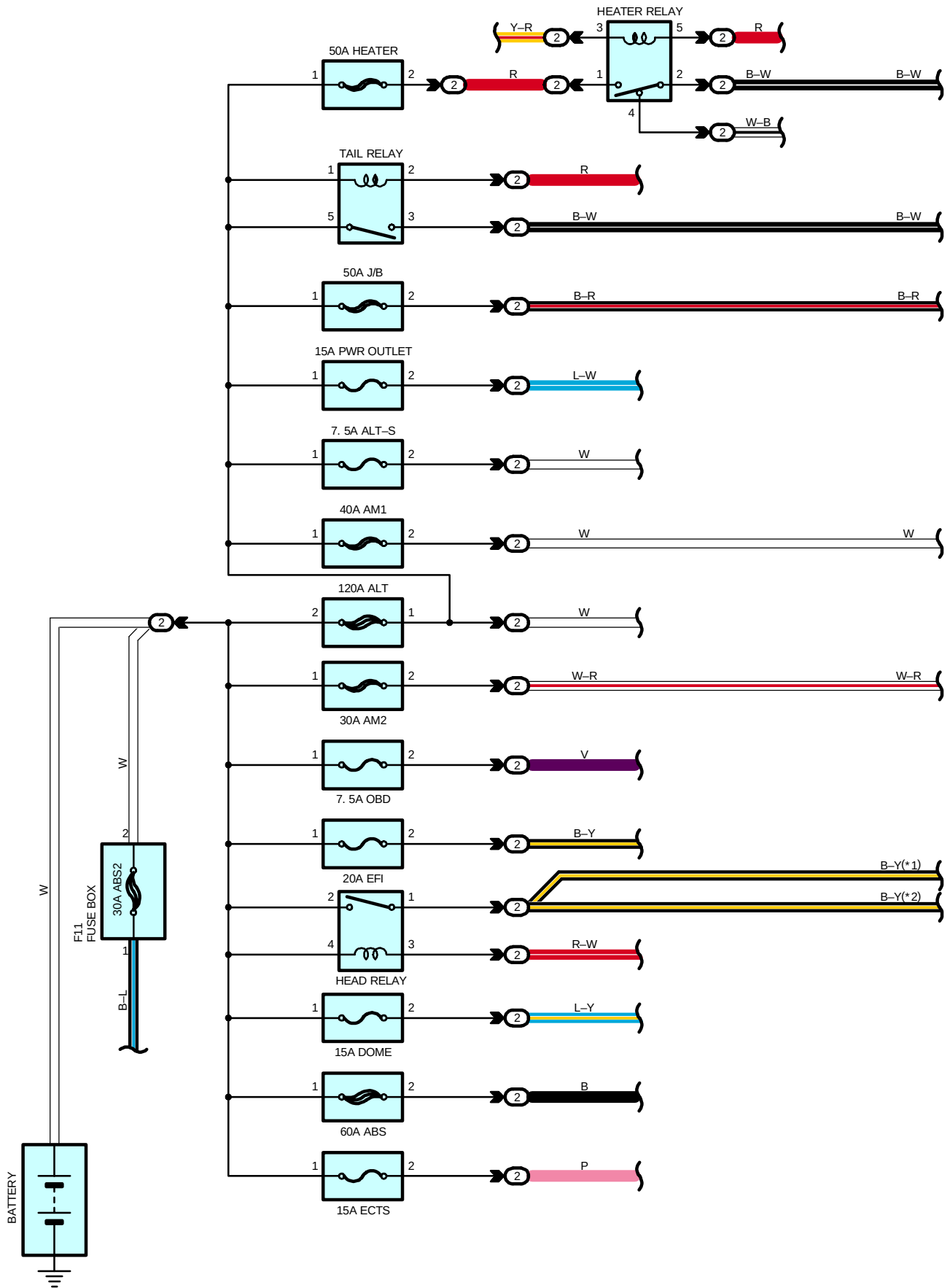
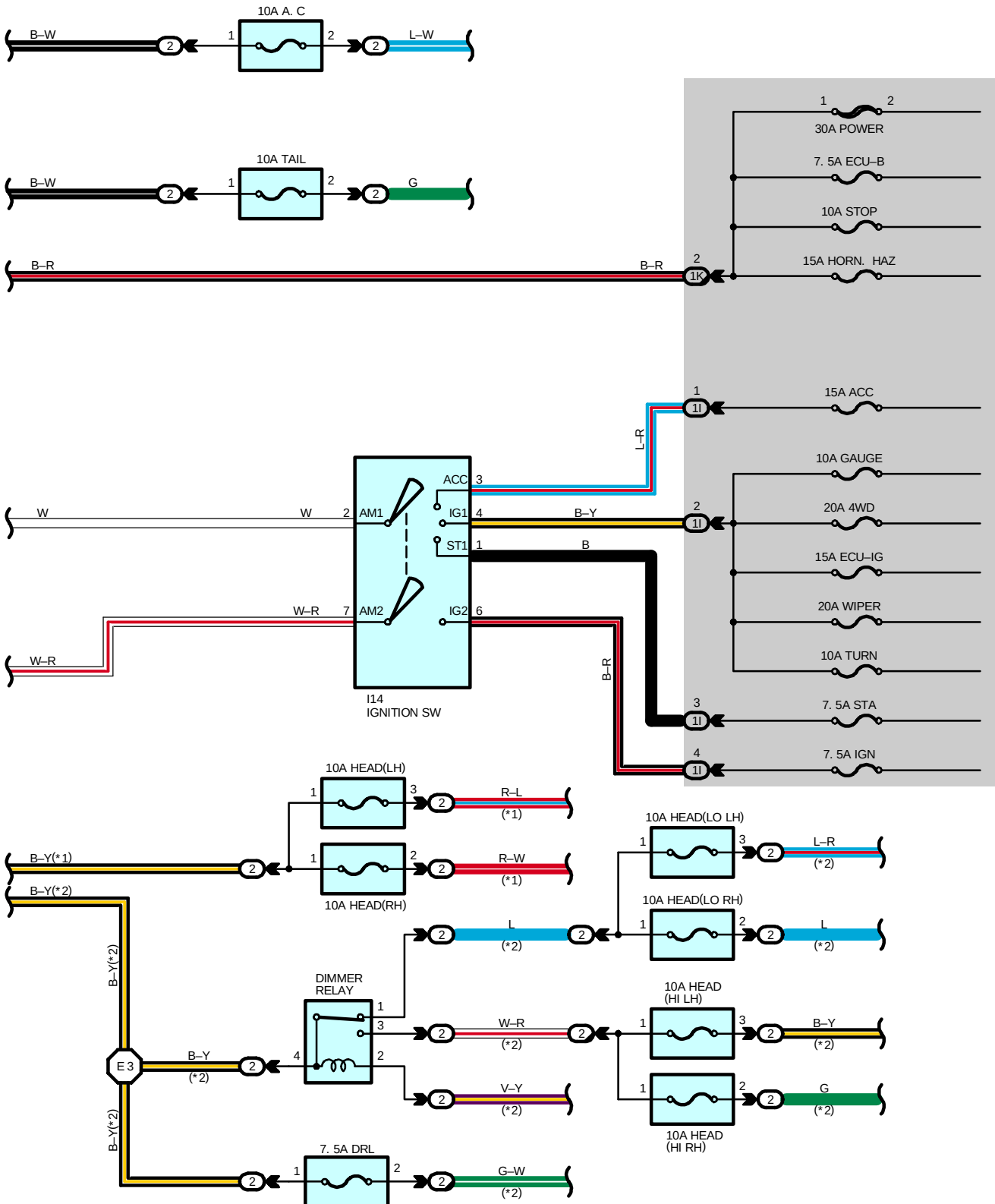




* 1 : W/O DAYTIME RUNNING LIGHT
 * 2 : W/ DAYTIME RUNNING LIGHT



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POWER SOURCE

SERVICE HINTS

HEATER RELAY

1-2 : Closed with ignition SW on and heater blower SW on

HEAD RELAY

2-1 : Closed with light control SW at **HEAD** position or dimmer SW at **FLASH** position
Closed with engine running and parking brake lever released (w/ daytime running light)

I14 IGNITION SW

2-3 : Closed with ignition key at **ACC** or **ON** position
2-4 : Closed with ignition key at **ON** or **ST** position
7-6 : Closed with ignition key at **ON** or **ST** position

TAIL RELAY

5-3 : Closed with light control SW at **TAIL** or **HEAD** position

DIMMER RELAY

4-3 : Closed with HEAD relay on and dimmer SW at **HIGH** or **FLASH** position

○ : PARTS LOCATION

Code	See Page	Code	See Page	Code	See Page
I14	35				

○ : RELAY BLOCKS

Code	See Page	Relay Blocks (Relay Block Location)
2	21	R/B No.2 (Engine Compartment Left)

○ : JUNCTION BLOCK AND WIRE HARNESS CONNECTOR

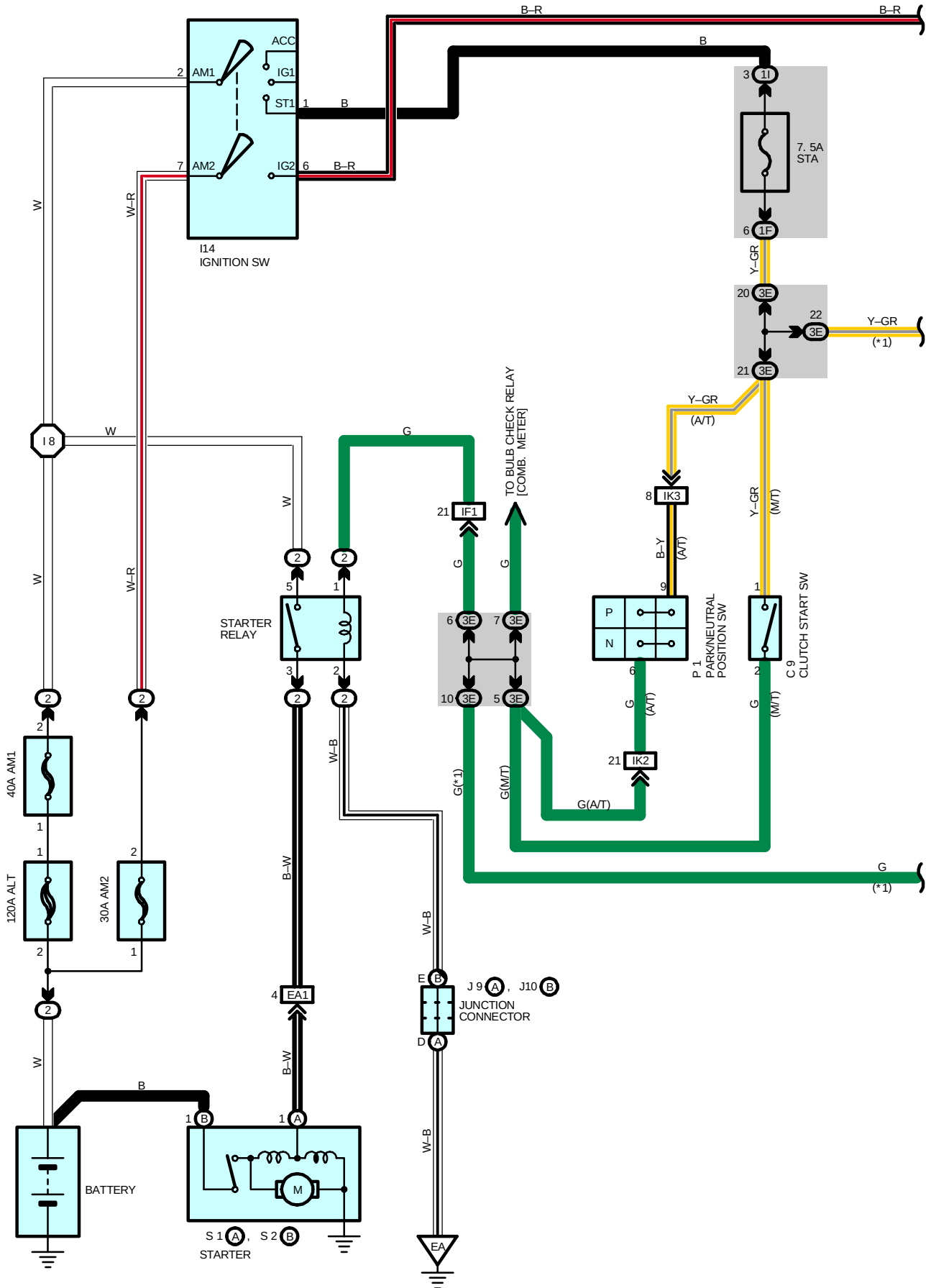
Code	See Page	Junction Block and Wire Harness (Connector Location)
1I	23	Engine Room Main Wire and J/B No.1 (Lower Finish Panel)
1K		

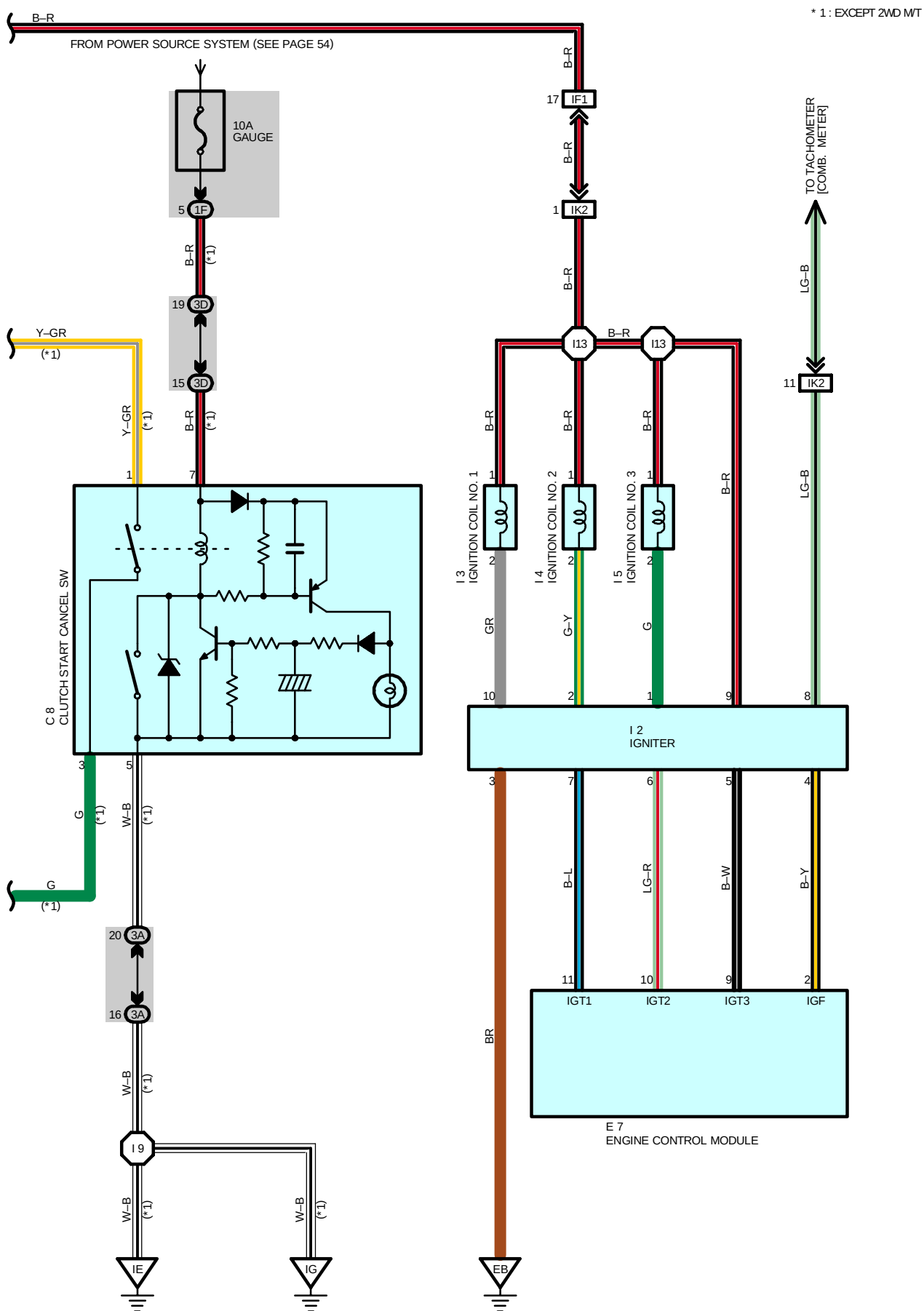
○ : SPLICE POINTS

Code	See Page	Wire Harness with Splice Points	Code	See Page	Wire Harness with Splice Points
E3	40 (5VZ-FE)	Engine Room Main Wire	E3	42 (3RZ-FE, 2RZ-FE)	Engine Room Main Wire

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STARTING AND IGNITION (5VZ-FE)





STARTING AND IGNITION (5VZ-FE)

SERVICE HINTS

S1 (A), S2 (B) STARTER

Points closed with Park/Neutral position SW at **P** or **N** position and ignition SW at **ST** position (A/T)

Points closed with clutch start SW or clutch start cancel SW on and ignition SW at **ST** position (M/T)

I14 IGNITION SW

7-6 : Closed with ignition SW at **ON** or **ST** position

2-1 : Closed with ignition SW at **ST** position

P1 PARK/NEUTRAL POSITION SW (A/T)

9-6 : Closed with A/T shift lever in **P** or **N** position

STARTER RELAY

5-3 : Closed with Park/Neutral position SW at **P** or **N** position and ignition SW at **ST** position (A/T)

5-3 : Closed with clutch start SW or clutch start cancel SW on and ignition SW at **ST** position (M/T)

C8 CLUTCH START CANCEL SW (M/T)

1-3 : Closed with ignition SW on and cancel SW on

C9 CLUTCH START SW (M/T)

1-2 : Closed with clutch pedal fully depressed

○ : PARTS LOCATION

Code	See Page	Code	See Page	Code	See Page
C8	34	I4	31 (5VZ-FE)	P1	31 (5VZ-FE)
C9	34	I5	31 (5VZ-FE)	S1	A 31 (5VZ-FE)
E7	35	I14	35	S2	B 31 (5VZ-FE)
I2	31 (5VZ-FE)	J9	A 31 (5VZ-FE)		
I3	31 (5VZ-FE)	J10	B 31 (5VZ-FE)		

○ : RELAY BLOCKS

Code	See Page	Relay Blocks (Relay Block Location)
2	21	R/B No.2 (Engine Compartment Left)

○ : JUNCTION BLOCK AND WIRE HARNESS CONNECTOR

Code	See Page	Junction Block and Wire Harness (Connector Location)
1F	23	Cowl Wire and J/B No.1 (Lower Finish Panel)
1I	23	Engine Room Main Wire and J/B No.1 (Lower Finish Panel)
3A	24	Cowl Wire and J/B No.3 (Behind the Instrument Panel Left)
3D		
3E		

□ : CONNECTOR JOINING WIRE HARNESS AND WIRE HARNESS

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
EA1	40 (5VZ-FE)	Engine Room Main Wire and Engine No.2 Wire (Near the Battery)
IF1	44	Engine Room Main Wire and Cowl Wire (Left Kick Panel)
IK2	44	Engine Wire and Cowl Wire (Above the Glove Box)
IK3		

▽ : GROUND POINTS

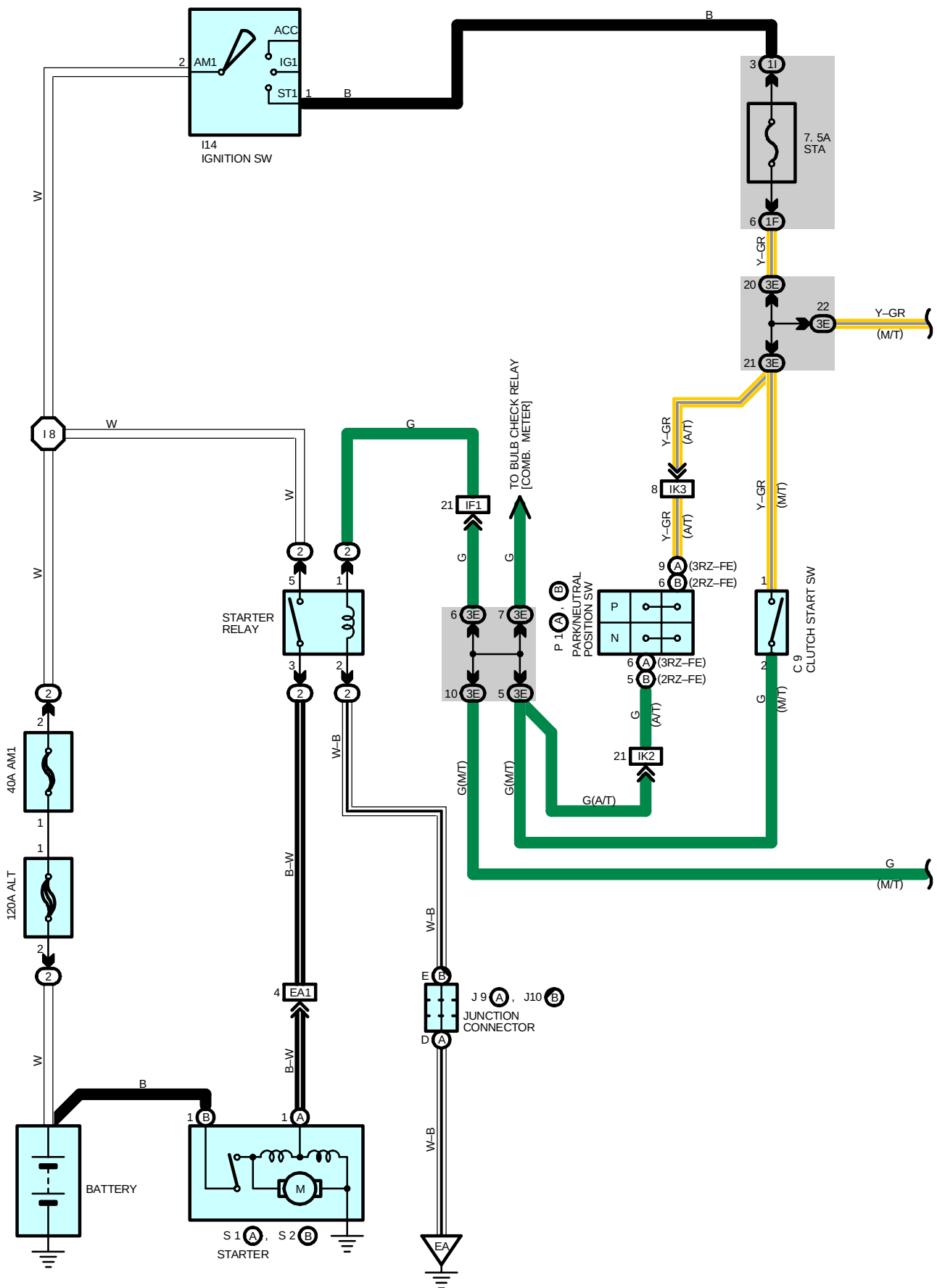
Code	See Page	Ground Points Location
EA	40 (5VZ-FE)	Front Left Fender
EB	40 (5VZ-FE)	Near the Throttle Body
IE	44	Around the Right Edge of the Reinforcement
IG	44	Around the Left Edge of the Reinforcement



: SPLICE POINTS

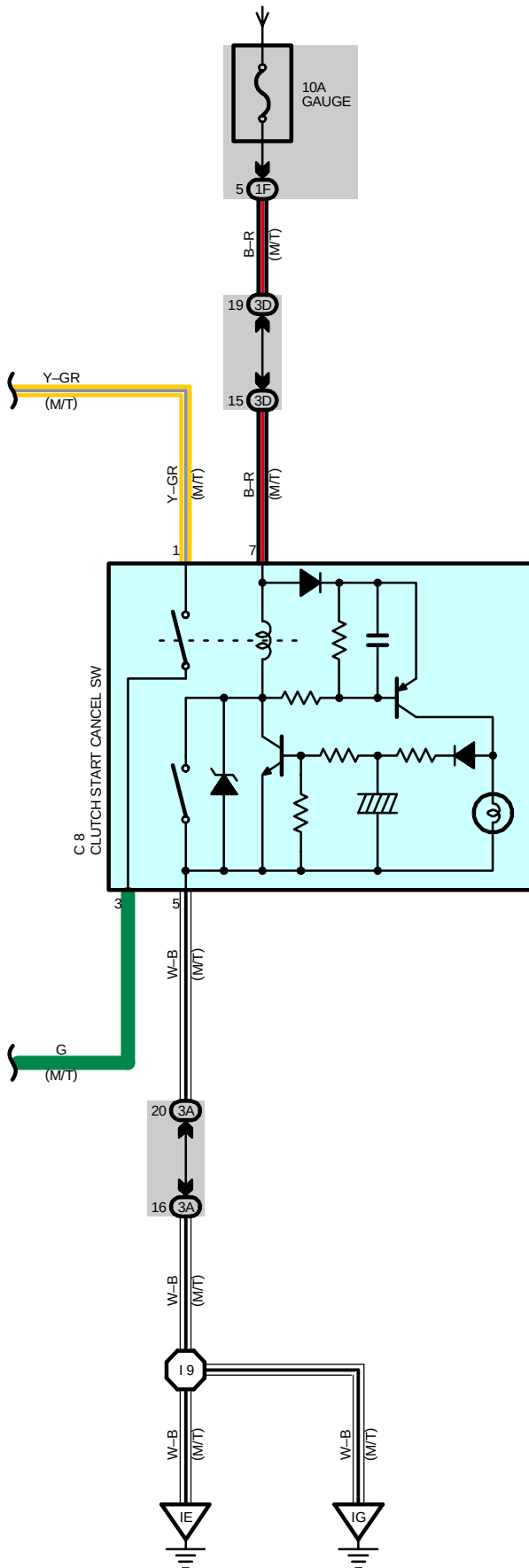
Code	See Page	Wire Harness with Splice Points	Code	See Page	Wire Harness with Splice Points
I8	44	Engine Room Main Wire	I13	44	Engine Wire
I9	44	Cowl Wire			

STARTING (3RZ-FE, 2RZ-FE)



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FROM POWER SOURCE SYSTEM (SEE PAGE 54)



STARTING (3RZ-FE, 2RZ-FE)

SERVICE HINTS

S1 (A), S2 (B) STARTER

Points closed with Park/Neutral position SW at **P** or **N** position and ignition SW at **ST** position (A/T)
Points closed with clutch start SW or clutch start cancel SW on and ignition SW at **ST** position (M/T)

I14 IGNITION SW

2-1 : Closed with ignition SW at **ST** position

P1 (A), (B) PARK/NEUTRAL POSITION SW (A/T)

(A) 9-(A) 6, (B) 6-(B) 5 : Closed with A/T shift lever in **P** or **N** position

STARTER RELAY

5-3 : Closed with Park/Neutral position SW at **P** or **N** position and ignition SW at **ST** position (A/T)
5-3 : Closed with clutch start SW or clutch start cancel SW on and ignition SW at **ST** position (M/T)

C8 CLUTCH START CANCEL SW (M/T)

1-3 : Closed with ignition SW on and cancel SW on

C9 CLUTCH START SW (M/T)

1-2 : Closed with clutch pedal fully depressed

○ : PARTS LOCATION

Code	See Page	Code	See Page	Code	See Page
C8	34	J9 A	33 (3RZ-FE, 2RZ-FE)	P1 B	33 (2RZ-FE)
C9	34	J10 B	33 (3RZ-FE, 2RZ-FE)	S1 A	33 (3RZ-FE, 2RZ-FE)
I14	35	P1 A	33 (3RZ-FE)	S2 B	33 (3RZ-FE, 2RZ-FE)

○ : RELAY BLOCKS

Code	See Page	Relay Blocks (Relay Block Location)
2	21	R/B No.2 (Engine Compartment Left)

○ : JUNCTION BLOCK AND WIRE HARNESS CONNECTOR

Code	See Page	Junction Block and Wire Harness (Connector Location)
1F	23	Cowl Wire and J/B No.1 (Lower Finish Panel)
1I	23	Engine Room Main Wire and J/B No.1 (Lower Finish Panel)
3A	24	Cowl Wire and J/B No.3 (Behind the Instrument Panel Left)
3D		
3E		

□ : CONNECTOR JOINING WIRE HARNESS AND WIRE HARNESS

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
EA1	42 (3RZ-FE, 2RZ-FE)	Engine Room Main Wire and Engine No.2 Wire (Near the Battery)
IF1	44	Engine Room Main Wire and Cowl Wire (Left Kick Panel)
IK2	44	Engine Wire and Cowl Wire (Above the Glove Box)
IK3		

▽ : GROUND POINTS

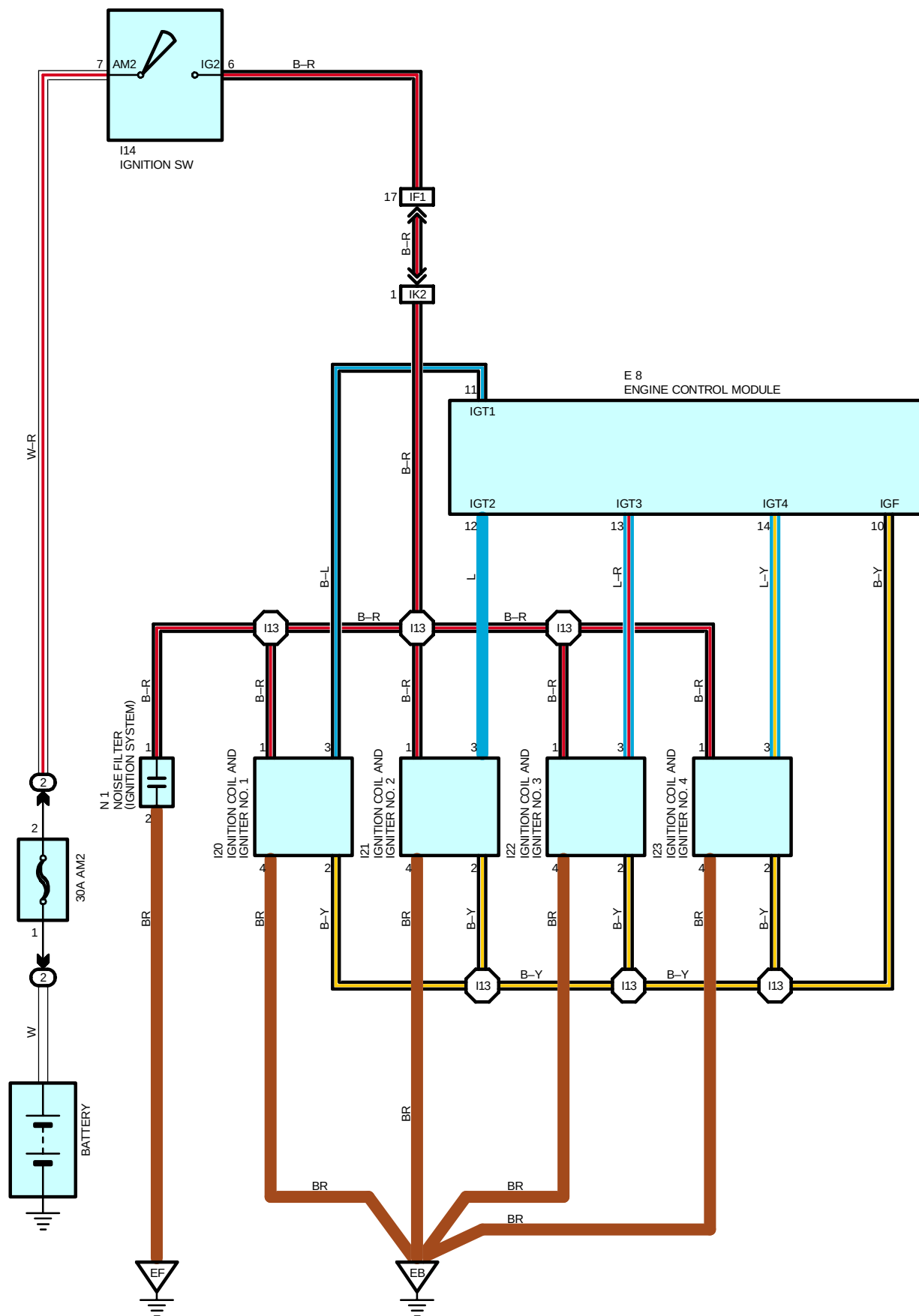
Code	See Page	Ground Points Location
EA	42 (3RZ-FE, 2RZ-FE)	Front Left Fender
IE	44	Around the Right Edge of the Reinforcement
IG	44	Around the Left Edge of the Reinforcement

○ : SPLICE POINTS

Code	See Page	Wire Harness with Splice Points	Code	See Page	Wire Harness with Splice Points
I8	44	Engine Room Main Wire	I9	44	Cowl Wire

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IGNITION (3RZ-FE, 2RZ-FE)



SERVICE HINTS

I14 IGNITION SW

7-6 : Closed with ignition SW at **ON** or **ST** position

: PARTS LOCATION

Code	See Page	Code	See Page	Code	See Page
E8	35	I21	33 (3RZ-FE, 2RZ-FE)	N1	33 (3RZ-FE, 2RZ-FE)
I14	35	I22	33 (3RZ-FE, 2RZ-FE)		
I20	33 (3RZ-FE, 2RZ-FE)	I23	33 (3RZ-FE, 2RZ-FE)		

: RELAY BLOCKS

Code	See Page	Relay Blocks (Relay Block Location)
2	21	R/B No.2 (Engine Compartment Left)

: CONNECTOR JOINING WIRE HARNESS AND WIRE HARNESS

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IF1	44	Engine Room Main Wire and Cowl Wire (Left Kick Panel)
IK2	44	Engine Wire and Cowl Wire (Above the Glove Box)

: GROUND POINTS

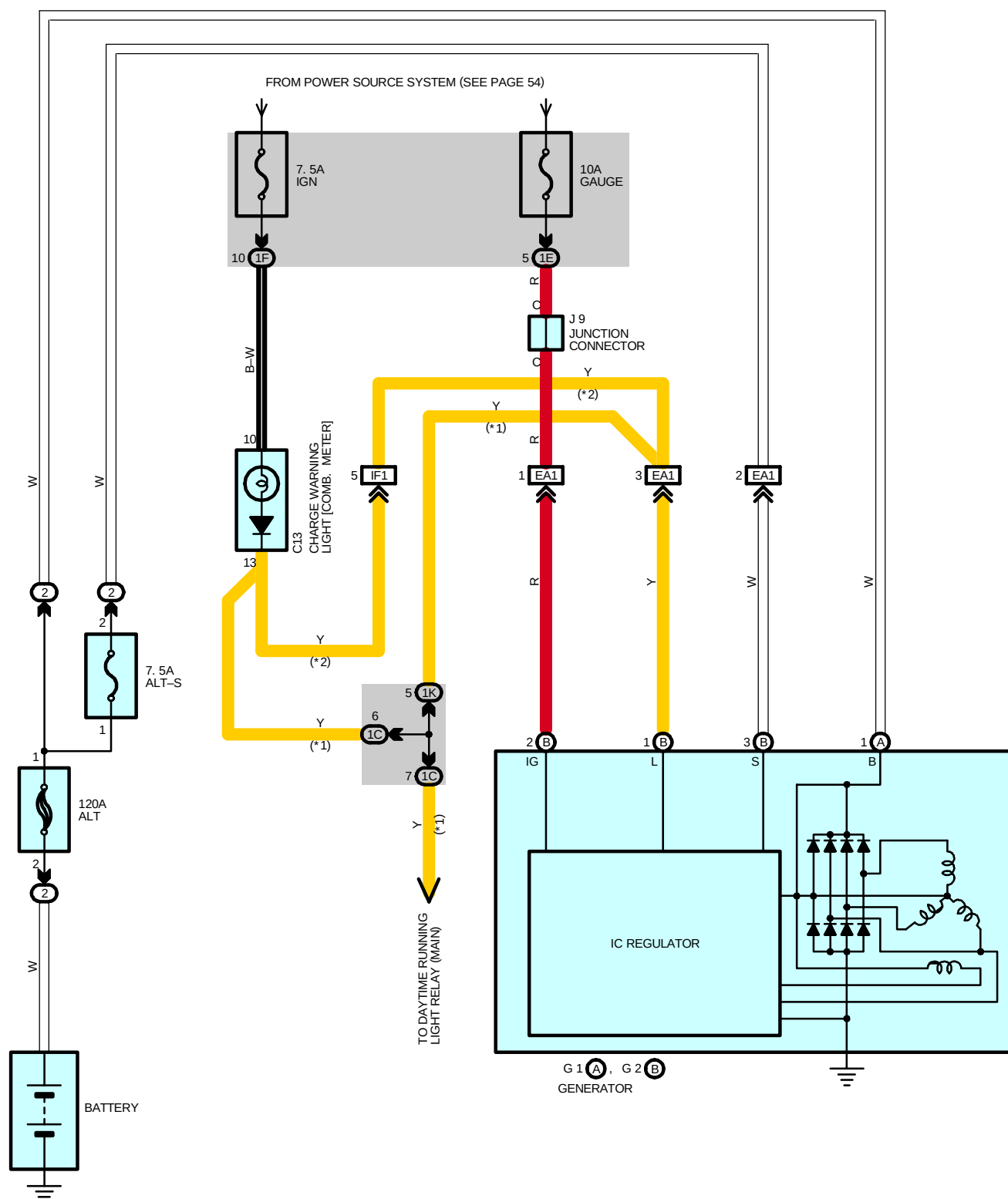
Code	See Page	Ground Points Location
EB	42 (3RZ-FE, 2RZ-FE)	Under the Data Link Connector 1
EF	42 (3RZ-FE, 2RZ-FE)	Ignition Coil Bracket

: SPLICE POINTS

Code	See Page	Wire Harness with Splice Points	Code	See Page	Wire Harness with Splice Points
I13	44	Engine Wire			

CHARGING

* 1 : W/ DAYTIME RUNNING LIGHT
* 2 : W/O DAYTIME RUNNING LIGHT



SERVICE HINTS

G2 (B) GENERATOR

- (B) 3-GROUND : **13.9–15.1** volts with engine running at **2000** rpm and **25°C (77°F)**
13.5–14.3 volts with engine running at **2000** rpm and **115°C (239°F)**
 (B) 1-GROUND : **0–4** volts with ignition SW at **ON** position and engine not running

○ : PARTS LOCATION

Code	See Page	Code	See Page	Code	See Page
C13	34	G2	B	J9	33 (3RZ-FE, 2RZ-FE)
G1	A				
	30 (5VZ-FE)				
	32 (3RZ-FE, 2RZ-FE)	J9		31 (5VZ-FE)	

○ : RELAY BLOCKS

Code	See Page	Relay Blocks (Relay Block Location)
2	21	R/B No.2 (Engine Compartment Left)

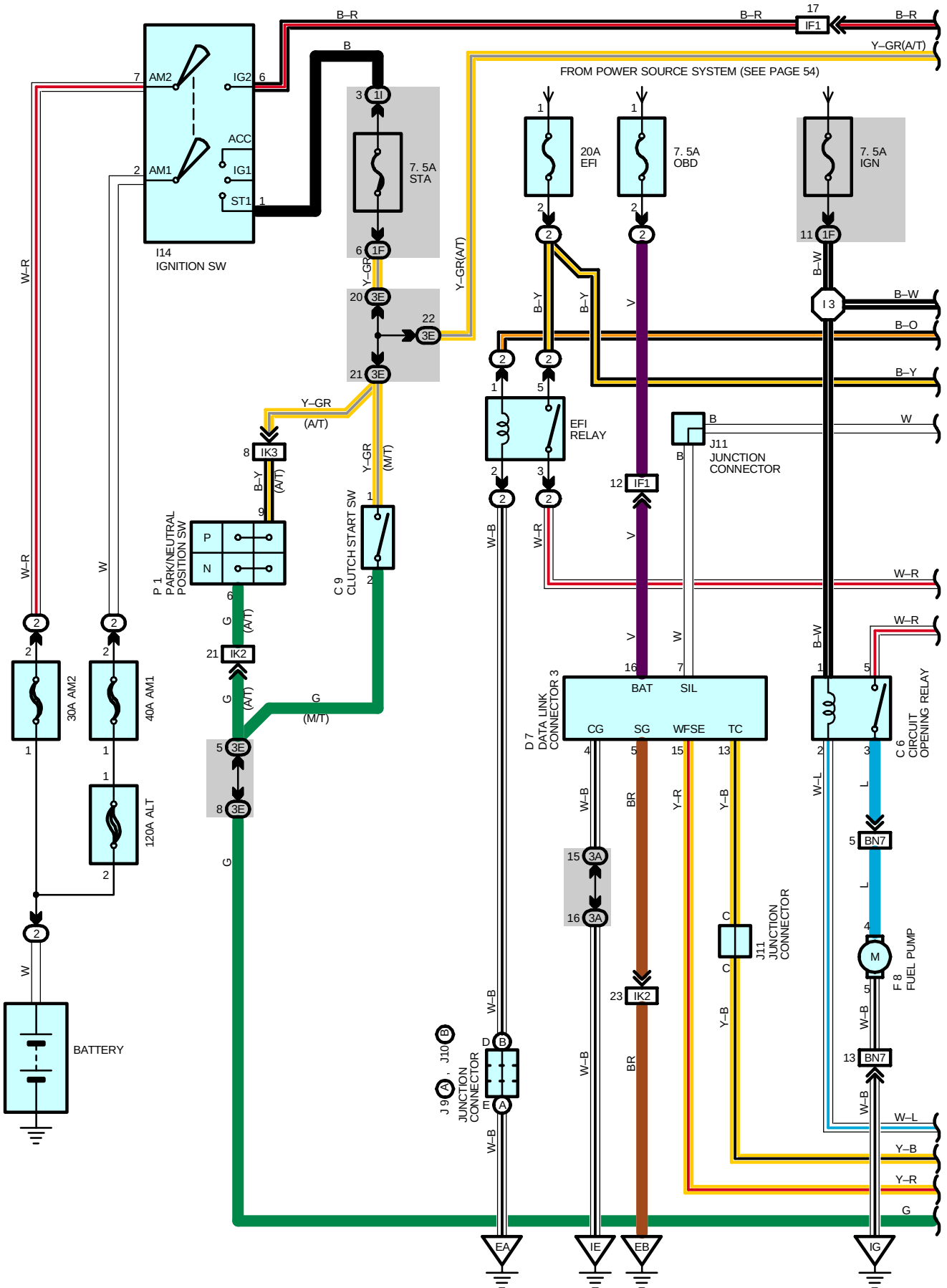
○ : JUNCTION BLOCK AND WIRE HARNESS CONNECTOR

Code	See Page	Junction Block and Wire Harness (Connector Location)
1C	23	Cowl Wire and J/B No.1 (Lower Finish Panel)
1E	23	Engine Room Main Wire and J/B No.1 (Lower Finish Panel)
1F	23	Cowl Wire and J/B No.1 (Lower Finish Panel)
1K	23	Engine Room Main Wire and J/B No.1 (Lower Finish Panel)

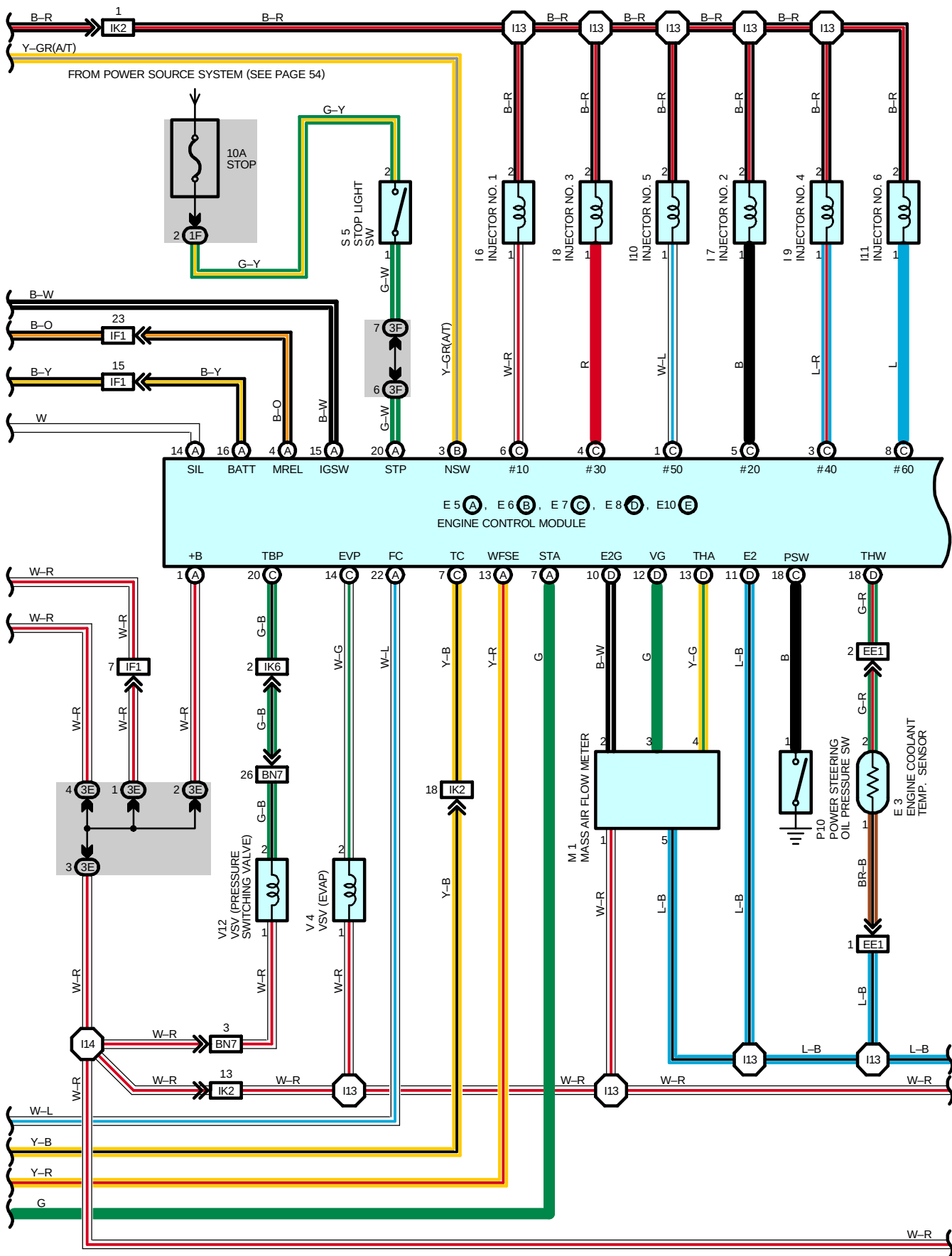
□ : CONNECTOR JOINING WIRE HARNESS AND WIRE HARNESS

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
EA1	40 (5VZ-FE)	Engine Room Main Wire and Engine No.2 Wire (Near the Battery)
	42 (3RZ-FE, 2RZ-FE)	
IF1	44	Engine Room Main Wire and Cowl Wire (Left Kick Panel)

