

TRAMCO

AIR SUPPORTED BELT CONVEYOR

JETBELT™

ASSEMBLY, OPERATION AND MAINTENANCE MANUAL



ORIGINAL INSTRUCTIONS



Read this manual before using product. Failure to follow instructions and safety precautions can result in serious injury, death, or property damage. Keep manual for future reference.

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AGI 
AG GROWTH INTERNATIONAL



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1. Introduction

Tramco JETBELT™ Air-Supported Belt Conveyor (JETBELT™ conveyor) is a conveyor designed to convey free flowing dry products (such as grain, coal, limestone and aggregates) in all types of industries, especially in applications where dust containment is crucial. JETBELT™ conveyors are tough, dependable, and provide efficient handling capacity with minimum product degradation and substantially reduced product-to-product contamination that you find with other designs. Product features include:

- Rugged, heavy-duty steel construction for durability in the most demanding applications.
- Dust and weather-tight construction to maintain product quality against the elements and prevent dust from escaping.
- Engineered heavy-duty external bearing design for easy maintenance.
- Belt alignment switch with automatic shutoff.
- Head and tail are equipped with removable covers to facilitate maintenance.

Before using the JETBELT™ conveyor, give this manual to the people who will be assembling, operating and maintaining this equipment. Reading and understanding the manual will reduce downtime and equipment failure, as well as help to ensure safe and efficient operation. A sign-off form is provided on the inside front cover for your convenience.

The serial number plates are located on the head assembly and on the tail assembly. Please mark the number in the space provided for easy reference.

Model #	
Serial #	
Production Year	


2. Safety


2.1. Safety Alert Symbol and Signal Words





This safety alert symbol indicates important safety messages in this manual. When you see this symbol, be alert to the possibility of injury or death, carefully read the message that follows, and inform others.

SIGNAL WORDS: Note the use of the signal words **DANGER**, **WARNING**, **CAUTION**, and **NOTICE** with the safety messages. The appropriate signal word for each message has been selected using the definitions below as a guideline.

 **DANGER** Indicates an imminently hazardous situation that, if not avoided, will result in serious injury or death.

 **WARNING** Indicates a hazardous situation that, if not avoided, could result in serious injury or death.

 **CAUTION** Indicates a hazardous situation that, if not avoided, may result in minor or moderate injury.

 **NOTICE** Indicates a potentially hazardous situation that, if not avoided, may result in property damage.


2.2. General Safety



The safety information found throughout this complete Safety Section of the manual applies to all safety practices. Additional instructions specific to a certain safety practice (such as Operation Safety), can be found in the appropriate section.

YOU are responsible for the **SAFE** use and maintenance of your equipment. **YOU** must ensure that you and anyone else who is going to work around the equipment understands all procedures and related **SAFETY** information contained in this manual.

Remember, **YOU** are the key to safety. Good safety practices not only protect you, but also the people around you. Make these practices a working part of your safety program. All accidents can be avoided.

- It is the equipment owner, operator, and maintenance personnel's responsibility to read and understand **ALL** safety instructions, safety decals, and manuals and follow them when assembling, operating, or maintaining the equipment. 
- Equipment owners must give instructions and review the information initially and annually with all personnel before allowing them to operate this product. Untrained users/operators expose themselves and bystanders to possible serious injury or death.
- This equipment is not intended to be used by children.
- Use this equipment for its intended purposes only.
- Do not modify the equipment in any way without written permission from the manufacturer. Unauthorized modification may impair the function and/or safety, and could affect the life of the equipment. Any unauthorized modification of the equipment will void the warranty.

2.3. Rotating Parts Safety

WARNING

- Keep body, hair, and clothing away from rotating pulleys, belts, chains, and sprockets.
- Do not operate with any guard removed or modified. Keep guards in good working order.
- Shut off and remove key or lock out power source before inspecting or servicing machine.



2.4. Drag Conveyor Safety

WARNING

- Keep body, hair, and clothing away from moving conveyor.
- Do not climb, sit, stand or walk on conveyor at any time.
- Shut off and remove key or lock out power source before inspecting or servicing machine.



2.5. Guards Safety

WARNING

- Install guards to prevent contact with moving parts.
- Do not operate equipment unless all guards are in place.
- Do not walk or step on guards.
- Lock out power before removing a guard.
- Ensure all guards are replaced after performing maintenance.

2.6. Ladder Safety

WARNING

Consider the following when using a ladder for installation, operating or maintenance related duties:

- Identify possible risks before using the ladder.
- Use belts and hoists to lift material up a ladder; maintain three points of contact with the ladder at all times.
- Ensure rungs are free from ice or material build up that makes climbing difficult

2.7. Working Alone

WARNING

Working alone can be dangerous. Consider the following:

- Identify the risks for working alone in your workplace and ensure a plan is in place to mitigate them.
- Do not operate, assemble, or maintain equipment alone.
- Ensure that maintenance is performed in accordance with all workplace safety programs and be sure all workers are aware of any maintenance work being performed.

2.8. Drives and Lockout/Tagout Safety

Inspect the power source(s) before using and know how to shut down in an emergency. Whenever you service or adjust your equipment, make sure you shut down your power source and follow lockout and tagout procedures to prevent inadvertent start-up and hazardous energy release. Know the procedure(s) that applies to your equipment from the following power sources. For example:

- De-energize, block, and dissipate all sources of hazardous energy.
- Lock out and tag out all forms of hazardous energy.
- Ensure that only 1 key exists for each assigned lock, and that you are the only one that holds that key.
- After verifying all energy sources are de-energized, service or maintenance may be performed.
- Ensure that all personnel are clear before turning on power to equipment.



For more information on occupational safety practices, contact your local health and safety organization.

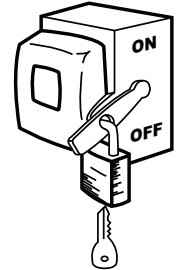
2.8.1. Electric Motor Safety

WARNING

Power Source

- Electric motors and controls shall be installed and serviced by a qualified electrician and must meet all local codes and standards.
- A magnetic starter should be used to protect your motor.
- You must have a manual reset button.
- Reset and motor starting controls must be located so that the operator has full view of the entire operation.
- Locate main power disconnect switch within reach from ground level to permit ready access in case of an emergency.
- Motor must be properly grounded.
- Guards must be in place and secure.
- Ensure electrical wiring and cords remain in good condition; replace if necessary.
- Use a totally enclosed electric motor if operating in extremely dusty conditions.

SERVICE DISCONNECT



Lockout

- The main power disconnect switch should be in the locked position during shutdown or whenever maintenance is performed.
- If reset is required, disconnect all power **before** resetting motor.

2.9. Personal Protective Equipment

Hard Hat

- Wear a hard hat to help protect your head.



Safety Glasses

- Wear safety glasses at all times to protect eyes from debris.



Ear Protection

- Wear ear protection to prevent hearing damage.



Coveralls

- Wear coveralls to protect skin.



Work Gloves

- Wear work gloves to protect your hands from sharp and rough edges.



Steel-Toe Boots

- Wear steel-toe boots to protect feet from falling debris.



3. Assembly



Before continuing, ensure you have completely read and understood this manual's Safety chapter, in addition to the safety information in the section(s) below.

3.1. Assembly Safety

WARNING

- Do not take chances with safety. The components can be large, heavy, and hard to handle. Always use the proper tools, rated lifting equipment, and lifting points for the job.
- Read and understand the assembly instructions to get to know the sub-assemblies and hardware that make up the equipment before proceeding to assemble the product.
- Carry out assembly in a large open area with a level surface.
- Always have two or more people assembling the equipment.
- Make sure you have sufficient lighting for the work area.
- Tighten all fasteners according to their specifications. Do not replace or substitute bolts, nuts, or other hardware that is of lesser quality than the hardware supplied by the manufacturer.

3.2. Check Shipment

Unload the parts at the assembly site and inspect them thoroughly while comparing the packing slip to the shipment. Ensure that all items have arrived and that none are damaged or fasteners have come loose during shipment.

It is important to report missing or damaged parts immediately to ensure that proper credit is received from either the manufacturer or from your distributor/dealer, and to ensure that any missing parts can be shipped quickly to avoid delaying the assembly process.

Note: Do not attempt to assemble or install a damaged component.

Note: Due to their length, the normal shipping practice will have the head and intermediate sections of the JETBELT™ conveyors being shipped separate from one another. See Section 3.8. for additional information. The tail section is typically shipped with the take-up assembly. The belt will be wrapped in plastic, coiled and then stacked on pallets.

3.3. Guidelines for Lifting and Moving the Conveyor

Observe the following guidelines to prevent damage to the drag conveyor when lifting or moving it during assembly and installation.

- Tramco recommends using spreader bars with slings to support the equipment during a lift.
- The unsupported span must not exceed 3 m.
- Lifts must be performed with a minimum of two support points.

NOTICE

Lifting the conveyor without proper support could damage the conveyor or its components.

WARNING

When choosing support points for especially heavy items such as drives or gates, consider the weight of the item in relation to load balance and bending effect.

3.4. JETBELT™ Components

JETBELT™ conveyor requires less horsepower and no idlers in either the material carrying or empty return pan, regardless of conveying distance. The head section is split, making removal of shaft and pulley assemblies easy. The tail section has bolt-on covers and a slot for pulley removal.



Figure 3.1

Typical JETBELT™ conveyor consists of the following components:

- Head discharge section with drive shaft
- Tail section with take-up assembly
- Intermediate trough section
- EZ-Flex belt
- Assembly bolts & alignment pins

Graphical representations of the components of the JETBELT™ conveyor can be found in sections 3.4.1. – 3.4.7.

Note: The graphical representations of the components of the JETBELT™ conveyor are **representative drawings only**. It is the responsibility of the purchaser to consult contract drawings for specific items on each conveyor.

3.4.1. JETBELT™ Overview

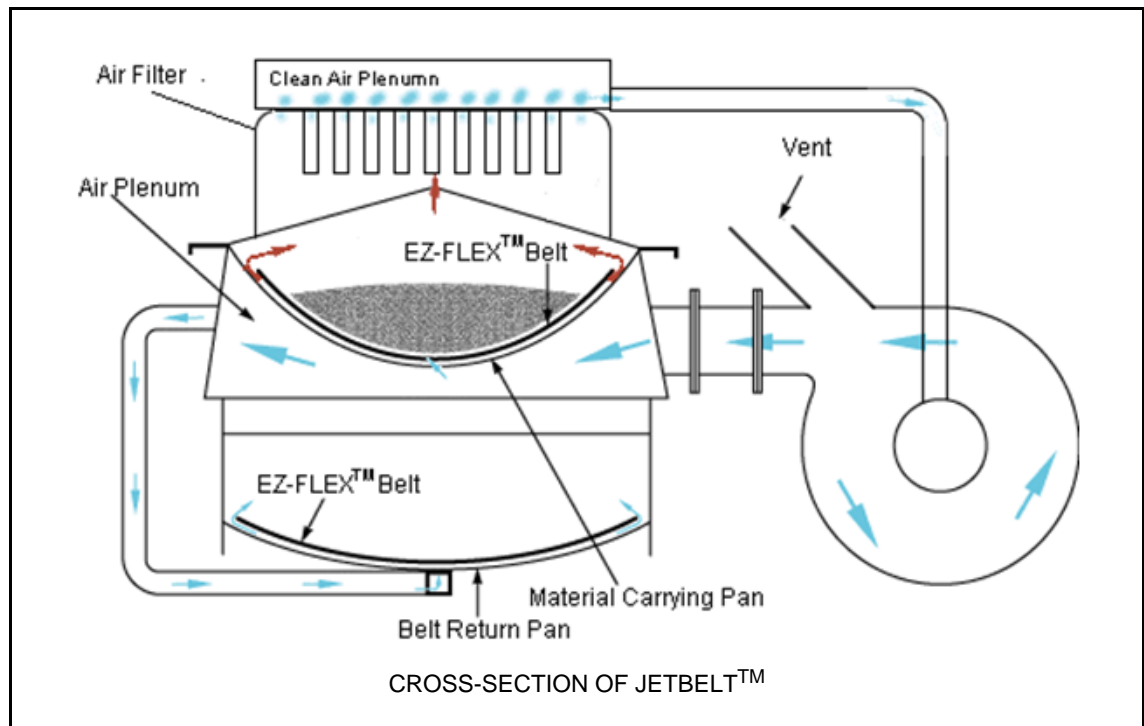


Figure 3.2

The load-carrying EZ-FLEX Belt is supported by a layer of air between the belt and the pan. The air is supplied from a fan, which pressurizes the air chamber under the pan. The air flows up through holes in the pan. The air is then vented to a dust control system. This unique design allows the JETBELT™ to free span 12 m or greater. TRAMCO exclusively uses the EZ-FLEX belt for its JETBELT™ conveyors. The EZ-FLEX belt combines unique qualities such as more lateral elasticity in cold climates and the ability to readily conform to the air film between the belt and the conveyor plenum, without compromising longitudinal strength.

