HEIDENHAIN

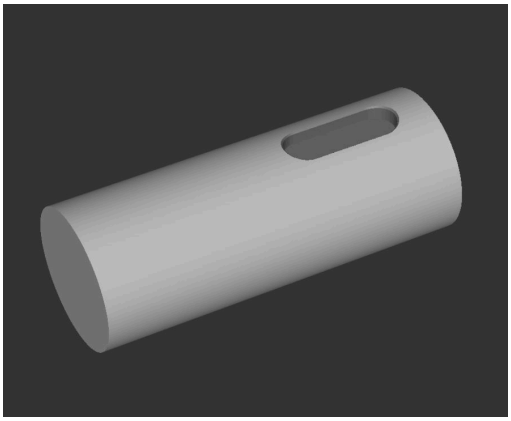
NC Solutions

Description of NC Program 5105

English (en)
5/2020

1 Description of NC program 5105_en.h

NC program for milling a keyway into a shaft and subsequently deburring it with a forming tool.



Requirement

Mill keyways into shafts. The slot widths and the shaft diameters of the individual products differ. In order to avoid rework, the slots should be deburred at the upper edge with a forming tool. However, the edge to be deburred depends on the slot width and the shaft diameter, meaning that simple contour programming is not possible.

NC program 5105_en.h

At the beginning of the program, define the blank form. Then the control calls the tool for milling the slot. In the subsequent Cycle 253 **SLOT MILLINGSLOT MILLING**, enter all parameters for milling the slot. Note that the preset must be set at the center of the shaft. Therefore, you have to define the shaft radius in parameter Q203 **SURFACE COORDINATE**.

After the cycle definition, the control pre-positions the tool to the middle of the slot. In the same NC block, it calls the machining cycle.

Then the control calls the tool for deburring the slot. In this **TOOL CALL** block, you use the values for **DL** and **DR** to define the contact point on the tooth of the forming tool.

Then the NC program 51051_en.h is defined as cycle.

In the next program section you must define all parameters required for deburring. These parameters are divided into two groups. You must always define the first group of Q parameters. If you conduct further machining processes between milling and deburring the slot, you must also define the second group of Q parameters. This is not the case in the example program. The NC blocks are therefore entered as comments. In this case, the control adopts the required values from Cycle 253. Subsequently, the control pre-positions the tool to the middle of the slot. With the cycle call, the control then jumps into the NC program 51051_en.h defined as cycle.

After the called NC program has been executed, the control returns to the main program. Then it retracts the tool in the tool axis and subsequently ends the NC program.

Required Q parameters

Parameter	Name	Meaning
Q201	DEPTH	Depth of the chamfer
Q222	SHAFT DIAMETER	Diameter of the shaft
Q200	SET-UP CLEARANCE	Incremental height to which the control positions the tool at rapid traverse before machining
Q204	2ND SET-UP CLEARANCE	Incremental height to which the control positions the tool at rapid traverse after machining
Q207	FEED RATE FOR MILLING	Traversing speed of the tool during milling

Q parameters that are only required if milling and deburring are not conducted immediately after one another.

