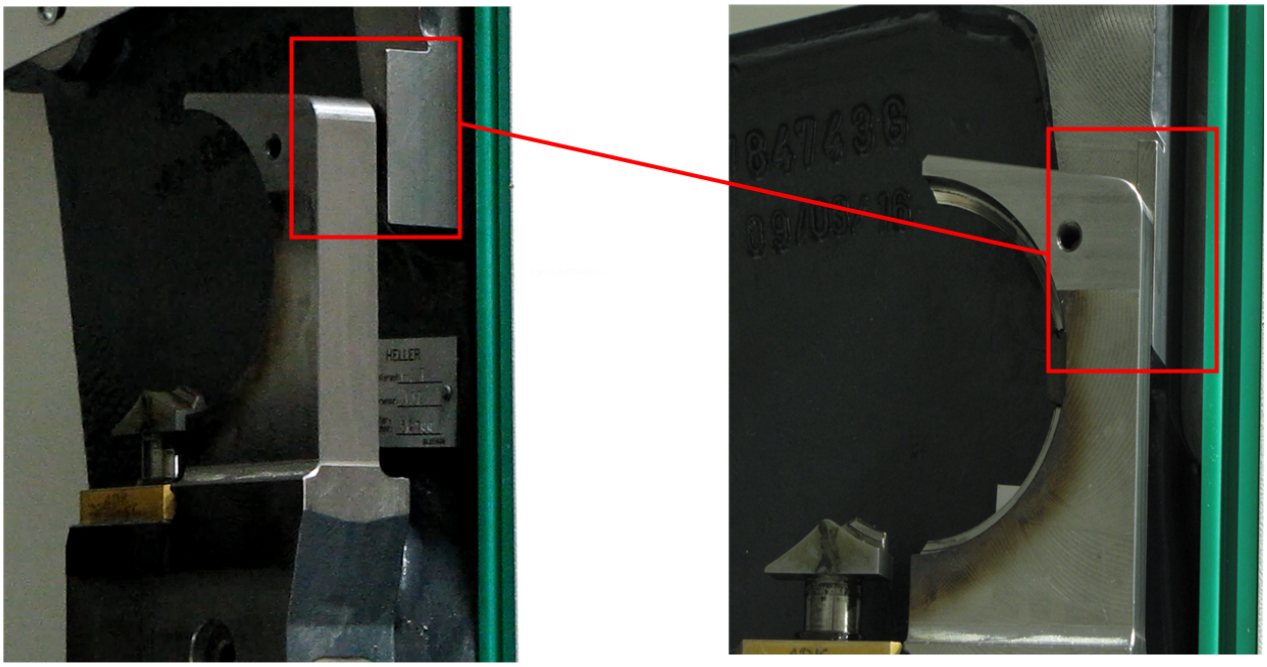
Determining the CT and ZT Reference Point Positions

HELLER

Description: This document explains the measuring procedure to determine if the tool changer has been displaced following a collision. Special Heller setting tools are required for exact measurements.

