

2 – About the FastBack® Model 50E

The FastBack® Model 50E is a horizontal motion conveyor. Product moves through a cycle that has a slow forward, fast backward motion. The horizontal motion of the FastBack® causes the flow rate (the rate at which product travels along the conveyor) to be proportional to the motion frequency of the conveyor. A faster flow rate results in lower bed depth (the height of the product in the pan).

The FastBack® Model 50E comes from the factory set up to run at its optimal speed of 56 Hz. This speed produces the fastest flow rate with the least mechanical stress. Operating the FastBack® at more than 56 Hz will not improve flow rates.



Operating the FastBack® at more than 56 Hz may contribute to early failure of key mechanical components and may void the product warranty.

The FastBack® Model 50E consists of two major subassemblies: the pan assembly and the drive assembly (see Photo 2-1). The sections that follow describe these subassemblies in detail.

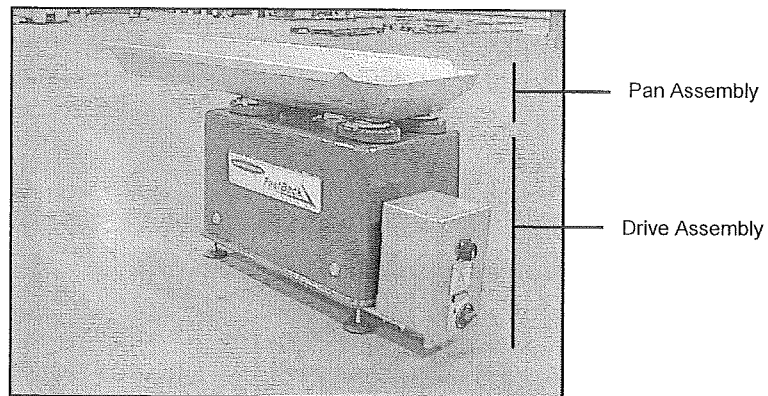


Photo 2-1 – Pan and Drive Subassemblies

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Pan Assembly

The pan assembly attaches to the top of the drive assembly with four lever-actuated, over-center band clamps. Three standard pan accessories are available: the adjustable nose discharge, fines screen section, and flow levelers.

Adjustable Nose Discharge

The adjustable nose discharge (see Photo 2-2) guides product to a weigher or scale. It allows the pan length to be adjusted for precise positioning of the product. The adjustable nose discharge attaches to the pan with two four-prong knobs.

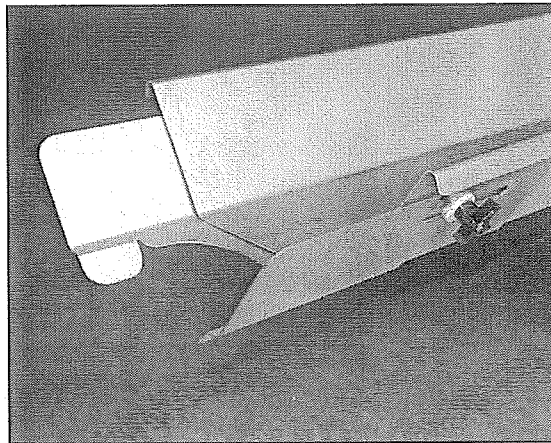


Photo 2-2 – Adjustable Nose Discharge

Fines Screen Insert

The fines screen insert (see Photo 2-3) is a drop-in accessory that removes product fines. It can be custom-engineered for specific product types.

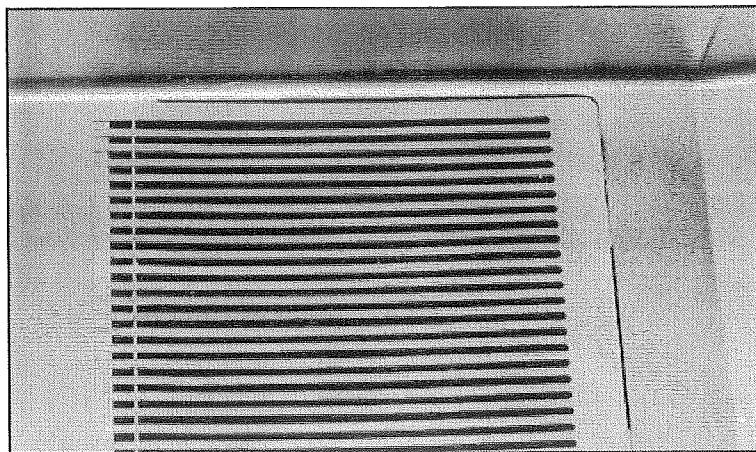


Photo 2-3 – Fines Screen Insert

Flow Levelers

Flow levelers (see Photo 2-4) are used to achieve consistent bed depth from front to rear and side to side in applications that require greater process control. They are typically used prior to scale drop points or seasoning drums and can be either installed in the pan or included in a pan insert.

