Maintenance on the cylinderhead

General remarks:

According to the Maintenance Schedule similary to regular checks , maintenance work belongs to the user`s duties. Both serve the purpose of :

- Safe and reliable operation
- Economically operation of the Plant

(e.g. increasing life time of the Engine and equipment, provides low Lub- and Fuel oil consumption)

First Class Service

Illustration

These Power Point Präsentation should give you a brief review about the Maintenance job on the Clyinder-

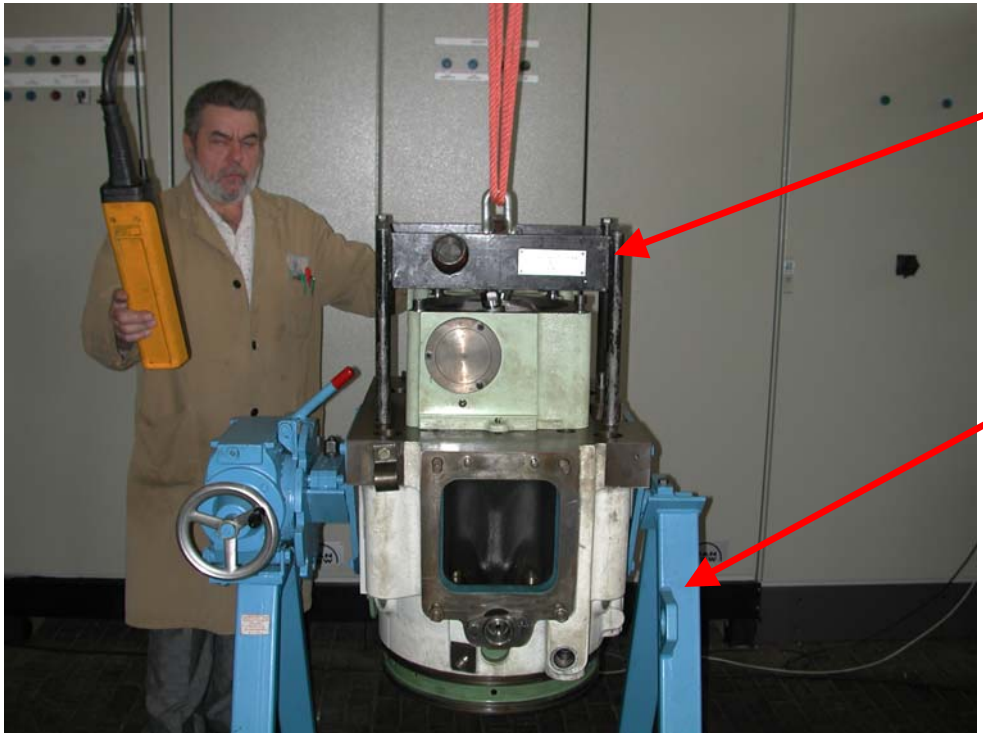
Head of a 32/40 engine type. Here you will also find a description of our new valve seat refacing machine.

Note: For further details , please refer to folder

B1 Working instructions

There you will also find the saftey regulations

Cylinderhead in turning device



Lifting column

(055.154-1)

Turnover stand

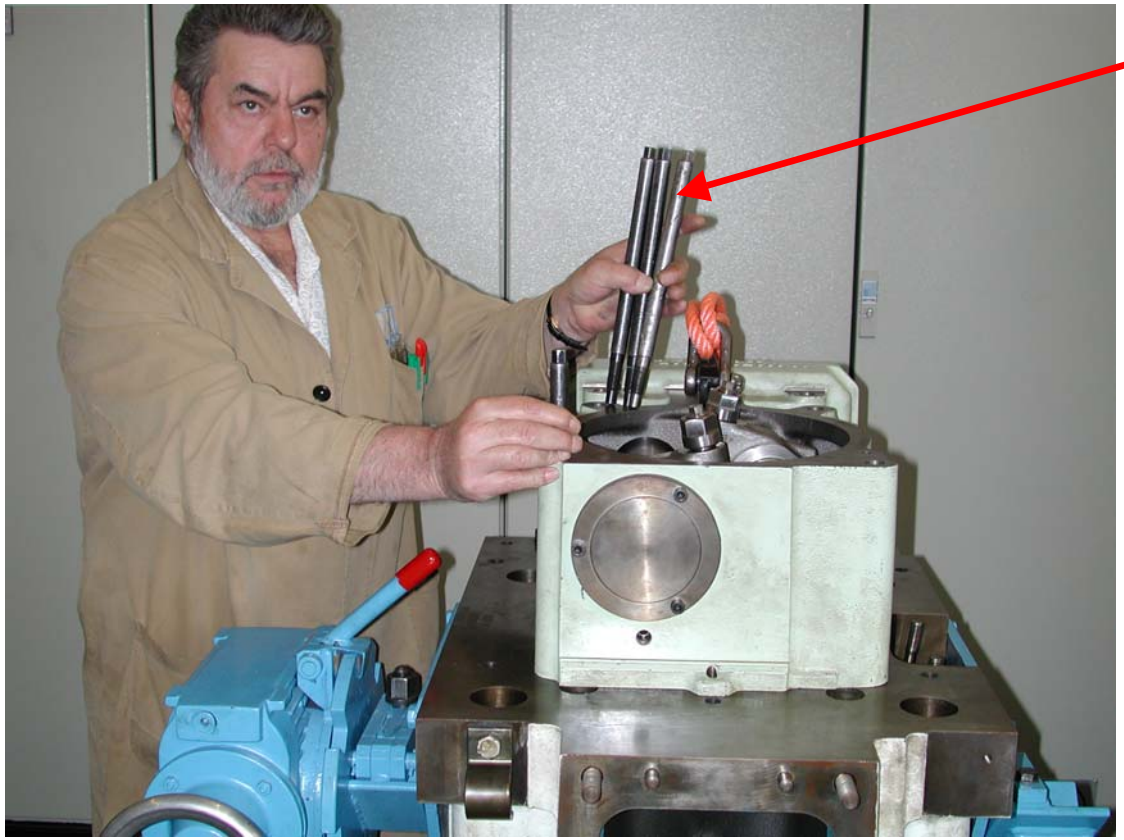
(055.153)

Cylinder Head dismantled from the engine and placed on the Turnover stand.

Removing Rocker arm casing

Screw the hexagon bolts out

Guide rods rocker arm casing



Screw the guide rods into the cylinder head,down to the contact

(Guide rods 111.125)

