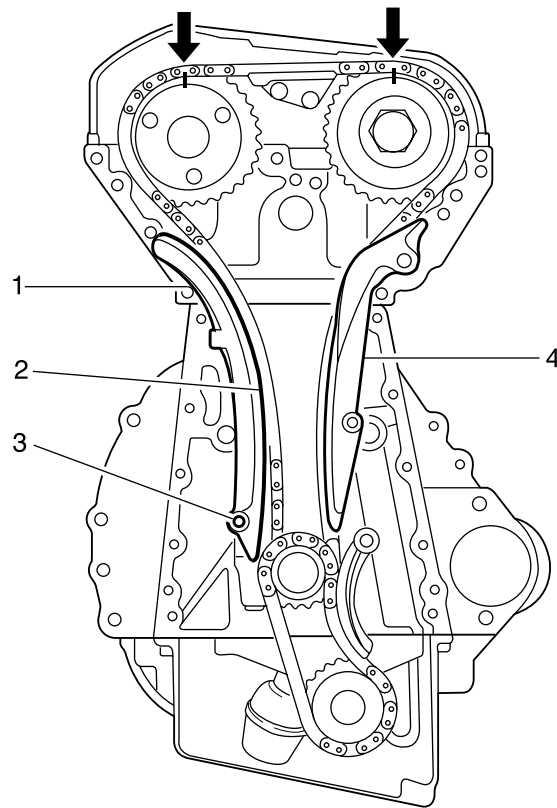


TENSIONING RAIL

Preceding Work : Removal of timing gear case cover



YAD1B2H0

- 1 Tensioning Rail
- 2 Plastic Guide

- 3 Tensioning Rail Pin
- 4 Guide Rail

Removal & Installation Procedure

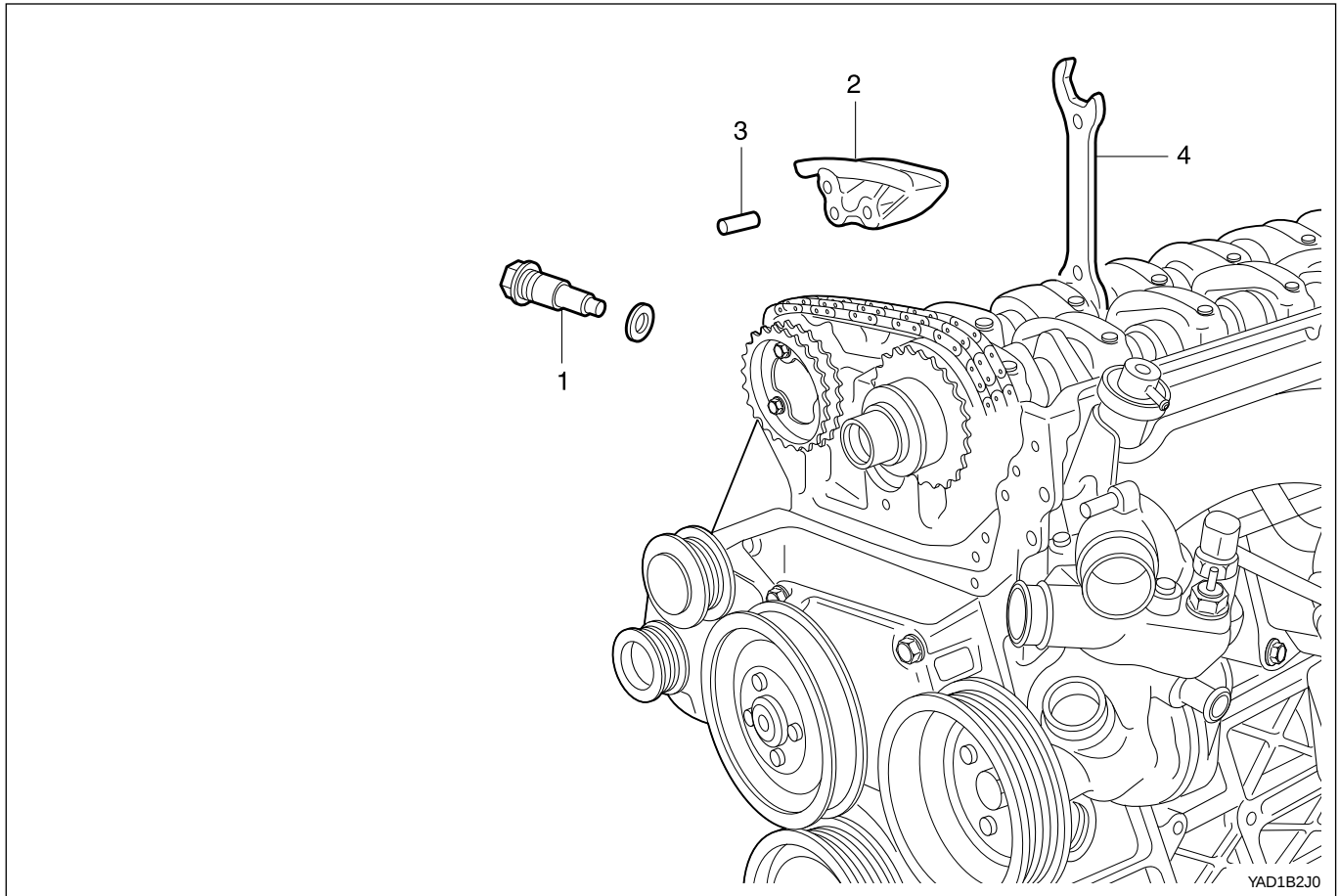
1. Put the assembly mark at the camshaft sprocket and the timing chain with the paint (arrow).
2. Remove the exhaust camshaft sprocket.
3. Remove the tensioning rail (1) from the tensioning rail pin (3).

Notice:

- Replace the plastic guide (2) if it is damaged.
 - For installation, exactly align the plastic guide (2) with the tensioning rail (1).
4. Installation should follow the removal procedure in the reverse order.
 5. Check the camshaft timing position.

CYLINDER HEAD GUIDE RAIL

Preceding Work : Removal of cylinder head cover



- 1 Chain Tensioner
- 2 Upper Guide Rail

- 3 Upper Guide Rail Pin
- 4 Wrench (Special Tool)

Removal & Installation Procedure

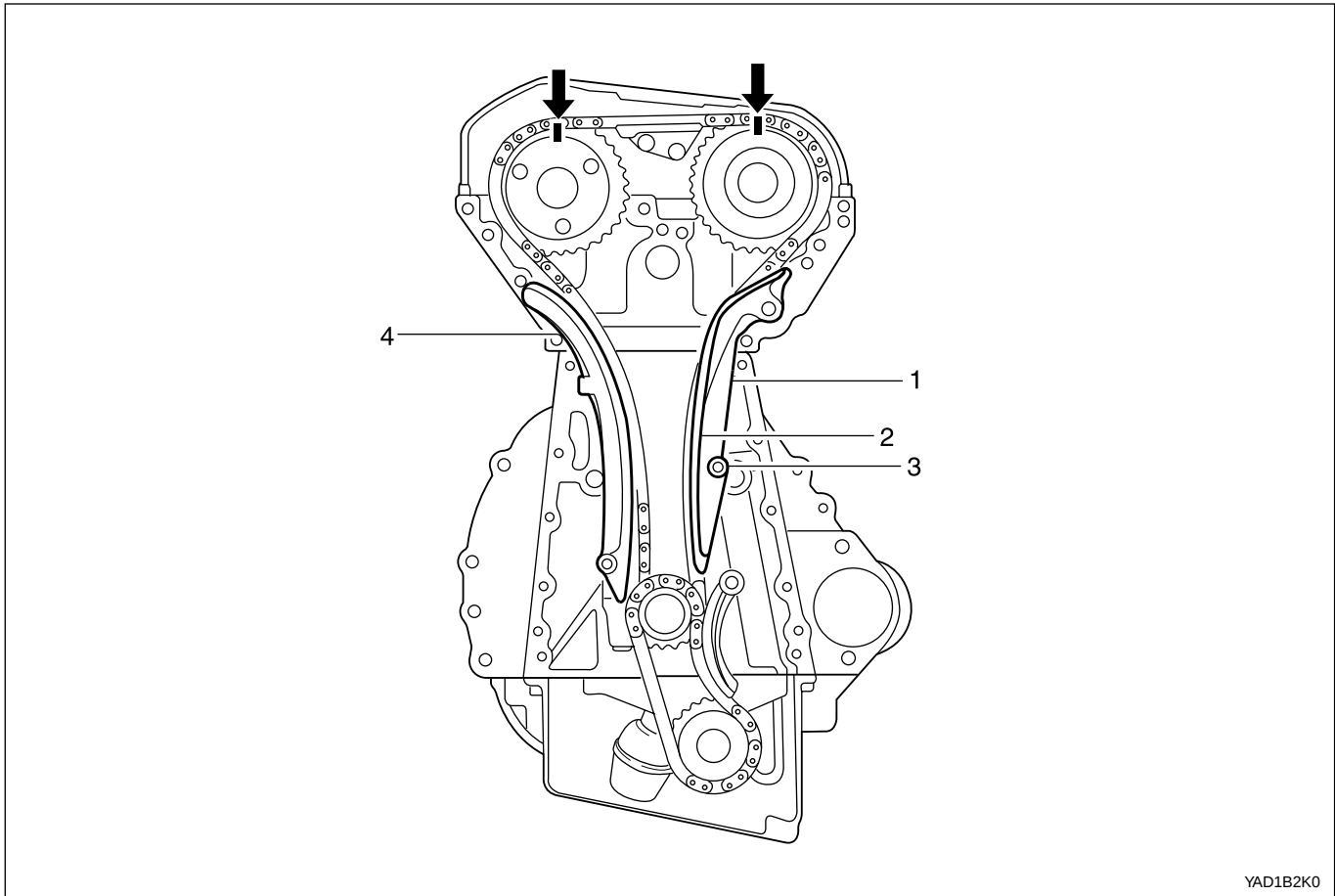
1. Remove the chain tensioner (1).
2. Turn the exhaust camshaft to the camshaft rotating direction using the wrench (4) and loosen the timing chain at upper guide rail (2).
3. Pull out the upper guide rail pin from the guide rail (2).
4. Turn the exhaust camshaft to the opposite direction of rotation using the wrench.
5. Check for damages at the upper sliding rail and replace it if necessary. Install the upper guide rail pin.
6. Install the chain tensioner.

Installation Notice

Tightening Torque	Screw Plug	40 N•m (30 lb-ft)
	Tensioner Assembly	72 - 88 N•m (53 - 65 lb-ft)

CRANKCASE GUIDE RAIL

Preceding Work : Removal of timing gear case cover



YAD1B2K0

- 1 Guide Rail
- 2 Plastic Guide

- 3 Guide Rail Pin
- 4 Tensioning Rail

Removal & Installation Procedure

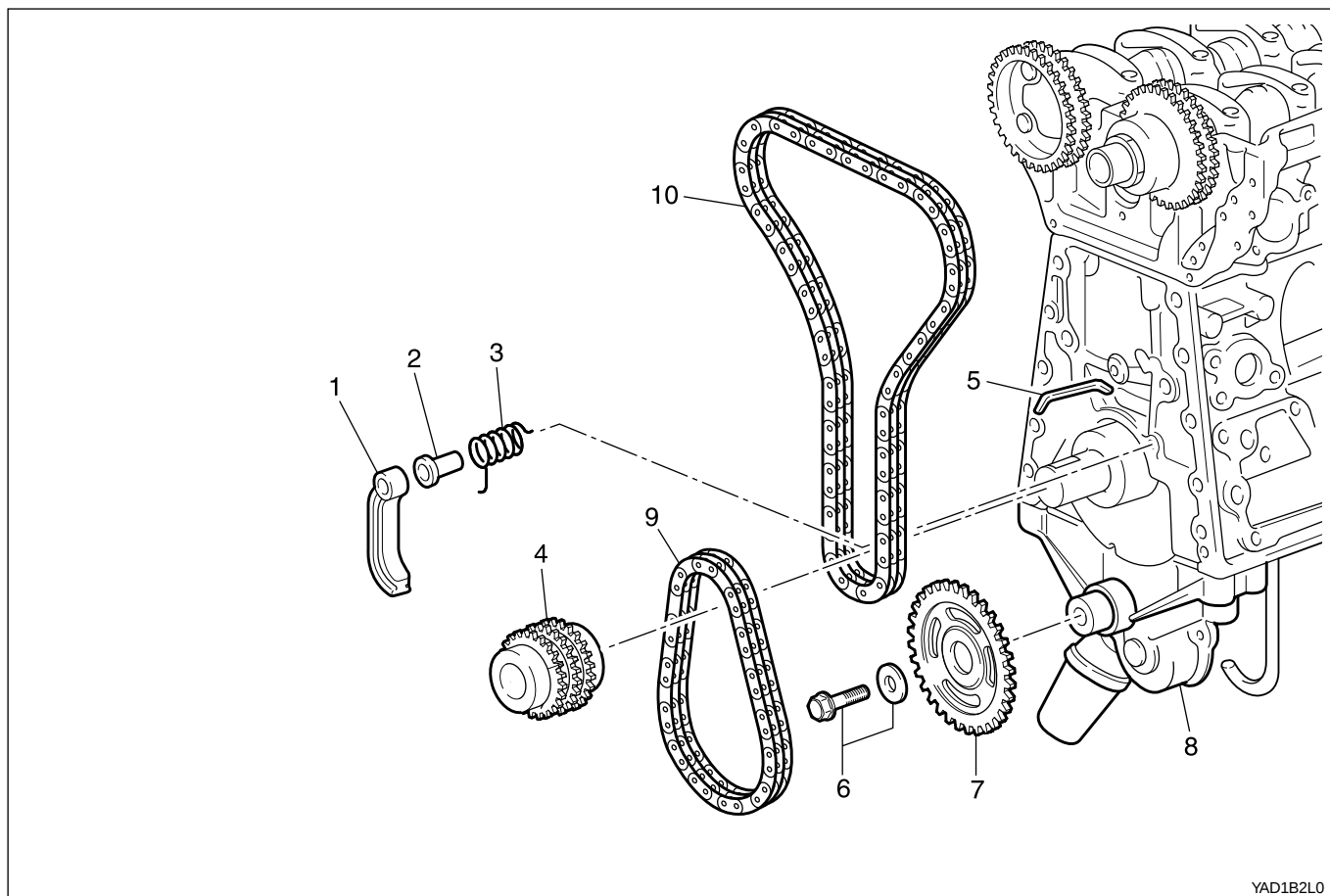
1. Put the assembly mark at the camshaft sprocket and the timing chain with the paint (arrow).
2. Remove the exhaust camshaft sprocket.
3. Remove the guide rail (1) from the guide rail pin (3).

