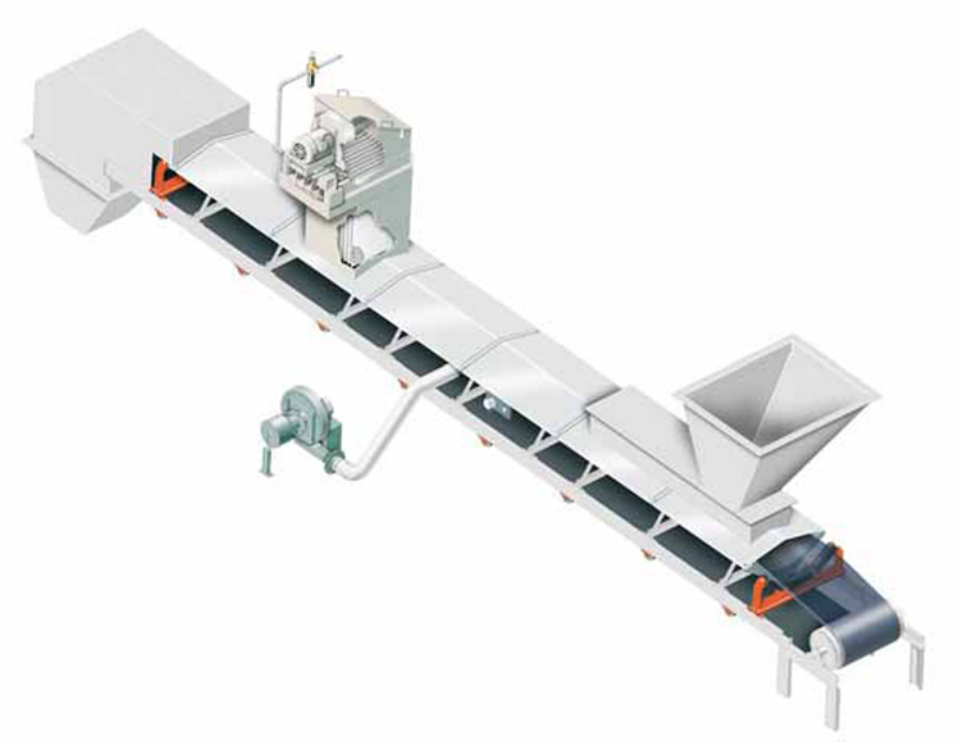
MARTIN®
Air-Supported Conveyor System

Go to MARTIN® Air-Supported Conveyor System web page



Operator's Manual
M3574

Important

MARTIN ENGINEERING HEREBY DISCLAIMS ANY LIABILITY FOR: DAMAGE DUE TO CONTAMINATION OF THE MATERIAL; USER'S FAILURE TO INSPECT, MAINTAIN AND TAKE REASONABLE CARE OF THE EQUIPMENT; INJURIES OR DAMAGE RESULTING FROM USE OR APPLICATION OF THIS PRODUCT CONTRARY TO INSTRUCTIONS AND SPECIFICATIONS CONTAINED HEREIN. MARTIN ENGINEERING'S LIABILITY SHALL BE LIMITED TO REPAIR OR REPLACEMENT OF EQUIPMENT SHOWN TO BE DEFECTIVE.

Observe all safety rules given herein along with owner and Government standards and regulations. Know and understand lockout/tagout procedures as defined by American National Standards Institute (ANSI) z244.1-1982, *American National Standard for Personnel Protection - Lockout/Tagout of Energy Sources - Minimum Safety Requirements* and Occupational Safety and Health Administration (OSHA) Federal Register, Part IV, 29 CFR Part 1910, *Control of Hazardous Energy Source (Lockout/Tagout); Final Rule*.

The following symbols may be used in this manual:

⚠ DANGER

Danger: Immediate hazards that will result in severe personal injury or death.

⚠ WARNING

Warning: Hazards or unsafe practices that could result in personal injury.

⚠ CAUTION

Caution: Hazards or unsafe practices that could result in product or property damages.

IMPORTANT

Important: Instructions that must be followed to ensure proper installation/operation of equipment.

NOTE

Note: General statements to assist the reader.

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DAMAGE WARNING STATEMENT

As stated in the installation manual, the orifice size is critical to the performance of the MARTIN® Air-Supported Conveyor System.

The orifice size for conveyor #_____will be _____or_____.

Deviating from this orifice size could effect the equipment function. In order to validate the warranty of this equipment, have the installation crew supervisor sign and date this form and return to Martin Engineering to ensure proper quality.

I verify the orifice size to be the size stated above.

_____of_____ Date_____

This document will be retained with the original purchase order as part of the ISO document procedure.

Follow-up will be done if no response is given.

Return to:
Martin Engineering
Attn: Transfer Point Project Manager
One Martin Place
Neponset, IL 61345-9766

For any questions, please call: 800-544-2947.

Detach and return to Martin Engineering

Introduction

General

The MARTIN® Air-Supported Conveyor uses a thin film of air to support the conveyor belt. The principle of air support limits mechanical friction to the drive mechanism at the head section, the tail pulley, and the take-up assembly resulting in a dramatic reduction in maintenance and operation costs.

