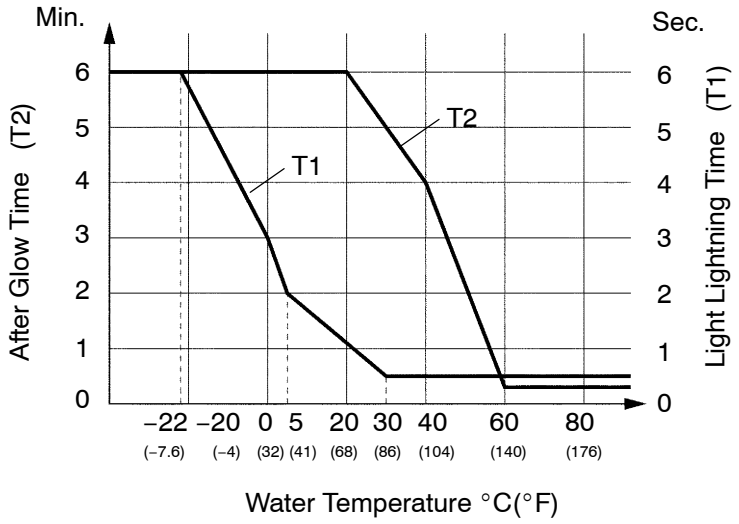
PRE–HEATING CONTROL CIRCUIT

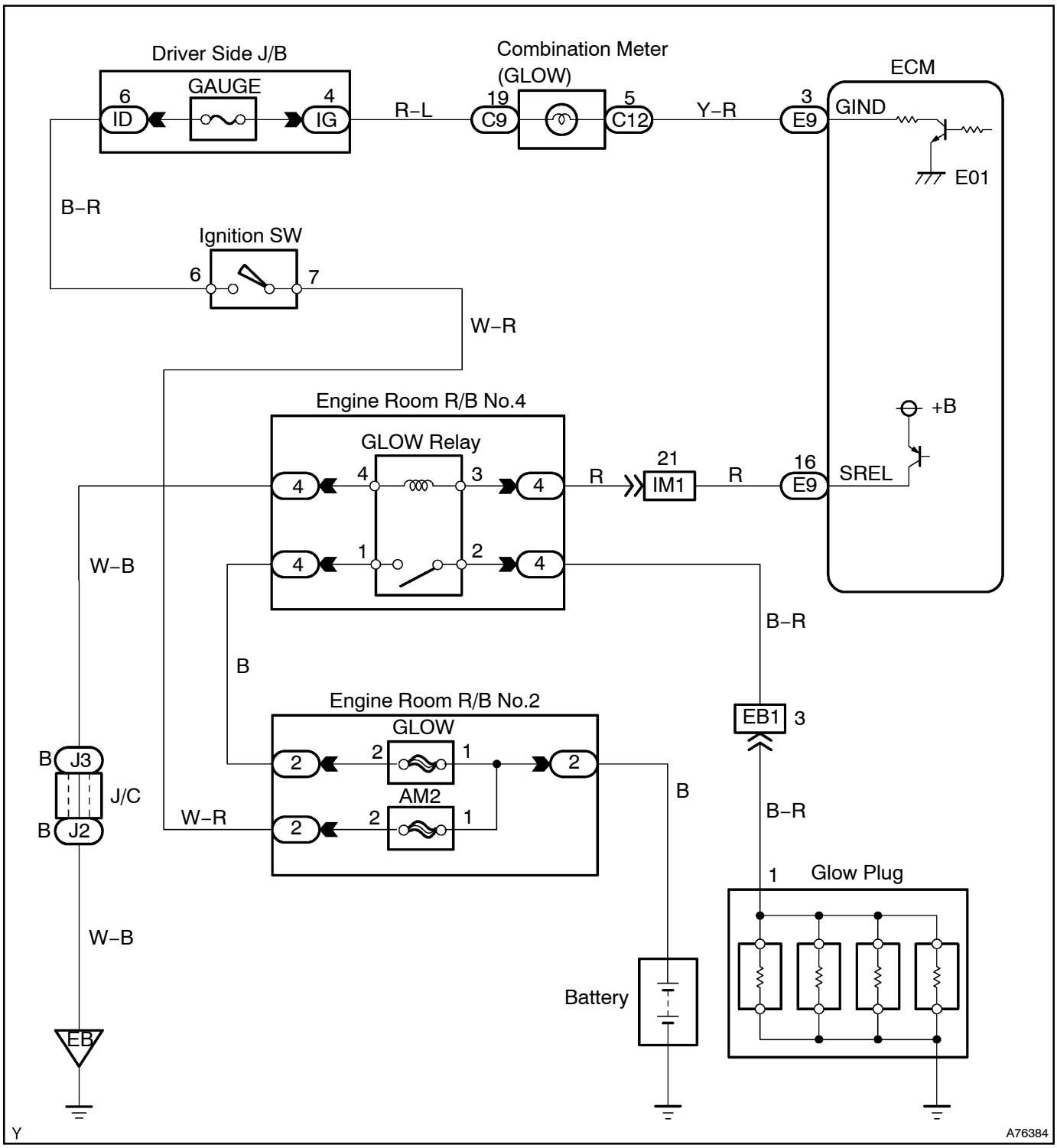
CIRCUIT DESCRIPTION

When the ignition switch turns ON, the ECM calculates the glow indicator lighting time/heating corresponding to the coolant temperature at that time and turns ON the glow indicator light/glow plug relay.
As the ceramics is used for a glow plug material, the current control is not performed.



A76623

WIRING DIAGRAM



INSPECTION PROCEDURE

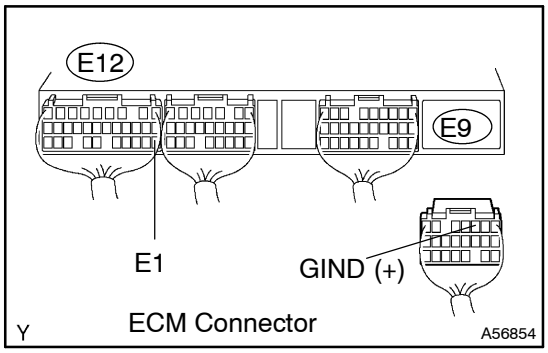
1	CHECK GLOW INDICATOR LIGHT

(a) Turn the ignition switch ON.
