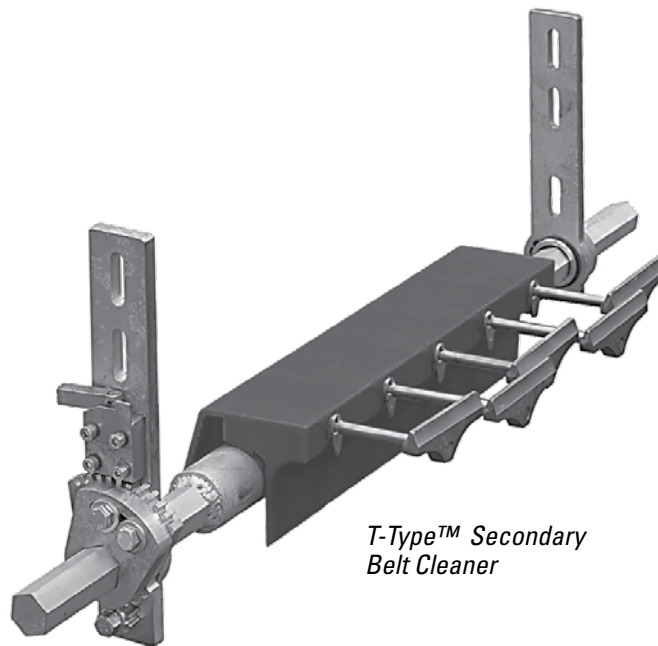


T-Type™ Secondary Belt Cleaner

Installation, Operation and Maintenance Manual



*T-Type™ Secondary
Belt Cleaner*

MHS HD Secondary Cleaner

Serial Number: _____
Purchase Date: _____
Purchased From: _____
Installation Date: _____

Serial number information can be found on the Serial Number Label included in the Information Packet found in the cleaner carton.

This information will be helpful for any future inquiries or questions about belt cleaner replacement parts, specifications or troubleshooting.

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Section 1 - Important Information

1.1 General Introduction

We at Flexco are very pleased that you have selected a T-Type™ Secondary Belt Cleaner for your conveyor system.

This manual will help you to understand the operation of this product and assist you in making it work up to its maximum efficiency over its lifetime of service.

It is essential for safe and efficient operation that the information and guidelines presented be properly understood and implemented. This manual will provide safety precautions, installation instructions, maintenance procedures and troubleshooting tips.

If, however, you have any questions or problems that are not covered, please visit our website or contact our Customer Service Department:

Customer Service: +49-7428-9406-0

Visit www.flexco.com for other Flexco locations and products.

Please read this manual thoroughly and pass it on to any others who will be directly responsible for installation, operation and maintenance of this cleaner. While we have tried to make the installation and service tasks as easy and simple as possible, **it does however require correct installation and regular inspections and adjustments to maintain top working condition.**

1.2 User Benefits

Correct installation and regular maintenance will provide the following benefits for your operation:

- Reduced conveyor downtime
- Reduced man-hour labor
- Lower maintenance budget costs
- Increased service life for the belt cleaner and other conveyor components

1.3 Service Option

The T-Type™ Secondary Belt Cleaner is designed to be easily installed and serviced by your on-site personnel. However, if you would prefer complete turn-key factory service, please contact your local Flexco Field Representative.

Section 2 - Safety Considerations and Precautions

Before installing and operating the T-Type™ Secondary Belt Cleaner, it is important to review and understand the following safety information.

There are set-up, maintenance and operational activities involving both **stationary** and **operating** conveyors. Each case has a safety protocol.

2.1 Stationary Conveyors

The following activities are performed on stationary conveyors:

- Installation
- Blade replacement
- Repairs
- Tension adjustments
- Cleaning

DANGER

It is imperative that OSHA/MSHA Lockout/Tagout (LOTO) regulations, 29 CFR 1910.147, be followed before undertaking the preceding activities. Failure to use LOTO exposes workers to uncontrolled behavior of the belt cleaner caused by movement of the conveyor belt. Severe injury or death can result.

Before working:

- Lockout/Tagout the conveyor power source
- Disengage any takeups
- Clear the conveyor belt or clamp securely in place

WARNING

Use Personal Protective Equipment (PPE):

- Safety eyewear
- Hardhats
- Safety footwear

Close quarters, springs and heavy components create a worksite that compromises a worker's eyes, feet and skull.

PPE must be worn to control the foreseeable hazards associated with conveyor belt cleaners. Serious injuries can be avoided.

2.2 Operating Conveyors

There are two routine tasks that must be performed while the conveyor is running:

- Inspection of the cleaning performance
- Dynamic troubleshooting

DANGER

Every belt cleaner is an in-running nip hazard. Never touch or prod an operating cleaner. Cleaner hazards cause instantaneous amputation and entrapment.