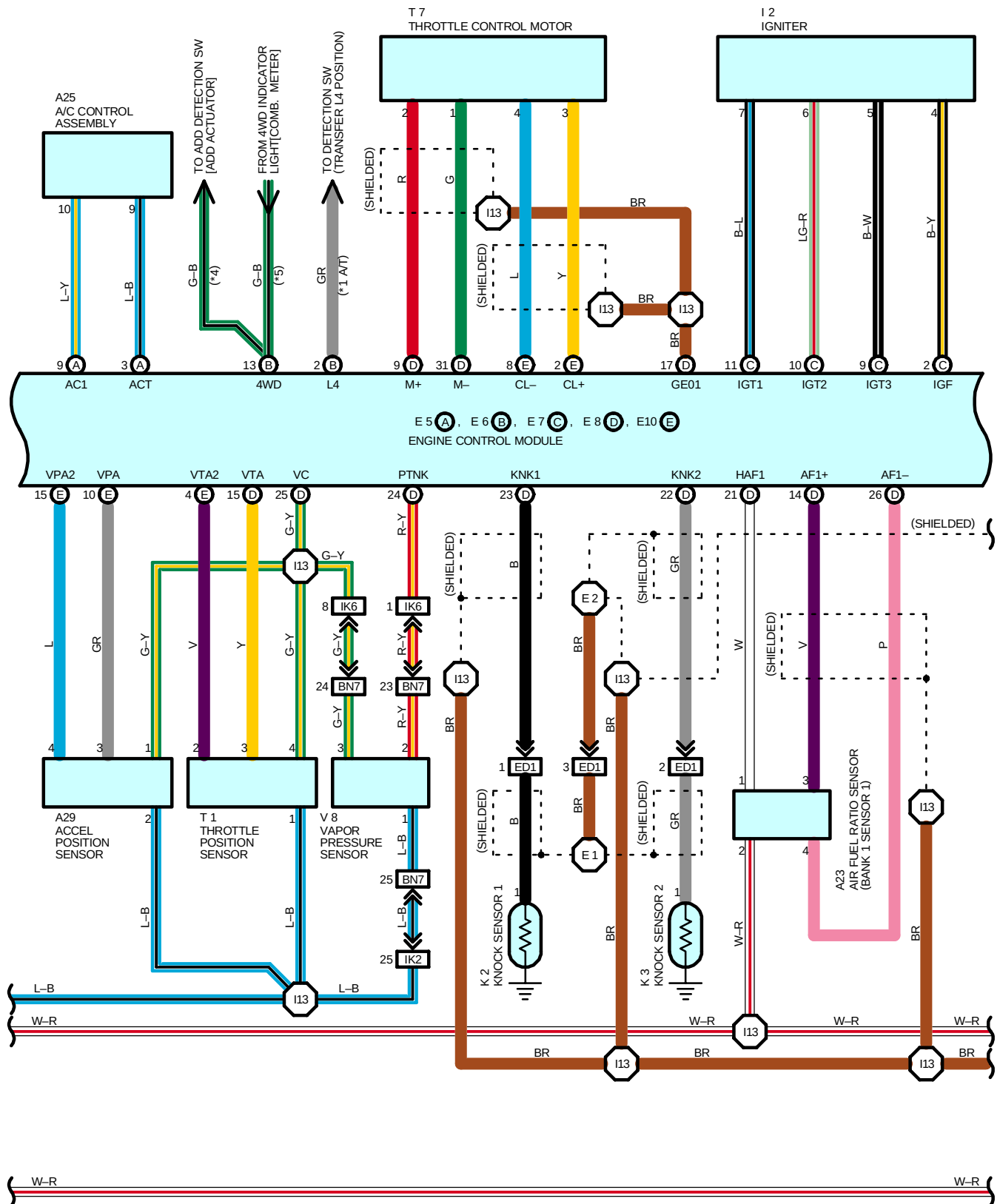
ENGINE CONTROL (5VZ-FE EXCEPT 2WD M/T)

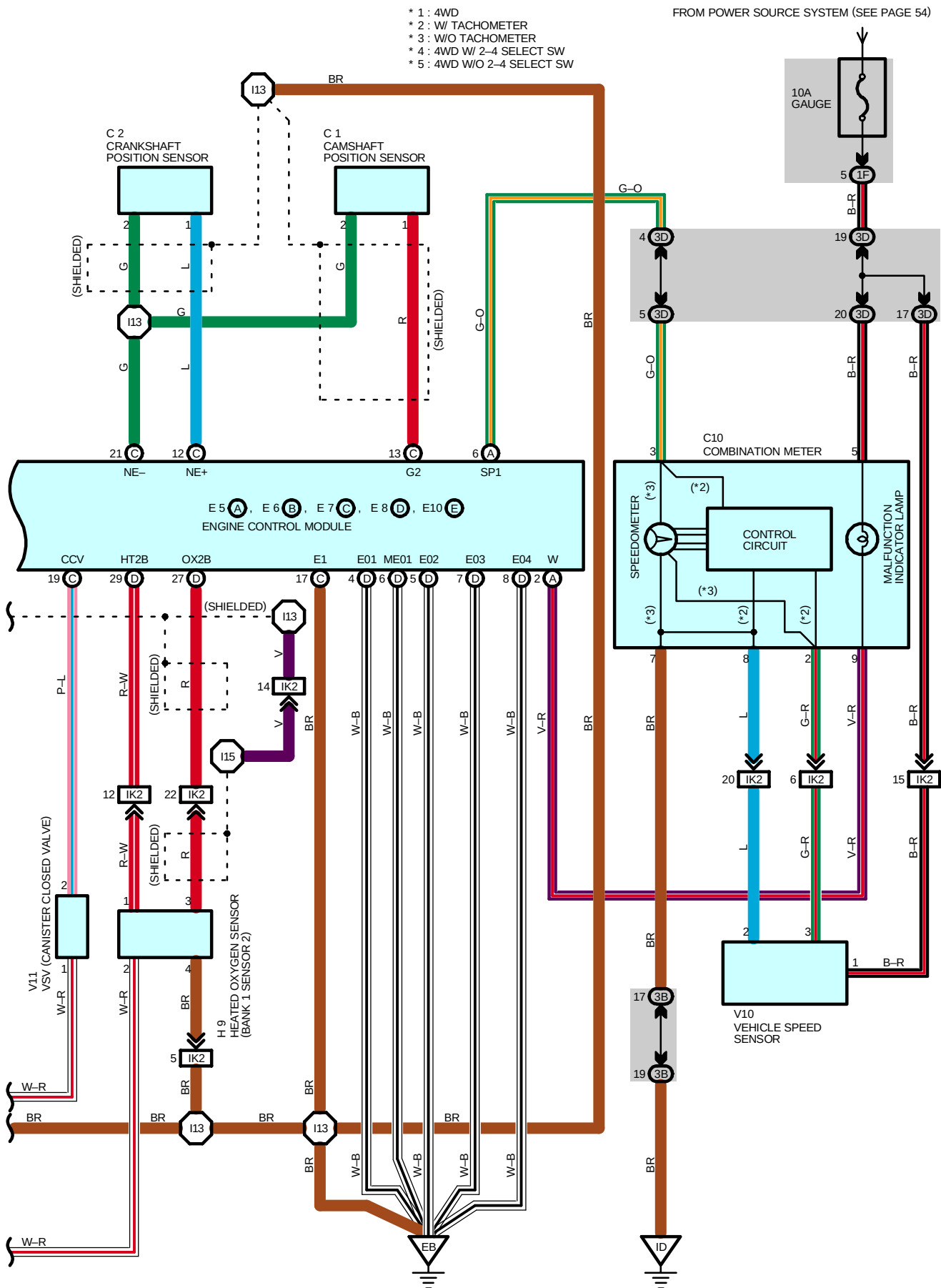


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ENGINE CONTROL (5VZ-FE EXCEPT 2WD M/T)





SYSTEM OUTLINE

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

1. INPUT SIGNAL

(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 water temp. Thus the engine coolant temp. is input in the form of a control signal to TERMINAL THW of the engine control module.

(2) Intake air temp. signal system

The intake air temp. sensor is installed inside 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) Heated oxygen sensor signal system

The oxygen density in the exhaust emissions is detected and input as a control signal to TERMINAL OX2B of the engine control module. To maintain stable detection performance by the heated oxygen sensor, a heater is used for warming the sensor. The heater is also controlled by the engine control module (HT2B).

(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 to TERMINAL NE+.

(5) Throttle signal system

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

(6) Vehicle speed signal system

The vehicle speed sensor detects the vehicle speed and inputs a control signal to TERMINAL SP1 of the engine control module via the combination meter.

(7) 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.

(8) 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.

(9) Intake air volume signal system

Intake air volume is detected by the mass air flow meter and a signal is input into TERMINAL VG of the engine control module as a control signal.

(10) Stop light SW signal system

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

(11) Starter 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) Engine knock signal system

Engine knocking is detected by the knock sensor 1 and 2 and the signals are input to TERMINALS KNK1 and KNK2 of the engine control module.

(13) 4WD signal system

Whether or not the vehicle is operating in 4WD mode is determined, and a control signal is input to TERMINAL 4WD of the engine control module.

(14) Air fuel ratio signal system

The air fuel ratio is detected and input as a control signal into TERMINAL AF1+ of the engine control module.

2. CONTROL SYSTEM

*** SFI system**

The SFI system monitors the engine conditions through the signals (Input signals (1 to 13)) 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, #40, #50 and #60 of the engine control module, causing the injectors to operate (to inject fuel). It is this system which, through the work of the engine control module, finely controls fuel injection in response to driving conditions.

*** Electronic Spark Advance system**

The ESA system monitors the engine conditions using the signals (input signals (1, 4, 5 to 7, 9, 11, 12)) 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 and IGT3 of the engine control module. This output controls the igniter to produce the most appropriate ignition timing for the driving conditions.

*** Heated oxygen sensor heater control system**

The heated oxygen sensor heater control system turns the heater to on when the intake air volume is low (Temp. of exhaust emissions low), and warms up the heated oxygen sensor to improve detection performance of the sensor. The engine control module evaluates the signals (Input signals (1, 4, 8, 9, 11)) from each sensor, current is output to TERMINAL HT2B and controls the heater.

3. DIAGNOSIS SYSTEM

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

4. FAIL-SAFE SYSTEM

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

ENGINE CONTROL (5VZ-FE EXCEPT 2WD M/T)

SERVICE HINTS

EFI RELAY

5-3 : Closed with ignition SW at **ON** or **ST** position

C6 CIRCUIT OPENING RELAY

5-3 : Closed with starter running or ignition SW at **ON** or **ST** position

I6, I7, I8, I9, I10, I11 INJECTOR

1-2 : **13.4-14.2** Ω

T1 THROTTLE POSITION SENSOR

2-1 : **4-9** kΩ

E3 ENGINE COOLANT TEMP. SENSOR

1-2 : **10-20** kΩ (**-20°C, -4°F**)
4-7 kΩ (**0°C, 32°F**)
2-3 kΩ (**20°C, 68°F**)
0.9-1.3 kΩ (**40°C, 104°F**)
0.4-0.7 kΩ (**60°C, 140°F**)
0.2-0.4 kΩ (**80°C, 176°F**)

E5 (A), E6 (B), E7 (C), E8 (D), E10 (E) ENGINE CONTROL MODULE

Voltage at engine control module wiring connectors

+B-E1 : **9-14** volts (Ignition SW on)

BATT-E1 : **9-14** volts (Always)

VC-E2 : **4.5-5.5** volts (Ignition SW on)

VTA-E2 : **0.3-0.8** volts (Ignition SW on and throttle valve fully closed)
3.2-4.9 volts (Ignition SW on and throttle valve fully open)

STA-E1 : **6** volts or more (Ignition SW at **ST** position)

W-E1 : **9-14** volts (No trouble and engine running)

THA-E2 : **0.5-3.4** volts (Ignition SW on and intake air temp. **20°C, 68°F**)

THW-E2 : **0.2-1.0** volts (Ignition SW on and coolant temp. **80°C, 176°F**)

SP1-E1 : Pulse generation with vehicle moving

STP-E1 : **7.5-14** volts (Stop light SW on)

IGT1, IGT2, IGT3-E1 : Pulse generation (Cranking or idling)

#10, #20, #30, #40, #50, #60-E1 : **9-14** volts (Ignition SW on)

RESISTANCE AT ECU WIRING CONNECTOR

(Disconnect wiring connector)

VTA-E2 : **3.3-10** kΩ (Throttle valve fully open)
0.2-0.8 kΩ (Throttle valve fully closed)

THA-E2 : **2-3** kΩ (Intake air temp. **20°C, 68°F**)

THW-E2 : **0.2-0.4** KΩ (Coolant temp. **80°C, 178°F**)

+B-E1 : **0.2-0.4** kΩ

NE+ -E1 : **140-180** Ω

○ : PARTS LOCATION

Code	See Page	Code	See Page	Code	See Page
A23	30 (5VZ-FE)	F8	36 (Double Cab)	K2	31 (5VZ-FE)
A25	34		37 (Except Double Cab)	K3	31 (5VZ-FE)
C1	30 (5VZ-FE)	H9	35	M1	31 (5VZ-FE)
C2	30 (5VZ-FE)	I2	31 (5VZ-FE)	P1	31 (5VZ-FE)
C6	34	I6	31 (5VZ-FE)	P10	31 (5VZ-FE)
C9	34	I7	31 (5VZ-FE)	S5	35
C10	34	I8	31 (5VZ-FE)	T1	31 (5VZ-FE)
D7	34	I9	31 (5VZ-FE)	V4	31 (5VZ-FE)
E3	30 (5VZ-FE)	I10	31 (5VZ-FE)	V8	36 (Double Cab)
E5	A 35	I11	31 (5VZ-FE)		37 (Except Double Cab)
E6	B 35	I14	35	V10	31 (5VZ-FE)
E7	C 35	J9	A 31 (5VZ-FE)	V11	31 (5VZ-FE)
E8	D 35	J10	B 31 (5VZ-FE)	V12	36 (Double Cab)
E10	E 35	J11	35		37 (Except Double Cab)

: RELAY BLOCKS

Code	See Page	Relay Blocks (Relay Block Location)
2	21	R/B No.2 (Engine Compartment Left)

: JUNCTION BLOCK AND WIRE HARNESS CONNECTOR

Code	See Page	Junction Block and Wire Harness (Connector Location)
1F	23	Cowl Wire and J/B No.1 (Lower Finish Panel)
1I	23	Engine Room Main Wire and J/B No.1 (Lower Finish Panel)
3A	24	Cowl Wire and J/B No.3 (Behind the Instrument Panel Left)
3B		
3D		
3E		
3F		

: CONNECTOR JOINING WIRE HARNESS AND WIRE HARNESS

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
ED1	40 (5VZ-FE)	Sensor Wire and Engine Wire (Over the Cylinder Head)
EE1	40 (5VZ-FE)	Engine Wire and Sensor Wire (Over the Cylinder Head)
IF1	44	Engine Room Main Wire and Cowl Wire (Left Kick Panel)
IK2	44	Engine Wire and Cowl Wire (Above the Glove Box)
IK3		
IK6		
BN7	46 (Double Cab) 48 (Except Double Cab)	Frame Wire and Cowl Wire (Under the Driver's Seat)

: GROUND POINTS

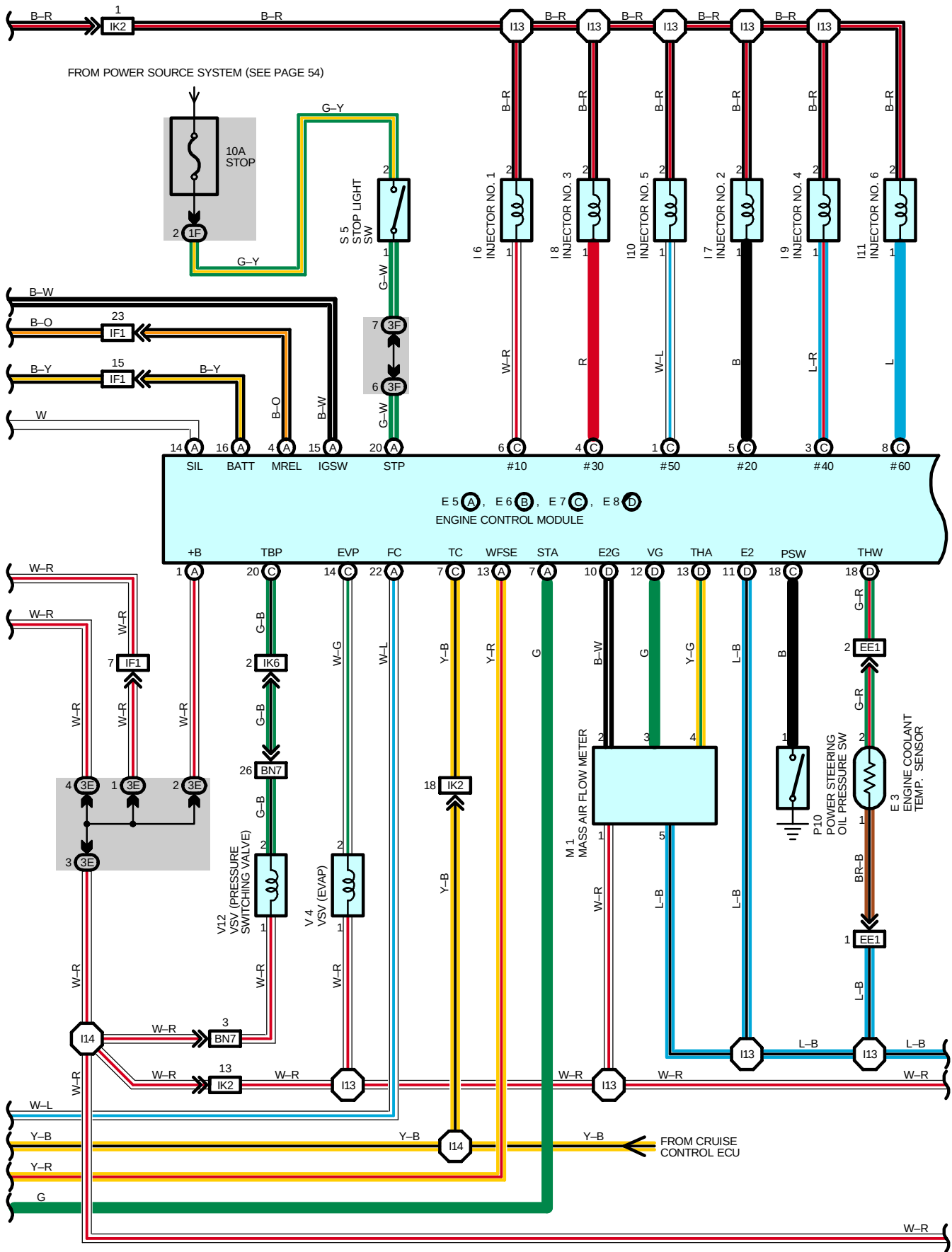
Code	See Page	Ground Points Location
EA	40 (5VZ-FE)	Front Left Fender
EB	40 (5VZ-FE)	Near the Throttle Body
ID	44	Left Kick Panel
IE	44	Around the Right Edge of the Reinforcement
IG	44	Around the Left Edge of the Reinforcement

: SPLICE POINTS

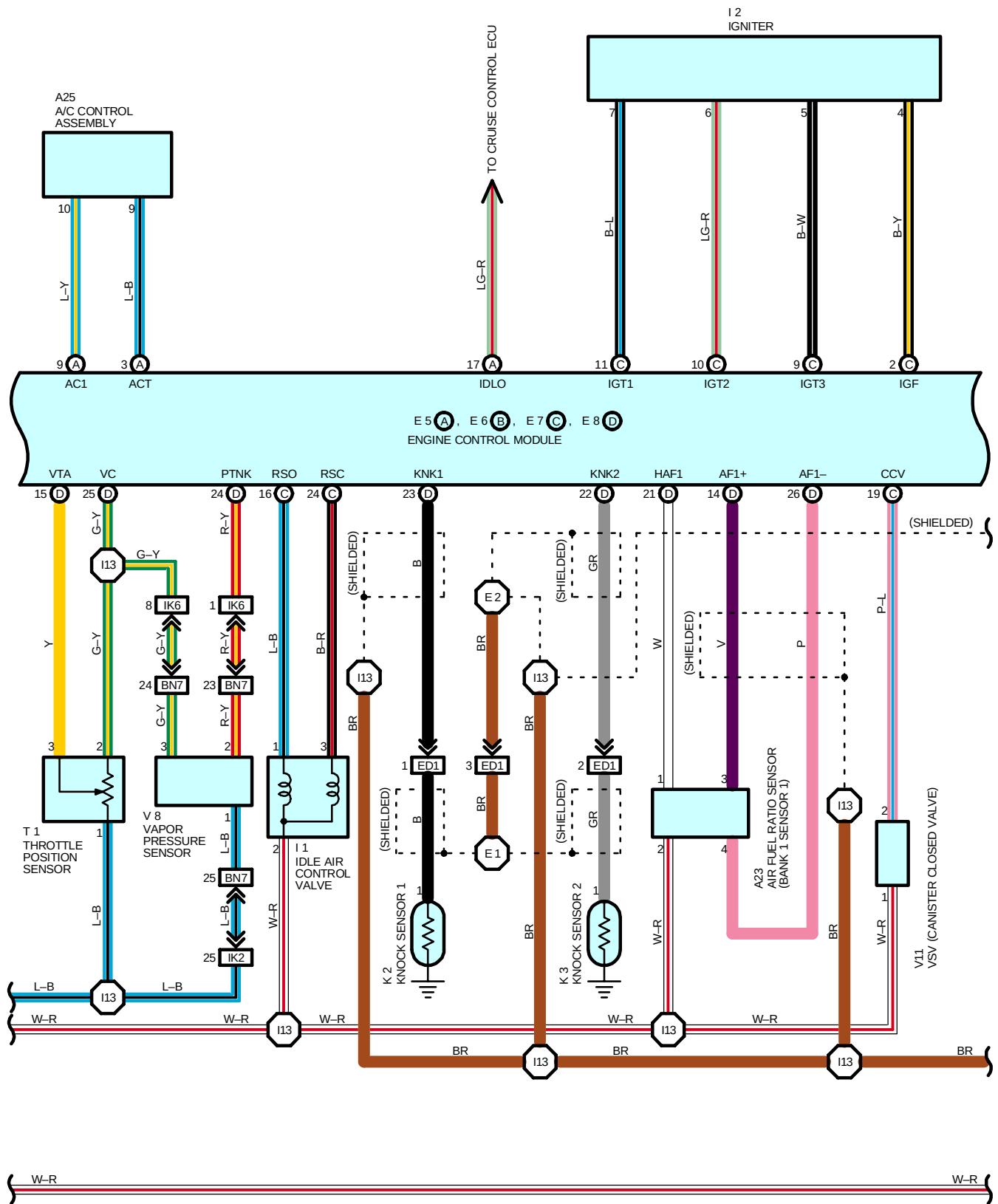
Code	See Page	Wire Harness with Splice Points	Code	See Page	Wire Harness with Splice Points
E1	40 (5VZ-FE)	Sensor Wire	I13	44	Engine Wire
E2	40 (5VZ-FE)	Engine Wire	I14	44	Cowl Wire
I3	44	Cowl Wire	I15		

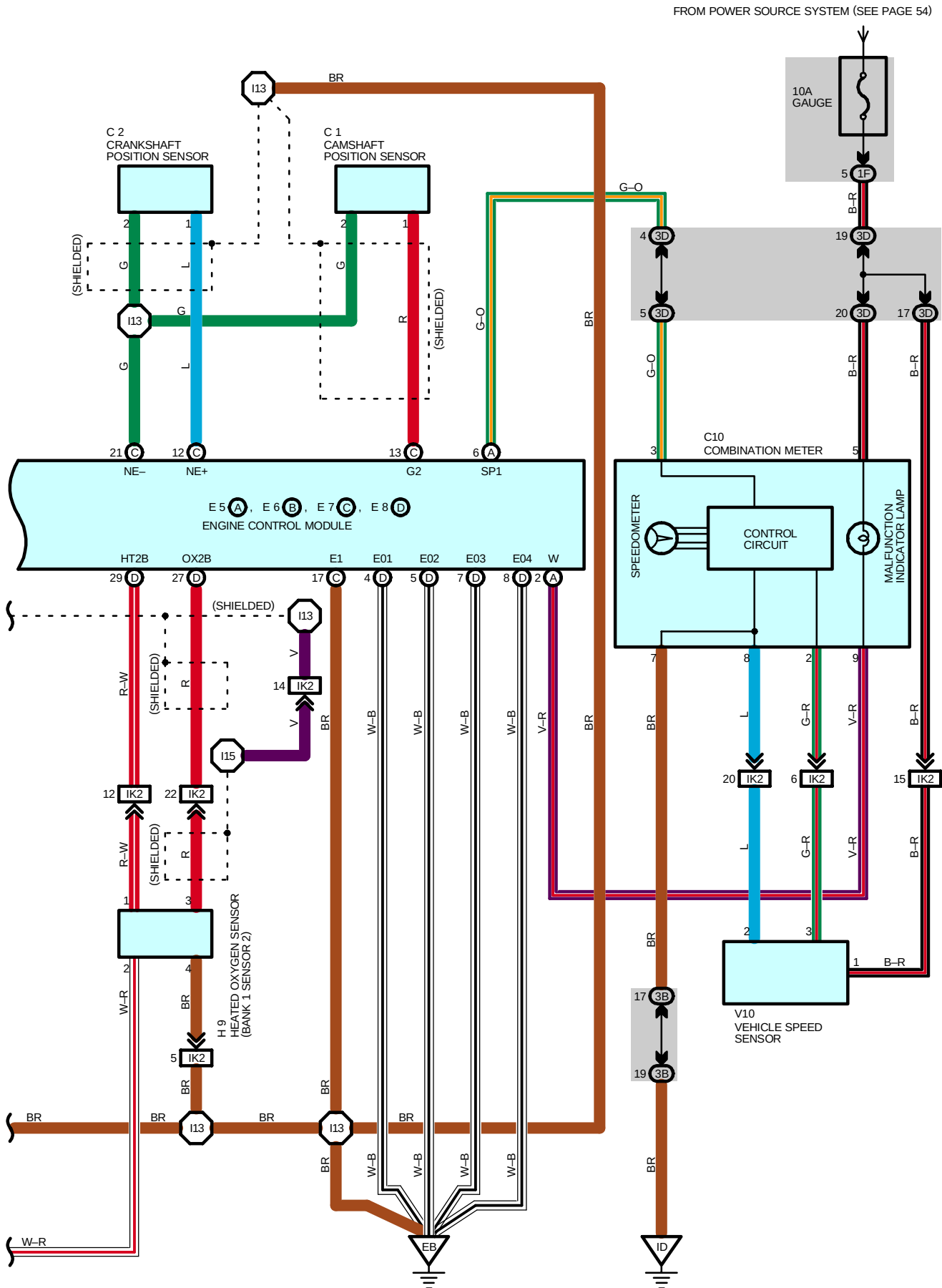
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ENGINE CONTROL (5VZ-FE 2WD M/T)





SYSTEM OUTLINE

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

1. INPUT SIGNAL

(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 water temp. Thus the engine coolant temp. is input in the form of a control signal to TERMINAL THW of the engine control module.

(2) Intake air temp. signal system

The intake air temp. sensor is installed inside 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) Heated oxygen sensor signal system

The oxygen density in the exhaust emissions is detected and input as a control signal to TERMINAL OX2B of the engine control module. To maintain stable detection performance by the heated oxygen sensor, a heater is used for warming the sensor. The heater is also controlled by the engine control module (HT2B).

(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 to TERMINAL NE+.

(5) Throttle signal system

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

(6) Vehicle speed signal system

The vehicle speed sensor detects the vehicle speed and inputs a control signal to TERMINAL SP1 of the engine control module via the combination meter.

(7) 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.

(8) 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.

(9) Intake air volume signal system

Intake air volume is detected by the mass air flow meter and a signal is input into TERMINAL VG of the engine control module as a control signal.

(10) Stop light SW signal system

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

(11) Starter 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) Engine knock signal system

Engine knocking is detected by the knock sensor 1 and 2 and the signals are input to TERMINALS KNK1 and KNK2 of the engine control module.

(13) 4WD signal system

Whether or not the vehicle is operating in 4WD mode is determined, and a control signal is input to TERMINAL 4WD of the engine control module.

(14) Air fuel ratio signal system

The air fuel ratio is detected and input as a control signal into TERMINAL AF1+ of the engine control module.

2. CONTROL SYSTEM

* SFI system

The SFI system monitors the engine conditions through the signals (Input signals (1 to 13)) 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, #40, #50 and #60 of the engine control module, causing the injectors to operate (to inject fuel). It is this system which, through the work of the engine control module, finely controls fuel injection in response to driving conditions.

* Electronic Spark Advance system

The ESA system monitors the engine conditions using the signals (input signals (1, 4, 5 to 7, 9, 11, 12)) 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 and IGT3 of the engine control module. This output controls the igniter to produce the most appropriate ignition timing for the driving conditions.

* Heated oxygen sensor heater control system

The heated oxygen sensor heater control system turns the heater to on when the intake air volume is low (Temp. of exhaust emissions low), and warms up the heated oxygen sensor to improve detection performance of the sensor. The engine control module evaluates the signals (Input signals (1, 4, 8, 9, 11)) from each sensor, current is output to TERMINAL HT2B and controls the heater.

3. DIAGNOSIS SYSTEM

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

4. FAIL-SAFE SYSTEM

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

ENGINE CONTROL (5VZ-FE 2WD M/T)

SERVICE HINTS

EFI RELAY

5-3 : Closed with ignition SW at **ON** or **ST** position

C6 CIRCUIT OPENING RELAY

5-3 : Closed with starter running or ignition SW at **ON** or **ST** position

I6, I7, I8, I9, I10, I11 INJECTOR

1-2 : **13.4-14.2** Ω

T1 THROTTLE POSITION SENSOR

2-1 : **4-9** kΩ

E3 ENGINE COOLANT TEMP. SENSOR

1-2 : **10-20** kΩ (**-20°C, -4°F**)
4-7 kΩ (**0°C, 32°F**)
2-3 kΩ (**20°C, 68°F**)
0.9-1.3 kΩ (**40°C, 104°F**)
0.4-0.7 kΩ (**60°C, 140°F**)
0.2-0.4 kΩ (**80°C, 176°F**)

E5 (A), E6 (B), E7 (C), E8 (D) ENGINE CONTROL MODULE

Voltage at engine control module wiring connectors

+B-E1 : **9-14** volts (Ignition SW on)

BATT-E1 : **9-14** volts (Always)

VC-E2 : **4.5-5.5** volts (Ignition SW on)

VTA-E2 : **0.3-0.8** volts (Ignition SW on and throttle valve fully closed)

3.2-4.9 volts (Ignition SW on and throttle valve fully open)

STA-E1 : **6** volts or more (Ignition SW at **ST** position)

W-E1 : **9-14** volts (No trouble and engine running)

THA-E2 : **0.5-3.4** volts (Ignition SW on and intake air temp. **20°C, 68°F**)

THW-E2 : **0.2-1.0** volts (Ignition SW on and coolant temp. **80°C, 176°F**)

SP1-E1 : Pulse generation with vehicle moving

STP-E1 : **7.5-14** volts (Stop light SW on)

IGT1, IGT2, IGT3-E1 : Pulse generation (Cranking or idling)

#10, #20, #30, #40, #50, #60-E1 : **9-14** volts (Ignition SW on)

RESISTANCE AT ECU WIRING CONNECTOR

(Disconnect wiring connector)

VTA-E2 : **3.3-10** kΩ (Throttle valve fully open)

0.2-0.8 kΩ (Throttle valve fully closed)

THA-E2 : **2-3** kΩ (Intake air temp. **20°C, 68°F**)

THW-E2 : **0.2-0.4** KΩ (Coolant temp. **80°C, 178°F**)

+B-E1 : **0.2-0.4** kΩ

NE+ -E1 : **140-180** Ω

○ : PARTS LOCATION

Code	See Page	Code	See Page	Code	See Page
A23	30 (5VZ-FE)	F8	37 (Except Double Cab)	K2	31 (5VZ-FE)
A25	34	H9	35	K3	31 (5VZ-FE)
C1	30 (5VZ-FE)	I1	31 (5VZ-FE)	M1	31 (5VZ-FE)
C2	30 (5VZ-FE)	I2	31 (5VZ-FE)	P10	31 (5VZ-FE)
C6	34	I6	31 (5VZ-FE)	S5	35
C9	34	I7	31 (5VZ-FE)	T1	31 (5VZ-FE)
C10	34	I8	31 (5VZ-FE)	V4	31 (5VZ-FE)
D7	34	I9	31 (5VZ-FE)	V8	36 (Double Cab)
E3	30 (5VZ-FE)	I10	31 (5VZ-FE)		37 (Except Double Cab)
E5	A 35	I11	31 (5VZ-FE)	V10	31 (5VZ-FE)
E6	B 35	I14	35	V11	31 (5VZ-FE)
E7	C 35	J9	A 31 (5VZ-FE)	V12	36 (Double Cab)
E8	D 35	J10	B 31 (5VZ-FE)		37 (Except Double Cab)
F8	36 (Double Cab)	J11	35		

 : RELAY BLOCKS

Code	See Page	Relay Blocks (Relay Block Location)
2	21	R/B No.2 (Engine Compartment Left)

 : JUNCTION BLOCK AND WIRE HARNESS CONNECTOR

Code	See Page	Junction Block and Wire Harness (Connector Location)
1F	23	Cowl Wire and J/B No.1 (Lower Finish Panel)
1I	23	Engine Room Main Wire and J/B No.1 (Lower Finish Panel)
3A	24	Cowl Wire and J/B No.3 (Behind the Instrument Panel Left)
3B		
3D		
3E		
3F		

 : CONNECTOR JOINING WIRE HARNESS AND WIRE HARNESS

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
ED1	40 (5VZ-FE)	Sensor Wire and Engine Wire (Over the Cylinder Head)
EE1	40 (5VZ-FE)	Engine Wire and Sensor Wire (Over the Cylinder Head)
IF1	44	Engine Room Main Wire and Cowl Wire (Left Kick Panel)
IK2	44	Engine Wire and Cowl Wire (Above the Glove Box)
IK6		
BN7	46 (Double Cab) 48 (Except Double Cab)	Frame Wire and Cowl Wire (Under the Driver's Seat)

 : GROUND POINTS

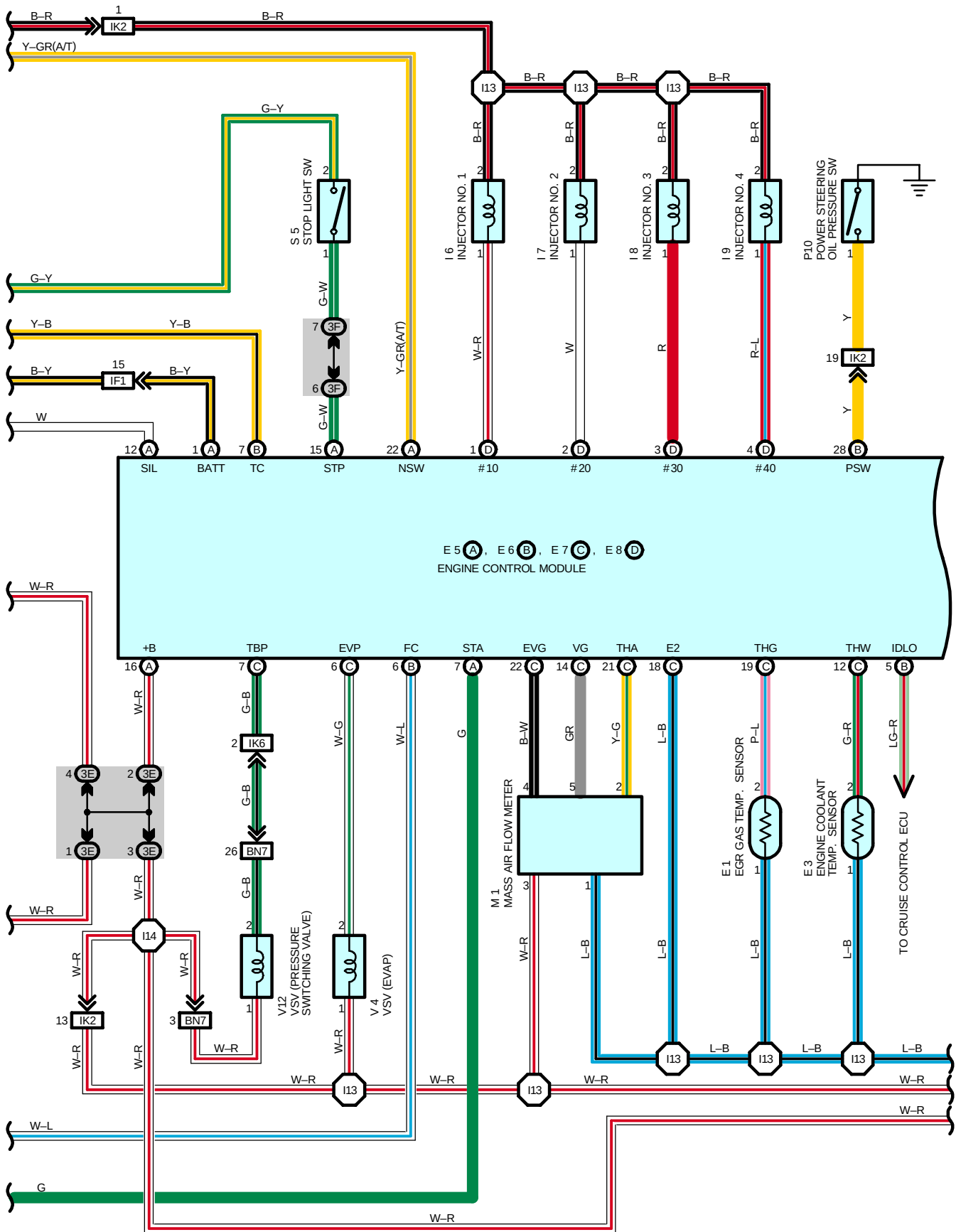
Code	See Page	Ground Points Location
EA	40 (5VZ-FE)	Front Left Fender
EB	40 (5VZ-FE)	Near the Throttle Body
ID	44	Left Kick Panel
IE	44	Around the Right Edge of the Reinforcement
IG	44	Around the Left Edge of the Reinforcement

 : SPLICE POINTS

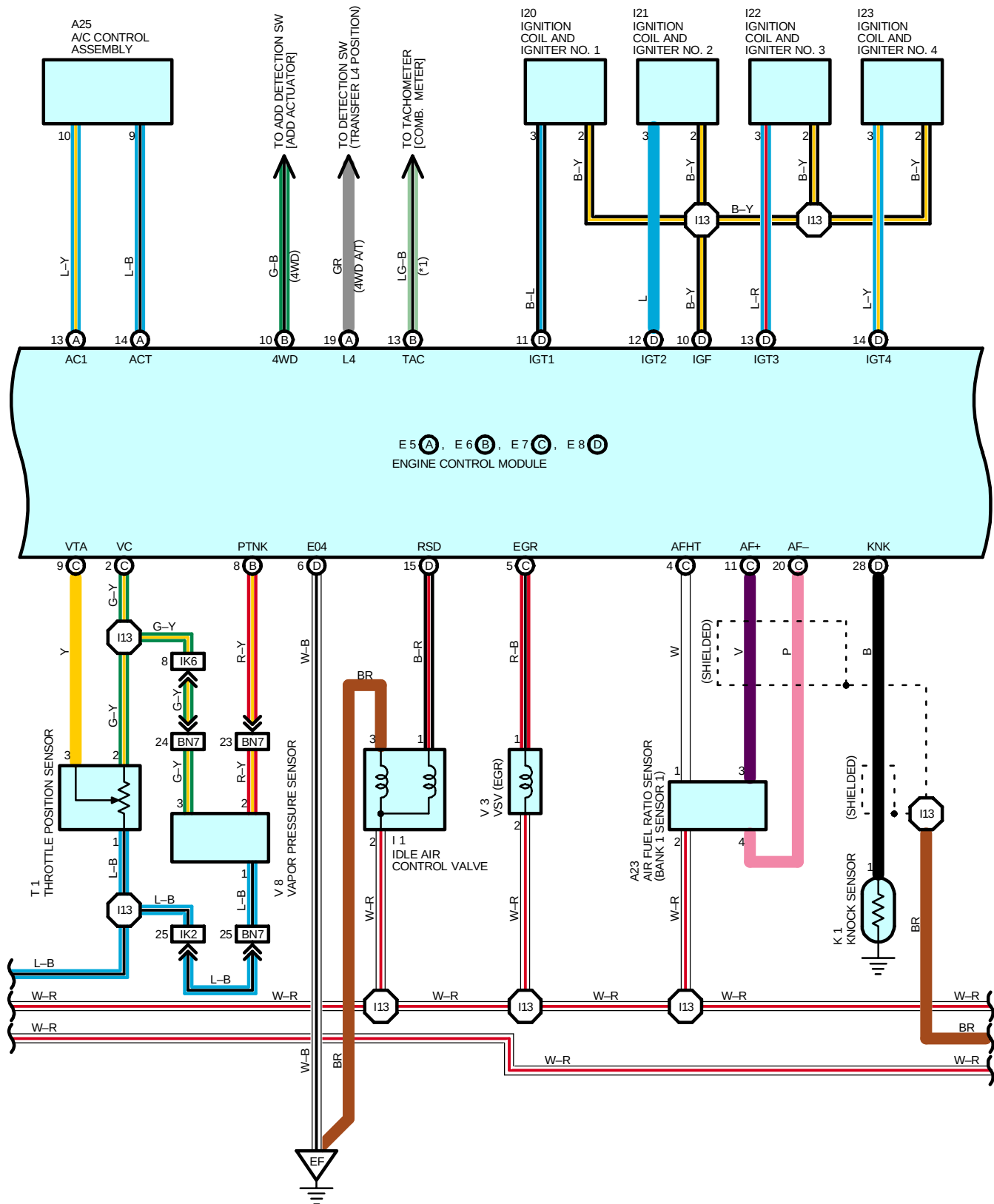
Code	See Page	Wire Harness with Splice Points	Code	See Page	Wire Harness with Splice Points
E1	40 (5VZ-FE)	Sensor Wire	I13	44	Engine Wire
E2	40 (5VZ-FE)	Engine Wire	I14	44	Cowl Wire
I3	44	Cowl Wire	I15		

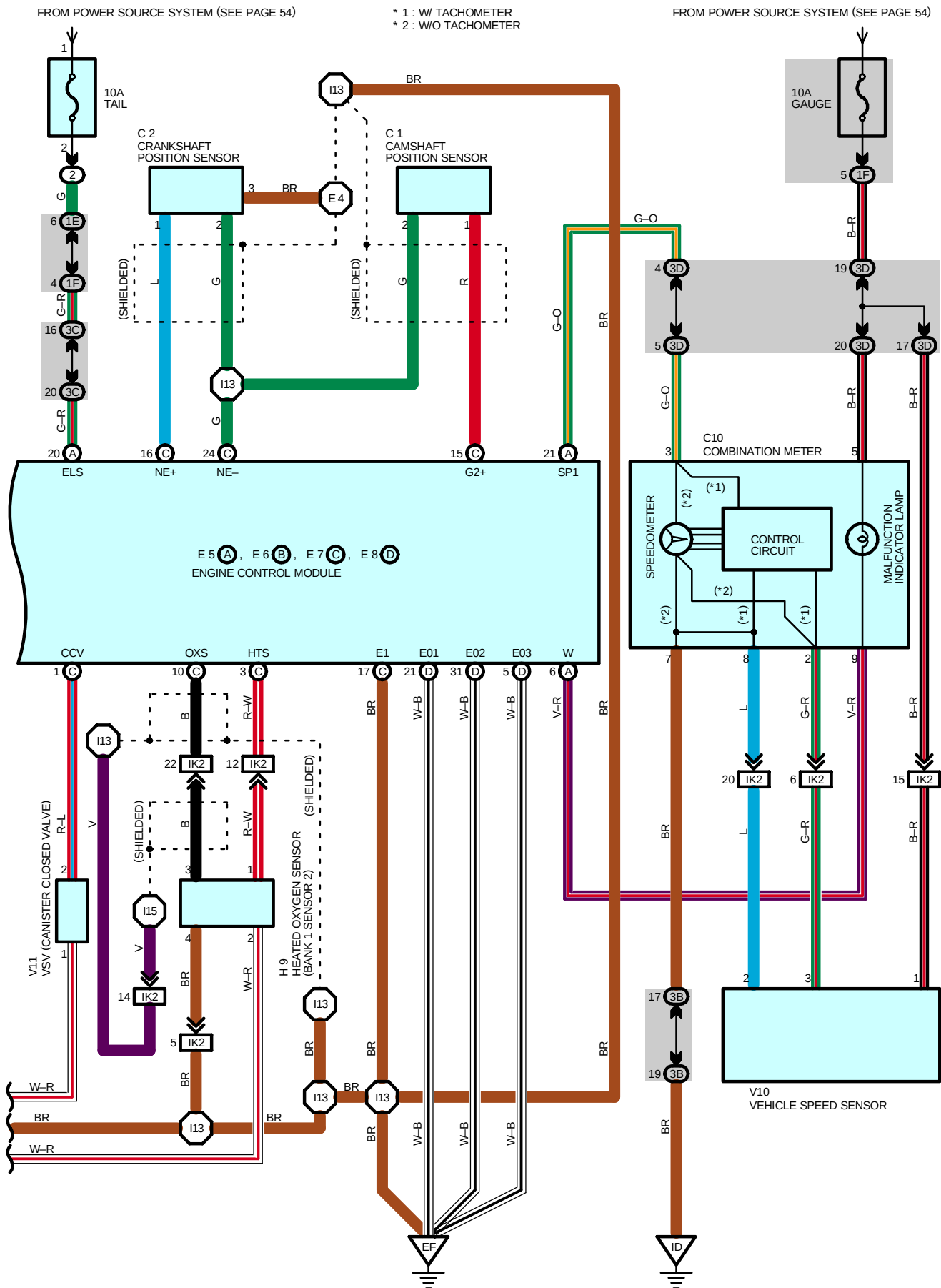
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ENGINE CONTROL (3RZ-FE)





SYSTEM OUTLINE

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

1. INPUT SIGNAL

(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 water temp. Thus the engine coolant temp. is input in the form of a control signal to TERMINAL THW of the engine control module.