3.4.2. Head Discharge Section with Drive Shaft

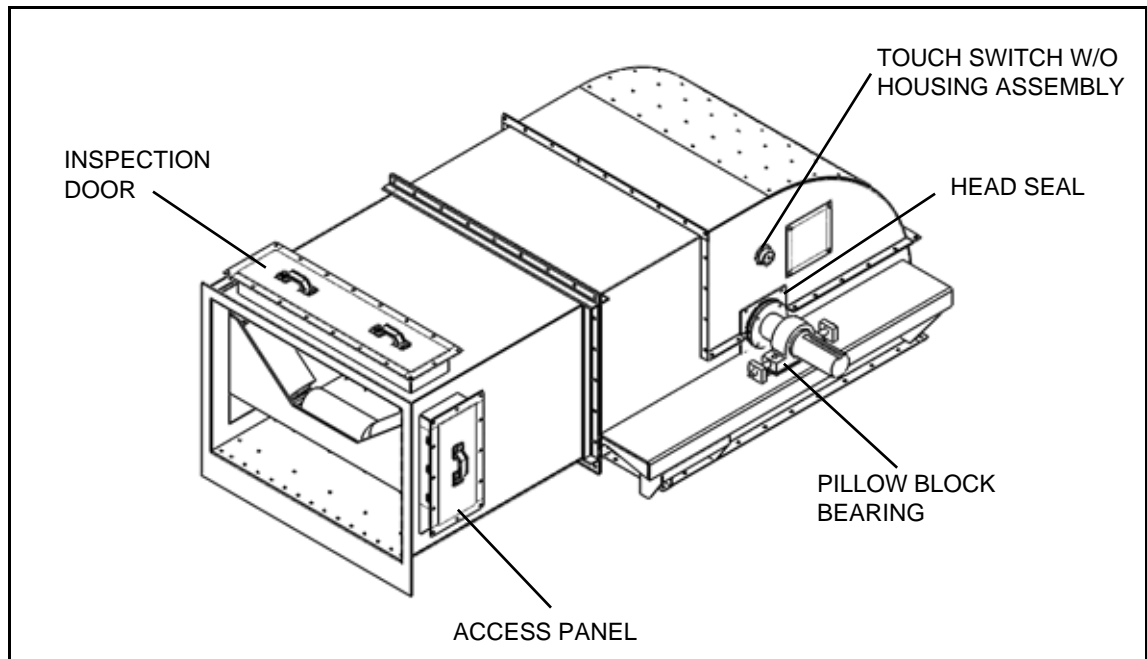


Figure 3.3

Note: The head discharge section with drive shaft is shown without the typical drive assembly.

