TRU-LINKER

MODEL III

‘Z’ LINKER

OPERATION AND MAINTENANCE

MANUAL

US PATENT NUMBERS
4420856 & 4418447

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INTRODUCTION
SECTION I

1.1 GENERAL

The "Z" Linker is a unique machine designed for use by Meat Packers in the sausage manufacturing industry. Basically, the machine forms and cuts individual links from a continuous stuffed length of casing (as shown in Figure 1-1). Portability, light weight, and high production at low cost are key elements of the "Z" Linker.

1.2 FEATURES

In addition to portability and low production cost, the "Z" Linker also has these features:

- Safe, reliable operation - by one person
- Simplified - high speed production (Up to 600 four inch links per minute)
- Small size - 20 x 20 x 26 inches (approximate)
- Low noise level
- USDA accepted
- Linking Head Sub-Assemblies
- Easy mounting - positioning
- Easily removable components
- Reliable totally enclosed gearmotor - UL approved
- Simplified maintenance, clean-up and sanitizing
- Operates in cold storage environment
- Built-in safety features
- Continuous or intermittent operation
- Self sharpening cutters
- Minimum vibration
- Virtually eliminates miss-cuts
- Absolute minimum of shoulder breaks
- Handles casing sizes 13 to 32 mm
- Link lengths consistently uniform
- Link length size can be changed within 10 to 15 minutes

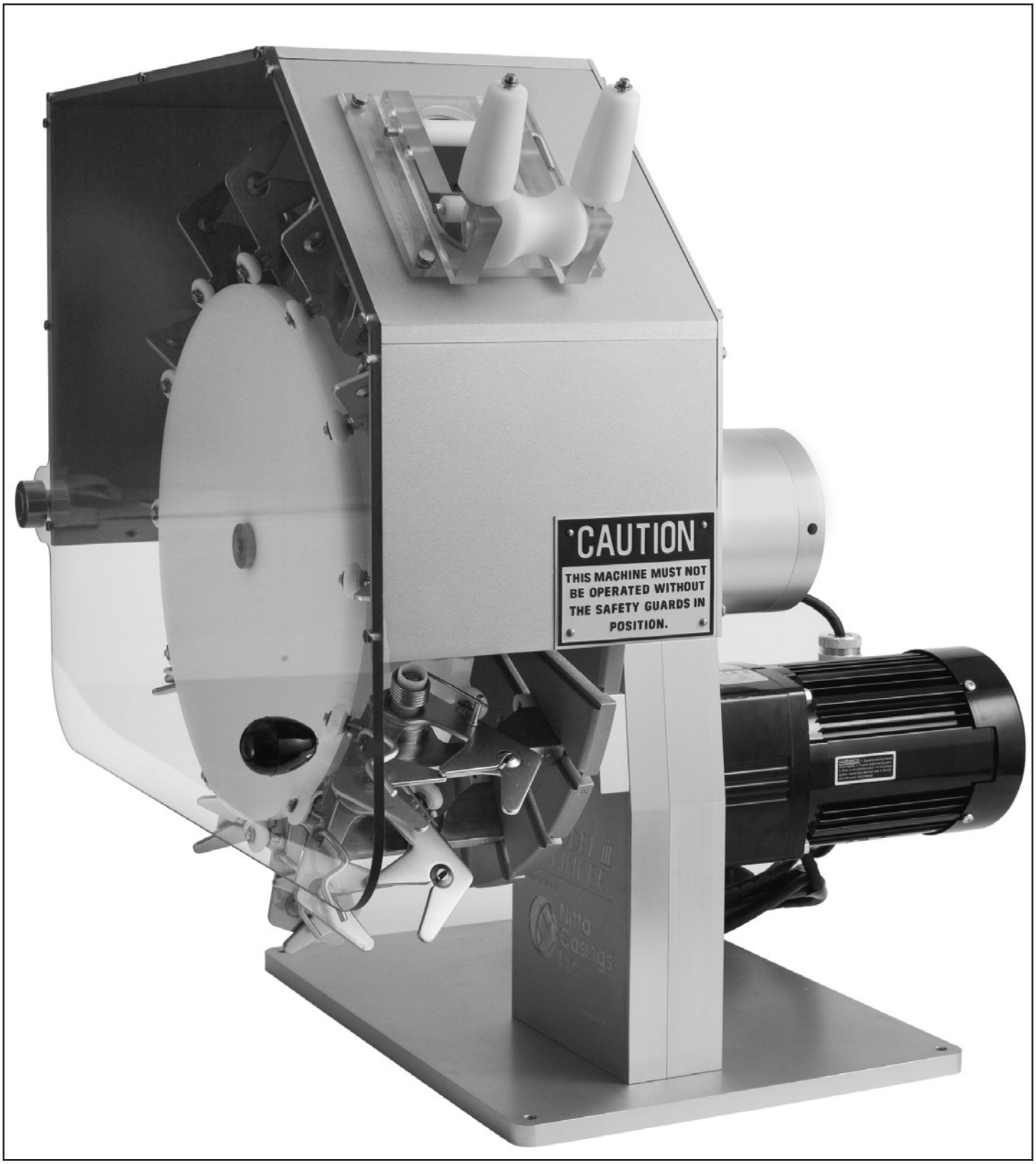


Figure 1-1 Model lll Z Linker.

1.3 ABOUT THIS MANUAL

This manual is divided into eight sections for easy reference to a particular part or subject. Please read the manual in its entirety to understand the operation of the machine and its function. Refer to Section III prior to installing the machine.

DESCRIPTION
SECTION II

2.1 GENERAL

The Linker is a motorized self-sharpening linker producing individual sausage links from a continuous length of stuffed sausage casing. It is capable of delivering 600 links per minute in a safe, clean environment. The machine uses a small 130 VDC powered gearmotor to drive a 16 inch circular slotted disc. The disc has twelve Linking Head Sub-Assemblies that grip, guide, form and cut individual links from a continuous length of stuffed sausage casing.

2.2 ASSEMBLIES - COMPONENT PARTS

Major assemblies and component parts are shown in Figures 2-1 and 2-3. A complete list of parts is included in Section VII.

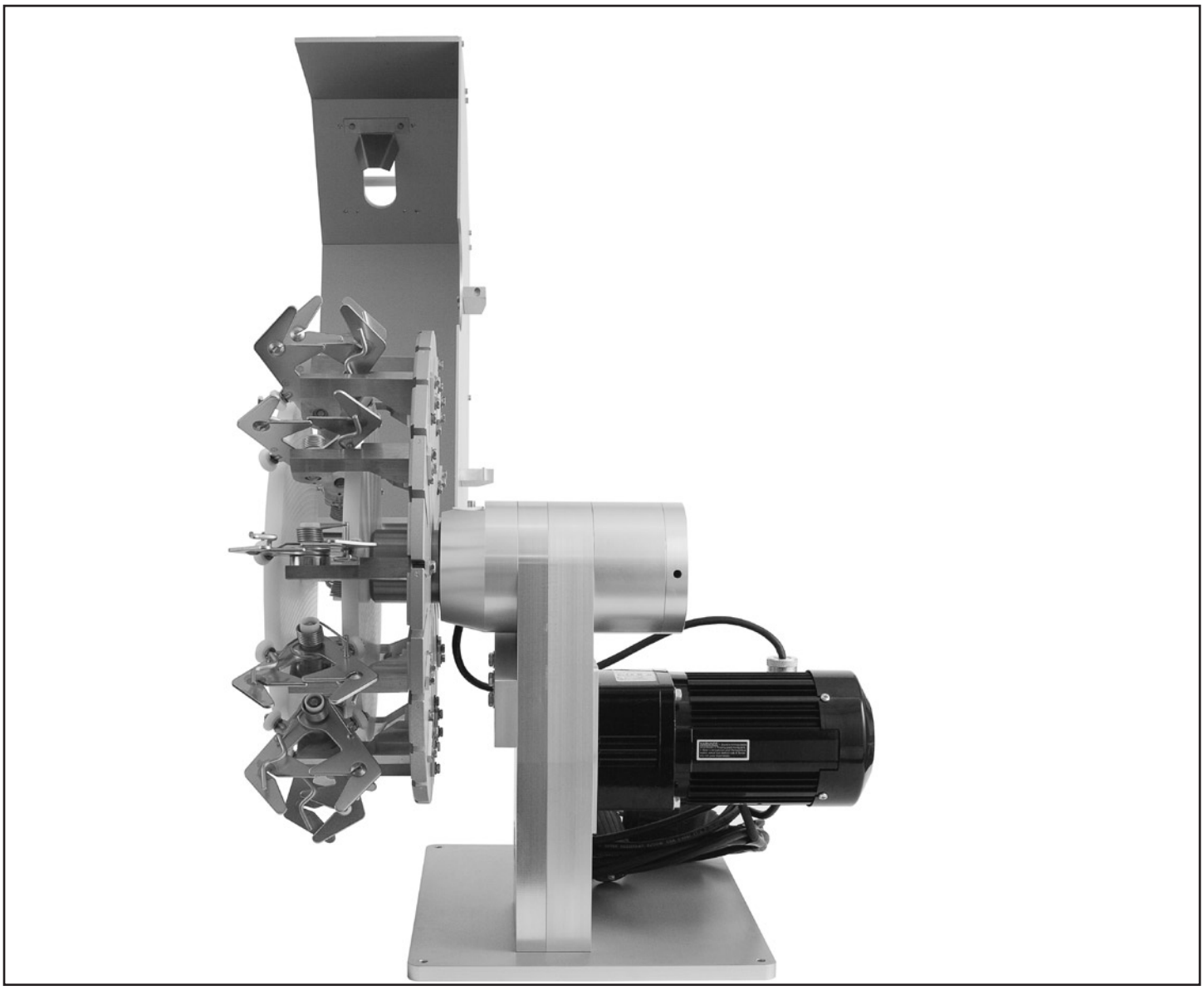


Figure 2-1 Model lll 'Z' Linker (Front View)

2.3 DISC ASSEMBLY

The Disc Assembly shown in Figure 2-2, is machined from plate aluminum. Twelve Linking Head Sub-Assemblies and parts shown in Figure 2-3 are clamped onto the Disc Assembly to complete this unit. The Disc Assembly is gear-driven. Rollers on the Linking Head Sub-Assemblies ride on cams (2-14). Cams affect scissors action in guiding (Figure 2-4), forming and cutting the sausage to link size.

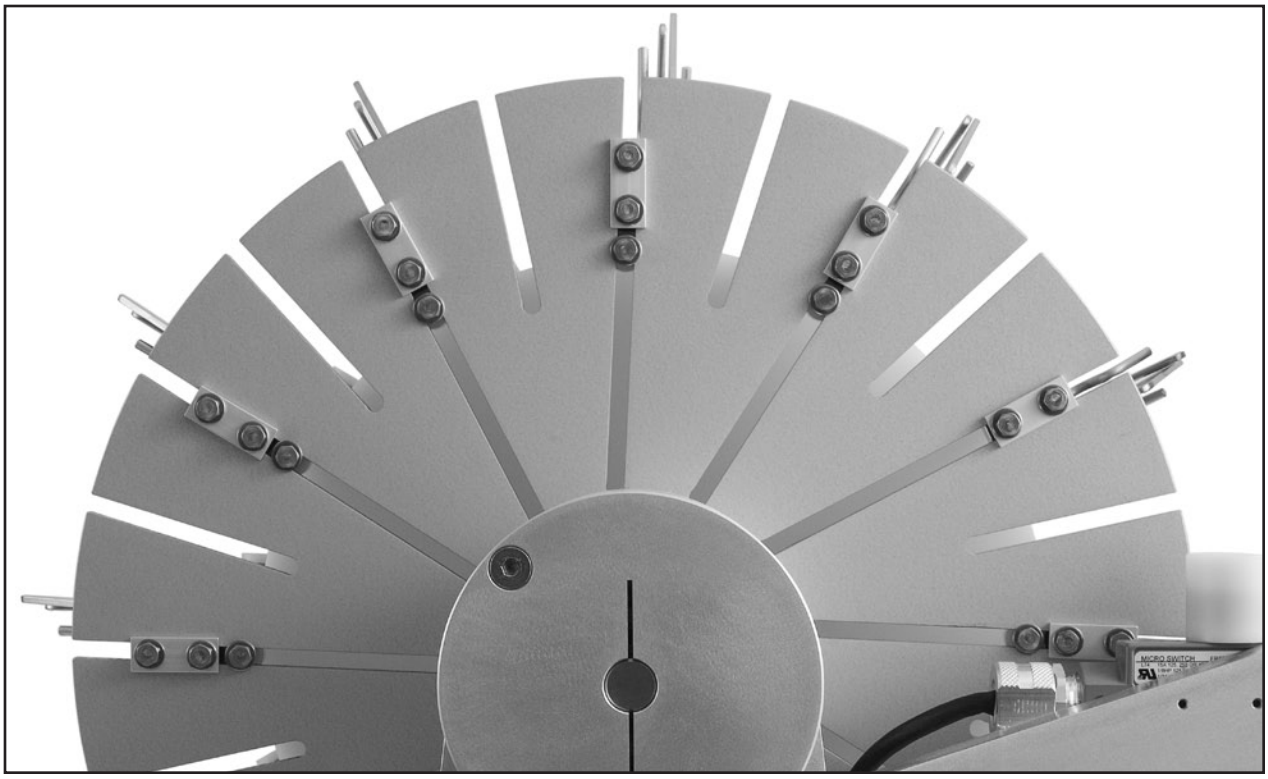
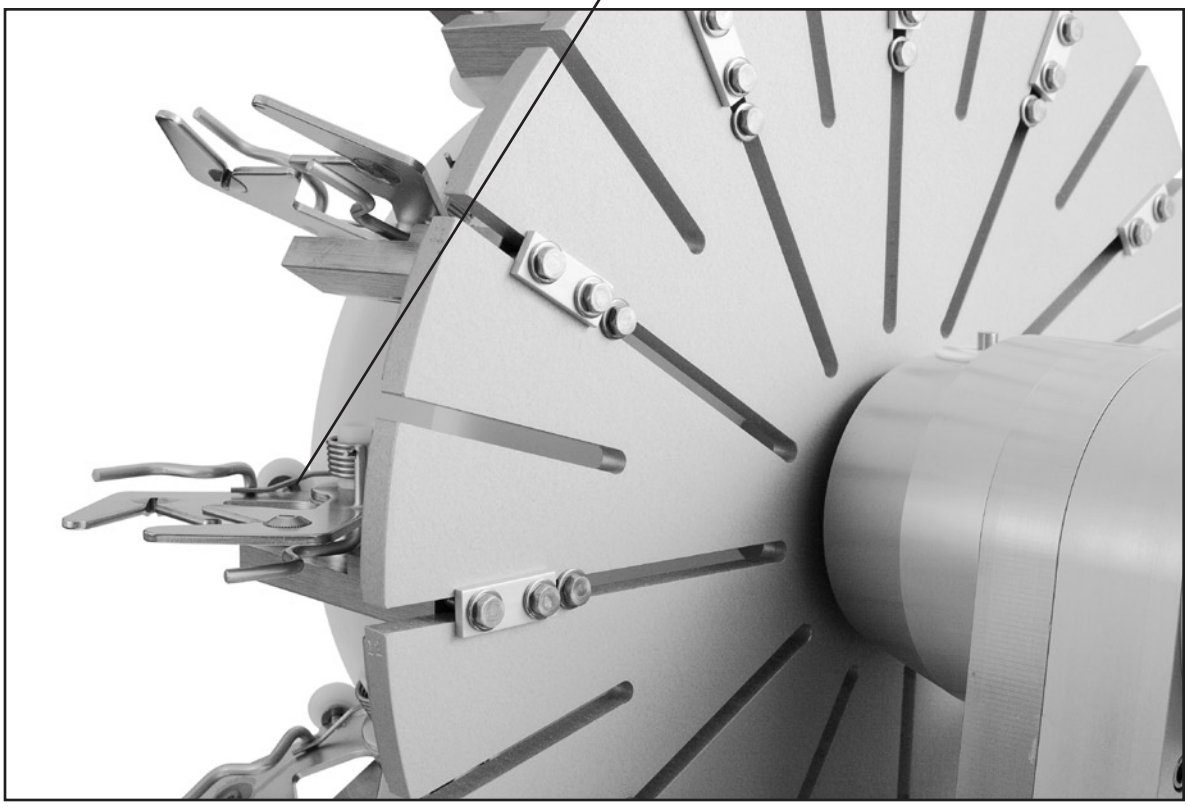


