Documentation Package
for CF-8 Axial Component Lead Former

PN 801-1-01

version 2.0 03/22/2021

CONTENTS of CF-8 Documentation Package	
Operating Guide	In addition to installation, set up, and operating procedures, this guide includes electrical schematics and maintenance, troubleshooting, spare parts, and specifications details.
Bills of Material	Includes an illustrated bill of material with associated part numbers for each CF-8 subassembly.
Die Catalog	Catalog of dies precisely manufactured by GPD Global® to accurately form Axial components into horizontally and vertically mounted configurations.
Set Up Form	Fill out this electronic Set Up form using your computer keyboard and then either print the results or save them to a new file.
Transport Wheel Maintenance	Instructions for installing rubber pads on transport wheel shims, plus how to replace the shims themselves - both the standard type and the rubber-padded type.
Calculator Software	Instructions for using the calculator software to calculate station settings and die set requirements.

611 Hollingsworth Street
Grand Junction, CO, USA 81505
tel: +1.970.245-0408
fax: +1.970.245-9674
request@gpd-global.com
www.gpd-global.com

CF-8
Axial Component Lead Former

Operating Instructions

Version 2.2
April 2, 2007

GPD Global®

611 Hollingsworth Street
P.O. Box 3836
Grand Junction, CO 81502
(970) 245-0408
FAX: (970) 245-9674

NOTE:

This document applies to these machine models:

- **CF-8** Precision Axial Component Lead Former
- **CF-15** Precision Axial Component Lead Former

The following exceptions apply when using this document for the **CF-15**:

1. Ignore all references to Stations 4 & 5 (they are not present on the CF-15).
2. Roller or dimpling dies are not applicable.
3. No crimping on the component leads is performed**.**

04/02/07

Warranty

GPD Global® (GPD) warrants that this product will be free from defects in material and workmanship for a period of one (1) year from the date of original purchase. GPD will repair, or at its option, replace this GPD Product during the warranty period at no charge, provided it is returned (shipping-postage paid) to the GPD, Colorado service facility.

The one year warranty does not cover normal wear and tear to the cutting and forming tooling, since life usually depends on use.

This warranty does not apply if the GPD product has been damaged by accident, abuse, misuse, or misapplication, has been modified without the written permission of GPD, or if any GPD serial number has been removed or defaced.

GPD IS NOT RESPONSIBLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM THE BREACH OF ANY EXPRESS OR IMPLIED WARRANTY INCLUDING ANY COSTS OF DAMAGE TO PROPERTY, AND, TO THE EXTENT PERMITTED BY LAW, DAMAGES FOR PERSONAL INJURY. THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES. ANY IMPLIED WARRANTIES, INCLUDING IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED IN DURATION TO ONE (1) YEAR FROM THE DATE OF RECEIPT OF THIS PRODUCT. GPD'S LIABILITY ON ANY CLAIM OF ANY KIND INCLUDING NEGLIGENCE, FOR LOSS OR DAMAGE ARISING OUT OF, CONNECTED WITH OR RESULTING FROM THE BREACH OF ANY EXPRESS OR IMPLIED WARRANTY OR THE DELIVERY, REPAIR, OR USE OF ANY GPD PRODUCT SHALL IN NO CASE EXCEED THE PRICE ALLOCABLE TO THE GPD PRODUCT WHICH GIVES RISE TO THE CLAIM.

Specifications, descriptions, and all information contained in this manual are subject to change and/or correction without notice.

Revisions

Version 1.0 release. All undated pages.

Version 2.0 release. All pages dated 12/01/90.

Version 2.1 release. All pages dated 08/30/91.

Version 2.2 release. All pages dated 04/02/07.

Table of Contents

References

CF-8 Bills of Material with Exploded View Drawings (P/N 801-1-05)
CF-8 Component Forming Dies Catalog (P/N 800-000)
CF-8 Setup Sheet (P/N 850-003)
Transport Wheel Maintenance Procedure (P/N 817-1-18)

Table Of Charts

Table of Figures

1.0 Introduction

The CF-8 Precision Axial Lead Former is designed to efficiently cut and form leads of axial electrical components up to a maximum rate of 25,000 parts per hour. Components are fed into the machine and then the component's leads are trimmed by carbide cutting blades, and crimped and/or cut in a manner that avoids stress on the leads. The leads are then formed into horizontal or vertical bends. The figure below illustrates the most common axial component forms that can be produced with the CF-8. Precision machined dies are quickly changed to make the different forms.

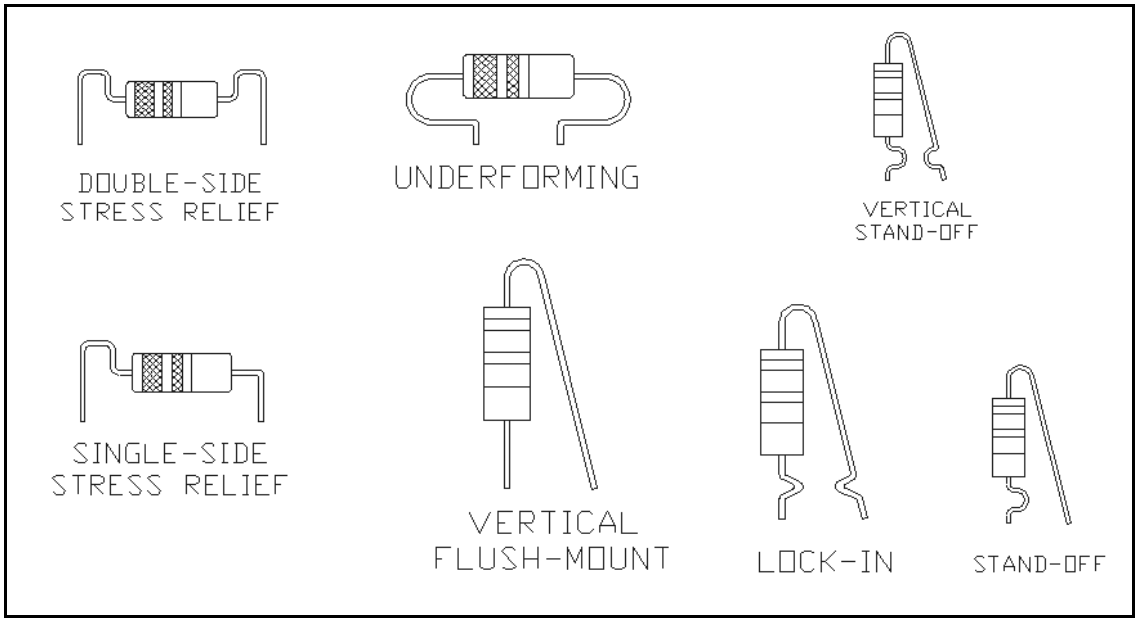


Figure 1 Axial Component Forms

Standard equipment includes an internal variable speed motor, power supply, and a dual component feeder to process both taped and single-fed bulk components. An optional component bulkfeeder or cardfeeder is also available.

Before operating the CF-8, read this *Operating Instructions* manual for safety precautions for the safety of both the operator and the machine.

2.0 Part Identification & Specifications

2.1 Part Identification

The key parts of the CF-8 are identified and illustrated in this section.

2.1.1 Front View

The illustration below identifies the basic operator regulated parts (clockwise from the top) of the CF-8 as seen from the front view.

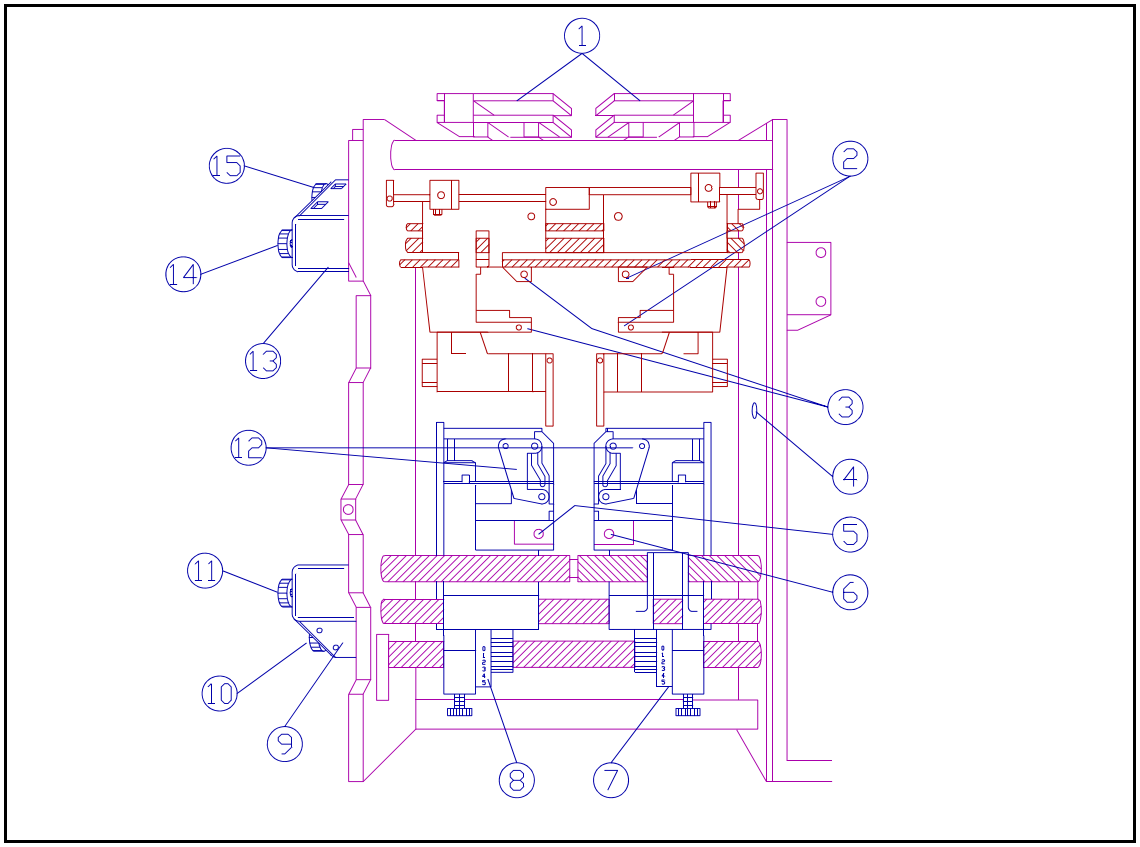


Figure 2 Front View, Part Identification

Item 1	Dual Infeed Chutes	Item 9	Stations 6 & 7 Counter Box
Item 2	Station 4 Die Holder (top & bottom)	Item 10	Station 7 Adjustment Knob
Item 3	Station 5 Die Holder (top & bottom)	Item 11	Station 6 Adjustment Knob
Item 4	Safety Switch	Item 12	Stations 6 & 7 Roller Assemblies
Item 5	Station 7 Die Holder		Stations 4 & 5 Counter Box
Item 6	Station 6 Die Holder	Item 13	Station 5 Adjustment Knob
Item 7	Station 8 Rollover Adjustment	Item 14	Station 4 Adjustment Knob
Item 8	Station 9 Rollover Adjustment	Item 15	

2.1.2 Rear View

The illustration below identifies the basic operator regulated parts (clockwise from the top) of the CF-8 as seen from the rear view.

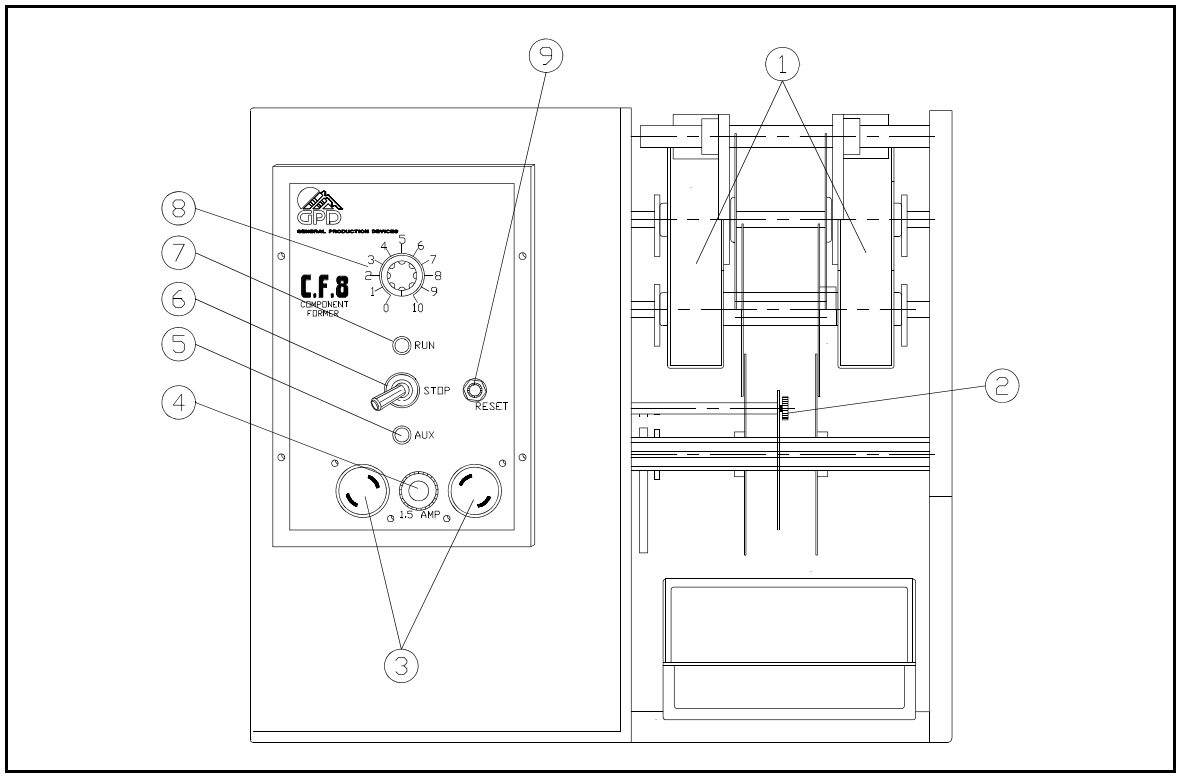


Figure 3 Rear View, Part Identification

Item 1	Exit Chutes	Item 6	Toggle Switch
Item 2	Ejector Blade Thumbscrew	Item 7	Run Mode Indicator Light
Item 3	Auxiliary Outlets	Item 8	Speed Control Knob
Item 4	Fuse Holder	Item 9	Reset Button
Item 5	Auxiliary Mode Indicator Light		

2.1.3 Left View

The illustration below identifies the basic operator regulated parts (clockwise from the top) of the CF-8 as seen from the left view.

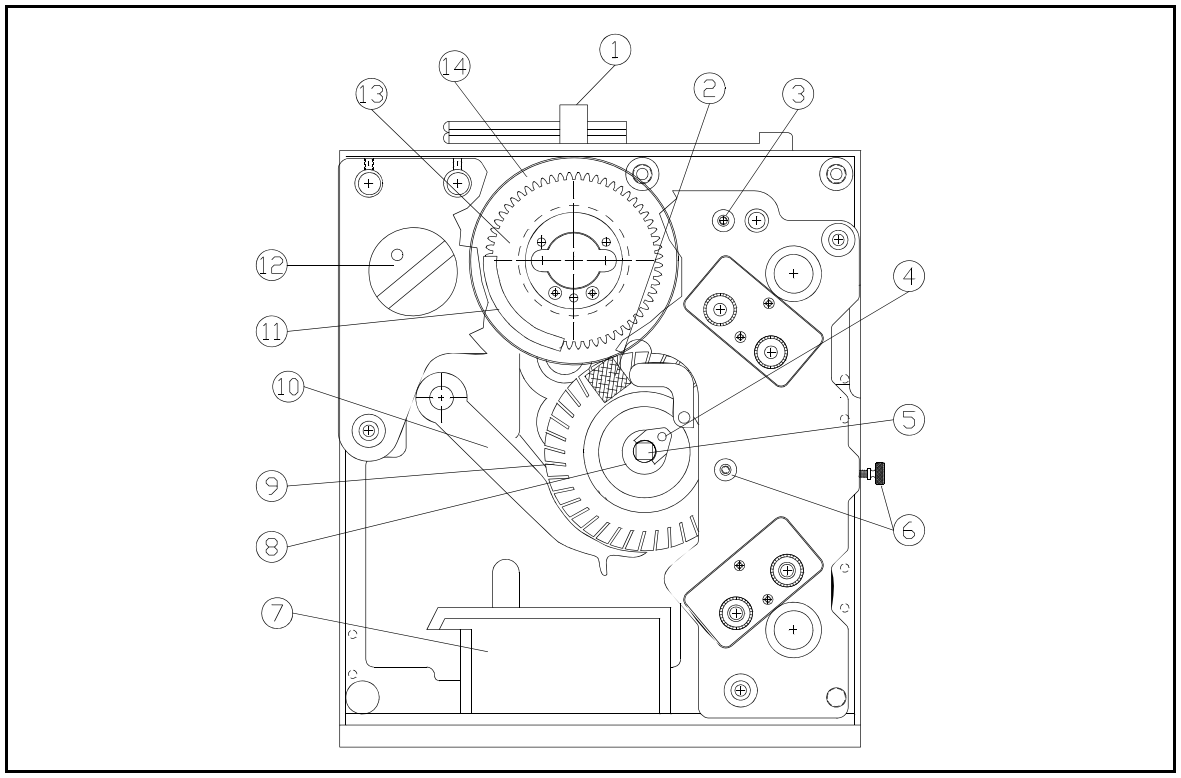


Figure 4 Left View, Part Identification

Item 1	Infeed Chute Plug	Item 8	Transport Wheel Hub
Item 2	Magnet Assembly	Item 9	Transport Wheel Shim
Item 3	Station 1 Adjustment Knob	Item 10	Component Ejector Blade
Item 4	Transport Wheel Hub Guide	Item 11	Sideplate Assembly
Item 5	Transport Wheel Square Shaft	Item 12	Safety Switch
Item 6	Safety Guards Locking Knobs	Item 13	Cutting Wheel Pair
Item 7	Component Bin	Item 14	Stations 2 & 3 Counter Box

Note: Items 11 and 13, the sideplate assembly and the cutting wheel pair, are shown in a cutaway. This is done for identification purposes only and is not meant to reflect the actual appearance of the CF-8.

2.1.4 Right View

The illustration below identifies the basic operator regulated parts of the CF-8 as seen from the right view.

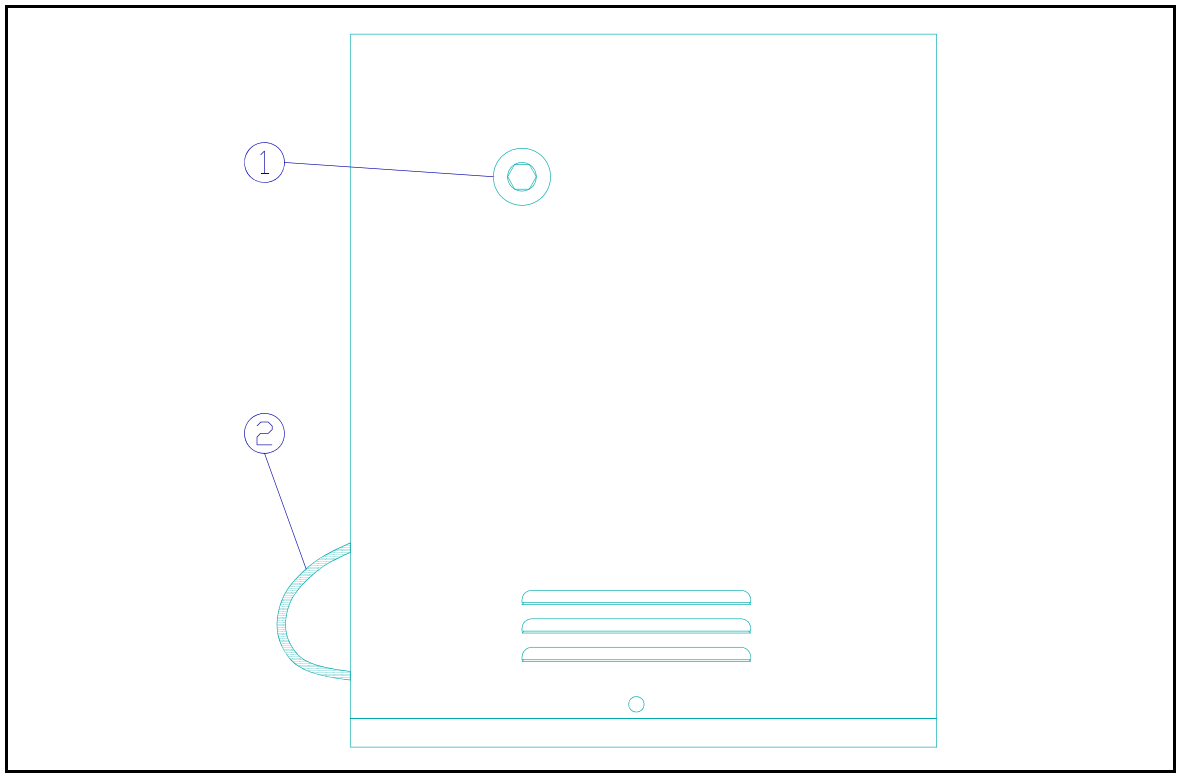


Figure 5 Right View, Part Identification

Item 1 Manual Hex Indexing
Item 2 Power Cord

2.1.5 Cutting & Forming Dies

The figure below illustrates examples of standard GPD cutting and forming dies.

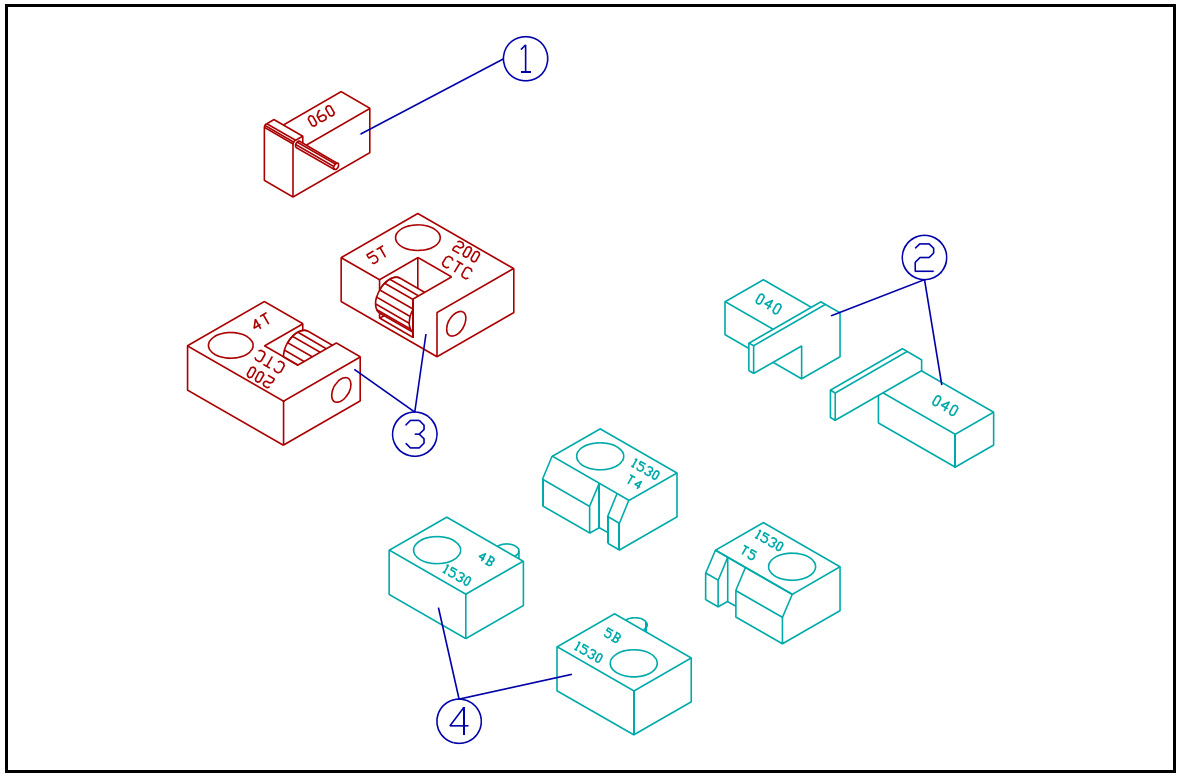


Figure 6 Cutting & Forming Dies, Part Identification

In the figure above:

	Die Type	Component Forming Use	Station Location
Item 1	Pin	Vertical	6 or 7
Item 2	Horizontal	Flush-mount	6 & 7
Item 3	Roller	Flush-mount	4 & 5
Item 4	Dimpling	Stand-off	4 & 5

2.1.6 Safety Guards

The illustration below identifies the Safety Guards.

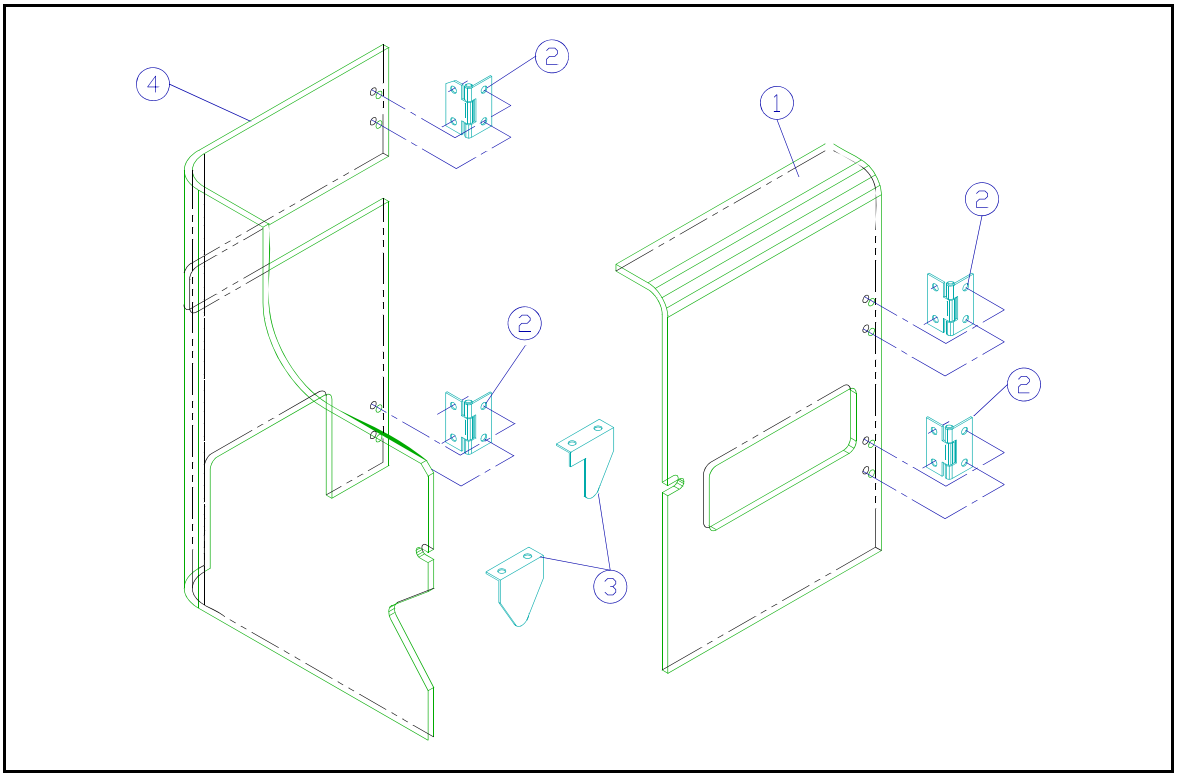


Figure 7 CF-8 Safety Guards, Part Identification

Item 1 Front Safety Guard
Item 2 Hinges
Item 3 Microswitch Brackets
Item 4 Rear Safety Guard

2.2 Specifications

2.2.1 Power Requirements

100 V Model

Voltage	100	V
Frequency	50/60	Hz
Current 3		Amp

120 V Model

Voltage	120	V
Frequency	50/60	Hz
Current 3		Amp

230 V Model

Voltage	230	V
Frequency	50/60	Hz
Current 1		Amp

2.2.2 Measurements

Height	14.0"	(356 mm)
Length	12.0"	(305 mm)
Width	18.0"	(457 mm)
Weight--Actual	96.0 lbs	(43.6 kg)
Weight--Shipping	102.0 lbs	(46.3 kg)

2.2.3 Production Rates (maximum number of components per hour)

Tape-mounted	25,000
Card-mounted	6,000
Bulk-fed	4,000

2.2.4 Processing Ranges

Figure 8 and **Figure 9** below illustrate various component elements. The CF-8 is capable of processing these elements within the ranges specified in the charts below. Ranges are specified for taped, card, and bulk components.

In the figure and charts below:

BD	=	Body Diameter	LL	=	Leg Length
BL	=	Body Length	WD	=	Wire Diameter
CTC	=	Center to Center	WL	=	Wire Length

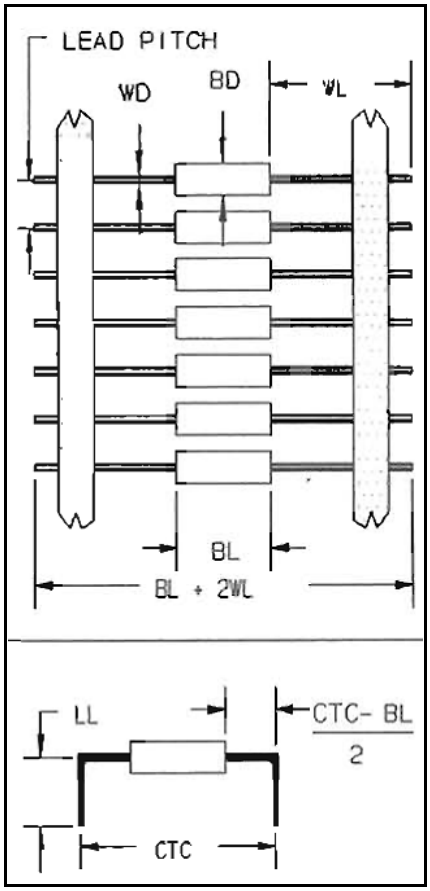


Figure 8 Component Elements
Lead Pitch = .2", .4"
(5mm, 10mm)

Taped Components				
	Inches		Metric (mm)	
Dimension	Min.	Max.	Min.	Max.
BD	0.050	0.750	1.3	19.1
BL	0.135	2.000	3.4	50.8
BL+2WL	1.500	BL+3.90	38.1	BL+99.06
CTC	*	2.400	*	61.0
(CTC-BL)÷2	0.040	**	1.0	**
LL	0.140	1.600	3.6	40.6
WD	0.015	0.060	0.4	1.5

Chart 1 Taped Components Processing Ranges

* Minimum CTC is dependent on the type of die used and the type of component being processed.

** Maximum = (2.4 - BL) ÷ 2 **or** (61mm - BL) ÷ 2.

Card & Bulk Components (same specs as taped except the following)				
	Inches		Metric (mm)	
Dimension	Min.	Max.	Min.	Max.
BL	0.135	2.300	3.4	58.4
BL+2WL	1.000	4.500	25.4	114.3
WD	0.015	0.052	0.4	1.3
BD	0.050	0.350	1.3	8.9

Chart 2 Card & Bulk Components Processing Ranges

2.2.4 Processing Ranges (continued)

In the figure and chart below:

B = Body to Bend H = Height of Leg
C = Crimp Height R = Bend Radius

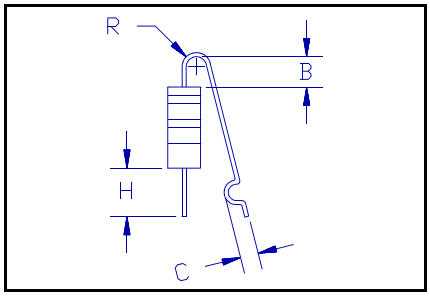


Figure 9 Vertical Component Elements

Vertical Components				
	Inches		Metric (mm)	
Dimension	Minimum	Maximum	Minimum	Maximum
B	0.070	---	1.8	---
C	0.045	0.065	1.1	1.7
H	0.180	---	4.6	---
R	0.020	0.050	0.5	1.3

Chart 3 Vertical Components Processing Ranges

3.0 Safety Instructions

Read Instructions

Read this manual before turning the power on.

Danger - Machine Operation

Keep fingers, clothing, and foreign objects away from wheels and spindles while machine is operating--failure to do so may result in bodily injury or damage to the machine.

Warning - Machine Adjustments

Read and follow the instructions in *5.0 Set-Up Procedure* before performing adjustments to the CF-8. Adjustments performed out of order can damage the machine.

Warning - Machine Parts Removal

Do not disassemble or remove parts of the CF-8. Read this instruction manual to identify which parts of the machine may be removed.

Caution - Operator Safety

Two plastic safety guards are provided to attach to the front and rear of the CF-8. The guards protect the operator from the moving parts of the machine while in operation. When closed, the guard's microswitch brackets depress safety switches, allowing the machine to operate. Do not defeat the safety switches and operate the machine without the guards in place.

The CF-8 should not be operated with the cover off the right side of the machine due to the danger that exists of electric shock or getting entangled with the belts, pulleys, and cams that drive the machine.

Caution - Power Supply

Make sure the power supplied to the CF-8 is the proper voltage and is fused at the proper amps. This information is on the rear of the machine next to the power cord and in section *2.2.1 Power Requirements.* Do not defeat the earth ground connection of the power cord.

4.0 Installation Procedure

Carefully unpack and check the machine for possible shipping damage. If any obvious damage is observed, contact the GPD service department prior to operating the machine. See cover page of this document for phone number and address.

4.1 Accessories

Listed below are the minimum accessories included with the CF-8. Part numbers listed to the right are included as an aid when necessary to re-order a particular item.

Accessory Item	Part Number
1 Reel and Tape Arm Assembly	707-107
1 Component Bin	701-EA
1 Scrap Bin	810-6-6
1 Footswitch	5100-0027
1 Set Standard Horizontal Dies	800A-0040
1 Single Pin Die	800D-7060
1 Transport Wheel System	817-1-200
1 Small Ejector Blade	817-1-12S
1 Tool Kit containing:	850-001-100
3 Hex "T" Wrenches (3/32", 1/8", 1/4")	
1 Hex "T" Wrenches with bend (1/8")	
2 Hex Ball Drivers (9/64", 3/16")	
1 Handi Hex (1/16")	
2 Allen Wrenches (5/32", 7/64")	
1 Transport Wheel Alignment Tool	
1 Large Ejector Blade	
1 Twist Lock Plug	
8 Pin Die Screws	
2 1/4"-20 x 7/8" Hex Cap Screws	
1 Manual	
1 Pad of Set-up Instruction Forms	

4.2 Accessory Installation

Danger - Keep fingers, clothing, and foreign objects away from wheels and spindles while machine is operating--failure to do so may result in bodily injury or damage to the machine.

Install reel arm holder & options

1. Match the rectangular end of the reel arm holder with the indentation on the front of the machine as shown in **Figure 10**, Item 1.
2. Position the reel arm holder so that the arm is slanting upward.
3. Fasten the reel arm holder with two included 1/4-inch cap screws to the position indicated by Item 2.
4. See section *7.0 Options* for optional equipment attachment instructions.

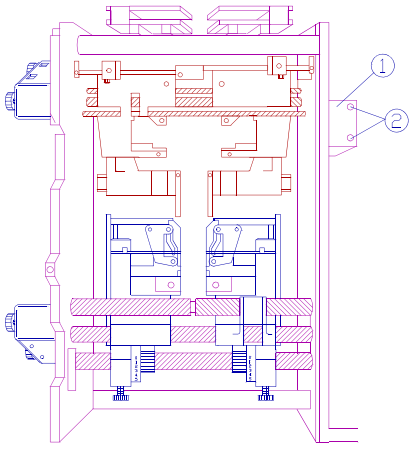


Figure 10 CF-8 Front View, Installation

Install front & rear safety guards

1. Position the front guard so that the hinges on the right side of the guard swing inside as illustrated in **Figure 11**, Item 1.
2. Fasten guard hinges with four included #10 button head screws.
3. Install the rear guard in a similar manner except that the hinges are on the left side of the guard.

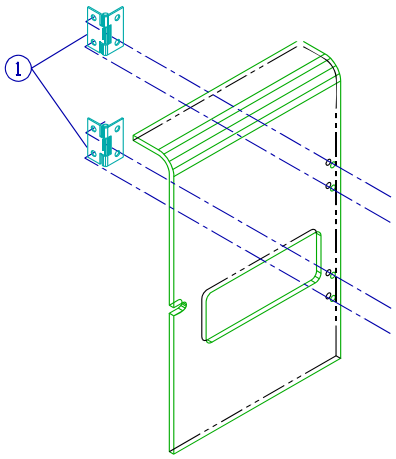


Figure 11 CF-8 Safety Guard, Installation

4.3 Footswitch Installation

The footswitch is an alternative to using the toggle switch (**Figure 12**, Item 2). When installed, depress the footswitch to turn the machine on and release to turn it off.

1. Insert the plug of the footswitch into one of the outlets (Item 4) located on the rear of the CF-8.
2. *Insert the twist lock plug from the tool kit into the remaining outlet.
3. Turn the plugs clockwise to lock into the outlets.
4. Set the speed control (Item 1) to "0."
5. Set the toggle switch down to "Aux." position. The auxiliary mode indicator light (Item 3) will light.
6. Turn the speed control to the desired operating speed.
7. If necessary to remove the plug, turn the plug counter-clockwise.

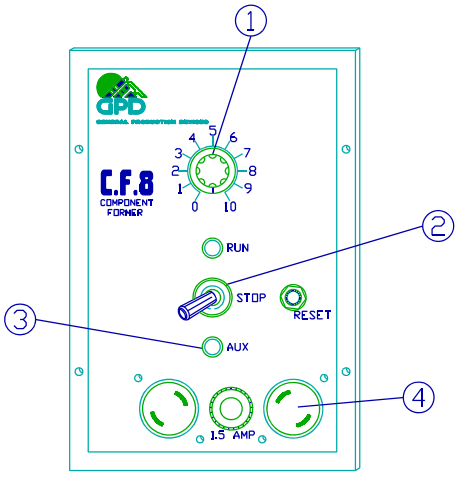


Figure 12 CF-8 Rear View, Footswitch Operation

***Note:** The auxiliary electrical outlets on the control panel are wired in series. It is necessary to install the twist lock plug to complete the circuit.

5.0 Set-Up Procedure

The CF-8 can be set-up to form different component elements. This section details the step-by-step instructions necessary to change the machine set-up. See the end of this section for a summary, in chart form, of the steps to take to set-up the CF-8.

5.1 Operations & Functions Summary

This section summarizes the method of operations and station functions the CF-8 uses to cut and form component leads. It is provided as a guide to the forming process and operator interaction with the machine.

5.1.1 Method of Operations

The following defines the steps that the CF-8 performs to cut and form axial components. The figure below illustrates the machine's basic operation sequence. If necessary, see section *2.1 Part Identification* to identify machine related parts.

1. **Feed Components**
   Components are fed into the machine with a bulkfeeder, cardfeeder, on reel and tape, or by hand through the dual infeed chutes (Station 1). See section *7.0 Options* for bulkfeeder and cardfeeder identification.
2. **Cut Leads**
   The tooth spaces of the cutting wheels (Stations 2 and 3) carry the components past the cutting blades that cut the leads. Trimmed leads slide down the exit chute into the scrap bin. The sideplate assemblies contain and guide the trimmed component as the cutting wheels carry the component to the transport wheels.
3. **Crimp Leads**
   The transport wheels pick up the component by the body and present it to the die blocks in Stations 4 and 5 where, depending on the type of dies installed, the leads are crimped, cut, or both.
4. **Form Legs**
   Further indexing presents the component to the dies in Stations 6 and 7 where the leads are formed into 90 degree bends or a vertical loop that form the legs of the component.

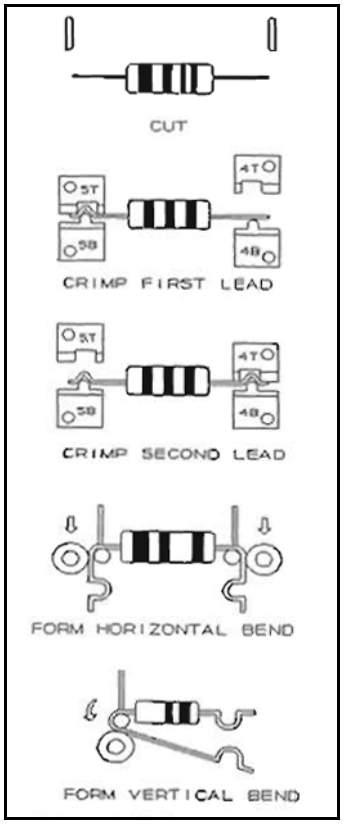


Figure 13 CF-8 Operation Sequence

5.1.1 Method of Operations (continued)

5. Eject Formed Component

The transport wheels present the fully formed component to the component ejector blade which causes the component to drop into the component bin for retrieval.

5.1.2 Station Function Summary

Stations 1 through 9 are operator adjustable. The following defines each Station's function and action on axial component elements. See *2.1 Part Identification* for examples of the machine parts referenced in the following.

- **Component elements** are identified in **Figure 14**.
  - Item 1 Body length
  - Item 2 Cut length
  - Item 3 Crimped lead
  - Item 4 Leg
  - Item 5 Leg bend
  - Item 6 Center to center
- **Station 1** adjusts for component body length. This Station adjusts the gaps of the infeed system and the transport wheel pair in tandem. **Always close this station before adjusting the other stations and adjust this station last.**
- **Stations 2 and 3** adjust for initial cut length of the component's lead.
- **Stations 4 and 5** utilize dies which can be chosen to crimp component leads to form components like stand-off, lock-in, and cut-off for either vertical or horizontal forms, and horizontal under-form. In addition, dies can be installed that have secondary cut-offs that trim the lead to a precise cut length.
- **Stations 6 and 7** adjust for the bend of the component's leg and control the center to center of the formed component.
- **Stations 8 and 9** adjust the travel on the roller assembly that controls the amount of bend on the component's leg.

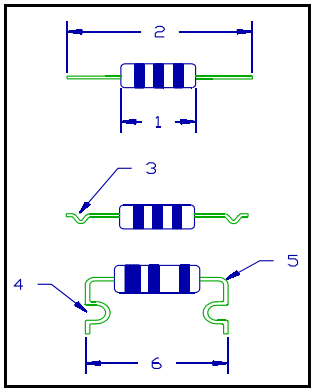


Figure 14 Component Elements

5.2 Initial Set-Up

Follow the instructions in this section **in the order listed** to prepare the CF-8 for die installation. Instructions for the following steps are in this section:

- Power off.
- Adjust Stations for tool change settings.
- Remove component ejector blade & transport wheel pair.

1. Power off.
   a) If necessary, see *2.1 Part Identification* to identify the parts of the CF-8 referenced in the following steps.
   b) Locate the speed control, toggle switch, and run mode indicator light on the rear of the machine.
   c) Adjust speed control to "0" and toggle switch to "STOP." The run mode indicator light will go out.

2. Adjust Stations for tool change settings.
   Warning - Damage to the transport wheels can result if the Stations are not adjusted in the order specified below. **Always close Station 1 fully before making any other adjustments and visually inspect the transport wheels to check that they are not in contact with Stations 6 and 7 before operating the machine.**
   a) Adjust Station 1 to fully closed--turn adjustment knob clockwise.
   b) Adjust the counter boxes of Stations 2 through 7 to read 1000. This is the tool change setting.
      1) In Stations 2 and 3, use the 9/64-inch hex ball driver (provided in the tool kit) to adjust the readings on the counter box.
      2) In Stations 4 through 7, turn the adjustment knobs on the counter boxes.

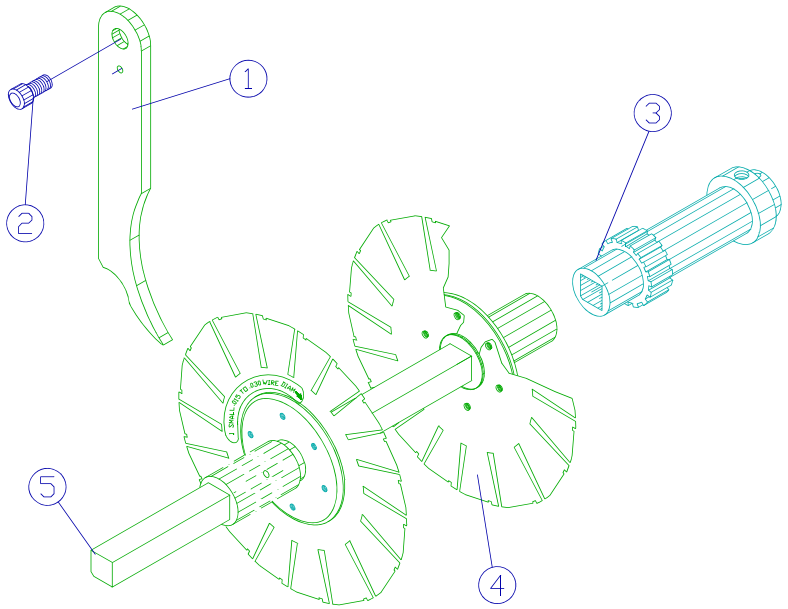


Figure 15 CF-8 Left View, Ejector Blade & Transport Wheel Removal

5.2 Initial Set-Up (continued)

3. Remove component ejector blade & transport wheel pair.
   a) Loosen the ejector blade thumbscrew (**Figure 15**, Item 2) and remove the component ejector blade (Item 1) from between the transport wheel pair (Item 4).
   b) Place a 1/8-inch bent hex "T" wrench (provided in the tool kit) in the hole located toward the end of the transport wheel shaft (Item 5) and pull firmly to unlock the shaft. **Note:** It may be necessary to manually index the machine until the hole toward the end of the transport wheel shaft is accessible. Insert the 1/4-inch hex "T" wrench (provided in the tool kit) in the hex cap screw located on the right of the machine. Turn the wrench until able to insert a wrench in the hole of the transport wheel shaft.
      1) Once unlocked, pull shaft smoothly from its receiver carrier (Item 3).
      2) Support the transport wheel pair while removing the shaft.
   c) Place transport wheel pair and shaft aside until ready for replacement.
      Caution - Store the transport wheel pair on a flat surface or on a dowel storage system. To avoid warping or damaging the wheel pair, **do not** store the wheel pair with pressure on its shims.

5.3 Select & Install CF-8 Hardware

To process different types of forms:

- Select dies.
- Calculate Station settings.
- Observe Station setting and component dimension limits.
- Install dies.
- Select and install the component ejector blade and transport wheel pair.
- Install or remove the dual infeed chute shims.

Instructions for selecting and installing the proper hardware follows.

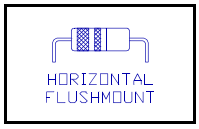
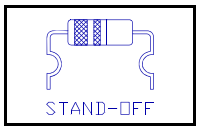
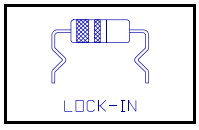
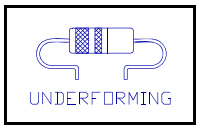
5.3.1 Select Dies

Dies are installed in Stations 4, 5, 6 and 7. These Stations:

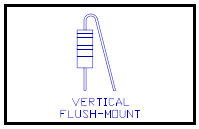
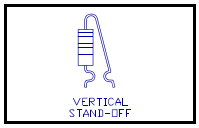
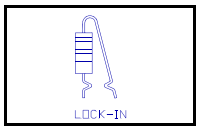
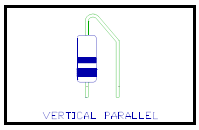
- Crimp the wire leads for the type of forms indicated in the figures below.
- Perform optional secondary cuts on the leads.
- Bend the leads for horizontal or vertical forms.

Stations 4 and 5 dies are cut-off, crimping, or a combination of both. Stations 6 and 7 hold horizontal, modified horizontal, or pin dies.

1. Identify the component form to be processed using the figures below.
2. Select the type of die to use in each Station from the information to the right of the figure.

	Station 4	Station 5	Station 6	Station 7
	Secondary Cut-Off (Optional)	Secondary Cut-Off (Optional)	Horizontal	Horizontal
	Stand-off	Stand-off	Modified Horizontal	Modified Horizontal
	Lock-in	Lock-in	Modified Horizontal	Modified Horizontal
	Underform	Underform	Modified Horizontal	Modified Horizontal

5.3.1 Select Dies (continued)

	Station 4	Station 5	Station 6	Station 7
	--- Relief	---	2A Military Stress Relief SE	2A Military Stress
	--- Relief	---	2A Military Stress Relief	2A Military Stress
	Secondary Cut-Off (Optional)	Secondary Cut-Off (Optional)	---	Pin
	Stand-off	Stand-off	---	Pin
	Lock-in	Lock-in	---	Pin
	---	Vertical Parallel	---	Pin

3. Select specific dies to install based on die type and wire diameter of the component to be processed.
   - Select dies for **Stations 4 & 5**.
     Stations 4 and 5 dies are marked to identify the Station position (**Figure 16**, Item 1) they occupy when installed and the wire capacity (Item 2).

   a) Select a die type based on the type of component to be formed. See *5.3.1 Select Dies*, steps 1 and 2.

   b) Select dies to install based on the wire diameter of the component to be processed.
   Example: "3045" marked on the die pair as in **Figure 16** refers to a wire diameter range of .030 to .045 inches (.76 mm to 1.14 mm).

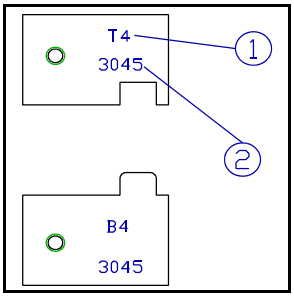


Figure 16 Stations 4 & 5 Die Selection

5.3.1 Select Dies (continued)

- Select dies for **Stations 6 & 7**.

  Horizontal, modified horizontal, and pin dies are installed in Stations 6 and 7. They are marked to identify the die width (**Figure 17**, Item 1) or pin diameter (Item 2), and the Station position (Item 3) they occupy when installed.

a) Select a die type based on the type of component to be formed. See *5.3.1 Select Dies*, steps 1 and 2.

b) Select a die to install based on the wire diameter of the component to be processed from the charts below.

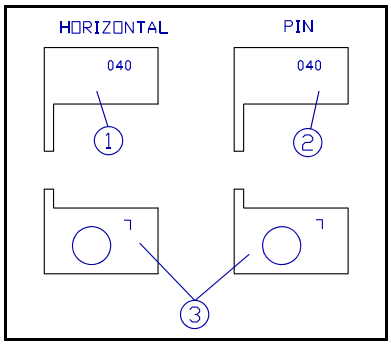


Figure 17 Die Identification

Component Wire Diameter Processing Ranges

Modified Horizontal & Horizontal Dies				
	Inches		Metric (mm)	
Die Marked	Min.	Max.	Min.	Max.
030	.015	.015	.38	.38
040	.015	.025	.38	.64
060	.015	.045	.38	1.14
080	.015	.060	.38	1.52
100	.015	.060	.38	1.52

Chart 4 Horizontal Die Processing Ranges

Pin Dies				
	Inches		Metric (mm)	
Die Marked	Min.	Max.	Min.	Max.
040	.000	.020	.00	.51
060	.021	.030	.53	.76
080	.031	.040	.79	1.02
100	.041	.050	1.04	1.27

Chart 5 Pin Die Processing Ranges

Note: The die markings on the horizontal dies equals die width (dwidth). The die markings on the pin dies equals pin diameter (pdia).

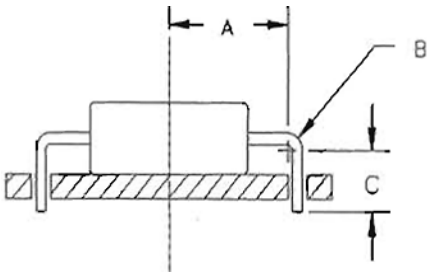
4. Record the die width (dwidth) or pin diameter (pdia) values from Chart 4 or Chart 5 for use in the following *5.3.2 Calculate Station Settings*.

5.3.2 Calculate Station Settings

Calculations are made to set the Station counter boxes to achieve the component's final form. The following calculations are intended for approximate Station settings only. It is expected that the operator will perform the calculations and make minor adjustments to the settings after inspecting (measuring) sample formed components.

1. Identify the desired formed component elements in the figures accompanying the following calculation sections for the type of component to be processed.
2. Perform the calculations in the appropriate section using values for:
   - Component to be processed (such as body length or wire diameter).
   - Desired formed component elements (such as center to center or stand-off height).
   - The die width or pin diameter of the die to be installed. (From Chart 4 or Chart 5 in *5.3.1 Select Dies*, step 3.)
3. Refer to the key listed at the end of each calculation section for abbreviations used in the formulas.

Example: The figure at right illustrates a horizontal flush-mount component on a printed circuit board. The values for component elements A, B, and C are defined by equations in each following form calculations section. If you want to form this component, perform the calculations in *Horizontal Flush Mount Form Calculations* to obtain the settings for the Station counter boxes.



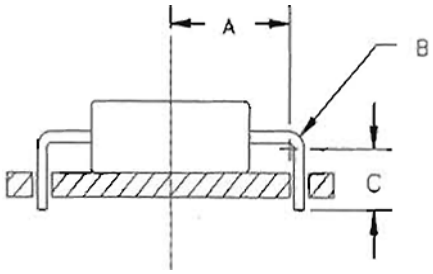
Note: Station counter box readings are in thousandths of an inch (mm for metric machines). A counter box reading 1000 = 1.0" (254 = 25.4 mm for metric machines).

Note: The calculations in this manual for the Station counter box settings are for flush-mount and stand-off forms only. For all other forms, refer to the CF-8 Formula Calculator Package (part no. 8201622) which automatically calculates the Station settings and recommends the appropriate dies for the selected form type. A reference manual is included.

5.3.2.1 Horizontal Flush-Mount Form Calculations

1. Use the values below in the following equations/calculations:
   cst = .015" (.38 mm) (constant die dimension)
   trnclr = .025" (.64 mm) (transport wheel clearance)
   edge = .050" (1.27 mm) (cut-off die edge)

2. Calculate the values for the dimensions illustrated in the figure at right:
   A = (ctc - (2dwidth + wdia)) ÷ 2 + cst
   B = ((dwidth - cst) + (wdia ÷ 2)) * (π ÷ 2)
   C = (bdia÷ 2) - (B ÷ (π ÷ 2)) + pcb + prt



3. Calculate/find the Station settings using the chart below.

Station	Calculation/Setting	Notes
6 & 7	A - cst	**To avoid damaging the transport wheels**, check that desired center to center (ctc) is greater than: *blen + 2dwidth + wdia + 2trnclr {+ .030" (0.76 mm) if using transport wheels with rubber pads}.*
2 & 3	A + B + C	If using secondary cut-off dies in Stations 4 & 5, add .150" (3.81 mm) to Stations 2 & 3.
4 & 5	1000 (254 metric)	If using secondary cut-off dies then **Stations 4 & 5 = A + B + C - edge**.
8 & 9	5 (setting)	For almost all horizontal forms the setting of 5 is recommended. Minor adjustments in the settings may be necessary after inspecting sample formed components.

Chart 6 Horizontal Flush-Mount Form Calculations/Settings

Key:	bdia =	body diameter	dwidth =	die width	prt =	protrusion
	blen =	body length	pcb =	board thickness	soh =	stand-off height
	ctc =	center to center	pdia =	pin diameter	wdia =	wire diameter

5.3.2.2 Horizontal Stand-Off Form Calculations

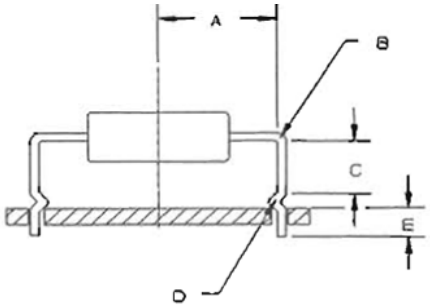
1. Use the values below in the following equations/calculations:
   cst = .015" (.38 mm) (constant die dimension)
   dimple = .020" (.51 mm) (wire dimple allowance)

2. Find the die variable values in the chart below for use in the following equations/calculations:

	1530 Dies		*3045 Dies*		*4560 Dies*	
Variable	**Inches**	**Metric (mm)**	**Inches**	**Metric (mm)**	**Inches**	**Metric (mm)**
x	.149	3.78	.199	5.05	.237	6.02
y	.021	0.53	.041	1.04	.076	1.93

Chart 7 Horizontal Stand-Off Die Dimension Variable Values

3. Calculate the values for the dimensions illustrated in the figure at right:
   A = (ctc - (2dwidth + wdia)) ÷ 2 + cst
   B = ((dwidth - cst) + (wdia ÷ 2)) * (π ÷ 2)
   C = (bdia ÷ 2) - (B ÷ (π ÷ 2)) + soh - x
   D = x + dimple
   E = pcb + prt



4. Calculate/find the Station settings using the chart below.

Station	Calculation/Setting	Notes
6 & 7	A - cst	**To avoid damaging the transport wheels**, check that desired center to center (ctc) is less than: *blen + 2dwidth + wdia + 2trnclr {+.030" (0.76 mm) if using transport wheels with rubber pads}.*
2 & 3	A + B + C + D + E	If using stand-off dies with secondary cut-offs in Stations 4 & 5, add .150" (3.81 mm) to Stations 2 & 3.
4 & 5	A + B + C - y	
8 & 9	5 (setting)	For almost all horizontal forms the setting of 5 is recommended. Minor adjustments in the settings may be necessary after inspecting sample formed components.

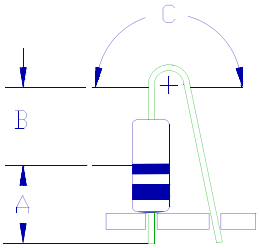
Chart 8 Horizontal Stand-Off Form Calculations/Settings

Key:								
bdia =	body diameter	dwidth =	die width	prt =	protrusion
blen =	body length	pcb =	board thickness	soh =	stand-off height
ctc =	center to center	pdia =	pin diameter	wdia =	wire diameter

5.3.2.3 Vertical Flush-Mount Form Calculations

1. Use the values below in the following equations/calculations:
   edge = .050" (1.27 mm) (cut-off die edge)
   trnclr = .025" (.64 mm) (transport wheel clearance)

2. Calculate the values for the dimensions illustrated in the figure at right:
   A = blen ÷ 2 + pcb + prt
   B = blen ÷ 2 + (pdia ÷ 2) + trnclr
   C = π * ((pdia ÷ 2) + (wdia ÷ 2))



3. Calculate/find the Station settings using the chart below.

Station	Calculation/Setting	Notes
6	1000 (254 metric)	For this type of form, this Station performs no bending and no die is installed. This setting backs the Station away from the forming process.
7	B - (pdia ÷ 2)	This formula is for the minimum distance from the end of the body to the beginning of the bend in the lead. For longer distances add desired value to dimension B.
2	A	
3	A + 2B + C	If using secondary cut-off dies in Stations 4 & 5, add .150" (3.81 mm) to Stations 2 & 3. The minimum cut length of Station 2 is blen ÷ 2 + .160" (metric = blen ÷ 2 + 4.06 mm). As a result, .100" (2.54 mm) is about the smallest possible protrusion below the board. For shorter protrusions, use secondary cut-off dies in Stations 4 & 5.
4 & 5	1000 (254 metric)	If using secondary cut-off dies, then **Station 4 = A - edge** and **Station 5 = A + 2B - edge**.
8	5 (setting)	Station 8 requires no adjustment since Station 6 performs no bend.
9	12 (setting)	For almost all vertical forms the setting of 12 is recommended. Minor adjustments in the settings may be necessary after inspecting sample formed components.

Chart 9 Vertical Flush-Mount Form Calculations/Setting

Key:								
bdia =	body diameter	dwidth =	die width	prt =	protrusion
blen =	body length	pcb =	board thickness	soh =	stand-off height
ctc =	center to center	pdia =	pin diameter	wdia =	wire diameter

5.3.2.4 Vertical Stand-Off Form Calculations

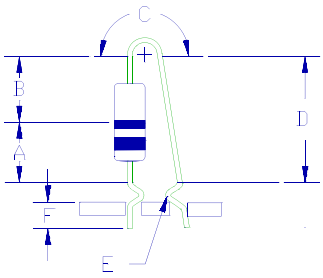
1. Use the values below in the following equations/calculations:
   dimple = .020" (.51 mm) (wire dimple allowance)
   trnclr = .025" (.64 mm) (transport wheel clearance)

2. Find the die variable values in the chart below for use in the following equations/calculations:

	1530 Dies		*3045 Dies*		*4560 Dies*	
Variable	**Inches**	**Metric (mm)**	**Inches**	**Metric (mm)**	**Inches**	**Metric (mm)**
x	.149	3.78	.199	5.05	.237	6.02
y	.021	0.53	.041	1.04	.076	1.93

Chart 10 Vertical Stand-Off Die Dimension Variable Values

3. Calculate the values for the dimensions illustrated in the figure at right:
   A = blen ÷ 2 + soh - x
   B = blen ÷ 2 + (pdia ÷ 2) + trnclr
   C = π * ((pdia ÷ 2) + (wdia ÷ 2))
   D = A + B
   E = x + dimple
   F = pcb + prt



(Continued on next page)

Key: bdia = body diameter; blen = body length; ctc = center to center; dwidth = die width; pcb = board thickness; pdia = pin diameter; prt = protrusion; soh = stand-off height; wdia = wire diameter

5.3.2.4 Vertical Stand-Off Form Calculations (continued)

4. Calculate/find the Station settings using the chart below.

Station	Calculation/Setting	Notes
6	1000 (254 metric)	For this type of form, this Station performs no bending and no die is installed. This setting backs the Station away from the forming process.
7	B - (pdia ÷ 2)	This formula is for the minimum distance from the end of the body to the beginning of the bend in the lead. For longer distances add desired value to dimension B.
2	A + E + F	
3	A + E + F + 2B + C	If using secondary cut-off dies in Stations 4 & 5, add .150" (3.81 mm) to Stations 2 & 3.
4	A - y	
5	A + 2B + C - y	If only crimping lead in Station 4, then Station 5 = 1000 (254 metric). Conversely, if only crimping lead in Station 5, then Station 4 = 1000 (254 metric). If using a secondary cut-off die, then y = .050" (1.27 mm) in the Station that is not crimping the lead.
8	5 (setting)	Station 8 requires no adjustment since Station 6 performs no bend.
9	12 (setting)	For almost all vertical forms the setting of 12 is recommended. Minor adjustments in the settings may be necessary after inspecting sample formed components.

Chart 11 Vertical Stand-Off Form Calculations/Setting

Key:	bdia	=	body diameter	dwidth	=	die width	prt	= protrusion
	blen	=	body length	pcb	=	board thickness	soh	= stand-off height
	ctc	=	center to center	pdia	=	pin diameter	wdia	= wire diameter

5.3.3 Observe Processing Limits

After calculating the Station settings, use this section to make sure that you are in compliance with the station setting and component dimension limits.

1. Observe the machine's limits as listed in the chart below:

Machine Processing Limits				
	Inches		Metric (mm)	
	Minimum	Maximum	Minimum	Maximum
Station 2 (blen÷2) +	.160	1.900	4.06	48.26
Station 3 (blen÷2) +	.160	1.800	4.06	45.72
*Station 4 (blen÷2) +	.025	1.400	.64	35.56
*Station 5 (blen÷2) +	.025	1.340	.64	34.04
**Station 6 (blen÷2) +	.025	1.300	.64	33.02
**Station 7 (blen÷2) +	.025	1.220	.64	30.99
Ejector Blade (small blade) (Component Body Length)	.000	.325	.00	8.26
Transport Wheel # 1 (Component Wire Diameter)	.015	.029	.38	.74
Transport Wheel # 2 (Component Wire Diameter)	.029	.042	.74	1.07
Transport Wheel # 3 (Component Wire Diameter)	.042	.062	1.07	1.57

Chart 12 CF-8 Processing Limits

* For the **Horizontal Center to Center** form:
Add .060" (1.52 mm) to Stations 4 and 5 minimums.

** For the **Military Stress Relief** form:
Add the appropriate forming plate thickness of .060" or .075" (1.52 or 1.91 mm) to Stations 6 and/or 7 minimums.

Key:								
bdia =	body diameter	dwidth =	die width	prt =	protrusion
blen =	body length	pcb =	board thickness	soh =	stand-off height
ctc =	center to center	pdia =	pin diameter	wdia =	wire diameter

5.3.3 Observe Processing Limits (continued)

2. Observe the component's dimension limits as listed in the chart below:

Component Dimension Processing Limits				
	Inches		Metric (mm)	
	Minimum	Maximum	Minimum	Maximum
Body Diameter	.050	.750	1.27	19.05
Body Length	.135	2.000	3.43	50.80
Center to Center	**	2.400	**	60.96
Wire Diameter	.015	.060	.38	1.52

Chart 13 CF-8 Component Dimension Processing Limits

** Minimum center to center is dependent on the type of die used and the type of component being processed.

Note: If wire diameter is greater than .029" (0.74 mm) install infeed shims. Refer to *5.3.6 Install or Remove Dual Infeed Chute Shims*.

5.3.4 Install Dies

Follow the instructions in this section to install dies in Stations 4, 5, 6, and 7.

1. Install dies in Stations 4 & 5.

   Dies installed in Stations 4 and 5 are paired and stamped with markings on the dies to indicate the position they occupy when installed. Install the die half marked:

   - "T" in the **t**op die holder.
   - "B" in the **b**ottom die holder.

   The numbers "4" or "5" indicate which Station the die is to occupy. **Figure 18** illustrates the die markings and an example of the crimping performed.

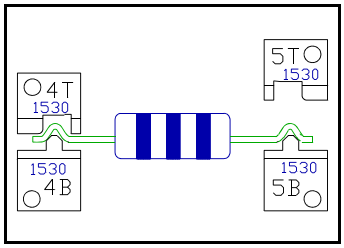


Figure 18 Stations 4 & 5 Die Markings

   a) **To install dimpling dies:**

      1) Open Stations 4 and 5 enough to allow easy access to the die holders.
      2) Clean die holders of all debris.
      3) Place dies in lower holders (**Figure 18**, Item 2) with die markings facing the rear of the machine.
      4) Push dies into the corners of the holders and fasten with 8/32x3/8 socket head screws provided.
      5) Follow above procedure to install upper dies.
      6) **Manually** index the machine to visually inspect the alignment of the upper and lower dies.
      7) If necessary, loosen the die screws, manually align dies flush with each other, and retighten die screws.

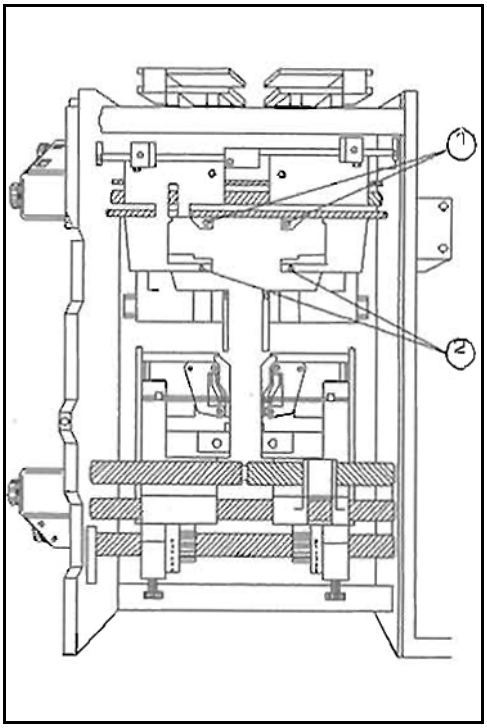


Figure 19 Dimpling Die Installation, Front View

5.3.4 Install Dies (continued)

b) **To install secondary cutting dies:**

1) Clean die holders of all debris.
2) Follow the dimpling die installation procedure outlined above to install the upper and lower dies.
3) Manually index the machine and visually inspect that the upper dies align with the lower dies as indicated in **Figure 20**, Item 3.
4) If necessary, loosen the die screws, manually align dies, and retighten die screws.
5) Check that the cut component leads do not brush the secondary exit chutes (Item 2).
   - If so, loosen the lower die holder screws (Item 1) and move the exit chutes away from the leads and retighten the die holder screws.

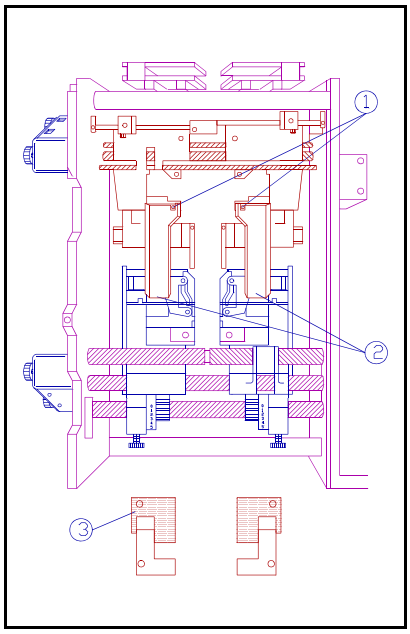


Figure 20 Secondary Cut-Off Die Installation, Front View

2. Install dies in Stations 6 & 7.

Dies installed in Stations 6 and 7 are stamped on the:

- Rear to indicate the Station they occupy when installed (**Figure 21**, Item 1).
- Top to indicate the width of the forming surface (Item 2).

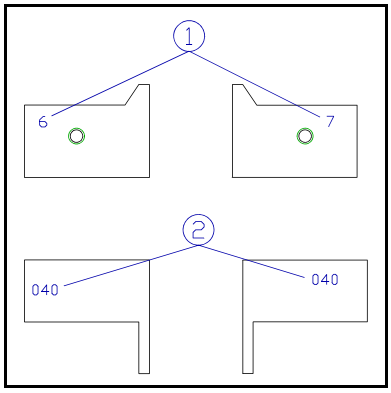


Figure 21 Stations 6 & 7 Die Markings

5.3.4 Install Dies **(continued)**

a) **To install horizontal and pin dies:**
   1) Open Stations 6 and 7 wide enough to allow easy access to the die holders.
   2) Clean die holders of all debris
   3) Place dies in holders with the Station numbers facing the rear of the machine (**Figure 22**, Item 1)
   4) Push dies into the corners of the holders and fasten with the 8/32x3/8 screws provided.

b) **To install double hump military stress relief dies:**
   1) Open Stations 6 and 7 wide enough to allow access to the die holders.
   2) Mount the appropriate forming plate (using the 800L-002 wrench and the 2-56 flat head screws provided) on the inside of the wire clamps as indicated **Figure 22**, Item 2.
      - Install plate marked 060 (Item 3) for wire diameter .015 to .030 inches (.38 to .76 mm).
      - Install plate marked 075 (Item 4) for wire diameter over .030 inches (.76 mm).
   3) Install the stress relief dies in Stations 6 and 7 following the procedure outlined above for horizontal and pin dies.

