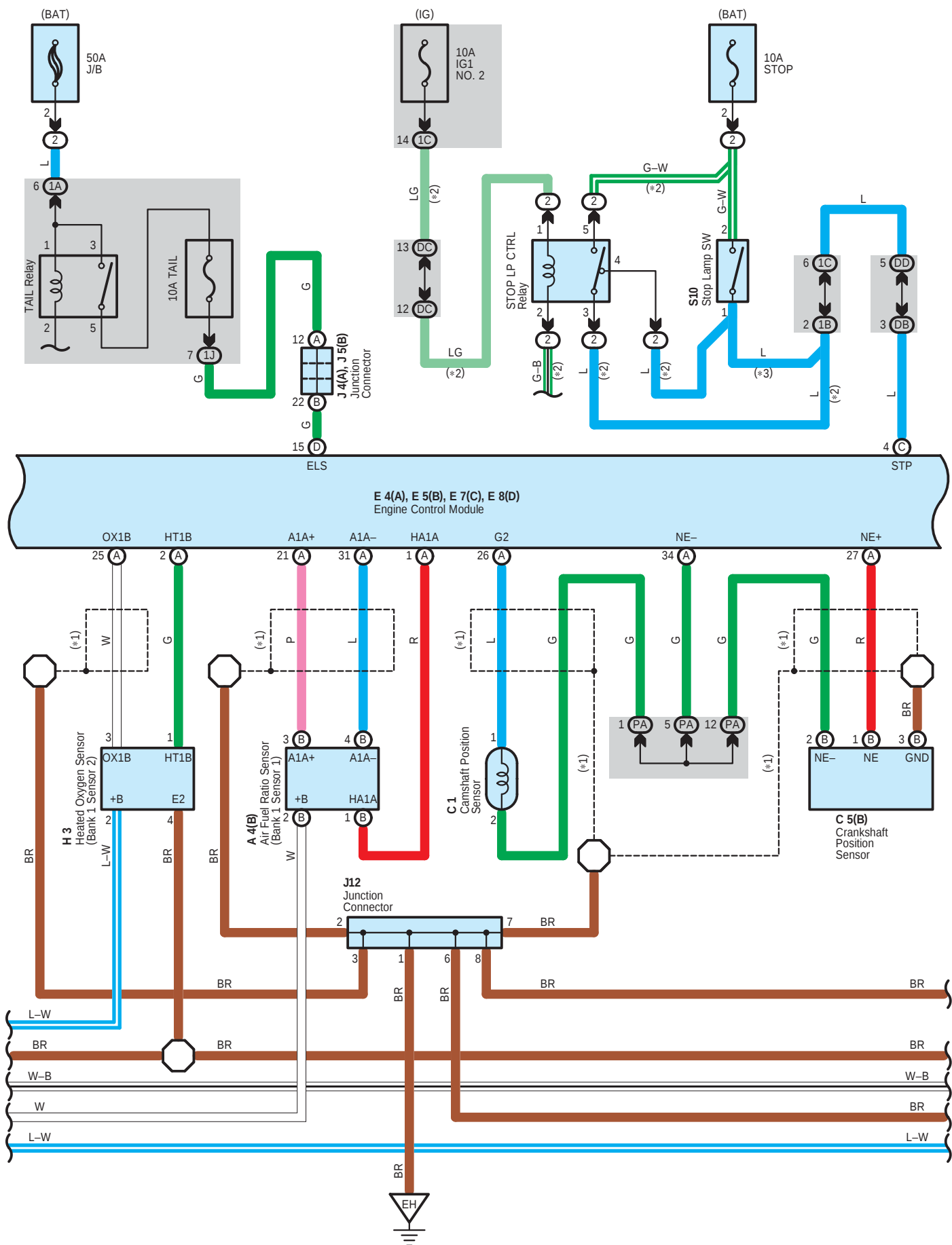


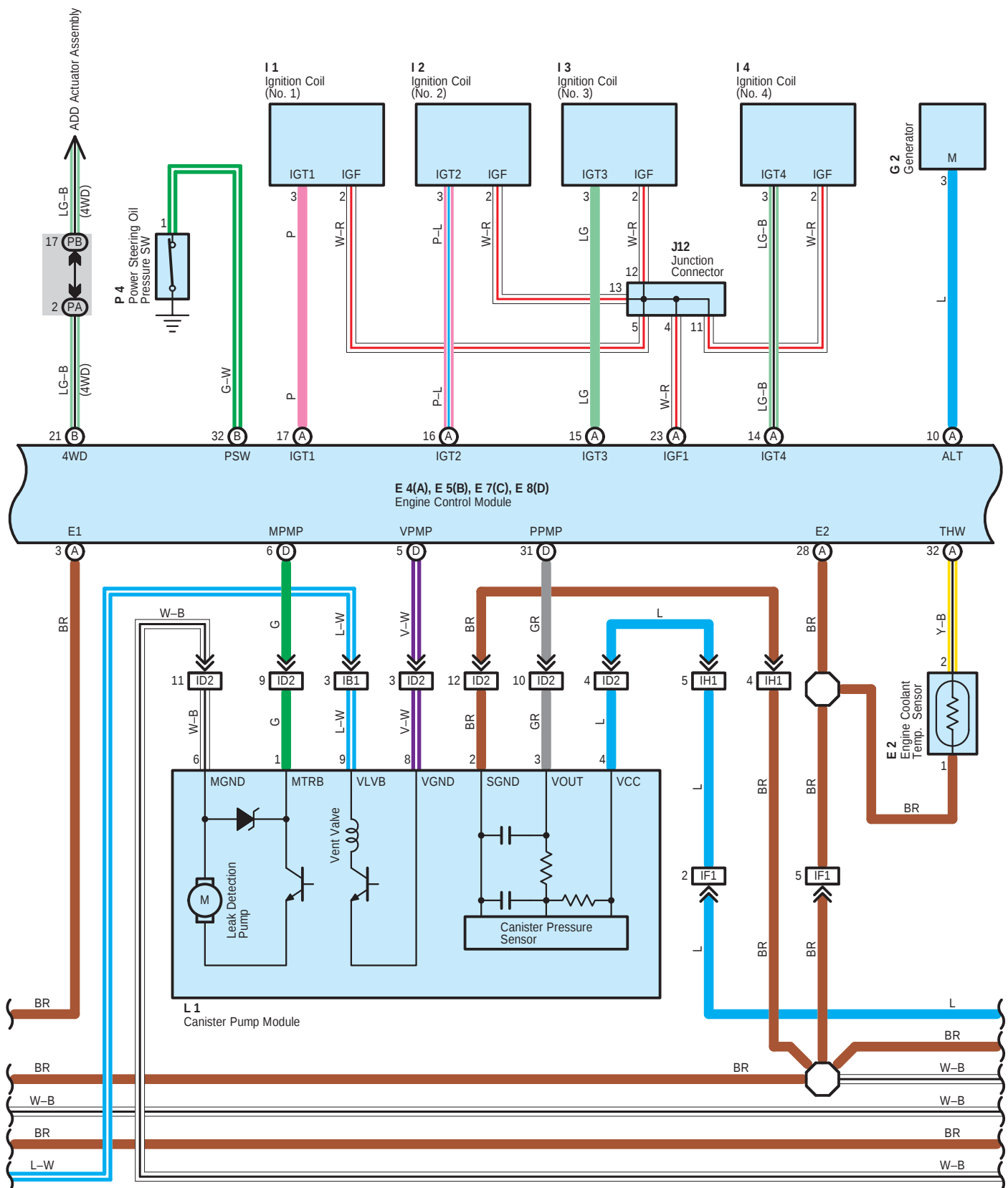


Engine Control for 2TR-FE

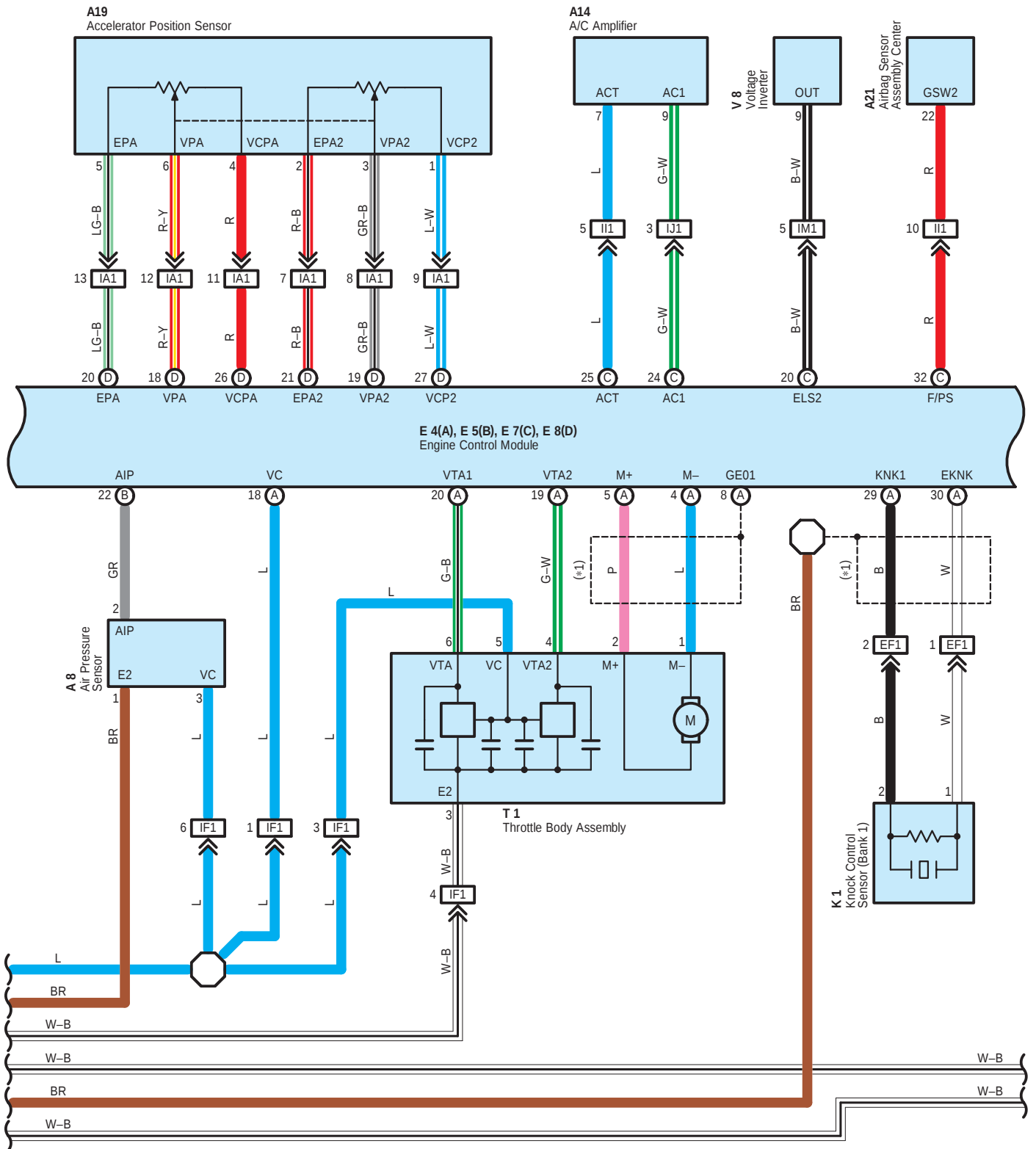
- * 1 : Shielded
- * 2 : w/ VSC
- * 3 : w/o VSC

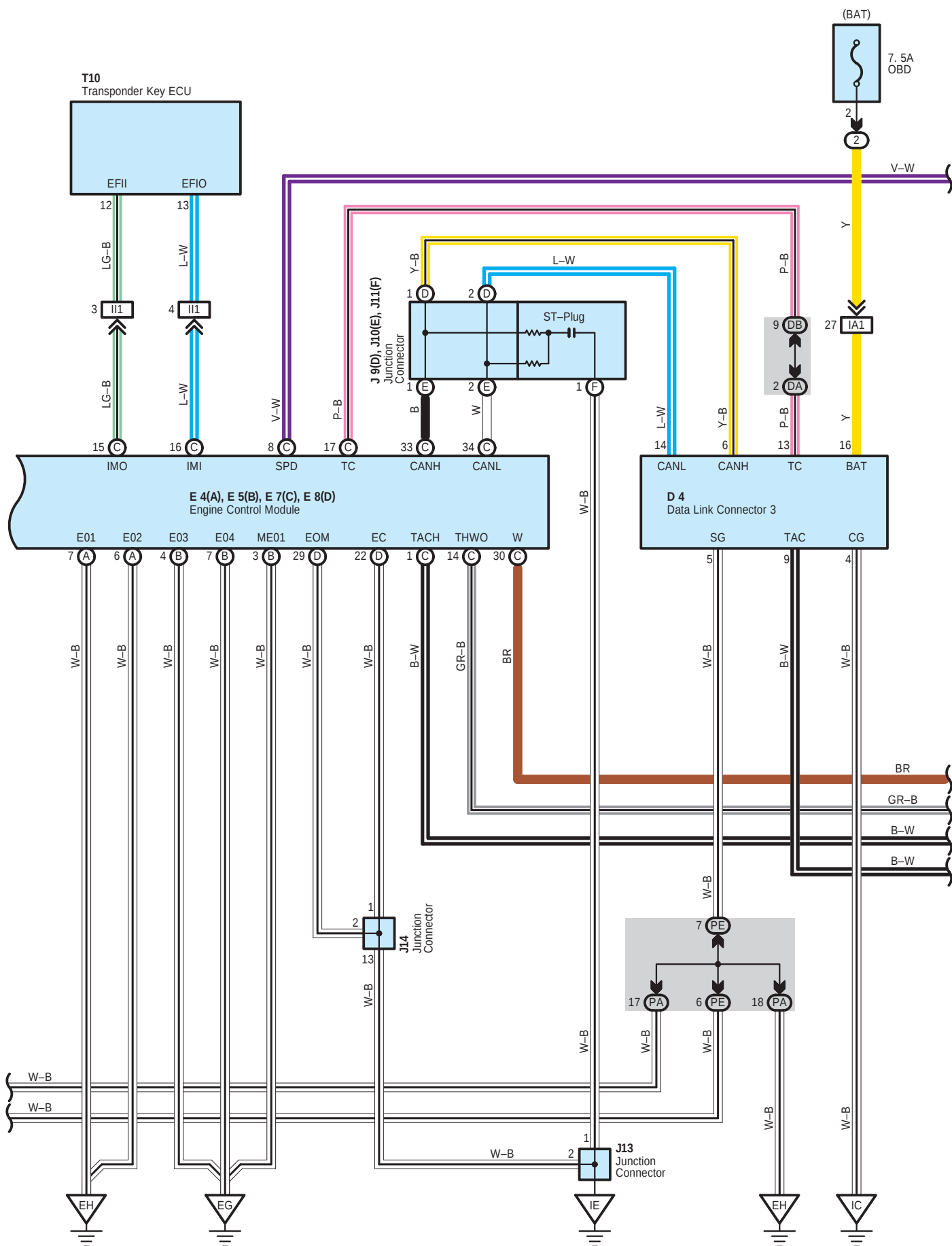


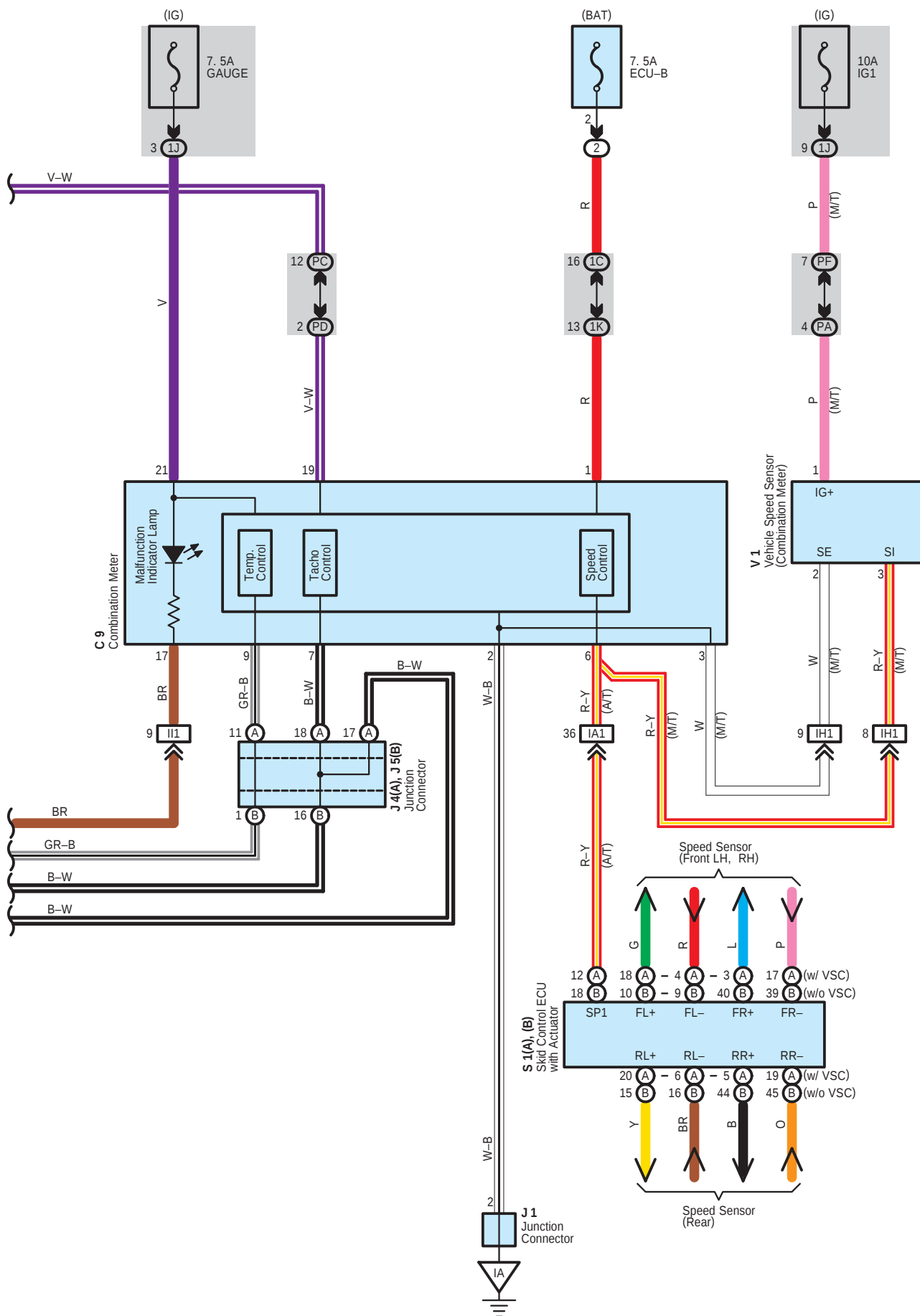




* 1 : Shielded







System Outline

The engine control system utilizes a microcomputer and maintains overall control of the engine, etc. An outline of engine control is given here.

1. Input Signals

(1) Engine coolant temp. signal system

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 as a control signal to TERMINAL THW of the engine control module.

(2) Intake air temp. signal system

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) Power steering oil pressure signal system

Power steering oil pressure is detected by the power steering oil pressure SW and is input as a control signal to TERMINAL PSW of the engine control module.

(4) RPM signal system

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 system

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

(6) Vehicle speed signal system

The vehicle speed is detected by the ABS speed sensor and the signal is input to TERMINAL SPD of the engine control module via the combination meter and the skid control ECU with actuator. (A/T)

The vehicle speed is detected by the vehicle speed sensor installed in the transaxle and the signal is input to TERMINAL SPD of the engine control module via the combination meter. (M/T)

(7) NSW signal system (A/T)

The Park/Neutral position SW detects whether the shift position is in neutral or not, and inputs a control signal to TERMINAL NSW of the engine control module.

(8) A/C SW signal system

The operating voltage of the A/C SW is detected and is input as a control signal to TERMINAL AC1 of the engine control module.

(9) Battery signal system

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

(10) Intake air volume signal system

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.

(11) STA signal system

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

(12) Oxygen sensor signal system

The oxygen density in the exhaust gases is detected and is input as a control signal into TERMINAL OX1B of the engine control module. To maintain stable detection performance by the oxygen sensor, a heater is used for warming the sensor. The heater is also controlled by the engine control module (HT1B).

(13) Engine knock signal system

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

(14) Electrical load signal system

When systems which cause a high electrical load such as the rear window defogger, taillight are turned on, a signal is input to TERMINALS ELS and ELS2 as a control signal.

(15) Air fuel ratio signal circuit

The air fuel ratio is detected and input as a control signal into TERMINAL A1A+ of the engine control module.

2. Control System

* SFI system

The SFI system monitors the engine conditions through the signals, which are input from each sensor to the engine control module. Based on this data and the program memorized in the engine control module, the most appropriate fuel injection timing is decided and current is output to TERMINALS #10, #20, #30 and #40 of the engine control module, operating the injectors (to inject fuel). This is the system which finely controls the fuel injection in response to the driving conditions, through the engine control module.

* ESA system

The ESA system monitors the engine conditions using the signals, which are input to the engine control module from each sensor. Based on this data and the program memorized in the engine control module, the most appropriate ignition timing is decided and current is output to TERMINALS IGT1, IGT2, IGT3 and IGT4 of the engine control module. This output controls the ignition coil and igniter No. 1, No. 2, No. 3 and No. 4 to produce the most appropriate ignition timing for the driving conditions.

* Knock control system

Knock control system controls the gate based on the engine rotation speed and detects knocking by the peak value of the knock sensor output during the gate open period, and then controls it to the most suitable ignition timing in proportion to the driving condition.

* Evapopurge control system

This system leads the vapor stuck to the canister to the surge tank in order not to agitate the air fuel by adjusting the fuel injection volume.

The signal at this time will be output from TERMINAL PRG of the engine control module to VSV (Purge).

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 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 the data (Standard values) recorded in the engine control module memory or else stops the engine.

○ : Parts Location

Code	See Page	Code	See Page	Code	See Page
A4	B 42 (2TR-FE)	E7	C 44	J10	E 45
A6	A 42 (2TR-FE)	E8	D 44	J11	F 45
A7	B 42 (2TR-FE)	F5	B 42 (2TR-FE)	J12	45
A8	42 (2TR-FE)	F6	42 (2TR-FE)	J13	45
A9	42 (2TR-FE)	F7	B 42 (2TR-FE)	J14	45
A10	42 (2TR-FE)	F8	42 (2TR-FE)	K1	43 (2TR-FE)
A14	44	F19	48 (*2)	L1	48 (*2)
A19	44		49 (*3)		49 (*3)
A21	44	G2	42 (2TR-FE)	M1	B 43 (2TR-FE)
C1	42 (2TR-FE)	H3	43 (2TR-FE)	P1	43 (2TR-FE)
C2	42 (2TR-FE)	I1	43 (2TR-FE)	P4	43 (2TR-FE)
C5	B 42 (2TR-FE)	I2	43 (2TR-FE)	S1	A 43 (2TR-FE)
C8	44	I3	43 (2TR-FE)		B 43 (2TR-FE)
C9	44	I4	43 (2TR-FE)	S10	45
D4	44	I7	45	T1	43 (2TR-FE)
D6	44	J1	45	T10	45
E2	42 (2TR-FE)	J4	A 45	V1	43 (2TR-FE)
E4	A 44	J5	B 45	V4	B 43 (2TR-FE)
E5	B 44	J9	D 45	V8	48 (*2)

○ : Relay Blocks

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

* 1 : Double Cab * 2 : Access Cab * 3 : Regular Cab * 4 : Separate Seat * 5 : Bench Seat

Engine Control for 2TR-FE



: Junction Block and Wire Harness Connector

Code	See Page	Junction Block and Wire Harness (Connector Location)
1A	28	Engine Room Main Wire and Driver Side J/B (Lower Finish Panel)
1B		
1C		
1H	29	Instrument Panel Wire and Driver Side J/B (Lower Finish Panel)
1I		
1J		
1K		
2A	24	Engine Room J/B (Engine Compartment Left)
2B	24	Engine Wire and Engine Room J/B (Engine Compartment Left)
2C	24	Engine Room Main Wire and Engine Room J/B (Engine Compartment Left)
DA	34	Instrument Panel Wire and Instrument Panel J/B No.1 (Left Kick Panel)
DB		
DC	34	Engine Room Main Wire and Instrument Panel J/B No.1 (Left Kick Panel)
DD		
PA	36	Engine Wire and Instrument Panel J/B No.2 (Right Side of Glove Box)
PB		
PC	36	Instrument Panel Wire and Instrument Panel J/B No.2 (Right Side of Glove Box)
PD		
PE		
PF		



: Connector Joining Wire Harness and Wire Harness

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
EA1	53 (2TR-FE)	Engine Wire and Engine Room Main Wire (Inside of Engine Room R/B)
EF1	53 (2TR-FE)	Engine Wire and Sensor Wire (Left Side of Cylinder Block)
IA1	54	Instrument Panel Wire and Engine Room Main Wire (Left Kick Panel)
IB1	54	Frame Wire and Engine Room Main Wire (Left Kick Panel)
ID2	54	Frame Wire and Instrument Panel Wire (Left Kick Panel)
IF1	55	Engine Wire and Engine Wire (Behind the Glove Box)
IH1	55	Engine Wire and Instrument Panel Wire (Right Side of Glove Box)
II1	55	Instrument Panel Wire and Instrument Panel Wire (Instrument Panel Brace RH)
IJ1	55	Instrument Panel Wire and Instrument Panel Wire (Right Kick Panel)
IM1	55	Floor No.3 Wire and Instrument Panel Wire (Under the Console Box)

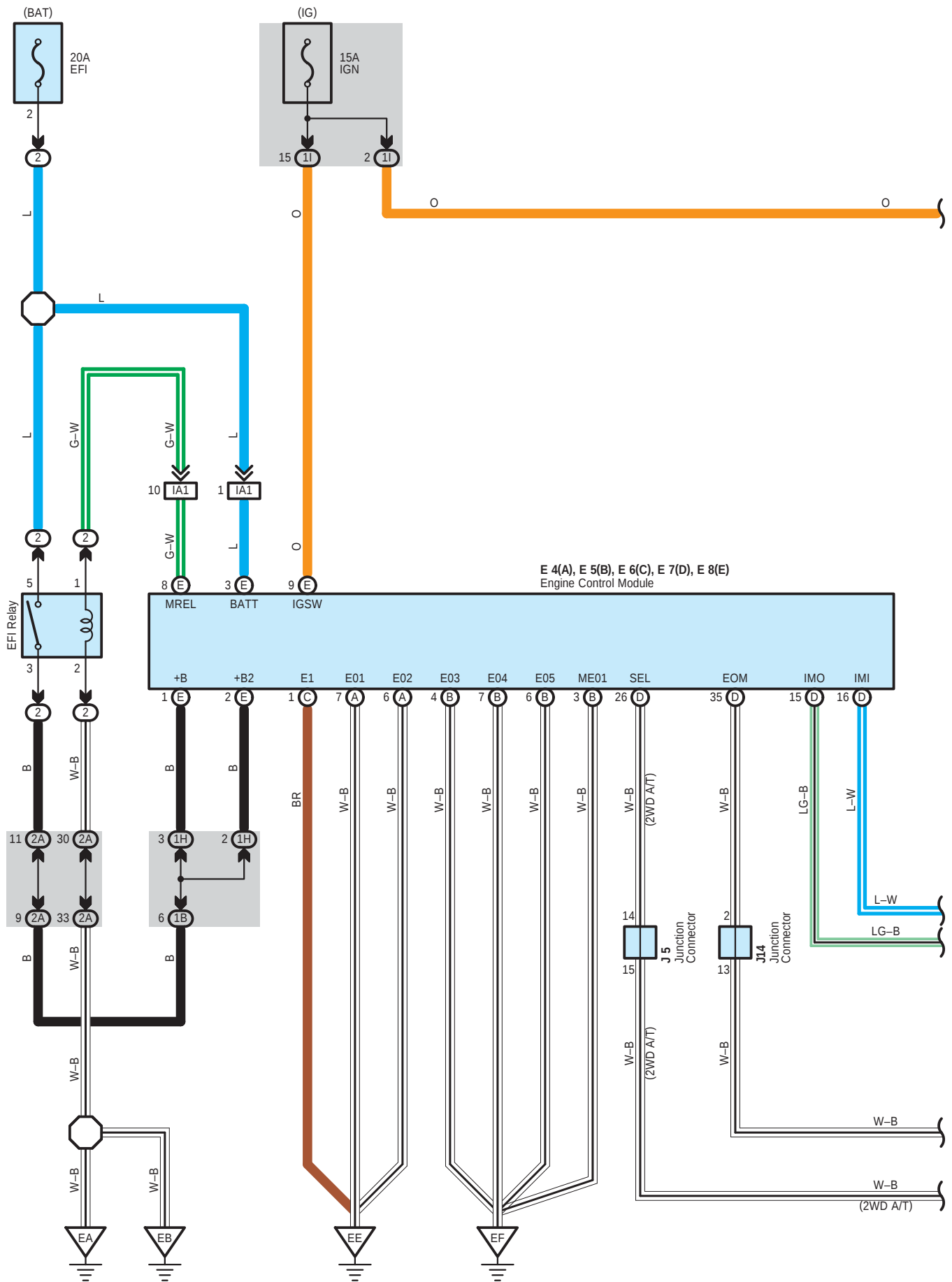


: Ground Points

Code	See Page	Ground Points Location
EA	53 (2TR-FE)	Front Right Fender
EB	53 (2TR-FE)	Front Left Fender
EG	53 (2TR-FE)	Rear Side of Cylinder Block
EH		
IA	54	Left Kick Panel
IC	54	Instrument Panel Brace RH
IE	54	Right Kick Panel
BD	57 (*2)	Near the Rear Differential
	58 (*3)	

* 1 : Double Cab * 2 : Access Cab * 3 : Regular Cab * 4 : Separate Seat * 5 : Bench Seat

Engine Immobiliser System for 1GR-FE



Engine Immobiliser System for 1GR-FE

: Parts Location

Code		See Page		Code		See Page		Code		See Page	
D4		44		E6	C	44		J13		45	
D11		46 (*1)		E7	D	44		J14		45	
		48 (*2)		E8	E	44		T9		45	
E4	A	44		H7		45		T10		45	
E5	B	44		J5		45		U1		45	

: 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	28	Engine Room Main Wire and Driver Side J/B (Lower Finish Panel)
1C		
1F	28	Floor No.2 Wire and Driver Side J/B (Lower Finish Panel)
1H	29	Instrument Panel Wire and Driver Side J/B (Lower Finish Panel)
1I		
1J		
1K		
2A	24	Engine Room J/B (Engine Compartment Left)
DA	34	Instrument Panel Wire and Instrument Panel J/B No.1 (Left Kick Panel)

: Connector Joining Wire Harness and Wire Harness

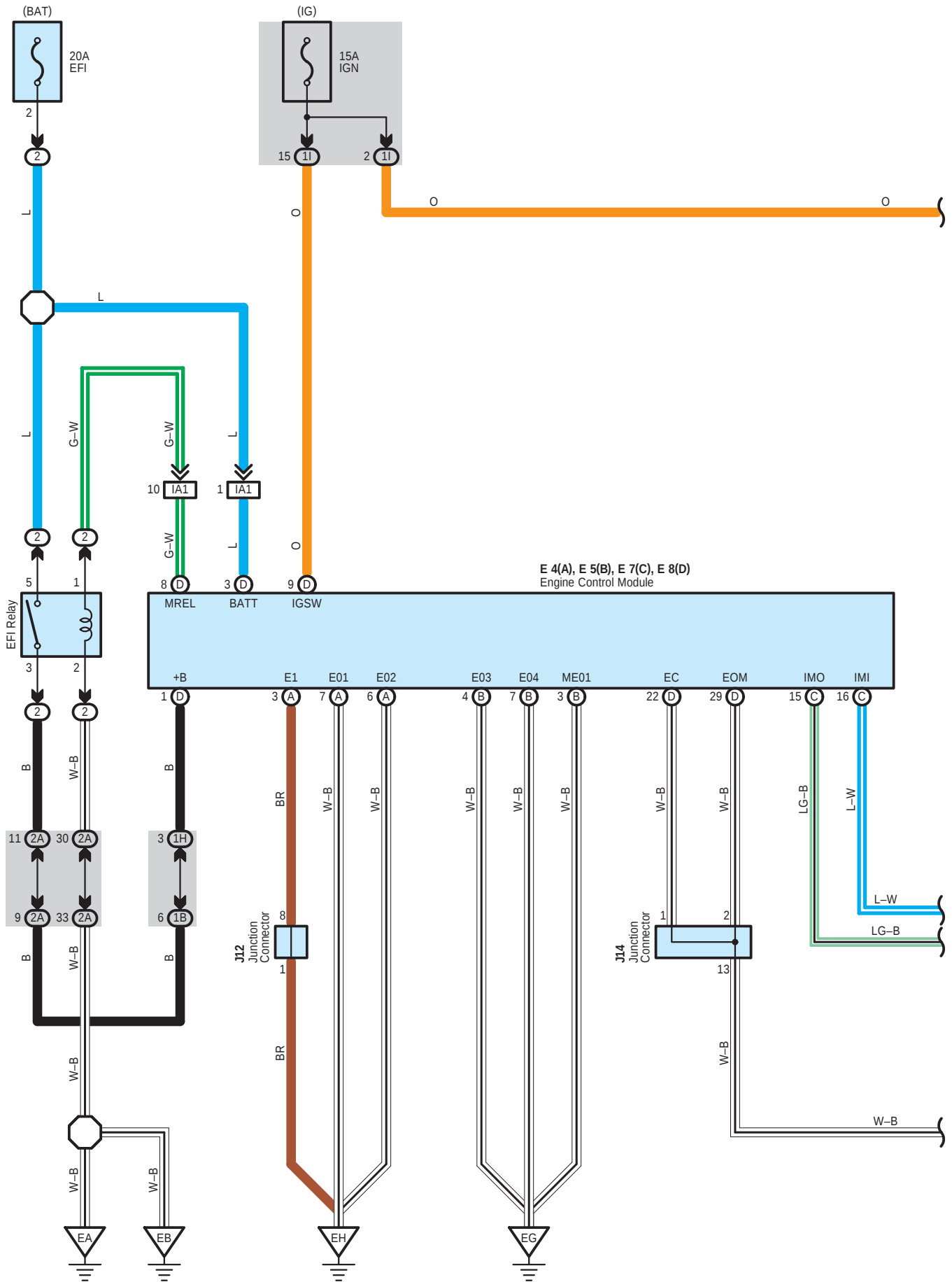
Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IA1	54	Instrument Panel Wire and Engine Room Main Wire (Left Kick Panel)
II1	55	Instrument Panel Wire and Instrument Panel Wire (Instrument Panel Brace RH)
IL1	55	Instrument Panel Wire and Floor Wire (Right Kick Panel)
BF1	57 (*2)	Rear Door No.2 Wire and Floor No.2 Wire (Under the Left Quarter Panel)

: Ground Points

Code	See Page	Ground Points Location
EA	52 (1GR-FE)	Front Right Fender
EB	52 (1GR-FE)	Front Left Fender
EE	52 (1GR-FE)	Rear Side of Right Bank Cylinder Block
EF	52 (1GR-FE)	Rear Side of Left Bank Cylinder Block
IC	54	Instrument Panel Brace RH
IE	54	Right Kick Panel
BB	56 (*1)	Floor Seat Cross Member RH
	57 (*2)	

* 1 : Double Cab * 2 : Access Cab * 3 : Regular Cab * 4 : Separate Seat * 5 : Bench Seat

Engine Immobiliser System for 2TR-FE



Engine Immobiliser System for 2TR-FE

: Parts Location

Code		See Page		Code		See Page		Code		See Page	
D4		44		E7	C	44		J13		45	
D11		48 (*2)		E8	D	44		J14		45	
		49 (*3)		H7		45		T9		45	
E4	A	44		J5		45		T10		45	
E5	B	44		J12		45		U1		45	

: 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	28	Engine Room Main Wire and Driver Side J/B (Lower Finish Panel)
1C		
1F	28	Floor No.2 Wire and Driver Side J/B (Lower Finish Panel)
1H	29	Instrument Panel Wire and Driver Side J/B (Lower Finish Panel)
1I		
1J		
1K		
2A	24	Engine Room J/B (Engine Compartment Left)
DA	34	Instrument Panel Wire and Instrument Panel J/B No.1 (Left Kick Panel)

: Connector Joining Wire Harness and Wire Harness

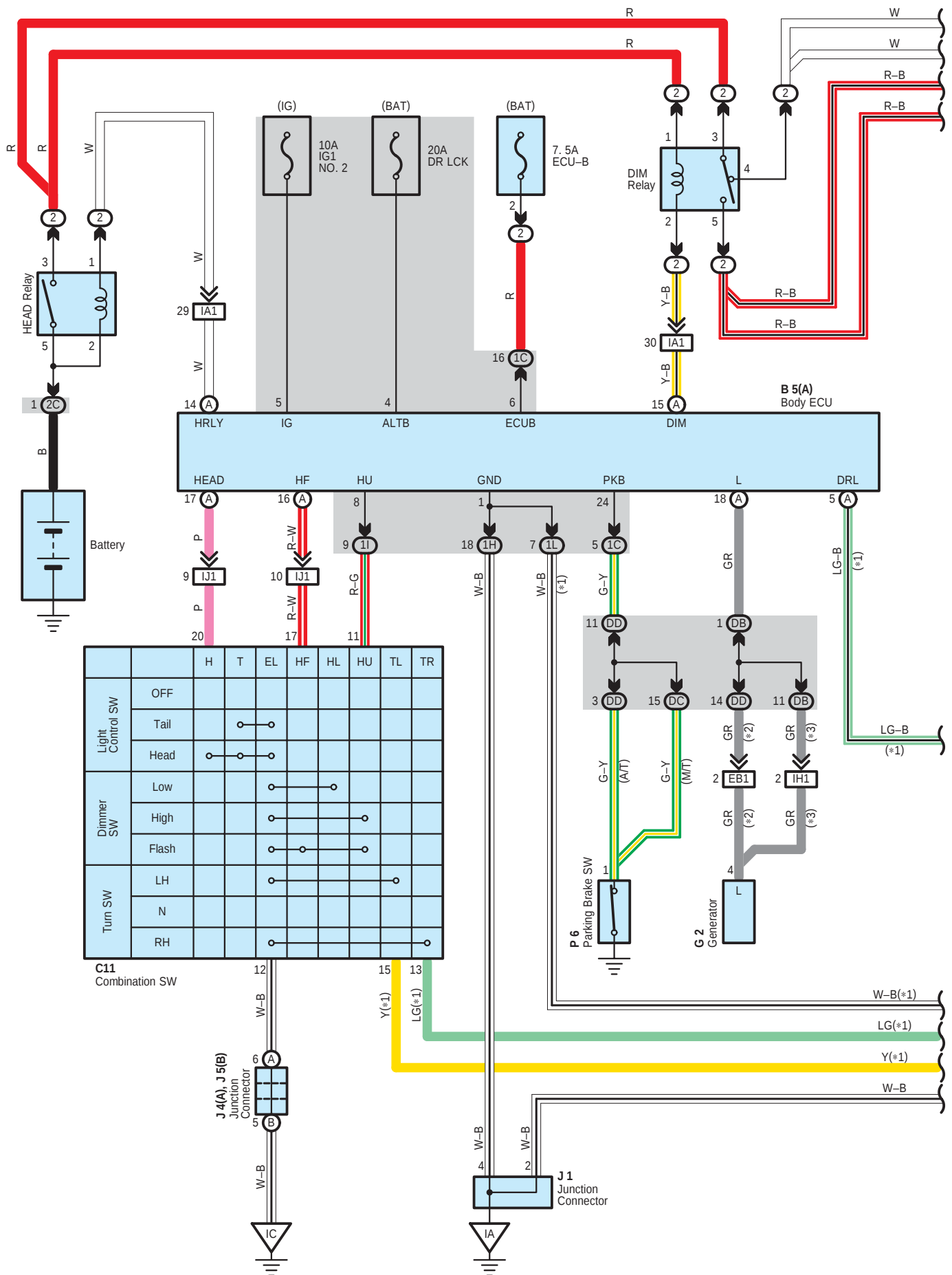
Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IA1	54	Instrument Panel Wire and Engine Room Main Wire (Left Kick Panel)
II1	55	Instrument Panel Wire and Instrument Panel Wire (Instrument Panel Brace RH)
IL1	55	Instrument Panel Wire and Floor Wire (Right Kick Panel)
BF1	57 (*2)	Rear Door No.2 Wire and Floor No.2 Wire (Under the Left Quarter Panel)

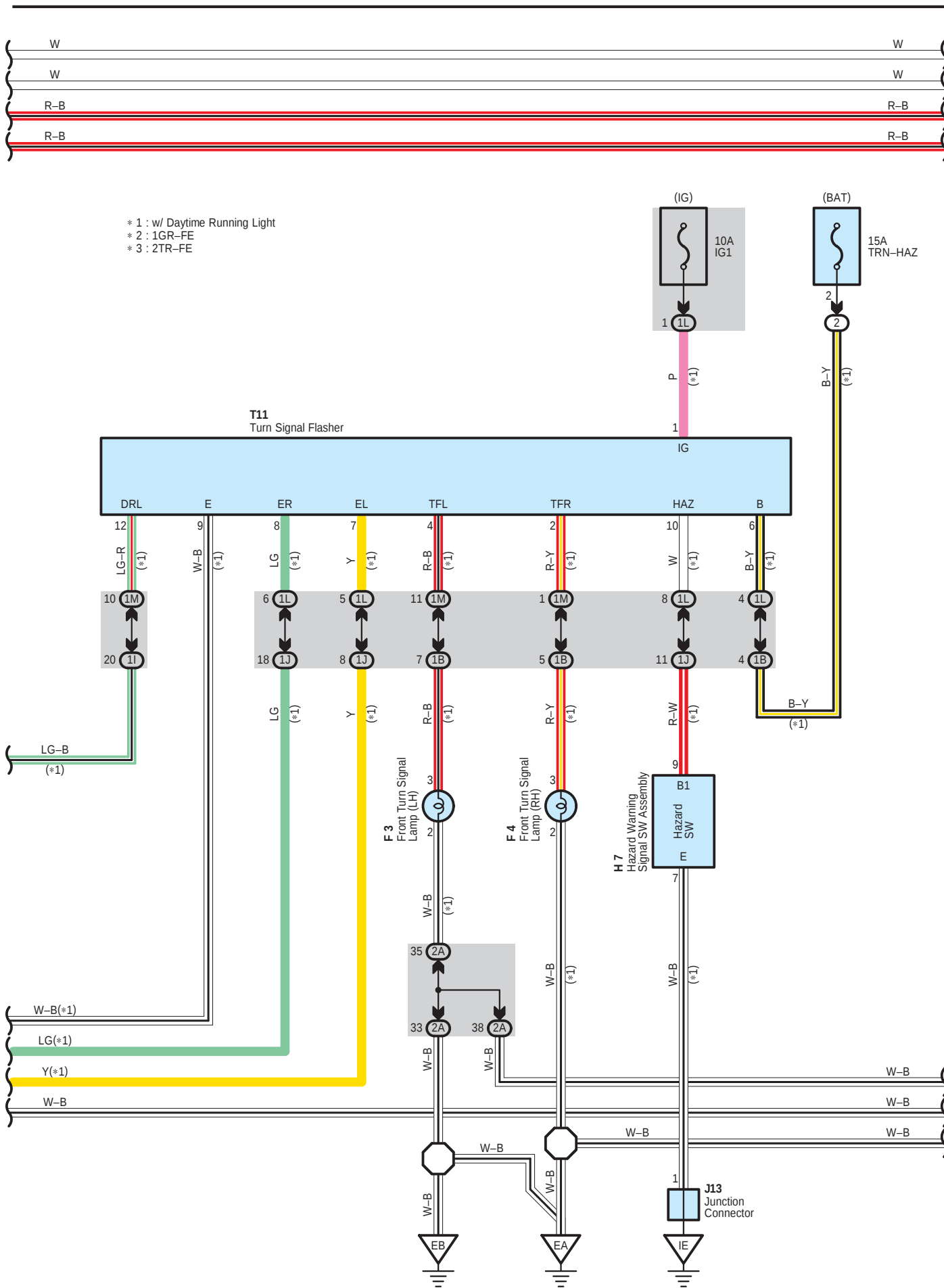
: Ground Points

Code	See Page	Ground Points Location
EA	53 (2TR-FE)	Front Right Fender
EB	53 (2TR-FE)	Front Left Fender
EG	53 (2TR-FE)	Rear Side of Cylinder Block
EH		
IC	54	Instrument Panel Brace RH
IE	54	Right Kick Panel
BB	57 (*2)	Floor Seat Cross Member RH
	58 (*3)	

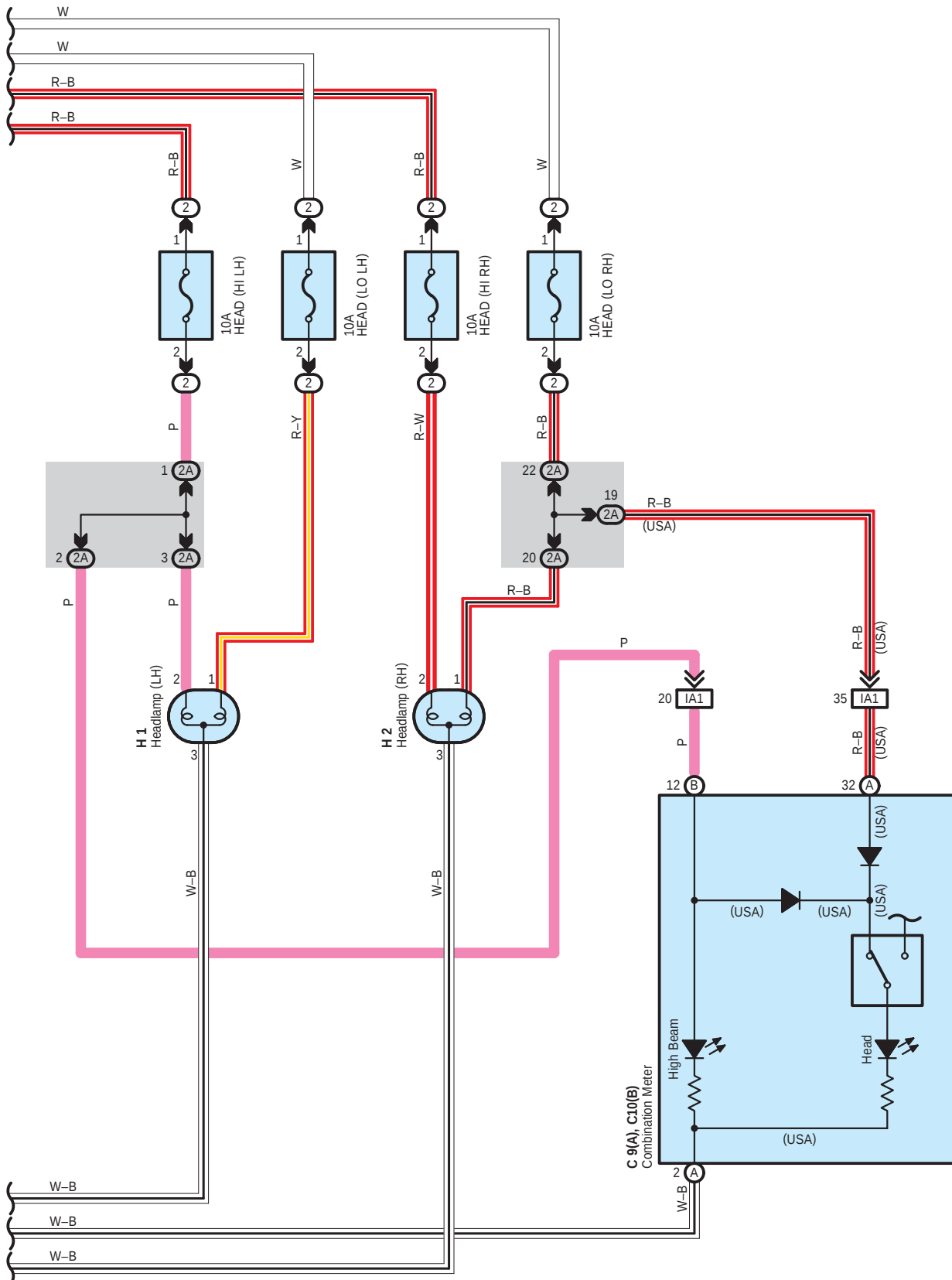
* 1 : Double Cab * 2 : Access Cab * 3 : Regular Cab * 4 : Separate Seat * 5 : Bench Seat

Headlight





Headlight



System Outline

(w/ daytime running light)

* This system is designed to automatically activate the turn signal lights during the daytime to keep the car highly visible to other vehicles. This system is controlled by the body ECU.

This system makes use of the turn signal lights as daytime running lights.

For this reason, when the turn signal lights are operated, the daytime running lights function is interrupted momentarily, which, however, will be brought back into operation as soon as the interposed operation is over.

* This system is enabled when the conditions given below are met.

- A) Ignition switch ON condition
- B) Turn signal lamp switch OFF condition
- C) Hazard lamp switch OFF condition
- D) Light control switch OFF condition
- E) Parking brake switch OFF condition (Parking brake out of operating condition)**

** : This system does not become active when the parking brake switch is ON. However, once the OFF signal of the parking brake switch is input into the body ECU, this system will become active thereafter, regardless of whether the parking brake switch is ON or OFF.

○ : Parts Location

Code		See Page	Code	See Page	Code		See Page
B5	A	44	F4	42 (2TR–FE)	H7		45
C9	A	44	G2	40 (1GR–FE)	J1		45
C10	B	44		42 (2TR–FE)	J4	A	45
C11		44	H1	41 (1GR–FE)	J5	B	45
F3	40 (1GR–FE)			43 (2TR–FE)	J13		45
	42 (2TR–FE)		H2	41 (1GR–FE)	P6		45
F4		40 (1GR–FE)		43 (2TR–FE)	T11		45

○ : 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	28	Engine Room Main Wire and Driver Side J/B (Lower Finish Panel)
1C		
1H	29	Instrument Panel Wire and Driver Side J/B (Lower Finish Panel)
1I		
1J		
1L	29	Relay Wire and Driver Side J/B (Lower Finish Panel)
1M		
2A	24	Engine Room J/B (Engine Compartment Left)
2C	24	Engine Room Main Wire and Engine Room J/B (Engine Compartment Left)
DB	34	Instrument Panel Wire and Instrument Panel J/B No.1 (Left Kick Panel)
DC	34	Engine Room Main Wire and Instrument Panel J/B No.1 (Left Kick Panel)
DD		

□ : Connector Joining Wire Harness and Wire Harness

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
EB1	52 (1GR-FE)	Engine No.2 Wire and Engine Room Main Wire (Inside of Engine Room R/B)
	53 (2TR-FE)	
IA1	54	Instrument Panel Wire and Engine Room Main Wire (Left Kick Panel)
IH1	55	Engine Wire and Instrument Panel Wire (Right Side of Glove Box)
IJ1	55	Instrument Panel Wire and Instrument Panel Wire (Right Kick Panel)

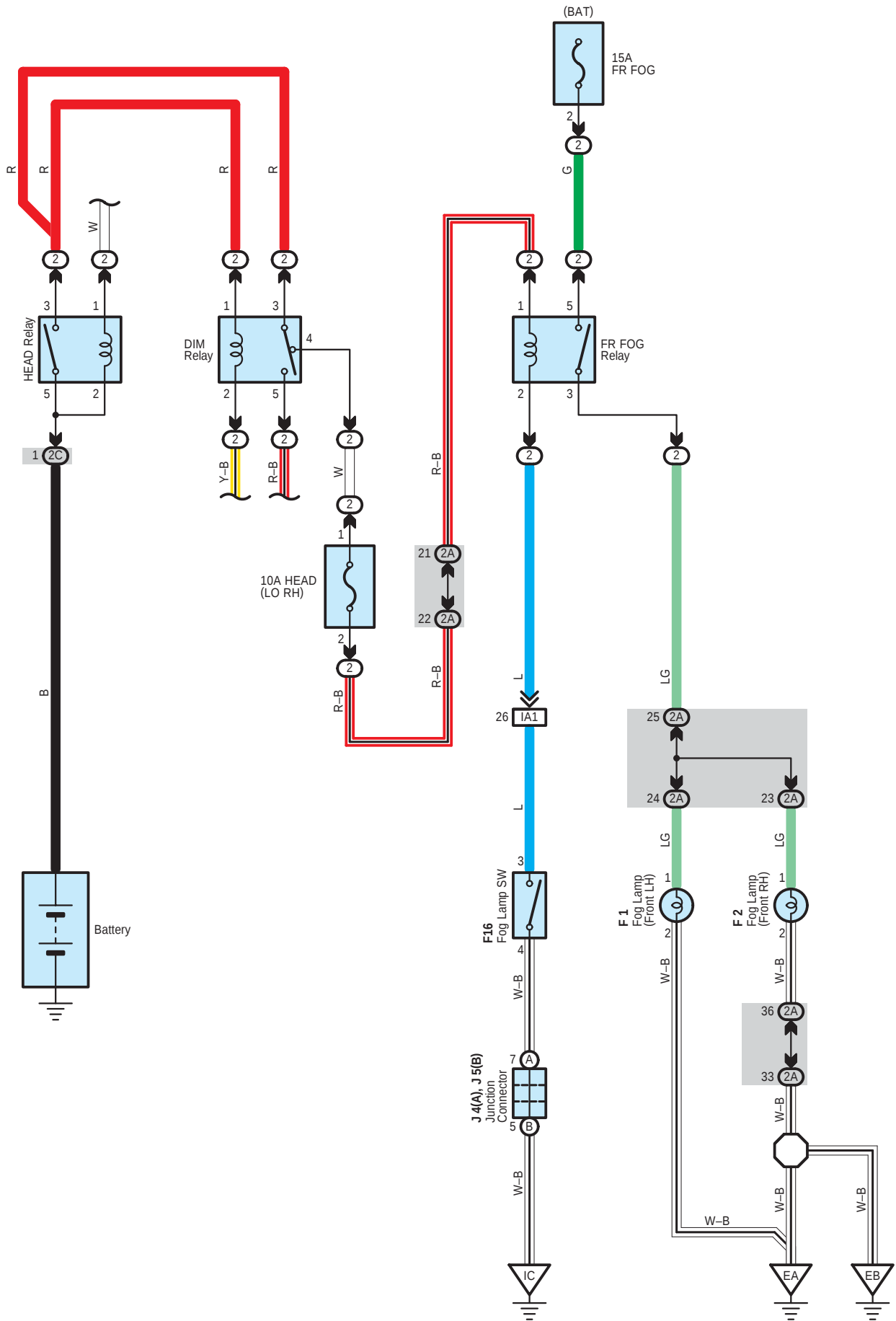
Headlight



: Ground Points

Code	See Page	Ground Points Location
EA	52 (1GR-FE)	Front Right Fender
	53 (2TR-FE)	
EB	52 (1GR-FE)	Front Left Fender
	53 (2TR-FE)	
IA	54	Left Kick Panel
IC	54	Instrument Panel Brace RH
IE	54	Right Kick Panel

Front Fog Light



 : Parts Location

Code	See Page	Code	See Page	Code	See Page
F1	40 (1GR-FE)	F16	44	J5	B
F2	40 (1GR-FE)	J4	A	45	

 : 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)
2A	24	Engine Room J/B (Engine Compartment Left)
2C	24	Engine Room Main Wire and Engine Room J/B (Engine Compartment Left)

 : Connector Joining Wire Harness and Wire Harness

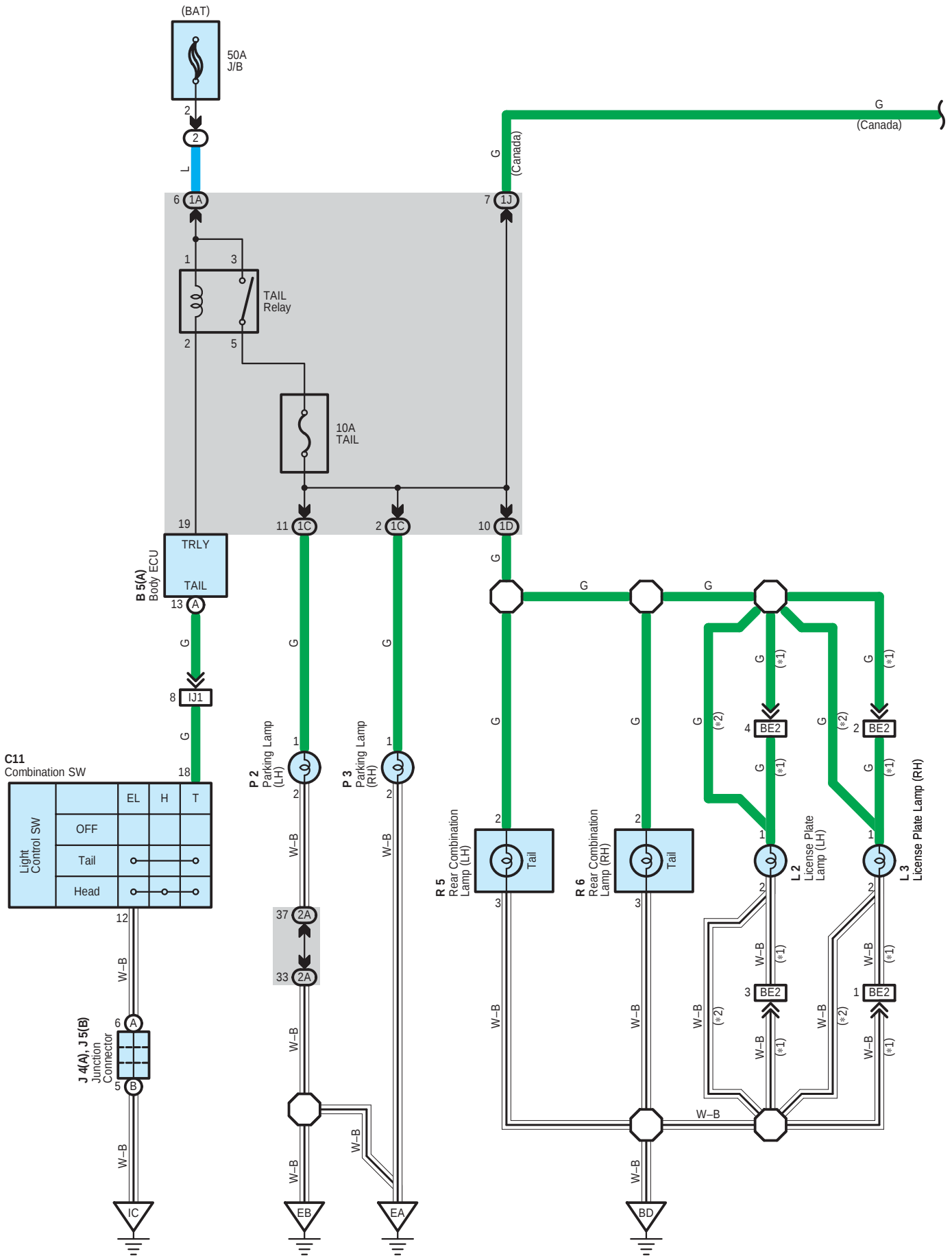
Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IA1	54	Instrument Panel Wire and Engine Room Main Wire (Left Kick Panel)

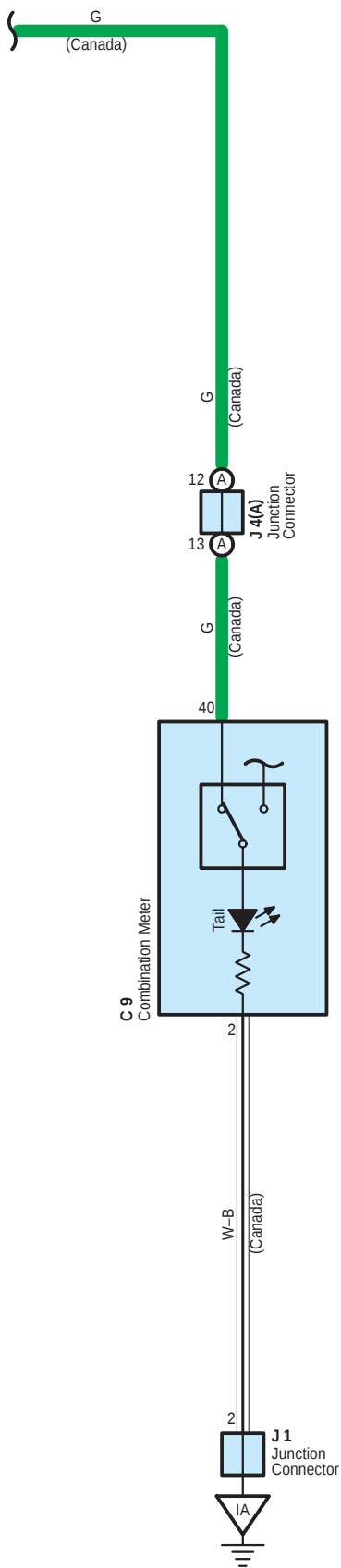
 : Ground Points

Code	See Page	Ground Points Location
EA	52 (1GR-FE)	Front Right Fender
EB	52 (1GR-FE)	Front Left Fender
IC	54	Instrument Panel Brace RH

Taillight

* 1 : w/ Trailer Towing
* 2 : w/o Trailer Towing





Taillight

: Parts Location

Code		See Page	Code	See Page	Code	See Page
B5	A	44	L2	49 (*3)	R5	47 (*1)
C9		44	L3	46 (*1)		48 (*2)
C11		44		48 (*2)		49 (*3)
J1		45		49 (*3)	R6	47 (*1)
J4	A	45	P2	41 (1GR–FE)		48 (*2)
J5	B	45		43 (2TR–FE)		49 (*3)
L2		46 (*1)	P3	41 (1GR–FE)		
		48 (*2)		43 (2TR–FE)		

: 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)
1A	28	Engine Room Main Wire and Driver Side J/B (Lower Finish Panel)
1C		
1D	28	Frame Wire and Driver Side J/B (Lower Finish Panel)
1J	29	Instrument Panel Wire and Driver Side J/B (Lower Finish Panel)
2A	24	Engine Room J/B (Engine Compartment Left)

: Connector Joining Wire Harness and Wire Harness

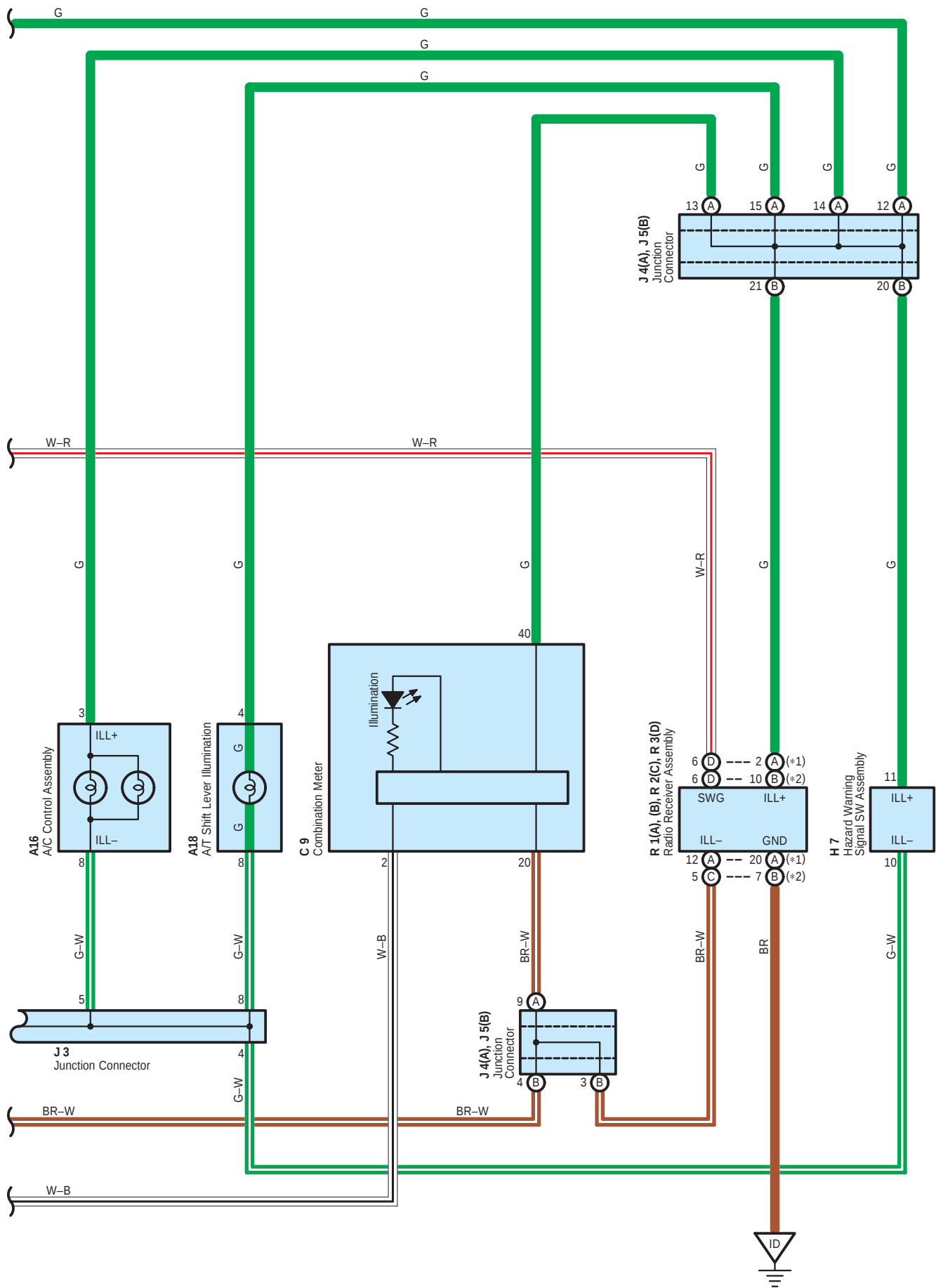
Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IJ1	55	Instrument Panel Wire and Instrument Panel Wire (Right Kick Panel)
BE2	56 (*1)	Frame No.3 Wire and Frame Wire (Behind the Trailer Socket)
	57 (*2)	

: Ground Points

Code	See Page	Ground Points Location
EA	52 (1GR-FE)	Front Right Fender
	53 (2TR-FE)	
EB	52 (1GR-FE)	Front Left Fender
	53 (2TR-FE)	
IA	54	Left Kick Panel
IC	54	Instrument Panel Brace RH
BD	56 (*1)	Near the Rear Differential
	57 (*2)	
	58 (*3)	

* 1 : Double Cab * 2 : Access Cab * 3 : Regular Cab * 4 : Separate Seat * 5 : Bench Seat





Illumination

○ : Parts Location

Code	See Page	Code	See Page	Code	See Page
A16	44	H7	45	R2	C
A18	44	J1	45	R3	D
B5	A	J2	45	R4	45
C9	44	J3	45	R8	45
C11	44	J4	A	S8	45
D5	44	J5	B	T17	45
D8	44	R1	A		
F16	44		B		

