NORVELL
COMPANY INCORPORATED

Free Swinging Sifter

Instruction Manual

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To assure optimum performance and reliability of your sifter, careful consideration should be given to all information presented herein.

Preparation Prior to Installing Sifter

Location

Insure that the sifter is installed where the ceiling structure will properly support the sifter's weight and gyratory operation. The sifters should be installed in a location that will provide adequate room for operation and service to the unit. Allow space for your operator to be able to easily remove and service the sieves from each section and to service the drive.

Inspection

Examine each unit for possible shipping damage. If any damage is noted, advise Norvell immediately so they can assist in replacing damaged items. If Norvell arranged shipping, they will contact the transportation carrier in order to file a claim. If transportation was arranged by the customer then it is their responsibility to contact the carrier in order to file a claim.

Uncrating Sifter (If shipped unassembled)

1. Move the sifter and crates to the area where installation will be made.
2. Remove the top of the crates, which is stapled.
3. Remove the ends of the crates, which are stapled.
4. Remove the sides of the crates, which are stapled.
5. Remove the sieves from the sifter boxes and stack the sieves in reverse-number order along the side of where sifter will be installed. As you do this, inspect the sieves to insure the clothing is tightly installed and is correct according to your specified flow. Inspect that the cleaners are in your sieves as ordered.
6. Remove the four double bolted steel clamps that hold the sifter box to the pallet at each corner.
7. Remove the 16 lag screws from tie bars and side channels on the drive frame.
8. Remove 4 nuts to free drive frame from pallet.

Uncrating Sifter (If shipped assembled)

1. Remove the top of the crate, which is stapled.
2. Remove both ends of the crate, which are stapled.
3. Remove the sides of the crate, which are stapled.
4. Remove lag screws from corner brackets.

At this point the boxes and drive, or assembled sifter, will still be sitting on the pallet(s).

Sifter Installation

Attaching the Sifter Boxes to the Drive Frame

(Skip to "Raising the Sifter" if your sifter arrived assembled.)

1. Raise the set of sifter boxes high enough to slide the pallet from underneath the sifter box. While doing so be careful of the bottom hopper outlets that extend below the box frame.

2. Place the boxes on dollies so each set of boxes can be moved into position for preparation to attach to the drive.

3. Remove the crate from the drive frame. Do not remove the metal "trees" from the drive until you are ready to attach the drive to the sifter boxes. The bolts for attaching the boxes to the drive frame are in the Parts Box and will match the holes in the drive frame. An isometric drawing has been included to show fastener locations, quantities, sizes and other hardware details for the sifter drive & box assembly.

4. Stand the drive frame on end – be sure the correct end is up. The top of the drive will have a hole in each corner of the metal plate for lifting eyes. The bottom will have drain holes going around the metal plate. Place the drive frame on dollies to move it to the location where the two sets of boxes can be attached.

5. Remove the metal "tree" from <u>one side of the drive only</u>. Leave the metal "tree" on the other side to hold drive in line. If this is a 4 Section sifter, the 10" center bolts will need to be inserted prior to attaching the boxes to the drive frame as this is not possible once the boxes are mounted against the drive frame.

6. Carefully push the sifter box to the drive frame until the sifter rails are against the vertical face of the drive plates. Be sure drive is in center of box. Tighten all drive and box bolts securely with a torque wrench to 90 ft. lbs. **NOTE: YOU MUST INSTALL THE BUSHINGS IN ALL LOCATIONS SHOWN ON THE ISO DRAWING. FAILURE TO DO SO WILL VOID THE MANUFACTURERS WARRANTY FOR THE SIFTER & DRIVE ASSEMBLY!**

7. When top and bottom drive assemblies are securely bolted, remove the metal "tree" from other side of drive and repeat the above steps for attaching the remaining box to the drive.

8. Install the sifter reed side channels and the top and bottom tie rods (2 section sifters will not have tie rods). As instructed in Step #5, the bushings must be installed on the studs after the side channel is placed into position. **FAILURE TO INSTALL THE BUSHINGS WILL VOID THE MANUFACTURERS WARRANTY!** Then the flat washers and ESNA nuts can be placed onto the studs and tightened securely with a torque wrench to 90 ft. lbs

Raising the Sifter

1. Raise the sifter into position using (2) jacks beneath the sifter or the Norvell sifter installation dollies. Hang your sifter approximately ¼" above desired height to prepare for leveling.

