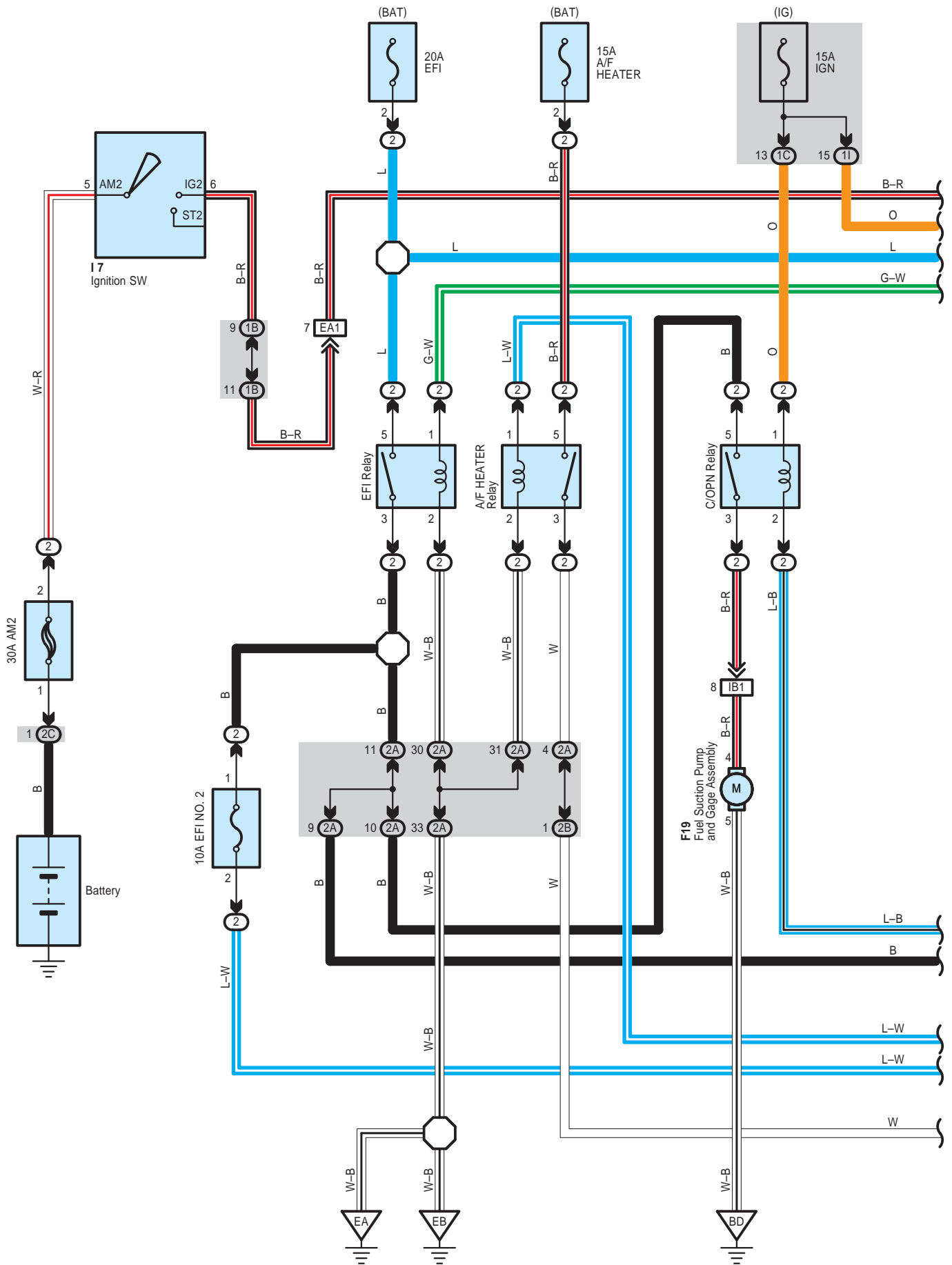
