

4E-FTE ENGINE

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4E-FTE ENGINE - ENGINE ADJUSTMENT

ENGINE ADJUSTMENT PARTS

TOOL	SPARK PLUG CLEANER	SPARK PLUG CLEANING
Measuring tools	09843-19010 Tacho pulse pick up wire 	Tachometer connection
	09843-18020 Diagnosis check wire 	Diagnosis connector short-circuiter
	Nippon Densou Limited ND 95506-00013 Belt tension gauge 	V belt tension measurement
	Straight ruler, push-pull gauge	V belt deflection measurement
	CO/HC meter	CO/HC density measurement
	Compression gauge	Compression pressure measurement

4E-FTE ENGINE - ENGINE ADJUSTMENT

BASIC INSPECTION

1. Inspect the coolant.
2. Inspect the engine oil.
3. Inspect the battery fluid quantity and ratio.
Standard ratio 1.25~1.27
4. Inspect the air cleaner element.
5. Inspect the spark plug.

Spark plug cap

MAKER	TYPE	STANDARD VALUE (MM)	LIMIT VALUE (MM)
ND	K16R-U11	1.0~1.1	1.3
NGK	BKR5EYA11		

6. Inspect the V belt tension and deflection.

Tension standard value

TYPE		STANDARD VALUE	WHEN ATTACHING A NEW BELT	WHEN INSPECTING
Alternator belt			55~65	25~40
P/S pump belt			55~65	25~40
A/C compressor belt	With P/S		70~80	30~35
	Without P/S			

Deflection amount standard value

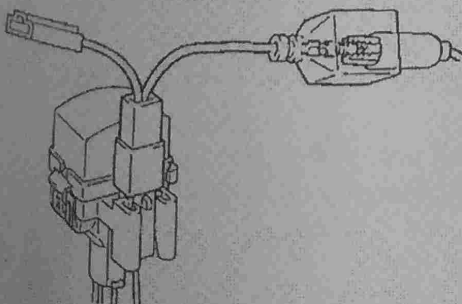
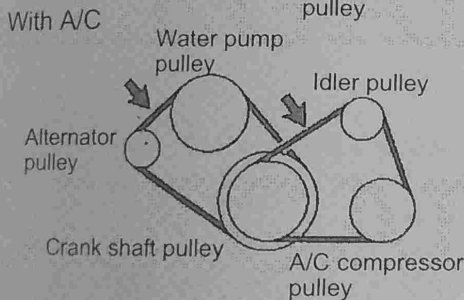
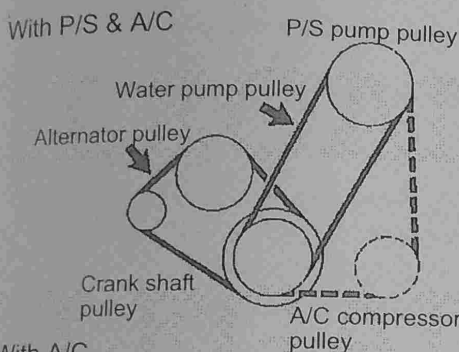
TYPE		STANDARD VALUE	WHEN ATTACHING A NEW BELT	WHEN INSPECTING
Alternator belt (10kg of force)			3.5~4.5	5.0~6.5
P/S pump belt (10kg of force)			9.0~10.0	9.0~11.0
A/C compressor belt	With P/S		5.0~6.0	7.0~8.5
	Without P/S			

Caution:

- When replacing the belt, adjust to the median value of the standard value for "when attaching a new belt".
- When checking a belt that has been used for longer than 5 minutes, check that the measured value is within the standard value of "when inspecting".
- When reattaching a belt that has been used for longer than 5 minutes, adjust so that the value is within the median value in

7. Attach the gauge.

- (1) For the primary signal detection type tachometer, attach the tachopulse pick-up wire to the diagnosis connector, and attach the tachometer.

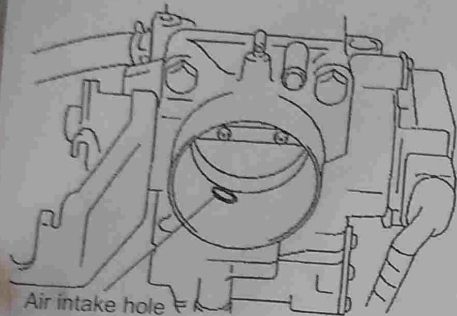


4E-FTE ENGINE - ENGINE ADJUSTMENT

8. Inspect while the air valve is cold.
 - (1) When the air valve is cold, check that the idle revolutions are increasing.
 - (2) Check that the revolutions decrease when blocking the air intake hole in the throttle body with a finger.

Note:

Wrap tape around your finger before carrying out the procedure.



9. Warm the engine.
10. Inspect when the air valve is warm.
 - (1) Check that the revolutions decrease below the standard value when blocking the air intake hole in the throttle body with a finger.Standard value: 100rpm

Note:

Wrap tape around your finger before carrying out the procedure.

11. Check that there are no abnormal sounds coming from the tappet.

12. Inspect and adjust the ignition timing and idle revolutions.
 - (1) Short-circuit the check connector $T_{e1} \leftrightarrow E_1$ terminals.

Caution:

Do not mistake the short-circuit locations as doing so will cause a fault.

- (2) Check the ignition timing.
Standard value: BTDC 9~11°
If the measured value is outside of the standard value, move the IIA and adjust to the median value of the standard value.

- (3) Check the idle revolution speed.
Standard value: 650~750rpm
If the measured value is outside of the standard value, turn the throttle adjusting screw and adjust to the median value of the standard value.

- (4) Open terminals $T_{e1} \leftrightarrow E_1$.

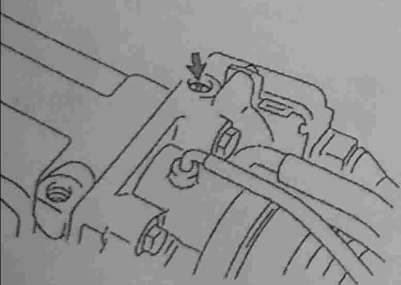
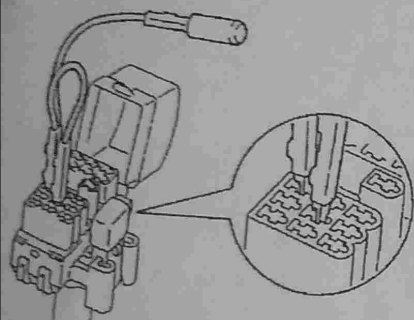
- (5) Check that the ignition timing is within the standard value.
Standard value: BTDC 9~11°

- (6) If the ignition timing has been adjusted, seal the IIA set bolt with seal tape.

13. Inspect the intake manifold negative pressure.
Standard value: more than 400mmHg

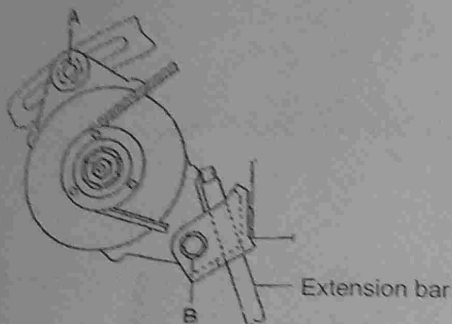
14. Compression inspection
Standard value: 13.0kg/cm² (250rpm)
Limit value: 10.0kg/cm² (250rpm)
Cylinder difference limit: 1.0kg/cm²

15. CO/HC density inspection
Standard value: CO density: less than 1.0%
HC density: less than 800ppm



4E-FTE ENGINE - ENGINE ADJUSTMENT

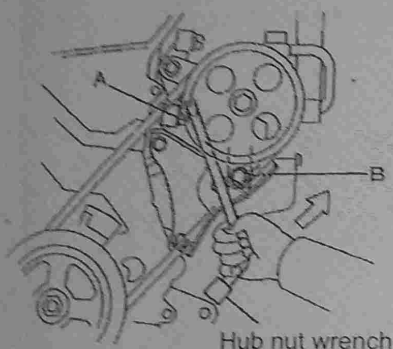
V BELT TENSION AND DEFLECTION AMOUNT ADJUSTMENT



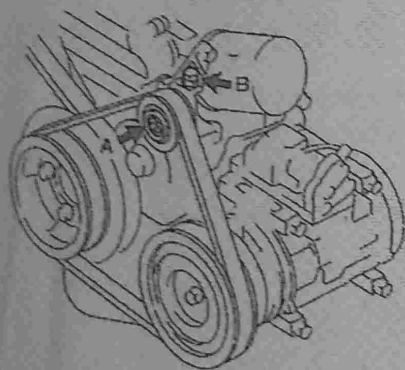
1. Adjust the alternator belt tension.
 - (1) Loosen securing bolt A and B.
 - (2) Use the extension bar from the lower side to adjust the tension, and tighten the securing bolt A.
T=120kg/cm

Caution:

Use an extension bar with a length of between 300mm and 400mm.



- (3) Tighten securing bolt B.
T=420kg/cm
 - (4) Check the belt tension or the deflection amount.
2. Adjust the P/S pump belt deflection. (Excluding A/C)
 - (1) Loosen securing bolts A and B.
 - (2) Use a hub nut wrench to raise the P/S pump to the pump bracket lower end supporting point, and tighten bolt B.
T=400kg/cm
 - (3) Tighten bolt A.
T=440kg/cm
 - (4) Check the belt tension or the deflection amount.

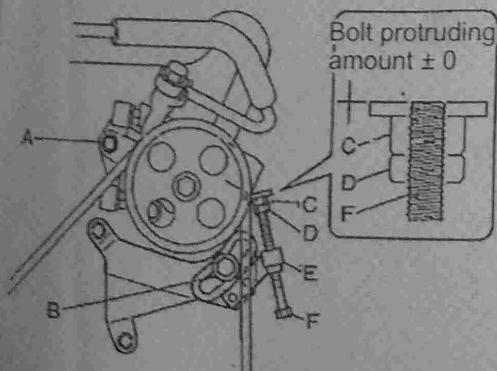


3. Adjust the A/C compressor belt tension.
 - (1) Loosen securing nut A.
 - (2) Adjust the adjustment bolt B to the standard tension.
 - (3) Tighten securing nut A.
 - (4) Check the belt tension or the deflection amount.

4. Adjust the P/S pump belt tension (with A/C)
 - (1) Loosen bolt A and B.
 - (2) Check that the protruding amount of the end of adjust bolt F from nut C is ± 0 mm, and secure nut C with lock nut D.
 - (3) Turn the adjust bolt F, and push the pump upwards, and adjust the belt tension to the standard value.
 - (4) Tighten bolts A and B.
T=440kg/cm (bolt A)
T=440kg/cm (bolt B)
 - (5) Loosen the adjust bolt F between 4 to 5 revolutions.

Caution:

Check that the clearance between the end of nut C and the P/S pump body contact area is above 5mm.



- (6) Secure adjust bolt F with lock E.
T=120kg/cm
 - (7) Check either the belt tension or deflection amount.
(Refer to Basic inspection on page 3)

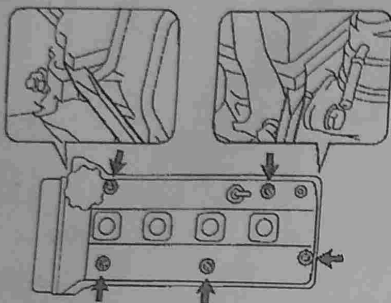
4E-FTE ENGINE - ENGINE ADJUSTMENT

VALVE CLEARANCE INSPECTION AND ADJUSTMENT

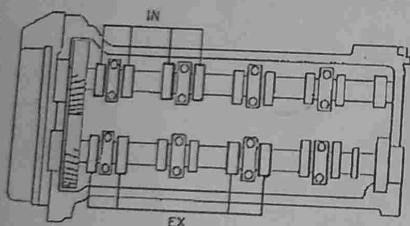
Caution:

Carry out the inspection and adjustment while the engine is cool.

1. Remove the intercooler system.
(Refer to "Intercooler system removal" on page 96)
2. Remove the PCV hose and air hose.
3. Remove the resistive cord.
4. Remove the cylinder head cover.
 - (1) Remove the oil filler cap.
 - (2) Remove the cap nut and seal washer.
 - (3) Use a driver to prise the areas shown in the diagram, and remove the cylinder head cover.



No. 1 cylinder compressed top dead centre

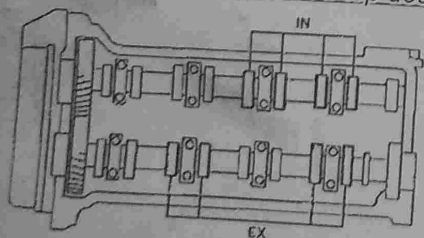


5. Inspect the valve clearance.
 - (1) Tighten the camshaft bearing cap to the specified torque.
 - (2) Measure the valve clearance for the areas shown in the diagram.

Standard value: IN 0.20 ± 0.03 mm (when cold)
EX 0.30 ± 0.03 mm (when cold)

If the measured value is outside of the standard value, adjust the valve clearance.

No. 4 cylinder compressed top dead centre

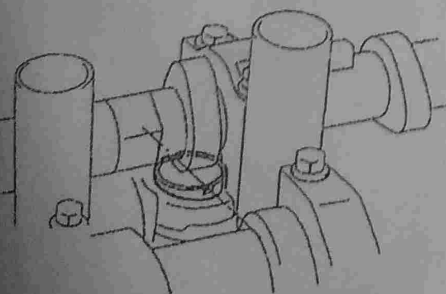


6. Adjust the valve clearance.

SST A 09248-05010
SST B 09258-05020

Intake

- (1) Rotate the crankshaft, and face the top of the valve clearance adjustment cam upwards.
- (2) Face the valve lifter notch horizontally towards the front and rear of the vehicle.



4E-FTE ENGINE - ENGINE ADJUSTMENT

(7) Use a micrometer, and measure the thickness of the removed adjusting shim.

(8) Select an adjusting shim.

Shim selection = thickness of the shim 6 (measured valve clearance - standard valve clearance)

(Example): If the intake valve clearance is 0.4mm, and the removed shim is 3.0mm.

Thickness of the selected shim = $3.00 + (0.40 - 0.20) = 3.20\text{mm}$.

Note:

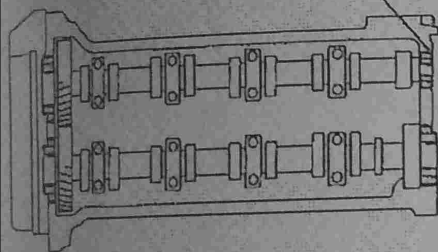
Shim type (mm)

There are 13 types of shims between 2.60mm and 3.20mm in 0.05 increments.

(9) Attach the selected shim, and use a SST A to remove the SST B.

(10) Check the valve clearance.

Seal packing black lubrication area



7. Attach the cylinder head cover.

(1) Remove the grease from the cover and cylinder head mounting surface.

(2) Lubricate the areas shown in the diagram with seal packing black, and attach the cylinder head cover within 5 minutes.

Caution:

Do not start the engine within 2 hours of installation.

(3) Tighten with 5 nuts and seal washers.

T=70kg/cm

(4) Attach the oil filler cap.

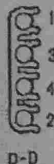
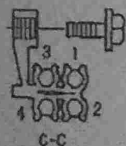
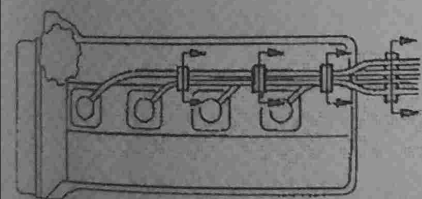
8. Attach the resistive cord.

9. Attach the Air hose.

10. Attach the PCV hose.

11. Attach the intercooler system.

(Refer to Basic inspection on page 3)



4E-FTE ENGINE - ENGINE ADJUSTMENT

CO/HC DENSITY INSPECTION

Note:

Adjustment is not required because the air-fuel ratio is controlled by the engine control computer.

1. Carry out a basic inspection.
(Refer to page 3)
2. Inspect the CO/HC density.

O₂ sensor checker inspection

- (1) Attach a checker wire to the diagnosis connector, and attach the O₂ sensor checker.
- (2) Retain an engine revolution speed of 2500rpm for approximately 90 seconds in order to warm the O₂ sensor.
- (3) Short circuit the (T_e1↔E1 terminals) on the check wire connector.
- (4) Retain an engine revolution speed of 2500rpm, place the O₂ sensor check changeover switch towards O_{x1}/V_{F1}, place the rotary switch into the V_F position, and check that the needle swings between 0 and 5V. Also measure the flashing speed of the Ox lamp.

Standard value:

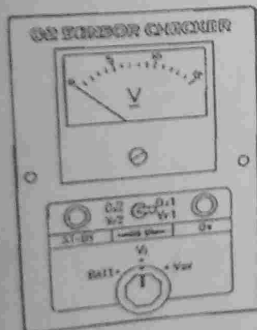
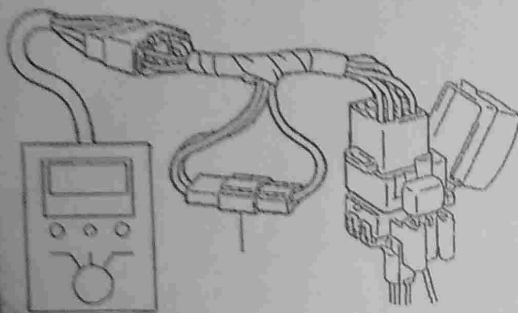
Needles swings: more than 8 times per 10 seconds

The Ox light flashes: more than 8 times per second

- (5) Open the connector.
- (6) Check that the Ox lamp is flashing while the engine is idling, and measure the voltage for V_{F1}.
Standard value $2.5 \pm 1.3V$
- (7) Inspect the CO/HC density while the engine is idling.
Standard value: CO density: less than 1.0%
HC density: less than 800ppm

Caution:

- Carry out procedures (3) onwards in a short period of time as the O₂ sensor will cool down.
- Check that the O₂ sensor check Ox lamp is flashing while measuring. If the Ox lamp stops flashing, redo procedures from procedure (2).

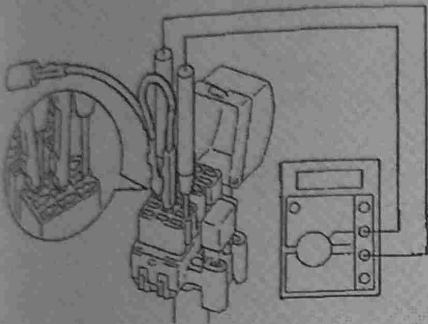


4E-FTE ENGINE - ENGINE ADJUSTMENT

Toyota electrical tester inspection

Caution:

- When using a tester that is not a Toyota electrical tester, use one with a inner resistance of more than $40k\Omega/V$ as the voltage will not be displayed if a circuit tester with a low amount of inner resistance is used.
- Mistaking the connection position of the check connector will cause a fault.



- (1) Attach the tester positive terminal to the check connector VF1 terminal, and attach the tester negative terminal to the E1 terminal.
- (2) Turn the electrical tester rotary switch to 20V.
- (3) Retain an engine revolution speed of 2500rpm for approximately 90 seconds in order to warm the O_2 sensor.
- (4) Use a checker wire connector to short circuit ($T_1 \leftrightarrow E1$ terminals).
- (5) Retain an engine revolution speed of 2500rpm and check the display of the electrical tester to make sure that it is changing between 0 and approximately 5V.
Standard value: changes more than 8 times per 10 seconds.
- (6) Open terminals $T_1 \leftrightarrow E1$.
- (7) Measure the voltage of the V_{F1} while the engine is idling.
Standard value $2.5 \pm 0.7V$
- (8) Check the density of the CO/HC while the engine is idling.
Standard value: CO density: less than 1.0%
HC density: less than 800ppm
- (9) Short circuit the $T_1 \leftrightarrow E1$ terminals, retain an engine revolution speed of 2500rpm, and check that the needle on the tester immediately moves between 0 and 5V. If the tester display does not change, redo the procedures from procedure (3).

Caution:

- Carry out procedures (3) onwards in a short period of time as the O_2 sensor will cool down.

- (10) Open terminals $T_1 \leftrightarrow E1$.

4E-FTE ENGINE - ENGINE ADJUSTMENT

NON-LOAD REVOLUTION SPEED CONTROL DEVICE

Caution:

Turn the electric fan OFF before carrying out the procedures.

NON-LOAD REVOLUTION SPEED CONTROL DEVICE INSPECTION

1. Carry out a basic inspection.
(Refer to page 3)
2. Non-load revolution speed control device inspection
 - (1) Remove the non-load revolution speed control ACV connector.
 - (2) Lower the revolution speed to 500rpm with the throttle adjusting screw.
 - (3) Attach the ACV connector and check that the engine revolution speed increases by about 200rpm.
 - (4) Adjust the idle revolution speed.

P/S IDLE UP INSPECTION

1. P/S idle up inspection
 - (1) Slowly turn the steering wheel from the centre position while the engine is idling, and check that the idle revolutions do not become unstable.

STAND ALONE TEST

ACV INSPECTION

1. Air flow inspection
 - (1) Apply battery voltage to between the ACV terminals, and check the air flow when the coil is conducting and when not conducting.
Standard: When conducting: Air flow
When not conducting: No air flow

4E-FTE ENGINE - EMISSION SYSTEM

EMISSION SYSTEM PARTS

TOOL	SPARK PLUG CLEANER	SPARK PLUG CLEANING
	09843-19010 Tacho pulse pick up wire 	Tachometer connection
Sound scope		Injector operation sound confirmation

AIR-FUEL RATIO COMPENSATOR

AIR-FUEL RATIO COMPENSATION FUNCTION INSPECTION

1. Carry out a basic inspection.
(Refer to page 3)

2. Air-fuel ratio compensator inspection

O₂ sensor checker inspection

- (1) Connect the O₂ sensor checker wire to the diagnosis connector, and attach the O₂ sensor checker.
- (2) Short circuit the (T_e1↔E1 terminals) on the check wire connector.
- (3) Retain an engine revolution speed of 2500rpm for approximately 90 seconds in order to warm the O₂ sensor.
- (4) Retain an engine revolution speed of 2500rpm, place the O₂ sensor check changeover switch towards O_x1/V_F1, place the rotary switch into the V_F position, and check that the needle swings between 0 and 5V. Also measure the flashing speed of the Ox lamp.

Standard value:

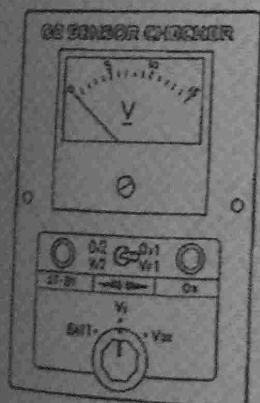
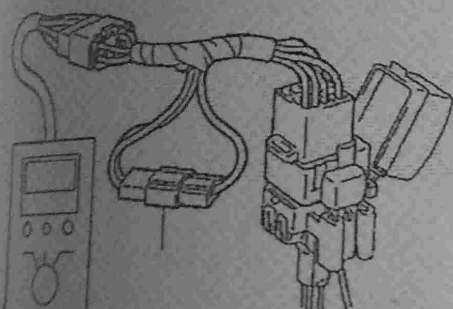
Needles swings: more than 8 times per 10 seconds

The Ox light flashes: more than 8 times per second

- (5) Open the connector.
- (6) Measure the voltage of the V_F1 while the engine is idling.
Standard value 2.5±0.7V

Caution:

- Carry out procedures (2) onwards in a short period of time as the O₂ sensor will cool down.
- Check that the O₂ sensor check Ox lamp is flashing while measuring. If the Ox lamp stops flashing, redo procedures from procedure (2).

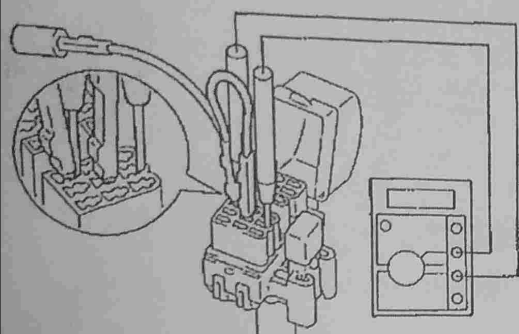


4E-FTE ENGINE - EMISSION SYSTEM

Toyota electrical tester inspection

Caution:

- When using a tester that is not a Toyota electrical tester, use one with a inner resistance of more than $40\text{k}\Omega/\text{V}$ as the voltage will not be displayed if a circuit tester with a low amount of inner resistance is used.
- Mistaking the connection position of the check connector will cause a fault.



- (1) Attach the tester positive terminal to the check connector VF1 terminal, and attach the tester negative terminal to the E1 terminal.
- (2) Turn the electrical tester rotary switch to 20V.
- (3) Retain an engine revolution speed of 2500rpm for approximately 90 seconds in order to warm the O₂ sensor.
- (4) Use a checker wire connector to short circuit (T_{e1} ↔ E1 terminals).
- (5) Retain an engine revolution speed of 2500rpm and check the display of the electrical tester to make sure that it is changing between 0 and approximately 5V.
Standard value: changes more than 8 times per 10 seconds.
- (6) Open terminals T_{e1} ↔ E1.
- (7) Measure the voltage of the V_{F1} while the engine is idling.
Standard value $2.5 \pm 0.7\text{V}$
- (8) Short circuit the T_{e1} ↔ E1 terminals, retain an engine revolution speed of 2500rpm, and check that the needle on the tester immediately moves between 0 and 5V. If the tester display does not change, redo the procedures from procedure (3).

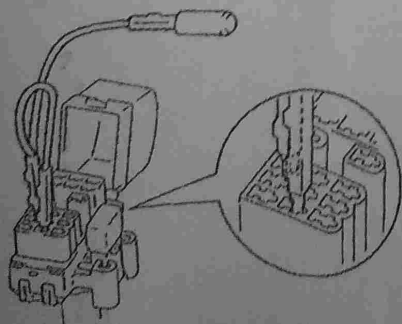
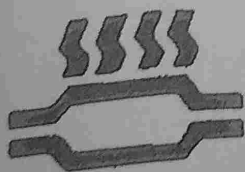
Caution:

- Carry out procedures (3) onwards in a short period of time as the O₂ sensor will cool down.

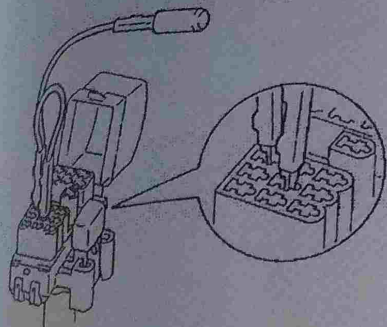
- (9) Open terminals T_{e1} ↔ E1.

CATALYTIC OVERHEATING WARNING DEVICE

1. Inspect the catalytic overheating warning device.
 - (1) Turn the ignition ON and check that the exhaust temperature light illuminates.
 - (2) Start the engine, and check that the exhaust temperature light turns off.
 - (3) When the engine is revving, use a diagnosis chick wire, and short-circuit between the diagnosis connector CCo ↔ E1 terminals, and check that the exhaust temperature light illuminates.



4E-FTE ENGINE - EMISSION SYSTEM



IGNITION TIMING CONTROL DEVICE

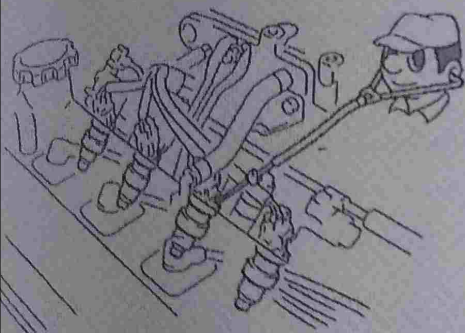
IGNITION TIMING CONTROL DEVICE FUNCTION INSPECTION

1. Carry out a basic inspection.
(Refer to page 3)
2. Ignition timing control function inspection
 - (1) Check the ignition timing when the $T_{e1} \leftrightarrow E1$ terminals on the check connector are short-circuited.
Standard value: BTDC 9~11°

Caution:

Do not mistake the short-circuit locations as doing so will cause a fault.

- (2) Open terminals $T_{e1} \leftrightarrow E1$.
- (3) Check that the ignition timing is within the standard value.
Standard value: BTDC 11~21°
- (4) Raise the engine revolution and check that the ignition timing is advancing.



DECELERATION CONTROL SYSTEM

DECELERATION CONTROL SYSTEM INSPECTION

1. Carry out a basic inspection.
(Refer to page 3)
2. Inspect the fuel cut function.
 - (1) Raise the engine revolutions to 3500rpm.
 - (2) Use a sound scope, and check the injector operation sound.
 - (3) Check that the injector operation sound stops briefly and then starts again when the throttle lever is released.
Standard value: Fuel cut revolution speed: 1625rpm
Recovery revolution speed: 1000rpm



STAND ALONE INSPECTION

Throttle position sensor inspection

1. IDL $\leftrightarrow$ E1 terminal resistance inspection

Caution:

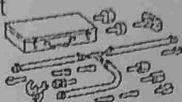
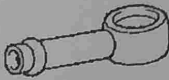
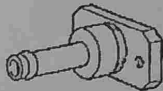
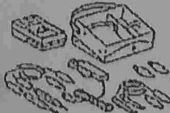
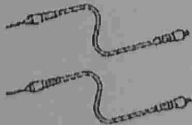
For vehicles with an automatic transmission, remove the throttle cable.

- (1) Place a wire gauge between the throttle lever and throttle stop screw, and use a Toyota electrical tester to measure the resistance between terminals IDL $\leftrightarrow$ E1.

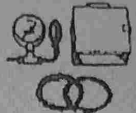
Standard value: 0.8mm conducting
0.9mm no conduction

4E-FTE ENGINE - EFI SYSTEM

EFI SYSTEM PARTS

SST	09240-00020 Wire gauge set		Throttle position sensor inspection
	09242-00080 Wire gauge (0.8mm)		
	09242-00090 Wire gauge (0.9mm)		
	09268-41045 Injection measuring seal set		Injector inspection
	09268-41080 Union No. 6		
	09268-41090 Union No. 7		
	09405-09015 Union No. 1		
	09467-13001 Clip		
	95336-08070 Hose		
Tools	09135-12150 Short driver		Throttle position sensor disassembly and assembly
Measuring tools	09082-00012 Toyota electrical tester		Inspection of parts
	09083-00060 Mini test lead		Computer inspection
	09842-30070 EFI inspection wire F		Injector inspection
	09843-18020 Diagnosis check wire		Diagnosis connector short-circuiting

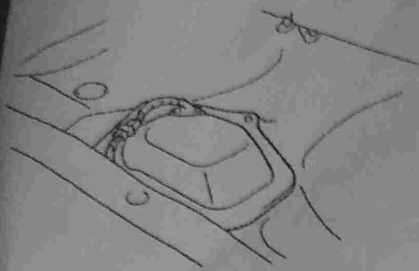
4E-FTE ENGINE - EFI SYSTEM

Measuring tools	Banzai Corporation TCP-2TB Turbocharger pressure gauge	Turbo pressure sensor inspection
		
	Banzai Corporation TB-501	Inspection of parts
		
	Sound scope	Injector operation sound confirmation
	Female cylinder	Injector inspection
	Temperature gauge	Water temperature sensor, intake-air temperature sensor

FUEL SYSTEM

FUEL OUTFLOW PREVENTION PROCEDURE

1. Remove the rear seat cushion.
2. Remove the fuel pump connector.
3. Start the engine.
(1) Start the engine, and after it stops, turn the ignition off.
4. Disconnect the negative side of the battery terminal.
5. Attach the fuel pump connector.
6. Attach the rear cushion.



FUEL LEAK INSPECTION

1. Disconnect the negative side of the battery terminal.
2. Short-circuit the check connector.
(1) Short-circuit the connector Fp↔+B terminals on the check connector.

Caution:

Do not mistake the short-circuit locations as doing so will cause a fault.

- (2) Turn the ignition switch ON, and operate the fuel pump.

Caution:

Do not start the engine.

3. Leak inspection

- (1) Inspect the fuel systems for a leak while fuel pressure is being applied.

FUNCTION INSPECTION

1. Fuel pump operation inspection
(1) Short-circuit the connector Fp↔+B terminals on the check connector.

Caution:

Do not mistake the short-circuit locations as doing so will cause a fault.

- (2) Turn the ignition switch ON, and check if there is an operation sound coming from the pump while the fuel pump is operating.

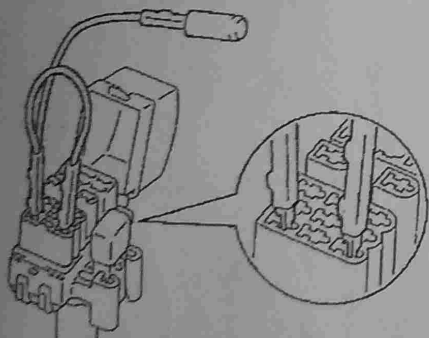
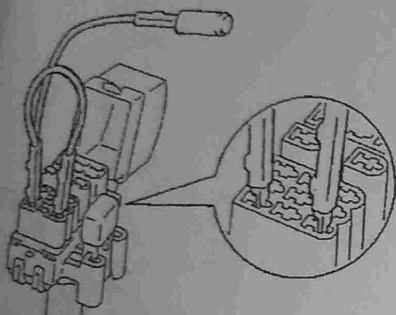
Caution:

Do not start the engine.

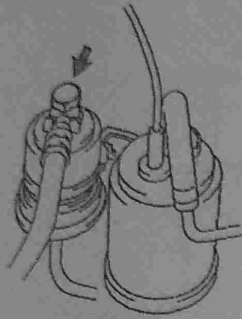
Note:

If the operation sound can not be heard properly, open the fuel tank cap and listen from the injection port.

- (3) The fuel pressure can be felt by pinching the fuel hose with your finger tips.



4E-FTE ENGINE - EFI SYSTEM

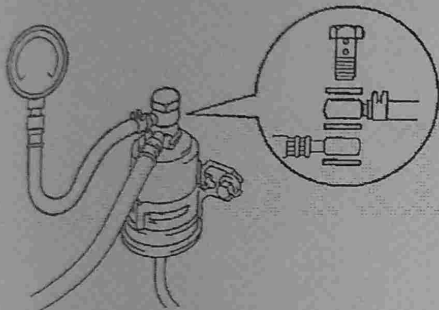


2. Fuel pressure inspection

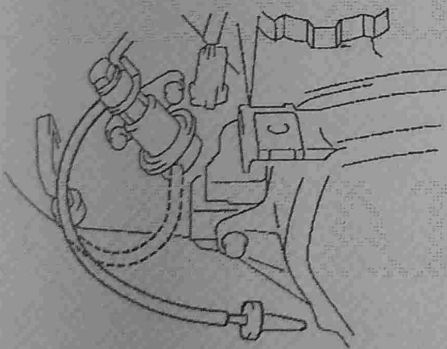
- (1) Carry out the fuel outflow prevention procedure.
- (2) Secure the fuel filter with a spanner, remove the union bolt, and remove the fuel main hose and gasket.

