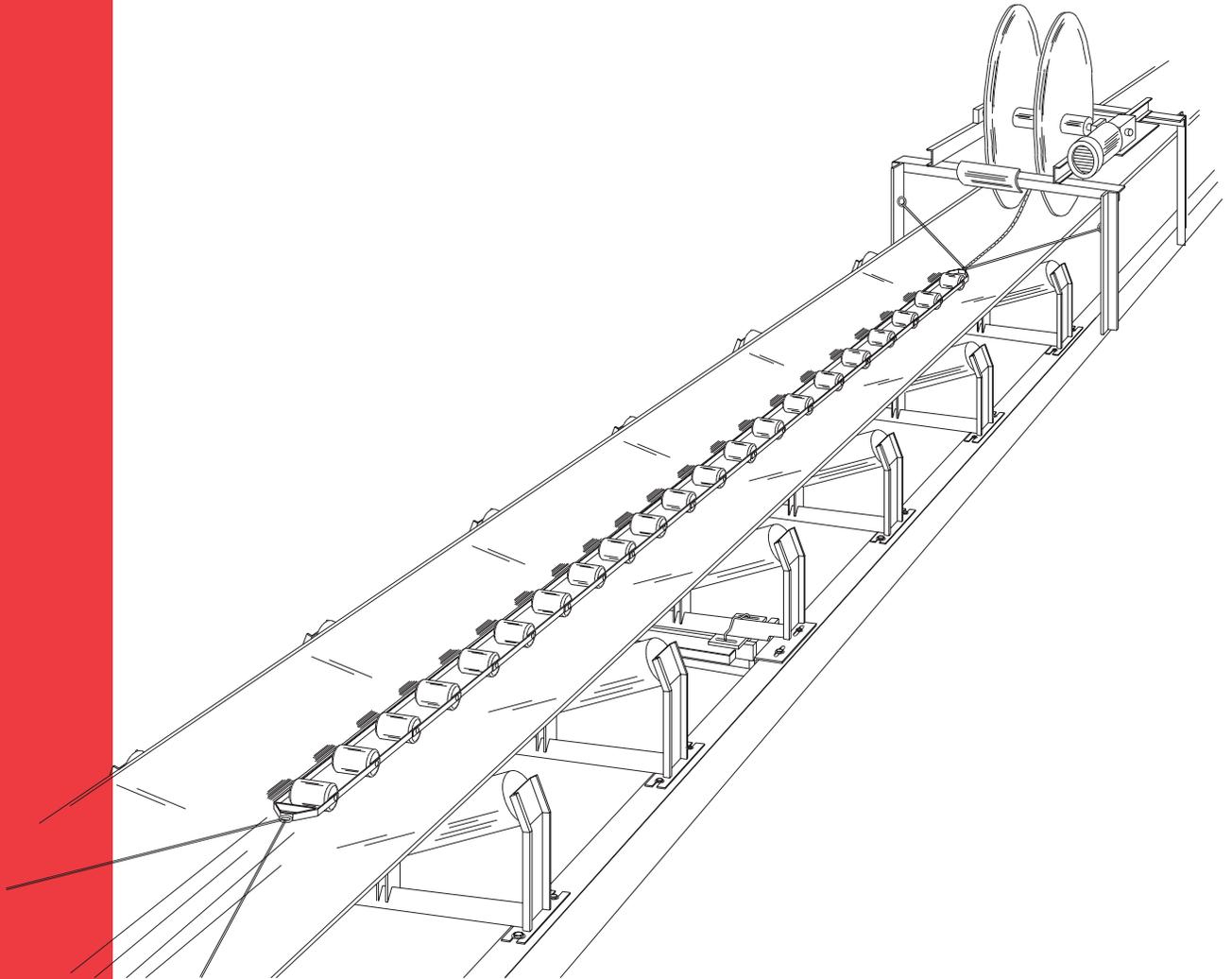


Test Chain Instruction Manual



Instruction Manual

PL-CMS001

October 1998

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About this Manual

This instruction manual is intended to provide the basic guidelines for installation, operation and maintenance of the calibration test chain and storage reel compartment.

About the use of test chains

Although there are 4 common methods for calibrating a belt scale, only the test chain method will be discussed.

• Purpose of test chain use in scale calibration.

