AUGER FLIGHT STRAIGHTENING

OPERATIONS MANUAL

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THIS BOOK IS DESIGNED TO PROVIDE SUPPLIES REQUIRED

for the SET-UP AND ADJUSTMENT PROCESS

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Prices: Prices in effect at time of shipment will apply. Prices are subject to change without notice. All prices are F.O.B. Clay Center, Kansas. Orders shipped from locations other than Clay Center, Kansas will be subject to additional charges, such as back freight and/or additional freight.

Service Charge: A service charge will be assessed for all past due balances as permitted by state law not to exceed 1-1/2% per month.

Minimum Order: Processing and handling costs necessitate a minimum charge of $15.00 net on all orders.

Back Orders: Back orders will be shipped as they become available. Contact Hutchinson,Mayrath Customer Service for alternative shipping options or if cancellation is desired.

Damaged Goods: It is the consignee's responsibility to check all shipments thoroughly upon receipt of goods. If any damage is discovered, it must be noted on the freight bill of lading before signing. The consignee must make necessary claims against the respective freight line. All damage claims must be submitted within 30 days of delivery receipt.

Shortages: All shortages must be noted at time of delivery. Shortages must be noted on the freight bill of lading before signing. Hutchinson,Mayrath must be advised of all concealed shortages upon discovery. Once notified of concealed shortages Hutchinson,Mayrath will advise corrective action to be taken.

Return of Goods: All returns must be approved by Hutchinson,Mayrath prior to shipment. All return requests will be issued a return authorization number. NO RETURNS WILL BE ACCEPTED WITHOUT A RETURN AUTHORIZATION NUMBER AND PRIOR AUTHORIZATION FROM THE FACTORY. All returns must be shipped prepaid. A 15% restocking charge will be applied to all returned merchandise. Custom Products may not be returned for credit. Only current products in new and salable condition may be returned. No safety devices may be returned for credit.

Modifications: It is the policy of Hutchinson,Mayrath to improve its product whenever possible and practical to do so. We reserve the right to make changes, improvements and modifications at any time without incurring the obligation to make such changes, improvements and modifications on any equipment sold previously.

Limited Warranty: (a) For a period of (1) year after receipt of goods by the original consumer buyer, Hutchinson,Mayrath will supply free of charge replacement parts for parts that prove defective in workmanship or material. Defective parts must be returned freight prepaid to a specified Hutchinson,Mayrath location. Only Hutchinson,Mayrath original repair parts may be used for warranty repairs.

(b) This limited warranty does not extend to parts designed to wear in normal operation and be replaced periodically; or to damage caused by negligence, accident, abuse or improper installation or operation.

(c) GOODS NOT MANUFACTURED BY HUTCHINSON,MAYRATH CARRY ONLY THE MANUFACTURER'S WARRANTY.

(d) THIS UNDERTAKING IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

FAILURE TO FOLLOW THE INSTRUCTIONS CONTAINED IN THE OWNER'S & OPERATOR'S MANUALS AND THE ITEMS LISTED BELOW WILL RESULT IN THE VOIDING OF THIS LIMITED WARRANTY.

(1) Improper assembly, including failure to properly install all safety equipment.
(2) Improper installation.
(3) Unauthorized alternations of goods.
(4) Goods operated when obviously in need of repair.
(5) Use of unauthorized repair parts.
(6) Irresponsible operation.
(7) Used to handle materials other than free flowing, nonabrasive and dry materials, as intended.
(8) Damaged through abusive use or accident.

Limitation of Liability: BUYER AGREES THAT IN NO EVENT SHALL HUTCHINSON,MAYRATH HAVE LIABILITY FOR DIRECT DAMAGES IN EXCESS OF THE CONTRACT PRICE OF THE GOODS IN RESPECT OF WHICH CLAIM IS MADE. BUYER FURTHER AGREES THAT IN NO EVENT SHALL HUTCHINSON,MAYRATH ON ANY CLAIM OF ANY KIND HAVE LIABILITY FOR LOSS OF USE, LOSS OF PROFITS, OR FOR ANY INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES.

SAFETY

GENERAL SAFETY STATEMENT

WARNING! Anyone who will operate or work around this machine shall first read this manual! This manual must be delivered with the equipment to its owner. Failure to read this manual and its safety instructions is a misuse of the equipment.

This manual was written with the safety of the operator and others who work with the equipment as our prime concern. The instructions presented will help the reader learn **SAFE** day to day work practices. We want you as our partner in safety.

It is your responsibility as an owner, operator or supervisor to know what specific safety requirements and precautions exist and to make these known to all other personnel working with the equipment or in the area, so that they too may safely perform their duties and avoid any potentially hazardous situations.

Follow safety policies/programs specific to your facility and to all local, state, and federal regulations.

Please remember safety equipment provides important protection for persons around a grain handling system that is in operation. Be sure all **ALL** safety shields and protection devices are installed and properly maintained. If any shields or guards are damaged or missing, contact your dealer to obtain the correct items for immediate replacement.

We suggest the implementation of a Safety Program for all personnel that includes, but is not limited to, the proper use of PPE (personal protective equipment), Fall Protection Systems and Lock Out-Tag Out procedures. If any PPE equipment is worn or damaged, replace immediately.

WARNING! Avoid any alterations of the equipment. Such alterations may create a dangerous situation where serious injury or death may occur.

SUPPLIES / TOOLS

Qty	Part Number	Description
2	**ST**1048168	Base Assembly Weldment
1	**ST**1048169	Center Support Base Weldment
1	**ST**1048170	Reference Stand Weldment
1	**ST**1048472	Leather Hammer with Two Piece Face Kit
2	**ST**1047677	Flight Straightening Rod 3/4” x 42” long
2	**ST**1047673	Flight Straightening Rod 1” x 42” long
2	**ST**1047672	Flight Straightening Rod 1-1/4” x 42” long
2	**ST**1047671	Flight Straightening Rod 1-1/2” x 42” long
2	**ST**1047670	Flight Straightening Rod 2” x 42”
1	**ST**1047803	Round to Round Flight Straightening Stub f/8” Standard PS
1	**ST**1047804	Round to Round Flight Straightening Stub f/10” Standard PS
1	**ST**52806	Flight Bushing 1.655” OD x 1.265” ID x 4.375” long
1	**ST**52807	Flight Bushing 1.655” OD x 1.515” ID x 4.375” long
1	**ST**52809	Flight Bushing 2.100” OD x 1.515” ID x 4.375” long
1	**ST**1008611	Tube Bushing 2.6” OD x 2.005” ID x 4-3/8” long
1	**ST**1047674	Flight Straightening Rod Tube Bushing Sleeve 1-1/4” ID x 42” long
1	**ST**1047675	Flight Straightening Rod Tube Bushing Sleeve 1-1/2” ID x 42” long
1	**ST**1047676	Flight Straightening Rod Tube Bushing Sleeve 2” ID x 42” long
1	**ST**1048064	Storage box for above Flight Straightening Rod /

