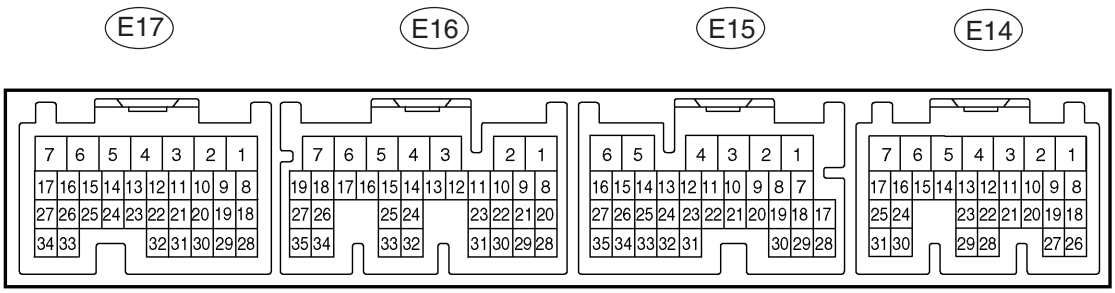
05NJ0–01

TERMINALS OF ECM



Y

A66714

HINT:

Each ECM terminal's standard voltage is shown in the table below.

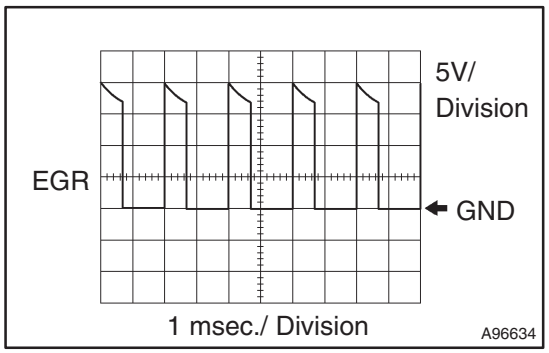
In the table, first follow the information under "Condition". Look under "Symbols (Terminal No.)" for the terminals to be inspected. The standard voltage between the terminals is shown under "Specified Condition".

Use the illustration above as a reference for the ECM terminals.

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
BATT (E15–2) – E1 (E16–7)	L – BR	Battery (for measuring battery voltage and for ECM memory)	Always	9 to 14 V
IGSW (E14–9) – E1 (E16–7)	B–O – BR	Ignition switch	Ignition switch ON	9 to 14 V
+B (E14–1) – E1 (E16–7)	B – BR	Power source of ECM	Ignition switch ON	9 to 14 V
MREL (E14–8) – E1 (E16–7)	W–G – BR	MAIN relay	Ignition switch ON	9 to 14 V
MREL (E14–8) – E1 (E16–7)	W–G – BR	MAIN relay	10 seconds elapsed after ignition switch OFF	0 to 1.5 V
VC (E17–18) – E2 (E17–28)	R–W – BR	Power source of sensor (a specific voltage)	Ignition switch ON	4.5 to 5.5 V
VPA (E14–22) – EPA (E14–28)	W–L – BR–W	Accelerator pedal position sensor (for engine control)	Ignition switch ON, accelerator pedal fully released	0.6 to 1.0 V
VPA (E14–22) – EPA (E14–28)	W–L – BR–W	Accelerator pedal position sensor (for engine control)	Ignition switch ON, accelerator pedal fully depressed	3.0 to 4.6 V
VPA2 (E14–23) – EPA2 (E14–29)	GR–G – BR–Y	Accelerator pedal position sensor (for sensor malfunction detection)	Ignition switch ON, accelerator pedal fully released	1.4 to 1.8 V
VPA2 (E14–23) – EPA2 (E14–29)	GR–G – BR–Y	Accelerator pedal position sensor (for sensor malfunction detection)	Ignition switch ON, accelerator pedal fully depressed	3.7 to 5.0 V
VCPA (E14–26) – EPA (E14–28)	LG–R – BR–W	Power source of accelerator pedal position sensor (for VPA)	Ignition switch ON	4.5 to 5.0 V
VCP2 (E14–27) – EPA2 (E14–29)	BR–R – BR–Y	Power source of accelerator pedal position sensor (for VPA2)	Ignition switch ON	4.5 to 5.0 V
VG (E16–24) – EVG (E16–32)	W–R – B–W	MAF meter	Idling, A/C switch OFF	0.5 to 3.4 V
THA (E17–31) – E2 (E17–28)	Y–B – BR Y–G – BR	IAT sensor	Atmospheric air temperature	0.5 to 3.4 V

