

**UNIT SPACING OPTIONS:**

- 16" - Double center unit required to achieve 16" spacing on 4-1/2° or 6°, 16" spacing from center outward
- 18" - Double center unit required to achieve 18" spacing on 4-1/2° or 6°, 18" spacing from center outward
- 20" - Use Center plates to achieve 20" (4-1/2°) or 20" (6°), 20" spacing from center outward
- 24" - No special mount plates required to achieve 24" spacing, see Mount Plate Options below.
- 30" - No special mount plates required to achieve 30" spacing, see Mount Plate Options below.

**MOUNT PLATE OPTIONS:**

- 4-1/2° LH/RH - Mounts to 4x6 (vertically oriented), 6x4 (horizontally oriented), 6x6 square (specify U-bolts needed)  
Choose 4-1/2° for Tank Bar applications or speeds from 5-8 mph  
STANDARD U-BOLTS: For 6" wide x 4" Tall tube  
OPTIONAL U-BOLTS: Specify if using on 4" wide x 6" Tall tube, or 6" x 6" Square tube
- 6° LH/RH - Mounts to 4x6 tube only (6" VERTICALLY ORIENTED)  
Choose 6° for Large Bar applications or speeds from 1-5 mph  
STANDARD U-BOLTS: For 4" wide x 6" Tall tube (Contact sales if other options are needed)

**CLOSURE ARM OPTIONS:**

- STANDARD: Single Closure arm LH/RH (Outer arm only). Specify 4-1/2° or 6° units.
- OPTION: Double Closure arms LH/RH (Unique outer arm and inner arm). Specify 4-1/2° or 6° units.

Note: To convert from Single closure to Double, both outer and inner double closure arms must be ordered. Parts cannot be added to the single closure arm to convert it to double.

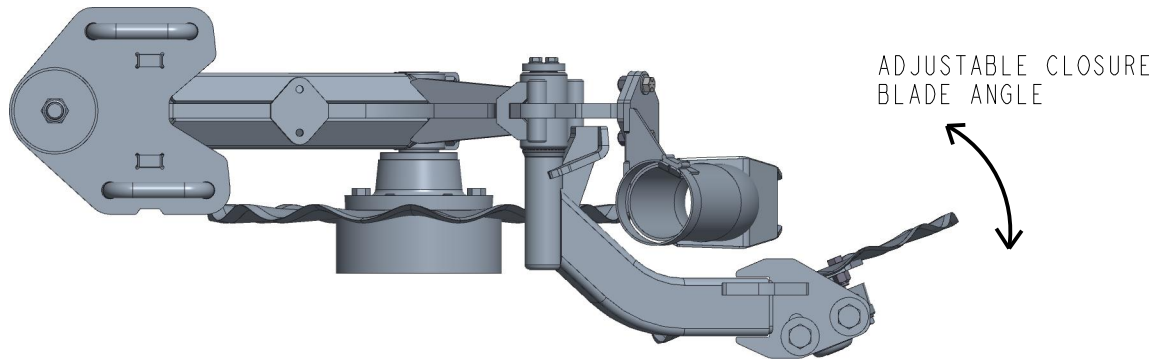
**HOSE CLAMP OPTIONS:**

- For 4-1/2° Units (Tank applications), clamps for 3" ID x 3.5" OD hose will come standard
- For 6° Units (Pull Type applications), clamps for 2.5" ID x 3" OD hose will come standard

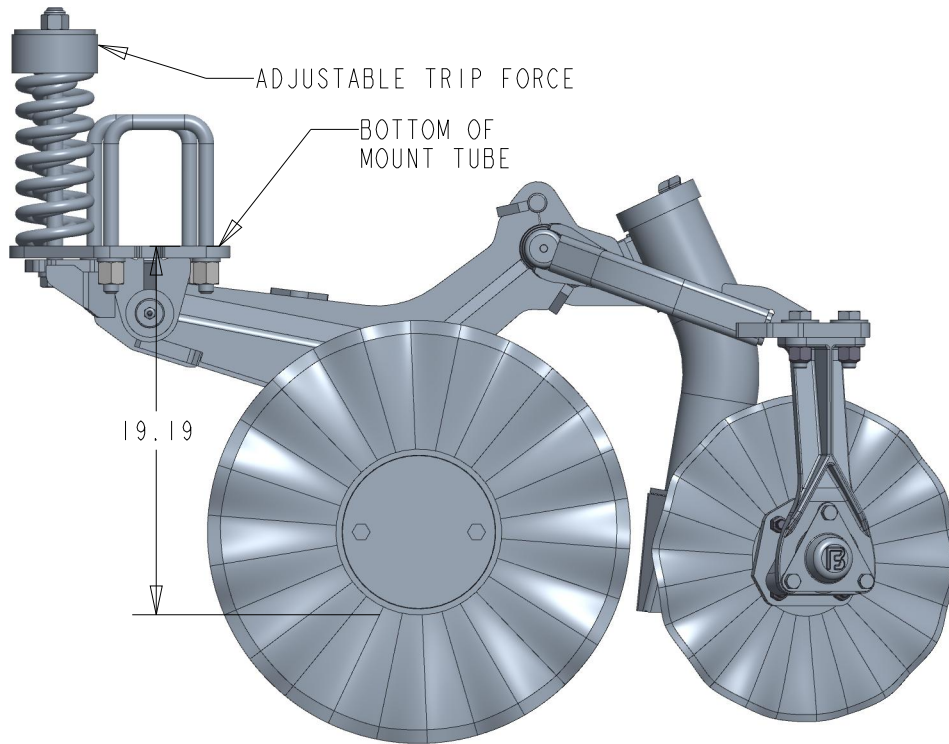
**OTHER FEATURES & SPECIFICATIONS**

- Main Coulter Blade - 22", 13 wave, 7mm thick
- Closure Blade - 17", 13 wave, 4.5mm thick
- Depth Gauge Wheel and Cover Plate come standard
- Cast ductile iron closure mount arm
- Greaseless closure arm bushing
- Bolt in Main hub/Spindle for easy removal

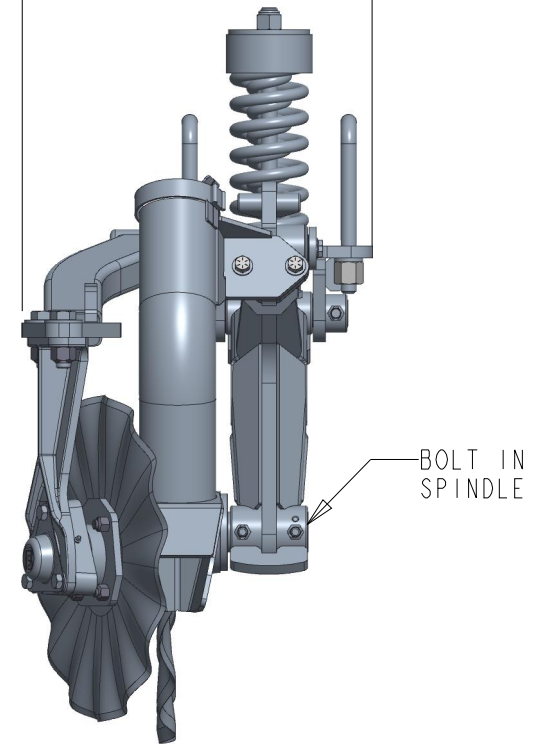
PHANTOM FEATURES AND SPECIFICATIONS:



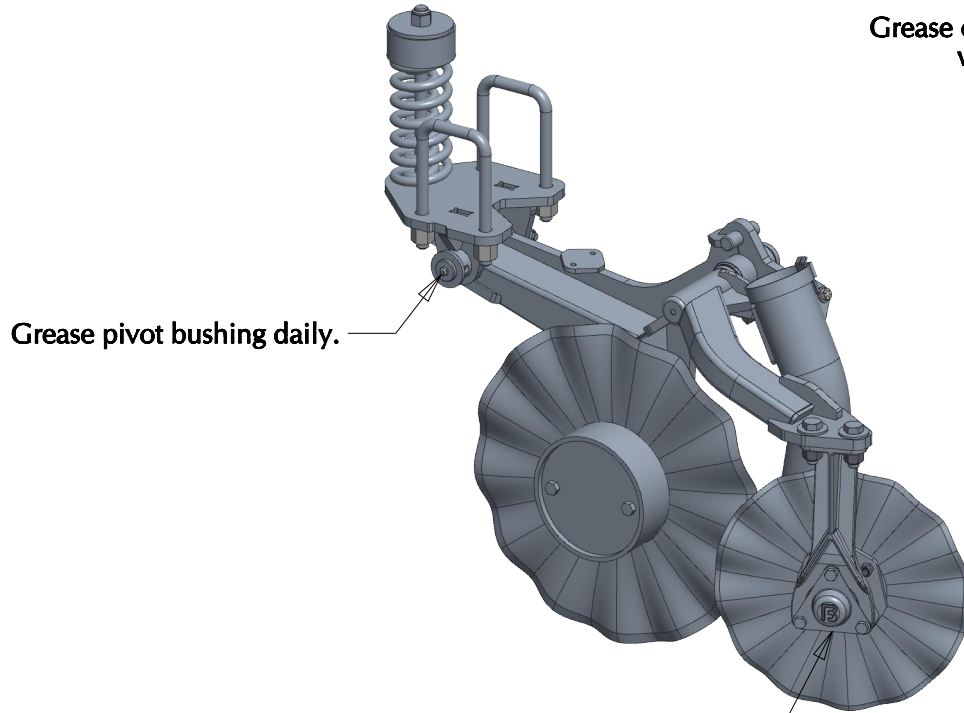
UNIT WEIGHT: 265 LBS



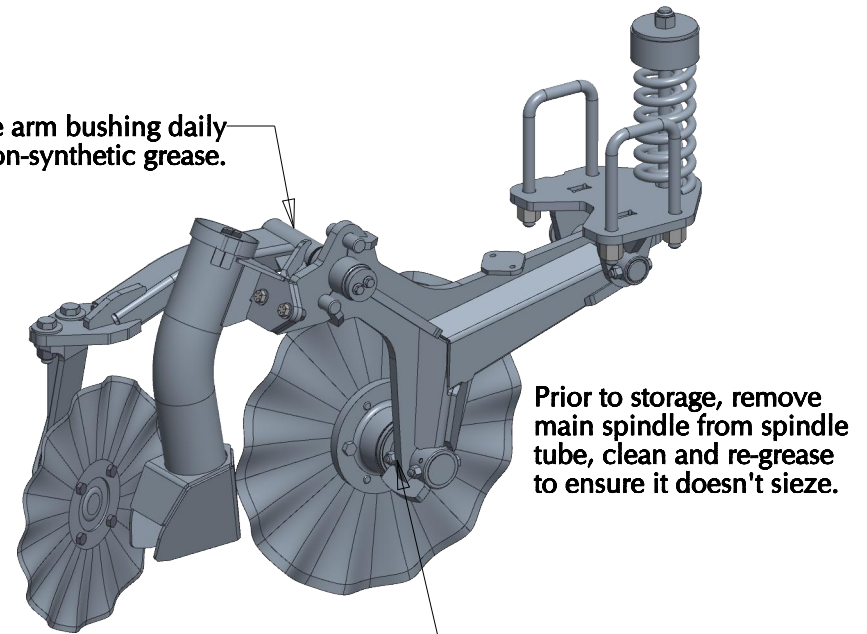
18.22 FOR 6° UNIT  
21.42 FOR 4-1/2° UNIT



**GENERAL MAINTENENCE:**



Grease closure arm bushing daily with non-synthetic grease.



To avoid over-greasing the main hub & compromising the seal, please perform the following steps between pumping seasons. No other greasing is necessary for the main hub.

1. Remove 1/2" plastic hole plug in the dust cap. You will need to remove the gauge wheel cap, 10-3892, to access the plug.
  2. Grease the main hub until grease comes out of the 1/2" hole.
  3. Replace the plastic hole plug, 70-2234, in the dust cap with a new one if the old one is damaged.
- If there is currently no hole in the dust cap, we strongly recommend removing the dust cap, drilling a 1/2" hole through the center & adding plastic hole plug 70-2234. Otherwise, the same procedure can be done by removing the dust cap, greasing the unit until grease fills the area where dust cap would be, then reinstalling the dust cap.

**DAILY MAINTENENCE :**

- Check bolts for tightness after first 10 hours & a brief visual check prior to each day's use.
- Check for location of drop tube to ensure manure is being applied to center of trench.

**GREASING:**

- Grease units as show in diagram above. Use NLGI Grade 2 or equivalent grease.
- For closure arm bushing, be sure to use non-synthetic, petroleum-based or lithium-based grease.

