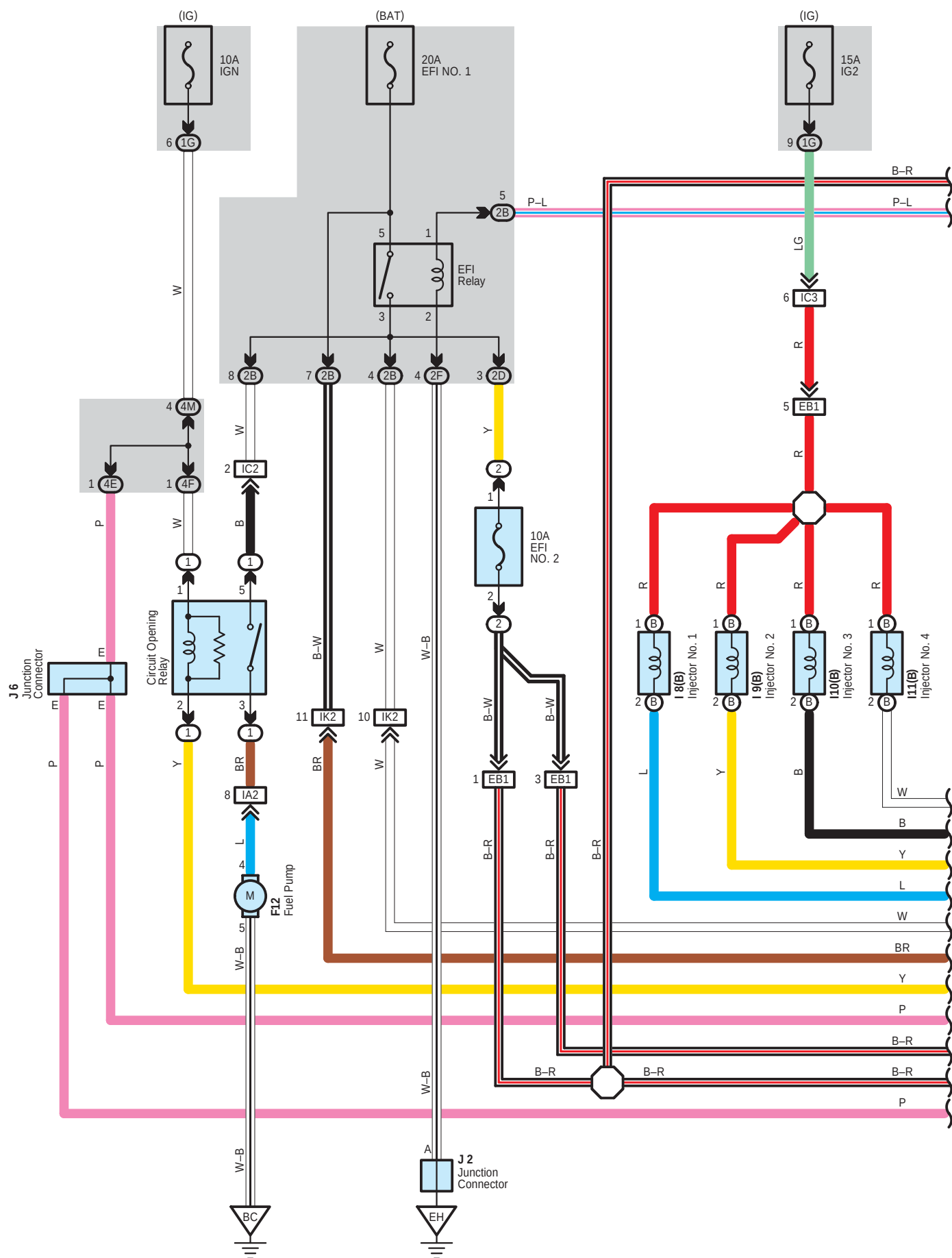
