






MTSWI No.	MTSWI	Date -	201112	Version – 1.2
Task	Install and Adjust MT S Gripper Arms			Timeframe – 6 hrs.
Materials Required		Equipment and tools		
<ol style="list-style-type: none"> <li>1. .System reference</li> <li>2. .Take-5 or equivalent</li> <li>3. .</li> <li>4. .</li> <li>5. .</li> <li>6. .</li> <li>7. .</li> </ol>		<ol style="list-style-type: none"> <li>1. .Machine</li> <li>2. .PPE as required</li> <li>3. .24mm spanner x2</li> <li>4. .Socket set</li> <li>5. .Spanner set</li> <li>6. .Hydraulic plugs and caps</li> <li>7. .</li> </ol>		

# SAFETY MUST BE YOUR FIRST PRIORITY

## SAFE WORK INSTRUCTIONS

### Install and Adjust MT 2000S Gripper Arms

	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		








**WARNING**  
**HIGH PRESSURE OIL can cause severe injury.**  
Disconnect power and drain accumulator before servicing hydraulic system.






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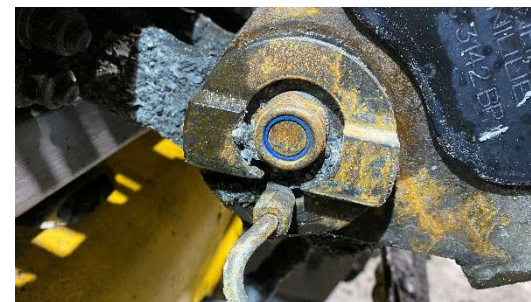
**Background** – The Maintenance Technique Gripper arms for the RHS 9-14 carousels have been designed for maximum service life and durability, while also being easily adjustable when performing rod alignments. Setting the arms position correctly is critical to drilling operations and feed/rod handler/arm reliability.

- **Step 1. Install drill rod between BSH and rockdrill.**
  - Using the rockdrill, install a retrieval spike or cut-down female end of drill rod to the BSH.  
**NOTE 1 – closing the bsh onto a female must be done with the female held by the rockdrill or bsh height will be incorrect, this also assumes the rockdrill cradle height is set (slides are adjusted and even) and alignment of rockdrill to BSH is correct.**
  - Move rockdrill to rearmost point on rail and install a drill rod, couple into spike/rod and rockdrill as per fig. 1. release the gripper jaws.
  
- **Step 2. Remove gripper arms.**
  - Mark, remove and cap all hoses. **NOTE 2 – if arms require pivoting, remove caps from cylinders, place oil tray under arms and move by hand.**
  - Mark and remove grease lines if fitted.
  - If MT arms already fitted, pay particular attention to the direction that cams are fitted as per fig. 2, as this will affect the alignment.
  - Remove gripper arms using a mechanical aid, such as an overhead crane, or 2-person lift.
  - **Note :Sliding a piece of plate between the feed cylinder and feed rail will ensure the arm bolts stay in position.**
  
- **Step 3. Install new arms**
  - Using the same lifting aid as in previous step, install new arms to rail.
  - If MT arms previously fitted, ensure cams are fitted in new arms in same orientation as arms removed, as per fig. 2.
  - Refit all hoses removed during step 2. **NOTE 3 – it is advisable to bleed air from circuit when new arms are installed, as air can cause erratic operation of the gripper arms.**
  - Refit any grease lines removed and grease.
  - Ensure correct size jaws are installed.

**NOTE 4 – it is important to note pin orientation of the MT arms, as they are ported for grease from only one side. Generally the pivot grease nipple to is on there bottom side.**



Fig. 2

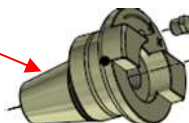


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### • Step 4. Adjusting drill centre

- Adjust Drill centre stop bolt (located at bottom of moving frame, (see fig. 1) so that is all the way in, as this contacting its stop point will affect the cam adjustment.
- Loosen the cam lock nuts (fig. 3) and strike the cam with a hammer or long punch to break the cam free.

**NOTE - never place antisieze or grease on the cam taper or they will not hold position. Dry or CRC.**



- With a rod in drill centre (Ensure NOTE 1 on the previous page has been followed) Start the machine and bring the arms toward drill centre, Stop the arms 20 or 30mm clear of the drill rod, JAWS OPEN. Turn off the machine and isolate.
- By hand, push one gripper onto the drill rod.
- Use the cams (fig 4) to set the (A) Arm length clearance first, Adjust the fixed jaw position to approx. 1mm clearance as per Fig2
- Use the stop bolt (fig 1) to adjust the (B) swing clearance to approx. 1mm as for fig2. swing the arm out and back in by hand and check that the fixed jaw has clearance as per fig 2.
- Repeat above steps with the other arm
- Start the machine, power the arms out and back to drill centre, recheck the clearance and make any minor adjustment so that the clearance is correct and even on both arms.
- Grip and open the jaws, the rod should not move or flex more than 1mm or 2mm.
- Lock up the drill centre bolt and cam bolts (approx. 220nm)



