CONE CRUSHER MANGANESE CHANGE

SUMMARY

All PPE must be worn.

Observe and abide by all safety warnings

Practice safe maintenance.

Lift chains to be checked that they have been tagged and tested.

Understand service procedure before doing any work. Keep area clean and dry.

Never lubricate, clean, service or adjust machine whilst it is moving.

Keep hands, feet and clothing clear of power driven parts and in-running nip points.

Position machine on level ground

Disengage all the power and operative controls to relieve pressure.
Stop the engine.
Implement lockout procedure.
Allow machinery to cool.

Securely support any machine elements that must be raised for service work.

Keep all parts in good condition and properly installed. Attend to damage immediately. Replace worn or broken parts.

Remove any build up of grease, oil or debris.

Isolate battery and lockout before making adjustments on machine systems or welding on machine.

Procedure

There is approximately 45mm – 50mm wear on liners
Always fit a new manganese mantle and concave as a "pair"

When monitoring wear
Close the upper frame hydraulic cylinders until the liners are just touching (refer to operators manual for correct procedure)
Then measure the pin centres on the upper frame
Minimum Cylinder dimensions have been revised
1000mm cone is now 690mm
1300mm cone is now 805mm

Once this measurement is reached, the liners must be replaced otherwise serious damage to the crusher will occur.

Remove rock box

1. Raise the feed conveyor, pin in place, and lower so that pins are taking weight of conveyor. Ensure that both pins are resting fully in their seats and retaining pins fitted.
2. Disconnect feed bowl level sensor (noting its current position)
3. Unbolt and lift off feed box

Removing upper frame

1. On the automax panel select manual and raise the upper frame to its maximum extent
2. Close (turn clockwise) the shut off valve 9B inside the hydraulic console to isolate the wedge ring hydraulic circuit from the main hydraulic system.

3. Open (turn anticlockwise) the shut off valve 9A inside the hydraulic console to allow all pressure in the wedge ring circuit to be released there by removing the loading from the wedge ring.

4. Drop the upper frame with the “close” button, to push the wedge ring down and thus free it from the mainframe to provide clearance needed to lift off the upper frame. The wedge pressure indicated on the pressure gauge should drop away to 0 – 28 bar.as the wedge ring frees off.
   Sometimes you may need to raise and lower the upper frame a few times to ease removal

   Ensure wedge ring is completely free to avoid lifting overload.

