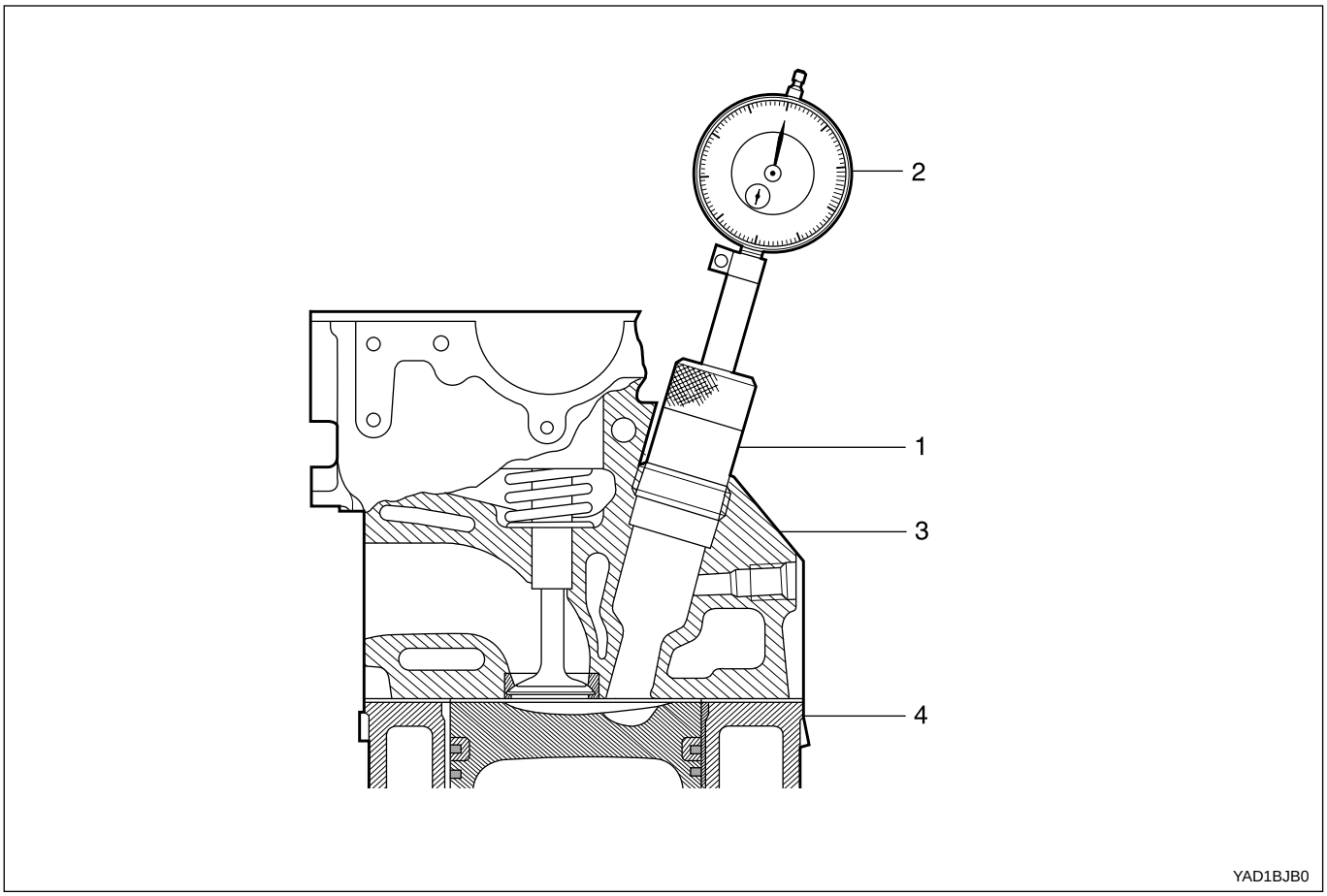
# TDC (TDC SENSOR BRACKET) SETTING

Preceding Work: Removal of No.1 cylinder prechamber



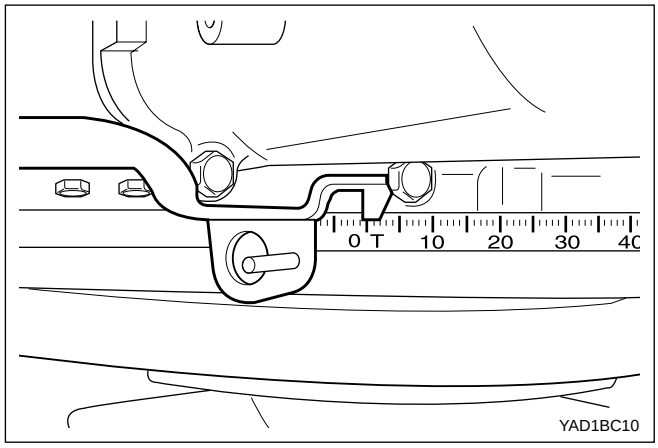

1 Measuring Device
2 Dial Gauge
3 Cylinder Head
4 Piston ..... Set at TDC

**Notice:**

The TDC sensor bracket must be adjusted in case of followings.

- When replacing the TDC sensor bracket.
- When replacing the crankshaft, the hub or the vibration damper.
- When replacing or installing the timing case cover.
- After engine overhauling.

* If the cylinder head is removed, the measuring pin of the dial gauge can be positioned on the piston crown. This is done by placing the magnetic dial holder on the mating surface of the crankcase.

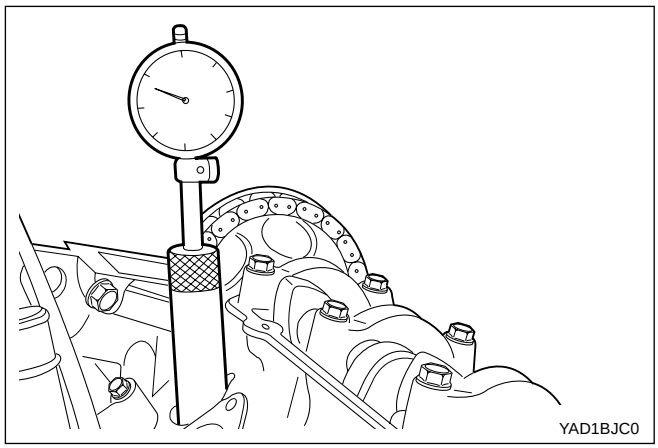



**Tools Required**

001 589 32 21 00 Dial Gauge
601 589 07 21 00 Measuring Device
667 589 01 21 00 Fixing Device

## Setting (With Cylinder Head Installed)

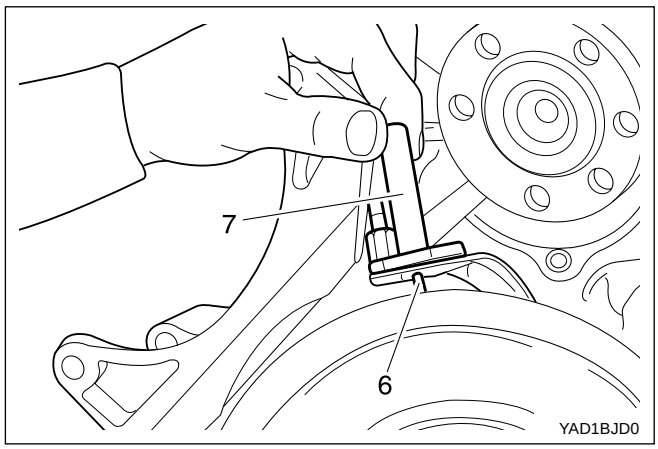
1. Remove the prechamber of No. 1 cylinder.
2. Position the piston of No.1 cylinder at BTDC 10°.




3. Install the measuring device 601 589 07 21 00 into the prechamber bore and position the dial gauge 001 589 53 21 00 with a preload of 5mm.
4. Slowly rotate the crankshaft in the direction of engine rotation until the large pointer on the dial gauge 001 589 53 21 00 stops (TDC position).

   **Notice:** The position of TDC is when the large pointer on the dial gauge is stopped before moving back.

5. Remove the reinstall the measuring device and position the dial gauge 001 589 53 21 00 scale at '0'.
6. Slowly rotate the crankshaft in the direction of engine rotation until the dial gauge 001 589 53 21 00 has moved back (counterclockwise) by 3.65 mm.




7. Insert fixing device into the sensor bracket.

   **Notice:** The pin (6) on the vibration damper must engage into the slot of the fixing device 667 589 01 21 00 (7).

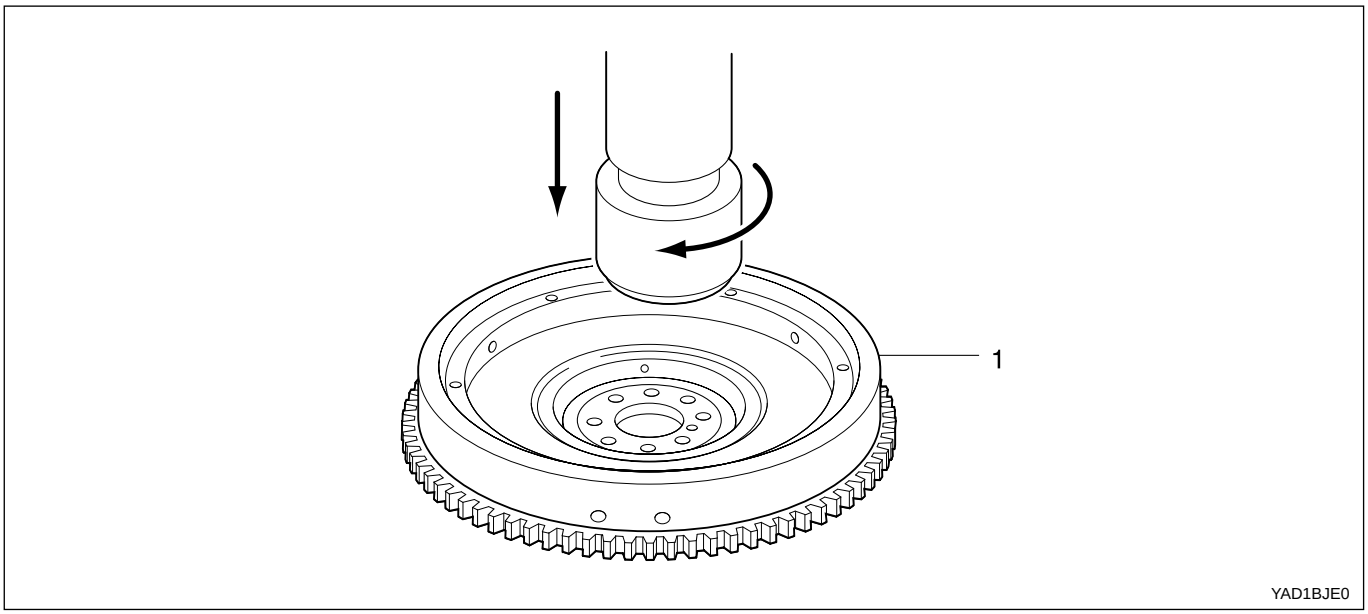
8. If the pin does not engage, adjust the setting of the sensor bracket by removing and tightening of the sensor bracket bolts.

   **Installation Notice**

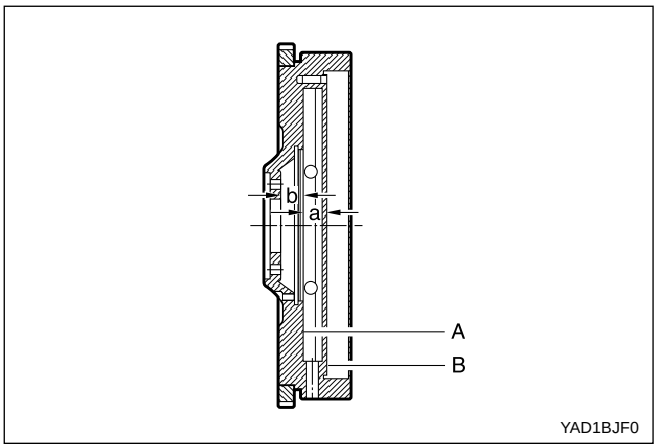
| | |
|---|---|
| Tightening Torque | 10 N•m (89 lb-in) |

   The timing mark on the damper must be positioned at ATDC 20°.

