

ENGINE CONTROL (FOR 2JZ-GE)

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. (WATER TEMP.) SIGNAL CIRCUIT

THE ENGINE COOLANT TEMP. SENSOR (WATER TEMP. SENSOR) DETECTS THE ENGINE COOLANT TEMP. (WATER TEMP.) AND HAS A BUILT-IN THERMISTOR WITH A RESISTANCE WHICH VARIES ACCORDING TO THE ENGINE COOLANT TEMP. (WATER TEMP.) IS INPUT INTO **TERMINAL THW** OF THE ENGINE CONTROL MODULE (ENGINE ECU) AS A CONTROL SIGNAL.

(2) INTAKE AIR TEMP. SIGNAL CIRCUIT

THE INTAKE AIR TEMP. SENSOR IS INSTALLED IN THE VOLUME AIR FLOW (AIR FLOW METER) AND DETECTS THE INTAKE AIR TEMP., WHICH IS INPUT AS A CONTROL SIGNAL TO **TERMINAL THA** OF THE ENGINE CONTROL MODULE (ENGINE ECU).

(3) OXYGEN DENSITY SIGNAL CIRCUIT

THE OXYGEN DENSITY IN THE EXHAUST EMISSION IS DETECTED AND INPUT AS A CONTROL SIGNAL FROM THE OXYGEN SENSOR NO. 1 AND NO. 2 TO **TERMINALS OX1, OX2** OF THE ENGINE CONTROL MODULE (ENGINE ECU) AND FROM THE HEATED OXYGEN SENSOR (OXYGEN SENSOR) SUB (FOR USA SPEC.) TO **TERMINAL OX3** OF THE ENGINE CONTROL MODULE (ENGINE ECU).

TO STABILIZE DETECTION PERFORMANCE BY THE HEATED OXYGEN SENSOR (OXYGEN SENSOR) SUB (FOR USA SPEC.) IS WARMED.

(4) RPM SIGNAL CIRCUIT

CRANKSHAFT POSITION IS DETECTED BY THE PICK-UP COIL INSTALLED INSIDE THE DISTRIBUTOR. CRANKSHAFT POSITION IS INPUT AS A CONTROL SIGNAL TO **TERMINALS G1** AND **G2** OF THE ENGINE CONTROL MODULE (ENGINE ECU), AND ENGINE SPEED IS INPUT TO **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 VTA1** OF THE ENGINE CONTROL MODULE (ENGINE ECU). WHEN THE VALVE IS COMPLETELY CLOSED, THE CONTROL SIGNAL IS INPUT INTO **TERMINAL IDL1**.

(6) VEHICLE SPEED CIRCUIT

THE VEHICLE SPEED IS DETECTED BY VEHICLE SPEED SENSOR (SPEED SENSOR) NO. 1 INSTALLED IN THE TRANSMISSION AND THE SIGNAL IS INPUT TO **TERMINAL SPD** OF THE ENGINE CONTROL MODULE (ENGINE ECU) VIA THE COMBINATION METER.

(7) NEUTRAL POSITION SIGNAL CIRCUIT

THE PARK/NEUTRAL POSITION SW (NEUTRAL START SW) DETECTS WHETHER THE SHIFT POSITION IS IN "N" AND "P" OR NOT, AND THE SIGNAL IS INPUT INTO **TERMINAL NSW** OF THE ENGINE CONTROL MODULE (ENGINE ECU).

(8) A/C SW SIGNAL CIRCUIT

THE OPERATING VOLTAGE OF THE A/C MAGNETIC CLUTCH IS DETECTED AND THE SIGNAL IS INPUT INTO **TERMINAL ACMG** OF ENGINE CONTROL MODULE (ENGINE ECU) AS A CONTROL SIGNAL.

(9) BATTERY SIGNAL CIRCUIT

VOLTAGE IS CONSTANTLY APPLIED TO **TERMINAL BATT** OF THE ENGINE CONTROL MODULE (ENGINE ECU). WITH THE IGNITION SW TURNED ON, THE VOLTAGE FOR ENGINE CONTROL MODULE (ENGINE ECU) START-UP POWER SUPPLY IS APPLIED TO **TERMINALS + B** AND **+ B1** OF THE ENGINE CONTROL MODULE (ENGINE ECU) VIA EFI MAIN RELAY.

THE CURRENT FLOWING THROUGH THE **IGN** FUSE FLOWS TO **TERMINAL IGSW** OF THE ENGINE CONTROL MODULE (ENGINE ECU).

(10) INTAKE AIR VOLUME SIGNAL CIRCUIT

INTAKE AIR VOLUME IS DETECTED BY THE VOLUME AIR FLOW (AIR FLOW METER) AND THE SIGNAL IS INPUT TO **TERMINAL KS** OF THE ENGINE CONTROL MODULE (ENGINE ECU) AS A CONTROL SIGNAL.

(11) STOP LIGHT SW SIGNAL CIRCUIT

THE STOP LIGHT SW IS USED TO DETECT WHETHER OR NOT THE VEHICLE IS BRAKING AND THE SIGNAL IS INPUT INTO **TERMINAL STP** OF THE ENGINE CONTROL MODULE (ENGINE ECU) AS A CONTROL SIGNAL.

