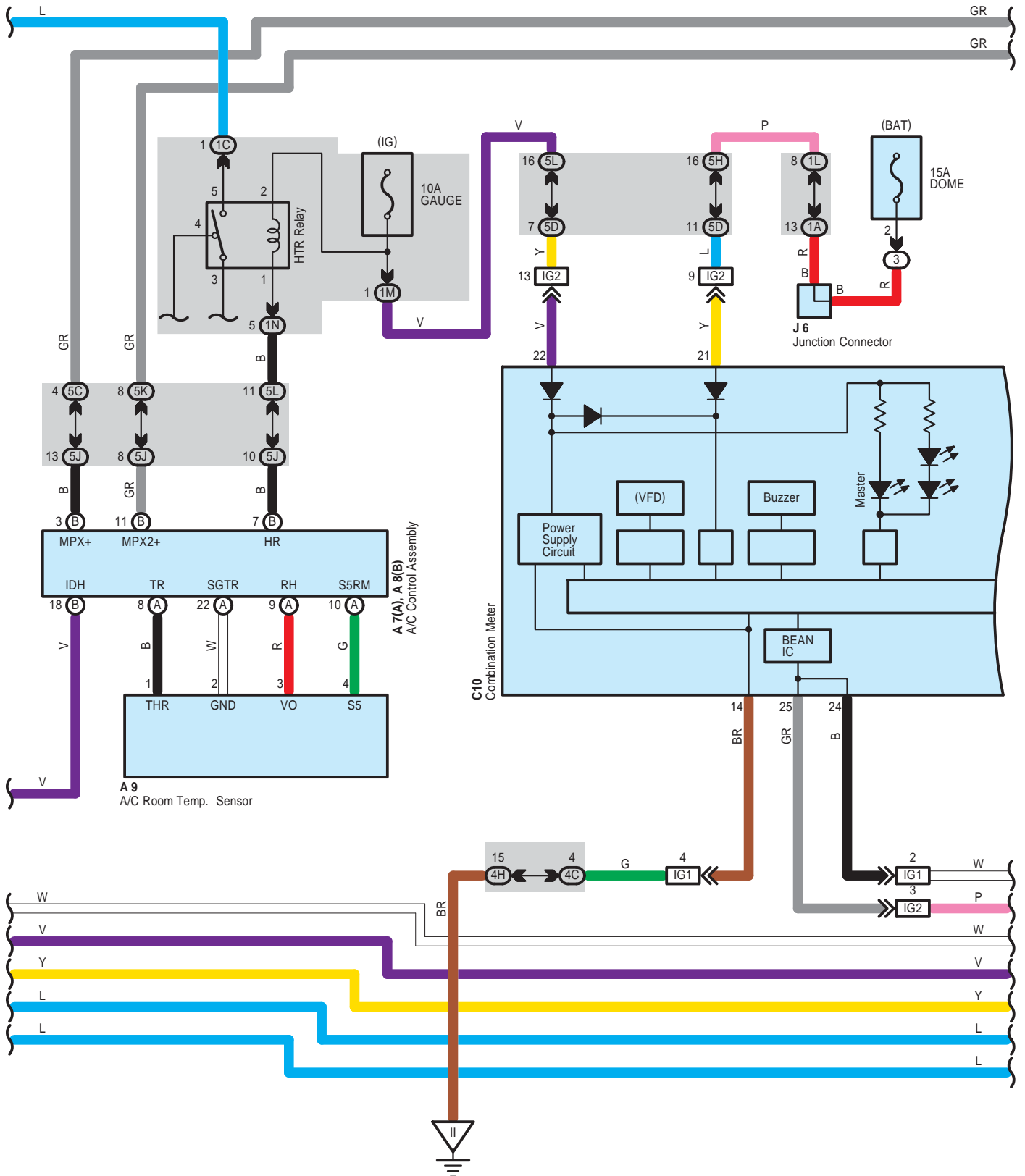
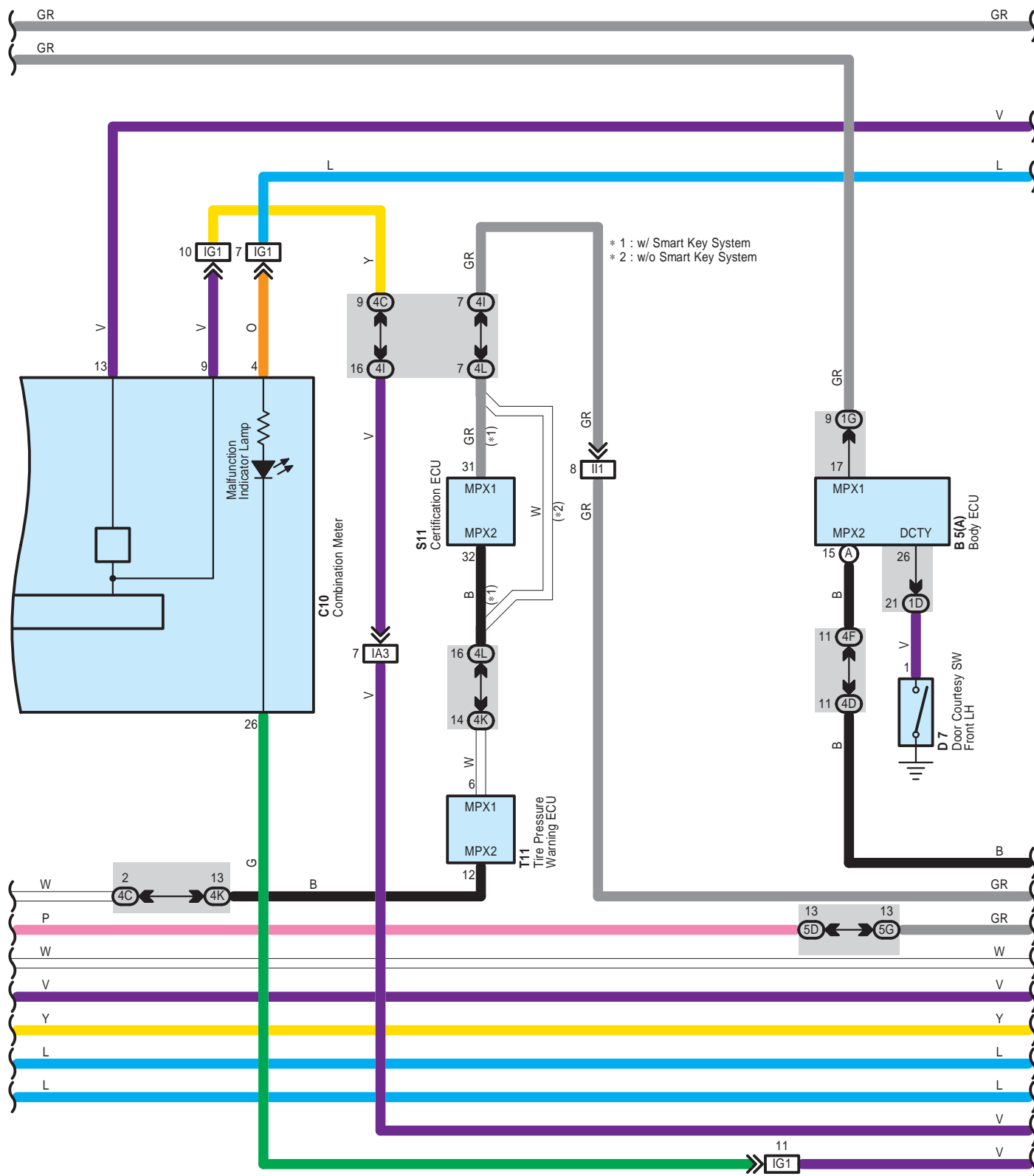




