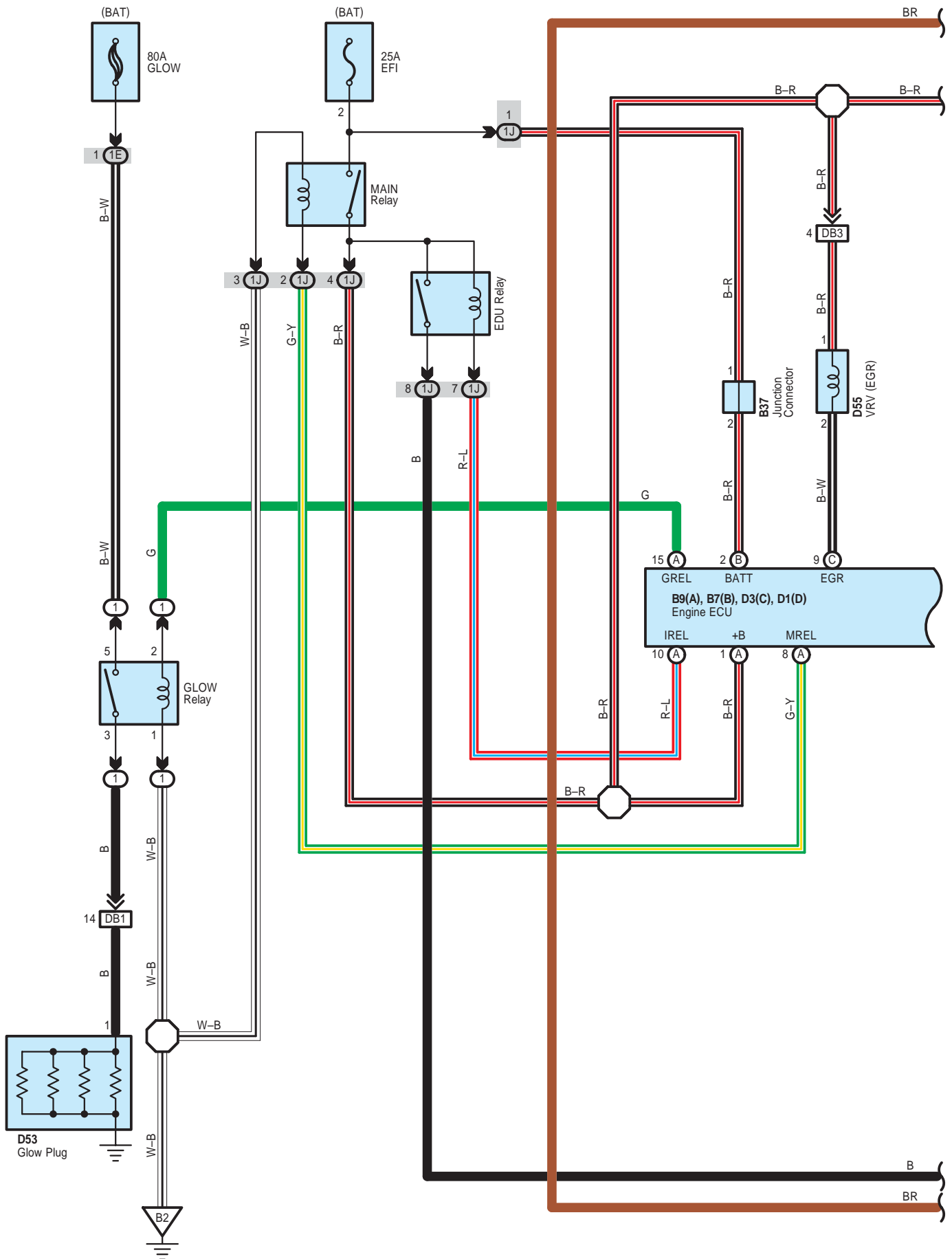
