

TDC

OPERATING PROCEDURES and OWNER MANUAL

CINCINNATI PRECISION MACHINERY 513-660-4133



LOCKFORMER

**DO NOT ATTEMPT TO
OPERATE THIS EQUIPMENT
BEFORE READING THESE
INSTRUCTIONS !**

OPERATOR SAFETY REMINDERS

The National Safety Council reminds us that many accidents are caused by the failure to follow fundamental safety rules or precautions. For this reason you as a careful operator are the best insurance against an accident.

UNLESS OTHERWISE NOTED, DO NOT MAKE ANY ADJUSTMENTS OR LUBRICATE MACHINE(S) WHILE IN MOTION.

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INVENTORY:

One standard 14 station Lockformer Double Extended Shaft (DES) TDC Machine with the following specifications:

- * 5 inch horizontal centers at Stations 1-5 and 8 in. horizontal centers at Stations 6-14 and 5 inch vertical centers throughout.
- * Double auxiliary shafts.
- * 1-1/4 inch diameter shafts.
- * Heavy duty race cage bearings throughout. A grease fitting has been placed at each bearing for its manual lubrication.
- * Constant speed drive of approximately 60 F.P.M.
- * 10 H.P. motor, wired as per order request.

Tooling consists of the following:

Standard TDC Ductforming rolls mounted on left auxiliary shafts to form special duct flange profile.

OPTIONAL Standard TDC Clip forming rolls inboard, or right outboard, if ordered: NOTE! Stamped numbers of Clip rolls (when mounted right outboard) must face inwards, towards plate!

OPTIONAL TDC II profile forming rolls, mounted inboard, if ordered. These may also be equipped with Standard LOCKFORMER Cold Seal Unit for automatic mastic application, if so ordered.

INSTALLATION:

Uncrate machine from its shipping skids and then inspect and remove all foreign particles that may have fallen into forming rolls, gears, chain, etc.

At the machine's operating site, level it to the floor area. Wire machine to an appropriate power source, (Voltage, phase, Hertz as requested in original customer order. Machine has been wired according to these specifications and must operate on this power) meeting all electrical standards and wiring color codes for your geographical area.

NOTE: THE ONLY FEATURES OF TDC ROLLSET LIKELY TO NEED ROUTINE RESETTING ARE: THE TWO-ROLL EXIT STRAIGHTENING OF THE LEFT, OUTBOARD TDC ROLLS, WHICH MUST BE MOVED UP OR DOWN TO ELIMINATE EXIT BOW FOR DIFFERENT STOCK THICKNESSES: THE RUBBER HOLD DOWN ROLLERS BESIDE THE TDC ROLLS WHICH SHOULD BE LOWERED SLIGHTLY TO FORM 18 GA. STOCK: AND PILLOW BLOCK SCREW TENSIONS OF STATION 14, DEPENDING ON THICKNESS OF STOCK TO BE FORMED.

MOST OF THESE INSTRUCTIONS MERELY GIVE THE PROPER CLEARANCE AND ALIGNMENT SETTINGS AT WHICH ITS FEATURES SHOULD STAY SET. MOST FEATURES ARE SET FOR ALL STOCK THICKNESSES, AND DO NOT NEED TO BE ROUTINELY RESET.

OPERATION OF TDC JOINT PROFILE ROLLSET, MOUNTED LEFT OUTBOARD

ROLL CAPACITY: 18-26 Ga. Galv. Steel

STOCK WIDTH: FORMS SHEET EDGE. TDC shape takes up approximately 1-7/8" of sheet edge, so for a duct section 36" long, blank must be approximately 39-3/4" (36 + 2 x 1-7/8).

NOTES: To form a duct using this profile, both edges of a sheet must be run through this rollset, held flush against the gauge bars mentioned below.

Also, the corner notching of these pieces must be finished before rollforming, and the Pittsburgh lock must be formed before the TDC flange. The TDC flange would interfere with the sheet passing through Pittsburgh forming rolls.

ENTRANCE GAUGE BAR SETTINGS:

Located on the front of the rollformer is an entrance table. The purpose of this table is to support the material being fed into the rollforming operations. On the top of the entrance table are the entrance gauge bars, mounted (for this rollset) with a riser plate to lift the entering stock to the best passline level.

The entrance gauge bars ensure correct alignment of the stock when entering the starting rolls. These bars are adjustable and it is important that they are set correctly. The exact locations of the entrance gauge bars have been determined during final machine testing. Inaccurately set or loose gauge bars can feed the stock improperly. Improperly fed stock can alter the amount of material engaged in the rolls, causing poorly formed or distorted shapes, material runout, and possibly jam the material in the rolls.

The entrance gauge locations should be checked periodically for accuracy. The correct locating dimensions are determined as follows:

Place straight edge along the outside face of the rolls (rollfaces have outer and inner hubs; place edge against inner hubs) and extending over the entrance table. Measure 2-7/16" from the straight edge to the gauge bar and lock it in place parallel to the gauge bar feed stock straight. See Illustration no. 1.

Check fasteners frequently: they should be firmly tightened.

SLIDING STOCK GUIDE ATTACHMENT (SSGA):

The horizontal distance between the roll stations of the TDC machine may be too great for shorter pieces to be properly gripped and formed by the next rolls in sequence. The special Sliding Stock Guide Attachment (SSGA) shipped mounted at the exit end of the machine on its outboard Glide Rail is used as a movable clamp, allowing pieces 6 - 15" long to have the TDC profile formed on them by outboard TDC rolls.

The SSGA is used by lifting off and removing the Upper Sheet Support Attachment over which the stock ordinarily slides (part # 51135) as noted in the accompanying drawing, # 55049. With the lower Glide Rail exposed, slide the SSGA into place on it at the entrance end of the machine beside the gauge bars, with its clamps nearer the entrance end. The slots in the lower legs of the SSGA are made to fit precisely over the edges of the rail, allowing the Attachment to slide straight but freely along it.

To form a short piece, position it with the edge to be formed against the gauge bar as usual and its rear edge against the back stop of the Attachment. Then fasten the SSGA clamps down on the piece to hold it firmly. If it is not wide enough to be secured by the outer clamp, use a vise grip to hold it near its outer edge. A piece must be fastened in two places, or it may pivot.

The rollformer may then be turned on, and holding the Attachment so hands remain as far from the rolls as possible, push it towards them, driving the piece into their grip. Allow the piece to be pulled normally by the rolls while it is engaged in them, pushing just firmly enough to compensate for the extra drag/weight of the attachment. Push the SSGA smoothly as it leaves one station, until the piece is firmly engaged in the next rolls. Push with extra force between Stations 5 & 6 because the piece must pass through an idler roll at this location, and may become stalled. Continue this procedure until the part comes out the exit end.

Remove SSGA and reinstall the Upper Sheet Support Attachment to return to normal forming process. Refer to drawing # 58175 for reinstallation settings of the Attachment at proper passline height and parallel, as required, to machine plate. Fine set the attachment level as needed for proper support.

Also, for this machine, the Upper Sheet Support Attachment is removed to make the TDC flange on an edge at 90 degrees (or at any angle) from an edge with the TDC profile formed on it already, to allow clearance for the flange in place to pass.

SHEET HOLD DOWN ROLL ASSEMBLY:

The long plate that is perpendicular above the Upper Sheet Support Attachment is mounted with rubber rollers that help control the tendency of the panel to bend upward as it is rollformed. These rollers have been placed so that their outer diameters are approximately level with the passline of the stock, and they will compress to allow for the different profiles (Pittsburgh lock or Right Angle Flange). If these rollers ever seem to be impeding the stock however, or not controlling the upward bow, their mounting plate may be raised or lowered (respectively) by simply loosening the bolts holding it to its overhead brackets and raising or lowering it in small increments as desired. If 18 Ga. stock does not form a satisfactory right angle, lower these rolls to press down on stock slightly more. Raise them again for thinner stock. Test a new setting with care, as setting rollers too low could impair the sheet's freedom of movement. This feature should not require resetting when the Upper Sheet Support Attachment is removed or reinstalled.

PILLOW BLOCK ADJUSTMENTS:

Each roll station is spring loaded and designed to float within an adjustable range of vertical travel. All roll stations can be adjusted independently.

This spring loaded design is intended to compensate for metal thickness variations by making the horizontal clearance between top and bottom mating rolls adjustable. Exact lateral positioning is maintained by dowel pins inserted into top of machine plate and pillow block base.

By increasing the tightness of the pillow block screws the vertical travel of the upper rolls is lessened and the horizontal clearance is reduced. Less horizontal clearance results in increased roll grip, tighter formed profile, and smaller inside corner radii. If formed part shows signs of marring, scratching, or fracturing of bends: increasing the horizontal clearance is suggested by loosening the pillow block screws.

Exact pillow block settings have been determined during final testing of machine. To achieve optimum results, it is recommended that all pillow blocks be set as follows; firmly tighten all pillow block screws, then loosen each set of two according to torque adjustment chart on Illustration no. 3. The degree of looseness of the final station on the left machine plate is greater than other locations because of the idler here.

