



Center Pivot

Installation Manual

Vortex Flow Amplifier



INTRODUCTION

This material is proprietary to G/S Vortex Systems and is not to be reproduced, or to be used, except in accordance with written authorization from G/S Vortex Systems management.

Additionally, this manual is intended for use in training, reference for service, and repairs.

Due to the continuous engineering of research and development, periodic revisions may be made to this publication. Always check with G/S Vortex Systems for any modifications or updates.

This publication will be divided into the following three sections:

1. Shut down, identification, and disassembly of the center pipe riser
2. Modify center pipe assembly
3. Reassemble center pivot assembly

SHUT DOWN AND DISASSEMBLY

1

Always follow all local, state, and federal safety requirements.

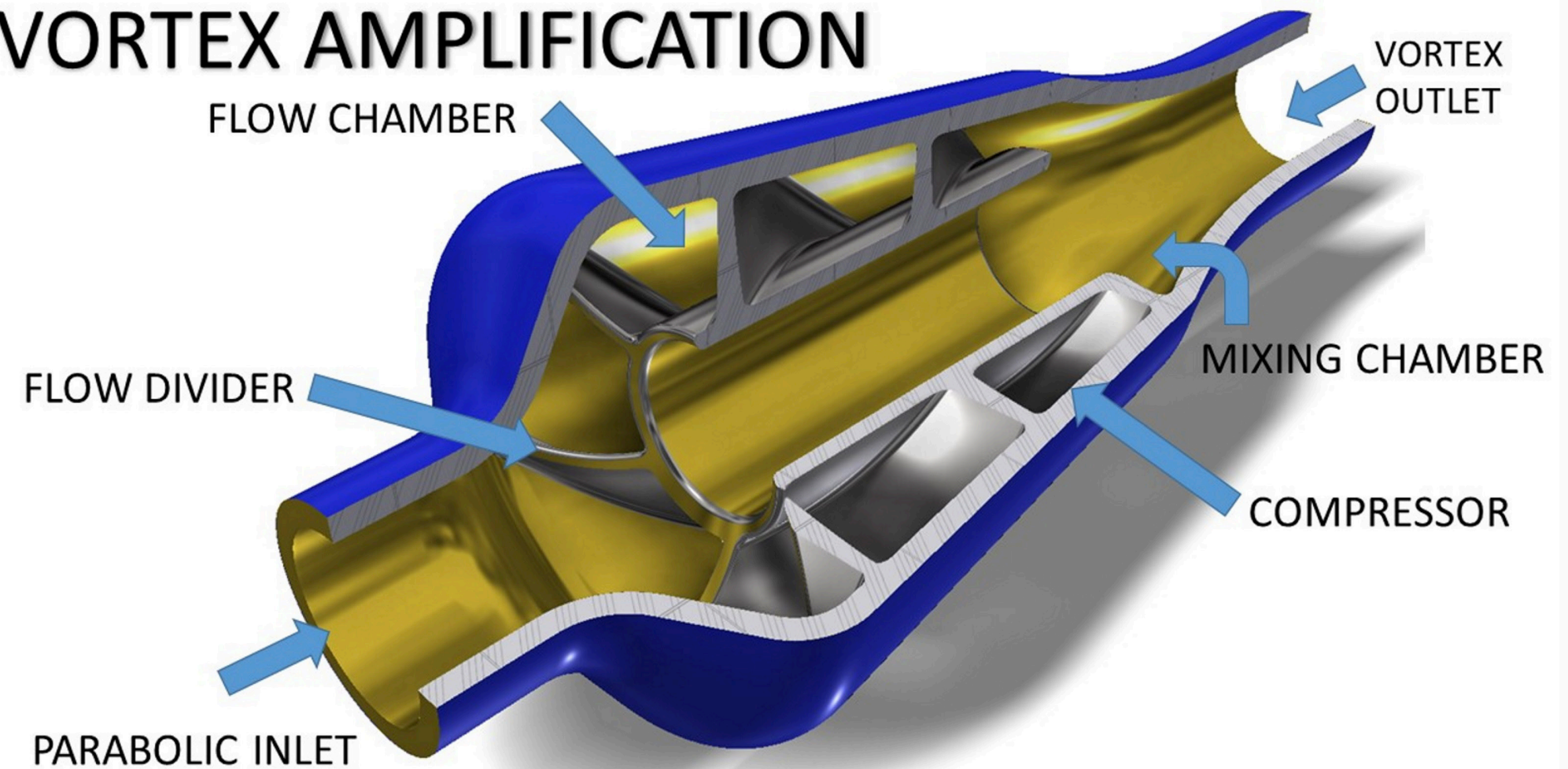
1. Identify any safety hazards, and document.
2. Do not work alone.
3. Wear all PPE (Personal Protective Equipment).
4. Lock Out & Tag Out the center pivots pumping system at the electrical panel.
5. Verify there is no electrical current on the center pivot.
6. If the pumping station is portable and operated with a PTO or an electrical power system they too must be de-energized and locked out.
7. Lock Out & Tag Out all pipe line supply valves supplying water to the center pivot.
8. Fall protection harness with certified OSHA training is required when working on the center pivot tower.
9. The tower's structural supports are not a ladder and not intended to be used as a working platform.
10. Always use an approved ladder and follow all OSHA rules while being used.