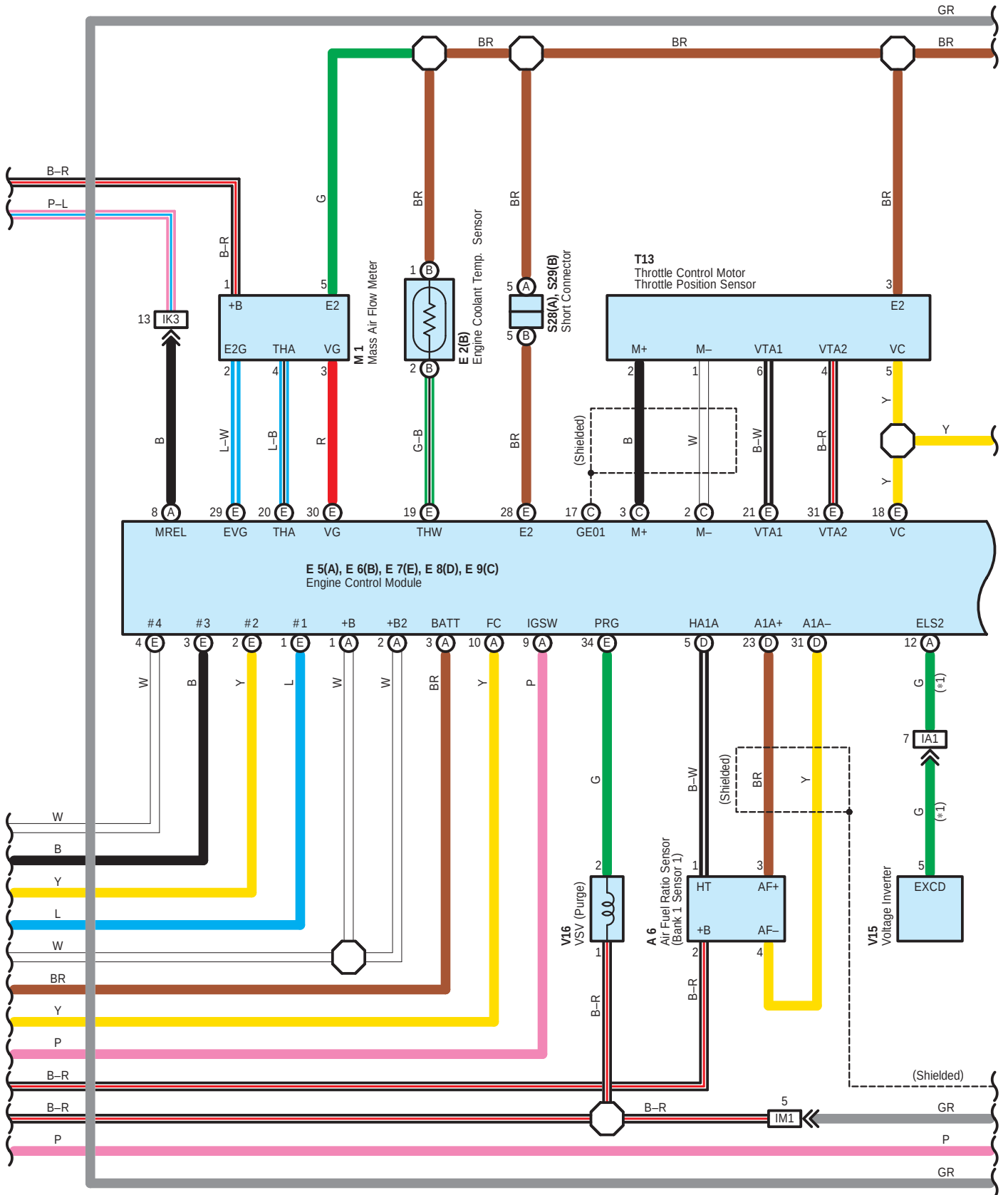