Figure 2-2 Disc Assembly with adjustable stop arm.

Figure 2-3 Linking Head Sub-Assembly.



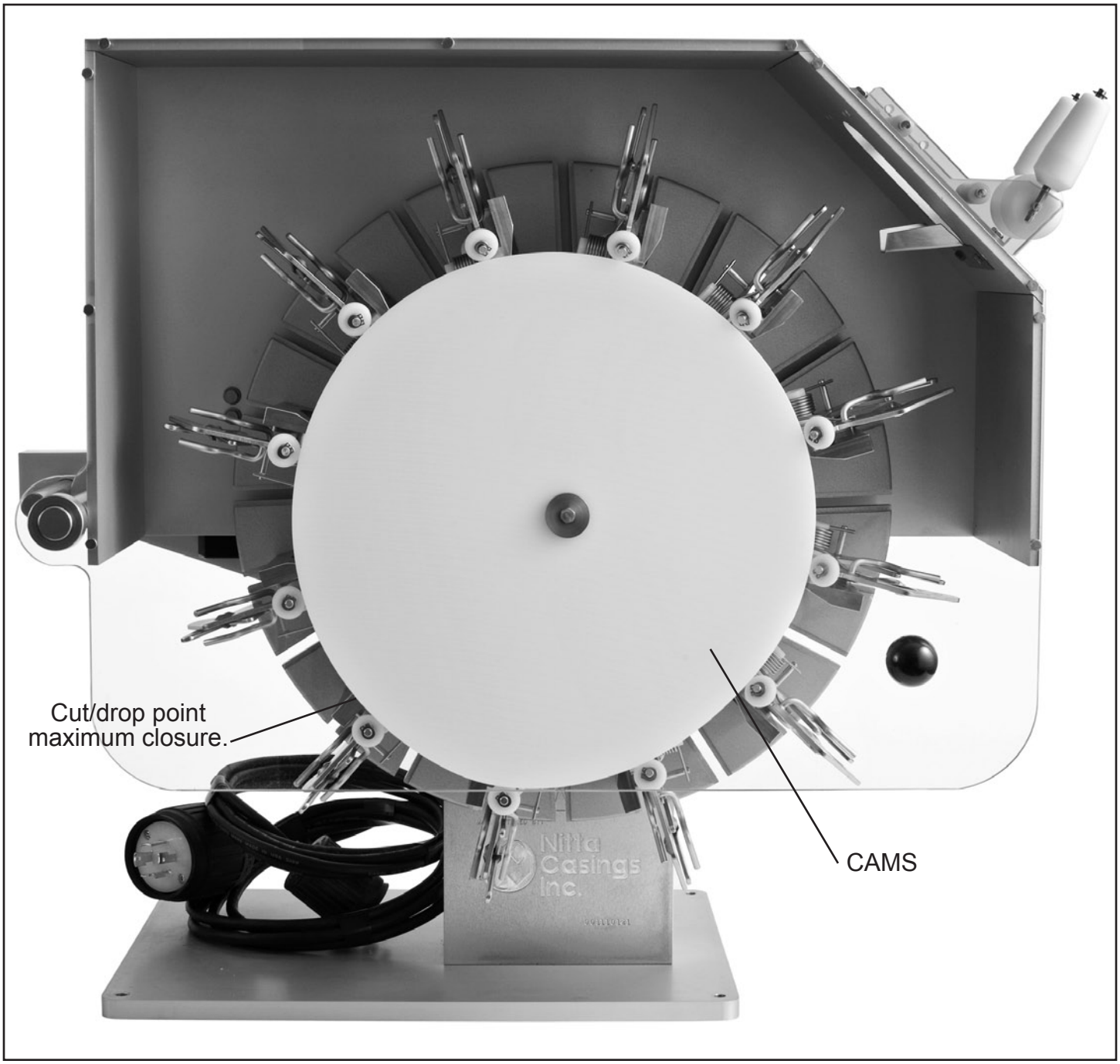


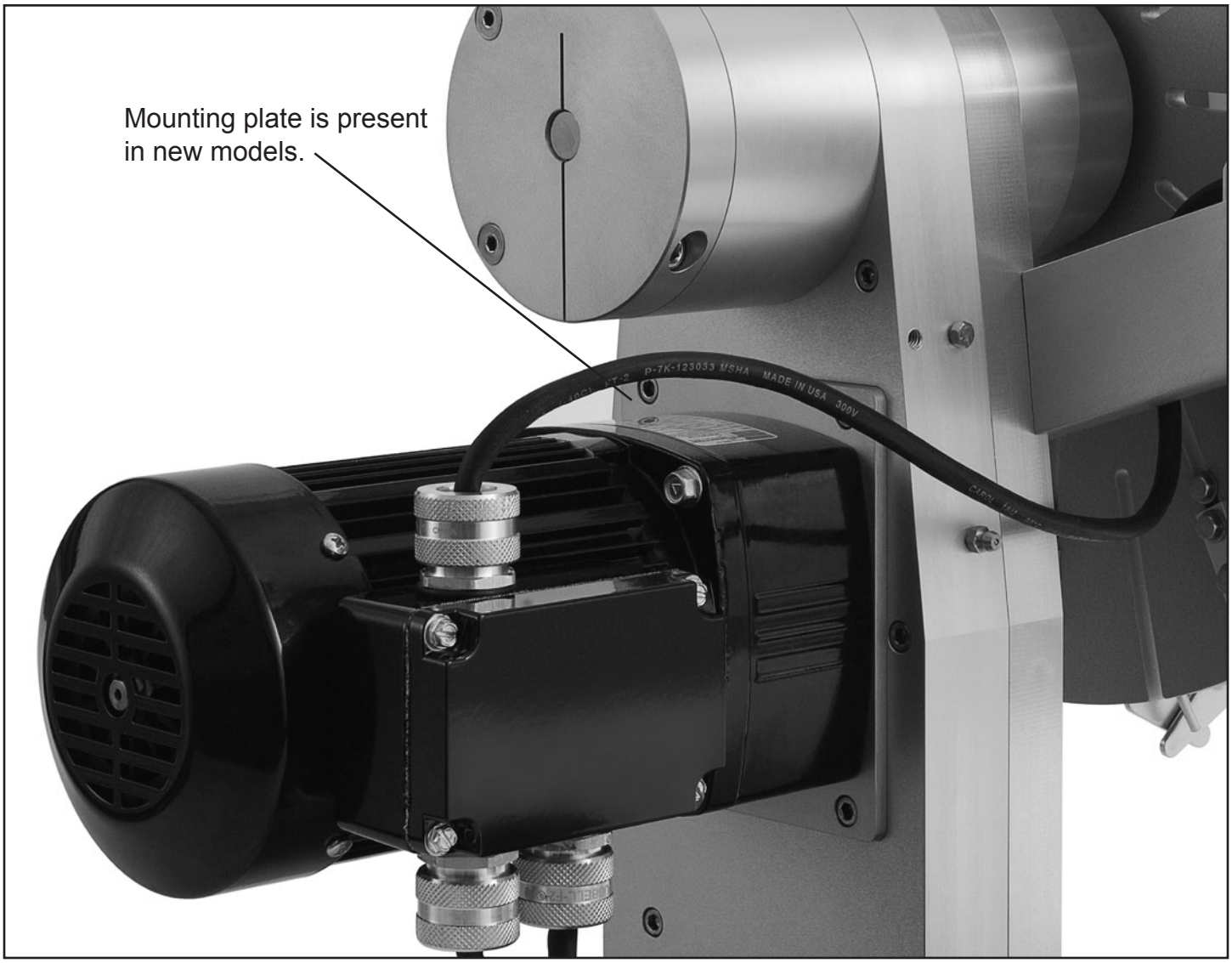
Figure 2-4 Cams
(Refer to 2.12 for more information on cams and their function.)

2.4 GEARMOTOR

The gearmotor (Figures 2-5) is totally enclosed, and features a variable speed controller. The gearmotor specifications follow:

Manufacturer	Bodine Electric Co. Chicago, Illinois
Stock No.	4184 FX 1020
Type	42D5BEPM-E3 UL Approved
Amperage	1.80
Speed (Motor)	0 - 2500 RPM
Speed - Gearmotor	0 - 62 RPM Ratio: 40:1
Controller Type	0855
Amperage	2.0

Figure 2-5 Gearmotor location.



2.5 DISC GAURD

The Disc Guard (Figure 2-6), is hinged to rise upward. When raised, (Figure 2-7), a Safety automatic "OFF" limit switch activating bracket is built onto and is part of the guard to disable the disc and motor when the guard is raised. An additional bracket "stop" adjacent to the limit switch holds the guard firmly in place.

CAUTION!

DO NOT RAISE DISC GUARD WHILE THE MACHINE IS OPERATING. IF NECESSARY TO RAISE GUARD, BE SURE MAIN POWER SWITCH IS OFF. THIS IS AN ADDITIONAL SAFETY PRECAUTION TO BE OBSERVED AT ALL TIMES.

Figure 2-6 Disc Guard in lowered position.