○ : 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

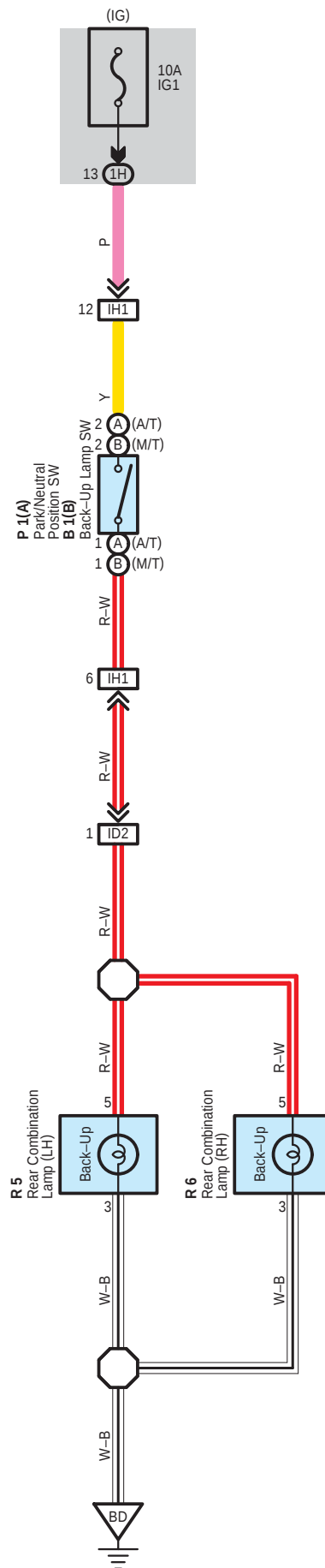
Code	See Page	Junction Block and Wire Harness (Connector Location)
1A	28	Engine Room Main Wire and Driver Side J/B (Lower Finish Panel)
1C		
1J	29	Instrument Panel Wire and Driver Side J/B (Lower Finish Panel)
DA	34	Instrument Panel Wire and Instrument Panel J/B No.1 (Left Kick Panel)
DC	34	Engine Room Main Wire and Instrument Panel 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)
IJ1	55	Instrument Panel Wire and Instrument Panel Wire (Right Kick Panel)

▽ : Ground Points

Code	See Page	Ground Points Location
IA	54	Left Kick Panel
IC	54	Instrument Panel Brace RH
ID		



 : Parts Location

Code		See Page	Code	See Page	Code	See Page
B1	B	40 (1GR-FE)	R5	47 (*1)	R6	48 (*2)
		42 (2TR-FE)		48 (*2)		49 (*3)
P1	A	41 (1GR-FE)		49 (*3)		
		43 (2TR-FE)	R6	47 (*1)		

 : Junction Block and Wire Harness Connector

Code	See Page	Junction Block and Wire Harness (Connector Location)
1H	29	Instrument Panel Wire and Driver Side J/B (Lower Finish Panel)

 : Connector Joining Wire Harness and Wire Harness

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
ID2	54	Frame Wire and Instrument Panel Wire (Left Kick Panel)
IH1	55	Engine Wire and Instrument Panel Wire (Right Side of Glove Box)

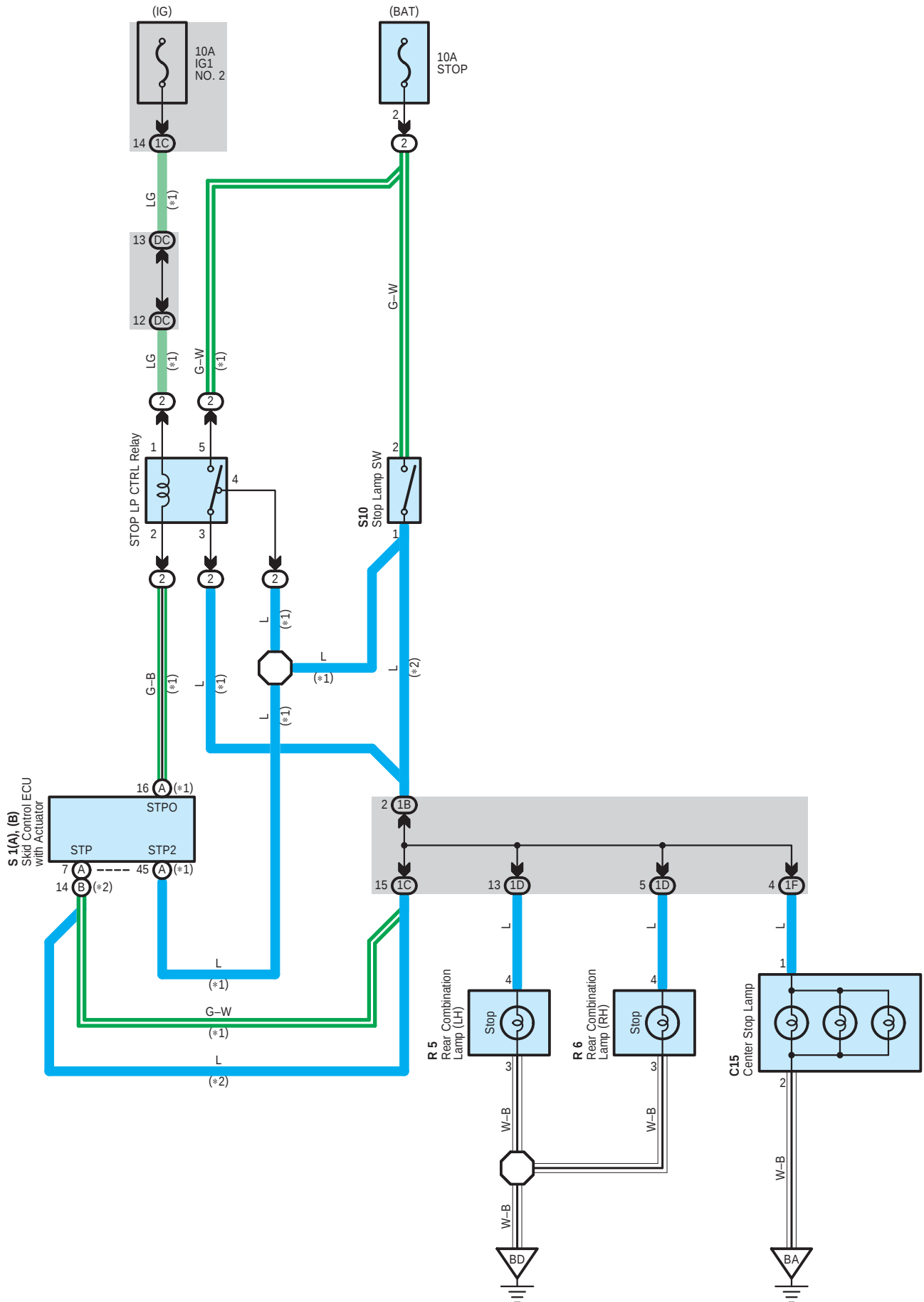
 : Ground Points

Code	See Page	Ground Points Location
BD	56 (*1)	Near the Rear Differential
	57 (*2)	
	58 (*3)	

* 1 : Double Cab * 2 : Access Cab * 3 : Regular Cab * 4 : Separate Seat * 5 : Bench Seat

Stop Light

* 1 : w/ VSC
* 2 : w/o VSC



 : Parts Location

Code	See Page	Code		See Page	Code		See Page
C15	46 (*1)	R5		49 (*3)	S1	A	43 (2TR–FE)
	48 (*2)	R6		47 (*1)		B	41 (1GR–FE)
	49 (*3)			48 (*2)			43 (2TR–FE)
R5	47 (*1)			49 (*3)	S10		45
	48 (*2)	S1	A	41 (1GR–FE)			

 : 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

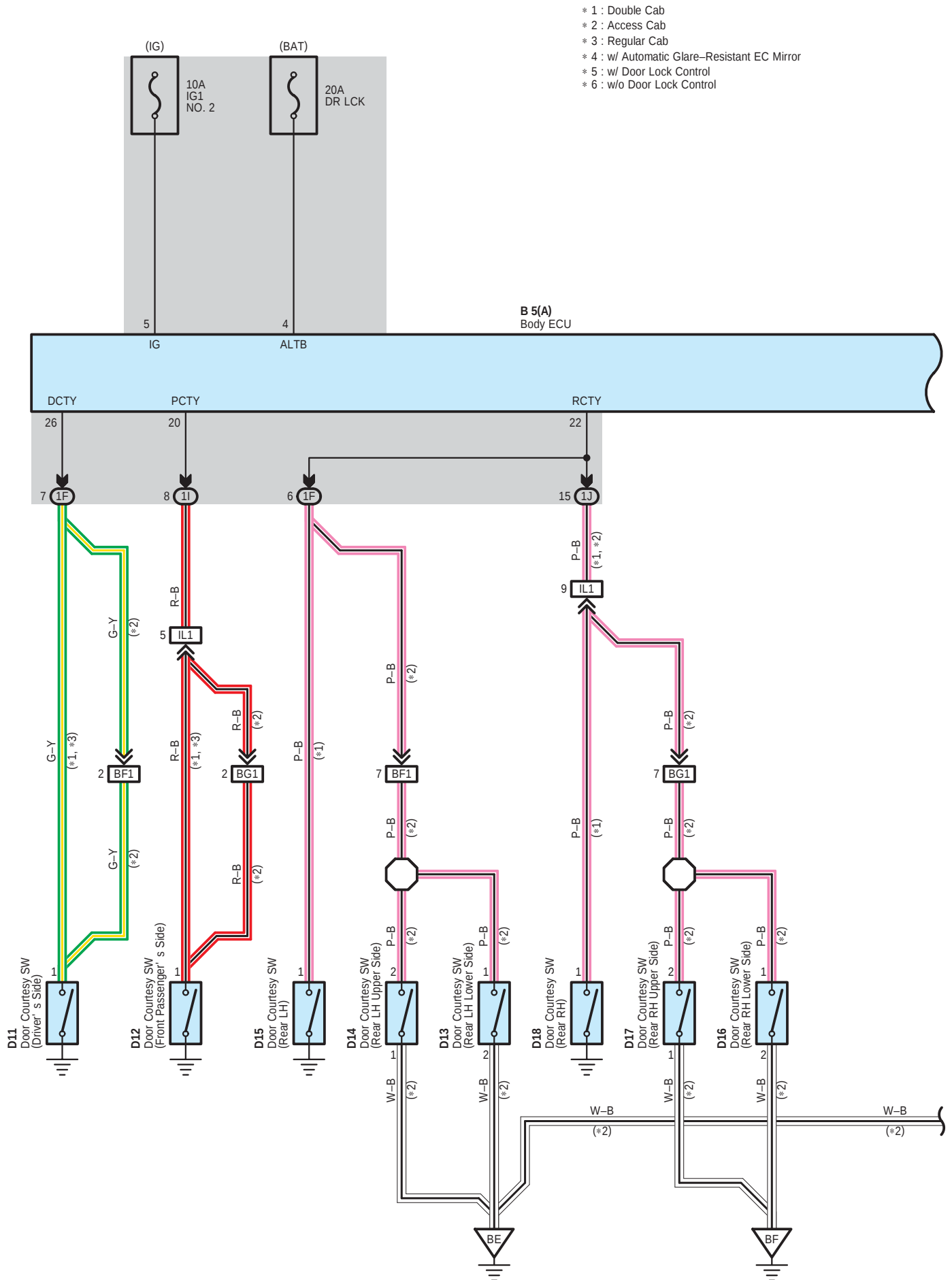
Code	See Page	Junction Block and Wire Harness (Connector Location)
1B	28	Engine Room Main Wire and Driver Side J/B (Lower Finish Panel)
1C		
1D	28	Frame Wire and Driver Side J/B (Lower Finish Panel)
1F	28	Floor No.2 Wire and Driver Side J/B (Lower Finish Panel)
DC	34	Engine Room Main Wire and Instrument Panel J/B No.1 (Left Kick Panel)

 : Ground Points

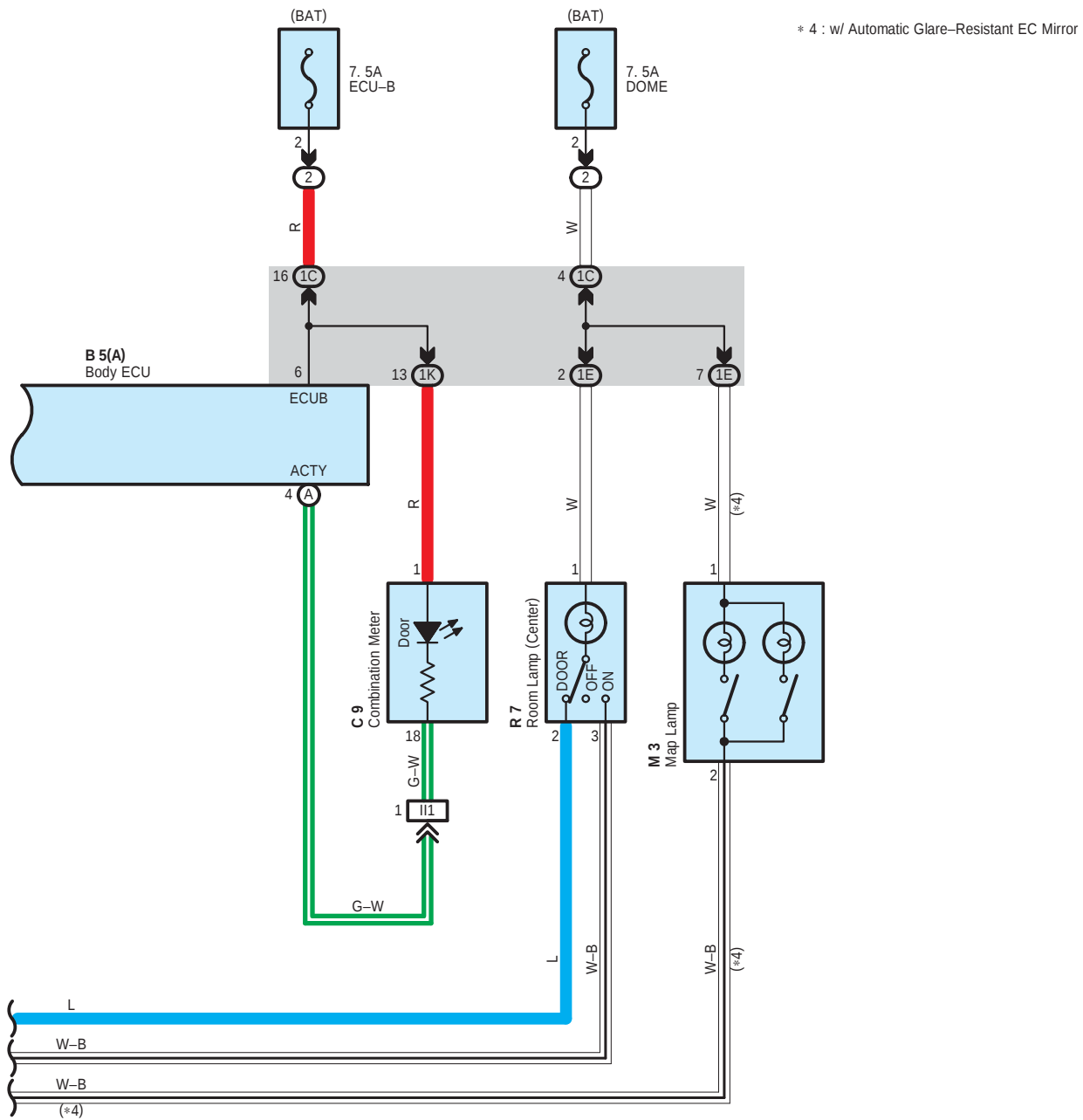
Code	See Page	Ground Points Location
BA	56 (*1)	Floor Seat Cross Member LH
	57 (*2)	
	58 (*3)	
BD	56 (*1)	Near the Rear Differential
	57 (*2)	
	58 (*3)	

* 1 : Double Cab * 2 : Access Cab * 3 : Regular Cab * 4 : Separate Seat * 5 : Bench Seat

Interior Light



Interior Light



 : Parts Location

Code	See Page	Code	See Page	Code	See Page
B5 A	44	D15	46 (*1)	J5 B	45
C9	44	D16	48 (*2)	J13	45
D11	46 (*1)	D17	48 (*2)	J14	45
	48 (*2)	D18	46 (*1)	M3	46 (*1)
	49 (*3)	D19	46 (*1)		48 (*2)
D12	46 (*1)		48 (*2)	R7	47 (*1)
	48 (*2)	D20	46 (*1)		48 (*2)
	49 (*3)		48 (*2)		49 (*3)
D13	48 (*2)	J1	45		
D14	48 (*2)	J4 A	45		

 : 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)
1C	28	Engine Room Main Wire and Driver Side J/B (Lower Finish Panel)
1D	28	Frame Wire and Driver Side J/B (Lower Finish Panel)
1E	28	Roof Wire and Driver Side J/B (Lower Finish Panel)
1F	28	Floor No.2 Wire and Driver Side J/B (Lower Finish Panel)
1H	29	Instrument Panel Wire and Driver Side J/B (Lower Finish Panel)
1I		
1J		
1K		

 : Connector Joining Wire Harness and Wire Harness

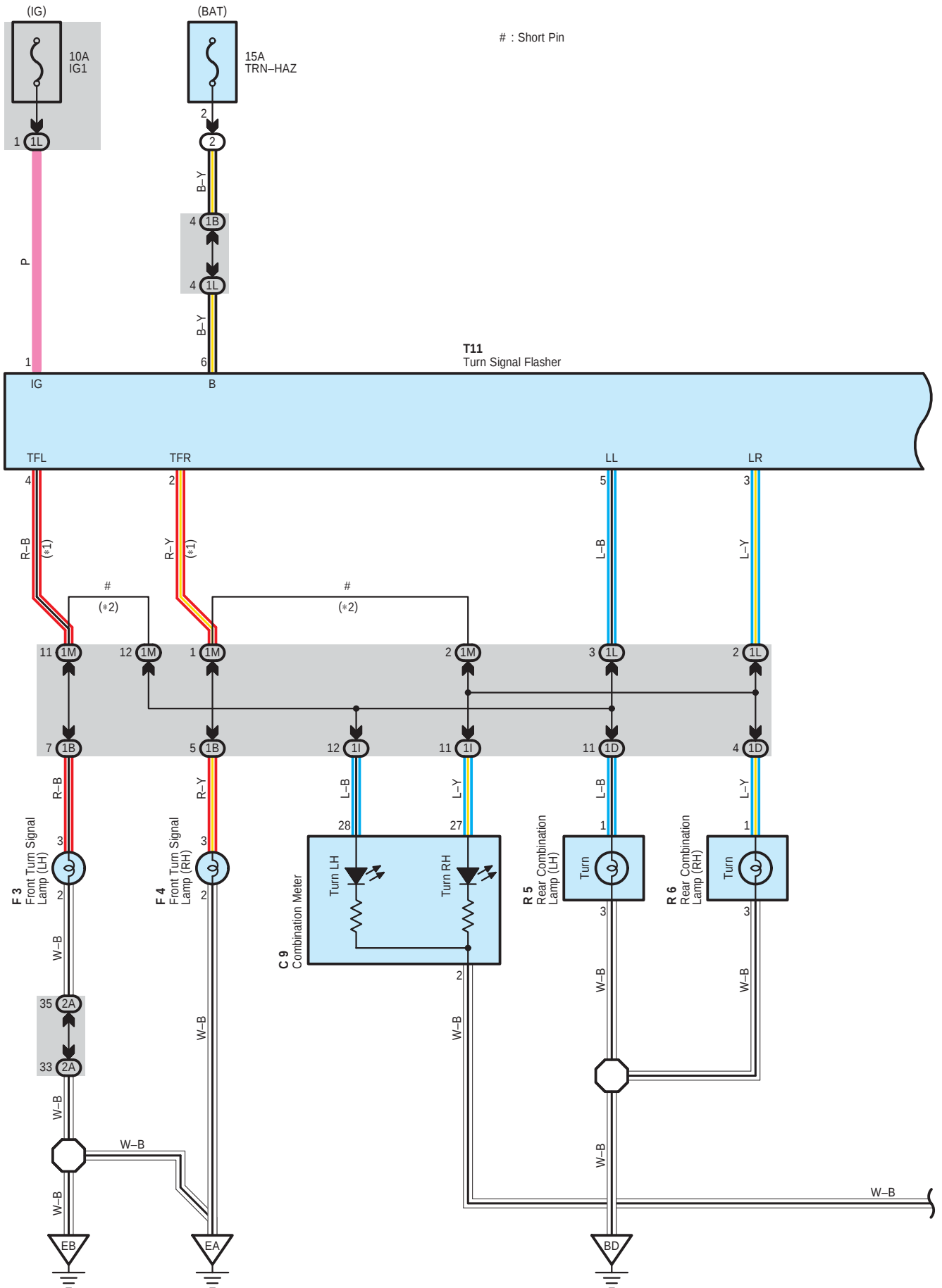
Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IC3	54	Front Door LH Wire and Instrument Panel Wire (Left Kick Panel)
II1	55	Instrument Panel Wire and Instrument Panel Wire (Instrument Panel Brace RH)
IK3	55	Front Door RH Wire and Instrument Panel Wire (Right Kick Panel)
IL1	55	Instrument Panel Wire and Floor Wire (Right Kick Panel)
BF1	57 (*2)	Rear Door No.2 Wire and Floor No.2 Wire (Under the Left Quarter Panel)
BG1	57 (*2)	Rear Door No.1 Wire and Floor Wire (Under the Right Quarter Panel)

 : Ground Points

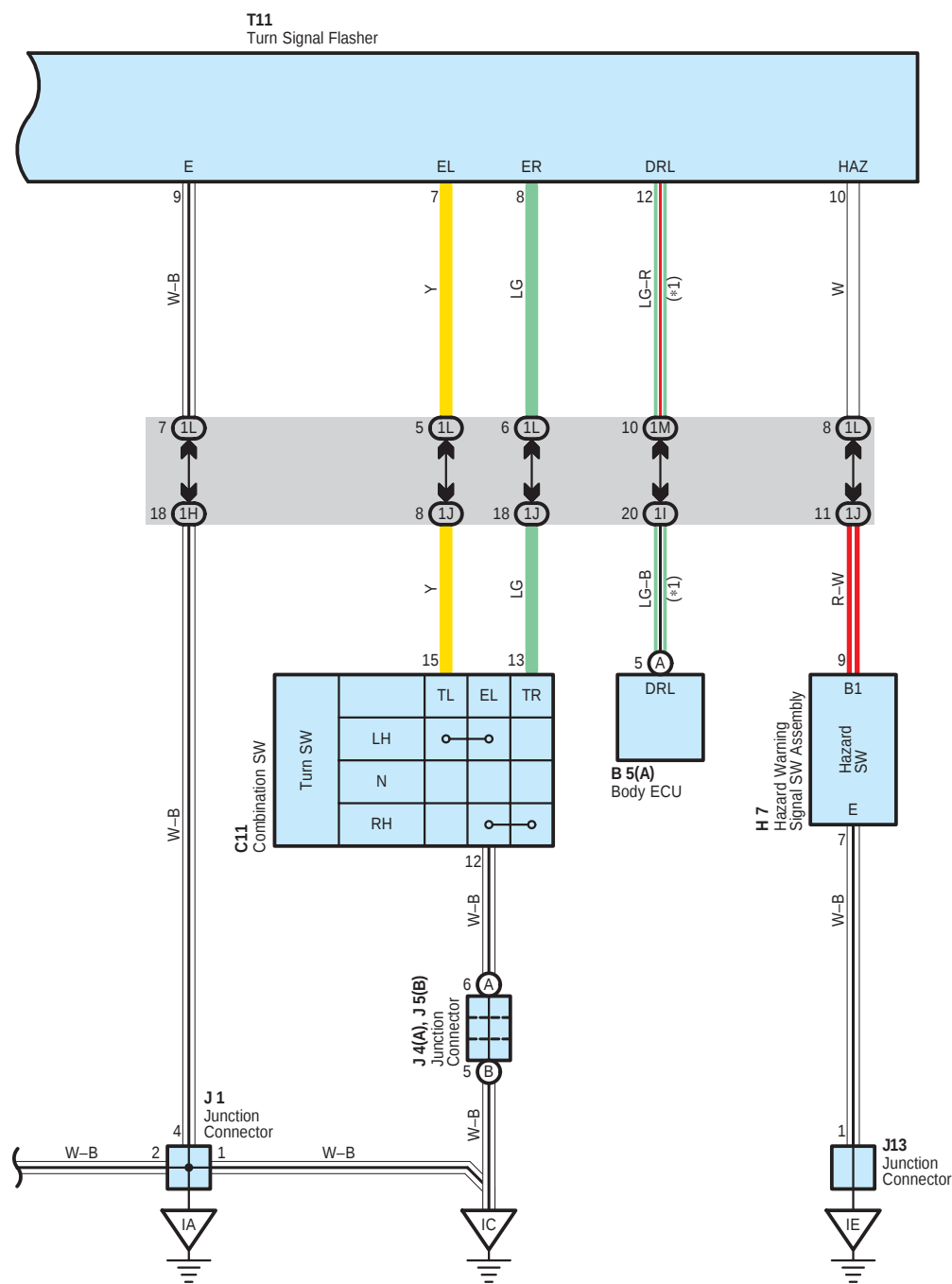
Code	See Page	Ground Points Location
IA	54	Left Kick Panel
IC	54	Instrument Panel Brace RH
IE	54	Right Kick Panel
BA	56 (*1)	Floor Seat Cross Member LH
	57 (*2)	
	58 (*3)	
BD	56 (*1)	Near the Rear Differential
	57 (*2)	
	58 (*3)	
BE	57 (*2)	Inside of the Access Door LH
BF	57 (*2)	Inside of the Access Door RH

* 1 : Double Cab * 2 : Access Cab * 3 : Regular Cab * 4 : Separate Seat * 5 : Bench Seat

Turn Signal and Hazard Warning Light



* 1 : w/ Daytime Running Light
* 2 : w/o Daytime Running Light



Turn Signal and Hazard Warning Light

: Parts Location

Code		See Page	Code		See Page	Code	See Page
B5	A	44	H7		45	R5	49 (*3)
C9		44	J1		45	R6	47 (*1)
C11		44	J4	A	45		48 (*2)
F3		40 (1GR-FE)	J5	B	45		49 (*3)
		42 (2TR-FE)	J13		45	T11	45
F4		40 (1GR-FE)	R5		47 (*1)		
		42 (2TR-FE)			48 (*2)		

: 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

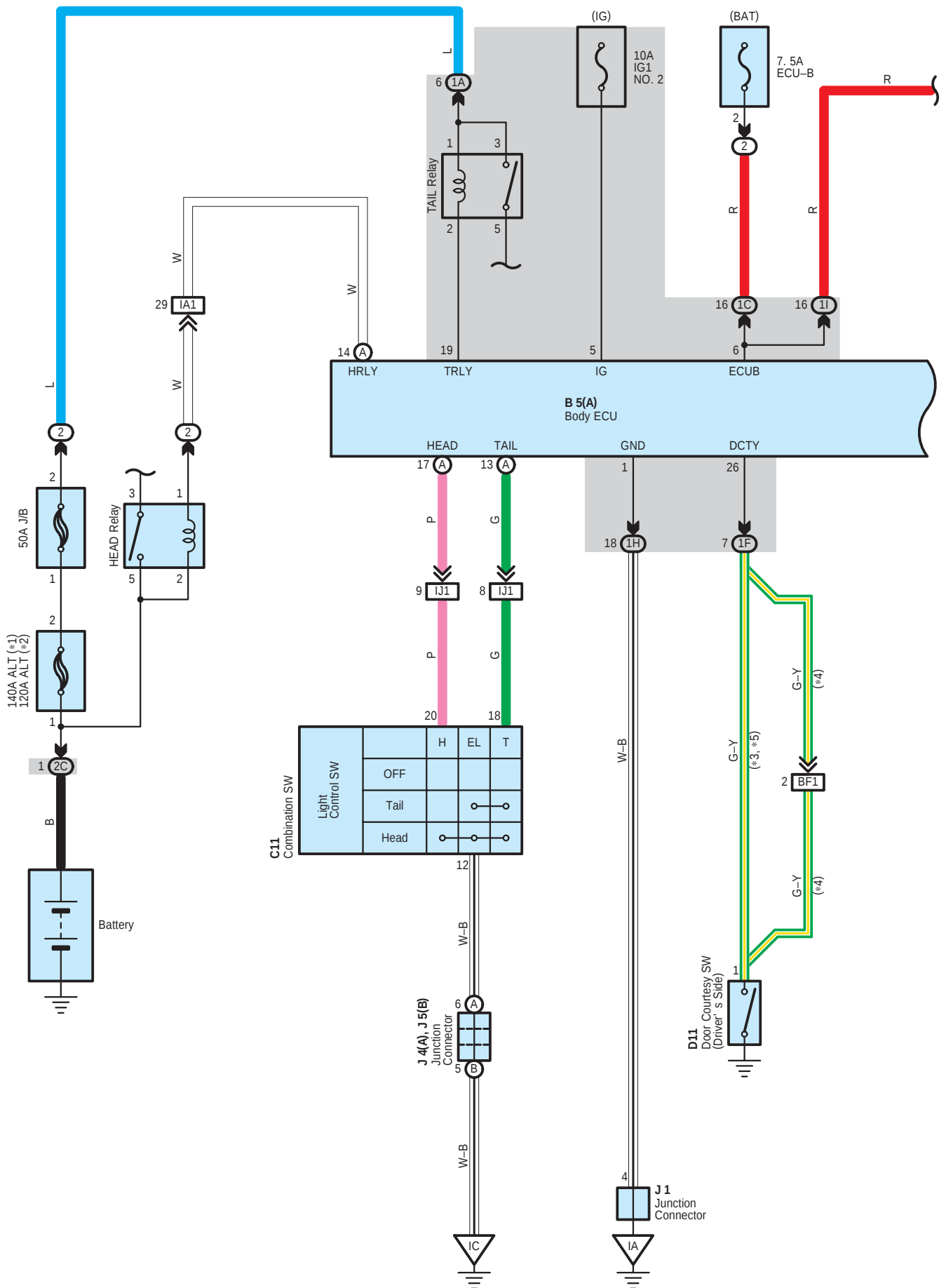
Code	See Page	Junction Block and Wire Harness (Connector Location)
1B	28	Engine Room Main Wire and Driver Side J/B (Lower Finish Panel)
1D	28	Frame Wire and Driver Side J/B (Lower Finish Panel)
1H	29	Instrument Panel Wire and Driver Side J/B (Lower Finish Panel)
1I		
1J		
1L	29	Relay Wire and Driver Side J/B (Lower Finish Panel)
1M		
2A	24	Engine Room J/B (Engine Compartment Left)

: Ground Points

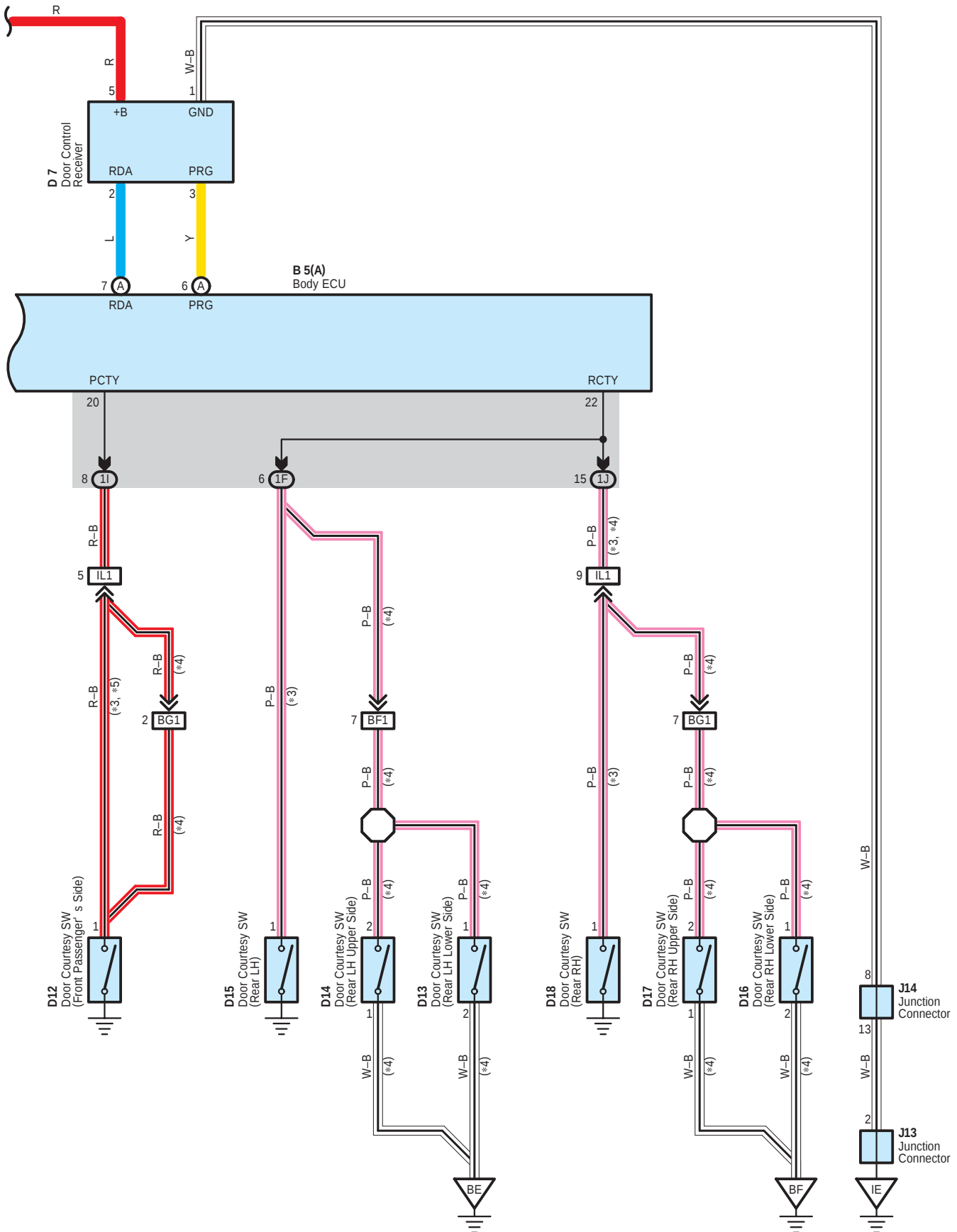
Code	See Page	Ground Points Location
EA	52 (1GR-FE)	Front Right Fender
	53 (2TR-FE)	
EB	52 (1GR-FE)	Front Left Fender
	53 (2TR-FE)	
IA	54	Left Kick Panel
IC	54	Instrument Panel Brace RH
IE	54	Right Kick Panel
BD	56 (*1)	Near the Rear Differential
	57 (*2)	
	58 (*3)	

* 1 : Double Cab * 2 : Access Cab * 3 : Regular Cab * 4 : Separate Seat * 5 : Bench Seat

Light Auto Turn Off System



- * 1 : w/ Trailer Towing
- * 2 : w/o Trailer Towing
- * 3 : Double Cab
- * 4 : Access Cab
- * 5 : Regular Cab



Light Auto Turn Off System

System Outline

- * When the other lamps than headlamps are lit under 'TAIL' or 'AUTO' condition of the light control SW, the tail lamps and front fog lamps are turned OFF if the ignition SW is turned from ON to OFF, and the driver side door is opened from closed condition.
- * When the headlamps are lit under 'HEAD' or 'AUTO' condition of the light control SW, if the ignition SW is turned from ON to OFF, and the light OFF delay time (30 seconds) has passed since all the doors are closed from open condition or under all the door locked condition, operating the wireless door lock function turns OFF the headlamps, tail lamps and front fog lamps.

○ : Parts Location

Code	See Page	Code	See Page	Code	See Page
B5	A	44		D12	48 (*2)
C11	44				49 (*3)
D7	44	D13	48 (*2)	J4	A
		D14	48 (*2)	J5	B
D11	46 (*1)	D15	46 (*1)	J13	45
	48 (*2)	D16	48 (*2)	J14	45
	49 (*3)	D17	48 (*2)		
D12	46 (*1)				

○ : 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)
1A	28	Engine Room Main Wire and Driver Side J/B (Lower Finish Panel)
1C		
1F	28	Floor No.2 Wire and Driver Side J/B (Lower Finish Panel)
1H		
1I	29	Instrument Panel Wire and Driver Side J/B (Lower Finish Panel)
1J		
2C	24	Engine Room Main Wire and Engine Room J/B (Engine Compartment Left)

□ : Connector Joining Wire Harness and Wire Harness

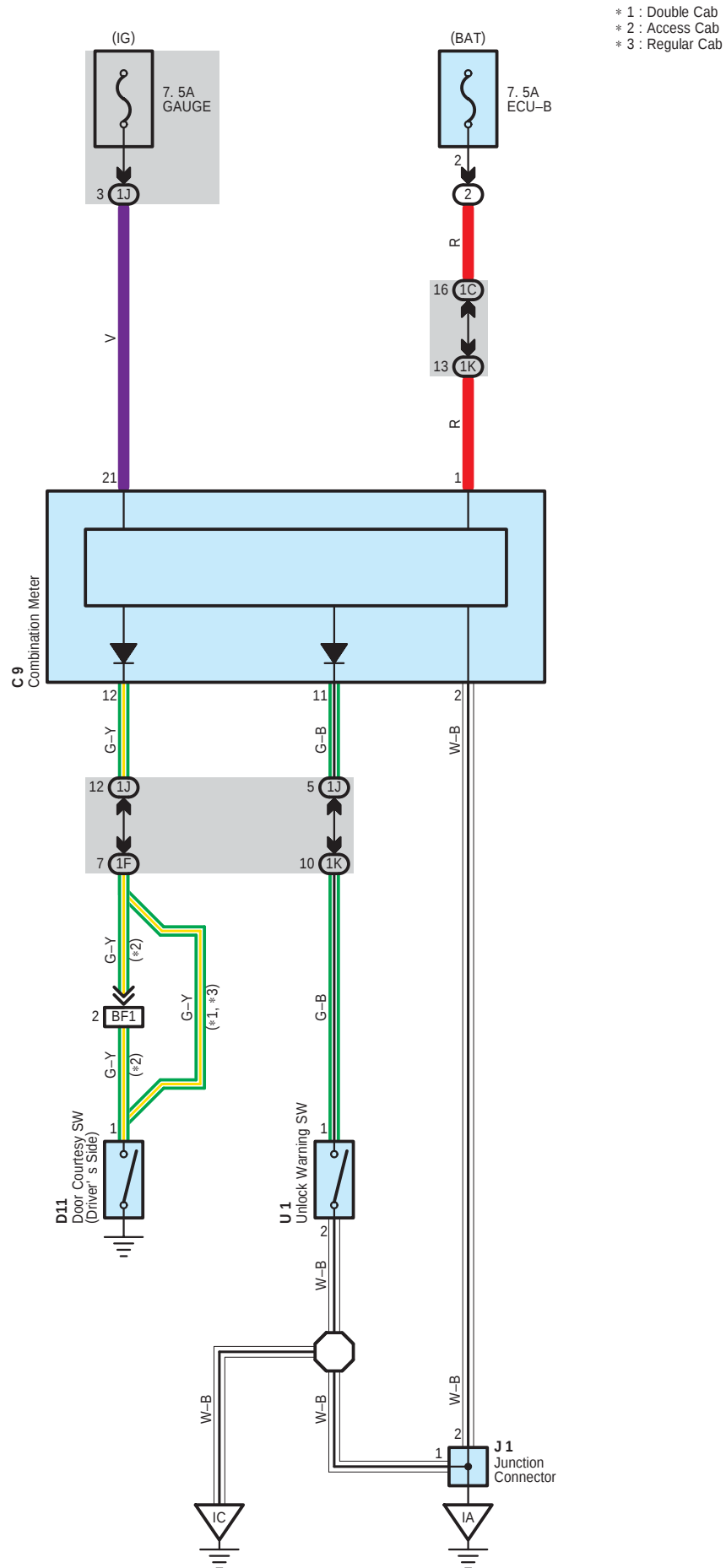
Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IA1	54	Instrument Panel Wire and Engine Room Main Wire (Left Kick Panel)
IJ1	55	Instrument Panel Wire and Instrument Panel Wire (Right Kick Panel)
IL1	55	Instrument Panel Wire and Floor Wire (Right Kick Panel)
BF1	57 (*2)	Rear Door No.2 Wire and Floor No.2 Wire (Under the Left Quarter Panel)
BG1	57 (*2)	Rear Door No.1 Wire and Floor Wire (Under the Right Quarter Panel)

▽ : Ground Points

Code	See Page	Ground Points Location
IA	54	Left Kick Panel
IC	54	Instrument Panel Brace RH
IE	54	Right Kick Panel
BE	57 (*2)	Inside of the Access Door LH
BF	57 (*2)	Inside of the Access Door RH

* 1 : Double Cab * 2 : Access Cab * 3 : Regular Cab * 4 : Separate Seat * 5 : Bench Seat

Key Reminder



System Outline

Key Reminder System

With the ignition key inserted in the key cylinder (Unlock warning SW on), the ignition SW still off and driver's door open (Door courtesy SW on), when a signal is input to TERMINAL 12 of the combination meter, the combination meter operates, current flows from TERMINAL 1 of the combination meter to TERMINAL 2 GROUND and key reminder buzzer sounds.

: Parts Location

Code	See Page	Code	See Page	Code	See Page
C9	44	D11	48 (*2)	J1	45
D11	46 (*1)		49 (*3)	U1	45

: 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)
1C	28	Engine Room Main Wire and Driver Side J/B (Lower Finish Panel)
1F	28	Floor No.2 Wire and Driver Side J/B (Lower Finish Panel)
1J	29	Instrument Panel Wire and Driver Side J/B (Lower Finish Panel)
1K		

: Connector Joining Wire Harness and Wire Harness

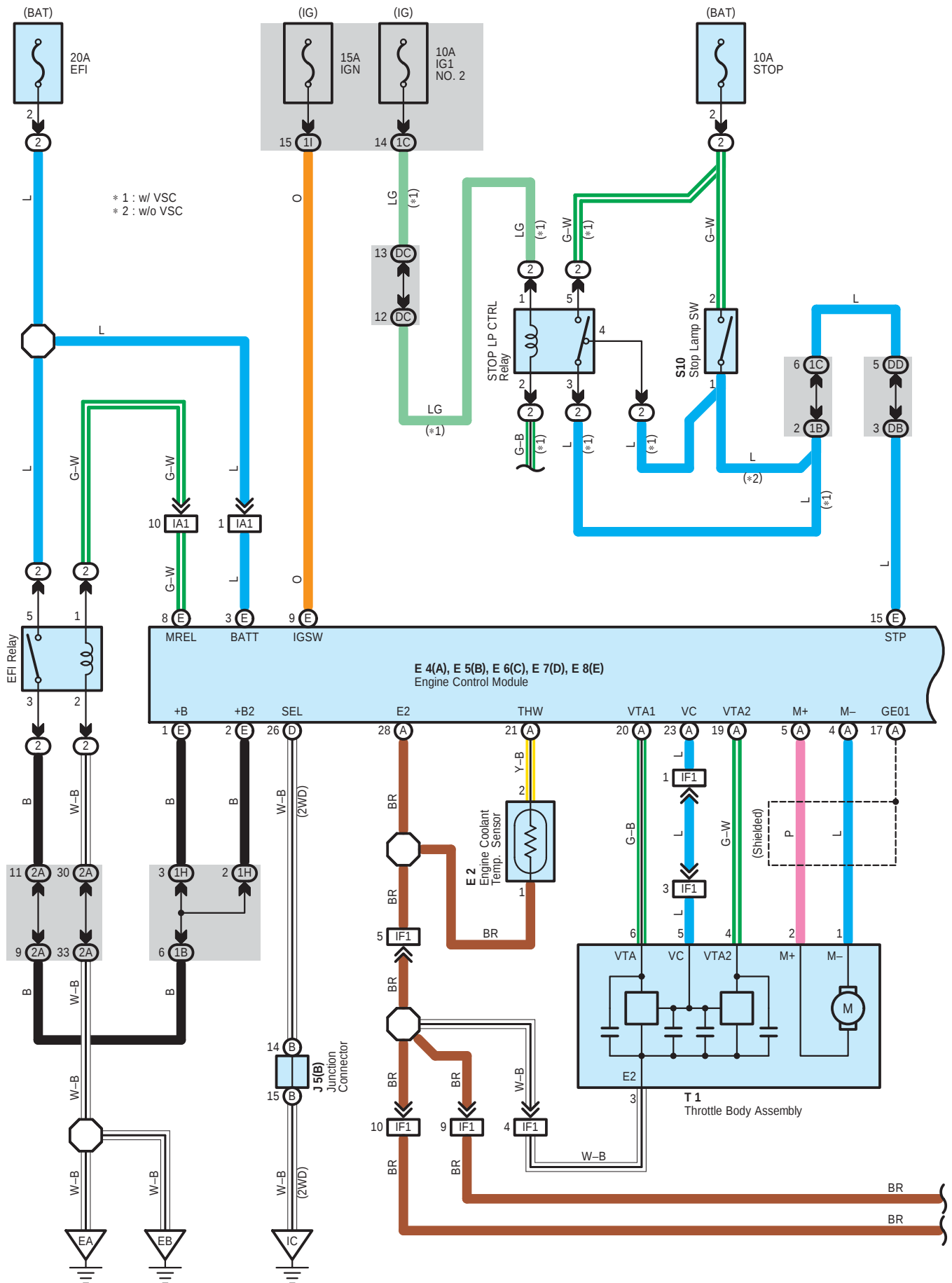
Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
BF1	57 (*2)	Rear Door No.2 Wire and Floor No.2 Wire (Under the Left Quarter Panel)

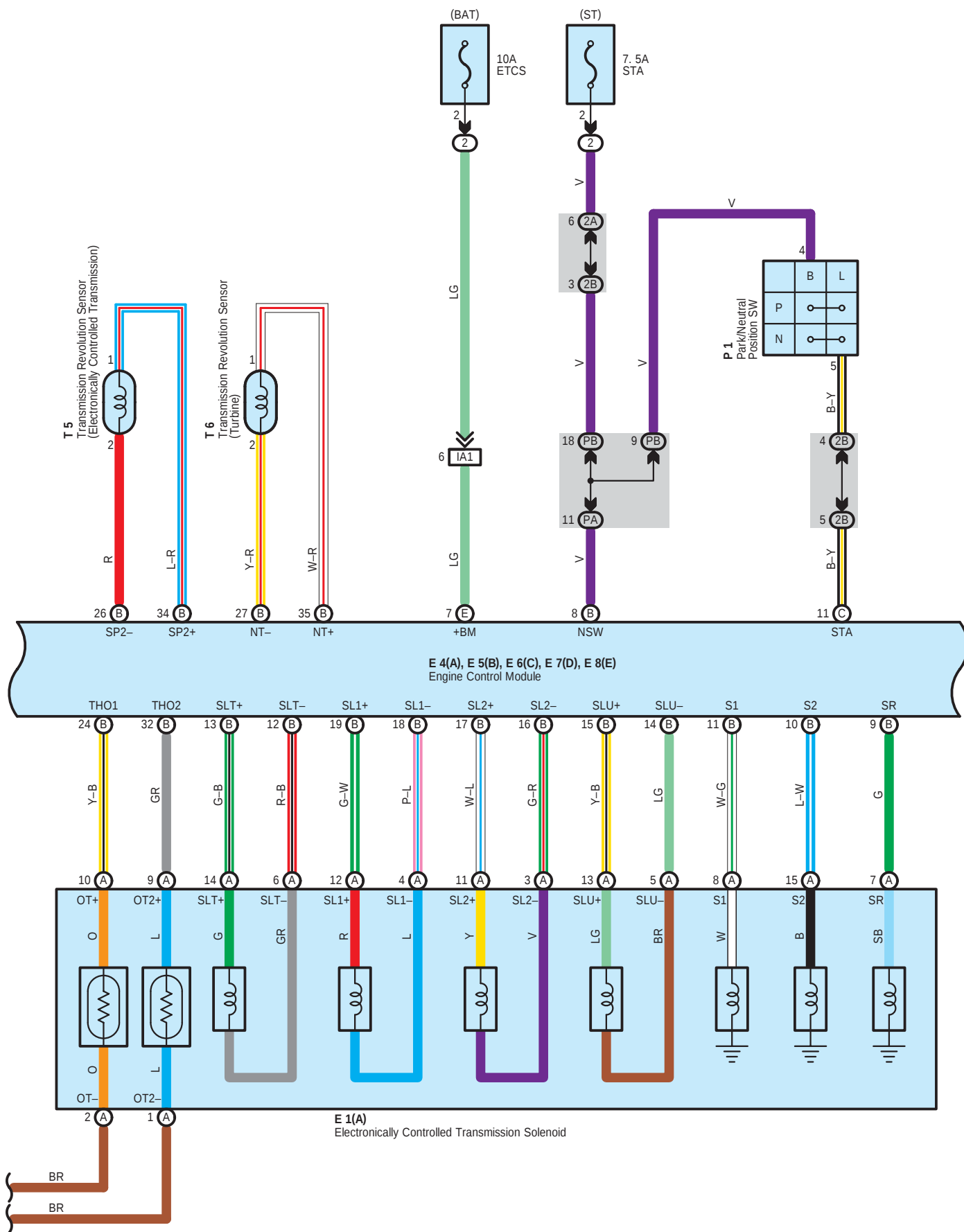
: Ground Points

Code	See Page	Ground Points Location
IA	54	Left Kick Panel
IC	54	Instrument Panel Brace RH

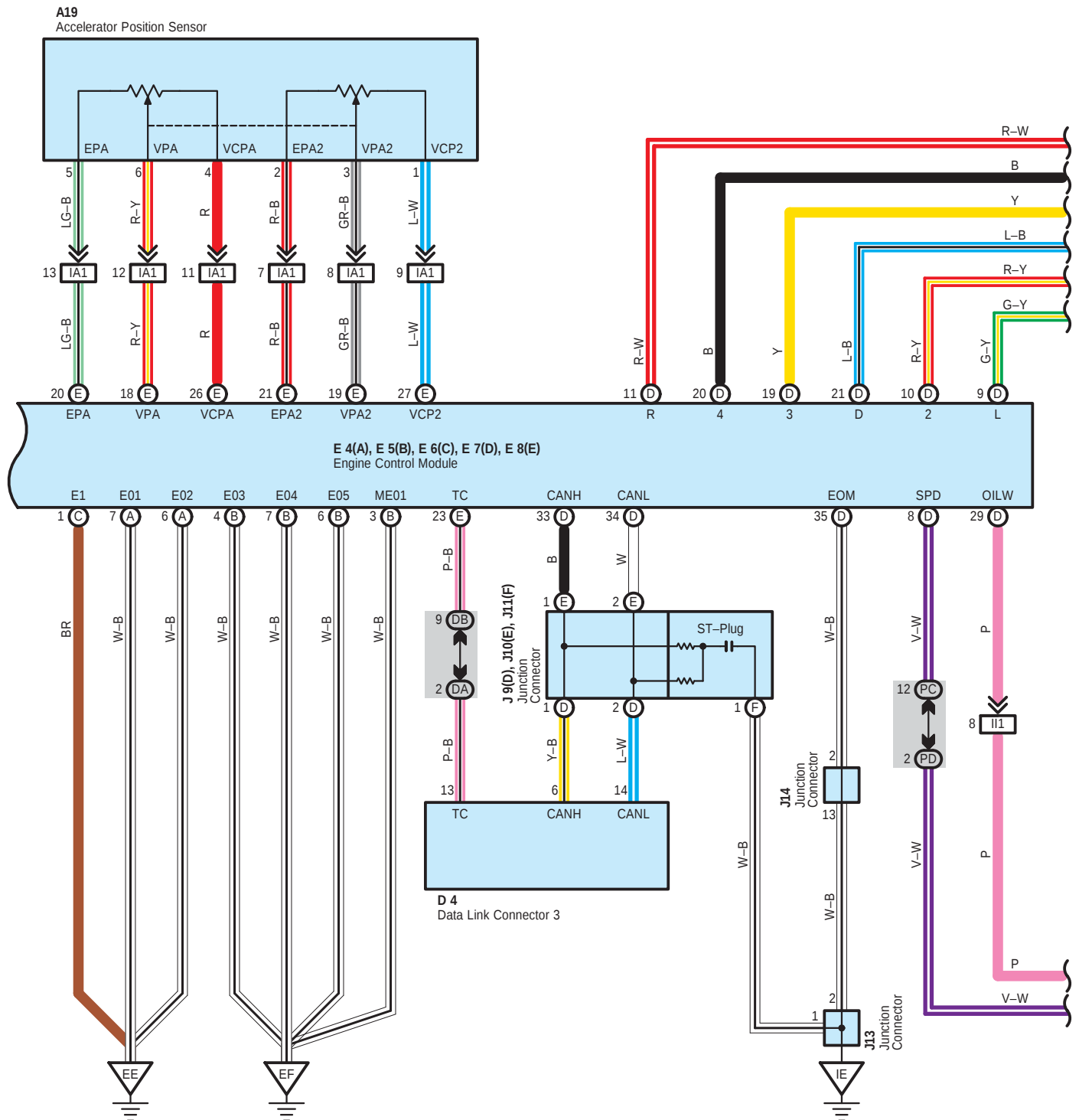
* 1 : Double Cab * 2 : Access Cab * 3 : Regular Cab * 4 : Separate Seat * 5 : Bench Seat

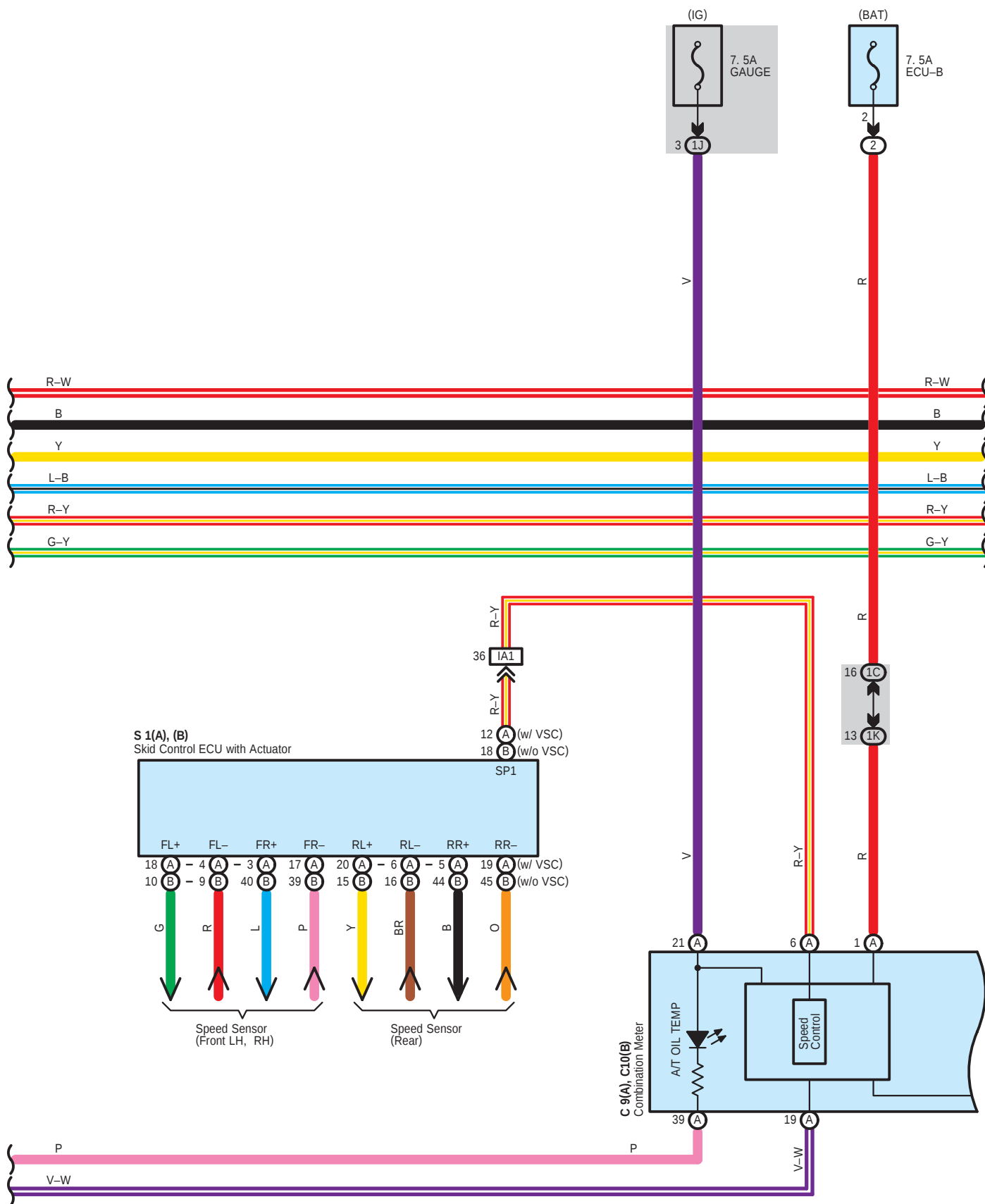
ECT and A/T Indicator for 1GR-FE



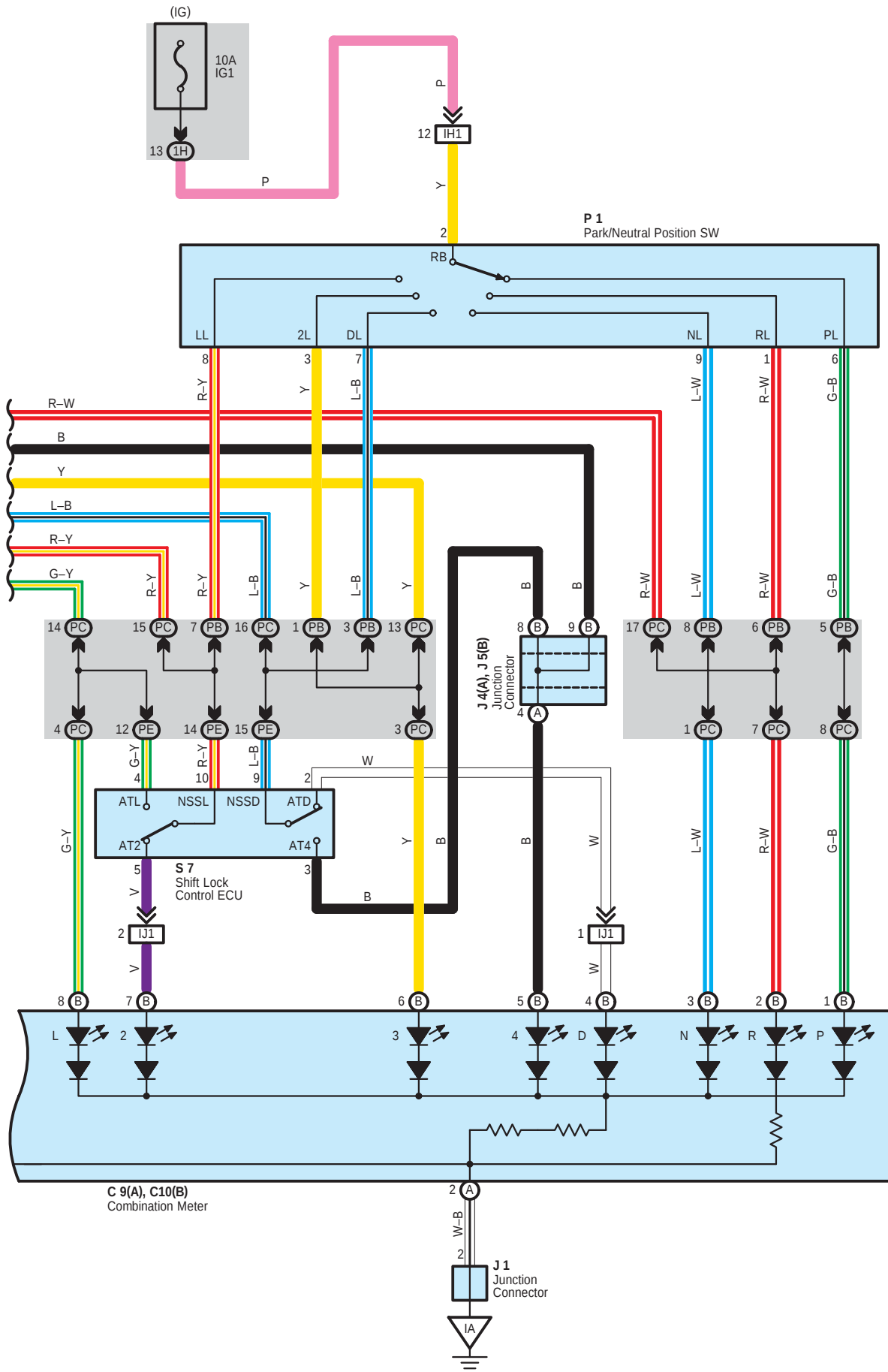


ECT and A/T Indicator for 1GR-FE





ECT and A/T Indicator for 1GR-FE



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 electronically controlled transmission, however, electrically controls the line pressure, throttle pressure, lock-up pressure and accumulator pressure etc. through the solenoid valve. The electronically controlled transmission 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. It makes smooth driving possible by shift selection for each gear which is the most appropriate to the driving conditions at that time, and by preventing 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 THW of the engine control module from the engine coolant temp. sensor and the vehicle speed signal from vehicle speed sensor is input to TERMINAL SP2+ of the engine control module. At the same time, the throttle valve opening signal from the throttle position sensor is input to TERMINALS VTA1 and VTA2 of the engine control module as throttle angle signal.

Based on these signals, the engine control module selects the best shift position for the driving conditions and sends current to the electronically controlled transmission solenoid.

2. Line Hydraulic Pressure Control

The engine control module adjusts the line hydraulic pressure to the optimal level by controlling TERMINAL SLT+ of the module according to the engine torque data. This realizes the smooth gear shifting.

3. High Response Gear Shifting Control

The engine control module performs the high response engine torque up control to control the ignition-timing lag as well as opening the electronic throttle when shifting down. By doing this, the gear shifting is performed in a short period of time. Moreover, the engine control module uses the orifice switching control, which optimizes the speed of applying and reducing the hydraulic pressure. And it realizes the fine shifting condition by applying and reducing hydraulic pressure slowly when the gear shifting shock is important and quickly when the high response is required.

4. Clutch Hydraulic Pressure Control

The engine control module controls the clutch operation in the optimal timing and with the best hydraulic pressure according to the engine torque data and the number of the clutch revolution

5. Lock-Up and Flexible Lock-Up Control

The engine control module carries out the lock-up control by controlling the TERMINAL SLU+ of the module according to the shift position, vehicle speed, throttle opening degree and running conditions. The engine control module also steadily keeps applying the lock-up clutch a delicate slippage to improve the transmission efficiency (Fuel efficiency) of the torque converter.

6. Stop Lamp SW Circuit

If the brake pedal is depressed (Stop lamp SW on) when driving in lock-up condition, a signal is input to TERMINAL STP of the engine control module. The engine control module operates and cuts the current to the solenoid to release lock-up.

7. AI-Shift Control

The engine control module judges whether the road is downslope or upslope by detecting the throttle opening degree or the vehicle's speed. Moreover it can expect the winding roads by detecting the turning condition of the vehicle. The engine control module keeps unnecessary shifting up from the fourth gear from operating and carries out the automatic shifting down to the third gear in order to control the vehicle running according to the road conditions. The engine control module also reads the driver's intention during driving from his (her) accelerating operation and the running conditions of the vehicle. As a result of that, ideal shifting patterns for each driver are automatically selected without any switching operations.

