

UP 🕦 🕒 DOWN

SYSTEM OUTLINE

THIS SYSTEM UTILIZES A MICROCOMPUTER AND MAINTAINS OVERALL CONTROL OF THE ENGINE, TRANSMISSION, ETC., AN OUTLINE OF ENGINE CONTROL IS GIVEN HERE.

1. INPUT SIGNALS

(1) WATER TEMP. SIGNAL SYSTEM

THE WATER TEMP. SENSOR DETECTS THE ENGINE COOLANT TEMP. AND HAS A BUILT-IN THERMISTOR WITH A RESISTANCE WHICH VARIES ACCORDING TO THE WATER TEMP. THUS THE WATER TEMP. IS INPUT IN THE FORM OF A CONTROL SIGNAL TO TERMINAL THW OF THE TCCS ECU.

(2) INTAKE AIR TEMP. SIGNAL SYSTEM

THE INTAKE AIR TEMP. SENSOR IS INSTALLED INSIDE THE AIR FLOW METER AND DETECTS THE INTAKE AIR TEMP., WHICH IS INPUT AS A CONTROL SIGNAL TO TERMINAL THA OF THE ECU.

(3) OX SENSOR SIGNAL SYSTEM

THE OXYGEN DENSITY IN THE EXHAUST EMISSIONS IS DETECTED AND INPUT AS A CONTROL SIGNAL TO TERMINAL OX1 OF THE ECU.

(4) RPM SIGNAL SYSTEM

CRANKSHAFT POSITION AND ENGINE RPM ARE 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 ECU, AND RPM IS INPUT TO TERMINAL NE.

(5) THROTTLE SIGNAL SYSTEM

THE THROTTLE POSITION SENSOR DETECTS THE THROTTLE VALVE OPENING ANGLE, WHICH IS INPUT AS A CONTROL SIGNAL TO TERMINAL VTA OF THE ECU, OR WHEN THE VALVE IS FULLY CLOSED, TO TERMINAL IDL.

(6) VEHICLE SPEED SIGNAL SYSTEM

THE SPEED SENSOR, INSTALLED INSIDE THE COMBINATION METER, DETECTS THE VEHICLE SPEED AND INPUTS A CONTROL SIGNAL TO TERMINAL SP1 OF THE ECU.

(7) NEUTRAL START SW SIGNAL SYSTEM

THE NEUTRAL START SW DETECTS WHETHER THE SHIFT POSITION IS IN NEUTRAL OR NOT, AND INPUTS A CONTROL SIGNAL TO TERMINAL NSW OF THE ECU.

(8) A/C SW SIGNAL SYSTEM

THE OPERATING VOLTAGE OF THE A/C MAGNET CLUTCH IS DETECTED AND INPUT IN THE FORM OF A CONTROL SIGNAL TO TERMINAL A/C OF THE ECU.

(9) BATTERY SIGNAL SYSTEM

VOLTAGE IS CONSTANTLY APPLIED TO TERMINAL BATT OF THE ECU. WHEN THE IGNITION SW IS TURNED TO ON, VOLTAGE FOR ECU OPERATION IS APPLIED VIA THE EFI MAIN RELAY TO TERMINALS +B AND B1 OF THE ECU. ALSO, CURRENT FLOWS VIA THE IGN FUSE TO TERMINAL IGSW OF THE ECU.

(10) INTAKE AIR VOLUME SIGNAL SYSTEM

INTAKE AIR VOLUME IS DETECTED BY THE POTENTIOMETER INSTALLED INSIDE THE AIR FLOW METER AND IS INPUT AS A CONTROL SIGNAL TO TERMINAL VS OF THE ECU. INSIDE THE AIR FLOW METER THERE IS ALSO A SW FOR FUEL PUMP OPERATION, AND WHEN THE MEASURING PLATE OPENS (AIR INTAKE OCCURS), THIS SW TURNS ON AND CURRENT FLOWS TO THE FUEL PUMP TO OPERATE IT.

(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 ECU.

(12) ENGINE KNOCK SIGNAL SYSTEM

ENGINE KNOCKING IS DETECTED BY THE KNOCK SENSOR AND INPUT AS A CONTROL SIGNAL TO TERMINAL KNK OF THE ECU.

SYSTEM OUTLINE

2. CONTROL SYSTEM

* EFI (ELECTRONIC FUEL INJECTION) SYSTEM

THE EFI SYSTEM MONITORS THE ENGINE CONDITIONS THROUGH THE SIGNALS EACH SENSOR (INPUT SIGNALS (1) TO (11)) INPUTS TO THE ECU. BASED ON THIS DATA AND THE PROGRAM MEMORIZED IN THE ECU, THE MOST APPROPRIATE FUEL INJECTION TIMING IS DECIDED AND CURRENT IS OUTPUT TO TERMINALS #10, #20, AND #30 OF THE ECU. CAUSING THE INJECTORS TO OPERATE (TO INJECT FUEL). IT IS THIS SYSTEM WHICH, THROUGH THE WORK OF THE ECU, FINELY CONTROLS FUEL INJECTION IN RESPONSE TO DRIVING CONDITIONS.