H14(A), H15(B), H16(C), H17(D)  
Hybrid Vehicle Control ECU



H14(A), H15(B), H16(C), H17(D)  
Hybrid Vehicle Control ECU

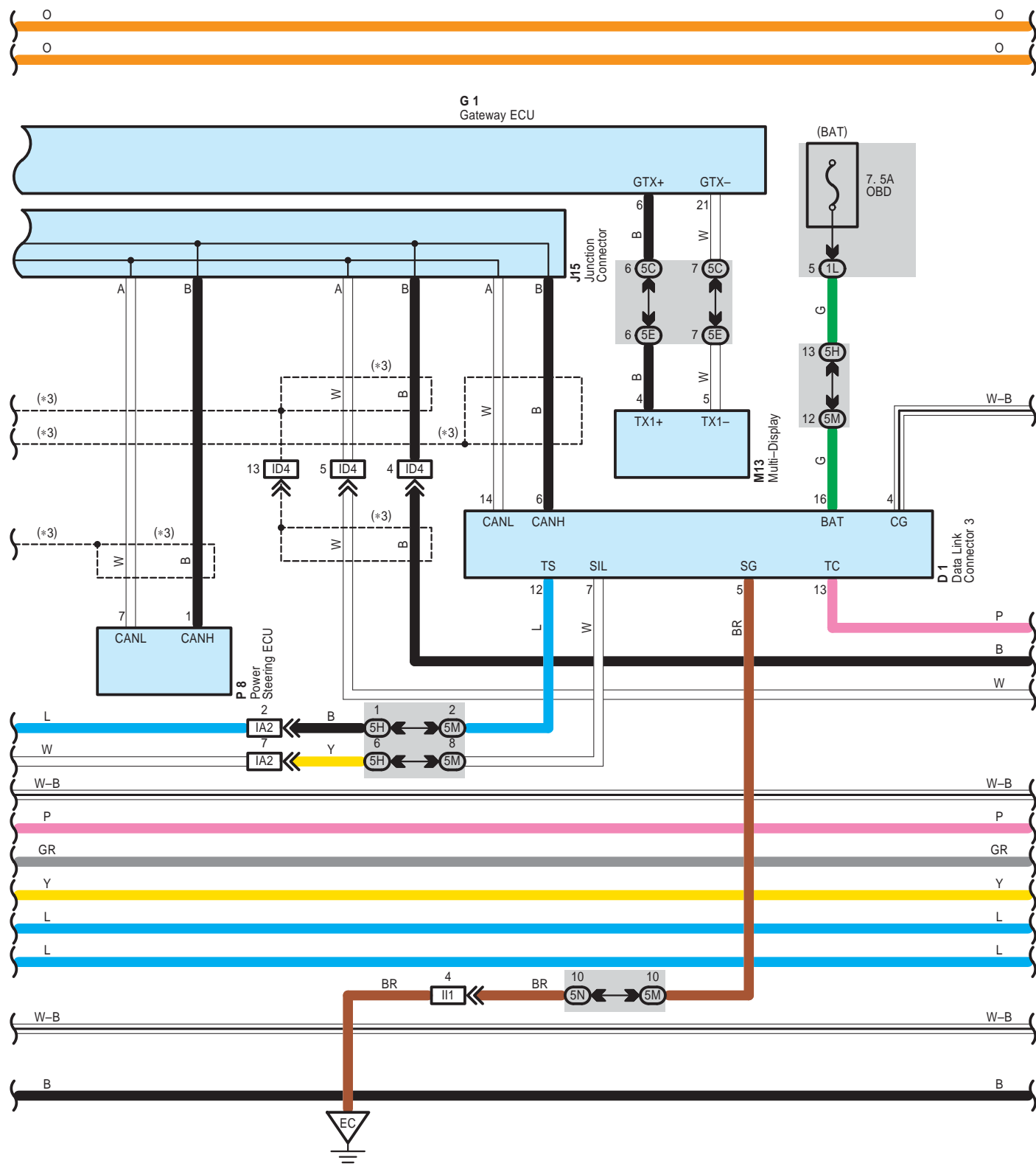








H14(A), H15(B), H16(C), H17(D)  
Hybrid Vehicle Control ECU

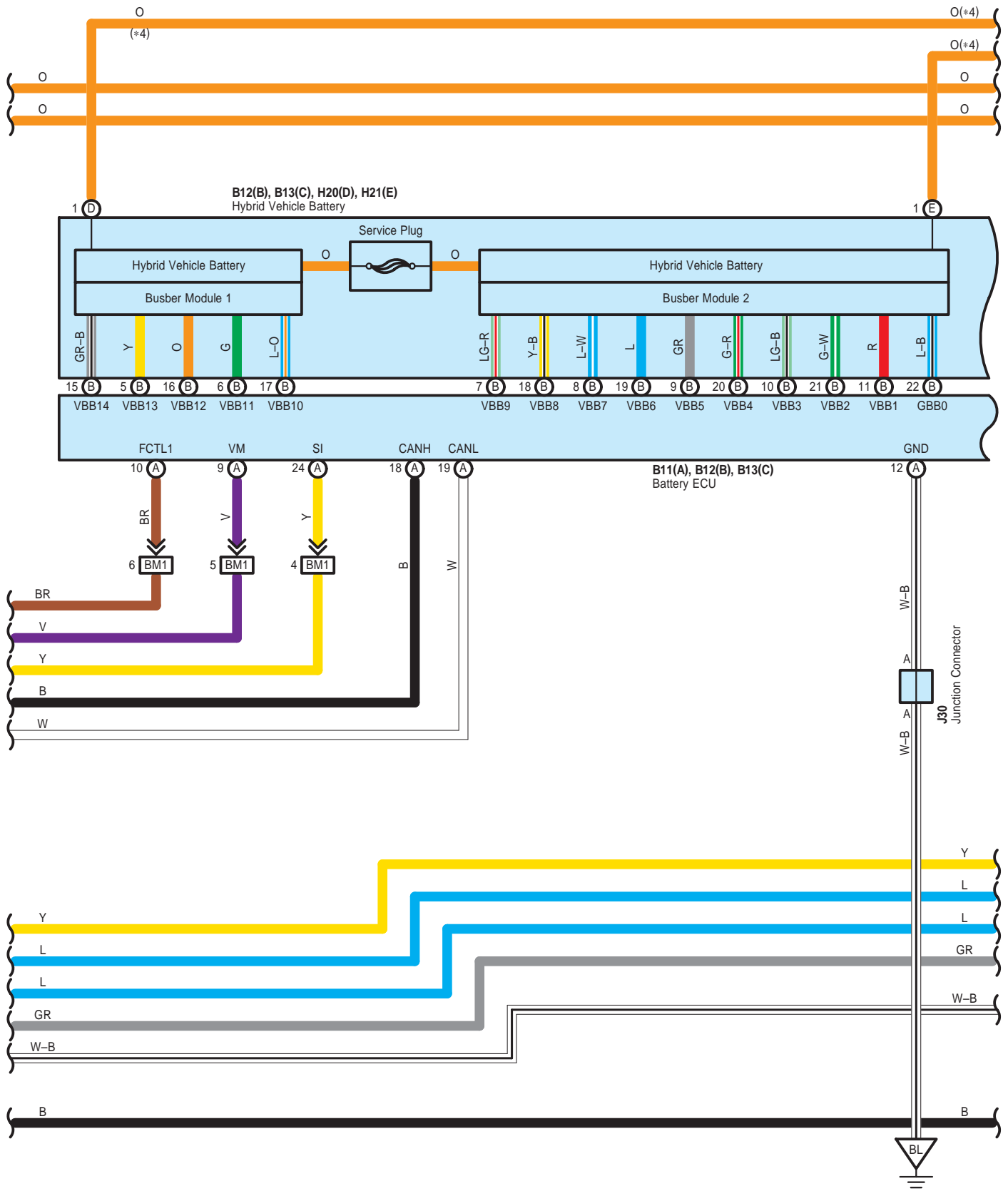


