

# V-Plough

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## Installation, Operation and Maintenance Manual

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# V-Plough

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Purchase Date: \_\_\_\_\_

Purchased From: \_\_\_\_\_

Installation Date: \_\_\_\_\_

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

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## 1.1 General Introduction

We at Flexco are very pleased that you have selected the V-Plough 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 web site or contact our Customer Service Department:

**Customer Service: +27-11-608-4180**

**Visit [www.flexco.com](http://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 plough and other conveyor components

## 1.3 Service Option

The V-Plough 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 Engineer or your Flexco Distributor.

## Section 2 - Safety Considerations and Precautions

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Before installing and operating the V-Plough, 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.

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### 2.1 Stationary Conveyors

The following activities are performed on stationary conveyors:

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

#### **DANGER**

It is imperative that Lockout/Tagout (LOTO) regulations, 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 ploughs. 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 plough is an in-running nip hazard. Never touch or prod an operating plough. Plough hazards cause instantaneous amputation and entrapment.

#### **WARNING**

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

#### **WARNING**

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

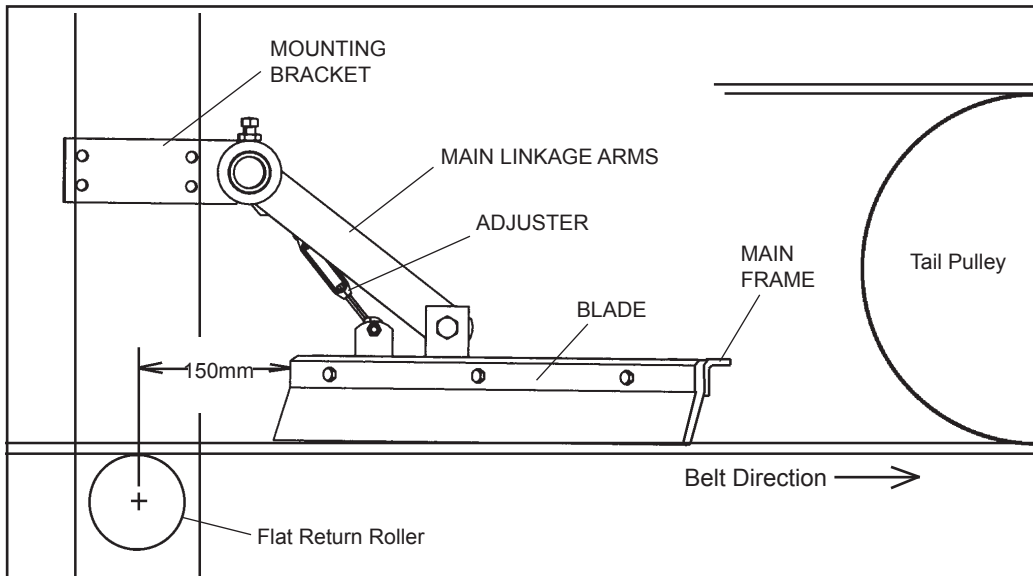
## Section 3 - Pre-installation Checks and Options

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### 3.1 Checklist

- Check that the plough size is correct for the beltline width
- Check the product carton and make sure all the parts are included
- Review the “Tools Needed” list on the top of the installation instructions
- Check the conveyor site:
  - Are there obstructions that may require plough location adjustments
  - Ensure proper clearance is available between topside and returnside belts (250mm)

## Section 4 - Installation Instructions - V-Plough



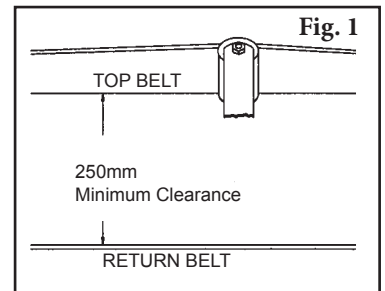
**Physically lock out and tag the conveyor at the power source before you begin installation.**

**Before Installation:** Ideally the V-Plough should be positioned in a flat area on the inside of the belt close to the tail pulley. For optimum cleaning performance, the nose of the plough should be located about 150mm behind a return roller.

