CONTENTS

M. MECHANISM

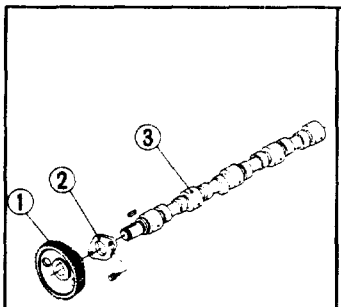
S. DISASSEMBLING AND SERVICING

SPECIFICATIONS

Model			D1403-B (E)	D1703-B (E)
Number of Cylinders			3	
Type			Vertical, water-cooled, 4-cycle diesel engine	
Bore x Stroke		mm (in.)	80 x 92.4 (3.15 x 3.64)	87 x 92.4 (3.43 x 3.64)
Total Displacement		cm^3 (cu. in.)	1393 (85.01)	1647 (100.55)
Engine	SAE Net Cont.	kW/rpm (HP/rpm)	18.6/2800 (25.0/2800)	22.4/2800 (30.0/2800)
	SAE Net Intermittent	kW/rpm (HP/rpm)	21.6/2800 (29.0/2800)	25.7/2800 (34.5/2800)
	SAE Gross Intermittent	kW/rpm (HP/rpm)	23.1/2800 (31.0/2800)	27.6/2800 (37.0/2800)
	DIN6271-NA	kW/rpm (PS/rpm)	18.4/2800 (25.0/2800)	22.1/2800 (30.0/2800)
	DIN6271-NB	kW/rpm (PS/rpm)	20.6/2800 (28.0/2800)	24.6/2800 (33.5/2800)
	DIN70020	kW/rpm (PS/rpm)	22.1/2800 (30.0/2800)	26.5/2800 (36.0/2800)
Maximum Bare Speed		rpm	3000	
Minimum Idling Speed		rpm	700 to 750	
Combustion Chamber			Spherical Type	
Fuel Injection Pump			Bosch Type Mini Pump (PFR 3M)	
Governor			Centrifugal Ball Mechanical Governor	
Direction of Rotation			Counter-clockwise (Viewed from flywheel side)	
Injection Nozzle			BOSCH Throttle-Type	
Injection Timing			0.314 rad. (18°) Before T.D.C	
Firing Order			1-2-3	
Injection Pressure			13.73 MPa (140 kgf/cm^2, 1991 psi)	
Compression Ratio			23 : 1	
Lubricating System			Forced Lubrication by trochoid Pump	
Oil Pressure Indicating			Electrical Type Switch	
Lubricating Filter			Full Flow Paper Filter (Cartridge Type)	
Cooling System			Pressurized radiation, forced Circulation with Water Pump	
Starting System			Electric Starting with Starter	
			12 V 1.2 kw	
Starting Support Device			By Glow Plug in Combustion Chamber	
Battery			12V 70 to 80 AH	
Dynamo for Charing			12V, 360W	
Fuel			Diesel Fuel No.2-D (ASTM D975)	
Lubricating Oil			Better than CD class (API)	
* Lubricating Oil Capacity	Oil pan depth 90 mm (3.54 in.)		5.6 ℓ (1.48 US gals, 1.23 Imp gals)	
	Oil pan depth 124 mm (4.88 in.)		7.0 ℓ (1.85 US gals, 1.54 Imp gals)	
Weight (Dry)		kg (lbs)	148 (326)	

*90 mm (3.54 in.) Oil pan depth is optional

[6] CAMSHAFT



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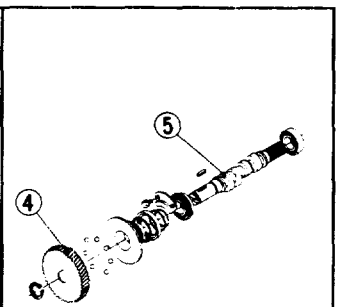

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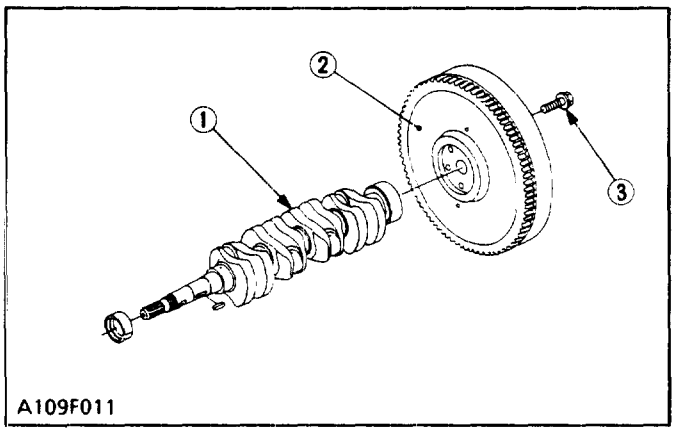
The camshaft (3) is made of special cast iron and the journal and cam sections are chilled to resist wear. The journal sections are force-lubricated. The fuel camshaft (5) controls the reciprocating movement of the injection pump. The fuel camshaft is made of carbon steel and the cam sections are quenched and tempered to provide greater wear resistance.

(1) Cam Gear
(2) Camshaft Stopper
(3) Camshaft
(4) Injection Pump Gear
(5) Fuel Camshaft

[7] FLYWHEEL



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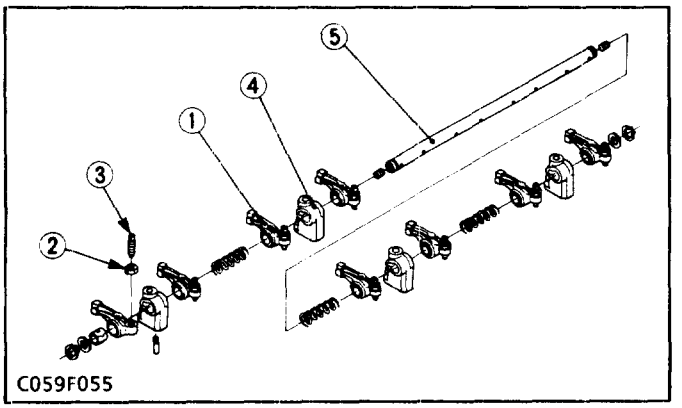
The flywheel stores the rotating force in the combustion stroke as inertial energy, reduces crankshaft rotating speed fluctuation and maintains the smooth rotating conditions.

The flywheel periphery is inscribed with the marks showing fuel injection timing angle lines and top dead center mark TC.

The flywheel has gear teeth around its outer rim, which mesh with the drive pinion of the starter.