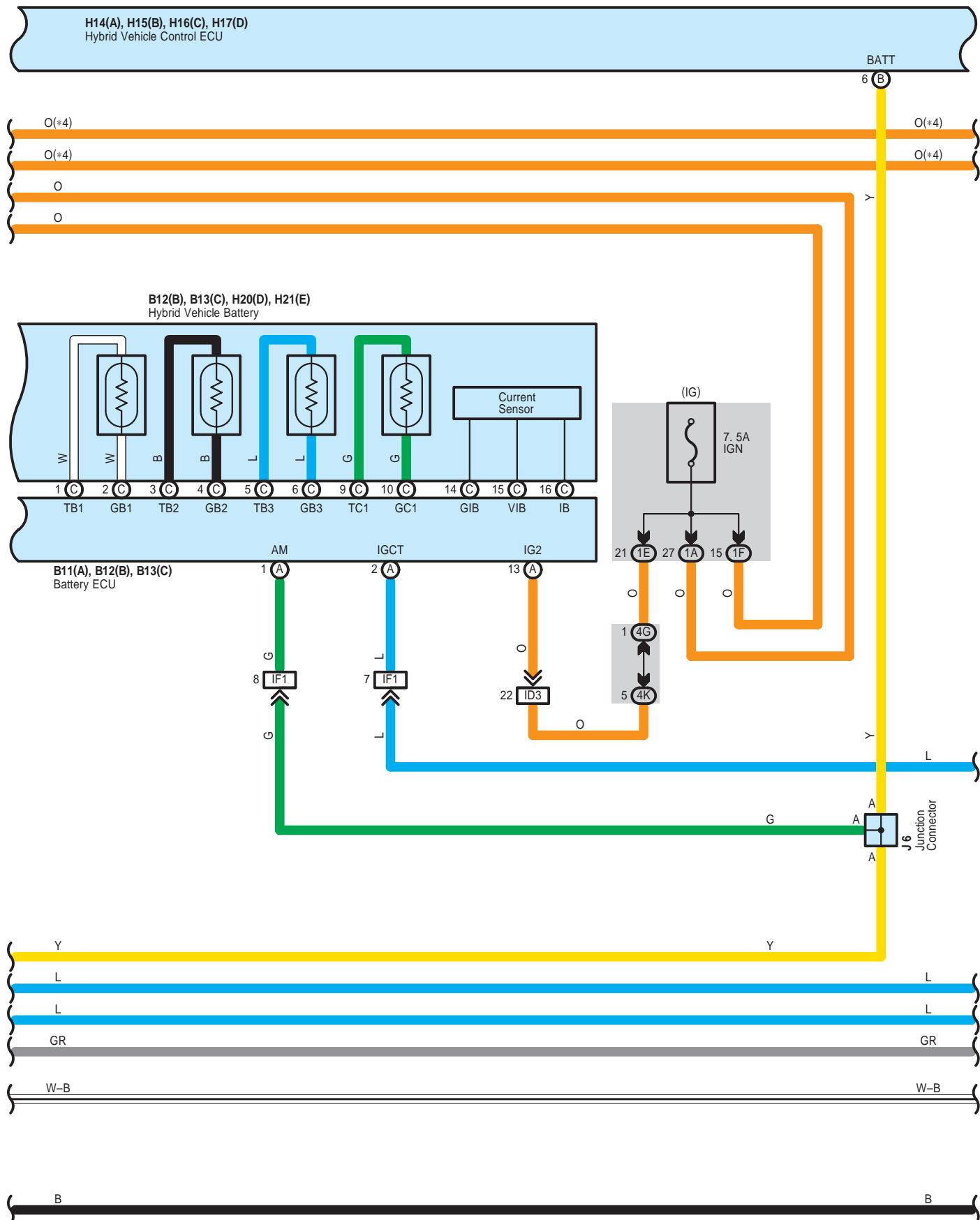




# TOYOTA Hybrid System

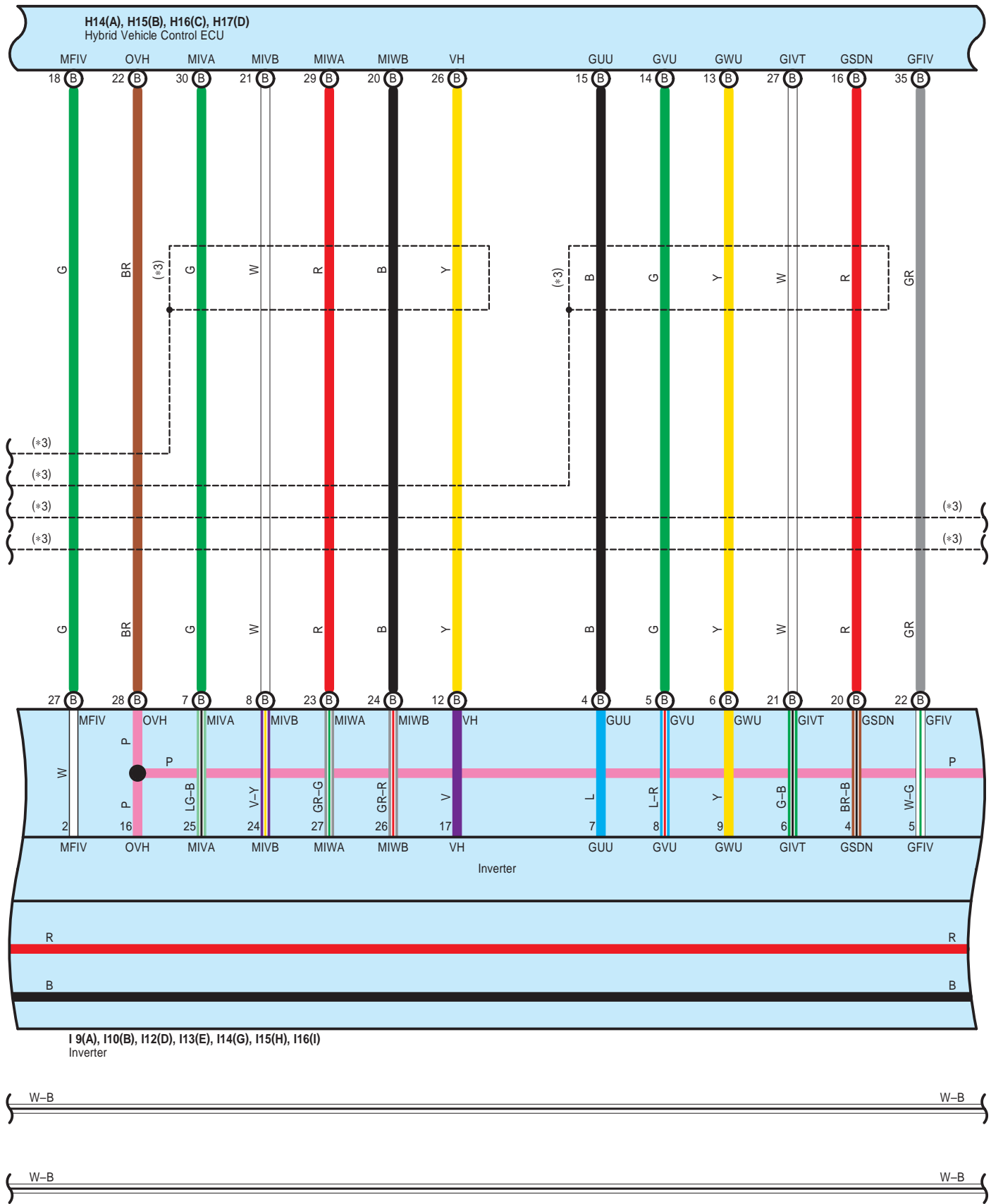
H14(A), H15(B), H16(C), H17(D)  
Hybrid Vehicle Control ECU

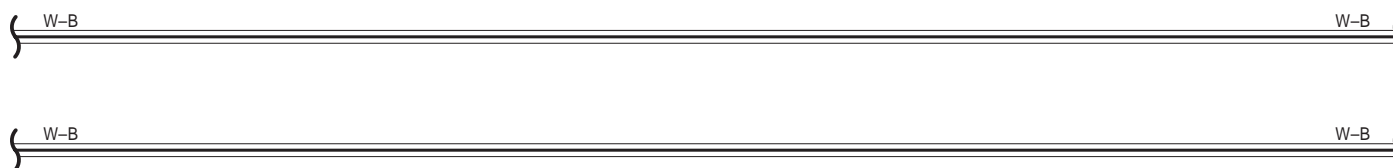
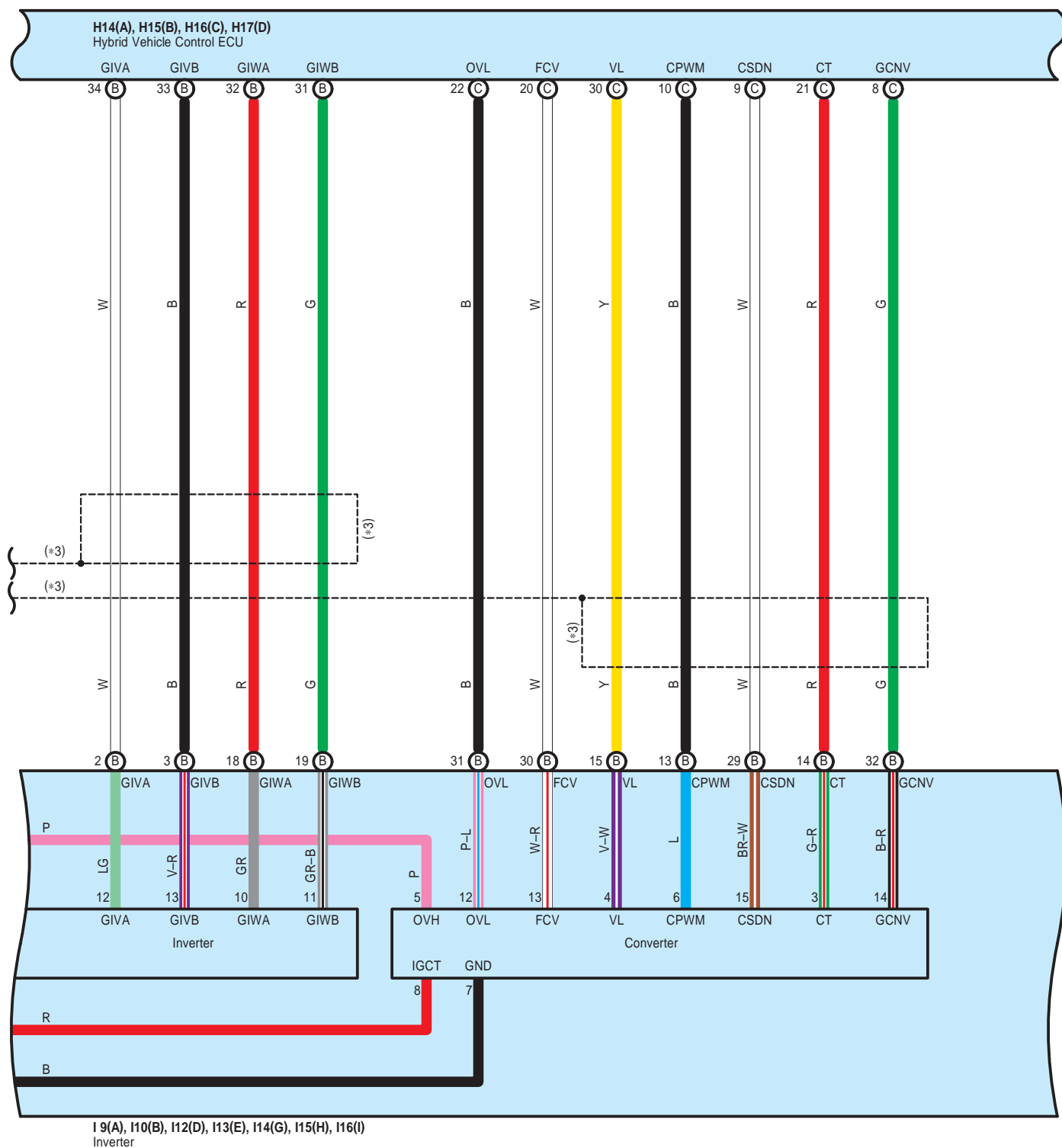




