HOW TO USE THIS MANUAL

IN00U-36

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-16 .

Be sure to read this before performing troubleshooting.

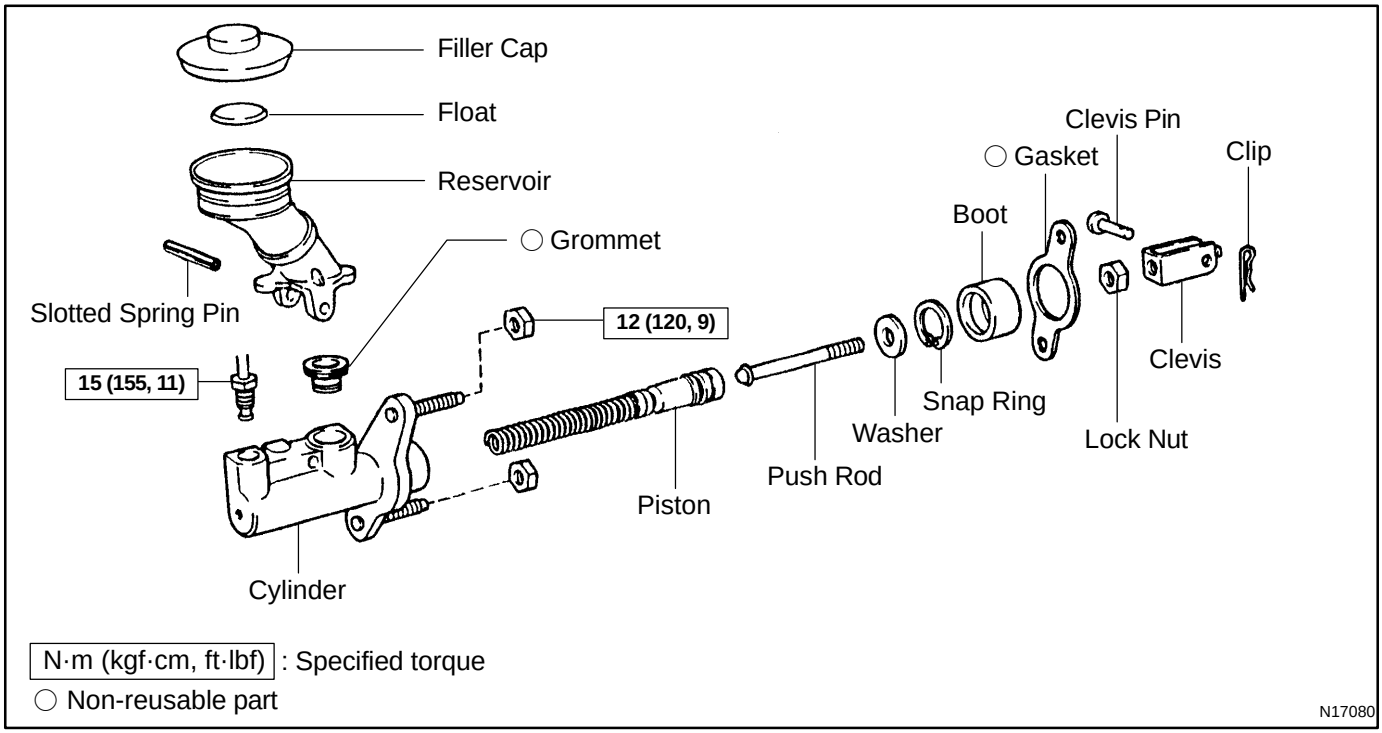
4. PREPARATION

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.

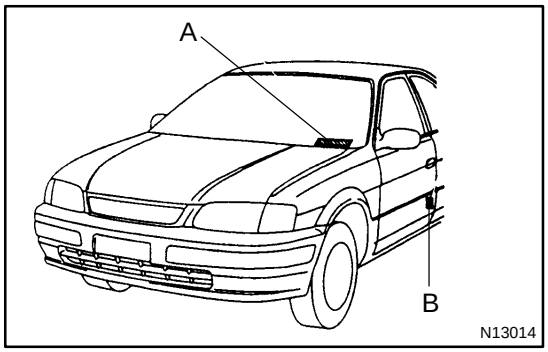
Example:



IDENTIFICATION INFORMATION

IN07B-01

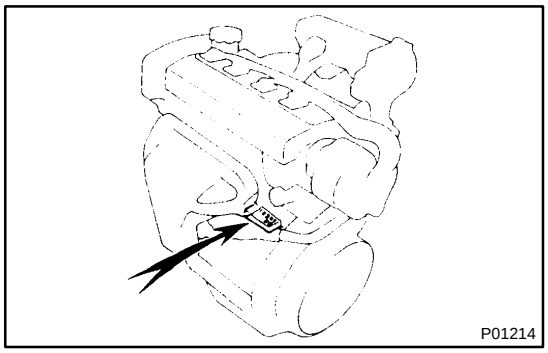
VEHICLE IDENTIFICATION AND ENGINE SERIAL NUMBER



1. VEHICLE IDENTIFICATION NUMBER

The vehicle identification number is stamped on the vehicle identification number plate and the certification label, as shown in the illustration.

A: Vehicle Identification Number Plate
B: Certification Label



2. ENGINE SERIAL NUMBER

The engine serial number is stamped on the engine block, as shown in the illustration.

CHASSIS

MA03P-02

INSPECTION

1. INSPECT STEERING LINKAGE

(a) Check the steering wheel freeplay (See page SR-10).

