VM-3659C

Installation, Operation and Maintenance Instructions

ERIEZ®

SINGLE MASS CONVEYOR
MODEL SM

ERIEZ MAGNETICS HEADQUARTERS: 2200 ASBURY ROAD, P.O. BOX 10608, ERIE, PA 16514-0608 U.S.A.
WORLD AUTHORITY IN ADVANCED TECHNOLOGY FOR MAGNETIC, VIBRATORY and METAL DETECTION APPLICATIONS

Introduction

This manual details the proper steps for installing, operating and maintaining the Eriez Single Mass Conveyor.

Careful attention to these requirements will assure the most efficient and dependable performance of this equipment.

If there are any questions or comments about the manual, please call Eriez at 814/835-6000 for Conveyor assistance.

Table of Contents

ERIEZ SINGLE MASS CONVEYOR - MODEL SM

Installation

DAMAGE IN SHIPMENT

When you receive your conveyor, examine it carefully for damage. If damage is found, report it immediately to Eriez Magnetics and the Carrier.

HANDLING

It is important to handle this equipment carefully to avoid twisting or bending the frame or pans. If lift lugs are provided, they must be used; otherwise, lift with slings.

A spreader board over the pan should be used to prevent your chain or cable from bending the pan while lifting.

An excessively large amount of weight placed on the pans or springs could damage the unit.

INSTALLATION PROCEDURES

SM Conveyors are single-mass systems and as with all such systems, it is mandatory that the base of each unit be anchored to a solid foundation. The following points must be observed for satisfactory and safe operation:

1. A solid foundation, such as a reinforced concrete footer of sufficient size for a given conveyor, must be provided.
2. The SM Conveyor must be securely fastened to the foundation. Attachment points must be in-line on the same level.
3. The SM Conveyor must not be suspension mounted. The installation must be limited to ground-floor or subgrade locations where an adequate foundation can be provided.

Eriez Magnetics will advise the forces to be considered for proper installation upon request.

The anchor points must be in-line and in the same plane. Installation is normally level but the unit may be down-sloped which will increase conveying speed or the unit may be up-sloped slightly which will decrease conveying speed.

The conveyor must not be placed directly under a hopper unless there is not any head load. Hoppers with head load should be emptied with a vibratory feeder which then drops the material onto the conveyor pan.

WIRING

Wiring to the motor should enter from a flexible conduit. Use of a motor starter and circuit protection is recommended. Wiring must be properly sized to prevent line voltage drop.

Motors commonly supplied are 1725 rpm, dual voltage polyphase. Connect wiring according to the manufacturer's instruction, usually located on the nameplate or in the conduit box cover.

Motor rotation should be such that the top of the pulley rotates in the opposite direction from the feed of the pan. However, some materials feed better with the belt turning in the same direction as the feed.

When controller is supplied connect according to instructions enclosed with this equipment.

SPECIAL TROUGHS AND ATTACHMENTS

Eriez Engineering Service Department should always be consulted before undertaking the design or construction of special troughs. The troughs as furnished by Eriez should not be modified or attachments added without first consulting Eriez, as the feeders and conveyors are a tuned mass system and damage will result. To do so will void the warranty.

Operation and Maintenance

DEFLECTION

Eriez single mass conveyors are normally set at approximately 5/8" (16 mm) pan deflection. This can be checked with an Eriez deflection sticker. The sticker is read while the equipment is operating by looking at the optical illusion in which the printed circles appears as double. Read the deflection where the two circles touch. A deflection sticker is shown in actual size in Figure 1.

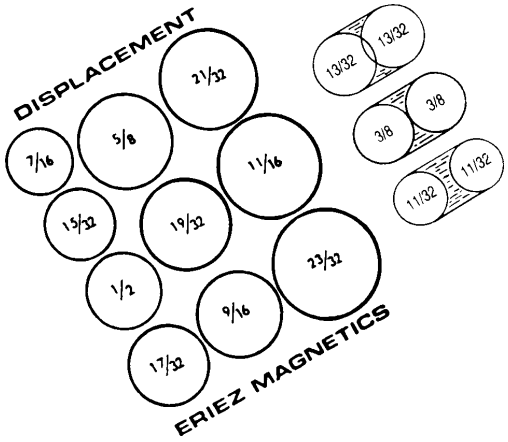


FIGURE 1

The deflection may also be read by holding a pencil very steadily (resting against a solid object) and touching the pan side with the pencil point while the pan is operating. Then stop the equipment and measure the deflection indicated by the line drawn on the side of the pan.

Do not operate with pan deflections greater than 5/8" (16 mm) because spring damage will result.

DEFLECTION ADJUSTMENT

ADJUSTMENT BY SPEED

The deflection may be changed by means of the adjustable drive sheave. Making the sheave smaller in pitch diameter will slow down the eccentric shaft and decrease the deflection. Increasing the drive sheave pitch diameter will increase deflection.

To adjust the drive sheave, first disconnect all power, then remove guard.