Picture of the Supplies

Pictures of the supplies listed on the previous page as needed

Base Assembly Weldment

Adjustable Center Support Base Weldment

Reference Stand

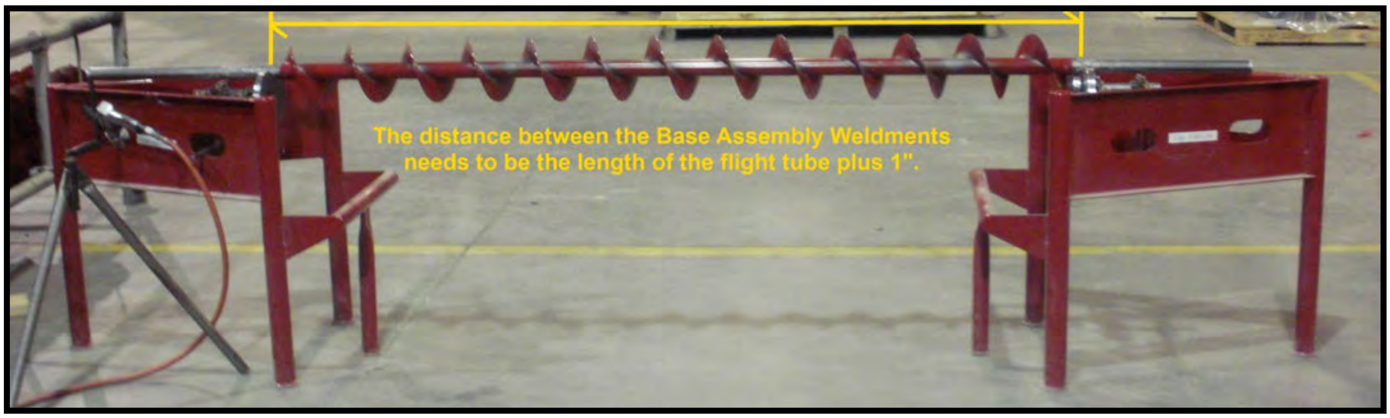
Leather Hammer

Storage box with Flight Straightening Rod /

Flight Straightening Rod Tube Bushing Sleeve

Flight Selection / Base Assembly Spacing

Select the flight which will be checked and adjusted for straightening.



Once the flight is selected and the length determined position the Base Assembly Weldments the proper distance apart.

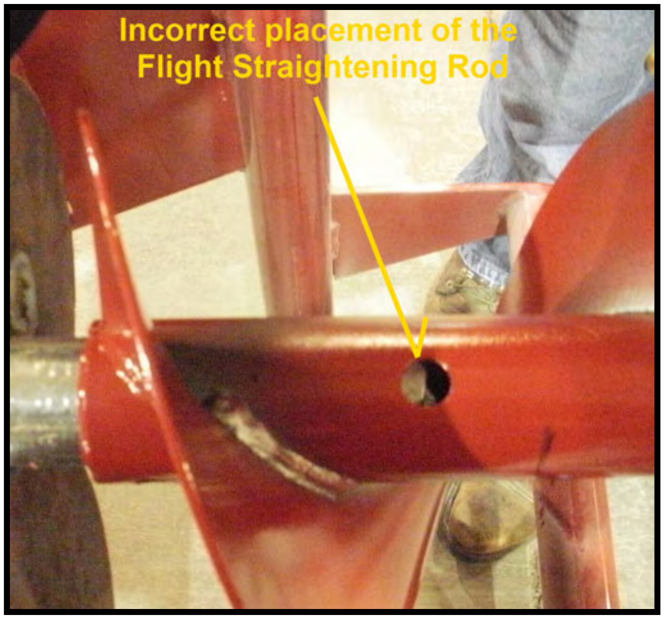
If the diameter or length requires the Center Support Weldment it will need to be installed at the approximate center point between the two Base Assembly Weldments.

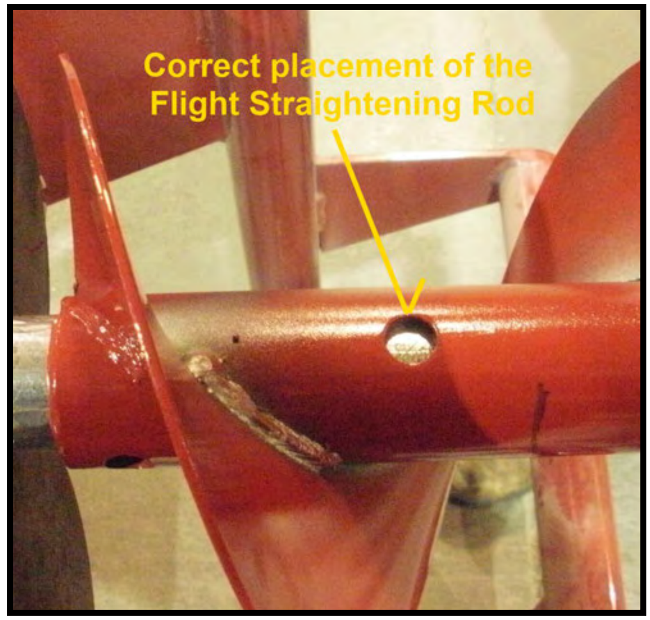
Selection of Rod / Stub / Rod Tube Bushing Sleeve

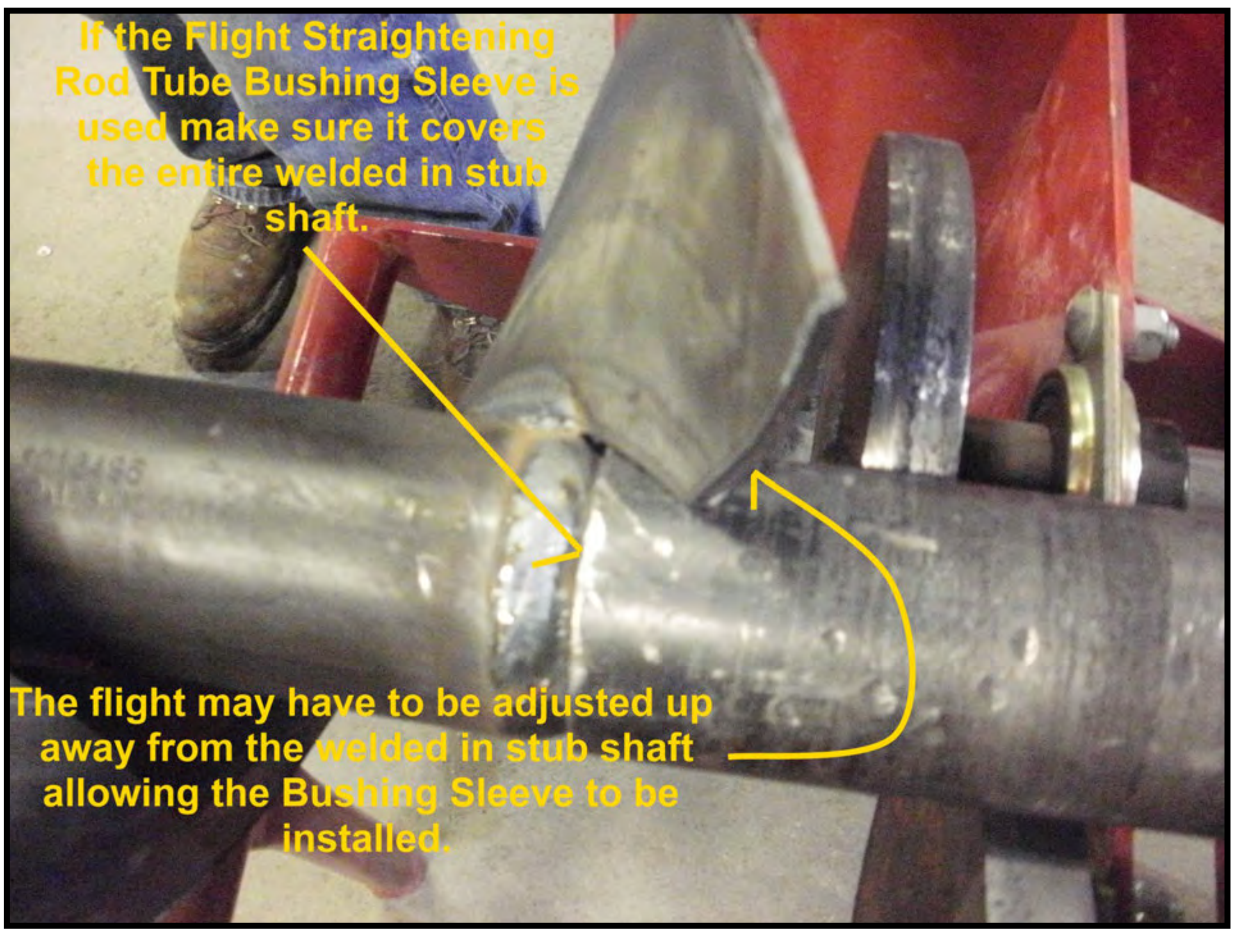
Measure the ID of the Flight tube or stub shaft to determine which Flight Straightening Rod / Flight Straightening Stub/ Flight Straightening Rod Tube Bushing Sleeve will be required. Once it is determined select the correct items from the storage box and place into /onto the end of the flight tube.