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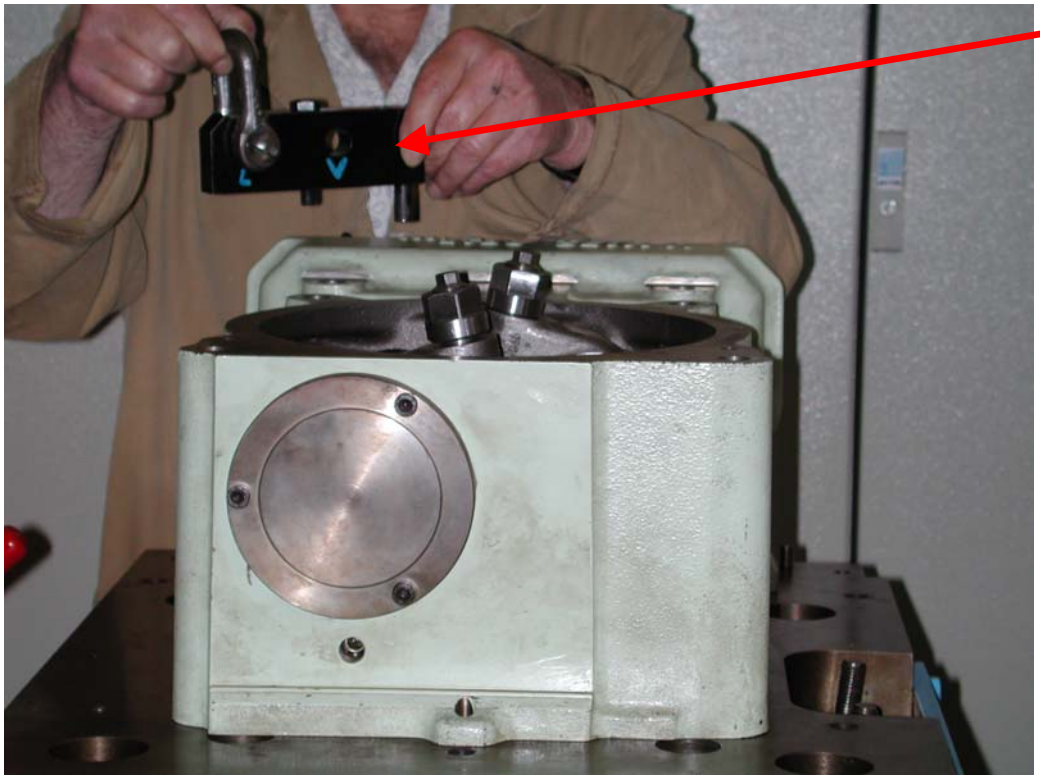
Suspension plate rocker arm casing



Suspension - plate

(121.124-1)

Put the suspension plate onto the rocker arm casing and fit the spring pin in the bore hole

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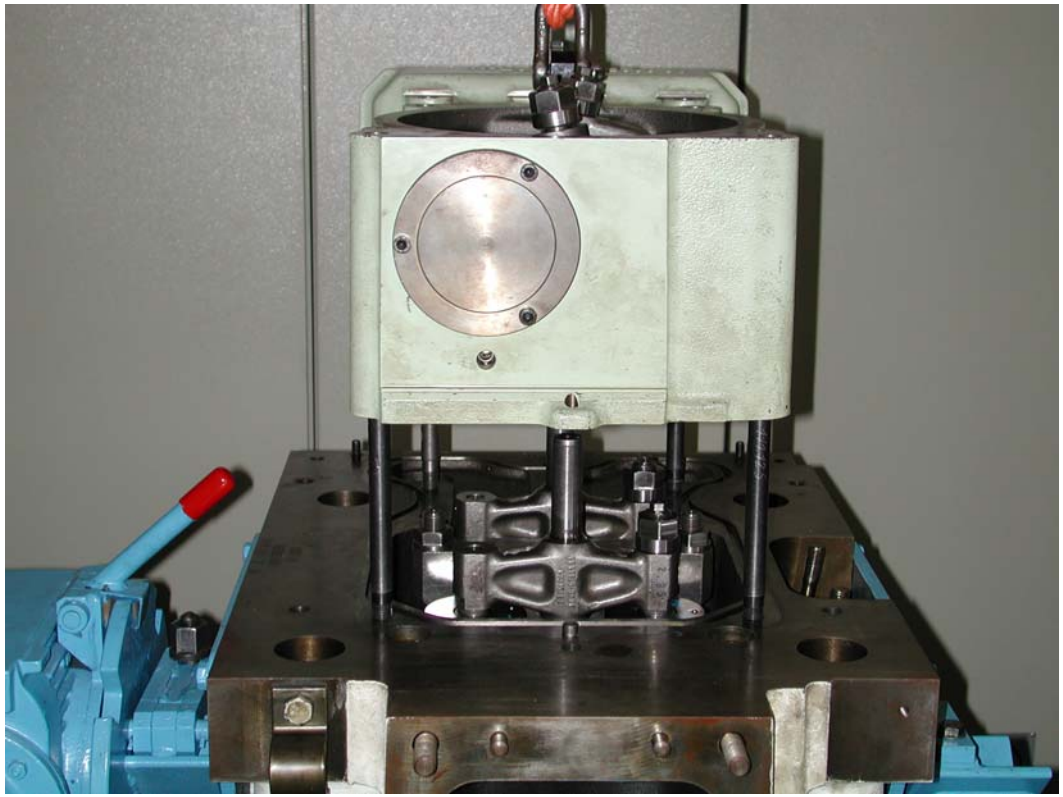
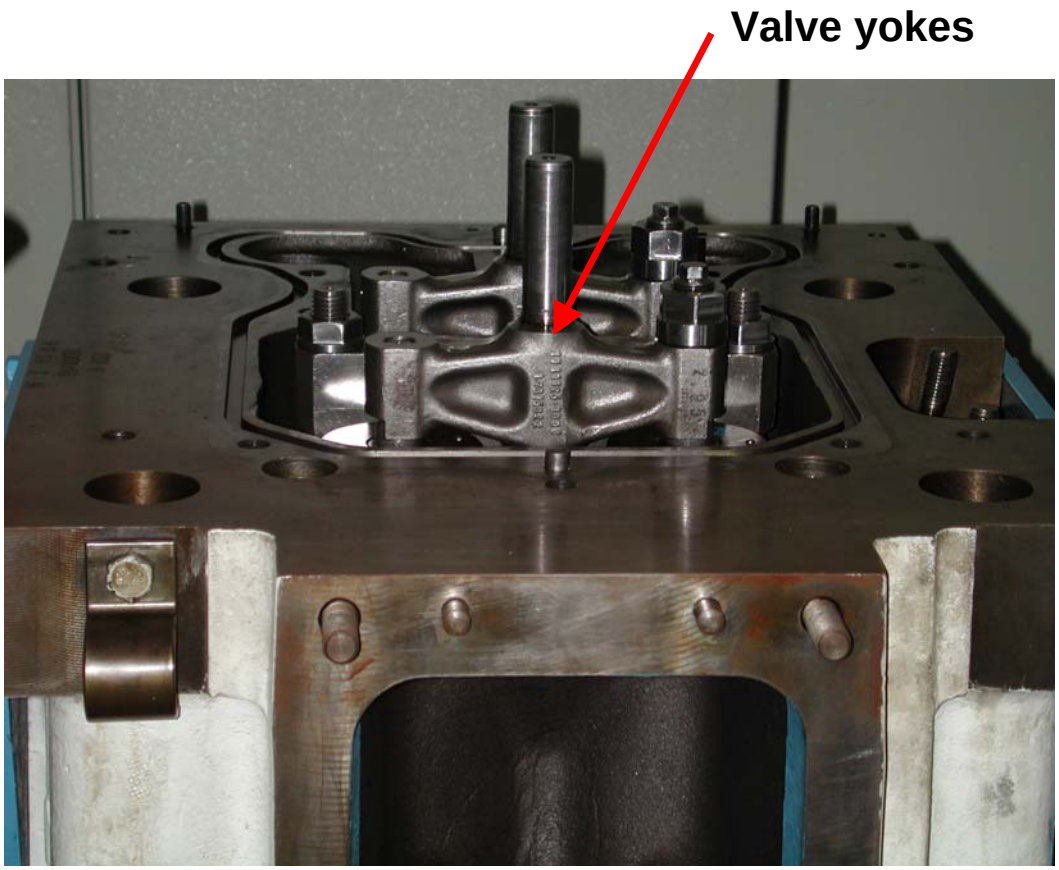
Lifting rocker arm casing



