



**Alberti®**

**SLIMLINE ANGLE HEADS**



**SLIMLINE**

**INSTRUCTION  
BOOK**

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## **SAFETY RECOMMENDATIONS**

- Do not touch or hold anything near the angle head when it is running or rotating in any manner.
- When the angle head is mounted in the machine spindle or in its tool magazine, be sure it is not hot and that spindle rotation is locked before handling it in any way.
- When the angle head is to be used, ensure its drive taper is correctly mated to the machine spindle, that the arrester arm and block engage fully and properly, and that the cutting tool is clamped tightly before engaging machine spindle drive.
- Make sure the cutting tool is designed to run in the same direction as the NSK output spindle rotation (clockwise - same direction as the machine tool spindle rotation).
- Use caution during set-up of the angle head. Angle heads are relatively heavy and can cause personal injury if dropped or mishandled.

## **AUTOMATIC TOOL CHANGER**

- Check Auto Tool Changer (ATC) speed and manually check loading and unloading of the tool into the machine tool spindle before running the machine in automatic cycle.
- Every 40-50 hours, check the release pin mechanism inside the arrester pin to be sure it moves freely and performs without obstruction.

## **SLIMLINE NSK TOOL INFORMATION**

- NSK IC-300, KC-300, MFC-300M, and MFC-300S tools are through hole type tools. The heads of these tools are not sealed, so it is possible that coolant and chips might eventually enter at the rear of the heads. IC, KC, and MFC series NSK tools use bronze bushings instead of ball bearings and should be used in light duty applications only.
- NSK RA-100 and RA-200 tools utilize ball bearings and feature a completely sealed head section. These tools are suitable for use in medium duty applications.
- The threaded input of NSK tools is not qualified to the output. To ensure accurate positioning, install the NSK tool in the Slimline angle head, clamp a ground mandrel in the NSK collet and use a dial gauge to check for precise position.
- The gears on NSK tools are not designed to withstand high axial thrust.
- A weekly visual inspection and cleaning of the NSK tool is recommended.
- Always use cutting tools with precise shanks to ensure proper tightening of the collet and minimal tool runout. It is recommended to gradually increase the RPM to operating speed when using a tool for the first time.
- For extended reach machining a CN-01 extension spacer may be used.

## TOOL RUN-IN

A short run-in of the tool is required to distribute the lubrication, to check that all components are functioning correctly, and to ensure that the retaining block is mounted correctly. The head will run hotter than normal during the first few hours of operation. Tool temperatures of up to 70°C (158°F) are acceptable if not associated by abnormal tool noise.

Prior to initial use of this tool, it is necessary to perform the following run-in procedure:

1. Run tool at 500 RPM for 20 minutes, then stop and wait 10 minutes.
2. Run tool at 1,500 RPM for 15 minutes, then stop and wait 10 minutes.
3. Run tool at 2,000 RPM for 15 minutes, then stop and wait 10 minutes.
4. Run tool at 3,000 RPM for 5 minutes.

Run-in procedure is complete.