# MACHINING OF FLYWHEEL




1 Flywheel



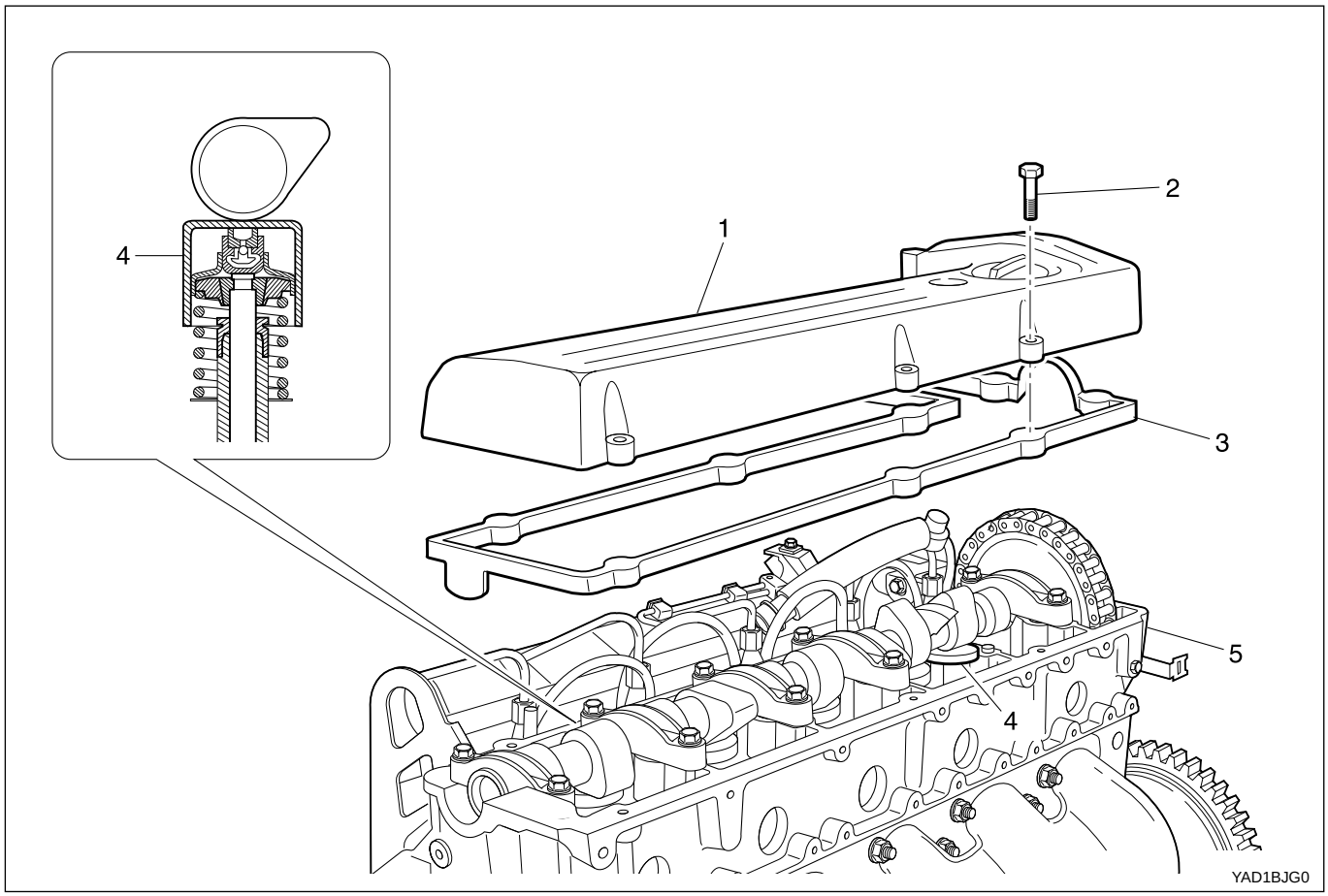

## Machining of Flywheel

**Notice:** Flywheels which have scorch marks, scoring or cracks in the clutch surface should be machined by grinding or precision-turning. If the scores or cracks are severe than permissible specifications, replace the flywheel.

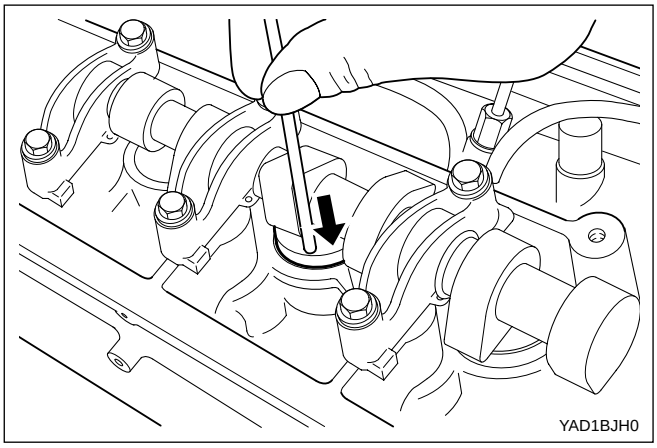
| | | |
|---|---|---|
| Distance ‘a’ | 19.3 - 19.5 mm | |
| Distance ‘b’ | New | 16.6 mm |
| | Repair up to | 15.6 mm |
| Max. axial runout | | 0.05 mm |

- When machining the clutch surface ‘A’, the mounting surface (B) for the clutch pressure plate should also be machined in accordance with ‘A’ to keep the distance ‘a’.
- Do not machine under ‘b’ value.
- When machining, fix the flywheel exactly not to exceed the standard runout.

# HYDRAULIC VALVE CLEARANCE COMPENSATION ELEMENT CHECK




1 Cylinder Head Cover
2 Bolt.....10 N•m (89 lb-in)
3 Gasket..... Replace
4 Valve Tappet
5 Cylinder Head




## Checking

**Notice:** The noise which continues short time during short travel (frequent starting of the engine) or engine starting after a long time storage is normal operating conditions. So, it does not need to be repaired. Determine the malfunctions in valve clearance compensation device with noise through following tests. If defective, replace as respectively.

1. Run the engine at more than 3000rpm for approx. 4 minutes.
2. Stop the engine. After 5minutes, check the engine oil level and adjust if necessary.
3. Remove the cylinder head cover.
4. Check the valve tappets at TDC position of each cylinders.
5. Using a drift, lightly press the valve tappet and measure clearance between the cam and valve tappet.

   **Notice:** If the clearance exceeds 0.4mm, replace the valve tappet.

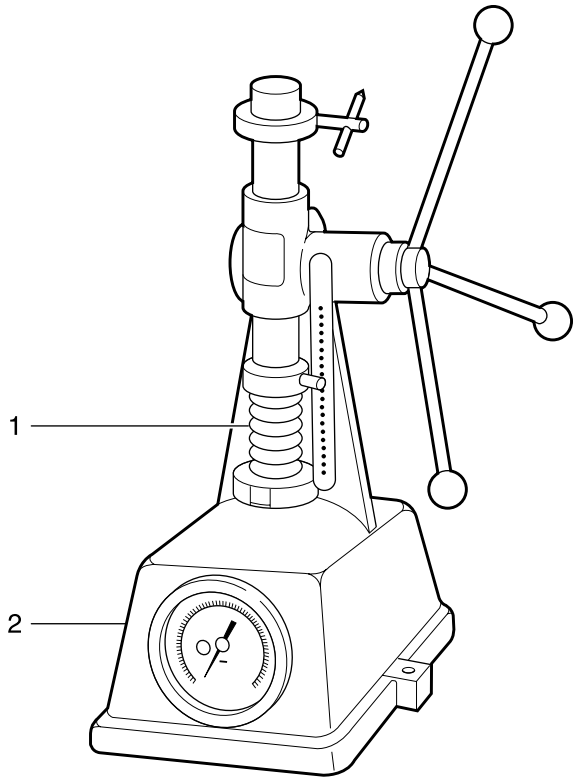
6. If a valve tappet moves down too far in comparison to the others, replace the valve tappet.
7. Rotate the engine and check the remaining valve tappets.

   **Notice:**

   - Unnecessary rotation of the engine will damage the valve tappets.
   - Do not rotate the engine by using the camshaft sprocket bolt or to the opposite direction of the engine rotation.

# VALVE SPRINGS CHECK

Preceding Work : Removal of valve spring




YAD1BJJ0

1 Valve Spring

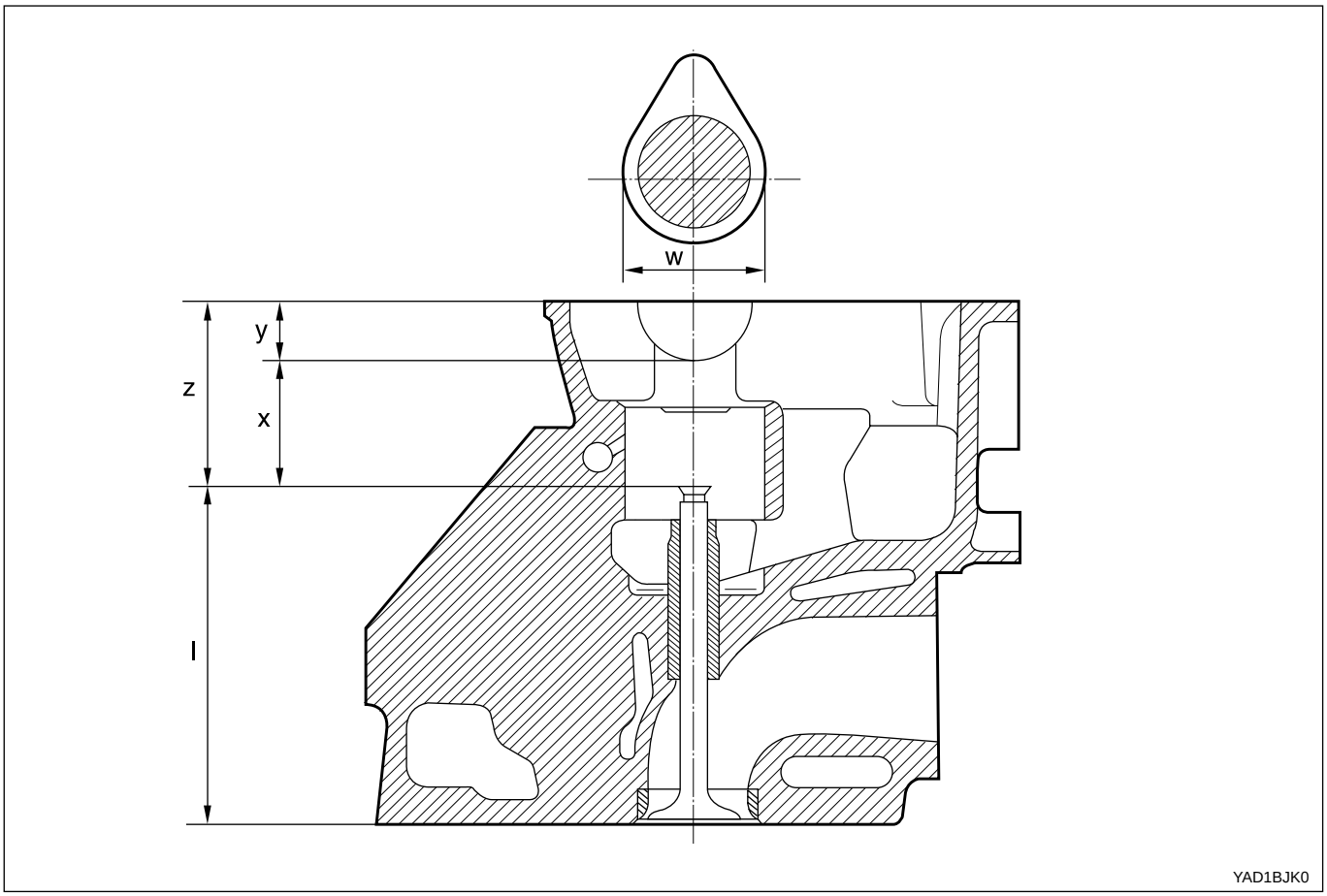
2 Spring Scale

## Service Data

| Outer diameter | Wire diameter | Free length | At preloaded | | |
|---|---|---|---|---|---|
| | | | Length | Tension (new) | Limit |
| 33.1 mm | 4.20 mm | 50.0 mm | 27 mm | 680 - 740 N | 612 N |

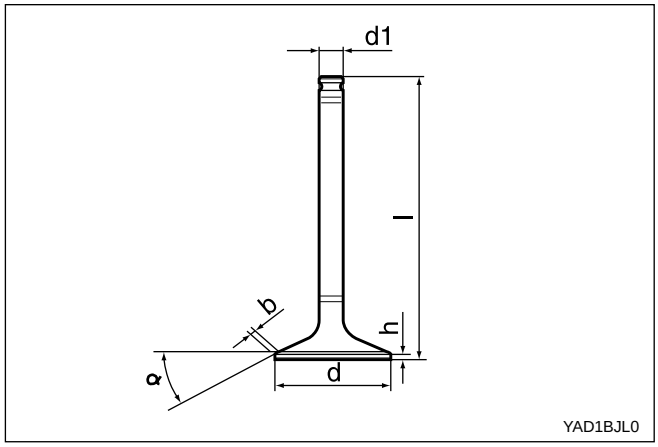
# CHECK AND MACHINING OF VALVES

Preceding Works: Removal of cylinder head
Removal of the vale spring
Removal of the valve