2. Insert the hickory reeds into the ceiling reed castings and tighten the reed clamps to 70 ft. lbs. with the torque wrench provided in the parts box (torque grade 8 bolts to 90 ft. lbs.).

3. Repeat Step #9 to attach the reeds to the side channel reed brackets.

Note that the sifter is not considered level at this point in the installation procedure.

Achieving Proper Tension on Reeds

1. Set (1) jack into position under one side of the drive frame, midway between the two sifter boxes on the reed bracket side, and raise the jack up until it supports the weight of the drive frame on that side of the sifter. *(See Page 6 for jack placement.)*

2. Loosen the reed clamps on both sets of reeds, on this side of the sifter, so that they are only finger tight in order for the sifter to be lowered to the desired height. The reeds will slip in the clamps and establish a uniform pull or tension on all reeds.

3. Lower the jack so that the sifter is in the desired position and secure the reed clamps to 70 ft. lbs. using a torque wrench (torque grade 8 bolts to 90 ft. lbs.).

Leveling

(See Page 6 & 7 for diagrams)

1. Place your level on the drive shaft in a diagonal position to determine if any of the corners are not level.

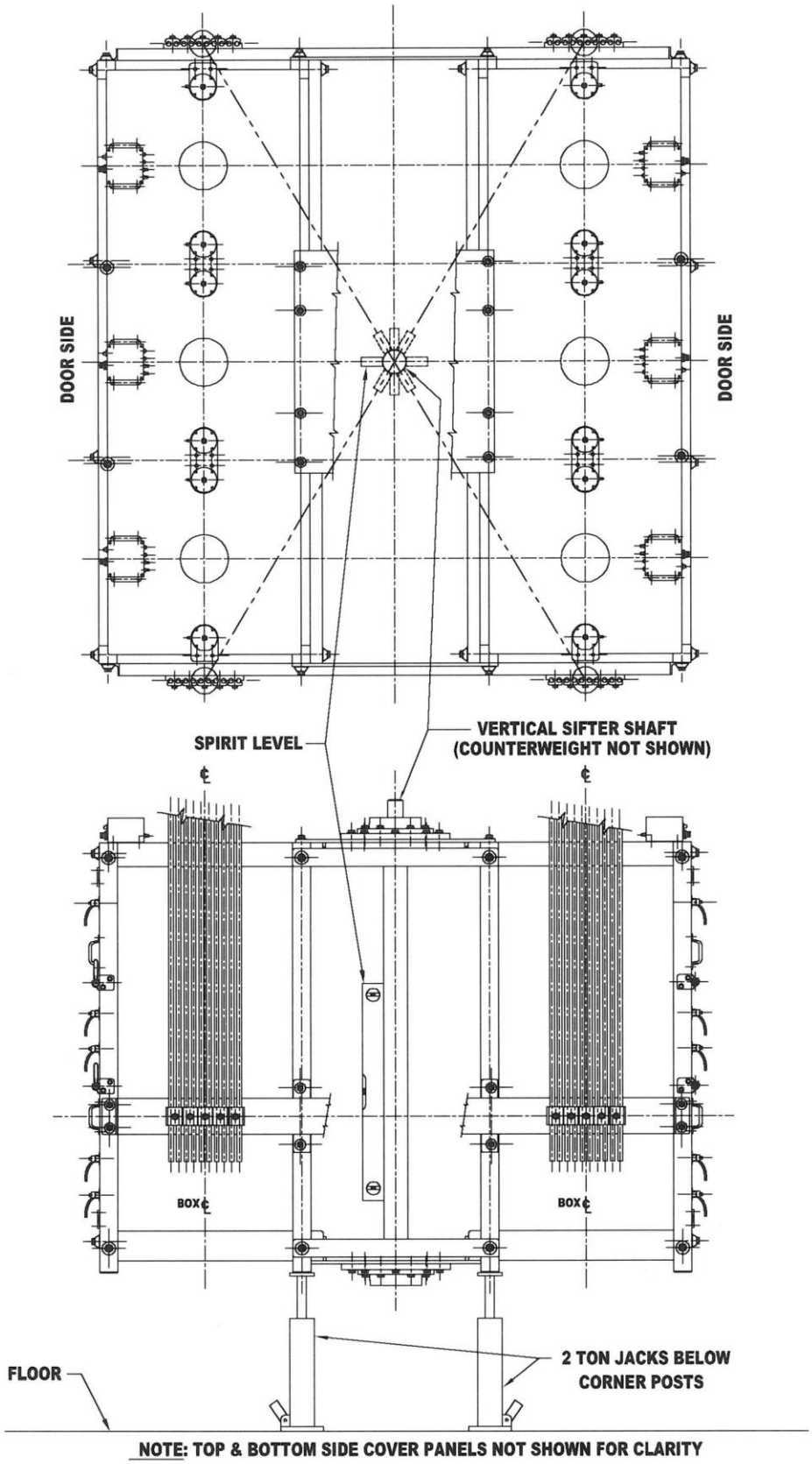
2. <u>If one specific corner is found to be too high</u>. Place your jack under that corner post and loosen the reed clamps nearest that corner so that they are finger tight. Lower with the jack until the level indicates a level condition from this corner to the diagonal corner. Re-tighten the clamps to 70 ft. lbs. using a torque wrench (torque grade 8 bolts to 90 ft. lbs.).