The modular construction simplifies its assembly. In order to ensure consistent and optimum air distribution, which is critical to effective operation, careful attention must be paid to the assembly of components, particularly in maintaining air-tight connections between component sections.

References

The following documents are referenced in this manual:

- *The National Electrical Code (NEC)*. National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy MA 02269-9101.
- American National Standards Institute (ANSI) z244.1-1982, *American National Standard for Personnel Protection - Lockout/Tagout of Energy Sources - Minimum Safety Requirements*, American National Standards Institute, Inc., 1430 Broadway, New York, NY 10018.
- Federal Register, Volume 54, Number 169, Part IV, 29 CFR Part 1910, *Control of Hazardous Energy Source (Lockout/Tagout); Final Rule*, Department of Labor, Occupational Safety Health Administration (OSHA), 32nd Floor, Room 3244, 230 South Dearborn Street, Chicago, IL 60604.

Safety

All safety rules in the above documents and all owner/employer safety rules must be strictly followed when working with this equipment.

Materials required

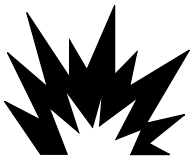
Only standard hand tools are required to install and maintain this equipment.

Before Installing Air-Supported Conveyor

IMPORTANT

The delivery service is responsible for damage occurring in transit. Martin Engineering CANNOT enter claims for damages. Contact your transportation agent for more information.

1. Inspect shipping container for damage. Report damage to delivery service immediately and fill out delivery service's claim form. Keep any damaged goods subject to examination.
2. Remove MARTIN® Air-Supported Conveyor from shipping container.
3. If anything is missing or damaged, contact Martin Engineering or a representative.



⚠WARNING

If equipment will be installed in an enclosed area, gas level or dust content must be tested before using a cutting torch or welding. Using a cutting torch or welding in an area with gas or dust may cause an explosion.

4. If using a cutting torch or welding, test atmosphere for gas level or dust content before installing unit.

Options (Included)

The purpose of the MARTIN® Air-Supported Conveyor System is to provide a fully-enclosed, weather-resistant conveyor. Top covers and belt cleaners are items for which we have a standard design.

Top Covers

Top Covers are peaked at the conveyor center line and slope at an 8° pitch. Water will run off the sides. The covers are made in 5’ lengths of 14 gauge galvanized steel. They are joined by a cover splice plate with 3/8” closed cellular foam gasket in order to keep dust in and water out of the conveyor. The left and right edges of the conveyor (where the covers join the conveyor) have 1/4” closed cellular foam gasket.

Only minimal tools are needed for installing top covers.

Additional Options (not included)

Wind skirt

NOTE

It is suggested that a wind skirt be purchased for severe applications where there are strong crosswinds, rain, sleet or snow.

It is important to keep the belt dry in order to maintain the integrity of the product it is conveying. The wind skirt helps substantially by sheltering the return belt from crosswinds, rain, sleet or snow. Strong crosswinds can cause a belt to move to one side and be misaligned as it rolls over the tail pulley, which results in tracking problems. Rain, sleet and snow can wet the belt, damaging the product being conveyed and interfering with proper airflow in the plenum.

A suggested wind skirt design consists of a 7 1/2" deep, 10' long strip of 14-gauge galvanized steel fastened by bolts to the left and right outer edge of the bottom of the conveyor. The return idlers for the belt should be supported on brackets attached to the wind skirt at 10' intervals. Cross bracket stiffeners should be attached between the right and the left side every 10' at the wind skirt splices.

Belt Cleaner

It is suggested that a MARTIN® Belt Cleaner System be used along with the MARTIN® Air-Supported Conveyor System. Pre-cleaners are installed on the face of the head pulley. On a dual cleaner system, the secondary cleaner is installed immediately following the pre-cleaner to remove stubborn material left on the conveyor belt. In typical installations, material scraped from the belt exits down the discharge chute.

Belt Tracking System

It is suggested that a MARTIN® Belt Tracking System be used along with the air supported conveyor (e.g. MARTIN® TRACKER Belt Tracking System).

Principles of Operation

The MARTIN® Air-Supported Conveyor operates using a thin film of air to support the belt. This arrangement minimizes the friction losses on the belt and thus eliminates costly and continuous maintenance on troughing idler assemblies. The equipment however, requires particular attention to two areas during assembly:

1. Since pressurized air is used to support the belt, heavy caulking with 100% clear silicone must be used at each joint. It is vitally important to make sure that the seals are air tight, otherwise the conveyor will not function properly.
2. Since there are no troughing idlers to steer the belt, the intermediate plenum sections must be correctly aligned and loads must be centered on the belt.

NOTE

If instructions are followed carefully, neither of these items will be problems and the conveyor will operate smoothly and efficiently.

Installation

IMPORTANT

Read entire section before beginning work. This manual provides instructions for installation of the MARTIN® Air-Supported Conveyor System.

⚠WARNING

Turn off and lock out/tag out energy source to conveyor before beginning work on MARTIN® Air-Supported Conveyor.

IMPORTANT

After careful consideration about the location of the MARTIN® Air-Supported Conveyor System, installations can begin.