### Tools Needed:

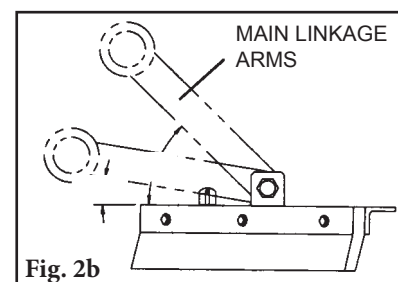
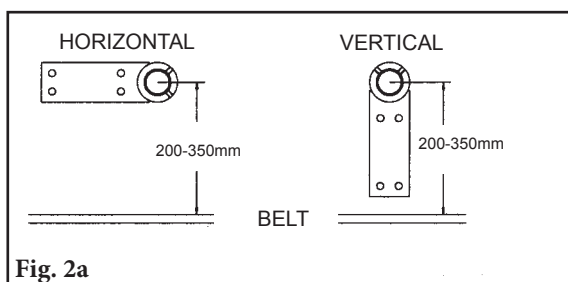
- 14mm wrench
- 13mm wrench
- 19mm wrench
- 24mm wrench

**STEP 1. Measure the distance between the top side and return belts.** A minimum of 250mm is required (Fig. 1). Place the V-Plough on the belt, positioned as specified above, to check for any clearance or obstruction problems.



**STEP 2. Position the mounting brackets in either a horizontal or vertical position.**

The centre line of the pole must be within a range of 200mm to 350mm above the return belt to insure proper performance (Fig. 2a). **IMPORTANT:** The main linkage arms must be operated in a range between a minimum of 10° and a maximum of 45° (Fig. 2b). This allows the V-Plough to float on the belt.



## Section 4 – Installation Instructions (cont.)

### STEP 3. Mark and drill holes for the mounting brackets.

Attach with 13mm bolts and nuts provided (Fig. 3). Welding is optional.

Fig. 3

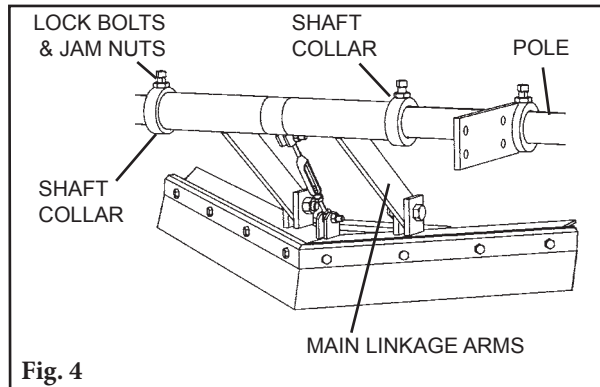
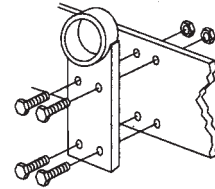


Fig. 4

### STEP 4. Centre the V-Plough on the belt.

Loosen the jam nuts and lock bolts on both stop collars on the pole. Slide the plough in the direction needed to centre it on the belt. Once located, slide stop collars up to main linkage arms and tighten the lock bolts and jam nuts (Fig. 4). **NOTE:** Do not push stop collars too tightly against the main linkage assemblies so that it restricts easy movement of the linkage.

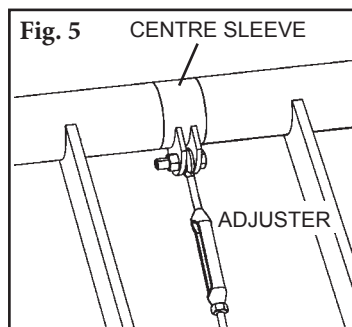


Fig. 5

### STEP 5. Attach the adjuster to the centre sleeve.

Remove the nut and bolt from the centre sleeve, insert the end of the adjuster between the brackets, and reinstall the nut and bolt (Fig. 5).