**AFTER EACH SEASON MAINTENENCE :**

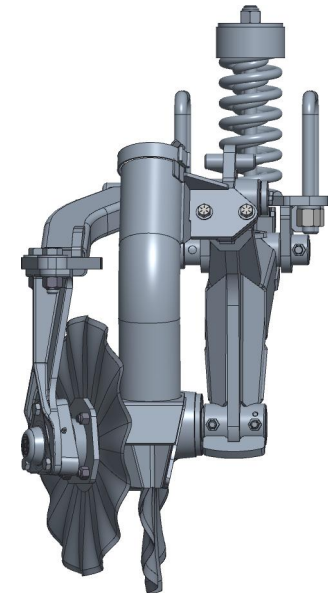
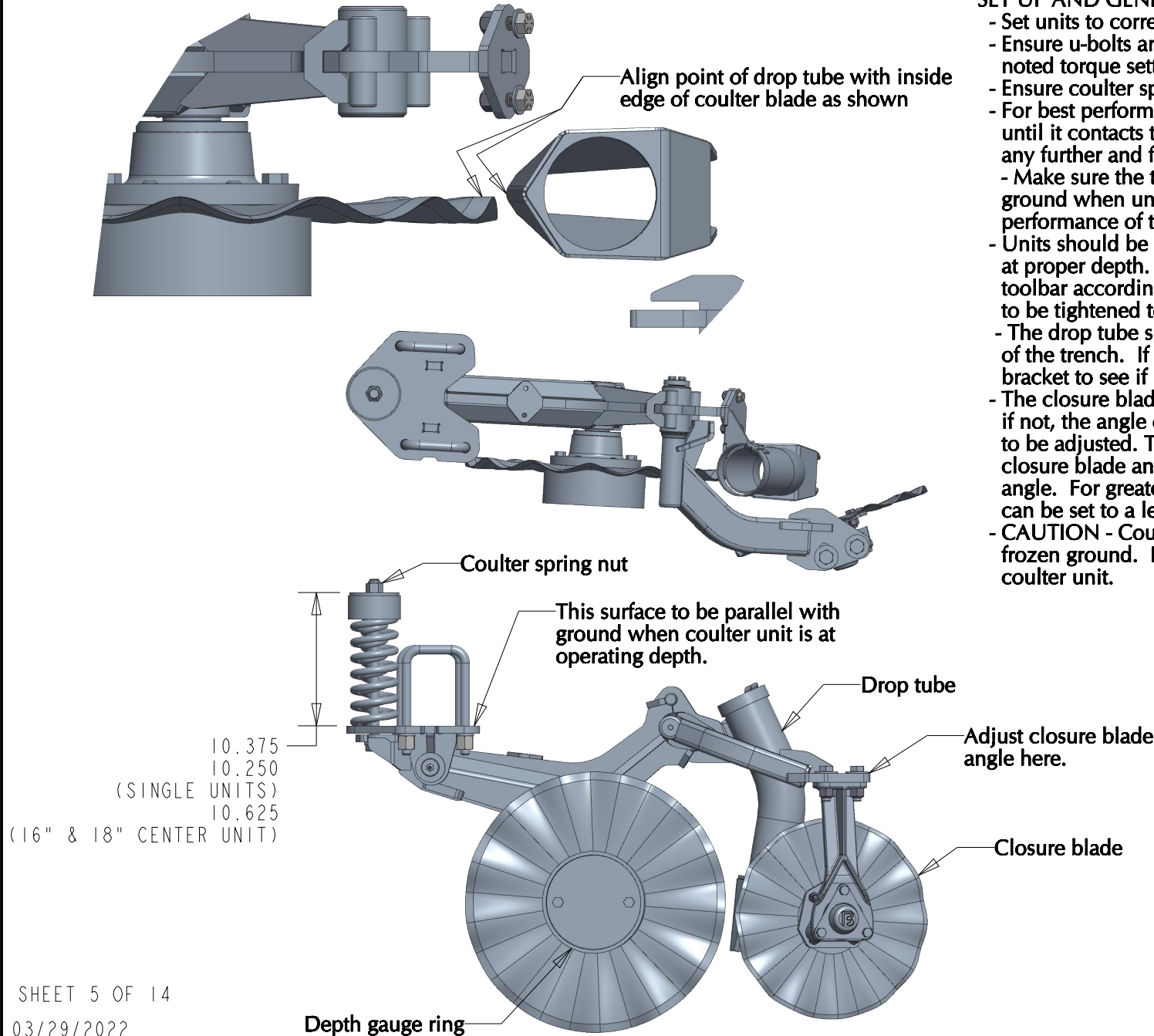
- Check all bolts for tightness. Torque specs listed in this manual.
- Check main hub and closure hub bearings for tightness and inspect seals. Wobble in main hub (bearing) should be less than .005" at outer diameter of hub. Rebuild bearings as needed. See hub assembly instructions in this manual.
- Remove hub & spindle from main arm - apply antisieze to spindle & reinstall.
- Check main arm pivot point for excessive slop (movement in the main arm resulting in loss of functionality). Replace pin and bushings as needed.
- Check closure arm pivot bushing for excessive slop (movement in the closure arm resulting in loss of functionality). Replace bushing as needed.
- Check both blades for excessive wear (resulting in loss of functionality) and replace as needed.

**SET UP AND GENERAL OPERATION:**

THE FOLLOWING SET UP INFORMATION IS CRITICAL TO THE OPERATION OF THE PHANTOM SERIES UNIT

**SET UP AND GENERAL OPERATION:**

- Set units to correct spacing noted on following pages.
- Ensure u-bolts are seated properly and tightened to noted torque settings.
- Ensure coulter springs are set to noted preload height.
- For best performance, insert hose fully into drop tube until it contacts the "V" at the bottom and can't be pushed any further and fully tighten hose clamp.
- Make sure the toolbar is running level with the ground when unit is at depth to ensure optimum performance of the Phantom unit.
- Units should be riding on depth gauge ring when unit is at proper depth. If unit is too shallow or too deep, adjust toolbar accordingly. Also, coulter spring nut may need to be tightened to penetrate the ground easier.
- The drop tube should be applying manure to the center of the trench. If not, check the drop tube and mounting bracket to see if it is bent or loose (see diagram).
- The closure blade should be covering the trench. If not, the angle of the mounting bracket may need to be adjusted. To compensate for slower speeds, closure blade angle can be set with a more aggressive angle. For greater speeds, the closure blade angle can be set to a less aggressive angle.
- CAUTION - Coulters not recommended for use in frozen ground. Frozen ground may cause damage to coulter unit.



