



ACRO-FLEX

FLEXIBLE SCREW DRY MATERIAL CONVEYOR



OPERATION AND MAINTENANCE MANUAL

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1.0 INTRODUCTION

Your Acro-Flex conveyor is a modern flexible dry material conveyor employing new and unique innovative design features allowing it to be the most flexible and easy to service system available.

The only moving part of the conveyor is the flexible spring which is connected to a motor and rotates within a flexible nylon tube conveying the product along the length of the tube.

There are four sizes of flexible spiral available listed in the table below - Sizes 44, 55, 67 and 90. **Modular** models 44, 55 and 67 can be modified to achieve higher capacities should your production requirements change. Please contact Acromet regarding modification to suit your needs.

Acro-Flex Model	Modular	Standard	Approx. Capacity (litres/hr) Nominal	Minimum Radius (metres)	Inside Inlet Flange Dim. (mm)	Outlet Tube Inside Dia. (Ø mm)	Nylon Tube I/D x O/D (Ø mm)
44	Yes	Yes	1000	2.5	360 x 110	Ø 136	44 x 51
55	Yes	Yes	2000	3.0	360 x 110	Ø 136	55 x 63
67	Yes	Yes	3500	4.0	360 x 110	Ø 136	67 x 80
90	n/a	Yes	9000	7.0	450 x 120	Ø 156	90 x 101

The Acro-Flex conveyor is both rugged and reliable, featuring a simple to clean self-supporting design, which will give long service life with the minimum of maintenance.

All conveyor models are adaptable. The inlet chamber can be attached to your hopper, or the conveyor can be provided with an inlet hopper.

- ◆ Inlet hopper with parallel to floor conveyor inlet chamber.
- ◆ Inlet hopper with angled inlet chamber position (45° angle).

Again please contact Acromet for advice or modifications for your Acro-Flex conveyor.

2.0 SAFETY PRECAUTIONS

Please read and familiarise yourself with all Sections of this and other Equipment Manuals before proceeding with installation.

2.1 General

- ◆ Observe all standard precautions which apply to moving machinery.
- ◆ Observe all standard precautions which apply to electrical equipment, drives and controls.
- ◆ Pay particular attention to the special safety "cautions" and "notes" in all manuals.

2.2 Mechanical Precautions:

Prior to undertaking any mechanical maintenance, repair, installation, etc:

- ◆ SWITCH OFF, and disconnect power before proceeding.
- ◆ Remove and/or lock switch in the "OFF" position.
- ◆ Ensure Conveyor infeeds and discharges are closed off to prevent feed material from contaminating personnel and equipment.
- ◆ Take precautions to prevent the ingress of any loose item within the conveyor inlet and inlet hopper.
- ◆ Personnel must wear the appropriate protective safety attire and remove loose clothing, jewellery, etc.

2.3 Electrical Precautions:

Before undertaking work on the electrical control or drives:

- ◆ DISCONNECT POWER and place a notice to advise others of the type of work in progress.
- ◆ Ensure all necessary grounds are in place and solid.
- ◆ DO NOT disconnect or disable ground connections.
- ◆ Follow all electrical regulations as required by electrical engineering authority.

3.0 GENERAL AND INSTALLATION PRECAUTIONS

3.1 General Precautions:

- ◆ Do not allow conveyor to run empty or starved of material.
- ◆ Do not run dry materials other than what your conveyor is designed for without consulting with Acromet.
- ◆ Do not allow tools, bags or any other foreign objects to enter the conveyor.
- ◆ Do not allow agglomerating or hygroscopic materials to sit in a non-operating conveyor long enough to set-up and become hard and bonded to the conveyor.

3.2 Installation Precautions:

- ◆ Conveyor should not be curved if it is not necessary, curving can shorten the life of the spiral and the conveying tube. If a curve is necessary its radius should be as large as possible. The minimum allowable are listed in the table in point 1.

Avoid curving tube at inlet and outlet ends for at least 750 mm wherever possible.

Under no circumstances allow for double ("S" type) curving of the conveyor nylon tube.

- ◆ Conveying tube should be supported at regular intervals, every 5-6 meters to avoid sagging. Connection of these supports to the nylon tube can be made with band clamps or pipe hangers. Remember to apply a rubber liner between metal clamps and the conveying tube and not to crush or squeeze the nylon tube into an oval.

