RECONDITIONING THE

SLIDING WEDGE

LOADING GATE

Reconditioning a Sliding Wedge Gate

Scope

Reconditioning a sliding wedge gate requires replacing the following components

1. Gate wedges
2. Wedge screws
3. Cross head springs
4. Wedge blocks
5. Gate shaft bushings
6. Toggle lever bushing

Repair or replacement of the following components may also be required after inspection

1. Gate flange
2. Stellite
3. Gate shaft
4. Gate cover
5. Cross head or crosshead link pin
6. Gate operating levers and links

Preparation

1. Completely disassemble the gate
2. Clean all components to remove sugar build up, scale, rust and corrosion
3. Sand blast the gate body if necessary to remove corrosion
4. Remove the stationary wedges
5. Grind off any remaining weld from back of gate flange
6. Remove the gate shaft bushings from gate body
7. Remove bushings from gate operating levers and links

Inspection

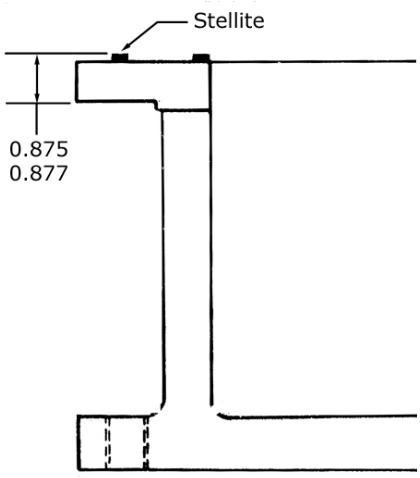
1. Inspect the stellite for cracks, chips or missing sections
2. Inspect the gate body for excessive corrosion
3. Inspect all operating levers and links for wear at bushing holes and link pin holes
4. Inspect the gate cover for worn out chrome plating
5. Inspect cross head link pin for wear
6. Measure the thickness from the face of the satellite to the back of the gate flange at all four corners of the gate body. The measurement must be the same at all four points. A new gate will measure 0.875 to 0.877 inches.
7. Inspect the gate shaft for wear at the bushing contact areas

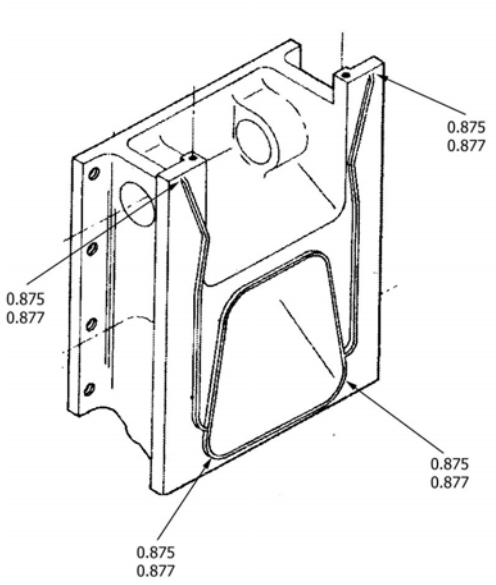
Repair and Correction Procedures

Gate Flange Thickness

For the gate wedges to seal the gate opening, the face of the stellite and the back of the gate flange must be parallel

1. If inspection shows all four corners measure the same from the face of the stellite to the back of the gate flange, but are less than 0.875 to 0.877 inches, record the difference. This difference will be taken into consideration when installing the new gate wedges
2. If the inspection indicates the four corners are not parallel, machine the back of the gate flange to restore parallelism before installing the new gate wedges. After machining, remeasure the distance from the face of the stellite to the back of the flange and record this measurement.





Stellite Damage

If the stellite bead is damaged it must be repaired to assure proper gate sealing. It is extremely difficult to replace a portion of a damaged stellite bead. It is best to replace the entire stellite portion.