* ESA (ELECTRONIC SPARK ADVANCE) SYSTEM

THE ESA SYSTEM MONITORS THE ENGINE CONDITIONS USING THE SIGNALS (INPUT SIGNALS (1, 4, 5, 6, 8, 10, 11, 12)) INPUT TO THE ECU FROM EACH SENSOR. BASED ON THIS DATA AND THE PROGRAM MEMORIZED IN THE ECU, THE MOST APPROPRIATE IGNITION TIMING IS DECIDED AND CURRENT IS OUTPUT TO TERMINALS IGT OF THE ECU. THIS OUTPUT CONTROLS THE IGNITER TO PRODUCE THE MOST APPROPRIATE IGNITION TIMING FOR DRIVING CONDITIONS.

* ISC (IDLE SPEED CONTROL) SYSTEM

THE ISC SYSTEM (STEP MOTOR TYPE) SETS THE APPROPRIATE IDLE SPEED ACCORDING TO THE ENGINE CONDITION AND PROVIDES IDLING STABILITY FOR FAST IDLE—UP WHEN THE ENGINE IS COLD AND WHEN THE IDLE SPEED HAS DROPPED DUE TO ELECTRICAL LOAD, ETC. THE ECU EVALUATES THE SIGNALS FROM EACH SENSOR (INPUT SIGNALS (1, 4 TO 8, 11)), OUTPUTS CURRENT TO TERMINALS ISC1, ISC2, ISC3 AND ISC4, AND CONTROLS THE ISC VALVE.

* EGR CONTROL SYSTEM

WITH THE EGR CONTROL SYSTEM, THE ECU EVALUATES THE (INPUT SIGNALS (1, 4, 10)) FROM EACH SENSOR, CURRENT IS OUTPUT TO TERMINAL EGR AND OPERATION OF THE EGR VALVE IS CONTROLLED.

* FUEL PUMP CONTROL SYSTEM

EVERY TIME THE NE SIGNAL IS INPUT THE ECU EVALUATES IT AND FOR 2 SECONDS OUTPUTS TO TERMINAL FC, TURNS THE CIRCUIT OPENING RELAY TO ON AND SENDS ELECTRIC CURRENT TO THE FUEL PUMP. ECU OPERATION OUTPUTS TO TERMINAL FPR AND CONTROLS THE FUEL PUMP CONTROL RELAY AND THUS CONTROLS THE FUEL PUMP DRIVE SPEED IN RESPONSE TO CONDITIONS.

3. DIAGNOSIS SYSTEM

WITH THE DIAGNOSIS SYSTEM, WHEN THERE IS A MALFUNCTIONING IN THE ECU SIGNAL SYSTEM, THE MALFUNCTION SYSTEM IS RECORDED IN THE MEMORY. THE MALFUNCTIONING SYSTEM CAN THEN 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 ECU MEMORY OR ELSE STOPS THE ENGINE.

