MAIN INDEX

HOW TO USE THIS MANUAL

IN04V-05

GENERAL INFORMATION

1. INDEX

An INDEX is provided on the first page of each section to guide you to the item to be repaired. To assist you in finding your way through the manual, the section title and major heading are given at the top of every page.

2. PRECAUTION

At the beginning of each section, a PRECAUTION is given that pertains to all repair operations contained in that section.

Read these precautions before starting any repair task.

3. TROUBLESHOOTING

TROUBLESHOOTING tables are included for each system to help you diagnose the problem and find the cause. The fundamentals of how to proceed with troubleshooting are described on page IN-9.

Be sure to read this before performing troubleshooting.

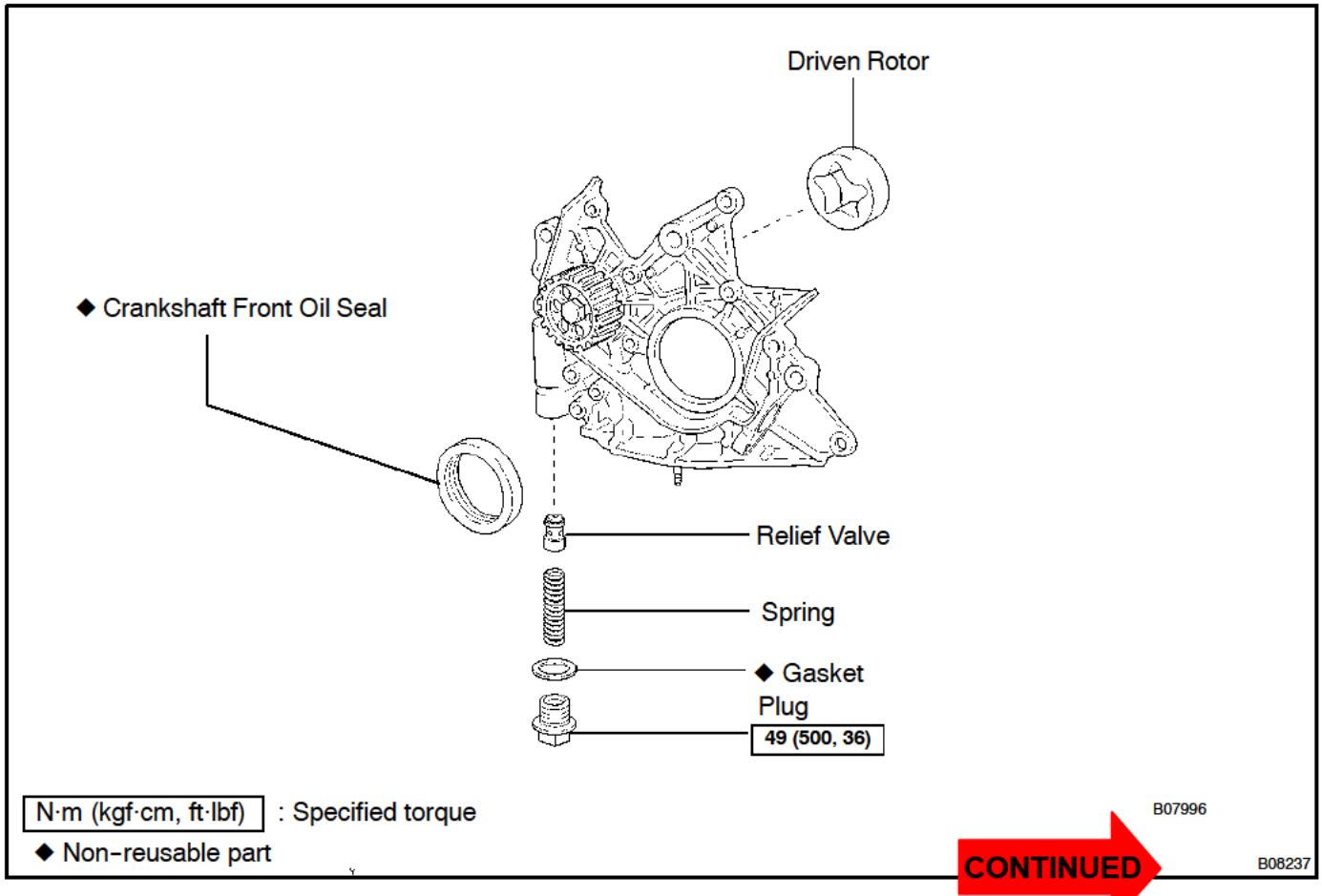
4. PREPARATION

Preparation lists the SST (Special Service Tools), recommended tools, equipment, lubricant and SSM (Special Service Materials) which should be prepared before beginning the operation and explains the purpose of each one.

5. REPAIR PROCEDURES

Most repair operations begin with an overview illustration. It identifies the components and shows how the parts fit together.