Do not rest tube on rim or edge of any surface or equipment.

4.0 MECHANICAL INSTALLATION

Familiarise yourself with all conveyor part names and numbers as indicated on the Acro-Flex parts List drawing (→ see Drawing No: 13000-010 on page 12) as well as Acro-Flex Inlet (→ see Fig. 1 on page 13) and Acro-Flex Outlet (→ see Fig. 2 on page 14) before proceeding with installation.

- 4.1 Initially fit the conveyor INLET (1) to a feed hopper with M8 bolts.
- 4.2 Fit the conveyor OUTLET (10) to a support frame or bracket, using M8 bolts and Nyloc nuts.

The OUTLET (10) can be supported by bolting to two vertical mounting brackets positioned on the opposite sides of conveyor outlet tube or alternatively:

- ◆ By bolting to the FLANGE BRACKETS (12) – provided optionally.
- ◆ By fitting the outlet tube flange to a support construction (holes for bolts in the outlet tube flange have to be drilled).

- 4.3 Prepare the NYLON TUBE (6) for installation by sliding the ADAPTOR FLANGES (5) followed by the 'O'-RINGS (4) onto both sides of the NYLON TUBE (6). Pay attention to direct the outlet adaptor flange chamfer toward the OUTLET (10) and the inlet adaptor flange chamfer toward the INLET (1).

Chamfers on internal diameter of the ADAPTOR FLANGES (5) are to accommodate the 'O'-RINGS (4).

- 4.4 Insert the NYLON TUBE (6) inside the OUTLET (10) paying attention to position the end of tube at point "A" (→ see Fig. 2). Slide the 'O'-RING (4) and ADAPTOR FLANGE (5) to the conveyor outlet flange and bolt the two flanges together (the 'O'-ring will be squeezed between the flanges and the nylon tube). It will secure the nylon tube in the fixed position inside the conveyor outlet.
- 4.5 Insert the other end of NYLON TUBE (6) inside the INLET (1), slide the 'O'-RING (4) and ADAPTOR FLANGE (5) to the conveyor inlet flange and bolt the two flanges together.
- 4.6 Mark the NYLON TUBE (6) at point "C" (→ see Fig. 1).
- 4.7 Unbolt the INLET (1) from the feed hopper and mark the NYLON TUBE (6) at point "B" (→ see Fig 1).
- 4.8 Fit the INLET (1) to the feed hopper with M8 bolts and Nyloc nuts, remembering to place the gasket between the inlet flange and the hopper flange.
- 4.9 Unbolt the ADAPTOR FLANGE (5) from the INLET (1) and withdraw the NYLON TUBE (6) from the INLET (1).

- 4.10 On the withdrawn end of the NYLON CONVEYING TUBE (6) cut the remaining length of the TUBE (6) at point "B" (→ see Fig. 1)
- 4.11 Install the shortened NYLON TUBE (6) inside the INLET (1) repeating step 4.5 and paying attention to position point "C" as marked in step 4.5 at the edge of the ADAPTOR FLANGE (5) (→ SEE Fig. 1).
- 4.12 Bolt the ELECTRIC MOTOR (13) to the OUTLET (10), then fit the MOTOR COUPLING HUB and WASHER on the motor shaft and secure with grub screw(s), and socket head cap screw (→ see attached drawing on page 15).
- 4.13 Slide the SPIRAL (7) with the MOTOR COUPLING BOSS through the INLET (1) and the NYLON TUBE (6) inserting it inside the OUTLET (10). Fit the COUPLING BOSS on the COUPLING HUB and secure with bolts (→ see attached drawing on page 15)
- 4.14 On the SPIRAL (7) measure a distance of 120 mm from the end wall of the INLET (1) (→ see point "D" Fig. 1) and cut the remaining length of spiral.
- 4.15 Fit the END CUP (2) to the INLET (1) (→ see Fig.1) and secure with two bolts.
- 4.16 Bolt the LID (11) to the OUTLET (10).

5.0 ELECTRICAL INSTALLATION

NOTE: Operations 5.1 and 5.2 must be carried out by a Qualified Electrician.

