

STARTING SYSTEM

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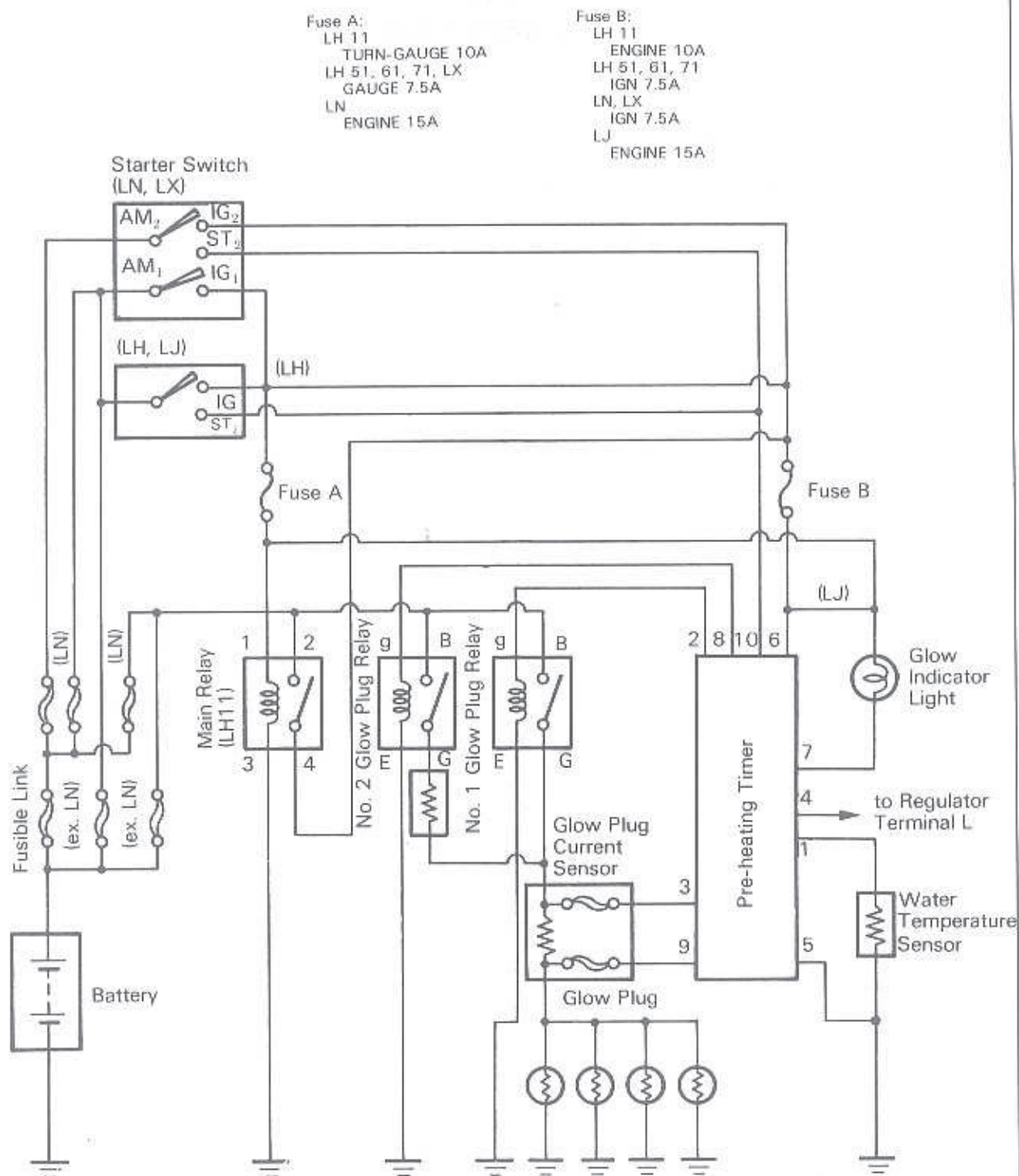
ST

PRE-HEATING SYSTEM

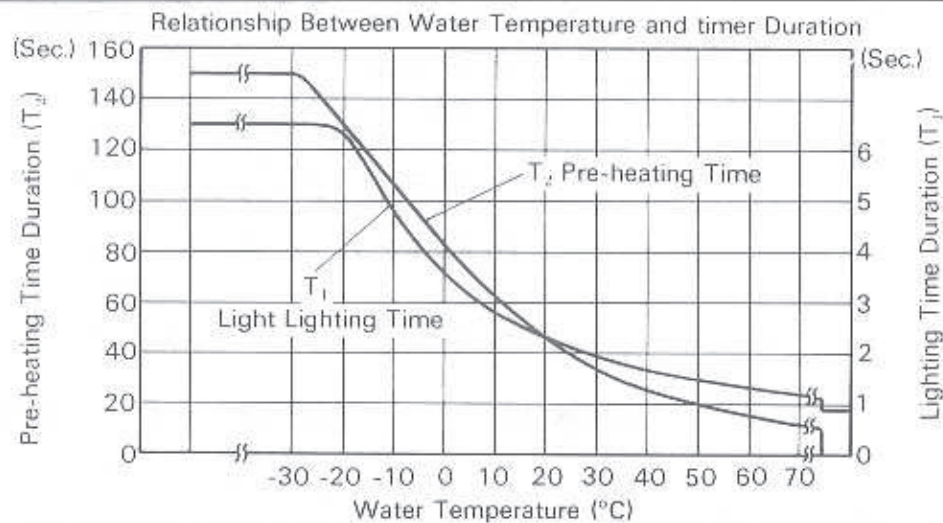
Super Glow Type

[Europe (LH, LX, LN, LJ)]