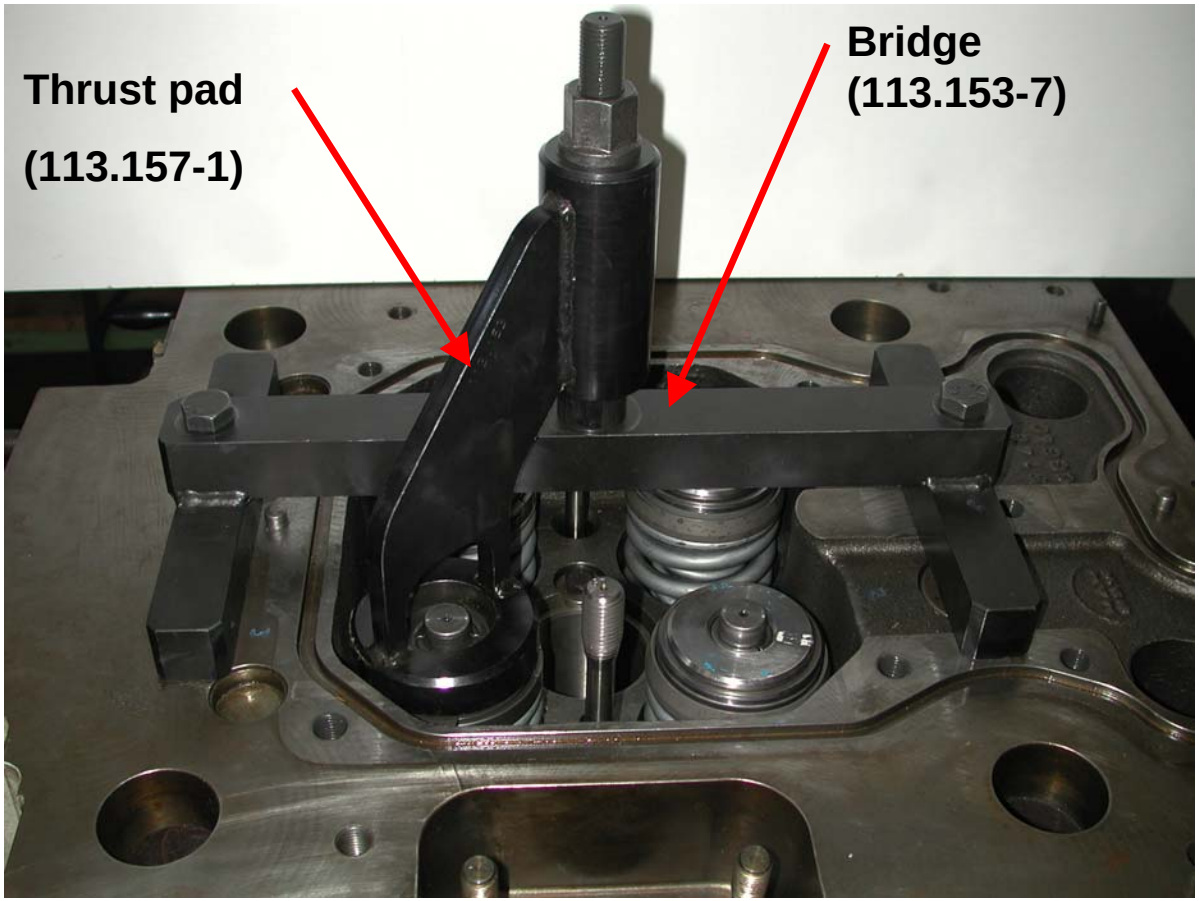
Carefully lift the rocker arm casing ,taking note of the valve jokes and put it down onto a wooden pad.

Removing valve yoke



After Dismantling of the rocker arm casing you can remove the valve yokes.

Removing exhaust and inlet valve



Attach the bridge and the Thrust pad on the cylinder head.

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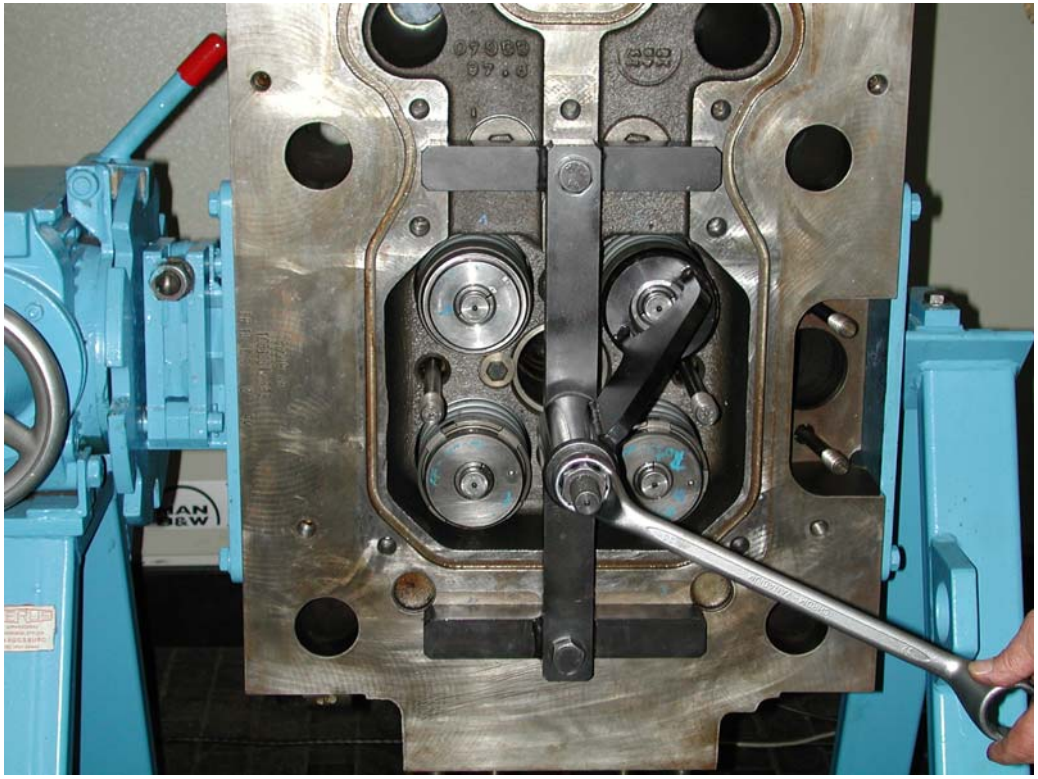
Removing the collet



- Depress the thrust pad by turning the hexagon ,thus preloading the compression springs sufficiently for removing the collet

Take off valve rotator or thrust bearing

After releasing the thrust pad , you can remove the valve rotator or thrust bearing together with the two compression Springs.

Exhaust valve

Exhaust valve cone with Propeller / Compression spring with Thrust bearing

Thrust Bearing

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Thrust Bearing dismantled

The Thrust bearing can be dismantled in a bench vice , with an Hammer and a copper bolt

Attention ! Never pack the valve rotator with grease!

Therefore you should use oil!

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Inlet valve

On the Inlet valve is no propeller , in this case the Valve rotator is in charge for turning the valver during operation.