If a Flight Straightening Rod is used make sure it is inserted about 6” into the flight tube.

Installation Rod / Stub / Rod Tube Bushing Sleeve Examples



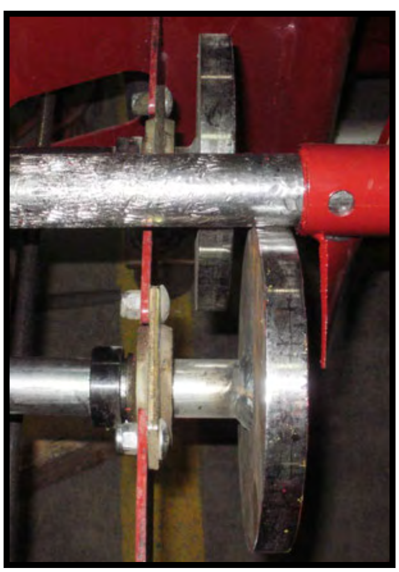


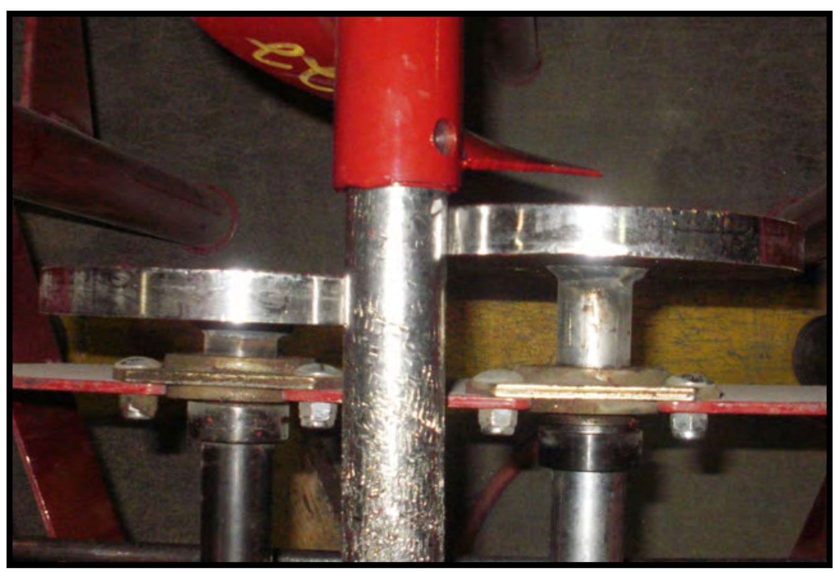


Installation of the flight on the Base Assemblies

Once the Flight Straightening Rod / Flight Straightening Rod Tube Bushing Sleeve is installed place one end of the flight on a Base Assembly weldment.

Raise the opposite end of the flight on the second Base Assembly weldment.





Adjust the Bases to the flight is positioned like the examples above.

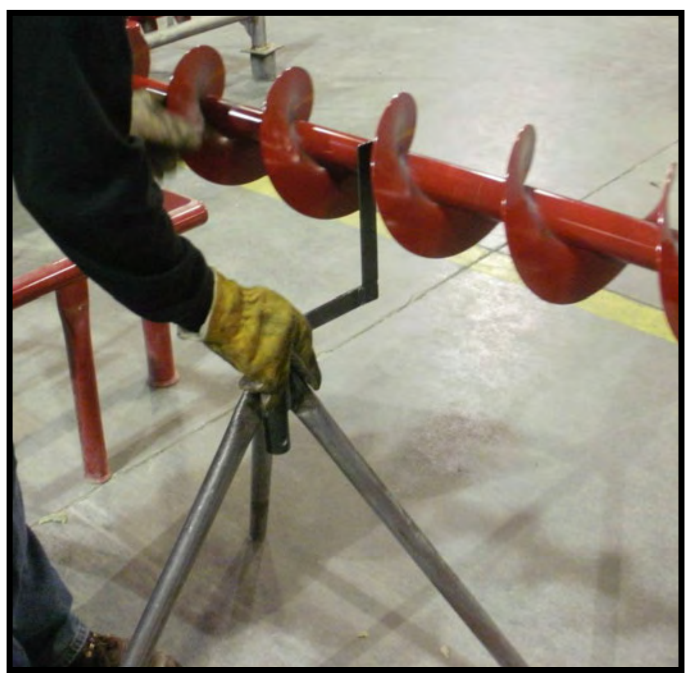
Initial Flight Reference Check

Stand at the end of the flight outside behind the Base Assembly Weldment sighting down the length of the flight.

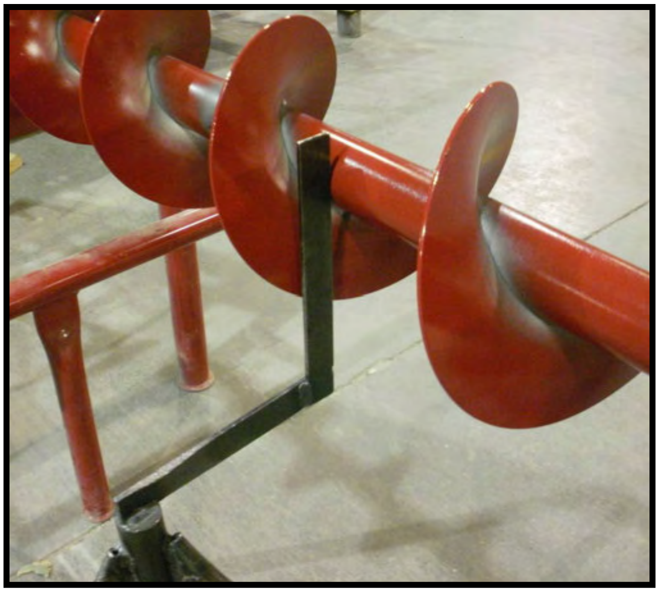
Turn the flight slowly watching the movement of the flight. Mentally note areas of the flight which do not stay in the visual center line. You are looking at the main section of the flight not the very ends in this step.

Note: When turning the flight release the shaft letting the flight continue to spin under its own motion. If the flight is straight during the turning process it will stop in a different positon each time.
If the flight stops in the same positon each time that will be an area to check with the Reference Stand Weldment.
Gravity is bring it to the same point each time.