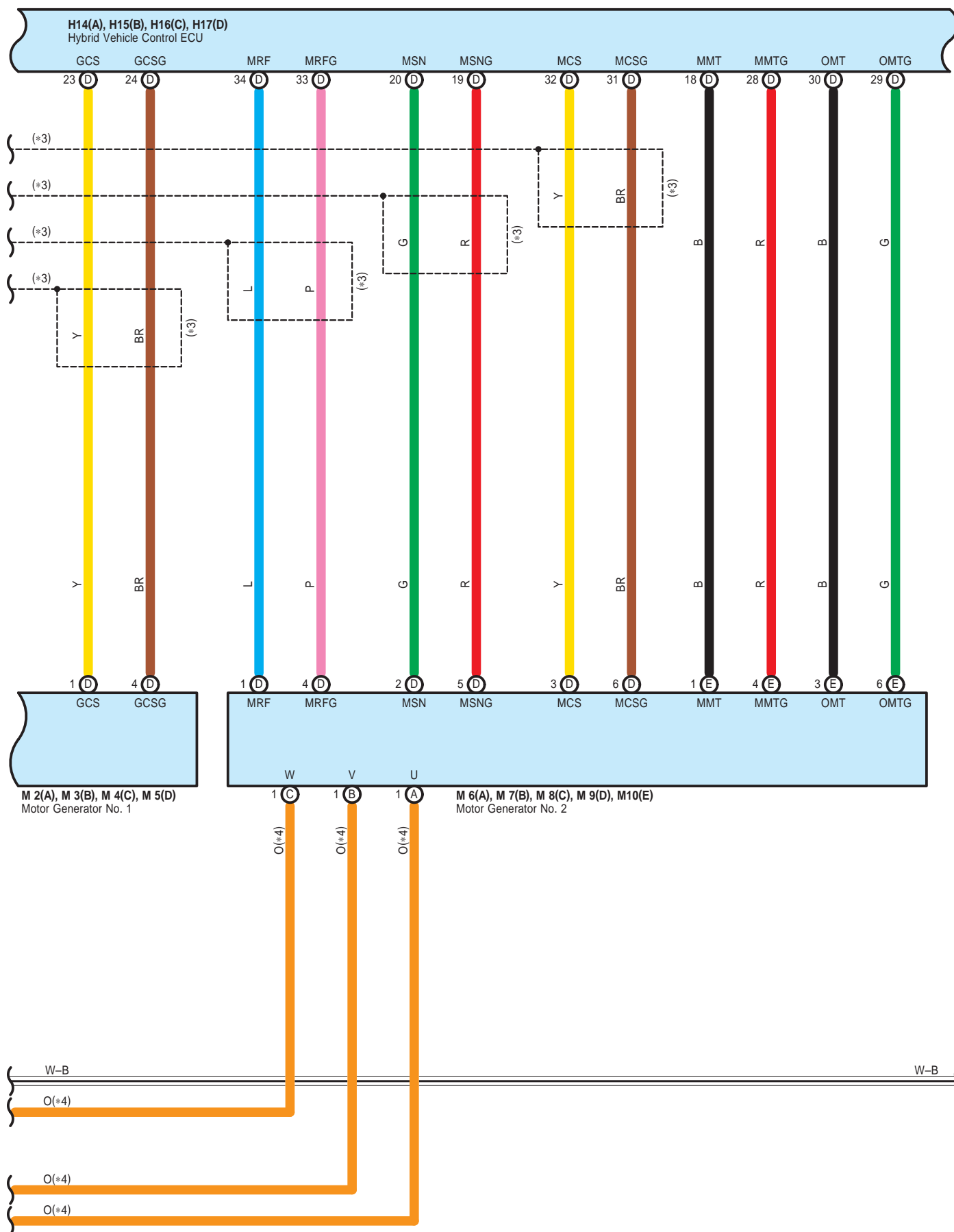






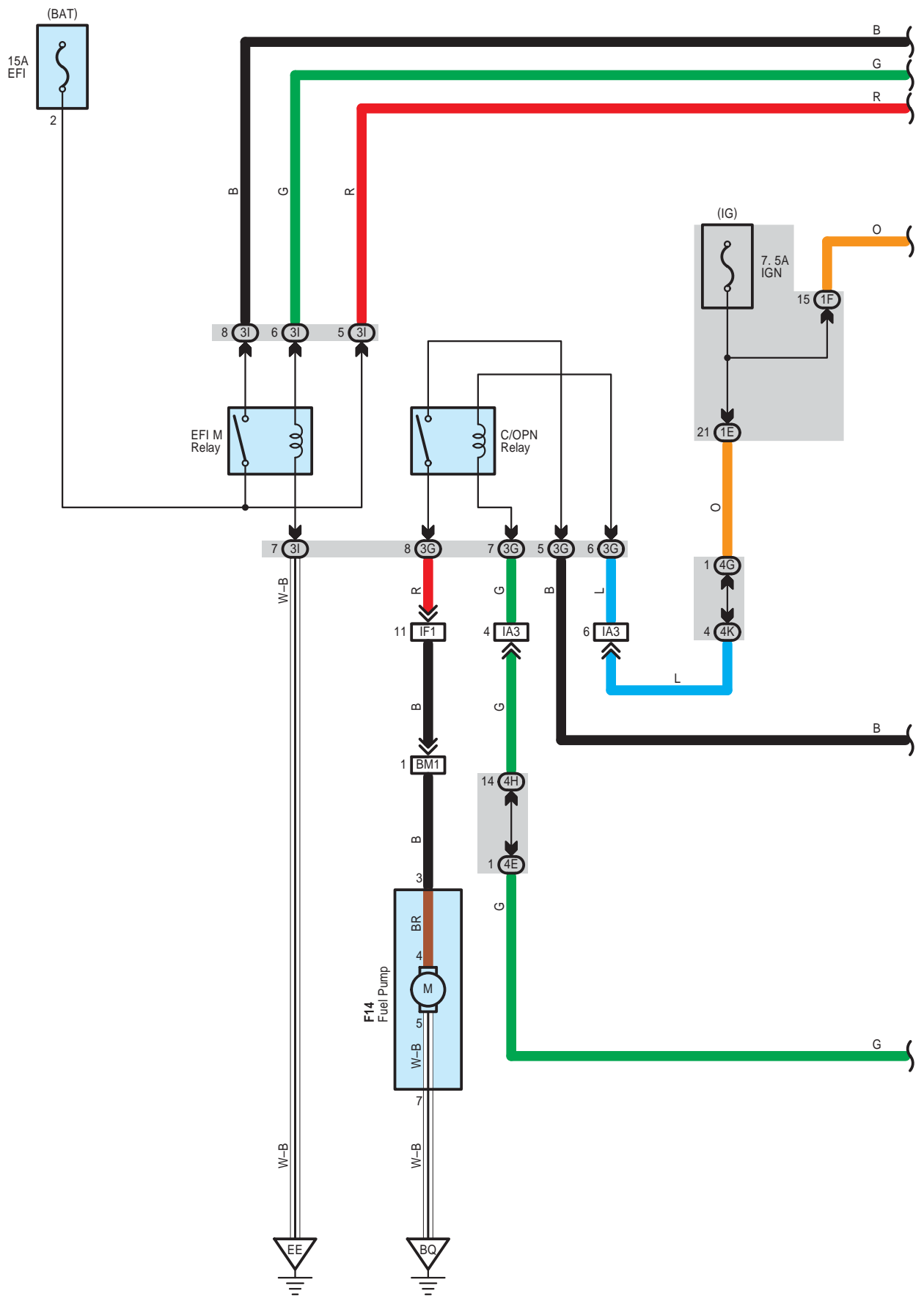






