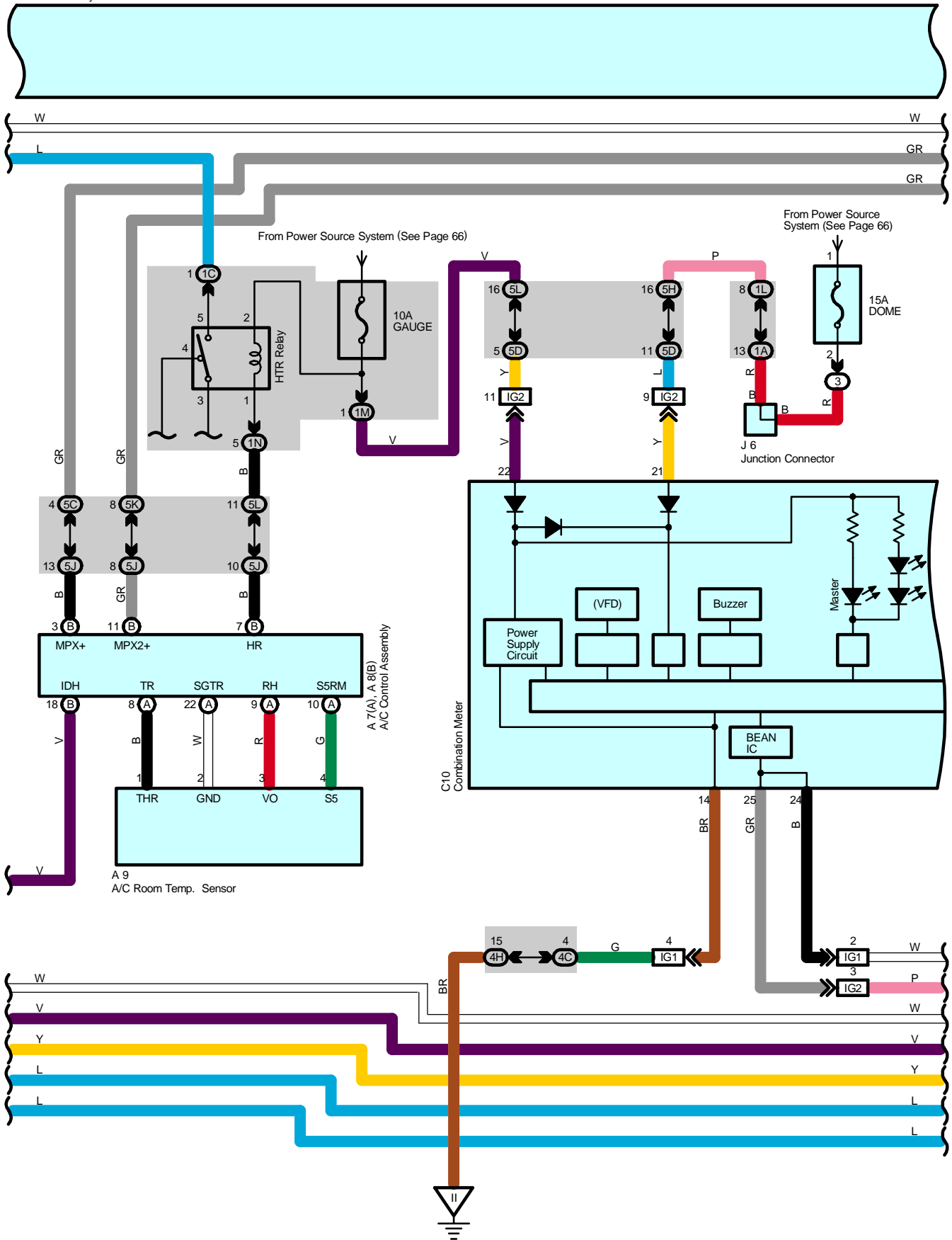
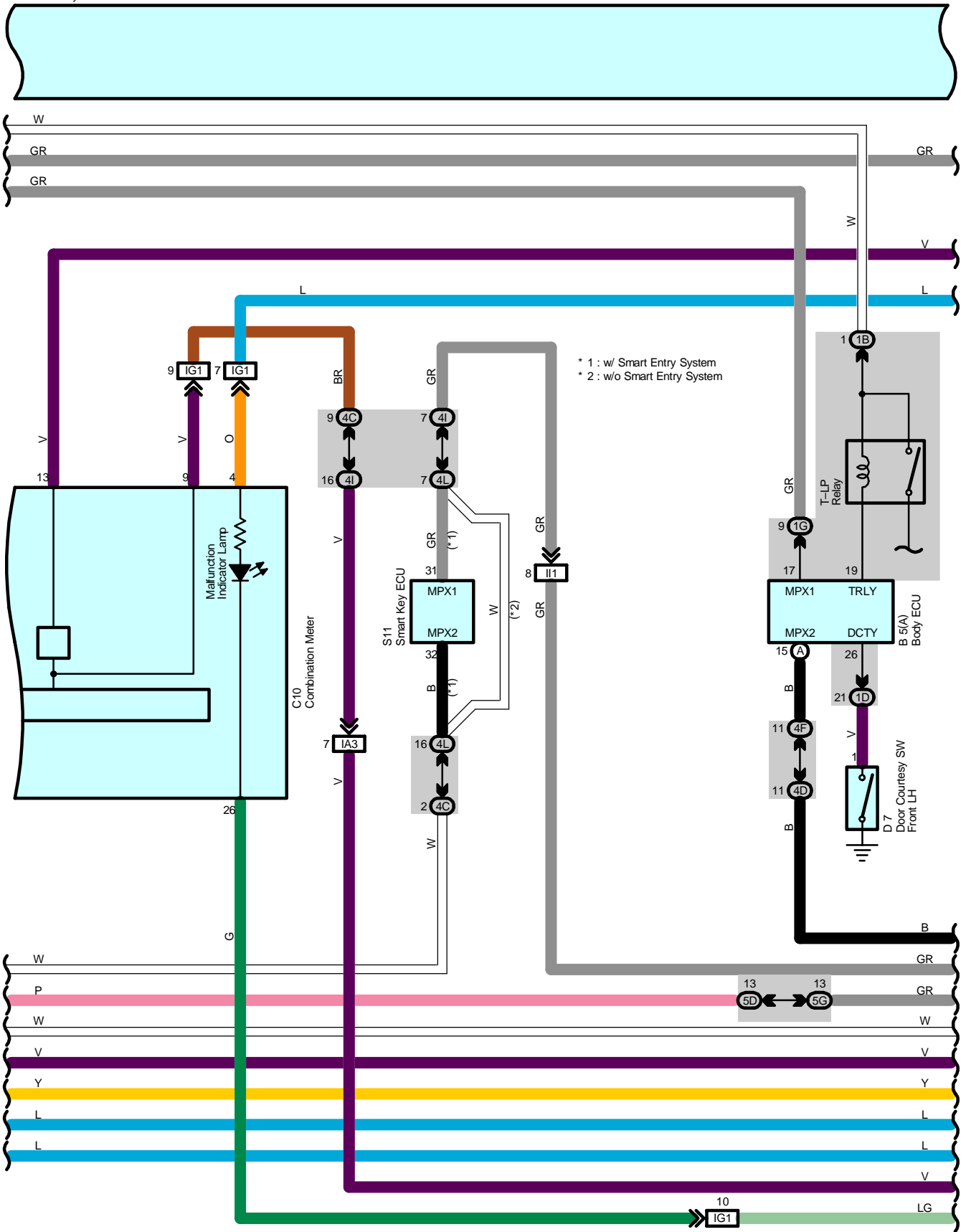