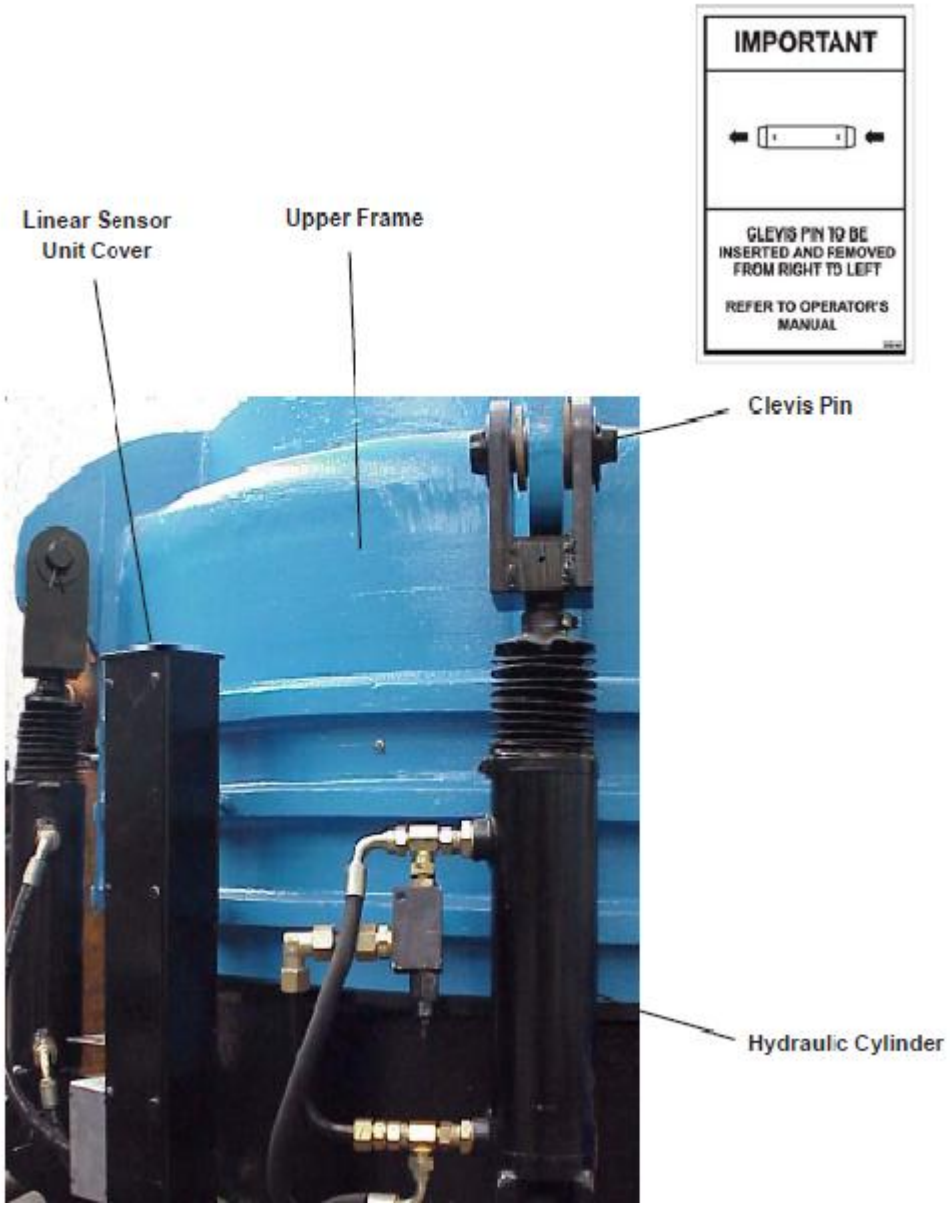


Figure 9g Dumpy Jack Circuit Shut Off Valves

5. Remove the linear sensor cover and disconnect the top bolt from the unit. (if fitted)**This is essential to avoid damage to sensor**
6. With suitable cranage connect approved lifting chains to the three lifting eyes on the upper frame. (do not take load at this point)
7. Raise the upper frame to maximum height, insert rest supports and lower upper frame to take the weight off the clevis pins.
8. Remove clevis pins and lay each cylinder outward.
9. With service tools fitted to three evenly spaced cylinders, assist cranage to lift upper frame using the three cylinders (note remaining cylinders not used will also extend, make sure all personnel are clear of all cylinders)
10. Make sure all personnel are clear
11. Lift off upper frame assembly from the machine and support on timber blocks on the ground.

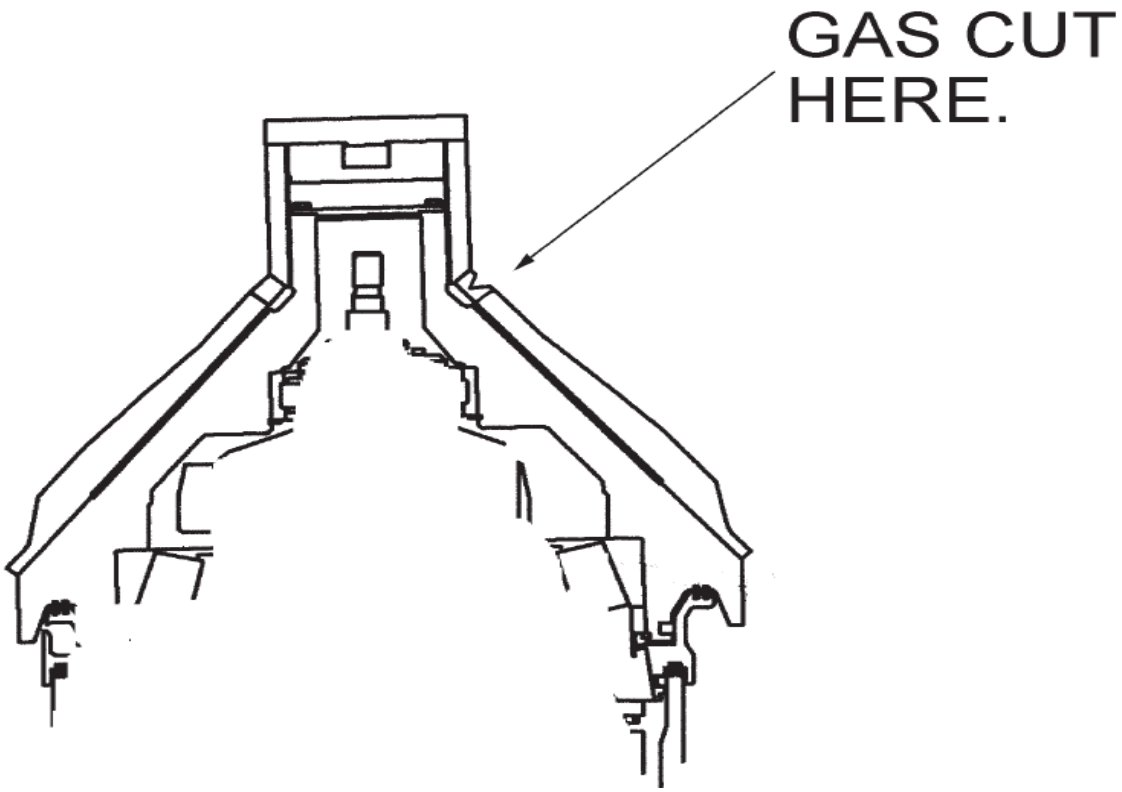
Note : clevis pins should be removed from right to left when facing machine to avoid disturbing the bearing located against the shoulder inside each lug on the upper frame.