5.1 Connect the DRIVE MOTOR (13) to the electrical supply.

The standard type of Acro-Flex drive is a fixed speed motor, but alternative drive options are:

- ◆ Fixed speed motor operated by a timer.
- ◆ Fixed speed A.C. motor controlled manually or automatically by variable frequency inverter to vary the speed.
- ◆ D.C. variable speed motor controlled manually or automatically by SCR controller.
- ◆ Geared motors.

WARNING:

- I DO NOT OPERATE THE CONVEYOR WITH THE THROTTLING TUBE 92) OUR OUTLET LID (11) REMOVED.**
- II DO NOT OPERATE THE CONVEYOR WITH THE INLET BOTTOM DOOR OPEN.**
- III DO NOT PLACE HANDS OR ANY OTHER OBJECTS WITHIN INLET HOPPER AREA WHILST CONVEYOR IS IN OPERATION.**

THERE IS A HIGH RISK OF INJURY TO PERSONNEL AND / OR DAMAGE TO THE EQUIPMENT IF THE ABOVE PROCEDURES ARE NOT FOLLOWED.

5.2 Check the Conveyor rotation by jogging motor "ON" and "OFF". The rotation must be **CLOCKWISE** when viewing the motor from the fan end. If the direction of rotation is wrong, change the power leads in the motor terminal box to reverse the direction.

Product discharge from the conveyor must fall freely and not be restricted in any way.

6.0 EARTHING

6.1 Electrical Supply Earthing

All electrical equipment must be connected to a suitable low noise earth supply in accordance with local regulations.

6.2 Static Earthing

Friction between the dry material and the conveyor, may cause a build up of static electricity. It is necessary to connect the conveyor parts to a suitable electrical earth in accordance with regulations.

NOTE: Special precaution should be taken for hazardous area use to avoid static sparking.

One of the following methods should be used for earthing:

- ◆ Bonding all metal components together with appropriate earthing conductors.
- ◆ Sleeving the conveyor nylon tube with a braided wire (metal tube can also be used).
- ◆ Wrapping braided wire around any flexible connections, then attaching this wire to an earth.

7.0 PRIMING THE CONVEYOR

- 7.1 Load the hopper or inlet with dry material for conveying, ensuring the spiral is covered.
- 7.2 Start the conveyor for a few seconds and then stop.
- 7.3 Keep repeating step 7.2. Check after each stop to ensure that product in the inlet covers the spiral and replenish the inlet with material if spiral is not covered.
- 7.4 Continue the above procedure until material begins to flow from the outlet, which indicates that the conveyor is primed and ready for use.

8.0 SETTING THE THROTTLING TUBE WHEN FITTED

Start the conveyor and observe material flow through the inlet hopper and out of the discharge tube

- ◆ Setting is correct when product flows steadily and there is no knocking or rattling of spiral.
 - Leave the knob of throttling tube position unchanged.
- ◆ Setting is too small when conveyor rattles permanently and flow of material is irregular.
 - Stop the conveyor, loosen the two throttling tube bolts, turn the knob by approximately 15° **anticlockwise** (viewed from the conveyor end), tighten bolts and start the conveyor again.
- ◆ Setting is too large when conveyor stalls, spiral "jerks", motor draws excessive current and flow of material is irregular.
 - Stop the conveyor, loosen the two throttling tube bolts, turn the knob by approximately 15° **clockwise** (viewed from the conveyor end), tighten bolts and start the conveyor again.

The largest throttling tube setting is when the knob is pointing vertically (turned **anticlockwise** viewed from the conveyor end) to the end stop. The smallest setting is when the knob is turned **clockwise** to the end stop.

NOTE: If the conveyor is to be used for the conveying of different dry materials, the throttling tube should be set for each product individually.

9.0 REVERSE FLOW MODE WHEN FITTED

This mode is to be used for cleaning of system and change-over to a new product.

- 9.1 Place a suitable container to collect product below the conveyor inlet.
- 9.2 Unbolt and remove the END CUP (2).
- 9.3 Start the conveyor in reverse mode for a few seconds and then stop. Keep repeating this step until the conveyor is empty of material.

NOTE: Special precaution should be taken with this procedure as the end of conveying spiral is rotating exposed and unprotected.

Do not place hands or any other objects within inlet hopper end area whilst conveyor is in operation. There is a high risk of injury to personnel and / or damage to the equipment.