WARNING

Belt cleaners can become projectile hazards. Stay as far from the cleaner as practical and use safety eyewear and headgear. Missiles can inflict serious injury.

WARNING

Never adjust anything on an operating cleaner. Unforeseeable belt projections and tears can catch on cleaners and cause violent movements of the cleaner structure. Flailing hardware can cause serious injury or death.

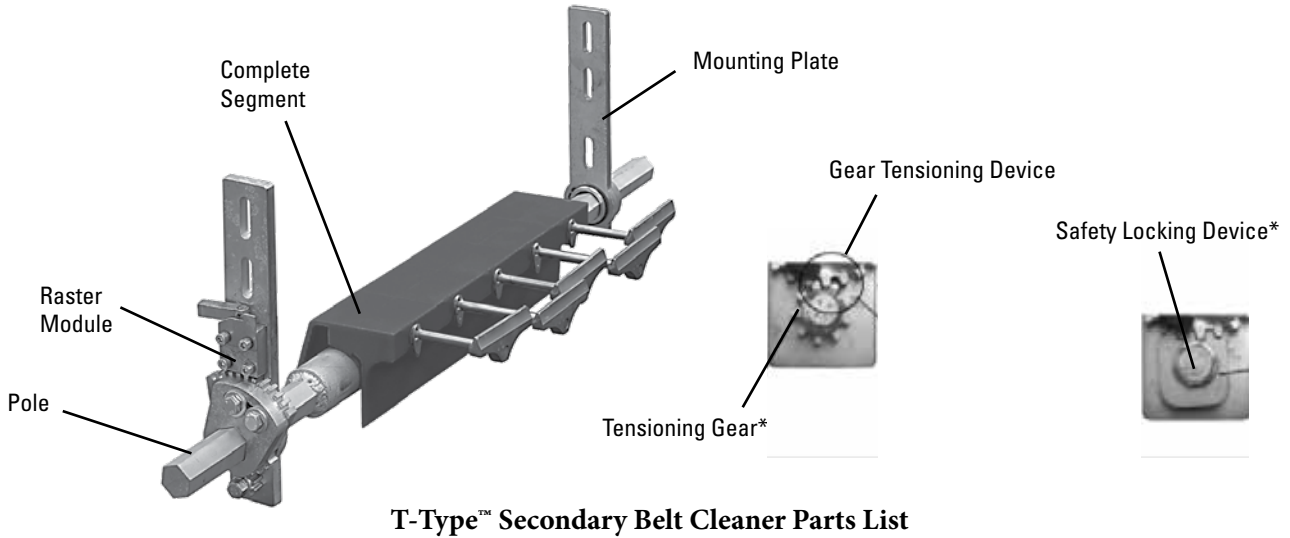
Section 3 - Pre-installation Checks and Options

3.1 Checklist

- Check that the cleaner size is correct for the beltline width
- Check the belt cleaner carton and make sure all the parts are included
- Check the conveyor site:
 - Will the cleaner be installed on a chute
 - Is the install on an open head pulley requiring mounting structure

Section 4 - Installation Instructions

4.0 T-Type™ Secondary Belt Cleaner



*Tensioning Gear and Safety Locking Device are not included in the delivery of the complete scraper. They are supplied independently and per individual customer ordering.

Physically lock out and tag the conveyor at the power source before you begin cleaner installation.

4.1 Before You Begin

- When mounting on the transfer hopper, an access opening may have to be cut out for mounting and inspection.
- Observe all safety precautions when using a cutting torch.
- When welding, protect all connector threads from weld spatter.

4.2 Installation and Operation

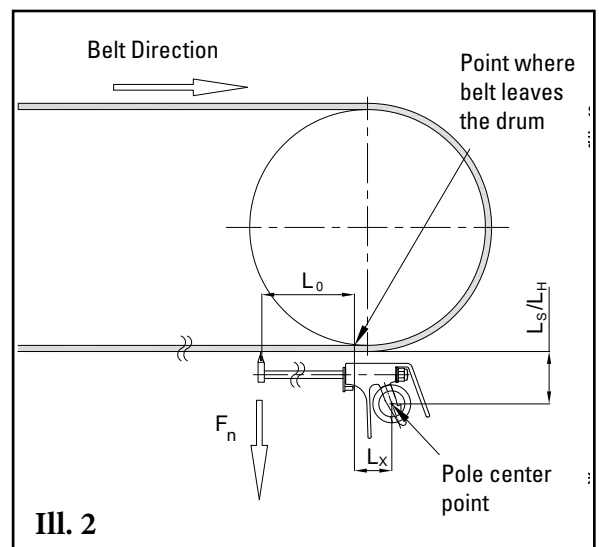
In order to install the scraper it is mandatory to disconnect the conveyor from the power supply and to ensure that no activation is possible by another person without prior notice.