NOTE! Before starting to form stock that is 18 Ga. thick or more, it is necessary to reset Pillow Block Screws on Station 14 (only on plate adjacent to TDC rolls); first, fully tighten the screws at these Stations, as explained above, then loosen these screws by 2-1/2 to 3 full turns; this should allow the profile to be formed at a correct degree of looseness. To return to forming thinner stock, reset these Pillow Block screws to their standard 1/2 turn loose setting.

SHIMS UNDER PILLOW BLOCKS:

The shims which are located between the pillow blocks and the machine plates help control the effective vertical distance between the top and bottom rolls. Rolls are designed based on .027" shims at each location. Exact shim sizes and locations are determined during final analysis and testing of rolls.

Each roll station may contain different quantities and thicknesses of shims according to assembly requirements for each machine. See Illustration no. 4 for shimming arrangement.

IF PILLOW BLOCKS ARE EVER REMOVED, IT IS IMPORTANT TO REPLACE THE SHIMS AND PILLOW BLOCK SCREWS INTO THEIR RESPECTIVE HOLES IN THE MACHINE PLATES TO MAKE SURE THAT THEY ARE REPLACED IN THEIR CORRECT LOCATIONS AT RE-ASSEMBLY.

Shims (.020" each) have been placed on the shafts behind both the top and bottom rolls at Stas. 3 & 4. These shims must be returned to these positions if they are ever removed to ensure correct roll alignment.

IDLER ROLLS: See Illustration # 5, 9 & 10

When forming some profiles it is common that only the main forming rolls are needed to provide desired results. Many rollforming applications can be done more efficiently by adding idler rolls either between roll stations or directly on the roll station itself.

Maintaining angularity of bends, opening of thin clearance sections, guiding of stock into next operations, and maintaining straightness are but a few conditions controlled by idler rolls. For this rollset, idlers have been installed between Stations 5-6, 12-13 and 13-14.

It is important that the material clearance dimension between the mating rolls allow material to move freely but be formed correctly. All idler assemblies have been factory set to form all stocks properly, so readjustment of these idler assemblies should seldom, if ever, be necessary. If these settings ever seem to need changing or are disturbed so that they need to be returned to original settings however, the following information may be used:

At Stations 5-6 the inner idler (nearer machine plate) is spring loaded and a small angle iron stop is bolted into place behind it to prevent roll from moving more than the proper amount of clearance. If desired, its forming power (the pressure it exerts on the stock) is adjustable by increasing or decreasing the tension of the spring on which the idler bracket is mounted. This tension may be adjusted at the screws on the rear of the bracket, under the crossbar. This must only be reset in small, gradual increments and tested after each change to reduce the possibility of stock jamming as it enters too rigid a setting. Its factory setting was with adjusting bolt heads approximately 3/8" away from bracket.

The lower, outer idler was factory set at slightly more than 2" between its edge and the machine plate for all gauges of metal. This setting should not require changing, and the roll should remain as located, reset only if problems arise. If this seems to be necessary, loosen lower bolts and outer bracket setting bolts and position this assembly at slightly more than 2" out. The upper idler/bracket must be removed entirely to allow access for measurement between the lower roll and plate. To do this, loosen two spring bolts to relieve their tension and remove the two 3/8" bolts (one at each end of the bracket crossbar) and lift off bracket. When reinstalling this reset spring bolts to approx. 3/8" from the plate. See reference dimensions shown in Illustration no. 5.

The idler assemblies at Stations 12-13 and 13-14 need no adjustment, having been set correctly for all gauges at the factory. The outer idlers are mounted in sprung brackets, and these idlers are up against the stationary inner ones until pushed apart by the stock passing between them. The outer positioning bolts of the outer idlers were both tightened so their ends were up against the rollblock, then loosened by one full turn at Stas. 12-13, and 1-1/2 turn at Stas. 13-14. These bolt settings allow the rolls to move the correct amount to let stock pass properly. Reset them this way if necessary. Illustrations 9 and 10 show correct mating and clearance areas.

CAUTION! IF CLEARANCE DIMENSION IS SET TOO TIGHT, A STOCK JAM-UP MAY OCCUR CAUSING POSSIBLE DAMAGE AND UNNECESSARY DOWNTIME OF MACHINE!

EXIT STRAIGHTENER

Mounted to the machine plate after the final forming rolls is an attachment designed to control any tendency of the stock to bow up or down. This is a bracket holding two idler rolls at a fixed distance apart, so that the profile passes between them. The bracket itself is slotted so the rolls may be raised or lowered together as needed to correct a down bow or an up bow, respectively, in gradual increments.

Note - Machines are generally shipped with this device set to straighten thicker stock, so it will probably be necessary to reset it to straighten thinner stock. See Illustration no. 7.

OPERATION OF OPTIONAL TDC CLIP ROLLS MOUNTED INBOARD OR RIGHT OUTBOARD

(All information below used for clip rolls in either space, except as noted.)

NOTE! Stamped numbers of Cliprolls (in right outboard position) must face inwards, towards plate, away from Installer! If such rolls must ever be installed at right outboard position, be sure to orient them this way!

ROLL CAPACITY: .024 - .030" Galv. Steel (This thickness is critical)

STOCK WIDTH: 2.125 inches

ENTRANCE GAUGE BAR SETTINGS

Located on the front of the rollformer is an entrance table. The purpose of this table is to support the material being fed into the rollforming operations. On the top of the entrance table are the entrance gauge bars.

The entrance gauge bars ensure correct alignment of the stock when entering the starting rolls. These bars are adjustable and it is important that they are set correctly. The exact locations of the entrance gauge bars have been determined during final machine testing. Inaccurately set or loose gauge bars can feed the stock improperly. Improperly fed stock can alter the amount of material engaged in the rolls, causing poorly formed or distorted shapes, material runout, and possibly jam the material in the rolls.

The entrance gauge locations should be checked periodically for accuracy. The original reference dimensions are determined as follows:

INBOARD:

Place a straight edge along the outside face of the left machine plate extending over the entrance table. Measure 2" from the straight edge to the left gauge bar at its end nearest rolls and 1-31/32" to the bar at its end furthest from rolls, and lock bar in place to feed stock at a slight taper. Set the right gauge bar stock width 2.125" away at both ends. See Illustration no. 2.

RIGHT OUTBOARD:

Place a straight edge on the outside face of the rolls (not spacers mounted on shafts beside them), extending over entrance table. Measure 2-9/16" from straight edge to the end of the bar nearest the rolls, and 2-19/32" from straight edge to the end of the bar furthest from the rolls, and lock the bar in place at this position, to feed stock at a slightly tapered angle. Set the right bar stock width 2.125" away. See Illustration #11.

NOTE: Drawing # 21187 shows precise specifications of the piece to be produced by these rolls. Before installation, check clip against this print to determine accuracy of these 3 dimensions, which are critical (within tolerance):

- 1.) 11/16" top leg overall length
- 2.) 78 degree angle of top right bend
- 3.) 1 length of 13/64" leg.

If these are formed inaccurately, installation may not be affected, but clip may not hold reliably.

ENTRANCE GAUGE BAR SETTING (cont.):

These dimensions may be corrected by making changes in tension of pillow block screws (in gradual increments) at Stations 5 & 6 to loosen or tighten profile, as seems necessary. If 42 degree, 13/64" final leg is formed too long and a reinforcing bar is used, installation may be difficult. If it is too short, clip may not stay in place. This length may be adjusted as desired by moving gauge bars slightly (but maintaining blank width distance between them) to engage stock further to right or left in rolls, altering length of this final leg as needed. Using steel thinner than tolerance dimension may also cause inaccurate forming.

Check gauge fasteners frequently: they should be firmly tightened.

PILLOW BLOCK ADJUSTMENTS:

Each roll station is spring loaded and designed to float within an adjustable range of vertical travel. All roll stations can be adjusted independently.

This spring loaded design is intended to compensate for metal thickness variations by making the horizontal clearance between top and bottom mating rolls adjustable. Exact lateral positioning is maintained by dowel pins inserted into top of machine plate and pillow block base.

By increasing the tightness of the pillow block screws the vertical travel of the upper rolls is lessened and the horizontal clearance is reduced. Less horizontal clearance results in increased roll grip, tighter formed profile, and smaller inside corner radii. If formed part shows signs of marring, scratching, or fracturing of bends: increasing the horizontal clearance is suggested by loosening the pillow block screws.

Exact pillow block settings have been determined during final testing of machine. To achieve optimum results, it is recommended that all pillow blocks be set as follows; firmly tighten all pillow block screws, then loosen each set of two according to torque adjustment chart on Illustration no. 3.

SHIMS UNDER PILLOW BLOCKS:

The shims which are located between the pillow blocks and the machine plates help control the effective vertical distance between the top and bottom rolls. Rolls are designed based on .027" shims at each location. Exact shim sizes and locations are determined during final analysis and testing of rolls.

Each roll station may contain different quantities and thicknesses of shims according to assembly requirements for each machine. See Illustration no. 4.