**IMPORTANT:** Tighten only until snug; the adjuster should move freely.

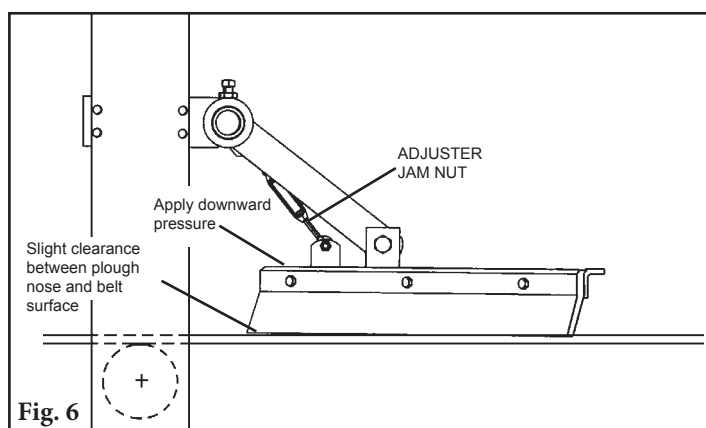


Fig. 6

### STEP 6. Position the V-Plough to the belt.

While applying downward pressure to the nose of the plough, turn the adjuster so that the nose just begins to lift off the surface of the belt (about 2-5 mm). Tighten the adjuster jam nut (Fig. 6).

### STEP 7. Test run and inspect.

Run the belt and check that the V-Plough runs smoothly and has an effective cleaning action. If any vibration occurs, turn the adjuster to raise the nose slightly.



## Section 5 - Pre-Operation Checklist and Testing

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### 5.1 Pre-Op Checklist

- Recheck that all fasteners are tightened properly
- Check the blade location on the belt
- Be sure that all installation materials and tools have been removed from the belt and the conveyor area

### 5.2 Test Run the Conveyor

- Run the conveyor for at least 15 minutes and inspect the performance
- Make adjustments as necessary

**NOTE:** Observing the plough when it is running and performing properly will help to detect problems or when adjustments are needed later.

## Section 6 - Maintenance

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

All safety procedures for inspection of equipment (stationary or operating) must be observed. The V-Plough operates near the tail pulley 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.

### 6.1 New Installation Inspection

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

### 6.2 Routine Visual Inspection (every 2-4 weeks)

A visual inspection of the plough and belt can determine:

- If the blade has optimal tensioning
- If the belt looks clean or if there are areas that are dirty
- If the blades are worn out and needs to be replaced
- If there is damage to the blade or other belt plough components
- If fugitive material is built up on the plough or in the transfer area
- If there is cover damage to the belt
- If there is vibration or bouncing of the plough on the belt
- Check for build up on the leading return roll

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

### 6.3 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 belt plough to perform the following tasks:

- Clean material buildup off of the belt plough blade and frame
- Closely inspect the blade for wear and any damage. Replace if needed.
- Ensure full blade to belt frame contact (tip should have slight clearance)
- Inspect the belt plough pole for damage
- Inspect all fasteners for tightness and wear. Tighten or replace as needed.
- Replace any worn or damaged components
- When maintenance tasks are completed, test run the conveyor to ensure the belt plough is performing properly

## Section 6 - Maintenance

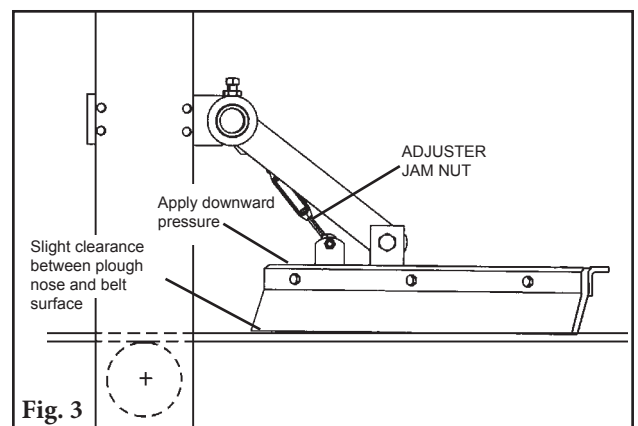
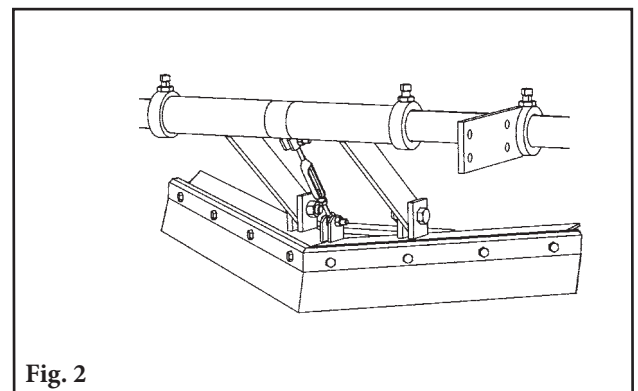
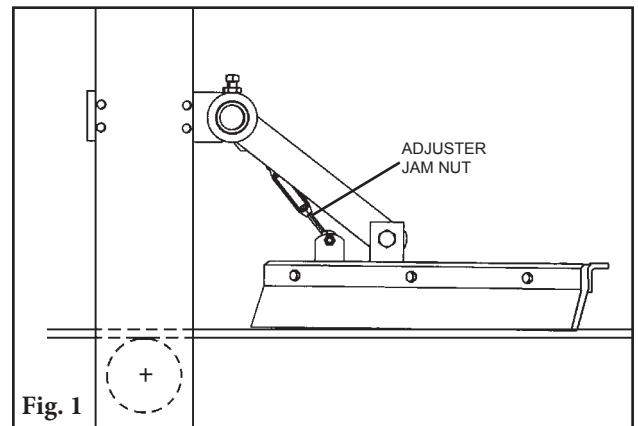
### 6.4 Blade Replacement Instructions

