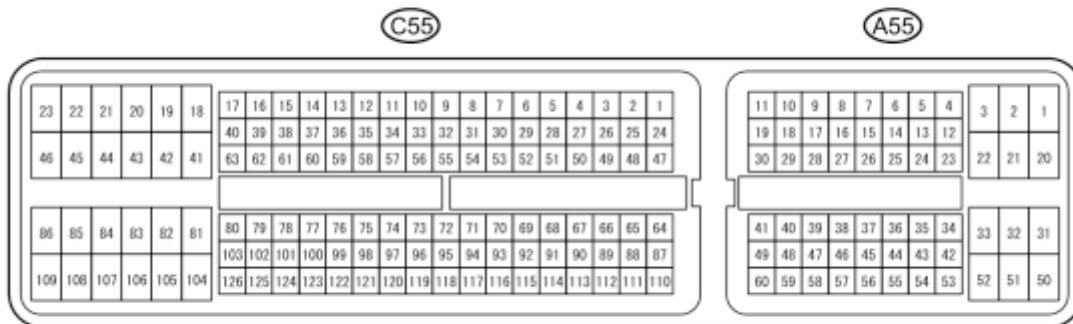


Last Modified: 6-2-2008	5.1 U	From: 200601
Model Year: 2007	Model: Camry	Doc ID: RM000002206002X
Title: 2GR-FE ENGINE CONTROL SYSTEM: SFI SYSTEM: TERMINALS OF ECM (2007 Camry)		

TERMINALS OF ECM

1. SFI SYSTEM



The standard normal voltage between each pair of the ECM terminals is shown in the table below. The appropriate conditions for checking each pair of the terminals are also indicated.

The check results should be compared with the standard normal voltage for that pair of terminals, listed in the "STD Voltages" column.

The illustration above can be used as a reference to identify the ECM terminal locations.

SYMBOLS (TERMINAL NO.)	WIRING COLORS	TERMINAL DESCRIPTIONS	CONDITIONS	STD VOLTAGES
+B (A55-2) - E1 (C55-81)	R - W-B	Power source of ECM	Ignition switch on (IG)	9 to 14 V
+B2 (A55-1) - E1 (C55-81)	R - W-B	Power source of ECM	Ignition switch on (IG)	9 to 14 V
BATT (A55-20) - E1 (C55-81)	Y - W-B	Battery (for measuring the battery voltage and for the ECM memory)	Always	9 to 14 V
VPMP (A55-42) - E1 (C55-81)	W - W-B	Vent valve operation signal (built into pump module)	Ignition switch on (IG)	9 to 14 V

SYMBOLS (TERMINAL NO.)	WIRING COLORS	TERMINAL DESCRIPTIONS	CONDITIONS	STD VOLTAGES
MPMP (A55-34) - E1 (C55-81)	G - W-B	Vacuum pump operation signal (built into pump module)	Vacuum pump OFF	0 to 3 V
MPMP (A55-34) - E1 (C55-81)	G - W-B	Vacuum pump operation signal (built into pump module)	Vacuum pump ON	9 to 14 V
+BM (A55-3) - E1 (C55-81)	LG - W-B	Power source of ETCS throttle motor	Always	9 to 14 V
MREL (A55-44) - E1 (C55-81)	O - W-B	EFI relay operation signal	Ignition switch on (IG)	9 to 14 V
IGSW (A55-28) - E1 (C55-81)	Y - W-B	Ignition switch signal	Ignition switch on (IG)	9 to 14 V
FC (A55-7) - E1 (C55-81)	FC (A55-7) - E1 (C55-81)	C/OPEN relay operation signal (fuel pump control)	Ignition switch on (IG), Engine stopped	9 to 14 V
FC (A55-7) - E1 (C55-81)	FC (A55-7) - E1 (C55-81)	C/OPEN relay operation signal (fuel pump control)	Ignition switch on (IG), Engine idling	0 to 1.5 V
STP (A55-36) - E1 (C55-81)	- W-B	Stop light switch signal	W-Brake pedal depressed	7.5 to 14 V
STP (A55-36) - E1 (C55-81)	- W-B	Stop light switch signal	W-Brake pedal released	Below 1.5 V
ST1- (A55-35) - E1 (C55-81)	GR - W-B	Stop light switch signal (opposite to STP terminal)	Ignition switch on (IG), W-Brake pedal depressed	Below 1.5 V
ST1- (A55-35) - E1 (C55-81)	GR - W-B	Stop light switch signal (opposite to STP terminal)	Ignition switch on (IG), W-Brake pedal released	7.5 to 14 V
ACCR*2 (A24-17) - E1 (C55-81)	B - W-B	ACC relay control signal	Cranking	Below 1.5 V
VPA (A55-55) - E1 (C55-81)	G - W-B	Accelerator pedal position sensor signal (for engine control)	Ignition switch on (IG), Accelerator pedal fully released	0.5 to 1.1 V
VPA (A55-55) - E1 (C55-81)	G - W-B	Accelerator pedal position sensor signal (for engine control)	Ignition switch on (IG), Accelerator pedal fully depressed	2.6 to 4.5 V