Using the Reference Stand Weldment position it along the main section of auger flight tube where you visually see an offset in the flight the point which will require adjustment.
This may be a couple places along the length of the flight.



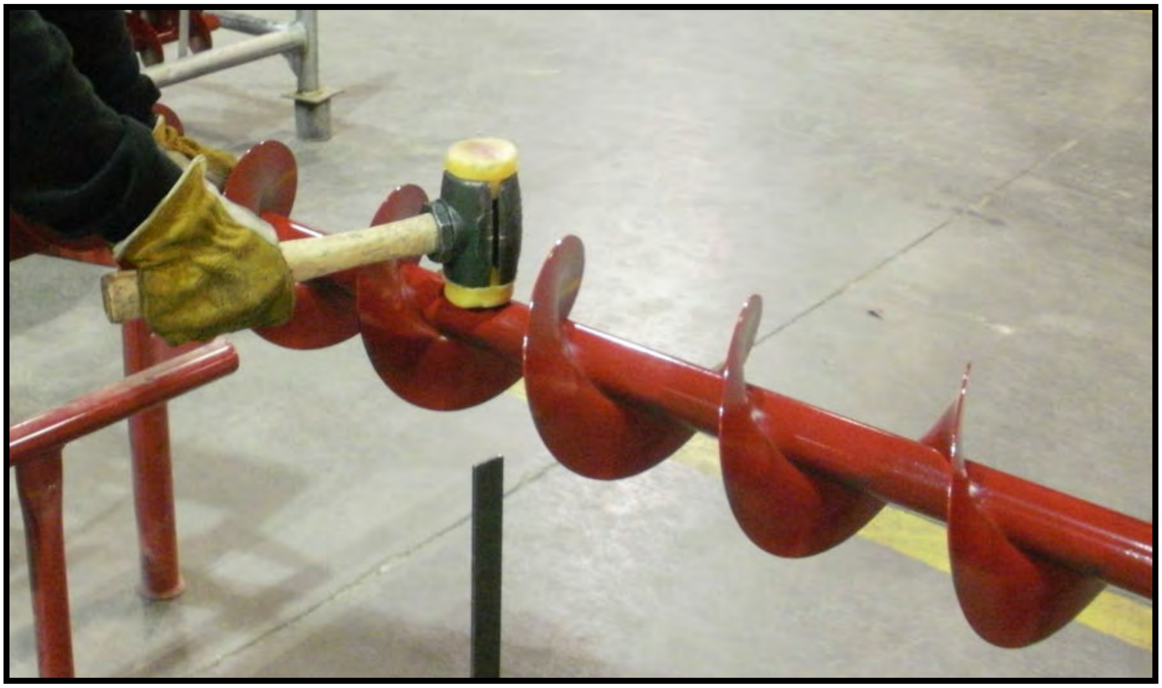
Reference Stand Weldment Initial Flight Check



Positon the Reference Stand Weldment where it is just touching the auger tube. Turn the flight one half (180 degree) revolution watching the relationship of the distance between the flight tube and the stand.

Note in the pictures the marks left on the paint by the vertical strap of the Reference Stand. These marks indicate a high point of the flight tube.
These high points need to be moved back towards the center line of the flight.

Main Section Flight Adjustment



Use the hammer provided with the kit. The size of the flight will determine how much force and number of strikes will be required.

Strike the flight tube with the hammer on the high point of the tube. This will move the tube back towards the center line.

Using the Reference Stand to check the flight once it has been adjusted. The process of adjustment and checking may have to be completed a couple of times for each location. There may be more than one location along the length of the flight to adjust. Complete the process for each area noted which does not follow the center line of the flight.

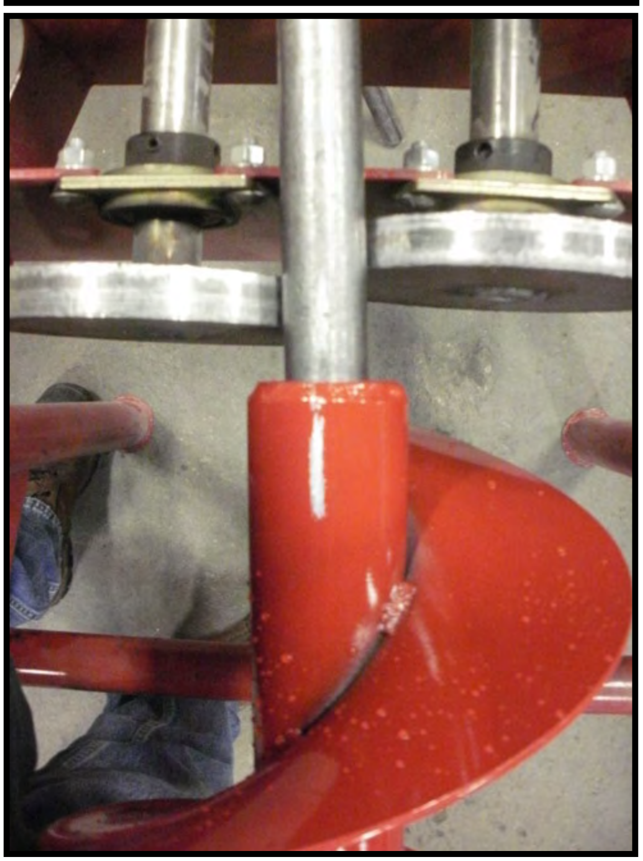
End Flight Reference Check

Once the main section of the flight has been straightened both ends will need to be checked and adjusted as needed.

Place a mark on the top of the Flight Straightening Rod / Stub /
Rod Tube Bushing Sleeve.

This will allow a visual reference and the flight is being rotated.

Positon the Reference Stand Weldment along the Flight Straightening Rod / Stub / Rod Tube Bushing Sleeve.



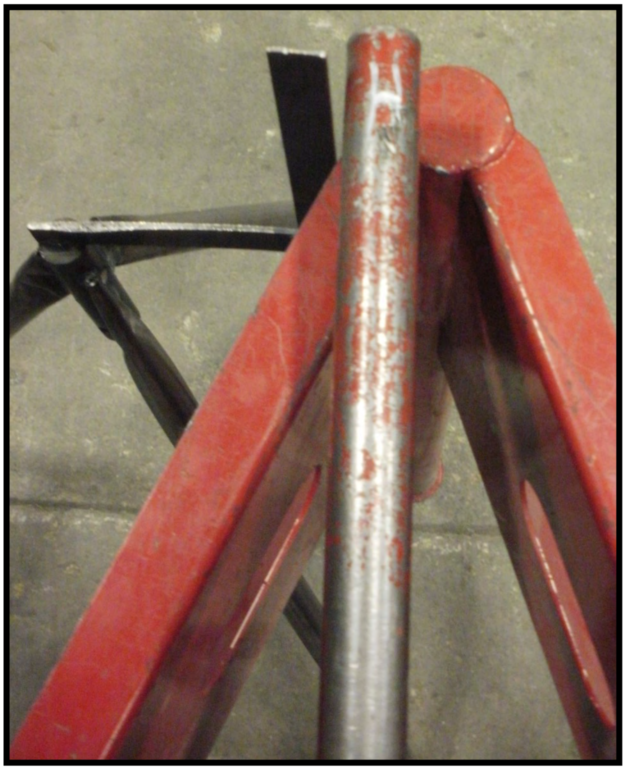
Before rotating the flight place a reference mark on the top of the fight tube.

