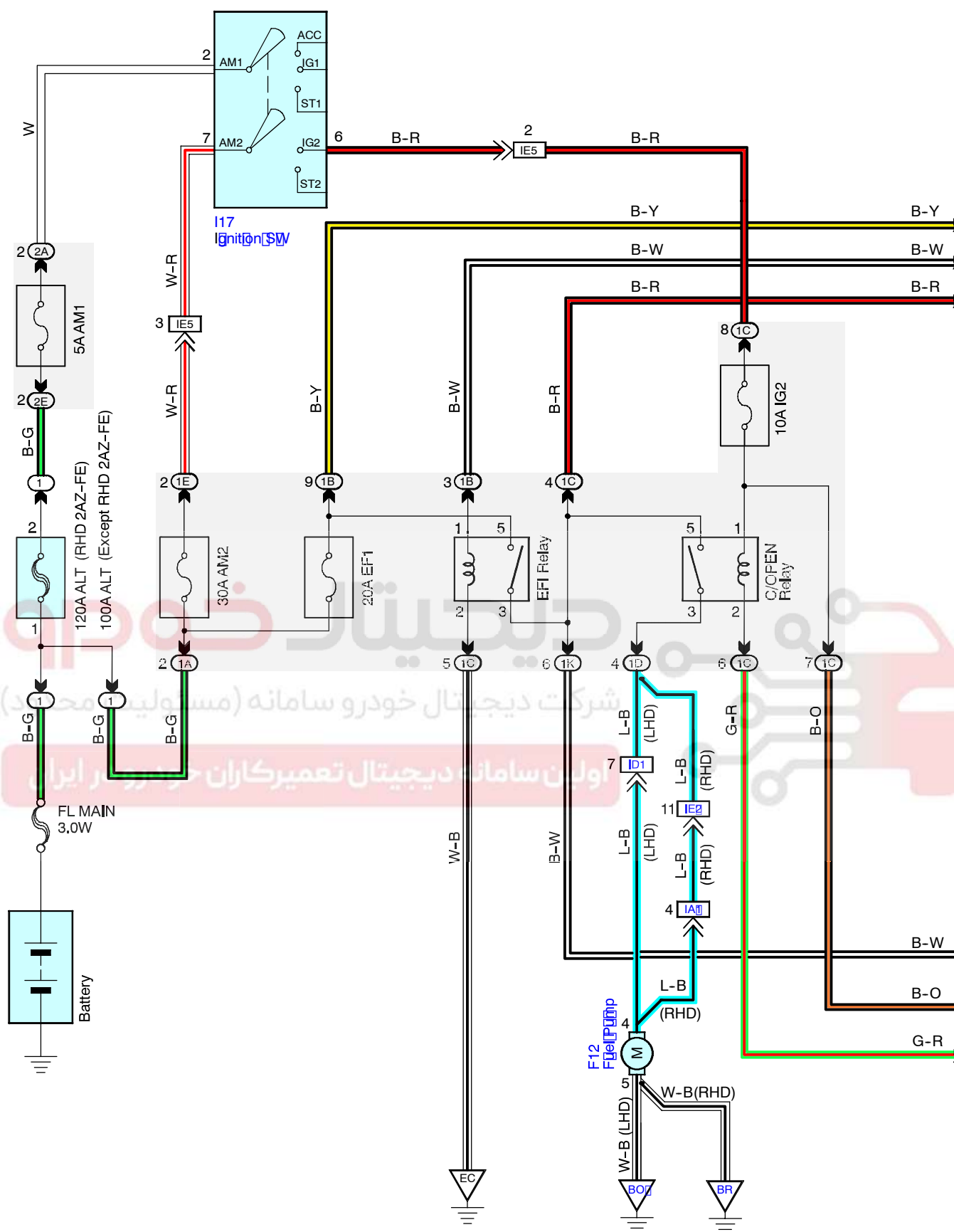