SYMBOLS (TERMINAL NO.)	WIRING COLORS	TERMINAL DESCRIPTIONS	CONDITIONS	STD VOLTAGES
VPA2 (A55-56) - EPA2 (A55-60)	R - O	Accelerator pedal position sensor signal (for sensor malfunction detection)	Ignition switch on (IG), Accelerator pedal fully released	1.2 to 2.0 V
VPA2 (A55-56) - EPA2 (A55-60)	R - O	Accelerator pedal position sensor signal (for sensor malfunction detection)	Ignition switch on (IG), Accelerator pedal fully depressed	3.4 to 5.0 V
EPA (A5-59) - VPA (A55-55)	Y - G	Accelerator pedal position sensor signal (for engine control)	Ignition switch on (IG), Accelerator pedal fully released	0.5 to 1.1 V
EPA (A5-59) - VPA (A55-55)	Y - G	Accelerator pedal position sensor signal (for engine control)	Ignition switch on (IG), Accelerator pedal fully depressed	2.6 to 4.5 V
EPA2 (A55-60) - VPA2 (A55-56)	O - R	Accelerator pedal position sensor signal (for sensor malfunction detection)	Ignition switch on (IG), Accelerator pedal fully released	1.2 to 2.0 V
EPA2 (A55-60) - VPA2 (A55-56)	O - R	Accelerator pedal position sensor signal (for sensor malfunction detection)	Ignition switch on (IG), Accelerator pedal fully depressed	3.4 to 5.0 V
PPMP (C55-77) - E1 (C55-81)	L - W-B	Pressure sensor signal (built into pump module)	Ignition switch on (IG)	3 to 3.6 V
TC (A55-27) - E1 (C55-81)	P - W-B	Terminal TC of DLC3	Ignition switch on (IG)	9 to 14 V
VCPA (A55-57) - EPA (A55-59)	B - Y	Power source of accelerator pedal position sensor (for VPA)	Ignition switch on (IG)	4.5 to 5.0 V
VCP2 (A55-58) - EPA2 (A55-60)	L - O	Power source of accelerator pedal position sensor (for VPA2)	Ignition switch on (IG)	4.5 to 5.0 V
TACH (A55-15) - E1 (C55-81)	B - W-B	Engine speed signal (for combination meter)	Idling	Pulse generation (see waveform 11)
CCS (A55-40) - E1 (C55-81)	W - W-B	Cruise control main switch signal	Ignition switch on (IG) CANCEL switch ON SET/COAST switch ON RES/ACC switch ON	10 to 16 V 6.6 to 10.1 V 4.5 to 7.1 V

SYMBOLS (TERMINAL NO.)	WIRING COLORS	TERMINAL DESCRIPTIONS	CONDITIONS	STD VOLTAGES
			Main switch ON	2.3 to 4.0 V Below 1 V
SPD (A55-24) - E1 (C55-81)	BR - W-B	Vehicle speed signal from combination meter	Ignition switch on (IG), driving wheel rotated slowly	Pulse generation (see waveform 8)
W (A55-24) - E1 (C55-81)	BR - W-B	Malfunction Indicator Lamp (MIL) operation signal	Ignition switch on (IG)	Below 3.0 V
W (A55-24) - E1 (C55-81)	BR - W-B	Malfunction Indicator Lamp (MIL) operation signal	Idling	9 to 14 V
CANH (A55-41) - CANL (A55-49)	B - W	CAN communication circuit	Ignition switch off	54 to 69 Ω
E1 (C55-81) - Body ground	W-B - -	Earth (ground) circuit of ECM	Always	Below 1 V
#10 (C55-45) - E01 (C55-22) #20 (C55-85) - E01 (C55-22) #30 (C55-44) - E01 (C55-22) #40 (C55-84) - E01 (C55-22) #50 (C55-43) - E01 (C55-22) #60 (C55-83) - E01 (C55-20)	B - W-B R - W-B Y - W-B L - W-B W-L - W-B BR - W-B	Fuel injector operation signal	Ignition switch on (IG)	9 to 14 V
#10 (C55-45) - E01 (C55-22) #20 (C55-85) - E01 (C55-22) #30 (C55-44) - E01 (C55-22) #40 (C55-84) - E01 (C55-22) #50 (C55-43) - E01 (C55-22) #60 (C55-83) - E01	B - W-B R - W-B Y - W-B L - W-B W-L - W-B BR - W-B	Fuel injector operation signal	Idling	Pulse generation (see waveform 3)

