Chipper Anvil Service Job Plan

Tools Required:

36MM Socket for Anvil Bolts

24MM Socket for Access door Bolts (15/16”)

1-1/8” Socket/wrench for guards

¾” Socket/wrench for guards

Long feeler gauges

Scraper

Air wand/blow gun

Angle grinder

5’-6’ Step Ladder

Important Torques:

Chipper Knife Clamp Studs – 420ft/lbs

Anvil Bolts – 540 ft/lbs

Important Clearances:

Anvil-knife clearance at 0.007”

Counter anvil-knife clearance at 0.040”

**Minimum allowable knife length is 8.511”**

Parts Required:

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| --- | --- | --- |
| Description: | Location: | Oracle Number: |
| ANVIL, VALON KONE 30579400 28-1/4 LG X 2-1/4 SQ | MAI.B8.F-J | 65803240 |
| ANVIL, SECONDARY, SS, 28 IN WD, 6 IN HIGH, 9/16 THK, W/ MTG STUDS, VALON KONE 40424200 | MAI.B8.F-J | 1267176 |
| CHIPPER FEEDWORKS CHAINS | BELT/CHAIN CABINET |  |
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Hazards/Controls:

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| Hazard: | Controls: |
| Knife Handling | Wear appropriate PPE for knife handling. Cut resistant gloves, apron, arm guards. |
| Uneven work surfaces | Use LVL planks in the chipper room to cover the openings in the floor under the chipper on either side of the feed works. |
| Working inside the chipper | Use step ladder to reach the anvil/counter anvil bolts easily. Inspect ladder before use to ensure it is in good condition. |
| Handling heavy parts | Anvils, knives, clams, and doors are heavy. Maintain good body position and use proper lifting techniques. Get help if needed. |
| Rotating chipper drum to measure knife – anvil clearance | Maintain adequate communication to ensure that the drum does not move unexpectedly. Keep hands clear when rotating the drum to measure clearance with feeler gauges. Engage brake whenever drum movement is not desired. |
| Hot work to cut off feed works chains | Follow hot work SOP. Clean area and have adequate fire protection in place. Wear hot work PPE – face shield, gloves. Inspect tools before use. |
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Job Instructions:

Start by following the Chipper ZES procedure. Once the equipment has been locked out remove the guarding around the chipper feed works and set out of the way. There are LVL planks near the chipper that will cover the holes on either side of the chipper. Install the planks, then you can start to remove the access panels on either side of the chipper anvil. Using a 24mm(15/16”) socket to remove the 4 bolts holding each panel on. The panel on the south side is located behind the drive belt guard, so you will have to open the hinged portion on the south side of the guard to access it. Remove the panels and set aside, out of the way. With the access panels removed, it is a good time to blow out the chipper anvil with compressed air before entering the chipper.

To remove the primary chipper anvil, you will need to use a 5’-6’ step ladder on top of the chipper discharge belt directly under the chipper to remove the anvil bolts, as well as the counter anvil if required. Use a 36mm socket and impact wrench to remove the anvil bolts. It is important at this time to make sure that you are wearing hearing protection as the noise from an impact in that confined space is incredibly loud. Once the bolts are removed the anvil can be slid out of the east side access panel. Clean any debris from the area where the anvil sits before installing the new anvil. The anvil bolts are supposed to be torqued to 540 ft/lbs, but due to space restrictions you will most likely have to use the best impact wrench you can find.

Now that the new anvil is installed, the old knives can be removed. Make sure you are wearing all the appropriate knife handling PPE (cut resistant gloves, apron and arm guards). To remove the knives, take off the 2 long handled bolts that hold the hinged part of the chipper lid and lift the lid all the way up. Next while wearing your PPE, rotate the chipper drum until the knife you wish to work on is in a good position and lock it in place with the hand pump that controls the brake that is located on the east side of the drum. To remove the knife clamps, use the impact wrench with a socket that is located just inside the grinding room next to the knife grinder control box. Once the knife clamp is loosened off, install the knife guard and remove it from the chipper. With the knife removed, use a scraper and an air wand to remove all debris from the pocket that the knife sits in. Install the new knife and remove the guard before tightening up the clamp with the impact. Repeat this procedure for the other 2 knives. After all the new knives are installed, use a ¾” torque wrench to tighten the knife clamp nuts to 420 ft/lbs.

With the new knives installed, slowly rotate the chipper drum while your co-worker measures the distance from the knife to the cutting edge of the new anvil for each knife with long feeler gauges. Due to the way that the chipper rotor was constructed, one knife will always be closer than the other two. It is critical that you set the distance between the knife and anvil with the longest knife otherwise it may strike the anvil. Once you have identified the longest knife you can begin adjusting the clearance. To do this, loosen the bolts holding the chipper rotor bearings in place, and use the pusher bolts on either side of the bearing housing to move the rotor the appropriate distance from the anvil (0.007”-0.012”). Once you have the clearance set, rotate the drum all the way around to make sure none of the knives contact the anvil. It may be necessary to tension the drive belt again depending on which direction the rotor was moved. The last thing to do is set the counter anvil. Locate the longest knife again and rotate the rotor until it is at the counter anvil. The counter anvil is clamped in place with ½” bolts through slotted holes. The target clearance for the counter anvil is 0.040”. If the counter anvil needs to be adjusted, one person will have to go inside the chipper again to hold a back up wrench on the counter anvil clamp bolts. Loosen the bolts and slide the counter anvil until it has the correct clearance to the knife. When it is in the correct spot, tighten the bolts back up.

Rotate the chipper again to make sure none of the knives contact either of the anvils. Make sure that all bolts that were loosened get tightened back up and all panels/guards get replaced. Once everything is cleaned up be sure to test run the chipper before completing the job.