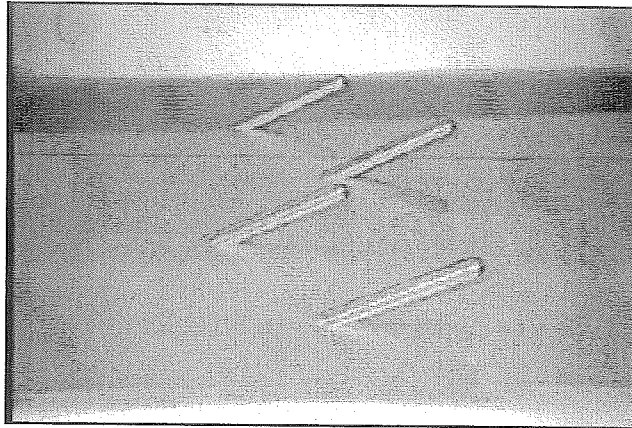


Photo 2-4 - Flow Levelers

Drive Assembly

This section describes the various components that make up the drive assembly. These components are as follows:

- Enclosure
- Slider Assembly
- Power Module
- Photoeye Assembly
- Proximity Sensor
- Motor Assembly
- Eccentric Sprocket System
- Counterweight
- Crankshaft Assembly
- Driveshaft
- Tensioner Sprocket Assembly
- Idler Sprocket Assembly
- Motor Junction Box
- Articulating Feet

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Enclosure

The one-piece enclosure covers the drive assembly (see Photo 2-5). It is attached to the drive assembly by four quarter-turn fasteners, one at each corner.



Always remove the enclosure completely before performing any maintenance on the drive assembly. Section 5 – Maintenance describes how to remove the enclosure.

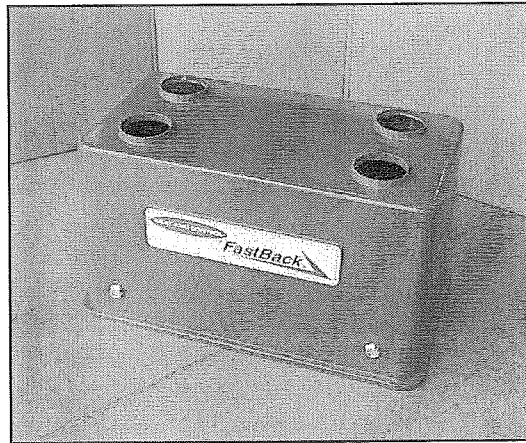


Photo 2-5 - Enclosure

Slider Assembly

The slider assembly (see Photo 2-6) prevents loose product from entering the drive assembly. It consists of four covers that slide with the pan to conceal the opening in the top of the enclosure. A pan attachment disk is bolted to the top of each slider cover.

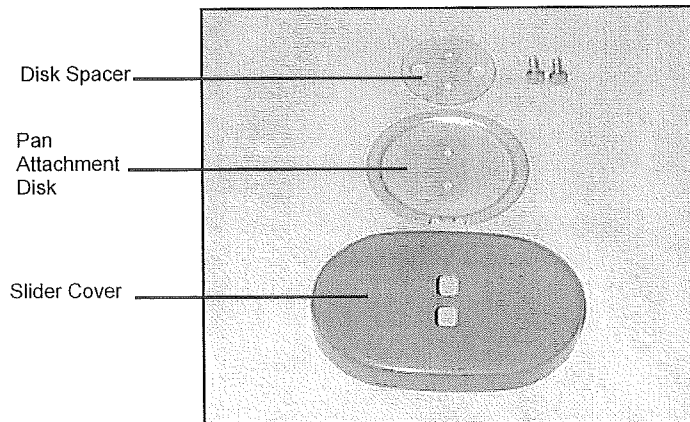


Photo 2-6 – Slider Assembly

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The slider assembly can include a slider seal inside the slider cover to make the drive assembly watertight (see Photo 2-7).

