MTSWI No.	MTSWI	Date -	AUG 2020	Version – 1.1
Task	Calibrate E series magazine position			Timeframe –

Materials Required
1. .Training Evidence Booklet
2. .MT Training manual
3. .Revise MSDS
4. .
5. .
6. .
7. .

Equipment and tools
1. .Machine/workbench
2. .Tags
3. .PPE as required
4. .Digital Gauge Kit
5. .Spanner set
6. .Specific port plugs and caps
7. . Drain tray

SAFETY MUST BE YOUR FIRST PRIORITY

SAFE WORK INSTRUCTIONS

CALIBRATE E SERIES MAGAZINE/ CAROUSEL POSITION

	Carefully read through relevant machinery information before use		Enclosed steel capped footwear must be worn at all times
	Safety eyewear must be worn at all times		Gloves must be worn if working with high pressure oils, not with rotary equipment
	Hearing protection must be worn		

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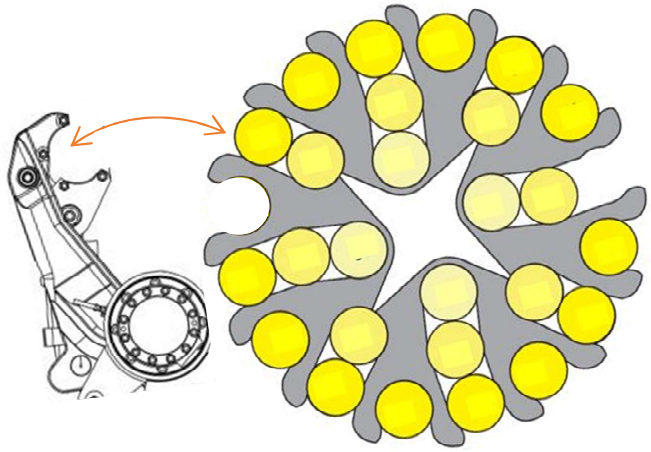
Task	CALIBRATE E SERIES MAZAZINE/CAROUSEL POSITION			

Background –Previous versions of the magazine/carousel with the locking pin required loosening and adjusting of the rod segment holders to adjust the alignment with the drill steel. New E series magazines/ carousels with rotary actuators can be adjusted by re calibrating the sensor as follows.

Ideally, this is performed with an empty carousel but as long as there is a 2 rod segment empty that a drill steel can be placed in, then the carousel can be adjusted.

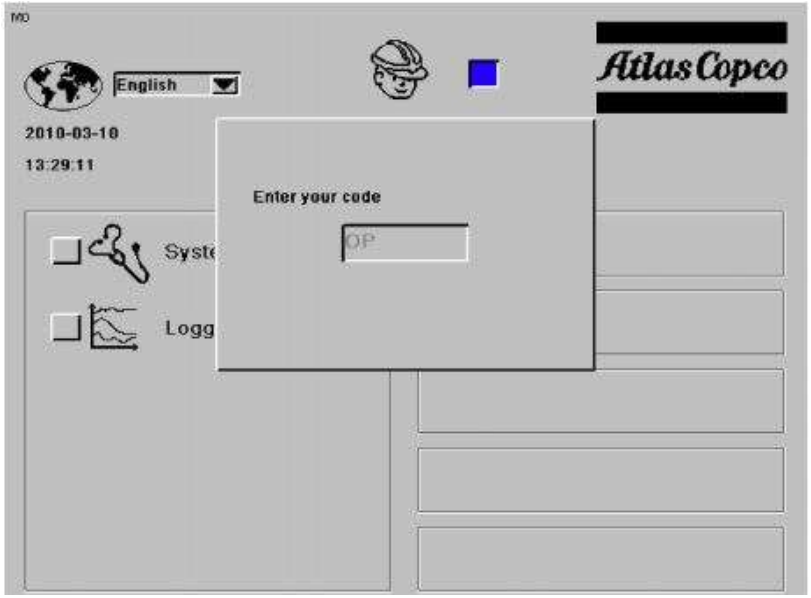
Step 1. Position the carousel on a 2 rod segment as shown in Fig 1.
Calibration must be done in this position.
Carefully swing the drill steel in and out of the segment to check the alignment.
If the alignment needs adjusting move to step 2

Fig 1



Step 2 Log in to the RCS screen using dongle and/or code as shown in Figure 2.