Notice:

- Replace the plastic guide (2) if damaged.
 - Connect the plastic guide (2) and the guide rail (1) by aligning them accurately when installing.
4. Installation should follow the removal procedure in the reverse order.
 5. Check the camshaft timing position.

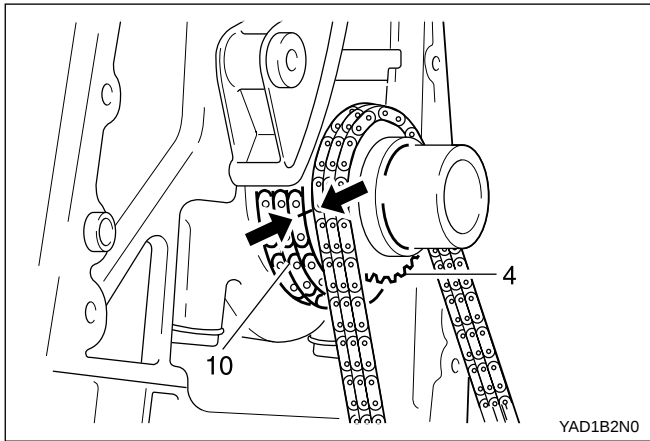
CRANKSHAFT SPROCKET

Preceding Work : Removal of oil pan
Removal of tensioning rail
Removal of crankcase guide rail



YAD1B2L0

- | | |
|----------------------------|------------------------------------|
| 1 Oil Pump Chain Tensioner | 6 Bolt (M8 x 20, 1 piece) / Washer |
| 2 Oil Pump Chain Bushing | 29-35 N•m (21-26 lb-ft) |
| 3 Oil Pump Chain Spring | 7 Oil Pump Sprocket |
| 4 Crankshaft Sprocket | 8 Oil Pump |
| 5 Key | 9 Oil Pump Roller Chain |
| | 10 Timing Chain |



Tools Required

615 589 01 33 00 Crankshaft Sprocket Puller

Removal & Installation Procedure

1. Put the assembly mark at the crankshaft sprocket (4) and the timing chain (10) with the paint (arrow).

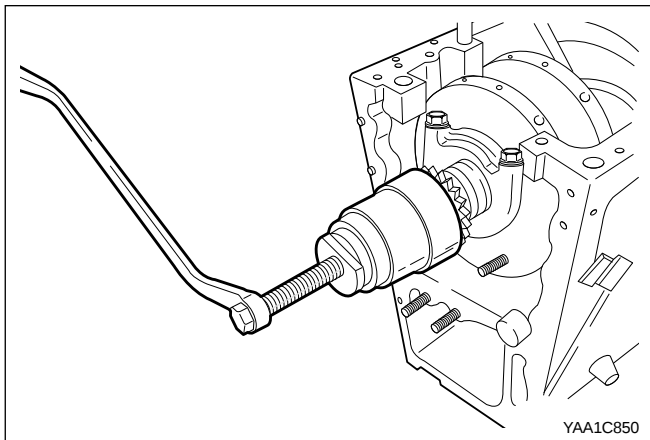
Notice: Align the assembly marks on crankshaft sprocket and timing chain. Also, align the assembly marks on camshaft sprocket and timing chain when installing.

2. Unscrew the bolt (6) and remove the oil pump sprocket (7) from the oil pump.

Installation Notice

Tightening Torque	29 - 35 N•m (21 - 26 lb-ft)
-------------------	--------------------------------

3. Remove the oil pump roller chain (9).
4. Remove the oil pump chain tensioner (1), oil pump chain bushing (2), and the oil pump chain spring (3).



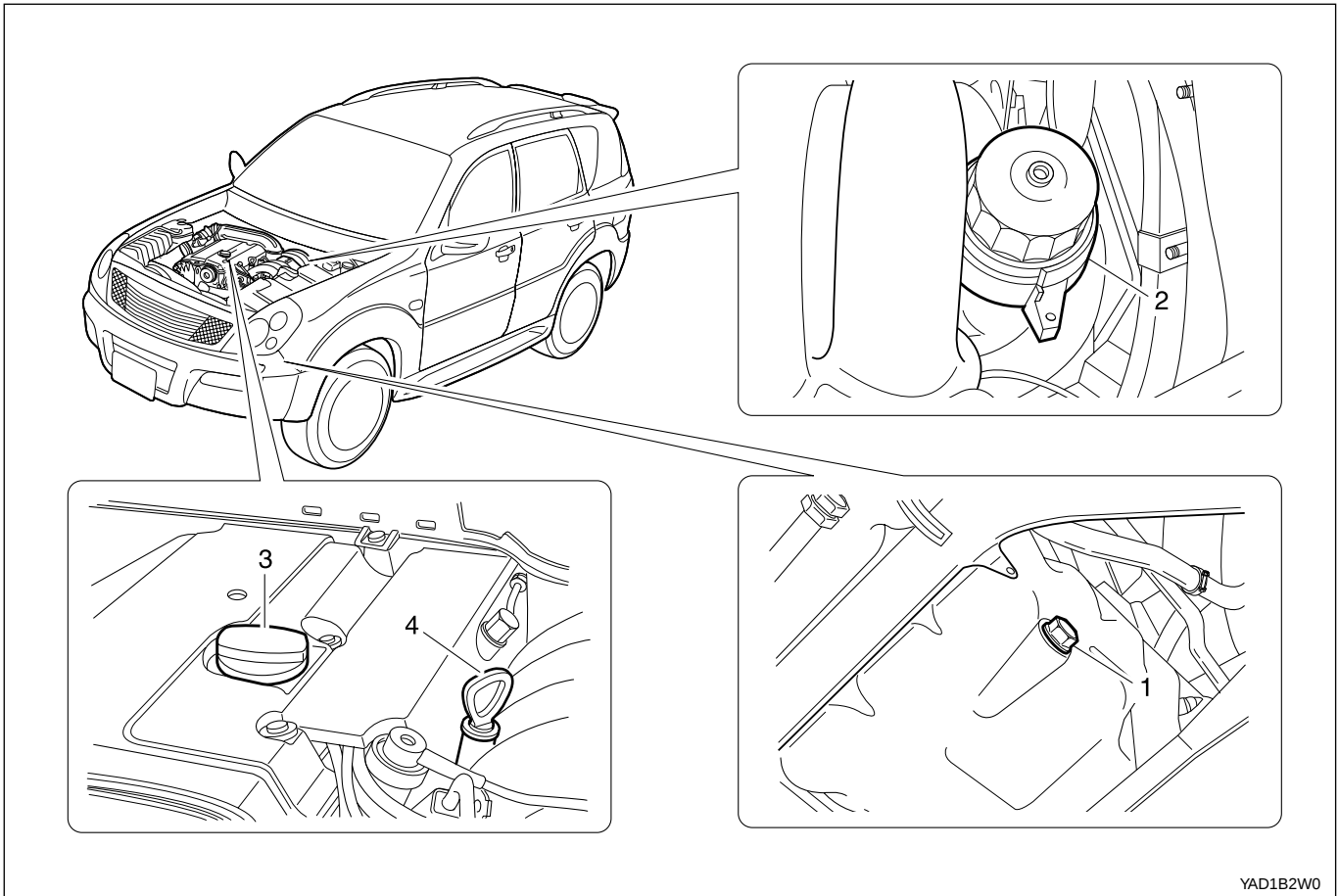
5. Remove the crankshaft sprocket (4) using the crankshaft sprocket puller 615 589 01 33 00.

Notice:

- Make sure not to lose the crankshaft pulley key (5) when removing.
 - Install the crankshaft sprocket (4) after warming it up.
6. Installation should follow the removal procedure in the reverse order.

LUBRICATION SYSTEM

ENGINE OIL SPECIFICATION



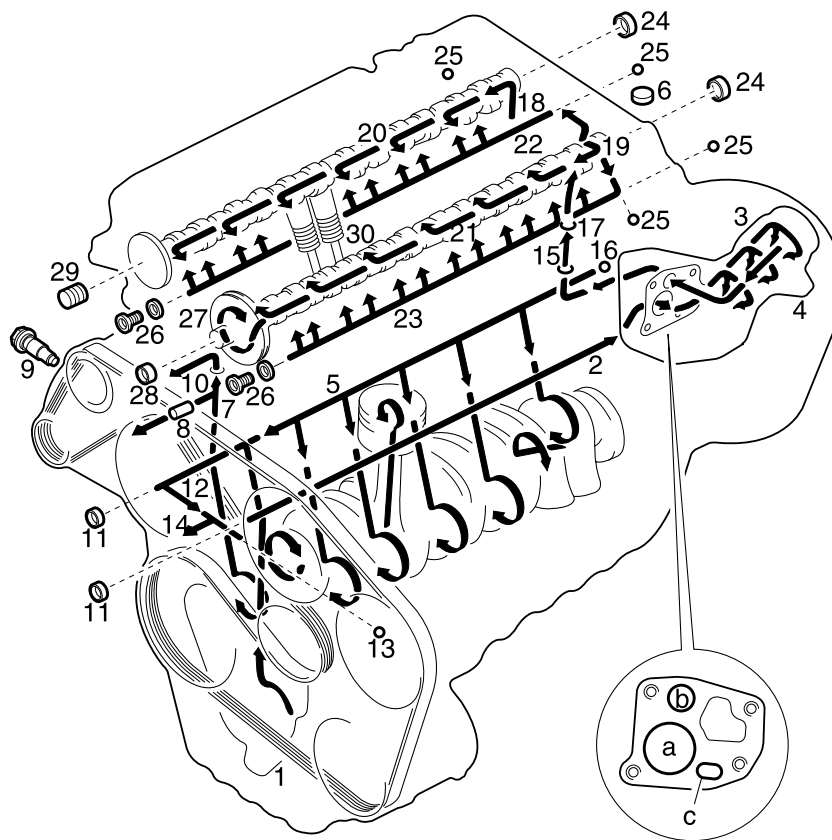
- 1 Drain Plug 25 N•m (18 lb-ft)
 2 Oil Filter

- 3 Engine Oil Filler Cap
 4 Dipstick Gauge

Specifications

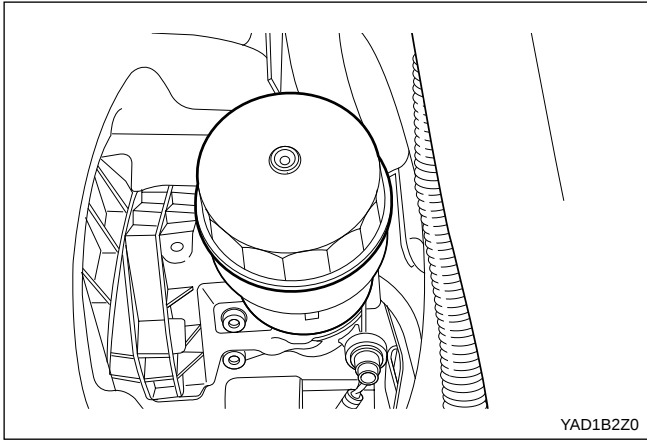
Application	Description
Capacity	Min : 6.7 L, Max : 8.2 L
Quality	• API SH or above grade
	• ACEA : A2 or A3
	• Approved oil by MB Sheet 229.1
Viscosity	• Approved oil by MB Sheet 224.1
Replacemant	• Initial at 1000-1500 km, Replace every 15000 km