IMPORTANT

Orifice size is critical to the performance of the MARTIN® Air-Supported Conveyor System. Refer to Damage Warning Statement on Page 1 of this manual and make sure correct orifice size is used. Deviating from this size could effect the equipment function.

Plenum Section Assembly

NOTE

A maximum of forty feet of Intermediate Plenum Section may be assembled together and with proper rigging, lifted into place and set on support stand(s).

NOTE

One plenum section is designed as an inlet section. This section must be installed in close proximity to the fan. Each application is designed for 12-foot flexible hose. Proper locations of these elements are vital to the supply of air to the MARTIN® Air-Supported Conveyor System.

1. Raise belt for easy access.
2. Remove all troughing idlers in designated area.
3. Install support brackets in existing troughing idler mounting holes. (Supports may need to be moved if a plenum splice is directly under a support location.)

NOTE

If installation includes placement of the MARTIN® Air-Supported Conveyor System under a drop zone, special considerations must be taken. If the chute wall in the drop zone is deteriorated or damaged, replacement must be made at this time. Actual transfer point length can be shortened due to the extension of the MARTIN® Air-Supported Conveyor sections. Minimal lengths of the MARTIN® Air-Supported Conveyor must be considered based on 3 times the belt width. This will allow the total air movement to settle down.

NOTE

The MARTIN® Air-Supported Conveyor plenum creates a stable belt line throughout the entire length of the plenums. For this reason, abrasion-resistant wear liner must be installed in the drop zone area. This wear liner will need to be set at 1/8" off the belt for the length of the drop zone and beyond that point for approximately 1 ft. This distance off the belt is crucial to the function of the MARTIN® Air-Supported Conveyor System. Excessive gap(s) between the belt and the wear liner could result in material leaking past the wear liner.

4. During assembly, line up Intermediate Plenum Sections end to end. These sections must be oriented consistently. See Figure 1.
5. Clean and dry contact surfaces. The contact surfaces must be clean and dry for the silicone to adhere to and joints to seal properly.

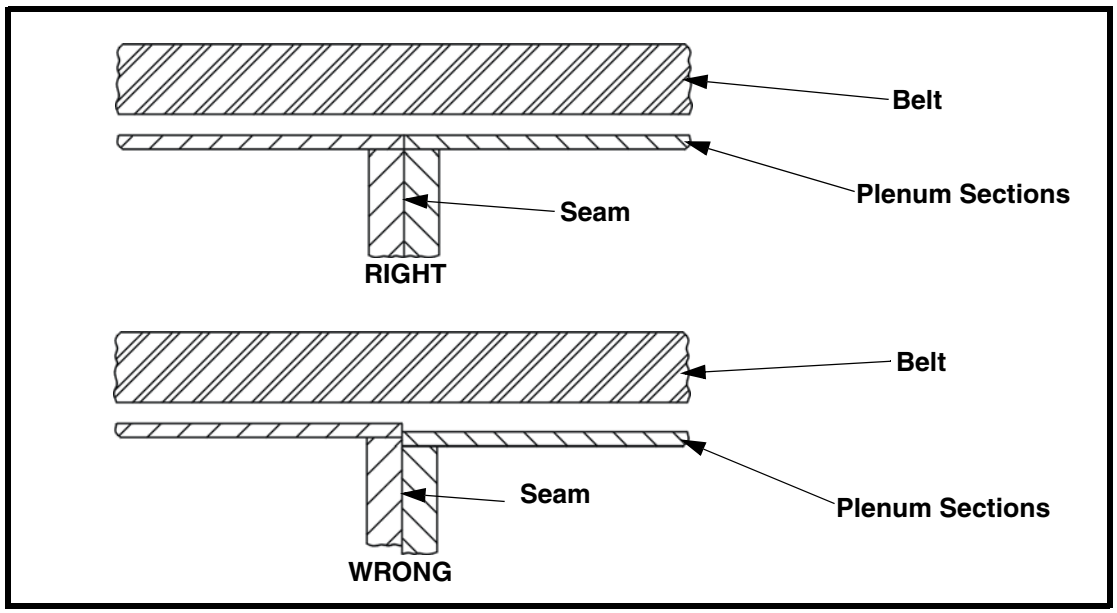


Figure 1. Lining Up Seams

6. Cover the face of each flange, filler strip, and edge of belt trough with 100% silicone sealant.

NOTE

A totally-sealed air chamber is critical. Allow 1/2 tube of silicone sealant per joint.

7. Squeeze together and bolt with 3/8 - 16 x 1-1/4" bolts with hex nuts and lock washers. Follow the bolt sequence pattern for first six bolts. Install the rest of the fasteners and tighten. Any excess silicone sealant will squeeze out of the seams.
8. Let silicone cure for a minimum of 24 hours.
9. After letting silicone cure for 24 hours, clean any excess silicone sealant that has squeezed out of the joints.

NOTE

Do not clean any excess until after a minimum of 24-hour cure period.

IMPORTANT

In order to ensure proper functioning of the belt, it is vitally important that the silicone joints inside the Plenum are cleaned flush to the troughing surface. Confirm that all hardware is tight and the conveyor is secured to the support structure.