(1) Crankshaft
(2) Flywheel
(3) Flywheel Screw

[8] ROCKER ARM



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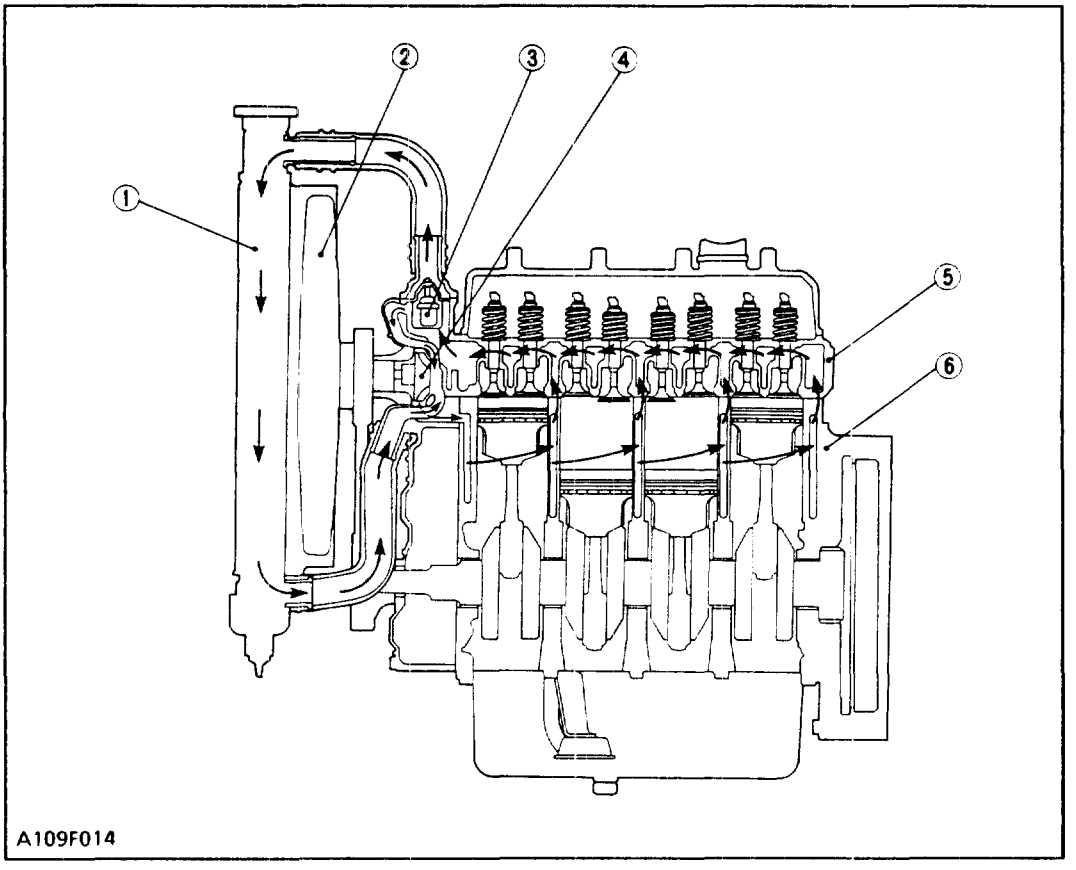
The rocker arm assembly includes the rocker arms (1), rocker arm brackets (4) and rocker arm shaft (5) push rods to an open/close movement of the inlet and exhaust valves.

Lubricating oil pressurized through the bracket to the rocker arm shaft, which serves as a fulcrum so that the rocker arm and the entire system are lubricated sufficiently.

(1) Rocker Arm
(2) Lock Nut
(3) Adjusting Screw
(4) Rocker Arm Bracket
(5) Rocker Arm Shaft

3 COOLING SYSTEM

[1] GENERAL



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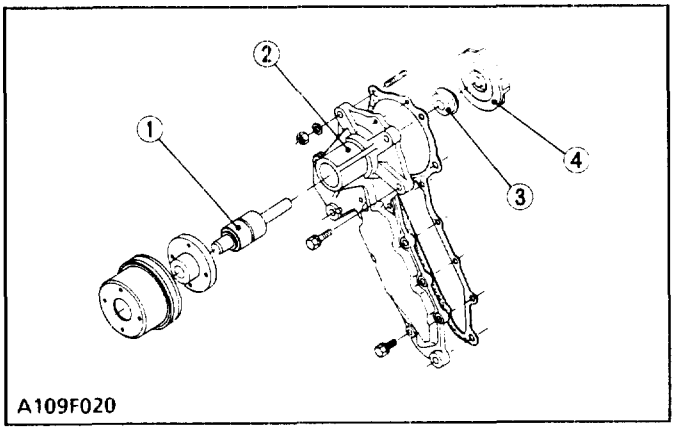
(1) Radiator
(2) Suction Fan
(3) Thermostat
(4) Water Pump
(5) Cylinder Head
(6) Cylinder Block

The cooling system consists of a radiator (1) (not included in the basic engine), centrifugal water pump (4), suction fan (2) and thermostat (3).

The water is cooled through the radiator core, and the fan set behind the radiator pulls cooling air through the core to improve cooling.

The water pump sucks the cooled water, forces it into the cylinder block and draws out the hot water. Then the cooling is repeated. Furthermore, to control temperature of water, a thermostat is provided in the system. When the thermostat opens, the water moves directly to radiator, but when it closes, the water moves toward the water pump through the bypass between thermostat and water pump. The opening temperature of thermostat is approx. 71°C (159.8°F).

[2] WATER PUMP



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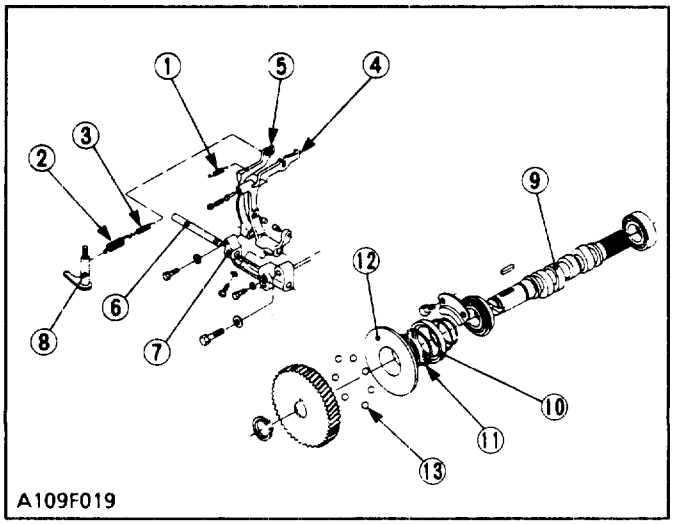
The water pump is driven by the crankshaft via a V-belt. Water cooled in the radiator is sucked into the water pump from its lower portion and is sent from the center of the water pump impeller (4) radially outward into the water jacket in the crankcase.

(1) Bearing Unit
(2) Water Pump Body
(3) Mechanical Seal
(4) Water Pump Impeller

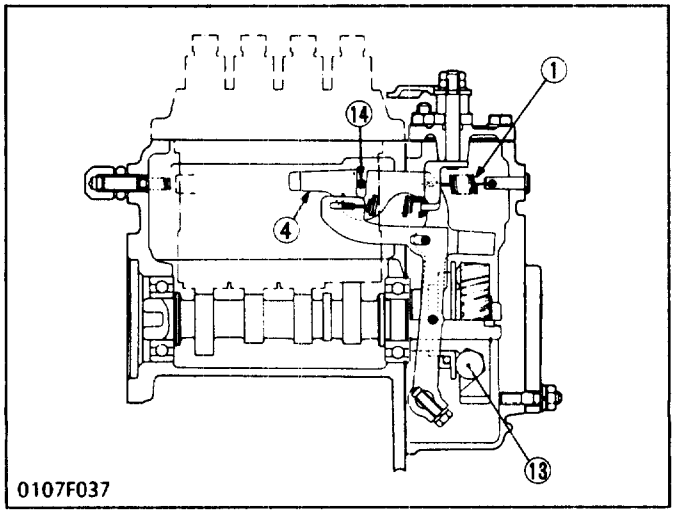
[6] GOVERNOR



The governor serves to keep engine speed constant by automatically adjusting the amount of fuel supplied to the engine according to changes in the load. This engine employs an all-speed governor which controls the centrifugal force of the steel ball (13) weight, produced by rotation of the fuel camshaft (9), and the tension of the governor spring 1 (2) and 2 (3) are balanced.