SYSTEM CIRCUIT



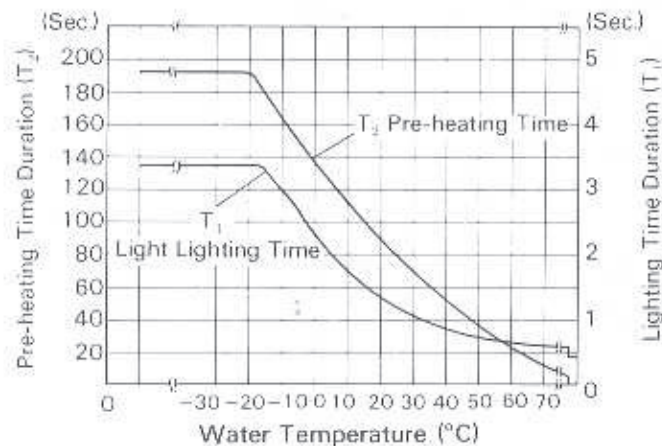
ex, LX



ST0048

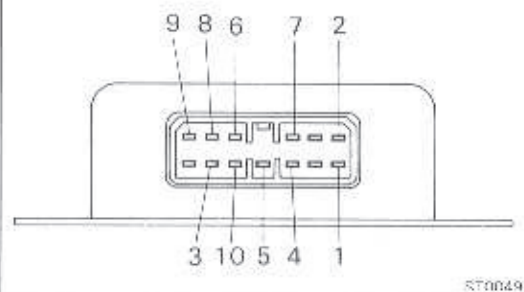
LX

Relationship Between Water Temperature and Timer Duration



ST0160

LH11, LN, LX, LJ



ST0049

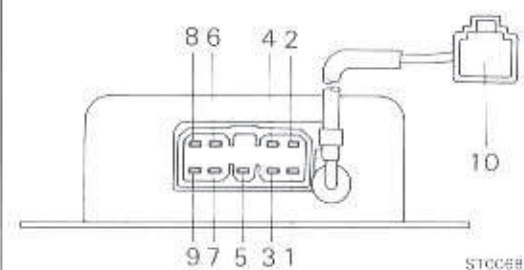
INSPECTION OF COMPONENTS

Pre-heating Timer

LOCATION

- LH 11, LX, LJ: Under the instrument panel on the passenger side.
- LH 51, 61, 71: Under the instrument panel center.
- LN: In the left cowl.

LH51, 61, 71



ST0068

Refer to Diesel Electrical System Diagnosis for inspection procedures. (See pages EM-11, 12)

No. 1 and No. 2 Glow Plug Relay

LOCATION

LN, LX: On the left fender apron in the engine compartment.

LH 11, 51, 61, 71 (No. 1): In the engine compartment on the left side.

LH 51, 61, 71 (No. 2): Under the instrument panel on the driver's side.

LH 11 (No. 2): Under the instrument panel on the passenger side.

INSPECT NO. 1 AND NO. 2 GLOW PLUG RELAY

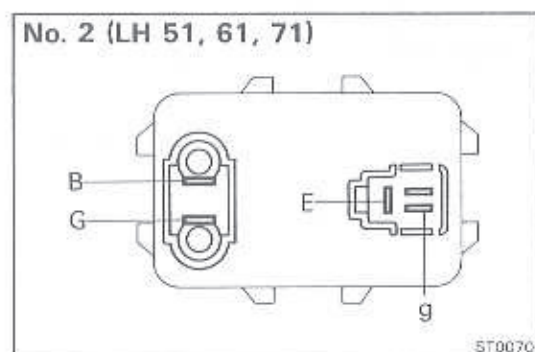
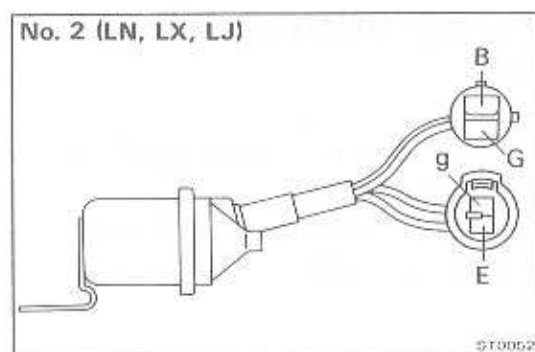
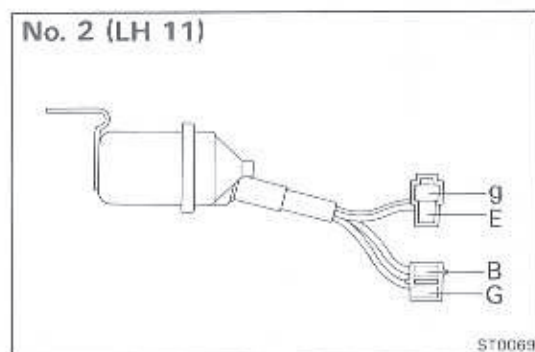
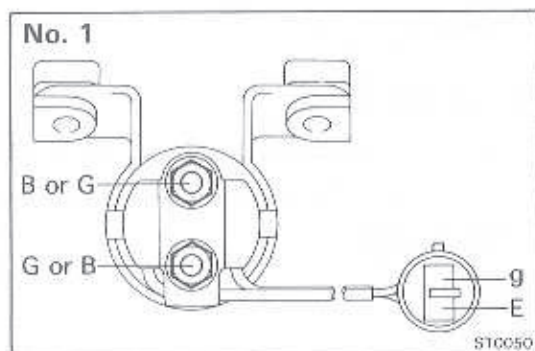
(a) Using an ohmmeter, check for continuity between the following terminals:

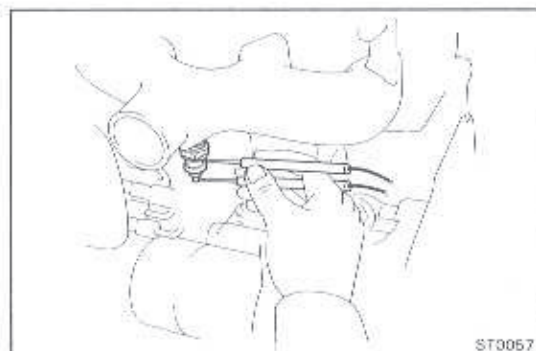
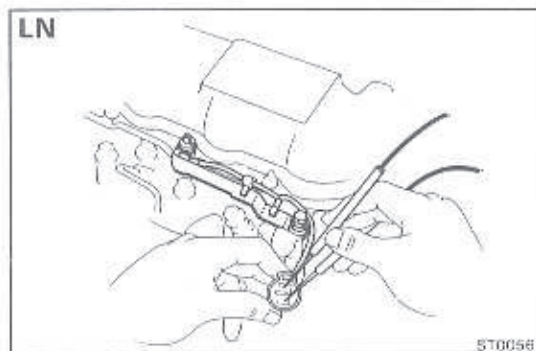
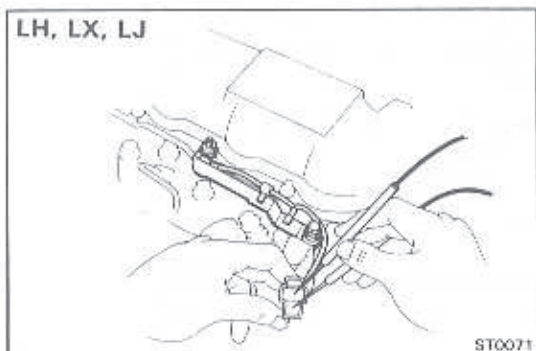
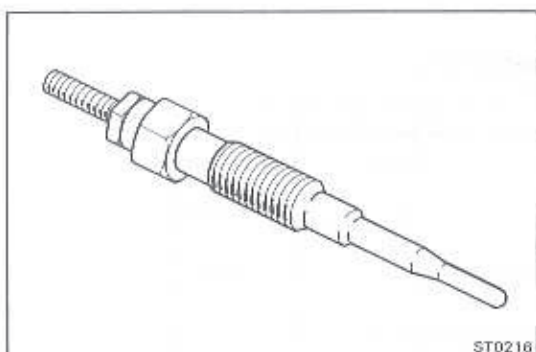
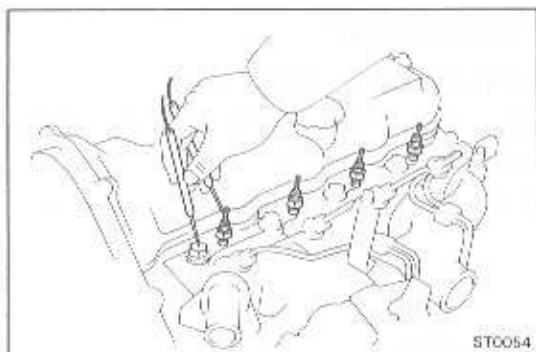
- E ↔ g **Continuity**
- B ↔ G **No continuity**

(b) Apply battery voltage between terminals E and g.

- B ↔ G **Continuity**

If continuity is not as specified, replace the relay.





Glow Plug

INSPECT GLOW PLUG

Using an ohmmeter, check that there is continuity between the glow plug terminal and ground.

If there is no continuity, replace the glow plug.

NOTE:

- Be careful not to damage the glow plug pipes as it could cause an open circuit or shorten life of the plugs.
- Avoid getting oil and gasoline on the glow plugs when cleaning.
- During inspection, be sure to wipe any oil off the glow plug terminals and bakelite washer with a dry cloth.
- Be careful not to apply more than 7 volts to the glow plug as it could cause an open circuit.

Glow Plug Current Sensor

INSPECT GLOW PLUG CURRENT SENSOR

Using an ohmmeter, check that there is continuity between the current sensor terminals.

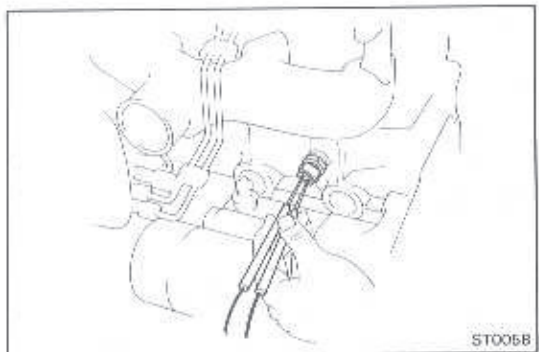
If there is no continuity, replace the current sensor.

