UNIVERSAL

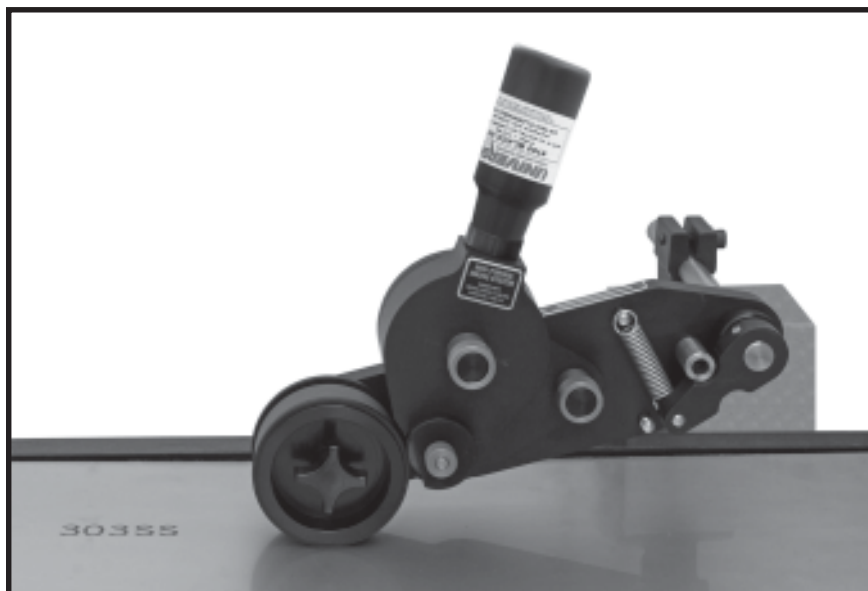**STENCILING & MARKING   SYSTEMS**

OWNER'S MANUAL

> ## NON-POROUS
> ## MIDSIZE CODERS
> ## ALL MODELS

INSTALLATION - OPERATION - MAINTENANCE

30355

UNIVERSAL STENCILING & MARKING SYSTEMS, INC.
P.O. BOX 871 - ST. PETERSBURG, FLORIDA 33731 USA
PH: (727) 894-3027 - E-Mail: sales@universal-marking.com
Website: www.universal-marking.com

NPMS-22291

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│ ┌─────────────────────────────────────────────────┐ │
│ │               IMPORTANT NOTE                    │ │
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UNIVERSAL products are manufactured to exacting standards and every available step has been taken to assure your complete satisfaction. It is most important that the instructions contained in this manual are read and carefully followed for best results. Failure to do so may result in unsatisfactory performance, damage to the equipment and personal injury.

PREFACE

Printing on non-porous materials has always been a major problem in industrial applications. The high degree of maintenance usually required to keep conventional "non-porous" machines operating has made many companies opt for manual marking as a cost effective alternative. With the UNIVERSAL Non-Porous Coders, printing on non-porous materials can be accomplished with the same relative ease as printing on porous materials. This breakthrough in Non-Porous printer design opens up in-plant printing opportunities which previously were regarded as too costly to consider.

Unlike the inks used to print on porous materials which dry through absorption into the material being printed, non-porous inks dry through the rapid evaporation of the ink solvents after the print is applied. Since the ink solvents must evaporate very rapidly on the printed material, they also evaporate very rapidly from the ink rolls and ink wells of conventional printers therefore requiring sometimes hourly re-inking of the printer.

The proprietary design of the UNIVERSAL Non-Porous Inking System effectively eliminates the rapid evaporation of the ink solvents from the ink roll and additionally provides for convenient automatic re-inking of the roll without interrupting the printing process. The final design of this system was the product of many months of design engineering and field testing. The final product is both simplistic in design and extremely effective in operation. The relatively low cost of these systems makes in-plant printing of all types of non-porous materials a practical reality. The following pages of this manual explain the installation, operation and maintenance of Non-Porous Midsize Coders and are the key to trouble free non-porous printing.

QUICK START
PAGES 13 THRU 18

This manual was written with a full understanding that very few people like to read manuals or have the time to do so. To accommodate those who have little time to spare, we have included a Quick Start section which will get your coder operating in just a few minutes.

To keep your coder operating properly, it is important to read and understand the Basic Principles of Operation section which explains the basic operation of the Non-Porous Inking System.

CODER SPECIFICATIONS

The specification section includes drawings with the basic dimensions of the coders, the net weights, maximum die capacities, maximum print width and print drum circumferences. This section also lists the specifications for the printing dies and an explanation of the Indexing and Non-Indexing models and the various mounting configurations.

SPECIFICATIONS

MIDSIZE CODER SPECIFICATIONS
TOP MOUNT SERIES

Model Shown: MS-120-NPRT
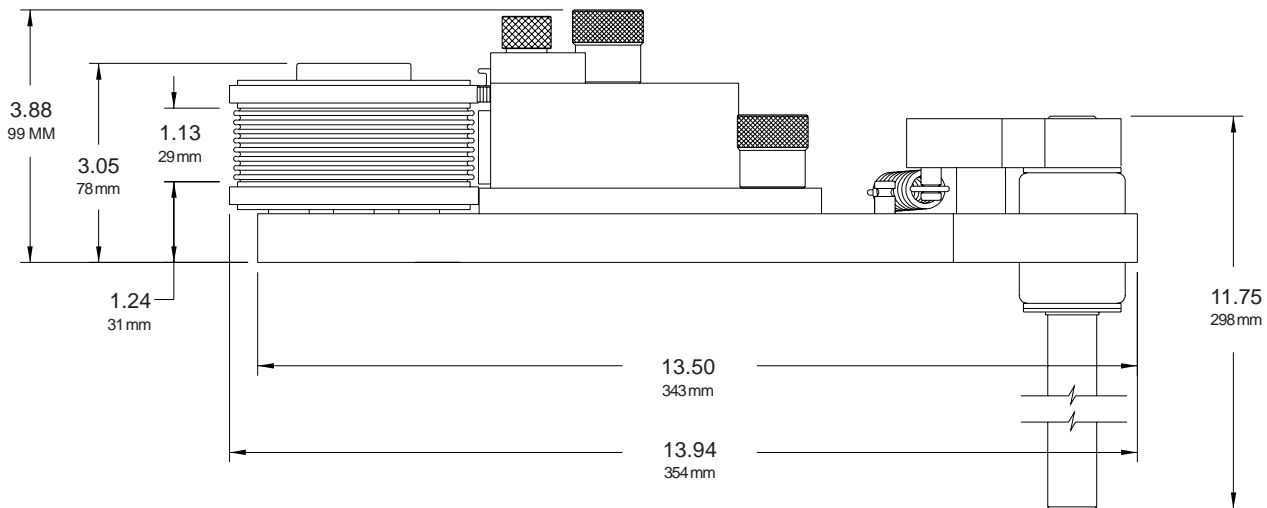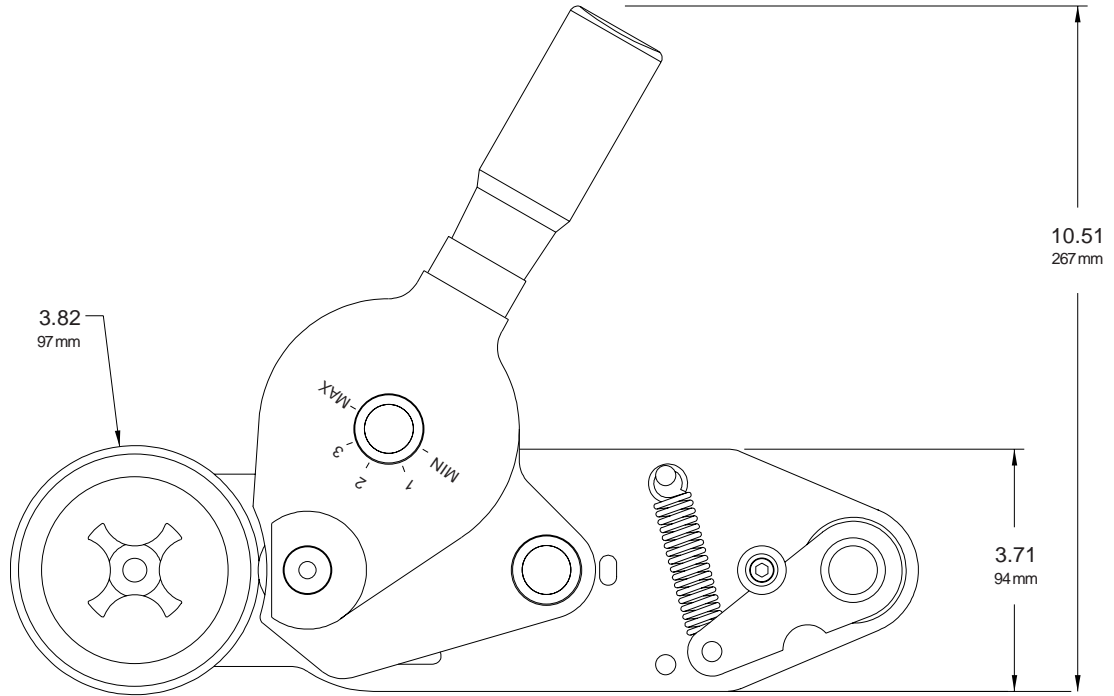
NET WEIGHT: 9 LBS. - 13 OZ. (4.45 KG.)
MAXIMUM DIE SIZE - US STANDARD: 7/8" (7 RIBS) X 11-3/8" LENGTH
MAXIMUM DIE SIZE - METRIC CODERS ONLY: 23.8 MM (7 RIBS) X 288.9 MM LENGTH
PRINT DRUM CIRCUMFERENCE: APPROXIMATELY 12.00" (305 MM) MEASURED AT DIE FACE

SPECIFICATIONS

MIDSIZE CODER SPECIFICATIONS
SIDE MOUNT SERIES

Model Shown: MS-150-NPRS

NET WEIGHT: 10 LBS. - 4 OZ. (4.65 KG.)
MAXIMUM DIE SIZE - US STANDARD: 7/8" (7 RIBS) X 14-1/4" LENGTH
MAXIMUM DIE SIZE - METRIC CODERS ONLY: 23.8 MM (7 RIBS) X 362 MM LENGTH
PRINT DRUM CIRCUMFERENCE: APPROXIMATELY 15.00" (381 MM) MEASURED AT DIE FACE

SPECIFICATIONS

MIDSIZE CODER SPECIFICATIONS
SIDE MOUNT SERIES
Model Shown: MS-180-NPRT
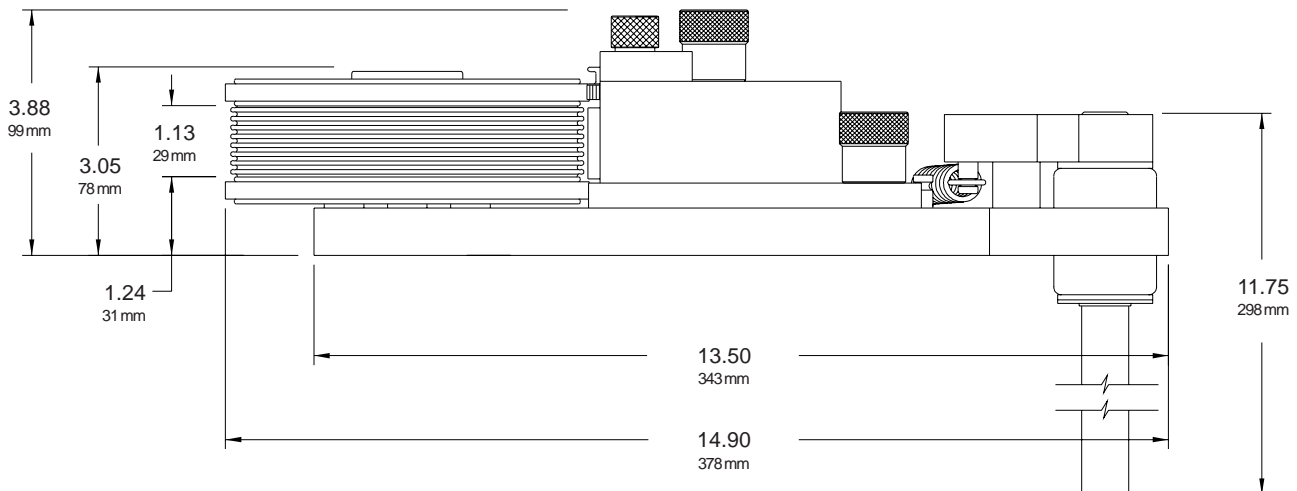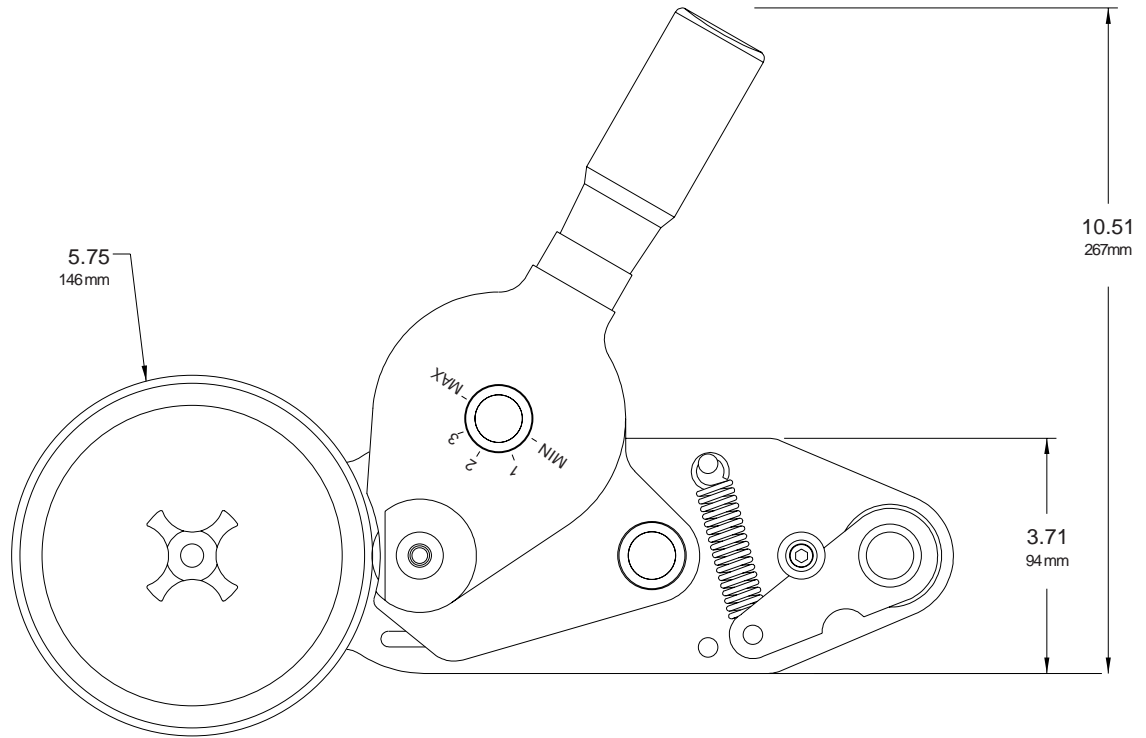
5.75
146 mm

10.51
267 mm

3.71
94 mm

3.88
99 mm

1.13
29 mm

3.05
78 mm

1.24
31 mm

11.75
298 mm

13.50
343 mm

14.90
378 mm

NET WEIGHT: *10 LBS. - 6 OZ. (4.71 KG.)*
MAXIMUM DIE SIZE - US STANDARD: *7/8" (7 RIBS) X 16-15/16" LENGTH*
MAXIMUM DIE SIZE - METRIC CODERS ONLY: *23.8 MM (7 RIBS) X 430.2 MM LENGTH*
PRINT DRUM CIRCUMFERENCE: *APPROXIMATELY 18.00" (457 MM) MEASURED AT DIE FACE*

SPECIFICATIONS

MIDSIZE CODER SPECIFICATIONS
TOP MOUNT SERIES

Model Shown: MS-220-NPRT
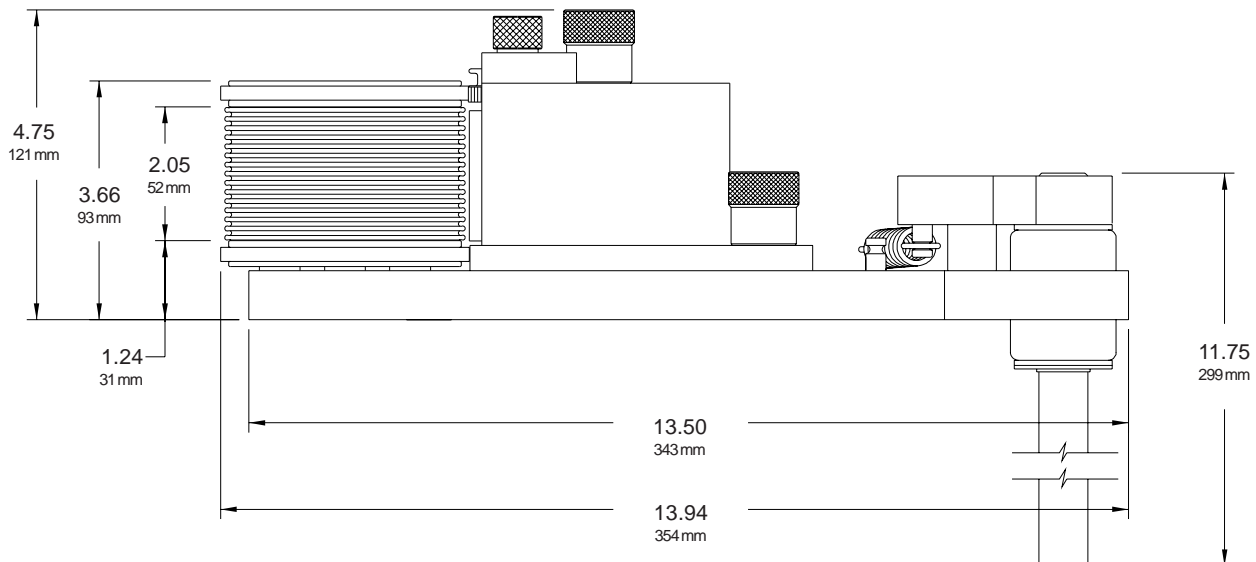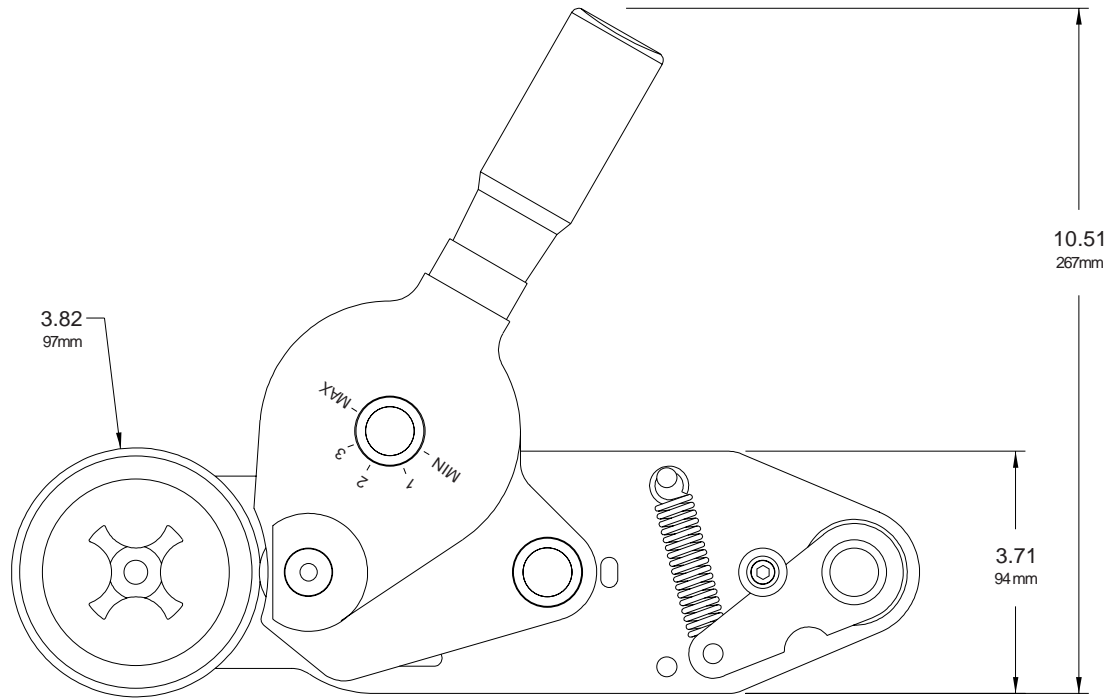
10.51
267mm