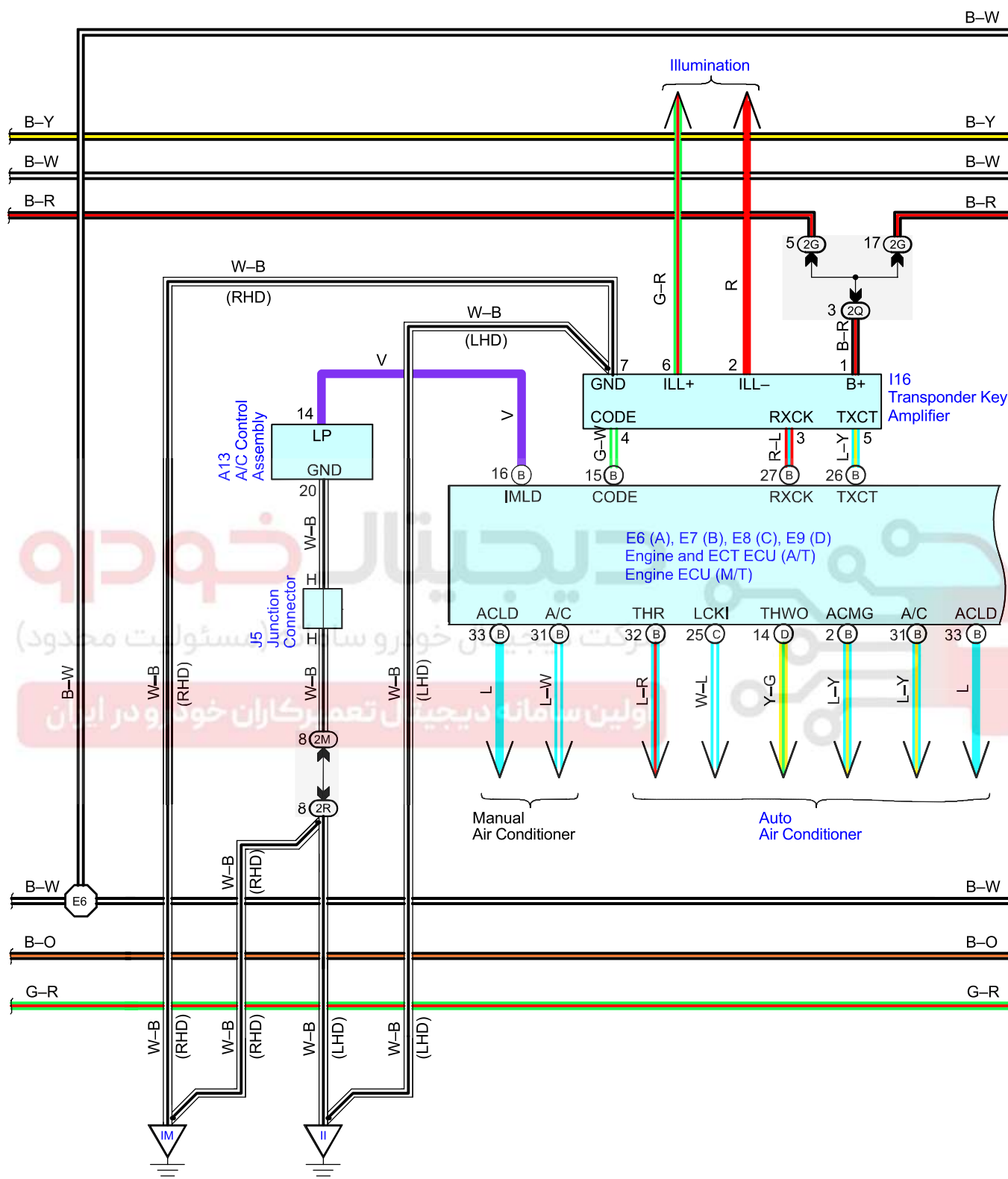