3.4.3. Tail Section with Manual Take-up Assembly

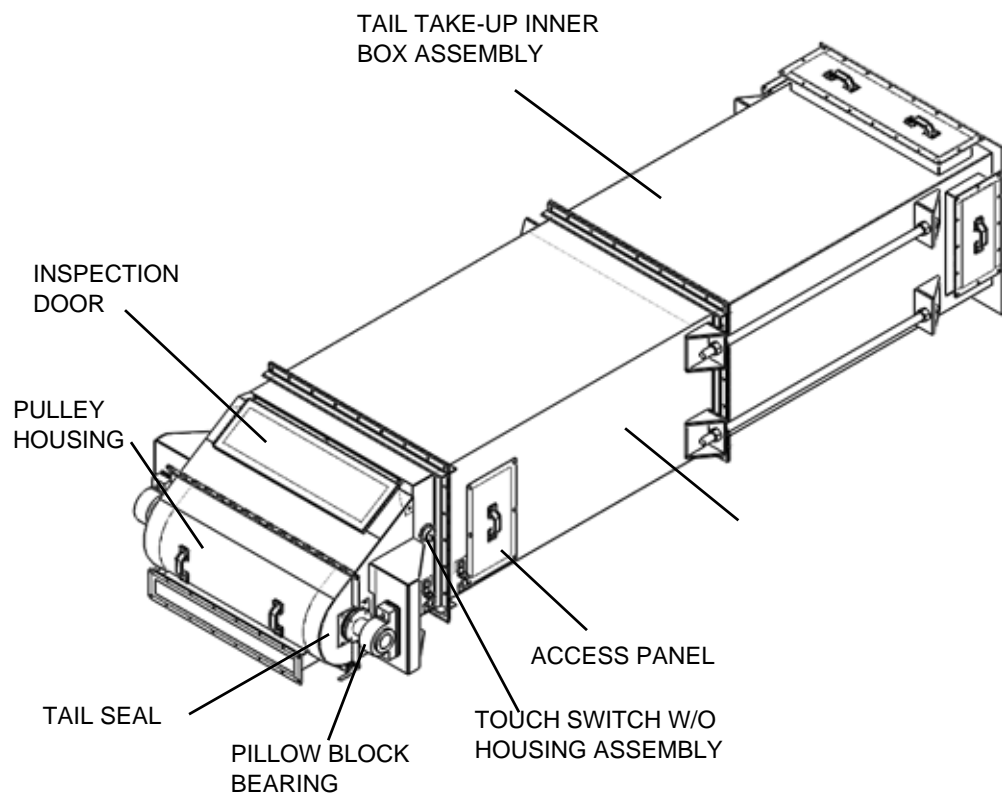


Figure 3.4

3.4.4. Intermediate Trough Section

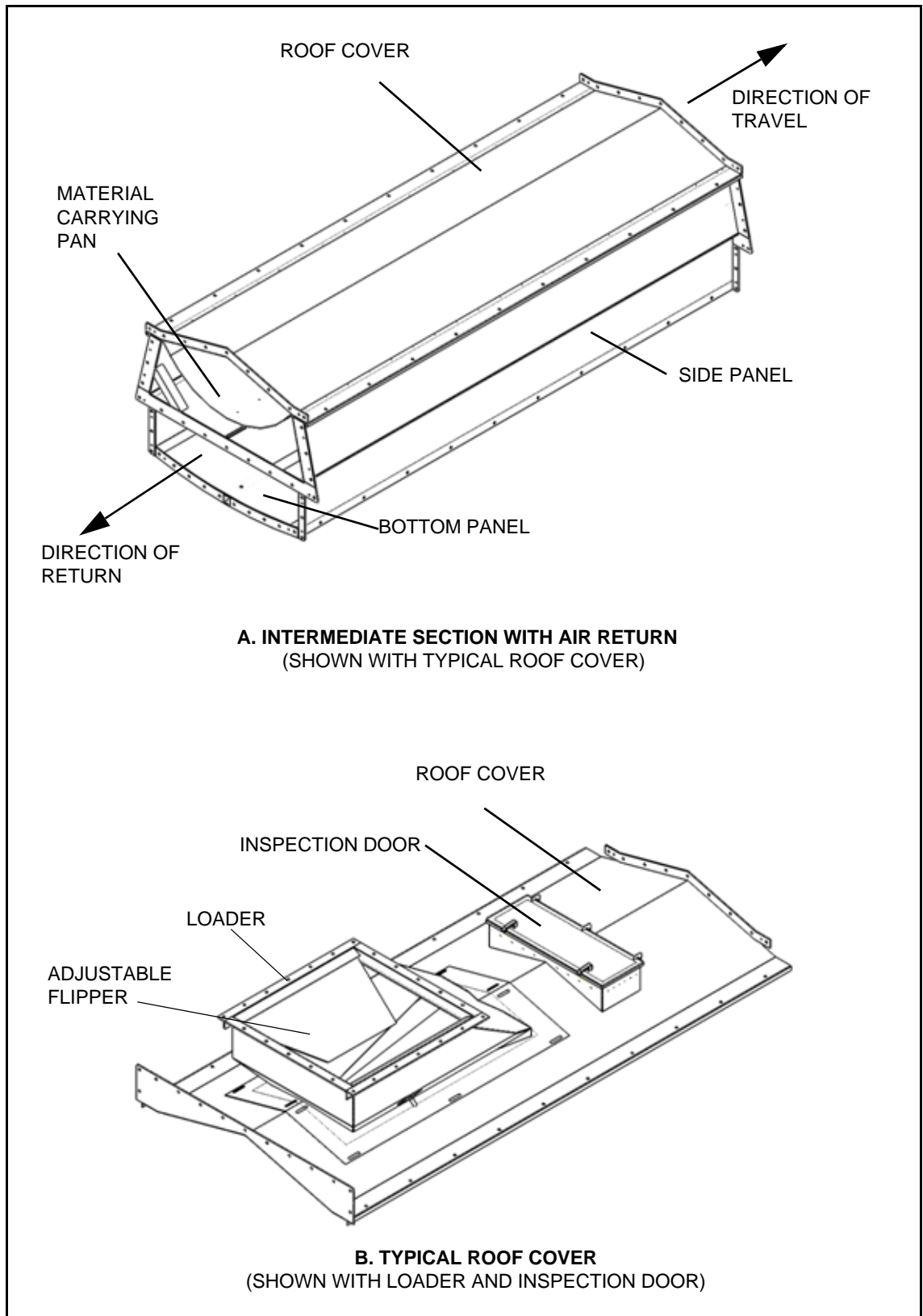


Figure 3.5

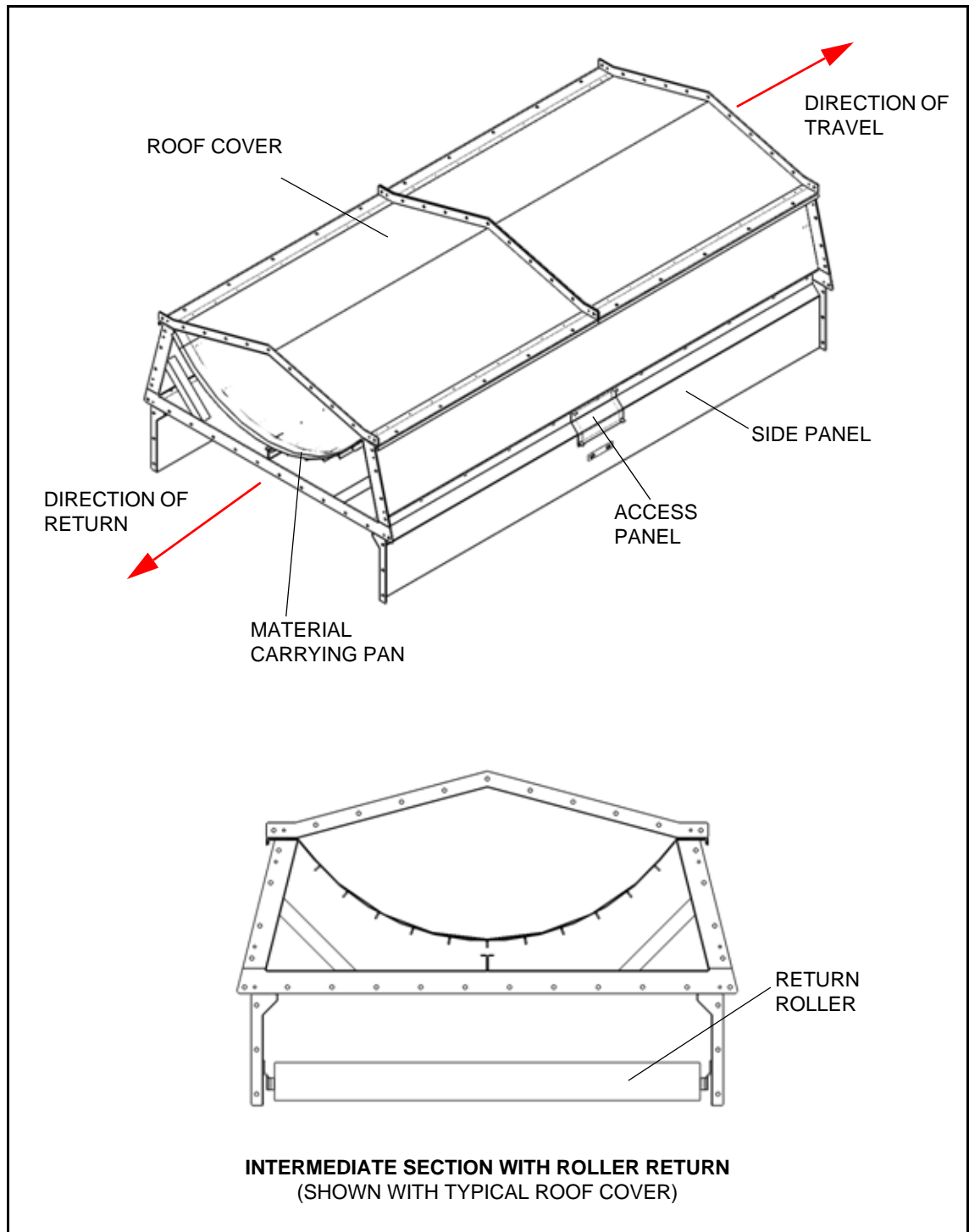


Figure 3.6

3.4.5. V-Plow Assembly

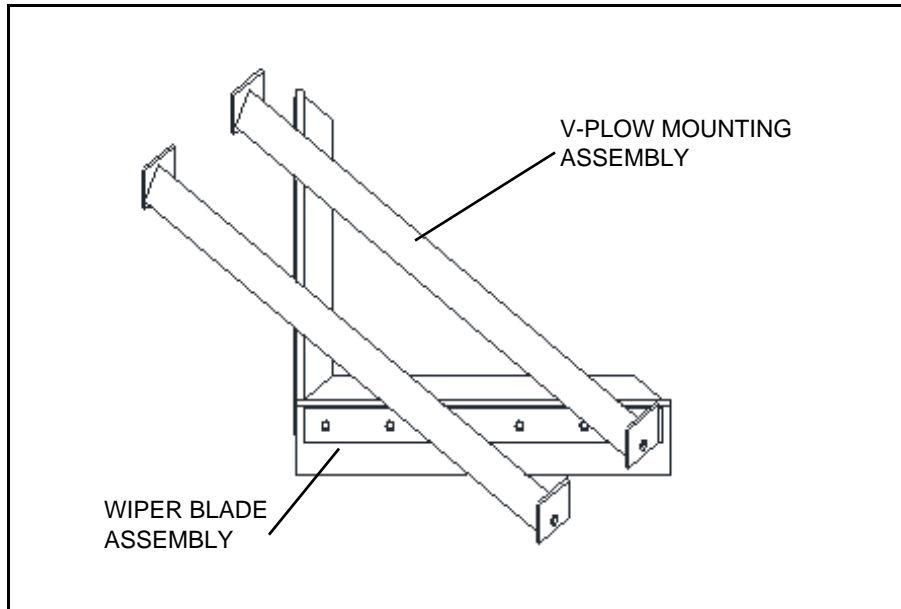


Figure 3.7

3.4.6. Touch Switch Assembly

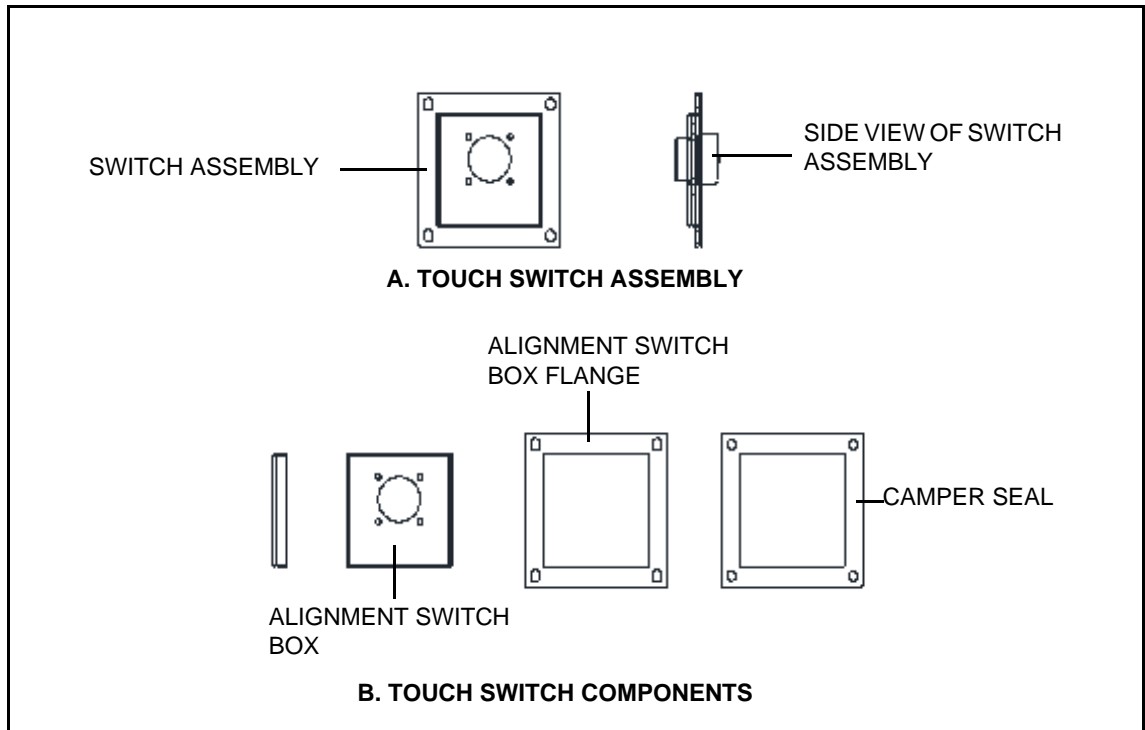


Figure 3.8

3.4.7. Head and Tail Rino Seals

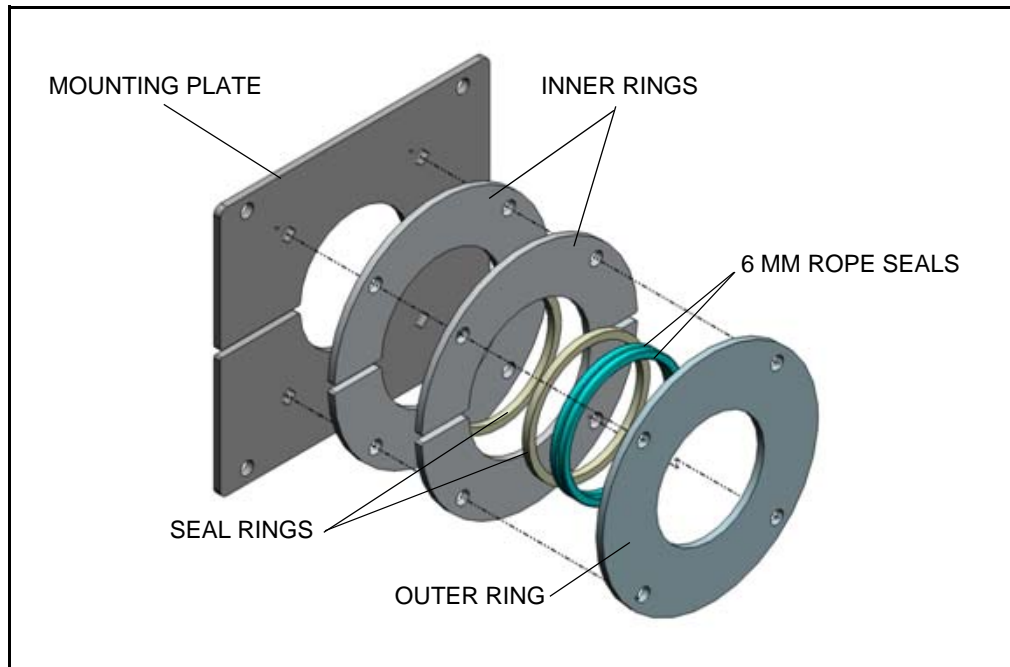


Figure 3.9

3.5. General Arrangement Drawings

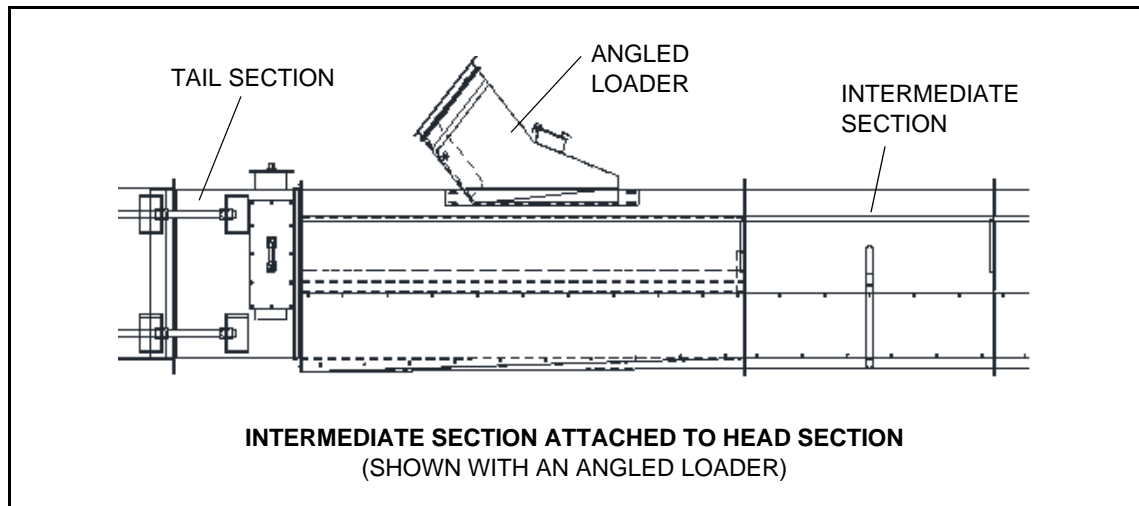


Figure 3.10

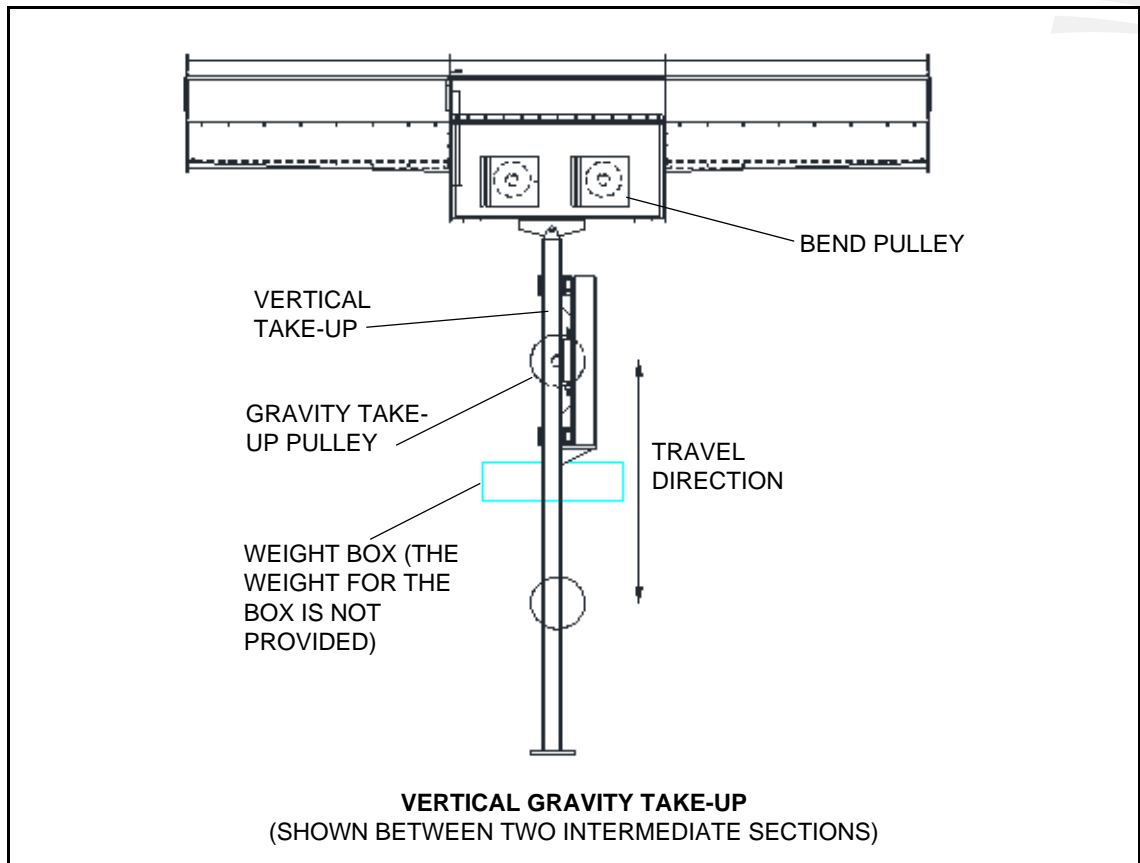


Figure 3.11

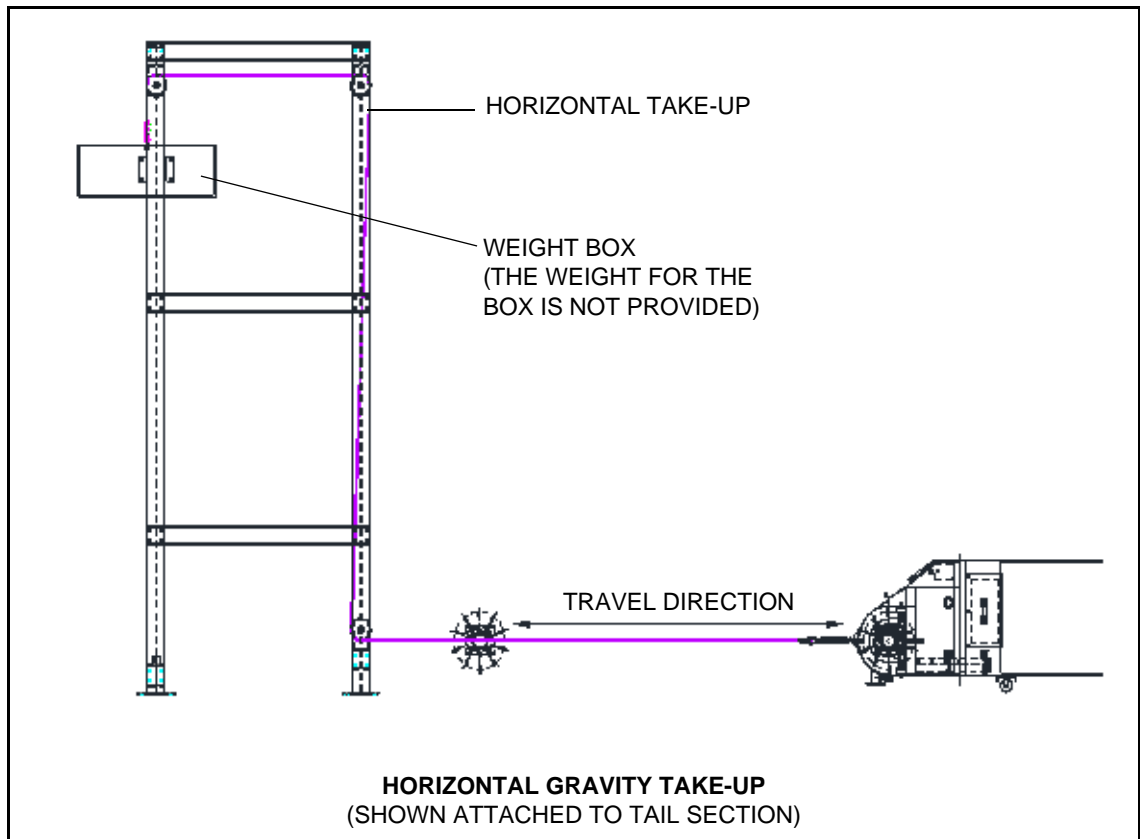


Figure 3.12

Note: A safety rail needs to enclose the take-up and the total “travel direction” area. A **safety rail** is not provided.