3.82
97mm

3.71
94mm

4.75
121mm

2.05
52mm

3.66
93mm

1.24
31mm

11.75
299mm

13.50
343mm

13.94
354mm

NET WEIGHT: *10 LBS. - 7 OZ. (4.73 KG.)*
MAXIMUM DIE SIZE - US STANDARD: *1-7/8" (14 RIBS) X 11-38" LENGTH*
MAXIMUM DIE SIZE - METRIC CODERS ONLY: *49.2 MM (13 RIBS) X 288.9 MM LENGTH*
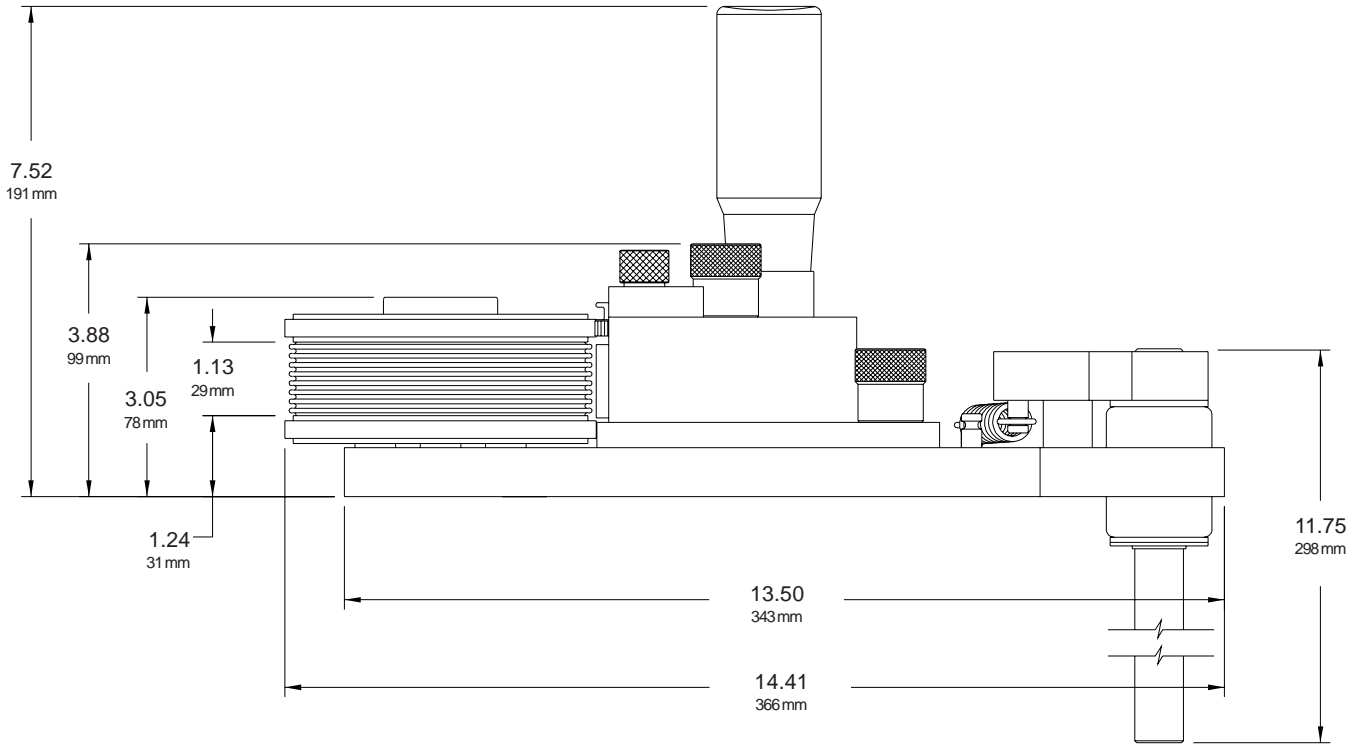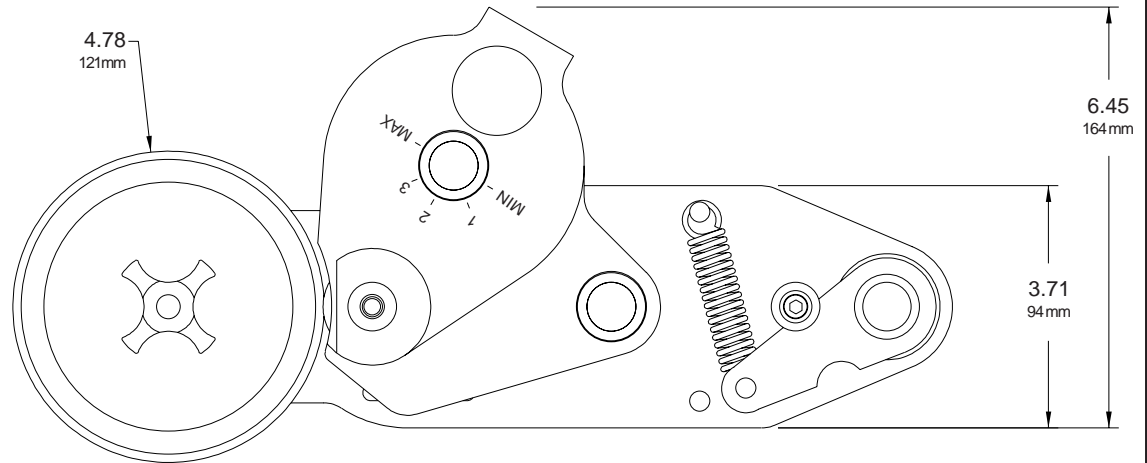*PRINT DRUM CIRCUMFERENCE:*   *APPROXIMATELY 12.00" (305 MM) MEASURED AT DIE FACE*

7

SPECIFICATIONS

MIDSIZE CODER SPECIFICATIONS
SIDE MOUNT SERIES

Model Shown: MS-250-NPRS
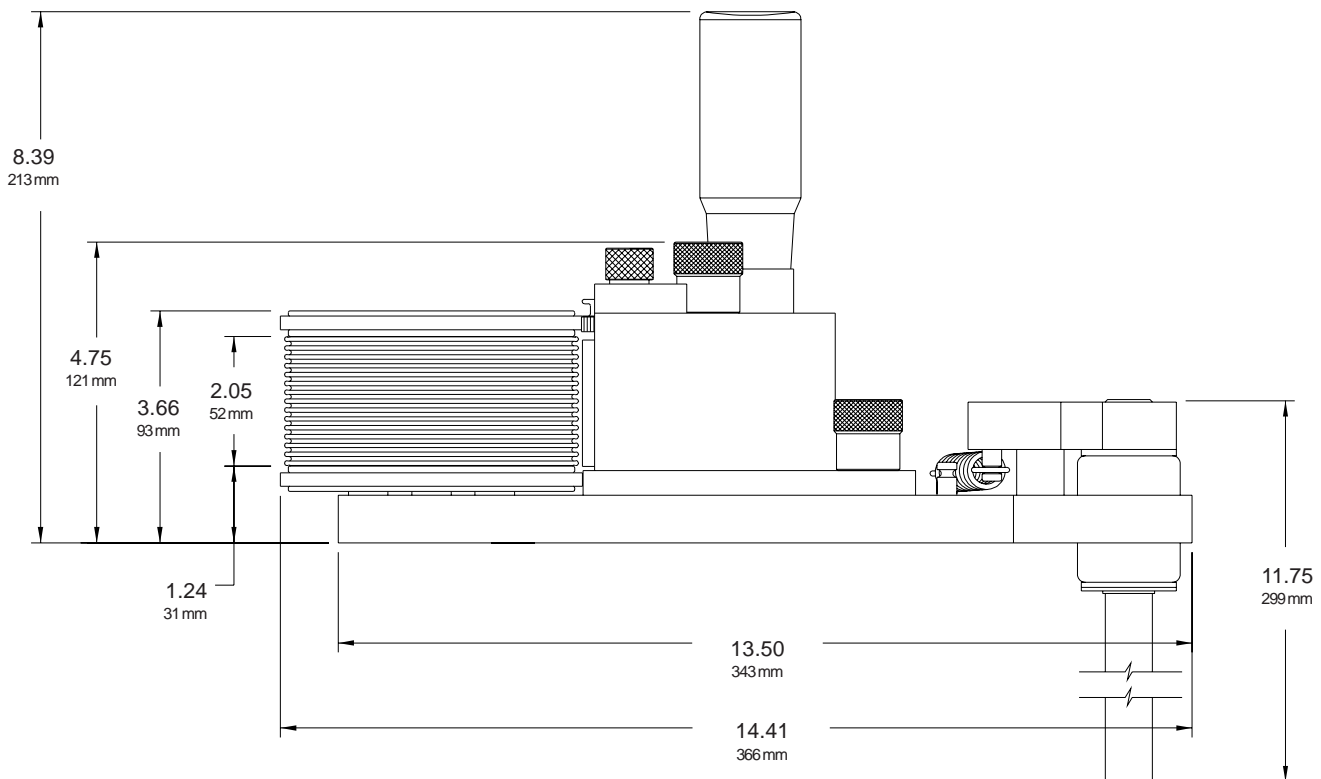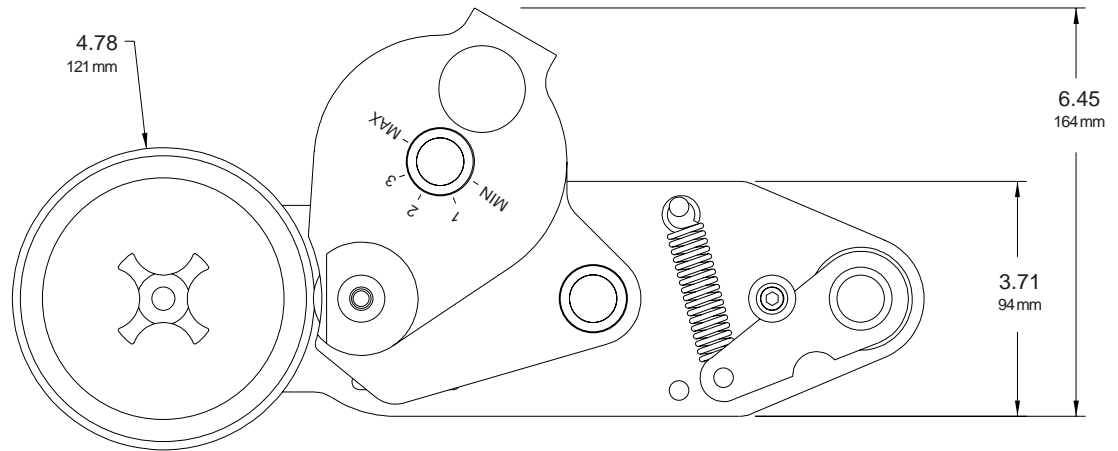
4.78
121 mm

6.45
164 mm

3.71
94 mm

8.39
213 mm

4.75
121 mm

3.66
93 mm

2.05
52 mm

1.24
31 mm

13.50
343 mm

14.41
366 mm

11.75
299 mm

NET WEIGHT: 11 LBS. - 1 OZ. (5.02 KG.)
MAXIMUM DIE SIZE - US STANDARD: 1-7/8" (14 RIBS) X 14-1/4" LENGTH
MAXIMUM DIE SIZE - METRIC CODERS ONLY: 49.2 MM (13 RIBS) X 362 MM LENGTH
PRINT DRUM CIRCUMFERENCE: APPROXIMATELY 15.00" (381 MM) MEASURED AT DIE FACE

SPECIFICATIONS

MIDSIZE CODER SPECIFICATIONS
TOP MOUNT SERIES

Model Shown: MS-280-NPRT
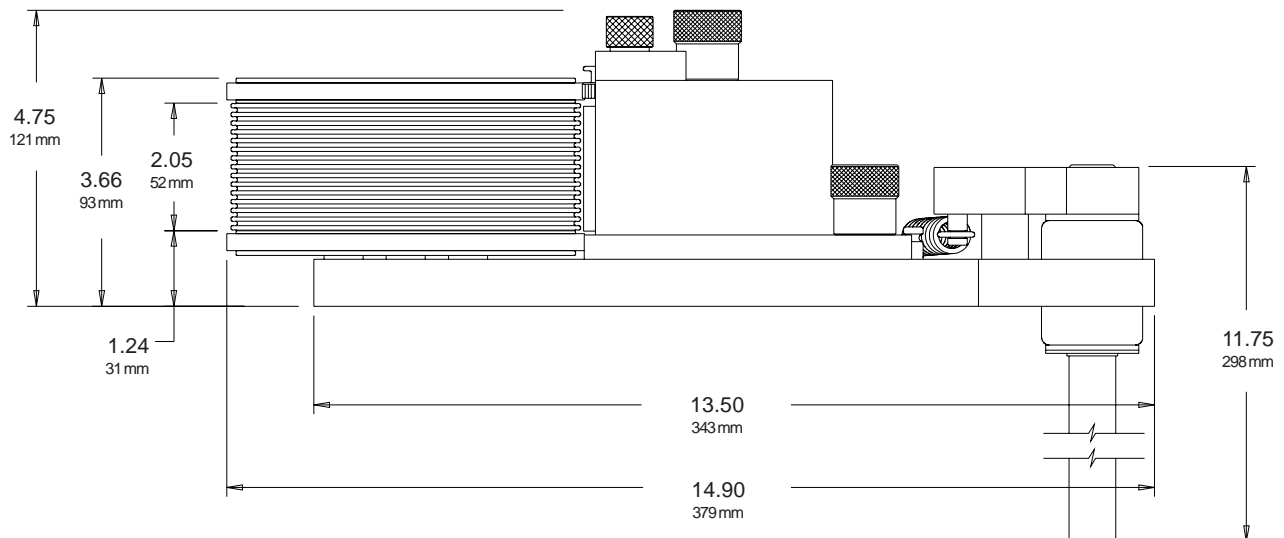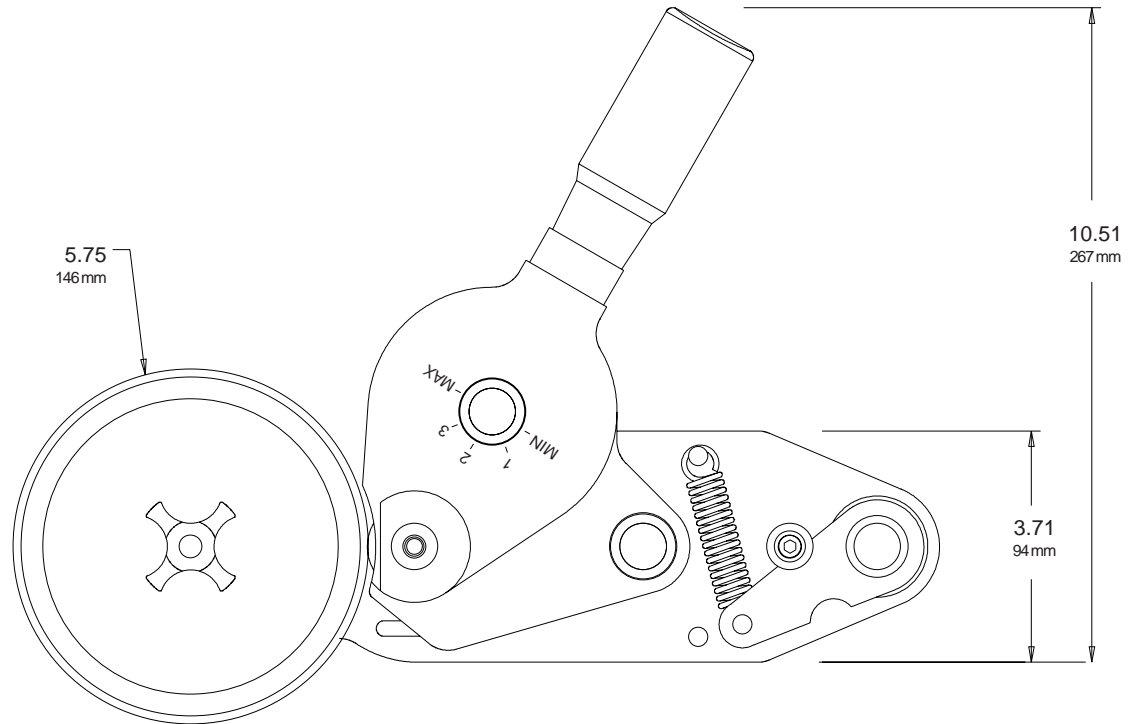
5.75
146 mm

10.51
267 mm

3.71
94 mm

MIN — MAX

4.75
121 mm

2.05
52 mm

3.66
93 mm

1.24
31 mm

11.75
298 mm

13.50
343 mm

14.90
379 mm

NET WEIGHT: 11 LBS. - 7 OZ. (5.19 KG.)
MAXIMUM DIE SIZE - US STANDARD: 1-7/8" (14 RIBS) X 16-15/16" LENGTH
MAXIMUM DIE SIZE - METRIC CODERS ONLY: 49.2 MM (13 RIBS) X 430 MM LENGTH
PRINT DRUM CIRCUMFERENCE: APPROXIMATELY 18.00" (457 MM) MEASURED AT DIE FACE

SPECIFICATIONS

INDEXING AND NON-INDEXING MODELS

Universal Midsize Coders are available in both indexing and non-indexing models.

Indexing coders contain a cam & spring return mechanism (Figure 1) which provides print registration capabilities when carton or drum printing. As the trailing edge of a carton passes the coder, the print drum is automatically rotated back to the same starting or "home" position. There must be adequate space between cartons at any given line speed for this mechanism to work properly. Printing with an indexing coder will allow the imprint on each carton to be registered in the same position relative to the leading edge of the carton.

CAM FOLLOWER
CAM
COMPRESSION SPRING
FOLLOWER GUIDE PIN
CAM & SPRING RETURN MECHANISM
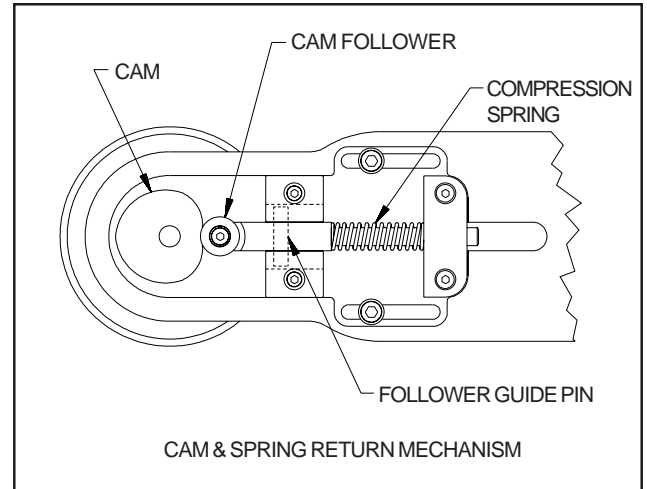
FIGURE 1

Non-indexing coders have print drums which simply rotate on bearings and repeat the print at an interval equal to the circumference of the print drum. If repeat intervals shorter than the print drum circumference are required, duplicate sets of dies can be installed on the print drum. Non-Indexing coders are generally used for web printing applications where the print drum stays in contact with the web at all times.

MOUNTING CONFIGURATION

The mounting configuration of a coder is determined by how the machine is designed to be mounted in relation to the product and its movement. All references to mounting configuration are made as though you are viewing the production line with the product moving away from you. Universal Midsize Coders are available from the factory in 4 different mounting configurations as shown in Figures 2 and 3.

RIGHT HAND SIDE MOUNT
LEFT HAND SIDE MOUNT

FIGURE 2

LEFT HAND TOP MOUNT
RIGHT HAND TOP MOUNT

FIGURE 3

The specific mounting configuration for the non-porous Midsize models, must be specified when ordering from the factory since they cannot be re-configured due to the asymmetrical design of the inking system.

10

SPECIFICATIONS

RIBtype® PRINTING DIES

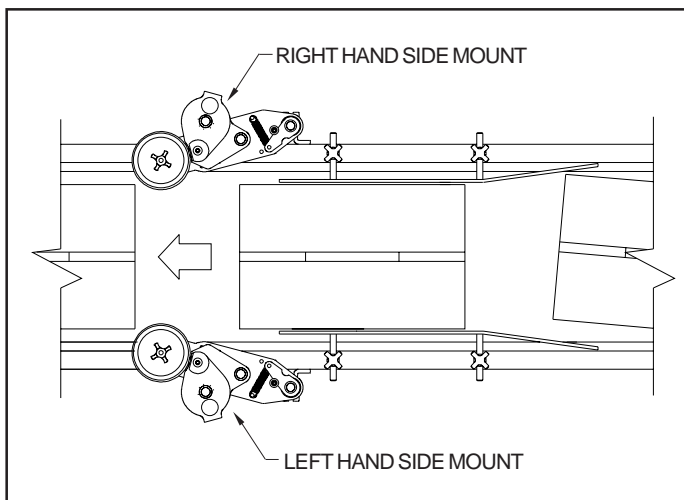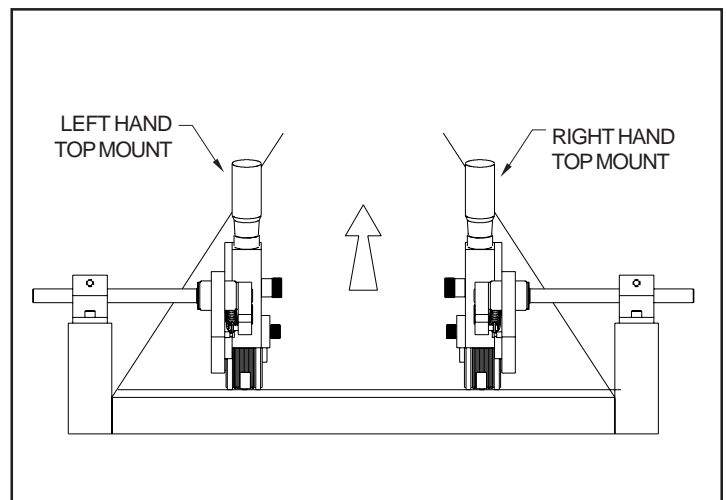Universal Non-Porous Coders are designed to use RIBtype® printing dies which have a molded rib backing. The ribs on the back of the die snap into mating ribs in the Drum Cover on the print drum.