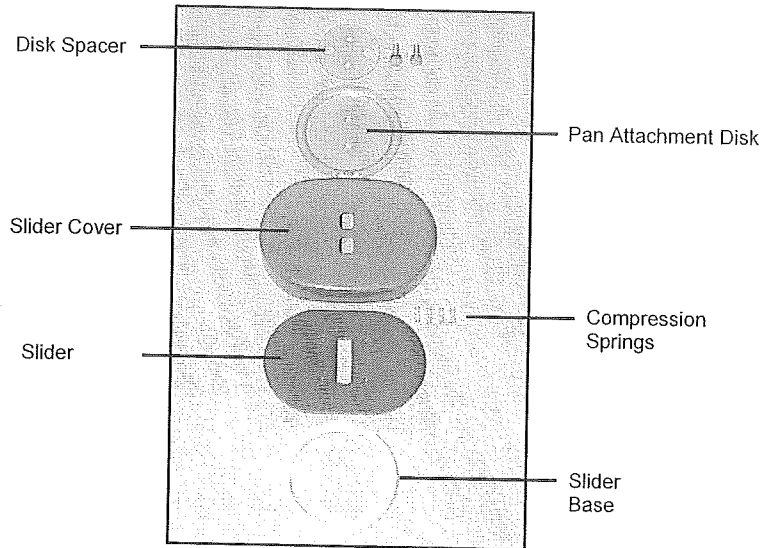


Photo 2-7 – Slider Assembly (for Washdown Environments)

Power Module

The power module connects power from the main power supply and the control source to the drive assembly. It is contained in a NEMA 4X (IP65) box that is attached to the outside of the drive assembly enclosure (see Photo 2-8).

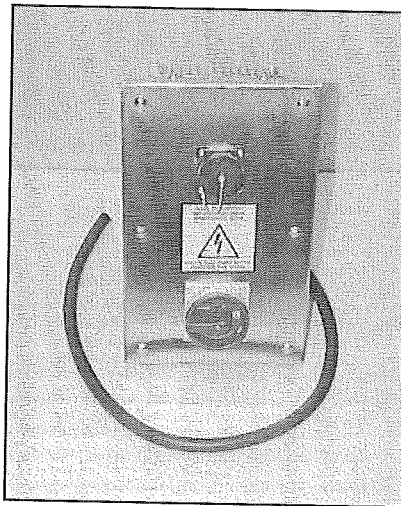


Photo 2-8 - Power Module Enclosure

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The power module can be programmed to run the FastBack® Model 50E in any of the following modes:

- Single speed, start/stop with or without run confirmation
- Multi-speed with or without run confirmation
- Variable speed (4-20mA analog input) with or without run confirmation

The power module comes from the factory wired to the drive assembly and initialized to run single speed, stop/start with run confirmation. During installation, the power module must be wired to the main power supply and to the control source at your facility. Section 4 – Installation Procedures describes this procedure.

The FastBack® Model 50E comes with either a Yaskawa power module.

Yaskawa Power Module

The Yaskawa power module comes from the factory with a hand-held operator and an I/O cable (see Photo 2-10). These accessories enable you to access the drive parameters, view error codes, and determine drive status.

Note: *The hand-held operator and I/O cable are supplied only with your facility's original order. Spares are available through Heat and Control (see Appendix B).*

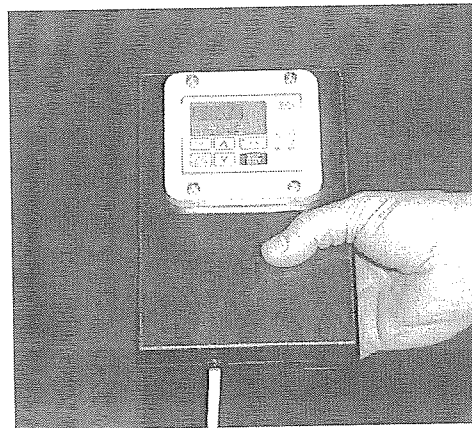


Photo 2-10 - Yaskawa Hand-Held Operator

Photoeye Assembly

The photoeye assembly is an optical sensing system used to regulate the bed depth of product in the pan. It consists of an *efector* (or comparable) photoeye, a quick-disconnect cable, and a bracket that holds it at a 45° angle above the pan (see Photo 2-11). Most applications require only a single photoeye. Two photoeyes are supplied if two bed depths are desired.