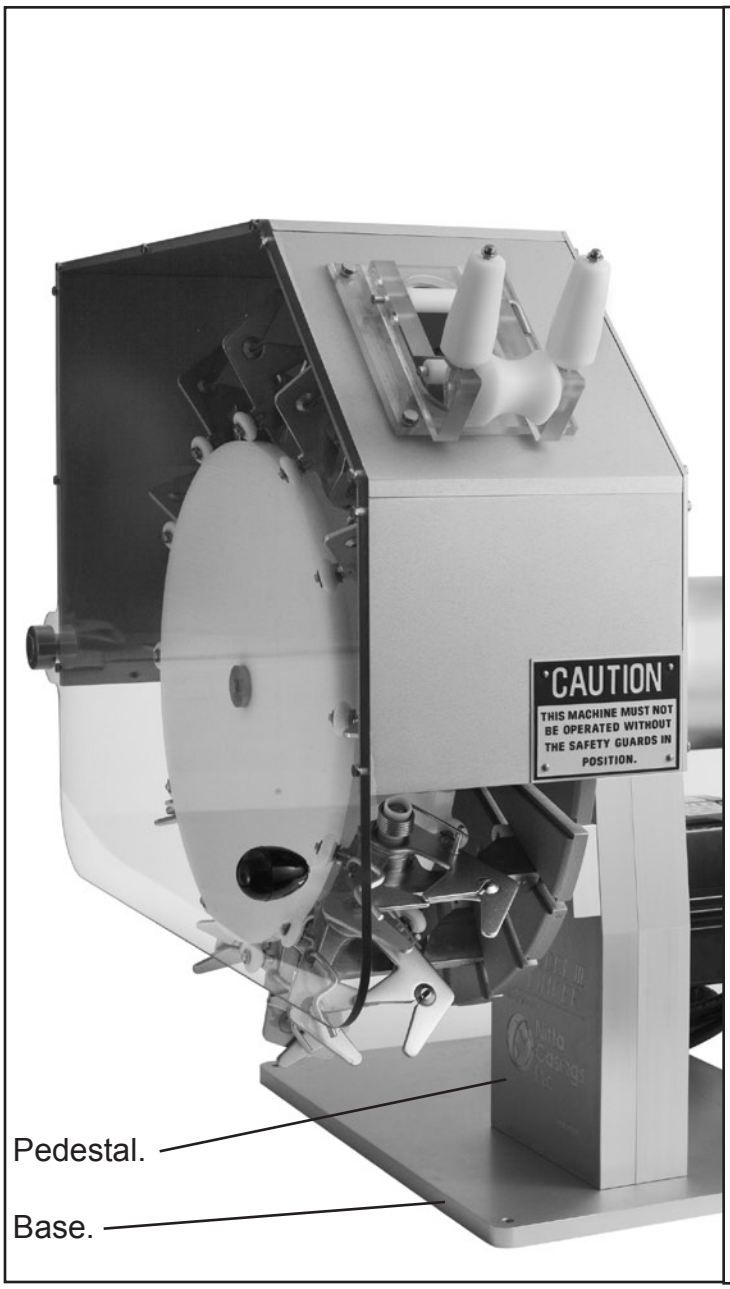
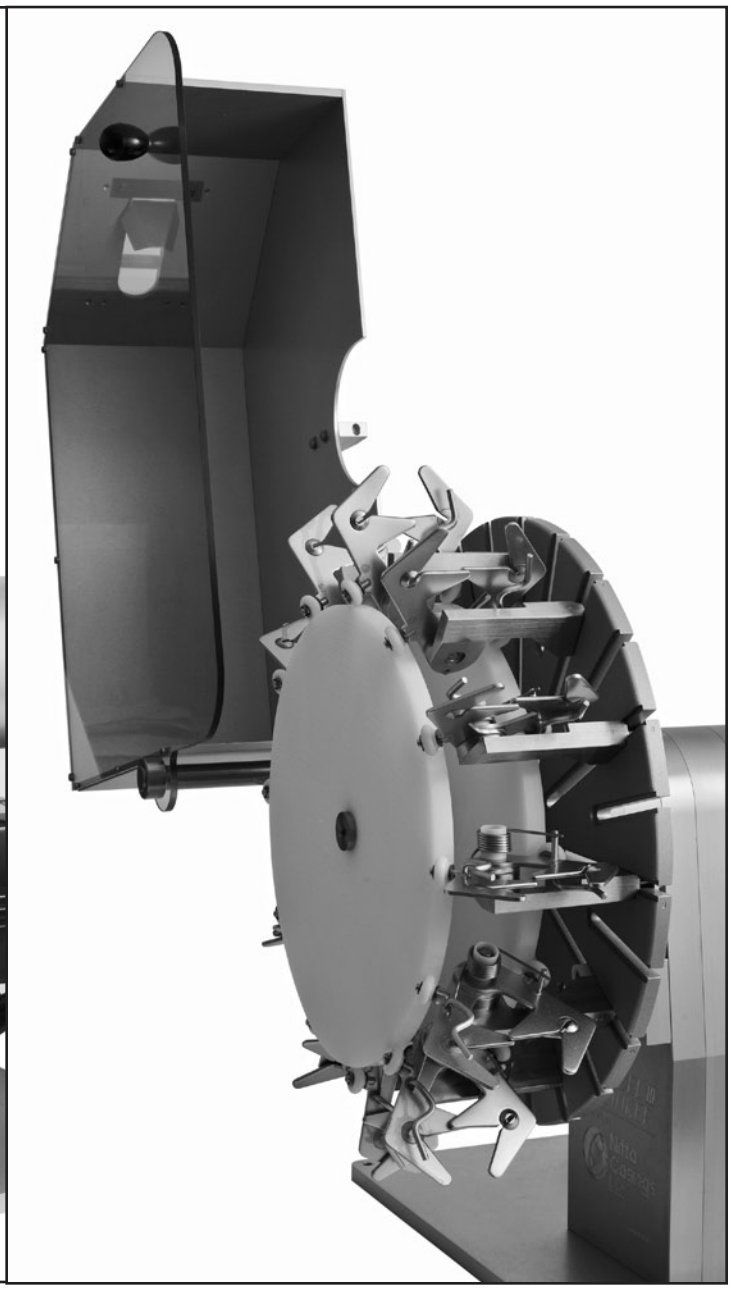


Figure 2-7 Disc Guard in raised position.



2.6 SWITCHES

A control box mounted “on-off” switch is the main control unit for the machine. The switch wiring is shown in Figure 2-8. Enclosing wiring is through the control box to the gear-motor, to stop and start the machine. An interlock through the safety limit switch disables the main control switch when the Disc Guard is in a raised position.

2.7 SAFETY LIMIT SWITCH

The Safety Limit Switch (Figure 2-9 & 2-10), is a micro switch designed to stop the gearmotor when the Disc Guard is raised. Refer to paragraph 2.5 for additional data.

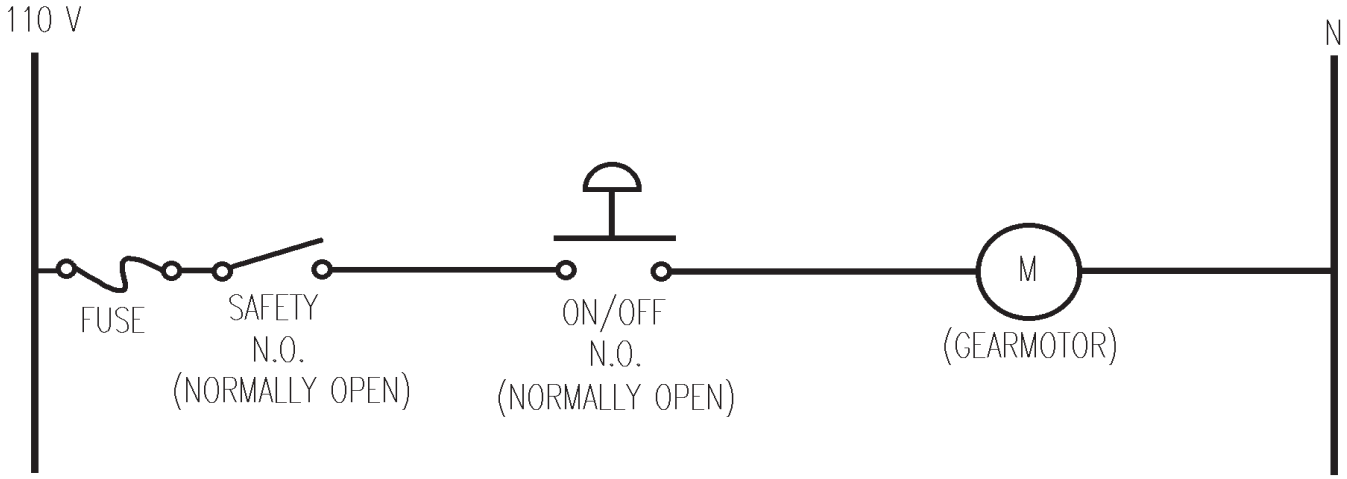


Figure 2-8 Switch Wiring Diagram.
NOTE: Safety Switch as shown is normally in open position when guard is up.

Figure 2-9 Detail of safety switch in closed position.

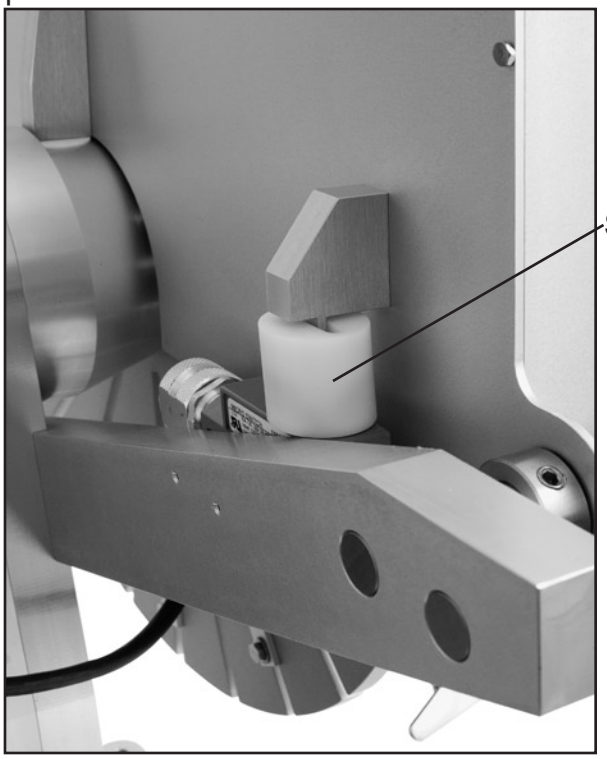
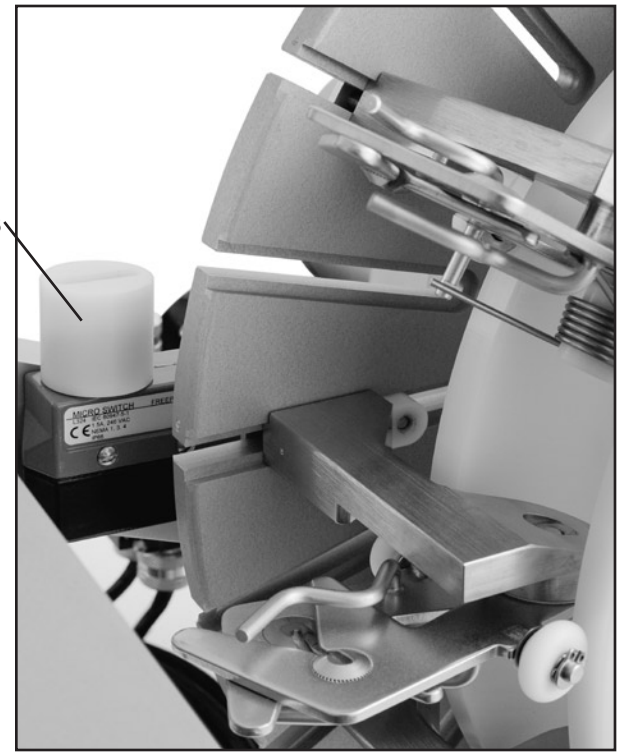


Figure 2-10 Detail of safety switch in open position.



2.8 PEDESTAL

The aluminum pedestal (shown in Figure 2-11) is primarily the base for bearings, gears and shafts. A four hole screw mounted bottom section holds the pedestal to a rectangular aluminum base plate that supports the machine.

2.9 GREASE FITTINGS

There is one grease fitting installed on the machine as shown in Figure 2-11. Refer to Section V for lubrication and grease specifications. Please note the vent screw should be removed before lubrication.

Figure 2-11 Pedestal, Set-screw Hole, and Lubrication Fitting.

2.10 Guide Roll Bracket Sub-Assembly

Continuous stuffed casings are guided to initial contact with the Linking Head Sub-Assemblies through the Guide Roll Bracket Sub-Assembly shown in Figure 1-1 & 2-12. A cut out elongated hole into the guard allows the continuous stuffed sausage casing to enter the machine as noted previously.

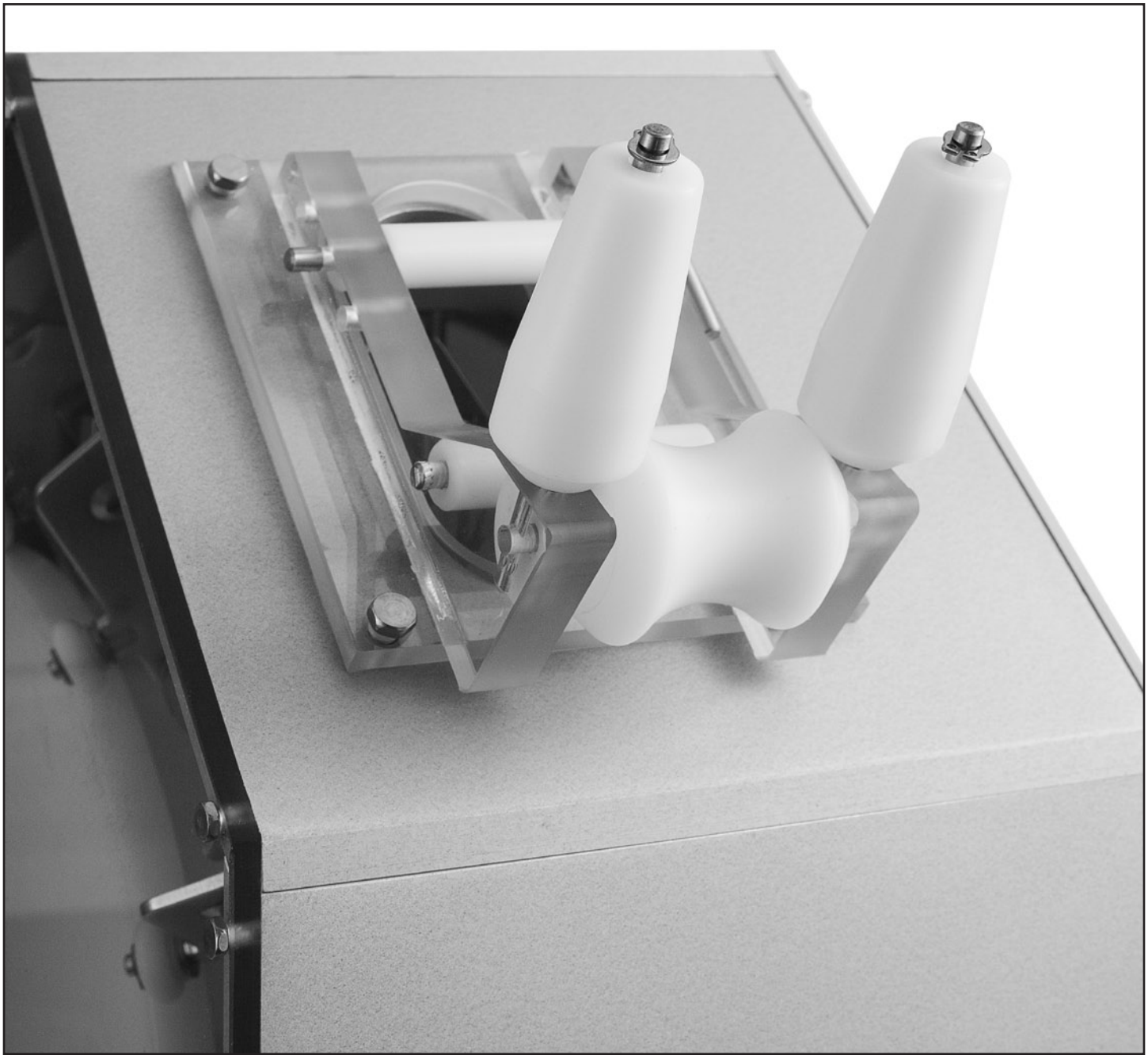


Figure 2-12 Guide Roll Bracket Sub-Assembly.