***Physically lock out and tag the conveyor at the power source before you begin maintenance.***

#### Tools Needed:

- 14mm wrench
- 13mm wrench
- 19mm wrench
- 24mm wrench

1. **Loosen adjuster jam nut.** After adjuster jam nut is loose the adjuster can be turned to provide more clearance for the new blade (Fig 1.)
2. **Remove worn blade.** Unscrew all bolts holding the old blade and face plate top main frame. Remove the blade and clean off any remaning material on plough frame (Fig 2.)
3. **Install new blade.** Use current bolts to secure new blade to main frame.
4. **Position the V-Plough to the belt.** While applying downward pressure to the nose of the plough, turn the adjuster so that the nose just begins to lift off the surface of the belt (about 2.5 mm). Tighten the adjuster jam nut (Fig. 3).
5. **Test run and inspect.** Run the belt and check that the V-Plough runs smoothly and has an effective cleaning action. If any vibration occurs, turn the adjuster to raise the nose slightly



## Section 6 - Maintenance

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### 6.5 Maintenance Log

Conveyor Name/No. \_\_\_\_\_

Date: \_\_\_\_\_ Work done by: \_\_\_\_\_ Service Quote #: \_\_\_\_\_

Activity: \_\_\_\_\_

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Date: \_\_\_\_\_ Work done by: \_\_\_\_\_ Service Quote #: \_\_\_\_\_

Activity: \_\_\_\_\_

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Date: \_\_\_\_\_ Work done by: \_\_\_\_\_ Service Quote #: \_\_\_\_\_

Activity: \_\_\_\_\_

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Date: \_\_\_\_\_ Work done by: \_\_\_\_\_ Service Quote #: \_\_\_\_\_

Activity: \_\_\_\_\_

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Date: \_\_\_\_\_ Work done by: \_\_\_\_\_ Service Quote #: \_\_\_\_\_

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Date: \_\_\_\_\_ Work done by: \_\_\_\_\_ Service Quote #: \_\_\_\_\_

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Date: \_\_\_\_\_ Work done by: \_\_\_\_\_ Service Quote #: \_\_\_\_\_

Activity: \_\_\_\_\_

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Date: \_\_\_\_\_ Work done by: \_\_\_\_\_ Service Quote #: \_\_\_\_\_

Activity: \_\_\_\_\_

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## Section 6 - Maintenance

### 6.6 Plough Maintenance Checklist

Plough: \_\_\_\_\_ Serial Number: \_\_\_\_\_

#### Beltline Information:

Beltline Number: \_\_\_\_\_ Belt Condition: \_\_\_\_\_

Belt Width: ☐ 450mm ☐ 600mm ☐ 750mm ☐ 900mm ☐ 1050mm ☐ 1200mm ☐ 1350mm ☐ 1500mm ☐ 1800mm ☐ 2100mm ☐ 2400mm

Head Pulley Diameter (Belt & Lagging): \_\_\_\_\_ Belt Speed: \_\_\_\_\_ fpm Belt Thickness: \_\_\_\_\_