12. Isolate and lock out machine again at this point to ensure plant cannot be started



Removing the Mantle

1. With the upper frame removed gas cut around the mantle within 20mm – 30mm of the top as per the diagram below. Always ensure you are a well ventilated area or use appropriate breathing protection.
2. Turn the mantle nut clockwise to remove (L.H thread) using sledging bar with retaining bolt fitted
3. Remove mantle nut with lifting bar and cranage
4. Break loose the fit between the mantle and the cone head by striking the lower section circumference with a hammer.
5. Weld lift points on to the mantle, ensure all personnel are standing clear and lift off mantle to the ground. (taking care not to damage thread)
6. Remove the old backing material and inspect the cone head seating where the surfaces have been ground. Remove any nicks or burrs with a file or grinder. Inspect the ground surface of the new mantle and again remove any nicks or burrs.



Mounting the Mantle

1. Apply the releasing agent to the unmachined surface, all around the cone head.
2. Place the new mantle onto the cone head and and install lubricated mantle nut.
3. Tighten down the mantle nut by turning counter clockwise (R.H) with the sledging bar.
4. Once you are satisfied the mantle nut is tight enough to align the mantle and seat on the cone head, release the mantle nut and lift off with lifting bar and carnage to allow the filler to be poured.
5. Prior to mixing the filler, grease the mantle nut thread to protect it from any filler spills.
6. Follow all safety precautions
7. Mix the filler and pour immediately

8. Pour the filler evenly around the mantle. Continue pouring until the filler reaches level B as shown in the diagram below.
9. Replace mantle nut and tighten counter clockwise (R.H). Use a hammer on the sledging bar to fully tighten.

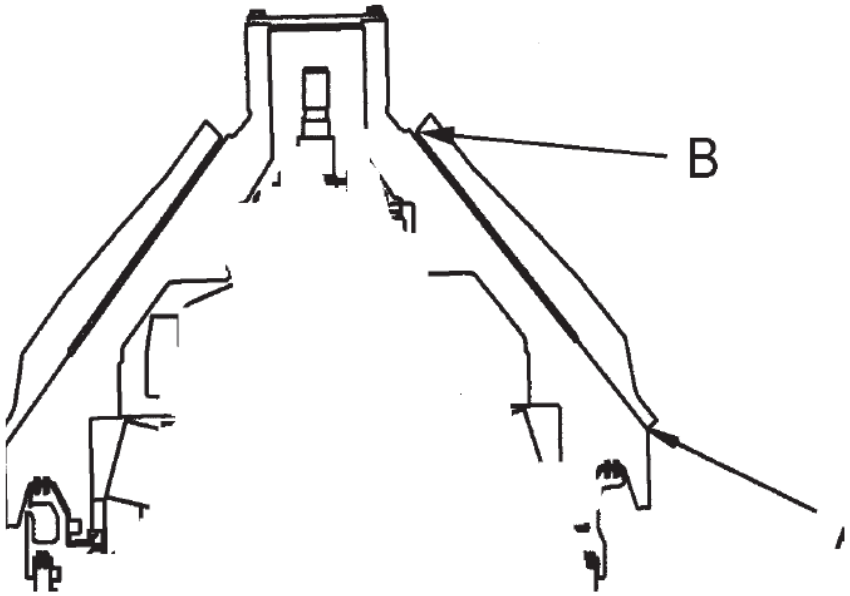


Figure 9q Section through the Cone Head showing correct filler level

Changing the Concave

The concave ring is held in place in the upper frame by a self tightening gun lock arrangement that automatically tightens the concave manganese on the concave wedges as the ring is put under load during crushing.