Turn the flight watching the relationship between the Reference Stand Weldment and the Flight Straightening Rod / Stub / Rod Tube Bushing Sleeve. If there is a point where the rod pulls away from the stand the flight will have to adjusted.

See adjustment procedure on the following page.

This process will need to be completed on each end of the flight.

End Flight Reference Check



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Note the distance between the two points. This is the maximum distance noted during the rotation of the flight.

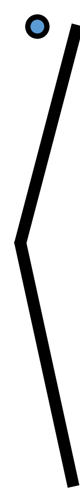
The top of the shaft has been marked with H for a reference point.

Do not rotate the flight until the next steps have been completed.

Before the flight is rotated an H has been placed at the 9 o clock positon which indicates the high spot on the flight tube. This is the location which must be adjusted.

Gap

High

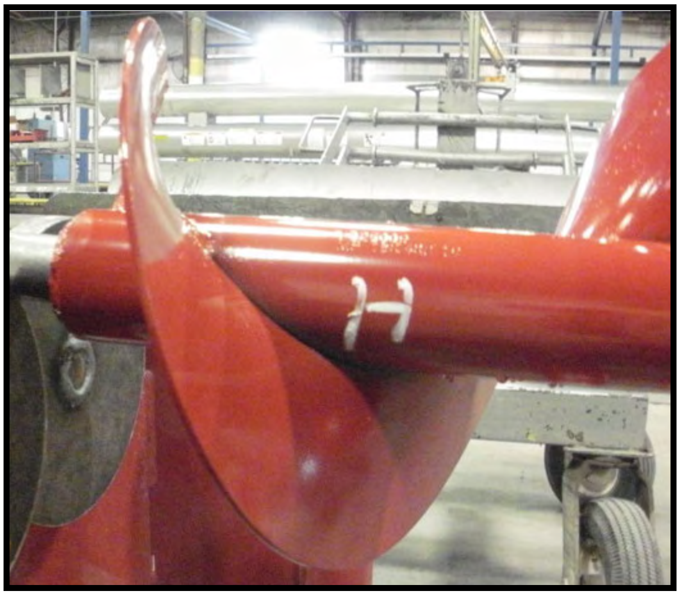


This example is extreme to explain more detail.

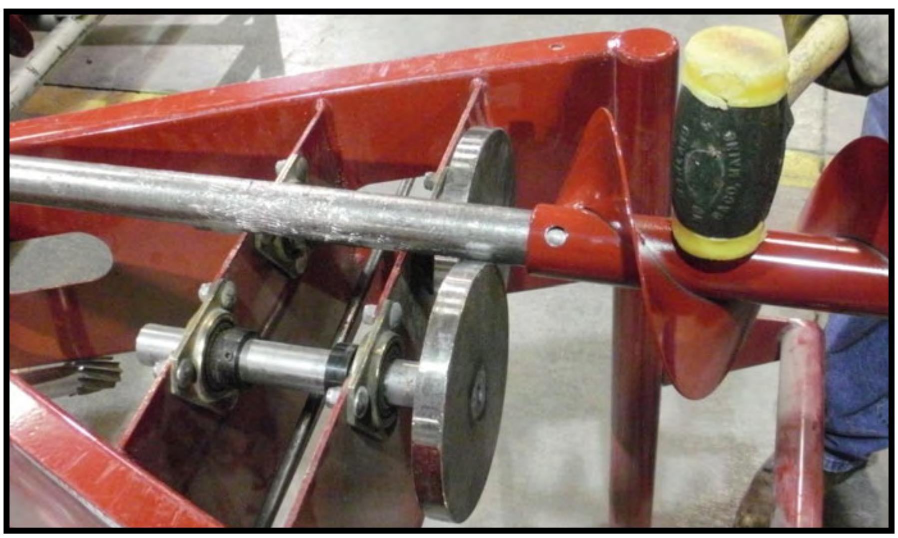
The blue dot is the reference point.

Note the large gap between the two. The location on the flight tube 180 degrees on the horizontal plane will the High point of the tube. This will be where the adjustment must be made.

End Flight Adjustment



Rotate the positon on the tube marked with the H from the 9 o clock positon to the 12 o clock position clockwise. This will place the high point on the top of the auger tube.



Use the hammer to adjust the flight as in the previous step.

Using the Reference Stand to check the flight once it has been adjusted. The process of adjustment and checking may have to be completed a couple of times.

Final Check of the Flight

Stand at the end of the flight outside behind the Base Assembly Weldment sighting down the length of the flight.

Turn the flight slowly watching the movement of the flight.   The flight should stay in the visual center line of the tube.

Note: When turning the flight release the shaft letting the flight continue to spin under its own motion. When the flight is straight it will stop in a different positon each time.

Note on the flight adjustment were made with the Month / Day / Year with a grease pencil.

Reverse steps which were used to place it on the bases. Dropping the flight may cause damage to completed process. Once the flight is on the ground remove the Flight Straightening Rod / Flight Straightening Rod Tube Bushing returning them to the storage box. Return the flight to its storage location.

Longer Auger Flight Process

The next section will show the steps required for longer Auger Flight Sections.
Many of the steps are the same as completed on the shorter sections.
Longer flight sections like the one pictured below will require mechanical assistance to move.

Select the flight which will be checked and adjusted for straightening.

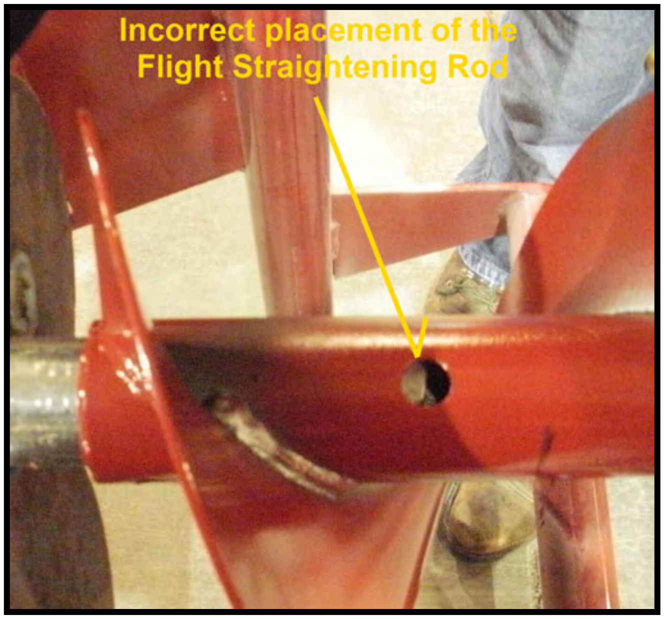
Once the flight is selected and the length determined position the Base Assembly Weldments the proper distance apart.

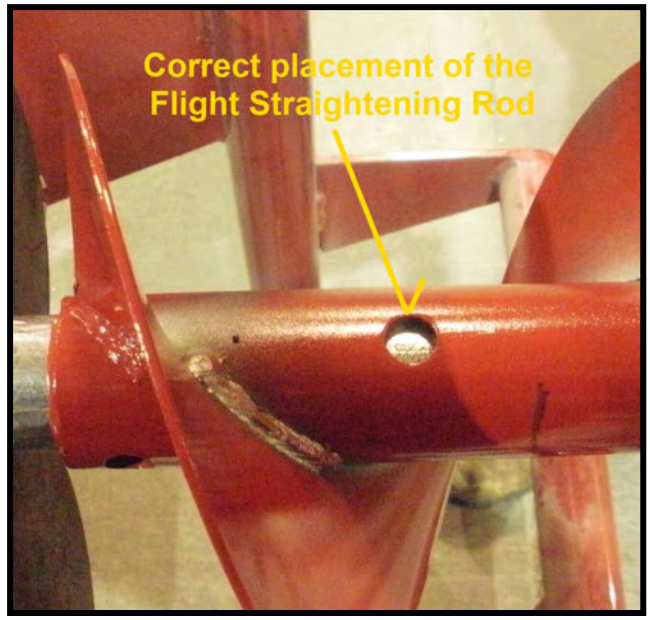
The longer sections will require the Center Support Base Weldment.