OIL CIRCULATION



YAD1B2X0

- | | |
|---|--|
| 1 Oil Pump | 20 Oil Supply (To Exhaust Camshaft Bearing) |
| 2 Oil Gallery (to oil filter) | 21 Oil Supply (To Intake Camshaft Bearing) |
| 3 Oil Filter | 22 Oil Gallery (Oil Supply to Exhaust Valve Tappet) |
| 4 Oil Pressure Switch | 23 Oil Gallery (Oil Supply to Intake Valve Tappet) |
| 5 Main Oil Gallery | 24 Camshaft Closing Cover |
| 6 Cylinder Head Closing Cover | 25 Ball ($\phi 8$ mm) |
| 7 Oil Gallery (At Chain Tensioner) | 26 Screw Plug |
| 8 Oil Non-return Valve | 27 Camshaft Adjuster |
| 9 Chain Tensioner | 28 Front Closing Cover (Intake Camshaft) |
| 10 Vent (Chain Tensioner) | 29 Front Treaded Bushing (Exhaust Camshaft) |
| 11 Front Closing Cover ($\phi 17$ mm) | 30 Valve tappet |
| 12 Oil Gallery (Perpendicular to The Shaft) | |
| 13 Ball ($\phi 6$ mm) | |
| 14 Oil Spray Nozzle (Timing Chain) | a Oil Gallery (From Oil Pump to Oil Filter) |
| 15 Oil Gallery (At Cylinder Head) | b Main Oil Gallery |
| 16 Ball ($\phi 15$ mm) | c Oil Return Line (Oil Returns to the Oil Pan when Replacing the Filter Element) |
| 17 Oil Restriction Inner ($\phi 4$ mm) | |
| 18 Oil Supply (To Exhaust Camshaft) | |
| 19 Oil Supply (To Intake Camshaft) | |



ENGINE OIL AND OIL FILTER ELEMENT

Tools Required

103 589 02 09 00 Oil Filter Remover

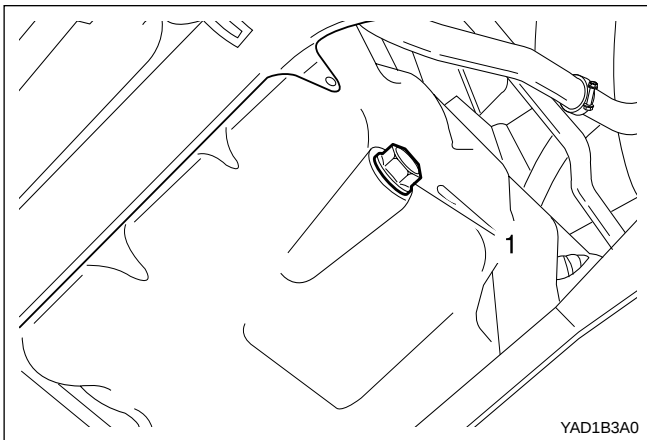
Replacement Procedure

1. Install the oil filter remover 103 589 02 09 00 on the oil filter cover.

Notice: Make the screw cover removable by tightening the bolt at the side of the oil filter remover 103 589 02 09 00.

2. Install the wrench to the upper bolt in the oil filter remover 103 589 02 09 00 and remove the oil cover by turning it.
3. Remove the oil filter element.

Notice: Work with a cloth under the vehicle when removing the oil filter element to not drain the oil.



4. Remove the drain plug (1) and drain the engine oil.

Notice: Leave the oil filler cap open to ease the engine oil discharge.

5. Tighten the engine oil drain plug after cleaning it.

Installation Notice

Tightening Torque	25 N•m (18 lb-ft)
-------------------	-------------------

Replace the seal washer with new one.

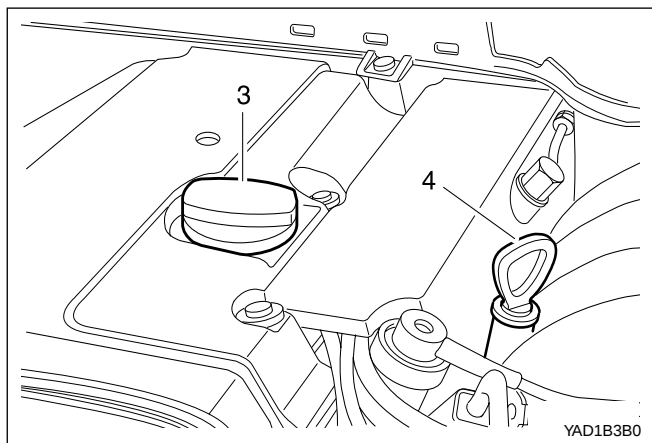
6. Replace the O-ring in the oil filter cover with new one.

Notice: Apply the engine oil to the O-ring.

7. Insert new oil filter element into the oil filter housing.
8. Temporarily tighten the oil filter cover. Install the oil filter remover 103 589 02 09 00, and then completely tighten it.

Installation Notice

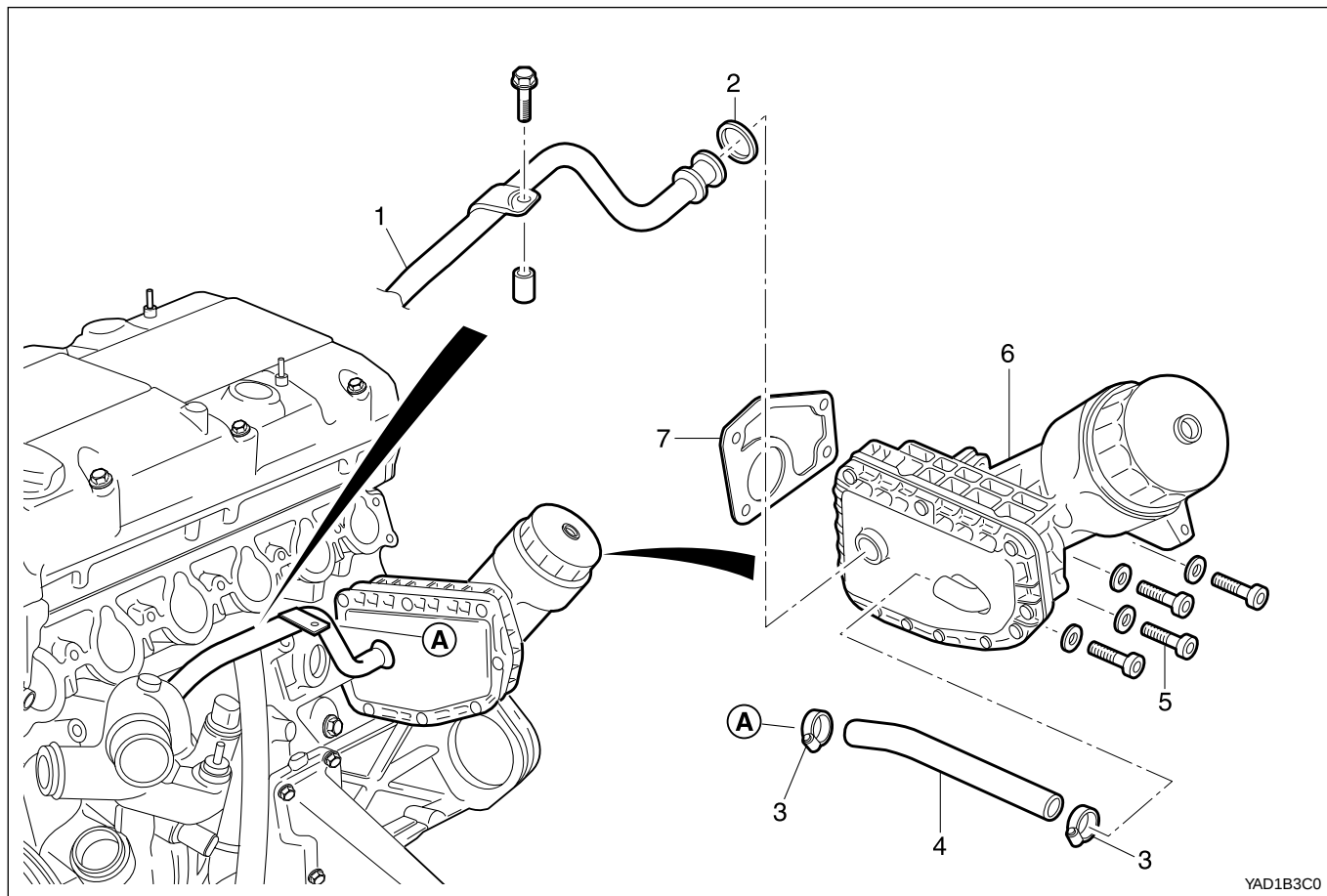
Tightening Torque	25 N•m (18 lb-ft)
-------------------	-------------------



9. Fill up engine oil through the engine oil filler opening (3).
10. Check for oil leaks at normal engine temperature after starting the engine.
11. Stop the engine and wait 5 minutes.
Check the oil level and fill up as specified if necessary.

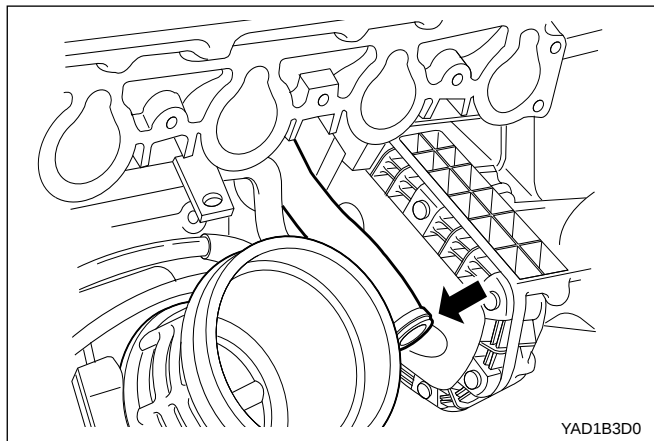
OIL FILTER

Preceding Work : Removal of starter motor
Removal of upper intake manifold



- 1 Coolant Line
- 2 O-ring Replace
- 3 Clip
- 4 Hose

- 5 Bolt..... 22.5-27.5 N•m (16.6-20.3 lb-ft)
- 6 Oil Filter
- 7 Gasket Replace



Removal & Installation Procedure

1. Drain the coolant from the crankcase.
2. Remove the each coolant line and hose.

3. Remove the oil filter bolt and then remove the oil filter.

Installation Notice

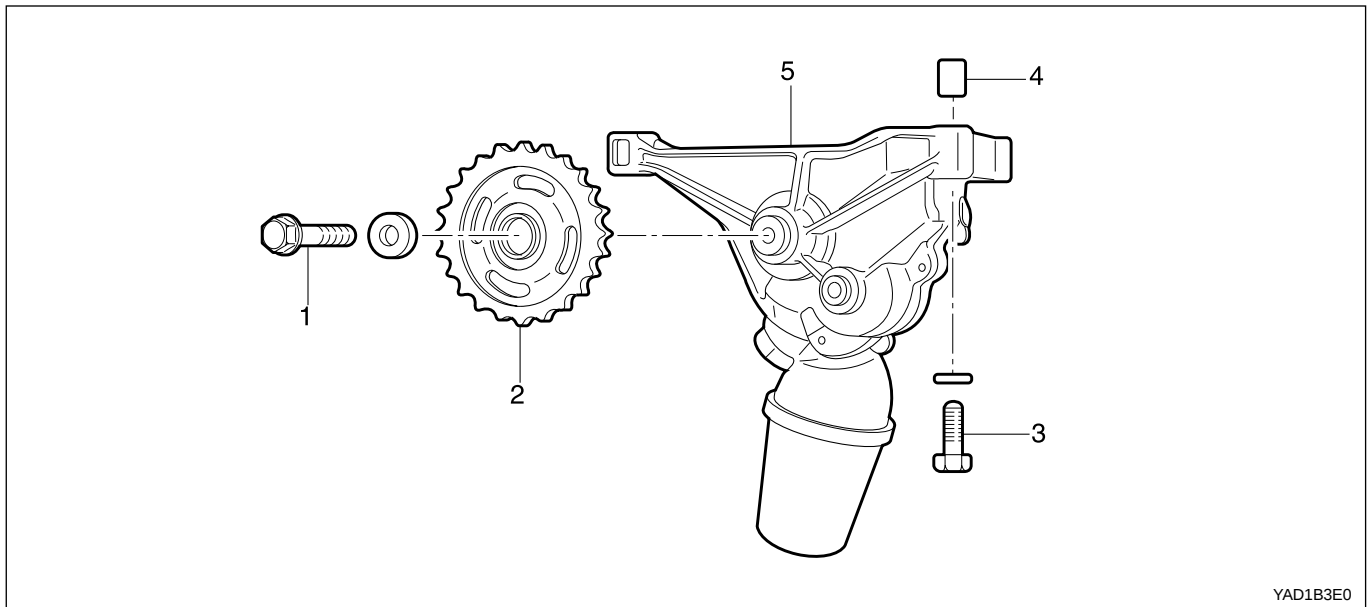
Tightening Torque	22.5 - 27.5 N•m (16.6 - 20.3 lb-ft)
-------------------	--

Replace the oil filter gasket.

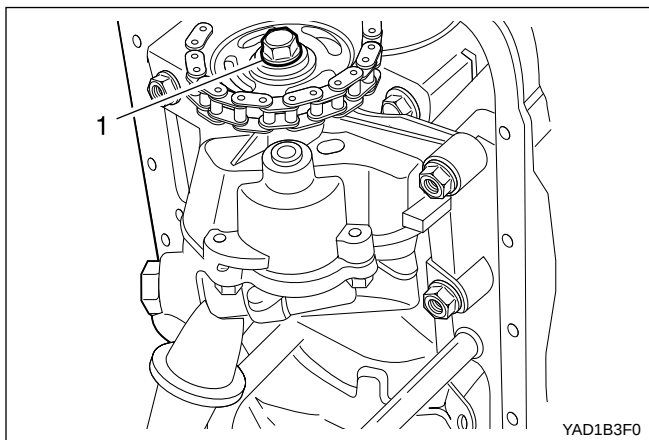
4. Installation should follow the removal procedure in the reverse order.
5. Check engine oil level.
6. Run the engine at idle and check the engine for leaks.