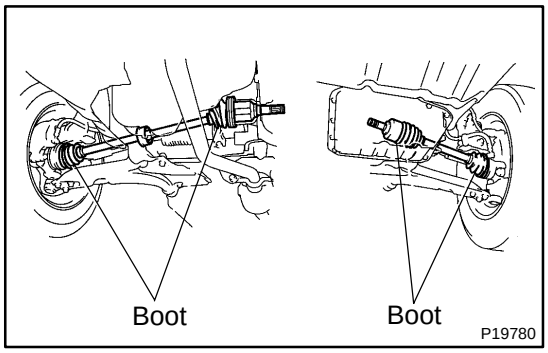
(b) Check the steering linkage for looseness or damage.

- Check that the tie rod ends do not have excessive play.
- Check that the dust seals and boots are not damaged.
- Check that the boot clamps are not loose.

2. INSPECT SRS AIRBAG (See page RS-2)

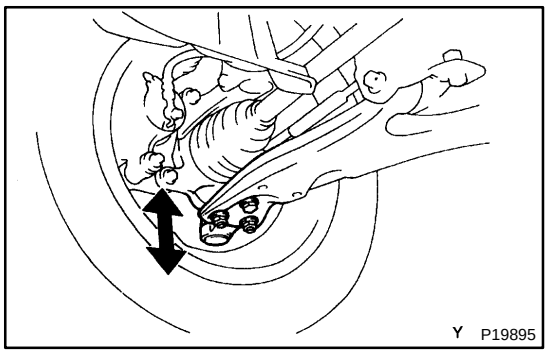
3. INSPECT STEERING GEAR HOUSING OIL

Check the steering gear housing for oil leakage.



4. INSPECT DRIVE SHAFT BOOTS

Check the drive shaft boots for clamp looseness, leakage or damage.



5. INSPECT BALL JOINT AND DUST COVERS

(a) Inspect the ball joints for excessive looseness.

(1) Jack up the front of the vehicle and place wooden blocks with a height of 180 - 200 mm (7.09 - 7.87 in.) under the front tires.

(2) Lower the jack until there is about half a load on the front coil spring. Place stands under the vehicle for safety.

(3) Make sure the front wheels are in a straightforward position and block the wheel with chocks.

(4) Move the lower arm up and down, and check that the ball joint has no excessive play.

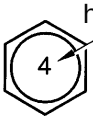
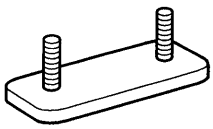
Maximum ball joint vertical play: 0 mm (0 in.)

If there is play, replace the ball joint.

STANDARD BOLT

HOW TO DETERMINE BOLT STRENGTH

SS00F-01

	Mark	Class		Mark	Class
Hexagon head bolt	 4- 5- 6- 7- 8- 9- 10- 11-	4T 5T 6T 7T 8T 9T 10T 11T	Hexagon flange bolt w/ washer hexagon bolt	 4 Protruding lines	9T
			Hexagon flange bolt w/ washer hexagon bolt	 5 Protruding lines	10T
	 No mark	4T	Hexagon flange bolt w/ washer hexagon bolt	 6 Protruding lines	11T
Hexagon flange bolt w/ washer hexagon bolt	 No mark	4T	Stud bolt		4T
Hexagon head bolt	 2 Protruding lines	5T			
Hexagon flange bolt w/ washer hexagon bolt	 2 Protruding lines	6T			6T
Hexagon head bolt	 3 Protruding lines	7T	Welded bolt		4T
Hexagon head bolt	 4 Protruding lines	8T			

V06821

DI4LD-02

CUSTOMER PROBLEM ANALYSIS CHECK

ENGINE CONTROL SYSTEM Check Sheet

Inspector's Name _____

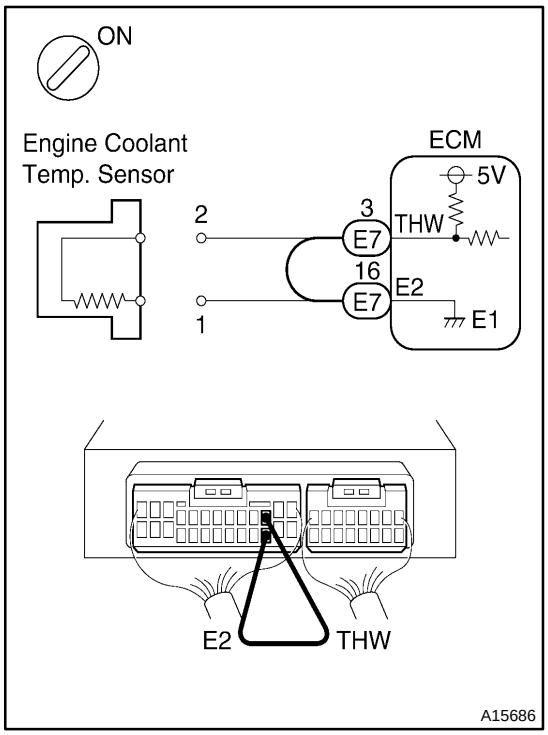
Customer's Name		**Model and Model Year**	
Driver's Name		**Frame No.**	
Date Vehicle Brought in		**Engine Model**	
License No.		**Odometer Reading**	km miles