Example:



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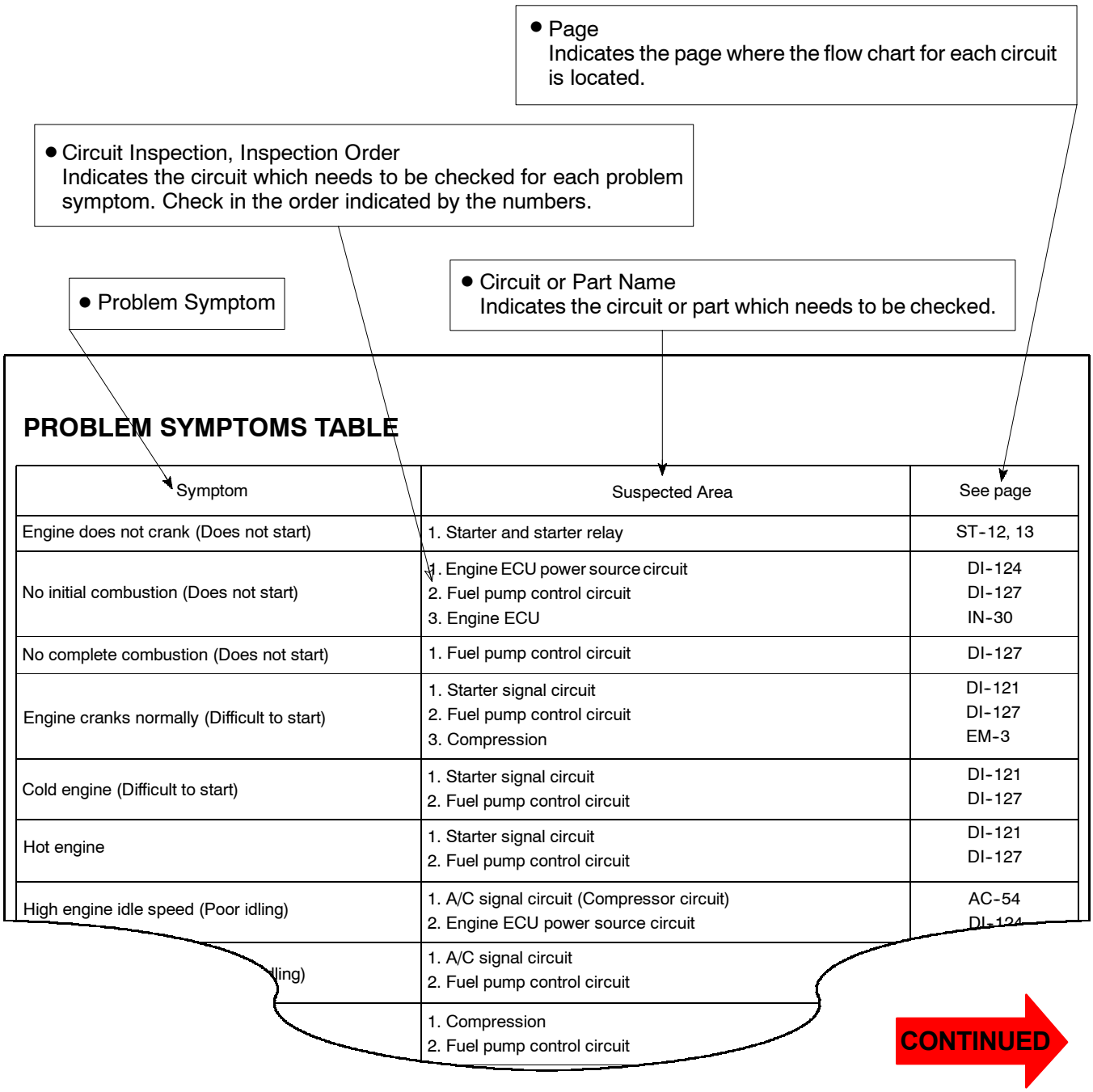
5. PROBLEM SYMPTOMS TABLE

The suspected circuits or parts for each problem symptom are shown in the table below. Use this table to troubleshoot the problem when a ”Normal” code is displayed in the diagnostic trouble code check but the problem is still occurring. Numbers in the table indicate the inspection order in which the circuits or parts should be checked.

HINT:

When the problem is not detected by the diagnostic system even though the problem symptom is present, it is considered that the problem is occurring outside the detection range of the diagnostic system, or that the problem is occurring in a system other than the diagnostic system.



PROBLEM SYMPTOMS TABLE

Symptom	Suspected Area	See page
Engine does not crank (Does not start)	1. Starter and starter relay	ST-12, 13
No initial combustion (Does not start)	1. Engine ECU power source circuit 2. Fuel pump control circuit 3. Engine ECU	DI-124 DI-127 IN-30
No complete combustion (Does not start)	1. Fuel pump control circuit	DI-127
Engine cranks normally (Difficult to start)	1. Starter signal circuit 2. Fuel pump control circuit 3. Compression	DI-121 DI-127 EM-3
Cold engine (Difficult to start)	1. Starter signal circuit 2. Fuel pump control circuit	DI-121 DI-127
Hot engine	1. Starter signal circuit 2. Fuel pump control circuit	DI-121 DI-127
High engine idle speed (Poor idling)	1. A/C signal circuit (Compressor circuit) 2. Engine ECU power source circuit	AC-54 DI-124
...lling)	1. A/C signal circuit 2. Fuel pump control circuit	
	1. Compression 2. Fuel pump control circuit	

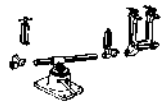
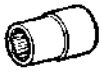
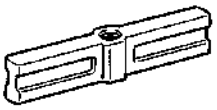
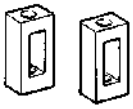
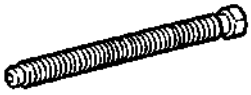
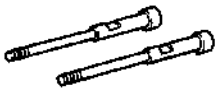
CONTINUED