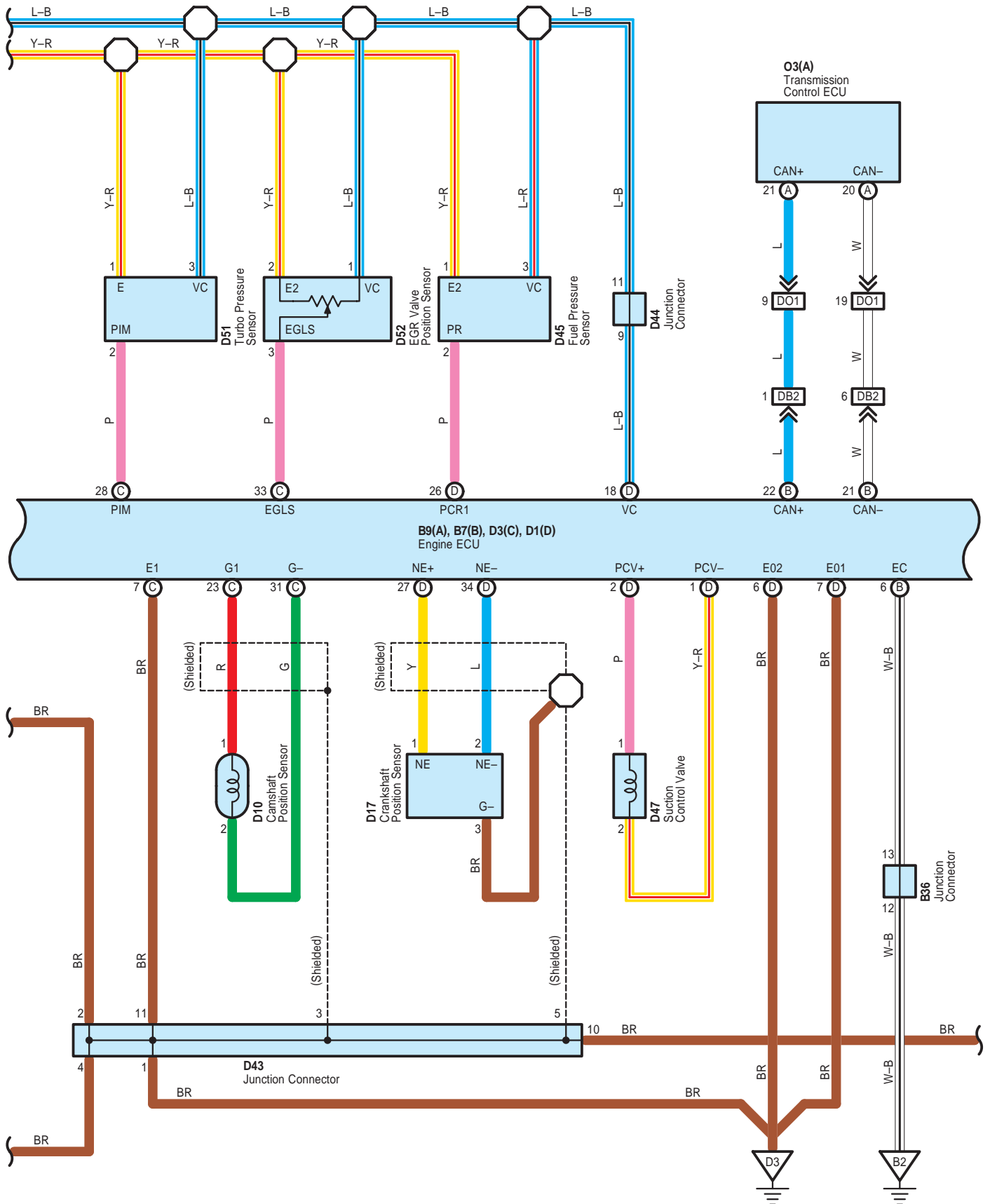