H14(A), H15(B), H16(C), H17(D)
Hybrid Vehicle Control ECU

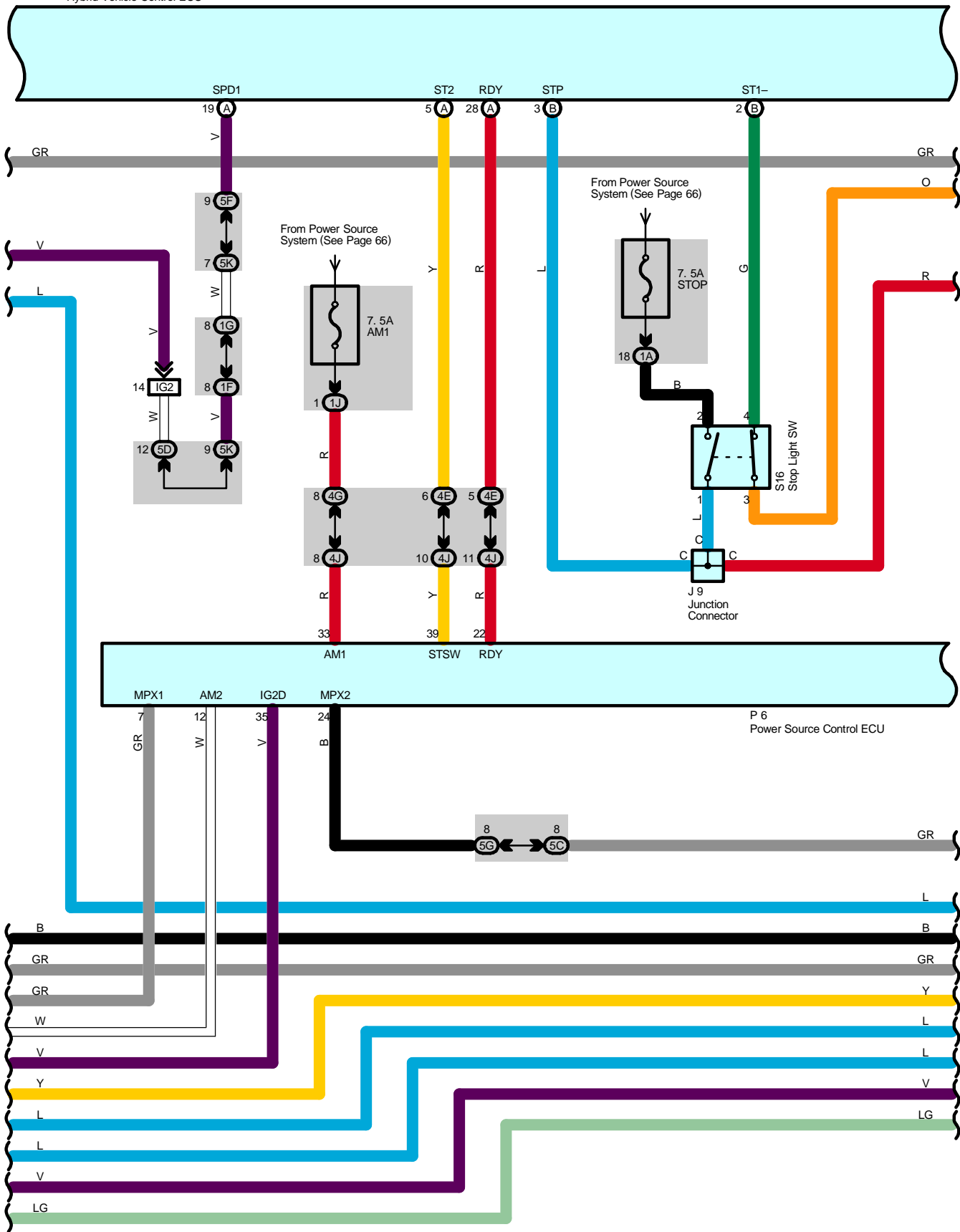


TOYOTA Hybrid System

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

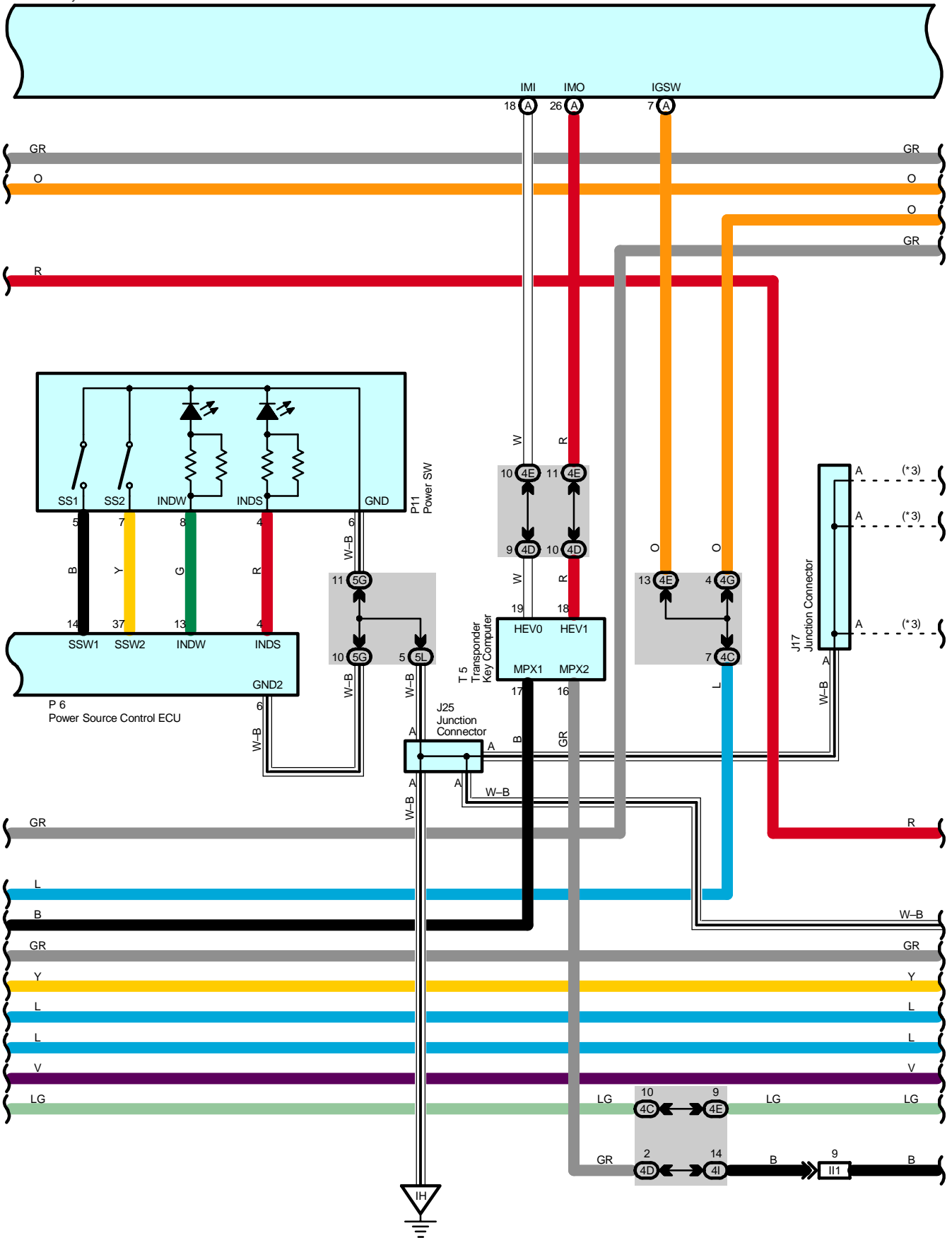


H14(A), H15(B), H16(C), H17(D)
Hybrid Vehicle Control ECU

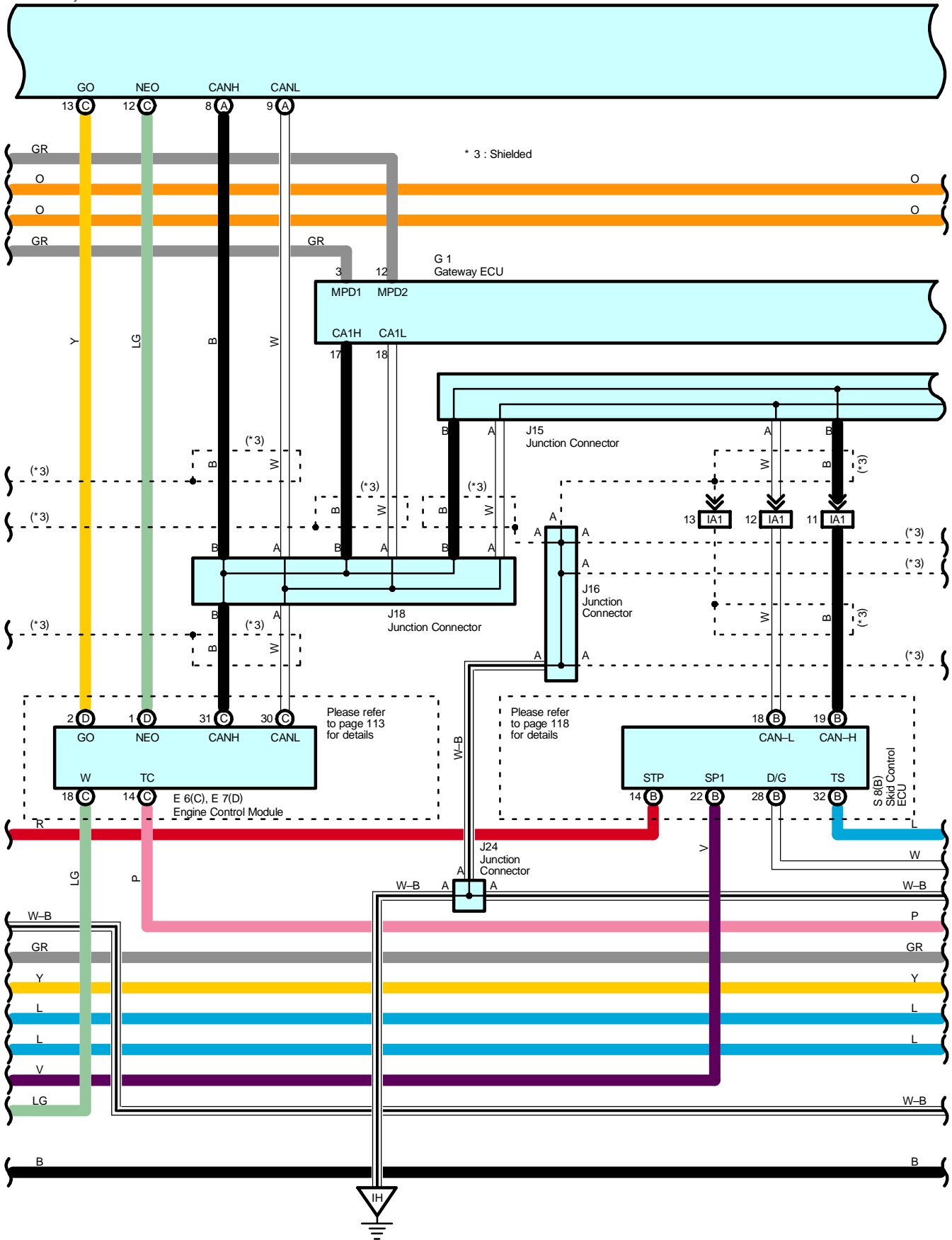