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Dismanteling Valve Rotator

Remove the circlip

Dismanteling Valve Rotator

Remove the cover

Dismanteling Valve Rotator

Remove the disk spring , balls and compression springs from the main body

Assembling Valve Rotator

Insert bearing balls and compression springs in the ball –pocket

Raceways located in the main body

Attention! Make sure that the balls are at the highest point of the slanting ball-pocket raceways,and thus all in the same direction

Assembling Valve Rotator

Insert the disk spring

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Assembling Valve Rotator

Put on the cover and install the circlip

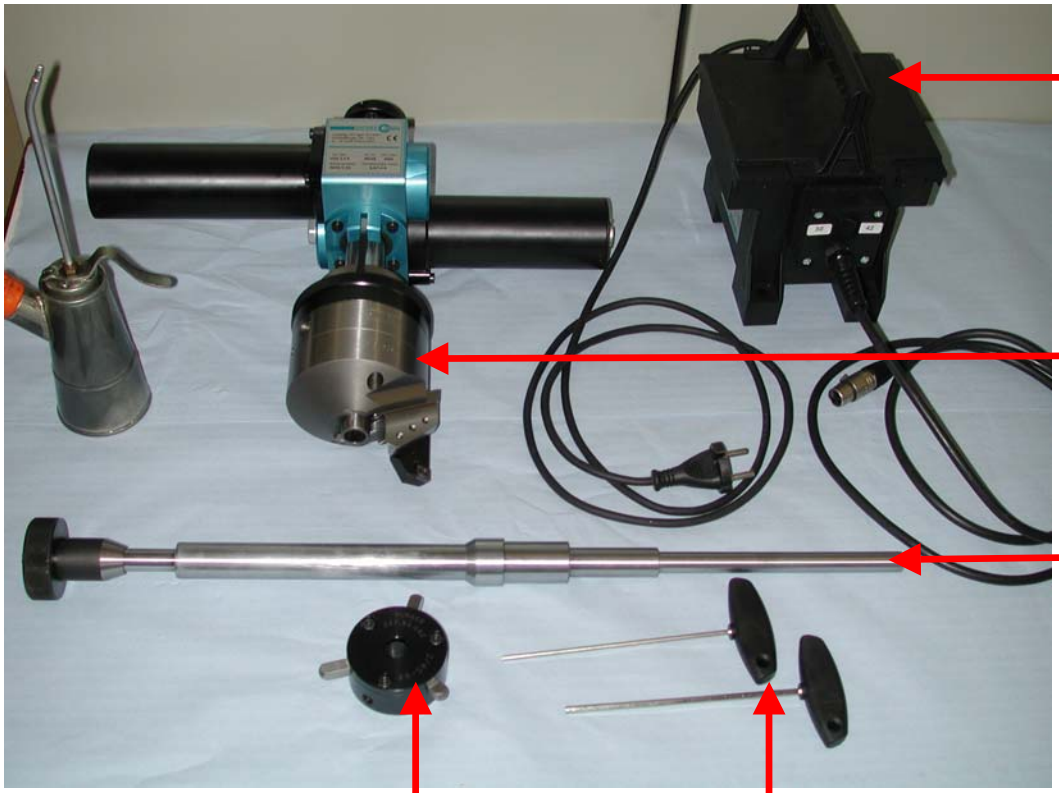
Removing valve cone

After the collet , bearing and compression spring has been removed ,you can remove the valve cone

O-Ring valve guide

Remove the O-Ring of the valve guide and clean the guide thoroughly

Lathe machine for valve seat



Power Supply Unit

Turning machine with head

Pilot

Centring Spider

Hexagon Screw driver

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Removing coke residues

Using the milling cutter to remove the coke residues from both sides of the valve guide. (Bearing surface for the pilot)

Using the milling cutter

Pilot

Before putting the pilot in positon mount the centring spider on the pilot and tighten the clamping screw

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Insert the Pilot

Insert the Pilot from the combustion chamber side , while doing so push the spring loaded pins inside and place the pilot in the cylinder head. Screw nut onto the pilot. Fix the spring loaded pins in place by using the clamping screw.

Moisten the Pilot

Moisten the shaft and the front surface of the pilot by a few drops of machinery oil

Place the Lathe machine in Position

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Lower Lathe machine

Open the clamping screw and lower the Lathe machine approx. in the center of the seat surface

Starting Position

Swivel arm is disengaged , slightly lift the machine and turn on the outer ring until the cutter plate is on the inside surface of the valve seat

Swivel Arm

Make sure the swivel arm has engaged in the groove provided in the cross- feed setting ring

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Depth feed setting ring

Turn the depth-feed setting ring anti – clockwise . In this connection one scale mark corresponds to depth feed of 0,025mm

Starting Position

Starting Position of the turning machine

Cutting oil

Before starting the machine put some cutting oil on the valve surface

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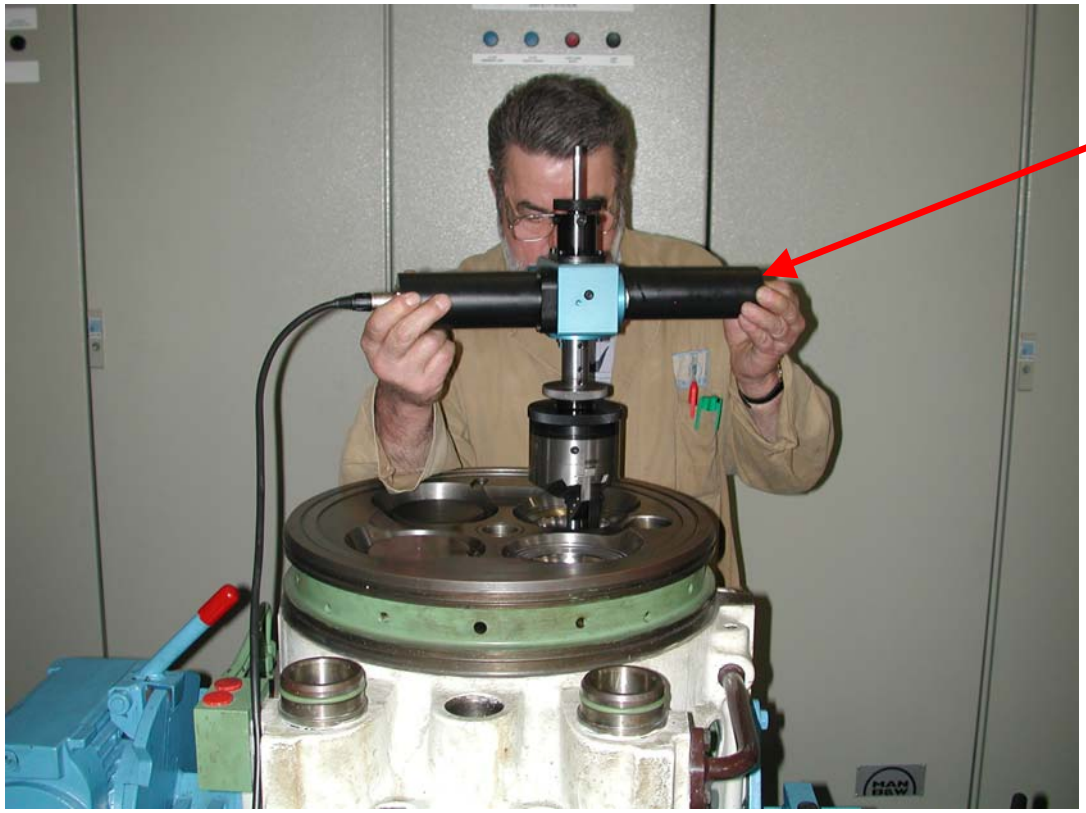
Start turning



Hold the turning machine with both hands , and start the cutting pass by depressing the push button.