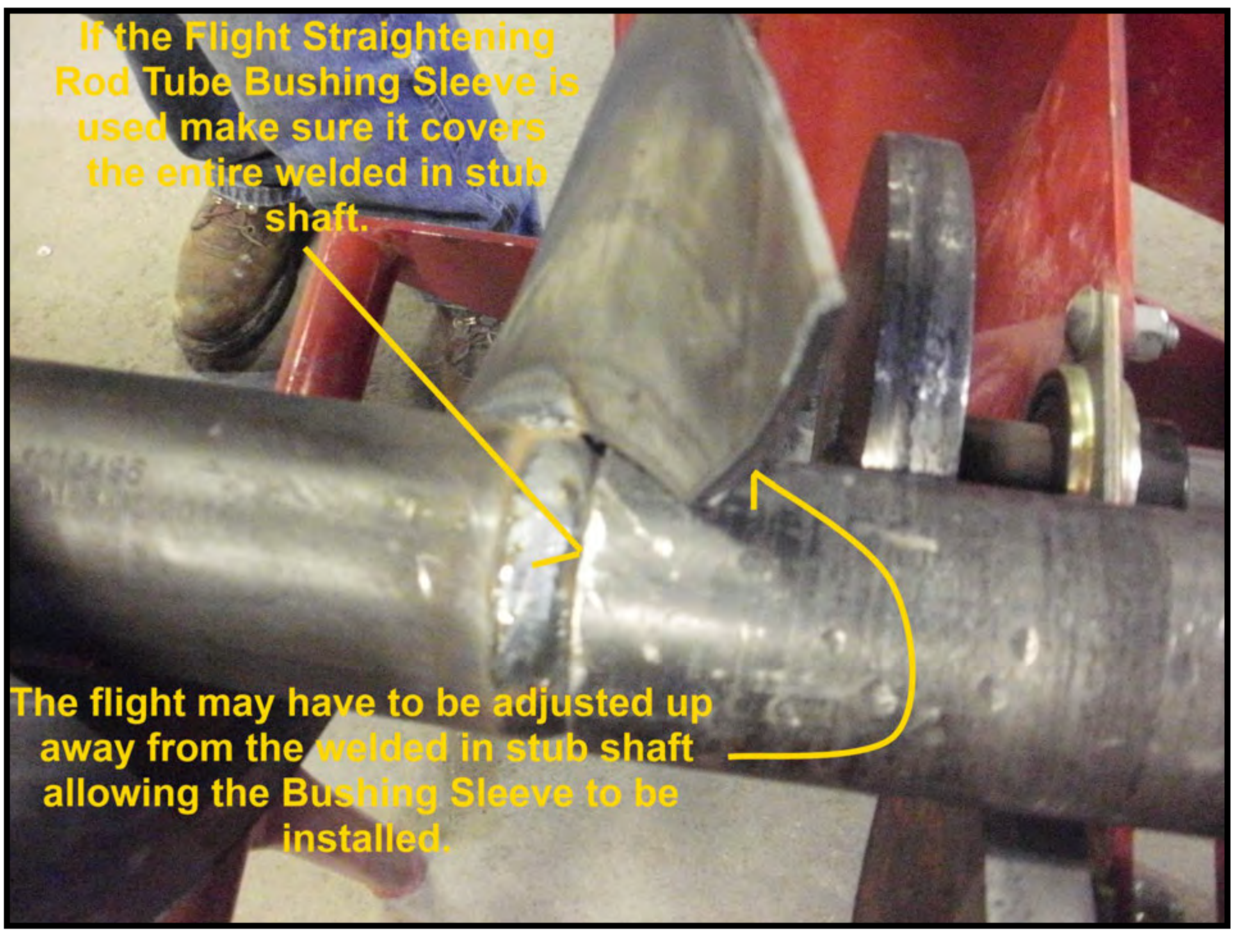
Measure the ID of the Flight tube or stub shaft to determine which Flight Straightening Rod / Flight Straightening Rod Tube Bushing Sleeve will be required. Once it is determined select the correct items from the storage box and place into /onto the end of the flight tube.

If a Flight Straightening Rod is used make sure it inserted about 6” into the flight tube.

Installation Rod / Stub / Rod Tube Bushing Sleeve Examples







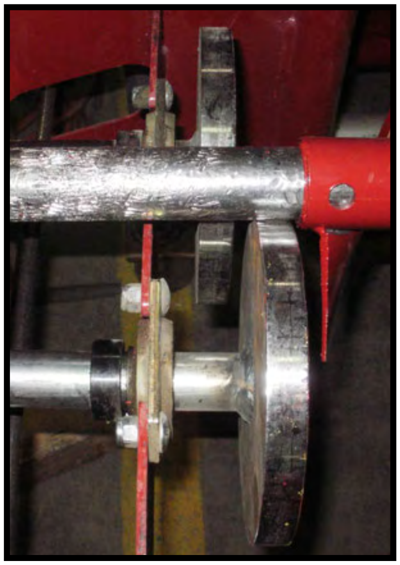
Installation of the flight on the Base Assemblies

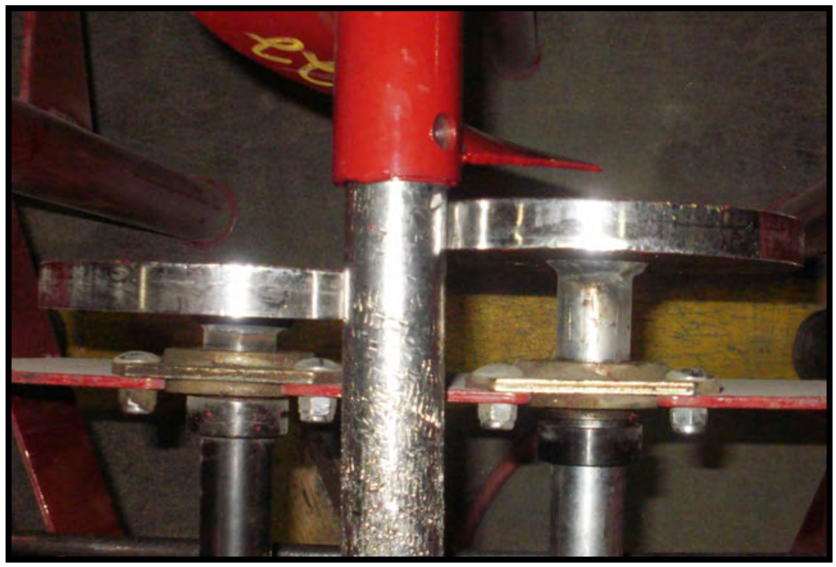
Positon one end of the flight on a base weldment. It is ok for the flight to have this natural gentle bow along its entire length.

Adjust the positon of the second base assembly allowing the remaining end of the auger flight to be lifted onto the rollers. Mechanical means may be required to complete the process.