TOYOTA Hybrid System

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

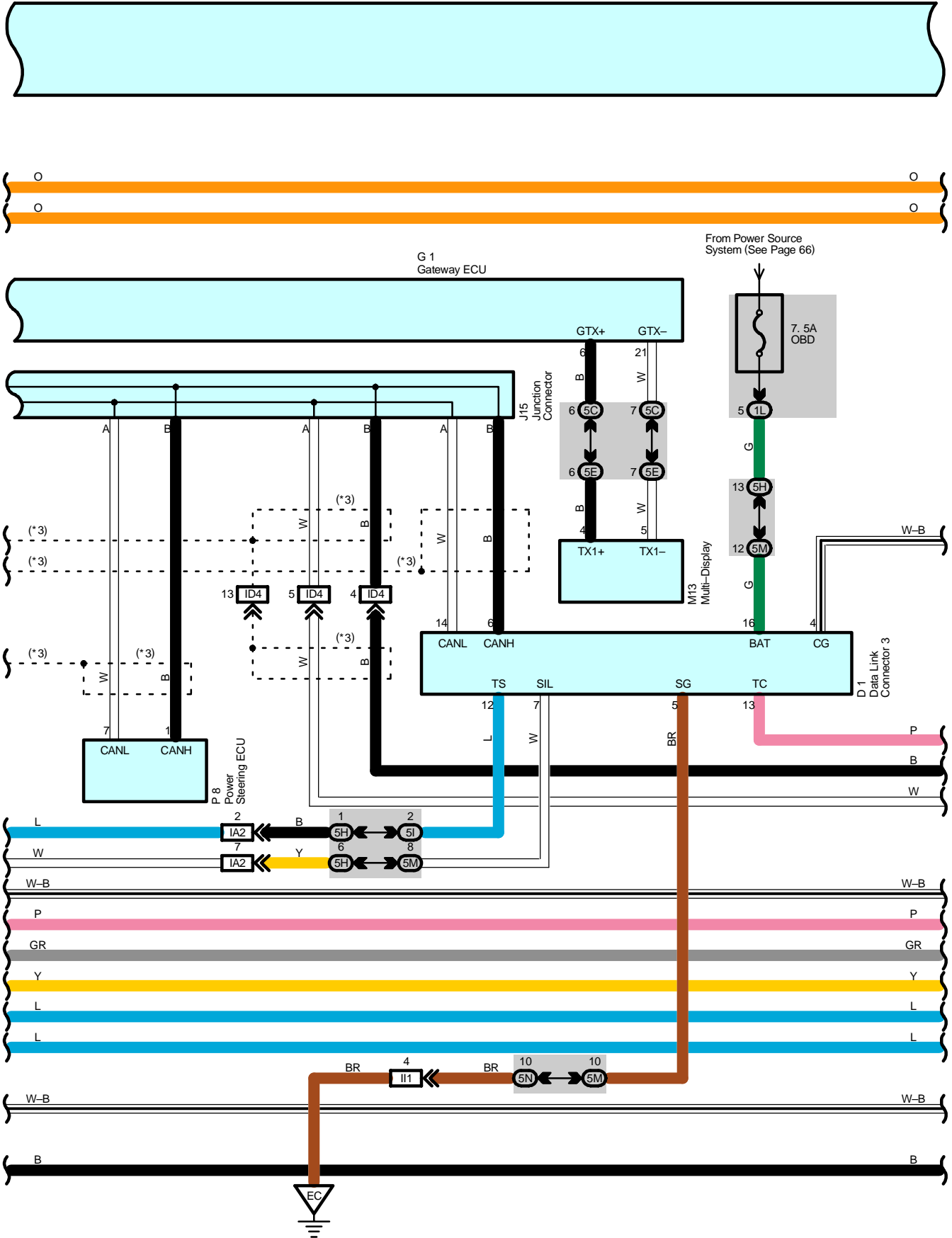


H14(A), H15(B), H16(C), H17(D)
Hybrid Vehicle Control ECU

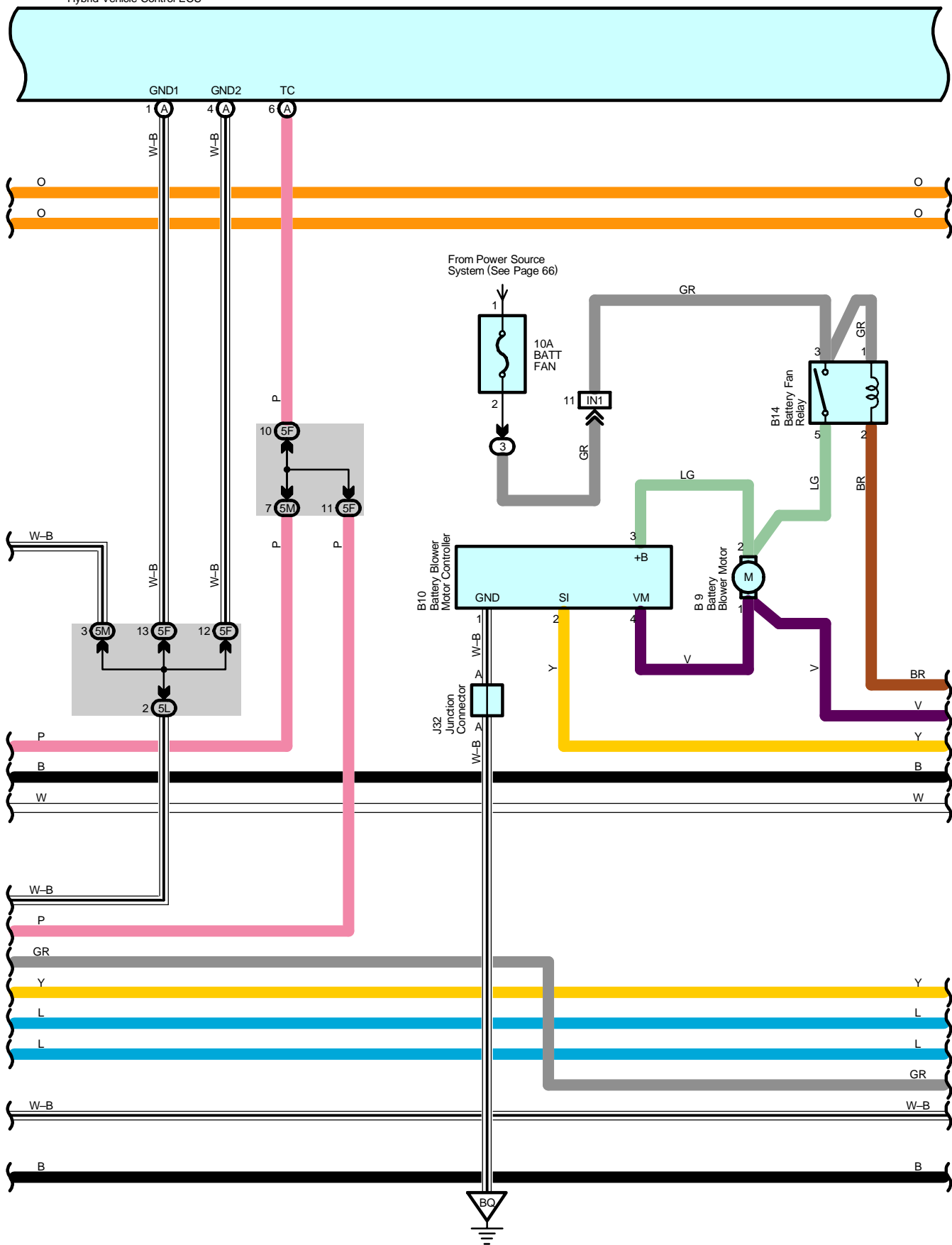


TOYOTA Hybrid System

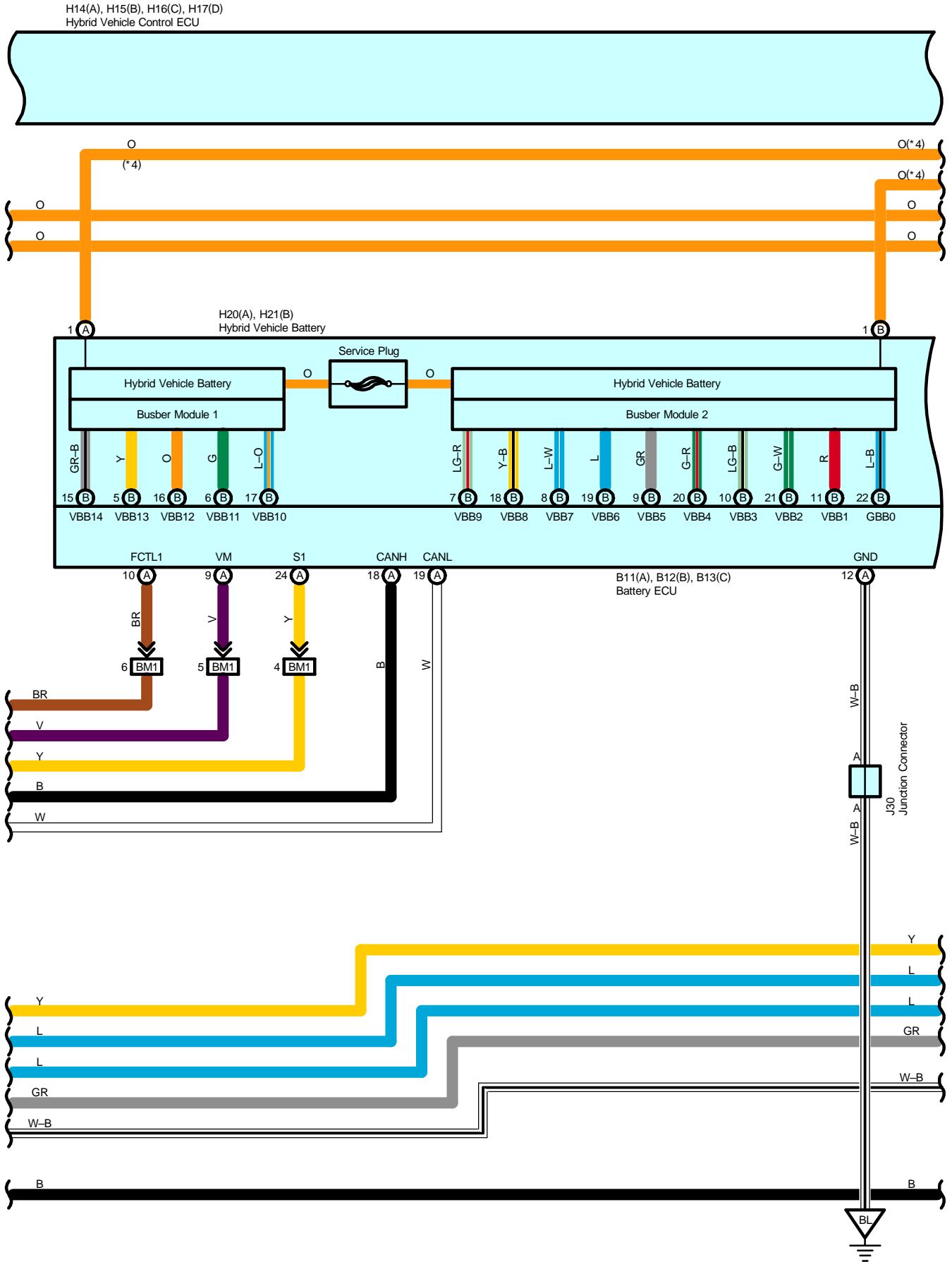
H14(A), H15(B), H16(C), H17(D)
Hybrid Vehicle Control ECU