Problem Symptoms	☐ **Engine does not Start**	☐ **Engine does not crank** ☐ **No initial combustion** ☐ **No complete combustion**
	☐ **Difficult to Start**	☐ **Engine cranks slowly** ☐ **Other** _____
	☐ **Poor Idling**	☐ **Incorrect first idle** ☐ **Idling rpm is abnormal** ☐ **High (rpm)** ☐ **Low (rpm)** ☐ **Rough idling** ☐ **Other** _____
	☐ **Poor Driveaability**	☐ **Hesitation** ☐ **Back fire** ☐ **Muffler explosion (after-fire)** ☐ **Surging** ☐ **Knocking** ☐ **Other** _____
	☐ **Engine Stall**	☐ **Soon after starting** ☐ **After accelerator pedal depressed** ☐ **After accelerator pedal released** ☐ **During A/C operation** ☐ **Shifting from N to D** ☐ **Other** _____
	☐ **Others**	

Datas Problem Occurred		
Problem Frequency		☐ **Constant** ☐ **Sometimes (times per day/month)** ☐ **Once only** ☐ **Other** _____
Condition When Problem Occurs	**Weather**	☐ **Fine** ☐ **Cloudy** ☐ **Rainy** ☐ **Snowy** ☐ **Various/Other** _____
	Outdoor Temperature	☐ **Hot** ☐ **Warm** ☐ **Cool** ☐ **Cold (approx. ____˚F/____˚C)**
	Place	☐ **Highway** ☐ **Suburbs** ☐ **Inner City** ☐ **Uphill** ☐ **Downhill** ☐ **Rough road** ☐ **Other** _____
	Engine Temp.	☐ **Cold** ☐ **Warming up** ☐ **After Warming up** ☐ **Any temp.** ☐ **Other** _____
	Engine Operation	☐ **Starting** ☐ **Just after starting (min.)** ☐ **Idling** ☐ **Racing** ☐ **Driving** ☐ **Constant speed** ☐ **Acceleration** ☐ **Deceleration** ☐ **A/C switch ON/OFF** ☐ **Other** _____

Condition of MIL		☐ **Remains on** ☐ **Sometimes light up** ☐ **Does not light up**
DTC Inspection	**Normal mode (Pre-check)**	☐ **Normal** ☐ **Malfunction code(s) (code)** ☐ **Freeze frame data ( )**
	Check Mode	☐ **Normal** ☐ **Malfunction code(s) (code)** ☐ **Freeze frame data ( )**

3	Check for open in harness or ECM.



PREPARATION:

(a) Remove the lower finish panel.

(b) Connect terminals THW and E2 of ECM connector together.

HINT:

Engine coolant temperature sensor connector is disconnected. Before checking, do a visual and contact pressure check for the ECM connector (See page IN-26).

(c) Turn the ignition switch ON.

CHECK:

Read the temperature value on the OBD II scan tool or TOYOTA hand-held tester.

OK:

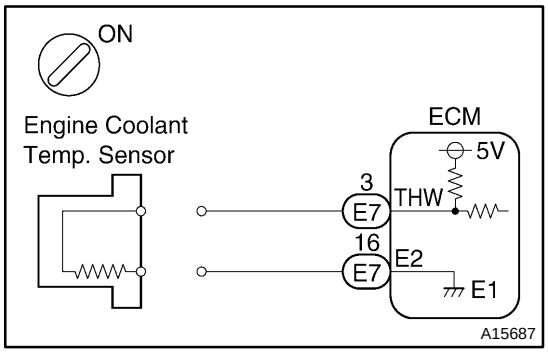
Temperature value: 140˚C (284˚F) or more

OK	Open in harness between terminal E2 or terminal THW, repair or replace harness.

NG

Confirm good connection at ECM.
If OK, replace ECM.

4	Check for short in harness and ECM.



PREPARATION:

(a) Disconnect the engine coolant temperature sensor connector.

(b) Turn the ignition switch ON.

CHECK:

Read the temperature value on the OBD II scan tool or TOYOTA hand-held tester.

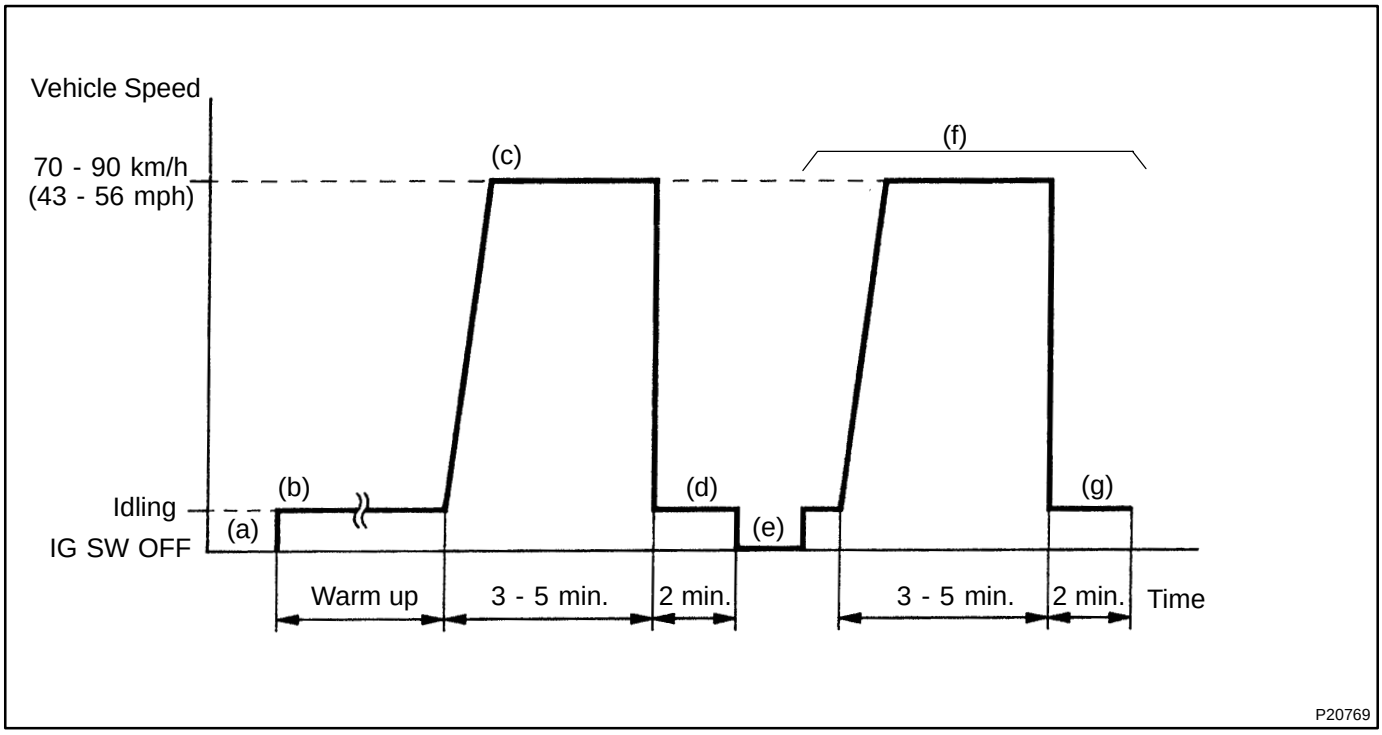
OK:

Temperature value: -40˚C (-40˚F)

OK	Replace engine coolant temperature sensor.

NG

SYSTEM CHECK DRIVING PATTERN



(a) Connect the OBD II scan tool or TOYOTA hand-held tester to the DLC3.
(b) Start the engine and warm it up with all accessories switched OFF.
(c) Run the vehicle at 70 - 90 km/h (43 - 56 mph) for 3 minutes or more.
(d) Idle the engine for about 2 minutes.
(e) Stop at safe place and turn the ignition switch OFF.
(f) Start the engine and do steps (c) and (d) again.
(g) Check the READINESS TESTS mode on the OBD II scan tool or TOYOTA hand-held tester. If COMPL is displayed and the MIL does not light up, the system is normal. If INCMPL is displayed and the MIL does not light up, run the vehicle again and check it.

HINT:
INCMPL is displayed when either condition (h) or (i) exists.
(h) The system check is incomplete.
(i) There is a malfunction in the system.

If there is a malfunction in the system, the MIL will light up after steps (b) to (f) above are done.

INSPECTION PROCEDURE

HINT:

- If DTC P0105 and/or P0106 and P0401 are output simultaneously, perform troubleshooting of DTC ”P0105” first.
- If DTC P0401 and P0402 are output simultaneously, perform troubleshooting of DTC P0402 first.

DI4LO-01

CUSTOMER PROBLEM ANALYSIS CHECK

ABS Check Sheet

Inspector's Name :

Customer's Name		**Registration No.**	
		Registration Year	/ /
		Frame No.	
Date Vehicle Brought In	/ /	**Odometer Reading**	km miles

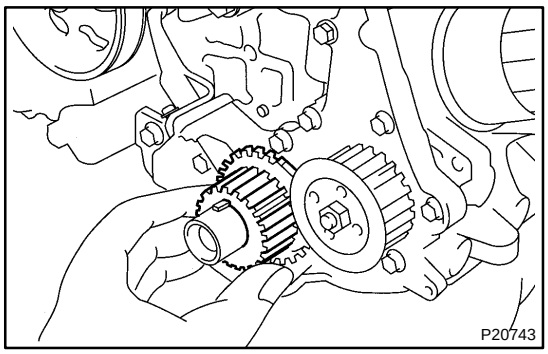
Date Problem First Occurred	/ /
Frequency Problem Occurs	☐ Continuous ☐ Intermittent (times a day)

Symptoms	☐ ABS does not operate.	
	☐ ABS does not operate intermittently.	
	ABS Warning Light Abnormal	☐ Remains ON ☐ Does not Light Up

DTC Check	**1st Time**	☐ Normal Code ☐ Malfunction Code (Code)
	2nd Time	☐ Normal Code ☐ Malfunction Code (Code)

EM1OE-01

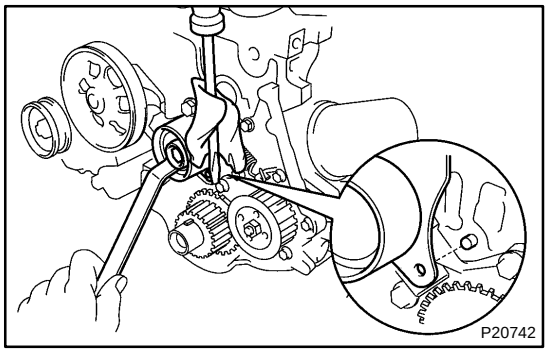
INSTALLATION



1. INSTALL CRANKSHAFT TIMING PULLEY

(a) Align the pulley set key with the key groove of the pulley.

(b) Slide on the timing pulley, facing the rotor side of the crankshaft position sensor inward.



2. TEMPORARILY INSTALL NO.1 IDLER PULLEY AND TENSION SPRING

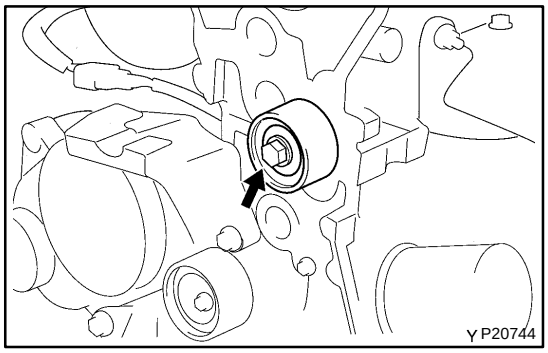
(a) Install the tension spring to the idler pulley.