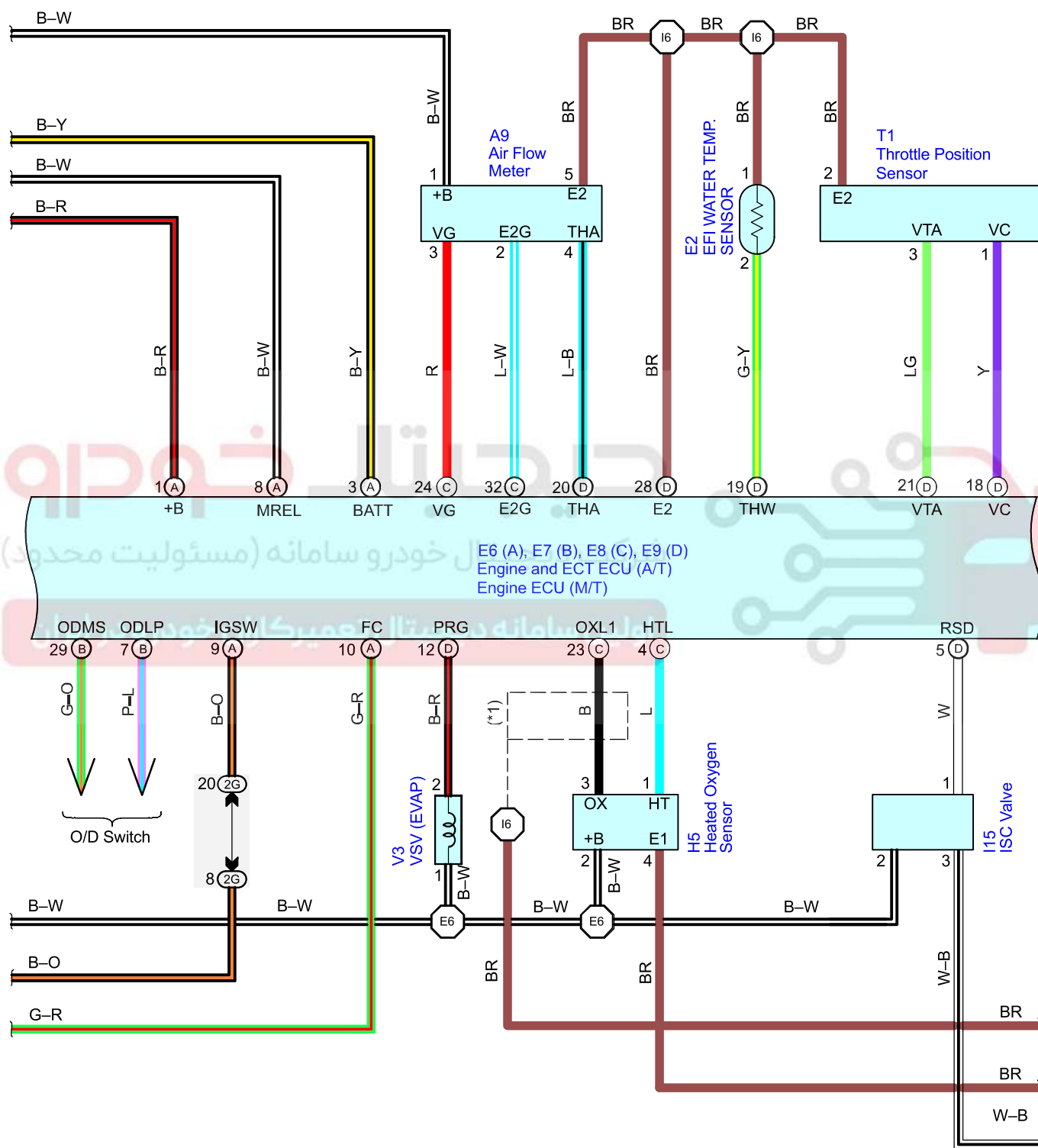