Blower Connection Section

1. The blower connection section must be located near the middle of the total conveyor run.
2. Continue Plenum section assembly in the same manner as above until all sections have been sufficiently caulked and bolted together.
3. When completing assembly of all sections, make sure to maintain alignment horizontally and vertically.

Top Covers

1. Position the 1/4" x 1" foam on the left and right edge of the conveyor trough.
2. Install splices spanning across the trough width and align with bolt holes in plenum assembly.
3. Install foam tape on the splice plates across the length as well as the width across the splice. This will ensure a proper seal between the splice and cover. See Figure 2.
4. Position splice plate over appropriate mounting holes.
5. Covers should then be placed between splice plates and bolted in place.

NOTE

Care needs to be taken while installing splice plates and covers to assure that seals remain in place and intact.

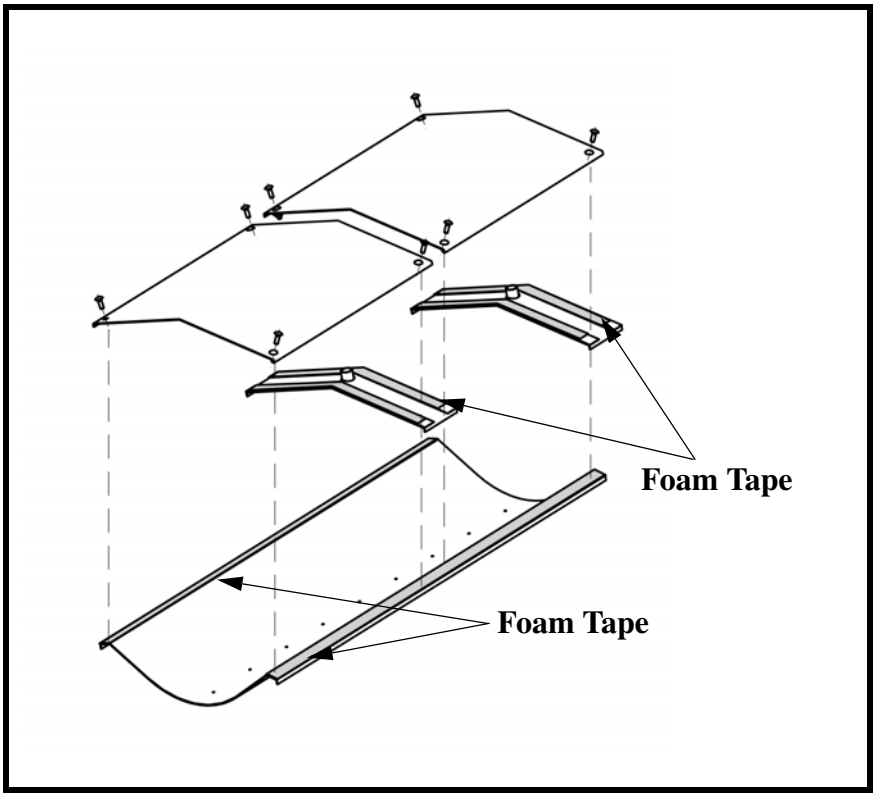
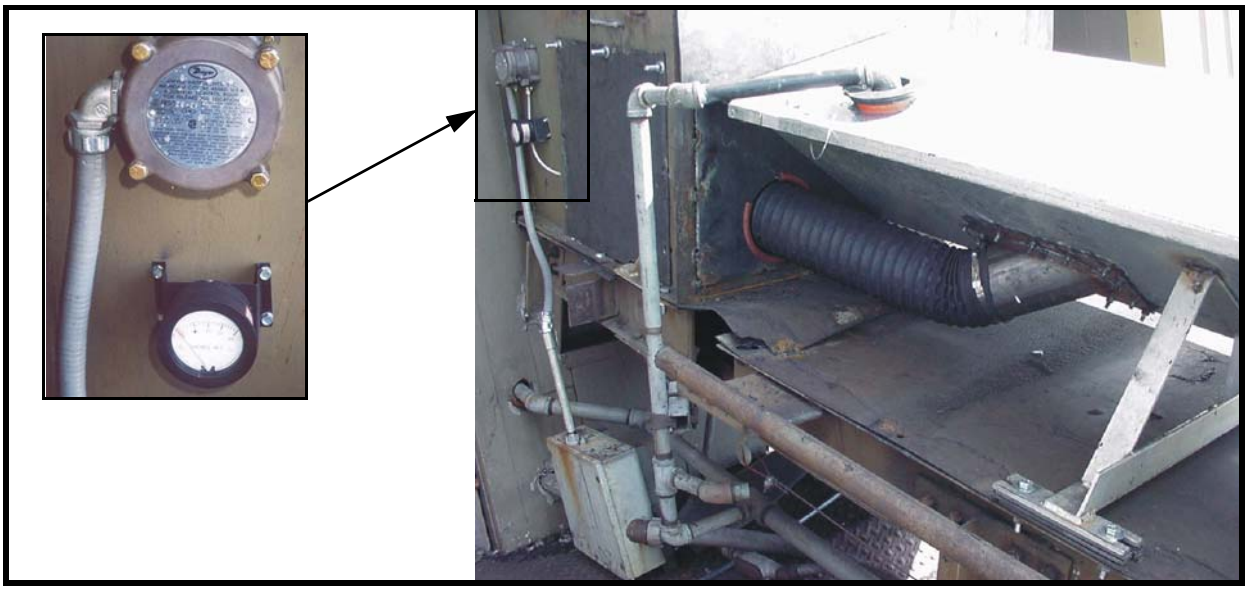


Figure 2. Plenum Tape Placement

Fan Installation



Installing the fan

Note: Included with each unit is a standard 12’ flexible hose length.