(b) Align the bracket pin hole with the pivot pin.

(c) Install the idler pulley with the bolt. Do not tighten the bolt yet.

(d) Pry the idler pulley toward the left as far as it will go and temporarily tighten the bolt.

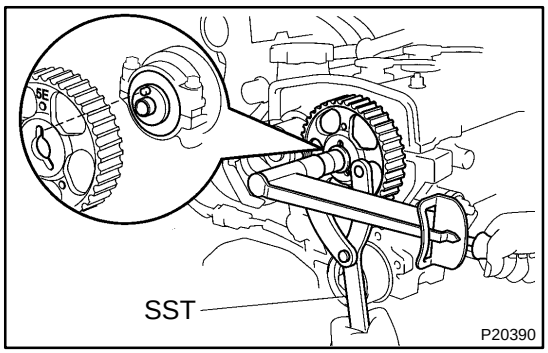
(e) Check that the idler pulley moves smoothly.



3. INSTALL NO.2 IDLER PULLEY

(a) Install the idler pulley with the bolt.
Torque: 28 N·m (280 kgf·cm, 20 ft·lbf)

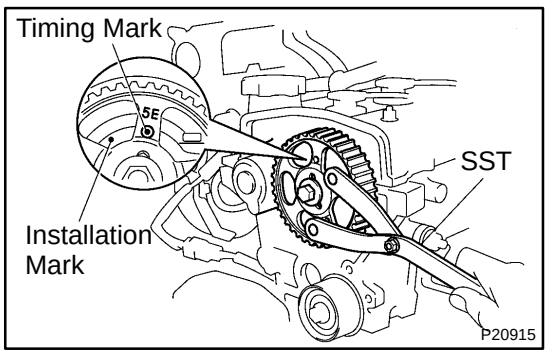
(b) Check that the idler pulley moves smoothly.



4. INSTALL CAMSHAFT TIMING PULLEY

(a) Align the camshaft knock pin with the knock pin groove on the pulley side with the 5E mark, and slide on the timing pulley.

(b) Using SST, install the pulley bolt.
SST 09960-10010 (09962-01000, 09963-01000)
Torque: 51 N·m (510 kgf·cm, 37 ft·lbf)



5. SET NO.1 CYLINDER TO TDC/COMPRESSION

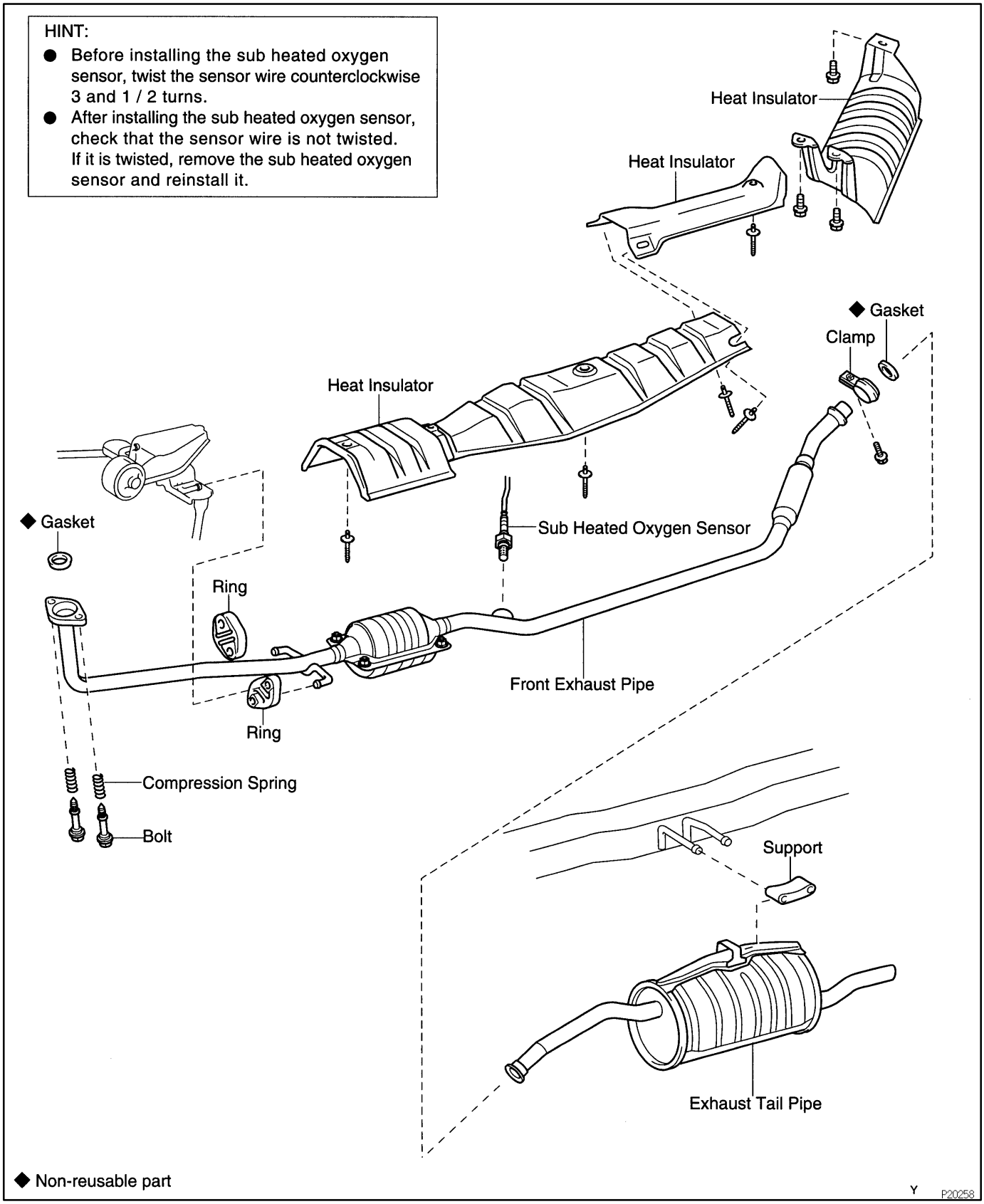
(a) Using SST, align the hole of the camshaft timing pulley on the side with the 5E mark with the timing mark of the bearing cap.
SST 09960-10010 (09962-01000, 09963-01000)