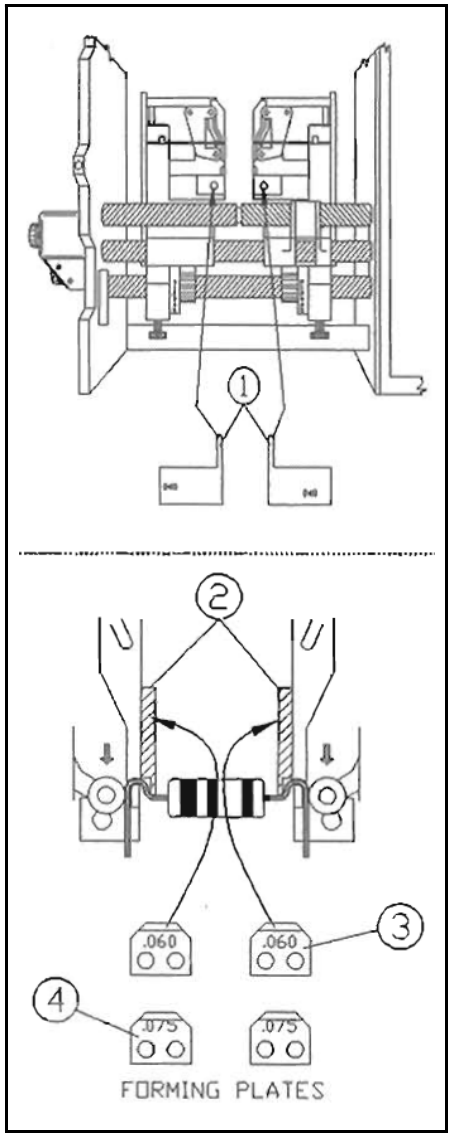


Figure 22 Stations 6 & 7 Die Installation, Front View

c) **To install single hump military stress relief dies:**
   1) Follow double hump military stress relief die installation procedure above to install forming plate in Station 7 only.
   2) Follow military stress relief die installation procedure above to install the dies except place the die marked SE in Station 6.

5.3.5 Select & Install Transport Wheel Pair & Component Ejector Blade

Instructions for the following steps are included in this section:

- Select component ejector blade and transport wheel pair.
- Check transport wheel pair timing.
- Install transport wheel pair.
- Install component ejector blade.

1. Select component ejector blade & transport wheel pair.
   a) The CF-8 comes with two different sized component ejector blades. To process components with body lengths over .325" use the larger ejector blade.
   b) Each of three available transport wheel pair unit is labeled to identify the range of wire diameter it will handle and the direction of rotation of the wheels.
      - Select a transport wheel pair to install based on the wire diameter of the component to be processed from the chart below.

Transport Wheel Pair Component Wire Diameter Processing Ranges				
	Inches		Metric (mm)	
Transport Wheel #	Minimum	Maximum	Minimum	Maximum
1	.015	.030	.38	.76
2	.030	.042	.76	1.07
3	.042	.062	1.07	1.58

Chart 14 Transport Wheel Selection

2. Check transport wheel pair timing.
   a) Place the right transport wheel and the alignment tool (**Figure 23**, Item 1) on the square shaft (Item 3).
   b) Time the wheel by locating the pin of the alignment tool in the wire pick-up position. See **Figure 23**, Item 2, for example.
   c) Repeat the timing procedure above for the left transport wheel.

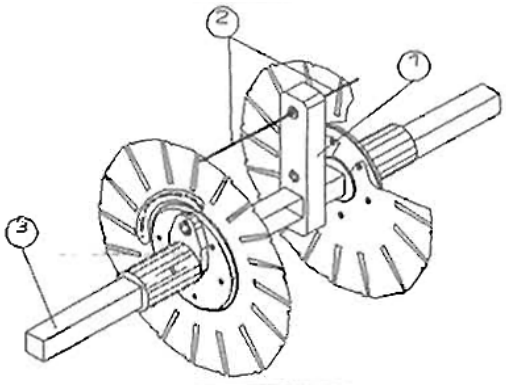


Figure 23 Transport Wheel Timing

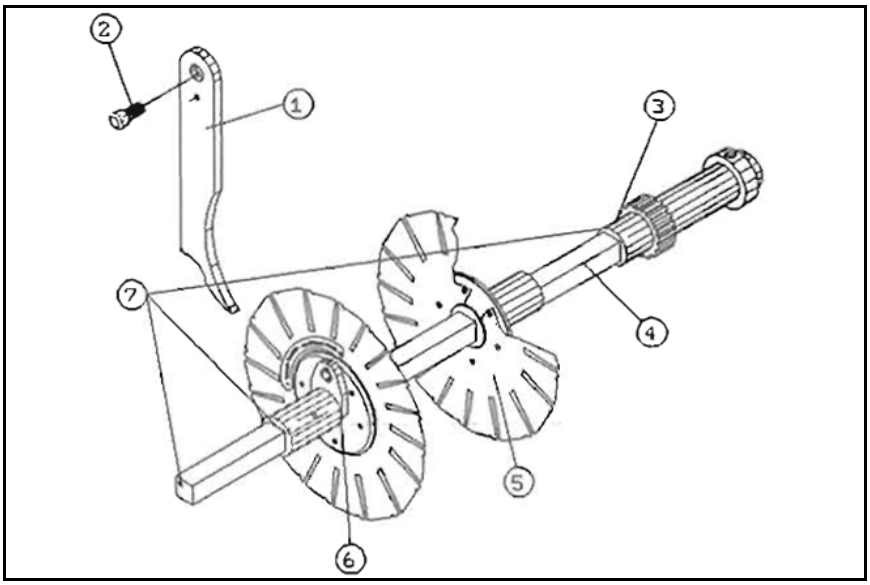


Figure 24 Transport Wheel Installation, Left View

5.3.5

Select & Install Transport Wheel Pair & Component Ejector Blade **(continued)**

3. Install transport wheel pair.
   a) Place the transport wheel pair hubs (**Figure 24**, Item 6) on the square shaft (Item 4) while aligning the red mark on the square shaft with the red marks on the transport wheel hubs. See **Figure 24**, Item 7, for example.
   b) Raise the aligned shaft above the transport wheel hub guides (see *2.1.3 Left View* to identify).
   c) Roll the aligned shaft down along the side of the guide and then up into the forks of the guides.
   d) Align the red mark of the shaft with the red mark of the receiver carrier (Item 3) and press shaft firmly into the carrier until the shaft locks into position.

4. Install selected component ejector blade.
   a) Place the selected component ejector blade (Item 1) onto its shaft.
   b) Position ejector blade between the transport wheel pair.
   c) Fasten ejector blade to shaft with its thumbscrew (Item 2).

5.3.6 Install or Remove Dual Infeed Chute Shims

If the wire diameter of the component to be processed is greater than .029 inches (0.74 mm) it is necessary to install shims in the dual infeed chutes. The shims are placed below the top plates of the chutes. See procedure outlined below.

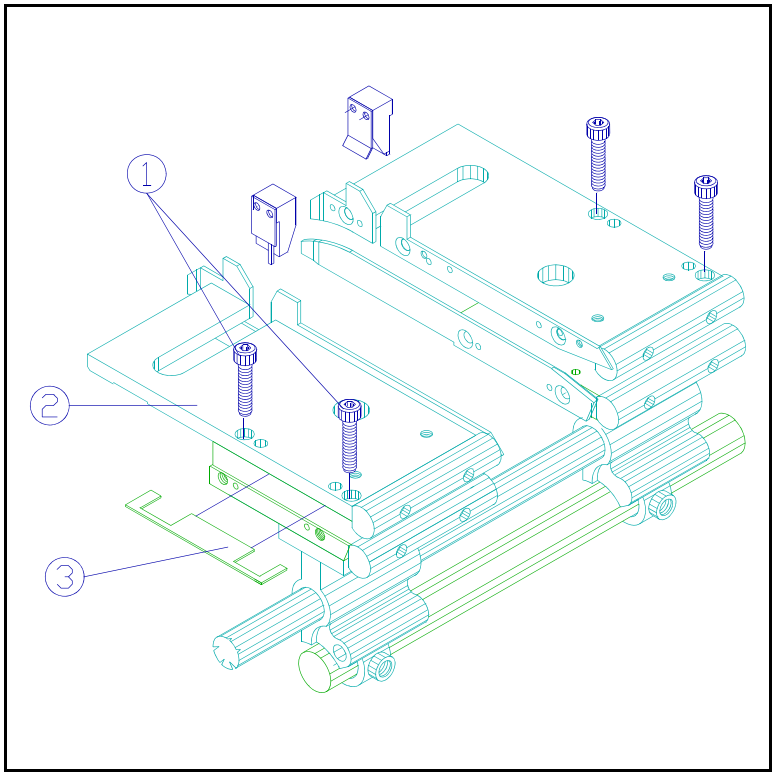


Figure 25 Infeed Chute, Top View, Shim Installation

1. Loosen the hex screws (Figure 25, Item 1) from the top of the infeed chute.
2. Place the infeed shim so that it is positioned under the top plate (Item 2) of the infeed chute as indicated in Figure 25, Item 3.
3. Refasten the hex screws.
4. If wire diameter is less than .030 inches (0.76 mm), remove infeed shims by following the reverse of the procedure above.

5.4 Adjust Stations

This section contains instructions for setting the Stations prior to production run. **Follow the instructions** in *5.2 Initial Set-Up* and *5.3 Select & Install CF-8 Hardware* **before** adjusting the Stations.

- Use the Station setting calculations obtained from section *5.3.2 Calculate Station Settings* to set the counter boxes of Stations 2 through 7.
- See section *2.1 Part Identification* if necessary to identify parts of the CF-8 referenced in the following instructions.

5.4.1 Adjust Stations 2 & 3

- Use the 9/64" hex ball driver from the tool kit to adjust the counter boxes for desired cut length of component's leads.

5.4.2 Adjust Stations 4 & 5

- Turn the adjustment knobs on the counter boxes to adjust for crimp position (and secondary cut-off, if any) on the component leads.
  Note: Since Station 5 crimps before Station 4, the component may not be completely re-centered on the transport wheels before being crimped by Station 4. As a result, it may be necessary to set Station 4 up to .020 inches (0.51 mm) less than Station 5.

5.4.3 Adjust Stations 6 & 7

- Turn the adjustment knobs on the counter boxes to adjust for placement of the bend on the component legs.

5.4.4 Adjust Stations 8 & 9

Stations 8 and 9 can be set from 0 to 12 and control the amount of bend on the component's leg by Stations 6 and 7. Horizontal 90 degree bends are formed when these Stations are normally set at 5. Vertical forms require more bend to form the loop on one leg. The higher the setting above 5 on Stations 8 and 9, the more the leg is bent over 90 degrees. **Do not** set Stations 8 or 9 past 7 unless a pin die is installed in Stations 6 or 7.

- Set the eccentric shaft collar to form horizontal or vertical bends on the component legs. See procedure below.

5.4.4 Adjust Stations 8 & 9 (continued)

1. To form horizontal components, set Stations 8 and 9 at 5.
   a) Loosen the eccentric shaft thumbscrews (**Figure 26**, Item 3).
   b) Rotate the eccentric shaft collar (Item 2) until the stamped notch above the Station number points to setting 5.
   c) Re-tighten thumbscrews to lock in the adjustment.
   d) Manually index the CF-8 and check that the wire clamps meet the lead wire at the same time on both sides.
      - If not, loosen the thumbscrews and make fine adjustments to the settings of the eccentric shaft collar until the wire clamps meet the lead wire at the same time.

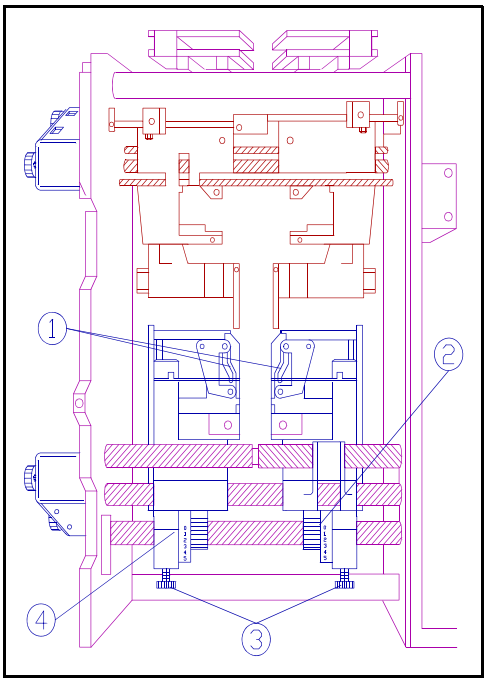


Figure 26 Stations 8 & 9 Settings

2. To form vertical components, set Station 9 initially at 10.
   - Form sample components (see *5.5 Form Sample Components*).
   - Increase the setting if too little loop.
   - Decrease the setting if too much loop.

   Note: It is an option to form vertical bends in Station 6 instead of Station 7. If so, install a pin die in Station 6 and follow procedure above to adjust the Station 8 setting.

   Caution: To avoid undue wear and stress on the machine, always return Stations 8 and 9 to a setting of 5 when forming horizontal bends. **Do not** exceed a setting of 7 when forming horizontal components. If it is necessary to exceed a setting of 7 at Stations 8 and 9 to form 90 degree bends, see section *9.0 Troubleshooting* to diagnose the problem.

5.4.5 Adjust Station 1

1. Refer to *5.3.6. Install or Remove Dual Infeed Chute Shims*.
   a) If the wire diameter of the component is **greater** than .029 inches (.074 mm) install shims.
   b) If the wire diameter of the component is **less** than .030 inches (.076 mm) remove shims.
2. Turn Station 1 adjustment knob to adjust for component body length and centering through the cutting wheel pair.
   - See procedure below.

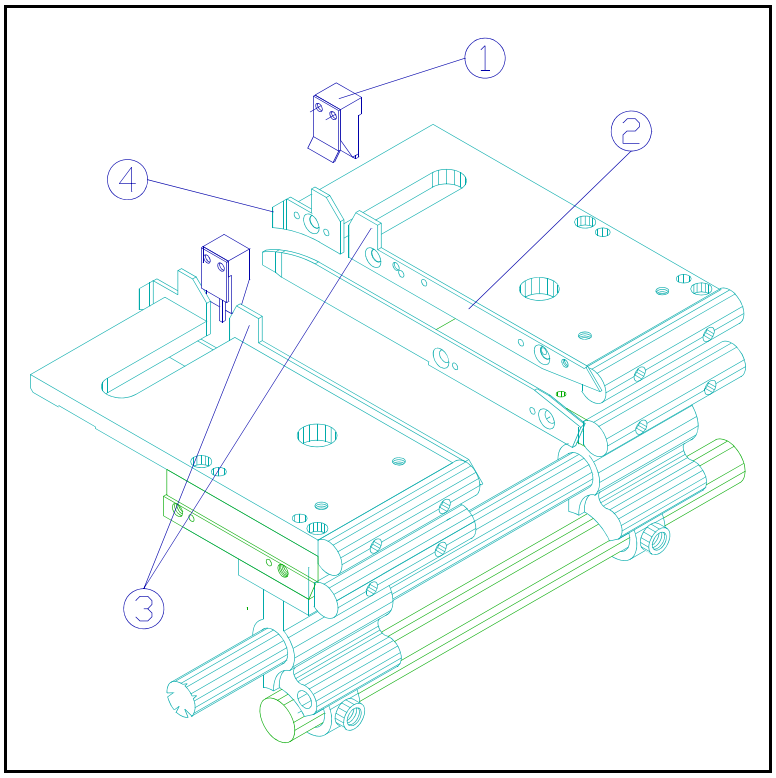


Figure 27 Top View, Station 1 Adjustment, Infeed Chute

a) Turn Station 1 adjustment knob *counter-clockwise* to increase the gap between the infeed chute guide blades (**Figure 27**, Item 2) far enough to accept the component to be processed.
   b) Remove the infeed chute plugs (Item 1) by pulling straight up.
   c) Place a single component between the infeed component guides (Item 3) and allow it to drop to engage the teeth of the cutting wheel pair.
   d) Run the machine at slow speed until the component exits the infeed chute stepped guides (Item 4).

5.4.5 Adjust Station 1 (continued)

e) Check that the component body does not foul in the stepped guides or for excessive play between the stepped guides.
   1) If the component body fouls between the stepped guides, turn the adjustment knob *counter-clockwise* until the component travels freely between the guides.
   2) If there is excessive play between the stepped guides, turn the adjustment knob *clockwise* to decrease the gap between stepped guides.

Warning: **Do not** force the adjustment of Station 1. Damage to the infeed chutes, cutting wheels, or components may result. **Always adjust Station 1 to a closed position before adjusting all other Stations.**

5.5 Form Sample Components

To verify Station settings, form sample components prior to production run.

1. If open, close and secure the safety guards so they will engage the safety switches (see *2.1.3 LEFT VIEW* if necessary for identification).
2. Introduce a component into the infeed chute.
3. Adjust the speed control to a low setting and the toggle switch to "RUN" and allow the component to progress through all Stations.
4. Inspect and measure the formed component for desired specifications.
5. Readjust Station settings if necessary and run another sample component.
   Readjustment Example: If the cut length of the left lead is .020 inches (0.51 mm) shorter than desired, increase the reading on the counter box of Station 3 by 20 (5 metric).
6. If components are not being cut and formed correctly after checking all adjustments and readjusting, see section *9.0 Troubleshooting* to identify the problem.

Note: All component bodies can vary in length by 5% or more. Also, some components have uneven protrusions on the ends of the component bodies. The CF-8 cannot compensate for these factors. Variations in the measurements of the cut and formed components may occur. As a result, all Station settings are approximations only.

5.6 Install Taped Components

Taped components can be fed into the CF-8 for a large production run. Follow the procedure below to install, adjust, and process taped components.

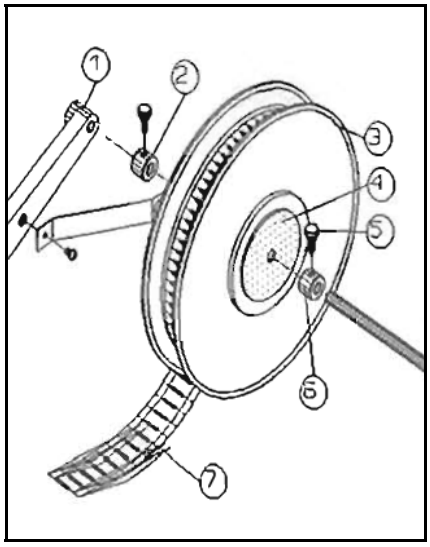


Figure 28 CF-8 Taped Components Installation

Install

1. Loosen the thumbscrews (**Figure 28**, Item 5) of the inner and outer locking collars (Items 2 & 6) and remove the outer aluminum washer (Item 4) from the reel and tape arm (Item 1).
2. Place the taped components reel (Item 3) onto the reel and tape arm.
   - Orient the reel so that when viewed from the left side of the machine, the taped components travel down from the right side of the reel, not the left.
   - See **Figure 28**, Item 7, for example.

Adjust

1. Center the components in the infeed chute as illustrated in **Figure 28**, Item 1.
2. Align the reel of taped components with the centered components in the infeed chute.
3. Position both aluminum washers against the centered reel of components.
4. Place locking collars against the washers and tighten the thumbscrews of the locking collars to hold the centered reel in place.

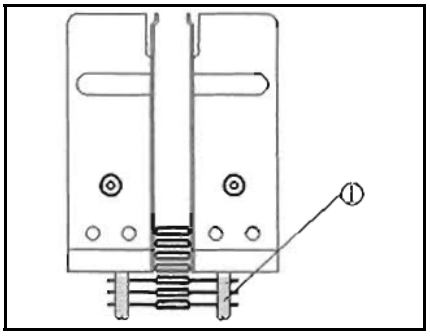


Figure 29 Infeed Chute, Top View, Component Centering

Process

1. Slide components through infeed chute so that the wire leads engage evenly with the teeth of the cutting wheel pair.
2. Run the machine at low speed and check that the components are being cut and formed to desired specifications.
3. If the components are not being cut and formed to specification, re-check relevant adjustments.
4. After adjustments are set, run the machine at chosen processing speed to process components.

5.7 Install Optional Feeders

If the CF-8 came with optional feeding attachments, remove the taped component dual infeed chute from its mount.

1. Remove the two hex-head cap screws located on the top of the infeed chute, as indicated in **Figure 30**, Item 1.
2. Lift the chute up off the machine.
3. Store the infeed chute in secure area for protection.
4. Refer to *7.1 Bulkfeeder & Cardfeeder Set-Up* to select and install optional feeders.

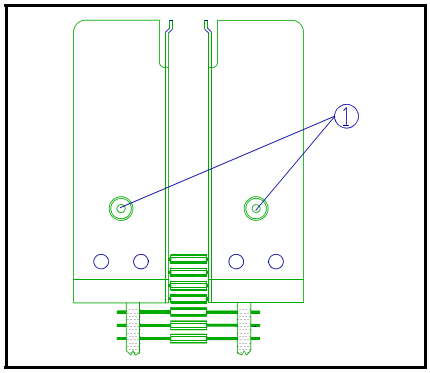


Figure 30 Infeed Chute, Top View, Removal

Note: When re-installing the taped component dual infeed chute, be sure to align the pins of the chute mount with the holes on the bottom of the chute.

5.8 Set-Up Adjustments Summary

As a quick reference for setting up the CF-8, the following steps are listed in chart form **in order** of set-up. **See relevant section noted beside each step for instructions on how to perform each step.**

Steps	Reference Section
Power the machine down and make initial tool change adjustments.	*5.2 Initial Set-Up*, steps 1 & 2.
Remove the component ejector blade and transport wheels.	*5.2 Initial Set-Up*, step 3.
Identify the component form to be processed.	*5.3.1 Select Dies*, step 1.
Select dies based on component form, die type, and wire diameter.	*5.3.1 Select Dies*, steps 2 & 3.
Calculate the Station settings.	*5.3.2 Calculate Station Settings*.
Check that Station settings and component dimensions are within processing limits.	*5.3.3 Observe Processing Limits*.
Install the selected dies.	*5.3.4 Install Dies*
Select and install the transport wheels and component ejector blade.	*5.5 Select & Install Transport Wheel Pair & Component Ejector Blade*.
Install or remove dual infeed chute shims.	*5.3.6 Install or Remove Dual Infeed Chute Shims*.
Adjust the Stations to cut and form components.	*5.4 Adjust Stations*.
Form sample components prior to production run.	*5.5 Form Sample Components*.
Install, adjust, and process taped components.	*5.6 Install Taped Components*.
Or install optional feeders.	*5.7 Install Optional Feeders*.

Chart 15 Set-Up Steps Quick Reference

6.0 Operating Instructions

The following instructions apply to a CF-8 equipped with the standard reel and tape arm and dual infeed chute. For instructions on optional feeders, see section *7.1 Bulkfeeder & Cardfeeder Set-Up*.

6.1 Power On

1. Read section *3.0 Safety Instructions* for safe machine operation.
2. If necessary, see section *2.1 Part Identification* for location of CF-8 parts.
3. Turn toggle switch to the "Stop" position.
4. Plug the CF-8 into the appropriate power supply.
5. Verify set-up adjustments for the components to be processed.
   a) Check the Station settings for the component to be processed.
   b) Load the reel and tape arm with components to be processed.
      1) Check that components are centered and slide forward freely in infeed chute.
      2) Check that the reel and tape arm is properly aligned with the centered components.

   Note: See section *5.0 Set-Up Procedure* if necessary for details on the proper steps to take to check the adjustments above.
6. Check that the component and scrap bins are empty and in place.
7. Check that the safety guards are in their proper positions.

6.2 Operating Instructions

1. Slide a short strip of taped components through infeed chute to engage with teeth of the cutting wheel pair.
2. Turn the speed control to "0," turn the machine on, and increase speed.
3. Allow components to proceed through all Stations and then inspect the cut and formed components for desired specifications.
4. If necessary, re-check set up adjustments for the components to be processed.
5. Turn speed control to desired operating speed.
6. Re-load reel and tape arm with reel of taped components to be processed when necessary.
   a) Turn speed control to "0" **before** introducing components into infeed chute.
   b) **After** the CF-8 is processing properly, turn machine to desired operating speed.
7. Empty component bin when full or if changing type of component to be processed.

6.3 Power Off

1. Turn speed control down to "0."
2. Set toggle switch to "Stop" position.

7.0 Options

The following options are available for the GPD CF-8:

- Bulkfeeders
- Calculator Software Package
- Cardfeeders
- Digital Electronic Component Counter
- Lazy Susan
- Markings Up
- Recommended Spare Parts Kit
- Secondary Exit Chute
- Work Station

Instruction manuals for the calculator software package and digital electronic component counter options are included when ordered. Instructions for options requiring installation and/or adjustment that do not have their own instruction manual follow.

Note: The markings up option allows the operator to interrupt the lead forming process before the legs of the component are formed. This allows the operator to manually turn the components so that any markings will be on the top of the component after the horizontal bend on the leads are formed.

7.1 Bulkfeeder & Cardfeeder Set-Up

The bulkfeeder and cardfeeder options allow the CF-8 to process components other than single-fed or tape-mounted. Loose components can be introduced to the bulkfeeder by hand or by an optional hopper and arm assembly.

Both models of feeders have identical bases, and are adjusted and mounted in the same manner. Use the following instructions to install and adjust both options.

Upon receiving the feeder, examine it for any shipping damage that may have occurred. Look for bent or broken parts and check that the gears turn freely. If damage is evident, contact GPD. The address and phone number are on the cover page of this manual.

7.1.1 Feeder Identification & Processing Ranges

The cardfeeder option is available in a standard height. The bulkfeeder option comes in a tall or a short version. The tall version can accommodate an optional hopper and arm assembly. See section *7.2 Hopper & Arm Assembly Installation* for instructions to install and adjust this option.

7.1.1 Feeder Identification & Processing Ranges (continued)

Both feeder options are identified by:

- Part numbers that indicate the recommended range of wire diameter of the components to be processed.
- Whether a hopper and arm assembly are included.

To aid in identifying your feeder, the version and range is stamped on the base of both feeder options. **For example**, "1B 020 032" indicates a tall bulkfeeder capable of processing components with a wire diameter of .020" to .032" (.51 mm to .81 mm). A letter stamped on the base without an accompanying number indicates a cardfeeder of standard height.

The chart below shows the wire processing ranges, version, and part number of available feeders.

Feeder Processing Ranges & Identification

Version	.030" - .055" (.76 - 1.40 mm)	.020" - .032" (.51 - .81 mm)	.014" - .020" (.36 - .51 mm)
Tall (with hopper)	BCF-1A	BCF-1B	BCF-1C
Tall (no hopper)	BCF-1ANH	BCF-1BNH	BCF-1CNH
Short	BCF-2A	BCF-2B	BCF-2C
Cardfeeders	CCF-TYPE-A	CCF-TYPE-B	CCF-TYPE-C

Note: BCF = Bulkfeeder; CCF = Cardfeeder
Note: Do not attempt to process components with wire diameters that fall outside the range specified above for your feeder. Wire diameters that are too large will not travel properly through the chutes of the feeders. Wire diameters that are too small will not be cut and formed consistently to desired specifications.

Chart 16 Optional Feeder Identification

Figure 31 illustrates the gap in the upright stampings of the bulk- and cardfeeders (Item 5 is an example of the zig-zag chute of the Bulkfeeder; the broken lines of Item 4 show the straight chute of the Cardfeeder). The width of the gaps of the chutes are factory pre-set to run the wire diameter ranges that the feeders can handle.

Note: Do not loosen the button head screws (Item 2). The alignment between the upper stamping (Item 3) and lower casting (Item 1), and the gaps of the feeder chutes are factory pre-set. If the screws are loosened, component misfeeding may result. Call your maintenance department if this happens.

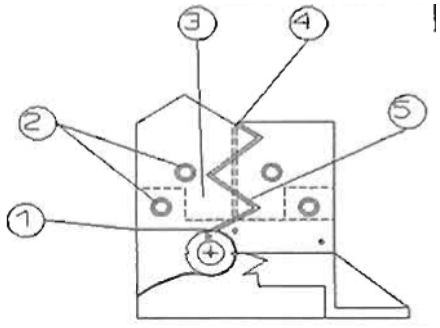


Figure 31 Rear Feeder Half, Inside View, Feeder Identification

7.1.2 Bulkfeeder Measurements

(Tall 1A, 1B, & 1C):

Height	10.0"	(254.0 mm)
Length	4.25"	(108.0 mm)
Width	5.25"	(133.4 mm)
Weight--Actual	3.7 lbs	(1.7 kg)
Weight--Shipping	6.0 lbs	(2.7 kg)

(Short 2A, 2B, & 2C):

Height	3.75"	(95.3 mm)
Length	4.25"	(108.0 mm)
Width	4.25"	(108.0 mm)
Weight--Actual	2.5 lbs	(1.1 kg)
Weight--Shipping	5.0 lbs	(2.3 kg)

7.1.3 Cardfeeder Measurements

(Type A, B, & C):

Height	8.0"	(203.2 mm)
Length	3.5"	(88.9 mm)
Width	5.0"	(127.0 mm)
Weight--Actual	2.0 lbs	(0.91 kg)
Weight--Shipping	4.0 lbs	(1.80 kg)

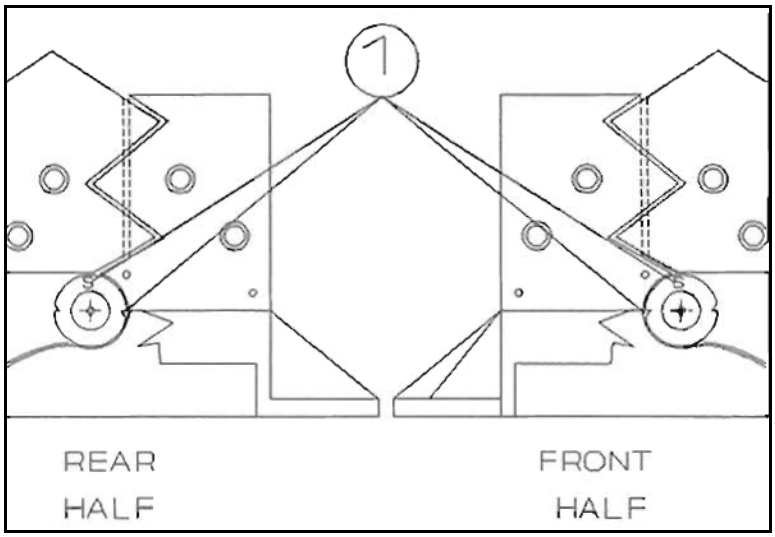


Figure 32 Pick-Up Disk Timing

7.1.4
Check Pick-Up Disk Timing

Before mounting the feeder, perform the following preliminary steps.

Figure 32, Item 1, illustrates the position of the pick-up disks on the base of a feeder. Note the position of the notches and the letters stamped on the disks--when timed properly, the letters and the sharp slopes of the notches will appear in the positions indicated.

1. Check the timing of the disks by following the steps below:
   a) Locate round window of top of the rear half of a feeder base as illustrated in **Figure 33**, Item 1.
   b) Locate the gear tooth with the red-colored notch inside the window.
   c) Turn the gear under the base of the feeder until the notch appears centered in the round window.
   d) Check that the position of the pick-up disks are as indicated in **Figure 32** above.
   e) Follow the same procedure for the other half of the feeder.

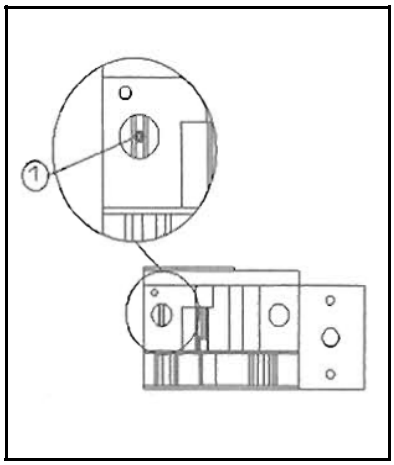


Figure 33 Rear Feeder Half, Top View, Disk Timing

7.1.4 Check Pick-Up Disk Timing (continued)

2. Verify disk rotation and timing.
   a) Check that letters stamped on the disks face out on both front and rear feeder halves as illustrated in **Figure 34**, Item 2.
   b) For a rear feeder half, check that position of the letter, sharp slopes, notches, and rotation (Item 1) are as illustrated in **Figure 34**.
   c) For a front feeder, verify that conditions in step "b" above are reversed as illustrated in **Figure 32**, Front Half.

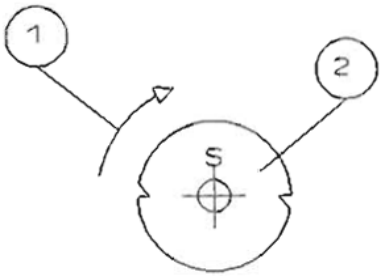


Figure 34 Pick-up Disk Rotation Direction

3. If disk not timed, re-seat disk on shaft.
   a) Remove the center screw of the pick-up disk (**Figure 35**, Item 1) and remove disk from shaft.
   b) Turn the gear under the base of the feeder until the notch appears centered in the round window (as per **Figure 33**, previous page).
   c) Replace disk on shaft so that the notches and letter are appropriately positioned as illustrated in **Figure 32**:
      - Rear Half

      Or
      - Front Half
   d) Check the timing of the disks as described on previous page, step 1.
   e) Replace and tighten disk center screw.
   f) If necessary, repeat above procedure to re-seat disk on other feeder half.

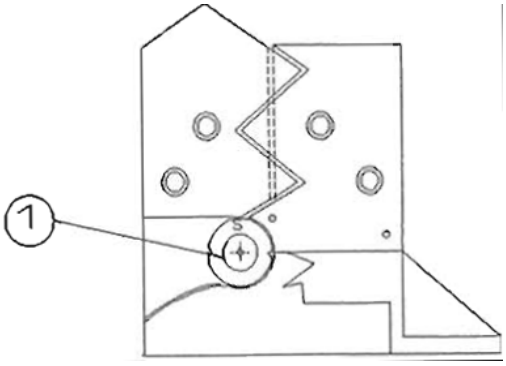


Figure 35 Rear Feeder Half, Inside View, Disk Timing

7.1.5 Install Feeder

Before mounting the feeders, follow the instructions in *5.0 Set-Up Procedure* to adjust the CF-8 for desired cut and form specifications of the components to be processed.

Verify feeder alignment

1. On the rear feeder half, visually check the alignment of the base of the L-shaped stamping (**Figure 36**, Item 3).
2. Verify that stamping is aligned with the fixed casting above it (Item 6).
3. Follow the same procedure to verify alignment of front feeder half.
4. If not aligned, contact maintenance personnel.

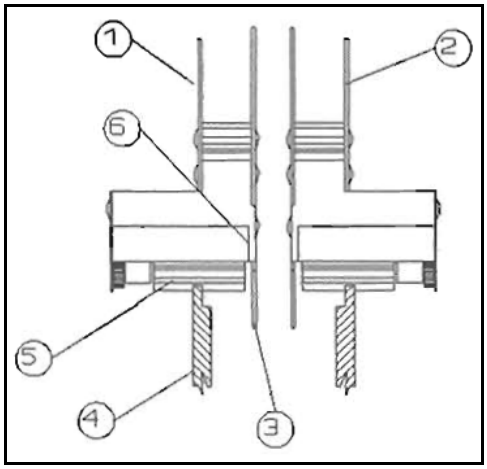


Figure 36 Component Feeder, Left View, Mounting

Install feeder

1. Remove dual infeed chute.
2. Place both feeder halves (**Figure 36**, Items 1 & 2) on the same locating dowel pins used with the infeed chute.
3. Verify that the:
   - Gap between the cutting wheels is wide enough to allow smooth insertion of the feeder bases.
   - Position of each feeder L-shaped stamping (Item 3) is between the cutting wheel pair (Item 4).
   - Gear of each feeder base (Item 5) meshes smoothly with the teeth of its cutting wheel (Item 4).
   - Pick-up disks at the base of the feeders are inside the gap between the cutting wheel pair.

Check timing

1. Check centering of red notch on gear as illustrated in **Figure 37**, Item 1.
2. If not centered, see previous section *7.1.4 Check Pick-Up Disk Timing*.
3. Place hex-head cap screw through hole (Item 2) located between dowel pin holes (Item 3) on base of feeder and tighten.
4. Repeat above procedure for the other half of the feeder.

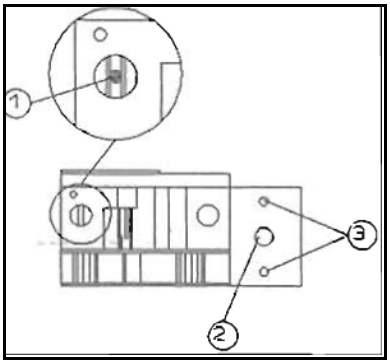


Figure 37 Rear Feeder Half, Top View, Mounting

7.1.6 Adjust Feeder For Component Body Lengths

1. With machine power off, place a sample of components to be processed at the top of the feeder track as illustrated in **Figure 38**, Item 1.
2. Turn Station 1 adjustment knob to adjust the gap (Item 2) between the upright stampings (Item 3) until component slides freely down the track.
3. After initial adjustment, fill feeder to the top of its track with samples of components to be processed.
4. Power on the CF-8 and process the components in the feeder at low speed.
5. Inspect the cut and formed components to ensure they are being processed to your specifications.
   - If the components are not being processed properly, re-check all adjustments.
6. Set the speed of the machine higher for processing.

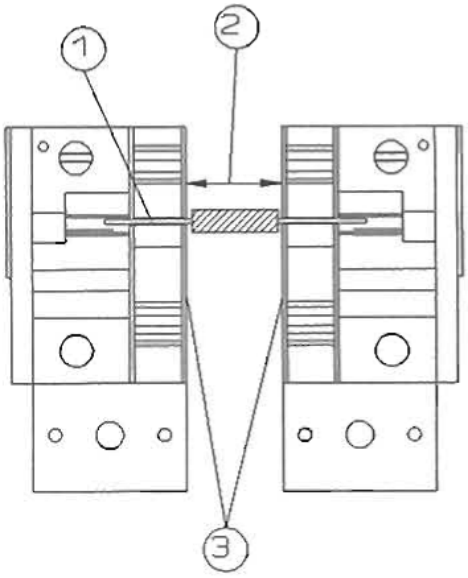


Figure 38 Component Feeder, Top View, Body Length Adjustment

Note: Processing speed depends on the quality and formed specifications of the components to be processed.

Note: All component bodies can vary in body length by up to 5%. As a result, all adjustments are approximations only and variation in the cut and formed components may occur. All clearances down the feeder track are based on square-ended, good quality components. For bulbous-ended components or components of non-uniform length, the clearances may need to be increased. This may result in a corresponding inaccuracy of body centering. Excessive body length clearance coupled with close center-to-center distances may cause component damage.

Note: Do not operate machine faster than components can be fed into the bulkfeeder or cardfeeder. If the feeder becomes empty of components, turn the machine off and re-load the feeder. Introducing components into an empty feeder while the CF-8 is operating at **any** speed may cause the machine to cut and form components inconsistently.

7.1.7 Identify Component Misfeeding Problems

1. Use the chart below to identify the possible component misfeeding problem.
2. Refer to the section in the right half of the chart to correct the problem.

Problem	See Section
Right and left halves of the feeder bases not timed properly to each other.	*7.1.4 Check Pick-Up Disk Timing*.
Pick-up disks seated incorrectly on their shafts.	*7.1.4 Check Pick-Up Disk Timing*.
Feeder or hopper adjusted incorrectly for body length.	*7.1.6 Adjust Feeder For Component Body Lengths* or *7.2 Install Hopper & Arm Assembly*.
Odd-shaped components.	*7.1.6 Adjust Feeder For Component Body Lengths*.
Inconsistent lead centricity.	*7.1.6 Adjust Feeder For Component Body Lengths*.
Incorrect bulkfeeder for the application.	*7.1.1 Feeder Identification & Processing Ranges*.

Chart 17 Component Misfeeding References

7.2 Install Hopper & Arm Assembly

An optional hopper is used to present components into a tall version bulkfeeder.

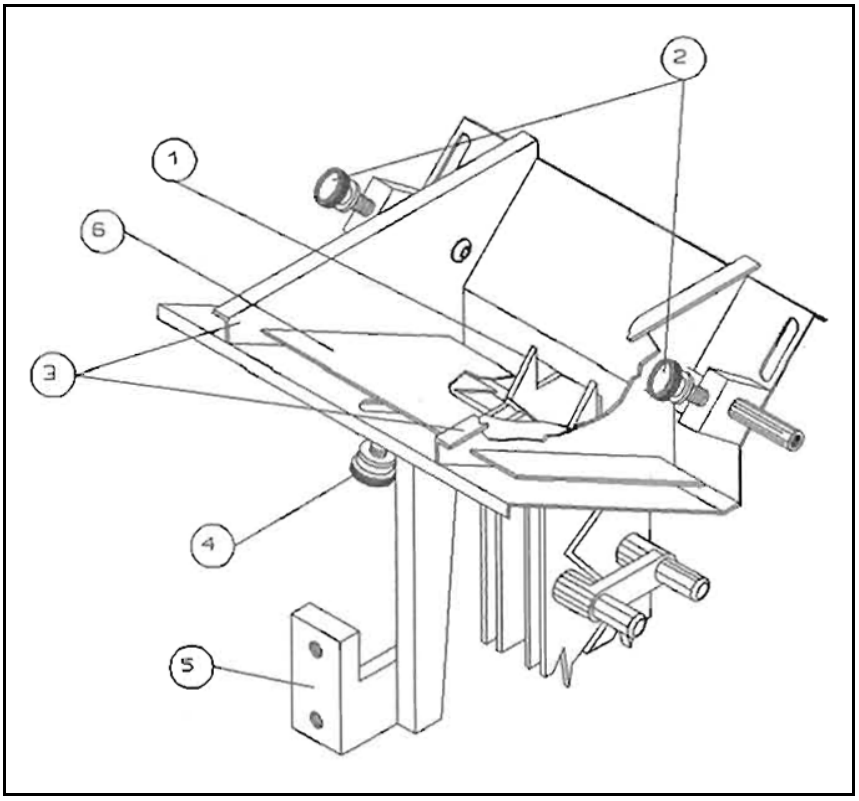


Figure 39 Optional Bulkfeeder Hopper

7.2.1 Install Hopper

1. Lower the hopper onto the top of the installed bulkfeeder.
2. Position the top of the bulkfeeder through the chute at the hopper base as illustrated in **Figure 38**, Item 1.
3. Attach the hopper support arm (Item 5) to the same pad as the reel and tape arm.

7.2.2 Adjust Hopper

1. Loosen thumbscrews (Item 2) to adjust for component length and centering.
2. Adjust the side pieces (Item 3) in or out to attain the minimum clearance while allowing the components to drop freely into the bulkfeeder.
3. Loosen gate adjustment thumbscrew (Item 4).
4. Slide the gate (Item 6) up or down to adjust for component body diameter.
5. Adjust the hopper to present components singly and smoothly to the bulkfeeder.
6. Tighten all thumbscrews to lock in adjustments.

8.0 Preventive Maintenance

A suggested maintenance schedule in chart form, maintenance steps, and an illustrated quick reference guide are included in this section.

Warning: Do not disassemble or remove parts of the CF-8. Changing of transport wheels and dies, and the installation or removal of the infeed chute and its shims are the only parts of the machine the operator should remove.

8.1 Preventive Maintenance Schedule

Note: Before performing the recommended maintenance, remove any feeders and transport wheels. See *5.0 Set-Up Procedure* for instructions on removing the feeders and wheels.

Service Interval	Location	Blow Dust Off	Wipe Clean	Lubricate (with 5 weight oil) (e.g. 3-in-1)
Daily	All surfaces	✓		
	Die block cranks			✓
	Spindles & shafts			✓
	Stations 6 & 7 slide assemblies			✓
	Stations 8 & 9 adjusting collars			✓
	Stations 4 & 5 dies		✓	

Chart 18 Preventive Maintenance Schedule

8.2 Preventive Maintenance Steps

Information pertaining preventive maintenance schedule items are listed here in alphabetic order. See *8.3 Quick Reference Illustrated Guide* for all figure references in this section.

All Surfaces

1. Blow dust off all surfaces.
2. Follow the lubrication procedure below since blowing dust off causes the lubricating oil to evaporate.

Spindles & Shafts Lubrication

1. See *5.4 Adjust Stations* for information to perform adjustments on the machine.
2. Remove feeders and transport wheels.
3. Adjust Stations 1 through 7 in to minimum settings.
4. Lubricate all spindles and shafts that support moving parts.
   - Avoid over-lubricating. Very little oil is needed.
   - Place oil on shafts and spindles nearest direction of travel. **For example**, with Stations 2 and 3 adjusted in to minimum settings, place oil near the *collar* (**Figure 41**, Item 1). When the Stations are adjusted out, place oil *nearest* the cutting wheels (**Figure 41**, Item 2).
5. Oil the remaining locations with 5 weight oil (e.g 3-in-1):
   a) On the main shaft and spindles of the cutting wheels and Stations 2 and 3 as indicated in **Figure 41** shaded areas.
   b) Where the shafts and spindles meet the infeed chute support blocks (**Figure 40**).

Cranks, Slide Assemblies, & Adjusting Collars Lubrication

1. Oil the following locations with 5 weight oil (e.g. 3-in-1):
   a) Where the crank attaches to the die block assemblies of Stations 4 and 5 as indicated in **Figure 42**.
   b) On the slide assembly and rollers of Stations 6 and 7 die holders as indicated in **Figure 43**.
   c) Loosen the thumbscrews of Stations 8 and 9 and slide the knurled adjusting collars out from their cranks until they resemble **Figure 44**.
      1) Place oil on shaft and on top of each collar, and slide the collars back and forth to distribute the oil.
      2) Reassemble by reversing the above steps.
2. After oiling, adjust all Stations out to maximum settings to distribute oil.
3. Re-oil Stations 1 through 7 as indicated in section *8.2 Preventive Maintenance*, "Spindles & Shafts Lubrication."
4. Adjust all Stations in to minimum settings to distribute the oil.

8.2 Preventive Maintenance Steps (continued)

5. Wipe clean any debris and excess oil noticed during the oiling process.

Stations 4 & 5 Dies

- Wipe clean any debris and oil off the cutting and forming dies in Stations 4 and 5.

8.3 Quick Reference Illustrated Guide

This sections contains five illustrations indicating the recommended oiling locations for Stations 1 through 9.

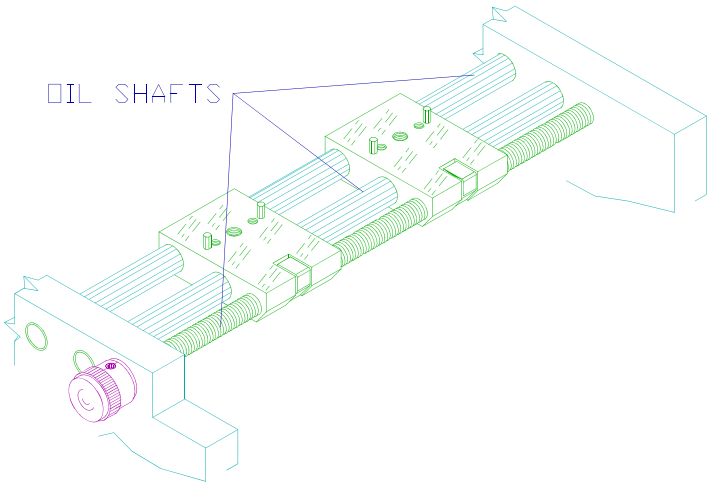


Figure 40 Station 1 Oiling Locations, Top View, Dual Infeed Chutes Removed

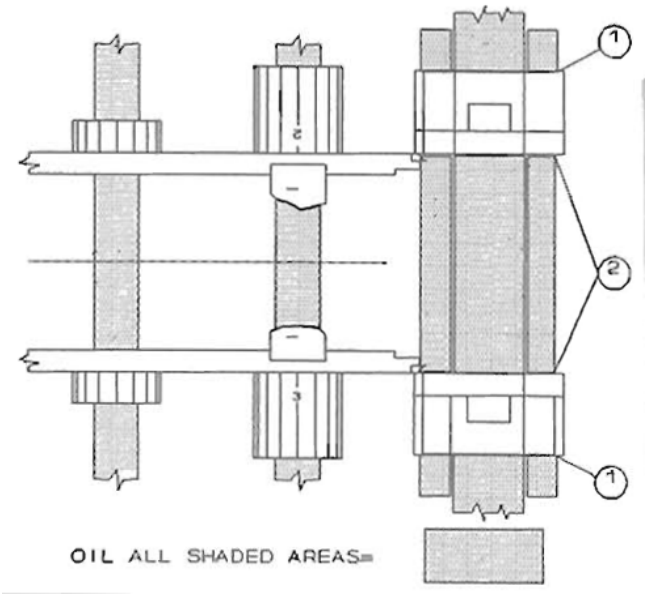


Figure 41 Stations 2 & 3 Oiling Locations, Top View

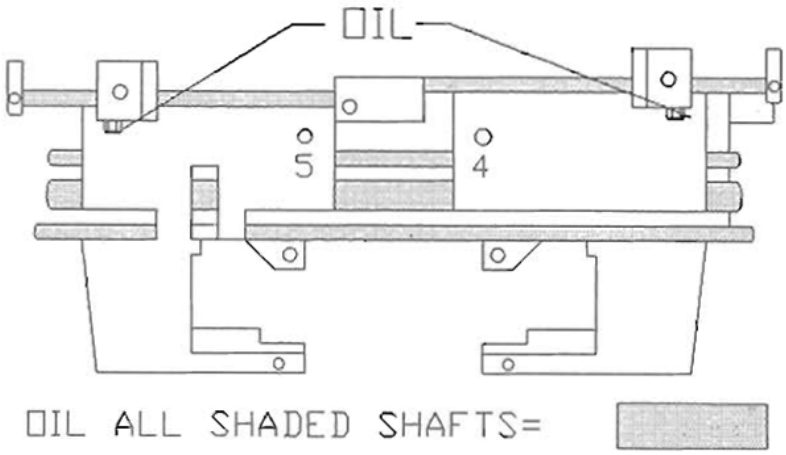


Figure 42 Stations 4 & 5 Oiling Locations, Front View

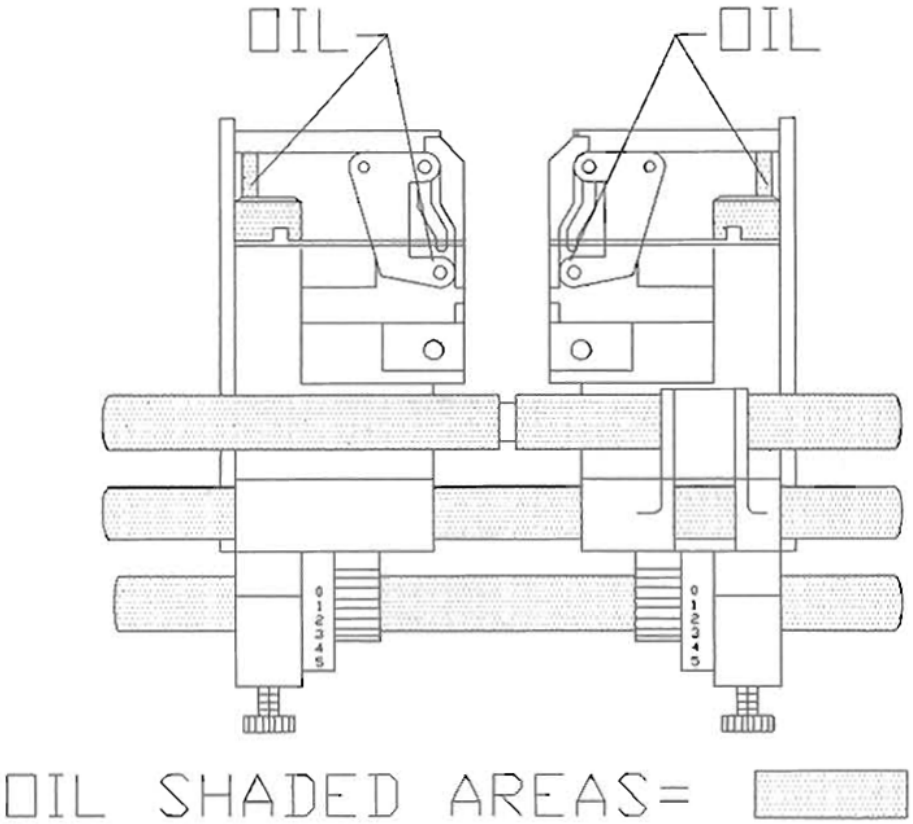


Figure 43 Stations 6, 7, 8, & 9 Oiling Locations, Front View

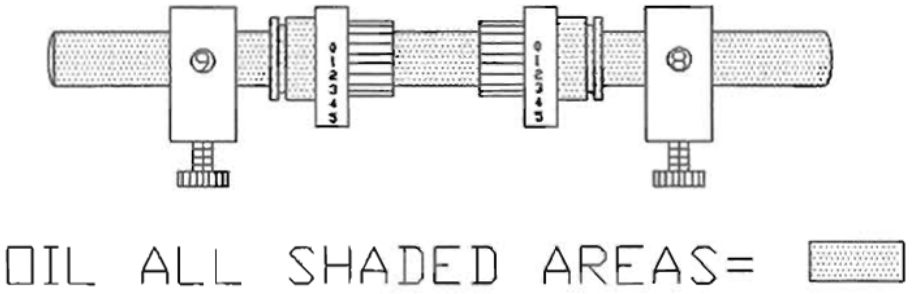


Figure 44 Stations 8 & 9 Oiling Locations, Adjusting Collars, Front View

9.0 Troubleshooting

This section contains four charts and an illustrated guide. Use the tables to troubleshoot common operating problems. Use the illustrated guide to troubleshoot common component forming problems.

9.1 Machine Not Rotating Properly

Problem	Action
Is the machine jammed with foreign objects?	Turn machine off and clear obstacles.
Is the power supply cord in serviceable condition?	Turn machine off and check cord.
Is the machine plugged into an appropriate, powered outlet?	Turn machine off, check outlet. Call maintenance.
Is the auxiliary plug and footswitch cord inserted properly into the control panel of the machine?	Check that the plug and cord are inserted properly, turn the speed control to a low setting, and depress footswitch.
Is the fuse in the receptacle on the control panel of the machine bad?	Replace fuse.
Are the safety shields open?	Close and secure shields.
Has the reset button on the control panel been depressed?	Press the reset button.
Can you hear noises from inside the machine but the cutting & transport wheels are not rotating?	Call maintenance--the internal clutch or motor belt needs attention.
Are the auxiliary or run mode indicator lights off?	Move the toggle on the control panel to run or auxiliary.

Chart 19 Troubleshooting -- Machine Not Rotating Properly

9.2 Machine Rotating Noisily

Problem	Action
Does the sound appear to come from within the cabinet?	Call maintenance.
Are the transport wheels in contact with Stations 6 and 7?	Readjust Stations. See *5.4 Adjust Stations*.
Are Stations 1, or 2 and 3, adjusted too small for the component body length?	Readjust Stations. See *5.4 Adjust Stations*.
Is the body length of the component being processed less than .325 inches (8.26 mm)?	Install the smaller ejector blade. See *5.3.5 Select & Install Transport Wheel Pair & Component Ejector Blade*.
Are the exit chutes rubbing on the cutting wheels?	The exit chutes are out of alignment. Call maintenance.
Are the dies in Stations 4 and 5 a matched set and aligned properly?	Match and align dies. See *5.3.1 Select Dies* and *5.3.4 Install Dies*.
Has the machine been serviced at regular intervals?	Perform preventive maintenance. See *8.0 Preventive Maintenance*.

Chart 20 Troubleshooting -- Machine Rotating Noisily

9.3 Components Fall Out of Machine

Problem	Action
Is the wire diameter of the component being processed out the transport wheel's processing range?	Install the proper transport wheels. See *5.3.5 Select & Install Transport Wheel Pair & Component Ejector Blade* .
Is the wire diameter greater than .029 inches (0.74 mm)?	Install the infeed shims. See *5.3.6. Install or Remove Dual Infeed Chute Shims*.
Are any of the fingers of the transport wheels obviously bent or broken?	Call maintenance to replace the wheel shims.
Do the components foul in Station 1?	Check the wire diameter processing range, infeed chute adjustment, and reel and tape arm alignment. See *5.0 Set-Up Procedure*.
Are the transport wheels rotating in the proper direction?	Check the transport wheel installation. See *5.3.5. Select & Install Transport Wheel Pair & Component Ejector Blade*.
Are the transport wheels timed properly?	Check the timing of the transport wheels. See *5.5.3 Select & Install Transport Wheel Pair & Component Ejector Blade*, step 2.
Is the speed control of the machine set too high?	Set the machine at a lower operating speed.
Are the dimensions of the component being processed outside the machine's processing range?	Check the component's dimensions. See *5.3.3 Observe Processing Limits*, step 2.
Are the dies in Stations 4 and 5 installed incorrectly?	Check Stations 4 and 5 die installation. See *5.3.4 Install Dies*, step 1.
Are the leads of the component bent?	Replace components being processed.

Chart 21 Troubleshooting -- Components Fall Out of Machine

Note: If none of the above solves the problem, call maintenance personnel.

9.4 Components Not Forming Properly

Problem	Action
Do the components foul in Station 1?	Check Station 1's adjustment, the component dimensions processing ranges, reel and tape arm alignment, and infeed shim installation. See *5.0 OPERATING INSTRUCTIONS*.
Do the cut and formed components resemble any of the components in the illustrations in *9.4.1 Illustrated Guide* below?	Follow the instructions to the right of the illustration that looks like the processed component.

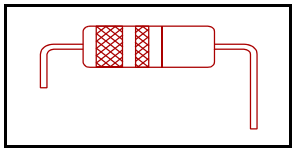
Chart 22 Troubleshooting -- Components Not Forming Properly

9.4.1 Illustrated Guide

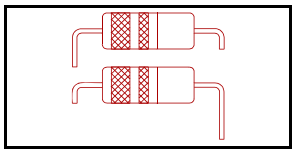
Use this illustrated guide as a quick reference to components not forming properly. Follow the instructions to the right of the illustration that resembles the processed component.

Note: Components may have combinations of the problems illustrated below. More than one action may need to be taken to achieve properly cut and formed components.

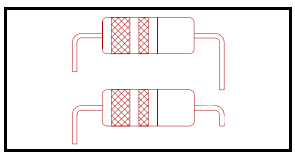
If none of the actions below solve the problem, call maintenance personnel.



. . . . . ▸ **Body centered, <u>uneven</u> leg lengths:** Check Stations 2 & 3 or 4 & 5 settings. See *5.4 Adjust Stations*.

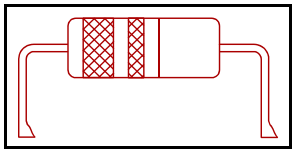


. . . . . ▸ **Body centered, <u>varying</u> uneven leg lengths:** Check Station 1 for too wide of a setting or check for infeed shim installation. See *5.4.5 Adjust Station 1*.

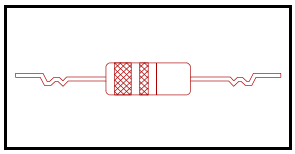


. . . . . ▸ **Body centered, <u>one</u> leg varies in length:** Stations 2, 3, 4, or 5 moving. Not operator adjustable. Call maintenance.

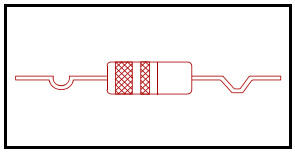
9.4.1 Illustrated Guide (continued)



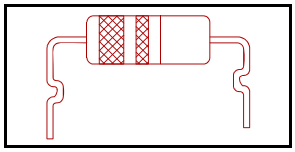
. . . . . ▸ **End of lead sheared or not clean cut:** Check die alignment in Stations 4 & 5. See *5.3.4 Install Dies*. Visually inspect dies for condition of cutting edge. Or if worn knifeholders, call maintenance.



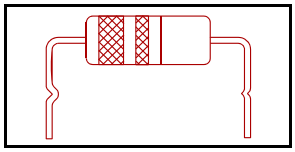
. . . . . ▸ **Wire marked near dimple:** Check die size and alignment. See *5.3.1 Select Dies* and *5.3.4 Install Dies*.



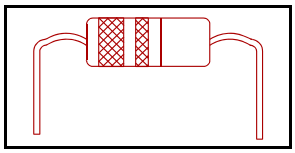
. . . . . ▸ **Unmatched dimples in the wire:** Check die size, selection, installation, and that Stations 4 & 5 dies are properly matched. See *5.3 Select & Install Hardware*.



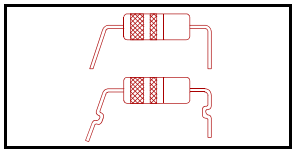
. . . . . ▸ **Bend to dimple distance unequal:** Check settings in Stations 4 & 5. See *5.3 Select & Install Hardware* and *5.4 Adjust Stations*.



. . . . . ▸ **Shallow or insufficient dimple in wire:** Check die selection in Stations 6 & 7. Check all other Station settings. See *5.3 Select & Install Hardware* and *5.4 Adjust Stations*.

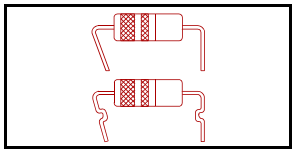


. . . . . ▸ **Wire bowed up from body to bend:** Check die alignment and selection. See *5.3. Select & Install Hardware*.

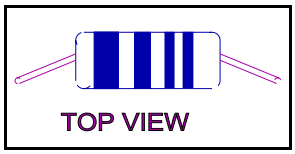


. . . . . ▸ **One leg insufficient bend:** Check die installation. Adjust Stations 8 or 9 to a higher setting not to exceed 7. If a higher setting is necessary, call maintenance. See *5.3 Select & Install Hardware* and *5.4 Adjust Stations*.

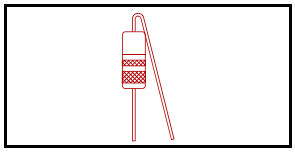
9.4.1 Illustrated Guide (continued)



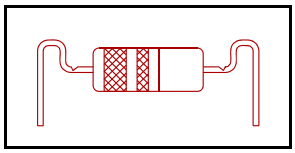
. . . . . ▸ **One leg bent too much:** Check die installation. Adjust Stations 8 or 9 to a lower setting. See *5.3 Select & Install Hardware* and *5.4 Adjust Stations*.



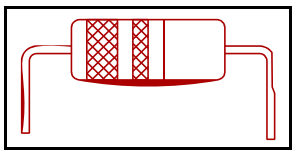
. . . . . ▸ **Wire pulled away from body, as seen from the top view:** Check dies for tin build up and scrape off if necessary. Check die installation for alignment. Check die selection for Stations 6 & 7. See *5.3 Select & Install Hardware*.



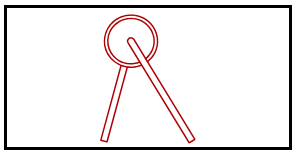
. . . . . ▸ **Wire touching body:** Install proper larger die in Stations 6 or 7. See *5.3 Select & Install Hardware*.



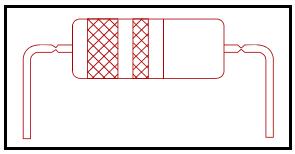
. . . . . ▸ **Crimp in wire near bend:** Check die and forming plate selection. See *5.3 Select & Install Hardware*.



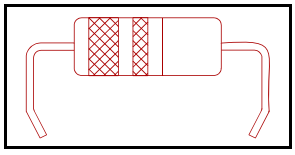
. . . . . ▸ **Wires scraped:** Stations 6 & 7 rollers dragging. Not operator adjustable. Call maintenance.



. . . . . ▸ **Splayed leads as seen from the side:** Check transport wheel timing. See *5.3.5 Select & Install Transport Wheel Pair & Component Ejector Blade*, step 2.



. . . . . ▸ **Wire marked close to body:** Use next larger transport wheel. Check component's dimension limits. See *5.3.5 Select & Install Transport Wheel Pair & Component Ejector Blade* and *5.3.3 Observe Processing Limits*.



. . . . . ▸ **Ends of legs bent in:** Adjust Stations 8 or 9 to a lower setting. See *5.4.4 Adjust Stations 8 & 9*.

10.0 Suggested Spare Parts Kits

Note: Items included in the spare parts kits may be ordered individually.

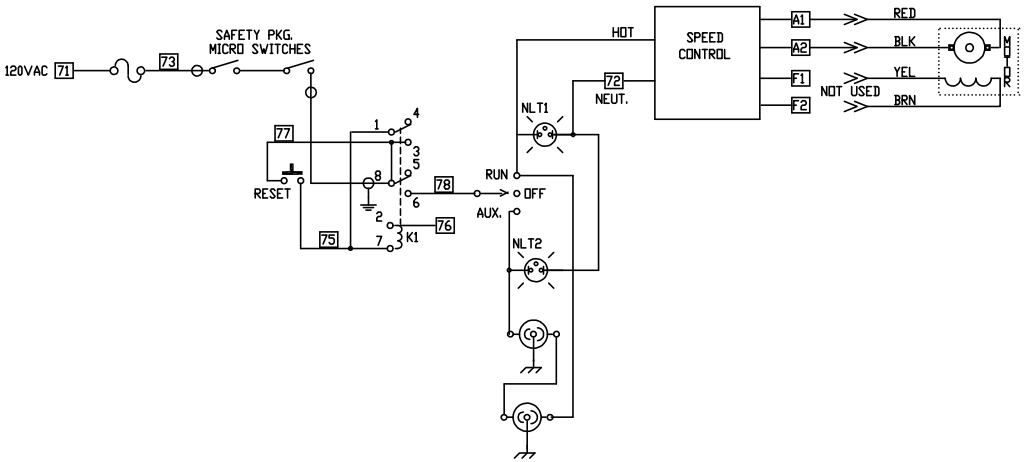
GPD Part Number	Part Description	Qty.
830-1-500	**SPARE PARTS KIT - 120V CF-8**	**1**
D0006	Timing Belt	1
G1001	Retaining Ring 5100-12	As Required
S5003	Spring Plunger S52P	2
S6002	Vlier Wrench VW-52	1
4300-0011	Fuse, Slow Blow	1
801-1-5	Leaf Spring	16
801-1-9	Wire Clamp with Red Insert	2
801-1-19	Pin Die Screws	8
801-1-22	Wireclamp Inserts - Red	4
817-1-3	Wheel Holder	2
817-1-14	Holder Screws	12
817-1-4L	Transport Wheel, Large, Pair	1
817-1-4M	Transport Wheel, Medium, Pair	1
817-1-4S	Transport Wheel, Small, Pair	1
821-4-12	Circlip Pliers	1

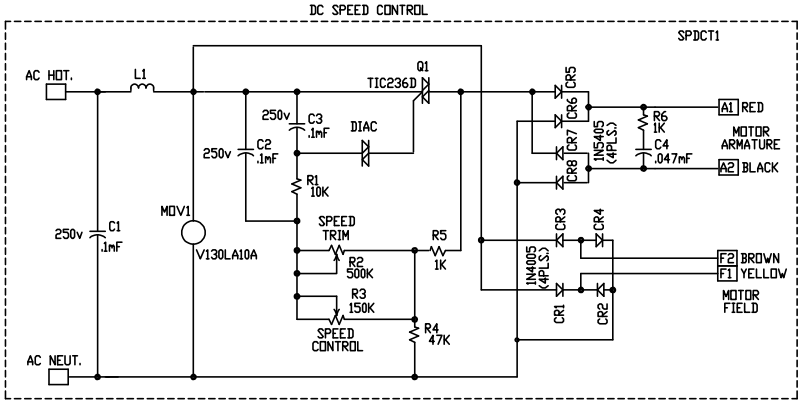
830-1-510	**SPARE PARTS KIT - 230V METRIC CF-8**	**1**
D0006	Timing Belt	1
G1001	Retaining Ring 5100-12	As Required
S5003	Spring Plunger S52P	2
S6002	Vlier Wrench VW-52	1
4300-0012	Fuse, Slow Blow	1
801-1-5	Leaf Spring	16
801-1-9	Wire Clamp with Red Insert	2
801-1-19	Pin Die Screws	8
801-1-22	Wireclamp Inserts - Red	4
817-1-14	Holder Screws	12
817-1-4L-MET	Transport Wheel, Large, Pair	1
817-1-4M-MET	Transport Wheel, Medium, Pair	1
817-1-4S-MET	Transport Wheel, Small, Pair	1
821-4-12	Circlip Pliers	1

GPD Part Number	Part Description	Qty.
830-1-530	**SPARE PARTS KIT - 230V CF-8**	**1**
D0006	Timing Belt	1
G1001	Retaining Ring 5100-12	As Required
S5003	Spring Plunger S52P	2
S6002	Vlier Wrench VW-52	1
4300-0012	Fuse, Slow Blow	1
801-1-5	Leaf Spring	16
801-1-9	Wire Clamp with Red Insert	2
801-1-19	Pin Die Screws	8
801-1-22	Wireclamp Inserts - Red	4
817-1-3	Wheel Holder	2
817-1-14	Holder Screws	12
817-1-4-L	Transport Wheel, Large, Pair	1
817-1-4-M	Transport Wheel, Medium, Pair	1
817-1-4-S	Transport Wheel, Small, Pair	1
821-4-12	Circlip Pliers	1

830-1-520	**SPARE PARTS KIT - 100V METRIC CF-8**	**1**
D0006	Timing Belt	1
G1001	Retaining Ring 5100-12	As Required
S5003	Spring Plunger S52P	2
S6002	Vlier Wrench VW-52	1
4300-0011	Fuse, Slow Blow	1
801-1-5	Leaf Spring	16
801-1-9	Wire Clamp with Red Insert	2
801-1-19	Pin Die Screws	8
801-1-22	Wireclamp Inserts - Red	4
817-1-3	Wheel Holder	2
817-1-14	Holder Screws	12
817-1-4L-MET	Transport Wheel, Large, Pair	1
817-1-4M-MET	Transport Wheel, Medium, Pair	1
817-1-4S-MET	Transport Wheel, Small, Pair	1
821-4-12	Circlip Pliers	1

Appendix A Electrical Diagram & Schematics





GPD GLOBAL

CUSTOMER:	DRAWN:	DATE:	THIS ASSEMBLY:	NAME:	DRWG NUMBER:
	SAH	04-05-07	ELE SCHEMATIC	CF-8	00010-008-000-00-0088001A

Index

CF-8
Precision Axial Lead Former

Bills of Material & Exploded Views

Version 2.3.1
October 29, 2014

Prepared by
GPD Global® Documentation Department

GPD Global®
611 Hollingsworth Street
Grand Junction, CO 81505
(970) 245-0408 FAX (970) 245-9674
www.gpd-global.com

Revisions

Version 2.3.1 release. All pages dated 10/29/14.

Version 2.3 release. All pages dated 09/20/96 and 04/04/07 (Cover page, Revisions page).

Version 2.2 release. All pages dated 02/03/92.

Version 2.1 release. All pages dated 08/30/91.

Version 2.0 release. All pages dated 12/01/90.