The standard printing dies are available in sets with many sizes and character styles. These sets are a combination of individual alphabetic and numeric characters or in sets containing numeric characters only. The character sets or "sorts" can be used to make up text messages and code numbers as necessary.

FIGURE 4

Printing dies are also available in "logo" form in which a complete text message, company logo or trademark is photographically reproduced from black and white art work on a single piece of rib backed rubber. These "logo" dies are more dimensionally stable than individual characters when installed on the print drum so they generally produce better print quality and are much faster to change in the field. For details on ordering custom logo dies, please contact our Customer Service Department.
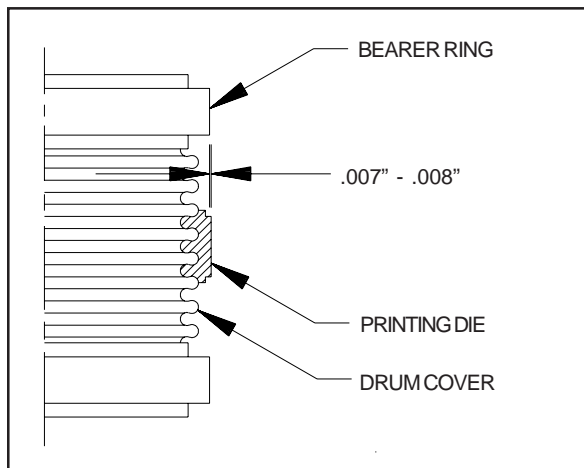
FIGURE 5

The dies are manufactured to precision thickness tolerances which are very critical to the performance of these coders. When installed, the face of the printing die should extend only .007" - .008" beyond the radius of the Bearer rings as shown in Figure 5. Using dies that do not meet the design specifications will result in poor print quality and possible damage to the transfer roll.

Although there are several competitive rib backed die systems available, it is very important to note that they are not all made to the same rib spacing or thickness specifications and are not interchangeable.

CODER MODELS DESIGNED FOR METRIC RIBtype® PRINTING DIES

Universal also offers Metric RIBtype® Die Systems for use in countries where metric character sizes are the standard. The Metric dies are thicker and the rib spacing differs slightly from the standard printing dies therefore the two versions are not compatible. To accommodate the differences, the print drums for Metric dies are machined to a slightly different diameter from the U.S. versions. The model numbers on Metric coders will have a "-T" suffix and have a distinct pink color.

11

SPECIFICATIONS

INK ROLLS

Universal offers two ink roll options for the Non-Porous Midsize Coder. Each roll has unique characteristics which will help determine the suitability for a specific printing application. The coders are designed to accommodate both types of ink rolls without modification. A detailed review of your printing requirements will determine the best choice of ink rolls for your particular application.

XF NEOPRENE INK ROLLS

Universal's XF Neoprene Ink Rolls are a re-inkable roll which can be used with a variety of alcohol or glycol base inks. These rolls are normally supplied in a dry condition with the coder and require **pre-inking** prior to installation. Pre-inked rolls are available from the factory and are recommended for first time users.

During production printing, when the ink capacity of the roll is depleted, installing a 4 Oz. Reservoir Ink Cartridge in the coder's reservoir Bottle Port will re-ink the roll automatically as production continues.
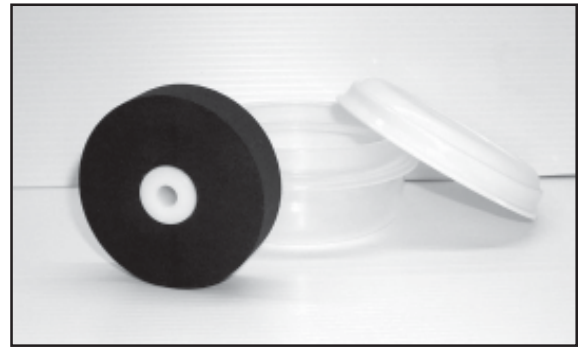

FIGURE 6

In high speed web printing applications, Universal's #100 Inks provide drying times of approximately 2 seconds at 75 Degree F. (24 Deg. C) ambient temperature. Many other inks, both dye and pigment based, can be used in these ink rolls to meet the specific application requirements. Refer to the Basic Principles of Operation section for more information on selecting an appropriate ink.

TYPE MT INK ROLLS

Universal's Type MT Ink Rolls are disposable pre-inked rolls which are available in a variety of fast drying colors. The MT Ink Rolls provide excellent color density and adhesion on most materials and an average yield of just under 500,000 impressions before replacement is necessary. Since these rolls are **not re-inkable**, all references in the manual regarding the use of the 4 Oz. reservoir Ink Cartridges should be disregarded when using these rolls on your coder. The ability to operate the coder without a Reservoir Ink Cartridge makes the MT Rolls particularly well suited for applications requiring printing on the bottom of web materials.

FIGURE 7

The Type MT Ink Rolls provide drying times between 4 - 7 seconds at 75 Degree F. (24 Deg. C) ambient temperature. The added convenience and simplicity of using the Type MT Ink Rolls makes them an ideal choice when production operators have little time to monitor the inking system.

INSTALLING THE PRE-INKED ROLL

Warning: Non-Porous inks contain flammable solvents. Do not smoke or handle these rolls in the presence of sparks or open flames. Inks will also stain clothing, furniture, carpeting and your hands. Rubber gloves should be worn during the following procedures.

The ink roll you install on the coder must be properly pre-inked. If your coder was supplied with a dry XF Neoprene ink roll, refer to the *Maintenance Section* on page 34 for pre-inking instructions.

Rollers that have been pre-inked at the factory are normally slightly oversaturated with ink to compensate for potential solvent loss during shipping and storage. If you received a pre-inked ink roll with your coder, it is important to examine the roll prior to installation. *The ink roll should be thoroughly saturated with ink but not dripping wet.* Excess ink can be easily removed by lightly rolling the ink roll across a clean piece of absorbent paper.

1-To install the pre-inked roll, first turn the Inking System Position Adjusting Knob and move the Inking System away from the Print Drum.

> This knob can be turned in a clockwise or counter-clockwise direction. To make removal of the Inking System Cover easier, the Knurled Drive Wheel should not be in contact with the rubber Bearer ring on the Print Drum.

FIGURE 8

2-Turn the Ink Roll Eccentric Adjusting Knob to the "MIN" position.

> This moves the ink roller axle away from the Transfer Roll and enables the ink roll to be installed without interference with the Transfer Roll during reassembly of the inking system.

FIGURE 9

3-While holding the Inking System Cover in place, remove the Cover Retaining Knob.

> The Cover Retaining Knob holds the Knurled Drive Wheel Cover, Knurled Drive Wheel and the Inking System Cover on the Coder.
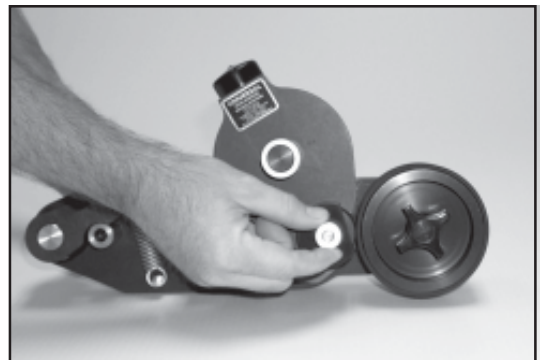

FIGURE 10

13

4-Remove the Knurled Drive Wheel Cover.

Note: The flat on the side of the Drive Wheel Cover is aligned towards the print drum. During reassembly, this must be replaced in the same position.
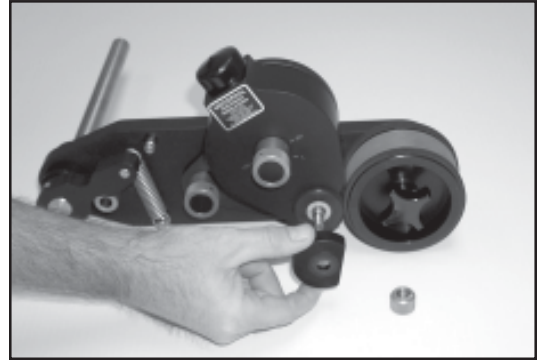
FIGURE 11

5-Continue to hold the Inking System Cover and Remove the Knurled Drive Wheel.

The Knurled Drive Wheel rests on top of the Transfer Roller and is installed over 3 stainless steel drive pins which protrude through 3 mating holes in the Drive Wheel.
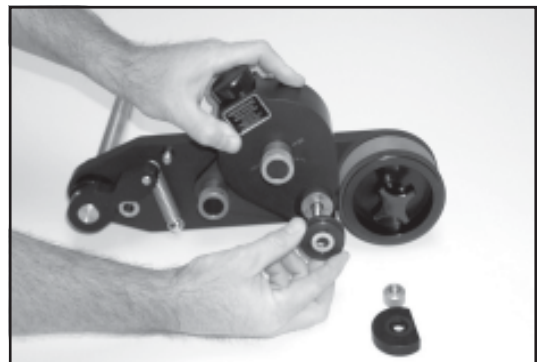
FIGURE 12

6 -Carefully pull the Inking System Cover directly away from the Inking System Baseplate. Do not let the cover drag across the surface of the Transfer Roller.

The Transfer Roll Surface is a finely engraved Delrin plastic material which can be easily scratched. When assembled, the Transfer Roll resides in a very close fitting cavity in the Inking System Cover.

FIGURE 13

7-Put on a pair of rubber gloves and remove the pre-inked ink roller from the storage container by inserting a small rod (a round shank screwdriver works nicely) in the center of the core.

Keeping ink off your gloves at this stage will prevent contamination of the external parts of the coder during roll installation.

FIGURE 14

14
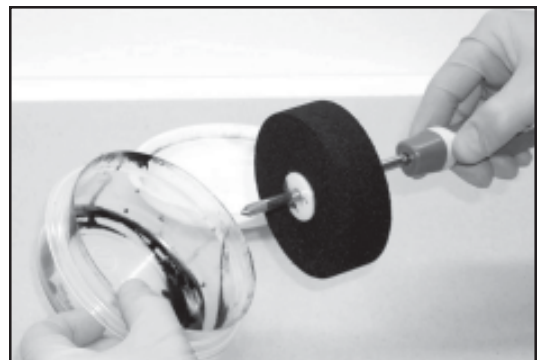
8-Inspect the roll for excess surface wetness. Remove any excess ink by rolling the roll lightly over a piece of absorbent paper.

Rolls which have been pre-inked at the factory are typically over saturated with ink to compensate for potential solvent loss during shipping and storage. Installing an over saturated roll on the coder will result in ink leakage from the Inking System and in extreme cases may damage the ball bearings in the Transfer Roll.
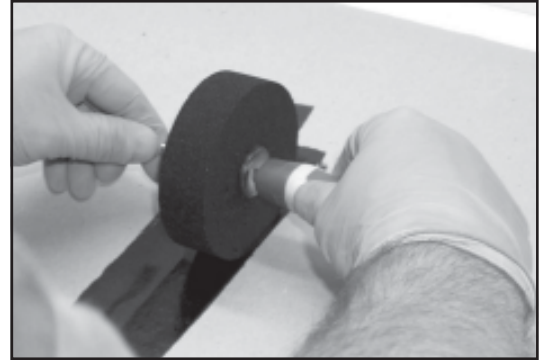
FIGURE 15

9-Install the ink roll on the Ink Roll Axle by aligning the end of the screwdriver with the end of the axle and pushing the roll onto the axle.

When this step is complete, replace the rubber gloveswith a clean pair to prevent ink contamination with the external parts of the coder.
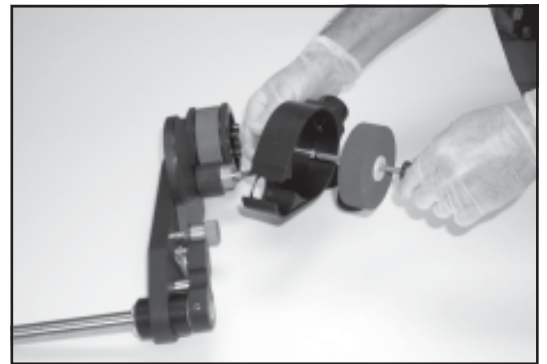
FIGURE 16

10-Immediately replace the Inking System Cover by carefully guiding the cover over the Transfer Roll. Try not to let the cover contact the surface of the Transfer Roll during this process. Make sure the Cover is seated properly against the Inking System Baseplate.

While handling the ink rolls, solvents will evaporate from the rolls very rapidly at normal room temperatures. The Inking System Cover must be replaced quickly to prevent solvent loss.
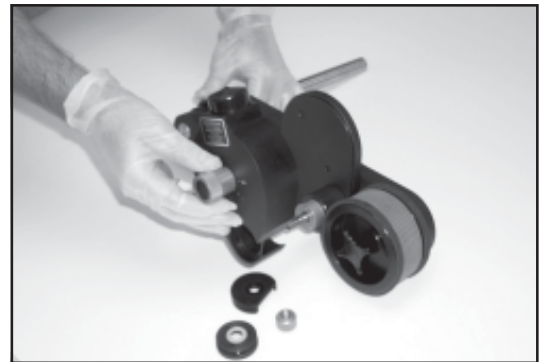
FIGURE 17

11-Replace the Knurled Drive Wheel by aligning the 3 small holes with the 3 stainless drive pins on the top of the Transfer Roll and pressing the Drive Wheel onto the Transfer Roll.

The tops of the stainless pins will be flush with the top of the Drive Wheel when seated properly.

FIGURE 18

12-Replace the Knurled Drive Wheel Cover and rotate it into position with the flat edge directly facing the Print Drum.

Hold the Drive Wheel Cover and Inking System Cover in place.
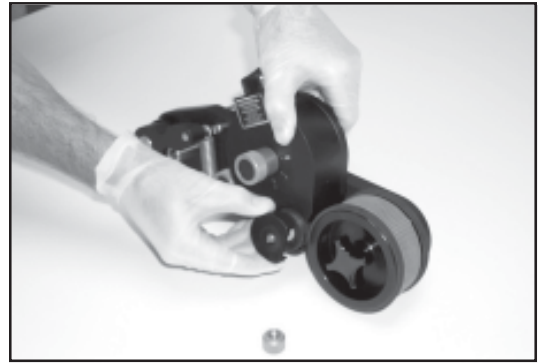
FIGURE 19

13-Replace the knurled Cover Retaining Knob and lightly tighten. _Do not over tighten this knob_ or you may bend the top of the Knurled Drive Wheel Cover and cause it to bind against the Knurled Drive Wheel.

The Cover Retaining Knob should be just tight enough to keep the Inking System Assembly together and prevent the Drive Wheel Cover from rotating out of position.

FIGURE 20

INSTALLING THE PRINTING DIES

Align the ribbed backing on the Printing Dies with the mating Drum Cover and press firmly until they are completely engaged. It is best to install the dies as close to the middle of the pint area on the Print Drum as possible.

Individual character codes or text messages are installed in a mirror image of normal written text. In other words, install in a right to left direction as shown. When printed, codes or text installed in this orientation will print in normal left to right order.

FIGURE 21

Note: To make die installation easier, particularly when installing large dies, moisten a sponge with water containing a small amount of liquid detergent. Lightly moisten the back of the printing die and then immediately press the die into the drum cover. Do not apply too much liquid or the dies will slip during printing. Do not apply silicone, oil or any other lubricating agent to the rib backing or the dies will not hold properly during printing.

When using the smaller individual characters to make up a code message, use the Type Blocking Kit included with your coder to support the leading and trailing ends of the type as shown.

Characters with only a 2 or 3 rib backing do not have the stability of the larger sizes when snapped into the drum cover. Adding the rib backed type blocks on either size of the code will provide added stability. The Type Blocks are not as thick as the Type and will not pick up ink from the Transfer Roll.

FIGURE 22

ADJUSTING THE INKING SYSTEM

With the Ink Roll and the Printing Dies installed, two final steps are required to prepare the coder for printing.

1- While rotating the Print Drum, turn the Inking System Position Adjusting Knob to move the Knurled Drive Wheel into contact with the rubber Bearer ring on the Print Drum.

When properly adjusted, the Knurled Drive Wheel will rotate as soon as the Print Drum is rotated. This adjustment also controls the contact pressure between the Transfer Roll and the face of the Printing Dies. The Printing Dies should contact the Transfer Roll with just enough pressure to transfer ink to the entire face of the Printing Die when the Ink Roll is properly adjusted.

FIGURE 23

2- Manually rotate the print drum continuously in one direction while slowly rotating the Ink Roll Eccentric Adjusting Knob from the "MIN" position towards the "MAX" position. Turn the Eccentric Knob in small increments and observe the face of the Printing Dies for signs of ink between each adjustment.

As soon as you can see complete ink coverage on the die faces, stop rotating the eccentric. Proper adjustment will normally be reached when the reference line on the Eccentric is somewhere between the 2 and 3 dial position.

FIGURE 24

This adjustment procedure brings the Ink Roller into contact with the surface of the Transfer Roller which in turn applies the ink to the face of the printing dies. Do not rotate the Ink Roll Eccentric Knob further than necessary towards the "MAX" position or the excess contact pressure will squeeze ink out of the ink roll and may cause dripping inside the cover.

**FOR CODER MOUNTING INSTRUCTIONS
REFER TO THE APPROPRIATE SECTION
FOR YOUR APPLICATION**

**WEB PRINTING - PAGE 22
CARTON PRINTING - PAGE 26**

BASIC PRINCIPLES OF OPERATION

NON-POROUS INKING SYSTEM

Inks designed for printing on non-porous surfaces contain very fast drying alcohol solvents, a component to impart color which can be either a liquid "dye" or a finely ground solid or "pigment", and a resin material which binds the color medium to the substrate surface. When the printed marks are applied by the coder, the solvents rapidly evaporate from the surface of the substrate leaving only the dried resin and color.

Preventing rapid solvent loss from the inking system, which would cause the coder to stop printing, has traditionally been a very difficult task. Universal's patented Non-Porous Inking System design has overcome this problem by enclosing all of the inking system components in a tightly sealed housing. This unique design offers all the capabilities of a flexographic printer without the limitations associated with having an open well of ink. The advantages of this design include minimal maintenance requirements, unrestricted mounting configurations and the ability to rapidly change ink colors.

The inking system is comprised of two main components, the neoprene ink roll, which serves as a reservoir for the ink, and a transfer or "anilox" roll which transfers the ink from the ink roll to the face of the printing die. (Fig. 25) To prevent the loss of ink solvent through evaporation, these rolls are mounted in separate precision machined cavities in a sealed aluminum housing. The integrity of the housing is such that the system can be left idle for days without damage to the ink roll.

The pre-inked neoprene ink roll is mounted on an eccentric which enables the roll to be adjusted into contact with the transfer roll. The surface of the transfer or "anilox" roll is finely engraved with thousands of microscopic cavities which pick up ink from the ink roll and transfer it to the surface of the printing dies. Since the transfer roll applies a very thin film of ink to the die face, the printed marks dry very rapidly. The neoprene ink roll has the capacity to store approximately 4 fluid ounces of ink.
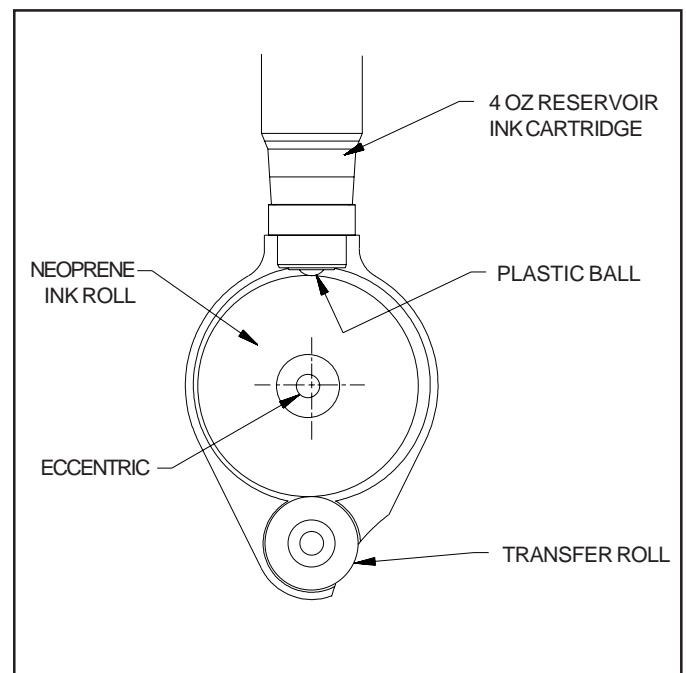

FIGURE 25

When the pre-inked neoprene ink roll starts showing signs of ink depletion, a Reservoir Ink Cartridge is threaded into the bottle port. The plastic ball in the cartridge comes into contact with the surface of the neoprene ink roll and when the ink roll rotates during the printing operation, a thin film of ink is transferred from the reservoir cartridge onto the surface of the ink roll.