LHD	Left-Hand Drive
LO	Low
MAP	Manifold Absolute Pressure
MAX.	Maximum
MIL	Malfunction Indicator Lamp
MIN.	Minimum
MP	Multipurpose
M/T	Manual Transmission
N	Neutral
O2S	Oxygen Sensor
O/D	Overdrive
O/S	Oversize
PKB	Parking Brake
PS	Power Steering
RAM	Random Access Memory
R/B	Relay Block
RH	Right-Hand
RHD	Right-Hand Drive
ROM	Read Only Memory
Rr	Rear
SICS	Starting Injection Control System
SPEC	Specification
SSM	Special Service Materials
SST	Special Service Tools
STD	Standard
SW	Switch
TACH	Tachometer
TDC	Top Dead Center
TEMP.	Temperature
TM	Transmission
TMC	TOYOTA Motor Corporation
TWC	Three-Way Catalyst
U/D	Underdrive
VCV	Vacuum Control Valve
VIN	Vehicle Identification Number
VSV	Vacuum Switching Valve
w/	With
W/H	Wire Harness
w/o	Without
WU-TWC	Warm Up Three-Way Catalytic Converter
2WD	Two Wheel Drive Vehicle (4x2)
4WD	For Wheel Drive Vehicle (4x4)

ENGINE FUEL

PP3F6-02

SST (Special Service Tools)

	09241-76022	Injection Pump Stand Set	
	09245-54010	Injection Pump Stand Arm	
	09260-54012	Injection Pump Tool Set	
	(09262-54010)	Distributor Head Plug Wrench	
	(09269-54020)	Socket 14 mm	
	(09951-05010)	Hanger 150	
	(09952-05010)	Slide Arm	
	(09953-05020)	Center Bolt 150	
	(09954-05010)	Claw No.1	CONTINUED

ELECTRONIC CONTROL DIESEL

SERVICE DATA

SS0L2-04

Throttle control motor	Resistance (2 and 1/3, 5 and 4/3)	at hot at cold	23 - 33 Ω 29 - 39 Ω
Timing control valve	Resistance	at 20°C (68°F)	10 - 14 Ω
Spill control valve	Resistance	at 20°C (68°F)	1 - 2 Ω
E-VRV for EGR (w/ EGR)	Resistance	at 20°C (68°F)	11 - 13 Ω
Water temperature sensor Fuel temperature sensor Intake air temperature sensor	Resistance	at -20°C (-4°F) at 0°C (32°F) at 20°C (68°F) at 40°C (104°F) at 60°C (140°F) at 80°C (176°F)	10 - 20 kΩ 4 - 7 kΩ 2 - 3 kΩ 0.9 - 1.3 kΩ 0.4 - 0.7 kΩ 0.2 - 0.4 kΩ
Turbo pressure sensor	Power source voltage		4.5 - 5.5 V
Engine speed sensor	Resistance	at 20°C (68°F)	205 - 255 Ω

CONTINUED

ACT (E7-13) - E1 (E5-22)	L-B - BR	IG switch ON	9 - 14
		At A/C cut controlled (Driving below 30 km/h, accelerator pedal fully opened for 5 sec.)	0 - 3
PDL (E7-9) - E1 (E5-22)	GR - BR	Accelerator pedal fully closed	9 - 14
		Accelerator pedal fully opened	0 - 3
TAC (E7-2) - E1 (E5-22)	B - BR	Idling	Pulse generation
TC (E8-18) - E1 (E5-22)	P-B - BR	IG switch ON	9 - 14
W (E8-12) - E1 (E5-22)	W - BR	Check engine warning light lights up	0 - 3
		Except check engine warning light lights up	9 - 14
G-IND (E8-3) - E1 (E5-22)	Y-R - BR	Glow indicator light lights up	0 - 3
		Except glow indicator light lights up	9 - 14
DATA (E6-13) - E1 (E5-22)	G-B - BR	For 0.5 sec. after IG switch ON	Pulse generation
CLK (E6-12) - E1 (E5-22)	G-W - BR	For 0.5 sec. after IG switch ON	Pulse generation
EGRC (E7-3) - E1 (E5-22)	R - BR	IG switch ON	0 - 3
		Maintain engine speed at 1500 rpm after warming up	9 - 14
IREL (E9-2) - E1 (E5-22)	G-Y - BR	IG switch ON	0 - 3
		At intake heater ON	9 - 14
VCH (E7-23) - E1 (E5-22)	Y-R - BR	Heater blower switch ON	0 - 3
		Heater blower switch OFF	9 - 14
SVR (E9-13) - E1 (E5-22)	L-W - BR	IG switch ON	0 - 1.5
VCT (E6-7) - E1 (E5-22)	L-B - BR	Heater blower switch ON	0 - 3
		Heater blower switch OFF	9 - 14
HSW (E9-20) - E1 (E5-22)	B-L - BR	Push on power heater switch	0 - 3
		Push off power heater switch	9 - 14
FSW (E7-7) - E1 (E5-22)	R-L - BR	At shift position in first position	9 - 14
		At other shift position in first position	0 - 3
PS (E7-9) - E1 (E8-22)	P - BR	Idling Turn steering wheel	0 - 3
		IG switch ON	9 - 14
SIL (E8-19) - E1 (E8-22)	V-W - BR	Connect hand-held tester to DLC3	Pulse generation
IMI (E9-17) - E1 (E8-22)	L-B - BR	Idling	Pulse generation
IMO (E9-6) - E1 (E8-22)	L-R - BR	A few sec. after engine staring	Pulse generation

NG

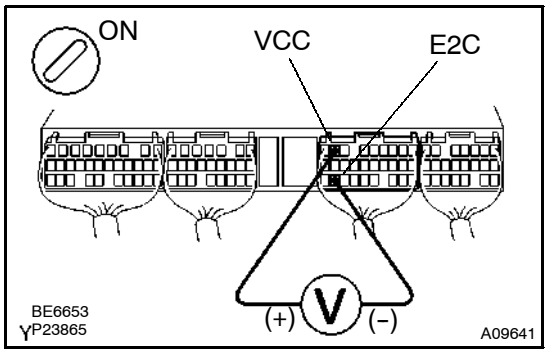
4	Check for open and short in harness and connector in VA or VAS between engine ECU and accelerator pedal position sensor (See page IN-20).