1. Grind away all of the stellite
2. Preheat the gate body to 350 degrees
3. Replace the stellite bead by welding
4. Surface grind the entire stellite bead to a thickness of 0.125 to 0.177 inches
5. Measure the distance from the face of the stellite to the back of the gate flange at all four corners of the gate opening to check for parallel. Record this measurement

Gate Shaft Wear

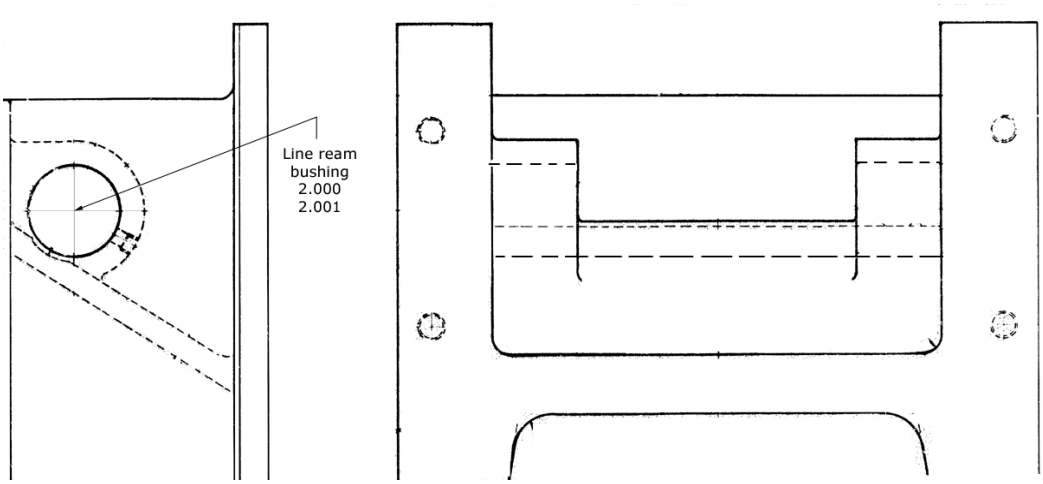
The gate shaft is cold drawn steel finished to 1.998 to 1.999 inch diameter. Many times it will show wear where it passes through the gate shaft bushings.

1. The repair gate shaft can be build up the worn portion and regrind to 1.998 to 1.999 inch diameter. Rechrome, after regrinding, with .001" thick hard chrome direct. One way of doing this is by metal spraying.
2. When replacing the gate shaft, it is necessary to cut the left hand key way for the gate operating lever. To locate the key way:
    a. Install the new gate shaft in the gate body
    b. Install the right hand gate operating lever and key and tighten on the shaft
    c. Slip the left hand gate operating lever onto the shaft
    d. Install a 1- 1/8 inch diameter rod through the link pin holes of both gate operating levers
    e. Tighten the left hand gate operating lever on the gate shaft
    f. Locate the left hand gate operating lever key way on the gate shaft
    g. Disassemble and machine the key way

Bushing Wear

Generally, it is only necessary to replace bushings. However if the bushings have been allowed to completely wear out to the point the surrounding metal has been damaged the whole assembly must be replaced or repaired.

1. To repair damaged bushing areas machine the hole in the assembly 0.200 inches oversize and press a 0.100 inch wall steel sleeve into the assembly
2. Press replacement bushings into sleeved hole
3. New gate bushings must always be replaced as a set and line reamed to 2.000 to 2.001 inch diameter
4. Standard bushing ODs
    a. Gate bushings: 2.500 inch
    b. Connecting link bushings: 1.375 inch
    c. Gate operating lever bushings: 2.000 inch, 1.125 inch, 0.9375 inch



Crosshead Link Pin Replacement

The pin in the crosshead is plug welded into the assembly

1. Drill out the existing pin and plug weld a new pin in place.

Gate Cover Plate

Replate the gate cover to repair worn out or damaged chrome plating. The overall thickness of the replated cover plate can not be less than 0.880 inch.

1. Strip the cover plate of all the existing chrome.
2. Surface grind the back side flat to remove all pitting and corrosion
3. Hard chrome plate to a minimum of 0.001 inches to 0.002 inches overall and 0.012 inches on the back side then regrind to 0.880 inches to 0.880 inches.
4. NOTE: Actual chrome thickness may have to be more than the minimum to restore the original 0.880 cover plate thickness.