This natural sag in the center of the auger flight is normal during the first step of the straightening process.

Installation of the flight on the Base Assemblies





Adjust the Bases to the flight is positioned like the examples above.

Initial Flight Reference Check

Stand at the end of the flight outside behind the Base Assembly Weldment sighting down the length of the flight.

Turn the flight slowly watching the movement of the flight. Mentally note areas of the flight which do not stay in the visual center line.

Note: When turning the flight release the shaft letting the flight continue to spin under its own motion. If the flight is straight during the turning process it will stop in a different positon each time. If the flight stops in the same positon each time that will be an area which will need to be adjusted.

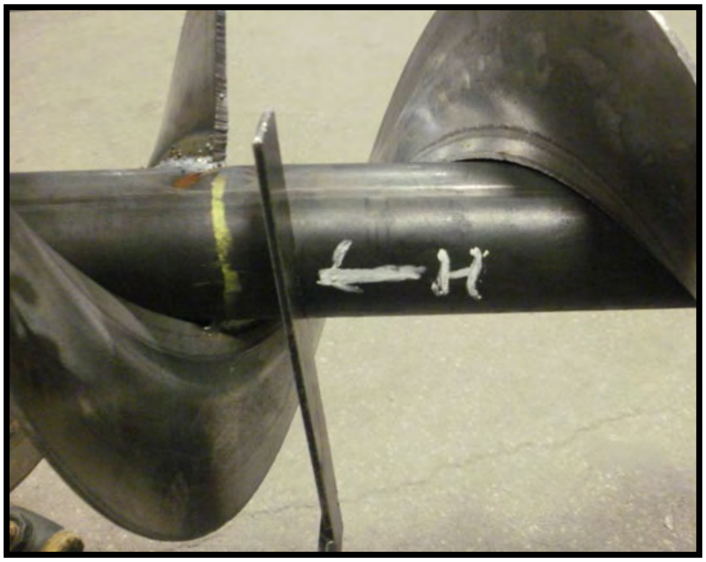
A flight of this length will allow gravity to assist with the straighten process. Locate the area where the flight needs to be adjusted and using your hands push down with enough pressure to make adjustments to the flight.

Center Support Base Weldment Installation

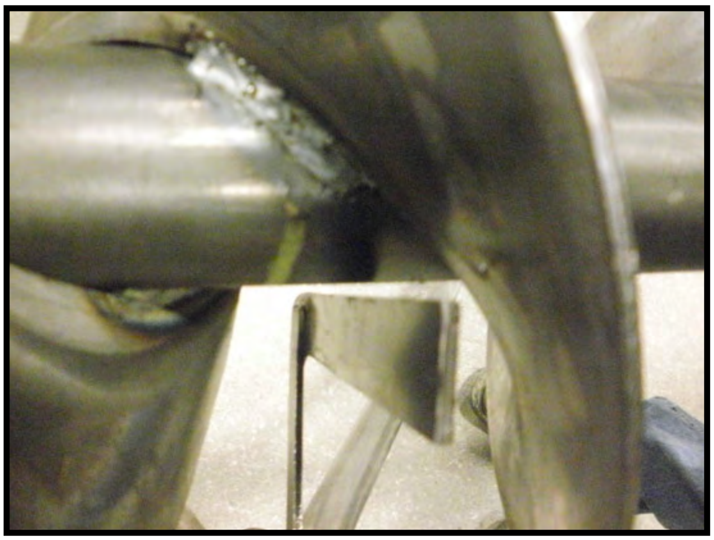
Once the flight has been adjusted in the center half of its length place the Center Support Base Weldment underneath the flight close to the center point of the flight.
The Center Support prevents the flight from moving back and forth (left and right) while checking and adjusting the outer 25% of the flight.

Areas where there are welds close together and on opposite sides of the flight tube may require close attention. The weld pull can affect the straightens of the tube.

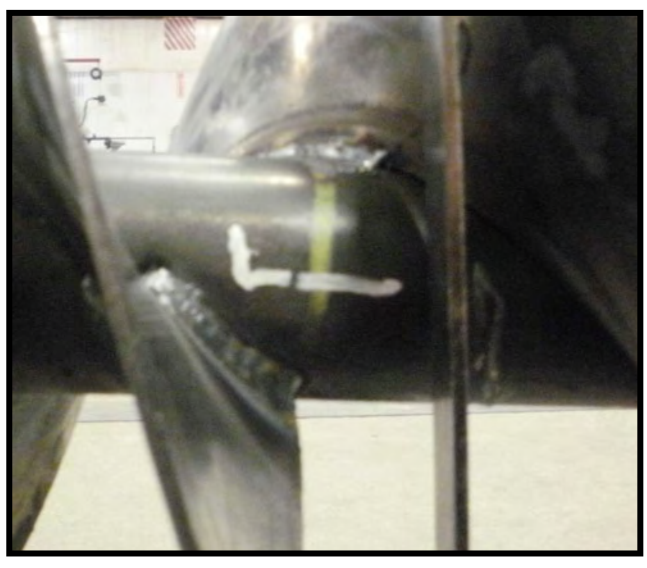
Double Flight Initial Check if Present



Using the Reference Stand Weldment complete the initial check where the double flight ends. This picture shows a high point on the tube (this is the point where the tube is touching the reference point) this point is marked at “H”.



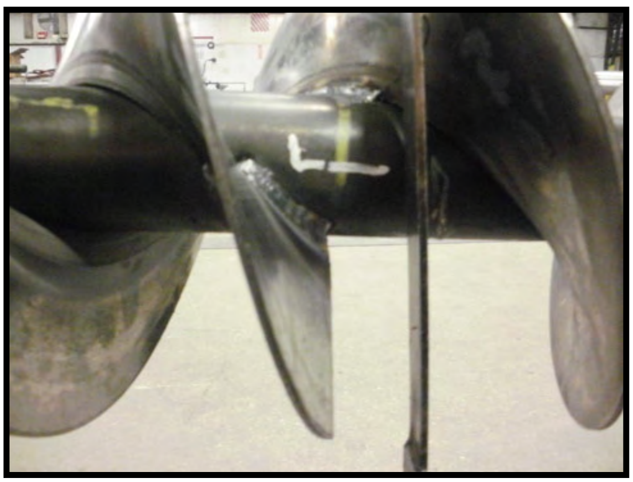
Turn the flight one complete revolution noting the low point (this is the point where the tube is the furthest away from the reference point) this point is marked “L”.



Double Flight Adjustment if Present

Using the hammer strike the flight on the area of the tube marked with the “H”. Because of the size, thickness of the tube and possible weld in bushings it may require many heavy hits.

A larger hammer like a 5 - 8 lb. Sledge hammer may be required.



Turn the flight watching the relationship between Reference Stand Weldment and the flight tube. Make any additional adjustments unit the contact between the low point and the reference base is consistent.