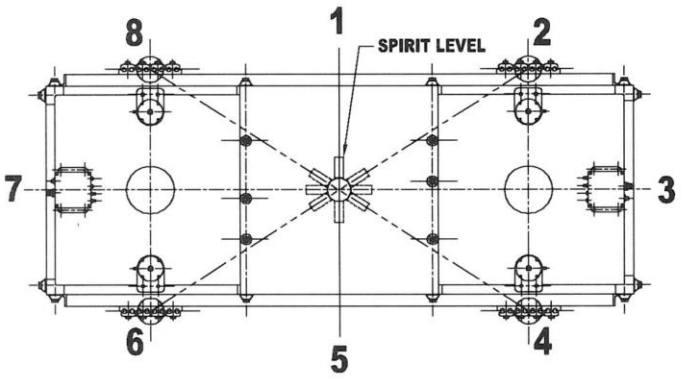
3. <u>If one specific corner is found to be too low.</u> Place your jack under that corner post and loosen the reed clamps nearest that corner. Raise this corner slightly above level, and finger-tighten the reed clamps. Then lower this corner by allowing the reeds to slip in the clamps as the jack is lowered. Lower until level is indicated on drive shaft. Re-tighten the clamps to 70 ft. lbs. using a torque wrench (torque grade 8 bolts to 90 ft. lbs.).

4. You should now double check the opposite diagonal corners with the level on the drive shaft. In addition, check the level of the sifter on the drive shaft from sifter door side to sifter door side and sifter reed side to sifter reed side.