CENTER PIVOT

Vortex Flow Amplifier

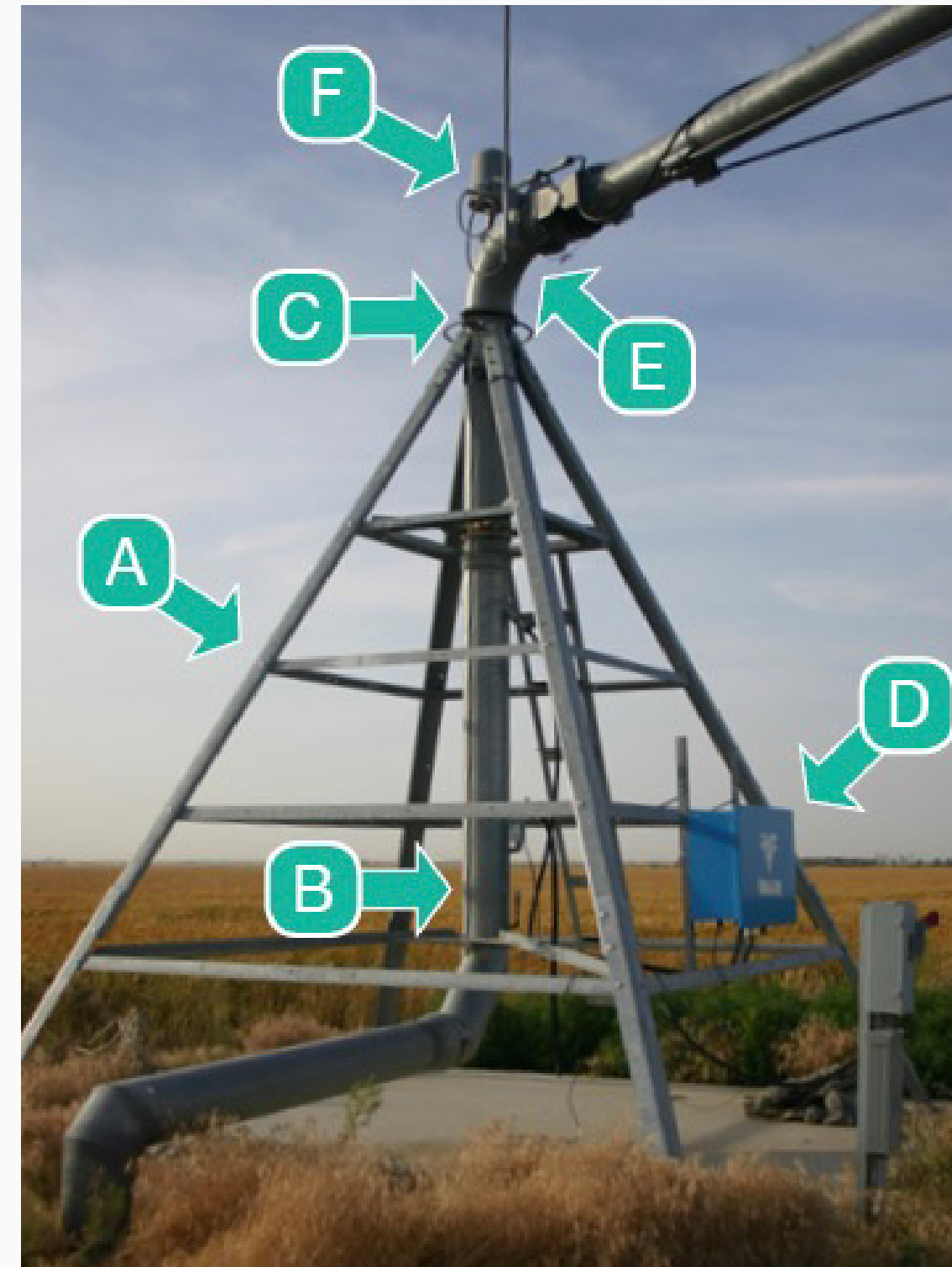
The material that the flow amplifier was cast from is a crosslinked polyurethane. It is a very stable material in a wide range of working temperatures. They are -35F (-37.2C) up to 140F (60C). The tensile strength is 14MPa, and it has a strong chemical resistance.