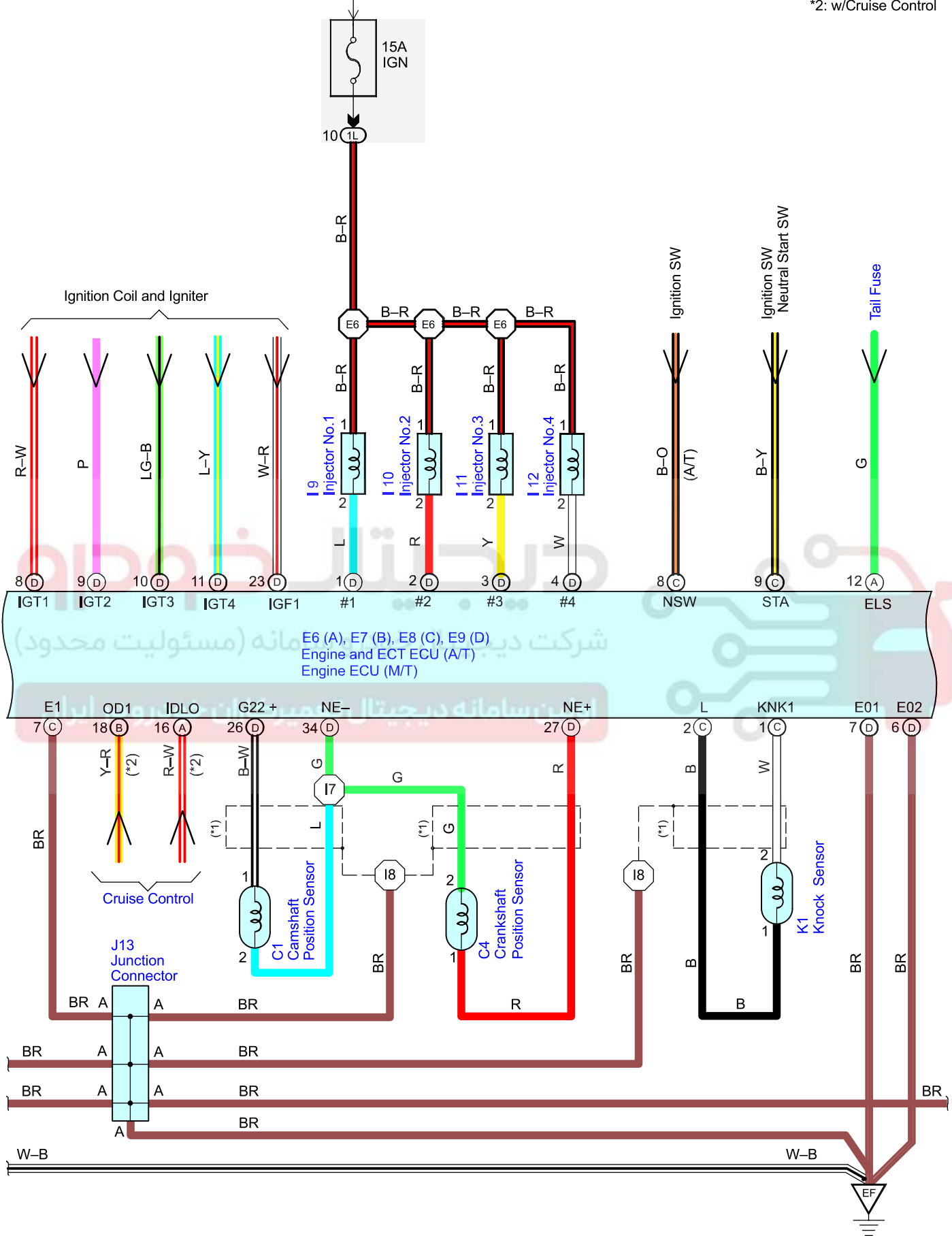


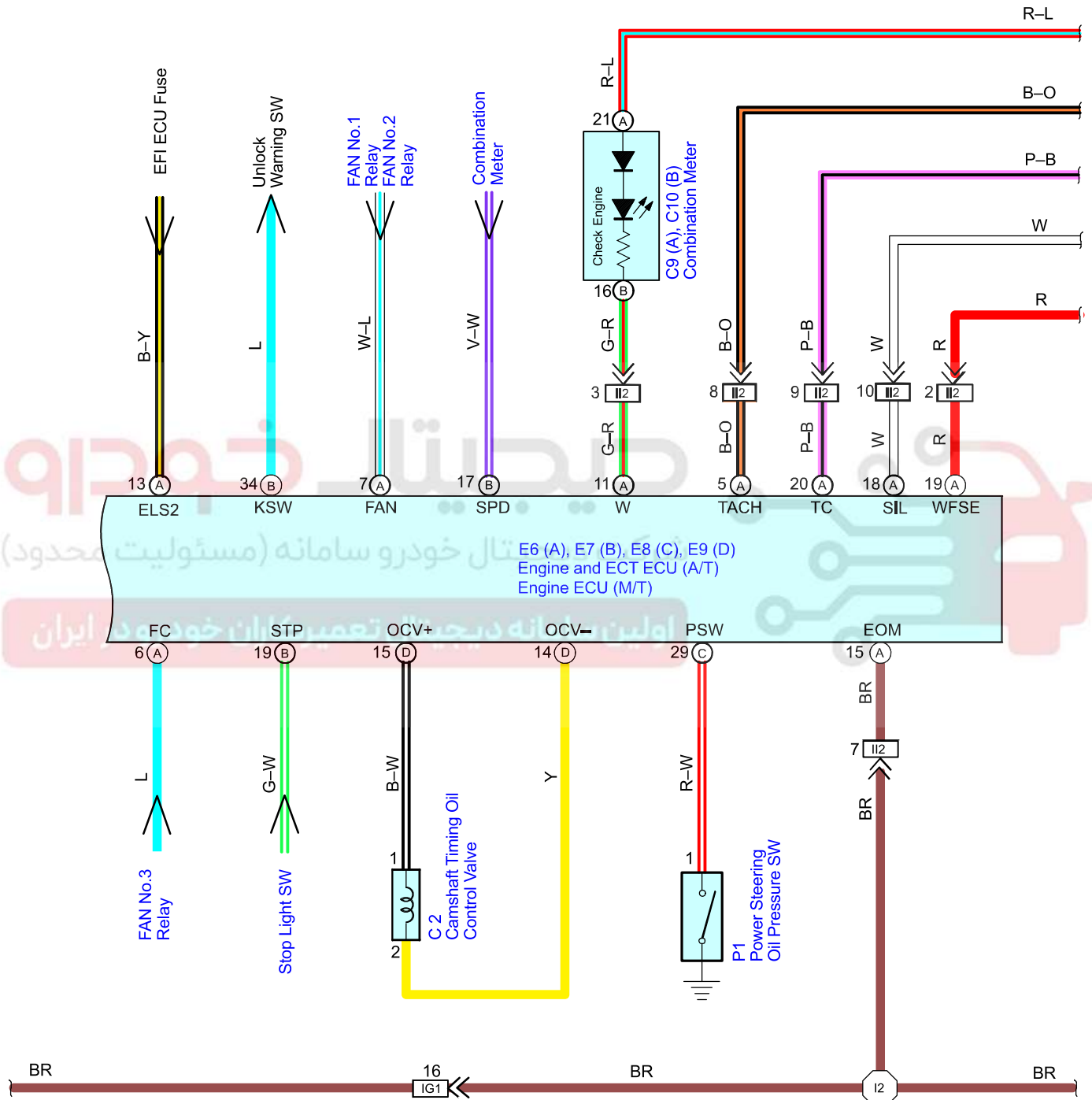


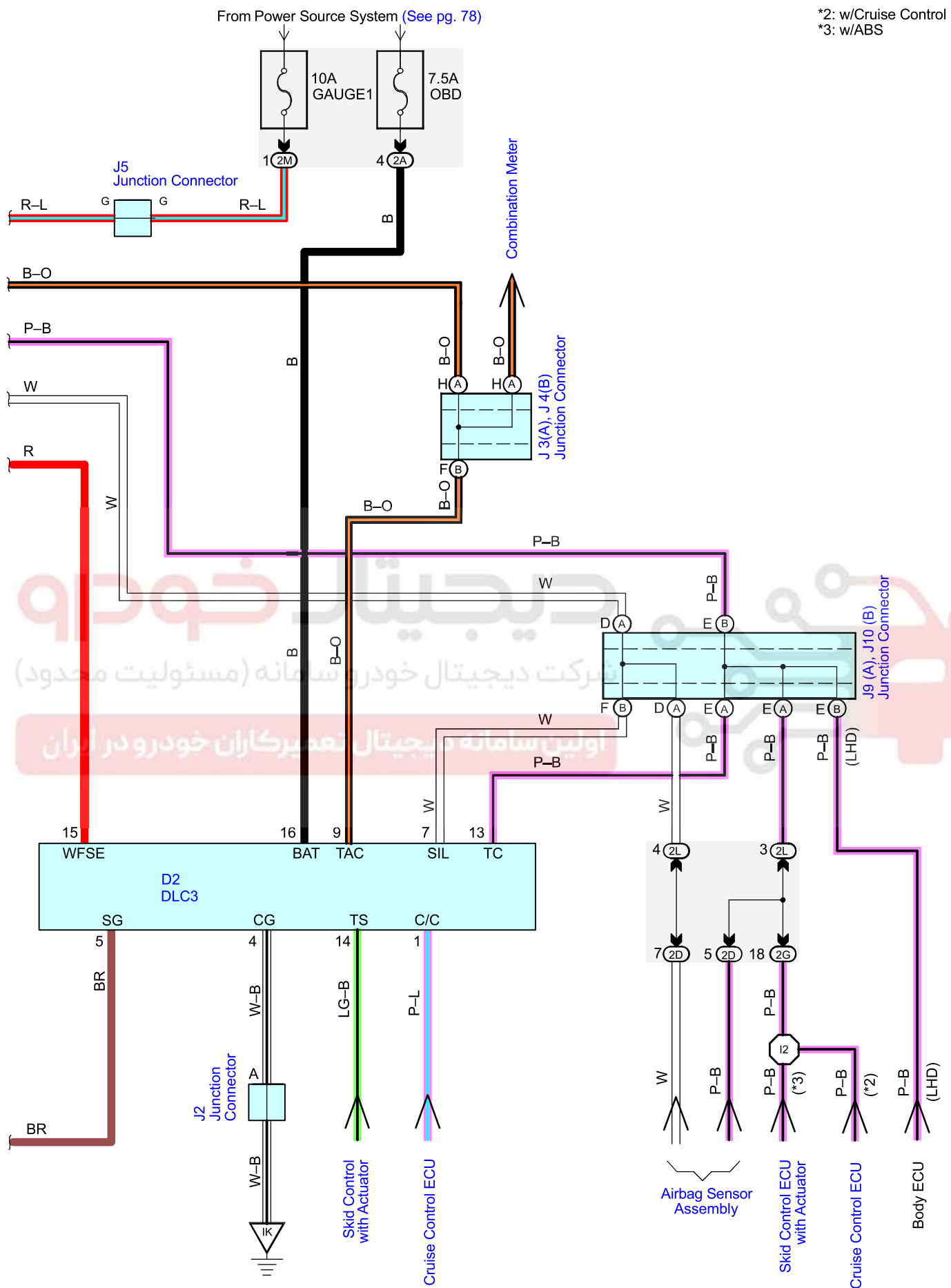


From Power Source System (See pg. 78)

*1: Shielded
*2: w/Cruise Control







Engine Control (2AZ-FE)

System Outline

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

1. Input Signals

(1) Engine coolant temp. signal circuit

The EFI water 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 and ECT ECU (A/T), engine ECU (M/T) as a control signal.

(2) Intake air temp. signal circuit

The intake air temp. sensor is installed in the air flow meter and detects the intake air temp. which is input as a control signal to TERMINAL THA of the engine and ECT ECU (A/T), engine ECU (M/T).

(3) Oxygen density signal circuit