3.6. General Assembly Instructions

Important: All component pieces (or conveyor sections) should be placed in proper sequence as illustrated in the drawing provided before starting the assembly.

NOTICE The JETBELT™ conveyor cannot be used to support other equipment.

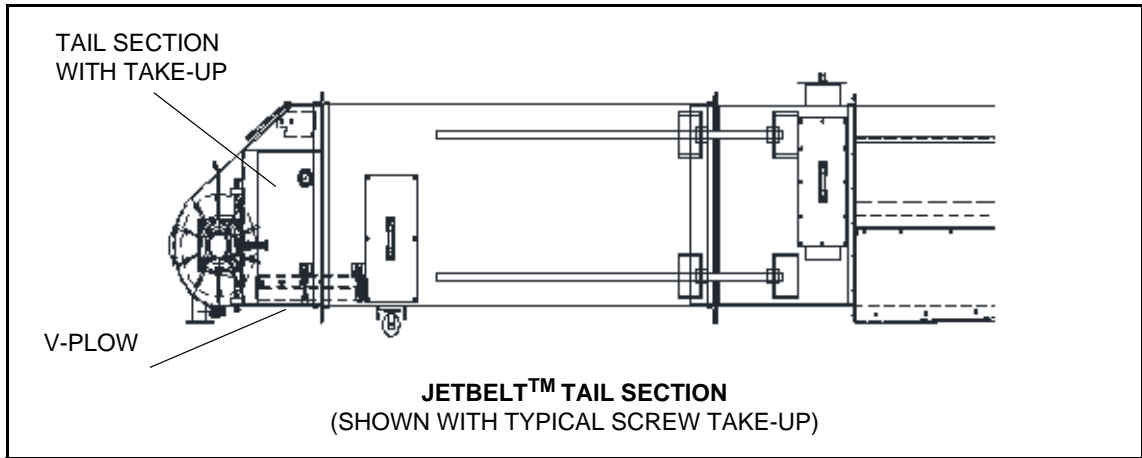


Figure 3.13

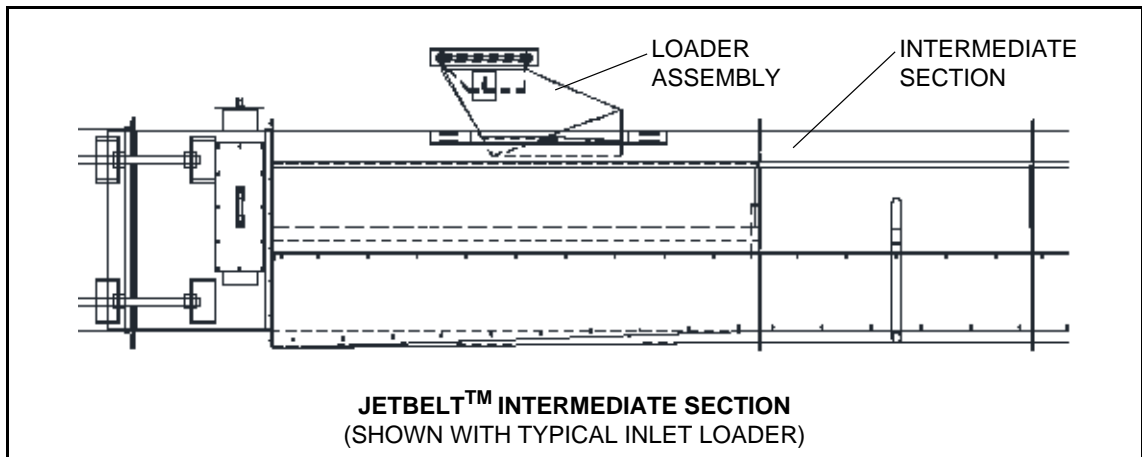


Figure 3.14

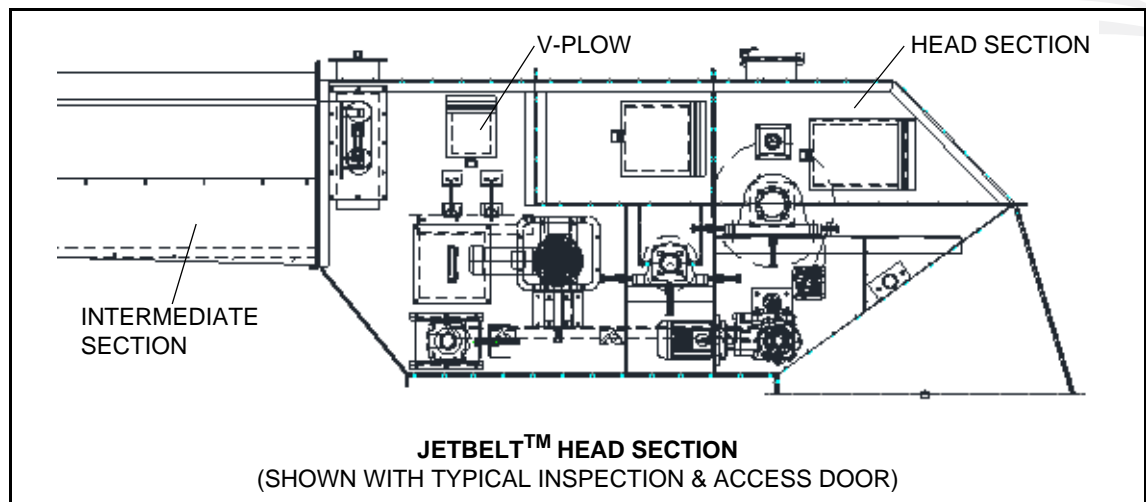


Figure 3.15

3.6.1. Section Assembly

For shop-assembled conveyors

1. Units are match marked and shipped in the longest sections practical for shipment. Field assembly can be accomplished by connecting marked joints in accordance with the packing list and/or drawing, if applicable.
2. Ensure the mounting surfaces for supporting the conveyor is level and true so there is no distortion in the conveyor.
3. Shims or grout should be used when required. Frequently check for straightness during assembly.

For conveyor assemblies purchased as parts/merchandise

1. Use the trough assembly match marks to place the conveyor troughs in proper sequence with the tail section, the bypass inlet (if applicable), and the head section in their proper locations. Connect the trough flanges loosely (See "Typical Flange Connection" on page 23.). Do not tighten bolts.
2. Align the trough bottom centerlines perfectly using the alignment pins; apply appropriate sealant (caulking, silicon, Gortex, or neoprene); then tighten flange bolts to manufacturer's torque specifications.
3. Tighten all anchor bolts to manufacturer's torque specifications.
4. Before connecting the belt, loosen take-up as much as possible. Check belt alignment. Check set screws and bearing bolts for tightness.
5. Connect top section for the belt. Refer to Section 3.6.5. for belt installation.

Note: On long conveyors, the use of a come-a-long may be necessary.

- Adjust take-up to remove excess slack from belt making sure that adjustment screws have been tightened equally to prevent misalignment.
- Install trough covers in the proper sequence. Handle covers with reasonable care to avoid warping or bending. Covers should be securely fastened.
- Install drive at the proper location and in accordance with separate instructions provided.
- Rotate conveyor manually to ensure that no binding occurs.

Note: Re-check the assembly if binding does occur.

- Check for proper direction of belt travel after electrical connections have been made and before attempting to handle material.
- If necessary, after lockout/tagout, reconnect electrical leads to reverse direction of material flow.

Note: All electrical work must be performed by a licensed electrician.

- Attach all gates, feed chute, discharge chute, etc., and connect all safety devices and controls according to the assembly drawing for your conveyor. **Carefully test to ensure proper operation.**

NOTICE Dragging the conveyor casing on the ground can damage flanges and casing sections.

Note: When lifting any assembly of the belt conveyor parts (i.e. the head and casing, or an assembly of casing), the line of the lifting force should be in line with the narrowest part of a casing section.

3.6.2. Conveyor Fan Installation

1. Install the conveyor fan assemblies with filters and connecting duct piping per Tramco general arrangement drawing and manufacturers installation instructions.
2. Install the pressure gage and low differential pressure switch for each plenum fan per manufacturers instructions.
3. Complete all wiring to provide power to plenum fans and interlock switches to shut down conveyor if plenum pressure drops.
4. Check fan operation for proper rotation and drops. Adjust dampers on pressure side of fans to obtain pressure in plenums.
5. Lock dampers in place so they can not be accidentally moved.
6. Check to see all fan systems are working correctly.

3.6.3. Take-Up Assembly

There are different types of gravity take-up options. Installation of two take-up (vertical and horizontal gravity take-up) are described below:

A. Vertical Gravity Take-Up

1. Install the vertical gravity take-up assembly as illustrated in Figure 3.11. Refer to the general arrangement drawing.
2. Check that the pulleys are level and square with the conveyor.
3. Check that the take-up guides are square and true with the conveyor.
4. Install the counterweight box, cables and clamps. Be sure cables are adjusted so the counterweight box pulls evenly on the take-up frame above.
5. Tighten all components securely in place.

B. Horizontal Gravity Take-Up

1. Install the horizontal gravity take-up assembly as illustrated in Figure 3.12. Refer to the general arrangement drawing.
2. Check that the pulleys are parallel and square with the conveyor.
3. Check that the take-up guides are square and true with the conveyor.

4. Install the counterweight box, cables and clamps. Be sure cables are adjusted so the counterweight box pulls evenly on the take-up frame above.
5. Tighten all components securely in place.