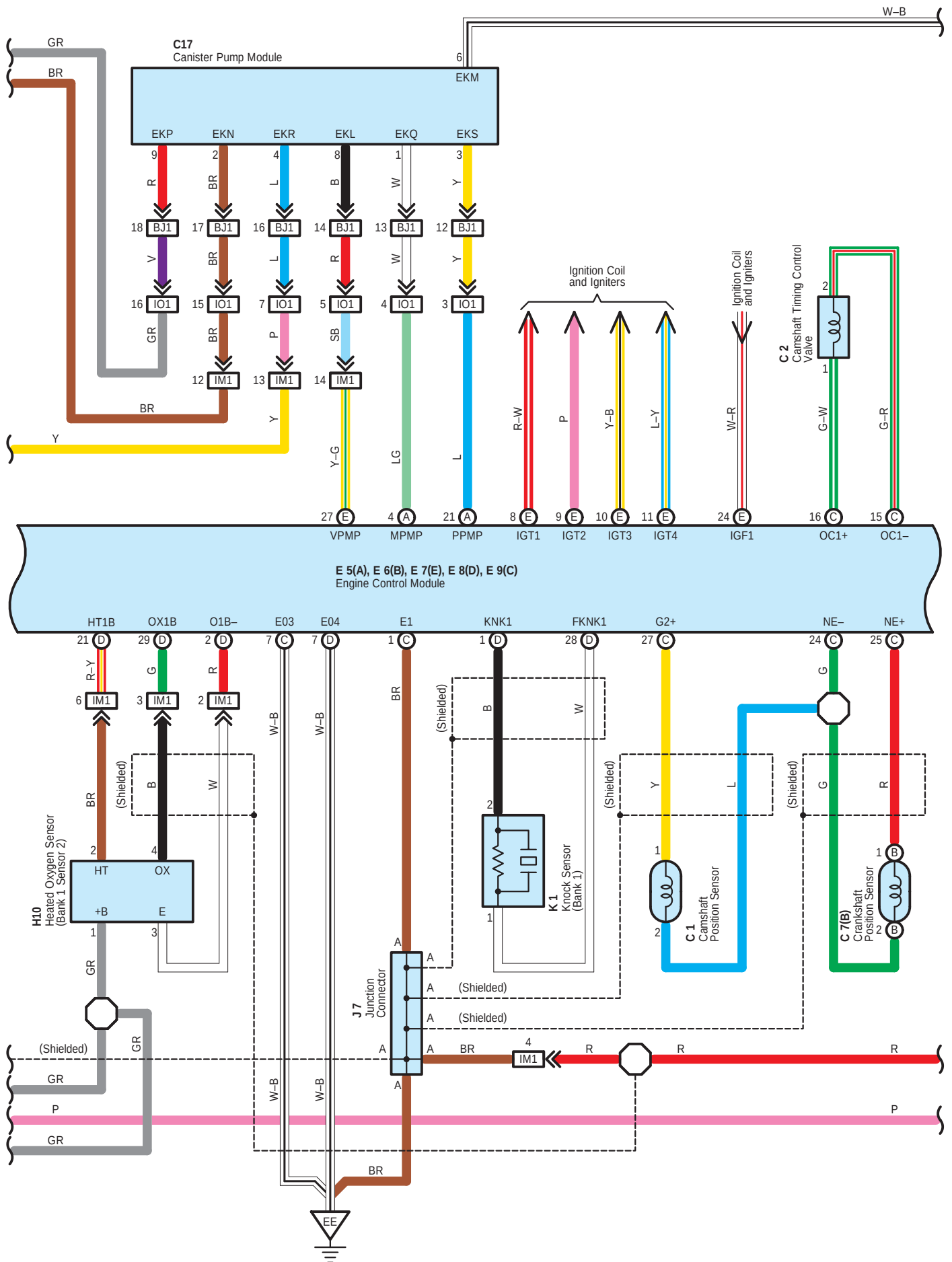
