

B.W.SINCLAIR, INC.

P.O. Box 1111

Wichita Falls TX 76307-1111

Phone 940/766-2556

Fax 940/766-0430

SCREW CONVEYOR INSTALLATION AND MAINTENANCE

Bulletin 100.IOM

INSTALLATION, OPERATION AND MAINTENANCE

General

Because of variations in length and installation conditions, screw conveyors are usually shipped as sub-assemblies. Most components are manufactured to the standards of the **Conveyor Equipment Manufacturers Association (CEMA)**. **SINCLAIR** will design and manufacture special components for unusual requirements. Conveyors can be ordered as complete units, shop assembled and match-marked before shipping, or as individual components to be aligned and assembled in the field. When **SINCLAIR** engineers the conveyor, complete specification drawings are generally furnished. Manufacturer's instructions should be followed.

INSTALLATION

Receiving

Check all assemblies and parts against shipping papers, and inspect for damage on arrival. Look for dented or bent trough and bent flanges, flighting, pipe or hangers. Minor damage incurred in shipping can be readily repaired in the field.

For severely damaged parts, file an immediate claim with the carrier. Before proceeding with erection, make sure that all supplementary instructions are included. If anything is missing, consult **SINCLAIR**.

Erection

Screw conveyor troughs must be assembled straight and true with no distortion. If anchor bolts are not in line, either move them or slot the conveyor feet or saddle holes. Use shims under feet as required to achieve correct alignment. Do not proceed with installation of shafts and screws until trough has been completely aligned and bolted down.

CONVENTIONAL CONVEYOR SCREWS

1. When shipped as loose parts, assemble bearings to trough end plates.
2. If trough ends are factory assembled with trough, check bearings and seals for possible misalignment which may have occurred during shipment. Realign if necessary.
3. Place troughs and trough ends in proper sequence with discharge spouts properly located. Connect the joints loosely. Do not tighten the bolts. Align trough bottom and centerline perfectly using piano wire. Then tighten joint bolts and all anchor bolts.
4. Begin assembly of screw sections, working from the thrust end. (Drive shaft and thrust bearings are normally at the discharge end to place the conveyor screw in tension.)
5. Place the first screw section in the trough, fitting it onto the end shaft. Install coupling bolts. If reinforcing lugs are on ends of flighting install screw so they are opposite the carrying side of the flight.
6. Insert coupling shaft into opposite end of conveyor pipe; install coupling bolts.
7. If screws are not close coupled, slide hanger over coupling and bolt to trough.
8. Pull conveyor screw away from discharge end of conveyor to seal the thrust connection and remove any play in coupling bolts.
9. Place next screw section in trough and fit onto coupling so that flighting end is about 180 deg. from end of flighting of first section. Install coupling bolts. (For close coupled conveyors without hangers: Assemble screws so that flighting at adjoining ends of screw sections align to provide a continuous surface. In the case of material supplied on orders for "components only" the coupling bolt holes are drilled in only one end of the coupling shafts

and it will be necessary to mark and drill the other end in field. Remove shaft from screw before drilling; **DO NOT**

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USE SCREW PIPE AS DRILL JIG.)

10. Insert coupling shaft into opposite end of pipe; install coupling bolts. Install hanger and pull out on pipe to remove any play. (See Step 8.)

11. Go back to hanger installed previously; center the bearing between ends of pipes, and tighten hanger mounting bolts. Revolve screw to check alignment. If screw doesn't turn freely, adjust hanger mountings until it does. Then proceed with installation of next screw section.

12. Alternately assemble screw sections, couplings, and hangers as in Steps 9 through 11 until all screw sections except the last one have been installed. Remove trough end to install last section.

13. Install tail shaft through end bearing and fasten into last screw section with coupling bolts. Check freedom of rotation of entire screw.

14. When trough end seals are used, be sure shafts are centered in seal openings.

15. Tighten collar set screws in any anti-friction bearings in trough ends and hangers. Check and tighten all hanger assembly and mounting bolts.

16. Tighten packing gland type seals only enough to prevent leakage. If tightened excessively they may impose a drag on the conveyor and wear rapidly.

17. Fill waste packed type seals with waste packing loosely but sufficiently to encircle the shaft and fill the corners, to prevent packing from rotating with the shaft.

18. Remove all debris from trough (bolts, nuts, shipping materials, etc.). Install covers in proper sequence to locate inlet openings. Handle covers with care to avoid warping and bending, and attach them with fasteners provided. Do not tighten excessively, especially when using gaskets, as leaks may occur when covers are permanently kinked.

19. Install drive at proper location in accordance with separate instructions provided. After electrical connections have been made and before handling any material, check screw rotation for proper direction of travel. Incorrect screw rotation can result in serious damage to the conveyor and to related feeding, conveying, and drive equipment. If rotation is incorrect, have electrician reverse motor rotation.