3.6.4. Typical Flange Connection

1. Insert the alignment band at the flange connection.

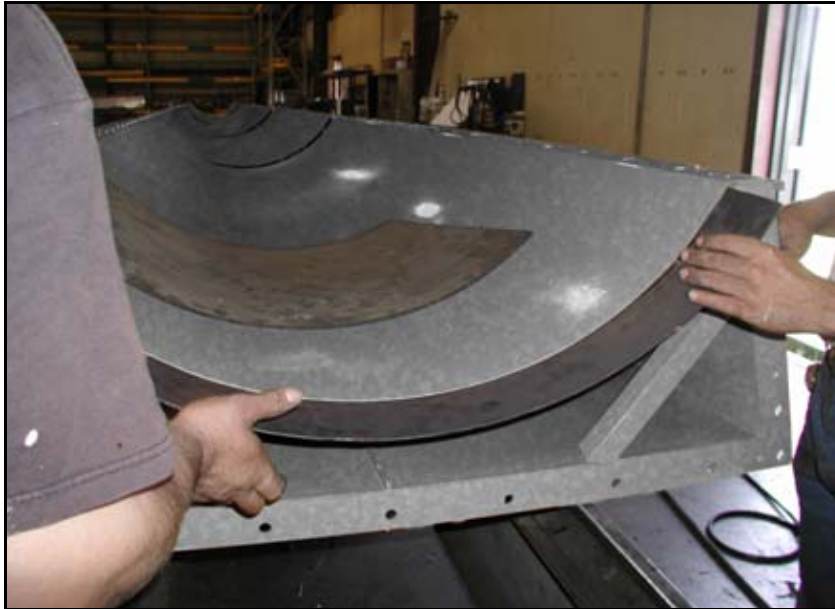


Figure 3.16

2. Center the alignment band along the length of the joint.

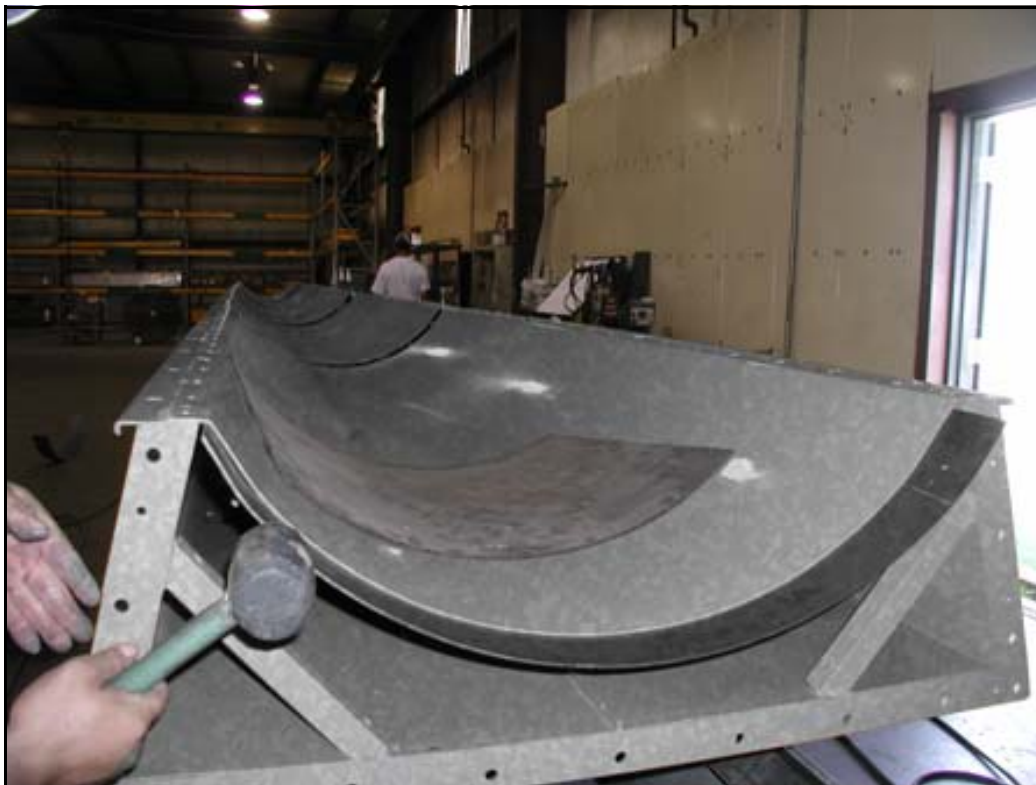


Figure 3.17

3. The alignment band has been centered along the length of the joint.

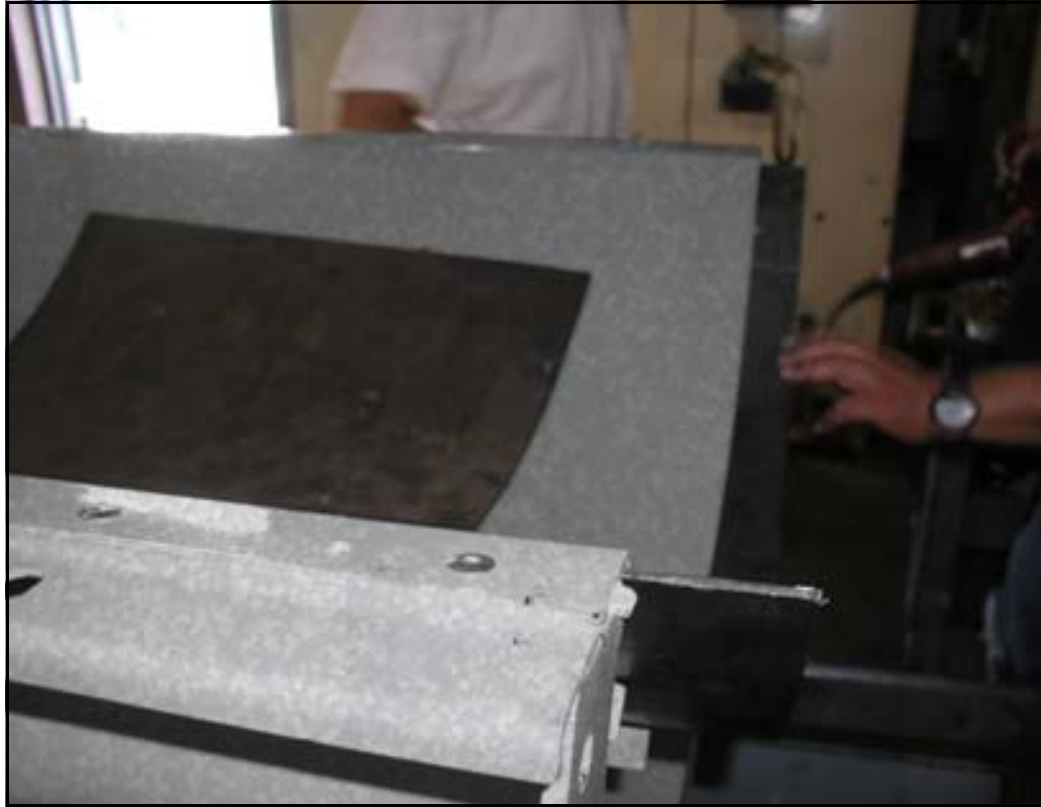


Figure 3.18

4. Apply silicone along the entire length of the joint.



Figure 3.19

5. Apply silicone onto all flange faces in the area shown.



Figure 3.20

6. Connect the beads of silicon as shown.



Figure 3.21

7. Align both sections and insert a connection rod, as shown.



Figure 3.22

8. Make sure the adjoining section slides over the alignment band.



Figure 3.23

9. Start tightening the connecting rods on both side at the same time.



Figure 3.24

10. Shows the sections coming together.

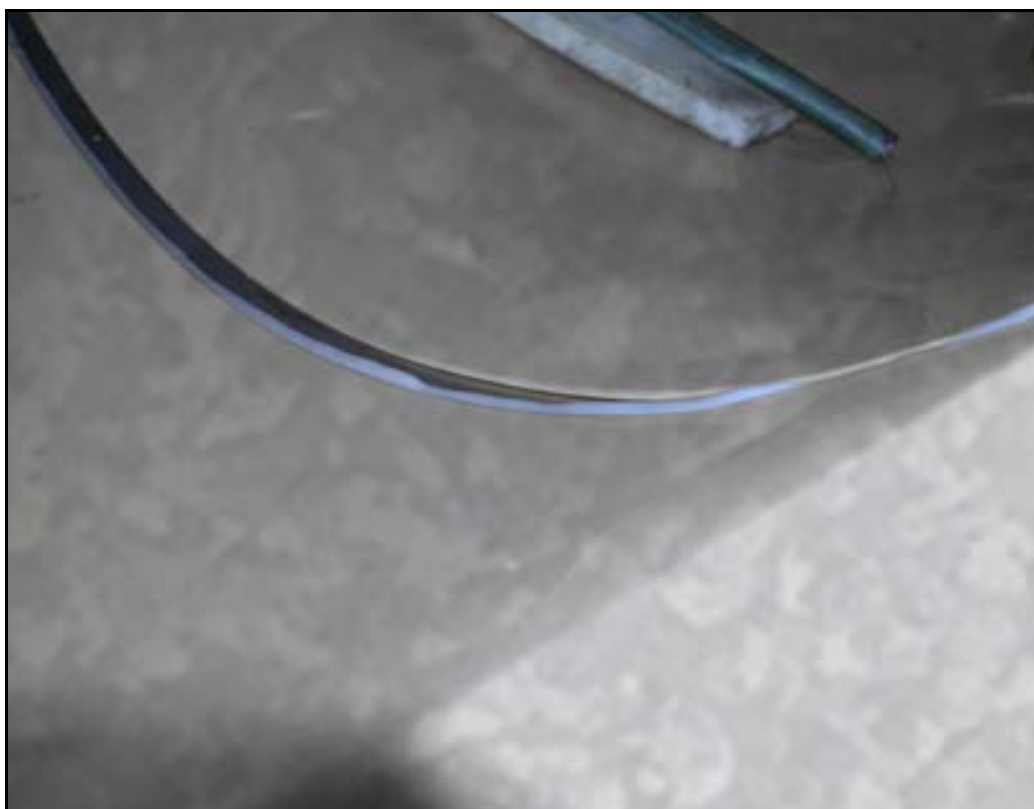


Figure 3.25

11. Completely tighten the connecting rods on both sides.



Figure 3.26

12. Connect the sections together using the flange bolts. Use an aligning rod if necessary. Then remove the connecting rods and replace with the appropriate flange bolt.



Figure 3.27

3.6.5. Belt Installation

1. Using the take-up adjustment screws, move the tail pulley to its shortest take-up position.

Note: If either gravity take-up option (vertical or horizontal) is used in place of the typical screw take-up, the main gravity pulley must be in its shortest take-up position during the installation of the belt.

2. Remove the head cover cap and thread a strong rope or cable down the length of the trough sections until the end can be removed through the tail section opening.
3. Attach a rope or cable to the belt. Fabricate a piece of steel angle to connect the rope to the belt as described in the following steps:
 - Cut the steel angle the same length as the belt width.
 - Drill holes in one side of steel angle to match the attaching holes in the belt.
 - Drill a single hole in the center of the other side of the steel angle for mounting an eyebolt.
4. Install the eyebolt, attach the steel angle to the end of the belt, and attach the rope or cable.
5. Use a rope or cable to pull the belt to the head pulley.
6. Secure the end of the belt in this position and thread the end of the rope or cable down the length of the trough sections.
7. Use the rope or cable to thread the belt over the head pulley, down the length of the trough sections, around the tail pulley and any gravity take-ups in the conveyor system.



8. Joining the ends of the belt: There are many different ways to join the ends of the belt. The best practice is to use the joining method as recommended by the belt manufacturer. Regardless of the joining method used, the use of a “vulcanized” belt splice kit is required. The vulcanized belt splice kit, with the necessary **belt splicing** instructions, can be ordered through Tramco or direct from the belt manufacturer.

Important: No belt and/or splice kit substitutions are to be made without the express written consent of an authorized representative of Tramco management.

- Prepare the ends of the belt using extreme care to ensure the belt ends are square and true. Failure to ensure the belt ends are square and true will result in the belt not tracking straight. The maximum tracking or wandering variation allowed for a JETBELT™ conveyor is 38 mm (+/- 13 mm). If the belt tracking or wandering is greater than this, the splice must be redone. Therefore, the more care used in making a proper splice, the less likely the belt will have a tendency to exceed the maximum tracking variation allowed.

Note: The importance of square and true belt ends to a successful belt splice must be stressed to the belt vulcanizer. With a properly spliced belt, the belt will perform as intended. A properly spliced belt is important, as the JETBELT™ conveyors are more critical of a crooked splice than conventional belt conveyors.

- Ensure the belt is properly tensioned after being spliced and/or having splice protectors/ flipper cleats installed.
- Tighten the belt to the proper specifications of the belt manufacturer.

3.6.6. Touch Switch Assembly

The belt alignment is monitored with a Touch Switch monitor installed near the top centerline of the head pulley to detect belt and head pulley misalignment. The belt alignment is also monitored with a Touch Switch monitor that is installed on the top carrying belt to detect belt misalignment and tail end.

The Touch Switch monitor will shut off the JETBELT™ conveyor if the belt alignment becomes misaligned. Adjusted properly and regularly monitored, the Touch Switch monitor is designed to prevent premature failure, wear and damage of the belt, pulleys, and the conveyor housings. The belt must be properly installed and tracked before belt alignment Touch Sensor monitors can be installed. Additional safety switches may be added to the JETBELT™ conveyor in accordance with their manufacturer's installation instructions.

3.6.7. Check Head Shaft for Level

It is possible that the level condition of shaft could have been altered during shipping and handling. If shaft is not level, install shims under the pillow-block bearing on the low side. The head section must be properly supported so there is no vertical or horizontal movement. The support structure should be attached to the bolted connections of the head section on the bottom or top depending on the design of the motor mount.

NOTICE If the head shaft is not level, the belt will not “track” properly and could wear a hole in the side of the head, pulleys, and the tail.

3.6.8. Adjusting the V-Plow

The V-Plow is a bolted on attachment (Figure 3.7) and is NOT set at the factory. Follow the procedure below to adjust the V-Plow.

1. Adjust the V-Plow so that the Neoprene blade is 6mm to 13mm above the conveyor belt. There are vertical slots in the Tail take-up outer box assembly to allow for easy adjustment of the V-Plow assembly.
2. As necessary, the V-Plow may have to be set at an angle to follow the belt line as it rises to the tail pulley.

Note: The V-Plow must be adjusted after the conveyor belt has been installed and properly tensioned.

3.6.9. Skirt Assembly

The skirt assembly prevents side spillage of material and keeps the load centered on the belt. Follow the steps below to make sure the skirt assembly is properly installed.

1. Ensure maximum distance between the skirt board is two-thirds the width of a troughed belt.
2. Adjust the height of the skirt assembly after the tension on the belt is set.
3. Lock the skirt assembly in place at the point where the neoprene wiper is approximately 3mm above the belt.