VORTEX AMPLIFICATION



Center Pivot Identification

- A. Pivot legs
- B. Pipe Riser
- C. Pivot Swivel
- D. Control Panel
- E. "J" Pipe
- F. Collector Ring



Linear Irrigation Systems

BEWARE! Fields are not level

All wheel driven linear irrigation systems are also applicable candidates for the installation of a G/S Vortex Systems “Flow Amplifier”. The shut down procedure for linear systems will also require wheel chocks on all four drive wheels. Wheel chocks should be one fourth the diameter of the wheel.

Details: 29 CFR 1910.178 (K) (I)



SHUT DOWN AND DISASSEMBLY

1

Additional views of Center Pivots
Both are standard pad tower assemblies.



SHUT DOWN AND DISASSEMBLY

1

Disassembly

DO NOT reuse any of the old hardware.

Detach side support brackets from the lower flanges. New mounting hardware will be used when reassembling. DO NOT reuse any of the old hardware. Top view shows the cross bar attached and the lower view is disconnected.

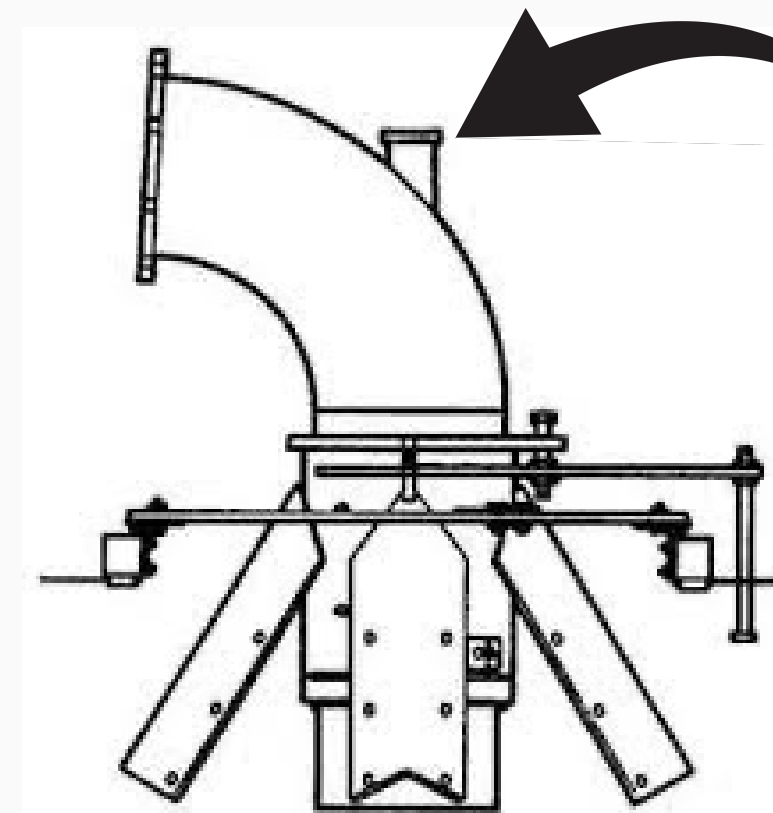


Center Pivot Alignment

The “J” pipe is at the top of the pipe riser and there is an alignment bar that extends into the pipe riser.



Remove pipe, cap screws, and plug the hole.