The printed impressions will improve within a few seconds after installation of the cartridge. When the printing operation is stopped, the Reservoir Ink Cartridge automatically stops feeding ink to the roller to prevent over saturation during idle periods.

It is important to note that the Reservoir Ink Cartridge is not considered to be an integral part of the inking system but is used only to *re-ink* the neoprene ink roll when needed. These cartridges should be installed only after the ink supply in the neoprene ink roll has been depleted and the printed marks indicate a need for more ink. Depending on the amount and size of the text being printed and number of imprints being applied per hour, the ink capacity of the neoprene ink roll may last anywhere from 1 hour to several days of continuous operation. Installing a 4 ounce Reservoir Ink Cartridge prematurely may result in over saturation of the neoprene ink roll and flooding of the inking system.

BASIC PRINCIPLES OF OPERATION

The knurled drive wheel shown in Figure 26 sits on top of the transfer roll and is engaged by three stainless steel drive pins. The knurled face of the drive wheel runs in contact with a bearer ring on the print drum. When the print drum starts to turn, the knurled drive wheel rotates the transfer roll at the exact surface speed of the die face. Keeping these two surfaces running at a synchronous speed ensures a uniform coating of ink on the die face and extends die life.
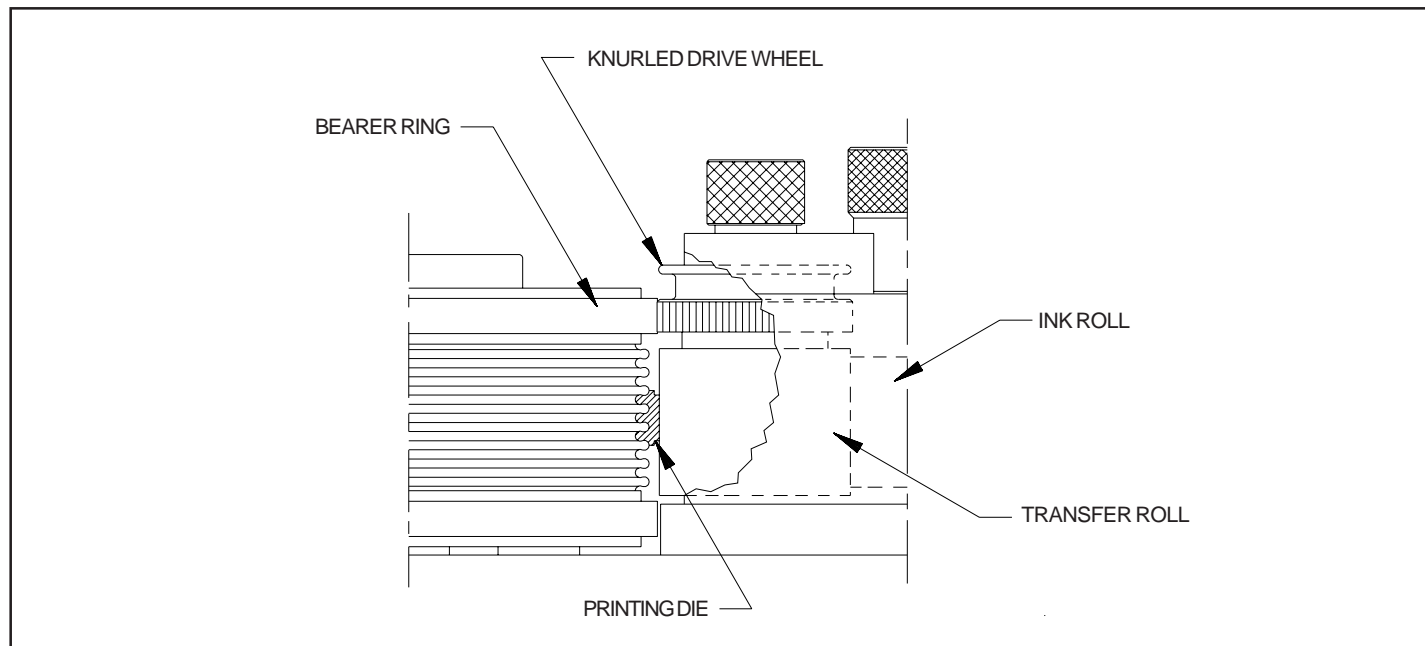

FIGURE 26

SELECTING AN APPROPRIATE INK

Universal's Non-Porous Inking System is compatible with a wide range of alcohol base marking inks. Although we offer a variety of inks for specific applications, you are not restricted to using only Universal brand inks. When selecting inks from other manufacturers however, it is your responsibility to make sure the inks are compatible with the coder.

Dye base inks contain liquid color which is translucent and will provide good color contrast only on light colored materials. These inks are generally faster drying than pigmented inks and normally produce less residue buildup on the transfer roll and printing dies, thus requiring less frequent cleaning of the coder. Although dye base inks are normally the easiest to use, they will fade more rapidly than pigmented inks when exposed to direct sunlight.

Pigmented inks contain finely ground solids which are opaque, providing much greater color contrast when marking on dark colored surfaces. These inks also resist fading when exposed to direct sunlight. Pigmented inks have a tendency to build up on the surface of the transfer roll and the die face more rapidly than dye base inks and will generally require more frequent cleaning of these parts.

The first step in selecting an appropriate ink, is to determine if the ink will bond to the surface of the material being printed and provide acceptable color contrast. It is normally recommended that inks be test printed on the material being marked with a rubber stamp to determine if the resulting marks are acceptable. Please note that when testing inks with a rubber stamp, the drying times will generally be much slower than when the inks are applied with the Non-Porous Midsize Coder.

It is extremely important to test the affect of other manufacturer's ink on the XF Neoprene ink roll. Since the ink roll must fit into a precision machined cavity in the inking system housing with little clearance, swelling of the roll, in reaction to non-compatible solvents in the ink, could cause serious problems with the performance of your coder. The dry XF neoprene ink roll measures 3.425" (86.99 mm) OD. After thoroughly saturating the ink roll with ink, the roll should not exceed 3.500" (88.90 mm) OD.

BASIC PRINCIPLES OF OPERATION

INK DRYING TIME CONSIDERATIONS

Universal #100 ink is an extremely fast drying formulation and is normally recommended for continuous motion web printing applications. In these applications, the ink must dry very rapidly on the material to prevent downstream transfer to idler rolls. When the print drum is rotating at high speeds, the dies rotate past the Transfer Roll where ink is applied and within milliseconds the die face contacts the surface of the material being printed and the impression is transferred as in Figure 27.

Depending on the specific characteristics of the printing application, some consideration needs to be given to the drying time of the ink and its suitability for the application. Printing on a plastic film in an intermittent motion form and fill machine may require a slower drying ink formulation than that recommended for high speed continuous web printing applications. Although extremely fast drying inks are normally specified by customers in all applications, the ink must be suitable for the specific application or it will not perform properly in the coder.
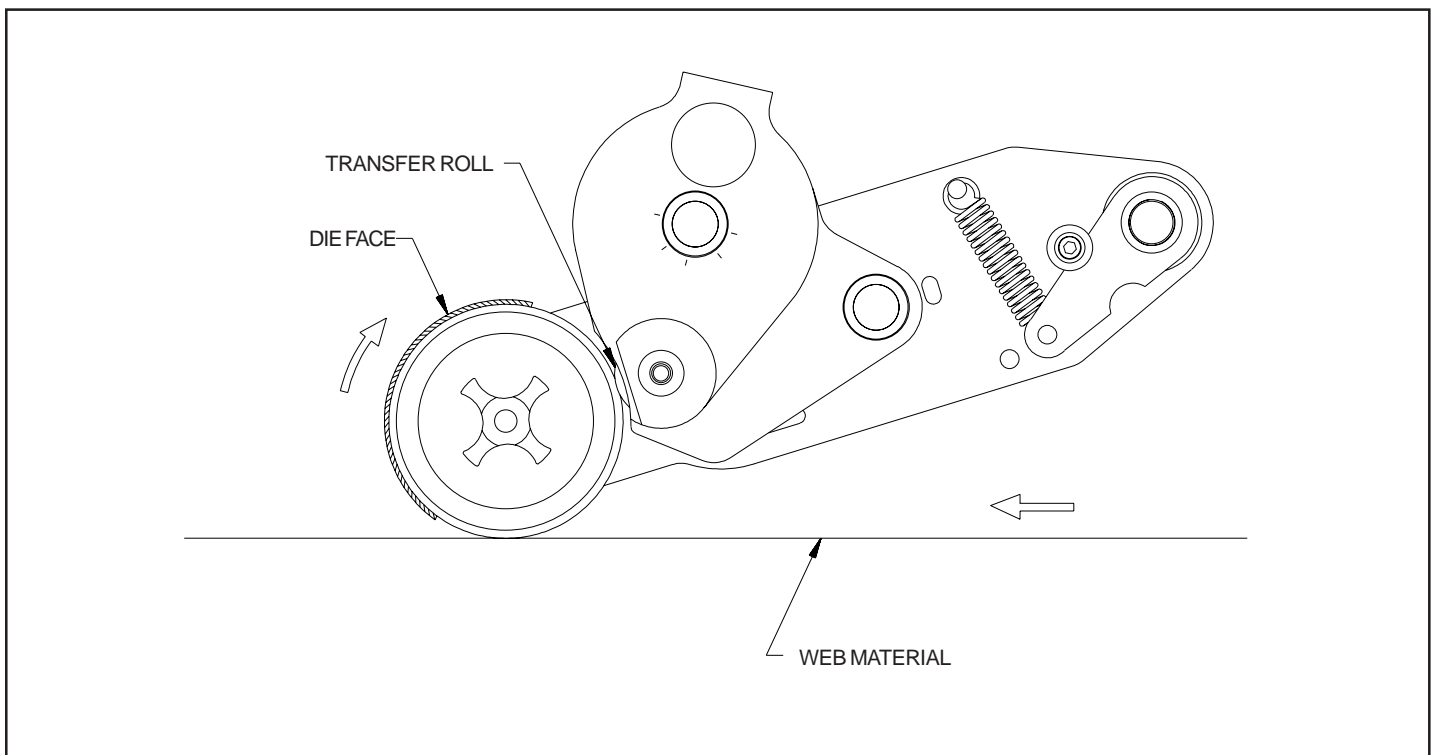

FIGURE 27

When printing on very slow moving web materials, the print drum rotates at much slower speeds. As a result, when the dies rotate past the Transfer Roll and the ink is applied, it may take several seconds for the dies to contact the web. Since the solvents in the #100 Inks evaporate very rapidly at normal room temperatures (even from the die faces), the die faces may be dry before contact with the web material. In these applications, a slightly slower drying ink formulation would be necessary to ensure that the ink remains wet on the die faces until they contact the web material.

When the coder is installed on a form and fill machine, the plastic film may move at fairly high speed when pulled from the supply roll but it stops for a period of time during the product fill cycle. In these applications, if the die face has already rotated passed the Transfer Roll and picked up ink and the web motion stops for several seconds, a very fast drying ink like the #100 will flash off the die face before the web motion resumes. It is therefore necessary to take into consideration the cycle rate of the particular machine when selecting an ink.

WEB PRINTING

INSTALLATION

This section applies to the installation of the Non-Porous Midsize Coders for printing on continuous web materials such as plastic films, rubber sheeting, metals and other extruded materials.

Careful consideration should be given to selecting an appropriate area in the production line for installation of the coder. Since the coders are friction driven by the moving web of material, a primary factor is to select an area where the position of the web material is accurately controlled and preferably supported by an idler or guide roller on the underneath side as shown in Figure 28.
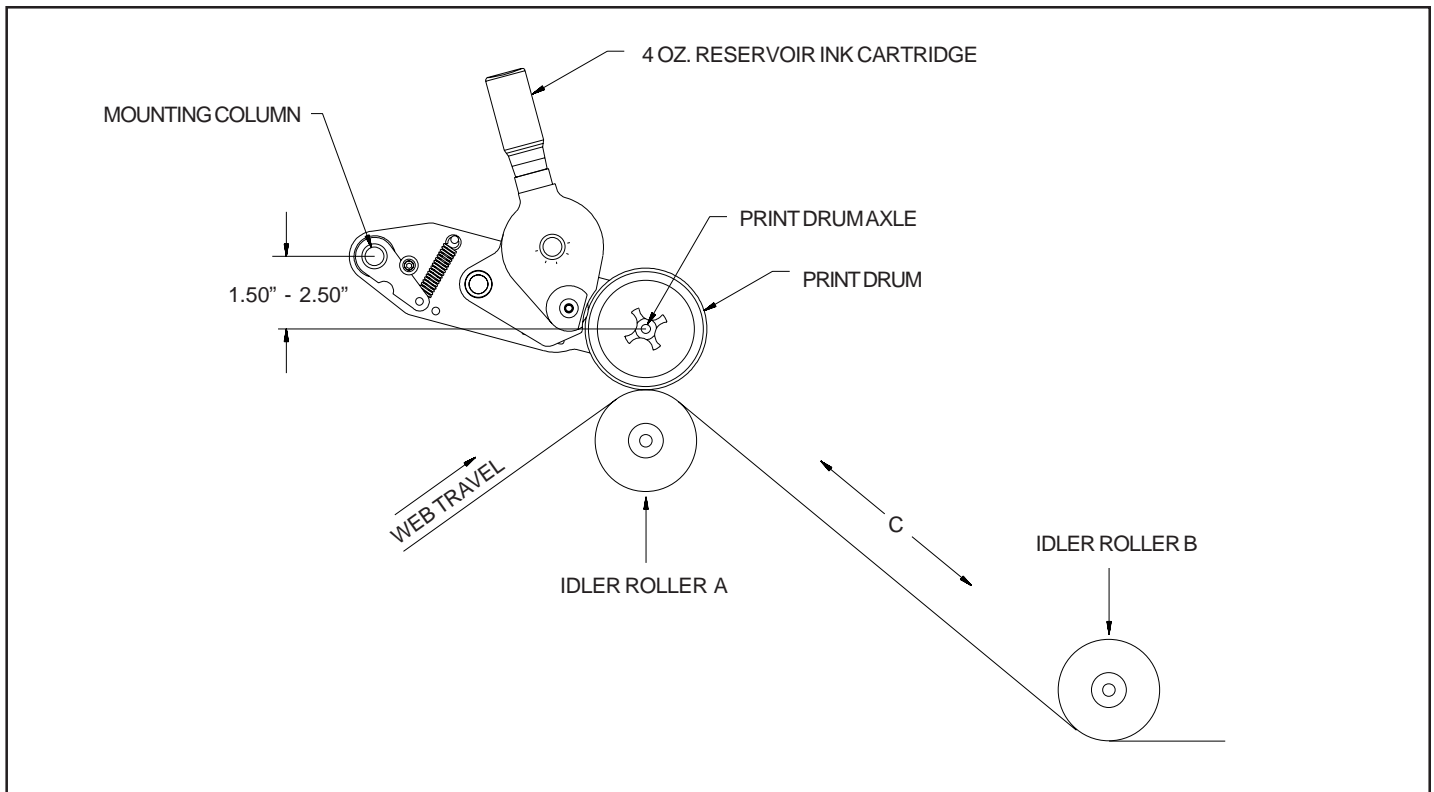

FIGURE 28

The only real consideration with respect to the attitude of the coder frame is that the 4 oz. reservoir ink cartridge (when installed) should be kept as near to a vertical position as possible with the plastic ball pointing down. This will ensure proper ink feed from the 4 oz. cartridge to the ink roll. When disposable Type MT Ink Rolls are used on the coder, 4 oz. Reservoir Ink Cartridges are not used and therefore the coder can be mounted in any convenient attitude. When installing the coder, the print drum axle of the coder should be in parallel alignment with the idler roll and the print drum should contact the web at the point where the web is tangent to the idler roll and solidly supported. It is also important that the distance "C" between idler roller "A" and idler roller "B" should be adequate so that at the maximum web speed, the ink will dry before the printed marks contact idler roller "B". If distance "C" is not adequate for the drying time of the ink used, a ghost image transfer of the marks may be overprinted on the web by idler roller "B".

To eliminate this problem, if idler roller positions are not adjustable, a slight undercut in the face of idler roller "B" where the printed marks pass under the roll, will prevent the wet marks from touching the face of the idler. Generally the undercut in the idler roller needs to be only .020" - .030" deep and slightly wider than the printed marks as shown in Figure 29.
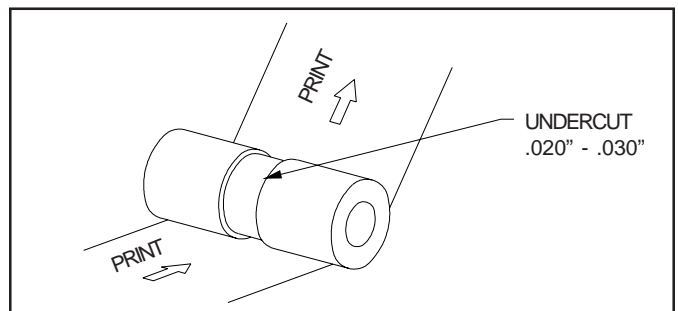

FIGURE 29

22

In high speed web applications, the distance the web travels at a given speed in 2-3 seconds can be substantial. It is important to note that when the printed web is tightly rewound, the additional pressure applied to the printed marks can increase the possibility of a ghost image transfer of the ink to the back of the web.

If this situation occurs and the web speed cannot be slowed down to allow more drying time, air blowers can be used to direct heated air on the printed marks to accelerate drying. Preheating the web material slightly with hot air before printing can also be an effective method to decrease the drying time. If either of these techniques are used, it is recommended that the hot air blowers be electrically tied into the web feed motor energizing circuit. This will ensure that the blowers are turned off automatically if the web is stopped.

MOUNTING THE CODER

1 - After determining the best location to mount the coder, install the supplied mounting bracket (Figure 30) on a rigid surface using two 3/8" diameter bolts, nuts, washers and lock washers (not supplied). Be sure that the mounting column of the coder is parallel to the idler roll.

2-Insert the mounting column into the mounting bracket and allow the print drum to pivot into contact with the idler roll. Do not tighten the bracket clamping screw at this time.
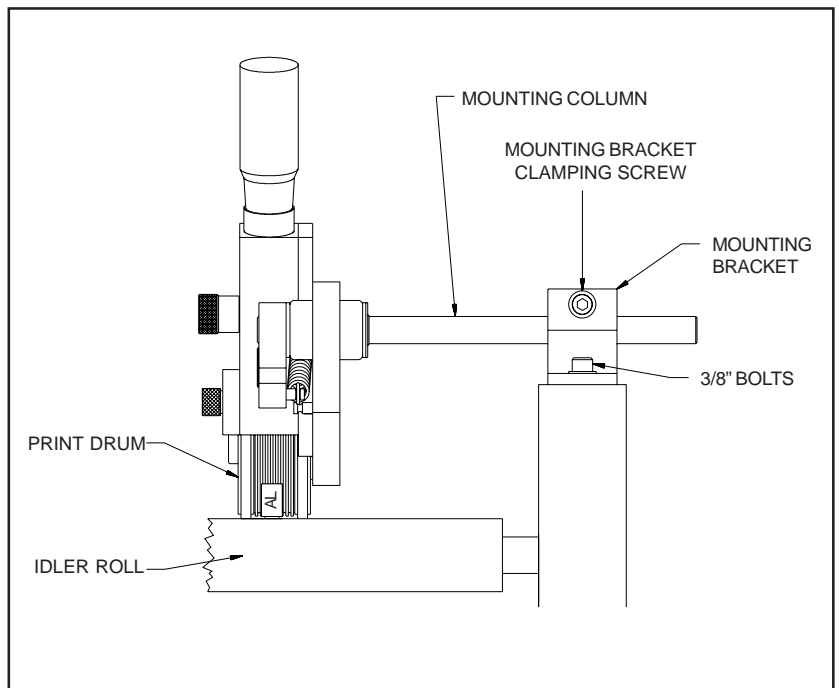
FIGURE 30
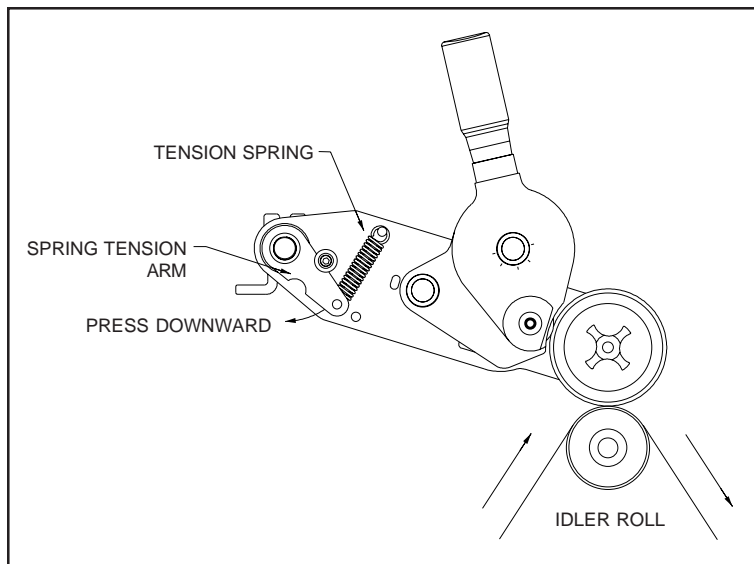
FIGURE 31

3 -Press down lightly on the spring tension arm to extend the tension spring slightly. (Figure 31) While holding pressure on the arm, tighten the mounting bracket clamping screw.