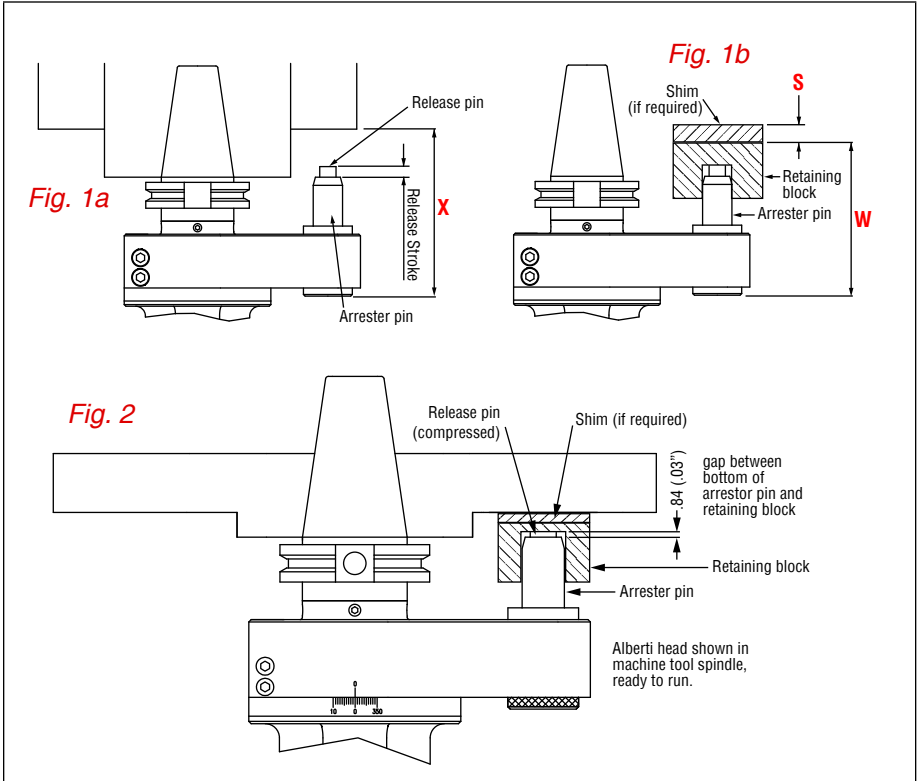
## DETERMINING THE RETAINING BLOCK THICKNESS

Use the following procedure to locate the retaining block so that the axial stroke of the release pin is exactly  $5^{+0.5\text{ mm}}$ .

1. Mount the angle head in the machine tool spindle and measure dimension **X**. (Fig 1a)
2. Remove the angle head from the machine tool spindle and slip the retaining block on the arrester pin.
3. Measure dimension **W** without pressing the release pin. (Fig 1b)
- 4<sup>a</sup>. If dimension **W** is less than dimension **X**, prepare a shim with thickness as below:  
$$S = (X - W + 5\text{mm})^{+0.5\text{mm}}$$
- 4<sup>b</sup>. If dimension **W** is greater than dimension **X**, machine the thickness of the retaining block as below:  
$$W = (X + 5\text{mm})^{+0.5\text{mm}}$$
5. Make sure the spring loaded release pin is depressed  $5\text{mm} \pm 0.5\text{ mm}$  when the angle head is mounted in the machine tool spindle to allow free rotation of the angle head spindle.
6. Make sure the bottom of the arrester pin does not come in contact with the bottom of the retaining block. (Fig 2)



# DETERMINING THE RETAINING BLOCK THICKNESS



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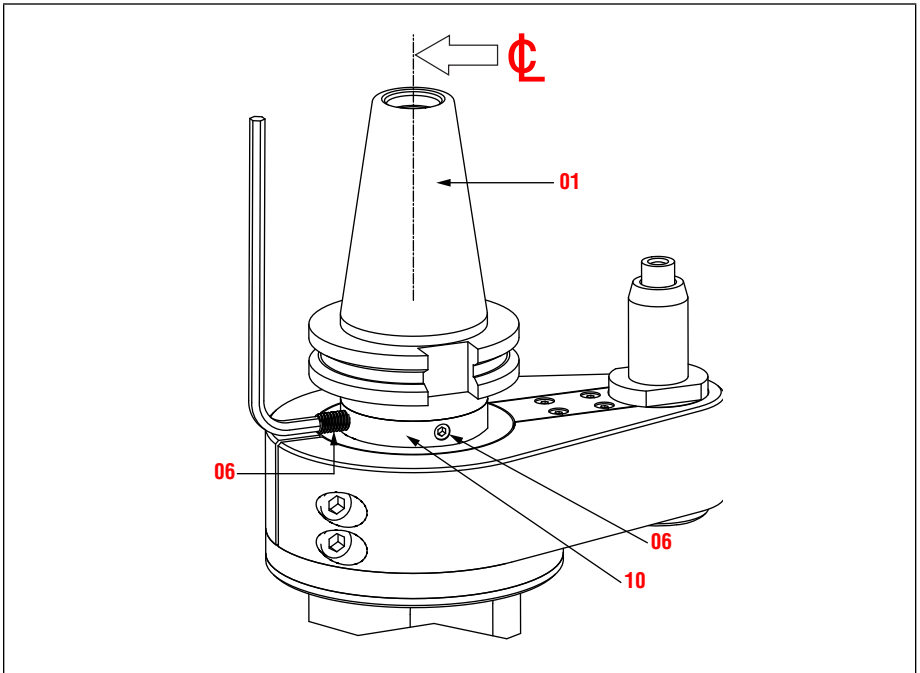
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## MOUNTING RETAINING BLOCK • ORIENTATION OF ARBOR