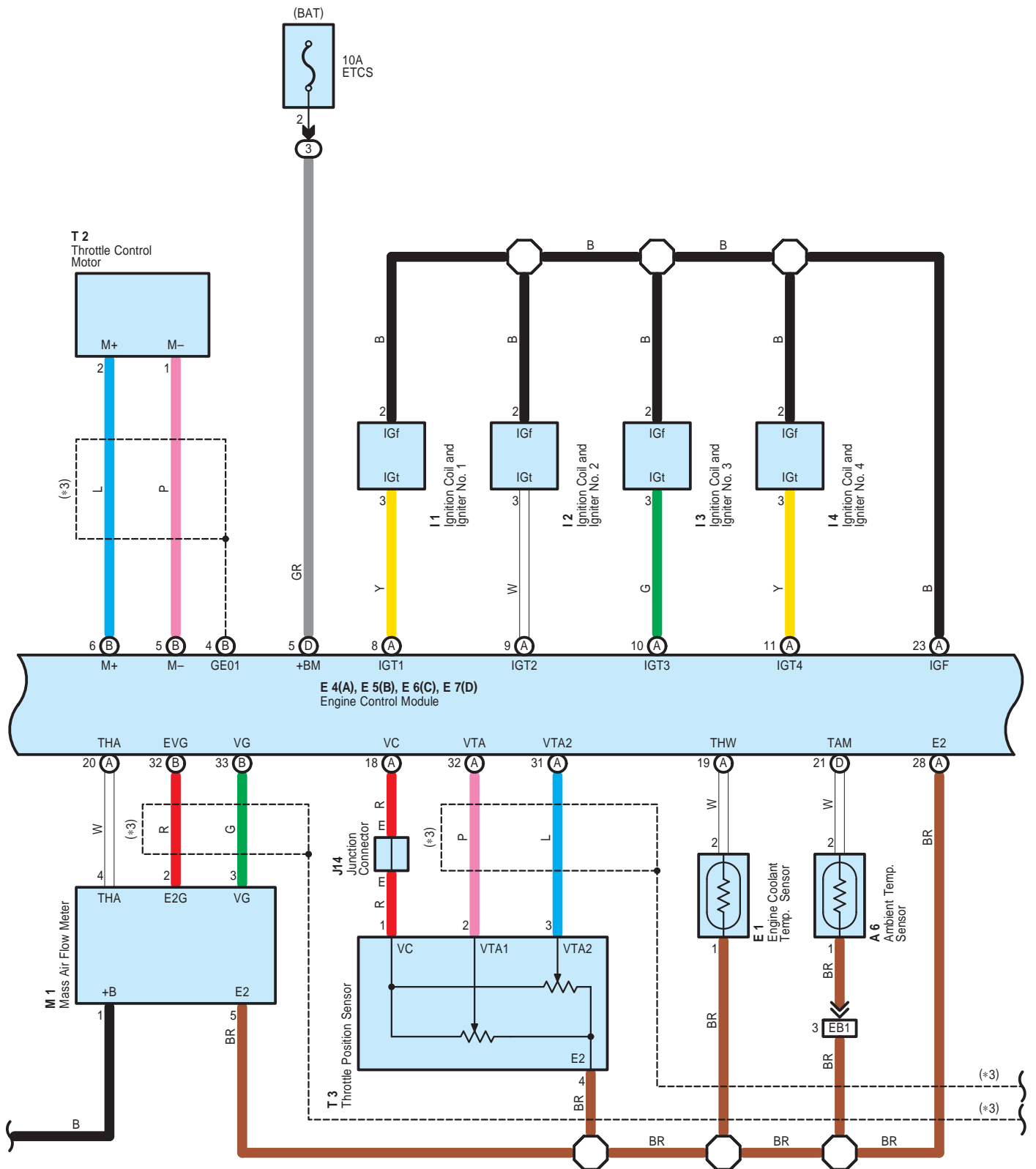






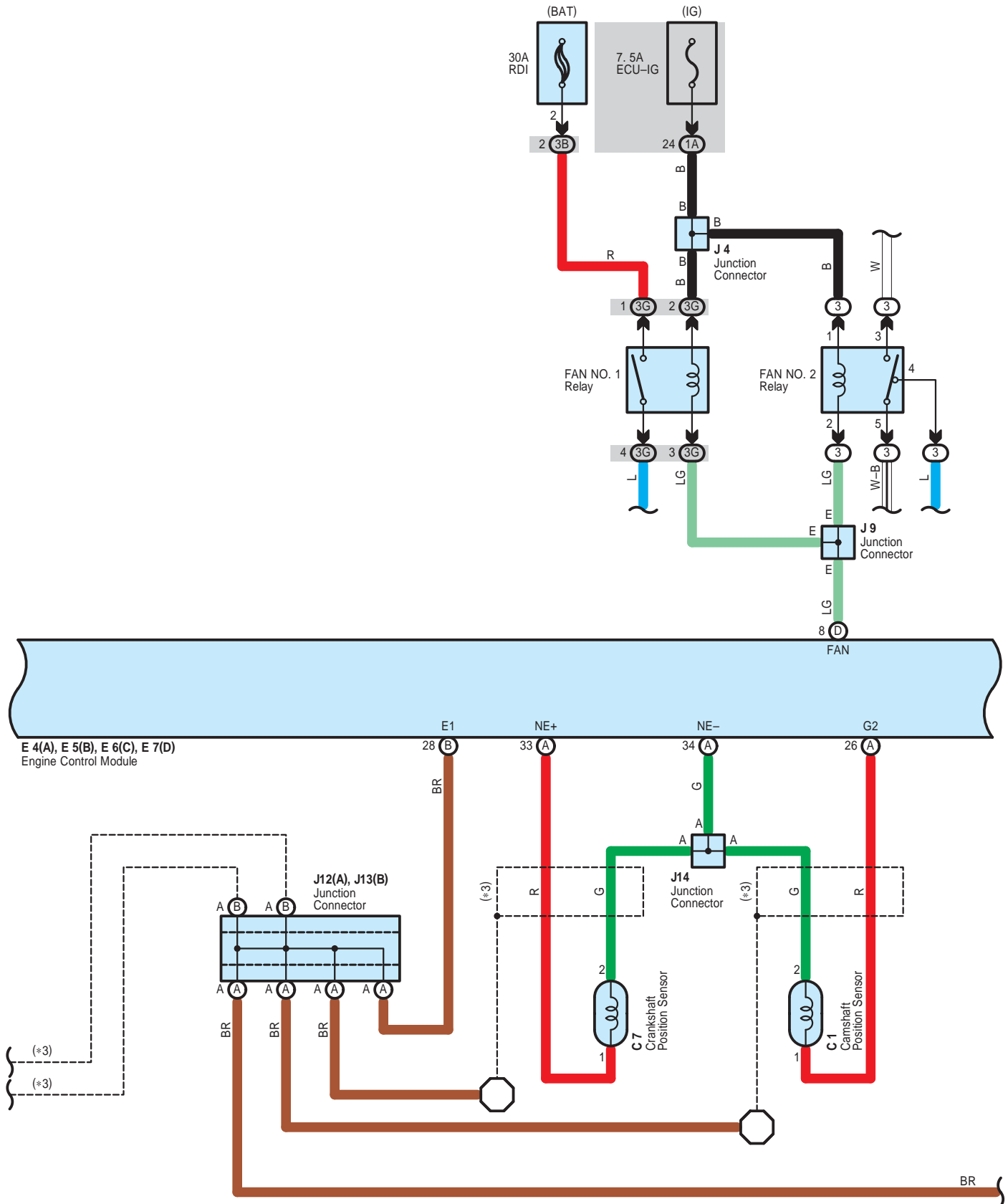
[Details of Engine Control Module Section]