Table of Contents

BOM15

Bill of Material for Assembly CF8.GENERAL
CF-8 General Parts

Effective As of: 06-01-96

ITEM	1...5...10	PART#.....	DESCRIPTION.....	QTY
1	1.....	802-1-2	SLIDE ROD	4 EA
2	1.....	802-1-12	WASHER	5 EA
3	1.....	802-1-12A	WASHER	1 EA
4	1.....	803-1-12	MAIN SHAFT DRIVE GEAR	1 EA
5	1.....	803-1-13	SPACER	1 EA
6	NOT APPLICABLE			
7	NOT APPLICABLE			
8	1.....	803-1-2	CUTTING WHEELS	2 EA
9	1.....	803-1-3	HUB	2 EA
10	NOT APPLICABLE			
11	NOT APPLICABLE			
12	1.....	804-1-6	COLLAR	2 EA
13	1.....	804-1-8A	PULLEY	1 EA
14	1.....	806-1-2	CAM	1 EA
15	1.....	807-1-1	MAIN DRIVE SHAFT	1 EA
16	1.....	807-1-2	IDLER SHAFT	1 EA
17	1.....	SACAN3118050	SCREW,ALLEN,CAP	AR EA
18	1.....	807-1-4A	PULLEY 19L050	1 EA
19	1.....	808-1-4	WASHER,.591-.593IDX.875OD	6 EA
20	1.....	808-1-5A	PULLEY 17L050	1 EA
21	1.....	808-1-6A	PULLEY 19L050	1 EA
22	1.....	809-4-19	INFEED SUPPORT ROD	1 EA
23	1.....	809-4-19A	INFEED SUPPORT ROD	1 EA
24	1.....	DA12100	PIN,DOWEL	AR EA
25	1.....	809-4-22	ROD ADJ	1 EA
26	1.....	809-4-23	BOLT	1 EA
27	1.....	809-4-24	NUT MODIFIED	1 EA
28	1.....	809-4-7	SUPPORT ROD	2 EA
29	1.....	**N.S.S.**	UPRIGHT	1 EA
30	1.....	810-3-1	REAR BEARING SUPPORT	1 EA
31	1.....	810-3-2	TIE BAR	4 EA
32	1.....	810-4-1	CABINET	1 EA
33	1.....	810-4-2	MICROSWITCH BRACKET	1 EA
34	1.....	810-4-2A	MICROSWITCH BRACKET	1 EA
35	1.....	810-4-3	MICROSWITCH BRACKET	2 EA
36	1.....	810-5-1	BASE	1 EA
37	1.....	810-5-3	MOTOR PULLEY	1 EA
38	1.....	810-6-5	STUD	2 EA
39	1.....	810-7-2	TIE BAR	3 EA
40	1.....	810-8-1	FRONT PLATE SUPPORT	1 EA
41	1.....	813-1-5	KNOB ADJUSTMENT	1 EA
42	1.....	817-1-1	SQUARE SHAFT	1 EA
43	1.....	817-1-10	NYLATRON SPACER	2 EA
44	1.....	817-1-11	EJECTOR SHAFT	1 EA
45	1.....	817-1-13	COLLAR	1 EA
46	1.....	817-1-12S	SMALL EJECTOR BLADE	1 EA
47	1.....	817-1-5	NYLATRON SPACER	2 EA
48	1.....	817-1-6	WHEEL GEAR	1 EA

N.S.S. = NOT SOLD SEPARATELY

BOM15

Bill of Material for Assembly CF8.GENERAL
CF-8 General Parts

Effective As of: 06-01-96

ITEM	1...5...10	PART#.....	DESCRIPTION.....	QTY
49	1.....	817-1-7	IDLER GEAR	1 EA
50	1.....	817-1-8	IDLER SHAFT	1 EA
51	1.....	817-1-9	IDLER BRACKET	1 EA
52	1.....	819-1-5	HINGE, SAFETY GUARD	1 EA
53	1.....	HG-210	HINGE, SAFETY GUARD	3 EA
54	1.....	NK-250	KNOB NEURAL	2 EA
55	NOT APPLICABLE			
56	NOT APPLICABLE			
57	1.....	B0001	BEARING 6002LLB	9 EA
58	1.....	B0002	BEARING	2 EA
59	1.....	B0003	BEARING	1 EA
60	1.....	B8001	STEEL BALL	3 EA
61	1.....	B8002	STEEL BALL	4 EA
62	1.....	D1505	COLLAR 5/8" CLAMP	1 EA
63	1.....	D0002	TIMING BELT	1 EA
64	1.....	D0003	TIMING BELT	1 EA
65	1.....	D0006	MOTOR BELT	1 EA
66	1.....	NSNA0632	NUT	AR EA
67	1.....	SACAN0632037	SCREW,ALLEN,CAP	AR EA
68	1.....	SACAN0632087	SCREW,ALLEN,CAP	AR EA
69	1.....	SABAN0632025	SCREW,ALLEN,BUTTON	AR EA
70	1.....	SPRAN0632037	SCR.P.RD.STL.	AR EA
71	1.....	SABAN0832037	SCREW,ALLEN,BUTTON	AR EA
72	1.....	TACAN0832018	SET.A.CU.STL.	AR EA
73	1.....	TACAN0832025	SET.A.CU.STL.	AR EA
74	1.....	NSNA1032	NUT	AR EA
75	1.....	SACAN1032050	SCREW,ALLEN,CAP	AR EA
76	1.....	SACAN1032125	SCREW,ALLEN,CAP	AR EA
77	1.....	SABAN1032037	SCREW,ALLEN,BUTTON	AR EA
78	1.....	SABAN1032050	SCREW,ALLEN,BUTTON	AR EA
79	1.....	TACAN1032025	SET.A.CU.STL.	AR EA
80	1.....	TAPAN1032025	SET.A.PT.STL.	AR EA
81	1.....	NSIA2520	NUT,NYLON INSERT	AR EA
82	1.....	F4552	WASHER FLAT	AR EA
83	1.....	SACAN2520037	SCREW,ALLEN,CAP	AR EA
84	1.....	SACAN2520050	SCREW,ALLEN,CAP	AR EA
85	1.....	SACAN2520062	SCREW,ALLEN,CAP	AR EA
86	1.....	SACAN2520075	SCREW,ALLEN,CAP	AR EA
87	1.....	SACAN2520087	SCREW,ALLEN,CAP	AR EA
88	1.....	SACAN2520125	SCREW,ALLEN,CAP	AR EA
89	1.....	SACAN2520200	SCREW,ALLEN,CAP	AR EA
90	1.....	SHHAN3716100	SCR.H.HX.STL.	AR EA
91	1.....	F5954	HEALI COIL	1 EA
92	1.....	RPAS09075	PIN,ROLL	AR EA
93	1.....	RPAS12075	PIN,ROLL	AR EA
94	1.....	DA12050	PIN,DOWEL	AR EA
95	1.....	G3009	WOODRUFF KEY 404	AR EA
96	1.....	G3013	WOODRUFF KEY 605	AR EA

N.S.S. = NOT SOLD SEPARATELY

BOM15

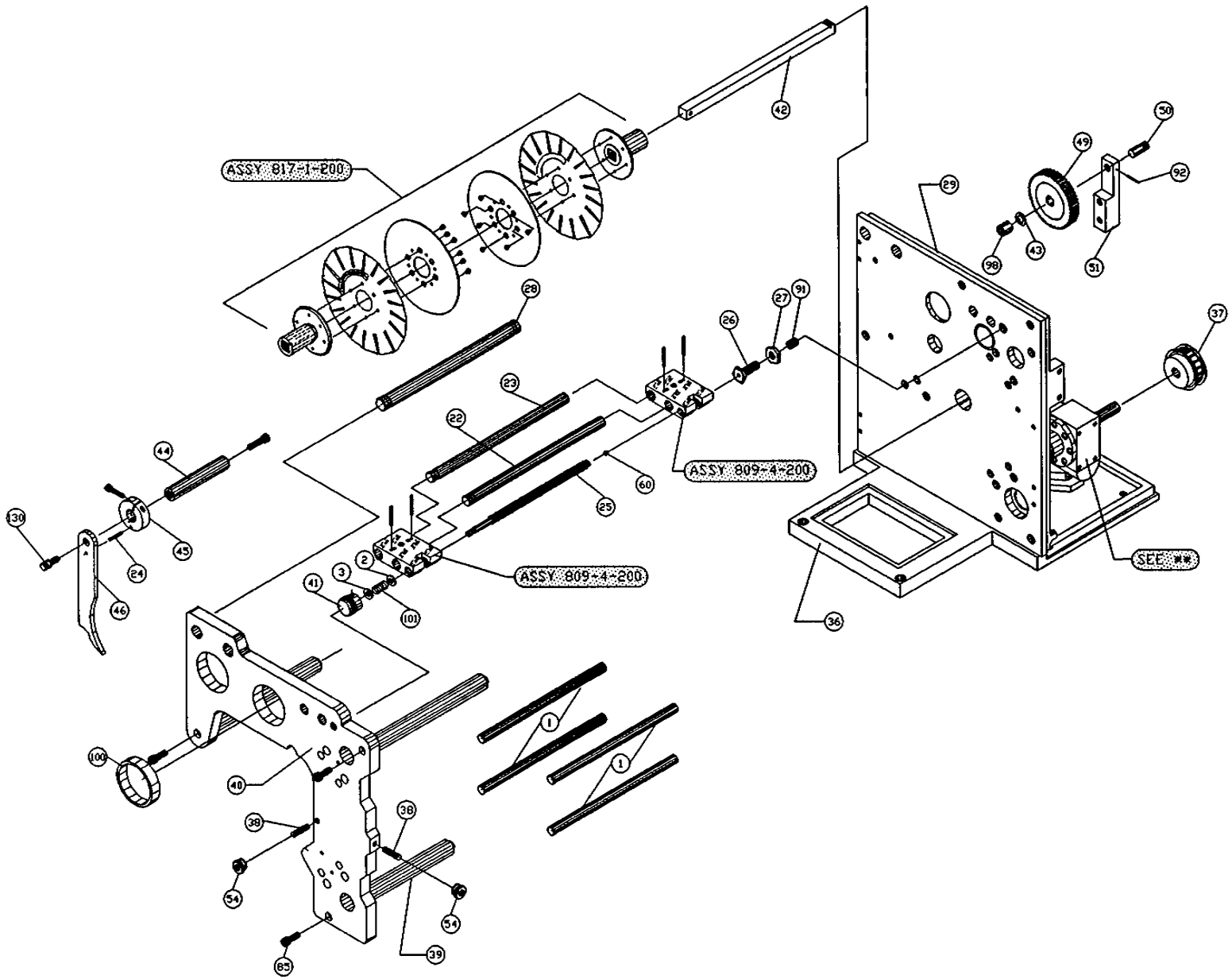
Bill of Material for Assembly CF8.GENERAL
CF-8 General Parts

Effective As of: 06-01-96

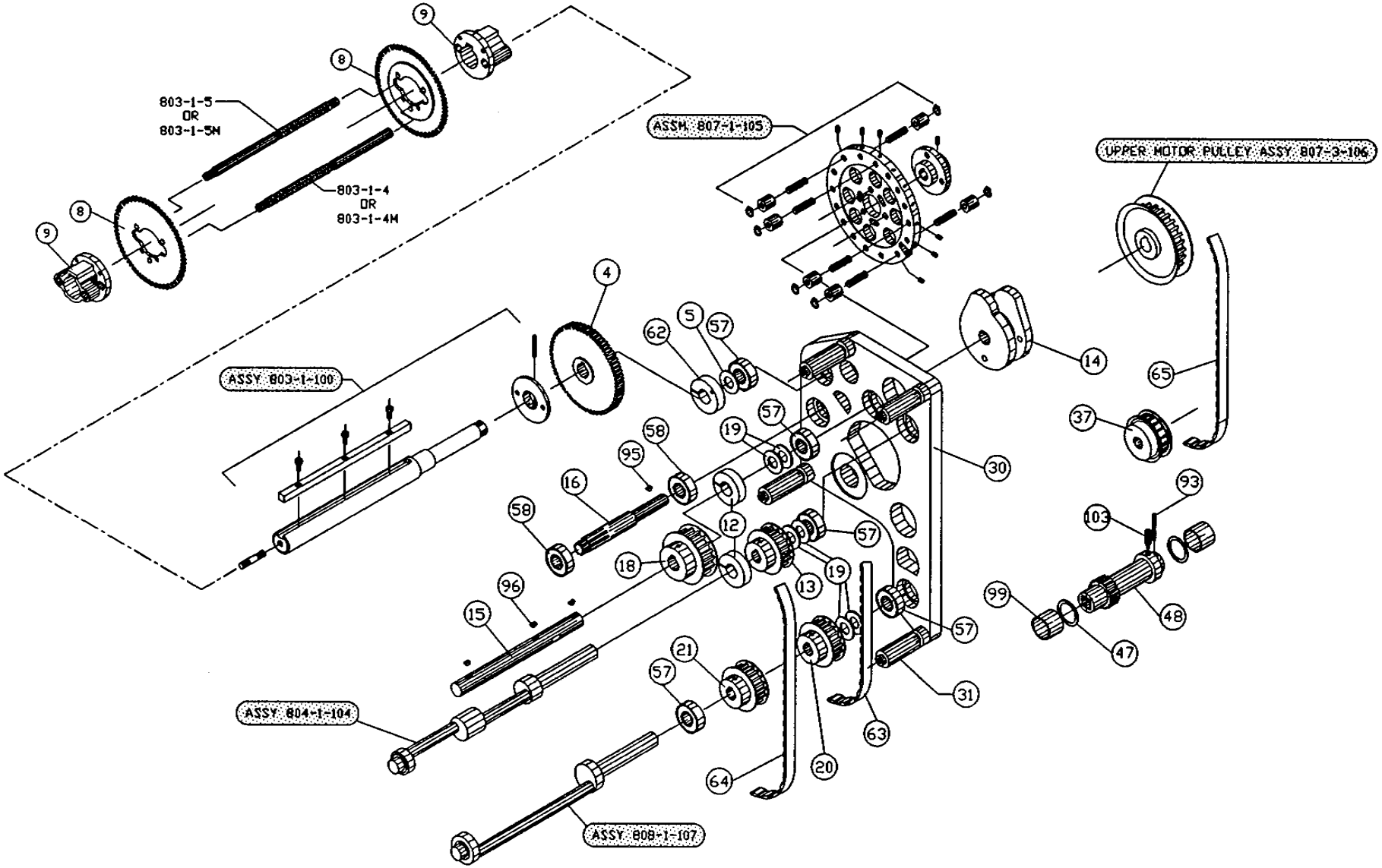
ITEM	1...5...10	PART#.....	DESCRIPTION.....	QTY
97	1.....	L0303	BRONZE BEARING	5 EA
98	1.....	L0504	BRONZE BEARING	1 EA
99	1.....	L1301	BUSHING	2 EA
100	1.....	L2001	BUSHING	1 EA
101	1.....	S0001	SPRING	1 EA
102	1.....	S4003	WASHER	AR EA
103	1.....	S5101	SPRING PLUNGER BH54	1 EA
104	1.....	2100-0121	CONNECTOR, TERMINAL	AR EA
105	1.....	2100-0123	CONNECTOR,TERMINAL	AR EA
106	1.....	2100-0122	CONNECTOR, TERMINAL	AR EA
107	1.....	2800-0028	WIRE TIES	18 EA
108	1.....	2800-0029	STICK DOWN PADS 1/2"	AR EA
109	1.....	3100-0004	HARDWARE ELECTRICAL	AR IN
110	1.....	3100-0005	HARDWARE ELECTRICAL	AR IN
111	1.....	3100-0006	HARDWARE ELECTRICAL	AR IN
112	1.....	3100-0008	HARDWARE ELECTRICAL	AR IN
113	1.....	4500-0008	SOCKET, RELAY	1 EA
114	1.....	5100-0028	SWITCH, LIMIT	2 EA
115	1.....	6000-0012	SHIELD CABLE TEFLON	AR IN
116	1.....	6000-0000	POWER CORD 6'7"	1 EA
117	1.....	6000-18-PV-GR	WIRE GREEN #18	AR IN
118	1.....	6000-20-PV-BLK	WIRE BLACK #20	AR IN
119	1.....	6000-20-PV-BLU	WIRE BLUE #20	AR IN
120	1.....	6000-20-HU-BRN	WIRE, 20AWG HOOKUP/BROWN	AR IN
121	1.....	6000-20-HU-RED	WIRE, 20AWG HOOKUP/RED	AR IN
122	1.....	6000-20-HU-YEL	WIRE, 20AWG HOOKUP/YELLOW	AR IN
123	NOT APPLICABLE			
124	1.....	819-1-1EA	ANTISTATIC SAFETY SHIELD	1 EA
125	1.....	810-6-6	SCRAP BIN	1 EA
126	1.....	819-1-3EA	ANTISTATIC SAFETY SHIELD	1 EA
127	1.....	701-EA	COMPONENT BIN ANTI STATIC	1 EA
128	NOT APPLICABLE			
129	1.....	2800-0024	STRAIN RELIEF	1 EA
130	1.....	707-B	THUMB SCREW	1 EA
131	1.....	801-1-16R	NUT ADJ (R)	1 EA
132	1.....	801-1-16L	NUT ADJ (L)	1 EA
133	1.....	IP009	INSPECTION FORM,CF-8	1 EA
134	1.....	2400-0012	DATA PLATE	1 EA

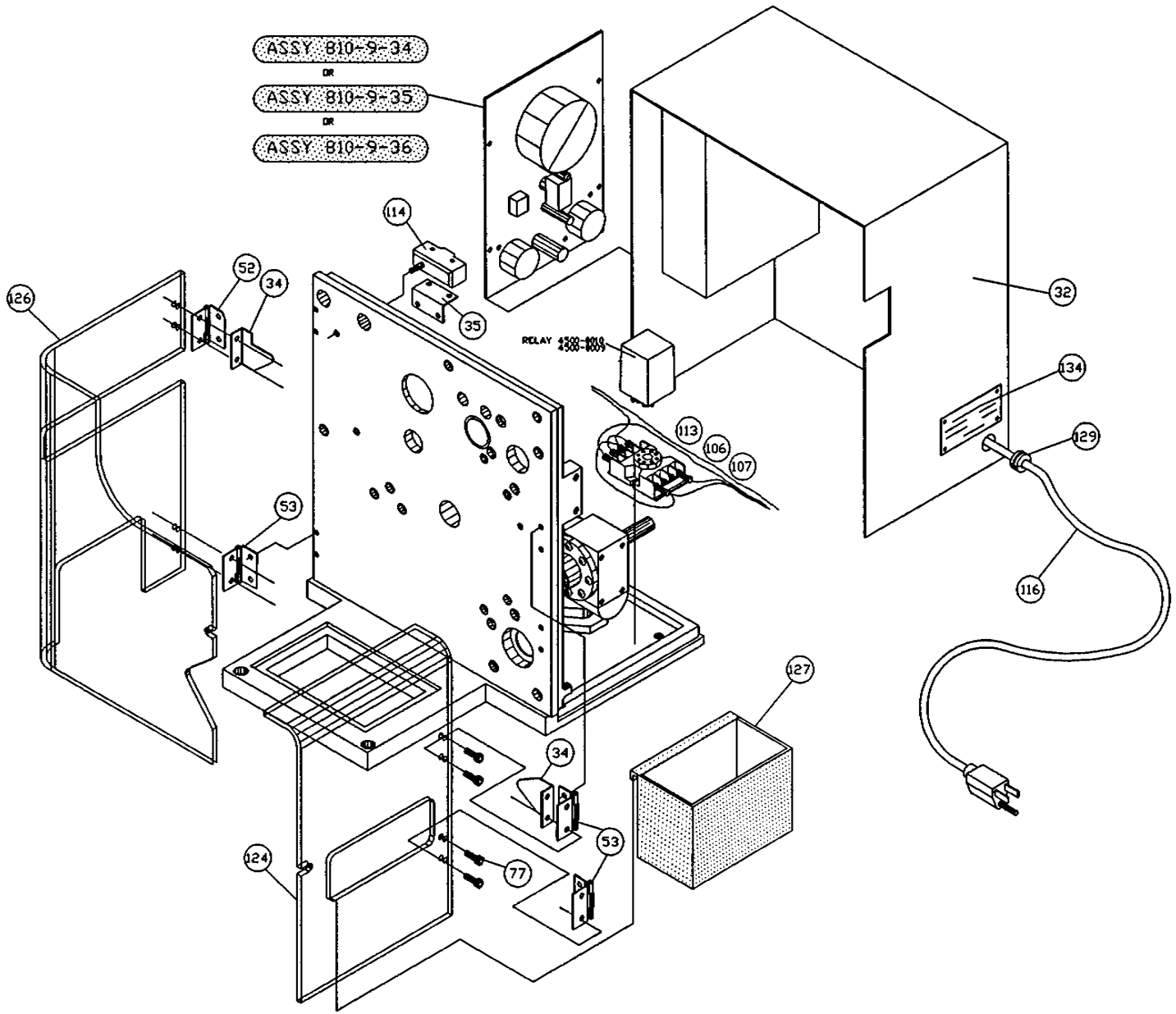
** 810-9-44 MOTOR 110V
810-9-45 MOTOR 220V
810-9-46 MOTOR 100V

N.S.S. = NOT SOLD SEPARATELY



CF-8 General Assembly (1 of 3)


803-1-5
OR
803-1-5M
803-1-4
OR
803-1-4M
ASSY 803-1-100
ASSY 804-1-104
ASSY 808-1-107
ASSM 807-1-105
UPPER MOTOR PULLEY ASSY 807-3-106



CF-8 General Assembly (3 of 3)

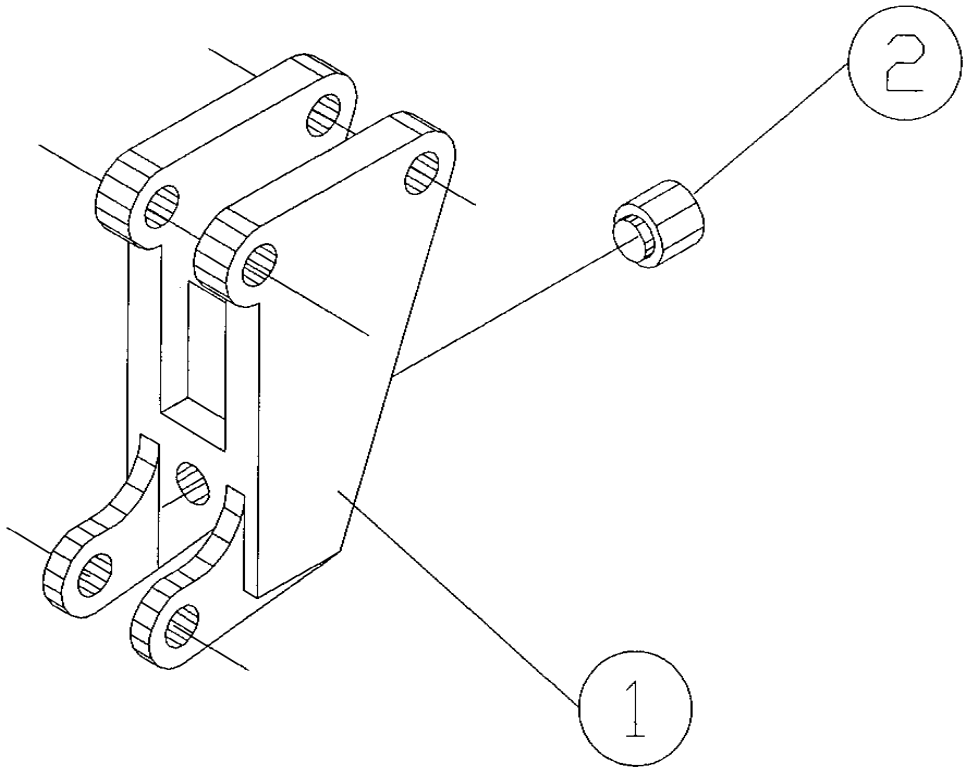
BOM15

Bill of Material for Assembly 801-1-100
Roller Support Assembly

Revision :A Revision Date: 04-01-89 Effective As of: 08-10-91

ITEM	1...5...10	PART#.....	DESCRIPTION.....	QTY
1	1.....	N.S.S.	ROLLER SUPPORT	1 EA
2	1.....	N.S.S.	PLUNGER REST	1 EA

N.S.S. = NOT SOLD SEPARATELY



GPD

Roller Support Assembly No. 801-1-100

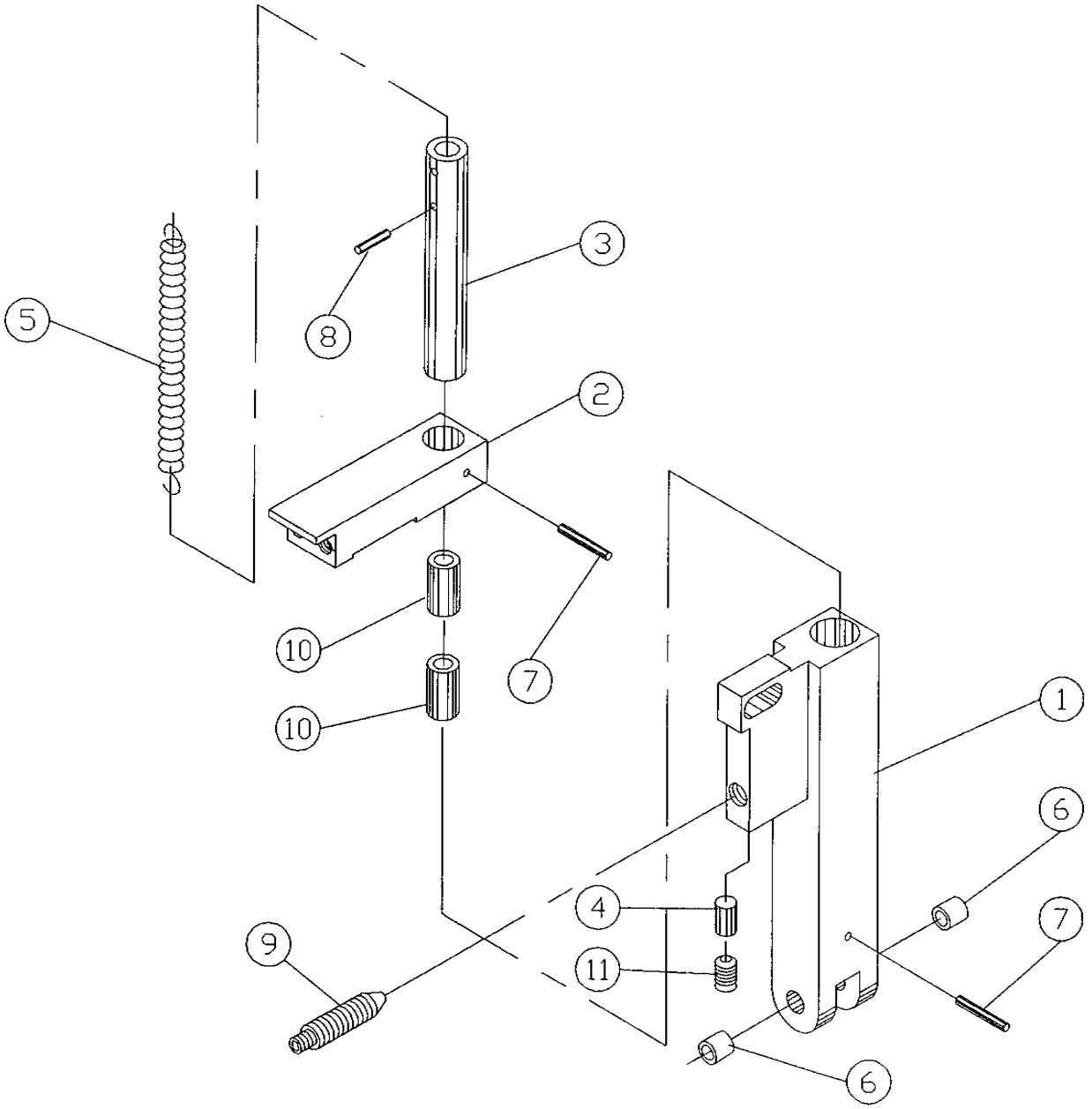
BOM15

Bill of Material for Assembly 801-1-200
Slide Assembly

Revision :A Revision Date: 04-01-89 Effective As of: 08-10-91

ITEM	1...5...10	PART#.....	DESCRIPTION.....	QTY
1	1.....	**N.S.S.**	SLIDE	1 EA
2	1.....	**N.S.S.**	CLAMP SUPPORT	1 EA
3	1.....	**N.S.S.**	SPRING BUSHING	1 EA
4	1.....	813-1-9	PLUG BRASS	1 EA
5	1.....	S2002	SPRING	1 EA
6	1.....	L0001	BUSHING	2 EA
7	1.....	RPAS06050	PIN,ROLL	AR EA
8	1.....	RPAS06031	PIN,ROLL	AR EA
9	1.....	S5003	SPRING PLUNGER S52P	1 EA
10	1.....	L0403	BUSHING	2 EA
11	1.....	TACAN0832012	SET.A.CU.STL.	AR EA

N.S.S. = NOT SOLD SEPARATELY



GPD

Slide Assembly No. 801-1-200

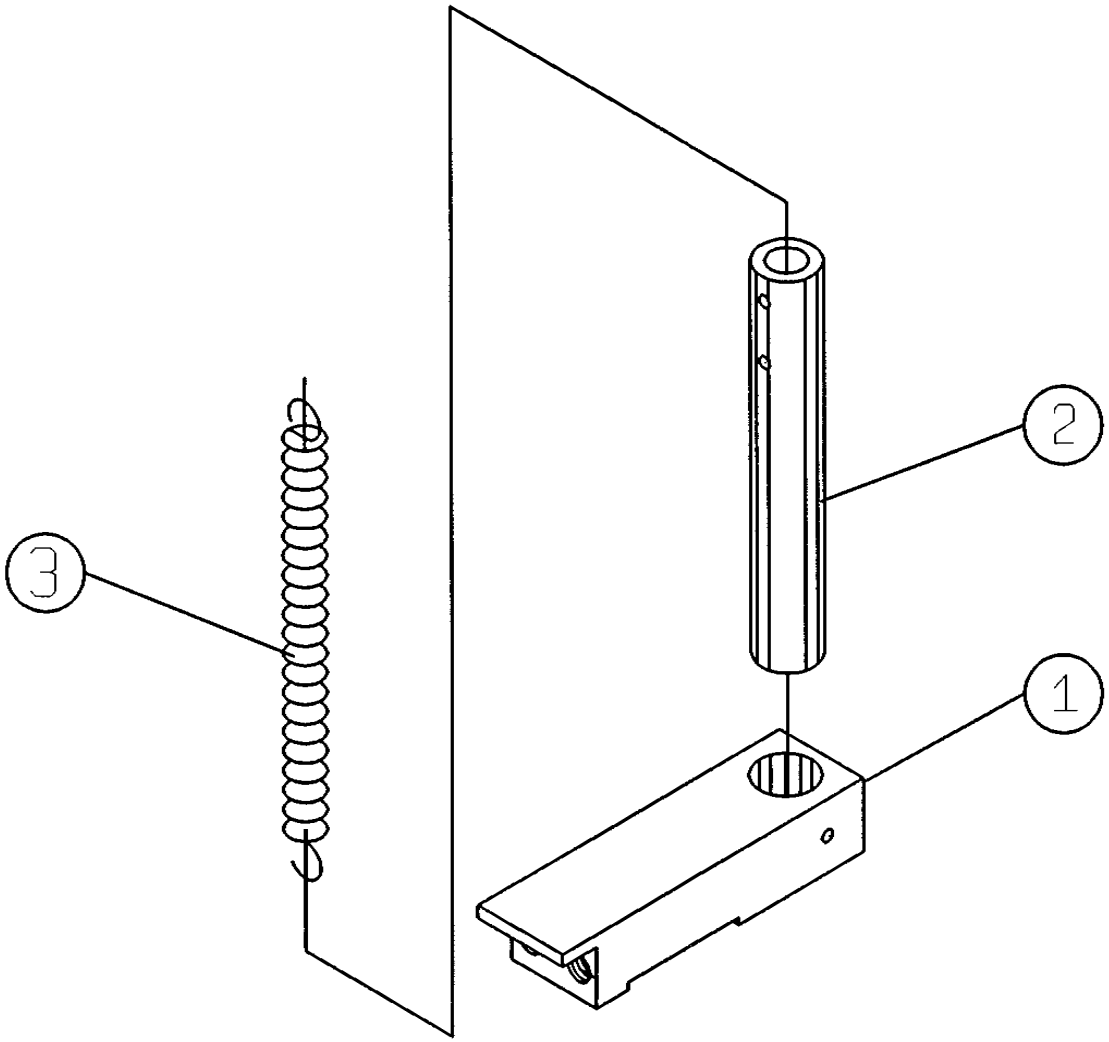
BOM15

Bill of Material for Assembly 801-1-201
Clamp Support Assembly

Revision :A Revision Date: 09-20-96 Effective As of: 09-20-96

ITEM	1...5...10	PART#.....	DESCRIPTION.....	QTY
1	1.....	**N.S.S.**	CLAMP SUPPORT	1 EA
2	1.....	**N.S.S.**	SPRING BUSHING	1 EA
3	1.....	S2002	SPRING	1 EA

N.S.S. = NOT SOLD SEPARATELY



GPD

Clamp Support Assembly No. 801-1-201

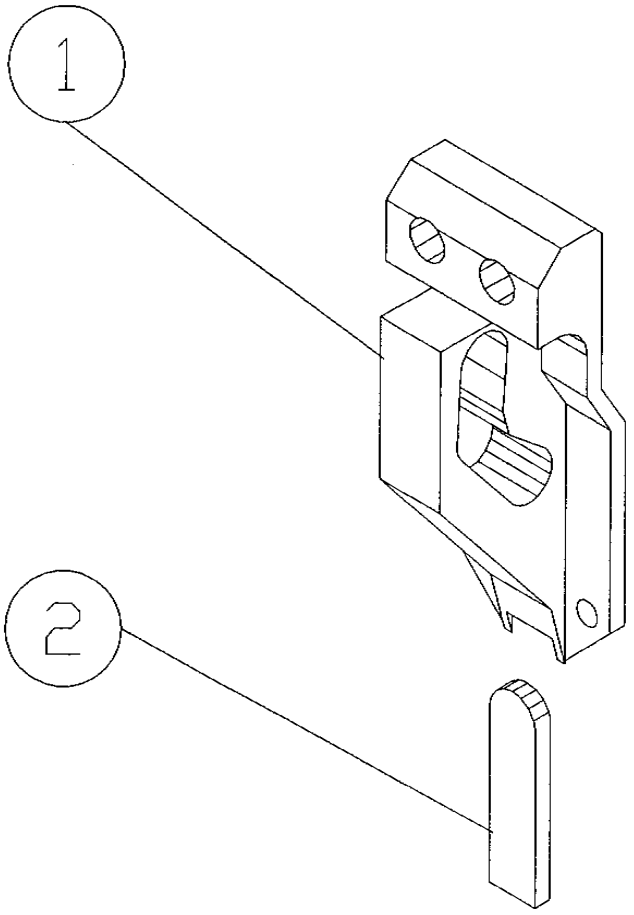
BOM15

Bill of Material for Assembly 801-1-9
Wire Clamp w/Red Insert

Revision :A Revision Date: 04-01-89 Effective As of: 08-10-91

ITEM	1...5...10	PART#.....	DESCRIPTION.....	QTY
1	1.....	N.S.S.	WIRE CLAMP HOUSING	1 EA
2	1.....	801-1-22	WIRECLAMP INSERT - RED	1 EA

N.S.S. = NOT SOLD SEPARATELY



GPD

Wire Clamp w/Red Insert No. 801-1-9

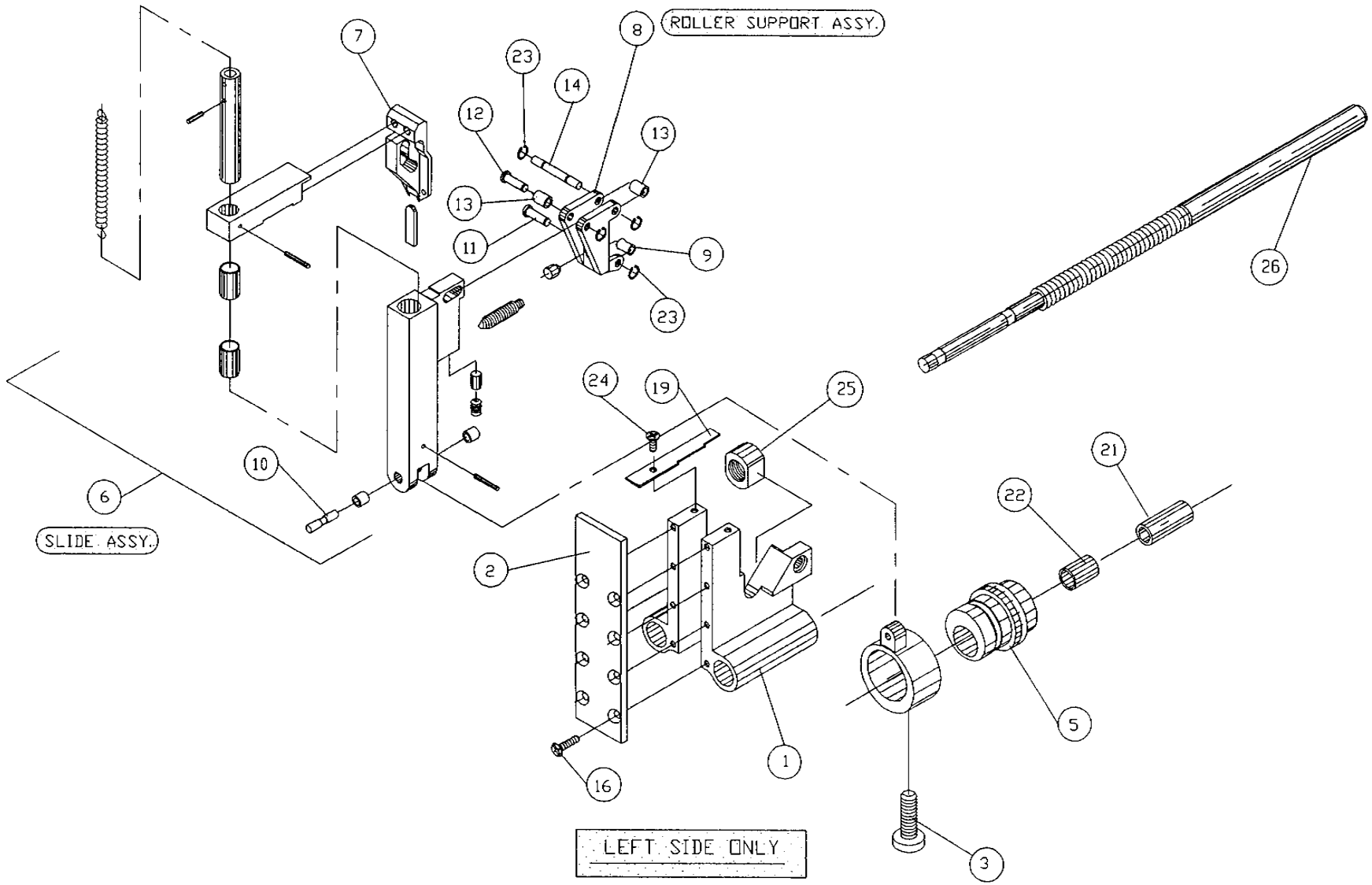
BOM15

Bill of Material for Assembly 801-3-100
Bending Die Block Assembly Station 7

Revision :A Revision Date: 04-01-89 Effective As of: 08-10-91

ITEM	1...5...10	PART#.....	DESCRIPTION.....	QTY
1	1.....	801-2-1L	BENDING DIE BLOCK STA.#7	1 EA
2	1.....	801-1-3	COVER PLATE	1 EA
3	1.....	801-1-20	SCREW,THUMB,WASHER FACE	1 EA
4	1.....	801-1-7#9	CRANK	1 EA
5	1.....	801-1-8L	COLLAR ADJ (L)	1 EA
6	1.....	801-1-200	SLIDE ASSEMBLY	1 EA
7	1.....	801-1-9	WIRE CLAMP W/RED INSERT	1 EA
8	1.....	801-1-100	ROLLER SUPPORT ASSM	1 EA
9	1.....	801-1-11	ROLLER	1 EA
10	1.....	801-1-12	CRANK PIN	1 EA
11	1.....	801-1-13	ROLLER PIN	1 EA
12	1.....	801-1-14	ROLLER SUPPORT PIN	1 EA
13	1.....	801-1-15	ROLLER	2 EA
14	1.....	801-1-17	WIRE CLAMP PIN	1 EA
15	NOT APPLICABLE			
16	1.....	SAFAN0440037	SCREW,ALLEN,FLATHEAD	AR EA
17	1.....	SACAN0632050	SCREW,ALLEN,CAP	AR EA
18	1.....	SACAN0440037	SCREW,ALLEN,CAP	AR EA
19	1.....	801-1-5	LEAF SPRING	8 EA
20	NOT APPLICABLE			
21	1.....	L0602	BUSHING	1 EA
22	1.....	L0601	BUSHING	1 EA
23	1.....	G1001	RETAINING RING	AR EA
24	1.....	TACAN0440012	SET.A.CU.STL.	AR EA
25	1.....	801-1-16R	NUT ADJUSTMENT (R)	1 EA
26	1.....	802-1-5	ROD ADJUSTMENT (R)	1 EA

N.S.S. = NOT SOLD SEPARATELY



Bending Die Block Assembly Station 7 No. 801-3-100

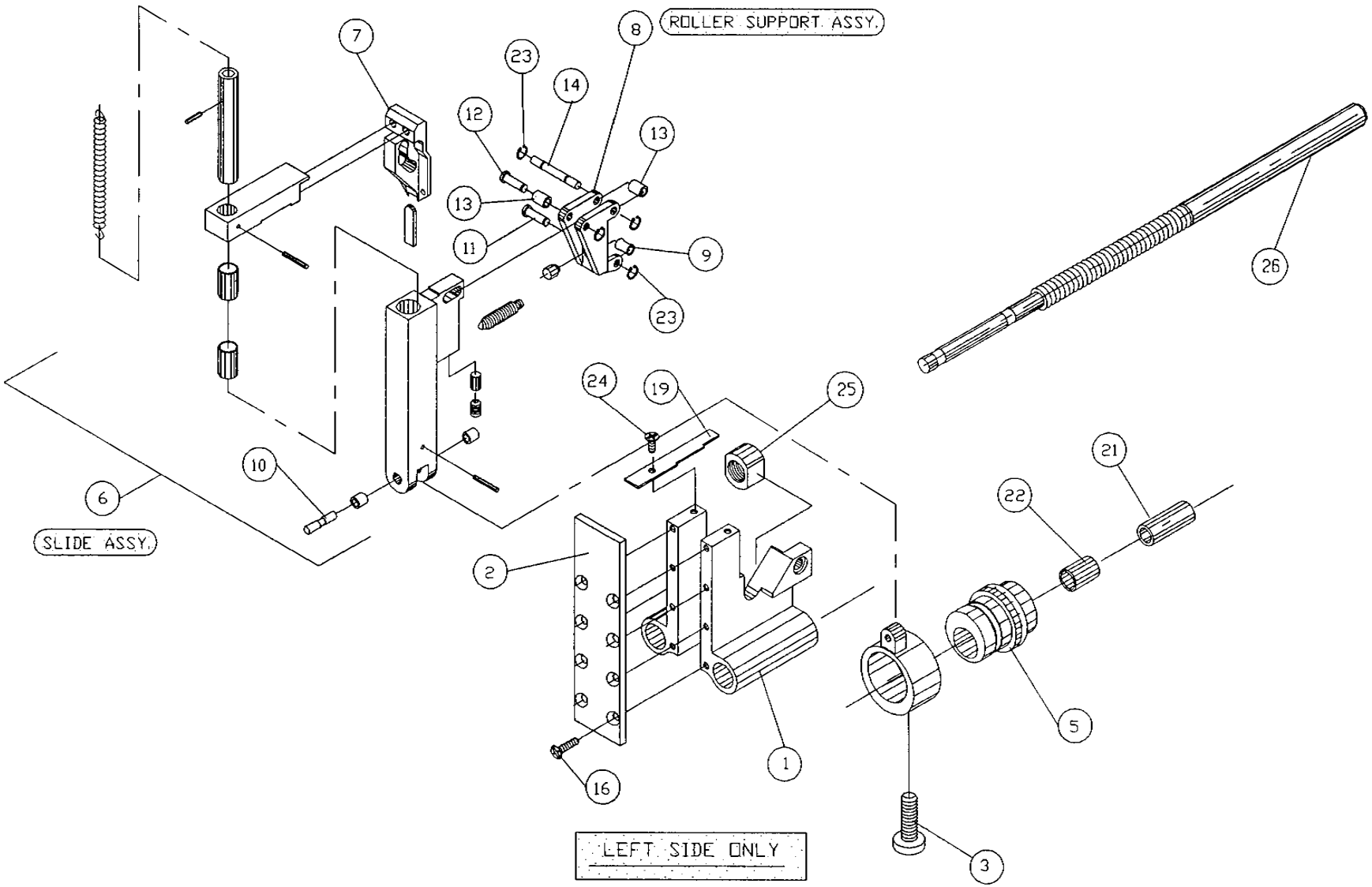
BOM15

Bill of Material for Assembly 801-3-100-MET
Bending Die Block Assembly Station 7 Metric

Revision :A Revision Date: 04-01-89 Effective As of: 08-10-91

ITEM	1...5...10	PART#.....	DESCRIPTION.....	QTY
1	1.....	801-2-1L	BENDING DIE BLOCK STA.#7	1 EA
2	1.....	801-1-3	COVER PLATE	1 EA
3	1.....	801-1-20	SCREW,THUMB,WASHER FACE	1 EA
4	1.....	801-1-7#9	CRANK	1 EA
5	1.....	801-1-8L	COLLAR ADJ (L)	1 EA
6	1.....	801-1-200	SLIDE ASSEMBLY	1 EA
7	1.....	801-1-9	WIRE CLAMP W/RED INSERT	1 EA
8	1.....	801-1-100	ROLLER SUPPORT ASSM	1 EA
9	1.....	801-1-11	ROLLER	1 EA
10	1.....	801-1-12	CRANK PIN	1 EA
11	1.....	801-1-13	ROLLER PIN	1 EA
12	1.....	801-1-14	ROLLER SUPPORT PIN	1 EA
13	1.....	801-1-15	ROLLER	2 EA
14	1.....	801-1-17	WIRE CLAMP PIN	1 EA
15	NOT APPLICABLE			
16	1.....	SAFAN0440037	SCREW,ALLEN,FLATHEAD	AR EA
17	1.....	SACAN0632050	SCREW,ALLEN,CAP	AR EA
18	1.....	SACAN0440037	SCREW,ALLEN,CAP	AR EA
19	1.....	801-1-5	LEAF SPRING	8 EA
20	NOT APPLICABLE			
21	1.....	L0602	BUSHING	1 EA
22	1.....	L0601	BUSHING	1 EA
23	1.....	G1001	RETAINING RING	AR EA
24	1.....	TACAN0440012	SET.A.CU.STL.	AR EA
25	1.....	801-1-16RM	NUT ADJUSTMENT (R) METRIC	1 EA
26	1.....	802-1-5M	ROD ADJUSTMENT (R) METRIC	1 EA

N.S.S. = NOT SOLD SEPARATELY



Bending Die Block Assembly Station 7 Metric No. 801-3-100M

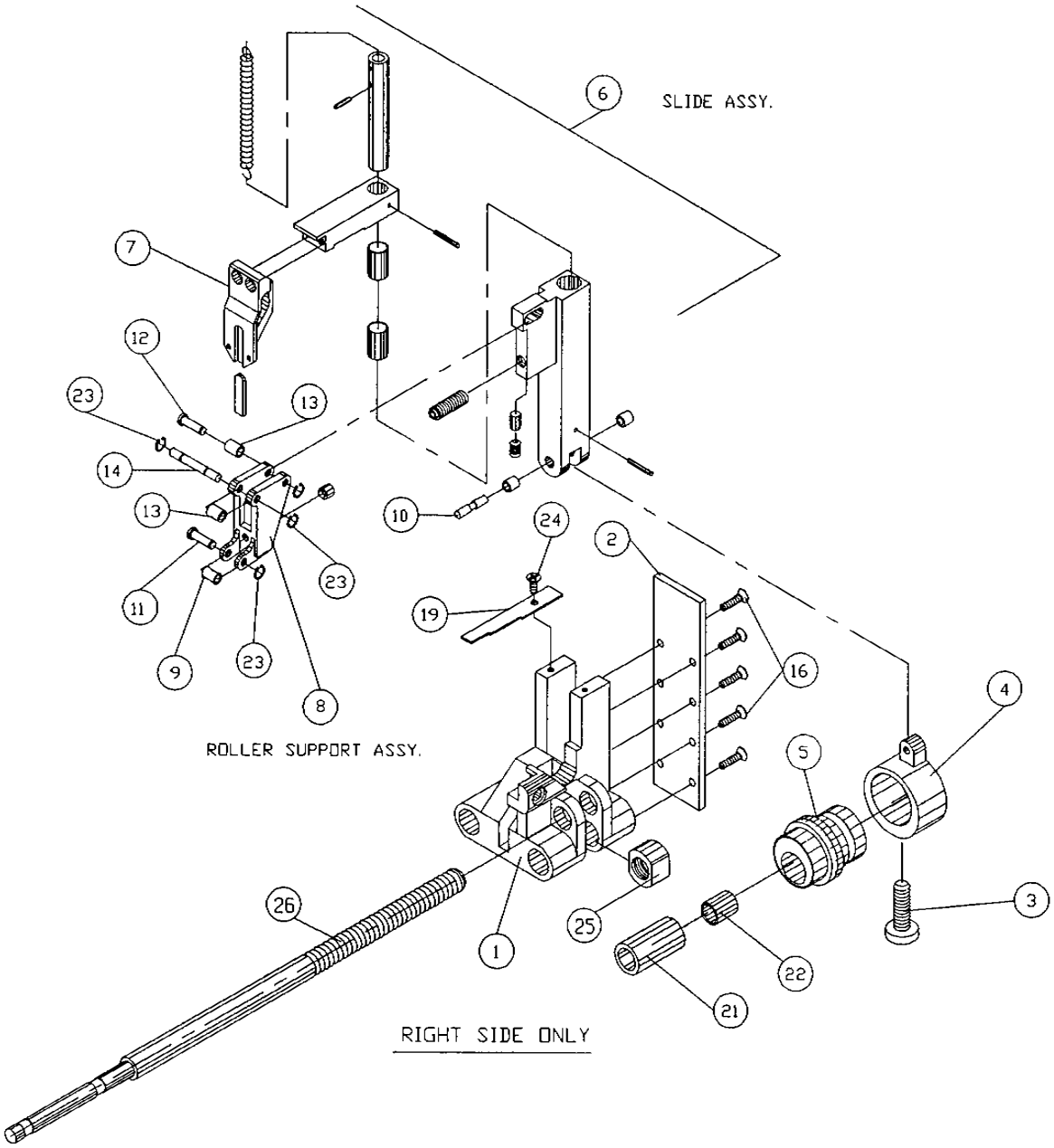
BOM15

Bill of Material for Assembly 801-3-101
Bending Die Block Assembly Station 6

Revision :A Revision Date: 01-01-89 Effective As of: 08-10-91

ITEM	1...5...10	PART#.....	DESCRIPTION.....	QTY
1	1.....	801-2-1R	BENDING DIE BLOCK STA.#6	1 EA
2	1.....	801-1-3	COVER PLATE	1 EA
3	1.....	801-1-20	SCREW,THUMB,WASHER FACE	1 EA
4	1.....	801-1-7#8	CRANK	1 EA
5	1.....	801-1-8R	COLLAR ADJ (R)	1 EA
6	1.....	801-1-200	SLIDE ASSEMBLY	1 EA
7	1.....	801-1-9	WIRE CLAMP W/RED INSERT	1 EA
8	1.....	801-1-100	ROLLER SUPPORT ASSM	1 EA
9	1.....	801-1-11	ROLLER	1 EA
10	1.....	801-1-12	CRANK PIN	1 EA
11	1.....	801-1-13	ROLLER PIN	1 EA
12	1.....	801-1-14	ROLLER SUPPORT PIN	1 EA
13	1.....	801-1-15	ROLLER	2 EA
14	1.....	801-1-17	WIRE CLAMP PIN	1 EA
15	NOT APPLICABLE			
16	1.....	SAFAN0440037	SCREW,ALLEN,FLATHEAD	AR EA
17	1.....	SACAN0632050	SCREW,ALLEN,CAP	AR EA
18	1.....	SACAN0440037	SCREW,ALLEN,CAP	AR EA
19	1.....	801-1-5	LEAF SPRING	8 EA
20	NOT APPLICABLE			
21	1.....	L0602	BUSHING	1 EA
22	1.....	L0601	BUSHING	1 EA
23	1.....	G1001	RETAINING RING	AR EA
24	1.....	TACAN0440012	SET.A.CU.STL.	AR EA
25	1.....	801-1-16L	NUT ADJUSTMENT (L)	1 EA
26	1.....	802-1-6	ROD ADJUSTMENT (R)	1 EA

N.S.S. = NOT SOLD SEPARATELY



Bending Die Block Assembly Station 6 No. 801-3-101

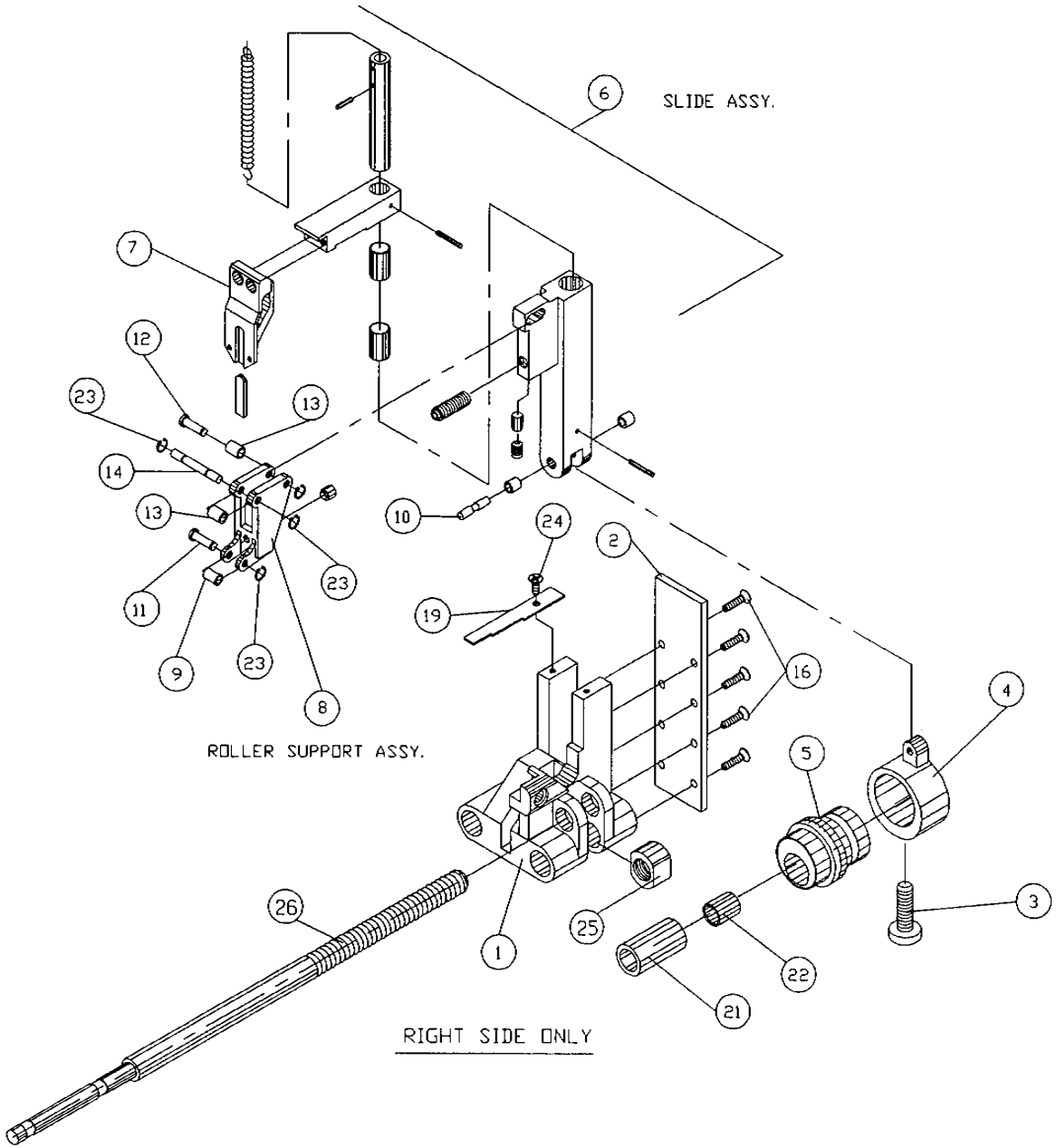
BOM15

Bill of Material for Assembly 801-3-101-MET
Bending Die Block Assembly Station 6 Metric

Revision :A Revision Date: 06-01-96 Effective As of: 06-01-96

ITEM	1...5...10	PART#.....	DESCRIPTION.....	QTY
1	1.....	801-2-1R	BENDING DIE BLOCK STA.#6	1 EA
2	1.....	801-1-3	COVER PLATE	1 EA
3	1.....	801-1-20	SCREW,THUMB,WASHER FACE	1 EA
4	1.....	801-1-7#8	CRANK	1 EA
5	1.....	801-1-8R	COLLAR ADJ (R)	1 EA
6	1.....	801-1-200	SLIDE ASSEMBLY	1 EA
7	1.....	801-1-9	WIRE CLAMP W/RED INSERT	1 EA
8	1.....	801-1-100	ROLLER SUPPORT ASSM	1 EA
9	1.....	801-1-11	ROLLER	1 EA
10	1.....	801-1-12	CRANK PIN	1 EA
11	1.....	801-1-13	ROLLER PIN	1 EA
12	1.....	801-1-14	ROLLER SUPPORT PIN	1 EA
13	1.....	801-1-15	ROLLER	2 EA
14	1.....	801-1-17	WIRE CLAMP PIN	1 EA
15	NOT APPLICABLE			
16	1.....	SAFAN0440037	SCREW,ALLEN,FLATHEAD	AR EA
17	1.....	SACAN0632050	SCREW,ALLEN,CAP	AR EA
18	1.....	SACAN0440037	SCREW,ALLEN,CAP	AR EA
19	1.....	801-1-5	LEAF SPRING	8 EA
20	NOT APPLICABLE			
21	1.....	L0602	BUSHING 07DU12	1 EA
22	1.....	L0601	BUSHING 07DU08	1 EA
23	1.....	G1001	RETAINING RING 5100-12	AR EA
24	1.....	TACAN0440012	SET.A.CU.STL.	AR EA
25	1.....	801-1-16LM	NUT ADJUSTMENT (L) METRIC	1 EA
26	1.....	802-1-6M	ROD ADJUSTMENT (L) METRIC	1 EA

N.S.S. = NOT SOLD SEPARATELY


6
SLIDE ASSY.
7
12
23
13
14
13
23
11
9
23
8
ROLLER SUPPORT ASSY.
10
24
2
19
16
4
5
3
26
1
25
22
21
RIGHT SIDE ONLY

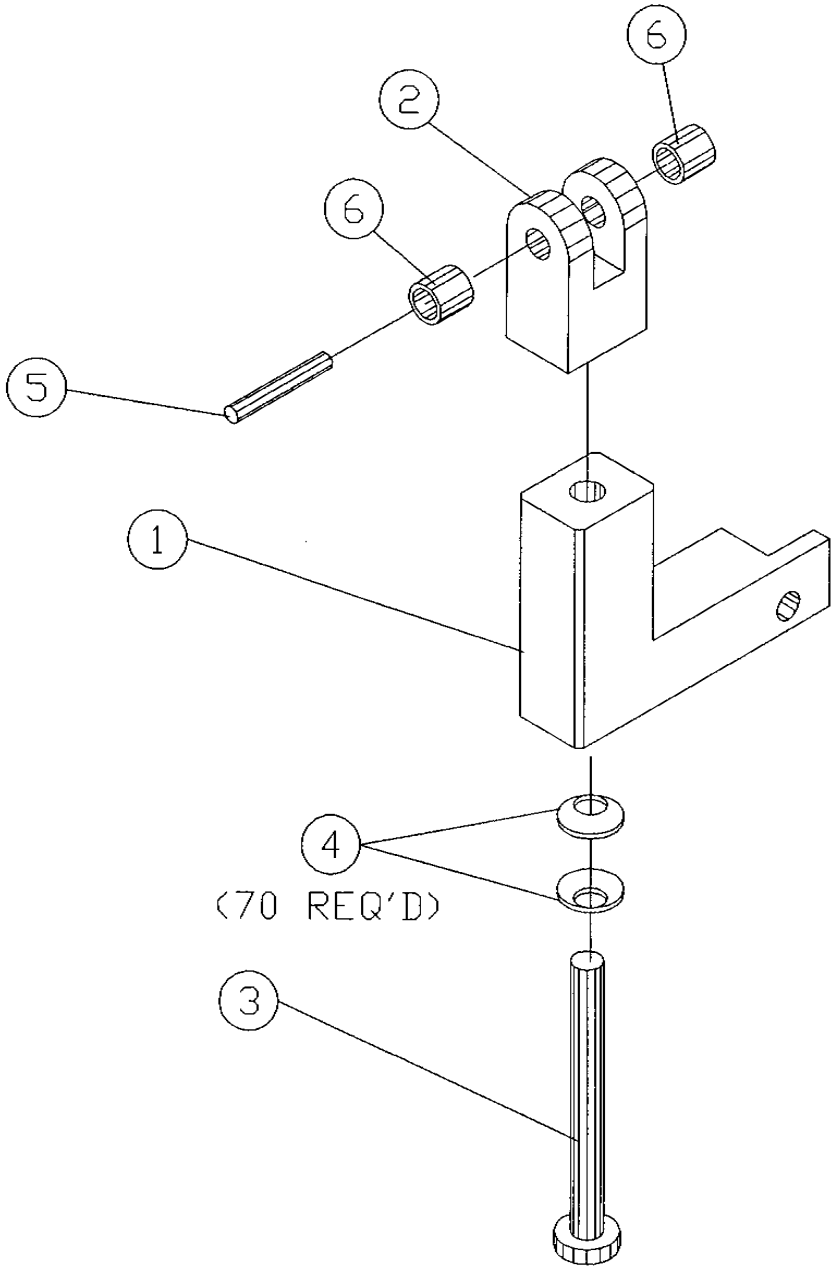
BOM15

Bill of Material for Assembly 802-1-100
Die Holder Assembly Station 5

Revision :A Revision Date: 06-01-96 Effective As of: 06-01-96

ITEM	1...5...10	PART#.....	DESCRIPTION.....	QTY
1	1.....	N.S.S.	DIE HOLDER (L)	1 EA
2	1.....	N.S.S.	CLEVIS	1 EA
3	1.....	N.S.S.	PULL ROD	1 EA
4	1.....	S4003	WASHER BO375-015	AR EA
5	1.....	RPAS06050	PIN,ROLL	AR EA
6	1.....	L0001	BUSHING	2 EA

N.S.S. = NOT SOLD SEPARATELY



GPD

Die Holder Assembly Station 5 No. 802-1-100

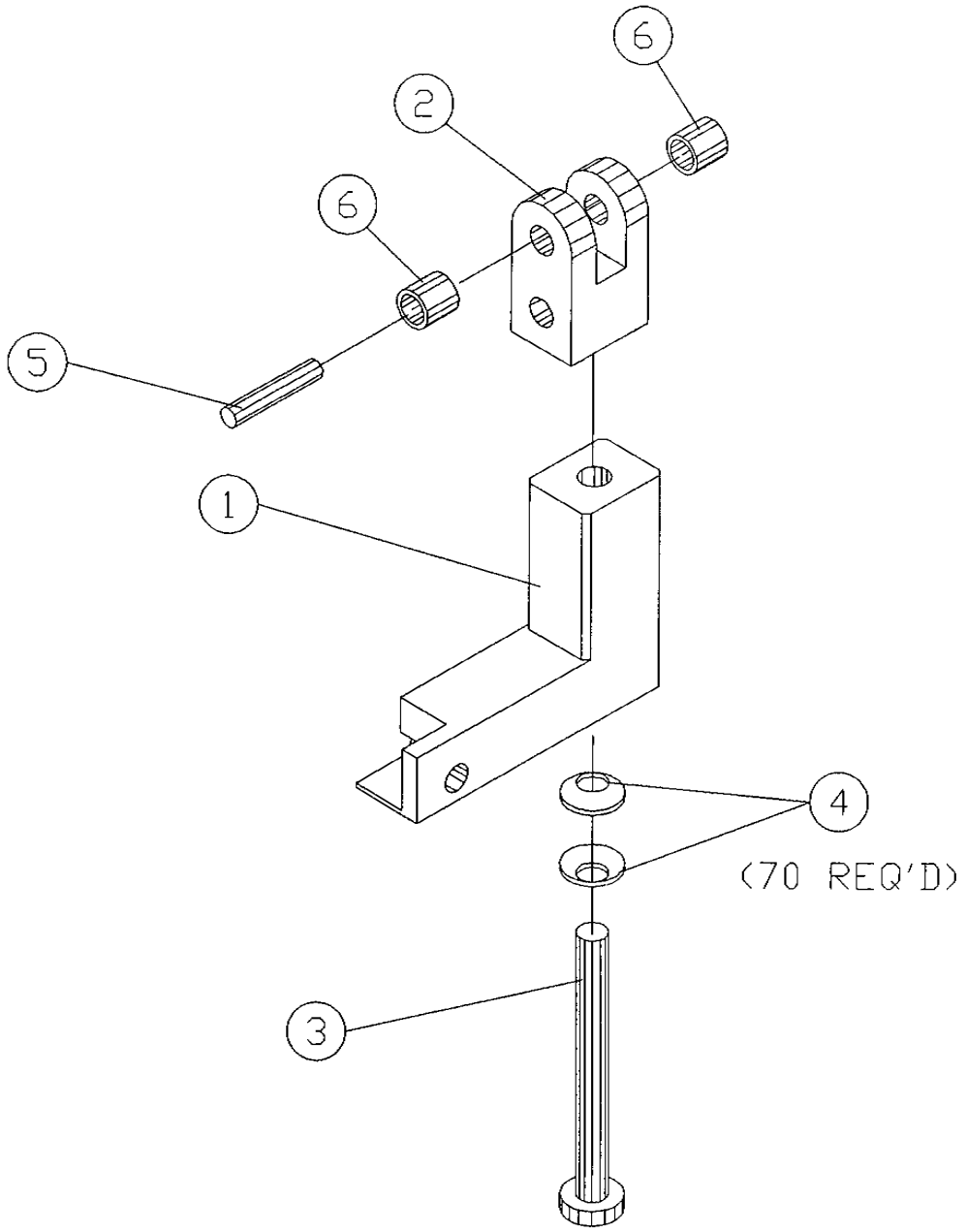
BOM15

Bill of Material for Assembly 802-1-101
Die Holder Assembly Station 4

Revision :A Revision Date: 04-01-89 Effective As of: 08-10-91

ITEM	1...5...10	PART#.....	DESCRIPTION.....	QTY
1	1.....	N.S.S.	DIE HOLDER (R)	1 EA
2	1.....	N.S.S.	CLEVIS	1 EA
3	1.....	N.S.S.	PULL ROD	1 EA
4	1.....	S4003	WASHER BO375-015	70 EA
5	1.....	RPAS06050	PIN,ROLL	AR EA
6	1.....	L0001	BUSHING	2 EA

N.S.S. = NOT SOLD SEPARATELY



GPD

Die Holder Assembly Station 4 No. 802-1-101

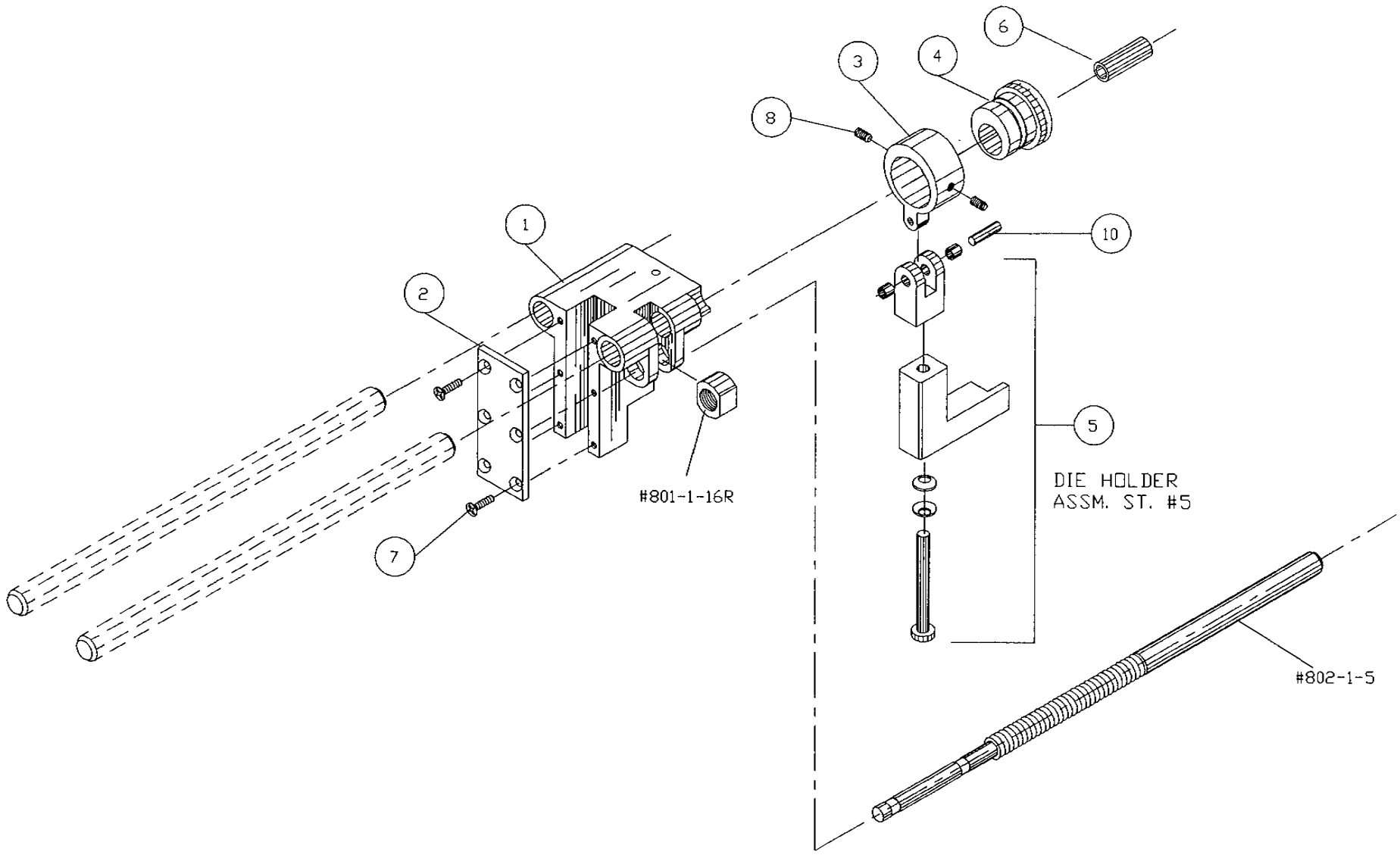
BOM15

Bill of Material for Assembly 802-3-102
Die Block Assembly Station 5

Revision :A Revision Date: 06-01-96 Effective As of: 06-01-96

ITEM	1...5...10	PART#.....	DESCRIPTION.....	QTY
1	1.....	802-2-4L	CRIMPING DIE BLOCK STA.#5	1 EA
2	1.....	802-1-8	COVER PLATE	1 EA
3	1.....	802-1-1E	CRANK EXTENDED STROKE	1 EA
4	1.....	802-1-13	BUSHING ECCENTRIC .015	1 EA
5	1.....	802-1-100	DIE HOLDER ASSM STA.#5	1 EA
6	1.....	L0602	BUSHING	1 EA
7	1.....	SAFAN0440037	SCREW,ALLEN,FLATHEAD	AR EA
8	1.....	TACAN0632018	SET.A.CU.STL.	AR EA
9	1.....	TACAN0440012	SET.A.CU.STL.	AR EA
10	1.....	801-1-12	CRANK PIN	1 EA
11	1.....	802-1-5	ROD ADJ (R)	1 EA
12	1.....	801-1-16R	NUT ADJ (R)	1 EA