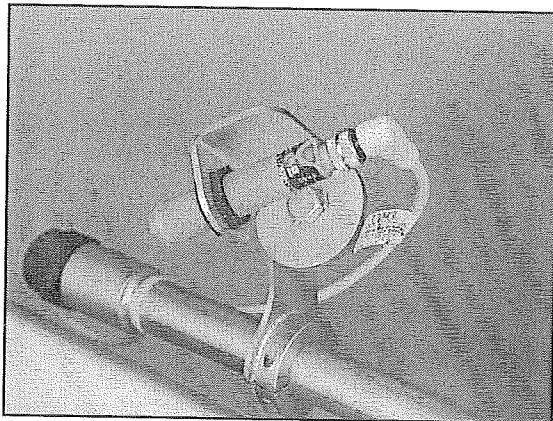


Photo 2-11 – Photoeye Assembly Positioned at 45° Angle

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The dual-voltage *efector* photoeye is a diffuse photoeye (it returns the signal off the product itself) (see Figure 2-1). It has a maximum focal length of 600 mm (24 inches) and is suitable for a washdown environment.

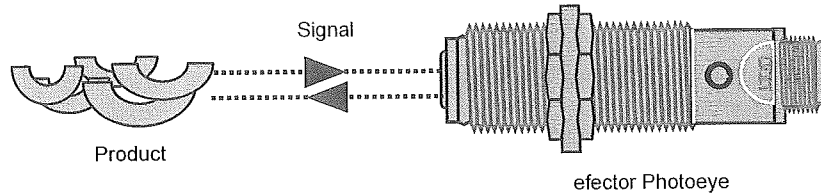


Figure 2-1 - efector Diffuse Photoeye

The FastBack® Model 50E comes from the factory with the photoeye assembly attached (see Photo 2-12).

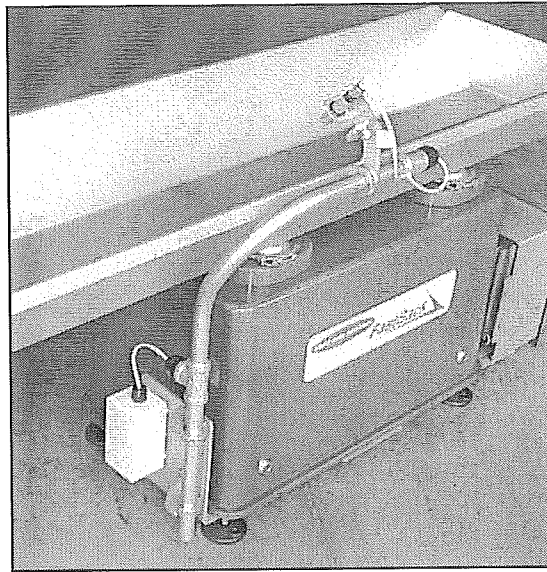


Photo 2-12 – Photoeye Assembly

A junction box on the drive assembly enclosure connects the photoeye assembly to the control source at your facility. During installation, the photoeye must be wired to its power supply and to the control source. In addition, the brackets holding the photoeye must be adjusted and tightened so that the photoeye is properly positioned for calibration to the desired bed depth. Section 4 – Installation Procedures describes both procedures.

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Proximity Sensor

A proximity sensor may be used to monitor changing bed depths and product travel rates. The sensor measures the distance between the height of the product in the pan and itself and returns a 4-20mA signal that is proportional to that distance. This signal may be used to control other equipment, such as a seasoning system.

The remaining subassemblies described in this section reside under the enclosure. Photos 2-13 and 2-14 show the motor side and eccentric sprocket side of the drive assembly, respectively, with the enclosure removed.