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Further details

- Repeat the steps with the feed adjusted in the range from 0,05-0,1mm until the valve seat to be machined is bright all over

- Using a coloured pencil , apply markings at several points of the valve seat, and carry out the last cutting pass as follows:
  Depth feed: one scale mark (0,025mm)
  Switch the speed switch on the power supply unit over to „42Volt“ position

- Take the turning machine off the pilot and remove the pilot

Further details

- Take care of the maximum admissible remachining of the valve seat . (see work card 113.06-02E page 06/06)
  If the the maximum value is reached already , you have to install a new valve seat ring (see work card . 113.04)

- Carry out a touching test (see next foil slide)

First Class Service

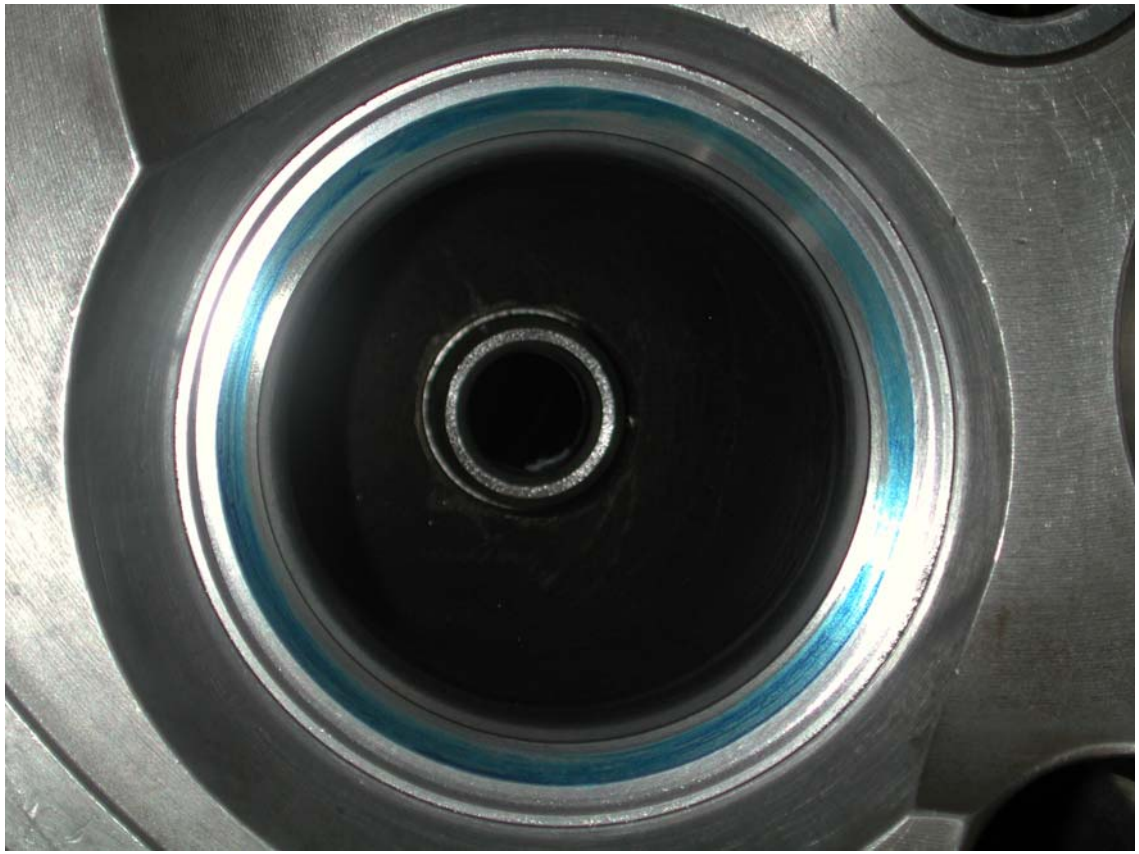
Touching Test

Fasten the touching bow to the valve cone .Apply a uniform film of ink as thin as possible to the valve set of the valve cone

Touching Test

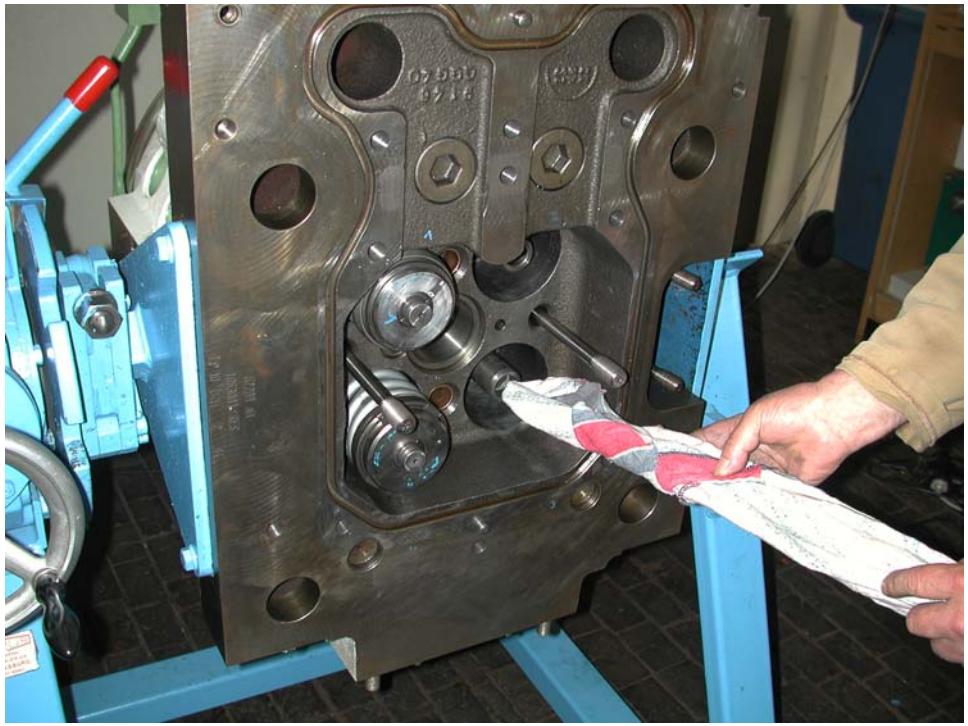
Slide the valve cone into ist valve guide and turn it by half revolution in vertical position and under pressure, using the touching bow.

Finale Check



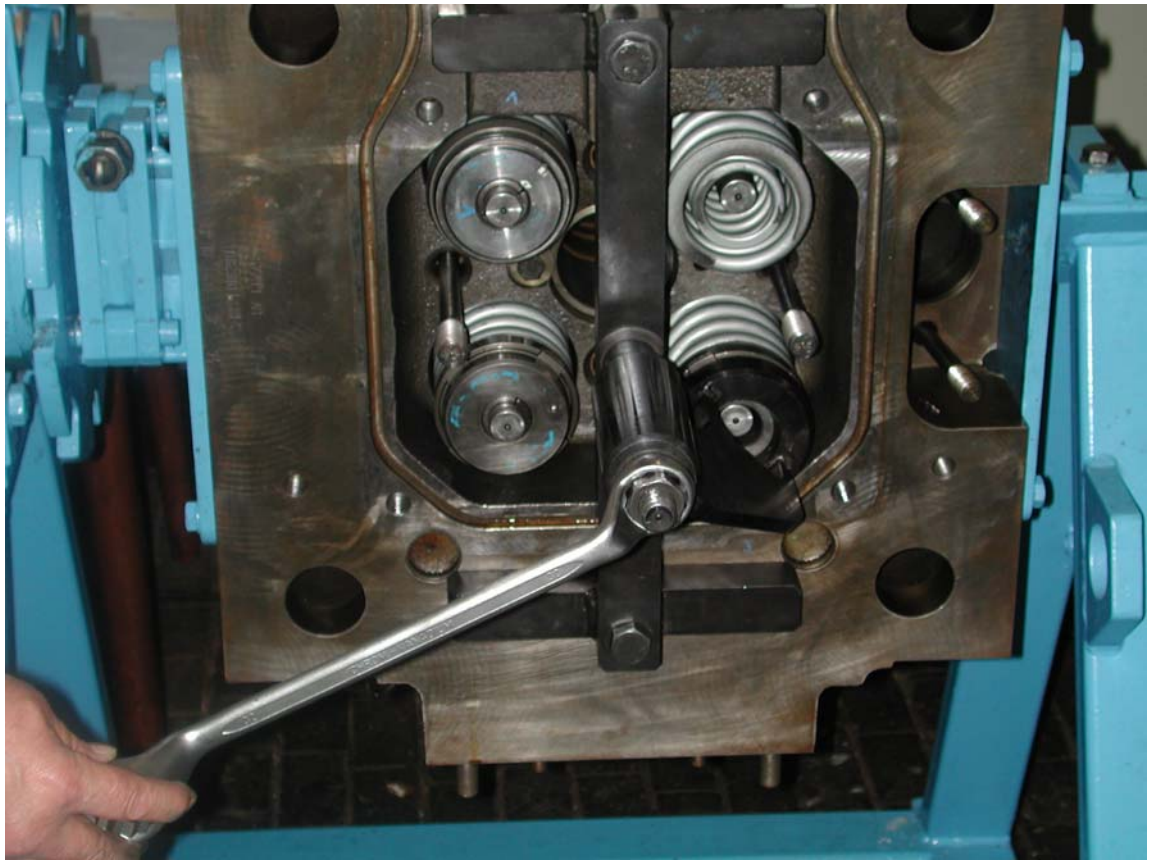
There must be a continous bearing zone at the external margin of the valve seat