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
THIA (E17–20) – E2 (E17–28)	Y–G – BR	Disel turbo IAT sensor	Idling, intake air temperature at 20˚C (68˚F)	0.5 to 3.4 V
THW (E17–19) – E2 (E17–28)	R–L – BR	ECT sensor	Idling, engine coolant temperature at 80˚C (176˚F)	0.2 to 1.0 V
STA (E14–7) – E1 (E16–7)	B–Y – BR L–Y – BR	Starter signal	Cranking	6.0 V or more
#1 (E17–24) – E1 (E16–7) #2 (E17–23) – E1 (E16–7) #3 (E17–22) – E1 (E16–7) #4 (E17–21) – E1 (E16–7)	B–W – BR R – BR V – BR Y–R – BR	Injector	Idling	Pulse generation (see waveform 3)
G+ (E16–23) – G– (E16–31)	Y – L	Camshaft position sensor	Idling	Pulse generation (see waveform 5)
NE+ (E17–27) – NE– (E17–34)	Y – L	Crankshaft position sensor	Idling	Pulse generation (see waveform 5)
STP (E15–15) – E1 (E16–7)	G–W – BR	Stop lamp switch	Ignition switch ON, brake pedal depressed	7.5 to 14 V
STP (E15–15) – E1 (E16–7)	G–W – BR	Stop lamp switch	Ignition switch ON, brake pedal released	0 to 1.5 V
ST1– (E15–14) – E1 (E16–7)	R–L – BR	Stop lamp switch (opposite to STP)	Ignition switch ON, brake pedal depressed	0 to 1.5 V
ST1– (E15–14) – E1 (E16–7)	R–L – BR	Stop lamp switch (opposite to STP)	Ignition switch ON, brake pedal released	7.5 to 14 V
TC (E14–11) – E1 (E16–7)	P–B – BR	Terminal TC of DLC3	Ignition switch ON	9 to 14 V
W (E14–12) – E1 (E16–7)	R–B – BR	MIL	MIL illuminated	0 to 3 V
W (E14–12) – E1 (E16–7)	R–B – BR	MIL	MIL not illuminated	9 to 14 V
SPD (E15–17) – E1 (E16–7)	V–R – BR	Speed signal from combination meter	Ignition switch ON, driving wheel is rotating slowly	Pulse generation (see waveform 7)
PIM (E16–28) – E2 (E17–28)	L–B – BR	Manifold absolute pressure sensor	Apply negative pressure of 40 kPa (300 mmHg, 11.8 in.Hg)	1.3 to 1.9 V
PIM (E16–28) – E2 (E17–28)	L–B – BR	Manifold absolute pressure sensor	Same as atmospheric pressure	2.4 to 3.1 V
PIM (E16–28) – E2 (E17–28)	L–B – BR	Manifold absolute pressure sensor	Apply positive pressure of 170 kPa (1,275 mmHg, 190.5 in.Hg)	3.7 to 4.3 V
IREL (E14–10) – E1 (E16–7)	B–W – BR	EDU relay	Ignition switch OFF	9 to 14 V
IREL (E14–10) – E1 (E16–7)	B–W – BR	EDU relay	Idling	0 to 1.5 V
TACH (E14–4) – E1 (E16–7)	B–W – BR	Engine speed	Idling	Pulse generation
PCR1 (E17–26) – E2 (E17–28)	R–Y – BR	Common rail pressure sensor (main)	Idling	1.7 to 2.2 V
PCR2 (E17–33) – E2 (E17–28)	R–Y – BR	Common rail pressure sensor (sub)	Idling	1.2 to 1.6 V
GREL (E14–15) – E1 (E16–7)	R – BR	GLOW relay	Cranking	9 to 14 V
GREL (E14–15) – E1 (E16–7)	R – BR	GLOW relay	Idling	0 to 1.5 V
THF (E17–29) – E2 (E17–28)	G–B – BR	Fuel temperature sensor	Ignition switch ON	0.5 to 3.4 V
ALT (E17–8) – E1 (E16–7)	G – BR	Generator duty ratio	Idling	Pulse generation
PCV+ (E17–2) – PCV– (E17–1)	G–W – G–Y	Suction control valve	Idling	Pulse generation (see waveform 2)
INJF (E17–25) – E1 (E16–7)	P – BR	EDU	Idling	Pulse generation (see waveform 4)
VNTO (E17–10) – E1 (E16–7)	B–O – BR	Turbo motor driver	Idling	Pulse generation (see waveform 6)
VNTI (E17–17) – E1 (E16–7)	R–B – BR	Turbo motor driver	Idling	Pulse generation (see waveform 6)
EGLS (E16–33) – E2 (E17–28)	L–Y – BR	EGR valve position sensor	Ignition switch ON	0.3 to 1.3 V