1. Install the fan within hose length to the blower connection. The hose length provided is sized specifically for each application, so it is vitally important not to install a longer hose.
2. Connect the hose to the blower connection section and the fan using hose clamps.
3. Avoid more than two bends in the hose, since bends can impair proper airflow. If a longer hose is needed contact Martin Engineering before any changes are made.
4. Connect hose to plenum inlet.

Power Wiring

NOTE

The customer is responsible for providing all power wiring and connections to the pressure switch interlock. It is imperative that the motor be wired through the pressure switch so the conveyor will not start until a minimum of 8” w.c. air pressure is detected in the plenum.

1. Set the pressure switch by turning the set-point adjustment screw in the top of the switch housing. The process of the plenum charge usually takes about 8 seconds. (Note: The pressure switch is preset to 8” w.c.)
2. Close all electrical connections.
3. Refer to Figure 3 for the MARTIN® Air-Supported Conveyor Control Diagram.

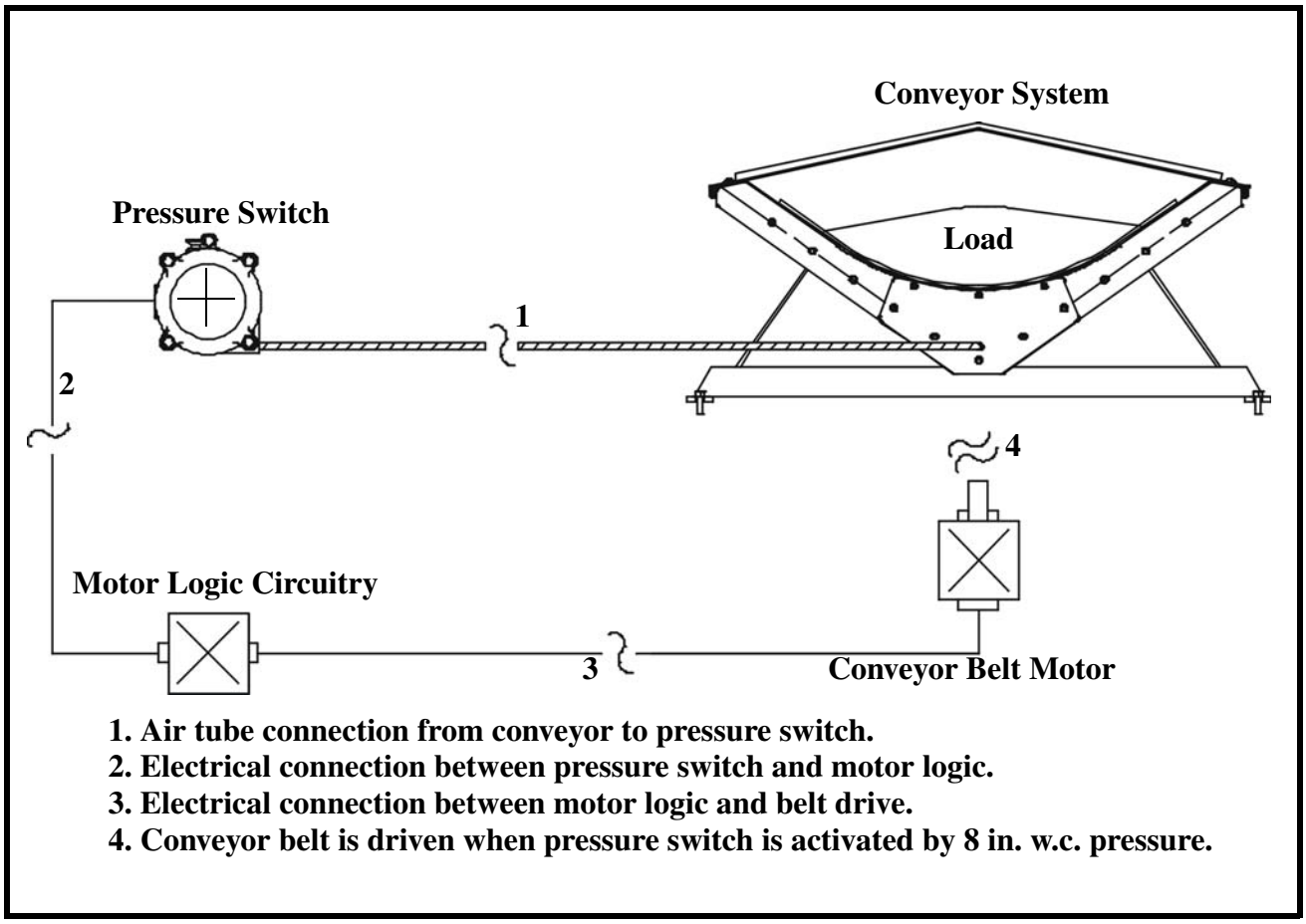


Figure 3. MARTIN® Air-Supported Conveyor Control Diagram

After Installing Air-Supported Conveyor

Start-up

1. When the unit is turned on, the fan will come on and start to fill the plenum with air. When the plenum is charged with a minimum of 8" w.c. air pressure, the motor will start and the belt will glide on a thin sheet of air.
2. Run the unit to track the belt so it runs on the center of the pulleys by adjusting the tracker provided with the complete system. Slower speed units require more time than faster speed units to see how the belt reacts to adjustments.
3. As material is fed onto the belt, adjust the deflector plates to direct the load to the center of the belt (optional).
4. After operating for a day, check the belt tension and make adjustments as required.
5. Recheck periodically for any visual signs of belt slippage or misalignment of any bolted members.

Maintenance

IMPORTANT

Read entire section before beginning work.

⚠WARNING