(12) STARTER SIGNAL CIRCUIT

TO CONFIRM WHETHER THE ENGINE IS CRANKING, THE VOLTAGE APPLIED TO THE STARTER MOTOR DURING CRANKING IS DETECTED AND THE SIGNAL IS INPUT INTO **TERMINAL STA** OF THE ENGINE CONTROL MODULE (ENGINE ECU) AS A CONTROL SIGNAL.

(13) ENGINE KNOCK SIGNAL CIRCUIT

ENGINE KNOCKING IS DETECTED BY KNOCK SENSOR NO. 1 AND NO. 2 AND THE SIGNAL IS INPUT INTO **TERMINALS KNK1** AND **KNK2** AS A CONTROL SIGNAL.

2. CONTROL SYSTEM

* SEQUENTIAL MULTIPOINT FUEL INJECTION (ELECTRONIC FUEL INJECTION) SYSTEM

THE SEQUENTIAL MULTIPOINT FUEL INJECTION (ELECTRONIC FUEL INJECTION) SYSTEM MONITORS THE ENGINE CONDITION THROUGH THE SIGNALS INPUT FROM EACH SENSOR (INPUT SIGNALS FROM (1) TO (13) ETC.) TO THE ENGINE CONTROL MODULE (ENGINE ECU). THE BEST FUEL INJECTION TIMING IS DECIDED BASED ON THIS DATA AND THE PROGRAM MEMORIZED BY THE ENGINE CONTROL MODULE (ENGINE ECU), AND THE CONTROL SIGNAL IS OUTPUT TO **TERMINALS #10, #20, #30, #40, #50 AND #60** OF THE ENGINE CONTROL MODULE (ENGINE ECU) TO OPERATE THE INJECTOR. (INJECT THE FUEL). THE SEQUENTIAL MULTIPOINT FUEL INJECTION (ELECTRONIC FUEL INJECTION) SYSTEM PRODUCES CONTROL OF FUEL INJECTION OPERATION BY THE ENGINE CONTROL MODULE (ENGINE ECU) IN RESPONSE TO THE DRIVING CONDITIONS.

* ESA (ELECTRONIC SPARK ADVANCE) SYSTEM

THE ESA SYSTEM MONITORS THE ENGINE CONDITION THROUGH THE SIGNALS INPUT TO THE ENGINE CONTROL MODULE (ENGINE ECU) FROM EACH SENSOR (INPUT SIGNALS FROM (1), (2), (4) TO (13) ETC.). THE BEST IGNITION TIMING IS DECIDED ACCORDING TO THIS DATA AND THE MEMORIZED DATA IN THE ENGINE CONTROL MODULE (ENGINE ECU) AND THE CONTROL SIGNAL IS OUTPUT TO **TERMINAL IGT** THIS SIGNAL CONTROLS THE IGNITER TO PROVIDE THE BEST IGNITION TIMING FOR THE DRIVING CONDITIONS.

* HEATED OXYGEN SENSOR (OXYGEN SENSOR) HEATER CONTROL SYSTEM (USA SPEC.)

THE HEATED OXYGEN SENSOR (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 OXYGEN SENSOR TO IMPROVE DETECTION PERFORMANCE OF THE SENSOR. THE ENGINE CONTROL MODULE (ENGINE ECU) EVALUATES THE SIGNALS FROM EACH SENSOR (INPUT SIGNALS FROM (1), (2), (4), (9) TO (11) ETC.,) AND OUTPUTS CURRENT TO **TERMINAL HT** TO CONTROL THE HEATER.

* IDLE AIR CONTROL (IDLE SPEED CONTROL) SYSTEM

THE IDLE AIR CONTROL (ISC) SYSTEM (STEP MOTOR TYPE) INCREASES THE ENGINE SPEED AND PROVIDES IDLING STABILITY FOR FAST IDLE-UP WHEN THE ENGINE IS COLD, AND WHEN THE IDLE SPEED HAS DROPPED DUE TO ELECTRICAL LOAD AND SO ON. THE ENGINE CONTROL MODULE (ENGINE ECU) EVALUATES THE SIGNALS FROM EACH SENSOR (INPUT SIGNALS FROM (1), (4), (5), (8), (9), (11) ETC.), OUTPUTS CURRENT TO **TERMINALS ISC1, ISC2, ISC3 AND ISC4** TO CONTROL THE IDLE AIR CONTROL VALVE (ISC VALVE).

* EGR CONTROL SYSTEM

THE EGR CONTROL SYSTEM DETECTS THE SIGNAL FROM EACH SENSOR (INPUT SIGNALS FROM (1), (4), (9), (10) ETC.), AND OUTPUTS CURRENT TO **TERMINAL EGR** TO CONTROL THE EGR VALVE.

* FUEL PUMP CONTROL SYSTEM

THE ENGINE CONTROL MODULE (ENGINE ECU) OUTPUTS CURRENT TO **TERMINAL FPC** AND CONTROLS THE FUEL PUMP ECU AND FUEL PUMP DRIVE SPEED IN RESPONSE TO CONDITIONS.