NG → Repair or replace harness or connector.

OK

Replace accelerator pedal.

5	Check voltage between terminals VCC and E2C of engine ECU connector.



PREPARATION:

(a) Remove the glove compartment door.

(b) Turn the ignition switch ON.

CHECK:

Measure the voltage between terminals VCC and E2C of the engine ECU connector.

OK:

Voltage: 4.5 - 5.5 V

NG → Check and replace engine ECU (See page IN-20).

OK

Check for open in harness and connector in VCC circuit between engine ECU and accelerator pedal position sensor (See page IN-20).

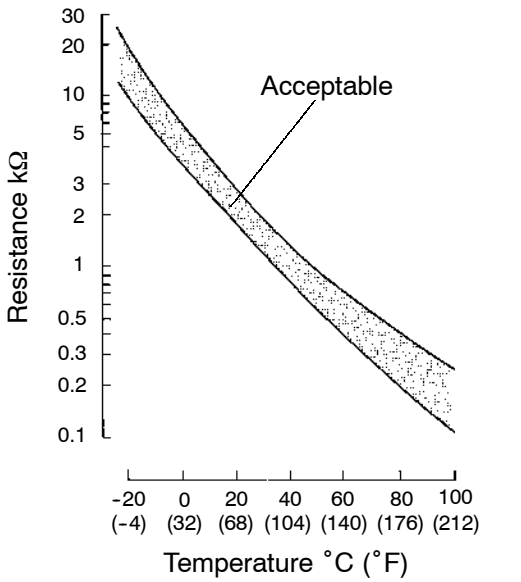
CONTINUED

D 8FM-01

DTC	39	Fuel Temp. Sensor Circuit Malfunction

CIRCUIT DESCRIPTION

Fig. 1



The fuel temperature sensor senses the fuel temperature. A thermistor built in the sensor changes the resistance value according to the fuel temperature. The lower the fuel temperature is, the greater the thermistor resistance value becames, and the higher the fuel temperature,is the lower the thermistor resistance value (See Fig. 1) becames.

The fuel temperature sensor is connected to the engine ECU (See below). The 5 V power source voltage in the engine ECU is applied to the fuel temperature sensor from terminal THF via a resistor R. That is, resistor R and the fuel temperature sensor are connected in series. When the resistance value of the fuel temperature sensor changes in accordance with changes in the fuel temperature, the potential at terminal THF also changes. Based on this signal, the engine ECU increases the fuel injection volume to improve driveability during low engine revolution and high fuel temperature.

DTC No.	DTC Detection Condition	Trouble Area
39	Open or short in fuel temperature sensor circuit for 0.5 seconds or more	• Open or short in fuel temp. sensor circuit • Fuel temp. sensor • Engine ECU

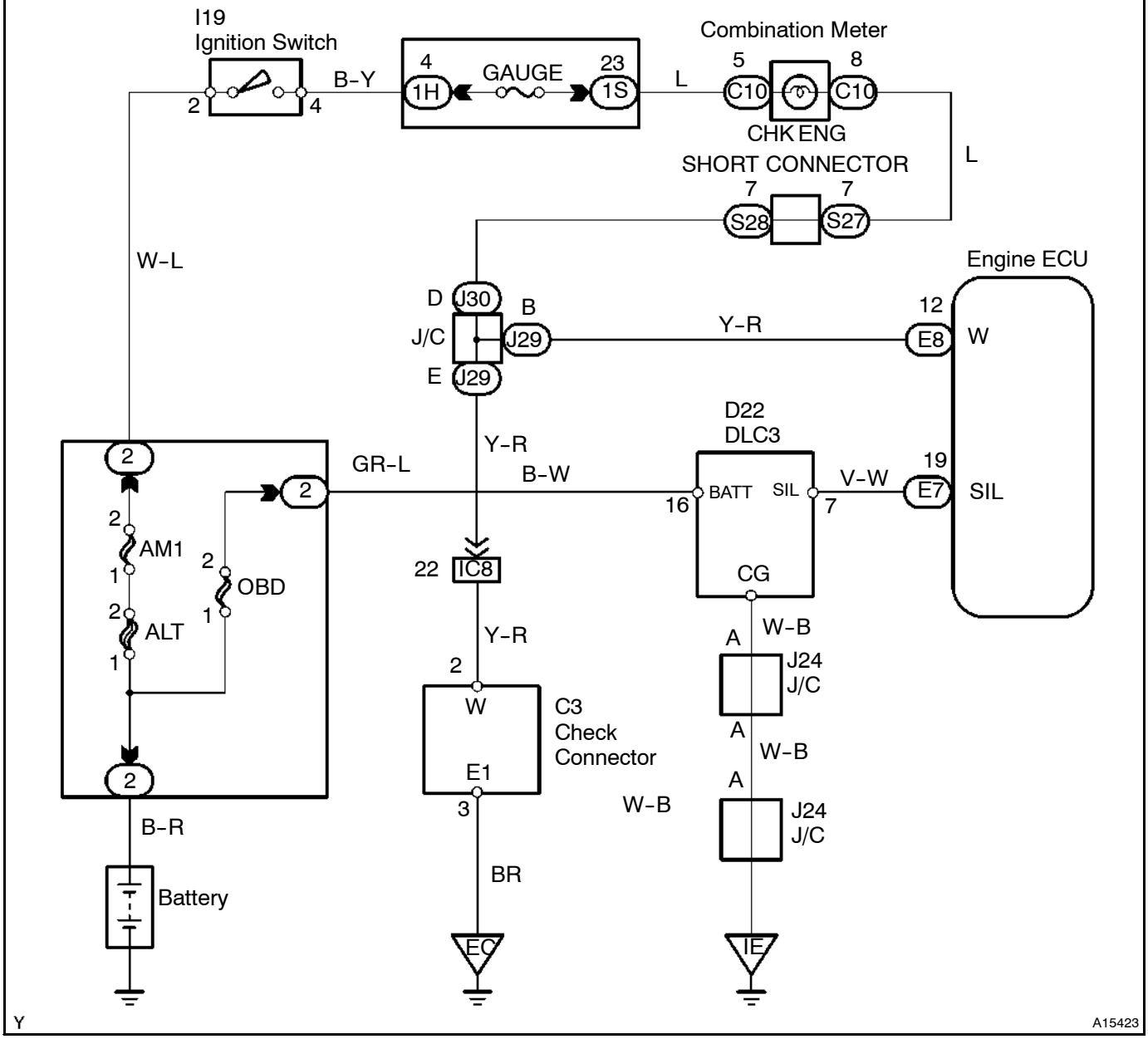
HINT:

After confirming DTC 39, use the hand-held tester to confirm the water temperature from the CURRENT DATA.

Displayed Temperature	Malfunction
-40°C (-40°F)	Open circuit
140°C (284°F) or more	Short circuit

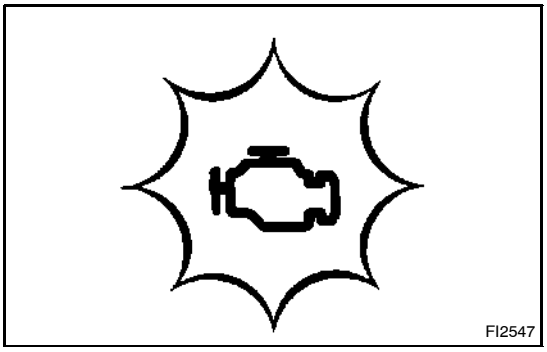
CONTINUED

Land Cruiser/Land Cruiser Prado



INSPECTION PROCEDURE

1	**Check check engine warning light condition.**



PREPARATION:

(a) Turn the ignition switch ON.

(b) Using SST, connect terminals TC and CG of the DLC3.

SST 09843-18040 (Picture not available.)

CHECK:

Check the check engine warning light condition.

OK:

Check engine warning light: Blinking

CONTINUED

D 8FT-01

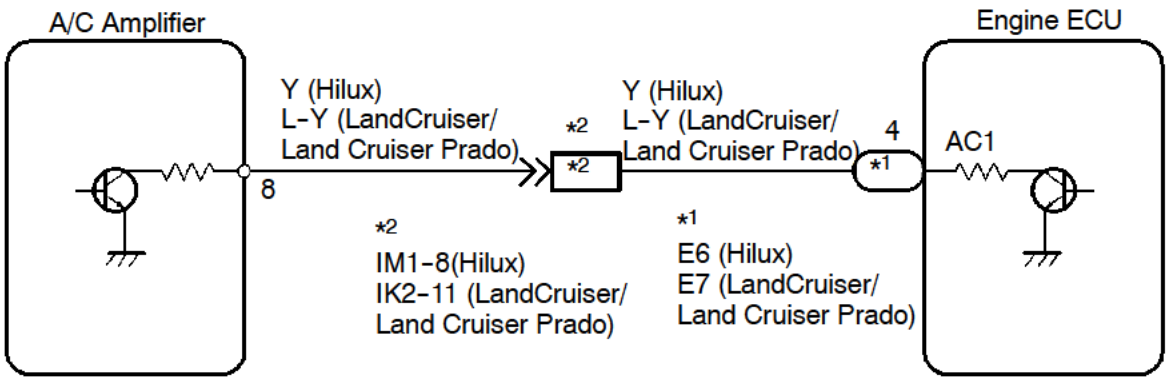
A/C Signal Circuit

CIRCUIT DESCRIPTION

When the A/C compressor is on, the A/C amplifier sends an A/C signal to the engine ECU, then engine ECU increases the fuel injection volume to improve the driveability during the engine idling.