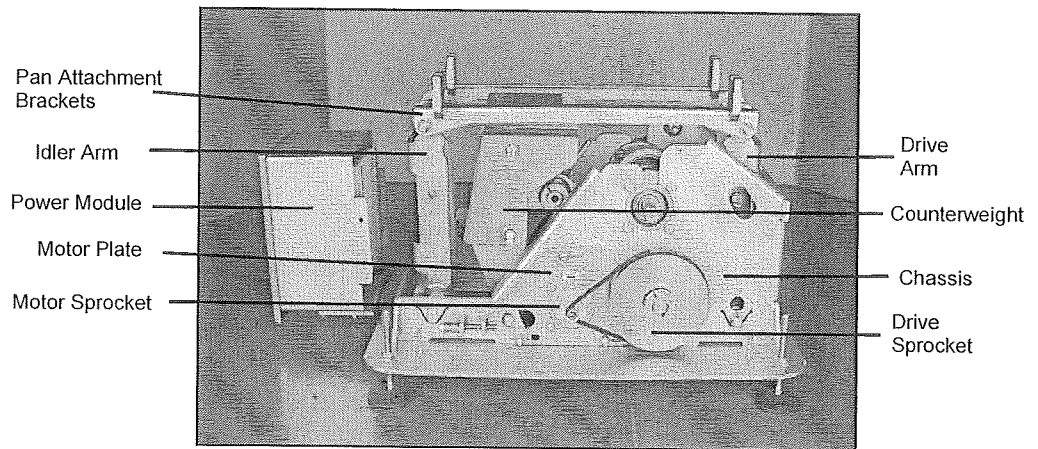


Photo 2-13 – Motor Side View of Drive Assembly

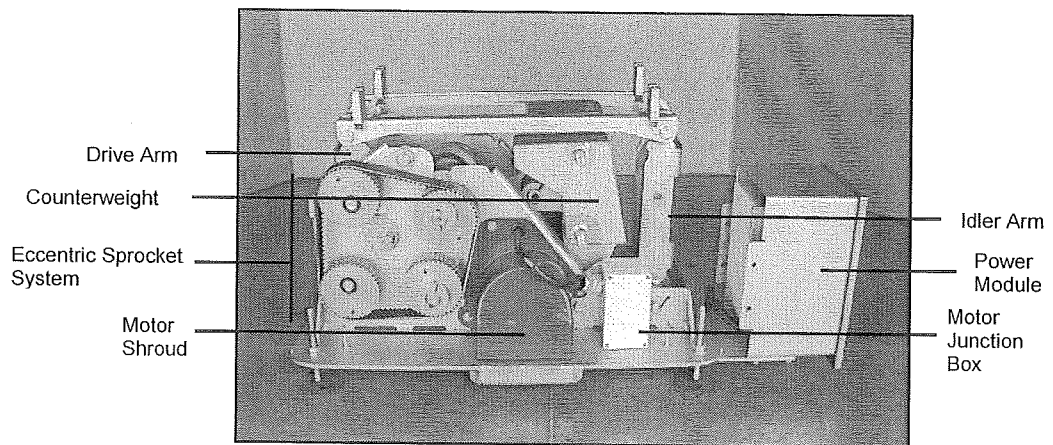


Photo 2-14 – Eccentric Sprocket Side View of Drive Assembly

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Motor Assembly

The motor assembly consists of a custom-engineered motor, a motor sprocket that is welded to the motor shaft, a liquid-tight cord grip, and power leads (see Photo 2-15). The totally enclosed, fan-cooled (TEFC) motor is face-mounted to the motor mounting plate with four bolts.

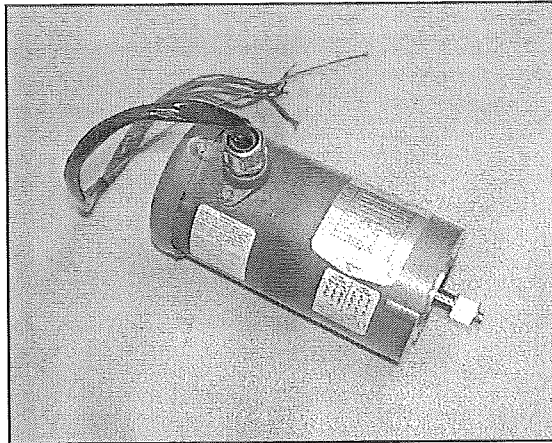


Photo 2-15 – Motor Assembly

Eccentric Sprocket System

The eccentric sprocket system consists of four sprockets that work together to create the slow forward and fast backward motion of the FastBack® (see Photo 2-16).