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SERVICE HINTS
EFI MAIN RELAY
 4-2: CLOSED WITH IGNITION SW AT ON OR ST POSITION
STARTER RELAY
 (3) 2- (3) 4: CLOSED WITH NEUTRAL START SW ON AND IGNITION SW AT ST POSITION
CIRCUIT OPENING RELAY
 (4) 1- (4) 2 : CLOSED WITH STARTER RUNNING OR MEASURING PLATE (AIR FLOW METER) OPEN
A16 AIR FLOW METER
 7-6: CLOSED WITH STARTER RUNNING OR MEASURING PLATE OPEN
 3-2:
        20-1200 Ω
        200–400 Ω
 3-4:
        10.0–20.0 KΩ (–20°C, –4°F)
4.0–7.0 KΩ (0°C, 32°F)
 3-1 ·
        2.0-3.0 KΩ (20°C, 68°F)
        0.9-1.3 KΩ (40°C, 104°F)
        0.4-0.7 KΩ (60°C 140°F)
F15 FUEL PUMP RESISTOR
  1–2: APPROX. 0.7 \Omega
11 ISC VALVE
 2–1, 3 : EACH 10–30 Ω
 5–4. 6 : EACH 10–30 \Omega
13, 14, 15, 16, 17, 18 INJECTOR
 1–2 : EACH 1.8–3.4 \Omega
T2 THROTTLE POSITION SENSOR
 2-4: 0.3-6.3 \text{ K}\Omega WITH CLEARANCE BETWEEN LEVER AND STOP SCREW 0 MM (0 IN.)
        LESS THAN 2.3 KΩ WITH CLEARANCE BETWEEN LEVEL AND STOP SCREW 0.4 MM (0.0157 IN.)
        \propto \Omega WITH 0.75 MM (0.0295 IN.)
       3.5-10.3 KΩ WITH THROTTLE VALVE FULLY OPEN
 1–4: 4.25–8.25 KΩ
W 3 EFI WATER TEMP. SENSOR
 1-2: APPROX. 6.0 KΩ (0°C, 32°F)
        APPROX. 1.5 KΩ (40°C, 104°F)
APPROX. 0.5 KΩ (80°C, 176°F)
T 3, T 4, T 5 TCCS ECU (ENGINE AND ECT ECU)
 VOLTAGE AT ECU CONNECTORS
                 T5 1- T4 14 : 10.0-14.0 VOLTS
           T5 12, T5 13- T4 14 : 10.0-14.0 VOLTS (IGNITION SW ON)
                  T5 4- T4 14 : 10.0-14.0 VOLTS (IGNITION SW ON)
                 T5 2- T4 14 : 10.0-14.0 VOLTS (IGNITION SW ON)
                  T3 12-T3 9 : 4.0-6.0 VOLTS (IGNITION SW ON, THROTTLE VALVE OPEN)
                  T3 1-T3 9 : 4.0-6.0 VOLTS (IGNITION SW ON)
                  T3 11-T3 9 : 0.1-1.0 VOLTS (IGNITION SW ON, THROTTLE VALVE FULLY CLOSED)
                               3.2-4.2 VOLTS (IGNITION SW ON, THROTTLE VALVE FULLY OPEN)
                   T3 2-T3 9 : 3.7-4.3 VOLTS (IGNITION SW ON, MEASURING PLATE FULLY CLOSED)
                               0.2-0.5 VOLTS (IGNITION SW ON, MEASURING PLATE FULLY OPEN)
                               2.3-2.8 VOLTS (IDLING)
                               1.0-2.0 VOLTS (3000 RPM)
       T4 12, 11, 25- T4 13, 26 : 10.0-14.0 VOLTS (IGNITION SW ON)
                   T3 3-T3 9 : 1.0-3.0 VOLTS (IGNITION SW ON, INTAKE AIR TEMP. 20°C, (68°F))
                  T3 4-T3 9 : 0.1-1.0 VOLTS (IGNITION SW ON COOLANT TEMP. 80°C, (176°F))
                 T5 11- T4 14 : 6.0-14.0 VOLTS WITH CRANKING
                 T4 20- T4 14 : 0.7-1.0 VOLTS (IGNITION SW ON)
           T4 7, 6, 5, 4– T4 14 : 9.0–14.0 VOLTS (IGNITION SW ON)
                 T5 5-T4 14 : 8.0-14.0 VOLTS NO TROUBLE ("CHECK ENGINE" WARNING LIGHT OFF) AND ENGINE RUNNING
                 T5 10- T4 14 : 10.0-14.0 VOLTS (IGNITION SW ON, AIR CONDITIONING ON)
                T3 15- T4 14 : 4.0-6.0 VOLTS WITH IGNITION SW ON, CHECK CONNECTOR TE1-E1 NOT CONNECT
                               0 VOLTS WITH IGNITION SW ON CHECK CONNETOR TE1-E1 CONNECT
                T5 22- T4 14 : 0 VOLTS WITH IGNITION SW ON, SHIFT POSITION P OR N RANGE
                               10.0-14.0 VOLT WITH IGNITION SW ON, SHIFT POSITION EXCEPT P OR N RANGE
RESISTANCE AT ECU CONNECTOR
 (DISCONNECT WIRING CONNECTOR FROM ECU)
                  T3 2–T3 9 : \infty \Omega (THROTTLE VALVE FULLY OPEN) LESS THAN 2.3K\Omega (THROTTLE VALVE FULLY CLOSE)
                  T3 11– T3 9 : 3500–10300 \Omega (THROTTLE VALVE FULLY OPEN)
                               200-1200 \Omega (THROTTLE VALVE FULLY CLOSED)
                   T3 2- T3 9 : 200-600 \Omega (MEASURING PLATE FULLY CLOSED)
                               200–1200 \Omega (MEASURING PLATE FULLY OPEN)
                  T3 3- T3 9
                               2000–3000 \Omega (INTAKE AIR TEMP. 20°C, 68°F)
                   T3 4– T3 9 : 200–400 \Omega (COOLANT TEMP. 80°C, 176°F)
              T4 15, 2– T3 16 : 140–180 \Omega
                 T4 1– T3 16 : 180–220 \Omega
            T4 7, 6, 5, 4 T5 12 : 10–30 \Omega
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: PARTS LOCATION