The oxygen density in the exhaust emission is detected by the heated oxygen sensor and input as a control signal to TERMINAL OX1B of the engine and ECT ECU (A/T), engine ECU (M/T).

(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 G22+ of the engine and ECT ECU (A/T), engine ECU (M/T), 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 TERMINAL VTA of the engine and ECT ECU (A/T), engine ECU (M/T).

(6) Vehicle speed circuit

The vehicle speed sensor, detects the vehicle speed and input to ABS speed sensor of the skid control ECU, from skid control ECU to TERMINAL SPD of the engine and ECT ECU (A/T), engine ECU (M/T), Via combination meter.

(7) Battery signal circuit

Voltage is constantly applied to TERMINAL BATT of the engine and ECT ECU (A/T), engine ECU (M/T). With the ignition SW turned on, the voltage for engine and ECT ECU (A/T), engine ECU (M/T) start-up power supply is applied to TERMINAL +B of the engine and ECT ECU (A/T), engine ECU (M/T) via the EFI main relay.

(8) A/C SW signal circuit

The A/C control assembly inputs the A/C operations into TERMINAL A/CS of the engine and ECT ECU (A/T), engine ECU (M/T).

(9) 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 and ECT ECU (A/T), engine ECU (M/T) as a control signal.

(10) 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 and ECT ECU (A/T), engine ECU (M/T) as a control signal.

(11) Engine knock signal circuit

Engine knocking is detected by knock sensor and the signal is input into TERMINAL KNK1 as a control signal.