○ : Parts Location

Code	See Page	Code	See Page	Code	See Page
A19	44	E7	D	J14	45
C9	A	E8	E	P1	41 (1GR-FE)
C10	B	J1	45	S1	A
D4	44	J4	A		B
E1	A	J5	B	S7	45
E2	40 (1GR-FE)	J9	D	S10	45
E4	A	J10	E	T1	41 (1GR-FE)
E5	B	J11	F	T5	41 (1GR-FE)
E6	C	J13	45	T6	41 (1GR-FE)

ECT and A/T Indicator for 1GR-FE

: 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	28	Engine Room Main Wire and Driver Side J/B (Lower Finish Panel)
1C		
1H	29	Instrument Panel Wire and Driver Side J/B (Lower Finish Panel)
1I		
1J		
1K		
2A	24	Engine Room J/B (Engine Compartment Left)
2B	24	Engine Wire and Engine Room J/B (Engine Compartment Left)
DA	34	Instrument Panel Wire and Instrument Panel J/B No.1 (Left Kick Panel)
DB		
DC	34	Engine Room Main Wire and Instrument Panel J/B No.1 (Left Kick Panel)
DD		
PA	36	Engine Wire and Instrument Panel J/B No.2 (Right Side of Glove Box)
PB		
PC	36	Instrument Panel Wire and Instrument Panel J/B No.2 (Right Side of Glove Box)
PD		
PE		

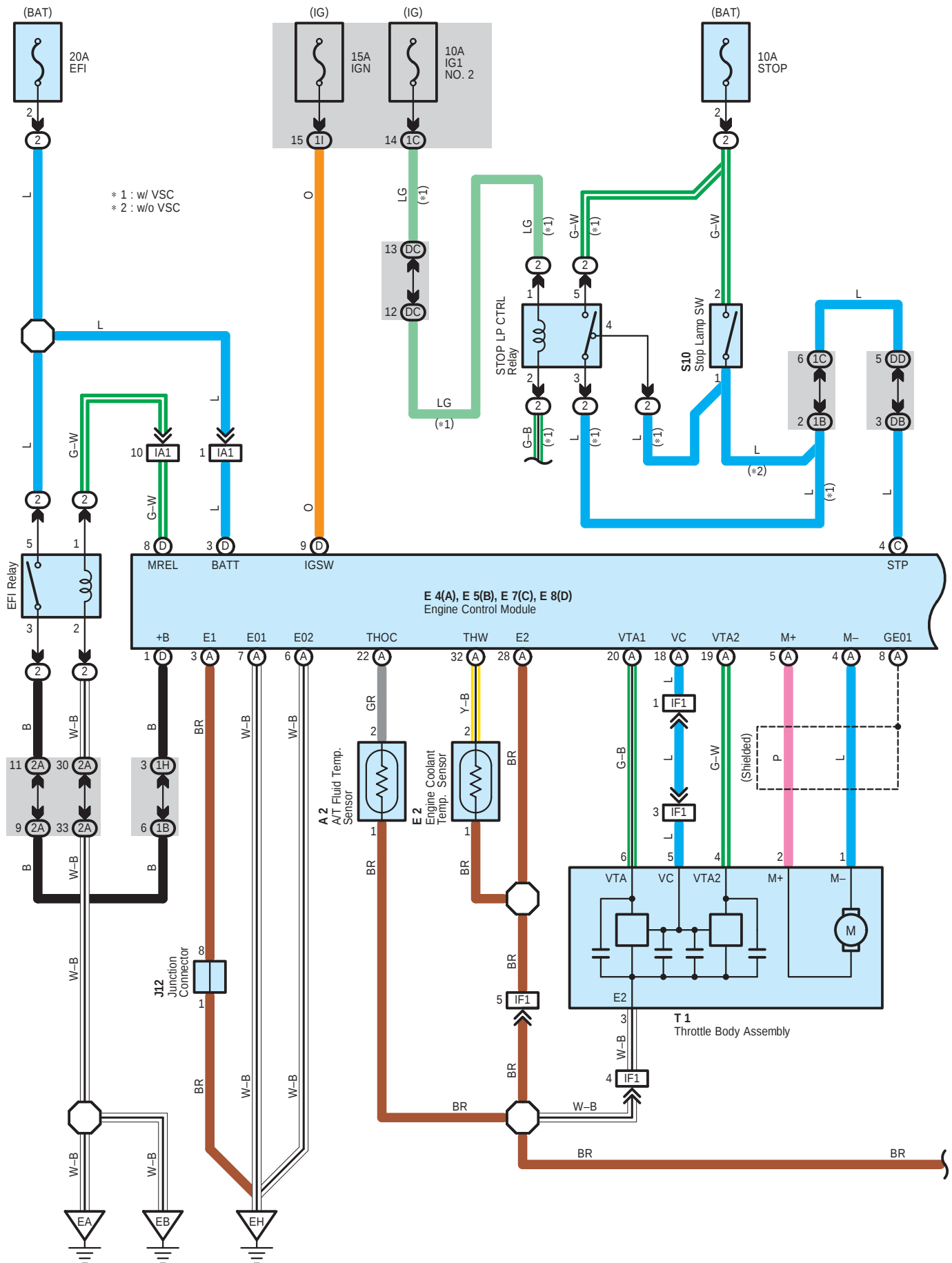
: Connector Joining Wire Harness and Wire Harness

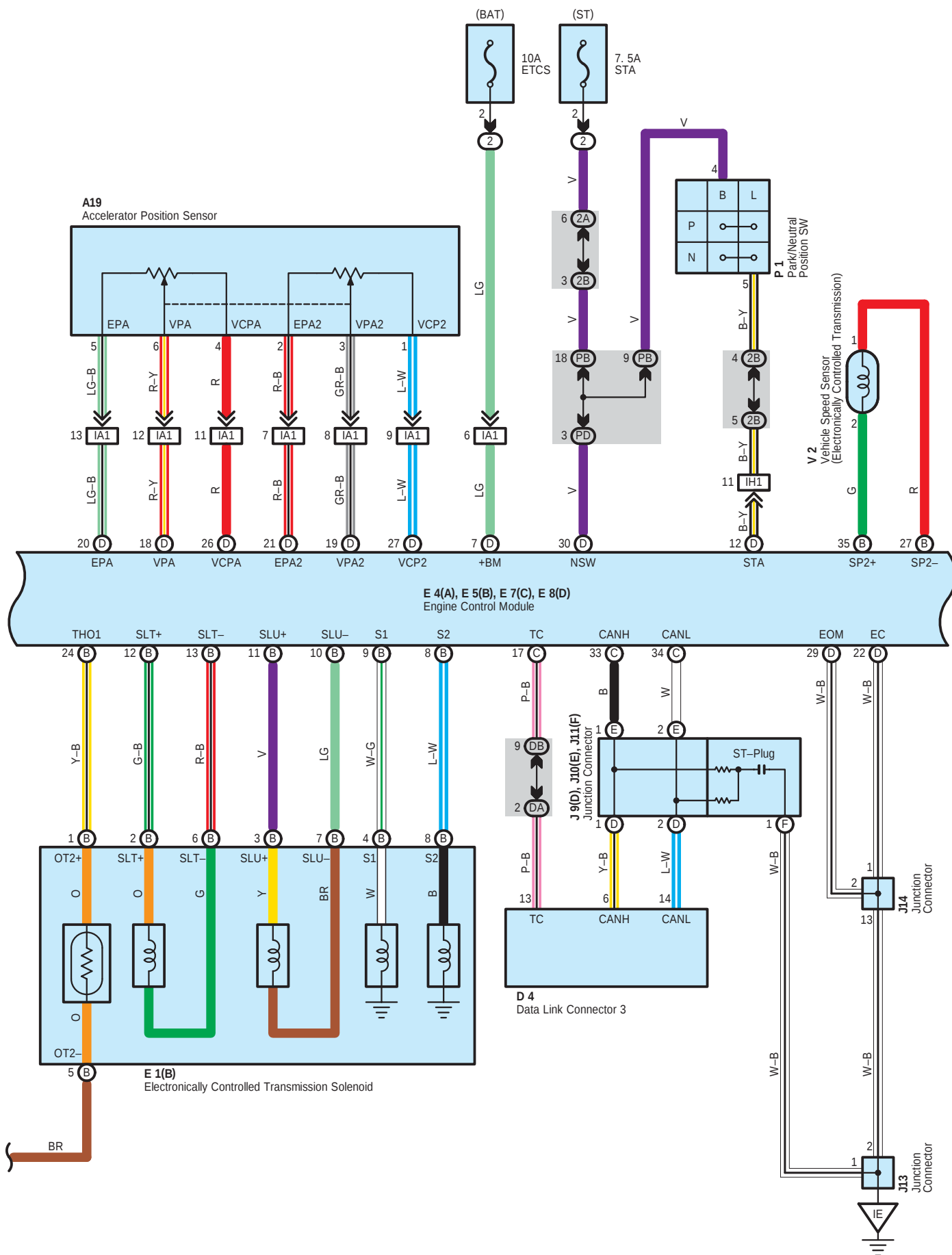
Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IA1	54	Instrument Panel Wire and Engine Room Main Wire (Left Kick Panel)
IF1	55	Engine Wire and Engine Wire (Behind the Glove Box)
IH1	55	Engine Wire and Instrument Panel Wire (Right Side of Glove Box)
II1	55	Instrument Panel Wire and Instrument Panel Wire (Instrument Panel Brace RH)
IJ1	55	Instrument Panel Wire and Instrument Panel Wire (Right Kick Panel)

: Ground Points

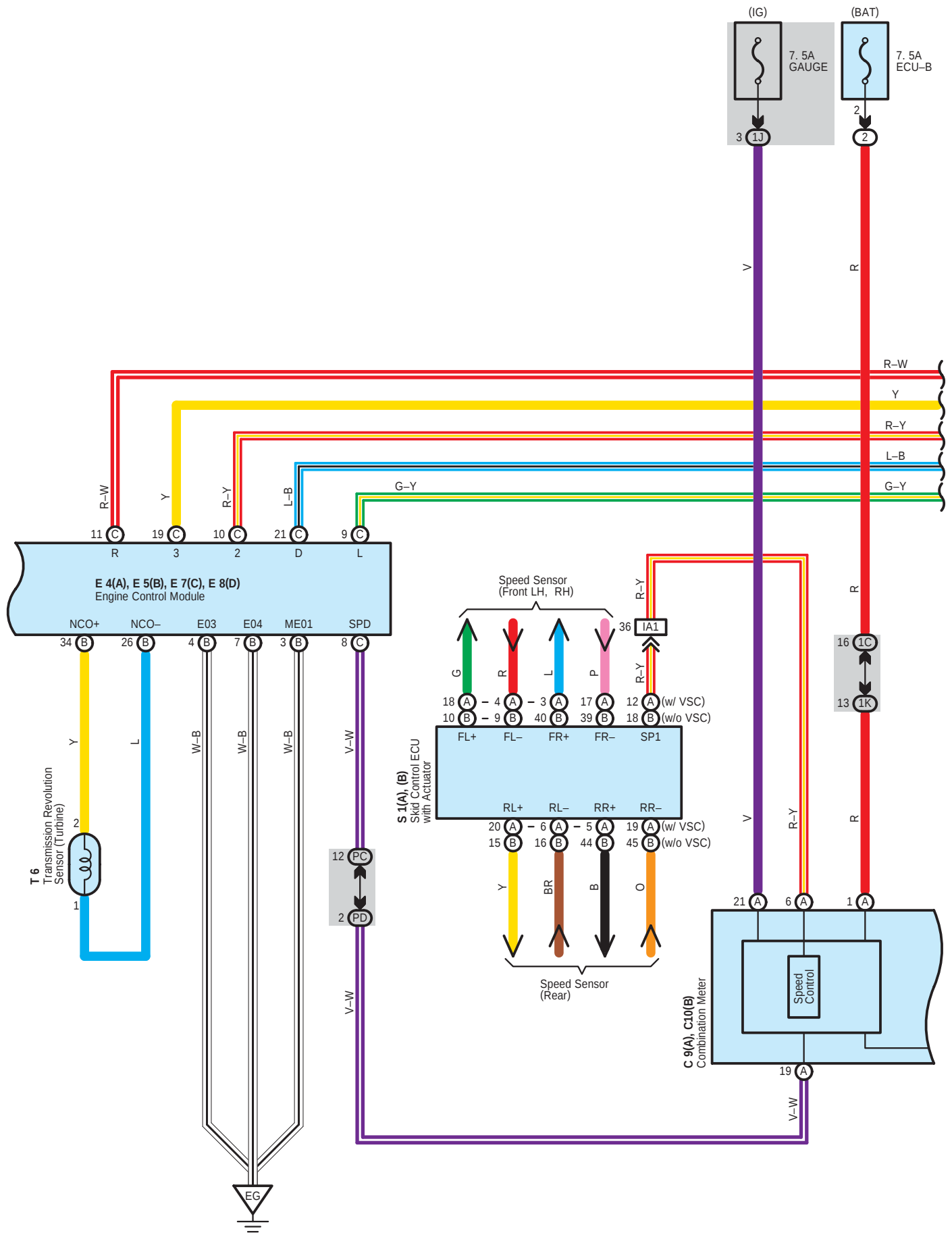
Code	See Page	Ground Points Location
EA	52 (1GR-FE)	Front Right Fender
EB	52 (1GR-FE)	Front Left Fender
EE	52 (1GR-FE)	Rear Side of Right Bank Cylinder Block
EF	52 (1GR-FE)	Rear Side of Left Bank Cylinder Block
IA	54	Left Kick Panel
IC	54	Instrument Panel Brace RH
IE	54	Right Kick Panel

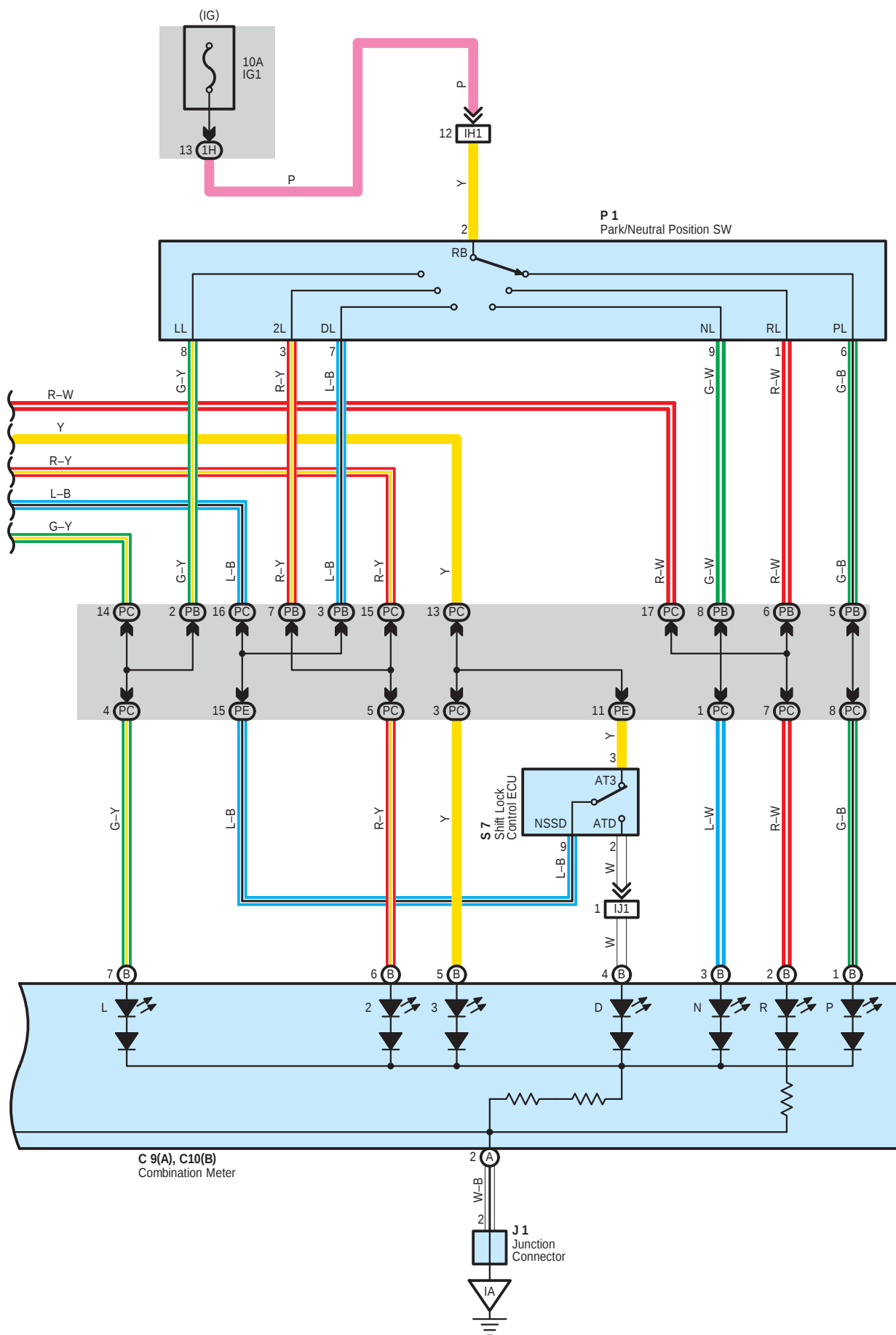
ECT and A/T Indicator for 2TR-FE





ECT and A/T Indicator for 2TR-FE





ECT and A/T Indicator for 2TR-FE

System Outline

Previous automatic transaxle have selected each gear shift using mechanically controlled throttle hydraulic pressure, governor hydraulic pressure and lock-up hydraulic pressure. The electronically controlled transmission, however, controls the line pressure and lock-up pressure etc. electrically, through the solenoid valve. The engine control module controls each solenoid valve based on the input signals from each sensor, which makes smooth driving possible by shift selection for each gear that is most appropriate to the driving conditions at that time.

1. Gear Shift Operation

During driving, the engine control module selects the shift for each gear which is most appropriate to the driving conditions, based on input signals from the engine coolant temp. sensor to TERMINAL THW of the engine control module, and also the input signals to TERMINAL SPD of the engine control module from the vehicle speed sensor devoted to the electronically controlled transmission. Current is then output to the electronically controlled transmission solenoid. When shifting to 1st speed, the current flows from TERMINAL S1 of the engine control module to TERMINAL (B) 4 of the solenoid to GROUND, and from TERMINAL S2 of the engine control module to TERMINAL 8 of the electronically controlled transmission solenoid to GROUND, and continuity to the No.1 and No.2 solenoid causes the shift.

For 2nd speed, the current flows from TERMINAL S1 of the engine control module to TERMINAL (B) 4 of the solenoid to GROUND, and from TERMINAL S2 of the engine control module to TERMINAL (B) 8 of the solenoid to GROUND, and continuity to solenoid No.1 and No.2 causes the shift.

For 3rd speed, there is no continuity No.1 solenoid, only to No.2, causing the shift.

Shifting into 4th speed (Overdrive) takes place when there is no continuity to both No.1 and No.2 solenoid.

2. Stop Lamp SW Circuit

If the brake pedal is depressed (Stop lamp SW on) when driving in lock-up condition, a signal is input to TERMINAL STP of the engine control module, the engine control module operates and continuity to the lock-up solenoid is cut.

3. AI-Shift Control

The engine control module judges whether the road is downslope or upslope by detecting the throttle opening degree or the vehicle's speed. Moreover it can expect the winding roads by detecting the turning condition of the vehicle. The engine control module keeps unnecessary shifting up from the fourth gear from operating and carries out the automatic shifting down to the third gear in order to control the vehicle running according to the road conditions. The engine control module also reads the driver's intention during driving from his (her) accelerating operation and the running conditions of the vehicle. As a result of that, ideal shifting patters for each driver are automatically selected without any switching operations.

○ : Parts Location

Code	See Page	Code	See Page	Code	See Page
A2	42 (2TR-FE)	E7	C 44	P1	43 (2TR-FE)
A19	44	E8	D 44	S1	A 43 (2TR-FE)
C9	A 44	J1	45		B 43 (2TR-FE)
C10	B 44	J9	D 45	S7	45
D4	44	J10	E 45	S10	45
E1	B 42 (2TR-FE)	J11	F 45	T1	43 (2TR-FE)
E2	42 (2TR-FE)	J12	45	T6	43 (2TR-FE)
E4	A 44	J13	45	V2	43 (2TR-FE)
E5	B 44	J14	45		

○ : 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	28	Engine Room Main Wire and Driver Side J/B (Lower Finish Panel)
1C		
1H	29	Instrument Panel Wire and Driver Side J/B (Lower Finish Panel)
1I		
1J		
1K		
2A	24	Engine Room J/B (Engine Compartment Left)
2B	24	Engine Wire and Engine Room J/B (Engine Compartment Left)
DA	34	Instrument Panel Wire and Instrument Panel J/B No.1 (Left Kick Panel)
DB		
DC	34	Engine Room Main Wire and Instrument Panel J/B No.1 (Left Kick Panel)
DD		
PB	36	Engine Wire and Instrument Panel J/B No.2 (Right Side of Glove Box)
PC	36	Instrument Panel Wire and Instrument Panel J/B No.2 (Right Side of Glove Box)
PD		
PE		

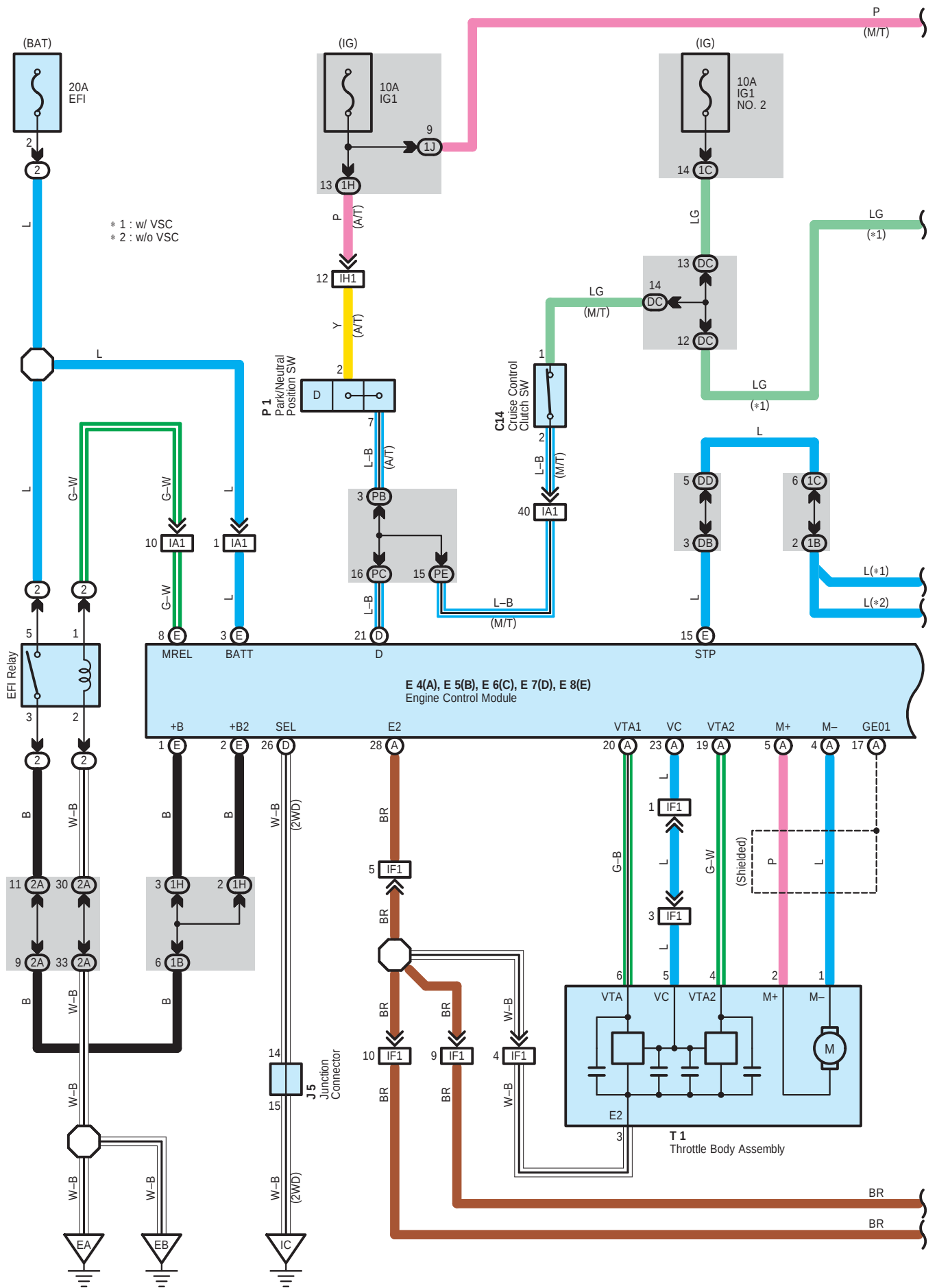
**: Connector Joining Wire Harness and Wire Harness**

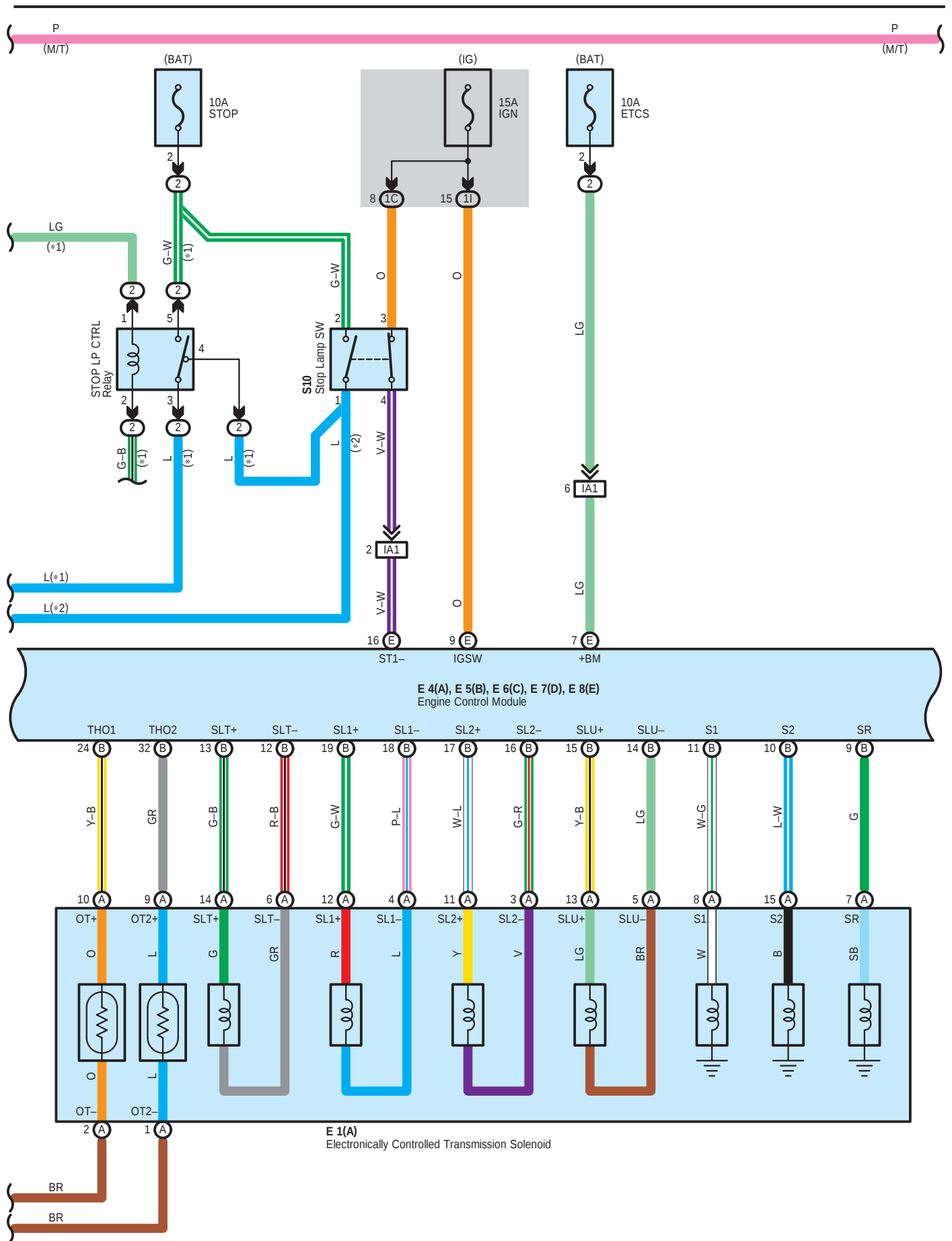
Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IA1	54	Instrument Panel Wire and Engine Room Main Wire (Left Kick Panel)
IF1	55	Engine Wire and Engine Wire (Behind the Glove Box)
IH1	55	Engine Wire and Instrument Panel Wire (Right Side of Glove Box)
IJ1	55	Instrument Panel Wire and Instrument Panel Wire (Right Kick Panel)

**: Ground Points**

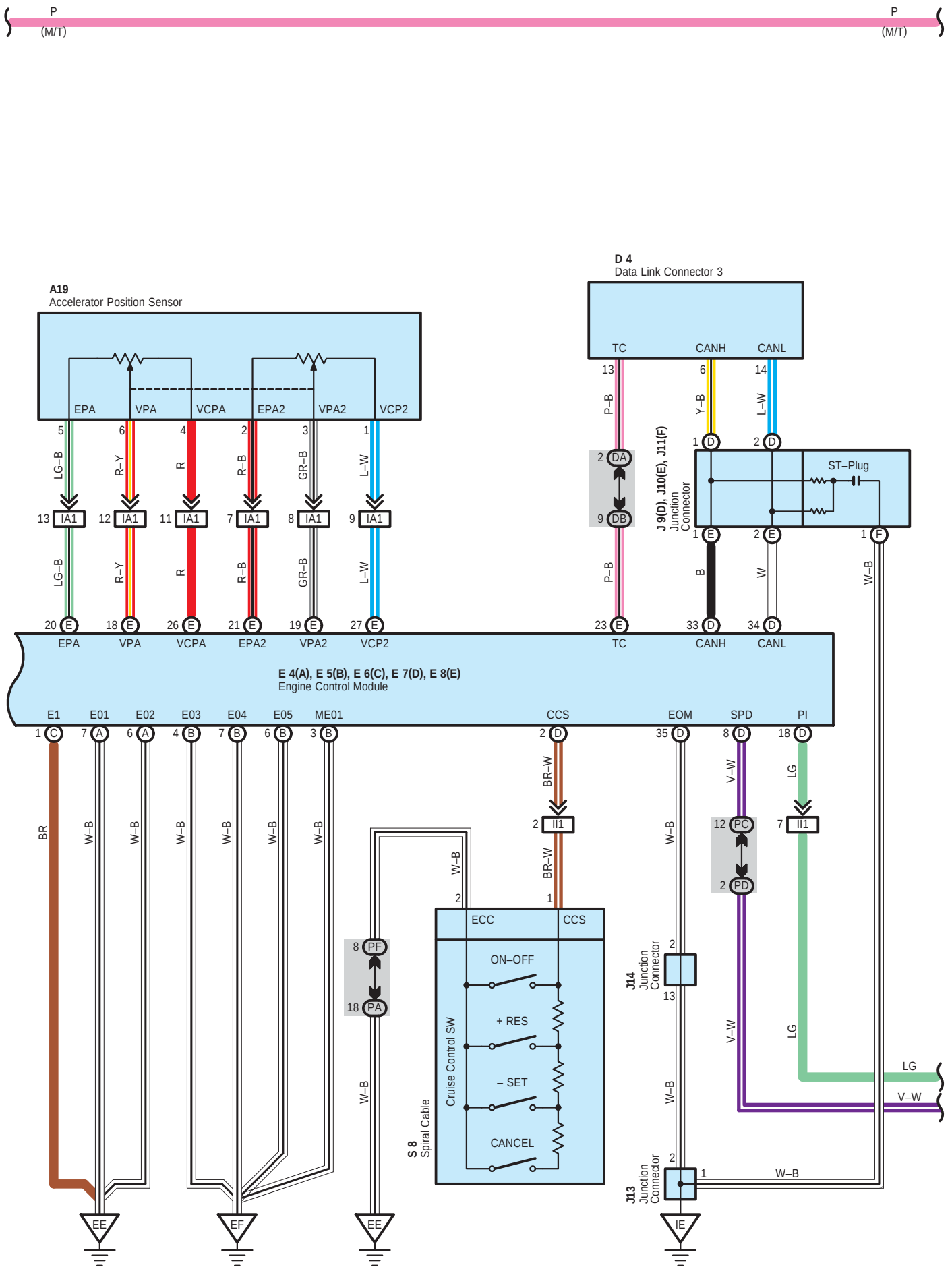
Code	See Page	Ground Points Location
EA	53 (2TR-FE)	Front Right Fender
EB	53 (2TR-FE)	Front Left Fender
EG	53 (2TR-FE)	Rear Side of Cylinder Block
EH		
IA	54	Left Kick Panel
IE	54	Right Kick Panel

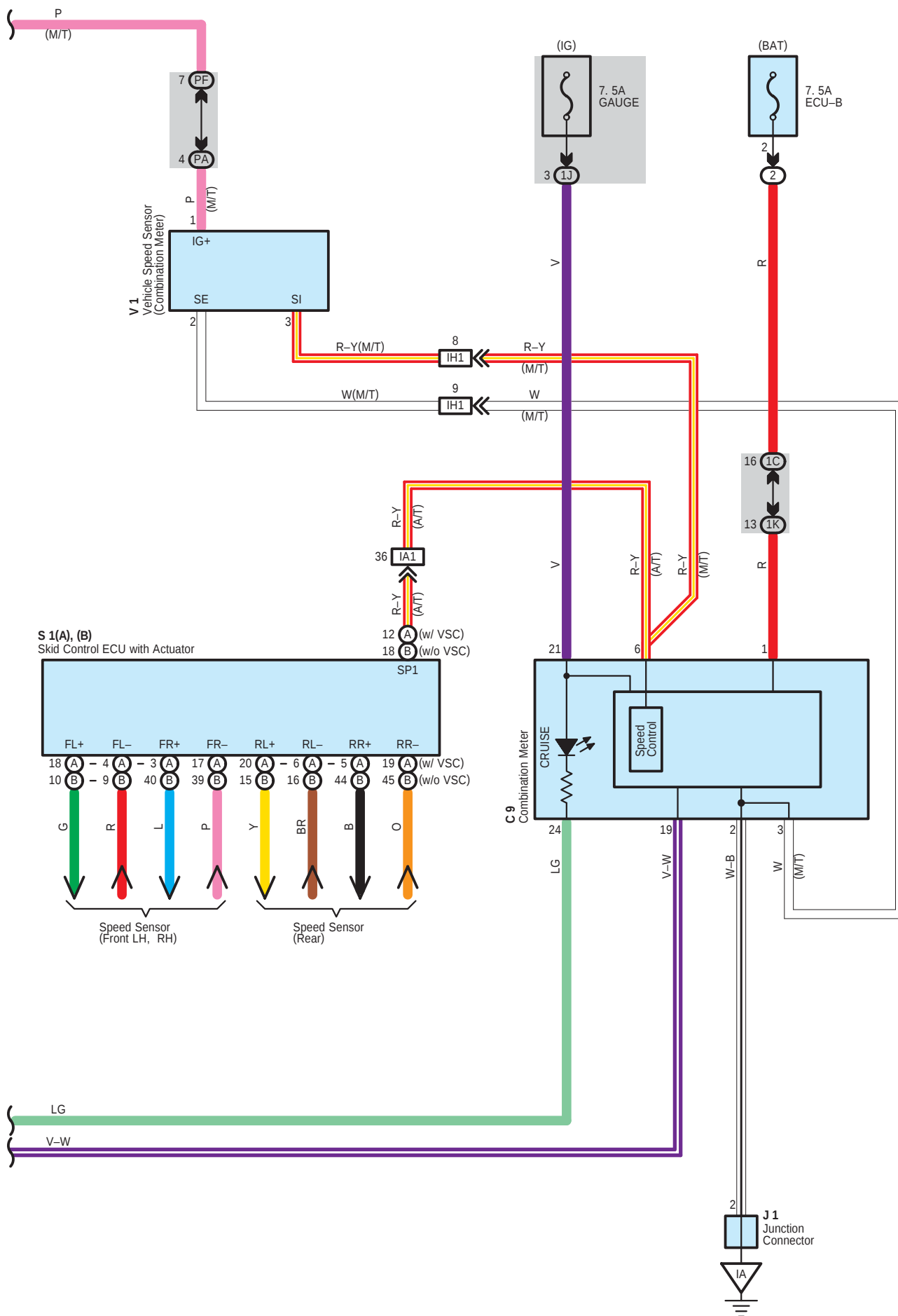
Cruise Control for 1GR-FE





Cruise Control for 1GR-FE





Cruise Control for 1GR-FE

System Outline

The cruise control system is a constant vehicle speed controller in which control of the switch on the instrument panel makes it possible to automatically adjust the opening of the engine throttle valve without depressing of the accel pedal.

1. Set Operation

When the ON-OFF SW is turned on, the system starts preparations necessary for the cruise control and turns on the indicator light in the combination meter.

2. Set Speed Control

When the – SET SW is operated with the cruise control main SW turned on during travelling, the constant vehicle speed is controlled.

3. Coast Control

When the – SET SW is kept turned on during cruise control travelling, the engine control module controls the throttle valve to decelerate the vehicle. Every time the – SET SW is turned on instantaneously, the vehicle speed is decelerated approximately 1.6 km/h.

4. Accel Control

When the + RES SW is kept turned on during cruise control travelling, the engine control module controls the throttle valve to accelerate the vehicle. Every time the + RES SW is turned on instantaneously, the vehicle speed is accelerated approximately 1.6 km/h.

5. Resume Control

When the vehicle speed is within the low speed limit (Approximately 40 km/h, 25 mph) if the cruise control is cancelled, use of the + RES SW accelerates the vehicle to the speed level used before canceling the cruise control.

6. Manual Cancel Mechanism

If any of the following signals is input during cruise control travelling, the cruise control is cancelled.

- * The stop lamp SW is turned on.
- * The CANCEL SW is turned on.
- * The ON-OFF SW is turned off.
- * Gear is shifted from D position to other positions than D (A/T).
- * Clutch pedal depressed (M/T).

7. Auto Cancel Function

If any of the following conditions is encountered, the cruise control is automatically cancelled.

- * The stop lamp SW wiring is faulty or short-circuited.
- * The vehicle speed signal is faulty.
- * The electronically controlled throttle malfunctions.
- * The actual vehicle speed becomes –16 km/h slower than the set speed.
- * The actual vehicle speed becomes slower than the minimum speed limit.

8. Overdrive Control Function

Overdrive is sometimes cut off on gradients during cruise control driving. When end of climbing gradient is determined by throttle opening degree information after overdrive is canceled, control is reset to overdrive condition after overdrive resetting timer operation. Also, when overdrive is cut off during accelerator resuming control, control is reset to overdrive condition when accelerator resuming control is finished.

○ : Parts Location

Code		See Page		Code		See Page		Code		See Page	
A19		44		E7	D	44		J14		45	
C9		44		E8	E	44		P1		41 (1GR–FE)	
C14		44		J1		45		S1	A	41 (1GR–FE)	
D4		44		J5		45			B	41 (1GR–FE)	
E1	A	40 (1GR–FE)		J9	D	45		S8		45	
E4	A	44		J10	E	45		S10		45	
E5	B	44		J11	F	45		T1		41 (1GR–FE)	
E6	C	44		J13		45		V1		41 (1GR–FE)	

○ : 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	28	Engine Room Main Wire and Driver Side J/B (Lower Finish Panel)
1C		
1H	29	Instrument Panel Wire and Driver Side J/B (Lower Finish Panel)
1I		
1J		
1K		
2A	24	Engine Room J/B (Engine Compartment Left)
DA	34	Instrument Panel Wire and Instrument Panel J/B No.1 (Left Kick Panel)
DB		
DC	34	Engine Room Main Wire and Instrument Panel J/B No.1 (Left Kick Panel)
DD		
PA	36	Engine Wire and Instrument Panel J/B No.2 (Right Side of Glove Box)
PB		
PC	36	Instrument Panel Wire and Instrument Panel J/B No.2 (Right Side of Glove Box)
PD		
PE		
PF		

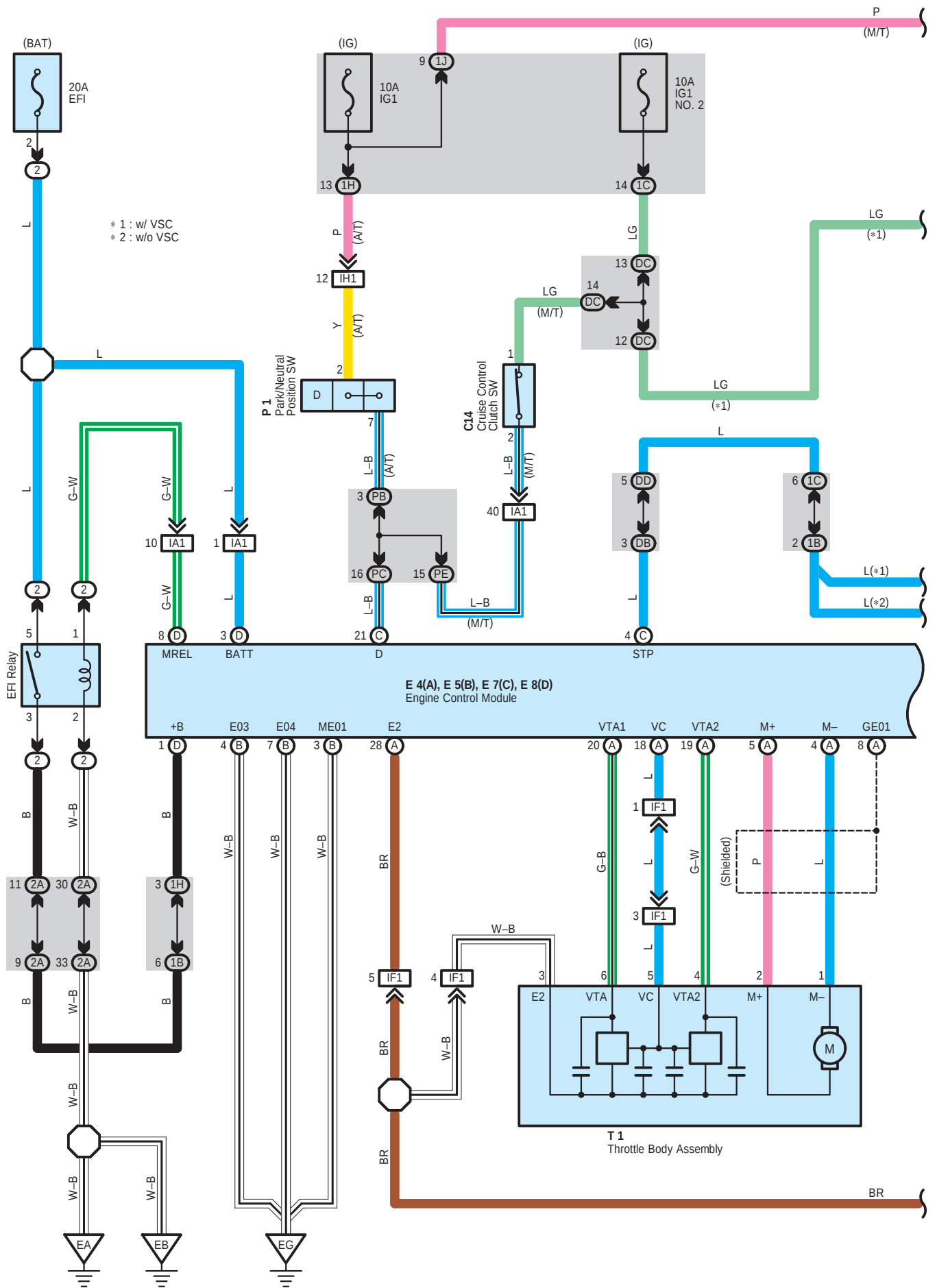
**: Connector Joining Wire Harness and Wire Harness**

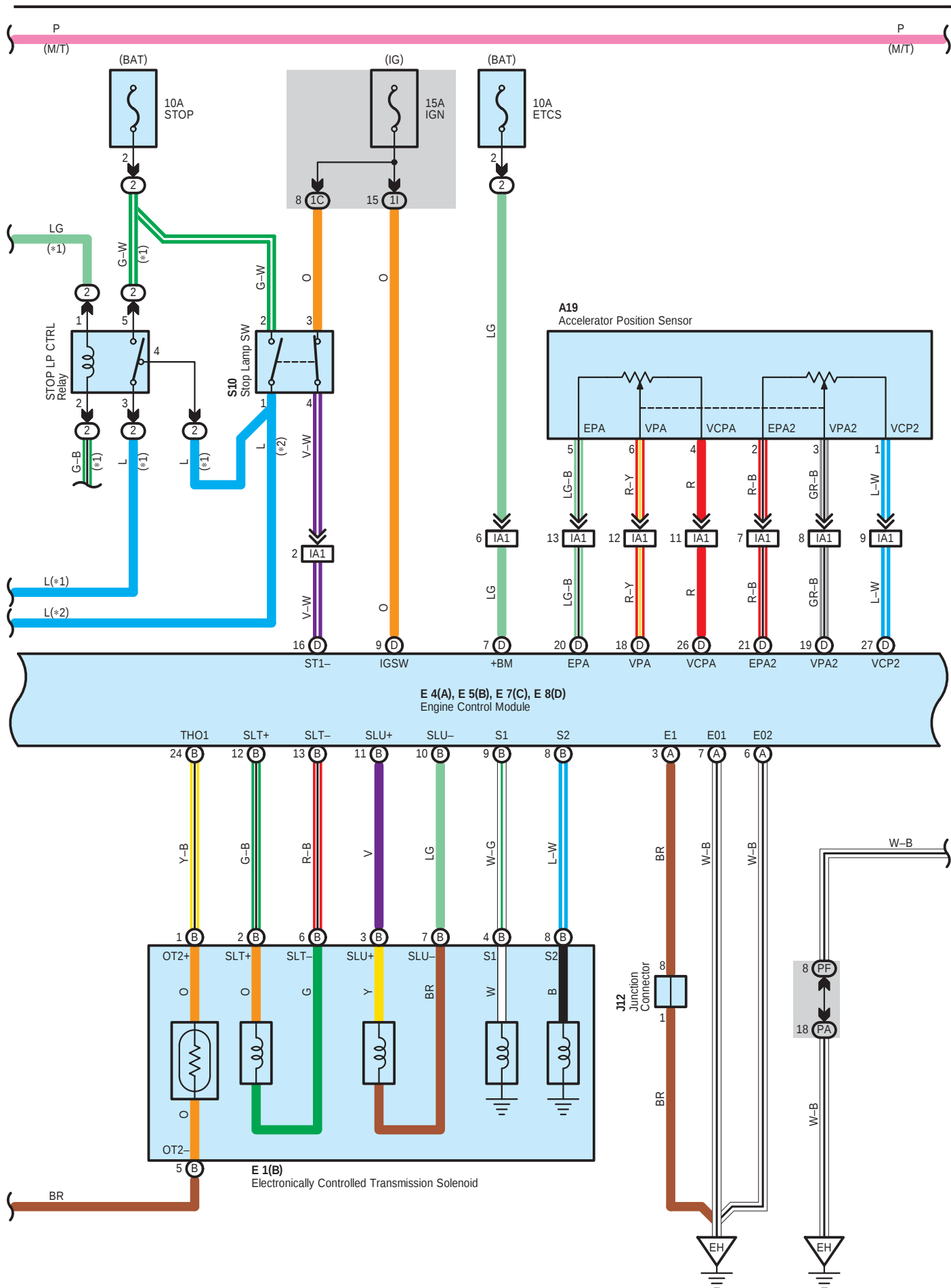
Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IA1	54	Instrument Panel Wire and Engine Room Main Wire (Left Kick Panel)
IF1	55	Engine Wire and Engine Wire (Behind the Glove Box)
IH1	55	Engine Wire and Instrument Panel Wire (Right Side of Glove Box)
II1	55	Instrument Panel Wire and Instrument Panel Wire (Instrument Panel Brace RH)

**: Ground Points**

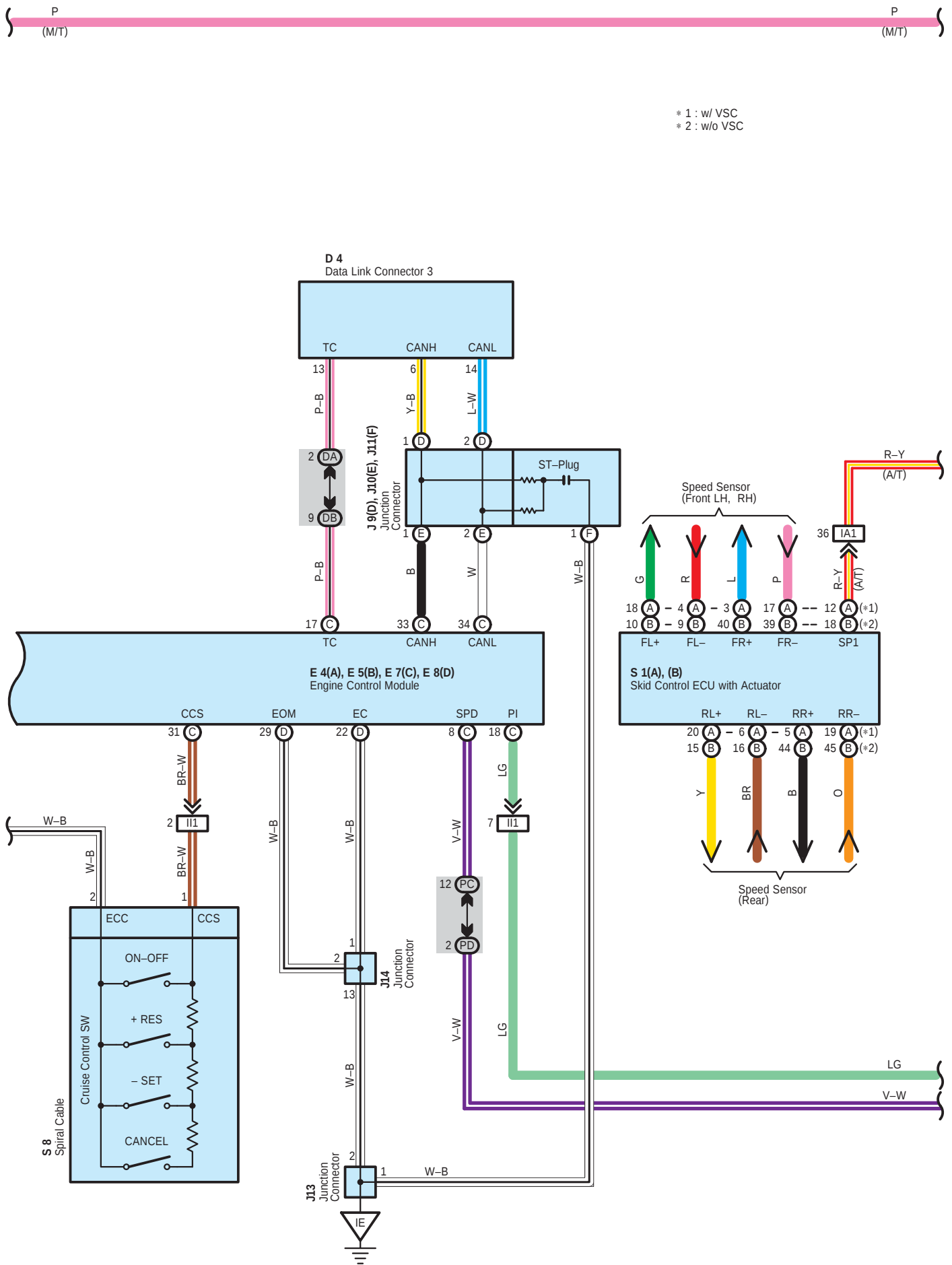
Code	See Page	Ground Points Location
EA	52 (1GR-FE)	Front Right Fender
EB	52 (1GR-FE)	Front Left Fender
EE	52 (1GR-FE)	Rear Side of Right Bank Cylinder Block
EF	52 (1GR-FE)	Rear Side of Left Bank Cylinder Block
IA	54	Left Kick Panel
IC	54	Instrument Panel Brace RH
IE	54	Right Kick Panel

Cruise Control for 2TR-FE





Cruise Control for 2TR-FE



Cruise Control for 2TR-FE

System Outline

The cruise control system is a constant vehicle speed controller in which control of the switch on the instrument panel makes it possible to automatically adjust the opening of the engine throttle valve without depressing of the accel pedal.

1. Set Operation

When the ON-OFF SW is turned on, the system starts preparations necessary for the cruise control and turns on the indicator light in the combination meter.

2. Set Speed Control

When the – SET SW is operated with the cruise control main SW turned on during travelling, the constant vehicle speed is controlled.

3. Coast Control

When the – SET SW is kept turned on during cruise control travelling, the engine control module controls the throttle valve to decelerate the vehicle. Every time the – SET SW is turned on instantaneously, the vehicle speed is decelerated approximately 1.6 km/h.

4. Accel Control

When the + RES SW is kept turned on during cruise control travelling, the engine control module controls the throttle valve to accelerate the vehicle. Every time the + RES SW is turned on instantaneously, the vehicle speed is accelerated approximately 1.6 km/h.

5. Resume Control

When the vehicle speed is within the low speed limit (Approximately 40 km/h, 25 mph) if the cruise control is cancelled, use of the + RES SW accelerates the vehicle to the speed level used before canceling the cruise control.

6. Manual Cancel Mechanism

If any of the following signals is input during cruise control travelling, the cruise control is cancelled.

- * The stop lamp SW is turned on.
- * The CANCEL SW is turned on.
- * The ON-OFF SW is turned off.
- * Gear is shifted from D position to other positions than D (A/T).
- * Clutch pedal depressed (M/T).

7. Auto Cancel Function

If any of the following conditions is encountered, the cruise control is automatically cancelled.

- * The stop lamp SW wiring is faulty or short-circuited.
- * The vehicle speed signal is faulty.
- * The electronically controlled throttle malfunctions.
- * The actual vehicle speed becomes –16 km/h slower than the set speed.
- * The actual vehicle speed becomes slower than the minimum speed limit.

8. Overdrive Control Function

Overdrive is sometimes cut off on gradients during cruise control driving. When end of climbing gradient is determined by throttle opening degree information after overdrive is canceled, control is reset to overdrive condition after overdrive resetting timer operation. Also, when overdrive is cut off during accelerator resuming control, control is reset to overdrive condition when accelerator resuming control is finished.

○ : Parts Location

Code		See Page	Code		See Page	Code	See Page	
A19		44	E8	D	44	P1		43 (2TR–FE)
C9		44	J1		45	S1	A	43 (2TR–FE)
C14		44	J9	D	45		B	43 (2TR–FE)
D4		44	J10	E	45	S8		45
E1	B	42 (2TR–FE)	J11	F	45	S10		45
E4	A	44	J12		45	T1		43 (2TR–FE)
E5	B	44	J13		45	V1		43 (2TR–FE)
E7	C	44	J14		45			

○ : 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**

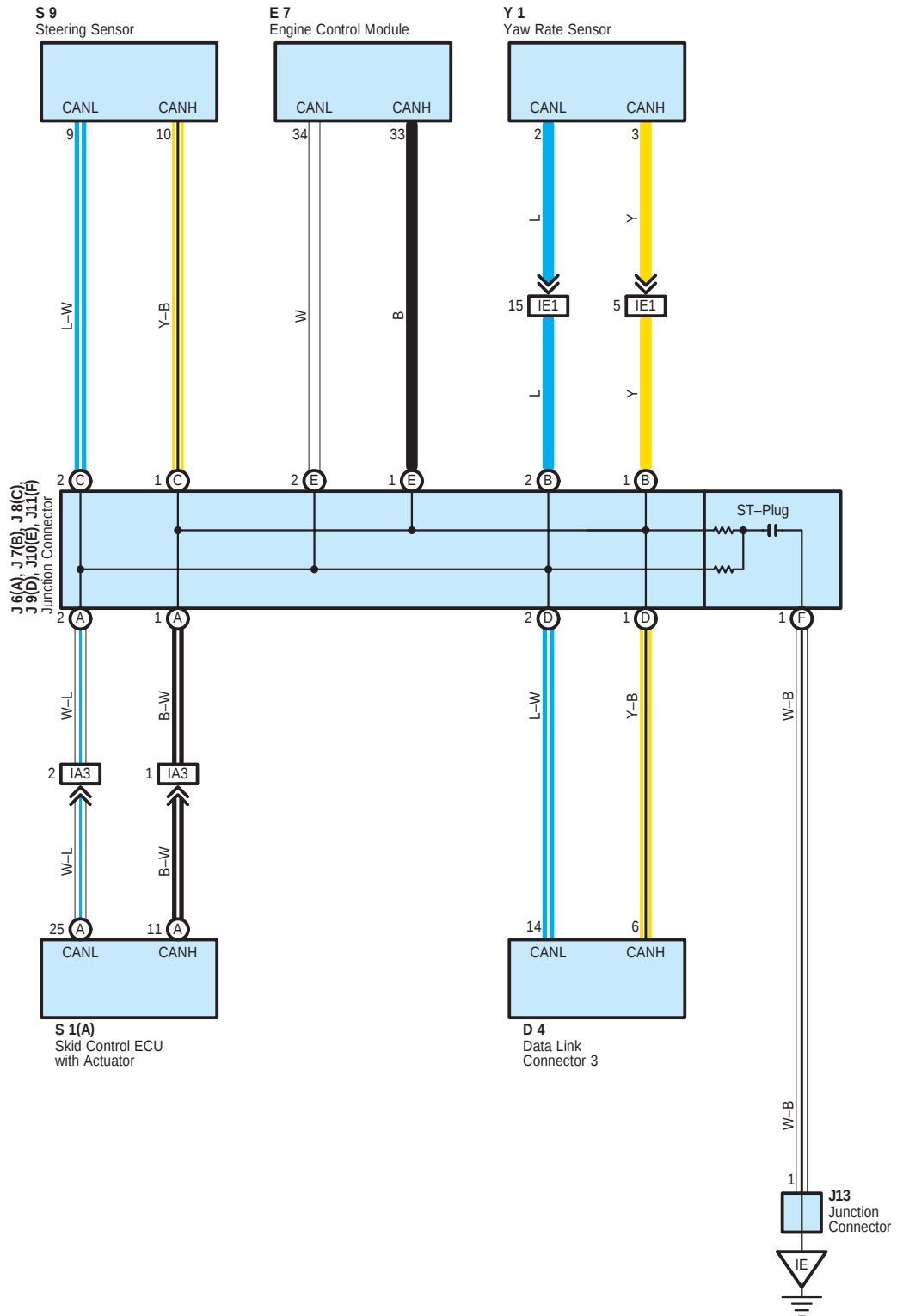
Code	See Page	Junction Block and Wire Harness (Connector Location)
1B	28	Engine Room Main Wire and Driver Side J/B (Lower Finish Panel)
1C		
1H	29	Instrument Panel Wire and Driver Side J/B (Lower Finish Panel)
1I		
1J		
1K		
2A	24	Engine Room J/B (Engine Compartment Left)
DA	34	Instrument Panel Wire and Instrument Panel J/B No.1 (Left Kick Panel)
DB		
DC	34	Engine Room Main Wire and Instrument Panel J/B No.1 (Left Kick Panel)
DD		
PA	36	Engine Wire and Instrument Panel J/B No.2 (Right Side of Glove Box)
PB		
PC	36	Instrument Panel Wire and Instrument Panel J/B No.2 (Right Side of Glove Box)
PD		
PE		
PF		

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

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IA1	54	Instrument Panel Wire and Engine Room Main Wire (Left Kick Panel)
IF1	55	Engine Wire and Engine Wire (Behind the Glove Box)
IH1	55	Engine Wire and Instrument Panel Wire (Right Side of Glove Box)
II1	55	Instrument Panel Wire and Instrument Panel Wire (Instrument Panel Brace RH)

**: Ground Points**

Code	See Page	Ground Points Location
EA	53 (2TR-FE)	Front Right Fender
EB	53 (2TR-FE)	Front Left Fender
EG	53 (2TR-FE)	Rear Side of Cylinder Block
EH		
IA	54	Left Kick Panel
IE	54	Right Kick Panel



System Outline

Multiplex communication system (CAN) uses a serial communication protocol and communicates with a differential voltage. In this network system, TERMINALS CANH and CANL are used for communication between the ECUs and sensors, and excellent data communication speed and communication error detecting facility are provided.

This system is working for the following systems:

- * ABS (w/ VSC)
- * Auto LSD
- * Cruise Control
- * Downhill Assist Control
- * Electronically Controlled Transmission and A/T Indicator
- * Engine Control
- * Hill-Start Assist Control
- * TRAC
- * VSC

○ : Parts Location

Code		See Page	Code		See Page	Code		See Page
D4		44	J9	D	45	S1	A	43 (2TR–FE)
E7		44	J10	E	45	S9		45
J6	A	45	J11	F	45	Y1		47 (*1)
J7	B	45	J13		45			48 (*2)
J8	C	45	S1	A	41 (1GR–FE)			49 (*3)

□ : Connector Joining Wire Harness and Wire Harness

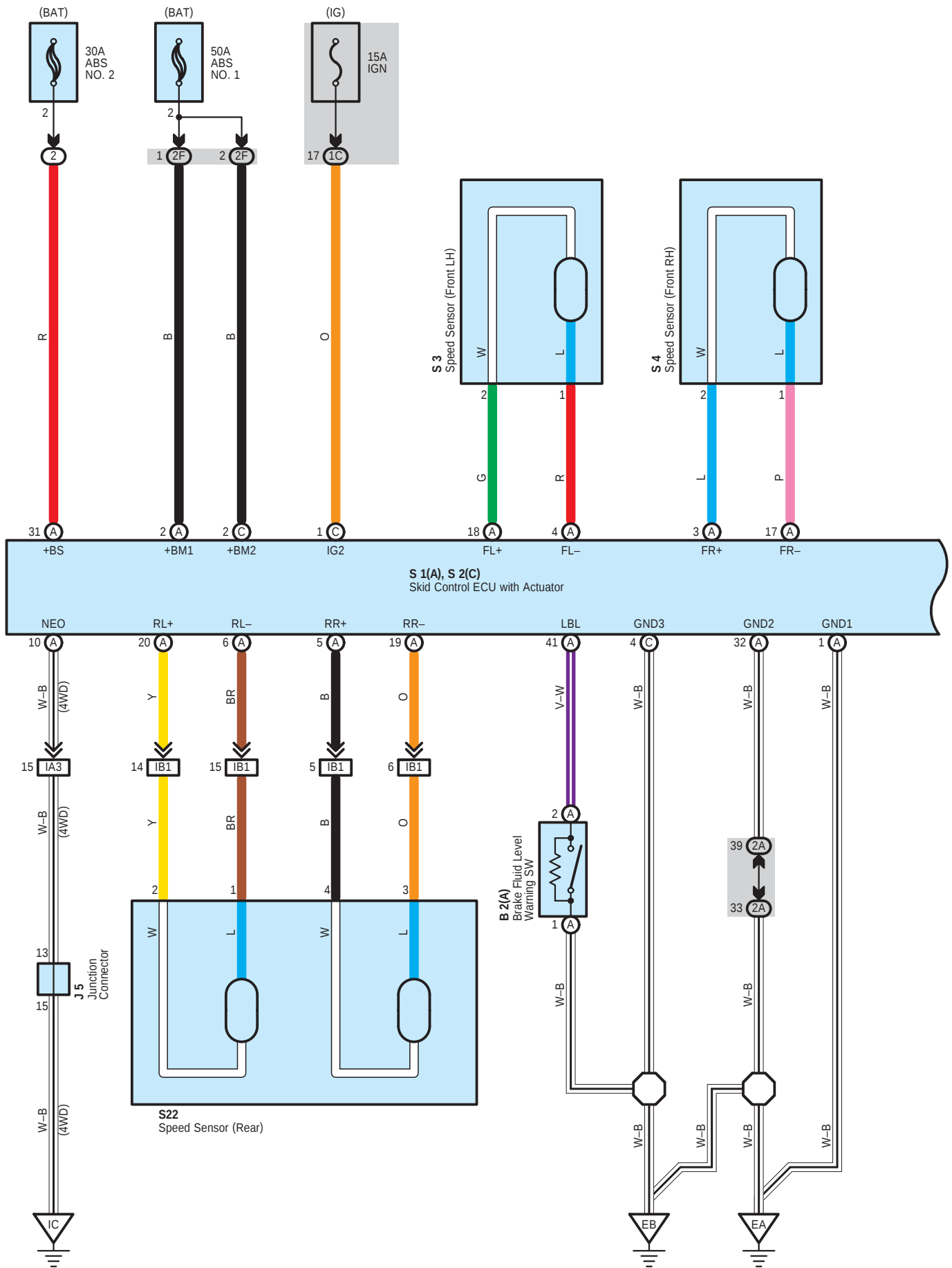
Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IA3	54	Instrument Panel Wire and Engine Room Main Wire (Left Kick Panel)
IE1	54	Instrument Panel Wire and Floor No.2 Wire (Left Kick Panel)

▽ : Ground Points

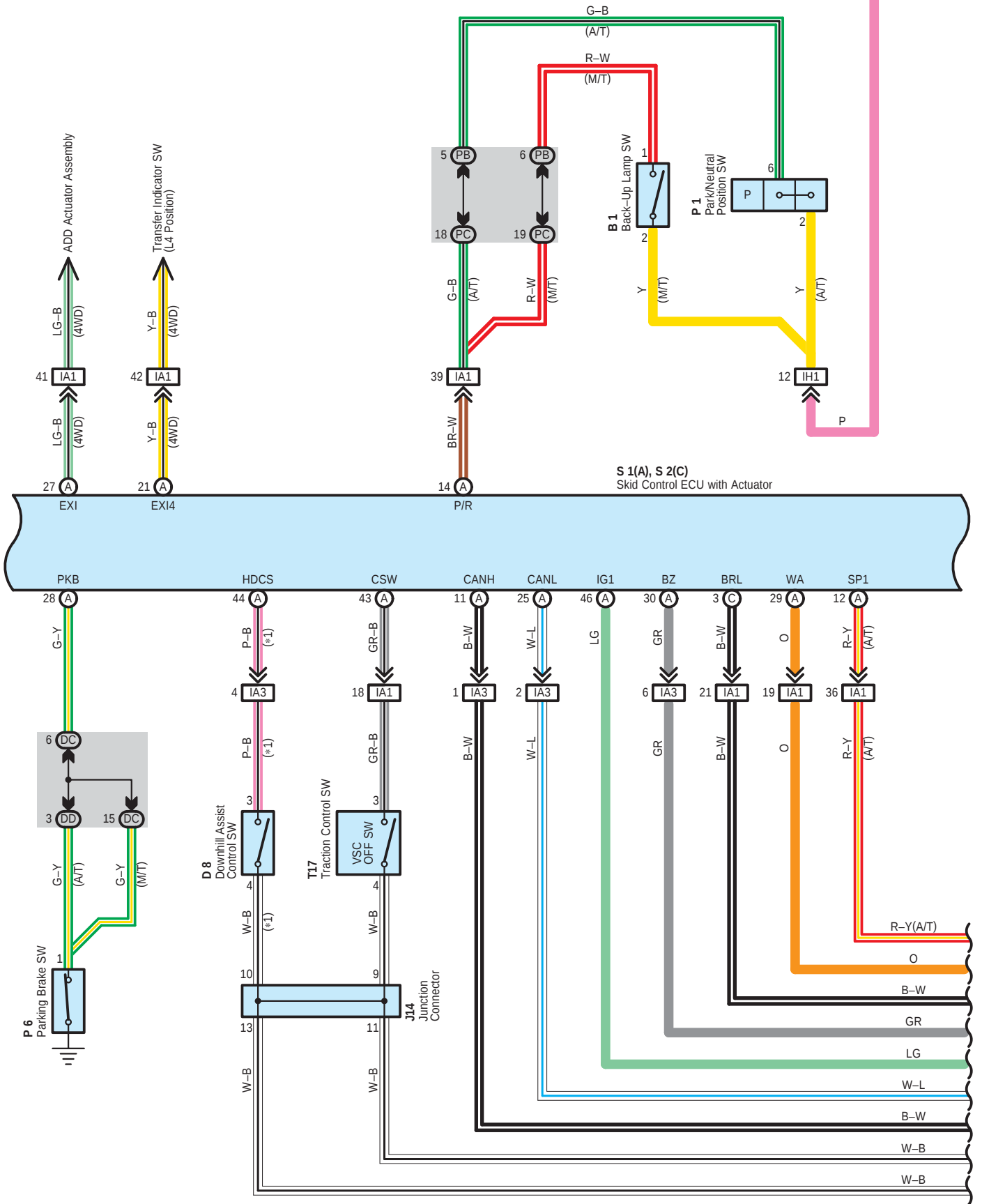
Code	See Page	Ground Points Location
IE	54	Right Kick Panel

* 1 : Double Cab * 2 : Access Cab * 3 : Regular Cab * 4 : Separate Seat * 5 : Bench Seat

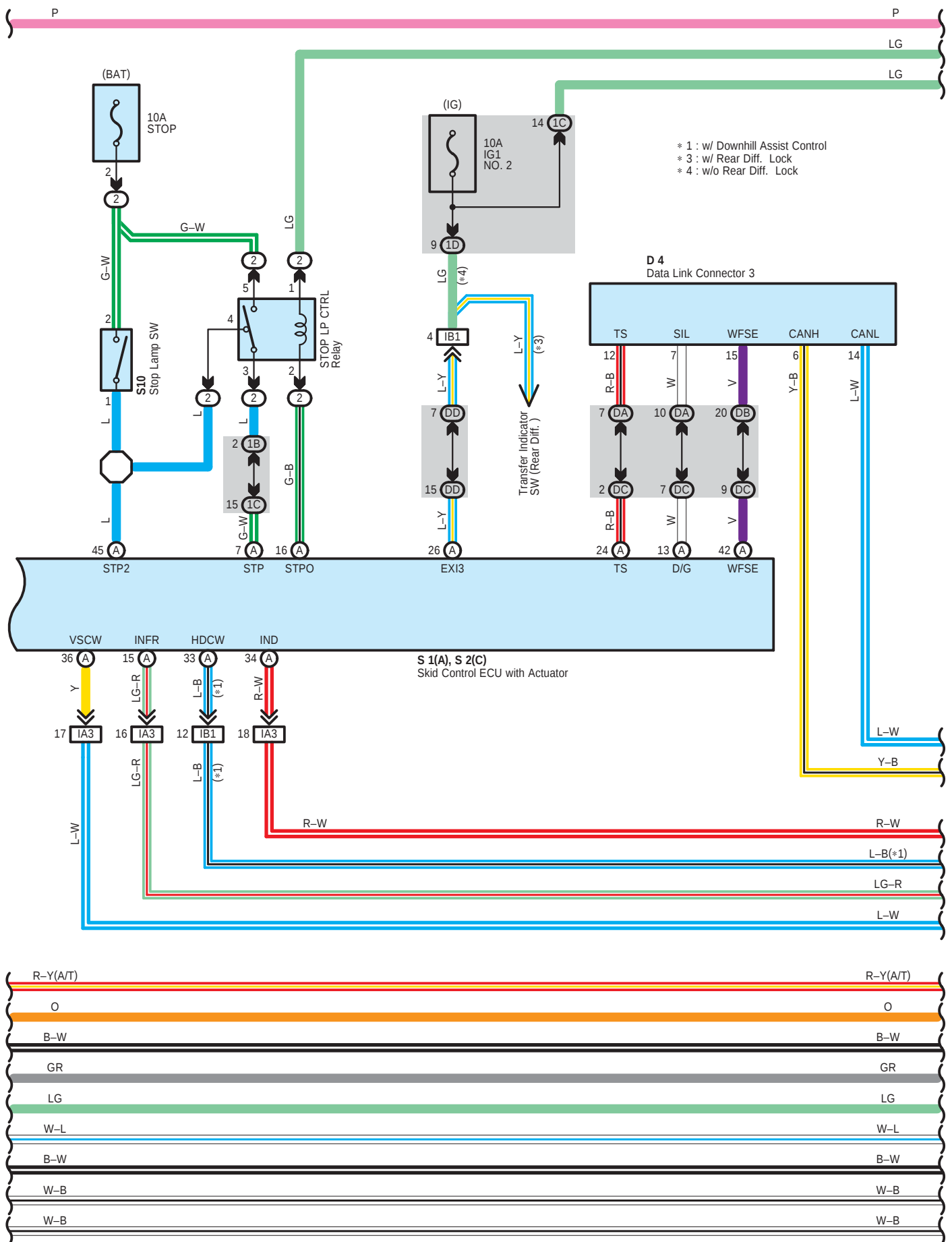
ABS, TRAC, VSC, Downhill Assist Control, Hill-Start Assist Control and Auto LSD

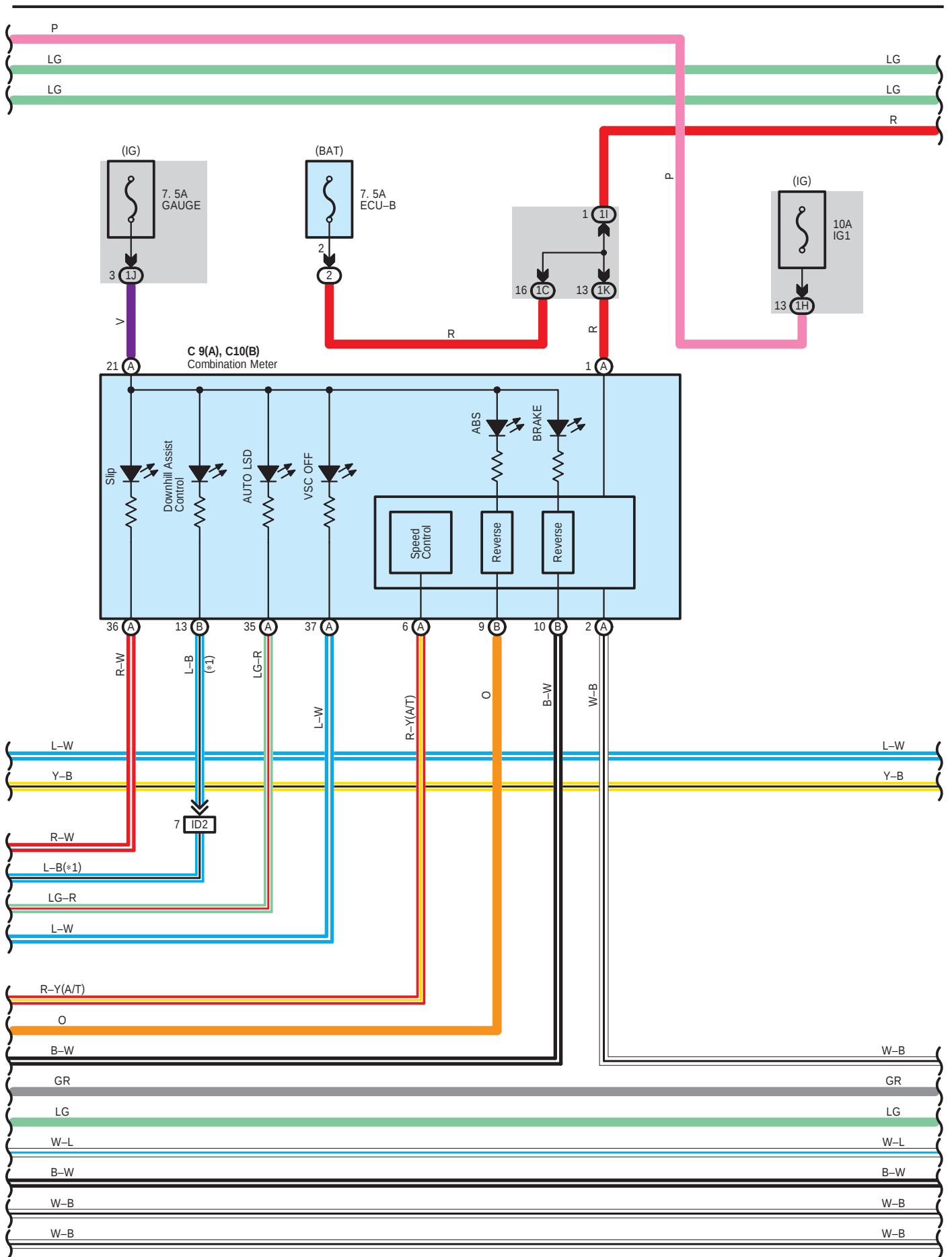


* 1 : w/ Downhill Assist Control

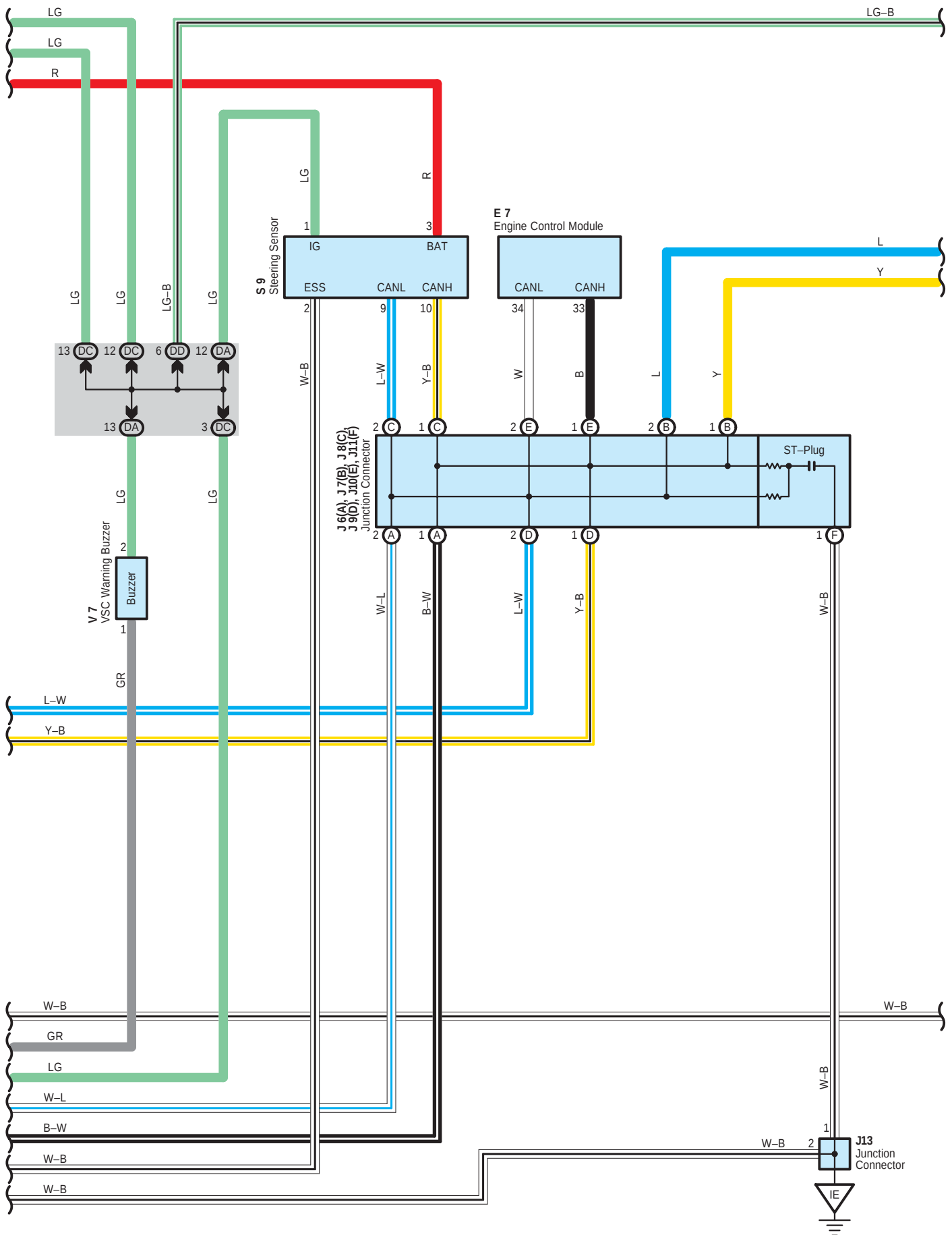


ABS, TRAC, VSC, Downhill Assist Control, Hill-Start Assist Control and Auto LSD





ABS, TRAC, VSC, Downhill Assist Control, Hill-Start Assist Control and Auto LSD



System Outline

1. Normal Operation

The VSC system helps prevent the vehicle from slipping sideways as a result of strong front wheel skid or strong rear wheel skid during cornering.