Installing valve cone



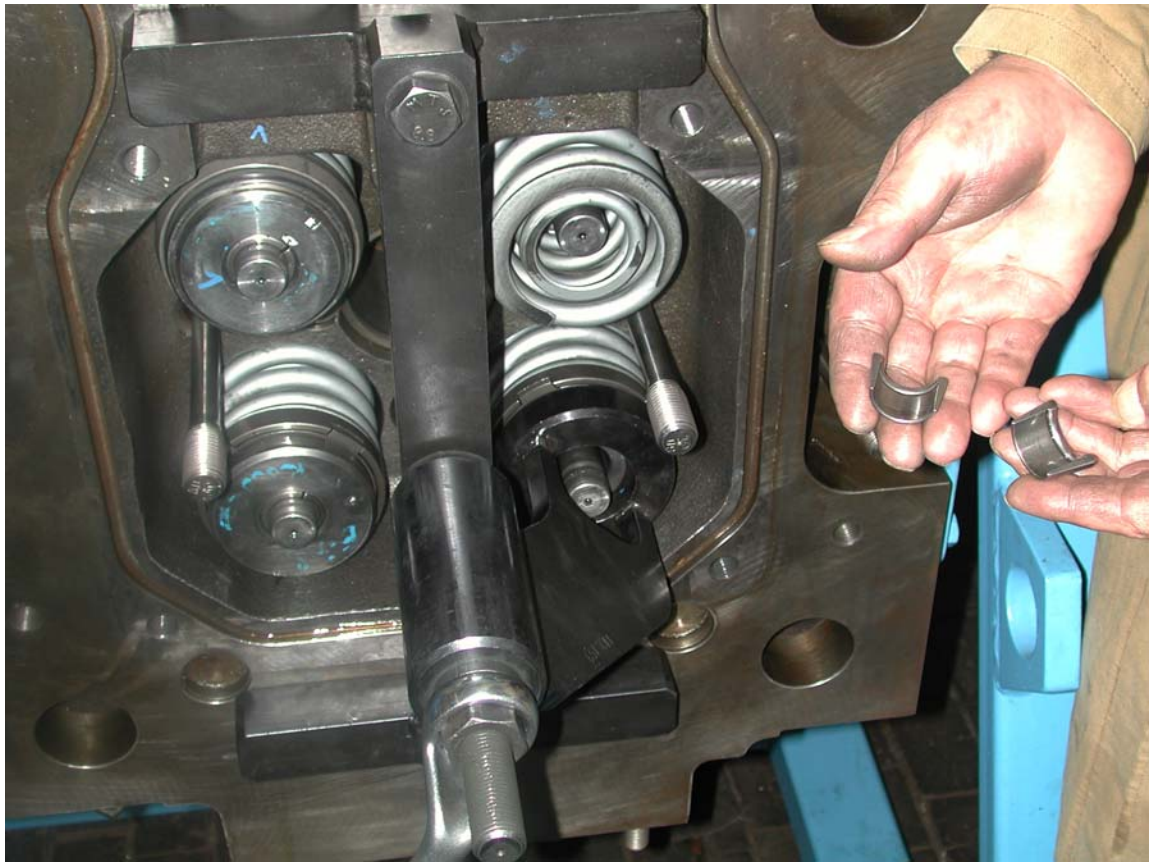
Clean the boreholes in the valve guide and the valve seat ring,and always use a new O-Ring in the valve guide

Fit the compression spring



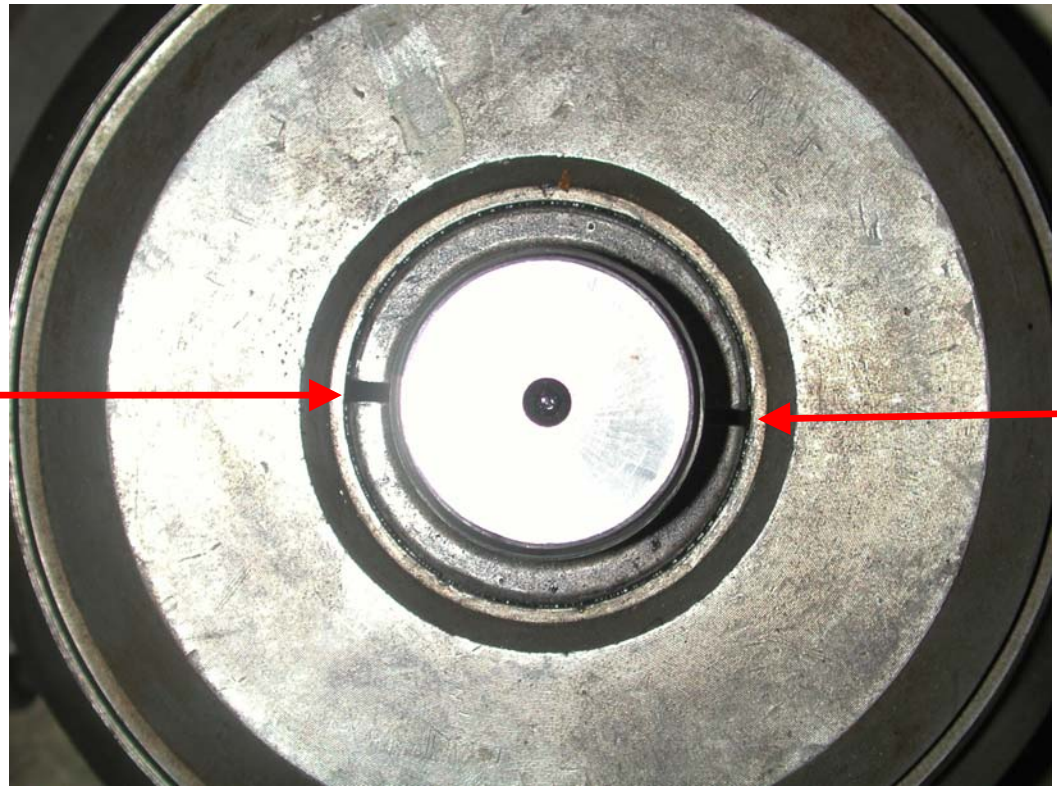
Fit the compression spring into the cylinder head and place the valve rotator or thrust bearing on the compression springs

Insert the collets



Depress the thrust pad by turning the hexagon nut , thus preloading the compression spring sufficiently for assembling the collets