Caution:

Use a rag to cover the fuel pipe line to remove any gasoline that spits out as there will be a small amount of fuel pressure remaining.

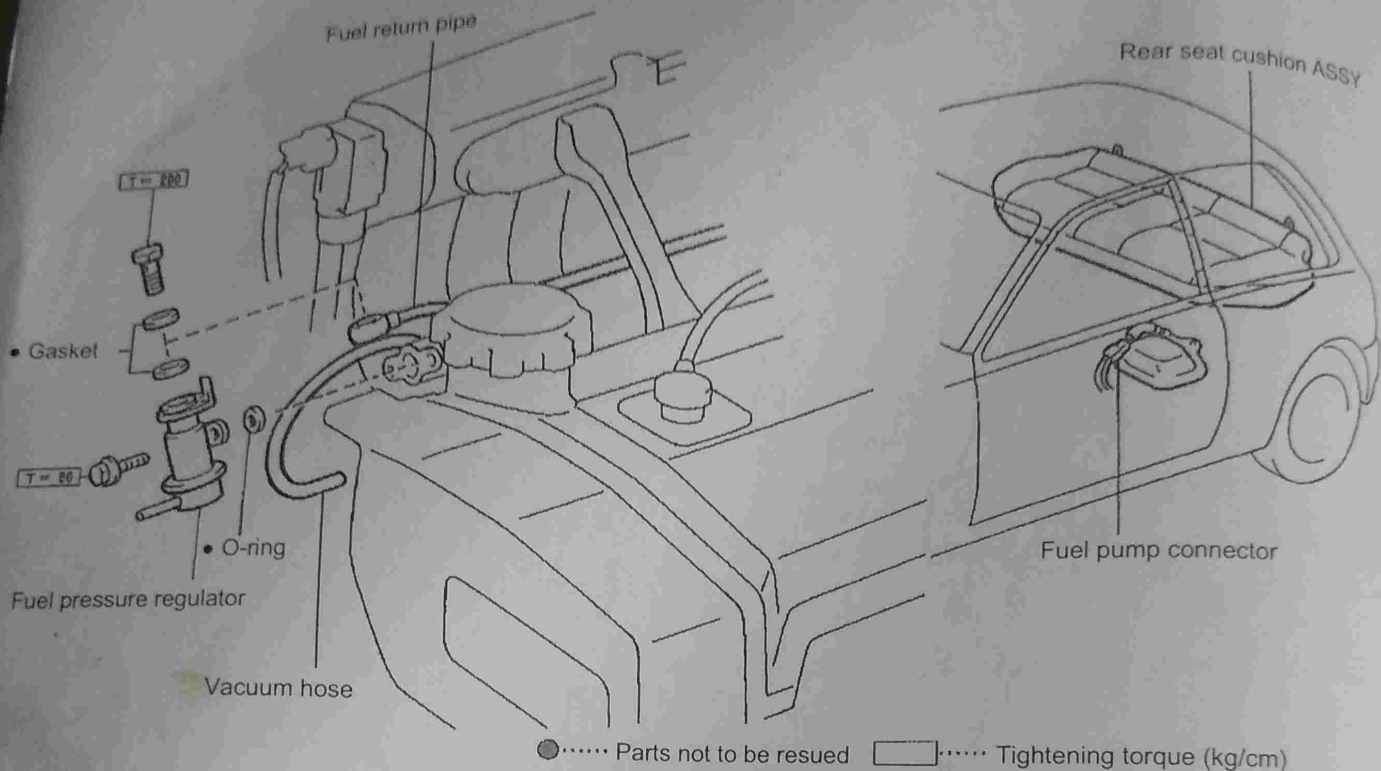


- (3) Attach a EFI fuel pressure gauge to the fuel filter by using the removed fuel main hose and a new gasket.
T = 300kg/cm



- (4) Disconnect the negative side of the battery terminal.
- (5) Inspect for fuel leaks.
- (6) Remove the brake regulator vacuum hose, and block the plug.
- (7) Measure the fuel pressure while the engine is idling.
Standard value: 2.75~3.15kg/cm²
- (8) Measure the fuel pressure while the vacuum hose is connected to the brake regulator.
Standard value: Approximately 2.35kg/cm²
- (9) Carry out the fuel outflow prevention procedure.
- (10) Remove the EFI fuel pressure gauge and gasket.
- (11) Secure the fuel filter with a spanner, and attach the fuel main hose to the union bolt through two new gaskets.
T = 300kg/cm
- (12) Inspect for fuel leaks.

PRESSURE REGULATOR DISASSEMBLY AND ASSEMBLY



PRESSURE REGULATOR REMOVAL

1. Carry out the fuel outflow prevention procedure.
(Refer to page 16)
2. Remove the vacuum hose.
3. Remove the fuel return pipe.
4. Remove the pressure regulator.

PRESSURE REGULATOR INSTALLATION

1. Remove the regulator.
 - (1) Lubricate the new O-ring with gasoline, and attach the pressure regulator.
 - (2) Attach the delivery valve while rotating the pressure regulator horizontally.
 - (3) Check that the pressure regulator is rotating smoothly.

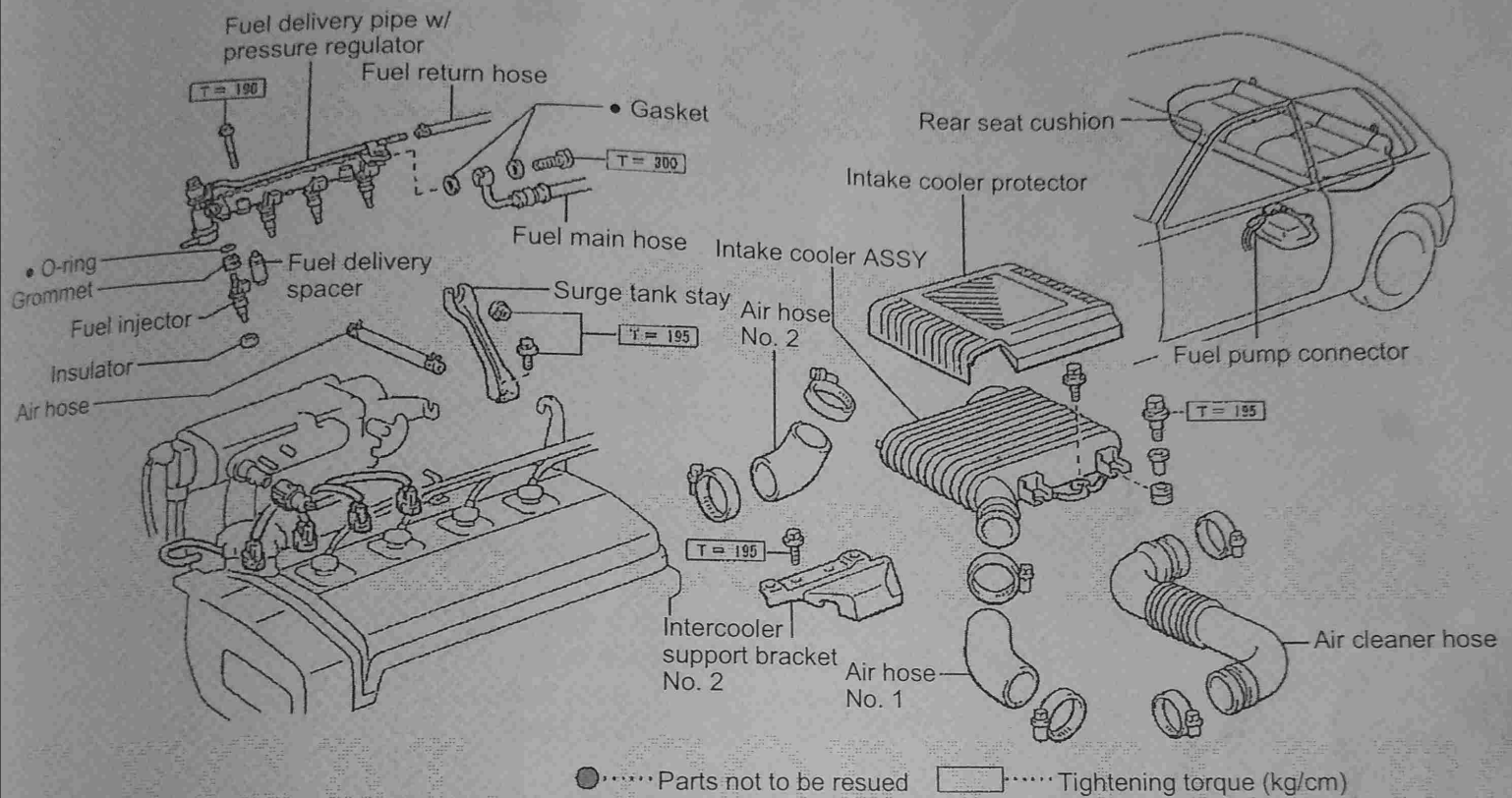
Caution:

If the pressure regulator does not rotate smoothly, remove the pressure regulator and redo procedures (1) and (2) as there maybe a problem with the O-ring.

- (4) Tighten the 2 bolts.
T=80kg/cm
2. Remove the fuel retain pipe.
3. Remove the vacuum hose.
4. Inspect for fuel leaks.
(Refer to page 16)

4E-FTE ENGINE - EFI SYSTEM

INJECTOR DISASSEMBLY AND ASSEMBLY



INJECTOR REMOVAL

1. Carry out the fuel outflow prevention procedure.
(Refer to page 16)
2. Remove the air cleaner.
3. Remove the intercooler protector.
4. Remove the intercooler ASSY.
 - (1) Remove the 4 bolts and band cable bolt.
 - (2) Loosen the air hose No. 1 and air hose No. 2 hose clamp, and remove the intercooler ASSY with the air hose connected.

4E-FTE ENGINE - EFI SYSTEM

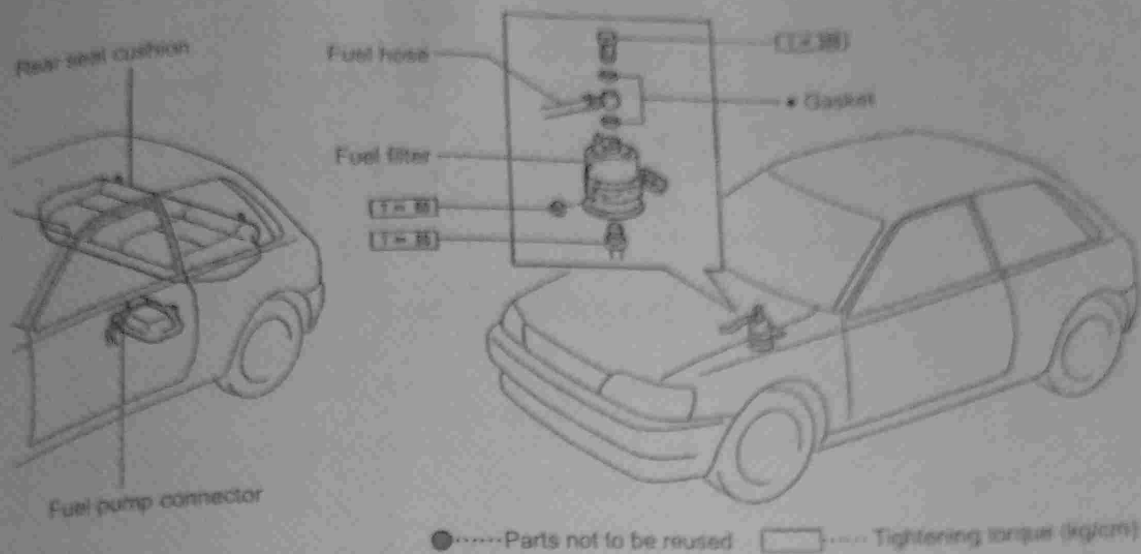
5. Remove the intercooler support bracket No. 2.
6. Remove the ventilation hose.
7. Remove the fuel main hose.
8. Disconnect the fuel return hose.
9. Remove the vacuum hose.
10. Disconnect the injector connector.
11. Remove the delivery pipe with injector.
12. Remove the injector.
13. Remove the O-ring and grommet.
14. Remove the injector vibration insulator.

INJECTOR INSTALLATION

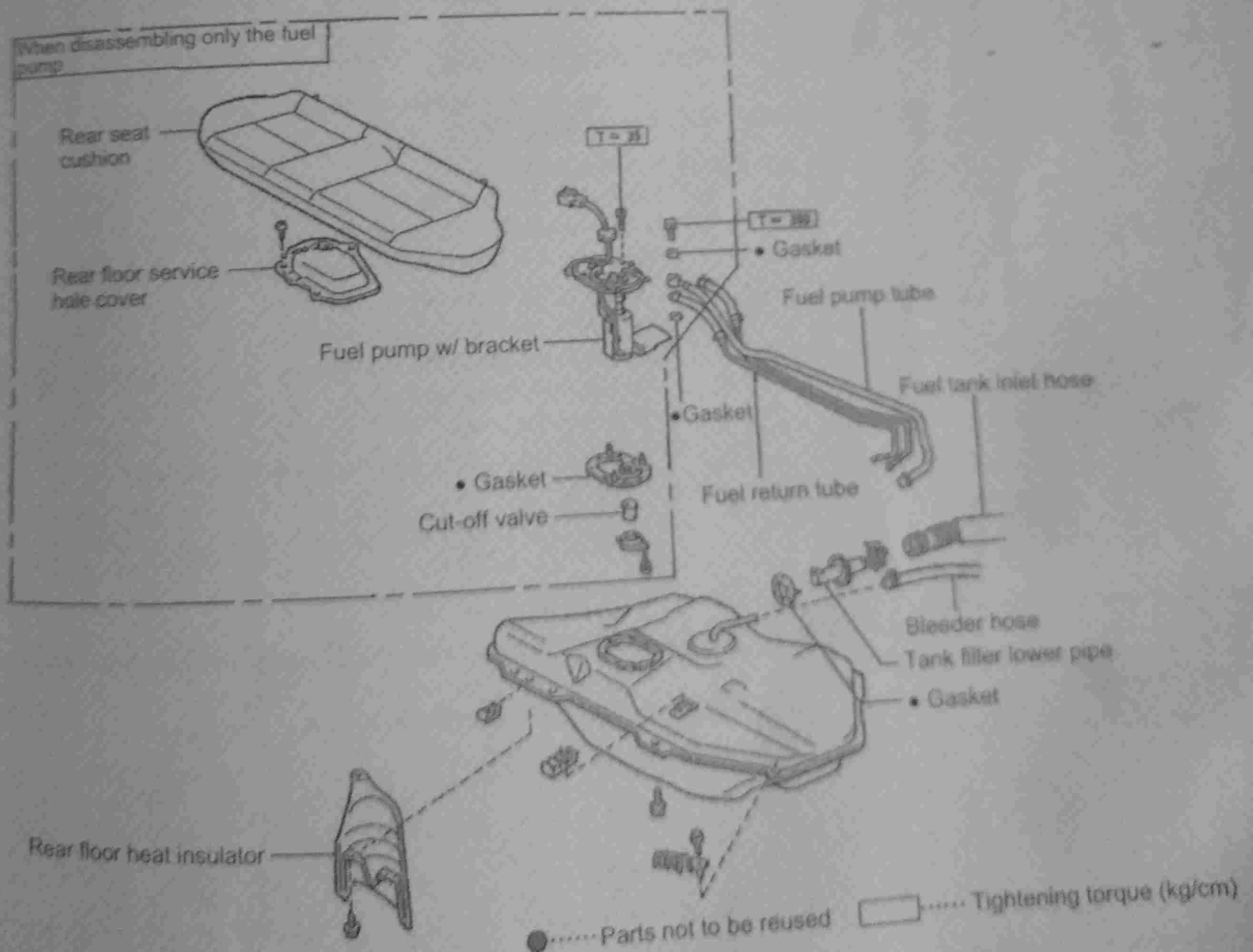
1. Attach the O-ring and grommet.
 - (1) Attach the new grommet.
 - (2) Lubricate the new O-ring with gasoline, and attach to the injector.
2. Attach the injector vibration insulator.
3. Attach the injector.
4. Attach the delivery pipe with injector.
T=190kg
5. Attach the injector connector.
6. Attach the vacuum hose.
7. Attach the fuel return hose.
8. Attach the fuel main hose.
T=195kg/cm
11. Attach the intercooler ASSY.
T=195kg/cm
12. Attach the intercooler protector.
13. Attach the air cleaner hose.
14. Inspect for fuel leaks
(Refer to page 16)

4E-FTE ENGINE - EFI SYSTEM

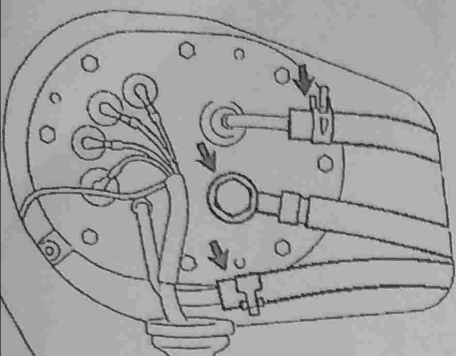
FUEL FILTER DISASSEMBLY DIAGRAM



FUEL PUMP & FUEL TANK DISASSEMBLY DIAGRAM



4E-FTE ENGINE - EFI SYSTEM



FUEL PUMP REMOVAL

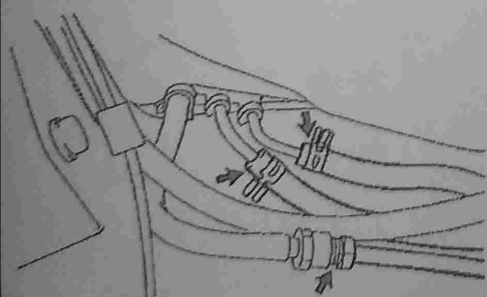
1. Carry out the fuel outflow prevention procedure.
2. Remove the rear floor service hole cover.
3. Disconnect the fuel cap & fuel hose.
4. Remove the fuel pump with the sender gauge attached.

FUEL PUMP INSTALLATION

1. Attach the fuel pump with the sender gauge attached.
 - (1) Remove the cut off valve, and replace the gasket.
 - (2) Attach the cut off valve.
 - (3) Attach the fuel pump with sender gauge with 8 screws.
T=35kg/cm
2. Attach the fuel tube & fuel hose.
T=300kg/cm
3. Attach the rear floor service hole cover.
4. Attach the fuel pump connector.
5. Attach the rear seat cushion.

FUEL TANK REMOVAL

1. Carry out the fuel outflow prevention procedure.
(Refer to page 16)
2. Drain the fuel.
 - (1) Remove the rear floor service hole cover.
 - (2) Disconnect the fuel tube and fuel hoses.
 - (3) Remove the fuel pump with sender gauge, and drain the fuel.
3. Disconnect the fuel tube & fuel hose.
4. Remove the rear floor heat insulator.
5. Disconnect the fuel tank inlet hose.
6. Disconnect the bleeder hose.
7. Remove the fuel tank.
 - (1) Remove the 4 bolts and remove the fuel tank.



FUEL TANK INSTALLATION

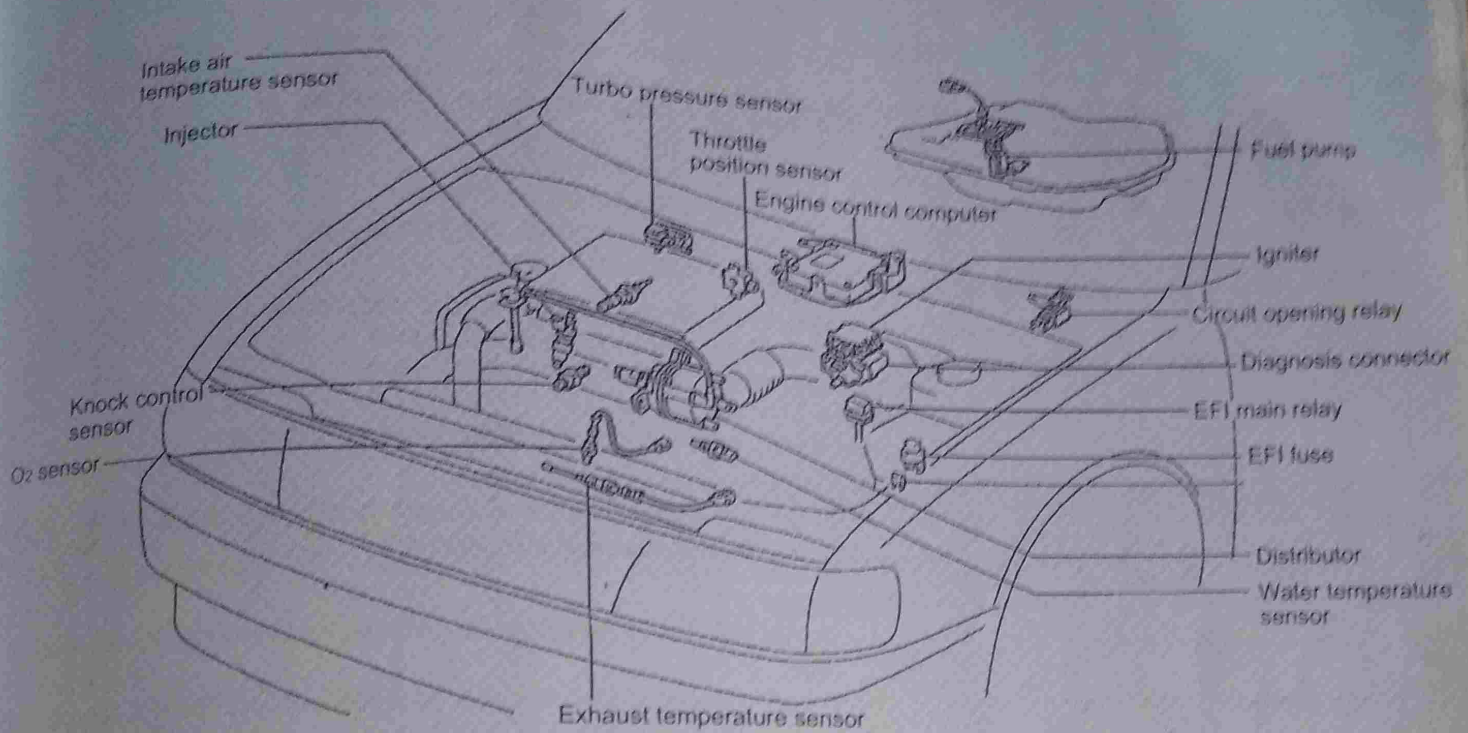
- (1) Carry out the removal procedures in the reverse order to install.

FUEL LEAK INSPECTION

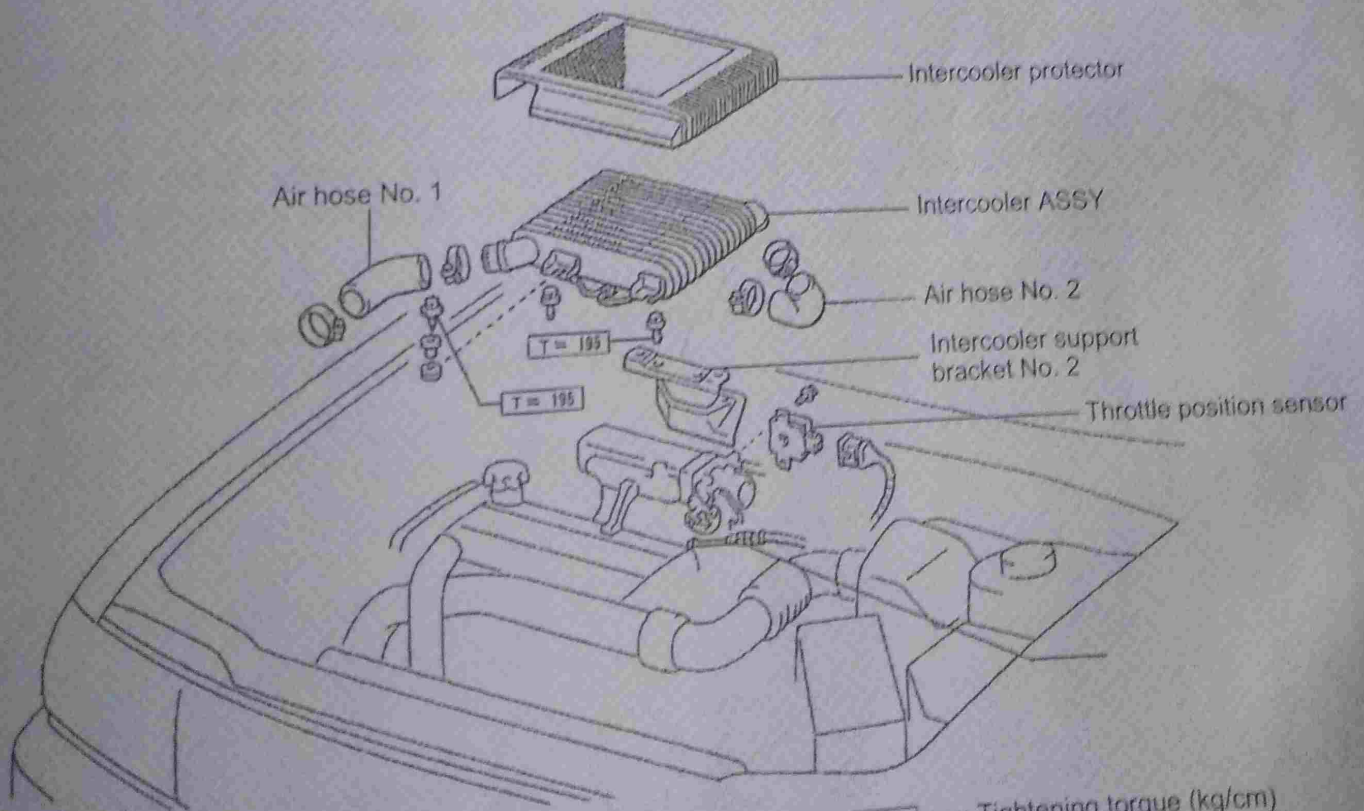
- (Refer to page 16)

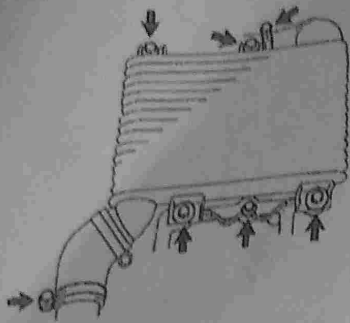
4E-FTE ENGINE - EFI SYSTEM

CONTROL SYSTEM COMPONENT LAYOUT DIAGRAM



THROTTLE POSITION SENSOR DISASSEMBLY DIAGRAM





THROTTLE POSITION SENSOR REMOVAL

1. Remove the intercooler protector.
2. Remove the intercooler ASSY.
 - (1) Remove the 4 bolts and the earth cable bolt.
 - (2) Loosen the air hose No. 1 and air hose No. 2 hose clamp, and remove the intercooler ASSY with the air hose attached.
3. Remove the intercooler support bracket No. 2.
4. Disconnect the throttle cable (A/T vehicles)
5. Disconnect the connector.
6. Remove the throttle position sensor.
 - (1) Remove the 2 screws, and remove the throttle position sensor.

Caution:

- Retain the throttle position sensor installation angle while removing, and do not allow the sensor to rotate.
- Do not drop the throttle position sensor.

THROTTLE POSITION SENSOR INSTALLATION

Attach the throttle position sensor.

- (1) Align the throttle position sensor shaft hole with the throttle valve shaft, and attach in a straight line.

Caution:

- Do not insert a screw driver etc. into the throttle position sensor shaft hole.
- When attaching the throttle position sensor, do not rotate the sensor.
- Do not remove the throttle position sensor cover.

- (2) Hold the throttle lever, and fully turn the throttle position sensor.
- (3) Place the throttle position sensor onto the rear end of the installation hole, and fasten with 2 screws.

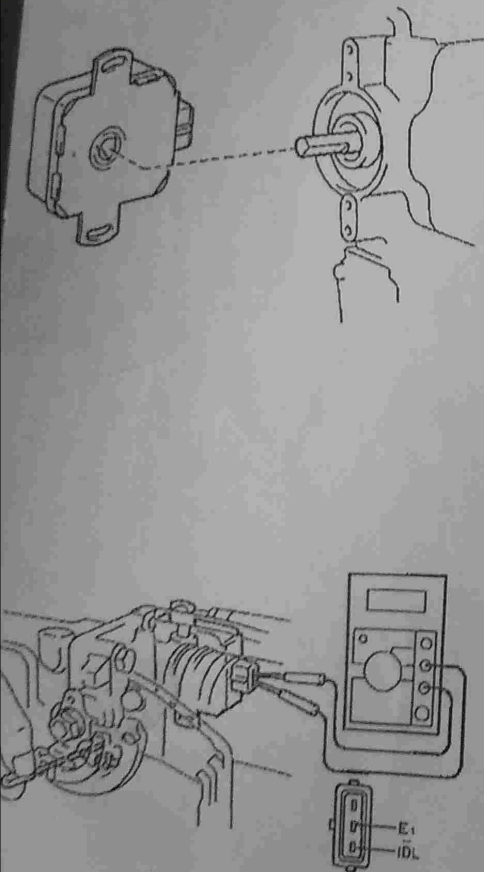
2. Adjust the throttle position sensor.

- (1) Place a 0.8mm wire gauge between the throttle stop screw and lever, and connect a Toyota electrical tester between terminals IDL↔E₁.

- (2) Rotate the throttle position sensor, and securely tighten the 2 screws in the position where the throttle position sensor conducts.

T=15 to 20kg/cm

- (3) Recheck the throttle position sensor.
- (4) Apply yellow paint to the mounting screws.



4E-FTE ENGINE - EFI SYSTEM

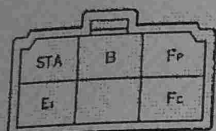
3. Connect the connectors.
4. Attach the throttle cable. (A/T vehicles)
5. Attach the intercooler support bracket No. 2.
T=195kg/cm
6. Attach the intercooler ASSY.
T=195kg/cm
7. Attach the intercooler protector.

CIRCUIT OPENING RELAY

CIRCUIT OPENING RELAY INSPECTION

1. Circuit opening relay inspection
 - (1) Use a Toyota electrical tester, and measure the resistance between terminals.

Standard value



TERMINAL	RESISTANCE VALUE (Ω)
STA ↔ E1	30~60
B ↔ Fc	80~120
B ↔ Fp	∞
	0 (Apply 12V between terminals STA ↔ E1)

ENGINE CONTROL COMPUTER

ENGINE CONTROL COMPUTER INSPECTION

1. Inspect the computer operation.
 - (1) Connect a mini tester lead to a Toyota electrical tester, and inspect from the reverse side of the connector.

Caution:

- Connect the connector to the computer, and inspect from the reverse side of the connector.
- For systems that do not have any measurement conditions, stop the engine and turn the ignition ON.

UNIT INSPECTION

FUEL PUMP

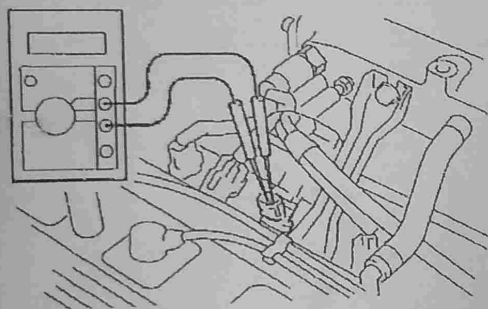
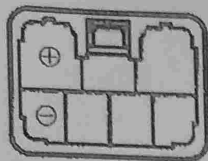
FUEL PUMP INSPECTION

1. Inspect the operation.
 - (1) Apply battery voltage pressure between terminals, and check that the motor is revolving.

Caution:

- Carry out the inspection in a short amount of time (within 10 seconds).
 - Move the pump as far away from the battery as possible.
 - Always carry out the switch operations from the battery side.
2. Battery terminal resistance
 - (1) Use a Toyota electrical tester, and measure the resistance between terminals.

Reference value: 0.2~3.0Ω



INJECTOR

INJECTOR INSPECTION

1. Inspect the terminal resistance.
 - (1) Remove the intercooler ASSY. (Refer to page 96)
 - (2) Remove the injector connector.
 - (3) Use a Toyota electrical tester, and measure the resistance between terminals.

Standard value: Approximately 13.8Ω (20°C)

2. Inspect for leaks and check the fuel injection amount.

Caution:

Disconnect from the battery and carry out the inspection in a well ventilated area.

- (1) Attach the pressure regulator, injector, fuel filter and return pipe to the SST.

SST 09268-41090 90405-09015 90467-13001
95335-08070 90268-41080

- (2) Short-circuit the check connector terminals Fp↔+B.

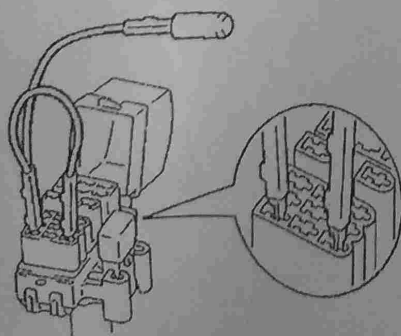
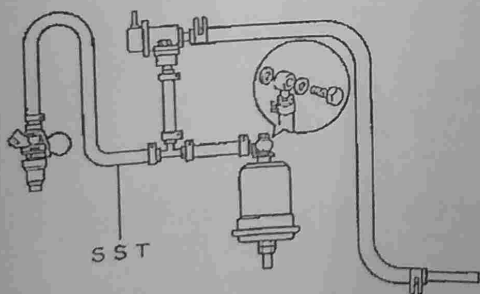
Caution:

Do not mistake the short-circuit locations as doing so will cause a fault.

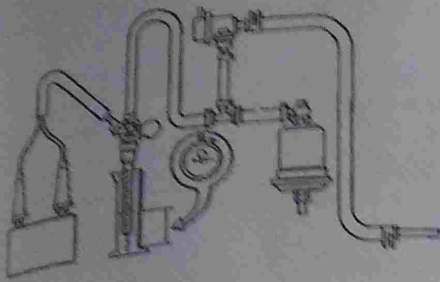
- (3) Turn the ignition switch ON, and operate the fuel pump.

Caution:

Do not start the engine.



4E-FTE ENGINE - EFI SYSTEM



- (4) Attach the EFI inspection wire F to the injector connector part.
- (5) Attach the plastic tube to the end of the injector.
- (6) Place a female cylinder at the end of the injector.
- (7) Connect a terminal rod to the battery, and measure the injector injection amount.

Standard value: 71 to 81cc/ 15 seconds

- (8) Remove the terminal rod from the battery, and check for leaks around the nozzle area.