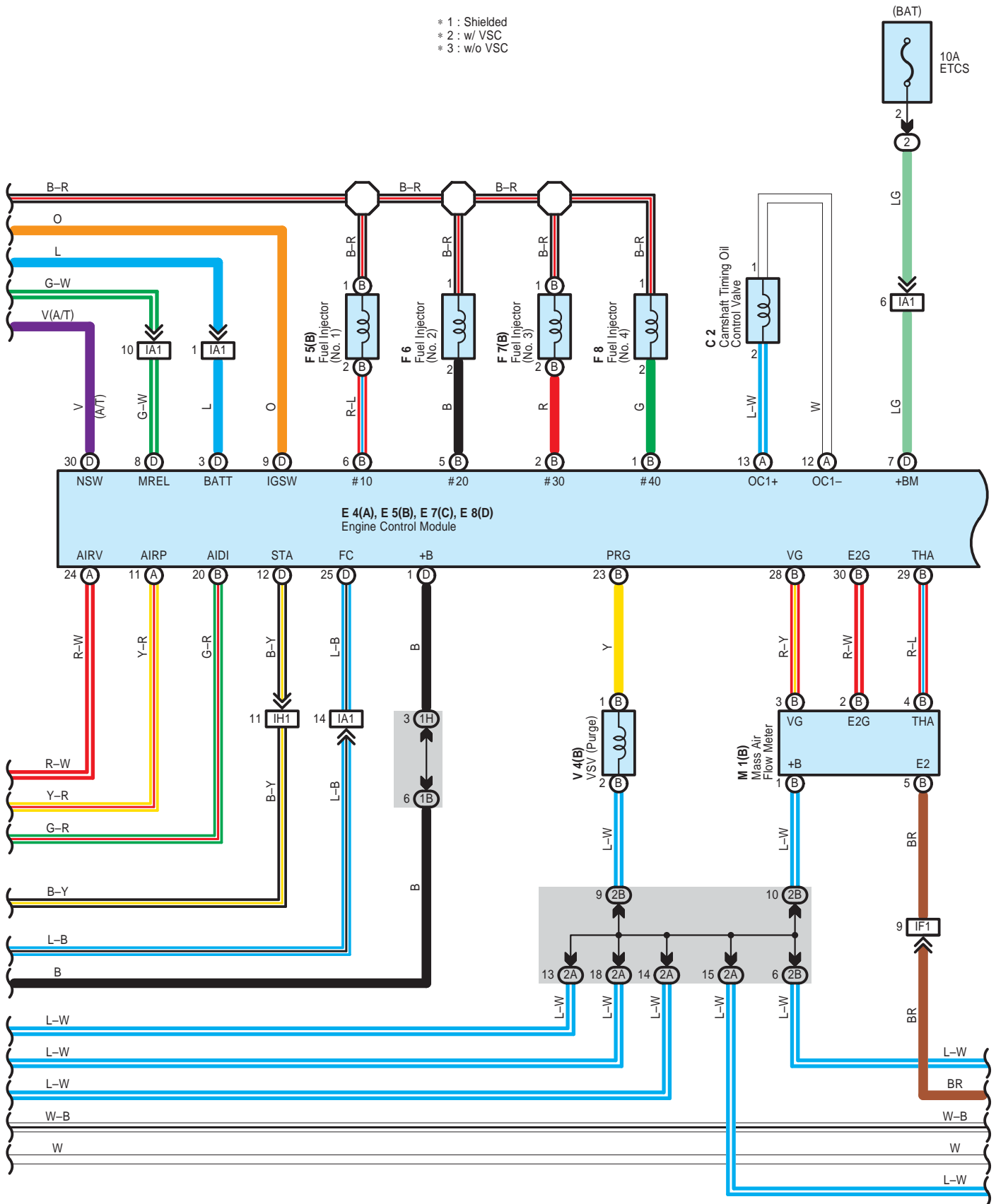