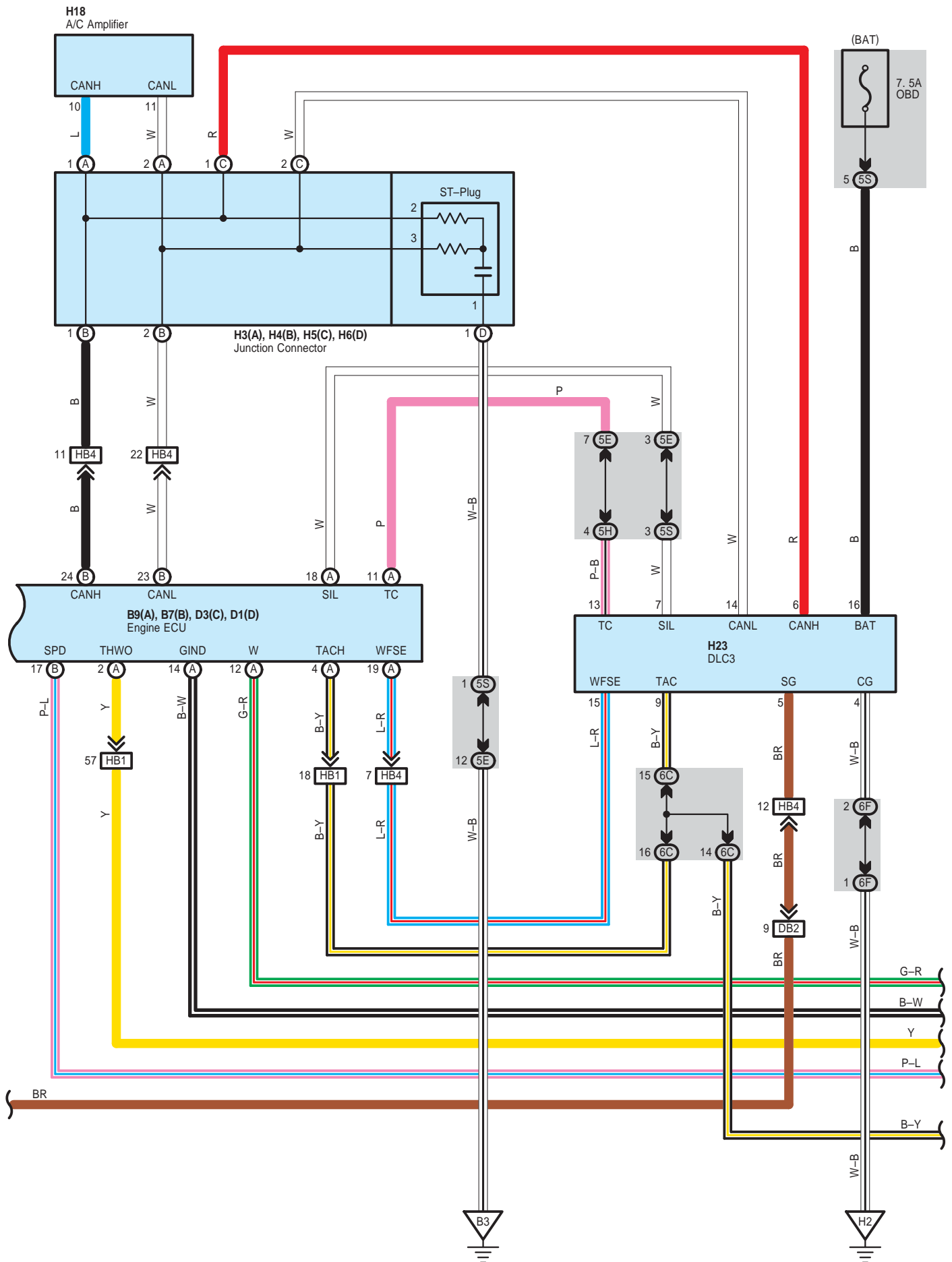
Engine Control (2KD-FTV)