4.3 Choosing the Installation Site

1. **Positioning the Pole.** If the conditions permit, the tensioning device is mounted directly to the conveyor structure. Otherwise, additional adaptive constructions must be made. The construction of the conveyor must definitely be sturdy enough at the fixing point of the scraper in order to avoid transferring vibrations during operation.

The line of contact between blade and conveyor belt should be in a span L_0 of where the belt leaves the drum or behind the head pulley at an appropriate point. However, it should be noted that the further away the scraper position from the drum, the greater the belt deflection caused by the pressure of the scraper blades to the belt.

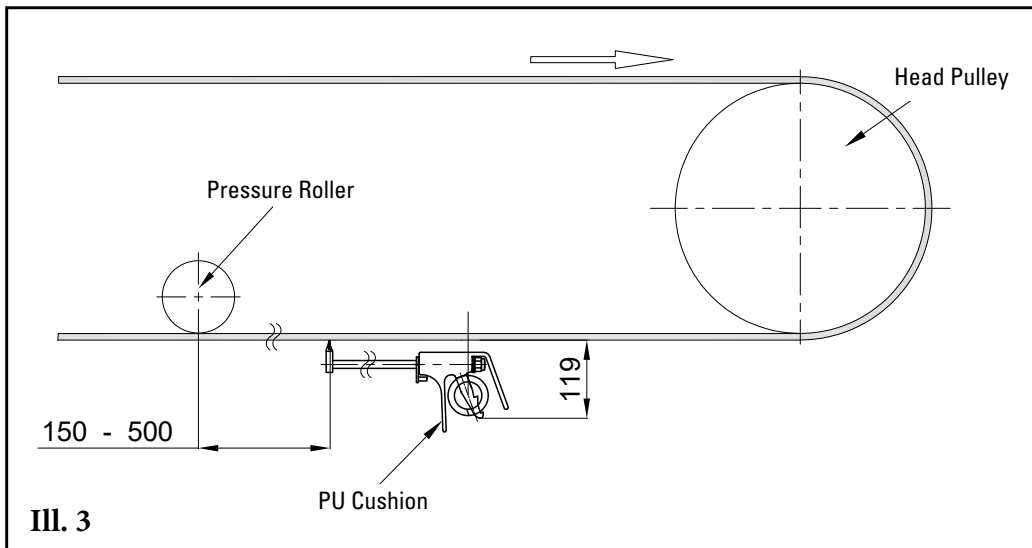
The position of the scraper in relation to the conveyor starts by determining the correct position of the pole in reference to the conveyor belt (L_s/L_H) and the head pulley (L_x) ill. 2.