OIL PUMP

Preceding Work : Removal of oil pan



- | | |
|-------------------------------|--------------------------------------|
| 1 Bolt (M8 x 20, 1 piece) | 3 Bolt (M8 x 35, 3 pieces) |
| 29-35 N•m (21-26 lb-ft) | 22.5-27.5 N•m(16.6-20.3 lb-ft) |
| 2 Sprocket (Oil Pump Drive) | 4 Spring Pin |
| | 5 Oil Pump |



Removal & Installation Procedure

1. Remove the bolt (1) from the oil pump drive sprocket (2) and separate the gear and the oil pump drive chain.

Installation Notice

Tightening Torque	29 - 35 N•m (21 - 26 lb-ft)
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2. Unscrew the oil pump mounting bolts (3).

Installation Notice

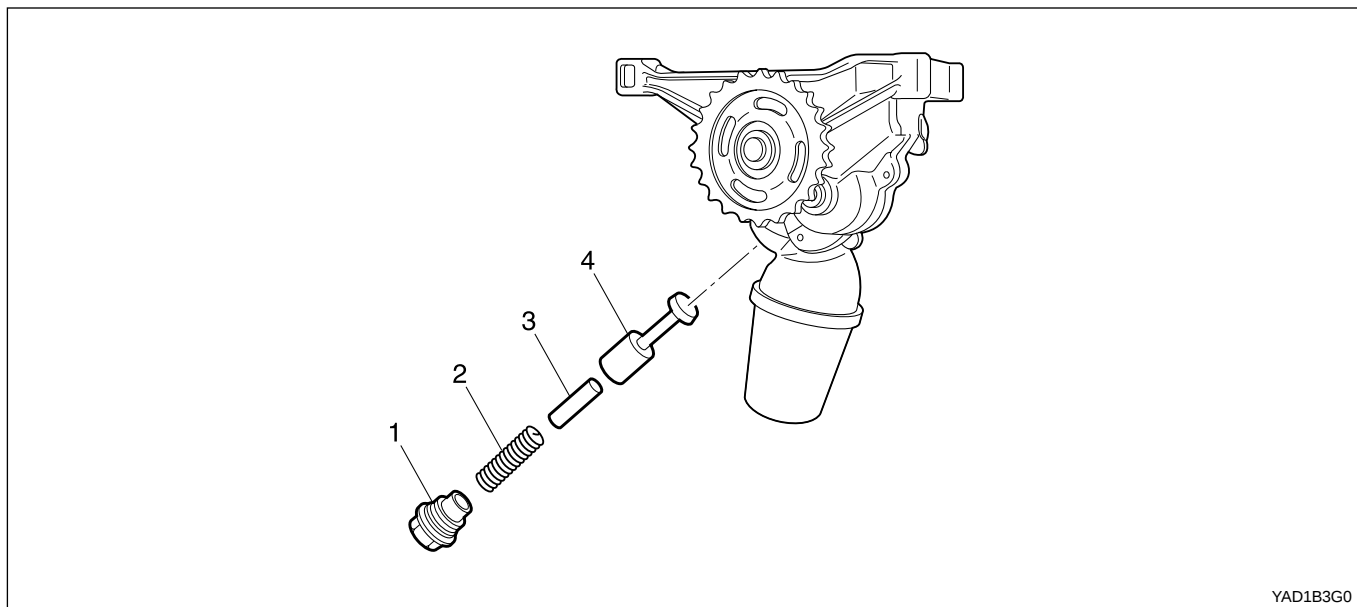
Tightening Torque	22.5 - 27.5 N•m (16.6 - 20.3 lb-ft)
-------------------	--

Tighten the baffle plate and the oil pump with the two bolts in right side first, and then tighten the other bolt.

3. Remove the oil pump and oil strainer assembly.
4. Replace the strainer in oil pump if necessary.
5. Installation should follow the removal procedure in the reverse order.

OIL PRESSURE RELIEF VALVE

Preceding Work : Removal of oil pan



- 1 Screw Plug 50 N•m (37 lb-ft)
2 Compression Spring

- 3 Guide Pin
4 Piston

Removal & Installation Procedure

1. Remove the screw plug (1).

Installation Notice

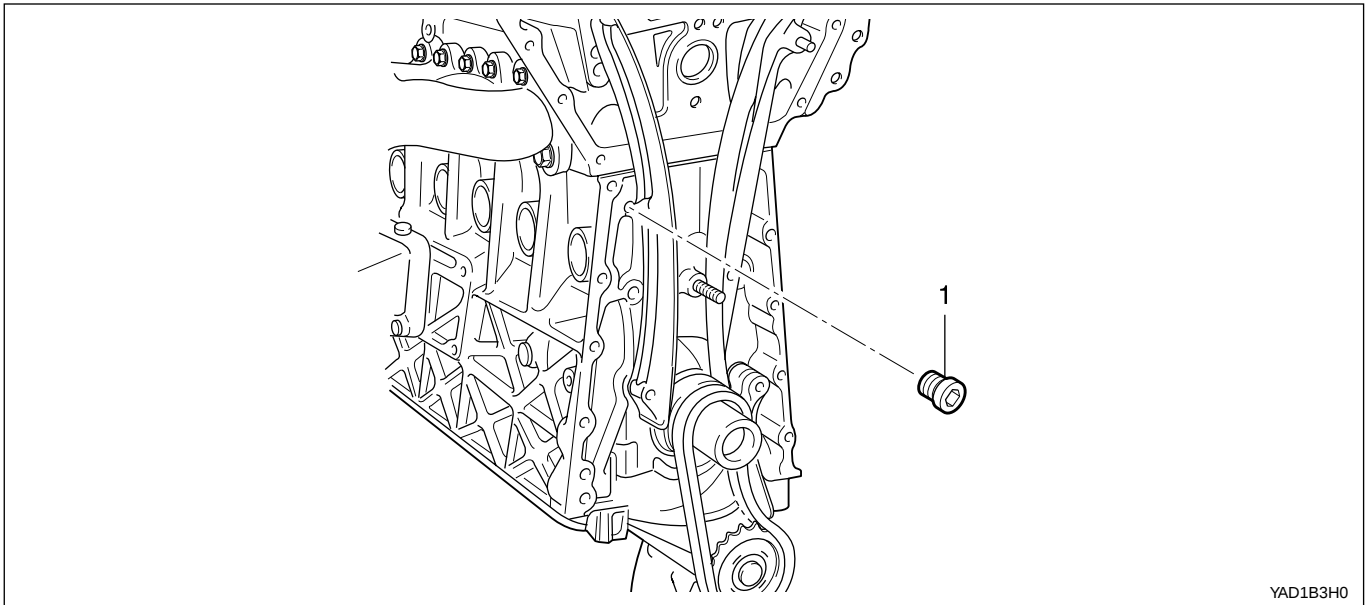
Tightening Torque	50 N•m (37 lb-ft)
-------------------	-------------------

2. Remove the spring (2), guide pin (3) and the piston (4).
3. Installation should follow the removal procedure in the reverse order.

Notice: Don't use the seal for the screw plug.

OIL NON-RETURN VALVE

Preceding Work : Removal of timing gear case cover

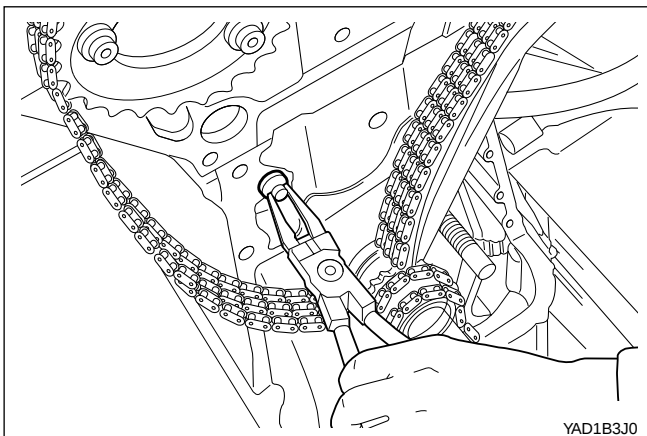


YAD1B3H0

1 Oil Non-return Valve

Functions

The non-return valve prevents the oil in the chain tensioner from drying up. In other words, it stops oil-returning in order to prevent the oil in the chain tensioner from getting dry. As a result, the chain tensioner can be activated with oil in itself.

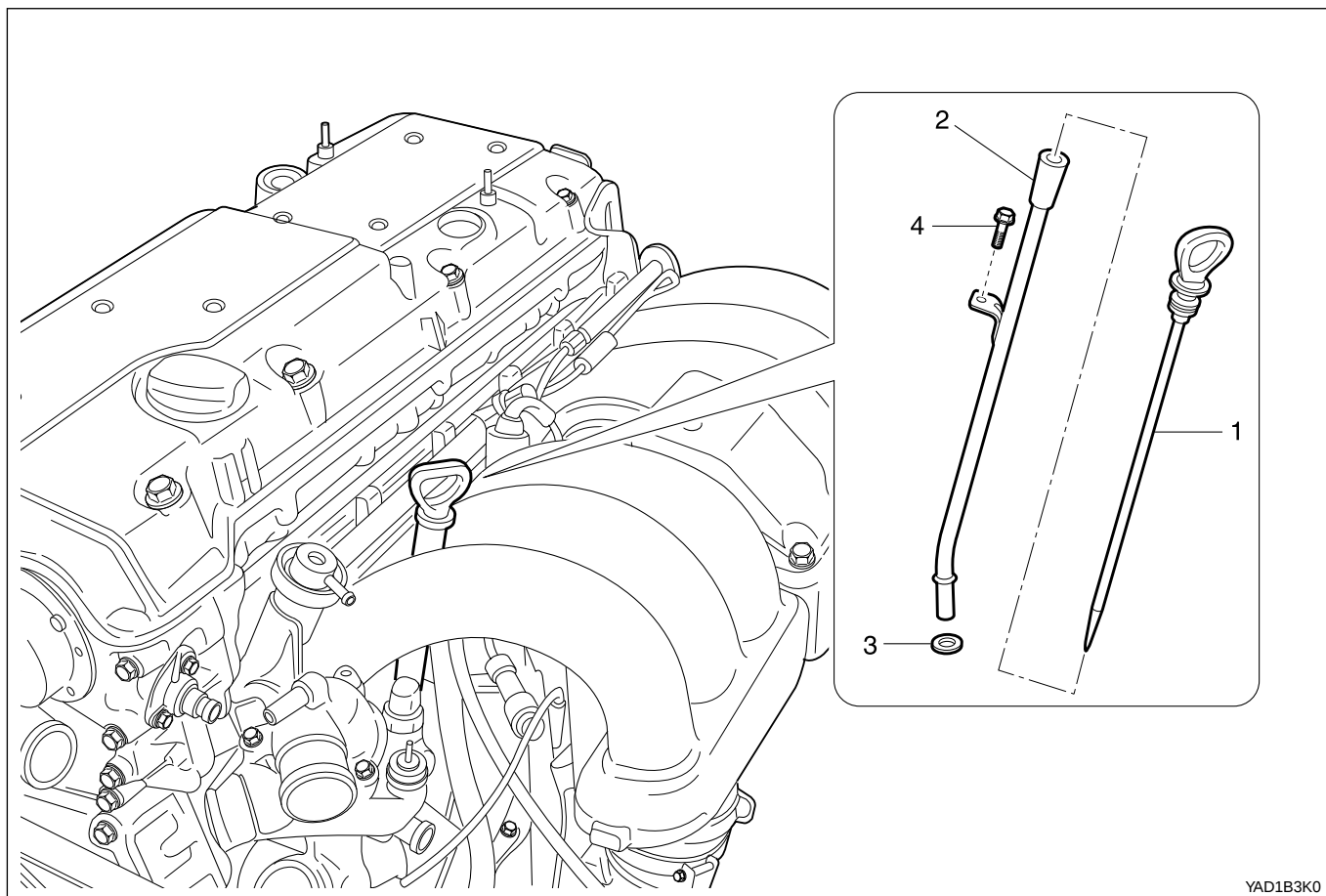


YAD1B3J0

Replacement Procedure

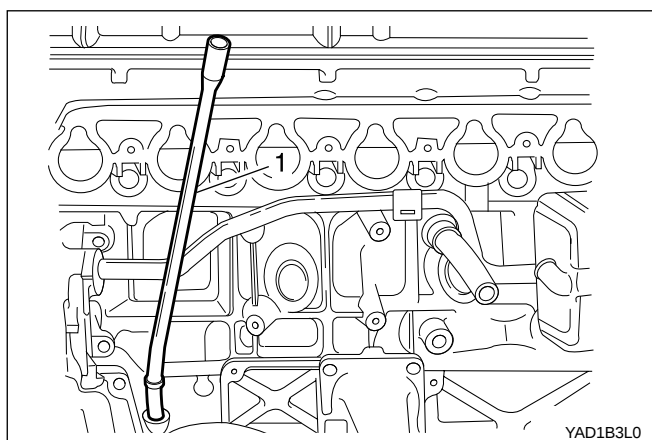
1. Remove the non-return valve using a pliers.
2. Insert new non-return valve with hand.