To locate the retaining block at the correct distance from the spindle center line and to assure the correct orientation of the arbor with reference to the arrester pin, use the following procedure:

1. Secure the retaining block by slightly tightening the mounting screws.
2. Loosen set screws **06** one turn and fit the head into the machine spindle (make sure that the arrester pin slips in easily).
3. Fully tighten the mounting screws of the retaining block.
4. Remove and carefully clean set screws **06**.
5. Check whether the collet chuck is properly oriented for tool change.
6. Put a few drops of Loctite 242e or equivalent on the threads of set screws **06** then tighten set screws **06** on orientation ring **10**.
7. Unload and load the head several times with the automatic tool changer to check for correct operation.
8. Dowel the retaining block to the machine tool to prevent any shifting.

**ATTENTION:** During the first automatic tool change, make sure that the angle head does not interfere with other components of the system.



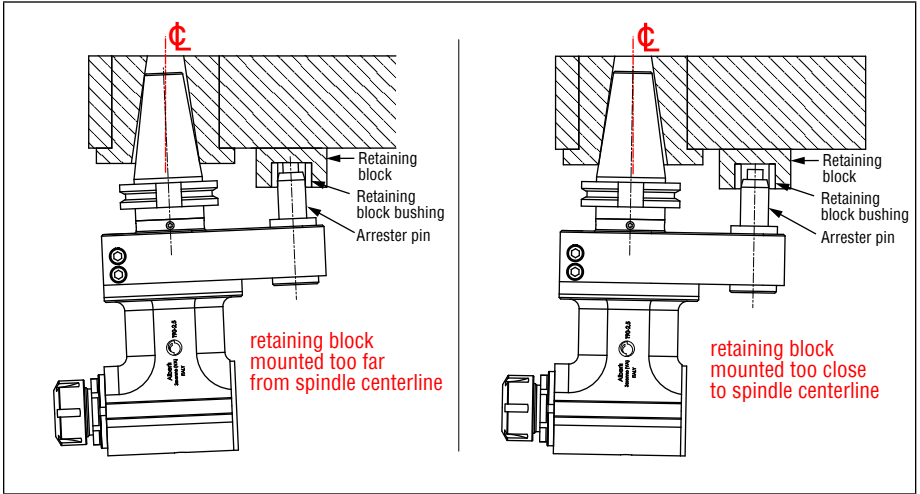
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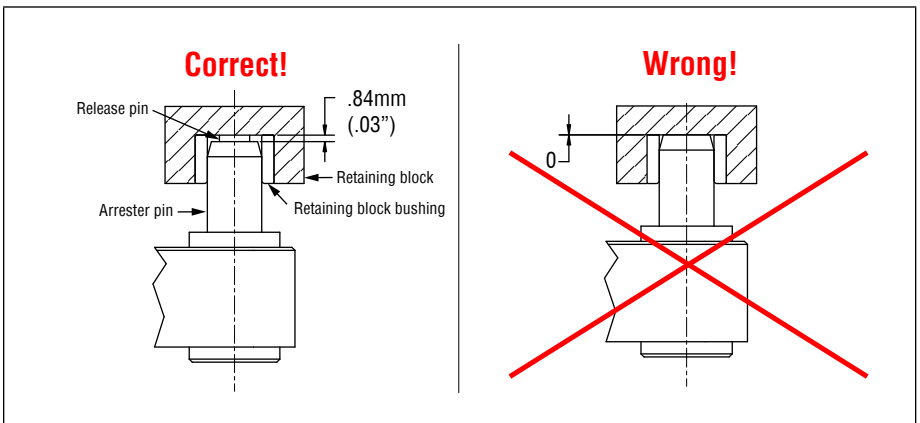
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# RETAINING BLOCK MOUNTING ERRORS

If the distance from the machine tool spindle centerline and the centerline of the retaining block bushing is not correct, the arrester pin on the angle head will not seat properly in the retaining block bushing. This will result in the conditions shown below, causing damage to the angle head bearings.



If the release pin (in the arrester pin) is completely compressed against the bottom of the retaining block, the shank of the angle head will not seat properly in the machine tool spindle, causing damage to the angle head bearings. The .84mm/.03" gap between the bottom of the arrester pin and the retaining block must be met in order for the angle head shank to seat properly in the machine tool spindle (see page 3).