**4-1/2 DEG LAYOUT (TANK BARS)**

SEE U-BOLT INSTALLATION PROCEDURE BEFORE ASSEMBLING MOUNT PLATES TO BAR

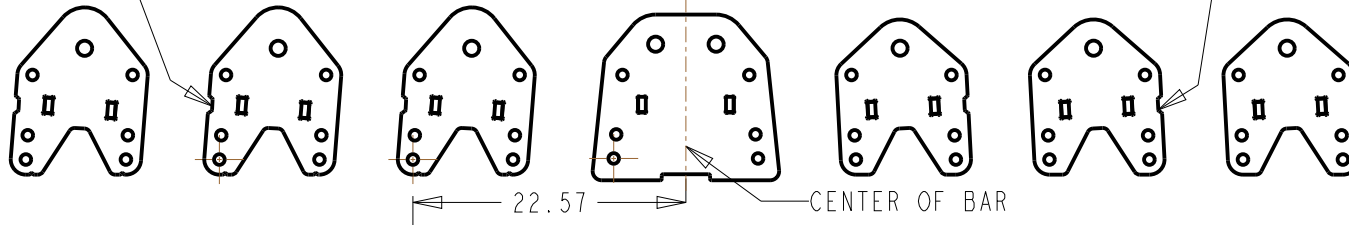
**16" SPACING**

FRONT OF TOOLBAR



LH UNIT NOTCH  
FACES OUTWARD

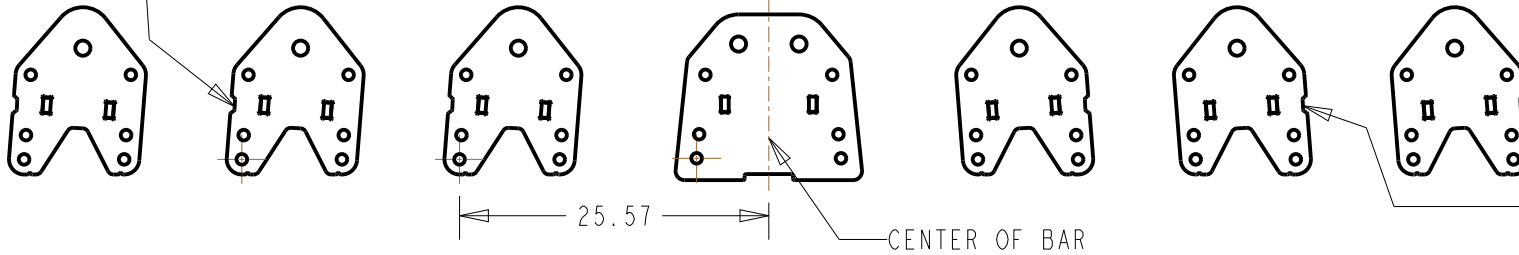
RH UNIT NOTCH  
FACES OUTWARD



**18" SPACING**

LH UNIT NOTCH  
FACES OUTWARD

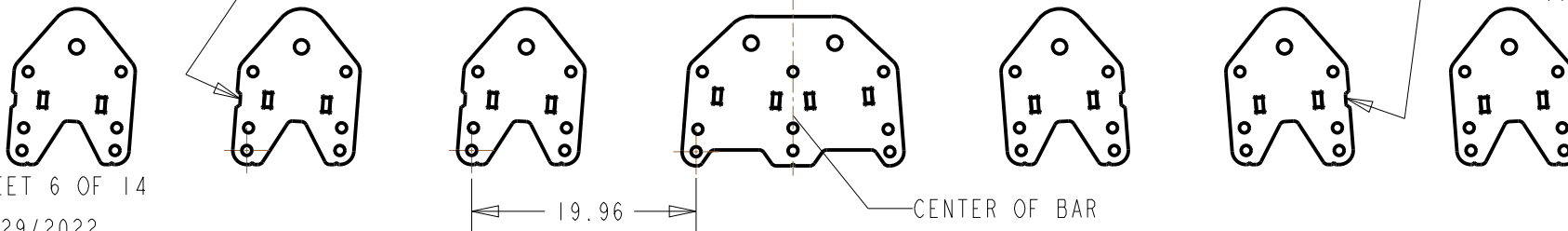
RH UNIT NOTCH  
FACES OUTWARD



**20" SPACING**

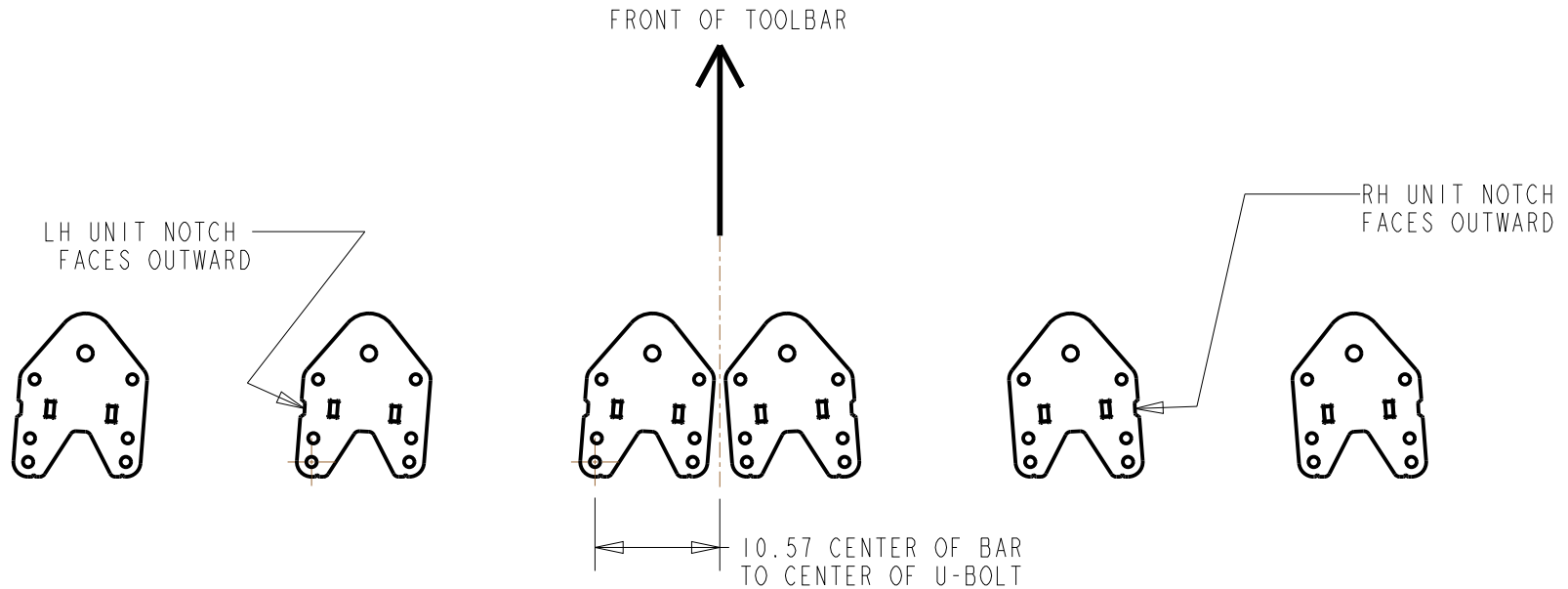
LH UNIT NOTCH  
FACES OUTWARD

RH UNIT NOTCH  
FACES OUTWARD

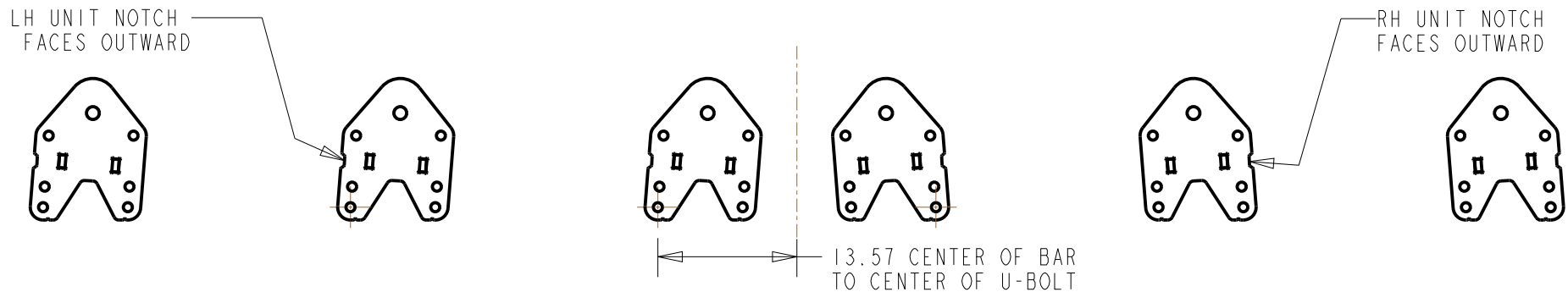


SEE U-BOLT INSTALLATION PROCEDURE  