OIL DIPSTICK GUIDE TUBE



- 1 Oil Dipstick Level Gauge
- 2 Oil Dipstick Guide Tube

- 3 O-ring
- 4 Bolt (M6 x 12, 1 piece)9-11 N•m (80-97 lb-in)



Removal & Installation Procedure

1. Pull out the oil dipstick level gauge (1).
2. Remove the bolt (4) in the upper intake manifold and remove the oil dipstick guide tube.

Installation Notice

Tightening Torque

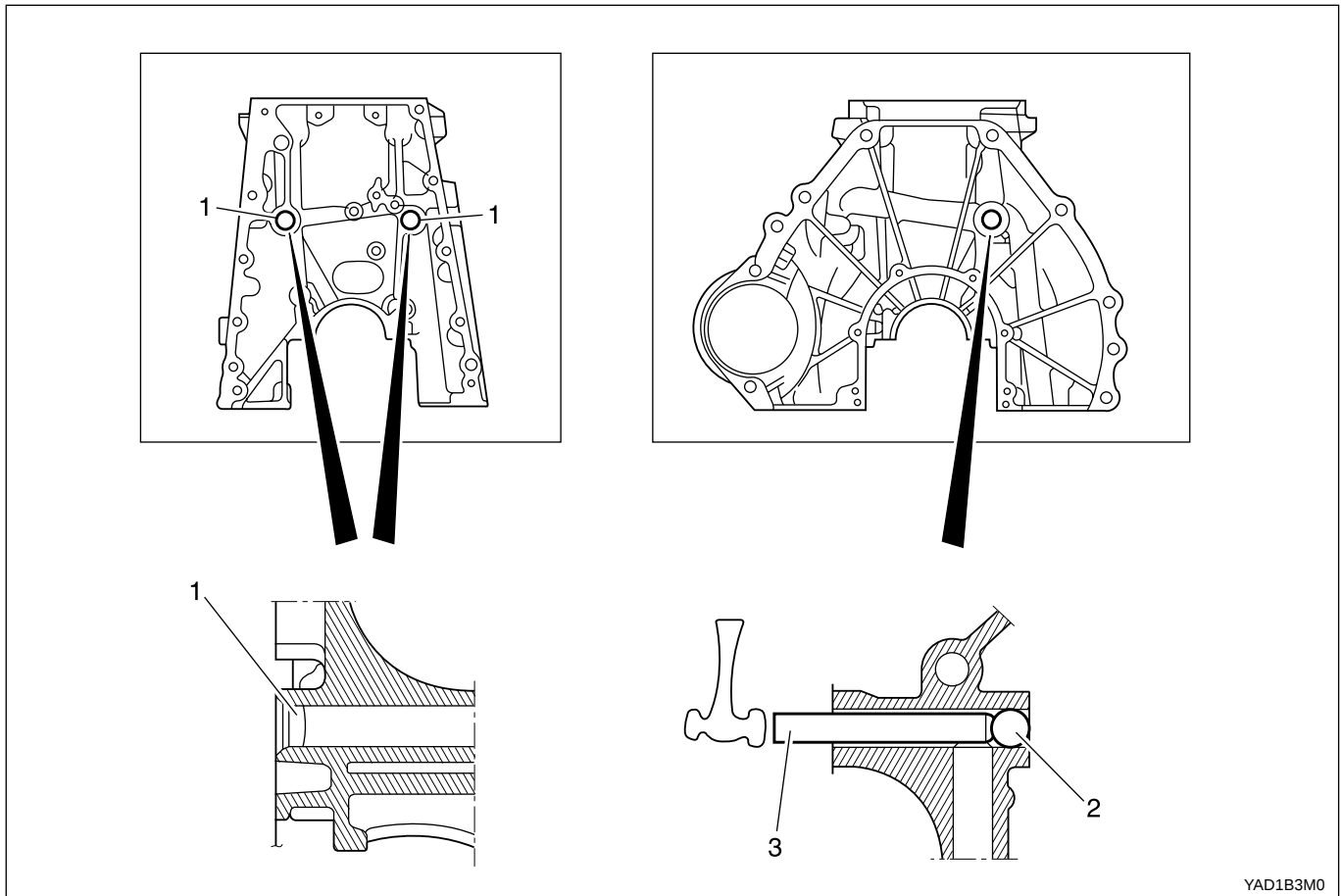
9 - 11 N•m
(80 - 97 lb-in)

3. Install new O-ring to the dipstick guide tube.
4. Installation should follow the removal procedure in the reverse order.
5. Check for leaks by starting the engine.

UNIT REPAIR

OIL GALLERY IN CRANKCASE

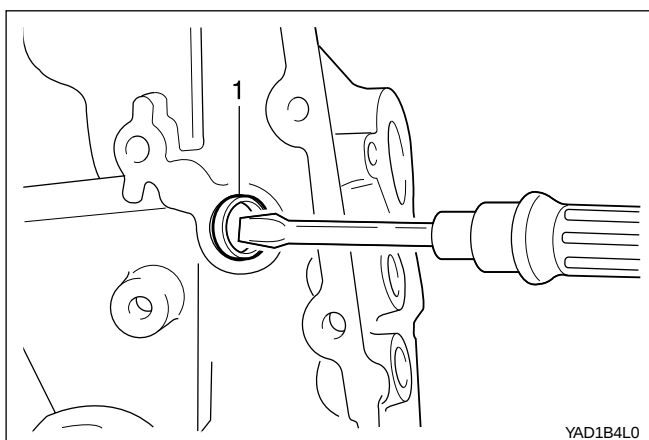
Preceding Work : Removal of crankshaft
Removal of oil spray nozzle



YAD1B3M0

- 1 Plug
2 Steel Ball

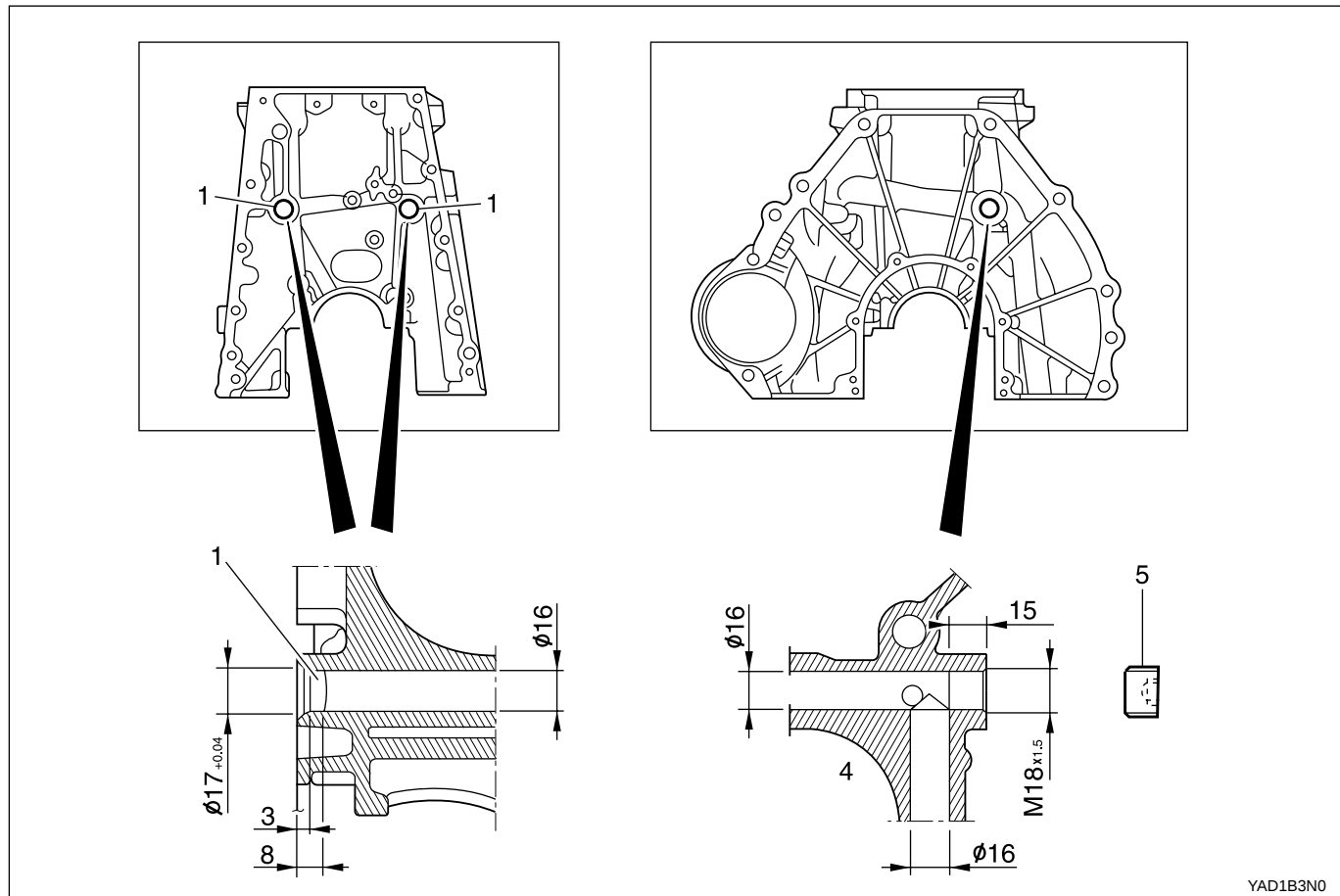
- 3 Round Bar $\phi 11 \times 750$ mm



YAD1B4L0

Cleaning Procedure

1. Remove the plug (1) with a screwdriver.
2. Using a round bar (3) and hammer, remove the steel ball (2).
3. Using the compressed air, blow into the oil galleries and clean it off.



YAD1B3N0

- 1 Plug Replace
2 -
3 -

- 4 Main Oil Gallery
5 Screw Plug

Tools Required

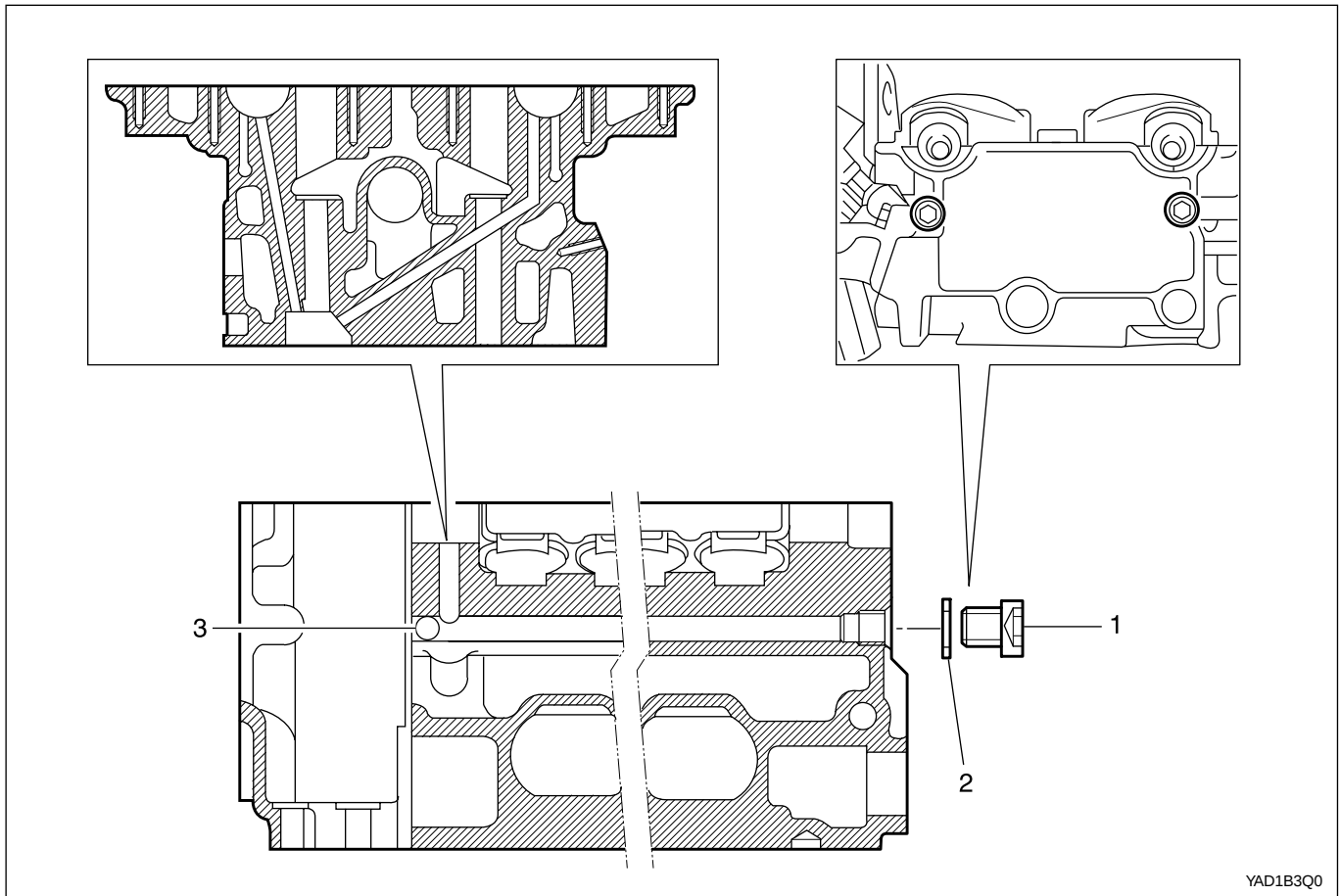
102 589 12 15 00 Drift

Sealing Procedure

1. Enlarge the end of main oil gallery (4) to be diameter of 16mm, depth of 15mm.
2. Using an M16 x 1.5 thread (tap), make the thread at the end of main oil gallery (4).
3. Thoroughly clean the oil gallery with compressed air and tighten the screw plug (M16 x 1.5) after applying sealing bond on it.
4. Apply Loctite 270 on new plug and tighten to the hole until the drift 102 589 12 15 00 is stopped after inserting new plug into the drift.