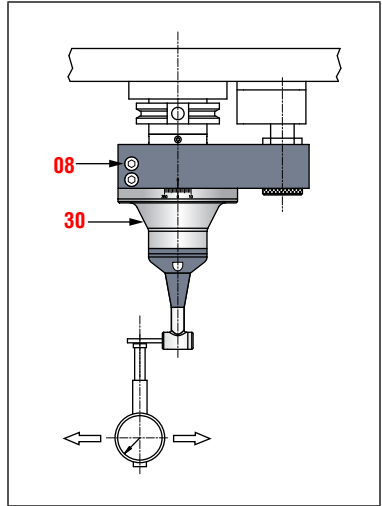
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## RADIAL POSITIONING OF SLIMLINE ANGLE HEADS

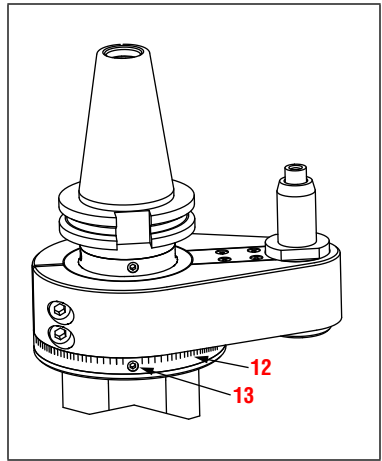
To position the angle head body radially around the Z axis of the machine tool, use the following procedure:

1. Mount the angle head on the machine.
2. Loosen screws **08**.
3. Rotate angle head body **30** to the required position.
3. Clamp a ground mandrel in the collet of the NSK output and use a dial gauge with a flat point to check for precise position.
5. Tighten screws **08**. Suggested screw torque 8-10 Nm (5.9-7.4 ft.lbs.). Do not use an extension for the Allen wrench.



## RE-SETTING

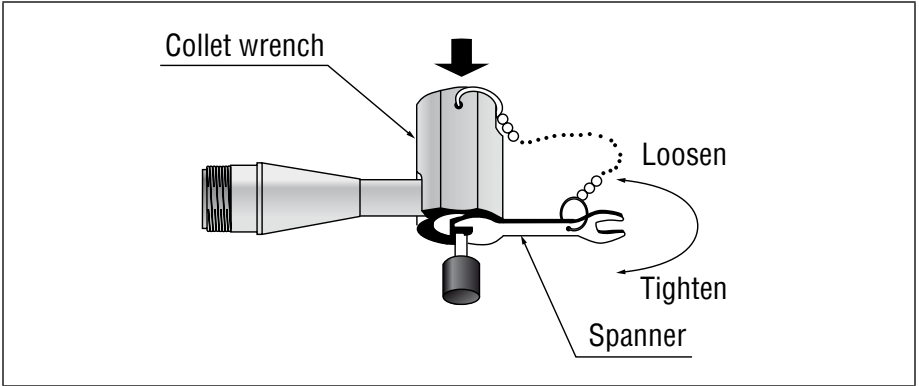
When the head is correctly oriented and positioned, graduated ring **12** can be reset. Loosen screw **13** and rotate the ring until the zero coincides with the reference notch in the indexing flange. Re-tighten screw **13**.





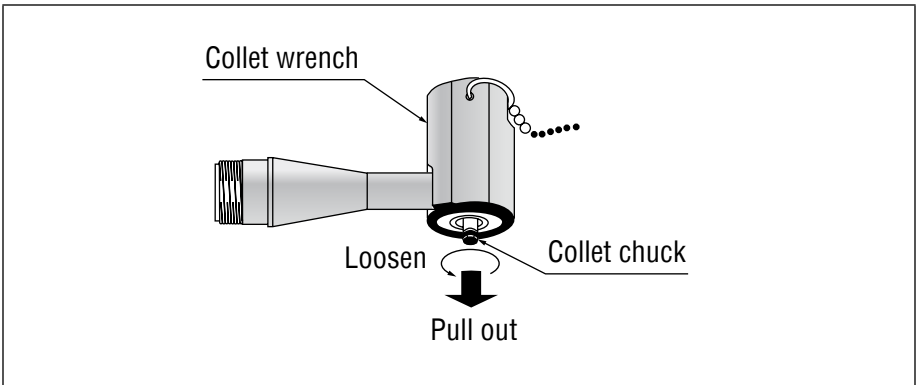
## MOUNTING A CUTTING TOOL • IC-300 • KC-300

Attach the collet wrench provided onto the head of the attachment. Apply light pressure to the head of the collet wrench. Place the spanner wrench on the chuck and turn it slowly counter-clockwise. The collet wrench will engage within 90° of wrench rotation. Keep turning the spanner wrench until the tool can be removed. When mounting a cutting tool, rotate the spanner wrench clockwise to tighten the tool firmly.