(1) Start Spring
(2) Governor Spring 1
(3) Governor Spring 2
(4) Fork Lever 1
(5) Fork Lever 2
(6) Fork Lever Shaft
(7) Fork Lever Holder
(8) Governor Lever
(9) Fuel Camshaft
(10) Governor Ball Case
(11) Steel Ball
(12) Governor Sleeve
(13) Steel Ball

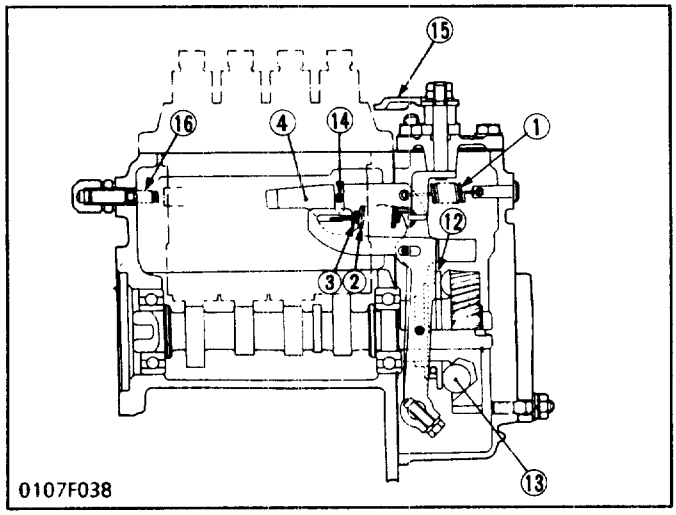
■ At start



Since the steel ball (13) have no centrifugal force, a fork lever 1 (4) is pulled to the right by the starter spring (1). Accordingly, the control rack (14) moves to the maximum injection position to assure easy starting.

(14) Control Rack

■ At idling



When the speed control lever (15) is set at the idling position after the engine starts, the governor spring 1 (2) does not work at all and the governor spring 2 (3) does only act slightly. The governor sleeve (12) is pushed leftward by a centrifugal force of steel ball (13).

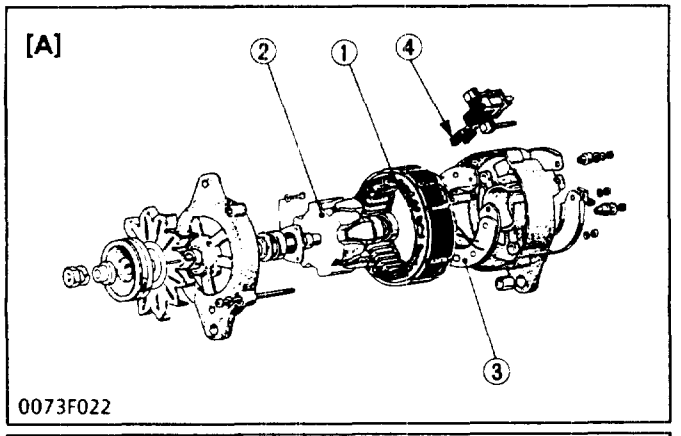
Therefore, the fork lever 1 (4) and control rack (14) are moved to the left by the governor sleeve and then the idling limit spring (16) is compressed by the control rack. As a result, the control rack is kept at a position where a centrifugal force of steel ball and forces start spring (1), governor spring 2 and idling limit spring are balanced, providing stable idling.

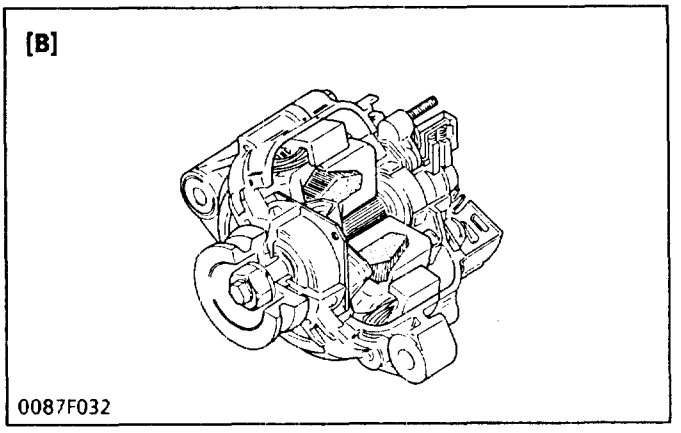
(15) Speed Control Lever
(16) Idling Limit Spring

6 ELECTRICAL SYSTEM

[1] CHARGING SYSTEM

(1) Alternator





The alternator generates 3-phase current at a fixed coil by the rotation of a rotor which is then emitted as full-wave rectified current by a diode. The alternator can generate power at all speeds from low to high.

(D1403-B, D1703-B, V1903-B, F2803-B)

A compact alternator with an IC regulator is used, having the following characteristics:

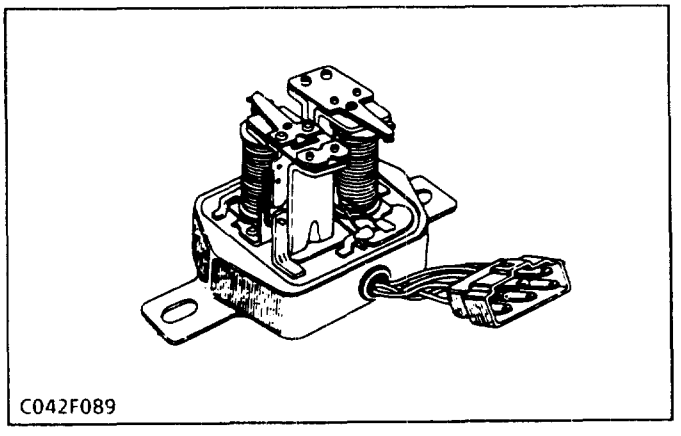
- Approximately 26% lighter and 17% smaller than a standard alternator.
- Cooling performance and safety have been improved by combining the cooling fan with the rotor and incorporating the fan / rotor unit inside the alternator.
- IC regulator is fitted inside the alternator.
- The rectifier, IC regulator and similar components are easy to remove, making it easier to service the alternator.

(1) Armature
(2) York
(3) Rectifier
(4) Brush

[A] Standard

[B] Compact type (equipped with IC regulator)

(2) Regulator (Contact type)



The regulator regulates the charging voltage. Since the alternator speed is varied by engine speed variation, the output voltage from alternator varies. However, constant voltage (12 V) must be supplied to the battery. That is the regulator which works to keep the charging voltage at 12 V.