1. Loosen motor plate mounting bolts.
2. Slide motor plate back to loosen belt.
3. Loosen set screw on sheave and remove from motor.
4. Loosen set screws that lock sheave halves and remove key if present.
5. Turn sheave halves so they move apart to decrease the pitch diameter or turn the opposite way to increase diameter.
6. Replace key and tighten set screws.
7. Place sheave on motor shaft, line up with driven sheave and tighten set screw.
8. Reinstall belt and pull motor tight against belt.
9. Tighten motor plate mounting bolts.
10. Replace guard.

If the driven sheave is removed, the tapered bushing must be carefully tightened to prevent slipping on the shaft. Tighten each bolt in the bushing until each is tightened to about 10 ft. lb. (14 Nm). Be sure to recheck the torque because tightening one bolt will loosen the others.

NOTE: Material build-up on pan may increase pan deflection and cause tuning spring failure or cracks in tray and base.

CAUTION: Do not operate unit with any associated equipment in direct contact with any part of the vibratory unit. Cracks can occur in the tray and base.

NOTE: Units may be supplied with manual variable speed sheaves. The speed and deflection may be changed merely by turning a handwheel. Do not exceed 5/8" (16 mm) pan deflection.

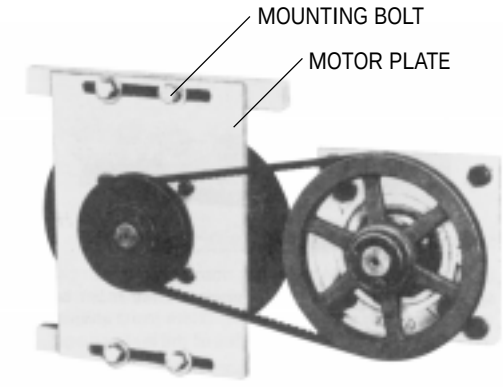


FIGURE 2

Operation and Maintenance (cont.)

ADJUSTMENT BY WEIGHTS

Deflection may also be changed without changing speed by changing the eccentric weights on the shaft. To do this, first remove the belt, then remove the four bolts from the bearing mounting plate and pull the shaft out as show in Figure 3.

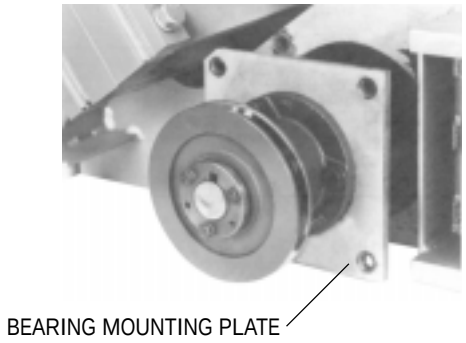


FIGURE 3

NOTE: Weights may be taken off to decrease the deflection or weights may be added to increase deflection. Never increase deflection to more than 5/8" (16 mm) on the pan. Be careful not to add more weights than will fit into the housing. The shaft should be marked before removing weight clamps to maintain the correct position of the weights on the shaft. (see Figure 4)

Remove the nuts from the weight clamps and take the weights off of the shaft. Change the number of weights and place the shaft back in the original position and replace the clamps, nuts, and spacer sleeves. Torque nuts tight (75 ft. lb. for 1/2 inch nuts and 150 ft. lb. for 5/8 nuts).

Reassemble the shaft into the unit and turn the sheave by hand to be sure it turns freely. Install the belt and run the drive to check the deflection.

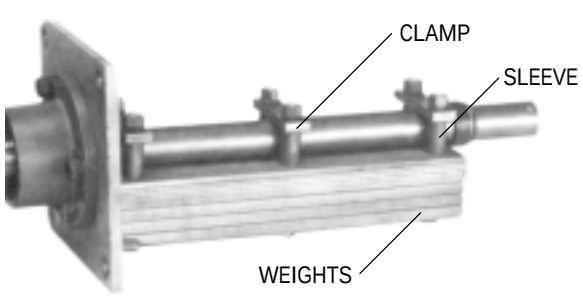


FIGURE 4

LUBRICATION

Bearings should be lubricated approximately every 200 hours of operation with gun grease suitable for roller bearings. To reach grease fittings, first shut down the unit, lockout tag out, then remove plugs from the two access holes on the end of the eccentric enclosures. Replace plugs when finished.

This bearing is factory lubricated with No. 2 consistency lithium base grease which is suitable for most applications. However, extra protection is necessary if bearing is subjected to excessive moisture, dust, or corrosive vapor. In these cases, bearing should contain as much grease as speed will permit (a full bearing with consequent slight leakage through the seal is the best protection against contaminant entry).

In extremely dirty environments, the bearing should be purged daily to flush out contaminants.

The following table is a general guide for normal operating conditions. However, some situations may require a change in lubricating periods as dictated by experience. If the bearing is exposed to unusual operating conditions, consult a reputable grease manufacturer.