## REPLACING THE COLLET CHUCK • IC-300 • KC-300

After the cutting tool is removed, rotate the collet chuck counter-clockwise with fingers until the collet chuck is disconnected. Remove the collet chuck. To replace, insert a new collet chuck and screw in a clockwise direction.



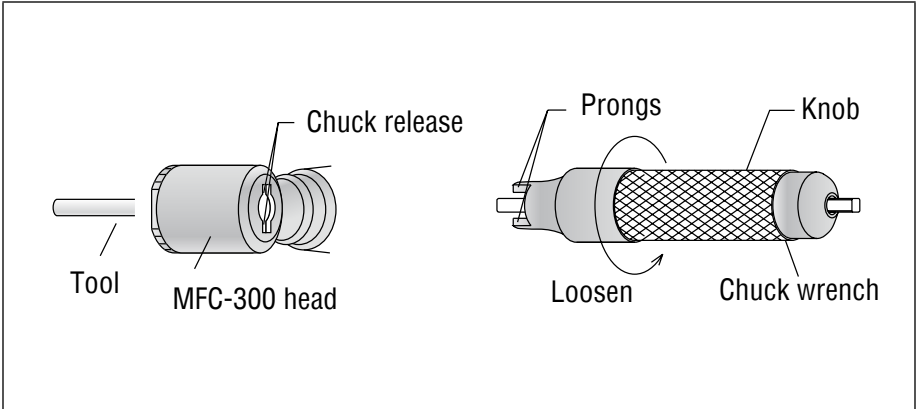
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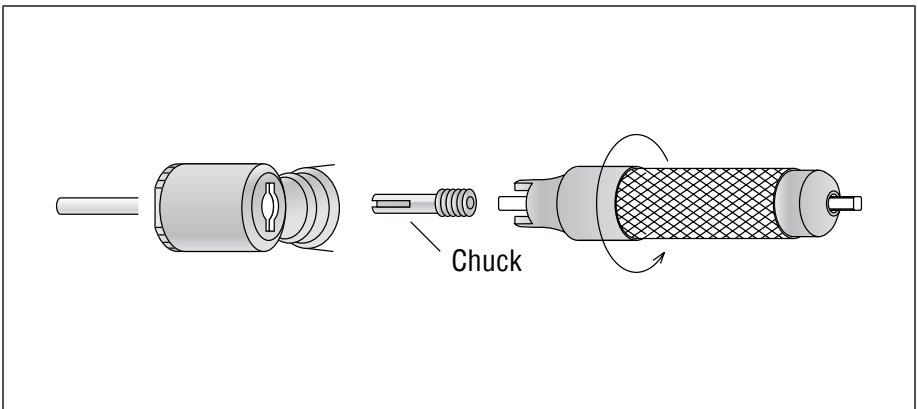
## MOUNTING A CUTTING TOOL • MFC-300S • MFC-300M

Insert the chuck wrench into the back of the angle head and rotate the knob then turn counter-clockwise to release the tool. Insert a new tool inside of the chuck and turn the knob of the chuck wrench clockwise to fix the tool.



## REPLACING THE COLLET CHUCK • MFC-300S • MFC-300M

Once the tool is removed, insert the knob into the back of the spindle and turn it counter clockwise to remove the chuck. Insert the new chuck into the spindle and turn the knob, located in the back of the spindle, clockwise until the collet is completely screwed in.