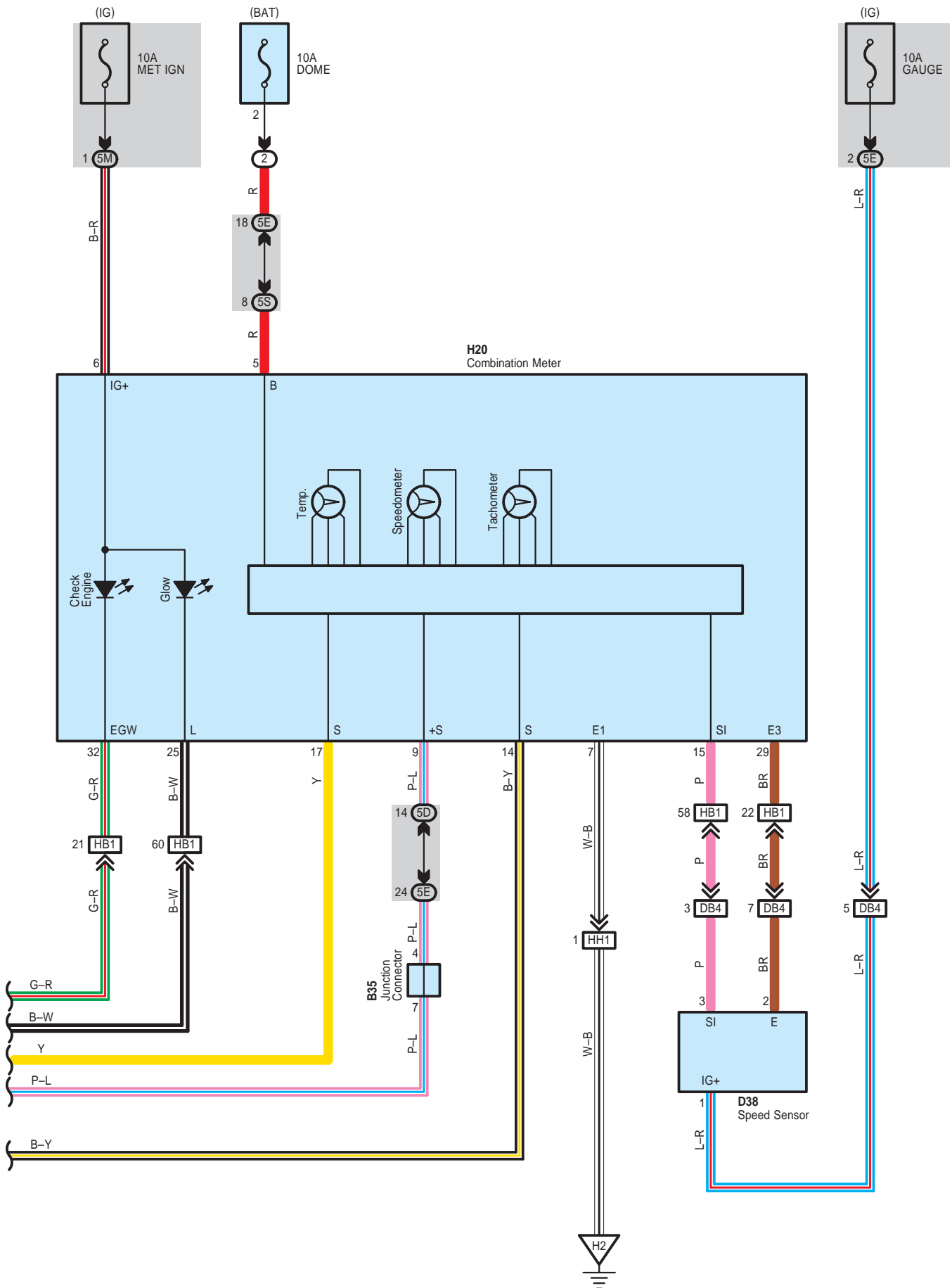


Engine Control (2KD-FTV)



Engine Control (2KD-FTV)





System Outline

This system utilizes an engine ECU and maintains overall control of the engine, transmission and so on. An outline of the engine control is explained here.

1. Input Signals

(1) Water temp. signal circuit

The water temp. sensor (Engine coolant) detects the engine coolant temp. and has a built-in thermistor with a resistance varies according to the engine coolant temp. Thus the engine coolant temp. is input in the form of a control signal to TERMINAL THW of the engine ECU.