(2) Intake air temp. signal system

The intake air temp. sensor is installed inside 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) Heated oxygen sensor signal system

The oxygen density in exhaust emissions is detected and input as a control signal to TERMINAL OXS of the engine control module. To maintain stable detection performance by the heated oxygen sensor, a heater is used for warming the sensor. The heater is also controlled by the engine control module (HTS).

(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 to TERMINAL NE+.

(5) Throttle signal system

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

(6) Vehicle speed signal system

The vehicle speed sensor detects the vehicle speed and inputs a control signal to TERMINAL SP1 of the engine control module via the combination meter.

(7) 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.

(8) 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.

(9) Intake air volume signal system

Intake air volume is detected by the mass air flow meter and a signal is input into TERMINAL VG of the engine control module as a control signal.

(10) Stop light SW signal system

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

(11) Starter 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) Engine knock signal system

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

(13) 4WD signal system

Whether or not the vehicle is operating in 4WD mode is determined, and a control signal is input to TERMINAL 4WD of the engine control module.

(14) Air fuel ratio signal system

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

2. CONTROL SYSTEM

* SFI system

The SFI system monitors the engine conditions through the signals (Input signals (1 to 13)) 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, causing the injectors to operate (to inject fuel). It is this system which, through the work of the engine control module, finely controls fuel injection in response to driving conditions.

* Electronic spark advance system

The ESA system monitors the engine conditions using the signals (input signals (1, 4, 5 to 7, 9, 11, 12)) 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 igniter to produce the most appropriate ignition timing for the driving conditions.

* Heated oxygen sensor heater control system

The heated oxygen sensor heater control system turns the heater to on when the intake air volume is low (Temp. of exhaust emissions low), and warms up the heated oxygen sensor to improve detection performance of the sensor. The engine control module evaluates the signals (Input signals (1, 4, 8, 9, 11)) from each sensor, current is output to TERMINAL HT1B and controls the heater.

3. DIAGNOSIS SYSTEM

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

4. FAIL-SAFE SYSTEM

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

ENGINE CONTROL (3RZ-FE)

SERVICE HINTS

EFI RELAY

5-3 : Closed with ignition SW at **ON** or **ST** position

C6 CIRCUIT OPENING RELAY

5-3 : Closed with starter running or ignition SW at **ON** or **ST** position

I6, I7, I8, I9 INJECTOR

1-2 : **13.4-14.2** Ω

T1 THROTTLE POSITION SENSOR

2-1 : **4-9** kΩ

E3 ENGINE COOLANT TEMP. SENSOR

1-2 : **10-20** kΩ (-20°C, -4°F)

4-7 kΩ (0°C, 32°F)

2-3 kΩ (20°C, 68°F)

0.9-1.3 kΩ (40°C, 104°F)

0.4-0.7 kΩ (60°C, 140°F)

0.2-0.4 kΩ (80°C, 176°F)

E5 (A), E6 (B), E7 (C), E8 (D) ENGINE CONTROL MODULE

Voltage at engine control module wiring connectors

+B-E1 : **9-14** volts (Ignition SW on)

BATT-E1 : **9-14** volts (Always)

VC-E2 : **4.5-5.5** volts (Ignition SW on)

VTA-E2 : **0.3-0.8** volts (Ignition SW on and throttle valve fully closed)

3.2-4.9 volts (Ignition SW on and throttle valve fully open)

STA-E1 : **6** volts or more (Ignition SW at **ST** position)

W-E1 : **9-14** volts (No trouble and engine running)

THA-E2 : **0.5-3.4** volts (Ignition SW on and intake air temp. **20°C, 68°F**)

THW-E2 : **0.2-1.0** volts (Ignition SW on and coolant temp. **80°C, 176°F**)

SP1-E1 : Pulse generation with vehicle moving

STP-E1 : **7.5-14** Volts (Stop light SW on)

RESISTANCE AT ECU WIRING CONNECTOR

(Disconnect wiring connector)

VTA-E2 : **3.3-10** kΩ (Throttle valve fully open)

0.2-0.8 kΩ (Throttle valve fully closed)

THA-E2 : **2-3** kΩ (Intake air temp. **20°C, 68°F**)

THW-E2 : **0.2-0.4** kΩ (Coolant temp. **80°C, 178°F**)

+B-E1 : **0.2-0.4** kΩ

NE+-E1 : **140-180** Ω

○ : PARTS LOCATION

Code	See Page	Code	See Page	Code	See Page
A23	32 (3RZ-FE)	F8	37 (Except Double Cab)	K1	33 (3RZ-FE)
A25	34	H9	35	M1	33 (3RZ-FE)
C1	32 (3RZ-FE)	I1	33 (3RZ-FE)	P1	33 (3RZ-FE)
C2	32 (3RZ-FE)	I6	33 (3RZ-FE)	P10	33 (3RZ-FE)
C6	34	I7	33 (3RZ-FE)	S5	35
C9	34	I8	33 (3RZ-FE)	T1	33 (3RZ-FE)
C10	34	I9	33 (3RZ-FE)	V3	33 (3RZ-FE)
D7	34	I14	35	V4	33 (3RZ-FE)
E1	32 (3RZ-FE)	I20	33 (3RZ-FE)	V8	36 (Double Cab)
E3	32 (3RZ-FE)	I21	33 (3RZ-FE)		37 (Except Double Cab)
E5	A 35	I22	33 (3RZ-FE)	V10	33 (3RZ-FE)
E6	B 35	I23	33 (3RZ-FE)	V11	33 (3RZ-FE)
E7	C 35	J9	A 33 (3RZ-FE)	V12	36 (Double Cab)
E8	D 35	J10	B 33 (3RZ-FE)		37 (Except Double Cab)
F8	36 (Double Cab)	J11	35		

 : RELAY BLOCKS

Code	See Page	Relay Blocks (Relay Block Location)
2	21	R/B No.2 (Engine Compartment Left)

 : JUNCTION BLOCK AND WIRE HARNESS CONNECTOR

Code	See Page	Junction Block and Wire Harness (Connector Location)
1E	23	Engine Room Main Wire and J/B No.1 (Lower Finish Panel)
1F	23	Cowl Wire and J/B No.1 (Lower Finish Panel)
1I	23	Engine Room Main Wire and J/B No.1 (Lower Finish Panel)
3A	24	Cowl Wire and J/B No.3 (Behind the Instrument Panel Left)
3B		
3C		
3D		
3E		
3F		

 : CONNECTOR JOINING WIRE HARNESS AND WIRE HARNESS

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IF1	44	Engine Room Main Wire and Cowl Wire (Left Kick Panel)
IK2	44	Engine Wire and Cowl Wire (Above the Glove Box)
IK3		
IK6		
BN7	46 (Double Cab) 48 (Except Double Cab)	Frame Wire and Cowl Wire (Under the Driver's Seat)

 : GROUND POINTS

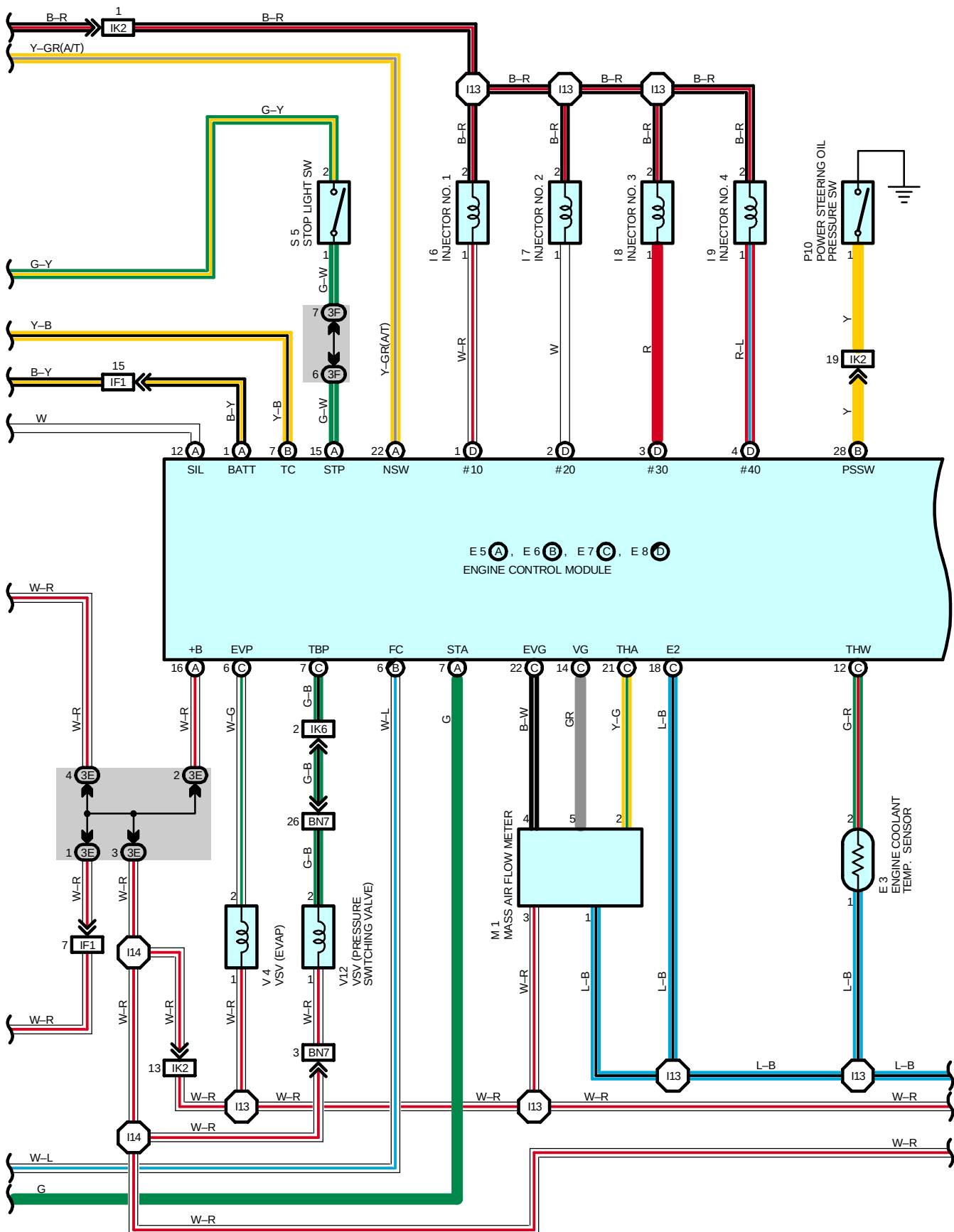
Code	See Page	Ground Points Location
EA	42 (3RZ-FE)	Front Left Fender
EF	42 (3RZ-FE)	Ignition Coil Bracket
ID	44	Left Kick Panel
IE	44	Around the Right Edge of the Reinforcement
IG	44	Around the Left Edge of the Reinforcement

 : SPLICE POINTS

Code	See Page	Wire Harness with Splice Points	Code	See Page	Wire Harness with Splice Points
E4	42 (3RZ-FE)	Engine Wire	I14	44	Cowl Wire
I3	44	Cowl Wire	I15		
I13	44	Engine Wire			

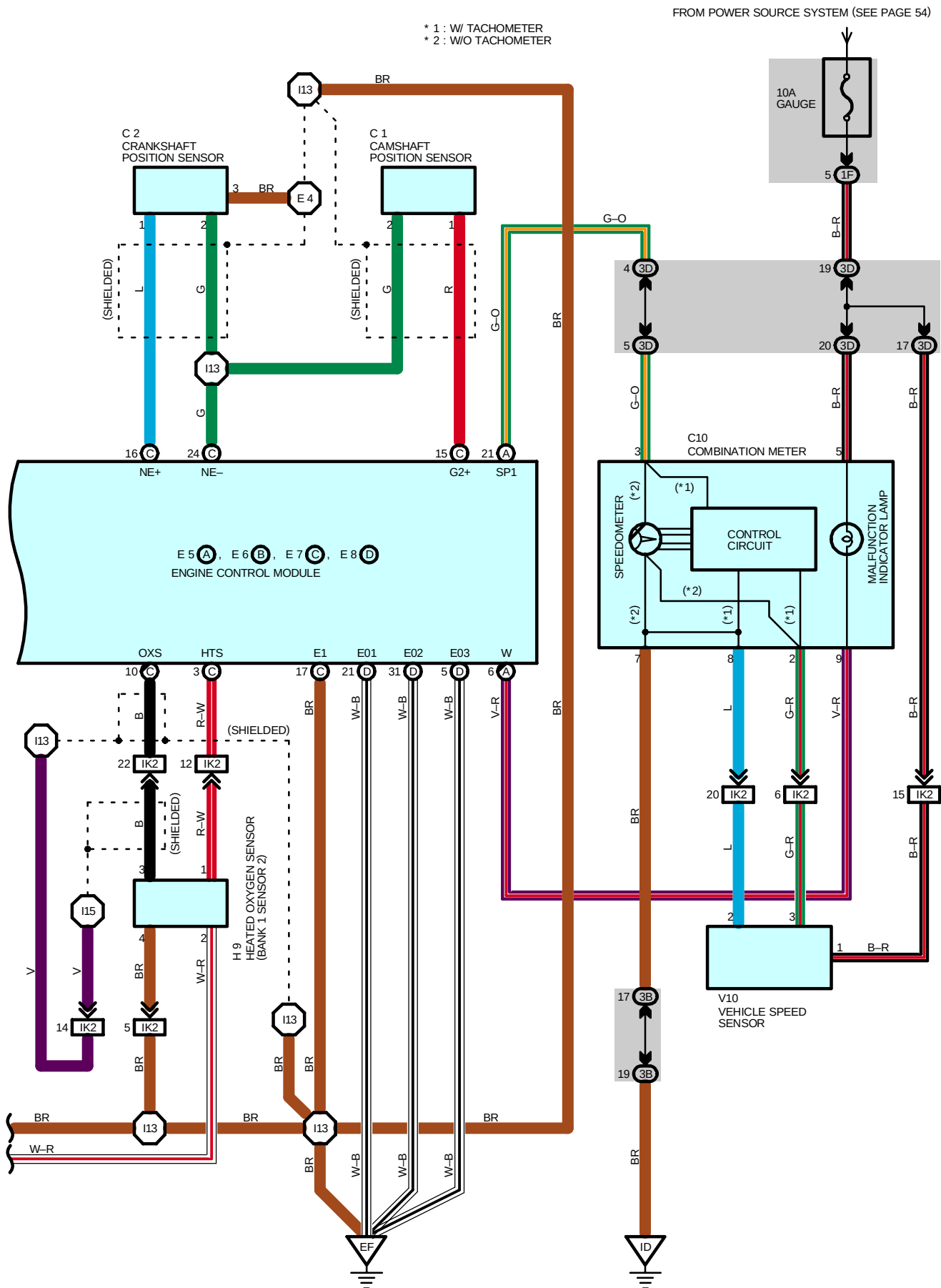
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SYSTEM OUTLINE

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

1. INPUT SIGNAL

(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 water temp. Thus the engine coolant temp. is input in the form of a control signal to TERMINAL THW of the engine control module.

(2) Intake air temp. signal system

The intake air temp. sensor is installed inside 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) Heated oxygen sensor signal system

The oxygen density in the exhaust emissions is detected and input as a control signal to TERMINAL OXS of the engine control module. To maintain stable detection performance by the heated oxygen sensor, a heater is used for warming the sensor. The heater is also controlled by the engine control module (HTS).

(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 to TERMINAL NE-.

(5) Throttle signal system

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

(6) Vehicle speed signal system

The vehicle speed sensor detects the vehicle speed and inputs a control signal to TERMINAL SP1 of the engine control module via the combination meter.

(7) 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.

(8) 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.

(9) Intake air volume signal system

Intake air volume is detected by the mass air flow meter and a signal is input into TERMINAL VG of the engine control module as a control signal.

(10) Stop light SW signal system

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

(11) Starter 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) Engine knock signal system

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

(13) Air fuel ratio signal system

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

2. CONTROL SYSTEM

* SFI system

The SFI system monitors the engine conditions through the signals (Input signals (1 to 12)) 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, causing the injectors to operate (to inject fuel). It is this system which, through the work of the engine control module, finely controls fuel injection in response to driving conditions.

* Electronic spark advance system

The ESA system monitors the engine conditions using the signals (input signals (1, 4, 5 to 7, 9, 11, 12)) 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 igniter to produce the most appropriate ignition timing for the driving conditions.

* Heated oxygen sensor heater control system

The heated oxygen sensor heater control system turns the heater to on when the intake air volume is low (Temp. of exhaust emissions low), and warms up the heated oxygen sensor to improve detection performance of the sensor. The engine control module evaluates the signals (Input signals (1, 4, 8, 9, 11)) from each sensor, current is output to TERMINAL HT1B and controls the heater.

3. DIAGNOSIS SYSTEM

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

4. FAIL-SAFE SYSTEM

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

ENGINE CONTROL (2RZ-FE)

SERVICE HINTS

EFI RELAY

5-3 : Closed with ignition SW at **ON** or **ST** position

C6 CIRCUIT OPENING RELAY

5-3 : Closed with starter running or ignition SW at **ON** or **ST** position

I6, I7, I8, I9 INJECTOR

1-2 : **13.4-14.2** Ω

T1 THROTTLE POSITION SENSOR

2-1 : **4-9** kΩ

E3 ENGINE COOLANT TEMP. SENSOR

1-2 : **10-20** kΩ (**-20°C, -4°F**)

4-7 kΩ (**0°C, 32°F**)

2-3 kΩ (**20°C, 68°F**)

0.9-1.3 kΩ (**40°C, 104°F**)

0.4-0.7 kΩ (**60°C, 140°F**)

0.2-0.4 kΩ (**80°C, 176°F**)

E5 (A), E6 (B), E7 (C), E8 (D) ENGINE CONTROL MODULE

Voltage at engine control module wiring connectors

+B-E1 : **9-14** volts (Ignition SW on)

BATT-E1 : **9-14** volts (Always)

VC-E2 : **4.5-5.5** volts (Ignition SW on)

VTA-E2 : **0.3-0.8** volts (Ignition SW on and throttle valve fully closed)

3.2-4.9 volts (Ignition SW on and throttle valve fully open)

STA-E1 : **6** volts or more (Ignition SW at **ST** position)

W-E1 : **9-14** volts (No trouble and engine running)

THA-E2 : **0.5-3.4** volts (Ignition SW on and intake air temp. **20°C, 68°F**)

THW-E2 : **0.2-1.0** volts (Ignition SW on and coolant temp. **80°C, 176°F**)

SP1-E1 : Plus generation with vehicle moving

STP-E1 : **7.5-14** volts (Stop light SW on)

IGT1, IGT2-E1 : Plus generator (Cranking or idling)

#10, #20, #30, #40-E1 : **9-14** volts (Ignition SW on)

RESISTANCE AT ECU WIRING CONNECTOR

(Disconnect wiring connector)

VTA-E2 : **3.3-10** kΩ (Throttle valve fully open)

0.2-0.8 kΩ (Throttle valve fully closed)

THA-E2 : **2-3** kΩ (Intake air temp. **20°C, 68°F**)

THW-E2 : **0.2-0.4** kΩ (Coolant temp. **80°C, 178°F**)

+B-E1 : **0.2-0.4** kΩ

NE+-E1 : **140-180** Ω

○ : PARTS LOCATION

Code	See Page	Code	See Page	Code	See Page
A23	32 (2RZ-FE)	F8	37 (Except Double Cab)	J10	B 33 (2RZ-FE)
A25	34	H9	35	J11	35
C1	32 (2RZ-FE)	I1	33 (2RZ-FE)	K1	33 (2RZ-FE)
C2	32 (2RZ-FE)	I6	33 (2RZ-FE)	M1	33 (2RZ-FE)
C6	34	I7	33 (2RZ-FE)	P1	33 (2RZ-FE)
C9	34	I8	33 (2RZ-FE)	P10	33 (2RZ-FE)
C10	34	I9	33 (2RZ-FE)	S5	35
D7	34	I14	35	T1	33 (2RZ-FE)
E3	32 (2RZ-FE)	I20	33 (2RZ-FE)	V4	33 (2RZ-FE)
E5	A 35	I21	33 (2RZ-FE)	V8	37 (Except Double Cab)
E6	B 35	I22	33 (2RZ-FE)	V10	33 (2RZ-FE)
E7	C 35	I23	33 (2RZ-FE)	V11	33 (2RZ-FE)
E8	D 35	J9	A 33 (2RZ-FE)	V12	37 (Except Double Cab)

 : RELAY BLOCKS

Code	See Page	Relay Blocks (Relay Block Location)
2	21	R/B No.2 (Engine Compartment Left)

 : JUNCTION BLOCK AND WIRE HARNESS CONNECTOR

Code	See Page	Junction Block and Wire Harness (Connector Location)
1E	23	Engine Room Main Wire and J/B No.1 (Lower Finish Panel)
1F	23	Cowl Wire and J/B No.1 (Lower Finish Panel)
1I	23	Engine Room Main Wire and J/B No.1 (Lower Finish Panel)
3A	24	Cowl Wire and J/B No.3 (Behind the Instrument Panel Left)
3B		
3C		
3D		
3E		
3F		

 : CONNECTOR JOINING WIRE HARNESS AND WIRE HARNESS

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IF1	44	Engine Room Main Wire and Cowl Wire (Left Kick Panel)
IK2	44	Engine Wire and Cowl Wire (Above the Glove Box)
IK3		
IK6		
BN7	48 (Except Double Cab)	Frame Wire and Cowl Wire (Under the Driver's Seat)

 : GROUND POINTS

Code	See Page	Ground Points Location
EA	42 (2RZ-FE)	Front Left Fender
EF	42 (2RZ-FE)	Ignition Coil Bracket
ID	44	Left Kick Panel
IE	44	Around the Right Edge of the Reinforcement
IG	44	Around the Left Edge of the Reinforcement

 : SPLICE POINTS

Code	See Page	Wire Harness with Splice Points	Code	See Page	Wire Harness with Splice Points
E4	42 (2RZ-FE)	Engine Wire	I14	44	Cowl Wire
I3	44	Cowl Wire	I15		
I13	44	Engine Wire			

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SERVICE HINTS

HEAD RELAY

2-1 : Closed with light control SW at **HEAD** position or dimmer SW at **FLASH** position

○ : PARTS LOCATION

Code	See Page	Code		See Page	Code		See Page
C12	34	H2		30 (5VZ–FE)	J10	B	31 (5VZ–FE)
C14	34			32 (3RZ–FE, 2RZ–FE)			33 (3RZ–FE, 2RZ–FE)
H1	30 (5VZ–FE)	J9	A	31 (5VZ–FE)			
	32 (3RZ–FE, 2RZ–FE)			33 (3RZ–FE, 2RZ–FE)			

○ : RELAY BLOCKS

Code	See Page	Relay Blocks (Relay Block Location)
2	21	R/B No.2 (Engine Compartment Left)

○ : JUNCTION BLOCK AND WIRE HARNESS CONNECTOR

Code	See Page	Junction Block and Wire Harness (Connector Location)
1C	23	Cowl Wire and J/B No.1 (Lower Finish Panel)
1J		
1K	23	Engine Room Main Wire and J/B No.1 (Lower Finish Panel)
1L	22	Cowl Wire and J/B No.1 (Lower Finish Panel)
3A	24	Cowl Wire and J/B No.3 (Behind the Instrument Panel Left)
3F		

□ : CONNECTOR JOINING WIRE HARNESS AND WIRE HARNESS

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IF1	44	Engine Room Main Wire and Cowl Wire (Left Kick Panel)

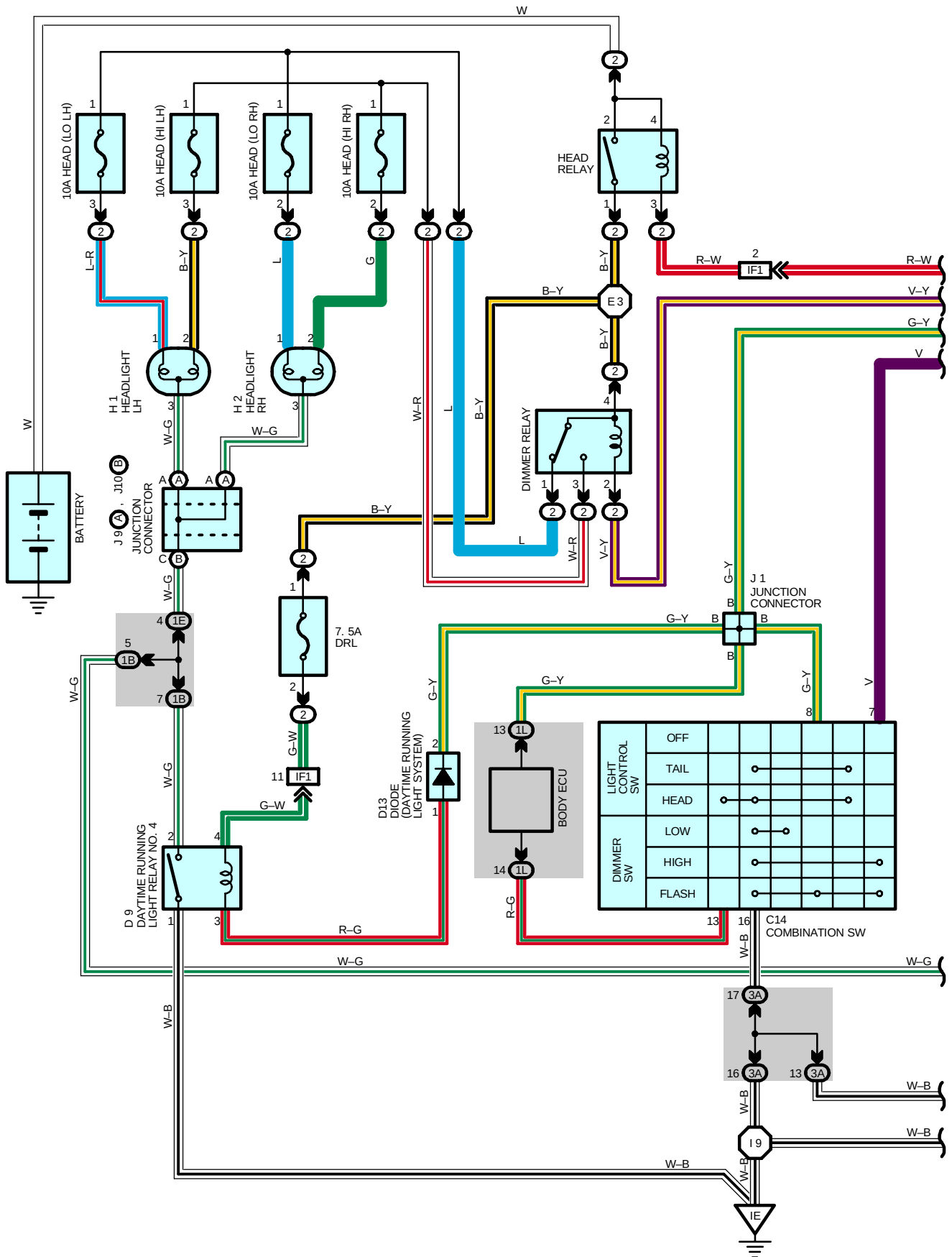
▽ : GROUND POINTS

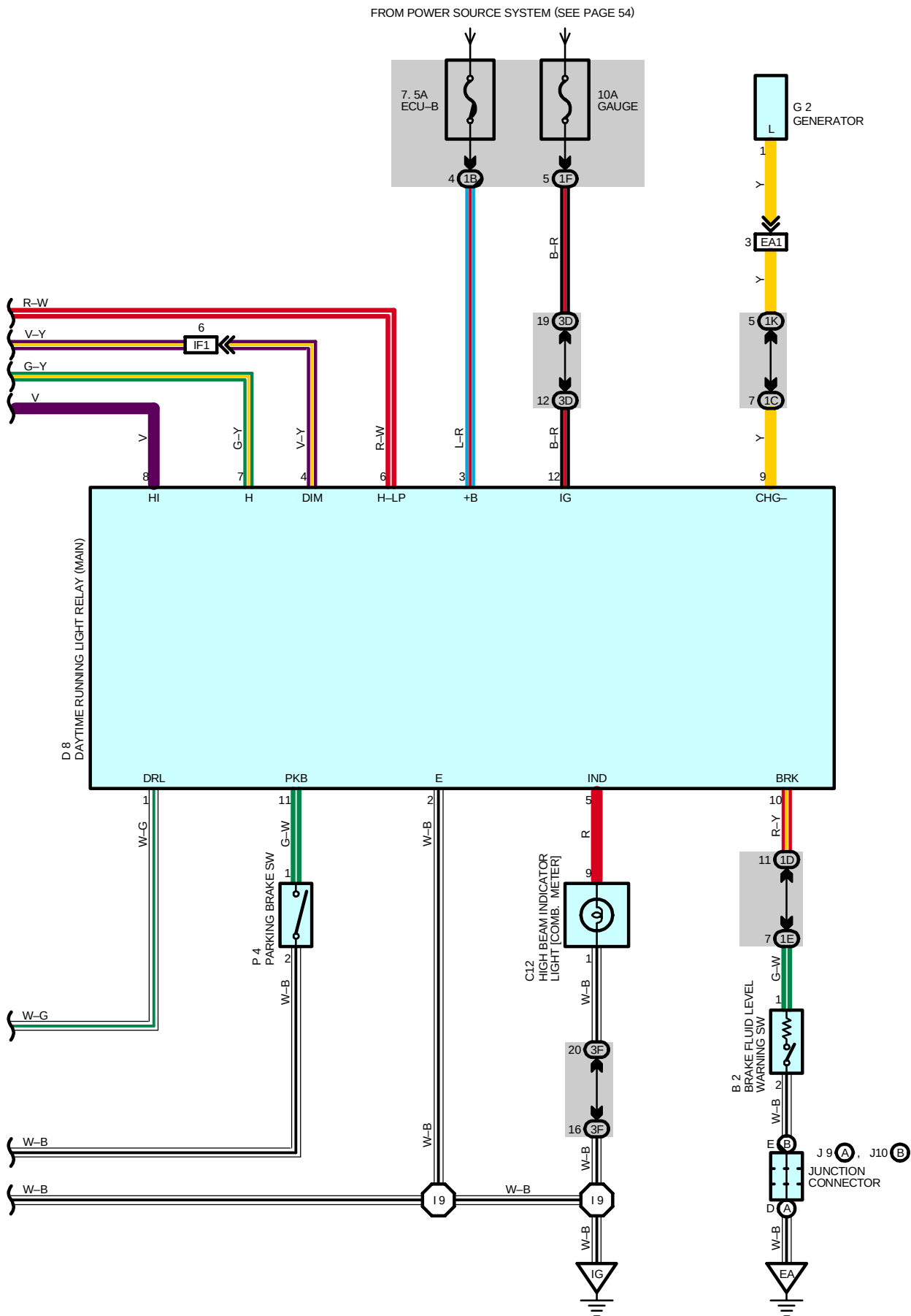
Code	See Page	Ground Points Location
IE	44	Around the Right Edge of the Reinforcement
IG	44	Around the Left Edge of the Reinforcement

○ : SPLICE POINTS

Code	See Page	Wire Harness with Splice Points	Code	See Page	Wire Harness with Splice Points
I9	44	Cowl Wire			

HEADLIGHT (w/ DAYTIME RUNNING LIGHT)





HEADLIGHT (w/ DAYTIME RUNNING LIGHT)

SYSTEM OUTLINE

1. DAYTIME RUNNING LIGHT OPERATION

When the engine is started, voltage generated at TERMINAL L of the generator is applied to TERMINAL 9 of the daytime running light relay (Main).

If the parking brake lever is pulled up (The parking brake SW on) at this time, the relay is not activated, so the daytime running light system does not operate. If the parking brake lever is then released (The parking brake SW off), a signal is input to TERMINAL 11 of the relay. This activates the relay, so current flows from battery to the HEAD relay (Point side) to TERMINAL 4 of the DIMMER relay to TERMINAL 1 to HEAD (LO LH), (LO RH) fuse to TERMINAL 1 of the headlights to TERMINAL 3 to TERMINAL 1 of the daytime running light relay (Main) to TERMINAL 2 to GROUND. This causes headlights to light up (Headlights light up dimmer than full brightness.).

Once the daytime running light system operates and headlights light up, headlights remain on even if the parking brake lever is pulled up (The parking brake SW on).

If the engine stalls and the ignition SW remains on, headlights remain lighted up even through current is no longer output from TERMINAL L of the generator. If the ignition SW is then turned off, the headlights go off. If the engine is started with the parking brake lever released (The parking brake SW off), the daytime running light system operates and headlights light up when the engine starts.

2. HEADLIGHT OPERATION

When the light control SW is switched to HEAD position, current flows from the DRL fuse to TERMINAL 4 of the daytime running light relay No.4 to TERMINAL 3 to TERMINAL 1 of the diode to TERMINAL 2 to body ECU to TERMINAL 13 of the light control SW to TERMINAL 16 to GROUND, activating the daytime running light relay No.4. Current then flows from the HEAD (LO LH), (LO RH) fuse to TERMINAL 1 of the headlights to TERMINAL 3 to TERMINAL 2 of the daytime running light relay No.4 to TERMINAL 1 to GROUND, causing headlights to light up at normal intensity.

When the dimmer SW is switched to HIGH position, the signal from the dimmer SW is input to the daytime running light relay (Main). This activates the relay and current flows from TERMINAL 4 of the DIMMER relay to TERMINAL 2 to TERMINAL 4 of the daytime running light relay (Main), activating the DIMMER relay.

This causes current to flow from TERMINAL 4 of the DIMMER relay to TERMINAL 3 to HEAD (HI LH), (HI RH) fuse to TERMINAL 2 of the headlights to TERMINAL 3 to TERMINAL 2 of the daytime running light relay No.4 to TERMINAL 1 to GROUND, causing headlights to light up at high beam.

When the dimmer SW is switched to FLASH position, the daytime running light relay (Main) is activated and current flows from TERMINAL 4 of the DIMMER relay to TERMINAL 2. Current from the DRL fuse flows TERMINAL 4 of the daytime running light relay No.4 to TERMINAL 3 to TERMINAL 1 of the diode to TERMINAL 2 to TERMINAL 8 of the dimmer SW to TERMINAL 16 to GROUND, and also flows from the HEAD (HI LH), (HI RH) fuse to TERMINAL 2 of the headlights to TERMINAL 3 to TERMINAL 2 of the daytime running light relay No.4 to TERMINAL 1 to GROUND, causing the high beam to operate.

SERVICE HINTS

HEAD RELAY

2-1 : Closed with light control SW at **HEAD** position or dimmer SW at **FLASH** position
Closed with engine running and parking brake lever released

DIMMER RELAY

4-3 : Closed with HEAD relay on and dimmer SW at **HIGH** or **FLASH** position

○ : PARTS LOCATION

Code	See Page	Code	See Page	Code		See Page
B2	30 (5VZ–FE)	G2	30 (5VZ–FE)	J9	A	31 (5VZ–FE)
	32 (3RZ–FE, 2RZ–FE)		32 (3RZ–FE, 2RZ–FE)			33 (3RZ–FE, 2RZ–FE)
C12	34	H1	30 (5VZ–FE)	J10	B	31 (5VZ–FE)
C14	34		32 (3RZ–FE, 2RZ–FE)			33 (3RZ–FE, 2RZ–FE)
D8	34	H2	30 (5VZ–FE)	P4		35
D9	34		32 (3RZ–FE, 2RZ–FE)			
D13	34	J1	35			

○ : RELAY BLOCKS

Code	See Page	Relay Blocks (Relay Block Location)
2	21	R/B No.2 (Engine Compartment Left)

 : JUNCTION BLOCK AND WIRE HARNESS CONNECTOR

Code	See Page	Junction Block and Wire Harness (Connector Location)
1B	23	Cowl Wire and J/B No.1 (Lower Finish Panel)
1C		
1D		
1E	23	Engine Room Main Wire and J/B No.1 (Lower Finish Panel)
1F	23	Cowl Wire and J/B No.1 (Lower Finish Panel)
1K	23	Engine Room Main Wire and J/B No.1 (Lower Finish Panel)
1L	22	Cowl Wire and J/B No.1 (Lower Finish Panel)
3A	24	Cowl Wire and J/B No.3 (Behind the Instrument Panel Left)
3D		
3F		

 : CONNECTOR JOINING WIRE HARNESS AND WIRE HARNESS

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
EA1	40 (5VZ-FE)	Engine Room Main Wire and Engine No.2 Wire (Near the Battery)
	42 (3RZ-FE, 2RZ-FE)	
IF1	44	Engine Room Main Wire and Cowl Wire (Left Kick Panel)

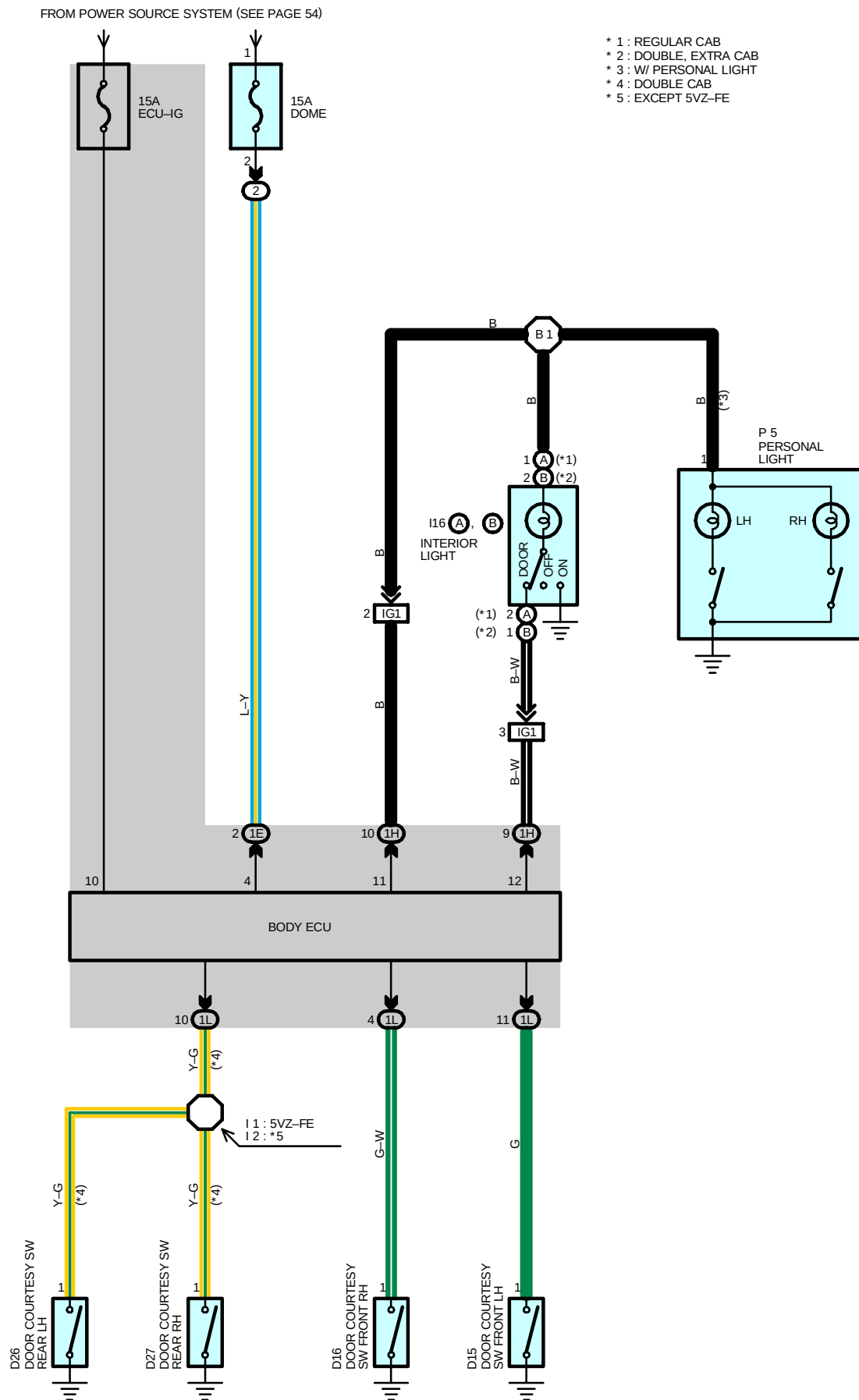
 : GROUND POINTS

Code	See Page	Ground Points Location
EA	40 (5VZ-FE)	Front Left Fender
	42 (3RZ-FE, 2RZ-FE)	
IE	44	Around the Right Edge of the Reinforcement
IG	44	Around the Left Edge of the Reinforcement

 : SPLICE POINTS

Code	See Page	Wire Harness with Splice Points	Code	See Page	Wire Harness with Splice Points
E3	40 (5VZ-FE)	Engine Room Main Wire	I9	44	Cowl Wire
	42 (3RZ-FE, 2RZ-FE)				

INTERIOR LIGHT



SERVICE HINTS**D15, D16, D26, D27 DOOR COURTESY SW FRONT REAR LH, RH**

1-GROUND : Closed with door open

 : PARTS LOCATION

Code	See Page	Code	See Page	Code	See Page
D15	34	D27	36 (Double Cab)	I16	B 37 (Except Double Cab)
D16	34	I16	A 37 (Except Double Cab)	P5	36 (Double Cab)
D26	36 (Double Cab)		B 36 (Double Cab)		37 (Except Double Cab)

 : RELAY BLOCKS

Code	See Page	Relay Blocks (Relay Block Location)
2	21	R/B No.2 (Engine Compartment Left)

 : JUNCTION BLOCK AND WIRE HARNESS CONNECTOR

Code	See Page	Junction Block and Wire Harness (Connector Location)
1E	23	Engine Room Main Wire and J/B No.1 (Lower Finish Panel)
1H	23	Cowl Wire and J/B No.1 (Lower Finish Panel)
1L	22	

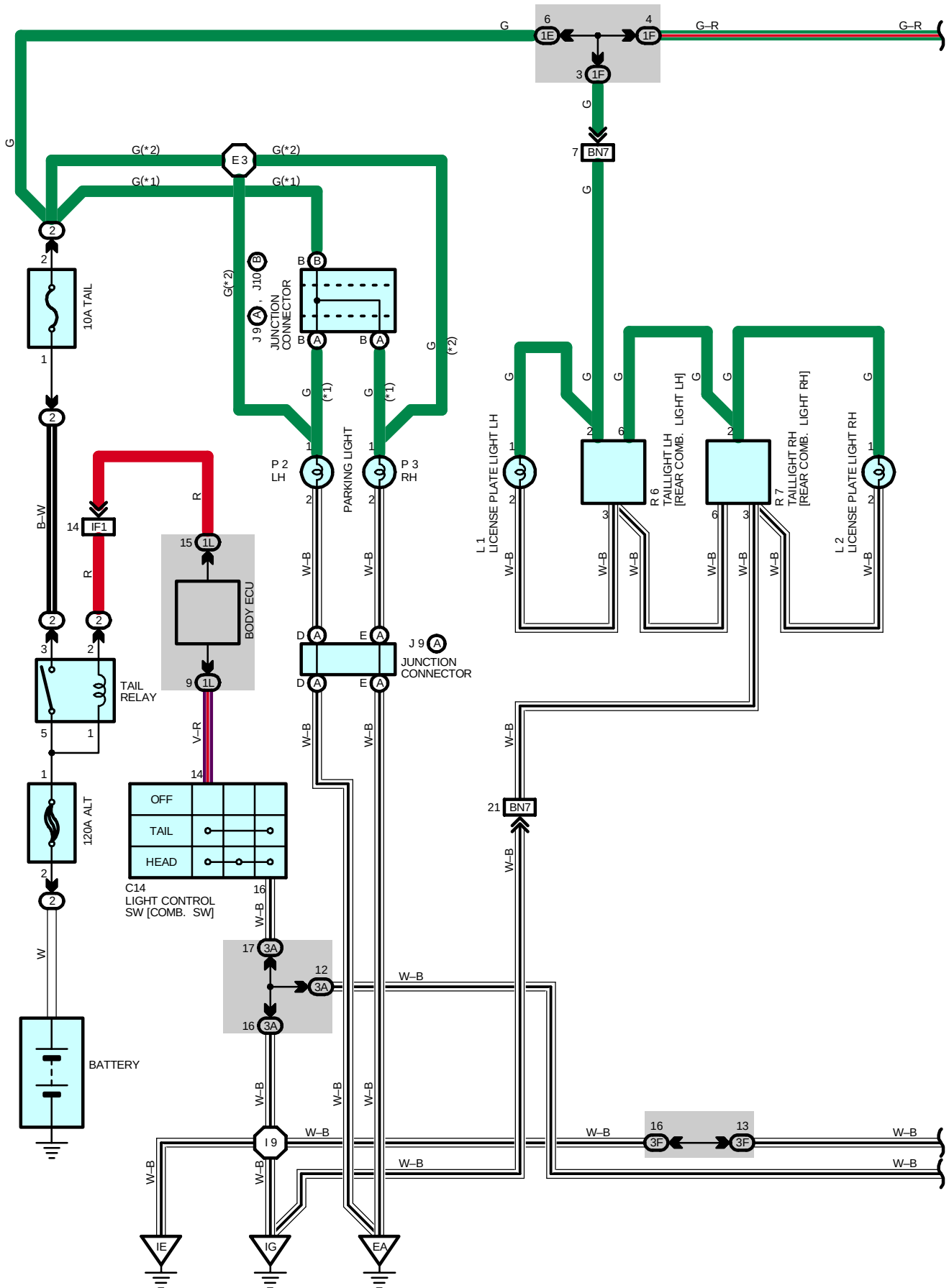
 : CONNECTOR JOINING WIRE HARNESS AND WIRE HARNESS

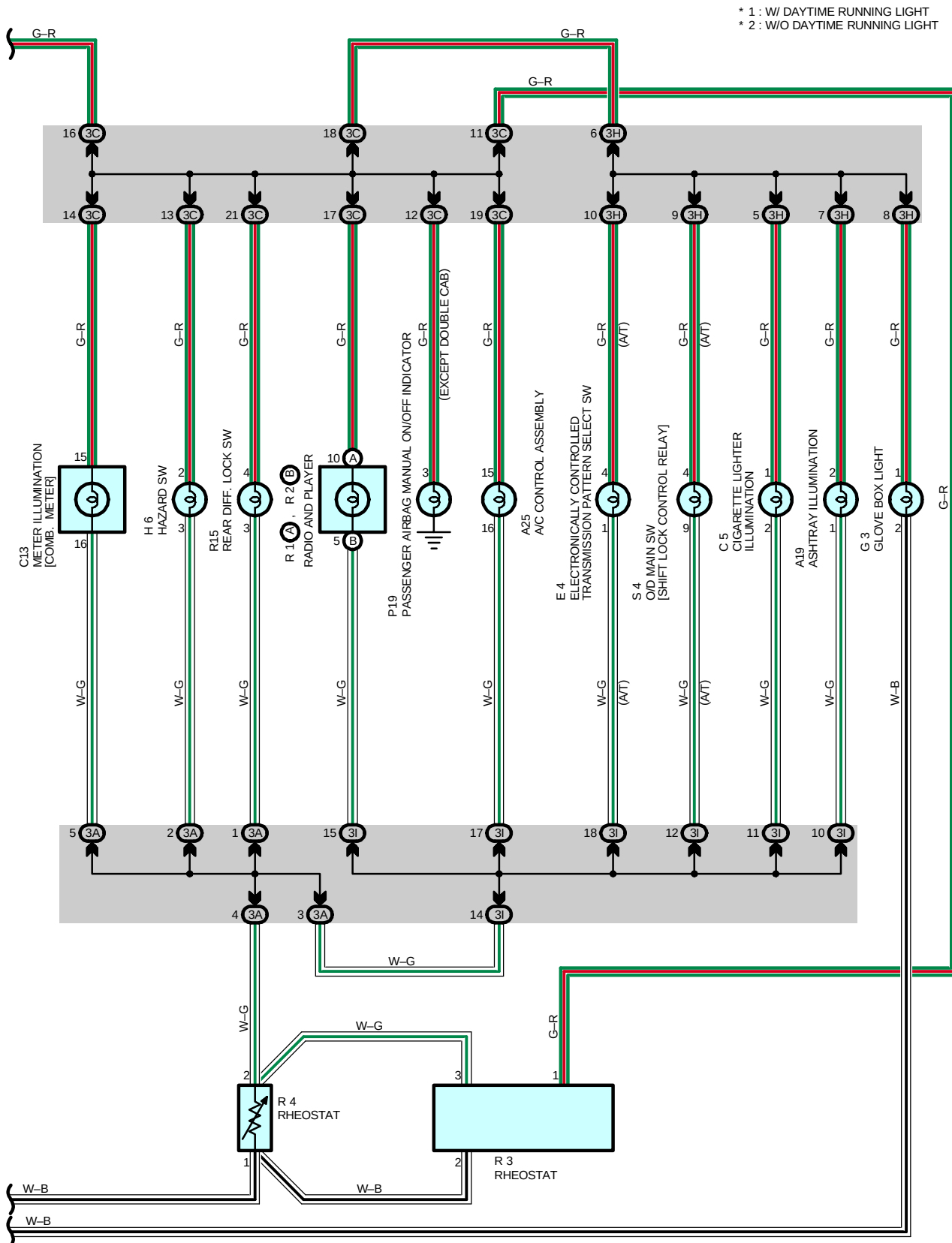
Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IG1	44	Cowl Wire and Roof Wire (Left Kick Panel)