2.11 LINKING HEAD SUB-ASSEMBLY (LINKER)

The Linking Head Sub-Assembly (2-13) is a device used in forming and cutting an individual sausage link from a continuous stuffed sausage casing. Disc mounted on the Linker as shown in Figure 2-3 & 2-14, it performs the essential task of forming and cutting sausage into individual links. Spring loaded “blades” are activated by two rollers riding on two cams (Figure 2-14). Rotation of the disc and cam action on the rollers guides, forms and cuts as noted (2-16). Twelve Linking Head Sub-Assemblies are bolted onto a retainer mounted on the slotted disc in a pre-determined located spaced equally around the disc. The cutters are hardened stainless steel self sharpening inserts.

Figure 2-13 Linking Head Sub-Assembly.

Figure 2-14 Linking Head Sub-Assembly in relationship to Mounting Discs and Cams.

2.12 CAMS

The cams are non-rotating solid nylon specially contoured discs (Figure 2-4 and 2-11). Each cam is designed to produce a “specific” link length. Fasteners hold the cams in position while the machine is operating.

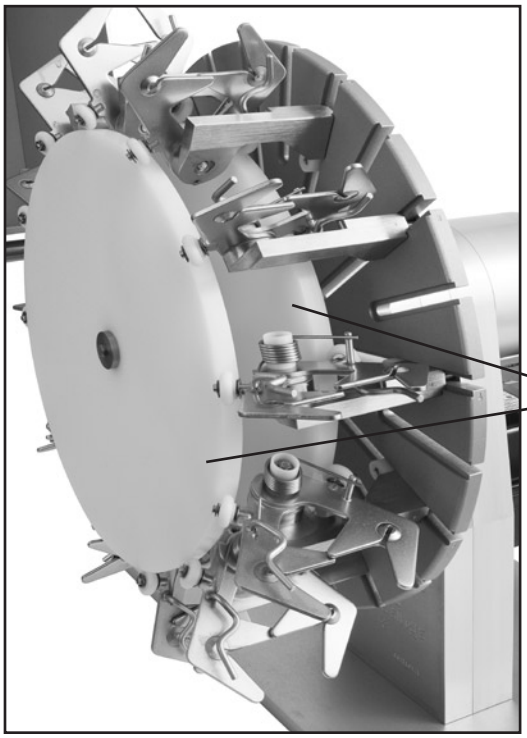


Figure 2-15 Cams and Linking Head Sub-Assembly.

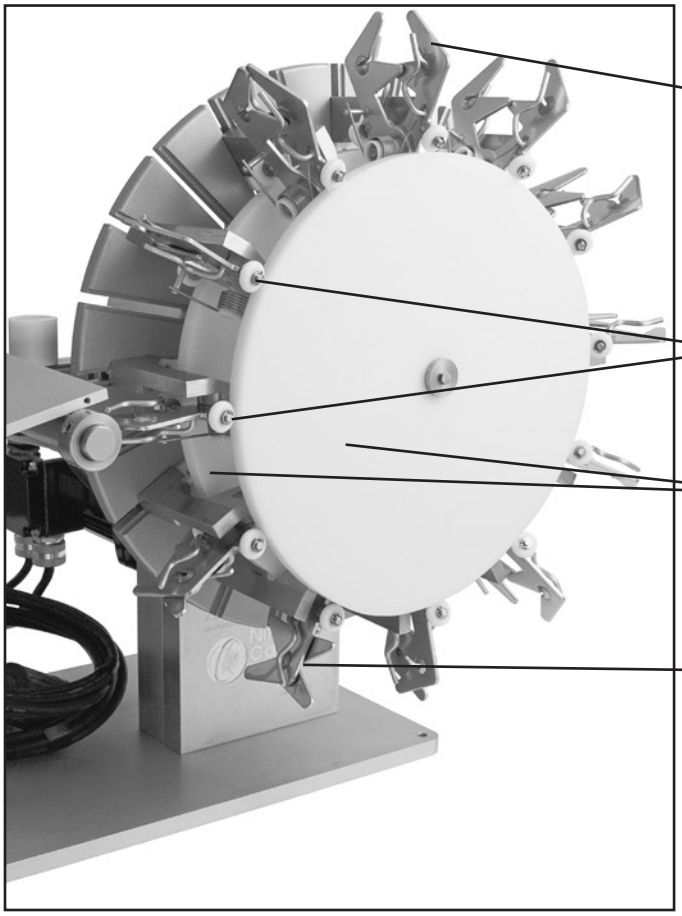


Figure 2-16 View of Closed and Open Linking Head Sub-Assembly.

2.13 OUTBOARD SUPPORTS

Outboard supports can be used to vary or fine-tune link-lengths in order to insure closer net-weight tolerances, improve count-per-pound and reduce give-away.

2.14 COMPONENTS

Other machine components and parts are listed in Section VII, Parts.

2.15 ELECTRICAL POWER PLUG

Each machine is furnished with a three prong grounded or equivalent AC plug cord as shown in Figure 2-17 with approximately a 12 foot power Plug.

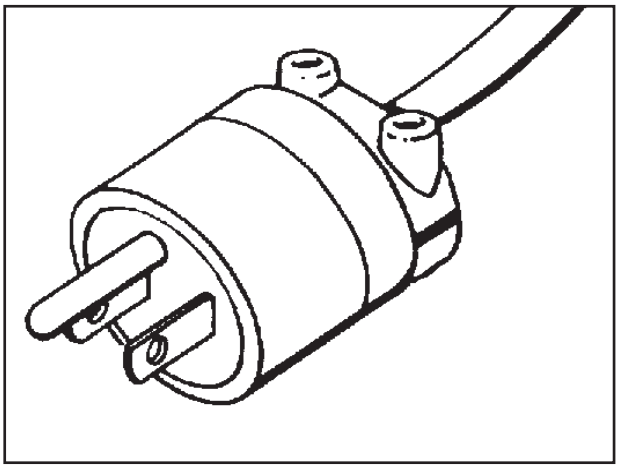


Figure 2-17 Part No. 70, W.W. Grainger Co. Power Plug, No. 2W052 or equivalent.

INSTALLATION
SECTION III

3.1 RECEIVING

Upon receiving the "Z" Linker machine, check container or box for visible damage. If damaged, mark the receiving carrier's bill of lading accordingly and notify us immediately. Do not unpack.

CAUTION
DO NOT USE HOOKS OR DEVICES THAT WILL DAMAGE CONTENTS. FORK LIFT ONLY AFTER BOX HAS BEEN PLACED ON A SUITABLE STURDY PALLET. DO NOT DROP BOX! DO NOT STORE IN HOT, HUMID LOCATION.

3.2 REMOVAL

It is essential that caution be observed in lifting the machine out of shipping box. Proceed as follows:

NOTE: Retain all fasteners for possible future use.

1. Remove cover screws.

2. Open front box cover.

3. Remove retaining bolts or screws from machine base.

4. Slide "Z" Linker toward you, and out of the box.. Do NOT grasp or lift the Disc Guard. Lift by holding onto pedestal (Figure 2-6) or base. Slide straight out-do not tilt or scrape sides.

5. Fasten "Z" Linker on a firm base in an upright position before energizing.

6. Do not expose machine to corrosive material, solvents, paint, thinners, and caustics.

3.3 INSPECTION

Tru-Linker has made every attempt to deliver a high quality, satisfactory product. Each machine has been thoroughly tested and inspected prior to packing and shipment.

Here's what you need to check for when you receive the "Z" Linker:

·Look at the machine carefully to be sure all parts and assemblies are solidly in place.

·Examine all fasteners nuts, bolts, screws, and so on. If any parts are loose, tighten accordingly. Do not over torque any parts. Damaged threads and parts will result.

·Inspect empty shipping container for loose fasteners, etc.

You may store the "Z" Linker in its original shipping container if you do not plan on using it immediately.

3.4 INSTALLATION

The "Z" Linker may be placed into immediate service after the inspection reveals that there is no corrective action required. Each machine is furnished with an AC power cord (Figure 2-12).

When installing the "Z" Linker, make sure the line cord does not touch or lie on a wet floor. Also be sure that the receptacle is free of obstructions and properly grounded. The machine gearmotor and switches are all water resistant units. Always use caution in handling electrical line cords and plugs.

3.4.1 MOUNTING

The "Z" Linker must be mounted to a solid platform. Base plate dimensions are 14 x 16 inches with one 5/16 inch mounting hole located at each round corner.

The "Z" Linker is normally mounted in an upright position. It may, however, be located in a slightly angled position to suit the application. Primary considerations in mounting are:

·Distance from horizontal feed table to feed roll not to exceed 12 inches. See Figure 3-2.

·Accessibility to a suitable electrical outlet or 110 VAC 60 Hz power source.

·Firm support of the machine.

·Access to a stuffer (filler) and table.

·Suitable removal of links after discharge from machine (600 links per minute).

·Maintenance of USDA cleanliness standards.

NOTE: Be sure to check out all requirements before operating the machine.

3.4.2 CONVEYORS

Installations may include conveyors shown in Figures 3-1 and 3-2. Be sure the machine is firmly mounted with no interference in any position.

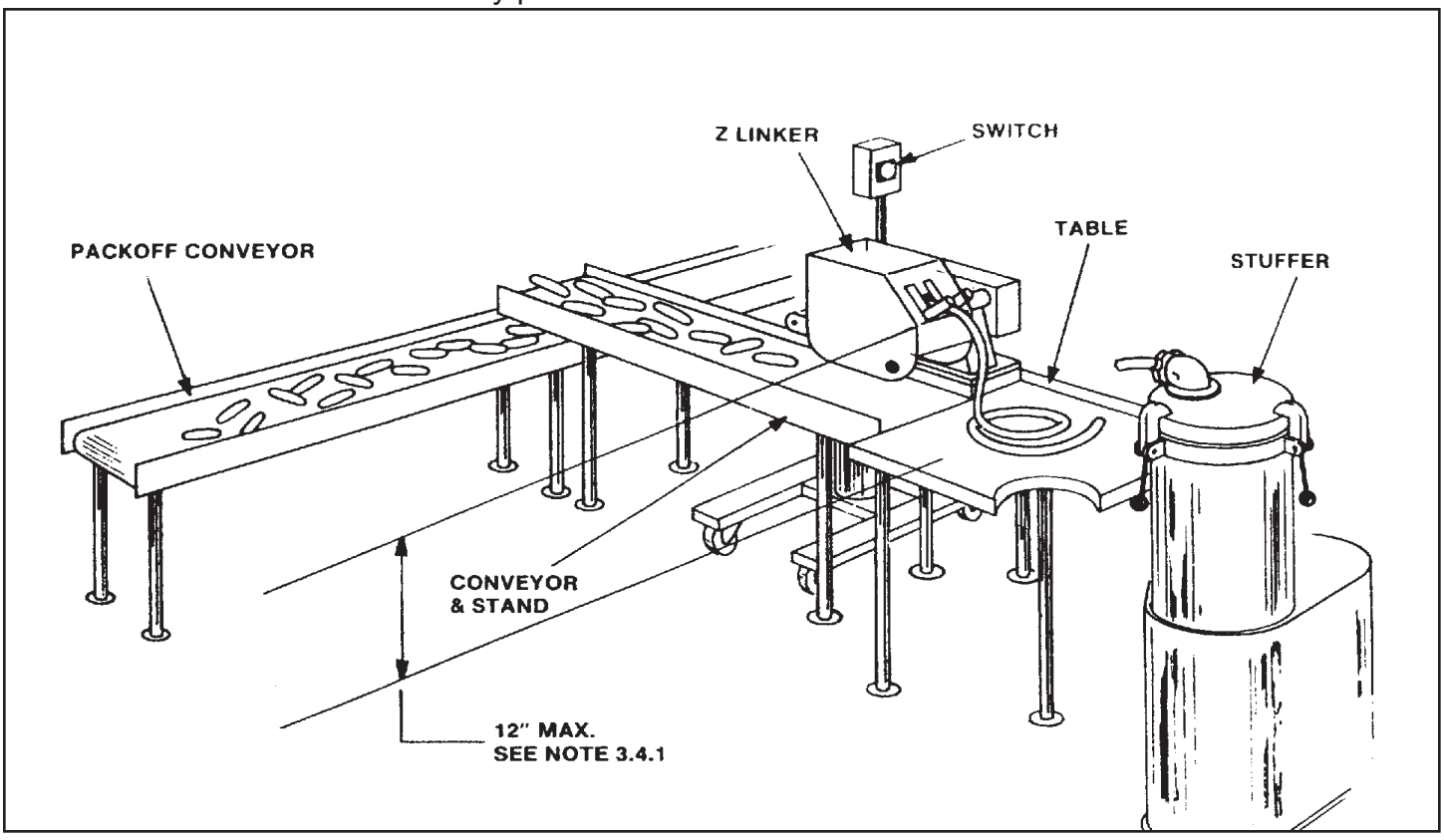


Figure 3-1 Z Linker with packoff conveyor.