WIRING DIAGRAM

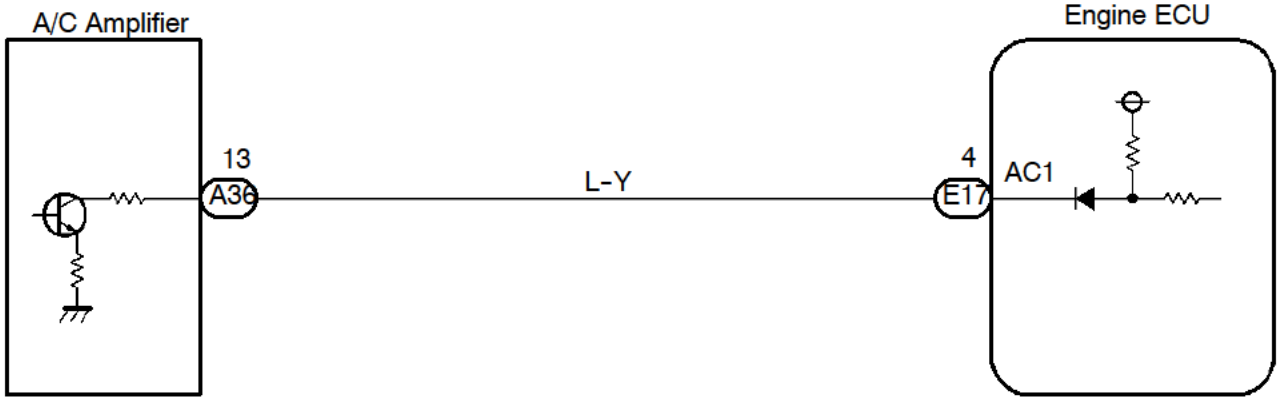
Hilux, Land Cruiser/LandCruiser Prado



Y

A15052

4Runner



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A15415

CONTINUED

TURBOCHARGER

TC01P-03

ON-VEHICLE INSPECTION

1. INSPECT INTAKE AIR SYSTEM

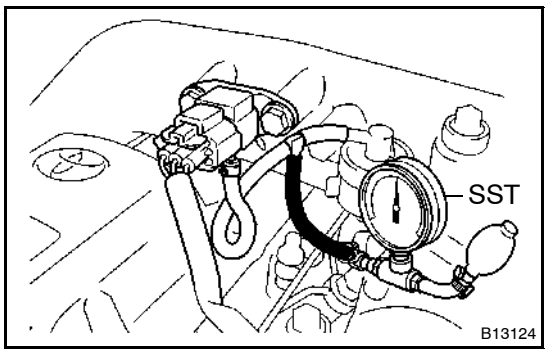
Check for leakage or clogging between the air cleaner housing and turbocharger inlet and between the turbocharger outlet and cylinder head.

- Clogged air cleaner .... Clean or replace element
- Hoses collapsed or deformed .... Repair or replace
- Leakage from connections .... Check each connection and repair
- Cracks in components .... Check and replace

2. INSPECT EXHAUST SYSTEM

Check for leakage or clogging between the cylinder head and turbocharger inlet and between the turbocharger outlet and exhaust pipe.

- Deformed components .... Repair or replace
- Foreign material in passages .... Remove
- Leakage from components .... Repair or replace
- Cracks in components .... Check and replace



3. CHECK TURBOCHARGER PRESSURE

(a) Warm up engine.

(b) Using a 3-way connector, connect SST (turbocharger pressure gauge) to the hose leading to the intake manifold.

SST 09992-00242

(c) Press in the clutch pedal, then press the accelerator pedal down as far as it will go. Measure the turbocharging pressure at maximum speed (approx. 4,600 rpm).

Standard pressure:

51 - 67 kPa (0.52 - 0.68 kgf/cm^2, 7.4 - 9.7 psi)

If the pressure is less than specified, check the intake air and exhaust systems for leakage.

If there is no leakage, replace the turbocharger.

If the pressure is above specification, check if the actuator hose is disconnected or cracked. If not, replace the turbocharger.