 : SPLICE POINTS

Code	See Page	Wire Harness with Splice Points	Code	See Page	Wire Harness with Splice Points
I1	44	Cowl Wire	B1	46 (Double Cab)	Roof Wire
I2				48 (Except Double Cab)	

TAILLIGHT AND ILLUMINATION





TAILLIGHT AND ILLUMINATION

SERVICE HINTS

C14 LIGHT CONTROL SW [COMB. SW]

14–16 : Closed with light control SW at **TAIL** or **HEAD** position

TAIL RELAY

3–5 : Closed with light control SW at **TAIL** or **HEAD** position

○ : PARTS LOCATION

Code		See Page		Code		See Page		Code		See Page	
A19		34		J10	B	33 (3RZ–FE, 2RZ–FE)		R2	B	35	
A25		34		L1		36 (Double Cab)		R3		35	
C5		34				37 (Except Double Cab)		R4		35	
C13		34		L2		36 (Double Cab)		R6		36 (Double Cab)	
C14		34				37 (Except Double Cab)				37 (Except Double Cab)	
E4		35		P2		31 (5VZ–FE)		R7		36 (Double Cab)	
G3		35				33 (3RZ–FE, 2RZ–FE)				37 (Except Double Cab)	
H6		35		P3		31 (5VZ–FE)		R15		35	
J9		A				33 (3RZ–FE, 2RZ–FE)		S4		35	
				P19		35					
J10	B	31 (5VZ–FE)		R1	A	35					

○ : RELAY BLOCKS

Code	See Page	Relay Blocks (Relay Block Location)
2	21	R/B No.2 (Engine Compartment Left)

○ : JUNCTION BLOCK AND WIRE HARNESS CONNECTOR

Code	See Page	Junction Block and Wire Harness (Connector Location)
1E	23	Engine Room Main Wire and J/B No.1 (Lower Finish Panel)
1F	23	Cowl Wire and J/B No.1 (Lower Finish Panel)
1L	22	
3A	24	Cowl Wire and J/B No.3 (Behind the Instrument Panel Left)
3C		
3F		
3H	26	Cowl Wire and J/B No.3 (Behind the Instrument Panel Center)
3I		

□ : CONNECTOR JOINING WIRE HARNESS AND WIRE HARNESS

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IF1	44	Engine Room Main Wire and Cowl Wire (Left Kick Panel)
BN7	46 (Double Cab)	Frame Wire and Cowl Wire (Under the Driver's Seat)
	48 (Except Double Cab)	

▽ : GROUND POINTS

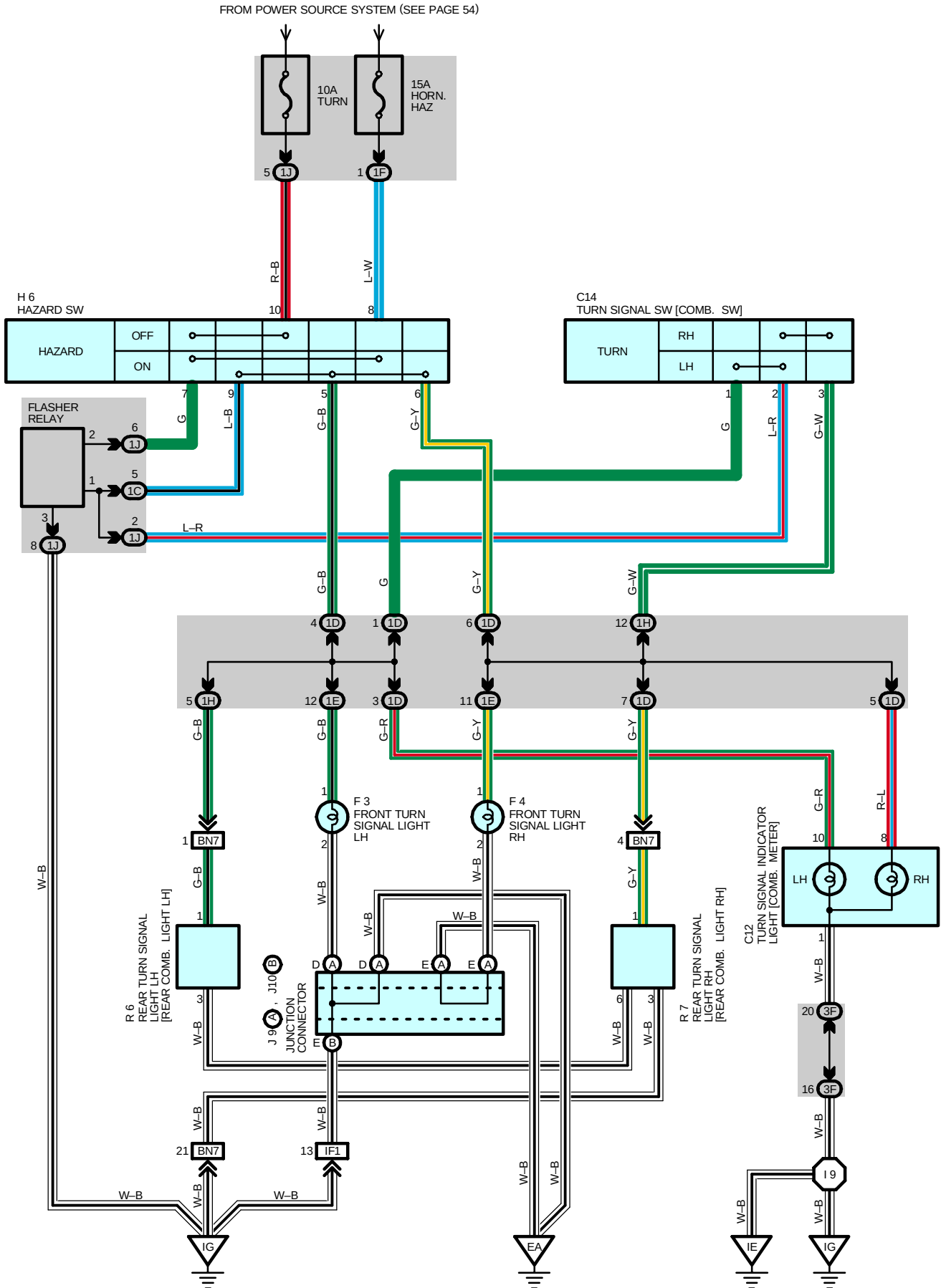
Code	See Page	Ground Points Location
EA	40 (5VZ–FE)	Front Left Fender
	42 (3RZ–FE, 2RZ–FE)	
IE	44	Around the Right Edge of the Reinforcement
IG	44	Around the Left Edge of the Reinforcement

○ : SPLICE POINTS

Code	See Page	Wire Harness with Splice Points	Code	See Page	Wire Harness with Splice Points
E3	40 (5VZ–FE)	Engine Room Main Wire	I9	44	Cowl Wire
	42 (3RZ–FE, 2RZ–FE)				

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TURN SIGNAL AND HAZARD WARNING LIGHT



SERVICE HINTS

FLASHER RELAY

2-GROUND : Approx. **12** volts with ignition SW on or hazard SW on

1-GROUND : Changes from **12** to **0** volts with ignition SW on and turn signal SW left or right, or with hazard SW on

○ : PARTS LOCATION

Code	See Page	Code	See Page	Code	See Page
C12	34	F4	32 (3RZ-FE, 2RZ-FE)	J10	B
C14	34	H6	35		
F3	30 (5VZ-FE)	J9	A	R6	36 (Double Cab)
	32 (3RZ-FE, 2RZ-FE)				37 (Except Double Cab)
F4	30 (5VZ-FE)	J10	B	R7	36 (Double Cab)
					37 (Except Double Cab)

○ : JUNCTION BLOCK AND WIRE HARNESS CONNECTOR

Code	See Page	Junction Block and Wire Harness (Connector Location)
1C	23	Cowl Wire and J/B No.1 (Lower Finish Panel)
1D		
1E	23	Engine Room Main Wire and J/B No.1 (Lower Finish Panel)
1F	23	Cowl Wire and J/B No.1 (Lower Finish Panel)
1H		
1J		
3F	24	Cowl Wire and J/B No.3 (Behind the Instrument Panel Left)

□ : CONNECTOR JOINING WIRE HARNESS AND WIRE HARNESS

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IF1	44	Engine Room Main Wire and Cowl Wire (Left Kick Panel)
BN7	46 (Double Cab) 48 (Except Double Cab)	Frame Wire and Cowl Wire (Under the Driver's Seat)

▽ : GROUND POINTS

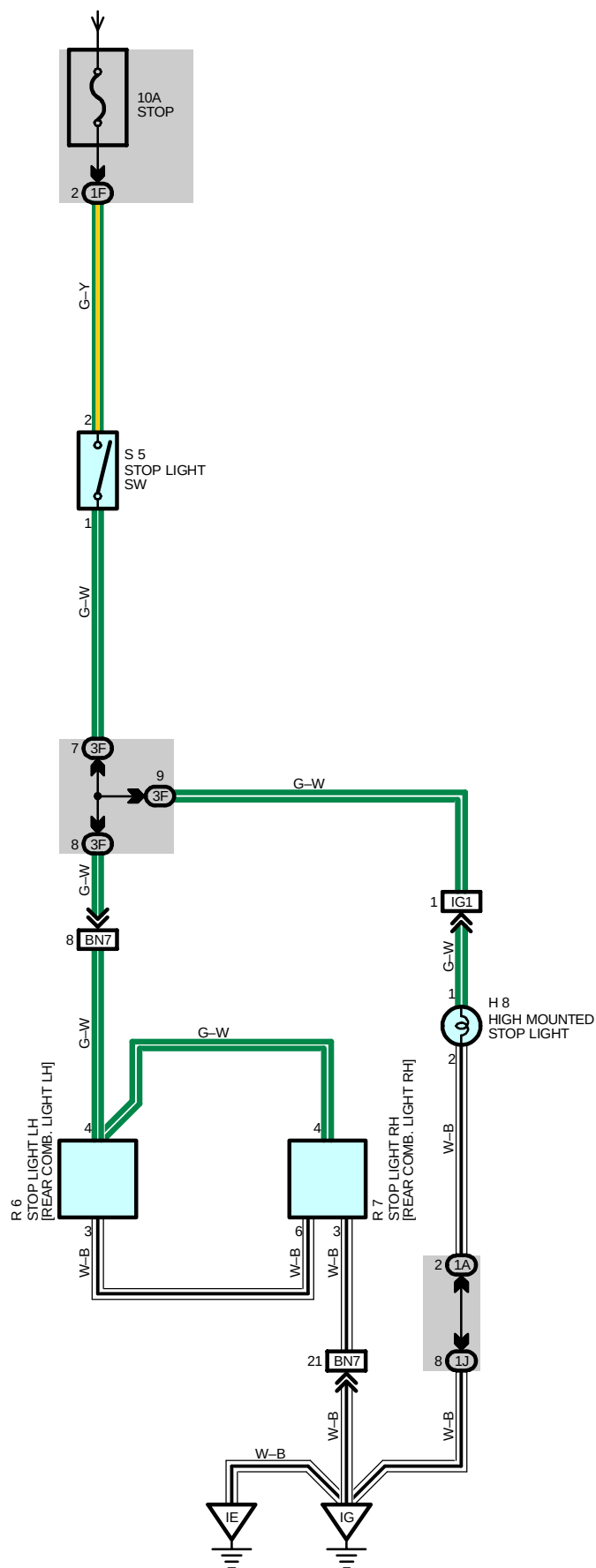
Code	See Page	Ground Points Location
EA	40 (5VZ-FE) 42 (3RZ-FE, 2RZ-FE)	Front Left Fender
IE	44	Around the Right Edge of the Reinforcement
IG	44	Around the Left Edge of the Reinforcement

○ : SPLICE POINTS

Code	See Page	Wire Harness with Splice Points	Code	See Page	Wire Harness with Splice Points
I9	44	Cowl Wire			

STOP LIGHT

FROM POWER SOURCE SYSTEM (SEE PAGE 54)



SERVICE HINTS**S5 STOP LIGHT SW**

2-1 : Closed with brake pedal depressed

 : PARTS LOCATION

Code	See Page	Code	See Page	Code	See Page
H8	36 (Double Cab)	R6	37 (Except Double Cab)	S5	35
	37 (Except Double Cab)	R7	36 (Double Cab)		
R6	36 (Double Cab)		37 (Except Double Cab)		

 : JUNCTION BLOCK AND WIRE HARNESS CONNECTOR

Code	See Page	Junction Block and Wire Harness (Connector Location)
1A	23	Roof Wire and J/B No.1 (Lower Finish Panel)
1F	23	Cowl Wire and J/B No.1 (Lower Finish Panel)
1J		
3F	24	Cowl Wire and J/B No.3 (Behind the Instrument Panel Left)

 : CONNECTOR JOINING WIRE HARNESS AND WIRE HARNESS

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IG1	44	Cowl Wire and Roof Wire (Left Kick Panel)
BN7	46 (Double Cab)	Frame Wire and Cowl Wire (Under the Driver's Seat)
	48 (Except Double Cab)	

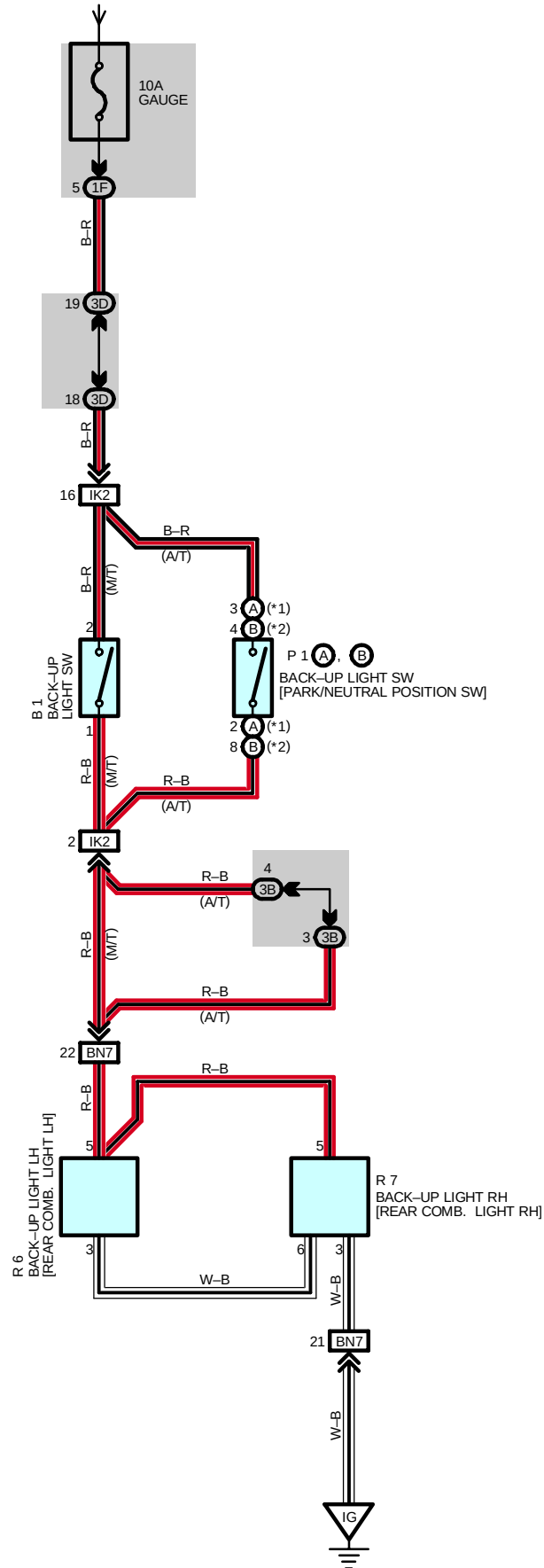
 : GROUND POINTS

Code	See Page	Ground Points Location
IE	44	Around the Right Edge of the Reinforcement
IG	44	Around the Left Edge of the Reinforcement

BACK-UP LIGHT

FROM POWER SOURCE SYSTEM (SEE PAGE 54)

* 1 : A/T EXCEPT 2RZ-FE
* 2 : 2RZ-FE A/T



SERVICE HINTS

P1 (A), (B) BACK-UP LIGHT SW [PARK/NEUTRAL POSITION SW] (A/T)

(A) 3–(A) 2, (B) 4–(B) 8 : Closed with shift lever in **R** position

B1 BACK-UP LIGHT SW (M/T)

2–1 : Closed with shift lever in **R** position

○ : PARTS LOCATION

Code	See Page	Code	See Page	Code	See Page
B1	30 (5VZ–FE)	P1	A 33 (3RZ–FE)	R6	37 (Except Double Cab)
	32 (3RZ–FE, 2RZ–FE)		B 33 (2RZ–FE)	R7	36 (Double Cab)
P1	A 31 (5VZ–FE)	R6	36 (Double Cab)		37 (Except Double Cab)

○ : JUNCTION BLOCK AND WIRE HARNESS CONNECTOR

Code	See Page	Junction Block and Wire Harness (Connector Location)
1F	23	Cowl Wire and J/B No.1 (Lower Finish Panel)
3B	24	Cowl Wire and J/B No.3 (Behind the Instrument Panel Left)
3D		

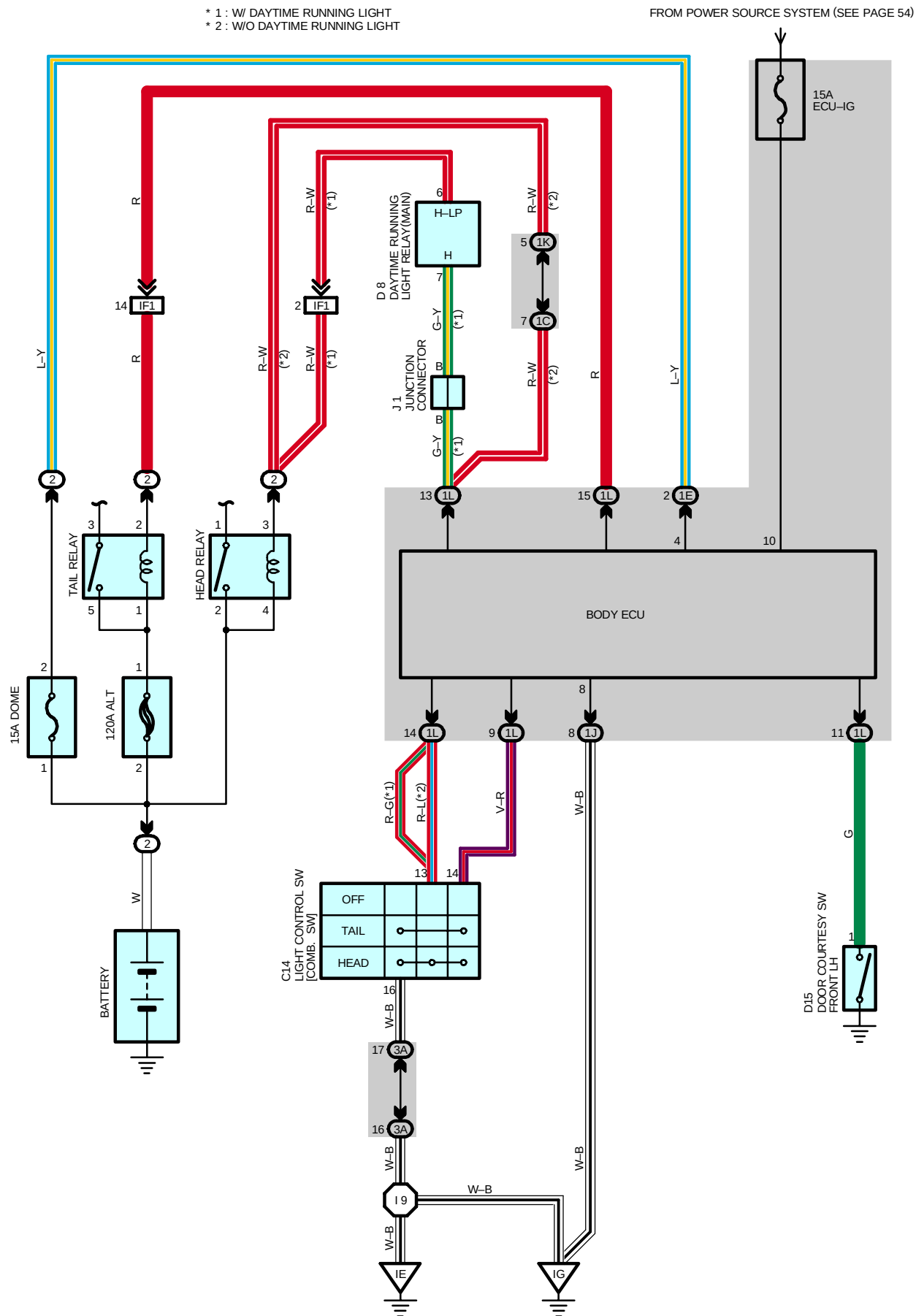
□ : CONNECTOR JOINING WIRE HARNESS AND WIRE HARNESS

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IK2	44	Engine Wire and Cowl Wire (Above the Glove Box)
BN7	46 (Double Cab)	Frame Wire and Cowl Wire (Under the Driver's Seat)
	48 (Except Double Cab)	

▽ : GROUND POINTS

Code	See Page	Ground Points Location
IG	44	Around the Left Edge of the Reinforcement

LIGHT AUTO TURN OFF



SYSTEM OUTLINE

The light auto turn off system automatically turns the taillight or headlight off according to the door open or close on the driver's side, and prevent failing to turn off the lights.

If the ignition switch is turned to OFF from ON with the headlight or taillight is on, the signal is input in the body ECU. If the driver's seat door is opened at that time, the signal from the door courtesy SW front LH is sent to the body ECU. The signal turns the headlight or taillight off by the body ECU.

SERVICE HINTS

BODY ECU

10-GROUND : Approx. **12** volts with ignition SW at **ON** or **ST** position

4-GROUND : Always approx. **12** volts

8-GROUND : Always continuity

: PARTS LOCATION

Code	See Page	Code	See Page	Code	See Page
C14	34	D15	34		
D8	34	J1	35		

: RELAY BLOCKS

Code	See Page	Relay Blocks (Relay Block Location)
2	21	R/B No.2 (Engine Compartment Left)

: JUNCTION BLOCK AND WIRE HARNESS CONNECTOR

Code	See Page	Junction Block and Wire Harness (Connector Location)
1C	23	Cowl Wire and J/B No.1 (Lower Finish Panel)
1E	23	Engine Room Main Wire and J/B No.1 (Lower Finish Panel)
1J	23	Cowl Wire and J/B No.1 (Lower Finish Panel)
1K	23	Engine Room Main Wire and J/B No.1 (Lower Finish Panel)
1L	22	Cowl Wire and J/B No.1 (Lower Finish Panel)
3A	24	Cowl Wire and J/B No.3 (Behind the Instrument Panel Left)

: CONNECTOR JOINING WIRE HARNESS AND WIRE HARNESS

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IF1	44	Engine Room Main Wire and Cowl Wire (Left Kick Panel)

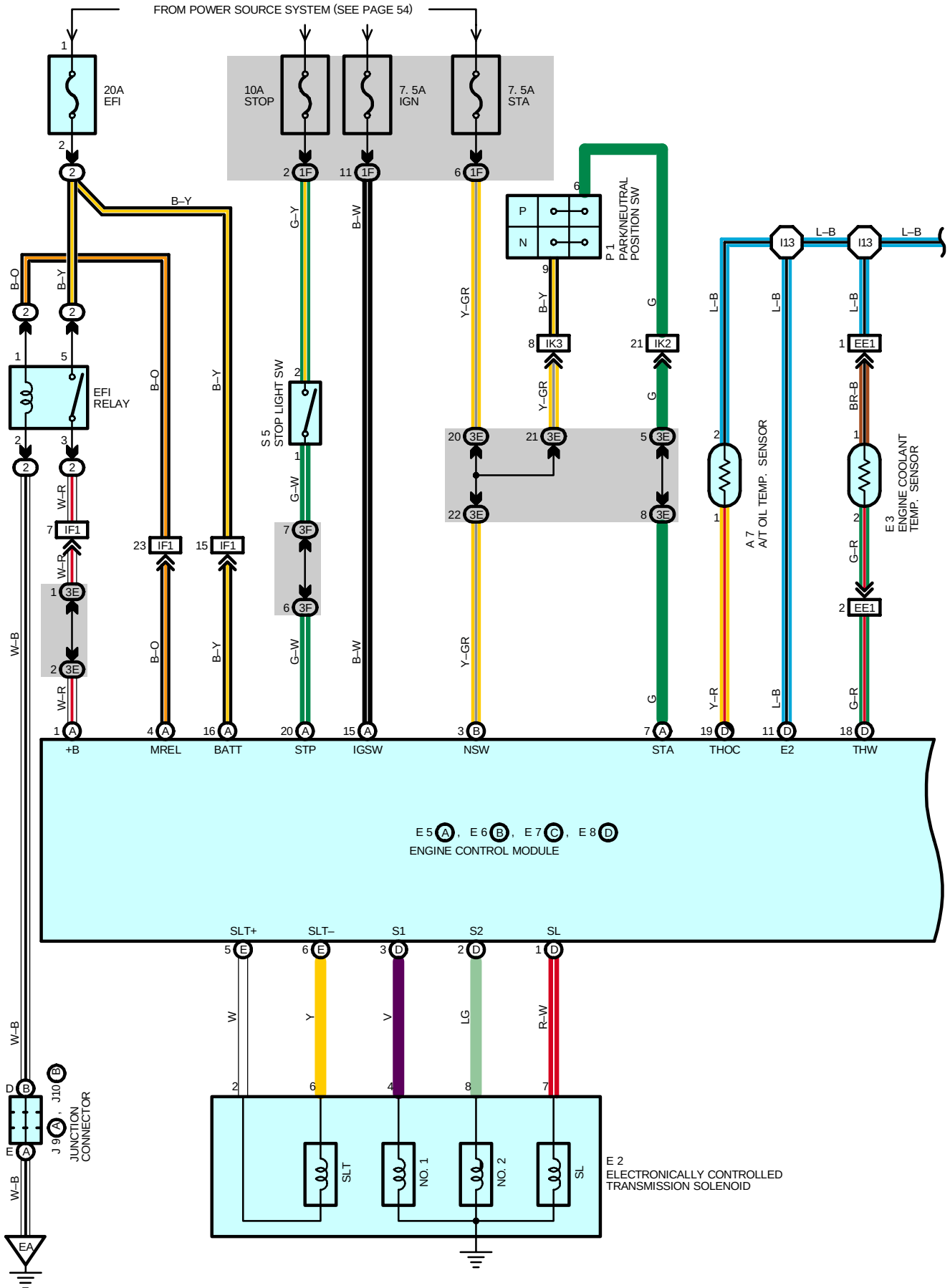
: GROUND POINTS

Code	See Page	Ground Points Location
IE	44	Around the Right Edge of the Reinforcement
IG	44	Around the Left Edge of the Reinforcement

: SPLICE POINTS

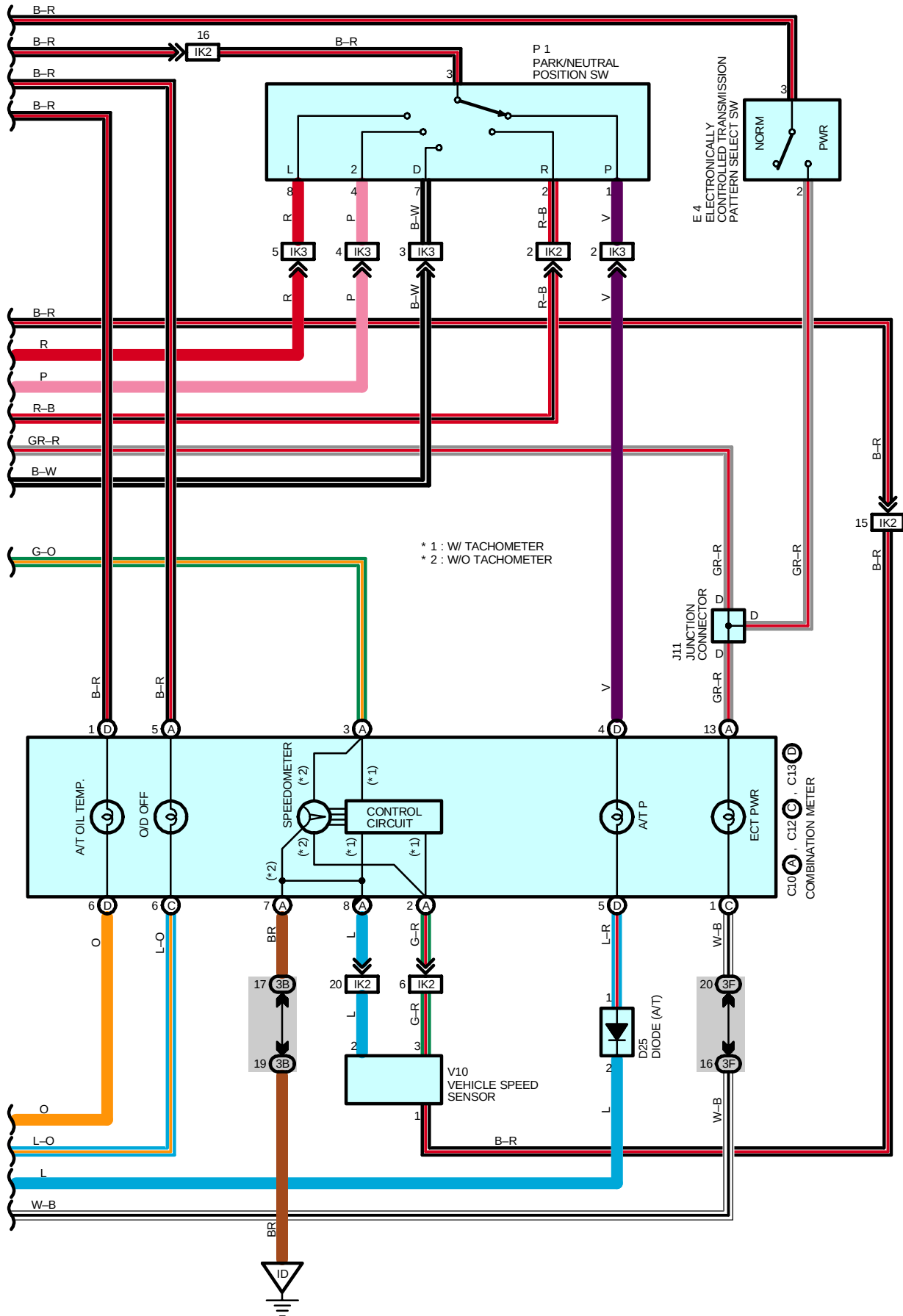
Code	See Page	Wire Harness with Splice Points	Code	See Page	Wire Harness with Splice Points
I9	44	Cowl Wire			

ELECTRONICALLY CONTROLLED TRANSMISSION (5VZ-FE)



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ELECTRONICALLY CONTROLLED TRANSMISSION (5VZ-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 governor pressure and lock-up sensor through the solenoid valve. Control of the solenoid valve by the engine control module based on the input signals from each sensor makes smooth driving possible by shift selection for each gear which 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 SP2+ 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, current flows from TERMINAL S1 of the engine control module to TERMINAL 1 of the electronically controlled transmission solenoid to GROUND, and continuity to the No.1 solenoid causes the shift.

For 2nd speed, current flows from TERMINAL S1 of the engine control module to TERMINAL 1 of the electronically controlled transmission solenoid to GROUND, and from TERMINAL S2 of the engine control module to TERMINAL 2 of the electronically controlled transmission solenoid to GROUND. And continuity to solenoid No.1 and No.2 causes the shift.

For 3rd speed, there is no continuity to No.1 solenoid, only to No.2 causing the shift. Shifting into 4th speed (Overdrive) takes place when there is no continuity to either No.1 or No.2 solenoid.

2. LOCK-UP OPERATION

When the engine control module judges from each signal that lock-up operation conditions have been met, current flows from TERMINAL SL of the engine control module to TERMINAL 3 of the electronically controlled transmission solenoid to GROUND, causing continuity to the lock-up solenoid and causing lock-up operation.

3. STOP LIGHT SW CIRCUIT

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

4. OVERDRIVE CIRCUIT

* O/D main SW on

When the O/D main SW is turned on, a signal is input to TERMINAL ODMS of the engine control module and engine control module operation causes gear shift when the conditions for overdrive are met.

* O/D main SW off

When the O/D main SW is turned off, a signal is input into TERMINAL ODMS of the engine control module, and turns on the O/D off indicator light. This activates the ECU, and the transmission system is controlled not to shift to overdrive.

5. A/T OIL TEMP. WARNING

When the A/T oil temp. sensor affixed to the transmission case detects that the fluid temp. is 150°C (302°F) or more, the engine control module operates and the current flowing through the GAUGE fuse flows to the A/T oil temp. warning light to TERMINAL OILW of the engine control module to GROUND, so that the warning light lights up, informing that the oil temp. is high. When the oil temp. drops to 120°C (248°F) or less, the engine control module stops operating and the warning light goes out.

ELECTRONICALLY CONTROLLED TRANSMISSION (5VZ-FE)

SERVICE HINTS

E2 ELECTRONICALLY CONTROLLED TRANSMISSION SOLENOID

1, 2, 3-GROUND : Approx. **13 Ω**

P1 PARK/NEUTRAL POSITION SW

3-GROUND : Approx. **12** volts with ignition SW ON position

S5 STOP LIGHT SW

1-2 : Closed with brake pedal depressed

E5 (A), E6 (B), E7 (C), E8 (D) ENGINE CONTROL MODULE

S1-E1 : **9-14** volts

S2,SL-E1 : **0-1.5** volts

STP-E1 : **7.5-14** volts with brake pedal depressed

: **0-1.5** volts with brake pedal released

THW-E2 : **0.2-1.0** volts with coolant temp. **80°C (176°F)**

THOC-E2 : **4-5** volts with fluid temp. **20°C (68°F)**

VTA-E2 : **0.3-0.8** volts with throttle valve fully closed

: **3.2-4.9** volts with throttle valve fully open

VC-E2 : **4.5-5.5** volts

SP1-E1 : Pulse generation with vehicle moving

2-E1 : **10-14** volts with shift lever at **2** position

: **0-2** volts with shift lever at except **2** position

L-E1 : **10-14** volts with shift lever at **L** position

: **0-2** volts with shift lever at except **L** position

OILW-E1 : **0.1-4.9** volts

+B-E1 : **9-14** volts

BATT-E1 : **9-14** volts

○ : PARTS LOCATION

Code	See Page	Code	See Page	Code	See Page
A7	30 (5VZ-FE)	E4	35	J13	35
C10	A 34	E5	A 35	P1	31 (5VZ-FE)
C12	C 34	E6	B 35	S4	35
C13	D 34	E7	C 35	S5	35
D7	34	E8	D 35	T1	31 (5VZ-FE)
D25	34	J9	A 31 (5VZ-FE)	V1	31 (5VZ-FE)
E2	30 (5VZ-FE)	J10	B 31 (5VZ-FE)	V10	31 (5VZ-FE)
E3	30 (5VZ-FE)	J11	35		

○ : RELAY BLOCKS

Code	See Page	Relay Blocks (Relay Block Location)
2	21	R/B No.2 (Engine Compartment Left)

○ : JUNCTION BLOCK AND WIRE HARNESS CONNECTOR

Code	See Page	Junction Block and Wire Harness (Connector Location)
1F	23	Cowl Wire and J/B No.1 (Lower Finish Panel)
3B	24	Cowl Wire and J/B No.3 (Behind the Instrument Panel Left)
3D		
3E		
3F		
3G	26	Cowl Wire and J/B No.3 (Behind the Instrument Panel Center)

□ : CONNECTOR JOINING WIRE HARNESS AND WIRE HARNESS

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
EE1	40 (5VZ-FE)	Engine Wire and Sensor Wire (Over the Cylinder Head)
IF1	44	Engine Room Main Wire and Cowl Wire (Left Kick Panel)
IK2	44	Engine Wire and Cowl Wire (Above the Glove Box)
IK3		

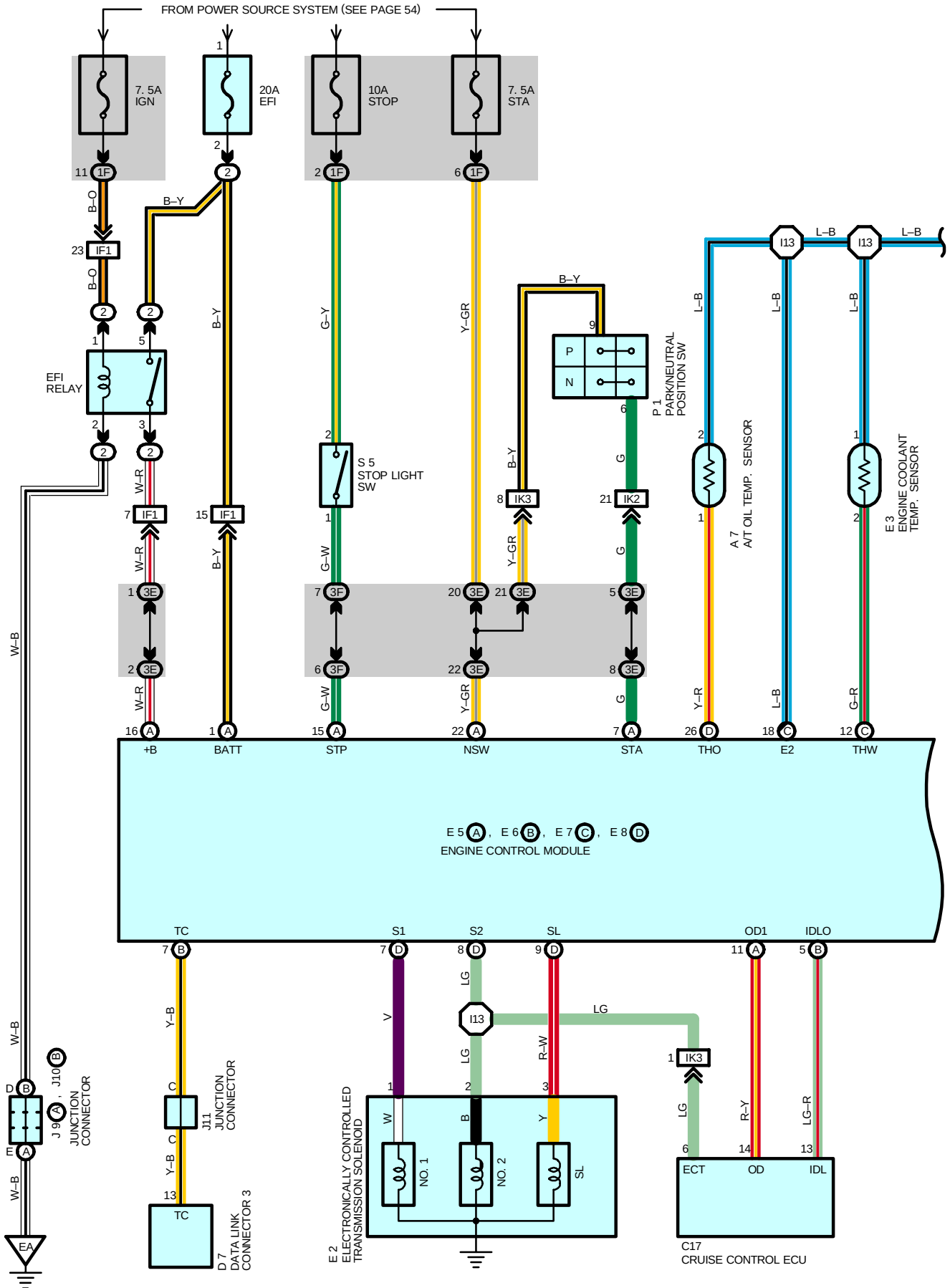
**: GROUND POINTS**

Code	See Page	Ground Points Location
EA	40 (5VZ-FE)	Front Left Fender
EB	40 (5VZ-FE)	Near the Throttle Body
ID	44	Left Kick Panel
IE	44	Around the Right Edge of the Reinforcement
IG	44	Around the Left Edge of the Reinforcement

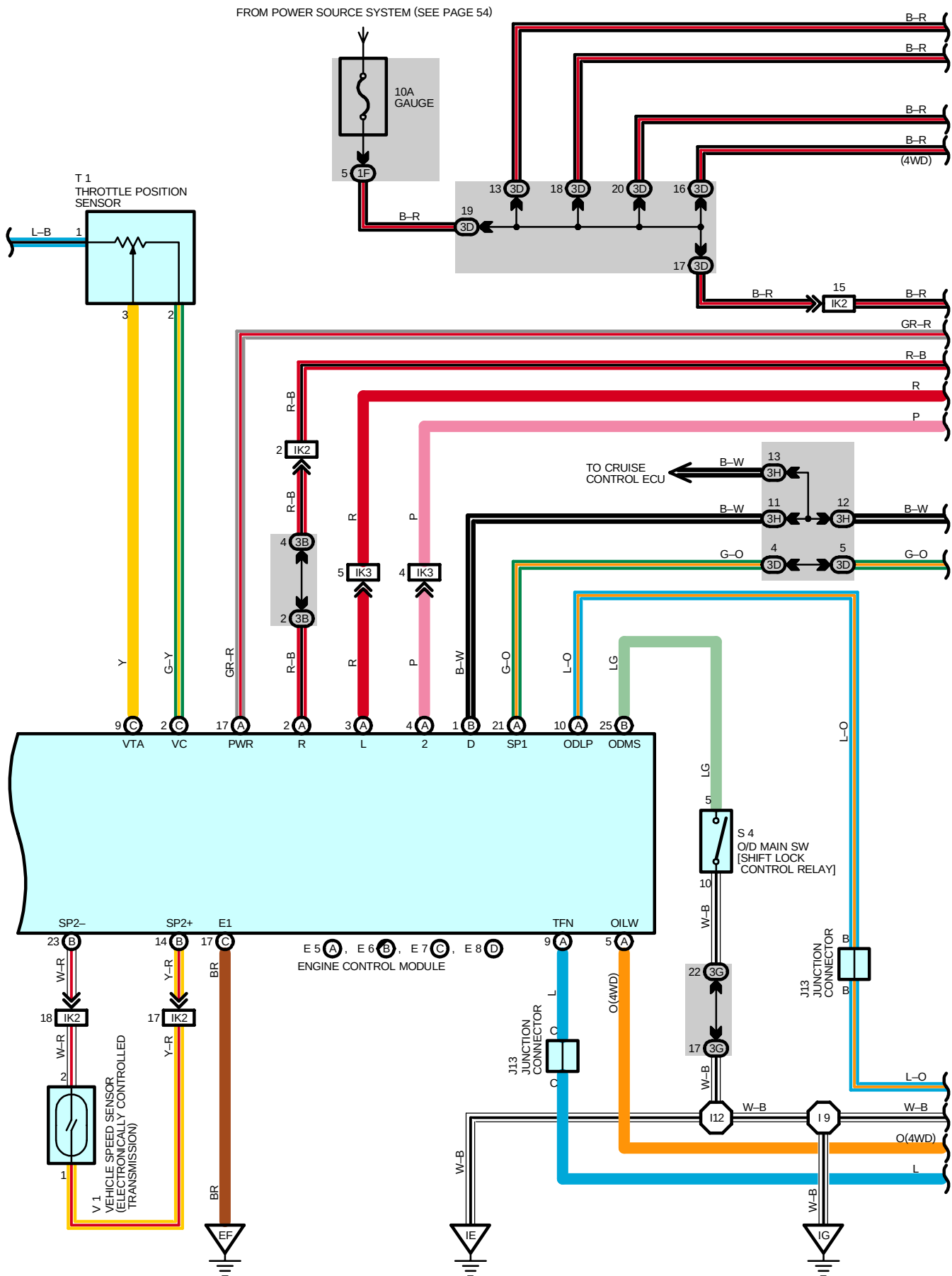
**: SPLICE POINTS**

Code	See Page	Wire Harness with Splice Points	Code	See Page	Wire Harness with Splice Points
I9	44	Cowl Wire	I13	44	Engine Wire
I12					

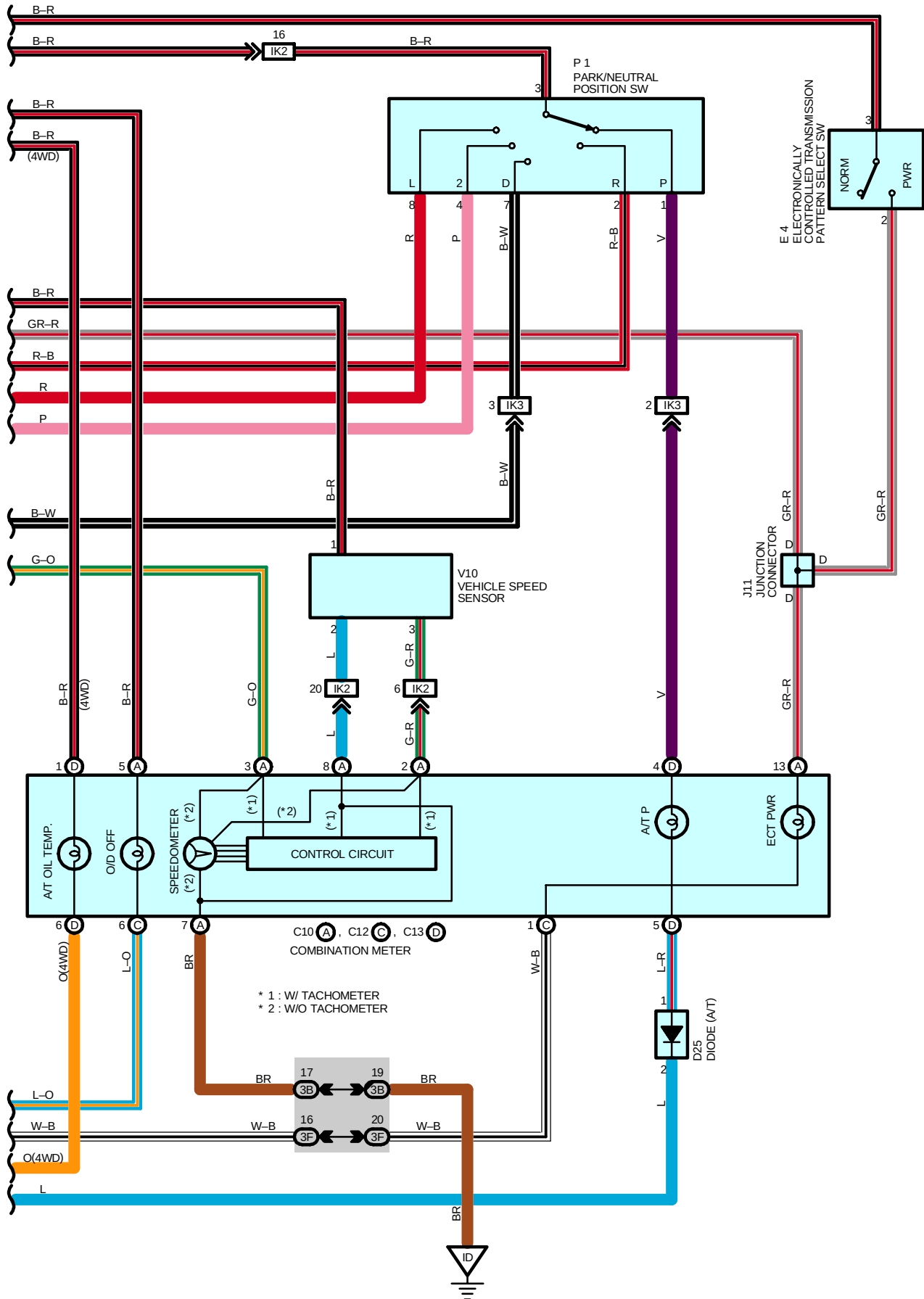
ELECTRONICALLY CONTROLLED TRANSMISSION (3RZ-FE)



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ELECTRONICALLY CONTROLLED TRANSMISSION (3RZ-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 governor pressure and lock-up pressure through the solenoid valve. Control of the solenoid valve by the engine control module based on the input signals from each sensor makes smooth driving possible by shift selection for each gear which 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 SP2+ 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, current flows from TERMINAL S1 of the engine control module to TERMINAL 1 of the electronically controlled transmission solenoid to GROUND, and continuity to the No.1 solenoid causes the shift.