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
EGR (E16–9) – E2 (E17–28)	L–R – BR	E–VRV for EGR	Ignition switch ON	Pulse generation (see waveform 1)
EGRC (E16–18) – E2 (E17–28)	Y–B – BR	VSV for EGR Cut	Ignition switch ON, EGR cuts (accelerator pedal fully depressed)	0 to 3 V
SCV (E17–15) – E2 (E17–28)	LG – BR	VSV for swirl control valve	VSV for swirl control valve ON (3,000 rpm or less)	0 to 3 V
CAN+ (E15–22) – E1 (E16–7)	V – BR	CAN communication line	Ignition switch ON	Pulse generation (see waveform 9)
CAN– (E15–21) – E1 (E16–7)	P – BR	CAN communication line	Ignition switch ON	Pulse generation (see waveform 10)
LU+A (E17–14) – E1 (E16–7) LU–A (E17–13) – E1 (E16–7) LU+B (E17–12) – E1 (E16–7) LU–B (E17–11) – E1 (E16–7)	W – BR LG – BR O – BR V – BR	Intake shutter	Engine switch ON (IG)	Pulse generation (See waveform 7)



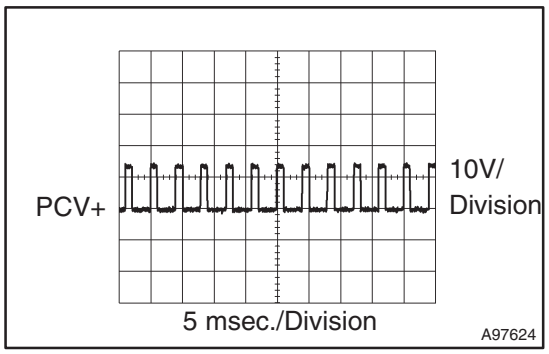
WAVEFORM 1

E–VRV for EGR signal

ECM Terminal Name	Between EGR and E1
Tester Range	5 V/Division, 1 msec./Division
Condition	Idling with warm engine

HINT:

The waveform varies depending on the electric vacuum regulating valve for EGR operation.



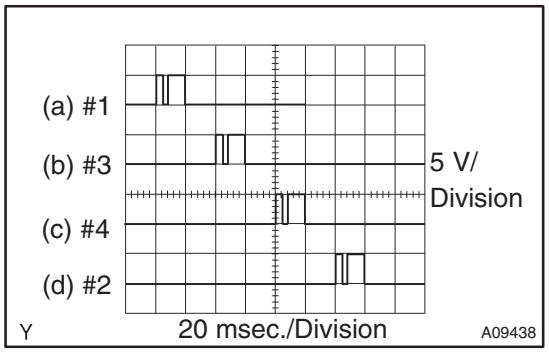
WAVEFORM 2

Suction control valve signal

ECM Terminal Name	Between PCV+ and PCV–
Tester Range	10 V/Division, 5 msec./Division
Condition	Idling or cranking with warm engine

HINT:

The waveform varies depending on the suction control valve operation.