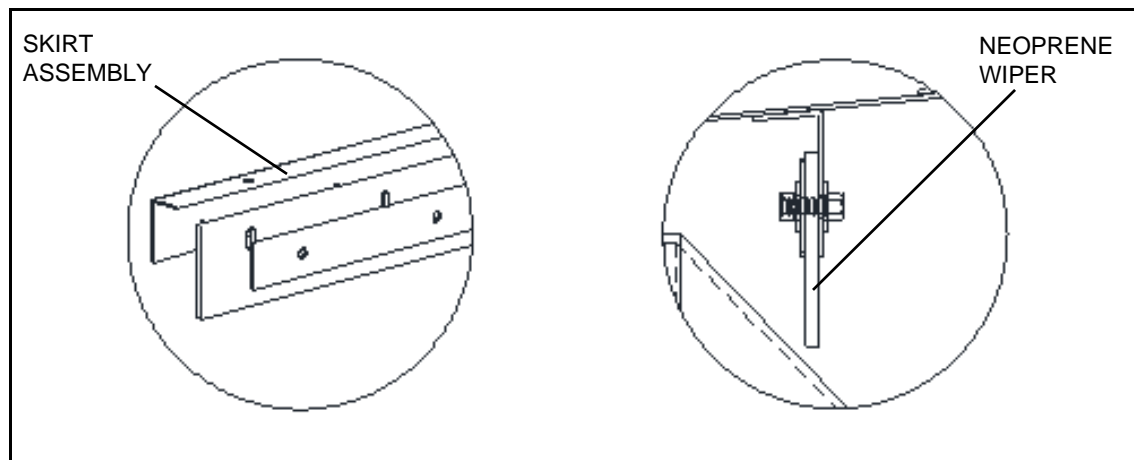


Figure 3.28

4. Check if the material is at rest on the belt before it reaches the end of the skirt. If the material is still tumbling as it passes the skirt end, lengthen the skirt or reduce the inlet speed to match the speed of the belt.

Note: The skirt assembly is only on the primary loader. All subsequent loaders **do not** have the skirt assembly.

3.7. Component Information

3.7.1. Drive

Installation

Depending on the type and size of the drive, and the customer order, it may be necessary to site fabricate a support/torque absorption point from a suitable structure. Fit the drive per the instructions in the **drive manufacturer's manual**.

Replacement

Refer to the ***drive manufacturer's manual***. Consult contract drawings for specific drive details used on the conveyor. Note the weight for lifting purposes. Follow the Lockout/Tagout procedures in this manual.

3.7.2. Bearings

Installation

Install the bearings per the instructions in the ***bearing manufacturer's manual***.

Replacement

Refer to the ***bearing manufacturer's manual*** for replacement recommendations for bearings operating at low speed. Consult contract drawings for specific bearing details used on the conveyor.

Note: Tramco recommends that bearings (or bushings) and seals be replaced every 2 years, or have vibration and/or temperature monitoring (done by others) carried out to ensure continued safe operation.

3.7.3. Seals

Installation

Refer to Figure 3.9 and 3.10 for the exploded isometric view of the head and tail seals. Install the seals as shown in these figures. Refer to bolt suppliers for **bolt torque specifications**.

Replacement

The head and tail section seals can be replaced by sliding the inner and outer rings along the shaft, prying out the rope seal, and fitting a new rope seal.

Note: Tramco recommends that bearings (or bushings) and seals be replaced every 2 years, or have vibration and/or temperature monitoring (done by others) carried out to ensure continued safe operation.

Important: All manufacturer's manuals, product information, and data sheets will be shipped with each conveyor. It is the responsibility of the contractor, installer, owner, and user to read and follow the manufacturer's installation instructions and maintenance recommendations.

3.8. Supplemental Illustrations

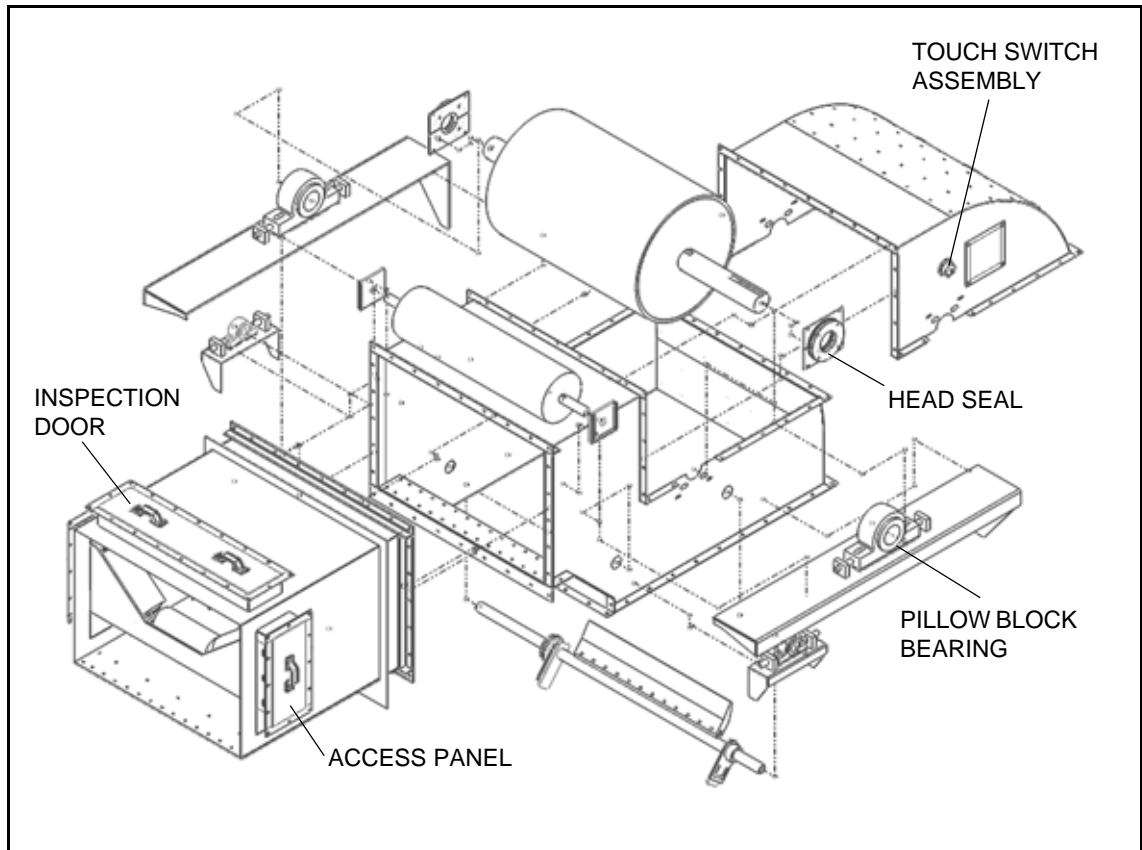


Figure 3.29 Exploded View of the Head Section

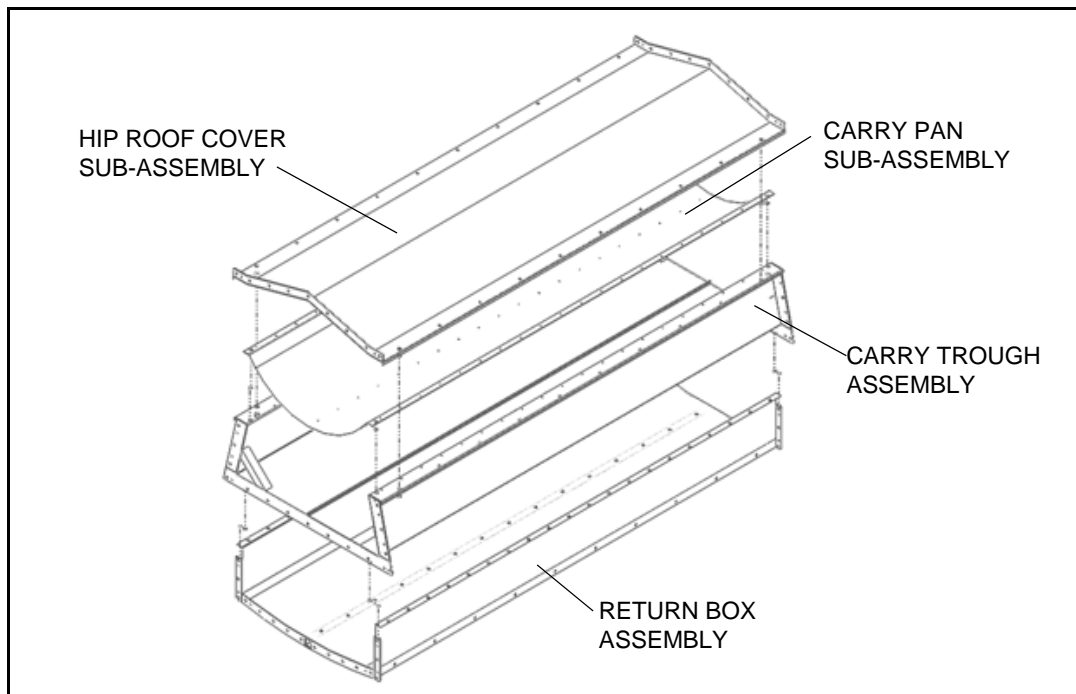


Figure 3.30 Exploded Isometric View of Intermediate Section w/ Air Return

Note: It is possible, in certain situations, that the carry trough assembly and the return box assembly will be shipped to the job site un-assembled thus requiring the intermediate section to be assembled in the field. As the intermediate section is required to be air tight, the application of silicon to the mating surfaces is required. See section 3.6.4. step 5. for an illustration of the proper area in which to apply the silicon.

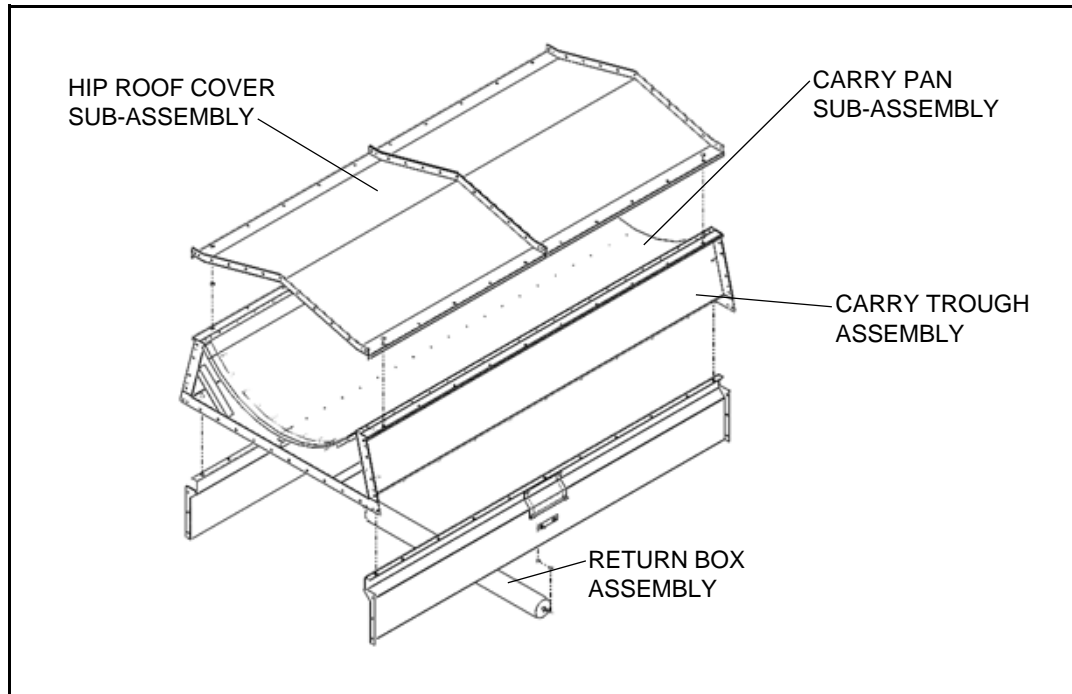


Figure 3.31 Exploded Isometric View of Intermediate Section w/ Roller Return

Note: It is possible, in certain situations, that the carry trough assembly and the return box assembly will be shipped to the job site un-assembled thus requiring the intermediate section to be assembled in the field.