10.0 MAINTENANCE

10.1 General Care

Periodic cleaning of the entire conveyor is recommended, especially when conveying adhesive, cohesive or hygroscopic products.

- ◆ First empty the conveyor by reversing flow of material as described in point 9. Cleaning can then take place using a safe and appropriate method.
- ◆ If further cleaning is required, the conveying tube and spiral should be removed and thoroughly cleaned.

Humidity can have a pronounced effect on certain dry materials. Ensure then that adequate ventilation or air drying/heating is available to prevent clogging or caking due to moisture absorption.

All fasteners should be checked regularly for tightness.

10.2 Drive Motor

Refer to Manufacturer's Instructions.

10.3 Controller (A.C. or D.C.)

Refer to Manufacturer's Instruction

11.0 TROUBLE SHOOTING

11.1 Conveyor Drive is not working

- ◆ Check power supply for failure.
- ◆ Check safety switches (if installed).

11.2 Motor Runs, but Product is not being Conveyed

- ◆ Check the direction of rotation of the drive unit. The correct rotation is marked on the driver.
- ◆ Ensure that product is present inside the conveyor inlet, and that the conveyor is primed.

11.3 **Conveyor runs and then stalls**

- ◆ It can occur when motor is overloaded (too much product entering the spiral).
- ◆ Check if there is a blockage at the outlet end caused by overfilling discharge container. If this has occurred, switch off the conveyor power supply and clean out blockage.
- ◆ Check if there is any foreign material or object caught in the conveyor.

NOTE: Never attempt to remove blockages when conveyor power supply is switched "ON".

11.4 **Conveyor works noisily**

- ◆ Ensure that the conveyor has been primed as described at point 7.0.

11.5 **Spiral Breakage**

- ◆ Could be caused by a blockage at the outlet end caused by overfilling discharge container.
- ◆ Spiral breakage could also be caused by foreign material or object caught in the conveyor.

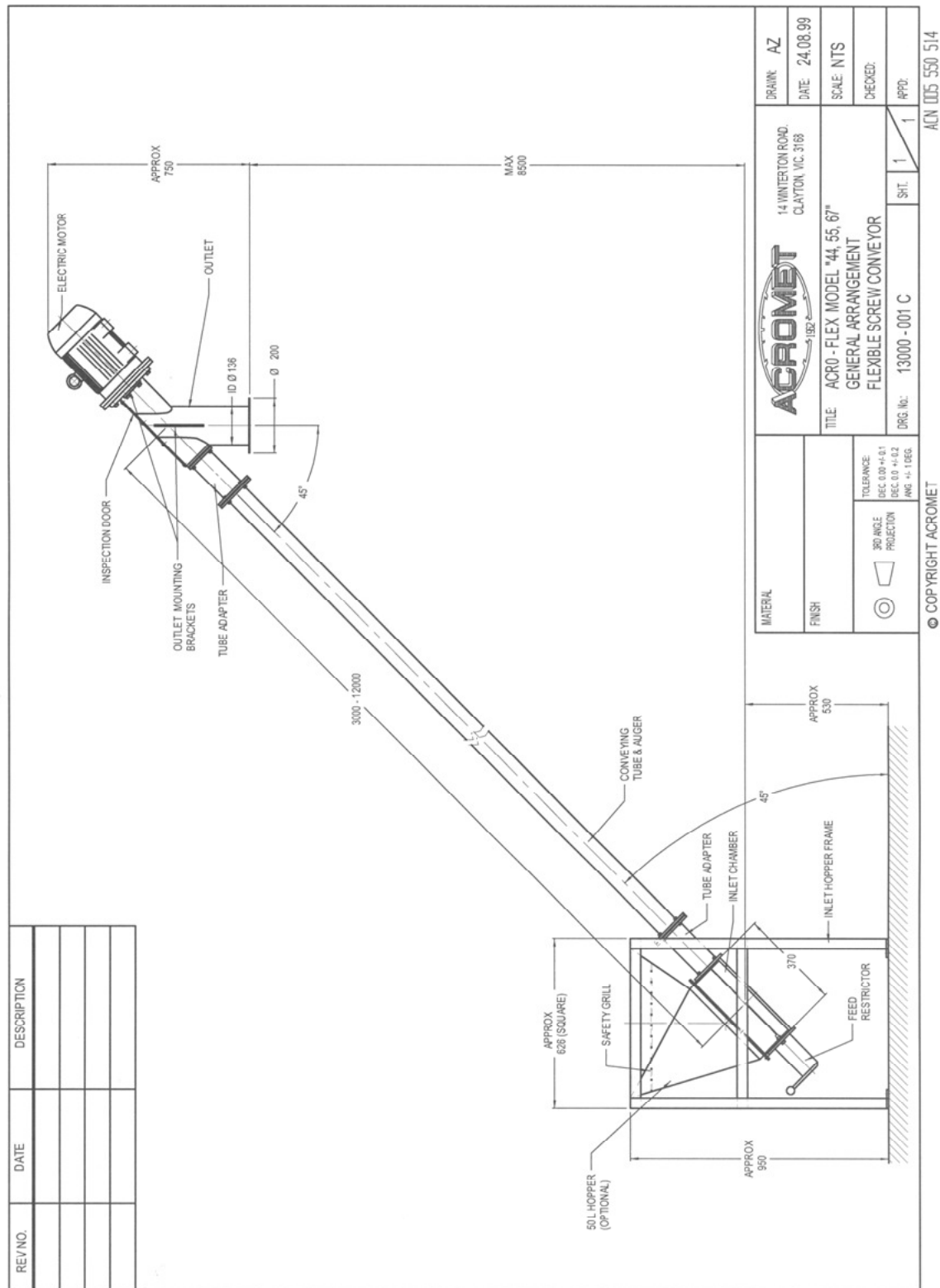
If the ingress of foreign bodies into the conveyor is a regular occurrence, it is strongly recommended to install a protective mesh on the conveyor inlet.