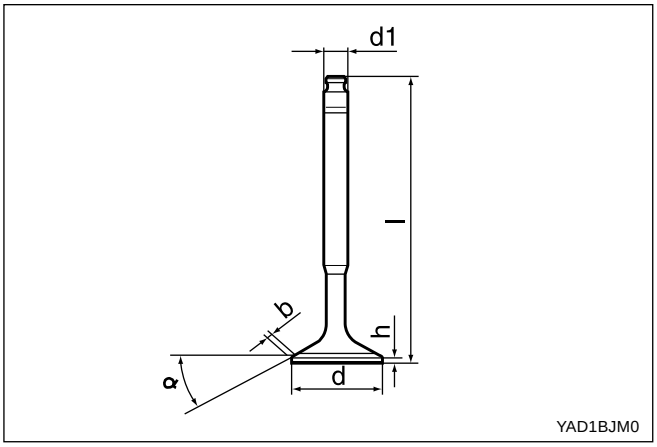



l Valve Length
w Camshaft Cam Basic Diameter
x Distance (Camshaft Basic Bore - Valve Stem)
y Half Camshaft Basic Bore Diameter
z Distance (Cylinder Head Cover Parting Surface - Valve Stem)

## Intake Valve



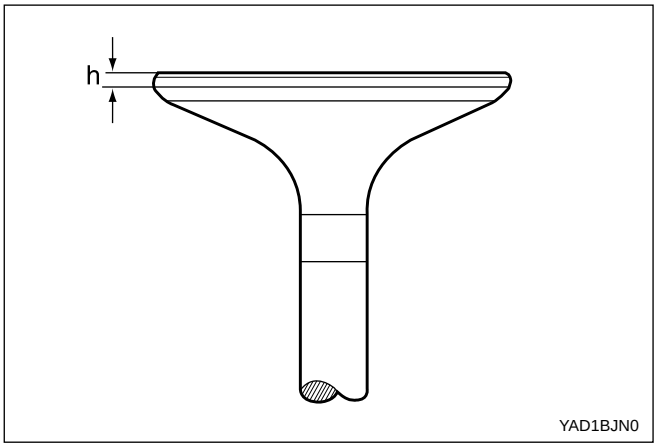

## Exhaust Valve




| Item | | Intake Valve | Exhaust Valve |
|---|---|---|---|
| Valve Disc Diameter ‘d’ | | 37.90 - 38.10 mm | 34.90 - 35.10 mm |
| Valve Disc Height ‘h’ | | 1.7 mm | 1.7 mm |
| Setting Angle “α” o r Machining the Valve | | 45° | 45° |
| Valve Stem Diameter ‘d1’ | | 7.955 - 7.970 mm | 9.945 - 8.960 mm |
| Valve Length ‘I’ | Standard | 106.20 - 106.60 mm | 106.20 - 106.60 mm |
| | Repair | 105.30 - 105.70 | 105.30 - 105.70 mm |
| Max. Permissible Runout at Valve Stem and Valve Seat | | 0.03 mm | 0.03 mm |

## Matching Valves

| | Camshaft Cam Basic Dia. W = 38.0 ± 0.2 mm | Camshaft Cam Basic Dia. W = 36.6 ± 0.2 mm | Valve to be used |
|---|---|---|---|
| Size (x) | 19.5 - 20.3 mm | 19.5 - 20.1 mm | Use machined valve, if needed new repair valve I = 105.5 ± 0.2 mm |
| Size (x) | 20.4 - 21.4 mm | 20.2 - 21.2 mm | Reuse valve |
| Size (x) | 21.4 - 21.97 mm | 21.2 - 21.97 mm | Use standard size valve I = 106.4 ± 0.2 mm |




**Tools Required**

001 589 32 21 00 Dial Gauge

**Commercial Tool**

Valve corn grinding machine

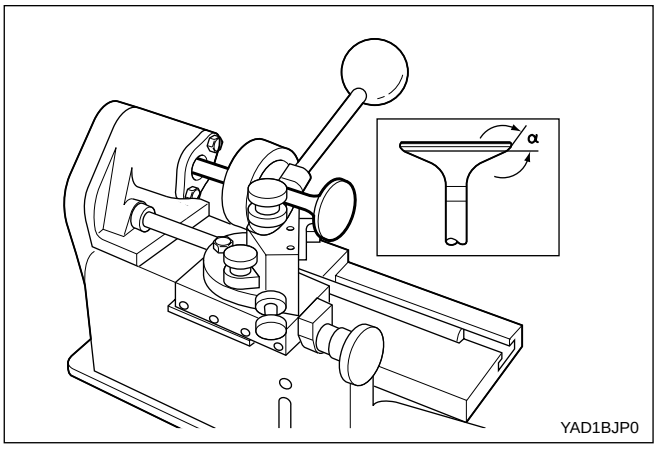
## Checking and Machining Procedure

1. Clean the valves and do visual check.

   **Notice:** Valves with wobbled valve disc, with worn or scored valve stem should be replaced.

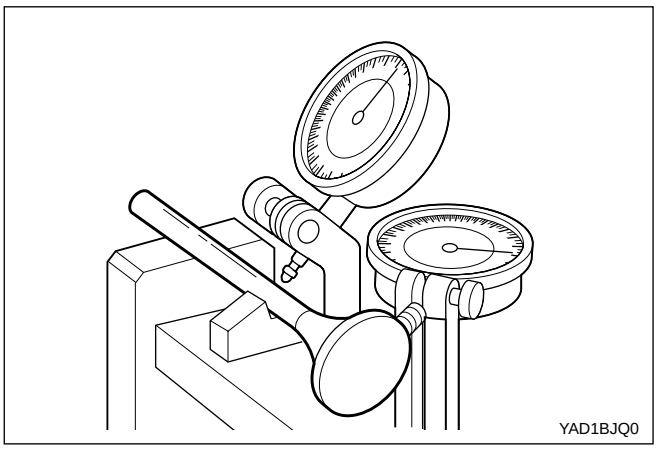
2. Measure valve disc height ‘h’.

| | | |
|---|---|---|
| Service data | Intake | 1.7 ± 0.15 mm |
| | Exhaust | 1.7 ± 0.15 mm |



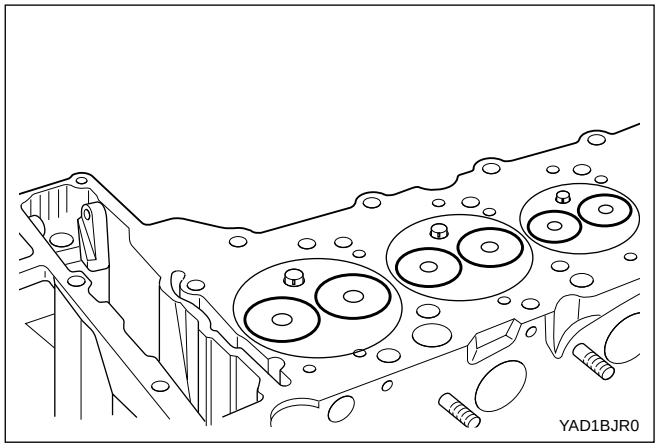

3. Machine the valve.

   **Notice:** Pay attention to setting angle ‘α’ .

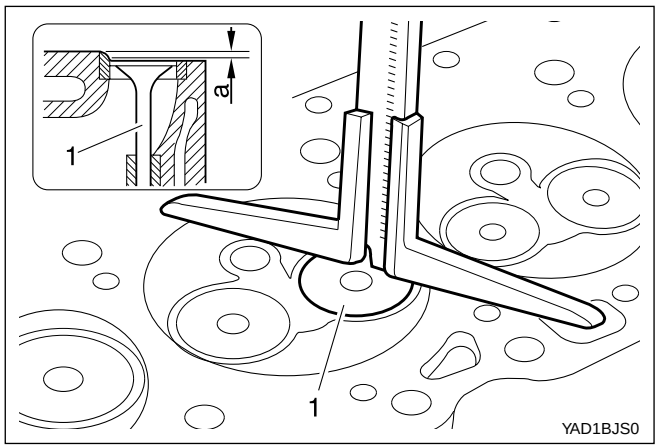



4. Measure radial runout between valve stem and valve seat with a dial gauge 001 589 32 21 00.

| | |
|---|---|
| Limit | Max. 0.03 mm |



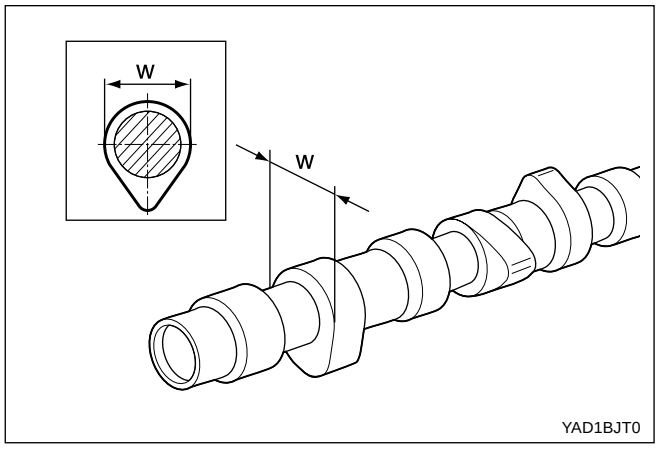

5. Clean the vales, valve seats and valve guides.
6. Coat the valve stem with oil and insert it into valve guide.




7. Insert the valves (1) into the valve guides according to marking.
8. Measure amount by which the valve arrears ‘a’.

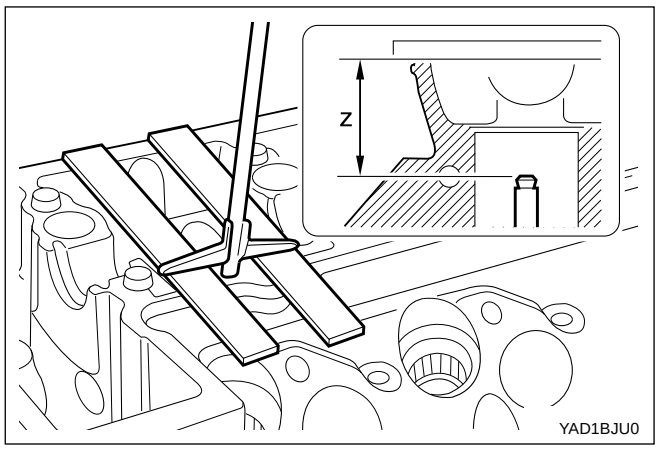
| | |
|---|---|
| Arrears ‘a’ | 0.1 - 0.7 mm |

**Notice:** If out of standard, replace the valve seat ring.




9. Measure camshaft cam basic diameter (w).

| | |
|---|---|
| Diameter ‘w’ | 38 ± 0.2 mm<br>or 37.6 ± 0.2 mm |




10. Measure distance ‘z’ (cylinder head cover parting surface - valve stem).

11. The distance ‘x’ (camshaft basic bore - valve stem).

    ‘x’ = ‘z’ - ‘y’.

    Determine the valve to use according to this measurement (See ‘matching valves’)

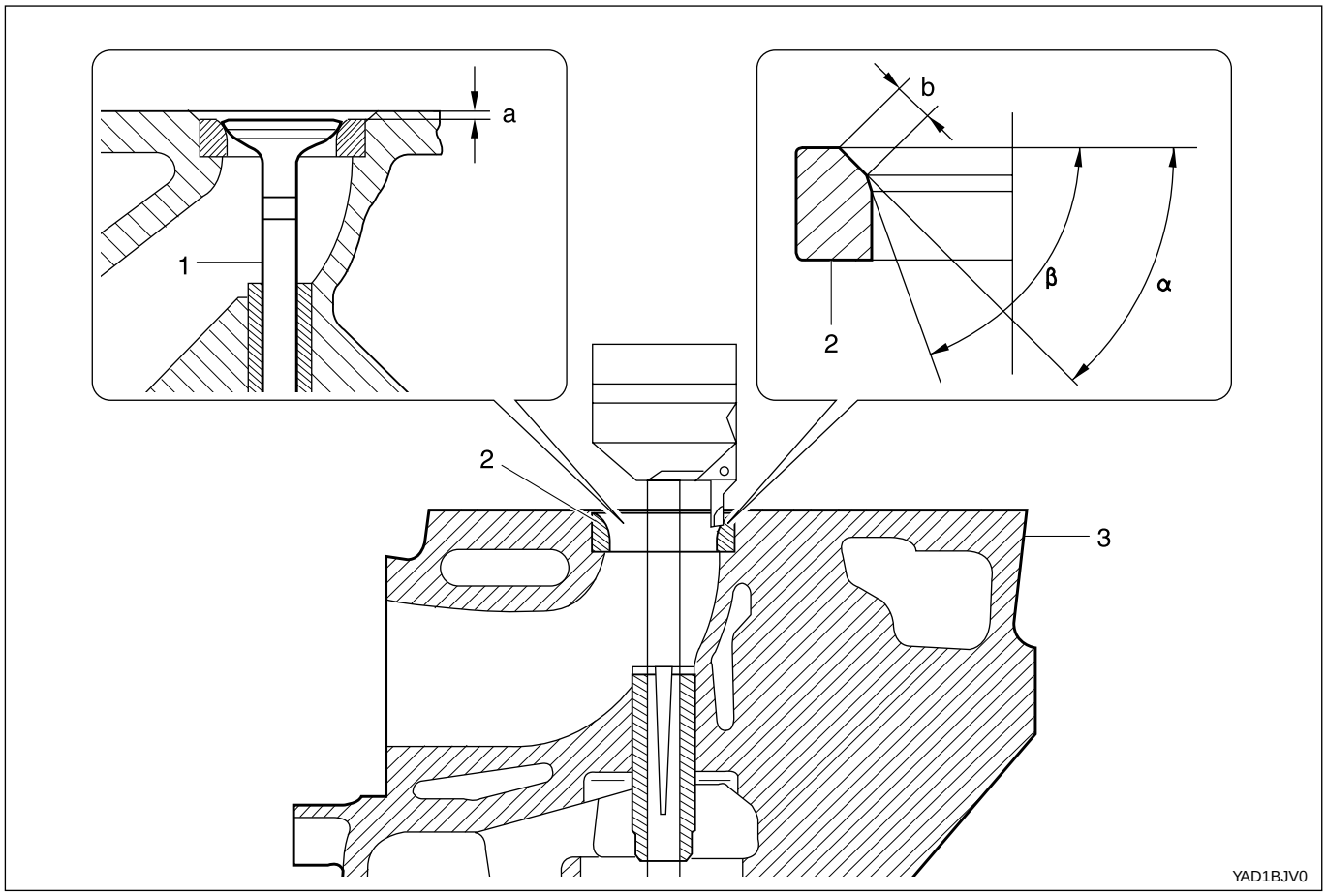
    Example) Measured value ‘w’ = 38.2 mm
    Measured value ‘z’= 36.5 mm
    Value ‘y’ = 15.5 mm

    ‘x’ = 36.5 - 15.5 = 21.0 mm

    In this case according to ‘Matching valves’ table, the installed valve may be used.