Center Pivot Alignment

Some models of center pivot structures do not have the vertical alignment bar going through the “J” pipe. If your assembly does not have the pivot pin no modification is required.



SHUT DOWN AND DISASSEMBLY

1

Riser Pipe

Secure the 90 Deg elbow with a floor jack prior to removing the riser pipe. Slowly lowering the jack for easy removal of the riser pipe. To remove the swivel joint at the “J” pipe you will have to lower it about 5” for clearance. For assembly, reverse this process and the floor jack will reinstall the riser pipe and flow amplifier into position.



SHUT DOWN AND DISASSEMBLY

1

Center Riser Removed



SHUT DOWN AND DISASSEMBLY

1

Verify Riser Angularity

NOTE: As shown here.

Angularity needs to be checked. As Shown. The center axis is critical with revolving components. Cross dimension from 9 O'clock to 3 O'clock. And from 12 O'clock to 6 O'clock. These are all made off the "J" pipes stub shaft. All adjustments are made on the flanges on the lower base.



SHUT DOWN AND DISASSEMBLY

1

Alignment of the Center Pivot

First measure and check vertical alignment. Adjust with floor jack as necessary.

Next locate a vertical reference point on the inlet side of the “J” pipe. Using your vertical reference point drop a “Plumb Bob” and verify the vertical plane. All adjustments are to be made on the inlets 90 Deg elbow. Over the years a tractor or field equipment could have bumped the C/P stand.



MODIFY CENTER PIPE ASSEMBLY

2

Modification Process

Do not interchange risers with any other. Check the bottom plate for any damage. Repair if required. We recommend stamping all parts to your C/P tower number for easy identification.



Flange Plates

Two steel #150 eight bolt circle flange plates are used in each modification. In each kit these will be supplied with all the required (75" Gr. #5) bolts, nuts, F/W's, and the seals.



MODIFY CENTER PIPE ASSEMBLY

2

Bottom Pipe Section Layout

The lower pipe sections length is critical. The total overall length from the outside of the lower flange face plate to the upper flange face plate is to be 14" +/- .125"

The perpendicularity over the 14" is measured through the pipe +/- .09"
Clean all loose rust with a wire brush.



MODIFY CENTER PIPE ASSEMBLY

2

Flange Welding

Clean the weld area thoroughly. Grinding and wire brushing will be required. Ensure that perpendicular requirements are still accurate. Follow all AWS D1.1 requirements.

Best welding practices are:

Using MIG .035" wire, 25 – 30 IPM at 19 - 22 Volts. The I.D. requires a .25" fillet and the O.D. requires a 2 pass 3/8" fillet. Remove slag and brush.



Gasket Seal Rings

During the assembly a round seal ring is required between all metallic flanges **as shown here.**

Alignment of the bolt circle is critical.

A bead of sealer is required between the pipes I.D. circle and the bolt hole circle. Sealant is required on both sides.

DO NOT use Silicone.

Tested and approved products are:

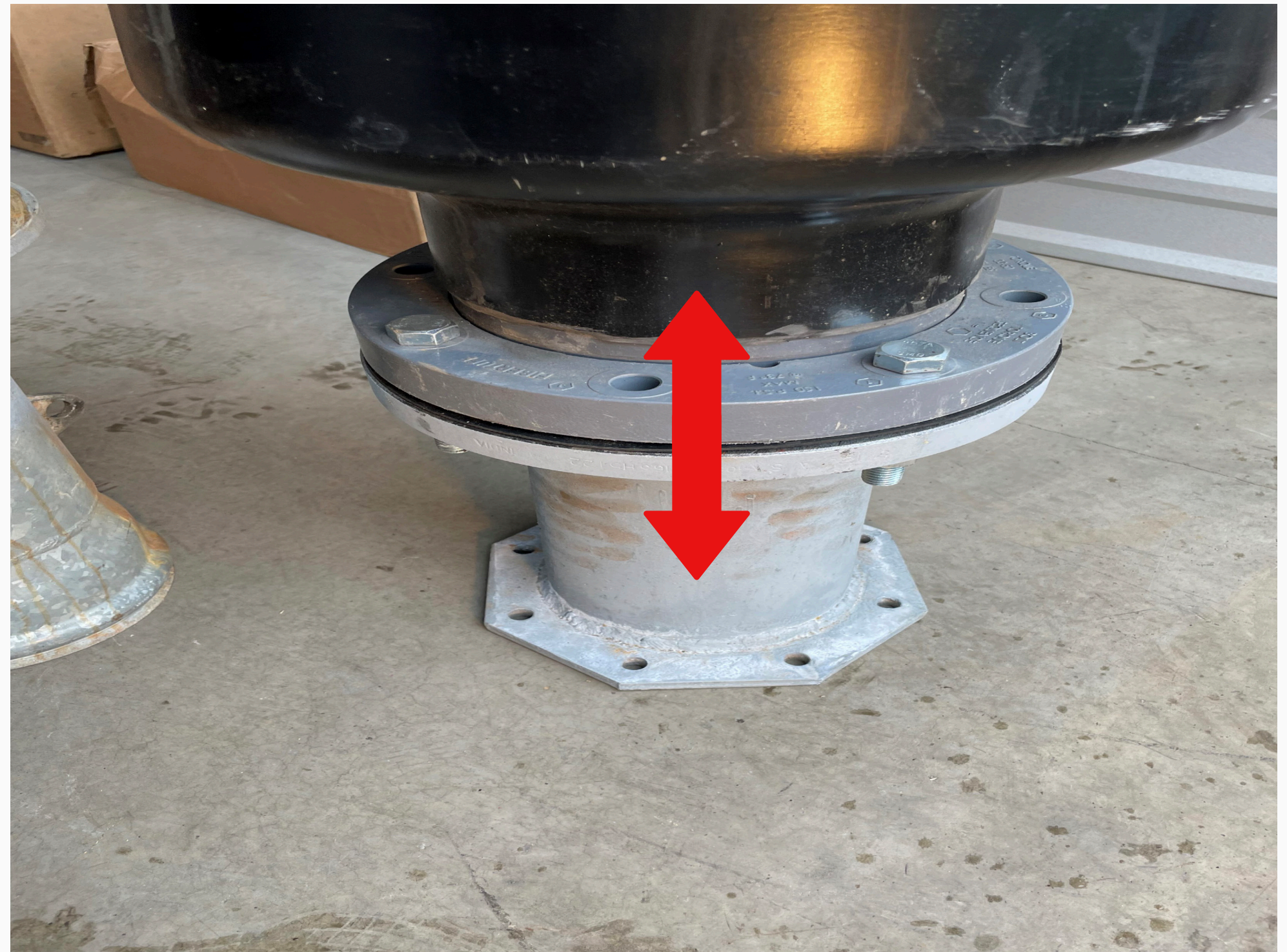
- PERMATEX #82194 Gasket Sealer
- 3M Scotch Grip #847 Sealer
- Gasgacinch #440-B Sealer



Checking Alignment

Checking alignment is critical.

Before applying sealant first do an alignment check. And check perpendicularity. By swiveling / twisting the F/A a small adjustment can be made. Once alignment is true mark the F/A – gray flange and the steel flange with a straight line. Now disassemble and apply the sealant. Align the assembly and install all eight $\frac{3}{4}$ " -16 NC bolts, F/W, and nuts applying "Loctite #222" to the threads of each bolt. Alternating (reverse torquing) slowly bring up to 215 Ft/lbs.



REASSEMBLE CENTER PIVOT ASSEMBLY

3

Assembly Process

Thoroughly clean and wire brush all the parts. Remove all loose rust prior to assembly.



REASSEMBLE CENTER PIVOT ASSEMBLY

3

Checking Alignment



Alignment Process

The alignment process and bolt assembly on the upper section are identical to the bottom riser section. Be sure to follow all alignment, sealant, and bolt torquing requirements as previously detailed.



Installation Riser and the F/A Assembly

First lower the floor jack slowly and stop when the span opening is three inches greater than the riser pipes total length. This allows clearance for assembly. Once aligned slowly jack vertically into place.



Lower Installation View

The Left hand side cross supports have not yet been reattached. With the floor jack positioned under the lower flange as shown, raise and secure the riser pipe. Then align the left hand lateral support with the lower flange and re-bolt.



REASSEMBLE CENTER PIVOT ASSEMBLY

3

Final Top Assembly Bolt Torquing
(215 Ft./Lbs.)