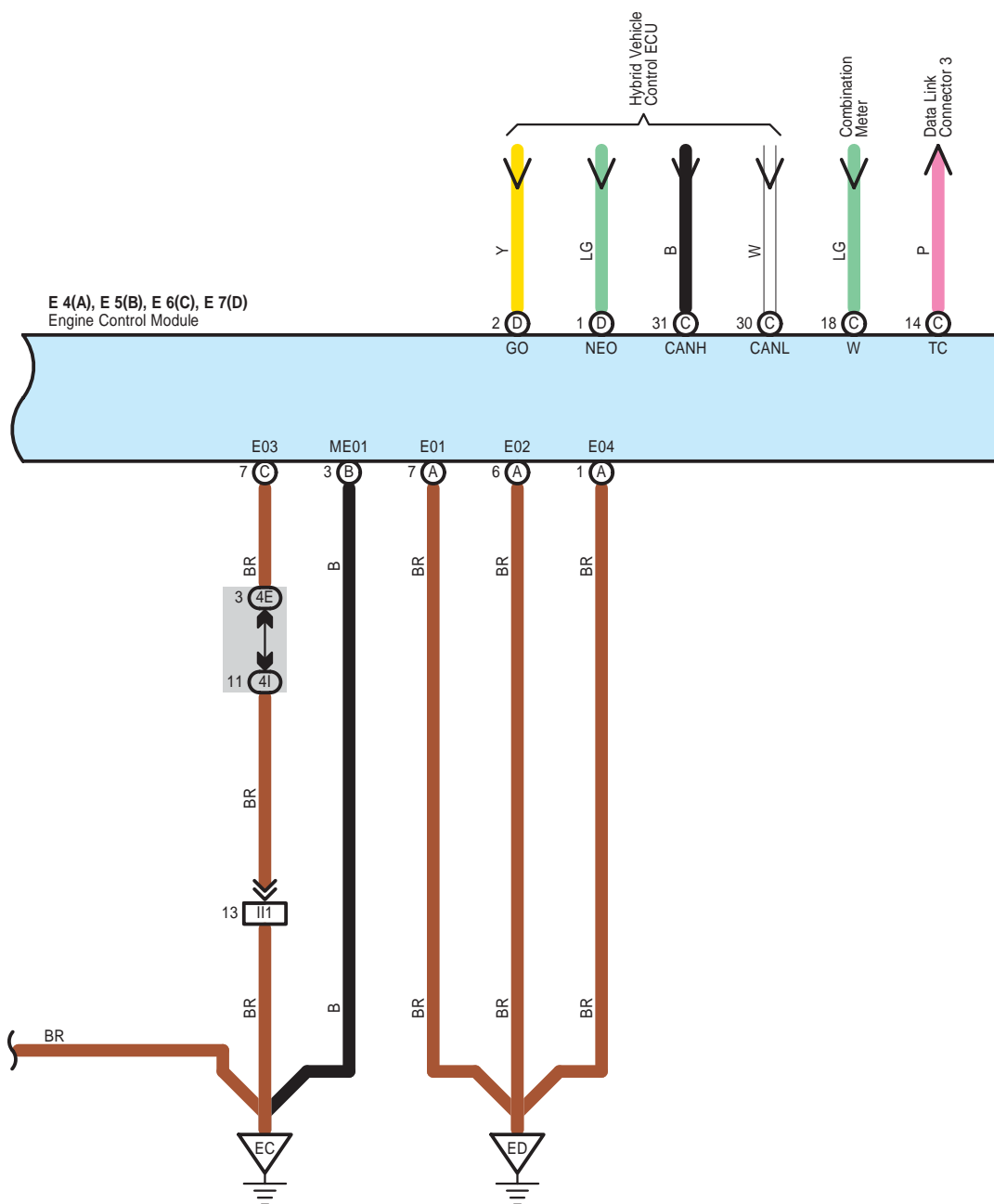


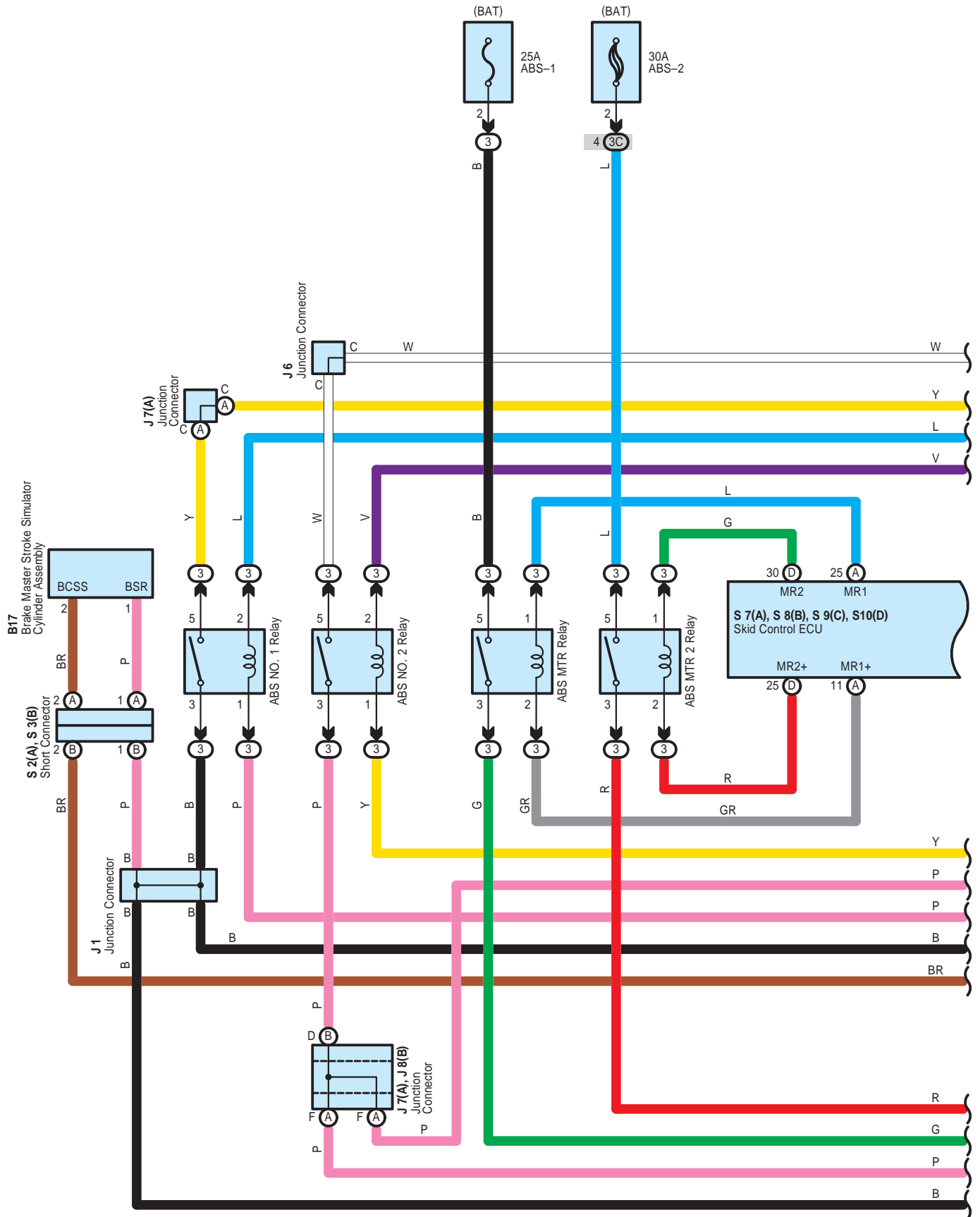


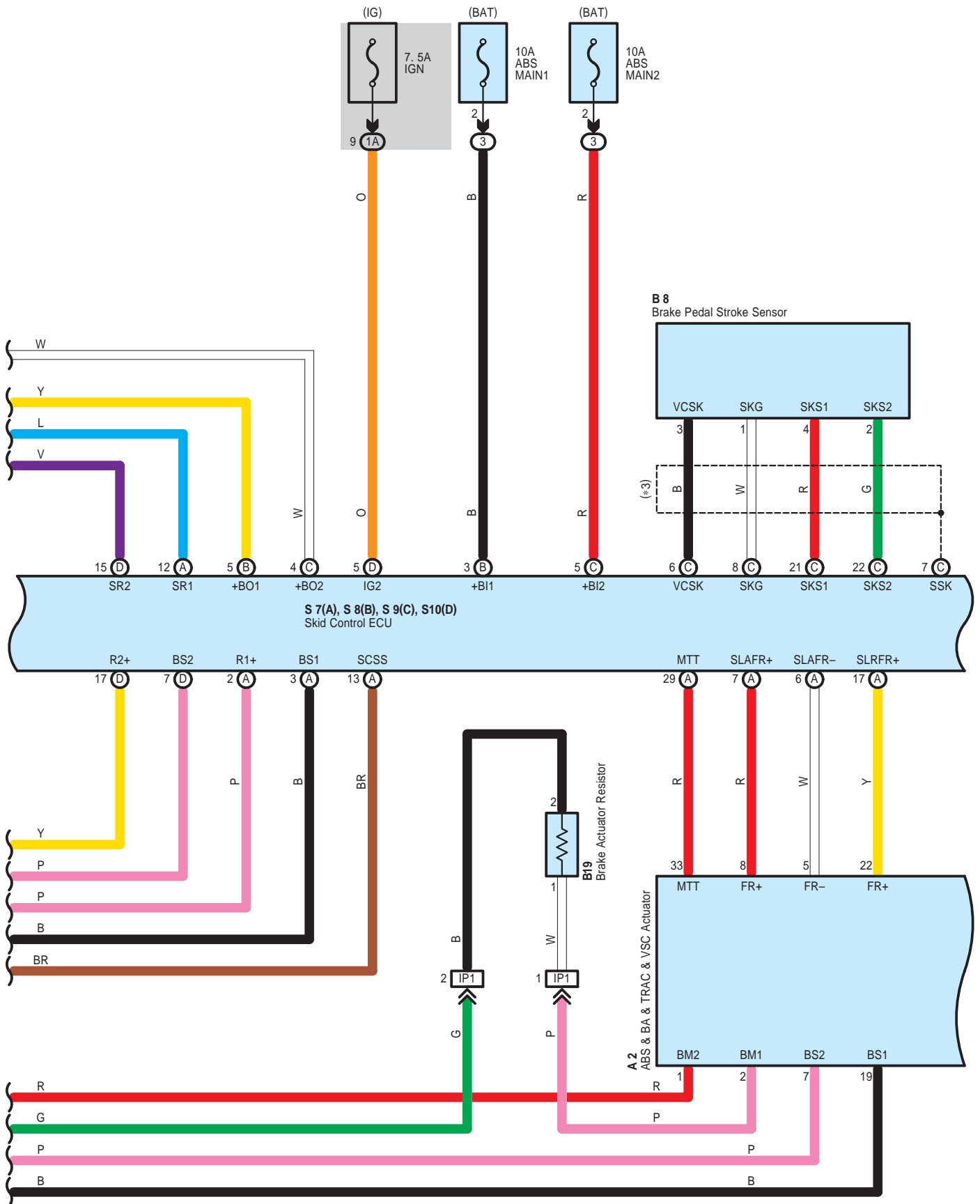
# TOYOTA Hybrid System

[Details of Engine Control Module Section]