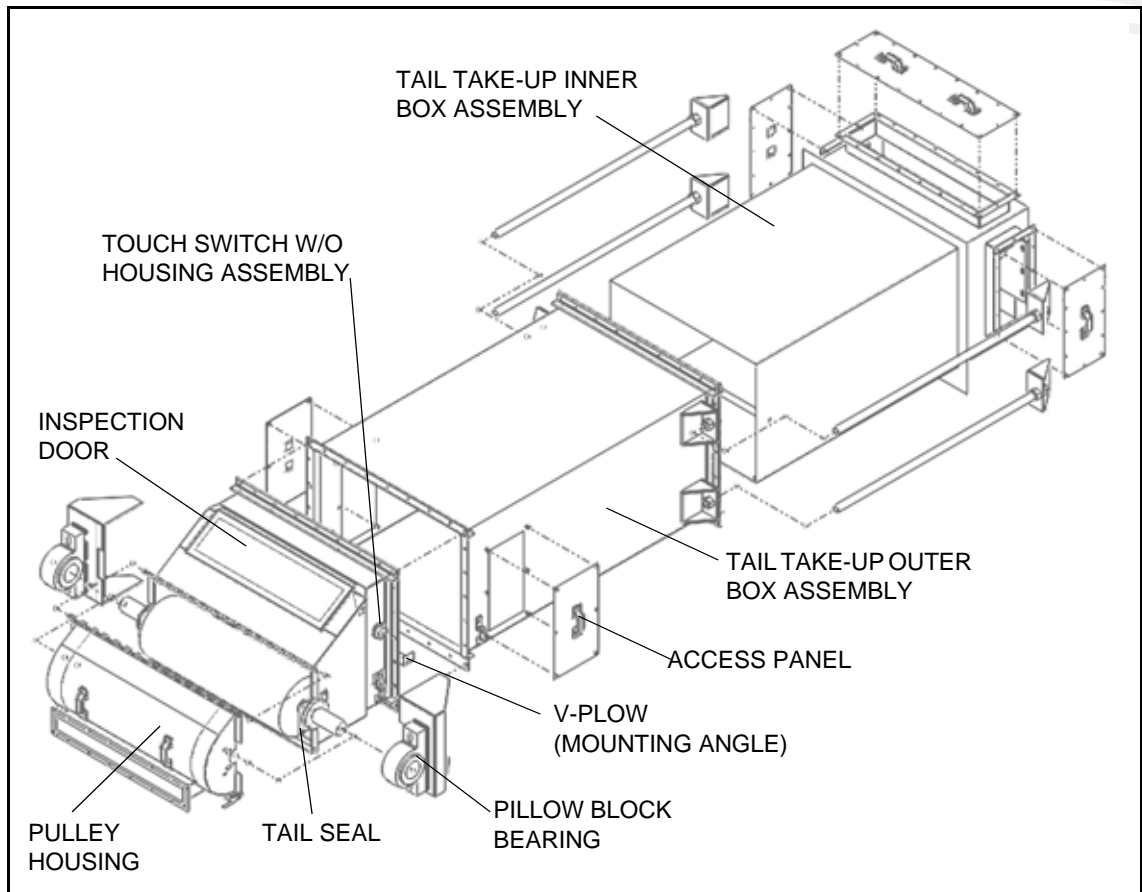


Figure 3.32 Exploded View of Tail Section with Screw Take-Up

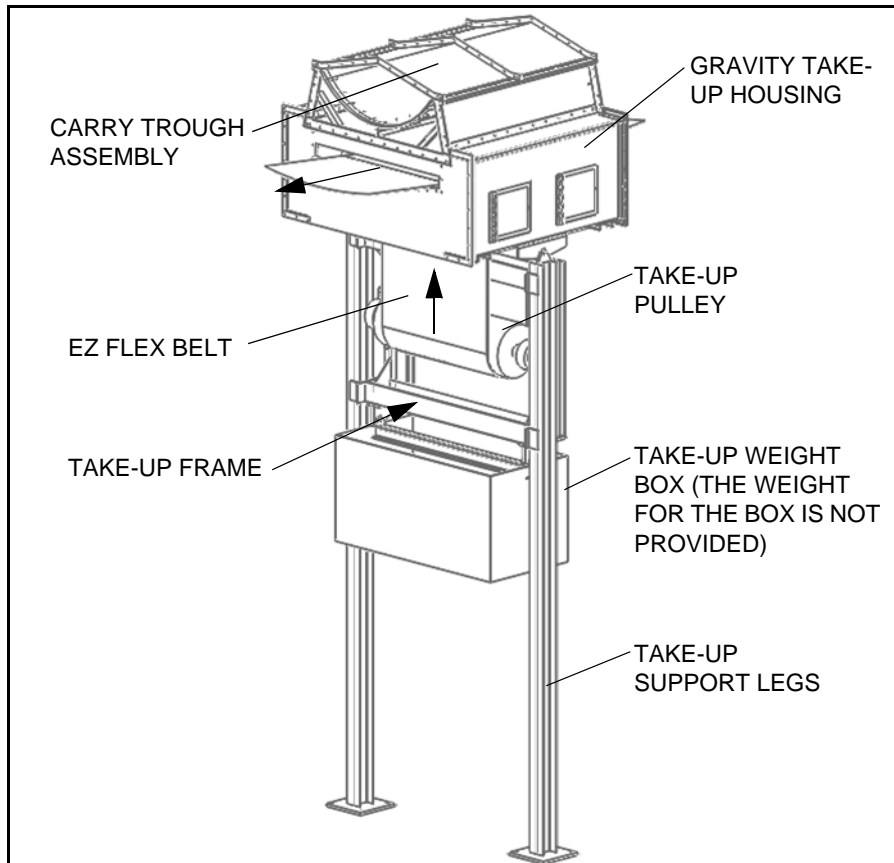


Figure 3.33 Isometric View of Typical Gravity Take-Up

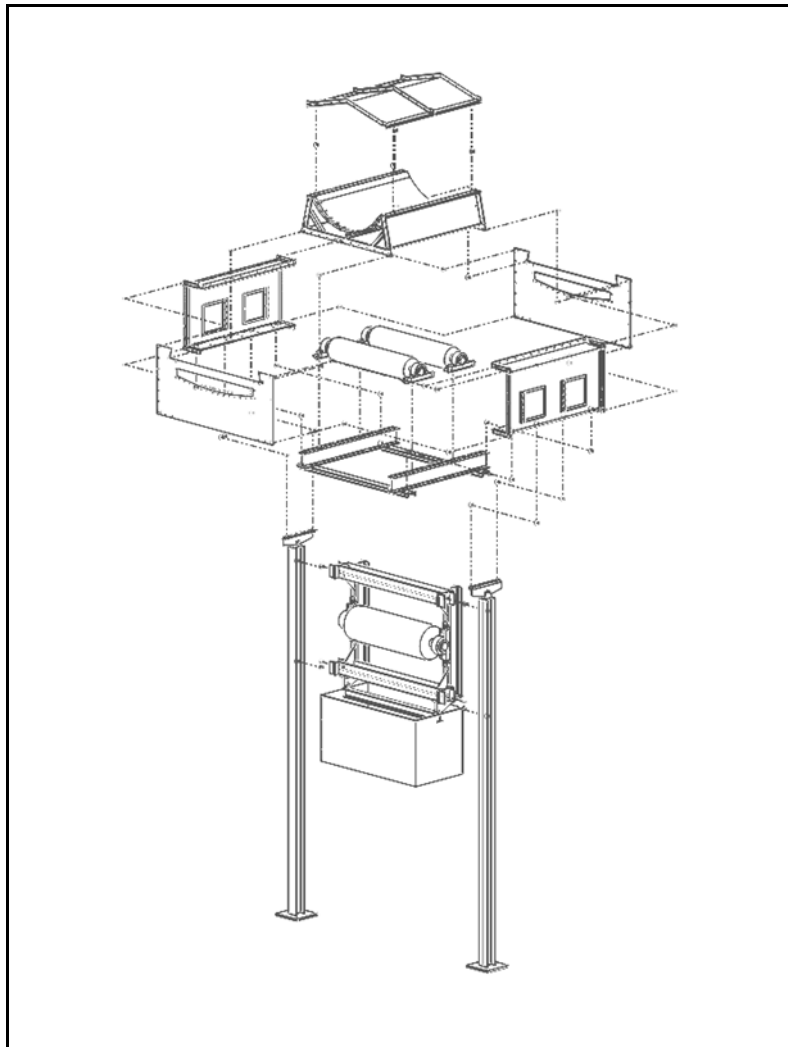


Figure 3.34 Exploded View of Typical Vertical Gravity Take-Up (Belt not shown for clarity)

4. Operation



Before continuing, ensure you have completely read and understood this manual's Safety chapter, in addition to the safety information in the section(s) below.



WARNING Do not operate JETBELT™ Air-Supported Conveyor unless the housing completely encloses the moving elements and power transmission guards are in place.

4.1. Pre-operation/Checklist

Before operating the JETBELT™ conveyor check to ensure:

1. Lubricate all bearings and drives.
2. Check the interior of the conveyor to ensure all tools, foreign materials, and other obstructions have been removed.
3. Check that all hardware is secure.
4. Check all set screws on pulleys, bearings, sheaves, gear reducers, etc. Although some set screws may have been installed at the factory, shipment, handling, and installation could have loosened them. We cannot be responsible for damage caused by loose set screws.
5. Check that the head shaft is level.
6. Check for proper rotation of motor and gear reducer.
7. Adjust take-up screws so that there is no slack in the belt and so that the tail shaft is level.
8. Lubricate all bearings and drives according to service instructions. Bearings and gear reducers are normally shipped without lubricant. Refer to bearing and gear reducer manufacturer's service instructions for recommended lubricant.
9. Install all covers, guards, safety devices or controls, and any interlock to other equipment and ensure they are operating properly.

4.2. Start Up

Operate the empty JETBELT™ conveyors for several hours as a break-in period. Look for bearing heat, unusual noises, or drive misalignment. Should any of these occur, check the following and take corrective steps.

1. When anti-friction bearings are used, check for proper lubrication. Insufficient or excessive lubricant will cause high operating temperatures.

NOTICE

To prevent excessive maintenance and lowered equipment life expectancy, ensure chains are tight and troughs and sprockets are properly aligned.

2. Check assembly and mounting bolts and set screws; tighten if necessary.

Important: After running the conveyor, stop it, lock out all power, and check discharge to ensure it is clear and material flow through the discharge will not be impeded in any way.

3. Restart the conveyor and gradually feed material. Gradually increase feed rate until the design capacity is reached.

Important: Do not overload conveyor. Do not exceed conveyor speed, capacity, material density, or rate of flow for which the conveyor and drive were designed.

4. Cut off feed and allow the conveyor to empty. Lock out power supply. Check all bolts and all alignments. Re-align as necessary, tighten all bolts, and check belt adjustment.
5. Check motor amperage frequently.
6. Check belt tension periodically. It may be necessary to re-adjust belt tension after running material in the conveyor.

4.3. General Operation

WARNING To prevent serious injury or death, keep body, hair, and clothing away from rotating pulleys, belts, chains, and sprockets.

1. Periodically run the conveyor empty for a few minutes to check for excessive vibration, loose fasteners, security of covers and guards, noise, and bearing and drive temperature.
2. Always operate the conveyor with covers, guards, and safety labels in place.
3. Always practice good housekeeping and keep a clear view of the conveyor loading, discharges, and all safety devices.
4. If the conveyor won't be operated for a prolonged period of time, operate until cleared of all material. This is particularly important when the material conveyed tends to harden, becomes more viscous or sticky, or spoils if allowed to stand for a long period of time. .

NOTICE After the first week of operation, check and re-tighten all bolts following the bolt manufacturer's torque specifications.

NOTICE Belt tension must be checked daily for the first several days, and then weekly until the belt has stabilized and adjustments are not required. This may happen quickly or over the space of a couple of months.

4.4. Shutdown/Storage

If the conveyor will be shutdown for more than one month, perform the following:

1. Remove all foreign material from the conveyor and check that the surface coatings are in good order.
2. Lubricate and protect all bearings and drives according to the manufacturer's instructions.
3. Rotate the gear reducer periodically according to the manufacturer's instructions.
4. Protect the conveyor from weather, moisture, and extreme temperatures as required. Do not use plastic or other coverings that promote condensation under the covering.
5. Coat all exposed metal surfaces with rust preventative oil. Follow all the manufacturer's instructions that come with the rust preventative oil.
6. Prior to a subsequent start-up, perform the installation and operation instructions in this manual.

5. Maintenance



Before continuing, ensure you have completely read and understood this manual's Safety chapter, in addition to the safety information in the section(s) below.

Proper maintenance habits on the conveyor mean a longer life, better efficiency, and safer operation. Please follow the guidelines below.



WARNING Before performing any internal inspections or maintenance, ensure that a mechanical lockout/ tagout is in place on the motor starter.

Establish routine periodic inspections of the entire conveyor to help provide continuous maximum operating performance.

5.1. Periodic Inspection

Trough	Check for wear and alignment.
	Tighten all bolts to manufacturer's torque specifications .
Shafts/Pulleys	Check for wear.
Belt	Check for wear or damage.
Nuts & Bolts	Check for wear and tightness.
Seals	Check for leakage, adjustment, and wear.
Bearings	Check for lubrication and noise.
Sprockets	Check for wear and alignment.
Take-up	Check belt tension, (If take-up is fully adjusted, a section of belting will need to be removed).
Gear Reducer(s)	Check for oil level and noise.
Chain Drive	Check chain tension and adjust as required.
Guards	Check for oil level (if applicable). Check nuts and bolts for tightness.
Motors	Check amperage frequently. Verify it is within operating parameters.

5.2. Belt

5.2.1. Examination for Wear

Periodically the belt should be examined for wear. The period between examinations may vary based on the power used, abrasiveness of material, shape of the conveyor, planned maintenance stops, etc. Regardless, the belt should be checked twice a year. In practice, maintenance records provide the best indication of belt deterioration. With good Maintenance Records, it's easier to predict when to replace the belt in any particular conveyor.

5.2.2. Replacement

The belt is required to be replaced when it becomes cracked, frayed, or burned beyond the point where traditional splicing or repairs can not be done safely. The maximum number of splices allowed per belt is three. Each splice should be spaced at least 3m from one splice joint to another. If repairing the belt requires more than three splices, the belt must be replaced.

Note: If the belt was required to be replaced due to being burned or melted, then the lagging pads must be examined for damage.