IF PILLOW BLOCKS ARE EVER REMOVED, IT IS IMPORTANT TO REPLACE THE SHIMS AND PILLOW BLOCK SCREWS INTO THEIR RESPECTIVE HOLES IN THE MACHINE PLATES TO MAKE SURE THAT THEY ARE REPLACED IN THEIR CORRECT LOCATIONS AT RE-ASSEMBLY.

ROLLSHIMS AND SPACERS:

INBOARD

All the rolls of this set were centered on their shafts by placing identical 1.480" spacers at both ends of the rolls on the shafts on the inboard position. These must be reinstalled if the rollshaft assemblies are ever removed, and their components separated. Also, shims may have been placed between the spacers and the rolls to locate the roll precisely at its best forming position relative to the passing stock. Note the quantity and location of such shims and be certain to reinstall them at their original positions if the rollshaft assemblies are ever taken apart.

RIGHT OUTBOARD

In this position, spacers are placed only on the outside face of the rolls. These rolls, spacers and any shims that may have been placed on the shafts with them for best forming results must be reinstalled in their original positions if the shaft assemblies are ever removed from the chassis and their components separated.

SLIDES: See Illustration no. 6

Occasionally it is necessary to provide one or more slides to enable partially formed stock to pass smoothly from station to station and minimize material springback. For these rolls, slides have been placed between Stations 6-7 and 7-8. These slides usually require no adjustments, however if removal or replacement is ever necessary, install the slide so that its contact surface is parallel to the passline and tangent to the outside roll diameter at the section in which it aligns. If specific positioning is required it will be illustrated on the accompanying sketch or layout drawing. Be sure that the slide contact surface bears no extreme pressure on part being formed.

EXIT STRAIGHTENER: See Illustrations 7 and 8

As the material passes through rollformer, stresses can be induced by the bending process causing material to bow as it exits the machine. The straightening unit attached to the exit table is used to eliminate bowing.

The straightener is designed using one or more bars properly fitted to the contour of the formed piece and is adjustable vertically and laterally.

The straightener operates on a principal of counteracting the force causing the bow by moving the unit in the opposite direction of the bow. For example, if the part emerges with a DOWN BOW the unit should be raised: if part emerges with a SIDE BOW to the left the unit should be moved to the right, etc. This straightener has already been set at an angled position to compensate for a side bow, and it is recommended that this position only be changed in small increments. Raising the straightener to control a DOWN bow can be done in small, gradual increments by raising the table, placing shims under the exit end of the straightener or turning the jacking screws (if present) beneath it until satisfactory results are achieved. To correct an UP bow by lowering the straightener, it may be necessary to lower the table, unless shims can be removed or an upward jackscrew setting lowered to move the straightener down.

EXIT STRAIGHTENER (cont.)

The idler roll on the exit straightener can be adjusted UP or DOWN to reduce a vertical bow by turning the adjustment screw in fine increments until the desired result is obtained. If range of adjustment does not improve part straightness proceed as outlined in preceding paragraph, then fine adjust with roll.

MAINTENANCE:

A good preventive maintenance program is a major step forward in assuring trouble free machine operation. In order to be effective, routine inspection, lubrication and adjustment schedules should be established and followed. The maintenance schedule should be based on normal machine usage which is considered to be approximately 40 hours of operation weekly.

Grease fitting locations of the machine are at the main drive bearings near all roll shaft bearings and idler gear bearings. In addition, grease fittings are located at each forming roll bearing. Bearings of the lower reduction unit and other lower chassis bearings can be lubricated through the fittings in the bracket at the side of the stand. The machine covers must be opened to reach the fittings of the pillow block and upper chassis.

Also, install grease fittings in each idler's bearing hole (on its exposed flat face) approx. every 80 hours of operation to lubricate their bearings. Be certain to remove fittings after use to avoid a collision of moving stock against them.

Also apply grease to all gear teeth regularly to help eliminate noise and galling of gears.

RECOMMENDED LUBRICANTS:

Standard Oil Co.Standard Viscous #3 or Polarine

TribolMolub Alloy #777-1

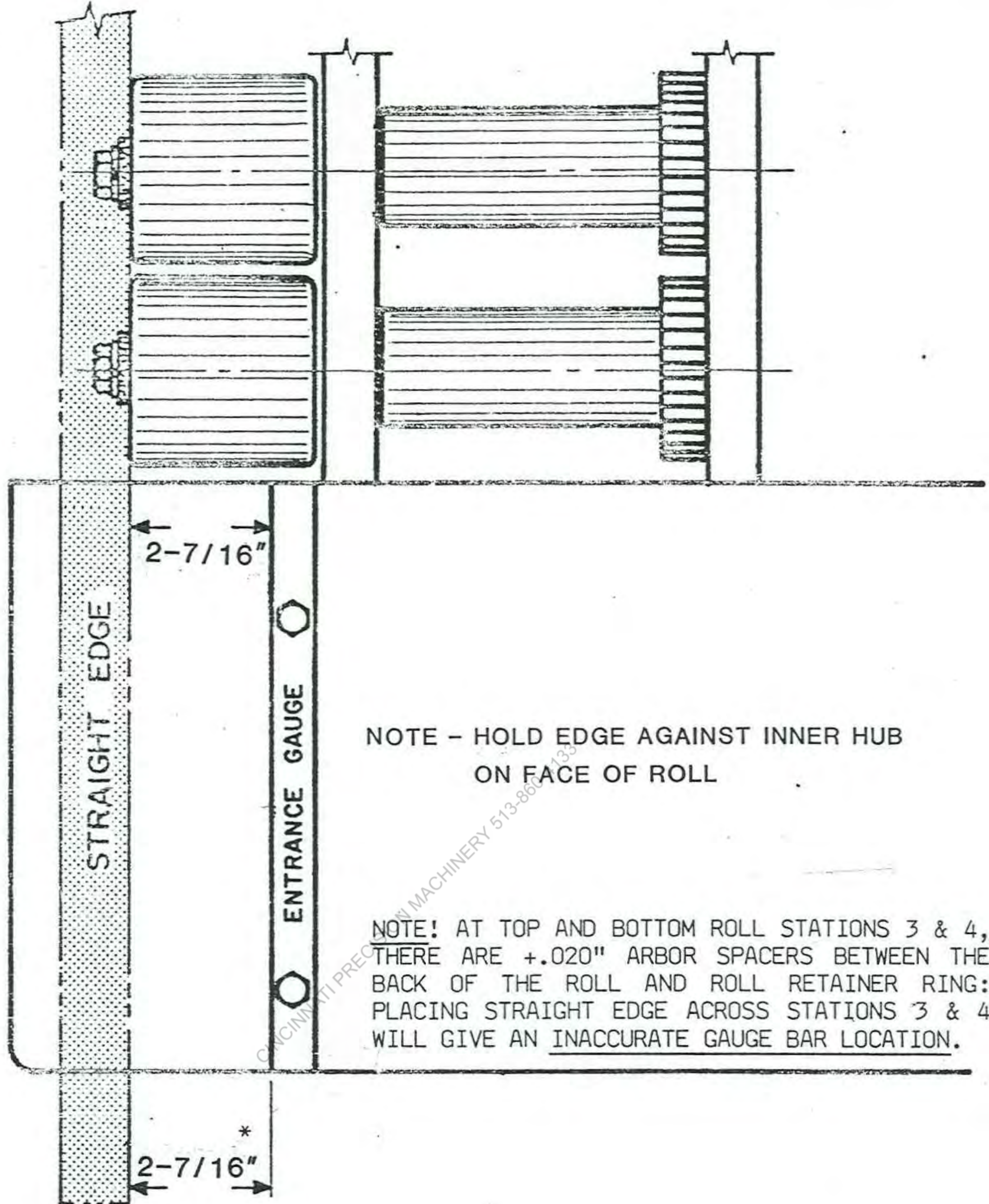
Mobil Oil Co.Mobil Plex EP2

MACHINE PARTS ORDERING:

If ever ordering machine parts, please specify on the order: For 14 station TDC-DES machine (include machine serial number marked on the machine).

REPLACEMENT ROLLS:

If ever ordering replacement rolls, please give all the information stamped on the side face of rolls.



PLACE A STRAIGHT EDGE FLUSH AGAINST THE SIDE OF THE TOP ROLLS AT (ONLY) THE FIRST 2 STATIONS, AND MEASURE AS SHOWN ABOVE, TO CONFIRM THE GIVEN SETTING.