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

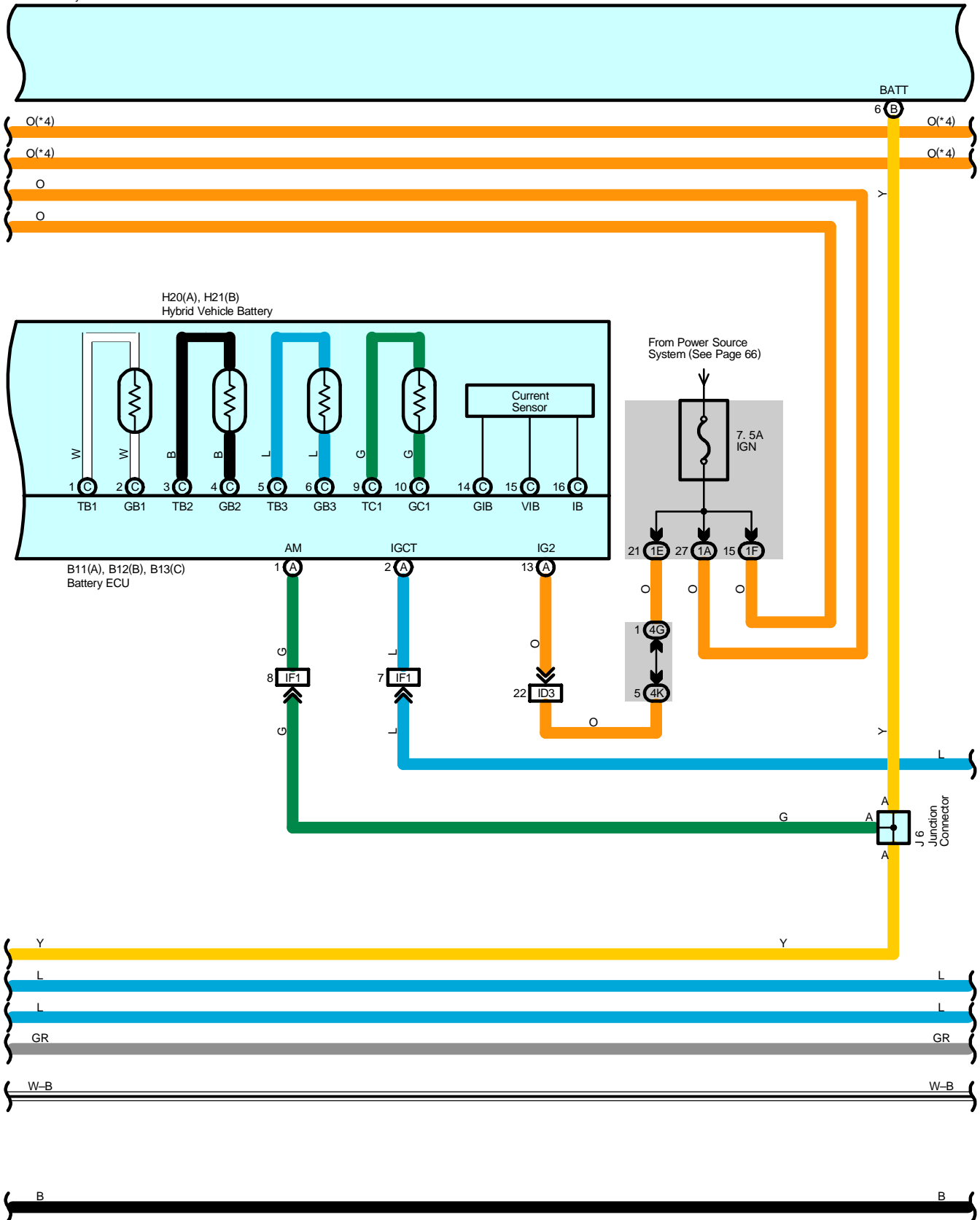


TOYOTA Hybrid System

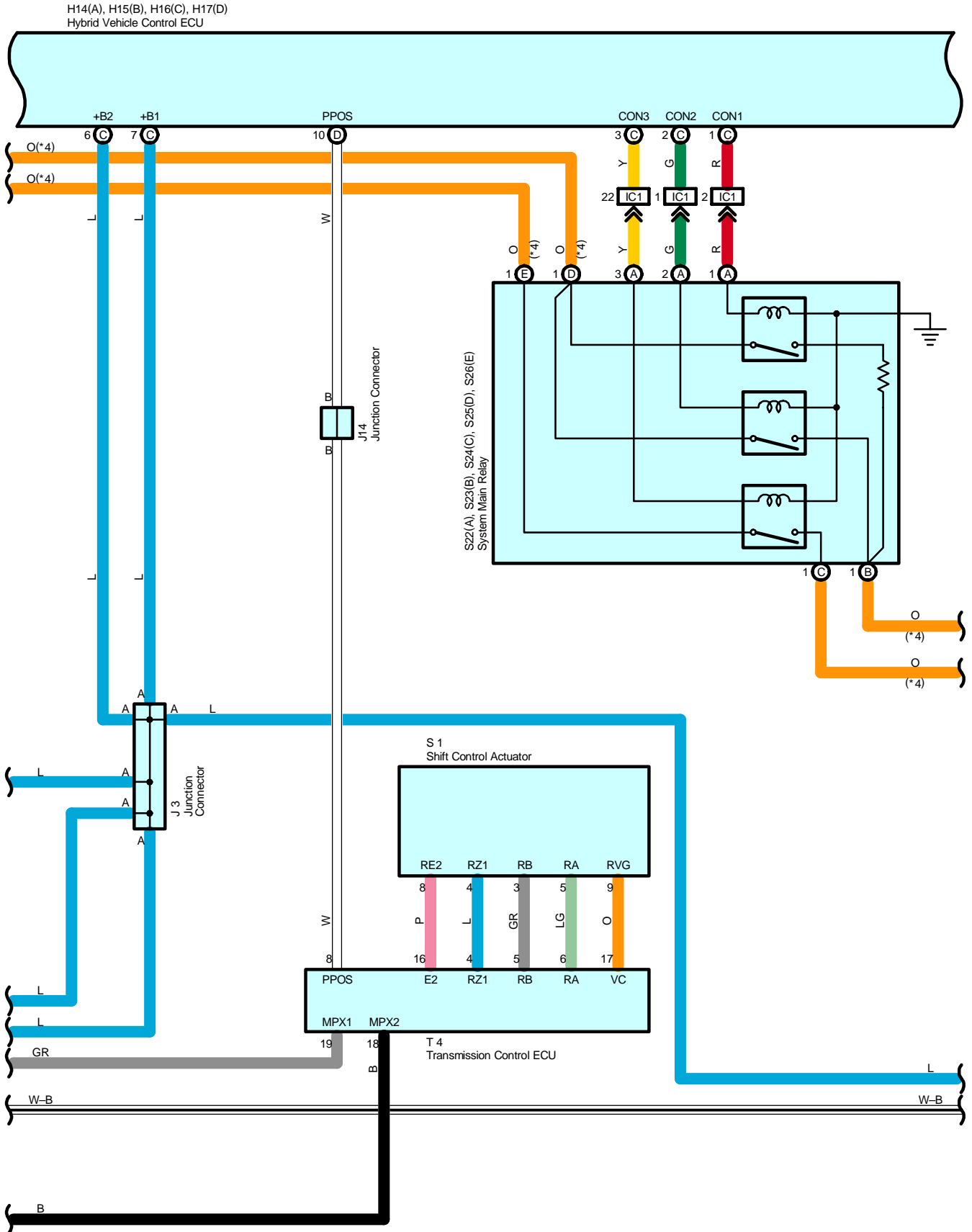


H14(A), H15(B), H16(C), H17(D)
Hybrid Vehicle Control ECU

* 4 : High Voltage

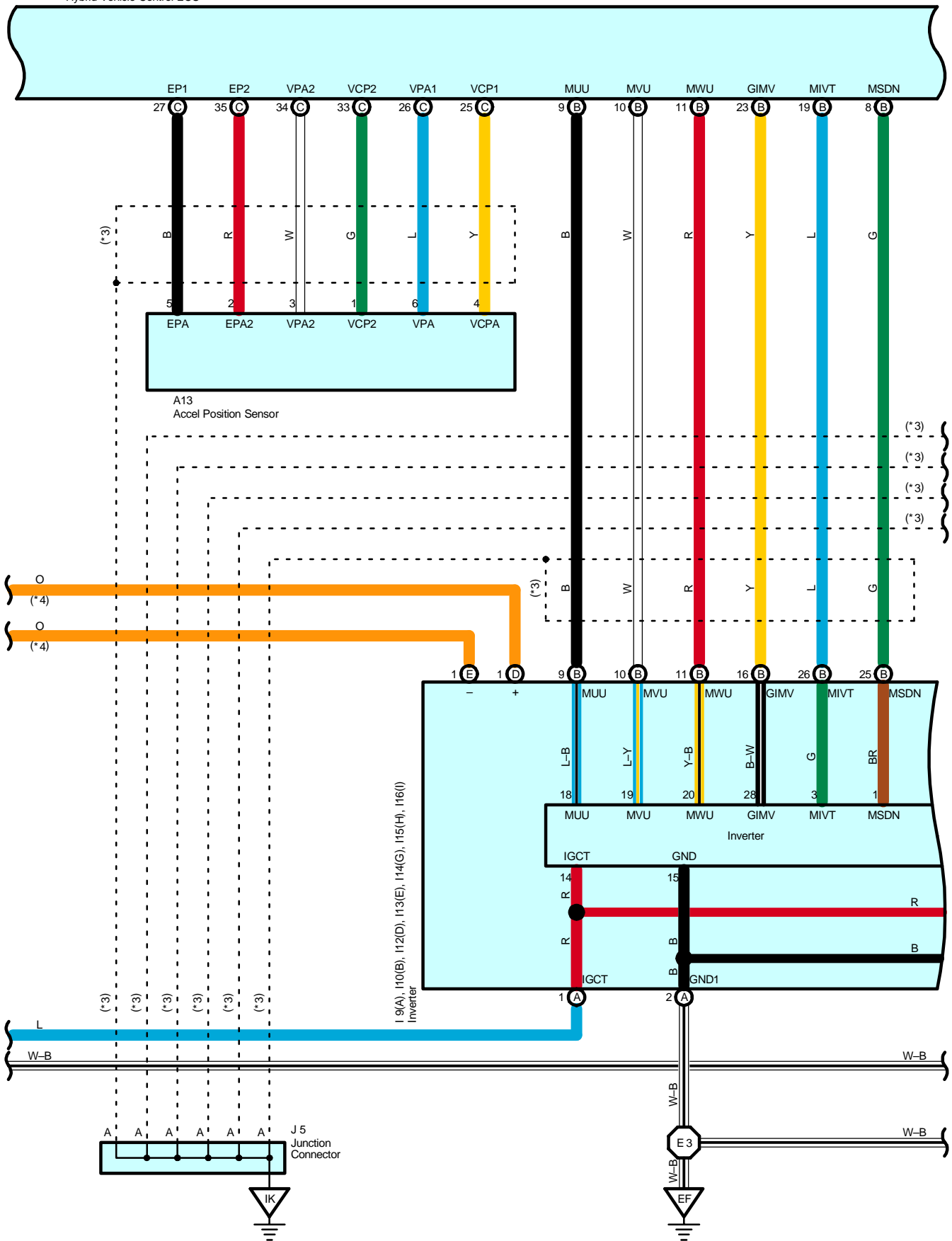


TOYOTA Hybrid System



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

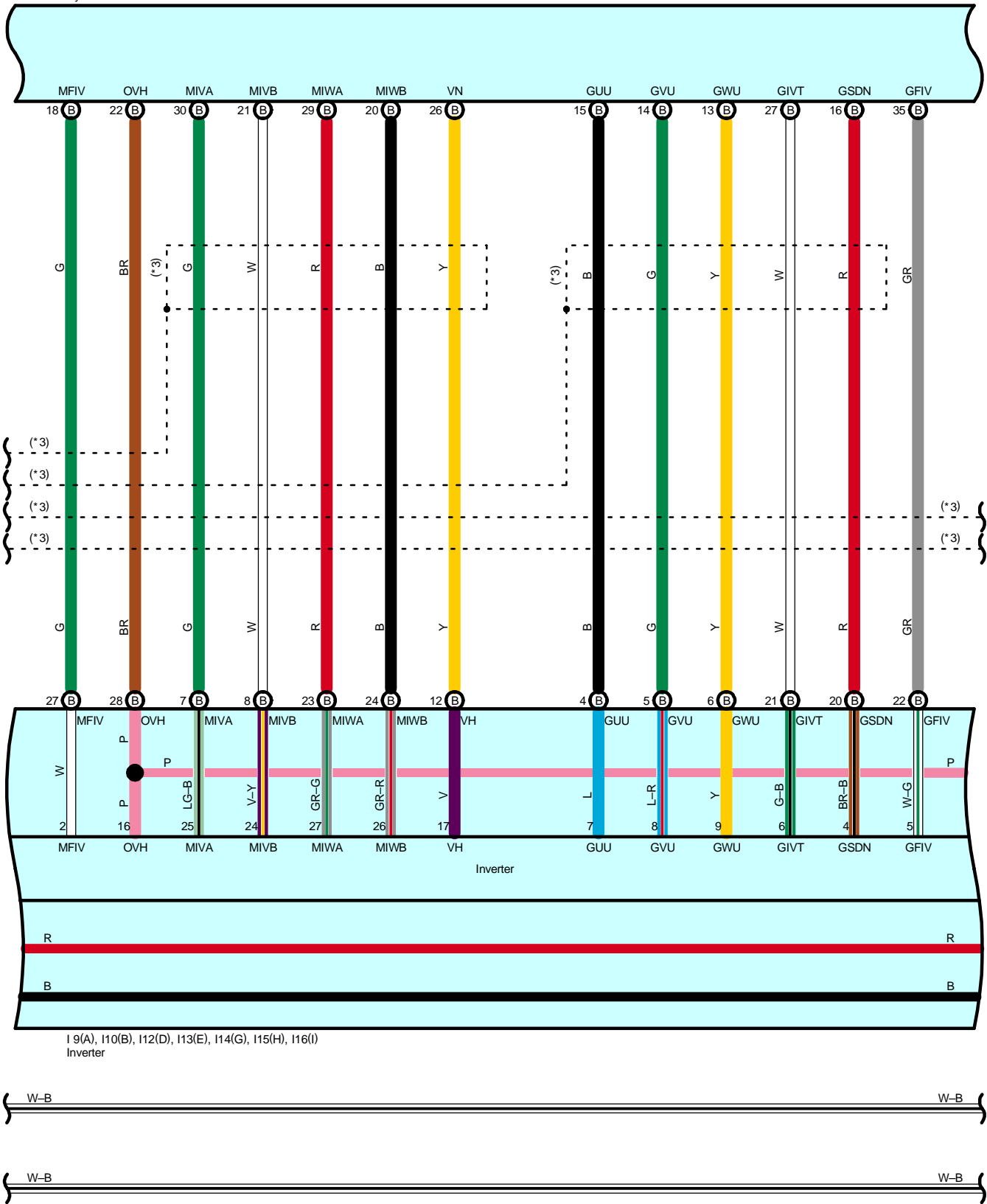
* 3 : Shielded
* 4 : High Voltage



TOYOTA Hybrid System

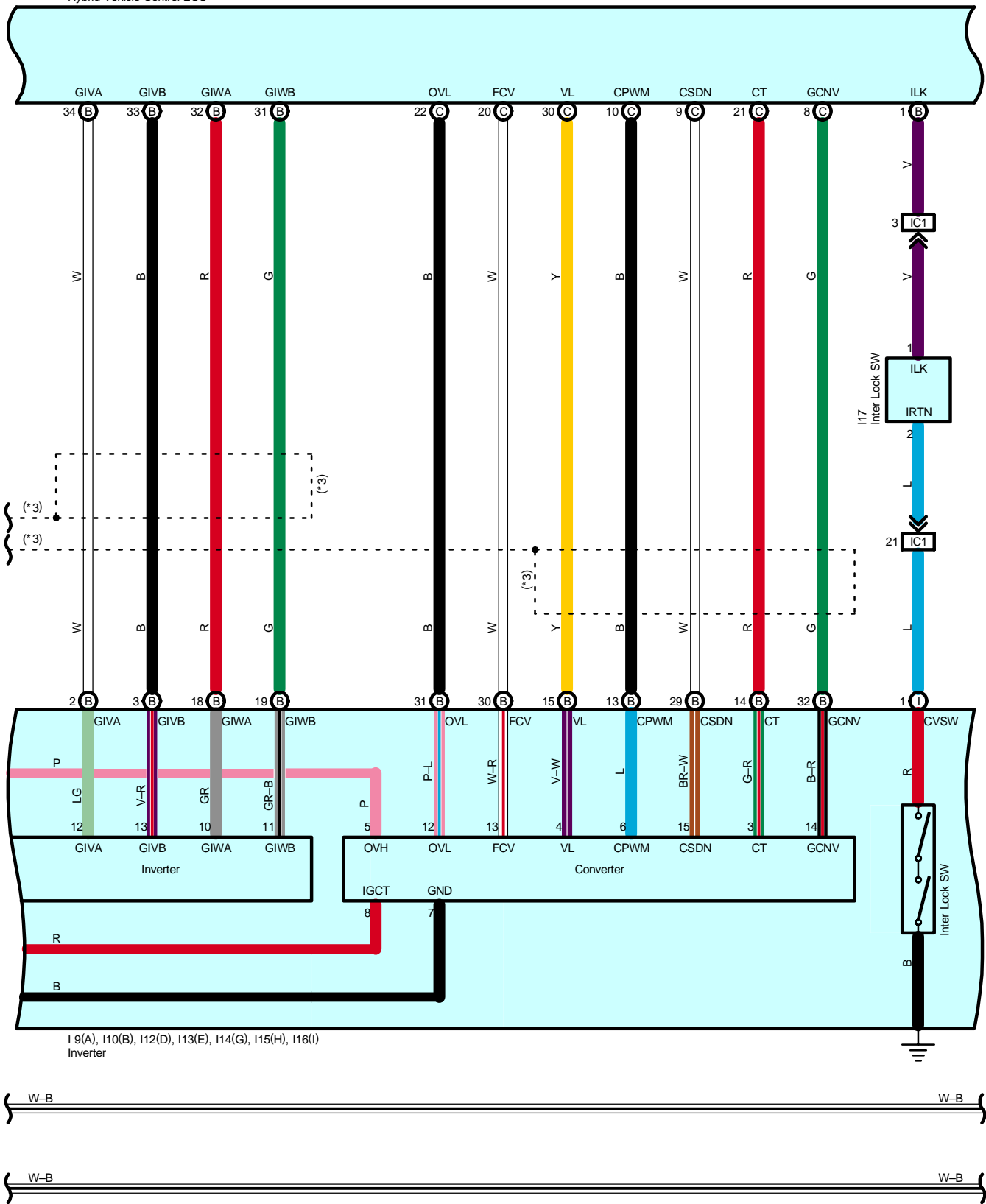
* 3 : Shielded