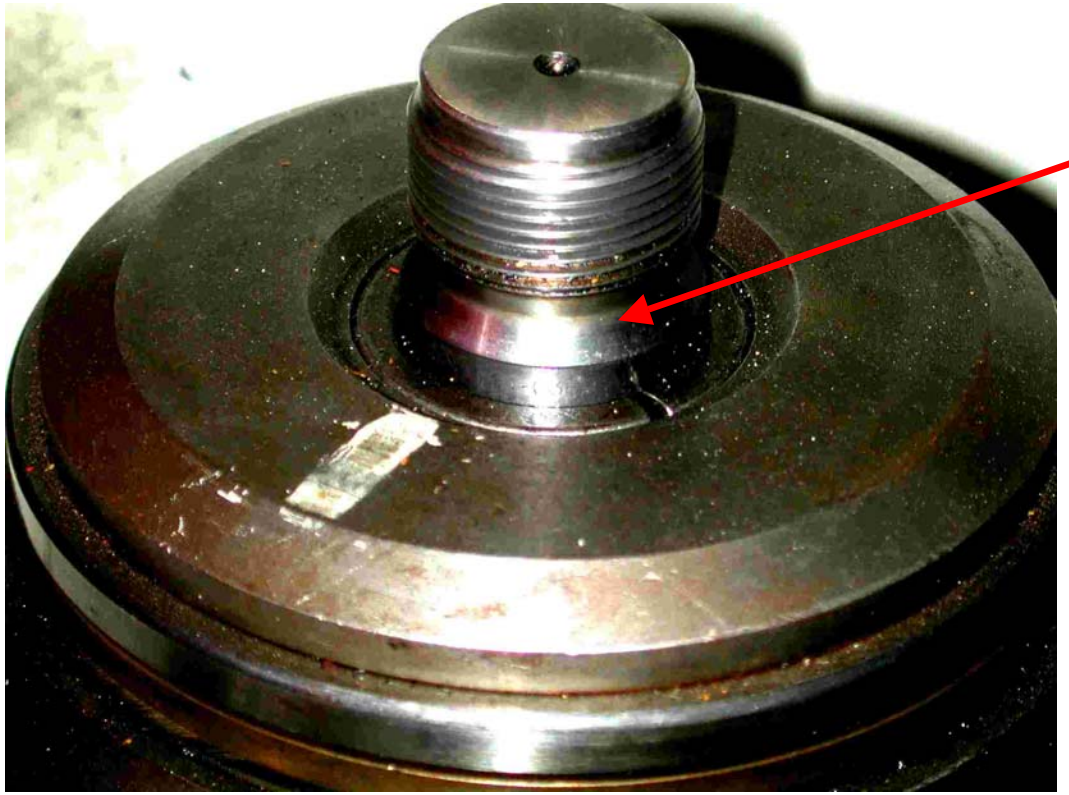
Installing the collet



Attention! Before unloading the compression springs, check that the two-part collet is insert properly, and the gap between the two parts is uniform

First Class Service

Installing the collet



Attention : Don`t place the collets on the thread runout!!!

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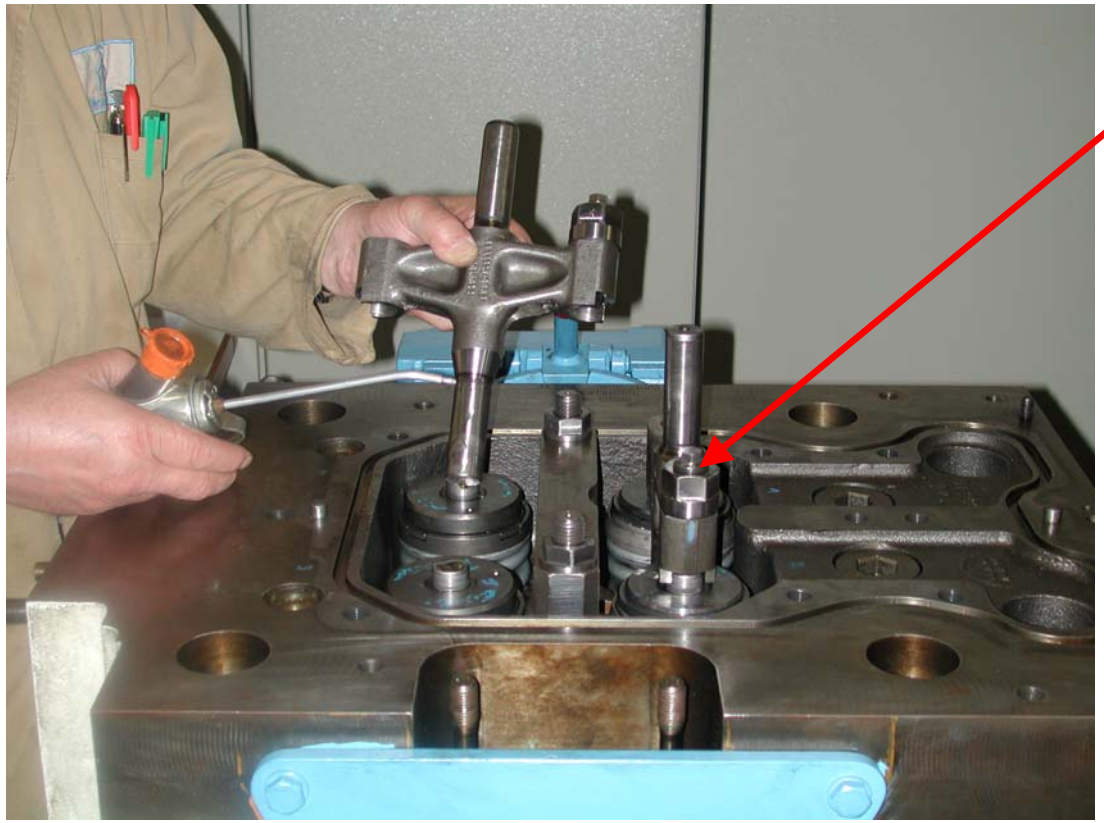
Fitting the valve yokes



Place both valve yokes in the Cylinder head

Setting screws with nut pointing towards the coupling end

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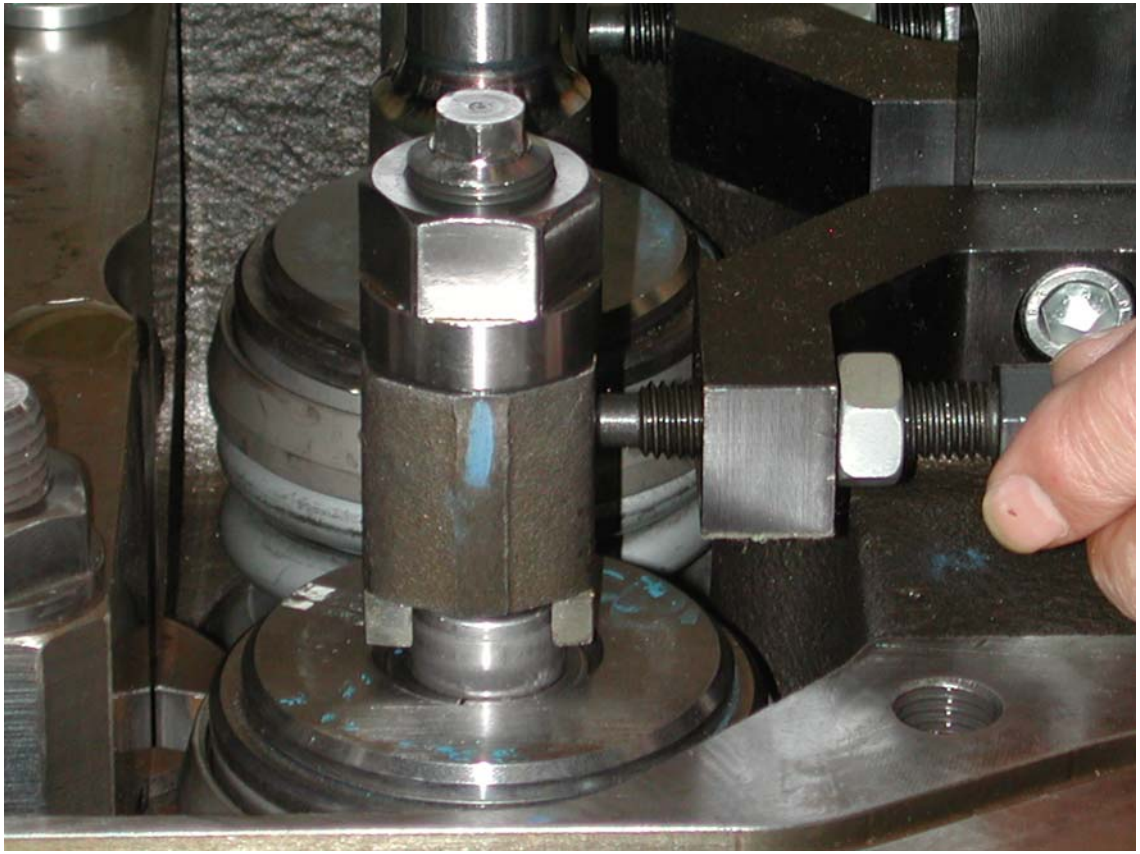
Setting tool