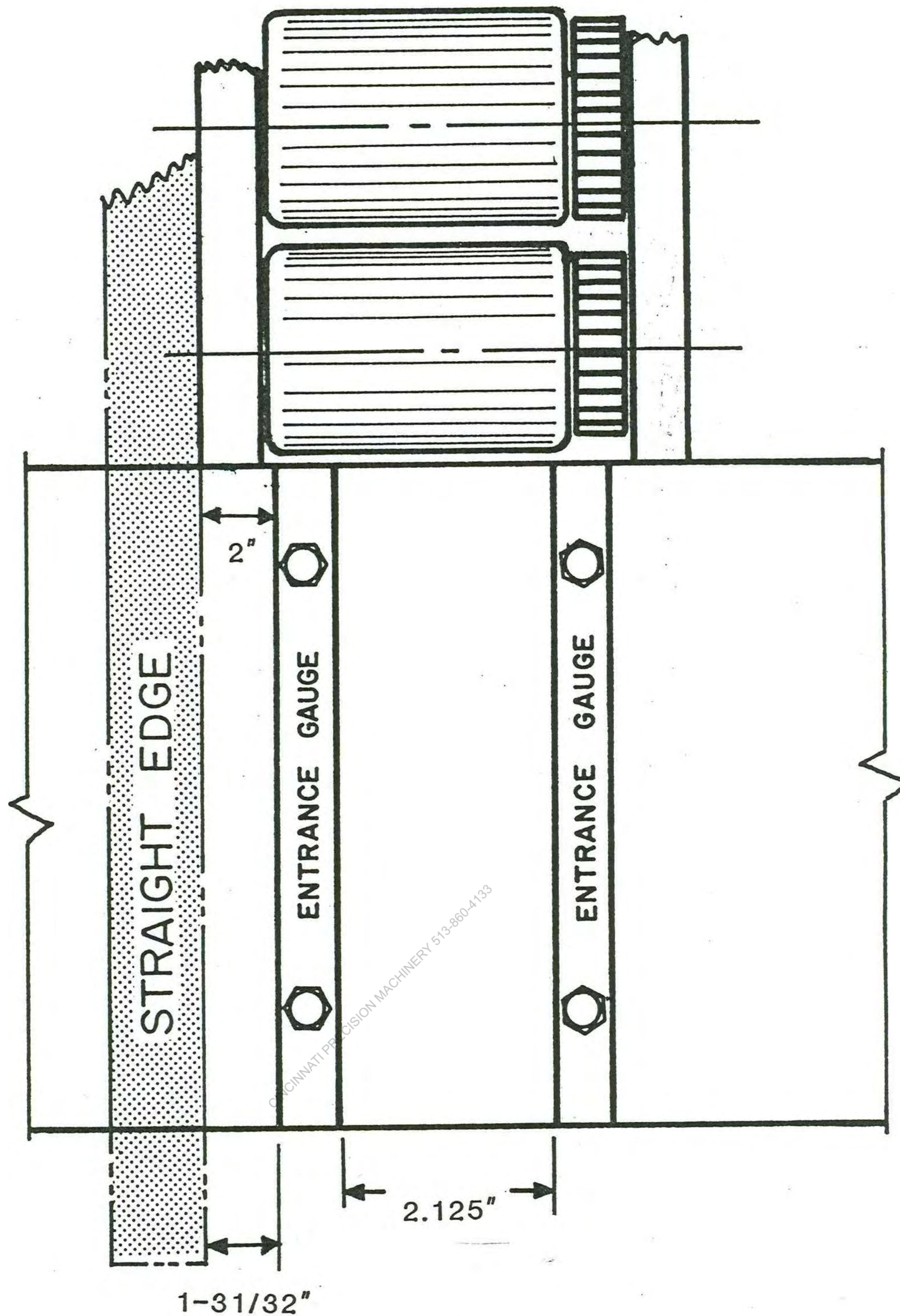
THE GIVEN GAUGE BAR SETTING IS STANDARD, AND CUSTOMER MAY VARY IT SLIGHTLY TO SUIT HIS NEEDS.

* AN ADDITIONAL 1/32" HERE MAY HELP KEEP MATERIAL UP TO THE GAUGE.

CHECK POSITION OF ENTRANCE GAUGE BAR OFTEN. BE SURE THAT THE BAR'S FASTENERS ARE KEPT TIGHT.

TDC DES INSTRUCTIONS ILLUS. # 1

ENTRANCE GAUGE SETTINGS



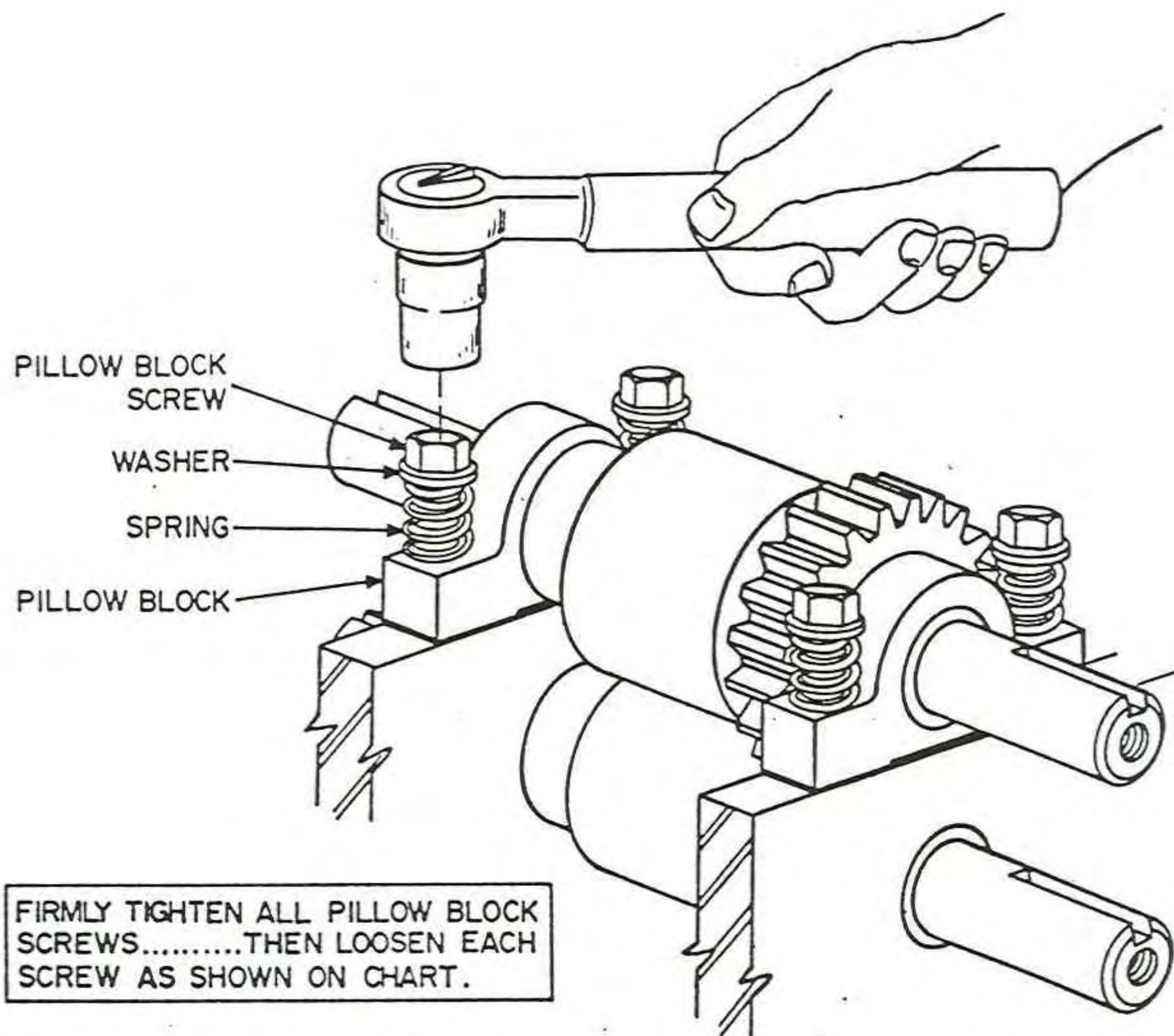
OPTIONAL TDC CLIP ROLLS (INBOARD POSITION)

POSITION STRAIGHT EDGE FLUSH AGAINST THE SIDE OF THE MACHINE PLATE AND HOLD FIRMLY IN PLACE WHILE MAKING MEASUREMENTS.

CHECK POSITION OF ENTRANCE GAUGE BARS OFTEN.

BE SURE THAT ALL ENTRANCE GAUGE FASTENERS ARE KEPT TIGHT.