This method has been used extensively for testing mechanical belt scales and it is often used to calibrate high capacity electronic belt scales and weighfeeders that cannot be material tested. The test chain is applied to the conveyor belt, secured at both ends enabling the chain to remain stationary over the weigh length. It rolls upon the surface of the moving belt conveyor to provide dynamic scale loading of a known weight value, which provides the calibration reference.

• The advantages of utilizing a test chain are:

The test load provided by a roller test chain will cause the surface of the belt to deflect in much the same manner as when material is on the belt, thereby simulating live material loading.

A much greater test load can be applied to high capacity belt scales and weighfeeders because most weighbridge designs can only accommodate a limited number of static weights applied to the suspension. This is especially important on systems that utilize mechanical weighing elements and lever systems, due to the need to calibrate the systems with the test load values close to the normal operating loads of the belt.

• Some cautionary points to consider.

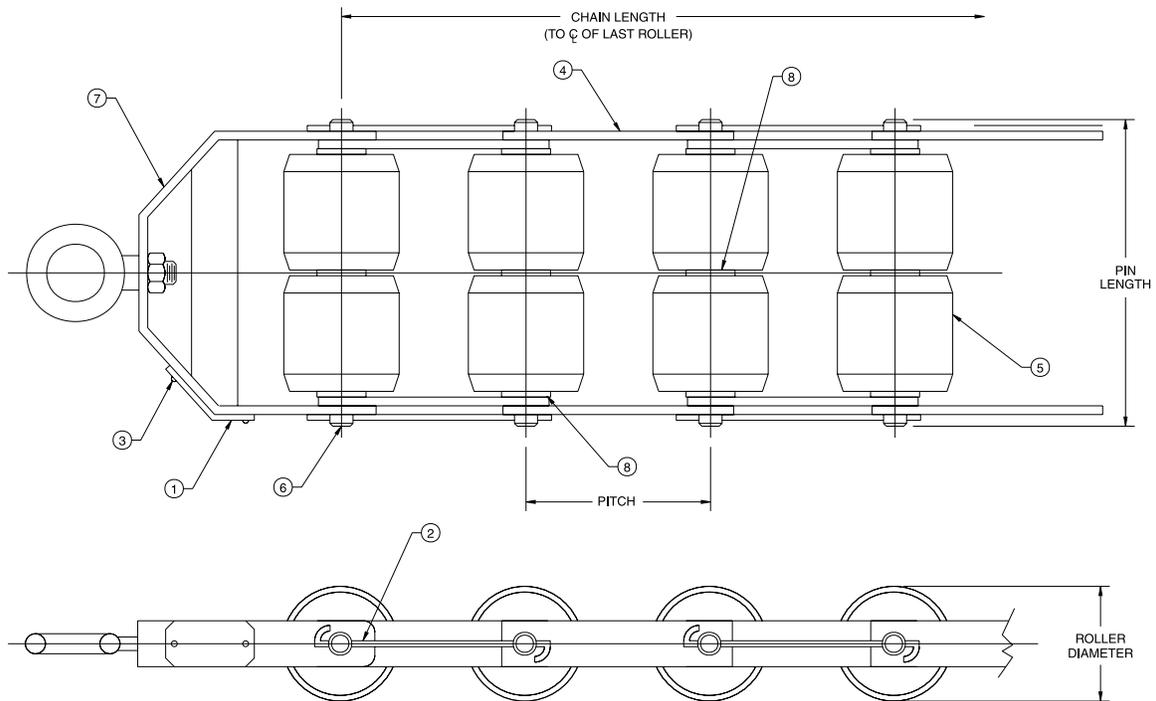
The use of test chains require provisions to be made for accessibility to the top (load) side of the conveyor belt in the scale area. Safety becomes an issue for the personnel working to place, secure and remove the test chains each time they are used.

As test chains are infrequently used, the need for routine inspection and maintenance becomes important. They must be lubricated and repaired as necessary to ensure safe reliable service. Annual weighing and measuring to determine the correct and accurate load value is required to compensate for wear, tear and stretching of the test chain components.