[3] TIGHTENING TORQUES

Screws, bolts and nuts must be tightened to the specified torque using a torque wrench, Several screws, bolts and nuts such as those used on the cylinder head must be tightened in proper sequence and at the proper torque.

(1) Tightening torques for special use screws, bolts and nuts

■ **NOTE**

- **For "*" marked screws, bolts and nuts on the table, apply engine oil to their threads and seats before tightening.**
- **After well cleaning its thread and bearing surface, fit a new head bolt (rust-preventive oil applied) without applying engine oil to it.**
- **When reusing the head bolt, apply engine oil to its thread and bearing surface before fitting it. After installing the engine, let it run for 30 minutes, and retighten the head bolt. (Before retightening it, loosen it by 30 to 90°.)**

Item	Size x Pitch	N·m	kgf·m	ft-lbs
Head cover cap nut	M8 x 1.25	6.9 to 8.8	0.7 to 0.9	5.1 to 6.5
* Head bolt	M11 x 1.25	93.1 to 98.0	9.5 to 10.0	68.7 to 72.3
* Bearing case bolt 1	M9 x 1.25	46.1 to 50.9	4.7 to 5.2	34.0 to 37.6
* Bearing case bolt 2	M10 x 1.25	68.6 to 73.5	7.0 to 7.5	50.6 to 54.2
* Flywheel bolt	M12 x 1.25	98.0 to 107.8	10.0 to 11.0	72.3 to 79.5
* Connecting rod bolt				
(Non-flange bolt)	M8 x 1.0	36.3 to 41.2	3.7 to 4.2	26.6 to 30.4
(flange bolt)	M8 x 1.0	44.1 to 49.0	4.5 to 5.0	32.5 to 36.2
* Rocker arm bracket nut	M8 x 1.25	22.5 to 27.5	2.4 to 2.8	17.4 to 20.3
* Idle gear shaft bolt	M8 x 1.25	22.5 to 27.5	2.4 to 2.8	17.4 to 20.3
* Crankshaft end nut	M30 x 1.5	137.3 to 156.9	14.0 to 16.0	101.2 to 115.7
Crankshaft end bolt (F2803-B(E))	M16 x 1.5	313.8 to 333.4	32.0 to 34.0	231.4 to 245.9
Glow plug	M10 x 1.25	19.6 to 24.5	2.0 to 2.5	14.5 to 18.1
Nozzle holder assembly	M20 x 1.5	49.0 to 68.6	5.0 to 7.0	36.2 to 50.6
Oil switch taper screw	PT 1/8	14.7 to 19.6	1.5 to 2.0	10.8 to 14.5
Injection pipe retaining nut	M12 x 1.5	24.5 to 34.3	2.5 to 3.5	18.1 to 25.3

(2) Tightening torques for general use screws, bolts and nuts

When the tightening torques are not specified, tighten the screws, bolts and nuts according to the table below.

Grade / Nominal Diameter / Unit	Standard Screw and Bolt (4) SG00F004			Special Screw and Bolt (7)		
	N·m	kgf·m	ft-lbs	N·m	kgf·m	ft-lbs
M 6	7.9 to 9.3	0.80 to 0.95	5.8 to 6.9	9.8 to 11.3	1.00 to 1.15	7.23 to 8.32
M 8	17.7 to 20.6	1.8 to 2.1	13.0 to 15.2	23.5 to 27.5	2.4 to 2.8	17.4 to 20.3
M10	39.2 to 45.1	4.0 to 4.6	28.9 to 33.3	48.1 to 55.9	4.9 to 5.7	35.4 to 41.2
M12	62.8 to 72.6	6.4 to 7.4	46.3 to 53.5	77.5 to 90.2	7.9 to 9.2	57.1 to 66.5

Screw and bolt material grades are shown by numbers punched on the screw and bolt heads. Prior to tightening, be sure to check out the numbers as shown below.

Punched Number	Screw and Bolt Material Grade
None or **4**	Standard Screw and Bolt SS41, S20C
7	Special Screw and Bolt S43C, S48C (Refined)

Valve Timing

Item			Factory Specification	Allowable Limit
Intake valve	D1403-B(E)	Open	0.14 rad. (8°) before T.D.C.	–
		Close	0.35 rad. (20°) after B.D.C.	–
	D1703-B(E) V1903-B(E) V2203-B(E) F2803-B(E)	Open	0.21 rad. (12°) before T.D.C.	–
		Close	0.63 rad. (36°) after B.D.C.	–
Exhaust valve		Open	1.05 rad. (60°) before B.D.C.	–
		Close	0.21 rad. (12°) after T.D.C.	–

Valve Spring

Free length	41.7 to 42.2 mm 1.6417 to 1.6614 in.	41.2 mm 1.6220 in.
Setting load / setting length	117.6 N/35.0 mm 12.0 kgf/35.0 mm 26.4 lbs/1.3780 in.	100.0 N/35.0 mm 10.2 kgf/35.0 mm 22.5 lbs/1.3780 in.
Tilt	–	1.0 mm 0.039 in.

Rocker Arm

(V2203-B), serial number: ~3422 Clearance between rocker arm shaft and rocker arm	0.018 to 0.070 mm 0.0007 to 0.0026 in.	0.15 mm 0.0059 in.
Rocker arm shaft O.D.	13.973 to 13.984 mm 0.5501 to 0.5506 in.	–
Rocker arm bush I.D.	14.002 to 14.043 mm 0.5513 to 0.5529 in.	–
(V2203-B(E), serial number: 3423~ and D1403-B(E), D1703-B(E), V1903-B(E), F2803(E), all) Clearance between rocker arm shaft and rocker arm	0.016 to 0.045 mm 0.0006 to 0.0018 in.	0.15 mm 0.0059 in.
Rocker arm shaft O.D.	13.973 to 13.984 mm 0.5501 to 0.5506 in.	–
Rocker arm I.D. for shaft	14.000 to 14.018 mm 0.5512 to 0.5519 in.	–

Tappet

Clearance between tappet and guide	0.020 to 0.062 mm 0.0008 to 0.0024 in.	0.07 mm 0.0028 in.
Tappet O.D.	23.959 to 23.980 mm 0.9433 to 0.9441 in.	–
Tappet guide I.D.	24.000 to 24.021 mm 0.9449 to 0.9457 in.	–

(4) FUEL SYSTEM

Injection Pump

Item		Factory Specification	Allowable Limit
Injection timing	D1403-B(E), D1703-B(E), V1903-B(E), V2203-B(E)	0.30 to 0.33 rad. T.D.C. (17° to 19° before)	–
	F2803-B(E)	0.31 to 0.35 rad. T.D.C. (18° to 20° before)	
Fuel tightness of pump element		–	14.7 MPa 150 kgf/cm², 2133 psi
Fuel tightness of delivery valve		More 10 seconds 14.7 → 13.7 MPa 150 → 140 kgf/cm² 2133 → 1990 psi	5 seconds 14.7 → 13.7 MPa 150 → 140 kgf/cm² 2133 → 1990 psi

Injection Nozzle

Fuel injection pressure	13.73 to 14.71 MPa 140 to 150 kgf/cm² 1991 to 2133 psi	–
Fuel tightness of nozzle valve seat	When the pressure is 12.75 MPa (130 kgf/cm², 1849 psi), the valve seat must be fuel tightness.	–

(5) ELECTRICAL SYSTEM

Starter

Commutator O.D.	30.0 mm 1.1811 in.	29.0 mm 1.1417 in.
Mica undercut	0.5 to 0.8 mm 0.0197 to 0.0315 in.	0.2 mm 0.0079 in.
Brush length	15.0 mm 0.591 in.	10.0 mm 0.394 in.