N.S.S. = NOT SOLD SEPARATELY



GPD

Die Block Assembly Station 5 No. 802-3-102

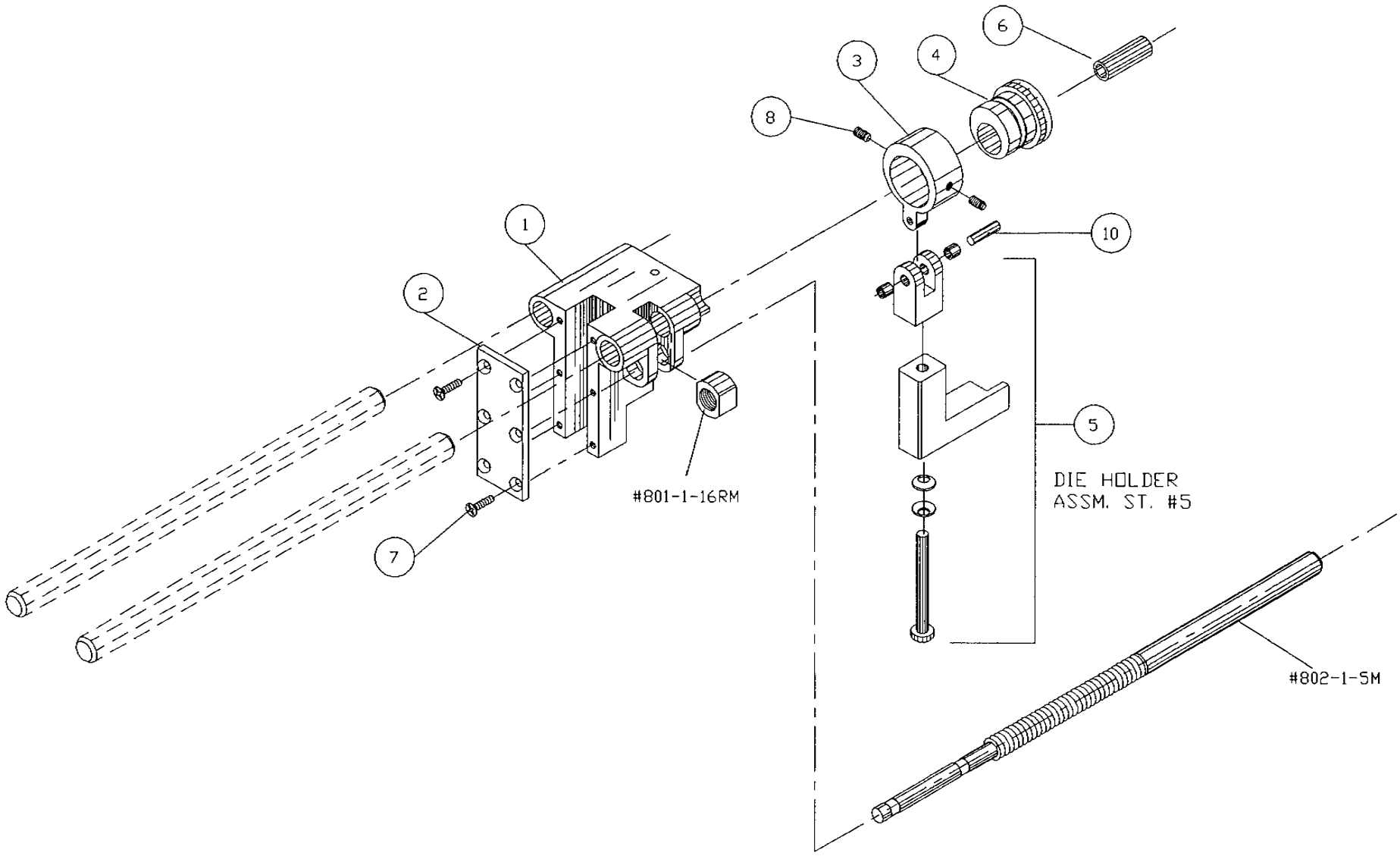
BOM15

Bill of Material for Assembly 802-3-102-MET
Die Block Assembly Station 5 Metric

Revision :A Revision Date: 06-01-96 Effective As of: 06-01-96

ITEM	1...5...10	PART#.....	DESCRIPTION.....	QTY
1	1.....	802-2-4L	CRIMPING DIE BLOCK STA.#5	1 EA
2	1.....	802-1-8	COVER PLATE	1 EA
3	1.....	802-1-1E	CRANK EXTENDED STROKE	1 EA
4	1.....	802-1-13	BUSHING ECCENTRIC .015	1 EA
5	1.....	802-1-100	DIE HOLDER ASSM STA.#5	1 EA
6	1.....	L0602	BUSHING	1 EA
7	1.....	SAFAN0440037	SCREW,ALLEN,FLATHEAD	AR EA
8	1.....	TACAN0632018	SET.A.CU.STL.	AR EA
9	1.....	TACAN0440012	SET.A.CU.STL.	AR EA
10	1.....	801-1-12	CRANK PIN	1 EA
11	1.....	802-1-5M	ROD ADJ (R) METRIC	1 EA
12	1.....	801-1-16RM	NUT ADJ (R) METRIC	1 EA

N.S.S. = NOT SOLD SEPARATELY



Die Block Assembly Station 5 Metric No. 802-3-102-MET

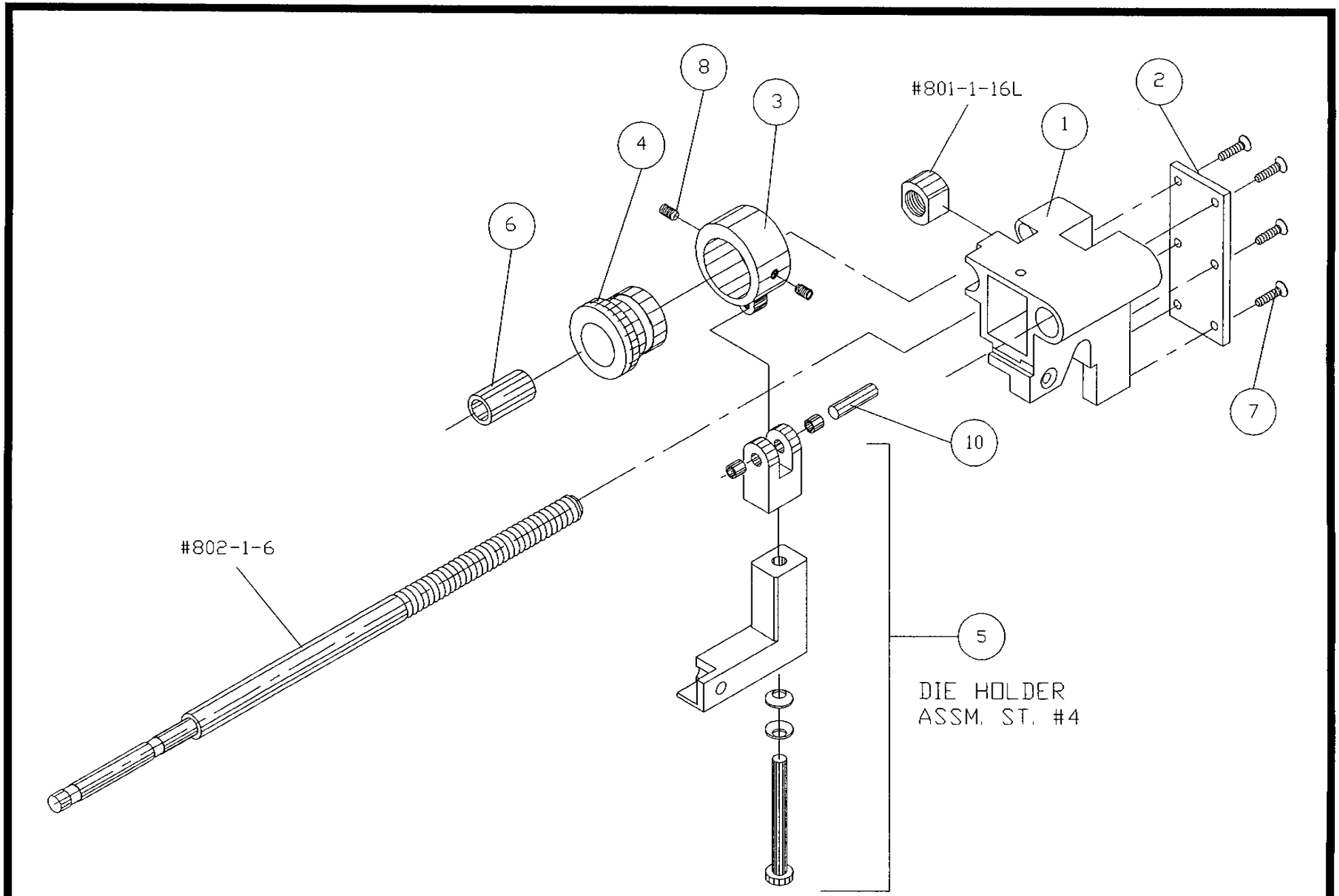
BOM15

Bill of Material for Assembly 802-3-103
Die Block Assembly Station 4

Revision :A Revision Date: 06-01-96 Effective As of: 06-01-96

ITEM	1...5...10	PART#.....	DESCRIPTION.....	QTY
1	1.....	802-2-4R	CRIMPING DIE BLOCK STA.#4	1 EA
2	1.....	802-1-8	COVER PLATE	1 EA
3	1.....	802-1-1E	CRANK EXTENDED STROKE	1 EA
4	1.....	802-1-13	BUSHING ECCENTRIC .015	1 EA
5	1.....	802-1-101	DIE HOLDER ASSM STA.4	1 EA
6	1.....	L0602	BUSHING	1 EA
7	1.....	SAFAN0440037	SCREW,ALLEN,FLATHEAD	AR EA
8	1.....	TACAN0632018	SET.A.CU.STL.	AR EA
9	1.....	TACAN0440012	SET.A.CU.STL.	AR EA
10	1.....	801-1-12	CRANK PIN	1 EA
11	1.....	802-1-6	ROD ADJ (L)	1 EA
12	1.....	801-1-16L	NUT ADJ (L)	1 EA

N.S.S. = NOT SOLD SEPARATELY



GPD

Die Block Assembly Station 4 No. 802-3-103

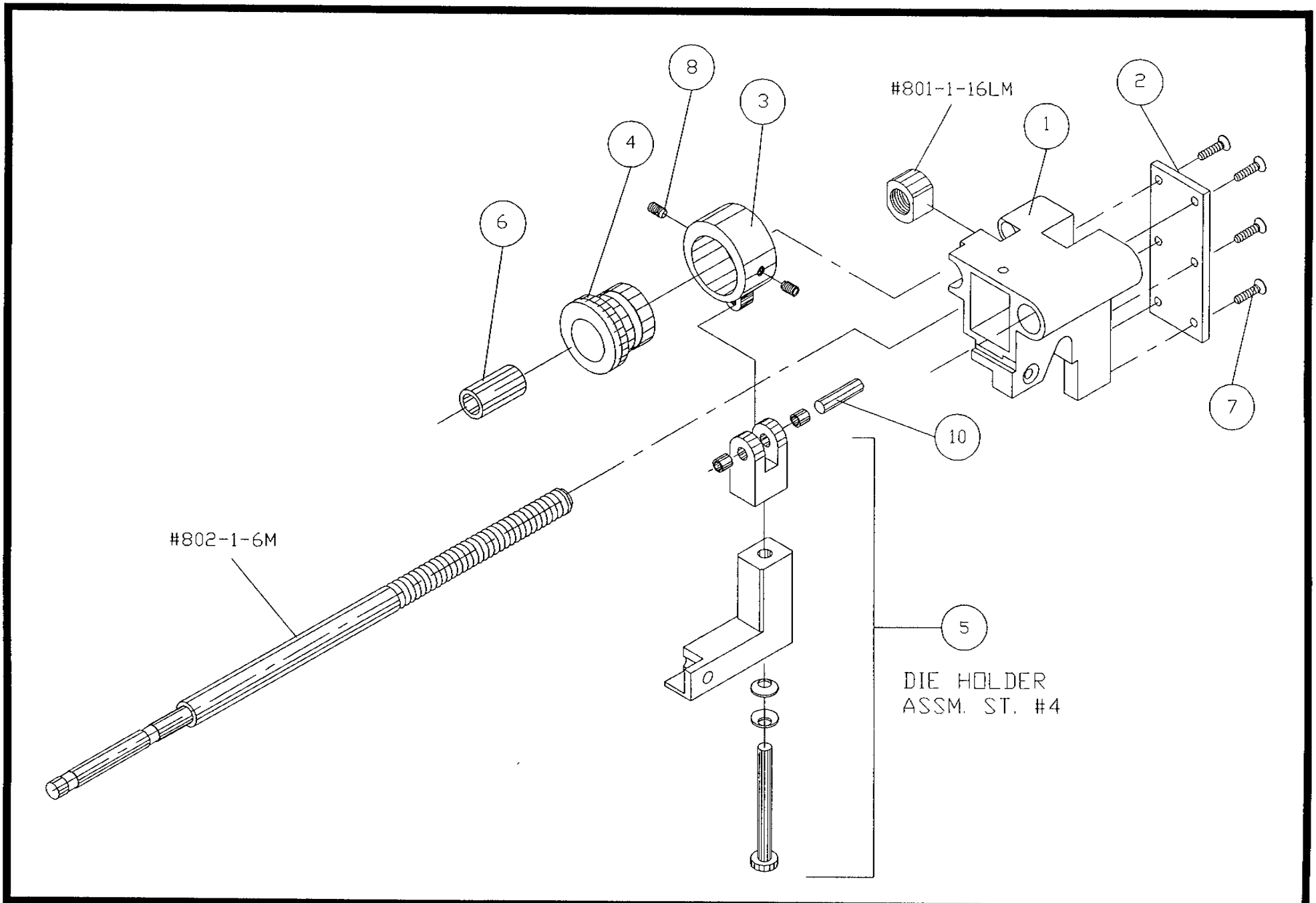
BOM15

Bill of Material for Assembly 802-3-103-MET
Die Block Assembly Station 4 Metric

Revision :A Revision Date: 06-01-96 Effective As of: 06-01-96

ITEM	1...5...10	PART#.....	DESCRIPTION.....	QTY
1	1.....	802-2-4R	CRIMPING DIE BLOCK STA.#4	1 EA
2	1.....	802-1-8	COVER PLATE	1 EA
3	1.....	802-1-1E	CRANK EXTENDED STROKE	1 EA
4	1.....	802-1-13	BUSHING ECCENTRIC .015	1 EA
5	1.....	802-1-101	DIE HOLDER ASSM STA.4	1 EA
6	1.....	L0602	BUSHING	1 EA
7	1.....	SAFAN0440037	SCREW,ALLEN,FLATHEAD	AR EA
8	1.....	TACAN0632018	SET.A.CU.STL.	AR EA
9	1.....	TACAN0440012	SET.A.CU.STL.	AR EA
10	1.....	801-1-12	CRANK PIN	1 EA
11	1.....	802-1-6M	ROD ADJ (L) METRIC	1 EA
12	1.....	801-1-16LM	NUT ADJ (L) METRIC	1 EA

N.S.S. = NOT SOLD SEPARATELY



Die Block Assembly Station 4 Metric No. 802-3-103-MET

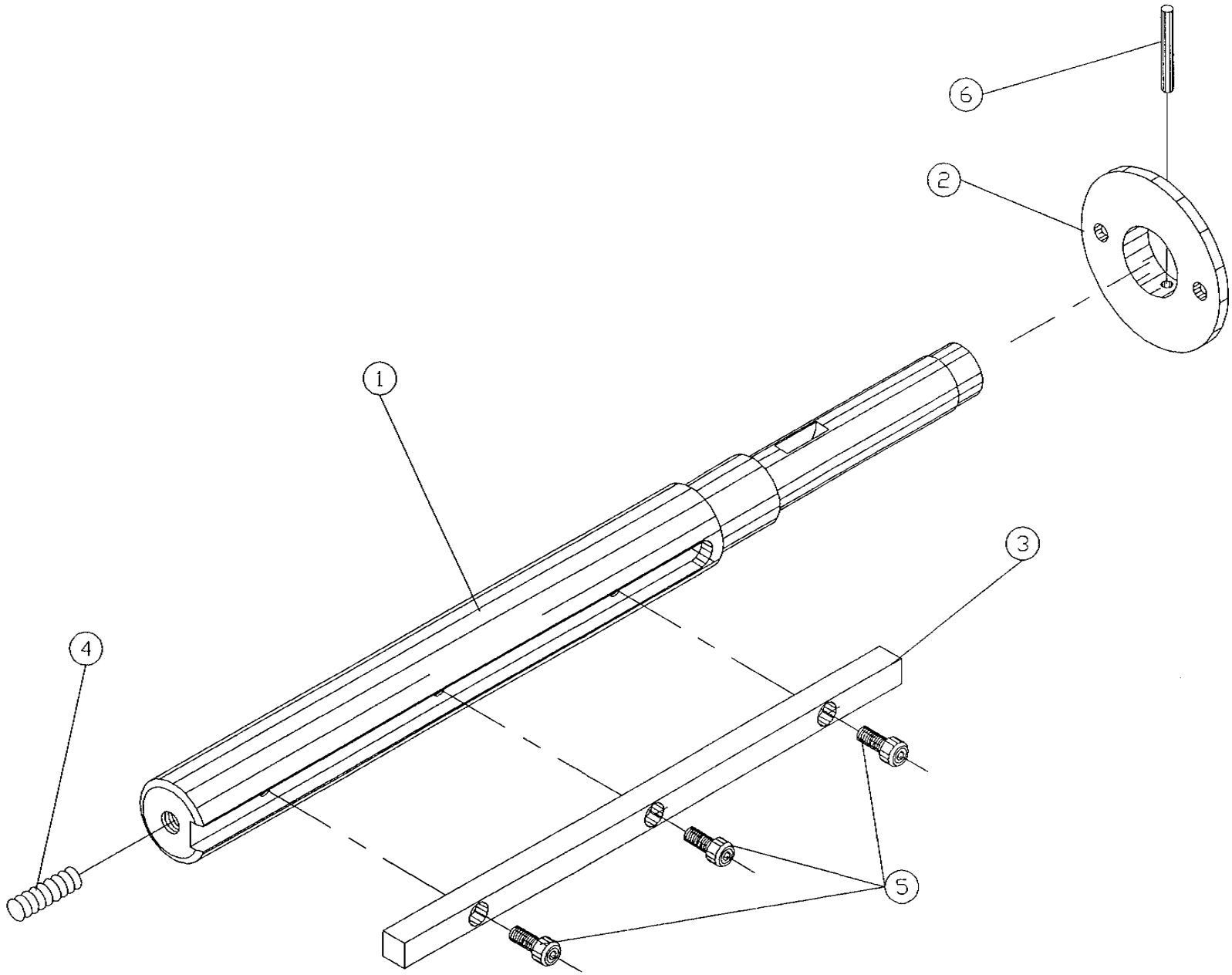
BOM15

Bill of Material for Assembly 803-1-100
Shaft - Main Shaft Assembly

Revision :A Revision Date: 06-01-96 Effective As of: 06-01-96

ITEM	1...5...10	PART#.....	DESCRIPTION.....	QTY
1	1.....	**N.S.S.**	SHAFT (CUTTING WHEELS)	1 EA
2	1.....	**N.S.S.**	WASHER (CUTTING WHEELS)	1 EA
3	1.....	803-1-6	KEY	1 EA
4	1.....	TACAN2520125	SET.A.CU.STL.	1 EA
5	1.....	SACAN0832037	SCREW,ALLEN,CAP	AR EA
6	1.....	RPAS12100	PIN,ROLL	AR EA

N.S.S. = NOT SOLD SEPARATELY



GPD

Shaft - Main Shaft Assembly No. 803-1-100

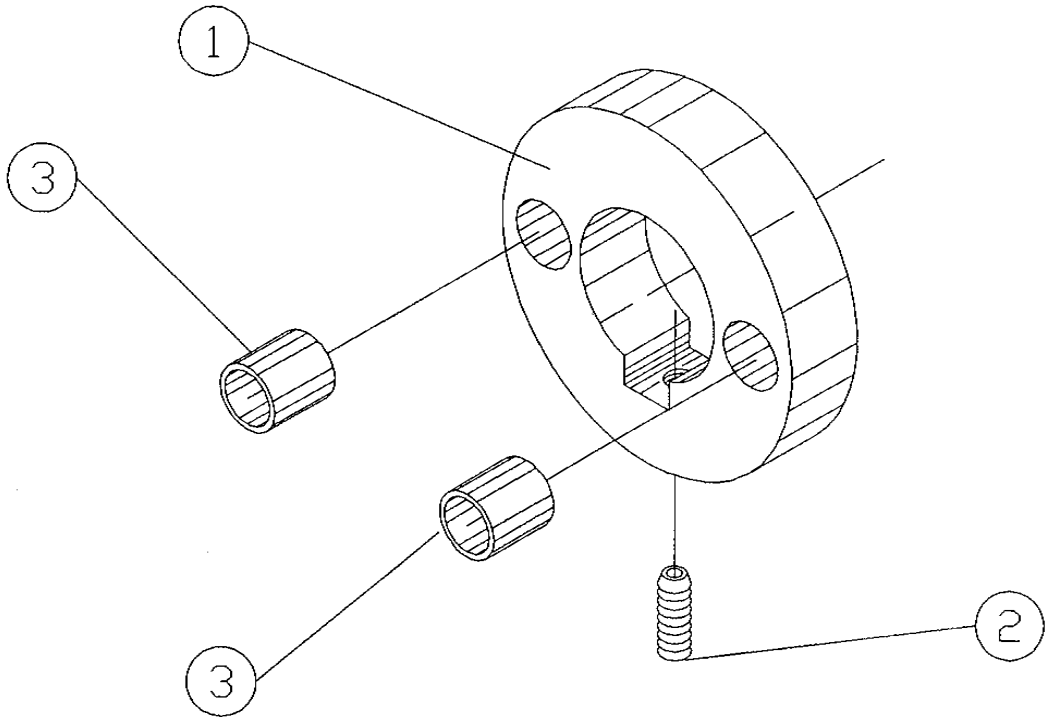
BOM15

Bill of Material for Assembly 803-1-110
Collar Assembly -- Cutting Wheels

Revision :A Revision Date: 04-01-89 Effective As of: 08-10-91

ITEM	1...5...10	PART#.....	DESCRIPTION.....	QTY
1	1.....	803-1-11	COLLAR (CUTTING WHEELS)	1 EA
2	1.....	TACAN0832025	SET.A.CU.STL.	AR EA
3	1.....	L0402	BUSHING	2 EA

N.S.S. = NOT SOLD SEPARATELY



GPD

Collar Assembly -- Cutting Wheels No. 803-1-110

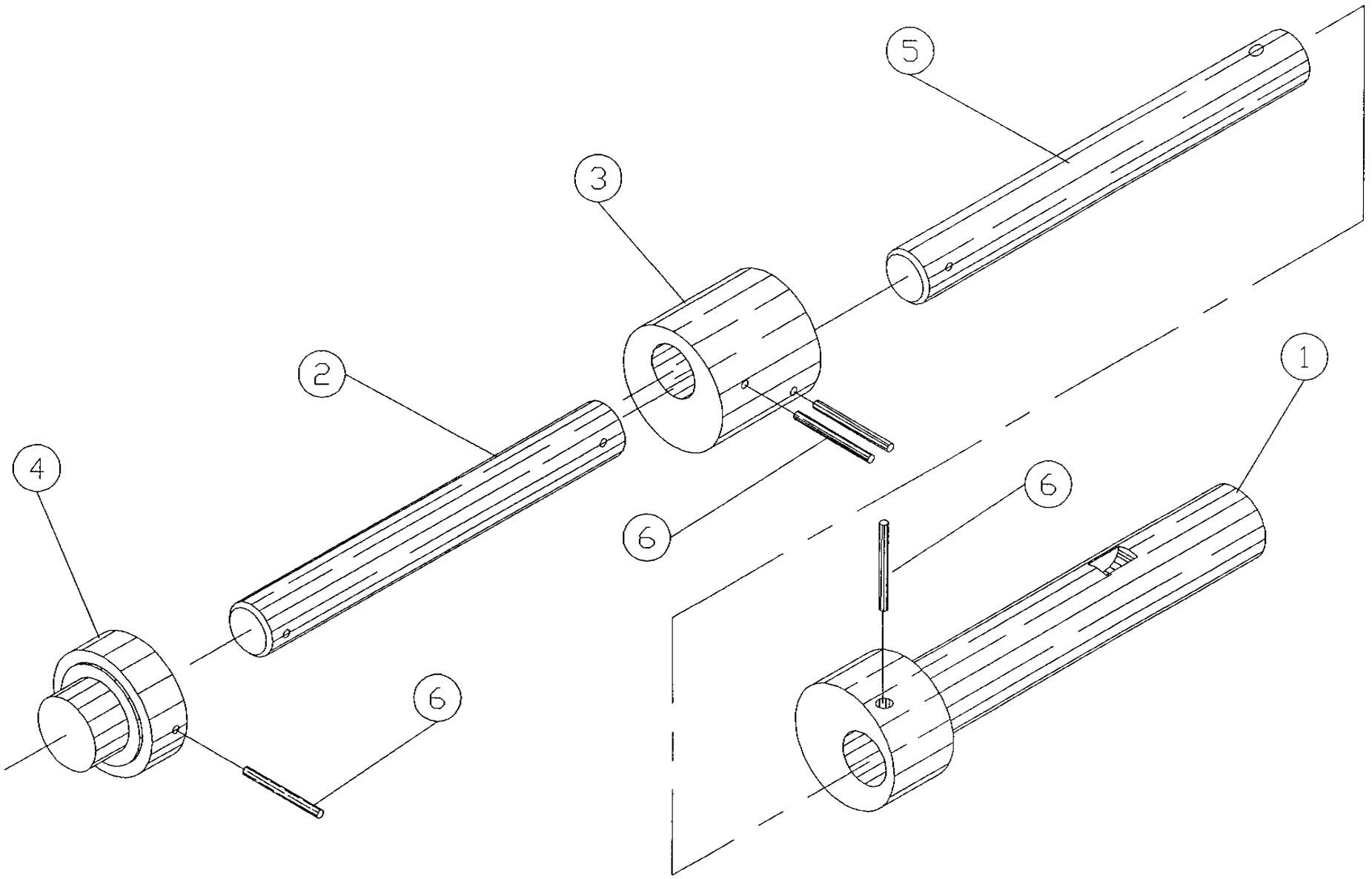
BOM15

Bill of Material for Assembly 804-1-104
Eccentric Shaft Assembly

Revision :A Revision Date: 01-01-89 Effective As of: 08-10-91

ITEM	1...5...10	PART#.....	DESCRIPTION.....	QTY
1	1.....	N.S.S.	ECCENTRIC SHAFT	1 EA
2	1.....	N.S.S.	CRANK SHAFT	1 EA
3	1.....	N.S.S.	ECCENTRIC CONNECTOR	1 EA
4	1.....	N.S.S.	ECCENTRIC HUB	1 EA
5	1.....	N.S.S.	CRANK SHAFT	1 EA
6	1.....	RPAS09075	PIN,ROLL	AR EA

N.S.S. = NOT SOLD SEPARATELY



GPD

Eccentric Shaft Assembly No. 804-1-104

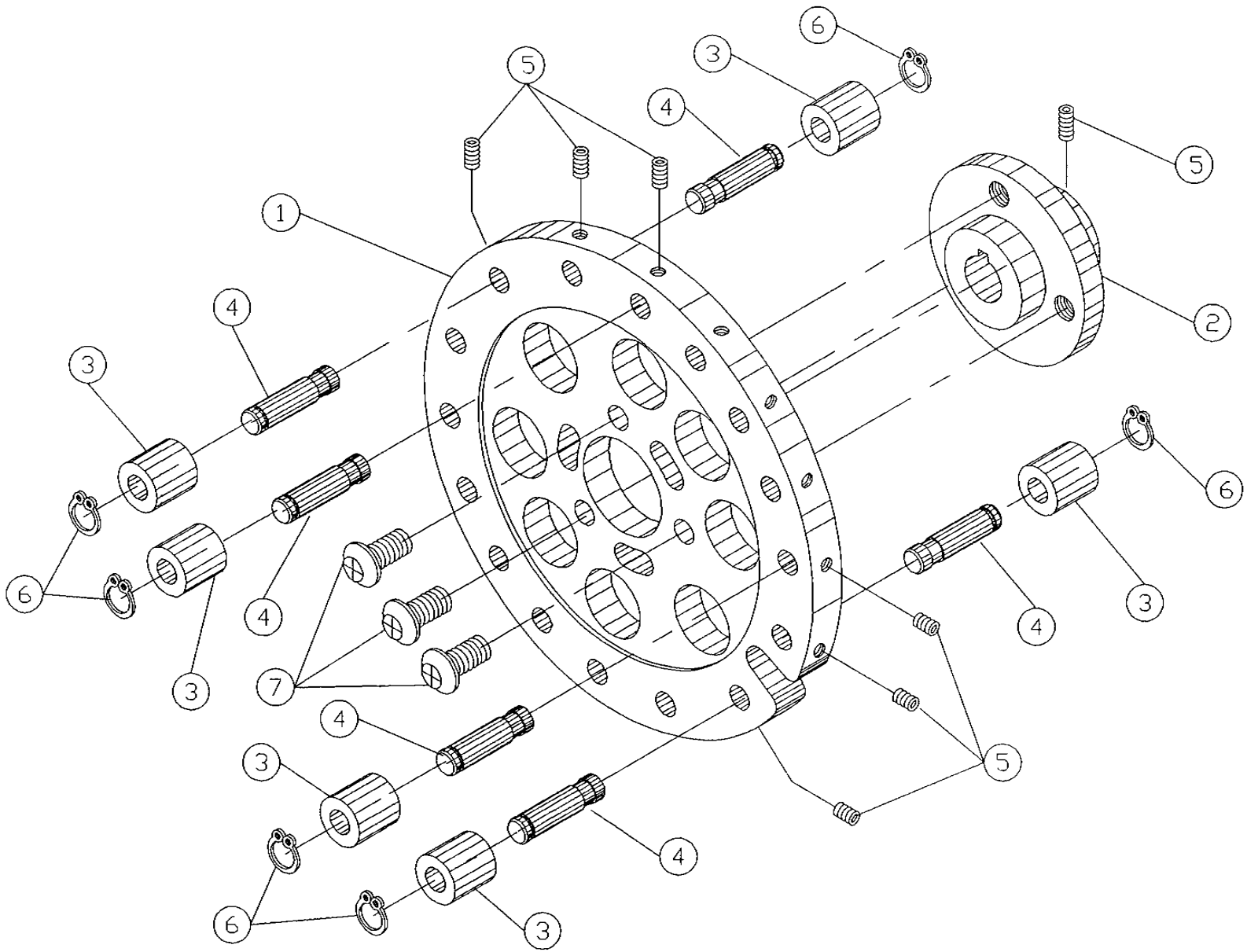
BOM15

Bill of Material for Assembly 807-1-105
Cam Follower Assembly

Revision :A Revision Date: 01-01-89 Effective As of: 08-10-91

ITEM	1...5...10	PART#.....	DESCRIPTION.....	QTY
1	1.....	**N.S.S.**	CAM FOLLOWER	1 EA
2	1.....	806-1-11	HUB (FOR CAM FOLLOWER)	1 EA
3	1.....	806-1-3	ROLLER (CAM FOLLOWER)	16 EA
4	1.....	**N.S.S.**	SPIGOT (CAM FOLLOWER)	16 EA
5	1.....	TACAN0632018	SET.A.CU.STL.	AR EA
6	1.....	G1007	RETAINING RING	AR EA
7	1.....	SABAN2520050	SCREW,ALLEN,BUTTON	AR EA

N.S.S. = NOT SOLD SEPARATELY



GPD

Cam Follower Assembly No. 807-1-105

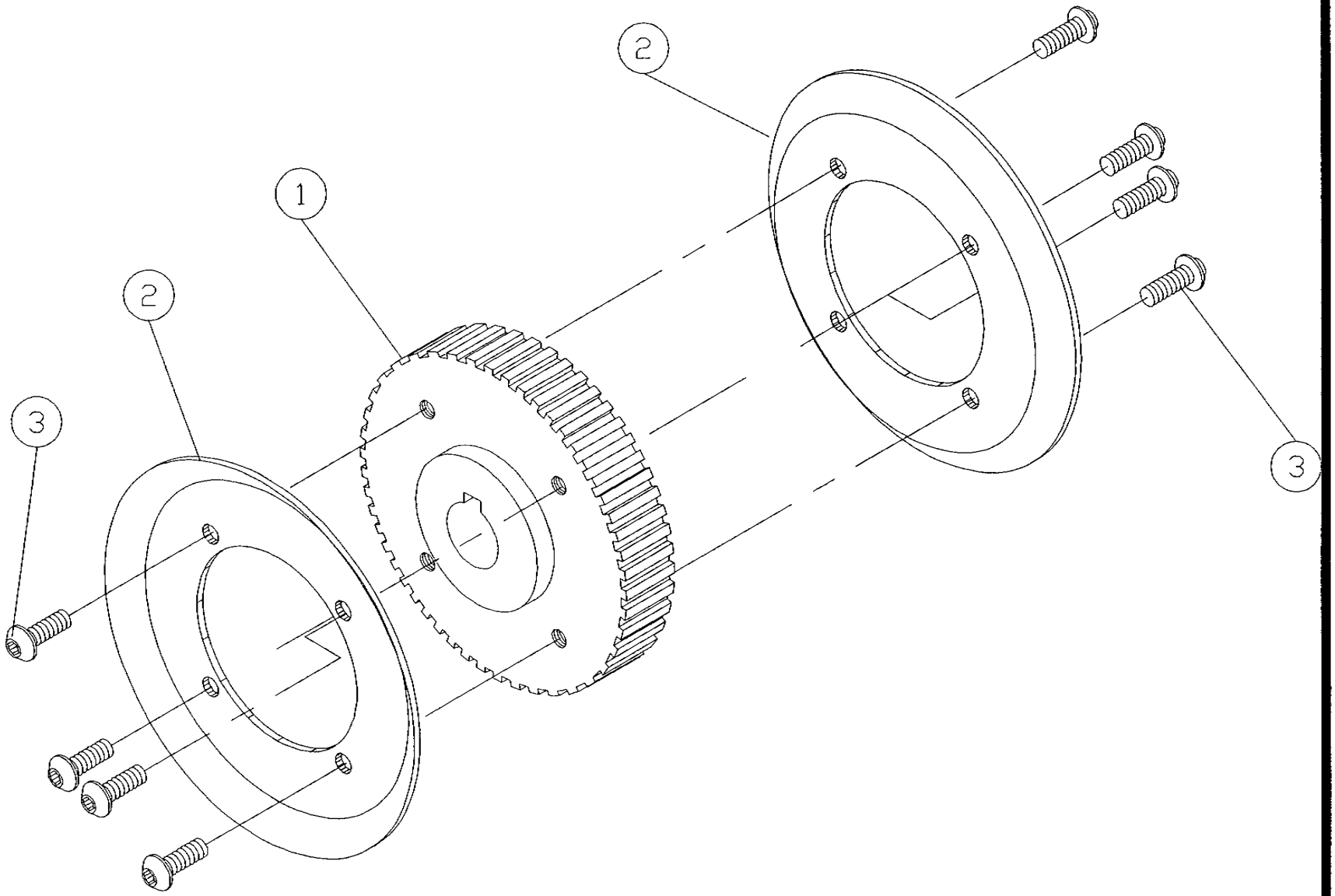
BOM15

Bill of Material for Assembly 807-3-106
Keyed Pulley Assembly

Revision :A Revision Date: 09-20-96 Effective As of: 09-20-96

ITEM	1...5...10	PART#.....	DESCRIPTION.....	QTY
1	1.....	807-1-3	PULLEY CLUTCH	1 EA
2	1.....	807-1-6	PULLEY FLANGE	2 EA
3	1.....	SABAN0832025	SCREW,ALLEN,BUTTON	AR EA

N.S.S. = NOT SOLD SEPARATELY



GPD

Keyed Pulley Assembly No. 807-3-106

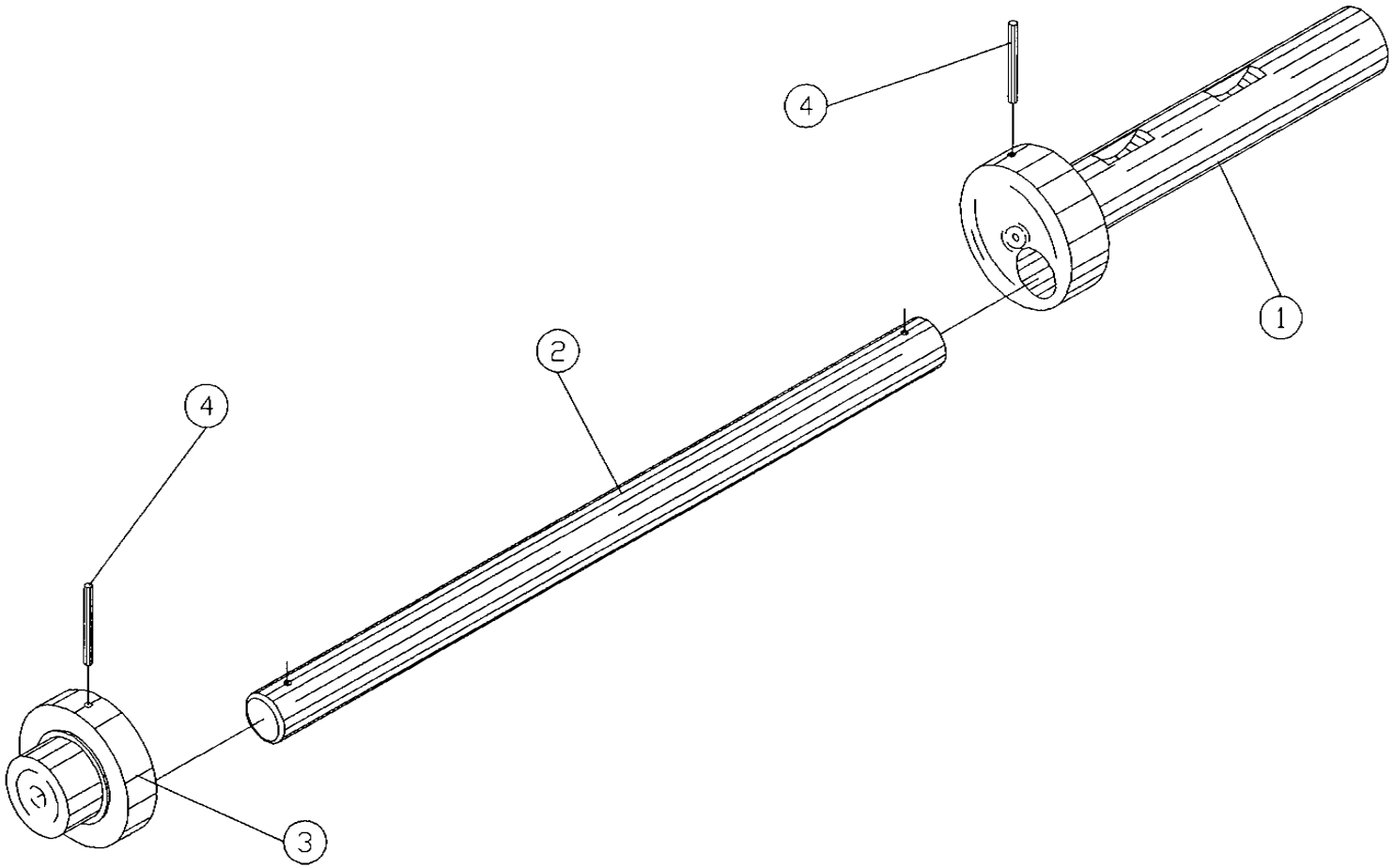
BOM15

Bill of Material for Assembly 808-3-107
Eccentric Shaft Assembly

Revision :A Revision Date: 01-01-89 Effective As of: 08-10-91

ITEM	1...5...10	PART#.....	DESCRIPTION.....	QTY
1	1.....	N.S.S.	ECCENTRIC SHAFT	1 EA
2	1.....	N.S.S.	CRANK SHAFT	1 EA
3	1.....	N.S.S.	ECCENTRIC HUB	1 EA
4	1.....	RPAS09075	PIN,ROLL	AR EA

N.S.S. = NOT SOLD SEPARATELY



GPD

Eccentric Shaft Assembly No. 808-3-107

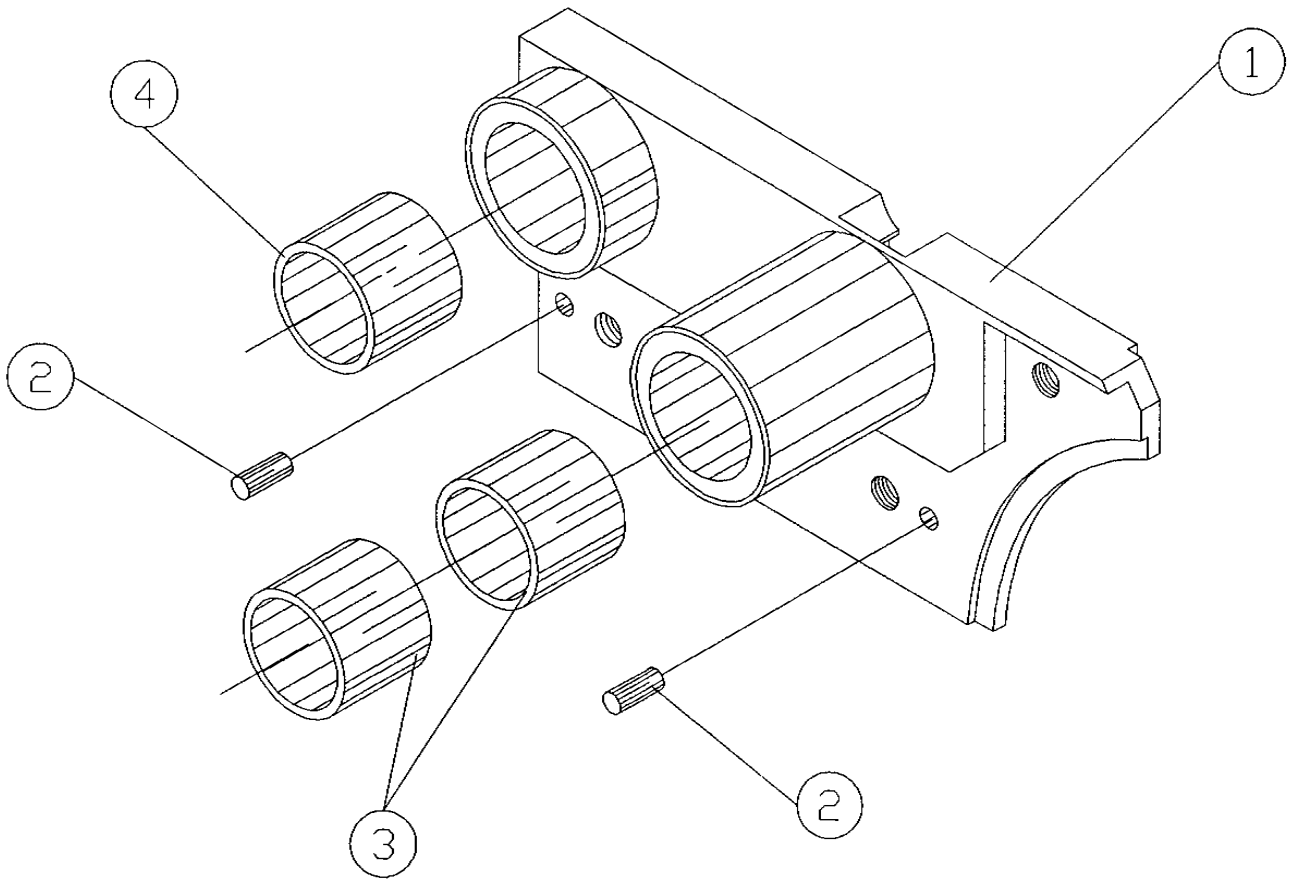
BOM15

Bill of Material for Assembly 809-3-100
Knifeholder Left Assembly

Revision :A Revision Date: 04-01-89 Effective As of: 08-10-91

ITEM	1...5...10	PART#.....	DESCRIPTION.....	QTY
1	1.....	**N.S.S.**	KNIFEHOLDER, LEFT	1 EA
2	1.....	G2506	PIN,DOWEL	AR EA
3	1.....	L0901	BUSHING	2 EA
4	1.....	L0902	BUSHING	1 EA

N.S.S. = NOT SOLD SEPARATELY



GPD

Knifeholder (Left) Assembly No. 809-3-100

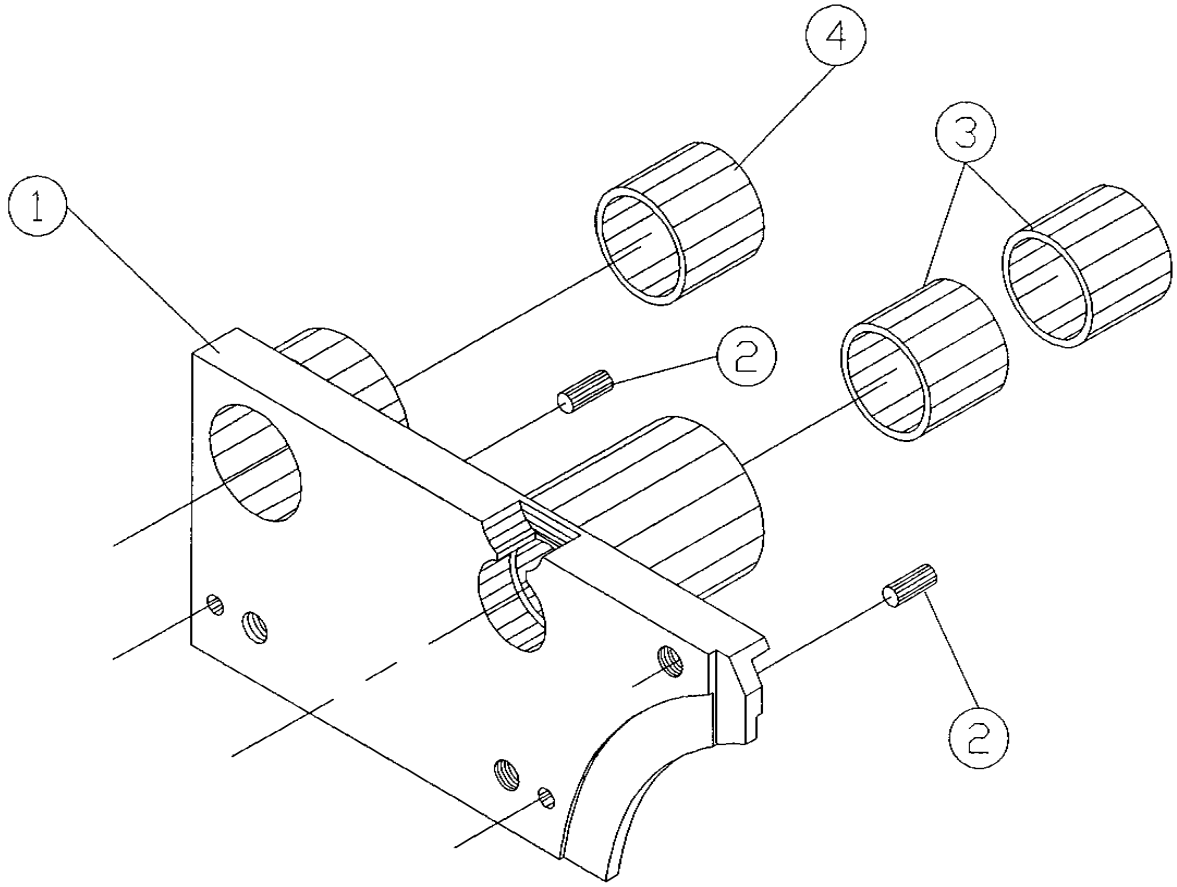
BOM15

Bill of Material for Assembly 809-3-200
Knifeholder Right Assembly

Revision :A Revision Date: 04-01-89 Effective As of: 08-10-91

ITEM	1...5...10	PART#.....	DESCRIPTION.....	QTY
1	1.....	N.S.S.	KNIFEHOLDER, RIGHT	1 EA
2	1.....	G2506	PIN,DOWEL	AR EA
3	1.....	L0901	BUSHING	2 EA
4	1.....	L0902	BUSHING	1 EA

N.S.S. = NOT SOLD SEPARATELY



GPD

Knifeholder (Right) Assembly No. 809-3-200

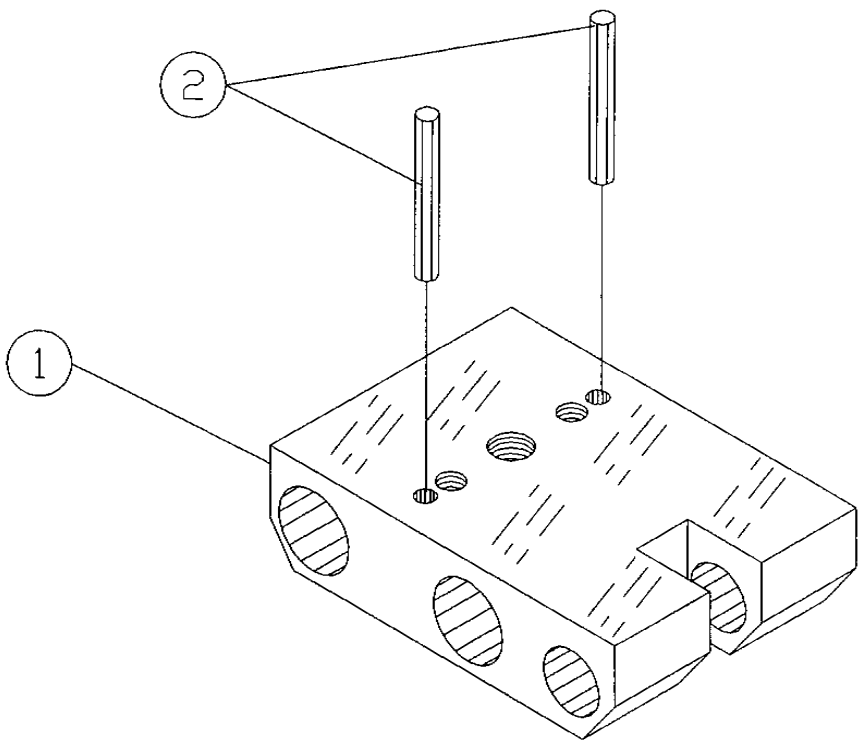
BOM15

Bill of Material for Assembly 809-4-200
Infeed Block Assembly

Revision :A Revision Date: 04-01-89 Effective As of: 08-10-91

ITEM	1...5...10	PART#.....	DESCRIPTION.....	QTY
1	1.....	**N.S.S.**	INFEED SUPPORT BLOCK	1 EA
2	1.....	DA12100	PIN,DOWEL	AR EA

N.S.S. = NOT SOLD SEPARATELY



GPD

Infeed Block Assembly No. 809-4-200

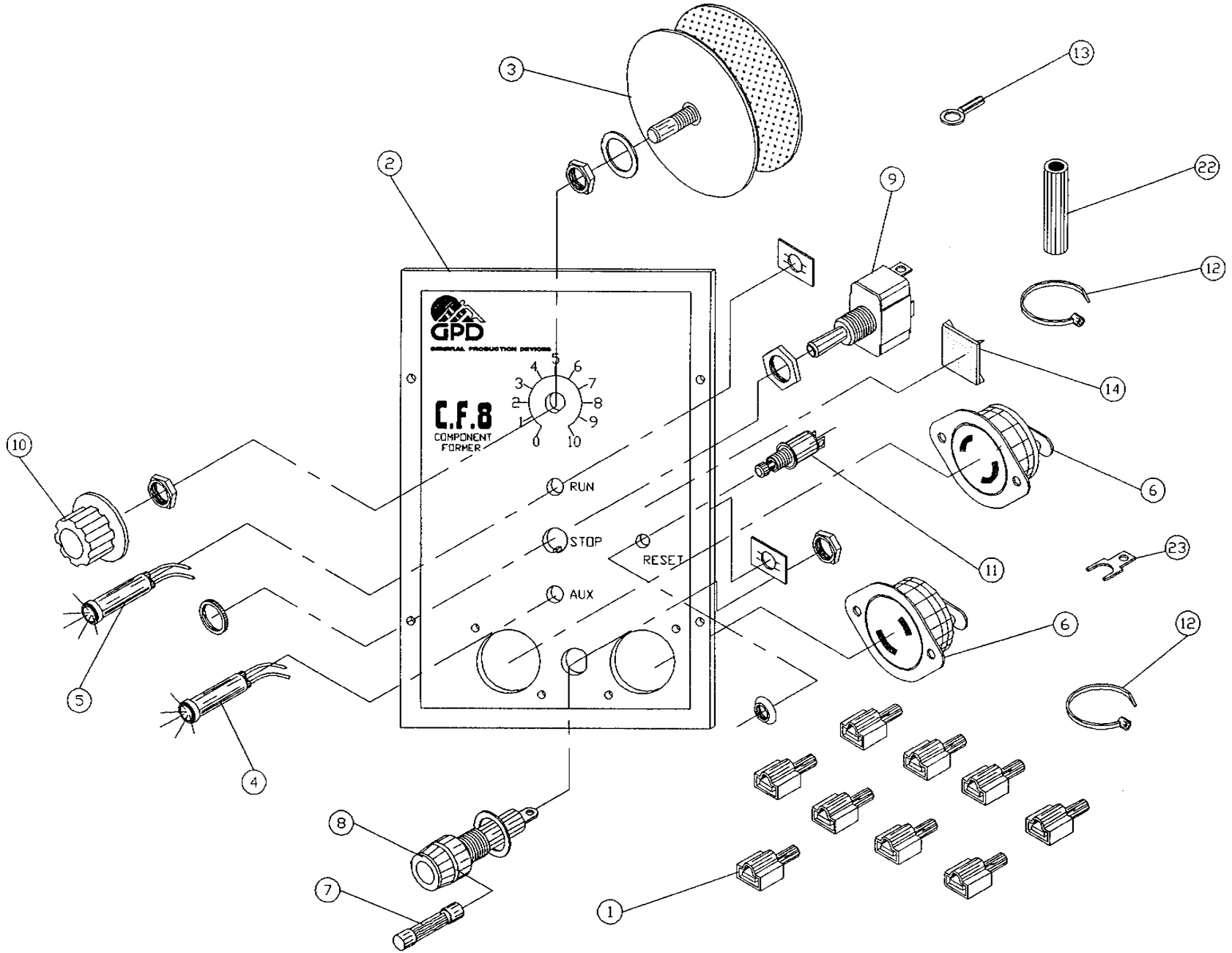
BOM15

Bill of Material for Assembly 810-9-34
120V 50/60HZ Control Unit

Revision :A Revision Date: 06-01-96 Effective As of: 06-01-96

ITEM	1...5...10	PART#.....	DESCRIPTION.....	QTY
1	1.....	2100-0124	CONNECTOR, TERMINAL	9 EA
2	1.....	1400-0005	FRONT PANEL CF8	1 EA
3	1.....	2200-0008	SPEED CONTROL 120V 60HZ	1 EA
4	1.....	2450-0015	PILOT LIGHT 110V ORANGE	1 EA
5	1.....	2450-0017	PILOT LIGHT 110V RED	1 EA
6	1.....	2800-0007	CONNECTOR AC	2 EA
7	1.....	4300-0011	FUSE,SLOW BLOW	1 EA
8	1.....	4300-0001	FUSE HOLDER,PANEL MOUNT	1 EA
9	1.....	5100-0037	SWITCH,TOGGLE	1 EA
10	1.....	2400-0006	KNOB 1/4" SHAFT	1 EA
11	1.....	5100-0024	SWITCH,PUSH BUTTON	1 EA
12	1.....	2800-0028	WIRE TIES	2 EA
13	1.....	2100-0122	CONNECTOR, TERMINAL	AR EA
14	1.....	2800-0029	STICK DOWN PADS 1/2"	AR EA
15	1.....	6000-20-HU-BRN	WIRE, 20AWG HOOKUP/BROWN	AR IN
16	1.....	6000-20-HU-RED	WIRE, 20AWG HOOKUP/RED	AR IN
17	1.....	6000-20-HU-ORN	WIRE, 20AWG HOOKUP/ORANGE	AR IN
18	1.....	6000-20-HU-YEL	WIRE, 20AWG HOOKUP/YELLOW	AR IN
19	1.....	6000-20-HU-GRN	WIRE, 20AWG HOOKUP/GREEN	AR IN
20	1.....	6000-20-HU-BLU	WIRE, 20AWG HOOKUP/BLU	AR IN
21	1.....	6000-20-HU-WHT	WIRE, 20AWG HOOKUP/WHITE	AR IN
22	1.....	2100-0167	CONNECTOR,TERMINAL	1 EA
23	1.....	2100-0143	CONNECTOR,TERMINAL	4 EA
24	1.....	SPPAL0632037	SCR.P.PN.STL	4 EA
25	1.....	NSLA0632	NUT,LOCK	4 EA

N.S.S. = NOT SOLD SEPARATELY



120V 50|60HZ Control Unit No. 810-9-34

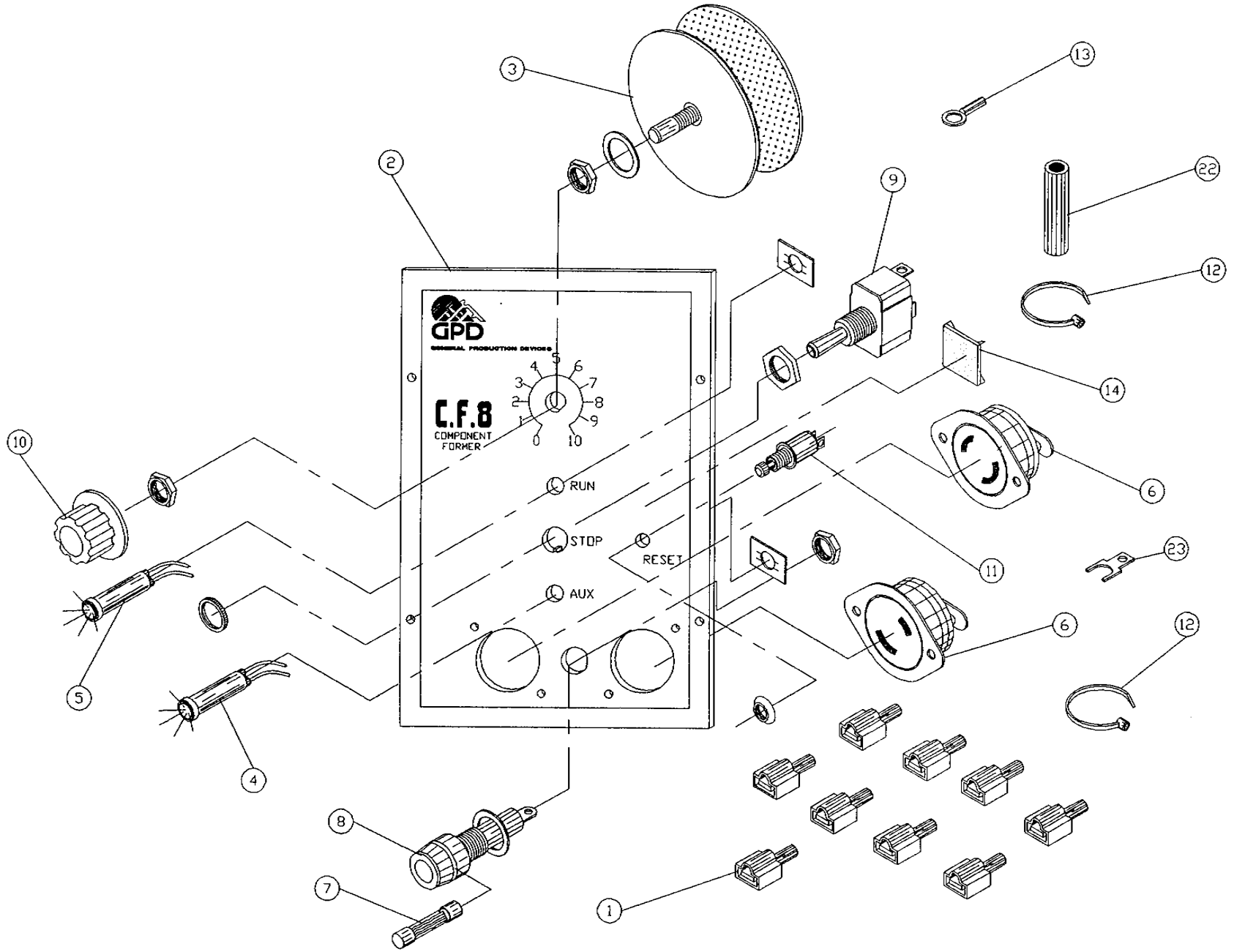
BOM15

Bill of Material for Assembly 810-9-35
230V 50HZ Control Unit

Revision :A Revision Date: 06-01-96 Effective As of: 06-01-96

ITEM	1...5...10	PART#.....	DESCRIPTION.....	QTY
1	1.....	2100-0124	CONNECTOR, TERMINAL	9 EA
2	1.....	1400-0005	FRONT PANEL CF8	1 EA
3	1.....	2200-0014	SPEED CONTROL 230V 50HZ	1 EA
4	1.....	2450-0016	AMBER INDICATOR 36HN2313	1 EA
5	1.....	2450-0018	RED INDICATOR 36HN2311	1 EA
6	1.....	2800-0007	CONNECTOR AC	2 EA
7	1.....	4300-0012	FUSE,SLOW BLOW	1 EA
8	1.....	4300-0001	FUSE HOLDER,PANEL MOUNT	1 EA
9	1.....	5100-0037	SWITCH,TOGGLE	1 EA
10	1.....	2400-0006	KNOB 1/4" SHAFT	1 EA
11	1.....	5100-0024	SWITCH,PUSH BUTTON	1 EA
12	1.....	2800-0028	WIRE TIES	2 EA
13	1.....	2100-0122	CONNECTOR, TERMINAL	AR EA
14	1.....	2800-0029	STICK DOWN PADS 1/2"	AR EA
15	1.....	6000-20-HU-BRN	WIRE, 20AWG HOOKUP/BROWN	AR IN
16	1.....	6000-20-HU-RED	WIRE, 20AWG HOOKUP/RED	AR IN
17	1.....	6000-20-HU-ORN	WIRE, 20AWG HOOKUP/ORANGE	AR IN
18	1.....	6000-20-HU-YEL	WIRE, 20AWG HOOKUP/YELLOW	AR IN
19	1.....	6000-20-HU-GRN	WIRE, 20AWG HOOKUP/GREEN	AR IN
20	1.....	6000-20-HU-BLU	WIRE, 20AWG HOOKUP/BLU	AR IN
21	1.....	6000-20-HU-WHT	WIRE, 20AWG HOOKUP/WHITE	AR IN
22	1.....	2100-0167	CONNECTOR,TERMINAL	1 EA
23	1.....	2100-0143	CONNECTOR,TERMINAL	4 EA

N.S.S. = NOT SOLD SEPARATELY



230V 50HZ Control Unit No. 810-9-35

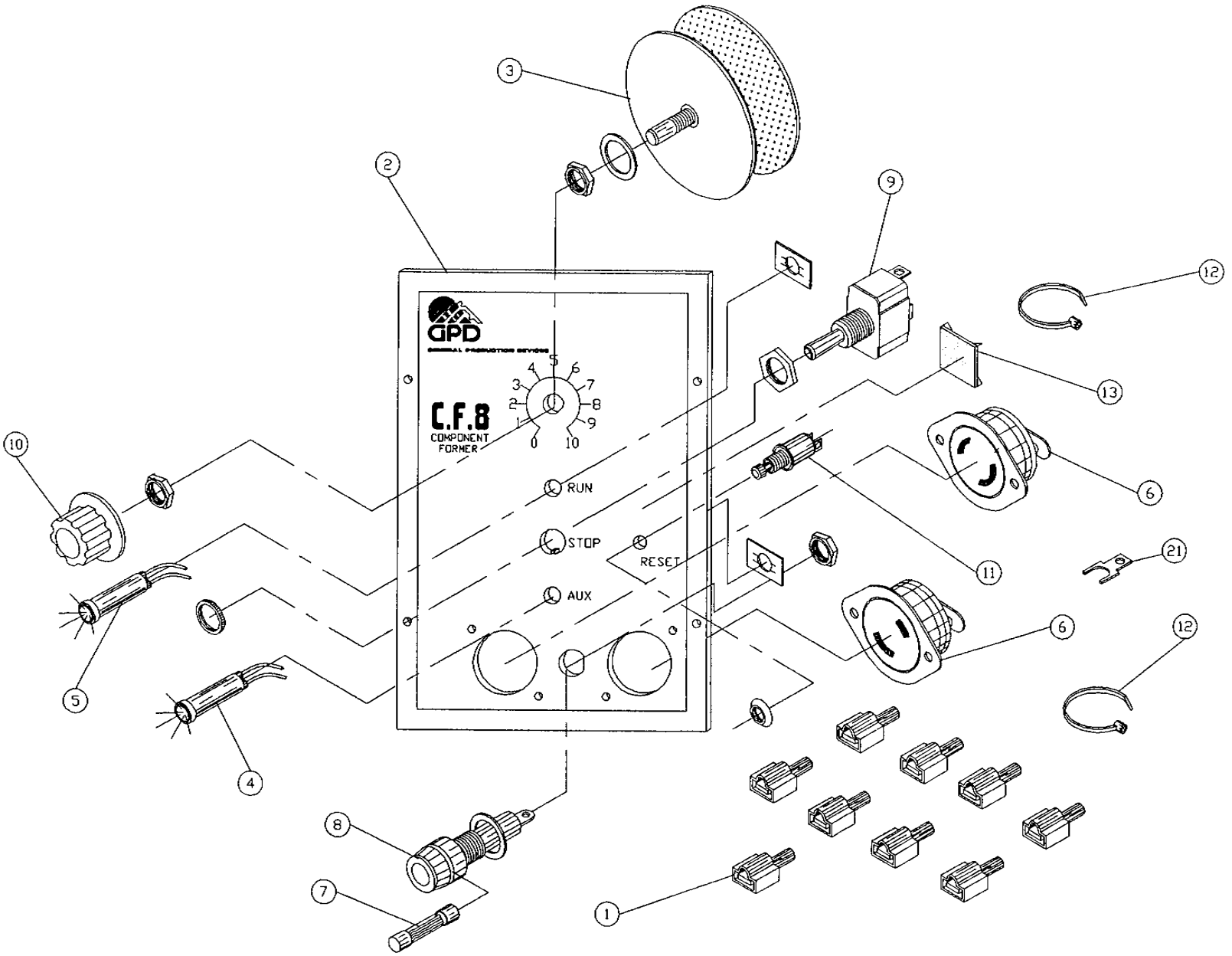
BOM15

Bill of Material for Assembly 810-9-36
100V 50HZ Control Unit

Revision :A Revision Date: 06-01-96 Effective As of: 06-01-96

ITEM	1...5...10	PART#.....	DESCRIPTION.....	QTY
1	1.....	2100-0124	CONNECTOR, TERMINAL	9 EA
2	1.....	1400-0005	CF8 FRONT PANEL	1 EA
3	1.....	2200-0008	SPEED CONTROL 120V 60HZ	1 EA
4	1.....	2450-0015	PILOT LIGHT 110V ORANGE	1 EA
5	1.....	2450-0017	PILOT LIGHT 110V RED	1 EA
6	1.....	2800-0007	RECEPTACLE TWIST LOCK	2 EA
7	1.....	4300-0011	FUSE MDL 3 AMP	1 EA
8	1.....	4300-0001	FUSE HOLDER,PANEL MOUNT	1 EA
9	1.....	5100-0037	SWITCH TOGGLE	1 EA
10	1.....	2400-0006	KNOB 1/4" SHAFT	1 EA
11	1.....	5100-0024	RESET BUTTON	1 EA
12	1.....	2800-0028	WIRE TIES	2 EA
13	1.....	2800-0029	STICK DOWN PADS 1/2"	AR EA
14	1.....	6000-20-HU-BRN	WIRE, 20AWG HOOKUP/BROWN	AR IN
15	1.....	6000-20-HU-RED	WIRE, 20AWG HOOKUP/RED	AR IN
16	1.....	6000-20-HU-ORN	WIRE, 20AWG HOOKUP/ORANGE	AR IN
17	1.....	6000-20-HU-YEL	WIRE, 20AWG HOOKUP/YELLOW	AR IN
18	1.....	6000-20-HU-GRN	WIRE, 20AWG HOOKUP/GREEN	AR IN
19	1.....	6000-20-HU-BLU	WIRE, 20AWG HOOKUP/BLU	AR IN
20	1.....	6000-20-HU-WHT	WIRE, 20AWG HOOKUP/WHITE	AR IN
21	1.....	2100-0143	CONNECTOR,TERMIANAL	4 EA