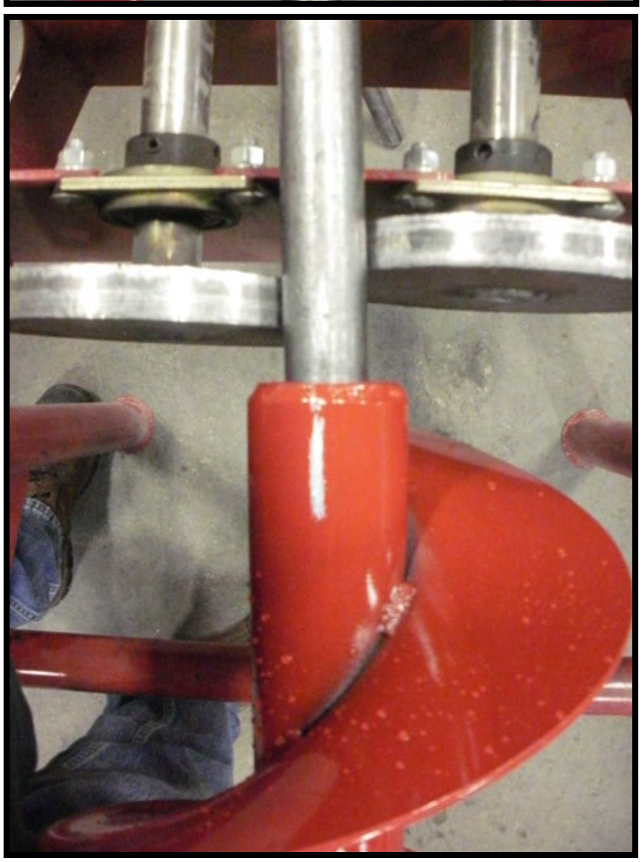
End Flight Reference Check

Once the main section of the flight and the area by the double flight if present has been straightened both ends will need to be checked and adjusted as needed.

Place a mark on the top of the Flight Straightening Rod / Stub /
Rod Tube Bushing Sleeve.

This will allow a visual reference and the flight is being rotated.

Positon the Reference Stand Weldment along the Flight Straightening Rod / Stub / Rod Tube Bushing Sleeve.



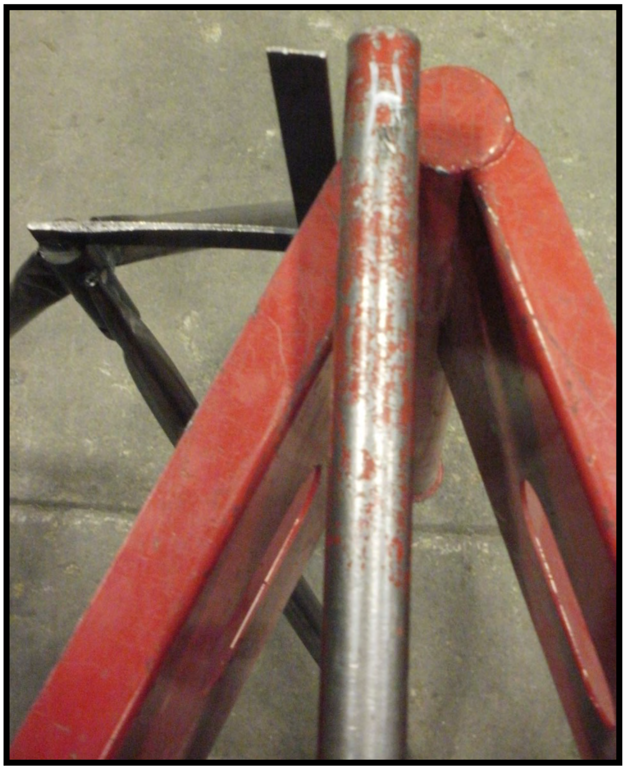
Before rotating the flight place a reference mark on the top of the fight tube.

Turn the flight watching the relationship between the Reference Stand Weldment and the Flight Straightening Rod / Stub / Rod Tube Bushing Sleeve. If there is a point where the rod pulls away from the stand the flight will have to adjusted.

See adjustment procedure on the following page.

This process will need to be completed on each end of the flight.

End Flight Reference Check



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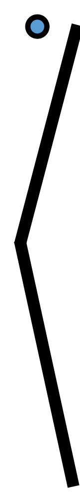
Note the distance between the two points. This is the maximum distance noted during the rotation of the flight.

The top of the shaft has been marked with H for a reference point.

Do not rotate the flight until the next steps have been completed.

Before the flight is rotated an H has been placed at the 9 o clock positon which indicates the high spot on the flight tube. This is the location which must be adjusted.



This example is extreme to explain more detail.

The blue dot is the reference point.

Note the large gap between the two. The location on the flight tube 180 degrees on the horizontal plane will the High point of the tube. This will be where the adjustment must be made.

End Flight Reference Adjustment

Rotate the positon on the tube marked with the H from the 9 o clock positon to the 12 o clock position clockwise. This will place the high point on the top of the auger tube.

Using the hammer strike the flight on the area of the tube marked with the "H". Because of the size, thickness of the tube and possible weld in bushings it may require many heavy hits. On Double Flights a regular hammer may be required because it is smaller in diameter and may fit better between the flights.

Using the Reference Stand to check the flight once it has been adjusted. The process of adjustment and checking may have to be completed a couple of times.

Stand at the end of the flight outside behind the Base Assembly Weldment sighting down the length of the flight.

Turn the flight slowly watching the movement of the flight.

Note: When turning the flight release the shaft letting the flight continue to spin under its own motion. If the flight is straight during the turning process it will stop in a different positon each time.

Note on the flight adjustment were made with the Month / Day / Year with a grease pencil.

Removal of the Flight from the stands

Remove the Center Support Base Weldment and then set one end of the flight to the ground.

It is ok for the flight to have this natural gentle bow along its entire length. If the flight is handled with care and not bounced or dropped during the process the action completed during the straightening process will not be reversed.

Completion of the Longer Flight Straightening Process

Remove the opposite end of the flight from the base assembly placing it on the ground.

From this point forward the flight must not be picked at one point instead supported in a couple places along the length to preserve the adjustments made.

Return the flight to the storage rack or the auger tube.

Return all of the Auger Flight Straightening supplies to their storage location.

Qty	Part Number	Description
2	**0000000**	Base Assembly Weldment
1	**0000000**	Center Support Base Weldment
1	**0000000**	Reference Stand Weldment

The below two items PN 1011461 and PN 11009253 need to be structured into one Part Number which can be sold with the kit.

1	1011461	Leather Hammer Replaceable Two Piece Face Kit
2	1009253	Leather Hammer Assembly Less Two Piece Face Kit
1	**0000000**	Leather Hammer Assembly with Two Piece Face Kit
1	52806	Flight Bushing 1-1/4” ID / 1-5/8” OD x 4-3/8” long
1	52809	Flight Bushing 1-1/2” ID / 2” OD x 4-3/8” long
1	52807	Flight Bushing 1-1/2” ID / 1-5/8” OD x 4-3/8” long
1	1008611	Flight Bushing 2” ID / 2 19/32” x 4-3/8” long
2	1047677	Flight Straightening Rod 3/4” x 42” long
2	1047673	Flight Straightening Rod 1” x 42” long
2	1047672	Flight Straightening Rod 1-1/4” x 42” long
2	1047671	Flight Straightening Rod 1-1/2” x 42” long
2	1047670	Flight Straightening Rod 2” x 42”
1	1047803	Square to Round Flight Straightening Stub f/8” Standard PS
1	1047804	Square to Round Flight Straightening Stub f/10” Standard PS
1	1047674	Flight Straightening Rod Tube Bushing Sleeve 1-1/4” ID x 42” long
1	1047675	Flight Straightening Rod Tube Bushing Sleeve 1-1/2” ID x 42” long
1	1047676	Flight Straightening Rod Tube Bushing Sleeve 2” ID x 42” long
1	**0000000**	Storage box for above Flight Straightening Rod / Flight Straightening Rod Tube Bushing Sleeve

AGI HUTCHINSON MAYRATH

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