OIL GALLERY IN CYLINDER HEAD

Preceding Work : Removal of cylinder head
Removal of camshaft
Removal of tappet



YAD1B3Q0

- | | |
|--------------------------------------|---------------------|
| 1 Screw Plug 15 N•m (11 lb-ft) | 3 Steel Ball (φ8mm) |
| 2 Seal | |

Cleaning Procedure

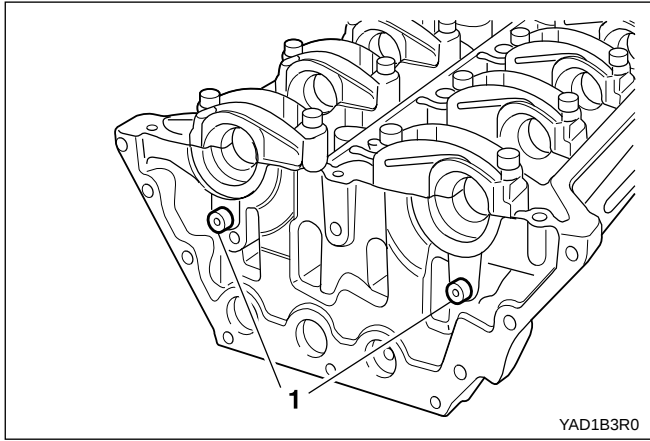
1. Remove the screw plug (1) and the seal (2).

Installation Notice

Tightening Torque	15 N•m (11 lb-ft)
-------------------	-------------------

Replace the seal with new one.

2. Clean the oil gallery using the compressed air.



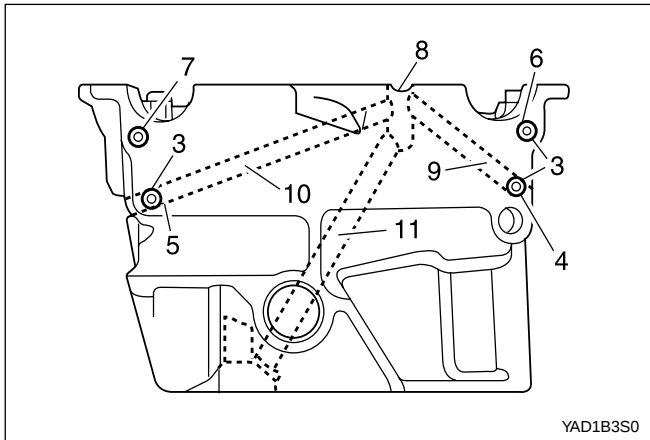
Sealing Procedure

1. Remove the screw plug (1) and the seal.

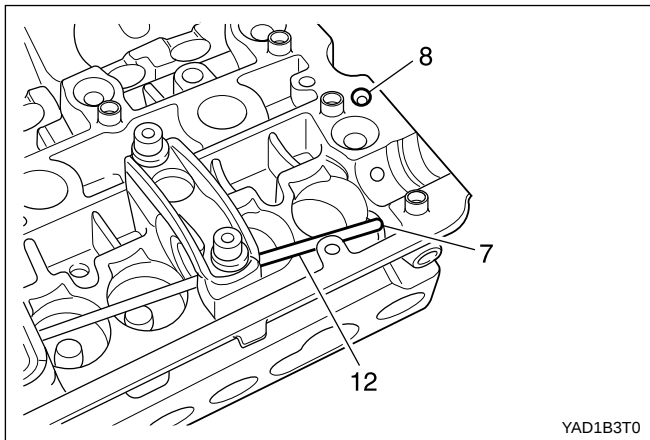
Installation Notice

Tightening Torque

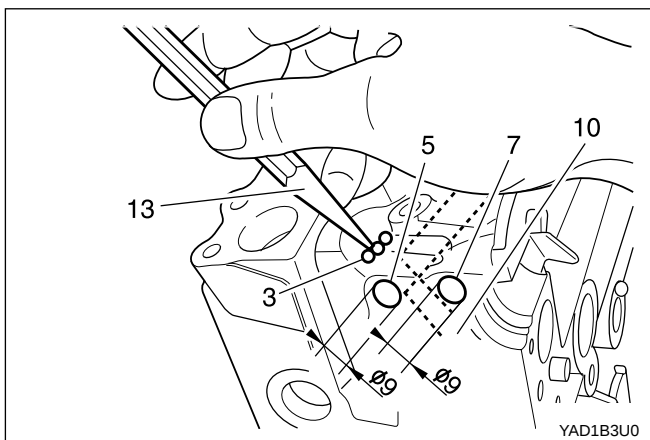
15 N•m (11 lb-ft)



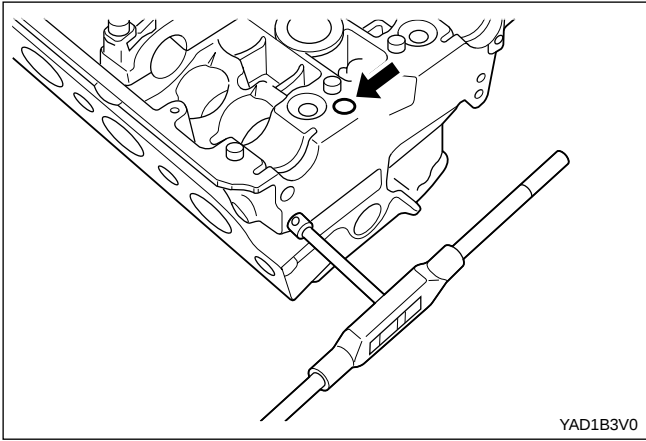
2. Remove the steel ball from the oil gallery (4), (5), (6) and (7) using the round bar (12, $\phi 6 \times 700$ mm).



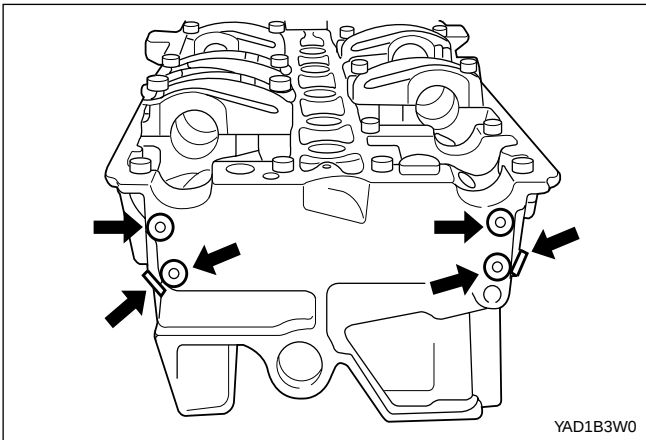
3. Remove the plug (8) using the screw driver.



4. Enlarge the oil gallery at the rear of the cylinder head to be diameter 9mm, depth 8mm.
5. Tap in the steel ball (3) from the side to the oil gallery using the punch (13).
6. Pull out the steel ball (3) using the round bar (12).
7. Enlarge the oil gallery to be diameter 9mm, depth 8 mm.



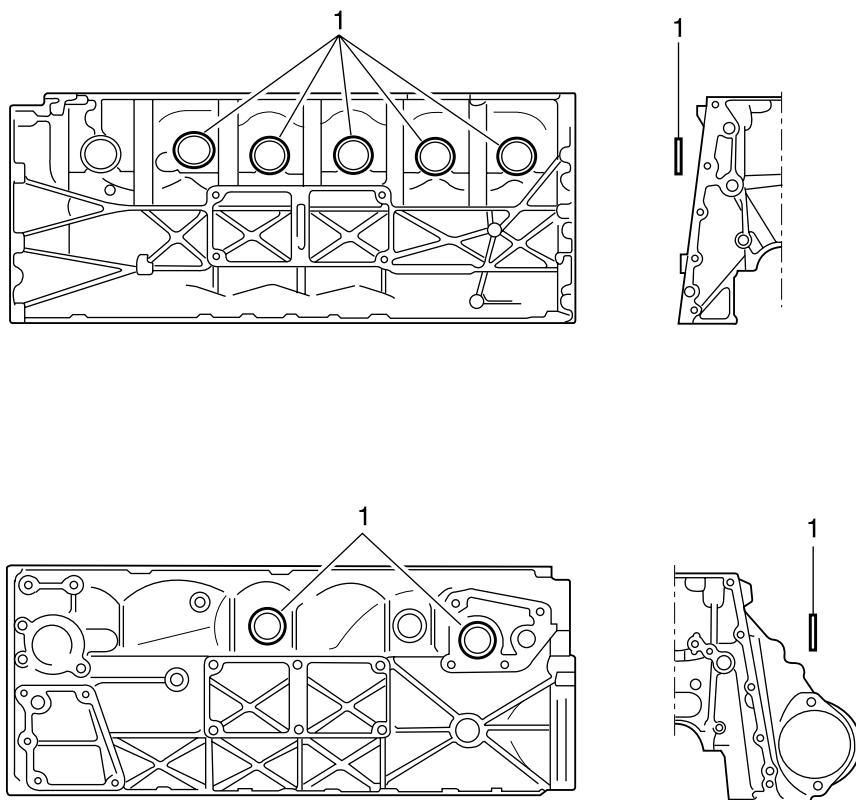
8. Make a screw hole at the oil gallery using M10 x 1 thread.
9. All the oil gallery should be cleaned with the compressed air.
10. Apply the Loctite 270 to new plug and press in using a suitable drift (arrow).



11. Tighten the screw plug with the seal (arrow).

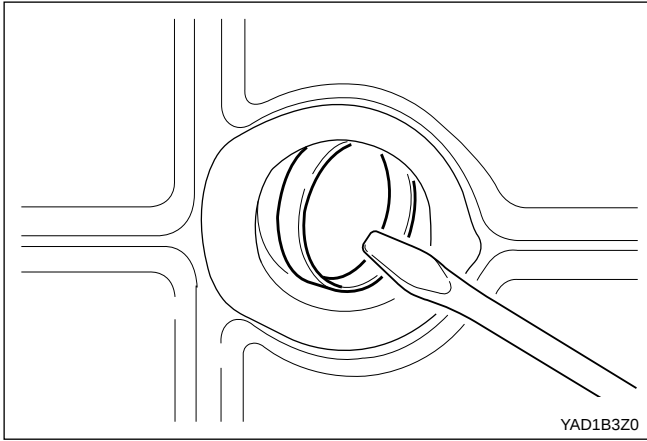
CORE PLUGS IN CRANKCASE

Preceding Work : Draining of the coolant



YAD1B3X0

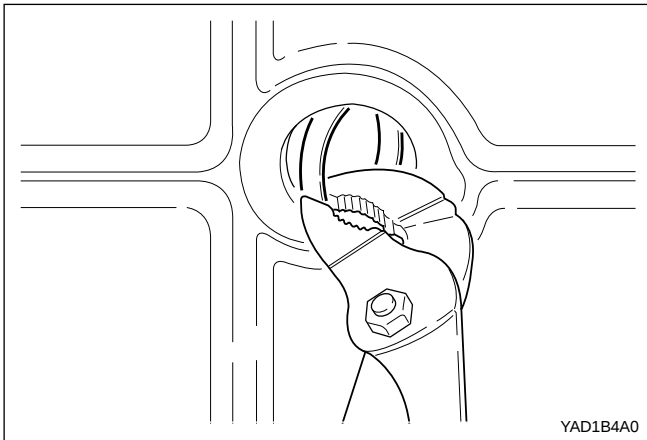
1 Core Plug Replace

**Tools Required**

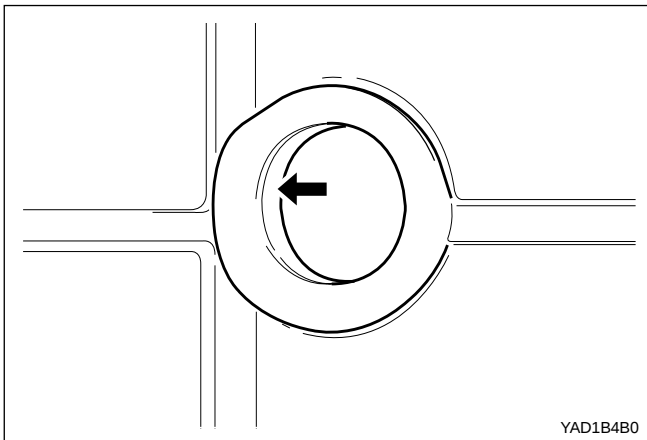
102 589 00 15 00 Drift

Replacement Procedure

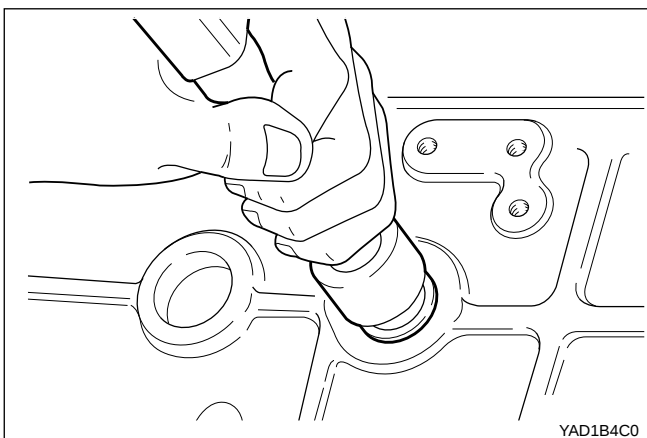
1. Remove the intake and exhaust manifolds.
2. Pull back the core plug until the end of one side comes out using the screw driver.