Belt Splice: \_\_\_\_\_ Condition of Splice: \_\_\_\_\_ Number of Splices: \_\_\_\_\_ ☐ Skived ☐ Unskived

Material conveyed: \_\_\_\_\_

Days per week run: \_\_\_\_\_ Hours per day run: \_\_\_\_\_

#### Blade Life:

Date blade installed: \_\_\_\_\_ Date blade inspected: \_\_\_\_\_ Estimated blade life: \_\_\_\_\_

Is blade making complete contact with belt? ☐ Yes ☐ No

Distance from wear line: Left \_\_\_\_\_ Middle \_\_\_\_\_ Right \_\_\_\_\_

Blade condition: ☐ Good ☐ Grooved ☐ Smiled ☐ Not contacting belt ☐ Damaged

Was Plough Adjusted: ☐ Yes ☐ No

Frame Condition: ☐ Good ☐ Bent ☐ Worn

Lagging: ☐ Side Lag ☐ Ceramic ☐ Rubber ☐ Other ☐ None

Condition of lagging: ☐ Good ☐ Bad ☐ Other \_\_\_\_\_

Cleaner's Overall Performance: \_\_\_\_\_ (Rate the following 1 - 5, 1= very poor - 5 = very good)

Appearance: ☐ Comments: \_\_\_\_\_

Location: ☐ Comments: \_\_\_\_\_

Maintenance: ☐ Comments: \_\_\_\_\_

Performance: ☐ Comments: \_\_\_\_\_

Other comments \_\_\_\_\_

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## Section 7 - Troubleshooting

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Problem	Possible Cause	Possible Solutions
Poor cleaning performance	Plough not making proper contact with belt	1. Check location of plough to flat return roller
		2. Check turnbuckle adjustment and check main linkage arm angles
Attaining proper float	Restriction in movement on linkage arms	Shaft/ stop collars may be too tight
Material getting through	Too much space between belt and blade	Check V-Plough nose for proper clearance between nose and belt. Check adjuster arm angles.

## Section 8 - Specs and CAD Drawings

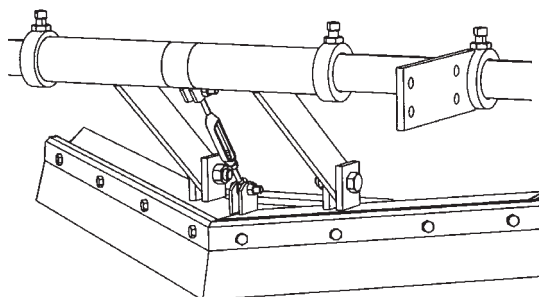
### 8.1 Specs and Guidelines

#### V-Plough

##### Belt Width Specifications

SIZE	BELT WIDTH (Min-Max)
	mm
Extra Small	450-600
Small	750-900
Medium	1050-1200
Large	1350-1500
1800	1800
2100	2100
2400	2400

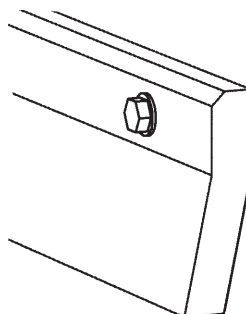
Use next larger size for belt widths between ranges.



#### V-Plough

##### Blade Specifications

Material	Polyurethane
Durometer	67-D
Working Temperature	-40° to 71° °C
Grease & Chemical Resistance	Excellent
Sticky Material Performance	Excellent