# MACHINING OF VALVE SEAT

Preceding Work: Removal of prechamber
Removal and inspection of valve, replace if necessary
Inspection of valve guide, replace if necessary




1 Valve
2 Valve Seat Ring
3 Cylinder Head
4 Valve Guide

a Valve Arreare
b Valve Seat Width
α Valve Seat Angle
β Valve Seat Free Angle

## Service Data

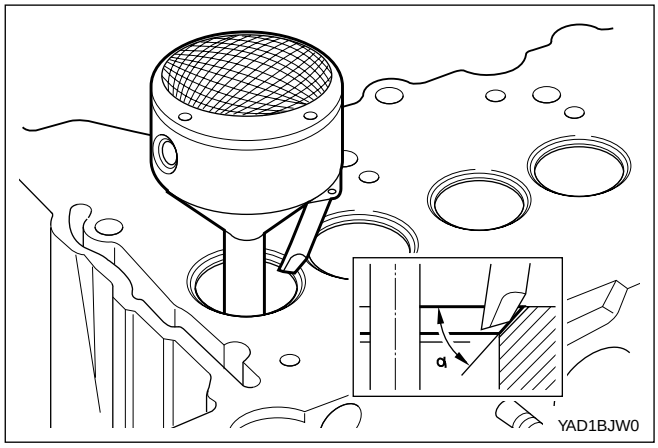
| Item | | Intake | Exhaust |
|---|---|---|---|
| Valve Arrears 'a' | | 0.1 - 0.7 mm | 0.1 - 0.7 mm |
| Valve Seat Width 'b' | | 1.2 - 1.7 mm | 1.5 - 2.0 mm |
| Valve Seat Angle '$\alpha$' | | 45° | 45° |
| Valve Seat Free Angle '$\beta$' | | 65° | 65° |
| Permissible Radial Runout | | 0.03 mm | 0.03 mm |
| Valve Length 'I' | Standard | 106.20 - 106.60 mm | 106.20 - 106.60 mm |
| | Repair | 105.30 - 105.70 mm | 105.30 - 105.70 mm |

## Matching Valves

| | **Camshaft Cam Basic Dia. w = 38.0 ± 0.2 mm** | **Camshaft Cam Basic Dia. w = 37.6 ± 0.2 mm** | **Valve to be Used** |
|---|---|---|---|
| Size (x) | 19.5 - 20.3 mm | 19.5 - 20.1 mm | Use machined valve, if needed use pair valve 1 = 105.5 ± 0.2 mm |
| Size (x) | 20.4 - 21.4 mm | 20.2 - 21.2 mm | Reuse valve |
| Size (x) | 21.4 - 21.97 mm | 21.2 - 21.97 mm | Use standard size valve I = 106.4 ± 0.2 mm |

## Commercial Tools

| | |
|---|---|
| Cylinder Head Clamping Devie | Hunger<br>D-8000 München 70<br>Type Ventilknecht K2000<br>Order No. 221 00 100 |
| Valve Seat Turning Tool | Hunger<br>D-8000 München 70<br>Type VDS 1A<br>Order No. 236 03 308 |
| Test Sat for Valves | Hunger<br>D-8000 München 70<br>Order No. 217 93 601 |

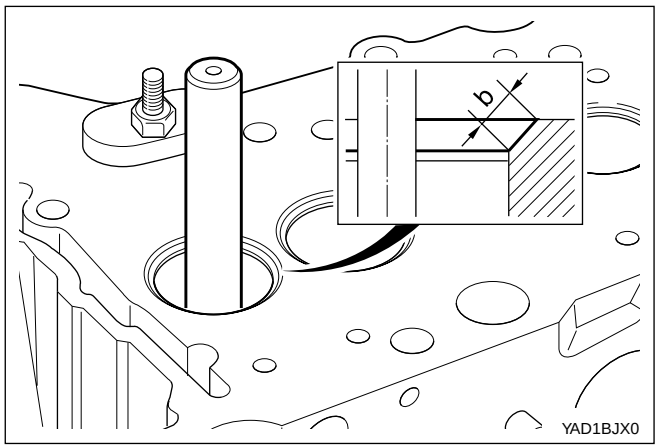



## Machining Procedure

Valve machining is required :

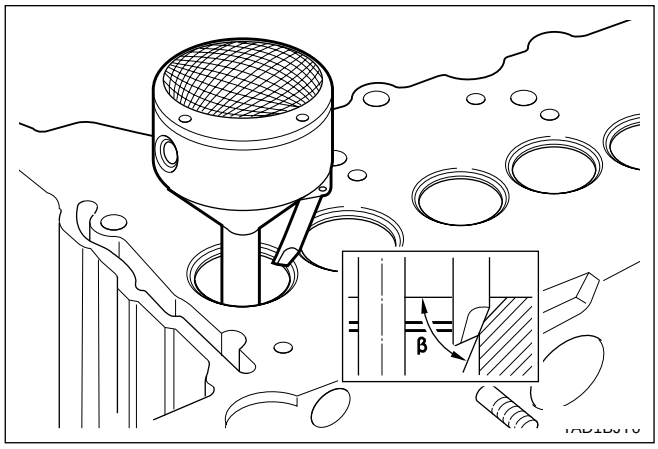
- When the valve is leaking.
- When replacing the valve.
- When replacing the valve guide.
- When replacing the valve seat or valve seatring.

1. Machine the valve seat ($\alpha$=45°).

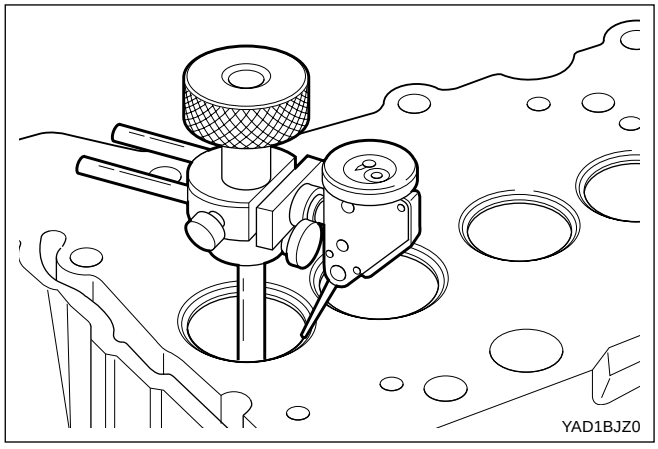



2. Measure valve seat width ‘b’.

| | | |
|---|---|---|
| Valve seat width ‘b’ | Intake | 1.2 - 1.7 mm |
| | Exhaust | 1.5 - 2.0 mm |