N.S.S. = NOT SOLD SEPARATELY



100V 50HZ Control Unit No. 810-9-36

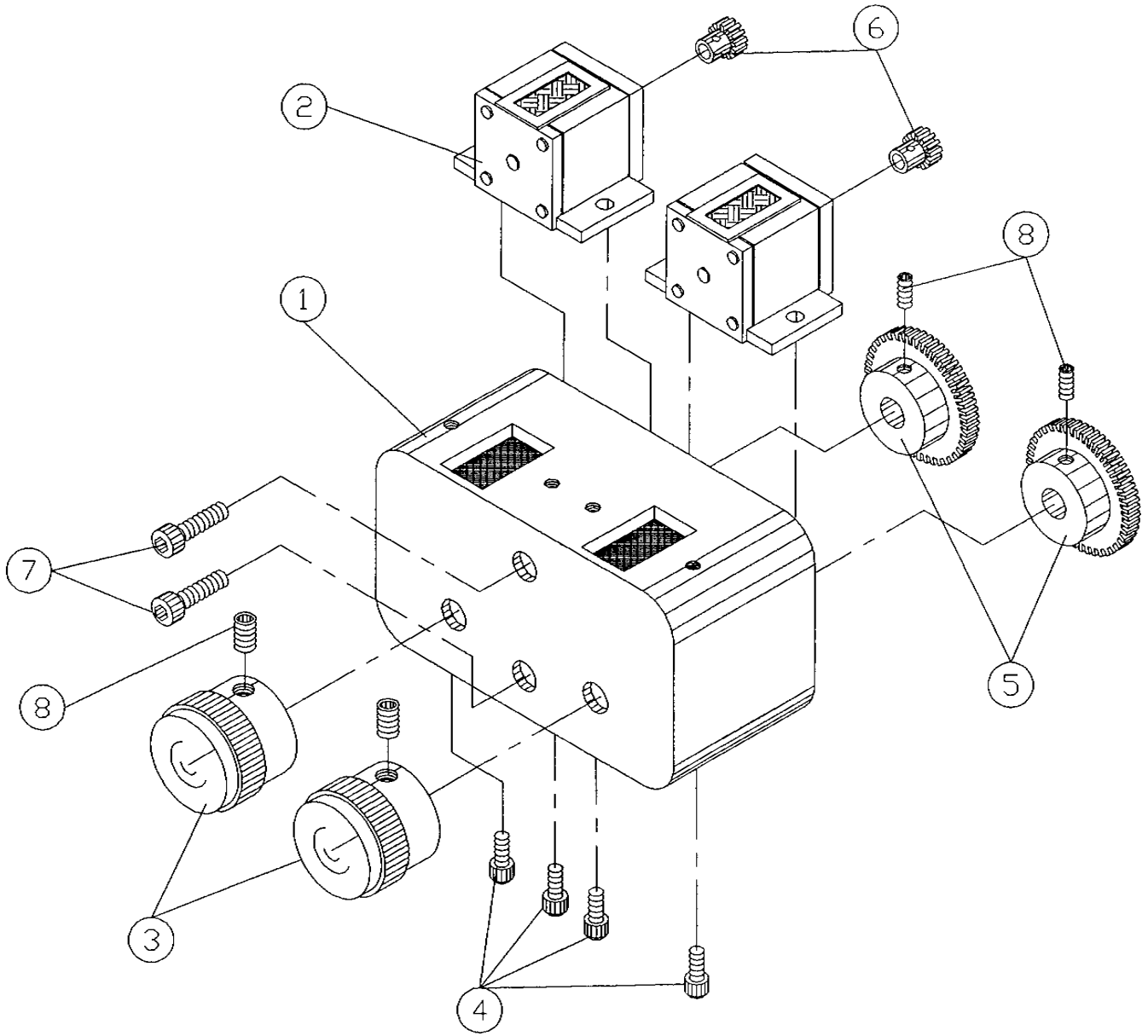
BOM15

Bill of Material for Assembly 813-1-108
Counter Box 4&5, 6&7 Assembly

Revision :A Revision Date: 06-01-96 Effective As of: 06-01-96

ITEM	1...5...10	PART#.....	DESCRIPTION.....	QTY
1	1.....	813-1-3	COUNTER BOX	1 EA
2	1.....	813-1-4	V/R COUNTER 745845-001	2 EA
3	1.....	813-1-5	KNOB ADJUSTMENT	2 EA
4	1.....	SACAN0440025	SCREW,ALLEN,CAP	AR EA
5	1.....	813-1-2	GEAR, SS	2 EA
6	1.....	813-1-1	GEAR, BRASS	2 EA
7	1.....	SACAN0632087	SCREW,ALLEN,CAP	AR EA
8	1.....	TACAN0632018	SET.A.CU.STL.	AR EA

N.S.S. = NOT SOLD SEPARATELY



GPD

Counter Box 4&5, 6&7 Assembly No. 813-1-108

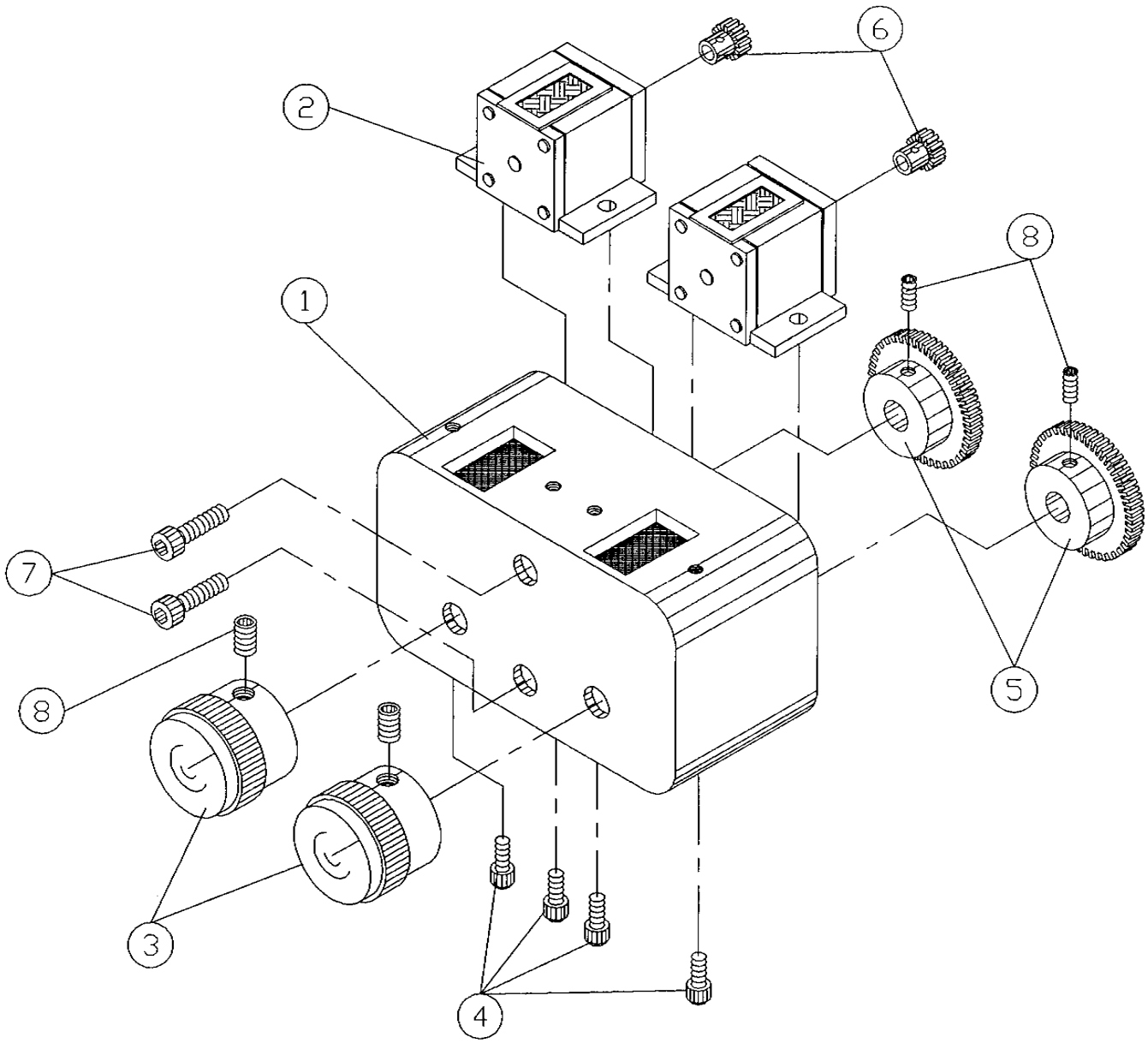
BOM15

Bill of Material for Assembly 813-1-108-MET
Counter Box 4&5, 6&7 Metric Assembly

Revision :A Revision Date: 06-01-96 Effective As of: 06-01-96

ITEM	1...5...10	PART#.....	DESCRIPTION.....	QTY
1	1.....	813-1-3	COUNTER BOX	1 EA
2	1.....	813-1-4	V/R COUNTER 745845-001	2 EA
3	1.....	813-1-5	KNOB ADJUSTMENT	2 EA
4	1.....	SACAN0440025	SCREW,ALLEN,CAP	AR EA
5	1.....	813-1-2M	GEAR LARGE METRIC	2 EA
6	1.....	813-1-1M	GEAR SMALL METRIC	2 EA
7	1.....	SACAN0632087	SCREW,ALLEN,CAP	AR EA
8	1.....	TACAN0632018	SET.A.CU.STL.	AR EA

N.S.S. = NOT SOLD SEPARATELY



GPD

Counter Box 4&5, 6&7 Metric Assembly No. 813-1-108-MET

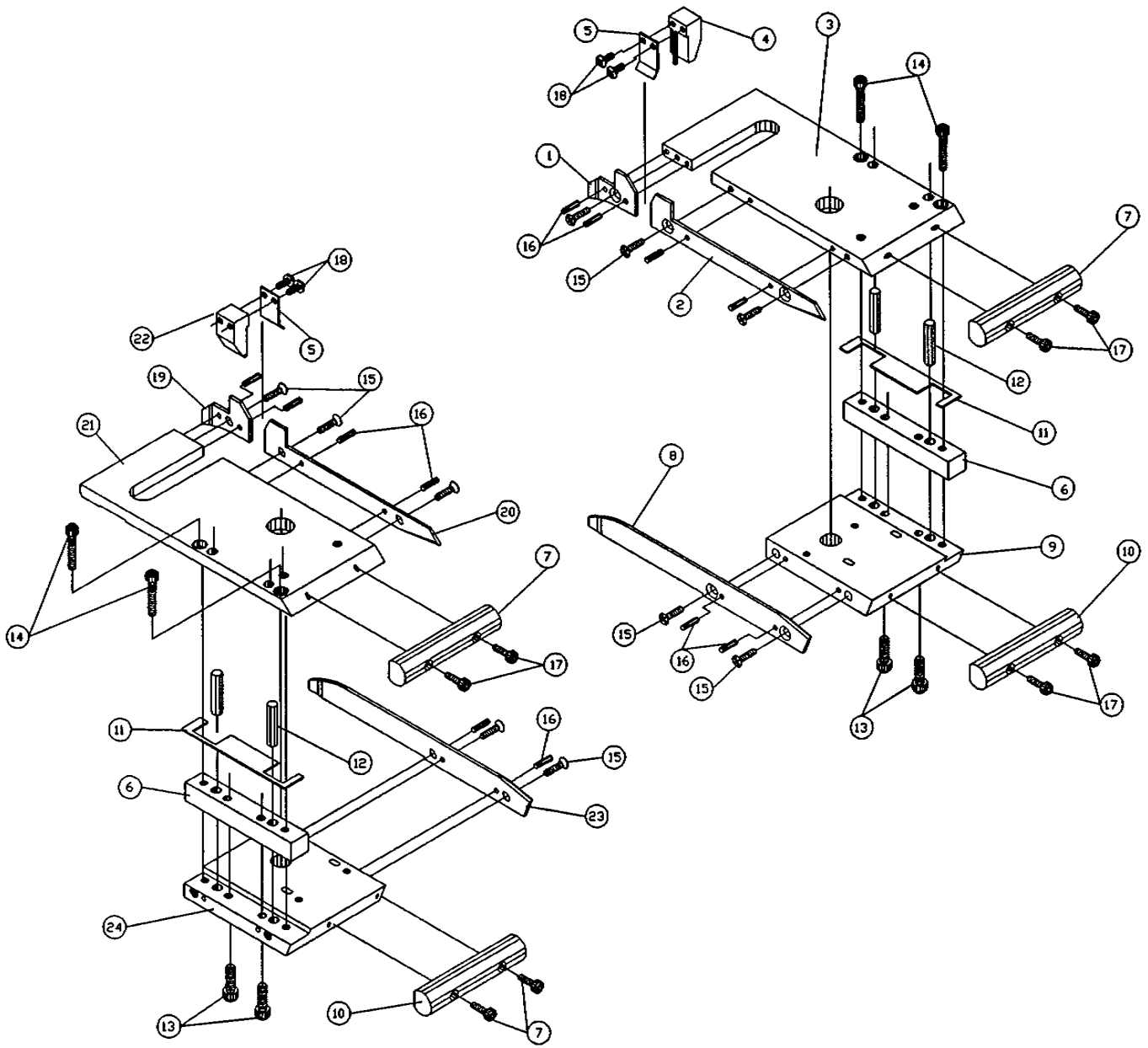
BOM15

Bill of Material for Assembly 816-2-100
Dual Infeed Chute Assembly

Revision :A Revision Date: 06-01-96 Effective As of: 06-01-96

ITEM	1...5...10	PART#.....	DESCRIPTION.....	QTY
1	1.....	816-1-10R	TOP FRONT GUIDE DUAL	1 EA
2	1.....	816-1-11R	TOP REAR GUIDE DUAL	1 EA
3	1.....	816-1-12R	DUAL INFEED TOP PLATE	1 EA
4	1.....	N.S.S.	INFEED CHUTE PLUG RIGHT	1 EA
5	1.....	N.S.S.	SPACER (SPRING STEEL)	2 EA
6	1.....	816-1-3	GAUGE SPACER	2 EA
7	1.....	816-1-4	TOP GDE INFEED CHUTE	2 EA
8	1.....	816-1-5R	BOTTOM BLADE, RIGHT	1 EA
9	1.....	816-1-6R	BTM BLK INFEED CHUTE	1 EA
10	1.....	816-1-7	BTM GDE INFEED CHUTE	2 EA
11	1.....	816-1-9	SHIM SPACER	2 EA
12	1.....	DA18087	PIN,DOWEL	AR EA
13	1.....	SACAN0632050	SCREW,ALLEN,CAP	AR EA
14	1.....	SACAN0632075	SCREW,ALLEN,CAP	AR EA
15	1.....	SAFAN0440025	SCREW,ALLEN,FLATHEAD	AR EA
16	1.....	RPAS09037	PIN,ROLL	AR EA
17	1.....	SACAN0440037	SCREW,ALLEN,CAP	AR EA
18	1.....	SABAN0440025	SCREW,ALLEN,BUTTON	AR EA
19	1.....	816-1-10L	TOP FRONT GUIDE DUAL	1 EA
20	1.....	816-1-11L	TOP REAR GUIDE DUAL	1 EA
21	1.....	816-1-12L	DUAL INFEED TOP PLATE	1 EA
22	1.....	N.S.S.	INFEED CHUTE PLUG LEFT	1 EA
23	1.....	816-1-5L	BOTTOM BLADE, LEFT	1 EA
24	1.....	816-1-6L	BTM BLK INFEED CHUTE	1 EA
25	1.....	IP513	INSPECT FORM,DUAL INFEED CHUTES	1 EA

N.S.S. = NOT SOLD SEPARATELY


5
4
3
18
14
1
16
7
15
2
17
12
11
6
8
9
10
15
16
15
13
17
18
22
5
19
15
16
21
20
7
14
17
11
16
15
12
6
23
24
13
10
7

BOM15

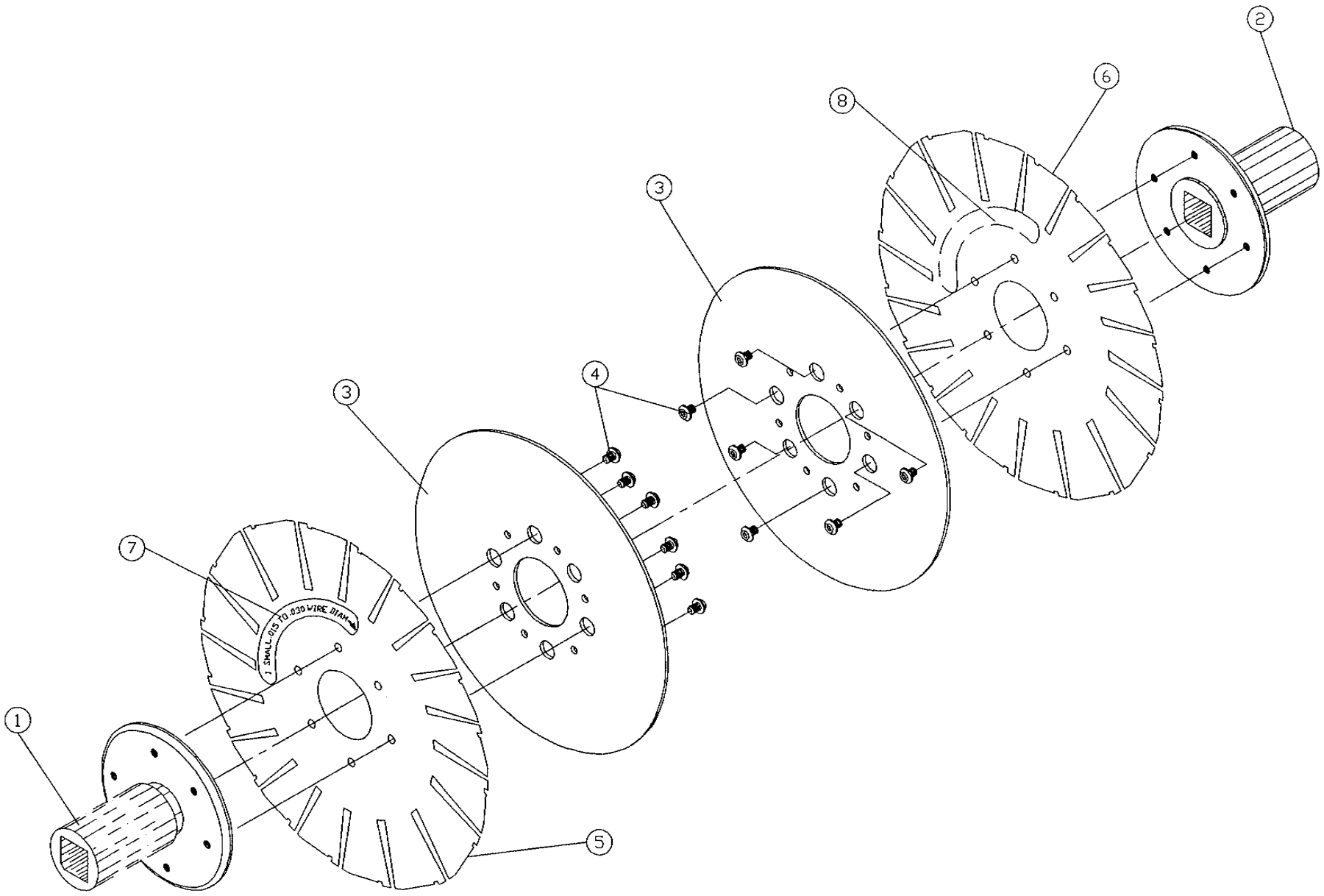
Bill of Material for Assembly 817-1-200
Transport Wheel System Small

Revision :A Revision Date: 08-23-96 Effective As of: 08-23-96

ITEM	1...5...10	PART#.....	DESCRIPTION.....	QTY
1	1.....	817-1-2	TRANSPORT WHEEL HUB, LEFT	1 EA
2	1.....	817-1-2A	TRANSPORT WHEEL HUB,RIGHT	1 EA
3	1.....	817-1-3	WHEEL HOLDER	2 EA
4	1.....	817-1-14	HOLDER SCREW	12 EA
5	1.....	**	TRANSPT WHL SHIM SML (L)	1 EA
6	1.....	**	TRANSPT WHL SHIM SML (R)	1 EA
7	1.....	817-1-400-L	STICKER,TRANSPORT WHEEL-LEFT	AR EA
8	1.....	817-1-400-R	STICKER,TRANSPORT WHEEL-RIGHT	AR EA

** SOLD IN PAIRS ONLY # 817-1-4S

N.S.S. = NOT SOLD SEPARATELY



GPD

Transport Wheel System Small No. 817-1-200

BOM15

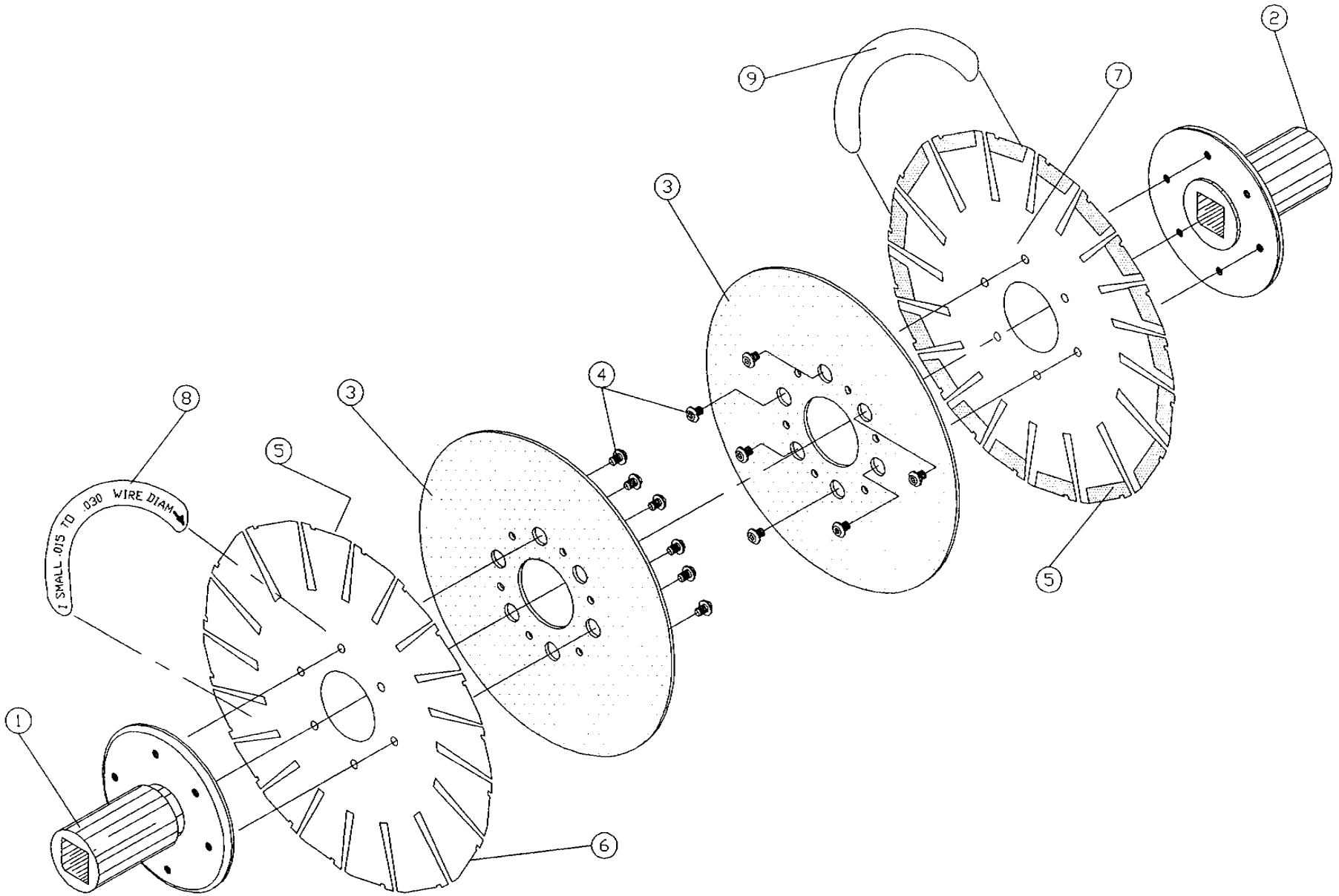
Bill of Material for Assembly 817-1-200-RUB
Transport Wheel System Small w/Pads

Revision :A Revision Date: 08-23-96 Effective As of: 08-23-96

ITEM	1...5...10	PART#.....	DESCRIPTION.....	QTY
1	1.....	817-1-2	TRANSPORT WHEEL HUB, LEFT	1 EA
2	1.....	817-1-2A	TRANSPORT WHEEL HUB,RIGHT	1 EA
3	1.....	817-1-3	WHEEL HOLDER	2 EA
4	1.....	817-1-14	HOLDER SCREW	12 EA
5	1.....	817-1-16	STRIPPING.RUBBER	32 EA
6	1.....	**	TRANSPT WHL SHIM SML (L)	1 EA
7	1.....	**	TRANSPT WHL SHIM SML (R)	1 EA
8	1.....	817-1-400-L	STICKER,TRANSPORT WHEEL-LEFT	AR EA
9	1.....	817-1-400-R	STICKER,TRANSPORT WHEEL-RIGHT	AR EA

** SOLD IN PAIRS ONLY # 817-1-4S-RUB

N.S.S. = NOT SOLD SEPARATELY



GPD **Transport Wheel System Small w/ Pads No. 817-1-200-RUB**

BOM15

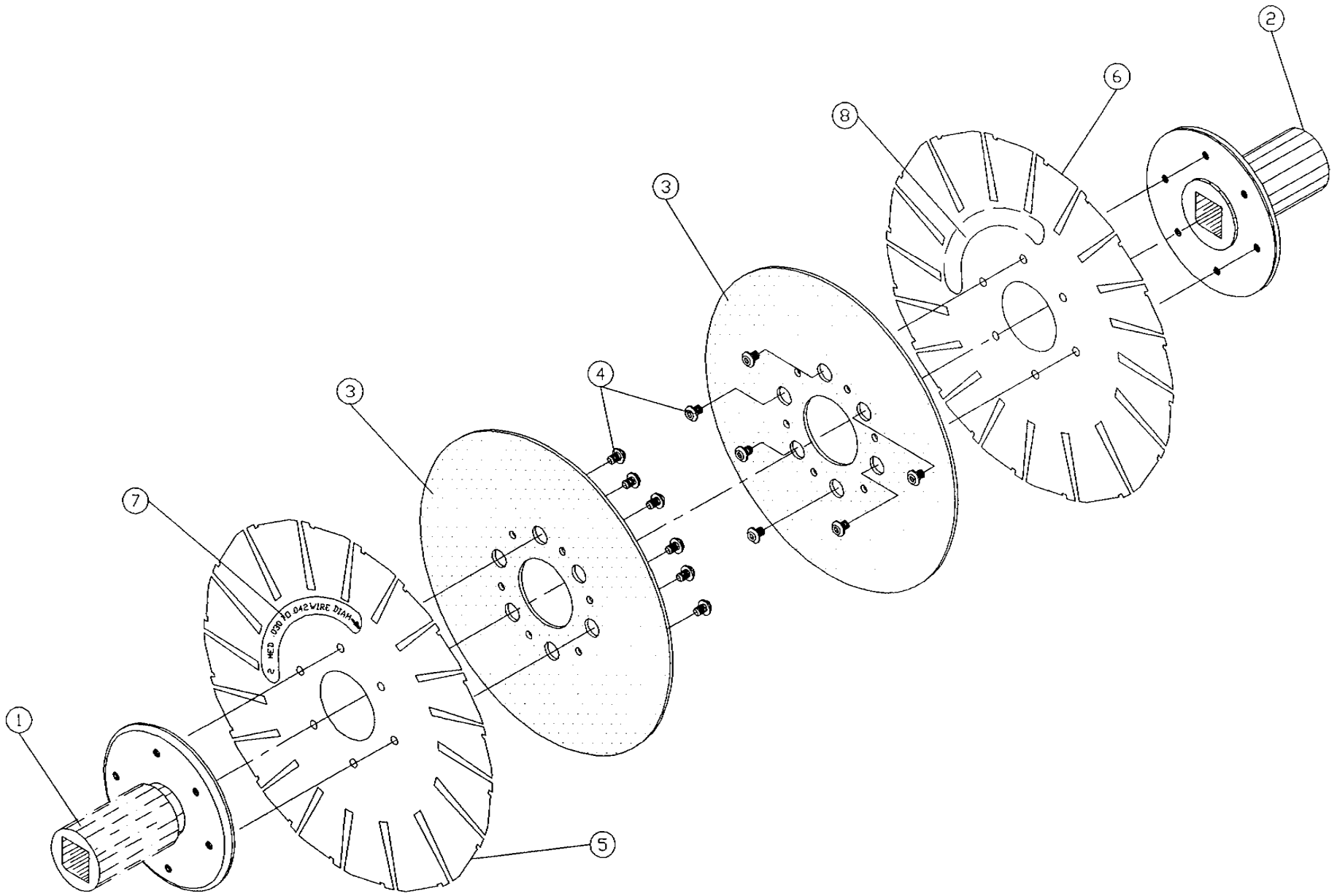
Bill of Material for Assembly 817-1-210
Transport Wheel System Med.

Revision :A Revision Date: 08-23-96 Effective As of: 08-23-96

ITEM	1...5...10	PART#.....	DESCRIPTION.....	QTY
1	1.....	817-1-2	TRANSPORT WHEEL HUB, LEFT	1 EA
2	1.....	817-1-2A	TRANSPORT WHEEL HUB,RIGHT	1 EA
3	1.....	817-1-3	WHEEL HOLDER	2 EA
4	1.....	817-1-14	HOLDER SCREW	12 EA
5	1.....	**	TRANSPT WHL SHIM MED (L)	1 EA
6	1.....	**	TRANSPT WHL SHIM MED (R)	1 EA
7	1.....	817-1-401-L	STICKER,TRANSPORT WHEEL-LEFT	AR EA
8	1.....	817-1-401-R	STICKER,TRANSPORT WHEEL-RIGHT	AR EA

** SOLD IN PAIRS ONLY # 817-1-4M

N.S.S. = NOT SOLD SEPARATELY



GPD

Transport Wheel System Med. No. 817-1-210

BOM15

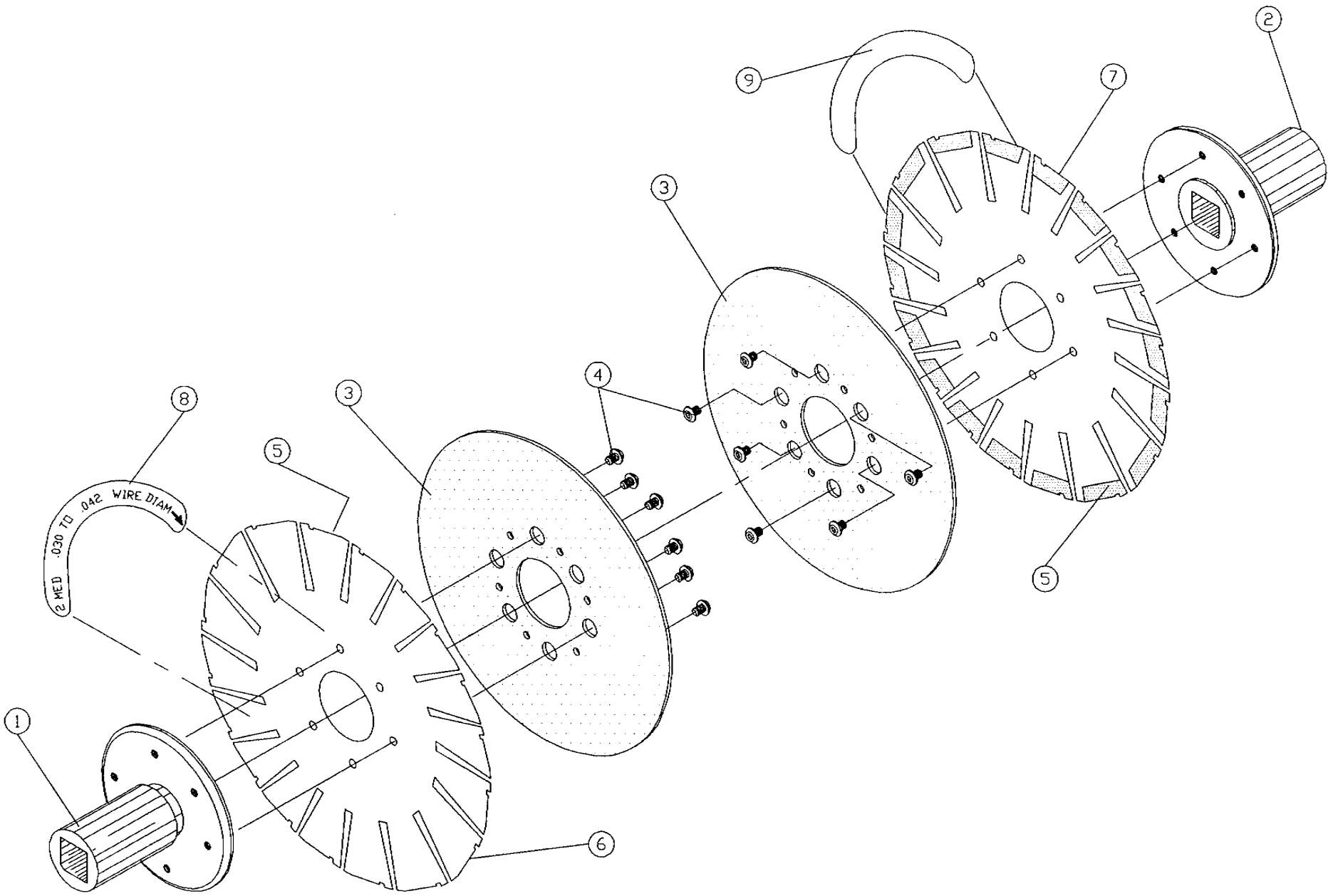
Bill of Material for Assembly 817-1-210-RUB
Transport Wheel System Med. w/Pads

Revision :A Revision Date: 08-23-96 Effective As of: 08-23-96

ITEM	1...5...10	PART#.....	DESCRIPTION.....	QTY
1	1.....	817-1-2	TRANSPORT WHEEL HUB, LEFT	1 EA
2	1.....	817-1-2A	TRANSPORT WHEEL HUB,RIGHT	1 EA
3	1.....	817-1-3	WHEEL HOLDER	2 EA
4	1.....	817-1-14	HOLDER SCREW	12 EA
5	1.....	817-1-16	STRIPPING.RUBBER	32 EA
6	1.....	**	TRANSPT WHL SHIM MED (L)	1 EA
7	1.....	**	TRANSPT WHL SHIM MED (R)	1 EA
8	1.....	817-1-401-L	STICKER,TRANSPORT WHEEL-LEFT	AR EA
9	1.....	817-1-401-R	STICKER,TRANSPORT WHEEL-RIGHT	AR EA

** SOLD IN PAIRS ONLY # 817-1-4M-RUB

N.S.S. = NOT SOLD SEPARATELY



GPD

Transport Wheel System Med. w/Pads No. 817-1-210-RUB

BOM15

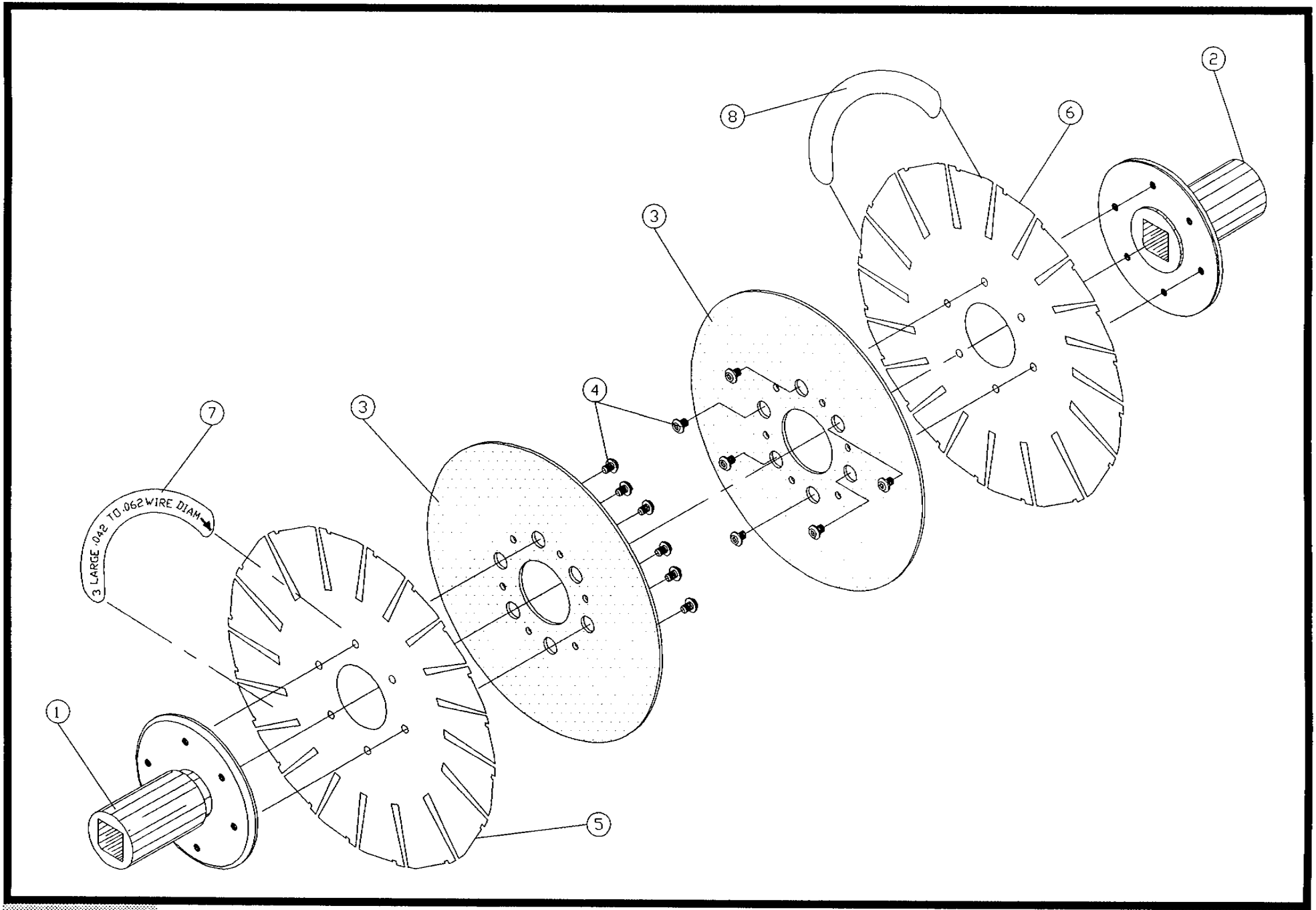
Bill of Material for Assembly 817-1-220
Transport Wheel System Lg.

Revision :A Revision Date: 08-23-96 Effective As of: 08-23-96

ITEM	1...5...10	PART#.....	DESCRIPTION.....	QTY
1	1.....	817-1-2	TRANSPORT WHEEL HUB, LEFT	1 EA
2	1.....	817-1-2A	TRANSPORT WHEEL HUB,RIGHT	1 EA
3	1.....	817-1-3	WHEEL HOLDER	2 EA
4	1.....	817-1-14	HOLDER SCREW	12 EA
5	1.....	**	TRANSPT WHL SHIM LRG (L)	1 EA
6	1.....	**	TRANSPT WHL SHIM LRG (R)	1 EA
7	1.....	817-1-402-L	STICKER,TRANSPORT WHEEL-LEFT	AR EA
8	1.....	817-1-402-R	STICKER,TRANSPORT WHEEL-RIGHT	AR EA

** SOLD IN PAIRS ONLY # 817-1-4L

N.S.S. = NOT SOLD SEPARATELY



GPD

Transport Wheel System Lg. No. 817-1-220

BOM15

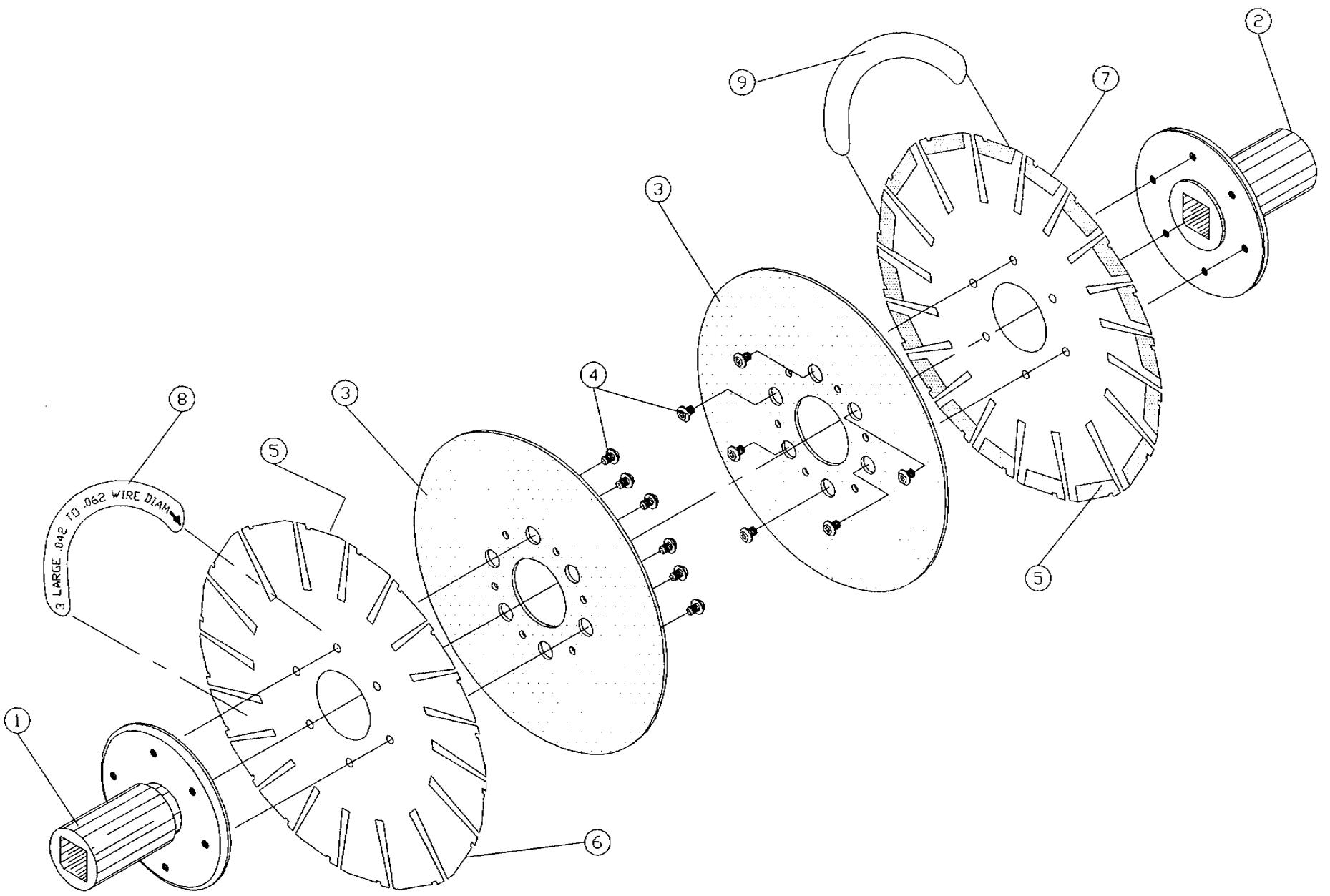
Bill of Material for Assembly 817-1-220-RUB
Transport Wheel System Lg. w/Pads

Revision :A Revision Date: 08-23-96 Effective As of: 08-23-96

ITEM	1...5...10	PART#.....	DESCRIPTION.....	QTY
1	1.....	817-1-2	TRANSPORT WHEEL HUB, LEFT	1 EA
2	1.....	817-1-2A	TRANSPORT WHEEL HUB,RIGHT	1 EA
3	1.....	817-1-3	WHEEL HOLDER	2 EA
4	1.....	817-1-14	HOLDER SCREW	12 EA
5	1.....	817-1-16	STRIPPING.RUBBER	36 EA
6	1.....	**	TRANSPT WHL SHIM LRG (L)	1 EA
7	1.....	**	TRANSPT WHL SHIM LRG (R)	1 EA
8	1.....	817-1-402-L	STICKER,TRANSPORT WHEEL-LEFT	AR EA
9	1.....	817-1-402-L	STICKER,TRANSPORT WHEEL-RIGHT	AR EA

** SOLD IN PAIRS ONLY # 817-1-4L-RUB

N.S.S. = NOT SOLD SEPARATELY



GPD

Transport Wheel System Lg. w/Pads No. 817-1-220-RUB

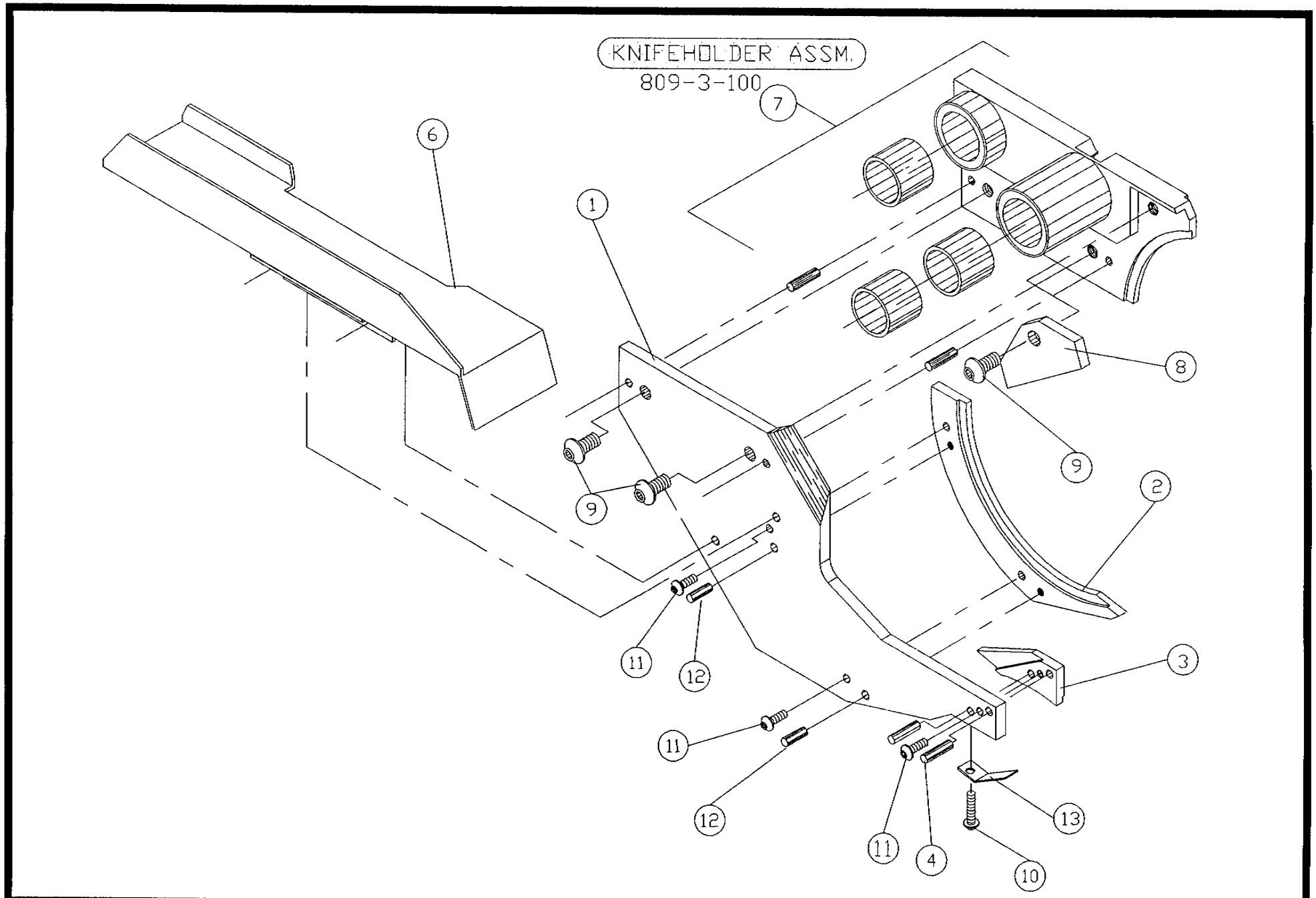
BOM15

Bill of Material for Assembly 818-1-100
Sideplate Assembly, Left

Revision :A Revision Date: 04-01-89 Effective As of: 08-10-91

ITEM	1...5...10	PART#.....	DESCRIPTION.....	QTY
1	1.....	818-1-1L	SIDE PLATE (L)	1 EA
2	1.....	818-1-2L	SEGMENT, LEFT	1 EA
3	1.....	818-1-3L	COMPONENT GUIDE, LEFT	1 EA
4	1.....	DA12050	PIN,DOWEL	AR EA
5	1.....	SACAN0440050	SCREW,ALLEN,CAP	AR EA
6	1.....	809-3-17L	EXIT CHUTE, LEFT	1 EA
7	1.....	809-3-100	KNIFEHOLDER LEFT ASSM	1 EA
8	1.....	809-4-2	CUTTING BLADE	1 EA
9	1.....	SABAN1032037	SCREW,ALLEN,BUTTON	AR EA
10	1.....	SABAN0440025	SCREW,ALLEN,BUTTON	AR EA
11	1.....	SACAN0440031	SCREW,ALLEN,CAP	AR EA
12	1.....	DA12037	PIN,DOWEL	AR EA
13	1.....	818-1-16L	COMPONENT KEEPER-LEFT	1 EA
14	1.....	SABAN0832025	SCREW,ALLEN,BUTTON	2 EA

N.S.S. = NOT SOLD SEPARATELY



GPD

Sideplate Assembly, Left No. 818-1-100

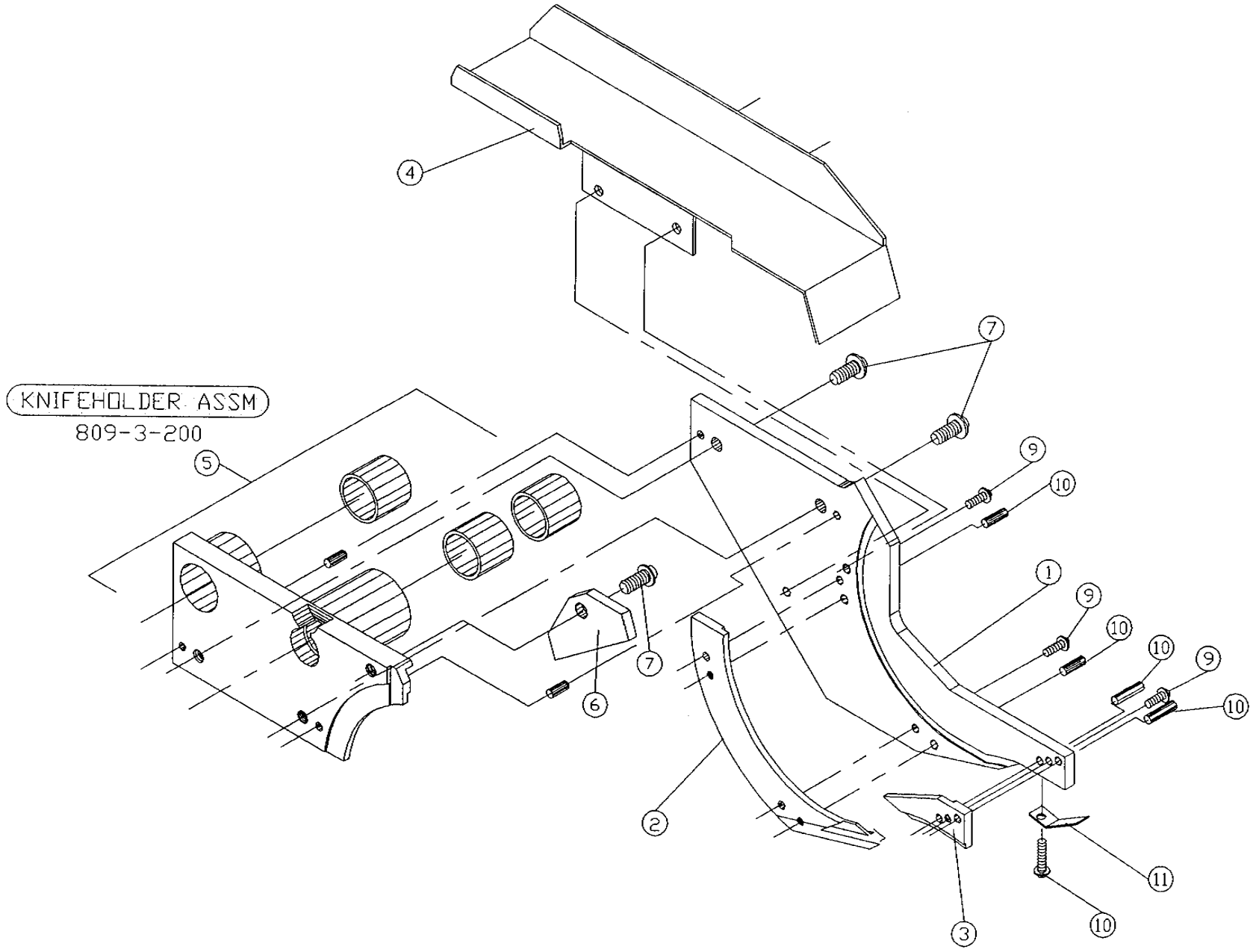
BOM15

Bill of Material for Assembly 818-1-200
Sideplate Assembly, Right

Revision :A Revision Date: 04-01-89 Effective As of: 08-10-91

ITEM	1...5...10	PART#.....	DESCRIPTION.....	QTY
1	1.....	818-1-1R	SIDE PLATE (R)	1 EA
2	1.....	818-1-2R	SEGMENT, RIGHT	1 EA
3	1.....	818-1-3R	COMPONENT GUIDE, RIGHT	1 EA
4	1.....	809-3-17R	EXIT CHUTE, RIGHT	1 EA
5	1.....	809-3-200	KNIFEHOLDER RIGHT ASSM	1 EA
6	1.....	809-4-2	CUTTING BLADE	1 EA
7	1.....	SABAN1032037	SCREW,ALLEN,BUTTON	AR EA
8	1.....	SABAN0632025	SCREW,ALLEN,BUTTON	AR EA
9	1.....	SACAN0440031	SCREW,ALLEN,CAP	AR EA
10	1.....	SABAN0440025	SCREW,ALLEN,BUTTON	AR EA
11	1.....	818-1-16R	COMPONENT KEEPER-RIGHT	1 EA
12	1.....	SABAN0832025	SCREW,ALLEN,BUTTON	2 EA

N.S.S. = NOT SOLD SEPARATELY



GPD

Sideplate Assembly, Right No. 818-1-200

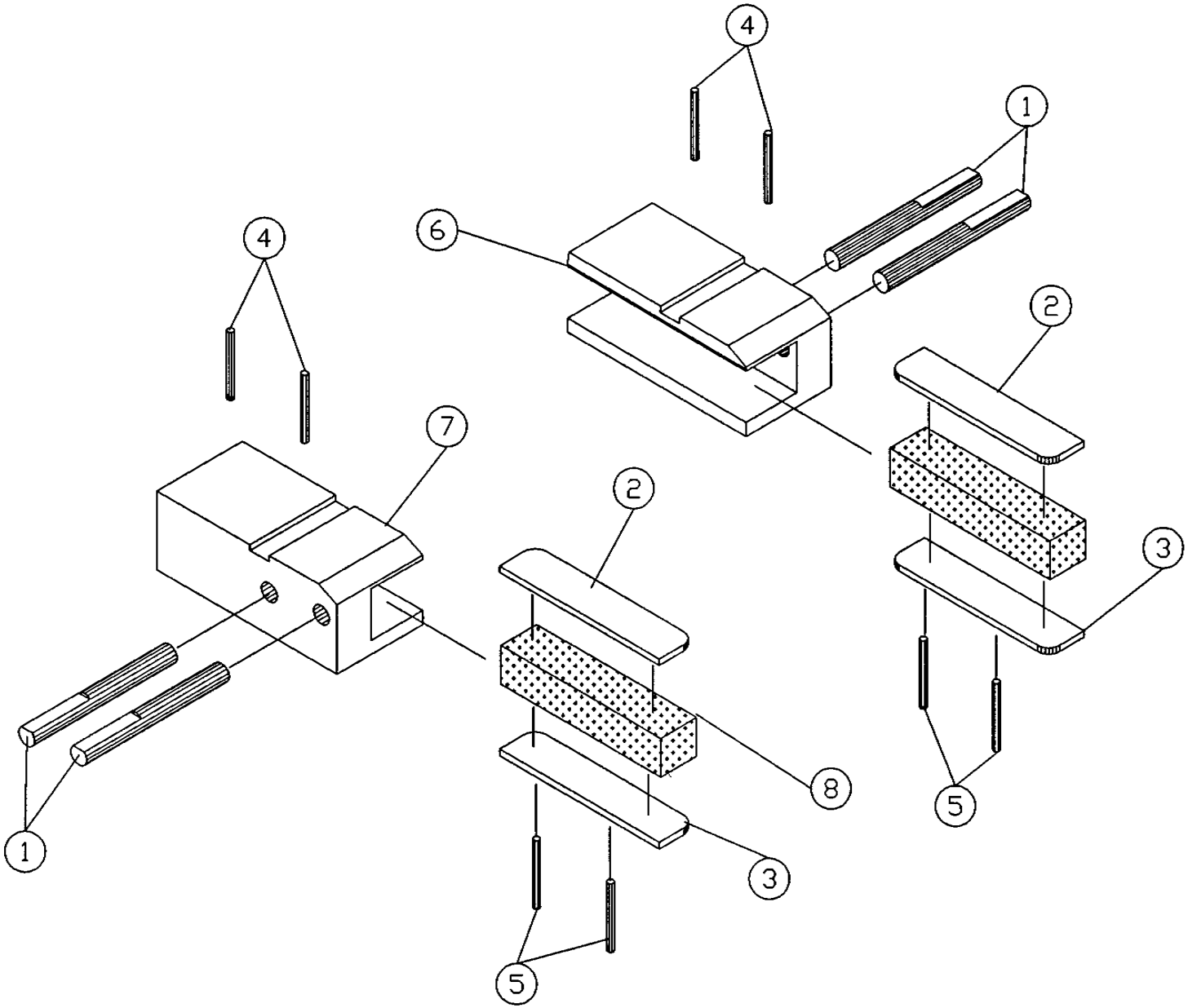
BOM15

Bill of Material for Assembly 818-1-300
Magnet Assembly

Revision :A Revision Date: 04-01-89 Effective As of: 08-10-91

ITEM	1...5...10	PART#.....	DESCRIPTION.....	QTY
1	1.....	N.S.S.	MAGNET ADJ SHAFT	4 EA
2	1.....	N.S.S.	MAGNET SIDE PLATE	2 EA
3	1.....	N.S.S.	MAGNET SIDE PLATE (14GA)	2 EA
4	1.....	N.S.S.	NON MAG PIN	4 EA
5	1.....	N.S.S.	NON MAG PIN	4 EA
6	1.....	N.S.S.	MAGNET HOLDER, RIGHT	1 EA
7	1.....	N.S.S.	MAGNET HOLDER, LEFT	1 EA
8	1.....	N.S.S.	MAGNET	2 EA

N.S.S. = NOT SOLD SEPARATELY



GPD

Magnet Assembly No. 818-1-300

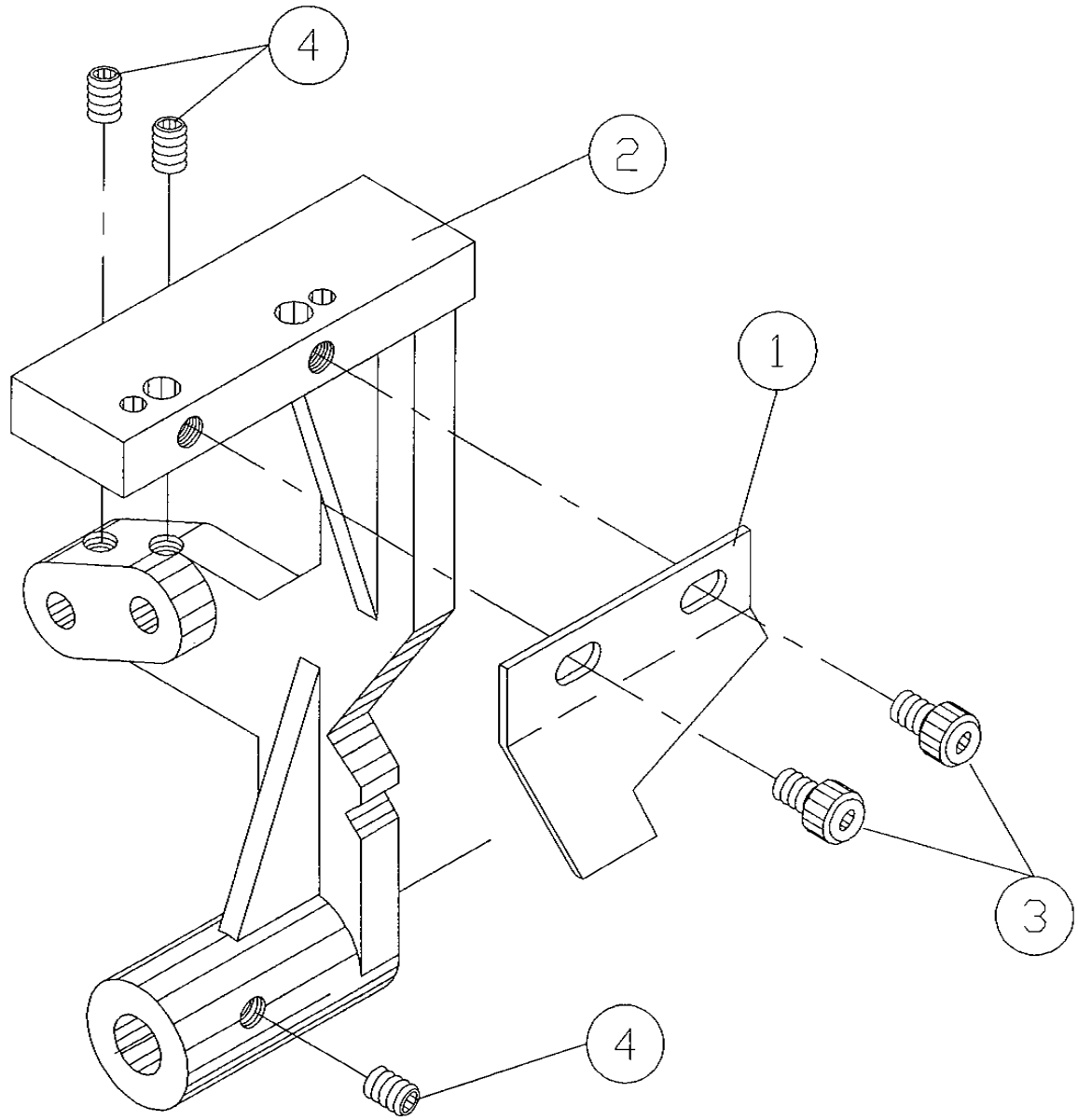
BOM15

Bill of Material for Assembly 818-1-400
Infeed Block Bracket (Right) Assembly

Revision :A Revision Date: 04-01-89 Effective As of: 08-10-91

ITEM	1...5...10	PART#.....	DESCRIPTION.....	QTY
1	1.....	818-1-11R	CRIMP DIE STOP, RIGHT	1 EA
2	1.....	818-1-5R	INFEED BLOCK BRACKET (R)	1 EA
3	1.....	SACAN0832025	SCREW,ALLEN,CAP	AR EA
4	1.....	TACAN0832018	SET.A.CU.STL.	AR EA

N.S.S. = NOT SOLD SEPARATELY



GPD

Infeed Block Bracket (Right) Assembly No. 818-1-400

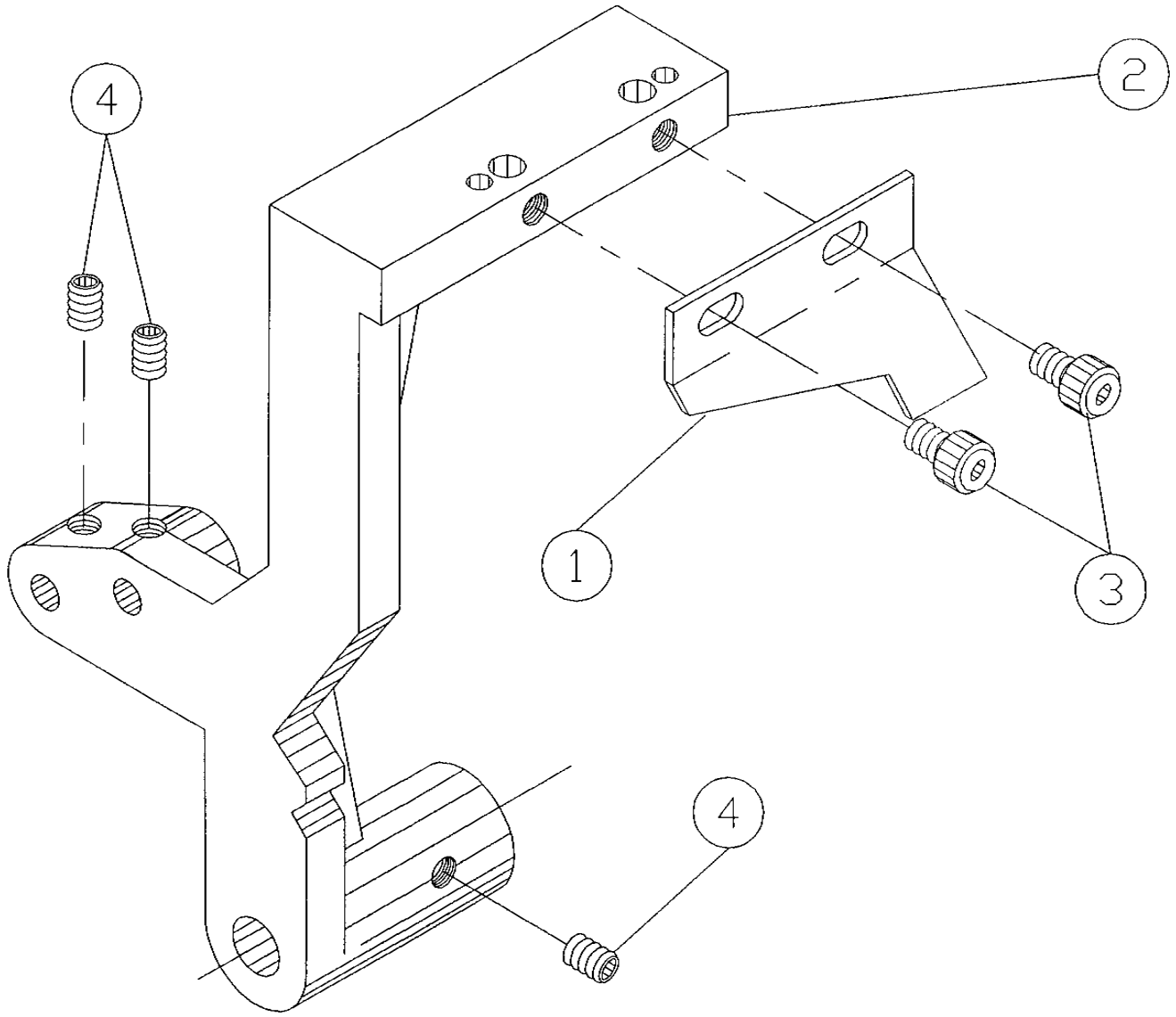
BOM15

Bill of Material for Assembly 818-1-500
Infeed Block Bracket (Left) Assembly

Revision :A Revision Date: 04-01-89 Effective As of: 08-10-91

ITEM	1...5...10	PART#.....	DESCRIPTION.....	QTY
1	1.....	818-1-11L	CRIMP DIE STOP, LEFT	1 EA
2	1.....	818-1-5L	INFEED BLOCK BRACKET (L)	1 EA
3	1.....	SACAN0832025	SCREW,ALLEN,CAP	AR EA
4	1.....	TACAN0832018	SET.A.CU.STL.	AR EA

N.S.S. = NOT SOLD SEPARATELY



GPD

Infeed Block Bracket (Left) Assembly No. 818-1-500

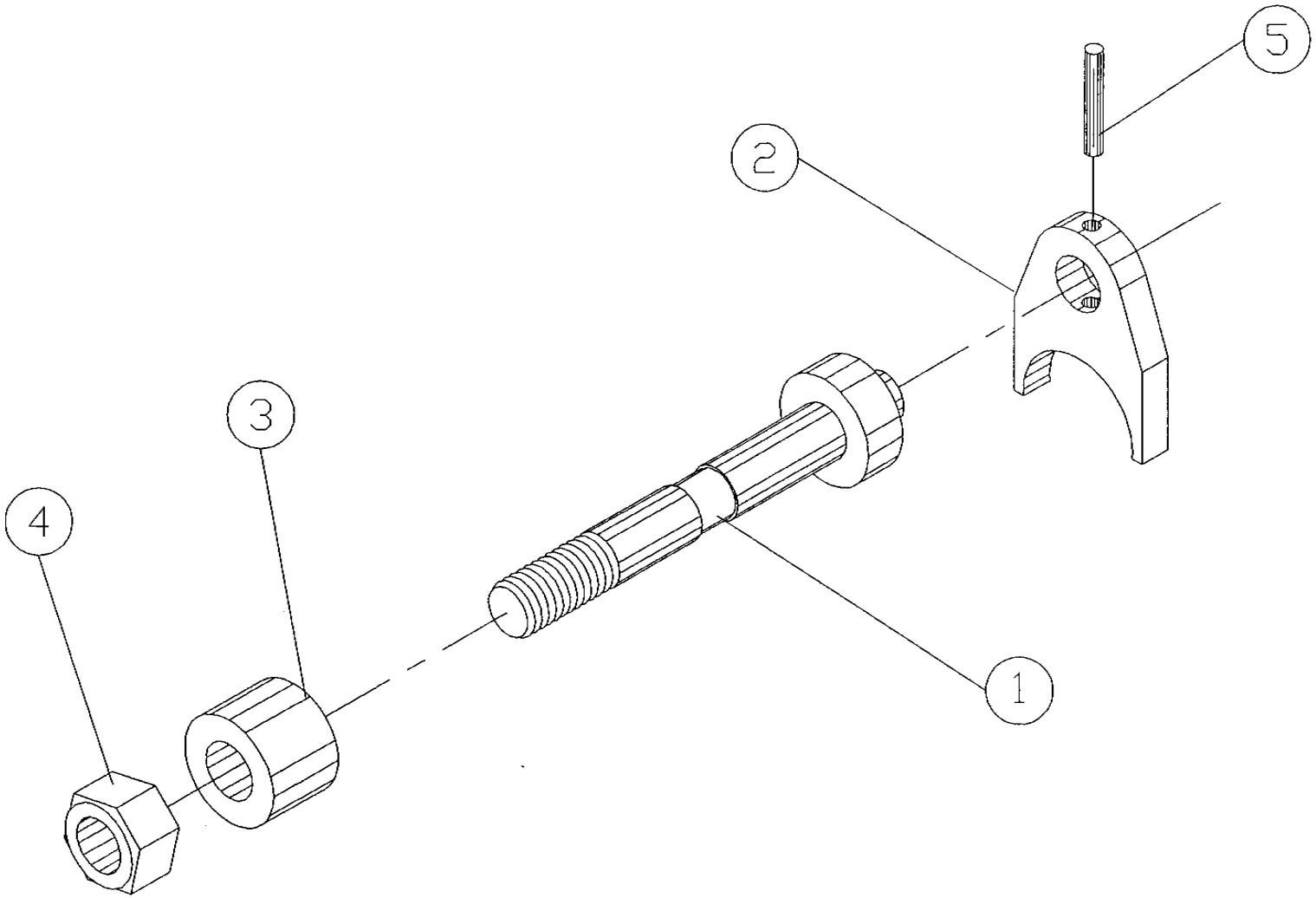
BOM15

Bill of Material for Assembly 818-1-600
Infeed Bracket Shaft Assembly

Revision :A Revision Date: 04-01-89 Effective As of: 08-10-91

ITEM	1...5...10	PART#.....	DESCRIPTION.....	QTY
1	1.....	N.S.S.	INFEED BRACKET SHAFT	1 EA
2	1.....	N.S.S.	HUB GUIDE	1 EA
3	1.....	818-1-8	POLYURATHANE SPRING	1 EA
4	1.....	NSIA3124	NUT,NYLON INSERT	AR EA
5	1.....	RPAS06062	PIN,ROLL	AR EA