Turn off and lock out/tag out energy source to conveyor before beginning work on MARTIN® Air-Supported Conveyor.

NOTE

Normal operating conditions may stretch the conveyor belt, causing it to lose optimal alignment. When belt stretching does occur, the conveyor will continue to operate, however, it will operate with reduced efficiency. In most cases this reduced efficiency is barely noticeable since the conveyor will continue to operate smoothly. To prevent or correct this problem, we recommend periodic belt alignment inspection every 3 to 6 months.

In the event that misalignment does occur:

1. **Adjust the belt take-up accordingly.**
2. **Inspect belt movement over the return idlers. Proper tracking can be restored by adjusting the belt at the return idlers.**

Part Numbers

This section provides part numbers for MARTIN® Air-Supported Conveyors and related equipment. Please reference part numbers when ordering parts.

MARTIN® Air-Supported Conveyor System

MARTIN® Air-Supported Conveyor Assembly, P/N 36600-XX. Refer to Figures 4a and 4b.

Labels

Conveyor Products Warning Label, P/N 23395. Refer to Figure 5.

Pinch Point Warning Label, P/N 30528. Refer to Figure 5.

No-Step Label, P/N 36684. Refer to Figure 5.

MARTIN® Product Label, P/N 32238-01. Refer to Figure 5.

MARTIN® Air-Supported Conveyor Product Label, P/N 36738. Refer to Figure 5.

Item	Description	Part No.	Qty
1	V-Plenum Weldment	36609-XX	1
2	Pan Weldment	36607-XX	1
3	Cover Splice Plate Weldment	36620-XX	1
4	Cover	36621-XX	2
5	Support Bracket Weldment	36625-XX	2
6	Plenum Cap	36626-XX	2
7	Assembly Hardware (not shown)	36629	1
8	Operator Manual (not shown)	M3574	1
*9	Conveyor Products Warning Label	23395	2
*10	Pinch Point Warning Label	30528	2
*11	Martin Product Label	32238-01	1
*12	No-Step Label	36684	2
*13	MARTIN® Air-Supported Conveyor Product Label	36738	2

*Refer to Label Placement Diagram, Figure 5.

Figure 4a. MARTIN® Air-Supported Conveyor Assembly, P/N 36630-XXXXXXX (Parts List)

Note: First XX indicates belt width (inches); next X indicates standard (S) or wide (W) base; last four Xs indicate troughing idler center roll height.

