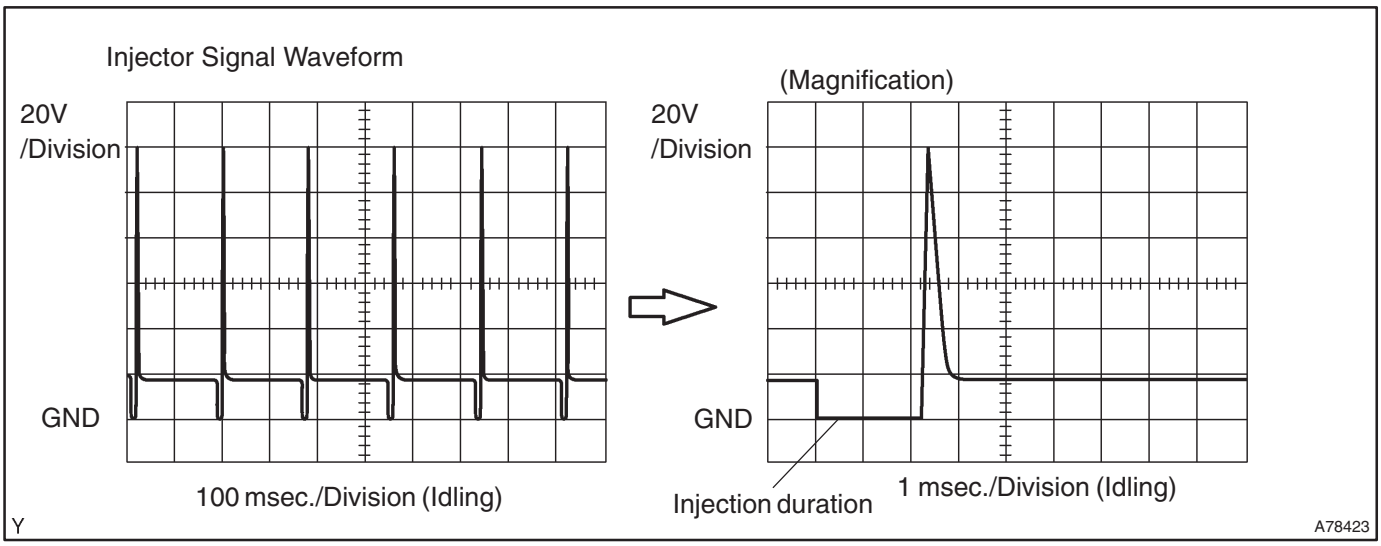
INJECTOR CIRCUIT

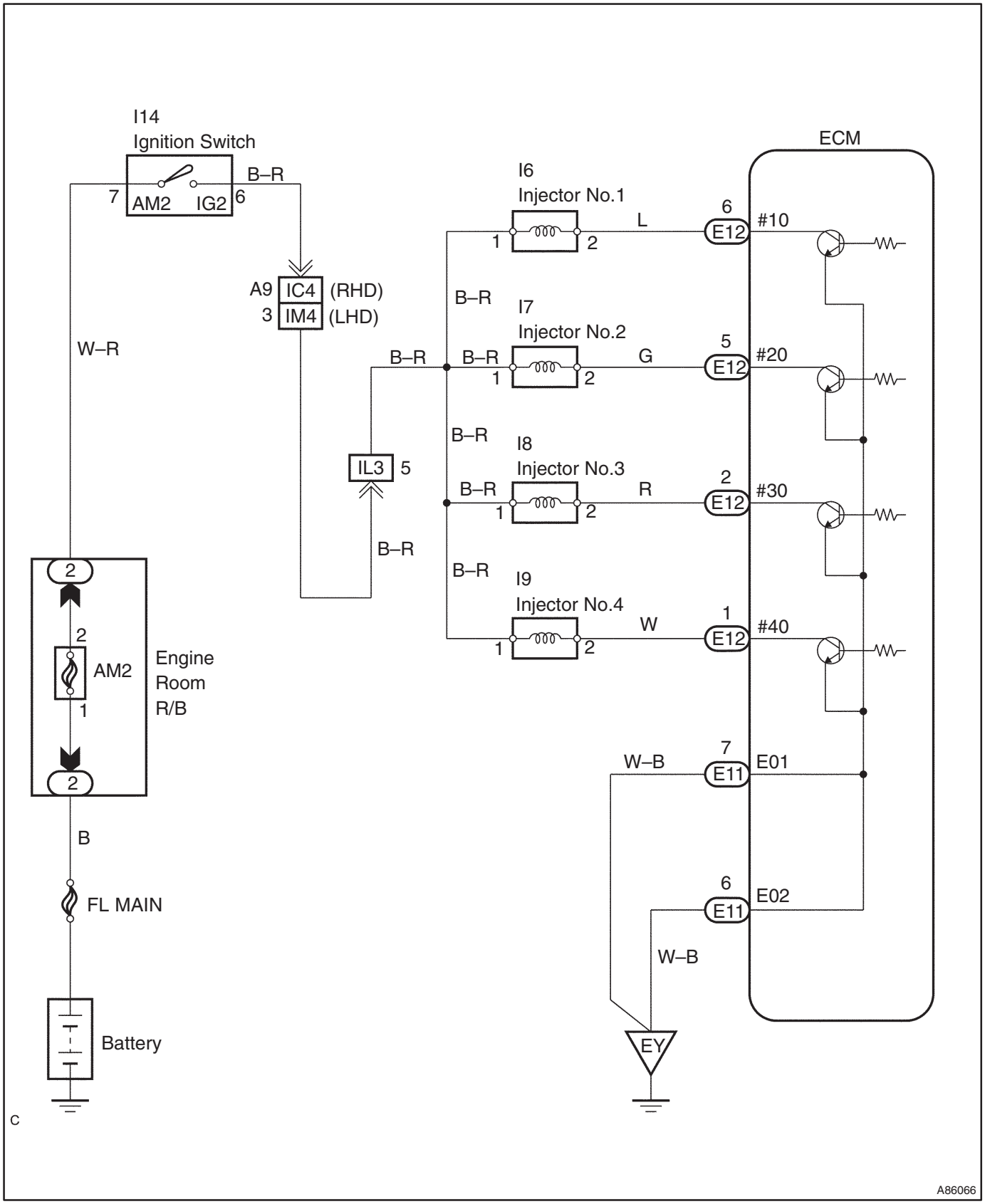
CIRCUIT DESCRIPTION

The fuel injectors are located on the intake manifold.
They inject fuel into the cylinders based on the signals from the ECM.
Reference: INSPECTION USING OSCILLOSCOPE
With the engine idling, check the waveform between terminals #10 to #60 and E01 of the ECM connectors.
HINT:

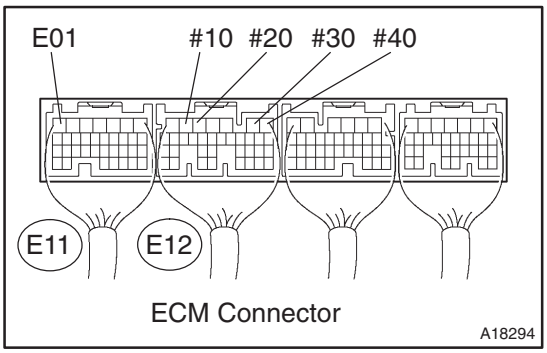
The correct waveform is as shown in the diagram below.



WIRING DIAGRAM



