ZX5 Transfer Table Crank set up

How to set up the cranks mechanically so the correct overlaps and limits are achieved.

Difficulty **Medium** Duration **30 minute(s)**

Contents

Introduction

This tutorial will show you how to mechanically set up the cranks and sensors so that the correct overlaps between the different cranks are achieved.
Crank C is the crank on the Machining Centre Outfeed that controls the single pop up.
Crank D is also mounted on the Machining Centre Outfeed and controls the pop ups on the Transfer Table.
Crank E is the crank on the Saw Infeed and controls the single pop up that moves the profile in to the channel.

UPDATE 2024

The default clutch spring setup has been found to be incorrect. The clutch spring contains 3 components, which is the wrong range for this application.
The correct spring setup is just one spring

Items

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Step 1 - Check the system friction and tension

There is no point in setting up the clutch torque if the transfer table friction points are not set correctly.
Common points where friction is encountered due to misalignment and misunderstanding :

1. Delrin wheel tightness (should turn between thumb and forefinger)
2. Over meshing of drive pinions to racks

Step 2 - Check Crank spring count

The default clutch spring setup has been found to be incorrect. The clutch spring contains 3 components, which is the wrong range for this application.
The correct spring setup is just one spring

Step 3 - Programme Eaton Drives.

Follow the instructions in this tutorial.

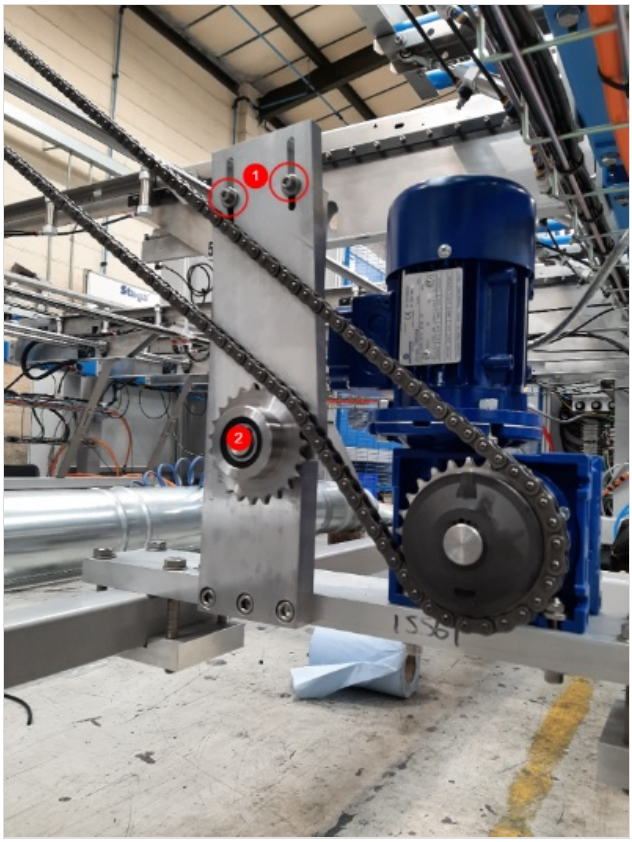
> ...It is vital that the Eaton drives are programmed correctly as the distance the cranks travel and the time they take to stop depend on the acceleration and deceleration of the drive.

> ...Programming the drives after the mechanical set up may lead to crashes. Ensure this is done first.

Step 4 - Set idler and tighten clutches

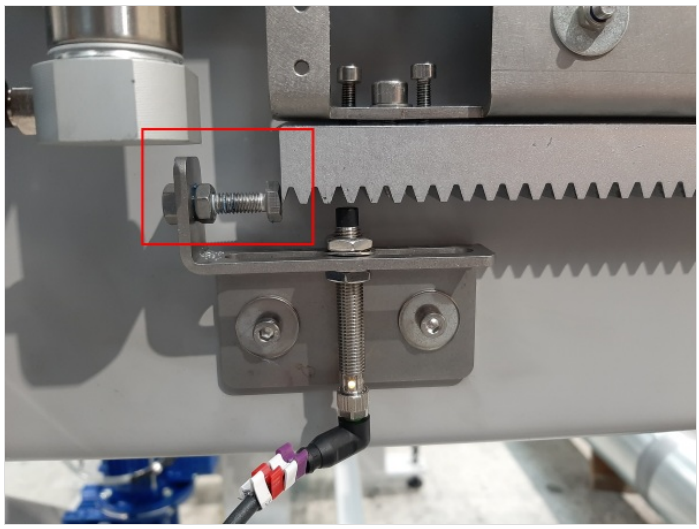
1. Loosen the two bolts holding the idler
2. Adjust until the idler sprocket is applying some pressure to the chain
3. Use a C spanner or a hammer and drift to tighten the clutch.