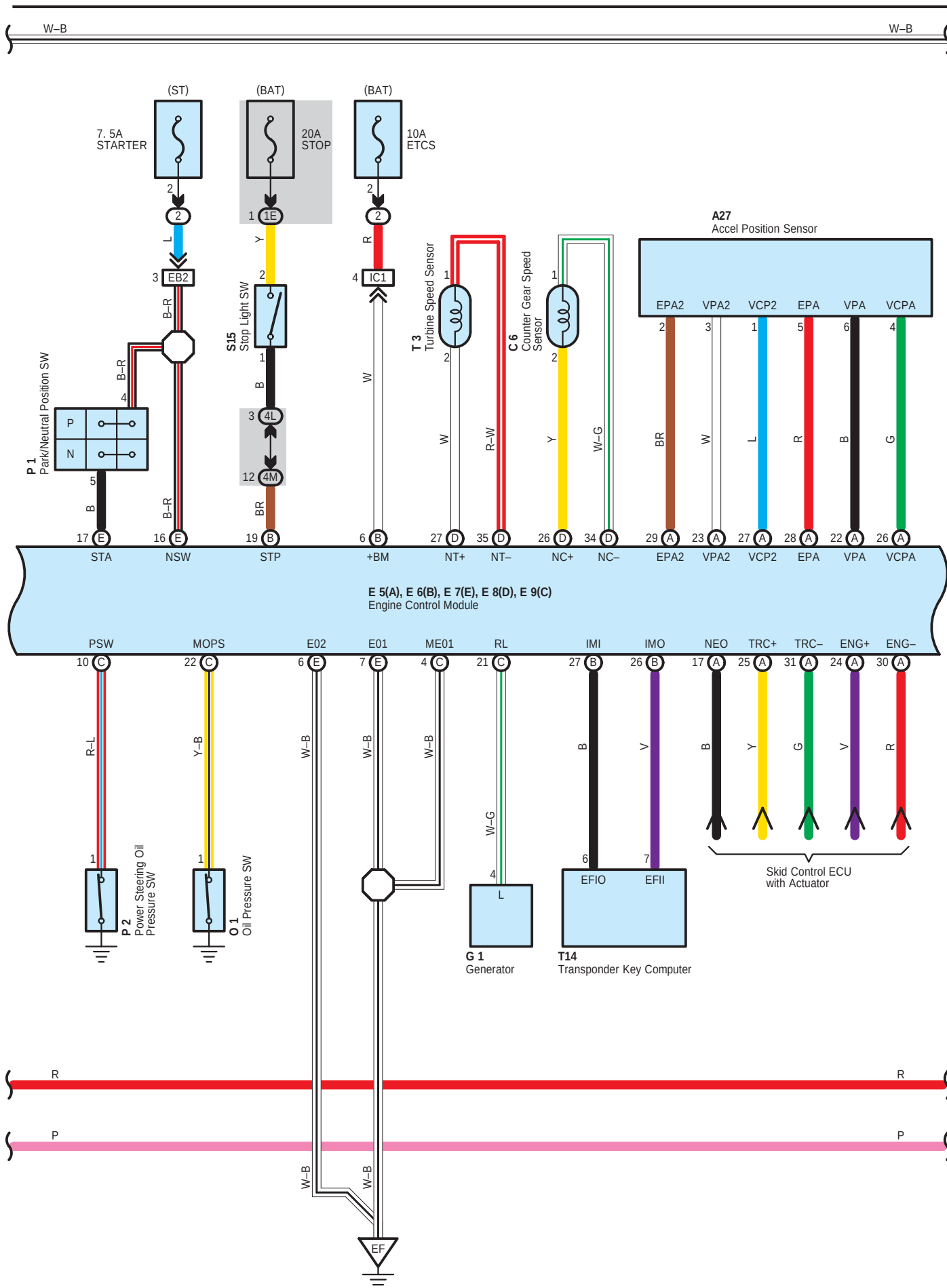