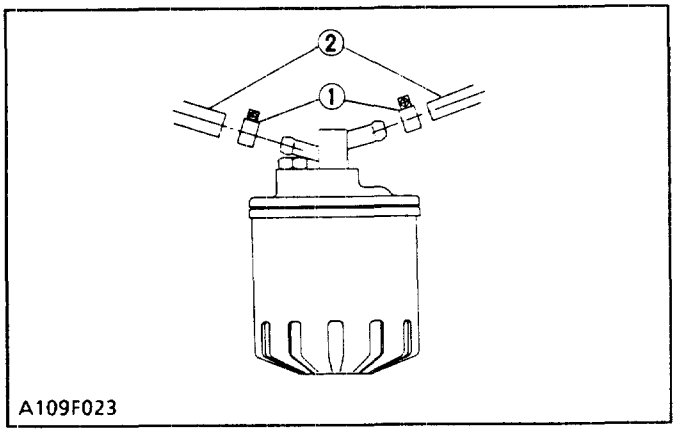
Alternator

Output current		14 V, 35 A/4000 rpm	–
Rotor coil resistance (F – E)	V2203-B(E)	4 Ω	–
	D1403-B(E), D1703-B(E), V1903-B(E), F2803-B(E)	2.9 Ω	
Slip Ring O.D.	V2203-B(E)	32.5 mm 1.2795 in.	32.1 mm 1.2638 in.
	D1403-B(E), D1703-B(E), V1903-B(E), F2803-B(E)	14.4 mm 0.567 in.	14.0 mm 0.551 in.
Brush length	V2203-B(E)	12.5 mm 0.4921 in.	5.5 mm 0.2165 in.
	D1403-B(E), D1703-B(E), V1903-B(E), F2803-B(E)	10.5 mm 0.413 in.	4.5 mm 0.177 in.

Glow Plug

Glow plug resistance	0.8 Ω	–

(2) Check Point of Every 50 hours



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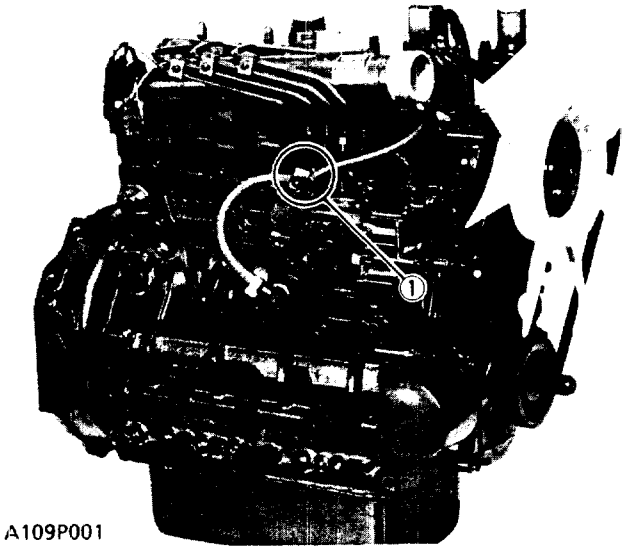
Checking Fuel Pipe

1. If the clamp (1) is loose, apply oil to the threads and securely retighten it.
2. The fuel pipe (2) is made of rubber and ages regardless of the period of service.
   Change the fuel pipe together with the clamp every two years.
3. However, if the fuel pipe and clamp are found to be damaged or deteriorate earlier than two years, then change or remedy.
4. After the fuel pipe and the clamp have been changed, bleed the fuel system.

⚠ CAUTION

- **Stop the engine when attempting the check and change prescribed above.**

(1) Clamp
(2) Fuel Pipe



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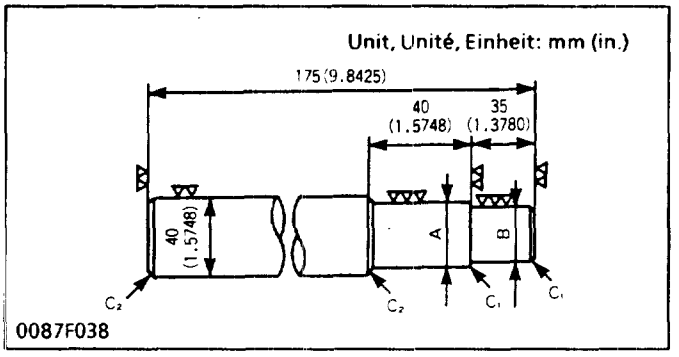
(When bleeding fuel system)

1. Fill the fuel tank with fuel, and open the fuel cock.
2. Open the air vent plug on the fuel injection pump.
3. Pull the engine stop knob back completely to prevent the engine from starting while turning the key to rotate the engiine for about 10 seconds.
4. Close the air vent plug.

■ NOTE

- **Always keep the air vent plug on the fuel injection pump closed except when air is vented, or it may cause the engine to stop.**

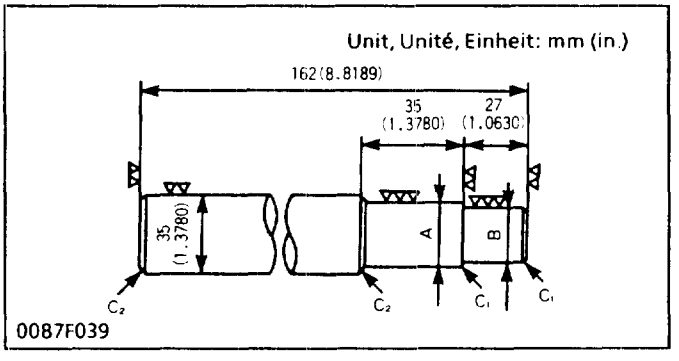
(1) Air Vent Plug



Idle gear Bushing Replacing Tool

Application: Use to press out and to press fit the idle gear bushing.