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



I 9(A), I10(B), I12(D), I13(E), I14(G), I15(H), I16(I)
Inverter

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

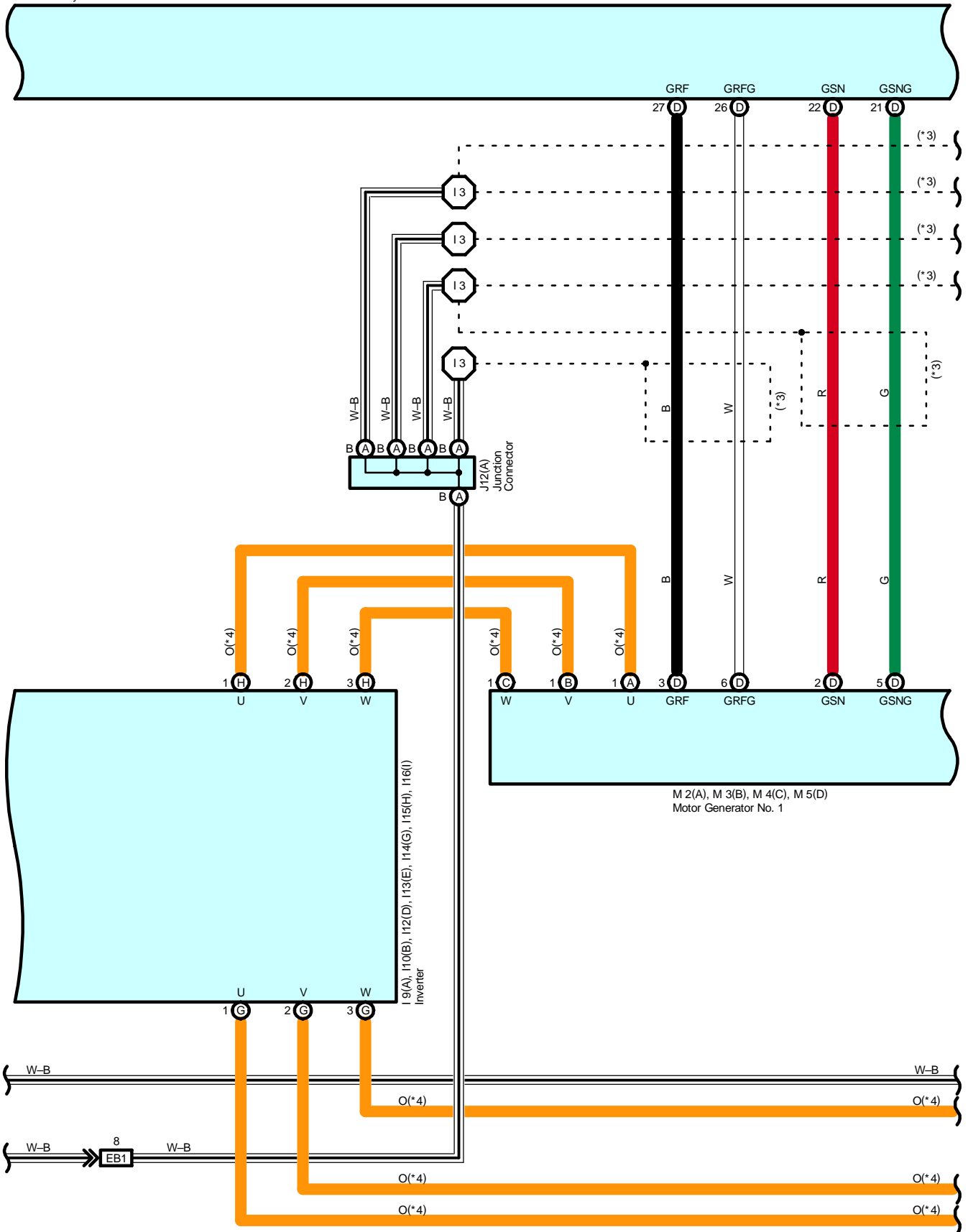


I 9(A), I10(B), I12(D), I13(E), I14(G), I15(H), I16(I)
Inverter

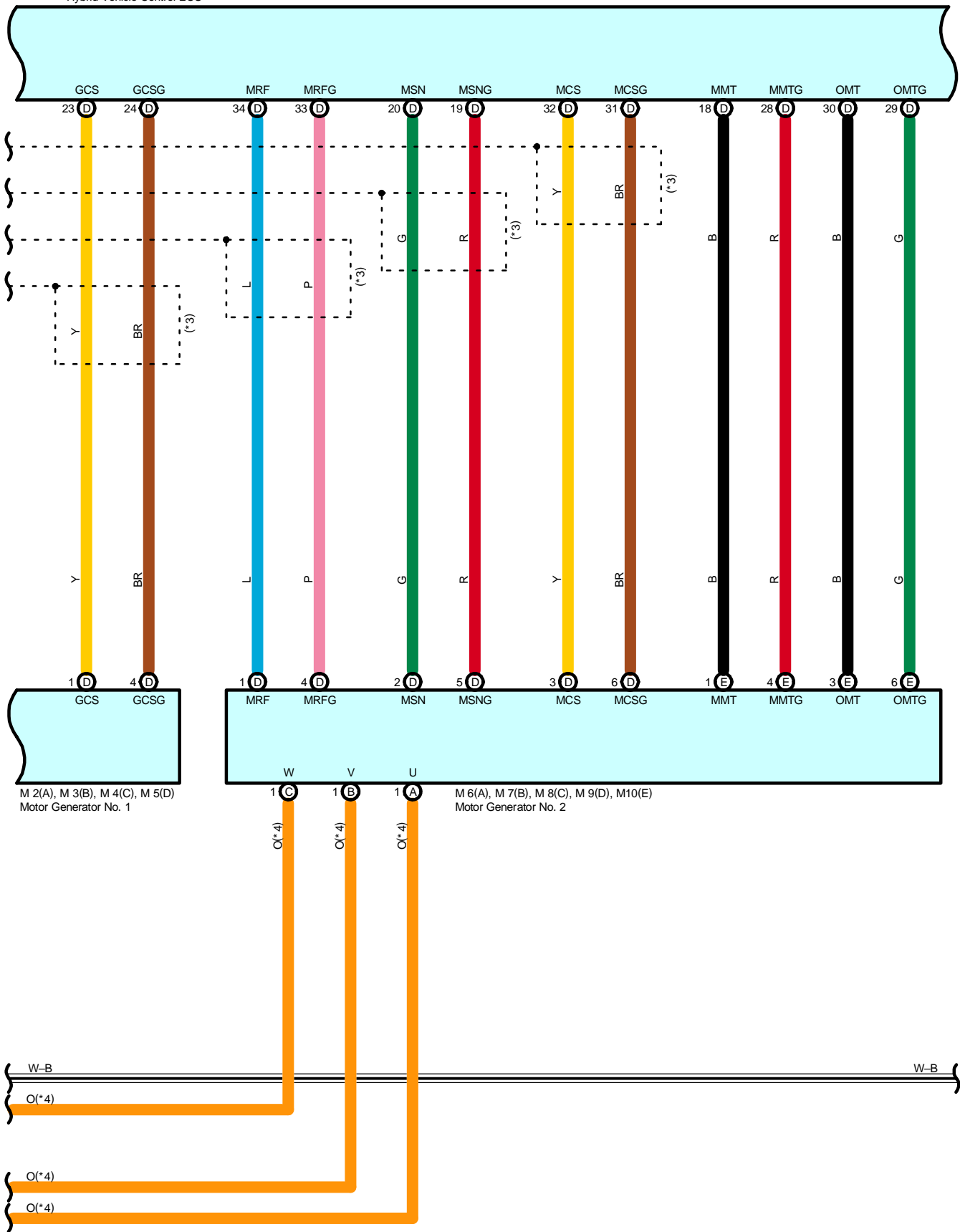
TOYOTA Hybrid System

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

* 3 : Shielded
* 4 : High Voltage



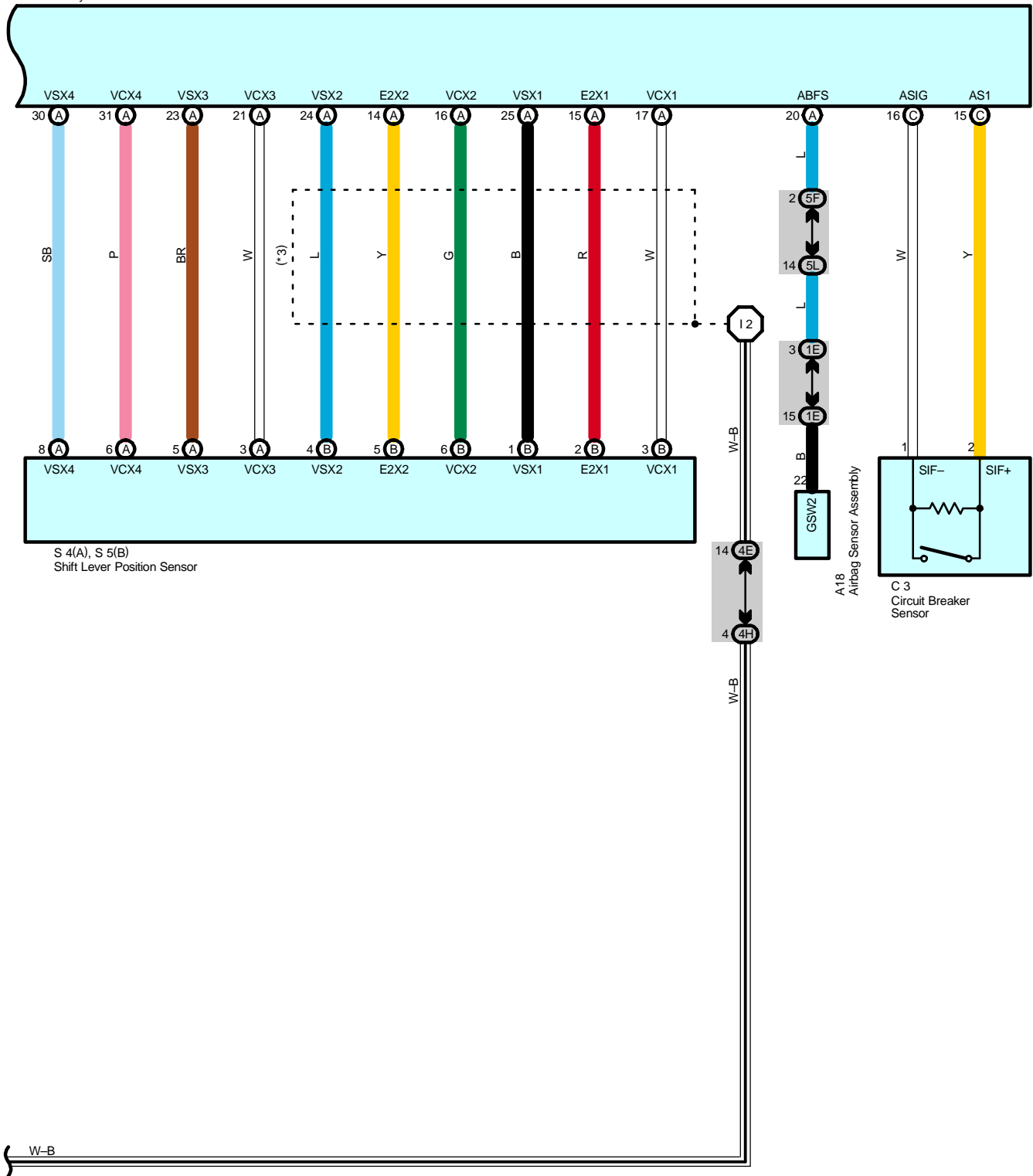
H14(A), H15(B), H16(C), H17(D)
Hybrid Vehicle Control ECU