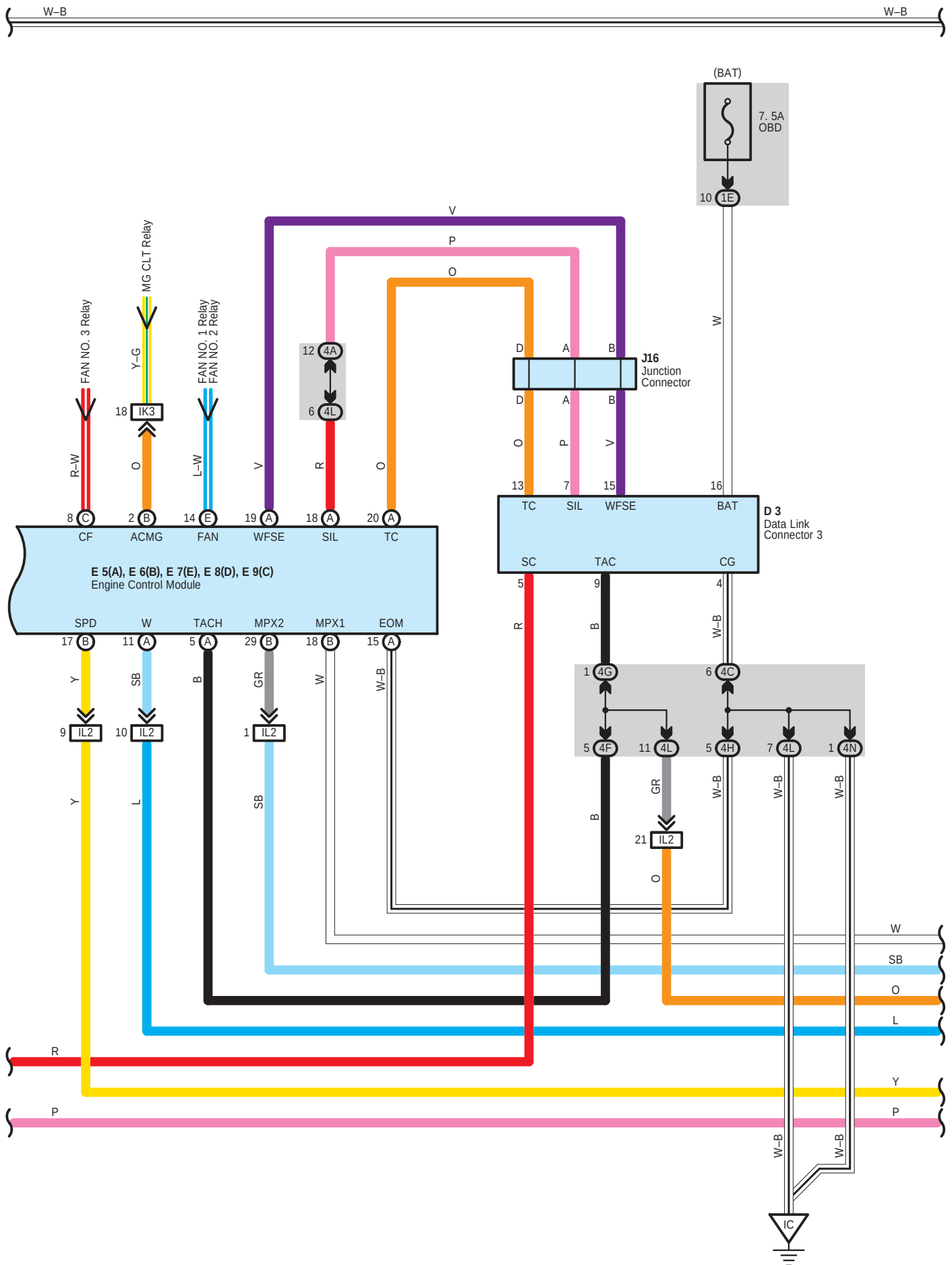


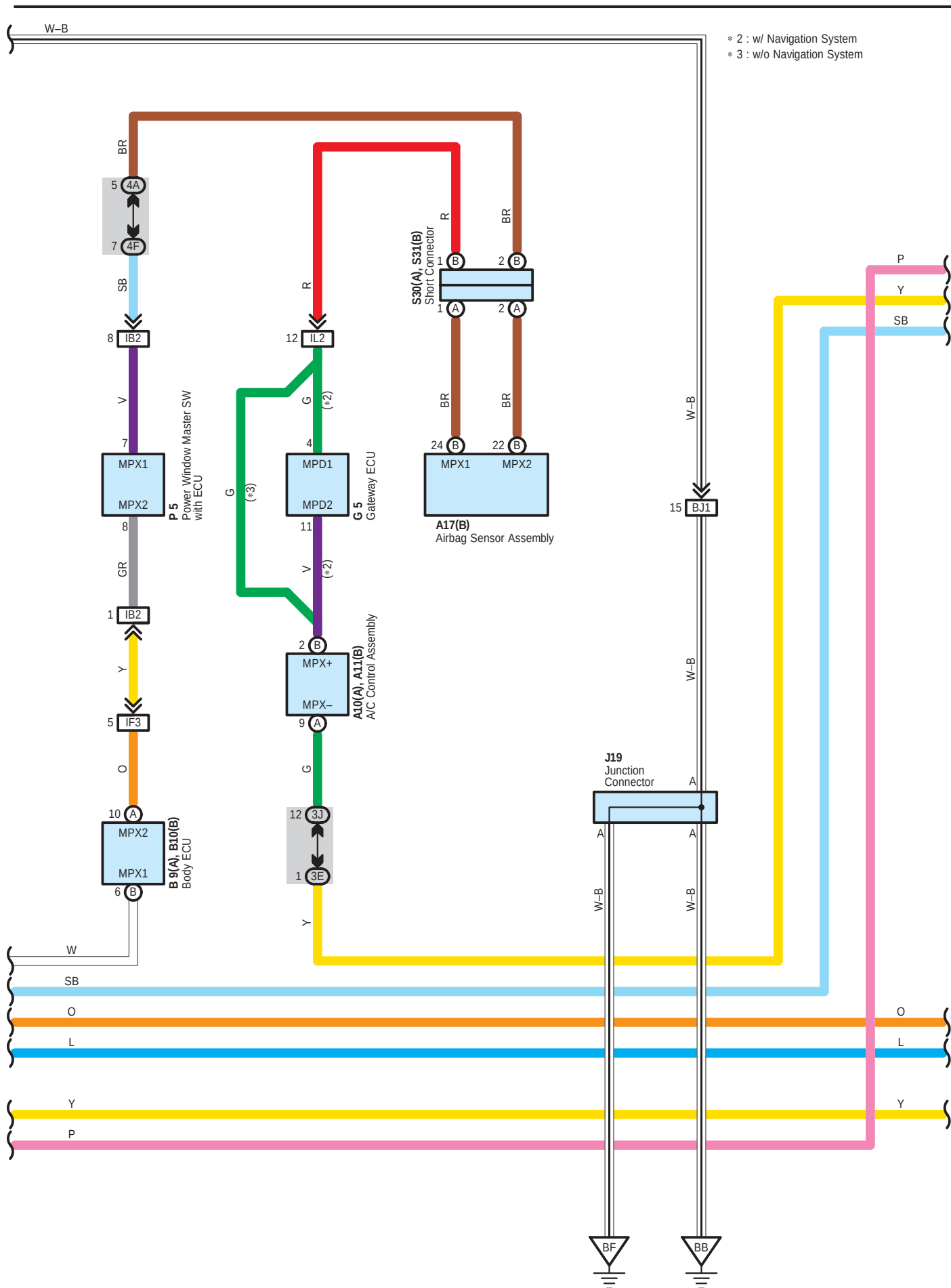
Engine Control for 2AZ-FE

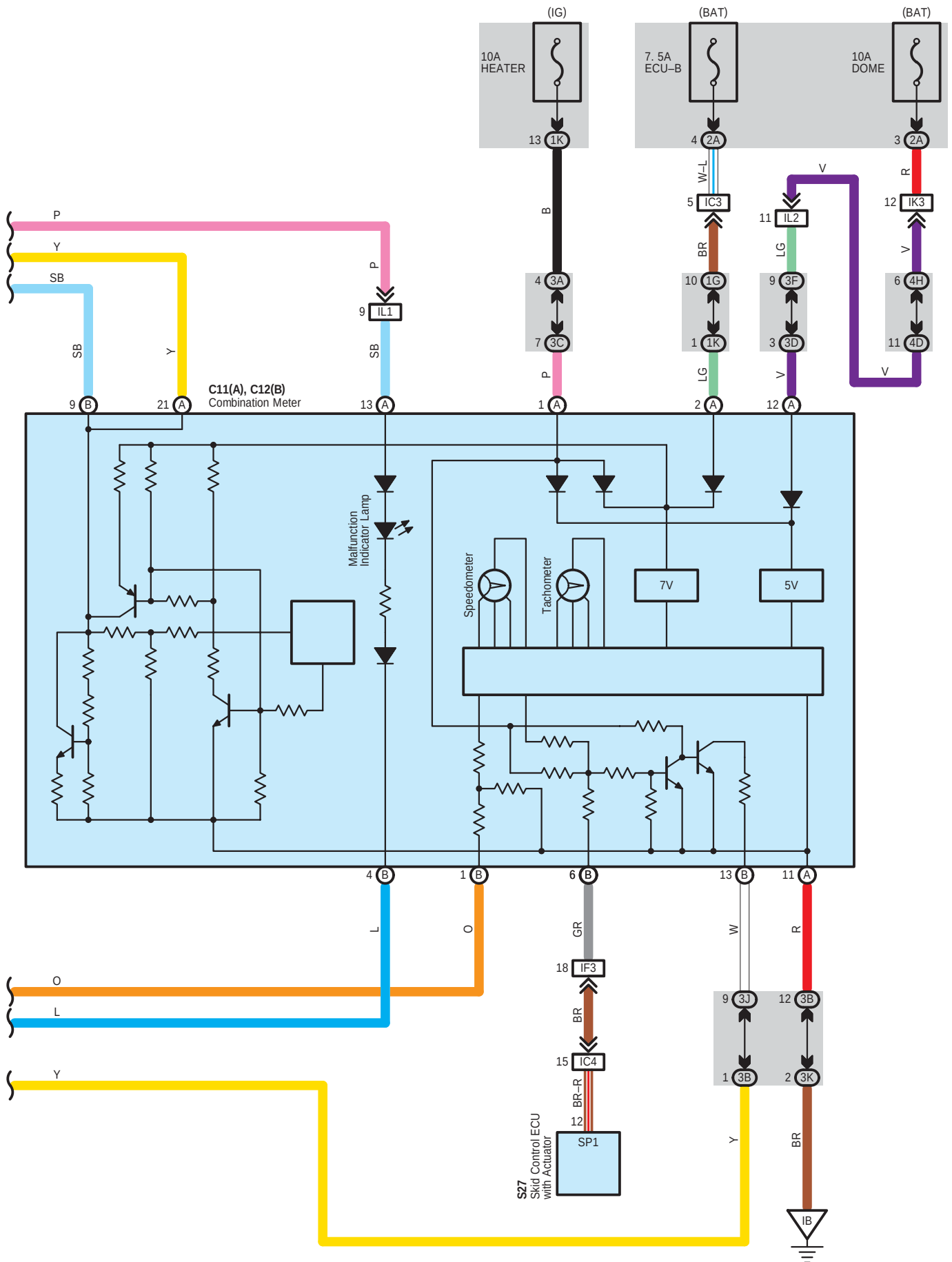




Engine Control for 2AZ-FE







System Outline

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

1. Input Signals

- (1) Engine coolant temp. signal circuit
The engine coolant temp. sensor detects the engine coolant temp. and has a built-in thermistor with a resistance, which varies according to the engine coolant temp.. The engine coolant temp. which is input into TERMINAL THW of the engine control module as a control signal.
- (2) Intake air temp. signal circuit
The intake air temp. sensor is installed in the mass air flow meter and detects the intake air temp. which is input as a control signal to TERMINAL THA of the engine control module.
- (3) Vehicle speed signal circuit
The vehicle speed signal is input from the ABS speed sensor to skid control ECU with actuator, and are sent to the engine control module through communication control.
- (4) RPM signal circuit
Camshaft position and crankshaft position are detected by the camshaft position sensor and crankshaft position sensor. Camshaft position is input as a control signal to TERMINAL G2+ of the engine control module, and engine RPM is input into TERMINAL NE+.
- (5) Throttle position signal circuit