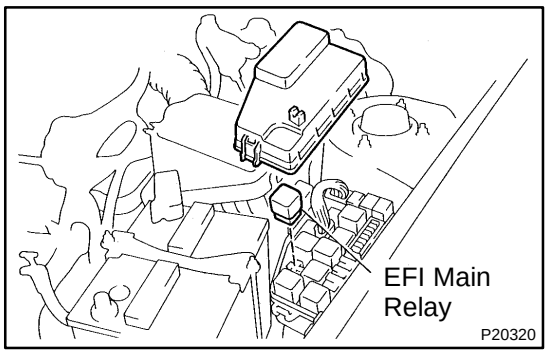
EXHAUST SYSTEM

COMPONENTS

EM1OC-01

HINT:
- Before installing the sub heated oxygen sensor, twist the sensor wire counterclockwise 3 and 1 / 2 turns.
- After installing the sub heated oxygen sensor, check that the sensor wire is not twisted. If it is twisted, remove the sub heated oxygen sensor and reinstall it.





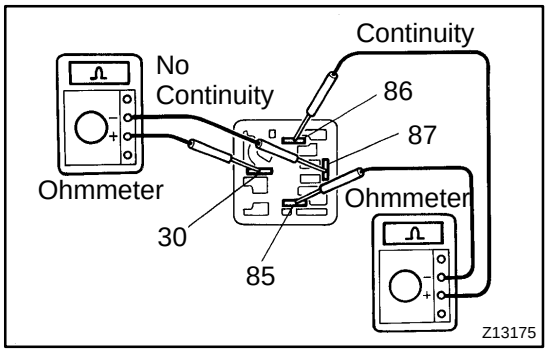
EFI MAIN RELAY

SF0XI-04

INSPECTION

1. REMOVE EFI MAIN RELAY (Marking: EFI MAIN)

LOCATION: In the engine compartment relay box.



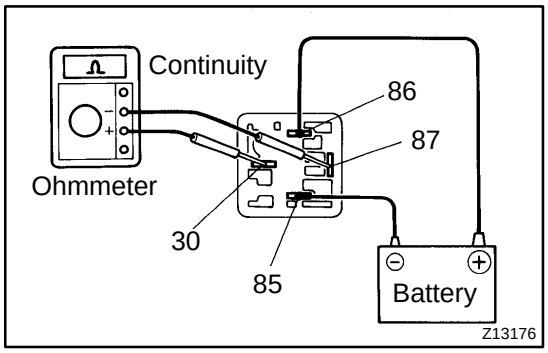
2. INSPECT EFI MAIN RELAY CONTINUITY

(a) Using an ohmmeter, check that there is continuity between terminals 86 and 85.

If there is no continuity, replace the relay.

(b) Check that there is no continuity between terminals 87 and 30.

If there is continuity, replace the relay.



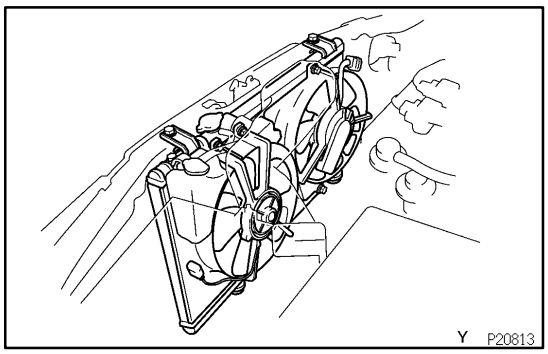
3. INSPECT EFI MAIN RELAY OPERATION

(a) Apply battery voltage across terminals 86 and 85.

(b) Using an ohmmeter, check that there is continuity between terminals 87 and 30.

If there is no continuity, replace the relay.

4. REINSTALL EFI MAIN RELAY



ELECTRIC COOLING FAN

CO0Y5-02

ON-VEHICLE INSPECTION

1. CHECK COOLING FAN OPERATION WITH LOW TEMPERATURE (Below 83˚C (181˚F))

(a) Turn the ignition switch ON.

(b) Check that the cooling fan stops.

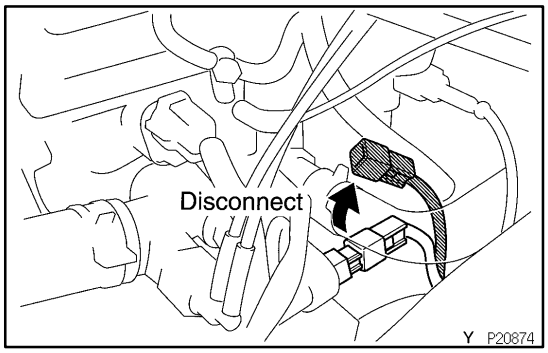
If not, check the cooling fan relay and ECT switch, and check for a separated connector or severed wire between the cooling fan relay and ECT switch.