11.6 **Nylon tube wear**

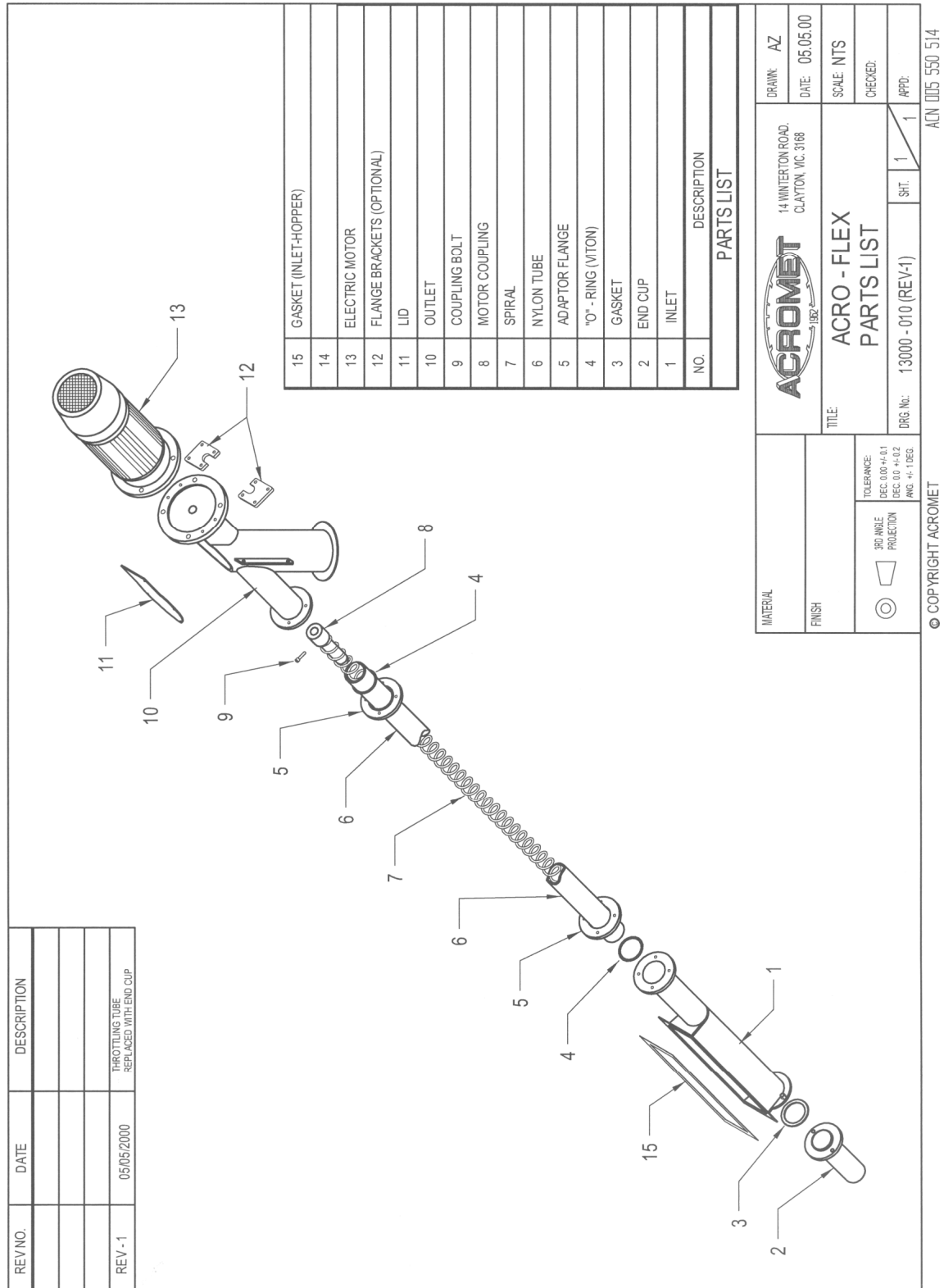
This could happen if nylon conveying tube was installed curved with too small a radius, or with double curves.