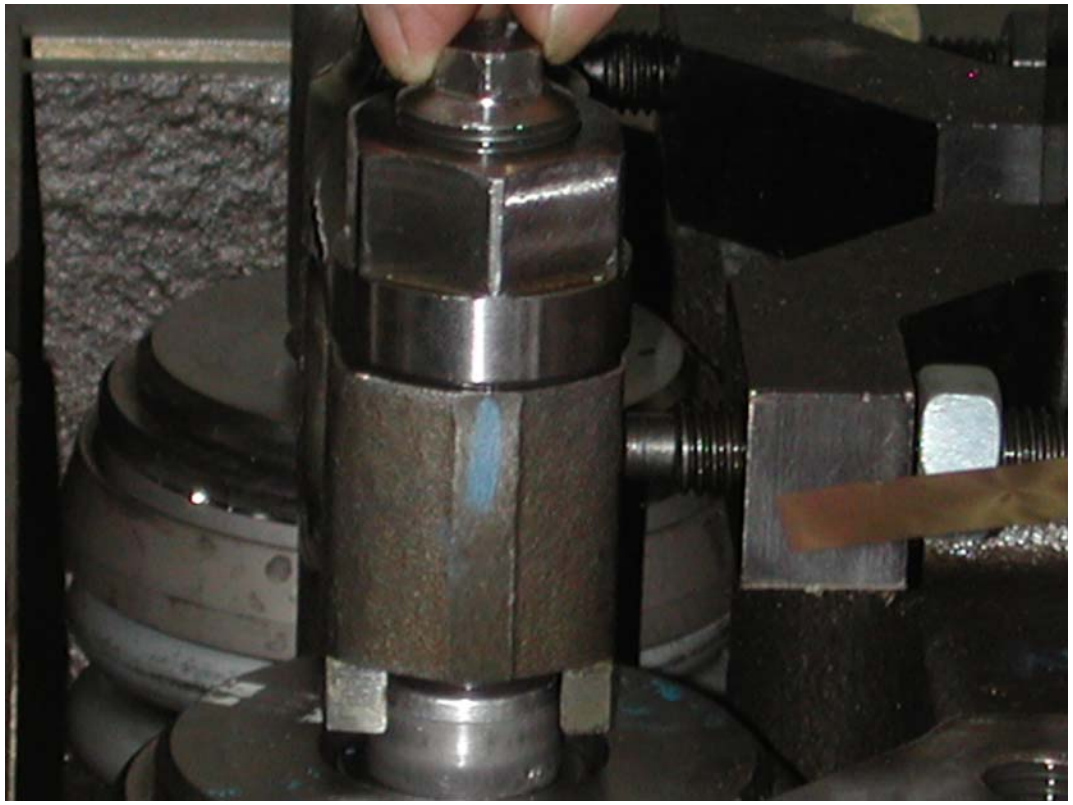
Attach the setting device (111.126) to the cylinderhead

Attach hexagon bolts



Turn the hexagon bolts until they contact the the valve yokes and secure the hexagon nuts

Adjust setting screw



Snugly place the thrust pad onto the valve cone. Screw in the setting screw until it also snugly contacts the valve cone. Tighten the nut by specified torque.

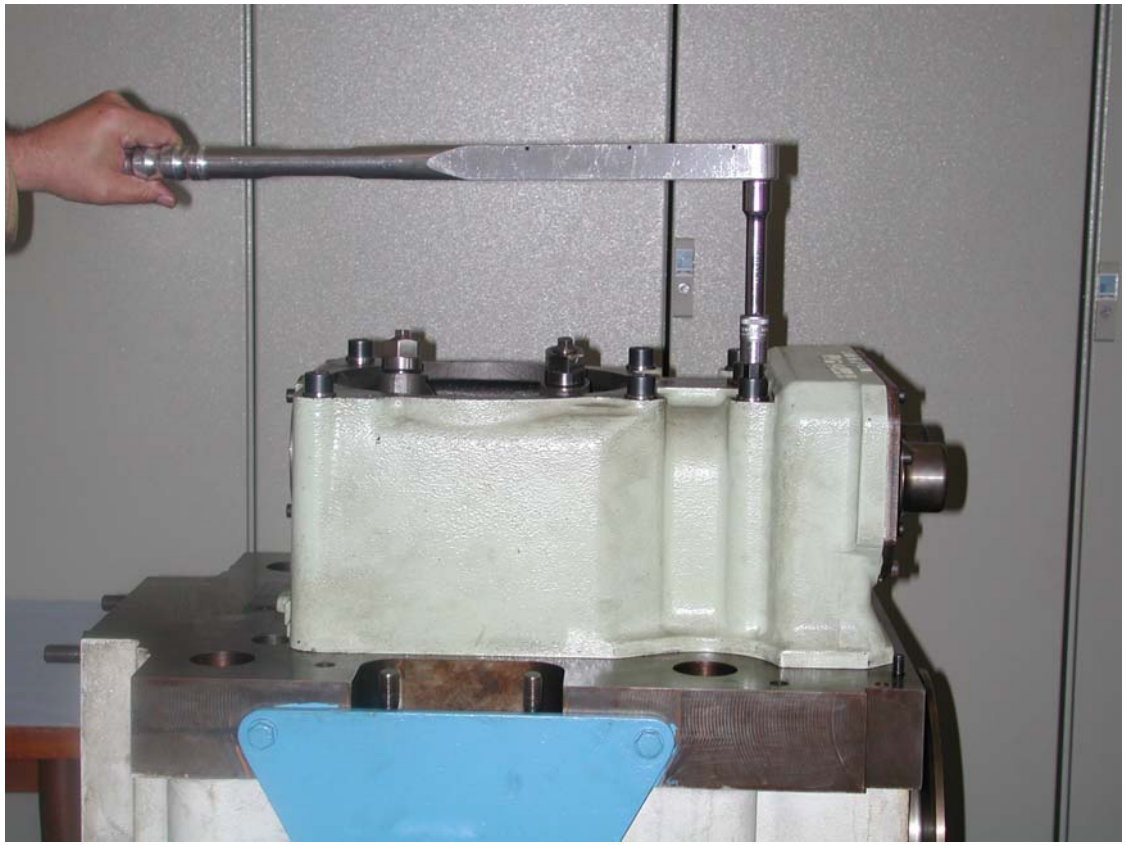
(see work card 000.30)

First Class Service

Mount the rocker arm casing

Carefully lower the rocker arm casing , making sure that the guide rods engage in the guide bores to avoid that the valve yokes become tilted during inserting.

Tighten the rocker arm casing



Tighten the rocker arm casing to the specified torque.

(refer to work card 000.30)

Thank you

Thank you for your attention . I hope this small presentation will be helpful by doing your maintenance job in the future.

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First Class Service