(c) Disconnect the ECT switch connector.

(d) Check that the cooling fan rotates.

If not, check the engine main relay, cooling fan relay, cooling fan, fuses, and check for short circuit between the cooling fan relay and ECT switch.

(e) Reconnect the ECT switch connector.

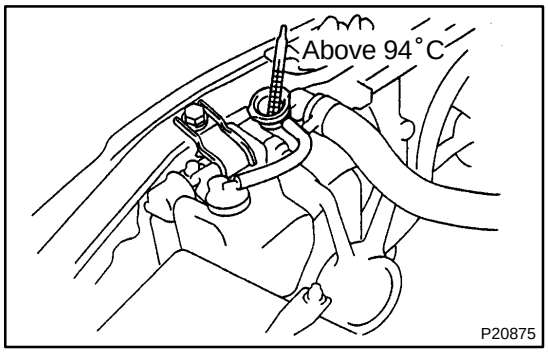


2. CHECK COOLING FAN OPERATION WITH HIGH TEMPERATURE (Above 94˚C (201˚F))

(a) Start the engine, and raise coolant temperature to above 94˚C (201˚F).

(b) Check that the cooling fan rotates.

If not, replace the ECT switch.



3. INSPECT NO.1 COOLING FAN

(a) Disconnect the cooling fan connector.

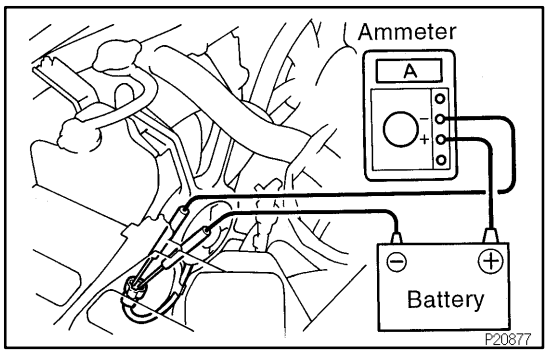
(b) Connect battery and ammeter.

(c) Check that the cooling fan rotates smoothly, and check the reading on the ammeter.

Standard amperage:

M/T	5.7 - 7.7 A
A/T	8.6 - 11.6 A

(d) Reconnect the cooling fan connector.



4. INSPECT NO.2 COOLING FAN

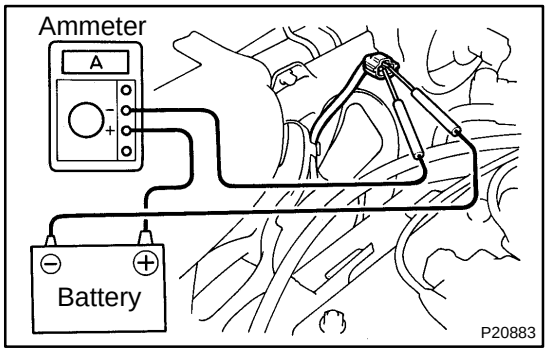
(a) Disconnect the cooling fan connector.

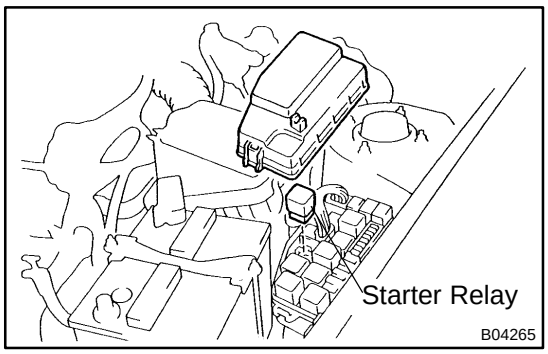
(b) Connect battery and ammeter.

(c) Check that the cooling fan rotates smoothly, and check the reading on the ammeter.

Standard amperage: 6.4 - 7.4 A

(d) Reconnect the cooling fan connector.





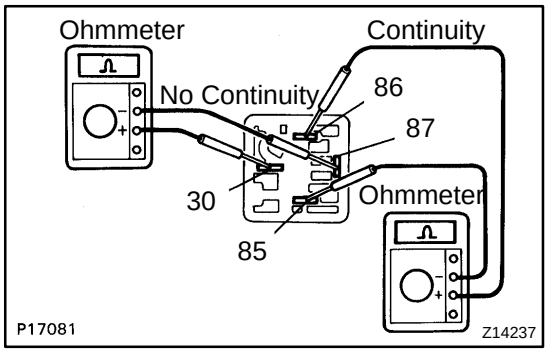
STARTER RELAY

ST088-10

INSPECTION

1. REMOVE RELAY BOX COVER

2. REMOVE STARTER RELAY (Marking: "ST")



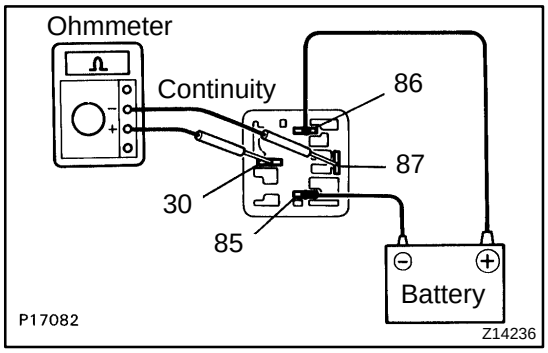
3. INSPECT RELAY CONTINUITY

(a) Using an ohmmeter, check that there is continuity between terminals 85 and 86.