SYMBOLS (TERMINAL NO.)	WIRING COLORS	TERMINAL DESCRIPTIONS	CONDITIONS	STD VOLTAGES
(C55-20)				
PSW (C55-810) - E1 (C55-81)	B - W-B	P/S pressure switch signal	Ignition switch on (IG)	9 to 14 V
STA (A55-48) - E1 (C55-81)	V - W-B	Starter relay operation signal	Cranking	9 to 14 V
STSW*2 (A55-14) - E1 (C55-81)	R - W-B	Starter relay operation signal	Cranking	9 to 14 V
OC2- (C55-51) - OC2+ (C55-52)	R - BR	Camshaft timing Oil Control Valve (OCV) operation signal (Intake side)	Ignition switch on (IG)	Pulse generation (see waveform 1)
OC2+ (C55-52) - OC2- (C55-51)	BR - R	Camshaft timing Oil Control Valve (OCV) operation signal (Intake side)	Ignition switch on (IG)	Pulse generation (see waveform 1)
OC1- (C55-57) - OC1+ (C55-58)	B - W	Camshaft timing Oil Control Valve (OCV) operation signal (Intake side)	Ignition switch on (IG)	Pulse generation (see waveform 1)
OC1+ (C55-58) - OC1- (C55-57)	W - B	Camshaft timing Oil Control Valve (OCV) operation signal (Intake side)	Ignition switch on (IG)	Pulse generation (see waveform 1)
VV2+ (C55-67) - VV2- (C55-90)	W - B	Variable Valve Timing (VVT) sensor signal (Intake side)	Idling	Pulse generation (see waveform 5)
VV1+ (C55-69) - VV1- (C55-92)	L - LG	Variable Valve Timing (VVT) sensor signal (Intake side)	Idling	Pulse generation (see waveform 5)
NE- (C55-111) - NE+ (C55-110)	R - G	Crankshaft position sensor signal	Idling	Pulse generation (see waveform 5)
NE+ (C55-110) - NE- (C55-111)	G - R	Crankshaft position sensor signal	Idling	Pulse generation

SYMBOLS (TERMINAL NO.)	WIRING COLORS	TERMINAL DESCRIPTIONS	CONDITIONS	STD VOLTAGES
				(see waveform 5)
EV2- (C55-89) - EV2+ (C55-66)	L - G-R	Variable Valve Timing (VVT) sensor signal (Exhaust side)	Idling	Pulse generation (see waveform 5)
EV2+ (C55-66) - EV2- (C55-89)	G-R - L	Variable Valve Timing (VVT) sensor signal (Exhaust side)	Idling	Pulse generation (see waveform 5)
EV1- (C55-91) - EV1+ (C55-68)	B - Y	Variable Valve Timing (VVT) sensor signal (Exhaust side)	Idling	Pulse generation (see waveform 5)
EV1+ (C55-68) - EV1- (C55-91)	Y - B	Variable Valve Timing (VVT) sensor signal (Exhaust side)	Idling	Pulse generation (see waveform 5)
OE1+ (C55-16) - OE1- (C55-17)	L - LG	Camshaft timing Oil Control Valve (OCV) operation signal (Exhaust side)	Ignition switch on (IG)	Pulse generation (see waveform 1)
OE2+ (C55-14) - OE2- (C55-15)	W-L - Y	Camshaft timing Oil Control Valve (OCV) operation signal (Exhaust side)	Ignition switch on (IG)	Pulse generation (see waveform 1)
VV2- (C55-90) - VV2+ (C55-67)	B - W	Variable Valve Timing (VVT) sensor signal (Intake side)	Idling	Pulse generation (see waveform 5)
VV1- (C55-92) - VV1+ (C55-69)	LG - L	Variable Valve Timing (VVT) sensor signal (Intake side)	Idling	Pulse generation (see waveform 5)
OE1- (B47-31) - OE1+ (B47-26)	LG - L	Camshaft timing Oil Control Valve (OCV) operation signal (Exhaust side)	Ignition switch on (IG)	Pulse generation (see waveform 1)