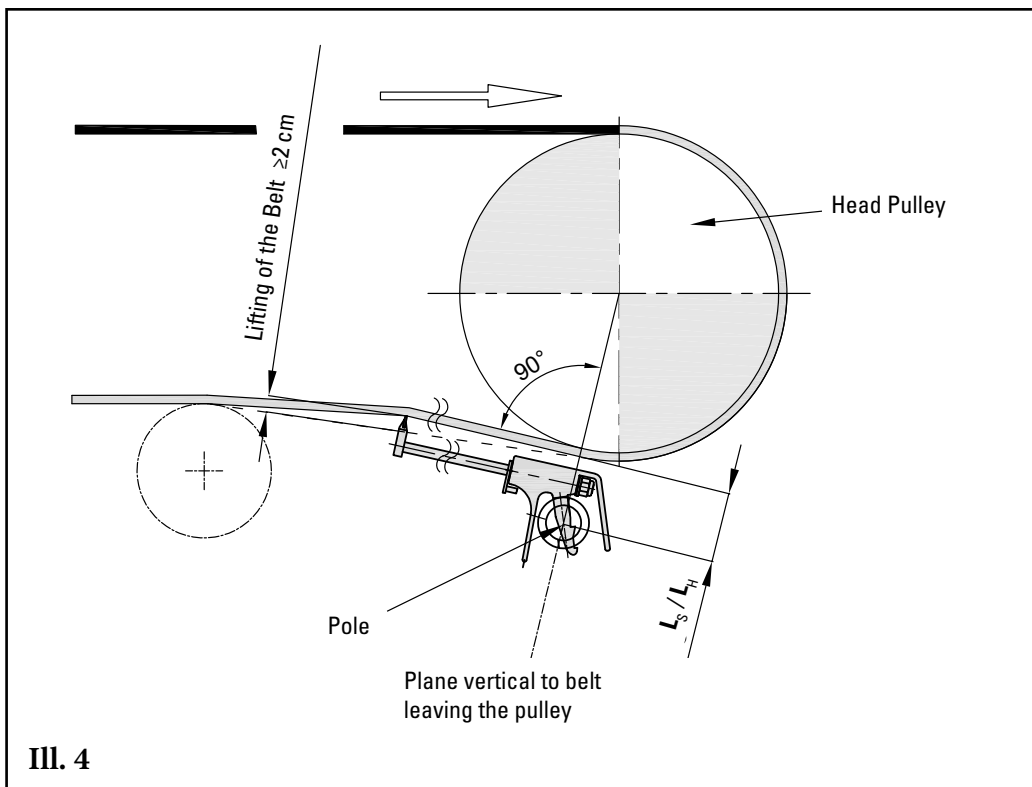
Section 4 - Installation Instructions

4.3 Choosing the Installation Site (cont.)

- Installing a Pressure Roller.** The distance between pole and conveyor belt underside is $L_S=83\text{mm}$ for S and $L_H=80\text{mm}$ for HD/H-version. The condition of $500\text{ mm} \geq L_0 \geq 150\text{ mm}$ must be observed. In any event, the pole position must be parallel on either side of the conveyor.



- Positioning the Scraper Near the Head Pulley.** If the belt is lifted by more than 2 cm after tensioning the scraper (ill. 4), a pressure roller (ill.3) should be mounted in a distance of 150-500 mm behind the contact between belt and blade.



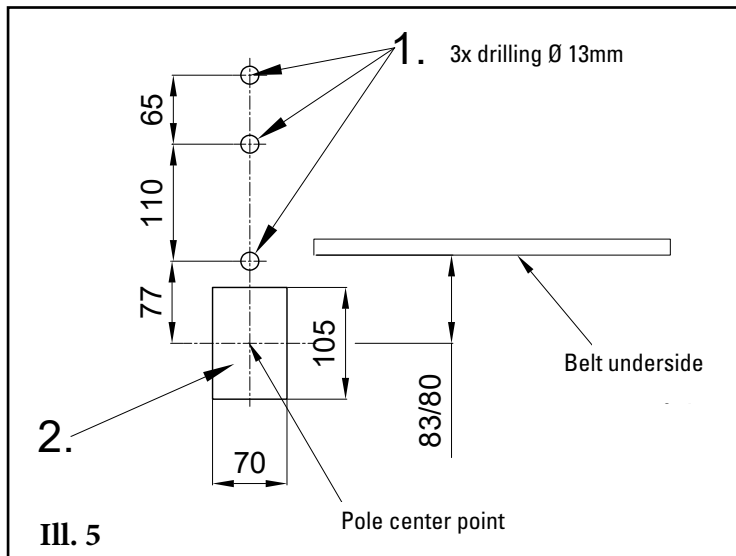
Section 4 - Installation Instructions

4.4 Producing Attachment Holes

1. **Position of the Attachment Drillings.** Prepare holes on both sides of the conveyor (2) to enable the insertion of the pole in the chute (ill. 5). Then prepare the holes (1) on either side of the conveyor to mount the tensioning device. Position the holes so that after fitting of the tensioning device the pole has a distance L_S/L_{H1} (80-83mm) to the underside of the belt (ill. 4). If the attachment holes are beyond the outline of the conveyor construction, additional adaptive supports should be mounted on the conveyor construction so that the scraper can be mounted in a distance of $L_X, L_0, L_S/L_{H1}$.

The tensioning device can be mounted at any desired angle to the belt (vertical, horizontal, diagonal), however, the required position according to illustration 4 must be adhered to. If mounted horizontally or diagonally, it must be possible to correct the position of the pole relating to the belt (oblong holes).

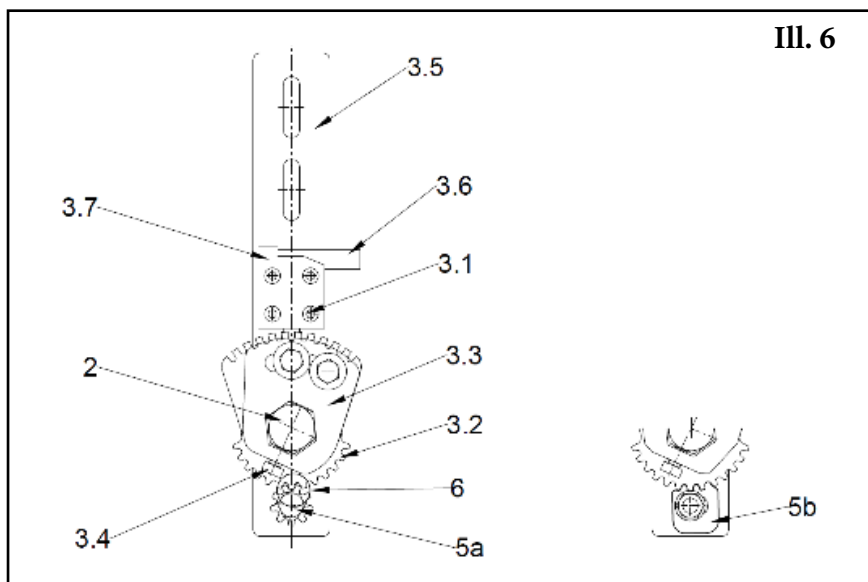
1. 3x drilling $\varnothing 13$ for mounting of the tensioning device.
2. Min. space for pole with segments