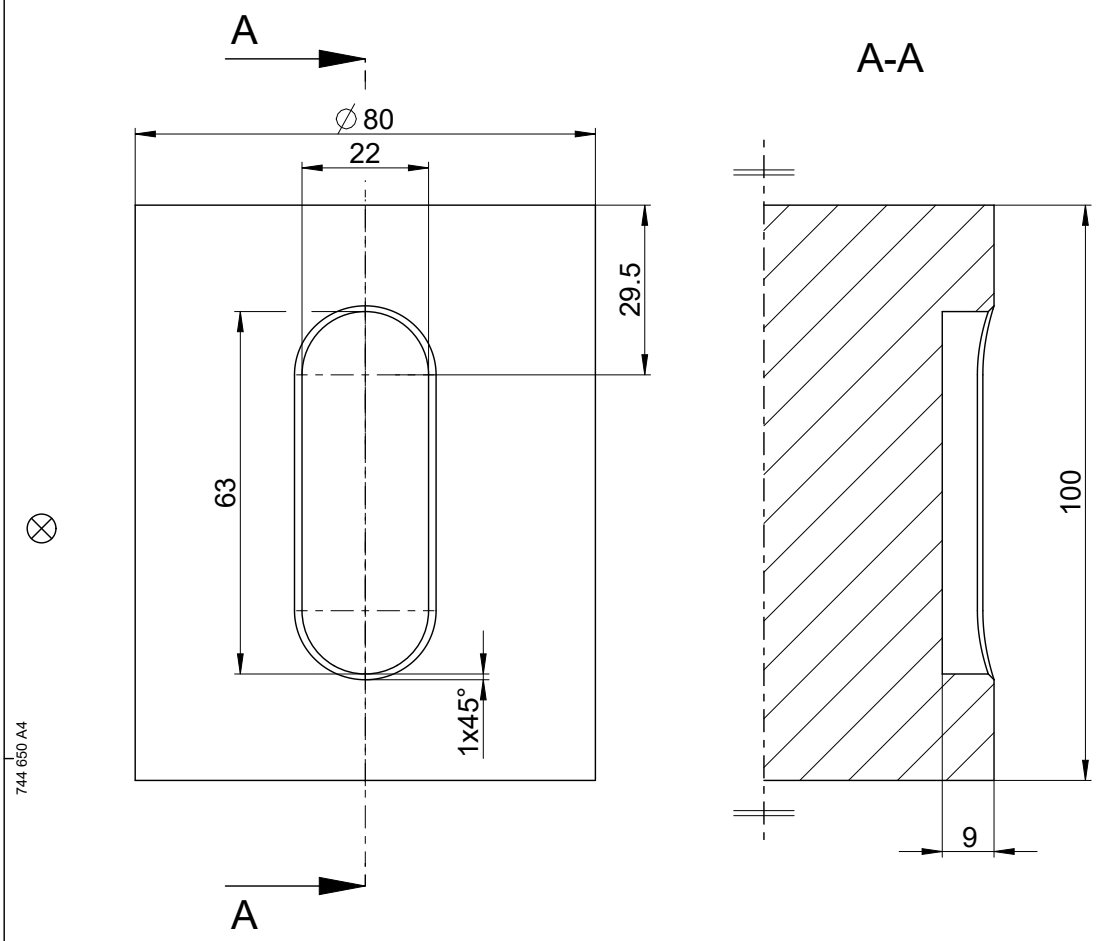
Parameter	Name	Meaning
Q218	SLOT LENGTH	Length of the slot in the main axis
Q219	SLOT WIDTH	Width of the slot in the secondary axis
Q374	ANGLE OF ROTATION	Angle by which the entire slot is rotated.
Q367	SLOT POSITION	Position of the slot relative to the position of the tool when the cycle is called
Q203	COORDINATE SURFACE	Coordinate of the workpiece surface

NC program 51051_en.h

In this NC program, the control calculates the tool paths for deburring the keyway and moves along these paths.

The calculation is rather complex. Therefore, a detailed description is not provided here.

Define all required data in the main program 5105_en.h. The control transfers the values into this NC program, so you do not need to edit this NC program.



			ID number
Text:			Change No. C000941-10 Phase: Nicht-Serie
	Original drawing Scale / Format	Nutenstein Groove stone Einzelteilzeichnung / Component Drawing	Werkstoff: Material:
RoHS	1:1 / A4		●blanke Flächen/Blank surfaces
Maße in mm / Dimensions in mm			
Werkstückkanten nach ISO 13715 Workpiece edges ISO 13715 -0.3 +0.3	Allgemeintoleranzen ISO 2768-mH ≦6mm: ±0,2 General tolerances ISO 2768-mH ≦6mm: ±0,2	Tolerierung nach ISO 8015 Tolerances as per ISO 8015 Oberflächenbehandlung: Surface treatment:	Oberflächen nach ISO 1302 Surfaces as per ISO 1302