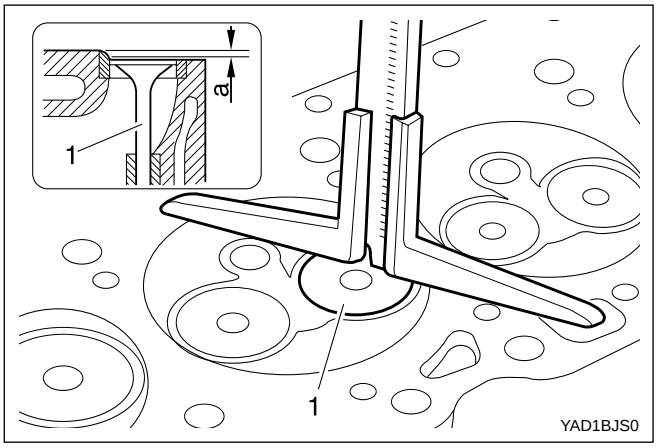



3. If the specification is exceeded, the valve seat width has to be corrected at the lower free angle of ‘$\beta$’ =65°.



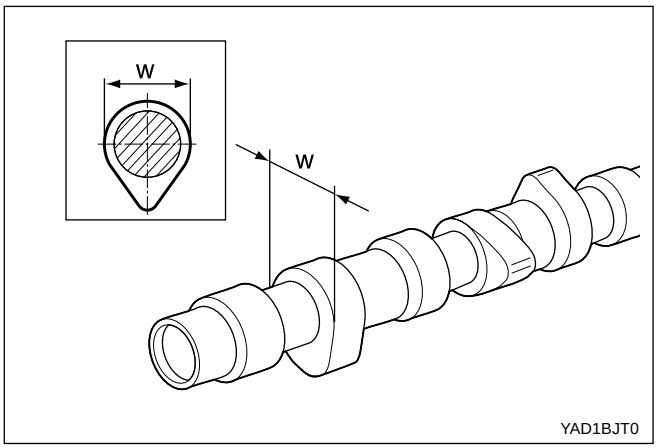

4. Measure radial runout.

| | |
|---|---|
| Runout | Max. 0.03 mm |



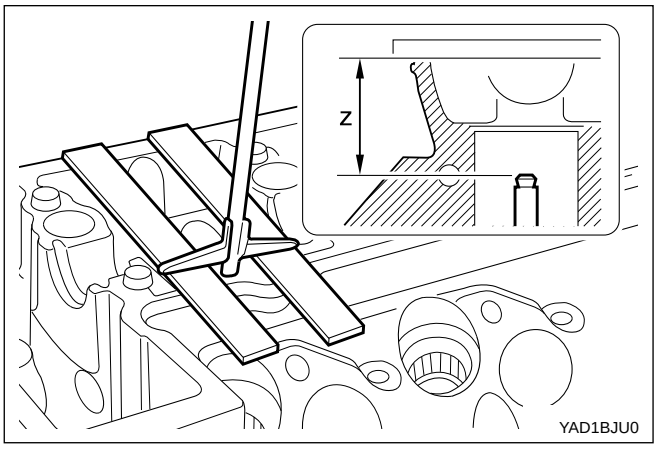

5. Insert the valve (1) into the valve guide according to marking and measure amount by which the valve arrears ‘a’.

| | |
|---|---|
| Arrears ‘a’ | 0.1 - 0.7 mm |

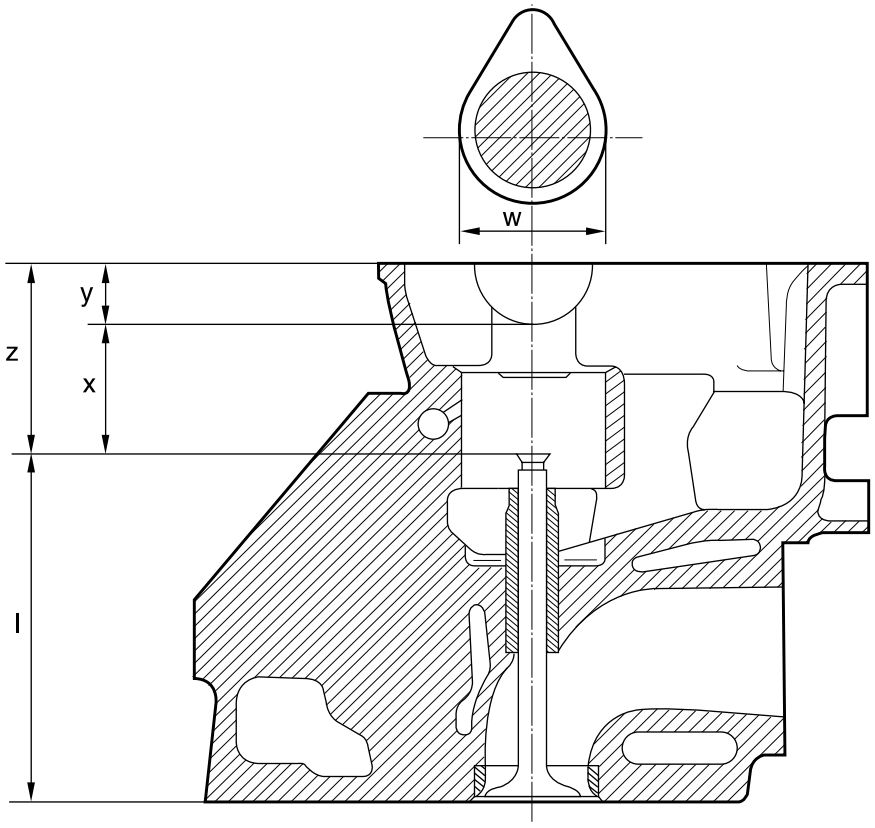



6. Measure camshaft cam basic circle diameter (w).

| | |
|---|---|
| Diameter ‘w’ | 38 ± 0.2 mm<br>or 37.6 ± 0.2 mm |




7. Measure distance ‘z’ (cylinder head cover parting surface - valve stem).

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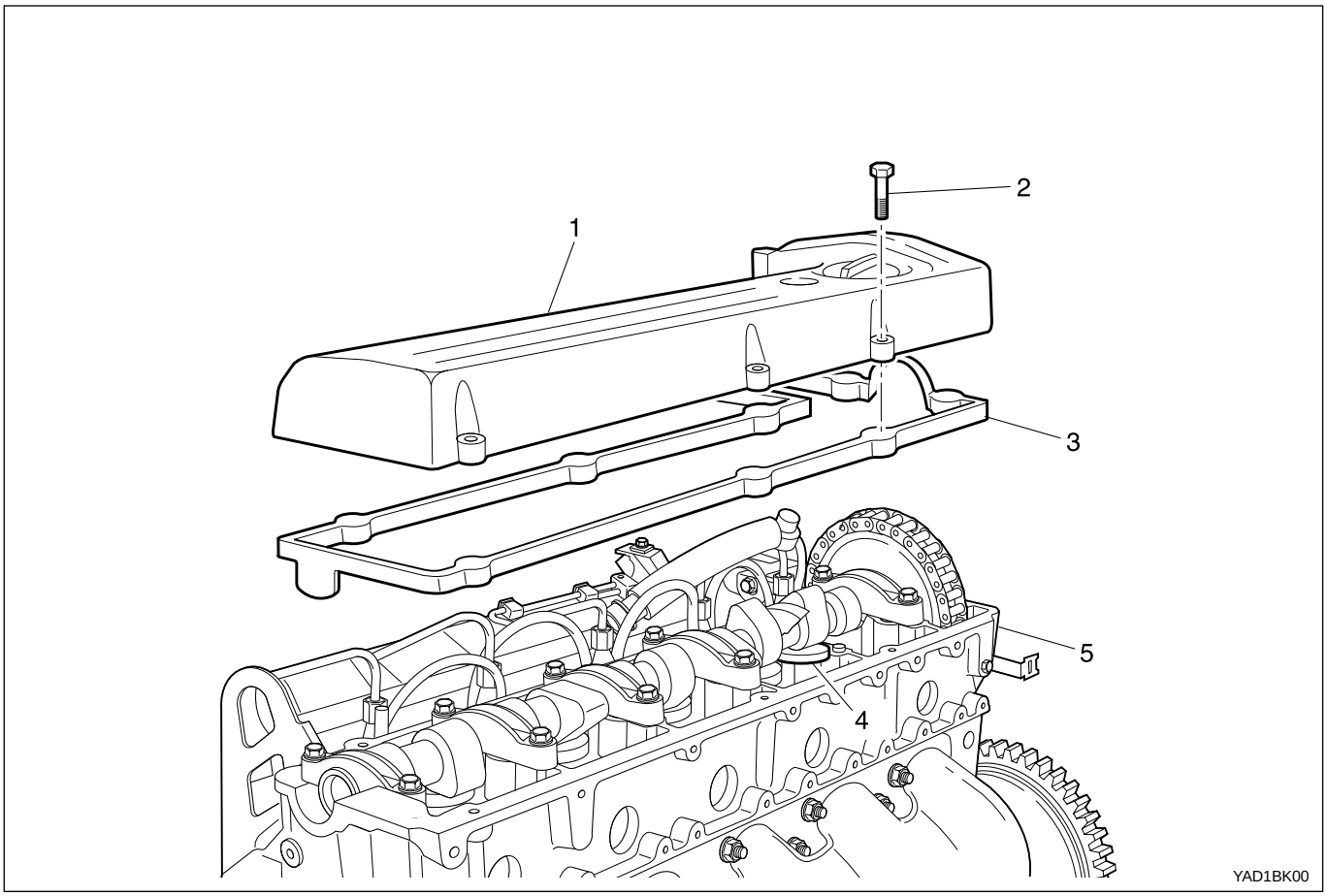
l Length of Valve
w Camshaft Cam Basic Circle Diameter
x Distance (Camshaft Basic Bore - Valve Stem)
y Half Camshaft Basic Bore Diameter
z Distance (CylinderHead Cover Parting Surface - Valve Stem)

8. Measure ‘x’ (Camshaft basic bore - valve stem).
   ‘x’ = ‘z’ - ‘y’
9. Determine the valve to be used.
   (See ‘Matching valves’)
   Example) Measured value ‘w’ = 38.2 mm
   Measured value ‘z’ = 36.5 mm
   Value ‘y’ = 15.5 mm
   ‘x’ = 36.5 - 15.5 = 21.0 mm
   In the case of a camshaft cam basic circle diameter ‘w’ = 38.2 mm and a distance ‘x’ = 21.0 mm, the installed valve may be used.

# CAMSHAFT TIMING TEST

Preceding Work: Removal of glow plug

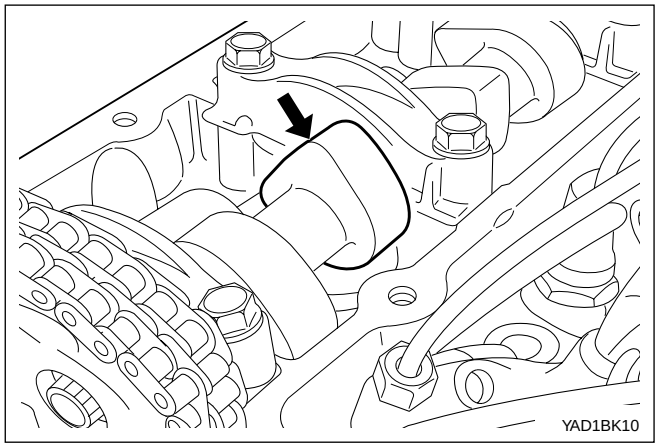


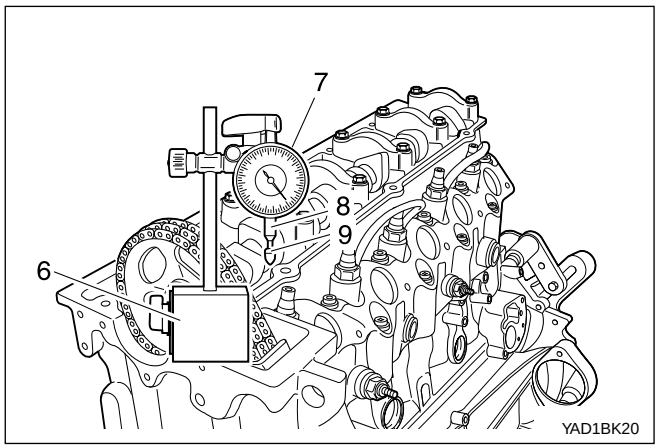

1 Cylinder Head Cover
2 Bolt.....10 N•m (89 lb-in)
3 Gasket..... Replace
4 Valve Tappet
5 Cylinder Head

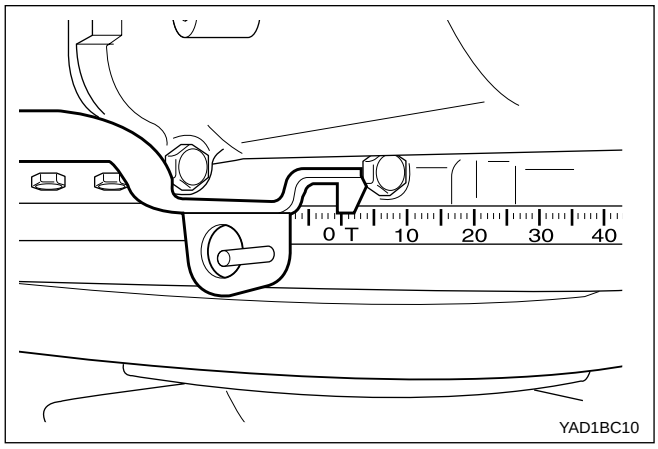
## Timing

| Condition of camshaft | Intake valve | | Exhaust valve | |
|---|---|---|---|---|
| | Open | Close | Open | Close |
| New | ATDC 11.33° | ABDC 17° | BBDC 28° | BTDC 15.25° |
| After approx. 20,000km | ATDC 12° | ABDC 18° | BBDC 27° | BTDC 14° |

*At 2mm of valve lifting stroke.




**Tools Required**

001 589 53 21 00 Dial Gauge
363 589 02 21 00 Dial Gauge Holder
366 589 00 21 05 Extension

## Measurement Procedure

1. Remove the cylinder head cover.
2. Rotate the engine in the direction of engine rotation until the intake valve of no. 1 cylinder is completely closed. The cam lobe faces up (arrow).

   **Notice:** Do not rotate the engine at the bolt of the crankshaft sprocket. Do not rotate the engine in the opposite direction of engine rotation. If do, this will cause serious measuring errors.

3. Install the dial gauge holder 363 589 02 21 00 and dial gauge 001 589 53 21 00 (7) with the extension 366 589 00 21 05 (8) to the cylinder head and position the tracer pin (9) onto the valve tappet (intake valve of cylinder no.1) with a preload of min. 3mm.

   **Notice:** The tracer pin should be positioned exactly vertical.

4. Set the dial gauge to ‘0’.
5. Rotate the engine further in direction of rotation until the dial gauge has moved back by 2 mm (valve lift) to 1mm.
6. Check the timing.

| | |
|---|---|
| New | ATDC 11.33° |
| After approx. | ATDC 12° |

   **Notice:** If timing is out of standard, the camshaft should be checked for wear and the timing chain for stretch. If a difference of more than 4° exists, the timing chain should be replaced.

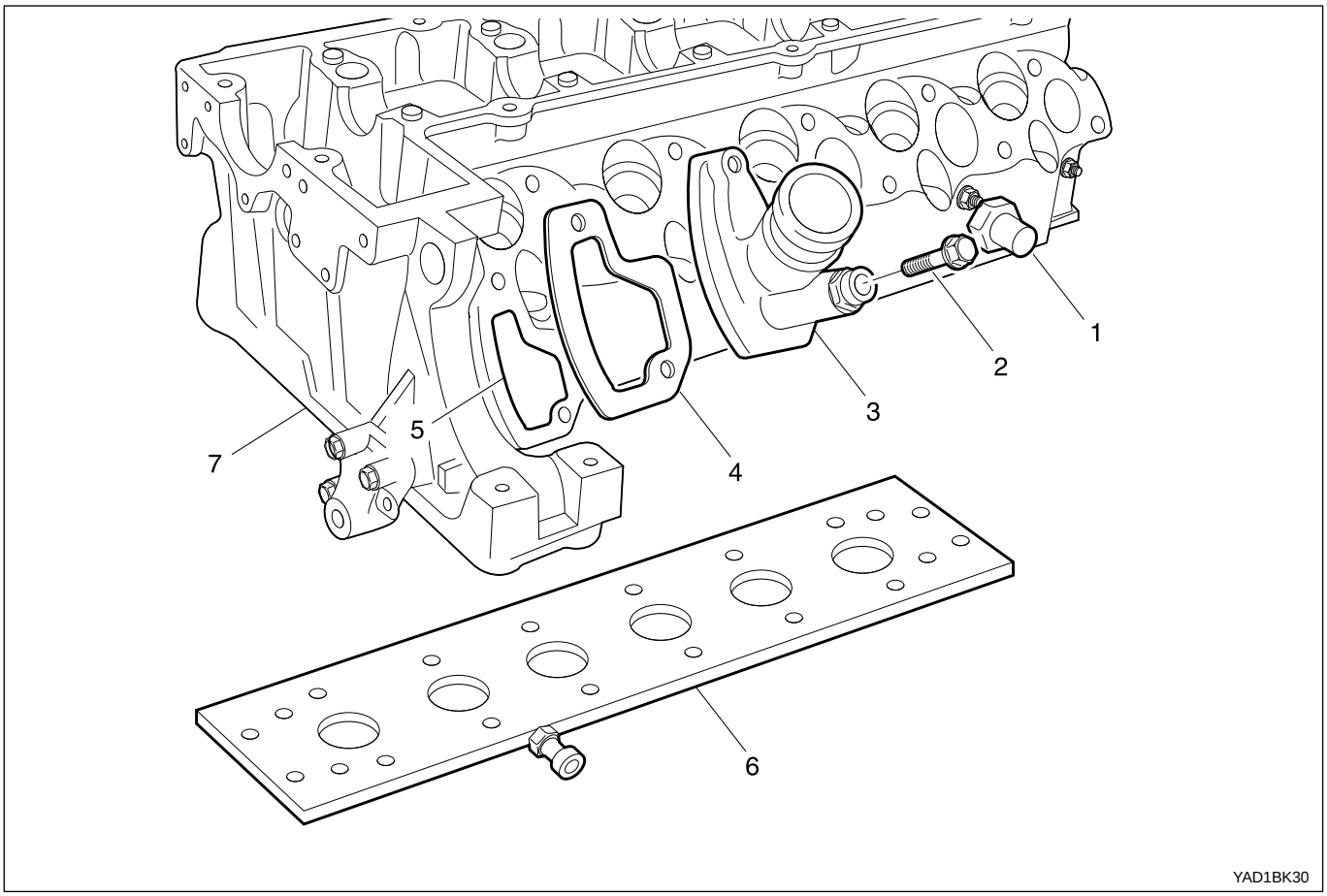
7. Replace the gasket and install the cylinder head cover.