ENTRANCE GAUGE SETTINGS



PILLOW BLOCK SCREW TORQUE SETTINGS

STATION	LEFT SIDE		RIGHT SIDE	
		Turns		Turns
1	1/2	Turns	1/2	Turns
2	1/8	"	"	"
3	"	"	"	"
4	"	"	"	"
5	"	"	"	"
6	1/2	"	"	"
7	"	"	"	"
8	"	"	"	"
9	"	"	"	"
10	"	"	"	"
11	"	"	"	"
12	"	"	"	"
13	"	"	"	"
14	SEE BELOW	"	"	"

PILLOW BLOCK SCREW ADJUSTMENT FOR STATION 14 LEFT SIDE ONLY

24, 22, and 20ga. - Fully tighten, then loosen 1/2 turn
 18 ga. - Fully tighten, then loosen 2-1/2 to 3 turns

50325

3/8-16 x 1/2 SHCS 60419

5/16-18 x 1/4 SHCS 60395

27183 BETWEEN 7/8
27182

27185

27184

1.731

1.231

27180 - AWX
27181 - INBD

5/16-18 x 1/4 SHCS
60395

5/16-18 x 1/4 60395

601-208

FEED

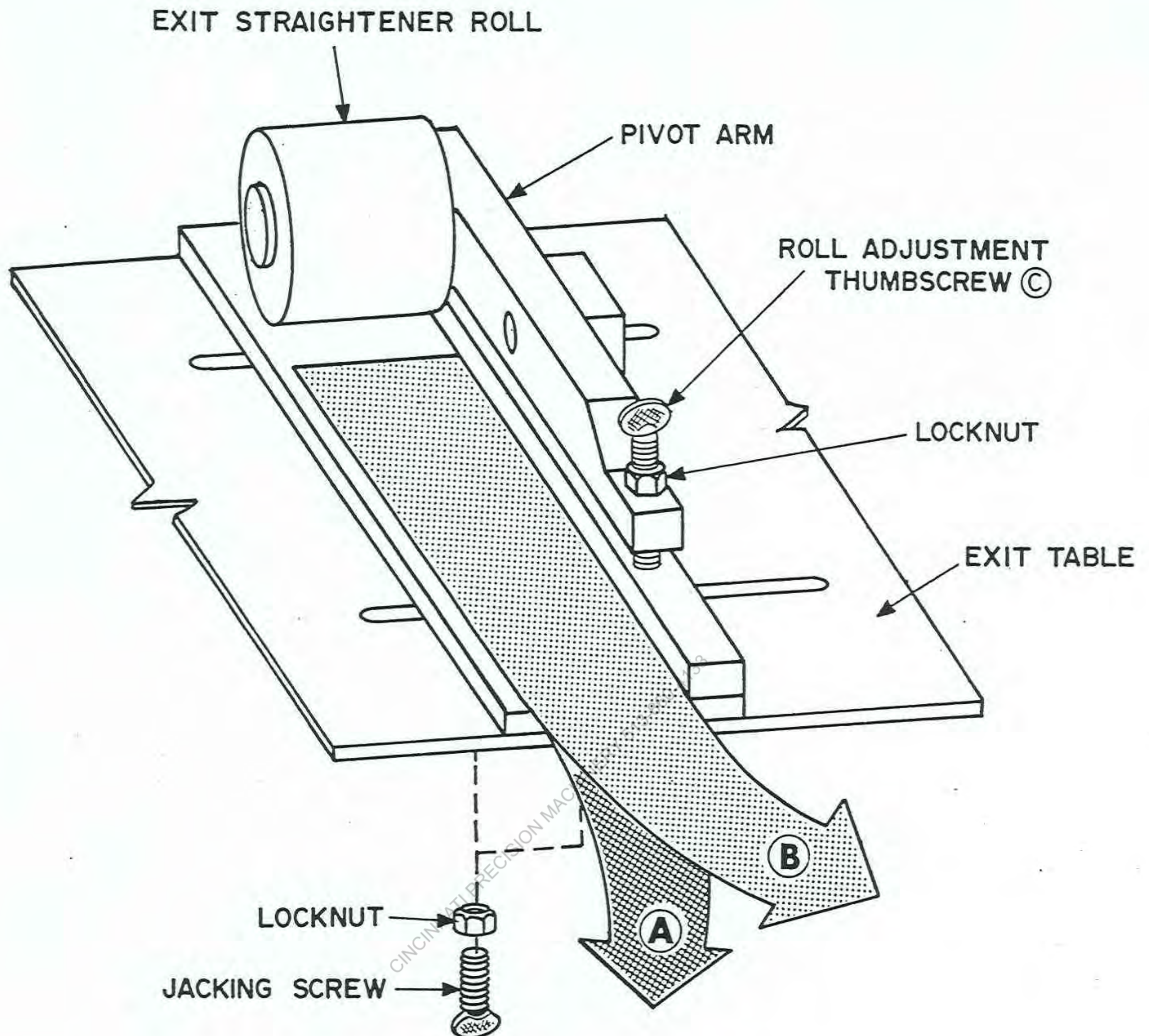
TDC DES INSTRUCTIONS

ILLUS. # 6

CINCINNATI PRECISION MACHINERY 513-860-4133

THE LOCKFORMER CO.			6.
711 OGDEN AVE.		LISLE, ILLINOIS 60532	5.
MACHINE	TDC CLEAT	PART NUMBER	4.
PART NAME	SLIDE ASSEMBLY	50325	3.
TYP.	6-7 & 7-B	SCALE	2.
MATERIAL	SEE DETAILS	FULL	
HEAT TREAT			
DRAWN BY	PCS	CHECKED BY	REVISIONS M
DATE	12-15-82		

FRAC. TOL.	DEC. TOL.	ANG. TOL.
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THIS EXIT STRAIGHTENER UNIT IS PROVIDED TO REDUCE BOW AS THE FINISHED PART IS EMERGING FROM THE ROLLFORMING OPERATION. TO ACHIEVE OPTIMUM STRAIGHTNESS...ADJUST AS FOLLOWS:

IF PART BOWS Laterally (A) OR (B) MOVE UNIT IN THE OPPOSITE DIRECTION OF THE BOW.

EXAMPLE: IF PART BOWS TO THE RIGHT (A) (AS VIEWED FROM THE ENTRANCE END OF THE MACHINE) MOVE STRAIGHTENER TO THE LEFT IN SMALL INCREMENTS TESTING RESULTS AFTER EACH ADJUSTMENT, UNTIL SATISFACTORY RESULTS ARE OBTAINED.

IF PART BOWS UP OR DOWN RAISE OR LOWER IDLER ROLL AS REQUIRED, IN OPPOSITE DIRECTION OF BOW. FIRST LOOSEN LOCKNUT ON THUMBSCREW (C) THEN ADJUST BY TURNING THUMBSCREW. TIGHTEN LOCKNUT AFTER ADJUSTMENT IS MADE.

EXIT STRAIGHTENER BASIC OPERATION DRAWING

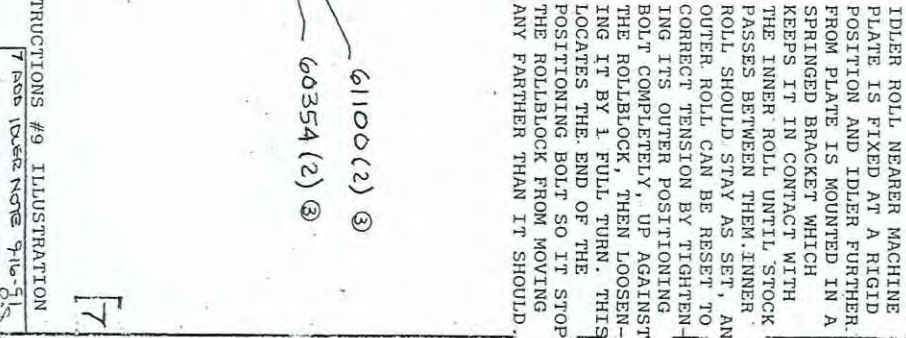
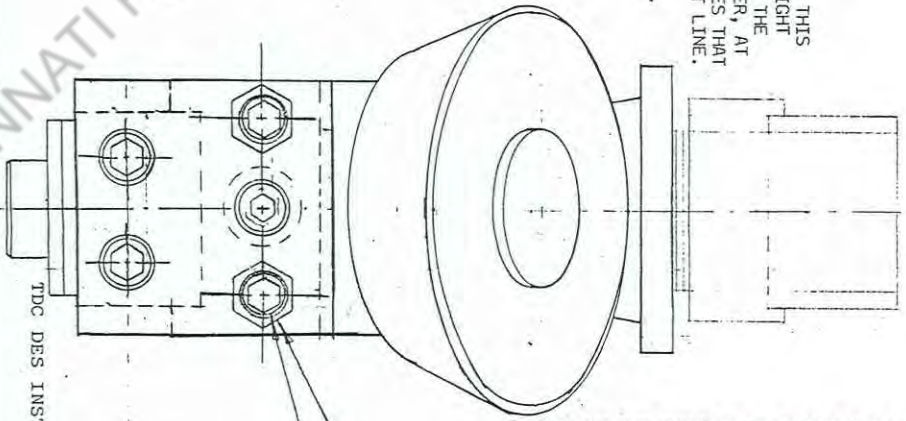
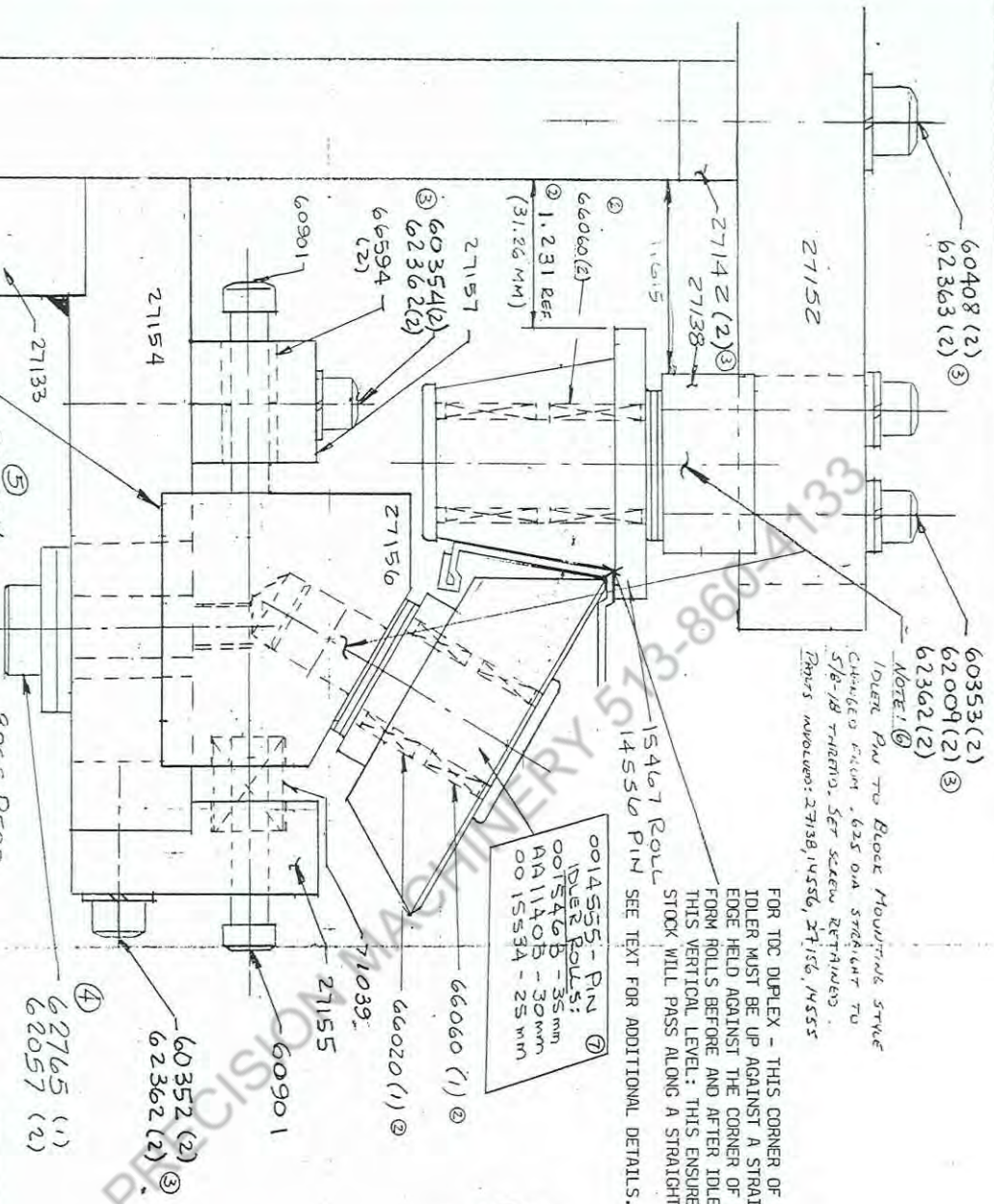
50321