3. Pull out the plug carefully using a pliers.



4. Clean the sealing surface and apply Loctite 241.

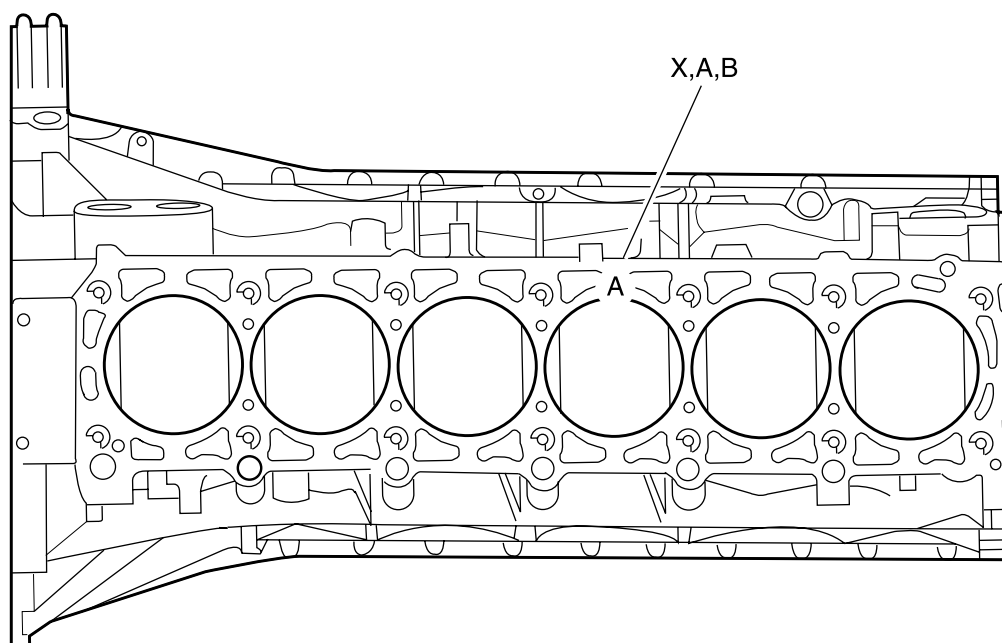


5. Press in new plug using a drift 102 589 00 15 00.

Notice: Wait for about 45 minutes before filling the coolant so that the Loctite hardens.

6. Warm up the engine and check the coolant for leaks.

CYLINDER BORE



YAD1B4D0

Group Code Letter and Cylinder Bore Size

Group Code Letter of Cylinder	Piston Type to be Used	Cylinder Bore Size (mm)
A	A or X	$\phi 89.900 - \phi 90.906$
X	A, X or B	$\phi 89.906 - \phi 89.912$
B	X or B	$\phi 89.912 - \phi 89.918$
X + 5	X + 5	$\phi 89.950 - \phi 89.968$
X + 10	X + 10	$\phi 90.000 - \phi 90.018$

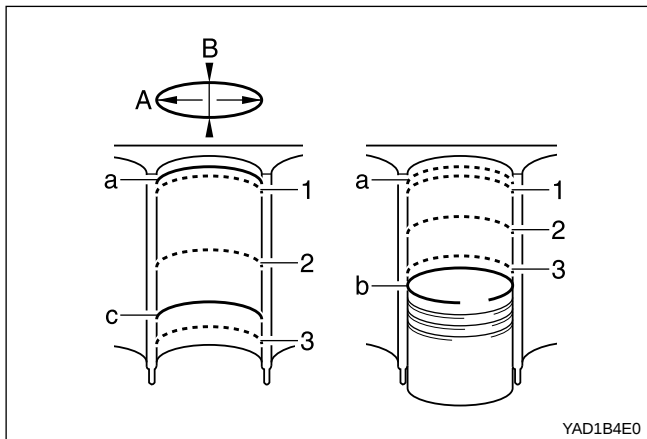
Repair Size

Type	Group Code Letter ¹⁾	Cylinder Bore Size (mm)
Standard Size $\phi 89.9$	A	$\phi 89.900 - \phi 90.906$
	X	$\phi 89.906 - \phi 89.912$
	B	$\phi 89.912 - \phi 89.918$
1st Repair Size (Standard Size + 0.25)	A	$\phi 90.150 - \phi 90.156$
	X	$\phi 89.156 - \phi 90.162$
	B	$\phi 90.162 - \phi 90.168$
2nd Repair Size (Standard Size + 0.5)	A	$\phi 90.400 - \phi 90.406$
	X	$\phi 90.406 - \phi 90.412$
	B	$\phi 90.412 - \phi 90.418$

¹⁾ The group code letters are carved on the surface of the piston crown and in the mating surface of the crankcase.

Service Data Standard

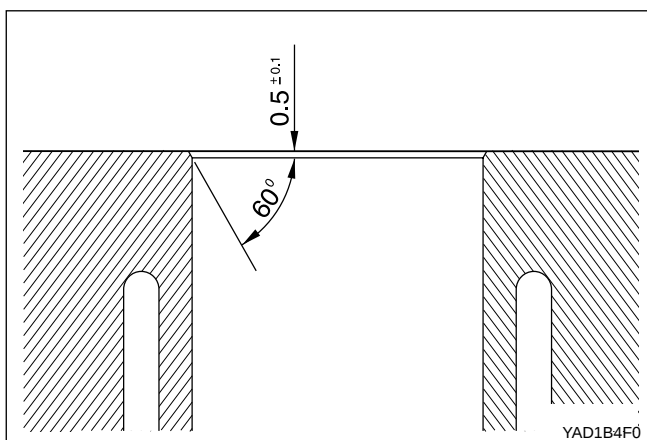
Wear Limit in Longitudinal and Transverse Direction		0.1 mm
Permissible Deviation of Cylinder Out-of-round	When new	0.007 mm
	Wear limit	0.05 mm
Permissible Deviation of Rectangular Cylinder Height (Except Chamfered Area)		0.05 mm
Basic Peak-to-valley Height After Final Honing and Brushing		0.003 - 0.006 mm
Chamfer Angle		60°
Honing Angle		50° ± 10°



Measurement of Cylinder Bore

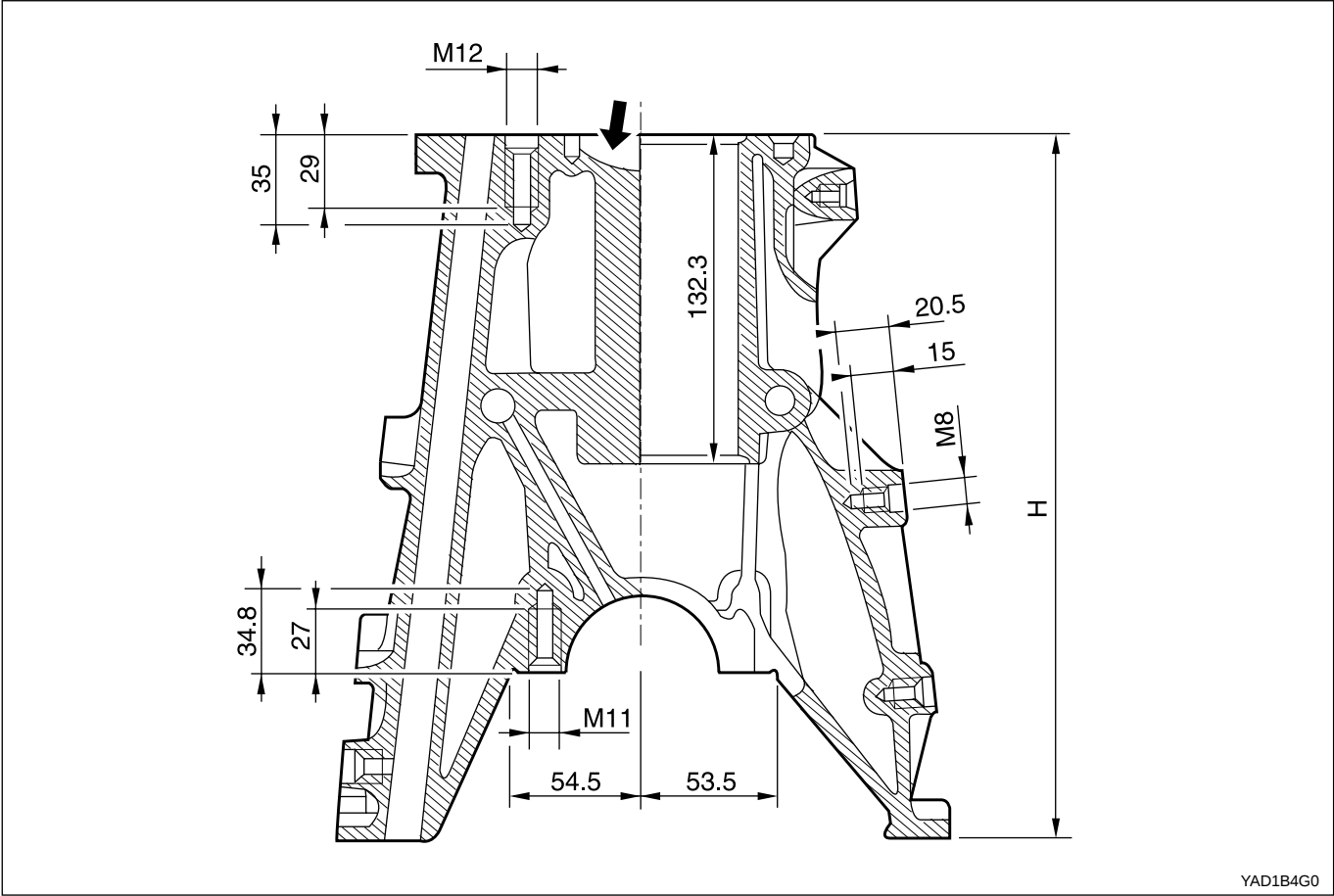
1. Clean the cylinder wall.
2. Using a internal diameter gauge, measure the bore size in axial and transverse direction at three points (1, 2, 3).

- 1,2,3. Measuring Points
- A. Axial Direction
 - B. Transverse Direction
 - a. Location of the No.1 Piston Ring at TDC
 - b. Location of the Piston BDC
 - c. Location of the Oil Ring at BDC



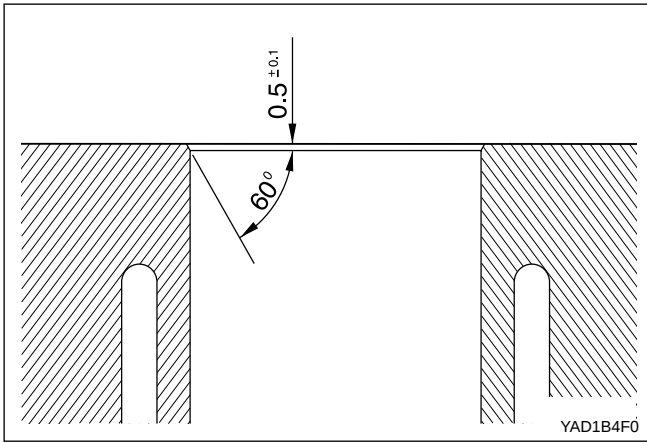
Chamfer Angle

CRANKCASE MATING SURFACE



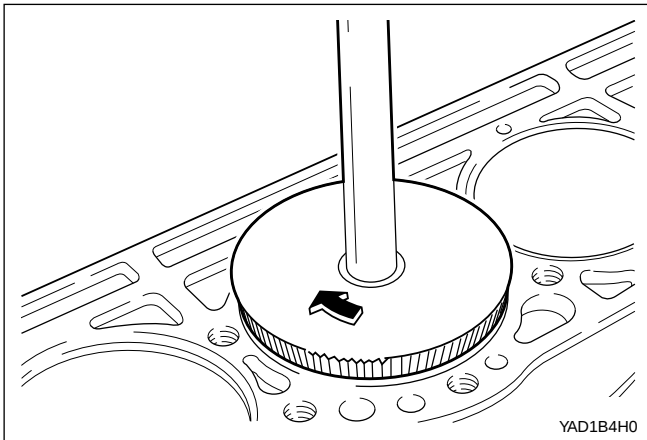
Service Data Standard

Height of The Crankcase “H” (When new)		282.25 - 282.35 mm
Minimum Height After Milling		281.95 mm
Flatness	Crankcase Upper Mating Surface	0.03 mm
	Crankcase Lower Mating Surface	0.04 mm
Permissible Deviation of Parallelism of The Upper to Lower Mating Surface	Axial Direction	0.1 mm
	Transverse Direction	0.05 mm
Peak-to-valley Height	Crankcase Upper Mating Surface	0.005 - 0.020 mm
	Crankcase Lower Mating Surface	0.025 mm