Fig 2



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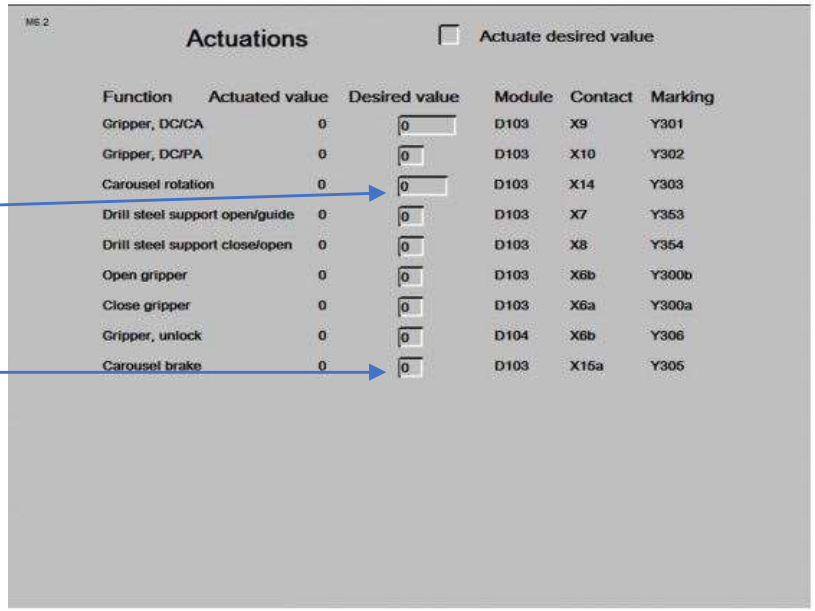
MAINTENANCE TECHNIQUE
UNDERGROUND DRILL RELIABILITY

Step 3. Navigate to the Actuations screen M6.2 as shown in FIG 3

Fig 3



Ensure the gripper arms and the drill steel are free from the carousel/magazine

Enter 500 in the carousel rotation box, this output is proportional, it may be necessary to increase this value in small increments (+25 at a time) up to 700 if the carousel does not rotate in step 4.

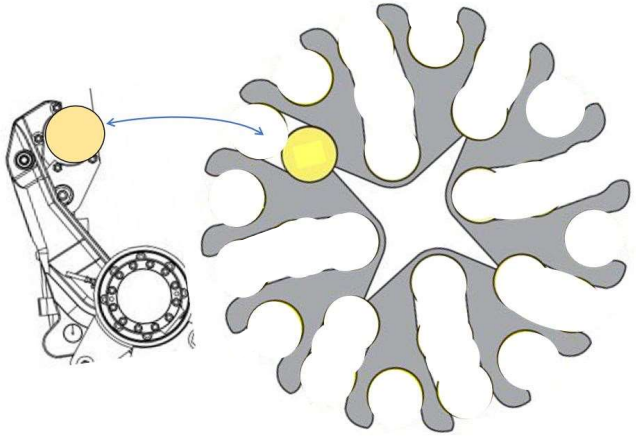
Enter 1 in the Carousel brake box
(This will release the carousel brake allowing movement)

Move the cursor to “actuate desired value” at the top of screen and hold enter key

Carousel should rotate slowly whilst the enter key is held down. If the carousel does not rotate, increase the figure in the carousel rotation box from 500 to 525 and try again. You can continue to increase this value up to 700 until the carousel rotates slowly. (If you reach 700 and the carousel does not rotate, stop and check for other problems)

Watch the carousel rotation and stop when the drill steel is aligned with the two rod segment. If you go too far or need to move the carousel in the opposite direction, change the value in the carousel rotation box to a negative value between -500 and -700 and actuate the desired value to move the carousel in the opposite direction.

Fig 4



Step 4. With a drill steel gripped in the rod handling arm, carefully swing the drill steel into and out of a two rod segment (FIG 4), checking the alignment with the segment as it is placed in and removed from the segment. There should be minimal movement of the carousel when the correct position is found. If correct, when opening and closing the gripper jaw on the drill steel, the magazine should remain relatively stationary. When swinging the empty gripper arms into and away from the drill steel (in the segment)the fixed jaw should not make contact with the drill steel on the way in or partially pull the drill steel from the segment on the way out.

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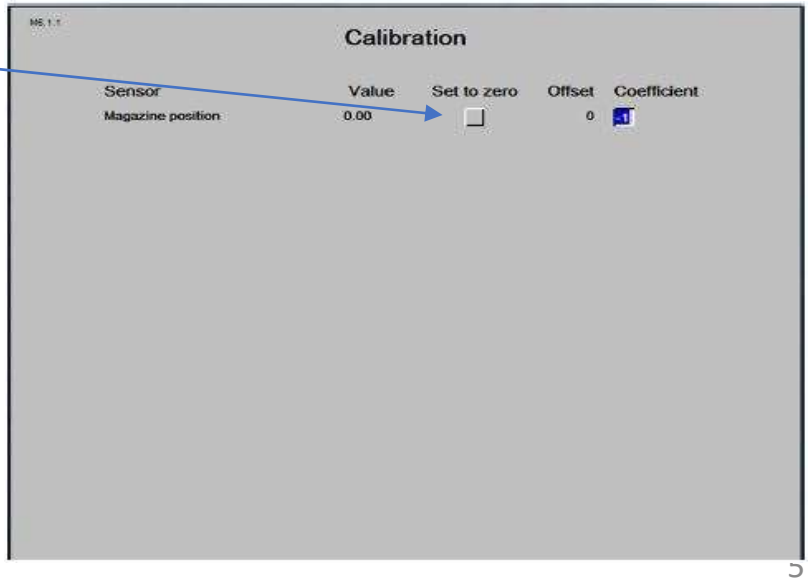
Step 5. Once you are happy with the alignment of the carousel
Navigate to screen 6.1 as shown in FIG 5
Place the cursor on “calibration” and press the enter key 