(b) Does the glow indicator light up?
(c) The glow indicator lights up for 0.5 sec. or more.

OK → **Go to step 6**

NG

2	INSPECT ECM(CHECK VOLTAGE)



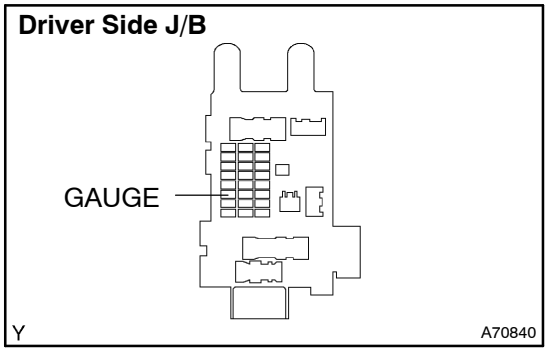
(a) Disconnect the ECM E9 connector.
(b) Turn the ignition switch ON.
(c) Measure the voltage between the terminals of the ECM connector.
Voltage:

Symbols (Terminal No.)	Specified condition
GIND (E9 – 3) ⇔ E1 (E12 – 22)	9 – 14 V

OK → **CHECK AND REPLACE ECM**

NG

3	CHECK FUSE(GAUGE FUSE)



(a) Remove the GAUGE fuse from the driver side J/B.
(b) Check the continuity of the GAUGE fuse.
Resistance: Continuity