This procedure is used to adjust the contact pressure which the print drum exerts against the web. Only enough pressure should be applied to ensure positive friction drive of the print drum. Excessive contact pressure will impose unnecessary drag on the web and may result in poor print quality.

WEB PRINTING

SPECIAL WEB PRINTING APPLICATIONS

Whether your printing application requires printing on narrow web material or you are printing directly on master rolls, Universal's Non-Porous Midsize Coders can be custom modified to accomodate both applications.

PLEASE NOTE: *The coder is designed to print using the ink contained in the **pre-inked ink roll**. Since a freshly saturated Ink Roll was just installed on the coder, the system will have plenty of ink. Installing a 4 oz. Reservoir Ink Cartridge at this time will result in over saturation of the ink roll and flooding of the Inking System. The 4 oz. Reservoir Ink Cartridge should not be installed until most of the ink is consumed from the ink roll and the print quality shows signs that more ink is needed.*

PRINTING ON NARROW WEB MATERIALS

In applications where the web material is too narrow for both friction drive bearers to contact the surface of the web, contact with one bearer ring is acceptable. When the web is too narrow for even one bearer ring to contact the web and still position the print as necessary, a custom modified guide roller can be utilized to allow for printing as shown in Figure 32. Using this approach, the idler roll must be machined with a groove which will not only accurately guide the web material and drive the idler roll but it must also keep the surface of the web material flush with the surface of the idler where the bearer rings make contact.
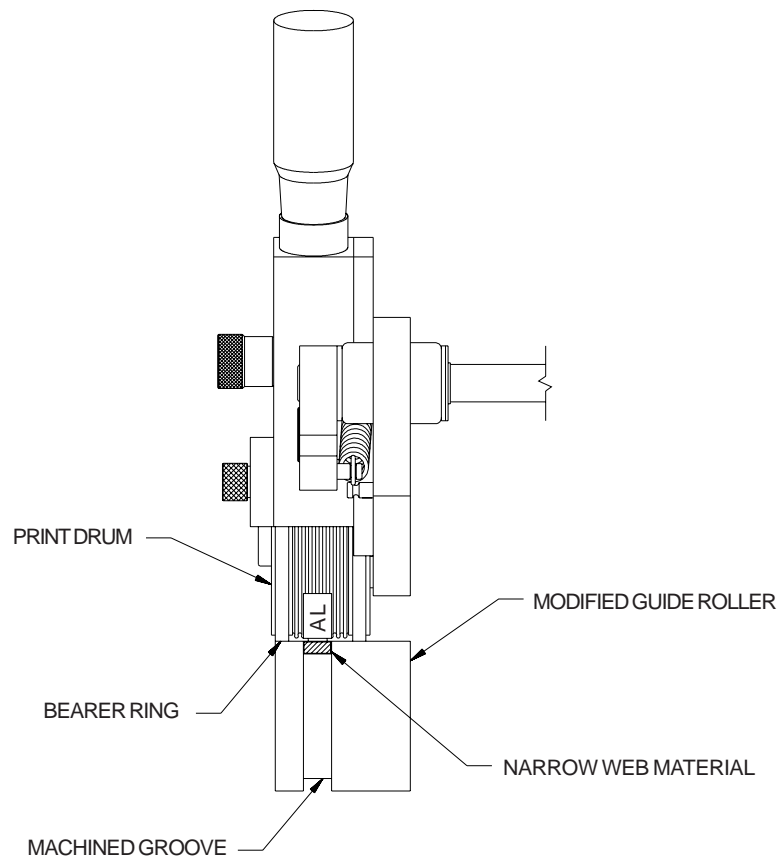
FIGURE 32

This method of mounting is generally more appropriate when the web material is extruded rubber or some similar material which has a high coefficient of friction since it must drive both the idler roll and the print drum. Using a custom guide roller which is driven by an external power source is certainly acceptable but it is generally rather costly since the surface speed of the guide roller must precisely match the speed of the web or smeared prints will result.

24

PRINTING DIRECTLY ON MASTER ROLLS

Universal Non-Porous Midsize Coders can also be mounted on custom designed arms which will enable them to print directly on the surface of a master roll of web material as it is unwound. This technique is frequently used when conveniently positioned idler rolls are not available. In these applications, as the master roll of web material decreases in size, the mounting arm pivots and keeps the print drum in constant contact with the surface of the roll as shown in Figure 33.

In an installation such as this, the arms are normally designed with added weights or with pneumatic controllers to maintain the proper printing pressure during changes in the master roll size. Contact our engineering department for further details on these mounting configurations.
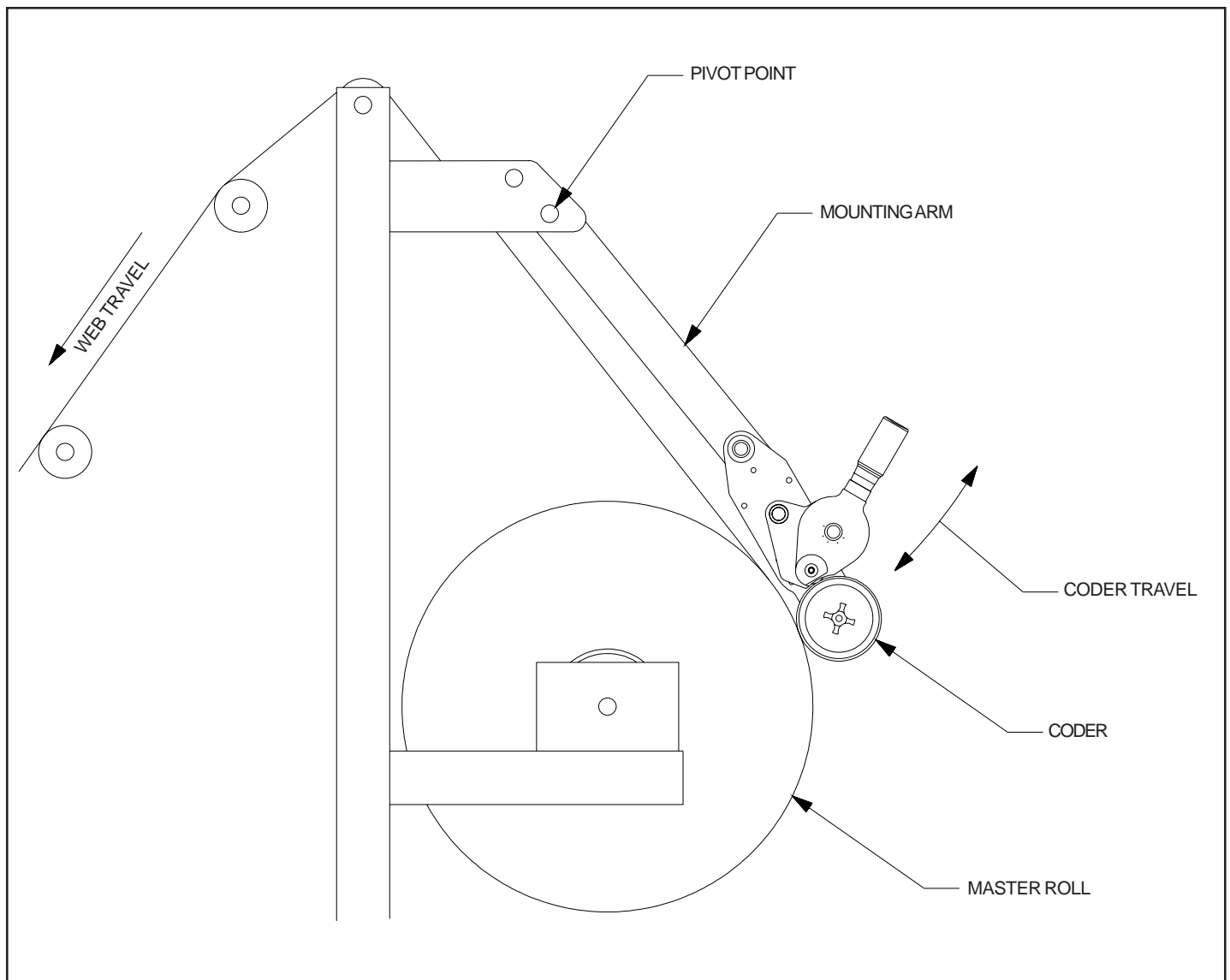

FIGURE 33

CARTON PRINTING

Printing on non-porous surfaces, such as waxed or varnished cartons, can be accomplished easily with Universal Non-Porous Midsize Coders. The selection of an appropriate place for installation on your conveyor line or other packaging equipment is a very important consideration in the performance of your coder. The most important factor to consider is carton alignment. To ensure print reliability and prevent damage to your coders, the cartons must be accurately guided through the printing station by guide rails. If your conveyor is not equipped with guide rails, they must be installed before proceeding with coder installation.

CARTON ALIGNMENT

Proper alignment of the cartons as they pass the printing station is imperative as shown in Figure 34. Improper alignment will produce poor print quality, poor print registration, and in extreme cases, could damage the machine.

GUIDE RAILS

IMPROPER ALIGNMENT

PROPER ALIGNMENT
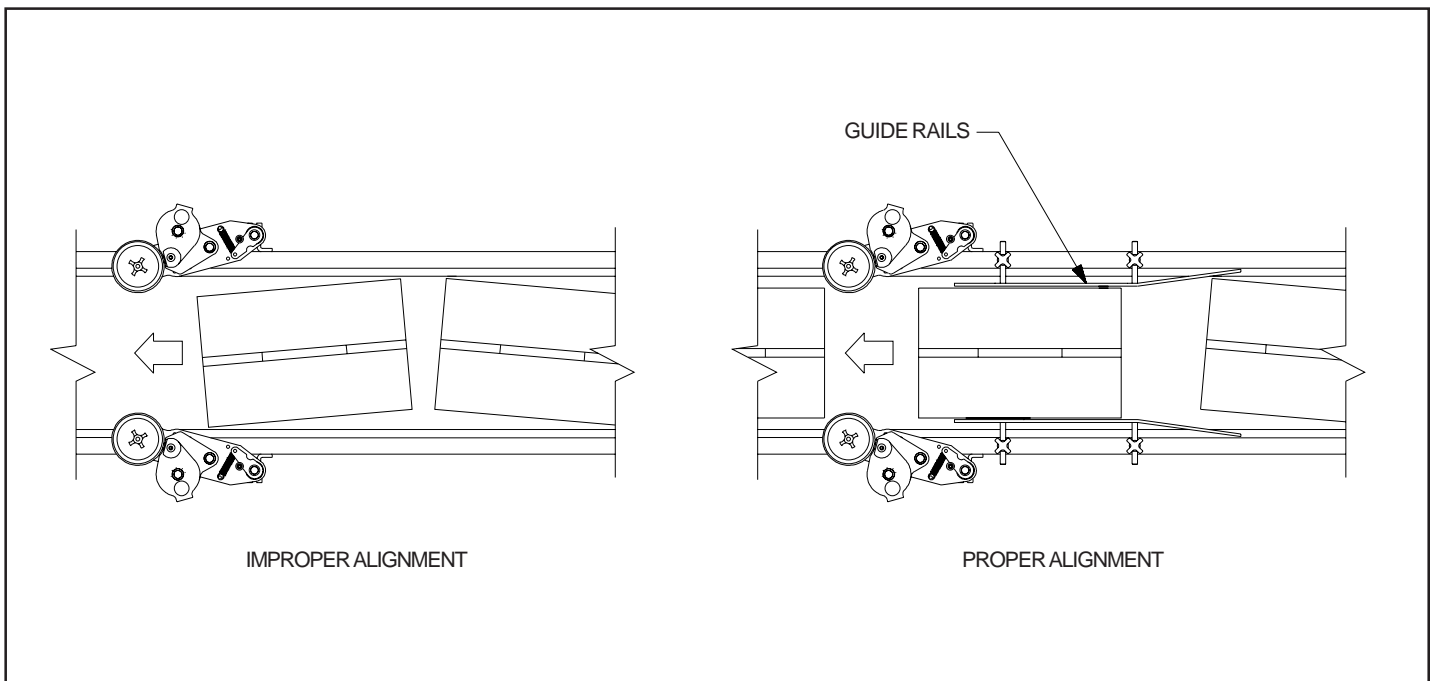
FIGURE 34

All Universal Non-Porous Coders are spring loaded so that the print drums will press against the carton surface on contact. This pressure is necessary to accomplish the friction drive rotation of the print drum and ensure enough printing pressure to give you a sharp impression. The spring tension mechanism on the coder will also compensate for slight variations in the width of the cartons without jamming the conveyor line. Excessive pressure, caused by improperly guided cartons, will result in smudged impressions and could cause damage to the extension spring that provides this printing pressure.

CARTON PRINTING

Universal Midsize coders are designed so the frame of the machine will pivot on the mounting column. This allows the print drum to deflect, or swing, on contact with the leading edge of the carton a maximum of 3". It is recommended that cartons be aligned between guide rails with no more than 1/4" clearance on each side as shown in Figure 35. This should allow ample clearance for cartons and protect your printer from damage.

CLEARANCE 1/4"

PRINTERS MOUNTED IN
CLOSE PROXIMITY TO
END OF GUIDE RAILS

GUIDE RAILS

CLEARANCE 1/4"
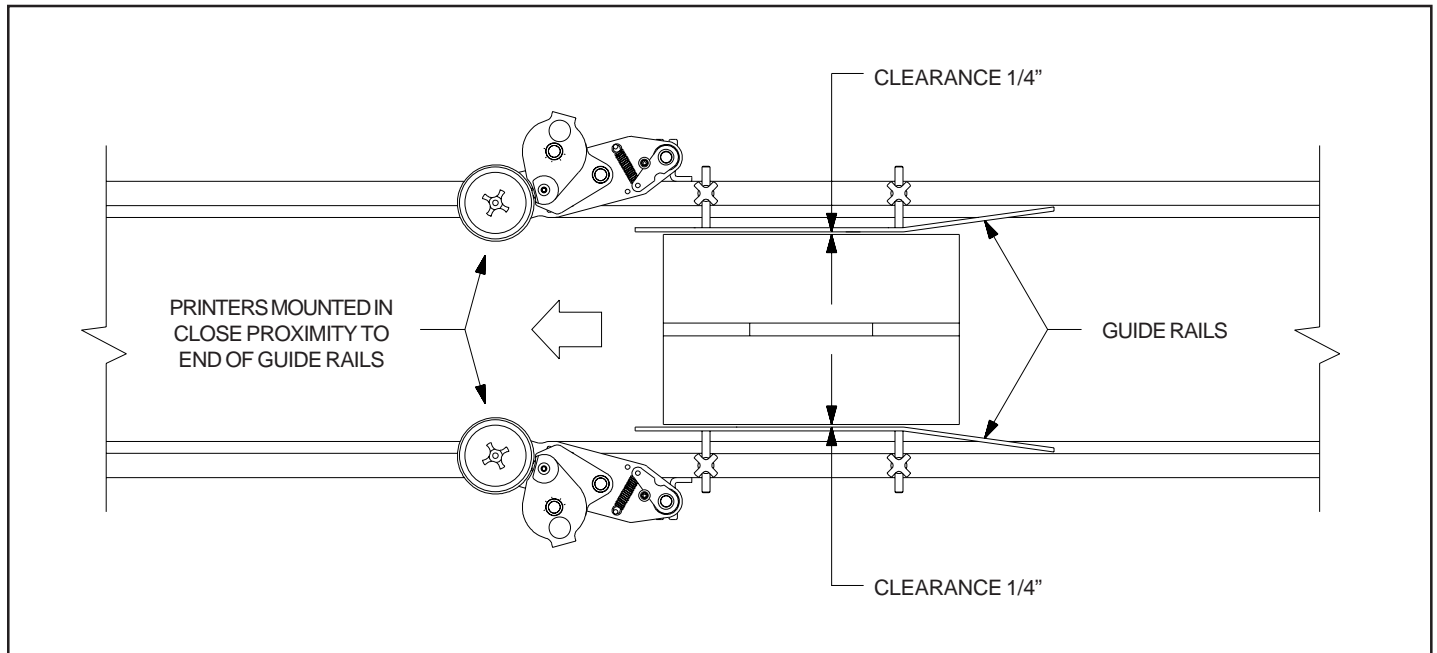
FIGURE 35

In most applications, installation of the printer can be accomplished by attaching the mounting bracket to the side rails of the powered conveyor using two 3/8" machine bolts. The printers should be mounted as close as possible to the end of the guide rails to insure that proper carton alignment is maintained at the printing station as shown in Figure 35.

Before tightening the mounting bolts, check alignment of the print drum. It is very important for proper tracking, that the top of the print drum is parallel to the top of the conveyor (Figure 36) and the side of the print drum is parallel to the side of the carton (Figure 37). Once this alignment has been achieved, tighten the mounting bolts.

IMPROPER TOP ALIGNMENT

PROPER TOP ALIGNMENT

FIGURE 36

IMPROPER SIDE ALIGNMENT

PROPER SIDE ALIGNMENT

FIGURE 37

CARTON PRINTING

1 - **Loosen the Mounting Column Clamping Screw and position the printer to the required height for printing. Swing the printer into positio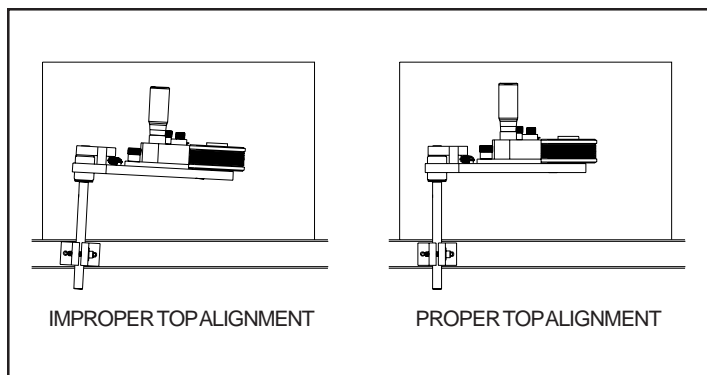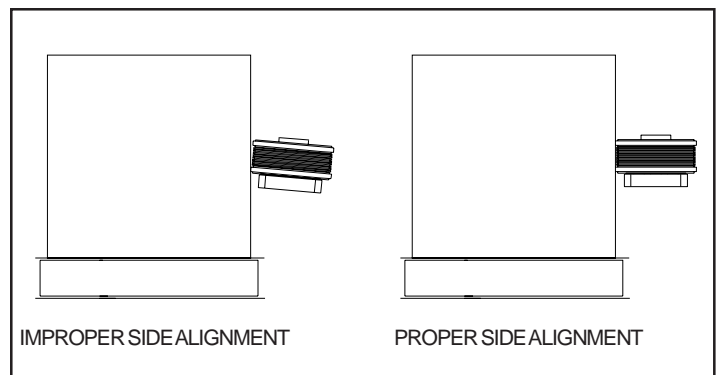n so the print drum will lightly contact the side of the cartons as they emerge from between the guide rails then tighten the Clamping Screw.**
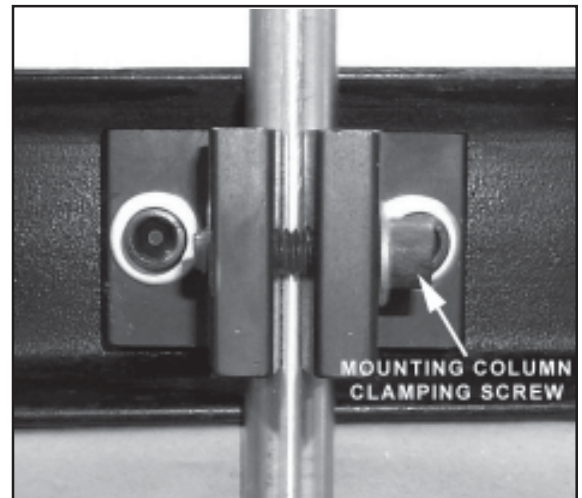
FIGURE 38