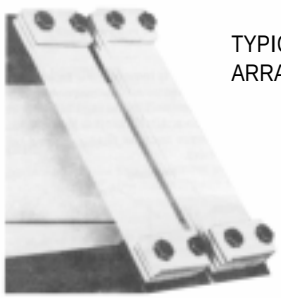
TABLE 1 - LUBRICATION GUIDE

Suggested Lubrication Period in Weeks			
Hours run per day	**251 to 500 rpm**	**501 to 750 rpm**	**751 to 1000 rpm**
8	12	10	7
16	7	5	4
24	5	3	2

Repairs

DEFLECTION

As mentioned earlier, the deflection is set at time of manufacture at approximately 5/8 inch (16 mm). Deflection may be adjusted by changing the speed or weights as described in the preceding section.



TYPICAL SPRING ARRANGEMENT

FIGURE 5

SPRING REPLACEMENT

Before disassembling springs, note how the clamps, springs, and spacers are arranged. They must be reassembled in the same order. There must always be a plastic spacer on both sides of the leaf springs.

Torque spring bolts to 78 ft. lbs. (106 Nm)

MOTOR REPLACEMENT

When replacing motors, replace with an identical hp, rpm and voltage motor and insure all sheaves are in proper alignment. Excessive belt wear will result if belts are operated misaligned. Always replace worn belts.

BELTS

Periodically inspect the belt for tension and wear. The belt should be tensioned to allow approximately 1/2-inch (12 mm) deflection at the mid-span when moderate pressure is applied by hand.

Excessively loose or tight belts will wear rapidly.

A new belt should be readjusted after a few hours of operation.

BEARING REPLACEMENT

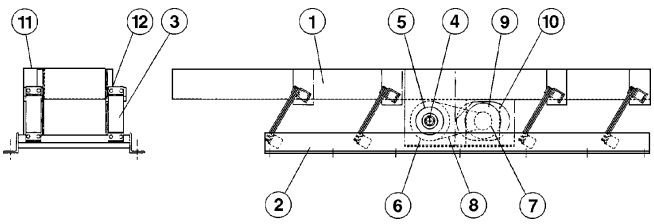
When replacing bearings on the eccentric shaft, DO NOT use the set screws to lock the bearing collar to the shaft. The eccentric shaft must free float on the inner race of the bearing for even wear.

Parts List

Item No.	Name	Quantity
1.	Trough (Specify Width & Length)	1
2.	Base Assembly (Specify Width & Length)	1
3.	Spring	As Req'd.
4.	Eccentric Shaft	1
5.	Flange Bearing (Specify Diameter of Bore)	2
6.	Driven Sheave (Specify Size)	1
7.	Variable Pitch Drive Sheave (Specify Size)	1
8.	"V" Belt (Specify Size)	1
9.	Motor (Specify HP, RPM, Phase, Hz)	1
10.	Motor Mounting Plate	1
11.	Belt Guard	1
12.	Spring Bolt	As Req'd.

NOTE: WHEN ORDERING PARTS BE SURE TO SPECIFY FEEDER MODEL AND STYLE, PART NUMBER AND QUANTITY.

NOTE: Units may be supplied with manual variable speed sheaves. The speed and deflection may be changed merely by turning a handwheel.



Troubleshooting

PROBLEM	CAUSE	REMEDY
Low Deflection	(a) heavy load on pan	(a) reduce load, improve hopper design
	(b) pan hitting fixed object	(b) provide clearance
	(c) unit out of tune due to damaged springs	(c) replace springs
	(d) belt slipping	(d) tighten belt, replace if worn
	(e) motor stalling due to incorrect voltage	(e) check motor wiring and voltage and correct
	(f) shaft running too slow due to incorrect ratio	(f) check rpm and correct
	(g) object added to pans	(g) remove object
	(h) malfunctioning control	(h) check direct line
	(i) loose spring bolts	(i) tighten spring bolts
	(j) material build-up on pan	(j) keep pan clean
No Deflection	(a) see Low Deflection	(a) see Low Deflection
	(b) motor failure	(b) replace motor and find cause of failure
	(c) no electricity	(c) check for electricity at terminals
	(d) broken, loose or thrown belt	(d) check belt and install properly
High Deflection	(a) shaft running too fast	(a) check rpm and correct
	(b) broken or damaged springs	(b) replace springs
	(c) object added to pans	(c) remove object
	(d) excessive temperature	(d) remove heat or reduce speed
	(e) material build up on pan	(e) keep pan clean
Noisy Operation	(a) mounting has come loose or is inadequate	(a) check mounting and correct
	(b) pan hitting material or object	(b) provide clearance
	(c) high deflection	(c) see High Deflection
	(d) cracks or breaks in pan or frame	(d) repair cracks or breaks
	(e) loose object on pan	(e) remove or secure objects
	(f) bearing failure	(f) replace bearing
	(g) loose spring bolts	(g) tighten bolts
Motor Overload Protection Tripping	(a) high deflection	(a) see High Deflection
	(b) inadequate ventilation	(b) provide air circulation
	(c) incorrect voltage	(c) check motor wiring and voltage
	(d) excessively tight belt	(d) loosen belt
	(e) defective motor	(e) replace motor
	(f) bearing failure	(f) replace bearings
	(g) operating on two legs of three phase line	(g) check terminals and fuses
	(h) pan jammed against external object or base	(h) provide clearance

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