The followings are two examples that can be considered as circumstances in which the tires exceed their lateral grip limit. The VSC system is designed to help control the vehicle behavior by controlling the engine's output and the brakes at each wheel when the vehicle is under one of the conditions indicated below.

- * When the front wheels lose grip in relation to the rear wheels (Strong front wheel skid tendency).
- * When the rear wheels lose grip in relation to the front wheels (Strong rear wheel skid tendency).

2. Electronic Brake–Force Distribution

Skid control ECU with actuator distributes appropriate brake–force to front and rear wheels (Control of brake–force distribution to front and rear wheels) corresponding to the vehicle driving conditions. It also makes effective use of rear wheel brake–force to match loading condition and decelerating of the vehicle, resulting to reduce depressing of brake pedal and to ensure effective braking. In braking during making a turn, the ECU controls appropriate brake–force distribution to right and left wheels (Control of brake–force distribution to right and left wheels) to ensure stability and braking of the vehicle.

3. Downhill Assist Control Operation

The downhill assist control operation controls braking action of each wheel to help prevent out–of–balance vehicle posture when descending a steep hill or traveling at a speed exceeding the threshold of wheel gripping capability. When the downhill assist control is in operation, the brake system controls vehicle speed within the range of 5 to 7 km/h.

For the downhill assist control to be operative all of the following conditions have to be met:

- * Downhill assist control switch = ON
- * Transfer L4 selected
- * Vehicle speed is 5 km/h or more, but less than 25 km/h.
- * Accelerator pedal OFF
- * Brake pedal OFF

4. Hill–Start Assist Control Operation

When starting on a steep hill for ascending, the hill–start assist control automatically puts the brake on momentarily – from the moment when the driver releases his foot from the brake pedal until he steps on the accelerator pedal – to help the driver start the vehicle safely and smoothly.

Please bear in mind, however, that it activates the brake system for only 3 seconds.

For the hill–start assist control to be operative all of the following conditions have to be met:

- * Shift position = D, 2, or L
- * Vehicle not moving forward with some wheel(s) slipping
- * Vehicle speed > 0 km/h

5. Active TRAC (4WD)

Active traction control system provides great effect of LSD (Limited Slip Differential) to deliver driving force lost due to the acceleration slip to each of 4 wheels by conducting the brake oil control on slipped wheels caused by acceleration during 4WD driving.

6. Auto LSD (2WD)

Auto LSD fulfills the function of LSD (Limited Slip Differential) by using the system of TRAC. It controls to focus on 'getting out', which ensures to recover from run–off condition and to take off on roads with much travel resistance such as sand.

 : Parts Location

Code	See Page	Code	See Page	Code	See Page
B1	40 (1GR-FE)	J9	D	45	S4
	42 (2TR-FE)	J10	E	45	
B2	A	J11	F	45	S9
		J13		45	S10
C9	A	J14		45	S22
C10	B	P1		41 (1GR-FE)	
D4				43 (2TR-FE)	
D8		P6		45	T17
E7		S1	A	41 (1GR-FE)	V7
J1				43 (2TR-FE)	Y1
J5		S2	C	41 (1GR-FE)	
J6	A			43 (2TR-FE)	
J7	B	S3		41 (1GR-FE)	
J8	C			43 (2TR-FE)	

 : 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	28	Engine Room Main Wire and Driver Side J/B (Lower Finish Panel)
1C		
1D	28	Frame Wire and Driver Side J/B (Lower Finish Panel)
1F	28	Floor No.2 Wire and Driver Side J/B (Lower Finish Panel)
1H	29	Instrument Panel Wire and Driver Side J/B (Lower Finish Panel)
1I		
1J		
1K		
2A	24	Engine Room J/B (Engine Compartment Left)
2F	25	Engine Room Main Wire and Engine Room J/B (Engine Compartment Left)
DA	34	Instrument Panel Wire and Instrument Panel J/B No.1 (Left Kick Panel)
DB		
DC	34	Engine Room Main Wire and Instrument Panel J/B No.1 (Left Kick Panel)
DD		
PB	36	Engine Wire and Instrument Panel J/B No.2 (Right Side of Glove Box)
PC	36	Instrument Panel Wire and Instrument Panel J/B No.2 (Right Side of Glove Box)

 : Connector Joining Wire Harness and Wire Harness

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IA1	54	Instrument Panel Wire and Engine Room Main Wire (Left Kick Panel)
IA3		
IB1	54	Frame Wire and Engine Room Main Wire (Left Kick Panel)
ID2	54	Frame Wire and Instrument Panel Wire (Left Kick Panel)
IE1	54	Instrument Panel Wire and Floor No.2 Wire (Left Kick Panel)
IH1	55	Engine Wire and Instrument Panel Wire (Right Side of Glove Box)

* 1 : Double Cab * 2 : Access Cab * 3 : Regular Cab * 4 : Separate Seat * 5 : Bench Seat

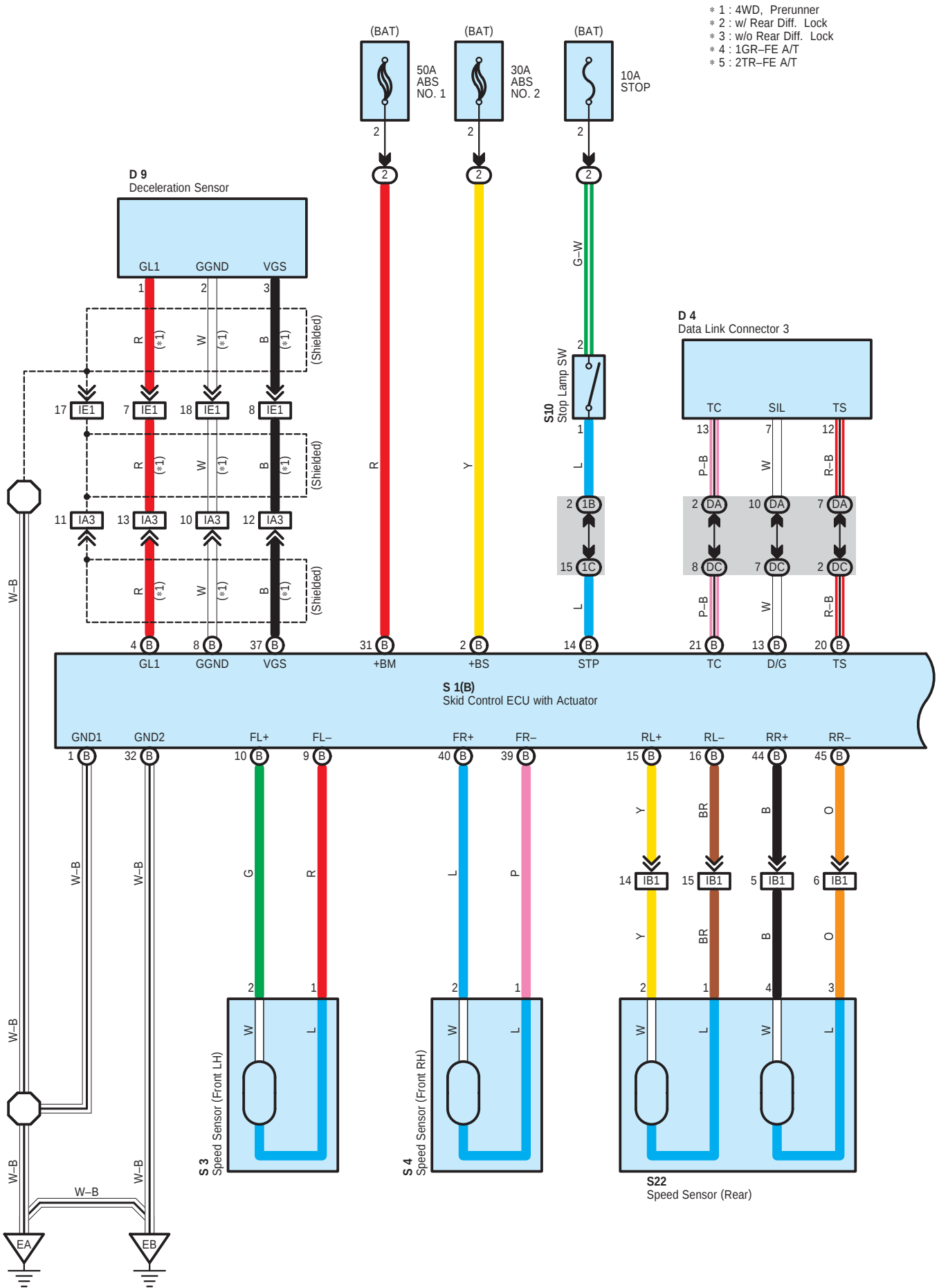
ABS, TRAC, VSC, Downhill Assist Control, Hill-Start Assist Control and Auto LSD

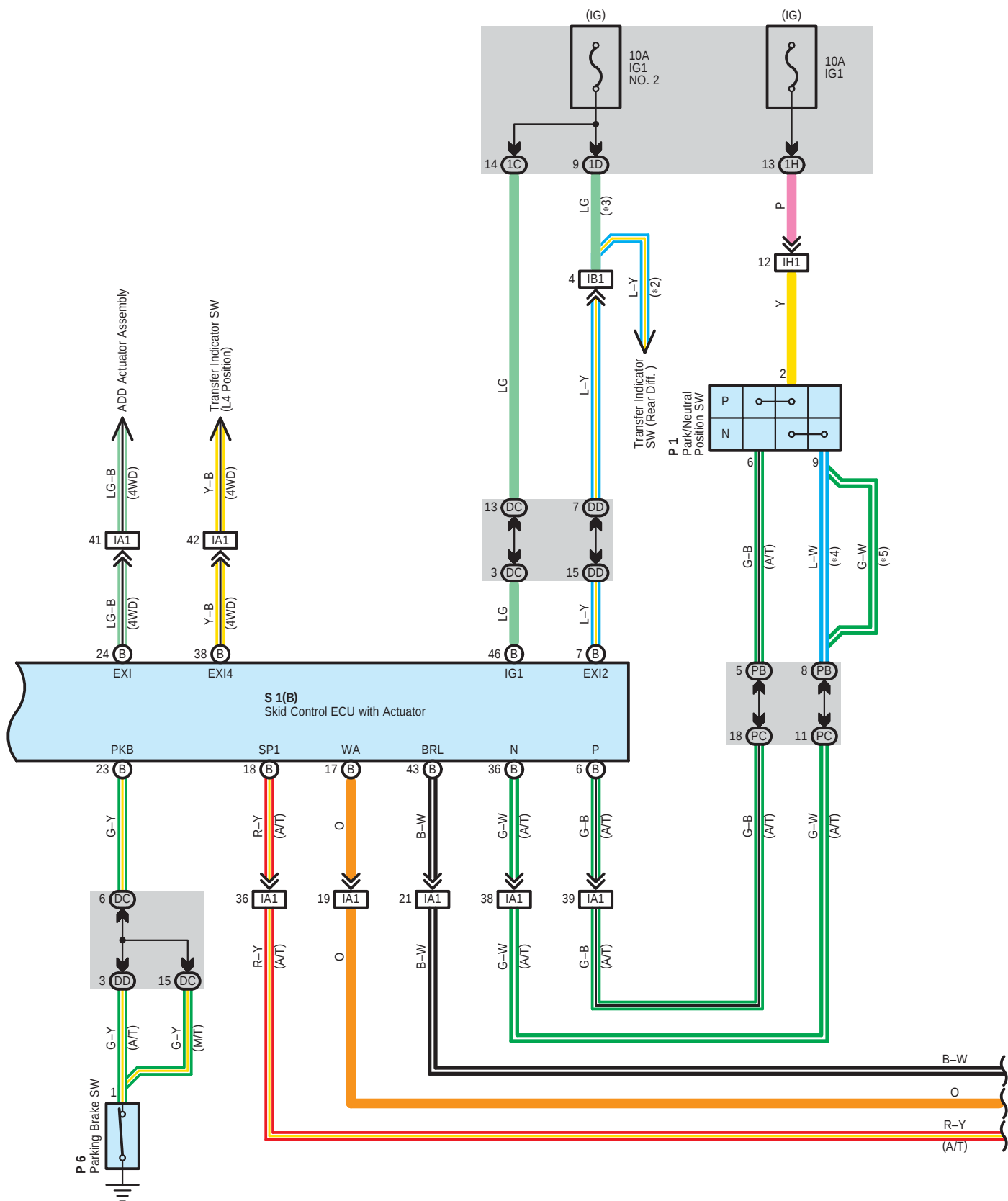


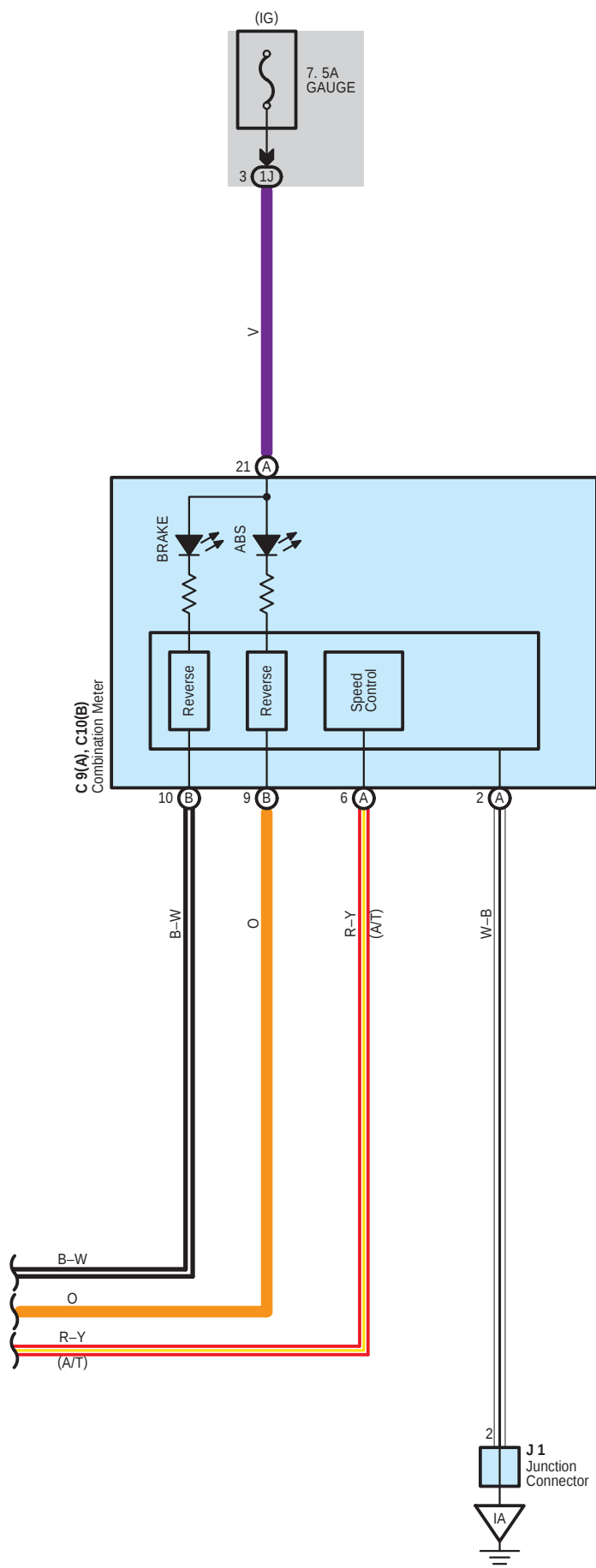
: Ground Points

Code	See Page	Ground Points Location
EA	52 (1GR-FE)	Front Right Fender
	53 (2TR-FE)	
EB	52 (1GR-FE)	Front Left Fender
	53 (2TR-FE)	
IA	54	Left Kick Panel
IC	54	Instrument Panel Brace RH
IE	54	Right Kick Panel
BA	56 (*1)	Floor Seat Cross Member LH
	57 (*2)	
	58 (*3)	

* 1 : Double Cab * 2 : Access Cab * 3 : Regular Cab * 4 : Separate Seat * 5 : Bench Seat







System Outline

This system controls the respective brake fluid pressures acting on the disc brake cylinders of the right front wheel, left front wheel and rear wheels when the brakes are applied in a panic stop so that the wheels do not lock. This results in improved directional stability and steerability during panic braking.

1. Input Signals

(1) Speed sensor signal

The speed of the wheels is detected and input to TERMINALS (B) 10, (B) 15, (B) 40 and (B) 44 of the skid control ECU with actuator.

(2) Stop lamp SW signal

A signal is input to TERMINAL (B) 14 of the skid control ECU with actuator when the brake pedal is depressed.

2. System Operation

During sudden braking the skid control ECU with actuator has signals input from each sensor, which controls the current to the solenoid inside the actuator and lets the hydraulic pressure acting on each wheel cylinder escape to the reservoir. The pump inside the actuator is also operating at this time and it returns the brake fluid from the reservoir to the master cylinder, thus preventing locking of the vehicle wheels.

If the skid control ECU with actuator judges that the hydraulic pressure acting on the wheel cylinder is insufficient, the current on the solenoid is controlled and the hydraulic pressure is increased. Holding of the hydraulic pressure is also controlled by the skid control ECU with actuator, by the same method as above. Pressure reduction, holding and increase are repeated to maintain vehicle stability and to improve steerability during sudden braking.

○ : Parts Location

Code	See Page	Code	See Page	Code	See Page
C9	A	44	P1	41 (1GR-FE)	S4
C10	B	44		43 (2TR-FE)	
D4		44	P6	45	S10
D9		46 (*1)	S1	B	41 (1GR-FE)
		48 (*2)			43 (2TR-FE)
		49 (*3)	S3		41 (1GR-FE)
J1		45			43 (2TR-FE)

○ : 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	28	Engine Room Main Wire and Driver Side J/B (Lower Finish Panel)
1C		
1D	28	Frame Wire and Driver Side J/B (Lower Finish Panel)
1H	29	Instrument Panel Wire and Driver Side J/B (Lower Finish Panel)
1J		
DA	34	Instrument Panel Wire and Instrument Panel J/B No.1 (Left Kick Panel)
DC	34	Engine Room Main Wire and Instrument Panel J/B No.1 (Left Kick Panel)
DD		
PB	36	Engine Wire and Instrument Panel J/B No.2 (Right Side of Glove Box)
PC	36	Instrument Panel Wire and Instrument Panel J/B No.2 (Right Side of Glove Box)

□ : Connector Joining Wire Harness and Wire Harness

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IA1	54	Instrument Panel Wire and Engine Room Main Wire (Left Kick Panel)
IA3		
IB1	54	Frame Wire and Engine Room Main Wire (Left Kick Panel)
IE1	54	Instrument Panel Wire and Floor No.2 Wire (Left Kick Panel)
IH1	55	Engine Wire and Instrument Panel Wire (Right Side of Glove Box)

* 1 : Double Cab * 2 : Access Cab * 3 : Regular Cab * 4 : Separate Seat * 5 : Bench Seat

ABS



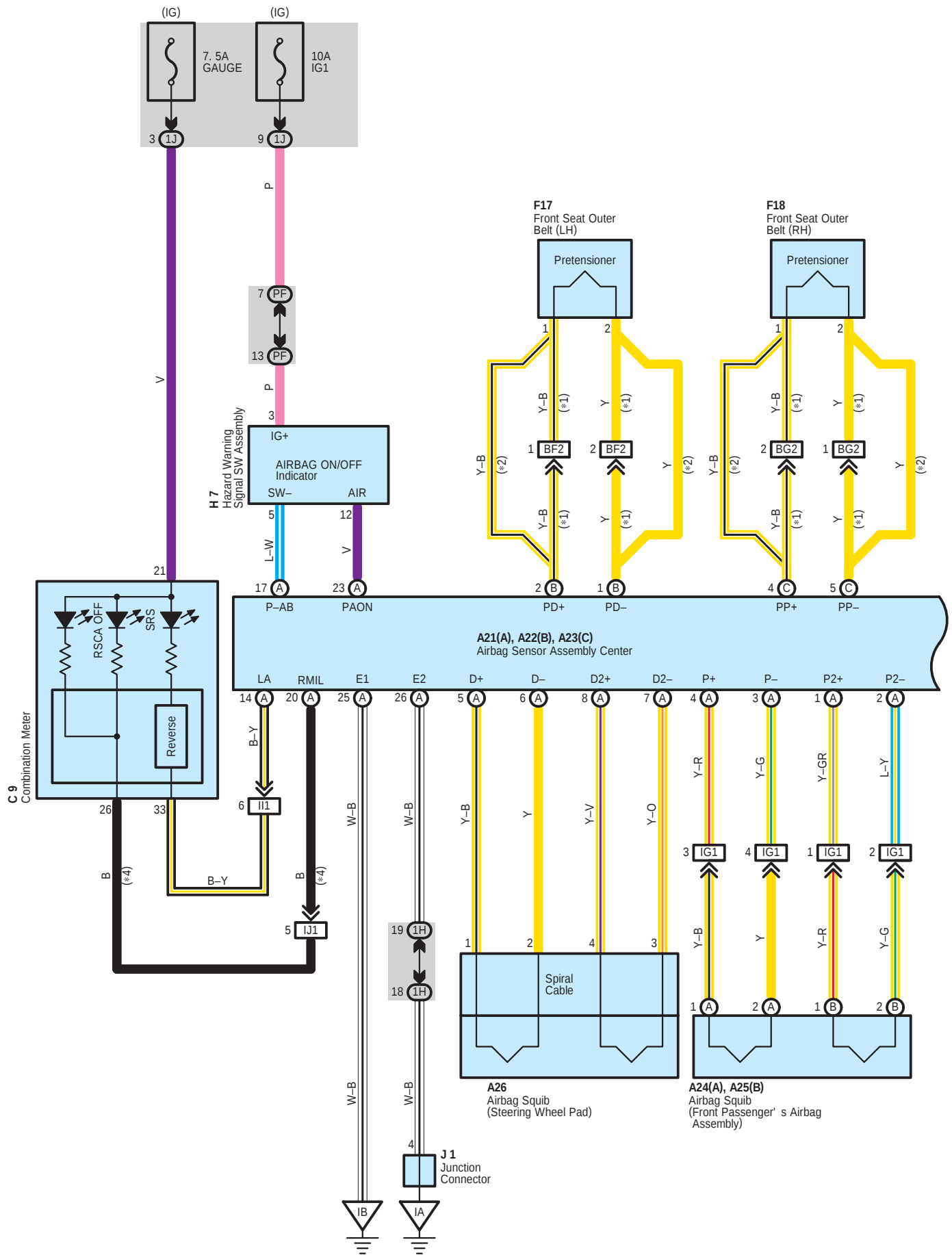
: **Ground Points**

Code	See Page	Ground Points Location
EA	52 (1GR-FE)	Front Right Fender
	53 (2TR-FE)	
EB	52 (1GR-FE)	Front Left Fender
	53 (2TR-FE)	
IA	54	Left Kick Panel

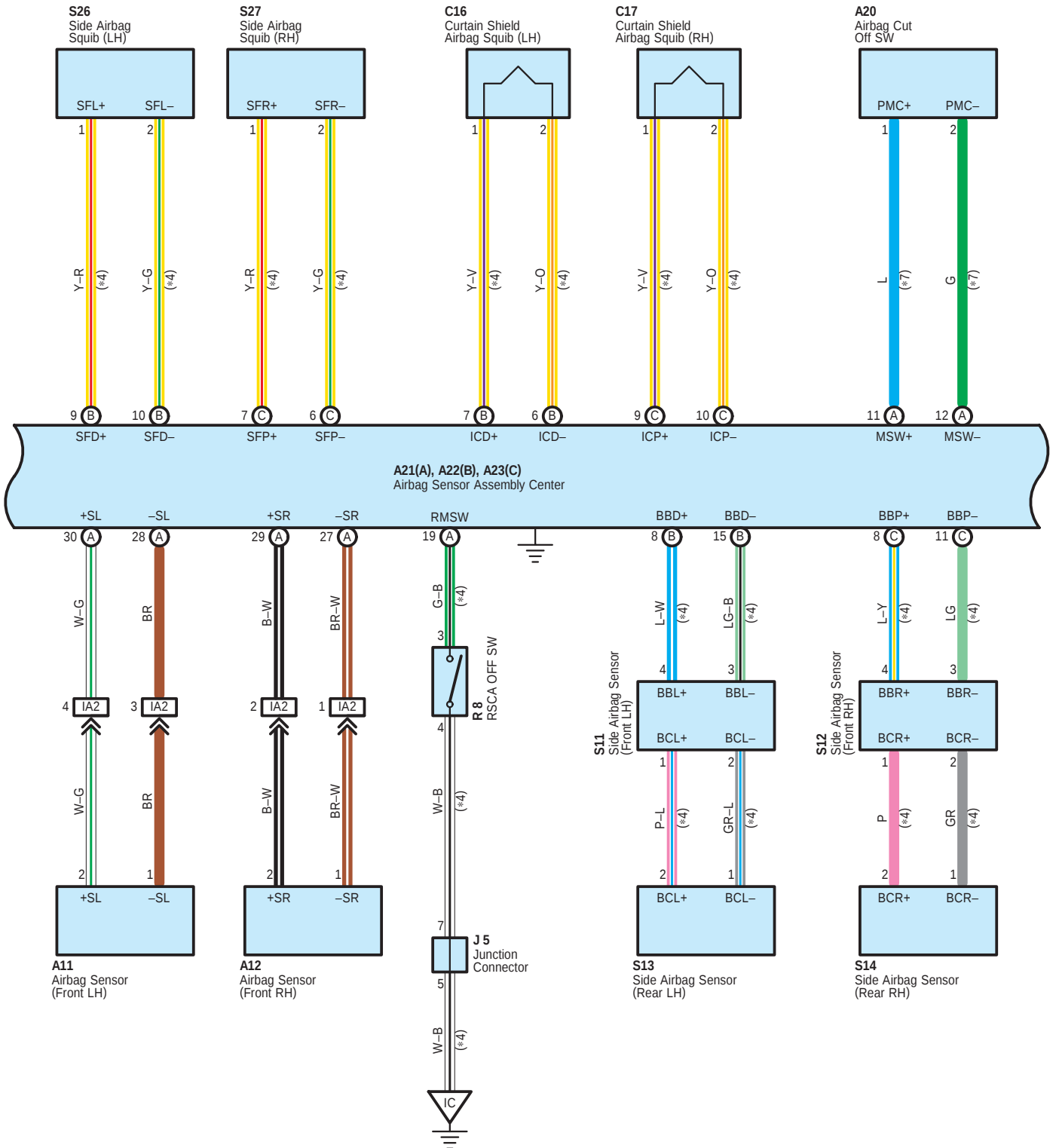
NOTICE: When inspecting or repairing the SRS, perform service in accordance with the following precautionary instructions and the procedure, and precautions in the Repair Manual applicable for the model year.

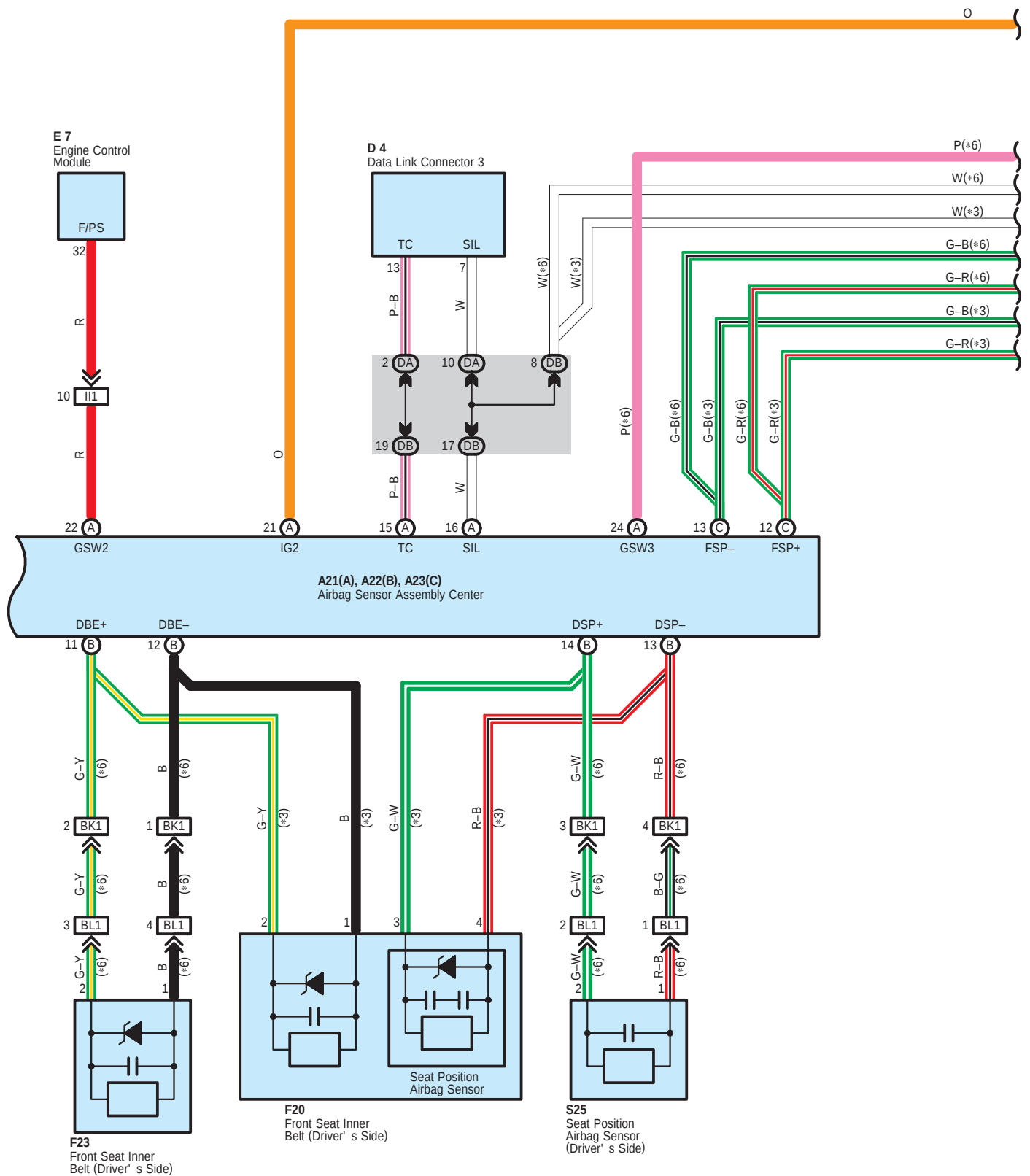
- Malfunction symptoms of the SRS are difficult to confirm, so the DTCs become the most important source of information when troubleshooting. When troubleshooting the SRS, always inspect the DTCs before disconnecting the battery.
- **Work must be started more than 90 seconds after the ignition SW is turned to the "LOCK" position and the negative (-) terminal cable is disconnected from the battery.**
(The SRS is equipped with a back-up power source so that if work is started within 90 seconds from disconnecting the negative (-) terminal cable of the battery, the SRS may deploy.)
- When the negative (-) terminal cable is disconnected from the battery, the memory of the clock and audio system will be cleared. So before starting work, make a record of the contents in the audio memory system. When work is finished, reset the audio systems as they were before and adjust the clock. Some vehicles have power tilt steering, power telescopic steering, power seat and power outside rear view mirror which are all equipped with memory function. However, it is not possible to make a record of these memory contents. So when the work is finished, it will be necessary to explain it to your customer, and ask the customer to adjust the features and reset the memory. To avoid erasing the memory in each system, never use a back-up power supply from outside the vehicle.
- Before repair, remove the airbag sensor if shocks are likely to be applied to the sensor during repair.
- Do not expose the following parts directly to hot air or flame;
- Even in cases of a minor collision where the SRS does not deploy, the following parts should be inspected;
- Never use SRS parts from another vehicle. When replacing parts, replace with new parts.
- For the purpose of reuse, never disassemble and repair the following parts.
- If the following parts have been dropped, or have cracks, dents and other defects in their case, bracket, and connector, replace with new one.
- Use a volt/ohmmeter with high impedance (10 k Ω /V minimum) for troubleshooting electrical circuits of the system.
- Information labels are attached to the periphery of the SRS components. Follow the instructions of the notice.
- After work on the SRS is completed, check the SRS warning light.
- If the vehicle is equipped with a mobile communication system, refer to the precaution in the IN section of the Repair Manual.

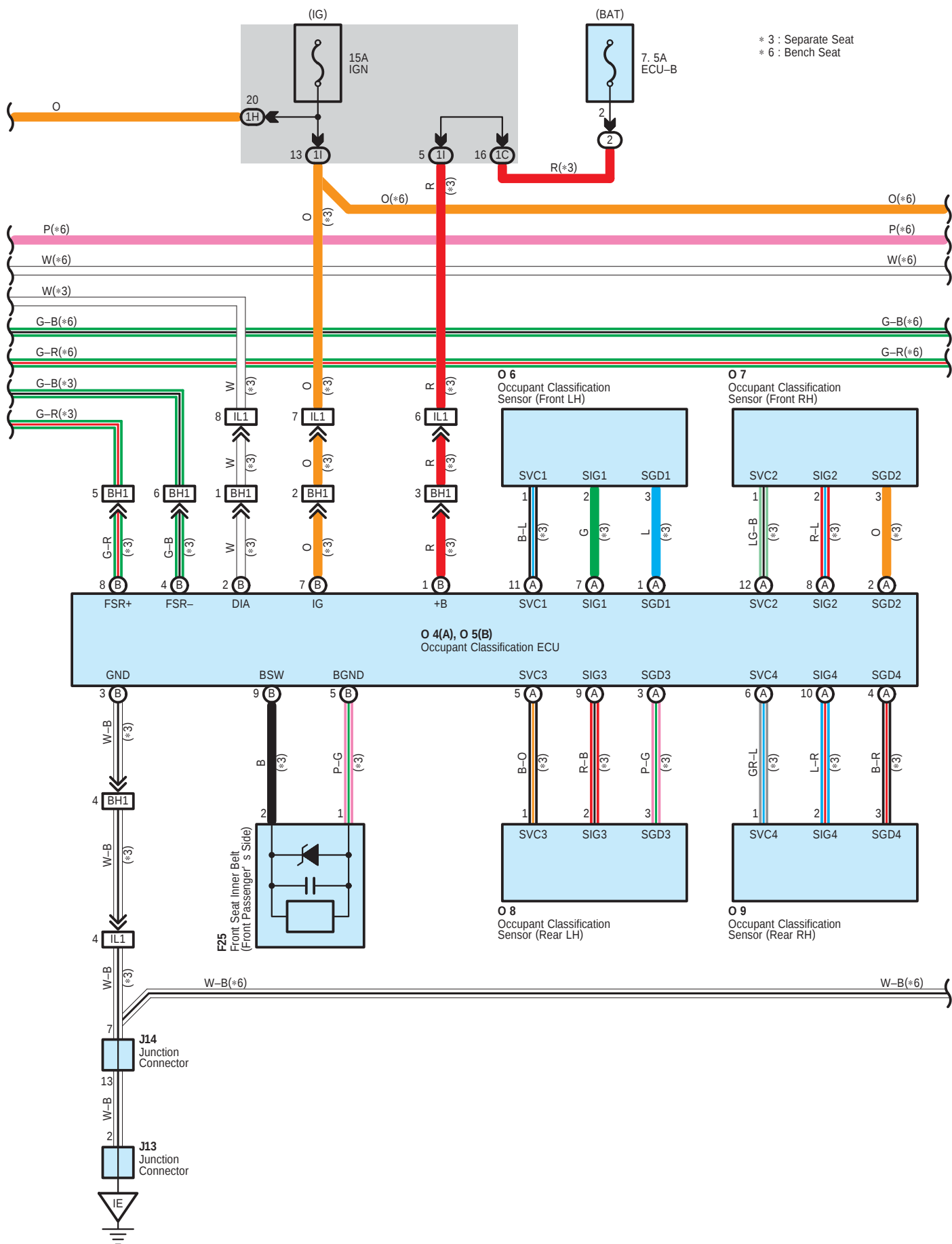
- * Steering wheel pad
- * Front passenger airbag assembly
- * Side airbag assembly
- * Curtain shield airbag assembly
- * Seat belt pretensioner
- * Center airbag sensor assembly
- * Front airbag sensor assembly
- * Side airbag sensor assembly
- * Rear airbag sensor assembly



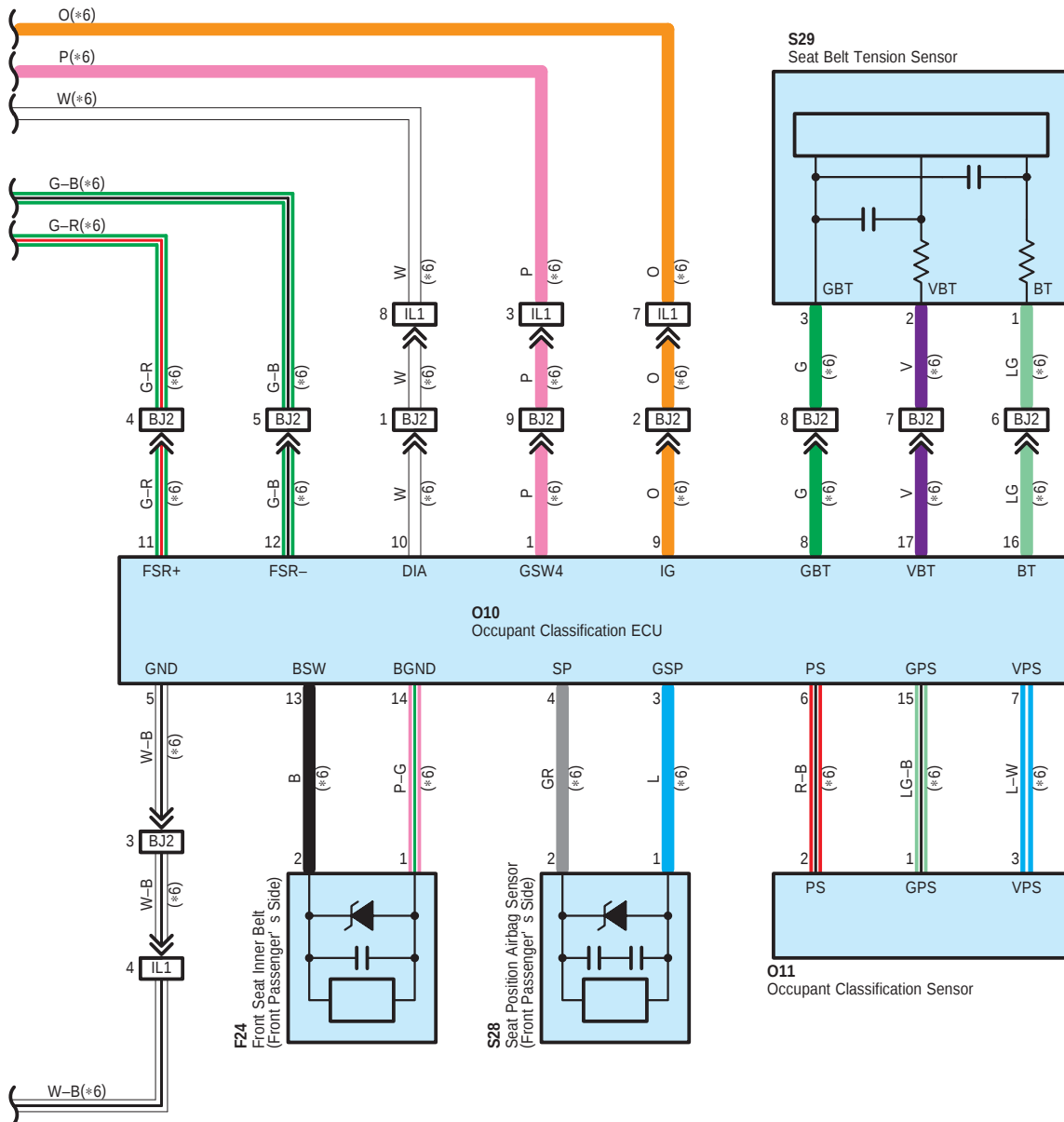
- * 1 : Access Cab
- * 2 : Except Access Cab
- * 4 : w/ Side Airbag
- * 7 : w/ Airbag Cut Off SW







* 6 : Bench Seat



System Outline

- * The system reaches an ignition judgment to deploy the following device based on the signals received from the front airbag sensor and deceleration sensor.
 - Driver Airbag
 - Front Passenger Airbag
 - Seat Belt Pretensioner
- * The system reaches an ignition judgment to deploy the following device based on the signals received from the side airbag sensors.
 - Side Airbags
 - Curtain Shield Airbags
- * The dual-stage SRS airbag system has been used for the driver and front passenger airbags. This system controls the optimal airbag inflation by judging the extent of impact, seat position (driver seat) and whether or not the seat belt is fastened (driver seat) and information from the Front Passenger Occupant Classification System.
- * The front passenger occupant classification system judges whether the front passenger seat is occupied by an adult or child (with child seat) or is unoccupied, according to the load applied to the front passenger seat and whether the seat belt is buckled. Based on the results, it restricts the deployment of the front passenger airbag, front passenger side airbag, and front passenger seat belt pretensioner. In addition, the system informs the driver of the result of the judgment through the use of the AIRBAG ON/OFF indicator lights.
- * The front passenger occupant classification system judges whether the front passenger seat is occupied by an adult or child (with child seat) or is unoccupied, according to the load applied to the front passenger seat, seat position (passenger), the load applied to the belt tension sensor (passenger), and whether the seat belt is buckled (passenger). Based on the results, it restricts the deployment of the front passenger airbag, front passenger side airbag, and front passenger seat belt pretensioner. In addition, the system informs the driver of the result of the judgment through the use of the AIRBAG ON/OFF indicator lights.
- * A Roll Sensing Curtain Shield Airbag system has been adopted in order to deploy the curtain shield airbags and the pretensioners, in the event that the vehicle rolls over.
- * A Roll Sensing Curtain Shield Airbag cutoff SW is provided near the driver side to enable the driver to disable this system.
- * The airbag manual ON–OFF switch is used to disable the deployment of the front and side airbags for the front passenger, such as when a child seat is installed on the front passenger seat.
- * The airbag sensor assembly transmits a signal to the engine control module in order to stop the fuel pump.

○ : Parts Location

Code	See Page	Code	See Page	Code	See Page
A11	40 (1GR–FE)	F17	48 (*2)	O7	50 (*4)
	42 (2TR–FE)		49 (*3)	O8	50 (*4)
A12	40 (1GR–FE)	F18	46 (*1)	O9	50 (*4)
	42 (2TR–FE)		48 (*2)	O10	51 (*5)
A20	44		49 (*3)	O11	51 (*5)
A21	A	F20	50 (*4)	R8	45
A22	B	F23	51 (*5)	S11	47 (*1)
A23	C	F24	51 (*5)	S12	47 (*1)
A24	A	F25	50 (*4)	S13	47 (*1)
A25	B	H7	45	S14	47 (*1)
A26	44	J1	45	S25	51 (*5)
C9	44	J5	45	S26	50 (*4)
C16	46 (*1)	J13	45	S27	50 (*4)
C17	46 (*1)	J14	45	S28	51 (*5)
D4	44	O4	A	S29	49 (*3)
E7	44	O5	B		
F17	46 (*1)	O6	50 (*4)		

○ : Relay Blocks

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

* 1 : Double Cab * 2 : Access Cab * 3 : Regular Cab * 4 : Separate Seat * 5 : Bench Seat



: Junction Block and Wire Harness Connector

Code	See Page	Junction Block and Wire Harness (Connector Location)
1C	28	Engine Room Main Wire and Driver Side J/B (Lower Finish Panel)
1H	29	Instrument Panel Wire and Driver Side J/B (Lower Finish Panel)
1I		
1J		
DA	34	Instrument Panel Wire and Instrument Panel J/B No.1 (Left Kick Panel)
DB		
PF	36	Instrument Panel Wire and Instrument Panel J/B No.2 (Right Side of Glove Box)



: Connector Joining Wire Harness and Wire Harness

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IA2	54	Instrument Panel Wire and Engine Room Main Wire (Left Kick Panel)
IG1	55	Instrument Panel Wire and Instrument Panel Assembly Wire (Behind the Glove Box)
II1	55	Instrument Panel Wire and Instrument Panel Wire (Instrument Panel Brace RH)
IJ1	55	Instrument Panel Wire and Instrument Panel Wire (Right Kick Panel)
IL1	55	Instrument Panel Wire and Floor Wire (Right Kick Panel)
BF2	57 (*2)	Rear Door No.2 Wire and Floor No.2 Wire (Under the Left Quarter Panel)
BG2	57 (*2)	Rear Door No.1 Wire and Floor Wire (Under the Right Quarter Panel)
BH1	60 (*4)	Floor Wire and Seat No.1 Wire (Under the Front Passenger's Seat)
BJ2	61 (*5)	Floor Wire and Seat No.1 Wire (Under the Front Seat RH)
BK1	61 (*5)	Floor No.2 Wire and Seat No.1 Wire (Under the Front Seat LH)
BL1	61 (*5)	Seat No.2 Wire and Seat No.1 Wire (Under the Front Seat LH)

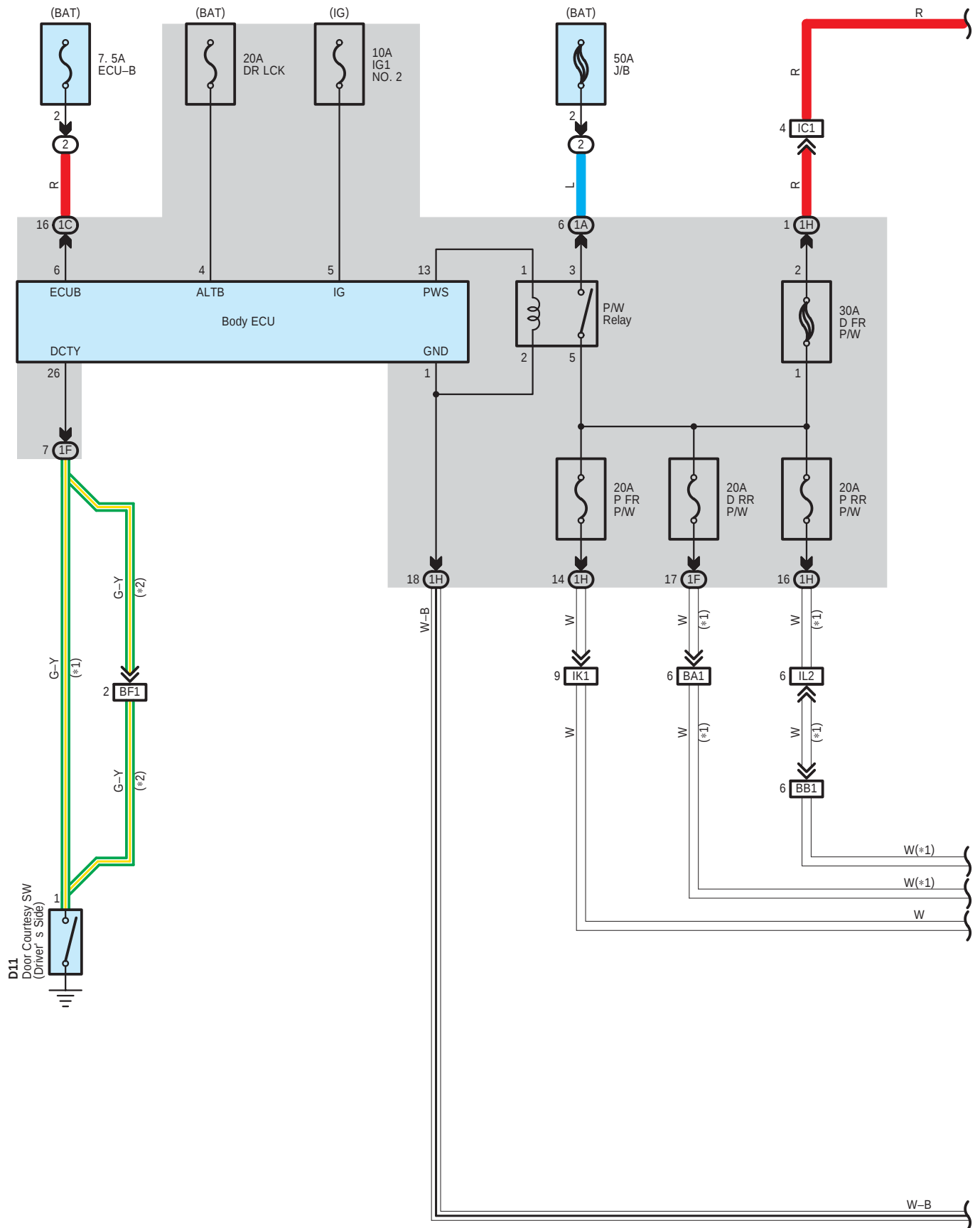


: Ground Points

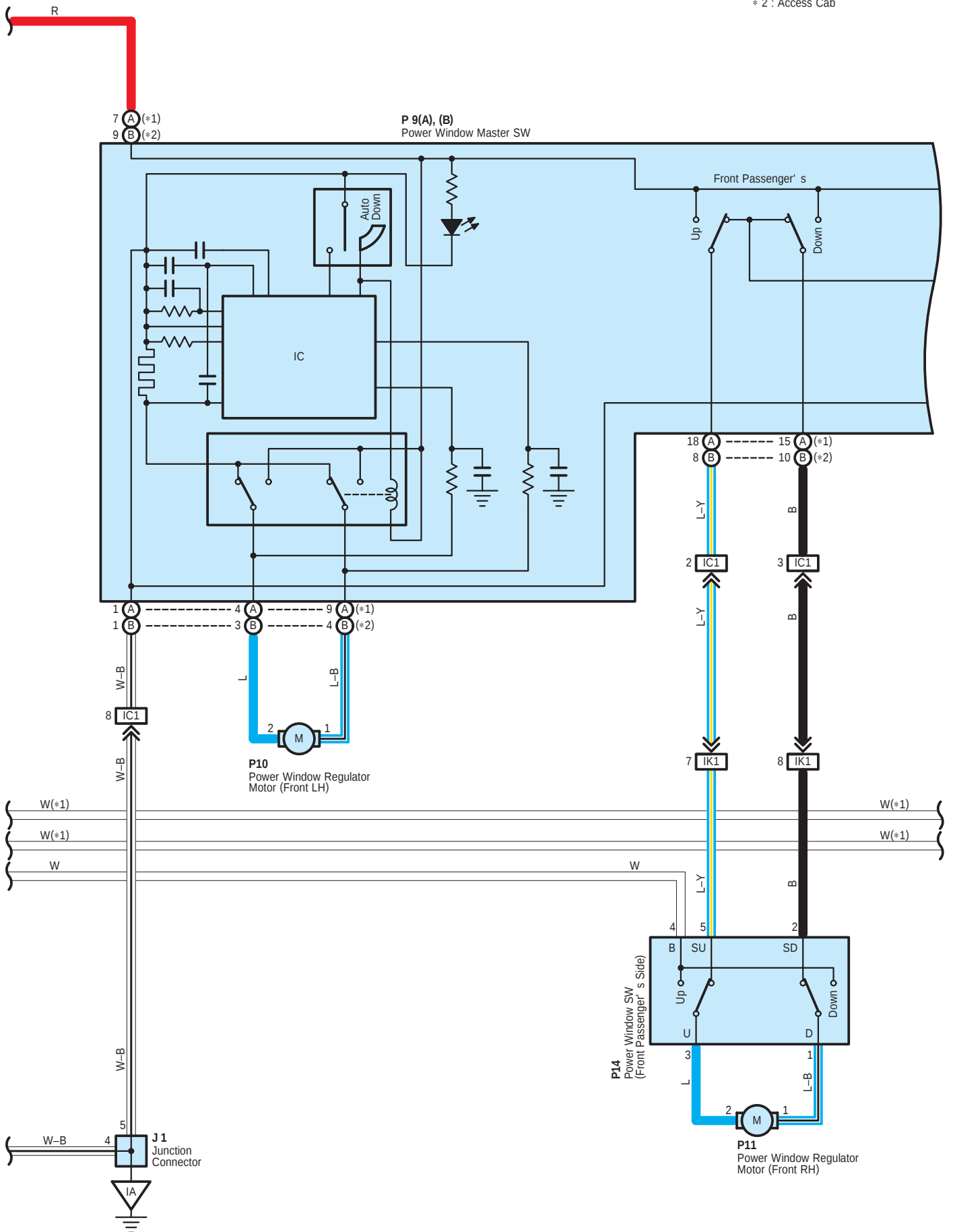
Code	See Page	Ground Points Location
IA	54	Left Kick Panel
IB	54	Instrument Panel Brace LH
IC	54	Instrument Panel Brace RH
IE	54	Right Kick Panel

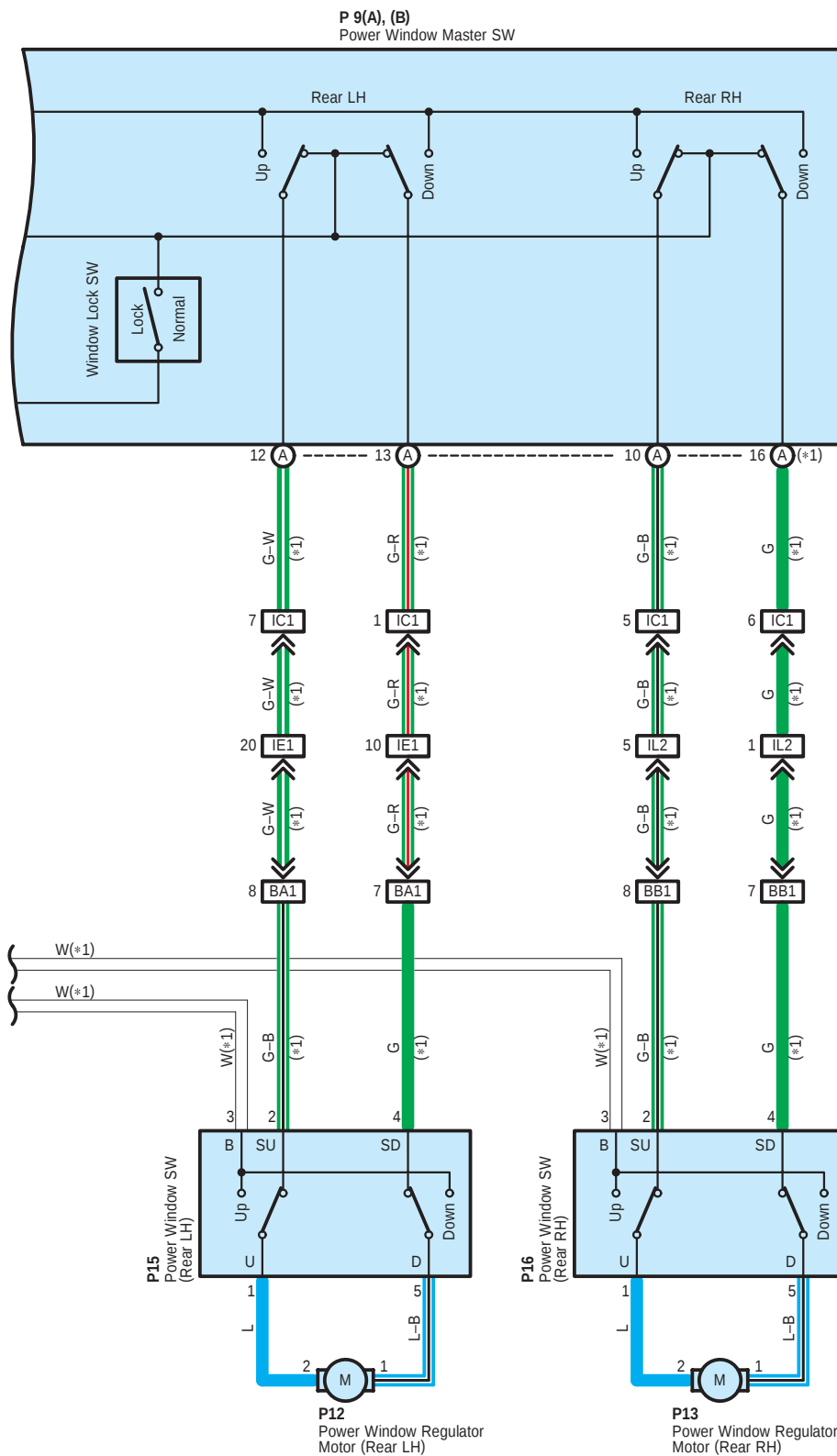
* 1 : Double Cab * 2 : Access Cab * 3 : Regular Cab * 4 : Separate Seat * 5 : Bench Seat

Power Window



* 1 : Double Cab
* 2 : Access Cab





System Outline

With the ignition SW turned on, current flows through the IG1 NO.2 fuse to TERMINAL 5 of the body ECU to TERMINAL 13 to TERMINAL 1 of the P/W relay to TERMINAL 2 to GROUND, activating the P/W relay, and the current flowing from TERMINAL 3 of the P/W relay flows to TERMINAL 5 to D FR P/W fuse to TERMINAL (A) 7 (Double cab), (B) 9 (Access cab) of the power window master SW, P FR P/W fuse to TERMINAL 4 of the power window SW (Front passenger's side), D RR P/W fuse to TERMINAL 3 of the power window SW (Rear LH), P RR P/W fuse to TERMINAL 3 of the power window SW (Rear RH).

1. Manual Operation (Driver's Window)

With the ignition SW turned on and with the power window master SW (Manual SW) in UP position, the current flowing to TERMINAL (A) 7 (Double cab), (B) 9 (Access cab) of the power window master SW flows to TERMINAL (A) 4 (Double cab), (B) 3 (Access cab) to TERMINAL 2 of the power window regulator motor (Front LH) to TERMINAL 1 to TERMINAL (A) 9 (Double cab), (B) 4 (Access cab) of the master SW to TERMINAL (A) 1 (Double cab), (B) 1 (Access cab) to GROUND and causes the power window regulator motor to rotate in the up direction. The window ascends only while the SW is being pushed.

In down operation, the current flowing from TERMINAL (A) 7 (Double cab), (B) 9 (Access cab) of the power window master SW to TERMINAL (A) 9 (Double cab), (B) 4 (Access cab) flows to TERMINAL 1 of the motor LH to TERMINAL 2 to TERMINAL (A) 4 (Double cab), (B) 3 (Access cab) of the master SW to TERMINAL (A) 1 (Double cab), (B) 1 (Access cab) to GROUND, flowing in the opposite direction to manual up operation, causing the motor to rotate in reverse and lowering the window.

2. Auto Down Operation (Driver's Window)

With the ignition SW on and with the auto SW of the power window master SW in DOWN position, the current flowing to TERMINAL (A) 7 (Double cab), (B) 9 (Access cab) of the master SW flows to TERMINAL (A) 9 (Double cab), (B) 4 (Access cab) of the master SW to TERMINAL 1 of the power window regulator motor (Front LH) to TERMINAL 2 to TERMINAL (A) 4 (Double cab), (B) 3 (Access cab) of the master SW to TERMINAL (A) 1 (Double cab), (B) 1 (Access cab) to GROUND, causing the motor to rotate towards the down side.

Then the solenoid in the master SW is activated and it locks the auto SW being pushed, causing the motor to continue to rotate in auto down operation.

When the window has completely descended, the current flowing between TERMINAL (A) 4 (Double cab), (B) 3 (Access cab) of the master SW and TERMINAL (A) 1 (Double cab), (B) 1 (Access cab) increases. As a result, the solenoid stops operating, the auto SW turns off and the flowing from TERMINAL (A) 7 (Double cab), (B) 9 (Access cab) of the master SW to TERMINAL (A) 9 (Double cab), (B) 4 (Access cab) is cut off, stopping the motor so that auto stop occurs.

3. Stopping of Auto Down at Driver's Window

When the manual SW (Driver's) is pushed to the up side during auto down operation, a ground circuit opens in the master SW and current does not flow from TERMINAL (A) 4 (Double cab), (B) 3 (Access cab) of the master SW to TERMINAL (A) 1 (Double cab), (B) 1 (Access cab), so the motor stops, causing auto down operation to stop. If the manual SW is pushed continuously, the motor rotates in the up direction in manual up operation.

4. Manual Operation by Power Window Control SW (Front RH Window)

With the power window SW (Front passenger's side) is pushed to the up side, the current flowing from TERMINAL 4 of the power window SW (Front passenger's side) flows to TERMINAL 3 to TERMINAL 2 of the power window regulator motor (Front RH) to TERMINAL 1 to TERMINAL 1 of the power window SW (Front passenger's side) to TERMINAL 2 to TERMINAL (A) 15 (Double cab), (B) 10 (Access cab) of the master SW to TERMINAL (A) 1 (Double cab), (B) 1 (Access cab) to GROUND. This causes the power window regulator motor (Front RH) to rotate in the up direction. Up operation is continuous only while the power window control SW RH is pushed to the up side. When the window descends, the current flowing to the motor flows in the opposite direction, from TERMINAL 1 to TERMINAL 2, and the motor rotates in reverse.