Section 4 - Installation Instructions

4.5 Mounting the Scraper

- a) The mounting of the secondary scraper T-Type™ starts with preparing the holes (2) on both sides of the conveyor, as described in ill. 5. Afterwards, the pole is slid through the holes. Place the mounting plates at the end of the pole (SW36) with the tensioning device at one side and the mounting plate with the locking ring on the other side and attach it directly or with additional supports on the conveyor structure.
- b) Condition: prior to installation, you must check that there is ample space for maintenance of the scraper. Further, you must ensure that the pole can turn freely around its axis.
- c) Scraper with dual tensioner must have the low part of the pinion plate (3.2) in illustration 6 point be adjusted in a way that both pinion plates (3.2) can be locked simultaneously by each tension lever.
- d) Place the complete segments (1) in the cut-outs of the the pole (2). Make sure that the fixing of the segment over the complete segment length consistently projects over the contour of the pole (illustration 11).
- e) The final pole (2) position relating to the belt needs to be corrected in a way that the complete segments (1) are symmetric to the belt. Lock the position of the tensioner with the locking screw 3.4 (illustration 6).
- f) Check all screw connections.



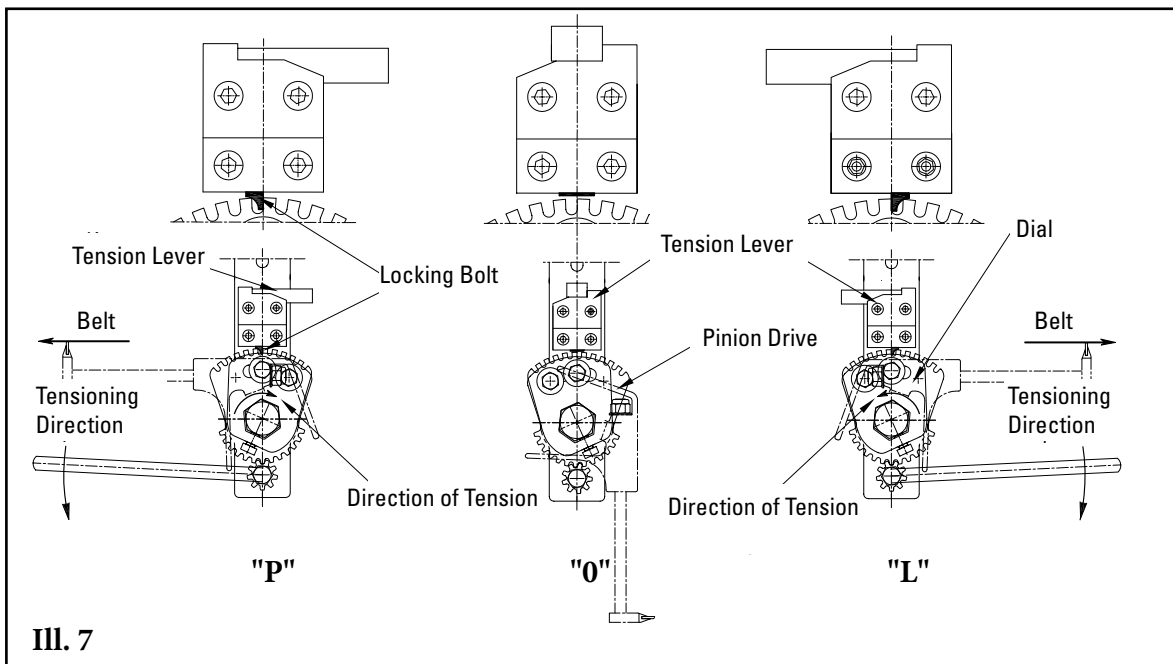
Section 4 - Installation Instructions

4.6 Tensioning the Scraper

After taking the above steps, the scraper can be tensioned. Functioning of the tensioning device is described in illustration 9. To increase tension the wrench SW 19 is turned on the tensioning gear and the torque is transferred to the pole via the mechanical gear. Please observe that turning the SW 19 wrench is opposite direction of the blade.