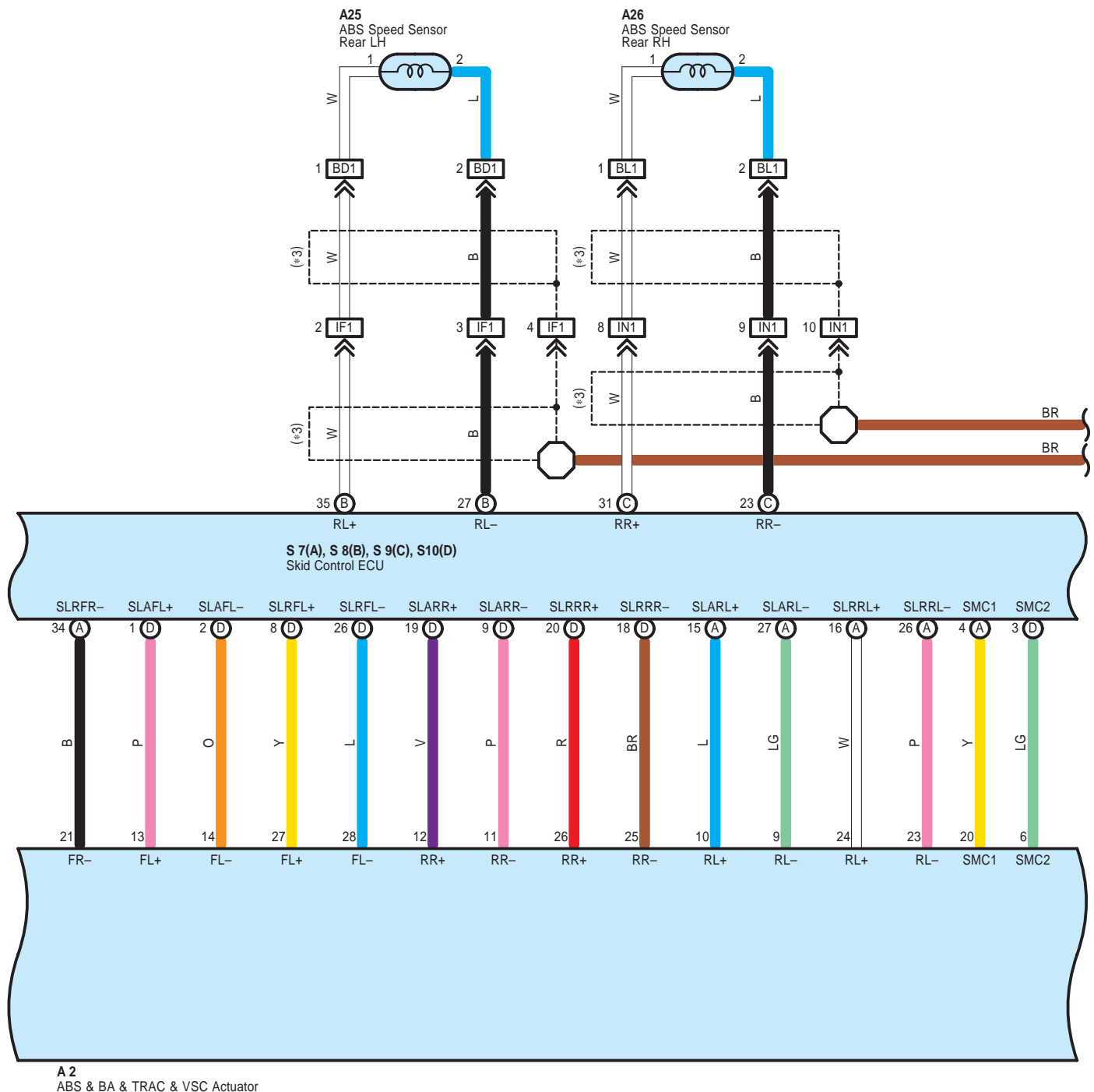


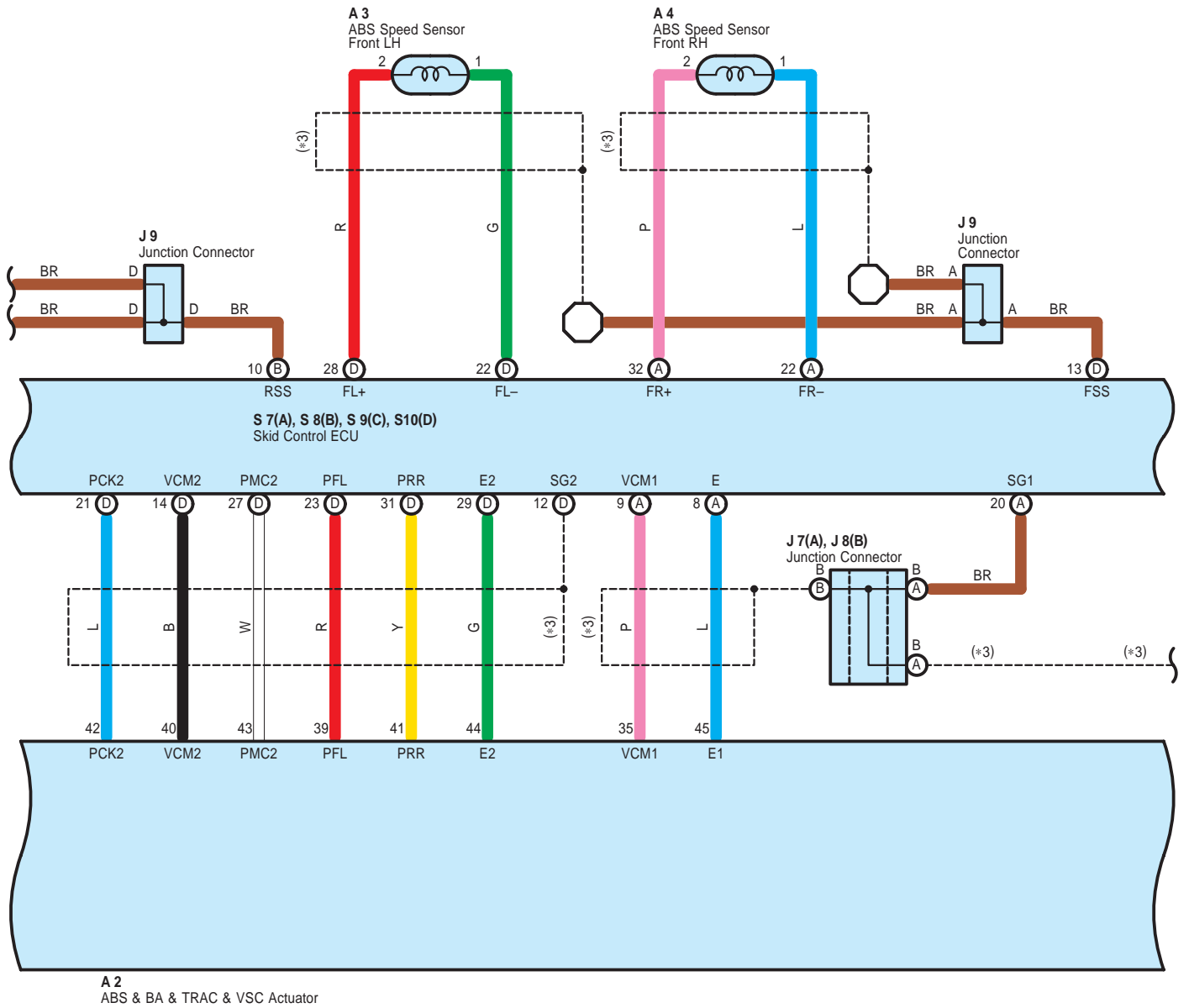


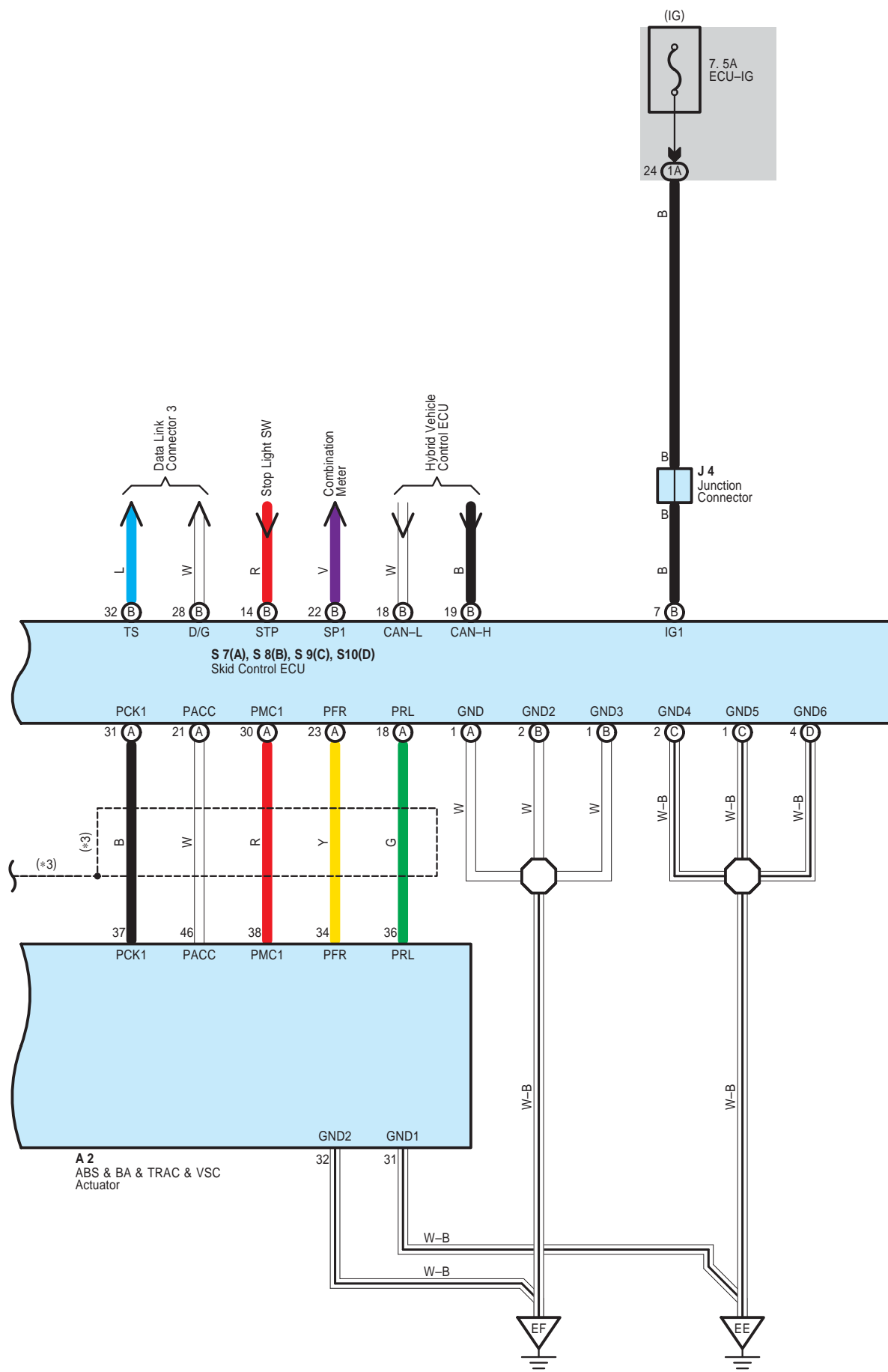


# TOYOTA Hybrid System

[Details of Skid Control ECU Section]







## System Outline

This system controls the following modes in order to achieve the most efficient operations to match the driving conditions.

### 1. Motor Generator Condition

- (1) Supply of electrical power from the HV battery to motor generator no.2 provides force to drive the wheels.
- (2) While the tires are driven by the engine via the planetary gears, motor generator no.1 activates to supply electricity via the planetary gears to motor generator no.2 to drive the wheels.
- (3) When the vehicle is decelerating, kinetic energy from the wheels is recovered into electrical energy and used to recharge the HV battery by motor generator no.2.

The hybrid vehicle control ECU switches between these modes (1, 2, 1+2, or 3) according to the driving conditions. However, when the state of charge of the HV battery is low, the HV battery is charged by the engine turning motor generator no.1.

### 2. Inverter

- \* The inverter converts high-voltage direct current of HV battery to three-phase alternating current for driving motor generator no.1 and motor generator no.2.
- \* The activation of the power transistors is controlled by the HV ECU. In addition, the inverter transmits necessary information for current control, such as the output amperage or voltage, to the HV ECU.
- \* Along with motor generator no.1 and motor generator no.2, the inverter is cooled by the exclusive radiator of the coolant system that is separated from that of the engine.
- \* In vehicle collision, circuit breaker sensor installed in the inverter outputs collision signal to stop the system.
- \* Boost converter has been adopted in the inverter, which increases rated voltage output from HV battery of DC 201.6V to DC 500V. After increasing voltage, the inverter converts direct current to alternating current.

### 3. Converter

The power source for auxiliary equipment of the vehicle such as the lights, audio system, and the air conditioning system, as well as the ECUs, is based on a rated voltage of DC 12V system. Because the generator outputs at DC 201.6V, the converter is used to transform the voltage from rated voltage of DC 201.6V to DC 12V in order to recharge the auxiliary battery. The converter is installed on the underside of the inverter.

### 4. HV Battery

- \* In Prius, the sealed nickel hydride (Ni-MH) battery has been adopted. This HV battery has high power density, lightweight and longevity to match characteristics of TOYOTA hybrid system. Because TOYOTA hybrid system controls charge/discharge to maintain charge/discharge control to maintain SOC (State of charge) at constant level while the vehicle is operating normally, it does not have to rely on the use of external recharges.
- \* The HV battery, battery ECU, system main relay and the cooling fan are put in a signal case which is placed in the luggage compartment behind the rear seat to make more effective use of vehicle space.
- \* A service plug that shuts off circuit is provided in the middle of the 28 modules (Rated battery capacity = 201.6V). Before servicing any portion of the high-voltage circuits, make sure to remove the service plug. Please do not READY ON when you remove the service plug. There is a possibility that battery ECU breaks down.
- \* To ensure the HV battery's performance, the battery ECU controls the operation of the cooling fan to avoid the heat that is generated in the HV battery during charging and discharging.