> ...Don't lock the clutch in place with the tabs until you're sure the correct tension has been achieved



Step 5 - Set mechanical end stops

These mechanical end stops should only ever be used as a fail safe in cases of sensors failing. These should be set so that the gears can never come off the racks.



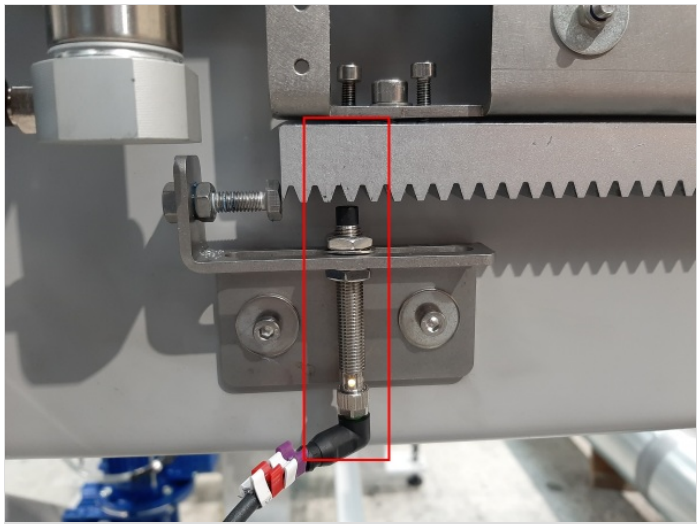
Step 6 - Roughly set sensor positions

Using a pair of 13mm spanners, nip the proximity sensors in place so that they are roughly in the middle of the slot.

> ...Ensure that the black part of the sensor is close enough to the rack that it makes the sensor but not so close that it is likely to get damaged by contact

Do this for all 6 sensors (2 on each assembly - 1 'home' and 1 'out')

> ...The 'Home' position for all cranks is when the pop ups are in the closest position to the machining centre - ready to receive the profile



Step 7 - Check crank directions

> ...It is easiest to start with the first crank in the sequence of unloading and transferring the profile across the transfer table. 'Crank C' then move on to 'Crank D' then 'Crank E'

- Using the outputs (1) run the crank in forward and reversing movements

> ...If the 'Home' sensor is made, the output for 'Crank reverse' will not work. Likewise, if the 'Out' sensor is made, the output for 'Crank forward' will not work. If they do and the crank attempts to continue a forward or reverse movement despite the switch being made, the direction of the crank needs to be changed by switching two of the phases on the bottom of the Eaton drive.

Step 8 - Set minimum and maximum positions

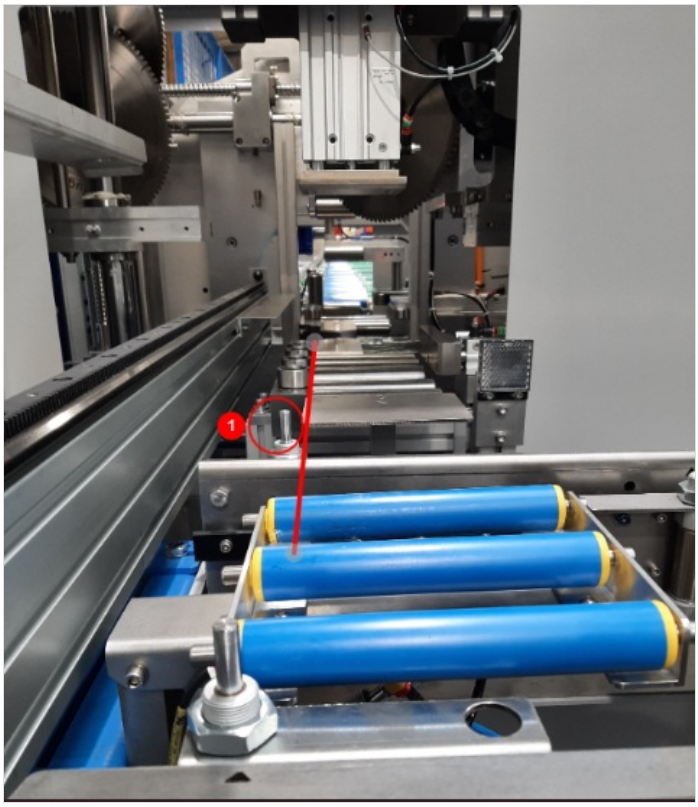
Moving the sensor left and right on the slot will change the distance the crank travels. The aim here is to stop the rack before it hits the mechanical end stops.