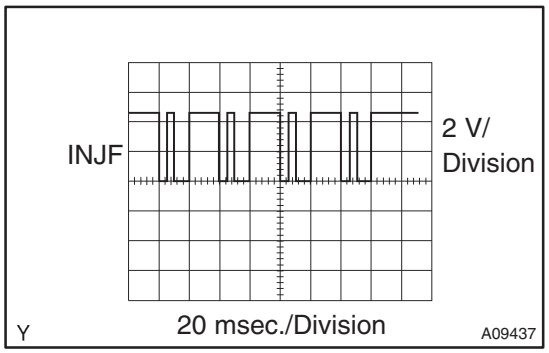
WAVEFORM 3

(a) Injector No. 1 injection signal
(b) Injector No. 2 injection signal
(c) Injector No. 3 injection signal
(d) Injector No. 4 injection signal

ECM Terminal Name	(a) Between #1 and E1 (b) Between #3 and E1 (c) Between #4 and E1 (d) Between #2 and E1
Tester Range	5 V/Division, 20 msec./Division
Condition	Idling with warm engine

HINT:

The waveform varies depending on the injector injection.



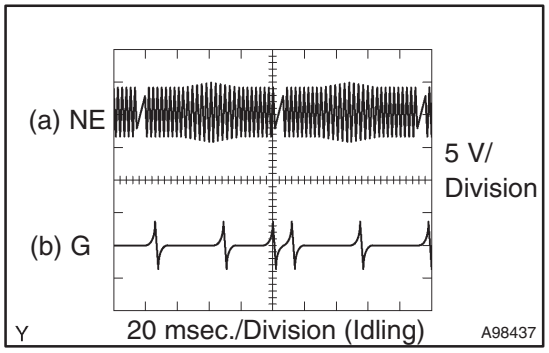
WAVEFORM 4

Injector injection confirmation signal

ECM Terminal Name	Between INJF and E1
Tester Range	2 V/Division, 20 msec./Division
Condition	Idling with warm engine

HINT:

The waveform varies depending on the injector injection.



WAVEFORM 5

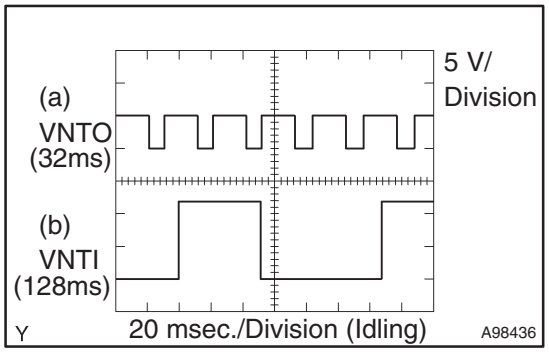
(a) Crankshaft position sensor signal

(b) Camshaft position sensor signal

ECM Terminal Name	(a) Between NE+ and NE– (b) Between G+ and G–
Tester Range	5 V/Division, 20 msec./Division
Condition	Idling with warm engine

HINT:

The waveform varies depending on the engine revolution.



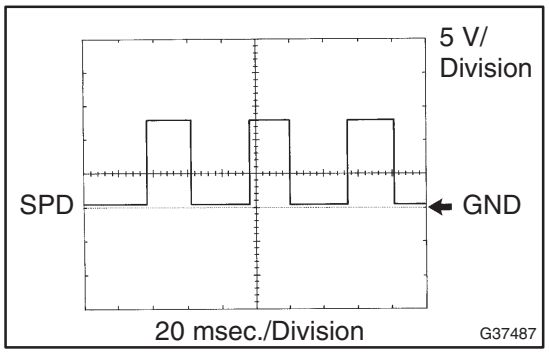
WAVEFORM 6

Turbo motor driver signal

ECM Terminal Name	(a) Between VNTO and E1 (b) Between VNTI and E1
Tester Range	5 V/Division, 20 msec./Division
Condition	Idling with warm engine

HINT:

The waveform varies depending on the turbocharger operation.