When the window lock SW is pushed to the lock side, the ground circuit to the front RH window becomes open. As a result, even if Open/Close operation of the front RH window is tried, the current from TERMINAL (A) 1 (Double cab), (B) 1 (Access cab) of the power window master SW is not grounded and the motor does not rotate, so the front RH window can not be operated and window lock occurs.

Power Window

5. Manual Operation (Rear LH, RH Window) [Double Cab]

With the power window SW (Rear LH, RH) pulled to the up side, the current flowing from TERMINAL 3 of the power window SW flows to TERMINAL 1 to TERMINAL 2 of the power window regulator motor to TERMINAL 1 to TERMINAL 5 of the power window SW to TERMINAL 4 to TERMINAL (A) 13 (LH) or (A) 16 (RH) of the master SW to TERMINAL (A) 1 to GROUND and causes the power window regulator motor (Rear LH, RH) to rotate in the up direction. The up operation continues only while the power window control SW is pulled to the up side. When the window descends, the current flowing to the motor flows in the opposite direction, from TERMINAL 2 to TERMINAL 1, and the motor rotates in reverse. When the window lock SW is pushed to the lock side, the ground circuit to the rear LH, RH window becomes open.

As a result, even if Open/Close operation of the rear LH, RH window is tried, the current from TERMINAL (A) 1 of the power window master SW is not grounded and the motor does not rotate, so the rear LH, RH window can not be operated and window lock occurs.

6. Key Off Power Window Operation

With the ignition SW turned from on to off, the body ECU operates for about 45 seconds and current flows from TERMINAL 1 of the P/W relay to TERMINAL 2 to GROUND. For this period, current also flows TERMINAL 1 to TERMINAL 2. This current flows to TERMINAL (A) 7 (Double cab), (B) 9 (Access cab) of the power window master SW and to TERMINAL 4 (Front RH), 3 (Rear) of the power window SW. As a result, for about approx. 43 seconds after the ignition SW is turned off, it is possible to raise and lower the power window by the functioning of the body ECU. Also, by opening the door (Door courtesy SW on) within about 45 seconds after turning the ignition SW to off, a signal is input to the body ECU. As a result, the body ECU turns off, and up and down movement of the window stops.

: Parts Location

Code	See Page	Code	See Page	Code	See Page
D11	46 (*1)	P10	47 (*1)	P13	47 (*1)
	48 (*2)		48 (*2)	P14	47 (*1)
J1	45	P11	47 (*1)		48 (*2)
P9	A 47 (*1)		48 (*2)	P15	47 (*1)
	B 48 (*2)	P12	47 (*1)	P16	47 (*1)

: 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)
1A	28	Engine Room Main Wire and Driver Side J/B (Lower Finish Panel)
1C		
1F	28	Floor No.2 Wire and Driver Side J/B (Lower Finish Panel)
1H	29	Instrument Panel Wire and Driver Side J/B (Lower Finish Panel)

: Connector Joining Wire Harness and Wire Harness

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IC1	54	Front Door LH Wire and Instrument Panel Wire (Left Kick Panel)
IE1	54	Instrument Panel Wire and Floor No.2 Wire (Left Kick Panel)
IK1	55	Front Door RH Wire and Instrument Panel Wire (Right Kick Panel)
IL2	55	Instrument Panel Wire and Floor Wire (Right Kick Panel)
BA1	56 (*1)	Rear Door No.2 Wire and Floor No.2 Wire (Under the Left Center Pillar)
BB1	56 (*1)	Rear Door No.1 Wire and Floor Wire (Under the Right Center Pillar)
BF1	57 (*2)	Rear Door No.2 Wire and Floor No.2 Wire (Under the Left Quarter Panel)

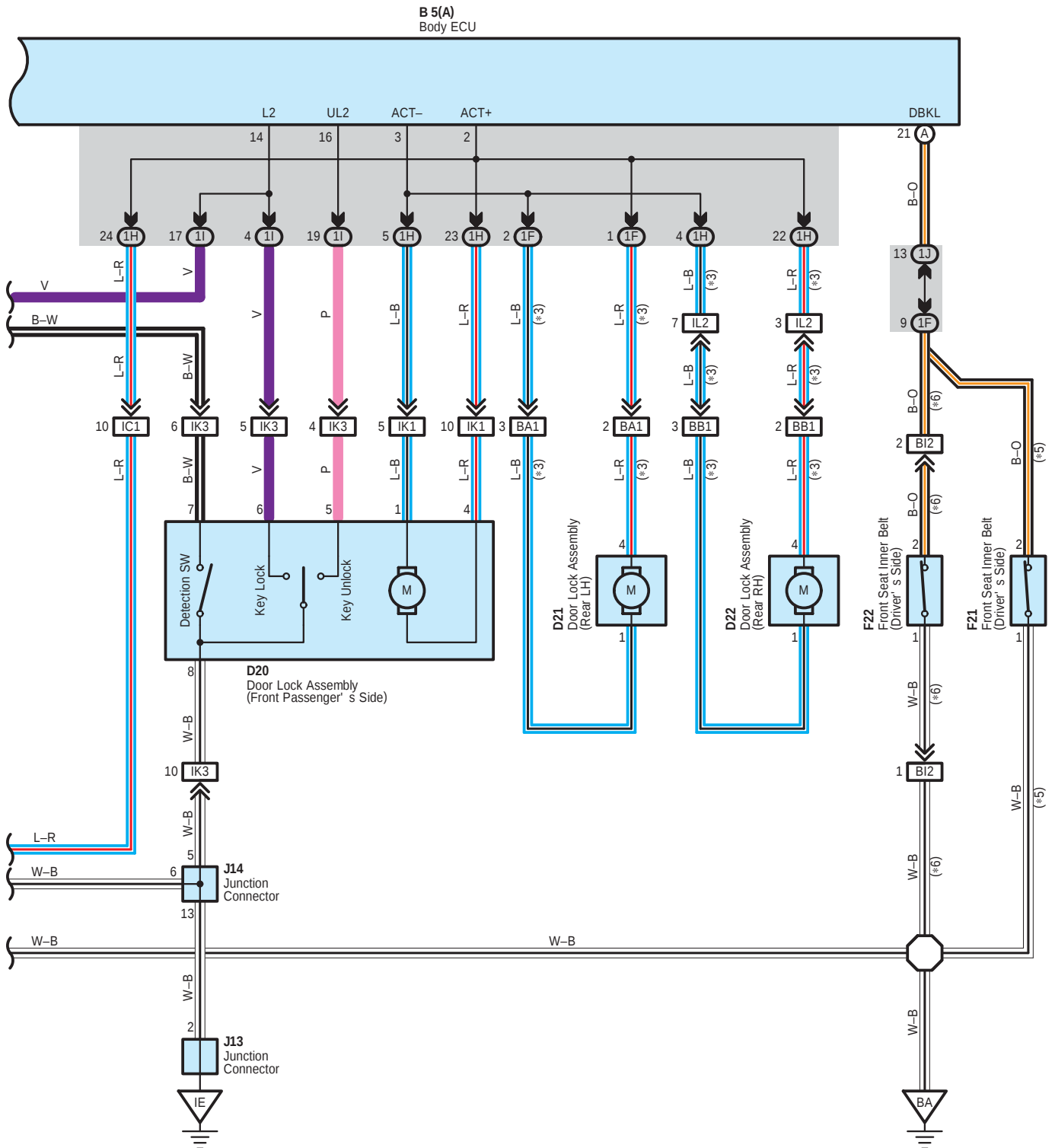
: Ground Points

Code	See Page	Ground Points Location
IA	54	Left Kick Panel

* 1 : Double Cab * 2 : Access Cab * 3 : Regular Cab * 4 : Separate Seat * 5 : Bench Seat



- * 3 : Double Cab
- * 4 : Access Cab
- * 5 : Separate Seat
- * 6 : Bench Seat



Door Lock Control

System Outline

1. Manual Unlock Operation

When the door lock control SW of the driver's or passenger's side door is pushed to UNLOCK, the door lock will unlock.

2. Manual Lock Operation

When the door lock control SW of the driver's or passenger's side door is pushed to LOCK, the door lock will lock.

3. Door Key Unlock Operation

* Unlock operation from driver's side door

When the driver's side door is unlocked once using the ignition key, only the driver's side door is unlocked. If this operation is repeated within 3 seconds, all the other doors are unlocked.

* Unlock operation from front passenger's side door

When the front passenger's side door is unlocked using the ignition key, all the other doors are unlocked, too.

○ : Parts Location

Code		See Page	Code	See Page	Code	See Page
B5	A	44	D22	46 (*1)	J13	45
D19		46 (*1)	D23	46 (*1)	J14	45
		48 (*2)		48 (*2)	P9	A
D20		46 (*1)	F21	50 (*4)		B
		48 (*2)	F22	51 (*5)	U1	45
D21		46 (*1)	J1	45		

○ : 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)
1C	28	Engine Room Main Wire and Driver Side J/B (Lower Finish Panel)
1F	28	Floor No.2 Wire and Driver Side J/B (Lower Finish Panel)
1H	29	Instrument Panel Wire and Driver Side J/B (Lower Finish Panel)
1I		
1J		
1K		

□ : Connector Joining Wire Harness and Wire Harness

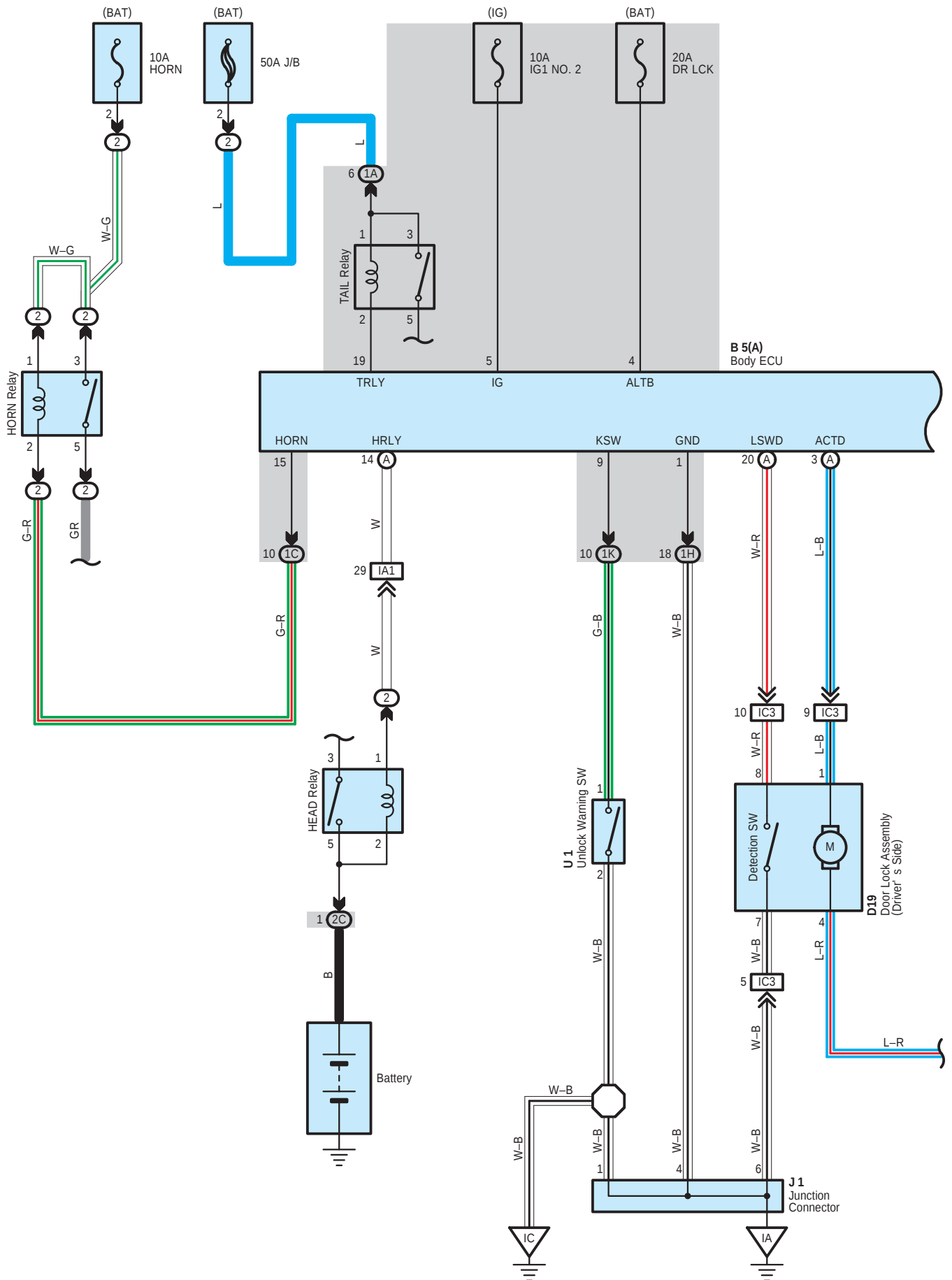
Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IC1	54	Front Door LH Wire and Instrument Panel Wire (Left Kick Panel)
IC3		
IK1	55	Front Door RH Wire and Instrument Panel Wire (Right Kick Panel)
IK3		
IL2	55	Instrument Panel Wire and Floor Wire (Right Kick Panel)
BA1	56 (*1)	Rear Door No.2 Wire and Floor No.2 Wire (Under the Left Center Pillar)
BB1	56 (*1)	Rear Door No.1 Wire and Floor Wire (Under the Right Center Pillar)
BI2	61 (*5)	Floor No.2 Wire and Seat No.1 Wire (Under the Front Seat LH)

▽ : Ground Points

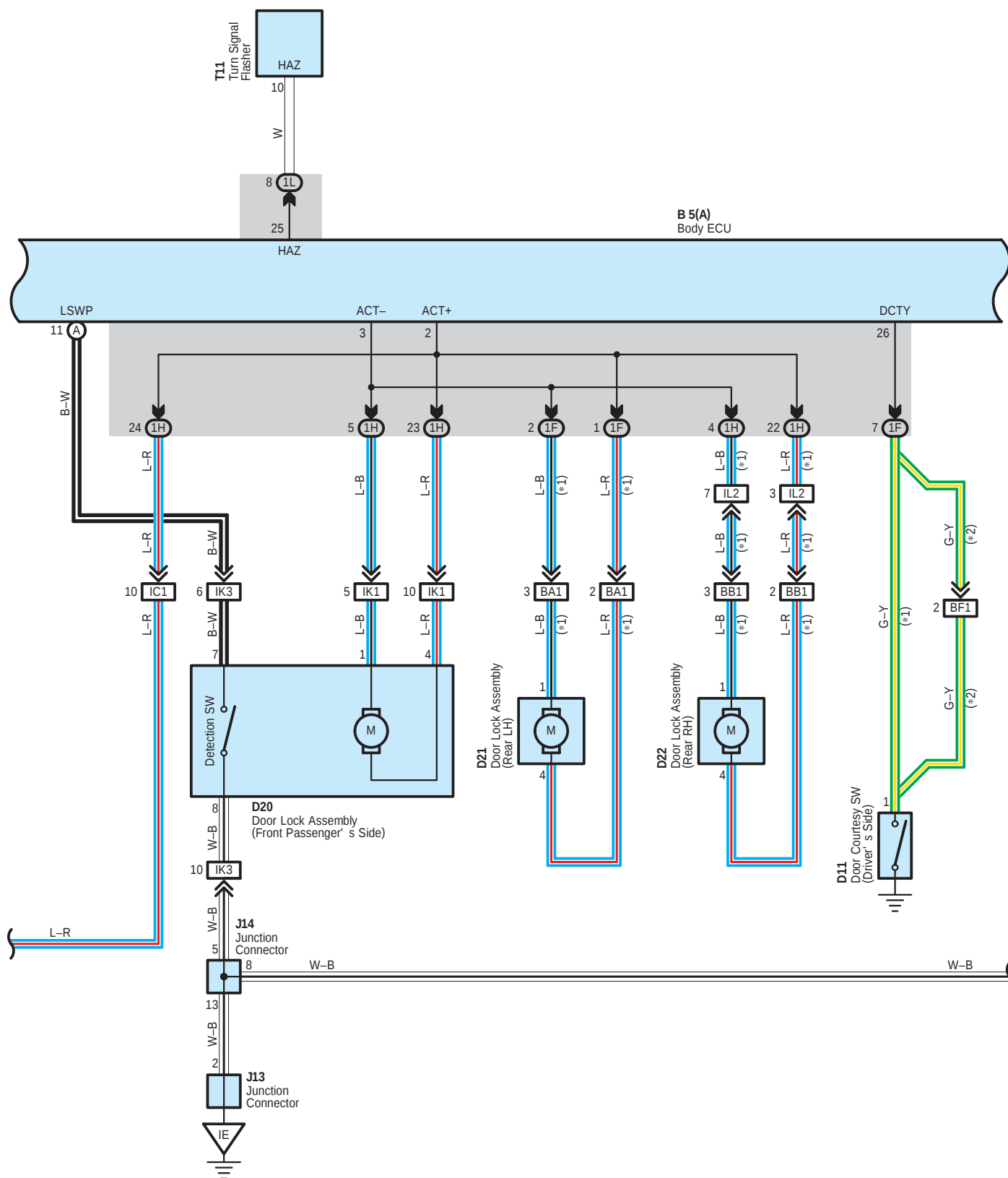
Code	See Page	Ground Points Location
IA	54	Left Kick Panel
IC	54	Instrument Panel Brace RH
IE	54	Right Kick Panel
BA	56 (*1)	Floor Seat Cross Member LH
	57 (*2)	

* 1 : Double Cab * 2 : Access Cab * 3 : Regular Cab * 4 : Separate Seat * 5 : Bench Seat

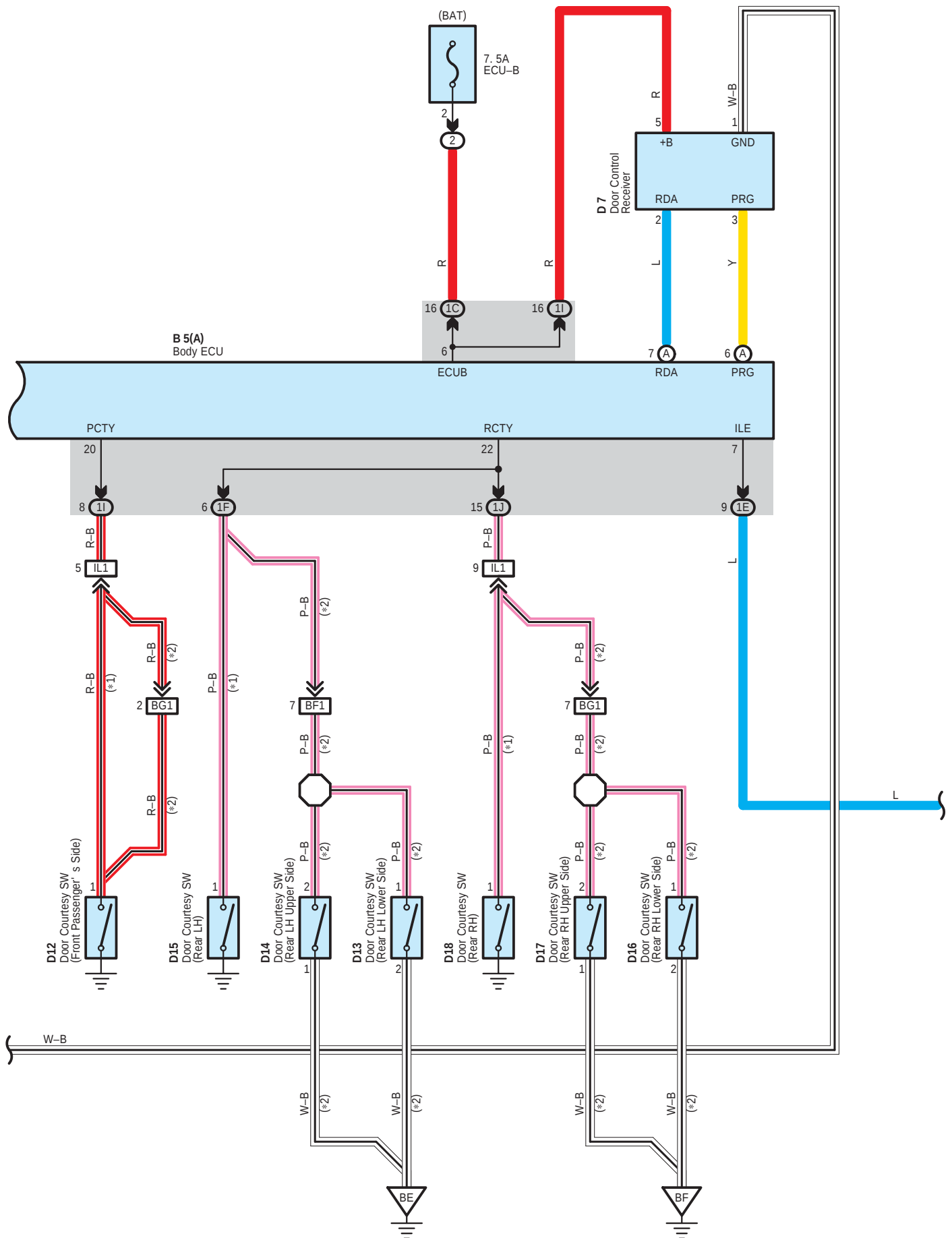
Wireless Door Lock Control

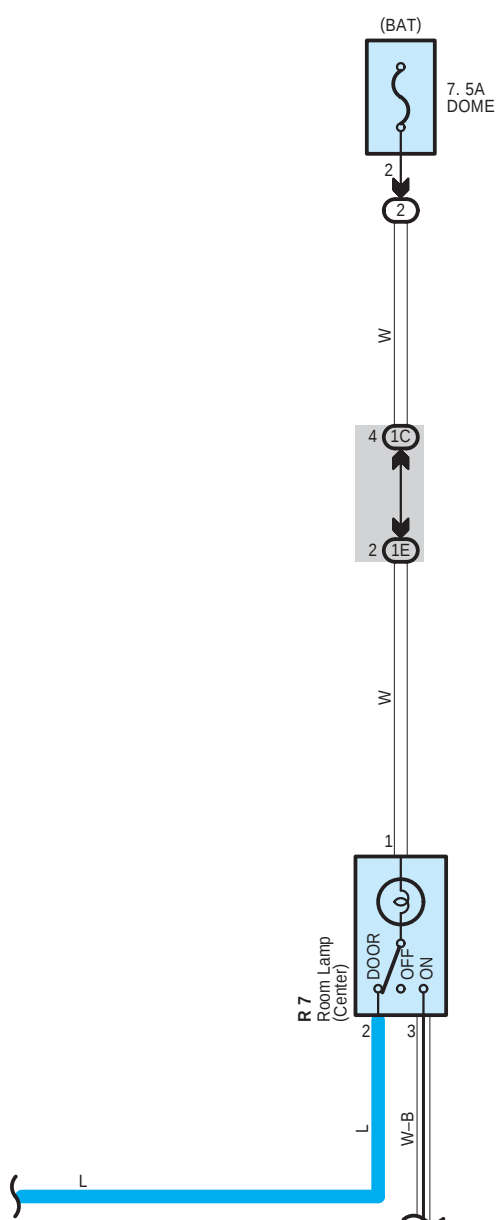


- * 1 : Double Cab
- * 2 : Access Cab



Wireless Door Lock Control





* 1 : Double Cab
* 2 : Access Cab

Wireless Door Lock Control

System Outline

Door lock control (Lock and unlock) and panic control (Theft alarm and flash) is performed by remote control, without the ignition key inserted in the door key cylinder, using low-power electrical waves emitted by a transmitter.

1. Normal Operation

* Lock operation

When the lock SW on the transmitter is pressed, all the doors are locked.

* Unlock operation

When the unlock SW on the transmitter is pressed once, only the driver door is unlocked. When the unlock SW is pressed again within 3 seconds, all the doors are unlocked.

2. Auto Lock Function

When the door is not actually opened within 30 seconds after the door has been unlocked by the unlock SW on the transmitter, all the doors are automatically locked. If any of the following conditions are detected, the wireless door lock does not function.

* Any door is opened.

* The ignition key is inserted into the ignition SW.

* When the lock detection SW of all the doors are locked.

3. Wireless Door Lock Stop Function

If any of the following conditions are detected, the wireless door lock does not function.

Lock operation

* When any door is open (Door courtesy SW on)

* The ignition key is inserted into the ignition SW (Unlock warning SW on)

* Ignition SW is on

Unlock operation

* Ignition SW is on

4. Visual Confirmation of Lock or Unlock

During lock operation, when the body ECU receives a lock signal from the door lock detection SW, the turn signal light is flashed once. During unlock operation, when the body ECU receives an unlock signal from the door lock detection SW, the turn signal light is flashed twice.

5. Remote Panic Operation

Panic will function when doors are locked or unlocked, open or closed. When the panic button (Transmitter) is pushed once, interior lights light up, and theft alarm and horn sounds and turn signal light, headlights and taillight flash. Then, the panic or the unlock button (Transmitter) is pushed once more, interior lights are turned off, sounding and flashing will stop. Panic will not function when ignition key is in ignition key cylinder.

6. Repeat Function

If the lock detection signal in response to the output signal is not received after the body ECU has output the lock signal, the lock signal is output again.

7. Illuminated Entry Function

When the body ECU detects the unlock state after the unlock operation has been made, it turns on the lights, such as the interior light for approx. 15 sec. If all the doors are locked during this operation, lighting is cancelled and the lights immediately fade out.

○ : Parts Location

Code	See Page	Code	See Page	Code	See Page
B5	A 44	D16	48 (*2)	J1	45
D7	44	D17	48 (*2)	J13	45
D11	46 (*1)	D18	46 (*1)	J14	45
	48 (*2)	D19	46 (*1)	R7	47 (*1)
D12	46 (*1)		48 (*2)		48 (*2)
	48 (*2)	D20	46 (*1)	T11	45
D13	48 (*2)		48 (*2)	U1	45
D14	48 (*2)	D21	46 (*1)		
D15	46 (*1)	D22	46 (*1)		

* 1 : Double Cab * 2 : Access Cab * 3 : Regular Cab * 4 : Separate Seat * 5 : Bench Seat

 : 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)
1A	28	Engine Room Main Wire and Driver Side J/B (Lower Finish Panel)
1C		
1E	28	Roof Wire and Driver Side J/B (Lower Finish Panel)
1F	28	Floor No.2 Wire and Driver Side J/B (Lower Finish Panel)
1H	29	Instrument Panel Wire and Driver Side J/B (Lower Finish Panel)
1I		
1J		
1K		
1L	29	Relay Wire and Driver Side J/B (Lower Finish Panel)
2C	24	Engine Room Main Wire and Engine Room J/B (Engine Compartment Left)

 : Connector Joining Wire Harness and Wire Harness

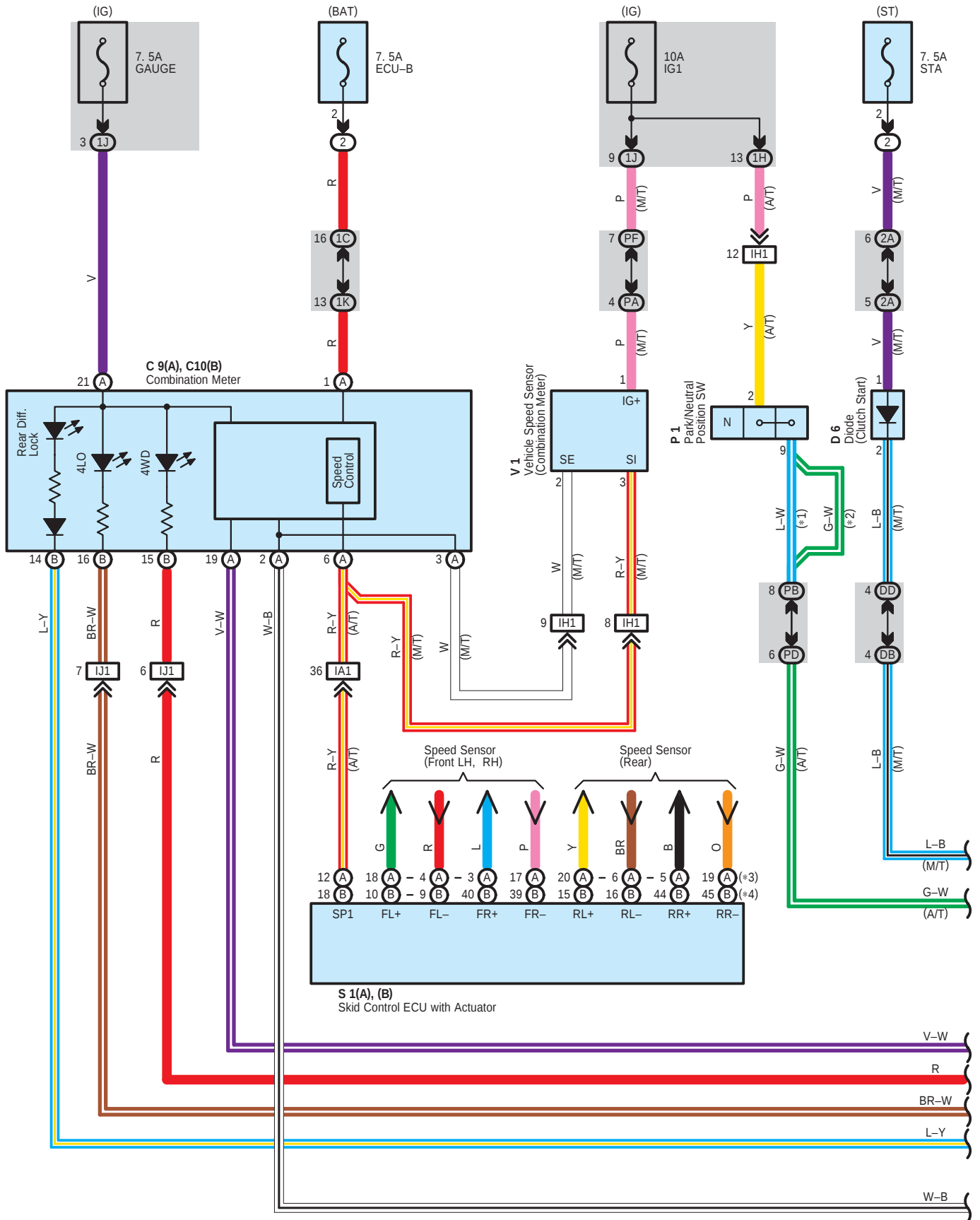
Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IA1	54	Instrument Panel Wire and Engine Room Main Wire (Left Kick Panel)
IC1	54	Front Door LH Wire and Instrument Panel Wire (Left Kick Panel)
IC3		
IK1	55	Front Door RH Wire and Instrument Panel Wire (Right Kick Panel)
IK3		
IL1	55	Instrument Panel Wire and Floor Wire (Right Kick Panel)
IL2		
BA1	56 (*1)	Rear Door No.2 Wire and Floor No.2 Wire (Under the Left Center Pillar)
BB1	56 (*1)	Rear Door No.1 Wire and Floor Wire (Under the Right Center Pillar)
BF1	57 (*2)	Rear Door No.2 Wire and Floor No.2 Wire (Under the Left Quarter Panel)
BG1	57 (*2)	Rear Door No.1 Wire and Floor Wire (Under the Right Quarter Panel)

 : Ground Points

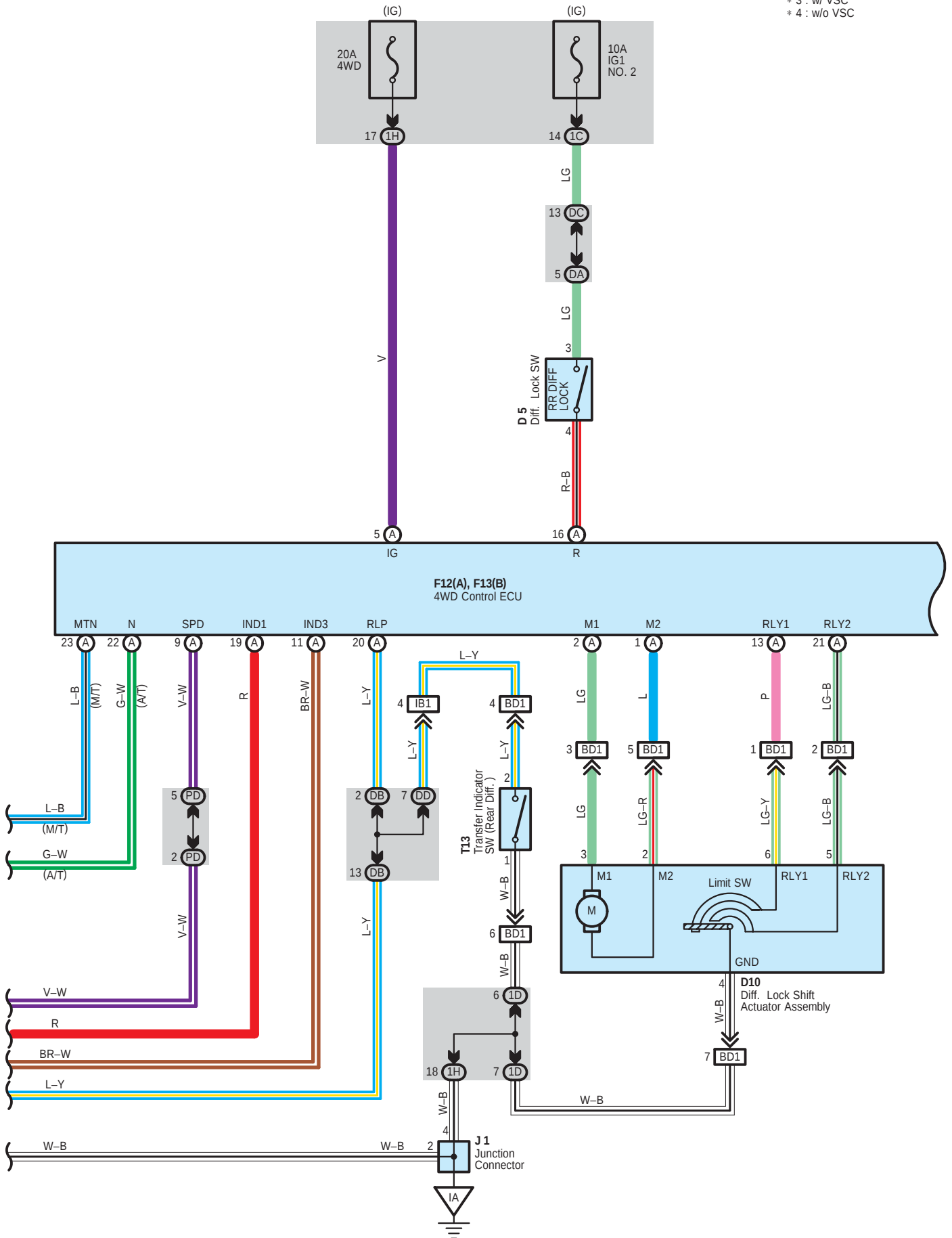
Code	See Page	Ground Points Location
IA	54	Left Kick Panel
IC	54	Instrument Panel Brace RH
IE	54	Right Kick Panel
BE	57 (*2)	Inside of the Access Door LH
BF	57 (*2)	Inside of the Access Door RH

* 1 : Double Cab * 2 : Access Cab * 3 : Regular Cab * 4 : Separate Seat * 5 : Bench Seat

Multi Mode 4WD and Rear Differential Lock (4WD)

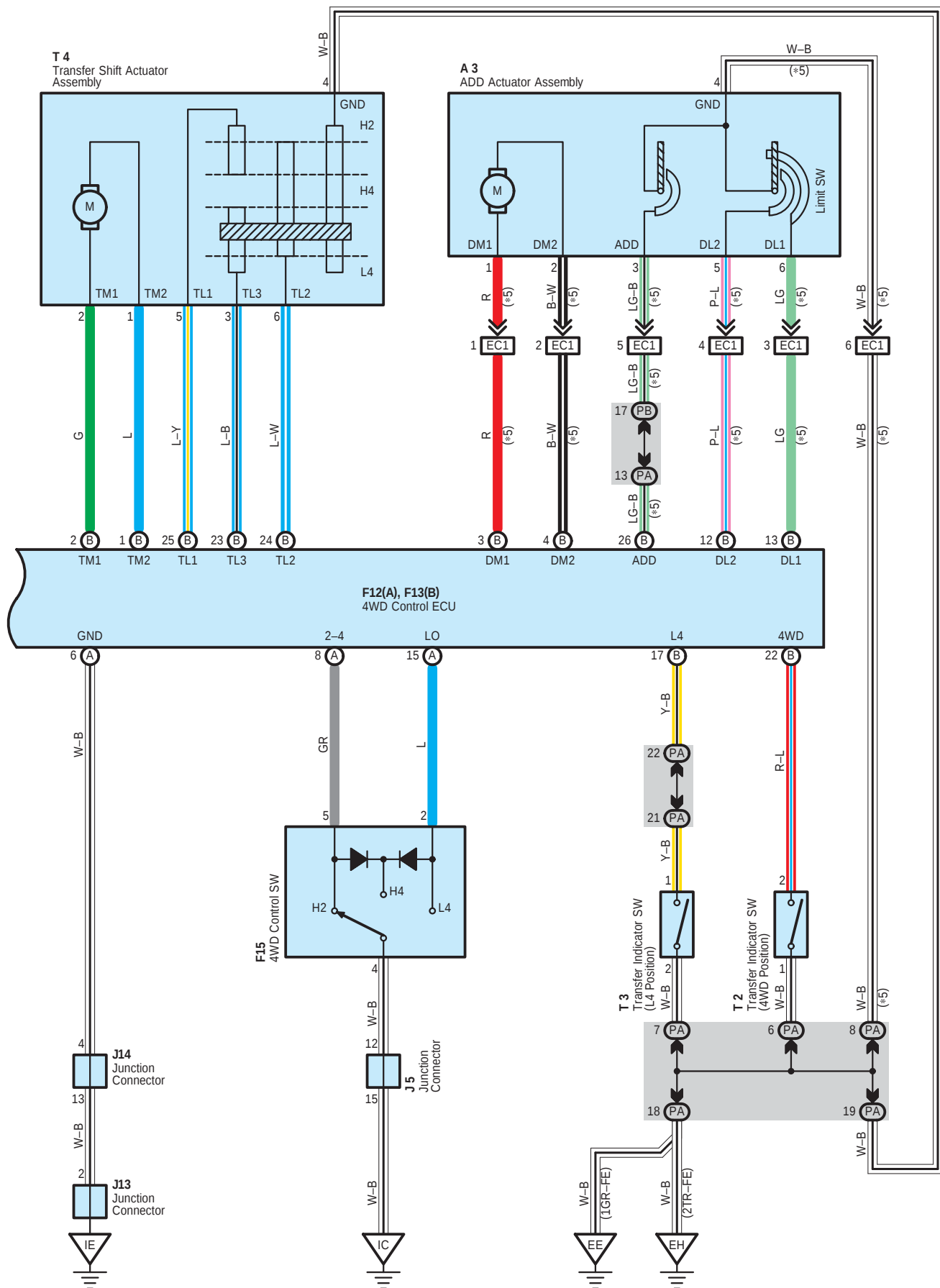


- * 1 : 1GR-FE A/T
- * 2 : 2TR-FE A/T
- * 3 : w/ VSC
- * 4 : w/o VSC



Multi Mode 4WD and Rear Differential Lock (4WD)

* 5 : w/ ADD



System Outline

Depending on the transfer shift actuator status and ADD actuator status, the 4WD control ECU drives the transfer shift actuator and ADD actuator to electrically change the gear position selected by the driver according to vehicle speed signal and neutral start switch signal.

1. Shift Select Control

Shifting from H2 into H4 position

When the 4WD control switch is turned from H2 into H4, this signal is input into 4WD control ECU (TERMINAL 2–4). Then, the 4WD control ECU moves the 2–4 select motor (TERMINAL 2, TERMINAL 1) in the transfer shift actuator assembly until the shift fork shaft shifts to the diff. free position, performing a shift into H4 position

Shifting from H4 into L4 position

When the 4WD control switch is turned from H4 into L4, this signal is input into 4WD control ECU (TERMINAL LO). Then, the 4WD control ECU drives the 2–4 select motor (TERMINAL 2, TERMINAL 1) in the transfer shift actuator assembly, shifting the shift fork shaft, performing a shift into L4 position.

Switching diff. lock ON when in L4 position.

When the diff. lock switch is turned ON with the 4WD control switch in L4 position, this signal is input into the 4WD control ECU (TERMINAL R). Then, the 4WD control ECU drives the diff. lock shift actuator (TERMINAL 2, TERMINAL 3) in the diff. lock shift actuator assembly until the shift fork shaft shifts to the diff. lock position, locking it in L4 position with the diff. lock.

2. Function of Limit Switch

Rear diff. lock limit switch (TERMINAL 5 and TERMINAL 6 of diff. lock shift actuator assembly)

The rear diff. lock limit switch in the diff. lock shift actuator assembly feeds back the current rear diff. lock status (Free or lock) information, which is based on the ON/OFF combination of the two switches, to the 4WD control ECU.

4WD limit switch (TERMINAL 3, TERMINAL 5 and TERMINAL 6 of transfer shift actuator assembly)

The 4WD limit switch in the transfer shift actuator assembly feeds back the current shift position status (H2 or H4) and diff. lock or diff. free status information, which is based on the ON/OFF combination of the three switches, to the 4WD control ECU.

ADD limit switch (TERMINAL 6 and TERMINAL 5 of ADD actuator assembly)

The ADD limit switch in the ADD actuator assembly feeds back the current front diff. lock or free status information, which is based on the ON/OFF combination of the two switches, to the 4WD control ECU.

3. Shift Limit Control

The 4WD control ECU interrupts the shift select control and give the driver a warning by means of buzzer (Integrated into the ECU) sound and blinking indicator light on the combination meter when the following shift change conditions exist.

The warning, however, can be canceled — when the 4WD control switch is canceled and the switch position is returned to where it was before the warning occurred.

- * Shift change from H2 into H4 with vehicle traveling at a speed reaching or exceeding 100 km/h (Buzzer sound and blinking 4WD indicator lights)
- * Shift change from H4 into L4 with vehicle traveling at a speed reaching or exceeding 5 km/h but within the A/T shift position N range (Buzzer sound and blinking 4LO indicator light) (A/T)
- * Shift change from H4 into L4 with vehicle traveling at a speed reaching or exceeding 3 km/h but within the clutch start SW on position (Buzzer sound and blinking 4LO indicator light) (M/T)

4. ADD Actuator Control (1GR-FE)

When switching between H2 (2WD) and H4 (4WD), the 4WD control ECU controls the way power is supplied to the ADD motor in the ADD actuator assembly, as shown below, to run the ADD motor in normal or reverse direction, thereby changing the status of the front diff. from free to lock, or vice versa.

For locking front diff.	TERMINAL DM1 +B
	TERMINAL DM2 GROUND
For unlocking front diff.	TERMINAL DM1 GROUND
	TERMINAL DM2 +B

Multi Mode 4WD and Rear Differential Lock (4WD)

: Parts Location

Code	See Page	Code	See Page	Code	See Page
A3	40 (1GR-FE)	F15	44	T2	41 (1GR-FE)
	42 (2TR-FE)	J1	45		43 (2TR-FE)
C9	A	J5	45	T3	41 (1GR-FE)
C10	B	J13	45		43 (2TR-FE)
D5	44	J14	45	T4	41 (1GR-FE)
D6	44	P1	41 (1GR-FE)		43 (2TR-FE)
D10	46 (*1)		43 (2TR-FE)	T13	47 (*1)
	48 (*2)	S1	41 (1GR-FE)		48 (*2)
	49 (*3)		43 (2TR-FE)		49 (*3)
F12	A		41 (1GR-FE)	V1	41 (1GR-FE)
F13	B		43 (2TR-FE)		43 (2TR-FE)

: 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)
1C	28	Engine Room Main Wire and Driver Side J/B (Lower Finish Panel)
1D	28	Frame Wire and Driver Side J/B (Lower Finish Panel)
1H	29	Instrument Panel Wire and Driver Side J/B (Lower Finish Panel)
1J		
1K		
2A	24	Engine Room J/B (Engine Compartment Left)
DA	34	Instrument Panel Wire and Instrument Panel J/B No.1 (Left Kick Panel)
DB		
DC	34	Engine Room Main Wire and Instrument Panel J/B No.1 (Left Kick Panel)
DD		
PA	36	Engine Wire and Instrument Panel J/B No.2 (Right Side of Glove Box)
PB		
PD	36	Instrument Panel Wire and Instrument Panel J/B No.2 (Right Side of Glove Box)
PF		

: Connector Joining Wire Harness and Wire Harness

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
EC1	52 (1GR-FE)	Engine Wire and Differential Wire (Near the Front Differential)
	53 (2TR-FE)	
IA1	54	Instrument Panel Wire and Engine Room Main Wire (Left Kick Panel)
IB1	54	Frame Wire and Engine Room Main Wire (Left Kick Panel)
IH1	55	Engine Wire and Instrument Panel Wire (Right Side of Glove Box)
IJ1	55	Instrument Panel Wire and Instrument Panel Wire (Right Kick Panel)
BD1	56 (*1)	Frame Wire and Differential Wire (Near the Rear Differential)
	57 (*2)	
	58 (*3)	

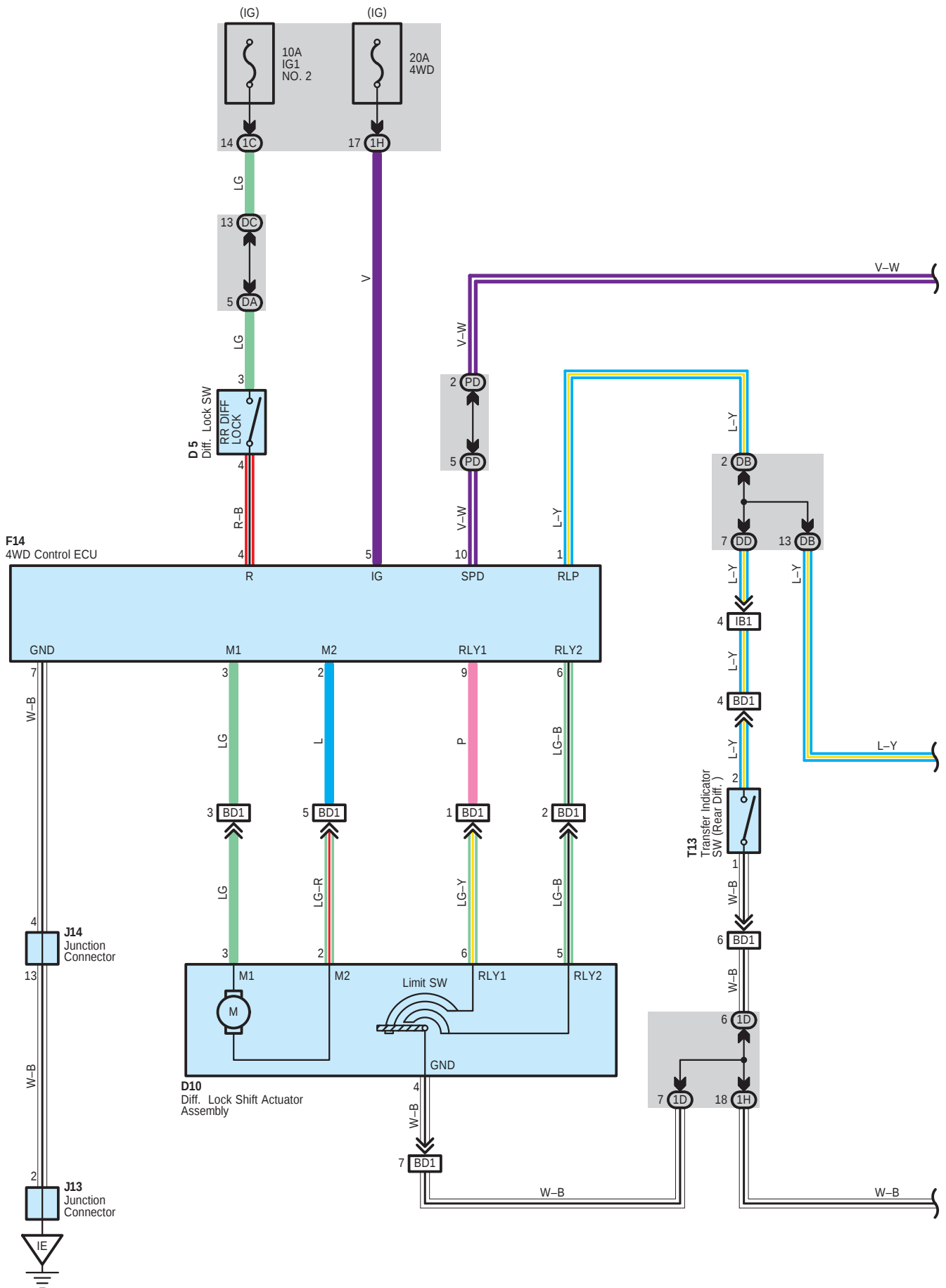
* 1 : Double Cab * 2 : Access Cab * 3 : Regular Cab * 4 : Separate Seat * 5 : Bench Seat

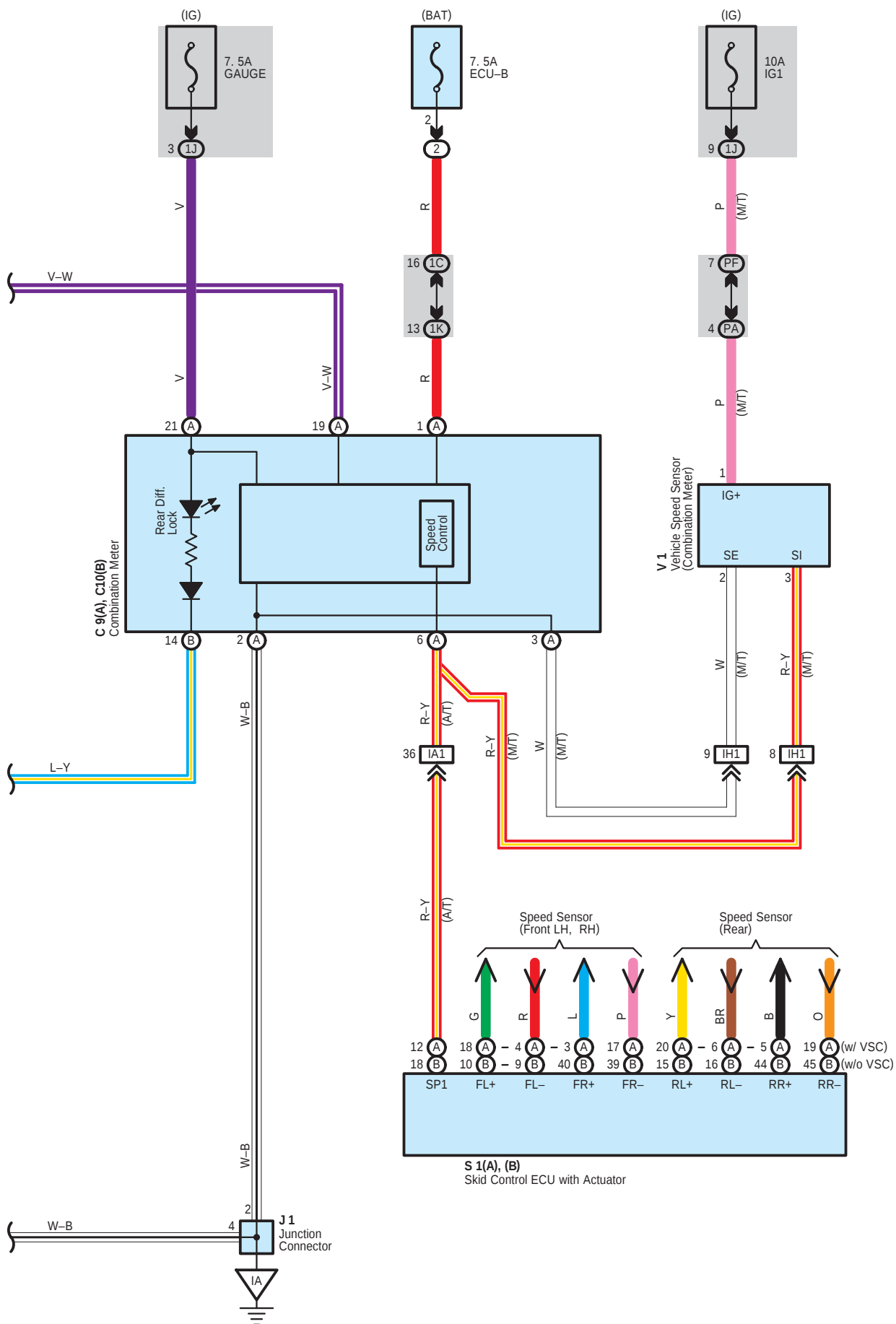


: **Ground Points**

Code	See Page	Ground Points Location
EE	52 (1GR-FE)	Rear Side of Right Bank Cylinder Block
EH	53 (2TR-FE)	Rear Side of Cylinder Block
IA	54	Left Kick Panel
IC	54	Instrument Panel Brace RH
IE	54	Right Kick Panel

Rear Differential Lock for 2WD





Rear Differential Lock for 2WD

System Outline

This system frees or locks the rear differential according to the position of the diff. lock SW. The differential will lock only when the transfer indicator SW (Rear diff.) is on and the vehicle speed is at 8 km/h (5 mph) or less.

When the diff. lock SW is switched from OFF position to ON position, current flows to TERMINAL 4 of the 4WD control ECU. If the limit SW on the lock side inside the diff. lock shift actuator assembly is on at this time, until the limit SW is turned off, current flows from the 4WD fuse to TERMINAL 5 of the 4WD control ECU to TERMINAL 3 to TERMINAL 3 of the diff. lock shift actuator to TERMINAL 2 to TERMINAL 2 of the 4WD control ECU to TERMINAL 7 to GROUND. This drives the diff. lock shift actuator and locks the rear differential. When the rear differential locks, the transfer indicator SW (Rear diff.) turns on, lighting up the rear diff. lock indicator light in the combination meter.

When the diff. lock SW is switched from ON position to OFF position, the current to TERMINAL 4 of the 4WD control ECU is cut off. If the limit SW on the free side inside the diff. lock shift actuator assembly is on, until the limit SW is turned off, current flows from the 4WD fuse to TERMINAL 5 of the 4WD control ECU to TERMINAL 2 to TERMINAL 2 of the diff. lock shift actuator assembly to TERMINAL 3 to TERMINAL 3 of the 4WD control ECU to TERMINAL 7 to GROUND. This drives the diff. lock shift actuator and frees the rear differential. When the rear differential is free, the transfer indicator SW (Rear diff.) and the rear diff. lock indicator light in the combination meter are turned off.

The rear diff. lock indicator light flashes when:

- * The diff. lock SW is switched to ON position during differential lock prohibition conditions (Vehicle speed above 8 km/h (5 mph)).
- * The transfer indicator SW (Rear diff.) is turned off during operation of the diff. lock shift actuator.

○ : Parts Location

Code		See Page	Code		See Page	Code		See Page
C9	A	44	J1		45	T13		47 (*1)
C10	B	44	J13		45			48 (*2)
D5		44	J14		45			49 (*3)
D10		46 (*1)	S1	A	41 (1GR-FE)	V1		41 (1GR-FE)
		48 (*2)			43 (2TR-FE)			43 (2TR-FE)
		49 (*3)		B	41 (1GR-FE)			
F14		44			43 (2TR-FE)			

○ : 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)
1C	28	Engine Room Main Wire and Driver Side J/B (Lower Finish Panel)
1D	28	Frame Wire and Driver Side J/B (Lower Finish Panel)
1H	29	Instrument Panel Wire and Driver Side J/B (Lower Finish Panel)
1J		
1K		
DA	34	Instrument Panel Wire and Instrument Panel J/B No.1 (Left Kick Panel)
DB		
DC	34	Engine Room Main Wire and Instrument Panel J/B No.1 (Left Kick Panel)
DD		
PA	36	Engine Wire and Instrument Panel J/B No.2 (Right Side of Glove Box)
PD	36	Instrument Panel Wire and Instrument Panel J/B No.2 (Right Side of Glove Box)
PF		

* 1 : Double Cab * 2 : Access Cab * 3 : Regular Cab * 4 : Separate Seat * 5 : Bench Seat

 : Connector Joining Wire Harness and Wire Harness

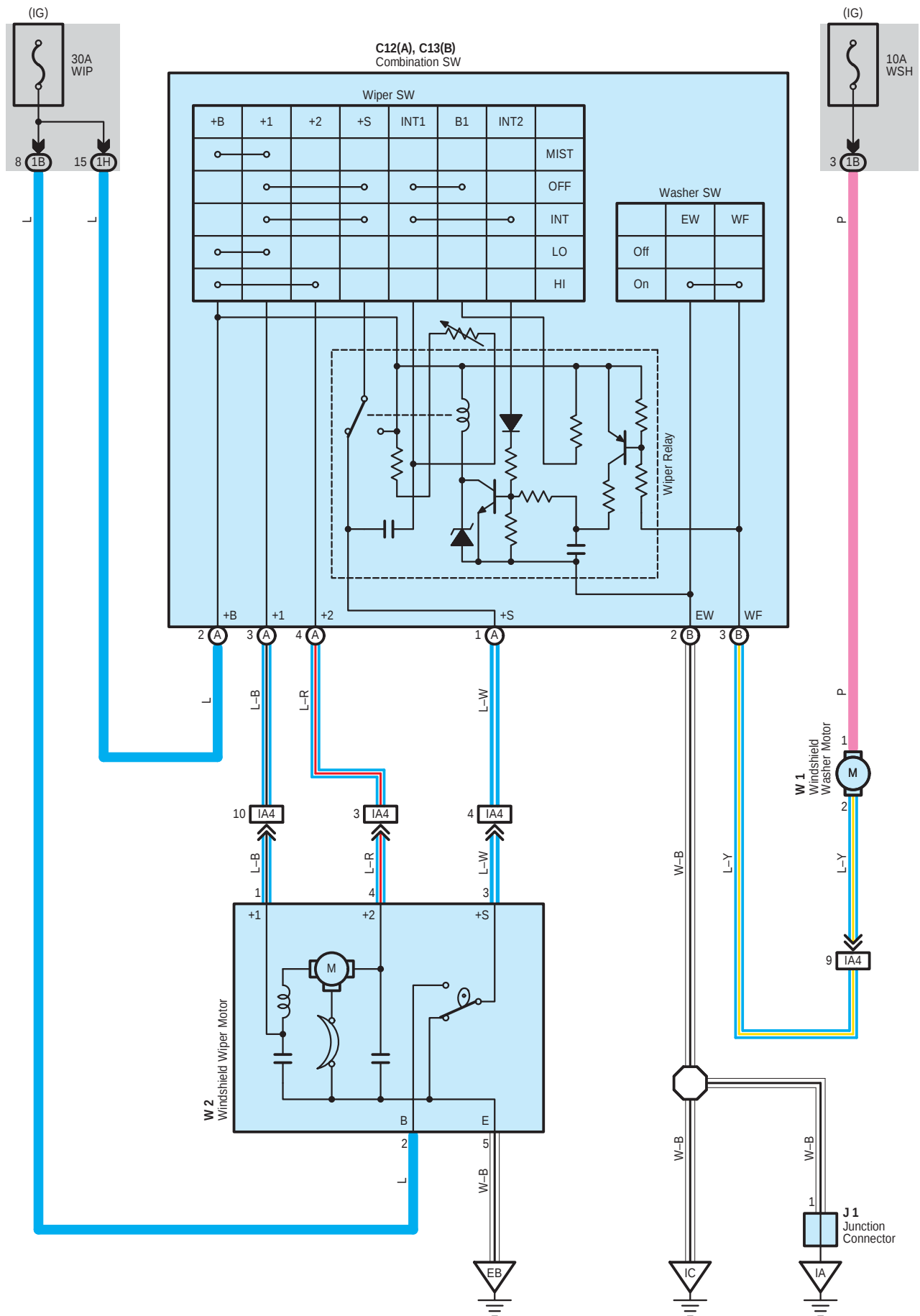
Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IA1	54	Instrument Panel Wire and Engine Room Main Wire (Left Kick Panel)
IB1	54	Frame Wire and Engine Room Main Wire (Left Kick Panel)
IH1	55	Engine Wire and Instrument Panel Wire (Right Side of Glove Box)
BD1	56 (*1)	Frame Wire and Differential Wire (Near the Rear Differential)
	57 (*2)	
	58 (*3)	

 : Ground Points

Code	See Page	Ground Points Location
IA	54	Left Kick Panel
IE	54	Right Kick Panel

* 1 : Double Cab * 2 : Access Cab * 3 : Regular Cab * 4 : Separate Seat * 5 : Bench Seat

Wiper and Washer with INT Time SW



System Outline

With the ignition SW turned on, the current flows to TERMINAL (A) 2 of the combination SW and TERMINAL 2 of the windshield wiper motor through the WIP fuse. The current flows to TERMINAL 1 of the windshield washer motor through the WSH fuse.

1. Low Speed Position

With the wiper and washer SW turned to LO position, the current flows from TERMINAL (A) 2 of the combination SW to TERMINAL (A) 3 to TERMINAL 1 of the windshield wiper motor to TERMINAL 5 to GROUND and causes the windshield wiper motor to run at low speed.

2. High Speed Position

With the wiper and washer SW turned to HI position, the current flows from TERMINAL (A) 2 of the combination SW to TERMINAL (A) 4 to TERMINAL 4 of the windshield wiper motor to TERMINAL 5 to GROUND and causes the windshield wiper motor to run at high speed.

3. INT Position

With the wiper and washer SW turned to INT position, the wiper relay operates and current flows from TERMINAL (A) 2 of the combination SW to TERMINAL (B) 2 to GROUND. This activates the intermittent circuit and the current flows from TERMINAL (A) 2 of the combination SW to TERMINAL (A) 3 to TERMINAL 1 of the windshield wiper motor to TERMINAL 5 to GROUND and the wiper operates. Intermittent operation is controlled by a condenser charge and discharge function in the relay.

4. Washer Continuous Operation

With the wiper and washer SW pulled to on position (Washer SW ON position), the current flows from the WSH fuse to TERMINAL 1 of the windshield washer motor to TERMINAL 2 to TERMINAL (B) 3 of the combination SW to TERMINAL (B) 2 to GROUND and causes the windshield washer motor to run and the window washer to spray. Simultaneously, current flows from the WIP fuse to TERMINAL (A) 2 of the combination SW to TERMINAL (A) 3 to TERMINAL 1 of the windshield wiper motor to TERMINAL 5 to GROUND, causing the wiper to function.

○ : Parts Location

Code	See Page	Code	See Page	Code	See Page
C12	A	44	W1	41 (1GR-FE)	W2
C13	B	44		43 (2TR-FE)	
J1		45	W2	41 (1GR-FE)	

○ : Junction Block and Wire Harness Connector

Code	See Page	Junction Block and Wire Harness (Connector Location)
1B	28	Engine Room Main Wire and Driver Side J/B (Lower Finish Panel)
1H	29	Instrument Panel Wire and Driver Side J/B (Lower Finish Panel)

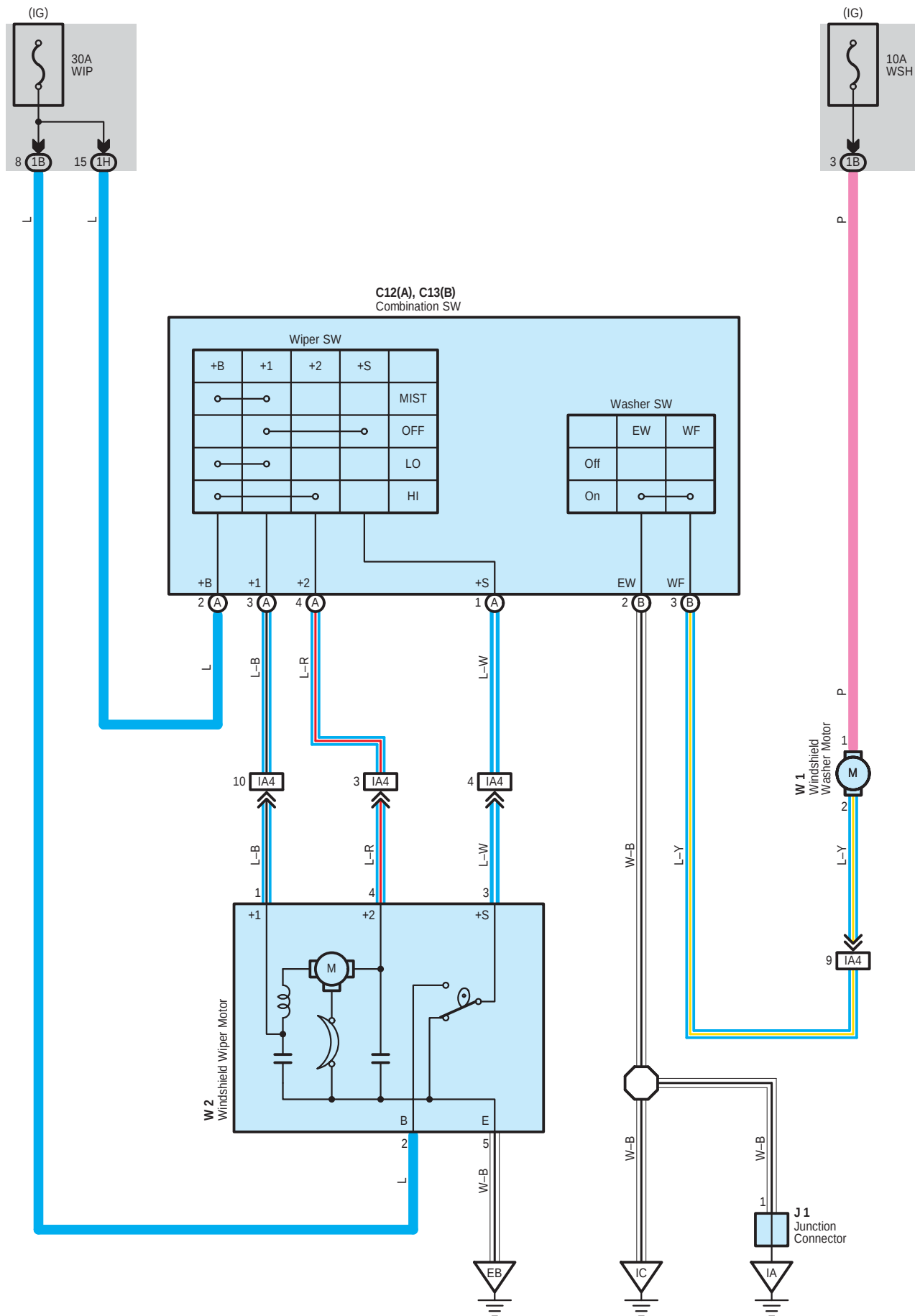
□ : Connector Joining Wire Harness and Wire Harness

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IA4	54	Instrument Panel Wire and Engine Room Main Wire (Left Kick Panel)

▽ : Ground Points

Code	See Page	Ground Points Location
EB	52 (1GR-FE)	Front Left Fender
	53 (2TR-FE)	
IA	54	Left Kick Panel
IC	54	Instrument Panel Brace RH

Wiper and Washer without INT Time SW



System Outline

With the ignition SW turned on, the current flows to TERMINAL (A) 2 of the combination SW and TERMINAL 2 of the windshield wiper motor through the WIP fuse. The current flows to TERMINAL 1 of the windshield washer motor through the WSH fuse.

1. Low Speed Position

With the wiper and washer SW turned to LO position, the current flows from TERMINAL (A) 2 of the combination SW to TERMINAL (A) 3 to TERMINAL 1 of the windshield wiper motor to TERMINAL 5 to GROUND and causes the windshield wiper motor to run at low speed.