1. Use gas to cut through the three lugs,
2. Clear all personnel from the area.
3. Using excavator apply a gentle downward load to the manganese to separate from the upper frame.

4. Remove the old backing material and dowels. Inspect the lower inside beveled edge of the upper frame seating. Remove any nicks or burrs.
5. Inspect the ground surfaces of the new concave manganese for the same.

Never lift the upper frame in mid air to clean the inside. Instead support the frame on timber on the ground. Laying it on its side and supported, to clean its ground surfaces.

6. Apply release agent to the cleaned inner surface of the upper frame
7. Place the new concave on timber blocks
8. Lift the upper frame over the concave and turn it so that the concave lugs will align with the recesses on the upper frame. Lower the upper frame to the ground, then attach and lift concave until the concave lugs pass through the upper frame recesses.
9. Rotate the upper frame to the left so that the concave lugs are located approximately 50mm past the dowel holes. After rotation, equally locate the concave wedges between the concave lugs and the upper frame.

   Tap in the wedges slightly and assess whether the wedges will take concave into correct position. Check that the concave is evenly seated all around in position A.

   Once satisfied all are correct , drive wedges fully home.
   Insert the dowels into the holes in the upper frame and drive home.

Note : If there is a gap between the concave wedge and the dowel pin which cannot be rectified by moving the wedge position, it may be necessary to tighten the wedges and then weld a piece of steel between the wedge and the dowel pin.

It important that the concave wedges are inserted evenly so that the concave ring is centrally located within the upper frame.

Placing the filler

1. Follow all safety precautions
2. Mix the filler and pour immediately
3. Stop pouring when the filler reaches the top of the concave.

Replacing the upper frame

1. Clean and lubricate the wedgring band and seals
2. Lower the upper frame over the lower frame onto the rest supports, taking care to line up the anti rotation stop on the upper frame with the guide post.
3. Start the machine engine and set on 1200 rpm, do not press any other start buttons.
4. On the hydraulic panel use the open and close button in manual mode to line up and insert each of the clevis pins on the cylinders.
5. Remember the clevis pins need to be inserted from left to right to avoid damage to the bearing.
6. Detach the lifting chains and shackles
7. Replace the linear position sensor and housing cover (if fitted)
8. Replace the rock box.
9. To restore wedge ring pressure close valve 9A, open valve 9B.
10. Carry out “ initial calibration procedure as detailed below

Calibration Procedure

Procedure

1. Observe all safety warnings.
2. Start the engine (Section 7.2.1). Set the engine speed at 1200rpm.
3. Continue with the **OPERATION** switch at **PLANT** and the **RADIO REMOTE CONTROL** switch at **ON** (Figure 7b). DO NOT press any of the start buttons.
4. On the Automax hydraulic panel (Figure 7i) switch to **MANUAL** and depress the **OPEN** button to raise the Upper Frame approximately 25-38mm (1" to 1½"). Look into the Automax crushing chamber to check there is no stone lodged in the chamber.
5. Now depress the **CLOSE** button until the manganese crushing members (mantle and concave) touch. This is indicated by a sudden rise in pressure shown on the gauge near the panel (Figure 7i) and release the button immediately.
6. Scroll to the ***New Mang*** display screen and then press ***Enter.***
7. Press the ***F4*** key to ***Zero*** the display and then press ***Escape.***
8. Scroll to the ***Set Gap*** display screen, press ***Enter*** and then press ***Enter*** again.
9. Key in the required closed side setting (mm) using the number keys, press the ***Enter*** and then press ***Escape.***
10. Scroll to the ***Current Gap*** display screen.
11. Depress the **OPEN** button; hold until the ***Current Gap*** display shows the gap to be above the ***Set Gap*** setting then switch to **AUTO**. The machine will automatically come down to the required setting.