For 2nd speed, current flows from TERMINAL S1 of the engine control module to TERMINAL 1 of the electronically controlled transmission solenoid to GROUND, and from TERMINAL S2 of the engine control module to TERMINAL 2 of the electronically controlled transmission solenoid to GROUND, and continuity to solenoid No.1 and No.2 causes the shift.

For 3rd speed, there is no continuity to No.1 solenoid, only to No.2 causing the shift. Shifting into 4th speed (Overdrive) takes place when there is no continuity to either No.1 or No.2 solenoid.

2. LOCK-UP OPERATION

When the engine control module judges from each signal that lock-up operation conditions have been met, current flows from TERMINAL SL of the engine control module to TERMINAL 3 of the electronically controlled transmission solenoid to GROUND, causing continuity to the lock-up solenoid and causing lock-up operation.

3. STOP LIGHT SW CIRCUIT

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

4. OVERDRIVE CIRCUIT

* O/D main SW on

When the O/D main SW is turned on, a signal is input to TERMINAL ODMS of the engine control module and engine control module operation causes gear shift when the conditions for overdrive are met.

* O/D main SW off

When the O/D main SW is turned off, a signal is input into TERMINAL ODMS of the engine control module, and turns on the O/D off indicator light. This activates the ECU, and the transmission system is controlled not to shift to overdrive.

ELECTRONICALLY CONTROLLED TRANSMISSION (3RZ-FE)

SERVICE HINTS

E2 ELECTRONICALLY CONTROLLED TRANSMISSION SOLENOID

1, 2, 3-GROUND : Approx. **13 Ω**

P1 PARK/NEUTRAL POSITION SW

3-GROUND : Approx. **12** volts with ignition SW **ON** position

S5 STOP LIGHT SW

2-1 : Closed with brake pedal depressed

E5 (A), E6 (B), E7 (C), E8 (D) ENGINE CONTROL MODULE

S1-E1 : **9-14** volts

S2, SL-E1 : **0-1.5** volts

STP-E1 : **7.5-14** volts with brake pedal depressed

: **0-1.5** volts with brake pedal released

THW-E2 : **0.2-1.0** volts with coolant temp. **80°C (176°F)**

THO-E2 : **4-5** volts with fluid temp. **20°C (68°F)**

VTA-E2 : **0.3-0.8** volts with throttle valve fully closed

: **3.2-4.9** volts with throttle valve fully open

VC-E2 : **4.5-5.5** volts

OD1-E1 : **4.5-5.5** volts

SP1-E1 : Pulse generation with vehicle moving

2-E1 : **10-14** volts with shift lever at **2** position

: **0-2** volts with shift lever at except **2** position

L-E1 : **10-14** volts with shift lever at **L** position

: **0-2** volts with shift lever at except **L** position

R-E1 : **10-4** volts with shift lever at **R** position

: **0-2** volts with shift lever at except **R** position

PWR-E1 : **7.5-14** volts with pattern select SW **PWR** position

: **0-1.5** volts with pattern select SW **NORM** position

+B-E1 : **9-14** volts

BATT-E1 : **9-14** volts

○ : PARTS LOCATION

Code	See Page	Code	See Page	Code	See Page
A7	32 (3RZ-FE)	E3	32 (3RZ-FE)	J11	35
C10	A 34	E4	35	J13	35
C12	C 34	E5	A 35	P1	33 (3RZ-FE)
C13	D 34	E6	B 35	S4	35
C17	34	E7	C 35	S5	35
D7	34	E8	D 35	T1	33 (3RZ-FE)
D25	34	J9	A 33 (3RZ-FE)	V1	33 (3RZ-FE)
E2	32 (3RZ-FE)	J10	B 33 (3RZ-FE)	V10	33 (3RZ-FE)

○ : RELAY BLOCKS

Code	See Page	Relay Blocks (Relay Block Location)
2	21	R/B No.2 (Engine Compartment Left)

○ : JUNCTION BLOCK AND WIRE HARNESS CONNECTOR

Code	See Page	Junction Block and Wire Harness (Connector Location)
1F	23	Cowl Wire and J/B No.1 (Lower Finish Panel)
3B	24	Cowl Wire and J/B No.3 (Behind the Instrument Panel Left)
3D		
3E		
3F		
3G		
3H	26	Cowl Wire and J/B No.3 (Behind the Instrument Panel Center)

 : CONNECTOR JOINING WIRE HARNESS AND WIRE HARNESS

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IF1	44	Engine Room Main Wire and Cowl Wire (Left Kick Panel)
IK2	44	Engine Wire and Cowl Wire (Above the Glove Box)
IK3		

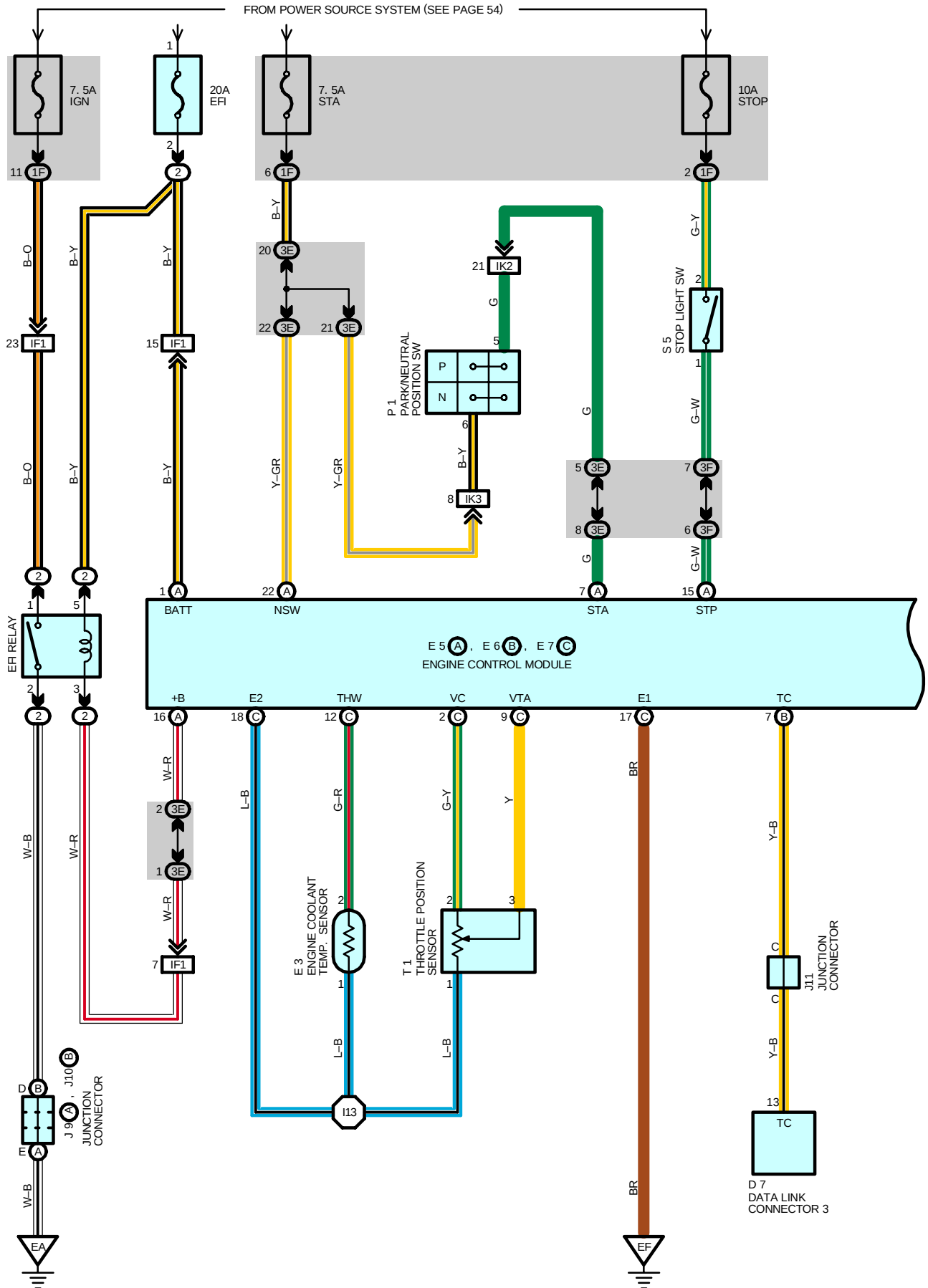
 : GROUND POINTS

Code	See Page	Ground Points Location
EA	42 (3RZ-FE)	Front Left Fender
EF	42 (3RZ-FE)	Ignition Coil Bracket
ID	44	Left Kick Panel
IE	44	Around the Right Edge of the Reinforcement
IG	44	Around the Left Edge of the Reinforcement

 : SPLICE POINTS

Code	See Page	Wire Harness with Splice Points	Code	See Page	Wire Harness with Splice Points
I9	44	Cowl Wire	I13	44	Engine Wire
I12					

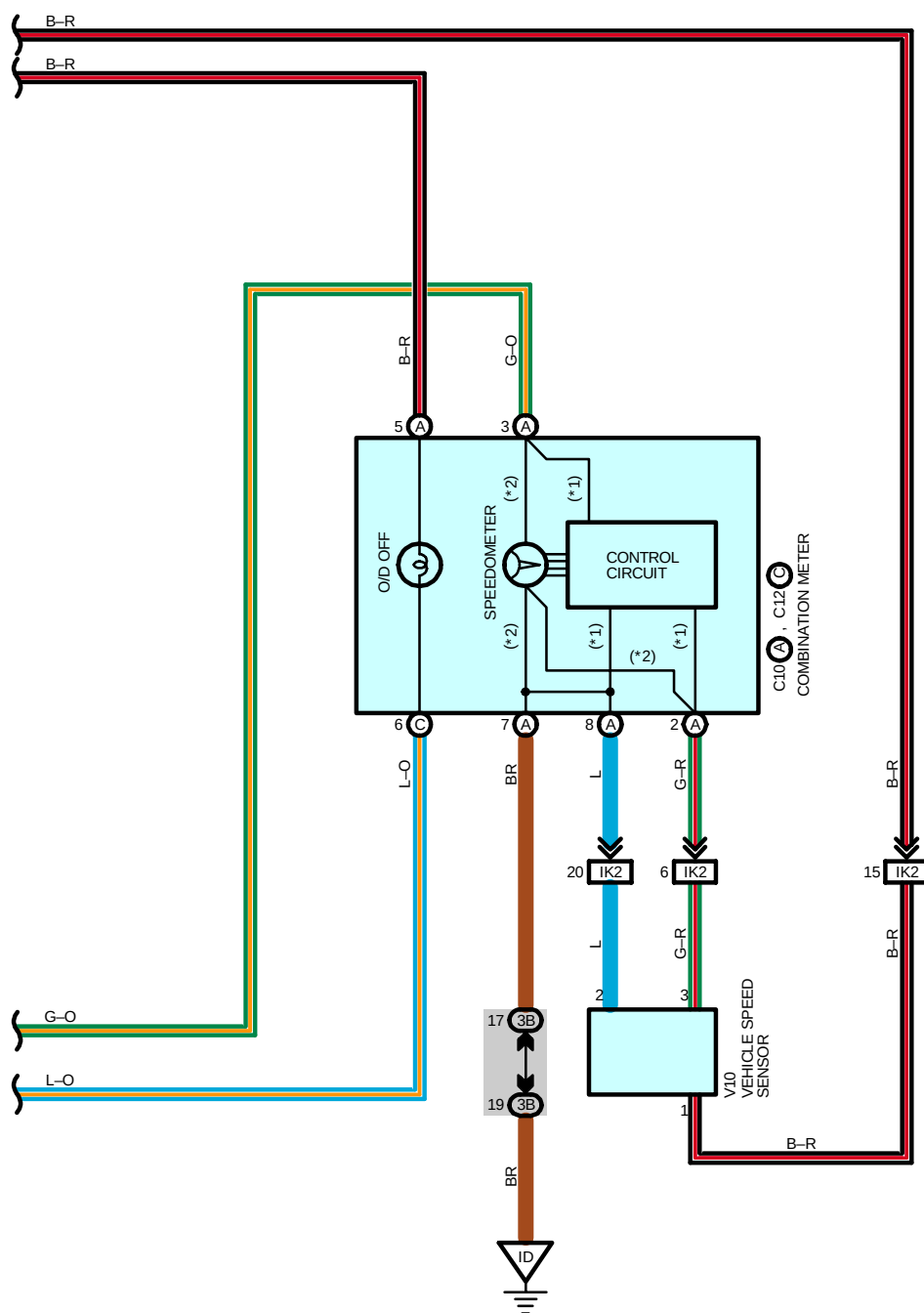
AUTOMATIC TRANSMISSION (2RZ-FE)



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AUTOMATIC TRANSMISSION (2RZ-FE)

* 1 : W/ TACHOMETER
* 2 : W/O TACHOMETER



SERVICE HINTS

O6 O/D ECU

3-GROUND : Approx. 12 volts with ignition SW at **ON** position

5-GROUND : Always continuity

○ : PARTS LOCATION

Code	See Page	Code	See Page	Code	See Page
C10	A	34	E7	C	35
C12	C	34	J9	A	33 (2RZ-FE)
C17		34	J10	B	33 (2RZ-FE)
D7		34	J11		35
E3		32 (2RZ-FE)	J13		35
E5	A	35	O1		33 (2RZ-FE)
E6	B	35	O6		35

○ : RELAY BLOCKS

Code	See Page	Relay Blocks (Relay Block Location)
2	21	R/B No.2 (Engine Compartment Left)

○ : JUNCTION BLOCK AND WIRE HARNESS CONNECTOR

Code	See Page	Junction Block and Wire Harness (Connector Location)
1F		
1G	23	Cowl Wire and J/B No.1 (Lower Finish Panel)
3B		
3D		
3E	24	Cowl Wire and J/B No.3 (Behind the Instrument Panel Left)
3F		
3G		
3H	26	Cowl Wire and J/B No.3 (Behind the Instrument Panel Center)

□ : CONNECTOR JOINING WIRE HARNESS AND WIRE HARNESS

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IF1	44	Engine Room Main Wire and Cowl Wire (Left Kick Panel)
IK2		
IK3	44	Engine Wire and Cowl Wire (Above the Glove Box)

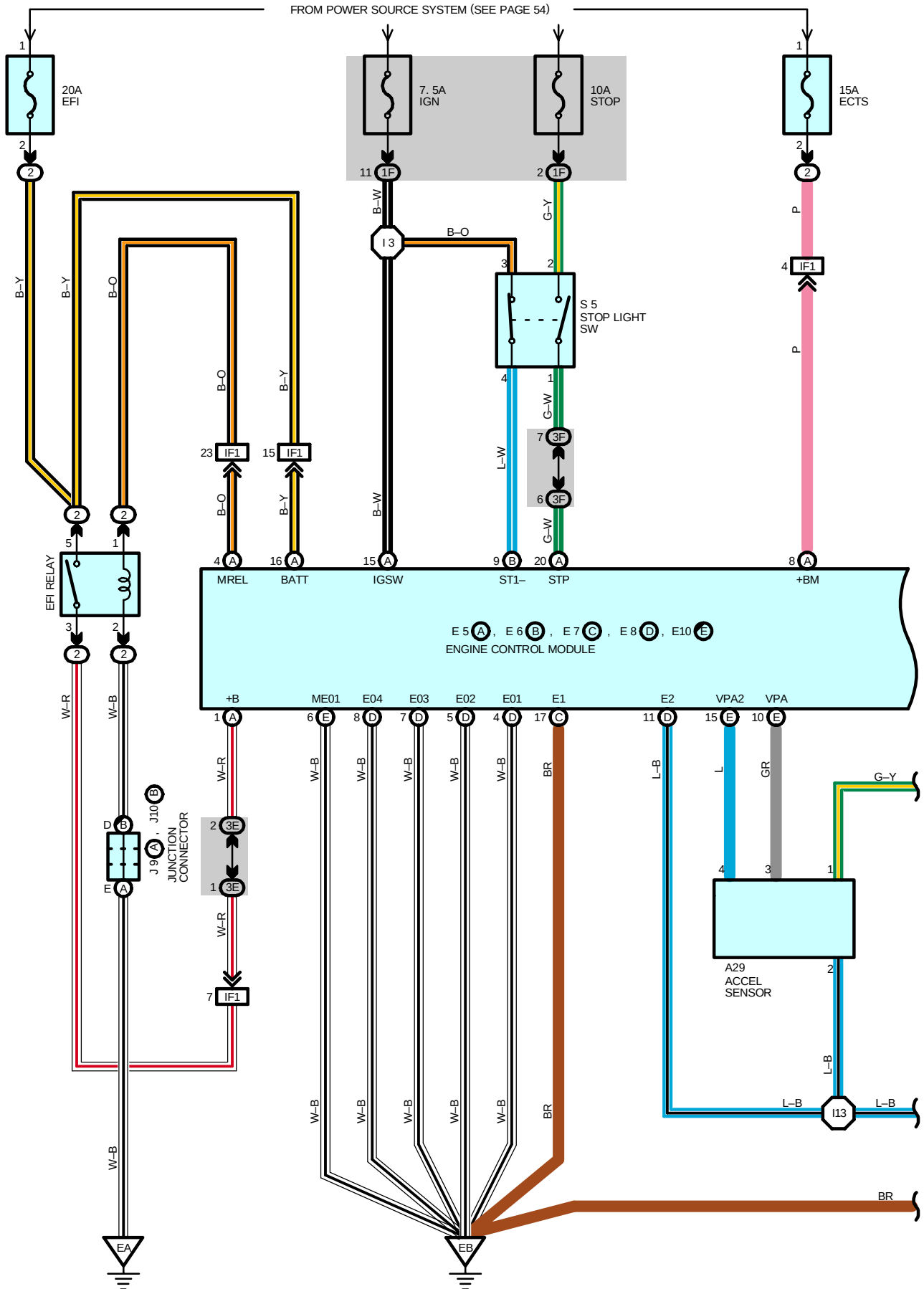
▽ : GROUND POINTS

Code	See Page	Ground Points Location
EA	42 (2RZ-FE)	Front Left Fender
EF	42 (2RZ-FE)	Ignition Coil Bracket
ID	44	Left Kick Panel
IE	44	Around the Right Edge of the Reinforcement
IG	44	Around the Left Edge of the Reinforcement

○ : SPLICE POINTS

Code	See Page	Wire Harness with Splice Points	Code	See Page	Wire Harness with Splice Points
I11			I13	44	Engine Wire
I12	44	Cowl Wire			

CRUISE CONTROL (EXCEPT 5VZ-FE 2WD M/T, 3RZ-FE AND 2RZ-FE)





CRUISE CONTROL (EXCEPT 5VZ-FE 2WD M/T, 3RZ-FE AND 2RZ-FE)

SYSTEM OUTLINE

The cruise control system is a constant vehicle speed controller which controls the opening angle of the engine throttle valve by the SW, and allows driving at a constant speed without depressing the accelerator pedal.

SET CONTROL

When the SET/COAST SW is operated while traveling with the main SW on, the speed when the SET/COAST SW is operated to off is memorized, and the vehicle speed is controlled at that speed.

COAST CONTROL

When the SET/COAST SW is operated to on, the cruise control opening angle requirement is turned to 0 to decrease the vehicle speed, and the speed when the SET/COAST SW is operated to off is memorized, and the vehicle speed is controlled at that speed.

Furthermore, every time the SET/COAST SW is operated momentarily (Approx. 0.5 sec.) to on, the memorized vehicle speed is decreased by approx. 1.6 km/h (1.0 mph).

ACCEL CONTROL

When the RES/ACC SW is operated to on, the throttle motor rotates the throttle valve to open direction to increase the vehicle speed, and the speed when the RES/ACC SW is operated to off is memorized, and the vehicle speed is controlled at that speed.

Furthermore, every time the RES/ACC SW is operated momentarily (Approx. 0.5 sec.) to on, the memorized vehicle speed is increased by approx. 1.6 km/h (1.0 mph).

MANUAL CANCEL MECHANISM

If any of the following signals are input during cruise control traveling, the current to the motor flows in the direction to close the throttle valve, and cancel the cruise control.

- (1) Stop lamp SW is on (Brake pedal is depressed)
- (2) The CANCEL SW of the control SW is on
- (3) CRUISE SW is off

RESUME CONTROL

After canceling the cruise control (Except when the main SW is off) if the vehicle speed is above the minimum speed limit (Approx. 40km/h, 25mph), operating the RES/ACC SW to on from off will cause the system to accelerate and resume to the vehicle speed before manual cancellation.

OVERDRIVE FUNCTION

The overdrive may be cut on an uphill grade, while traveling with the cruise control.

After the overdrive is cut, if the vehicle speed reaches the overdrive resume speed (Set speed minus 2 km/h (1.2 mph)), and if the system determines that the uphill grade has finished, the overdrive will resume after the overdrive timer operation.

AUTO CANCEL OPERATION

If any of the following conditions are detected, the set speed is erased and the control is canceled.

- (1) Disconnection and/or short in the stop light SW
- (2) Malfunction in the vehicle speed signal
- (3) Malfunction in the electronic throttle parts
- (4) Malfunction in the stop light SW input circuit
- (5) Malfunction in the cancel circuit
- (6) The actual vehicle speed becomes slower than the minimum speed limit
- (7) The actual vehicle speed becomes -16 km/h (10 mph) slower than the set speed

SERVICE HINTS

E5 (A), E6 (B), E7 (C), E8 (D), E10 (E) ENGINE CONTROL MODULE

Voltage at engine control module wiring connectors

+B-E1 : **9-14** volts (Ignition SW on)

BATT-E1 : **9-14** volts (Always)

VC-E2 : **4.5-5.5** volts (Ignition SW on)

VTA-E2 : **0.3-0.8** volts (Ignition SW on and throttle valve fully closed)

3.2-4.9 volts (Ignition SW on and throttle valve fully open)

SP1-E1 : Pulse generation with vehicle moving

STP-E1 : **7.5-14** volts (Stop light SW on)

C19 CRUISE CONTROL SW [COMB. SW]

5-4 : Approx. **68** Ω with RESUME/ACCEL SW on

Approx. **198** Ω with SET/COAST SW on

Approx. **418** Ω with CANCEL SW on

S5 STOP LIGHT SW

2-1 : Closed with brake pedal depressed

3-4 : Opened with brake pedal depressed

: PARTS LOCATION

Code		See Page	Code		See Page	Code	See Page
C10	A	34	E8	D	35	P1	33 (3RZ–FE, 2RZ–FE)
C13	D	34	J9	A	31 (5VZ–FE)	S5	35
C19		34			33 (3RZ–FE, 2RZ–FE)	T1	31 (5VZ–FE)
E5	A	35	J10	B	31 (5VZ–FE)		33 (3RZ–FE, 2RZ–FE)
E6	B	35			33 (3RZ–FE, 2RZ–FE)		
E7	C	35	P1		31 (5VZ–FE)	V10	33 (3RZ–FE, 2RZ–FE)

: RELAY BLOCKS

Code	See Page	Relay Blocks (Relay Block Location)
2	21	R/B No.2 Engine Compartment Left

: JUNCTION BLOCK AND WIRE HARNESS CONNECTOR

Code	See Page	Junction Block and Wire Harness (Connector Location)
1F	23	Cowl Wire and J/B No.1 Lower Finish Panel
3B	26	Cowl Wire and J/B No.3 Behind the Instrument Panel Left
3D		
3E		
3F		

: CONNECTOR JOINING WIRE HARNESS AND WIRE HARNESS

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IF1	44	Engine Room Main Wire and Cowl Wire Left Kick Panel
IK2	44	Engine Wire and Cowl Wire Above the Glove Box
IK3	44	Engine Wire and Cowl Wire Above the Glove Box

: GROUND POINTS

Code	See Page	Ground Points Location
EA	40 (5VZ-FE)	Front Left Fender
	42 (3RZ-FE, 2RZ-FE)	
EB	40 (5VZ-FE)	Near the Throttle Body
	42 (3RZ-FE, 2RZ-FE)	Under the Data Link Connector 1
ID	44	Left Kick Panel

CRUISE CONTROL (EXCEPT 5VZ-FE 2WD M/T, 3RZ-FE AND 2RZ-FE)



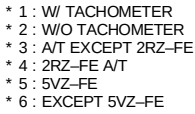
: SPLICE POINTS

Code	See Page	Wire Harness with Splice Points	Code	See Page	Wire Harness with Splice Points
I3	44	Cowl Wire	I13	44	Engine Wire

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CRUISE CONTROL (5VZ-FE 2WD M/T, 3RZ-FE AND 2RZ-FE)

SYSTEM OUTLINE

With the ignition SW turned to on, current flows from GAUGE fuse to TERMINAL 1 of the cruise control indicator light and from ECU-IG fuse to TERMINAL B of the cruise control ECU. When the ignition SW is on and the cruise control SW is turned on, a signal is input from TERMINAL 5 of the cruise control SW to TERMINAL CCS of the cruise control ECU. As a result, the cruise control ECU functions and the current to TERMINAL B of the cruise control ECU flows to TERMINAL GND to GROUND, and the cruise control system is ready for operation.

At the same time, the current from the GAUGE fuse flows to TERMINAL 1 of the cruise control indicator light to TERMINAL 8 to TERMINAL Pi of the cruise control ECU to TERMINAL GND to GROUND, causing the cruise control indicator light to light up, indicating that the cruise control is ready for operation.

1. SET OPERATION

When the cruise control main SW is turned on and the set SW is pushed with the vehicle speed within the set limit (Approx. 40 km/h, 25 mph to 200 km/h, 124 mph), a signal is input to TERMINAL CCS of the cruise control ECU and the vehicle speed at the time the set SW is released is memorized in the ECU as the set speed.

2. SET SPEED CONTROL

During cruise control driving, the ECU compares the set speed memorized in the ECU with the actual vehicle speed input into TERMINAL SPD of the cruise control ECU from the speedometer, and controls the cruise control actuator to maintain the set speed.

When the actual vehicle speed is lower than the set speed, the ECU causes the current to the cruise control actuator to flow from TERMINAL MO of the cruise control ECU to TERMINAL 1 of the cruise control actuator to TERMINAL 2 to TERMINAL MC of the cruise control ECU. As a result, the motor in the cruise control actuator is rotated to open the throttle valve and the throttle cable is pulled to increase the vehicle speed.

When the actual vehicle speed is higher than the set speed, the current to the cruise control actuator flows from TERMINAL MC of the ECU to TERMINAL 2 of the cruise control actuator to TERMINAL 1 to TERMINAL MO of the cruise control ECU. This causes the motor in the cruise control actuator to rotate to close the throttle valve and return the throttle cable to decrease the vehicle speed.

3. COAST CONTROL

During cruise control driving, while the coast SW is on, the cruise control actuator returns the throttle cable to close the throttle valve and decrease the driving speed. The vehicle speed when the coast SW is turned off is memorized and the vehicle continues at the new set speed.

4. ACCEL CONTROL

During cruise control driving, while the accel SW is turned on, the cruise control actuator pulls the throttle cable to open the throttle valve and increase the driving speed.

The vehicle speed when the accel SW is turned off is memorized and the vehicle continues at the new set speed.

5. RESUME CONTROL

Unless the vehicle speed falls below the minimum speed limit (Approx. 45 km/h, 25 mph) after canceling the set speed by the cancel SW, pushing the resume SW will cause the vehicle to resume the vehicle speed set before cancellation.

6. MANUAL CANCEL MECHANISM

If any of the following operations occurs during cruise control operation, the magnetic clutch of the actuator turns off and the motor rotates to close the throttle valve and the cruise control is released.

- * Placing the shift lever in except D position (A/T) or cruise control clutch SW off (M/T). "A Signal is not input to TERMINAL D of the ECU"
- * Depressing the brake pedal (Stop light SW on). "A Signal is input to TERMINAL STP- of the ECU"
- * Pushing the cancel SW (Cancel SW on). "A Signal is input to TERMINAL CCS of the ECU"

7. AUTO CANCEL FUNCTION

A) If any of the following operating conditions occurs during cruise control operation, the set speed is erased, the current flowing to the magnetic clutch is stopped and the cruise control is released (Cruise SW turns off).

When this occurs, the ignition SW must be turned off once before the main SW will turn on.

- * Over current to transistor driving motor and/or magnetic clutch.
- * Current to control the throttle valve in motor becomes always ON.
- * Open circuit in magnetic clutch.
- * Momentary interruption of vehicle speed signal
- * Short circuit in cruise control SW.
- * Motor does not operate despite the motor drive signal being output.

B) If any of the following conditions occurs during cruise control operation, the set speed is erased and the cruise control is released. (The power of magnetic clutch is cut off until the set SW is ON again.)

- * When the vehicle speed falls below the minimum speed limit (approx. 40 km/h, 25 mph)
- * When the vehicle speed falls more than 16 km/h (10 mph) below the set speed, E.G. on an upward slope.
- * When power to the cruise control system is momentarily cut off.

C) If any of the following condition occurs during cruise control operation, the cruise control is released. But in this case, the set speed is not erased. If the vehicle speed is more than the minimum speed limit (Approx. 40 km/h, 25 mph), cruise control operation is possible using SET or RESUME on the control SW.

- * Open circuit between TERMINAL L of the cruise control ECU and TERMINAL 3 of the stop light SW.

SERVICE HINTS

C17 CRUISE CONTROL ECU

16-GROUND : Always continuity

9-GROUND : Approx. 12 volts with ignition SW at **ON** position

12-GROUND : 4 pulse with 1 rotation of the rotor shaft

2-GROUND : Approx. 12 volts with brake pedal depressed (One of the cancel SW)

C19 CRUISE CONTROL SW [COMB. SW]

5-4 : Approx. 68 Ω with RESUME/ACCEL SW on

Approx. 198 Ω with SET/COAST SW on

Approx. 418 Ω with CANCEL SW on

C3 CRUISE CONTROL ACTUATOR

3-4 : Approx. 38.5 Ω

○ : PARTS LOCATION

Code	See Page	Code	See Page	Code	See Page
C3	30 (5VZ-FE)	D7		34	P1
	32 (3RZ-FE, 2RZ-FE)	E5	A	35	
C10	34	E6	B	35	S5
C13	34	E8	D	35	V10
C16	34	J11		35	
C17	34	O6		35	
C19	34	P1	A	31 (5VZ-FE)	

○ : JUNCTION BLOCK AND WIRE HARNESS CONNECTOR

Code	See Page	Junction Block and Wire Harness (Connector Location)
1F	23	Cowl Wire and J/B No.1 (Lower Finish Panel)
1G		
3A	24	Cowl Wire and J/B No.3 (Behind the Instrument Panel Left)
3B		
3D		
3F		
3H	26	Cowl Wire and J/B No.3 (Behind the Instrument Panel Center)

CRUISE CONTROL (5VZ-FE 2WD M/T, 3RZ-FE AND 2RZ-FE)

 : CONNECTOR JOINING WIRE HARNESS AND WIRE HARNESS

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IK2	44	Engine Wire and Cowl Wire (Above the Glove Box)
IK3		

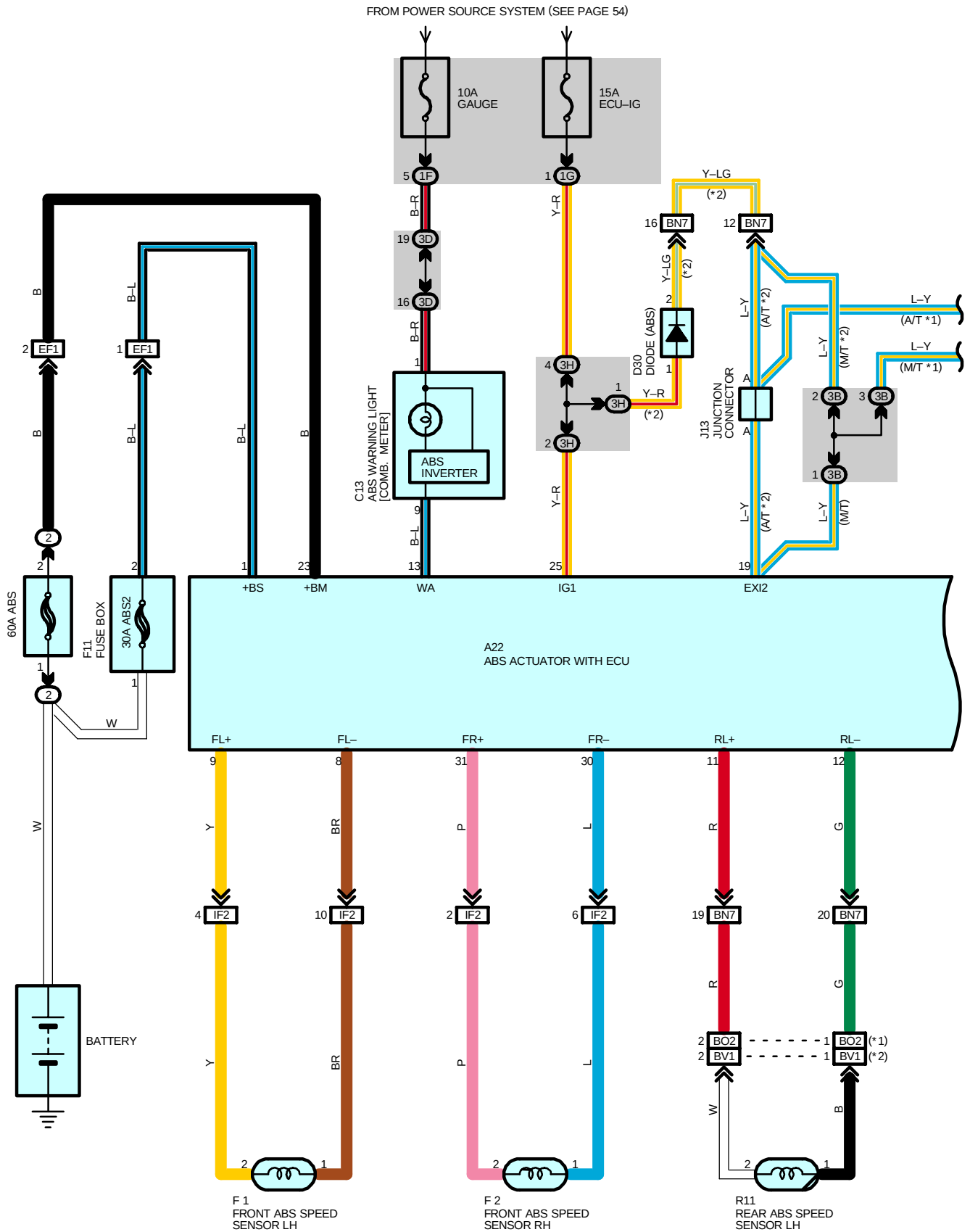
 : GROUND POINTS

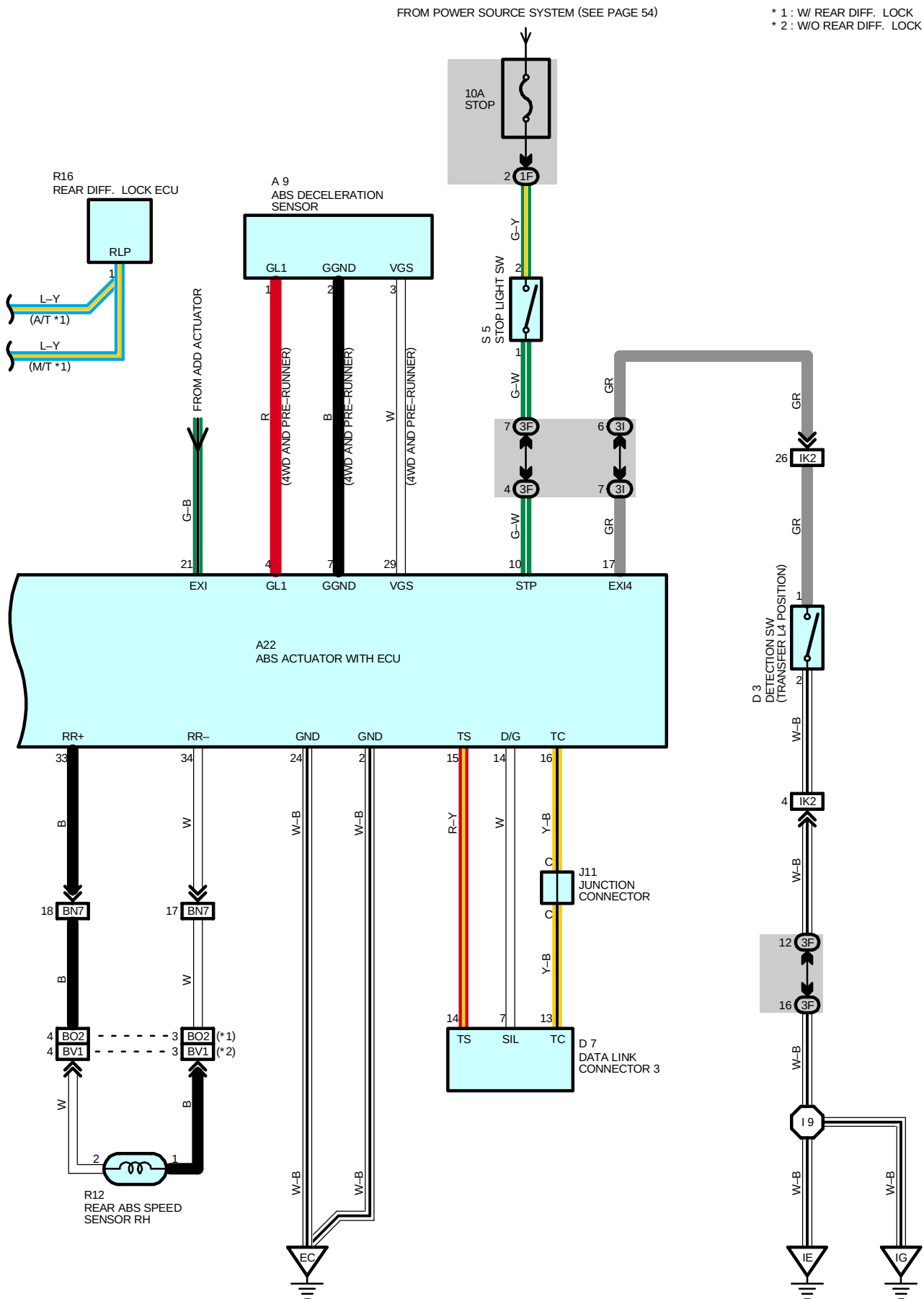
Code	See Page	Ground Points Location
ID	44	Left Kick Panel
IE	44	Around the Right Edge of the Reinforcement
IG	44	Around the Left Edge of the Reinforcement

 : SPLICE POINTS

Code	See Page	Wire Harness with Splice Points	Code	See Page	Wire Harness with Splice Points
I9	44	Cowl Wire	I14	44	Cowl Wire

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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 SIGNAL

(1) Speed sensor signal

The speed of the wheels is detected and input to TERMINALS FL+, FR+, RL+ and RR+ of the ABS actuator with ECU.

(2) Stop light SW signal

A signal is input to TERMINAL STP of the ABS actuator with ECU when the brake pedal is depressed.

(3) Deceleration sensor signal

Longitudinal acceleration is detected and a signal is input to the ABS actuator with ECU.

2. SYSTEM OPERATION

During sudden braking, the ABS actuator with ECU which has signals input from each sensor lets the hydraulic pressure acting on each wheel cylinder escape to the reservoir.

The pump inside the ABS actuator with ECU is also operating at this time and it returns the brake fluid from the reservoir to the master cylinder, thus preventing locking of vehicle wheels.

If the ABS actuator with ECU judges that the hydraulic pressure acting on the wheel cylinder is insufficient, the current acting on the solenoid is controlled and the hydraulic pressure is increased.

Holding of the hydraulic pressure is also controlled by the ECU, by the same method as above, by repeated pressure reduction. Holding and increase are repeated to maintain vehicle stability and to improve steerability during sudden braking.