N.S.S. = NOT SOLD SEPARATELY



GPD

Infeed Bracket Shaft Assembly No. 818-1-600

BOM15

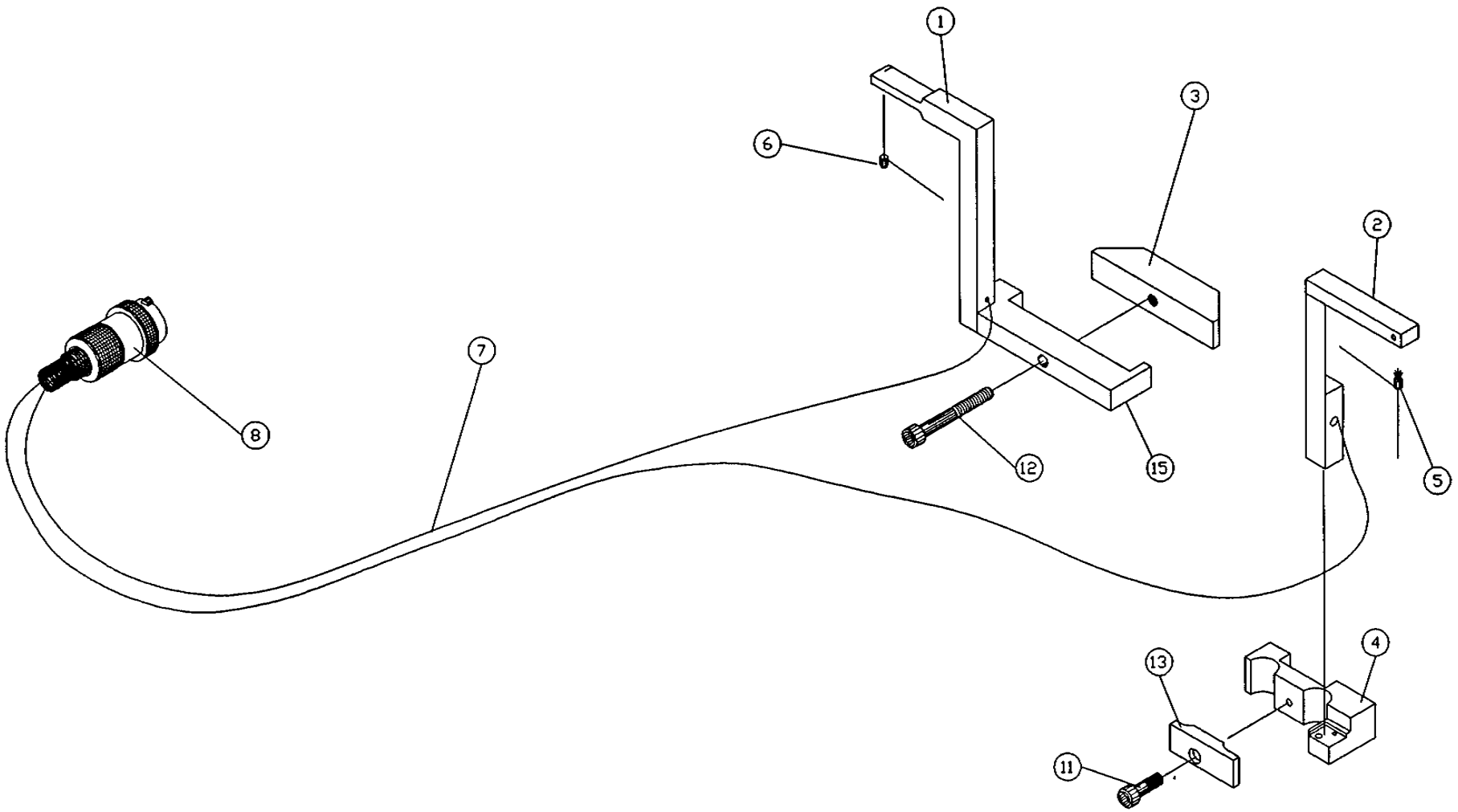
Bill of Material for Assembly 821-1-100

CF8 Counter Bracket Assembly

Revision :A Revision Date: 09-20-96 Effective As of: 09-20-96

ITEM	1...5...10	PART#.....	DESCRIPTION.....	QTY
1	1.....	**N.S.S.**	SENSOR MOUNT	1 EA
2	1.....	**N.S.S.**	SENSOR MOUNT	1 EA
3	1.....	820-1-2	SENSOR COUNTER	1 EA
4	1.....	**N.S.S.**	SENSOR BRACKET	1 EA
5	1.....	3700-0008	EMITTER, IR	1 EA
6	1.....	3700-0009	DETECTOR, IR	1 EA
7	1.....	6000-0015	COAXIAL WIRE RG 174/V	AR IN
8	1.....	2100-0053	CONNECTOR, MICROPHONE	1 EA
9	1.....	SACAN0632050	SCREW,ALLEN,CAP	AR EA
10	1.....	SACAN0440062	SCREW,ALLEN,CAP	AR EA
11	1.....	SACAN0832050	SCREW,ALLEN,CAP	AR EA
12	1.....	SACAN1032150	SCREW,ALLEN,CAP	AR EA
13	1.....	820-1-9	COUNTER BRACKET	1 EA
14	1.....	2800-0014	HARDWARE ELECTRICAL	1 EA
15	1.....	**N.S.S.**	COUNTER BRACKET	1 EA

N.S.S. = NOT SOLD SEPARATELY



GPD

CF8 Counter Bracket Assembly No. 821-1-100

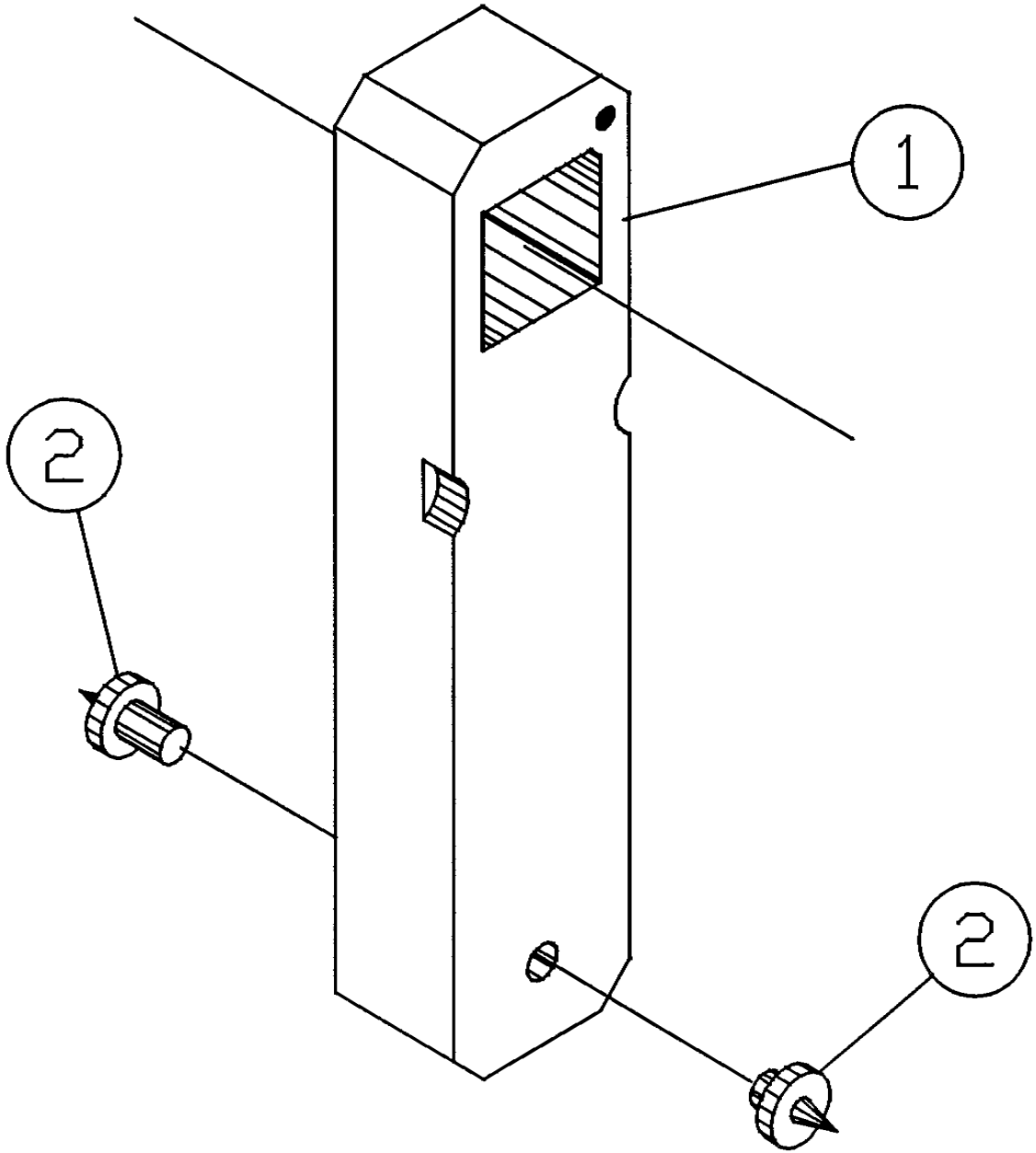
BOM15

Bill of Material for Assembly 821-2-100
Transport Wheels Alignment Tool

Revision :A Revision Date: 06-01-96 Effective As of: 06-01-96

ITEM	1...5...10	PART#.....	DESCRIPTION.....	QTY
1	1.....	N.S.S.	TRANSPORT WHEEL GAUGE BODY	1 EA
2	1.....	N.S.S.	TRANSPORT WHEEL GAUGE LOC. PT.	2 EA

N.S.S. = NOT SOLD SEPARATELY



GPD

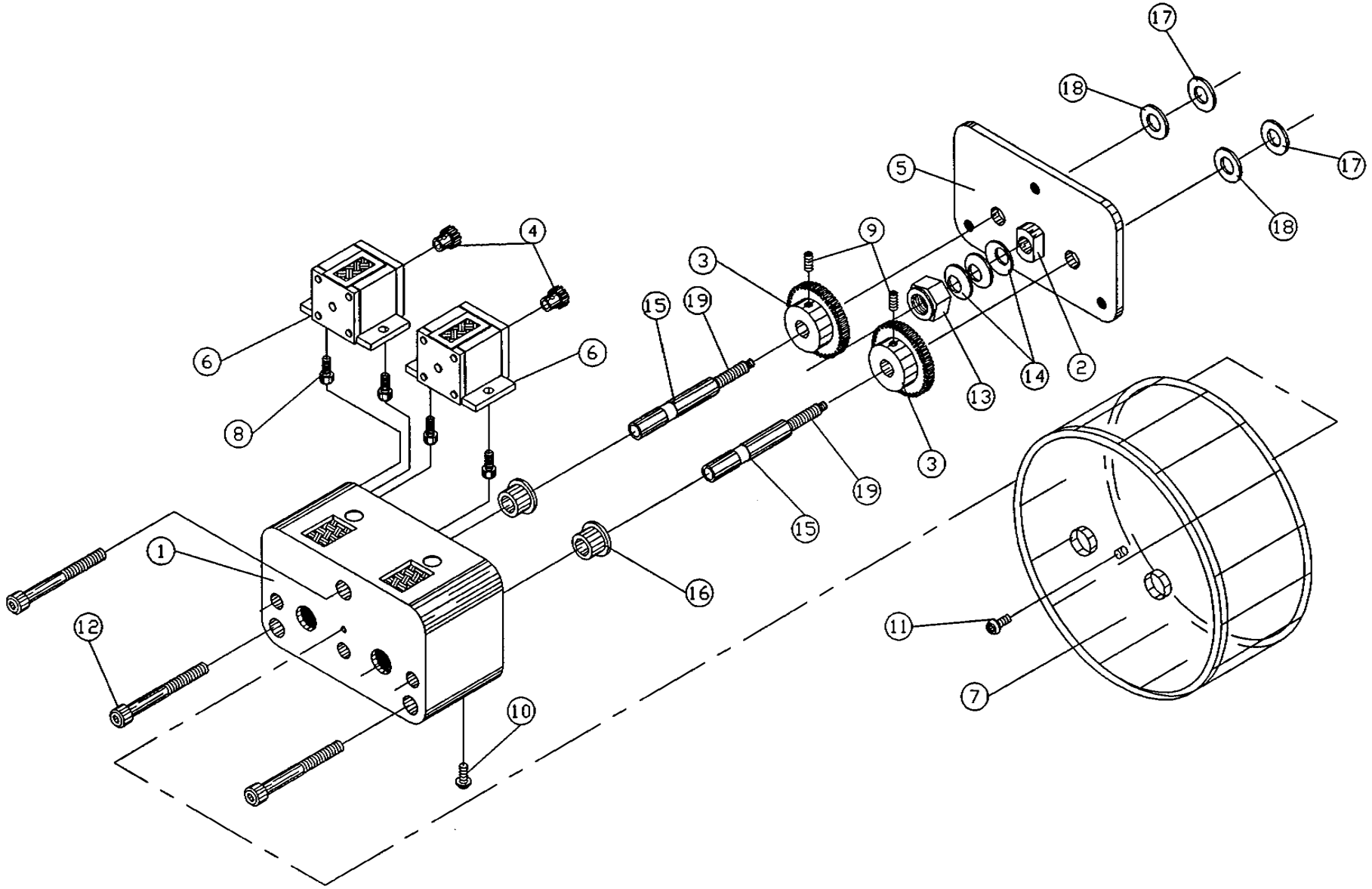
Transport Wheels Alignment Tool No. 821-2-100

BOM15 Bill of Material for Assembly 825-1-114
Counter Box 2&3 Assembly

Revision :B Revision Date: 10-29-14 Effective As of: 09-20-96

ITEM	1...5...10	PART#.....	DESCRIPTION.....	QTY
1	1.....	825-1-1	COUNTER BOX (2&3)	1 EA
2	1.....	825-2-2	SPACER	1 EA
3	1.....	813-1-2	GEAR, SS	2 EA
4	1.....	813-1-1	GEAR, BRASS	2 EA
5	1.....	825-2-5	BACK PLATE	1 EA
6	1.....	825-3-5	V/R COUNTER 745835-001	2 EA
7	1.....	825-4-1	COUNTER SHIELD PLASTIC	1 EA
8	1.....	SABAN0440025	SCREW,ALLEN,BUTTON	AR EA
9	1.....	TACAN0632018	SET.A.CU.STL.	AR EA
10	1.....	M0009	BUTTON PLUG 245-019	8 EA
11	1.....	SACAN0440025	SCREW,ALLEN,CAP	AR EA
12	1.....	SACAN0832150	SCREW,ALLEN,CAP	AR EA
13	1.....	NSIA2520	NUT,NYLON INSERT	AR EA
14	1.....	S4001	WASHER BO500-018	4 EA
15	1.....	825-3-4	SHAFT EXTENSION	2 EA
16	1.....	00/0036	BUSHING,FLANGE,OILITE	2 EA
17	1.....	803-1-17	WASHER, HARDENED .025	2 EA
18	1.....	803-1-18	WASHER, BRASS .050 THICK	2 EA
19	1.....	TAFAN1032100	SET.A.FT.STL.	AR EA

N.S.S. = NOT SOLD SEPARATELY



GPD

Counter Box 2&3 Assembly No. 825-1-114

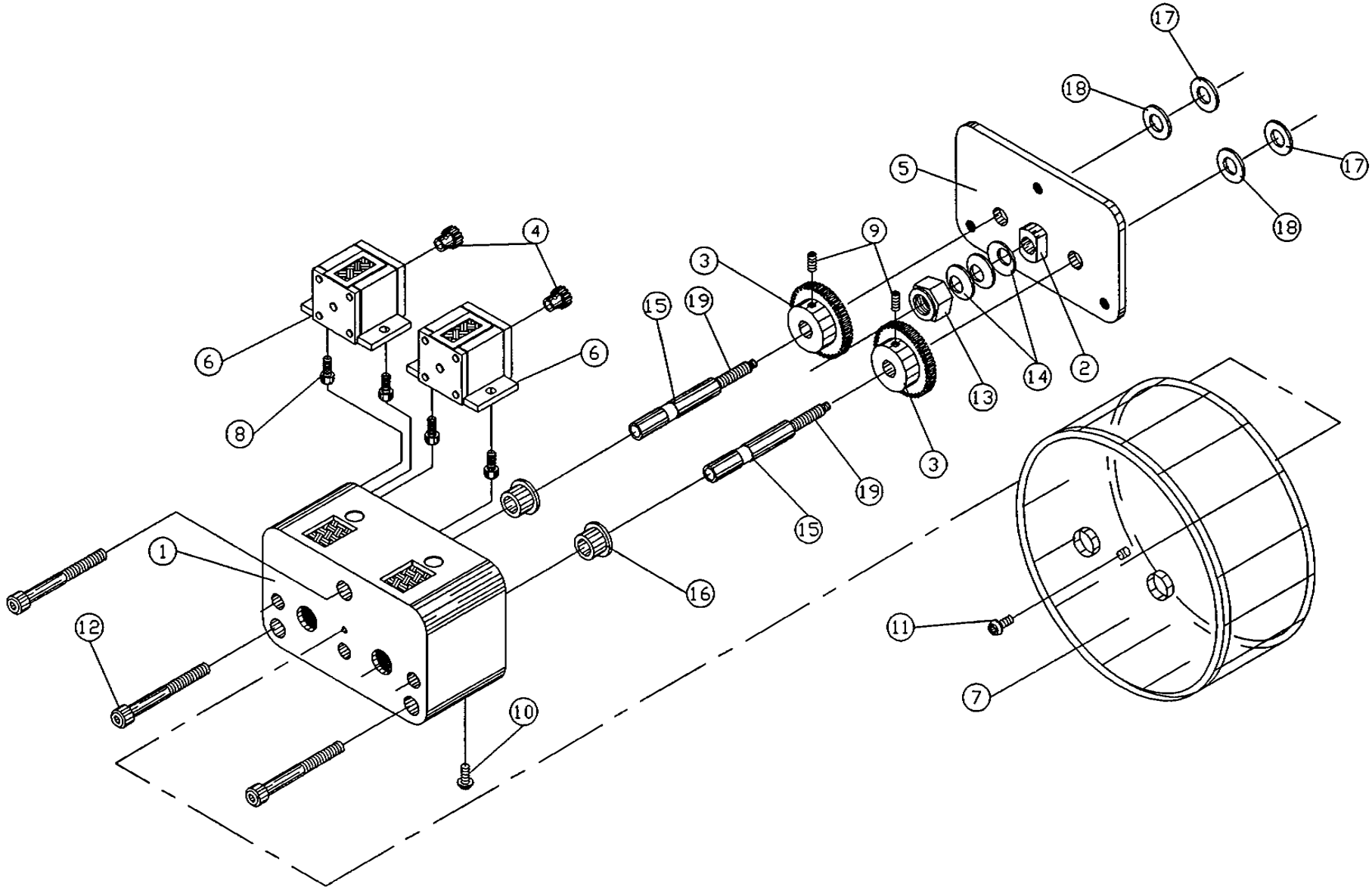
BOM15

Bill of Material for Assembly 825-1-114-MET
Counter Box 2&3 Metric Assembly

Revision :B Revision Date: 09-20-96 Effective As of: 09-20-96

ITEM	1...5...10	PART#.....	DESCRIPTION.....	QTY
1	1.....	825-1-1	COUNTER BOX (2&3)	1 EA
2	1.....	825-2-2	SPACER	1 EA
3	1.....	813-1-2M	GEAR LARGE METRIC	2 EA
4	1.....	813-1-1M	GEAR SMALL METRIC	2 EA
5	1.....	825-2-5	BACK PLATE	1 EA
6	1.....	825-3-5	V/R COUNTER 745835-001	2 EA
7	1.....	825-4-1	COUNTER SHIELD PLASTIC	1 EA
8	1.....	SABAN0440025	SCREW,ALLEN,BUTTON	AR EA
9	1.....	TACAN0632018	SET.A.CU.STL.	AR EA
10	1.....	M0009	BUTTON PLUG 245-019	8 EA
11	1.....	SACAN0440025	SCREW,ALLEN,CAP	AR EA
12	1.....	SACAN0832150	SCREW,ALLEN,CAP	AR EA
13	1.....	NSIA2520	NUT,NYLON INSERT	AR EA
14	1.....	S4001	WASHER 80500-018	AR EA
15	1.....	825-3-4	SHAFT EXTENSION	2 EA
16	1.....	00/0036	BUSHING,FLANGE,OILITE	2 EA
17	1.....	803-1-17	WASHER, HARDENED .025	2 EA
18	1.....	803-1-18	WASHER, BRASS .050 THICK	2 EA
19	1.....	TAFAN1032050	SET.A.FT.STL.	AR EA

N.S.S. = NOT SOLD SEPARATELY



GPD

Counter Box 2&3 Metric Assembly No. 825-1-114-MET

BOM15

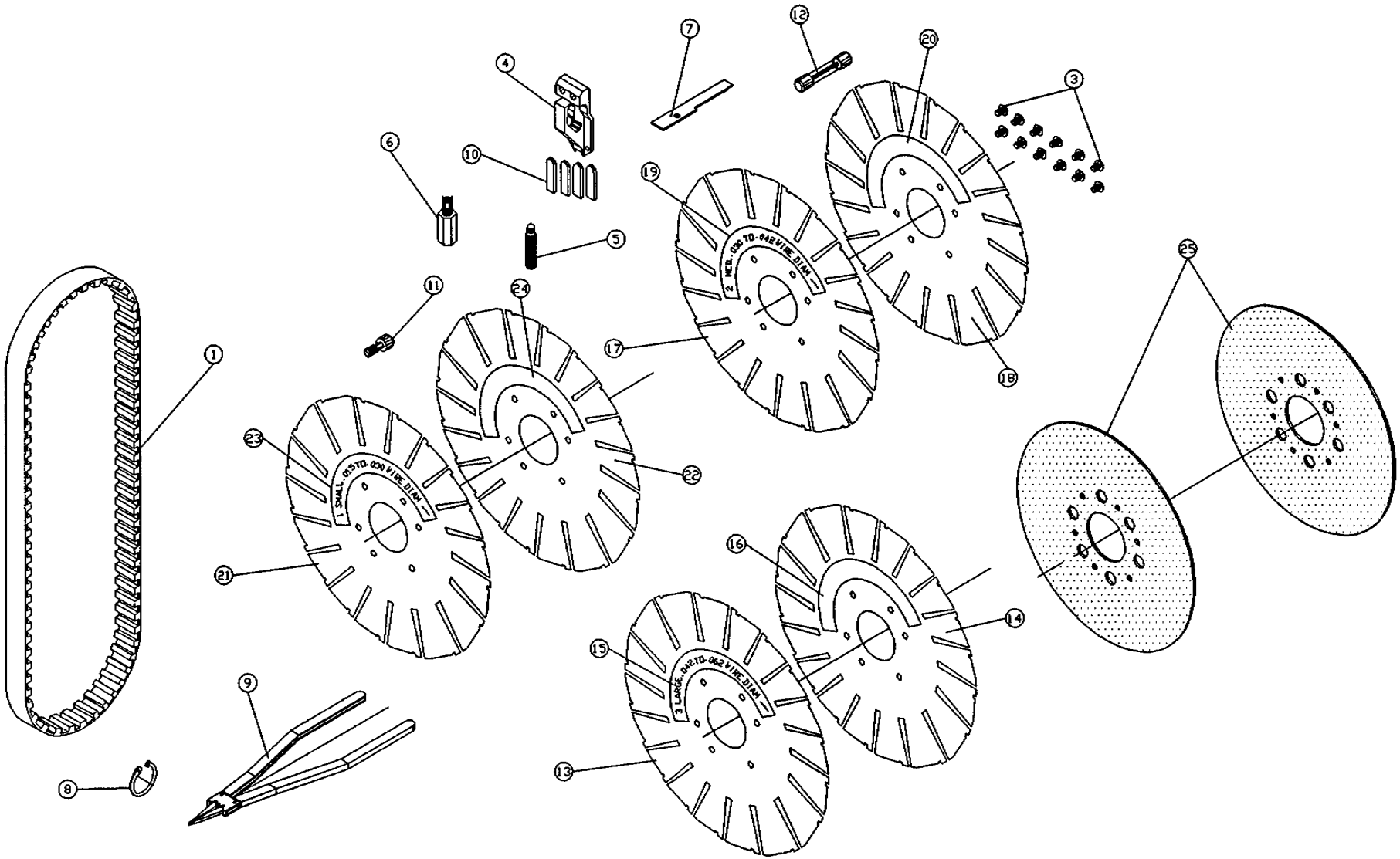
Bill of Material for Assembly 830-1-500
120V 60HZ CF8 Spare Parts Kit

Revision :A Revision Date: 09-20-96 Effective As of: 09-20-96

ITEM	1...5...10	PART#.....	DESCRIPTION.....	QTY
1	1.....	D0006	MOTOR BELT	1 EA
2	NOT APPLICABLE			
3	1.....	817-1-14	HOLDER SCREW	12 EA
4	1.....	801-1-9	WIRE CLAMP W/RED INSERT	2 EA
5	1.....	S5003	SPRING PLUNGER S52P	2 EA
6	1.....	S6002	VLIER WRENCH VW-52	1 EA
7	1.....	801-1-5	LEAF SPRING	16 EA
8	1.....	G1001	RETAINING RING 5100-12	AR EA
9	1.....	821-4-12	CIRCLIP PLIERS	1 EA
10	1.....	801-1-22	WIRECLAMP INSERT - RED	4 EA
11	1.....	801-1-19	PIN DIE SCREW	8 EA
12	1.....	4300-0011	FUSE,SLOW BLOW	1 EA
13	1.....	*	TRANSPT WHL SHIM LRG (L)	1 EA
14	1.....	*	TRANSPT WHL SHIM LRG (R)	1 EA
15	1.....	817-1-402-L	STICKER TRANSPORT WHEEL-LEFT	AR EA
16	1.....	817-1-402-R	STICKER TRANSPORT WHEEL-RIGHT	AR EA
17	1.....	**	TRANSPT WHL SHIM MED (L)	1 EA
18	1.....	**	TRANSPT WHL SHIM MED (R)	1 EA
19	1.....	817-1-401-L	STICKER TRANSPORT WHEEL-LEFT	AR EA
20	1.....	817-1-401-R	STICKER TRANSPORT WHEEL-RIGHT	AR EA
21	1.....	***	TRANSPT WHL SHIM SML (L)	1 EA
22	1.....	***	TRANSPT WHL SHIM SML (R)	1 EA
23	1.....	817-1-400-L	STICKER TRANSPORT WHEEL-LEFT	AR EA
24	1.....	817-1-400-R	STICKER TRANSPORT WHEEL-RIGHT	AR EA
25	1.....	817-1-3	WHEEL HOLDER	2 EA

* SOLD IN PAIRS ONLY # 817-4-4L (817-4-4L-RUB IF WITH RUBBER PADS)
** SOLD IN PAIRS ONLY # 817-4-4M (817-4-4M-RUB IF WITH RUBBER PADS)
*** SOLD IN PAIRS ONLY # 817-4-4S (817-4-4S-RUB IF WITH RUBBER PADS)

N.S.S. = NOT SOLD SEPARATELY



GPD

120V 60HZ CF8 Spare Parts Kit No. 830-1-500

BOM15

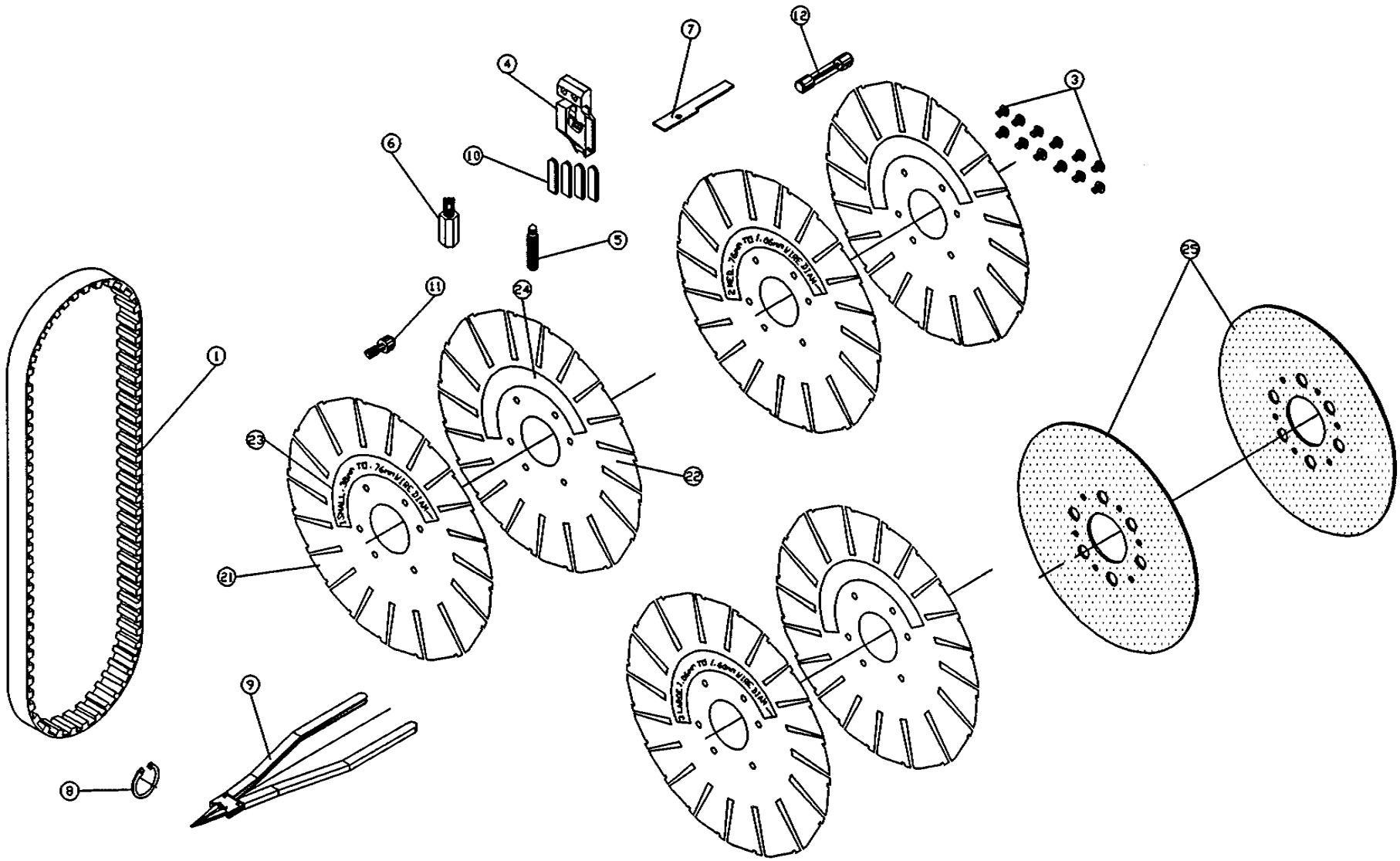
Bill of Material for Assembly 830-1-510
230V 50HZ CF8 Metric Spare Parts Kit

Revision :A Revision Date: 09-20-96 Effective As of: 09-20-96

ITEM	1...5...10	PART#.....	DESCRIPTION.....	QTY
1	1.....	D0006	MOTOR BELT	1 EA
2	NOT APPLICABLE			
3	1.....	817-1-14	HOLDER SCREW	12 EA
4	1.....	801-1-9	WIRE CLAMP W/RED INSERT	2 EA
5	1.....	S5003	SPRING PLUNGER S52P	2 EA
6	1.....	S6002	VLIER WRENCH VW-52	1 EA
7	1.....	801-1-5	LEAF SPRING	16 EA
8	1.....	G1001	RETAINING RING 5100-12	AR EA
9	1.....	821-4-12	CIRCLIP PLIERS	1 EA
10	1.....	801-1-22	WIRECLAMP INSERT - RED	4 EA
11	1.....	801-1-19	PIN DIE SCREW	8 EA
12	1.....	4300-0012	FUSE,SLOW BLOW	1 EA
13	1.....	*	TRANSPT WHL SHIM LRG (L)	1 EA
14	1.....	*	TRANSPT WHL SHIM LRG (R)	1 EA
15	1.....	817-1-402-L	STICKER,TRANSPORT WHEEL-LEFT	AR EA
16	1.....	817-1-402-R	STICKER,TRANSPORT WHEEL-RIGHT	AR EA
17	1.....	**	TRANSPT WHL SHIM MED (L)	1 EA
18	1.....	**	TRANSPT WHL SHIM MED (R)	1 EA
19	1.....	817-1-401-L	STICKER TRANSPORT WHEEL-LEFT	AR EA
20	1.....	817-1-401-R	STICKER TRANSPORT WHEEL-RIGHT	AR EA
21	1.....	***	TRANSPT WHL SHIM SML (L)	1 EA
22	1.....	***	TRANSPT WHL SHIM SML (R)	1 EA
23	1.....	817-1-400-L	STICKER TRANSPORT WHEEL-LEFT	AR EA
24	1.....	817-1-400-R	STICKER TRANSPORT WHEEL-RIGHT	AR EA
25	1.....	817-1-3	WHEEL HOLDER	2 EA

* SOLD IN PAIRS ONLY # 817-4-4L (817-4-4L-RUB IF WITH RUBBER PADS)
** SOLD IN PAIRS ONLY # 817-4-4M (817-4-4M-RUB IF WITH RUBBER PADS)
*** SOLD IN PAIRS ONLY # 817-4-4S (817-4-4M-RUB IF WITH RUBBER PADS)

N.S.S. = NOT SOLD SEPARATELY



GPD

230V 50HZ CF8 Metric Spare Parts Kit No. 830-1-510

BOM15

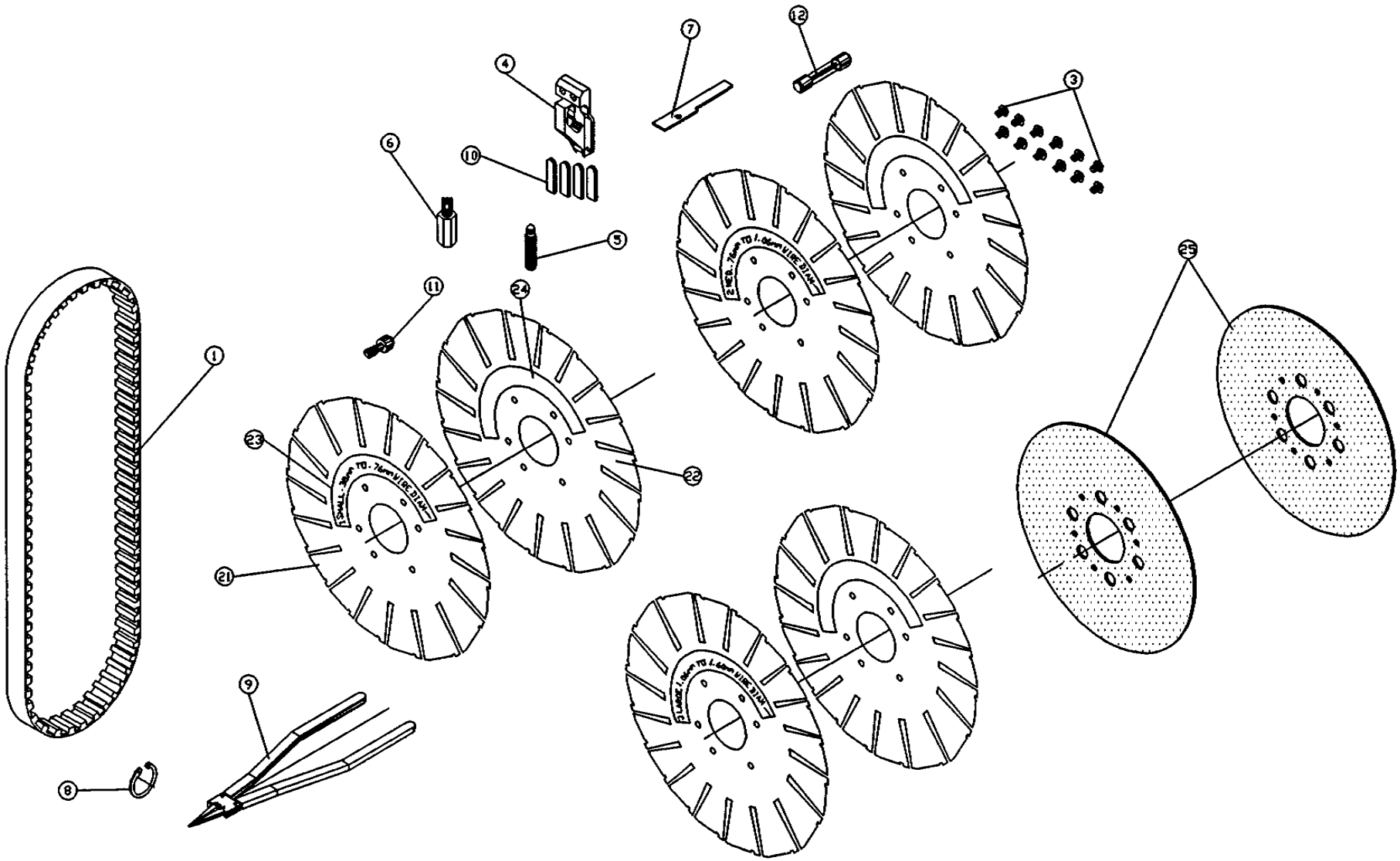
Bill of Material for Assembly 830-1-520
100V 50HZ CF8 Metric Spare Parts Kit

Revision :A Revision Date: 09-20-96 Effective As of: 09-20-96

ITEM	1...5...10	PART#.....	DESCRIPTION.....	QTY
1	1.....	D0006	MOTOR BELT	1 EA
2	NOT APPLICABLE			
3	1.....	817-1-14	HOLDER SCREW	12 EA
4	1.....	801-1-9	WIRE CLAMP W/RED INSERT	2 EA
5	1.....	S5003	SPRING PLUNGER S52P	2 EA
6	1.....	S6002	VLIER WRENCH VW-52	1 EA
7	1.....	801-1-5	LEAF SPRING	16 EA
8	1.....	G1001	RETAINING RING 5100-12	AR EA
9	1.....	821-4-12	CIRCLIP PLIERS	1 EA
10	1.....	801-1-22	WIRECLAMP INSERT - RED	4 EA
11	1.....	801-1-19	PIN DIE SCREW	8 EA
12	1.....	4300-0011	FUSE, SLOW BLOW	1 EA
13	1.....	*	TRANSPT WHL SHIM LRG (L)	1 EA
14	1.....	*	TRANSPT WHL SHIM LRG (R)	1 EA
15	1.....	817-1-402-L	STICKER,TRANSPORT WHEEL-LT	AR EA
16	1.....	817-1-402-R	STICKER,TRANSPORT WHEEL-RT	AR EA
17	1.....	**	TRANSPT WHL SHIM MED (L)	1 EA
18	1.....	**	TRANSPT WHL SHIM MED (R)	1 EA
19	1.....	817-1-401-L	STICKER,TRANSPORT WHEEL-RT	AR EA
20	1.....	817-1-401-R	STICKER,TRANSPORT WHEEL-RT	AR EA
21	1.....	***	TRANSPT WHL SHIM SML (L)	1 EA
22	1.....	***	TRANSPT WHL SHIM SML (R)	1 EA
23	1.....	817-1-400-L	STICKER,TRANSPORT WHEEL-LT	AR EA
24	1.....	817-1-400-R	STICKER,TRANSPORT WHEEL-RT	AR EA
25	1.....	817-1-3	WHEEL HOLDER	2 EA

* SOLD IN PAIRS ONLY # 817-4-4L (817-4-4L-RUB IF WITH RUBBER PADS)
** SOLD IN PAIRS ONLY # 817-4-4M (817-4-4M-RUB IF WITH RUBBER PADS)
*** SOLD IN PAIRS ONLY # 817-4-4S (817-4-4M-RUB IF WITH RUBBER PADS)

N.S.S. = NOT SOLD SEPARATELY



100V 50HZ CF8 Metric Spare Parts Kit No. 830-1-520

BOM15

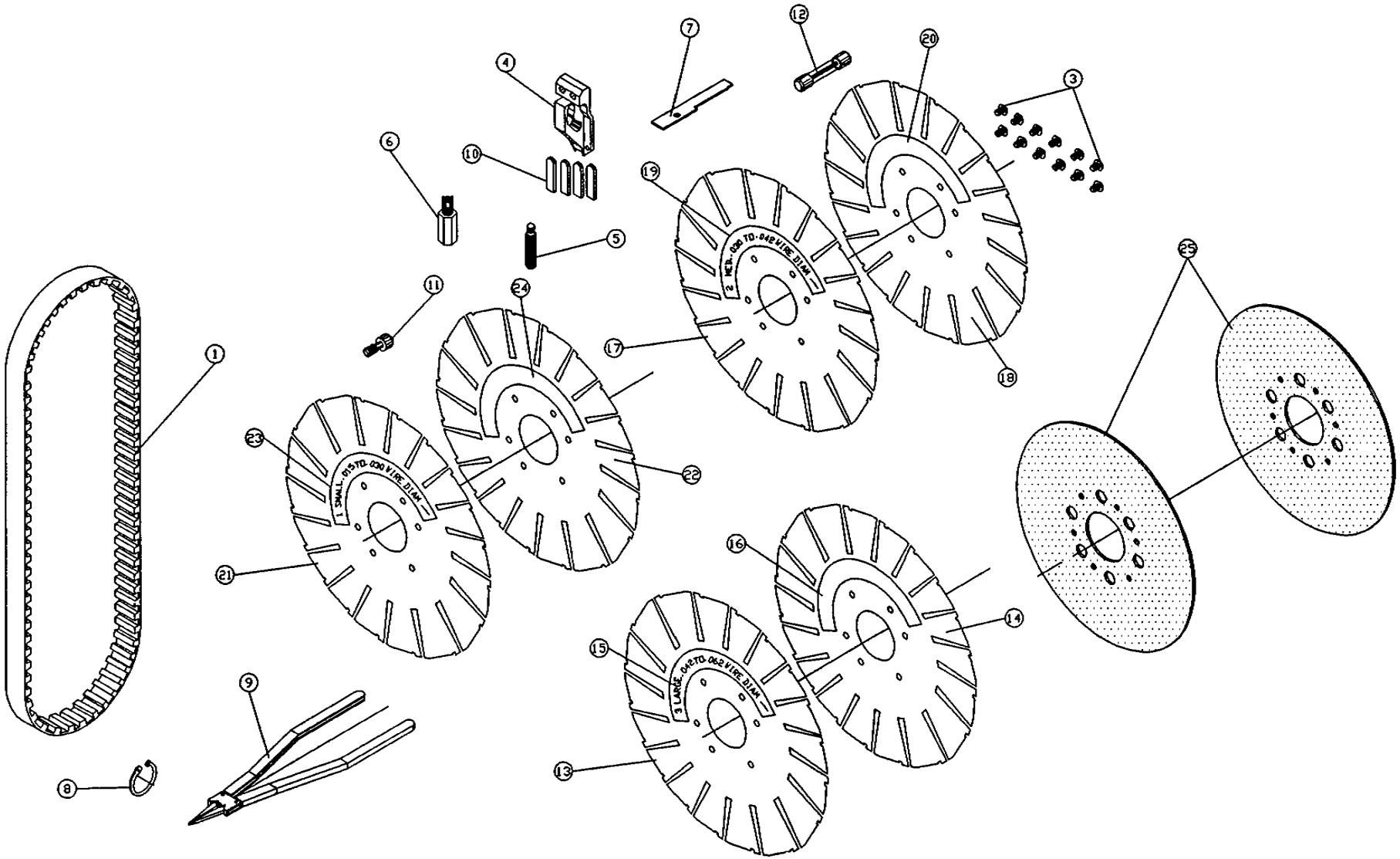
Bill of Material for Assembly 830-1-530
230V 50HZ CF8 Spare Parts Kit

Revision :A Revision Date: 09-20-96 Effective As of: 09-20-96

ITEM	1...5...10	PART#.....	DESCRIPTION.....	QTY
1	1.....	D0006	MOTOR BELT	1 EA
2	NOT APPLICABLE			
3	1.....	817-1-14	HOLDER SCREW	12 EA
4	1.....	801-1-9	WIRE CLAMP W/RED INSERT	2 EA
5	1.....	S5003	SPRING PLUNGER S52P	2 EA
6	1.....	S6002	VLIER WRENCH VW-52	1 EA
7	1.....	801-1-5	LEAF SPRING	16 EA
8	1.....	G1001	RETAINING RING 5100-12	AR EA
9	1.....	821-4-12	CIRCLIP PLIERS	1 EA
10	1.....	801-1-22	WIRECLAMP INSERT - RED	4 EA
11	1.....	801-1-19	PIN DIE SCREW	8 EA
12	1.....	4300-0012	FUSE,SLOW BLOW	1 EA
13	1.....	*	TRANSPT WHL SHIM LRG (L)	1 EA
14	1.....	*	TRANSPT WHL SHIM LRG (R)	1 EA
15	1.....	817-1-402-L	STICKER,TRANSPORT WHEEL-LT	AR EA
16	1.....	817-1-402-R	STICKER,TRANSPORT WHEEL-RT	AR EA
17	1.....	**	TRANSPT WHL SHIM MED (L)	1 EA
18	1.....	**	TRANSPT WHL SHIM MED (R)	1 EA
19	1.....	817-1-401-L	STICKER,TRANSPORT WHEEL-RT	AR EA
20	1.....	817-1-401-R	STICKER,TRANSPORT WHEEL-RT	AR EA
21	1.....	***	TRANSPT WHL SHIM SML (L)	1 EA
22	1.....	***	TRANSPT WHL SHIM SML (R)	1 EA
23	1.....	817-1-400-L	STICKER,TRANSPORT WHEEL-LT	AR EA
24	1.....	817-1-400-R	STICKER,TRANSPORT WHEEL-RT	AR EA
25	1.....	817-1-3	WHEEL HOLDER	2 EA

* SOLD IN PAIRS ONLY # 817-4-4L (817-4-4L-RUB IF WITH RUBBER PADS)
** SOLD IN PAIRS ONLY # 817-4-4M (817-4-4M-RUB IF WITH RUBBER PADS)
*** SOLD IN PAIRS ONLY # 817-4-4S (817-4-4S-RUB IF WITH RUBBER PADS)

N.S.S. = NOT SOLD SEPARATELY



230V 50HZ CF8 Spare Parts Kit No. 830-1-530

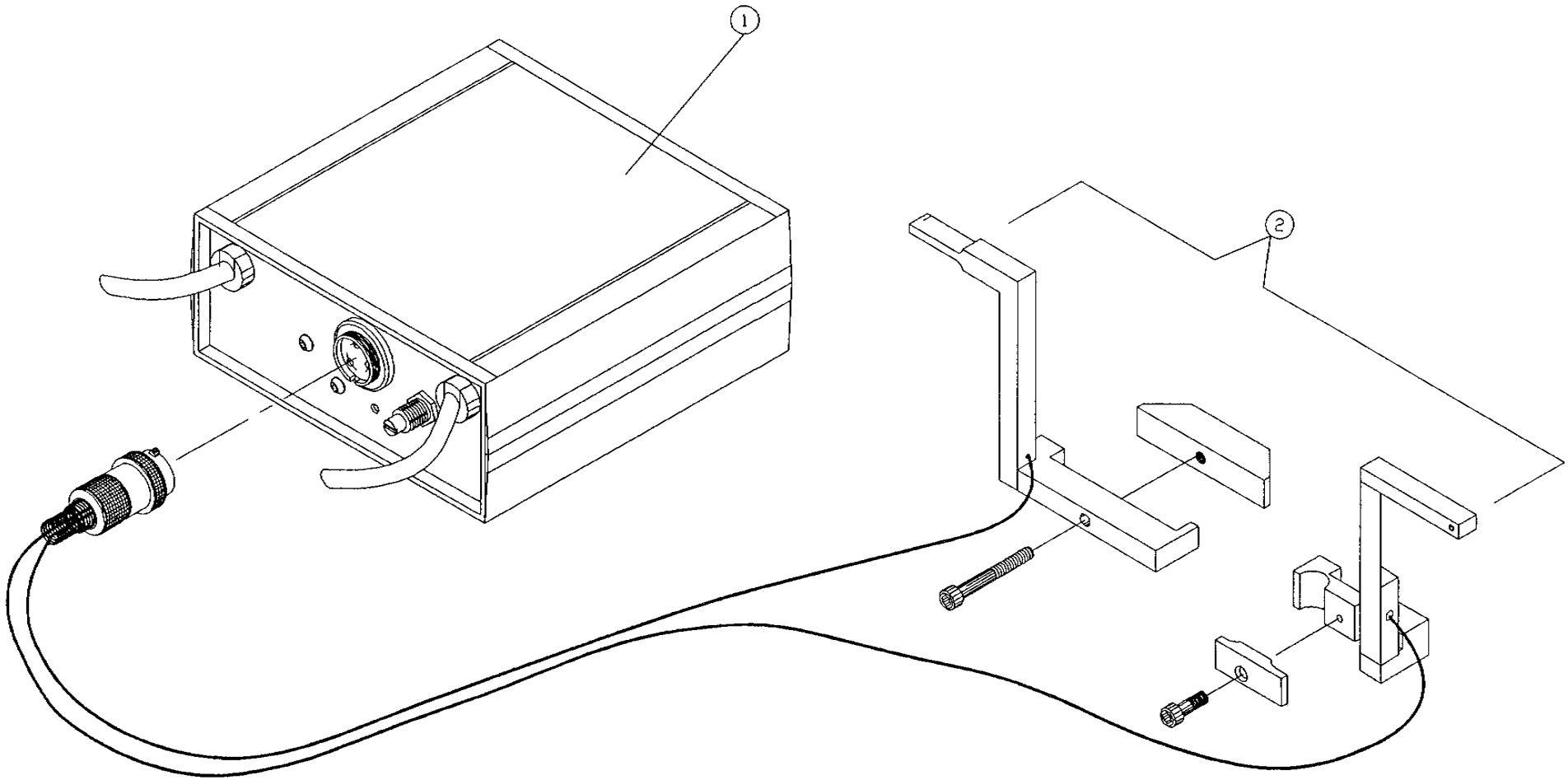
BOM15

Bill of Material for Assembly 830-1-600
120V 50/60HZ CF8 Counter Package

Revision :A Revision Date: 08-26-96 Effective As of: 08-26-96

ITEM	1...5...10	PART#.....	DESCRIPTION.....	QTY
1	1.....	CC789-1	PRESET COUNTER-120V	1 EA
2	1.....	821-1-100	CF8 COUNTER BRACKET ASSY	1 EA
3	1.....	830-1-601	PROCEDURE,COUNTER INSTALL	1 EA

N.S.S. = NOT SOLD SEPARATELY



GPD

120V 50/60HZ CF8 Counter Package No. 830-1-600

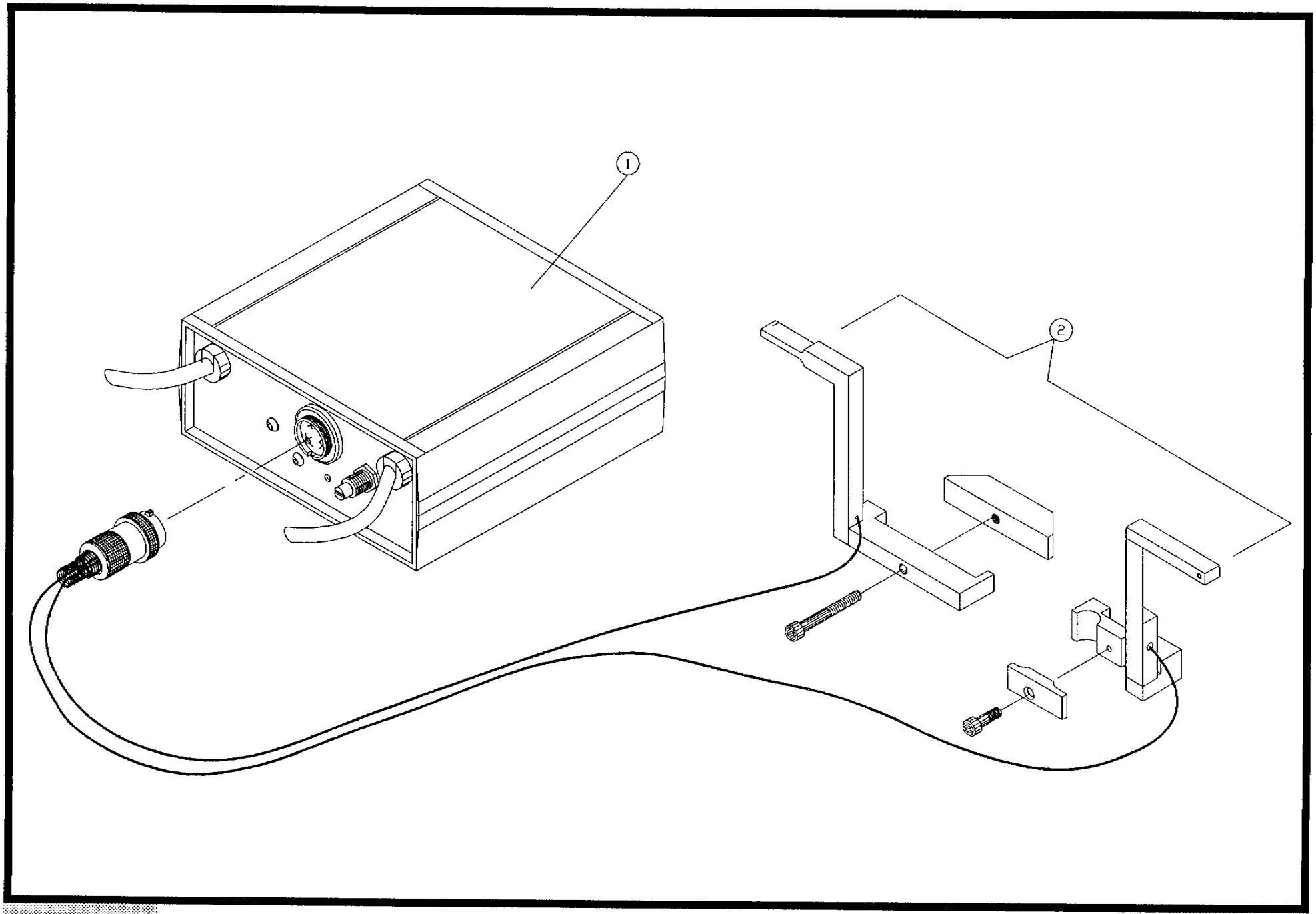
BOM15

Bill of Material for Assembly 830-1-610
230V 50HZ CF8 Counter Package

Revision :A Revision Date: 08-26-96 Effective As of: 08-26-96

ITEM	1...5...10	PART#.....	DESCRIPTION.....	QTY
1	1.....	CC789-2	PRESET COUNTER-230V	1 EA
2	1.....	821-1-100	CF8 COUNTER BRACKET ASSY	1 EA
3	1.....	830-1-601	PROCEDURE,COUNTER INSTALL	1 EA

N.S.S. = NOT SOLD SEPARATELY



GPD

230V 50HZ CF8 Counter Package No. 830-1-610

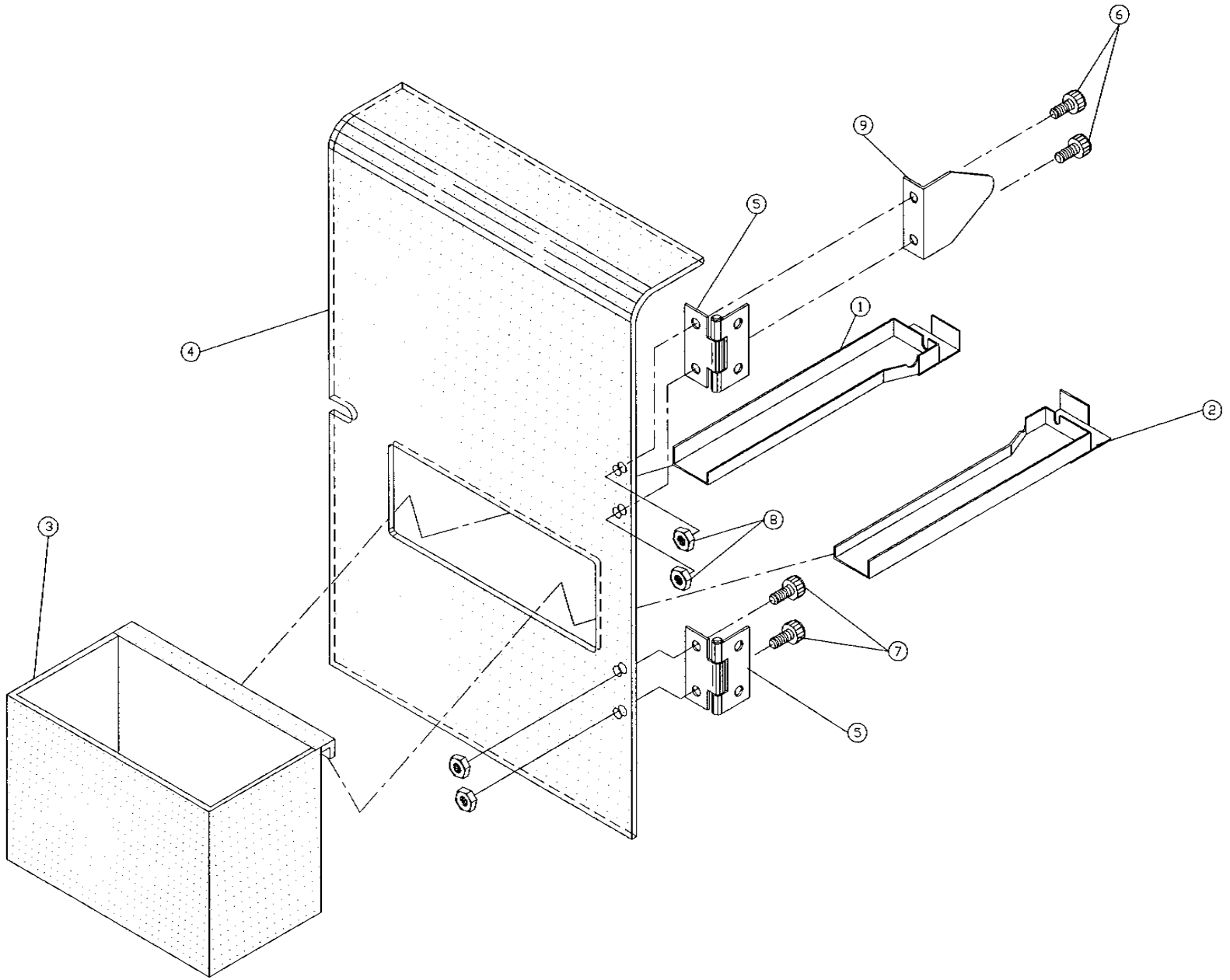
BOM15

Bill of Material for Assembly 830-700
CF8 Secondary Exit Package

Revision :A Revision Date: 08-27-96 Effective As of: 08-27-96

ITEM	1...5...10	PART#.....	DESCRIPTION.....	QTY
1	1.....	820-0-4L	CHUTE.SECONDARY.EXIT.LEFT	1 EA
2	1.....	820-0-4R	CHUTE.SECONDARY.EXIT.RGHT	1 EA
3	1.....	711-1	SCRAP BIN	1 EA
4	1.....	819-1-1EA	ANTISTATIC SAFETY SHIELD	1 EA
5	1.....	HG-210	HINGE, SAFETY GUARD	2 EA
6	1.....	SACAN1032050	SCREW,ALLEN,CAP	AR EA
7	1.....	SABAN1032037	SCREW,ALLEN,BUTTON	AR EA
8	1.....	NSNA1032	NUT	AR EA
9	1.....	810-4-2A	MICROSWITCH BRACKET	1 EA

N.S.S. = NOT SOLD SEPARATELY



GPD

CF8 Secondary Exit Package No. 830-700

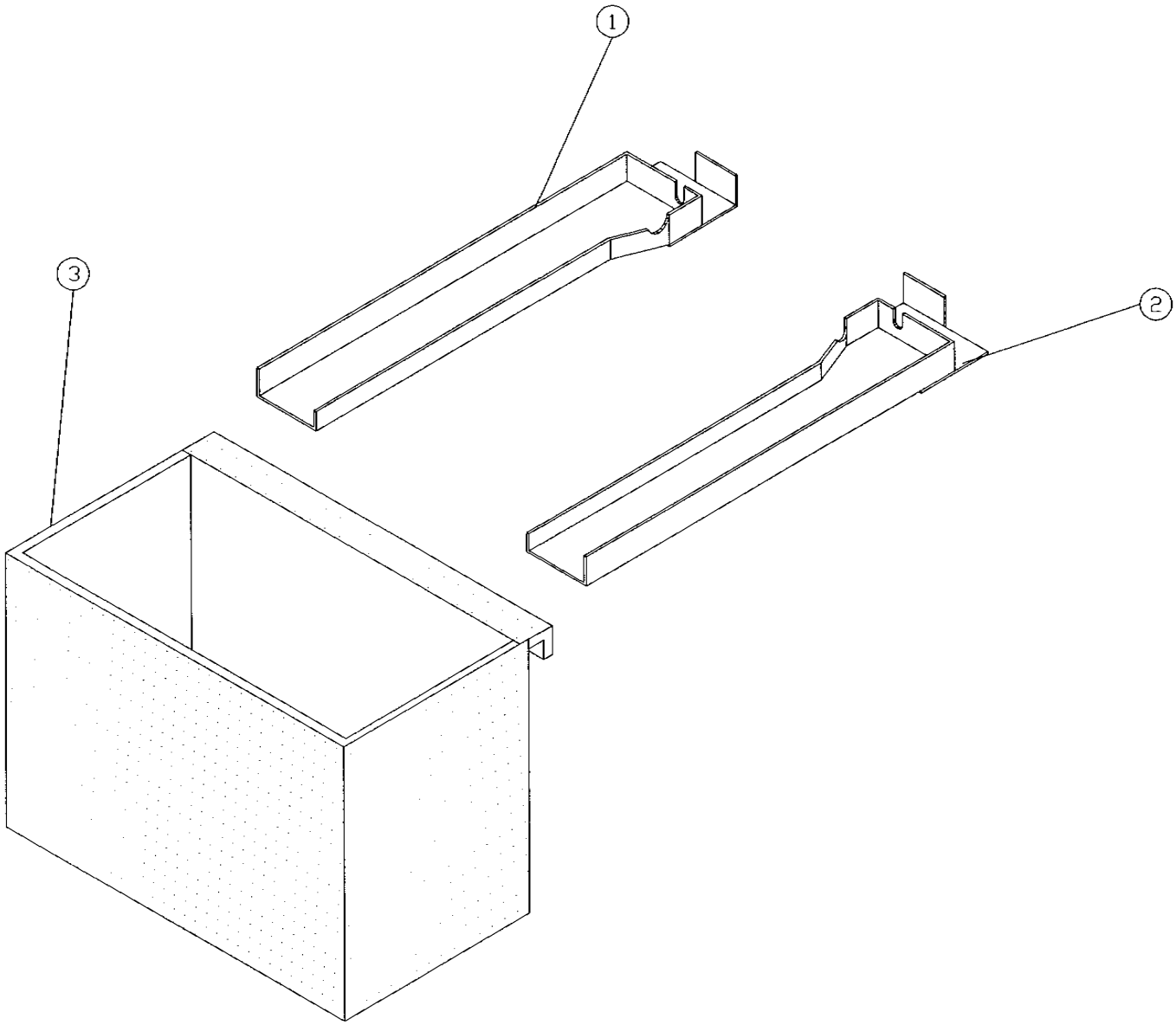
BOM15

Bill of Material for Assembly 830-705
CF8 Secondary Exit Option

Revision :A Revision Date: 08-27-96 Effective As of: 08-27-96

ITEM	1...5...10	PART#.....	DESCRIPTION.....	QTY
1	1.....	820-0-4L	CHUTE.SECONDARY.EXIT.LEFT	1 EA
2	1.....	820-0-4R	CHUTE.SECONDARY.EXIT.RGHT	1 EA
3	1.....	711-1	SCRAP BIN	1 EA

N.S.S. = NOT SOLD SEPARATELY



GPD

CF8 Secondary Exit Option No. 830-705

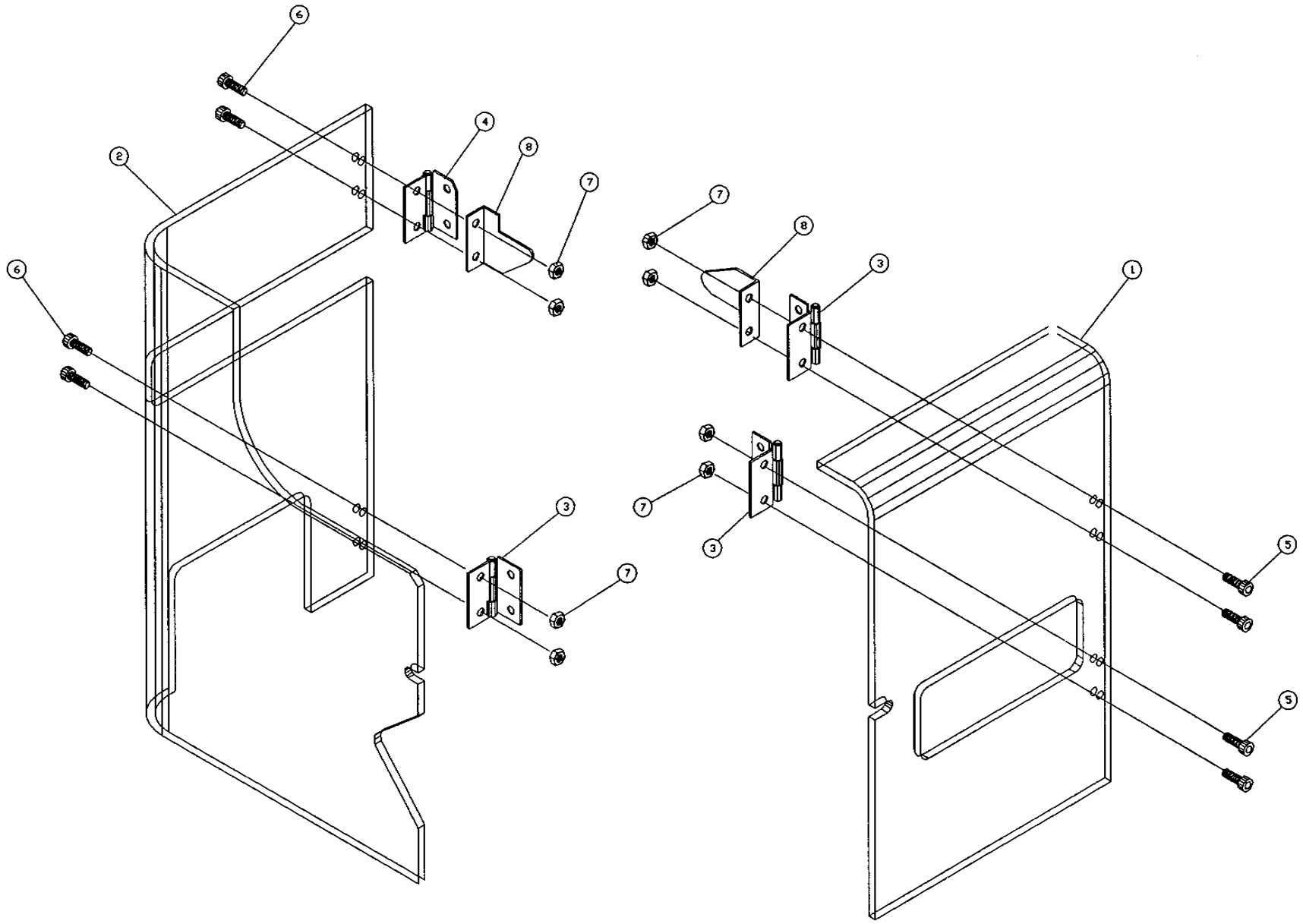
BOM15

Bill of Material for Assembly 830-1-720
CF8 Antistatic Shield Package

Revision :A Revision Date: 08-27-96 Effective As of: 08-27-96

ITEM	1...5...10	PART#.....	DESCRIPTION.....	QTY
1	1.....	819-1-1EA	ANTISTATIC SAFETY SHIELD	1 EA
2	1.....	819-1-3EA	ANTISTATIC SAFETY SHIELD	1 EA
3	1.....	HG-210	HINGE, SAFETY GUARD	3 EA
4	1.....	819-1-5	HINGE - SAFETY GUARD	1 EA
5	1.....	SACAN1032050	SCREW,ALLEN,CAP	AR EA
6	1.....	SABAN1032037	SCREW,ALLEN,BUTTON	AR EA
7	1.....	NSNA1032	NUT	AR EA
8	1.....	810-4-2A	MICROSWITCH BRACKET	2 EA

N.S.S. = NOT SOLD SEPARATELY



GPD

CF8 Antistatic Shield Package No. 830-1-720

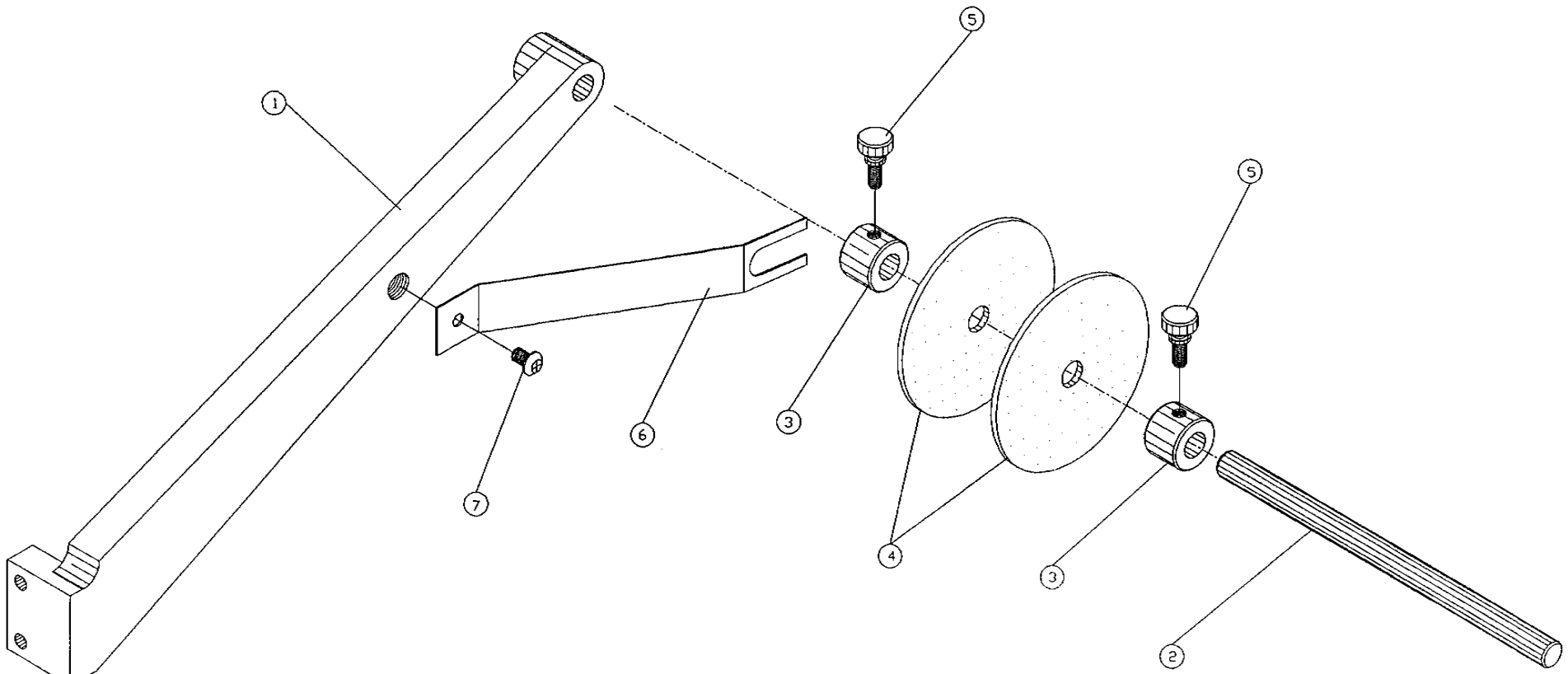
BOM15

Bill of Material for Assembly 707-107
Reel Holder

Revision :A Revision Date: 08-27-90 Effective As of: 08-27-90

ITEM	1...5...10	PART#.....	DESCRIPTION.....	QTY
1	1.....	707-1	REEL AND TAPE ARM	1 EA
2	1.....	707-3	SPINDLE - REEL & TAPE KIT	1 EA
3	1.....	707-4	LOCKING COLLAR R&T KIT	2 EA
4	1.....	707-A	ALUMINUM WASHER R&T KIT	2 EA
5	1.....	707-B	THUMB SCREW	2 EA
6	1.....	707-F	SPRING R&T KIT	1 EA
7	1.....	SABSN2520037	SCR.A.BN.SST.1/4-20X3/8	AR EA

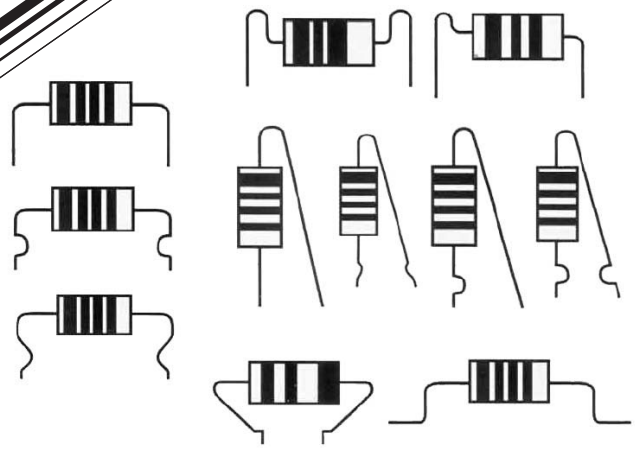
N.S.S. = NOT SOLD SEPARATELY



GPD

REEL HOLDER ASSY - 707 - 107

GPD Global
611 Hollingsworth Street
Grand Junction, CO 81505
Tel: (970) 245-0408 Fax: (970) 245-9674
Web: www.gpd-global.com



CF-8

Component Forming Dies

CF-8 Component Forming Dies are precisely manufactured to form Axial Components accurately into horizontally and vertically mounted configurations.