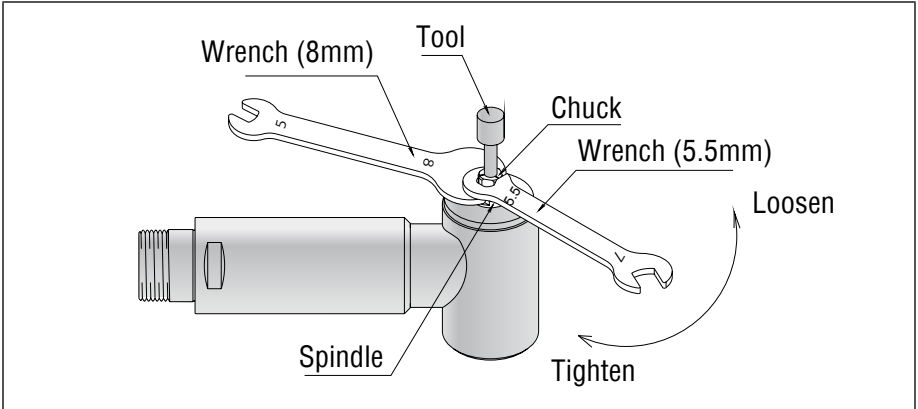
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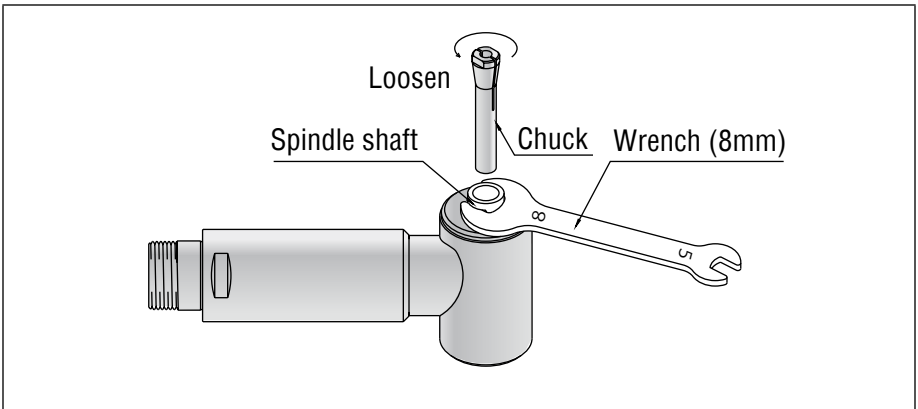
## MOUNTING A CUTTING TOOL • RA-100 • RA-200

Set the provided 8mm wrench on the spindle. Place the provided 5.5mm wrench on the chuck and turn it counter-clockwise to loosen the collet and remove the cutting tool. Insert the new tool and tighten the collet by turning clockwise.