4. INSPECT IMPELLER WHEEL ROTATION (See page TC-3)

5. INSPECT ACTUATOR OPERATION (See page TC-3)

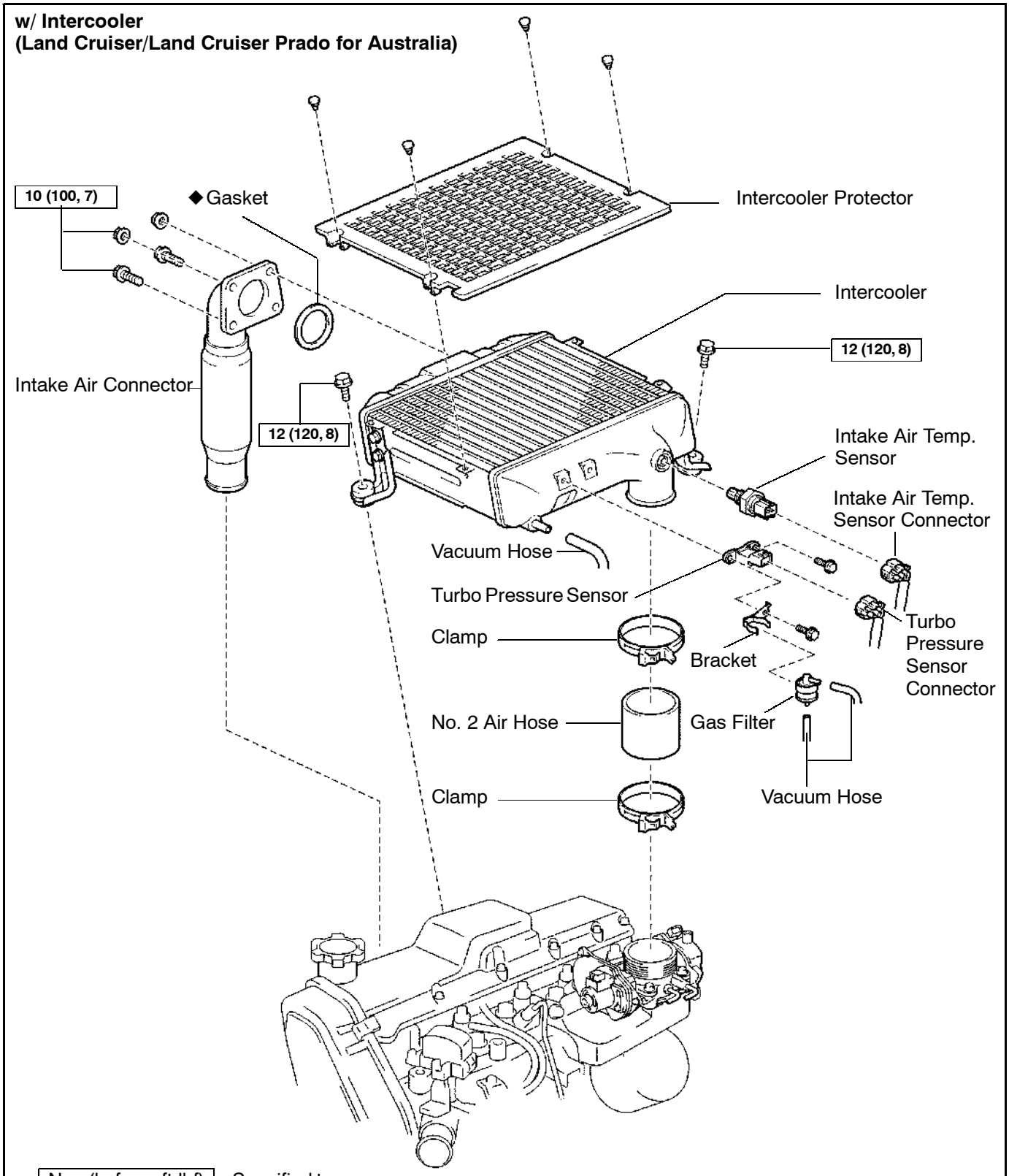
6. INSPECT TURBO PRESSURE SENSOR (See page ED-15)

INTERCOOLER

COMPONENTS

TC039-01

w/ Intercooler
(Land Cruiser/Land Cruiser Prado for Australia)

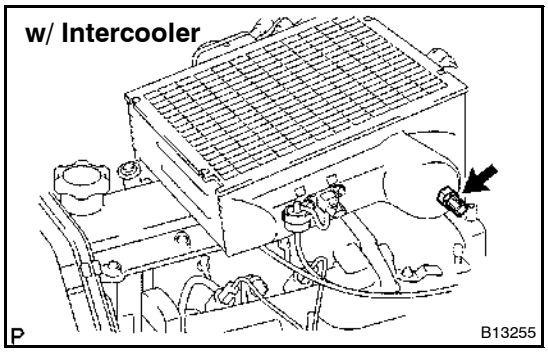


N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non-reusable part

P

B13241



INTAKE AIR TEMPERATURE SENSOR

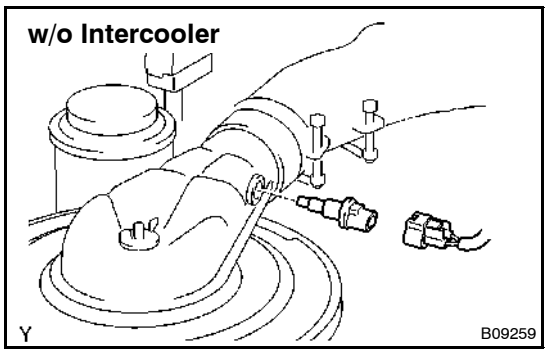
INSPECTION

ED041-01

1. w/ Intercooler:
REMOVE INTAKE AIR TEMPERATURE SENSOR

(a) Disconnect the sensor connector.

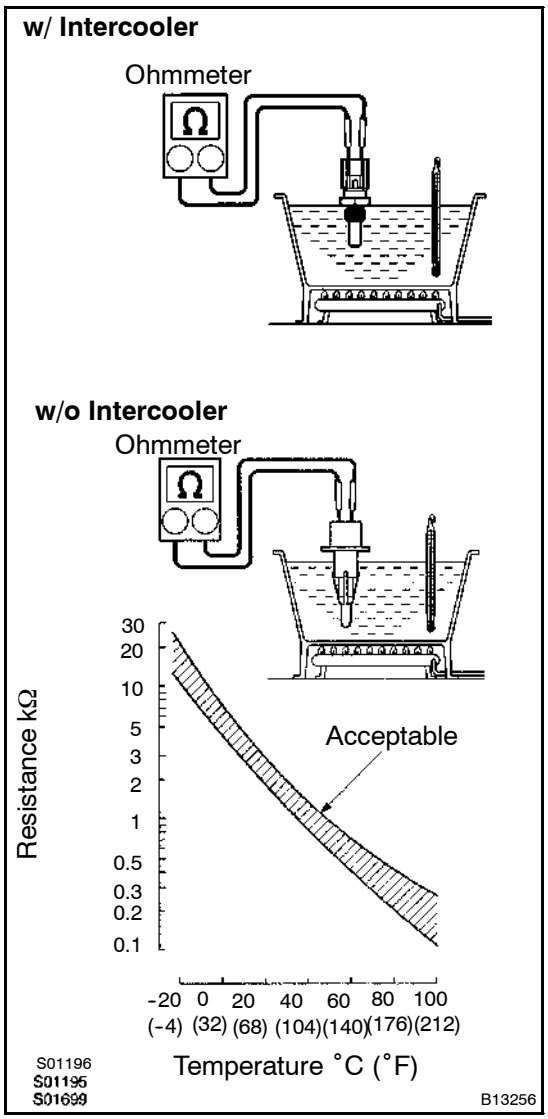
(b) Using a 22 mm deep socket wrench, remove the sensor.