Fig 5

Step 6. Screen M6.1.1 should be shown as in FIG 6
Do not alter the Co-efficient but move the cursor to “set to zero” box and press the enter key  to reset the carousel position.

Fig 6



Note-Coefficient is <u>usually</u> negative 1. The coefficient is set so that the sensor value increases when indexing in drilling direction.

Compartment numbers increase in anticlockwise direction.

Indexing in drilling direction is anticlockwise, increasing compartment numbers.

Indexing in removal direction is clockwise, decreasing compartment numbers.

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Step 7. Ensure the rod handling arms and the drill steel are free of the carousel and select a direction of carousel indexing using key 19 or 21 on the left hand keypad. Press button 22 to index the carousel to various positions around the carousel. Try swinging the drill steel into different segments and check the carousel alignment is ok.

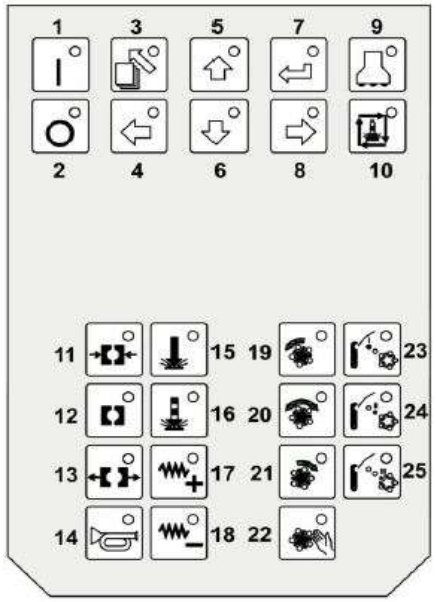
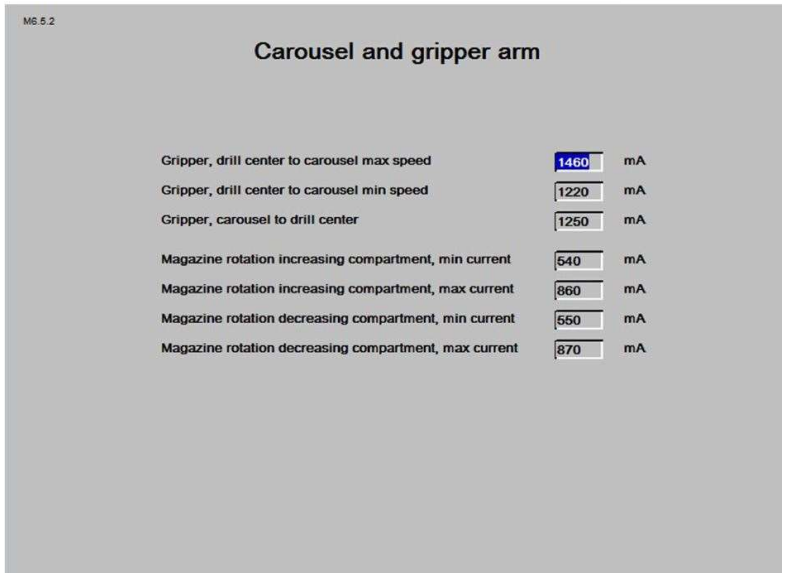


Fig 7

*Note- If the alignment results are inconsistent check that carousel indexing speed is **moderate**. If the indexing speed is too high the carousel may overshoot its position, If the indexing speed is set too slow the carousel may stop too early at the start of its sensor tolerance. Adjustments to the carousel speeds are made on the screen M6.5.2 (FIG 8)*

Fig 8



MT recommended settings for Carousel and gripper arms are below.

Gripper drill centre to carousel max speed	**1750ma**
Gripper drill centre to carousel min speed	**1050ma**
Gripper carousel to drill centre	**1700ma**
Magazine rotation increasing compartment min current	**590ma**
Magazine rotation increasing compartment max current	**770ma**
Magazine rotation decreasing compartment min current	**590ma**
Magazine rotation decreasing compartment max current	**770ma**