BEFORE ASSEMBLING MOUNT PLATES TO BAR

**24" SPACING**



**30" SPACING**



**6 DEG LAYOUT (TANK BARS)**

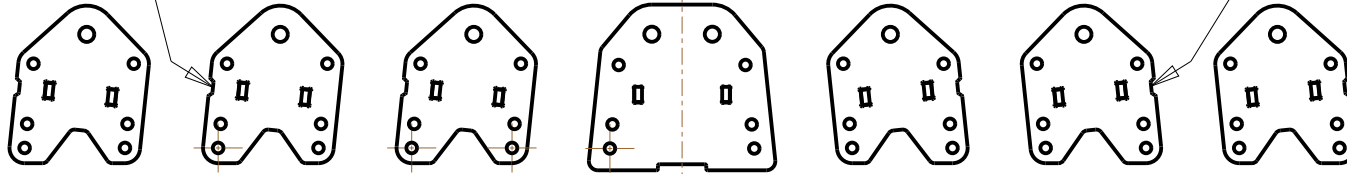
SEE U-BOLT INSTALLATION PROCEDURE BEFORE ASSEMBLING MOUNT PLATES TO BAR

**16" SPACING**

FRONT OF TANK BAR

LH UNIT NOTCH  
FACES OUTWARD

RH UNIT NOTCH  
FACES OUTWARD



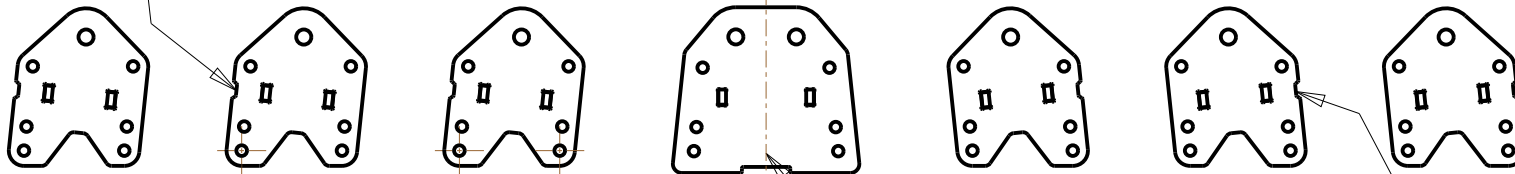
14.06 CENTER OF BAR TO  
CENTER OF FIRST U-BOLT

CENTER OF TANK BAR

**18" SPACING**

LH UNIT NOTCH  
FACES OUTWARD

RH UNIT NOTCH  
FACES OUTWARD



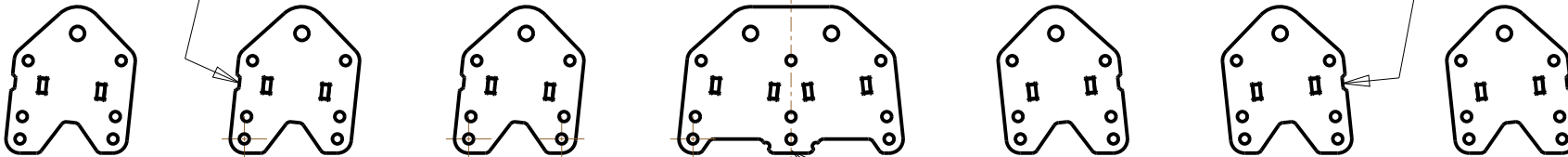
17.06 CENTER OF BAR TO  
CENTER OF FIRST U-BOLT