Glow Plug Resistor

INSPECT GLOW PLUG RESISTOR

Using an ohmmeter, check that there is continuity between the resistor terminals.

If there is no continuity, replace the resistor.



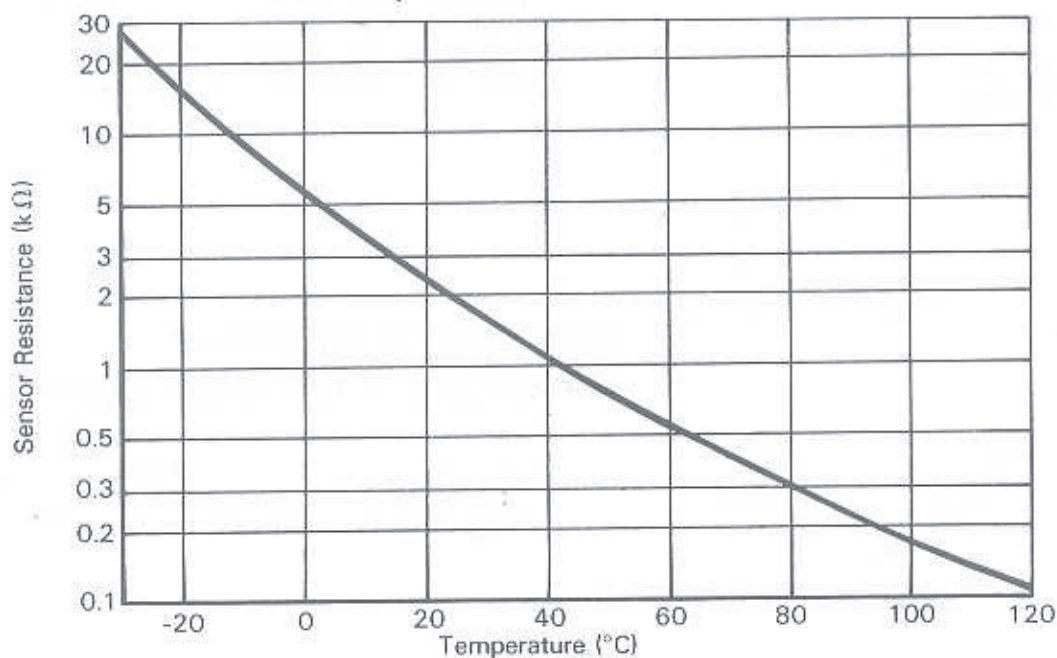
Water Temperature Sensor

INSPECT WATER TEMPERATURE SENSOR

Using an ohmmeter, check the resistance between the water temperature sensor terminals.

If the resistance is not as specified, replace the water temperature sensor.