GPD Part No. 800-000

DIES CAN BE SELECTED AND ORDERED BY ACCESSING THE BRIEF INDEX LOCATED AT THE FRONT OF THE CATALOG. THE INDEX IS A NUMERICAL LISTING OF DIE NUMBERS AND A BRIEF EXPLANATION OF EACH. THESE SAME DIES ARE LISTED AGAIN IN THE MAIN BODY OF THE CATALOG AND ILLUSTRATE DIE FUNCTION AND LIMITATION IN A DETAILED FORMAT.

WHEN ORDERING SPECIAL* DIES OR CONFIGURATIONS NOT SHOWN IN THE CATALOG ADDITIONAL INFORMATION IS REQUIRED IN THE FORM OF COMPONENT SAMPLES, P.C. BOARD SAMPLES, AND DESIRED COMPONENT SHAPE INFORMATION.

* SPECIAL DIES MAY BE SUBJECT TO A PRE-DETERMINED ENGINEERING CHARGE. IN SOME CASES WE MAY NOT BE ABLE TO ACCOMPLISH THE REQUESTED FORM DUE TO MACHINE AND DIE LIMITATIONS.

WE WOULD LIKE TO HELP YOU IN ANY WAY WITH YOUR FORMING NEEDS. PLEASE CALL 970-245-0408

STANDARD DELIVERY TIMES FOR DIES:

STANDARD DIES	STOCK TO 4 WEEKS
MODIFICATIONS OR SPECIAL DIES	6-8 WEEKS

CF-8 Die Catalog for Component Forming Dies
TABLE OF CONTENTS

= requires purchase of secondary exit chute package
* = available on machines after 9/1/89 or CF8s upgraded with extended stroke capability in Stations 4&5

TYPE & P/N	DESCRIPTION	PAGES

CF-8 NOTCHED PLATE KIT 35

800L-0NPK CF-8 Notched Plate Kit

CENTER-TO-CENTER DIE SET 11 & 12

800C-0200 1/8 Watt 200 CTC Die Set
800C-1000 1000 CTC Die Set

UNDERFORMING DIE SET (6 PIECE) (previously 800I-0000) 13 & 14

800I-0040 Under forming Die Set with .040 Pin Die
800I-0060 Under forming Die Set with .060 Pin Die
800I-0080 Under forming Die Set with .080 Pin Die

REFLOW DIES 15 & 16

800J-0030 Reflow Die (30)
800J-0035 Reflow Die (35)
800J-0040 Reflow Die (40)
800J-0045 Reflow Die (45)
800J-0050 Reflow Die (50)
800J-0055 Reflow Die (55)
800J-0060 Reflow Die (60)
800J-0065 Reflow Die (65)
800J-0070 Reflow Die (70)
800J-0080 Reflow Die (80)
800J-0090 Reflow Die (90)
800J-0100 Reflow Die (100)
800J-0110 Reflow Die (110)
800J-0120 Reflow Die (120)
800J-0130 Reflow Die (130)

LOCK-IN KIT (14 PIECE DIE KIT) 18, 19 & 20

800F-1000 .015/ .030 with .040 Modified Horizontal
800F-1200 .015/ .025 with .040 Modified Horizontal
800F-2000 .025/ .035 with .040 Modified Horizontal
800F-3000 .030/ .045 with .060 Modified Horizontal
800F-4000 .045/ .062 with .060 Modified Horizontal

= requires purchase of secondary exit chute package
* = available on machines after 9/1/89 or CF8s upgraded with extended stroke capability in Stations 4&5

TYPE & P/N	DESCRIPTION	PAGES

LOCK-IN KIT (6 PIECE DIE KIT) 18, 19 & 20

800P-0900	Lock-In Kit with .015/.030 (AA) Dimple
800P-1000	Lock-In Kit with .015/ .030 (A) Dimple
800P-1100	Lock-In Kit with .015/ .030 (B] Dimple
800P-1200	Lock-In Kit with .015/ .030 (C) Dimple
800P-1300	Lock-In Kit with .015/ .030 (D) Dimple
800P-2900	Lock-In Kit with .030/.045 (AA) Dimple
800P-3000	Lock-In Kit with .030/ .045 (A) Dimple
800P-3100	Lock-In Kit with .030/ .045 (B) Dimple
800P-3200	Lock-In Kit with .030/ .045 (C) Dimple
800P-3300	Lock-In Kit with .030/ .045 (D) Dimple
800P-3900	Lock-In Kit with .045/.062 (AA) Dimple
800P-4000	Lock-In Kit with .045/ .062 (A) Dimple
800P-4100	Lock-In Kit with .045/ .062 (B) Dimple
800P-4200	Lock-In Kit with .045/ .062 (C) Dimple
800P-4300	Lock-In Kit with .045/ .062 (D) Dimple

FLUSHMOUNT LOCK-IN (14 PIECE KIT) 21 & 22

800M-1000	.015 / .030 with .040 Modified Horizontal
800M-3000	.030 / .045 with .060 Modified Horizontal
800M-4000	.045 / .062 with .060 Modified Horizontal

LOCK-IN KIT WITH KNIFE (14 PIECE DIE KIT) *** #** 23 & 24

800G-1000	.015 / .030 (.030/ .040 Protrusion)
800G-1100	.015 / .030 (.045/ .055 Protrusion)
800G-1200	.015 / .025 (.045/ .055 Protrusion) w/.040 modified horizontal
800G-2000	.025 / .035 (.045/ .055 Protrusion) w/.040 modified horizontal
800G-3000	.030 / .045 (.030/ .040 Protrusion)
800G-3100	.030 / .045 (.045/ .055 Protrusion)
800G-4000	.045 / .062 (.030/ .040 Protrusion)
800G-4100	.045 / .062 (.045/ .055 Protrusion)

= requires purchase of secondary exit chute package
* = available on machines after 9/1/89 or CF8s upgraded with extended stroke capability in Stations 4&5

= requires purchase of secondary exit chute package
* = available on machines after 9/1/89 or CF8s upgraded with extended stroke capability in Stations 4&5

SPECIAL DOUBLE DIMPLE DIES WITH SECONDARY CUT (6 PIECE) 31

800N-6000	with .030 Modified Horizontal Die, Flush Mount only (.050/ .060 Protrusion)
800N-7000	with .030 Modified Horizontal Die, Stand-Off, Lock-In (.050/ .060 Protrusion)
800N-8000	with .030 Modified Horizontal Die, Stand-Off, Lock-In (.050/ .060 Protrusion)
800N-9000	with .040 Modified Horizontal Die, Stand-Off, Lock-In (.050/ .060 Protrusion)

HALF PIN 33 & 34

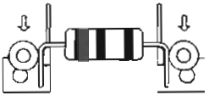
800T-6040	.020 Station #6
800T-7040	.020 Station #7
800T-6060	.030 Station #6
800T-7060	.030 Station #7
800T-6070	.035 Station #6
800T-7070	.035 Station #7
800T-6080	.040 Station #6
800T-7080	.040 Station #7
800T-6100	.050 Station #6
800T-7100	.050 Station #7
800T-6120	.060 Station #6
800T-7120	.060 Station #7
800T-6140	.070 Station #6
800T-7140	.070 Station #7
800T-6160	.080 Station #6
800T-7160	.080 Station #7

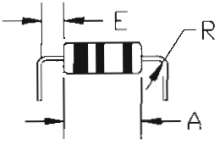
HORIZONTAL BEND DIES.

HORIZONTAL BEND DIES FORM COMPONENT LEAD WIRES AT 90° TO PRODUCE A HORIZONTAL CONFIGURATION.

MEASUREMENTS IN MILLIMETERS

HORIZONTAL BEND DIES ARE PLACED IN STATIONS 6 & 7.





WHEN SELECTING DIES DETERMINE (E) DIMENSION.
TO FIND MINIMUM CENTER-TO-CENTER DISTANCE
ADD BODY LENGTH (A) + 2(E) + 1 LEAD DIA.

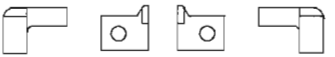
.030 HORIZONTAL DIE SET	E= 1.52 MIN.	RADIUS= 0.38
.040 HORIZONTAL DIE SET	E= 1.78 MIN.	RADIUS= 0.76
.060 HORIZONTAL DIE SET	E= 2.29 MIN.	RADIUS= 1.14
.080 HORIZONTAL DIE SET	E= 2.79 MIN.	RADIUS= 1.65
.100 HORIZONTAL DIE SET	E= 3.30 MIN.	RADIUS= 2.16

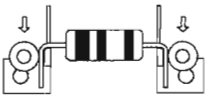
HORIZONTAL BEND DIES.

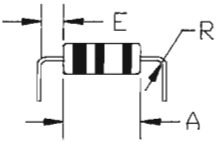
HORIZONTAL BEND DIES FORM COMPONENT LEAD WIRES AT 90° TO PRODUCE A HORIZONTAL CONFIGURATION.

MEASUREMENTS IN INCHES

HORIZONTAL BEND DIES ARE PLACED IN STATIONS 6 & 7.







WHEN SELECTING DIES DETERMINE (E) DIMENSION.
TO FIND MINIMUM CENTER-TO-CENTER DISTANCE
ADD BODY LENGTH (A) + 2(E) + 1 LEAD DIA.

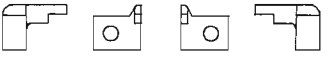
.030	HORIZONTAL	DIE SET	E= .060	MIN.	RADIUS= .015
.040	HORIZONTAL	DIE SET	E= .070	MIN.	RADIUS= .030
.060	HORIZONTAL	DIE SET	E= .090	MIN.	RADIUS= .045
.080	HORIZONTAL	DIE SET	E= .110	MIN.	RADIUS= .065
.100	HORIZONTAL	DIE SET	E= .130	MIN.	RADIUS= .085

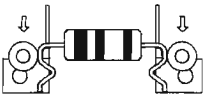
MODIFIED HORIZONTAL BEND DIES.

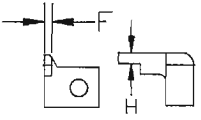
MODIFIED HORIZONTAL DIES HAVE A RELIEF GROUND IN THEM TO ALLOW FOR THE BENDING OF LEADS WITH STAND-OFF OR LOCK-IN DIMPLES.

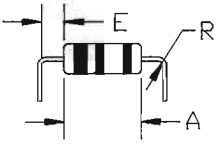
MEASUREMENTS IN MILLIMETERS

MODIFIED HORIZONTAL BEND DIES ARE PLACED IN STATIONS 6 & 7.









WHEN SELECTING DIES DETERMINE (E) DIMENSION.
TO FIND MINIMUM CENTER-TO-CENTER DISTANCE
ADD BODY LENGTH (A) + 2(E) + 1 LEAD DIA.

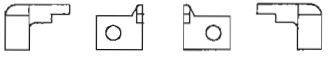
.030 HORIZONTAL DIE SET	E= 1.52 MIN.	RADIUS= 0.38	H=1.02 F=0.76
.040 HORIZONTAL DIE SET	E= 1.78 MIN.	RADIUS= 0.76	H AND F=1.02
.060 HORIZONTAL DIE SET	E= 2.29 MIN.	RADIUS= 1.14	H AND F=1.52
.080 HORIZONTAL DIE SET	E= 2.79 MIN.	RADIUS= 1.65	H AND F=2.03
.100 HORIZONTAL DIE SET	E= 3.30 MIN.	RADIUS= 2.16	H AND F=2.54

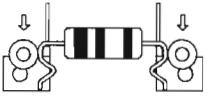
MODIFIED HORIZONTAL BEND DIES.

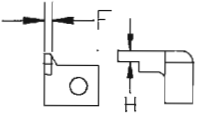
MODIFIED HORIZONTAL DIES HAVE A RELIEF GROUND IN THEM TO ALLOW FOR THE BENDING OF LEADS WITH STAND-OFF OR LOCK-IN DIMPLES.

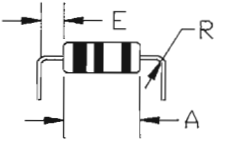
MEASUREMENTS IN INCHES

MODIFIED HORIZONTAL BEND DIES ARE PLACED IN STATIONS 6 & 7.







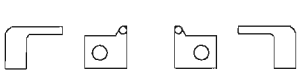


WHEN SELECTING DIES DETERMINE (E) DIMENSION.
TO FIND MINIMUM CENTER-TO-CENTER DISTANCE
ADD BODY LENGTH (A) + 2(E) + 1 LEAD DIA.

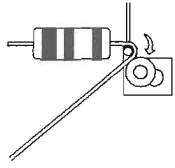
.030 HORIZONTAL DIE SET	E= .060 MIN.	RADIUS= .015	H=.040 F=.030
.040 HORIZONTAL DIE SET	E= .070 MIN.	RADIUS= .030	H AND F=.040
.060 HORIZONTAL DIE SET	E= .090 MIN.	RADIUS= .045	H AND F=.060
.080 HORIZONTAL DIE SET	E= .110 MIN.	RADIUS= .065	H AND F=.080
.100 HORIZONTAL DIE SET	E= .130 MIN.	RADIUS= .085	H AND F=.100

PIN DIES.

PIN DIES FORM COMPONENT LEADS AT ANGLES GREATER THAN 90; AND ARE USED IN THE FORMING OF VERTICAL OR SPECIAL UNDERFORMING CONFIGURATIONS.



PIN DIES ARE PLACED IN STATIONS 6 & 7.
FOR DOING VERTICAL BENDS.
PIN DIES ARE PLACED IN STATIONS 6 AND 7
FOR UNDERFORMING.

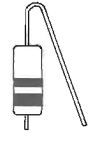


PIN DIES MAY BE ORDERED SEPARATELY
OR IN PAIRS AND ARE AVAILABLE IN
THE FOLLOWING DIAMETERS

.040	DIE RADIUS= 0.51
.060	DIE RADIUS= 0.76
.080	DIE RADIUS= 1.02
.100	DIE RADIUS= 1.27

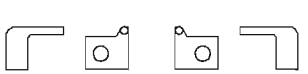
MEASUREMENTS
IN MILLIMETERS

A COMMON FORM PRODUCED
USING A PIN DIE

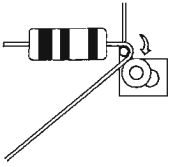


PIN DIES.

PIN DIES FORM COMPONENT LEADS AT ANGLES GREATER THAN 90°, AND ARE USED IN THE FORMING OF VERTICAL OR SPECIAL UNDERFORMING CONFIGURATIONS.



PIN DIES ARE PLACED IN STATIONS 6 & 7.
FOR DOING VERTICAL BENDS.
PIN DIES ARE PLACED IN STATIONS 6 AND 7
FOR UNDERFORMING.

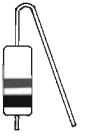


PIN DIES MAY BE ORDERED SEPARATELY
OR IN PAIRS AND ARE AVAILABLE IN
THE FOLLOWING DIAMETERS

.040	DIE RADIUS= .020
.060	DIE RADIUS= .030
.080	DIE RADIUS= .040
.100	DIE RADIUS= .050

MEASUREMENTS IN INCHES

A COMMON FORM PRODUCED
USING A PIN DIE



VERTICAL PARALLEL DIES.

VERTICAL PARALLEL DIES WORK IN CONJUNCTION WITH PIN DIES FOR VERTICAL COMPONENT PLACEMENT WHEN MOUNTING TO A P.C.BOARD

MEASUREMENTS IN MILLIMETERS

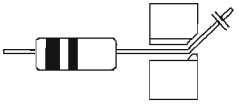
VERTICAL PARALLEL DIES ARE ORDERED AS KITS. A KIT CONTAINS SEVEN DIES THAT WILL FORM LEAD WIRE DIAMETERS OF 0.38 THROUGH 1.52.

VERTICAL PARALLEL DIE KIT:

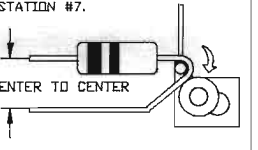
1 - 1530 ST	USE .060 PIN DIE	VERTICAL PARALLEL DIES.
1 - 1530 SB		
1 - 3060 ST *	USE .080 PIN DIE	
1 - 3045 SB		
1 - 4560 SB		
1 - .060		PIN DIES.
1 - .080		

*(TOP DIE FOR 3045 & 4564)

VERTICAL PARALLEL DIES ARE PLACED IN STATION #5.

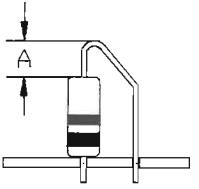


PIN DIE IS PLACED IN STATION #7.



1530 DIES CAN PRODUCE A 5.08 C-C MIN. WITH 0.38-0.76 WIRE DIA.

3060 DIES CAN PRODUCE A 7.62 C-C MIN. WITH 0.76-1.52 WIRE DIA.



FLUSH MOUNT
VERTICAL CONFIGURATION

WHEN USING 1530 DIES DIMENSION (A) = 3.18 MIN.

WHEN USING 3045 DIES DIMENSION (A) = 4.06 MIN.

WHEN USING 4560 DIES DIMENSION (A) = 4.45 MIN.

VERTICAL PARALLEL DIES.

VERTICAL PARALLEL DIES WORK IN CONJUNCTION WITH PIN DIES FOR VERTICAL COMPONENT PLACEMENT WHEN MOUNTING TO A P.C.BOARD

MEASUREMENTS IN INCHES

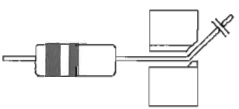
VERTICAL PARALLEL DIES ARE ORDERED AS KITS. A KIT CONTAINS SEVEN DIES THAT WILL FORM LEAD WIRE DIAMETERS OF .015 THROUGH .064.

VERTICAL PARALLEL DIE KIT:

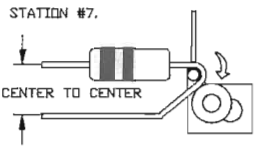
1 - 1530 5T	USE .060 PIN DIE	VERTICAL PARALLEL DIES.
1 - 1530 5B		
1 - 3060 5T *	USE .080 PIN DIE	
1 - 3045 5B		
1 - 4560 5B		
1 - .060		PIN DIES.
1 - .080		

*(TOP DIE FOR 3045 & 4564)

VERTICAL PARALLEL DIES ARE PLACED IN STATION #5.

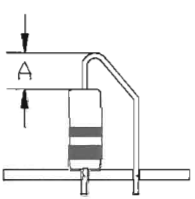


PIN DIE IS PLACED IN STATION #7.



1530 DIES CAN PRODUCE A .200 C-C MIN. WITH .015-.030 WIRE DIA.

3060 DIES CAN PRODUCE A .300 C-C MIN. WITH .030-.060 WIRE DIA.



FLUSH MOUNT VERTICAL CONFIGURATION

WHEN USING 1530 DIES DIMENSION (A) = .125 MIN.

WHEN USING 3045 DIES DIMENSION (A) = .160 MIN.

WHEN USING 4560 DIES DIMENSION (A) = .175 MIN.

TYPE 2A
MILITARY STRESS RELIEF DIES

FOR 0.38 - 1.02 WIRE DIAMETERS

MEASUREMENTS IN MILLIMETERS

DOUBLE HUMP


.030 HORZ.


.040 HORZ.

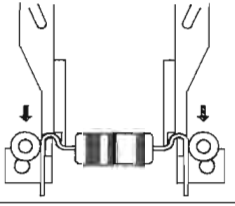

.060 HORZ.

FORMING PLATES


.060


.075


SUPPLIED ALLEN WRENCH



MSR-2A KIT CONTAINS 7 DIES 4 FORMING PLATES, MOUNTING SCREWS, AND MOUNTING WRENCH

6 SPECIAL HORIZONTAL DIES WITH A BLADE THICKNESS OF .030, .040 AND .060 FOR DOUBLE HUMP

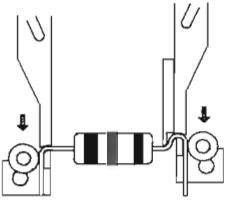
DIE MARKED SE IS USED IN STATION 6 FOR A SINGLE HUMP

FORMING PLATES ARE .060 AND .075 THICK. THE .060 IS FOR CLOSE CENTER TO CENTER AND LEAD DIA. OF 0.38 TO 0.76. THE .075 PLATE IS USED FOR CENTER TO CENTER OVER 11.43 AND WHEN USING LEAD DIA. UP TO 1.02.

SINGLE HUMP

FOR SINGLE HUMP
PLACE S.E. DIE IN STA. 6


S.E. DIE

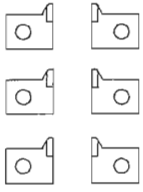


TYPE 2A
MILITARY STRESS RELIEF DIES

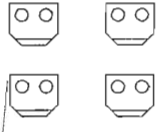
FOR .015 - .040 WIRE DIAMETERS

MEASUREMENTS IN INCHES

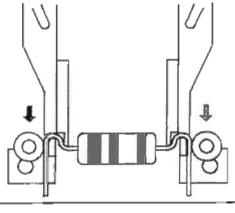
DOUBLE HUMP



FORMING PLATES



SUPPLIED ALLEN WRENCH



MSR-2A KIT CONTAINS 7 DIES 4 FORMING PLATES, MOUNTING SCREWS, AND MOUNTING WRENCH

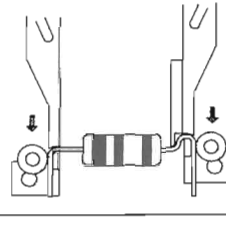
6 SPECIAL HORIZONTAL DIES WITH A BLADE THICKNESS OF .030, .040 AND .060 FOR DOUBLE HUMP

DIE MARKED SE IS USED IN STATION 6 FOR A SINGLE HUMP

FORMING PLATES ARE .060 AND .075 THICK. THE .060 IS FOR CLOSE CENTER TO CENTER AND LEAD DIA. OF .015 TO .030. THE .075 PLATE IS USED FOR CENTER TO CENTER OVER .450 AND WHEN USING LEAD DIA. UP TO .040.

SINGLE HUMP

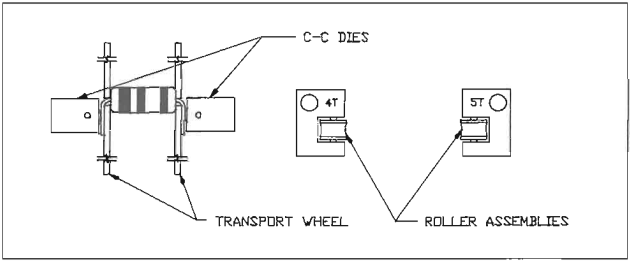
FOR SINGLE HUMP
PLACE S.E. DIE IN STA. 6



CENTER TO CENTER DIES

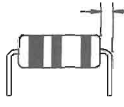
CENTER TO CENTER DIES ARE DESIGNED TO PRODUCE A 90° BEND CLOSE TO THE COMPONENT BODY WHERE MINIMUM C-C DIMENSIONS ARE REQUIRED. C-C DIES ARE USED EXCLUSIVELY FOR HORIZONTAL CONFIGURATIONS.

MEASUREMENTS IN MILLIMETERS



C-C DIES USE ROLLER ASSEMBLIES AND THE TRANSPORT WHEEL TO BEND LEADS AT 90°.

C-C DIES ARE PLACED IN STATIONS 4 & 5 AND ARE ADJUSTED BY STATION DIAL SETS TO ACCOMMODATE COMPONENT BODY LENGTHS.

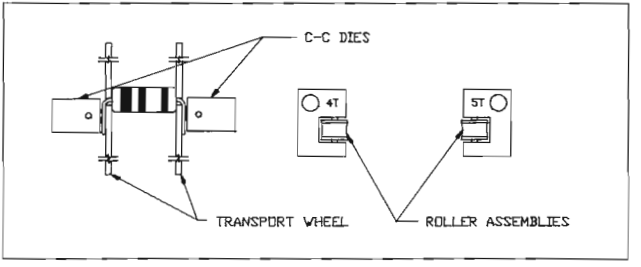


(F) MINIMUMS CAN BE DETERMINED BY ADDING 0.76 FOR THE TRANSPORT WHEEL + LEAD WIRE DIAMETER.

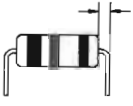
CENTER TO CENTER DIES

CENTER TO CENTER DIES ARE DESIGNED TO PRODUCE A 90° BEND CLOSE TO THE COMPONENT BODY WHERE MINIMUM C-C DIMENSIONS ARE REQUIRED. C-C DIES ARE USED EXCLUSIVELY FOR HORIZONTAL CONFIGURATIONS.

MEASUREMENTS IN INCHES



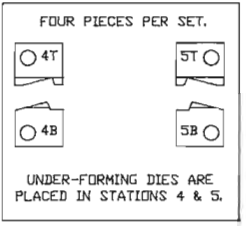
C-C DIES USE ROLLER ASSEMBLIES AND THE TRANSPORT WHEEL TO BEND LEADS AT 90°.
C-C DIES ARE PLACED IN STATIONS 4 & 5 AND ARE ADJUSTED BY STATION DIAL SETS TO ACCOMMODATE COMPONENT BODY LENGTHS.

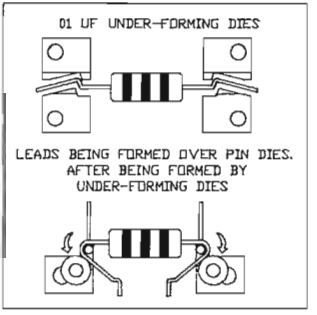


(F) MINIMUMS CAN BE DETERMINED BY ADDING .030" FOR THE TRANSPORT WHEEL + LEAD WIRE DIAMETER.

UNDER-FORMING DIES.

UNDER-FORMING DIES BEND COMPONENT LEADS UNDERNEATH THE COMPONENT BODY RESULTING IN A CENTER TO CENTER DISTANCE THAT IS LESS THAN THE COMPONENT BODY LENGTH.



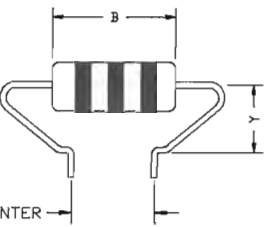


MEASUREMENTS IN MILLIMETERS

2.29 IS THE MINIMUM BETWEEN BODY AND INSIDE RADIUS, ALLOWING 0.76 CLEARANCE FOR TRANSPORT WHEEL AND 1.52 FOR PIN DIE.

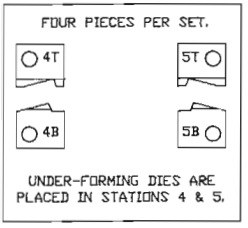
THE COMPONENTS AXIAL CENTER INCREASES AS CENTER TO CENTER DECREASES.
THE CHART BELOW SHOWS INCREASES IN (Y) FOR 0.38, 0.51, 0.64 AND 0.76 LEAD DIAMETERS. THE CHART STARTS WHERE THE CENTER TO CENTER DISTANCE IS THE SAME AS THE BODY LENGTH. FOR SMALLER CENTER TO CENTER DISTANCES EQUATE (B - CENTER TO CENTER DISTANCE = X).

X	Y			
B-(C-C)	0.38	0.51	0.64	0.76
.000	3.81	4.06	4.32	4.57
0.51	4.83	5.08	5.33	5.59
1.02	5.84	6.10	6.35	6.60
1.52	6.86	7.11	7.37	7.62
2.03	7.87	8.13	8.38	8.64
2.54	8.89	9.14	9.40	9.65

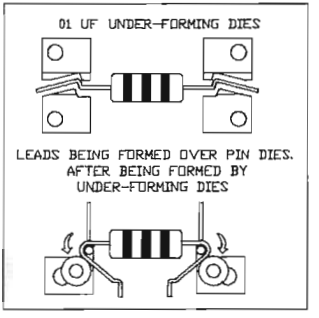


UNDER-FORMING DIES.

UNDER-FORMING DIES BEND COMPONENT LEADS UNDERNEATH THE COMPONENT BODY RESULTING IN A CENTER TO CENTER DISTANCE THAT IS LESS THAN THE COMPONENT BODY LENGTH.



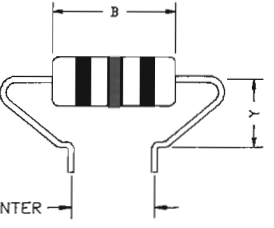
MEASUREMENTS IN INCHES



.090 IS THE MINIMUM BETWEEN BODY AND INSIDE RADIUS, ALLOWING .030 CLEARANCE FOR TRANSPORT WHEEL AND .060 FOR PIN DIE.

THE COMPONENTS AXIAL CENTER INCREASES AS CENTER TO CENTER DECREASES.
THE CHART BELOW SHOWS INCREASES IN (Y) FOR .015, .020, .025 AND .030 LEAD DIAMETERS. THE CHART STARTS WHERE THE CENTER TO CENTER DISTANCE IS THE SAME AS THE BODY LENGTH. FOR SMALLER CENTER TO CENTER DISTANCES EQUATE (B - CENTER TO CENTER DISTANCE = X).

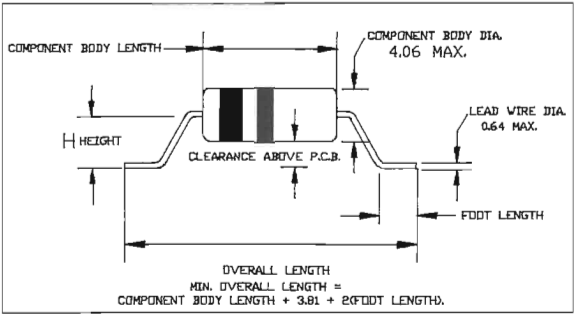
X	Y			
B-(C-C)	.015	.020	.025	.030
.000	.150	.160	.170	.180
.020	.190	.200	.210	.220
.040	.230	.240	.250	.260
.060	.270	.280	.290	.300
.080	.310	.320	.330	.340
.100	.350	.360	.370	.380



REFLOW DIES.

REFLOW DIES FORM LEAD WIRES INTO SURFACE MOUNT CONFIGURATIONS. THEY PROVIDE A SLIGHT FLATTENING OF THE LEADS IN THE (FOOT) DIMENSION WHICH STABILIZES THE COMPONENT WHEN SURFACE MOUNTING ON A P.C.BOARD REFLOW DIES ARE ALSO AVAILABLE WITH KNIVES TO CUT CONTROLLED (FOOT) DIMENSION LENGTHS. *

MEASUREMENTS IN MILLIMETERS

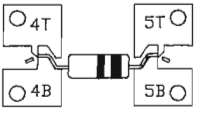


REFLOW DIES ARE IDENTIFIED BY SIZES A THROUGH O.
A=0.76 B=0.89 C=1.02 D=1.14 E=1.27 F=1.40 G=1.52 H=1.65 I=1.78
J=2.03 K=2.29 L=2.54 M=2.79 N=3.05 O=3.30

A-O DIRECTLY RELATE TO THE (H) DIMENSION.
(H)= 1/2 THE BODY DIA. + CLEARANCE IF NEEDED.

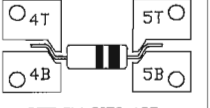
* SPECIAL ORDER DIES.

FOUR PIECES PER SET.



REFLOW DIES WITH KNIVES ARE PLACED IN STATIONS 4 & 5.

FOUR PIECES PER SET.



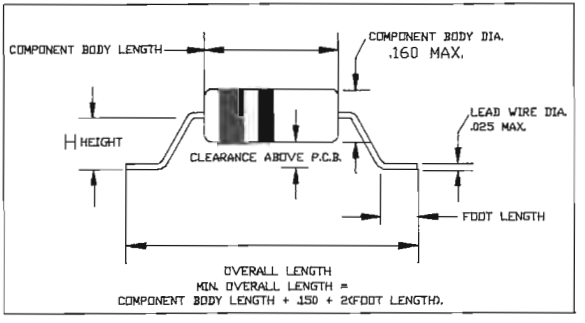
REFLOW DIES ARE PLACED IN STATIONS 4 & 5.

WHEN ORDERING REFLOW DIES WITH KNIVES, BODY LENGTH, OVERALL LENGTH AND THE (H) DIMENSION MUST BE SUPPLIED.

REFLOW DIES.

REFLOW DIES FORM LEAD WIRES INTO SURFACE MOUNT CONFIGURATIONS. THEY PROVIDE A SLIGHT FLATTENING OF THE LEADS IN THE (FOOT) DIMENSION WHICH STABILIZES THE COMPONENT WHEN SURFACE MOUNTING ON A P.C.BOARD REFLOW DIES ARE ALSO AVAILABLE WITH KNIVES TO CUT CONTROLLED (FOOT) DIMENSION LENGTHS. *

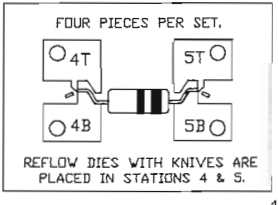
MEASUREMENTS IN INCHES

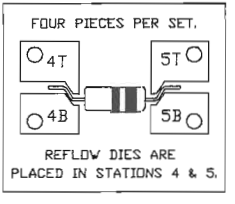


REFLOW DIES ARE IDENTIFIED BY SIZES A THROUGH O.
A=.030 B=.035 C=.040 D=.045 E=.050 F=.055 G=.060 H=.065 I=.070
J=.080 K=.090 L=.100 M=.110 N=.120 O=.130

A-O DIRECTLY RELATE TO THE (H) DIMENTION.
(H)= 1/2 THE BODY DIA. + CLEARANCE IF NEEDED.

* SPECIAL ORDER DIES.





WHEN ORDERING REFLOW DIES WITH KNIVES, BODY LENGTH, OVERALL LENGTH AND THE (H) DIMENSION MUST BE SUPPLIED.

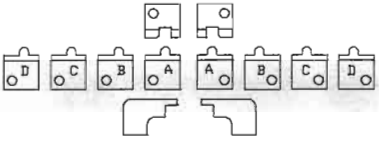
THIS PAGE
INTENTIONALLY
LEFT BLANK

LOCK-IN DIES.

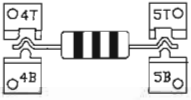
LOCK-IN DIES FORM A CONTROLLED DIMPLE INTO LEAD WIRE(S).
THESE DIES ARE AVAILABLE TO ACCOMMODATE VARIOUS LEAD WIRE AND P.C.BOARD HOLE DIA. AND CAN BE ORDERED AS KITS OR SEPARATELY. USED IN CONJUNCTION WITH OTHER CF-8 DIES THEY PROVIDE THE LOCK-IN FOR A STAND-OFF OR VERTICAL CONFIGURATION.

(SELECT LOCK-IN DIES AS PER WIRE AND P.C.BOARD HOLE DIA. SEE PAGE 19 AND 20)

A DIE KIT CONTAINS 2 TOPS AND 8 BOTTOMS. AND 2 MODIFIED HORIZONTAL DIES.



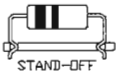
MODIFIED HORIZONTAL DIES.



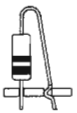
LOCK-IN DIES ARE PLACED IN STATIONS 4 & 5.

MODIFIED HORIZONTAL DIES ARE PLACED IN STATIONS 6 & 7.

SOME COMMON FORMS THAT INCORPORATE LOCK-IN DIES.



STAND-OFF



VERTICAL CONFIGURATION

LOCK-IN DIE KITS

FOR 1.59 P.C.BOARD

THE 1530 KIT CONTAINS DIES FOR 0.38,0.51,0.64,0.76 WIRE DIA. AND 2 MODIFIED HORIZONTAL .040 DIES.

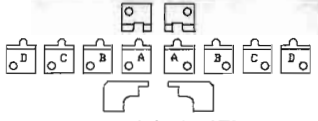
LEAD WIRE DIA.	P.C.BOARD HOLE DIA. A	B	C	D
0.38	0.51	0.64	0.76	0.89
0.51	0.64	0.76	0.89	1.02
0.64	0.76	0.89	1.02	1.14
0.76	0.89	1.02	1.14	1.27

THE 3045 KIT CONTAINS DIES FOR 0.76,0.89,1.02,1.14 WIRE DIA. AND 2 MODIFIED HORIZONTAL .060 DIES.

LEAD WIRE DIA.	P.C.BOARD HOLE DIA. A	B	C	D
0.76	1.02	1.14	1.27	1.40
0.89	1.14	1.27	1.40	1.52
1.02	1.27	1.40	1.52	1.65
1.14	1.40	1.52	1.65	1.78

MEASUREMENTS IN MILLIMETERS

A DIE KIT CONTAINS 2 TOPS AND 8 BOTTOMS. AND 2 MODIFIED HORIZONTAL DIES.



THE 4560 KIT CONTAINS DIES FOR 1.14,1.27,1.40,1.52 WIRE DIA. AND 2 MODIFIED HORIZONTAL .060 DIES.

LEAD WIRE DIA.	P.C.BOARD HOLE DIA. A	B	C	D
1.14	1.40	1.52	1.65	1.78
1.27	1.52	1.65	1.78	1.91
1.40	1.65	1.78	1.91	2.03
1.52	1.78	1.91	2.03	2.16

FOR 0.79 P.C.BOARD

THE 1525 KIT CONTAINS DIES FOR 0.38,0.51,0.64 WIRE DIA. AND 2 MODIFIED HORIZONTAL .030 DIES.

LEAD WIRE DIA.	P.C.BOARD HOLE DIA. A	B	C	D
0.38	0.51	0.64	0.76	0.89
0.51	0.64	0.76	0.89	1.02
0.64	0.76	0.89	1.02	1.14

THE 2535 KIT CONTAINS DIES FOR 0.64,0.76,0.89 WIRE DIA. AND 2 MODIFIED HORIZONTAL .040 DIES.

LEAD WIRE DIA.	P.C.BOARD HOLE DIA. A	B	C	D
0.64	0.76	0.89	1.02	1.14
0.76	0.89	1.02	1.14	1.27
0.89	1.02	1.14	1.27	1.40

LOCK-IN DIE KITS

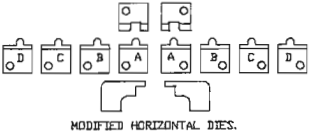
FOR .062 P.C.BOARD

THE 1530 KIT CONTAINS DIES FOR .015,.020,.025,.030 WIRE DIA. AND 2 MODIFIED HORIZONTAL .040 DIES.

LEAD WIRE DIA.	P.C.BOARD HOLE DIA. A	B	C	D
.015	.020	.025	.030	.035
.020	.025	.030	.035	.040
.025	.030	.035	.040	.045
.030	.035	.040	.045	.050

MEASUREMENTS IN INCHES

A DIE KIT CONTAINS 2 TOPS AND 8 BOTTOMS. AND 2 MODIFIED HORIZONTAL DIES.



MODIFIED HORIZONTAL DIES.

THE 3045 KIT CONTAINS DIES FOR .030,.035,.040,.045 WIRE DIA. AND 2 MODIFIED HORIZONTAL .060 DIES.

LEAD WIRE DIA.	P.C.BOARD HOLE DIA. A	B	C	D
.030	.040	.045	.050	.055
.035	.045	.050	.055	.060
.040	.050	.055	.060	.065
.045	.055	.060	.065	.070

THE 4560 KIT CONTAINS DIES FOR .045,.050,.055,.060 WIRE DIA. AND 2 MODIFIED HORIZONTAL .060 DIES.

LEAD WIRE DIA.	P.C.BOARD HOLE DIA. A	B	C	D
.045	.055	.060	.065	.070
.050	.060	.065	.070	.075
.055	.065	.070	.075	.080
.060	.070	.075	.080	.085

FOR .031 P.C.BOARD

THE 1525 KIT CONTAINS DIES FOR .015,.020,.025 WIRE DIA. AND 2 MODIFIED HORIZONTAL .030 DIES.

LEAD WIRE DIA.	P.C.BOARD HOLE DIA. A	B	C	D
.015	.020	.025	.030	.035
.020	.025	.030	.035	.040
.025	.030	.035	.035	.045

THE 2535 KIT CONTAINS DIES FOR .025,.030,.035 WIRE DIA. AND 2 MODIFIED HORIZONTAL .040 DIES.

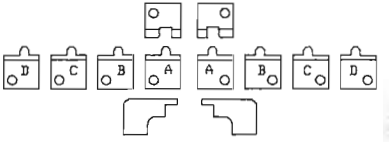
LEAD WIRE DIA.	P.C.BOARD HOLE DIA. A	B	C	D
.025	.030	.035	.040	.045
.030	.035	.040	.045	.050
.035	.040	.045	.050	.055

FLUSH MOUNT LOCK-IN DIES.

FLUSH MOUNT LOCK-IN DIES FORM A CONTROLLED DIMPLE INTO LEAD WIRE(S). THIS ALLOWS A COMPONENT TO BE HORIZONTALLY MOUNTED ON A P.C.BOARD WITH AN IN HOLE LOCK-IN. DIES CAN BE ORDERED AS KITS OR IN PARTIAL KITS. EACH DIE SET COVERS A GIVEN WIRE AND P.C.BOARD HOLE RANGE. (SEE CHART BELOW).

MEASUREMENTS IN MILLIMETERS

A DIE KIT CONTAINS 2 TOPS AND 8 BOTTOMS. AND 2 MODIFIED HORIZONTAL DIES.

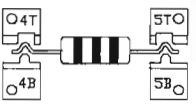


MODIFIED HORIZONTAL DIES.

A COMMON FORM THAT USES THE FLUSH MOUNT LOCK-IN FORM.

FLUSH MOUNT

NOTE: CUT-OFF, LOCK-IN DIES CAN BE ORDERED WITH PROTRUSION RANGE OF 0.76-1.02 FOR 1.59 P.C.BOARD AND 1.14-1.40 FOR P.C.BOARD.



LOCK-IN DIES ARE PLACED IN STATIONS 4 & 5.

MODIFIED HORIZONTAL DIES ARE PLACED IN STATIONS 6 & 7.

FOR 1.59 P.C.BOARD

THE 1530 KIT CONTAINS DIES FOR 0.38,0.51,0.64,0.76 WIRE DIA. AND 2 MODIFIED HORIZONTAL .040 DIES.

LEAD WIRE DIA.	P.C.BOARD HOLE DIA. A	B	C	D
0.38	0.51	0.64	0.76	.035
0.51	0.64	0.76	.035	1.02
0.64	0.76	.035	1.02	1.14
0.76	.035	1.02	1.14	1.27

THE 3045 KIT CONTAINS DIES FOR 0.76,0.89,1.02,1.14 WIRE DIA. AND 2 MODIFIED HORIZONTAL .060 DIES.

LEAD WIRE DIA.	P.C.BOARD HOLE DIA. A	B	C	D
0.76	1.02	1.14	1.27	1.40
0.89	1.14	1.27	1.40	1.52
1.02	1.27	1.40	1.52	1.65
1.14	1.40	1.52	1.65	1.78

THE 4560 KIT CONTAINS DIES FOR 1.14,1.27,1.40,1.52 WIRE DIA. AND 2 MODIFIED HORIZONTAL .060 DIES.

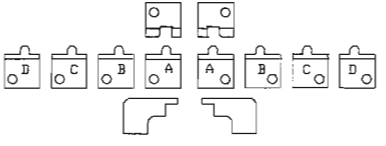
LEAD WIRE DIA.	P.C.BOARD HOLE DIA. A	B	C	D
1.14	1.40	1.52	1.65	1.78
1.27	1.52	1.65	1.78	1.91
1.40	1.65	1.78	1.91	2.03
1.52	1.78	1.91	2.03	2.16

FLUSH MOUNT LOCK-IN DIES.

FLUSH MOUNT LOCK-IN DIES FORM A CONTROLLED DIMPLE INTO LEAD WIRE(S). THIS ALLOWS A COMPONENT TO BE HORIZONTALLY MOUNTED ON A P.C.BOARD WITH AN IN HOLE LOCK-IN. DIES CAN BE ORDERED AS KITS OR IN PARTIAL KITS. EACH DIE SET COVERS A GIVEN WIRE AND P.C.BOARD HOLE RANGE. (SEE CHART BELOW).

MEASUREMENTS IN INCHES

A DIE KIT CONTAINS 2 TOPS AND 8 BOTTOMS, AND 2 MODIFIED HORIZONTAL DIES.

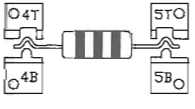


MODIFIED HORIZONTAL DIES.

A COMMON FORM THAT USES THE FLUSH MOUNT LOCK-IN FORM.

FLUSH MOUNT

NOTE: CUT-OFF, LOCK-IN DIES CAN BE ORDERED WITH PROTRUSION RANGE OF .030-.040 FOR .062 P.C.BOARD AND .045-.055 FOR P.C.BOARD.



LOCK-IN DIES ARE PLACED IN STATIONS 4 & 5.

MODIFIED HORIZONTAL DIES ARE PLACED IN STATIONS 6 & 7.

FOR .062 P.C.BOARD

THE 1530 KIT CONTAINS DIES FOR .015,.020,.025,.030 WIRE DIA. AND 2 MODIFIED HORIZONTAL .040 DIES.

LEAD WIRE DIA.	P.C.BOARD HOLE DIA. A	B	C	D
.015	.020	.025	.030	.035
.020	.025	.030	.035	.040
.025	.030	.035	.040	.045
.030	.035	.040	.045	.050

THE 3045 KIT CONTAINS DIES FOR .030,.035,.040,.045 WIRE DIA. AND 2 MODIFIED HORIZONTAL .060 DIES.

LEAD WIRE DIA.	P.C.BOARD HOLE DIA. A	B	C	D
.030	.040	.045	.050	.055
.035	.045	.050	.055	.060
.040	.050	.055	.060	.065
.045	.055	.060	.065	.070

THE 4560 KIT CONTAINS DIES FOR .045,.050,.055,.060 WIRE DIA. AND 2 MODIFIED HORIZONTAL .060 DIES.

LEAD WIRE DIA.	P.C.BOARD HOLE DIA. A	B	C	D
.045	.055	.060	.065	.070
.050	.060	.065	.070	.075
.055	.065	.070	.075	.080
.060	.070	.075	.080	.085

CUT-OFF, LOCK-IN DIES.

CUT-OFF, LOCK-IN DIES PRODUCE THE SAME FORM AS LOCK-IN DIES WITH THE ADDITION OF A KNIFE WHICH IS MANUFACTURED AS PART OF THE DIE. THIS KNIFE MAKES IT POSSIBLE TO CONTROL THE LENGTH OF PROTRUSION THROUGH THE P.C.BOARD AT A RANGE OF 1.14-1.40 FOR A 1.59 P.C.BOARD.*

MEASUREMENTS IN MILLIMETERS

FOR 1.59 P.C.BOARD

THE 1530 KIT CONTAINS DIES FOR 0.38,0.51,0.64,0.76 WIRE DIA. AND 2 MODIFIED HORIZONTAL .040 DIES.

LEAD WIRE DIA.	P.C.BOARD HOLE DIA. A	B	C	D
0.38	0.51	0.64	0.76	0.89
0.51	0.64	0.76	0.89	1.02
0.64	0.76	0.89	1.02	1.14
0.76	0.89	1.02	1.14	1.27

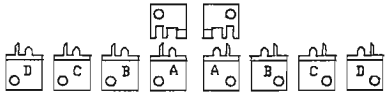
THE 3045 KIT CONTAINS DIES FOR 0.76,0.89,1.02,1.14 WIRE DIA. AND 2 MODIFIED HORIZONTAL .060 DIES.

LEAD WIRE DIA.	P.C.BOARD HOLE DIA. A	B	C	D
0.76	1.02	1.14	1.27	1.40
.035	1.14	1.27	1.40	1.52
1.02	1.27	1.40	1.52	1.65
1.14	1.40	1.52	1.65	1.78

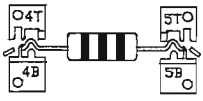
THE 4560 KIT CONTAINS DIES FOR 1.14,1.27,1.40,1.52 WIRE DIA. AND 2 MODIFIED HORIZONTAL .060 DIES.

LEAD WIRE DIA.	P.C.BOARD HOLE DIA. A	B	C	D
1.14	1.40	1.52	1.65	1.78
1.27	1.52	1.65	1.78	1.91
1.40	1.65	1.78	1.91	2.03
1.52	1.78	1.91	2.03	2.16

A DIE KIT CONTAINS 2 TOPS AND 8 BOTTOMS. AND 2 MODIFIED HORIZONTAL DIES.



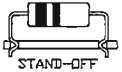
MODIFIED HORIZONTAL DIES.



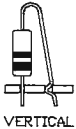
CUT-OFF, LOCK-IN DIES ARE PLACED IN STATIONS 4 & 5.

MODIFIED HORIZONTAL DIES ARE PLACED IN STATIONS 6 & 7.

SOME COMMON FORMS THAT INCORPORATE CUT-OFF, LOCK-IN DIES.



STAND-OFF



VERTICAL CONFIGURATION

*CUT-OFF, LOCK-IN DIES CAN ALSO BE ORDERED WITH PROTRUSION RANGES OF 0.76-1.02 FOR 1.59 P.C.BOARD AND 1.14-1.40 FOR 0.79 P.C.BOARD

NOTE: EXTREME CARE MUST BE TAKEN WHEN INSTALLING THESE DIES, SO AS NOT TO DAMAGE THE CUTTING SURFACE.

CUT-OFF, LOCK-IN DIES.

CUT-OFF, LOCK-IN DIES PRODUCE THE SAME FORM AS LOCK-IN DIES WITH THE ADDITION OF A KNIFE WHICH IS MANUFACTURED AS PART OF THE DIE. THIS KNIFE MAKES IT POSSIBLE TO CONTROL THE LENGTH OF PROTRUSION THROUGH THE P.C.BOARD AT A RANGE OF .045-.055 FOR A .062 P.C.BOARD.*

MEASUREMENTS IN INCHES

FOR .062 P.C.BOARD

THE 1530 KIT CONTAINS DIES FOR .015,.020,.025,.030 WIRE DIA. AND 2 MODIFIED HORIZONTAL .040 DIES.

LEAD WIRE DIA.	P.C.BOARD HOLE DIA. A	B	C	D
.015	.020	.025	.030	.035
.020	.025	.030	.035	.040
.025	.030	.035	.040	.045
.030	.035	.040	.045	.050

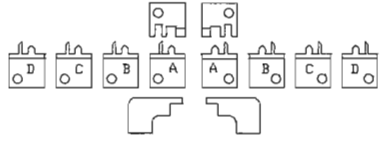
THE 3045 KIT CONTAINS DIES FOR .030,.035,.040,.045 WIRE DIA. AND 2 MODIFIED HORIZONTAL .060 DIES.

LEAD WIRE DIA.	P.C.BOARD HOLE DIA. A	B	C	D
.030	.040	.045	.050	.055
.035	.045	.050	.055	.060
.040	.050	.055	.060	.065
.045	.055	.060	.065	.070

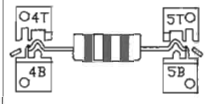
THE 4560 KIT CONTAINS DIES FOR .045,.050,.055,.060 WIRE DIA. AND 2 MODIFIED HORIZONTAL .060 DIES.

LEAD WIRE DIA.	P.C.BOARD HOLE DIA. A	B	C	D
.045	.055	.060	.065	.070
.050	.060	.065	.070	.075
.055	.065	.070	.075	.080
.060	.070	.075	.080	.085

A DIE KIT CONTAINS 2 TOPS AND 8 BOTTOMS. AND 2 MODIFIED HORIZONTAL DIES.



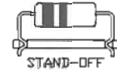
MODIFIED HORIZONTAL DIES.



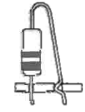
CUT-OFF, LOCK-IN DIES ARE PLACED IN STATIONS 4 & 5.

MODIFIED HORIZONTAL DIES ARE PLACED IN STATIONS 6 & 7.

SOME COMMON FORMS THAT INCORPORATE CUT-OFF, LOCK-IN DIES.



STAND-OFF



VERTICAL CONFIGURATION

*CUT-OFF, LOCK-IN DIES CAN ALSO BE ORDERED WITH PROTRUSION RANGES OF .030-.040 FOR .062 P.C.BOARD AND .045-.055 FOR .031 P.C.BOARD

NOTE: EXTREME CARE MUST BE TAKEN WHEN INSTALLING THESE DIES, SO AS NOT TO DAMAGE THE CUTTING SURFACE.

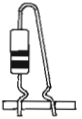
STAND-OFF DIES.

STAND-OFF DIES FORM A CONTROLLED DIMPLE INTO LEAD WIRE(S). THESE DIES ARE AVAILABLE TO ACCOMMODATE VARIOUS LEAD WIRE SIZES AND P.C.BOARD HOLE DIAMETERS. USED IN CONJUNCTION WITH OTHER CF-8 DIES, FORMS SUCH AS HORIZONTAL STAND-OFF AND VERTICAL STAND-OFF CAN BE PRODUCED.

MEASUREMENTS IN MILLIMETERS

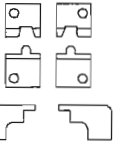
SOME COMMON FORMS THAT INCORPORATE STAND-OFF DIES.

HORIZONTAL STAND-OFF



VERTICAL STAND-OFF

SIX PIECES PER SET.



STAND-OFF DIES ARE PLACED IN STATIONS 4 & 5.

MODIFIED HORIZONTAL DIES ARE PLACED IN STATIONS 6 AND 7

DIES ARE SELECTED BY WIRE DIAMETERS.		
SET 1530	FORMS WIRE DIAMETERS	0.38 THROUGH 0.76
SET 3045	FORMS WIRE DIAMETERS	0.76 THROUGH 1.14
SET 4560	FORMS WIRE DIAMETERS	1.14 THROUGH 1.52

SIX PIECE DIE KITS INCLUDE:
1530 FORMING DIES AND .040 MODIFIED HORIZONTALS
3045 FORMING DIES AND .060 MODIFIED HORIZONTALS
4560 FORMING DIES AND .060 MODIFIED HORIZONTALS

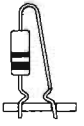
STAND-OFF DIES.

STAND-OFF DIES FORM A CONTROLLED DIMPLE INTO LEAD WIRE(S). THESE DIES ARE AVAILABLE TO ACCOMMODATE VARIOUS LEAD WIRE SIZES AND P.C.BOARD HOLE DIAMETERS. USED IN CONJUNCTION WITH OTHER CF-8 DIES, FORMS SUCH AS HORIZONTAL STAND-OFF AND VERTICAL STAND-OFF CAN BE PRODUCED.

MEASUREMENTS IN INCHES

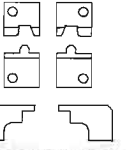
SOME COMMON FORMS THAT INCORPORATE STAND-OFF DIES.

HORIZONTAL STAND-OFF

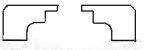


VERTICAL STAND-OFF

SIX PIECES PER SET.



STAND-OFF DIES ARE PLACED IN STATIONS 4 & 5.



MODIFIED HORIZONTAL DIES ARE PLACED IN STATIONS 6 AND 7

DIES ARE SELECTED BY WIRE DIAMETERS.		
SET 1530	FORMS WIRE DIAMETERS	.015 THROUGH .030
SET 3045	FORMS WIRE DIAMETERS	.030 THROUGH .045
SET 4560	FORMS WIRE DIAMETERS	.045 THROUGH .060

SIX PIECE DIE KITS INCLUDE:
1530 FORMING DIES AND .040 MODIFIED HORIZONTALS
3045 FORMING DIES AND .060 MODIFIED HORIZONTALS
4560 FORMING DIES AND .060 MODIFIED HORIZONTALS

STAND-OFF CUT-OFF DIES.

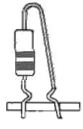
STAND-OFF CUT-OFF DIES PRODUCE THE SAME FORMS AS STAND-OFF DIES WITH THE ADDITION OF A SECONDARY CUT-OFF KNIFE. THIS KNIFE MAKES IT POSSIBLE TO CONTROL BELOW BOARD PROTRUSION OF 1.27-1.52 FOR A 1.59 P.C.BOARD.

SHORTER PROTRUSIONS OF 0.76-1.02 FOR A 1.59 P.C.BOARD CAN BE SPECIAL ORDERED

MEASUREMENTS IN MILLIMETERS

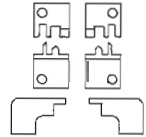
SOME COMMON FORMS THAT INCORPORATE STAND-OFF CUT-OFF DIES.

HORIZONTAL STAND-OFF CUT-OFF

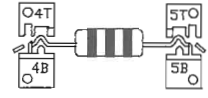


VERTICAL STAND-OFF CUT-OFF

SIX PIECES PER SET.



MODIFIED HORIZONTAL DIES ARE PLACED IN STATIONS 6 AND 7



STAND-OFF CUT-OFF DIES ARE PLACED IN STATIONS 4 & 5.

CARE MUST BE TAKEN WHEN INSTALLING DIES TO NOT DAMAGE KNIVES

DIES ARE SELECTED BY WIRE DIAMETERS.

SET 1530	FORMS WIRE DIAMETERS	0.38 THROUGH 0.76
SET 3045	FORMS WIRE DIAMETERS	0.76 THROUGH 1.14
SET 4560	FORMS WIRE DIAMETERS	1.14 THROUGH 1.52

SIX PIECE DIE KITS INCLUDE:
1530 FORMING DIES AND .040 MODIFIED HORIZONTALS
3045 FORMING DIES AND .060 MODIFIED HORIZONTALS
4560 FORMING DIES AND .060 MODIFIED HORIZONTALS

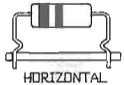
STAND-OFF CUT-OFF DIES.

STAND-OFF CUT-OFF DIES PRODUCE THE SAME FORMS AS STAND-OFF DIES WITH THE ADDITION OF A SECONDARY CUT-OFF KNIFE. THIS KNIFE MAKES IT POSSIBLE TO CONTROL BELOW BOARD PROTRUSION OF .050-.060 FOR A .062 P.C.BOARD.

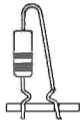
SHORTER PROTRUSIONS OF .030-.040 FOR A .062 P.C.BOARD CAN BE SPECIAL ORDERED

MEASUREMENTS IN INCHES

SOME COMMON FORMS THAT INCORPORATE STAND-OFF CUT-OFF DIES.

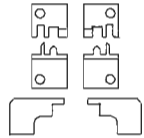


HORIZONTAL STAND-OFF CUT-OFF

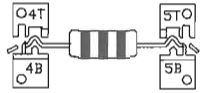


VERTICAL STAND-OFF CUT-OFF

SIX PIECES PER SET.



MODIFIED HORIZONTAL DIES ARE PLACED IN STATIONS 6 AND 7



STAND-OFF CUT-OFF DIES ARE PLACED IN STATIONS 4 & 5.

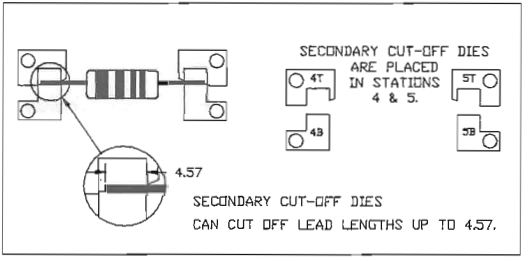
CARE MUST BE TAKEN WHEN INSTALLING DIES TO NOT DAMAGE KNIVES

DIES ARE SELECTED BY WIRE DIAMETERS.		
SET 1530	FORMS WIRE DIAMETERS	.015 THROUGH .030
SET 3045	FORMS WIRE DIAMETERS	.030 THROUGH .045
SET 4560	FORMS WIRE DIAMETERS	.045 THROUGH .060

SIX PIECE DIE KITS INCLUDE:
1530 FORMING DIES AND .040 MODIFIED HORIZONTALS
3045 FORMING DIES AND .060 MODIFIED HORIZONTALS
4560 FORMING DIES AND .060 MODIFIED HORIZONTALS

SECONDARY CUT-OFF DIES.

SECONDARY CUT-OFF DIES ARE KNIVES THAT WILL REDUCE THE LEAD LENGTH TO A CONTROLLED DISTANCE FROM THE COMPONENT BODY.

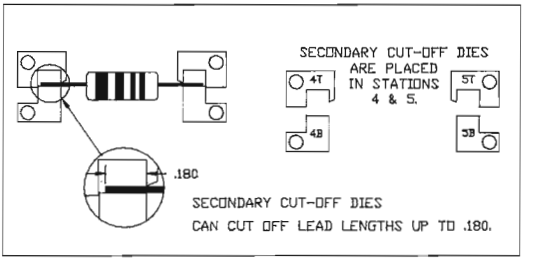


THESE DIES REQUIRE A EXIT CHUTE AND A MODIFIED LEXAN GUARD. THE EXIT CHUTE IS TO GUIDE THE CUT LEAD FROM THE CRIMPING DIE POSITION, WITHOUT FALLING AND INTERFERING WITH THE BENDING DIE STATION. THE MODIFIED GUARD ALLOWS THE SCRAP LEADS TO BE DEPOSITED OUTSIDE OF THE MACHINE.

MEASUREMENTS IN MILLIMETERS

SECONDARY CUT-OFF DIES.

SECONDARY CUT-OFF DIES ARE KNIVES THAT WILL REDUCE THE LEAD LENGTH TO A CONTROLLED DISTANCE FROM THE COMPONENT BODY.



THESE DIES REQUIRE A EXIT CHUTE AND A MODIFIED LEXAN GUARD. THE EXIT CHUTE IS TO GUIDE THE CUT LEAD FROM THE CRIMPING DIE POSITION, WITHOUT FALLING AND INTERFERING WITH THE BENDING DIE STATION. THE MODIFIED GUARD ALLOWS THE SCRAP LEADS TO BE DEPOSITED OUTSIDE OF THE MACHINE.

MEASUREMENTS IN INCHES

SPECIAL
DOUBLE DIMPLE LOCK-IN DIES
WITH KNIFE

MEASUREMENTS IN MILLIMETERS

THESE DIES PROVIDE A FLUSH MOUNT STAND OFF LOCK-IN FORM. EACH DIE COVERS A WIRE RANGE AND P.C.BOARD HOLE SIZE RANGE.

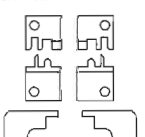
DIE SET #6 DOES A FLUSH MOUNT LOCK-IN ONLY.

DIE SETS #7,8 AND 9 DO A FLUSH MOUNT OR STAND-OFF LOCK-IN.

P.C.BOARD HOLE AND WIRE RANGES

DIE SET	P.C.BOARD HOLE	WIRE DIA.
6	0.95-1.15 M.M.	0.50-0.60 M.M.
7	1.00-1.30 M.M.	0.60-0.80 M.M.
8	0.80-1.10 M.M.	0.45-0.65 M.M.
9	1.00-1.30 M.M.	0.66-0.85 M.M.

SIX PIECES PER SET



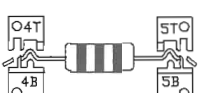
#6-030 M.H.

#7-030 M.H.

#8-030 M.H.

#9-040 M.H.

MODIFIED HORIZONTAL DIES.



NOTE: CARE MUST BE TAKEN WHEN INSTALLING DIES SO AS NOT TO DAMAGE KNIVES

SPECIAL
DOUBLE DIMPLE LOCK-IN DIES WITH KNIFE

MEASUREMENTS IN INCHES

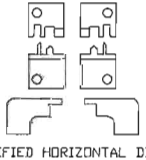
THESE DIES PROVIDE A FLUSH MOUNT STAND OFF LOCK-IN FORM. EACH DIE COVERS A WIRE RANGE AND P.C.BOARD HOLE SIZE RANGE.

DIE SET #6 DOES A FLUSH MOUNT LOCK-IN ONLY..

DIE SETS #7,8 AND 9 DO A FLUSH MOUNT OR STAND-OFF LOCK-IN.

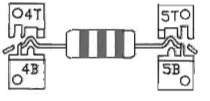
P.C.BOARD HOLE AND WIRE RANGES		
DIE SET	P.C.BOARD HOLE	WIRE DIA.
6	.037-.045 IN.	.020-.024 IN.
7	.039-.051 IN.	.024-.031 IN.
8	.031-.043 IN.	.018-.026 IN.
9	.039-.051 IN.	.026-.033 IN.

SIX PIECES PER SET



#6-030 M.H.
#7-030 M.H.
#8-030 M.H.
#9-040 M.H.

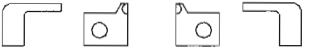
MODIFIED HORIZONTAL DIES.

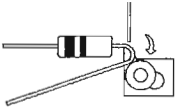


NOTE: CARE MUST BE TAKEN WHEN INSTALLING DIES SO AS NOT TO DAMAGE KNIVES

HALF PIN DIES.

FOR CLOSE TO BODY VERTICAL BENDS





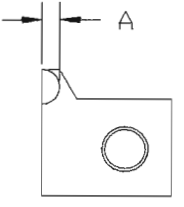
HALF PIN DIES ARE PLACED IN STATIONS 6 & 7 FOR DOING VERTICAL BENDS.

HALF PIN DIES ARE PLACED IN STATIONS 6 AND 7 FOR UNDER FORMING

HALF PIN DIES MAY BE ORDERED SEPARATELY OR IN PAIRS AND ARE AVAILABLE IN THE FOLLOWING DIAMETERS

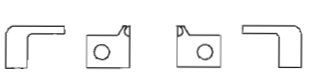
MEASUREMENTS IN MILLIMETERS

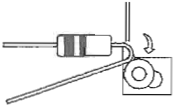
RADIUS A DIM.	PIN DIE
0.89	.070
1.02	.080
1.27	.100
1.52	.120
2.03	.160



HALF PIN DIES.