(12) Air fuel ratio signal system

The air fuel ratio is detected and input as a control signal into TERMINAL AF1A+ of the engine and ECT ECU (A/T), engine ECU (M/T).

2. Control System

* EFI system

The EFI system monitors the engine condition through the signals input from each sensor to the engine and ECT ECU (A/T), engine ECU (M/T). And the control signal is output to TERMINALS #10, #20, #30, #40 of the engine and ECT ECU (A/T), engine ECU (M/T) to operate the injector (Inject the fuel). The EFI system controls the fuel injection operation by the engine and ECT ECU (A/T), engine ECU (M/T) in response to the driving conditions.

* ESA system

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

* Heated oxygen sensor heater control system

The heated oxygen sensor heater control system turns the heater on when the intake air volume is low (Temp. of exhaust emissions is low), and warms up the heated oxygen sensor to improve detection performance of the sensor. The engine and ECT ECU (A/T), engine ECU (M/T) evaluates the signals from each sensor, and outputs current to TERMINAL HT1B to control the heater.

3. Diagnosis System

With the diagnosis system, when there is a malfunction in the engine and ECT ECU (A/T), engine ECU (M/T) 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 and ECT ECU (A/T), engine ECU (M/T) memory or else stops the engine.

دیجیتال خودرو

شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران



Engine Control (2AZ-FE)

Service Hints

E6 (A), E7 (B), E8 (C), E9 (D) Engine and ECT ECU (A/T), Engine ECU (M/T)

BATT-E1 : Always 9.0–14.0 volts

VC-E2 : 4.5–5.5 volts (Ignition SW at ON position)

VTA-E2 : 0.3–1.0 volts (Ignition SW on and throttle valve fully closed)
3.2–4.9 volts (Ignition SW on and throttle valve fully open)

VG-E2G : 1.1–1.5 volts (Engine idling and A/C SW off)

THA-E2 : 0.5–3.4 volts (Engine idling and intake air temp. 20° C, 68° F)

THW-E2 : 0.2–1.0 volts (Engine idling and coolant temp. 80° C, 176° F)

IGF1-E1 : 4.5–5.5 volts (Ignition SW at ON position)

Pulse generation (Engine idling)

SIL-E1 : Pulse generation (During transmission)

TACH-E1 : Pulse generation (Engine idling)

STA-E1 : 6.0 volts or more (Engine cranking)

FC-E01 : 9.0–14.0 volts (Ignition SW at ON position)

SPD-E1 : Pulse generation (Ignition SW on and rotate driving wheel slowly)

W-E01 : Below 3.0 volts (Ignition SW at ON position)

NSW-E1 : 9.0–14.0 volts (Ignition SW on and other shift position in P or N position)

0–3.0 volts (Ignition SW on and shift position in P or N position)

EVP1-E01 : 9.0–14.0 volts (Ignition SW at ON position)

STP-E1 : 7.5–14.0 volts (Ignition SW on and brake pedal depressed)

Below 1.5 volts (Ignition SW on and brake pedal released)

KNK1-E1 : Pulse generation (Engine idling)

PSW-E1 : 9.0–14.0 volts (Ignition SW at ON position)

IGSW-E1 : 9.0–14.0 volts (Ignition SW at ON position)

MREL-E1 : 9.0–14.0 volts (Ignition SW at ON position)

G22+, NE+ –NE– : Pulse generation (Engine idling)

OCV+ –OCV– : Pulse generation (Ignition SW at ON position)

HTL-E1 : 9.0–14.0 volts (Engine idling)

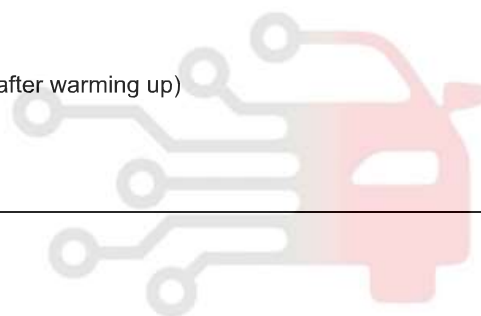
Below 3.0 volts (Ignition SW at ON position)

OXL1-E1 : Pulse generation (Maintain engine speed at 2500 rpm for 90 sec. after warming up)