Fig. 1

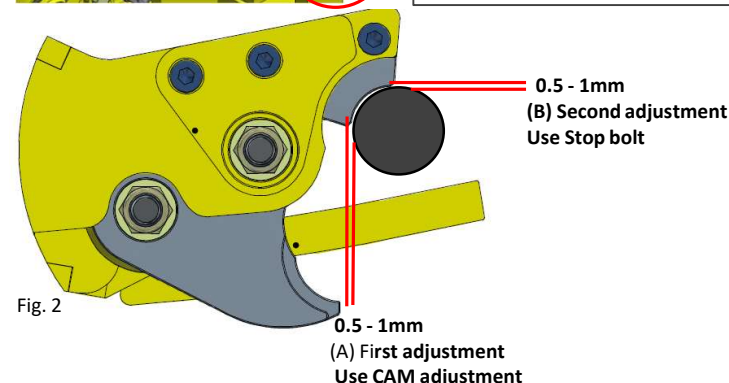
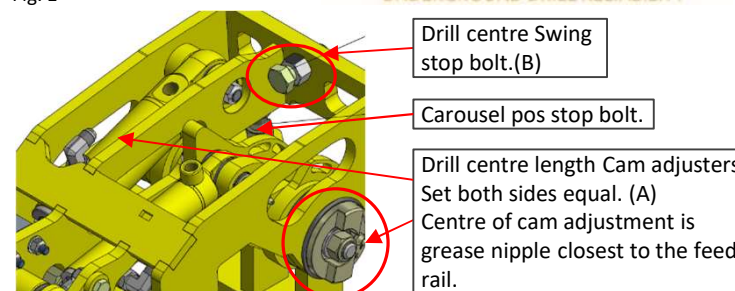


Fig. 2



Fig. 3 Cam lock nut Strike here



Fig. 5

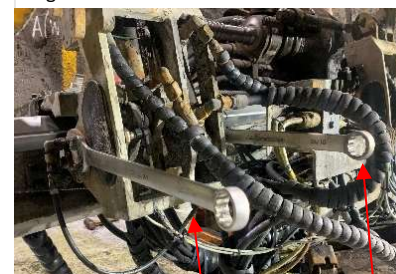


Fig. 4 24mm spanner

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- **Step 4. Checking clearance between rod and protection.**

- With the rod uncoupled and in position to be put away (uncoupled at M6) move the arms into the carousel, watching as the rod passes through the gap in the protection. Cycle the arms 2-3 times checking both ends, there should be a 5-10mm gap between the top of rod and top section of protection (fig. 1) both ends.

**NOTE – this gap is critical in ensuring rods do not fall out when indexing.**

- If adjustment is required, loosen the nuts that retain rotation motor (fig. 1) for rear, or bearing retaining cap bolts (fig. 2) for front. Take care not to fully remove front bolts.

- **Step 5. Adjusting segments and carousel stop bolt.**

- Swing the rod into the last segment position of the carousel and check that the rod passes evenly between the fingers of each segment. If force is applied to segments, adjust segment rotation on the carousel shaft (fig. 3) so that the rod is central to both segment.
- With the rod completely away, check that there is a 1-2mm gap between the inner profile of segment and drill rod (as per fig. 4).
- If there is no gap, adjust stop bolt (fig. 5) out to increase gap, in to decrease gap.
- Lock the adjuster, approx 220nm.



Fig.1

Nuts for rear adjustment

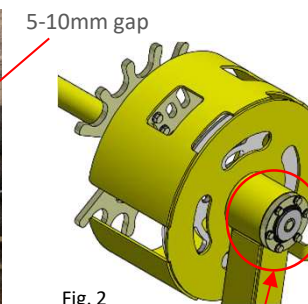


Fig. 2

Bolts for front adjustment

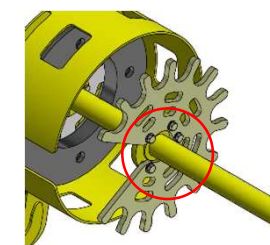


Fig. 3

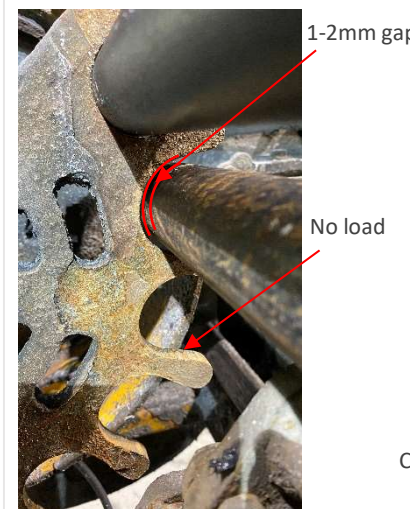


Fig. 4



Carousel stop bolt

Fig. 5