TOYOTA Hybrid System

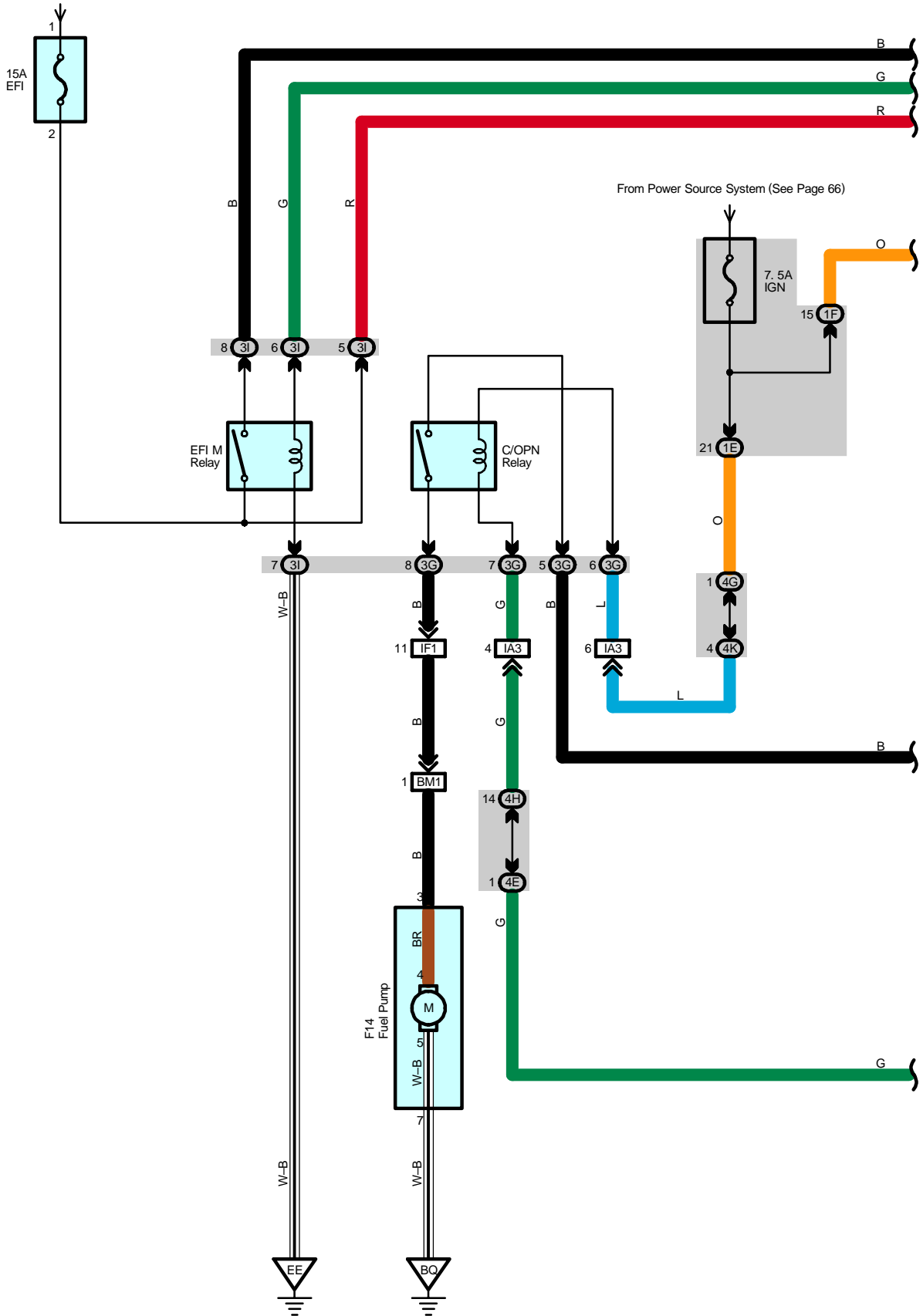
* 3 : Shielded

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



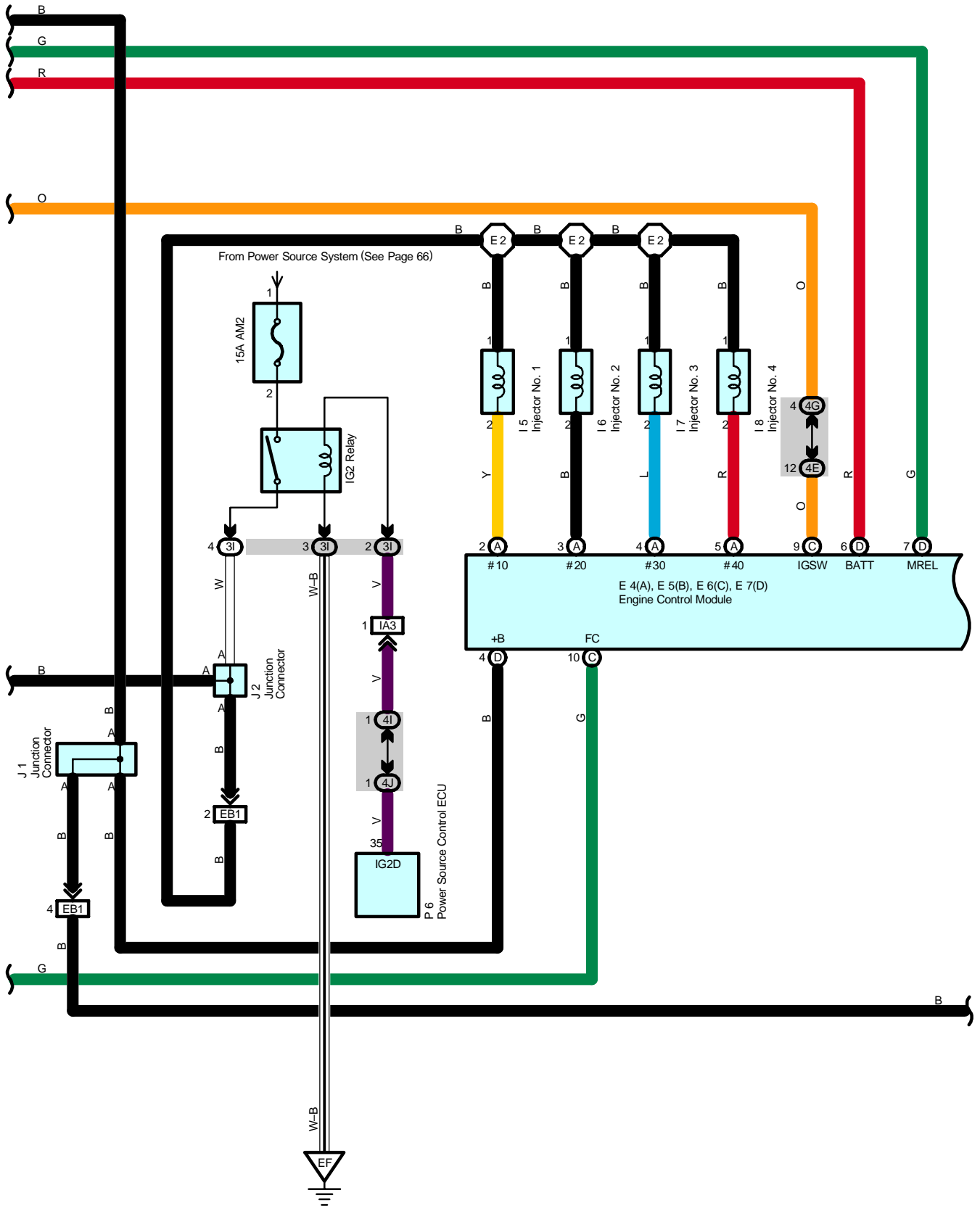
[Details of Engine Control Module Section]

From Power Source System (See Page 66)



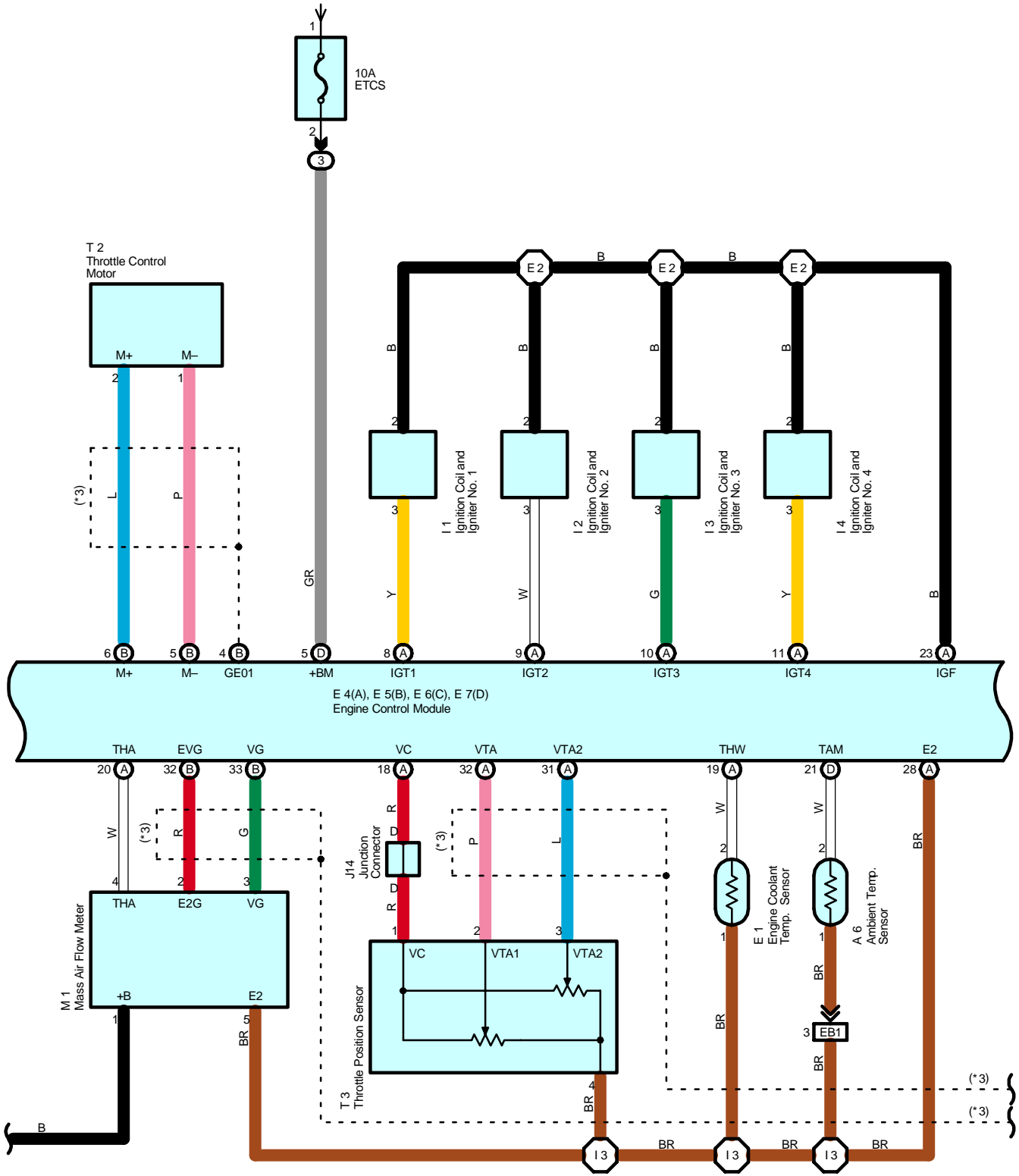
TOYOTA Hybrid System

[Details of Engine Control Module Section]



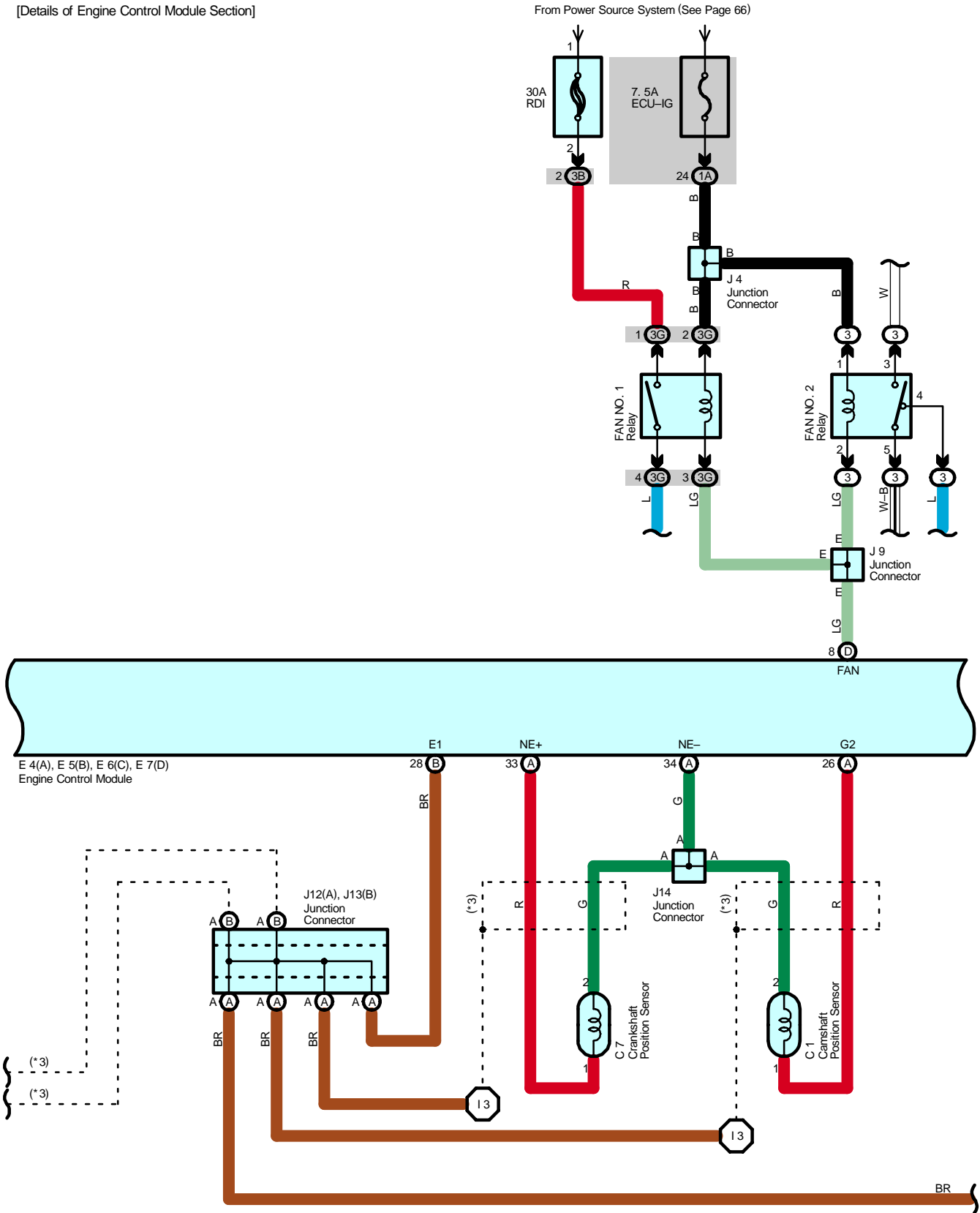
From Power Source System (See Page 66)