   **Installation Notice**

| | |
|---|---|
| Tightening Torque | 10 N•m (89 lb-in) |

# CYLINDER HEAD PRESSURE LEAKAGE TEST

Preceding Work: Removal of the cylinder head
Removal of the exhaust manifold
Removal of the valve




1 Feed Pipe
2 Bolt
3 Return Connection
4 Gasket ..... Replace
5 Coolant Gallery ..... Sealing
6 Pressure Measuring Plate ..... Completely tight to the cylinder head
7 Cylinder Head .....
Immerse with pressure measuring plate into warm water of approx. 60°C (140°F) and pressurize with compressed air of 2 bar.

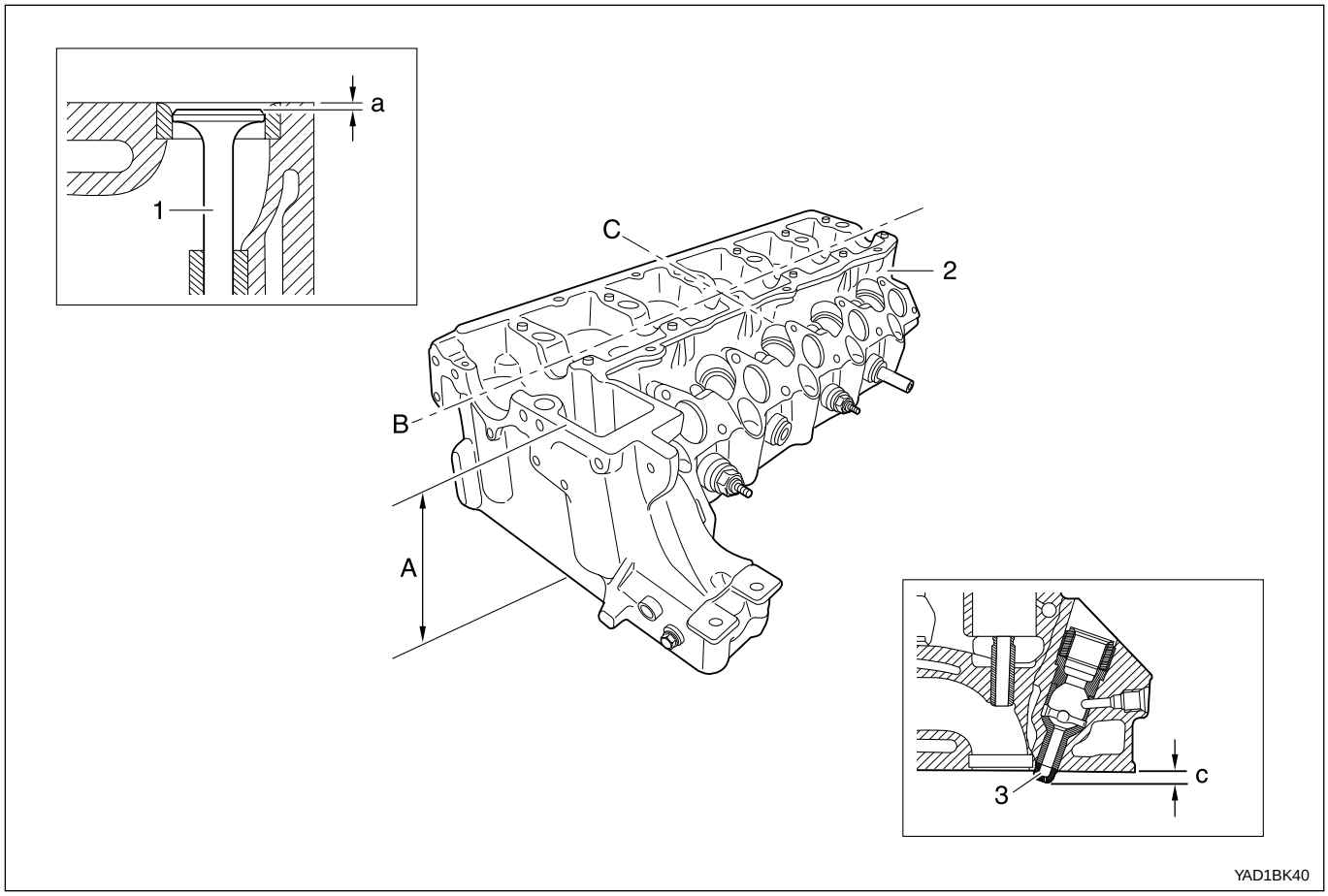
**Notice:** If air bubbles are seen, replace the cylinder head.

**Tools Required**

115 589 34 63 00 Mounting Device
601 589 00 25 00 Pressure Testing Device

# FACING CYLINDER HEAD MATING SURFACE

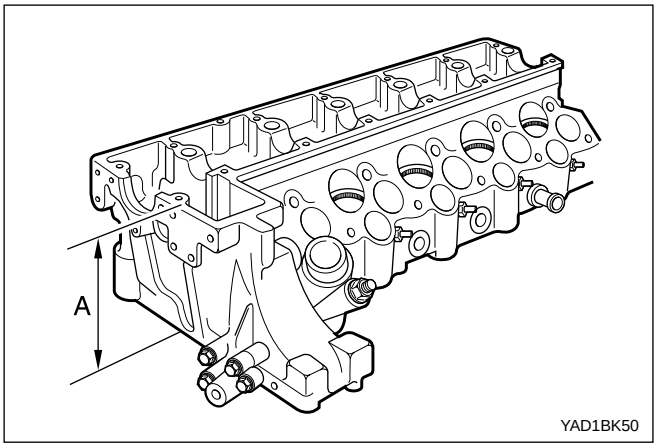
Preceding Work: Removal of prechamber
Cylinder head pressure leakage test




1 Valve
2 Cylinder Head
3 Prechamber
A Height of Cylinder Head
B Longitudinal Direction
C Transverse Direction
a Valve Arrears
b Prechamber Protrusion

## Service Data

| | | |
|---|---|---|
| Height 'A'<br>(Cylinder Head Surface - Cylinder Head Cover Surface) | | 142.9 - 143.1 mm |
| Minimum Height After Machining | | 142.5 mm |
| Permissible Unevenness of Parting Surface | In Longitudinal Direction | 0.08 mm |
| | In Transverse Direction | 0.0 mm |
| Permissible Variation of Parallelism (Longitud. direction) | | Max. 0.1 mm |
| Peak-to-Valley Height | | 0.0017 mm |
| Valve Arrears 'a' | Intake Valve | 0.1 - 0.7 mm |
| | Exhaust Valve | 0.1 - 0.7 mm |
| Prechamber Protrusion 'c' | | 7.6 - 8.1 mm |

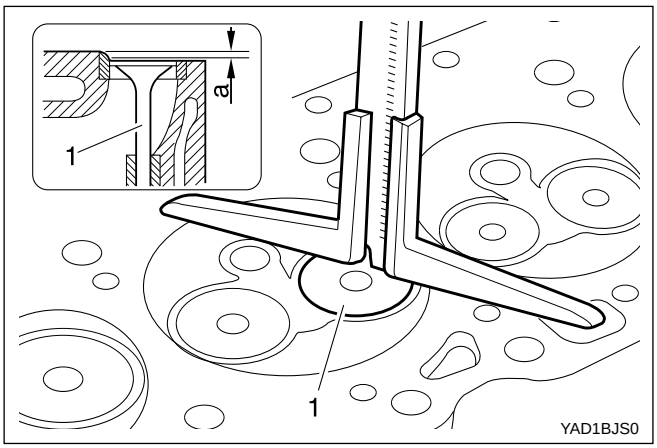



## Measurement Procedure

1. Measure height ‘A’.

| Limit | 142.5 mm |
|---|---|

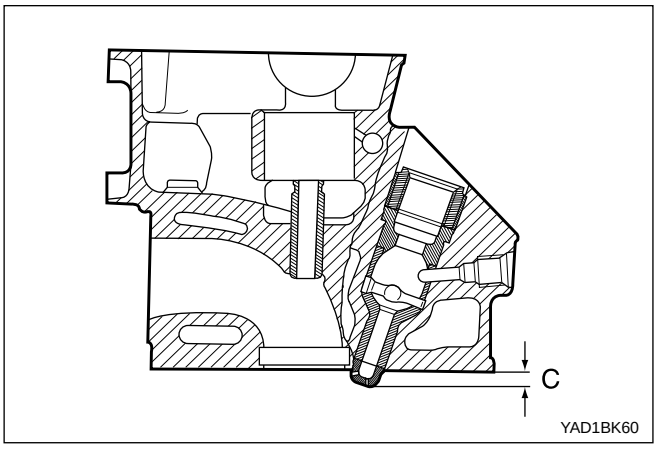
**Notice:** If the height is less than 142.5 mm, replace the cylinder head.




2. Insert the valve (1) and measure valve arrears ‘a’.

| Valve Arrears ‘a’ | 0.1 - 0.7 mm |
|---|---|

**Notice:** If out of standard, machine the valve seat.



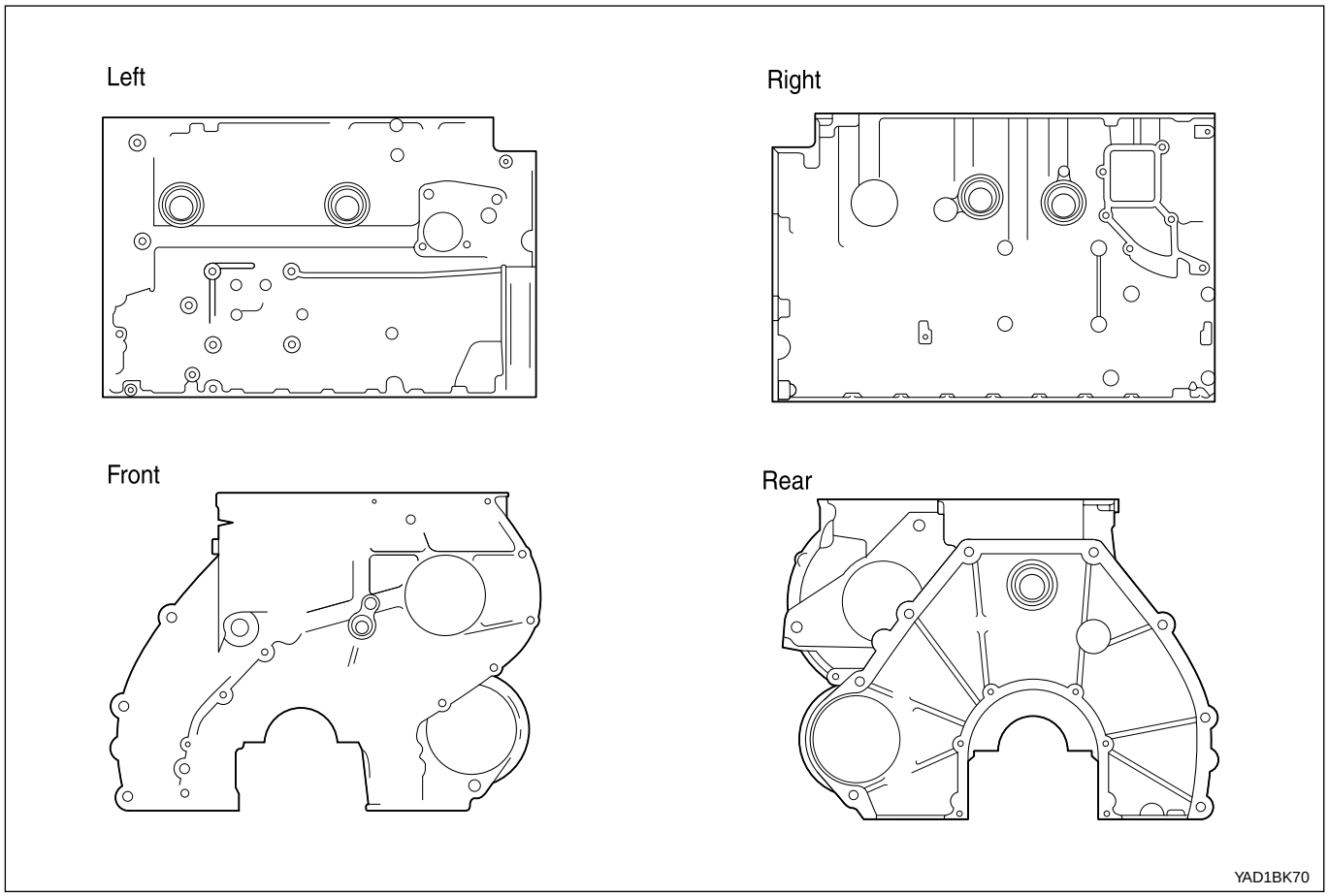

3. Install the prechamber and measure protrusion ‘c’

| Protrusion ‘c’ | 7.6 - 8.1 mm |
|---|---|

4. Assemble the engine and check the valve timing.

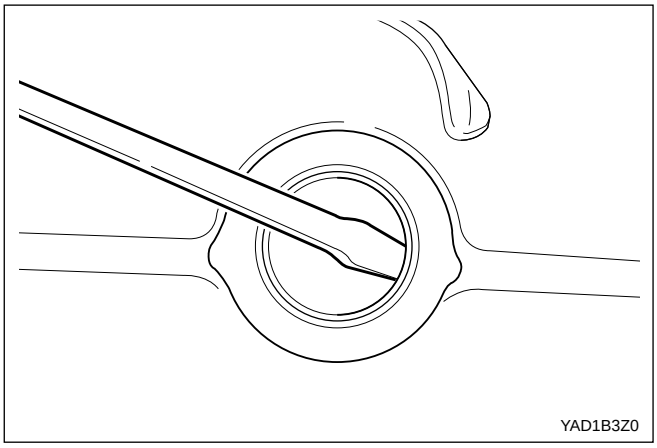
# REPLACEMENT OF CRANKCASE CORE PLUG

## Core Plug




## Service Data

| | |
|---|---|
| Left | $\phi$ 34 mm |
| | 3 EA |
| Right | $\phi$ 34 mm |
| | 3 EA |
| Front | $\phi$ 17 mm |
| | 1 EA |
| Rear | $\phi$ 34 mm |
| | 1 EA |