SERVICE HINTS

F1, F2 FRONT ABS SPEED SENSOR LH, RH

1-2 : 0.92-1.22 kΩ (20°C, 68°F)

R11, R12 REAR ABS SPEED SENSOR LH, RH

1-2 : 0.89-1.29 kΩ (20°C, 68°F)

A22 ABS ACTUATOR WITH ECU

6-GROUND : 10-14 volts with ignition SW on

24-GROUND : 10-14 volts with stop light SW on (Brake pedal depressed)

2, 18-GROUND : Always continuity

S5 STOP LIGHT SW

2-1 : Closed with brake pedal depressed

PARTS LOCATION

Code	See Page	Code	See Page	Code	See Page
A9	34	F1	30 (5VZ-FE)	R11	37 (Except Double Cab)
A22	30 (5VZ-FE)		32 (3RZ-FE, 2RZ-FE)	R12	36 (Double Cab)
	32 (3RZ-FE, 2RZ-FE)	F2	30 (5VZ-FE)		37 (Except Double Cab)
C13	34		32 (3RZ-FE, 2RZ-FE)	R16	35
D3	30 (5VZ-FE)	J11	35	S5	35
	32 (3RZ-FE, 2RZ-FE)	J13	35		
D30	34	R11	36 (Double Cab)		

RELAY BLOCKS

Code	See Page	Relay Blocks (Relay Block Location)
2	21	R/B No.2 (Engine Compartment Left)

 : JUNCTION BLOCK AND WIRE HARNESS CONNECTOR

Code	See Page	Junction Block and Wire Harness (Connector Location)
1F	23	Cowl Wire and J/B No.1 (Lower Finish Panel)
1G		
3B	24	Cowl Wire and J/B No.3 (Behind the Instrument Panel Left)
3D		
3F		
3H	26	Cowl Wire and J/B No.3 (Behind the Instrument Panel Center)
3I		

 : CONNECTOR JOINING WIRE HARNESS AND WIRE HARNESS

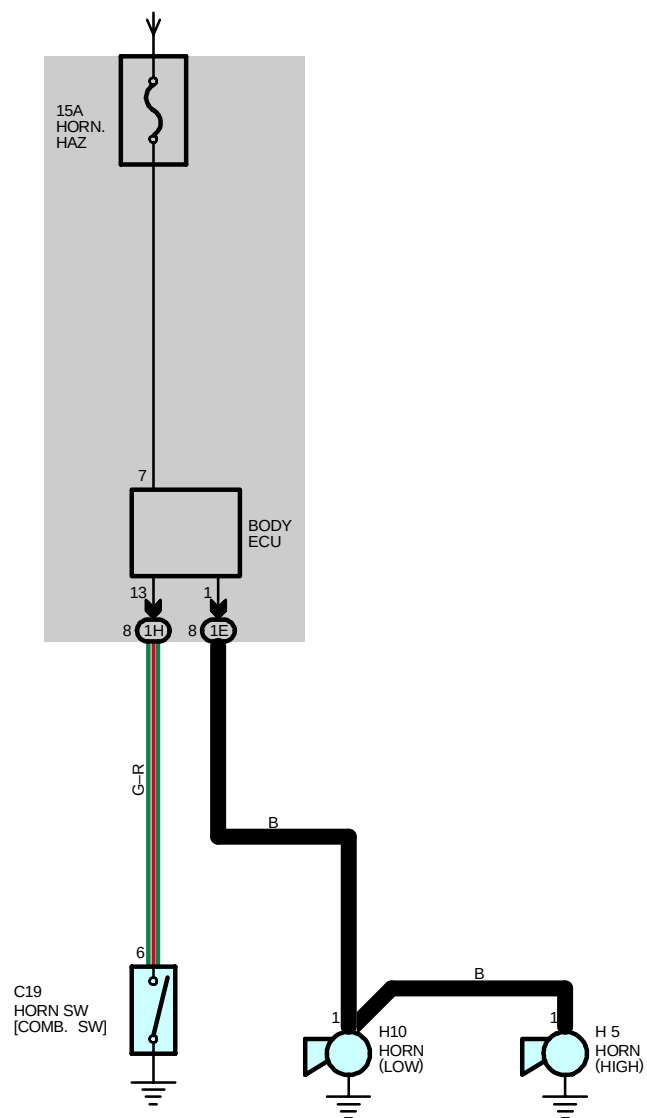
Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
EF1	40 (5VZ-FE)	Cowl Wire and Engine Room Main Wire (Front Right Fender)
	42 (3RZ-FE, 2RZ-FE)	
IF2	44	Engine Room Main Wire and Cowl Wire (Left Kick Panel)
IK2	44	Engine Wire and Cowl Wire (Above the Glove Box)
BN7	46 (Double Cab)	Frame Wire and Cowl Wire (Under the Driver's Seat)
	48 (Except Double Cab)	
BO2	46 (Double Cab)	Frame Wire and Differential No.2 Wire (Rear Side Member LH)
	48 (Except Double Cab)	
BV1	48 (Except Double Cab)	Frame Wire and Skid Control Sensor Wire (Rear Side Member LH)

 : GROUND POINTS

Code	See Page	Ground Points Location
EC	40 (5VZ-FE)	Front Right Fender
	42 (3RZ-FE, 2RZ-FE)	
IE	44	Around the Right Edge of the Reinforcement
IG	44	Around the Left Edge of the Reinforcement

 : SPLICE POINTS

Code	See Page	Wire Harness with Splice Points	Code	See Page	Wire Harness with Splice Points
I9	44	Cowl Wire			



SERVICE HINTS

BODY ECU

13-GROUND : Continuity with horn SW on

: PARTS LOCATION

Code	See Page	Code	See Page	Code	See Page
C19	34	H5	32 (3RZ-FE, 2RZ-FE)	H10	32 (3RZ-FE, 2RZ-FE)
H5	30 (5VZ-FE)	H10	30 (5VZ-FE)		

: JUNCTION BLOCK AND WIRE HARNESS CONNECTOR

Code	See Page	Junction Block and Wire Harness (Connector Location)
1E	23	Engine Room Main Wire and J/B No.1 (Lower Finish Panel)
1H	23	Cowl Wire and J/B No.1 (Lower Finish Panel)

NOTICE: When inspecting or repairing the SRS, perform the operation in accordance with the following precautionary instructions and the procedure and precautions in the Repair Manual for the applicable 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 after 90 seconds from when the ignition switch 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 be deployed.)
- When the negative (-) terminal cable is disconnected from the battery, the memory of the clock and audio system will be canceled. So before starting work, make a record of the contents memorized in the audio memory system. When work is finished, reset the audio systems as they were before and adjust the clock. To avoid erasing the memory in each memory system, never use a back-up power supply from outside the vehicle.
- Before repairs, remove the airbag sensor if shocks are likely to be applied to the sensor during repairs.
- Do not expose the steering wheel pad, front passenger airbag assembly, seat belt pretensioner, center airbag sensor assembly or front airbag sensor assembly directly to hot air or flames.
- Even in cases of a minor collision where the SRS does not deploy, the steering wheel pad, front passenger airbag assembly, seat belt pretensioner, center airbag sensor assembly and front airbag sensor assembly should be inspected.
- Never use SRS parts from another vehicle. When replacing parts, replace them with new parts.
- Never disassemble and repair the steering wheel pad, front passenger airbag assembly, seat belt pretensioner, center airbag sensor assembly or front airbag sensor assembly in order to reuse it.
- If the steering wheel pad, front passenger airbag assembly, seat belt pretensioner, center airbag sensor assembly or front airbag sensor assembly has been dropped, or if there are cracks, dents or other defects in the case, bracket or connector, replace them with new ones.
- Use a volt/ohmmeter with high impedance (10 k Ω /V minimum) for troubleshooting the system's electrical circuits.
- Information labels are attached to the periphery of the SRS components. Follow the instructions on the notices.
- After work on the SRS is completed, perform the SRS warning light check.
- If the vehicle is equipped with a mobile communication system, refer to the precaution in the IN section of the Repair Manual.





SYSTEM OUTLINE

The SRS is a driver protection device which has a supplemental role to the seat belts.

When the ignition SW is turned to ACC or ON, the current from the ACC fuse flows to TERMINAL (B) 6 of the center airbag sensor assembly. Only when the ignition SW on, the current from the IGN fuse flows to TERMINAL (B) 5 of the center airbag sensor assembly.

If an accident occurs while driving, deceleration caused by a frontal impact is detected (by sensor) and when the frontal impact exceeds a set level, the current from the ACC or IGN fuse flows to TERMINALS (B) 6 or (B) 5 of the center airbag sensor assembly. This current flows to TERMINAL (B) 14 to TERMINAL 1 of the airbag squib (Steering wheel pad) to TERMINAL 2 to TERMINAL (B) 13 of the center airbag sensor assembly, and also flows to TERMINAL (B) 10 of the center airbag sensor assembly to TERMINAL 2 of the airbag squib (Front passenger airbag assembly) to TERMINAL 1 of the center airbag assembly (Double cab) or TERMINAL (B) 10 of the center airbag sensor assembly to TERMINAL 1 of the passenger airbag manual on/off SW to TERMINAL 3 to TERMINAL 1 of the airbag squib (Front passenger airbag assembly) to TERMINAL 2 to TERMINAL 2 of the passenger airbag manual on/off SW to TERMINAL 4 to TERMINAL (B) 11 of the center airbag sensor assembly (Except double cab). Furthermore, the current flows to TERMINAL (B) 27 or (B) 28 to GROUND, causing the center airbag squibs to expand.

When the safing sensor built into the center airbag sensor assembly is on, airbag sensor is off and the current from the ACC or IGN fuse flows same as above-mentioned flowing, causing the airbag squibs to expand. When the safing sensor built into the center airbag sensor assembly is on, the airbag sensor on one of the above-mentioned circuits is activated so that current flows to the airbag squibs and causes them to operate.

The airbag stored inside the steering wheel pad is instantaneously expanded to soften the shock to the driver.

The airbag stored inside the passenger's instrument panel is instantaneously expanded to soften the shock to the passenger.

1. FRONT PASSENGER AIRBAG MANUAL ON/OFF OPERATION (EXCEPT DOUBLE CAB)

When the passenger airbag manual on/off SW is on, the current flowing from the ACC or IGN fuse to the airbag squib (Front passenger airbag assembly) is same as above, causing the airbag squib (Front passenger airbag assembly) to expand in an accident.

If the passenger airbag manual on/off SW is turned to off, the current flows from the ACC fuse to TERMINAL 1 of the passenger airbag manual on/off indicator to TERMINAL 2 to GROUND, lighting the indicator up. Then the current between TERMINAL (B) 11 of the airbag sensor assembly and the airbag squib (Front passenger airbag assembly) is cut off, so that it does not expand the airbag squib (Front passenger airbag assembly) in an accident.

○ : PARTS LOCATION

Code		See Page		Code		See Page		Code		See Page	
A18		34		C21	B	34		J11	35		
A21		34		C22	C	34		P19	35		
B6		36 (Double Cab)		D7		34		P20	35		
		37 (Except Double Cab)		F9		30 (5VZ–FE)		P21	36 (Double Cab)		
C10	A	34				32 (3RZ–FE, 2RZ–FE)			37 (Except Double Cab)		
C12		C		34		30 (5VZ–FE)		P22	36 (Double Cab)		
C20		A		34		32 (3RZ–FE, 2RZ–FE)			37 (Except Double Cab)		

○ : JUNCTION BLOCK AND WIRE HARNESS CONNECTOR

Code	See Page	Junction Block and Wire Harness (Connector Location)
1F	23	Cowl Wire and J/B No.1 (Lower Finish Panel)
1G		
1M		
3A	24	Cowl Wire and J/B No.3 (Behind the Instrument Panel Left)
3D		
3F		
3G	26	Cowl Wire and J/B No.3 (Behind the Instrument Panel Center)
3H		

□ : CONNECTOR JOINING WIRE HARNESS AND WIRE HARNESS

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IF3	44	Engine Room Main Wire and Cowl Wire (Left Kick Panel)

**: GROUND POINTS**

Code	See Page	Ground Points Location
ID	44	Left Kick Panel
IE	44	Around the Right Edge of the Reinforcement
IG	44	Around the Left Edge of the Reinforcement
IH	44	Right Kick Panel

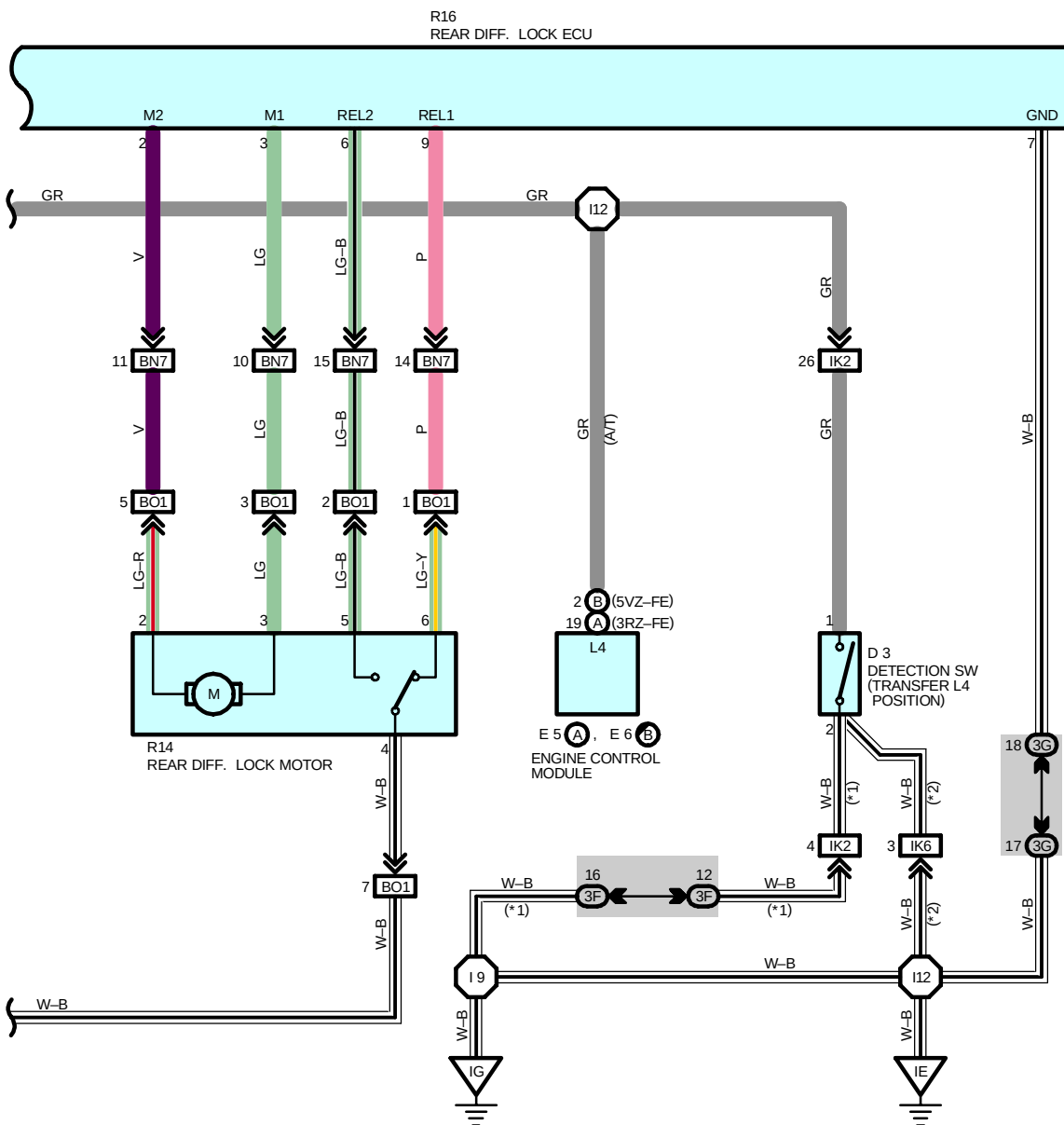
**: SPLICE POINTS**

Code	See Page	Wire Harness with Splice Points	Code	See Page	Wire Harness with Splice Points
I9	44	Cowl Wire			

REAR DIFFERENTIAL LOCK



- * 1 : W/ 2-4 SELECT SW
- * 2 : W/O 2-4 SELECT SW



REAR DIFFERENTIAL LOCK

SYSTEM OUTLINE

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

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

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

The rear diff. lock indicator light flashes when:

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

SERVICE HINTS

R15 REAR DIFF. LOCK SW

5-2 : Closed with the diff. lock SW at **ON** position

R16 REAR DIFF. LOCK ECU

(Disconnected wiring connector from ECU)

- 7-GROUND : Always continuity
- 10-GROUND : Pulse generation with vehicle moving
- 5-GROUND : **9-14** volts with the ignition SW on
- 1-GROUND : About **0** volts with the rear diff. lock indicator light on
: **9-14** volts with the rear diff. lock indicator light off

R14 REAR DIFF. LOCK MOTOR

2-3 : **0.3-100** Ω

○ : PARTS LOCATION

Code	See Page	Code	See Page	Code	See Page
A22	30 (5VZ-FE)	E5	A	35	R14
	32 (3RZ-FE)	E6	B	35	
C10	A	34	F6	35	R15
C13	D	34	J13	35	R16
D3	30 (5VZ-FE)	R13	36 (Double Cab)	V10	31 (5VZ-FE)
	32 (3RZ-FE)		37 (Except Double Cab)		33 (3RZ-FE)

○ : JUNCTION BLOCK AND WIRE HARNESS CONNECTOR

Code	See Page	Junction Block and Wire Harness (Connector Location)
1F	23	Cowl Wire and J/B No.1 (Lower Finish Panel)
1J		
3B	24	Cowl Wire and J/B No.3 (Behind the Instrument Panel Left)
3D		
3F		
3G	26	Cowl Wire and J/B No.3 (Behind the Instrument Panel Center)
3H		
3I		

 : CONNECTOR JOINING WIRE HARNESS AND WIRE HARNESS

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IK2	44	Engine Wire and Cowl Wire (Above the Glove Box)
IK6		
BN7	46 (Double Cab) 48 (Except Double Cab)	Frame Wire and Cowl Wire (Under the Driver's Seat)
BO1	46 (Double Cab) 48 (Except Double Cab)	Frame Wire and Differential No.2 Wire (Rear Side Member LH)

 : GROUND POINTS

Code	See Page	Ground Points Location
ID	44	Left Kick Panel
IE	44	Around the Right Edge of the Reinforcement
IG	44	Around the Left Edge of the Reinforcement

 : SPLICE POINTS

Code	See Page	Wire Harness with Splice Points	Code	See Page	Wire Harness with Splice Points
I9	44	Cowl Wire	B6	46 (Double Cab)	Frame Wire
I12				48 (Except Double Cab)	



SERVICE HINTS

S4 SHIFT LOCK CONTROL RELAY

- 1-GROUND : Approx. **12** volts with the ignition SW at **ACC** or **ON** position
- 3-GROUND : Approx. **12** volts with the ignition SW at **ON** position
- 7-GROUND : Always continuity
- 8-GROUND : Approx. **12** volts with the brake pedal depressed

: PARTS LOCATION

Code	See Page	Code	See Page	Code	See Page
S4	35	S5	35	U1	35

: JUNCTION BLOCK AND WIRE HARNESS CONNECTOR

Code	See Page	Junction Block and Wire Harness (Connector Location)
1F	23	Cowl Wire and J/B No.1 (Lower Finish Panel)
1G		
1H		
3A	24	Cowl Wire and J/B No.3 (Behind the Instrument Panel Left)
3F		
3G	26	Cowl Wire and J/B No.3 (Behind the Instrument Panel Center)

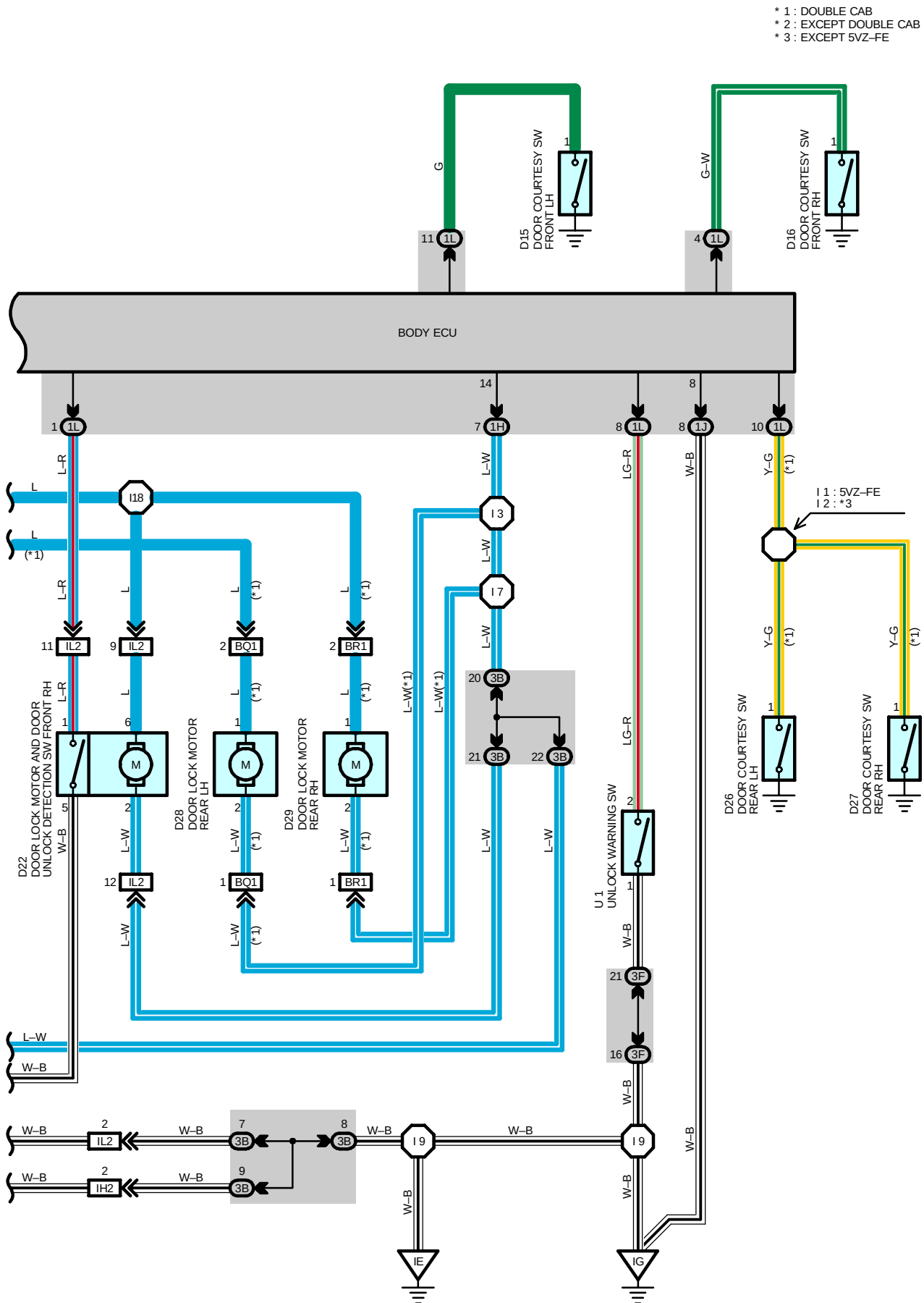
: GROUND POINTS

Code	See Page	Ground Points Location
IE	44	Around the Right Edge of the Reinforcement
IG	44	Around the Left Edge of the Reinforcement

: SPLICE POINTS

Code	See Page	Wire Harness with Splice Points	Code	See Page	Wire Harness with Splice Points
I9	44	Cowl Wire	I12	44	Cowl Wire





DOOR LOCK CONTROL

SYSTEM OUTLINE

Current always flows to TERMINAL 3 of the body ECU through the POWER fuse.

1. MANUAL LOCK OPERATION

To push the door lock control SW or door key lock and unlock SW to LOCK position, a lock signal is input to the body ECU and causes the ECU to function. Current flows from TERMINAL 3 of the ECU to TERMINAL 14 to TERMINALS 3 (Front LH), 2 (Front RH, rear) of the door lock motors to TERMINALS 7 (Front LH), 6 (Front RH), 1 (Rear) to TERMINAL 15 of the ECU to TERMINAL 8 to GROUND and the door lock motor causes the door to lock.

2. MANUAL UNLOCK OPERATION

To push the door lock control SW or door key lock and unlock SW to UNLOCK position, an unlock signal is input to the body ECU and causes the ECU to function. Current flows from TERMINAL 3 of the ECU to TERMINAL 15 to TERMINALS 7 (Front LH), 6 (Front RH), 1 (Rear) of the door lock motors to TERMINALS 3 (Front LH), 2 (Front RH, rear) to TERMINAL 14 of the ECU to TERMINAL 8 to GROUND and the door lock motor causes the door to unlock.

3. IGNITION KEY REMINDER OPERATION

- * Operating door lock knob (in door lock motor operation)

With ignition key in cylinder (Unlock warning SW on), when any door is opened and locked using door lock knob (Door lock motor), all doors are locked once but each door is unlocked soon by the function of the body ECU. As a result, current flows from TERMINAL 3 of the ECU to TERMINAL 15 to TERMINALS 7 (Front LH), 6 (Front RH), 1 (Rear) of the door lock motors to TERMINALS 3 (LH), 2 (Front RH, rear) to TERMINAL 14 of the ECU to TERMINAL 8 to GROUND and causes all the doors to unlock.

- * Operating door lock control SW or door key lock and unlock SW

With ignition key in cylinder (Unlock warning SW on), when any door is opened and locked using the door lock control SW or door key lock and unlock SW, all doors are locked once but each door is unlocked by the function of the SW contained in motor, which inputs the signal to the body ECU. According to this input signal, current flows from TERMINAL 3 of the ECU to TERMINAL 15 to TERMINALS 7 (Front LH), 6 (Front RH), 1 (Rear) of the door lock motors to TERMINALS 3 (Front LH), 2 (Front RH, rear) to TERMINAL 14 of the ECU to TERMINAL 8 to GROUND and causes all the doors to unlock.

SERVICE HINTS

BODY ECU

8-GROUND : Always continuity.

3, 4-GROUND : Always approx. 12 volts

15-GROUND : Approx. 12 volts for 0.2 seconds with following operations.

- * Door lock control SW unlocked.

- * Door lock control SW locked with ignition key in cylinder and LH door open.

(Ignition key reminder function)

- * Door lock knob locked with ignition key in cylinder and LH door open. (Ignition key reminder function)

- * Unlocking the LH, RH door cylinder with key.

14-GROUND : Approx. 12 volts for 0.2 seconds with following operations.

- * Door lock control SW locked.

- * Locking the LH, RH door cylinder with key.

D15, D16, D26, D27 DOOR COURTESY SW FRONT REAR LH, RH

1-GROUND : Closed with door open.

D21, D22 DOOR LOCK MOTOR, DOOR UNLOCK DETECTION SW AND DOOR KEY LOCK AND UNLOCK SW LH, RH

4-8 (LH), 1-5 (RH) : Closed with UNLOCK position.

U1 UNLOCK WARNING SW

2-1 : Closed with key in cylinder.

: PARTS LOCATION

Code	See Page	Code	See Page	Code	See Page
D15	34	D21	37 (Except Double Cab)	D28	36 (Double Cab)
D16	34	D22	36 (Double Cab)	D29	36 (Double Cab)
D20	36 (Double Cab)		37 (Except Double Cab)	P7	A 36 (Double Cab)
	37 (Except Double Cab)	D26	36 (Double Cab)		B 37 (Except Double Cab)
D21	36 (Double Cab)	D27	36 (Double Cab)	U1	35

 : RELAY BLOCKS

Code	See Page	Relay Blocks (Relay Block Location)
2	21	R/B No.2 (Engine Compartment Left)

 : JUNCTION BLOCK AND WIRE HARNESS CONNECTOR

Code	See Page	Junction Block and Wire Harness (Connector Location)
1E	23	Engine Room Main Wire and J/B No.1 (Lower Finish Panel)
1H	23	Cowl Wire and J/B No.1 (Lower Finish Panel)
1J		
1L		
3B	24	Cowl Wire and J/B No.3 (Behind the Instrument Panel Left)
3E		
3F		

 : CONNECTOR JOINING WIRE HARNESS AND WIRE HARNESS

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IH2	44	Front Door LH Wire and Cowl Wire (Left Kick Panel)
IL2	44	Front Door RH Wire and Cowl Wire (Right Kick Panel)
BQ1	46 (Double Cab)	Rear Door No.2 Wire and Cowl Wire (Under the Left Center Pillar)
BR1	46 (Double Cab)	Rear Door No.1 Wire and Cowl Wire (Under the Right Center Pillar)

 : GROUND POINTS

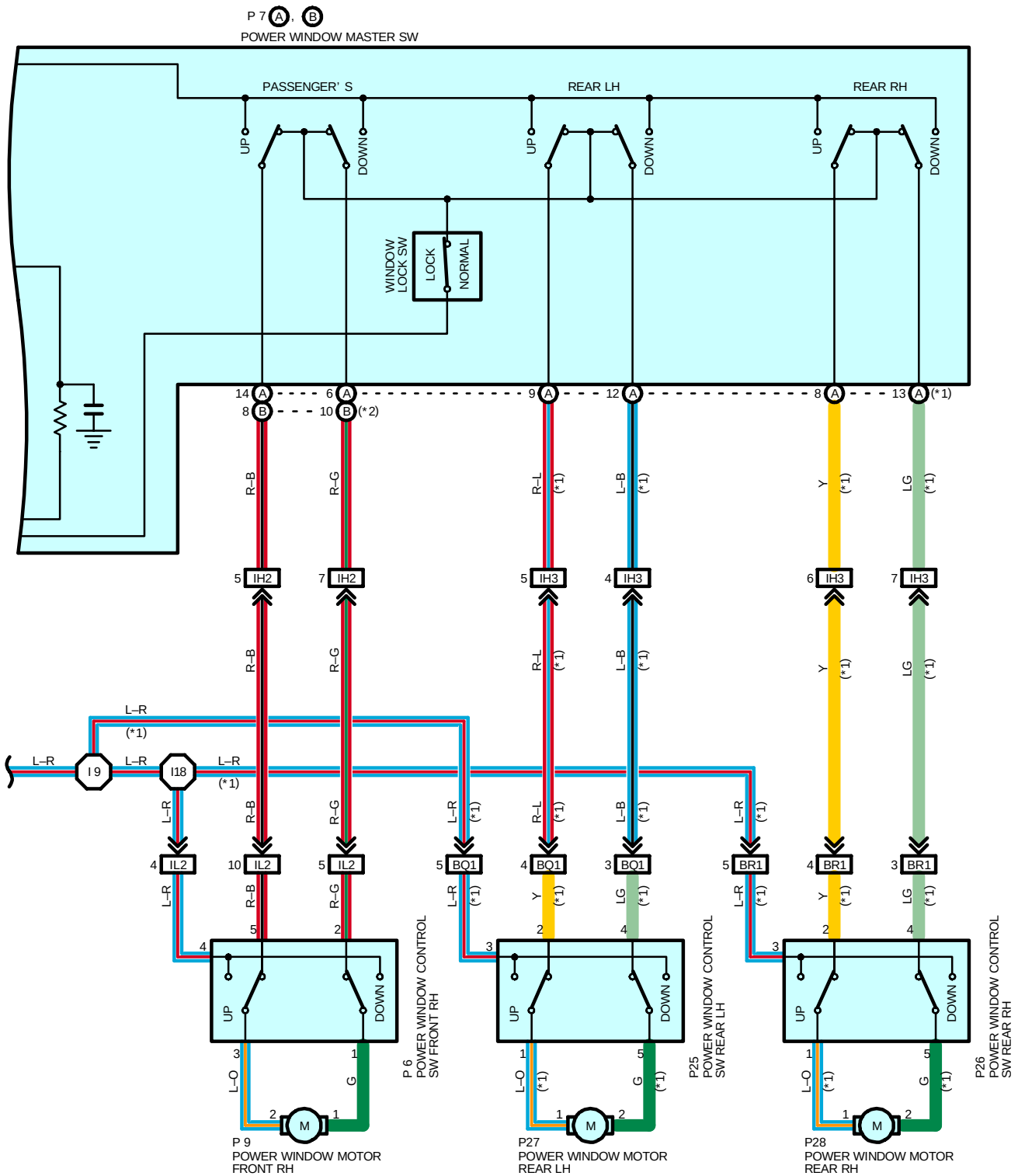
Code	See Page	Ground Points Location
IE	44	Around the Right Edge of the Reinforcement
IG	44	Around the Left Edge of the Reinforcement

 : SPLICE POINTS

Code	See Page	Wire Harness with Splice Points	Code	See Page	Wire Harness with Splice Points
I1	44	Cowl Wire	I18	44	Cowl Wire
I2			B2	46 (Double Cab)	Front Door LH Wire
I3				48 (Except Double Cab)	
I5			B3	46 (Double Cab)	Front Door RH Wire
I7				48 (Except Double Cab)	
I9					



* 1 : DOUBLE CAB
 * 2 : EXCEPT DOUBLE CAB



SYSTEM OUTLINE

With the ignition SW turned on, current flows through the ECU-IG fuse to TERMINAL 10 of the body ECU to TERMINAL 2 to TERMINAL 1 of the PWR relay to TERMINAL 2 to GROUND, activating the PWR relay, and the current flowing from TERMINAL 5 of the PWR relay flows to TERMINAL 3 to TERMINAL (A) 10 (Double cab), (B) 9 (Except double cab) of the power window master SW and TERMINAL 4 (Front RH), 3 (Rear) of the power window control SW.

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) 10 (Double cab), (B) 9 (Except double cab) of the power window master SW flows to TERMINAL (A) 1 (Double cab), (B) 3 (Except double cab) to TERMINAL 1 of the power window motor LH to TERMINAL 2 to TERMINAL (A) 5 (Double cab), (B) 4 (Except double cab) of the master SW to TERMINAL (A) 3 (Double cab), (B) 1 (Except double cab) to GROUND and causes the power window 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) 10 (Double cab), (B) 9 (Except double cab) of the power window master SW to TERMINAL (A) 5 (Double cab), (B) 4 (Except double cab) flows to TERMINAL 2 of the motor LH to TERMINAL 1 to TERMINAL (A) 1 (Double cab), (B) 3 (Except double cab) of the master SW to TERMINAL (A) 3 (Double cab), (B) 1 (Except double 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) 10 (Double cab), (B) 9 (Except double cab) of the master SW flows to TERMINAL (A) 5 (Double cab), (B) 4 (Except double cab) of the master SW to TERMINAL 2 of the power window motor LH to TERMINAL 1 to TERMINAL (A) 1 (Double cab), (B) 3 (Except double cab) of the master SW to TERMINAL (A) 3 (Double cab), (B) 1 (Except double 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) 1 (Double cab), (B) 3 (Except double cab) of the master SW and TERMINAL (A) 3 (Double cab), (B) 1 (Except double cab) increases. As a result, the solenoid stops operating, the auto SW turns off and the flowing from TERMINAL (A) 10 (Double cab), (B) 9 (Except double cab) of the master SW to TERMINAL (A) 5 (Double cab), (B) 4 (Except double 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) 1 (Double cab), (B) 3 (Except double cab) of the master SW to TERMINAL (A) 3 (Double cab), (B) 1 (Except double 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 control SW front RH is pushed to the up side, the current flowing from TERMINAL 4 of the power window control SW front RH flows to TERMINAL 3 to TERMINAL 2 of the power window motor front RH to TERMINAL 1 to TERMINAL 1 of the power window control SW front RH to TERMINAL 2 to TERMINAL (A) 6 (Double cab), (B) 10 (Except double cab) of the master SW to TERMINAL (A) 3 (Double cab), (B) 1 (Except double cab) to GROUND. This causes the power window 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) 3 (Double cab), (B) 1 (Except double 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.

5. MANUAL OPERATION (REAR LH, RH WINDOW) [DOUBLE CAB]

With the power window control SW rear LH, RH pulled to the up side, the current flowing from TERMINAL 3 of the power window control SW flows to TERMINAL 1 to TERMINAL 1 of the power window motor to TERMINAL 2 to TERMINAL 5 of the power window control SW to TERMINAL 4 to TERMINAL (A) 12 (LH) or (A) 13 (RH) of the master SW to TERMINAL (A) 3 (Double cab), (B) 1 (Except double cab) to GROUND and causes the power window 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 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 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) 3 (Double cab), (B) 1 (Except double cab) 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 PWR relay to TERMINAL 2 to GROUND. For this period, current also flows TERMINAL 5 to TERMINAL 3. This current flows to TERMINAL (A) 10 (Double cab), (B) 9 (Except double cab) of the power window master SW and to TERMINAL 4 (Front RH), 3 (Rear) of the power window control SW. As a result, for about 45 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.

SERVICE HINTS

D15, D16 DOOR COURTESY SW FRONT LH, RH

1-GROUND : Continuity with door open

BODY ECU

10-GROUND : Approx. **12** volts with ignition SW at **ON** position

3, 4-GROUND : Always approx. **12** volts

P7 (A), (B) POWER WINDOW MASTER SW

(A) 3, (B) 1-GROUND : Always continuity

(A) 10, (B) 9-GROUND : Approx. **12** volts with ignition SW on and stays at **12** volts for **45** seconds after the ignition SW is turned off, but if a door is opened in this **45** seconds period, voltage will drop to **0** volts

(A) 1, (B) 3-GROUND : Approx. **12** volts with ignition SW at **ON** position and master SW at **UP** position

(A) 5, (B) 4-GROUND : Approx. **12** volts with ignition SW at **ON** position and master SW at **DOWN** or **AUTO DOWN** position

WINDOW LOCK SW

Open with window lock SW at **LOCK** position

: PARTS LOCATION

Code	See Page	Code	See Page	Code	See Page
D15	34	P7	37 (Except Double Cab)	P25	36 (Double Cab)
D16	34	P8	36 (Double Cab)	P26	36 (Double Cab)
P6	36 (Double Cab)		37 (Except Double Cab)	P27	36 (Double Cab)
	37 (Except Double Cab)	P9	36 (Double Cab)	P28	36 (Double Cab)
P7	36 (Double Cab)		37 (Except Double Cab)		

: RELAY BLOCKS

Code	See Page	Relay Blocks (Relay Block Location)
2	21	R/B No.2 (Engine Compartment Left)

: JUNCTION BLOCK AND WIRE HARNESS CONNECTOR

Code	See Page	Junction Block and Wire Harness (Connector Location)
1C	23	Cowl Wire and J/B No.1 (Lower Finish Panel)
1E	23	Engine Room Main Wire and J/B No.1 (Lower Finish Panel)
1J	23	Cowl Wire and J/B No.1 (Lower Finish Panel)
1L	22	
3B	24	Cowl Wire and J/B No.3 (Behind the Instrument Panel Left)

: CONNECTOR JOINING WIRE HARNESS AND WIRE HARNESS

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IH2	44	Front Door LH Wire and Cowl Wire (Left Kick Panel)
IH3		
IL2	44	Front Door RH Wire and Cowl Wire (Right Kick Panel)
BQ1	46 (Double Cab)	Rear Door No.2 Wire and Cowl Wire (Under the Left Center Pillar)
BR1	46 (Double Cab)	Rear Door No.1 Wire and Cowl Wire (Under the Right Center Pillar)

POWER WINDOW



: GROUND POINTS

Code	See Page	Ground Points Location
IE	44	Around the Right Edge of the Reinforcement
IG	44	Around the Left Edge of the Reinforcement

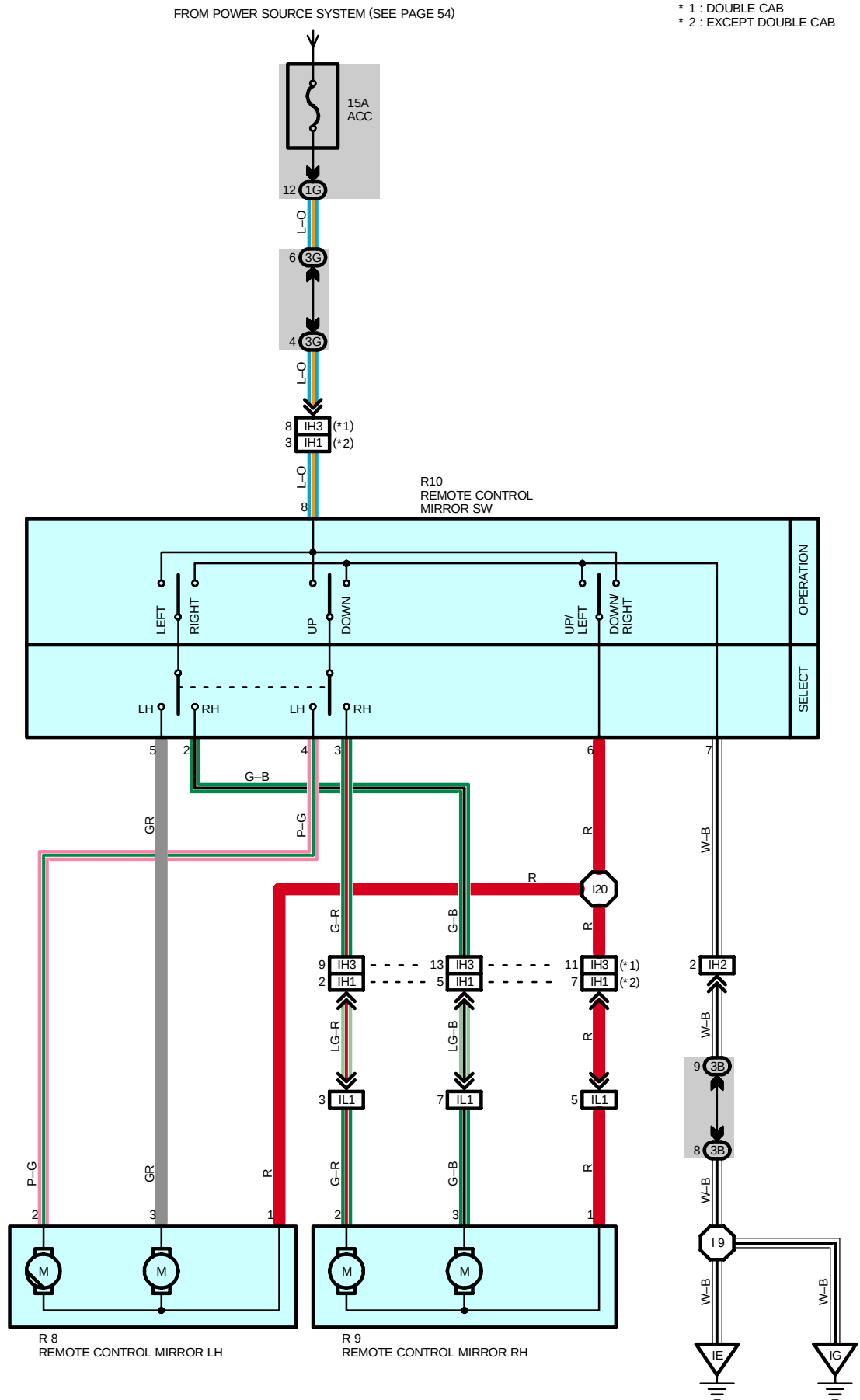


: SPLICE POINTS

Code	See Page	Wire Harness with Splice Points	Code	See Page	Wire Harness with Splice Points
I9	44	Cowl Wire	I18	44	Cowl Wire

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REMOTE CONTROL MIRROR (w/ POWER WINDOW)



SERVICE HINTS

R10 REMOTE CONTROL MIRROR SW

- 8-GROUND : Approx. **12** volts with ignition SW at **ACC** or **ON** position
- 6-7 : Continuity with operation SW at **UP** or **LEFT** position
- 8-6 : Continuity with operation SW at **DOWN** or **RIGHT** position

○ : PARTS LOCATION

Code	See Page	Code	See Page	Code	See Page
R8	36 (Double Cab)	R9	36 (Double Cab)	R10	36 (Double Cab)
	37 (Except Double Cab)		37 (Except Double Cab)		37 (Except Double Cab)

○ : JUNCTION BLOCK AND WIRE HARNESS CONNECTOR

Code	See Page	Junction Block and Wire Harness (Connector Location)
1G	23	Cowl Wire and J/B No.1 (Lower Finish Panel)
3B	24	Cowl Wire and J/B No.3 (Behind the Instrument Panel Left)
3G	26	Cowl Wire and J/B No.3 (Behind the Instrument Panel Center)

□ : CONNECTOR JOINING WIRE HARNESS AND WIRE HARNESS

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IH1	44	Front Door LH Wire and Cowl Wire (Left Kick Panel)
IH2		
IH3		
IL1	44	Front Door RH Wire and Cowl Wire (Right Kick Panel)

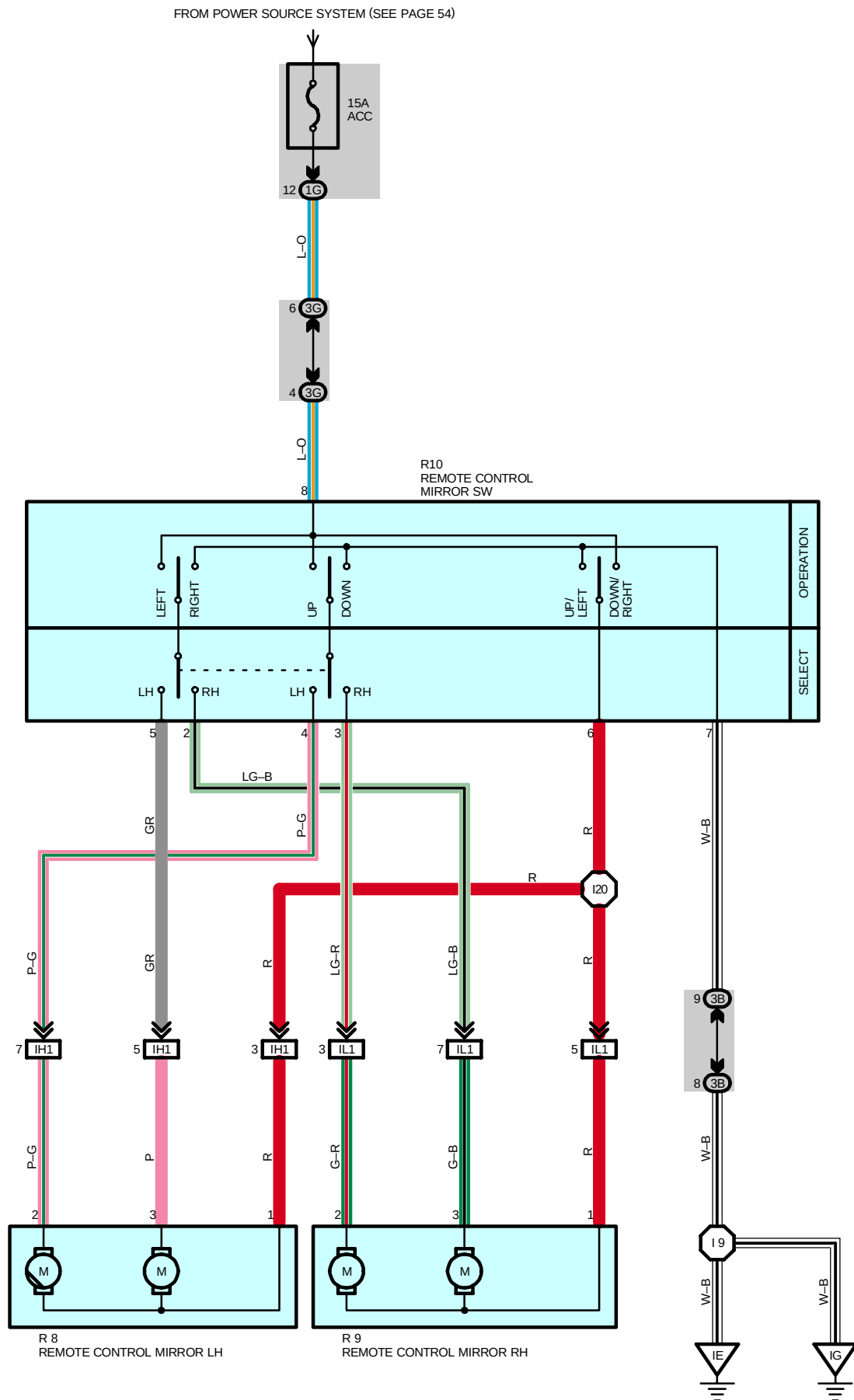
▽ : GROUND POINTS

Code	See Page	Ground Points Location
IE	44	Around the Right Edge of the Reinforcement
IG	44	Around the Left Edge of the Reinforcement

○ : SPLICE POINTS

Code	See Page	Wire Harness with Splice Points	Code	See Page	Wire Harness with Splice Points
I9	44	Cowl Wire	I20	44	Front Door LH Wire

REMOTE CONTROL MIRROR (w/o POWER WINDOW)



SERVICE HINTS

R10 REMOTE CONTROL MIRROR SW

- 8-GROUND : Approx. **12** volts with ignition SW at **ACC** or **ON** position
- 6-7 : Continuity with operation SW at **UP** or **LEFT** position
- 8-6 : Continuity with operation SW at **DOWN** or **RIGHT** position

○ : PARTS LOCATION

Code	See Page	Code	See Page	Code	See Page
R8	36 (Double Cab)	R9	36 (Double Cab)	R10	36 (Double Cab)
	37 (Except Double Cab)		37 (Except Double Cab)		37 (Except Double Cab)

○ : JUNCTION BLOCK AND WIRE HARNESS CONNECTOR

Code	See Page	Junction Block and Wire Harness (Connector Location)
1G	23	Cowl Wire and J/B No.1 (Lower Finish Panel)
3B	24	Cowl Wire and J/B No.3 (Behind the Instrument Panel Left)
3G	26	Cowl Wire and J/B No.3 (Behind the Instrument Panel Center)

□ : CONNECTOR JOINING WIRE HARNESS AND WIRE HARNESS

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IH1	44	Front Door LH Wire and Cowl Wire (Left Kick Panel)
IL1	44	Front Door RH Wire and Cowl Wire (Right Kick Panel)

▽ : GROUND POINTS

Code	See Page	Ground Points Location
IE	44	Around the Right Edge of the Reinforcement
IG	44	Around the Left Edge of the Reinforcement

○ : SPLICE POINTS

Code	See Page	Wire Harness with Splice Points	Code	See Page	Wire Harness with Splice Points
I9	44	Cowl Wire	I20	44	Front Door LH Wire



SYSTEM OUTLINE

With the ignition SW turned on, current flows to TERMINAL 17 of the wiper and washer SW, TERMINAL 2 of the washer motor and TERMINAL 2 of the wiper motor through the WIPER fuse.