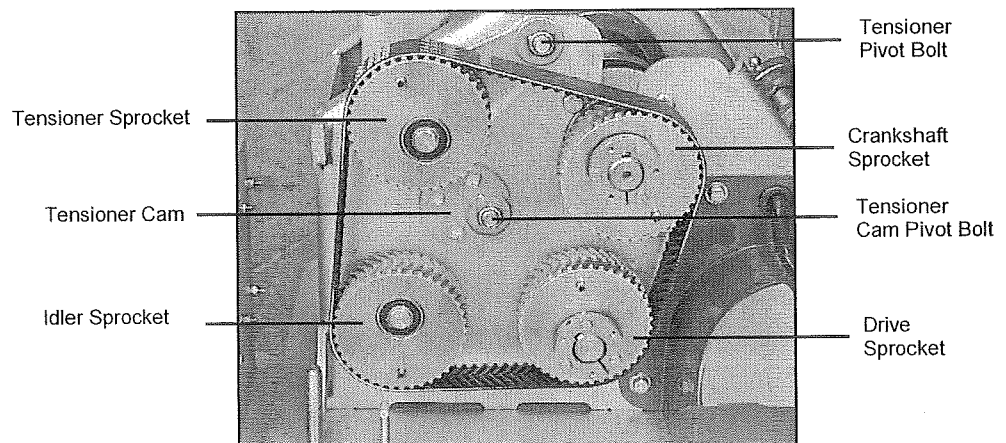


Photo 2-16 – Eccentric Sprocket System

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- The drive sprocket and crankshaft sprocket are connected to the driveshaft and crankshaft, respectively.
- The tensioner sprocket is part of the tensioner sprocket assembly (see “Tensioner Sprocket Assembly” later in this section).
- The idler sprocket is part of the idler sprocket assembly (see “Idler Sprocket Assembly” later in this section).
- The tensioning cam applies the load required to tension the eccentric timing belt. Section 5 – Maintenance describes this procedure.

Counterweight

The counterweight compensates for the dynamic forces of the pan. It consists of a base billet and a series of counterweight plates that are bolted in pairs to the billet. Each counterweight is custom-engineered for a specific pan. Photo 2-17 shows a typical counterweight and its position inside the drive assembly.

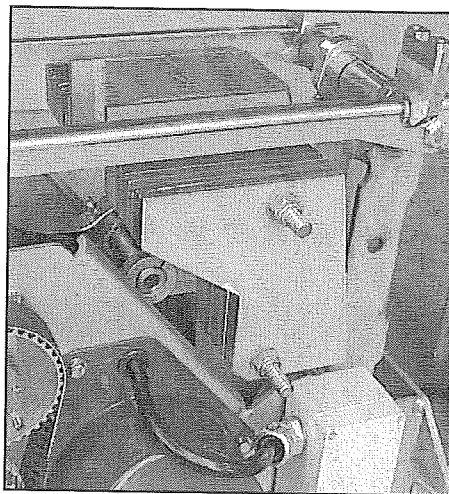


Photo 2-17 - Counterweight

Crankshaft Assembly

The crankshaft assembly drives the pan and the counterweight. It consists of a crankshaft and two connecting rods, one for the drive arm and one for the counterweight (see Photo 2-18).