5. Double-check the shaft for plumb and repeat the above steps as necessary.

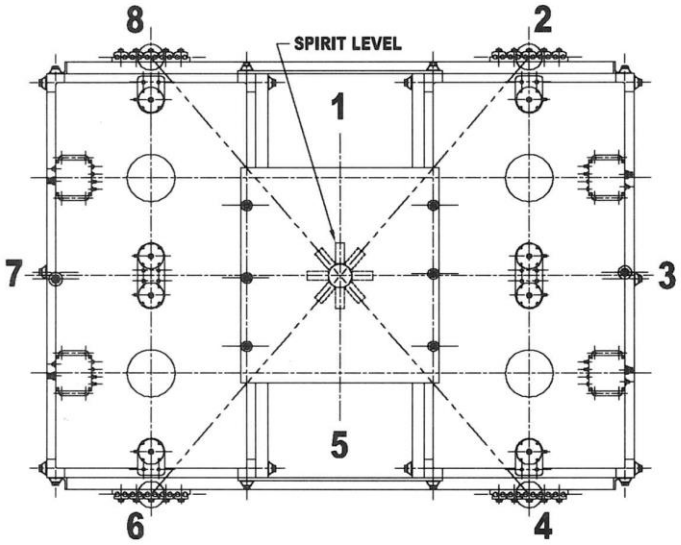
LEVELING DIAGRAM FOR NORVELL FREE-SWINGING SIFTERS



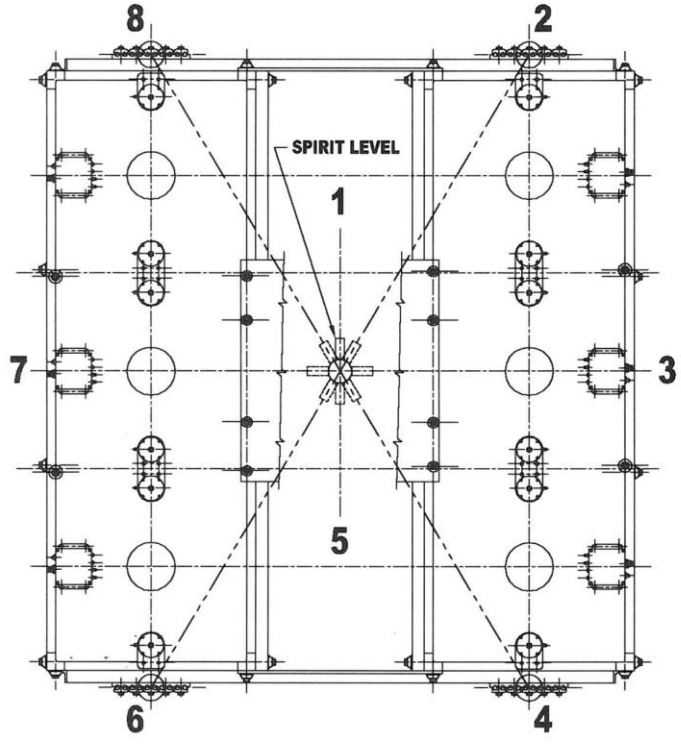


LEVELING DIAGRAM FOR NORVELL FREE-SWINGING SIFTERS 2, 4, AND 6 SECTIONS

2 SECTION SIFTER DIAGRAM



4 SECTION SIFTER DIAGRAM



6 SECTION SIFTER DIAGRAM

6. All new Norvell Free-Swinging sifters are provided with safety cables that mount in place of a reed at each corner of the sifter. Once the above steps are completed, please fill out the data sheet and email or fax it back to Norvell in order for the safety cables to be manufactured to the correct lengths. A Drawing will be included with the safety cables that will show how they are installed. The Drawing shows a typical LH cable & caps. The RH cable & caps are similar but caps have milled slots on the opposite side.

Trial Run

1. Wire the motor on temporary basis for a trial run.

2. Attach the airline to the sifter.

3. Replace your sieves and doors and tighten them properly.

4. Start up the sifter for a trial run and run empty for several hours.

5. If the sifter is operating correctly, it is now ready to be wired for permanent use. If the sifter is not operating correctly, please contact Norvell at 800-653-3147.

6. Install the upper and lower drive cover panels at each side of the sifter, bolting it to the side channels and steel tie bars. Do NOT over-tighten these bolts, as it may cause damage to the cover panels. Use only enough torque on the bolts to ensure the cover panel stays securely in place during sifter operation.

Congratulations!

Your new Norvell Free-Swinging Sifter is now ready to be put into production!

RPM & Circle Diameter

To Increase or Decrease Circle Diameter

Should you desire a larger or smaller circle diameter, please contact Norvell so that we may assist you.

If you are able make the adjustments on your own, we would appreciate it if you could still contact Norvell so that we may keep a record of it.

To Increase or Decrease Sifter RPM

To change the sifter RPM, the drive and driven sheaves can be replaced with the necessary sized sheaves in order to achieve the desired limits. The v-belts will also need to be changed. Again, please contact Norvell so that we may assist you.

Circle Diameter	Recommended RPM
2”	250 – 280
2 ½”	240 – 265
3”	220 – 240
3 ½”	190 – 220
4”	180 – 190

Lubrication Instructions

The Norvell Free-Swinging Sifter drive is equipped with heavy duty grease lubricated bearings. Before inserting the bearings into the Norvell drive, they are carefully checked, cleaned, and then lubricated with Conoco Multiplex Red #2[1] grease, unless otherwise specified by the customer, using a hand pump gun system.

Compatible vs. Comparable

Please Note: The Conoco Multiplex Red # 2 grease furnished by Norvell is lithium based. Please do not mix this grease with one of a different base. While you may find *comparable* greases, **NOT ALL GREASE IS COMPATIBLE**. Should your facility require a Food Grade grease, completely purge bearings, gear boxes, & couplers prior to use. Incompatible greases will starve the bearing for lubrication, and can potentially ruin the sifter.

Each bearing compartment contains a zero pressure grease release zerk. The installed zerk contains no spring or ball within its structure to trap built up pressures or overflowing grease. This protection is a definite over-lubrication safety factor, assuming that no leaks occur at the oil seals; and providing the zerk fitting opening is maintained and not plugged.