NG → **CHECK FOR SHORT IN ALL HARNESS AND COMPONENTS CONNECTED GAUGE FUSE**

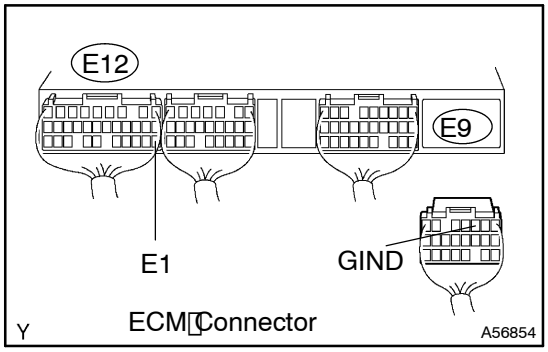
OK

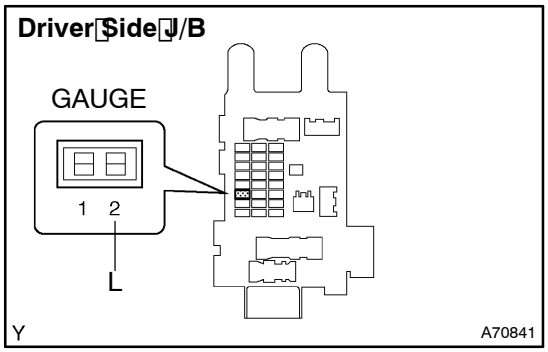
4	CHECK GLOW INDICATOR LIGHT

NG → **REPLACE BULB**

OK

5	CHECK HARNESS AND CONNECTOR (ECM – COMBINATION METER, COMBINATION METER – GAUGE FUSE)





(a) Disconnect the ECM E9 connector.
(b) Disconnect the combination meter C9 and C12 connector (See page 71–25).
(c) Remove the GAUGE fuse from the driver side J/B.
(d) Check the continuity between the wire harness side connector.

Standard (Check for open):

Symbols (Terminal No.)	Specified condition
GLW–(C12 – 5) (Terminal arrangement on 05–1554) ⇔ GIND (E9 – 3)	Continuity
L (GAUGE fuse terminal 2 of J/B) ⇔ IG+ (C9 – 19) (Terminal arrangement on 05–1554)	

NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

CHECK AND REPLACE ECM

6	CHECK FOR INDICATOR LIGHTING TIME AND AFTER GLOW TIME (See page 19–30)

NG → CHECK AND REPLACE ECM

OK

7	READ OUTPUT DTC (See page 05–303)

SST 09843–18040

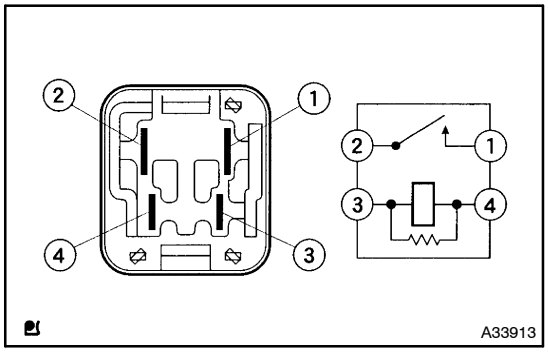
Result:

	A	B
RESULT	Other DTC is not output	Other DTC is output

B → GO TO RELEVANT DTC CHART

A

8 INSPECT GLOW PLUG (SUB) RELAY ASSY



(a) Check the glow plug relay for continuity.
(1) Using an ohmmeter, check that there is continuity between each terminal.

Specified condition:

Between terminal	Specified condition
1 – 2	No continuity
3 – 4	Continuity

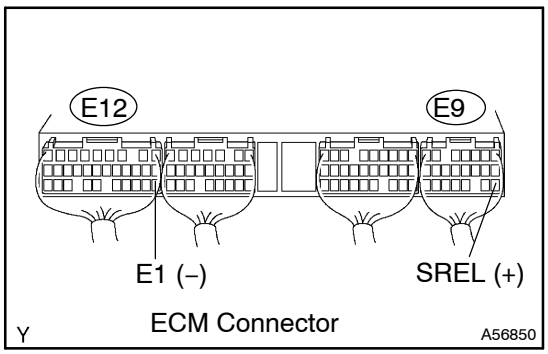
(2) Using an ohmmeter, check that there is continuity between terminals 1 and 2 when the battery voltage is applied across terminals 3 and 4.