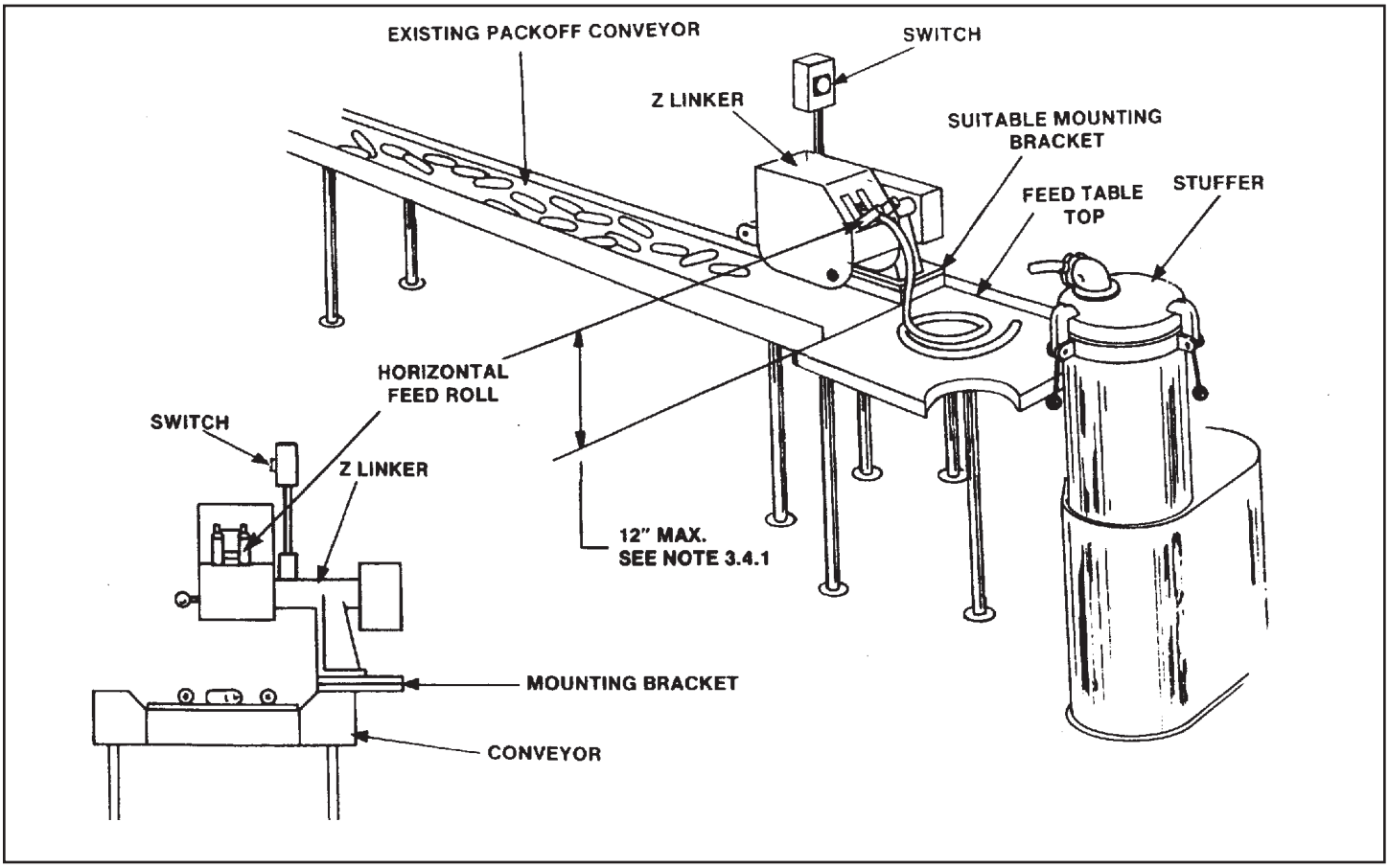


Figure 3-2 Z Linker with single conveyor installation.

OPERATIONS
SECTION IV

4.1 PROCEDURE

Operation of the "Z" Linker machine is a simple procedure that requires only one operator with minimum training. It is assumed that a sausage stuffer is available for providing continuous length stuffed sausage casings to the Linker. To begin manufacturing links, proceed as follows:

1. Be sure the "Z" Linker machine is firmly mounted close by or adjacent to the sausage stuffer.

2. Connect the AC power cord to a nearby AC 110 VAC 60 Hz receptacle.

3. Have a convenient container or conveyor at the discharge end of the Linker to receive the cut links.

4. Refer to Figure 3-1 and 3-2 for orientation and guidance.

5. Be sure that the disc guard is in place. Check rotating parts to be sure no obstructions are present. Then turn power on.

6. Feed one end of stuffed sausage casing into the Guide Roll Bracket Sub-Assembly. The machine is "self feeding" if coiled sausage casing is positioned as illustrated in Figures 3-1 and 3-2.

7. Stop machine by pushing control box switch to "OFF" whenever a sufficient number of links have been made. It is not recommended to leave the machine running while unattended.

If any problems are encountered, refer to Section VI Troubleshooting.

MAINTENANCE
SECTION V

5.1 GENERAL

Specific parts on the machine should be regularly serviced and/or adjusted to keep it operating satisfactorily over a long period of time. When maintenance is performed the operator or technician should be familiar with the part or assembly - its function and purpose. Other sections of this manual will help with this procedure. Here is a suggested maintenance schedule that may be followed to assist in maintaining the machine.

CAUTION

BE SURE POWER SWITCH IS "OFF" AND LINE CORD OUT OF WALL OR RECEPTACLE.

5.2 MAINTENANCE SCHEDULE

DAILY	
ITEM	**PROCEDURE**
All machine parts that contain residual meat or sausage products. All parts that may be dirty. Inspect moving parts.	Clean only with USDA approved cleaner. Blow dry. Spray with food grade oil. Observe caution. Tighten any loose fasteners or parts.
WEEKLY	
Lubrication Fitting. CAM Rollers.	If machine has been running continuously, lubricate fitting, using grease gun (pressure type) sparingly. If machine has had limited use, lubricate monthly (See appendix for recommended lubricant). Lubricate linking heads with USDA approved lubricant.
MONTHLY	
Inspect entire machine.	Tighten all fasteners. Replace parts that appear worn. Some machine parts may be repaired, such as Linking Head Sub-Assemblies. See paragraph 5-3.

5.3 LINKING HEAD SUB-ASSEMBLIES REPAIR OR ADJUSTMENT

Linking Head Sub-Assemblies that do not cut cleanly should be replaced with part #05X02. Refer to Figure 5-1 for an illustration of the Linker and to Figure 5-2 for Linker parts.

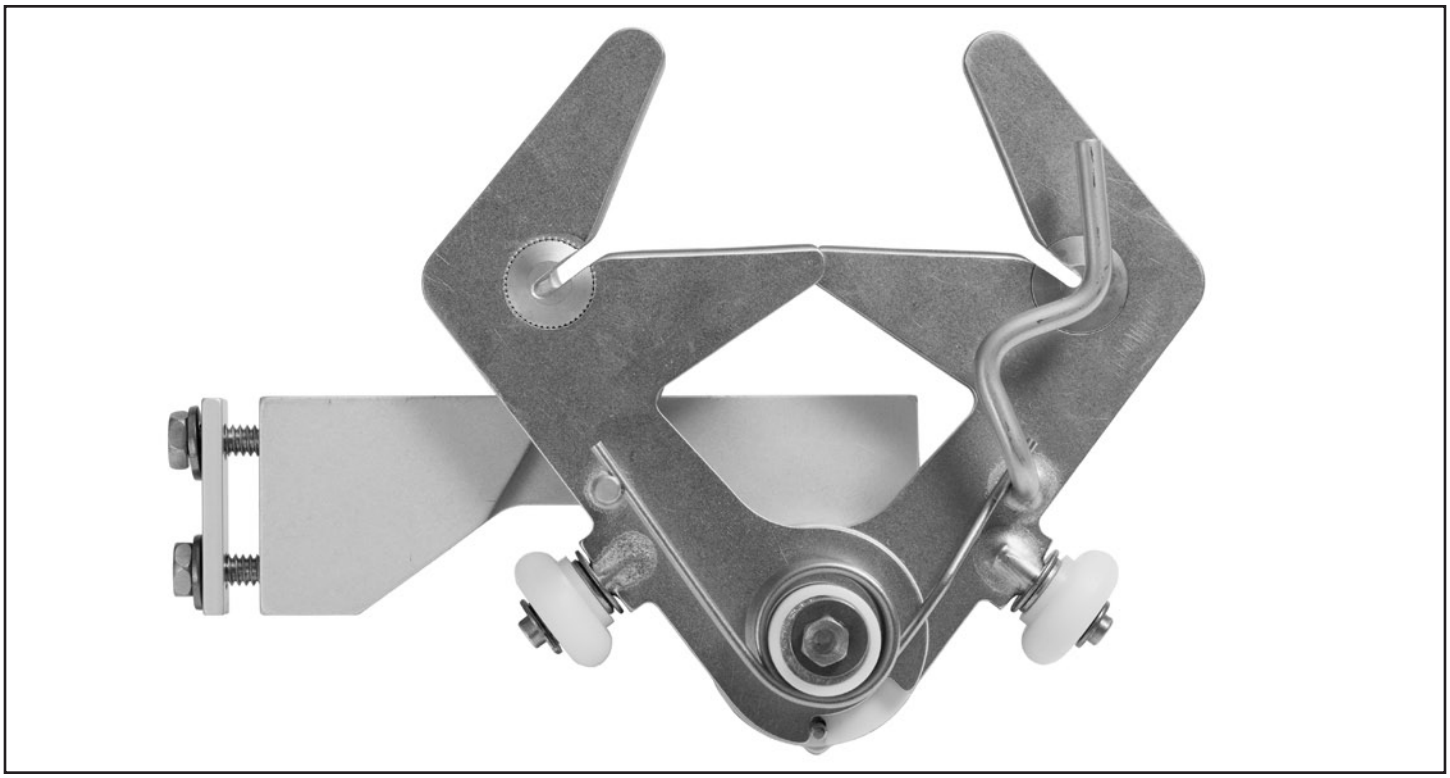
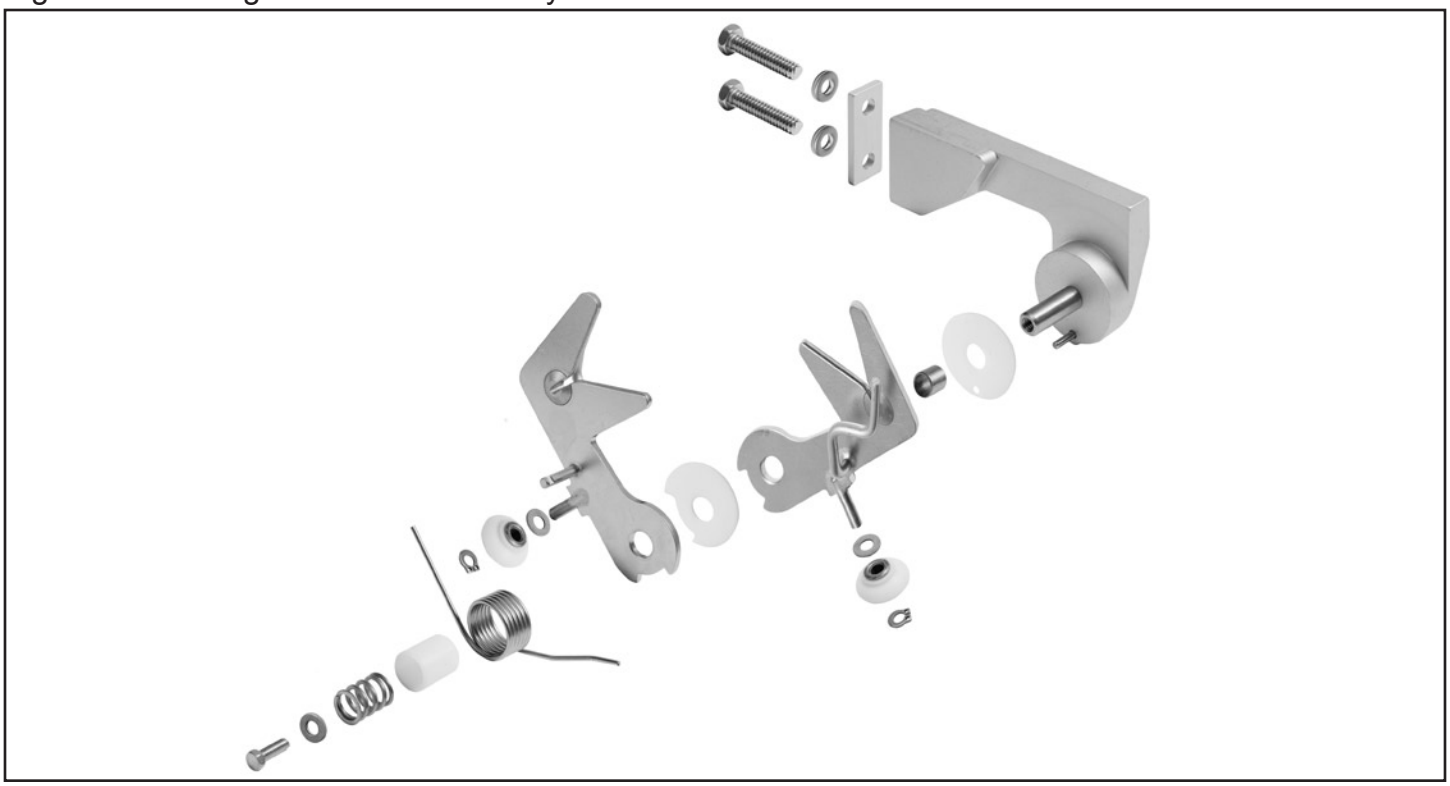


Figure 5-1 Linking Head Sub-Assembly.

Figure 5-2 Linking Head Sub-Assembly Parts.



Refer to page 43, Figure 7-1 for labeled, exploded view of Linking Head Sub-Assembly and part numbers.

5.3.1 DISASSEMBLY

These instructions show you how to disassemble the linking head Sub-Assembly.

1. Remove torsion spring by grasping the spring, compressing it, and lifting straight out.

2. Remove the machine screw holding the compression spring in the spring holder.

3. Remove spring holder. The spring holder holds the compression spring in place and centers the torsion spring.

4. Remove compression spring.

5. Remove outer (left hand) blade (left hand blade is not interchangeable with right hand blade).

6. Remove Teflon washer (.030).

7. Remove other (right hand) blade (right hand blade is not interchangeable with left hand blade).

8. Remove bronze bushing.

9. Remove Teflon washer (.015).

10. Reassemble in reverse order

NOTE

The torsion springs keeps rollers on the blades against the stops.

12. Check all parts for wear, tension compression and fit.

13. Remove and replace <u>all parts</u> that do not conform to fit and function.

5.3.2 BLADE REPLACEMENT

Complete blade replacement kits are available; part # 05X02.

5.4 ADJUSTMENT

Adjustment of the "Z" Linker is a precise task that requires careful attention to compression, tension and fit. When making adjustments for the first time, use an adjacent functioning Linking Head Sub-Assembly as a model. Once the proper adjustments have been made, go on to the next Linking Head Sub-Assembly and repeat the adjustment procedure. If problems develop, refer to the Troubleshooting Section for additional instruction.