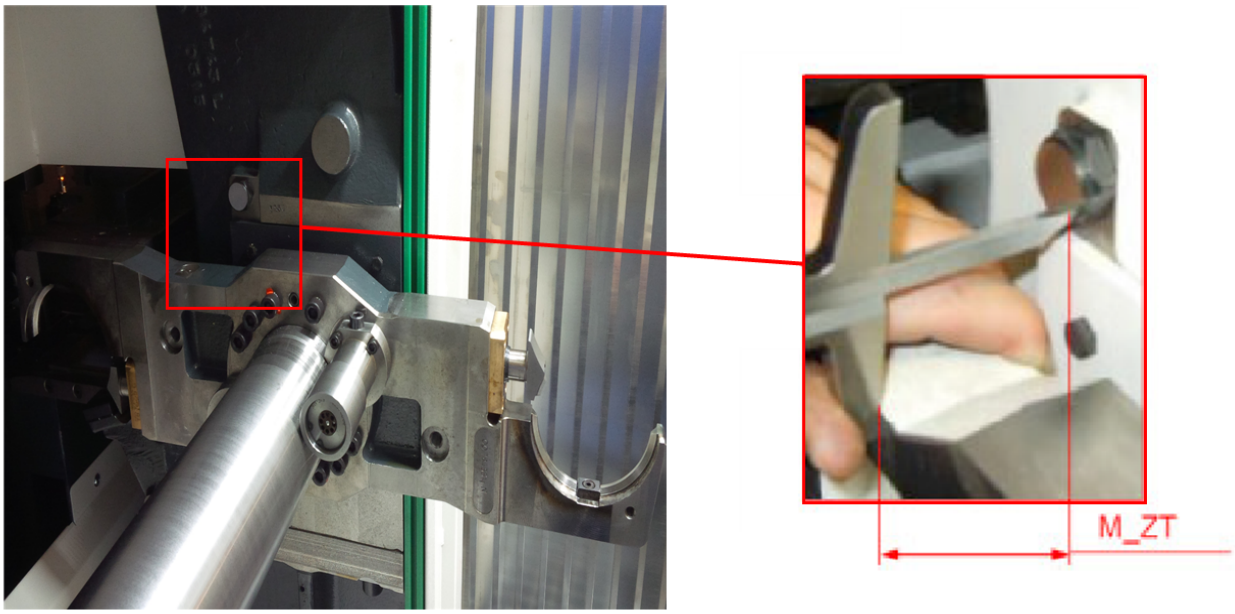
CT1 axis: Using a depth gage, measure the distance from the flat on the tool changer housing to the ground surface on the tool changer gripper. Jog the axis incrementally until these surfaces are aligned.

HSK 100 = 0.000mm +/- 0.050



ZT1 axis: Swivel the CT1 axis with individual funtions to the -90 position (tool gripper 1 to spindle and tool gripper 2 in provisional place). Using a depth gage, measure the distance from the outside of the tool changer arm to the ground surface of the rest pad on the tool changer housing. Jog the axis incrementally until the correct dimension is acheived.

HSK 100 = 51.5 mm +/- 0.050

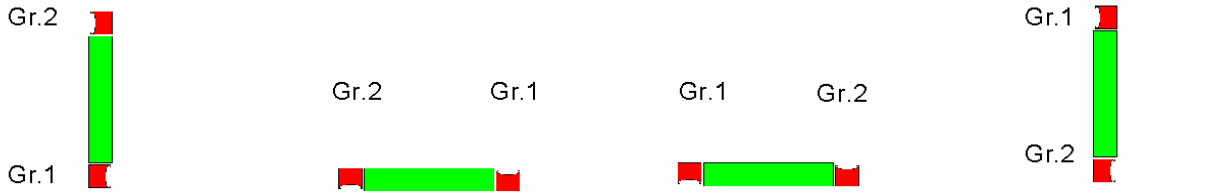


Service

Positions of the tool changer

Home position:

Because the gripper lifting motion is performed via a ball screw, the gripper cannot rotate infinitely in one direction, as it executes a lifting motion analogous to the spindle pitch at the same time as the rotational movement. There are therefore 2 different home positions, gripper 1 points up or gripper 2 points up. This results in the following NC positions.



Rest position | Unclamping position | Clamping position | Rest position

ZT1 = 0 mm to -50 mm

CT1 = -90° to 90°

ZT1 = -50 mm to -5 mm

CT1 = 0°	**CT1 = -90°**	**CT1 = 90°**	**CT1 = 180°**
ZT1 = 0 mm	**ZT1 = 0 mm**	**ZT1 = -5 mm°**	**ZT1 = -5 mm**

Tool change abort:

If a tool change is aborted due to a power failure or if the machine is switched off when the tool changer is not in the home position, the channel variable SYG_IM[3] may be set to a value of -99, indicating an undefined status. Writing to the variable can inform the setup cycle of the last valid tool changer movement. The variable can be found in

[Select menu] [Parameter] [User variables] [Channel GUD] [GUD selection] [M GUD].

The following decimal values are written to this variable during a tool change procedure:

99 = home position gripper 1 or gripper 2 up

10 = tool changer swivels with CT1 axis to spindle

20 = tool changer retracts tool with ZT1 axis from spindle or provisioning place

30 = tool changer swivels with CT1 axis by 180°

40 = tool changer places tool in spindle or on provisioning place

50 = tool changer swivels with CT1 axis to home position

99 = home position gripper 1 or gripper 2 up

By entering a corresponding decimal value, the control system can be informed of the last valid movement, making the setup functions again available for operation. Only the positions of the tools must be checked in the management.