1. LOW SPEED POSITION

With wiper SW turned to LOW position, current flows from TERMINAL 17 of the wiper and washer SW to TERMINAL 7 to TERMINAL 5 of the wiper motor to TERMINAL 4 to GROUND and causes the wiper motor to run at low speed.

2. HIGH SPEED POSITION

With wiper SW turned to HIGH position, current flows from TERMINAL 17 of the wiper and washer SW to TERMINAL 8 to TERMINAL 3 of the wiper motor to TERMINAL 4 to GROUND and causes the motor to run at high speed.

3. INT POSITION

With wiper SW turned to INT position, the relay operates and the current which is connected by relay function flows from TERMINAL 17 of the wiper and washer SW to TERMINAL 2 to GROUND. This flowing the intermittent circuit and current flows from TERMINAL 17 of the wiper and washer SW to TERMINAL 7 to TERMINAL 5 of the wiper motor to TERMINAL 4 to GROUND and the wiper functions.

The intermittent operation is controlled by charging and discharging of the condenser installed in the relay and the intermittent time is controlled by a time control SW to change the charging time of the condenser.

4. WASHER CONTINUOUS OPERATION

With the washer SW turned to on, current flows from TERMINAL 2 of the washer motor to TERMINAL 1 to TERMINAL 11 of the wiper and washer SW to TERMINAL 2 to GROUND and causes to the washer motor to run, and the window washer is jetted.

This causes current to flow to washer continuous operation circuit in TERMINAL 17 of the wiper and washer SW to TERMINAL 7 to TERMINAL 5 of the wiper motor to TERMINAL 4 to GROUND and the wiper functions.

SERVICE HINTS

C15 WIPER AND WASHER SW [COMB. SW]

2-GROUND : Always continuity

17-GROUND : Approx. 12 volts with ignition SW at **ON** position

7-GROUND : Approx. 12 volts with wiper and washer SW at **LOW** position

Approx. 12 volts every 3 to 12 seconds intermittently with wiper SW at **INT** position

16-GROUND : Approx. 12 volts with ignition SW on unless wiper motor at **STOP** position

8-GROUND : Approx. 12 volts with ignition SW on and wiper and washer SW at **HIGH** position

11-2 : Continuity with washer SW on

W3 WIPER MOTOR

1-2 : Closed unless wiper motor at **STOP** position

: PARTS LOCATION

Code	See Page	Code	See Page	Code	See Page
C15	34	W1	33 (3RZ-FE, 2RZ-FE)	W3	33 (3RZ-FE, 2RZ-FE)
W1	31 (5VZ-FE)	W3	31 (5VZ-FE)		

: JUNCTION BLOCK AND WIRE HARNESS CONNECTOR

Code	See Page	Junction Block and Wire Harness (Connector Location)
1G	23	Cowl Wire and J/B No.1 (Lower Finish Panel)
3D	24	Cowl Wire and J/B No.3 (Behind the Instrument Panel Left)
3F		

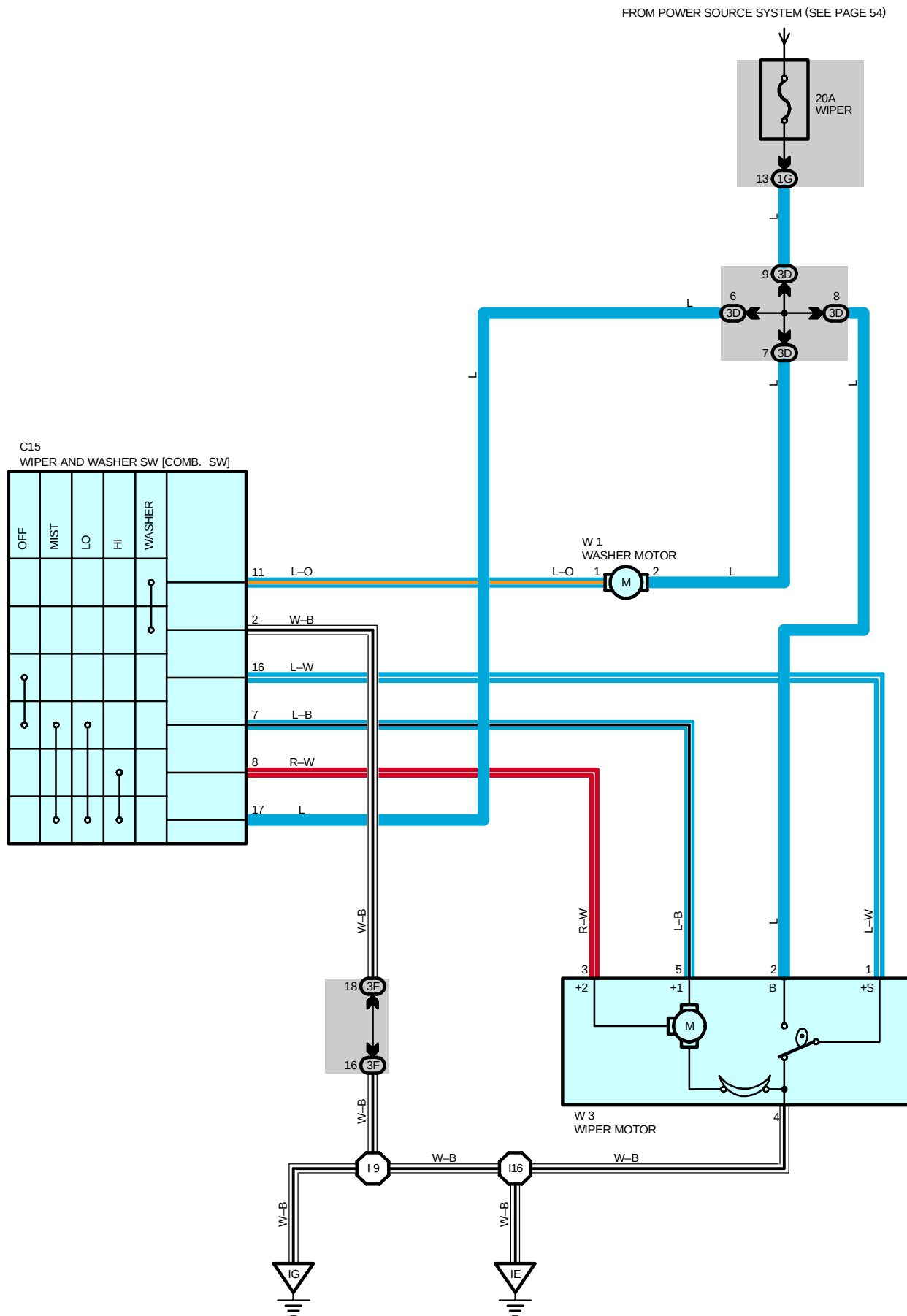
: GROUND POINTS

Code	See Page	Ground Points Location
IE	44	Around the Right Edge of the Reinforcement
IG	44	Around the Left Edge of the Reinforcement

: SPLICE POINTS

Code	See Page	Wire Harness with Splice Points	Code	See Page	Wire Harness with Splice Points
I9	44	Cowl Wire	I16	44	Cowl Wire

WIPER AND WASHER (w/o INT TIME SW MECHANISM)



SYSTEM OUTLINE

With the ignition SW turned on, current flows to TERMINAL 17 of the wiper and washer SW, TERMINAL 2 of the washer motor and TERMINAL 2 of the wiper motor through the WIPER fuse.

1. LOW SPEED POSITION

With wiper SW turned to LOW position, current flows from TERMINAL 17 of the wiper and washer SW to TERMINAL 7 to TERMINAL 5 of the wiper motor to TERMINAL 4 to GROUND and causes the wiper motor to run at low speed.

2. HIGH SPEED POSITION

With wiper SW turned to HIGH position, current flows from TERMINAL 17 of the wiper and washer SW to TERMINAL 8 to TERMINAL 3 of the wiper motor to TERMINAL 4 to GROUND and causes the motor to run at high speed.

3. MIST POSITION

With the wiper SW turned to MIST position, current flows from TERMINAL 17 of the wiper and washer SW to TERMINAL 7 to TERMINAL 5 of the wiper motor to TERMINAL 4 to GROUND and causes the wiper motor to run at low speed.

4. WASHER CONTINUOUS OPERATION

With the washer SW turned to on, current flows from TERMINAL 2 of the washer motor to TERMINAL 1 to TERMINAL 11 of the wiper and washer SW to TERMINAL 2 to GROUND and causes the washer motor to run, and the window washer is jetted.

SERVICE HINTS

C15 WIPER AND WASHER SW [COMB. SW]

2-GROUND : Always continuity

17-GROUND : Approx. **12** volts with ignition SW at **ON** position

7-GROUND : Approx. **12** volts with wiper and washer SW at **LOW** or **MIST** position

16-GROUND : Approx. **12** volts with ignition SW on unless wiper motor at **STOP** position

8-GROUND : Approx. **12** volts with ignition SW on and wiper and washer SW at **HIGH** position

11-2 : Continuity with washer SW on

W3 WIPER MOTOR

1-2 : Closed unless wiper motor at **STOP** position

○ : PARTS LOCATION

Code	See Page	Code	See Page	Code	See Page
C15	34	W1	33 (3RZ-FE, 2RZ-FE)	W3	33 (3RZ-FE, 2RZ-FE)
W1	31 (5VZ-FE)	W3	31 (5VZ-FE)		

○ : JUNCTION BLOCK AND WIRE HARNESS CONNECTOR

Code	See Page	Junction Block and Wire Harness (Connector Location)
1G	23	Cowl Wire and J/B No.1 (Lower Finish Panel)
3D	24	Cowl Wire and J/B No.3 (Behind the Instrument Panel Left)
3F		

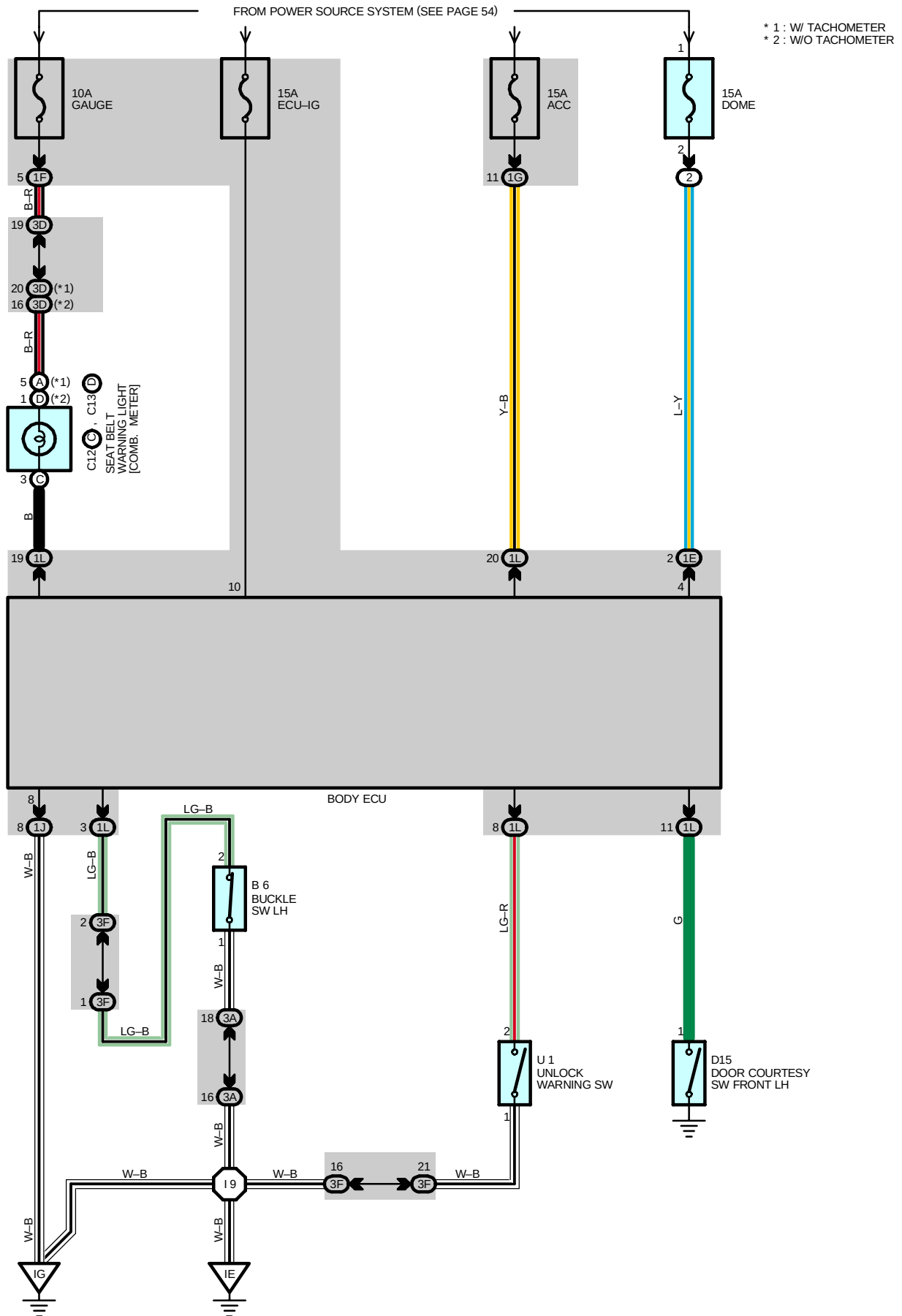
▽ : GROUND POINTS

Code	See Page	Ground Points Location
IE	44	Around the Right Edge of the Reinforcement
IG	44	Around the Left Edge of the Reinforcement

○ : SPLICE POINTS

Code	See Page	Wire Harness with Splice Points	Code	See Page	Wire Harness with Splice Points
I9	44	Cowl Wire	I16	44	Cowl Wire

KEY REMINDER AND SEAT BELT WARNING



SYSTEM OUTLINE

Current always flows to TERMINAL 4 of the body ECU through the DOME fuse.

1. SEAT BELT WARNING SYSTEM

When the ignition SW is turned on, current flows from the ECU-IG fuse to TERMINAL 10 of the body ECU. At the same time, current flows to the ECU from the GAUGE fuse through the seat belt warning light. This current activates the body ECU and, for approx. 4-8 seconds, the current flowing through the warning light flows from ECU to TERMINAL 8 to GROUND, causing the warning light to light up. At the same time as the warning light lights up, a buckle SW LH on signal is input to the body ECU, the current flowing from TERMINAL 4 of the body ECU flows to TERMINAL 8 to GROUND and the seat belt warning buzzer sounds for approx. 4-8 seconds. However, if the seat belt is put on (Buckle SW LH off) during this period (While the buzzer is sounding), a signal input to the body ECU stops and the current flowing from TERMINAL 4 of the body ECU to TERMINAL 8 to GROUND is cut, causing the buzzer to stop.

2. KEY REMINDER SYSTEM

With the ignition key inserted in the key cylinder (Unlock warning SW on), the ignition SW still off and front LH door open (Door courtesy SW on), a signal is input to the body ECU, the body ECU operates and current flows from TERMINAL 10 of the ECU to TERMINAL 8 to GROUND and the key reminder buzzer sounds.

SERVICE HINTS

B6 BUCKLE SW LH

1-2 : Open with driver's seat belt in use

D15 DOOR COURTESY SW FRONT LH

1-GROUND : Closed with LH door open

BODY ECU

10-GROUND : Approx. 12 volts with ignition SW on

4-GROUND : Always approx. 12 volts

8-GROUND : Always continuity

: PARTS LOCATION

Code	See Page	Code	See Page	Code	See Page	
B6	36 (Double Cab)	C12	C	34	D15	34
	37 (Except Double Cab)	C13	D	34	U1	35

: RELAY BLOCKS

Code	See Page	Relay Blocks (Relay Block Location)
2	21	R/B No.2 (Engine Compartment Left)

: JUNCTION BLOCK AND WIRE HARNESS CONNECTOR

Code	See Page	Junction Block and Wire Harness (Connector Location)
1E	23	Engine Room Main Wire and J/B No.1 (Lower Finish Panel)
1F	23	Cowl Wire and J/B No.1 (Lower Finish Panel)
1G		
1J		
1L	22	
3A	24	Cowl Wire and J/B No.3 (Behind the Instrument Panel Left)
3D		
3F		

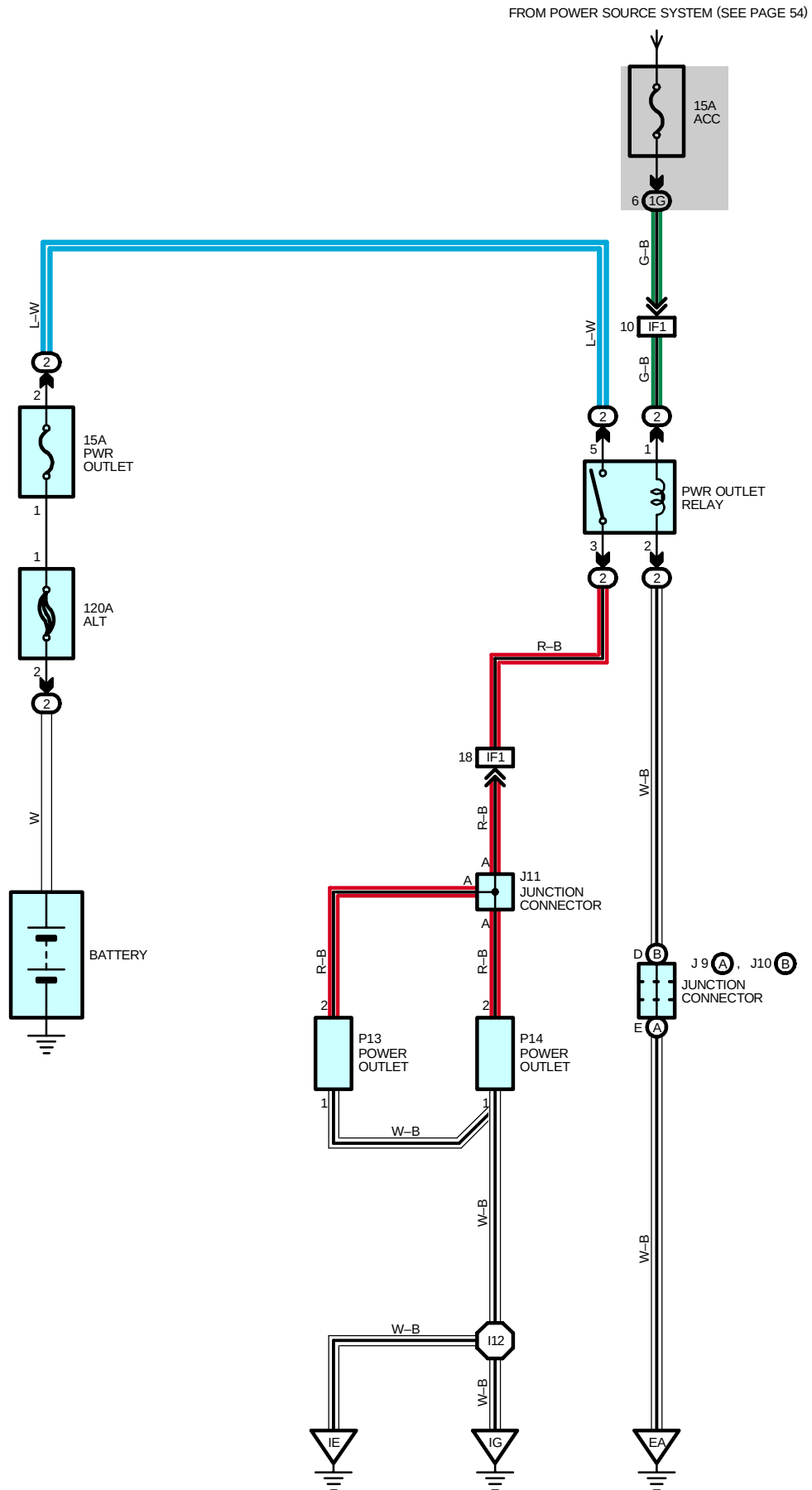
: GROUND POINTS

Code	See Page	Ground Points Location
IE	44	Around the Right Edge of the Reinforcement
IG	44	Around the Left Edge of the Reinforcement

: SPLICE POINTS

Code	See Page	Wire Harness with Splice Points	Code	See Page	Wire Harness with Splice Points
I9	44	Cowl Wire			

POWER OUTLET



SERVICE HINTS

P13, P14 POWER OUTLET

2-GROUND : Approx. **12** volts with the ignition SW at **ACC** or **ON** position

1-GROUND : Always continuity

: PARTS LOCATION

Code		See Page	Code		See Page	Code		See Page
J9	A	31 (5VZ-FE)	J10	B	33 (3RZ-FE, 2RZ-FE)	P14		35
		33 (3RZ-FE, 2RZ-FE)			35			
J10	B	31 (5VZ-FE)	P13		35			

: RELAY BLOCKS

Code	See Page	Relay Blocks (Relay Block Location)
2	21	R/B No.2 (Engine Compartment Left)

: JUNCTION BLOCK AND WIRE HARNESS CONNECTOR

Code	See Page	Junction Block and Wire Harness (Connector Location)
1G	23	Cowl Wire and J/B No.1 (Lower Finish Panel)

: CONNECTOR JOINING WIRE HARNESS AND WIRE HARNESS

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IF1	44	Engine Room Main Wire and Cowl Wire (Left Kick Panel)

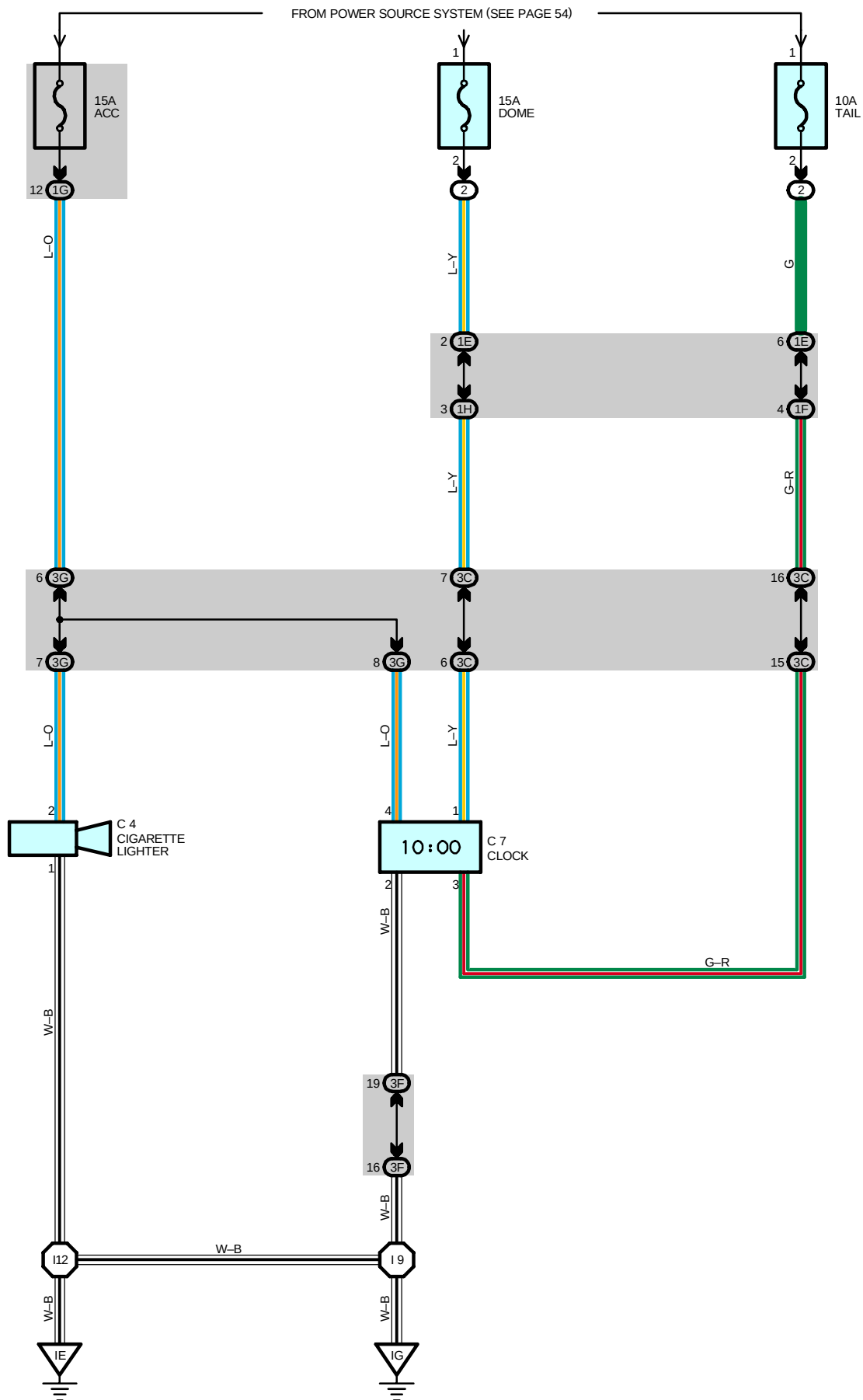
: GROUND POINTS

Code	See Page	Ground Points Location
EA	40 (5VZ-FE)	Front Left Fender
	42 (3RZ-FE, 2RZ-FE)	
IE	44	Around the Right Edge of the Reinforcement
IG	44	Around the Left Edge of the Reinforcement

: SPLICE POINTS

Code	See Page	Wire Harness with Splice Points	Code	See Page	Wire Harness with Splice Points
I12	44	Cowl Wire			

CIGARETTE LIGHTER AND CLOCK



SERVICE HINTS

C4 CIGARETTE LIGHTER

2-GROUND : Approx. **12** volts with ignition SW at **ON** and **ACC** position

1-GROUND : Always continuity

C7 CLOCK

1-GROUND : Always approx. **12** volts (Power for clock)

4-GROUND : Approx. **12** volts with ignition SW at **ON** or **ACC** position (Power for indication)

3-GROUND : Approx. **12** volts with light control SW at **TAIL** or **HEAD** position (Signal of indication)

2-GROUND : Always continuity

○ : PARTS LOCATION

Code	See Page	Code	See Page	Code	See Page
C4	34	C7	34		

○ : RELAY BLOCKS

Code	See Page	Relay Blocks (Relay Block Location)
2	21	R/B No.2 (Engine Compartment Left)

○ : JUNCTION BLOCK AND WIRE HARNESS CONNECTOR

Code	See Page	Junction Block and Wire Harness (Connector Location)
1E	23	Engine Room Main Wire and J/B No.1 (Lower Finish Panel)
1F	23	Cowl Wire and J/B No.1 (Lower Finish Panel)
1G		
1H		
3C	24	Cowl Wire and J/B No.3 (Behind the Instrument Panel Left)
3F		
3G	26	Cowl Wire and J/B No.3 (Behind the Instrument Panel Center)

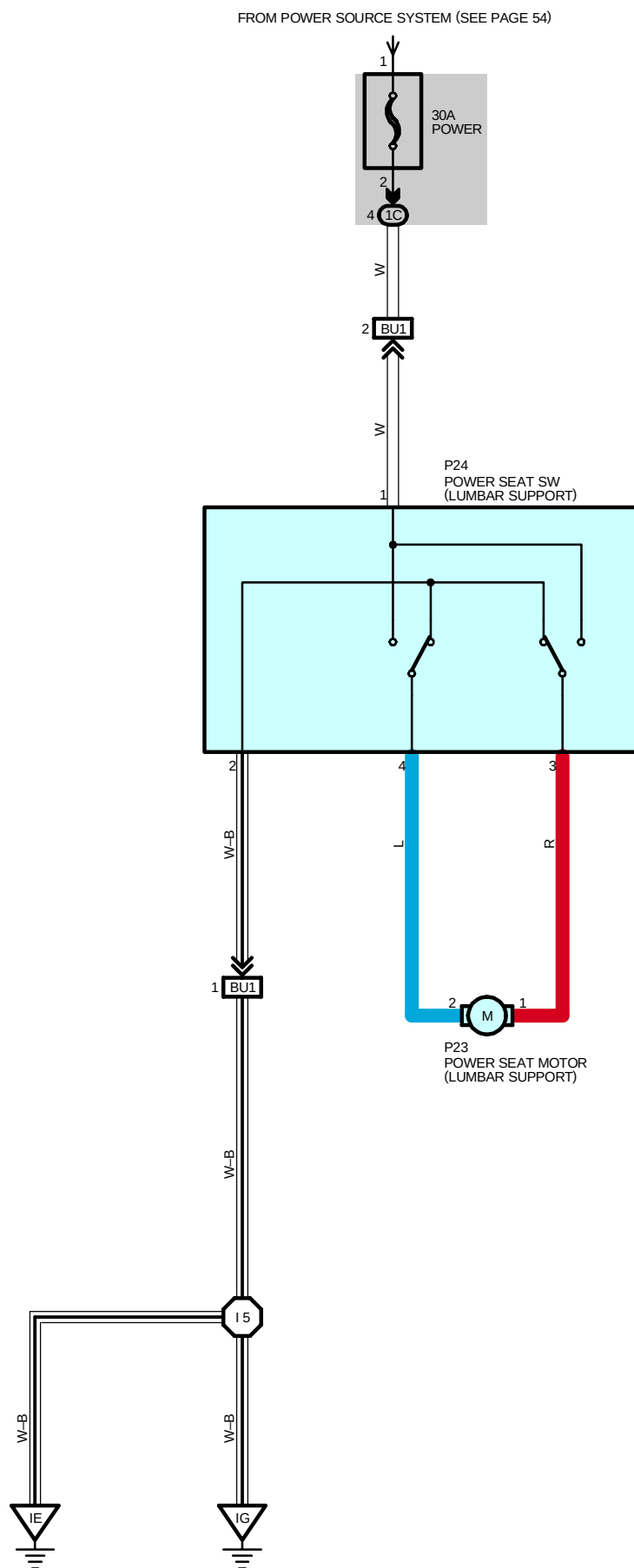
▽ : GROUND POINTS

Code	See Page	Ground Points Location
IE	44	Around the Right Edge of the Reinforcement
IG	44	Around the Left Edge of the Reinforcement

○ : SPLICE POINTS

Code	See Page	Wire Harness with Splice Points	Code	See Page	Wire Harness with Splice Points
I9	44	Cowl Wire	I12	44	Cowl Wire

POWER SEAT



SERVICE HINTS

P24 POWER SEAT SW (LUMBAR SUPPORT)

- 1-GROUND : Always approx. 12 volts
- 2-GROUND : Always continuity

: PARTS LOCATION

Code	See Page	Code	See Page	Code	See Page
P23	38	P24	38		

: JUNCTION BLOCK AND WIRE HARNESS CONNECTOR

Code	See Page	Junction Block and Wire Harness (Connector Location)
1C	23	Cowl Wire and J/B No.1 (Lower Finish Panel)

: CONNECTOR JOINING WIRE HARNESS AND WIRE HARNESS

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
BU1	50	Cowl Wire and Seat No.1 Wire (Under the Driver's Seat)

: GROUND POINTS

Code	See Page	Ground Points Location
IE	44	Around the Right Edge of the Reinforcement
IG	44	Around the Left Edge of the Reinforcement

: SPLICE POINTS

Code	See Page	Wire Harness with Splice Points	Code	See Page	Wire Harness with Splice Points
I5	44	Cowl Wire			



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RADIO AND PLAYER

SERVICE HINTS

R1 (A) RADIO AND PLAYER

- (A) 3-GROUND : Approx. **12** volts with ignition SW at **ON** or **ACC** position
 (A) 4-GROUND : Always approx. **12** volts
 (A) 7-GROUND : Always continuity

○ : PARTS LOCATION

Code	See Page	Code	See Page	Code	See Page
R1	A	35	S7	37 (Except Double Cab)	T5
R2	B	35	S8	36 (Double Cab)	37 (Except Double Cab)
S6		36 (Double Cab)	37 (Except Double Cab)	T6	36 (Double Cab)
		37 (Except Double Cab)	S9	36 (Double Cab)	37 (Except Double Cab)
S7		36 (Double Cab)		37 (Except Double Cab)	

○ : RELAY BLOCKS

Code	See Page	Relay Blocks (Relay Block Location)
2	21	R/B No.2 (Engine Compartment Left)

○ : JUNCTION BLOCK AND WIRE HARNESS CONNECTOR

Code	See Page	Junction Block and Wire Harness (Connector Location)
1E	23	Engine Room Main Wire and J/B No.1 (Lower Finish Panel)
1G	23	Cowl Wire and J/B No.1 (Lower Finish Panel)
1H		
3C	24	Cowl Wire and J/B No.3 (Behind the Instrument Panel Left)

□ : CONNECTOR JOINING WIRE HARNESS AND WIRE HARNESS

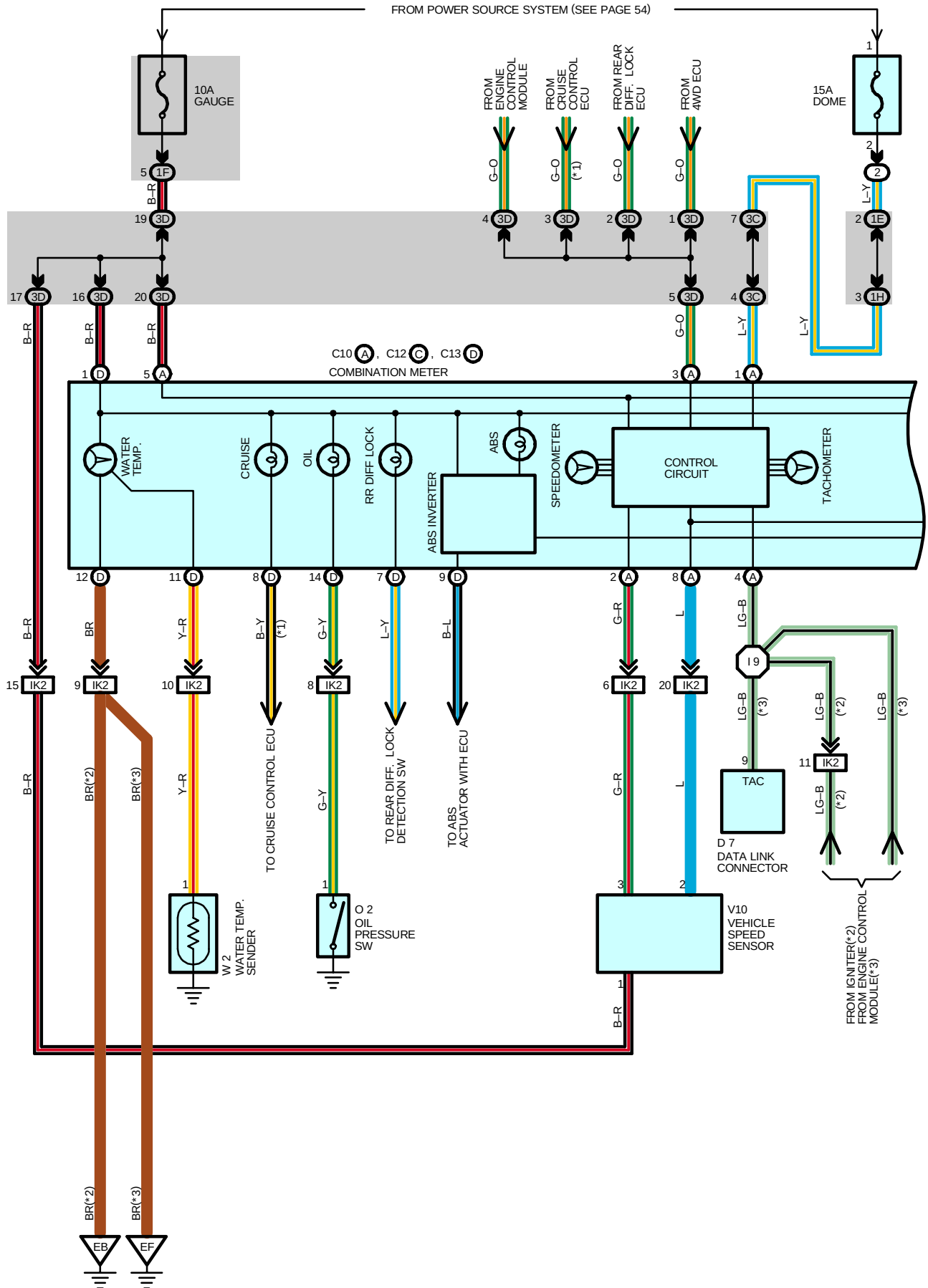
Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IH1	44	Front Door LH Wire and Cowl Wire (Left Kick Panel)
IH3		
IL1	44	Front Door RH Wire and Cowl Wire (Right Kick Panel)
BQ1	46 (Double Cab)	Rear Door No.2 Wire and Cowl Wire (Under the Left Center Pillar)
BQ2		
BR1	46 (Double Cab)	Rear Door No.1 Wire and Cowl Wire (Under the Right Center Pillar)
BR2		
BS1	48 (Except Double Cab)	Rear Speaker LH Wire and Cowl Wire (Under the Left Center Pillar)
BT1	48 (Except Double Cab)	Rear Speaker RH Wire and Cowl Wire (Under the Right Center Pillar)

▽ : GROUND POINTS

Code	See Page	Ground Points Location
IH	44	Right Kick Panel

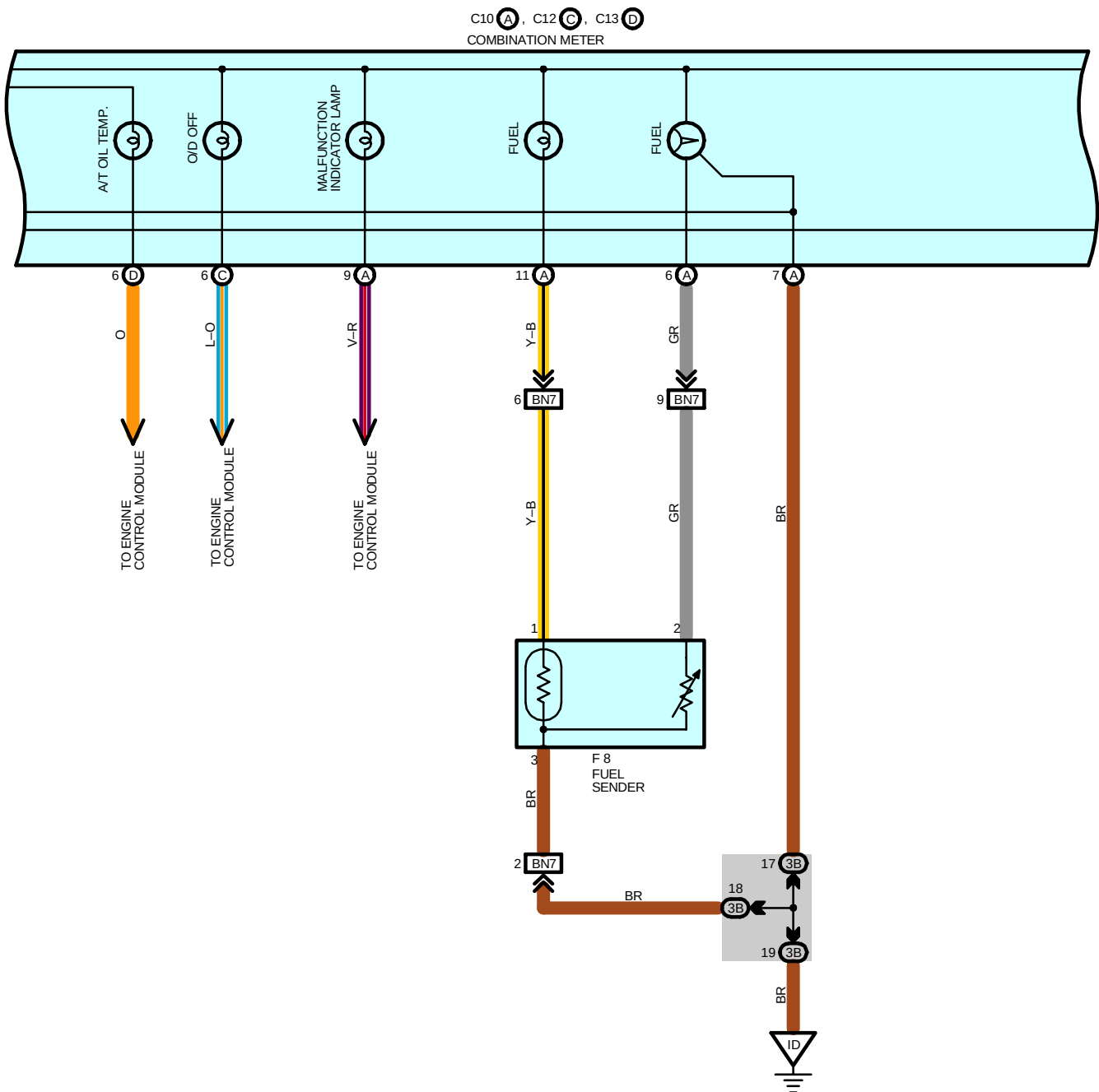
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COMBINATION METER (w/ TACHOMETER)

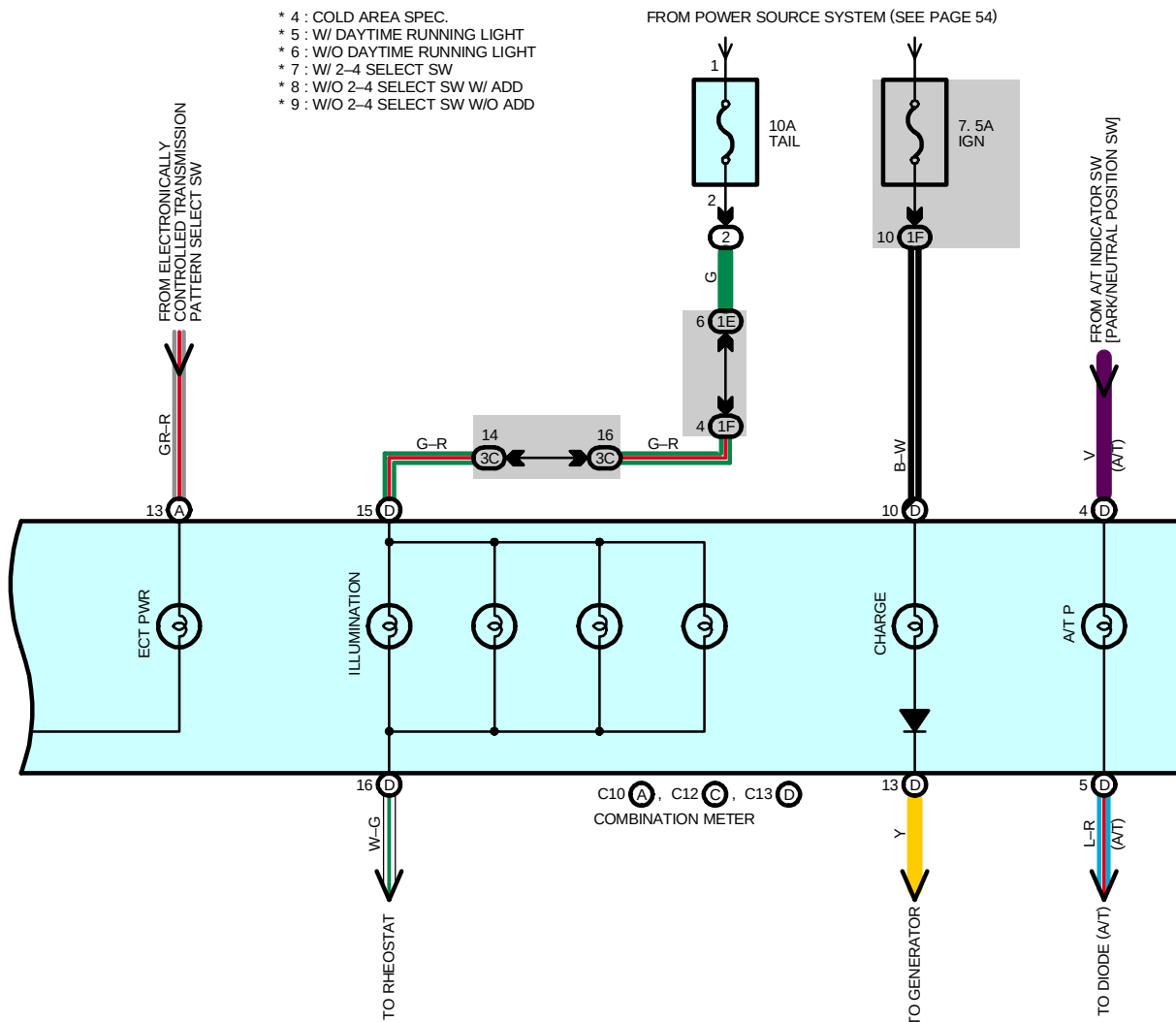


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- * 1 : W/ CRUISE CONTROL
- * 2 : 5VZ-FE
- * 3 : 3RZ-FE, 2RZ-FE