SYMBOLS (TERMINAL NO.)	WIRING COLORS	TERMINAL DESCRIPTIONS	CONDITIONS	STD VOLTAGES
OE2- (C55-15) - OE2+ (C55-14)	Y - W-L	Camshaft timing Oil Control Valve (OCV) operation signal (Exhaust side)	Ignition switch on (IG)	Pulse generation (see waveform 1)
HT1B (C55-48) - E1 (C55-81) HT2B (C55-47) - E1 (C55-81)	LG - W-B Y - W-B	Heated oxygen sensor heater operation signal	Idling	Below 3.0 V
HT1B (C55-48) - E1 (C55-81) HT2B (C55-47) - E1 (C55-81)	LG - W-B Y - W-B	Heated oxygen sensor heater operation signal	Ignition switch on (IG)	9 to 14 V
ACM (C55-42) - E1 (C55-81)	L-B - W-B	VSV for active control mount system operation signal	Ignition switch on (IG)	9 to 14 V
M- (C55-18) - ME01 (C55-20)	R - B	Throttle drive motor operation signal (negative terminal)	Idling with warm engine	Pulse generation (see waveform 10)
M+ (C55-19) - ME01 (C55-20)	G - B	Throttle drive motor operation signal (positive terminal)	Idling with warm engine	Pulse generation (see waveform 9)
E02 (C55-21) - Body ground	B-W - -	Earth (ground) circuit of ECM	Always	Below 1 V
E01 (C55-22) - Body ground	W-B - -	Earth (ground) circuit of ECM	Always	Below 1 V
IGT1 (C55-40) - E1 (C55-81) IGT2 (C55-39) - E1 (C55-81) IGT3 (C55-38) - E1 (C55-81) IGT4 (C55-37) - E1 (C55-81) IGT5 (C55-36) - E1 (C55-81) IGT6 (C55-35) - E1	W - W-B GR - W-B G - W-B LG - W-B P - W-B G-R - W-B	Ignition coil with igniter (ignition signal)	Idling	Pulse generation (see waveform 6)

SYMBOLS (TERMINAL NO.)	WIRING COLORS	TERMINAL DESCRIPTIONS	CONDITIONS	STD VOLTAGES
(C55-81)				
GE01(C55-41) - E1 (C55-81)	G-R - W-B	Shielded earth (ground) circuit of throttle drive motor	Always	Below 1 V
OX1B (C55-88) - EX1B (C55-65) OX2B (C55-87) - EX2B (C55-64)	W - BR B - W-B	Heated oxygen sensor signal	With engine speed at 2,500 rpm for 2 minutes after warming up	Pulse generation (see waveform 2)
VTA2 (C55-99) - ETA (C55-97)	W-L - P	Throttle position sensor signal (for sensor malfunction detection)	Ignition switch on (IG), Accelerator pedal fully released	2.1 to 3.1 V
VTA2 (C55-99) - ETA (C55-97)	W-L - P	Throttle position sensor signal (for sensor malfunction detection)	Ignition switch on (IG), Accelerator pedal fully depressed	4.5 to 5.0 V
VTA1 (C55-98) - ETA (C55-97)	Y - P	Throttle position sensor signal (for engine control)	Ignition switch on (IG), Throttle valve fully closed	0.5 to 1.2 V
VTA1 (C55-98) - ETA (C55-97)	Y - P	Throttle position sensor signal (for engine control)	Ignition switch on (IG), Throttle valve fully open	3.2 to 4.8 V
THW (C55-79) - ETHW (C55-78)	B - P	Engine coolant temperature sensor signal	Idling, Engine coolant temperature 80°C (176°F)	0.2 to 1.0 V
THA (C55-71) - ETHA (C55-74)	P - G-R	Intake air temperature sensor signal	Idling, Intake air temperature 20°C (68°F)	0.5 to 3.4 V
IGF1 (C55-106) - E1 (C55-81)	BR - W-B	Ignition coil with igniter (ignition confirmation signal)	Ignition switch on (IG)	4.5 to 5.0 V
IGF1 (C55-106) - E1 (C55-81)	BR - W-B	Ignition coil with igniter (ignition confirmation signal)	Idling	Pulse generation (see waveform 6)
AICV (A55-4) - E1 (C55-81)	V - W-B	VSV for Air intake control system operation signal	Ignition switch on (IG)	9 to 14 V
E2G (C55-73) - E1 (C55-81)	LG - W-B	Earth (ground) circuit of sensor for mass air flow	Always	Below 1 V