Recommendation

- After the initial 30-day period of operating the sifter, check your bearing lubrication.
- When applying grease, apply two to four strokes.[2]
- On a 24 hour per day application, add eight pumps of our recommended grease[3] per month per bearing.
- Every precaution should be taken to avoid over-greasing. This could damage the sifter bearing grease seals.
- Bearings should be checked occasionally for damaged grease seals causing leaks. If the seal leaks, grease bearings as often as necessary until damaged seals can be replaced at a convenient time.

Caution:

Keep in mind that during periods of operation, expansion and contraction takes place within the sifter bearing compartments. This causes pressure which may result in excessive grease discharging through the grease zerk. Norvell sifter drive bearings are designed to operate at 180-degree temperatures. The neoprene grease seals are designed to accept temperatures up to 250 degrees. Sifter bearings may run hot during their first 48 hours of operation and will taper down in heat as they are run.

1 Conoco Multiplex Red #2 is a high-quality, multipurpose, extreme-pressure, lithium based grease. This grease is recommended for heavy-duty, heavily loaded anti-friction and plain bearings.

2 Please note that every grease gun is different and there are multiple variables to be taken into consideration; such as ambient temperature, humidity, continuous hours of operation, etc.; that will affect how much grease your bearing will require.

3 Norvell recommends using Conoco Multiplex Red #2 or an equivalent lithium based grease.

Torque Instructions

This preventive maintenance procedure will insure longer sifter life by guarding against loose bolts resulting from normal wood shrinkage caused by plant temperature or humidity changes, etc.

Norvell recommends that you tighten your sifter bolts with a **torque** wrench to the below specifications every 90 days:

- 5/8" bolts – 15/16" socket – 90 foot-pounds
  - *Sifter Box*
  - *Sifter Drive to Box*
  - *Side Channel & Tie Bar Plate*

- ½" bolts – 3/4" socket – 70 foot-pounds
  - *Reed Caps (Ceiling & Side Channel)*
  - *Weight Plates*[2]

- ½" bolts - 3/4" socket – 90 foot-pounds[1]
  - *Grade 8 Cable Clamp Brackets (Ceiling & Side Channel)*

DO NOT use a hammer to tighten the door handle nuts. The door handle nuts are to be tightened only enough to press the door firmly against the sieves and to hold the sieves firmly against the internal plush strips. The door handles must be tightened evenly on both sides.

1 The only exception to this are the ½" bolts on the side panel covers enclosing the weight bucket drive. These should be tightened enough to hold the side panel cover in place securely, over-tightening these bolts could severely damage the side panel covers.

2 This only applies to sifters manufactured after September 2015.

Preventative Maintenance for Sieves, Doors, and Press Tops

This preventive maintenance procedure will insure longer sieve and sifter life by maintaining a tight stack of sieves and eliminating any movement of the sieves within the sifter.

Periodically remove the sieves and inspect the clothing for wear.

Check the machinery plush on the following:

- Sifter door & Doorway
- The inside sifter wall corner plush strips
- Sieves
- Press Top

Replace the plush whenever it becomes worn. The principle use of the plush is to seal and cushion the sieves and door within the sifter.

To prevent sieve leakage do the following prior to operating the sifter:

- Double check the hold down screws, Pressure Regulators, or Air Cylinders to be sure that the Press Tops are down securely against the sieves.
- Check that the sifter door is locked in and secured with the door locking clamps.
    - **Never** try to open the door by "wedging" out the door with a screwdriver. Always use a **Duck Billed Sifter Pry Bar**[1,2] on the pry bar plates when opening the doors to avoid damaging the doors.

Insure that the tie-rods spanning the door sections of the sifter are tightly fastened.

1 Please be sure and use the Duck Billed Sifter Pry Bar supplied by Norvell, as any other Duck Billed / Pry Bar will cause damage to the Sifter Door.

2 These Duck Billed Pry Bars also make great back scratchers; however, Norvell is not responsible for damage caused to body parts or time lost due to enjoyment.

Miscellaneous
Preventative Maintenance

- Check the condition of your drive v-belt monthly and replace it after it has become excessively worn. Be sure to maintain the proper tension on the belt as it will wear excessively if improperly tensioned.

- Inspect the ½" cables for excessive wear.