The throttle position sensor detects the throttle valve opening angle as a control signal, which is input into TERMINALS VTA1 and VTA2 of the engine control module.
- (6) Battery signal circuit
Voltage is constantly applied to TERMINAL BATT of the engine control module. With the ignition SW turned on, the voltage for engine control module start-up power supply is applied to TERMINALS +B and +B2 of the engine control module via the EFI relay.
The current flowing through the IGN fuse flows to TERMINAL IGSW of the engine control module.
- (7) Intake air volume signal circuit
Intake air volume is detected by the mass air flow meter and the signal is input to TERMINAL VG of the engine control module as a control signal.
- (8) Stop light SW signal circuit
The stop light SW is used to detect whether the vehicle is braking or not and the signal is input into TERMINAL STP of the engine control module as a control signal.
- (9) Starter signal circuit
To confirm whether the engine is cranking, the voltage is applied to the starter motor during cranking is detected and the signal is input into TERMINAL STA of the engine control module as a control signal.
- (10) Engine knock signal circuit
Engine knocking is detected by knock sensor and the signal is input into TERMINAL KNK1 as a control signal.
- (11) Air fuel ratio signal system
The air fuel ratio is detected and input as a control signal into TERMINAL A1A+ of the engine control module.
- (12) Oxygen sensor signal circuit
The oxygen density in the exhaust gases is detected and input as a control signal into TERMINAL OX1B 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 engine control module (O1B-).
- (13) Fuel cut in a collision
The system receives the collision signal from center airbag sensor assembly in the vehicle has a collision and stops the fuel pump operation on the side of the engine control module.

Engine Control for 2AZ-FE

2. Control System

* SFI system

The SFI system monitors the engine condition through the signals input from each sensor (Input signals from (1) to (12) etc.) to the engine control module. And the control signal is output to TERMINALS #1, #2, #3 and #4 of the engine control module to operate the injector (Inject the fuel). The SFI system controls the fuel injection operation by the engine control module in response to the driving conditions.

* ESA system

The ESA system monitors the engine condition through the signals input to the engine control module from each sensor (Input signals from (1) to (12) etc.). The best ignition timing is decided according to this data and the memorized data in the engine control module and the control signal is output to TERMINALS IGT1, IGT2, IGT3 and IGT4. This signal controls the igniter to provide the best ignition timing for the driving conditions.