CENTER OF TANK BAR

**20" SPACING**

LH UNIT NOTCH  
FACES OUTWARD

RH UNIT NOTCH  
FACES OUTWARD

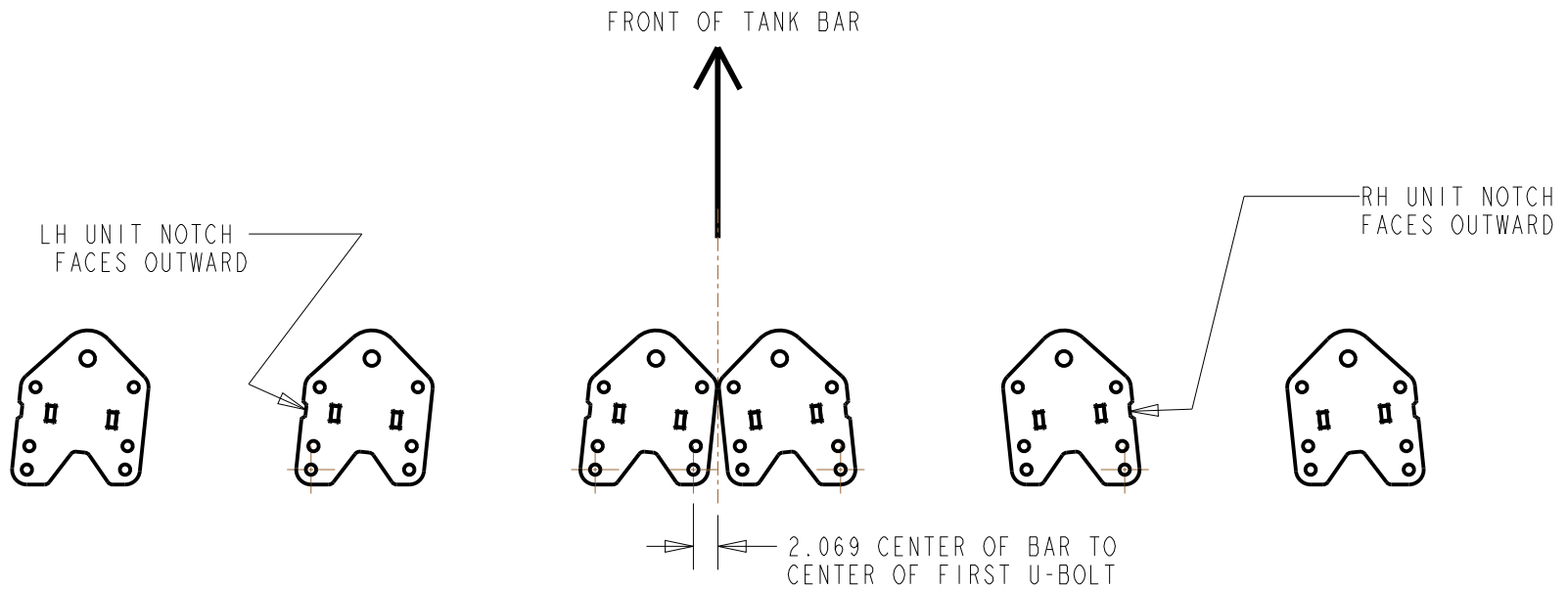


20.448 CENTER OF BAR TO  
CENTER OF FIRST U-BOLT

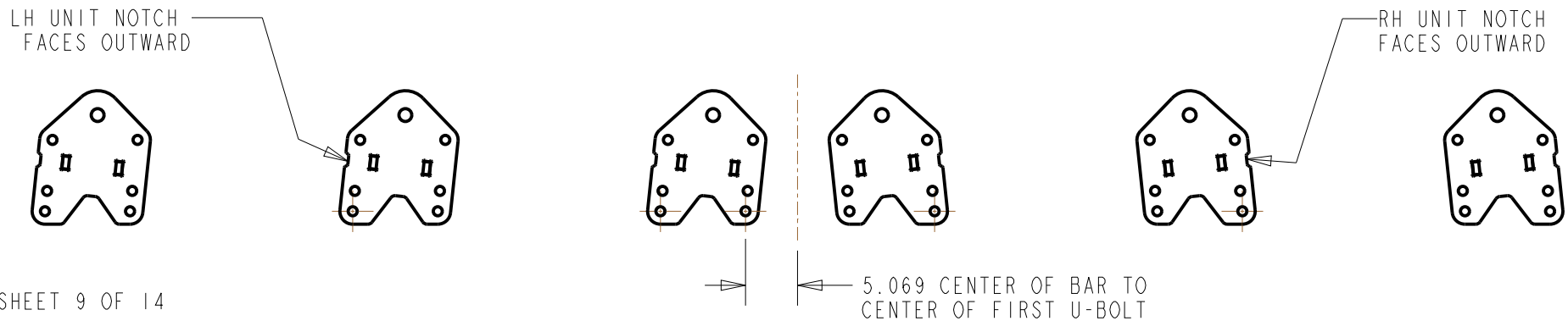
CENTER OF TANK BAR

SEE U-BOLT INSTALLATION PROCEDURE  
BEFORE ASSEMBLING MOUNT PLATES TO BAR

**24" SPACING**



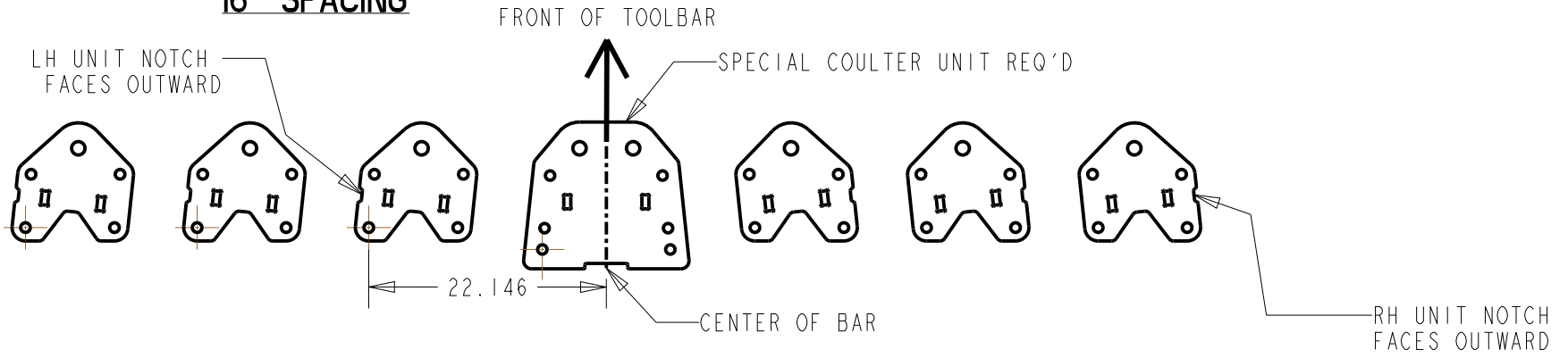
**30" SPACING**



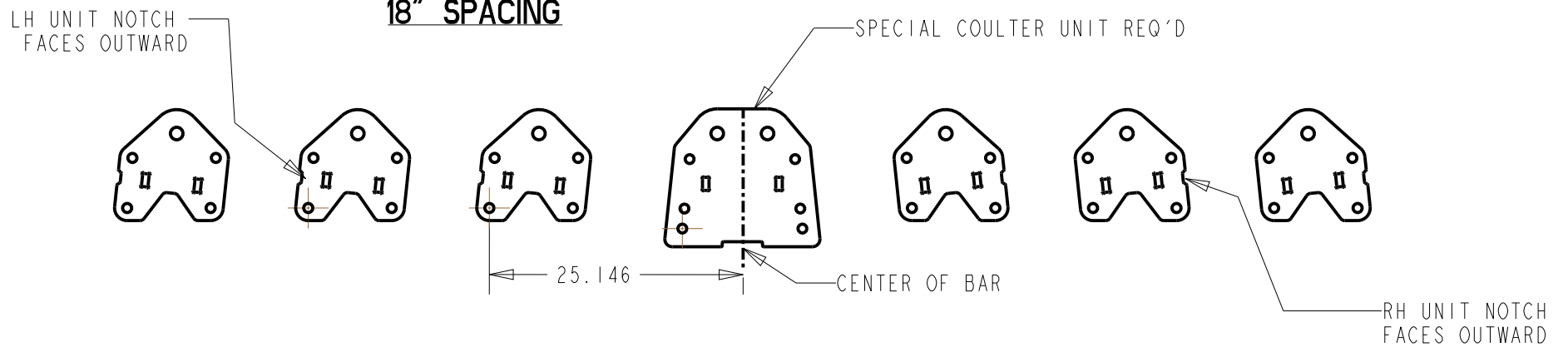
**6 DEG LAYOUT (LARGE BARS)**

SEE U-BOLT INSTALLATION PROCEDURE BEFORE ASSEMBLING MOUNT PLATES TO BAR

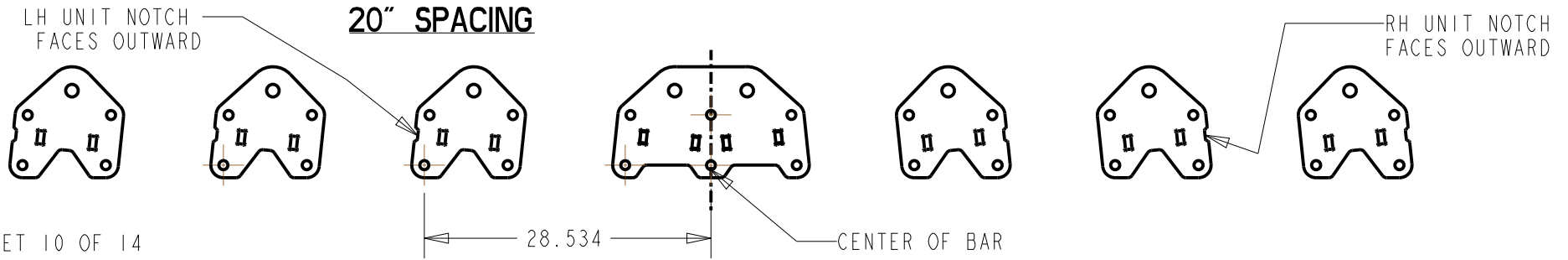
**16" SPACING**



**18" SPACING**



**20" SPACING**



6 DEG LAYOUT (LARGE BARS)

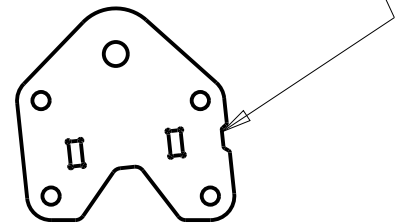
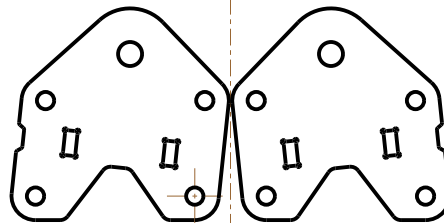
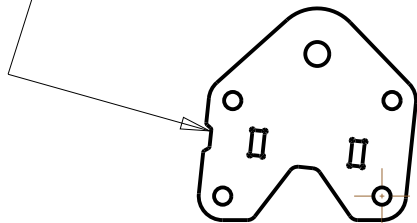
SEE U-BOLT INSTALLATION PROCEDURE  
BEFORE ASSEMBLING MOUNT PLATES TO BAR