2. High Speed Position

With the wiper and washer SW turned to HI position, the current flows from TERMINAL (A) 2 of the combination SW to TERMINAL (A) 4 to TERMINAL 4 of the windshield wiper motor to TERMINAL 5 to GROUND and causes the windshield wiper motor to run at high speed.

3. MIST Position

With the wiper SW turned to MIST position, current flows from TERMINAL (A) 2 of the combination SW to TERMINAL (A) 3 to TERMINAL 1 of the windshield wiper motor to TERMINAL 5 to GROUND and causes the windshield wiper motor to run at low speed.

4. Washer Continuous Operation

With the wiper and washer SW pulled to washer position (Washer SW ON position), the current flows from the WSH fuse to TERMINAL 1 of the windshield washer motor to TERMINAL 2 to TERMINAL (B) 3 of the combination SW to TERMINAL (B) 2 to GROUND and causes the windshield washer motor to run and the window washer to spray. Simultaneously, current flows from the WIP fuse to TERMINAL (A) 2 of the combination SW to TERMINAL (A) 3 to TERMINAL 1 of the windshield wiper motor to TERMINAL 5 to GROUND, causing the wiper to function.

: Parts Location

Code	See Page	Code	See Page	Code	See Page
C12	A	44	W1	41 (1GR-FE)	W2
C13	B	44		43 (2TR-FE)	
J1		45	W2	41 (1GR-FE)	

: Junction Block and Wire Harness Connector

Code	See Page	Junction Block and Wire Harness (Connector Location)
1B	28	Engine Room Main Wire and Driver Side J/B (Lower Finish Panel)
1H	29	Instrument Panel Wire and Driver Side J/B (Lower Finish Panel)

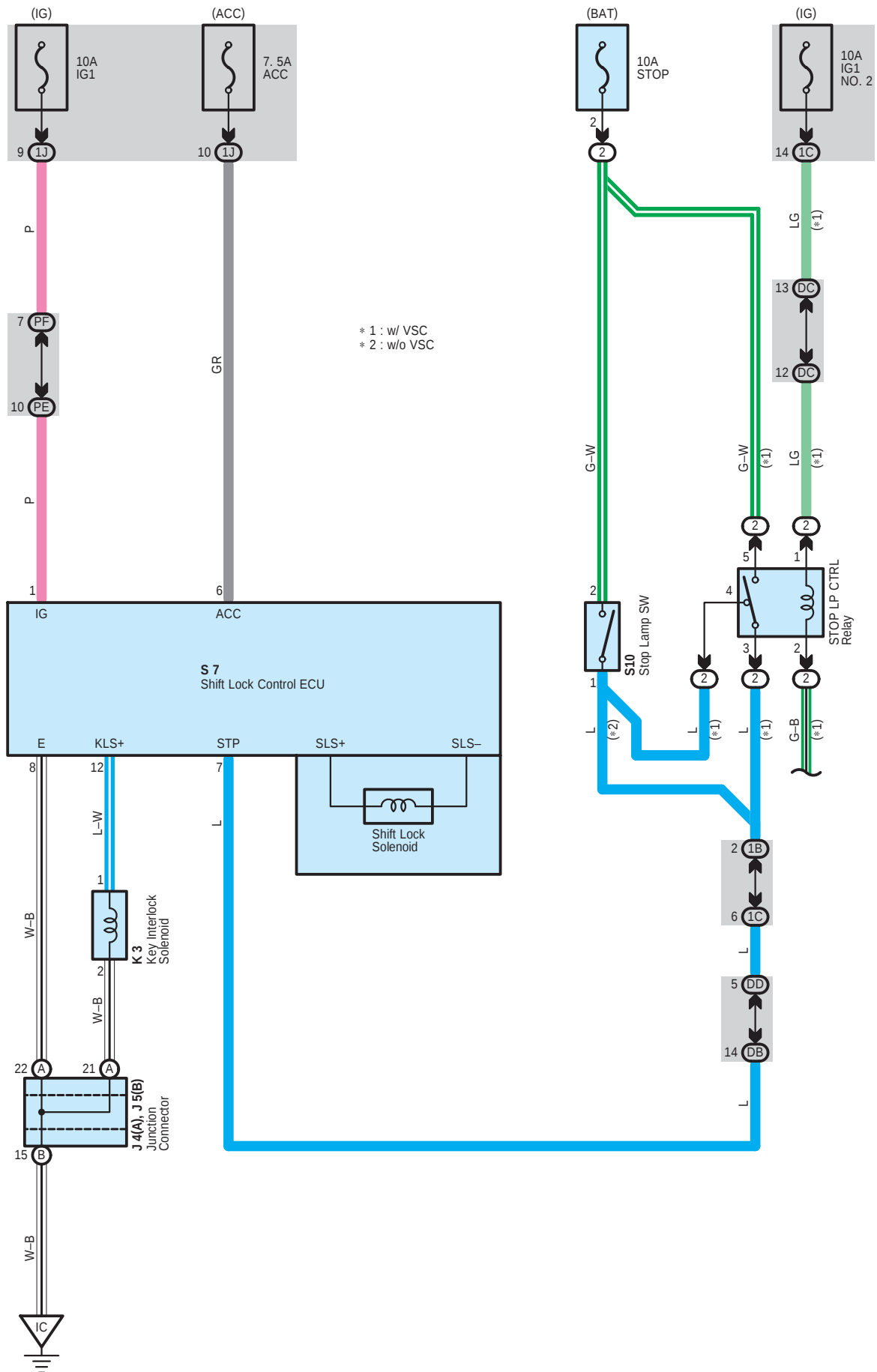
: Connector Joining Wire Harness and Wire Harness

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IA4	54	Instrument Panel Wire and Engine Room Main Wire (Left Kick Panel)

: Ground Points

Code	See Page	Ground Points Location
EB	52 (1GR-FE)	Front Left Fender
	53 (2TR-FE)	
IA	54	Left Kick Panel
IC	54	Instrument Panel Brace RH

Shift Lock



System Outline

When the ignition SW is turned to ACC position the current from the ACC fuse flows to TERMINAL 6 of the shift lock control ECU. When the ignition SW is turned to ON position, the current from the IG1 fuse flows to TERMINAL 1 of the shift lock control ECU.

1. Shift Lock Mechanism

If the brake pedal is depressed with the ignition SW set at ON (The stop lamp SW is on), the shift lock control ECU is activated, allowing the driver to change the shift lever to a position other than the P position.

2. Key Interlock Mechanism

With the ignition SW at ON or ACC position, when the shift lever is put in P position, the current flowing from TERMINAL 12 of the shift lock control ECU to key interlock solenoid is cut off. This causes the key interlock solenoid to turn off (Lock lever disengages from LOCK position) and the ignition key can be turned from ACC to LOCK position.

○ : Parts Location

Code		See Page	Code	See Page	Code	See Page
J4	A	45	K3	45	S10	45
J5	B	45	S7	45		

○ : Relay Blocks

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

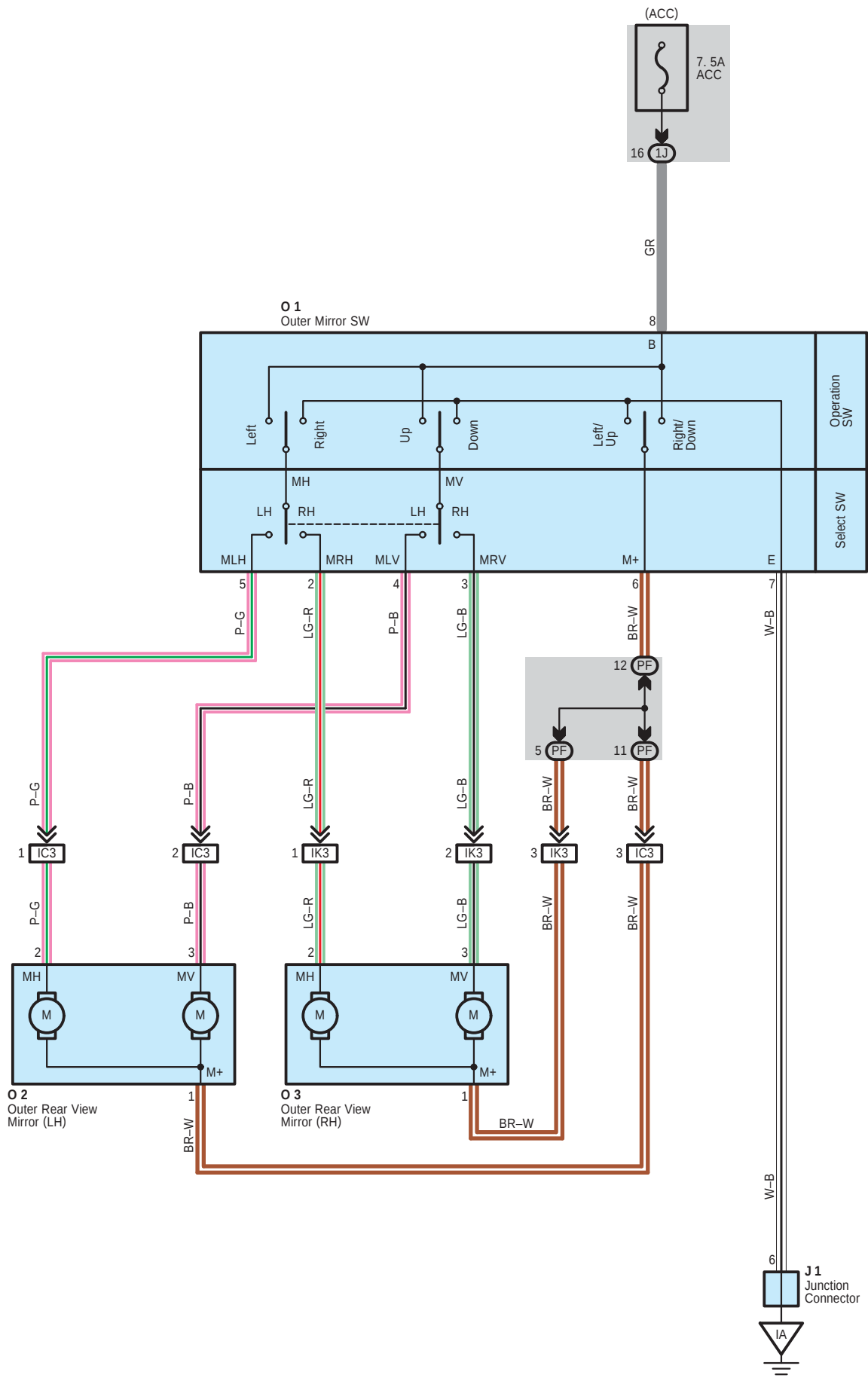
○ : Junction Block and Wire Harness Connector

Code	See Page	Junction Block and Wire Harness (Connector Location)
1B	28	Engine Room Main Wire and Driver Side J/B (Lower Finish Panel)
1C		
1J	29	Instrument Panel Wire and Driver Side J/B (Lower Finish Panel)
DB	34	Instrument Panel Wire and Instrument Panel J/B No.1 (Left Kick Panel)
DC	34	Engine Room Main Wire and Instrument Panel J/B No.1 (Left Kick Panel)
DD		
PE	36	Instrument Panel Wire and Instrument Panel J/B No.2 (Right Side of Glove Box)
PF		

▽ : Ground Points

Code	See Page	Ground Points Location
IC	54	Instrument Panel Brace RH

Remote Control Mirror



 : Parts Location

Code	See Page	Code	See Page	Code	See Page
J1	45	O2	46 (*1)	O3	46 (*1)
O1	45		48 (*2)		48 (*2)

 : Junction Block and Wire Harness Connector

Code	See Page	Junction Block and Wire Harness (Connector Location)
1J	29	Instrument Panel Wire and Driver Side J/B (Lower Finish Panel)
PF	36	Instrument Panel Wire and Instrument Panel J/B No.2 (Right Side of Glove Box)

 : Connector Joining Wire Harness and Wire Harness

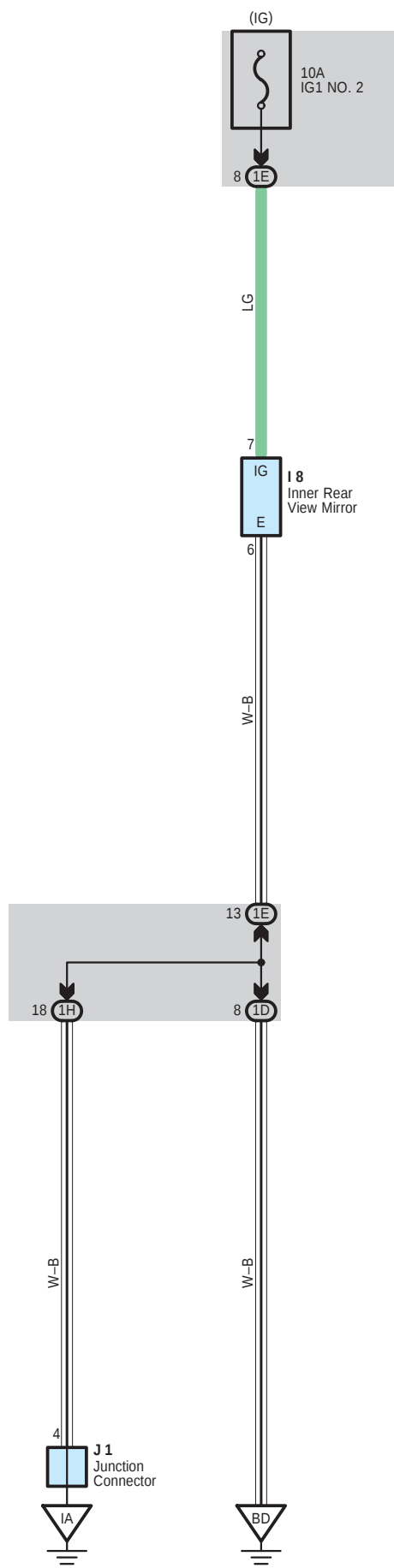
Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IC3	54	Front Door LH Wire and Instrument Panel Wire (Left Kick Panel)
IK3	55	Front Door RH Wire and Instrument Panel Wire (Right Kick Panel)

 : Ground Points

Code	See Page	Ground Points Location
IA	54	Left Kick Panel

* 1 : Double Cab * 2 : Access Cab * 3 : Regular Cab * 4 : Separate Seat * 5 : Bench Seat

Automatic Glare-Resistant EC Mirror



 : Parts Location

Code	See Page	Code	See Page	Code	See Page
I8	46 (*1)	I8	48 (*2)	J1	45

 : Junction Block and Wire Harness Connector

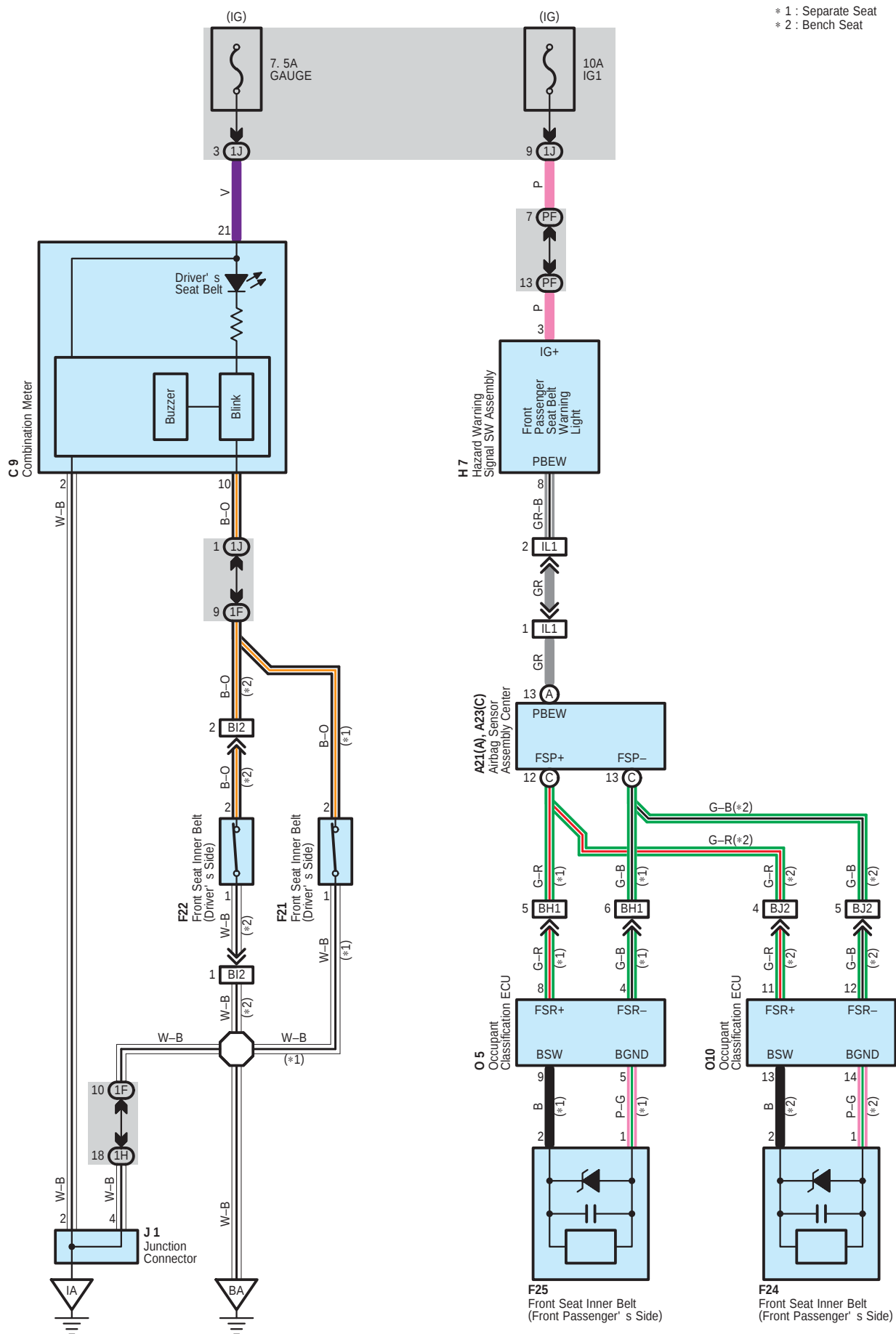
Code	See Page	Junction Block and Wire Harness (Connector Location)
1D	28	Frame Wire and Driver Side J/B (Lower Finish Panel)
1E	28	Roof Wire and Driver Side J/B (Lower Finish Panel)
1H	29	Instrument Panel Wire and Driver Side J/B (Lower Finish Panel)

 : Ground Points

Code	See Page	Ground Points Location
IA	54	Left Kick Panel
BD	56 (*1)	Near the Rear Differential
	57 (*2)	

* 1 : Double Cab * 2 : Access Cab * 3 : Regular Cab * 4 : Separate Seat * 5 : Bench Seat

Seat Belt Warning



System Outline

When the driver has not fastened the seat belt while the ignition SW is ON, the driver seat belt warning light blinks, and a warning buzzer comes on.

Also, in the front passenger seat, a sensor recognizes passenger, and when the passenger has not fastened the seat belt, the front passenger seat belt warning light blinks.

○ : Parts Location

Code		See Page	Code	See Page	Code	See Page
A21	A	44	F22	51 (*5)	J1	45
A23	C	44	F24	51 (*5)	O5	50 (*4)
C9		44	F25	50 (*4)	O10	51 (*5)
F21		50 (*4)	H7	45		

○ : Junction Block and Wire Harness Connector

Code	See Page	Junction Block and Wire Harness (Connector Location)
1F	28	Floor No.2 Wire and Driver Side J/B (Lower Finish Panel)
1H	29	Instrument Panel Wire and Driver Side J/B (Lower Finish Panel)
1J		
PF	36	Instrument Panel Wire and Instrument Panel J/B No.2 (Right Side of Glove Box)

□ : Connector Joining Wire Harness and Wire Harness

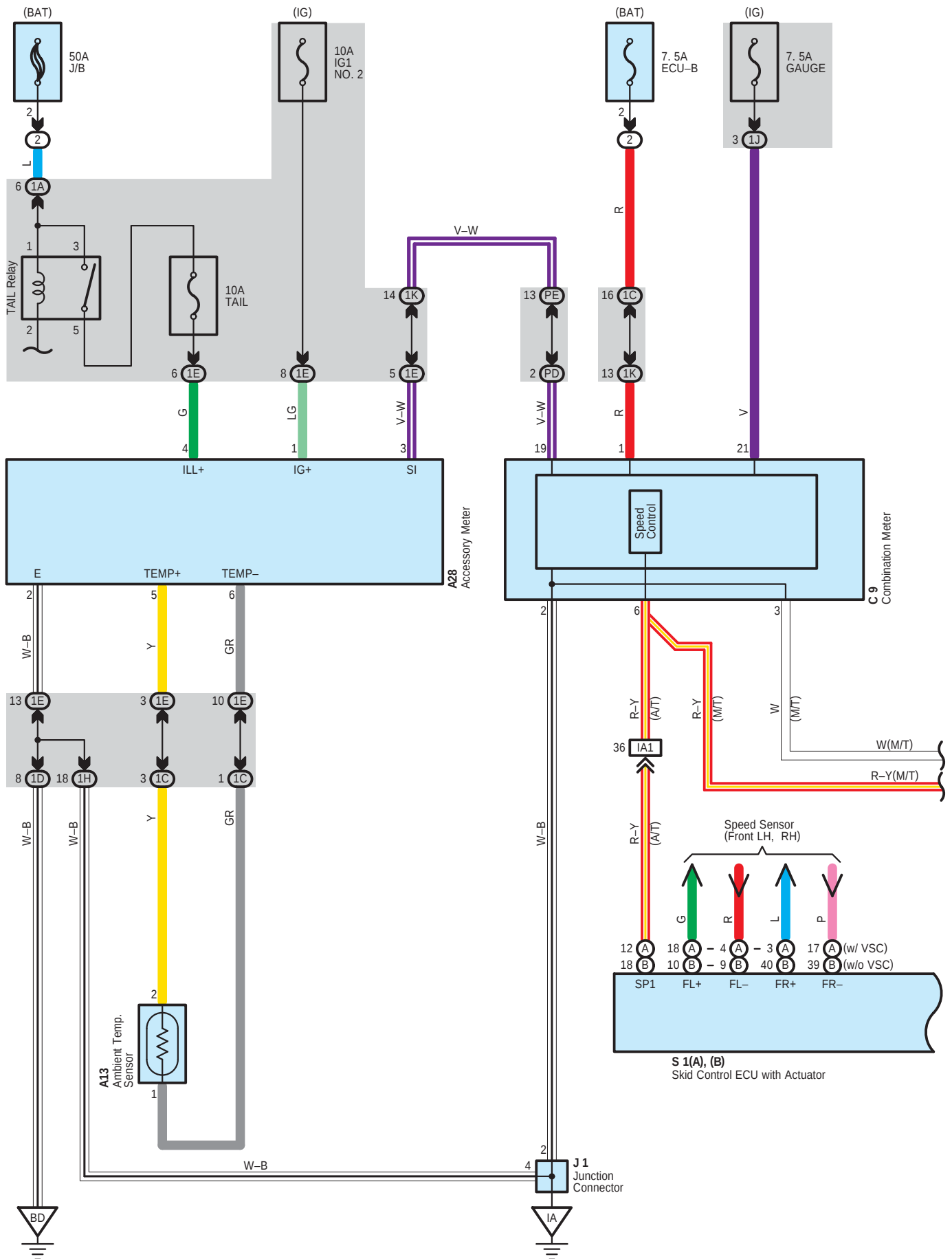
Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IL1	55	Instrument Panel Wire and Floor Wire (Right Kick Panel)
BH1	60 (*4)	Floor Wire and Seat No.1 Wire (Under the Front Passenger's Seat)
BI2	61 (*5)	Floor No.2 Wire and Seat No.1 Wire (Under the Front Seat LH)
BJ2	61 (*5)	Floor Wire and Seat No.1 Wire (Under the Front Seat RH)

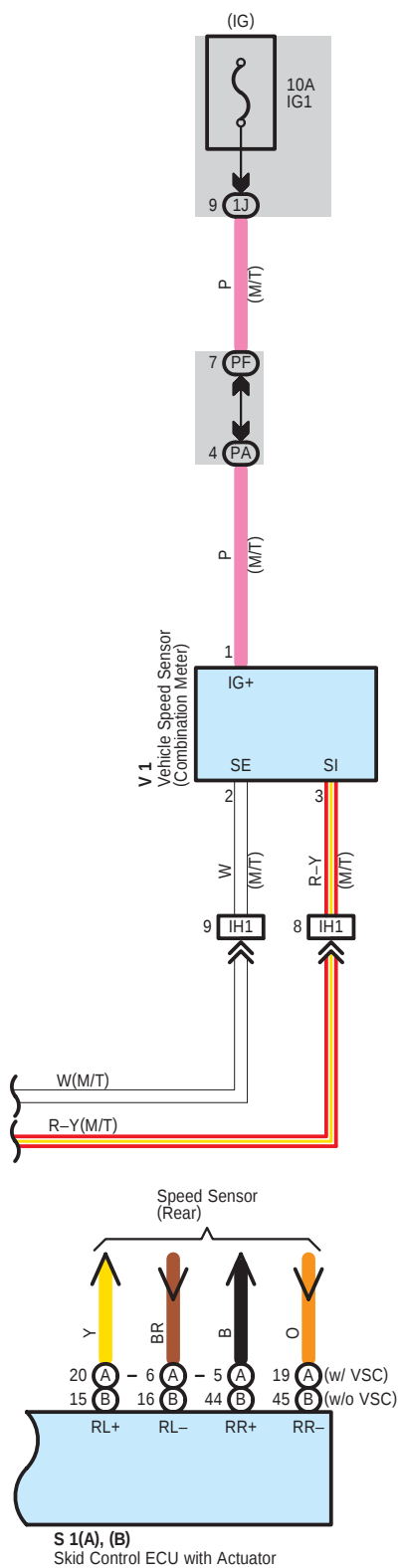
▽ : Ground Points

Code	See Page	Ground Points Location
IA	54	Left Kick Panel
BA	56 (*1)	Floor Seat Cross Member LH
	57 (*2)	
	58 (*3)	

* 1 : Double Cab * 2 : Access Cab * 3 : Regular Cab * 4 : Separate Seat * 5 : Bench Seat

Accessory Meter





Accessory Meter

: Parts Location

Code	See Page	Code		See Page	Code		See Page
A13	40 (1GR-FE)	C9		44	S1	B	41 (1GR-FE)
	42 (2TR-FE)	J1		45			43 (2TR-FE)
A28	46 (*1)	S1	A	41 (1GR-FE)	V1		41 (1GR-FE)
	48 (*2)			43 (2TR-FE)			43 (2TR-FE)

: 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)
1A	28	Engine Room Main Wire and Driver Side J/B (Lower Finish Panel)
1C		
1D		
1E	28	Roof Wire and Driver Side J/B (Lower Finish Panel)
1H	29	Instrument Panel Wire and Driver Side J/B (Lower Finish Panel)
1J		
1K		
PA	36	Engine Wire and Instrument Panel J/B No.2 (Right Side of Glove Box)
PD	36	Instrument Panel Wire and Instrument Panel J/B No.2 (Right Side of Glove Box)
PE		
PF		

: Connector Joining Wire Harness and Wire Harness

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IA1	54	Instrument Panel Wire and Engine Room Main Wire (Left Kick Panel)
IH1	55	Engine Wire and Instrument Panel Wire (Right Side of Glove Box)

: Ground Points

Code	See Page	Ground Points Location
IA	54	Left Kick Panel
BD	56 (*1)	Near the Rear Differential
	57 (*2)	

* 1 : Double Cab * 2 : Access Cab * 3 : Regular Cab * 4 : Separate Seat * 5 : Bench Seat



 : Parts Location

Code	See Page	Code	See Page	Code	See Page
H5	41 (1GR-FE)	H6	41 (1GR-FE)	S8	45
	43 (2TR-FE)		43 (2TR-FE)		

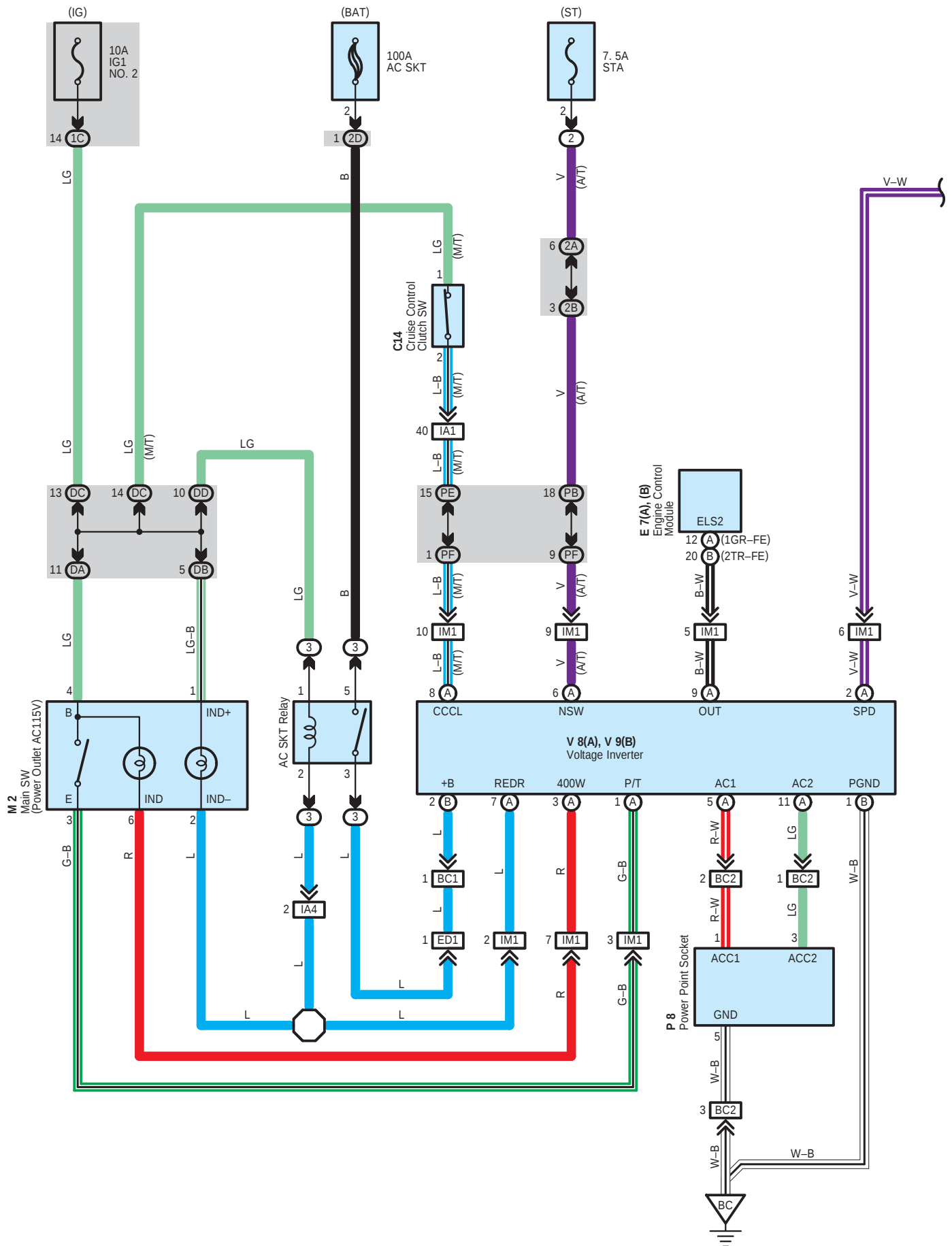
 : Relay Blocks

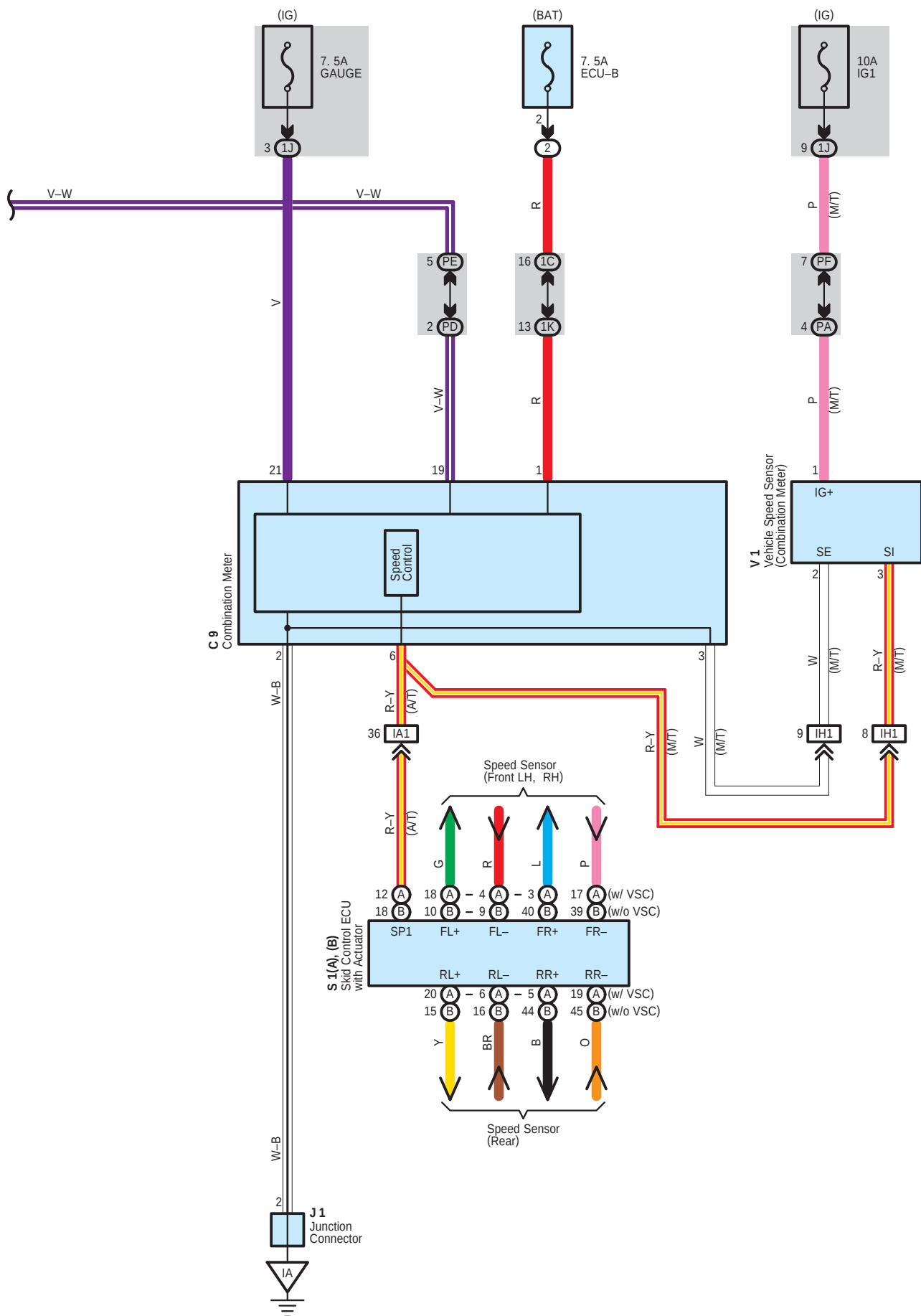
Code	See Page	Relay Blocks (Relay Block Location)
2	24	Engine Room R/B (Engine Compartment Left)

 : Junction Block and Wire Harness Connector

Code	See Page	Junction Block and Wire Harness (Connector Location)
1C	28	Engine Room Main Wire and Driver Side J/B (Lower Finish Panel)
1I	29	Instrument Panel Wire and Driver Side J/B (Lower Finish Panel)

Power Outlet for 115V





Power Outlet for 115V

: Parts Location

Code		See Page	Code		See Page	Code		See Page
C9		44	P8		47 (*1)	V8	A	47 (*1)
C14		44			48 (*2)			48 (*2)
E7	A	44	S1	A	41 (1GR–FE)	V9	B	47 (*1)
	B	44		B	43 (2TR–FE)			48 (*2)
J1		45	V1		41 (1GR–FE)			
M2		45			43 (2TR–FE)			

: Relay Blocks

Code	See Page	Relay Blocks (Relay Block Location)
2	24	Engine Room R/B (Engine Compartment Left)
3	23	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)
1C	28	Engine Room Main Wire and Driver Side J/B (Lower Finish Panel)
1J	29	Instrument Panel Wire and Driver Side J/B (Lower Finish Panel)
1K		
2A	24	Engine Room J/B (Engine Compartment Left)
2B	24	Engine Wire and Engine Room J/B (Engine Compartment Left)
2D	24	Engine Room Main Wire and Engine Room J/B (Engine Compartment Left)
DA	34	Instrument Panel Wire and Instrument Panel J/B No.1 (Left Kick Panel)
DB		
DC	34	Engine Room Main Wire and Instrument Panel J/B No.1 (Left Kick Panel)
DD		
PA	36	Engine Wire and Instrument Panel J/B No.2 (Right Side of Glove Box)
PB		
PD	36	Instrument Panel Wire and Instrument Panel J/B No.2 (Right Side of Glove Box)
PE		
PF		

: Connector Joining Wire Harness and Wire Harness

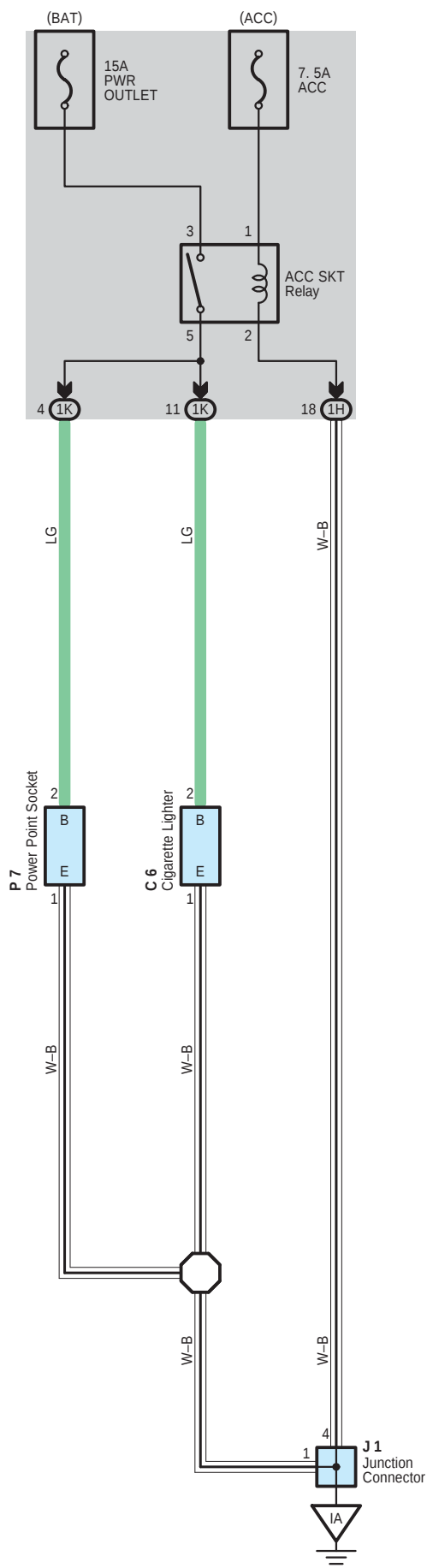
Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
ED1	52 (1GR-FE)	Frame No.2 Wire and Engine Room Main Wire (Front Fender Apron RH)
	53 (2TR-FE)	
IA1	54	Instrument Panel Wire and Engine Room Main Wire (Left Kick Panel)
IA4		
IH1	55	Engine Wire and Instrument Panel Wire (Right Side of Glove Box)
IM1	55	Floor No.3 Wire and Instrument Panel Wire (Under the Console Box)
BC1	56 (*1)	Frame No.2 Wire and Floor No.3 Wire (Floor Seat Cross Member RH)
	57 (*2)	
BC2	56 (*1)	
	57 (*2)	

: Ground Points

Code	See Page	Ground Points Location
IA	54	Left Kick Panel
BC	56 (*1)	Near the Voltage Inverter
	57 (*2)	

* 1 : Double Cab * 2 : Access Cab * 3 : Regular Cab * 4 : Separate Seat * 5 : Bench Seat

Cigarette Lighter and Power Outlet for 12V



 : Parts Location

Code	See Page	Code	See Page	Code	See Page
C6	44	J1	45	P7	45

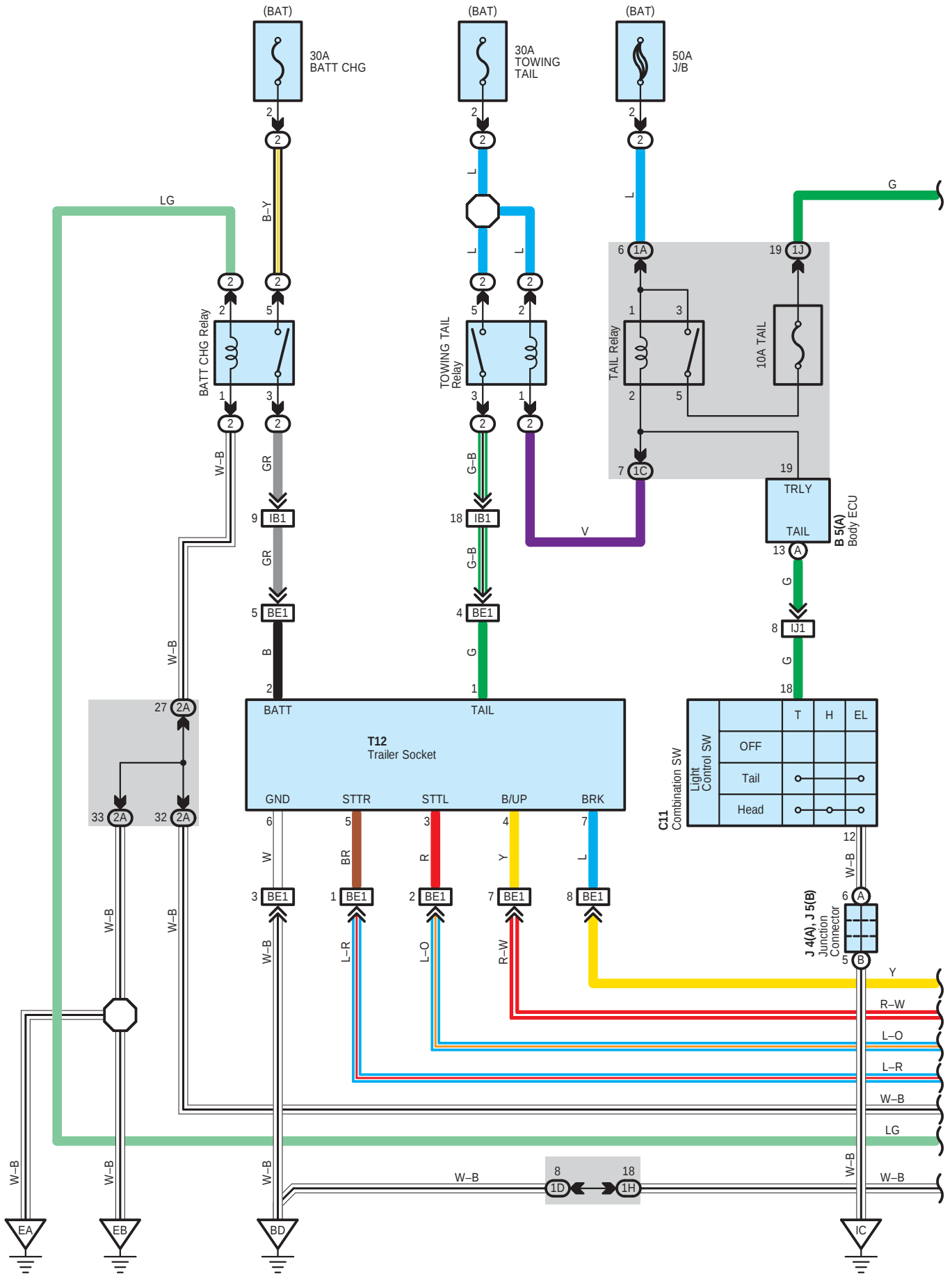
 : Junction Block and Wire Harness Connector

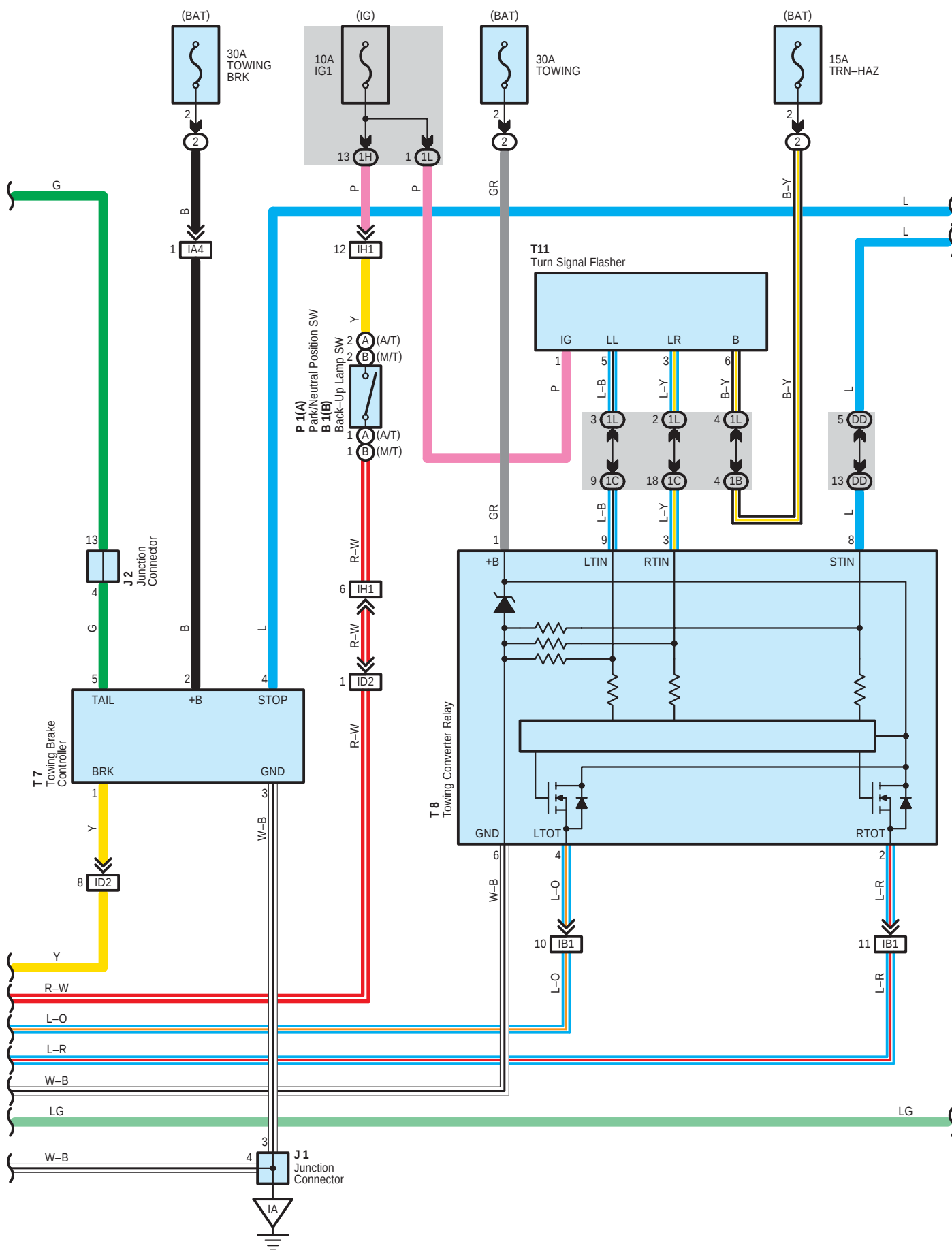
Code	See Page	Junction Block and Wire Harness (Connector Location)
1H	29	Instrument Panel Wire and Driver Side J/B (Lower Finish Panel)
1K		

 : Ground Points

Code	See Page	Ground Points Location
IA	54	Left Kick Panel

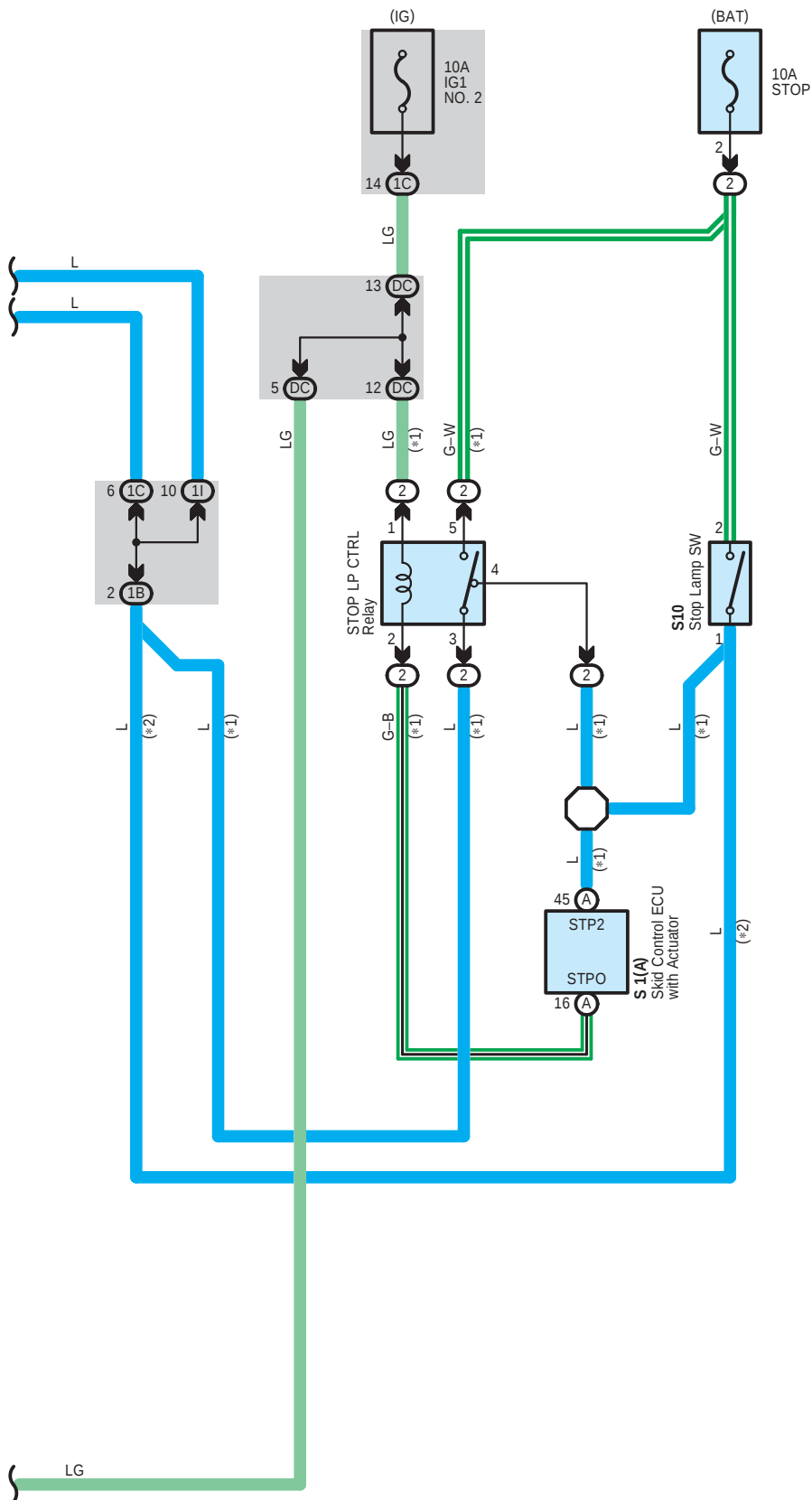
Trailer Towing





Trailer Towing

* 1 : w/ VSC
* 2 : w/o VSC



 : Parts Location

Code		See Page	Code		See Page	Code	See Page
B1	B	40 (1GR-FE)	J4	A	45	S10	45
		42 (2TR-FE)	J5	B	45	T7	45
B5	A	44	P1	A	41 (1GR-FE)	T8	45
C11		44			43 (2TR-FE)	T11	45
J1		45	S1	A	41 (1GR-FE)	T12	47 (*1)
J2		45			43 (2TR-FE)		48 (*2)

 : 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)
1A	28	Engine Room Main Wire and Driver Side J/B (Lower Finish Panel)
1B		
1C		
1D	28	Frame Wire and Driver Side J/B (Lower Finish Panel)
1H	29	Instrument Panel Wire and Driver Side J/B (Lower Finish Panel)
1I		
1J		
1L	29	Relay Wire and Driver Side J/B (Lower Finish Panel)
2A	24	Engine Room J/B (Engine Compartment Left)
DC	34	Engine Room Main Wire and Instrument Panel J/B No.1 (Left Kick Panel)
DD		

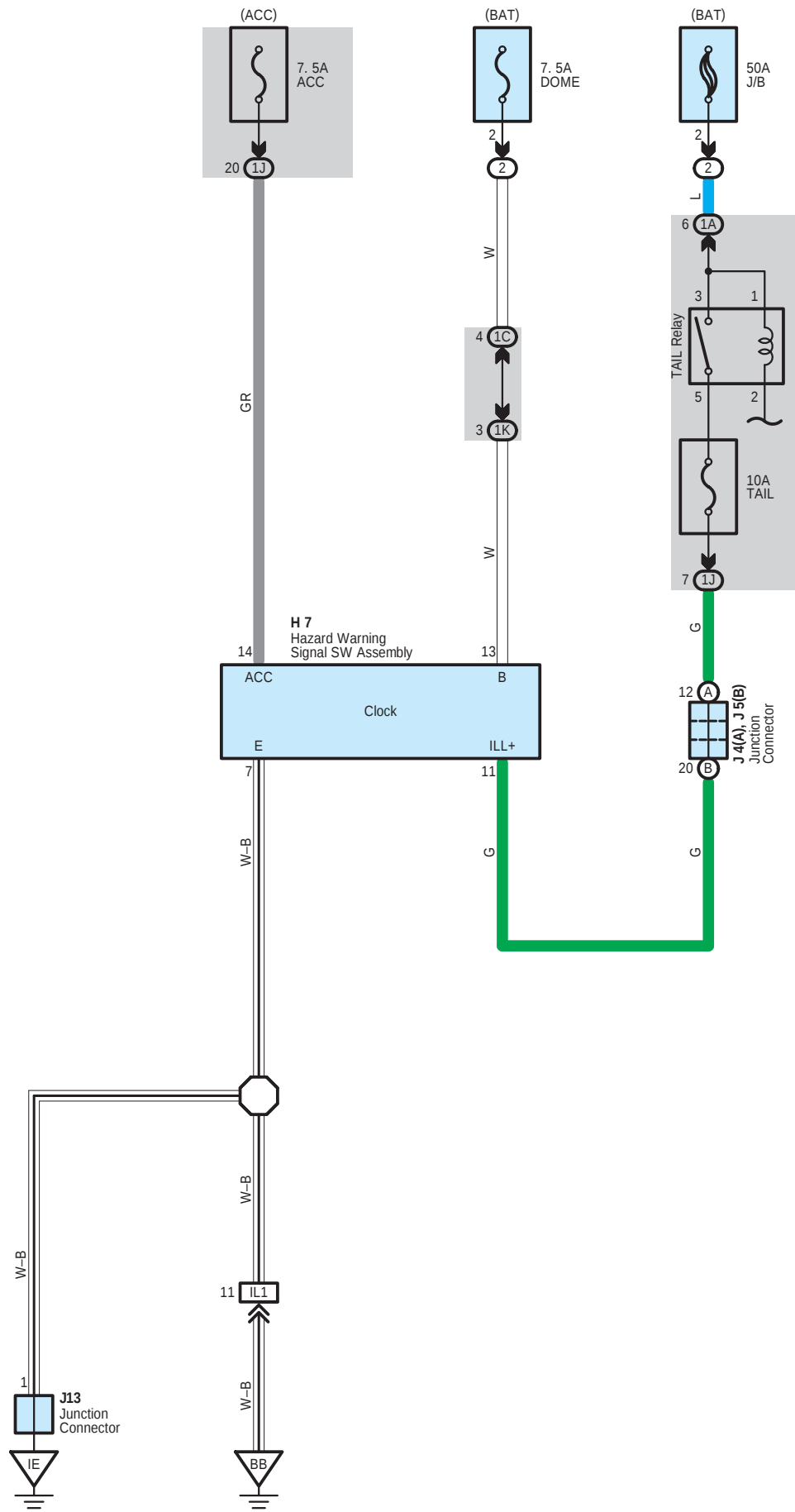
 : Connector Joining Wire Harness and Wire Harness

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IA4	54	Instrument Panel Wire and Engine Room Main Wire (Left Kick Panel)
IB1	54	Frame Wire and Engine Room Main Wire (Left Kick Panel)
ID2	54	Frame Wire and Instrument Panel Wire (Left Kick Panel)
IH1	55	Engine Wire and Instrument Panel Wire (Right Side of Glove Box)
IJ1	55	Instrument Panel Wire and Instrument Panel Wire (Right Kick Panel)
BE1	56 (*1)	Frame No.3 Wire and Frame Wire (Behind the Trailer Socket)
	57 (*2)	

 : Ground Points

Code	See Page	Ground Points Location
EA	52 (1GR-FE)	Front Right Fender
	53 (2TR-FE)	
EB	52 (1GR-FE)	Front Left Fender
	53 (2TR-FE)	
IA	54	Left Kick Panel
IC	54	Instrument Panel Brace RH
BD	56 (*1)	Near the Rear Differential
	57 (*2)	

* 1 : Double Cab * 2 : Access Cab * 3 : Regular Cab * 4 : Separate Seat * 5 : Bench Seat



 : Parts Location

Code	See Page	Code	See Page	Code	See Page
H7	45	J5	B	45	
J4	A	45	J13	45	

 : 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)
1A	28	Engine Room Main Wire and Driver Side J/B (Lower Finish Panel)
1C		
1J	29	Instrument Panel Wire and Driver Side J/B (Lower Finish Panel)
1K		

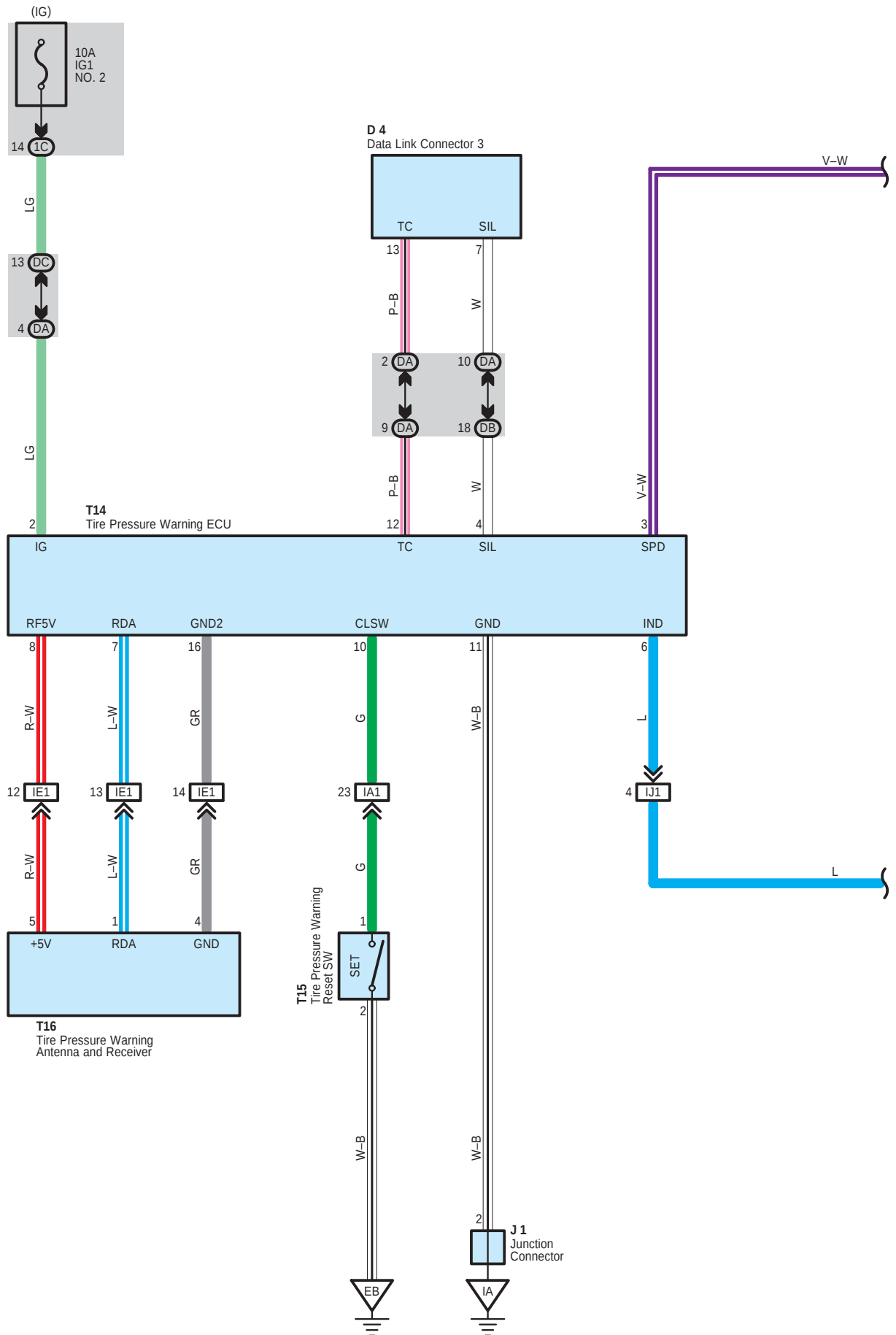
 : Connector Joining Wire Harness and Wire Harness

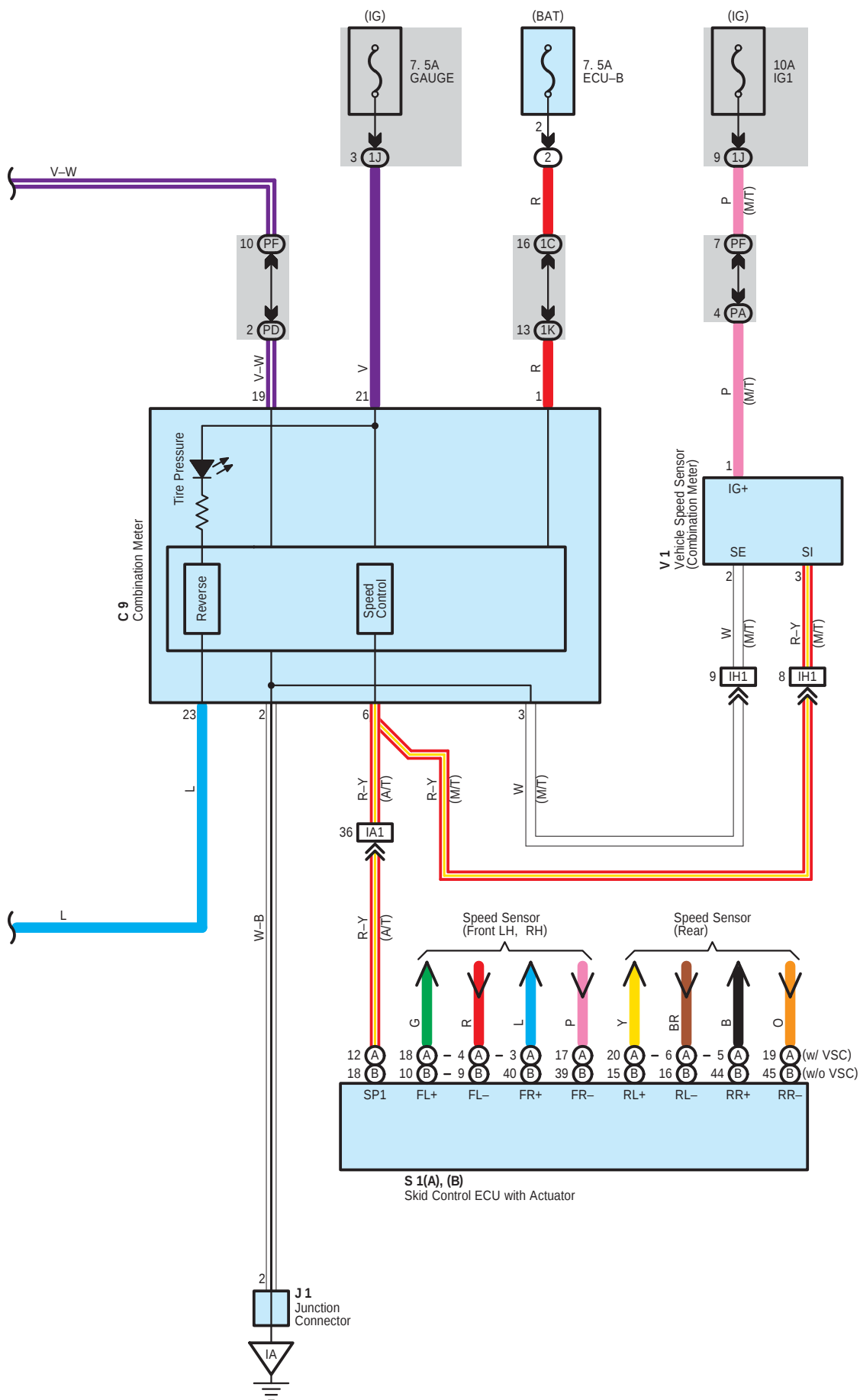
Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IL1	55	Instrument Panel Wire and Floor Wire (Right Kick Panel)

 : Ground Points

Code	See Page	Ground Points Location
IE	54	Right Kick Panel
BB	56 (*1)	Floor Seat Cross Member RH
	57 (*2)	
	58 (*3)	

* 1 : Double Cab * 2 : Access Cab * 3 : Regular Cab * 4 : Separate Seat * 5 : Bench Seat





Tire Pressure Warning System

System Outline

The air pressure sensor installed in the tire wheel detects the tire air pressure and transmits signals to the vehicle side receiver. When the detected tire air pressure is below a specified level, the warning light in the combination meter comes on to inform the driver.

Press the tire pressure warning reset SW for 3 seconds with the ignition SW at ON position after the tire pressure is adjusted to the specified value. It will lead the tire pressure warning ECU to control and warn the pressure according to the specified value.

Warnings when the tire pressure is low

* When the tire air pressure is below a specified level, the warning light in the combination meter comes on.