* ACIS (ACOUSTIC CONTROL INDUCTION SYSTEM)

ACIS INCLUDES A VALVE IN THE BULKHEAD SEPARATING THE SURGE TANK INTO TWO PARTS. THIS VALE IS OPENED AND CLOSED IN ACCORDANCE WITH THE DRIVING CONDITIONS TO CONTROL THE INTAKE MANIFOLD LENGTH IN TWO STAGES FOR INCREASED ENGINE OUTPUT IN ALL RANGES FROM LOW TO HIGH SPEEDS.

THE ENGINE CONTROL MODULE (ENGINE ECU) JUDGES THE VEHICLE SPEED BY THE SIGNALS ((4), (5)) FROM EACH SENSOR AND OUTPUTS SIGNALS TO THE TERMINAL ACIS TO CONTROL THE VSV (FOR INTAKE CONTROL VALVE).

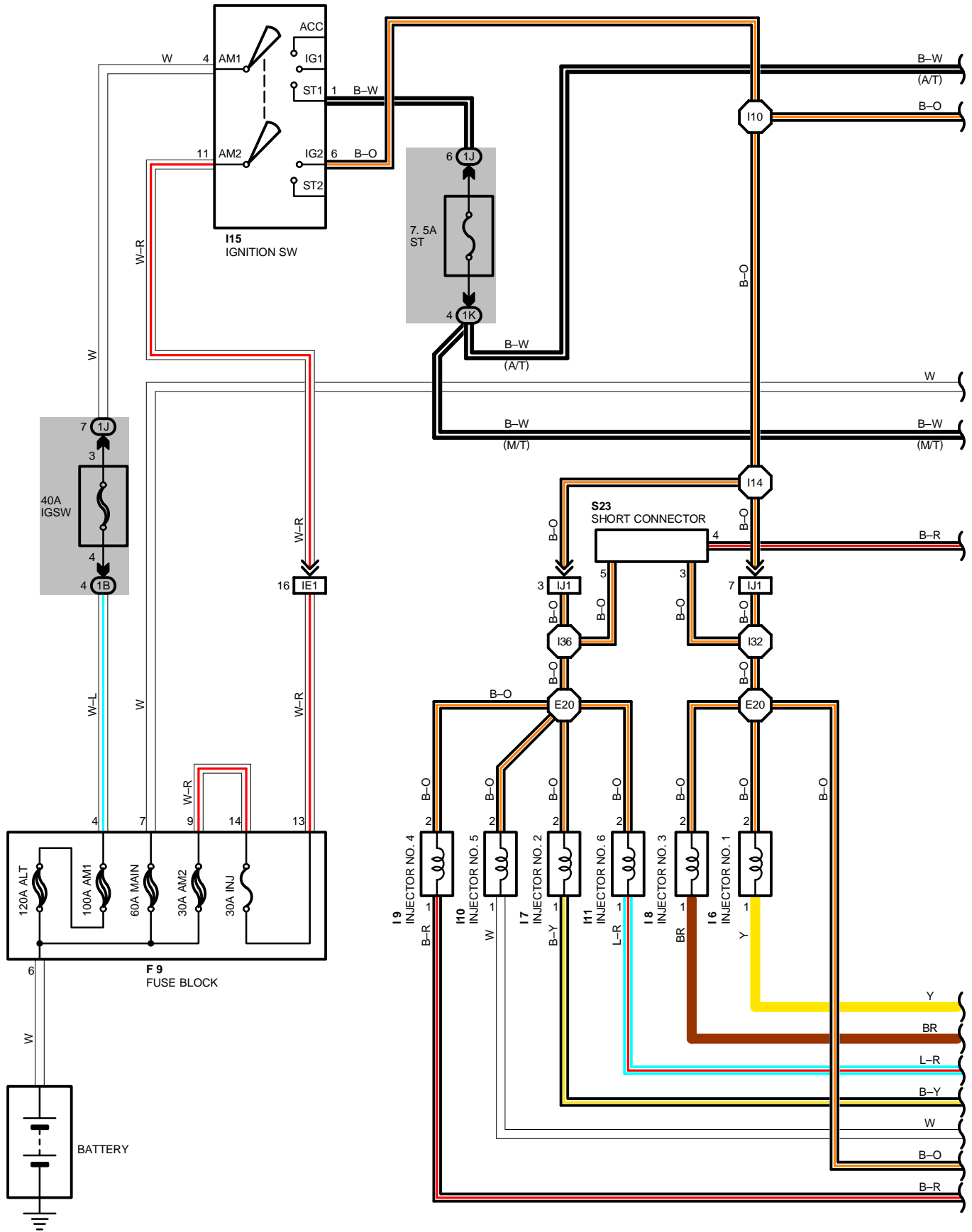
3. DIAGNOSIS SYSTEM

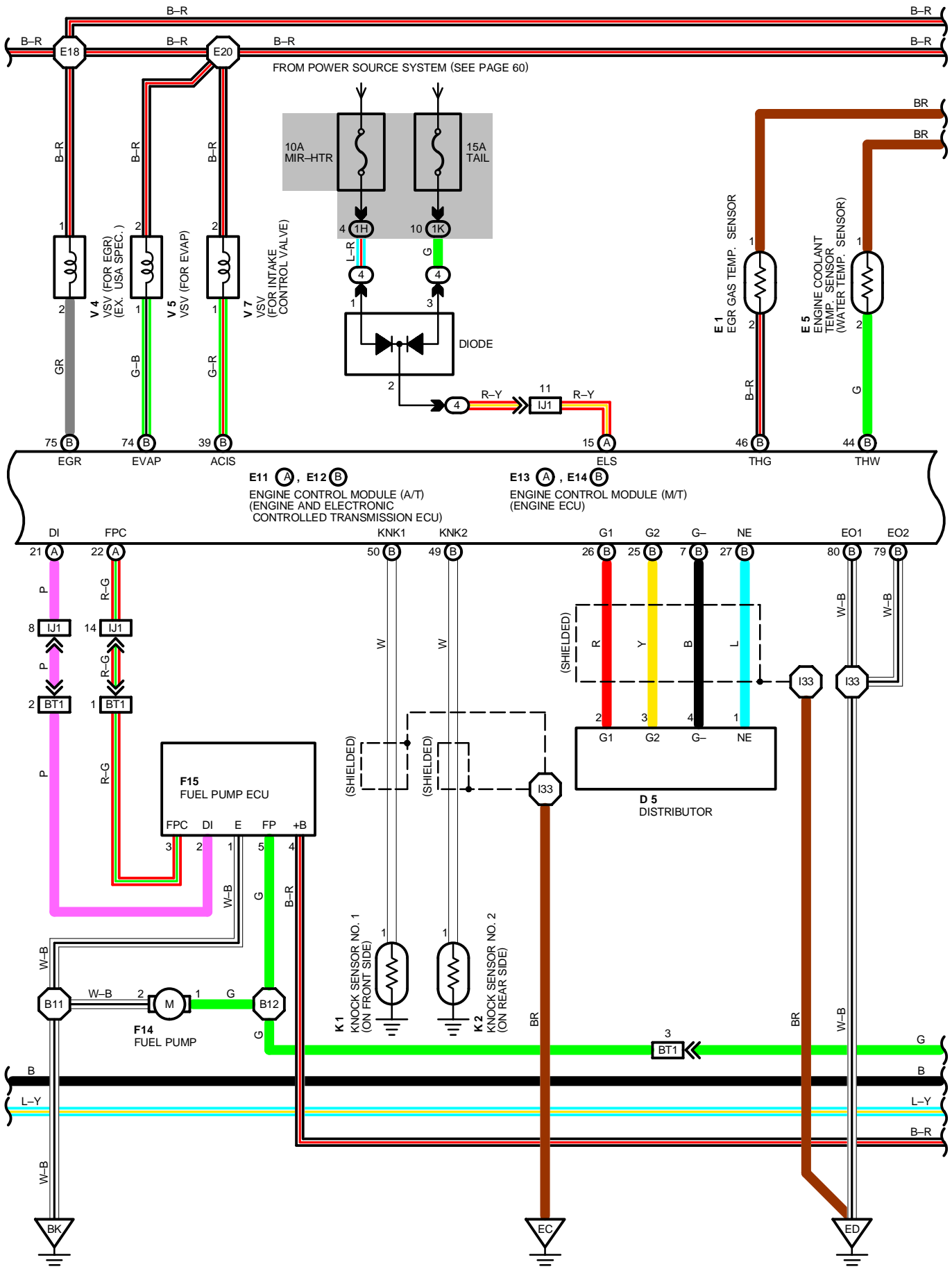
WITH THE DIAGNOSIS SYSTEM, WHEN THERE IS A MALFUNCTION IN THE ENGINE CONTROL MODULE (ENGINE ECU) SIGNAL SYSTEM, THE MALFUNCTIONING SYSTEM IS RECORDED IN THE MEMORY. THE MALFUNCTIONING SYSTEM CAN BE FOUND BY READING THE CODE DISPLAYED BY THE MALFUNCTION INDICATOR LAMP (CHECK ENGINE WARNING LIGHT).