Prior to tensioning the scraper the ratchet lever must be adjusted according to the tensioning direction, please observe the mounting of the tension lever guide plate 3.7 (ill. 6) "P" – right or "L" – left.

The tensioning device must be tensioned in a way that the pole turns only in the direction that the tensioning lever points. Turning the pole opposite direction that the tensioning level points may lead to damage of the tensioning bolt. The turn of the pole in any direction can be effected if the tensioning lever is in position "0" in illustration 7.



Position "P"– right tension (turning) of the complete segments only possible clockwise.

Position "0"– in this position (assembly and maintenance position) it is impossible to set or keep the tension.

Position "L"– left tension (turning) of the complete segments is only possible counterclockwise.

On installation the tension lever guide plate can be installed depending on scraper tensioning direction in position "P" or "L". The locking plate is fixed with two M8-hexagon socket screws.

The scraper is tensioned until the respective Fn-pressure value of the blades takes effect on the belt. The Fn-pressure value (ill. 6) is measured by weight and chosen according to Chart 1.

Chart 1: Fn-pressure value of the blades of the secondary scraper T-Type on the conveyor belt

Conditions	Clamping force	Fn-Pressure (kg)
Very wet, muddy, greasy material and at belt speeds > 3.5 m/s	Very high tension force, only allowed for undamaged belts	20 – 30 kg
Very wet, muddy material and at belt speeds <3.5 m/s	High tensioning force, only allowed for undamaged belts	20 – 25 kg
Wet and sandy material at belt speeds <1,5 m/s	Medium tensioning force	15 – 20 kg
For severely damaged belts	Low tensioning force	<15 kg

Section 5 - Maintenance

Flexco belt cleaners are designed to operate with minimum maintenance. However, to maintain superior performance some service is required. When the cleaner is installed a regular maintenance program should be set up. This program will ensure that the cleaner operates at optimal efficiency and problems can be identified and fixed before the cleaner stops working.

All safety procedures for inspection of equipment (stationary or operating) must be observed. The T-Type Secondary Belt Cleaner operates at the discharge end of the conveyor and is in direct contact with the moving belt. Only visual observations can be made while the belt is running. Service tasks can be done only with the conveyor stopped and by observing the correct lockout/tagout procedures.

5.1 New Installation Inspection

After the new cleaner has run for a few days a visual inspection should be made to ensure the cleaner is performing properly. Make adjustments as needed.

5.2 Routine Visual Inspection (every 2-4 weeks)

A visual inspection of the cleaner and belt should look for:

- If adjusting brackets are set correctly for optimal tensioning
- If belt looks clean or if there are areas that are dirty
- If blade is worn out and needs to be replaced
- If there is damage to the blade or other cleaner components
- If fugitive material is built up on cleaner or in the transfer area
- If there is cover damage to the belt
- If there is vibration or bouncing of the cleaner on the belt
- If a snub pulley is used, a check should be made for material buildup on the pulley
- Significant signs of carryback

If any of the above conditions exist, a determination should be made on when the conveyor can be stopped for cleaner maintenance.

5.3 Routine Physical Inspection (every 6-8 weeks)

When the conveyor is not in operation and properly locked and tagged out, a physical inspection of the cleaner to perform the following tasks:

- Clean material buildup off of the cleaner blade and pole
- Closely inspect the blade for wear and any damage. Replace if needed.
- Ensure full blade to belt contact
- Inspect the cleaner pole for damage
- Inspect all fasteners for tightness and wear. Tighten or replace as needed.
- Replace any worn or damaged components
- Check the tension of the cleaner blade to the belt. Adjust the tension if necessary using the steps in Chart 1.
- When maintenance tasks are completed, test run the conveyor to ensure the cleaner is performing properly.

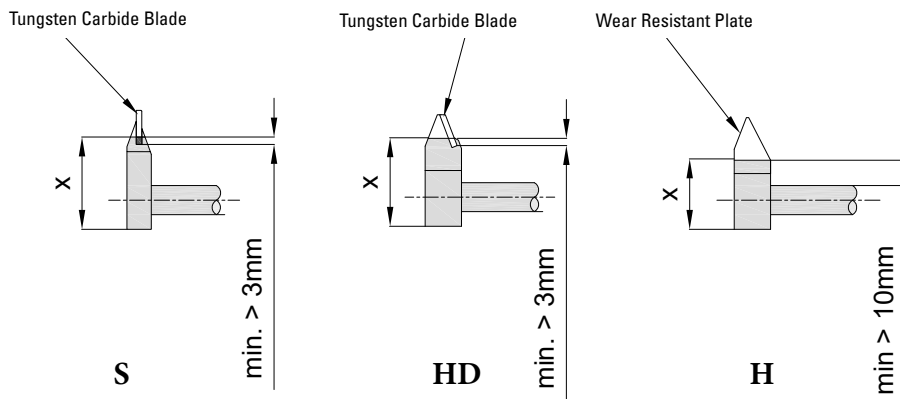
Section 5 - Maintenance

5.4 Maintenance Instructions

The scrapers are low-maintenance; however, please observe the following:

- Cleaning of the complete segments as necessary
- Pressure of the blades on the belt - depending on the cleaning efficiency
- Check that all screws are properly tightened
- Correct position of the scraper - as per illustration 2/4
- Wear of the blades as per illustration 8

If any of the above conditions exist, a determination should be made on when the conveyor can be stopped for cleaner maintenance.



III. 8

If the x measurement reaches x_{min} , blades need to be changed out.

1. Platte S - $x_{min} = 37\text{mm}$
2. HD Platte - $x_{min} = 36\text{mm}$
3. Platte H - $x_{min} = 28\text{mm}$

5.5 Information

It may happen with Blades for S- and HD-parts that the wear on the right and left side of the tungsten carbide blade is not equally distributed. Therefore it has to be ensured that the difference in height of both end blades to the middle is no more than 3 mm.

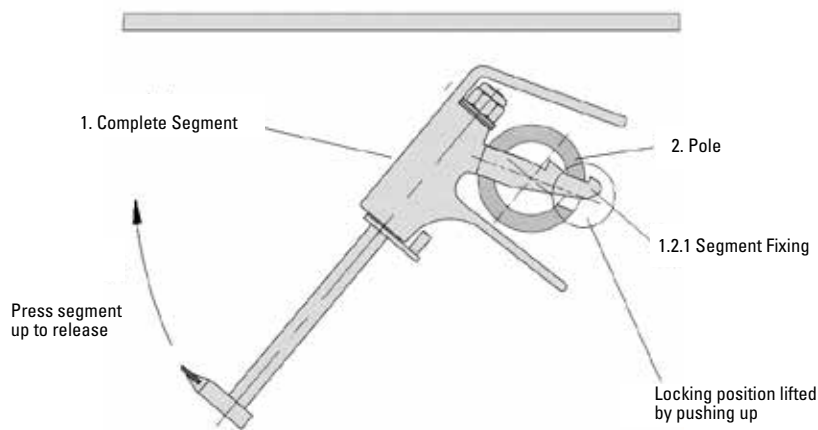
If one of the conditions is reached, the user is obliged to change out the blades.

Section 5 - Maintenance

5.6 Replacing the Complete Segments

1. Release tension lever according to paragraph
2. Bend segment in a way that the segment fixing is released (illustration 9).
3. Detach the complete segment from the pole.
4. Insert the new segments into the cut-outs until the correct mounting position is reached.
(segment fixing 1.2.1. Illustration 9 outside the pole).
5. Eliminate the possibility of damage to the segments (check state of conveyor belt and splice, fix damages).
6. Check rotations of the scraper with segments (the scraper with segments should run freely around its axis).
7. Tension the scraper as per point 3.2.3.
8. Check effectiveness of the belt cleaning process.
9. Correct pressure F_n if needed.

It is always recommended to replace segments if worn.



III. 9

5.7 Intervals for Maintenance/Inspection

- Each week - in 3-shift operation
- Every 2 weeks - in 2-shift operation
- Every 3 weeks - in 1-shift operation
- Daily if conditions are extreme, i.e. if the ambient temperature falls below 0°C or the temperature of the conveyed material exceeds 80°C

Section 5 - Maintenance

5.8 Troubleshooting

If there is a malfunction of the scraper, observe the following instructions:

Problem	Possible Cause	Possible Solutions
Cleaning result is insufficient	Complete segments are incorrectly fitted (too tight or too weak)	Correct the pressure F_n according to the recommendation of Chart 1 and check the free rotation of the scraper
	Complete segments do not touch the belt	Check that installation is in accordance with mounting instructions - check the free rotation of the scraper
	Complete segments are damaged or worn	Replace with complete new ones
	Complete segments or the scraper are dirty	Clean complete segments and scraper
	Pole is not perpendicular to the conveyor	Check if the installation corresponds with the mounting instructions. Check the position of the mounting plate, the pole and complete segments
	Not all complete segments are evenly touching the conveyor belt	Release the scraper, clean the complete segments, and tension the scraper again

Due to the uneven distribution of the conveyed material on the belt but also uneven wear of the belt, a unequal wear of the complete segments is acceptable. In this case complete segments should be replaced periodically.