2. w/o Intercooler:
REMOVE INTAKE AIR TEMPERATURE SENSOR

(a) Disconnect the sensor connector.

(b) Remove the sensor.



3. INSPECT INTAKE AIR TEMPERATURE SENSOR

Using an ohmmeter, measure the resistance between the terminals.

Resistance: Refer to the chart graph

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

4. w/ Intercooler:
REINSTALL INTAKE AIR TEMPERATURE SENSOR

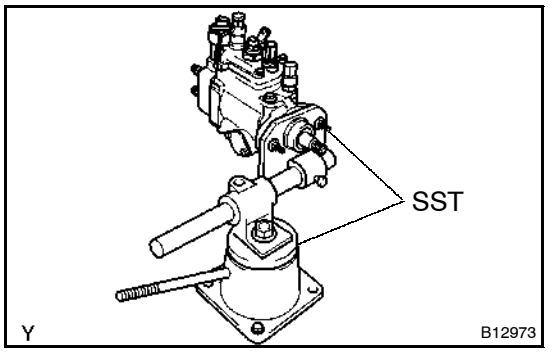
(a) Using a 22 mm deep socket wrench, install the sensor.
Torque: 29.4 N·m (300 kgf·cm, 20 ft·lbf)

(b) Connect the sensor connector.

5. w/o Intercooler:
REINSTALL INTAKE AIR TEMPERATURE SENSOR

FU08M-01

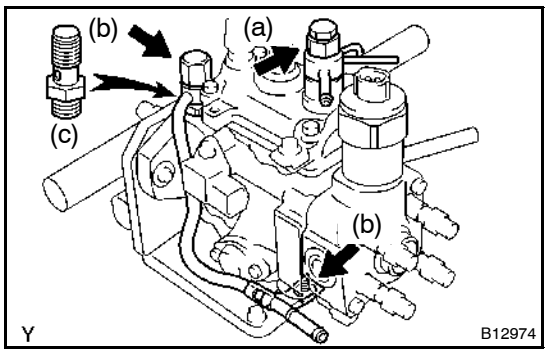
DISASSEMBLY



1. MOUNT PUMP ASSEMBLY TO SST (STAND)

SST 09241-76022, 09245-54010

2. REMOVE SET KEY OF DRIVE PULLEY FROM DRIVE SHAFT

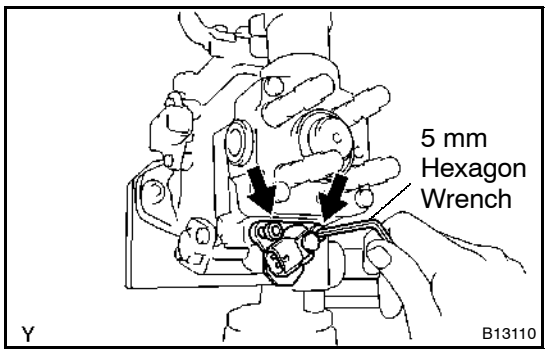


3. REMOVE FUEL PIPES AND INLET HOLLOW SCREW

(a) Remove the overflow screw, fuel outlet pipe and 2 gaskets.

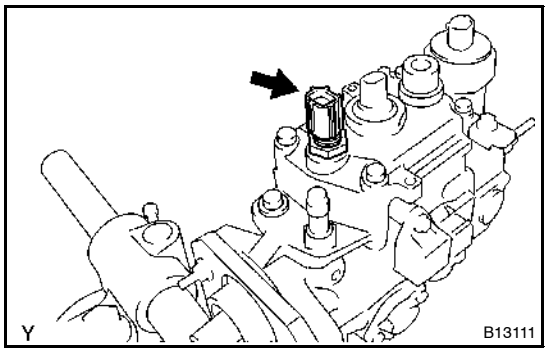
(b) Remove the cap nut, bolt, fuel inlet pipe and 2 gaskets.

(c) Remove the fuel inlet hollow screw and gasket.



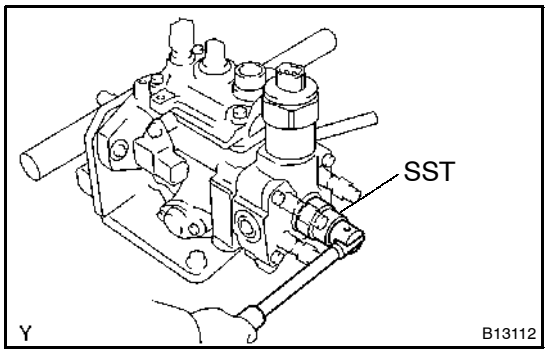
4. REMOVE TIMING CONTROL VALVE

Using a 5 mm hexagon wrench, remove the 2 bolts and timing control valve.



5. REMOVE FUEL TEMPERATURE SENSOR

Using a 19 mm deep socket wrench, remove the fuel temperature sensor and O-ring.



6. REMOVE DISTRIBUTIVE HEAD PLUG

Using SST, remove the distributive head plug.

SST 09260-54012 (09262-54010)

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