24" SPACING

FRONT OF TOOLBAR

LH UNIT NOTCH  
FACES OUTWARD

RH UNIT NOTCH  
FACES OUTWARD

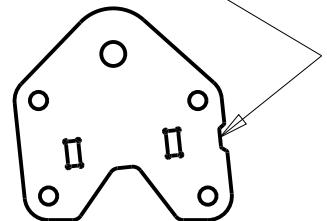
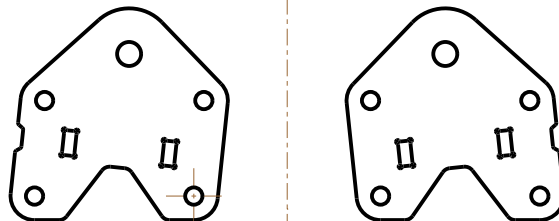
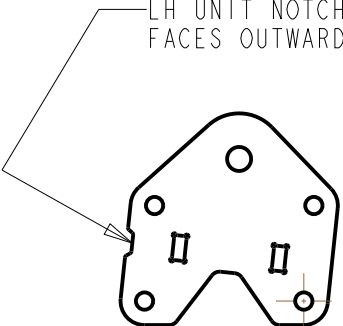


1.86 CENTER OF BAR TO  
CENTER OF FIRST U-BOLT

30" SPACING

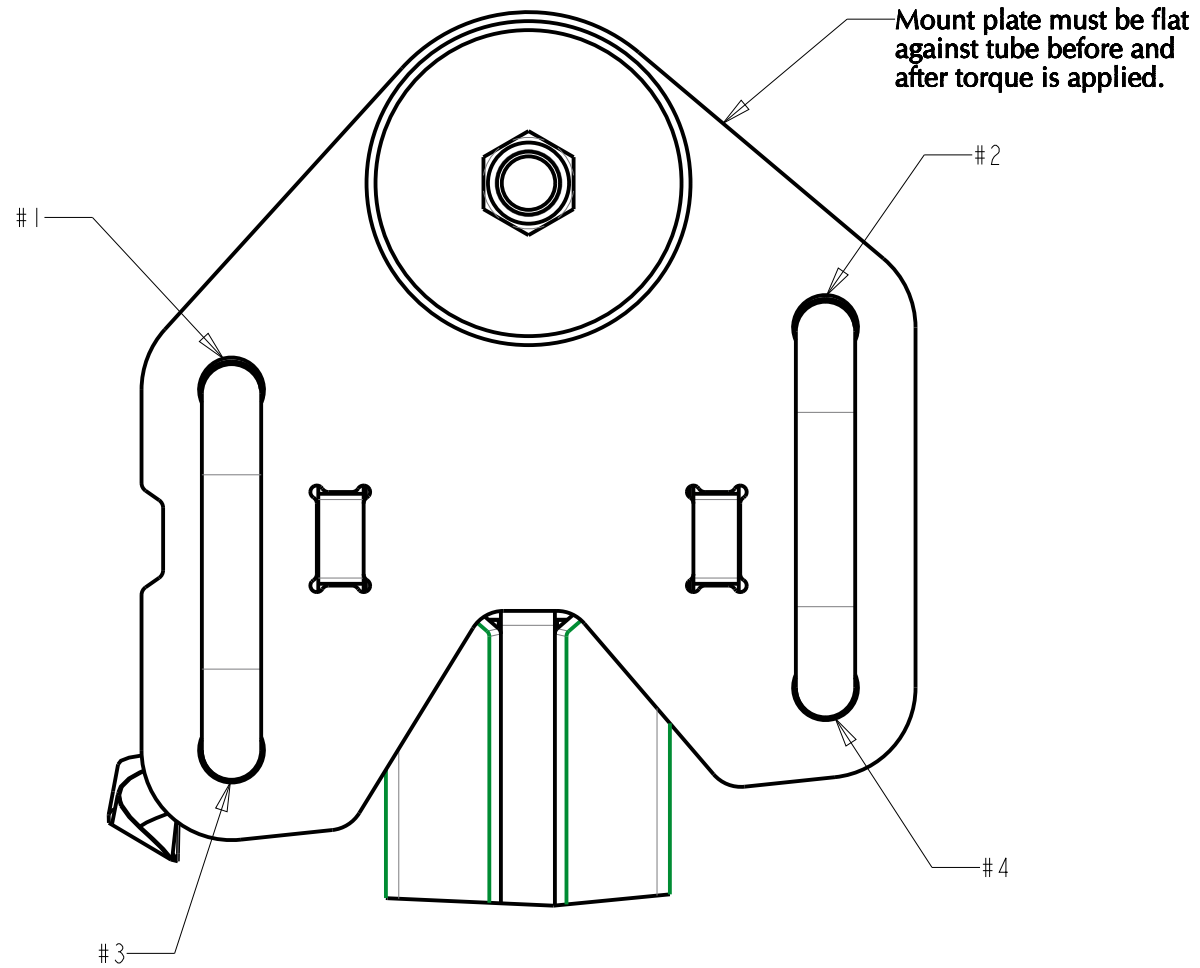
LH UNIT NOTCH  
FACES OUTWARD

RH UNIT NOTCH  
FACES OUTWARD



4.864 CENTER OF BAR TO  
CENTER OF FIRST U-BOLT

U-BOLT TIGHTENING INSTRUCTIONS:

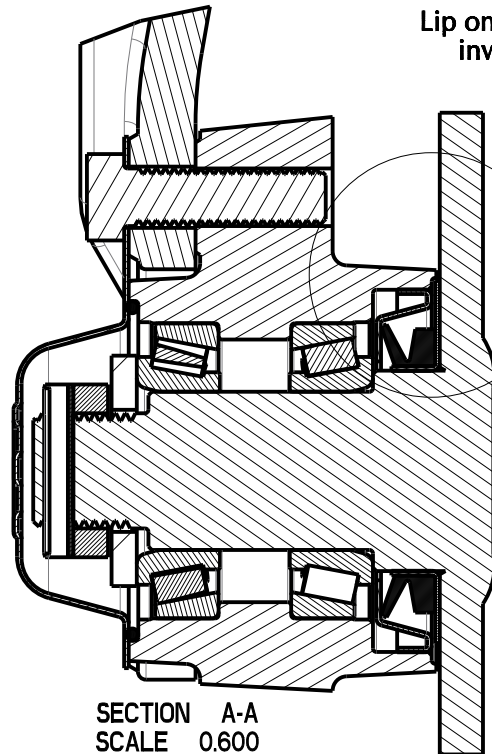
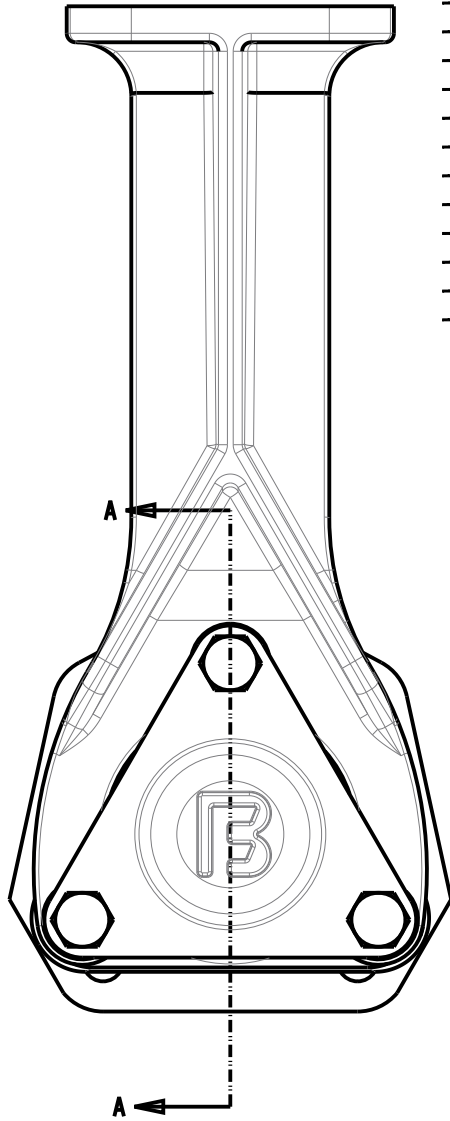