IGT1, IGT2, IGT3, IGT4-E1 : Pulse generation (Engine idling)

#10, #20, #30, #40-E01 : 9.0–14.0 volts (Ignition SW at ON position)

Pulse generation (Engine idling)



اولین سامانه دیجیتال تعمیرکاران خودرو در ایران

 : Parts Location

Code	See Page	Code	See Page	Code	See Page
A9	34 (LHD)	E8	C	J2	37 (LHD)
	44 (RHD)				47 (RHD)
A13	36 (LHD)	E9	D	J3	37 (LHD)
	46 (RHD)				47 (RHD)
C1	34 (LHD)	F12		J4	37 (LHD)
	44 (RHD)				47 (RHD)
C2	34 (LHD)	H5		J5	37 (LHD)
	44 (RHD)				47 (RHD)
C4	34 (LHD)	I9		J9	37 (LHD)
	44 (RHD)				47 (RHD)
C9	36 (LHD)	I10		J10	37 (LHD)
	46 (RHD)				47 (RHD)
C10	36 (LHD)	I11		J13	37 (LHD)
	46 (RHD)				47 (RHD)
D2	36 (LHD)	I12		K1	35 (LHD)
	46 (RHD)				45 (RHD)
E2	34 (LHD)	I15		P1	35 (LHD)
	44 (RHD)				45 (RHD)
E6	37 (LHD)	I16		T1	35 (LHD)
	47 (RHD)				45 (RHD)
E7	37 (LHD)	I17		V3	35 (LHD)
	47 (RHD)				45 (RHD)

 : Relay Blocks

Code	See Page	Relay Blocks (Relay Block Location)
1	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	24	Engine Room Main Wire and Engine Room J/B (Engine Compartment Left)
1B		
1C		
1D		
1E		
1K	24	Engine Wire and Engine Room J/B (Engine Compartment Left)
1L		
2A	26	Instrument Panel Wire and Driver Side J/B (Lower Finish Panel)
2D	26	Engine Room Main Wire and Driver Side J/B (Lower Finish Panel)
2E		
2G		
2L	26	Instrument Panel Wire and Driver Side J/B (Lower Finish Panel)
2M		
2O		
2Q		
2R		

Engine Control (2AZ-FE)

 : Connector Joining Wire Harness and Wire Harness

Code	See Page	Joining Wire Harness and Wire Harness (Connector Location)
IA1	67 (RHD)	Instrument Panel Wire and Floor Wire (Right Kick Panel)
ID1	55 (LHD)	Engine Room Main Wire and Floor Wire (Left Kick Panel)
IE2	67 (RHD)	Engine Room Main Wire and Instrument Panel (Left Side of Steering Column Tube)
IE5	55 (LHD)	Engine Room Main Wire and Instrument Panel (Right Side of Steering Column Tube)
	67 (RHD)	Engine Room Main Wire and Instrument Panel (Left Side of Steering Column Tube)
II2	58 (LHD)	Engine Room Main Wire and Instrument Panel Wire (Right Kick Panel)
	70 (RHD)	Engine Room Main Wire and Instrument Panel Wire (Left Kick Panel)

 : Ground Points

Code	See Page	Ground Points Location
BO	60 (LHD)	Front Side of Rear Quarter Wheel House LH
BR	72 (RHD)	Front Side of Rear Quarter Wheel House RH
EC	54 (LHD 2AZ-FE)	Left Fender
	66 (RHD 2AZ-FE)	
EF	54 (LHD 2AZ-FE)	Intake Side of Cylinder Block
	66 (RHD 2AZ-FE)	
II	55 (LHD)	Instrument Panel Reinforcement LH
IK	55 (LHD)	Instrument Panel Brace LH
	67 (RHD)	Instrument Panel Brace RH
IM	67 (RHD)	Instrument Panel Reinforcement RH

 : Splice Points

Code	See Page	Wire Harness with Splice Points	Code	See Page	Wire Harness with Splice Points
E6	54 (LHD)	Engine Wire	I6	70 (RHD)	Engine Wire
	66 (RHD)		I7	58 (LHD)	
I2	58 (LHD)	Instrument Panel Wire	I8	70 (RHD)	
	70 (RHD)			58 (LHD)	
I6	58 (LHD)	Engine Wire		70 (RHD)	