4. FAIL-SAFE SYSTEM

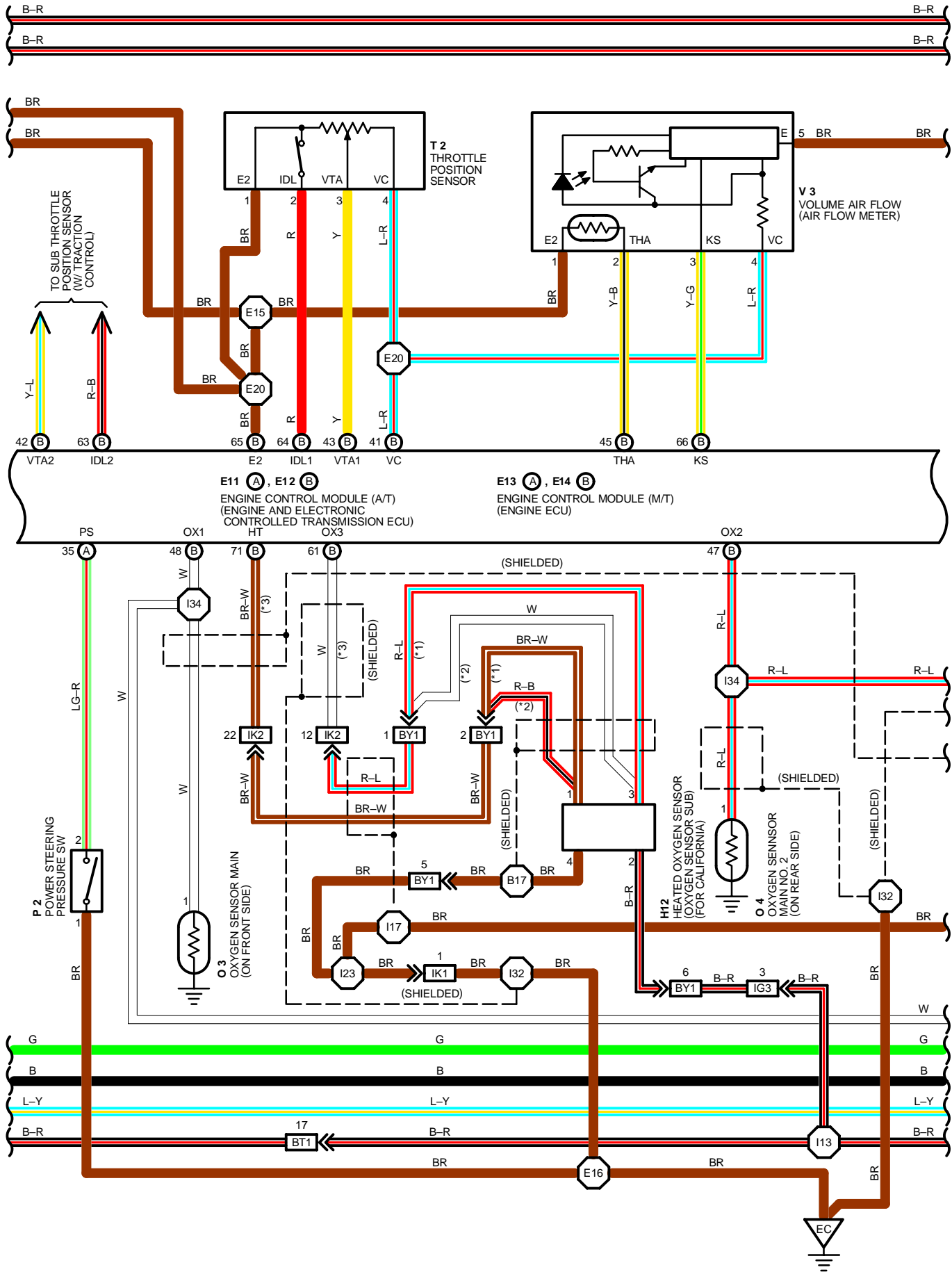
WHEN A MALFUNCTION HAS OCCURRED IN ANY SYSTEM, IF THERE IS A POSSIBILITY OF ENGINE TROUBLE BEING CAUSED BY CONTINUED CONTROL BASED ON THE SIGNALS FROM THAT SYSTEM, THE FAIL-SAFE SYSTEM EITHER CONTROLS THE SYSTEM BY USING DATA (STANDARD VALUES) RECORDED IN THE ENGINE CONTROL MODULE (ENGINE ECU) MEMORY OR ELSE STOPS THE ENGINE.

ENGINE CONTROL (FOR 2JZ-GE)