NOTE: THIS IDLER ROLL SET-UP SHOULD NOT BE CHANGED FROM ITS ORIGINAL SETTING. IDLER ROLL NEARER MACHINE PLATE IS FIXED AT A RIGID POSITION AND IDLER FURTHER FROM PLATE IS MOUNTED IN A SPRINGED BRACKET WHICH KEEPS IT IN CONTACT WITH THE INNER ROLL UNTIL STOCK PASSES BETWEEN THEM. INNER ROLL SHOULD STAY AS SET, AND OUTER ROLL CAN BE RESET TO CORRECT TENSION BY TIGHTENING ITS OUTER POSITIONING BOLT COMPLETELY, UP AGAINST THE ROLLBLOCK, THEN LOOSENING IT BY 1 FULL TURN. THIS LOCATES THE END OF THE POSITIONING BOLT SO IT STOPS THE ROLLBLOCK FROM MOVING ANY FARTHER THAN IT SHOULD.

FOR TOC DUPLEX - THIS CORNER OF THIS IDLER MUST BE UP AGAINST A STRAIGHT EDGE HELD AGAINST THE CORNER OF THE FORN ROLLS BEFORE AND AFTER IDLER, AT THIS VERTICAL LEVEL: THIS ENSURES THAT STOCK WILL PASS ALONG A STRAIGHT LINE.

15467 ROLL
14556 PIN SEE TEXT FOR ADDITIONAL DETAILS.

0014535 - PIN ⑦
IDLER ROLLS:
0015467 - 35mm
0011408 - 30mm
0015534 - 25mm



FRAC. TOL.	DEC. TOL.	ANG. TOL.

THE LOCKFORMER CO.		711 OGDEN AVE.	
MACHINE TDC		PART NUMBER 50321	
PART NAME IDLER ASSEMBLY		SCALE FULL	
STATIONS 1, 2, 13		DATE 14 MAY 82	
MATERIAL HEAT TREAT		DRAWN BY DDEVITO	
		CHECKED BY	

7. ADD IDLER NOTE 916-51	8. APPROVED DATE 1/15/82
9. ADD CAUTION 7-14-88	10. APPROVED DATE 1/15/83
11. APPROVED 62765 ± 5.20-83	12. APPROVED 070/1267 M
13. SEE C.O. 854488 DD	14. APPROVED 9-5-85
15. APPROVED 9-5-85	16. APPROVED 9-5-85
REVISIONS M	

NOTE ①

INLET PIN TO BLOCK MOUNTING CHANGED. SEE DUBS. ST2329, ST2321

60408(2) ④
62363(2) ④

27152

27142(2) ④
1.869

27138

66060(2)
③ 1.589 REF.
(140.36 MM)

27157
60354(2)
62362(2) ④
#60594(2)
60901

27154

27134

CAUTION

ASSY. LOCKUP SHOULD ALLOW PART 27156 TO BE FREE SLIDING

60408(2) ④
62363(2) ④

FOR TDC DUPLEX - THIS CORNER OF THIS IDLER MUST BE UP AGAINST A STRAIGHT EDGE HELD AGAINST THE CORNER OF THE FORM ROLLS BEFORE AND AFTER IDLER, AT THIS VERTICAL LEVEL: THIS ENSURES THAT STOCK WILL PASS ALONG A STRAIGHT LINE.

SEE TEXT FOR ADDITIONAL DETAILS.

IDLER ROLL: ③
D015A69 - 35mm
R011A04 - 30mm
D015533 - 25mm

66060 (1) ③
66020 (1) ③
71039

27155

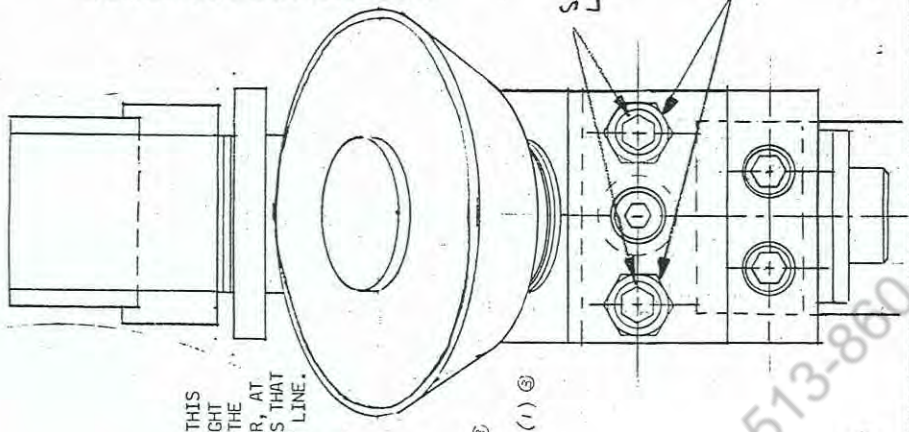
60901

60354 (2)

61100 (2)

END OF

60352 (2) ④
62362 (2) ④



IDLER FURTHER FROM PLATE IS MOUNTED IN A SPRINGED BRACKET WHICH KEEPS IT IN CONTACT WITH THE INNER ROLL UNTIL STOCK PASSES BETWEEN THEM. INNER ROLL SHOULD REMAIN AS SET, AND OUTER ROLL CAN BE RESET TO CORRECT TENSION BY TIGHTENING ITS OUTER POSTIONING BOLT COMPLETELY, UP AGAINST THE ROLLBLOCK, THEN LOOSENING IT BY 1-1/2 FULL TURN. THIS LOCATES THE END OF THE POSITIONING BOLT SO IT STOPS THE ROLL-BLOCK FROM MOVING ANY FARTHER THAN IT SHOULD.

SPRING BRACKET TRAVEL LIMITING SCREWS

LOCKNUTS

TDC DES INSTRUCTIONS ILLUSTRATION # 10

8. ADD CHANGES NOTE 7-14-88. BJS

5. ADDED 62765, 62057

4. SEE C.O. 070/7267

3. REVISED PER KAM

2. REMOVED PART # 27143

2-23-84 RJS

THE LOCKFORMER CO. 711 OGDEN AVE. LIBLE, ILLINOIS 60832		PART NUMBER 50322	
MACHINE TDC - 90		SCALE FULL	
PART NAME IDLER ASSEMBLY		DATE 14 MAY 82	
MATERIAL STATION'S 13-14		CHECKED BY DDEVITO	
DRAWN BY DDEVITO		HEAT TREAT	

- (3) B-1212 BRG. #66060
- (2) B-128 BRG. #66020
- (4) TRA-1220 #66339
- (2) NTA-1220 #66332

BEARINGS READ

(1) 62765 (5)
(2) 62057

2. ADDED TOLERANCE MOUNTING KEY. NEW TORQUE 33 INCH LBS

REC. TOL. ANG. TOL.