YAD1B3Z0

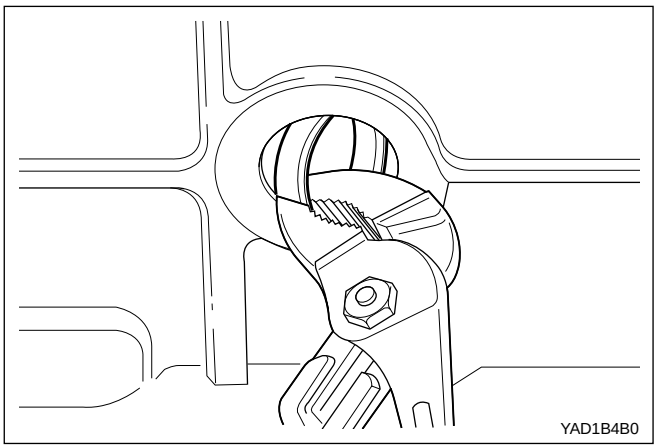
**Tools Required**

102 589 00 15 00 Drift

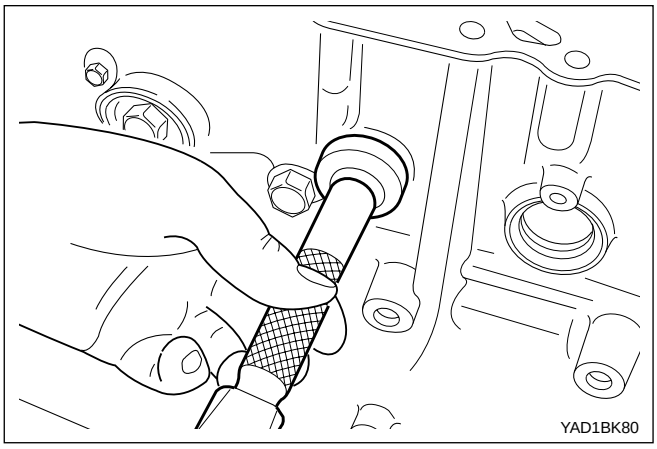
102 589 12 15 00 Drift

## Replacement Procedure

1. Completely drain the coolant.
2. Remove any parts which impede access.
   (Example : transmission, injection pump)
3. Place the screwdriver to the deepdrawn edge of the core plug and pull forward and then rotate 90°.


YAD1B4B0

4. Pull out the core plug with pliers.

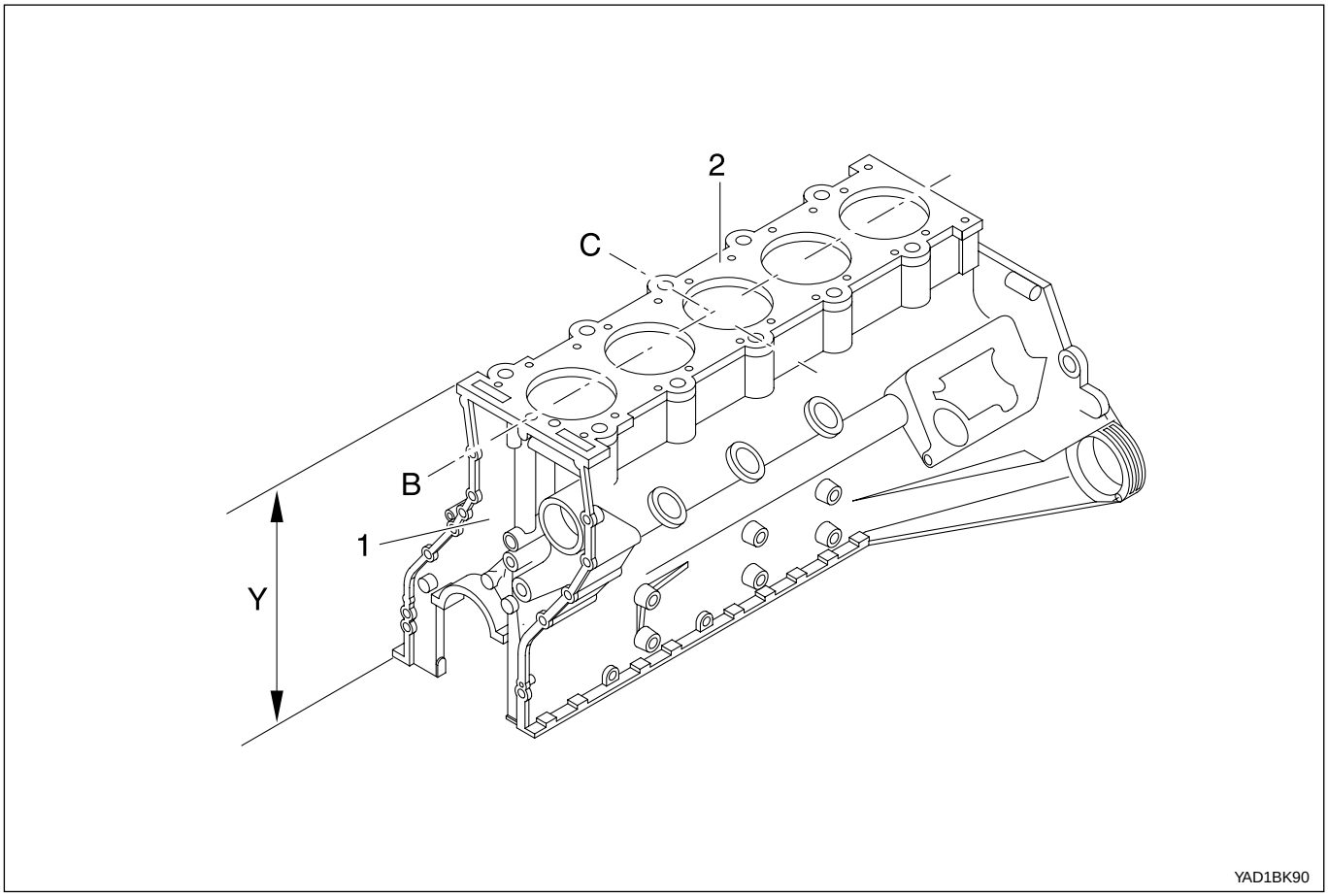

YAD1BK80

5. Thoroughly clean the sealing surface and apply Loctite 241.
6. Install the new core plug by using a drift.
7. Install the removed parts and fill the coolant.

   **Notice:** The adhesive must be allowed to harden for about 45 minutes before filling of coolant.

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

# FACING CRANKCASE CONTACTING SURFACE




1 Crankcase
2 Crankcase Contacting Surface

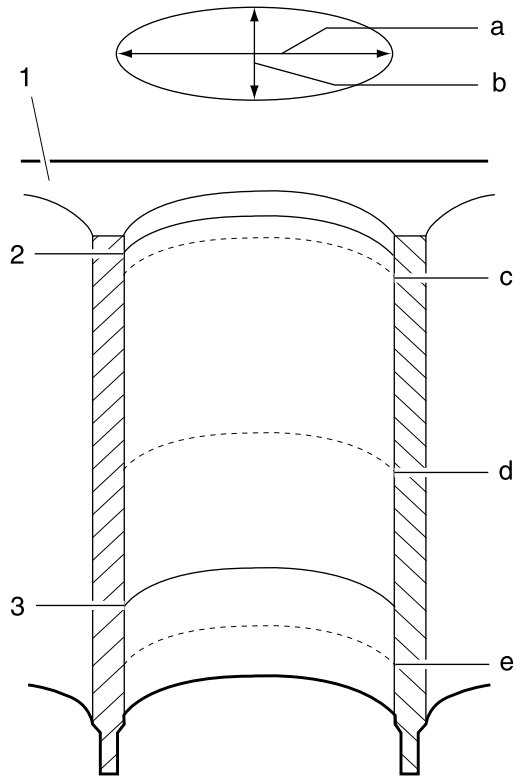
B Longitudinal Direction
C Transverse Direction

Y Height (crankcase upper surface - crankcase lower surface)

## Service Data

| | | |
|---|---|---|
| Height 'Y' | | Min. 299.62 mm |
| Permissible unevenness of contacting surface | In longitudinal direction (B) | 0.06 mm |
| | In transverse direction (C) | 0.06 mm |
| Permissible roughness upper contacting surface | | 0.0006 - 0.0016 mm |
| Permissible variation of parallelism of crankcase upper surface to lower surface in longitudinal direction | | 0.05 mm |
| Piston protrusion at TDC to crankcase upper surface | Max. | 0.965 mm |
| | Min. | 0.735 mm |

# CYLINDER BORE MEASUREMENT




YAD1BKA0

1 Crankcase Contacting Surface
2 TDC of 1 st Piston Ring
3 BDC of Ring

a Longitudinal Direction
b Transverse Direction
c,d,e Measuring Point

## Service Data

| | | |
|---|---|---|
| Standard size | Code letter 'A' | 89.000 - 89.006 mm |
| | Code letter 'X' | 89.006 - 89.012 mm |
| | Code letter 'B' | 89.012 - 89.018 mm |
| Wear limit in direction of travel and in transverse direction | | Max. 0.20 mm |
| Permissible deviation of cylinder shape | When new | 0.01 mm |
| | Wear limit | 0.05 mm |
| Honing angle | | 50° ± 10° |

# SPECIFICATIONS

## FASTENER TIGHTENING SPECIFICATIONS

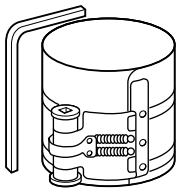
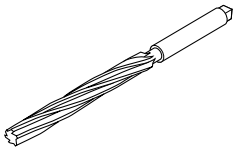
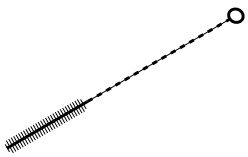
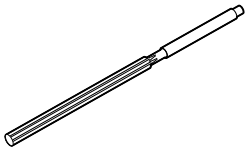
| Application | | N•m | Lb-Ft | Lb-In |
|---|---|---|---|---|
| 12-Sided Stretch Bolt (Flywheel) | | 45 + 90° | 33 + 90° | - |
| Camshaft Bearing Cap Bolt | | 25 | 18 | - |
| Camshaft Sprocket Bolt | | 25 + 90° | 18 + 90° | - |
| Chain Tensioner | | 80 | 59 | - |
| Connecting Rod Bearing Cap Bolt | | 35 + 90° | 26+ 90° | - |
| Cooling Fan Belt Pulley Bolt | | 10 | - | 89 |
| Cooling Fan Shroud Bolt | | 3 - 7 | - | 27 - 62 |
| Crankshaft Bearing Cap Bolt | | 55 + 90° | 41 + 90° | - |
| Crankshaft Belt Pulley Bolt | | 23 | 17 | - |
| Cylinder Head Bolt | 1st Step | 10 | - | 89 |
| | 2nd Step | 35 | 26 | - |
| | Torque Angel | 90° | 90° | - |
| | Wait For | 10 min | 10 min | - |
| | Torque Angel | 90° | 90° | - |
| Cylinder Head Cover Bolt | | 10 | - | 89 |
| Damper Bolt | | 21 | 15 | - |
| Drain Plug (Cylinder Head) | | 30 | 22 | - |
| End Cover Bolt | | 10 | - | 89 |
| Engine Mounting Bolt | | 50 - 75 | 37 - 55 | - |
| Exhaust Manifold Nut | | 25 | 18 | - |
| Fuel Filter Pipe Bolt | | 25 | 18 | - |
| Fuel Line (to Injection Pump) | | 13 | 10 | - |
| Fuel Pipe (to Injection Nozzle) | | 18 | 13 | - |
| Fuel Pipe (to Injection Pump) | | 18 | 13 | - |
| Generator Bracket Bolt | | 25 | 18 | - |
| Generator Mounting Bolt | Upper | 25 | 18 | - |
| | Lower | 45 | 33 | - |
| Guide Pulley Bolt | | 23 | 17 | - |
| Guide Pulley Bracket Bolt | | 9 | - | 80 |
| Hub Bolt | | 200 + 90° | 148 + 90° | - |
| Idle Pulley Bolt | | 23 | 17 | - |
| Injection Nozzle | | 40 | 30 | - |
| Injection Pump Mounting Bolt | | 23 | 17 | - |
| Intake Manifold Nut | | 25 | 18 | - |
| Oil Dipstick Tube Bracket Bolt | | 10 | - | 89 |
| Oil Filter Housing Bolt | | 25 | 18 | - |
| Oil Filter Housing Cap | | 25 | 18 | - |