SYMBOLS (TERMINAL NO.)	WIRING COLORS	TERMINAL DESCRIPTIONS	CONDITIONS	STD VOLTAGES
		meter		
VG (C55-72) - E2G (C55-73)	L-B - LG	Mass Air Flow (MAF) meter signal	Idling, Shift lever position P or N, A/C switch OFF	0.5 to 3.0 V
ACIS (C55-107) - E1 (C55-81)	R - W-B	VSV for ACIS (Acoustic Control Induction System) operation signal	Ignition switch on (IG)	9 to 14 V
PRG (C55-108) - E1 (C55-81)	G-R - W-B	Purge VSV for EVAP system operation signal	Ignition switch on (IG)	9 to 14 V
PRG (C55-108) - E1 (C55-81)	G-R - W-B	Purge VSV for EVAP system operation signal	Idling	Pulse generation (see waveform 7)
HA2A (C55-109) - E05 (C55-46)	B-W - W	A/F sensor heater operation signal	Idling	Below 3.0 V
HA2A (C55-109) - E05 (C55-46)	B-W - W	A/F sensor heater operation signal	Ignition switch on (IG)	9 to 14 V
HA1A (C55-86) - E04 (C55-23)	G - W	A/F sensor heater operation signal	Idling	Below 3.0 V
HA1A (C55-86) - E04 (C55-23)	G - W	A/F sensor heater operation signal	Ignition switch on (IG)	9 to 14 V
ME01 (C55-20) - E1 (C55-81)	B - W-R	Earth (ground) circuit of ECM	Always	Below 1 V
E03 (C55-104) - E1 (C55-81)	B - W-B	Earth (ground) circuit of ECM	Always	Below 1 V
HT2B (C55-47) - E1 (C55-81) HT1B (C55-48) - E1 (C55-81)	Y - W-B LG - W-B	Heated oxygen sensor heater operation signal	Idling	Below 3.0 V
HT2B (C55-47) - E1 (C55-81) HT1B (C55-48) - E1 (C55-81)	Y - W-B LG - W-B	Heated oxygen sensor heater operation signal	Ignition switch on (IG)	9 to 14 V
E05 (C55-46) - E1 (C55-81)	W - W-B	Earth (ground) circuit of ECM	Always	Below 1 V

SYMBOLS (TERMINAL NO.)	WIRING COLORS	TERMINAL DESCRIPTIONS	CONDITIONS	STD VOLTAGES
E04 (C55-23) - E1 (C55-81)	W - W-B	Earth (ground) circuit of ECM	Always	Below 1 V
NSW (C55-62) - E1 (C55-81)	R - W-B	Park/Neutral position switch signal	Ignition switch on (IG), Shift lever position P or N	Below 3.0 V
NSW (C55-62) - E1 (C55-81)	R - W-B	Park/Neutral position switch signal	Ignition switch on (IG), Shift lever position other than P or N	9 to 14 V
EKN2 (C55-117) - KNK2 (C55-118)	W - B	Earth (ground) circuit of knock sensor	With engine speed at 4,000 rpm after warming up	Pulse generation (see waveform 4)
KNK2 (C55-118) - EKN2 (C55-117)	B - W	Knock sensor signal	With engine speed at 4,000 rpm after warming up	Pulse generation (see waveform 4)
A1A+ (C55-93) - E1 (C55-81)	P - W-B	A/F sensor signal	Ignition switch on (IG)	3.3 V*1
A1A+ (C55-93) - E1 (C55-81)	P - W-B	A/F sensor signal	Ignition switch on (IG)	3.0 V*1
A2A+ (C55-120) - E1 (C55-81)	L - W-B	A/F sensor signal	Ignition switch on (IG)	3.3 V*1
A2A+ (C55-120) - E1 (C55-81)	L - W-B	A/F sensor signal	Ignition switch on (IG)	3.0 V*1
EKNK (C55-94) - KNK1 (C55-95)	G - R	Earth (ground) circuit of knock sensor	With engine speed at 4,000 rpm after warming up	Pulse generation (see waveform 4)
KNK1 (C55-95) - EKNK (C55-94)	R - G	Knock sensor signal	With engine speed at 4,000 rpm after warming up	Pulse generation (see waveform 4)
A1A- (C55-116) - E1 (C55-81)	P - W-B	A/F sensor	Ignition switch on (IG)	3.3 V*1
A1A- (B46-30) - E1 (C55-81)	P - W-B	A/F sensor	Ignition switch on (IG)	3.0 V*1