(2) Intake air temp. signal circuit

The intake air temp. sensor is detects the intake air temp., which is input as a control signal to TERMINAL THA of the engine ECU.

(3) 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 G1 of the engine ECU, and engine RPM is input into TERMINAL NE+.

(4) Throttle signal circuit

The accelerator position sensor detects the accelerator pedal opening angle, which is input as a control signal to TERMINALS VPA and VPA2 of the engine ECU.

(5) Vehicle speed signal circuit

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

(6) Battery signal circuit

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

(7) Started signal circuit

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 ECU.

(8) Fuel temp. signal circuit

The fuel temp. sensor is detects the fuel temp., which is input as a control signal to TERMINAL THF of the engine ECU.

(9) Intake air vacuum pressure signal system

Intake air vacuum pressure is detected by the turbo pressure sensor and is input as a control signal to TERMINAL PIM of the engine ECU.

2. Control System

*** EGR control**

The EGR control system detects the signals from each sensor, then the current is output to the TERMINAL EGR to control the VRV (EGR).

*** Common rail pressure control**

The target rail pressure is calculated according to the engine status (Accelerator opening, engine speed) and environmental change detected by sensors. The fuel amount to be pressure-fed from the supply pump is calculated so as to match the indicated value of rail pressure sensor with the target value and the signal is sent to the intake amount adjusting valve of the supply pump in order to control the rail pressure.

*** Fuel injection timing control**

The fuel injection timing is controlled by calculating the basic fuel injection timing based on the engine status (Accelerator opening, engine speed), making corrections according to environmental change detected by sensors, then sending a signal to the solenoid control valve of the injector via the injector driver (EDU).

*** Fuel injection volume control**

The fuel injection volume is controlled by calculating the basic fuel injection volume based on the engine status (Accelerator opening, engine speed), making corrections according to environmental change detected by sensors and the inside pressure conditions in the rail, then sending a signal to the solenoid control valve of the injector via the injector driver (EDU).

*** Pilot injection control**

The fuel injection volume and timing are controlled by calculating the pilot injection volume/timing based on the engine status (Accelerator opening, engine speed), making corrections according to environmental change detected by sensors, then sending a signal to the solenoid control valve of the injector via the injector driver (EDU).

3. Diagnosis System

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

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 ECU memory or else stops the engine.

Engine Control (2KD-FTV)

○ : Parts Location

Code		See Page		Code		See Page							
A2		48 (LHD)		D3	C	53 (*5)		D48	A	45 (*2)			
		56 (RHD)		D6	B	45 (*2)				53 (*5)			
B1		48 (LHD)				D10		53 (*5)		D49		45 (*2)	
		56 (RHD)		45 (*2)				53 (*5)					
B2		48 (LHD)		D17				53 (*5)		D50	B	45 (*2)	
		56 (RHD)						45 (*2)				53 (*5)	
B7	B	45 (*2)				D24		53 (*5)		D51		45 (*2)	
		53 (*5)						53 (*5)					
B9	A	45 (*2)		D25				53 (*5)		D52		45 (*2)	
		53 (*5)						53 (*5)					
B13	A	45 (*2)				D26		53 (*5)		D53		45 (*2)	
		53 (*5)						53 (*5)					
B15	B	45 (*2)		D27				53 (*5)		D55		45 (*2)	
		53 (*5)						53 (*5)					
B29		45 (*2)				D32		53 (*5)		H3	A	42, 49 (LHD)	
		53 (*5)						45 (*2)				42, 57 (RHD)	
B34		48 (LHD)		D37				53 (*5)		H4	B	42, 49 (LHD)	
		56 (RHD)						45 (*2)				42, 57 (RHD)	
B35		45 (*2)				D38		53 (*5)		H5	C	42, 49 (LHD)	
		53 (*5)						45 (*2)				42, 57 (RHD)	
B36		45 (*2)		D43				53 (*5)		H6	D	42, 49 (LHD)	
		53 (*5)						45 (*2)				42, 57 (RHD)	
B37		45 (*2)				D44		53 (*5)		H18		49 (LHD)	
		53 (*5)						45 (*2)				57 (RHD)	
B38		45 (*2)		D45				53 (*5)		H20		49 (LHD)	
		53 (*5)						45 (*2)				57 (RHD)	
B39		45 (*2)				D46		53 (*5)		H23		49 (LHD)	
		53 (*5)						45 (*2)				57 (RHD)	
D1	D	45 (*2)		D47				53 (*5)		O3	A	48 (LHD)	
		53 (*5)						45 (*2)				56 (RHD)	
D3	C	45 (*2)				53 (*5)							