5.5 MAINTENANCE OF OTHER PARTS

Other parts, assemblies and components of the machine require practically no maintenance. If additional procedures are required, they will be included in the Addendum Section of this manual.

TROUBLESHOOTING
SECTION VI

You should read this section carefully and understand it thoroughly prior to repairing or replacing machine equipment. This section contains tables that identify a problem and show recommended solutions to the problem.

6.1 PARTS

Do not replace parts with anything other than standard Tru-Linker Co. equipment. The Parts List in Section VII lists parts and equipment that can be ordered for replacement or used as spares.

6.2 TOOLS

Only use those tools which are specifically suited for the job. Do not force fit any threaded parts.

6.3 IDENTIFICATION

All assembly parts that are removed should be replaced in reverse order of disassembly. Be sure that each part removed is secured in a separate area to avoid loss or improper reassembly. Parts and assemblies noted herein are described in Section II.

6.4 SAFETY PRECAUTIONS

Never troubleshoot the machine while it is energized. Rotating and moving parts are potential hazards if guards are removed. "Z" Linker is a safe machine to operate when proper safety precautions are observed. Never change switches, the machine fuse, controller components, or other parts without first removing the AC line cord from the receptacle or wall socket.

6.5 AUTHORIZED PERSONNEL

Only authorized technicians, mechanics, electricians, or other qualified personnel should be allowed to repair, service, or maintain the machine.

6.6 TABLES

This section contains two tables, which identify potential electrical and mechanical problems, and gives you step-by-step solutions to those problems.

TABLE 6-1
ELECTRICAL TROUBLESHOOTING

PROBLEM	SOLUTION
A. Machine does not run when main switch (ON-OFF) is pushed.	**STEP 1** Check AC line cord to outlet connection. Be sure that connections are solid and AC power is available. A lamp or circuit tester in the outlet will indicate current flow or no power. If test indicates no power, check utility circuit breaker or fuse. Reset circuit breaker or replace fuse with one of equal amperage. **CAUTION!** **REMOVE AC LINE CORD FROM WALL OR RECEPTACLE BEFORE MOVING ON TO STEP 2.** **STEP 2** Place AC line cord into socket or receptacle. Start machine. If inoperative, check AC line cord continuity with ohm meter. Open machine control box for connections through line cord for this test. Repair or replace faulty wires or AC line cord. Check fuse if machine does not run, proceed to Step 3. **STEP 3** **a.** Check operation of Safety Limit Switch by lifting Disc Guard slightly until activating bracket just clears the top of switch. **CAUTION!** **BE CAREFUL NOT TO INSERT FINGERS OR TOOLS NEAR DISC. MACHINE MAY START AND CAUSE DAMAGE OR INJURY WHEN SWITCH IS ACTIVATED.** **b.** Push Safety Limit Switch several times using a flat-headed screwdriver. If machine runs, lower Disc Guard and continue operations. If machine does not run with cover closed, turn to the next page.

TABLE 6-1
ELECTRICAL TROUBLESHOOTING (Continued)

PROBLEM	SOLUTION
B. Machine does not run when main switch (ON-OFF) is pushed and Disc Guard is making contact with Safety Limit Switch.	**STEP 4** Push firmly on cover (do not force cover or use excessive pressure). If machine runs only by holding cover firmly, the fault indicates a defective Safety Limit Switch. Remove and replace Safety Limit Switch. **STEP 5** Lower Disc Guard cover and switch power to ON. The machine should run. If it does not run, proceed to Step 6 to check for bracket contact with the switch. **STEP 6** Follow these steps to troubleshoot the main ON-OFF switch. **a.** Remove AC line cord form the outlet or receptacle. **b.** Remove switch from pivot bracket. **c.** Check internal switch connections. If loose or corroded, replace connectors. Minor oxidation should be removed with fine grit sandpaper. **NOTE** *Before replacing the internal switch connections, check the continuity with an Ohm Meter. Activate switch repeatedly.* **d.** Reassemble in reverse order of disassembly and plug in AC line cord if switch measures continuity on the meter. Turn switch to ON position and continue operations. If switch is defective, replace it (remove AC line cord before disassembly or installation).

TABLE 6-1
ELECTRICAL TROUBLESHOOTING (Continued)

PROBLEM	SOLUTION
B. Machine does not run when main switch is placed in the ON position and Disc Guard is making contact with Safety Limit Switch.	**STEP 6 (CONTINUED)** If the machine still doesn't run, proceed to Step 7 to troubleshoot the Gearmotor. **STEP 7** **a.** Inspect Gearmotor for "burnout". Usually an acrid odor indicates a burned out commentator, sticking brushes, contacts, or faulty wiring. **b.** Open junction box (Step 2) and inspect the motor wiring connections and the machine fuse. If faulty, replace fuse (may have "blown" while testing). If motor wires from motor to the junction box are defective, replace the wires. **NOTE** *Insert silicone sealer into all junction box screw holes before reassembly. Check gasket-if torn or loose, replace gasket.* **c.** Replace junction box cover, gasket, and screws. **NOTE** *Motor removal applies to new machines. See addendum 7.4 for instructions on machines made prior to 2010.* **d**. Start machine-if it runs, continue operations. If machine does not run, replace motor by following these instructions: · Remove 4 retaining bolts. · Remove motor control wires. · Remove motor and replace with new one in reverse order of disassembly. (Continued on next page.)

TABLE 6-1
ELECTRICAL TROUBLESHOOTING (Continued)

PROBLEM	SOLUTION
	STEP 7 (CONTINUED) ·Replace AC line cord to power the Linker. ·Start machine. If it runs, continue operations.
B. Machine does not run when main switch is placed in the ON position and Disc Guard is making contact with Safety Limit Switch.	If machine does not run, repeat Step 2. If machine is still inoperative, contact your local Tru-Linker Sales Representative for assistance.
C. Machine continues to run when switched off.	**a.** Pull AC line cord out of receptacle or outlet. Replace as necessary. Observe all cautions. **b.** Repeat previous procedures starting with switches and control box wiring checkout. Do not attempt to bypass electrical interlocks. If problem cannot be solved, consult your local Tru-Linker Sales Representative for assistance.

TABLE 6-2
MECHANICAL TROUBLESHOOTING

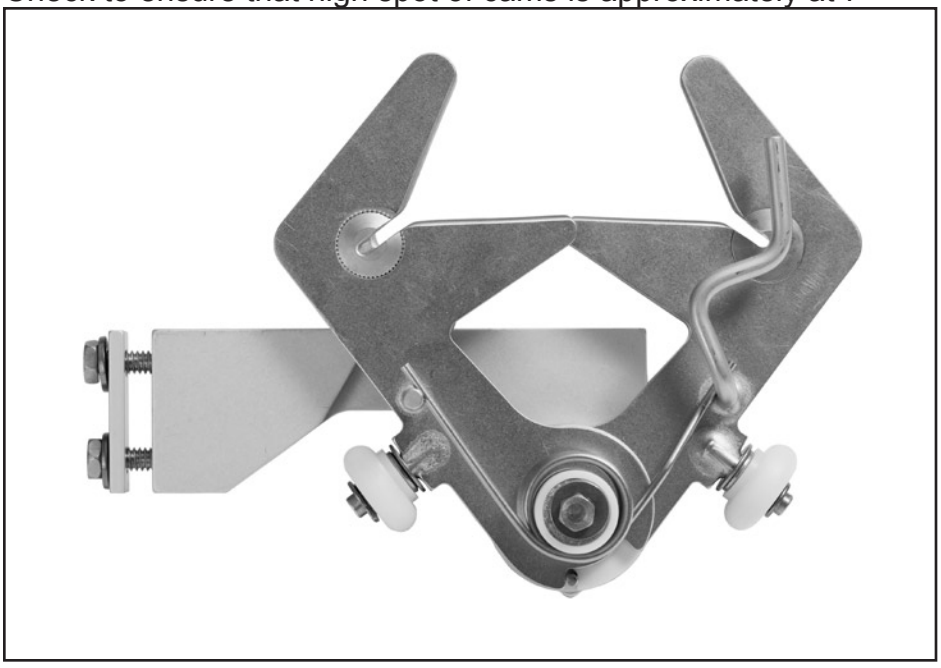
PROBLEM	SOLUTION
A. Machine vibrates when running.	Check and tighten all mounting screws and bolts to a snug fit with one additional ¼ turn. Do not over torque any fastener. Make sure cam is properly aligned (see paragraph 2-13).
B. Machine does not receive stuffed sausage casing onto Linking Head Sub-Assemblies* as specified.	**STEP 1** Check hinge shaft and setscrew collar adjustment. Probable cause is a misaligned Disc Guard. Loosen setscrew collars on each side of guard and shift to align with forming and cutting "blades" on Linking Head Sub-Assemblies. Tighten set screw collars in aligned position. **STEP 2** Check Guide roll Bracket Sub-Assembly to see if it turns freely. If it does not turn freely, turn the roller by hand until free. A small application of lubricant specified in Section V may free the roller. If roller continues to bind or if one or more of the roller posts are missing, replace Guide roll Bracket Sub-Assembly. **STEP 3** Check to ensure that high spot of cams is approximately at 7
C. Miss-cut. Machine does not cut every link. **NOTE** *Figure 6-1 illustrates extreme open position. The actual condition could be with both upper projections closer together depending upon CAM positions. No form, grip, or cut action is possible with unit in position shown.*	 **Figure 6-1** Linking Head Sub-Assembly - *open position.*

TABLE 6-2
MECHANICAL TROUBLESHOOTING (Continued)

PROBLEM	SOLUTION
C. Miss-Cut. Machine does not cut every link. **D.** Miss-cut (double link). Machine does not cut every link. Links are continuous to about 8 inches in length or double the required 4-inch size. Linker Torsion Springs do not compress.	**NOTE** *A number identifies each Linking Head Sub-Assembly location on the Disc Assembly on the outer rim of the disc. Use the numbered positions to identify individual units.* **a.** Look through guard while machine is operating to observe which Linker is causing the cutting issue. **NOTE** *The machine may be started & stopped quickly each time via the control box switch to determine which numbered Linker is causing a Miss-Cut.* **b.** De-energize the machine and lift Disc Guard. Check faulty Linking Head Sub-Assembly by observing if blades and cutters overlap approximately 3/16". Rotate the disc by hand until the numbered faulty Linker is at the top of the machine. **c.** Lower identified Stop Arm by approximately 0.010 inches. Carefully note and mark last position before loosening Stop Arm retaining screws. Secure Stop Arm in new position. **d.** Secure Linker in new (lowered) position. Repeat Steps b and c until the 3/16" overlap is achieved. If overlap does not occur, check compression spring retaining nut (Figure 6-2). Tighten if loose and rotate disc by hand. Check to determine if 3/16" overlap occurs. If it does, continue operations. If not, remove faulty Linking Head and replace with new Linking Head Sub-Assembly. **NOTE** Observe safety precautions (Paragraph 6.4) before continuing with the next procedure.

TABLE 6-2
MECHANICAL TROUBLESHOOTING (Continued)

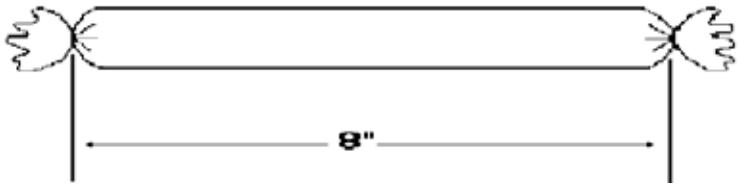
PROBLEM	SOLUTION
D. Miss-cut (double link). Machine does not cut every link. Links are continuous to about 8 inches in length or double the required 4“ size. Linker Torsion Springs do not compress.	**a.** Examine Linker Torsion Springs, Isolate faulty spring. **b.** Remove any obstructions that would cause the Torsion Spring to keep blades in an open position. **c**. Stop Machine. Remove and replace any faulty Torsion Spring. Refer to Section V for guidance.  **Figure 6-2** Miss-cut or 8” link.
E. Shoulder break occurs as shown in Figure 6-3. Casing is broken.	 **Figure 6-3** Link shoulder break. **a.** Check for obstruction in Linking Head Sub-Assembly cutter insert (See Figure 6-1). **b.** Check Z-Bar position in relation to insert cutting edge. **c.** Check vertical distance of feed roller from feed table. It should not exceed 12”. See Figure 3-1 and Figure 3-2. **d.** Check for over stuffing. **e.** Check for incorrect wet-out conditions. **f**. Check blade sets (Part # 05x02) for misalignment, looseness or deformity replace entire assembly.

TABLE 6-2
MECHANICAL TROUBLESHOOTING (Continued)

PROBLEM	SOLUTION
F. Machine develops unusual noises.	**STEP 1** **a.** Lubricate all fittings. **b.** Isolate noise and service components. **c**. Feel machine parts. If running hot, stop machine and repair or replace bearings, gearmotor, or parts. **STEP 2** **a.** Move machine to another location. Then re-start it and note any changes. **b.** Remove and replace (or repair) faulty parts.

PARTS LIST
SECTION VII

7.1 ORDERING PARTS

Use illustrations to identify the part and then refer to the "Z" Linker Model III Parts List for ordering information. When ordering parts, please include the part number, quantity, and part description.

7.2 PARTS NOT ILLUSTRATED

Certain parts may not be illustrated such as junction box wires, fasteners, washers, and other items. Refer to the original machine part and describe it by location and function.

7.3 PARTS LIST

Attached is a list of parts for the "Z" Linker. If the word "***note***" or "***special***" is listed for your part number in the QUANTITY REQUIRED column, refer to the Addendum at the end of this section for more information.