Spare Parts List

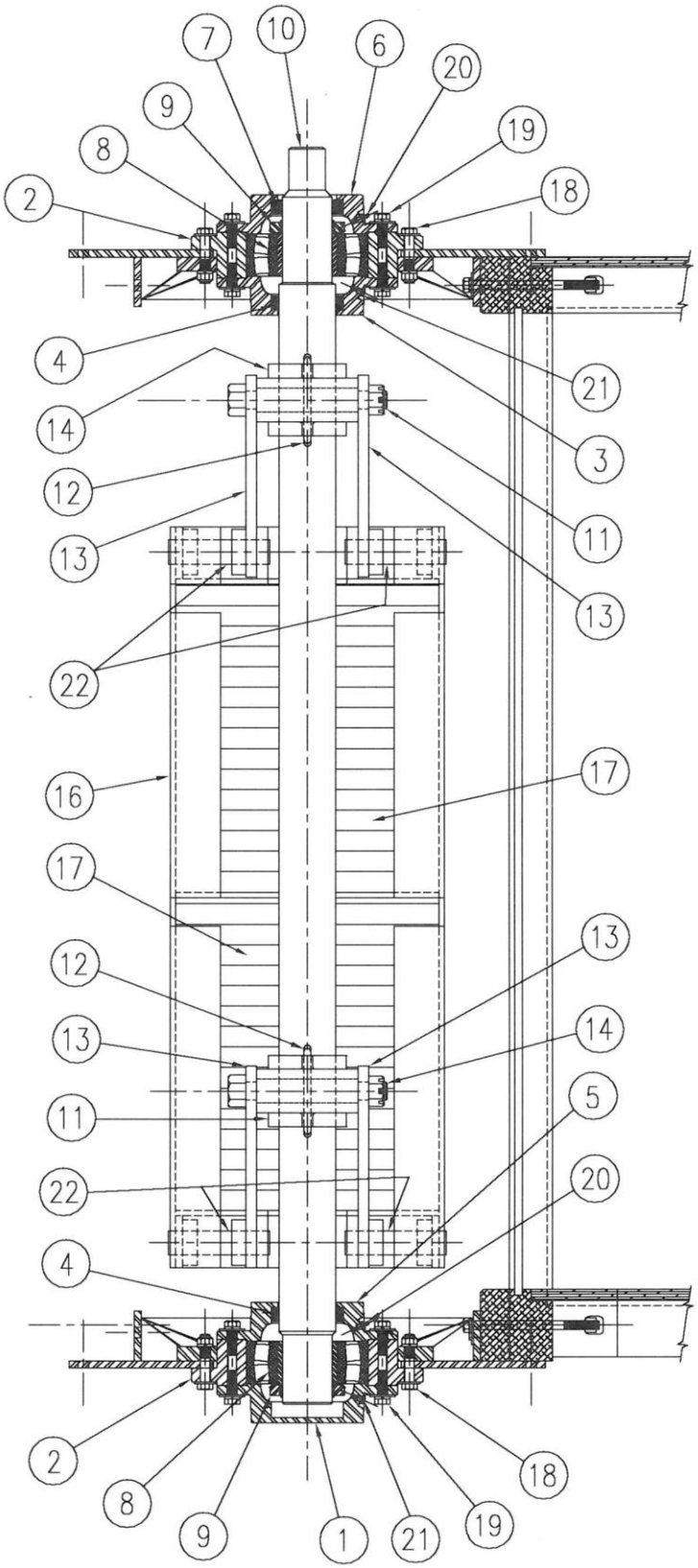
Norvell carries spare parts in stock. There are times that a slight delay may occur due to a production run, momentarily exhausting the items in stock. It is recommended that mills stock a minimum amount of spare parts at their plant, required for emergency reasons and where any amount of down time is critical to the mills production.