We recommend regular inspection of the nylon tube for wear. If there is a hole in the tube, the whole tube section or length should be replaced.

GENERAL ARRANGEMENT



ACRO-FLEX PARTS LIST



ACRO-FLEX INLET

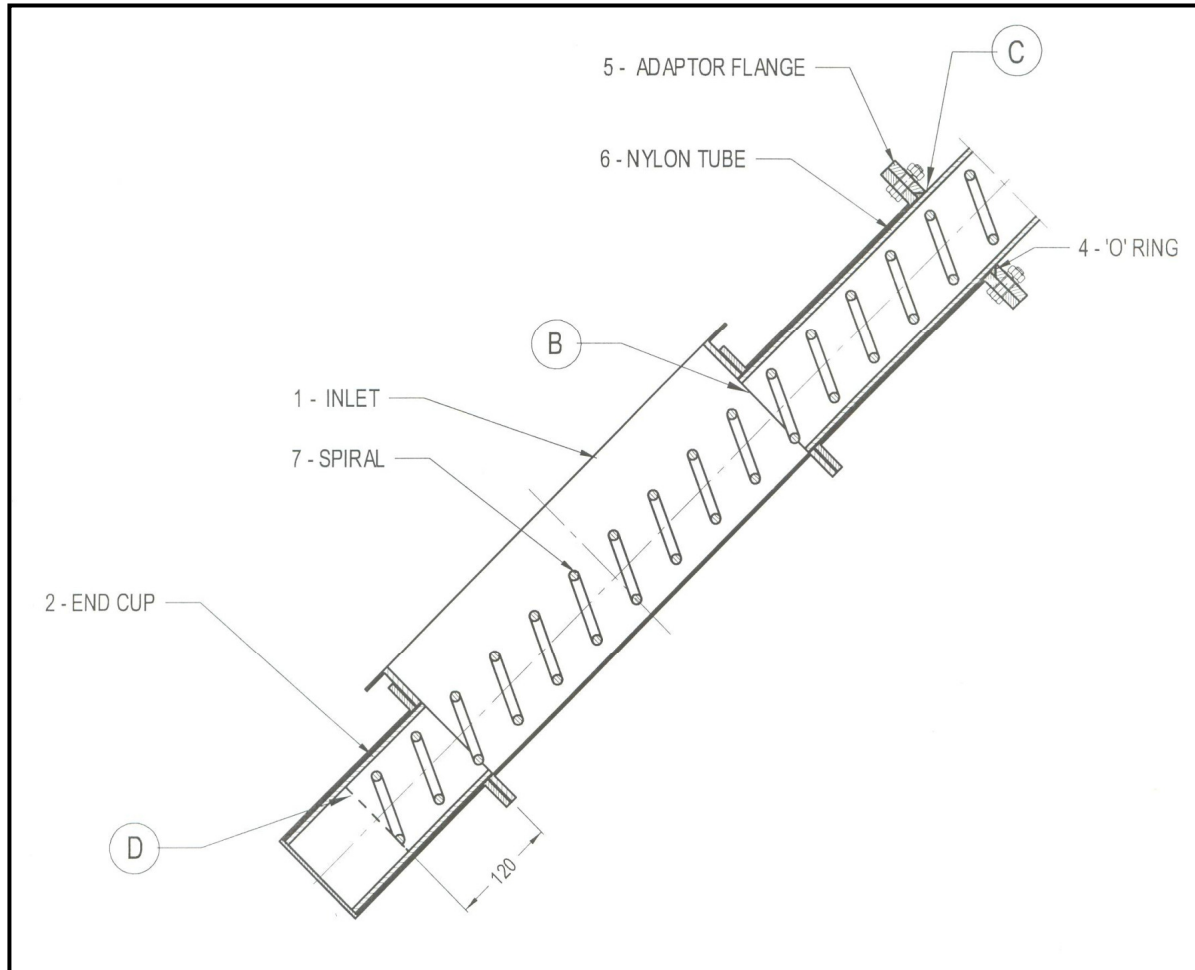


FIG. 1

ACRO-FLEX OUTLET

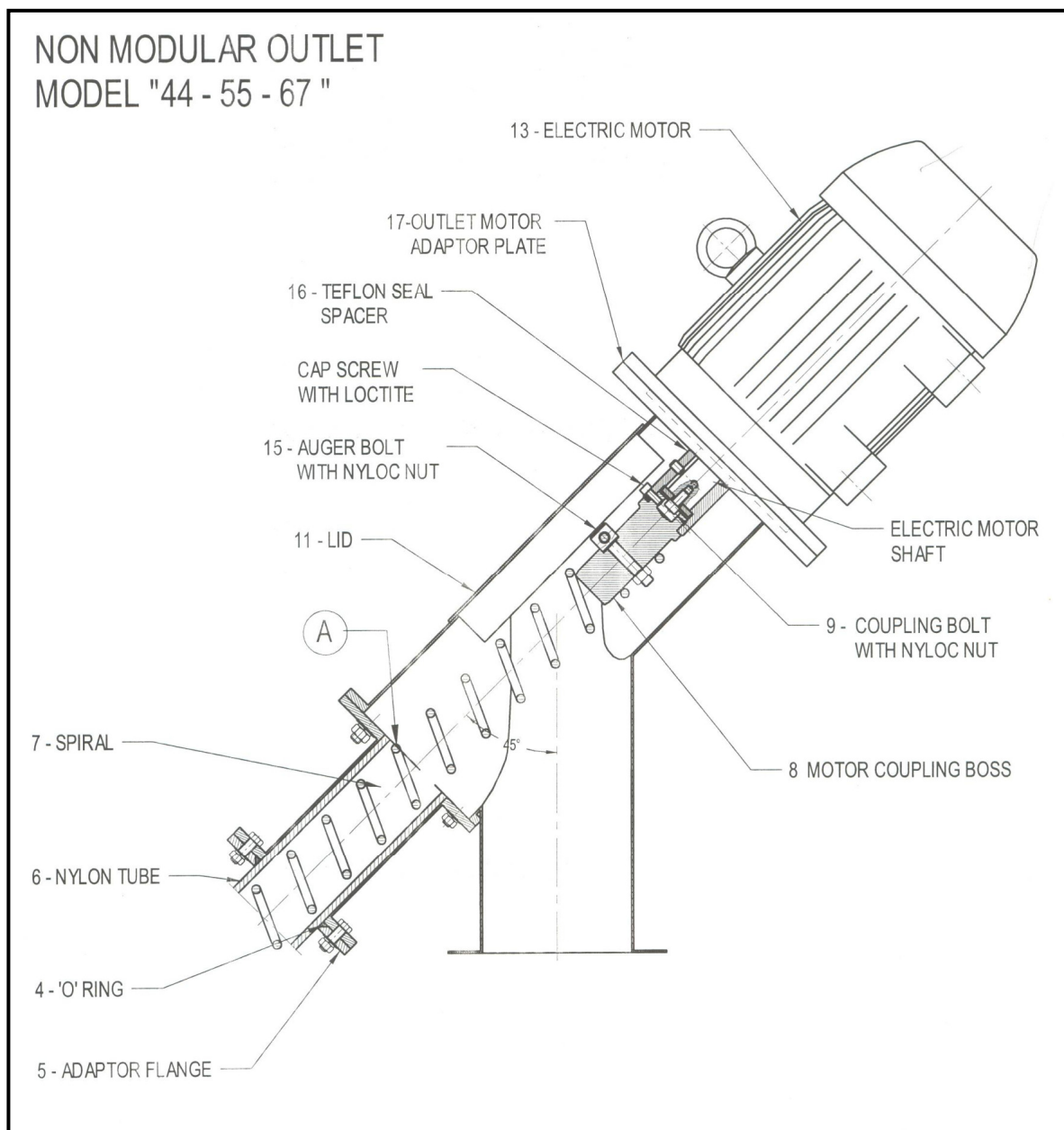


FIG. 2

12.0 PARTS LIST AND RECOMMENDED SPARE PARTS

* - Recommended Spare Parts

MODEL " "

Acro-Flex Code:

ITEM	PART NO:	DESCRIPTION	QTY REQD	NOTES
1	001-AS SPEC	Conveyor Inlet	1	Includes: 2 off M10 Nuts and washers
2	002-AS SPEC	End Cup	1	
3 *	003-	End Cup Gasket	1	
4 *	004-	'O'-Ring (Viton)	2	
5	005-AS SPEC	Adaptor Flange	2	
6 *	006-AS SPEC	Nylon Conveying Tube	1	Length:
7 *	007-AS SPEC	Conveying Spiral	1	Length:
8A *	008-AS SPEC	Motor Coupling Hub	1	Motor Frame Size: <u>Hub Includes:</u> ◆ (1 off) Key ◆ (2 off) Grub screw M8
8B *	008-AS SPEC	Motor Coupling Boss	1	
9 *	009-AS SPEC	Coupling Bolt	1	Cup HD Bolt M8 x 45
10	010- AS SPEC	Conveyor Outlet	1	
11	011- AS SPEC	Conveyor Outlet Lid	1	
12	012- AS SPEC	Flange Brackets (Optional)	2	<u>Includes:</u> (Quantities for two off flange brackets) ◆ (4 off) M10 x 26 Hex Bolts ◆ (4 off) Flat Washers for M10 thread ◆ (4 off) Spring Washers for M10 thread
13	013- AS SPEC	Electric Motor	1	Power kW
14 *	014- AS SPEC	Outlet Lid Gasket	1	Optional
15 *	015	Inlet-Hopper Gasket	1	For flanged inlet only
18	018-13000-251	Tube Coupling (For 8 meter or longer conveyor only)	1	<u>Includes:</u> ◆ (2 off) 'O'-Rings (Item: 4) ◆ (2 off) Adaptor Flanges (Item: 5) ◆ (8 off) M8 x 30 Hex Screws ◆ (8 off) M8 Nyloc Nuts ◆ Flat Washers for M8 thread
19	031- AS SPEC	Inlet Hopper (Optional)	1	Standard or Custom built
32A		Screw Hex, M10 x 35 (to fit the Motor) (For Motor Frame Size 90L only)	4	<u>Includes:</u> ◆ (4 off) M10 Nyloc Nuts ◆ (4 off) Flat Washers for M10 thread
32B		Screw Hex, M12 x 35 (to fit the Motor)	4	<u>Includes:</u> ◆ (4 off) M12 Nyloc Nuts ◆ (4 off) Flat Washers for M12 thread
34 *		Screw Hex, M8 x 30 (to fit the Nylon Tube)	8	<u>Includes:</u> 8 off M8 Nuts and Washers
35		Screw Hex, M8 x 20 (to fit Inlet) (can be replaced with studs)	8	<u>Includes:</u> 8 off M8 Nuts and Washers
36 *		Screw Button Head Socket M5 x 8 (Outlet Lid)	→	<u>Quantity:</u> ◆ (6 off) for Non Modular Models ◆ (8 off) for Modular Models
60		Safety Switch Set	1	Optional