5.3. Pulley Lagging

JETBELT™ conveyors typically come with lagging pads fully secured to the surface of the head pulley. A lagging pad, with exceptional traction due to its unique design of double grooving and small molded “in slits” or “sipes”, yields an extra firm grip on the belt. The lagging pads have precisely formed steel backing plates to match each pulley. The lagging pads are bonded to the steel backing plates using hot-vulcanization under pressure. This results in lagging pad stability and long life. The self cleaning of the pulley surface occurs due to the spaces between the pads, the double grooving, and the pad sipes. Foreign material is forced to the edges of the pulley along the lagging spaces.

5.3.1. Examination for Wear

Periodically examine the pulley’s lagging for signs of wear. The period between examinations should precisely match the examination times of the belt. Signs of wear include:

- Thinning of the lagging pad.
- Missing portions of the lagging pads.
- Separation of the lagging pad from the steel backing plate.
- Ashing or surface damage due from the belt being burned or melted.

5.3.2. Replacement

The lagging pads are design to be replaced without removing the pulleys from their operating position. The lagging pads are designed to fit under the lips of the metal retainers, which allow the lagging pads to slide in and out during installation.

- Remove the head access covers.
- Remove any other attachments that obstruct access to the pulley
- Loosen the belt (split the belt if necessary).
- Remove the fasteners holding the metal retainers onto the pulley.
- Remove the worn lagging pads.
- Replace the new lagging pads onto the pulley and tighten the metal retainers to fully secure the new lagging pads to the pulley.

Note: In some cases it may be desirable to further amplify the tracking effects on a standard center-crowned or end-crowned pulley by adding a Step-Crown lagging pad in addition to the built in pulley crown.

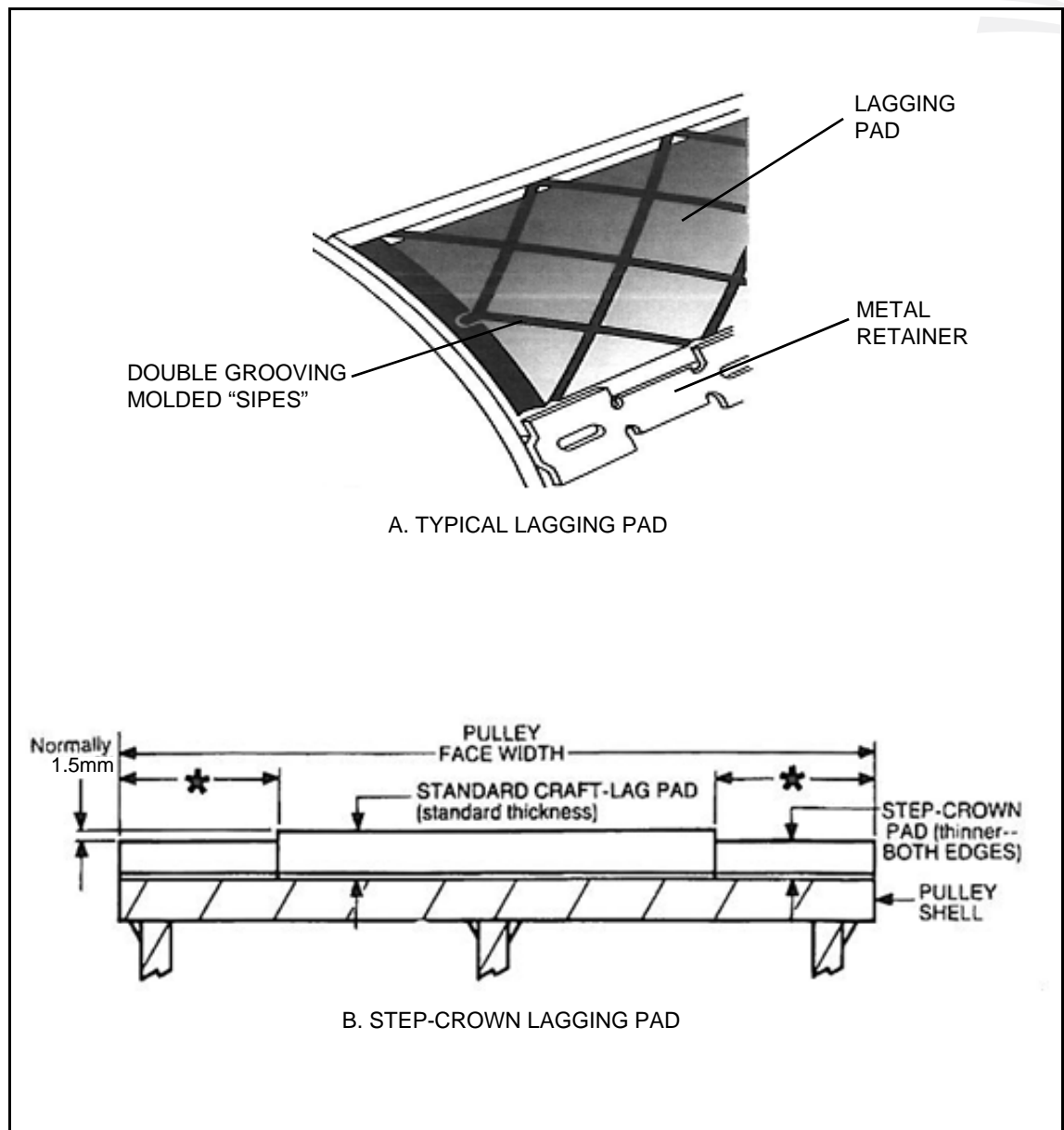


Figure 5.1



6. Troubleshooting



Before continuing, ensure you have completely read and understood this manual's Safety chapter, in addition to the safety information in the section(s) below.

In the following section, we have listed some causes and solutions to some of the problems you may encounter in the field.



WARNING Fully disengage and lock out the power source before attempting any modifications or repairs.

If you encounter a problem that is difficult to solve, even after having read through this troubleshooting section, please contact your local dealer or distributor. Before you contact them, please have this operation manual and the serial number from your machine ready.

PROBLEM	CAUSE	SOLUTION
Belt tracking	All portions of the belt are running to one side at a given point along the length of the conveyor.	Square up the idler pulleys directly preceding the trouble point.
		Advance, in the direction of travel, the end of the idler pulley that has shifted.
	Conveyor housing is crooked.	Straighten the entire conveyor.
	Sticking idler pulleys.	Clean and lubricate the idler pulleys.
	Build up of material on idler, head and/or tail pulleys.	Clean all the pulleys.
	Belt shifts to a low side of the conveyor housing.	Level the entire conveyor.
	Bowed belt.	Adjust tension on the belt.
		Cut out bow and splice in new section of belt.
	Conveyor belt runs to one side for a long distance while loaded.	Check if the load is off center.
		Adjust material loading.
	Increase the tension to get the belt to conform to the crown of the pulleys.	Belt is too stiff to track properly. Replace with less stiff belt.
		Increase the tension to get the belt to conform to the crown of the pulleys.
Tail pulley not properly aligned with head pulley.	Verify that the head pulley is square and plumb.	
	Align the tail pulley with the head pulley.	
	Verify all the idler pulleys are aligned with the head and tail pulleys.	
Premature trough failure	Belt rubbing on the housing.	Re-align the belt.
	Excessive belt speed.	Check belt speed.
Accelerated belt wear	Belt is too tight.	Reduce tension on the belt.
	Speed is too high.	Reduce speed. Consult Tramco to determine proper belt speed.
	Foreign objects.	Remove foreign objects.



PROBLEM	CAUSE	SOLUTION
Belt breakage	Worn belt.	Replace belt if worn.
	Take-up is loose.	Adjust take-up.
	Obstruction in conveyor.	Remove obstruction.
	Pulley mis-alignment	Align pulleys.
	Plugged discharge.	Remove material from discharge.
	Overloading conveyor.	Regulate feed into conveyor.
Drive shaft breakage	Excessive torque.	Recalculate horsepower requirements.
	Obstruction in conveyor.	Remove obstruction.
	Overloading conveyor.	Regulate feed into conveyor.
Bearing failure	Material getting into bearing.	Add or upgrade seal to keep material out of bearing Change outboard bearing.
	Insufficient/Excessive lubrication	Lubricate properly. Follow manufacturer's specs.
	End thrust is causing bearing failure.	Properly install bearing to eliminate end thrust on bearing.
Motor/Heaters overload	Amperage demand too excessive for motor.	Recheck horsepower calculations.
	Incorrect motor size.	Check material properties. (In field conditions)
		Verify capacity is within established design parameters.
		Regulate feed rate.
Capacity	Rated capacity not being reached.	Verify belt speed matches the design specifications.
		Check belt speed under full load.
		Make sure the head pulley is not slipping.
		Re-check design specifications.
Discharge	Conveyor plugging up and shutting down.	Discharge plug switch must be located to detect a plug and shut down the conveyor
	Rated capacity is not reached.	Check the size of the spouting.
		Check the spouting angle. Make sure it is not too flat to allow the material to flow at conveyor capacity.
Loading problem	Material is spilling off the belt.	Verify that the skirt is adjusted properly.
		Increase the conveyor speed or reduce the inlet feed rate.
V-Plow	Splice hitting in the tail section.	Adjust V-Plow. Refer to Section 3.4.5.



TERMS AND CONDITIONS OF SALE

TERMS OF SALE

All prices quoted, unless otherwise noted, are in GBP, and Ex Works. Hull, England.

PAYMENT TERMS

To be agreed upon.

SHIPMENT

[X] weeks after acceptance of the purchase order and receipt of approval drawings. To be agreed upon.

NORMAL SHIPPING PRACTICE

Head and tail sections will be bolted to their respective adjoining intermediate sections. Intermediate sections will have the chain assembled and placed inside the trough, secured and wired in place. All conveyor components are completely preassembled and 'matched marked' prior to shipment.

Other items: Limit switches, motion sensors, inlet flanges, support legs, drive components, etc., if required, are shipped loose and must be installed in the field at the owner's expense.

FREIGHT OPTIONS

Collect: The carrier will bill you directly, based on your discount. If you do not have a discount, they will apply our discount.

Prepaid & Add: The carrier will bill us, and we will then send you a bill for the freight.

PAINTING/GALVANIZING

Surface Preparation: All surfaces are adequately cleaned.

Paint Application: The Paint Application will be done over the exterior surfaces. The standard exterior finish consists of One (1) Coat 50/150 DFT Primer, One (1) coat Gloss Alkyd Enamel in a Regal Yellow Colour.

Galvanized: Conforms to EN ISO 1461.

PRICE AND ACCEPTANCE

All quotations are valid only for thirty (30) days from date of quotation. Sale of goods is not considered complete until the order is accepted by TRAMCO EUROPE LTD, HULL, ENGLAND. All orders are subject to credit approval.

TAXES

This quotation does not include excise or taxes of any kind.

WARRANTY

Goods manufactured by Seller shall conform to the description and specifications set out herein, shall be fit for the ordinary purposes for which such goods are used, and shall be free of defects in workmanship and material at time of shipment.

Providing such equipment is properly installed with competent supervision, and within the load limits for which it was sold, and provided further the equipment is free from critical speed, torsional or other type vibration, no matter how induced.

THERE ARE NO WARRANTIES OF MERCHANTABILITY OR OTHERWISE, EXCEPT OF TITLE, WHICH EXTEND BEYOND THAT STATED ABOVE.

REMEDIES

- a. Seller's liability and Buyer's remedy for breach of warranty or otherwise is expressly limited to repair or replacement of non-conforming machinery or machinery parts of Seller's manufacture when the same are returned F.O.B. Seller's factory within twelve (12) month of shipment hereunder or refund of the purchase price thereof after charging, in either instance, for the service rendered by the non-conforming product.
- b. Seller's liability with respect to any item not of Seller's manufacture shall be limited to that of the Vendor thereof.
- c. Repairs to, alterations of, or work done on equipment warranted hereunder without Seller's prior written authorisation shall void all warranties applicable thereto.
- d. In no event shall Seller's liability exceed the purchase price of the non-conforming item.

SAFETY DEVICES

The products are provided with only those safety devices identified herein. IT IS THE RESPONSIBILITY OF PURCHASER TO FURNISH APPROPRIATE GUARDS FOR MACHINERY PARTS in compliance with OSHA standards, as well as any other safety devices desired by Purchaser and/or required by law.

DELAYS

The Seller shall not be liable for loss of damage resulting from any delay or failure to make delivery of all or any part of the equipment purchased. If shipment is delayed by Purchaser, Seller reserves the right to invoice Purchaser and store the products at Purchaser's expense.

CLERICAL ERROR

Right is reserved to make any corrections in prices quoted due to stenographic or clerical errors on the part of the Seller.

ENTIRE AGREEMENT

This agreement is the entire and only agreement between Purchaser and the Seller; and, no oral statement or agreements not confirmed herein, or by a subsequent written agreement, shall be binding on either Purchaser or the Seller.

CANCELLATION

All orders are considered firm contracts and are not subject to cancellation except on terms that would indemnify Seller against loss.

APPLICABLE LAW

This quotation shall be interpreted and governed in all respects by the law of England. Any part of this agreement contrary to the law of any state shall not invalidate any other part of this agreement in such state.

TRAMCO

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