Standard value: Less than 1 drop per 3 minutes

TURBO PRESSURE SENSOR

TURBO PRESSURE SENSOR INSPECTION

1. Output voltage inspection

- (1) Turn the ignition ON while the engine is stopped.
- (2) Use a Toyota electrical tester and mini tester lead and measure the voltage between terminals Vcc ↔ E₁.

Standard value: 4.5 to 5.5V

Caution:

Connect the connector to the computer, and inspect from the reverse side of the connector.

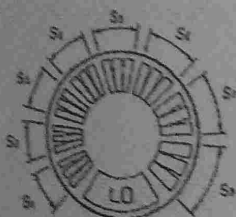
- (3) Remove the vacuum sensor vacuum hose, and connect a Mityvac.
- (4) Use a Toyota electrical tester, and measure the voltage change between terminals PIM ↔ E₂ while applying negative pressure of 600mmHg from an atmospheric release state.

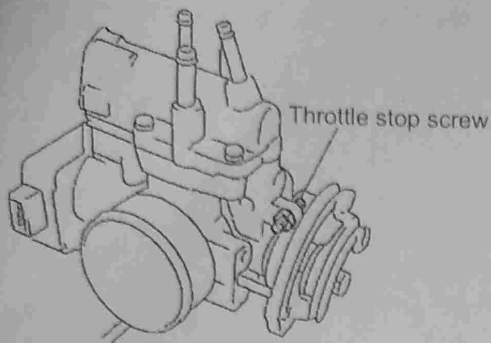
Standard: 2.3 to 3.0V → 0.7 to 1.3V

- (5) Remove the turbo pressure sensor vacuum hose, and connect the pressure gauge.
- (6) Use a Toyota electrical tester, and measure the voltage between PIM ↔ E₂ terminals while increasing pressure.

Standard value

CHARGING PRESSURE (KG/CM ²)	PIM ↔ E ₂ VOLTAGE (V)	TURBOMETER INNER LIGHT SEGMENT NUMBER (REFERENCE)
0.1	2.7~3.0	S1 or S1-S2
0.3	3.1~3.3	S1-S3 or S1-S4
0.6	3.6~3.9	S1-S7 or S1-S8





THROTTLE BODY

THROTTLE BODY INSPECTION AND ADJUSTMENT

1. Throttle body inspection

- (1) Check that there is no excessive play in the throttle valve shaft.
- (2) Check that all the ports are not clogged.
- (3) Check that the closing of the throttle valve is smooth.
- (4) Inspect the clearance between the throttle stop screw and lever with the throttle valve in a fully closed position.

Standard: no clearance

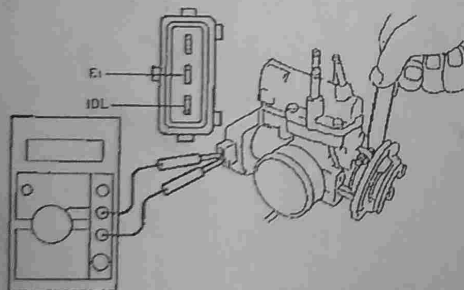
Adjust so that there is no clearance.

Caution:

Do not adjust the throttle stop screw more than required.

2. Clearance adjustment

- (1) Loosen the throttle stop screw lock nut, and loosen until it is no longer in contact with the screw.
- (2) Check that the throttle valve is completely closed.
- (3) Tighten the throttle stop screw by 1/4 of a rotation at the point when it comes into contact with the lever, and secure with a lock nut.
- (4) Carry out an inspection on the throttle position sensor.



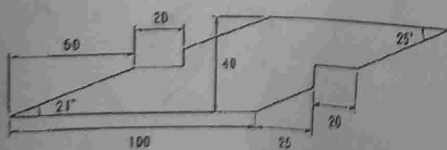
THROTTLE POSITION SENSOR

THROTTLE POSITION SENSOR INSPECTION

1. IDL↔E1 terminal conduction inspection

- (1) Place a thickness gauge between the throttle stop screw and lever, and use a Toyota electrical tester to carry out a conduction inspection between terminals IDL↔E1.

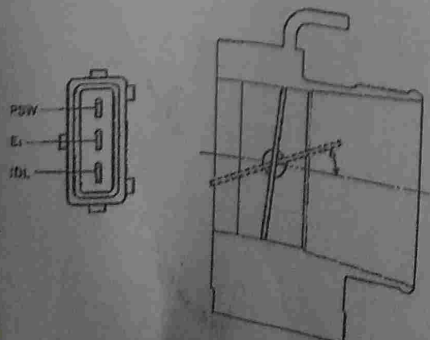
Standard: 0.8mm conduction
0.9mm no conduction

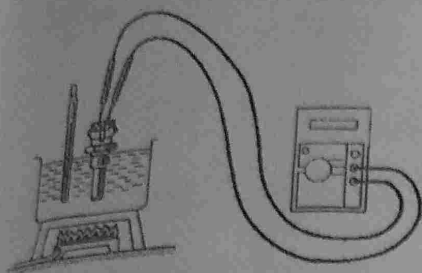


2. PSW↔E1 terminal conduction inspection

- (1) Create an angle gauge out of a thick paper, and use a Toyota electrical tester to carry out a conduction inspection between terminals PSW↔E1.

Standard: gauge angle 25°: no conduction
gauge angle 21°: conduction



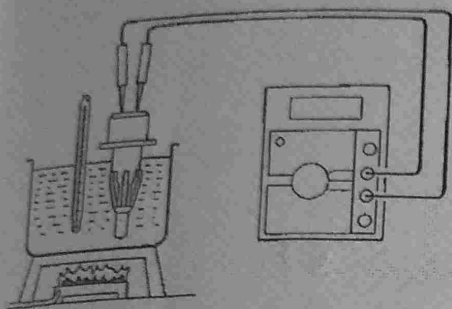


WATER TEMPERATURE SENSOR

WATER TEMPERATURE SENSOR

1. Inspect the terminal resistance.
 - (1) Use a Toyota electrical test to measure the resistance between terminals.

Standard: 2 to 3k Ω (water temperature 20°C)
0.2 to 0.4k Ω (water temperature 80°C)



INTAKE AIR TEMPERATURE SENSOR

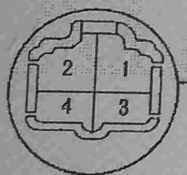
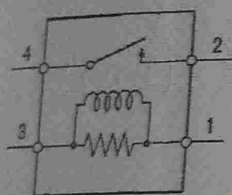
INTAKE AIR TEMPERATURE SENSOR INSPECTION

1. Terminal resistance measurement
 - (1) Leave the sensor in water with a temperature 20°C for at least one minute before measuring the resistance between the terminals.

Standard value: 2.2 to 2.7k Ω

Caution:

Do not place the end of the sensor into a water depth of more than 25mm.



EFI MAIN RELAY

EFI MAIN RELAY INSPECTION

1. EFI main relay inspection
 - (1) Use a Toyota electrical test to measure the resistance between terminals.

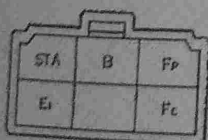
Standard: 2 to 3k Ω (water temperature 20°C)
0.2 to 0.4k Ω (water temperature 80°C)
 - (2) Apply a battery voltage between terminals 1 $\leftrightarrow$ 3, and check that terminals 2 $\leftrightarrow$ 4 are conducting.

CIRCUIT OPENING RELAY

CIRCUIT OPENING RELAY INSPECTION

1. Circuit opening relay inspection
 - (1) Use a Toyota electrical tester, and measure the resistance between terminals.

Standard value



TERMINAL	RESISTANCE VALUE (Ω)
STA $\leftrightarrow$ E ₁	30~60
B $\leftrightarrow$ F _c	80~120
B $\leftrightarrow$ F _p	∞
	0 (Apply 12V between terminals STA $\leftrightarrow$ E ₁)

4E-FTE ENGINE - EFI SYSTEM

ENGINE CONTROL COMPUTER

ENGINE CONTROL COMPUTER INSPECTION

1. Inspect the computer operation.
(1) Connect a mini tester lead to a Toyota electrical tester, and inspect from the reverse side of the connector.

Caution:

- Connect the connector to the computer, and inspect from the reverse side of the connector.
- For systems that do not have any measurement conditions, stop the engine and turn the ignition ON.

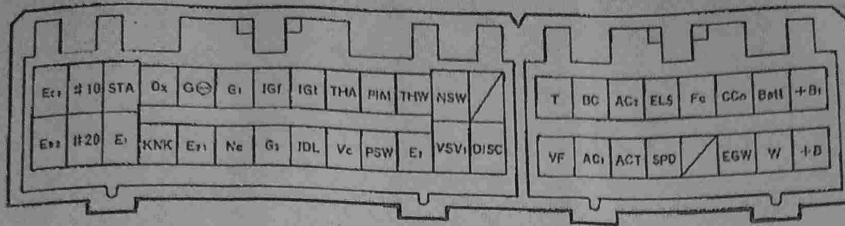
FUEL SENDER Ω

4.3 - 10.3 Ohms Ω (Full)

112.3 - 112.6 Ω Ohms (Empty)

Wires = PINK (Signal)
Brown (Ground)
BLACK (Ground)

4E-FTE ENGINE - EFI SYSTEM



INSPECTION SYSTEM	TERMINAL	MEASUREMENT CONDITIONS	STANDARD VALUE (V)
Electrical system	Batt - body earth	Standard	10~14
	+B 0 body earth	---	10~14
	+B1: body earth		
Throttle position sensor system	IDL - body earth	Throttle valve fully open	Less than 0.5
		Throttle valve open (more than 1.5°)	10~14
	PSW - body earth	Throttle valve fully closed	More than 11
		Throttle valve fully opened	Less than 0.5
Vacuum sensor system	PIM - body earth	Port the port pressure is atmospheric pressure	2.3~2.9
		Port negative pressure of 200mmHg	When there is atmospheric pressure, the output value decreases by 0.6~1.0
	Vc - body earth	---	4.5~5.5
Intake air temperature sensor system	THA - body earth	Atmospheric temperature is approximately 20°C	2.0~2.5
Water temperature sensor system	THW - body earth	Coolant temperature approximately 20°C	0.4~0.7
Starter signal system	STA - body earth	When cranking	More than 6
Injection signal system	#10, #20 - body earth	---	10~14
		When idling	Pulse generation
Igniter system	IGf - body earth	---	Less than 0.5
		When idling	Pulse generation
	IGt - body earth		Pulse generation
Distributor system	G1-G (negative)	When idling	Pulse generation
	G2-G (negative)		
	Ne-G (negative)		
Others	NSW - body earth	P, N range (A/T)	Less than 0.5
		Outside of P, N range (A/T)	10~14
	SPD - body earth	Rotate the drive wheels slowly	Changes between 0↔10~14
	CC2 - body earth	---	4.0~5.5
	Ox - body earth	Retain the engine revolutions at 2500rpm for 90 seconds after the engine warms up	Changes between 0↔1.0
	W - body earth	When the check engine warning lamp is on (disconnect the water temperature sensor connector)	Less than 3.3
		When the engine is idling (when the lamps are off)	10~14
	EGW - body earth	When the exhaust temperature warning lamp is on (short circuit check connector terminals - CCo↔E1)	Less than 3.3
		When idling the engine (lamps are off)	10~14
	Vf - body earth	After retaining the engine revolutions at 2500rpm for 90 seconds after the engine warms up, idle the engine and short-circuit between terminals T↔E1	Changes between 0↔5.5
	Fc - body earth		10~14
		When idling the engine	0~3

4E-FTE ENGINE - EFI SYSTEM

INSPECTION SYSTEM	TERMINAL	MEASUREMENT CONDITIONS	STANDARD VALUE (V)
Others	ELS - body earth	Tail lamp and defogger switch OFF	Less than 0.5
		Tail lamp is ON or defogger switch is ON	10~14
	ACT - body earth	Air conditioner is ON (magnet clutch is ON)	10~14
		For 3 seconds after the engine revolution speed decreases below than 1200rpm and the negative pressure decreases below 680.	Less than 1.0
	DISC - body earth	IG switch is ON, and the check connector TE1- E1 terminals are disconnected	Less than 3.3
		When cranking	10~14
	AC1 - body earth	Air conditioner is OFF	10~14
		Air conditioner is ON (ECON, A/C mode with the magnet clutch ON)	Less than 1.0
	AC2 - body earth	Air conditioner is OFF	10~14
		Air conditioner is ON (A/C mode with the magnet clutch ON)	Less than 1.0
	VSV1 - body earth	Turbo switch is ON (Lo mode)	Less than 0.5
		Turbo switch is OFF (Hi mode)	10~14
	BC - body earth	Turbo switch is ON (Lo mode)	Less than 0.5
		Turbo switch is OFF (Hi mode)	10~14
	E01 - body earth	Conduction inspection	Conduction
	E02 - body earth		
	E1 - body earth		
	E2 - body earth		
	E21 - body earth		

4E-FTE ENGINE - ENGINE ASSY

ENGINE ASSY PARTS

SST	09228-06500 Oil filter wrench	Oil filter disassembly and assembly
		
Tools	09816-30010 Oil pressure switch socket	Oil pressure switch disassembly and assembly
		
	09090-04010 Engine spring device	Engine disassembly and assembly
		
	Tape socket wrench (14mm)	Front exhaust pipe disassembly and assembly
Grease, others	Adhesive 1324	Fly wheel and drive plate bolt lubrication, oil pressure switch lubrication
	Seal packing 1282B	Water pump mounting surface lubrication, water outlet housing mounting surface lubrication
	Castle MG Gear Oil Special	Transmission injection
	Castle Auto Fluid D-II	
	LLC	Use to fill
	Engine oil	Use to fill

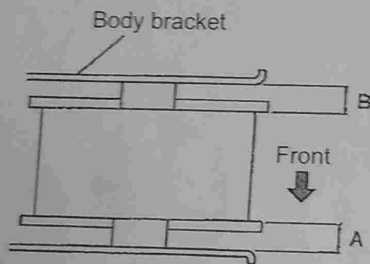
4E-FTE ENGINE - ENGINE ASSY

ENGINE ASSY ASSEMBLY AND DISASSEMBLY TIGHTENING TORQUE TABLE

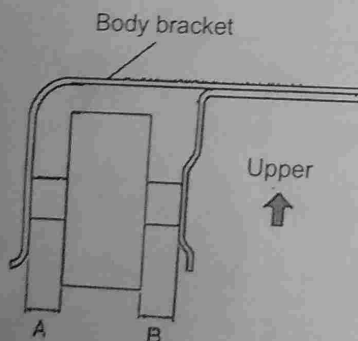
P/S pump + bracket	Adjusting bolt		400
	Through bolt		440
EX front pipe + manifold converter			630**
EX pipe support bracket + cylinder lock			195
Clutch release cylinder + transmission			120
Engine mounting insulator RH +	Body	Through bolt	650
	Bracket	Bolt	650
		Nut**	650
Engine mounting insulator LH	Body	Through bolt	880
	Bracket	Bolt	490
Engine mounting insulator RR +	Body	Through bolt	650
	Bracket	bolt	800

M/T	Rear end plate +	Cylinder block	(M6)	75
	Transmission +		(M10)	470
			(M12)	650
		Starter		400
		Fly-wheel +	Clutch cover	
	Crankshaft			900**
A/T	Rear end plate +	Cylinder block	(M6)	75
	Transmission +		(M10)	470
			(M12)	650
		Starter		400
	Fly-wheel +	Clutch cover		185**
		Crankshaft		900**

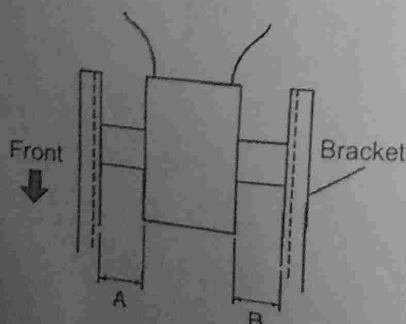
RH



LH



RR



DISASSEMBLY AND ASSEMBLY PROCEDURE PRECAUTIONS

1. Inspect the engine mounting insulator.
(1) Shake the engine several times and check that the clearance of the left and right mounting insulators and brackets is equal.

Note:

- A-B $\leq \pm 3.0\text{mm}$ (RH)
- A-B $\leq \pm 3.0\text{mm}$ (LH)
- A-B $\leq \pm 4.5\text{mm}$ (RR)

2. Disassembly and assembly of the P/S pump.
(1) Remove the P/S pump with the high/low pressure hose attached, and hang with a wire.
3. Disassemble the A/C compressor (with A/C)
(1) Remove the A/C compressor with the high/low pressure hose attached, and hang with a wire.
4. Attach the torque converter. (A/T)
(1) Lubricate with adhesive 1324.

Caution:

Do not start the engine within 1 hour of installation.

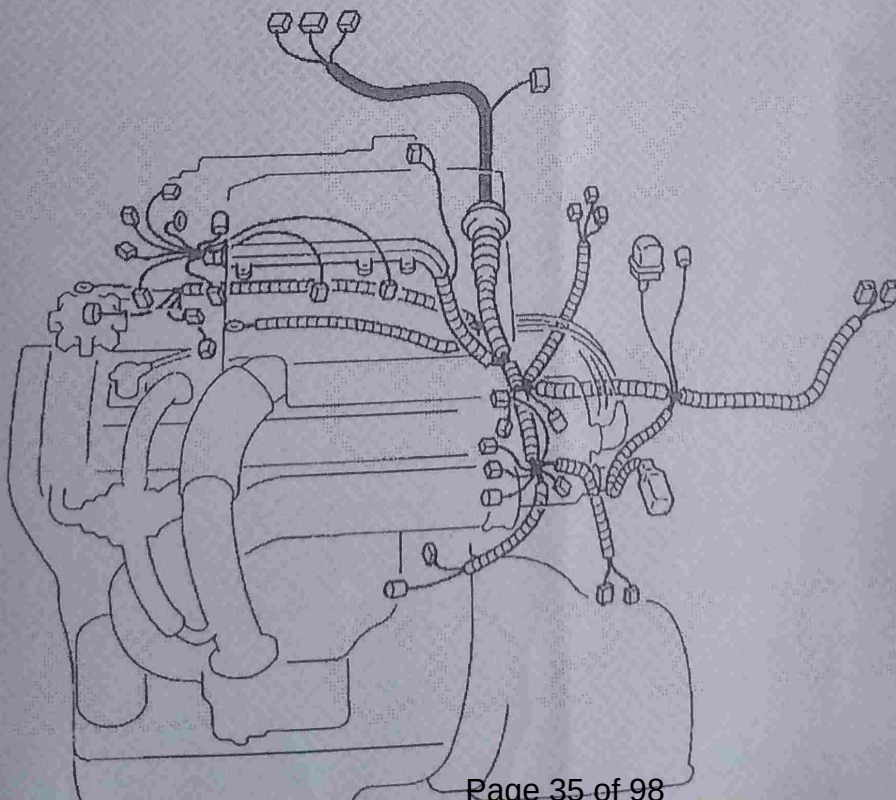
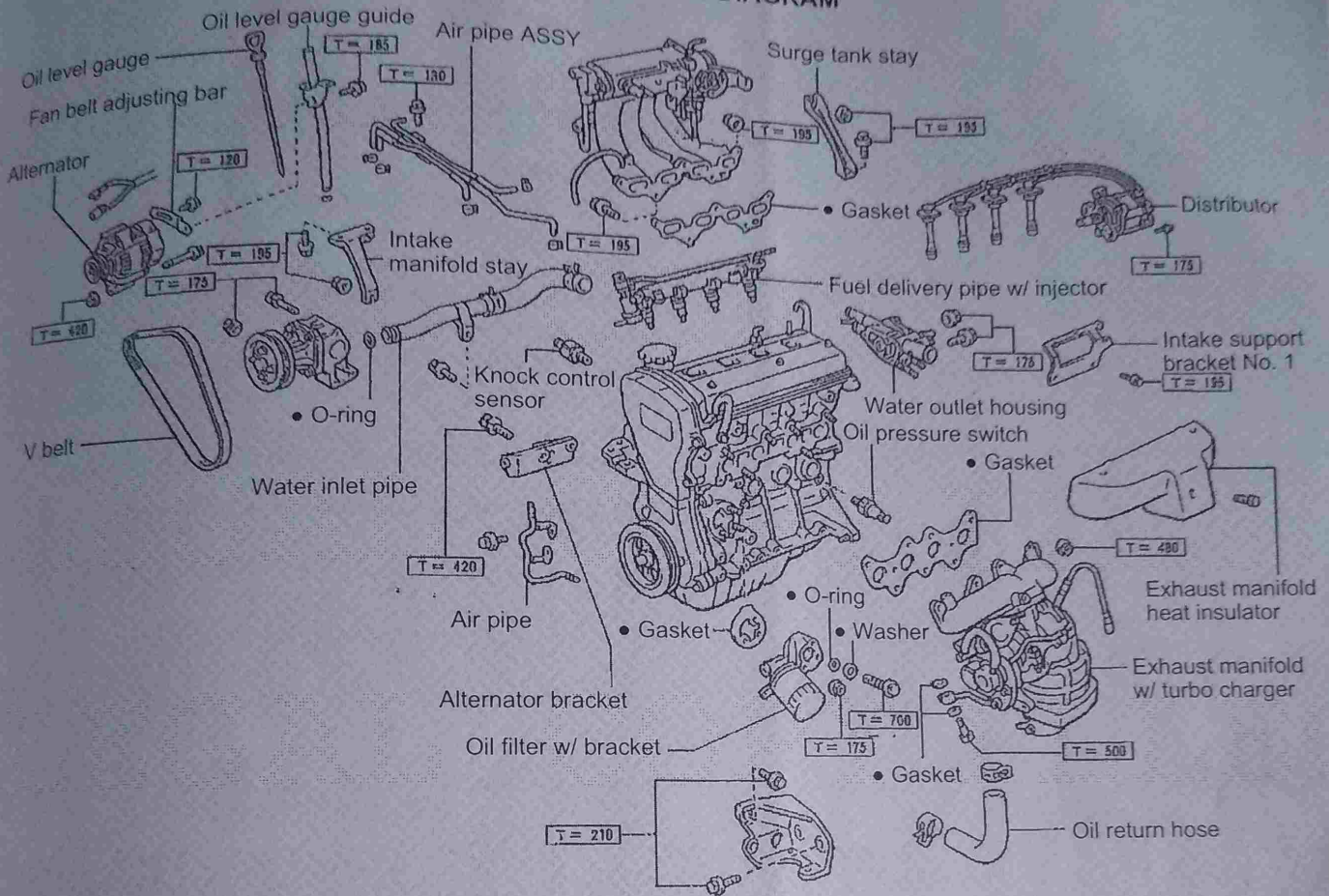
5. Remove the engine wire harness.
(1) Remove the connector from the vehicle side (engine control computer, relay block etc.), and attach the engine wire harness together with the engine w/ transmission.
6. Attach the fly-wheel and drive plate.
(1) Lubricate with adhesive 1324.

Caution:

Do not start the engine within 1 hour of installation.

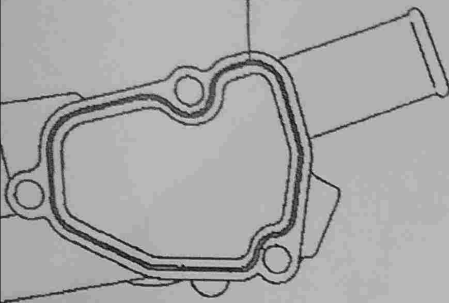
4E-FTE ENGINE - ENGINE ASSY

PARTIAL ENGINE ASSY DISASSEMBLY DIAGRAM



4E-FTE ENGINE - ENGINE ASSY

Seal packing 1282B lubrication



DISASSEMBLY AND ASSEMBLY PROCEDURE PRECAUTIONS

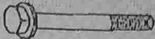
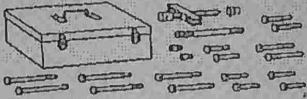
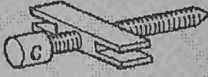
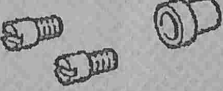
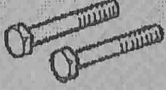
1. Oil pressure switch installation
(1) Attach after lubricating with adhesive 1324.
(Refer to page 72)
2. Water pump installation
(1) Attach after lubricating with seal packing 1282B.
3. Oil filter installation
(1) Use a SST to tighten the oil filter.
(Refer to page 72)
4. Water outlet housing installation
(1) Lubricate the mounting surfaces.
(2) Lubricate the areas shown on the diagram with packing 1282B continuously to $\phi 2\sim 3\text{mm}$, and attach the cylinder within 5 minutes.

Caution:

Do not add coolant within 2 hours of attaching the water outlet housing.

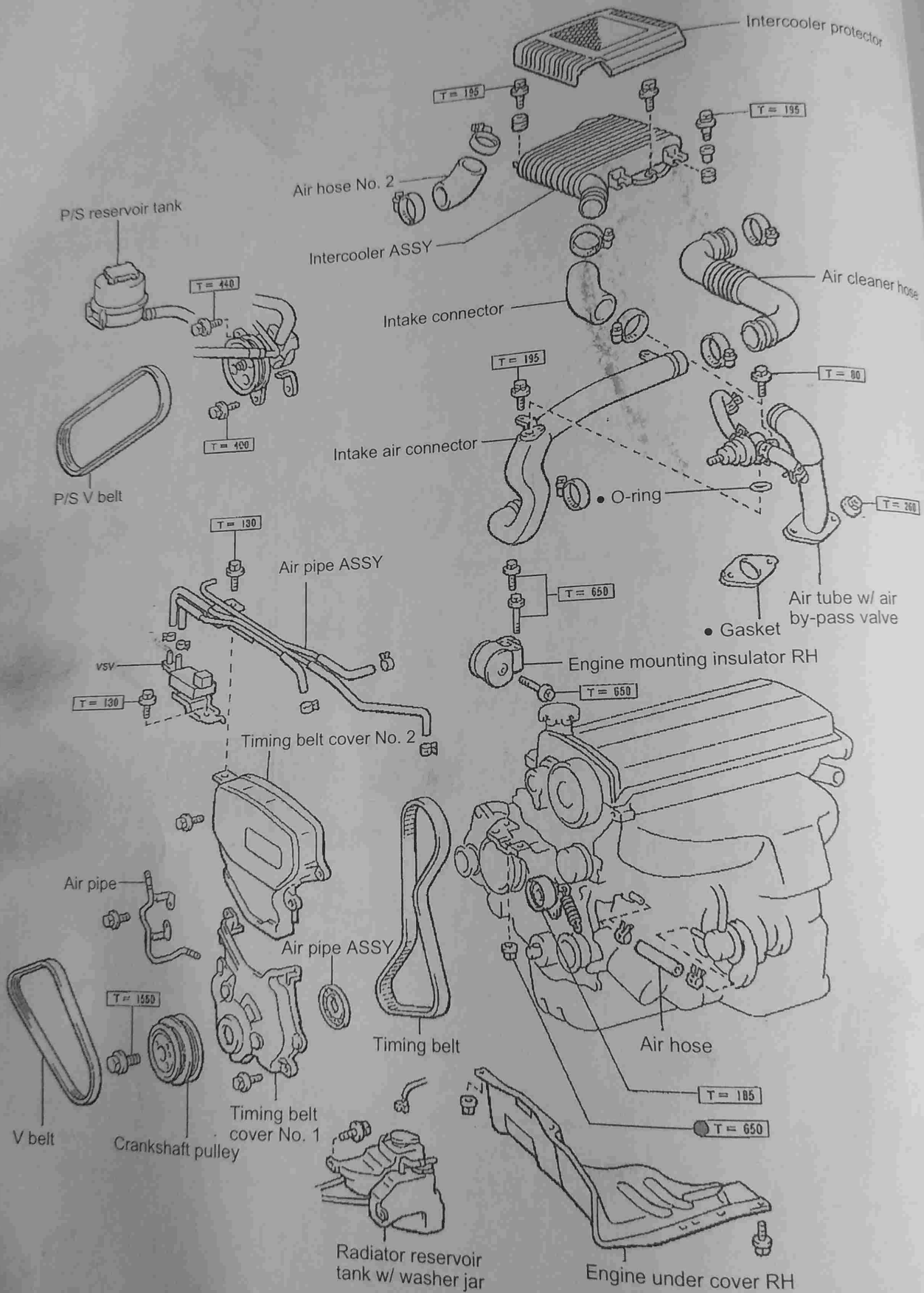
4E-FTE ENGINE - ENGINE

ENGINE PARTS

SST	09213-14010 Crankshaft pulley holding tool		Securing the crankshaft pulley
	09213-54015 Crankshaft pulley holder tool		
	90119-08216 Hold with washer		Securing the crankshaft pulley
	09213-60017 Crankshaft pulley under gear pulley		
	09213-00020 Body with bolt		Crankshaft pulley removal
	09213-00030 Handle		
	09213-00040 Attachment set		
	09213-00060 Bolt set		
Grease, others	09330-00021 Companion flange holding tool		Securing the crankshaft pulley
	LLC		Use to fill
	Engine oil		Lubricating parts

4E-FTE ENGINE - ENGINE

TIMING BELT DISASSEMBLY DIAGRAM

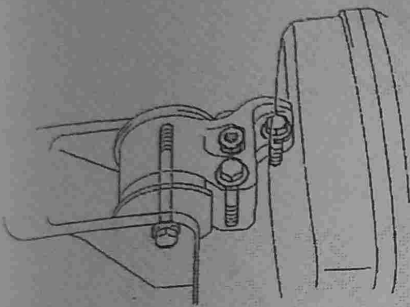
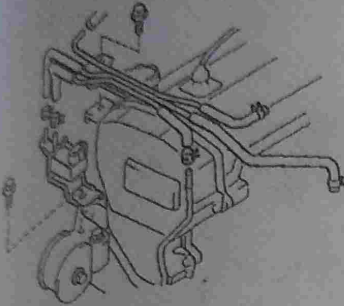


●.....Parts not to be reused

.....Tightening torque (kg/cm)

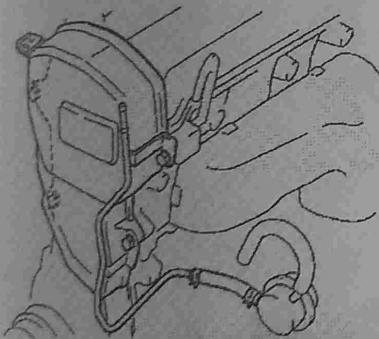
TIMING BELT REMOVAL

1. Remove the window shield washer jar.
2. Remove the radiator reservoir tank.
3. Remove the intercooler protector.
(Refer to "Intercooler system removal" on page 96)
4. Remove the VSV and air pipe ASSY.
 - (1) Disconnect the air hose and remove the air pipe ASSY.
 - (2) Disconnect the connector and remove the VSV.
5. Disconnect the P/S reservoir tank (with P/S connected)
 - (1) Disconnect the reservoir tank from the bracket and remove without removing the hose.

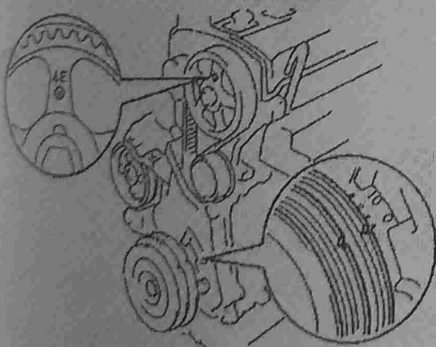


6. Remove the engine mounting insulator RH.
 - (1) Support the oil pan with a wooden block placed on top of a jack.
 - (2) Remove the 2 bolts and 1 nut, and detach the engine mounting insulator RH and bracket.
 - (3) Remove the through bolt, and attach the insulator.
7. Remove the V ribbed belt.

8. Remove the timing belt cover No. 2 and air pipe.
 - (1) Remove the 4 bolts, and remove the air pipe and timing belt cover No. 2



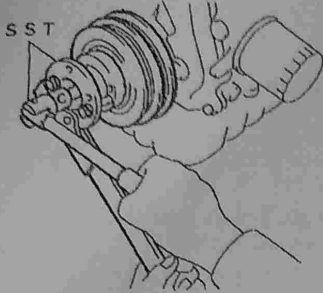
9. Set the No. 1 cylinder compressed top dead centre.
 - (1) Align the camshaft timing pulley "4E" mark hole with the camshaft bearing cap No. 1 alignment mark.



Cylinder

1	-	150 PSI
2	-	150 PSI
3	-	120 PSI
4	-	

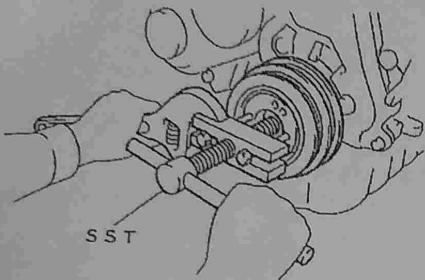
4E-FTE ENGINE - ENGINE



10. Remove the crankshaft pulley.

(1) Lower the engine.

(2) Use the SST, and remove the crankshaft pulley bolt.
SST 09213-14010 90119-08216 09330-00021

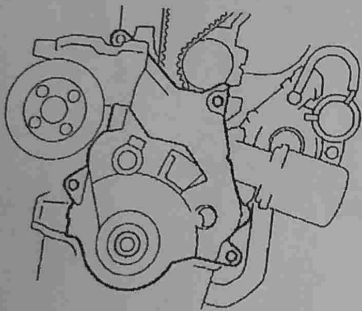


(3) Remove the crankshaft pulley.

Note:

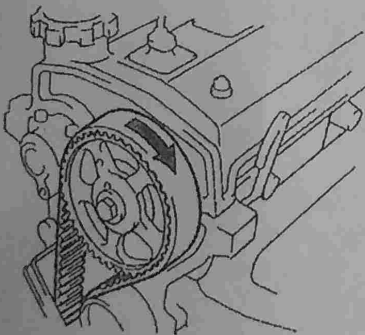
Use a SST if the pulley joint is stiff.

SST 09213-00020 09213-00030 09213-00040
09213-00060



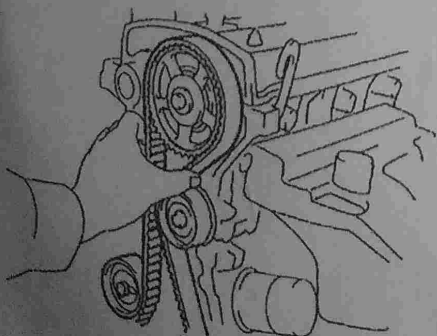
11. Remove the timing belt cover No. 1.

12. Remove the timing belt guide.



13. Remove the timing belt.

(1) Use chalk etc to label the rotation direction on the rear surface of the timing belt.



(2) Loosen the timing belt idler No. 1 bolt.

(3) Pinch the camshaft timing pulley lower area with the belt, move the idler No. 1 to the left and secure.