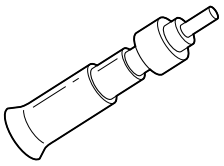
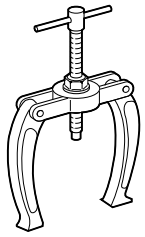
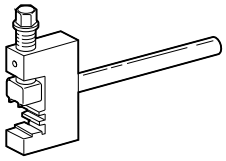
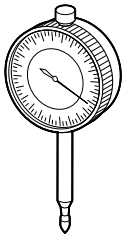
# FASTENER TIGHTENING SPECIFICATIONS (Cont'd)

| Application | | N•m | Lb-Ft | Lb-In |
|---|---|---|---|---|
| Oil Pan Bolt | Socket Bolt | 10 | - | 89 |
| | M6 | 10 | - | 89 |
| | M8 | 25 | 18 | - |
| Oil Pan Drain Plug | | 25 | 18 | - |
| Oil Pump Mounting Bolt | | 25 | 18 | - |
| Oil Pump Sprocket Bolt | | 25 | 18 | - |
| Oil Pump Screw Plug | | 50 | 37 | - |
| Oil Spray Nozzle Bolt | | 10 | - | 89 |
| Power Steering Dump Pulley Bolt | | 32 | 24 | - |
| Prechamber Threaded Ring | | 130 | 96 | - |
| Skid Plate Bolt | | 28 - 47 | 21 - 35 | - |
| Socket Bolt | | 25 | 18 | - |
| Stud Bolt | | 12 | - | 106 |
| TDC Sensor Bracket Bolt | | 10 | - | 89 |
| Tensioning Lever Nut | | 21 | 15 | - |
| Tensioning Pulley Bolt | | 29 | 21 | - |
| Timing Case Cover Bolt | | 10 | - | 89 |
| Transmission Mounting Bolt | | 54 - 68 | 40 - 50 | - |
| Turbo Charger to Exhaust Pipe Bolt | | 30 | 22 | - |
| Vacuum Pump Mounting Bolt | | 10 | - | 89 |

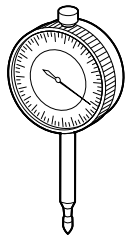
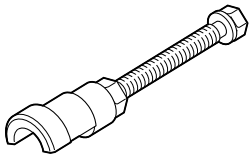
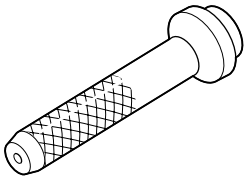
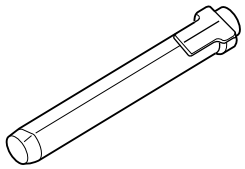
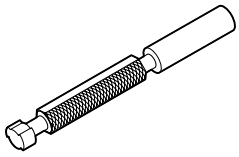
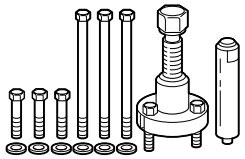
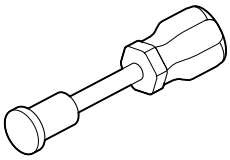
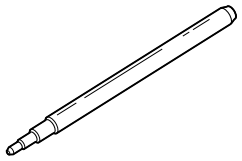
# SPECIAL TOOLS AND EQUIPMENT

## SPECIAL TOOLS TABLE

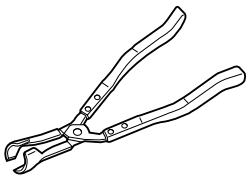
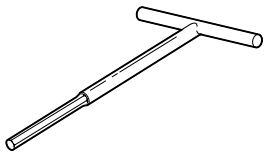
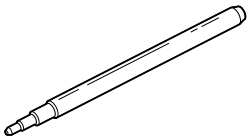
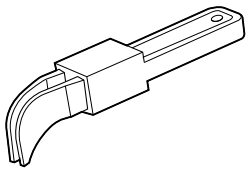
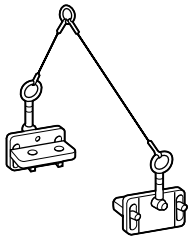
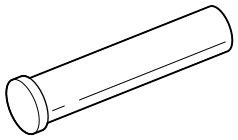
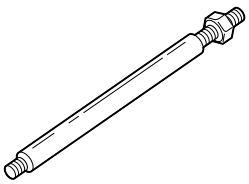
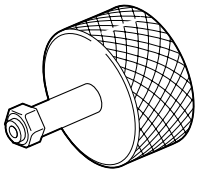
| | |
|---|---|
|  YAD1BKW0 | **000 589 04 14 00 Tensioning Strap** |
|  YAD1BLC0 | **000 589 10 53 00 Reamer (for Exhaust)** |
|  YAD1BL60 | **000 589 10 68 00 Cylinder Brush** |
|  YAD1BLD0 | **000 589 21 53 00 Reamer (for Intake)** |

| | |
|---|---|
|  YAD1BKS0 | **000 589 25 33 00 Internal Extractor** |
|  YAD1BKR0 | **000 589 33 33 00 Counter Support** |
|  YAD1B1W0 | **000 589 58 43 00 Chain Assembling Device** |
|  YAD1BLG0 | **001 589 32 21 00 Dial Gauge** |

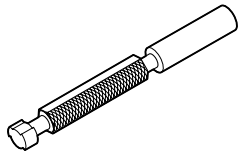
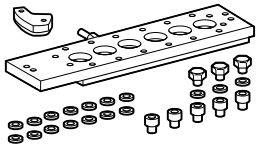
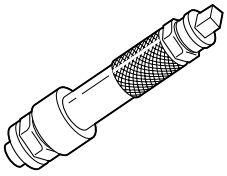
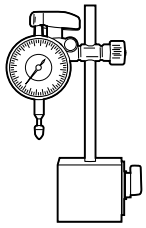
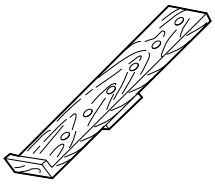
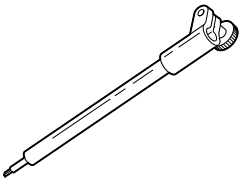
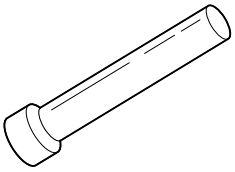
# SPECIAL TOOLS TABLE (Cont'd)

| | | | |
|---|---|---|---|
|  YAD1BKJ0 | **001 589 53 21 00 Dial Gauge** |  YAD1BKU0 | **102 589 05 33 00 Puller** |
|  YAD1B3Y0 | **102 589 00 15 00 (ϕ 34) Drift** |  YAD1B1A0 | **102 589 12 15 00 (ϕ 17) Drift** |
|  YAD1BLF0 | **102 589 00 23 00 Go/No Go Gauge (for Intake)** |  YAD1BKM0 | **103 589 00 33 00 Puller** |
|  YAD1BKX0 | **102 589 03 40 00 Magnetic Bar** |  YAD1BL80 | **103 589 02 15 00 Drift (for Exhaust)** |

# SPECIAL TOOLS TABLE (Cont'd)

| | | | |
|---|---|---|---|
|  YAD1BL40 | **104 589 00 37 00**<br>**Pliers** |  YAD1BKF0 | **116 589 03 07 00**<br>**T Type Socket Wrench** |
|  YAD1BL70 | **105 589 03 15 00**<br>**Drift (for Intake)** |  YAD1BL10 | **116 589 06 63 00**<br>**Magnetic Finger** |
|  YAD1BKG0 | **115 589 34 63 00**<br>**Mounting Device** |  YAD1BKV0 | **116 589 07 15 00**<br>**Drift** |
|  YAD1BLH0 | **116 589 02 34 00**<br>**Thread Bolt** |  YAD1B580 | **116 589 20 33 00**<br>**Sliding Hammer** |

# SPECIAL TOOLS TABLE (Cont'd)

| | | | |
|---|---|---|---|
|  YAD1BLE0 | **117 589 03 23 00**<br>**Go/No Go Gauge**<br>**(for Exhaust)** |  YAD1BKH0 | **601 589 00 25 00**<br>**Pressure Testing Device** |
|  YAD1BL90 | **346 589 00 63 00**<br>**Super Cooling Box** |  YAD1BKD0 | **601 589 00 66 00**<br>**Counter Sink** |
|  YAD1BKQ0 | **363 589 02 21 00**<br>**Dial Gauge Holder** |  YAD1BKY0 | **601 589 01 59 00**<br>**Assembling Board** |
|  YAD1BKP0 | **366 589 00 21 05**<br>**Extension** |  YAD1BL50 | **601 589 02 43 00**<br>**Drift** |

# SPECIAL TOOLS TABLE (Cont'd)

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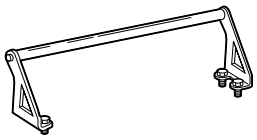
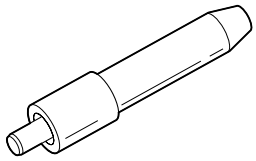
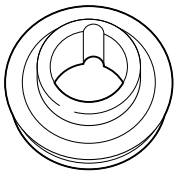
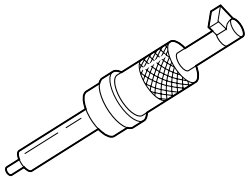
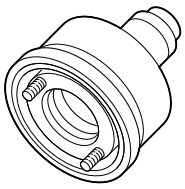
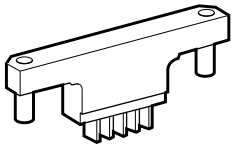
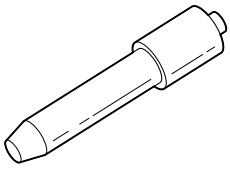
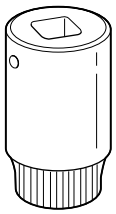
|---|---|---|---|
|  YAD1BKZ0 | **601 589 02 59 00 Supporting Bridge** |  YAD1BLB0 | **601 589 06 15 00 Drift (for Exhaust)** |
|  YAD1B790 | **601 589 03 14 00 Sleeve** |  YAD1BKK0 | **601 589 07 21 00 Measuring Device** |
|  YAD1BKN0 | **601 589 03 43 00 Oil Seal Assembler** |  YAD1B720 | **602 589 00 40 00 Engine Lock** |
|  YAD1BLA0 | **601 589 05 15 00 Drift (for Intake)** |  YAD1BKB0 | **603 589 00 09 00 Serration Wrench** |

# SPECIAL TOOLS TABLE (Cont'd)

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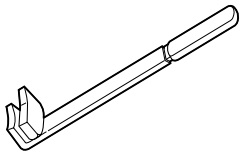
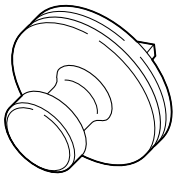
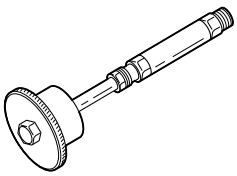
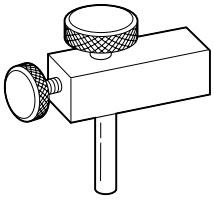
|---|---|
|  YAD1B4K0 | **603 589 00 40 00**<br>**Counter Holder** |
|  YAD1BL20 | **603 589 01 40 00**<br>**Holding Wheel** |
|  YAD1BKC0 | **657 589 03 63 00**<br>**Sliding Hammer** |
|  YAD1BKE0 | **667 589 00 23 00**<br>**Height Gauge** |

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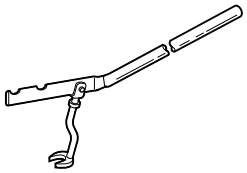
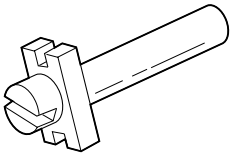
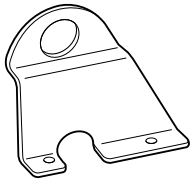
|---|---|
|  YAD1BL00 | **667 589 00 31 00**<br>**Press Lever** |
|  YAD1BKL0 | **667 589 01 21 00**<br>**Fixing Device** |
|  YAD1BL30 | **667 589 02 63 00**<br>**Supporting Bar** |