- Tighten u-bolts using a cross pattern sequence.
- Tighten #1 then #4 to partial torque.
- Then partial torque #2 and #3.
- Using same sequence.
- Fully torque u-bolt nuts to 225-250 ft-lbs.

## CLOSURE HUB/ARM ASSEMBLY INSTRUCTIONS - 80-1170:

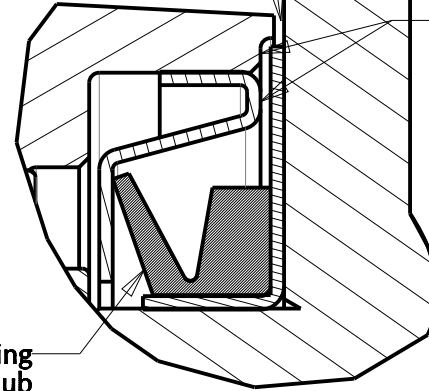
### ASSEMBLY INSTRUCTIONS:

- USE EXTREME PRESSURE NLGI 2 GREASE. Overbased Calcium Sulfonate preferred. Lithium Complex is an acceptable substitute.
- Press peer bearing cups into hub.
- Place a greased peer bearing cone in bore.
- Press counterface into hub until flush with undercut.
- Slide spindle sub-assembly into hub sub-assembly.
- Place greased peer bearing cone in hub.
- Install washer and nut.
- Torque nut to 50 ft-lb. Loosen fully.
- Hand tighten nut then tighten only until roll pin hole is visible
- Install roll pin.
- Fill with grease until grease purges through rollers.
- Place greased o-ring in hub bore.
- Place vertical mount arm on hub flange face.
- Grease inside of dust cap cavity.
- Place dust cap against o-ring.
- Hand start 1/2" cap screws into hub.
- Torque each bolt to approximately 30 ft-lb.
- Then torque each bolt to approximately 60 ft-lb.
- Then torque each bolt to wrench indicated 90 ft-lb.
- After torquing last bolt, recheck other two.



SECTION A-A  
SCALE 0.600

When full, grease will purge from gap.



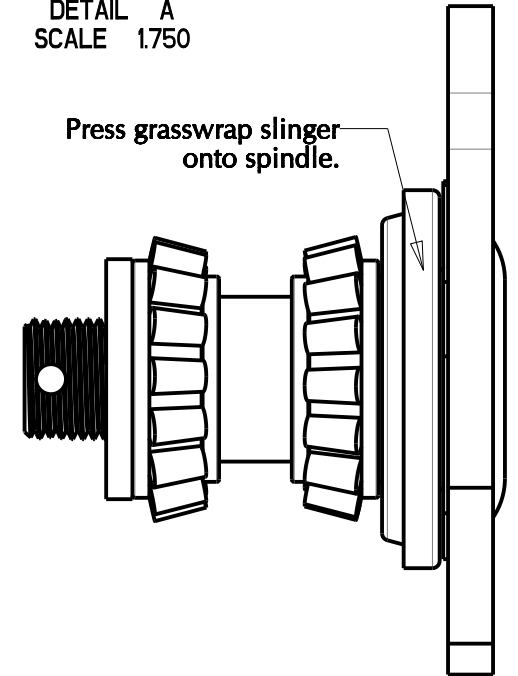
Outer face of counterface plate to be flush with this surface when fully seated. Do not push past this surface.

DETAIL A  
SCALE 1.750

Lip on seal to be facing inward towards hub

SEE DETAIL A

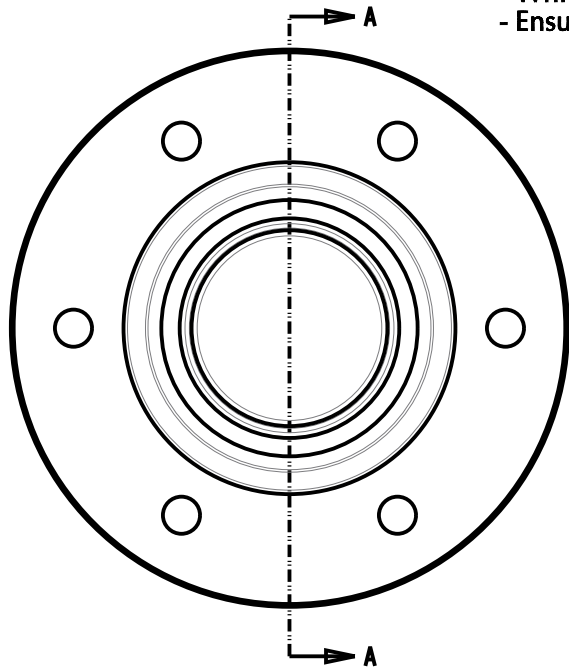
Press grasswrap slinger onto spindle.



## MAIN HUB ASSEMBLY INSTRUCTIONS - 80-1190:

### ASSEMBLY INSTRUCTIONS:

- USE EXTREME PRESSURE NLGI 2 GREASE. Overbased Calcium Sulfonate preferred. Lithium Complex is an acceptable substitute.
- Screw grease zerk fitting into hub.
- Press smaller bearing cup (outer) into hub.
- Press larger bearing cup (outer) into hub.
- Grease larger bearing cone (inner) and press into bearing cup.
- Press greased triple lip seal (grease rubber portion only) into hub bore to proper depth (see diagram).
- Apply a light layer of grease to the portion of the spindle that contacts the seal, then insert spindle fully until bearing stops on shoulder as show below.
- Grease smaller bearing cone (inner) and press into bearing cup.
- Install washer and slotted nut onto spindle until it contacts the outboard cone. use a torque wrench to tighten the nut to 50 ft-lbs. Spin the hub. Loosen fully. Hand tighten. Tighten nut until next slot aligns with cotter pin hole (min 1/10th turn).
- Install cotter pin.
- Grease hub until grease purges through bearings and surrounds nut.
- Grease inside of dust cap cavity.
- While supporting the hub, Install dust cap.
- Ensure the hub rotates and the spindle has no play.



Outer face of seal to be flush with this surface when fully seated. Do not push past this surface.