TECHNICAL DATA AND SPECIFICATIONS

Test chains

- 70 lb/ft x 22 ft long (104 kg/m x 6.7m)
- Finished weight 1590 lbs (721 kg)
- Hot rolled steel rollers, 4 inch diameter
- Fixed pin construction, double roll, roller pitch 6 inches
- Pin width 11.5 inch.
- Link weight 1.0 lbs
- Welded shackle ends



ITEM No.	PART DESCRIPTION
1	BRASS PLATE, DWG. 10A4-119
2	ROLL BAR, SS
3	RIVET, SPAE-NAUR RTV-2008
4	TEST CHAIN LINK
5	TEST CHAIN ROLLER
6	TEST CHAIN ROLLER PIN, REMOVABLE
7	TEST CHAIN SHACKLE
8	WASHER

Materials

- eye bolt, Spae-naur EYB-14 or equivalent
- 1/4 inch diameter Aircraft Cable twisted strands 7 x 19, stainless steel, breaking strength 7000 lbs.

Apply with wire rope clips; torque required 15 ft/lbs.

Federal Specification -FF-C-4500, Type 1, Class 2

Suggests a minimum 3 clips with 7 inches of turn back (loop)

TEST CHAIN SELECTION

This is based upon the application needs and information as supplied by the customer.

A calibration range is generally targeted between 50 to 80% of the maximum design load.

Belt Scale's Design Information:

Belt Scale's Capacity:	1500 MTPH
Design Load Maximum:	166.67 kg/m
Idler Spacing:	1.0 m on scale; fixed idlers are 0.9 m
Type of belt scale	4 weigh idlers
Belt Width:	1400 mm
Belt Speed:	2.5 m/sec

In selecting the test chain loading, a value rounded up to the nearest lb/ft loading was made. The value was equivalent to 104 kg/m (70 lb/ft). The length is based on the idler spacing for a 4 idler belt scale. The test chain length spreads across 2 fix approach idlers, the 4 weigh idlers and two fixed retreat idlers. The chain length in these applications is equivalent to 6.7m (22 ft.)

Design size is based on 62.5 % of belt loading or at a loading of 104 kg/m (70 lb/ft).

The finished stamped value is derived from the actual manufactured results.

The motorized storage reel is sized for a 1400 mm belt width with a conveyor width outside to outside of stringer channels of 1820 mm, "C" dimension as given by the customer.

The conveyor incline for these application's are quantity 2 at 12.5 ° and 1 at 10.2°.

Installation and Field Run of the Test Chain and Reel.

On preparation for the installation, transportation must be arranged to carry the components to the conveyor for which is intended. *Care must be taken to avoid injury to personnel during the handling of the items.* Larger size test chains are usually broken down into sections for ease of handling.

These sections must be re-assembled prior to use and installation on the storage reel.

Some mechanical assistance may be required to lift the chains onto the conveyor.

The test chain storage reel provided by Milltronics requires support steel structure for installation above the conveyor.

Locate the area suitable for the storage reel for flat or inclined conveyors - this should be upstream of the belt scale's location toward the head pulley. For declined conveyors the reel should be located to the upper side of the conveyor, approach end.

This enables the test chain to be lowered into place by gravity. The motorized reel is used only for retrieving the chain during storage.

Once the location has been selected, ensure that the reel is centered over the centerline of belt and it will clear the maximum material bed depth anticipated for the application. Material loads should not come in contact with any portion of the storage reel.