2 - **Check the print drum contact with the cartons while the conveyor is under power and adjust the print drum position to obtain approximately 1/4" - 3/8" deflection as shown in Figure 39.**
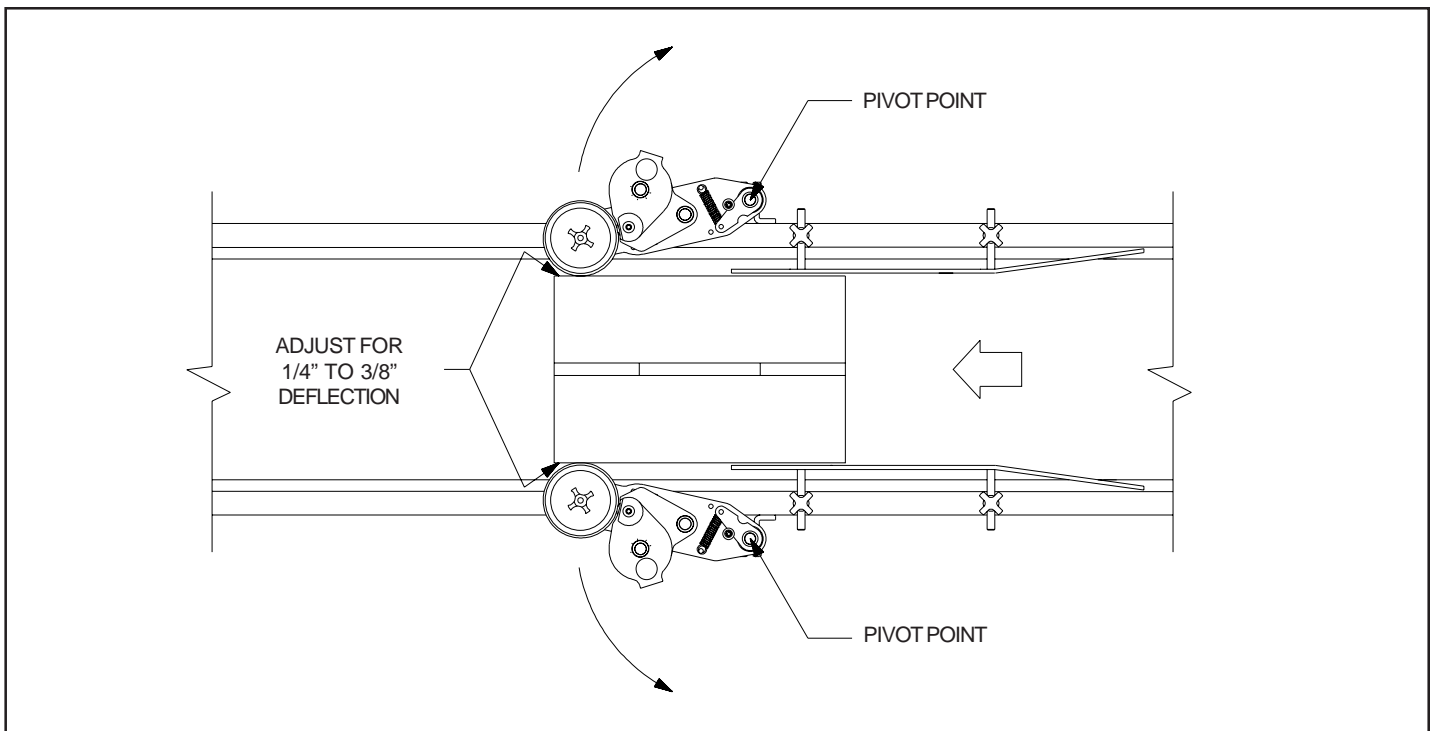
FIGURE 39

DIE POSITIONING FOR INDEXING APPLICATIONS ON CARTONS

Non-Indexing models of the coder do not offer print registration capabilities, therefore mounting the printing dies at a specific location on the print drum is not important. On Indexing machines, however, the position of the die on the print drum determines the registration of the print on the carton. Since non-porous marking inks are normally extremely fast drying, die positioning will also have an affect on the ability of the coder to reliably transfer ink to the carton surface. Production cycle rates, ambient temperature and ink selection are also factors which have to be considered to ensure proper performance of the system.

Figure 40 illustrates the best die position for carton printing when using extremely fast drying inks. Note that the leading edge of the printing die should be positioned, rotationally, upstream of the transfer roll. When the leading edge of the carton contacts the print drum, the drum begins to rotate in a clockwise direction. The die travels a short distance and then contacts the transfer roll where ink is applied to the die face. This distance can be adjusted by loosening the print drum knob and rotating the print drum to the desired position. When the die contacts the carton the mark is applied. The print drum will continue to rotate until the trailing edge of the carton passes the coder, then the print drum will automatically return to the same starting position.
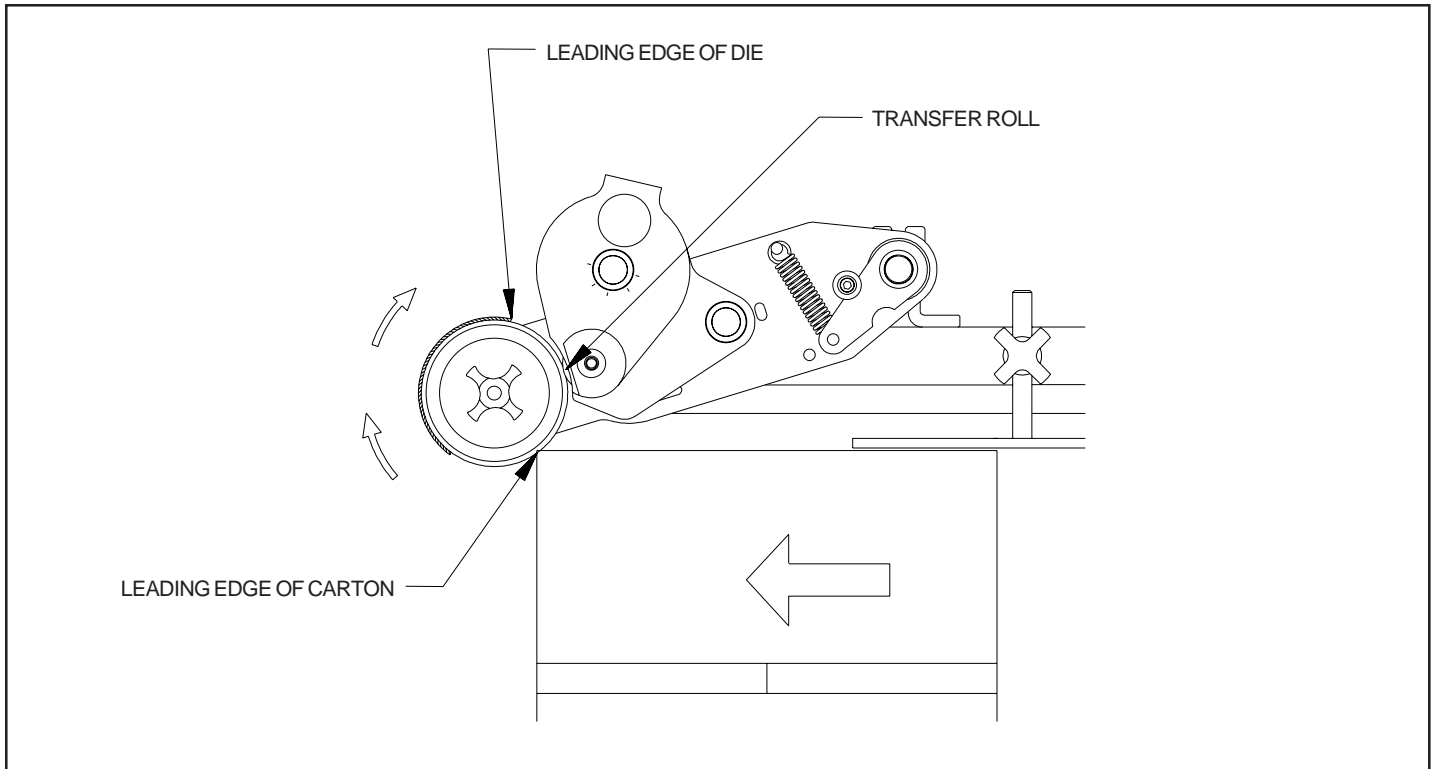

FIGURE 40

Installing the printing dies in this position does restrict how close to the leading edge of the carton you can register the print, but, it is one of the only ways to ensure a good imprint on every carton. Since the fastest drying non-porous inks will dry in approximately 2 seconds at 75 Degree F. ambient temperature, the ink will also dry on the die face within 2 seconds after it is applied by the transfer roll. If the dies have not contacted the carton surface before then, no imprint will be transferred to the carton.

If the cycle rate of the production line is very fast and the ambient temperature is relatively low, the printing dies could be positioned rotationally downstream of the transfer roll so they print much closer to the leading edge of the carton. When the coder completes one printing cycle, a portion of the die, or all of the die, may have already passed the transfer roll and picked up ink in preparation for printing the next carton. The coder can remain idle like this for only a fraction of a second before the next carton must contact the print drum or the ink will dry on the die face and not be transferred to the carton.

If your production cycle rate is not fast enough, but you still need to print close to the leading edge of the carton, the only alternative is to use a slower drying non-porous ink. When selecting an ink, be sure to consider ambient temperature. It can have a dramatic affect on ink drying times. Hot ambient temperatures make inks dry faster while cold ambient temperatures retard drying.

DRUM PRINTING

Printing on non-porous surfaces, such as steel drums, can be accomplished easily with Universal Non-Porous Midsize Coders. The selection of an appropriate place for installation on your conveyor line or other packaging equipment is a very important consideration in the performance of your coder. The most important factor to consider is drum alignment. To ensure print reliability and prevent damage to your coders, the drums must be accurately guided through the printing station by guide rails. If your conveyor is not equipped with guide rails they must be installed before proceeding with coder installation.

DRUM ALIGNMENT

Proper alignment of the drums as they pass the printing station is imperative as shown in Figure 41. Improper alignment will produce poor print quality, poor print registration, and in extreme cases, could damage the machine. A guide rail on the back side of the drum, opposite the coder, should be positioned at the same vertical height as the coder print drum. This will prevent the drum from moving when the coder begins to apply print pressure on the drum side.
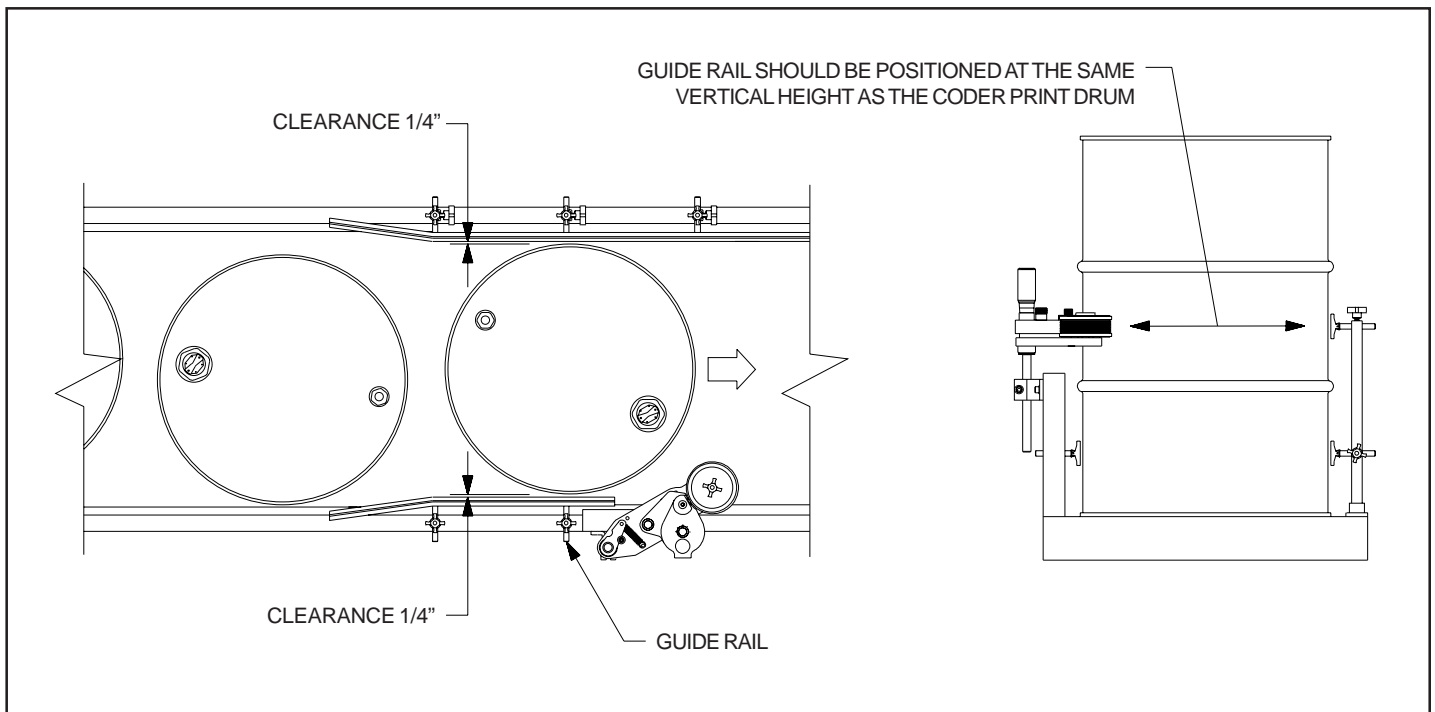
FIGURE 41

All Universal Non-Porous Coders are spring loaded so that the print drums will press against the drum surface on contact. This pressure is necessary to accomplish the friction drive rotation of the print drum and ensure enough printing pressure to give you a sharp impression. The spring tension mechanism on the coder will also compensate for slight variations in the diameter of the drums without jamming the conveyor line. Excessive pressure, caused by improperly guided drums, will result in smudged impressions and could cause damage to the extension spring that provides this printing pressure.

Universal Midsize coders are designed so the frame of the machine will pivot on the mounting column. This allows the print drum to deflect, or swing, on contact with the drum a maximum of 3". It is recommended that drums be aligned between guide rails with no more than 1/4" clearance on each side as shown in Figure 41. This should allow ample clearance for drums and protect your printers from damage.

30

DRUM PRINTING

In most applications, installation of the printer can be accomplished by attaching the mounting bracket to the side rails of the powered conveyor using two 3/8" machine bolts. The printers should be mounted as close as possible to the end of the guide rails to insure that proper drum alignment is maintained at the printing station.

Before tightening the mounting bolts, check alignment of the print drum. It is very important for proper tracking, that the top of the print drum is parallel to the top of the conveyor (see Figure 42) and the side of the print drum is parallel to the side of the drum (see Figure 43). Once this alignment has been achieved, tighten the mounting bolts. Loosen the mounting column clamping screw (Figure 36) and position the printer to the required height for printing.

IMPROPER TOP ALIGNMENT   PROPER TOP ALIGNMENT

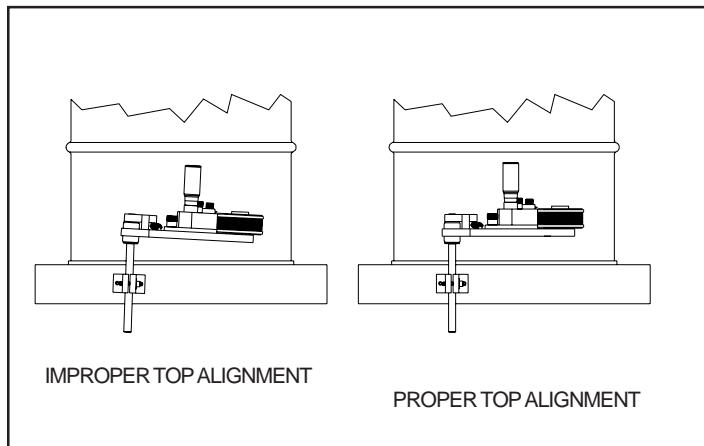FIGURE 42

IMPROPER SIDE ALIGNMENT   PROPER SIDE ALIGNMENT
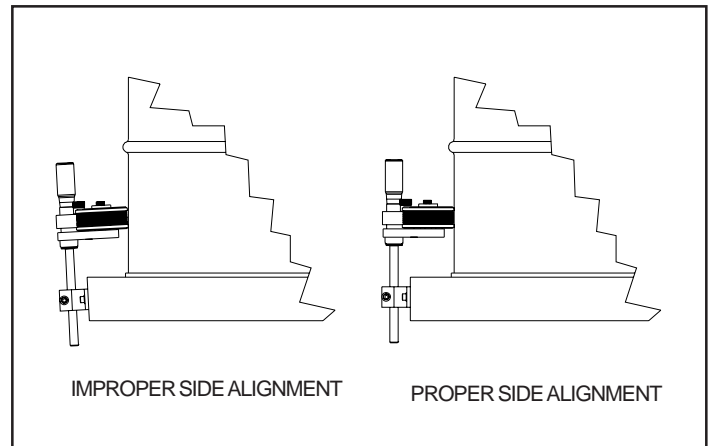
FIGURE 43

Swing the printer in until the print drum lightly contacts the side of the drums as they emerge from between the guide rails as shown in Figure 44.

CONTACT POINT OF DRUM
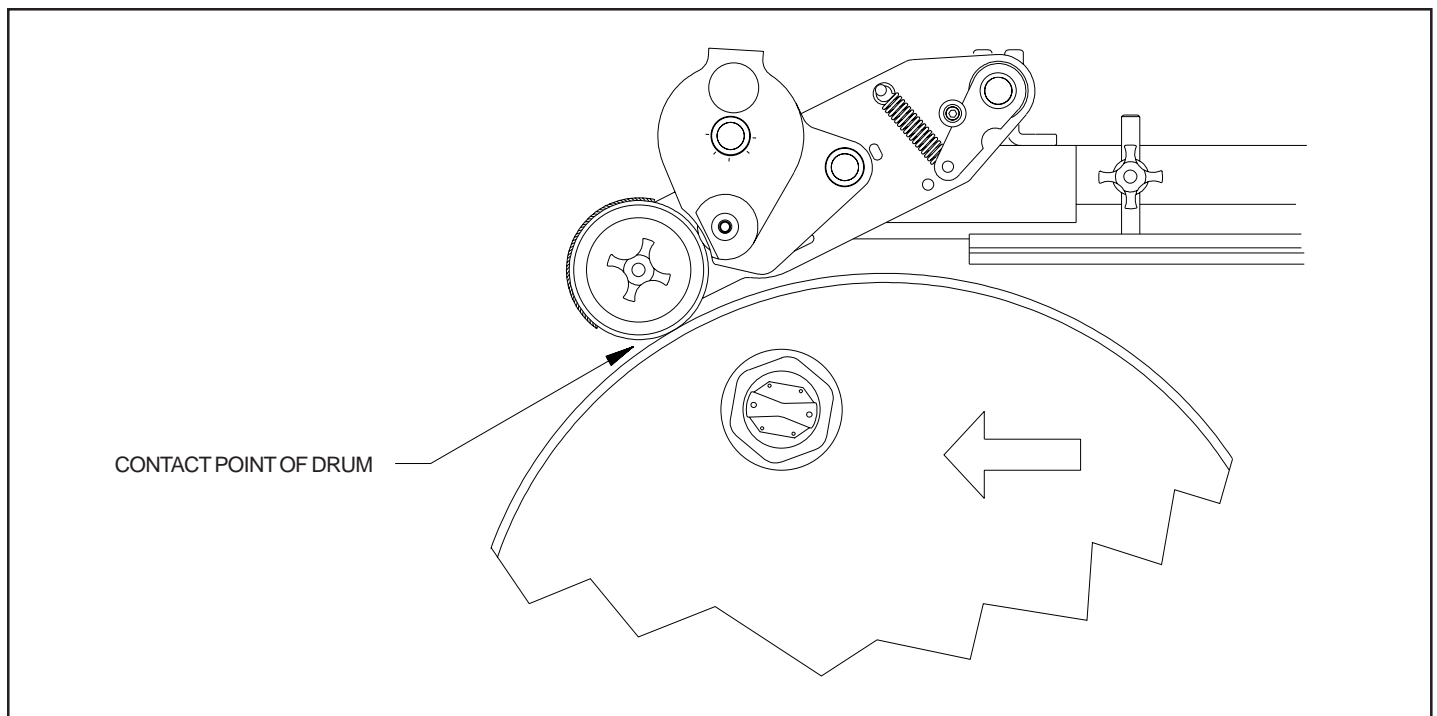
FIGURE 44

DRUM PRINTING

In order to achieve the maximum print length for your print drum, each different size print drum will need to be positioned with a certain amount of deflection as shown in Figure 45. The 12" circumference print drums need 1.54", the 15" circumference print drums, 2.36" and the 18" circumference print drums, 3.35". This will allow the coder to remain in contact with the metal drum for the full print length of the drum.

At this position, all three size coders should not extend over the conveyor more than 40 degrees, otherwise, it may cause a repeat of the mark or a premature failure of the tension arm spring.

1.54" DEFLECTION

12" PRINT AREA

MS-120 AND MS-220 PRINT DRUM

2.36' DEFLECTION

15" PRINT AREA

MS-150 AND MS-250 PRINT DRUM

3.35" DEFLECTION

18" PRINT AREA

MS-180 & MS-280 PRINT DRUM

FIGURE 45

Figure 46 illustrates the best die position for drum printing when using extremely fast drying inks.