20. Lubricate drive and all bearings in accordance with manufacturer's instructions. **DRIVES ARE SHIPPED WITHOUT OIL.**

21. **MAKE SURE HAZARD LABELS AFFIXED TO TROUGHS AND/OR COVERS ARE IN PLACE AND NOT OBSCURED.**

OPERATION

1. ALWAYS operate conveyor in accordance with proper safety precautions.
2. DO NOT place hands or feet in conveyor opening.
3. NEVER walk on conveyor covers or gratings.
4. DO NOT put conveyor to any other use than that for which it was designed.
5. AVOID poking or prodding material in conveyor with bar or stick inserted through openings.
6. ALWAYS have a clear view of conveyor loading and unloading points and all safety devices.
7. Keep area around conveyor, drive, and control station free of debris and obstacles.
8. NEVER operate conveyor without covers, grating, guards and other safety devices in position.

Initial Startup (Without Material)

1. **REMEMBER - screw conveyor drive is shipped WITHOUT oil. Add oil to drive in accordance with manufacturer's instructions.**

2. **MAKE SURE** before initial startup that conveyor is empty, that end bearings and hangers are lubricated, and that all covers, guards, and safety equipment are properly installed.

3. If conveyor is part of a material handling system, make certain that conveyor controls are interlocked electrically with those for other units in system.

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4. Check direction of conveyor rotation in each unit to assure correct flow of material.
5. Operate conveyor while empty for several hours, making a continuous check for heating of bearings, misalignment of drive, and noisy operation. If any of these occur proceed as follows:
 - a. If anti-friction bearings are used, check supply of lubricant. Either too little or too much lubricant can cause high operating temperatures.
 - b. Lock out power supply and check for misalignment in trough ends, screws and hangers. Loosen, and readjust or shim as necessary. If unable to eliminate misalignment, check parts for possible damage during shipment.
 - c. Check assembly and mounting bolts.

Initial Startup (With Material)

1. CHECK that the conveyor discharge is clear before feeding material.
2. Increase feed rate gradually until rated capacity is reached.
3. Stop and start conveyor several times, and allow to operate for several hours.
4. Shut off conveyor and lock out power supply. Remove covers and check coupling bolts for tightness. Check hanger bearings, realign if necessary and retighten mounting bolts.
5. Replace covers.

Extended Shut Down

If conveyor is to be inoperative for a long period of time, it is advisable to permit it to operate for a period of time after the feed has been cut off in order to discharge as much material as possible from the trough. However, there is a nominal clearance of 1/2" between the screw and the trough and this procedure will allow a small amount of material to remain in the trough. Therefore, if the material is corrosive, or hygroscopic or has a tendency to harden or set up, the trough should be cleaned completely after the conveyor is shut down and power locked out.

MAINTENANCE

Establish routine periodic inspection of the entire conveyor to insure continuous maximum operating performance. Practice good housekeeping. Keep the area around the conveyor and drive clean and free of obstacles to provide easy access and to avoid interference with the function of the conveyor or drive.

1. Lock out power to motor before doing any maintenance work - - preferably with a padlock on control.
2. Do not remove padlock from control, nor operate conveyor until covers and guards are securely in place.

Servicing of Conveyor Components

In most cases this involves removing an unserviceable part and installing a replacement. The installation procedures are outlined in the section entitled ERECTION. Specific instructions for the removal of various conveyor components follow.

Conventional Conveyor Screws

To remove a section or sections of conventional conveyor screw, proceed from end opposite the drive. Remove trough end, conveyor screw sections, coupling shafts, and hangers until all screw sections have been removed, or until damaged or worn section is removed.

To reassemble, follow above steps in reverse order.

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Sections of conventional conveyor screw equipped with split flight couplings may be removed individually with a minimum of disturbance of adjacent sections.

Couplings and Hangers

Replace couplings and hanger bearings when wear in either part exceeds 1/8". Replace coupling bolts when excessive wear causes play.

LUBRICATION

Frequency of lubrication will depend on factors such as the nature of the application, bearing materials, and operating conditions. Weekly inspection and lubrication is advisable until sufficient experience permits establishment of a longer interval.

Drive

Lubricate the drive following manufacturer's instructions provided for the speed reducer and the other drive components requiring lubrication. **Speed reducers are generally shipped WITHOUT oil.**

Ball or Roller Bearings

Ball and roller bearings may be furnished in trough ends or hangers. Lubricate in accordance with manufacturer's instructions provided.

Babbitted or Bronze Bushed Bearings

Babbitted or bronze bushed bearings may be furnished in trough ends or hangers. Lubricate in accordance with manufacturer's instructions.

Other Bearings

For oilless or graphite bronze, hard or chilled iron, oil impregnated wood, or plastic laminate hanger bearings, no lubrication is required.

***WARNING!! LOCK OUT EQUIPMENT PRIOR TO ANY MAINTENANCE.
DO NOT OPERATE CONVEYOR WITHOUT SAFETY GUARDS AND COVERS
IN PLACE.***