Water Temperature Sensor Performance curve

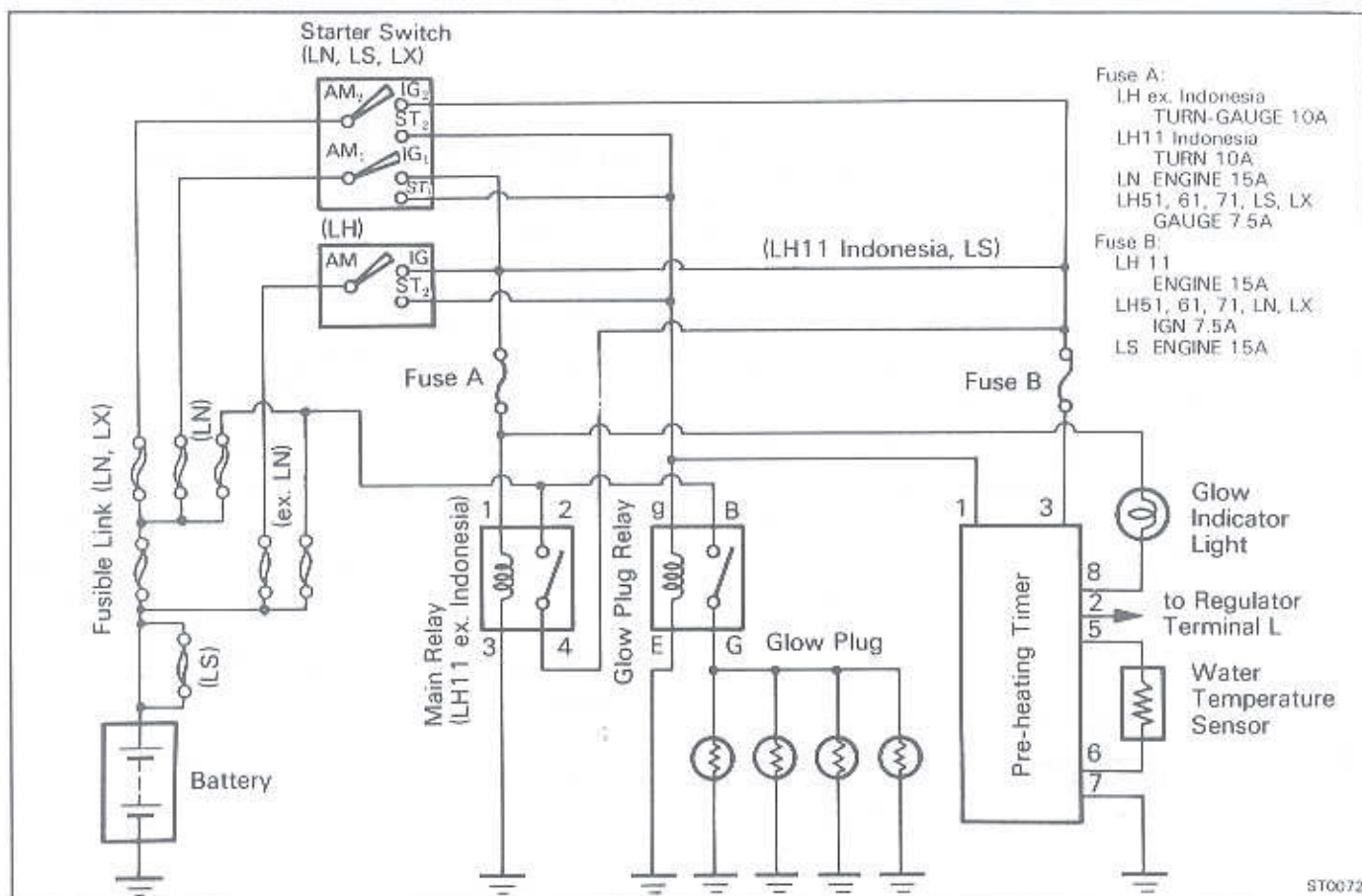


ST0066

Main Relay
(See page CH-20)

Variable Delay Type [General Destinations (LH, LN, LX, LS)]

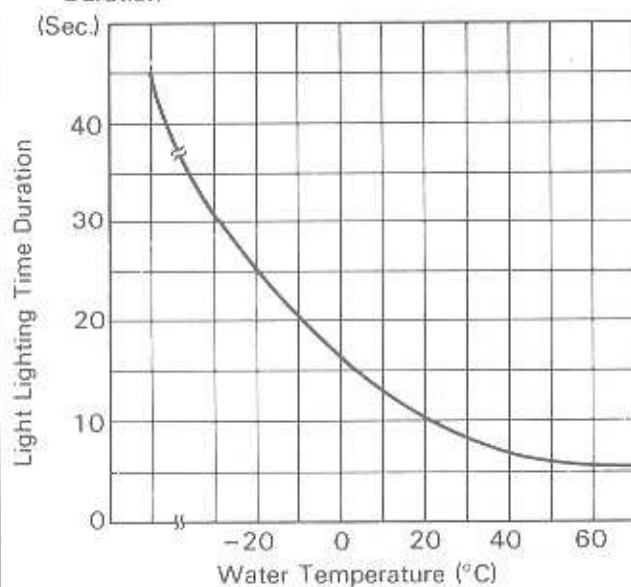
SYSTEM CIRCUIT



ST0072

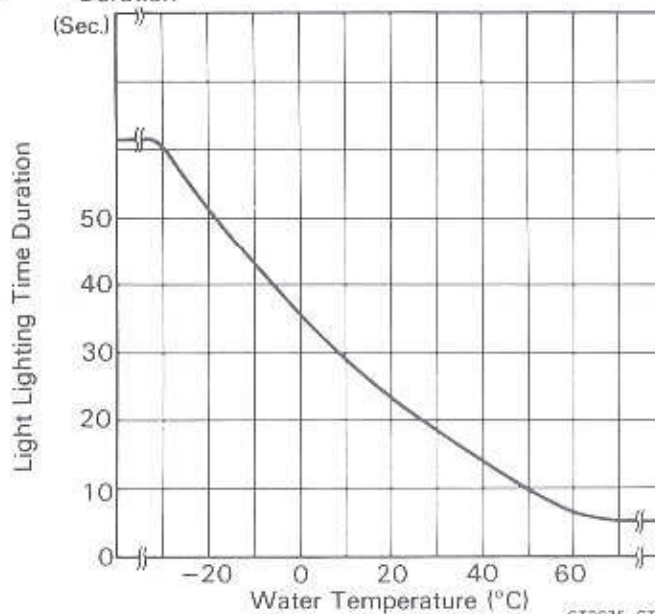
LH11

Relationship Between Water Temperature and Timer Duration



LH51, 61, 71, LN, LS, LX

Relationship Between Water Temperature and Timer Duration



ST0075 ST0074

INSPECTION OF COMPONENTS

Pre-Heating Timer

LOCATION

LH11, LS, LX: Under the instrument panel on the passenger side.

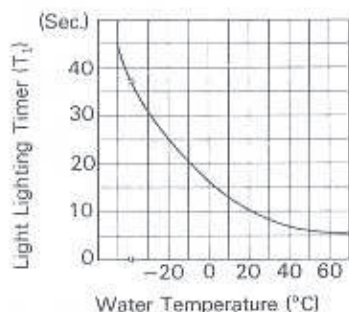
LH51, 61, 71: Under the instrument panel center.

LN: In the left cowl.

(a) Turn the starter switch "ON" and measure the lighting time of the glow indicator light.