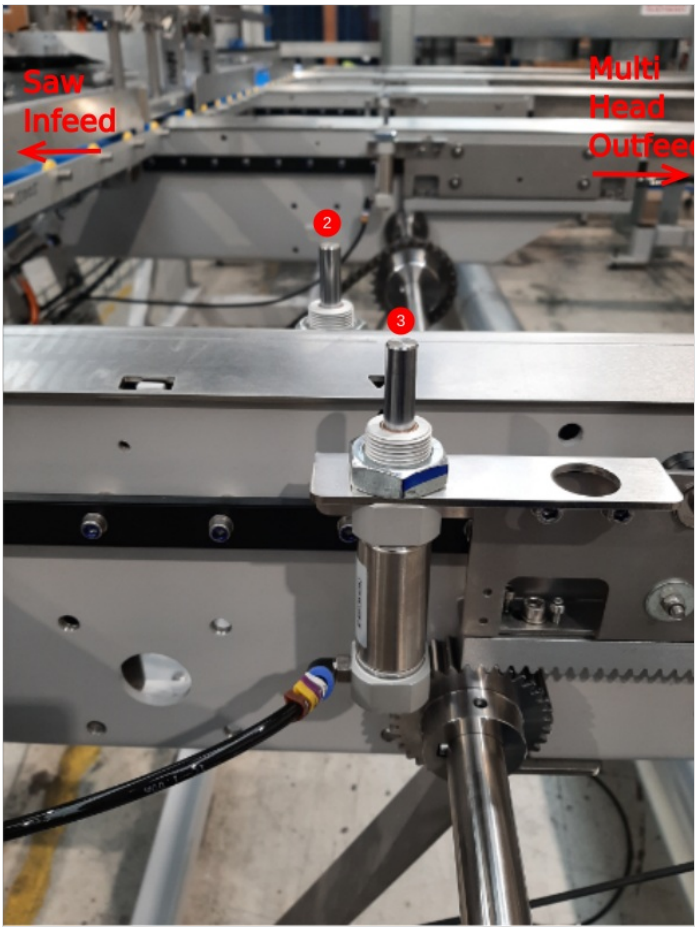
You may have to run the cranks backwards and forwards a few times to get these right.
The aim is for the gap between the end stop and the rack to be between 3mm and 8mm each time. IT MUST NOT BOTTOM OUT

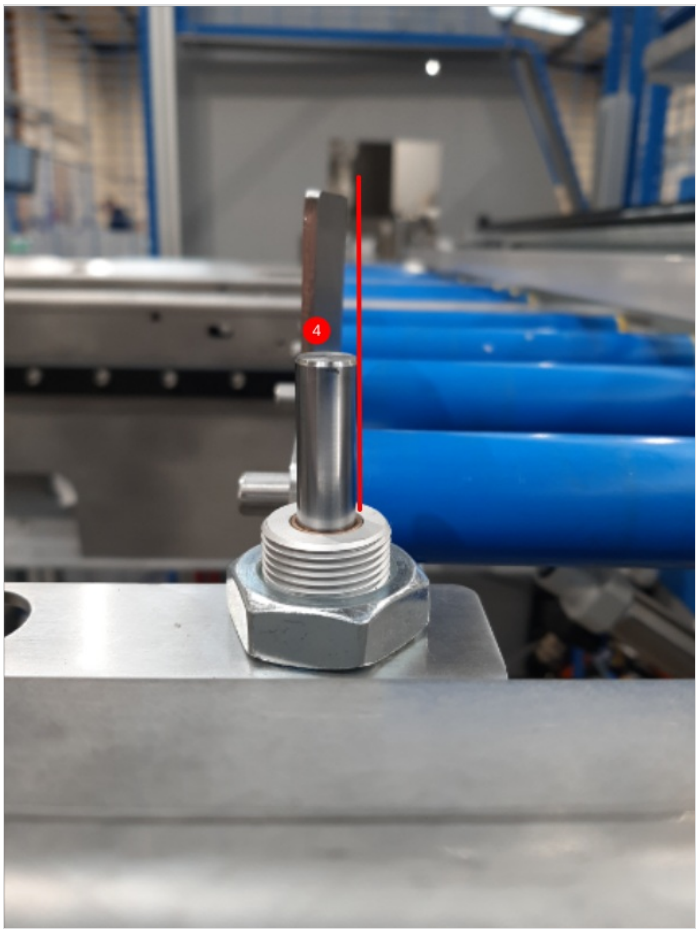
Step 9 - Check overlaps between the different racks

It is important to get the overlaps between the cranks correct so that the profile is transferred smoothly from one module to the next and to also avoid collisions between the grippers and the pop ups.

- Crank C 'Home' position (1) needs to be behind the backfence
- Crank C 'Out' position needs to overlap Crank D 'Home' position
- Crank D 'Out' (2) position needs to overlap Crank E 'Home' (3) position
- Crank E 'Out' position (4) needs to sit in front of the Saw Infeed backfences but not so far forward that it will be hit by the gripper (5)







Step 10 - Lock off sensors and mechanical end stops