FRAC. TOL.

CAUTION

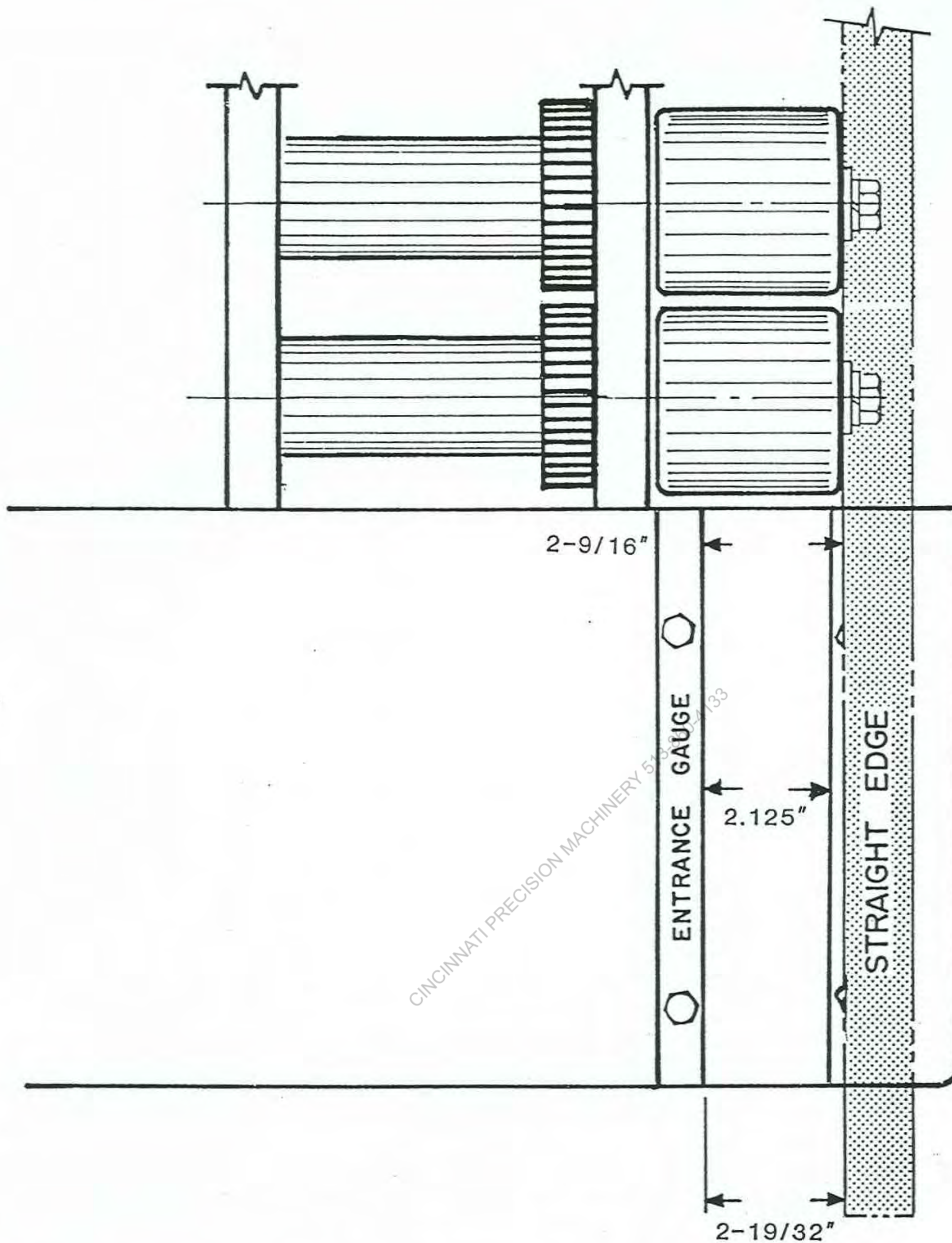
NOTE

REF.

REV.

DATE

REVISIONS



OPTIONAL TDC CLIP ROLLS (MOUNTED OUTBOARD)

POSITION STRAIGHT EDGE FLUSH AGAINST SIDE OF ROLLS AT THE FIRST 3 STATIONS AND HOLD FIRMLY IN PLACE WHILE MAKING MEASUREMENTS.

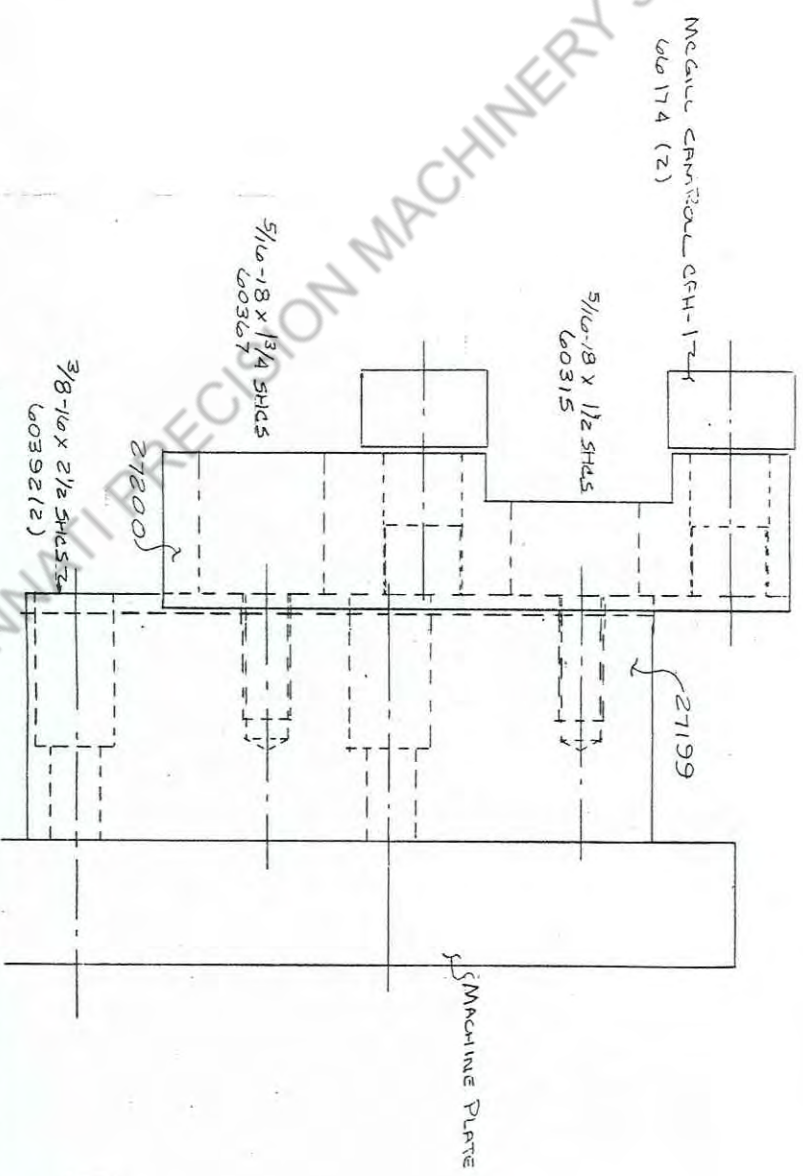
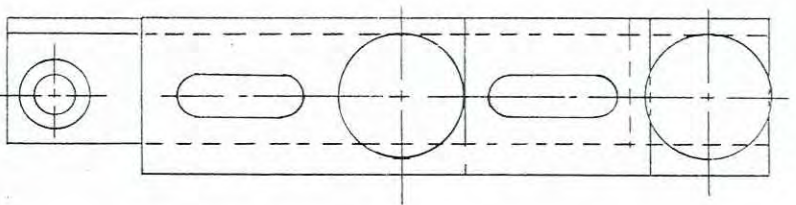
CHECK POSITION OF ENTRANCE GAUGE BARS OFTEN.

BE SURE THAT ALL ENTRANCE GAUGE FASTENERS ARE KEPT TIGHT.