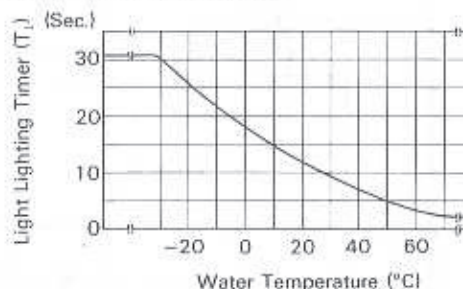
Glow time at 20°C (68°F): 9 – 15 seconds

LH 11

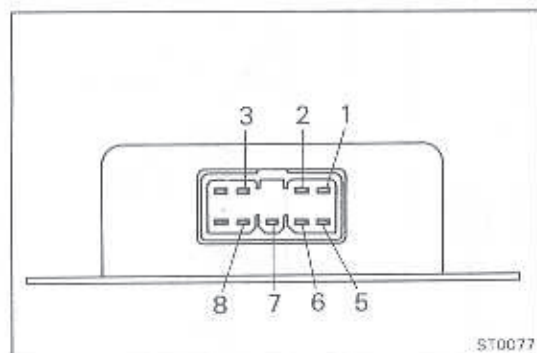


ST0075

LH51, 61, 71, LN, LS, LX



ST0162



ST0077

- (b) Check that there is voltage at terminal 1 of the pre-heating timer when the starter switch is turned to "ON".
- (c) Turn the starter switch to "START", and then check that there is no voltage at terminal 1.

Glow Plug Relay

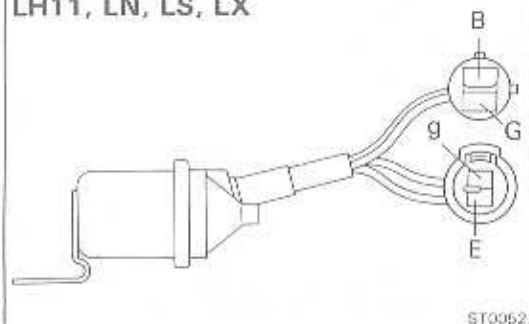
LOCATION

LH11: Under the instrument panel on the passenger side.

LH51, 61, 71: Under the instrument panel center.

LN, LS, LX: On the left fender apron in the engine compartment.

LH11, LN, LS, LX



ST0052

INSPECT GLOW PLUG RELAY

- (a) Using an ohmmeter, check for continuity between the following terminals:

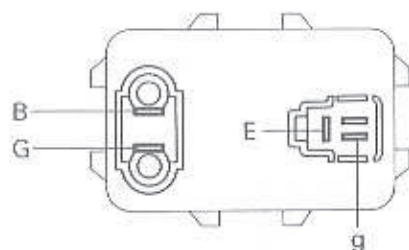
- E ↔ g Continuity
- B ↔ G No continuity

- (b) Apply battery voltage between terminals E and g.

- B ↔ G Continuity

If continuity is not as specified, replace the relay.

LH51, 61, 71



ST0070

Glow Plug

(See page ST-5)