In the winter, ice and snow should be removed from the scraper and scraper should be checked for proper functioning before start of work. In the winter Flexco T-Type™ scraper should be serviced in a special way (in shorter intervals than described in point 5.2/5.3/5.7). These preventative measures protect the belt during successive starts of the conveyor from damages, e.g. caused by frozen material.

The manufacturer of the scraper assumes no liability for damages caused by incorrect installation, wrong maintenance or the use of non-original spare parts.

5.9 Waste Disposal (used parts)

Flexible PU cushions may not be disposed of in regular waste bins. Please contact your local authorities for further instructions. All other parts may be recycled.

Section 5 - Maintenance

5.10 Maintenance Log

Conveyor Name/No. _____

Date: _____ Work done by: _____ Service Quote #: _____

Activity: _____

Date: _____ Work done by: _____ Service Quote #: _____

Activity: _____

Date: _____ Work done by: _____ Service Quote #: _____

Activity: _____

Date: _____ Work done by: _____ Service Quote #: _____

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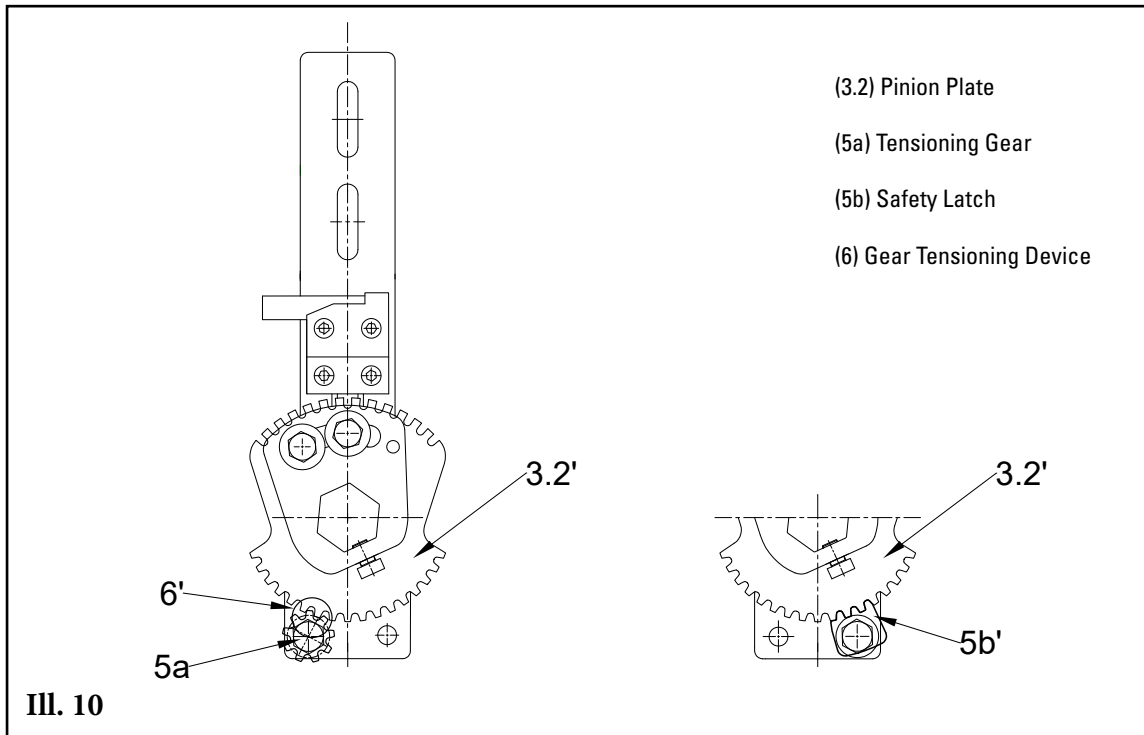
Activity: _____

Section 6 - HD Tensioning Device

6.1 Accessories

Different versions and configurations of the T-Type™ Secondary Belt Cleaner

In special cases, the secondary scraper T-Type™ can be equipped with a HD tensioning device instead of a standard tensioner (ill. 10). If it is impossible to drill a hole in the side of the conveyor structure, a bypass access may be used. The manufacturer must be consulted individually in each of the cases.



The tensioning device HD differs from the standard tensioner through the construction of the pinion plate (3.2) and the safety latch (5b). It is recommended to use this tensioning device in applications of belt widths greater than 1200mm. This solution is used for lighter tensioning of the scraper — a larger gear ratio (6).

The installation, tension and initial operation of the T-Type™ Secondary Belt Cleaner with HD tensioning device is the same as described under point 4.



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