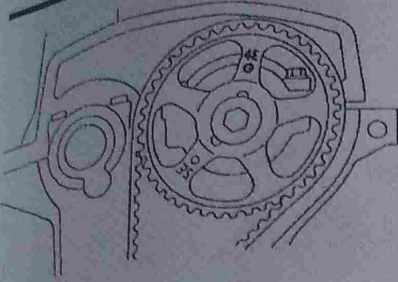
(4) Remove the timing belt.

4E-FTE ENGINE - ENGINE

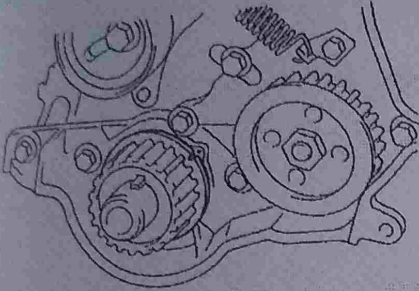
TIMING BELT INSTALLATION

1. Attach the timing belt.

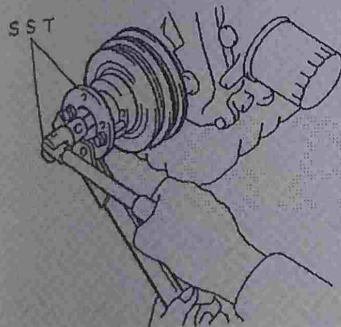
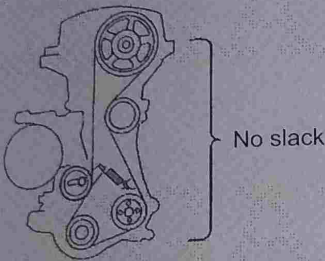
- (1) Check that the camshaft timing pulley "4 E" mark hole is aligned with the camshaft bearing cap No. 1 mark.



- (2) Align the crankshaft timing pulley flange area notch with the oil pump mark.



- (3) Check the rotation direction while attaching the timing belt, and attach so that there is no slack.



2. Attach the crankshaft pulley

- (1) Attach the crankshaft pulley.

- (2) Use a SST to tighten the crankshaft pulley bolt.

SST 09213-14010 90119-08216 09330-00021

T=1550kg/cm

3. Attach the timing belt cover No. 2 and air pipe.

4. Attach the V ribbed belt.

5. Attach the engine mounting insulator RH.

- (1) Insert the engine mounting insulator RH into the bracket, and fasten the 2 bolts and 1 nut.

- (2) Operate the jack and fasten the through bolt.

- (3) Tighten the insulator and bracket.

T=650kg/cm

- (4) Remove the jack, and tighten the through bolt.

T=650kg/cm

6. Attach the VSV and air pipe.

- (1) Attach the VSV to the engine mounting insulator RH.

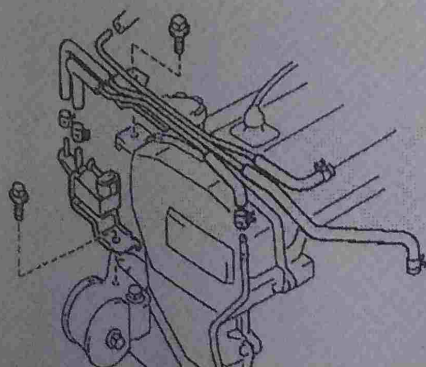
- (2) Connect the connector to the air hoses.

7. Attach the P/S reservoir tank (with the P/S attached).

8. Attach the intake air connector.

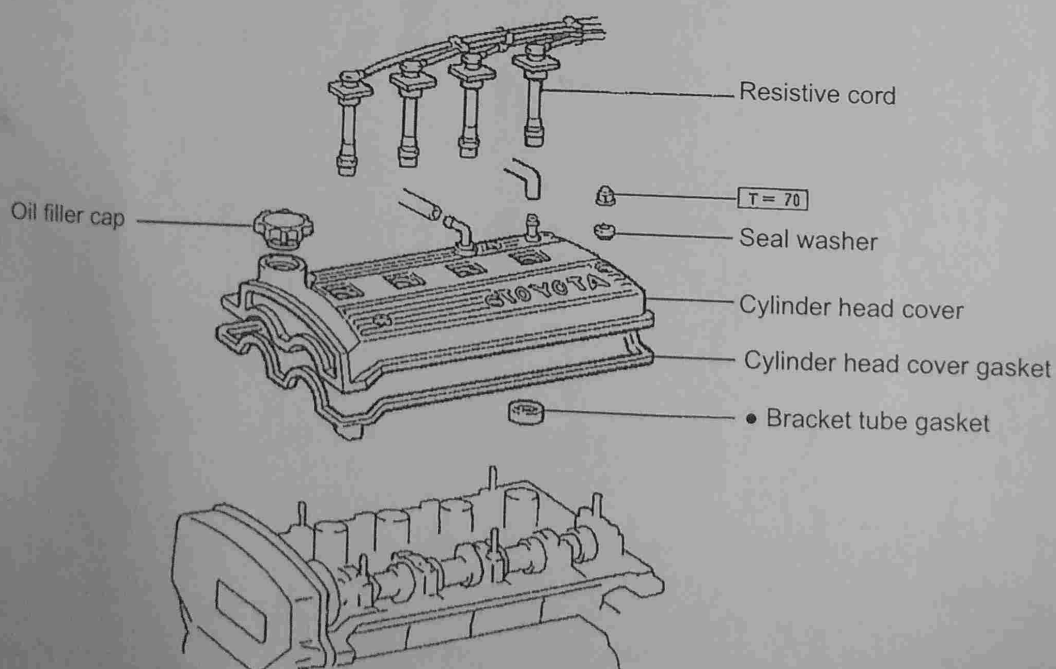
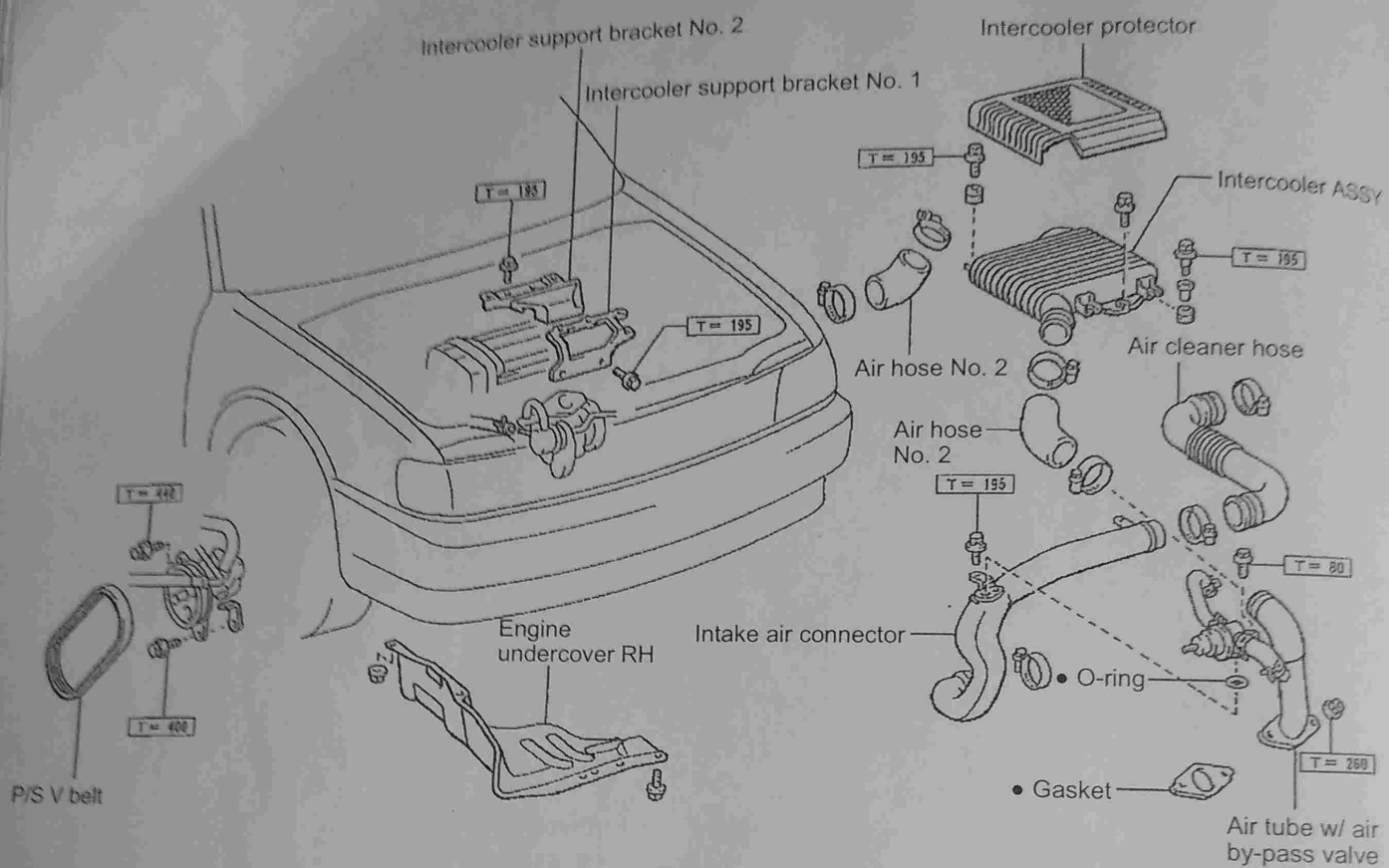
9. Attach the radiator reservoir tank.

10. Attach the wind shield washer jar.



4E-FTE ENGINE - ENGINE

PLUG TUBE GASKET DISASSEMBLY DIAGRAM

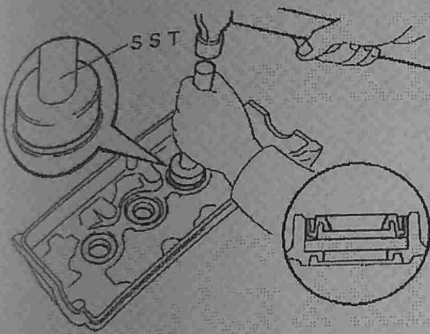
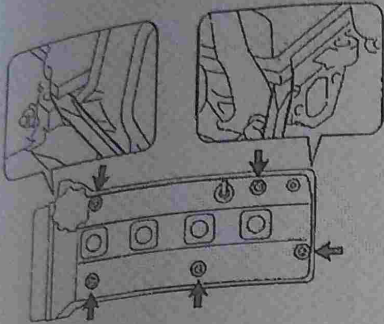


●..... Parts not to be reused □..... Tightening torque (kg/cm)

4E-FTE ENGINE - ENGINE

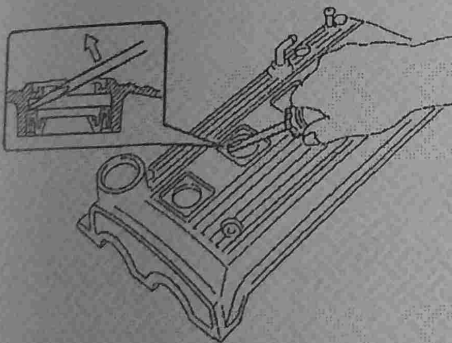
PLUG TUBE GASKET REPLACEMENT

1. Remove the intercooler system.
2. Remove the PCV hose and air hose.
3. Remove the intercooler support bracket No. 1.
4. Remove the resistive cord.
5. Remove the cylinder head cover.
 - (1) Remove the oil filler cap.
 - (2) Remove the cap nut and seal washer.
 - (3) Use a screw driver to prise the areas shown in the diagram, and remove the cylinder head cover.

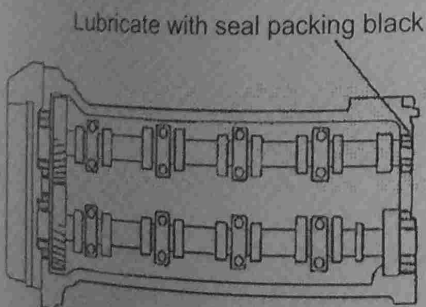


6. Remove the plug tube gasket.
 - (1) Use a flat head screw driver to remove.

7. Attach the plug tube gasket.
 - (1) Use a SST to strike and install the new gasket in the position shown in the diagram.



8. Remove the plug tube gasket.
 - (1) Use a flat head screw driver to remove.
9. Attach the cylinder head cover.
 - (1) Remove the grease from the cover and cylinder mounting surface.
 - (2) Lubricate the areas shown in the diagram with seal packing black, and attach within 5 minutes.

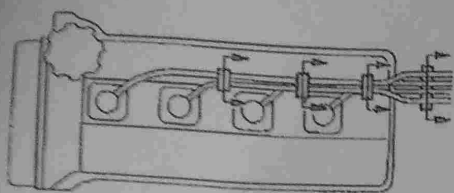


Caution:

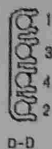
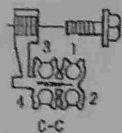
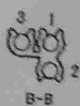
Do not start the engine within 2 hours of installation.

- (3) Tighten the 5 nuts and seal washers.
 $T=70\text{kg/cm}$
- (4) Attach the oil filler cap.

4E-FTE ENGINE - ENGINE

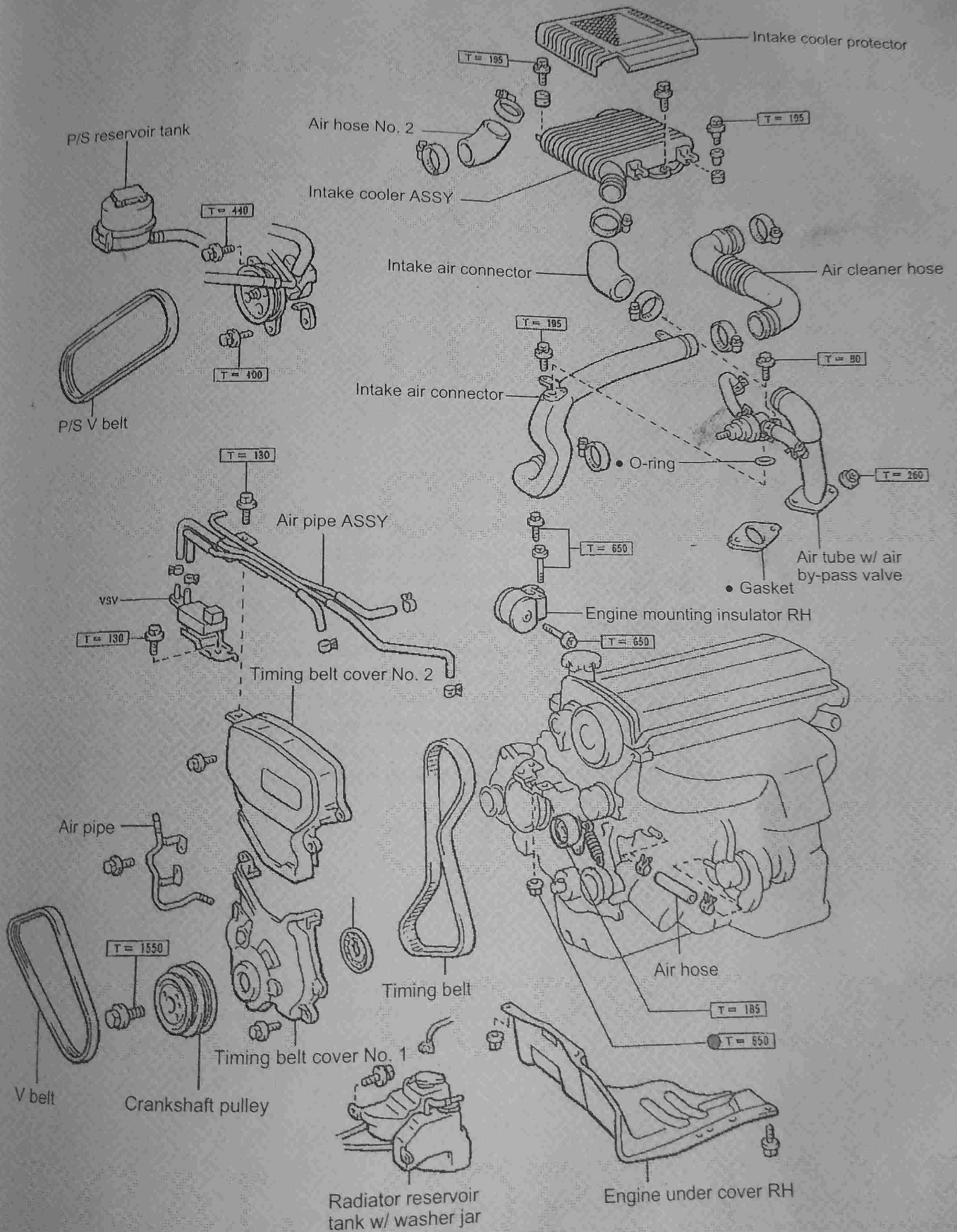


10. Attach the resistive cord.
 11. Attach the intercooler support bracket.
 12. Attach the PCV hose and air hose.
 13. Attach the intercooler system.
- (Refer to "Intercooler system installation" on page 97)



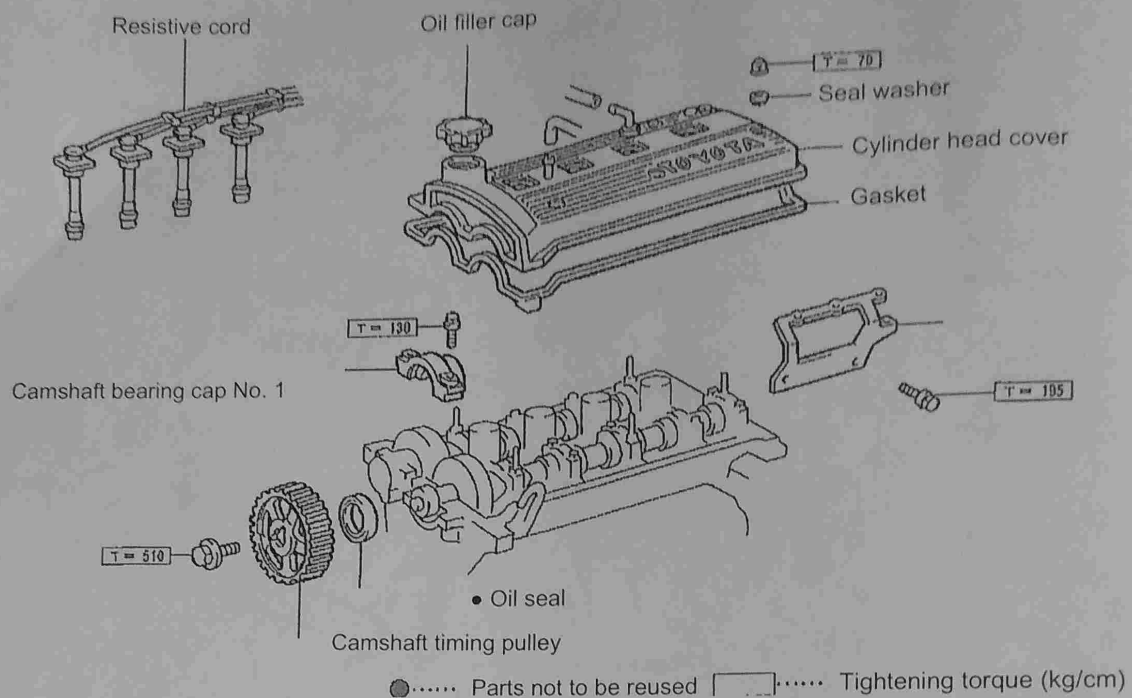
4E-FTE ENGINE - ENGINE

CAMSHAFT OIL SEAL DISASSEMBLY DIAGRAM



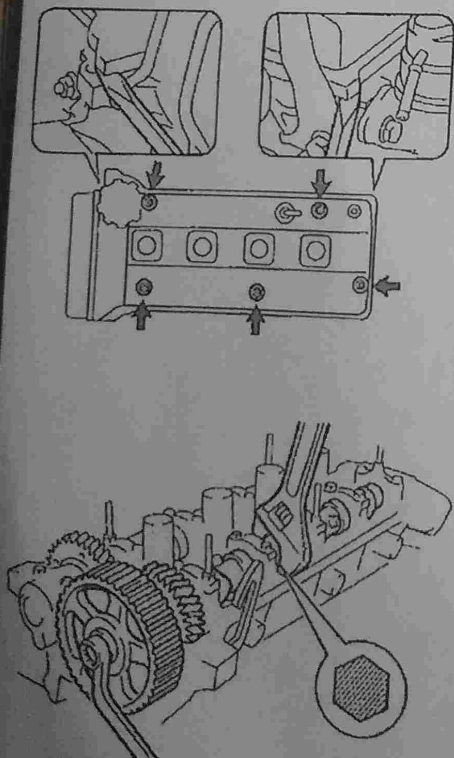
●..... Parts not to be reused □..... Tightening torque (kg/cm)

4E-FTE ENGINE - ENGINE

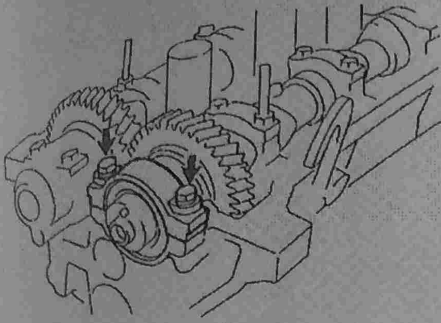


CAMSHAFT OIL SEAL REPLACEMENT

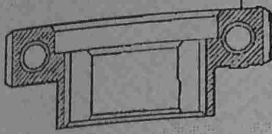
1. Remove the timing belt.
(Refer to page 39)
2. Remove the PCV hose and air hose.
3. Remove the resistive cord.
4. Remove the intercooler support bracket No. 1.
5. Remove the cylinder head cover.
 - (1) Remove the oil filler cap.
 - (2) Remove the cap nut and seal washer.
 - (3) Use a driver to prise the areas shown in the diagram, and remove the cylinder head cover.
6. Remove the camshaft timing pulley.
 - (1) Use the camshaft service hexagon area to secure the camshaft as shown in the diagram, and remove the pulley set bolt.
 - (2) Remove the camshaft timing pulley.



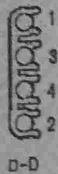
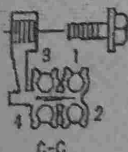
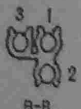
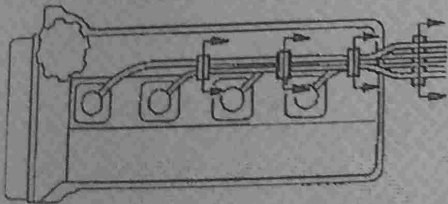
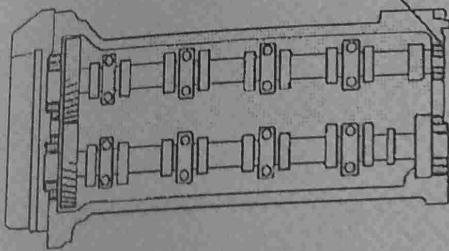
4E-FTE ENGINE - ENGINE



Lubricate with seal packing black



Lubricate with seal packing black



7. Replace the camshaft oil seal.
 - (1) Remove the camshaft bearing cap No. 1.
 - (2) Remove the camshaft oil seal.
 - (3) Lubricate the new oil seal lip area with Castle MP grease No. 2, and insert from the lip area side into the camshaft.

Caution:

- Do not reverse the lip.
- Insert securely into the cylinder head.

- (4) Remove the grease from the camshaft bearing cap No. 1 mounting surface.
- (5) Lubricate the area on the bearing cap shown in the diagram with seal packing black, and attach to the cylinder within 5 minutes, and evenly tighten the bolts.
T=130kg/cm

Caution:

Do not start the engine within 2 hours of installation.

8. Attach the cylinder head cover.
 - (1) Remove the grease from the cover and cylinder mounting surface.
 - (2) Lubricate the areas shown in the diagram with seal packing black, and attach within 5 minutes.

Caution:

Do not start the engine within 2 hours of installation.

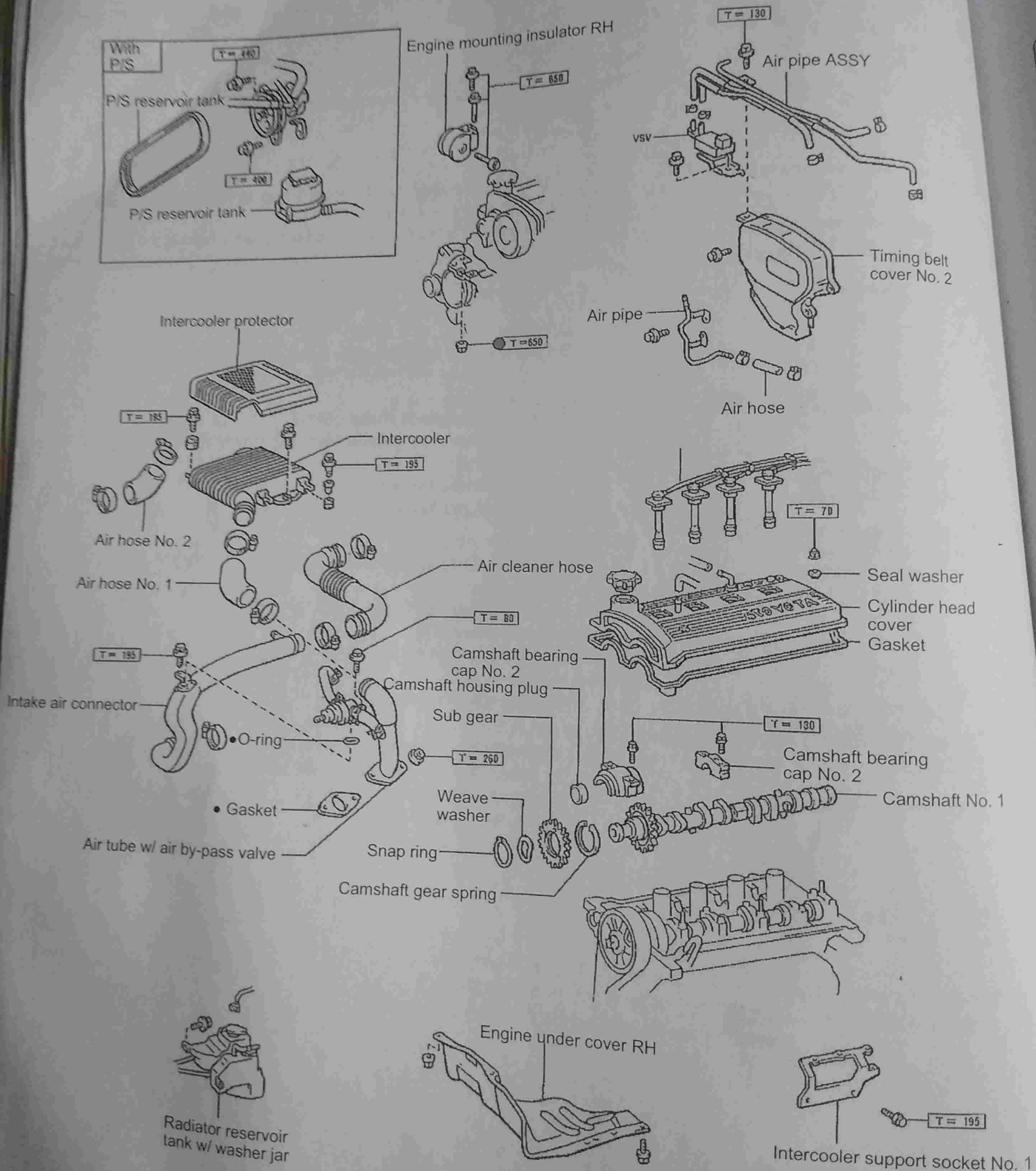
- (3) Tighten the 5 nuts and seal washers.
T=70kg/cm
- (4) Attach the oil filler cap.

9. Attach the resistive cord.

10. Attach the intercooler support bracket No. 1.
11. Attach the PCV hose and air hose.
12. Attach the timing belt.
(Refer to page 41)

4E-FTE ENGINE - ENGINE

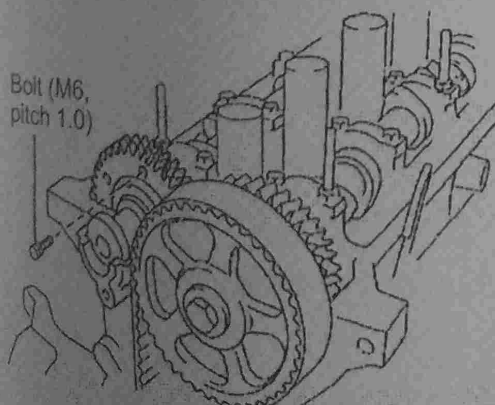
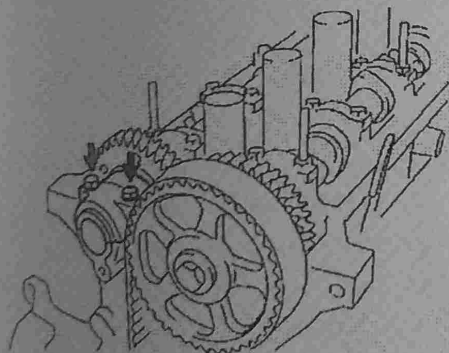
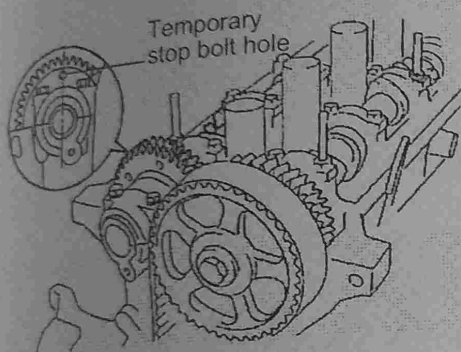
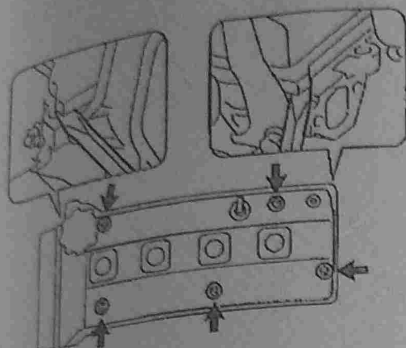
CAMSHAFT DISASSEMBLY DIAGRAM



•..... Parts not to be reused

CAMSHAFT NO. 1 REMOVAL

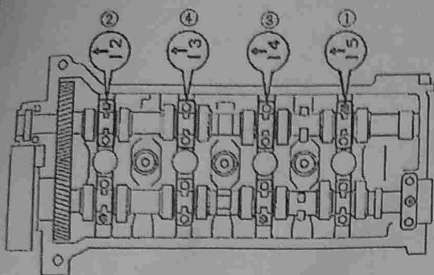
1. Remove the windshield washer jar.
2. Remove the radiator reservoir tank.
3. Remove the intercooler protector.
(Refer to page 96, "Intercooler system removal" procedures 1 to 6)
4. Remove the VSV and air pipe ASSY.
(Refer to page 39, "Timing belt removal" procedures 4, 5, 6 and 8)
5. Remove the PCV hose and air hose.
6. Remove the resistive cord.
7. Remove the intercooler support bracket No. 1.
8. Remove the cylinder head cover.
 - (1) Remove the oil filler cap.
 - (2) Remove the cap nut and seal washer.
 - (3) Use a screw driver to prise the areas shown in the diagram, and remove the cylinder head cover.
9. Remove the camshaft No. 1.
 - (1) Use the service hexagon to rotate the camshaft so that the sub gear securing bolt hole is facing directly upwards, and set so that the No. 3 and No. 4 cam nose will be on the lower side and the lift amount is the even.



- (2) Remove the camshaft bearing cap No. 2.
- (3) Remove the camshaft housing plug.

- (4) Secure the sub gear to the driven gear with a bolt (M6, pitch 1.0).
T=55kg/cm

4E-FTE ENGINE - ENGINE

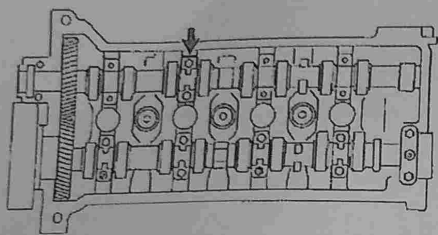


(5) Attach the camshaft bearing cap No. 3 in the order shown in the diagram.

Caution:

- Do not prise the camshaft with tools or apply excessive force on the camshaft.
- Do not damage the cylinder head side thrust bearing.

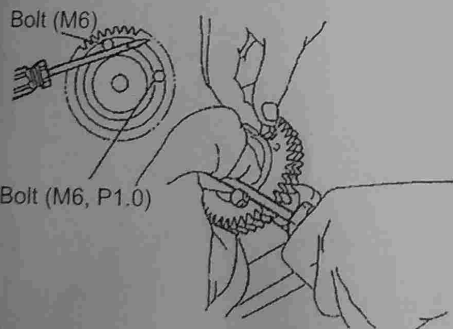
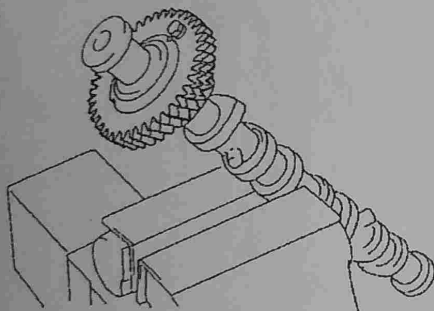
(6) Remove the camshaft No. 1.



CAMSHAFT NO. 1 DISASSEMBLY

1. Remove the sub gear.

(1) Protect the intake camshaft service hexagon area with an aluminium cap and secure in a vice.



(2) Insert a bolt (M6) into the sub gear as shown in the diagram.
 (3) Insert a driver between the bolt (M6) and the camshaft journal, and apply force to the bolt and sub gear and rotate towards the right. Remove the sub gear securing bolt (M6, pitch 1.0) that was attached during the camshaft removal procedures.

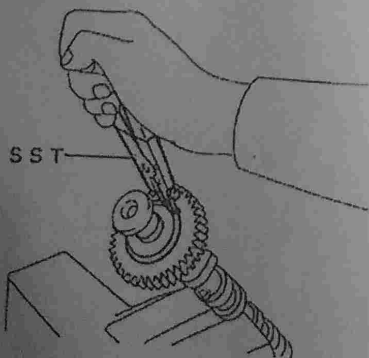
Caution:

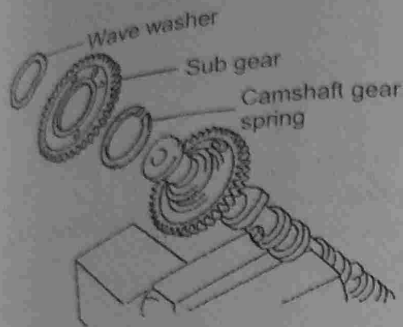
- Apply a rag to prevent damaging the cam journal.
- Check that the bolt is attached firmly to the sub gear.

(4) Use a SST to remove the snap ring.