* 3 : Shielded

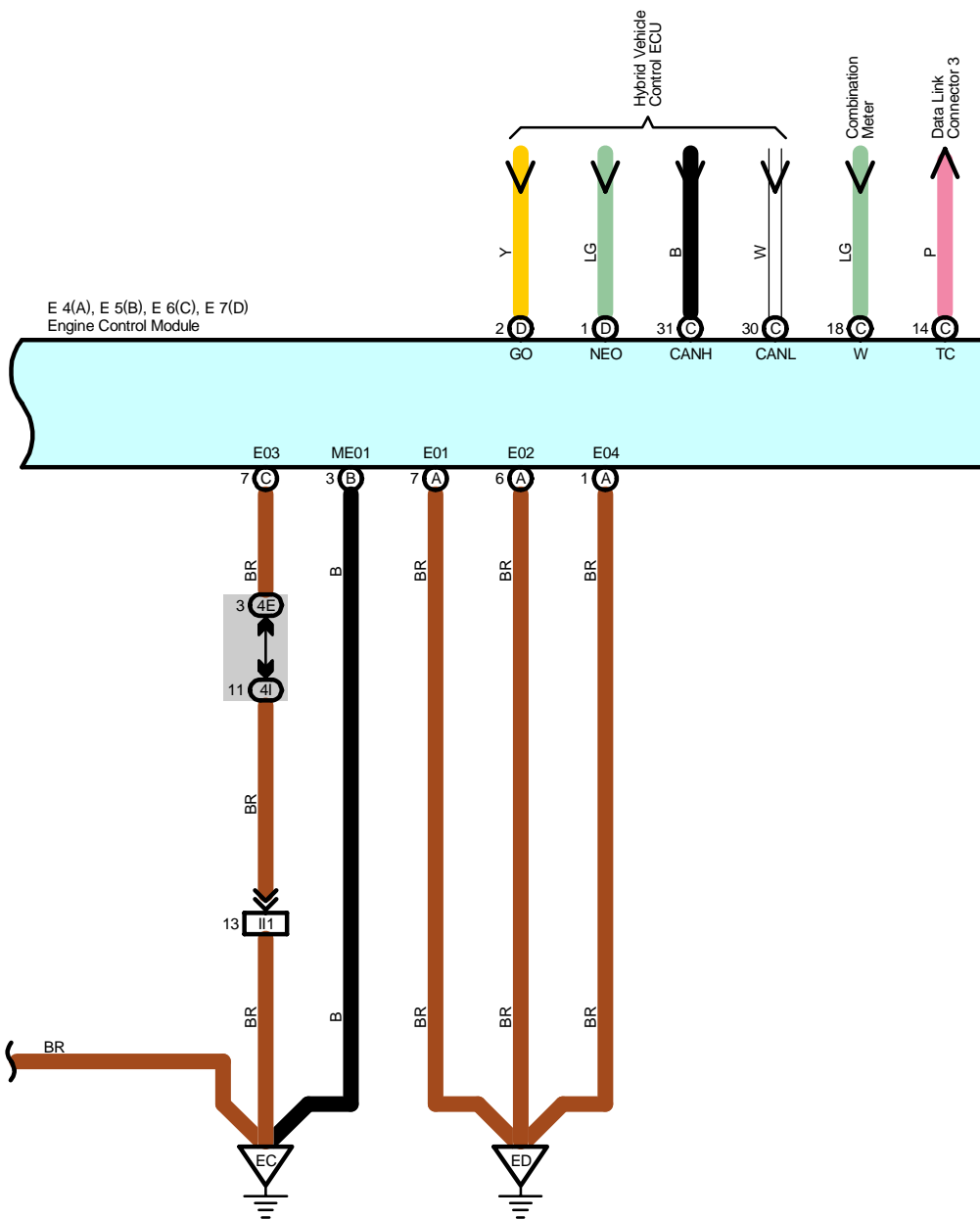


TOYOTA Hybrid System

[Details of Engine Control Module Section]



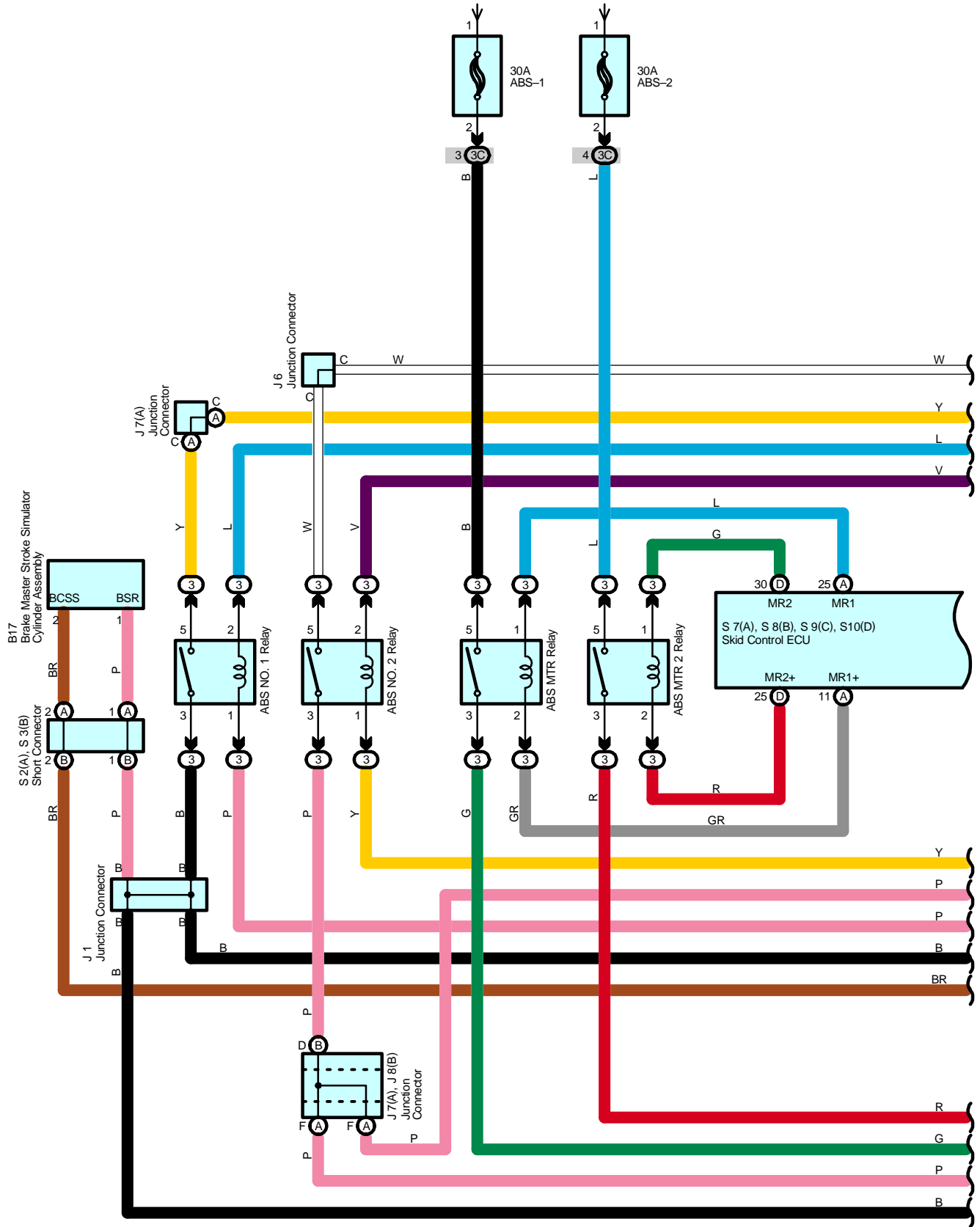
* 3 : Shielded



TOYOTA Hybrid System

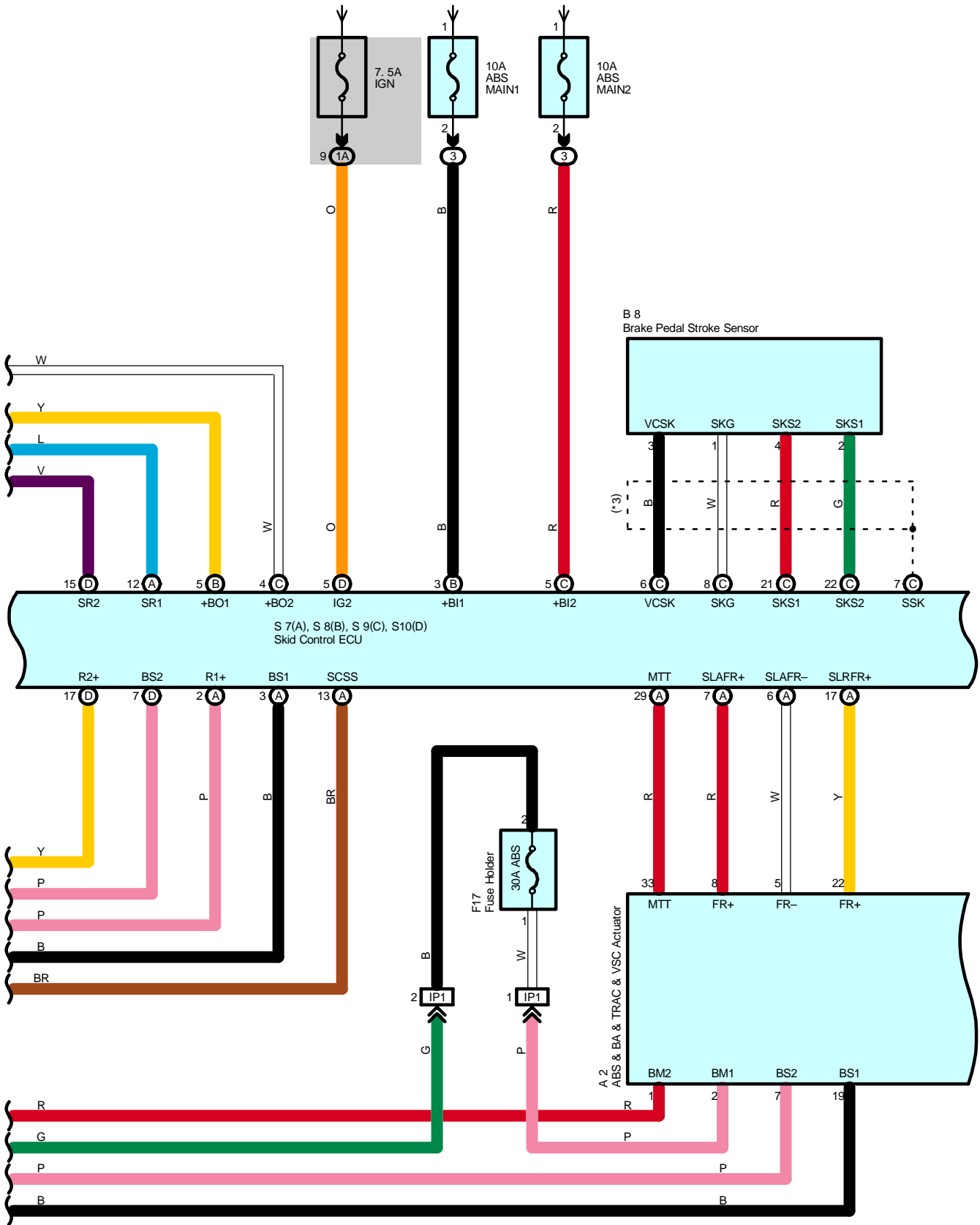
[Details of Skid Control ECU Section]

From Power Source System (See Page 66)



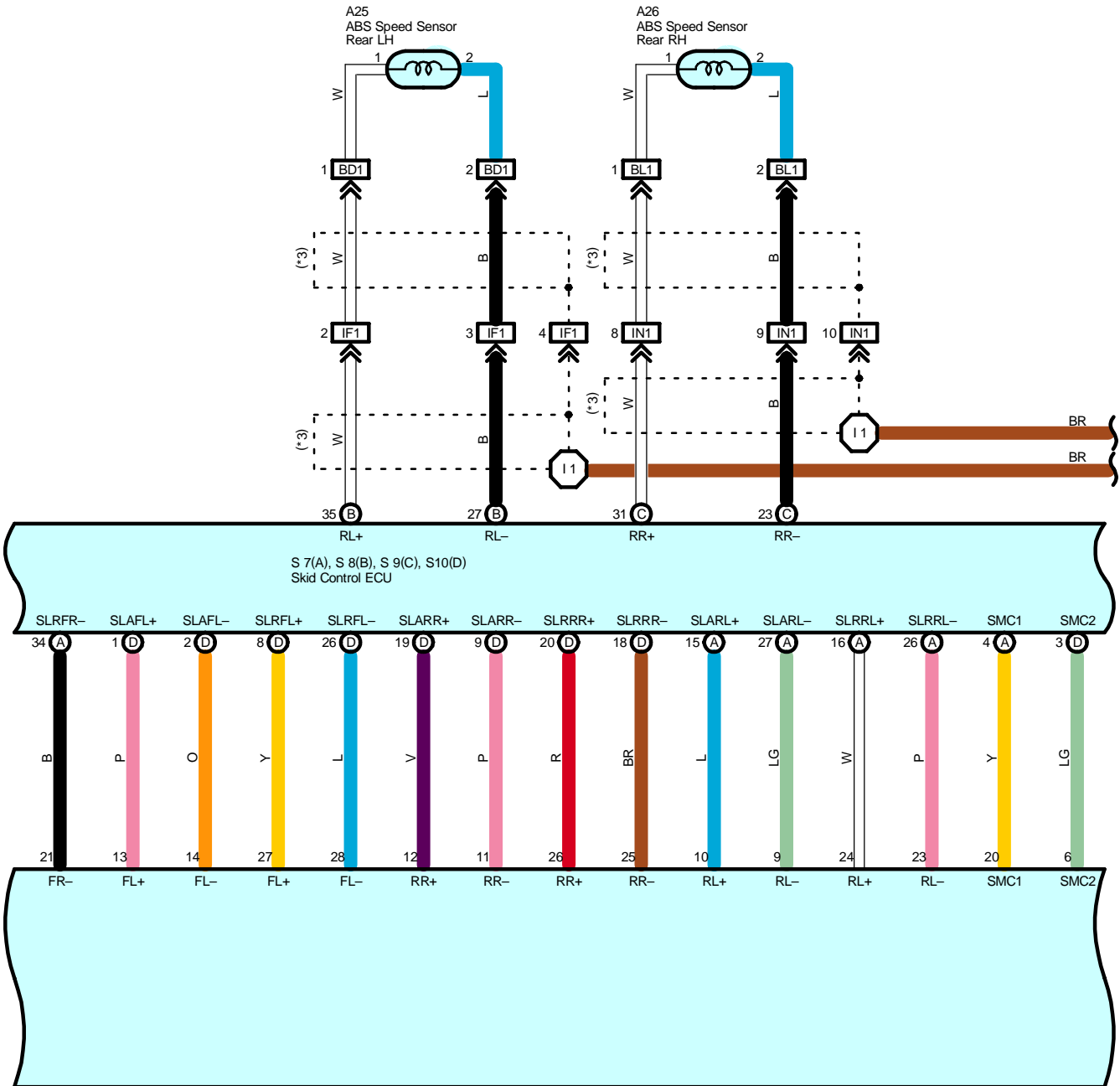
From Power Source System (See Page 66)