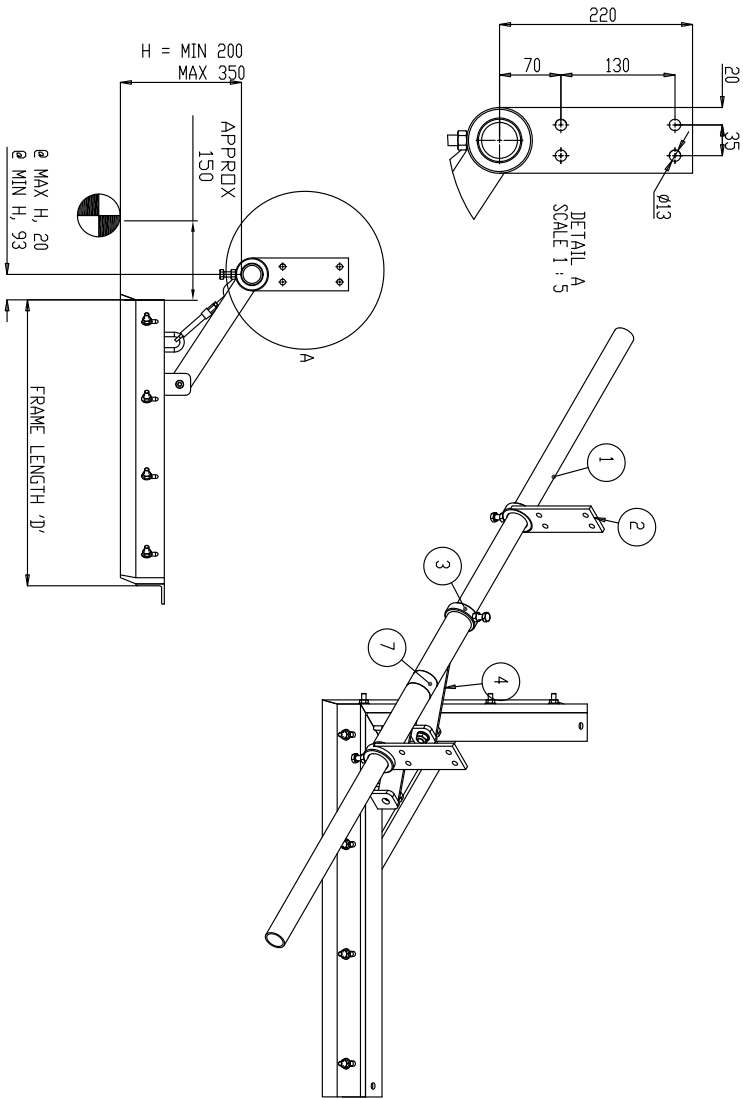
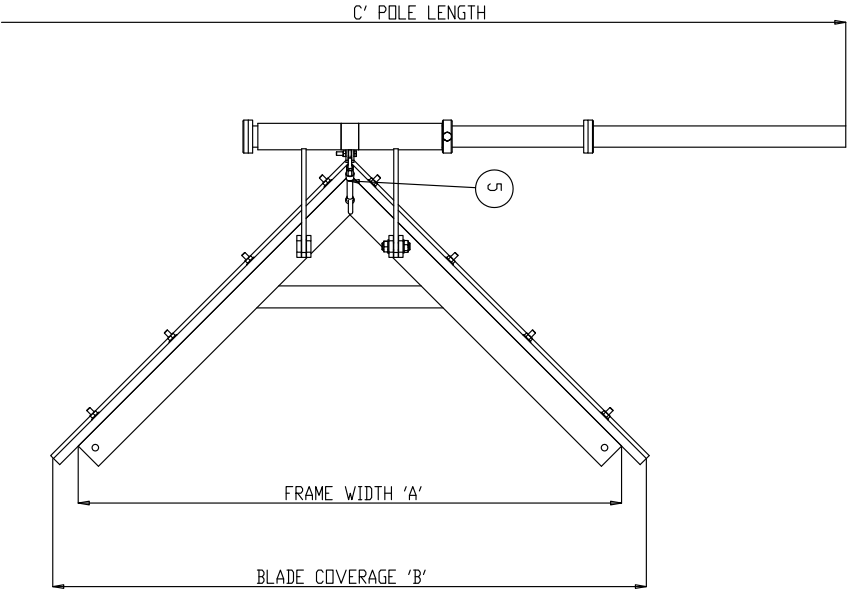


#### Application Guidelines

- Belt Splice.....Mechanically Fastened/Vulcanized
- Belt Speed .....5m/s for V-Plough; 3.5m/s for Diagonal Plough
- Belt Direction.....One Way