COMBINATION METER (w/ TACHOMETER)

SERVICE HINTS

B2 BRAKE FLUID LEVEL WARNING SW

1-2 : Closed with float down

C10 (A), C12 (C), C13 (D) COMBINATION METER

(A) 5, (D)1-GROUND : Approx. 12 volts with ignition SW on

(A) 7, (C) 1, (D)12-GROUND : Always continuity

P4 PARKING BRAKE SW

1-2 : Closed with parking brake lever pulled up

○ : PARTS LOCATION

Code	See Page	Code	See Page	Code	See Page
B2	30 (5VZ-FE)	F8	37 (Except Double Cab)	V10	31 (5VZ-FE)
	32 (3RZ-FE, 2RZ-FE)	J9	31 (5VZ-FE)		33 (3RZ-FE, 2RZ-FE)
C10	A 34		33 (3RZ-FE, 2RZ-FE)	W1	31 (5VZ-FE)
C12	C 34	J10	31 (5VZ-FE)		33 (3RZ-FE, 2RZ-FE)
C13	D 34		33 (3RZ-FE, 2RZ-FE)	W2	31 (5VZ-FE)
D7	34	O2	31 (5VZ-FE)		33 (3RZ-FE, 2RZ-FE)
D8	34		33 (3RZ-FE, 2RZ-FE)		
F8	36 (Double Cab)	P4	35		

○ : RELAY BLOCKS

Code	See Page	Relay Blocks (Relay Block Location)
2	21	R/B No.2 (Engine Compartment Left)

○ : JUNCTION BLOCK AND WIRE HARNESS CONNECTOR

Code	See Page	Junction Block and Wire Harness (Connector Location)
1D	23	Cowl Wire and J/B No.1 (Lower Finish Panel)
1E	23	Engine Room Main Wire and J/B No.1 (Lower Finish Panel)
1F	23	Cowl Wire and J/B No.1 (Lower Finish Panel)
1H		
3A	24	Cowl Wire and J/B No.3 (Behind the Instrument Panel Left)
3B		
3C		
3D		
3F		
3G	26	Cowl Wire and J/B No.3 (Behind the Instrument Panel Center)

□ : CONNECTOR JOINING WIRE HARNESS AND WIRE HARNESS

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IK2	44	Engine Wire and Cowl Wire (Above the Glove Box)
BN7	46 (Double Cab)	Frame Wire and Cowl Wire (Under the Driver's Seat)
	48 (Except Double Cab)	

▽ : GROUND POINTS

Code	See Page	Ground Points Location
EA	40 (5VZ-FE)	Front Left Fender
	42 (3RZ-FE, 2RZ-FE)	
EB	40 (5VZ-FE)	Near the Throttle Body
EF	42 (3RZ-FE, 2RZ-FE)	Ignition Coil Bracket
ID	44	Left Kick Panel
IE	44	Around the Right Edge of the Reinforcement
IG	44	Around the Left Edge of the Reinforcement

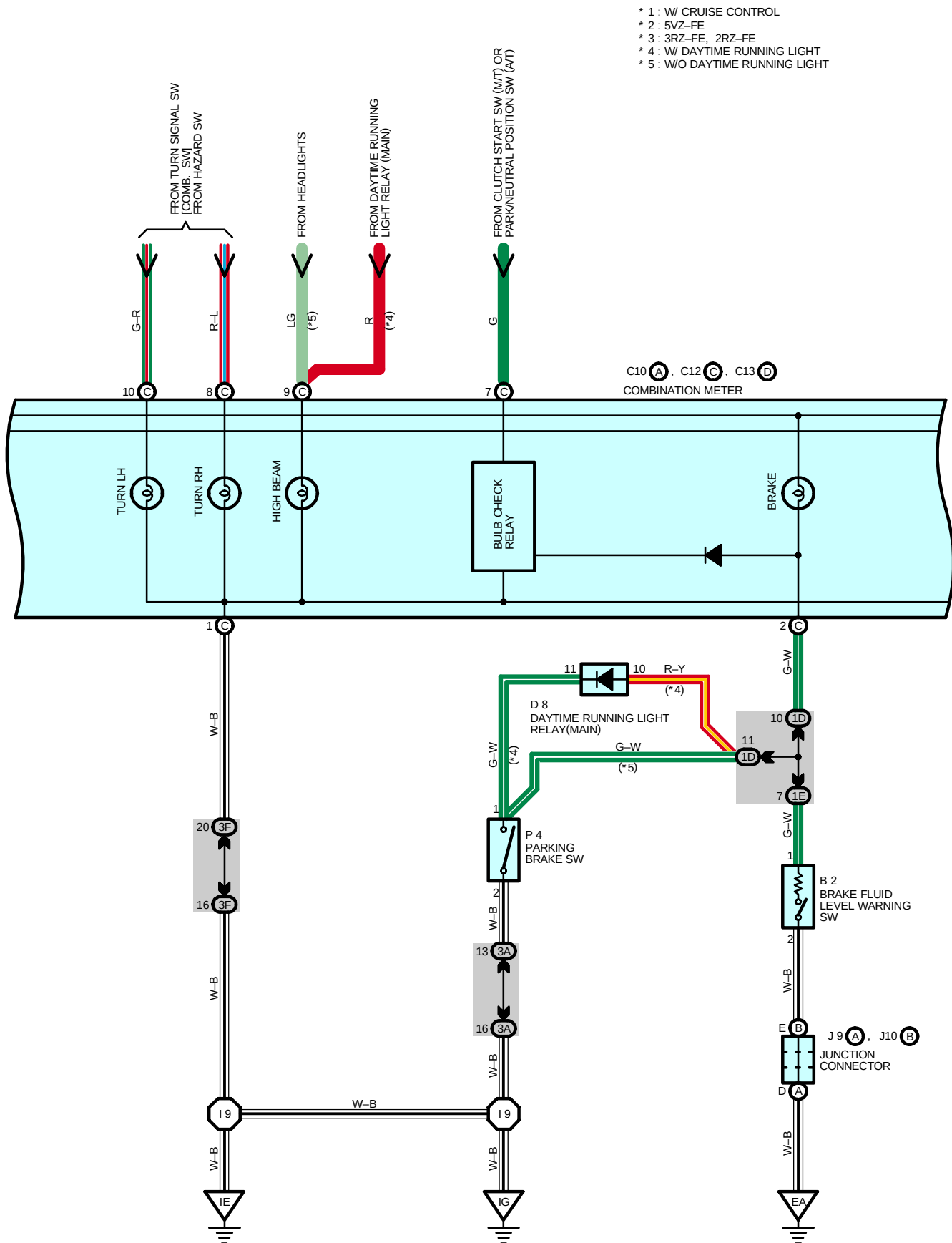


: SPLICE POINTS

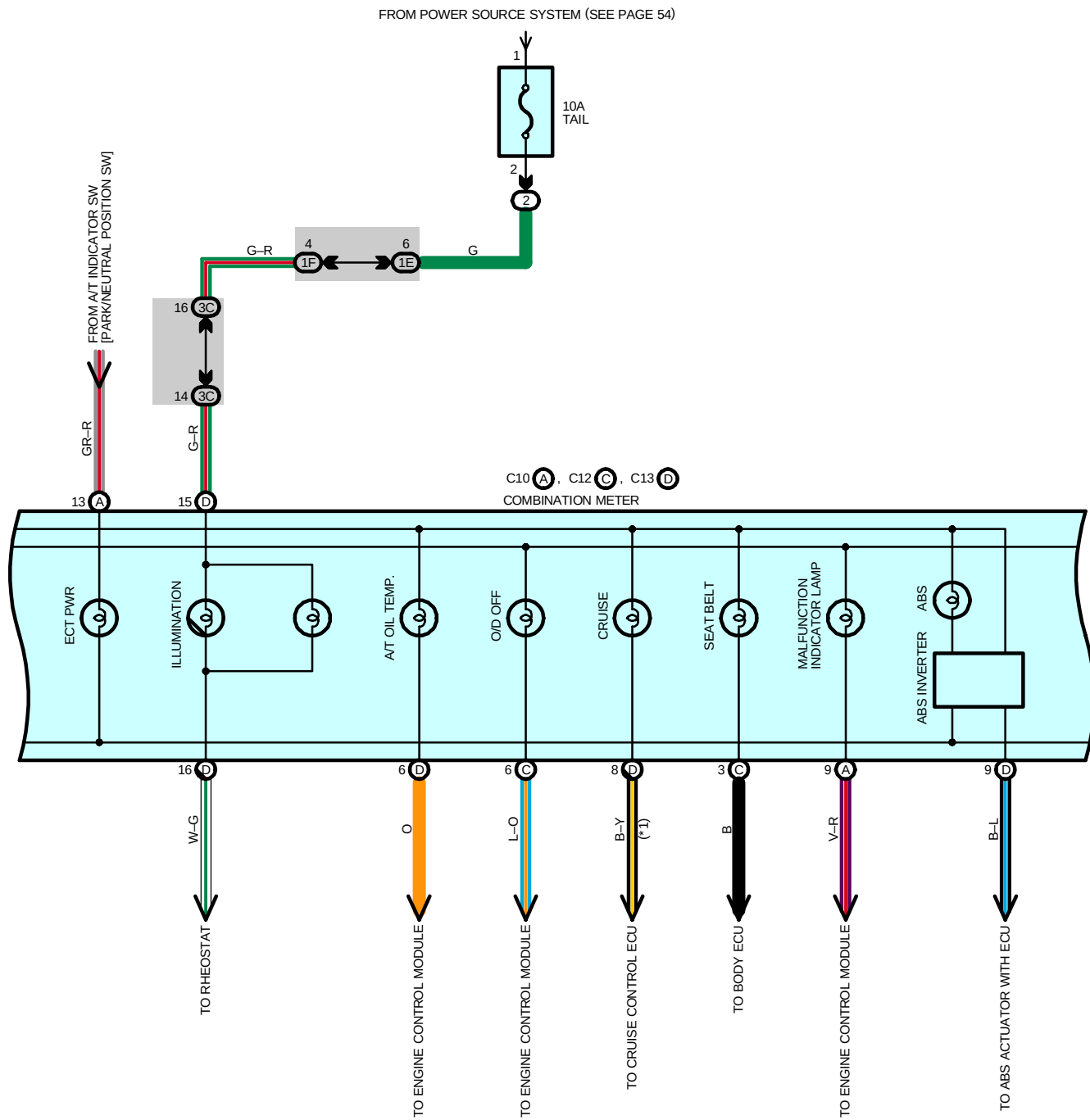
Code	See Page	Wire Harness with Splice Points	Code	See Page	Wire Harness with Splice Points
I9	44	Cowl Wire	I12	44	Cowl Wire

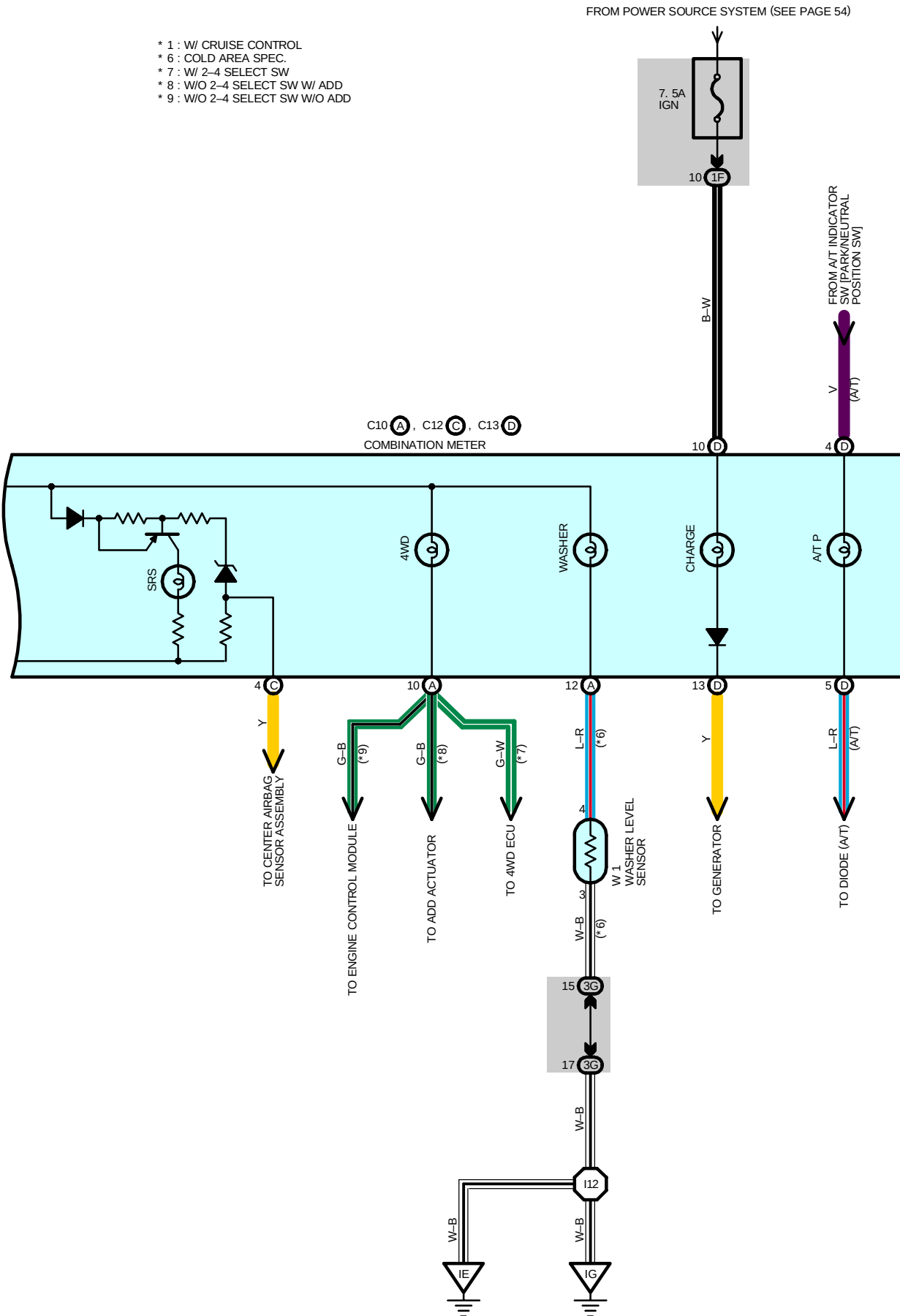
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COMBINATION METER (w/o TACHOMETER)





COMBINATION METER (w/o TACHOMETER)

SERVICE HINTS

B2 BRAKE FLUID LEVEL WARNING SW

1-2 : Closed with float down

C10 (A), C12 (C), C13 (D) COMBINATION METER

(A) 5, (D)1-GROUND : Approx. 12 volts with ignition SW on

(A) 7, (C) 1, (D)12-GROUND : Always continuity

P4 PARKING BRAKE SW

1-2 : Closed with parking brake lever pulled up

○ : PARTS LOCATION

Code	See Page	Code	See Page	Code	See Page
B2	30 (5VZ-FE)	F8	37 (Except Double Cab)	P4	35
	32 (3RZ-FE, 2RZ-FE)	J9	A	V10	31 (5VZ-FE)
C10	A 34				33 (3RZ-FE, 2RZ-FE)
C12	C 34	J10	B	W1	31 (5VZ-FE)
C13	D 34				33 (3RZ-FE, 2RZ-FE)
D8	34	O2		W2	31 (5VZ-FE)
F8	36 (Double Cab)				33 (3RZ-FE, 2RZ-FE)

○ : RELAY BLOCKS

Code	See Page	Relay Blocks (Relay Block Location)
2	21	R/B No.2 (Engine Compartment Left)

○ : JUNCTION BLOCK AND WIRE HARNESS CONNECTOR

Code	See Page	Junction Block and Wire Harness (Connector Location)
1D	23	Cowl Wire and J/B No.1 (Lower Finish Panel)
1E	23	Engine Room Main Wire and J/B No.1 (Lower Finish Panel)
1F	23	Cowl Wire and J/B No.1 (Lower Finish Panel)
3A	24	Cowl Wire and J/B No.3 (Behind the Instrument Panel Left)
3B		
3C		
3D		
3F		
3G	26	Cowl Wire and J/B No.3 (Behind the Instrument Panel Center)

□ : CONNECTOR JOINING WIRE HARNESS AND WIRE HARNESS

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IK2	44	Engine Wire and Cowl Wire (Above the Glove Box)
BN7	46 (Double Cab)	Frame Wire and Cowl Wire (Under the Driver's Seat)
	48 (Except Double Cab)	

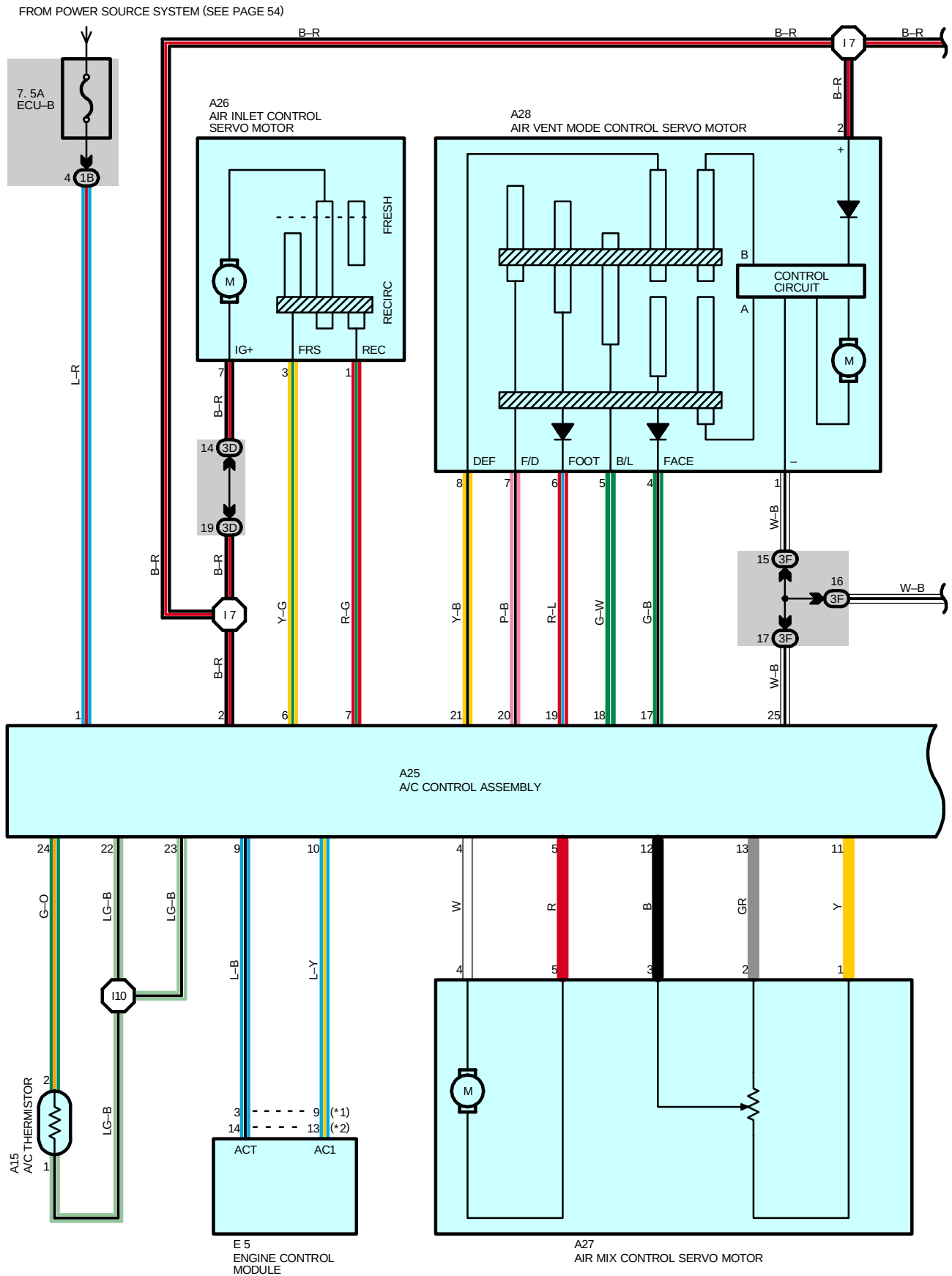
▽ : GROUND POINTS

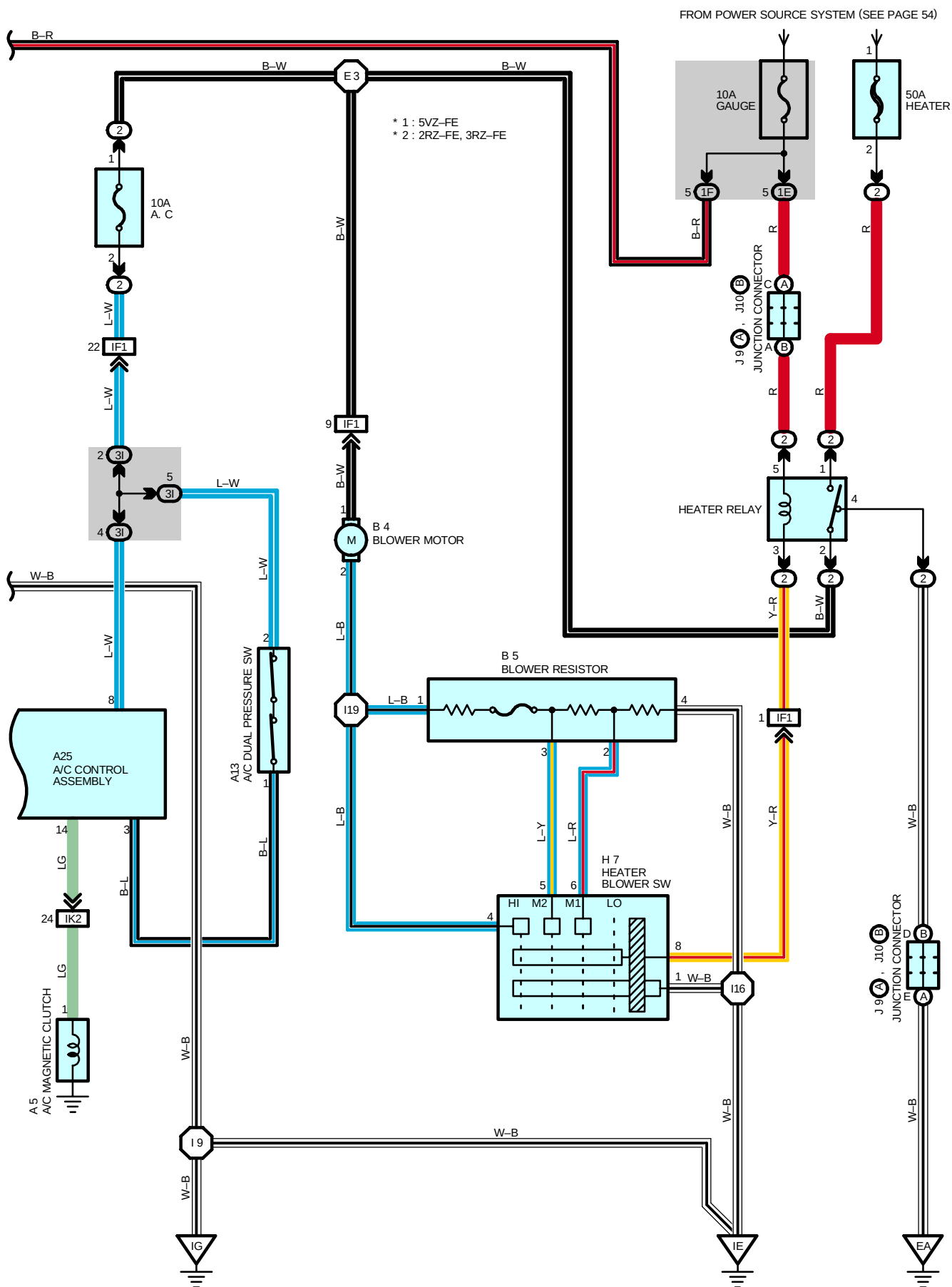
Code	See Page	Ground Points Location
EA	40 (5VZ-FE)	Front Left Fender
	42 (3RZ-FE, 2RZ-FE)	
EB	40 (5VZ-FE)	Near the Throttle Body
EF	42 (3RZ-FE, 2RZ-FE)	Ignition Coil Bracket
ID	44	Left Kick Panel
IE	44	Around the Right Edge of the Reinforcement
IG	44	Around the Left Edge of the Reinforcement



: SPLICE POINTS

Code	See Page	Wire Harness with Splice Points	Code	See Page	Wire Harness with Splice Points
I9	44	Cowl Wire	I12	44	Cowl Wire





SYSTEM OUTLINE

1. HEATER BLOWER MOTOR OPERATION

With the ignition SW on, the current from the GAUGE fuse flows to TERMINAL 5 of the HEATER relay to TERMINAL 3 to TERMINAL 8 of the heater blower SW.

(Low speed operation)

When the heater blower SW is moved to the low speed position, the current applied to TERMINAL 8 of the heater blower SW flows from TERMINAL 1 to GROUND, causing the HEATER relay to come on. Then the current flowing from the HEATER fuse flows to TERMINAL 1 of the HEATER relay to TERMINAL 2 to TERMINAL 1 of the blower motor to TERMINAL 2 to TERMINAL 1 of the blower resistor to TERMINAL 4 to GROUND, causing the blower motor to rotate.

At this time, current flows against the full resistance of the blower resistor, so the motor rotates slowly at low speed.

(Operation at speed M1, M2)

When the heater blower SW is moved to the speed M1 position, the current applied to TERMINAL 8 of the heater blower SW flows to TERMINAL 1 to GROUND, turning the HEATER relay to on. Then, the same as with low speed, current passes from the blower motor to TERMINAL 1 of the blower resistor to TERMINAL 2 to TERMINAL 6 of the heater blower SW to TERMINAL 1 to GROUND. At this time, the resistance of the blower resistor is less than it is for low speed, so the blower motor rotates faster than it does at low speed. With the heater blower SW in the M2 position, current flowing through the motor flows from TERMINAL 1 of the blower resistor to TERMINAL 3 to TERMINAL 5 of the heater blower SW to TERMINAL 1 to GROUND. At this time, the resistance of the blower resistor is less than for speed M1, so the blower motor rotates faster than for speed M1.

(High speed operation)

With the heater blower SW in high speed position, until the HEATER relay comes on and current flows to the blower motor, operation is the same as for speed M1 and M2. The current passing through the blower motor flows to TERMINAL 4 of the heater blower SW to TERMINAL 1 to GROUND without flowing through the blower resistor, so that the blower motor rotates at the fastest speed, high speed.

2. AIR INLET CONTROL SERVO MOTOR OPERATION

(Switching from FRESH to RECIRC)

With the ignition SW turned on, the current flows from GAUGE fuse to TERMINAL 7 of the air inlet control servo motor to TERMINAL 3 to TERMINAL 6 of the A/C control assembly to TERMINAL 25 to GROUND, the motor rotates and the damper moves to the RECIRC side. When the damper operates with the A/C SW at RECIRC position, the damper position signal is input from TERMINAL 1 of the servo motor to TERMINAL 7 of the A/C control assembly. As a result, current to the servo motor circuit is cut off by the A/C control assembly, so the damper stops at that position.

(Switching from RECIRC to FRESH)

With the ignition SW turned on, when the RECIRC/FRESH SW is switched to the FRESH side, the current flows from TERMINAL 7 of the air inlet control servo motor to TERMINAL 3 to TERMINAL 6 of the A/C control assembly to TERMINAL 25 to GROUND, the motor rotates and the damper stops at that position.

3. AIR VENT MODE CONTROL SERVO MOTOR OPERATION

When the ignition SW turned on, the current flows from GAUGE fuse to TERMINAL 2 of the A/C control assembly.

(Switching from DEF to FACE)

The current flows from TERMINAL 17 of the A/C control assembly to TERMINAL 4 of the air vent mode control servo motor to TERMINAL 8 to TERMINAL 21 of the A/C control assembly to TERMINAL 25 to GROUND. The motor rotates and the damper moves to the FACE side. When the damper operates with the A/C SW at FACE position, the damper position signal is input from TERMINAL 8 of the servo motor to the TERMINAL 21 of the A/C control assembly. As a result, current to the servo motor circuit is cut off by the A/C control assembly, so the damper stops at that position.

(Switching from FACE to DEF)

The current flows from TERMINAL 21 of the A/C control assembly to TERMINAL 8 of the air vent control servo motor to TERMINAL 4 to TERMINAL 17 of the A/C control assembly to TERMINAL 25 to GROUND, the motor rotates and the damper stops at that position.

4. AIR MIX CONTROL SERVO MOTOR CONTROL

When the temperature control SW is pressed, the A/C control assembly sends a signal to the air mix control servo motor. This signal drives the motor to reach the temperature set by the temperature control SW, and moves the film damper.

5. AIR CONDITIONING OPERATION

When the blower SW is set to on, current from the HEATER fuse flows through the HEATER relay (Point side) to A.C fuse to TERMINAL 2 of the A/C dual pressure SW to TERMINAL 1 to TERMINAL 3 of the A/C control assembly. The evaporator temp. signal from the A/C thermistor are all supplied to the A/C control assembly. When the A/C SW is turned on, the A/C SW on signal is sent to activate the A/C control assembly. Current flows from the A/C control assembly to the magnetic clutch, turning the compressor on. The A/C operation is shut off when a signal indicating low evaporator temp., or abnormally high or low refrigerant pressure, is supplied while the engine high speed signal exists. When one of these signals is received, the assembly shuts off the A/C operation.

SERVICE HINTS

HEATER RELAY

1-2 : Closed with ignition SW on and blower SW on.

A13 A/C DUAL PRESSURE SW

1-2 : Open with refrigerant pressure at less than approx. **2.0 kgf/cm² (28.4 psi, 196 kpa)** or more than approx. **32 kgf/cm² (455 psi, 3138 kpa)**.

○ : PARTS LOCATION

Code	See Page	Code	See Page	Code	See Page
A5	30 (5VZ-FE)	A27	34	J9	A
	32 (3RZ-FE, 2RZ-FE)	A28	34		
A13	34	B4	34	J10	B
A15	34	B5	34		
A25	34	E5	35		
A26	34	H7	35		

○ : RELAY BLOCKS

Code	See Page	Relay Blocks (Relay Block Location)
2	21	R/B No.2 (Engine Compartment Left)

○ : JUNCTION BLOCK AND WIRE HARNESS CONNECTOR

Code	See Page	Junction Block and Wire Harness (Connector Location)
1B	23	Cowl Wire and J/B No.1 (Lower Finish Panel)
1E	23	Engine Room Main Wire and J/B No.1 (Lower Finish Panel)
1F	23	Cowl Wire and J/B No.1 (Lower Finish Panel)
3D	24	Cowl Wire and J/B No.3 (Behind the Instrument Panel Left)
3F		
3I	26	Cowl Wire and J/B No.3 (Behind the Instrument Panel Center)

□ : CONNECTOR JOINING WIRE HARNESS AND WIRE HARNESS

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IF1	44	Engine Room Main Wire and Cowl Wire (Left Kick Panel)
IK2	44	Engine Wire and Cowl Wire (Above the Glove Box)

▽ : GROUND POINTS

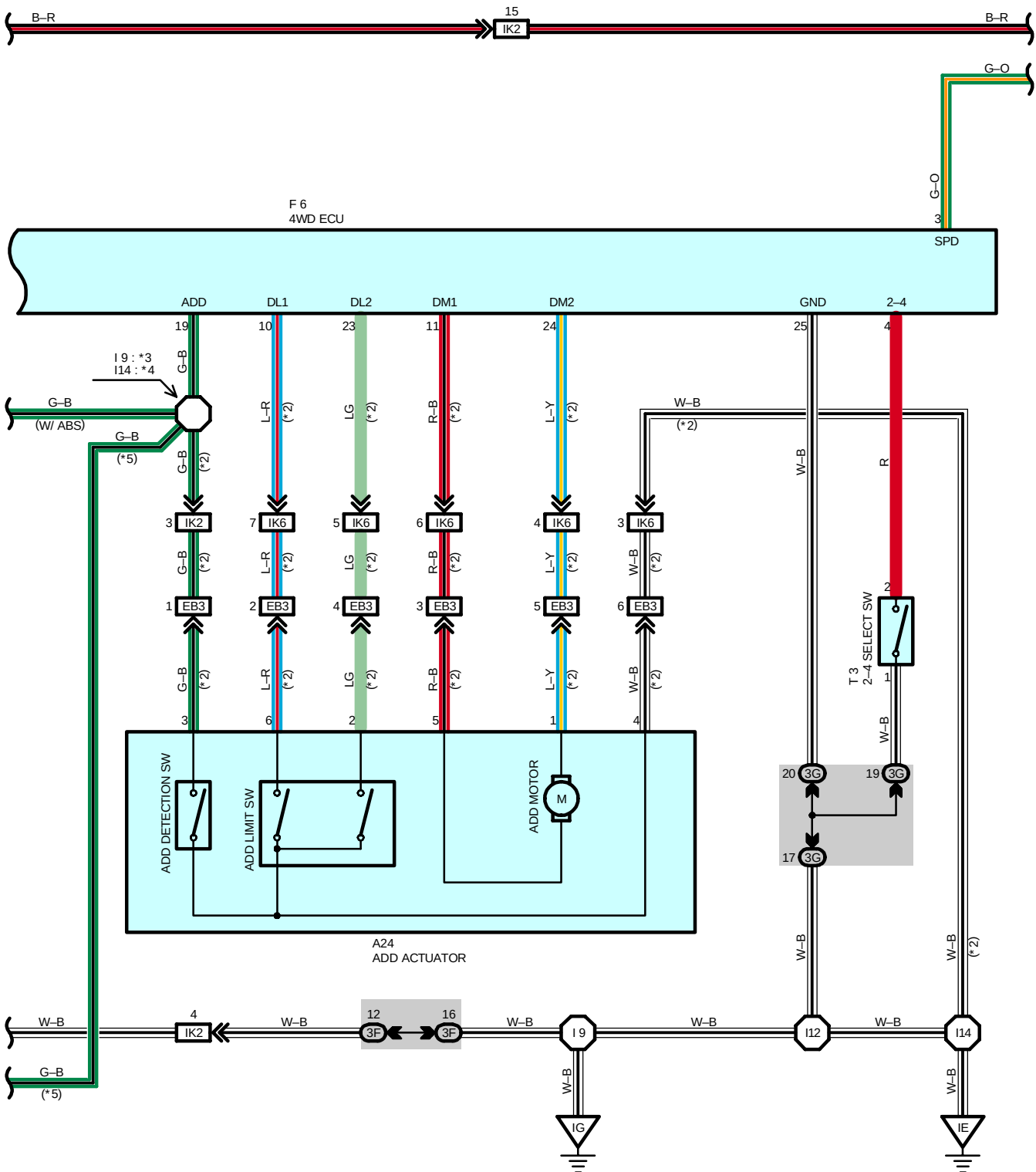
Code	See Page	Ground Points Location
EA	40 (5VZ-FE)	Front Left Fender
	42 (3RZ-FE, 2RZ-FE)	
IE	44	Around the Right Edge of the Reinforcement
IG	44	Around the Left Edge of the Reinforcement

○ : SPLICE POINTS

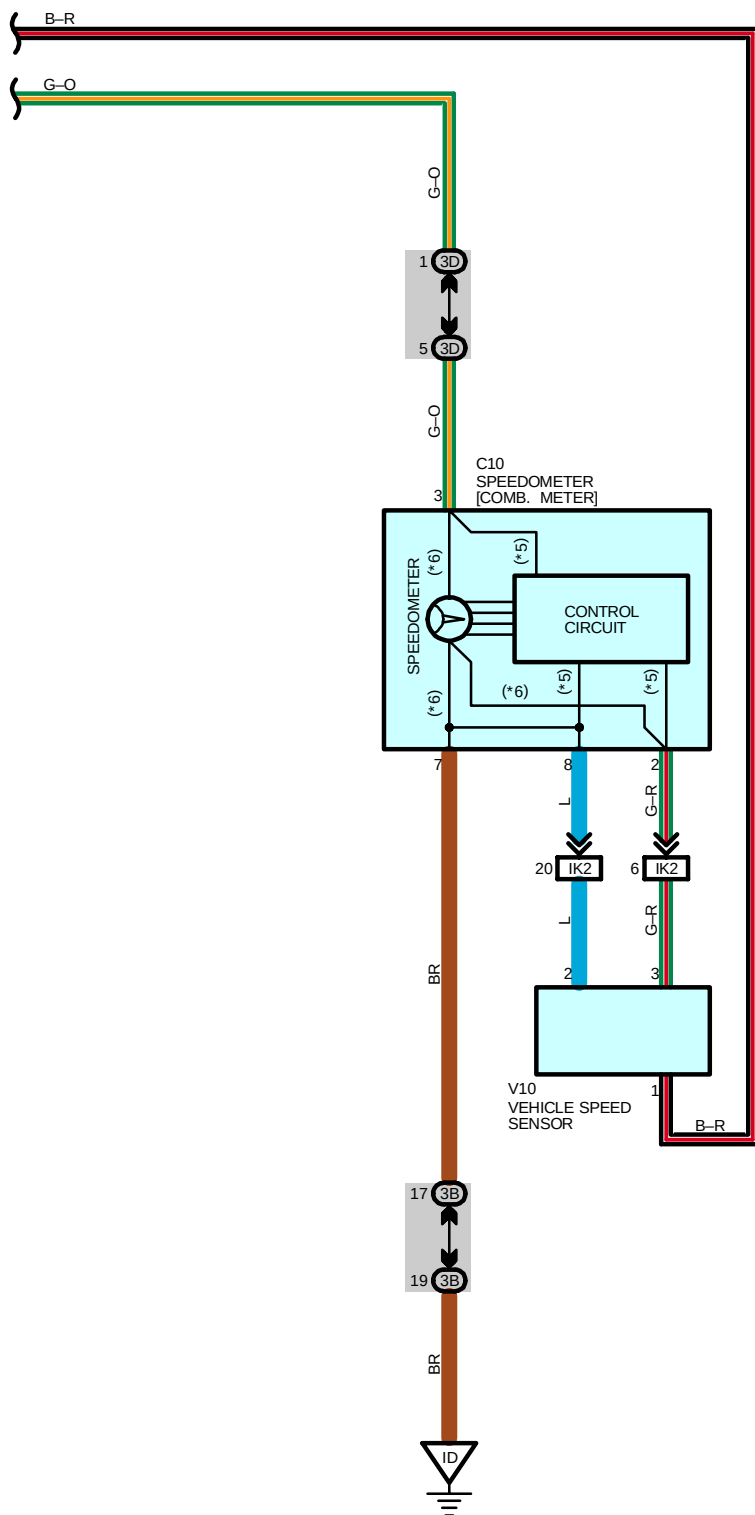
Code	See Page	Wire Harness with Splice Points	Code	See Page	Wire Harness with Splice Points
E3	40 (5VZ-FE)	Engine Room Main Wire	I10	44	Cowl Wire
	42 (3RZ-FE, 2RZ-FE)		I16		
I7	44	Cowl Wire	I19		
I9					



- * 1 : A/T
- * 2 : W/ ADD
- * 3 : W/ DAYTIME RUNNING LIGHT
- * 4 : W/O DAYTIME RUNNING LIGHT
- * 5 : 5VZ-FE 2WD M/T



* 5 : W/ TACHOMETER
* 6 : W/O TACHOMETER



SYSTEM OUTLINE

The 4WD ECU operates the 2-4 select motor in accordance with the conditions of the 2-4 select SW, the detection SW (Transfer 4WD position) and the detection SW (Transfer L4 position). It also controls the range over which shifting from H2 to H4 is possible based on the vehicle speed sensor. If the 2-4 select SW is pushed in while shifting is prohibited, it causes the 4WD indicator light to flash and sounds a warning buzzer to inform the driver. The warning buzzer is built into the ECU. The operation of the ECU is as follows.

2-4 SELECT SYSTEM

The 2-4 select system selects between 2WD and 4WD by means of a 2-4 select SW located in the transfer shift lever knob which provides good operability.

This system uses an ECU which drives the 2-4 select motor in accordance with signals from various sensors and accomplishes shifting between 2WD and 4WD. Shifting between H4 to L4 is accomplished by operating the transfer shift lever as before. This system also permits shifting between H2 and H4 without first shifting to H4. All models equipped with 2-4 select system are also equipped with the add, explained later.

(1) Shifting from H4 to H2

When the 2-4 select SW is turned off, a signal is input to the 2-4 select motor from the 4WD ECU, activating the 2-4 select motor so that the transfer changes to 2WD (H2 position).

At this time, the detection SW (Transfer 4WD position) and ADD indicator SW are off, so the 4WD indicator light goes off.

(2) Shifting from H2 to H4 (During normal driving)

When the 2-4 select SW is turned on, a signal is input to the 2-4 select motor from the 4WD ECU, activating the 2-4 select motor so that the transfer changes to 4WD (H4 position)

(3) Shifting from H2 to H4 (High speed driving)

The vehicle speed within below approx. 100 km/h, 62 mph, activating the 2-4 select motor so that the transfer changes to 4WD (H4 position)

The 4WD ECU stops the signal to the 2-4 select motor with the signal from the vehicle speed sensor. At the same time, it causes the 4WD indicator light to light up and the warning buzzer inside the 4WD ECU to sound.

(4) Shifting to L4

When the transfer shift lever is moved to L4 position, the transfer changes to LO position. This turns the detection SW (Transfer L4 position) on, so regardless of whether the 2-4 select SW is on or off, a signal is input to the 2-4 select motor from the 4WD ECU, activating the 2-4 select motor so that the transfer changes to 4WD (L4 position) in LO condition.

SERVICE HINTS

F6 4WD ECU

12-GROUND : Approx. 12 volts with ignition SW at **ON** position

25-GROUND : Always continuity

3-GROUND : 4 pulses with 1 rotation

4-GROUND : 2 volts or less with 2-4 select SW on

18-GROUND : 2 volts or less with detection SW (Transfer L4 position) on and transfer shift lever at **L4** position

T3 2-4 SELECT SW

1-2 : Closed with 2-4 select SW on

P1 A/T INDICATOR SW [PARK/NEUTRAL POSITION SW]

3-1 : Closed with A/T shift lever at **P** position

○ : PARTS LOCATION

Code	See Page	Code	See Page	Code	See Page
A22	30 (5VZ-FE)	D5	30 (5VZ-FE)	R16	35
A24	30 (5VZ-FE)	D25	34	T2	31 (5VZ-FE)
C10	34	E6	35	T3	35
C13	34	F6	35	V10	31 (5VZ-FE)
D3	30 (5VZ-FE)	J13	35		
D4	30 (5VZ-FE)	P1	31 (5VZ-FE)		

4WD (w/ 2-4 SELECT SW)

: JUNCTION BLOCK AND WIRE HARNESS CONNECTOR

Code	See Page	Junction Block and Wire Harness (Connector Location)
1F	23	Cowl Wire and J/B No.1 (Lower Finish Panel)
1J		
3B	24	Cowl Wire and J/B No.3 (Behind the Instrument Panel Left)
3D		
3E		
3F		
3G	26	Cowl Wire and J/B No.3 (Behind the Instrument Panel Center)
3H		
3I		

: CONNECTOR JOINING WIRE HARNESS AND WIRE HARNESS

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
EB3	40 (5VZ-FE)	Engine Wire and Differential Wire (Front Differential Upper Side)
IK2	44	Engine Wire and Cowl Wire (Above the Glove Box)
IK3		
IK6		

: GROUND POINTS

Code	See Page	Ground Points Location
ID	44	Left Kick Panel
IE	44	Around the Right Edge of the Reinforcement
IG	44	Around the Left Edge of the Reinforcement

: SPLICE POINTS

Code	See Page	Wire Harness with Splice Points	Code	See Page	Wire Harness with Splice Points
I9	44	Cowl Wire	I13	44	Engine Wire
I12			I14	44	Cowl Wire

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4WD (w/o 2-4 SELECT SW)

SERVICE HINTS

P1 A/T INDICATOR SW [PARK/NEUTRAL POSITION SW]

3-1 : Closed with A/T shift position at **P** position

D4 DETECTION SW (TRANSFER NEUTRAL POSITION)

1-2 : Closed with transfer position at **N** position

○ : PARTS LOCATION

Code	See Page	Code	See Page	Code	See Page
A22	30 (5VZ-FE)	D3	32 (3RZ-FE)	E6	B 35
	32 (3RZ-FE)	D4	30 (5VZ-FE)	J13	35
A24	30 (5VZ-FE)		32 (3RZ-FE)	P1	31 (5VZ-FE)
	32 (3RZ-FE)	D5	30 (5VZ-FE)		33 (3RZ-FE)
C10	34		32 (3RZ-FE)	R16	35
C13	34	D25	34	T4	35
D3	30 (5VZ-FE)	E5	A 35		

○ : JUNCTION BLOCK AND WIRE HARNESS CONNECTOR

Code	See Page	Junction Block and Wire Harness (Connector Location)
1F	23	Cowl Wire and J/B No.1 (Lower Finish Panel)
1J		
3D	24	Cowl Wire and J/B No.3 (Behind the Instrument Panel Left)
3E		
3H	26	Cowl Wire and J/B No.3 (Behind the Instrument Panel Center)
3I		

□ : CONNECTOR JOINING WIRE HARNESS AND WIRE HARNESS

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
EB3	40 (5VZ-FE)	Engine Wire and Differential Wire (Front Differential Upper Side)
	42 (3RZ-FE)	
IK2	44	Engine Wire and Cowl Wire (Above the Glove Box)
IK3		
IK6		

▽ : GROUND POINTS

Code	See Page	Ground Points Location
IE	44	Around the Right Edge of the Reinforcement
IG	44	Around the Left Edge of the Reinforcement

○ : SPLICE POINTS

Code	See Page	Wire Harness with Splice Points	Code	See Page	Wire Harness with Splice Points
I9	44	Cowl Wire	I13	44	Engine Wire
I12			I14	44	Cowl Wire

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2003 TOYOTA TACOMA

ELECTRICAL WIRING DIAGRAM

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