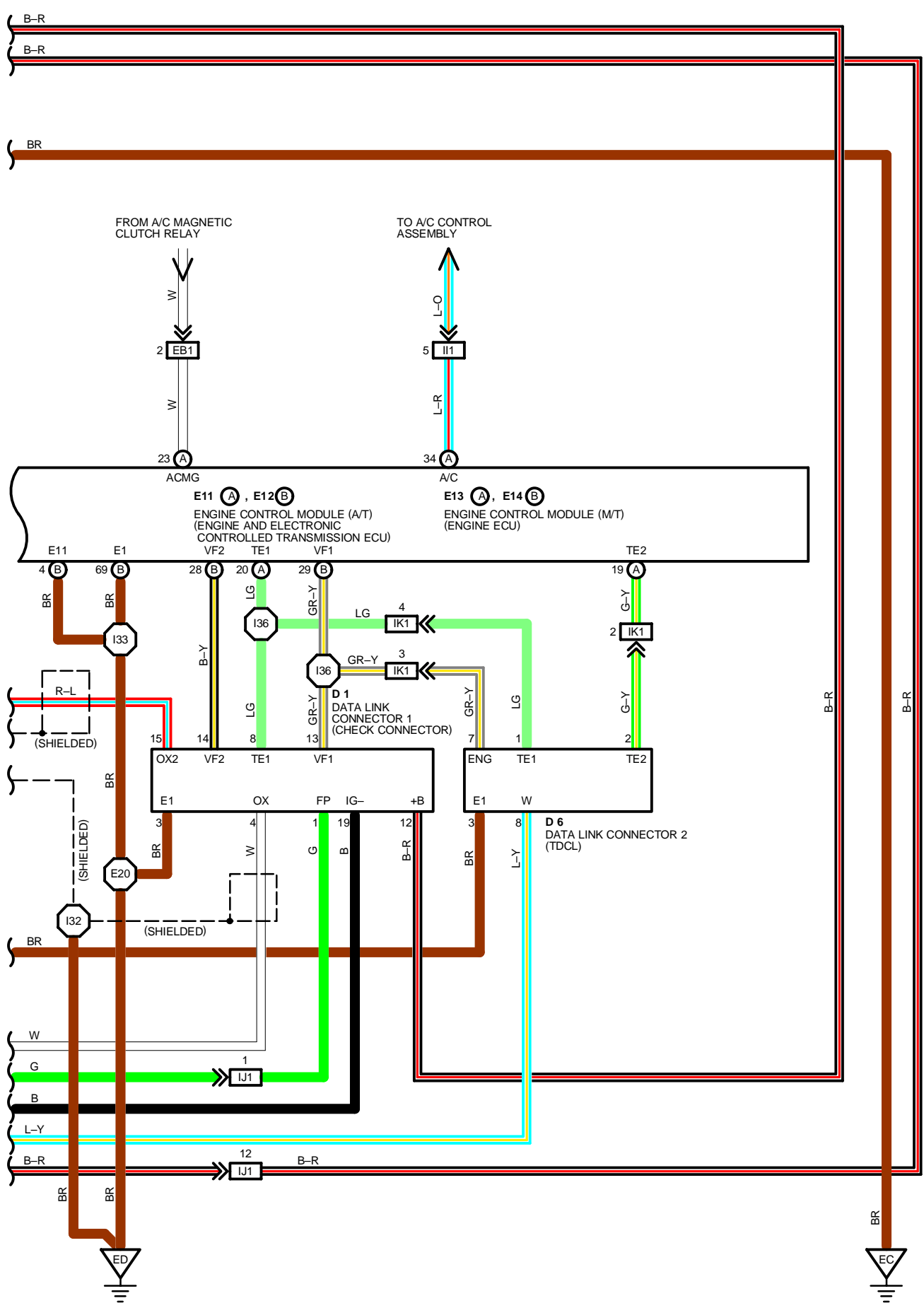




ENGINE CONTROL (FOR 2JZ-GE)



- *1 : W/ CD PLAYER
- *2 : W/O CD PLAYER
- *3 : FOR CALIFORNIA



ENGINE CONTROL (FOR 2JZ-GE)

SERVICE HINTS

EFI MAIN RELAY

2-4: CLOSED WITH IGNITION SW AT ON OR ST POSITION

E5 ENGINE COOLANT TEMP. SENSOR (WATER TEMP. SENSOR)

1-2: APPROX. 16K Ω (-20°C, -4°F)
: APPROX. 2.5K Ω (20°C, 68°F)
: APPROX. 0.3K Ω (80°C, 176°F)

E1 EGR GAS TEMP. SENSOR (FOR USA SPEC.)

1-2: 69K Ω - 89K Ω (50°C, 122°F)
12K Ω - 15K Ω (100°C, 212°F)
2K Ω - 4K Ω (150°C, 302°F)

E11, E12, E13, E14 ENGINE CONTROL MODULE (ENGINE AND ELECTRONIC CONTROLLED TRANSMISSION ECU (A/T), ENGINE ECU (M/T))

VOLTAGE AT ENGINE CONTROL MODULE (ENGINE ECU)