Specified condition: Continuity

NG → **REPLACE GLOW PLUG (SUB) RELAY ASSY**

OK

9 INSPECT ECM(CHECK VOLTAGE)



(a) Turn the ignition switch START.
(b) Measure the voltage between the terminals of the ECM connector.

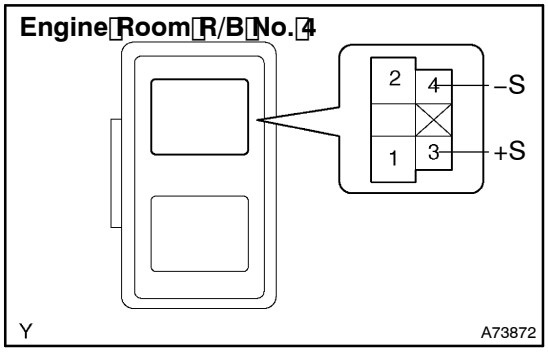
Voltage:

Symbols (Terminal No.)	Condition	Specified condition
SREL (E9 – 16) ⇔ E1 (E12 – 22)	Cranking	9 – 14 V

NG → **CHECK AND REPLACE ECM**

OK

10	CHECK HARNESS AND CONNECTOR (ECM – GLOW PLUG RELAY, GLOW PLUG RELAY – BODY GROUND)



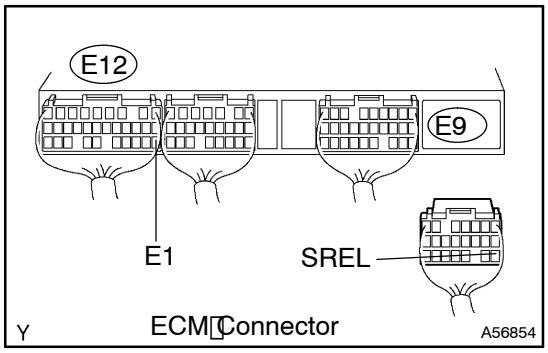
(a) Disconnect the ECM E9 connector.
(b) Disconnect the glow plug relay from the engine room R/B No. 4.
(c) Check the continuity between the wire harness side connector.

Standard (Check for open):

Symbols (Terminal No.)	Specified condition
+S (GLOW relay terminal 3 of R/B) ⇔ SREL (E9 – 16)	Continuity
–S (GLOW relay terminal 4 of R/B) ⇔ Body ground	

Standard (Check for short):

Symbols (Terminal No.)	Specified condition
SREL (E9 – 16) ⇔ E1 (E12 – 22)	No continuity



NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

11	INSPECT GLOW PLUG ASSY (See page 19–30)

NG → REPLACE GLOW PLUG ASSY (See page 19–32)

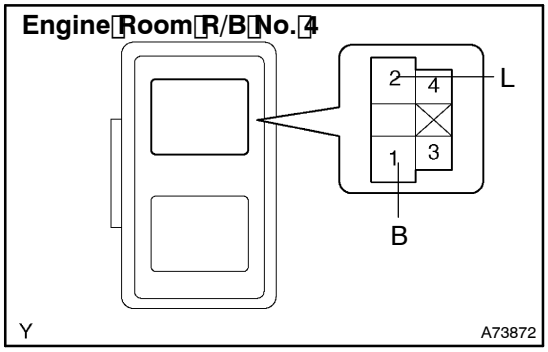
OK

12	INSPECT GLOW PLUG ASSY (INSTALLATION)

NG → TIGHTEN GLOW PLUG

OK

13	CHECK HARNESS AND CONNECTOR (GLOW PLUG RELAY – GLOW PLUG, GLOW PLUG RELAY – BATTERY)



(a) Remove the glow plug relay from the engine room R/B No. 4.
(b) Disconnect the glow plug wire.
(c) Check the continuity between the wire harness.

Standard (Check for open):

Symbols (Terminal No.)	Specified condition
L (Glow plug relay terminal 2 of R/B) ⇔ Glow plug wire	Continuity
B (Glow plug relay terminal 1 of R/B) ⇔ Positive terminal of the battery	

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

OK

PROCEED TO NEXT CIRCUIT INSPECTION SHOWN ON PROBLEM SYMPTOMS TABLE (See page 05–303)