SST 09904-00010 09904-00040

(5) Remove the wave washer, sub gear and camshaft gear spring.





CAMSHAFT NO. 1 ASSEMBLY

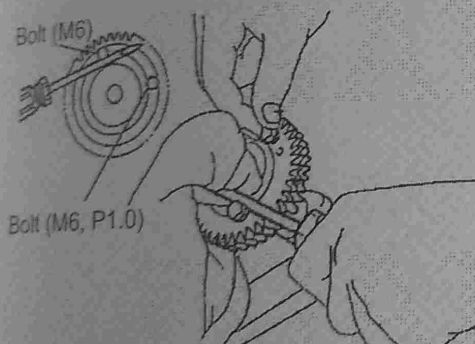
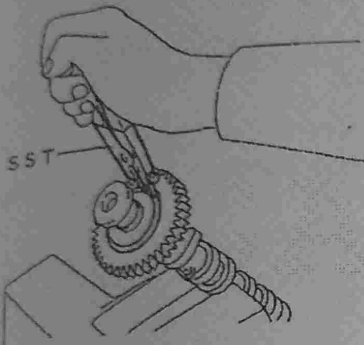
1. Attach the sub gear.

- (1) Protect the intake camshaft service hexagon area with an aluminium cap and secure in a vice.
- (2) Attach the camshaft gear spring, sub gear and the wave washer to the camshaft driven gear.

Caution:

Face the driver gear side of the sub gear towards the protruding part of the spring stopper pin.

- (3) Use the SST to attach the snap ring.
SST 09904-0010 09904-00040



- (4) Insert a bolt (M6) into the sub gear as shown in the diagram.
- (5) Insert a driver between the bolt (M6) and the camshaft journal, rotate the bolt and sub gear towards the right, align the sub gear mounting auxiliary hole and the camshaft driver gear mounting auxiliary hole and tighten the securing bolt (M6, pitch 1.0).

Reference value: $T=55\text{kg/cm}$

- Apply a rag to prevent damaging the cam journal.
- Check that the bolt is attached firmly to the sub gear.

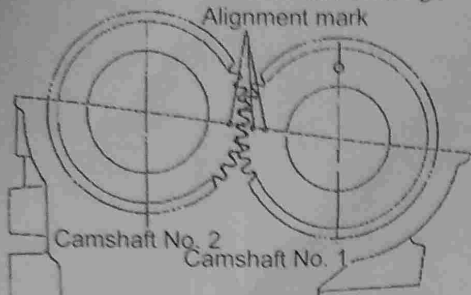
Note:

When attaching the camshaft, make sure that the force of the does not effect the sub gear.

- (6) After attaching the securing bolt (M6, pitch 1.0), remove bolts (M6)

Rear view of camshaft gear

Alignment mark

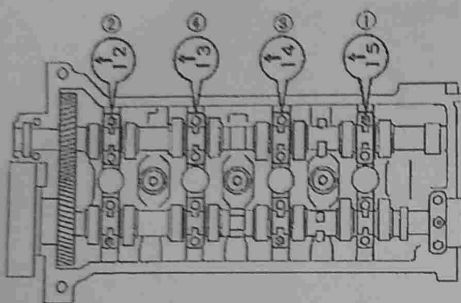


CAMSHAFT NO. 1 INSTALLATION

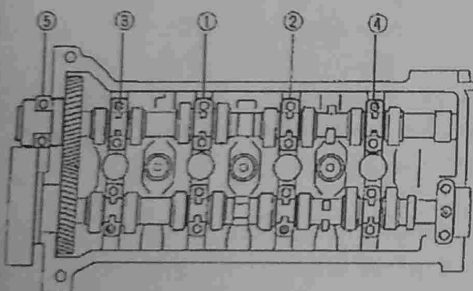
1. Attach the camshaft No. 1.
 - (1) Lubricate the camshaft cam and gear areas as well as the cylinder head journal area with engine oil.
 - (2) Check that the camshaft No. 2 alignment mark position is the same as the position shown in the diagram.
 - (3) Move the top of the camshaft drive gear while rotating the camshaft No. 1, align the camshaft drive gear with the camshaft driven gear alignment mark, and set to the top of the cylinder head.

Caution:

Do not damage the cylinder head side thrust bearing.



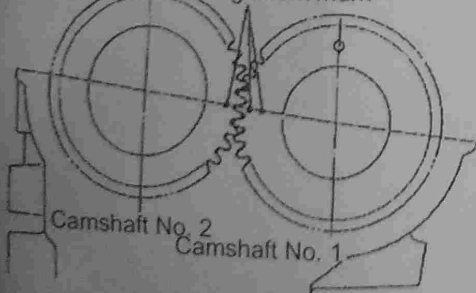
- (4) Temporarily assemble the camshaft bearing cap No. 3 as shown in the diagram.
- (5) Remove the bolt that is securing that sub gear.
- (6) Assemble the camshaft bearing cap No. 2 and the camshaft housing plug.



- (7) Tighten the bolts equally about 2 to 3 times in the order shown in the diagram.
 $T=130\text{kg/cm}$

Rear view of camshaft gear

Alignment mark

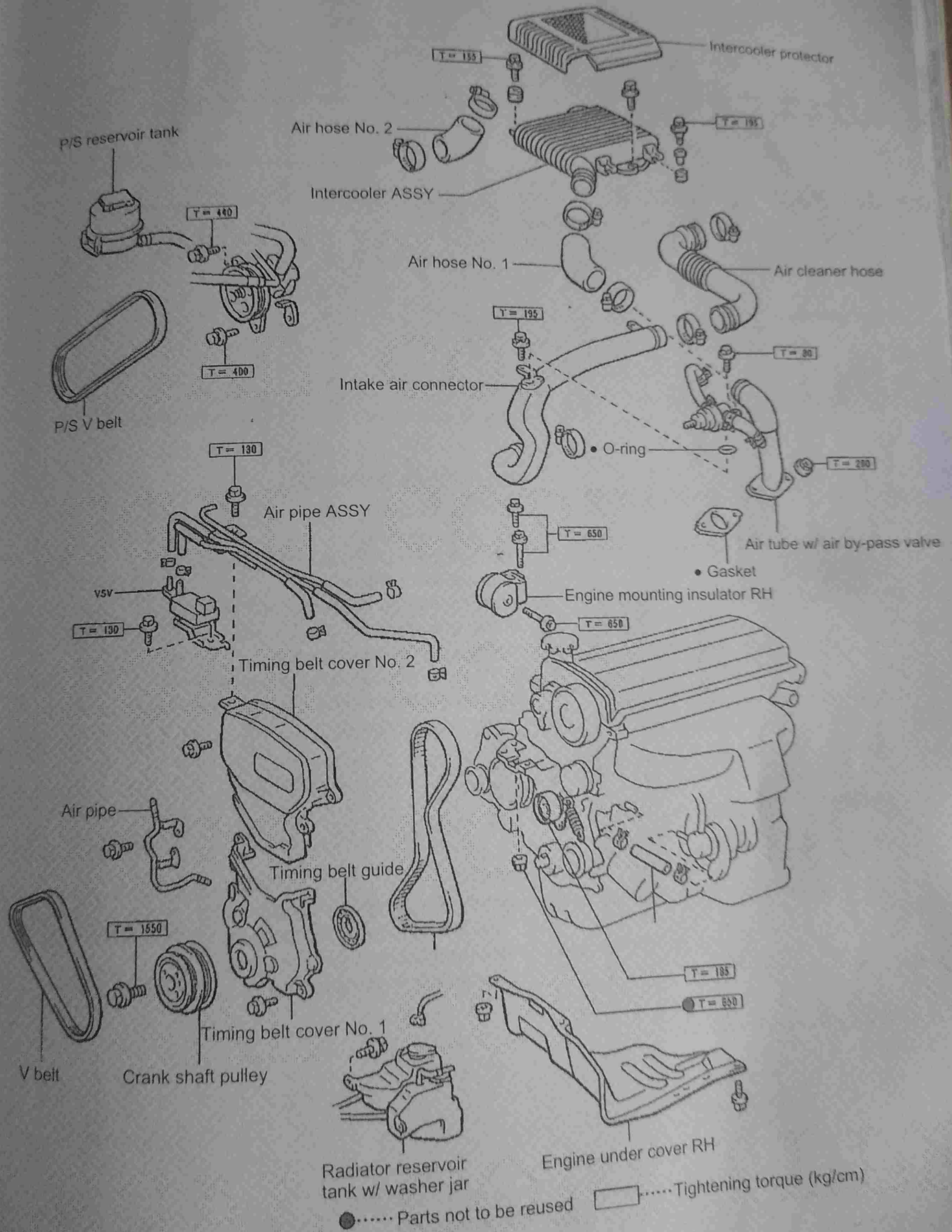


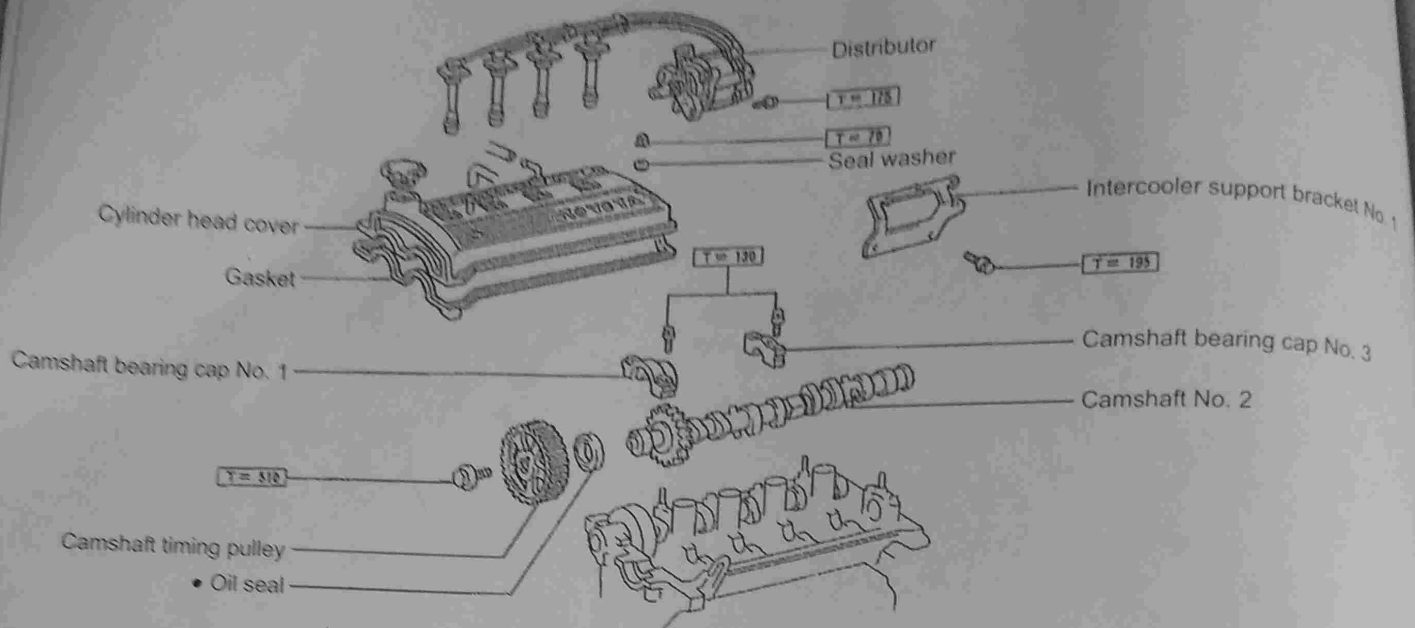
- (8) Turn the crankshaft clockwise, and check that the camshaft No. 1 and No. 2 TDC marks (RR side) are aligned above the head cover alignment surface.
2. Attach the cylinder head cover.
(Refer to page 6)
3. Attach the intercooler support bracket. No. 1.
4. Attach the PCV hose and air hose.
5. Attach the timing belt cover No. 2. and air pipe.
6. Attach the engine mounting insulator RH.
(Refer to page 41, procedures 5 to 7)
7. Attach the intake air connector.
(Refer to page 96, "Intercooler system removal" procedures 2 to 8)
8. Attach the radiator reservoir tank.
9. Attach the windshield washer jar.

4E-FTE ENGINE - ENGINE

CAMSHAFT NO. 1

DISASSEMBLY DIAGRAM





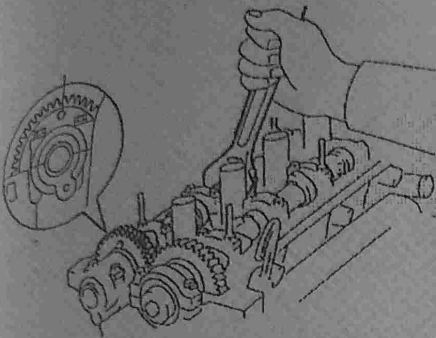
●..... Parts not to be reused T=120..... Tightening torque (kg/cm)

CAMSHAFT NO. 2 REMOVAL

1. Remove the timing belt
(Refer to page 39)
2. Remove the PCV hose and air hose.
3. Remove the resistive cord.
4. Remove the intercooler support bracket No. 1.
5. Remove the cylinder head cover.
 - (1) Remove the oil filler cap.
 - (2) Remove the cap nut and seal washer.
 - (3) Prise the areas shown in the diagram with a driver and remove the cylinder cover.
6. Remove the camshaft timing pulley.
 - (1) Use the camshaft service hexagon part to secure the camshaft, and remove the pulley set bolt.
 - (2) Remove the camshaft timing pulley.

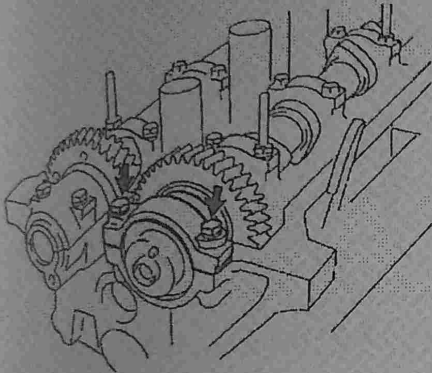
7. Remove the distributor
8. Remove the IIA.

4E-FTE ENGINE - ENGINE



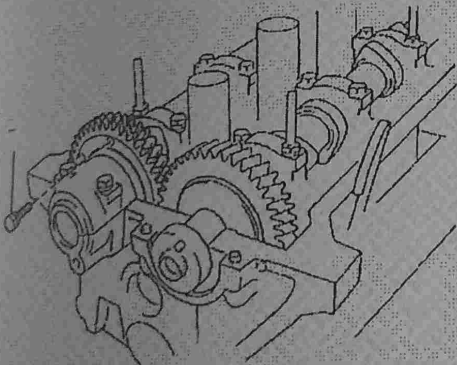
9. Remove the camshaft No. 2.

(1) Use the service hexagon to rotate the camshaft No. 1, and set the sub gear securing bolt hole on the top.



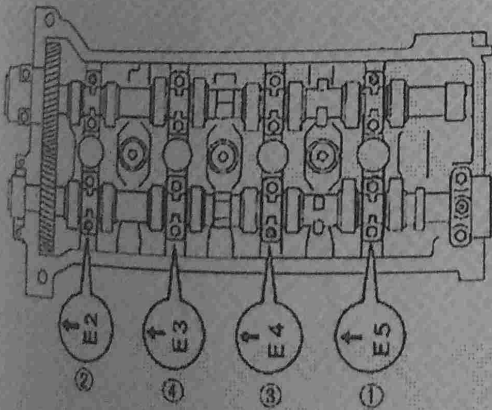
(2) Remove the camshaft bearing cap No. 1.

(3) Remove the camshaft oil seal.



(4) Secure the sub gear to the driven gear with a bolt (M6, pitch 1.0).

T=55kg/cm



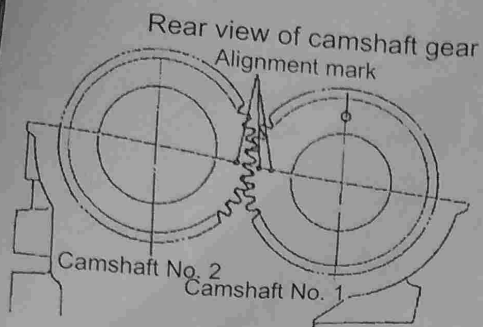
(5) Attach the camshaft bearing cap No. 3 in the order shown in the diagram.

Caution:

- Do not prise the camshaft with tools or apply excessive force to the camshaft.
- Do not damage the cylinder head side thrust bearing.

(6) Remove the camshaft No. 2.

4E-FTE ENGINE - ENGINE



CAMSHAFT NO. 2 INSTALLATION

1. Attach the camshaft No. 2.
 - (1) Lubricate the camshaft cam and gear areas as well as the cylinder head journal area with engine oil.
 - (2) Check that the camshaft No. 1 alignment mark position is the same as the position shown in the diagram.
 - (3) Move the top of the camshaft drive gear while rotating the camshaft No. 2, align the camshaft drive gear with the camshaft driven gear alignment mark, and set to the top of the cylinder head.

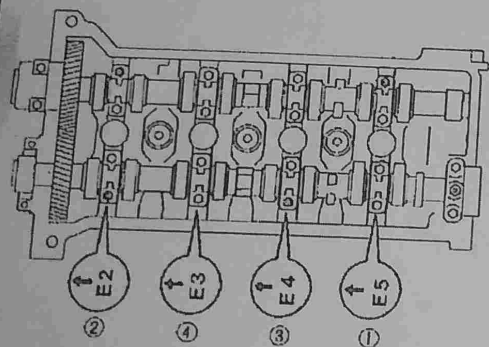
Caution:

Do not damage the cylinder head side thrust bearing.

- (4) Lubricate the new oil seal lip area with Castle MP grease No. 2, and insert from the lip area side into the camshaft.

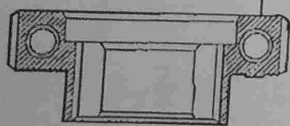
Caution:

- Do not reverse the lip.
- Insert securely into the cylinder head.



- (5) Temporarily assemble the camshaft bearing cap No. 3 as shown in the diagram.

Lubricate with seal packing black

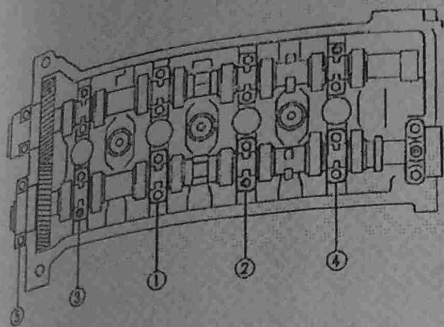


- (6) Remove the grease from the camshaft bearing cap No. 1 mounting surface.
- (7) Lubricate the area on the bearing cap shown in the diagram with seal packing black, and attach to the cylinder within 5 minutes, and evenly tighten the bolts.

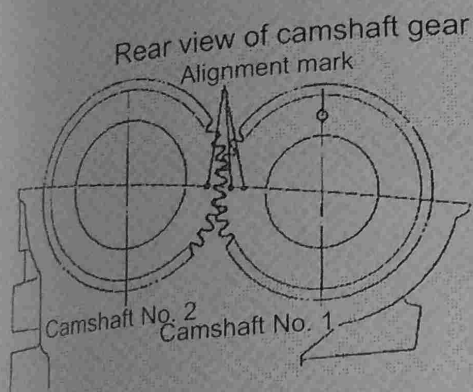
Caution:

Do not start the engine within 2 hours of installation.

4E-FTE ENGINE - ENGINE



- (8) Tighten the bolts equally about 2 to 3 times in the order shown in the diagram.
T=130kg/cm



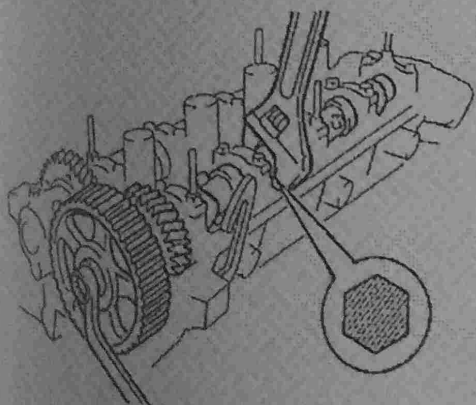
- (9) Remove the bolt (M6, pitch 1.0) that is securing the sub gear.
(10) Turn the crankshaft clockwise, and check that the camshaft No. 1 and No. 2 TDC marks (RR side) are aligned above the head cover alignment surface.

2. Attach the IIA.

- (1) Lubricate the new O-ring with engine oil, and attach the O-ring to the IIA.
- (2) Insert the IIA so that the camshaft No. 2 rear side notch and the IIA coupling gear with each other.
- (3) Fully tighten the 2 bolts
T=175kg/cm
- (4) Connect the IIA connector and the vacuum hose.
- (5) Attach the air injection manifold w/air hose No. 1.

3. Attach the camshaft timing pulley.

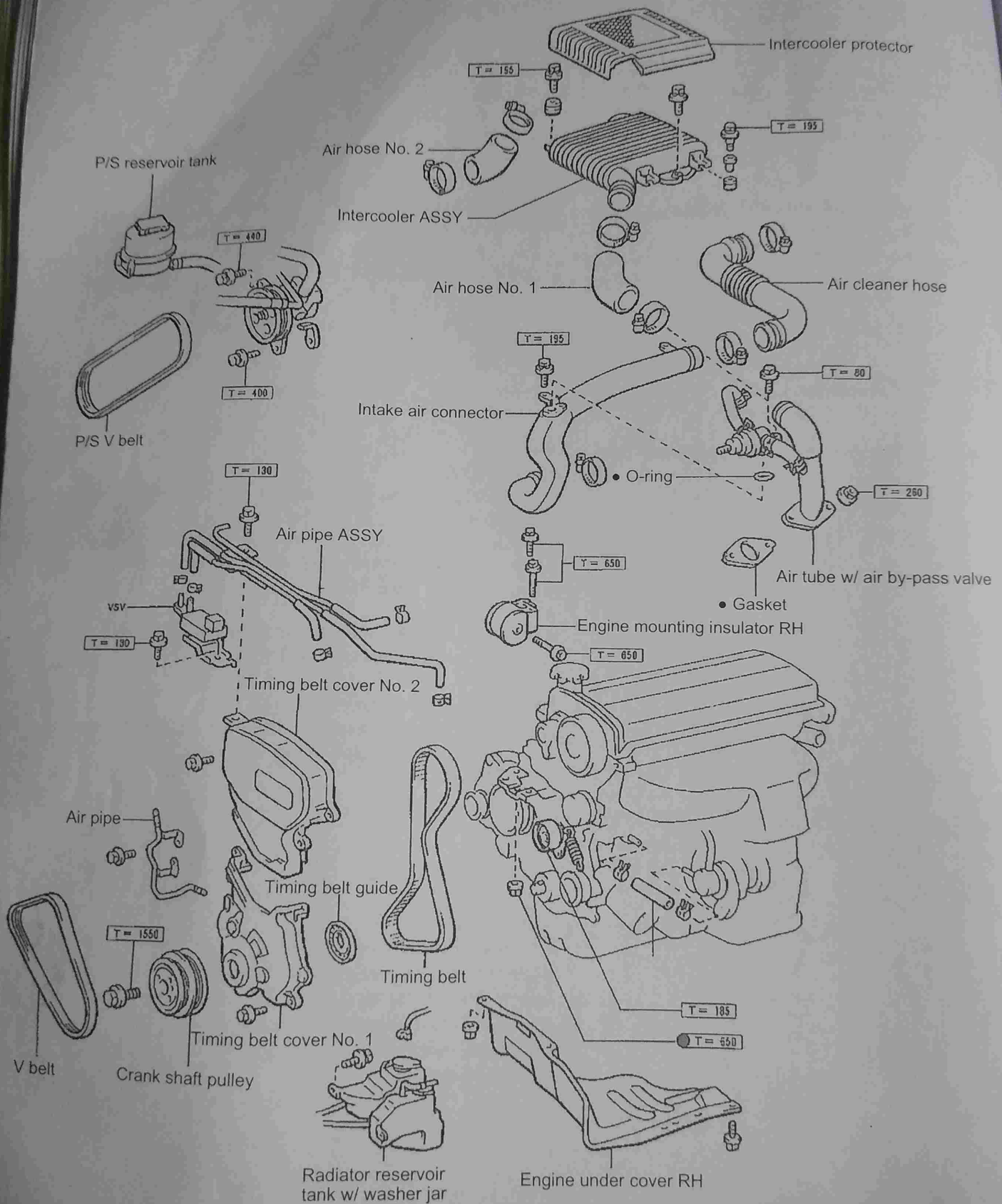
- (1) Use the service hexagon area of the camshaft to attach camshaft timing pulley to the camshaft.
T=510kg/cm



4. Attach the cylinder head cover
(Refer to page 6, procedures 7 and 8)
5. Attach the intercooler support bracket No. 1.
6. Attach the PCV hose and air hose.
7. Attach the timing belt
(Refer to page 41)

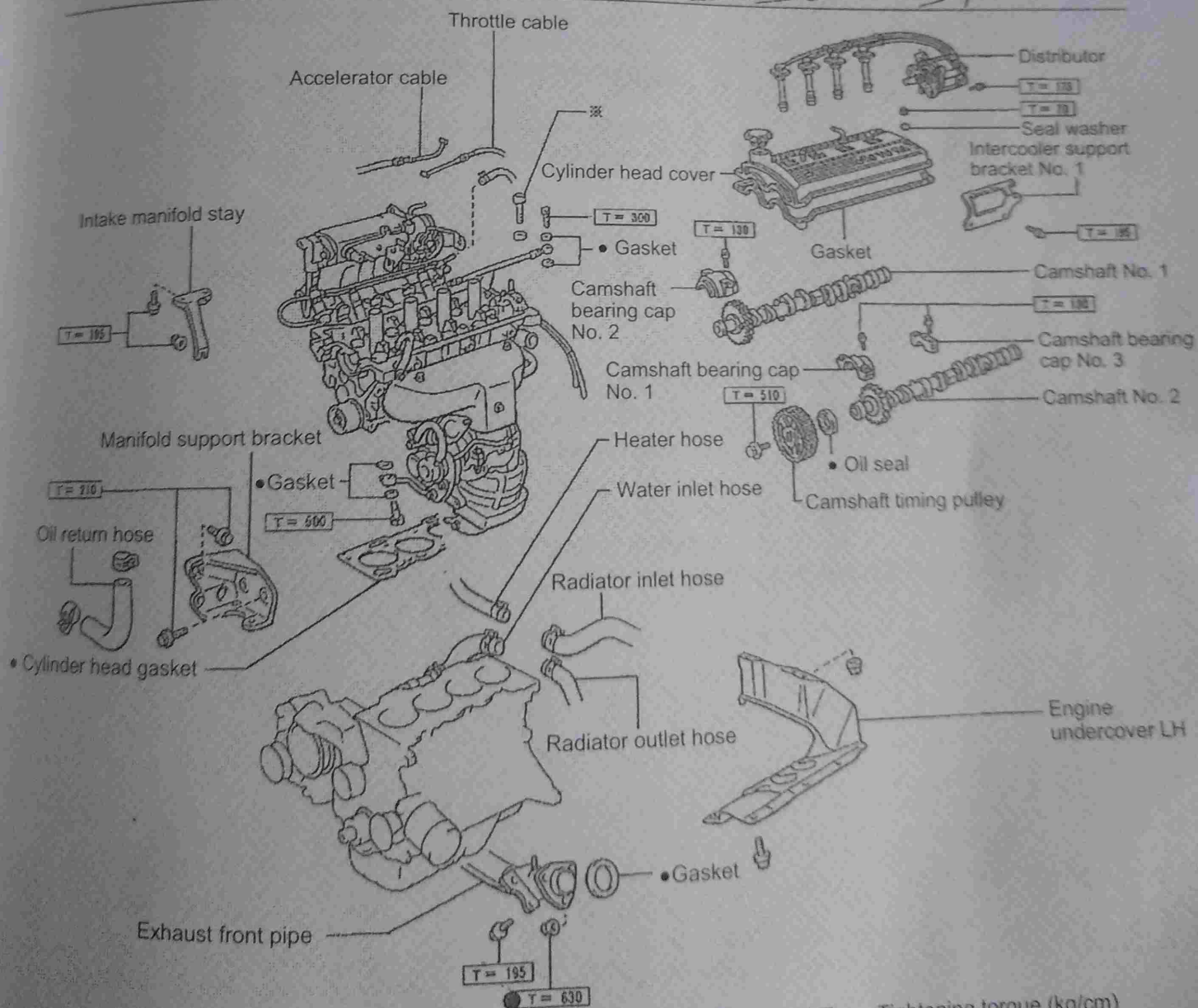
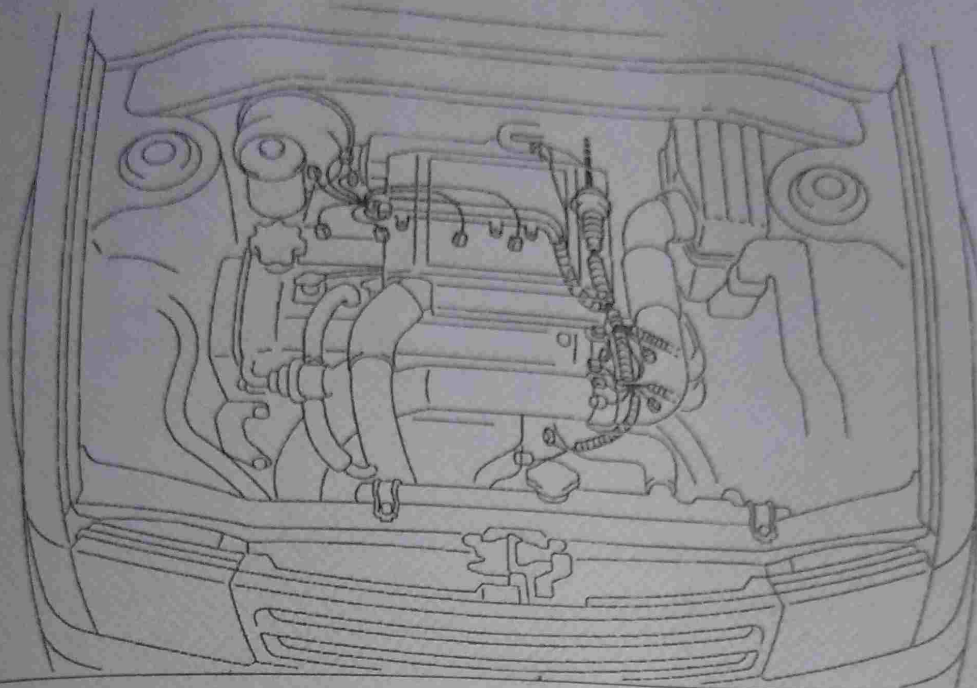
4E-FTE ENGINE - ENGINE

CYLINDER HEAD GASKET DISASSEMBLY DIAGRAM



Parts not to be reused Tightening torque (kg/cm)

4E-FTE ENGINE - ENGINE



※..... Plastic range tightening

..... Parts not to be reused
Page 59 of 9

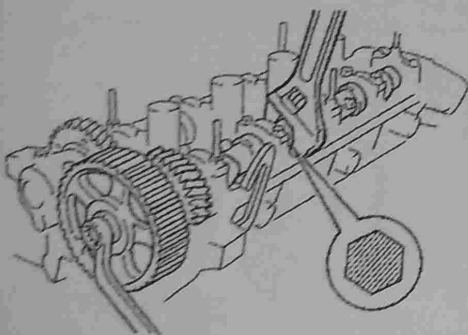
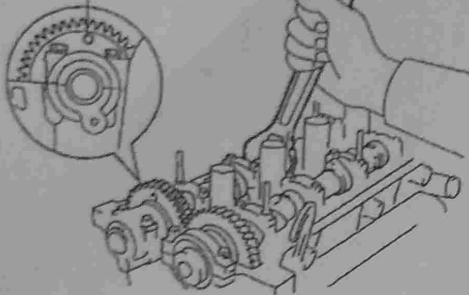
..... Tightening torque (kg/cm)

4E-FTE ENGINE - ENGINE

CYLINDER HEAD GASKET REMOVAL

1. Drain the coolant.
2. Carry out the fuel discharge prevention procedures.
(Refer to page 16)
3. Remove the timing belt.
(Refer to page 39)
4. Remove the PCV hose and air hose.
5. Remove the resistive cord
6. Remove the cylinder head cover.
 - (1) Remove the oil filler cap.
 - (2) Remove the cap nut and seal washer.
 - (3) Prise the areas shown in the diagram with a driver and remove the cylinder cover.

Stopping bolt hole

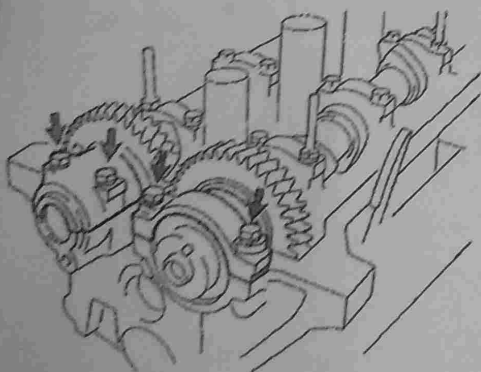


7. Remove the camshaft timing pulley.
 - (1) Use the camshaft service hexagon part to secure the camshaft, and remove the pulley set bolt.
 - (2) Remove the camshaft timing pulley.

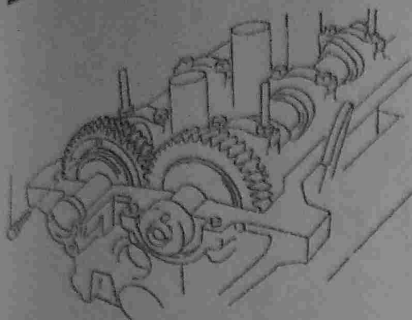
8. Remove the distributor.
9. Remove the camshaft No. 2.

- (1) Use the service hexagon area to turn the camshaft No. 1, and set so that the sub gear fastening bolt hole position is at the top.

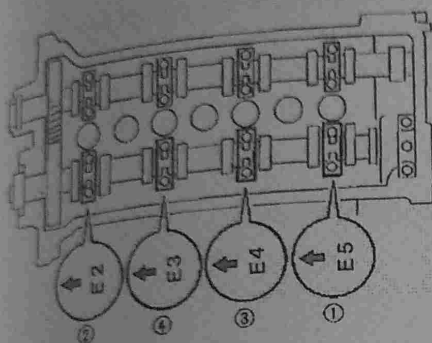
10. Remove the camshaft No. 2.
 - (1) Remove camshaft bearing cap No. 1 and No. 2.
 - (2) Remove the camshaft oil seal.