Drive Parts

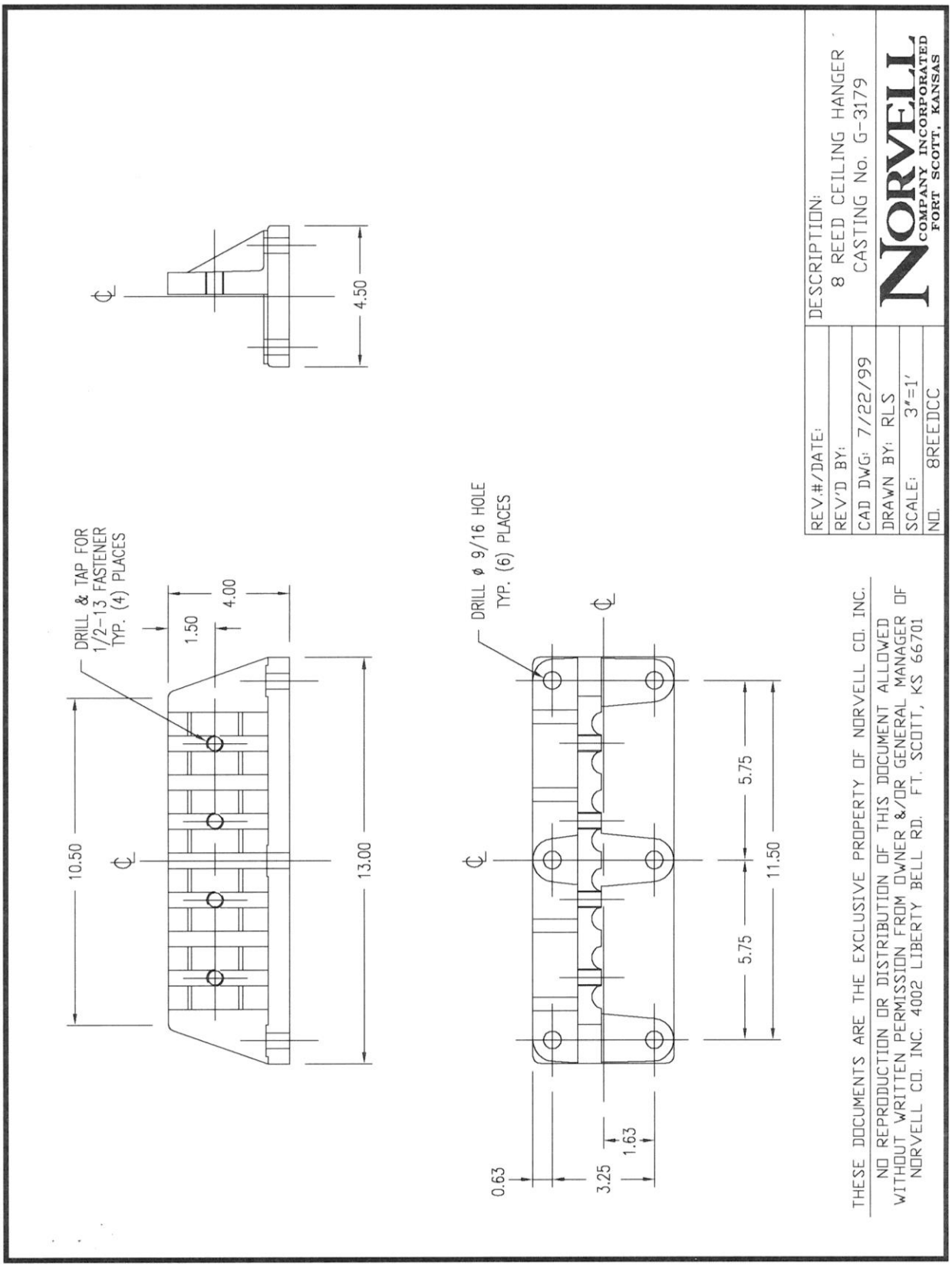
Item Number	Description	Part Number	Quantity
1	Bearing Cap “Closed End”	G-3216	1
2	Bearing Housing with Adapter	G-3214	2
3	Bearing Cap “Inside”	G-3215	1
4	National Oil Seal #455026		2
5	Bearing Cap “Inside”	G-3215	1
6	Bearing Cap “Outside”	G-3215	1
7	National Oil Seal #455034		4
8	Bearing #22320 - SNW 120 Adapter		2
9	Nylon Stop Nuts		2
10	Shaft, 3-15/16” Diameter		1
11	Shaft Counterweight Bracket		2
12	1/2” x 1/2” Key		2
13	Bucket Upper Swivel Arms		2
14	Bracket Pin and Nut Assembly		2
15	Bucket Lower Swivel Arms		2
16	Weight Bucket Assembly		1
17	Counter weights		Call
18	5/8 - 11 x 2” H.H.C.S. with lock washers		24
19	5/8 - 11 x 3 ½” 1/4” H.H.C.S. with lock washers and nuts		16
20	1/8” grease relief zerk		2
21	1/8” pipe plugs		2
22	Bucket Pin and Sleeve Assembly		4

Sifter Parts

Description	Part Number	Quantity
Door Clamps	G3171	Varies
½” Door Handle Nuts	Handle Nut ½”	Varies
3/8” Tie Rod Handle Nuts	Handle Nut 3/8”	Varies