GUIDELINES FOR INSTALLATION

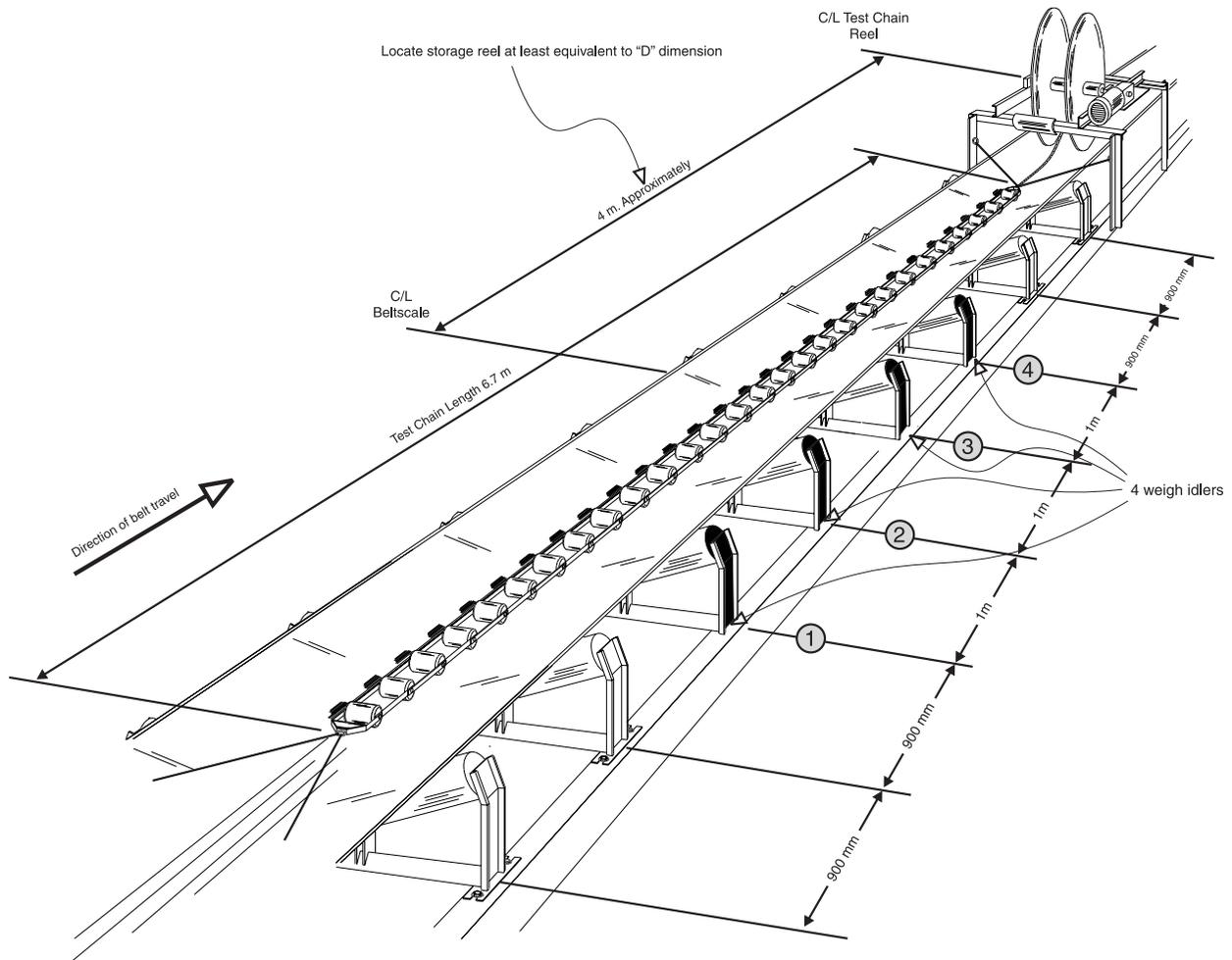
1. Support legs, gussets, brackets and mounting bolts are to be supplied by customer. A mechanical engineer should oversee the installation and verify the support structure.
2. A 30 foot (9m) length of stainless steel wire rope is supplied with clips. One end of the cable is attached to the test chain shackle, with the other end of the cable to the spool piece of the reel.
3. Position local control station within direct viewing of the storage reel and the belt scale. Minimum requirements for the control station (supplied by customer).
Forward / Reverse or (raise /lower), 3 position (on, off, on) spring return configuration.
4. Provision for AC power is required for wiring of gearmotor. Ensure the power source is available. All wiring must be done in conjunction with approved conduit, boxes and fittings and to procedure in accordance with all governing regulation.
5. Upright posts constructed of angle iron may be placed at opposite end of the test chain. These may be welded to main conveyor stringers both sides, for securing the test chain's free end while in use. Eye hooks attached to the posts will allow for securing the wire rope cables from the test chain shackle. This will position the test chain and allow it to track centrally on the belt.
6. Refer to installation or outline diagrams.
7. Review all areas of the installation to ensure the safety aspects of the mechanics have been met. All welding, hardware, fasteners, wiring etc. must be sound and secure.

GUIDELINES FOR OPERATION

Follow the calibration details for the manufacture's belt scale to perform a "Zero" calibration.

Check for and adjust to a acceptable repeatability and error.

1. Ensure the free end of the chain has been released from the storage reel. During the next step of the operation, the conveyor belt must be stopped, to prevent injury to operating personnel. Precautions should be taken so that material flow is not introduced to the belt under test
2. Using the control station lower the test chain onto the conveyor belt. Spread the test chain out until it spans across the weigh idler suspension, two idlers from the approach side, to two idler on the retreat side of the weigh suspension. This is often referred to as the A2 approach idlers to R2 retreat idlers. Refer to diagram below.