○ : Parts Location

Code	See Page	Code	See Page	Code	See Page
C9	44	S1	B	41 (1GR-FE)	T16
D4	44			43 (2TR-FE)	
J1	45	T14	45	V1	41 (1GR-FE)
S1	A	T15	45		43 (2TR-FE)
		T16	47 (*1)		

○ : 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)
1C	28	Engine Room Main Wire and Driver Side J/B (Lower Finish Panel)
1J	29	Instrument Panel Wire and Driver Side J/B (Lower Finish Panel)
1K		
DA	34	Instrument Panel Wire and Instrument Panel J/B No.1 (Left Kick Panel)
DB		
DC	34	Engine Room Main Wire and Instrument Panel J/B No.1 (Left Kick Panel)
PA	36	Engine Wire and Instrument Panel J/B No.2 (Right Side of Glove Box)
PD	36	Instrument Panel Wire and Instrument Panel J/B No.2 (Right Side of Glove Box)
PF		

□ : Connector Joining Wire Harness and Wire Harness

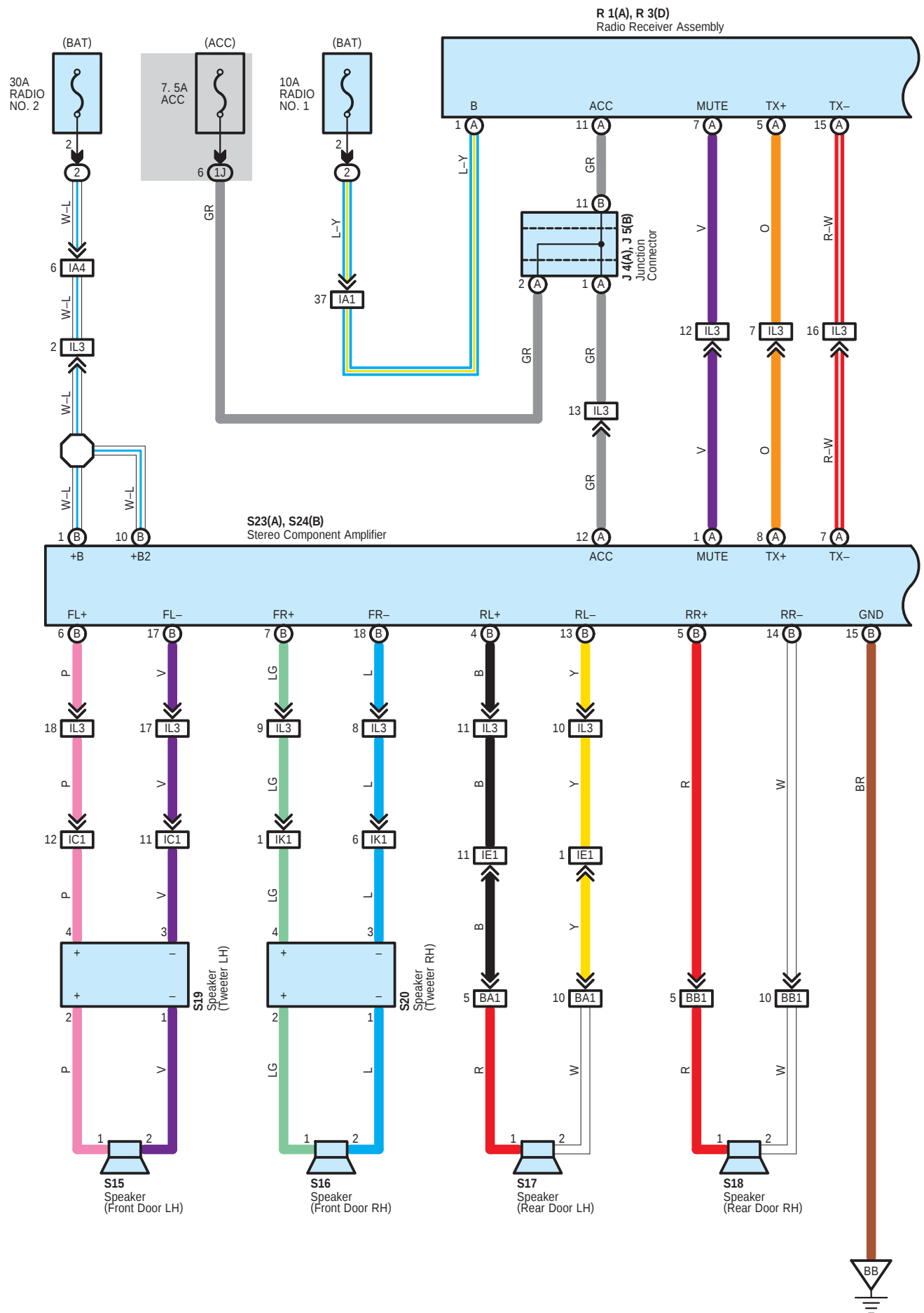
Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IA1	54	Instrument Panel Wire and Engine Room Main Wire (Left Kick Panel)
IE1	54	Instrument Panel Wire and Floor No.2 Wire (Left Kick Panel)
IH1	55	Engine Wire and Instrument Panel Wire (Right Side of Glove Box)
IJ1	55	Instrument Panel Wire and Instrument Panel Wire (Right Kick Panel)

▽ : Ground Points

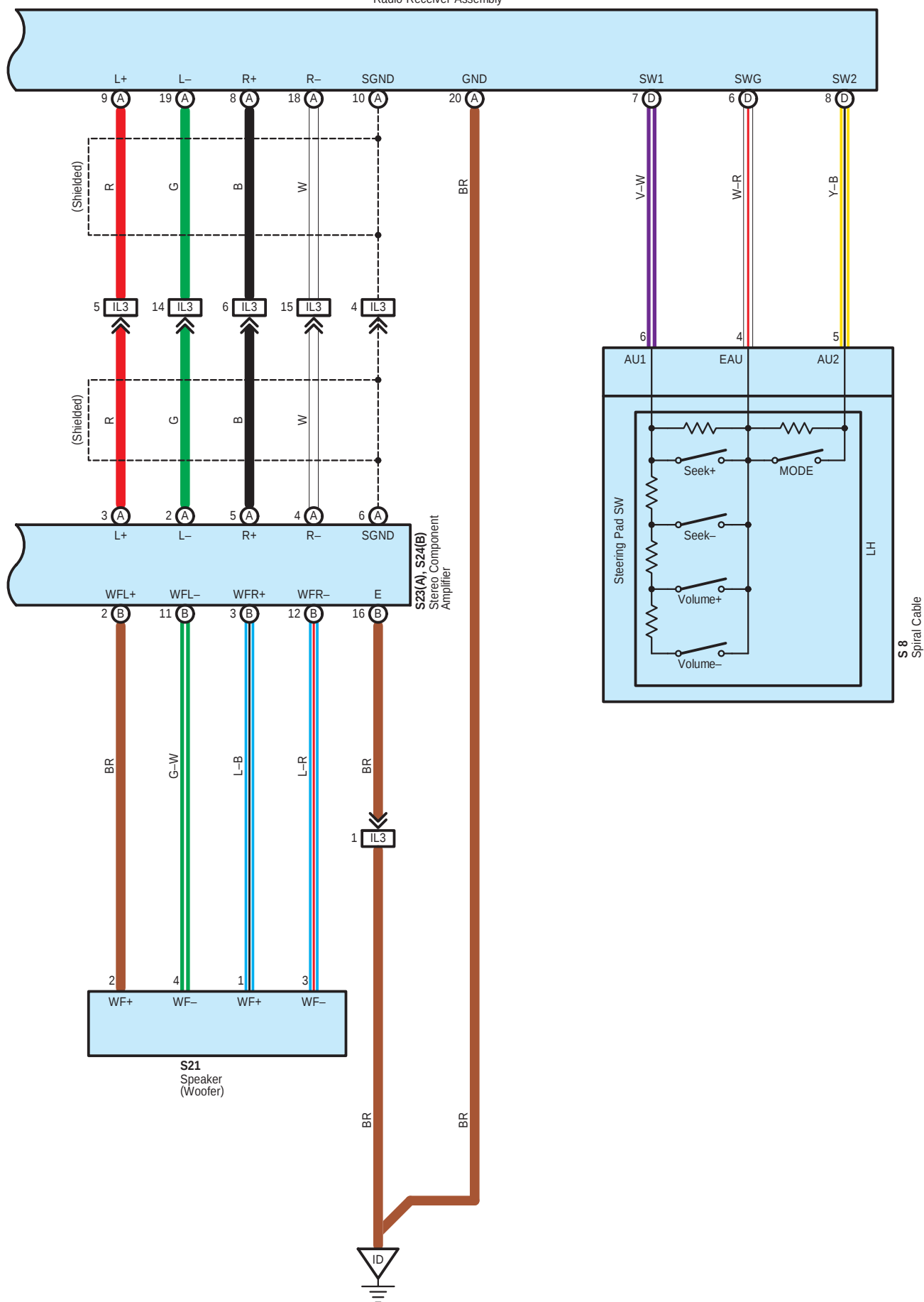
Code	See Page	Ground Points Location
EB	52 (1GR-FE)	Front Left Fender
	53 (2TR-FE)	
IA	54	Left Kick Panel

* 1 : Double Cab * 2 : Access Cab * 3 : Regular Cab * 4 : Separate Seat * 5 : Bench Seat

Audio System for Separate Type Amplifier



R 1(A), R 3(D)
Radio Receiver Assembly



Audio System for Separate Type Amplifier

: Parts Location

Code		See Page	Code	See Page	Code	See Page
J4	A	45	S15	47 (*1)	S20	47 (*1)
J5	B	45	S16	47 (*1)	S21	47 (*1)
R1	A	45	S17	47 (*1)	S23	A 47 (*1)
R3	D	45	S18	47 (*1)	S24	B 47 (*1)
S8		45	S19	47 (*1)		

: 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)
1J	29	Instrument Panel Wire and Driver Side J/B (Lower Finish Panel)

: Connector Joining Wire Harness and Wire Harness

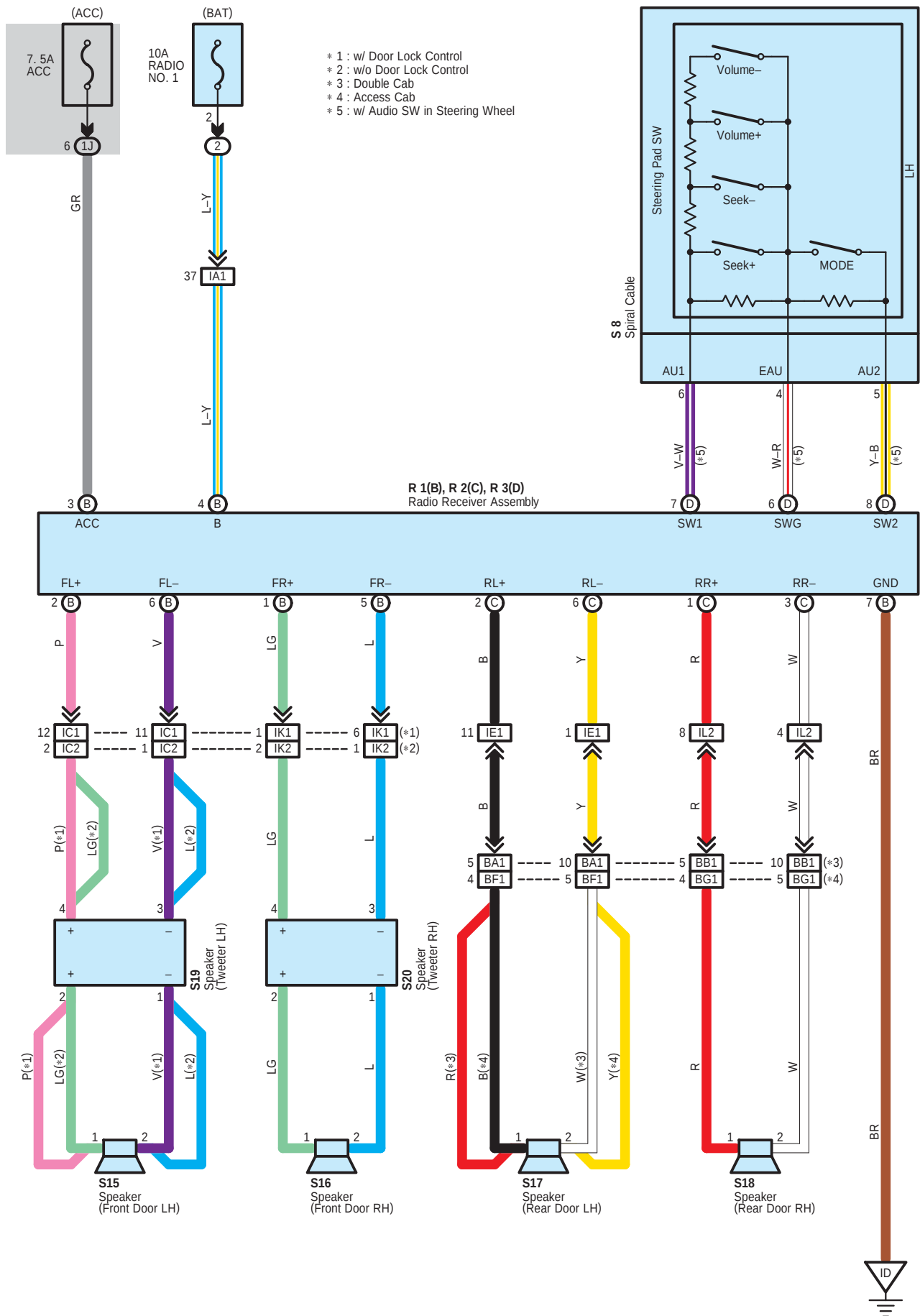
Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IA1	54	Instrument Panel Wire and Engine Room Main Wire (Left Kick Panel)
IA4		
IC1	54	Front Door LH Wire and Instrument Panel Wire (Left Kick Panel)
IE1	54	Instrument Panel Wire and Floor No.2 Wire (Left Kick Panel)
IK1	55	Front Door RH Wire and Instrument Panel Wire (Right Kick Panel)
IL3	55	Instrument Panel Wire and Floor Wire (Right Kick Panel)
BA1	56 (*1)	Rear Door No.2 Wire and Floor No.2 Wire (Under the Left Center Pillar)
BB1	56 (*1)	Rear Door No.1 Wire and Floor Wire (Under the Right Center Pillar)

: Ground Points

Code	See Page	Ground Points Location
ID	54	Instrument Panel Brace RH
BB	56 (*1)	Floor Seat Cross Member RH

* 1 : Double Cab * 2 : Access Cab * 3 : Regular Cab * 4 : Separate Seat * 5 : Bench Seat

Audio System for Built-in Type Amplifier



 : Parts Location

Code		See Page	Code	See Page	Code	See Page
R1	B	45	S16	47 (*1)	S19	47 (*1)
R2	C	45		48 (*2)		48 (*2)
R3	D	45		49 (*3)		49 (*3)
S8		45	S17	47 (*1)	S20	47 (*1)
S15	47 (*1)			48 (*2)		48 (*2)
	48 (*2)		S18	47 (*1)		49 (*3)
	49 (*3)			48 (*2)		

 : 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)
1J	29	Instrument Panel Wire and Driver Side J/B (Lower Finish Panel)

 : Connector Joining Wire Harness and Wire Harness

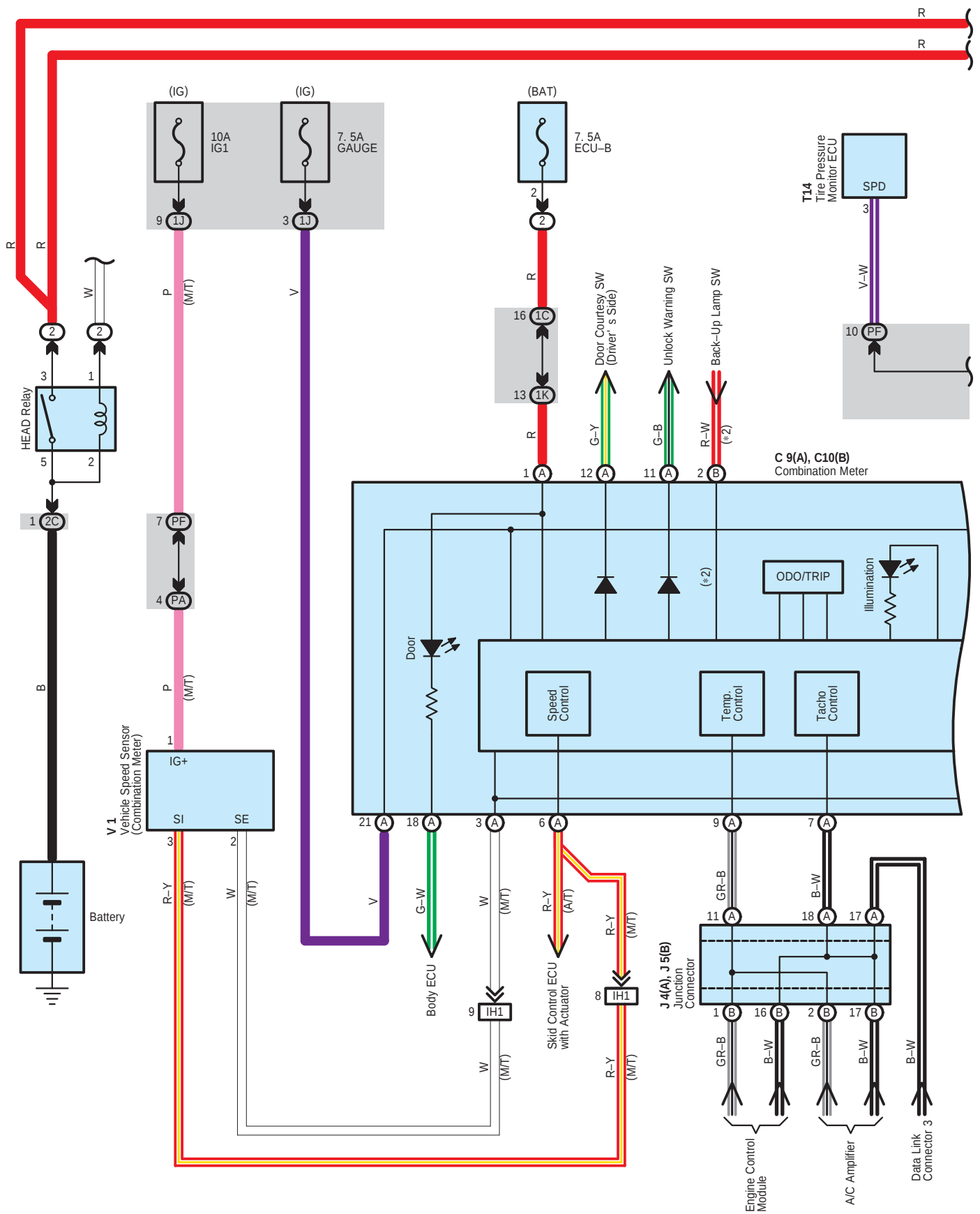
Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IA1	54	Instrument Panel Wire and Engine Room Main Wire (Left Kick Panel)
IC1	54	Front Door LH Wire and Instrument Panel Wire (Left Kick Panel)
IC2		
IE1	54	Instrument Panel Wire and Floor No.2 Wire (Left Kick Panel)
IK1	55	Front Door RH Wire and Instrument Panel Wire (Right Kick Panel)
IK2		
IL2	55	Instrument Panel Wire and Floor Wire (Right Kick Panel)
BA1	56 (*1)	Rear Door No.2 Wire and Floor No.2 Wire (Under the Left Center Pillar)
BB1	56 (*1)	Rear Door No.1 Wire and Floor Wire (Under the Right Center Pillar)
BF1	57 (*2)	Rear Door No.2 Wire and Floor No.2 Wire (Under the Left Quarter Panel)
BG1	57 (*2)	Rear Door No.1 Wire and Floor Wire (Under the Right Quarter Panel)

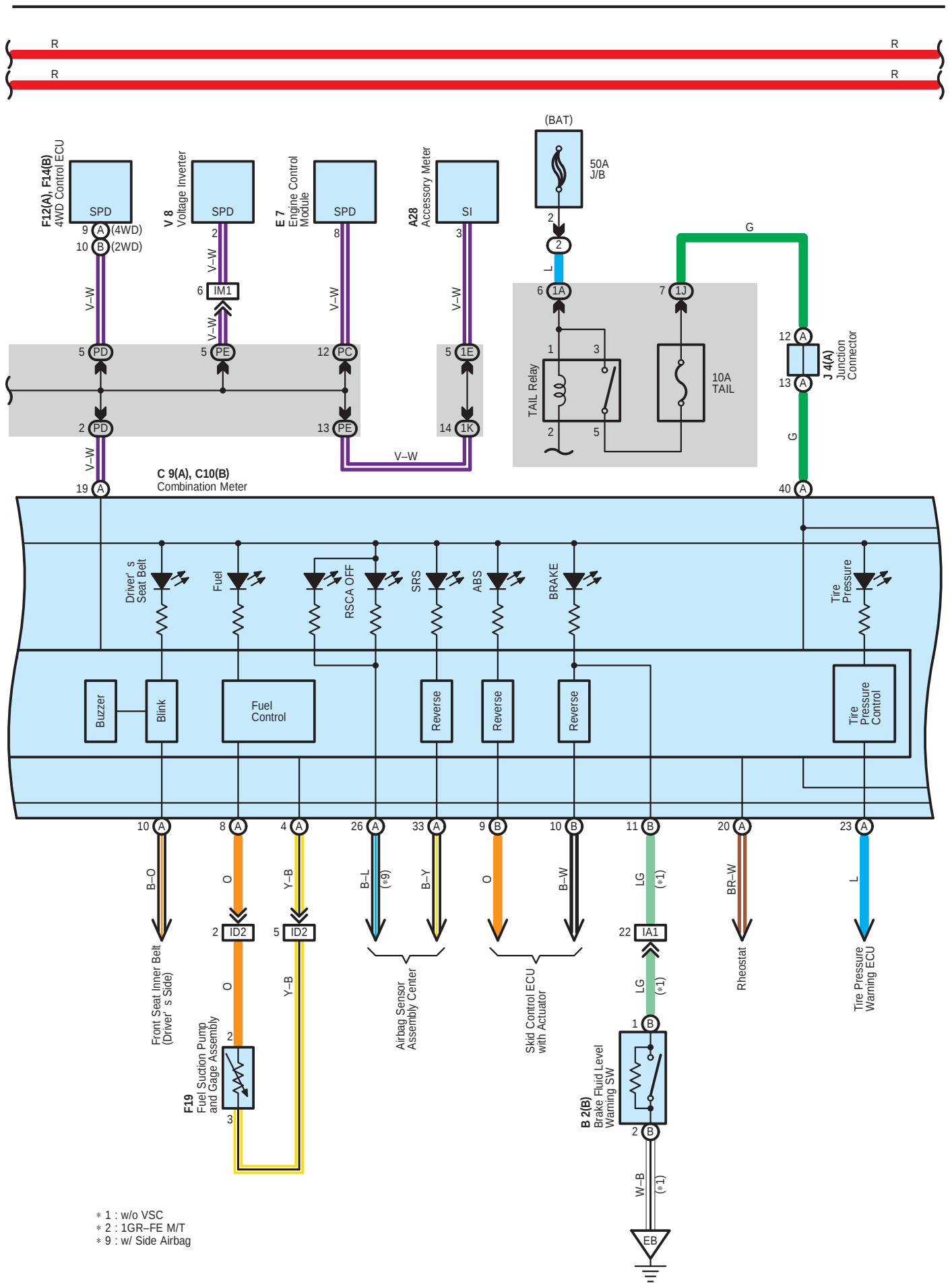
 : Ground Points

Code	See Page	Ground Points Location
ID	54	Instrument Panel Brace RH

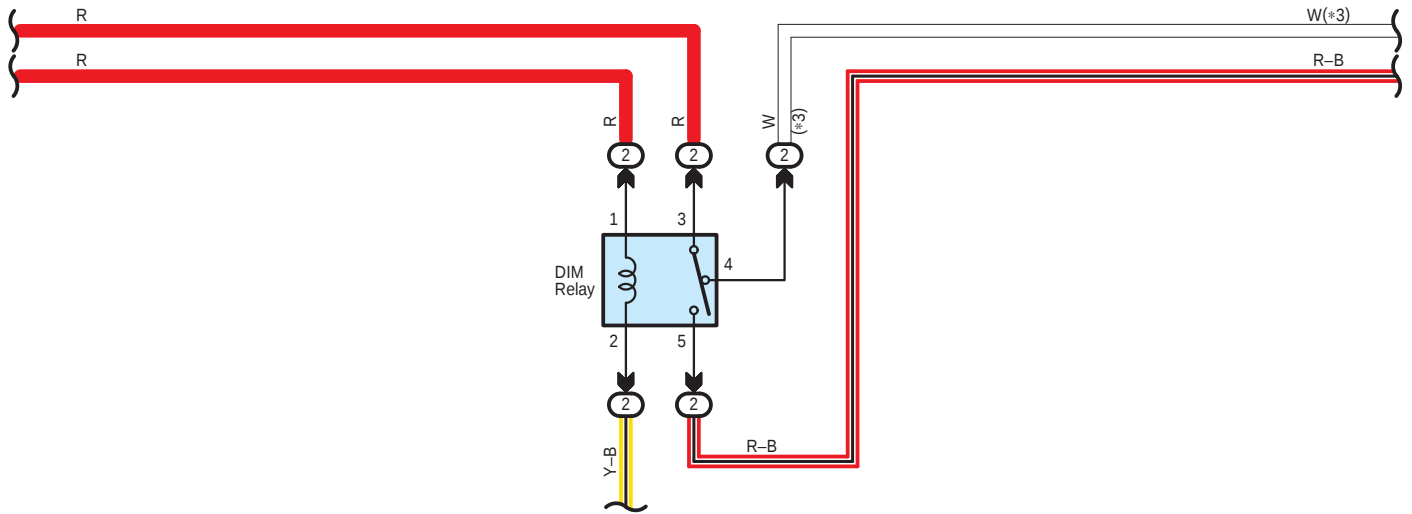
* 1 : Double Cab * 2 : Access Cab * 3 : Regular Cab * 4 : Separate Seat * 5 : Bench Seat

Combination Meter

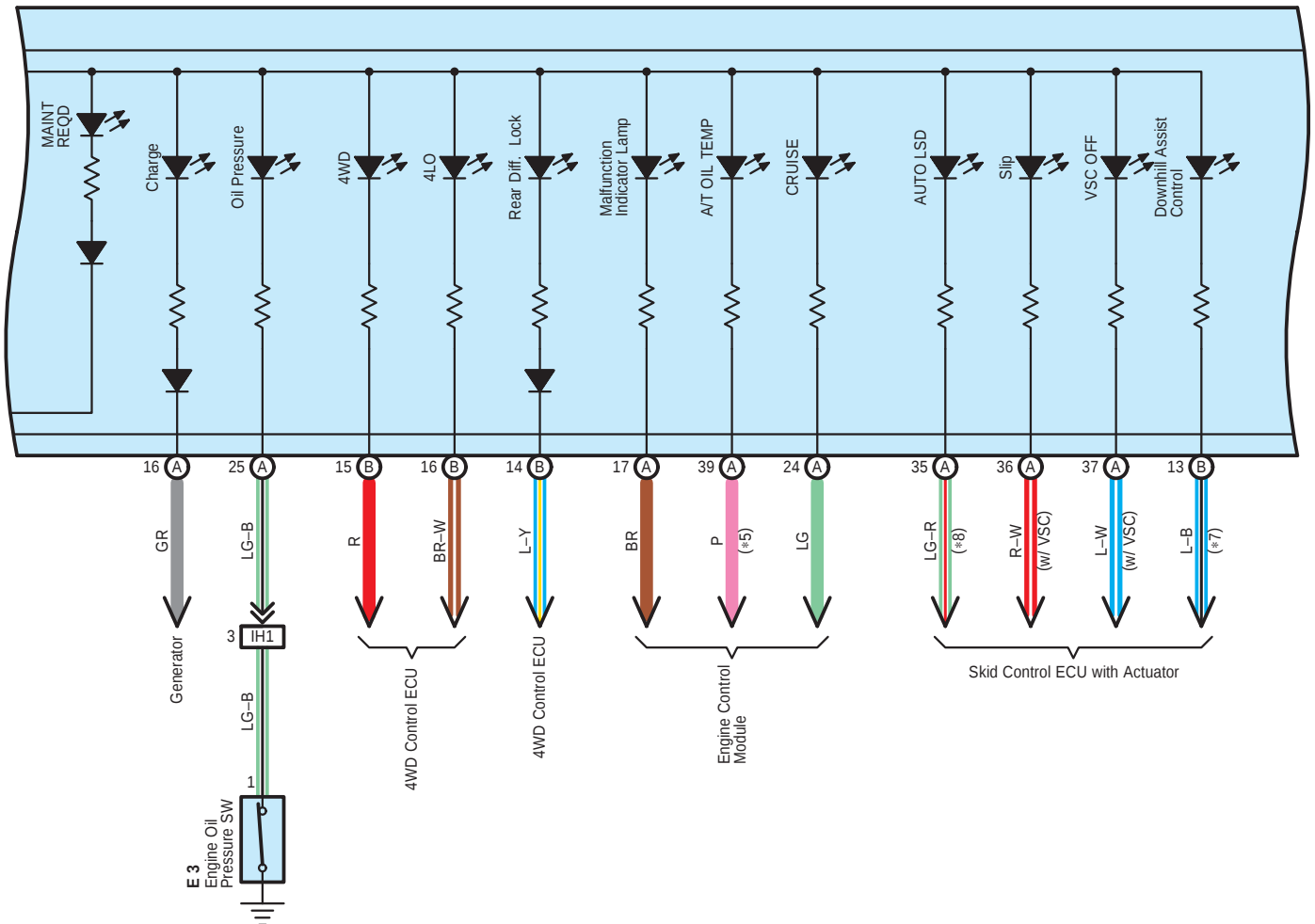


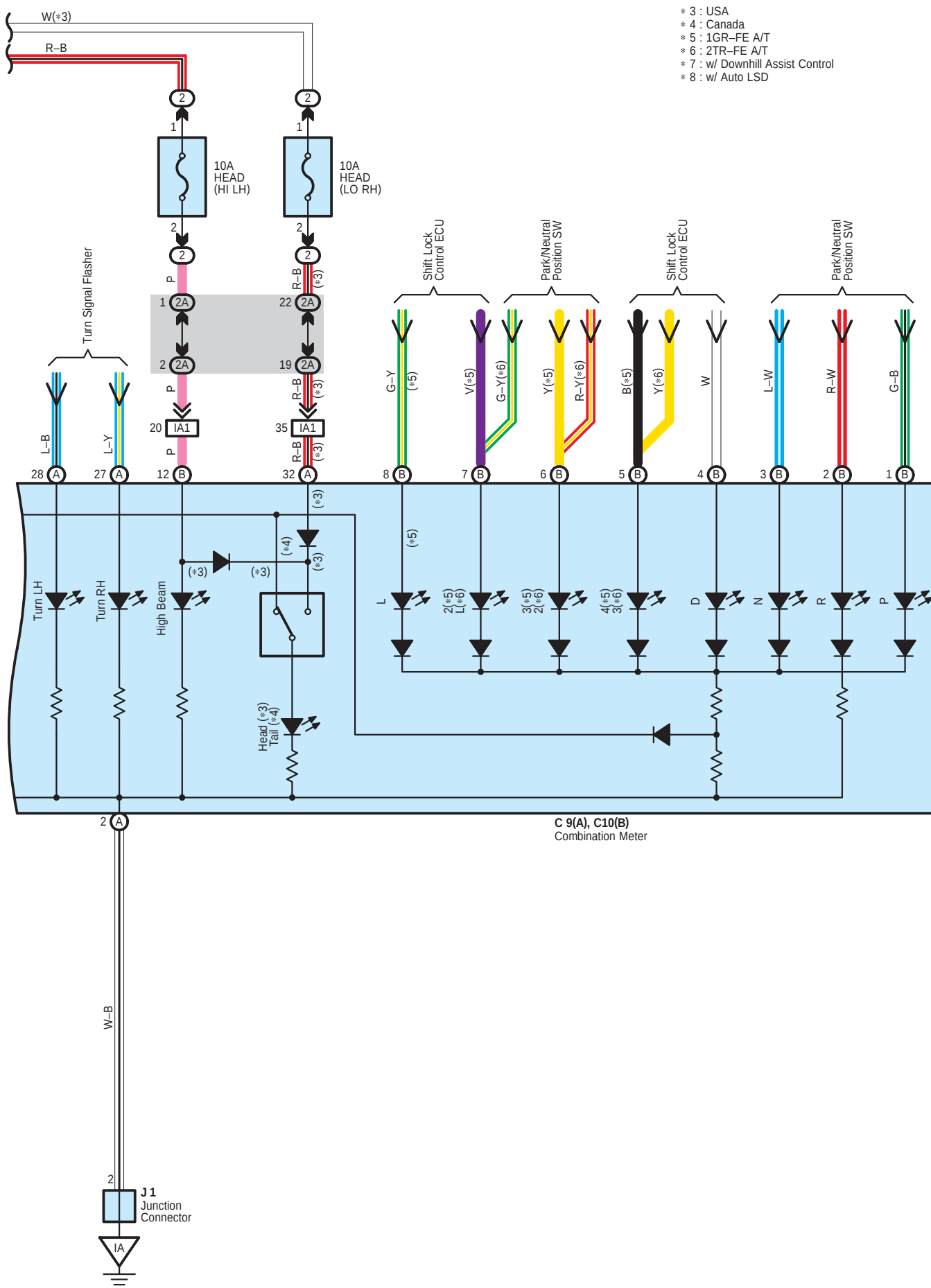


Combination Meter



C 9(A), C10(B)
Combination Meter





Combination Meter

: Parts Location

Code		See Page		Code		See Page		Code		See Page	
A28		46 (*1)		E7		44		J5	B	45	
		48 (*2)		F12	A	44		T14		45	
B2	B	40 (1GR–FE)		F14	B	44		V1		41 (1GR–FE)	
		42 (2TR–FE)		F19		46 (*1)				43 (2TR–FE)	
C9	A	44				48 (*2)		V8		47 (*1)	
C10	B	44				49 (*3)				48 (*2)	
E3		40 (1GR–FE)		J1		45					
		42 (2TR–FE)		J4	A	45					

: 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)
1A	28	Engine Room Main Wire and Driver Side J/B (Lower Finish Panel)
1C		
1E	28	Roof Wire and Driver Side J/B (Lower Finish Panel)
1J	29	Instrument Panel Wire and Driver Side J/B (Lower Finish Panel)
1K		
2A	24	Engine Room J/B (Engine Compartment Left)
2C	24	Engine Room Main Wire and Engine Room J/B (Engine Compartment Left)
PA	36	Engine Wire and Instrument Panel J/B No.2 (Right Side of Glove Box)
PC	36	Instrument Panel Wire and Instrument Panel J/B No.2 (Right Side of Glove Box)
PD		
PE		
PF		

: Connector Joining Wire Harness and Wire Harness

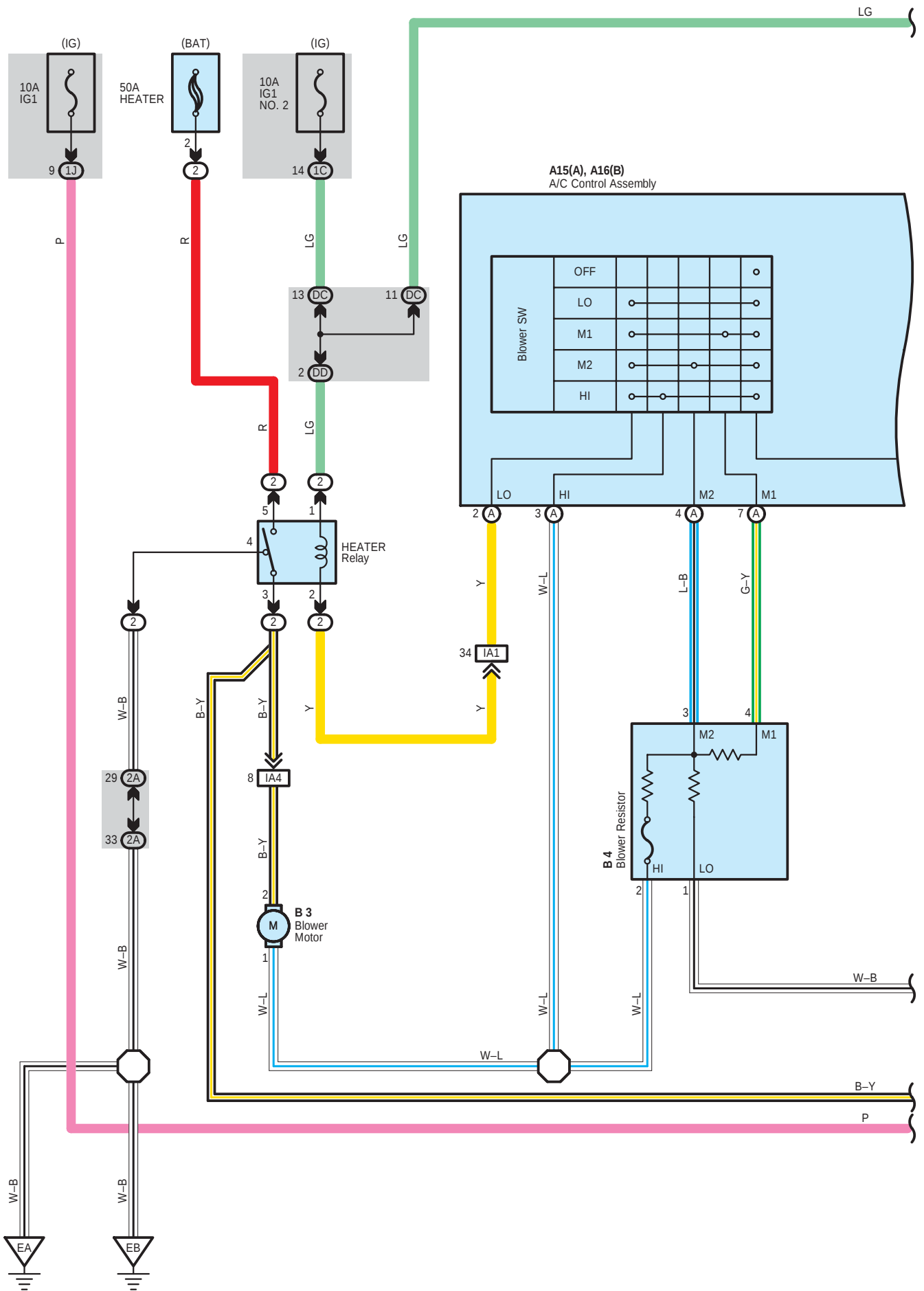
Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IA1	54	Instrument Panel Wire and Engine Room Main Wire (Left Kick Panel)
ID2	54	Frame Wire and Instrument Panel Wire (Left Kick Panel)
IH1	55	Engine Wire and Instrument Panel Wire (Right Side of Glove Box)
IM1	55	Floor No.3 Wire and Instrument Panel Wire (Under the Console Box)

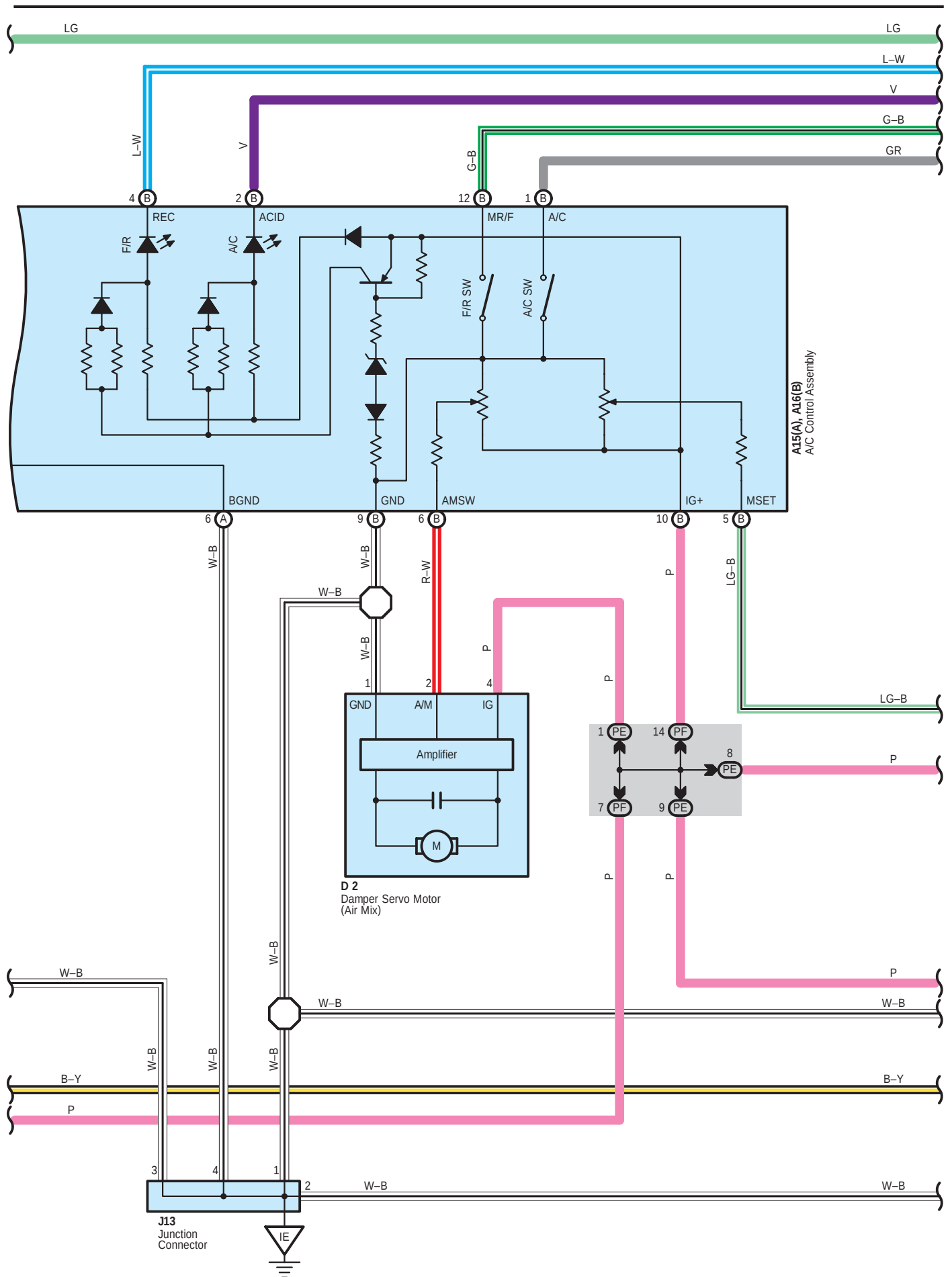
: Ground Points

Code	See Page	Ground Points Location
EB	52 (1GR-FE)	Front Left Fender
	53 (2TR-FE)	
IA	54	Left Kick Panel

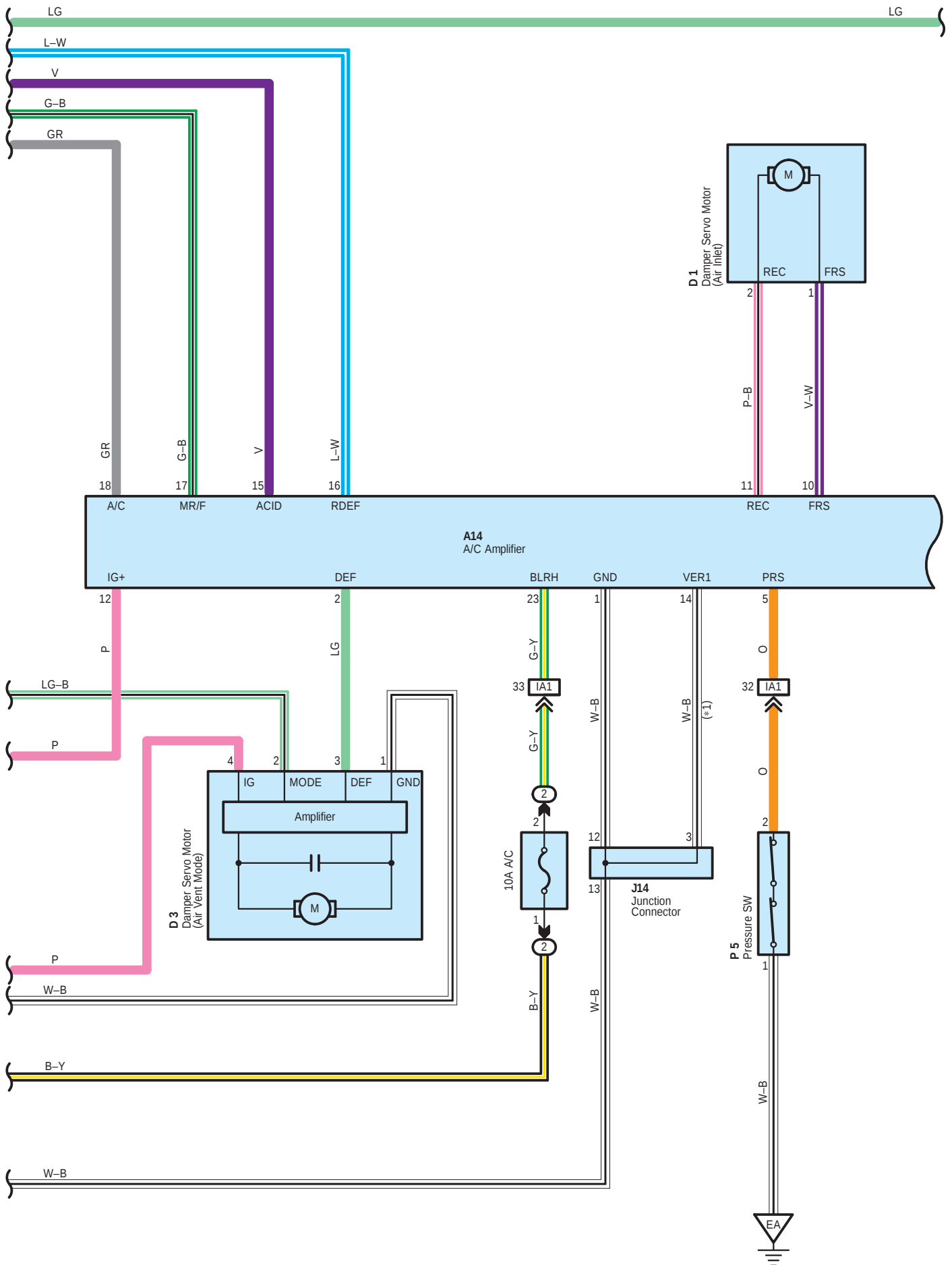
* 1 : Double Cab * 2 : Access Cab * 3 : Regular Cab * 4 : Separate Seat * 5 : Bench Seat

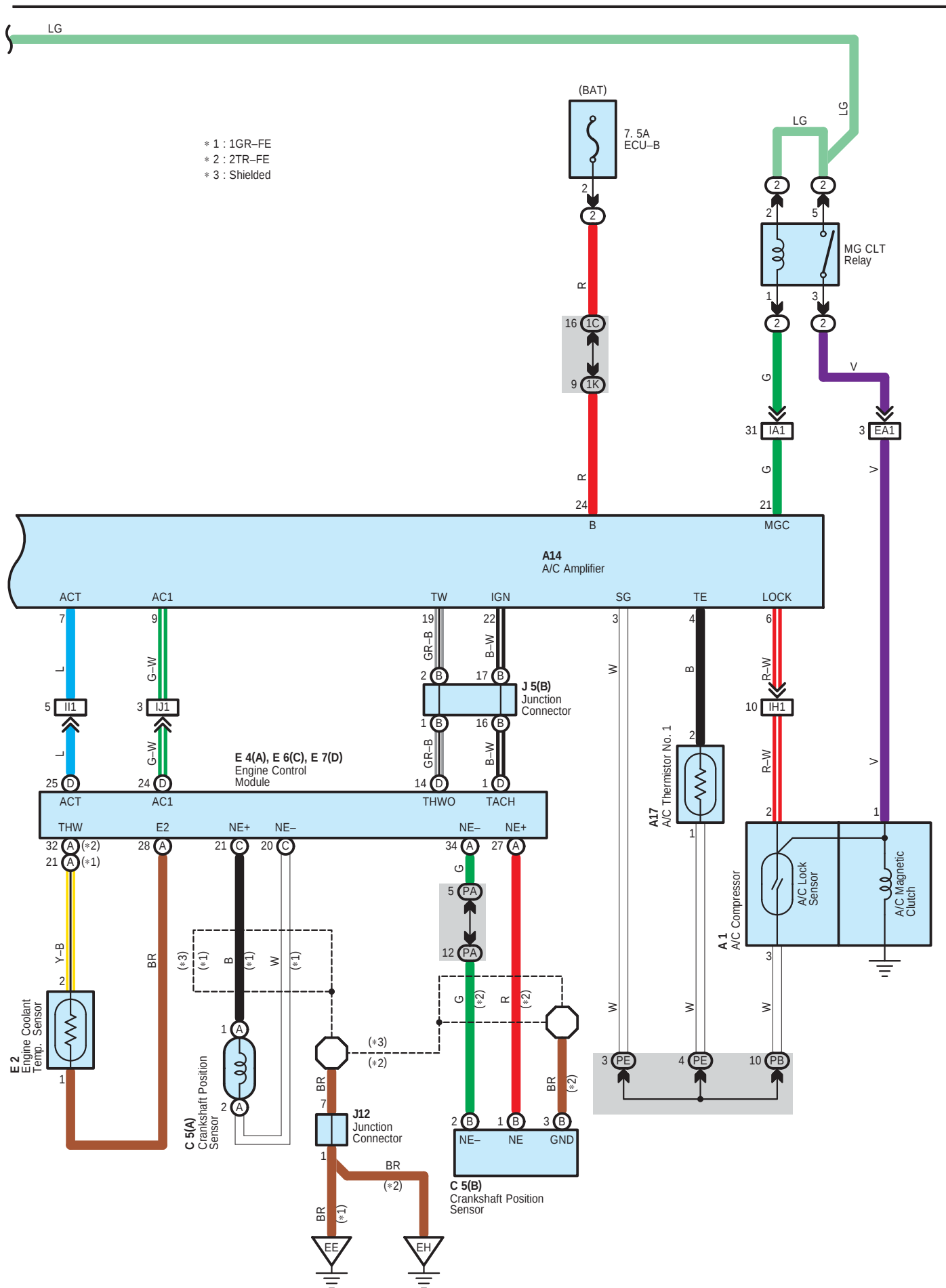
Air Conditioning





Air Conditioning





Air Conditioning

System Outline

The A/C amplifier receives various signals, I.E., the engine RPM from the engine control module and coolant temperature from the engine control module, etc.

When the engine is started and the A/C SW (A/C control assembly) is on, a signal is input to the A/C amplifier.

As a result, current flows from IG1 NO.2 fuse to TERMINAL 2 of the MG CLT relay to TERMINAL 1 to TERMINAL MGC of the A/C amplifier to GROUND, turning the MG CLT relay on, so that the magnetic clutch is on and the A/C compressor operates.

If the integration control and panel detects the following conditions, it stops the air conditioning:

- * Evaporator outlet air temperature is too low.
- * There is a marked difference between the compressor speed and the engine speed.
- * The refrigerant pressure is abnormally high or abnormally low.
- * The engine speed is too low.
- * Rapid acceleration occurs.

○ : Parts Location

Code	See Page	Code	See Page	Code	See Page
A1	40 (1GR-FE)	C5	A 40 (1GR-FE)	E6	C 44
	42 (2TR-FE)		B 42 (2TR-FE)	E7	D 44
A14	44	D1	44	J5	B 45
A15	A 44	D2	44	J12	45
A16	B 44	D3	44	J13	45
A17	44	E2	40 (1GR-FE)	J14	45
B3	44		42 (2TR-FE)	P5	41 (1GR-FE)
B4	44	E4	A 44		43 (2TR-FE)

○ : 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)
1C	28	Engine Room Main Wire and Driver Side J/B (Lower Finish Panel)
1J	29	Instrument Panel Wire and Driver Side J/B (Lower Finish Panel)
1K		
2A	24	Engine Room J/B (Engine Compartment Left)
DC	34	Engine Room Main Wire and Instrument Panel J/B No.1 (Left Kick Panel)
DD		
PB	36	Engine Wire and Instrument Panel J/B No.2 (Right Side of Glove Box)
PE	36	Instrument Panel Wire and Instrument Panel J/B No.2 (Right Side of Glove Box)
PF		

□ : Connector Joining Wire Harness and Wire Harness

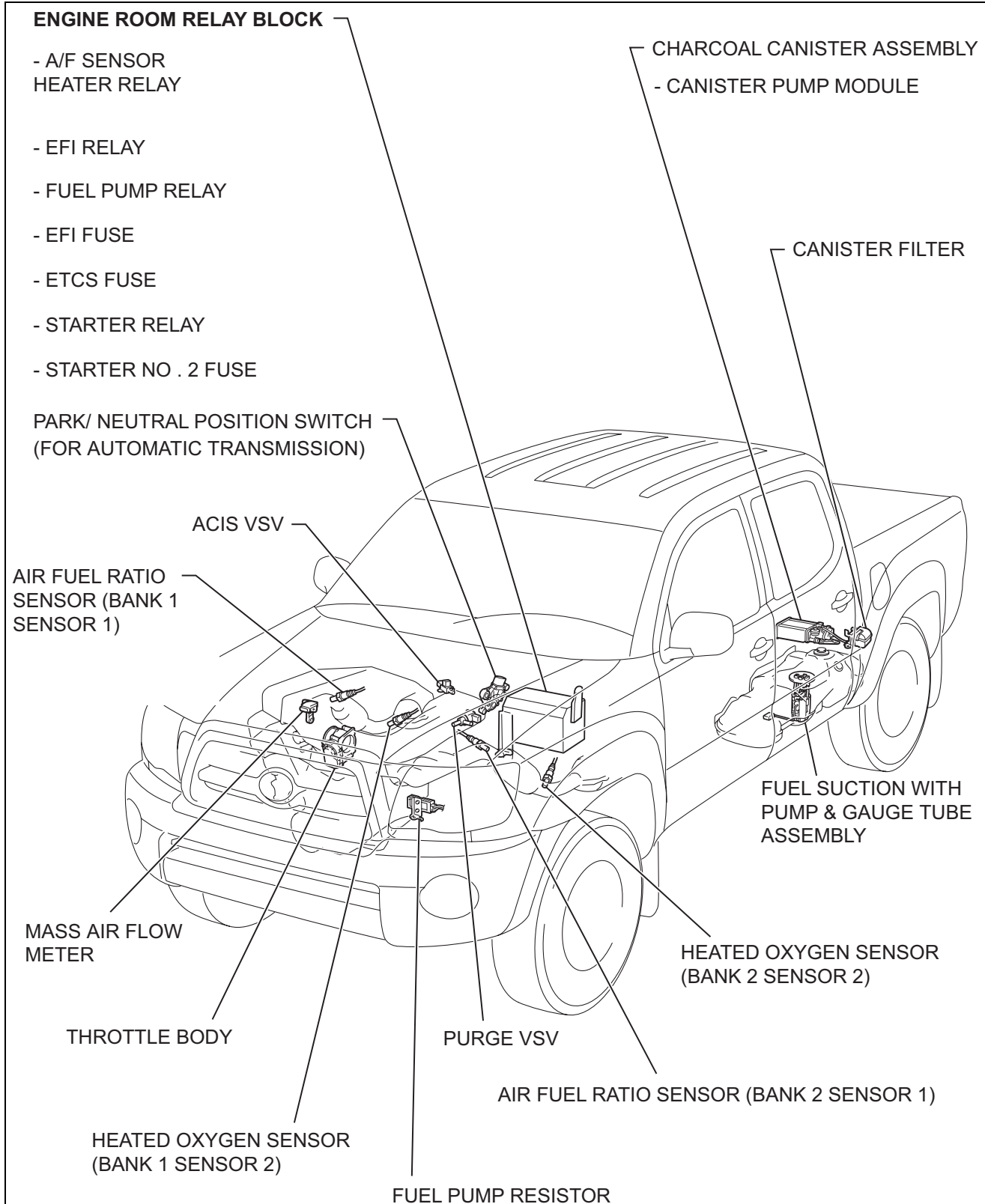
Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
EA1	52 (1GR-FE)	Engine Wire and Engine Room Main Wire (Inside of Engine Room R/B)
	53 (2TR-FE)	
IA1	54	Instrument Panel Wire and Engine Room Main Wire (Left Kick Panel)
IA4		
IH1	55	Engine Wire and Instrument Panel Wire (Right Side of Glove Box)
II1	55	Instrument Panel Wire and Instrument Panel Wire (Instrument Panel Brace RH)
IJ1	55	Instrument Panel Wire and Instrument Panel Wire (Right Kick Panel)



: Ground Points

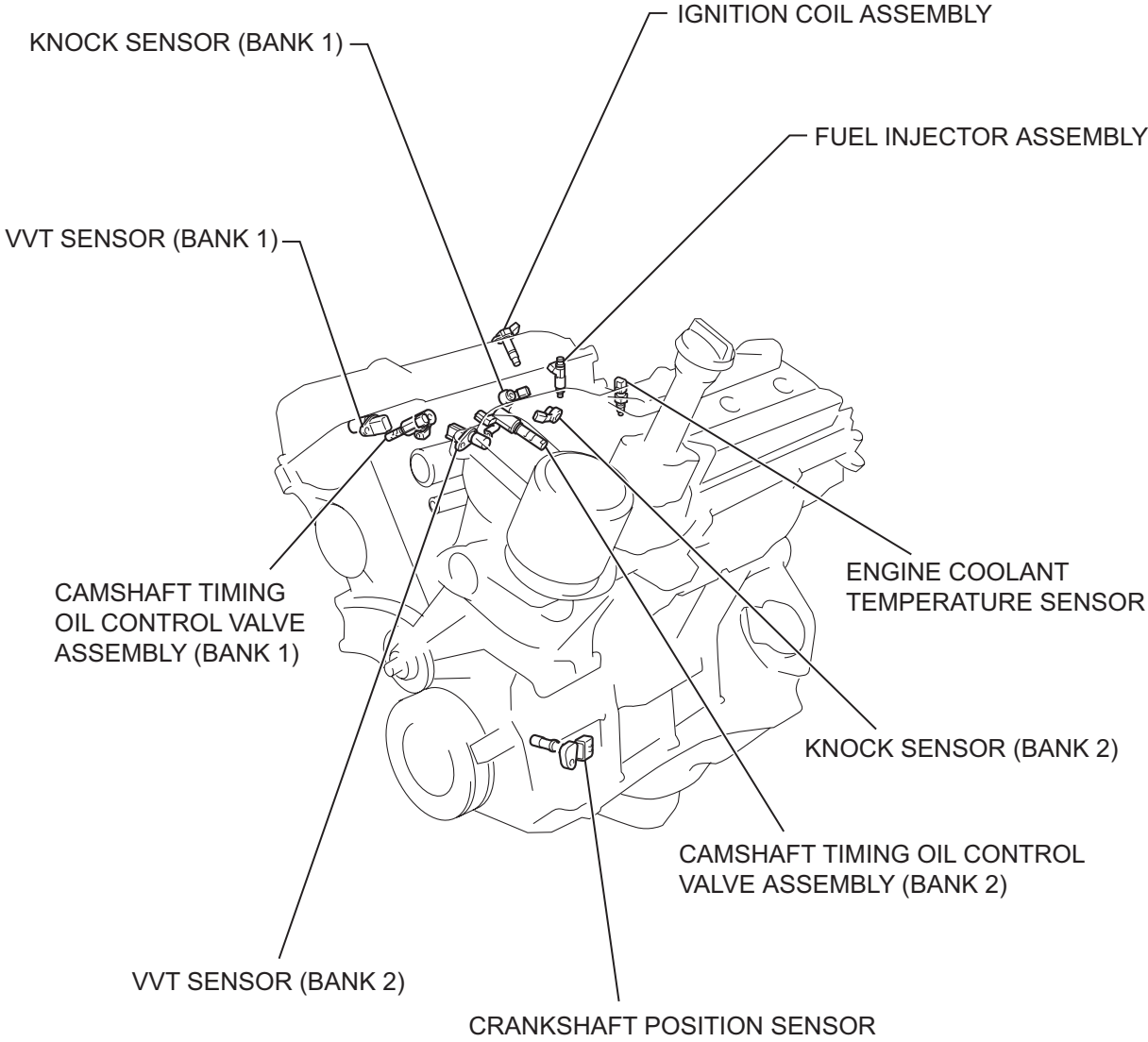
Code	See Page	Ground Points Location
EA	52 (1GR-FE)	Front Right Fender
	53 (2TR-FE)	
EB	52 (1GR-FE)	Front Left Fender
	53 (2TR-FE)	
EE	52 (1GR-FE)	Rear Side of Right Bank Cylinder Block
EH	53 (2TR-FE)	Rear Side of Cylinder Block
IE	54	Right Kick Panel

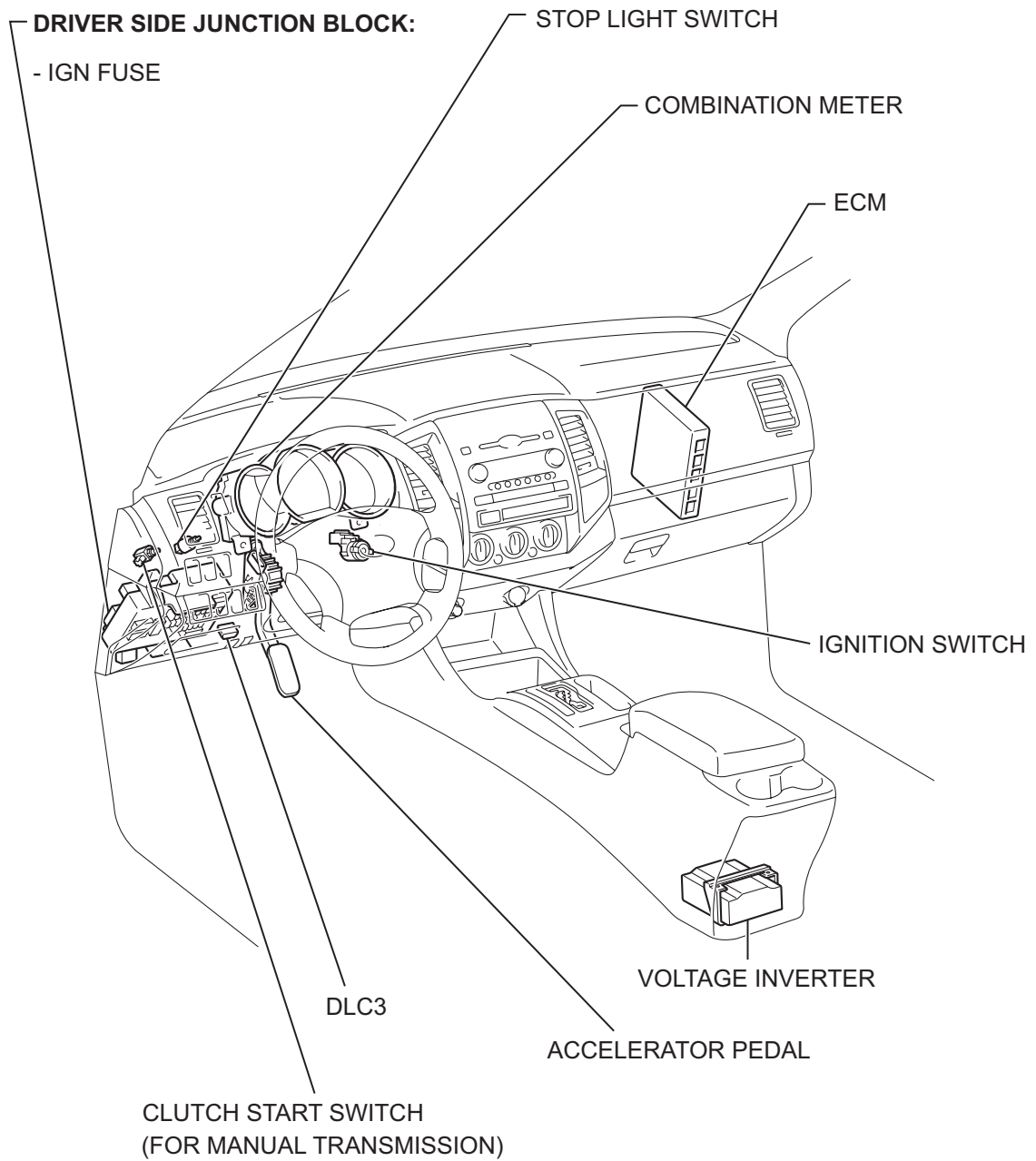
PARTS LOCATION



ES

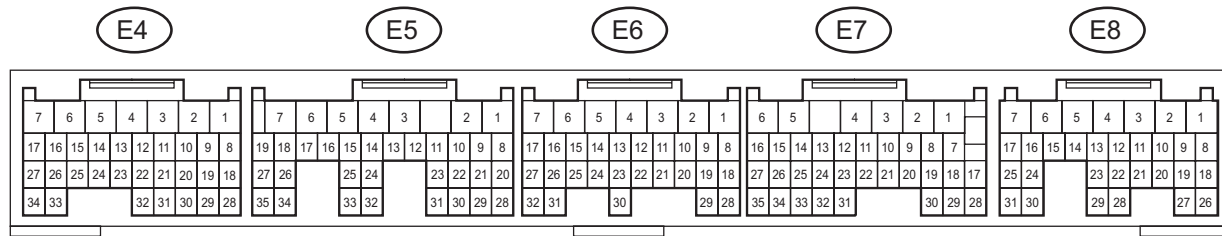
ES





ES

TERMINALS OF ECM



A121603E02

HINT:

The standard normal voltage between each pair of ECM terminals is shown in the table below. The appropriate conditions for checking each pair of terminals are also indicated.

The result of checks should be compared with the standard normal voltage for that pair of terminals, displayed in the STD Voltages column.

The illustration above can be used as a reference to identify the ECM terminal locations.