1	INSPECT ECM(#10, #20, #30 OR #40 VOLTAGE)



(a) Turn the ignition switch to ON.
(b) Measure the voltage according to the value(s) in the table below.

Standard:

Tester Connection	Specified Condition
#10 (E12–6) – E01 (E11–7)	9 to 14 V
#20 (E12–5) – E01 (E11–7)	9 to 14 V
#30 (E12–2) – E01 (E11–7)	9 to 14 V
#40 (E12–1) – E01 (E11–7)	9 to 14 V

OK → **Go to step 4**

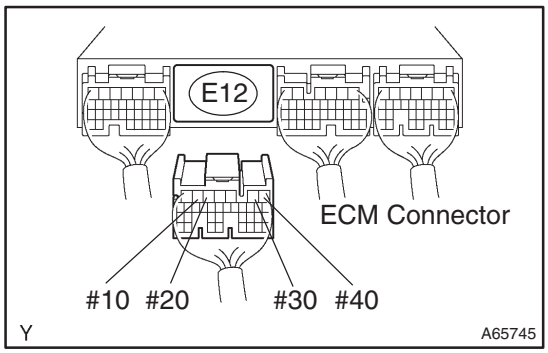
NG

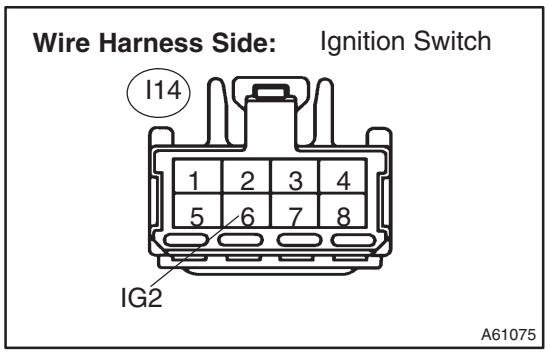
2	INSPECT FUEL INJECTOR ASSY (See page 11–8)