3. Secure both ends of the test chain using wire rope cables attached to the eye bolts of the frame on the storage reel and at opposite end. The test chain should lay flat on the center roll of each idler, with the links of the chain in a horizontal position to the conveyor belt.
4. Run conveyor at the normal operating belt speed and observe the performance of the test chain. The rollers of the chain should run freely without incident and track centrally to the middle of belt. No side motion or “snaking” should be observed. This would impact on the results being non repeatable and varying. To eliminate this occurrence the wire rope guide cable (stays) would require readjustment until the problem is solved. Tension should not be applied to the retrieving cable.
5. Continue to run the conveyor and perform the “span” calibration as outlined in the scale manufacture’s manual. On completion of the exercise stop the conveyor. Retrieve the test chain by using the control station to raise the test chain into the storage reel. The wire rope cable should be left attached to the shackle. While raising ensure the shackle of the chain is free to move and does not bind onto any portion of the storage reel.
6. Once completely retrieved secure the free end of the chain using the wire rope. It may be advisable to disable the gearmotor by removing power from the unit. This would prevent any unauthorized or accidental release of the chain during normal belt operation. The test chains should never be released while material is on the belt.

Frequency of calibration is determined by the repeatability of the span results, and the monitoring of the scale’s performance.

TEST CHAIN REEL DESIGN SHEET

TEST CHAIN REEL DESIGN SHEET

P/N 26151529 REF. DRAWING: 1-7440044Z-DD-C

MILLTRONICS JOB #: 341302

STYLE: 1:1 RATIO MANUAL 6.4:1 RATIO MANUAL MOTORIZED

NUMBER OF SPOOL COMPARTMENTS: 1

DISC DIAMETER: _____ inches 1220 mm

SPOOL WIDTH "A": _____ inches 305 mm
(Dimension "A")

SPOOL WIDTH "B": _____ inches N/A mm
(Dimension "B")

BELT WIDTH: _____ inches 1400 mm

STRINGER WIDTH: _____ inches 1820 mm
(Dimension "C")

REEL LOCATION: _____ feet 4.0 m
(Dimension "D")

ACCESS SIDE: RIGHT LEFT CONVEYOR INCLINE: 12.5 DEG.

MOTORIZED REELS ONLY:

GEARMOTOR			
MANUFACTURER: <u>NORD</u>			
MODEL NO: <u>SK 42125</u>			
POWER:	<u>3</u>	HP	_____ KW
SPEED:	MOTOR <u>1750</u>	RPM	SPOOL <u>9.4</u> RPM
SUPPLY:	<u>380</u>	VAC,	<u>3</u> PH, <u>50</u> HZ

COMMENTS: _____

REFERENCE TEST CHAIN: 70 lb/ft x 22 ft. Part No 74401419

	DATE
DRAWN: <u>SC</u>	<u>June 1/98.</u>
CHECKED:	
APPROVED:	

Form #: 2-625

Test Chain

Periodic checks should be made on all parts of the test chain.

The links and rollers should be free to move on shafts, broken or missing retaining pins must be replaced. Wire rope anchoring cables should not be frayed, corroded or twisted, clips to be tight on the cable.

To ensure safe and free movement at all times, the chain should be lubricated with light machine oil to prevent rusting. This can be done by submerging the chain in a oil bath, or spraying with common lubricants or rust prohibitor.

Due to environmental conditions a hood or cover may be placed over the storage reel minimizing dirt or debris from falling onto the test chain.

Annual verification of the chain may be made against a known certified platform scale and length to precision measurements. Recalculate with the following measurements.

Test Chain Mass (without shackles) :	_____	Lb or Kg
Length stretched, reference from center of first roll to center of last roll.	_____	Ft or M
Roller Pitch: from technical data.	_____	Ft or M
Weight of 1 link:	_____	Lb or Kg
<u>Mass + weight of 2 links</u> Stretched length + 1 Pitch	= _____	lb/ft or Kg/m Load Equivalent.
	_____	Chain Length Ft or M

Storage Reel

All components should be inspected. Pillow block bearings supporting reel to be lubricated during periodic maintenance. Motor and gearbox should be obstruction free, etc.

This assembly in whole or in part must never be put to anything other than it's intended use.