Symbols (Terminal No.)	Wiring Colors	Terminal Descriptions	Conditions	STD Voltages
BATT (E8-3) - E1 (E6-1)	L - BR	Battery (for measuring the battery voltage and for the ECM memory)	Always	9 to 14 V
+BM (E8-7) - E1 (E6-1)	LG - BR	Power source of throttle motor	Always	9 to 14 V
IGSW (E8-9) - E1 (E6-1)	O - BR	Ignition switch	Ignition switch ON	9 to 14 V
+B (E8-1) - E1 (E6-1)	B - BR	Power source of ECM	Ignition switch ON	9 to 14 V
+B2 (E8-2) - E1 (E6-1)	B - BR	Power source of ECM	Ignition switch ON	9 to 14 V
OC1+ (E6-17) - OC1- (E6-16)	G-Y - L-B	Camshaft timing oil control valve (OCV)	Ignition switch ON	Pulse generation (see waveform 1)
OC2+ (E6-15) - OC2- (E6-14)	L-W - L-R	Camshaft timing oil control valve (OCV)	Ignition switch ON	Pulse generation (see waveform 1)
MREL (E8-8) - E1 (E6-1)	G-W - BR	EFI relay	Ignition switch ON	9 to 14 V
VC (E4-23) - E2 (E4-28)	L - BR	Power source of sensor (specific voltage)	Ignition switch ON	4.5 to 5.0 V
VG (E4-30) - E2G (E4-29)	R-Y - R-W	Mass air flow meter	Idling, Shift lever position P or N, A/C switch OFF	0.5 to 3.0 V
THA (E4-22) - E2 (E4-28)	R-L - BR	Intake air temperature sensor	Idling, Intake air temperature 20°C (68°F)	0.5 to 3.4 V
THW (E4-21) - E2 (E4-28)	Y-B - BR	Engine coolant temperature sensor	Idling, Engine coolant temperature 80°C (176°F)	0.2 to 1.0 V
VTA1 (E4-20) - E2 (E4-28)	G-B - BR	Throttle position sensor (for engine control)	Ignition switch ON, Throttle valve fully closed	0.5 to 1.2 V
VTA1 (E4-20) - E2 (E4-28)	G-B - BR	Throttle position sensor (for engine control)	Ignition switch ON, Throttle valve fully open	3.2 to 4.8 V

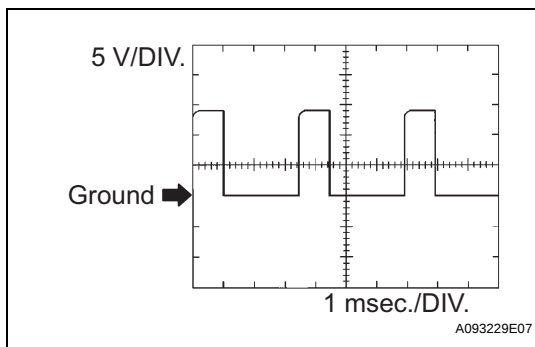
Symbols (Terminal No.)	Wiring Colors	Terminal Descriptions	Conditions	STD Voltages
VTA2 (E4-19) - E2 (E4-28)	G-W - BR	Throttle position sensor (for sensor malfunction detection)	Ignition switch ON, Accelerator pedal fully released	2.1 to 3.1 V
VTA2 (E4-19) - E2 (E4-28)	G-W - BR	Throttle position sensor (for sensor malfunction detection)	Ignition switch ON, Accelerator pedal fully depressed	4.5 to 5.0 V
VPA (E8-18) - EPA (E8-20)	R-Y - LG-B	Accelerator pedal position sensor (for engine control)	Ignition switch ON, Accelerator pedal fully released	0.5 to 1.1 V
VPA (E8-18) - EPA (E8-20)	R-Y - LG-B	Accelerator pedal position sensor (for engine control)	Ignition switch ON, Accelerator pedal fully depressed	2.6 to 4.5 V
VPA2 (E8-19) - EPA2 (E8-21)	GR-B - R-B	Accelerator pedal position sensor (for sensor malfunction detection)	Ignition switch ON, Accelerator pedal fully released	1.2 to 2.0 V
VPA2 (E8-19) - EPA2 (E8-21)	GR-B - R-B	Accelerator pedal position sensor (for sensor malfunction detection)	Ignition switch ON, Accelerator pedal fully depressed	3.4 to 5.0 V
VCPA (E8-26) - EPA (E8-20)	R - LG-B	Power source of accelerator pedal position sensor (for VPA)	Ignition switch ON	4.5 to 5.0 V
VCP2 (E8-27) - EPA2 (E8-21)	L-W - R-B	Power source of accelerator pedal position sensor (for VPA2)	Ignition switch ON	4.5 to 5.0 V
HA1A (E5-2) - E04 (E5-7) HA2A (E5-1) - E05 (E5-6)	R - W-B B-W - W-B	A/F sensor heater	Idling	Below 3.0 V
HA1A (E5-2) - E04 (E5-7) HA2A (E5-1) - E05 (E5-6)	R - W-B B-W - W-B	A/F sensor heater	Ignition switch ON	9 to 14 V
A1A+ (E5-22) - E1 (E6-1)	P - BR	A/F sensor	Ignition switch ON	3.3 V*1
A2A+ (E5-23) - E1 (E6-1)	W - BR	A/F sensor	Ignition switch ON	3.3 V*1
A1A- (E5-30) - E1 (E6-1)	L - BR	A/F sensor	Ignition switch ON	2.9 V*1
A2A- (E5-31) - E1 (E6-1)	R - BR	A/F sensor	Ignition switch ON	2.9 V*1
HT1B (E4-1) - E1 (E6-1) HT2B (E5-5) - E1 (E6-1)	G - BR L - BR	Heated oxygen sensor heater	Idling	Below 3.0 V
HT1B (E4-1) - E1 (E6-1) HT2B (E5-5) - E1 (E6-1)	G - BR L - BR	Heated oxygen sensor heater	Ignition switch ON	9 to 14 V
OX1B (E4-18) - E2 (E4-28) OX2B (E5-33) - E2 (E4-28)	W - BR B - BR	Heated oxygen sensor	Maintain engine speed at 2,500 rpm for 2 minutes after warming up	Pulse generation (see waveform 2)
#10 (E6-2) - E01 (E4-7) #20 (E6-3) - E01 (E4-7) #30 (E6-4) - E01 (E4-7) #40 (E6-5) - E01 (E4-7) #50 (E6-6) - E01 (E4-7) #60 (E6-7) - E01 (E4-7)	R-L - W-B B - W-B R - W-B G - W-B Y - W-B L - W-B	Injector	Ignition switch ON	9 to 14 V
#10 (E6-2) - E01 (E4-7) #20 (E6-3) - E01 (E4-7) #30 (E6-4) - E01 (E4-7) #40 (E6-5) - E01 (E4-7) #50 (E6-6) - E01 (E4-7) #60 (E6-7) - E01 (E4-7)	R-L - W-B B - W-B R - W-B G - W-B Y - W-B L - W-B	Injector	Idling	Pulse generation (see waveform 3)
KNK1 (E5-29) - EKNK (E5-28)	B - W	Knock sensor	Maintain engine speed at 4,000 rpm after warming up	Pulse generation (see waveform 4)
KNK2 (E5-21) - EKN2 (E5-20)	G - R	Knock sensor	Maintain engine speed at 4,000 rpm after warming up	Pulse generation (see waveform 4)
VV1+ (E6-19) - VV1- (E6-29)	R - G	Variable valve timing (VVT) sensor	Idling	Pulse generation (see waveform 5)

Symbols (Terminal No.)	Wiring Colors	Terminal Descriptions	Conditions	STD Voltages
VV2+ (E6-18) - VV2- (E6-28)	Y - L	Variable valve timing (VVT) sensor	Idling	Pulse generation (see waveform 5)
NE+ (E6-21) - NE- (E6-20)	B - W	Crankshaft position sensor	Idling	Pulse generation (see waveform 5)
IGT1 (E4-8) - E1 (E6-1) IGT2 (E4-9) - E1 (E6-1) IGT3 (E4-10) - E1 (E6-1) IGT4 (E4-11) - E1 (E6-1) IGT5 (E4-12) - E1 (E6-1) IGT6 (E4-13) - E1 (E6-1)	P - BR P-L - BR LG - BR LG-B - BR GR - BR G - BR	Ignition coil with igniter (ignition signal)	Idling	Pulse generation (see waveform 6)
IGF1 (E4-24) - E1 (E6-1)	W-R - BR	Ignition coil with igniter (ignition confirmation signal)	Ignition switch ON	4.5 to 5.0 V
IGF1 (E4-24) - E1 (E6-1)	W-R - BR	Ignition coil with igniter (ignition confirmation signal)	Idling	Pulse generation (see waveform 6)
PRG (E4-34) - E1 (E6-1)	Y - BR	Purge VSV	Ignition switch ON	9 to 14 V
PRG (E4-34) - E1 (E6-1)	Y - BR	Purge VSV	Idling	Pulse generation (see waveform 7)
SPD (E7-8) - E1 (E6-1)	V-W - BR	Speed signal from combination meter	Ignition switch ON, Rotate driving wheel slowly	Pulse generation (see waveform 8)
STA (E6-11) - E1 (E6-1)	B-Y - BR	Starter signal	Cranking	9 to 14 V
STP (E8-15) - E1 (E6-1)	L - BR	Stop light switch	Brake pedal depressed	7.5 to 14 V
STP (E8-15) - E1 (E6-1)	L - BR	Stop light switch	Brake pedal released	Below 1.5 V
ST1- (E8-16) - E1 (E6-1)	V-W - BR	Stop light switch (opposite to STP terminal)	Ignition switch ON, Brake pedal depressed	Below 1.5 V
ST1- (E8-16) - E1 (E6-1)	V-W - BR	Stop light switch (opposite to STP terminal)	Ignition switch ON, Brake pedal released	7.5 to 14 V
NSW (E5-8) - E1 (E6-1)	V - BR	Park/Neutral position switch	Ignition switch ON, Shift lever position in P or N	Below 3.0 V
NSW (E5-8) - E1 (E6-1)	V - BR	Park/Neutral position switch	Ignition switch ON, Shift lever position other than P and N	9 to 14 V
M+ (E4-5) - ME01 (E5-3)	P - W-B	Throttle motor	Idling with warm engine	Pulse generation (see waveform 9)
M- (E4-4) - ME01 (E5-3)	L - W-B	Throttle motor	Idling with warm engine	Pulse generation (see waveform 10)
FC (E8-10) - E1 (E6-1)	L-B - BR	Fuel pump control	Ignition switch ON	9 to 14 V
FPR (E6-30) - E1 (E6-1)	Y-R - BR	Fuel pump control	Ignition switch ON	9 to 14 V
W (E7-30) - E1 (E6-1)	BR - BR	MIL	Ignition switch ON	Below 3.0 V
W (E7-30) - E1 (E6-1)	BR - BR	MIL	Idling	9 to 14 V
ELS (E7-13) - E1 (E6-1)	G - BR	Electric load	Defogger switch OFF	0 to 1.5 V
ELS (E7-13) - E1 (E6-1)	G - BR	Electric load	Defogger switch ON	7.5 to 14 V
ELS2 (E7-12) - E1 (E6-1)	B-W - BR	Electric load	Taillight switch OFF	0 to 1.5 V
ELS2 (E7-12) - E1 (E6-1)	B-W - BR	Electric load	Taillight switch ON	7.5 to 14 V
TC (E8-23) - E1 (E6-1)	P-B - BR	Terminal TC of DLC 3	Ignition switch ON	9 to 14 V
TACH (E7-1) - E1 (E6-1)	B-W - BR	Engine speed	Idling	Pulse generation (see waveform 11)
ACIS (E4-33) - E1 (E6-1)	W-L - BR	VSV for ACIS	Ignition switch ON	9 to 14 V
PSW (E6-10) - E1 (E6-1)	G-W - BR	P/S pressure switch	Ignition switch ON	9 to 14 V
VPMP (E8-5) - E1 (E6-1)	V-W - BR	Vent valve (built into canister pump module)	Ignition switch ON	9 to 14 V
MPMP (E8-6) - E1 (E6-1)	G - BR	Leak detection pump (built into canister pump module)	Leak detection pump OFF	0 to 3 V

Symbols (Terminal No.)	Wiring Colors	Terminal Descriptions	Conditions	STD Voltages
MPMP (E8-6) - E1 (E6-1)	G - BR	Leak detection pump (built into canister pump module)	Leak detection pump ON	9 to 14 V
PPMP (E8-22) - E2 (E4-28)	GR - BR	Canister pressure sensor (built into canister pump module)	Ignition switch ON	3 to 3.6 V
F/PS (E7-32) - E1 (E6-1)	R - BR	Airbag sensor assembly	Idling with warm engine	Pulse generation (see waveform 12)
CANH (E7-33) - E1 (E6-1)	B - BR	CAN communication line	Ignition switch ON	Pulse generation (see waveform 13)
CANL (E7-34) - E1 (E6-1)	W - BR	CAN communication line	Ignition switch ON	Pulse generation (see waveform 14)

*1: The ECM terminal voltage is constant regardless of the output voltage from the sensor.

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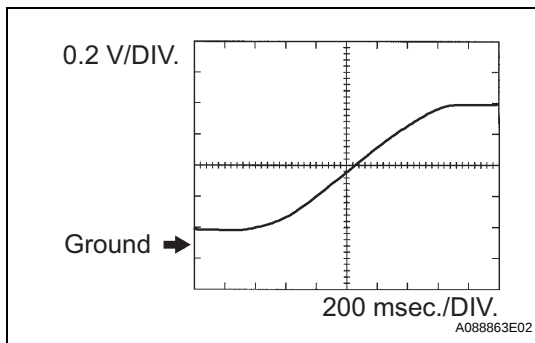


1. WAVEFORM 1 Camshaft timing oil control valve (OCV)

ECM Terminal Names	Between OC1+ and OC1- or OC2+ and OC2-
Tester Ranges	5 V/DIV, 1 msec./DIV
Conditions	Idling

HINT:

The wavelength becomes shorter as the engine rpm increases.

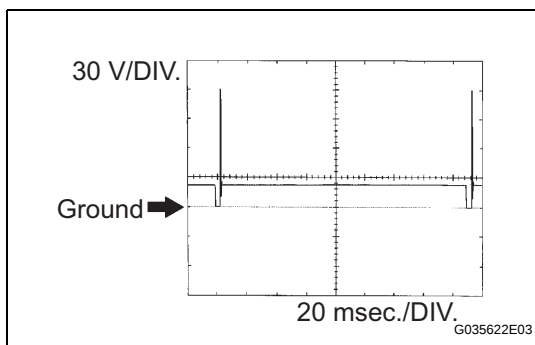


2. WAVEFORM 2 Heated oxygen sensor

ECM Terminal Names	Between OX1B and E2 or OX2B and E2
Tester Ranges	0.2 V/DIV, 200 msec./DIV
Conditions	Engine speed maintained at 2,500 rpm for 2 minutes after warming up sensor

HINT:

In the DATA LIST, item O2S B1S2 or O2S B2S2 shows the ECM input values from the heated oxygen sensor.

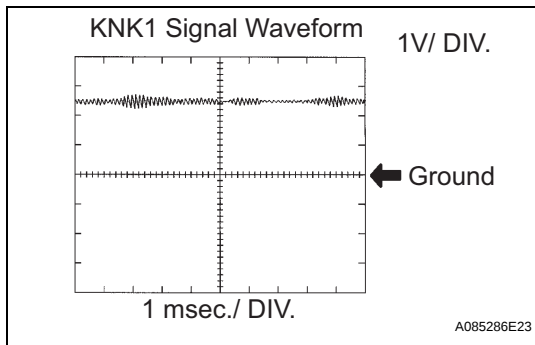


3. WAVEFORM 3 Fuel injector

ECM Terminal Names	Between #10 (to 60) and E01
Tester Ranges	30 V/DIV, 20 msec./DIV
Conditions	Idling

HINT:

The wavelength becomes shorter as the engine rpm increases.



4. WAVEFORM 4 Knock sensor

ECM Terminal Names	Between KNK1 and EKNK or KNK2 and EKN2
Tester Ranges	0.01 to 10 V/DIV, 0.01 to 10 msec./DIV
Conditions	Engine speed maintained at 4,000 rpm after warming up engine

HINT:

- The wavelength becomes shorter as the engine rpm increases.
- The waveforms and amplitudes displayed on the tester differ slightly depending on the vehicle.

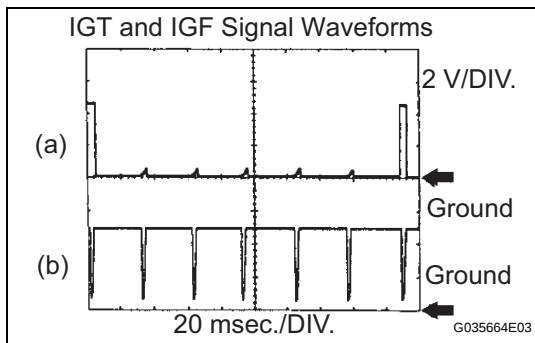
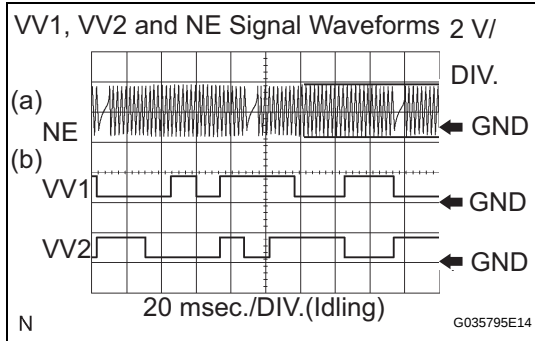
5. WAVEFORM 5

- (a) VVT sensor
(b) Crankshaft position sensor

ECM Terminal Names	(a) Between NE+ and NE- (b) Between VV1+ and VV1- or VV2+ and VV2-
Tester Ranges	2 V/DIV, 20 msec./DIV
Conditions	Idling

HINT:

The wavelength becomes shorter as the engine rpm increases.



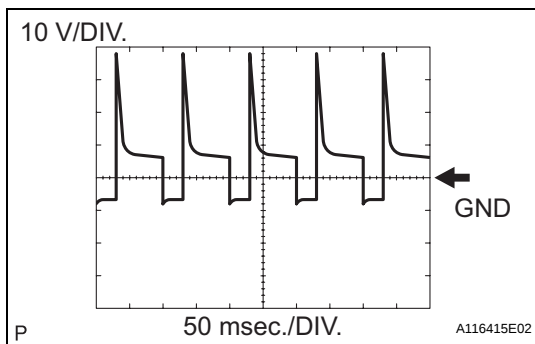
6. WAVEFORM 6

- (a) Igniter IGT signal (from ECM to igniter)
(b) Igniter IGF signal (from igniter to ECM)

ECM Terminal Names	(a) Between IGT (1 to 6) and E1 (b) Between IGF1 and E1
Tester Ranges 2	2 V/DIV, 20 msec./DIV
Conditions	Idling

HINT:

The wavelength becomes shorter as the engine rpm increases.

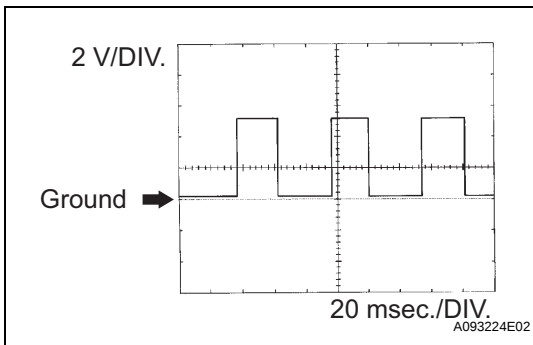


7. WAVEFORM 7 Purge VSV

ECM Terminal Names	Between PRG and E01
Tester Ranges	10 V/DIV, 50 msec./DIV
Conditions	Idling

HINT:

If the waveform is not similar to the illustration, check the waveform again after idling for 10 minutes or more.



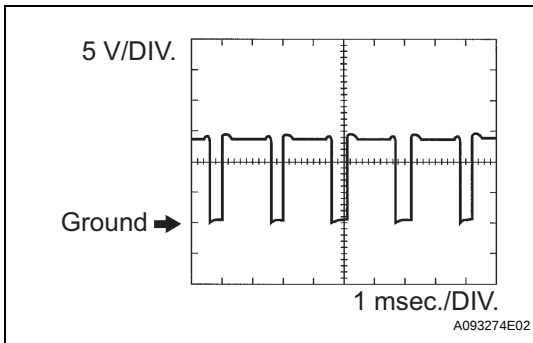
8. WAVEFORM 8

Vehicle speed signal

ECM Terminal Names	Between SPD and E1
Tester Ranges	2 V/DIV, 20 msec./DIV
Conditions	Driving at 12 mph (20 km/h)

HINT:

The wavelength becomes shorter as the vehicle speed increases.



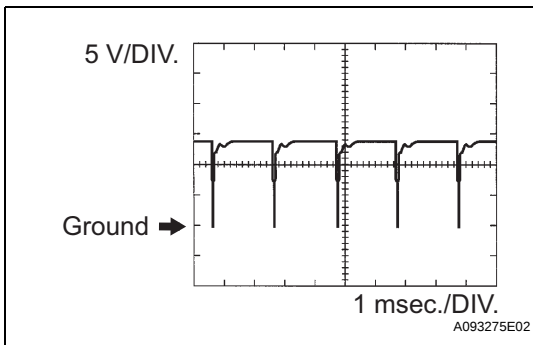
9. WAVEFORM 9

Throttle actuator positive terminal

ECM Terminal Names	Between M+ and ME01
Tester Ranges	5 V/DIV, 1 msec./DIV
Conditions	Idling with warm engine

HINT:

The duty ratio varies depending on the throttle actuator operation.



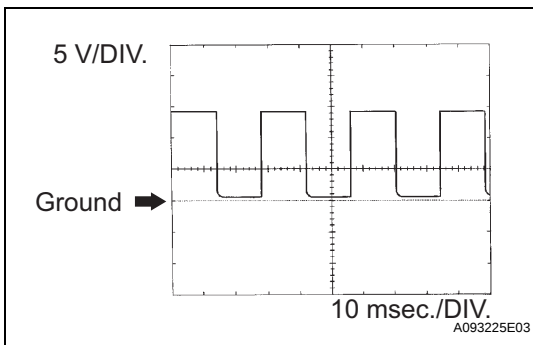
10. WAVEFORM 10

Throttle actuator negative terminal

ECM Terminal Names	Between M- and ME01
Tester Ranges	5 V/DIV, 1 msec./DIV
Conditions	Idling with warm engine

HINT:

The duty ratio varies depending on the throttle actuator operation.



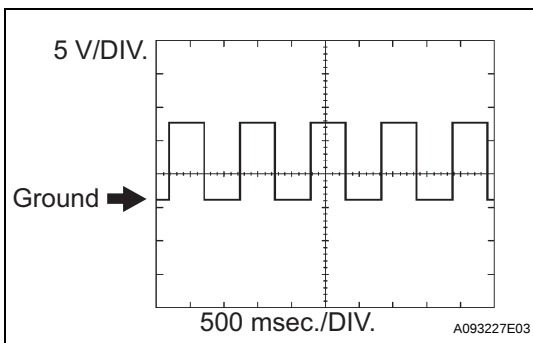
11. WAVEFORM 11

Engine speed signal

ECM Terminal Names	Between TACH and E1
Tester Ranges	5 V/DIV, 10 msec./DIV
Conditions	Idling

HINT:

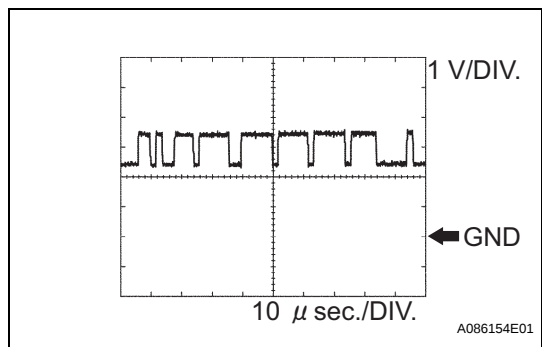
The wavelength becomes shorter as the engine rpm increases.



12. WAVEFORM 12

Airbag sensor assembly

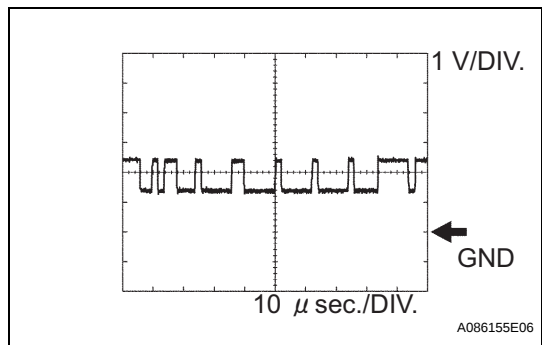
ECM Terminal Names	Between F/PS and E1
Tester Ranges	5 V/DIV, 500 msec./DIV
Conditions	Idling with warm engine



13. WAVEFORM 13
CAN communication signal

ECM Terminal Names	Between CANH and E1
Tester Ranges	1 V/DIV, 10 μ sec./DIV
Conditions	Stop engine and ignition switch ON

HINT:
The wavelength varies depending on the CAN communication signal.



14. WAVEFORM 14
CAN communication signal

ECM Terminal Names	Between CANL and E1
Tester Ranges	1 V/DIV, 10 μ sec./DIV
Conditions	Stop engine and ignition switch ON

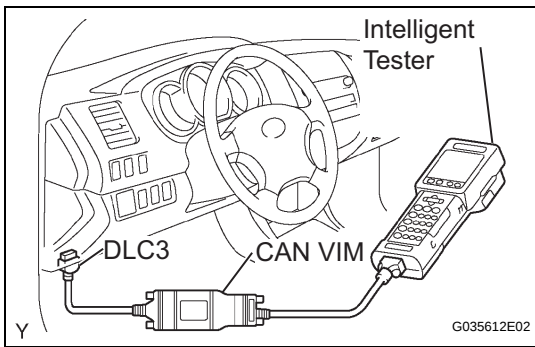
HINT:
The wavelength varies depending on the CAN communication signal.

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DIAGNOSIS SYSTEM

- 1. DESCRIPTION**
- When troubleshooting OBD II (On-Board Diagnostics) vehicles, an intelligent tester (complying with SAE J1987) must be connected to the DLC3 (Data Link Connector 3) of the vehicle. Various data in the vehicle's ECM (Engine Control Module) can be then read. OBD II regulations require that the vehicle's on-board computer illuminates the MIL (Malfunction Indicator Lamp) on the instrument panel when the computer detects a malfunction in:
- (a) The emission control systems and components
 - (b) The power train control components (which affect vehicle emissions)



(c) The computer itself

In addition, the applicable DTCs (Diagnostic Trouble Codes) prescribed by SAE J2012 are recorded on 3 consecutive trips, the MIL turns off automatically but the DTCs remain recorded in the ECM memory.

To check DTCs, connect an intelligent tester to the DLC3. The tester displays DTCs, freeze frame data, and a variety of engine data. The DTCs and freeze frame data can be erased with the tester (See page [ES-38](#)).

In order to enhance OBD function on vehicles and develop the Off-Board diagnosis system, CAN communication is introduced in this system (CAN: Controller Area Network). It minimizes a gap between technician skills and vehicle technology. CAN is a network, which uses a pair of data transmission lines, spanning multiple computers and sensors. It allows a high speed communication between the systems and to simplify the wire harness connection.

Since this system is equipped with the CAN communication, connecting the CAN VIM (VIM: Vehicle Interface Module) with an intelligent tester is necessary to display any information from the ECM. (Also the communication between an intelligent tester and the ECM uses CAN communication signals.) When confirming the DTCs and any data of the ECM, connect the CAN VIM between the DLC3 and an intelligent tester.

2. NORMAL MODE AND CHECK MODE

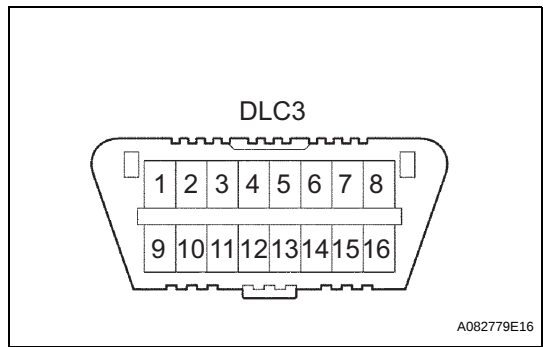
The diagnosis system operates in normal mode during normal vehicle use. In normal mode, 2 trip detection logic is used to ensure accurate detection of malfunctions. Check mode is also available as an option for technicians. In check mode, 1 trip detection logic is used for simulating malfunction symptoms and increasing the system's ability to detect malfunctions, including intermittent problems (intelligent tester only) (See page [ES-12](#)).

3. 2 TRIP DETECTION LOGIC

When a malfunction is first detected, the malfunction is temporarily stored in the ECM memory (1st trip). If the same malfunction is detected during the next subsequent drive cycle, the MIL is illuminated (2nd trip).

4. FREEZE FRAME DATA

Freeze frame data record the engine condition (fuel system, calculated engine load, engine coolant temperature, fuel trim, engine speed, vehicle speed, etc) when malfunctions are detected. When troubleshooting, freeze frame data can help determine if the vehicle was moving or stationary, if the engine was warmed up or not, if the air-fuel ratio was lean or rich, and other data, from the time the malfunction occurred.



5. DLC3 (Data Link Connector 3)

The vehicle's ECM uses the ISO 15765-4 for communication protocol. The terminal arrangement of the DLC3 complies with SAE J1962 and matches the ISO 15765-4 format.

Symbols	Terminal No.	Names	Reference terminals	Results	Conditions
SIL	7	Bus "+" line	5 - Signal ground	Pulse generation	During transmission
CG	4	Chassis ground	Body ground	1 Ω or less	Always
SG	5	Signal ground	Body ground	1 Ω or less	Always
BAT	16	Battery positive	Body ground	9 to 14 V	Always
CANH	6	CAN "High" line	CANL	54 to 69 Ω	Ignition switch OFF*
CANH	6	CAN "High" line	Battery positive	1 MΩ or higher	Ignition switch OFF*
CANH	6	CAN "High" line	CG	200 Ω or higher	Ignition switch OFF*
CANL	14	CAN "Low" line	Battery positive	1 MΩ or higher	Ignition switch OFF*
CANL	14	CAN "Low" line	CG	200 Ω or higher	Ignition switch OFF*

HINT:

*: Before measuring the resistance, leave the vehicle as is for at least 1 minute and do not operate the ignition switch, any other switches or the doors.

HINT:

The DLC3 is the interface prepared for reading various data from the vehicle's ECM. After connecting the cable of an intelligent tester, turn the ignition switch ON and turn the tester ON. If a communication failure message is displayed on the tester screen (on the tester: UNABLE TO CONNECT TO VEHICLE), a problem exists in either the vehicle or tester. In order to identify the location of the problem, connect the tester to another vehicle.

If communication is normal: Inspect the DLC3 on the original vehicle.

If communication is impossible: The problem is probably with the tester itself. Consult the Service Department listed in the instruction manual.

6. BATTERY VOLTAGE

Battery Voltage:

11 to 14 V

If the voltage is below 11 V, recharge the battery before proceeding.

7. MIL (Malfunction Indicator Lamp)

- (a) The MIL is illuminated when the ignition switch is first turned ON (the engine is not running).

- (b) The MIL should turn off when the engine is started. If the MIL remains illuminated, the diagnosis system has detected a malfunction or abnormality in the system.

HINT:

If the MIL is not illuminated when the ignition switch is first turned ON, check the MIL circuit (See page [ES-411](#)).

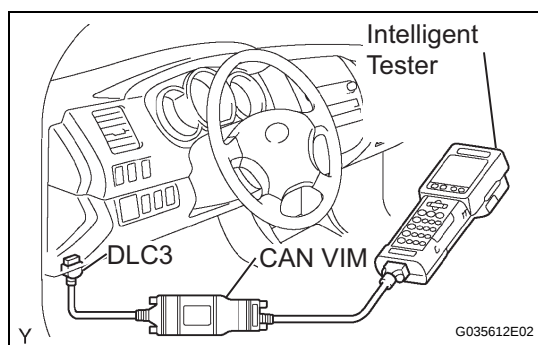
DTC CHECK / CLEAR

NOTICE:

When the diagnosis system is changed from normal mode to check mode or vice versa, all DTCs and freeze frame data recorded in normal mode are erased. Before changing modes, always check and make a note of DTCs and freeze frame data.

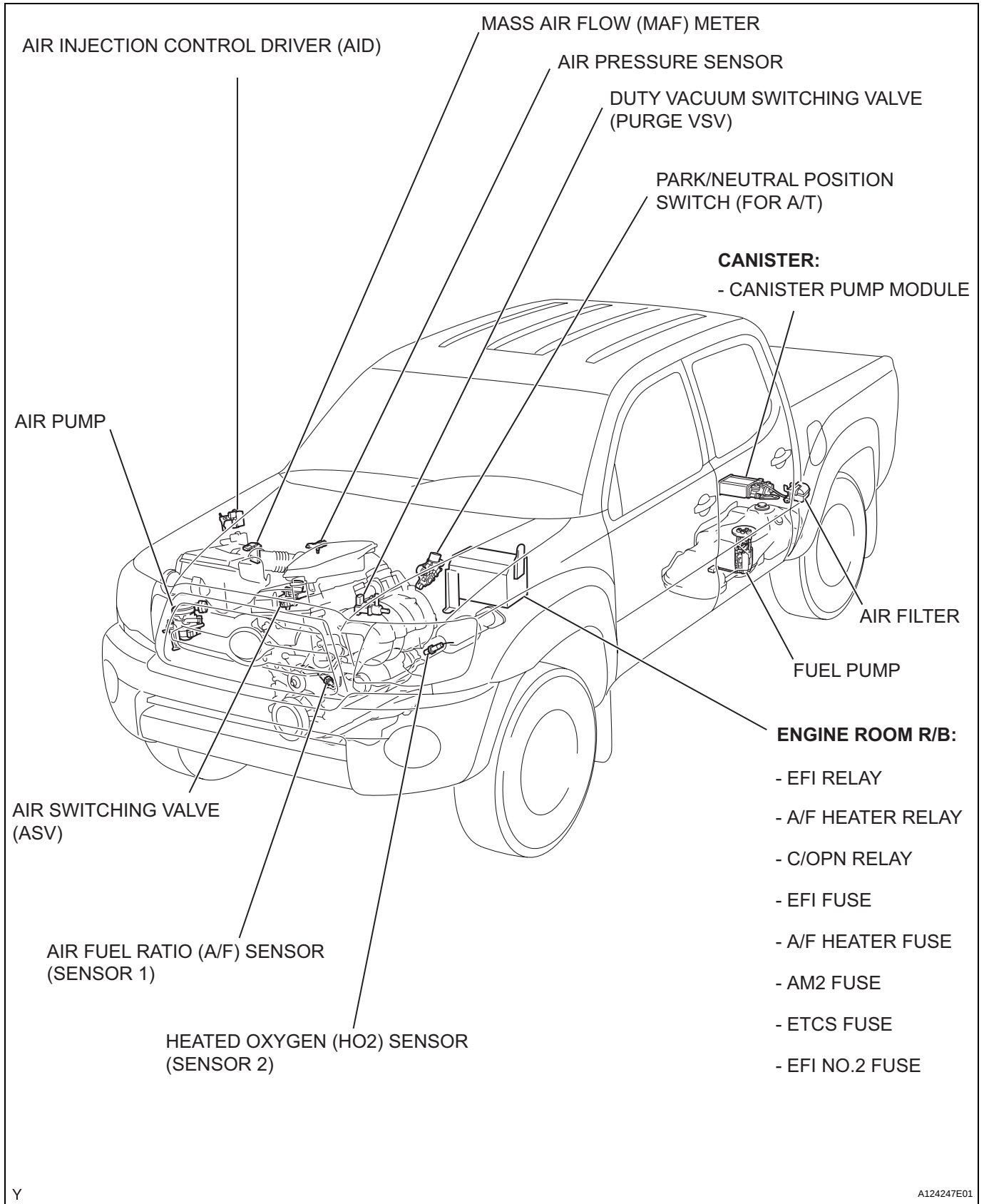
HINT:

- DTCs which are stored in the ECM can be displayed on an intelligent tester. An intelligent tester can display current and pending DTCs.
- Some DTCs are not set if the ECM does not detect the same malfunction again during a second consecutive driving cycle. However, such malfunctions, detected on only one occasion, are stored as pending DTCs.

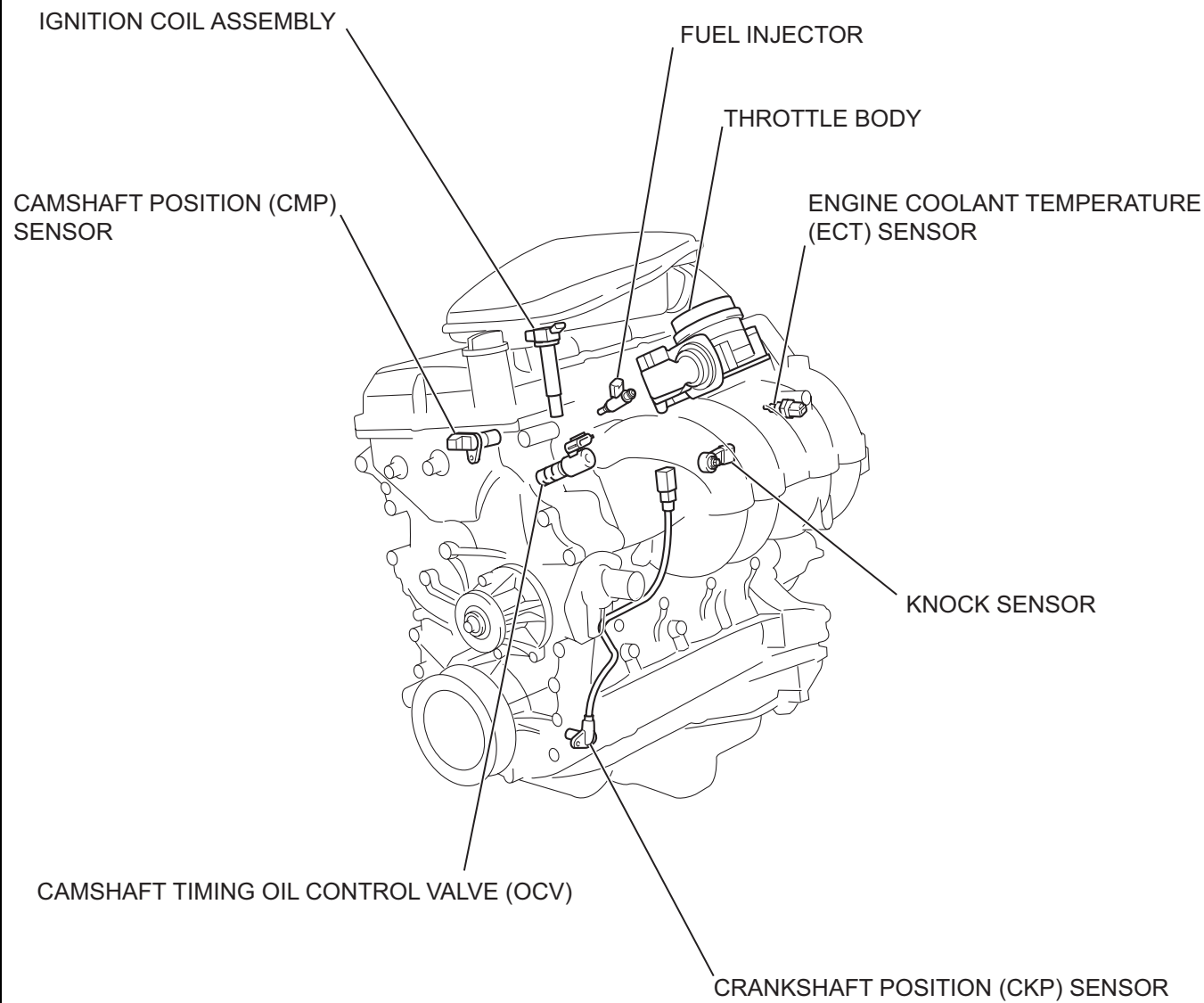


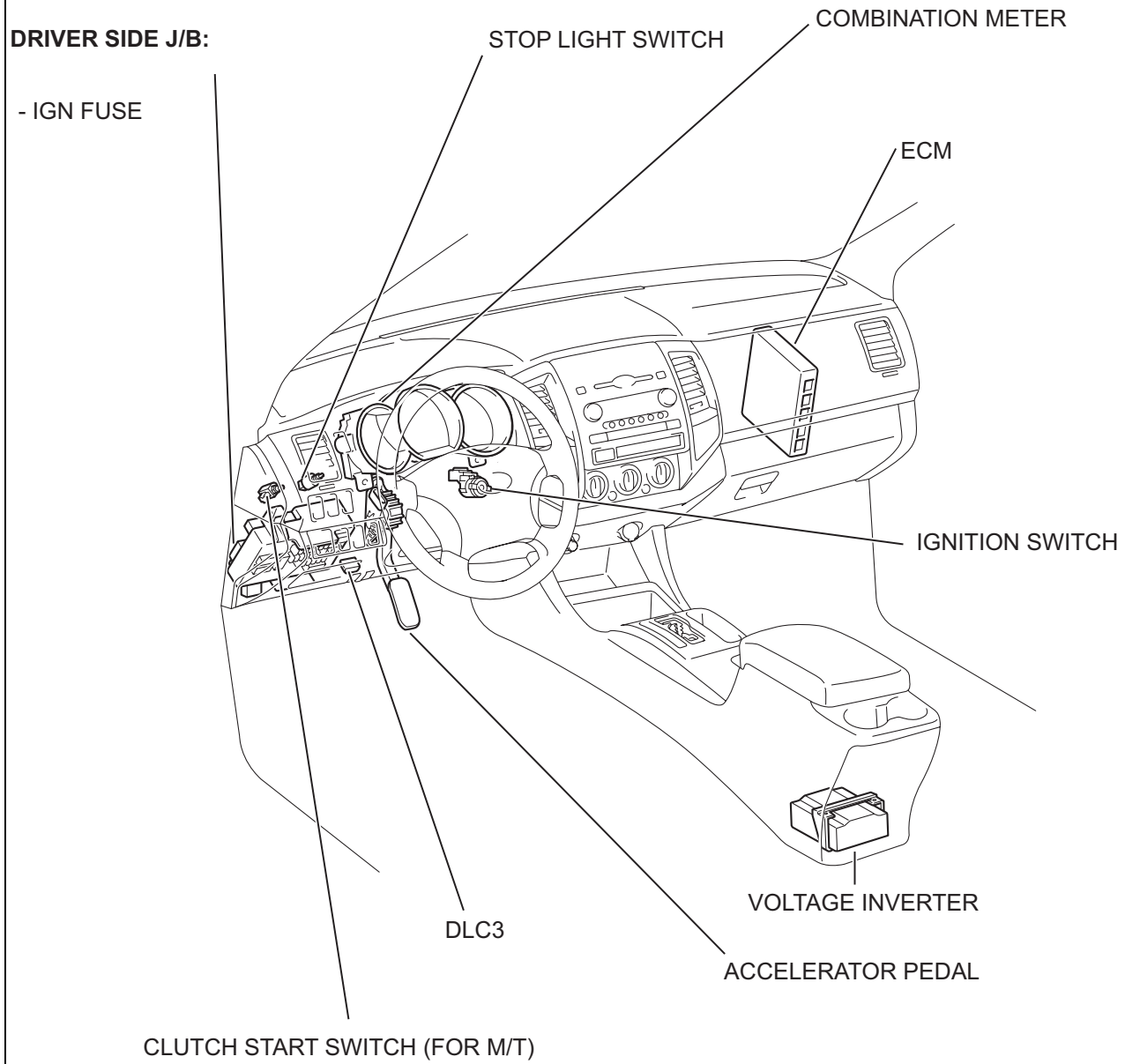
- CHECK DTC (Using an intelligent tester)**
 - Connect an intelligent tester to the DLC3.
 - Turn the ignition switch ON.
 - Turn the tester ON.
 - Select the following menu items: DIAGNOSIS / ENHANCED OBD II / DTC INFO / CURRENT CODES.
 - Check the DTC(s) and freeze frame data, and then write them down.
 - Check the details of the DTC(s) (See page [ES-57](#)).
- CLEAR DTC (Using an intelligent tester)**
 - Connect an intelligent tester to the DLC3.
 - Turn the ignition switch ON.
 - Turn the tester ON.
 - Select the following menu items: DIAGNOSIS / ENHANCED OBD II / DTC INFO / CLEAR CODES.
 - Press the YES button.
- CLEAR DTC (Without using an intelligent tester)**
 - Perform either one of the following operations.
 - Disconnect the negative battery cable for more than 1 minute.
 - Remove the EFI and ETCS fuses from the Relay Block (R/B) located inside the engine compartment for more than 1 minute.

PARTS LOCATION



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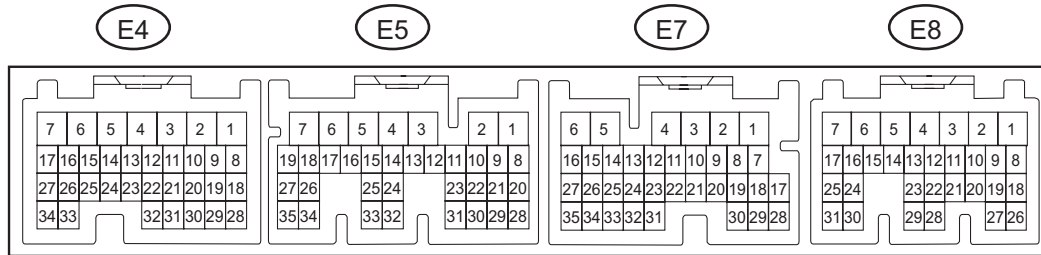




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TERMINALS OF ECM



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C121776E01

HINT:

The standard normal voltage between each pair of ECM terminals is shown in the table below. The appropriate conditions for checking each pair of terminals are also indicated. The result of checks should be compared with the standard normal voltage for that pair of terminals, displayed in the STD Voltage column. The illustration above can be used as a reference to identify the ECM terminal locations.

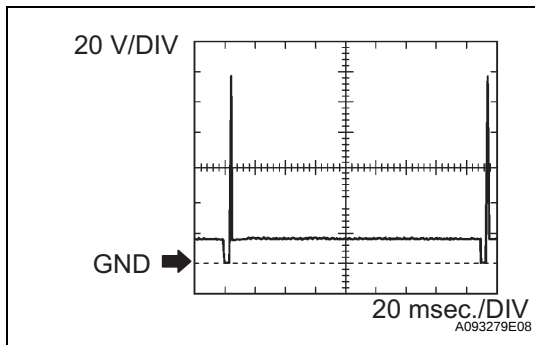
Symbols (Terminals No.)	Wiring Colors	Terminal Descriptions	Conditions	STD Voltages
BATT (E8-3) - E1 (E4-3)	L - BR	Battery (for measuring battery voltage and for ECM memory)	Always	9 to 14 V
+BM (E8-7) - E1 (E4-3)	LG - BR	Power source of throttle motor	Always	9 to 14 V
IGSW (E8-9) - E1 (E4-3)	O - BR	Ignition switch	Ignition switch ON	9 to 14 V
+B (E8-1) - E1 (E4-3)	B - BR	Power source of ECM	Ignition switch ON	9 to 14 V
MREL (E8-8) - E1 (E4-3)	G-W - BR	EFI relay	Ignition switch ON	9 to 14 V
VC (E4-18) - E2 (E4-28)	L - BR	Power source of sensor (specific voltage)	Ignition switch ON	4.5 to 5.0 V
VTA1 (E4-20) - E2 (E4-28)	G-B - BR	Throttle position sensor (for engine control)	Ignition switch ON, Accelerator pedal fully released	0.5 to 1.1 V
VTA1 (E4-20) - E2 (E4-28)	G-B - BR	Throttle position sensor (for engine control)	Ignition switch ON, Accelerator pedal fully depressed	3.3 to 4.9 V
VTA2 (E4-19) - E2 (E4-28)	G-W - BR	Throttle position sensor (for sensor malfunction detection)	Ignition switch ON, Accelerator pedal fully released	2.1 to 3.1 V
VTA2 (E4-19) - E2 (E4-28)	G-W - BR	Throttle position sensor (for sensor malfunction detection)	Ignition switch ON, Accelerator pedal fully depressed	4.5 to 5.0 V
VPA (E8-18) - EPA (E8-20)	R-Y - LG-B	Accelerator pedal position sensor (for engine control)	Ignition switch ON, Accelerator pedal fully released	0.5 to 1.1 V
VPA (E8-18) - EPA (E8-20)	R-Y - LG-B	Accelerator pedal position sensor (for engine control)	Ignition switch ON, Accelerator pedal fully depressed	2.6 to 4.5 V
VPA2 (E8-19) - EPA2 (E8-21)	GR-B - R-B	Accelerator pedal position sensor (for sensor malfunction detection)	Ignition switch ON, Accelerator pedal fully released	1.2 to 2.0 V
VPA2 (E8-19) - EPA2 (E8-21)	GR-B - R-B	Accelerator pedal position sensor (for sensor malfunction detection)	Ignition switch ON, Accelerator pedal fully depressed	3.4 to 5.0 V
VCPA (E8-26) - EPA (E8-20)	R - LG-B	Power source of accelerator pedal position sensor (for VPA)	Ignition switch ON	4.5 to 5.0 V
VCP2 (E8-27) - EPA2 (E8-21)	L-W - R-B	Power source of accelerator pedal position sensor (for VPA2)	Ignition switch ON	4.5 to 5.0 V

Symbols (Terminals No.)	Wiring Colors	Terminal Descriptions	Conditions	STD Voltages
VG (E5-28) - E2G (E5-30)	R-Y - R-W	Mass air flow meter	Idling, Shift position P or N, A/C switch OFF	0.5 to 3.0 V
THA (E5-29) - E2 (E4-28)	R-L - BR	Intake air temperature sensor	Idling, Intake air temperature 20°C (68°F)	0.5 to 3.4 V
THW (E4-32) - E2 (E4-28)	Y-B - BR	Engine coolant temperature sensor	Idling, Engine coolant temperature 80°C (176°F)	0.2 to 1.0 V
#10 (E5-6) - E01 (E4-7) #20 (E5-5) - E01 (E4-7) #30 (E5-2) - E01 (E4-7) #40 (E5-1) - E01 (E4-7)	R-L - W-B B - W-B R - W-B G - W-B	Injector	Ignition switch ON	9 to 14 V
#10 (E5-6) - E01 (E4-7) #20 (E5-5) - E01 (E4-7) #30 (E5-2) - E01 (E4-7) #40 (E5-1) - E01 (E4-7)	R-L - W-B B - W-B R - W-B G - W-B	Injector	Idling	Pulse generation (see waveform 1)
IGT1 (E4-17) - E1 (E4-3) IGT2 (E4-16) - E1 (E4-3) IGT3 (E4-15) - E1 (E4-3) IGT4 (E4-14) - E1 (E4-3)	P - BR P-L - BR LG - BR LG-B - BR	Ignition coil with igniter (ignition signal)	Idling	Pulse generation (see waveform 2)
IGF1 (E4-23) - E1 (E4-3)	W-R - BR	Ignition coil with igniter (ignition confirmation signal)	Ignition switch ON	4.5 to 5.0 V
IGF1 (E4-23) - E1 (E4-3)	W-R - BR	Ignition coil with igniter (ignition confirmation signal)	Idling	Pulse generation (see waveform 2)
G2 (E4-26) - NE- (E4-34)	L - G	Camshaft position sensor	Idling	Pulse generation (see waveform 3)
NE+ (E4-27) - NE- (E4-34)	R - G	Crankshaft position sensor	Idling	Pulse generation (see waveform 3)
FC (E8-25) - E1 (E4-3)	L-B - BR	Fuel pump control	Ignition switch ON	9 to 14 V
FC (E8-25) - E1 (E4-3)	L-B - BR	Fuel pump control	Idling	Below 1.5 V
M+ (E4-5) - ME01 (E5-3)	P - W-B	Throttle actuator	Idling with warm engine	Pulse generation (see waveform 4)
M- (E4-4) - ME01 (E5-3)	L - W-B	Throttle actuator	Idling with warm engine	Pulse generation (see waveform 5)
A1A+ (E4-21) - E1 (E4-3)	P - BR	A/F sensor	Always (Ignition switch ON)	3.3 V ^{*1}
A1A- (E4-31) - E1 (E4-3)	L - BR	A/F sensor	Always (Ignition switch ON)	3.0 V ^{*1}
OX1B (E4-25) - E2 (E4-28)	W - BR	Heated oxygen sensor	Engine speed maintained 2,500 rpm for 2 minutes after warming up sensor	Pulse generation (see waveform 6)
HA1A (E4-1) - E04 (E5-7)	R - W-B	A/F sensor heater	Idling	Below 3.0 V
HA1A (E4-1) - E04 (E5-7)	R - W-B	A/F sensor heater	Ignition switch ON	9 to 14 V
HT1B (E4-2) - E03 (E5-4)	G - W-B	Heated oxygen sensor heater	Idling	Below 3.0 V
HT1B (E4-2) - E03 (E5-4)	G - W-B	Heated oxygen sensor heater	Ignition switch ON	9 to 14 V
KNK1 (E4-29) - EKNK (E4-30)	B - W	Knock sensor	Maintain engine speed 4,000 rpm after warming up engine	Pulse generation (see waveform 7)
OC1+ (E4-13) - OC1- (E4-12)	L-W - W	Camshaft timing oil control valve (OCV)	Idling	Pulse generation (see waveform 8)
PRG (E5-23) - E01 (E4-7)	Y - W-B	Purge VSV	Ignition switch ON	9 to 14 V
PRG (E5-23) - E01 (E4-7)	Y - W-B	Purge VSV	Idling	Pulse generation (see waveform 9)
VPMP (E8-5) - E1 (E4-3)	V-W - BR	Vent valve (built into canister pump module)	Ignition switch ON	9 to 14 V

Symbols (Terminals No.)	Wiring Colors	Terminal Descriptions	Conditions	STD Voltages
MPMP (E8-6) - E1 (E4-3)	G - BR	Leak detection pump (built into canister pump module)	• Leak detection pump OFF	0 to 3 V
MPMP (E8-6) - E1 (E4-3)	G - BR	Leak detection pump (built into canister pump module)	• Leak detection pump ON	9 to 14 V
PPMP (E8-31) - E2 (E4-28)	GR - BR	Canister pressure sensor (built into canister pump module)	Ignition switch ON	3 to 3.6 V
STA (E8-12) - E1 (E4-3)	B-Y - BR	Starter signal	Shift position N, Ignition switch START	5.5 V or more
STP (E7-4) - E1 (E4-3)	L - BR	Stop light switch	Brake pedal depressed	7.5 to 14 V
STP (E7-4) - E1 (E4-3)	L - BR	Stop light switch	Brake pedal released	Below 1.5 V
ST1- (E8-16) - E1 (E4-3)	V-W - BR	Stop light switch	Ignition switch ON, Brake pedal depressed	Below 1.5 V
ST1- (E8-16) - E1 (E4-3)	V-W - BR	Stop light switch	Ignition switch ON, Brake pedal released	7.5 to 14 V
W (E7-30) - E01 (E4-7)	BR - W-B	MIL	Idling	9 to 14 V
W (E7-30) - E01 (E4-7)	BR - W-B	MIL	Ignition switch ON	Below 3.5 V
ELS (E8-15) - E1 (E4-3)	G - BR	Electric load	Tail light switch ON	7.5 to 14 V
ELS (E8-15) - E1 (E4-3)	G - BR	Electric load	Tail light switch OFF	0 to 1.5 V
ELS2 (E7-20) - E1 (E4-3)	B-W - BR	Electric load	Vehicle stationary, Voltage inverter outputs more than 100 W	9 to 14 V
ELS2 (E7-20) - E1 (E4-3)	B-W - BR	Electric load	Vehicle stationary, Voltage inverter outputs 100 W or less	0 to 1.5 V
TACH (E7-1) - E1 (E4-3)	B-W - BR	Engine speed	Idling	Pulse generation (see waveform 10)
SPD (E7-8) - E1 (E4-3)	V-W - BR	Speed signal from combination meter	Driving at 12 mph (20 km/h)	Pulse generation (see waveform 11)
TC (E7-17) - E1 (E4-3)	P-B - BR	Terminal TC of DLC 3	Ignition switch ON	9 to 14 V
PSW (E5-32) - E1 (E4-3)	G-W - BR	Power steering oil pressure switch	While turning steering wheel	Below 1.5 V
F/PS (E7-32) - E1 (E4-3)	R - BR	Airbag sensor assembly	Idling with warm engine	Pulse generation (see waveform 12)
NSW (E8-30) - E1 (E4-3)	V - BR	Park/Neutral switch signal	IG switch ON and shift lever P or N position	Below 1 V
NSW (E8-30) - E1 (E4-3)	V - BR	Park/Neutral switch signal	IG switch ON and shift lever except P and N	9 to 14 V
*2 CANH (E7-33) - E1 (E4-3)	B - BR	Communication signal with other components	Ignition switch ON	Pulse generation (see waveform 13)
*2 CANL (E7-34) - E1 (E4-3)	W - BR	Communication signal with other components	Ignition switch ON	Pulse generation (see waveform 14)
AIRV (E4-24) - E1 (E4-3)	R-W - BR	Air switching valve for secondary air injection system	Idling	9 to 14 V
AIRP (E4-11) - E1 (E4-3)	Y-R - BR	Air pump control	Idling	9 to 14 V
AIDI (E5-20) - E1 (E4-3)	G-R - BR	Diagnostic information signal for air injection system	Air injection system operates	Pulse generation (see waveform 15)
AIP (E5-22) - E2 (E4-28)	GR - BR	Secondary air injection system pressure signal	Ignition switch ON	4.5 to 5.0 V

*1: The ECM terminal voltage is constant regardless of the output voltage from the sensor.

*2: Only for the vehicle equipped with VSC (see page [CA-22](#)).

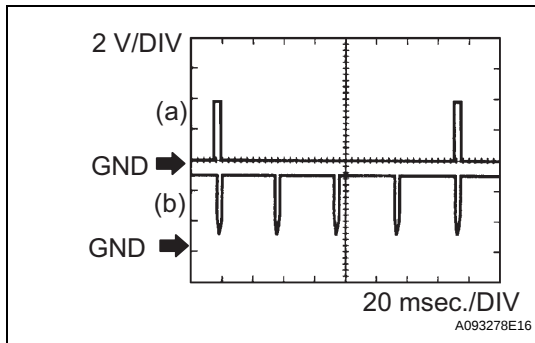
**1. WAVEFORM 1**

Fuel injector

ECM Terminal Names	Between #10 (to 40) and E01
Tester Ranges	20 V/DIV, 20 msec./DIV
Conditions	Idling

HINT:

The wavelength becomes shorter as the engine rpm increases.

**2. WAVEFORM 2**

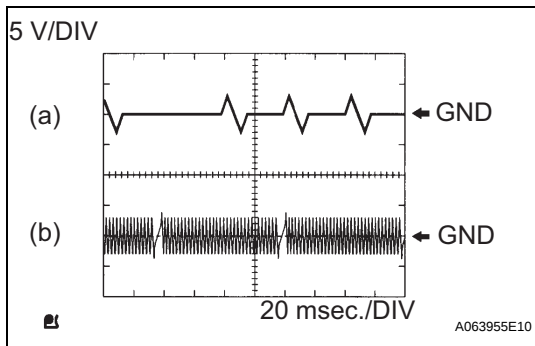
(a) Igniter IGT signal (from ECM to igniter)

(b) Igniter IGF signal (from igniter to ECM)

ECM Terminal Names	(a) Between IGT (1 to 4) and E1 (b) Between IGF1 and E1
Tester Ranges	2 V/DIV, 20 msec./DIV
Conditions	Idling

HINT:

The wavelength becomes shorter as the engine rpm increases.

**3. WAVEFORM 3**

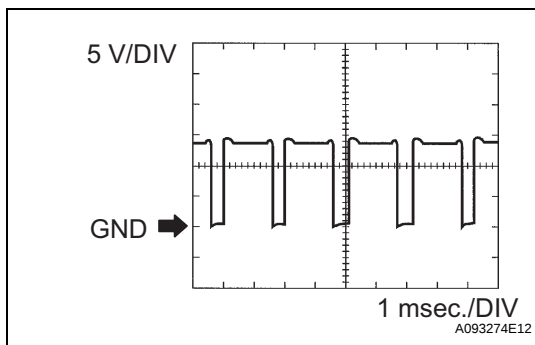
(a) Camshaft position sensor

(b) Crankshaft position sensor

ECM Terminal Names	(a) Between G2 and NE- (b) Between NE+ and NE-
Tester Ranges	5 V/DIV, 20 msec./DIV
Conditions	Idling

HINT:

The wavelength becomes shorter as the engine rpm increases.

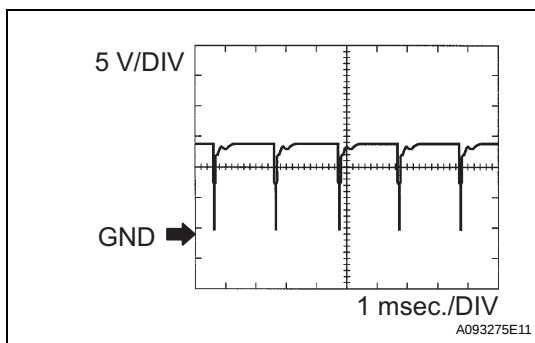
**4. WAVEFORM 4**

Throttle actuator positive terminal

ECM Terminal Names	Between M+ and ME01
Tester Ranges	5 V/DIV, 1 msec./DIV
Conditions	Idling with warm engine

HINT:

The duty ratio varies depending on the throttle actuator operation.

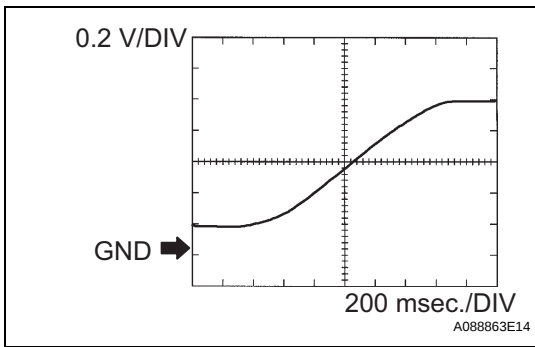
**5. WAVEFORM 5**

Throttle actuator negative terminal

ECM Terminal Names	Between M- and ME01
Tester Ranges	5 V/DIV, 1 msec./DIV
Conditions	Idling with warm engine

HINT:

The duty ratio varies depending on the throttle actuator operation.



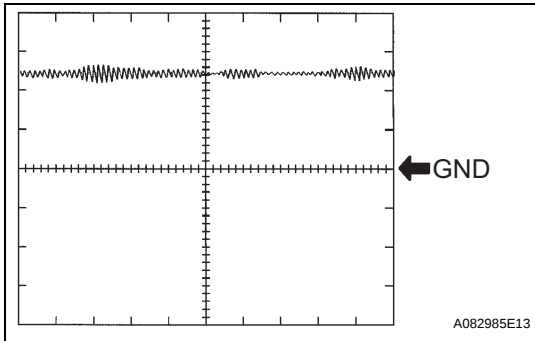
6. WAVEFORM 6

Heated oxygen sensor

ECM Terminal Names	Between OX1B and E2
Tester Ranges	0.2 V/DIV, 200 msec./DIV
Conditions	Engine speed maintained 2,500 rpm for 2 minutes after warming up engine

HINT:

In the DATA LIST, item O2S B1S2 shows the ECM input values from the heated oxygen sensor.



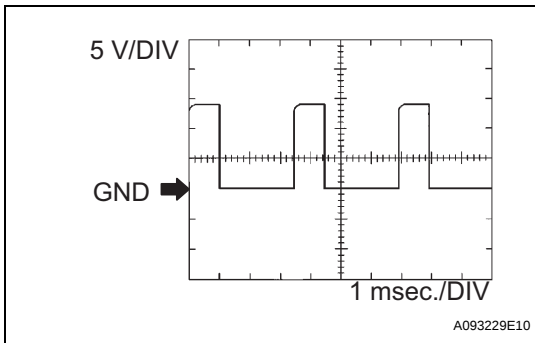
7. WAVEFORM 7

Knock sensor

ECM Terminal Names	Between KNK1 and EKNK
Tester Ranges	0.01 to 10 V/DIV, 0.01 to 10 msec./DIV
Conditions	Engine speed maintained 4,000 rpm after warming up engine

HINT:

- The wavelength becomes shorter as the engine rpm increases.
- The waveforms and amplitudes displayed differ slightly depending on the vehicle.



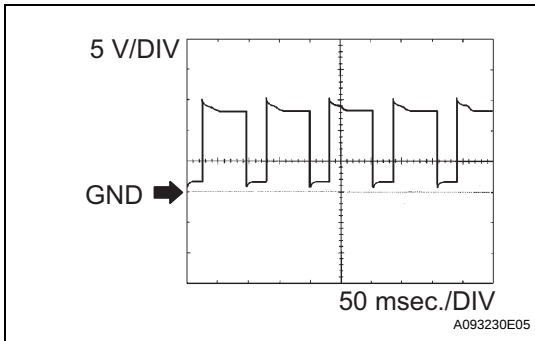
8. WAVEFORM 8

Camshaft timing oil control valve (OCV)

ECM Terminal Names	Between OC1+ and OC1-
Tester Ranges	5 V/DIV, 1 msec./DIV
Conditions	Idling

HINT:

The wavelength becomes shorter as the engine rpm increases.



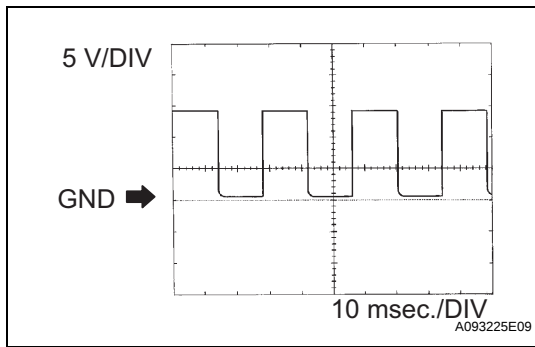
9. WAVEFORM 9

EVAP VSV

ECM Terminal Names	Between PRG and E01
Tester Ranges	5 V/DIV, 50 msec./DIV
Conditions	Idling

HINT:

If the waveform is not similar to the illustration, check the waveform again after idling for 10 minutes or more.

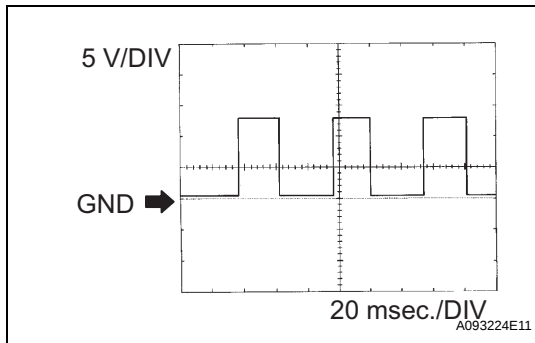
**10. WAVEFORM 10**

Engine speed signal

ECM Terminal Names	Between TACH and E1
Tester Ranges	5 V/DIV, 10 msec./DIV
Conditions	Idling

HINT:

The wavelength becomes shorter as the engine rpm increases.

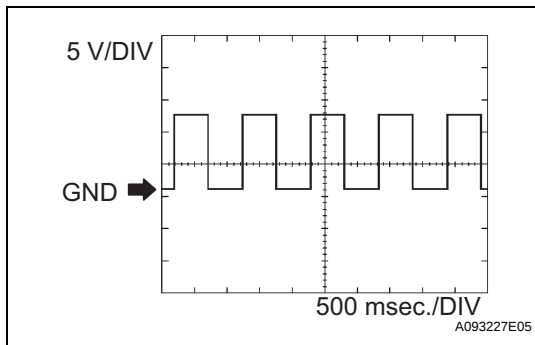
**11. WAVEFORM 11**

Vehicle speed signal

ECM Terminal Names	Between SPD and E1
Tester Ranges	5 V/DIV, 20 msec./DIV
Conditions	Driving at 12 mph (20 km/h)

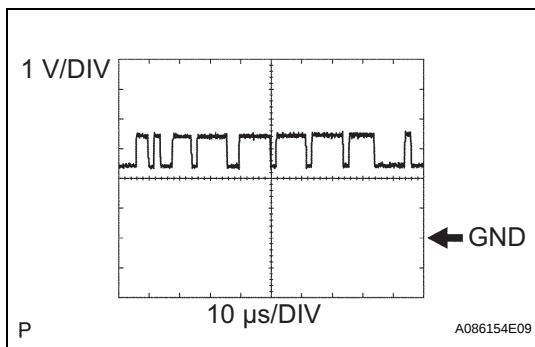
HINT:

The wavelength becomes shorter as the vehicle speed increases.

**12. WAVEFORM 12**

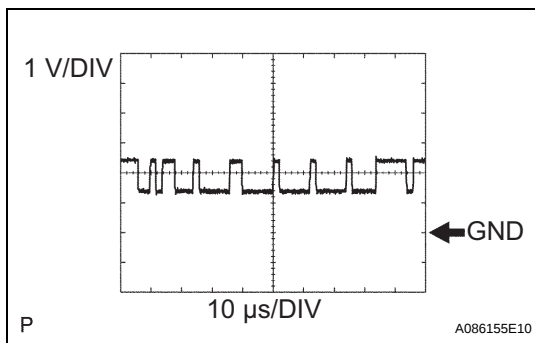
Airbag sensor assembly

ECM Terminal Names	Between F/PS and E1
Tester Ranges	5 V/DIV, 500 msec./DIV
Conditions	Idling with warm engine

**13. WAVEFORM 13**

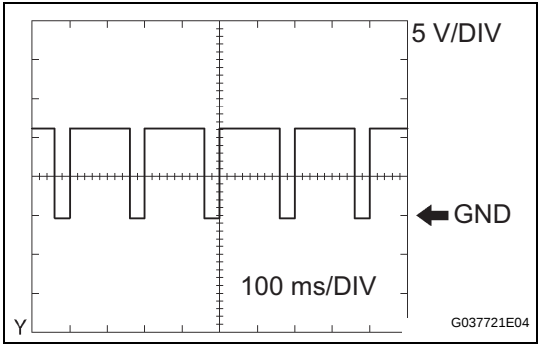
CAN communication signal (reference)

ECM Terminal Names	Between CANH and E1
Tester Ranges	1 V/DIV, 10 μs/DIV
Conditions	Ignition switch ON

**14. WAVEFORM 14**

CAN communication signal (reference)

ECM Terminal Names	Between CANL and E1
Tester Ranges	1 V/DIV, 10 μs/DIV
Conditions	Ignition switch ON



15. WAVEFORM 15

Terminal DI of air injection control driver

ECM Terminal Names	Between AIDI and E1
Tester Ranges	5 V/DIV, 100 ms/DIV
Conditions	Performing ACTIVE TEST using intelligent tester (air injection system)

HINT:

The wavelength changes when the air injection control driver detects malfunctions in the air injection system (see page [ES-200](#)).

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