REASSEMBLE CENTER PIVOT ASSEMBLY

3

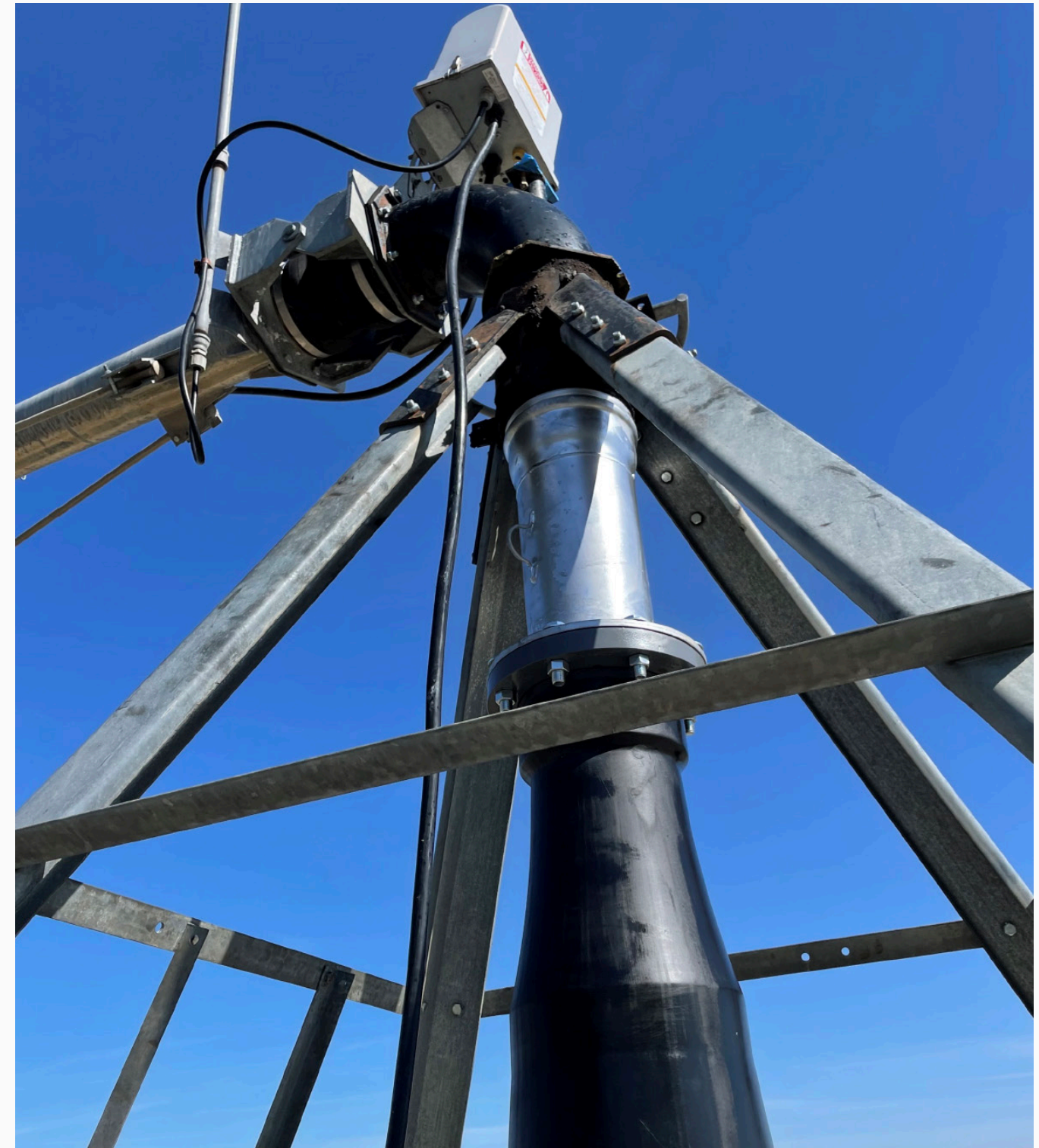
Torque Wrench

The torque wrench should be certified and calibrated.

The riser bolts will be torqued to 215 Ft./Lbs. They are to be brought up to required torque specifications in steps of 50 Ft./Lbs.



Top view of the Vertical Riser and “J” Pipe Assembly



REASSEMBLE CENTER PIVOT ASSEMBLY

3

Completed Modified Assembly

This is a 10 span C/P irrigation system.



REASSEMBLE CENTER PIVOT ASSEMBLY

3

GS VORTEX Systems

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