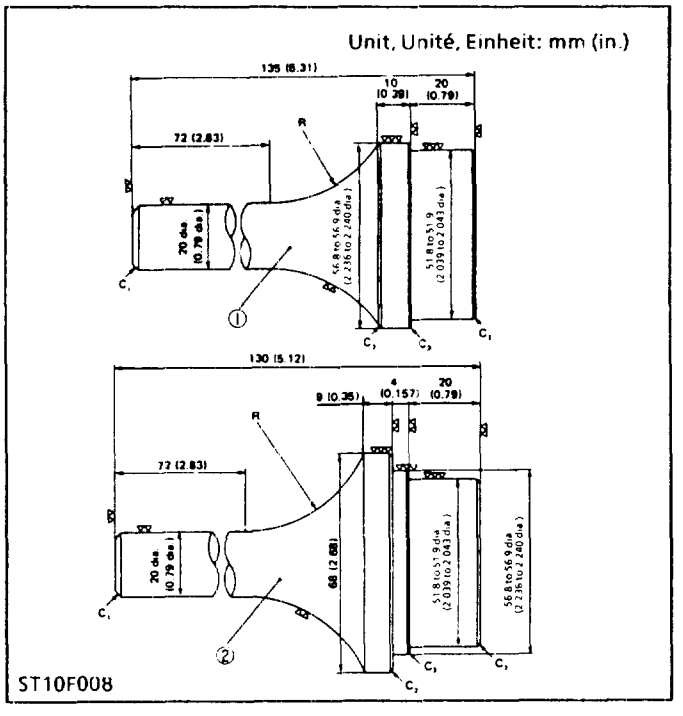
V2203-B(E)	A	35.90 to 35.95 mm 1.4134 to 1.4154 in.
	B	31.959 to 31.975 mm 1.2582 to 1.2589 in.
D1403-B(E) D1703-B(E) V1903-B(E) F2803-B(E)	A	41.90 to 41.95 mm 1.6496 to 1.6516 in.
	B	37.959 to 37.975 mm 1.4950 to 1.4951 in.



Small End Bushing Replacing Tool

Application: Use to press out and to press fit the small end bushing.

A	27.90 to 27.95 mm 1.0984 to 1.1004 in.
B	25.002 to 25.011 mm 0.9843 to 0.9847 in.

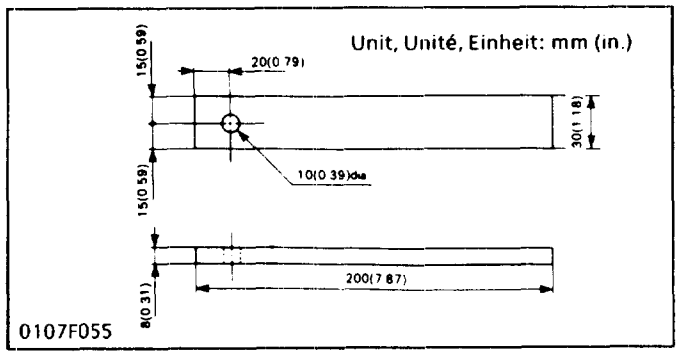


Crankshaft Bearing 1 Replacing Tool

Application: Use to press out and to press fit the crankshaft bearing 1.

*Chamfer	mm	in.
C_1	2.0	0.079
C_2	1.0	0.039
C_3	0.3	0.012

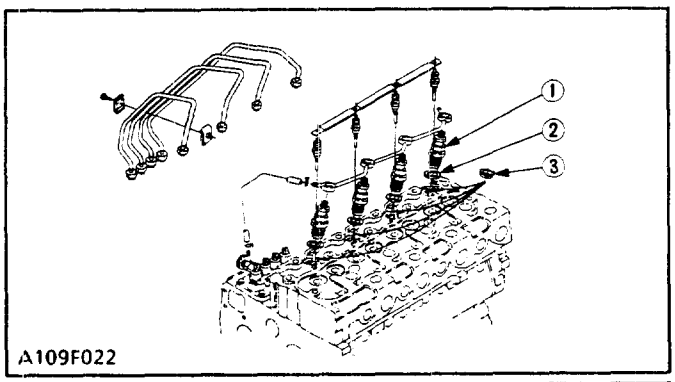
**Radius	mm	in.
R	240	1.57

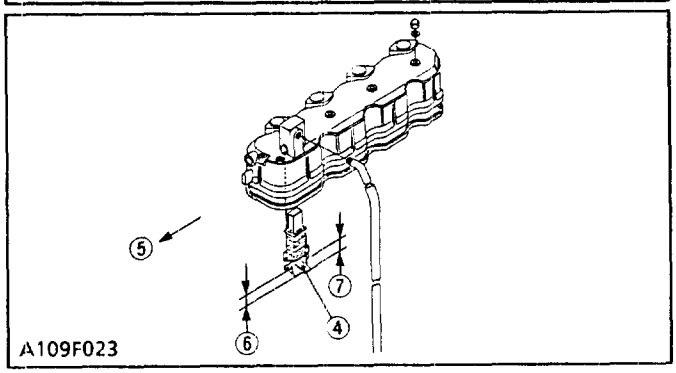


Flywheel Stopper

Application: Use to loosen and tighten the flywheel screw.

[3] CYLINDER HEAD AND VALVES





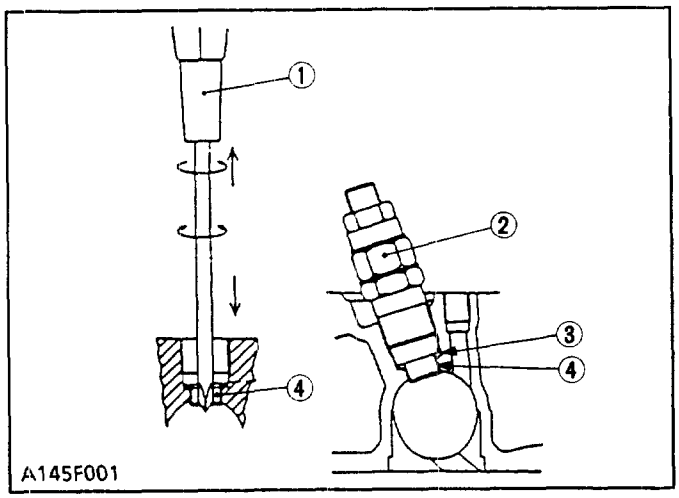
Cylinder Head Cover and Nozzle Holder

1. Remove the injection pipes and overflow pipes.
2. Remove the glow plugs.
3. Remove the nozzle holder and copper gaskets.
4. Remove the heat seal.
5. Remove the head cover.

(When reassembling)

- Check to see that the cylinder head cover gasket is not defective.
- Be sure to place the heat seal (3) and breather oil shield (4) (See Fig).

(1) Nozzle Holder
(2) Copper Gasket
(3) Heat Seal
(4) Breather Oil Shield
(5) Gear Case Side
(6) Short Plate
(7) Long Plate



Nozzle Heat Seal Service Removal Procedure

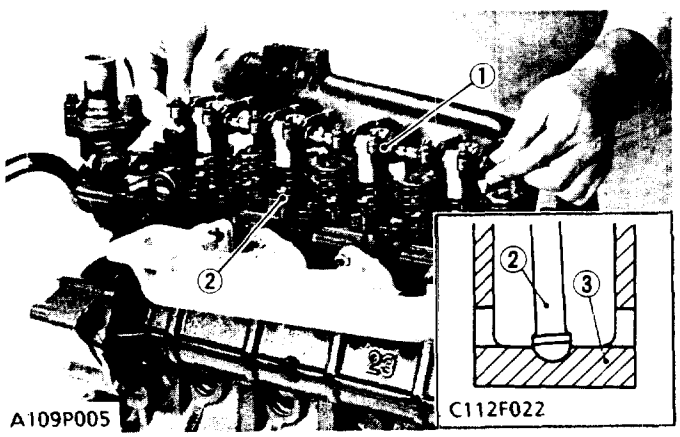
■ IMPORTANT

- **Use a plus (phillips head) screw driver that has a Dia. which is bigger than the heat seal hole (Approx. 6 mm) 1/4 in..**

1. Drive screw driver lightly into the heat seal hole.
2. Turn screw driver three or four times each way.
3. While turning the screw driver, slowly pull the heat seal out together with the injection nozzle gasket.