Note that the leading edge of the printing die should be positioned, rotationally, upstream of the transfer roll. When the contact point of the drum contacts the print drum, the print drum begins to rotate in a clockwise direction. The die travels a short distance and then contacts the transfer roll where ink is 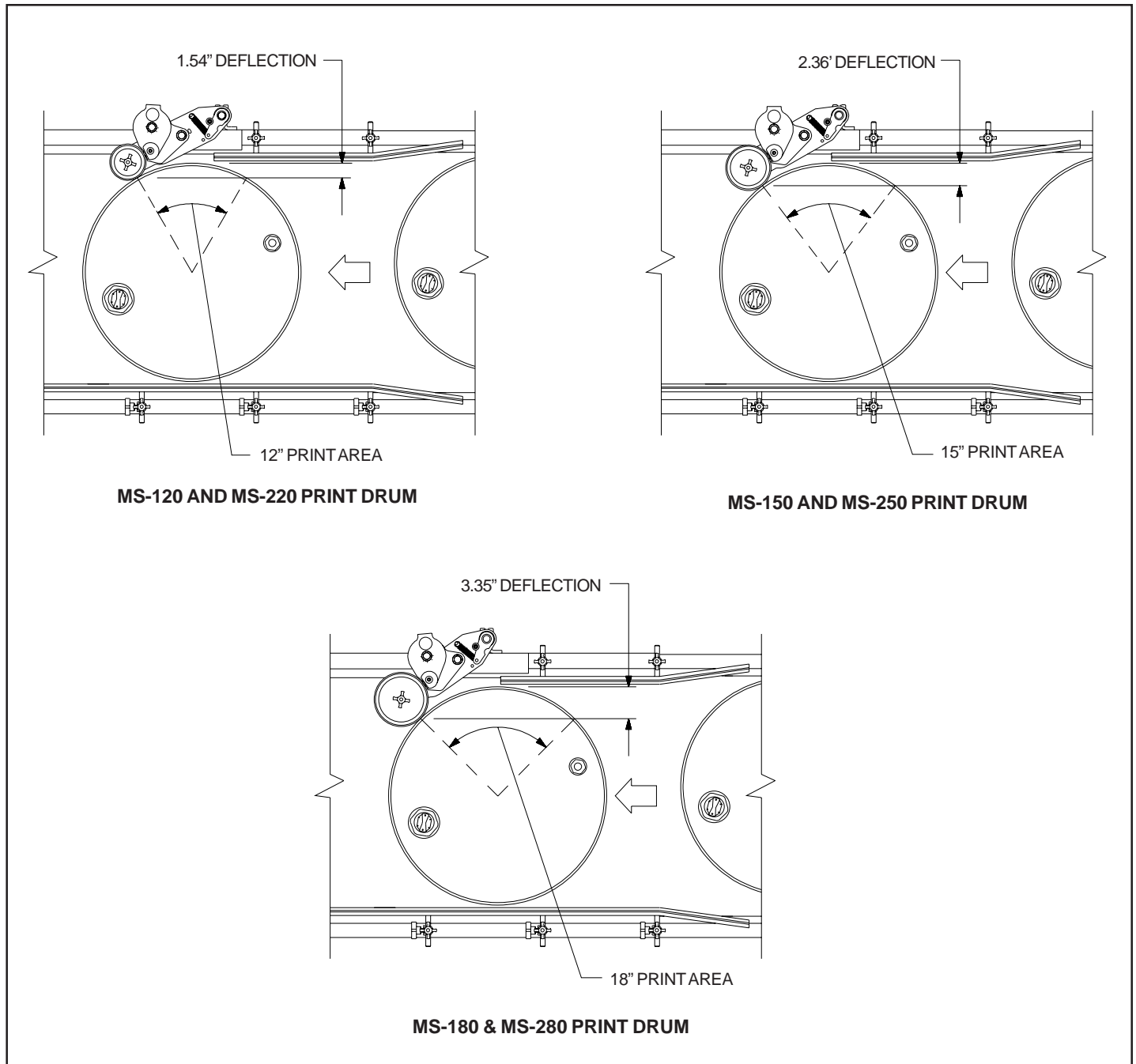applied to the die face. This distance can be adjusted by loosening the print drum knob and rotating the print drum to the desired position. When the die contacts the drum, the mark is applied. The print drum will continue to rotate until the drum passes through the printing station. The print drum will automatically return to the same starting position.

Although installing the printing dies in this position restricts how close to the contact point of the drum you can register the print, it is one of the only ways to ensure a good imprint on every drum. Since the fastest drying non-porous inks will dry in approximately 2 seconds at 75 Degree F. ambient temperature, the ink will also dry on the die face within 2 seconds after it is applied by the transfer roll. If the dies have not contacted the drum surface before then, no imprint will be transferred to the drum.

LEADING EDGE OF PRINTING DIE

TRANSFER ROLL

CONTACT POINT OF DRUM
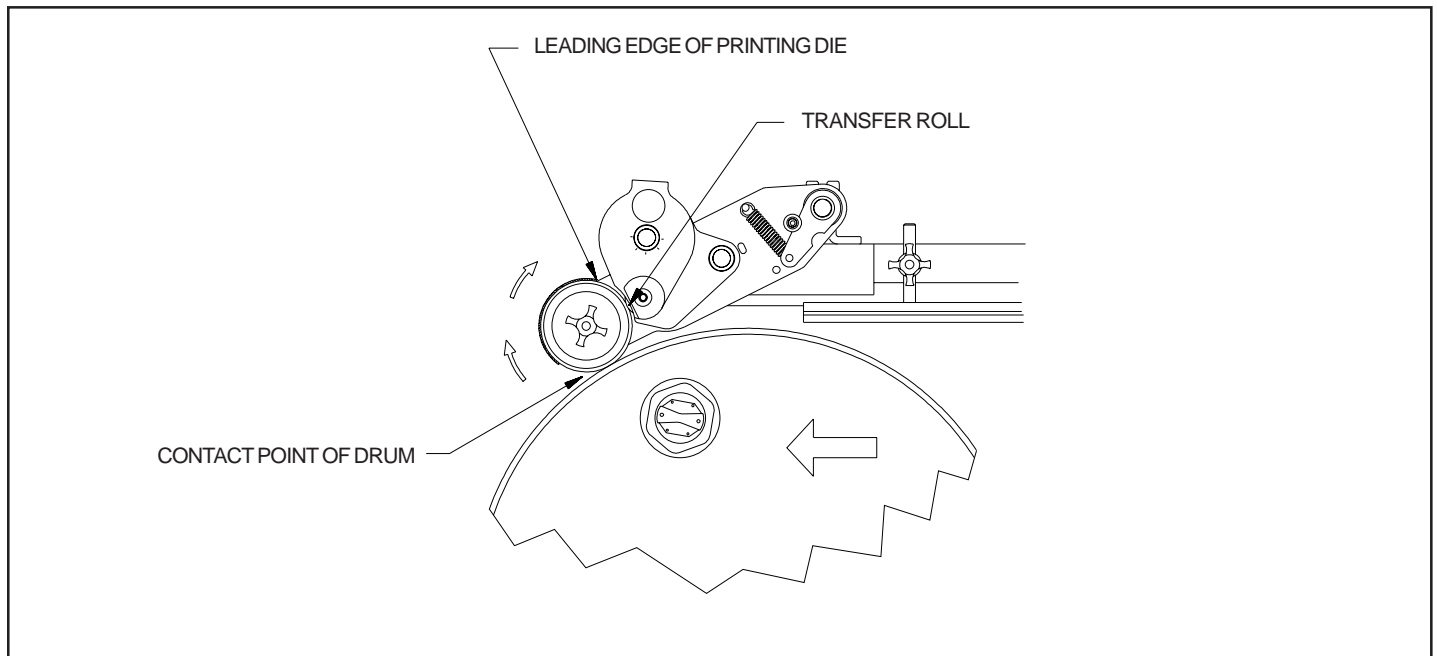
FIGURE 46

If the cycle rate of the production line is very fast and the ambient temperature is relatively low, the printing dies could be positioned rotationally downstream of the transfer roll so they print much closer to the contact point of the drum. When the coder completes one printing cycle, a portion of the die, or all of the die, may have already passed the transfer roll and picked up ink in preparation for printing the next drum. The coder can remain idle like this for only a fraction of a second before the next drum must contact the print drum or the ink will dry on the die face and not be transferred to the drum.

If your production cycle rate is not fast enough, but you still need to print close to the contact point of the drum, the only alternative is to use a slower drying non-porous ink. When selecting an ink, be sure to consider ambient temperature. It can have a dramatic affect on ink drying times. Hot ambient temperatures make inks dry faster while cold ambient temperatures retard drying.

PRE-INKING A NEW INK ROLL

When you are ready to begin printing, you must install a pre-inked, ink roll which has been properly inked with the appropriate non-porous ink. Unless you ordered a pre-inked roll with your machine, you will find a dry roll in a plastic container with your coder. A dry XF Neoprene ink roll has the same characteristics as a sponge. A 1" roll has the capacity to absorb approximately 3 fluid ounces of ink and a 2" roll, 6 fluid ounces of ink. Please follow the guidelines below to properly pre-ink your roll:

Warning: Non-Porous Inks contain flammable solvents. Do not smoke or handle these rolls in the presence of sparks or open flames. Inks will also stain clothing, furniture, carpeting and your hands. Rubber gloves should be worn during the following procedures.

Note: Dry rolls __cannot__ be inked automatically using the 4 Oz. Reservoir Ink Cartridges.

1- Remove the dry roll from the storage container. Pour enough ink into the container to cover the roller.
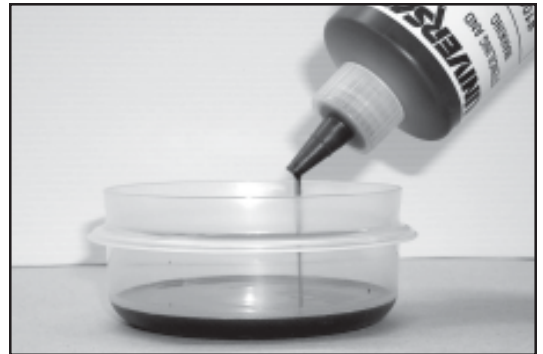

FIGURE 47

2- Carefully place the roll into the container of ink. Using your finger tips, firmly press down on the foam side of the ink roll and then release the pressure. Repeat this process several times while rotating the roll in the container and pressing on different areas. This will force the air out of the roll and the voids will be filled with ink.

Remove the roll from the storage container and turn it over, placing the un-inked side down in the container. Repeat the process above until all the ink in the container has been absorbed into the roll.

FIGURE 48

3- Inspect the roll to ensure it is completely saturated with ink but not dripping wet. If the surface of the roll seems excessively wet after inking, remove the excess ink by inserting a rod, or screwdriver, through the core and while pressing down lightly, roll the roller across a clean piece of paper.

After this process is completed, the roll should immediately be installed on the coder or it should be placed back in the storage container and the lid tightly sealed to prevent solvent evaporation.
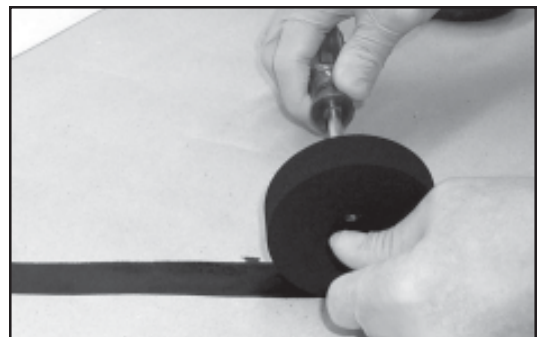

FIGURE 49

CLEANING THE TRANSFER ROLL

The surface of the transfer roll is made from DuPont Delrin material and the O.D. of the roll is finely engraved which enables it to hold a uniform film of ink. This surface material is very fragile and under no circumstances should you attempt to clean it with anything abrasive.

Warning: Most of the ink solvents used for cleaning are flammable liquids. Follow all safety precautions recommended by the manufacturer during this process.

1 - To clean dust and ink residue from the surface of the transfer roll, first remove it from the coder. Lightly saturate a soft cotton cloth with the appropriate ink solvent and gently rub the surface of the roll until it is clean.

DO NOT SUBMERGE THE TRANSFER ROLL IN SOLVENT!

If the transfer roll is submerged in solvent, the bearings will be permanently damaged.

FIGURE 50

CLEANING THE CODER

1 - Periodically, the inking system should be disassembled and inspected for ink residue and dust contamination. To remove ink contamination from the surface of the machine, moisten a soft cotton cloth with the appropriate ink solvent and rub it across the contaminated area.

The frequency of required cleaning can be greatly reduced if the inking system is kept in proper adjustment during normal operation and if the ink roll does not become over saturated with ink.

FIGURE 51

35

CLEANING THE RIBtype® DIES

All inks which are formulated for printing on non-porous surfaces contain a resin binder which bonds the dye or pigment in the ink to the surface of the material being printed. As the ink begins to dry, this binder becomes "tacky" or "sticky". While in this stage of the drying process, the tack on the dies will tend to pick up both airborne dust and any dust or dirt on the surface of the material being printed. When this happens, the dies should be cleaned or replaced. The easiest method of cleaning the dies requires the appropriate solvent for the ink being used, a pair of rubber gloves, safety glasses, an apron to protect your clothing is recommended, a toothbrush, some clean paper towels and a plastic bag to protect your workbench from staining. (Naturally, the toothbrush will never be suitable for oral hygiene use after this process.)

After some period of use, the accumulation of contaminates on the dies will cause degradation of the print quality; cleaning the printing dies, excluding excessive wear to the die face, will restore the print quality of the coder.

1-Place the contaminated Die on top of several layers of paper towels to absorb the excess solvent. Pour just enough solvent on the face of the printing die to cover the die face.

FIGURE 52

2-Using the toothbrush, carefully scrub the face of the die to remove the contamination and old ink as shown. Add more solvent as necessary and repeat the process until the die is clean.

Do not submerge or soak the dies in solvent as this may cause swelling of the rubber compound.

FIGURE 53

3-Blot the surface of the die with a clean paper towel to dry as shown in and reinstall the clean dies on the coder.
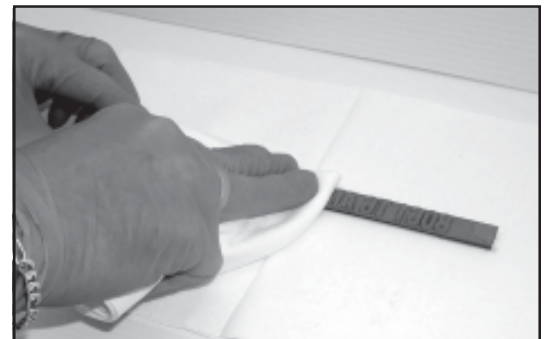

FIGURE 54

MODEL CONVERSION

PRINT DRUM ASSEMBLY - MODEL CONVERSION

The Universal Midsize Coders have been designed to accommodate three different print drum diameters. Models MS-120/MS-220 have a 12" circumference print drum, models MS-150/MS-250 have a 15" circumference print drum and models MS-180/MS-280 have a 18" circumference print drum. The Field converting from one model to the other is very quick and easy (See Figure 56). **NOTE: Models prior to January 1, 2011, cannot convert to the MS-180 or MS-280, 18" print drums because the baseplates don't have slot #3.**

1-Remove the two mounting screws and delrin washers from the inking system baseplate. These items are located on either side of the bottom of the coder.

2-Lift the inking system assembly away from the coder baseplate and reposition the eccentric pin in the appropriate slot. 12" circumference print drums are positioned in slot # 1 and 15" circumference print drums are positioned in slot # 2 and the 18" circumference print drum is positioned in slot # 3. Ensure the rectangular guide tab, on the bottom of the inking system, is seated in the guide slot on the coder baseplate.

3-Replace the two mounting screws and delrin washers in the inking system baseplate. Tighten screws just enough to allow the inking system to move by turning the inking system eccentric knob. If screws are over-tightened, adjustment of the transfer roll pressure will not be possible.

4-Unscrew the print drum knob and remove the print drum. Replace with the appropriate print drum and tighten the print drum knob.

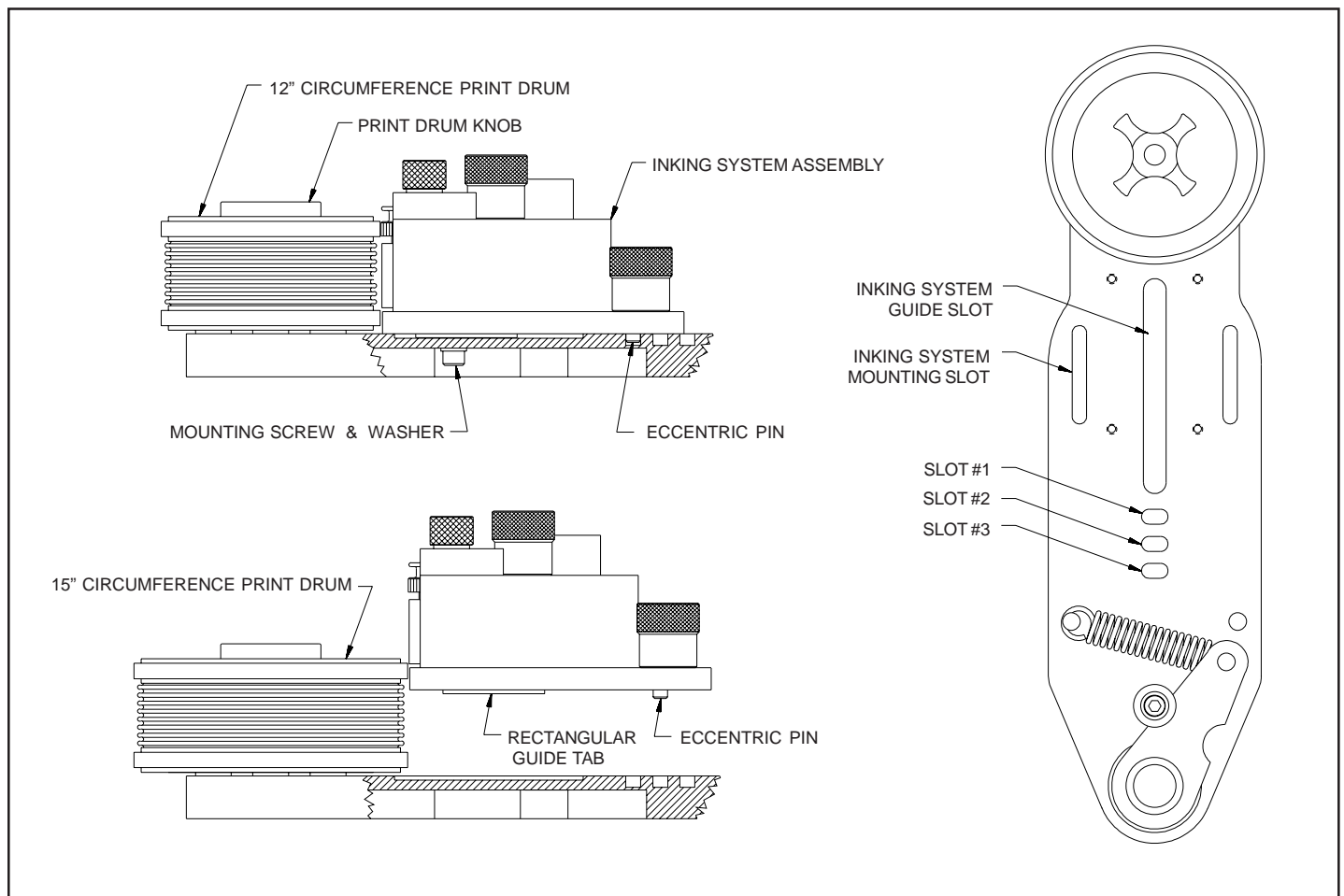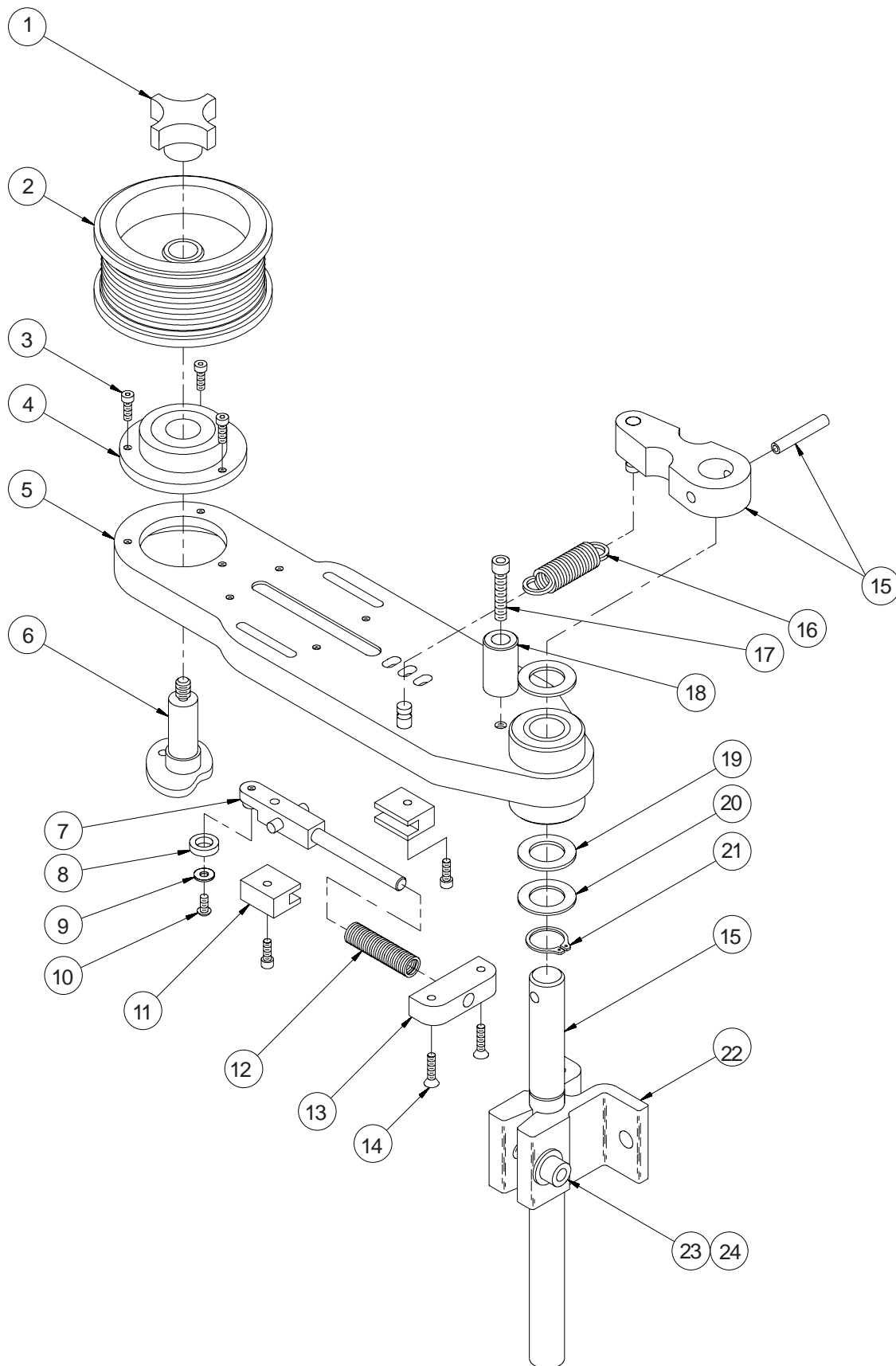**5-**Re-adjust the transfer roll pressure, tighten mounting screws and begin printing.