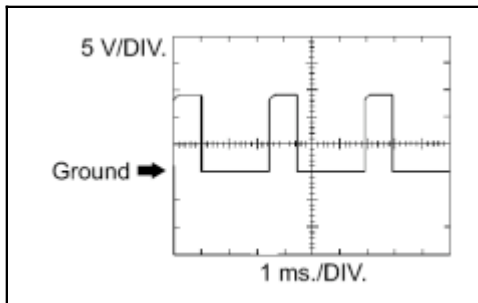
SYMBOLS (TERMINAL NO.)	WIRING COLORS	TERMINAL DESCRIPTIONS	CONDITIONS	STD VOLTAGES
A2A- (C55-119) - E1 (C55-81)	Y - W-B	A/F sensor	Ignition switch on (IG)	3.3 V*1
A2A- (C55-119) - E1 (C55-81)	Y - W-B	A/F sensor	Ignition switch on (IG)	3.0 V*1
OX2B (C55-87) - EX2B (C55-64) OX1B (C55-88) - EX1B (C55-65)	B - W-R W - BR	Heated oxygen sensor signal	With engine speed at 2,500 rpm for 2 minutes after warming up	Pulse generation (see waveform 2)

*1: The ECM terminal voltage is constant regardless of the output voltage from the sensor.

*2: With Smart Key system

(a) WAVEFORM 1

(1) Camshaft timing Oil Control Valve (OCV) operation signal

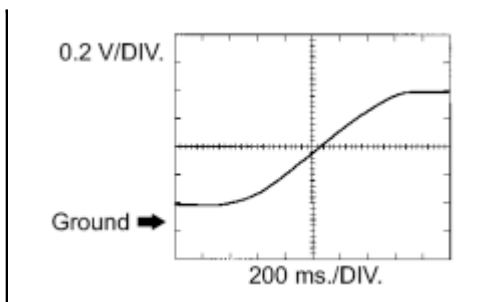


ECM Terminal Names	Between OC1+ and OC1- , OC2+ and OC2- , OE1+ and OE1- , or OE2+ and OE2-
Tester Ranges	5 V/DIV, 1 ms./DIV
Conditions	Idling

The wavelength becomes shorter as the engine rpm increases.

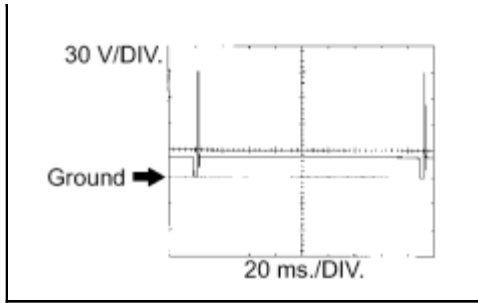
(b) WAVEFORM 2

(1) Heated oxygen sensor signal



ECM Terminal Names	Between OX1B and EX1B, or OX2B and EX2B
Tester Ranges	0.2 V/DIV, 200 ms./DIV
Conditions	Engine speed is maintained at 2,500 rpm for 2 minutes after sensor is warmed up

In the DATA LIST, item O2S B1S2 shows the ECM input values from the heated oxygen sensor.



(c) WAVEFORM 3

(1) Fuel injector operation signal

ECM Terminal Names	Between #10 (to 60) and E01
Tester Ranges	30 V/DIV, 20 ms./DIV
Conditions	Idling

The wavelength becomes shorter as the engine rpm increases.