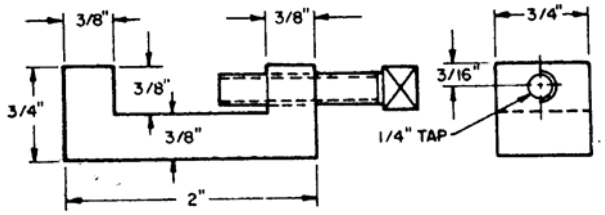
Wedge Replacement

Proper wedge placement is critical to assure proper functioning of the gate. A misaligned set of gate wedges will compromise not only the gate operation but also that of the entire loading system. For rebuilding, it is best to remove the gate from the gate spout and set it up on a bench fixture. When reconditioning an old gate, stellite wear and gate body condition must be taken into consideration.

Before beginning, complete all of the above inspections and complete any necessary repairs.

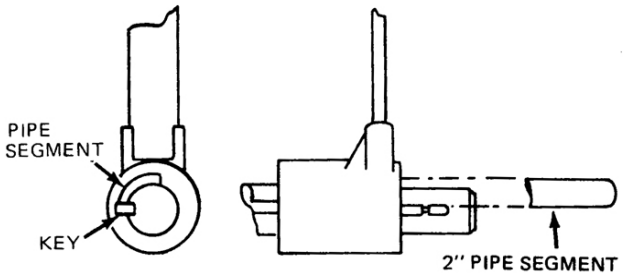
Special tools required:

“C” clamps (2)



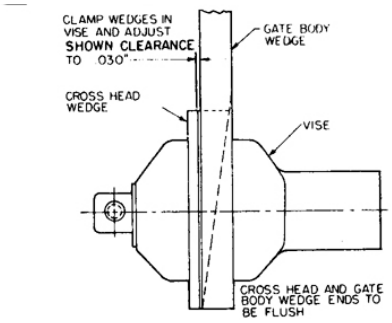
"C" CLAMP

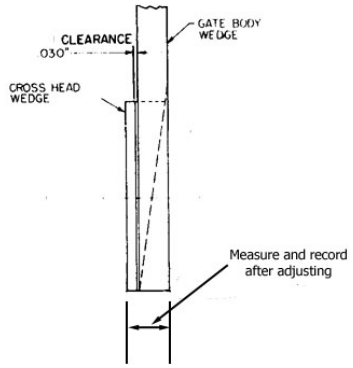
Gate handle spacer (1)



Checking the Wedge Set

1. Before attaching the wedges to the gate body check the wedge set for proper clearance between the cross head wedge (7inches long) and the gate body wedge (17-3/4inches long).
2. Clamp the wedge set in a vise making sure the ends of the wedges are flush.
3. Check the clearance between the cross head wedge and gate body wedge. The clearance must be *not less* 0.030 inches
4. If the clearance between the cross head wedge and the gate body wedge is *less* than 0.030 inches, lightly tap the top of the cross head wedge to obtain the proper clearance.
5. Mark and grind off the end of the cross head wedge so that both wedge ends are flush.
6. Measure and record the overall thickness of the wedge set.





Compensating For Wear

Assembling the wedge set to the gate body with both ends of the wedges flush assumes the distance from the face of the stellite to the back of the gate flange measures between 0.877 and 0.875 inches. This may not be the case for an old gate. (See Gate Flange Thickness section above)

1. To compensate for the wear, extend the cross head wedge beyond the end of the gate body wedge until the overall thickness of the wedge set plus the measured thickness of the face of the stellite to the back of the gate flange equals 0.877 inches.
    a. Example: If the face of the stellite to the back of the gate flange measures 0.777 inches, the cross head wedge must be extended until the wedge set thickness is increased by 0.100 inches
2. Mark and grind off the end of the cross head wedge so that both wedge ends are flush