FIGURE 55

NON-POROUS MIDSIZE CODER

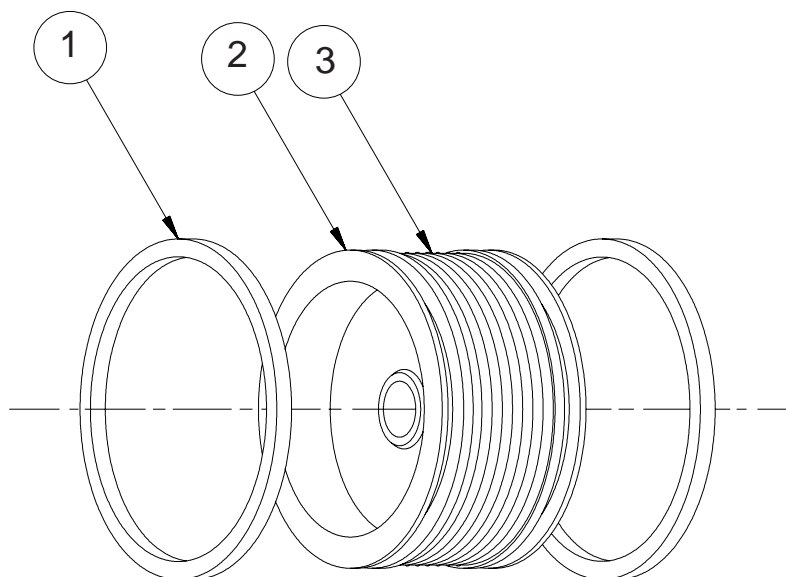| KEY NO.	PART NUMBER	QTY. REQD.	DESCRIPTION
1	MRM-CL20	1	KNOB, PRINT DRUM
2	MSC-120-PDA-NP	1	MS-120 NON-POROUS PRINT DRUM ASSEMBLY
	MSC-150-PDA-NP		MS-150 NON-POROUS PRINT DRUM ASSEMBLY
	MSC-180-PDA-NP		MS-180 NON-POROUS PRINT DRUM ASSEMBLY
	MSC-220-PDA-NP		MS-220 NON-POROUS PRINT DRUM ASSEMBLY
	MSC-250-PDA-NP		MS-250 NON-POROUS PRINT DRUM ASSEMBLY
	MSC-280-PDA-NP		MS-280 NON-POROUS PRINT DRUM ASSEMBLY
	MSC-120-PDA-NT		MS-120 NON-POROUS PRINT DRUM ASSEMBLY, METRIC
	MSC-150-PDA-NT		MS-150 NON-POROUS PRINT DRUM ASSEMBLY, METRIC
	MSC-180-PDA-NT		MS-180 NON-POROUS PRINT DRUM ASSEMBLY, METRIC
	MSC-220-PDA-NT		MS-220 NON-POROUS PRINT DRUM ASSEMBLY, METRIC
	MSC-250-PDA-NT		MS-250 NON-POROUS PRINT DRUM ASSEMBLY, METRIC
	MSC-280-PDA-NT		MS-280 NON-POROUS PRINT DRUM ASSEMBLY, METRIC
3	MS-36	5	SCREW, 8-32 X 1/2" SHC (FOR INDEXING MODELS)
		3	SCREW, 8-32 X 1/2" SHC (FOR NON-INDEXING MODELS)
4	MSC-BHA	1	BEARING & HUB ASSEMBLY
5	MSC-BPA	1	BASEPLATE ASSEMBLY
6	MSC-ACA	1	AXLE & CAM ASSEMBLY (FOR INDEXING MODELS)
	MS-28		AXLE, PRINT DRUM (FOR NON-INDEXING MODELS)
7	MSC-CFA	1	CAM FOLLOWER ASSEMBLY
8	MS-18	1	BEARING, CAM FOLLOWER
9	MS-32	1	#8 FLAT WASHER
10	MS-33	1	SCREW, 8-32 X 3/8" BHS
11	MS-04	2	GUIDE, CAM FOLLOWER
12	MS-30	1	COMPRESSION SPRING - FOR MS-120, MS-220, MS-150 & MS-250 CODERS
	MC-36	1	COMPRESSION SPRING - FOR MS-180 & MS-280 CODER ONLY
13	MS-01	1	GUIDE, COMPRESSION SPRING SHAFT
14	MS-35	2	SCREW, 8-32 X 3/4" FHS
15	MSC-MCA	1	MOUNTING COLUMN ASSEMBLY
16	MS-31	1	TENSION ARM SPRING
17	CF-02	1	SCREW, 1/4-20 X 1-1/4" SHC
18	MS-15	1	STOP, SPRING TENSION ARM
19	CW-05	2	3/4" NYLON FLAT WASHER
20	CW-01	1	3/4" STEEL FLAT WASHER
21	CF-13	1	SNAP RING, 3/4" DIAMETER
22	CM-17	1	MOUNTING BRACKET
23	CF-09	1	SCREW, 3/8-16 X 1-1/2" SHC
24	CW-02	1	3/8" STEEL FLAT WASHER

NON-POROUS MIDSIZE CODER INKING SYSTEM
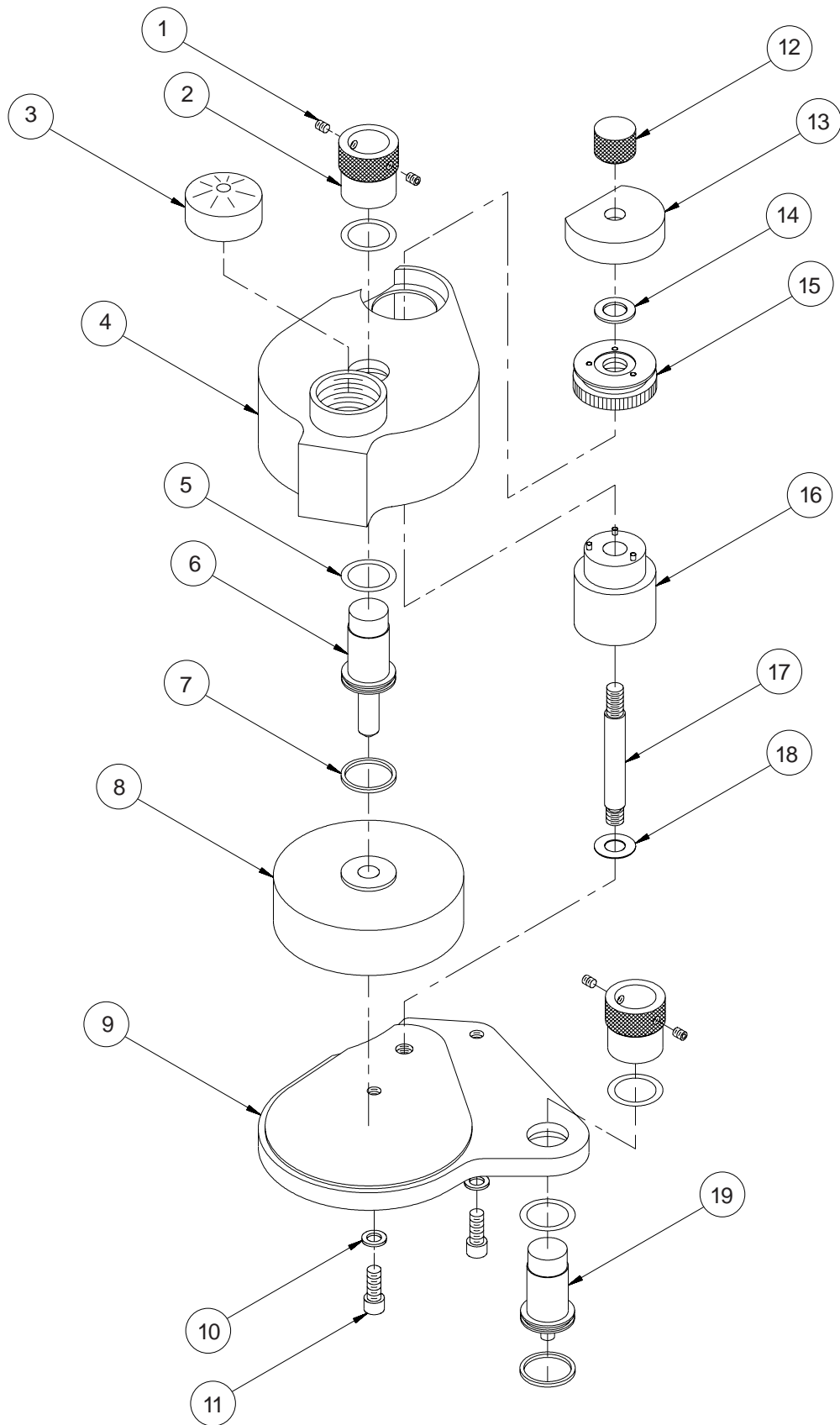
NON-POROUS MIDSIZE CODER INKING SYSTEM

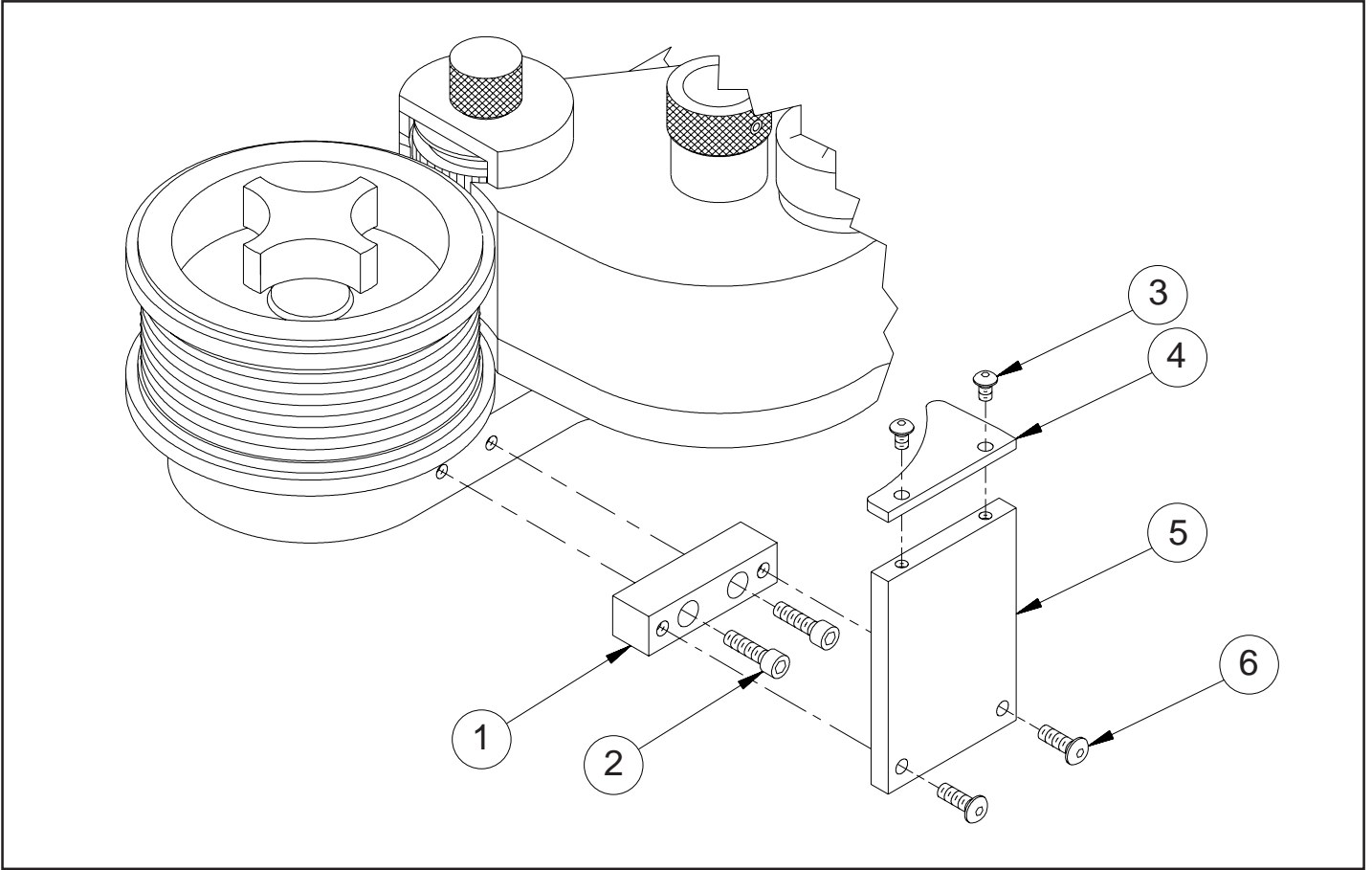| KEY NO.	PART NUMBER	QTY. REQD.	DESCRIPTION
1	HP-06	4	SET SCREW, 8-32 X 3/16" CPS
2	NP-19	2	ECCENTRIC KNURLED KNOB
3	NP-29	1	BLACK VINYL CAP
4	MSC-CA-NPLS	1	COVER ASSEMBLY, 1" NP LEFT SIDE
	MSC-CA-NPLT		COVER ASSEMBLY, 1" NP LEFT TOP
	MSC-CA-NPRS		COVER ASSEMBLY, 1" NP RIGHT SIDE
	MSC-CA-NPRT		COVER ASSEMBLY, 1" NP RIGHT TOP
	MSC-CA2-NPLS		COVER ASSEMBLY, 2" NP LEFT SIDE
	MSC-CA2-NPLT		COVER ASSEMBLY, 2" NP LEFT TOP
	MSC-CA2-NPRS		COVER ASSEMBLY, 2" NP RIGHT SIDE
	MSC-CA2-NPRT		COVER ASSEMBLY, 2" NP RIGHT TOP
5	HP-42	4	DELRIN WASHER
6	MSC-IRES	1	1" INK ROLL ECCENTRIC & SHAFT ASSEMBLY
	MSC-IRES-2		2" INK ROLL ECCENTRIC & SHAFT ASSEMBLY
7	NP-21	2	O-RING, ECCENTRIC
8	NP-XC1	1	1" NP XF NEOPRENE INK ROLL
	NP-XC2		2" NP XF NEOPRENE INK ROLL
9	MS-34	1	BASEPLATE, NP LEFT INKING SYSTEM
	MS-06		BASEPLATE, NP RIGHT INKING SYSTEM
10	MS-29	2	DELRIN WASHER
11	MC-02	2	SCREW, 1/4-20 X 5/8" SHC
12	NP-17	1	COVER RETAINING KNOB
13	NP-16	1	DRIVE WHEEL COVER
14	NP-15	1	DELRIN WASHER, DRIVE WHEEL
15	NP-14	1	KNURLED DRIVE WHEEL W/DELRIN WASHER
16	NP-TRA-1	1	1" TRANSFER ROLL ASSEMBLY
	NP-TRA-2		2" TRANSFER ROLL ASSEMBLY
17	NP-05	1	1" TRANSFER ROLL AXLE
	NP-06		2" TRANSFER ROLL AXLE
18	HP-04	1	3/8" BRASS FLAT WASHER
19	MSC-ISEA	1	INKING SYSTEM ECCENTRIC ASSEMBLY

NON-POROUS MIDSIZE CODER 1" PRINT DRUM

KEY NO.	PART NUMBER	QTY. REQD.	DESCRIPTION
1	MS-20	2	BEARER RING, MS-120
	MS-21		BEARER RING, MS-150
	CO-02S		BEARER RING, MS-180
2	PRINT DRUMS ONLY AVAILABLE IN COMPLETE PRINT DRUM ASSEMBLIES. SEE PAGES 38 & 39 (KEY 2)		
3	MS-11	1	MS-120 RIBtype® DRUM COVER
	MS-12		MS-150 RIBtype® DRUM COVER
	CLP-BL1		MS-180 RIBtype® DRUM COVER
	MS-11T		MS-120 RIBtype® DRUM COVER - METRIC
	MS-12T		MS-150 RIBtype® DRUM COVER - METRIC
	CLP-BL1T		MS-180 RIBtype® DRUM COVER - METRIC

NON-POROUS MIDSIZE CODER 2" PRINT DRUM
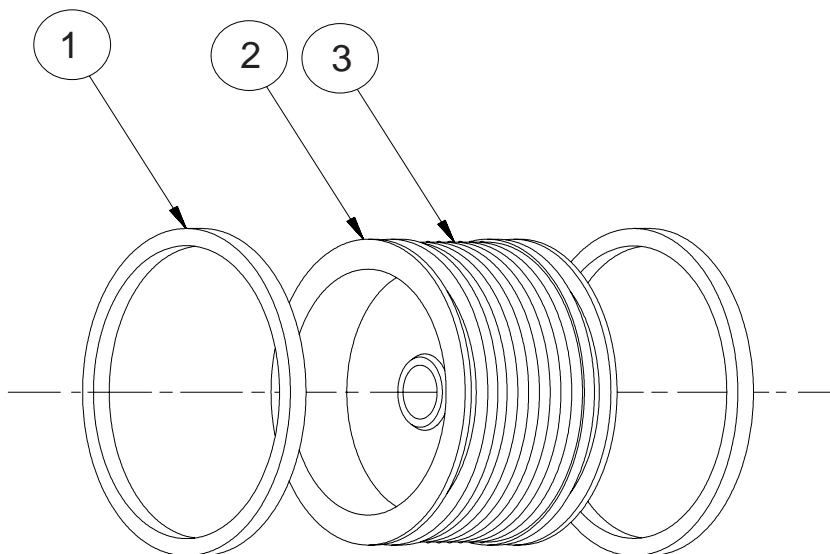
KEY NO.	PART NUMBER	QTY. REQD.	DESCRIPTION
1	MS-20	2	BEARER RING, MS-220
	MS-21		BEARER RING, MS-250
	CO-02S		BEARER RING, MS-280
2	PRINT DRUMS ONLY AVAILABLE IN COMPLETE PRINT DRUM ASSEMBLIES. SEE PAGES 38 & 39 (KEY 2)		
3	MS-47	1	MS-220 RIBtype® DRUM COVER
	MS-50		MS-250 RIBtype® DRUM COVER
	CLP-BL2		MS-280 RIBtype® DRUM COVER
	MS-47T		MS-220 RIBtype® DRUM COVER - METRIC
	MS-50T		MS-250 RIBtype® DRUM COVER - METRIC
	CLP-BL2T		MS-280 RIBtype® DRUM COVER - METRIC

NON-POROUS MIDSIZE CODER CE GUARD

KEY NO.	PART NUMBER	QTY. REQD.	DESCRIPTION
1	NP-81	1	STAND OFF, MS-120 & MS-220
	NP-76		STAND OFF, MS-150 & MS-250
	NP-85		STAND OFF, MS-180
2	NP-77	2	SCREW, 8-32 X 3/4" SHC
3	NP-66	2	SCREW, 6-32 X 1/4" BHC
4	NP-79	1	END PLATE, MS-120 & MS-220
	NP-74		END PLATE, MS-150 & MS-250
	NP-86		END PLATE, MS-180 & MS-280
5	NP-82	1	TOP PLATE, MS-120
	NP-78		TOP PLATE, MS-150
	NP-87		TOP PLATE, MS-180
	NP-80		TOP PLATE, MS-220
	NP-75		TOP PLATE, MS-250
	NP-88		TOP PLATE, MS-280
6	HP-10	2	SCREW, 8-32 X 1/2" BHC