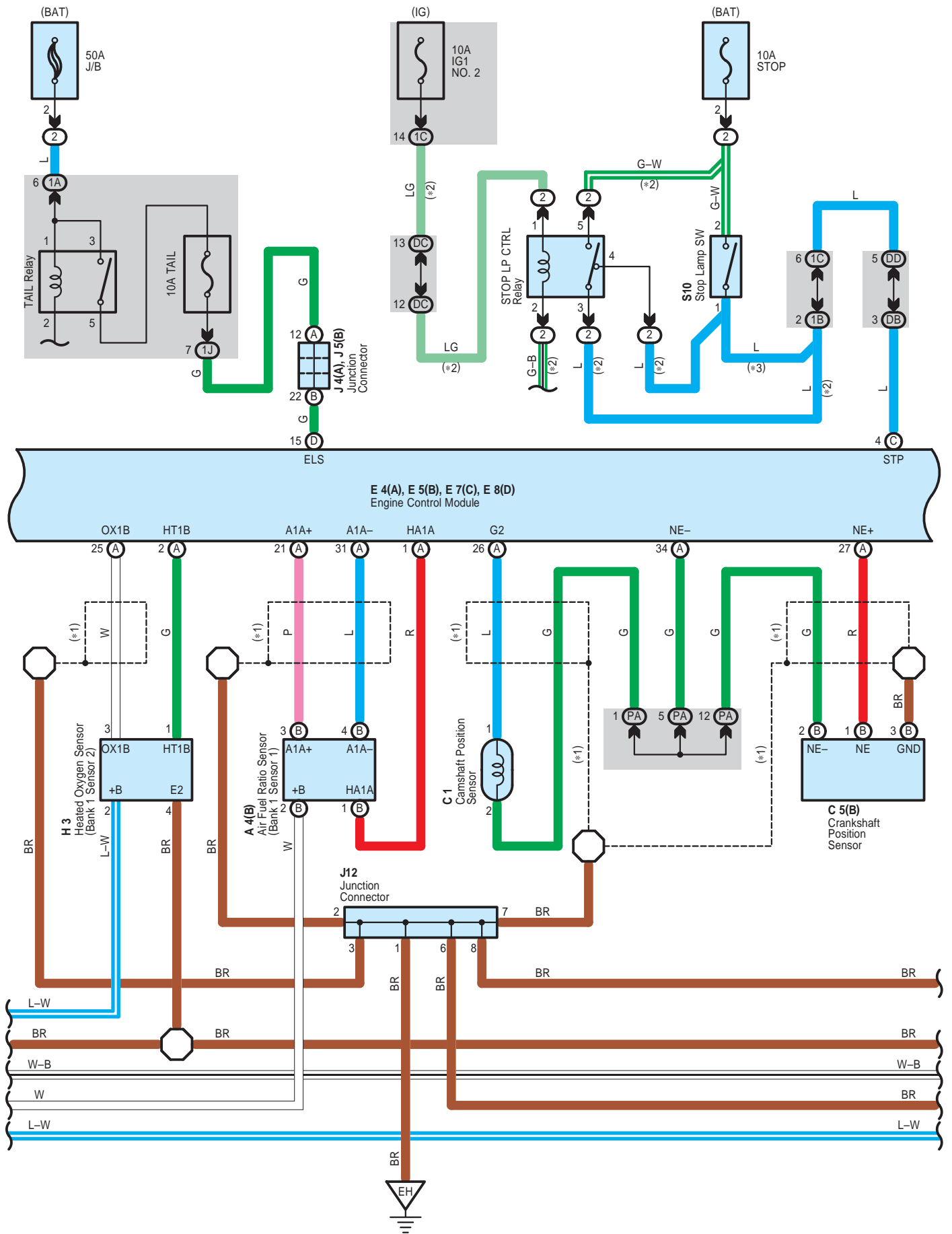
Engine Control for 2TR-FE



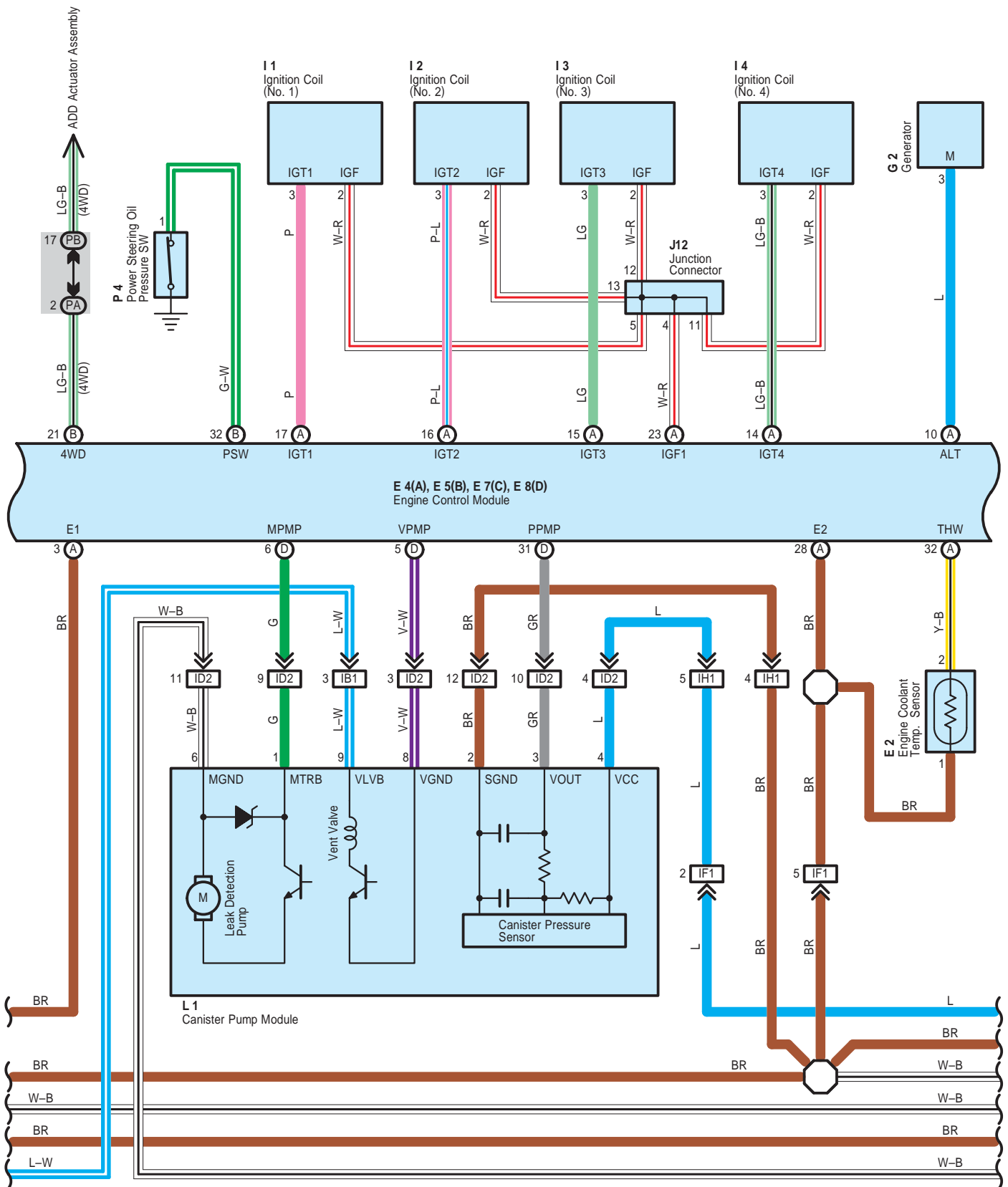
Engine Control for 2TR-FE

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

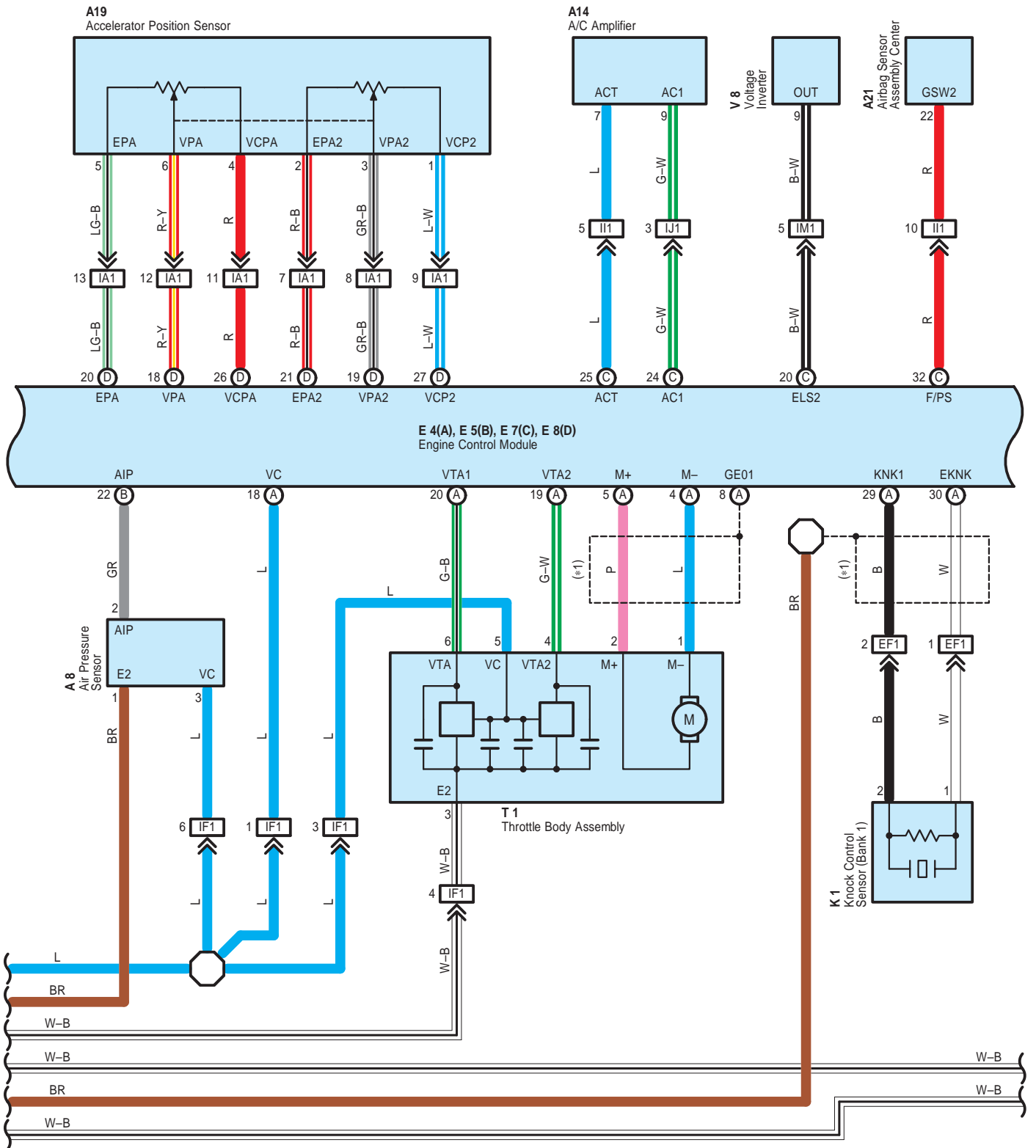




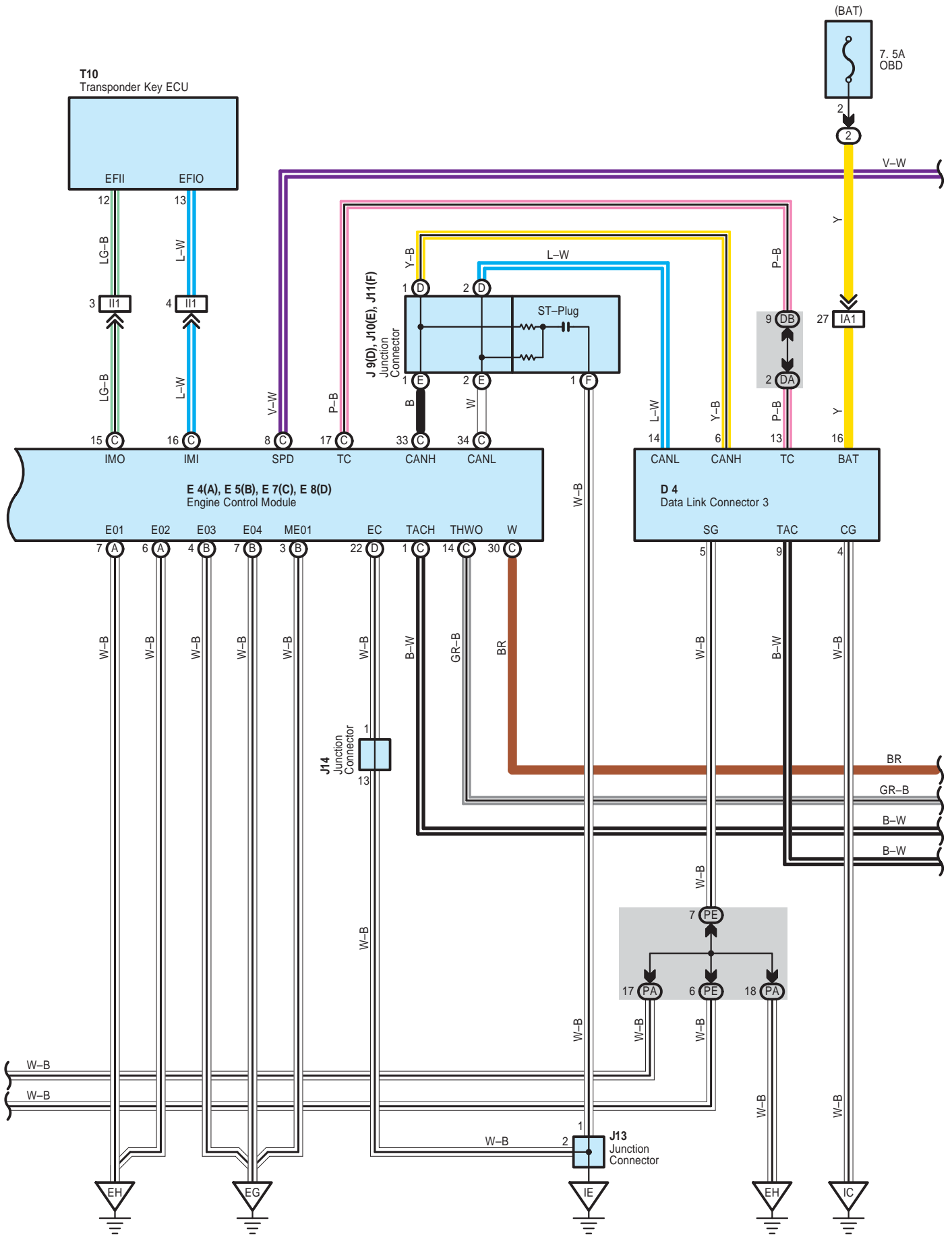
Engine Control for 2TR-FE

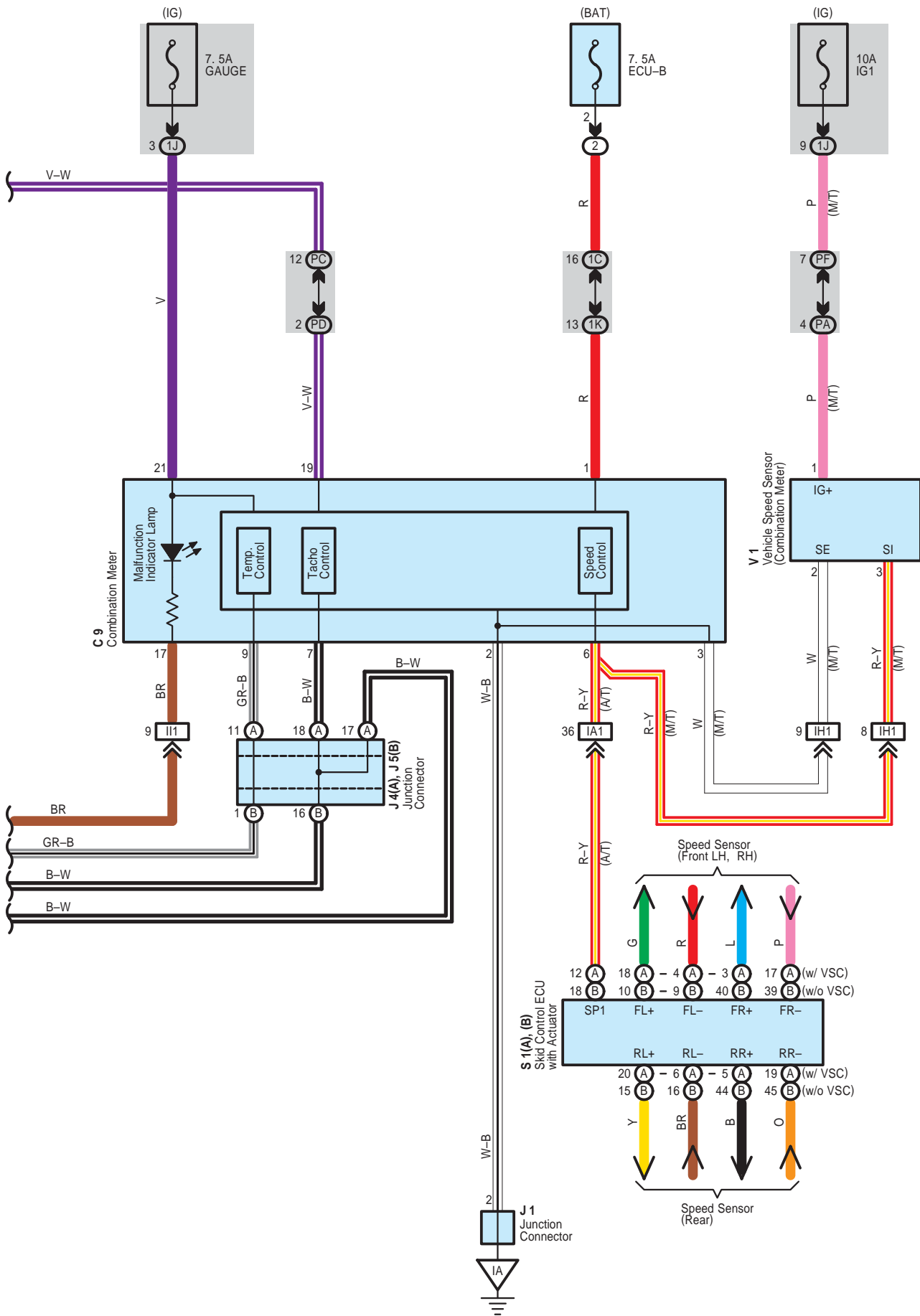


* 1 : Shielded



Engine Control for 2TR-FE





Engine Control for 2TR-FE

System Outline

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

1. Input Signals

(1) Engine coolant temp. signal system

The engine coolant temp. sensor detects the engine coolant temp. and has a built-in thermistor with a resistance which varies according to the engine