4E-FTE ENGINE - ENGINE



- (3) Secure the sub gear to the driven gear with a bolt (M6, pitch 1.0)
T=55kg/cm

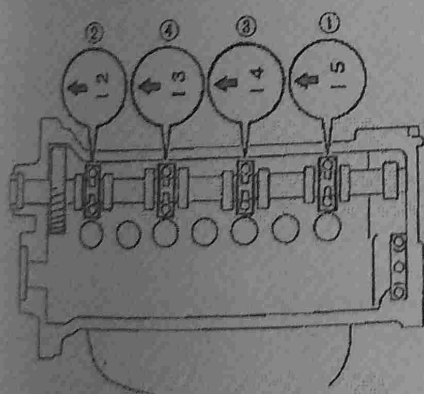
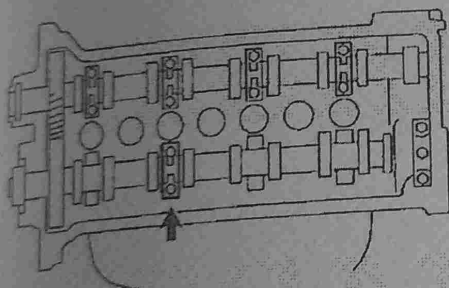


- (4) Remove the camshaft bearing cap No. 3 in the order shown in the diagram.

Caution:

- Do not prise the camshaft with tools or apply excessive force on the camshaft.
- Do not damage the cylinder head side thrust bearing.

- (5) Remove the camshaft No. 1.



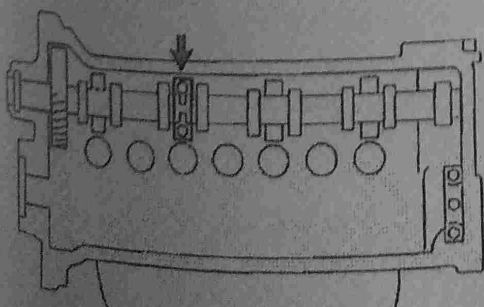
11. Remove the camshaft No. 1.

- (1) Remove the camshaft bearing cap No. 3 in the order shown in the diagram.

Caution:

- Do not prise the camshaft with tools or apply excessive force on the camshaft.
- Do not damage the cylinder head side thrust bearing.

- (2) Remove the camshaft No. 1.



4E-FTE ENGINE - ENGINE

12. Remove the accelerator cable.
13. Remove the throttle cable.
14. Disconnect the fuel hose.
15. Disconnect the connector.
16. Disconnect the radiator hose and water hose.
17. Disconnect the booster vacuum hose.
18. Disconnect the heater hose.
19. Disconnect the intake manifold stay.
20. Remove the engine under cover LH.
21. Disconnect the front exhaust pipe.
(Refer to page 91, "Turbocharger removal" procedures 4 to 7)
22. Remove the cylinder head gasket.
(1) Use a double hexagon wrench 8mm and loosen the head bolts, and remove the bolts and plate washer.
Tools 09043-50080

Caution:

Do not drop the bolts inside the washer & cylinder head.

- (2) Remove the cylinder head and gasket.

CYLINDER HEAD GASKET INSTALLATION

1. Attach the cylinder head gasket.
(1) Attach the new cylinder heads to cylinder block while making sure the cylinder heads are on the correct side and are facing the correct direction.
(2) Attach the cylinder to the cylinder block.

- (3) Lubricate the bolt and the washer with a small amount of engine oil.
- (4) Set the washer to the cylinder head bolt hole position before inserting the bolt into the cylinder head.

Caution:

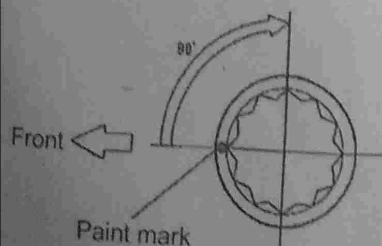
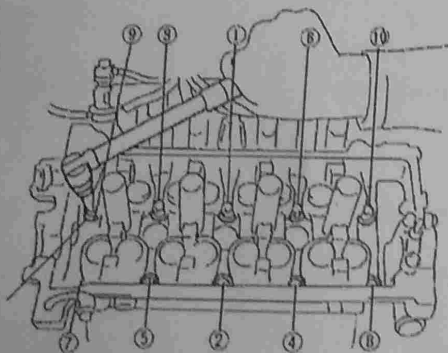
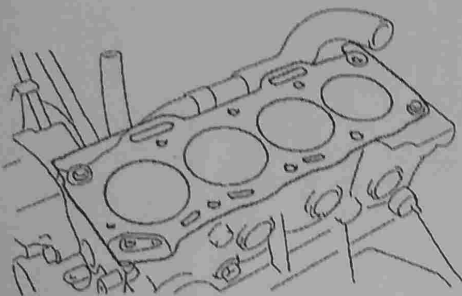
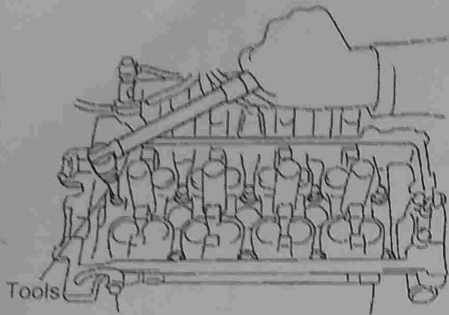
Insert the long side into the EX side and insert the short side into the IN side.

- (5) Use a double hexagon wrench 8mm and temporarily tighten the head bolts in the order shown in the diagram before tightening to the specified torque.

Tool 09043-50080

T=550kg/cm

- (6) Apply a paint mark to the engine front side of the cylinder head bolt head area.
- (7) Tighten the cylinder head bolt by 90° in the order described in procedure (5), and check that all of the paint marks on the bolts are facing 90°.



2. Attach the manifold support bracket.
(Refer to page 92, "Turbocharger removal" procedures 11 to 15")
3. Attach the intake manifold stay.
T=185kg/cm
4. Attach the heater hose.
5. Booster vacuum hose.
6. Attach the radiator hose and water hose.
7. Attach the connector
8. Attach the fuel hose.
9. Attach the throttle cable.
10. Attach the accelerator cable.

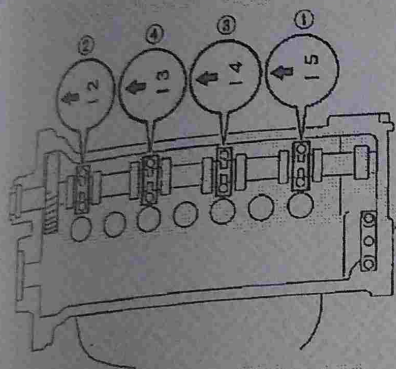
11. Attach the camshaft No. 1 and No. 2.

- (1) Lubricate the camshaft cam, gear area and cylinder head journal area with engine oil.
- (2) Set the camshaft No. 1 on the cylinder head so that the camshaft No. 1 sub gear securing bolt (M6, P1.0) is facing upwards.

Caution:

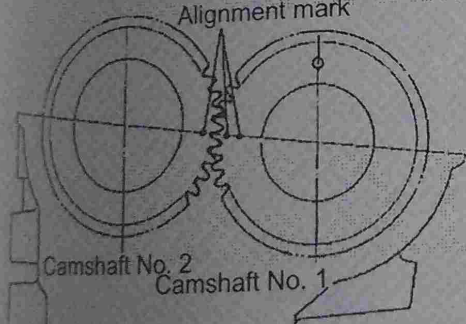
Do not damage the cylinder head side thrust bearing.

- (3) Remove the camshaft bearing cap No. 3 in the order shown in the diagram.



Rear view of camshaft gear

Alignment mark

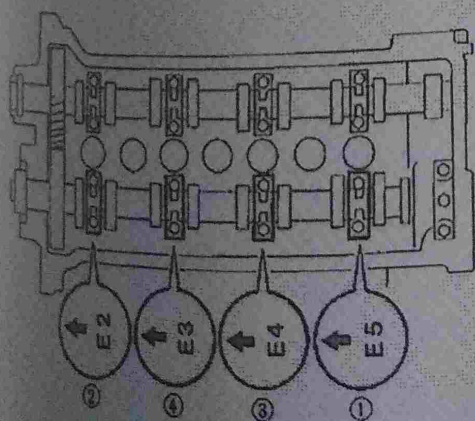


- (4) Lubricate the camshaft cam, gear area and cylinder head journal area with engine oil.
- (5) Check that the camshaft No. 1 alignment mark is in the position shown in the diagram.
- (6) Move the top of the camshaft driven gear while rotating the camshaft No. 2, align the camshaft drive gear with the camshaft driven gear alignments marks, and set on the cylinder head.

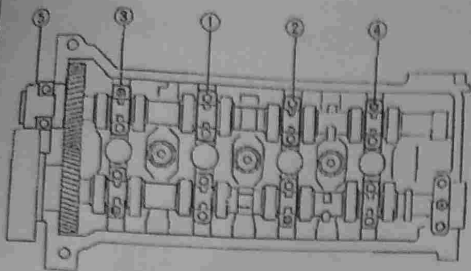
Caution:

Do not damage the cylinder head side thrust bearing.

- (7) Temporarily attach the camshaft bearing cap No. 3 as shown in the diagram.
- (8) Remove the sub gear securing bolt (M6, P1.0)
- (9) Attach the camshaft bearing cap No. 2 and the camshaft housing plug.



4E-FTE ENGINE - ENGINE



- (10) Tighten the bolts 2 to 3 times in the order shown in the diagram.
 $T=130\text{kg/cm}$

Lubricate with seal packing black



- (11) Lubricate the new oil seal lip area with Castile MP Grease No. 2, and insert into the camshaft from the lip area side.

Caution:

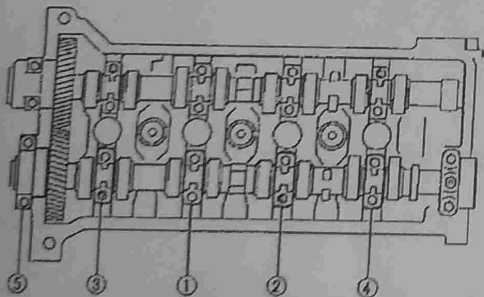
- Do not reverse the lip.
- Insert securely into the cylinder head.

- (12) Remove the grease from the camshaft bearing cap No. 1 installation surface.
 (13) Lubricate the area on the bearing cap shown in the diagram with seal packing black, and attach to the cylinder within 5 minutes.

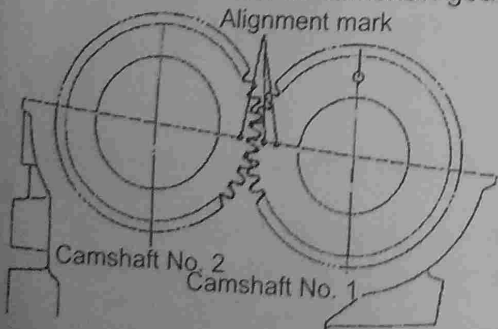
Caution:

Do not start the engine within 2 hours of installation.

- (14) Tighten the bolts 2 to 3 times in the order shown in the diagram.
 $T=130\text{kg/cm}$

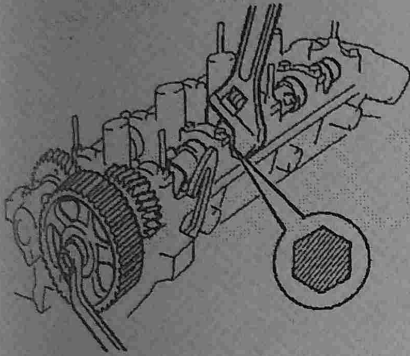


Rear view of camshaft gear
 Alignment mark



- (15) Turn the crankshaft clockwise, and check that the camshaft No. 1 and No. 2 TDC marks (RR side) are aligned above the head cover alignment surface.

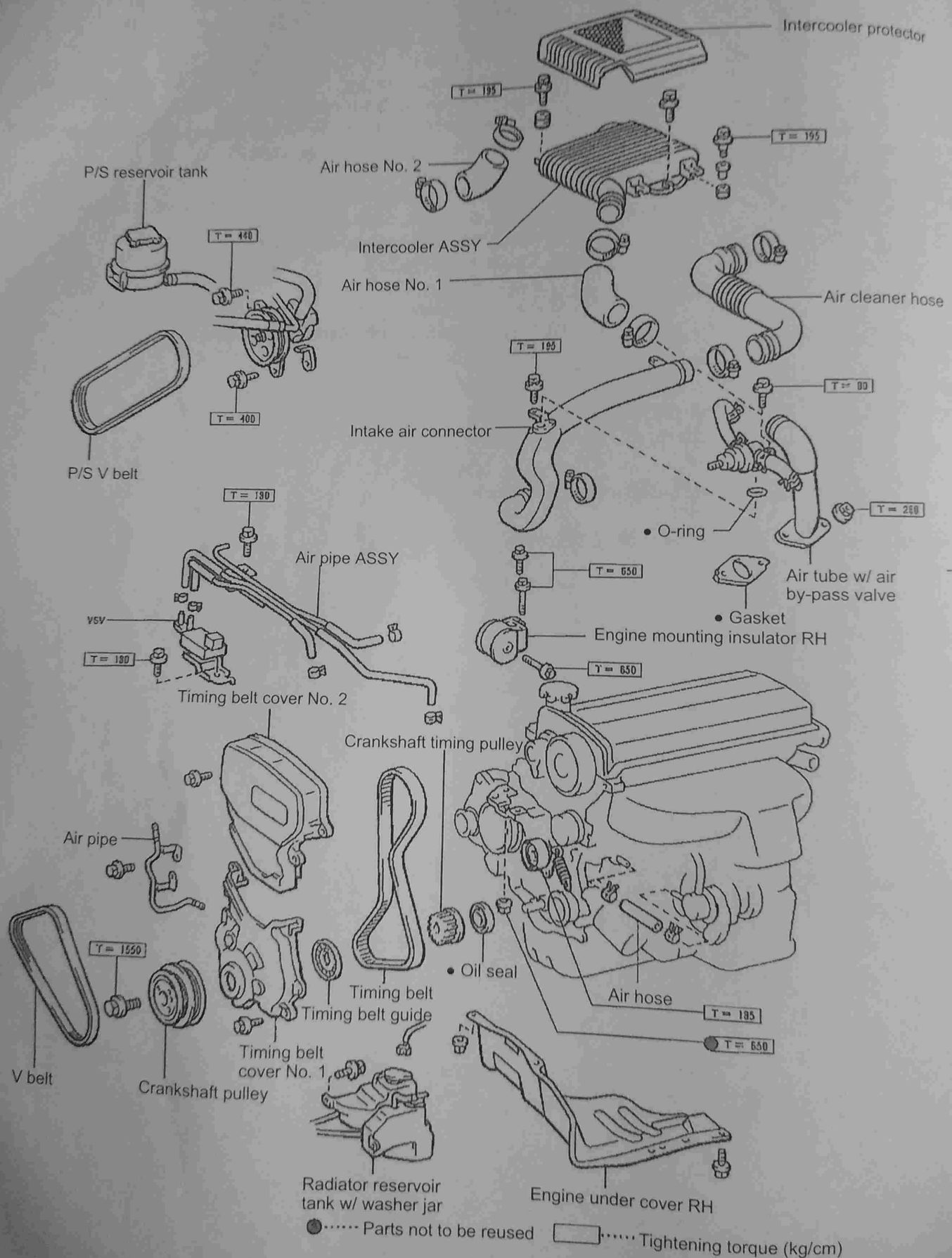
4E-FTE ENGINE - ENGINE



12. Attach the distributor.
 - (1) Lubricate the new O-ring with engine oil and attach the O-ring to the distributor.
 - (2) Insert the distributor so that the camshaft No. 2 rear side notch and the distributor coupling gear with each other.
 - (3) Tighten the 2 bolts.
T=175kg/cm
 - (4) Attach the connector.
13. Attach the camshaft timing pulley.
 - (1) Use the camshaft service hexagon part to attach the camshaft tightening pulley to the camshaft.
T=510kg/cm
14. Attach the cylinder head cover.
(Refer to page 6, procedures 7 to 8)
15. Attach the PCV hose and air hose.
16. Attach the timing belt.
(Refer to page 41)
17. Add the coolant.
18. Adjust the tension and deflection amount of the V belt.
(Refer to page 5)

4E-FTE ENGINE - ENGINE

CRANKSHAFT FRONT OIL SEAL DISASSEMBLY DIAGRAM



4E-FTE ENGINE - ENGINE

CRANKSHAFT FRONT OIL SEAL REPLACEMENT

1. Remove the timing belt.
(Refer to page 39)
2. Remove the crankshaft timing pulley
(1) If the timing pulley cannot be removed by hand, remove with 2 drivers as shown in the diagram.

Caution:

Use a rag in order not to damage the body.

3. Remove the crankshaft front oil seal.
(1) Remove the lip with a cutter knife.
(2) Wrap plastic tape around a flat head screw driver, and prise and remove the crankshaft front oil seal.

Caution:

After removing the oil seal, check that the crankshaft chamfering area is not damaged. If damaged, even out with sandpaper (#400).

4. Attach the crankshaft front oil seal.
(1) Lubricate the oil seal lip area with Castle MP Grease No. 2.

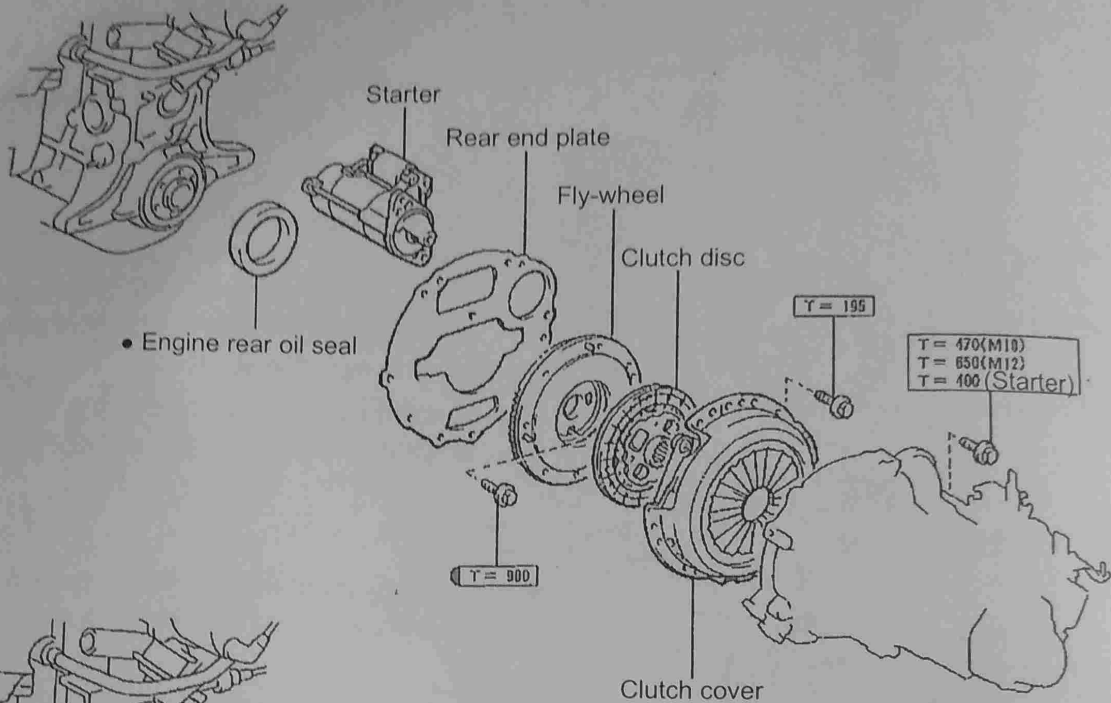
Caution:

Do not allow foreign objects to come into contact with the lip area.

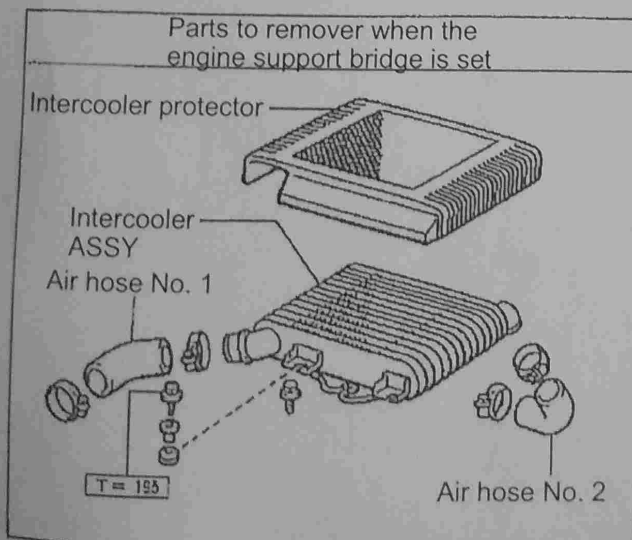
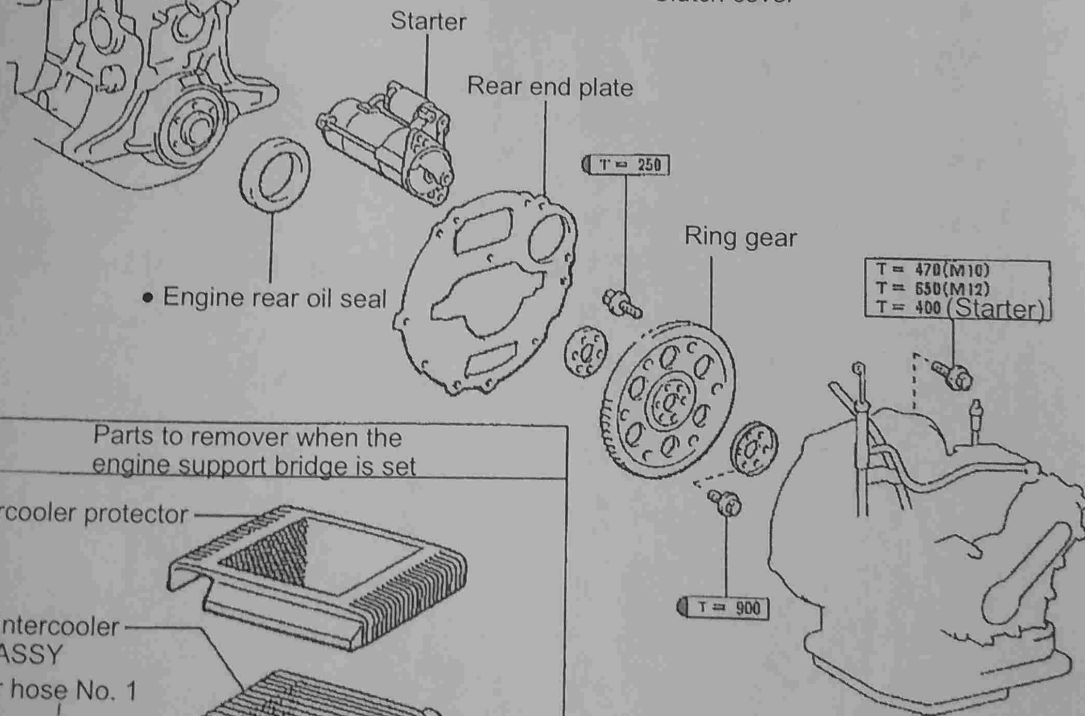
- (2) Use a SST to strike the oil seal.
SST 09636-20010
- (3) Check that the oil seal has been applied equally around the outer circumference surface.
- (4) Wipe the grease off from the crankshaft.
5. Remove the crankshaft timing pulley.
6. Attach the timing belt.
(Refer to page 41)

ENGINE REAR OIL SEAL DISASSEMBLY DIAGRAM

M/T



A/T



..... Precoat bolt ●..... Parts not to be reused Tightening torque (kg/cm)

4E-FTE ENGINE - ENGINE

ENGINE REAR OIL SEAL REPLACEMENT

1. Remove the clutch unit. (M/T)
(Refer to clutch)
2. Remove the automatic transmission. (A/T)

Caution:

Set the engine support bridge in the position shown in the diagram, and attach a hook to the left side engine cover.

3. Disconnect the RH engine mount.
(1) Support the bottom of the oil pan with a jack and protect with a block of wood. Remove the RH engine mount insulator through bolt, lower the jack and lower the right side of the engine.

4. Remove the fly-wheel or driver plate.
(1) Use a SST to retain the crankshaft pulley, and secure the crankshaft.

SST 09330-00021 09213-14010

5. Remove the rear end plate.
6. Remove the rear oil seal.
(1) Use a cutter knife to remove the lip area.
(2) Wrap a flat head screw driver with plastic tape, apply a rag to the crankshaft and prise and remove the oil seal.

Caution:

After removing the oil seal, check that the crankshaft chamfering area is not damaged. If damaged, even out with sandpaper (#400).

7. Attach the crankshaft rear oil seal.

- (1) Lubricate the oil seal lip area with Castle MP Grease No. 2.

Caution:

Do not allow foreign objects to come into contact with the lip area.

- (2) Use a SST to strike the oil seal.

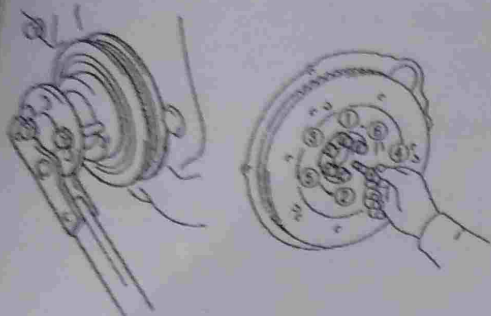
SST 09636-20010

- (3) Check that the oil seal has been applied equally around the outer circumference surface.

- (4) Wipe the grease off from the crankshaft.

8. Remove the rear end plate.

4E-FTE ENGINE - ENGINE



9. Attach the fly wheel or drive plate.
 - (1) Remove the grease from the set bolt and bolt hole.
 - (2) Set the fly-wheel or drive plate.
 - (3) Lubricate the 2 to 3 screw protruding parts at the end of the bolt with adhesive 1324.
 - (4) Use the SST to retain the crankshaft pulley, secure the fly-wheel or drive plate, and tighten the set bolts in the order shown in the diagram.
- SST 09330-00021 09213-14010
T=900kg/cm

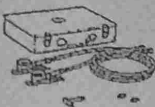
Caution:

Do not start the engine within one hour of installation.

10. Attach the RH engine mount.
 - (1) Attach the RH engine mount insulator through bolt.
T=650kg/cm
11. Attach the automatic transmission. (A/T)
12. Attach the clutch unit. (M/T)
(Refer to clutch)

4E-FTE ENGINE - LUBRICATION

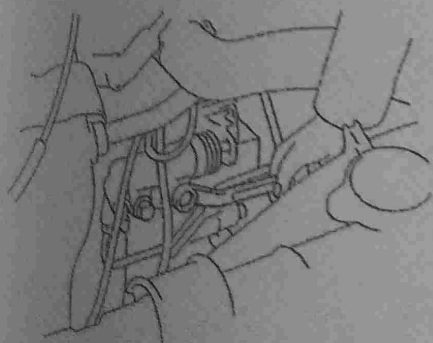
LUBRICATION PARTS

SST	09228-06500 Oil filter wrench 	Oil filter disassembly and assembly
Tools	Socket wrench (27mm) 09011-12270	Oil pressure switch disassembly and assembly
	Deep socket wrench (14mm)	Front exhaust pipe disassembly and assembly
Measuring tools	Banzai Limited OPG-200 - Automatic transmission oil pressure gauge 	Oil pressure measurement
	Banzai Limited OPG-220 - Adapter 	Oil pressure measurement
Grease, others	Adhesive 1324	Lubrication of the oil pressure switch
	Engine oil	Use to fill

FUNCTION INSPECTION

Oil filter inspection

1. Inspect the oil.
2. Remove the clutch release cylinder (M/T).
 - (1) Remove the clip from the bell crank support bracket.
 - (2) Remove the clutch pipe clamp.
 - (3) Remove the 2 bolts, and remove the release cylinder from the transmission with the clutch pipe attached.



3. Remove the manifold converter heat insulator.
 - (1) Remove the 2 bolts, and remove the heat insulator.
4. Remove the oil pressure switch.
 - (1) Disconnect the connector.
 - (2) Use a 27mm socket wrench, and remove the oil pressure switch.

Caution:

Do not fully insert the socket wrench into spinner handle connection area (square area), instead only partially insert.

4E-FTE ENGINE - LUBRICATION

5. Attach the oil pressure gauge.
(1) Attach the oil pressure gauge with the adapter attached.
6. Warm the engine.
7. Measure the oil pressure.
Standard value: When idling 0.5kg/cm²
 When 5000rpm 4.0±0.4kg/cm²
8. Remove the oil pressure gauge.
9. Remove the oil pressure switch.
(1) Lubricate the screw part with adhesive 1324, and use a SST to attach.
SST 09816-30010
T=150kg/cm

Caution:

Do not start the engine within one hour of attaching.

- (2) Attach the connector.
10. Attach the clutch release cylinder (M/T).
T=120kg/cm

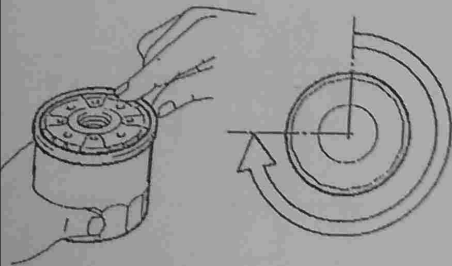
OIL FILTER

OIL FILTER REMOVAL

1. Remove the oil filter
(1) Use a SST to remove the oil filter
SST -09228-06500

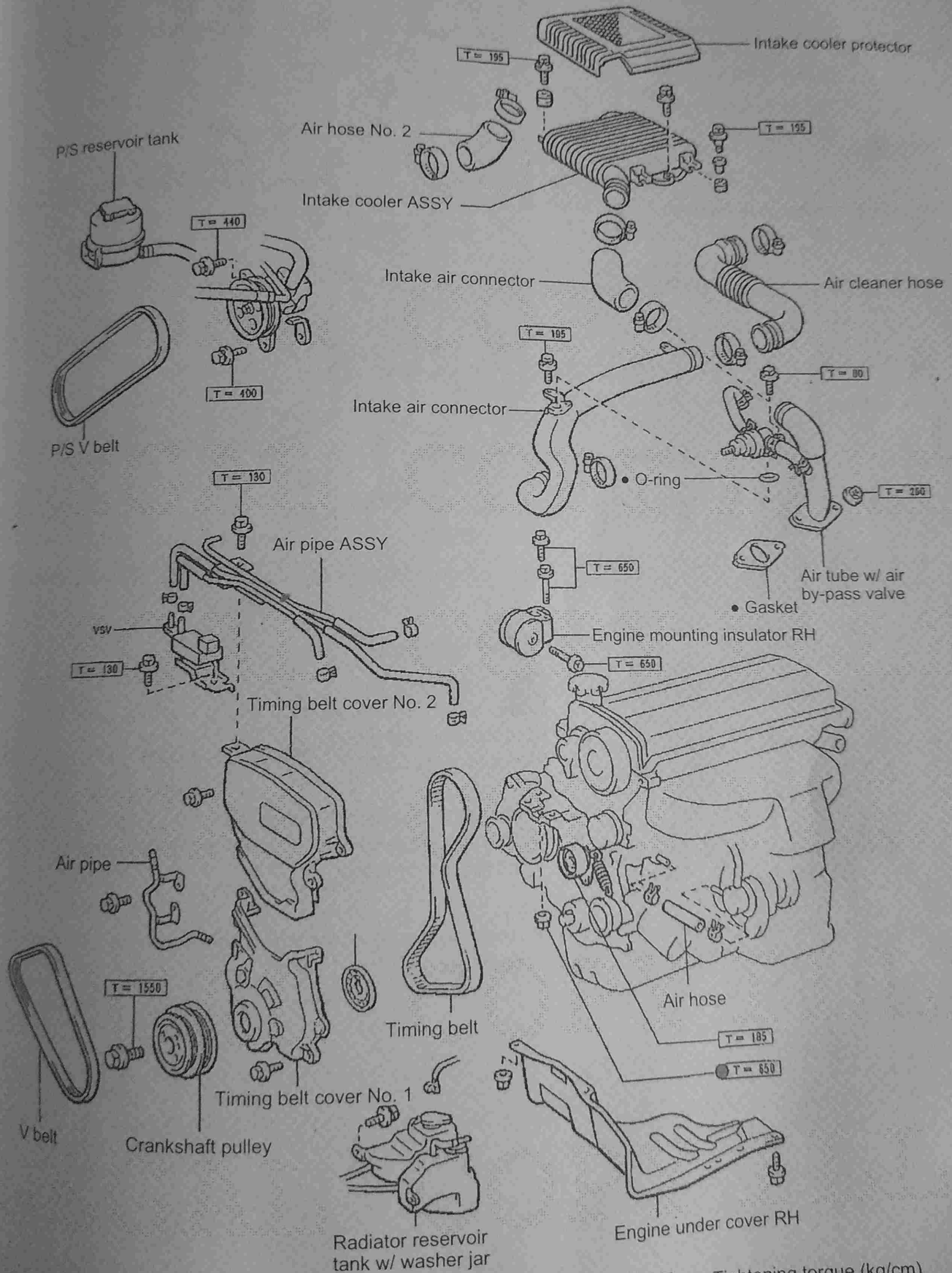
OIL FILTER INSTALLATION

1. Attach the oil filter
(1) Remove any dirt and foreign objects from the engine side mounting surface.
(2) Apply a small amount of engine oil to the new oil filter O-ring.
(3) Manually attach the O-ring until it comes into contact with the mounting surface.
(4) Turn the O-ring another 3/4 of a revolution after it comes into contact with the mounting surface and use a SST to tighten.
SST 09228-06500
2. Inspect for oil leaks.
3. Check the oil quantity

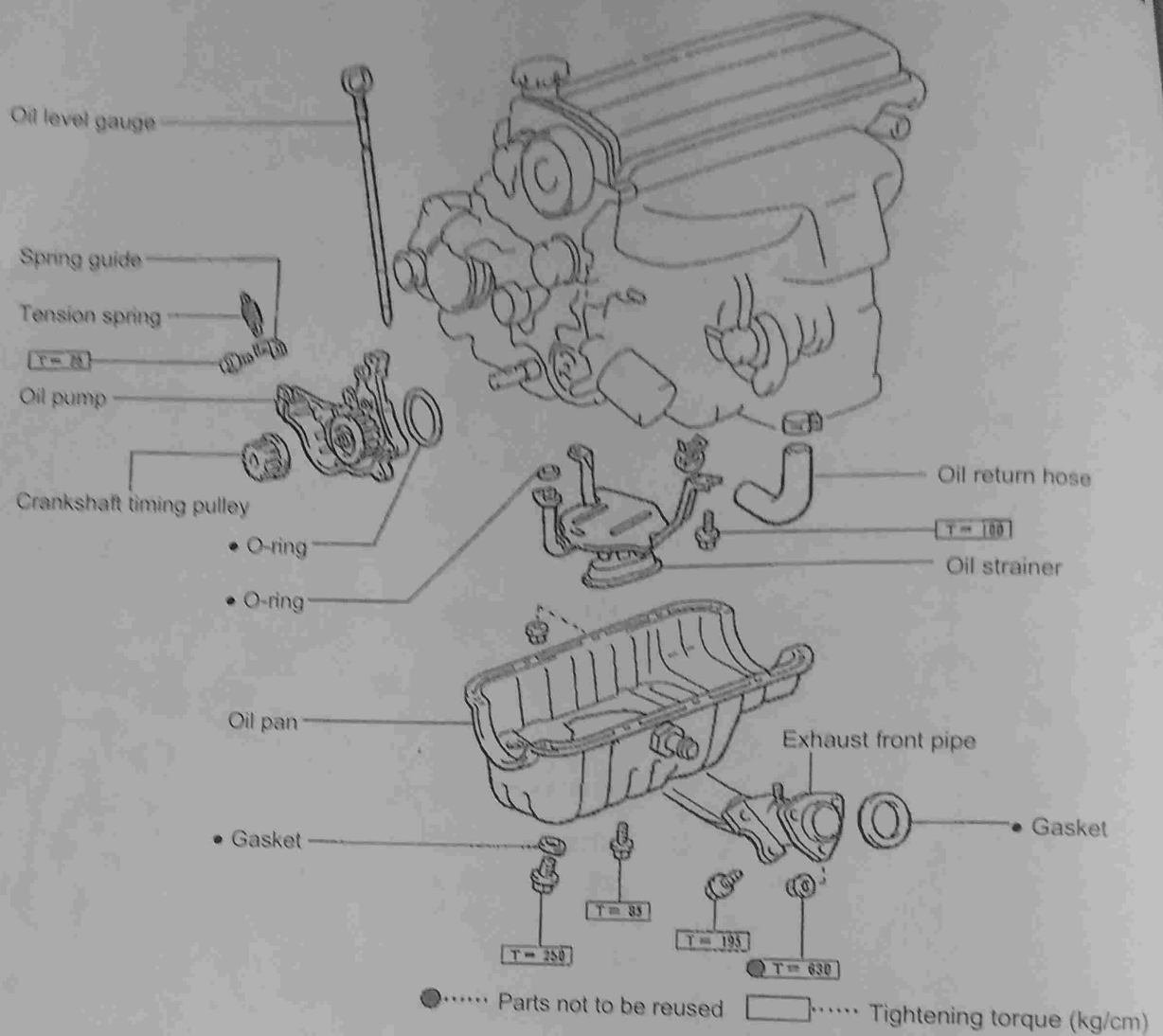


4E-FTE ENGINE - LUBRICATION

OIL PUMP DISASSEMBLY DIAGRAM



4E-FTE ENGINE - LUBRICATION

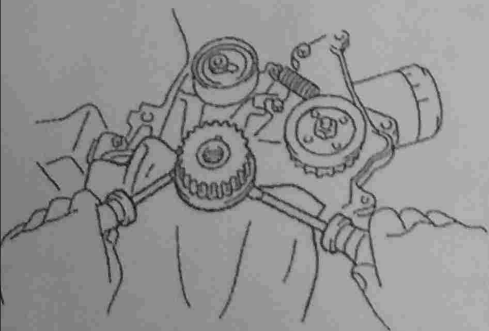


OIL PUMP REMOVAL

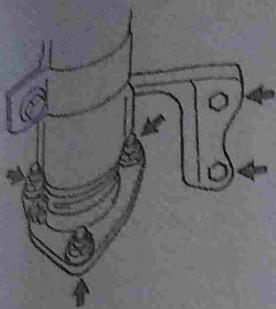
1. Drain the engine oil.
2. Remove the oil level gauge.
3. Remove the timing belt.
(Refer to page 39)
4. Remove the crankshaft timing pulley
(1) Use two screw drivers to remove the if the timing pulley cannot be moved by hand.