BATT - E1 : ALWAYS 9-14 VOLTS
IGSW, + B, + B1 - E1 : 9-14 VOLTS WITH IGNITION SW ON
VC - E2 : 4.5 - 5.5 VOLTS WITH IGNITION SW ON
IDL1, IDL2 - E2 : 0-3 VOLTS WITH IGNITION SW ON AND THROTTLE VALVE FULLY CLOSED
: 9-14 VOLTS WITH IGNITION SW ON AND THROTTLE VALVE FULLY OPEN
VTA1, VTA2 - E2 : 0.3 - 0.8 VOLTS WITH IGNITION SW ON AND THROTTLE VALVE FULLY CLOSED
: 3.2 - 4.9 VOLTS WITH IGNITION SW ON AND THROTTLE VALVE FULLY OPEN
THA - E2 : 0.5 - 3.4 VOLTS WITH IDLING, INTAKE AIR TEMP. 20°C (68°F)
THW - E2 : 0.2 - 1.0 VOLTS WITH IDLING, WATER TEMP. 80°C (176°F)
STA - E1 : 6.0 VOLTS OR MORE WITH CLANKING
#10, #20, #30 - E01: 9-14 VOLTS WITH IGNITION SW ON
: PULSE GENERATION WITH IDLING
#40, #50, #60 - E01: 9-14 VOLTS WITH IGNITION SW ON
: PULSE GENERATION WITH IDLING
IGF - E1 : BELOW 1 VOLTS WITH IGNITION SW ON
: PULSE GENERATION WITH IDLING
MREL - E1 : 9-14 VOLTS WITH IGNITION SW ON
DI - E1 : 7.5 VOLTS OR MORE WITH IDLING
ACIS - E01: 9-14 VOLTS WITH IGNITION SW ON
EVAP - E01: 9-14 VOLTS WITH IGNITION SW ON
ISC1, ISC2, ISC3, ISC4 - E01: 9-14 VOLTS WITH IGNITION SW ON
HT - E01: 9-14 VOLTS WITH IGNITION SW ON
EGR - E1 : 9-14 VOLTS WITH ENGINE SPEED AT 3500 RPM
NSW - E1 : 0-3 VOLTS WITH IGNITION SW ON AND SHIFT LEVER "P", "N" POSITION
: 9-14 VOLTS WITH IGNITION SW ON AND OTHER SHIFT LEVER "P", "N" POSITION
TE1 - E1 : 9-14 VOLTS WITH IGNITION SW ON
TE2 - E2 : 9-14 VOLTS WITH IGNITION SW ON
W - E1 : 9-14 VOLTS WITH IDLING
: 0-3 VOLTS WITH IGNITION SW ON
A/C - E1 : 0-1.5 VOLTS WITH A/C SW ON (AT IDLING)
: 7.5-14 VOLTS WITH A/C SW OFF
ACMG - E1 : 0-3 VOLTS WITH A/C SW ON (AT IDLING)
TR - E1 : 9-14 VOLTS WITH IGNITION SW ON
VT01, VT02 - E2 : 0.3 - 0.8 VOLTS WITH IGNITION SW ON AND THROTTLE VALVE FULLY CLOSED
: 3.2 - 4.9 VOLTS WITH IGNITION SW ON AND THROTTLE VALVE FULLY OPEN

I1 IDLE AIR CONTROL VALVE (ISC VALVE)

5-4.6 : 10 Ω - 30 Ω
2-1.3 : 10 Ω - 30 Ω

I6, I7, I8, I9, I10, I11 INJECTOR

1-2 : 13.4 Ω - 14.2 Ω

H12 HEATED OXYGEN SENSOR (OXYGEN SENSOR) (FOR USA SPEC.)

1-2 : 5.1 Ω - 6.3 Ω

T2 THROTTLE POSITION SENSOR

1-4 : 4.0K Ω - 9.0K Ω
1-3 : 3.3K Ω - 10.0K Ω WITH THROTTLE VALVE FULLY OPEN
0.2K Ω - 0.8K Ω WITH THROTTLE VALVE FULLY CLOSED
1-2 : INFINITY WITH CLEARANCE BETWEEN LEVER AND STOP SCREW 0.55MM (0.022 IN.)
2.3K Ω OR LESS WITH CLEARANCE BETWEEN LEVER AND STOP SCREW 0.45MM (0.018 IN.)

○ : PARTS LOCATION

CODE	SEE PAGE	CODE	SEE PAGE	CODE	SEE PAGE
C11	30	F15	32	O 3	28
C13	B 30	H12	32	O 4	28
C14	A 30	I 1	28	P 1	28
D 1	28	I 2	28	P 2	28
D 5	28	I 6	28	S10	B 30
D 6	30	I 7	28	S11	A 30
E 1	28	I 8	28	S13	30
E 5	28	I 9	28	S23	30
E11	A 30	I10	28	T 2	28
E12	B 30	I11	28	V 1	28
E13	A 30	I15	30	V 3	28
E14	B 30	K 1	28	V 4	28
F 9	28	K 2	28	V 5	28
F14	32	N 4	31	V 7	28

○ : RELAY BLOCKS

CODE	SEE PAGE	RELAY BLOCKS (RELAY BLOCK LOCATION)
2	19	ENGINE COMPARTMENT LEFT
4	22	LEFT KICK PANEL (J/B NO.1 LEFT)

○ : JUNCTION BLOCK AND WIRE HARNESS CONNECTOR

CODE	SEE PAGE	JUNCTION BLOCK AND WIRE HARNESS (CONNECTOR LOCATION)
1B	20	ENGINE ROOM MAIN WIRE
1E	20	INSTRUMENT PANEL WIRE
1H	20	COWL WIRE
1I		
1J		
1K		
3A	22	INSTRUMENT PANEL WIRE
3D		

□ : CONNECTOR JOINING WIRE HARNESS AND WIRE HARNESS

CODE	SEE PAGE	JOINING WIRE HARNESS AND WIRE HARNESS (CONNECTOR LOCATION)
EB1	36	ENGINE WIRE AND ENGINE ROOM MAIN WIRE (FRONT SIDE OF R/B NO.2)
EB2		
IE1	40	ENGINE ROOM MAIN WIRE AND COWL WIRE (R/B NO. 4)
IG2	40	INSTRUMENT PANEL WIRE AND COWL WIRE (R/B NO. 5)
IG3	40	INSTRUMENT PANEL WIRE AND COWL WIRE (RIGHT KICK PANEL)
II1	40	ENGINE WIRE AND A/C WIRE (BEHIND GLOVE BOX)
IJ1	40	ENGINE WIRE AND COWL WIRE (RIGHT KICK PANEL)
IJ2		
IK1	40	ENGINE WIRE AND INSTRUMENT PANEL WIRE (RIGHT KICK PANEL)
IK2		
BT1	44	FLOOR WIRE AND COWL WIRE (LEFT KICK PANEL)
BY1	44	INSTRUMENT PANEL WIRE AND FLOOR NO.3 WIRE (RIGHT KICK PANEL)