* 3 : Shielded

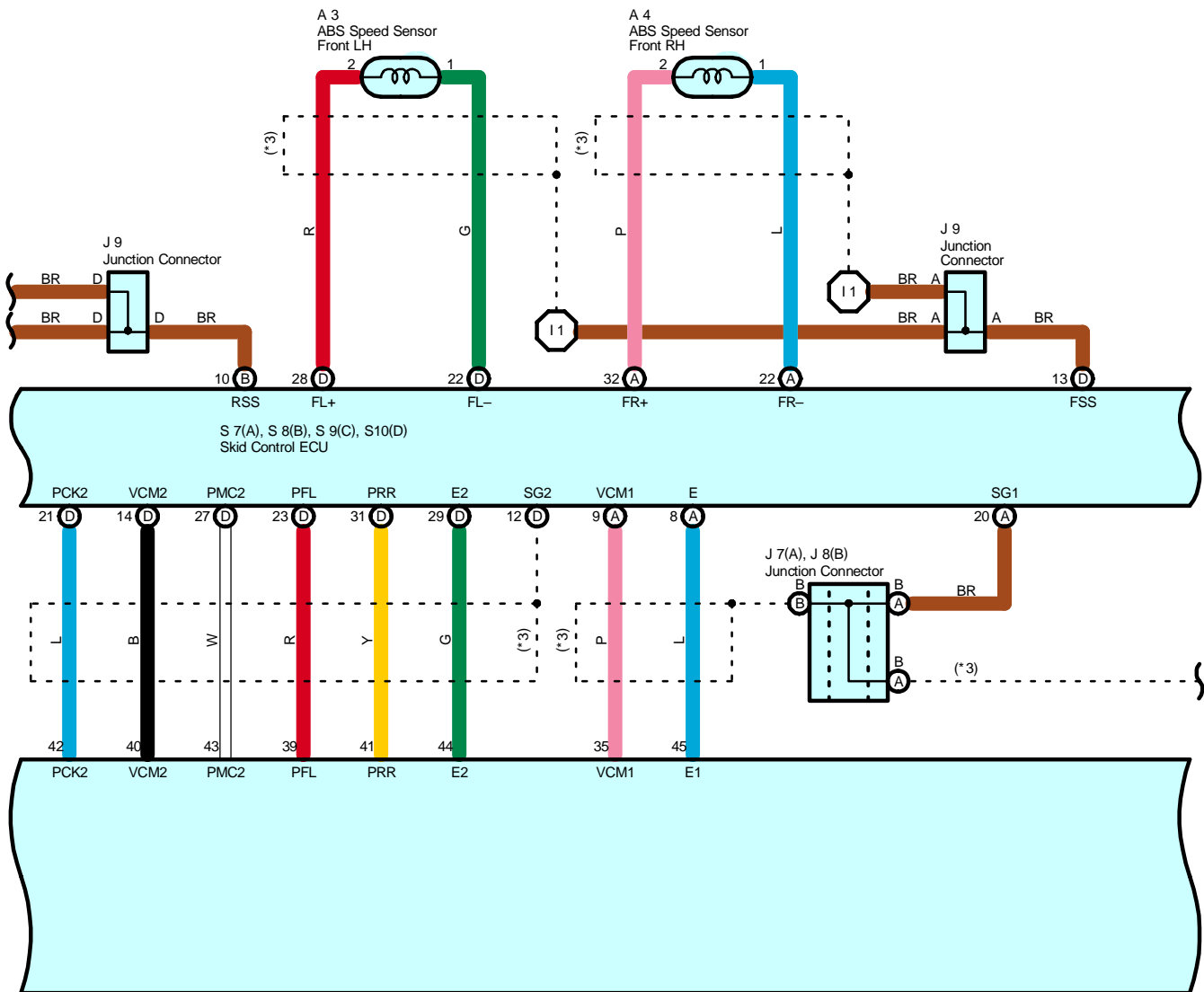


TOYOTA Hybrid System

[Details of Skid Control ECU Section]



A 2
ABS & BA & TRAC & VSC Actuator



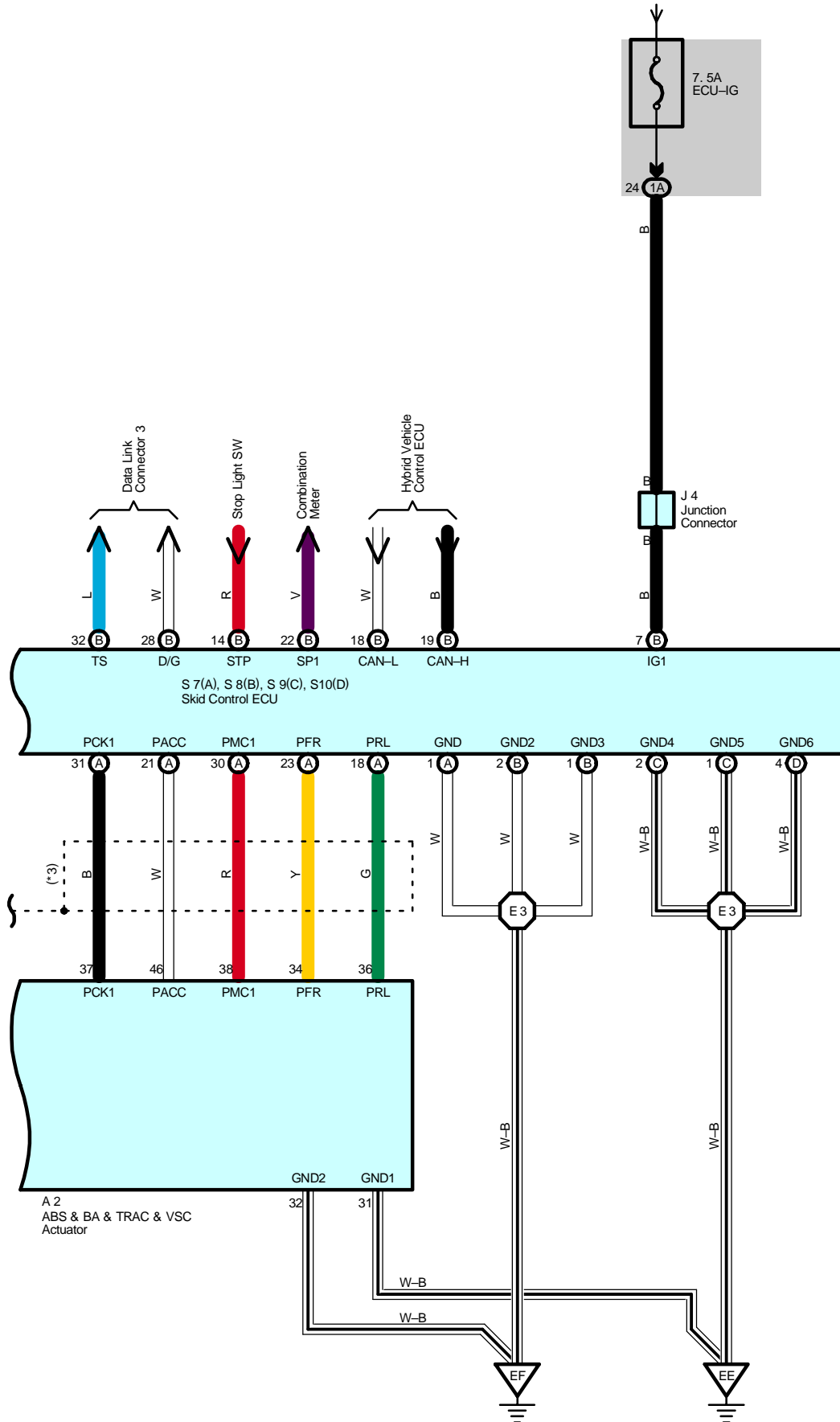
A 2
ABS & BA & TRAC & VSC Actuator

TOYOTA Hybrid System

[Details of Skid Control ECU Section]

From Power Source System (See Page 66)

* 3 : Shielded



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.

Service Hints

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

- (B) 6-Ground : Always approx. 12 volts
- (C) 6, (C) 7-Ground : Approx. 12 volts with the hybrid system at ON (READY) position
- (A) 7-Ground : Approx. 12 volts with the power SW at IG ON position
- (B) 3-Ground : Approx. 12 volts with the brake pedal depressed
- (A) 1, (A) 4-Ground : Always continuity

TOYOTA Hybrid System

○ : Parts Location

Code	See Page	Code	See Page	Code	See Page
A2	44	H15	B 47	J30	51
A3	44	H16	C 47	J32	51
A4	44	H17	D 47	M1	45
A6	44	H20	A 51	M2	A 45
A7	A 46	H21	B 51	M3	B 45
A8	B 46	I1	45	M4	C 45
A9	46	I2	45	M5	D 45
A13	46	I3	45	M6	A 45
A18	46	I4	45	M7	B 45
A25	50	I5	45	M8	C 45
A26	50	I6	45	M9	D 45
B5	A 46	I7	45	M10	E 45
B8	46	I8	45	M13	48
B9	50	I9	A 45	P6	49
B10	50	I10	B 45	P8	49
B11	A 50	I12	D 45	P11	49
B12	B 50	I13	E 45	S1	45
B13	C 50	I14	G 45	S2	A 45
B14	50	I15	H 45	S3	B 45
B17	44	I16	I 45	S4	A 49
C1	44	I17	51	S5	B 49
C3	44	J1	45	S7	A 49
C5	A 44	J2	45	S8	B 49
C6	B 44	J3	45	S9	C 49
C7	44	J4	45	S10	D 49
C10	47	J5	48	S11	49
D1	47	J6	48	S16	49
D7	50	J7	A 48	S22	A 53
E1	44	J8	B 48	S23	B 53
E4	A 47	J9	48	S24	C 53
E5	B 47	J12	A 48	S25	D 53
E6	C 47	J13	B 48	S26	E 53
E7	D 47	J14	48	S27	45
F14	51	J15	48	S28	45
F15	A 51	J16	48	T2	45
F16	B 51	J17	48	T3	45
F17	47	J18	48	T4	49
G1	47	J24	48	T5	49
H14	A 47	J25	48	W3	45

○ : 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	28	Engine Room Main Wire and Driver Side J/B (Lower Finish Panel)
1B		
1C		
1D	28	Floor Wire and Driver Side J/B (Lower Finish Panel)
1E	28	Instrument Panel Wire and Driver Side J/B (Lower Finish Panel)
1F		
1G		
1J		
1L		
1M		
1N	22	Engine Room Main Wire and Engine Room J/B (Engine Compartment Left)
3B		
3C		
3D		
3E		
3G		
3I	22	Frame Wire and Engine Room J/B (Engine Compartment Left)
3J		
3M	36	Instrument Panel Wire and Center Connector No.1 (Behind the Combination Meter)
4C		
4D		
4E		
4F		
4G		
4H		
4I		
4J		
4K		
4L		
5C	40	Instrument Panel Wire and Center Connector No.2 (Instrument Panel Brace RH)
5D		
5E		
5F		
5G		
5H		
5I		
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	54	Engine Wire and Engine Room Main Wire (Inside of the Engine Room R/B)
IA1	56	Engine Room Main Wire and Instrument Panel Wire (Upper Parts of Front Body Pillar LH)
IA2		
IA3		
IC1	56	Engine Room Main Wire and Floor Wire (Cowl Side Panel LH)
ID3	56	Instrument Panel Wire and Floor Wire (Left Kick Panel)
ID4		
IF1	56	Floor Wire and Engine Room Main Wire (Left Kick Panel)
IG1	58	Instrument Panel Wire and Instrument Panel No.2 Wire (Behind the Combination Meter)
IG2		
II1	58	Engine Wire and Instrument Panel Wire (Behind the Glove Box)
IN1	58	Floor No.2 Wire and Engine Room Main Wire (Right Kick Panel)
IP1	58	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	62	Skid Control Sensor No.2 Wire and Floor No.2 Wire (Front Side of Right Quarter Panel)
BM1	62	Floor No.2 Wire and Floor Wire (Rear Side of Right Quarter Panel)

: Ground Points

Code	See Page	Ground Points Location
EC	54	Engine Block
ED		
EE	54	Left Side of the Suspension Tower
EF		
IH	56	Cowl Side Panel LH
II	56	Instrument Panel Brace LH
IK	56	Cowl Side Panel RH
BL	60	Rear Side of Left Quarter Panel
BQ	60	Rear Side of Right Quarter Panel

: Splice Points

Code	See Page	Wire Harness with Splice Points	Code	See Page	Wire Harness with Splice Points
E2	54	Engine Wire	I2	58	Instrument Panel Wire
E3	54	Engine Room Main Wire	I3	58	Engine Wire
I1	58	Instrument Panel Wire			