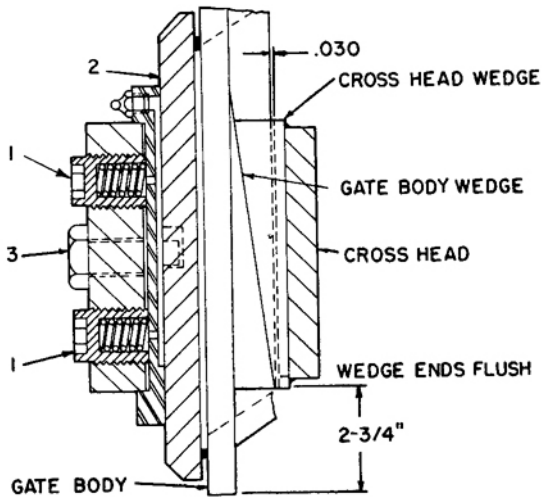
Installing the Gate Cover

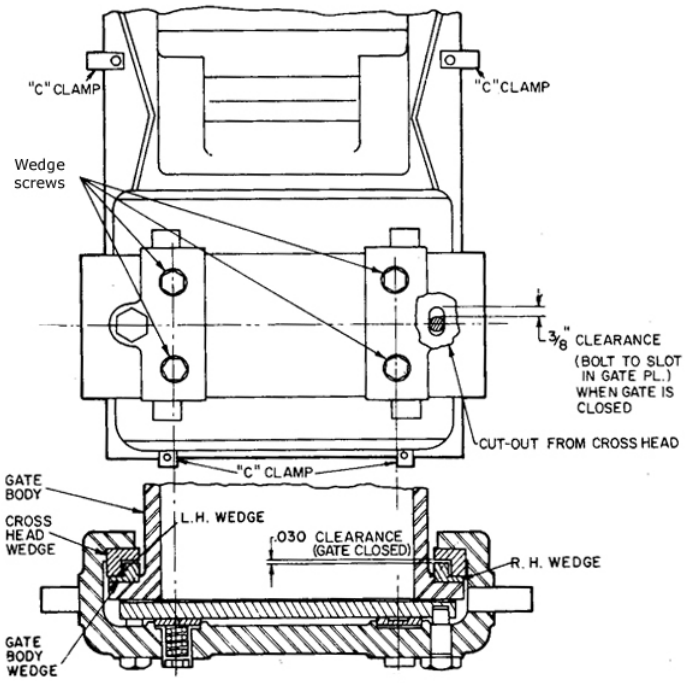
For assembly, the mount the gate body on a bench fixture in the normal operating position

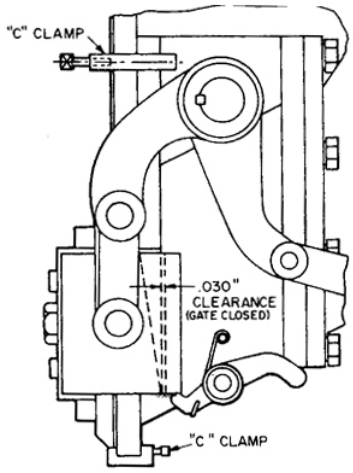
1. Assemble the gate shaft, operating levers, connecting links and cross head body to the gate body
2. Install the gate shaft key and emergency hand lever on the right end of the gate shaft and insert the gate spacer special tool.
3. Pull down on the emergency gate lever to assure the gate is in the full closed position
4. Attach the two "C" clamps to the bottom of the gate body.
5. Position the gate cover behind the cross head so that it sits on the two "C" clamps.
6. Install the gate cover support screws (3) making sure they rest on the bottom of the slot in the cover plate.
7. Install the cross head springs and wedge screws. Do not tighten.

Installing the Gate Wedges

1. Locate the gate body wedge on the back of the gate flange approximately 2-3/4 inches from the bottom of the gate flange.
2. Hold the gate body wedge in place with "C" clamps placed approximately 3 inches from the top of the gate body
3. Slide the cross head wedge in place so it is centrally located on the back of the cross head.
4. Lightly tighten the four wedge screws (1) and check to see that the bottom of the gate body wedge is flush with the bottom of the cross head wedge. This is the setting to obtain the 0.030 inch clearance between the straight faces of the wedges.
5. Tighten all four wedge screws so all surfaces are metal to metal.
6. Weld the gate body wedge to the gate body at the top and bottom and into the 3/4 inch x 1/4 inch notch on the side.
7. Weld the cross head wedge to the cross head at the top and bottom.




"C" CLAMP
"C" CLAMP
Wedge screws
3/8" CLEARANCE (BOLT TO SLOT IN GATE PL.) WHEN GATE IS CLOSED
CUT-OUT FROM CROSS HEAD
"C" CLAMP
GATE BODY
CROSS HEAD WEDGE
L.H. WEDGE
.030 CLEARANCE (GATE CLOSED)
R.H. WEDGE
GATE BODY WEDGE


"C" CLAMP
.030" CLEARANCE (GATE CLOSED)
"C" CLAMP