# Section 8 - Specs and CAD Drawings

## 8.2 CAD Drawings



V Plough - Poly Urethane blade - Mild Steel				V Plough - Poly Urethane blade - Stainless Steel			
BELT WIDTH (mm)	ITEM	ITEM CODE	WEIGHT (kg)	ITEM	ITEM CODE	WEIGHT (kg)	
450	BP450	73102	23	BP450-S.S	73337	24	A FRAME WIDTH
600	BP600	73104	28	BP600-S.S	73338	25	B BLADE COVERAGE
750	BP750	73106	35	BP750-S.S	73339	27	C POLE LENGTH
900	BP900	73107	42	BP900-S.S	73340	29	D FRAME LENGTH
900	BP900	73108	28	BP900-S.S	73341	30	
1050	BP1050	73110	31	BP1050-S.S	73342	32	
1200	BP1200	73112	38	BP1200-S.S	73343	39	
1400	BP1400	73113	42	BP1400-S.S	73344	44	
1500	BP1500	73114	42	BP1500-S.S	73345	45	
1600	BP1600	73115	44	BP1600-S.S	73346	46	
1800	BP1800	73117	65	BP1800-S.S	73347	67	



## Section 9 - Replacement Parts

### 9.1 Replacement Parts List

Replacement Parts		MILD STEEL		STAINLESS STEEL	
DESCRIPTION	ORDERING NUMBER	ITEM CODE	ORDERING NUMBER	ITEM CODE	
Pole	BP450-750-PL	73109	BP450-750-PL-S/S	A0683	
	BP800-1050-PL	73111	BP800-1050-PL-S/S	A0613	
	BP1200-1400-PI	73118	BP1200-1400-PI-S/S	A0621	
	BP1500-1600-PI	73119	BP1500-1600-PI-S/S	A0647	
	BP1800-PL	73121	BP1800-PL-S/S	A1547	
Mounting Bracket	BP-MB	73123	BP-MB-S/S	A0615	
Shaft Collar	BP-SC	73125	BP-SC-S/S	A0616	
Linkage Arm	BP-LA	73127	BP-LA-S/S	A0614	
Standard Turnbuckle	BP-TL	73141	BP-TB	73138	
Standard U-Bolt			BP-UB	73139	
Turnbuckle Linkage			BP-TL-S/S	A0617	

### Replacement Blades

#### Poly Urethane-pair

BELT WIDTH mm	ORDERING NUMBER	ITEM CODE	WT. KG.
450	BP450-B	74055	0.9
600	BP600-B	73777	0.9
750	BP750-B	73778	1.8
800	BP800-B	74057	1.8
900	BP900-B	73779	1.8
1050	BP1050-B	73780	1.8
1200	BP1200-B	73781	1.8
1400	BP1400-B	73782	2.3
1500	BP1500-B	73783	2.3
1600	BP1600-B	73784	2.7
1800	BP1800-B	73785	3.2

Note: Poly Urethane Blades are approved for use in underground mines



## Section 10 - Other Flexco Conveyor Products

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Flexco provides many conveyor products that help your conveyors to run more efficiently and safely. These components solve typical conveyor problems and improve productivity. Here is a quick overview on just a few of them:

### EZP1 Precleaner



- Patented ConShear™ blade renews its cleaning edge as it wears
- Visual Tension Check™ for optimal blade tensioning and simple retensioning
- Quick and easy one-pin blade replacement
- Material Path Option™ for optimal cleaning and reduced maintenance

### Flexco Slider/Impact Beds



- Adjusting troughing angles for easy installation and adjustability
- Long-wearing UHMW for sealing the load zone
- Offered in both Light & Medium duty designs to affordably fit your application

### MHS Secondary Cleaner



- Long-wearing tungsten carbide blades for superior cleaning efficiency
- Patented FormFlex™ cushions independently tension each blade to the belt for consistent, constant cleaning power
- Easy to install, simple to service
- Works with Flexco mechanical belt splices

### PT Max™ Belt Trainer



- Patented “pivot & tilt” design for superior training action
- Dual sensor rollers on each side to minimize belt damage
- Pivot point guaranteed not to freeze up
- Available for topside and return side belts

### Flexco Specialty Belt Cleaners



- “Limited space” cleaners for tight conveyor applications
- High Temp cleaners for severe, high heat applications
- A rubber fingered cleaner for chevron and raised rib belts
- Multiple cleaner styles in stainless steel for corrosive applications

## **The Flexco Vision**

To become the leader in maximising  
belt conveyor productivity for our customers worldwide  
through superior service and innovation.

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