Caution:

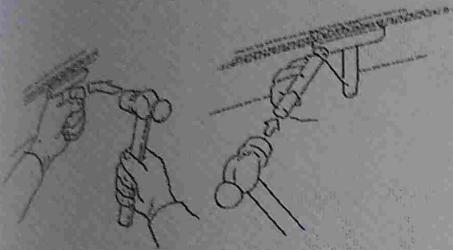
Place a rag on the tip of the screw drivers to prevent scratching the oil pump body.



4E-FTE ENGINE - LUBRICATION



5. Disconnect the front exhaust pipe.
(1) Remove the 3 nuts and the 2 support bracket bolts, and detach the manifold converter and exhaust pipe.

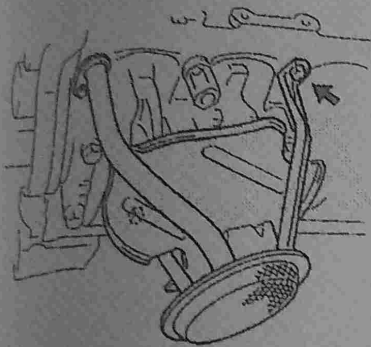


6. Remove the turbo oil hose.

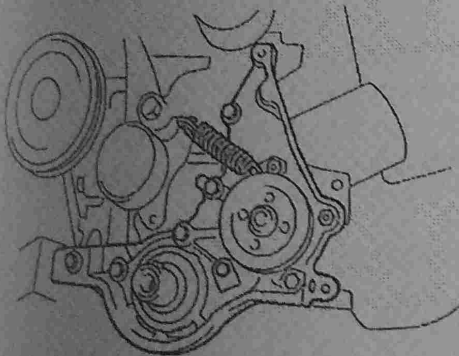
7. Remove the oil pan.
(1) Remove the 2 nuts and 8 bolts.
(2) Remove the oil pan seal cutter, and remove the oil pan.

Caution:

- Do not strike the oil pump body area.
- Strike slowly to prevent damaging the oil pan flange area.

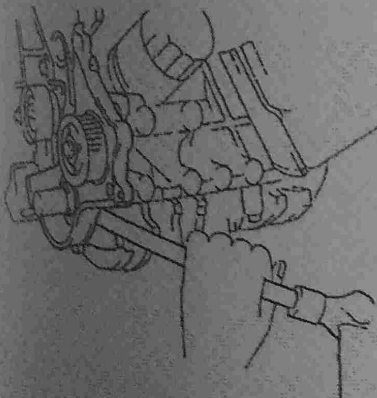


8. Remove the oil strainer.
(1) Remove the 3 bolts, and remove the oil strainer.
(2) Remove the O-ring from the oil strainer.

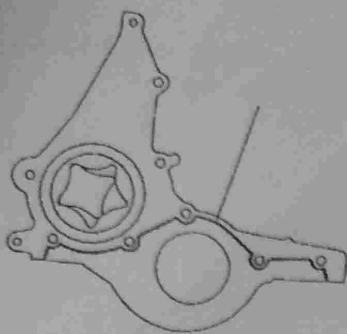


9. Remove the oil pump.
(1) Remove the tension clip.
(2) Remove the 9 bolts and the spring bracket.

- (3) Use a brass bar to strike the oil pump.
(4) Remove the O-ring.



4E-FTE ENGINE - LUBRICATION

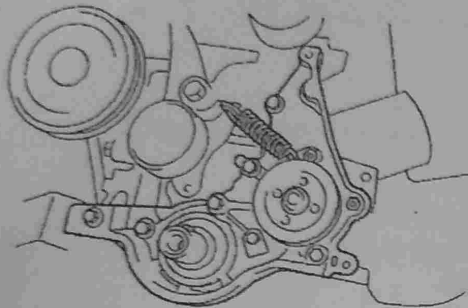


OIL PUMP INSTALLATION

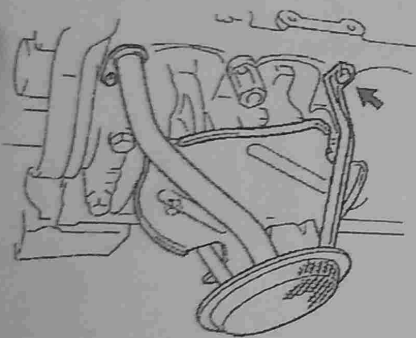
1. Attach the oil pump.
 - (1) Remove the grease from the oil pump.
 - (2) Attach the new O-ring to the oil pump side.
 - (3) Lubricate the area shown on the diagram with seal packing black continuously to $\phi 2 \sim 3$ mm, and attach the cylinder within 5 minutes.

Caution:

- Lubricate the vicinity of the bolt hole, without leaving any gaps.
- Do not add coolant within 2 hours of attaching the water outlet housing.

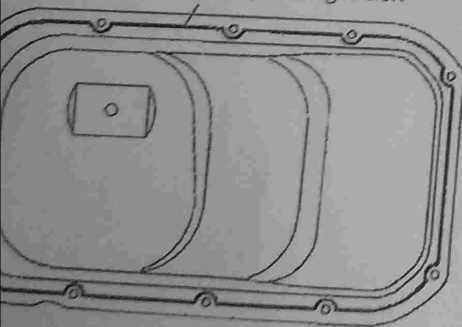


- (4) Attach the spring bracket and 9 bolts.
 $T=75\text{kg/cm}$
- (5) Attach the tension spring.



2. Attach the oil strainer.
 - (1) Lubricate the new O-ring with a small amount of engine oil, and attach the oil strainer.
 - (2) Attach the oil strainer with 3 bolts.
 $T=75\text{kg/cm}$

Lubricate with seal packing black



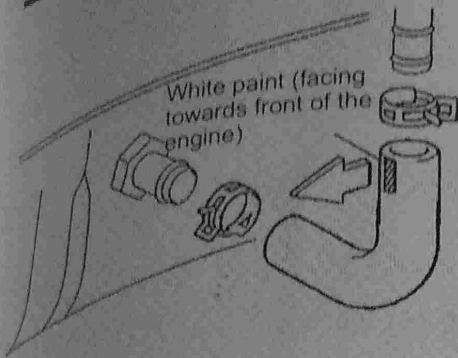
3. Attach to the oil pan.
 - (1) Remove the grease from the oil pan.
 - (2) Lubricate the area shown on the diagram with seal packing black continuously ($\phi 3$ to 4 on both of the oil pan sides, and $\phi 6$ to 7 on the horizontal arch area), and attach within 5 minutes.

Caution:

- Lubricate the vicinity of the bolt hole, without leaving any gaps.
- Do not add coolant within 2 hours of attaching the water outlet housing.

- (3) Attach the 2 nuts and 8 bolts.
 $T=85\text{kg/cm}$

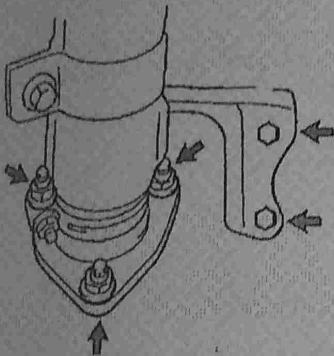
4E-FTE ENGINE - LUBRICATION



4. Attach the timing belt.

Caution:

Face the white paint towards the front of the engine (right side of the vehicle).



5. Attach the front exhaust pipe.

(1) Attach the 3 new nuts to the front exhaust pipe through new gaskets.

T=630kg/cm

(2) Attach the exhaust pipe support bracket with 2 bolts.

T=195kg/cm

6. Attach the crankshaft timing pulley.

(1) Align and attach the crankshaft key.

7. Attach the timing belt.

(Refer to page 41)

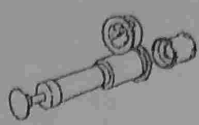
8. Attach the oil level gauge.

9. Add the engine oil.

10. Check for leaks.

4E-FTE ENGINE - ENGINE COOLING

COOLING PARTS

Measuring gauge	RCT-2A Banzai corporation - Radiator cap tester	Water leak inspection
		
	RCT-2A-30S Banzai - Radiator cap tester adapter set A	Water leak inspection
		
Grease, others	Seal packing 1282B	Lubricate the water pump mounting surface
	LLC	Use to fill

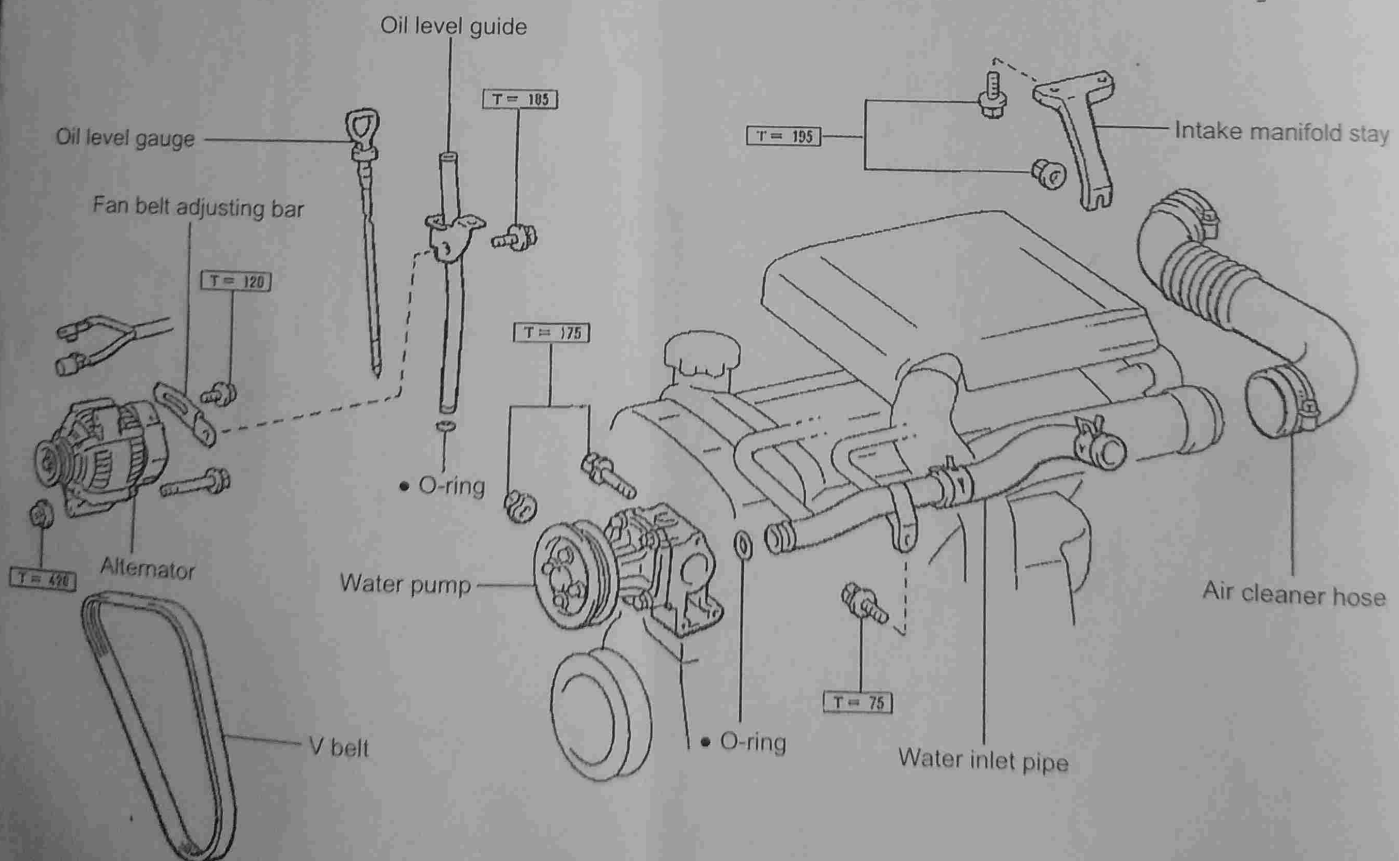
FUNCTION INSPECTION

COOLANT SYSTEM LEAK INSPECTION

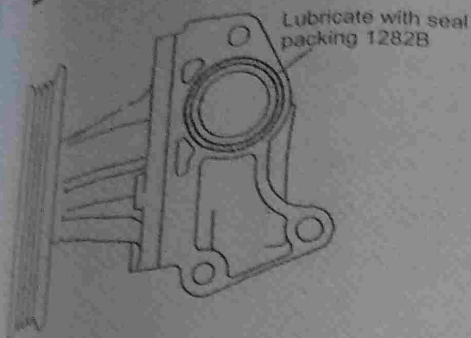
(3) Fill with water, attach the tester and apply pressure.
Standard value 1.2kg/cm³

WATER PUMP

DISASSEMBLY DIAGRAM



●..... Parts not to be reused □..... Tightening torque (kg/cm)



DISASSEMBLY AND ASSEMBLY PROCEDURE PRECAUTIONS

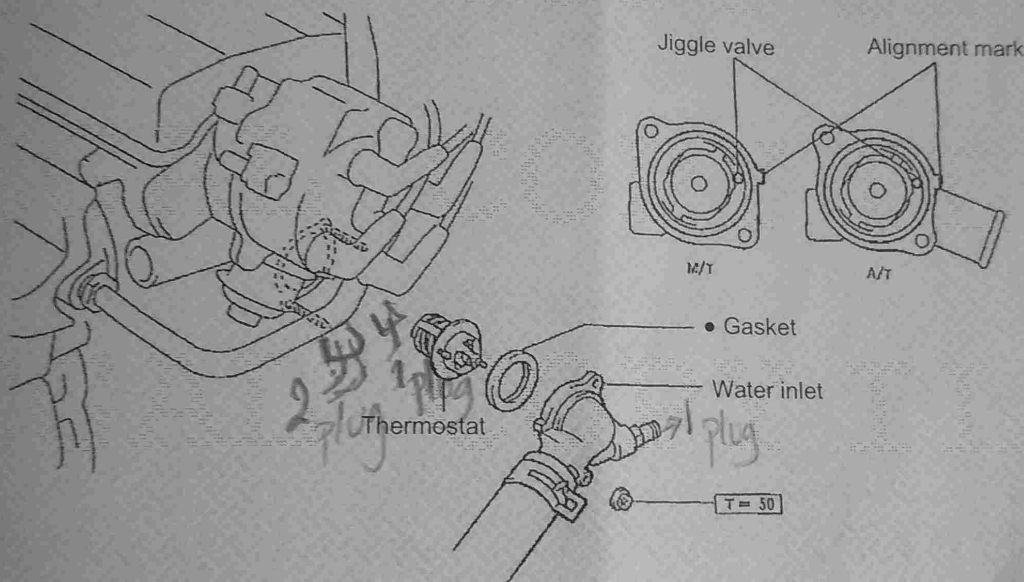
1. Remove the water pump.
 - (1) Move the water pump just enough so that it can be removed without removing the water inlet pipe.
2. Attach the water pump.
 - (1) Remove the grease from the mounting surface.
 - (2) Lubricate the areas shown on the diagram with packing 1282B continuously to $\phi 2\sim 3\text{mm}$, and attach the cylinder block within 5 minutes.

Caution:

- The seal packing 1282B is the same colour as the seal packing black. Do not mistake for seal packing black.
- Do not add coolant within 2 hours of attaching the water outlet housing.

THERMOSTAT

DISASSEMBLY DIAGRAM



●..... Parts not to be reused □..... Tightening torque (kg/cm)

COOLING FAN

FUNCTION INSPECTION

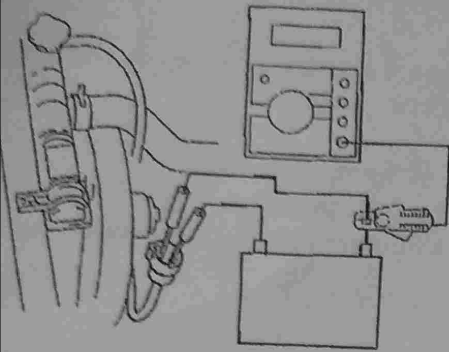
1. Inspect while cool. (Coolant is below 83°C)
 - (1) When turning the ignition switch ON, check that the fan does not rotate.
 - (2) Check that the fan rotates when the temperature detect No. 2 switch connector is disconnected, and does not rotate when connected.
2. Inspect while hot. (Coolant is above 93°C)
 - (1) Idle the engine.
 - (2) Check that the fan starts when the water coolant reaches above 93°C and stops once the coolant reaches below 83°C .

4E-FTE ENGINE - ENGINE COOLING

UNIT INSPECTION

COOLING FAN MOTOR INSPECTION

- (1) Connect the motor side connector to a Toyota electrical tester 200A probe and to a battery.
- (2) Check that the motor rotates smoothly and that the voltage is within the standard value.
Standard value: Less than 10A



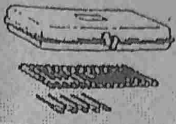
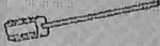
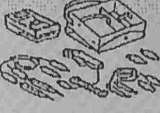
4E-FTE ENGINE - IGNITION

IGNITION

Caution:

- Do not disconnect the battery cable while the engine is revving.
- Do not carry out an operation that will cause a harmful pulse to be generated.

PARTS

SST	09240-00020 Wire gauge set		Measure the air gap
	09242-0020 Wire gauge (0.2mm)		
	09242-0050 Wire gauge (0.5mm)		
	09082-00012 Toyota electrical tester		IIA inspection
	Oscilloscope		Igniter inspection

FUNCTION INSPECTION

Spark inspection

- (1) Remove the fuel cut solenoid connector.
- (2) Remove only one spark plug.
- (3) Attach the removed spark plug to the high tension cord, and earth the spark plug earth electrode.
- (4) Crank the engine and inspect the sparks.

Caution:

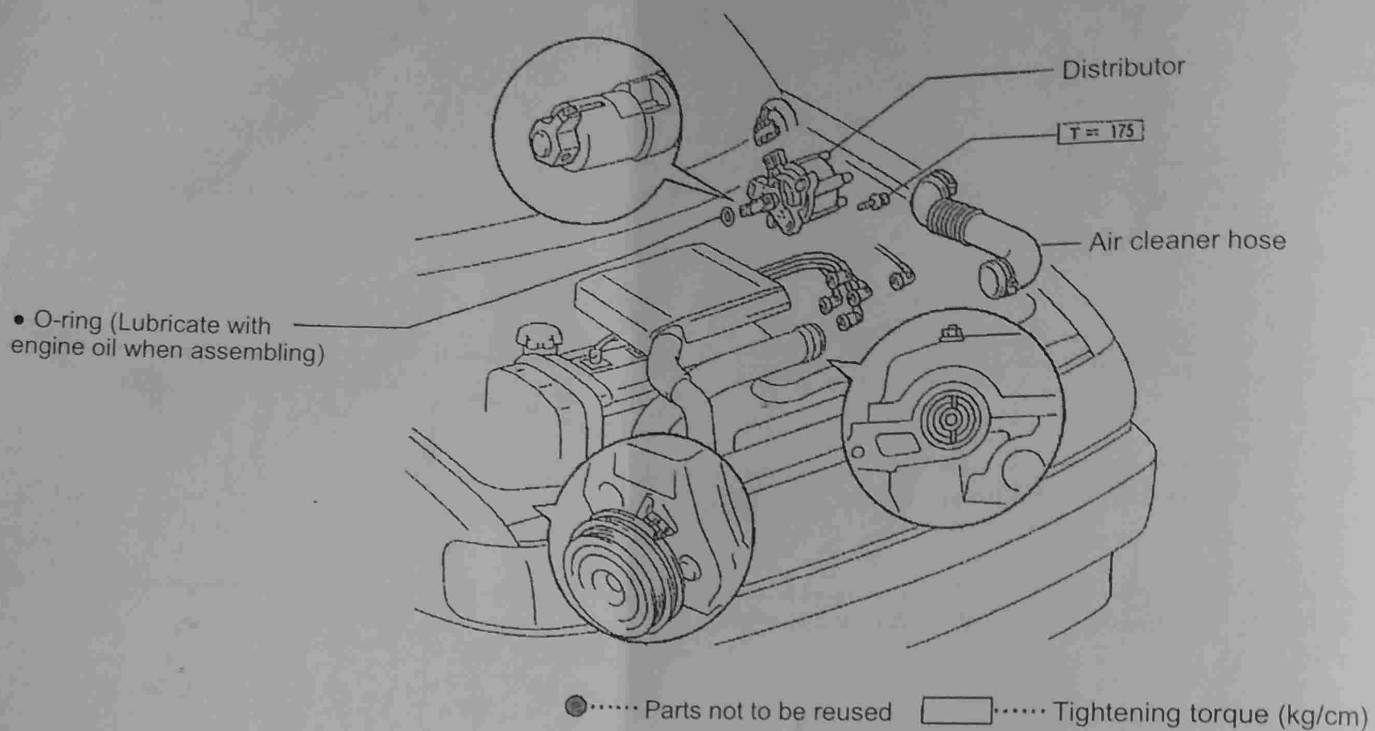
Do not crank the engine for longer than 1 to 2 seconds.

- (5) Attach the spark plug.

T=180kg/cm

- (6) Use a different spark plug and carry out procedures (2) to
- (7) Attach the fuel cut solenoid connector.

DISTRIBUTOR DISASSEMBLY DIAGRAM



UNIT INSPECTION

Resistive cord inspection

1. Measure the resistance.
Limit 25k Ω / unit

Spark plug inspection

1. Remove the intercooler protector.
2. Remove the intercooler ASSY.
3. Remove the spark plug.
4. Clean the spark plug and inspect the gap.
(Refer to "Basic inspection" on page 3)
5. Attach the spark plug.
T=180kg/cm
6. Attach the intercooler ASSY.
7. Attach the intercooler protector.

IGNITION COIL INSPECTION

1. Measure the input voltage.
 - (1) Remove the ignition coil connector.
 - (2) Turn the ignition ON.
 - (3) Measure the voltage between the harness side connector (+) terminals.
Standard value 10~14V
 - (4) Turn the ignition OFF.
 - (5) Connect the connector.

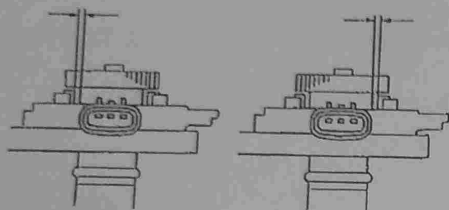
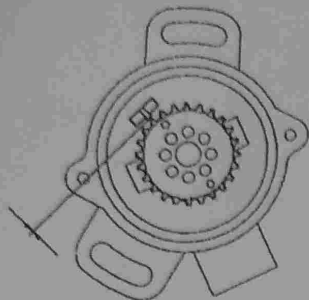
2. Measure the primary coil resistance.
 - (1) Use a tester to measure the resistance between the ignition coil (+) and (-) terminals.
Standard value 0.4~0.5Ω (when cold)

3. Measure the secondary coil resistance.
 - (1) Use a tester to measure the resistance between the ignition coil (+) terminal and the high pressure terminal.
Standard value 10~14Ω (when cold)

4E-FTE ENGINE - IGNITION

DISTRIBUTOR INSPECTION

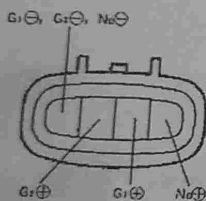
1. Inspect the air gap.
 - (1) Remove the distributor gap and rotor.
 - (2) Use a thickness gauge and measure the Ne signal pick-up air gap.
Standard value 0.2~0.5
If the measured value is outside of the standard value, replace the distributor housing.



- (3) Use a SST, and measure the G₁ and G₂ signal pick-up air gap.

SST 09242-00020 09242-00050
Standard value 0.2~0.4mm

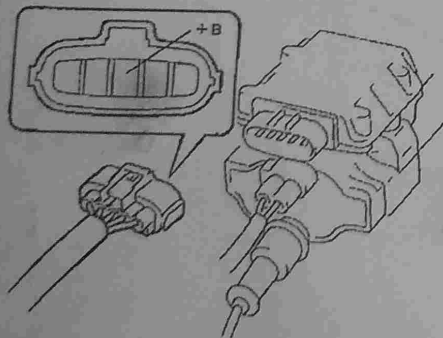
If the measured value is outside of the standard value, replace the distributor housing.



2. Measure the resistance between terminals.
 - (1) Measure the resistance between terminals.
Standard value G₁(+)↔G₁(-) 140~180Ω
G₂(+)↔G₂(-) 140~180Ω
Ne(+)↔Ne(-) 180~220Ω

IGNITION COIL INSPECTION

1. Measure the input voltage.
 - (1) Remove the ignition coil connector.
 - (2) Turn the ignition ON.
 - (3) Measure the voltage between the wire harness side 5 pin connect +B terminal↔ earth.
Standard value 10~14V
 - (4) Attach the 5 pin connector



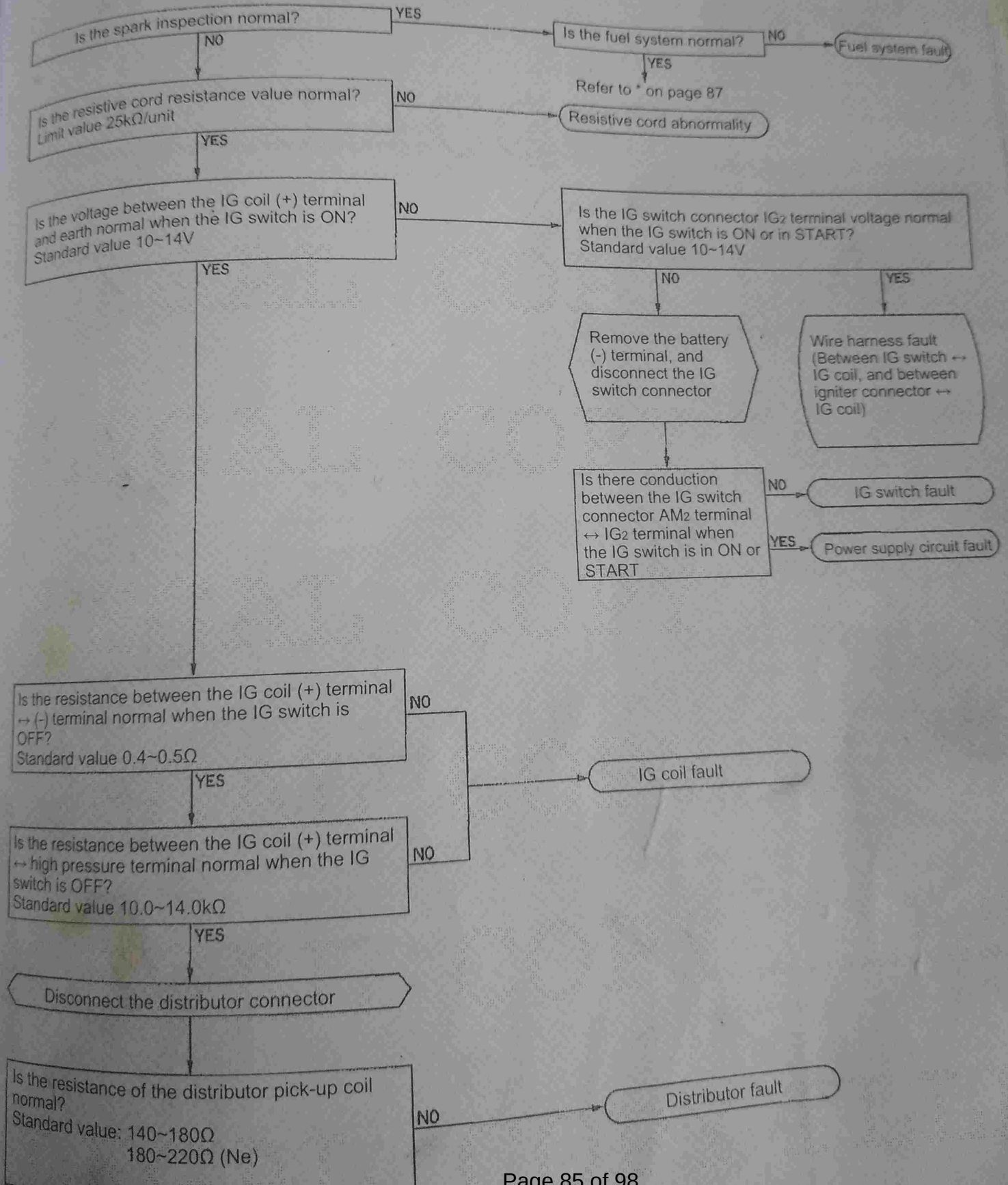
4E-FTE ENGINE - IGNITION

2. Inspect the ignition inner power transistor ON.

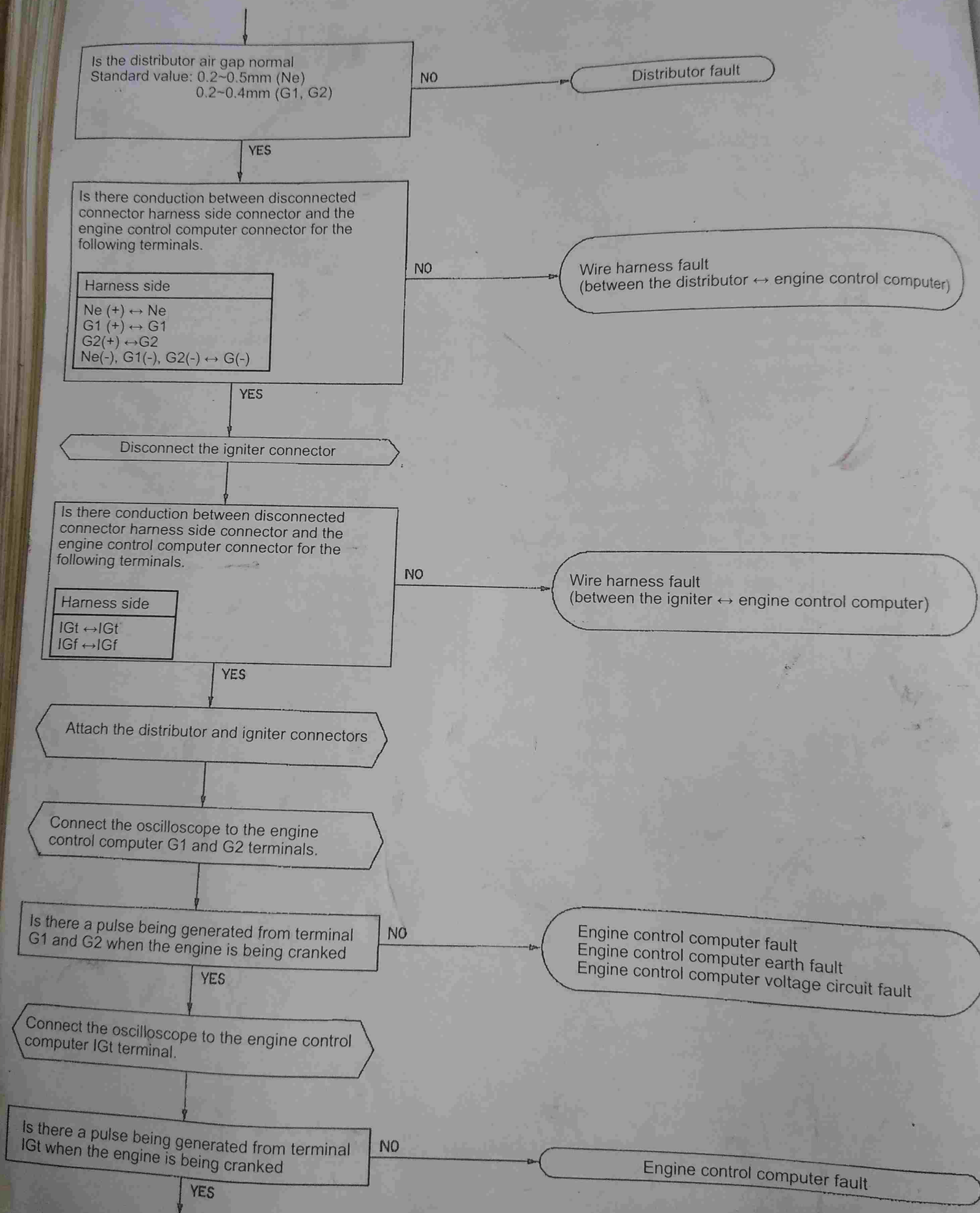
Caution:

The igniter has many IC parts built-in. If there is a problem with power transistor ON inspection, carry out the following inspection.