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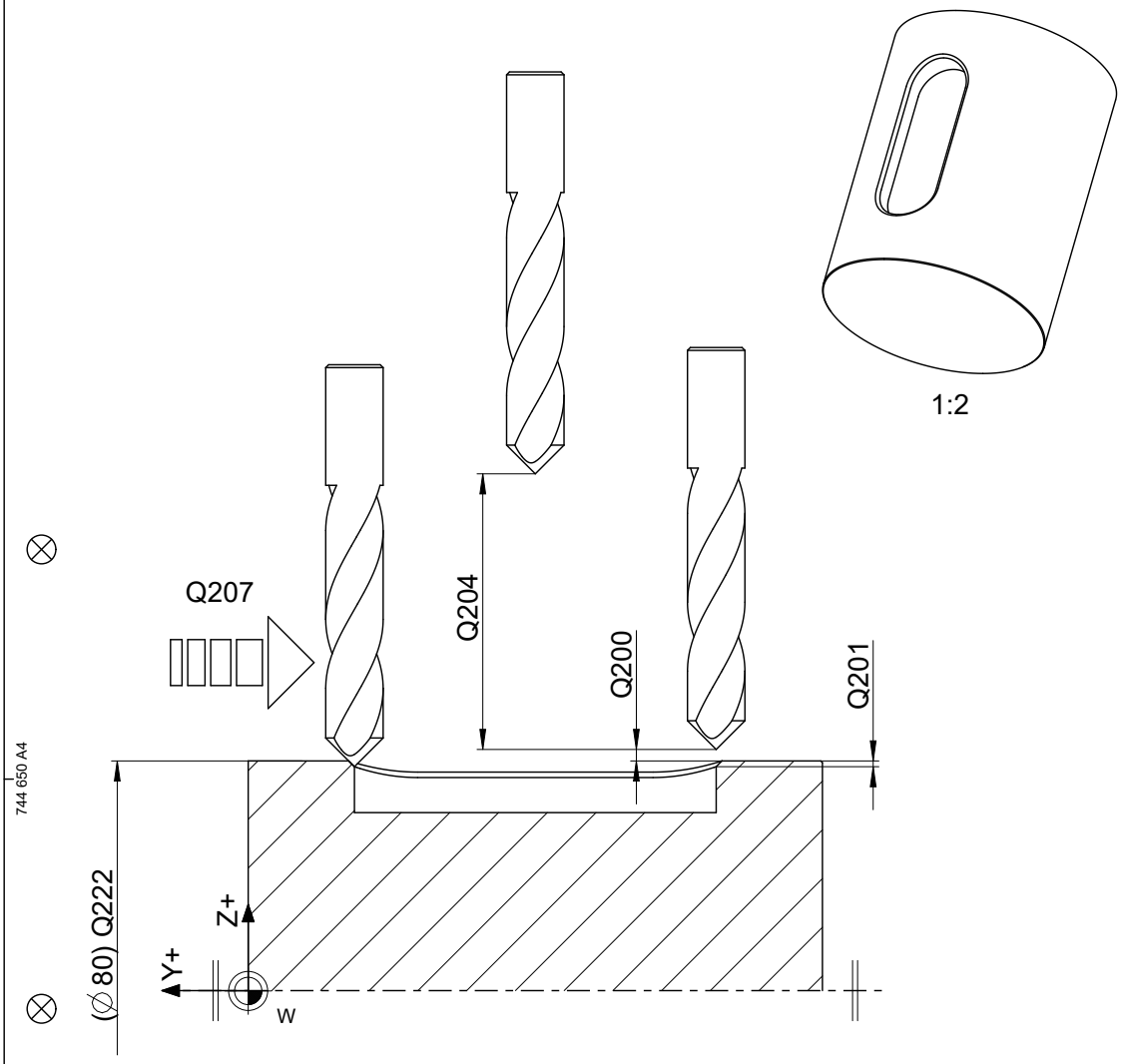

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