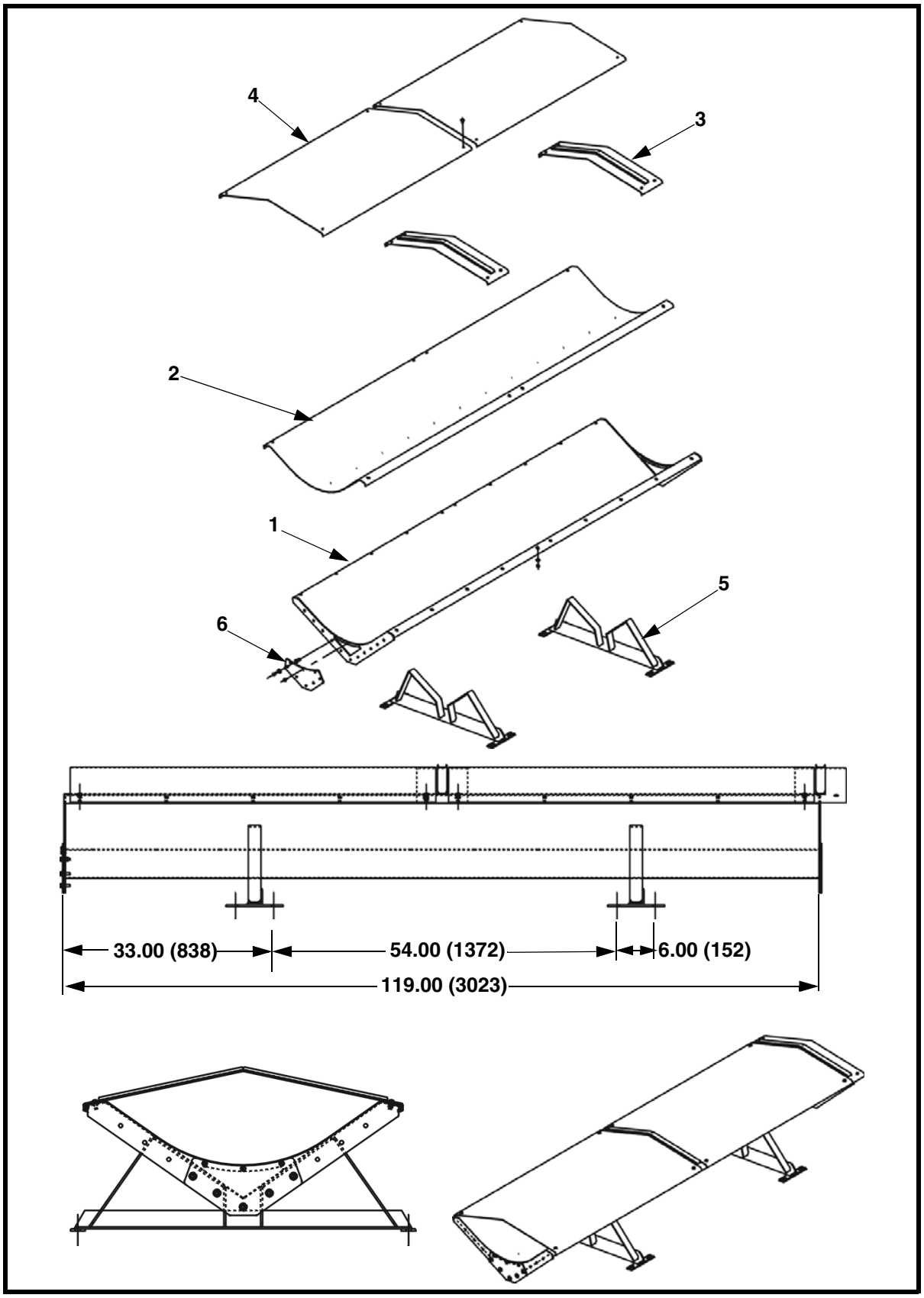


Figure 4b. MARTIN® Air-Supported Conveyor Assembly, P/N 36630-XXXXXXX

Appendix

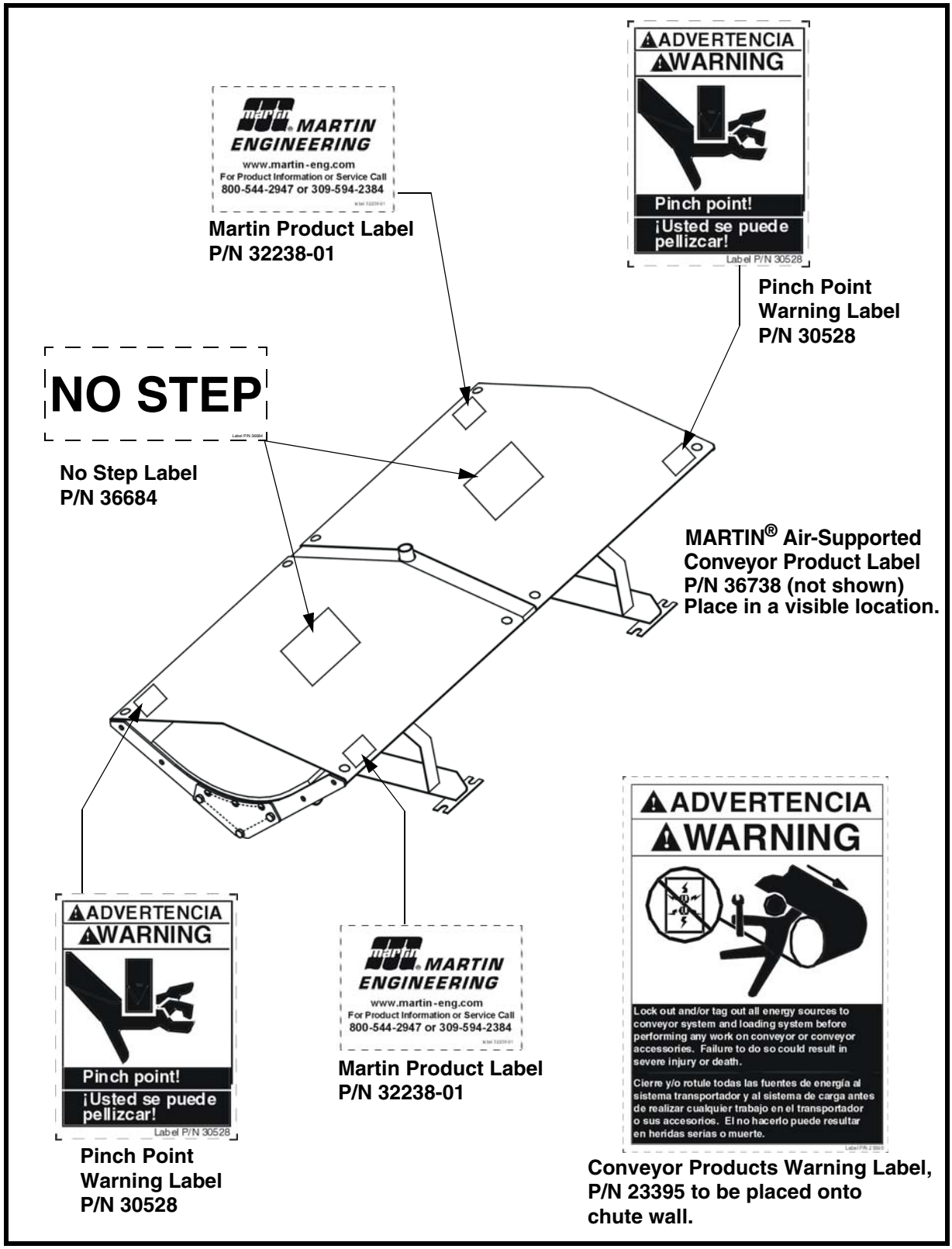


Figure 5. Label Placement Diagram

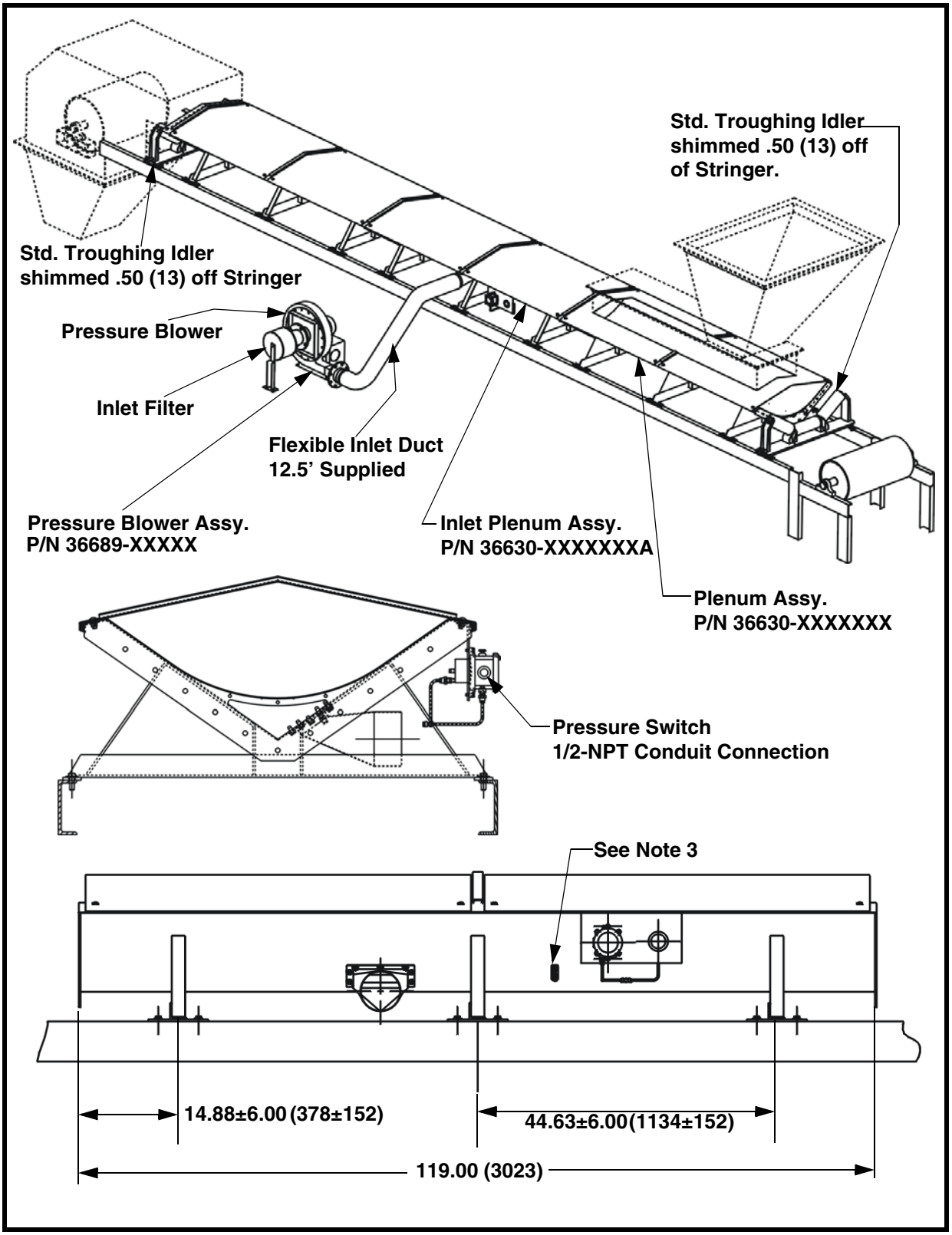


Figure 6. Typical Installation of MARTIN® Air-Supported Conveyor System

MARTIN® Air-Supported Conveyor with top section removed.

Figure 7. Photos showing installation of a MARTIN® Air-Supported Conveyor

Notes

Problem Solved™

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Fax 800 814 1553
www.martin-eng.com

Form No. M3574-01/09