NORVELL SIFTER "SUPER DRIVE"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DRAWN BY: RLS
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DESCRIPTION:
8 REED CEILING HANGER
CASTING No. G-3179
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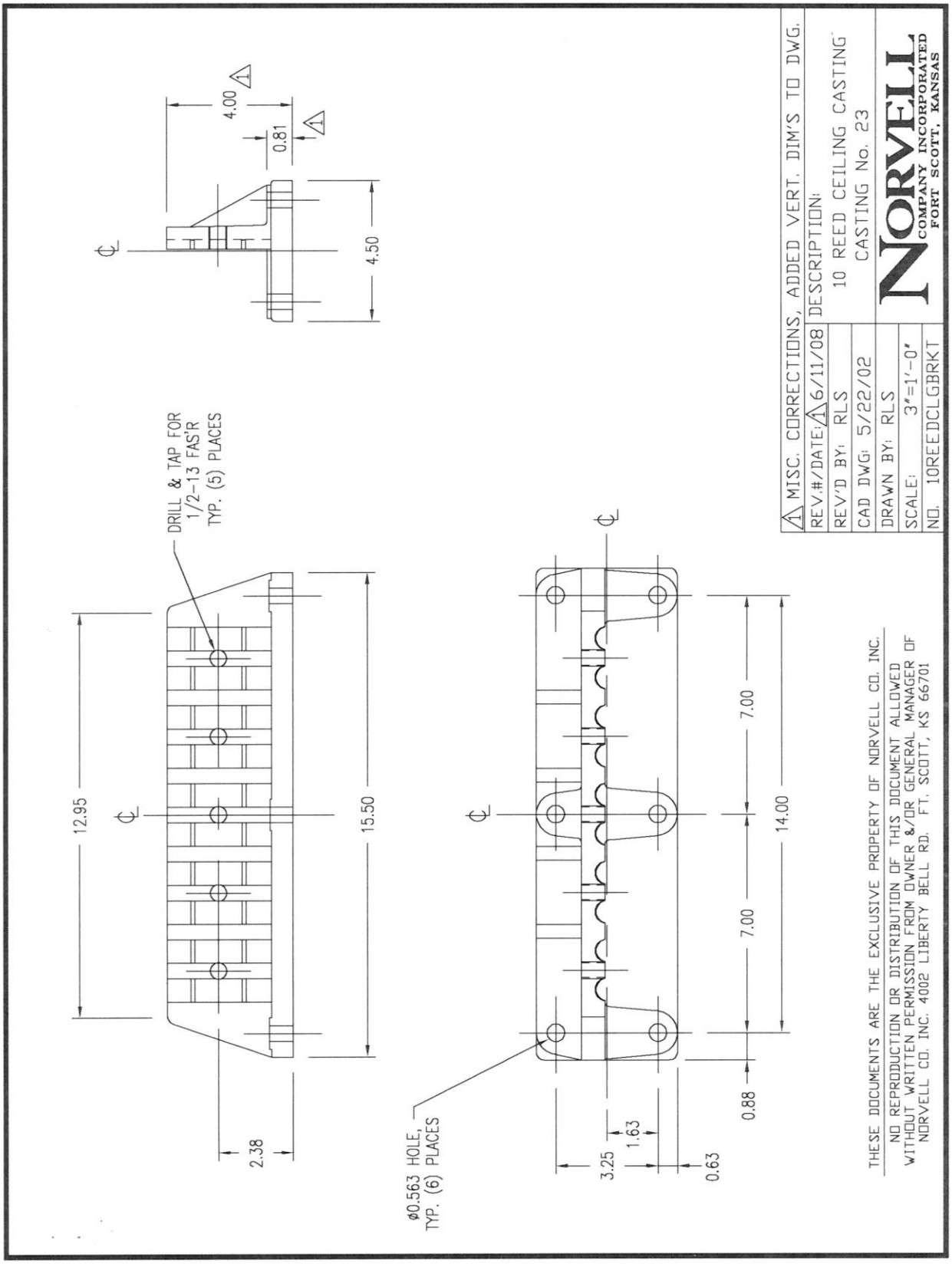
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CAD DWG: 5/22/02
DRAWN BY: RLS
SCALE: 3"=1'-0"
NO. 10REEDCLGBRKT
DESCRIPTION:
10 REED CEILING CASTING
CASTING No. 23
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