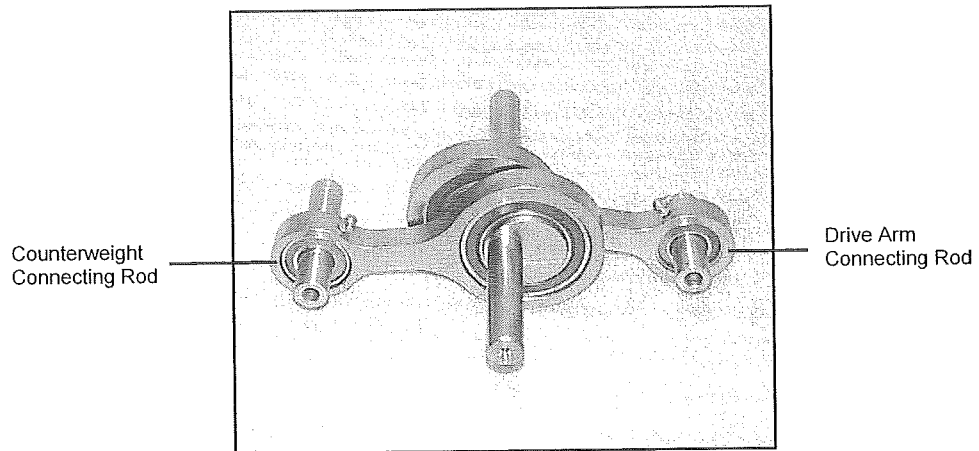


Photo 2-18 – Crankshaft Assembly



Heat and Control strongly recommends replacing worn crankshaft assemblies with new or rebuilt assemblies from Heat and Control. Do not replace individual components of this assembly. In addition, one spare crankshaft assembly should be kept on hand. Section 5 - Maintenance describes how to replace the crankshaft assembly.

Note: *Worn crankshaft assemblies may be returned to the Heat and Control Galesburg office for guaranteed rebuild services. Contact the Galesburg office at (309) 342-5518.*

Driveshaft

The driveshaft (Photo 2-19) transfers power from the motor sprocket to the eccentric sprocket system. It consists of a polished OD shaft with a ¼-inch key slot on each end.

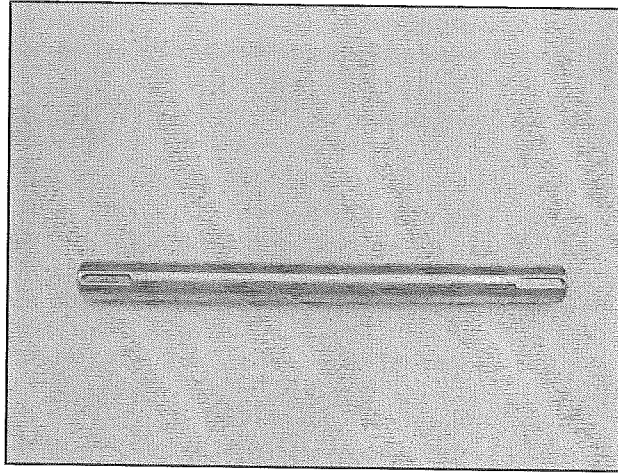


Photo 2-19 - Driveshaft



Heat and Control strongly recommends replacing the driveshaft with a new driveshaft from Heat and Control. In addition, one spare driveshaft should be kept on hand.

Tensioner Sprocket Assembly

The tensioner sprocket assembly is part of the eccentric sprocket system and is used to tension the eccentric sprocket belt. It consists of an idler sprocket with two bearings mounted on a shaft. This shaft is welded to the tensioner arm and pivots about the narrow end. Photo 2-20 shows the tensioner sprocket assembly.

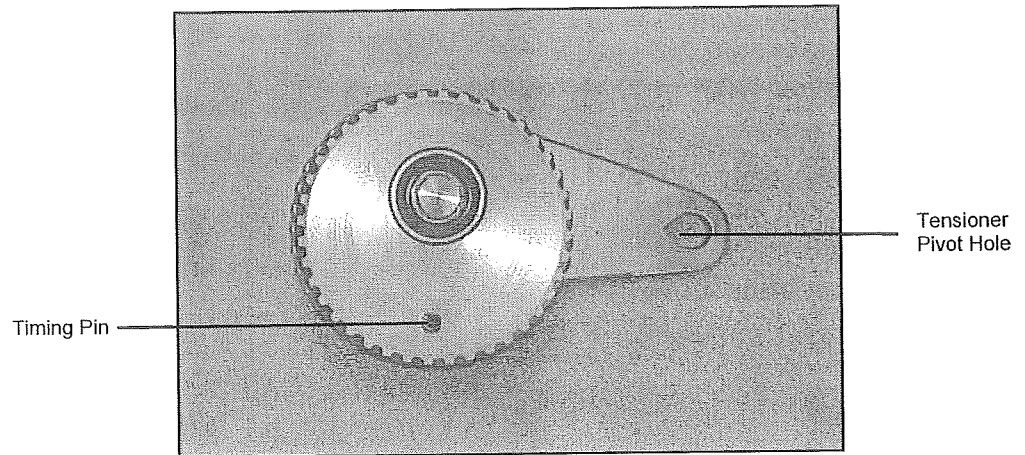


Figure 2-20 - Tensioner Sprocket Assembly



Heat and Control strongly recommends replacing the tensioner sprocket assembly with new components from Heat and Control. In addition, one spare idler sprocket and two bearings should be kept on hand.