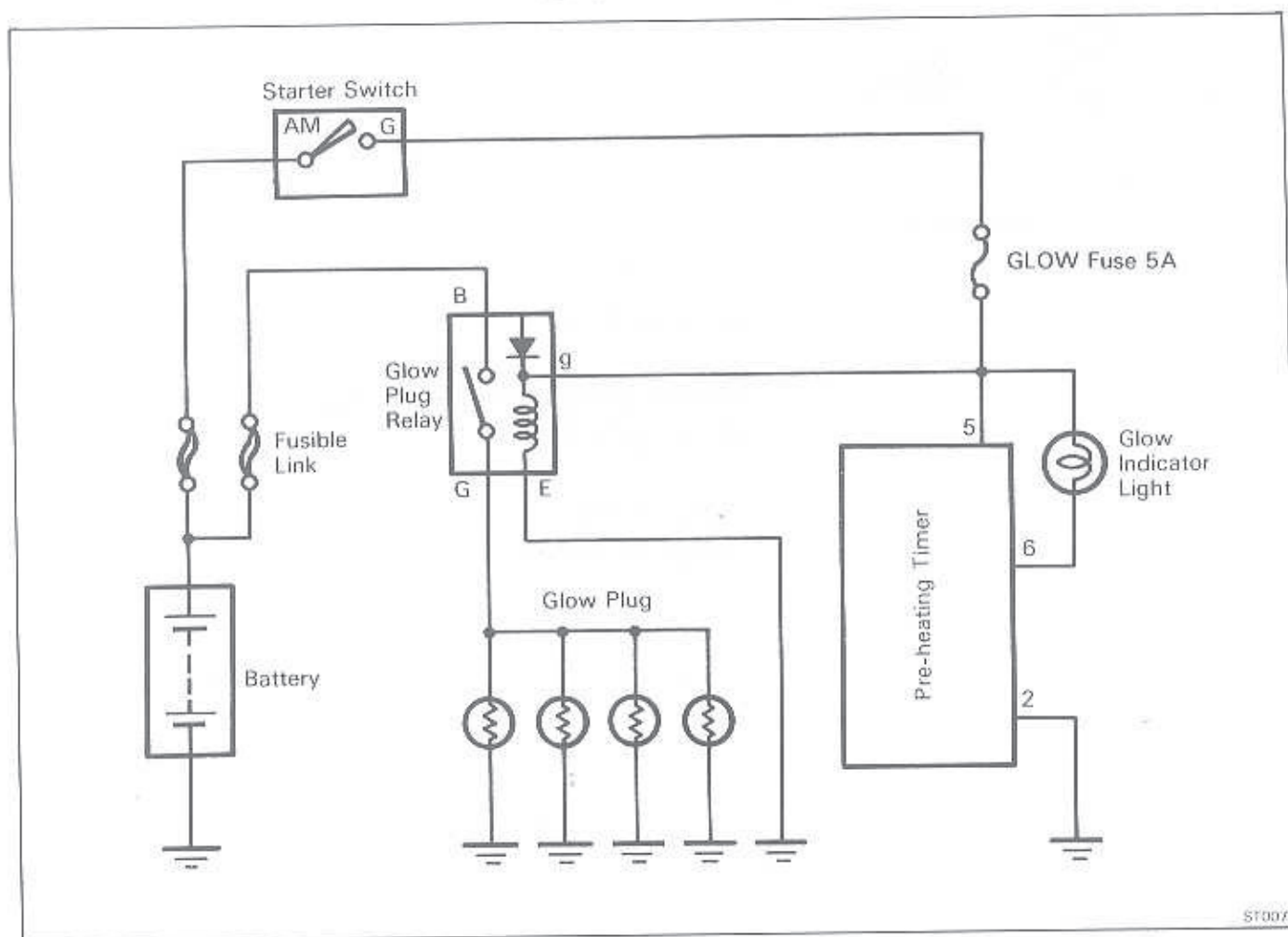
Water Temperature Sensor

(See page ST-6)

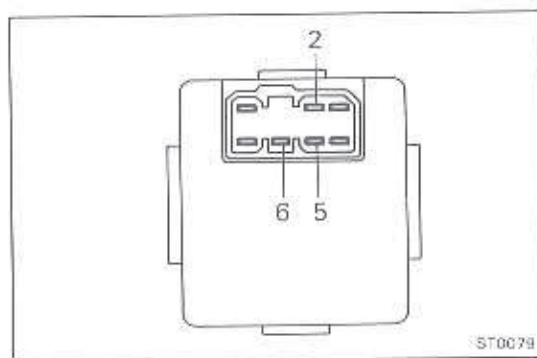
Main Relay

(See page CH-20)

Fixed Delay Type (LY) SYSTEM CIRCUIT



ST0078



ST0079

INSPECTION OF COMPONENTS Pre-Heating Timer

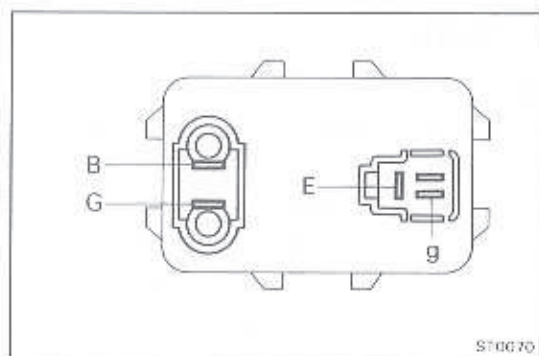
LOCATION: Under the instrument panel on the passenger side.

INSPECT PRE-HEATING TIMER

- (a) Turn the starter switch to "G" and measure the lighting time of the glow indicator light.

**Glow time at $-25 - 60^{\circ}\text{C}$ ($-13 - 140^{\circ}\text{F}$):
15 - 19.5 seconds**

- (b) Check that there is voltage at terminal 5 of the pre-heating timer when the starter switch is turned to "G".