○ : Relay Blocks

Code	See Page	Relay Blocks (Relay Block Location)
1	23 (*8)	Engine Room R/B No.1 (Engine Compartment Front)
2	28	Engine Room R/B No.2 (Inside of Battery Room)
4	29	Instrument Panel R/B (Under the Glove Box)

* 1 : LHD 2TR-FE * 2 : LHD 2KD-FTV * 3 : LHD 5L-E * 4 : RHD 2TR-FE * 5 : RHD 2KD-FTV * 6 : RHD 5L-E * 7 : 2TR-FE
 * 8 : 2KD-FTV, 5L-E

**: Junction Block and Wire Harness Connector**

Code	See Page	Junction Block and Wire Harness (Connector Location)
1E	24	Engine Room Main Wire and Engine Room J/B No.1 (Engine Compartment Front)
1J	25	
5D	30	Instrument Panel Wire and Instrument Panel J/B (Left Side of Instrument Panel)
5E	30	Engine Room Main Wire and Instrument Panel J/B (Left Side of Instrument Panel)
5H	30	Instrument Panel Wire and Instrument Panel J/B (Left Side of Instrument Panel)
5J		
5M	31	
5S		
6C	38 (LHD)	Instrument Panel Wire and Center J/B (Instrument Panel Reinforcement LH)
	38 (RHD)	Instrument Panel Wire and Center J/B (Instrument Panel Reinforcement RH)
6F	38 (LHD)	Instrument Panel Wire and Center J/B (Instrument Panel Reinforcement LH)
	38 (RHD)	Instrument Panel Wire and Center J/B (Instrument Panel Reinforcement RH)

**: Connector Joining Wire Harness and Wire Harness**

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
AB1	64 (LHD)	Cowl to Head Lamp Wire and Engine Room Main Wire (Left Side of the Instrument Panel J/B)
	72 (RHD)	
BD1	61 (*2)	Engine Room Main Wire and Engine Wire (Front Floor Panel Right)
	69 (*5)	
DB1	61 (*2)	Engine Wire and Engine Room Main Wire (Front Side of Engine Room R/B No.1)
	69 (*5)	
DB2	61 (*2)	
	69 (*5)	
DB3	61 (*2)	
	69 (*5)	
DB4	61 (*2)	
	69 (*5)	
DO1	61 (*2)	Engine Wire and Floor Wire (Front Floor Panel Right)
	69 (*5)	
HB1	64 (LHD)	Instrument Panel Wire and Engine Room Main Wire (Under the Instrument Panel J/B)
	72 (RHD)	
HB4	64 (LHD)	
	72 (RHD)	
HH1	64 (LHD)	Instrument Panel Wire and Instrument Panel Wire (Near the Steering Column)
	72 (RHD)	Instrument Panel Wire and Instrument Panel Wire (Instrument Panel Reinforcement RH)

**: Ground Points**

Code	See Page	Ground Points Location
B2	61 (*2)	Front Floor Panel Right
	69 (*5)	
B3	61 (*2)	Front Floor Panel Left
	69 (*5)	
D3	61 (*2)	Engine Block
	69 (*5)	
H2	64 (LHD)	Instrument Panel Reinforcement
	72 (RHD)	

* 1 : LHD 2TR-FE * 2 : LHD 2KD-FTV * 3 : LHD 5L-E * 4 : RHD 2TR-FE * 5 : RHD 2KD-FTV * 6 : RHD 5L-E * 7 : 2TR-FE
* 8 : 2KD-FTV, 5L-E