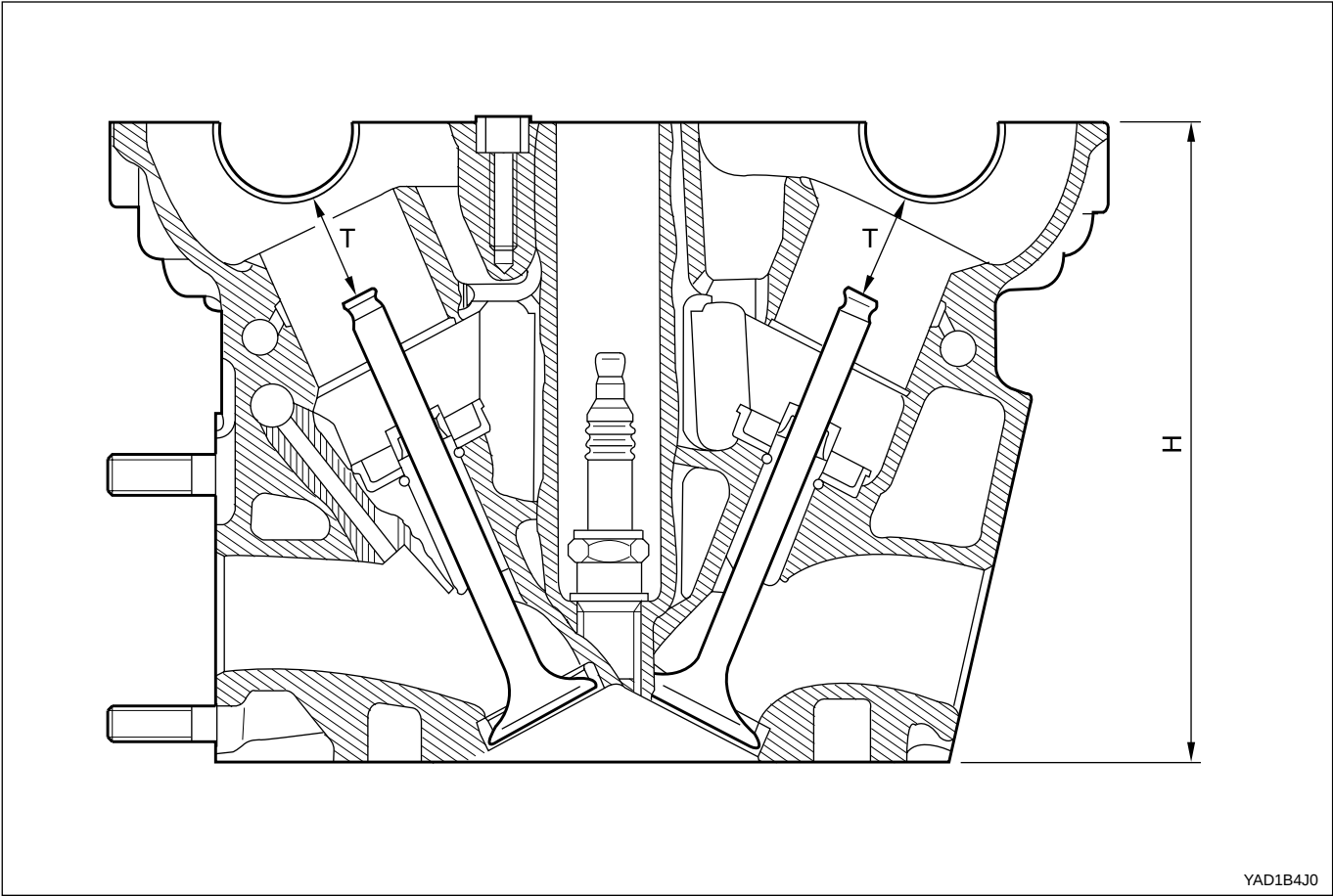
Chamfering Procedure

1. Chamfer angle : 60°
2. Polish the lower chamfered area evenly with a grinder after finishing the chamfering with a suitable tool (e.g., hand milling cutter).



CYLINDER HEAD MATING SURFACE

Preceding Work : Removal of valves



Service Data Standard

Overall Height of Cylinder Head			135.9 - 136.0 mm
Minimum Height After Machining			135.5 mm
Flatness	Axial Direction		0.08 mm
	Transverse Direction		0.0 mm
Distance 'T' (Between Camshaft Bearing and Valve Stem)	Standard Size	Intake	24.21 - 24.75 mm
		Exhaust	22.21 - 22.75 mm
	Repair Size	Intake	23.96 - 24.51 mm
		Exhaust	21.96 - 22.51 mm

Notice: Do not exceed 0.4mm for the milling of the mating surface of crankcase and cylinder head.

Measurement of Mating Surface

1. Measure the height (H) of the cylinder head (refer to *Service data standard*).
2. Check the mating surface of the cylinder head.
3. Mill the sharp edge of the combustion chamber.
4. Re-measure the height (H) of the cylinder head.
5. Seal the intake and exhaust valves.
6. Measure the dimension (T) between the camshaft bearing and the valve system (refer to *Service data standard*).
7. Mill the cylinder head valve seat (refer to *Service data standard*).

Universal Tool

Surface Grinding Machine	Sceledum, Type RTY Roaro Schio/Italy
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SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

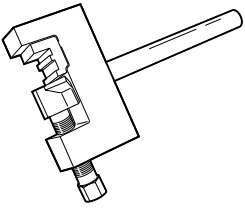
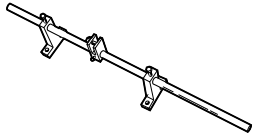
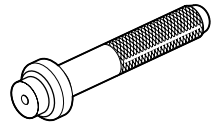
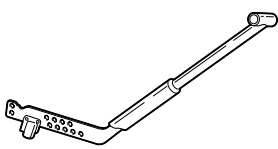
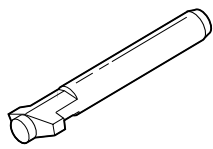
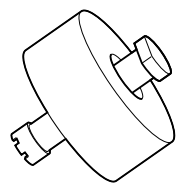
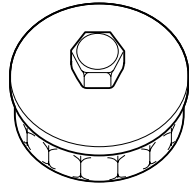
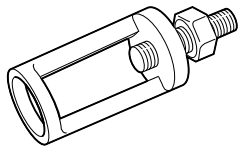
Application		N•m	Lb-Ft	Lb-In
A/C Bracket Bolt		22.5 - 27.5	16.6 - 20.3	-
Armature Bolt in Camshaft Actuator		35	26	-
Belt Tensioning Pulley Nut		40.5 - 49.5	29.9 - 36.5	-
Camshaft Actuator Bolt		9 - 11	-	80 - 97
Camshaft Adjuster Mounting Nut		60 - 70	44 - 52	-
Camshaft Bearing Cap Bolt		22.5 - 27.5	16.6 - 20.3	-
Chain Tensioner Assembly		72 - 88	53 - 65	-
Chain Tensioner Screw Plug		40	30	-
Connecting Rod Bearing Cap Bolt		40 + 5 90° + 10°	30 + 3.7 90° + 10°	-
Cooling Fan Bracket Bolt		22.5 - 27.5	16.6 - 20.3	-
Crankshaft Bearing Cap Bolt		50 - 60 90° + 5°	37 - 44 90° + 5°	-
Crankshaft Sealing Rear Cover Mounting Bolt		9 - 11	-	80 - 97
Cylinder Block Drain Plug		30	22	-
Cylinder Head Bolt		55 + 90° + 90°	41 + 90° + 90°	-
Cylinder Head Cover Bolt		9 - 11	-	80 - 97
Cylinder Head Front Cover Bolt		22.5 - 27.5	16.6 - 20.3	-
Engine Mounting Bracket Nut		70	52	-
Exhaust Camshaft Sprocker Bolt		18 - 22 90° ± 5°	13 - 16 90° ± 5°	-
Exhaust Manifold and Pipe		30	22	-
Flywheel Mounting Bolt		45 + 5 90° + 10°	33 + 3.7 90° + 10°	-
Fuel Feed and Return Hose to Fuel Rail		21 - 25	15 - 18	-
Generator Carrier Bolt		25	18	-
Intake Air Duct Nut		9 - 11	-	80 - 97
Intake Flange Shaft Bolt		18 - 22 90° ± 5°	13 - 16 90° ± 5°	-
Lower Engine Mounting Nut		38	28	-
Oil Dipstick Guide Tube Bolt		9 - 11	-	80 - 97
Oil Drain Plug		22.5 - 27.5	16.6 - 20.3	-
Oil Filter Bolt		22.5 - 27.5	16.6 - 20.3	-
Oil Filter Cover		25	18	-
Oil Gallery Screw Plug in Cylinder Head		15	11	-
Oil Pan Bolt	M10	40	30	-
	M8	22.5 - 27.5	16.6 - 20.3	-
	M6	9 - 11	-	80 - 97

FASTENER TIGHTENING SPECIFICATIONS (Cont'd)

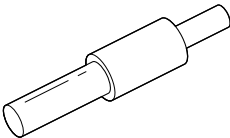
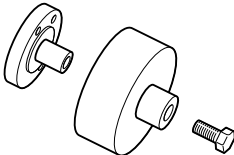
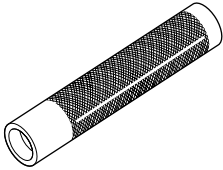
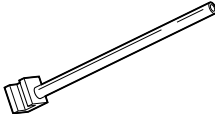
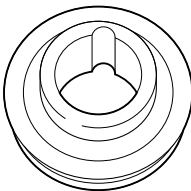
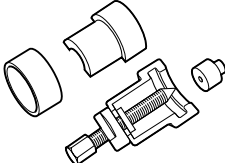
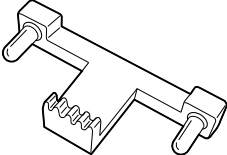
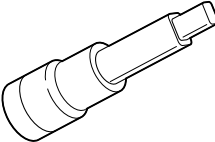
Application		N•m	Lb-Ft	Lb-In
Oil Pressure Relief Valve Screw Plug		50	37	-
Oil Pump Drive Sprocket Bolt		29 - 35	21 - 26	-
Oil Pump Mounting Bolt		22.5 - 27.5	16.6 - 20.3	-
Oil Pump Sprocket Bolt		29 - 35	21 - 26	-
Spark Plug Cover Bolt		9 - 11	-	80 - 97
Steering Pump Bolt		22.5 - 27.5	16.6 - 20.3	-
Tensioning Device Bolt		26 - 32	19 - 24	-
Timing Gear Case Cover Bolt	M8	22.5 - 27.5	16.6 - 20.3	-
	M6	9 - 11	-	80 - 97
Torque Converter Mounting Bolt		42	31	-
Transmission Mounting Nut		54 - 68	40 - 50	-
Under Cover		28 - 47	21 - 35	-
Upper Engine Mounting Nut		70	52	-
Vibration Damper Center Bolt		180 - 220 90° + 10°	133 - 162 90° + 10°	-
Water Pump Pulley Bolt		22.5 - 27.5	16.6 - 20.3	-

SPECIAL TOOLS AND EQUIPMENT

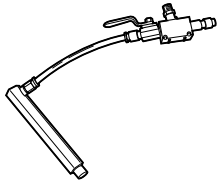
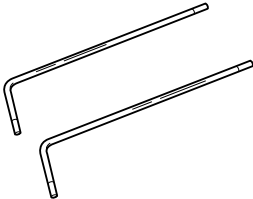
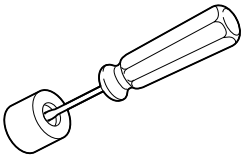
SPECIAL TOOLS TABLE

 YAD1B1W0	000 589 58 43 00 Chain Assembly	 YAD1B0W0	111 589 01 59 00 Supporting Bar
 YAD1B3Y0	102 589 00 15 00 Drift	 YAD1B0X0	111 589 18 61 00 Lever Pusher
 YAD1B3P0	102 589 12 15 00 Drift	 YAD1B580	111 589 20 33 00 Sliding Hammer
 YAD1B2Y0	103 589 02 09 00 Oil Filter Remover	 YAD1B0Y0	111 589 25 63 00 Thrust Piece

SPECIAL TOOLS TABLE (Cont'd)

 YAD1B570	116 589 01 34 00 Threaded Pin	 YAD1B730	601 589 03 43 00 Crankshaft Rear Seal Installer
 YAD1B1L0	119 589 00 43 00 Drift	 YAD1B4K0	603 589 00 40 00 Fan Clutch Holder
 YAD1B790	601 589 03 14 00 Crankshaft Front Seal Installer	 YAD1B2M0	615 589 01 33 00 Crankshaft Sprocket Puller
 YAD1B720	602 589 00 40 00 Engine Lock	 YAD1B560	617 589 00 10 00 AllenWrench Socket

SPECIAL TOOLS TABLE (Cont'd)

 YAD1B0Z0	DW110-090 Connecting Hose	 YAD1B0K0	DW110-120 Holding Pin
 YAD1B1A0	DW110-100 Valve Tappet Remover		