



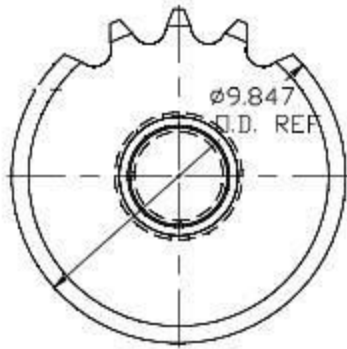
## Chain Adjustment

Like most things that are man-made chains do not last forever and eventually, your chain must be replaced. For this service tip, we will look at the replacement and adjustment of the feed chains including their mating components.

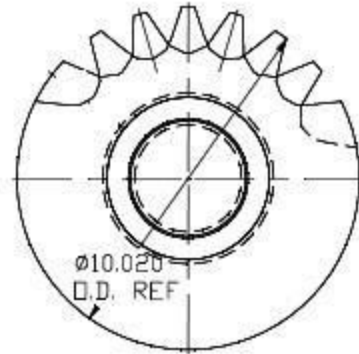
After all of the chain has been removed from the mast, you will want to inspect all of your roller chain sprockets or leaf chain sheaves and their pins (axles) for wear. In the case of the sprockets, there is typically an elongation at the root of the tooth that also leads to a narrowing of the tooth itself. This is the result of an extremely worn chain and poor lubrication that has created too much distance between the individual rollers. When this chain is in tension from drill string weight, the rollers will erode the sprocket teeth. This type of wear warrants replacement of the sprocket. Attempting to use a new chain with worn sprockets will only lead to premature chain failure.

If the sprockets or sheave appear to be in usable condition, you still should remove the pins and inspect both the pins and bushings for wear. There are thrust washers on either side of these components to absorb the wear from any side loads. Many lower sheaves or sprockets incorporate a lip seal as a preventative measure to limit the intrusion of contaminants. All of these items must be inspected and replaced as needed in order to maintain a proper operating feed system.

So now you are ready to install your new chain. The most critical dimension to consider in the case of roller chain masts with dual feed cylinders is the distance from the timing tube on the crown of the mast to the connection at the trunnion bar spacers by the rotation gearbox. The tooth count must be equal to ensure that the rotation gearbox will hang and travel straight when feeding up and down the mast. The timing tube design on these systems changed in the early nineties from an inline sprocket (Illustration 1) to a half-pitch offset (Illustration 2). With this design timing tube, you will have to have one side one-half pitch in advance of the second side when doing your initial connection. You will also want to leave the jam nut at the trunnion spacer block backed off on one side until chain tension is set.

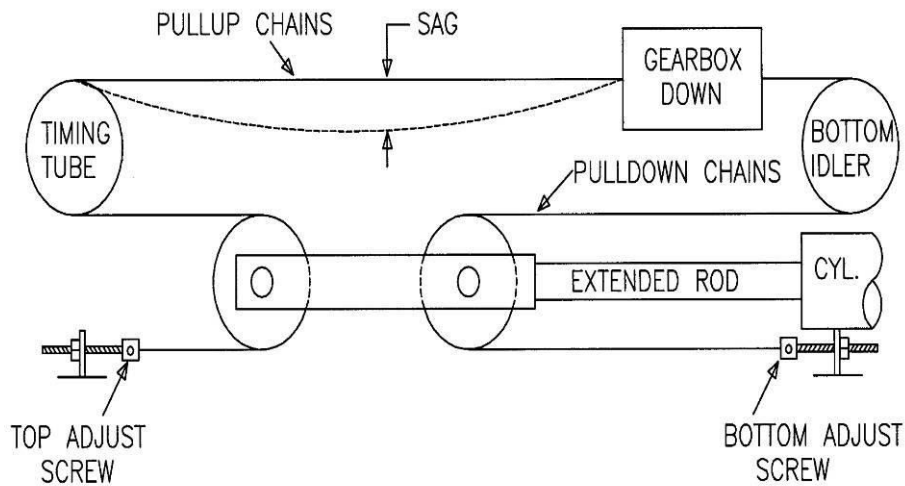


**TEETH IN LINE**



**TEETH OFFSET**

To set proper chain tension you must bring the rotation gearbox to the table. Place a steel plate on the table, and use the slow feed circuit with the down feed relief backed out to apply minimal pressure of the gearbox shaft against the plate. Slowly apply pressure using the down feed relief valve; 200 to 300 psi for the leaf type chain and 500 to 600 psi for the roller type chain. Lower the mast to the transport position and leave the engine running to maintain hydraulic pressure in the feed circuit. Using the chain adjusters you want to achieve three inches of sag in leaf type chain and two and one half inches of sag in the roller type chain. This measurement is to be taken in middle of the upper chain with the rotation gearbox at the table.



Once chain tension is set on the dual feed cylinder masts you must measure the distance from the table to the bottom of the trunnion plates on each side to insure a proper alignment of the gearbox shaft to the slipbox. This distance is adjusted with the screws that pass through the trunnion spacers. Once set you can lock the jam nuts at all adjustments points and make sure the mechanical locks for all nuts are engaged. Lastly, install any guards that were removed for easy access to insure proper personal protection.



Chain Adjuster Lock



Lower Chain Guard

**NOTE:** As the chain begins to wear you will have to remove links in order to maintain proper chain adjustment. Make certain that you alternate link removal from the upper chains the first time, and then the lower chains the next time, etc. Removing from one set all of the time will move the terminal location of the rotation gearbox in that direction. For example: If you remove links from the top chain only, the rotation gearbox will be closer to the mast crown when the feed cylinders are fully closed. When the feed cylinder is fully extended the rotation gearbox will not reach the table.

In closing, a final reminder that if you provide proper lubrication and adjustment, you will double the life of your feed chain and prevent unwanted damage to the feed cylinder rods.