3. Diagnosis System

With the diagnosis system, when there is a malfunction in the engine control module signal system, the malfunctioning system is recorded in the memory. The malfunctioning system can be found by reading the code displayed by the malfunction indicator lamp.

4. Fail-safe System

When a malfunction has occurred 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.

○ : Parts Location

Code	See Page	Code	See Page	Code	See Page
A6	40 (2AZ-FE)	E6	B 42	K1	41 (2AZ-FE)
A10	A 42	E7	E 42	M1	41 (2AZ-FE)
A11	B 42	E8	D 42	O1	41 (2AZ-FE)
A17	B 42	E9	C 42	P1	41 (2AZ-FE)
A27	42	F12	44	P2	41 (2AZ-FE)
B9	A 42	G1	40 (2AZ-FE)	P5	44
B10	B 42	G5	43	S15	43
C1	40 (2AZ-FE)	H10	43	S27	41 (2AZ-FE)
C2	40 (2AZ-FE)	I8	B 41 (2AZ-FE)	S28	A 43
C6	40 (2AZ-FE)	I9	B 41 (2AZ-FE)	S29	B 43
C7	B 40 (2AZ-FE)	I10	B 41 (2AZ-FE)	S30	A 43
C11	A 42	I11	B 41 (2AZ-FE)	S31	B 43
C12	B 42	J2	41 (2AZ-FE)	T3	41 (2AZ-FE)
C17	44	J6	43	T13	41 (2AZ-FE)
D3	42	J7	43	T14	43
E2	B 40 (2AZ-FE)	J16	43	V16	41 (2AZ-FE)
E5	A 42	J19	44	V15	45

○ : Relay Blocks

Code	See Page	Relay Blocks (Relay Block Location)
1	24	R/B No.1 (Lower Finish Panel)
2	22	Engine Room R/B (Engine Compartment Left)



: Junction Block and Wire Harness Connector

Code	See Page	Junction Block and Wire Harness (Connector Location)
1E	29	Cowl Wire and Instrument Panel J/B (Lower Finish Panel)
1G		
1K	28	Instrument Panel Wire and Instrument Panel J/B (Lower Finish Panel)
2A	27	Engine Room Main Wire and Engine Room J/B (Engine Compartment Left)
2B		
2D		
2F		
3A	30	Instrument Panel Wire and Center J/B (Behind the Instrument Panel Center)
3B		
3C		
3D		
3E		
3F		
3J	31	
3K		
4A	33	Cowl Wire and Passenger Side J/B (Right Side of Grove Box)
4C		
4D		
4E		
4F		
4G		
4H		
4L		
4M	32	
4N		



: Connector Joining Wire Harness and Wire Harness

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
EB1	49 (2AZ–FE)	Engine Wire and Engine Room Main Wire (Front Side of Engine Room R/B)
EB2		
IA1	50	Cowl Wire and Floor No.2 Wire (Left Kick Panel)
IA2		
IB2	50	Front Door LH Wire and Cowl Wire (Left Kick Panel)
IC1	50	Engine Room Main Wire and Cowl Wire (Left Cowl Side Panel)
IC2		
IC3		
IC4		
IF3	50	Instrument Panel Wire and Cowl Wire (Right Side of Instrument Panel J/B)
IK2	51	Engine Room Main Wire and Cowl Wire (Right Cowl Side Panel)
IK3		
IL1	51	Instrument Panel Wire and Cowl Wire (Upper Side of Passenger Side J/B)
IL2		
IM1	51	Engine Wire and Cowl Wire (Right Kick Panel)
IO1	51	Cowl Wire and Floor Wire (Right Kick Panel)
BJ1	52	Floor Wire and Floor No.4 Wire (Right Side of Rear Floor Crossmember)

Engine Control for 2AZ-FE



: Ground Points

Code	See Page	Ground Points Location
EE	49 (2AZ-FE)	Intake Side of Cylinder Block
EF	49 (2AZ-FE)	Left Side of Cylinder Block
EH	49 (2AZ-FE)	Under the Left Headlight
IB	50	Right Instrument Panel Brace
IC	50	Right Cowl Side Panel
BB	52	Right Center Pillar
BC	52	Left Side of Rear Cross Member
BF	52	Near the Rear Side Marker Light RH