If there is no continuity, replace the relay.

(b) Check that there is no continuity between terminals 30 and 87.

If there is continuity, replace the relay.



4. INSPECT RELAY OPERATION

(a) Apply battery voltage across terminals 85 and 86.

(b) Using an ohmmeter, check that there is continuity between terminals 30 and 86.

If there is no continuity, replace the relay.

5. REINSTALL STARTER RELAY

6. REINSTALL RELAY BOX COVER

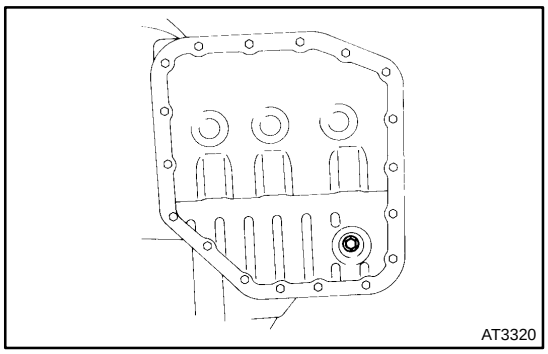
TROUBLESHOOTING

MX07D-03

PROBLEM SYMPTOMS TABLE

Use the table below to help you find the cause of the problem. The numbers indicate the priority of the likely cause of the problem. Check each part in order. If necessary, replace these parts.

Symptom	Suspect Area	See page
Noise	15.Oil (Level low)	MX-4
	16.Oil (Wrong)	MX-4
	17.Gear (Worn or damaged)	MX-7
	18.Bearing (Worn or damaged)	MX-7
Oil leakage	1. Oil (Level too high)	MX-4
	2. Gasket (Damaged)	MX-7
	3. Oil seal (Worn or damaged)	MX-7
	4. O-Ring (Worn or damaged)	MX-7
Hard to shift or will not shift	1. Control cable (Faulty)	MX-40
	2. Synchronizer ring (Worn or damaged)	MX-20 MX-27
	3. Shift key spring (Damaged)	MX-20 MX-27
Jumps out of gear	1. Locking ball spring (Damaged)	MX-7
	2. Shift fork (Worn)	MX-7
	3. Gear (Worn or damaged)	MX-7
	4. Bearing (Worn or damaged)	MX-7


AT3320

VALVE BODY ASSEMBLY

AX0RX-01

ON-VEHICLE REPAIR

1. DRAIN ATF

Remove the drain plug and drain the ATF into the suitable container.

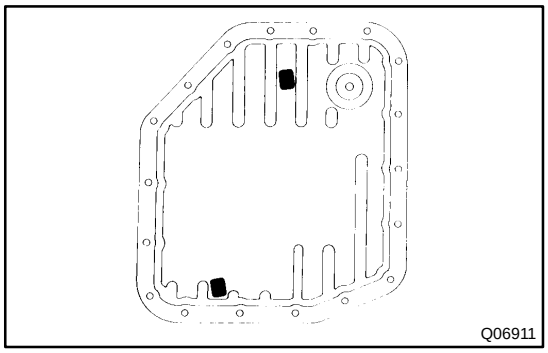
Torque: 17 N·m (175 kgf·cm, 13 ft·lbf)

2. REMOVE OIL PAN AND GASKET

NOTICE:

Some fluid will remain in the oil pan. Remove the oil pan bolts and carefully remove the oil pan assembly. Discard the gasket.

Torque: 4.9 N·m (50 kgf·cm, 43 in.·lbf)

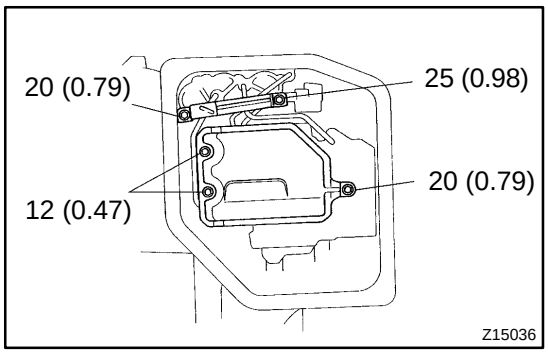

Q06911

3. EXAMINE PARTICLES IN PAN

Remove the magnets and use then to collect any steel chips. Look at the chips on the magnet carefully to anticipate what type of wear you will find in the transaxle.

Steel (magnetic) ..... bearing, gear and plate wear

Brass (non-magnetic) ..... bushing wear



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4. REMOVE OIL STRAINER AND APPLY PIPE BRACKET

(a) Remove the 3 bolts and oil strainer.

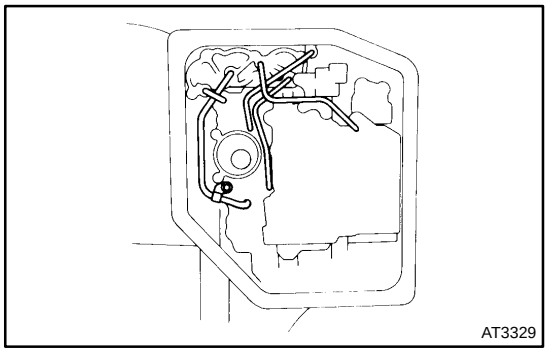
NOTICE:

Be careful as some oil will come out of the strainer.

Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)

(b) Remove the 2 bolts and apply pipe bracket.

Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)


AT3329

5. REMOVE OIL PIPES

(a) Remove the clamp bolt.

(b) Pry up the both pipe ends with a large screwdriver and remove the 4 pipes.

NOTICE:

Be careful not to bend or damage the pipes.