Idler Sprocket Assembly

The idler sprocket assembly takes up the slack in the eccentric timing belt during operation. It consists of a stationary idler in the eccentric sprocket system, and an idler sprocket with two bearings mounted on a shoulder bolt. Photo 2-21 shows the idler sprocket.

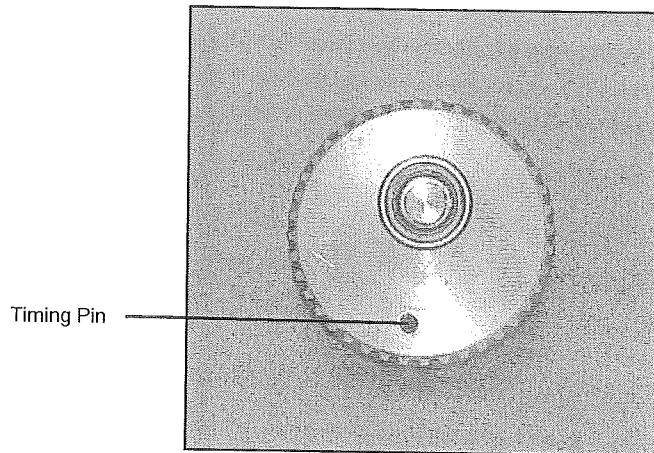


Photo 2-21 – Idler Sprocket



Heat and Control strongly recommends replacing the idler sprocket assembly with new components from Heat and Control. In addition, one spare idler sprocket and two bearings should be kept on hand.

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Motor Junction Box

The watertight (NEMA 4, IP65) motor junction box contains a modular terminal strip for connecting the motor leads to the power module leads. The box lid contains a wiring diagram for 230V or 460V applications. Photo 2-22 shows the motor junction box.

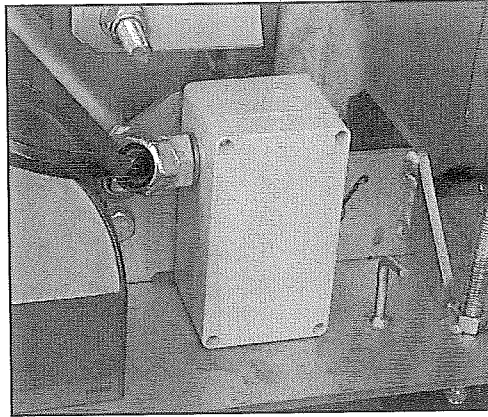


Photo 2-22 - Motor Junction Box

Articulating Feet

The four articulating feet allow the FastBack® pan assembly to be positioned exactly as specified in the equipment layout drawing. The feet also secure the drive assembly to the support structure. Each articulating foot extends 2 inches vertically, ± 1 inch, with 5° of swivel (see Photo 2-23).

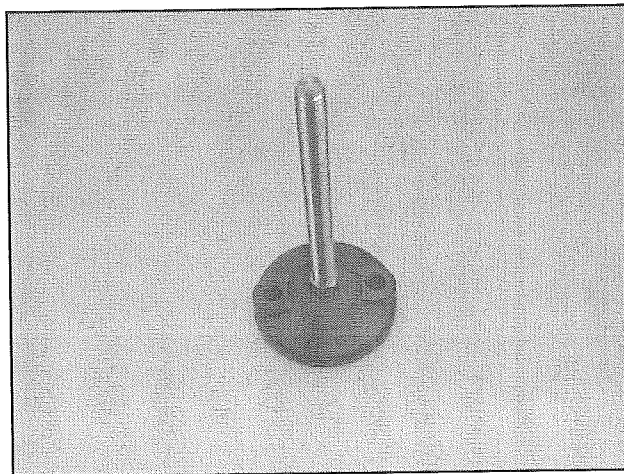


Photo 2-23 - Articulating Foot