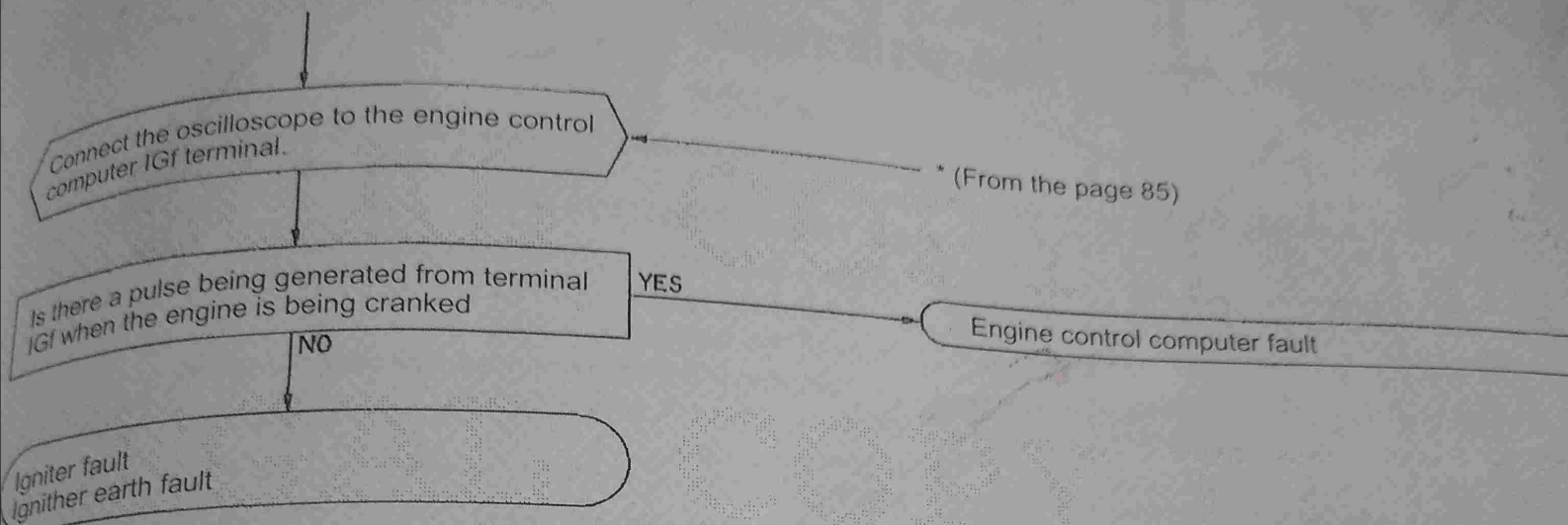
THE ENGINE WILL NOT START WHEN THE STARTER IS TURNED



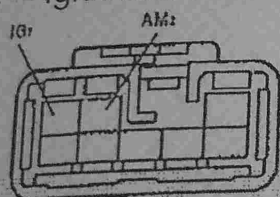
4E-FTE ENGINE - IGNITION



4E-FTE ENGINE - IGNITION

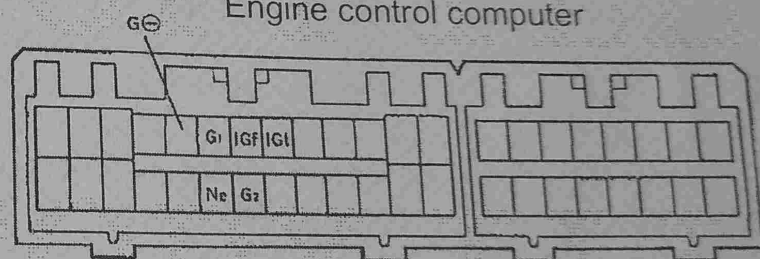


Ignition switch



g-0-2

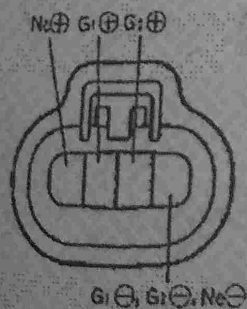
Engine control computer



R5099

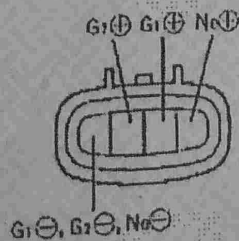
Distributor

(Harness side)



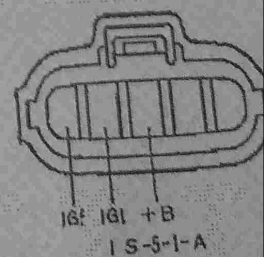
1 S-4-J-E

(Vehicle side)



R5280

Igniter
(Harness side)



1 S-5-1-A

4E-FTE ENGINE - CHARGING

CHARGING

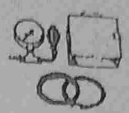
Caution:

Do not remove the battery cable while the engine is revving.

FUNCTION INSPECTION

1. Inspect the battery relative weight.
Standard value 1.25~1.27
2. Inspect the battery terminal.
3. Inspect the V belt tension and deflection amount.
(Refer to page 3, procedure 6)
4. Inspect the fuse.
5. Inspect the wiring.
6. Inspect for abnormal sounds.
(1) Check if there is an abnormal sound coming from the alternator while the engine is revving.
7. Inspect while there is no load (adjustment voltage, output voltage current inspection)
8. Inspect while there is a load.

TURBOCHARGER & INTERCOOLER PARTS

SST	Banzai Limited TCP-2TB Turbocharger pressure gauge 	Actuator inspection
Grease, others	LLC	Use to fill

FUNCTION INSPECTION

Turbocharger system inspection

1. Inspect the operation of the actuator and VSV.
 - (1) Remove the actuator hose, and attach the turbo pressure gauge.
 - (2) Start and idle the engine.
 - (3) Set the charging pressure changeover switch to the LO side, and apply a force of approximately 0.36kg/cm^2 to the actuator with the turbo pressure gauge, and check that the rod moves.

Caution:

Do not apply a pressure of more than 0.6kg/cm^2 to the actuator.

- (4) When the charging pressure changeover switch is in normal mode, check that the turbo pressure gauge display is 0.

2. Inspect the turbocharger charging pressure.

- (1) Warm the engine.

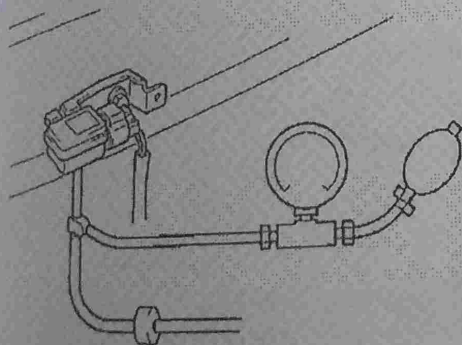
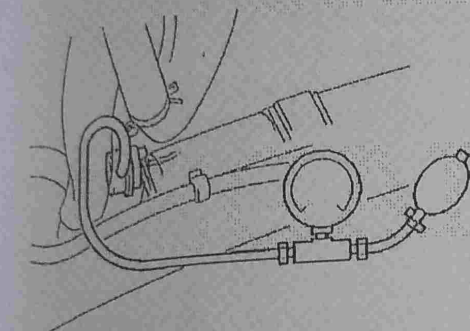
Standard: coolant temperature $80\sim 90^\circ\text{C}$

- (2) Place the charging pressure changeover switch into the normal mode side.

- (3) Attach the 3 way between intake manifold and the turbo pressure sensor, and attach the turbo pressure gauge.

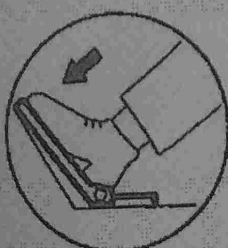
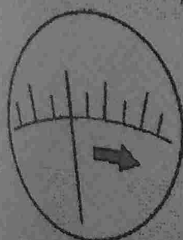
- (4) Measure the chagreover pressure while driving at full throt in third gear and with the engine revolutions above 2400rpm
Standard value $0.61\sim 0.75\text{kg/cm}^2$

3. Turbo pressure sensor inspection.
(Refer to page 27)

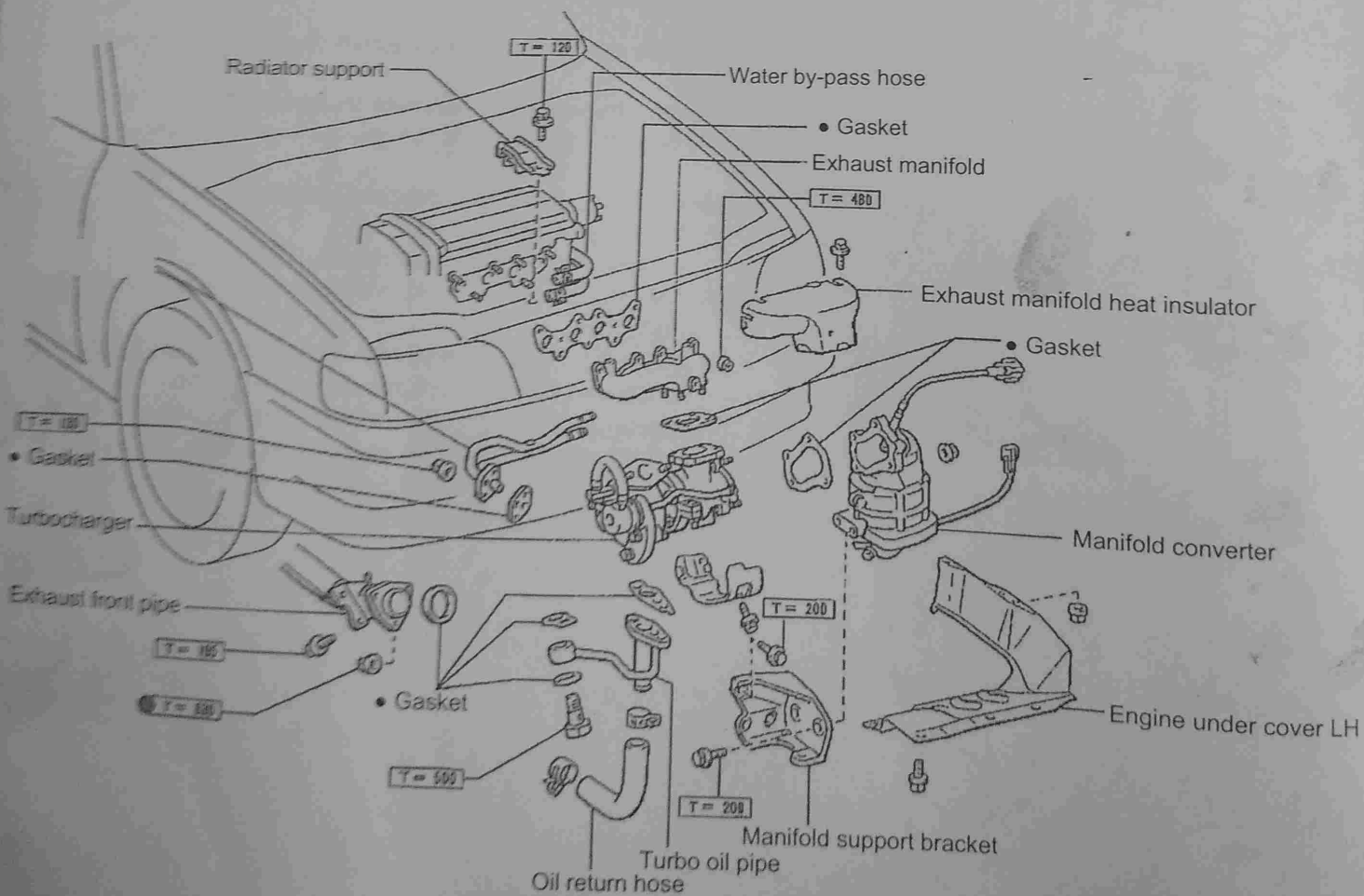


Greater than 2400rpm

Full Acceleration



TURBOCHARGER
DISASSEMBLY DIAGRAM



Page 90 of 98

4E-FTE ENGINE - TURBOCHARGER & INTERCOOLER

TURBOCHARGER REMOVAL

1. Remove the intercooler system
(Refer to page 96)
2. Remove the engine under cover LH.
3. Drain the coolant.
4. Detach the front exhaust pipe.

5. Remove the turbo oil hose.

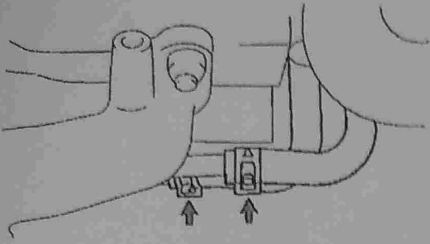
6. Remove the turbo oil pipe union bolt.
(1) Remove the oil filter bracket union bolt, and remove the 2 gaskets.

7. Remove the manifold support bracket.

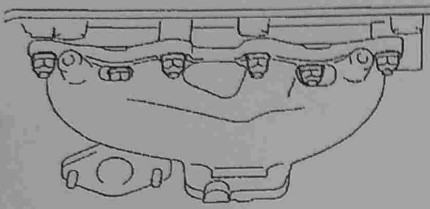
8. Remove the radiator upper support RH.
9. Remove the exhaust manifold heat insulator.

4E-FTE ENGINE - TURBOCHARGER & INTERCOOLER

10. Disconnect the turbo water hose.
(1) Remove the clamp, and disconnect the 2 water hoses.
11. Disconnect the O_2 sensor and the exhaust temperature sensor connector.



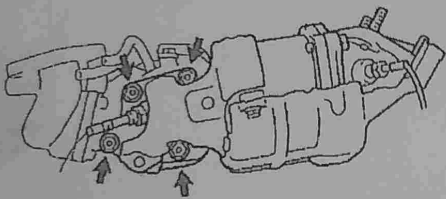
12. Remove the turbocharger ASSY w/ exhaust manifold & manifold converter.
(1) Remove the 6 nuts, and remove the turbocharger from the cylinder head with the exhaust manifold and manifold converter attached, and remove from the lower side of the vehicle.
(2) Remove the gasket.



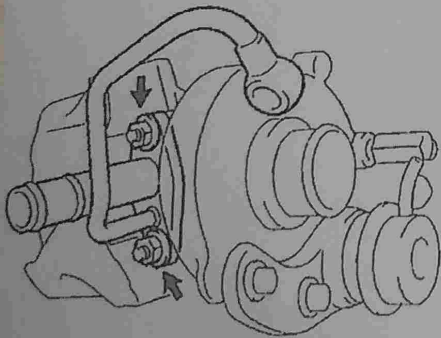
Caution:

- Do not damage the radiator.
- Do not warp the actuator rod or oil pipe.

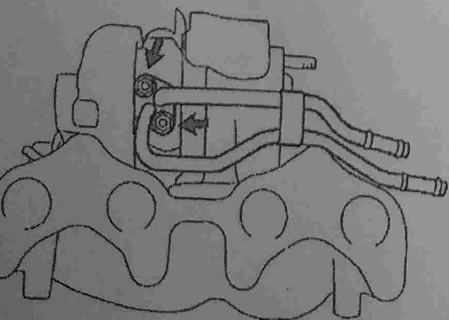
13. Remove the manifold converter.
(1) Remove the 4 nuts, and remove the manifold converter and gasket from the turbocharger.



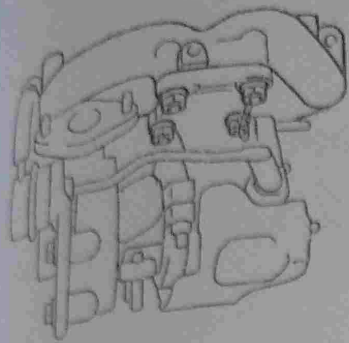
14. Remove the turbo oil pipe.
(1) Remove the 2 nuts, and remove the turbo oil pipe and gasket.



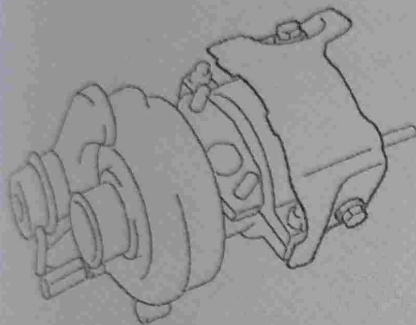
15. Remove the water by-pass pipe No. 2.
(1) Remove the 2 nuts, and remove the water by-pass pipe No. 2 and gasket.



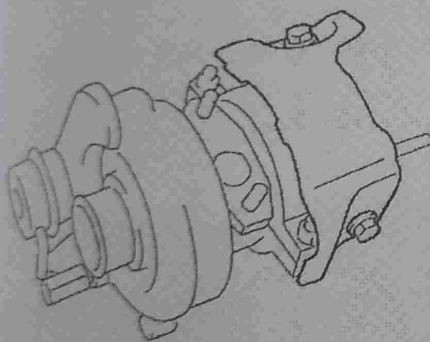
4E-FTE ENGINE - TURBOCHARGER & INTERCOOLER



16. Remove the exhaust manifold.
(1) Remove the 4 nuts, and remove the exhaust manifold and gasket.

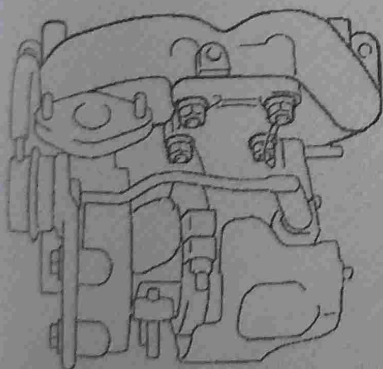


17. Remove the turbo insulator.

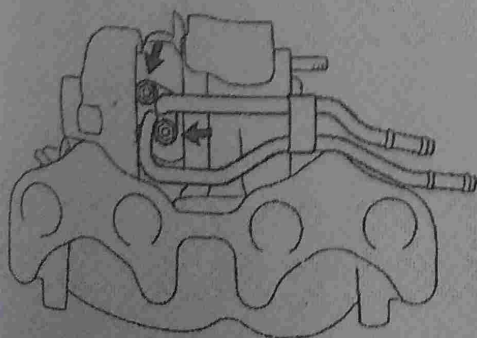


TURBOCHARGER INSTALLATION

1. Attach the turbo insulator
T=185kg/cm

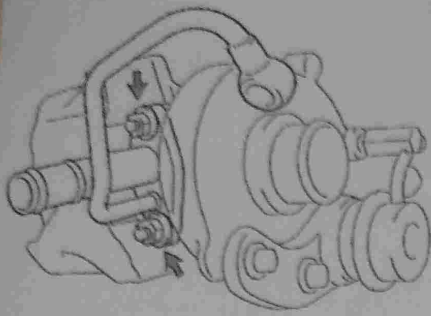


2. Attach the exhaust manifold.
(1) Attach the 4 nuts through a gasket to attach the exhaust manifold.
T=500kg/cm



3. Attach the water by-pass pipe No. 2.
(1) Attach the 2 nuts through gaskets to attach the water by-pass pipe No. 2.
T=75kg/cm

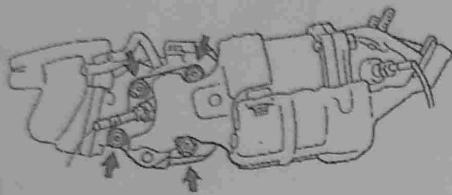
4E-FTE ENGINE - TURBOCHARGER & INTERCOOLER



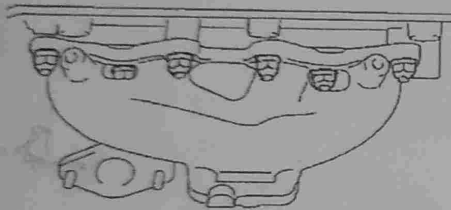
4. Attach the turbo oil pipe.
(1) Attach the 2 nuts through gaskets to attach the oil pipe.
T=130kg/cm

Caution:

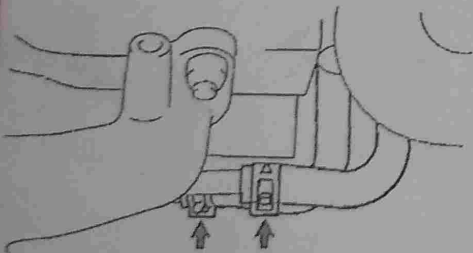
- Align the gasket oil pressure with the return hole.



5. Attach the manifold converter.
(1) Attach the 4 nuts through a gasket to attach the manifold converter.
T=250kg/cm

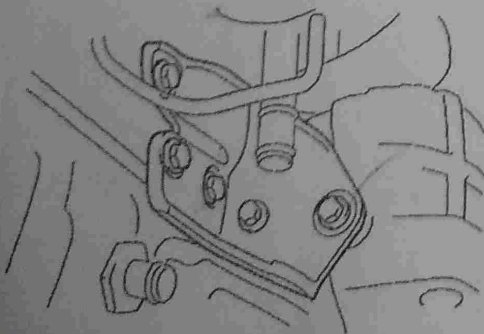


6. Attach the turbocharger ASSY w/ exhaust manifold & manifold converter.
(1) Place the turbocharger w/ manifold & converter into the engine room from the lower side of the vehicle.
(2) Attach the 6 nuts through a gasket to attach the cylinder head.
T=480kg/cm



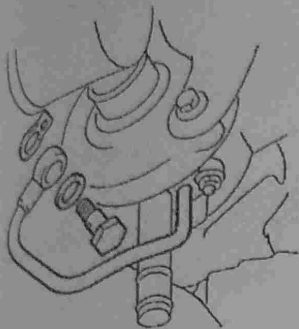
7. Connect the O₂ sensor and exhaust temperature sensor connector.
8. Connect the turbo water hose.
9. Attach the exhaust manifold heat insulator.
T=80kg/cm

10. Attach the radiator upper support RH.
T=120kg/cm



11. Attach the manifold support bracket.
T=200kg/cm

4E-FTE ENGINE - TURBOCHARGER & INTERCOOLER

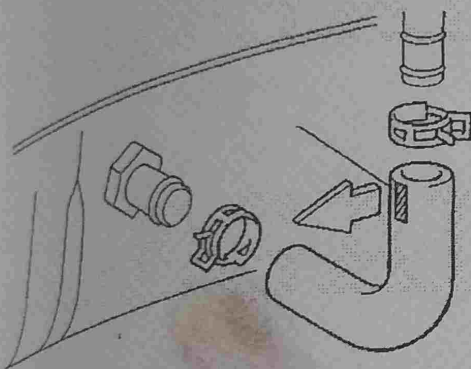


12. Attach the turbo oil pipe union bolt.

(1) Attach the 2 nuts through gaskets to attach the union bolt.
T=500kg/cm

Note:

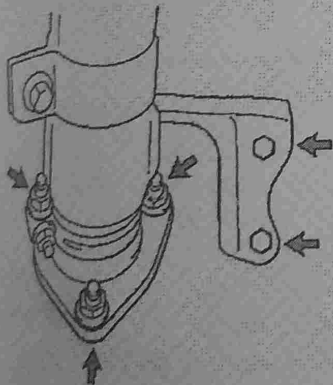
Attach the gasket with a flange to the oil filter bracket side.



13. Attach the turbo oil hose.

Caution:

Face the white paint towards the engine front side (right side of the vehicle).



14. Attach the front exhaust pipe.

(1) Attach the 2 nuts through gaskets to attach the exhaust pipe
T=630kg/cm

(2) Attach the exhaust pipe support bracket with 2 bolts.

15. Attach the engine under cover LH.

16. Attach the intercooler system.

(Refer to page 97)

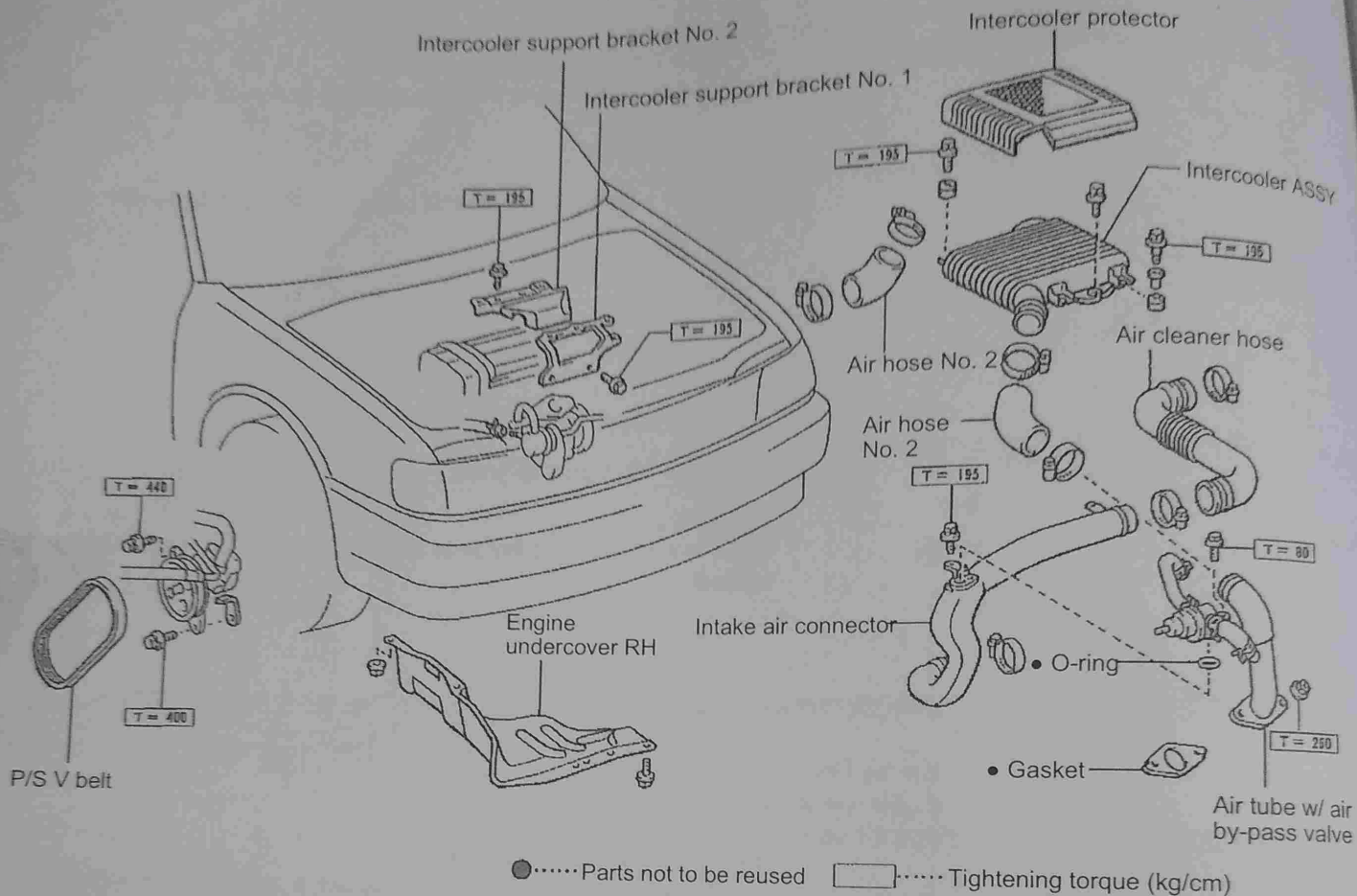
17. Add the coolant.

18. Inspect the coolant and check for engine oil leaks.

19. Inspect the turbocharger system.

(Refer to page 89)

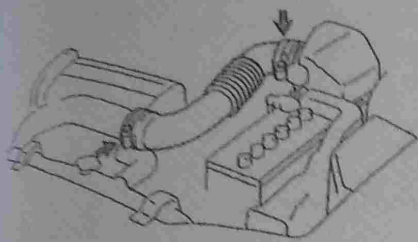
4E-FTE ENGINE - TURBOCHARGER & INTERCOOLER



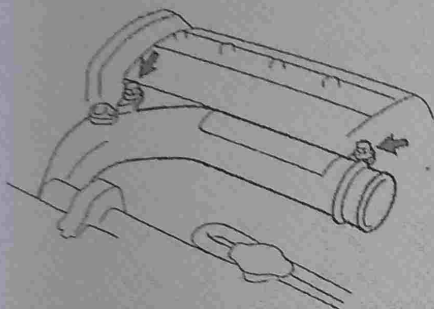
INTERCOOLER SYSTEM REMOVAL

1. Remove the intercooler protector.
2. Remove the intercooler ASSY.
 - (1) Remove the 4 bolts and pump cable bolt.
 - (2) Loosen the air hose No. 1 and air hose No. 2 hose clamp, and remove the intercooler ASSY with the air hose connected.
3. Remove the air by-pass valve ASSY w/ air tube.
 - (1) Disconnect the PCV hose and air hose.
 - (2) Remove the air by-pass valve securing bolt.
 - (3) Remove the 2 air tube nuts, and remove the air by-pass valve with the air tube attached.
 - (4) Remove the gasket and the air by-pass valve O-ring.

4E-FTE ENGINE - TURBOCHARGER & INTERCOOLER



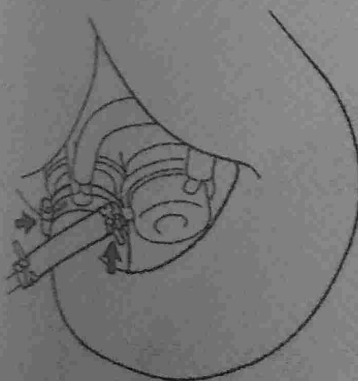
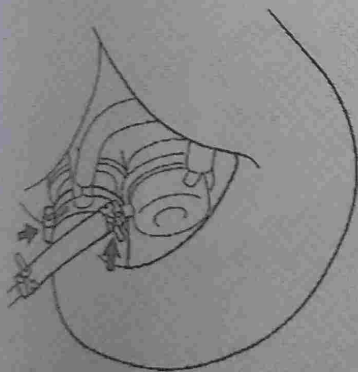
4. Remove the air cleaner hose.
 - (1) Loosen the air cleaner hose clamp, and remove the air cleaner hose.



5. Remove the engine under cover RH.
6. Remove the intake air connector.
 - (1) Remove the 2 intake air connector bolts.

- (2) Loosen the P/S bane pump through bolt and the securing bolt, and remove the V ribbed belt.
- (3) Remove the through bolt and securing bolt and weld nut, and remove the P/S bane pump with the low-high pressure hose attached from the front side of the vehicle.

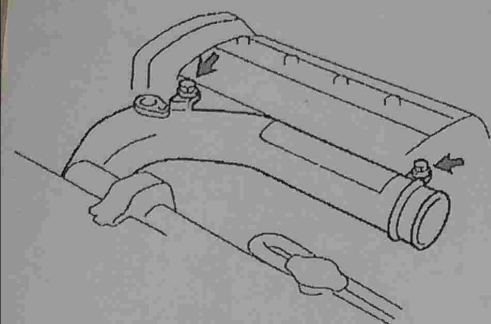
- (4) Disconnect the turbocharger actuator air hose.
- (5) Loosen the hose clamp and remove the intake air connector.
7. Remove the intercooler support bracket No. 1 and No. 2.



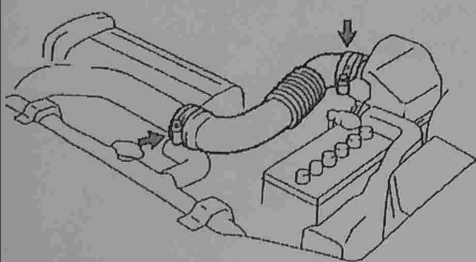
INTERCOOLER SYSTEM INSTALLATION

1. Attach the intercooler support bracket No. 1 and No. 2.
T=195kg/cm
2. Attach the intake air connector.
 - (1) Insert the end of the intake air connector into the turbocharger and secure with the hose clamp.
 - (2) Connect the turbocharger actuator air hose.

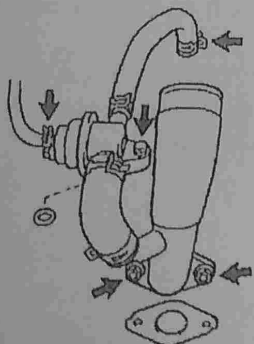
4E-FTE ENGINE - TURBOCHARGER & INTERCOOLER



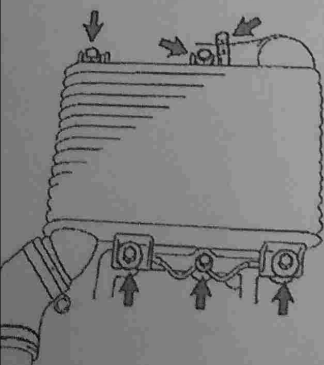
- (3) Fasten the P/S pump and V ribbed belt.
- (4) Tighten the 2 intake air connector bolts.
3. Adjust the V belt tension and deflection amount.
(Refer to page 5)
4. Attach the engine under cover RH.



5. Attach the air cleaner hose w/ air cleaner cap.



6. Attach the air by-pass valve ASSY w/ air tube.
 - (1) Attach the new gasket to the turbocharger air tube mounting area.
 - (2) Attach the new O-ring to the air by-pass valve.
 - (3) Attach the air by-pass valve w/ air tube with 2 nuts and bolts.
T=80kg/cm (bolt)
T=260kg/cm (nut)
 - (4) Connect the PCV hose and air hose.



7. Remove the intercooler ASSY.
 - (1) Attach the 4 bolts and pump cable bolt.
T=195kg/cm (M 8)
T=80kg/cm (M 6)
 - (2) Attach the air hose No. 1 and No. 2 to the hose clamp.

Caution:

Face the hose clamp bolts in the direction shown in the diagram and check that the bolts are not interfering with any other components.

8. Attach the intercooler protector.