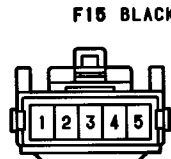
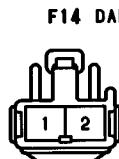
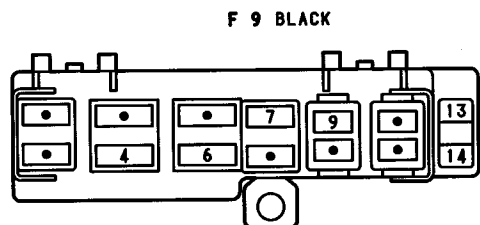
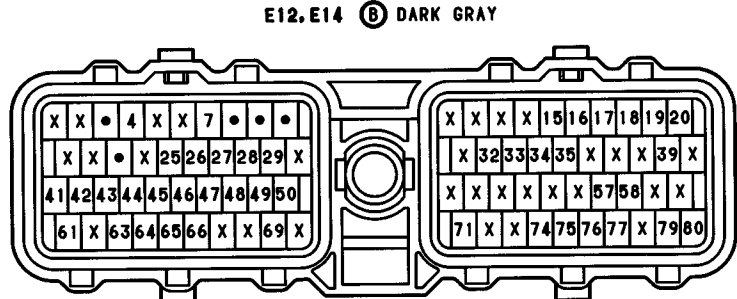
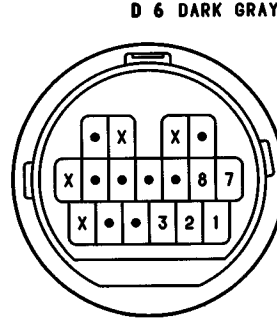
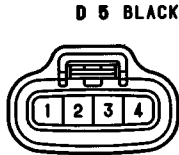
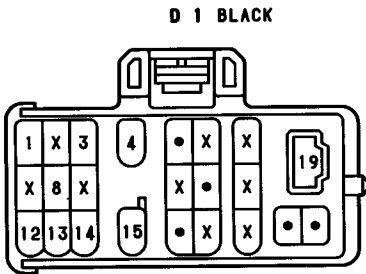
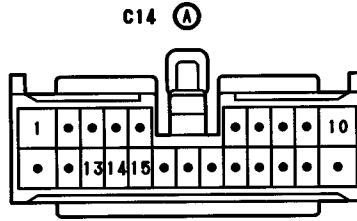
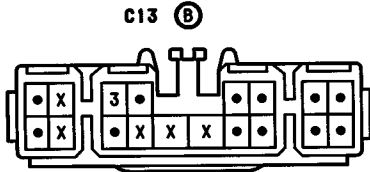
ENGINE CONTROL (FOR 2JZ-GE)

▽ : GROUND POINTS

CODE	SEE PAGE	GROUND POINTS LOCATION
EB	38	FRONT SIDE OF LEFT FENDER
EC	38	FRONT SIDE OF INTAKE MANIFOLD
ED	38	REAR SIDE OF CYLINDER HEAD RH
IH	40	UNDER THE ASHTRAY LH
BK	44	UNDER THE CENTER PILLAR LH

○ : SPLICE POINTS

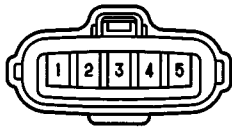
CODE	SEE PAGE	WIRE HARNESS WITH SPLICE POINTS	CODE	SEE PAGE	WIRE HARNESS WITH SPLICE POINTS
E15	38	ENGINE WIRE	I22	42	INSTRUMENT PANEL WIRE
E16			I23		
E17			I32	42	ENGINE WIRE
E18			I33		
E20			I34		
I10	42	COWL WIRE	I36	44	FLOOR MAIN WIRE
I13			B11		
I14			B12		
I17	42	INSTRUMENT PANEL WIRE	B17	44	FLOOR NO.3 WIRE



I 1 DARK GRAY



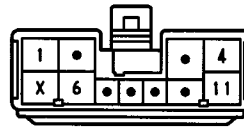
I 2 BLACK



I 6: I 7: I 8: I 9: I 10: I 11 GRAY



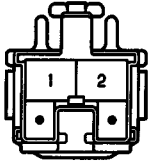
I15 BLACK



K 1, K 2 DARK GRAY



N 4, 813



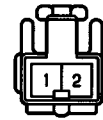
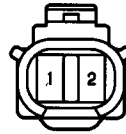
O 3, O 4 DARK GRAY



P 1 GRAY



P 2 DARK GRAY S10 B



S11 A



S23



T 2 BLACK



V 1 GRAY



V 3 BLACK



V 4 BLACK



V 5 BLUE



V 7 BROWN