### 5. Regenerative System Operation

This system operates the motor as a generator to change the kinetic energy of the vehicle into the electricity when accel pedal is released or foot braking decelerates the vehicle speed, and store the electricity in the battery.

# TOYOTA Hybrid System

## ○ : Parts Location

Code		See Page	Code		See Page	Code		See Page
A2		46	H16	C	49	M1		47
A3		46	H17	D	49	M2	A	47
A4		46	H20	D	53	M3	B	47
A6		46	H21	E	53	M4	C	47
A7	A	48	I1		47	M5	D	47
A8	B	48	I2		47	M6	A	47
A9		48	I3		47	M7	B	47
A13		48	I4		47	M8	C	47
A18		48	I5		47	M9	D	47
A25		52	I6		47	M10	E	47
A26		52	I7		47	M13		50
B5	A	48	I8		47	P6		51
B8		48	I9	A	47	P8		51
B9		52	I10	B	47	P11		51
B10		52	I12	D	47	S1		47
B11	A	52	I13	E	47	S2	A	47
B12	B	52	I14	G	47	S3	B	47
B13	C	52	I15	H	47	S4	A	51
B14		52	I16	I	47	S5	B	51
B17		46	I17		53	S7	A	51
B19		48	J1		47	S8	B	51
C1		46	J2		47	S9	C	51
C3		46	J3		47	S10	D	51
C5	A	46	J4		47	S11		51
C6	B	46	J5		50	S16		51
C7		46	J6		50	S22	A	55
C10		49	J7	A	50	S23	B	55
D1		49	J8	B	50	S24	C	55
D7		52	J9		50	S25	D	55
E1		46	J12	A	50	S26	E	55
E4	A	49	J13	B	50	S27	A	47
E5	B	49	J14		50	S28	B	47
E6	C	49	J15		50	T2		47
E7	D	49	J16		50	T3		47
F14		53	J17		50	T4		51
F15	A	28, 53	J18		50	T5		51
F16	B	28, 53	J24		50	T11		51
G1		49	J25		50	W3		47
H14	A	49	J30		53			
H15	B	49	J32		53			

## ○ : Relay Blocks

Code	See Page	Relay Blocks (Relay Block Location)
3	22	Engine Room R/B (Engine Compartment Left)



: Junction Block and Wire Harness Connector

Code	See Page	Junction Block and Wire Harness (Connector Location)
1A	30	Engine Room Main Wire and Driver Side J/B (Lower Finish Panel)
1C		
1D	30	Floor Wire and Driver Side J/B (Lower Finish Panel)
1E	30	Instrument Panel Wire and Driver Side J/B (Lower Finish Panel)
1F		
1G		
1L		
1M	31	
1N		
3B	23	Engine Room Main Wire and Engine Room J/B (Engine Compartment Left)
3C		
3E		
3G	24	
3I		
3J		
3M	23	Frame Wire and Engine Room J/B (Engine Compartment Left)
4C	38	Instrument Panel Wire and Center Connector No.1 (Behind the Combination Meter)
4D		
4E		
4F		
4G		
4H		
4I		
4J		
4K		
4L		
5C	42	Instrument Panel Wire and Center Connector No.2 (Instrument Panel Brace RH)
5D		
5E		
5F		
5G		
5H		
5J		
5K		
5L		
5M		
5N		

# TOYOTA Hybrid System

## : Connector Joining Wire Harness and Wire Harness

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
EB1	56	Engine Wire and Engine Room Main Wire (Inside of the Engine Room R/B)
IA1	58	Engine Room Main Wire and Instrument Panel Wire (Upper Parts of Front Body Pillar LH)
IA2		
IA3		
IC1	58	Engine Room Main Wire and Floor Wire (Cowl Side Panel LH)
ID3	58	Instrument Panel Wire and Floor Wire (Left Kick Panel)
ID4		
IF1	58	Floor Wire and Engine Room Main Wire (Left Kick Panel)
IG1	59	Instrument Panel Wire and Instrument Panel No.2 Wire (Behind the Combination Meter)
IG2		
II1	59	Engine Wire and Instrument Panel Wire (Behind the Glove Box)
IN1	59	Floor No.2 Wire and Engine Room Main Wire (Right Kick Panel)
IP1	59	Engine Room No.2 Wire and Engine Room Main Wire (Upper Parts of Front Body Pillar LH)
BD1	60	Skid Control Sensor No.1 Wire and Floor Wire (Front Side of Left Quarter Panel)
BE1	60	Frame Wire and Floor No.2 Wire (Front Side of Left Quarter Panel)
BL1	61	Skid Control Sensor No.2 Wire and Floor No.2 Wire (Front Side of Right Quarter Panel)
BM1	61	Floor No.2 Wire and Floor Wire (Rear Side of Right Quarter Panel)

## : Ground Points

Code	See Page	Ground Points Location
EC	56	Engine Block
ED		
EE	56	Left Side of the Suspension Tower
EF		
IH	58	Cowl Side Panel LH
II	58	Instrument Panel Brace LH
IK	58	Cowl Side Panel RH
BL	60	Rear Side of Left Quarter Panel
BQ	60	Rear Side of Right Quarter Panel