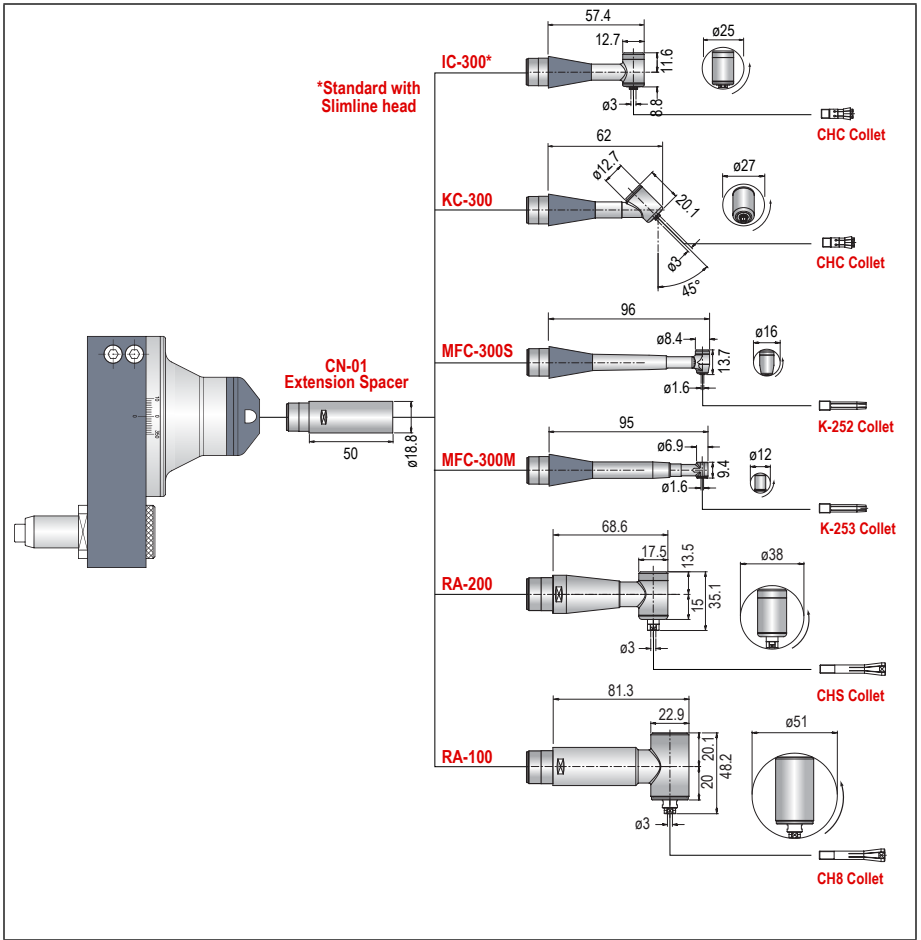


## REPLACING THE COLLET CHUCK • RA-100 • RA-200

Remove the cutting tool using above instructions. Use the provided wrench to hold the spindle in place and remove the collet by turning it counter-clockwise by hand.



# SLIMLINE/NSK TOOLING CHART



# NSK TOOL TECHNICAL INFORMATION

TECHNICAL DATA	IC-300	KC-300	MFC-300S	MFC-300M	RA-200	RA-100	CN-01
Ratio	1:3/4	1:3/4	1:1	1:1	1:1.5	1:2.67	1:1
Max. NSK Output RPM	15,000	15,000	15,000	15,000	13,330	7,490	15,000
Torque	.74 ft lbs	.74 ft lbs	.74 ft lbs	.74 ft lbs	2.95 ft lbs	2.95 ft lbs	-
NSK Collet	CHC	CHC	K-252	K-253	CHS	CH8	-



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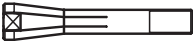
# COLLETS

## CHC (for IC-300, KC-300)



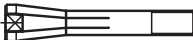
Model	Inside Diameter (mm)
GP-59071-00	1.0
GP-59018-00	1.2
GP-59072-00	1.4
GP-59020-00	1.5
GP-59021-00	1.6
GP-59022-00	1.8
GP-59023-00	2.0
GP-59024-00	2.35
GP-59015-00	3.0
GP-59010-00	3.175

## K-252 (for MFC-300S)



Model	Inside Diameter (mm)
GP-59025-00	1.6

## K-253 (for MFC-300M)



Model	Inside Diameter (mm)
GP-59026-00	1.6

## CHS (for RA-200)



Model	Inside Diameter (mm)
GP-59027-00	0.8
GP-59028-00	0.9
GP-59029-00	1.0
GP-59030-00	1.1
GP-59031-00	1.2
GP-59032-00	1.3
GP-59033-00	1.4
GP-59034-00	1.5
GP-59012-00	1.6
GP-59035-00	1.7
GP-59036-00	1.8
GP-59037-00	1.9
GP-59016-00	2.0
GP-59038-00	2.1
GP-59039-00	2.2
GP-59040-00	2.3
GP-59041-00	2.35
GP-59042-00	2.4
GP-59013-00	2.5
GP-59043-00	2.6
GP-59044-00	2.7
GP-59045-00	2.8
GP-59046-00	2.9
GP-59009-00	3.0
GP-59011-00	3.175

## CH8 (for RA-100)



Model	Inside Diameter (mm)
GP-59047-00	0.8
GP-59048-00	0.9
GP-59049-00	1.0
GP-59050-00	1.1
GP-59051-00	1.2
GP-59052-00	1.3
GP-59053-00	1.4
GP-59054-00	1.5
GP-59055-00	1.6
GP-59056-00	1.7
GP-59057-00	1.8
GP-59058-00	1.9
GP-59059-00	2.0
GP-59060-00	2.1
GP-59061-00	2.2
GP-59062-00	2.3
GP-59063-00	2.35
GP-59064-00	2.4
GP-59065-00	2.5
GP-59066-00	2.6
GP-59067-00	2.7
GP-59068-00	2.8
GP-59069-00	2.9
GP-59070-00	3.0
GP-59008-00	3.175



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## **WARRANTY**

All product lines sold by KOMA Precision Inc. carry a manufacturers guarantee of one year from the date of purchase. This warranty covers parts and labor due to defects in materials and workmanship. This warranty does not apply to any products that have been subject to misuse, neglect or accident. Products repaired by KOMA Precision Inc. will carry a 90 day warranty. Additional or extended warranty is available upon request for an additional fee.

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# NOTES



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