PART NO.	QTY REQ'D	DESCRIPTION	UNITS
00X05	1	Cap	1
00X06	12	Clamp Plate (on Linking Head Sub-Assembly)	1
00X20	1	Limit Switch	1
00X27	1	Cam Shaft Spacer	1
00X28	1	Cam Shaft Key	1
00X33	48	#10 Flat Washer (.062" thick)	50 (1 bag)
00X36	26	Retaining Ring (Small)	20 (1 bag)
00X37	1	Retaining Ring (Large)	2 (1 bag)
00X46	2	Vertical Guide Pin (on Disc Guard)	1 *
00X64	12	Teflon Washer (.015") (on Linking Head Sub-Assembly)	25 (1 bag)
00X65	12	Teflon Washer (.030") (on Linking Head Sub-Assembly)	25 (1 bag)
00X66	12	Spring Holder (.59") (on Linking Head Sub-Assembly)	10 (1 bag)
00X69	12	Compression Spring (on Linking Head Sub-Assembly)	25 (1 bag)
00X70	12	Torsion Spring (on Linking Head Sub-Assembly)	5* (1 bag)
00X71	12	Stop (on Disc Assembly)	1
00X72	1	Grease Fitting	1
00X78	5	Cord Stress Connector	1 *
00X82	1	10/32" x 5/8" Hex Head Cap Screw, S/S	10 (1 bag)
00X84	3	1/4" Flat Washer, S/S	1 (1 bag)
00X97	12	8/32" x 1/2" Cap Screw, S/S	25 (1 bag)
00X98	2	Vertical Guide Roll (on disc guard)	2 (1 bag)
00X99	1	Horizontal Guide Roll (on disc guard)	1
01X00	1	Horizontal Pin (on disc guard)	1 *
01X01	2	Horizontal Roll (on disc guard)	2 (1 bag)
01X02	1	Horizontal Adjust Pin (on disc guard)	1
01X11	24	10/24" x 7/8" Cap Screw, S/S	16 (1 bag)*
01X13	12	Cylindrical Bearing	8 (1 bag)*
01X14	1	Caution Sign	1

PART NO.	QTY REQ'D	DESCRIPTION	UNITS
01X21	2	6/32" x 1-1/4" Round Head Machine Screw, S/S	10 (1 bag)
01X38	12	Arm (on Linking Head Sub-Assembly)	1 *
01X40	24	Roller (on Linking Head Sub Assembly)	1
01X48	4	1/4" x 5/8" Dowel Pin	1
01X77	note	Guide Roll Bracket Sub-Assembly (see addendum)	1
01X88	8-12	Casing Support (Depending on Config.)	1
02X16	1	Limit Switch Safety Cap	1
05X02	note	Single Blade Set (on Linking Head Sub Assembly) (see addendum)	1
12X05	1	Base	1
12X06	(special order)	Pedestal – not a stock item (see addendum)	1
12X07	1	Front Bearing Housing	1
12X08	1	Rear Bearing Housing	1
12X09	1	Disc 16" - 12 Slots	1
12X10	1	Disc 16" - 10 Slots	1
12X11	1	Disc 16" - 8 Slots	1
12X12	1	Disc Shaft	1
12X13	1	Disc Locking Nut	1
12X14	1	Disc Shaft Key	1
12X15	1	Cam Shaft	1
12X16	1	Cam Shaft Lock	1
12X17	1	Disc Guard Mounting Bracket	1
12X18	2	3/4" Shaft Collar	1 (1 bag)
12X19	4	5/16-18 x 1" Socket Cap Screw	1 (1 bag)
12X20	1	5/16-18 x 2-1/2" Socket Cap Screw	1 (1 bag)
12X21	3	1/4-20 x 1-1/2" Hex Head Screw	1 (1 bag)
12X22	1	1/4 HP DC Gearmotor (as is from Manufacturer)	1
12X23	2	Motor Brushes	1 (1 bag)
12X24	1	On/off Switch	1

PART NO.	QTY REQ'D	DESCRIPTION	UNITS
12X25	1	Speed Control	1
12X26	1	Potentiometer	1
12X27	1	Hubbell Plug (Type 4729C)	1
12X28	1	Connector	1
12X29	1	Intermediate Shaft	1
12X30	2	Disc Shaft Thrust Washer (.752") (on intermediate shaft)	1 *
12X31	8	1/4"-20 x 1-3/4" Socket Cap Screw	1 (1 bag)
12X32	1	Disc Shaft Gear	1
12X33	1	Idler Gear	1
12X34	1	Motor Shaft Gear	1
12X35	1	Idler Bearing	1
12X36	1	Disc Shaft Bearing (rear) 2.951"	1
12X37	2	Cam Shaft Bearing	1
12X38	1	Disc Guard	1
12X39	2	Jacking Screws	1 (1 bag)
12X40	2	Disc Shaft Thrust Washer (1.773")	1
12X41	1	Disc Shaft Bearing (front) 3.148"	1
12X42	1	DC Motor Sub-Assembly (Pre-wired)	1
12X43	1	Speed Control Sub-Assembly	1
12X44	1	Motor Brush Cap	1
12X45	1	DC Junction Box	1
12X68	1	Lexan Guard Plate	1
12X69	1	Disc Guard Pivot Shaft	1
12X70	1	Disc Guard Stop Pin	1
12X71	1	Front Bearing Seal	1
12X72	1	Grease Plug	1
12X73	4	1/4"-20 x 3/4" Socket Head Cap Screw	8 (1 bag)
12X74	8	1/4"-20 x 1-3/4" Socket Head Cap Screw	10 (1 bag)

PART NO.	QTY REQ'D	DESCRIPTION	UNITS
12X75	2	1/4"-20 x 1-1/4" Socket Head Cap Screw	2 (1 bag)
12X76	4	1/4"-28 x 3/4" Socket Head Cap Screw	4 (1 bag)
12X77	1	Motor Mount Sub-Plate	1
12X78	2	1/4"-20 x 1-1/4" Flat Head Socket Cap Screw	2 (1 bag)
12X79	1	1/4"-20 x 3/16" Socket Set Screw	1
12X80	3	1/4"-20 x 1/4" Socket Set Screw	3 (1 bag)
12X81	1	1/4"-20 x 3/8" Socket Set Screw	4 (2 bags)
12X82	2	1/4"-20 x 1/2" Socket Set Screw	2 (1 bag)
12X83	1	1/4"-20 x 3/4" Socket Set Screw	1
12X84	1	Hubbell Seal Tite Cover HBL6023	1
12X85	1	Hubbell Seal Tite Cover HBL6024	1
86X29	1	Disc Shaft Gear Key	1

Left Hand Z-Linker Machine Parts

12X61	1	Disc Guard Mounting Bracket - LH (in lieu of 12X17)	1
12X62	1	Disc 16" - 12 Slots - LH (in lieu of 12X09)	1
12X63	1	Disc 16" - 10 Slots - LH (in lieu of 12X10)	1
12X66	1	Disc 16" - 8 Slots - LH (in lieu of 12X11)	1
12X86	1	Base - LH (in lieu of 12X05)	1*
86X41	8	Arm (on Linking Head Sub Assembly) LH (in lieu of 01X38)	1 *

*Note: " * " one should be sufficient. However, it would take more for total parts replacement.*

CAMS

PART NO.	QTY REQ'D	DESCRIPTION	UNITS
12X59		Cam 3.437	1 pair (1 set)
12X50		Cam 3.5	1 pair (1 set)
12X67		Cam 3.5 (fast rise)	1 pair (1 set)
12X51		Cam 3.625	1 pair (1 set)
12X52		Cam 3.75	1 pair (1 set)
12X57		Cam 3.75 (fast rise)	1 pair (1 set)
12X53		Cam 3.875	1 pair (1 set)
12X58		Cam 3.875 (fast rise)	1 pair (1 set)
12X54		Cam 4.0	1 pair (1 set)
12X60		Cam 4.0 (fast rise)	1 pair (1 set)
12X56		Cam 4.25	1 pair (1 set)

Cams are sold in paired sets only.

7.4 ADDENDUM

Note, Part 05X02:
Paired matched set – contains LH/RH Blade Linking Head Blades, Teflon Washers = 00X64 & 00X65, Compression Spring = 00X69, Spring Holder = 00X66, and Cylindrical bearing = 01X13.

Note, Part 01X77:
Consists of 2 (00X36) Retaining Rings, 2 (00X46) Vertical Guide Pins, 2 (00X98) Vertical Guide Rolls, 1 (00X99) Horizontal Guide Roll, 1 (01X00) Horizontal Roll Pin, 2 (01X01) Horizontal Rolls, and 1 (01X02) Horizontal Adjustment Pin. These parts come completely assembled in a lexan frame. *[This part can be used to repair old style Disc Guards (1983-89) by cutting out the old frame and drilling and tapping mounting holes for the new style faceplate.]*

Replacing motors on "Z" Linkers made prior to the 2010 year:

- Remove Disc Guard.
- Remove Linking Heads (set nylon stops before removing).
- Remove 12 x 16 cam shaft lock.
- Remove cam shaft (entire assembly).
- Remove disc.
- Remove base plate.
- Remove (6) 12X31 Allen screws on "motor side of the case".
- Carefully separate the two pedestal assemblies (NOTE: 12X40 Thrust washers could bind during disassembly).
- Tilt and shake the pedestal while separating to avoid breaking the thrust washers.