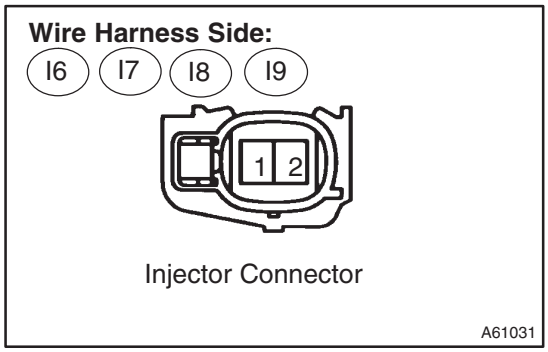
NG → **REPLACE FUEL INJECTOR ASSY**

OK

3	CHECK HARNESS AND CONNECTOR(INJECTOR – ECM, INJECTOR – IGNITION SWITCH)







(a) Check the harness and connectors between the injector and ECM.
  (1) Disconnect the I6, I7, I8 and/or I9 injector connector(s).
  (2) Disconnect the E12 ECM connector.
  (3) Measure the resistance according to the value(s) in the table below.

Standard(Check for open):

Tester Connection	Specified Condition
Injector (I6–2) – #10 (E12–6)	Below 1 Ω
Injector (I7–2) – #20 (E12–5)	Below 1 Ω
Injector (I8–2) – #30 (E12–2)	Below 1 Ω
Injector (I9–2) – #40 (E12–1)	Below 1 Ω

Standard(Check for short):

Tester Connection	Specified Condition
Injector (I6–2) or #10 (E12–6) – Body ground	10 kΩ or higher
Injector (I7–2) or #20 (E12–5) – Body ground	10 kΩ or higher
Injector (I8–2) or #30 (E12–2) – Body ground	10 kΩ or higher
Injector (I9–2) or #40 (E12–1) – Body ground	10 kΩ or higher

  (4) Reconnect the injector connector(s).
  (5) Reconnect the ECM connector.

(b) Check the harness and connectors between the injector and ignition switch.
  (1) Disconnect the I6, I7, I8 and/or I9 injector connector(s).
  (2) Disconnect the I14 ignition switch connector.
  (3) Measure the resistance according to the value(s) in the table below.

Standard(Check for open):

Tester Connection	Specified Condition
Injector (I6–1) – IG2 (I14–6)	Below 1 Ω
Injector (I7–1) – IG2 (I14–6)	Below 1 Ω
Injector (I8–1) – IG2 (I14–6)	Below 1 Ω
Injector (I9–1) – IG2 (I14–6)	Below 1 Ω

Standard(Check for short):

Tester Connection	Specified Condition
Injector (I6–1) or IG2 (I14–6) – Body ground	10 kΩ or higher
Injector (I7–1) or IG2 (I14–6) – Body ground	10 kΩ or higher
Injector (I8–1) or IG2 (I14–6) – Body ground	10 kΩ or higher
Injector (I9–1) or IG2 (I14–6) – Body ground	10 kΩ or higher

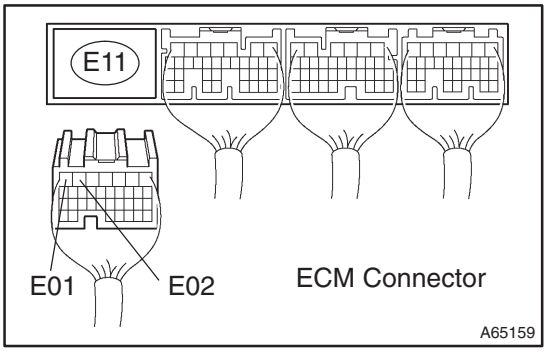
  (4) Reconnect the injector connector.
  (5) Reconnect the ignition switch connector.

NG	REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

CHECK ECM POWER SOURCE CIRCUIT (See page 05–168)

4 CHECK HARNESS AND CONNECTOR(ECM GROUND)



(a) Disconnect the E11 ECM Connector.
(b) Measure the resistance according to the value(s) in the table below.

Standard:

Tester Connection	Specified Condition
E01 (E11–7) – Body ground	Below 1 Ω
E02 (E11–6) – Body ground	Below 1 Ω

(c) Reconnect the ECM connector.

NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

5 INSPECT FUEL INJECTOR ASSY (See page 11–6)

NG → **REPLACE FUEL INJECTOR ASSY**

OK

PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE (See page 05–8)