CODE	SEE PAGE	CODE	SEE PAGE	CODE	SEE PAGE
A16	24	I1	24	N 1	24
C 1	24	12	24	01	24
C 9	25	13	24	O 4	26
C15	25	14	24	T 2	24
C16	25	15	24	Т3	25
D 1	24	16	24	T 4	25
E 1	24	17	24	T 5	25
E 3	24	18	24	T 6	25
F 5	24	I10	25	V 1	24
F 6	24	J 2	25	W 3	24
F 8	26	K 1	24		

: RELAY BLOCKS

CODE	SEE PAGE	RELAY BLOCKS (RELAY BLOCK LOCATION)	
3	19	R/B NO. 3 (LEFT KICK PANEL)	
4	19	R/B NO. 4 (RIGHT KICK PANEL)	

: JUNCTION BLOCK AND WIRE HARNESS CONNECTOR

CODE	SEE PAGE	JUNCTION BLOCK AND WIRE HARNESS (CONNECTOR LOCATION)		
1A	20	COWL WIRE AND J/B NO. 1 (LEFT KICK PANEL)		
1B	20	INSRUMENT PANEL WIRE AND J/B NO. 1 (LEFT KICK PANEL)		
1F				
1G		COWL WIRE AND J/B NO. 1 (LEFT KICK PANEL)		
1H	20			
11				
1J				
2A	00	COMM. WHITE AND HE NO. O (NICAD THE DATTED) O		
2B	22	COWL WIRE AND J/B NO. 2 (NEAR THE BATTERY)		
2C	22	ENGINE ROOM MAIN WIRE AND J/B NO. 2 (NEAR THE BATTERY)		
2D	22	COWL WIRE AND J/B NO. 2 (NEAR THE BATTERY)		
2E	22	ENGINE ROOM MAIN WIRE AND J/B NO. 2 (NEAR THE BATTERY)		

: CONNECTOR JOINING WIRE HARNESS AND WIRE HARNESS

CODE	SEE PAGE	JOINING WIRE HARNESS AND WIRE HARNESS (CONNECTOR LOCATION)	
B1	28	COWL WIRE AND ENGINE WIRE (NEAR THE BATTERY)	
B2	30	ENGINE WIRE AND COWL WIRE (BEHIND GLOVE BOX)	
В3			
D1	30	COWL WIRE AND R/B NO. 4 (RIGHT KICK PANEL)	
E1	30	INCTRUMENT DANIEL WIDE AND COME WIDE (UD NO. 4)	
E2		INSTRUMENT PANEL WIRE AND COWL WIRE (J/B NO. 1)	
E3	30	INSTRUMENT PANEL WIRE AND COWL WIRE (BEHIND GLOVE BOX)	
I1	32	FLOOR NO. 1 WIRE AND COWL WIRE (RIGHT KICK PANEL)	
12		FLOOR NO. I WIRE AND COWL WIRE (RIGHT RICK PAINEL)	

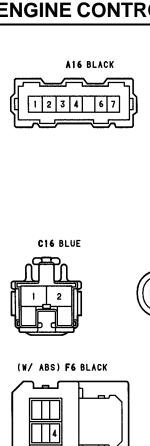
: GROUND POINTS

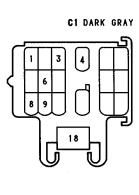
CODE	SEE PAGE	GROUND POINTS LOCATION
В	28	FRONT OF LEFT FENDER
С	28	AIR INTAKE CHAMBER
G	30	R/B NO. 4 SET BOLT
I	32	RIGHT REAR PILLAR

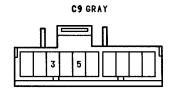
: SPLICE POINTS

CODE	SEE PAGE	WIRE HARNESS WITH SPLICE POINTS	CODE	SEE PAGE	WIRE HARNESS WITH SPLICE POINTS
E 6	28	ENGINE WIRE	18	30	COWL WIRE
E 7			l12		
E 8	28	COWL WIRE	I13		
E11	28	ENGINE WIRE	l14	30	ENGINE WIRE
13	28	COWL WIRE			









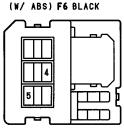


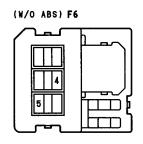












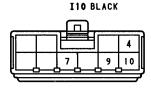


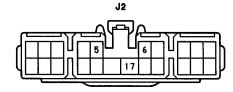












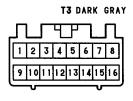


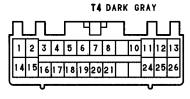


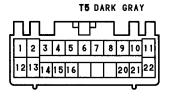
















W3 GREEN





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