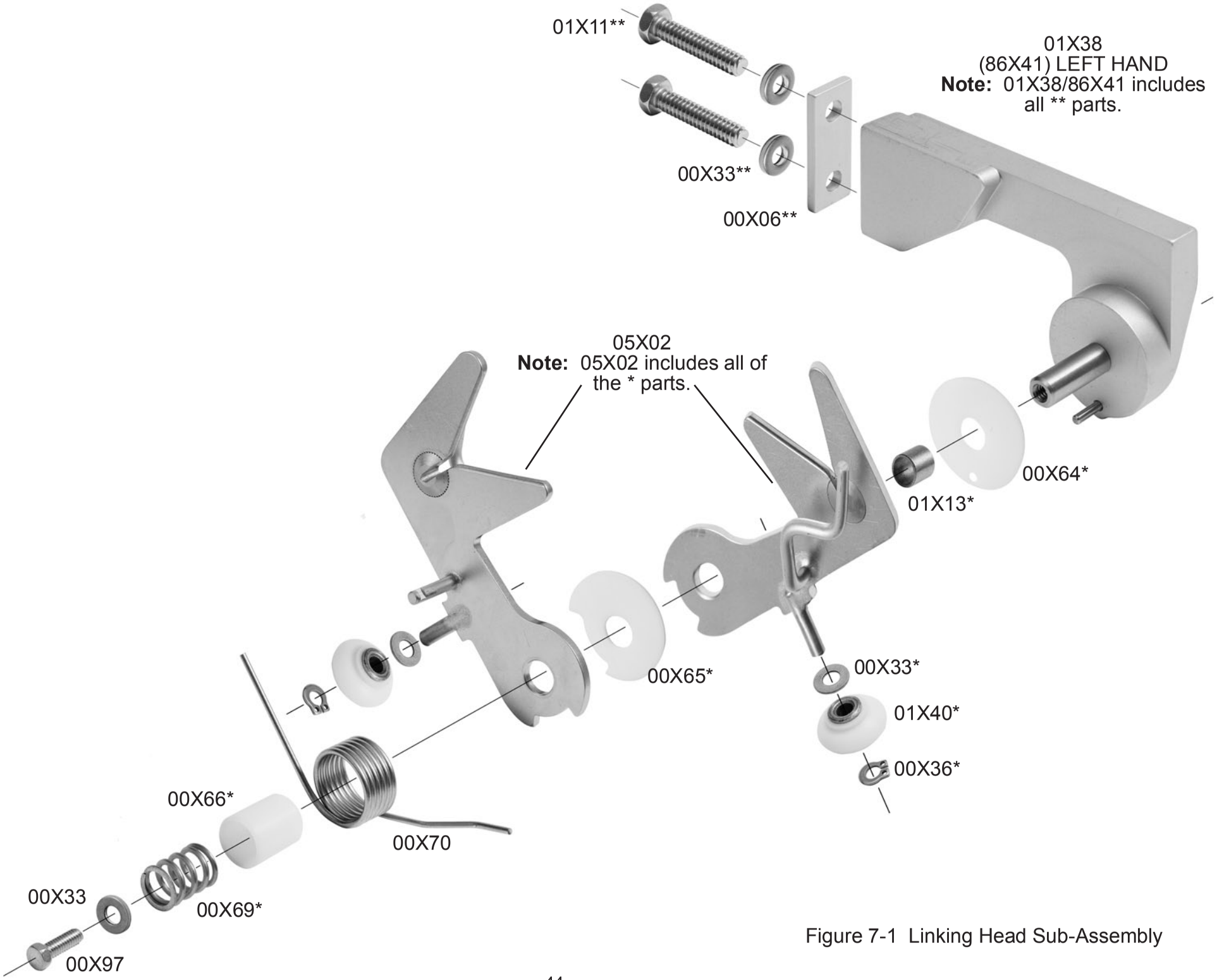


Figure 7-1 Linking Head Sub-Assembly

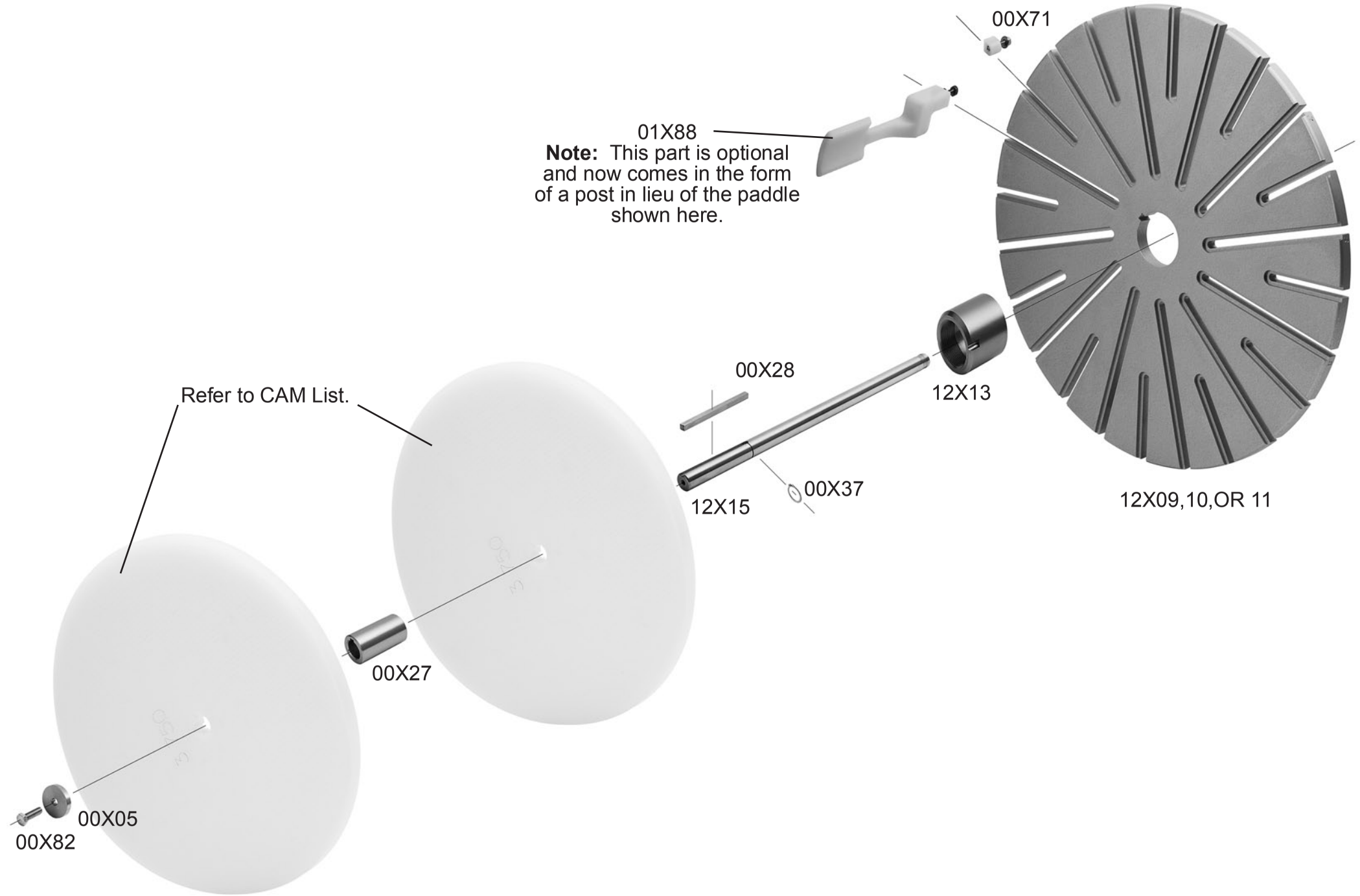


Figure 7-2 Pedestal Assembly Section **A**

Figure 7-3 Pedestal Assembly Section **B**

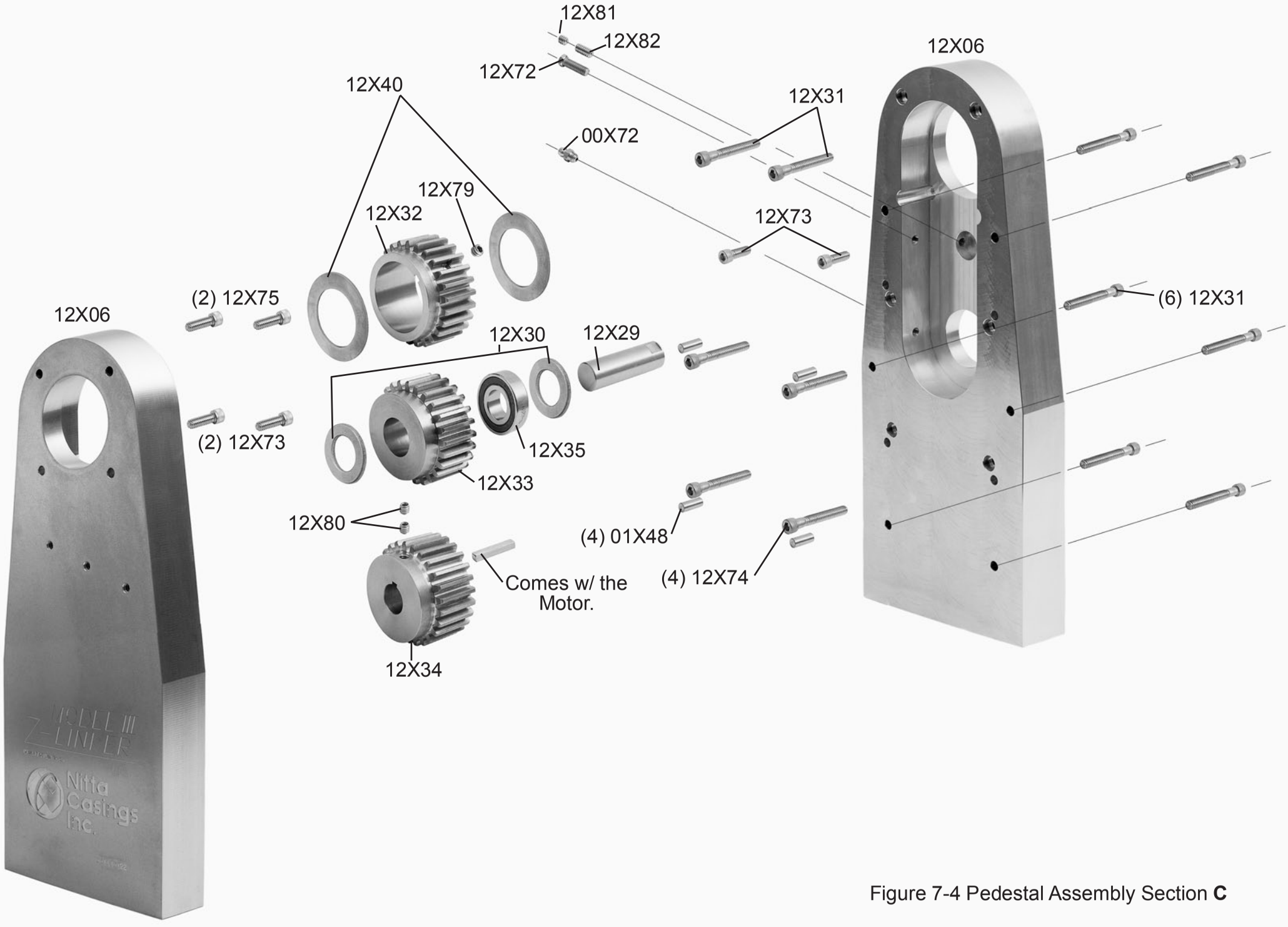


Figure 7-4 Pedestal Assembly Section **C**

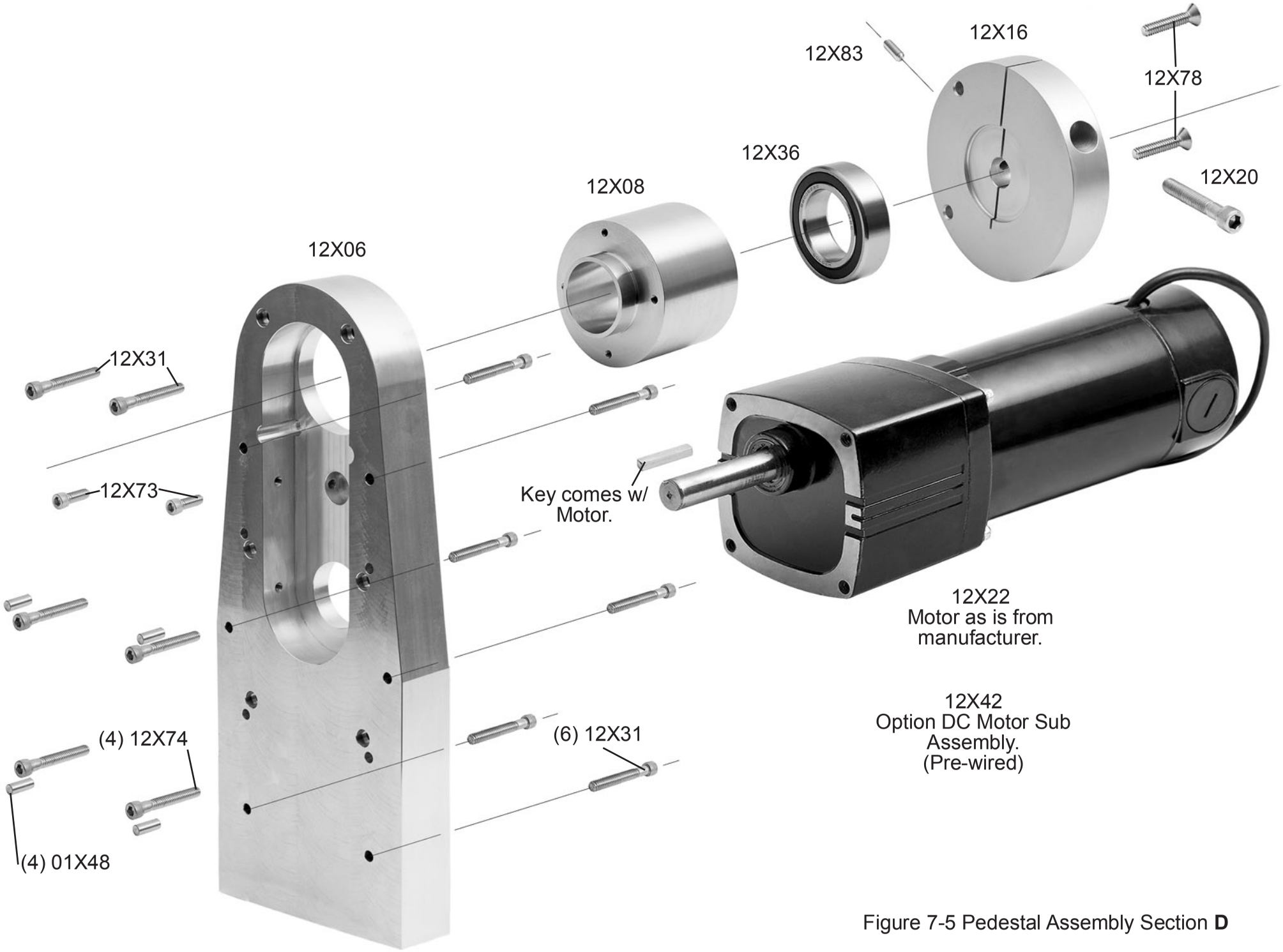


Figure 7-5 Pedestal Assembly Section **D**

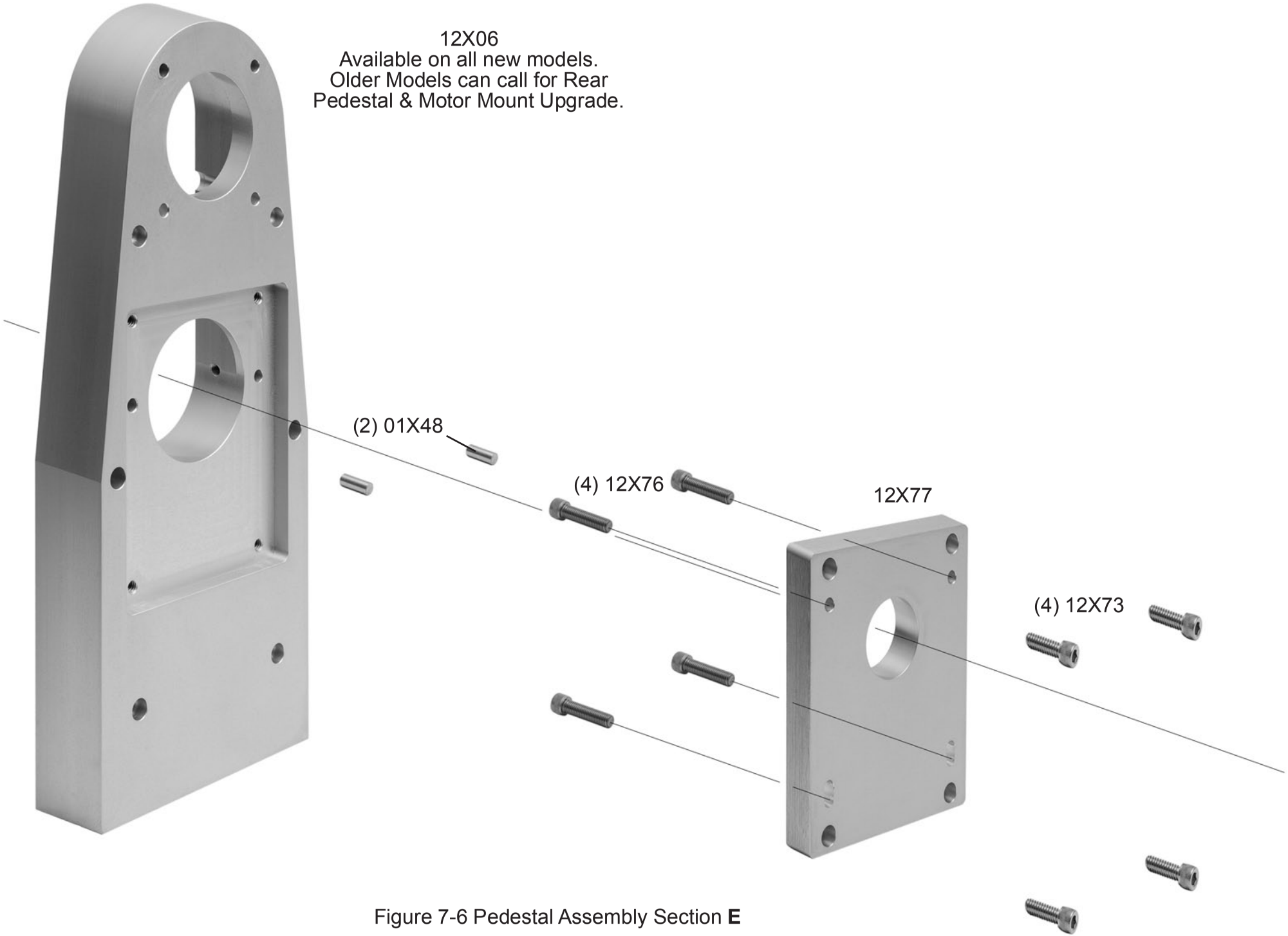


Figure 7-6 Pedestal Assembly Section **E**