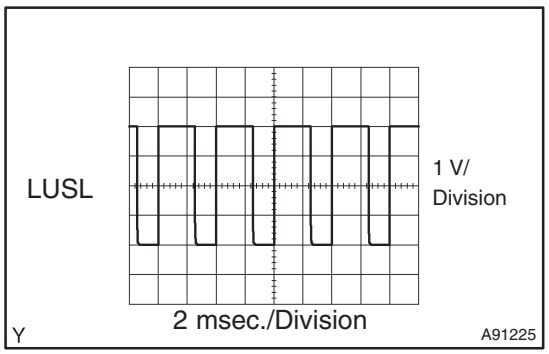
WAVEFORM 7

Vehicle speed signal

ECM Terminal Name	Between SPD and E1
Tester Range	5 V/Division, 20 msec./Division
Condition	While driving the vehicle

HINT:

The wavelength becomes shorter as the vehicle speed increases.



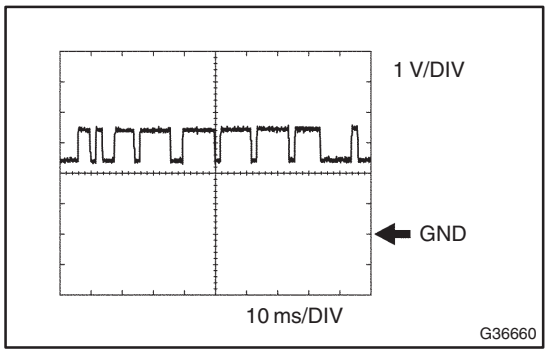
WAVEFORM 8

Diesel throttle signal

ECM Terminal Name	Between LUSL and E1
Tester Range	1 V/Division, 2 msec./Division
Condition	Warm engine with racing engine

HINT:

The waveform varies depending on the diesel throttle signal operation.



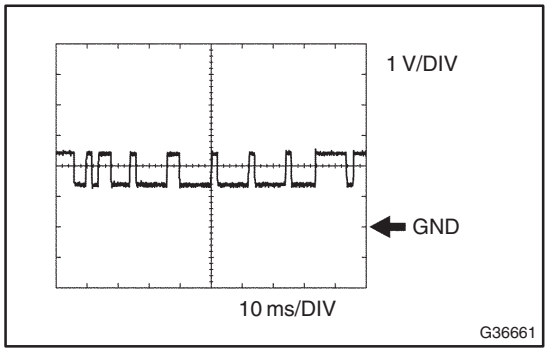
WAVEFORM 9

CAN communication signal

ECM Terminal Name	Between CAN+ and E1
Tester Range	1 V/Division, 10 msec./Division
Condition	Engine is stopped, ignition ON

HINT:

The waveform varies depending on the CAN communication signal.



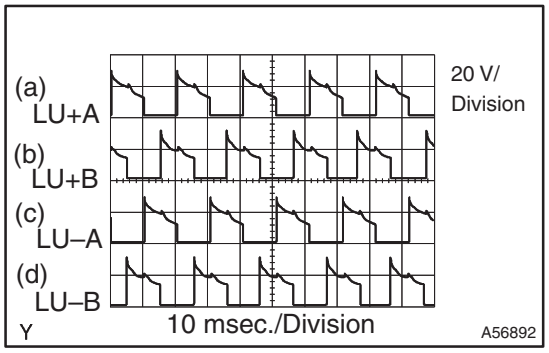
WAVEFORM 10

CAN communication signal

ECM Terminal Name	Between CAN– and E1
Tester Range	1 V/Division, 10 msec./Division
Condition	Engine is stopped, ignition ON

HINT:

The waveform varies depending on the CAN communication signal.



WAVEFORM 11

Intake shutter signal

ECM Terminal Name	(a) Between LU+A and E1 (b) Between LU–A and E1 (c) Between LU+B and E1 (d) Between LU–B and E1
Tester Range	20 V/Division, 10 msec./Division
Condition	Idling with warm engine

HINT:

The waveform varies depending on intake shutter operation.