   If the heat seal drops, repeat the above procedure. Heat seal and injection nozzle gasket must be changed when the injection nozzle is removed for cleaning or for service.

(1) Plus Screw Driver
(2) Injection Nozzle
(3) Injection Nozzle Packin
(4) Heat Seal



Rocker Arm, Push Rod and In./Ex. Manifold

1. Remove the rocker arm as a unit.
2. Remove the push rods.
3. Remove the In./Ex. manifold.

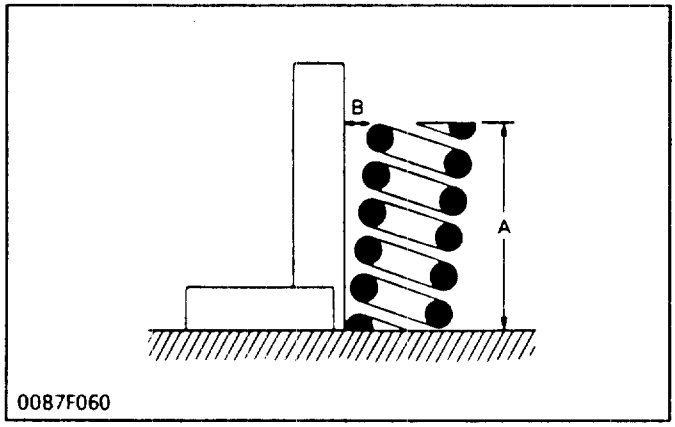
(When reassembling)

- When putting the push rods onto the tappets, check to see if their ends are properly engaged with the grooves.

■ IMPORTANT

- **After reassembling the rocker arm, be sure to adjust the valve clearance.**

(1) Rocker Arm
(2) Push Rod
(3) Tappet



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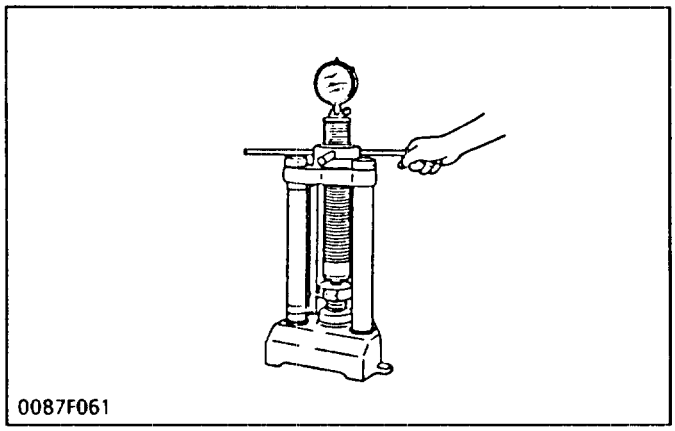
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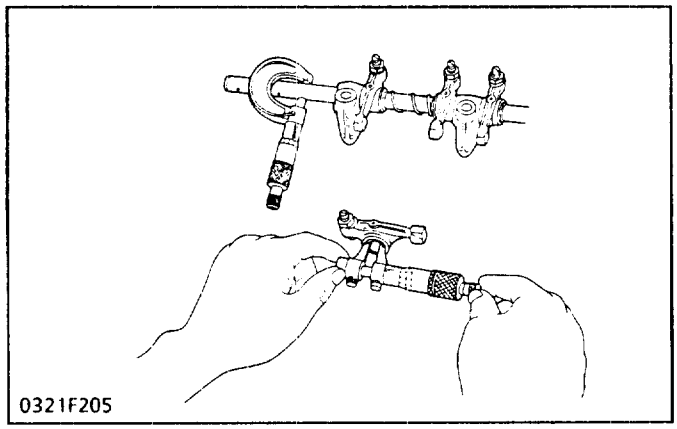
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Valve Spring

1. Measure the length **A** with vernier calipers. If the measurement is less than the allowable limit, replace.
2. Put the spring on a surface plate, place a square on the side of the spring, and check to see if the entire side is in contact with the square. Rotate the spring and measure the maximum **B**.
   If the measurement exceeds the allowable limit, replace.
3. Check the entire surface of the spring for scratches. Replace it, if any.
4. Place the spring on a tester and compress it to the same length it is actually compressed in the engine.
   Read the compression load on the gauge.
   If the measurement exceeds the allowable limit, replace it.

Free length	Factory spec.	41.7 to 42.2 mm 1.6417 to 1.6614 in.
	Allowable limit	41.2 mm 1.6220 in.
Tilt	Factory spec.	1.0 mm 0.039 in.
Setting load / Setting length	Factory spec.	12.0 kgf / 35.0 mm 117.6 N / 35.0 mm 26.4 lbs. / 1.3780 in.
	Allowable limit	10.2 kgf / 35.0 mm 100.0 N / 35.0 mm 22.5 lbs. / 1.3780 in.

Oil Clearance of Rocker Arm Shaft and Bearing

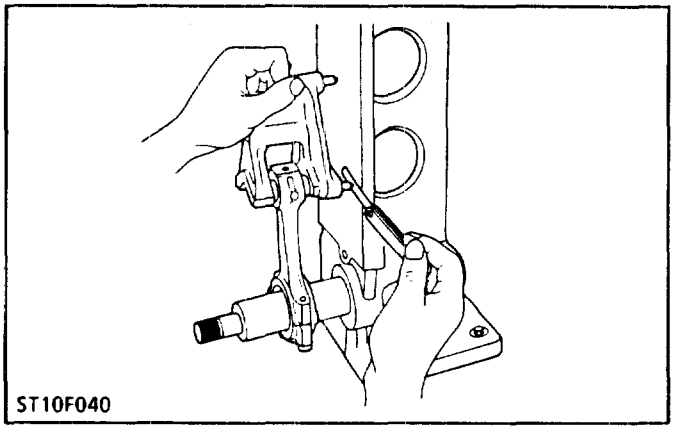
1. Measure the rocker arm bearing I.D. with an inside micrometer.
2. Measure the rocker arm shaft O.D. with an outside micrometer.
3. If the clearance exceeds the allowable limit, replace the bushing.
4. If the clearance still exceeds the allowable limit after replacing the bushing, replace the rocker arm shaft.

[With bushing]

Oil clearance of rocker arm shaft and bush	Factory spec.	0.018 to 0.070 mm 0.0007 to 0.0026 in.
	Allowable limit	0.15 mm 0.0059 in.
Rocker arm shaft O.D.	Factory spec.	13.973 to 13.984 mm 0.5501 to 0.5506 in.
Rocker arm bush I.D.	Factory spec.	14.002 to 14.043 mm 0.5513 to 0.5529 in.