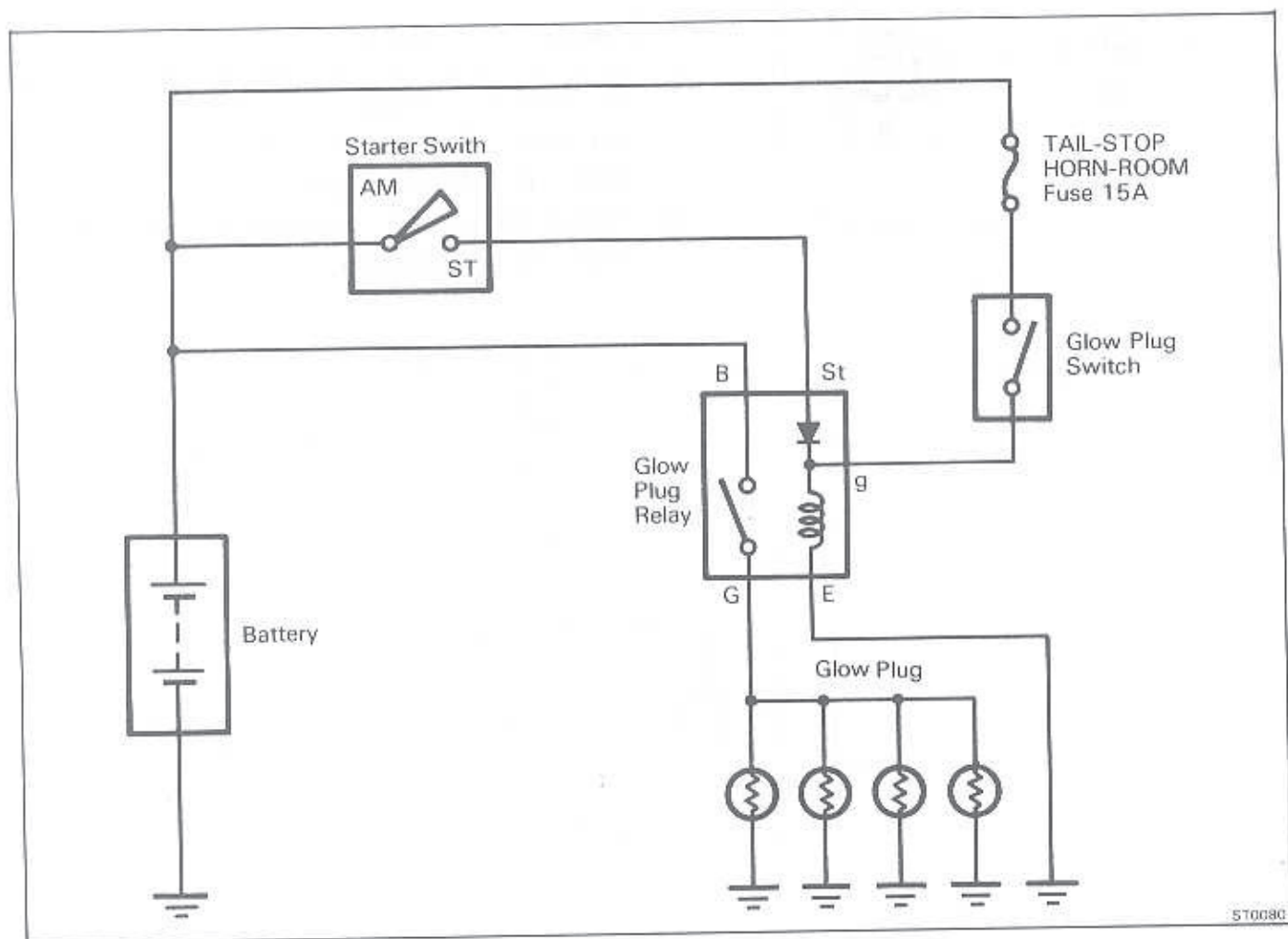
Glow Plug Relay

LOCATION: On the windshield wiper motor bracket.

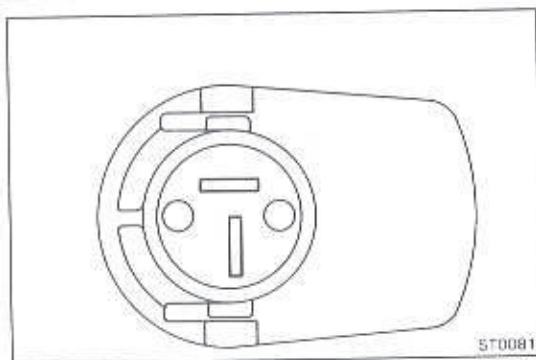
INSPECT GLOW PLUG RELAY

- (a) Using an ohmmeter, check for continuity between the following terminals:
 - E ↔ g **Continuity**
 - B ↔ G **No continuity**
- (b) Apply battery voltage between terminals E and g.
 - B ↔ G **Continuity**

Manual Type (LF) SYSTEM CIRCUIT



ST0080



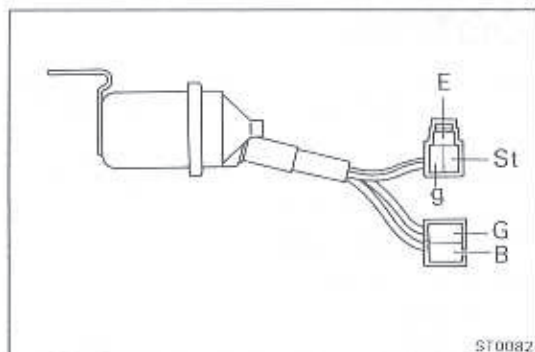
INSPECTION OF COMPONENTS Glow Plug Switch

INSPECT GLOW PLUG SWITCH

Check for continuity between terminals.

Terminal	B	g
Switch position		
OFF		
ON	○	○

If continuity is not as specified, replace the switch.



Glow Plug Relay

LOCATION: On the left fender apron in the engine compartment.

INSPECT GLOW PLUG RELAY

- (a) Using an ohmmeter, check for continuity between the following terminals.

• **E → g Continuity**

• **E → St**

Positive (+) test probe to terminal St

Negative (–) test probe to terminal E

Continuity

Positive (+) test probe to terminal E

Negative (–) test probe to terminal St

No continuity

• **B → G No continuity**

- (b) Apply battery voltage between terminals E and g.

• **B → G Continuity**

- (c) Apply battery voltage between terminals E and St.

• **B → G**

Battery positive (+) terminal to terminal St

Battery negative (–) terminal to terminal E

Continuity

If continuity is not as specified, replace the relay.

TROUBLESHOOTING

Problem	Possible cause	Remedy	Page
Engine will not crank	Battery charge low	Check battery specific gravity Charge or replace battery	CH-5
	Battery cables loose, corroded or worn	Repair or replace cables	
	Fusible link blown	Replace fusible link	
	Starter relay faulty	Check relay	ST-27
	Starter faulty	Repair starter	ST-15
	Starter switch faulty	Replace starter switch	
Engine cranks slowly	Battery charge low	Check battery specific gravity Charge or replace battery	CH-5
	Battery cables loose, corroded or worn	Repair or replace cables	
	Starter faulty	Repair starter	ST-15
Starter continues to run	Starter faulty	Repair starter	ST-15
	Starter switch faulty	Replace starter switch	
	Short in wiring	Repair wiring	
Starter spins - engine will not crank	Pinion gear teeth broken or faulty starter	Repair starter	ST-15
	Flywheel teeth broken	Replace flywheel	

STARTING SYSTEM CIRCUIT