FOR CLOSE TO BODY VERTICAL BENDS



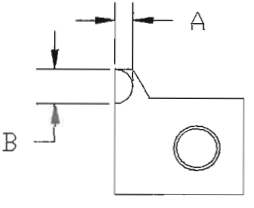


HALF PIN DIES ARE PLACED IN
STATIONS 6 & 7 FOR DOING VERTICAL BENDS.
HALF PIN DIES ARE PLACED IN
STATIONS 6 AND 7 FOR UNDER FORMING

HALF PIN DIES MAY BE ORDERED SEPARATELY
OR IN PAIRS AND ARE AVAILABLE IN THE FOLLOWING DIAMETERS

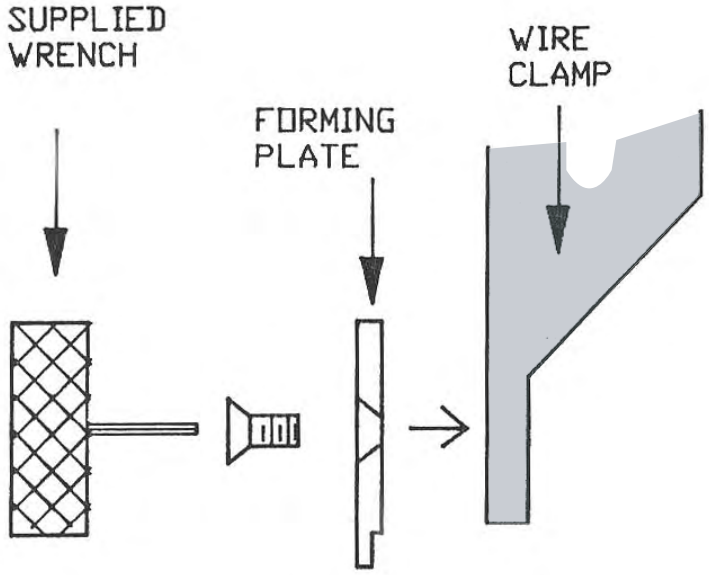
MEASUREMENTS IN INCHES

RADIUS A DIM.	PIN DIE B DIM.
.035	.070
.040	.080
.050	.100
.060	.120
.080	.160



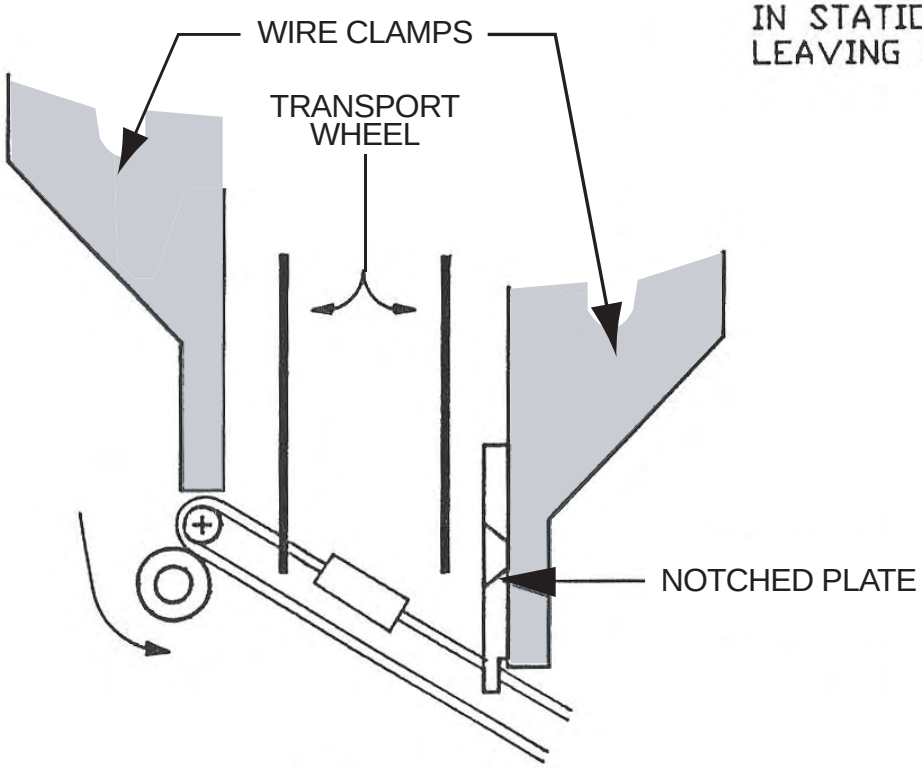
Installation Instructions
CF-8 Notched Plate Kit

P/N 800L-ONPK



1. OPEN STATIONS 6 & 7
REMOVE TRANPORT WHEEL
ATTACH PLATE TO STATION 6
WIRE CLAMP INSIDE FACE.
USING SUPPLIED SCREWS
AND WRENCH

2. PLACE .060 PIN
IN STATION 7 WHILE
LEAVING STATION 6 EMPTY



3. STATION 7 | STATION 6

SET STROKE ON STAT. 9 TO 12
SET STROKE ON STAT. 8 TO 4
PART WILL FALL INTO PARTS BIN
AS THEY INDEX FROM PIN DIE.

GPD Global

Revised 07/11/05

Press TAB key to begin online entries and to move to next field.

PREPARED BY	DATE
CHECKED BY	DATE
CUSTOMER	

GPD Global®

CF-8 /15 COMPONENT FORMING MACHINE
SET UP INSTRUCTION SHEET

PROJECT NO.
P.C.B. NO.
DWG. NO.

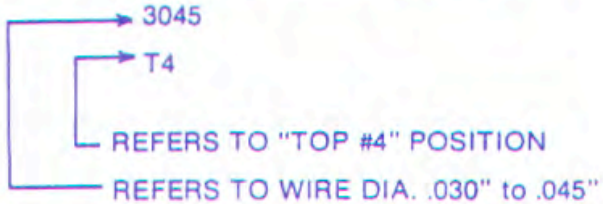
PART NUMBER OR PROGRAM NUMBER	COMPONENT STYLE	DIE NUMBER AT POSITION				TRANSPORT WHEEL NO.	SCALE READING AT POSITION									REMARKS
		4	5	6	7		1	2	3	4	5	6	7	8	9	

WHEN ADJUSTING FROM ONE SET UP TO ANOTHER, ALWAYS CLOSE STATION #1 BEFORE MAKING OTHER ADJUSTMENTS.

DIE CODING AND DIE INSTALLATION

EXAMPLE:

A DIMPLING DIE MARKED SUCH



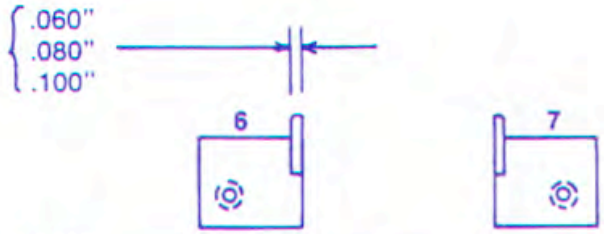
1530 REFERS TO .015 to .030" WIRE DIA.

3045 REFERS TO .030 to .045" WIRE DIA.

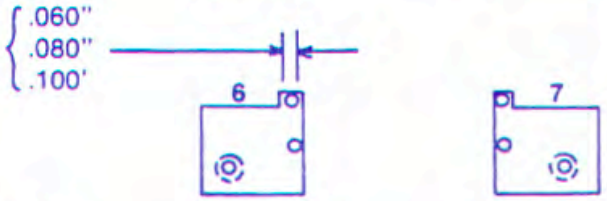
4564 REFERS TO .045 to .064" WIRE DIA.

FACING THE MACHINE WITH THE POWER SUPPLY FACING YOU, DIES ARE INSTALLED AS FOLLOWS:

REFERS TO DIE ANVIL WIDTH
HORIZONTAL 90° BENDS
(ALWAYS USE IN PAIRS)



REFERS TO PIN DIAMETER
DOUBLE PIN DIES ARE FOR STAND OFF
OR LOCK IN LEADS
(CLOSE TO BOARD)



REFERS TO PIN DIAMETER
SINGLE PIN DIE IS FOR VERTICAL
COMPONENTS

Transport Wheel Shims
MAINTENANCE INSTRUCTIONS

Purpose:

- The following procedures are intended for use by qualified operator or maintenance personnel.
- Select the desired operation and follow the instructions indicated.

In order to:	do this:
Install rubber pads on transport wheel shims	follow all steps listed.
Replace *standard* transport wheel shims	1. Perform steps 1. through 8. 2. Skip steps 9. through 13. 3. Perform step 14.
Replace *rubber padded* transport wheel shims	

Procedure:

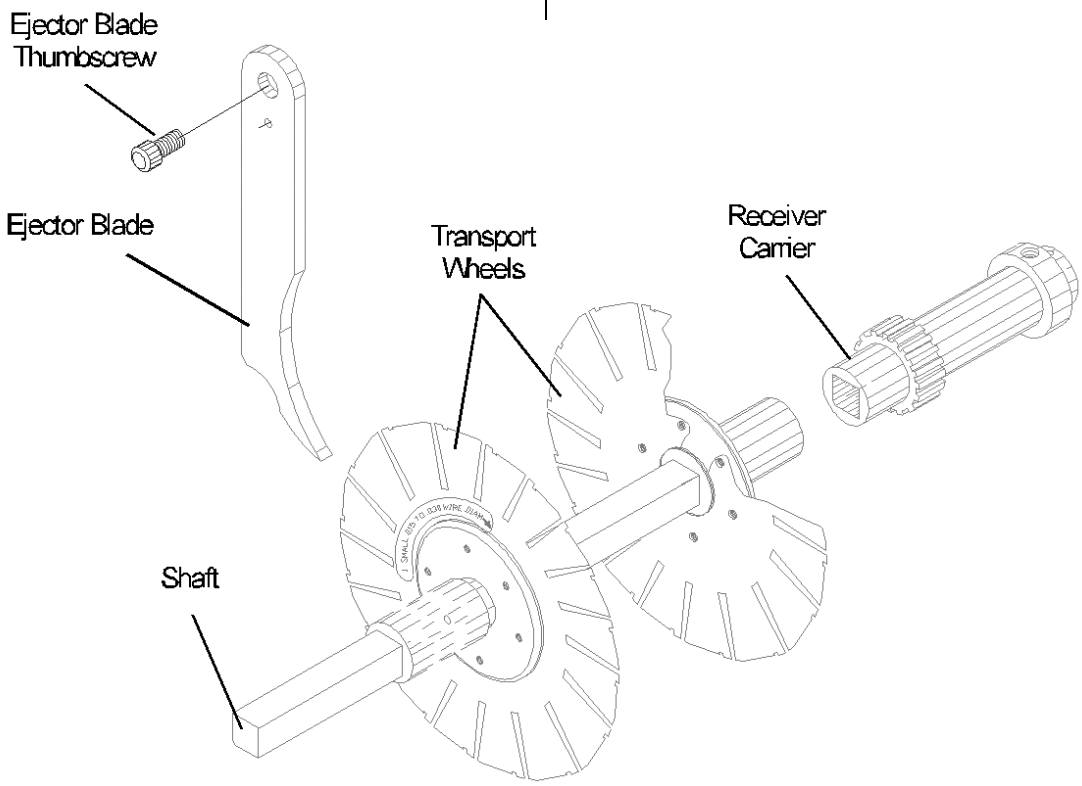
1. Remove transport wheels from machine:

a. Loosen the *ejector blade thumbscrew* (see below) and remove the component *ejector blade* from between the pair of *transport wheels*.

b. Place a 1/8" bent hex "T" wrench (provided in tool kit) in the hole located toward the end of the transport wheel shaft and pull firmly to unlock the shaft.

NOTE: To access the shaft's hole, you may have to manually index the machine until it is accessible: Insert the 1/4" hex "T" wrench (provided in tool kit) in the hex cap screw located on machine's right side. Turn the wrench until you can insert a wrench in the transport wheel shaft's hole.

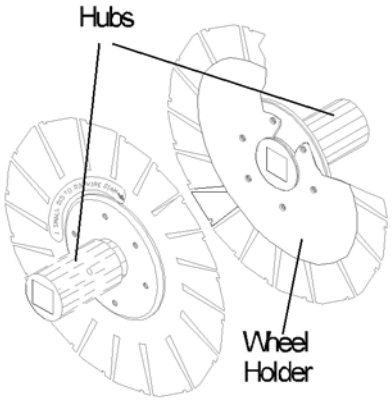
c. Once unlocked, pull the shaft smoothly from its *receiver carrier* and then support the transport wheels while removing the shaft.



GPD Global
611 Hollingsworth Street, Grand Junction, CO 81505
(970) 245-0408 FAX (970) 245-9674

2. Remove the hub and wheel holders.
Remove the six (6) screws securing the hub and wheel holder in place on each transport wheel.

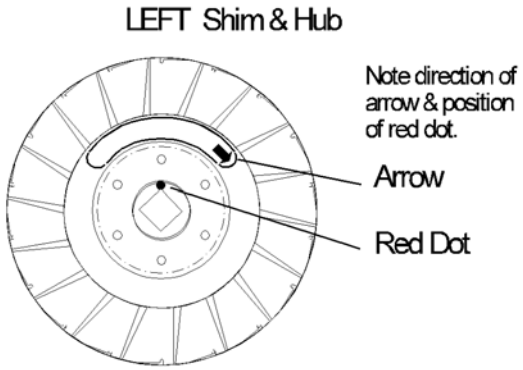
Clean any debris out from between the shim and wheel holder.



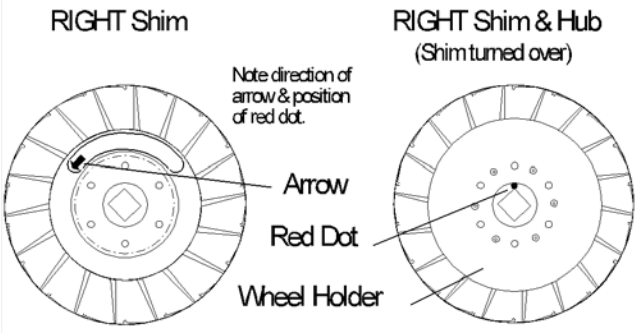
3. Check hub surface for flatness.
If it has a run-out variance over .003" (0.08 mm), replace the hub.

4. Check transport wheel holder surface for flatness.
Inspect for flatness on a surface plate or with a dial indicator. If using the dial indicator, indicate the transport wheel holder's outer circumference. Factory specification is ±.002" (0.05 mm) at perimeter.

5. Reassemble transport wheel shims, hubs, and holders.
a. Match up the left shim with the left hub.



b. Match up the right shim with the right hub.



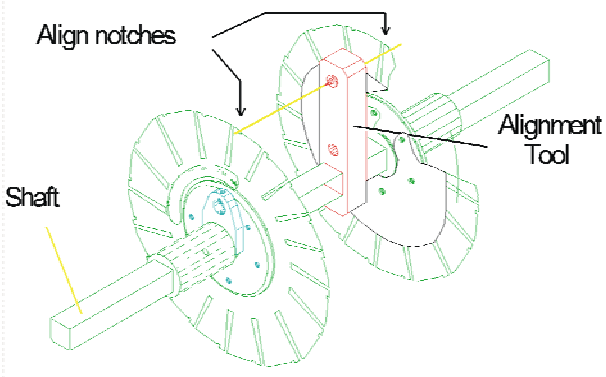
c. Install the flat wheel holder on the each shim loosely - DO NOT tighten the screws at this time.

6. Set timing.
a. Place the right transport wheel and the *alignment tool* on the square *shaft*.

b. *Align the notches* by locating the alignment tool's pin in the transport wheel's component wire pick-up position and tighten screws to secure.

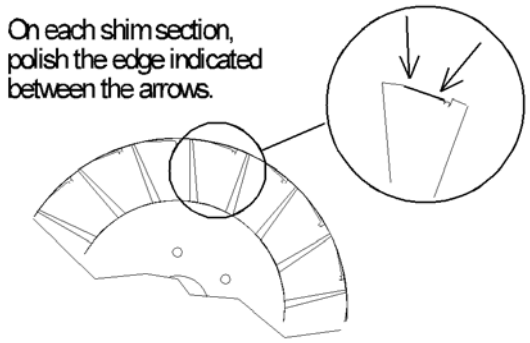
c. Repeat for left transport wheel.

d. Check transport wheel pair timing: Slide both wheels onto the shaft as close together as possible. Check the notches of one wheel to the notches of the other for alignment. If not properly aligned, loosen screws on one wheel and adjust its notches until they are aligned.



7. Polish the edges.
Using a medium grit (220) sandpaper, polish outer edge of each transport wheel segment.

If possible, also demagnetize the transport wheels.

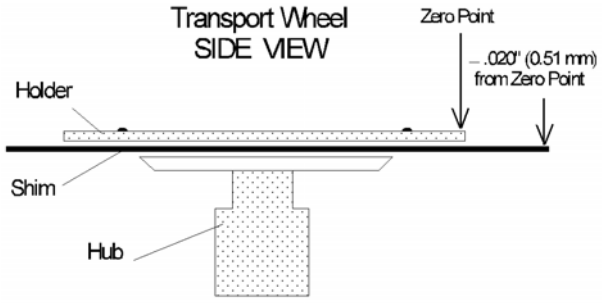


8. Tweak transport wheel segments for consistent tension if necessary. Transport wheels should be rechecked monthly or if inconsistent forming occurs.

a. With a transport wheel shim mounted on the hub, measure the difference between the outer edge of the transport wheel holder and the outer edge of any segment of the transport shim (see below).

The transport wheel holder should measure .020" (0.51 mm) higher than the transport wheel shim.

Bend the transport wheel shim segment until this measurement is achieved.

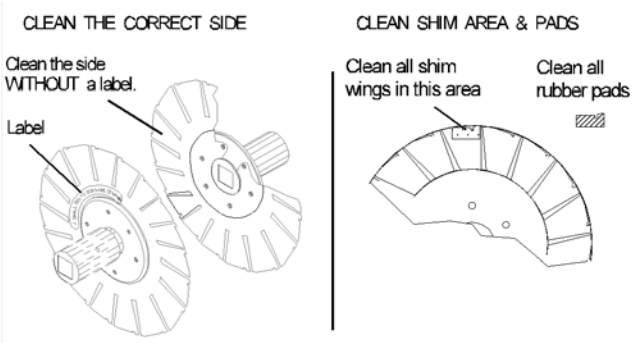


b. Indicate the remaining transport wheel shim segments and set them to the same height as the first one you set (±.001" [0.03 mm]).

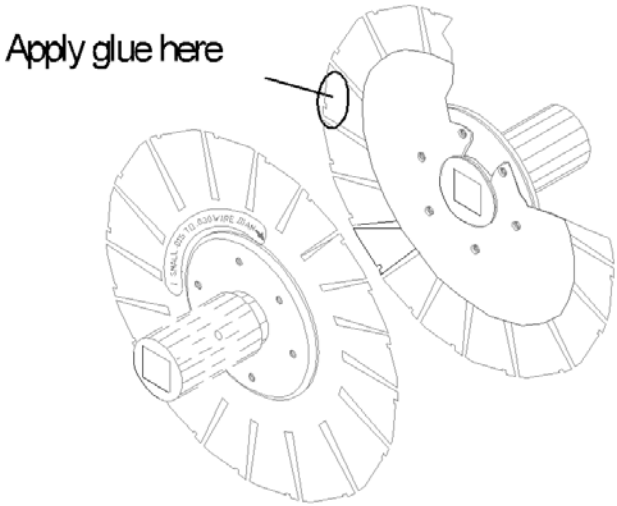
c. Repeat steps for other transport wheel shim.

9. Decide if the left, right, or both transport wheels require rubber pads.
This decision is application dependant.

10. Clean the surfaces.
Swab the surfaces of the rubber pads and the transport wheels to receive pads with alcohol.



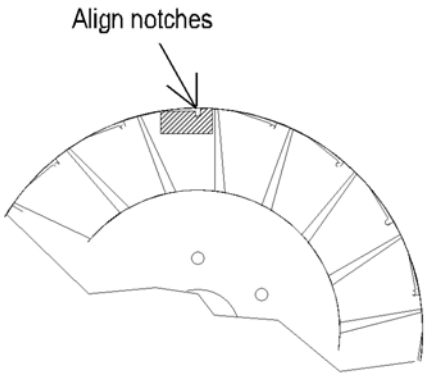
11. Apply glue.
Sparingly apply Loctite's Black Max 380 or 454 Surface Adhesive to each transport wheel segment. ***Use light pressure to avoid warpage.***



12. Apply rubber pads.
Apply a rubber pad to the transport wheel shims:

a. Align the bottom of the rubber pad's notch to the bottom of the transport wheel's notch.

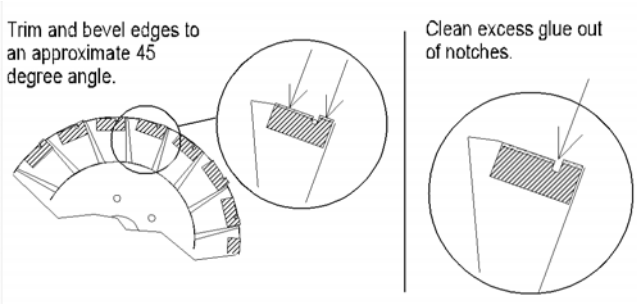
b. Press outward from the pad's center to expel any excess glue and/or air bubbles. Hold pad in place until the glue sets (3-5 seconds).



13. Trim and bevel rubber and clean off excess glue.

Using a razor blade, trim any excess rubber from the top edge of the transport wheel segment where components will ride:

- Bevel cuts at an approximate 45 degrees.
- Using the razor blade, clean any excess glue out of the notch and off the top edge.



14. Reinstall transport wheels on machine.
Refer to the transport wheel installation instructions in *CF-8 Operating Instructions*.

GPD GLOBAL®

CF-8 FORMULA CALCULATOR SOFTWARE

USER'S GUIDE

Version 1.1
June 7, 2001

GPD Global®
611 Hollingsworth Street
Grand Junction, CO 81505
(970) 245-0408 FAX (970) 245-9674
web: www.gpd-global.com email: request@gpd-global.com

TABLE OF CONTENTS

1.0 INTRODUCTION

The CF-8 Calculator Software package (Part No. CF8CALPKG) calculates station settings and die requirements on a customer-supplied IBM PC/XT compatible computer for use on the GPD CF-8 Precision Lead Former.

This software assists with set-ups and new forms. **Operator set up is faster and a lot more accurate.** Just enter the values of the component dimensions, forming parameters, and form type. Strike one function key and the computer automatically calculates all station settings and recommends appropriate dies. If parameters are selected outside the limits of the machine, the program will suggest an optional form or different die selection. This protects the machine from damage due to improper set up.

GPD Global®'s CF-8 Precision Lead Former shears and forms leads for a wide variety of axial electrical components. Simple die changes enable the CF-8 to produce many different forms of leads with minimal effort on the part of the machine operator.

2.0 FEATURES

Software residing on the customer-supplied computer communicates with the operator through a series of user-friendly menus and data entry screens, eliminating the need for the operator to know anything about computers. The engineer and/or operator calculates machine settings through the keyboard. Except for selection of a part number, the user does not need to be familiar with a typewriter keyboard beyond using various function keys.

An operator or engineer who is familiar with the use of menus and data entry on a computer can begin using the CF-8 Calculator Package with no additional training beyond acquaintance with the CF-8.

2.1 THE DATA BASE

The CF-8 Calculator Package maintains a data base of known parts in the attached computer. Information is referenced by part number, which may consist of a primary and secondary number. The operator can find a desired part number knowing only a portion of the number.

2.2 DEFINING A PART

The engineer can easily enter new data or change existing data for a part. In general, the engineer enters only known information about the part such as part sizes and desired final form. Dies required and die adjustments are calculated automatically.

2.3 DIE SELECTION AND ADJUSTMENT

In most cases, the operator simply uses a part number to select the part to process. The CF-8 Calculator Package then tells the operator what dies to install. After dies are installed, the operator adjusts the machine as required for the selected part.

2.4 SECURITY

The engineer can define passwords to restrict selected features of the CF-8 Calculator Package to use only by authorized personnel.

2.5 REPORTS

The CF-8 Calculator Package offers the ability to generate printed reports of material on the data base. These features require the installation of a printer using Epson-compatible controls as LPT1.

3.0 STARTING THE FORMULA CALCULATOR SOFTWARE

To begin the CF-8 Formula Calculator tutorial:

1. Turn on the computer. At the MSDOS prompt, type

   CD\CF12 [ENTER]
   CF12 [ENTER]

2. The opening screen appears (Figure 1). This screen requests a password to begin operations. When the CF-8 Calculator Package is first installed, no password is in effect; in this case, just press [Enter] to continue.

3. If passwords have been placed on the system, enter the password and press [Enter]. If an invalid password is entered, a screen appears to indicate the error; follow the displayed instructions and re-enter the password.

NOTE: Always check the bottom of the screen for instructions.

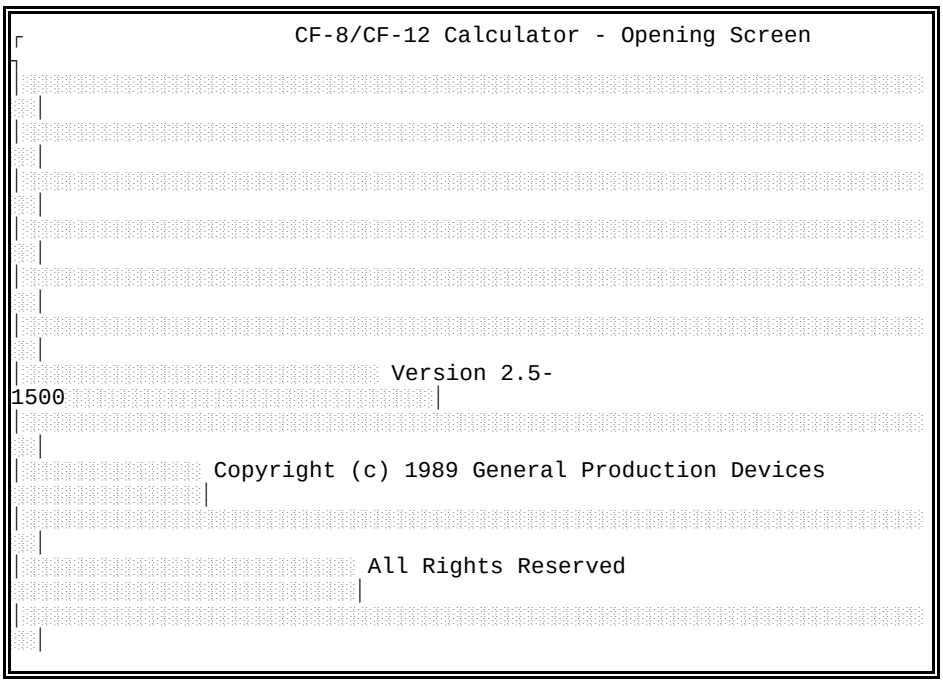


Figure 1 Opening Screen

NOTE: The password entered will not be displayed on the screen.

When operation continues, the Calibration Mode screen (Figure 2) is displayed. When using this software as a calculator this function is not used. Skip this step by pressing [ESC].

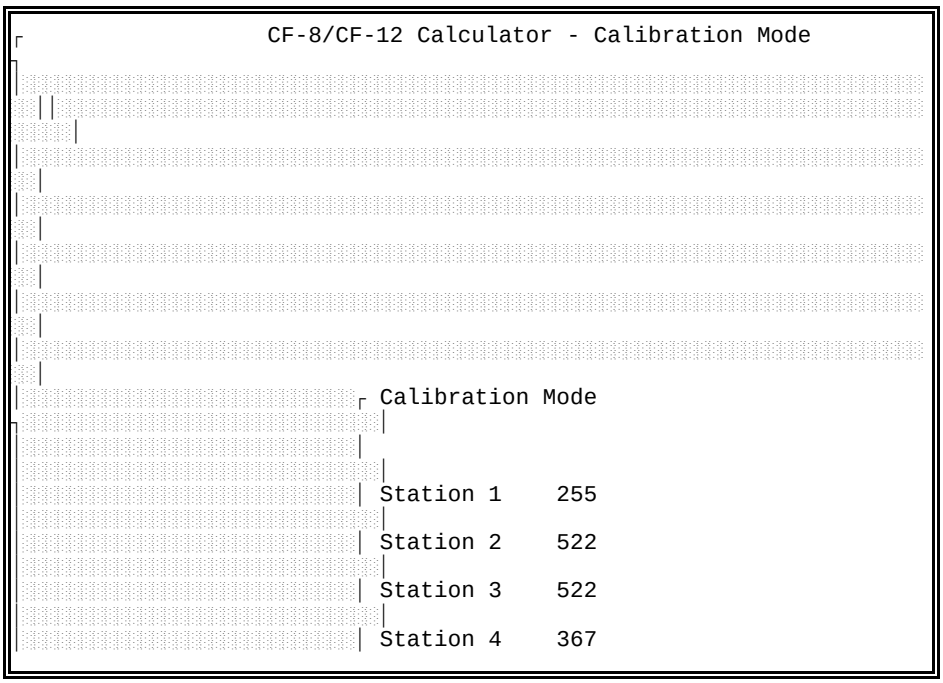


Figure 2 Calibration Mode

3.1 SELECTING A FUNCTION

After the initial calibration screen is passed, the Main Menu (Figure 3) is displayed. The menu highlight is at the first entry in the top row of the menu. You can move the highlight to any entry along the top row with the [Left ←] and [Right →] keys. Do this now and observe that another sub-menu appears below each entry as the highlight is moved. The highlight can also be moved to an entry by typing the first letter of the entry. The highlight can be moved to an entry on one of these sub-menus with the [Up ↑] and [Down ↓] keys.

The meaning of each selection on this menu is described later in this manual. Select an entry by moving the highlight to the desired entry and pressing [Enter]. If passwords have been defined, you may not be able to select some functions.

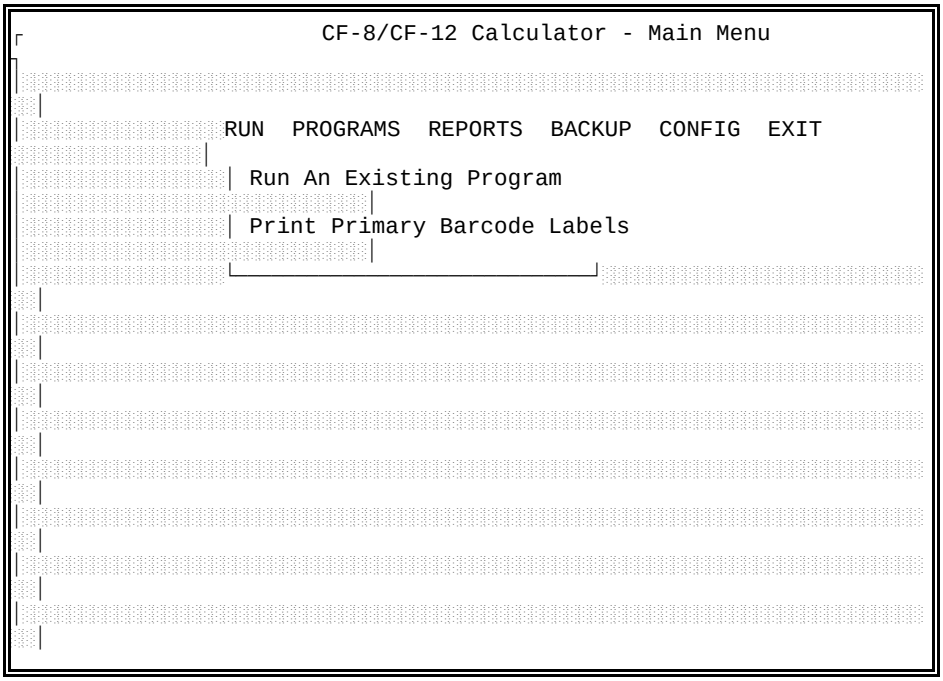


Figure 3 Main Menu

The major selections across the top of the menu allow you to perform functions as follows:

3.1.1 Programs

This option allows you to create or modify parts in the data base. You can define a new part or select a part to modify after selecting PROGRAMS.

3.1.2 Reports

This option allows you to print selected types of reports if you have a printer attached to the customer-supplied computer. You may be able to limit the range of material printed after selecting one of these options. If the printer is not ready, the software will wait until it is ready; if there is no printer attached, the software ignores the request.

3.1.3 Backup

This option allows you to format disks and create a backup of the CF-8 Calculator Package software and data base to the formatted disks.

NOTE: Current backups should always be available in case the data base is accidentally destroyed by a power failure or other disaster.

3.1.4 Exit

This selection exits to the MSDOS monitor on the computer. It is usually password-protected and is usually used only to restore the data base from backup disks.

4.0 CREATING/CHANGING PROGRAMS

New CF-8 Calculator Package programs are created or changed by selecting PROGRAMS from the main menu. When this option is selected, the Access Program Information screen (Figure 4) is displayed.

4.1 ADDING A NEW PROGRAM

There are two ways to create a new CF-8 Calculator Package program. If the new program is similar to an existing program, you can duplicate the existing program and edit it by modifying program screen with different function key options; this process is described in Section 4.2 *Changing Existing Programs*. To create an entirely new program not based on an existing program, press [F1] (ADD) in the Access Program Information screen. This displays an empty program screen similar to Figure 4.

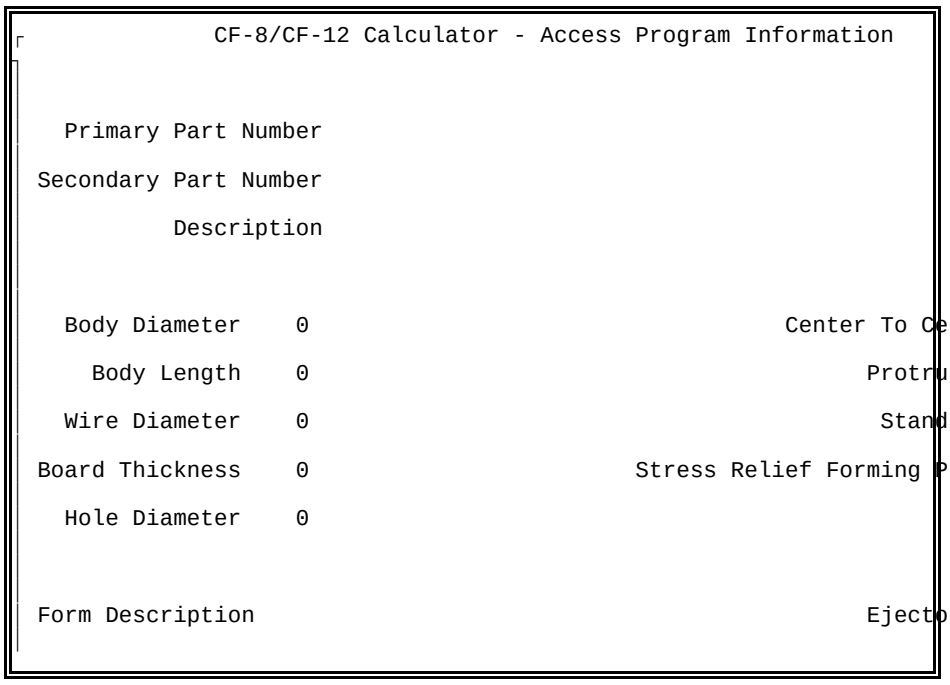


Figure 4 Access Program Information Screen

To create the program, begin by filling in the part number and description entries with the desired information (see sample program screen, Figure 5). Enter the raw part characteristics Body Diameter, Body Length, and Wire Diameter as integers (in units of .001 inches or .01 mm depending on your configuration). Then enter the PC board characteristics of Thickness, Hole Diameter, and mounting characteristics of Center To Center hole spacing, Protrusion through the board, Stand-Off spacing, and the Stress Relief Forming Plate (if used) in the same units.

Note that some of the characteristics may have minimum and/or maximum acceptable values. If you enter a value out of the acceptable range, an overlaid display will indicate the acceptable values.

Next move to the Form Description and press [Enter] to display a list of supported forms. Use the [Up ↑] and [Down ↓] to select the desired form and press [Enter]. Available forms and their names are shown in Appendix *Form Descriptions*; consult this appendix if, necessary, to obtain the required form name.

Once a form has been selected, press [F1] to calculate the remainder of the entries. If no calculation errors occur, the remainder of the screen is filled with the calculated information. If the calculation was not possible, a Help screen appears with information about why the calculation failed and what you can do to correct it. (If the Help screen exceeds the size of the display, use [Up ↑] and [Down ↓] to see the rest of the screen). Correct the problem and recalculate.

If you wish to use dies other than those recommended by the software, move to the desired die description (other than Stations 4 (top) or 5 (top)) and press [Enter]. If dies are allowed in that station for the selected form, a list will appear. Use the [Up ↑] and [Down ↓] to select a die and press [Enter]. Then press [F1] to recalculate the station settings.

When the calculation is complete, you can test the program by installing the proper dies. Then adjust the machine and run several parts. If any values need changing, change them and repeat the process. Whenever a dimension is modified, pressing [F1] will recalculate both the die descriptions and the station settings. If only a die description is modified, pressing [F1] will only recalculate the station settings.

When you are satisfied with the program, press [F10] to save it. To exit without saving the program, press [Esc].

4.2 CHANGING EXISTING PROGRAMS

To change an existing program (or to create a copy of an existing program as a starting point for creating a new program), the existing program must first be displayed. To locate a program, press [F3] (Search) and select the desired program. To see a list of available programs, press [Enter]. A filled-in screen such as that shown in Figure 5 appears.

If you want to change the program displayed, press [F2] to edit. To create a new program from an existing program, press [F9] (Duplicate), change the part number to the new part number, and press [F10] to establish the new program.

To edit the displayed program, simply change the entries as needed, press [F1] to recalculate and [F10] to save the changes. All operations are the same as when adding a new part.

```
              CF-8/CF-12 Calculator - Access Program Information


   Primary Part Number SAMPLE
 Secondary Part Number
           Description 1/4 WATT RESISTOR


   Body Diameter  125                                  Center To Center  450
     Body Length  250                                        Protrusion   60
   Wire Diameter   30                                         Stand-Off  100
 Board Thickness   62                       Stress Relief Forming Plate    0
   Hole Diameter   40


 Form Description H SOLI                                     Ejector Blade 1
```

Figure 5 Existing Program Screen

4.3 DELETING A PROGRAM

To delete an existing program, first display it (using the Search function, [F3], if necessary). Then press [F4] (Delete). Press [Y] in response to the message, then press [Enter]. Be sure you want to do this: once a program is deleted, it cannot be restored.

4.4 PRINTING A PROGRAM

If your computer has a printer attached, the program data can be printed. First display the desired program (using the Search function, [F3], if necessary). Then press [F6] (Print). If the printer is not ready, the software waits until it is ready; if there is no printer attached the request is ignored.

5.0 REPORTS

Program data can be printed, if the computer has a printer attached, by selecting one of the options from the sub-menu under REPORTS on the main menu. If no printer is attached, the request is ignored. If a printer is attached but not ready when a print request is made, the software waits for the printer to become ready.

5.1 LIST ALL PROGRAM INFORMATION

This option first requests a part number, then prints all data associated with the part. It is essentially the same as requesting Print from the PROGRAMS option.

5.2 LIST BY PART NUMBER RANGE

This option requests a primary part number. If you supply no part number, all part numbers are printed. If you supply only a partial part number, all part numbers starting with the supplied characters are printed.

This option allows you to select printing of detail data (the same printout as produced by LIST ALL PROGRAM INFORMATION), or printing of a reduced list containing only primary and secondary part numbers with descriptions.

5.3 LIST BY DESCRIPTION RANGE

This option requests a part description rather than a primary part number. If you supply no description, all part numbers are printed. If you supply only a partial description, all part numbers having descriptions starting with the supplied characters are printed.

This option allows you to select printing of detail data (the same printout as produced by LIST ALL PROGRAM INFORMATION), or

printing of a reduced list containing only primary and secondary part numbers with descriptions.

6.0 BACKUP

The BACKUP option on the main menu allows backup to floppy disk of all files in the CF-8 Calculator Package. **Backups are important!** In case of a local disaster, they allow you to restore your system with minimal loss. It is recommended that you back up your files once a week or whenever a large number of programs have been created or changed. Keep the backups in a safe place.

If you are using the stand-alone version of the CF-8 Calculator Package software, you can transfer data between the CF-8 (or CF-12) and the stand-alone system with backup disks. Simply back up the data on one system and restore it on another.

NOTE: The BACKUP option on the main menu can only be used with MSDOS versions 5.0 or earlier.

6.1 FORMAT

Prior to selecting BACKUP, a sufficient number of formatted disks must be available for the backup. The FORMAT option allows you to format disks in preparation for a backup. In general, you should format one more disk than was needed for the last backup assuming a regular backup schedule.

WARNING: Formatting destroys any data on the disks!

Do not format the disks used for your prior backup. Always keep the last set of backup disks until the next set is complete. It is preferable to keep at least 3 consecutive sets of backup disks.

6.2 BACKUP

To back up data files, obtain a sufficient quantity of formatted disks and select BACKUP from the menu. The software prompts for new disks as needed. As each disk is removed, label it with the date, number of the disk, and any other information pertaining to the backup. When backup is complete, store the disks in a safe place.

6.3 RESTORING DATA

To restore data from backup disks, first select EXIT from the main menu. When the MSDOS prompt appears, mount the first disk of the backup set and type

RESTORE A: C:[Enter]

to begin the restore. You will be prompted to mount the backup disks in order as they are needed.

When the restore is complete, type

CF12[Enter]

to restart the CF-8 Calculator Package software.

NOTE: RESTORE can only be used with MSDOS versions 5.0 or earlier.

7.0 SYSTEM CONFIGURATION

Many features of the CF-8 Calculator Package are flexible, allowing the individual site to select options tailored to the needs of the site. These features include passwords, operator restrictions, and details such as whether units of displayed values are in inches or millimeters.

To change the system configuration, move the highlight on the main menu to CONFIG. The main menu displays the configuration options shown in Figure 6. Select the appropriate item to perform an operation as described in the remainder of this chapter.

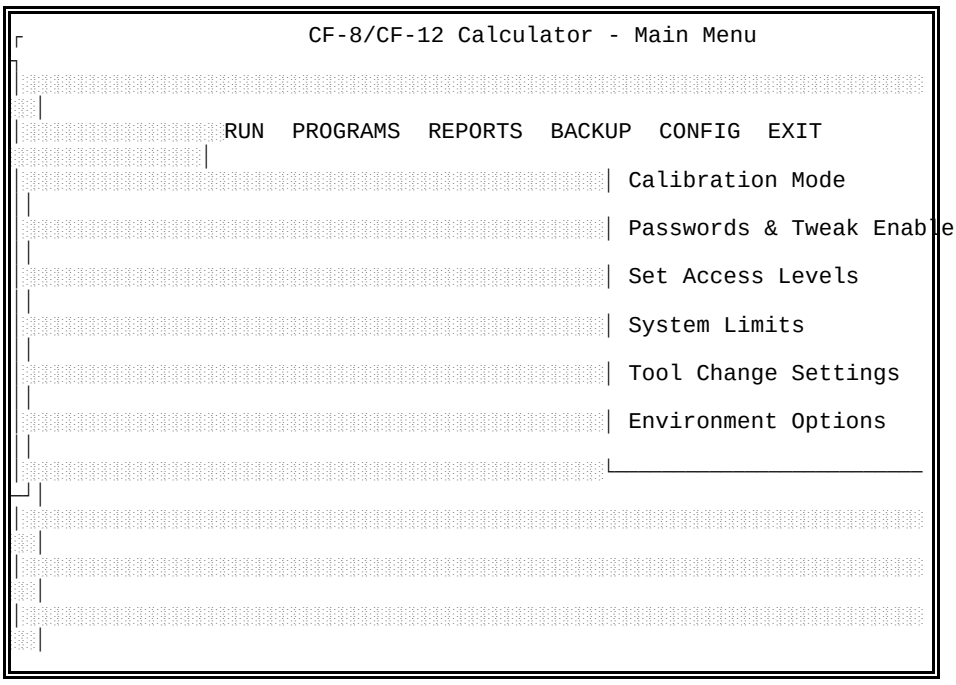


Figure 6 Configuration Options

7.1 PASSWORDS & TWEAK ENABLES

The engineer can assign passwords for the operator and engineer and can restrict the use of tweak mode. Select PASSWORDS AND TWEAK ENABLES from the main menu; the screen shown in Figure 7 appears.

Enter the passwords for the operator and engineer (the operator password is not effective if the engineer password is blank). This screen only defines passwords; passwords must be enabled with SET ACCESS LEVELS before they are effective.

Whether tweaking is allowed (enabled) and whether tweak changes may be saved only applies to control software on the CF-12. Ignore this function if using the software as a calculator.

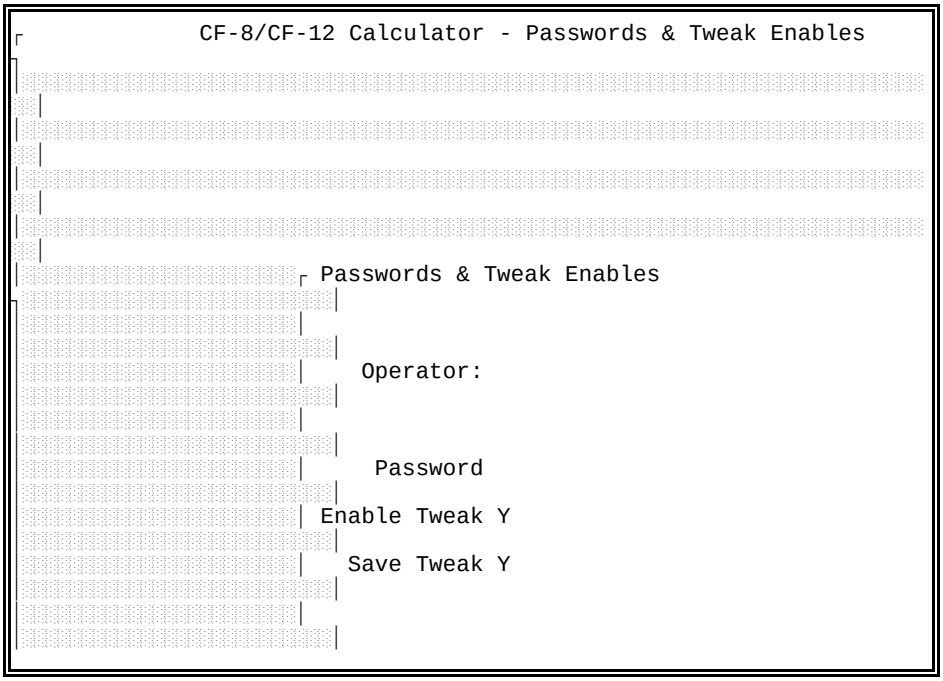


Figure 7 Passwords and Tweak Enables Screen

7.2 SET ACCESS LEVELS

The operator can be allowed or denied access to various system features. To change these restrictions, select SET ACCESS LEVELS from the main menu; the display shown in Figure 8 appears. For each feature, Level 0 allows access with no password; Level 1 allows access with the operator password or the engineer password; and Level 2 allows access with the engineer password only. (Passwords are defined with the option PASSWORDS AND TWEAK ENABLES).

Each entry in Set Access Levels Figure 8, controls access to a display screen. Two entries on the list control access to the PROGRAMS and EXIT options on the main menu. The other entries control access to sub-menus of the CONFIG option on the main menu.

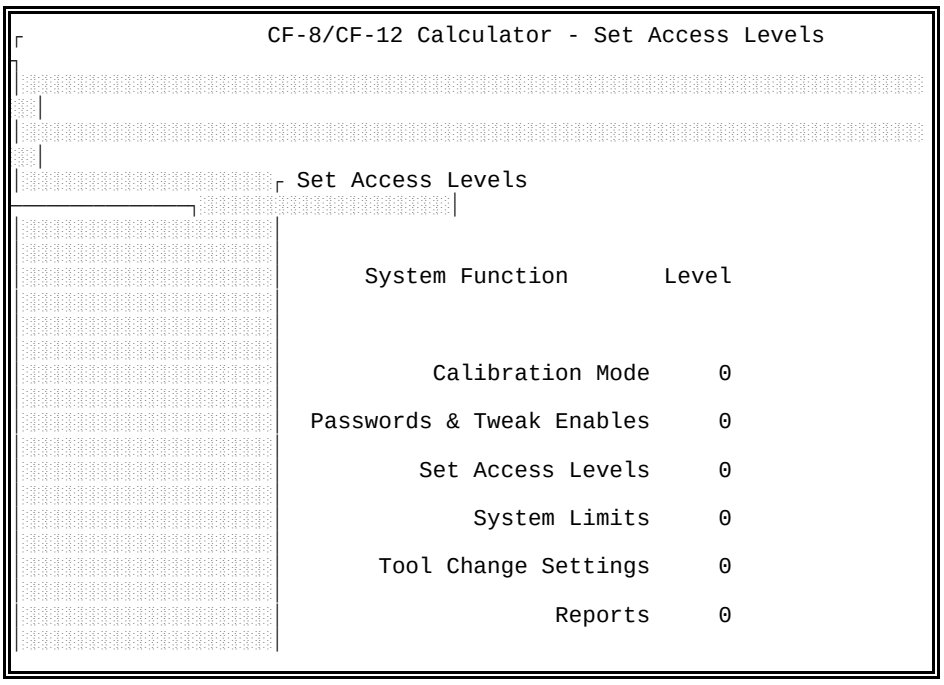


Figure 8 Set Access Levels Screen

7.3 SYSTEM LIMITS

Not applicable to the CF-8 Calculator Package.

7.4 TOOL CHANGE SETTINGS

Not applicable to the CF-8 Calculator Package.

7.5 ENVIRONMENT OPTIONS

Various internal options can be configured as needed by selecting ENVIRONMENT OPTIONS from the main menu. The screen shown in Figure 9 appears.

Units for display and data entry can be set to inches (I) or millimeters (M) as desired. This value can be changed at any time; existing data are displayed in the selected units regardless of the units used to enter the data.

Detail Parts per Page can be set to 1 or 2.

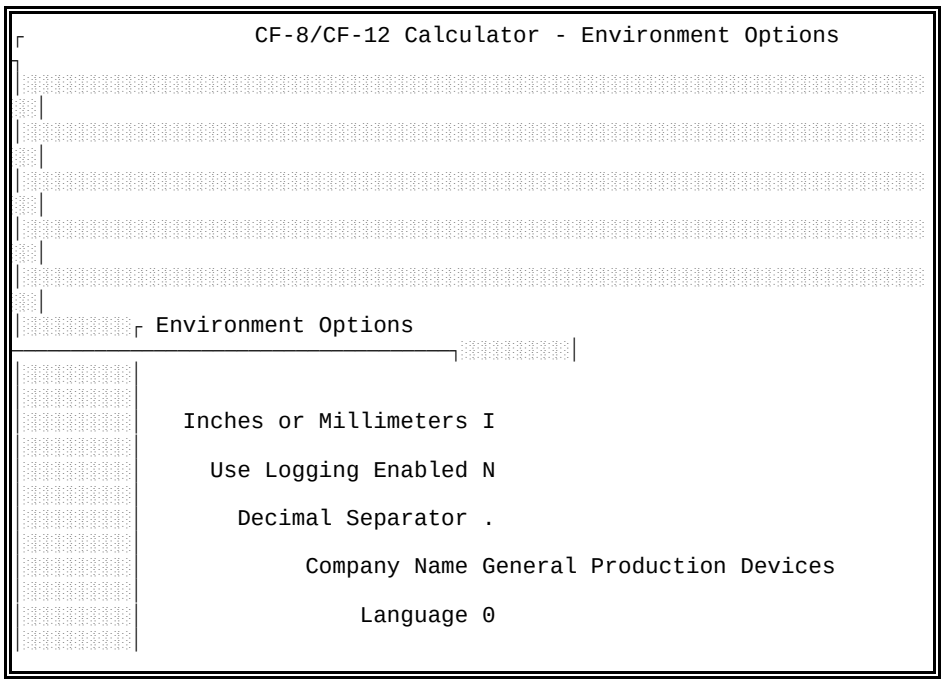


Figure 9 Environment Options Screen

The character used as a decimal separator can be chosen by the site. This character is usually a period for English-speaking sites or a comma for many European sites.

8.0 EXIT TO MSDOS

The EXIT option on the main menu exits from the CF-8 Calculator Package software to the MSDOS operating system. This option is not needed for most CF-8 (or CF-12) operations and is normally disabled for operator usage.

Typically, this feature is used for only two purposes: to restore data from backup disks as described in Chapter 6 *BACKUP*, and to install updated versions of the CF-8 Calculator Package software as described in Chapter 9 *INSTALL SOFTWARE UPDATE(S)*.

9.0 INSTALL SOFTWARE UPDATE(S)

9.1 FIRST TIME INSTALLATION

If you are installing Version 2.5 of the software on the CF-12 for the first time, or you are installing the CF-8 Calculator Package on a hard disk, perform the following set of instructions applicable to the type of operating system used by your computer:

Windows Operating Systems:

1. Place the new software disk in Drive A. Select Programs > MS-DOS Prompt from the Windows Start button.

2. At the C:\WINDOWS prompt, create a directory by typing the following:

   MD CF12 [Enter].

3. Copy the CF-8 Calculator Package onto the C: drive by typing the following:

   COPY A:*.* C:\WINDOWS\CF12 [Enter].

DOS Operating Systems:

1. Place the new software disk in Drive A. At the MSDOS prompt, type

   A:INSTALL [Enter]

2. Follow the instructions given in the install program.

9.2 RUNNING CF-8 CALCULATOR PACKAGE FROM A FLOPPY DISK

If you do not have a hard disk and would like to use the CF-8 Calculator Package on a floppy system, perform the following set of instructions applicable to the type of operating system used by your computer:

Windows Operating Systems:

1. Place the CF-8 Calculator Package disk in Drive A.

2. Double-click on the Windows “My Computer” icon.

3. Double-click on the Floppy (A:) drive selection.

4. Start the CF-8 Calculator Program by double-clicking on the A:\CF12CALC.EXE file.

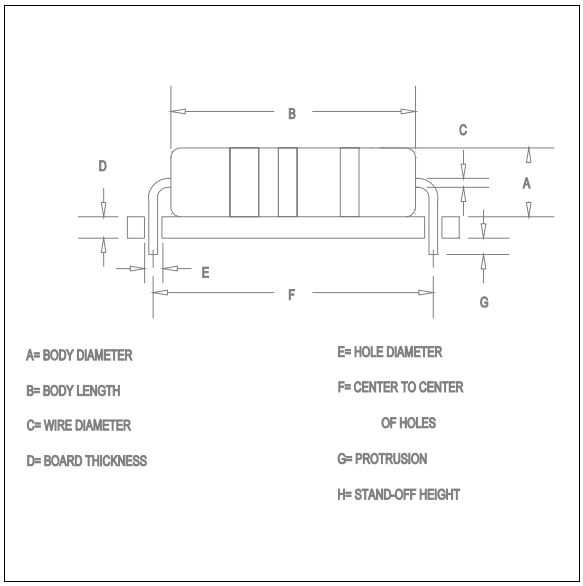
DOS Operating Systems:

1. Place the CF-8 Calculator Package disk in Drive A. At the MSDOS prompt, type

   A: [Enter]
   CF12 [Enter]

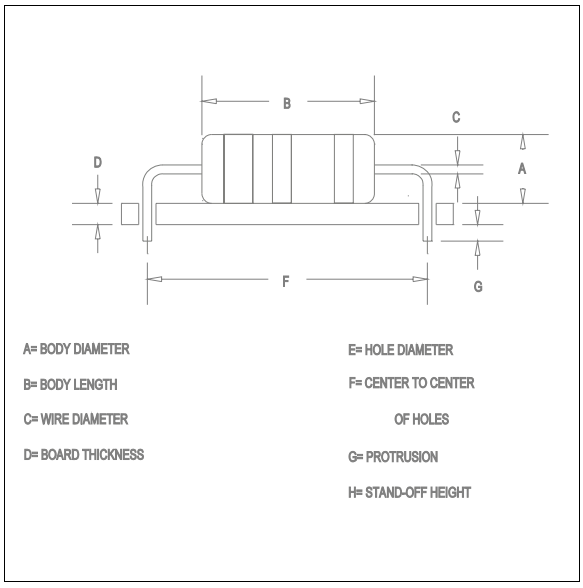
2. At this point the CF-8 Calculator Package software will load and run.

APPENDIX FORM DESCRIPTIONS



H CTC

Horizontal Center To Center
Max Lead Dia. .030"

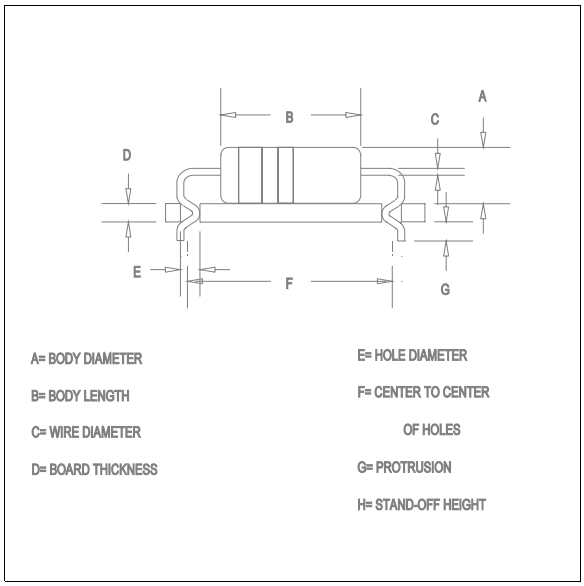


H FM

Horizontal Flush-Mount

H FM CO

Horizontal Flush-Mount With Cutoff

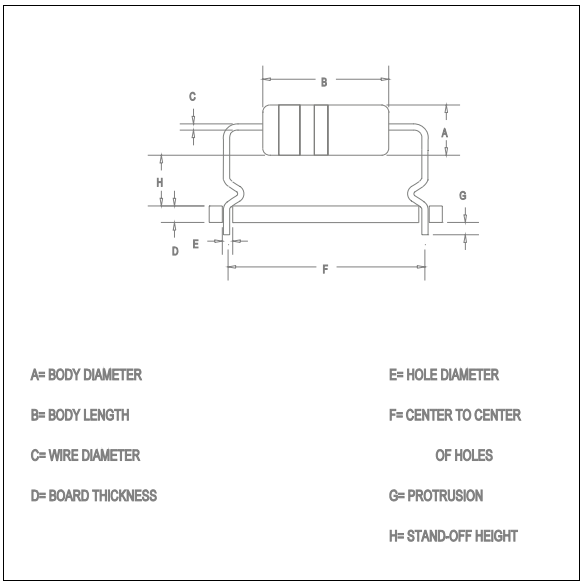


H FMLI

Horizontal Flush-Mount
Lock-In

H FMLI CO

Horizontal Flush-Mount
Lock-In With Cutoff

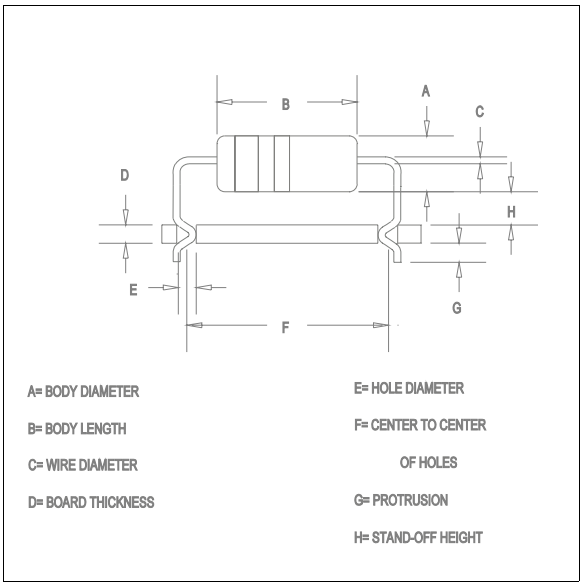


H SO

Horizontal Stand-Off

H SO CO

Horizontal Stand-Off
With Cutoff

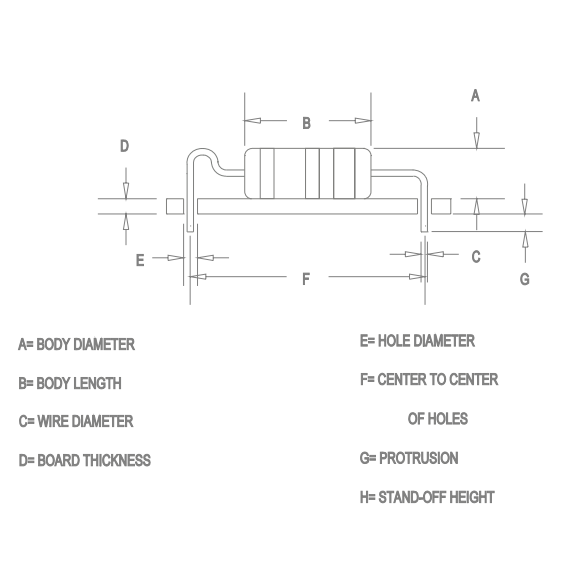


H SOLI

Horizontal Stand-Off
Lock-In

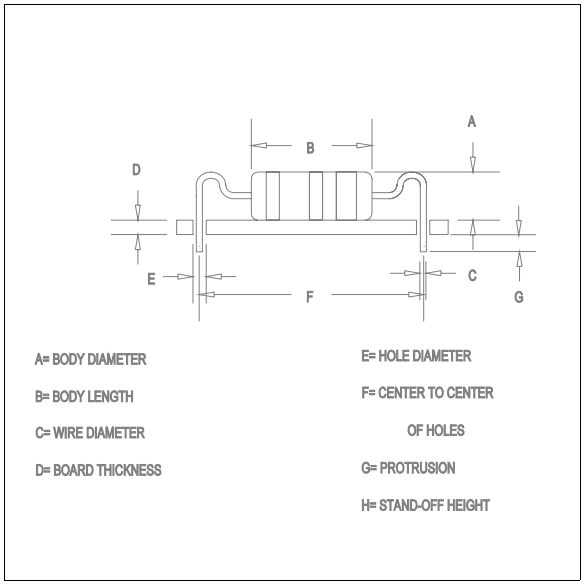
H SOLI CO

Horizontal Stand-Off
Lock-In With Cutoff



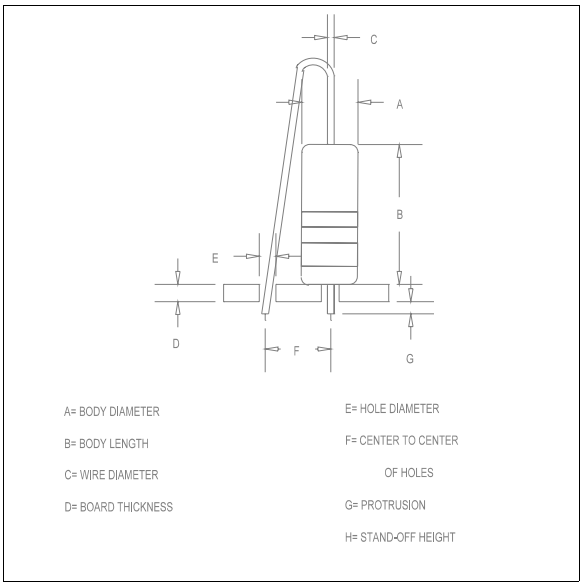
TYPE 2A MSR SGL

Type 2A Military Stress
Relief (Single Hump)



TYPE 2A MSR DBL

Type 2A Military Stress Relief (Double Hump)

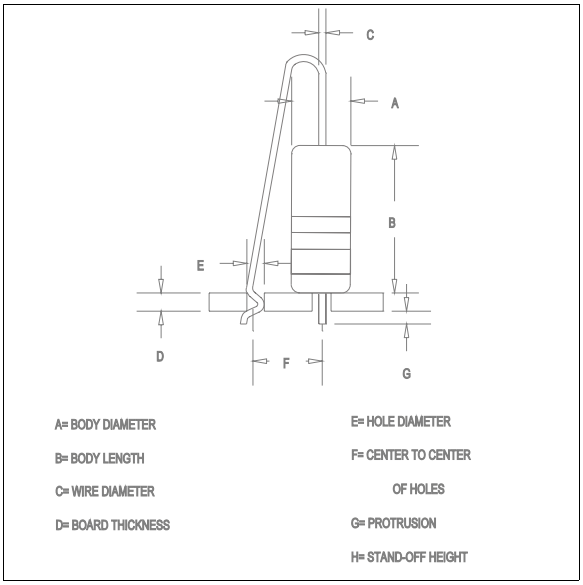


V FM

Vertical Flush-Mount

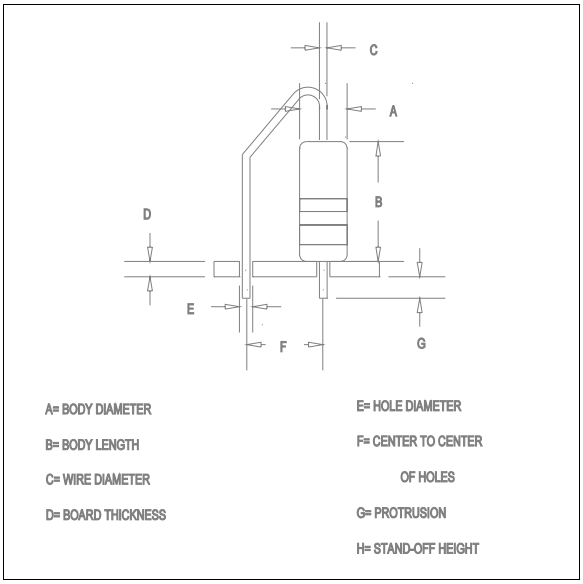
V FM CO

Vertical Flush-Mount With Cutoff

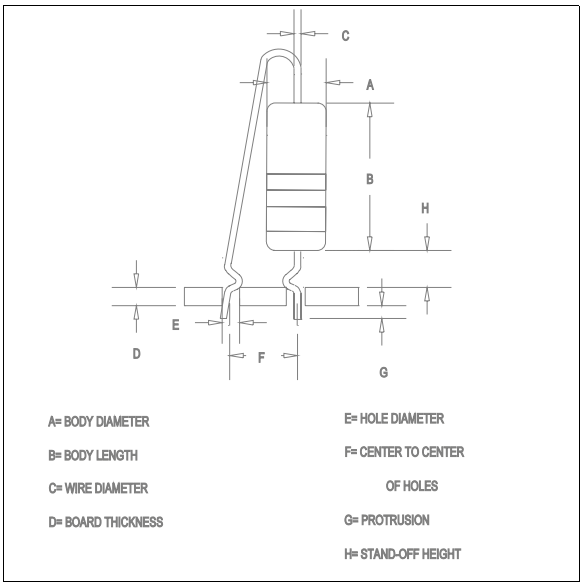


V FMLI
Vertical Flush-Mount
Lock-In

V FMLI CO
Vertical Flush-Mount
Lock-In With Cutoff

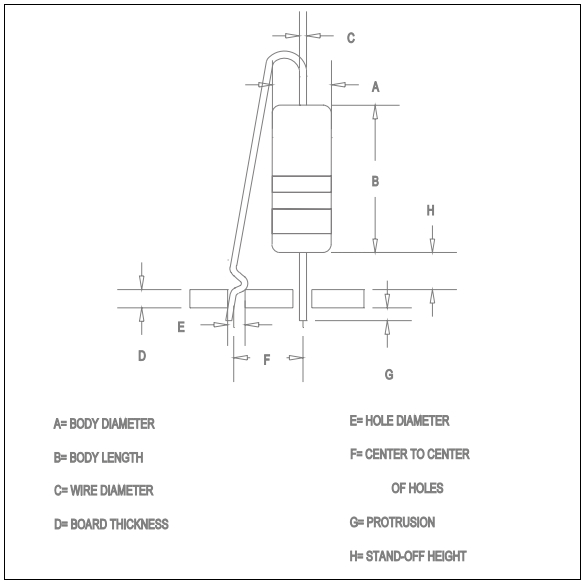


VP FM
Vertical Parallel
Flush-Mount



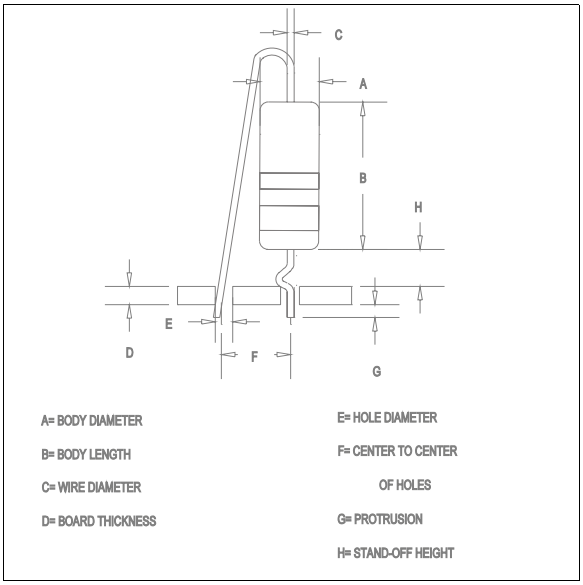
V SO B
Vertical Stand-Off
(Both Leads)

V SO B CO
Vertical Stand-Off
(Both Leads) With Cutoff



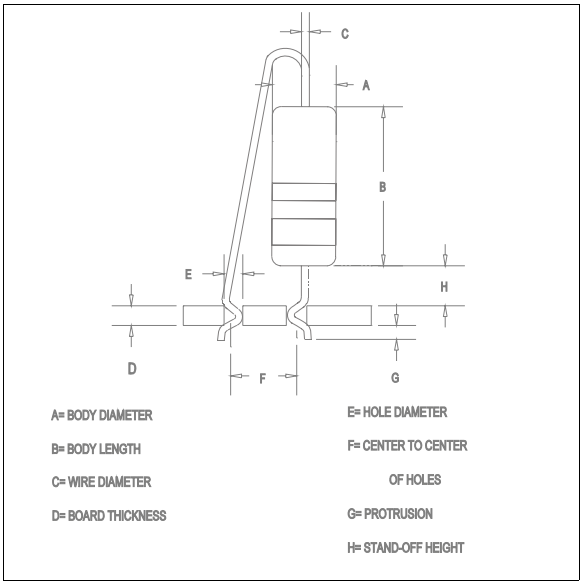
V SO L
Vertical Stand-Off
(Long Lead)

V SO L CO
Vertical Stand-Off
(Long Lead) With Cutoff



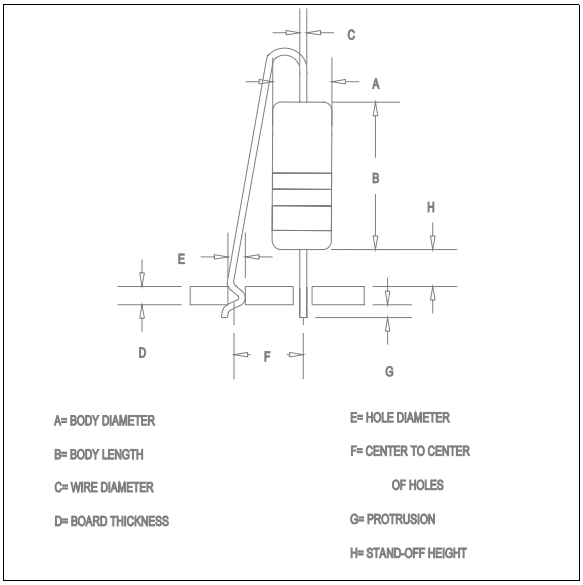
V SO S
Vertical Stand-Off
(Short Lead)

V SO S CO
Vertical Stand-Off
(Short Lead) With Cutoff



V SOLI B
Vertical Stand-Off Lock-In
(Both Leads)

V SOLI B CO
Vertical Stand-Off Lock-In
(Both Leads) With Cutoff

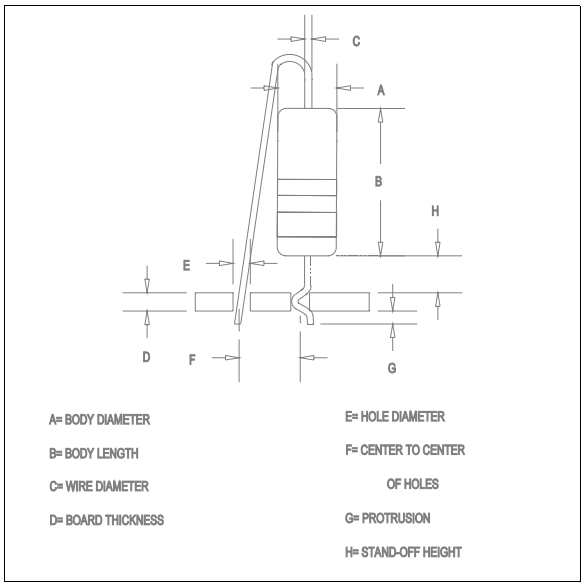


V SOLI L

Vertical Stand-Off Lock-In (Long Lead)

V SOLI L CO

Vertical Stand-Off Lock-In (Long Lead) With Cutoff



V SOLI S

Vertical Stand-Off Lock-In (Short Lead)

V SOLI S CO

Vertical Stand-Off Lock-In (Short Lead) With Cutoff