[Bushless type]

Oil clearance of rocker arm shaft and bearing	Factory spec.	0.016 to 0.045 mm 0.0006 to 0.0015 in.
	Allowable limit	0.15 mm 0.0059 in.
Rocker arm shaft O.D.	Factory spec.	13.973 to 13.984 mm 0.5501 to 0.5506 in.
Rocker arm bush I.D.	Factory spec.	14.000 to 14.018 mm 0.5512 to 0.5517 in.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Connecting Rod Alignment

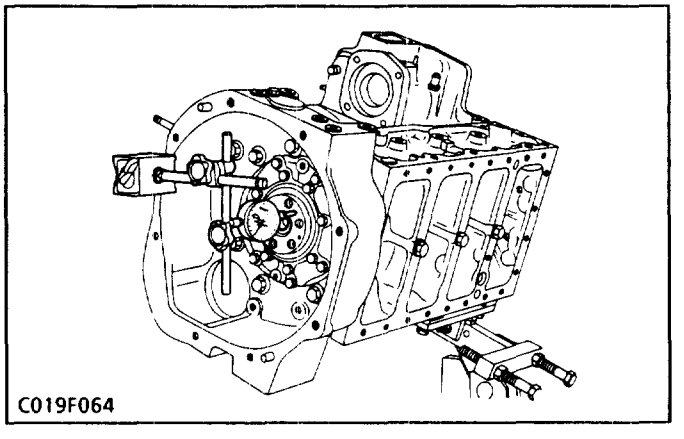
■ **NOTE**

- **Since the I.D. of the connecting rod small end bushing is the basis of this check, check the bushing for wear beforehand.**

1. Install the piston pin into the connecting rod.
2. Install the connecting rod on the connecting rod alignment tool.
3. Put a gauge over the piston pin and move it against the face plate.
4. If the gauge does not fit squarely against the face plate, measure the space between the pin of the gauge and the face plate.
5. If the measurement exceeds the allowable limit, replace the connecting rod.

Connecting rod alignment	Allowable limit	0.05 mm 0.0020 in.

[4] CRANKSHAFT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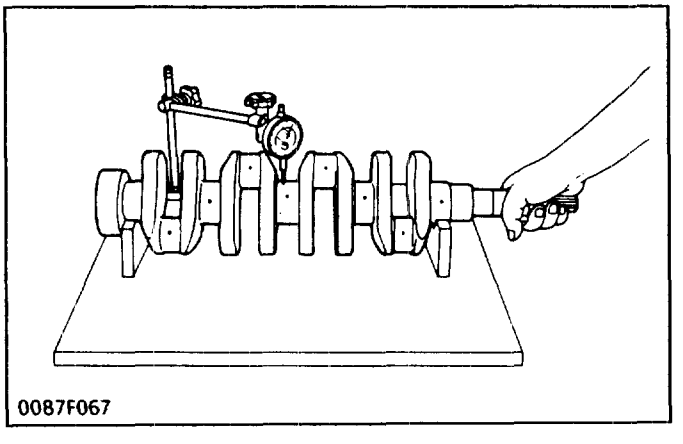
Side Clearance of Crankshaft

1. Move the crankshaft to the flywheel side.
2. Set a dial indicator to the crankshaft.
3. Measure the end play by pulling the crankshaft toward the crank gear.
4. If the measurement exceeds the allowable limit, replace the thrust bearing 1 and 2.

Crankshaft side clearance	Factory spec.	0.15 to 0.31 mm 0.0059 to 0.0122 in.
	Allowable limit	0.5 mm 0.0197 in.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Crankshaft Alignment

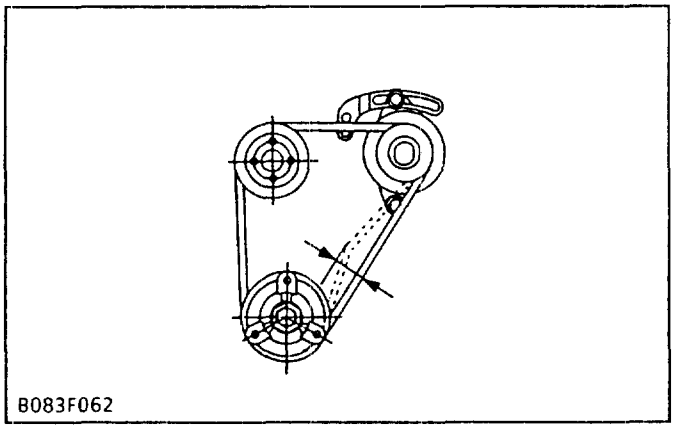
1. Support the crankshaft with V-blocks on the surface plate and set a dial indicator with its tip on the intermediate journal at right angle.
2. Rotate the crankshaft on the V-blocks and get the misalignment (half of the measurement).
3. If the misalignment exceeds the allowable limit, replace the crankshaft.

Crankshaft Alignment	Allowable limit	0.02 mm 0.00079 in.

3 COOLING SYSTEM

CHECKING

[1] FAN BELT



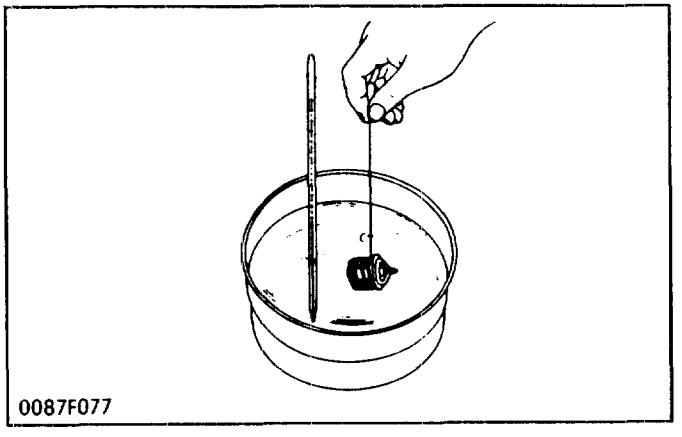
Fan Belt Tension

1. Press the fan belt between fan pulley and pulley at force of 10 kgf (98N, 22 lbs).
   Check if the fan belt deflection is 10 to 12 mm (0.394 to 0.472 in.)
2. If the deflection is not within the factory specifications, loosen the bolt and nuts, and relocate the alternator to adjust.

[2] RADIATOR

CAUTION

- **When removing the radiator cap, wait at least ten minutes after the engine has stopped and cooled down. Otherwise, hot water may gush out, scalding nearby people.**



Thermostat's Valve Opening Temperature

1. Push down the thermostat valve and insert a string between the valve and the valve seat.
2. Place the thermostat and a thermometer in a container with water and gradually heat the water.
3. Hold the string to suspend the thermostat in the water. When the water temperature rises, the thermostat valve will open, allowing it to fall down from the string.
   Read the temperature at this moment on the thermometer.
4. Continue heating the water and read the temperature when the valve has risen by about 8 mm (0.315 in.).
5. If the measurement is not acceptable, replace the thermostat.

Thermostat's valve opening temperature	Factory spec.	69.5 to 72.5°C 157.1 to 162.5°F
Temperature at which thermostat completely opens	Factory spec.	85°C 185.5°F