coolant temp. Thus the engine coolant temp. is input as a control signal to TERMINAL THW of the engine control module.

(2) Intake air temp. signal system

The intake air temp. sensor is installed in the mass air flow meter and detects the intake air temp., which is input as a control signal to TERMINAL THA of the engine control module.

(3) Power steering oil pressure signal system

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

(4) RPM signal system

Camshaft position and crankshaft position are detected by the camshaft position sensor and crankshaft position sensor. Camshaft position is input as a control signal to TERMINAL G2 of the engine control module, and engine RPM is input into TERMINAL NE+.

(5) Throttle signal system

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

(6) Vehicle speed signal system

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

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

(7) NSW signal system (A/T)

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

(8) A/C SW signal system

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

(9) Battery signal system

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

(10) Intake air volume signal system

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

(11) STA signal system

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

(12) Oxygen sensor signal system

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

(13) Engine knock signal system

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

(14) Electrical load signal system

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

(15) Air fuel ratio signal circuit

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

2. Control System

* SFI system

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

* ESA system

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

* Knock control system

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

* Evapopurge control system

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

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

3. Diagnosis System

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

4. Fail-Safe System

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

○ : Parts Location

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

○ : Relay Blocks

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

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

Engine Control for 2TR-FE

: Junction Block and Wire Harness Connector

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

: Connector Joining Wire Harness and Wire Harness

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

: Ground Points

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

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