ENTRANCE GAUGE SETTINGS

50319

TDC



METALL CHAMFERED CFH-174
60174 (2)

5/16-18 x 1 1/2 SHCS
60315

5/16-18 x 1 3/4 SHCS
60367

3/8-16 x 2 1/2 SHCS
60392(12)

27200

27199

MACHINE PLATE

2

FRAC. TOL.	DEC. TOL.	ANG. TOL.	THE LOCKFORMER CO. 711 OGDEN AVE. DEPT. 11, LINCOLN SQUARE CHICAGO, ILLINOIS 60632	
MACHINE T.D.C.			PART NUMBER 50319	
PART NAME DUCT EXIT STRAIGHTENER			ILLUS. # 12	
MATERIAL See Details			SCALE Full	
DRAWN BY Ros			DATE 3-17-83	
CHECKED BY			REVISIONS	
HEAT TREAT			2. ADDED LEFT HAND	
			5.25.85	

MTA 1220 66332 (1)
 TPA 1220 66339 (2)

B1212 66060 (1)

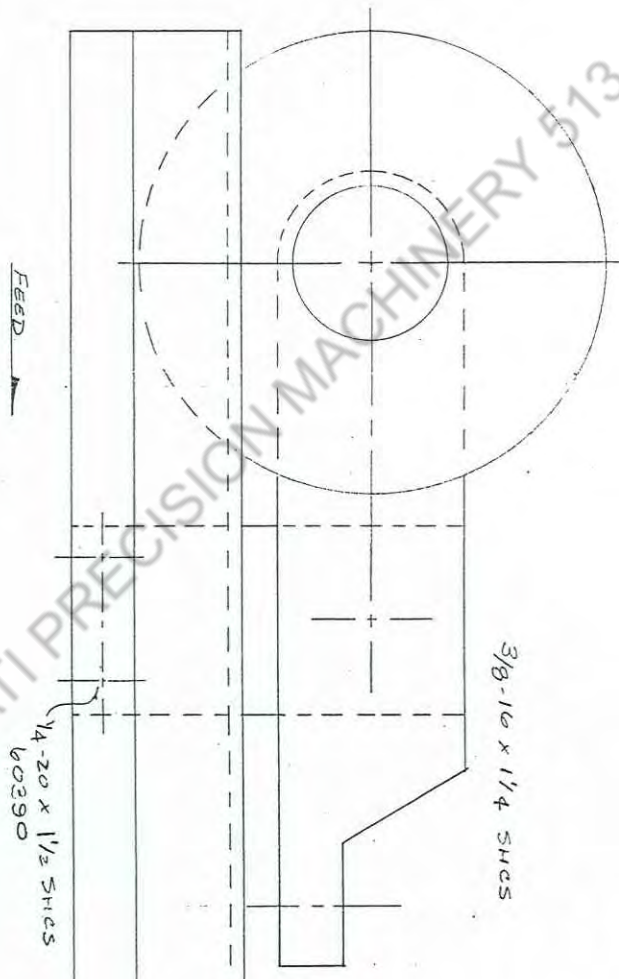
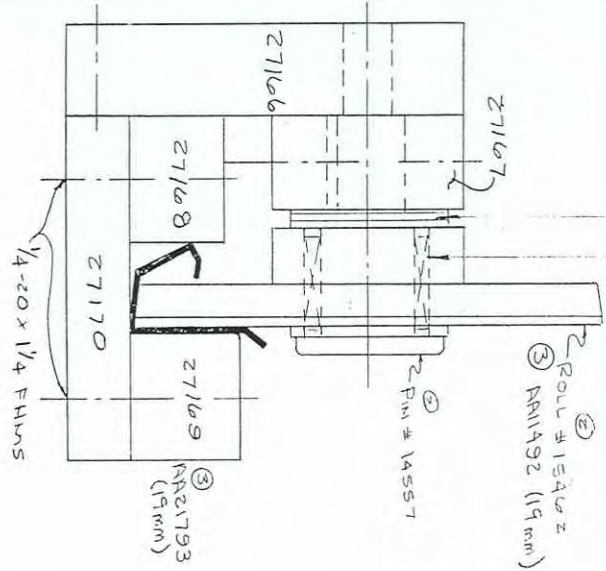


ILLUSTRATION # 8

THE LOCKFORMER CO.

711 OGDEN AVE.
 LISLE, ILLINOIS 60332

MACHINE TDC CLEAR
 PART NAME EXIT STRAIGHTENER
 PART NUMBER 50324

MATERIAL SEE DETAILS
 HEAT TREAT
 SCALE FULL

DRAWN BY RAS
 CHECKED BY
 DATE 11-30-82

NO.	REVISIONS
1.	
2.	ADDED 1/4" DIA PARTS (M)
3.	7-28-83 RAS M
4.	4-5-83 RAS M

3

TDC DOUBLE EXTENDED SHAFT MACHINE PARTS LIST

	<u>COMPONENT</u>	<u>QTY</u>	<u>LOC</u>	<u>DESCRIPTION</u>
0709977	0053590	1	ASF	WRENCH WELDMENT
0560312	0013053	1	2A85	2ND DRV SHFT
<u>LWR REDUCTION</u>	0013054	1	2A85	3RD DRV SHFT
	0013504	3	3A20	SPCR PL
	0014037	1	OR51	LWR RDCT GEAR
	0020916	1	OR88	LWR RDCT PLT
	0020917	1	OR88	LWR RDCT PLT
	0023605	2	OR09	RDCT BASE BAR
	0032902	1	7A39	LUBE CONN HLDR
	0060156	4	AS21	1/2-13X2HHCS
	0060243	4	AS22	5/8-11X2 HHCS
	0060460	4	1B04	1/2-13X1 1/4SHCS
	0060470	2	AS25	5/8-11X1-1/4 SHCS
	0061160	4	AS28	1/2-13HN HVY SF
	0062057	4	AS34	1/2ID WSHR
	0062364	4	1C17	1/2 LCK WSHR
	0062365	4	1C17	5/8 LCK WSHR
	0062511	3	AS35	5160-175 RET RG
	0062703	2	AS18	3/16X1-1/4ROLL PIN
	0066118	4	9A29	HJ283716 BRG
	0066334	2	9A39	TRC 2840 RC
	0066335	1	9A39	NTA 2840 BRG
	0066452	3	9A48	TT2400-1 THRUST
	0066600	4	1C06	1/4X1/8 FEMALE CPG
	0066621	4	1C06	889 L IMP ELBW
	0066640	4	1C06	1610 GRS FTG
	0066700	120	1C25	1/4"OD NYLA TUBING
0600610	0080214	1	5B22	REES CYL PB JOF
<u>ELECTRICALS</u>	0080270	1	MOT	10HP 1800 21ST MTR
(460/3/60)	0080441	240	OR95	1/2 LI QUATITE
	0080487	2	5B28	T&B 5252 90DEG CON
	0080602	20	8B16	RG TNG TERMINAL
	0080731	15ft.	5B36	12 GA WIRE
	0080717	1		CORD 80717
	0081343	1	1B08	A999AY295 CTRL PNL
	0081523	3	7B26	H2009 HEATER
0600620	0080214	1	5B22	REES CYL PB JOF
<u>ELECTRICALS</u>	0080270	1	MOT	10HP 1800 21ST MTR
(230/3/60)	0080457	240	OR95	3/4 LIQUATITE
	0080488	2	5B28	T&B 5253 90 CONN
	0080602	20	8B16	RG TNG TERMINAL
	0080730	15ft.	5B36	8 GA WIRE
	0080717	1		CORD 80717
	0081343	1	1B08	A999AY295 CTRL PNL
	0081521	3	7B25	H2014A HEATER
0701001	0058799	1	4C11	TDC WRENCH ASSY
<u>TDC CORNER</u>				
<u>CRIMP WRENCH</u>				

(Foster) 01/05/2001 Costed Single Level BOM FOR 701009
 UM: EA IT: 0 DESCRIPTION: TDC SLIDING TABLE,CAM TYPE

STOCK NUMBER	COMPONENT DESCRIPTION	QTY USED	Ext Stand	Ext Rollid
23098	GUIDE BLOCKS	4.00	138.72	138.72
60300	SHCS,1/4-20X3/8	4.00	0.16	0.16
60308	SHCS,1/4-20X2-3/4	4.00	0.32	0.32
62370	WSHR,LOCK,1/4,MED	4.00	0.04	0.04
62683	PIN,ROLL,1/8X1-1/4	1.00	0.02	0.02
62707	PIN,ROLL,1/4X1-1/2,LG	1.00	0.07	0.07
62715	PIN,ROLL,3/16X1-1/2#59-040-187	1.00	0.03	0.03
62886	PIN,ROLL,3/16X2,#59-040-187-	1.00	0.05	0.05
66459	BRG,DU-10,3/4X1-1/4X1/16	3.00	4.11	4.11
66461	BRG,AA-839-13,3/4X7/8X1	2.00	0.86	0.86
AA13340	CAM SHAFT	1.00	100.28	100.91
AA21058	CARRIER PLATE	1.00	66.27	66.46
AA21059	PIVOT BRKT	2.00	73.60	73.60
AA35830	SHIM PLATE	1.00	12.00	12.00
AA35831	SHIM PLATE	1.00	31.12	31.12
AA51810	HANDLE WLDT.	1.00	80.92	80.28
AA55120	ASSY, TDC SLIDER	0.00	0.00	0.00
AA55121	14 STA. TDC DES SHEET SUPRT/	0.00	0.00	0.00
AA71159	13AFT COLLAR #3C75 3/4X1-1/4X	1.00	0.52	0.52
	TOTALS		509.09	509.27

CINCINNATI PRECISION MACHINERY 572-860-4133

	<u>COMPONENT</u>	<u>QTY</u>	<u>LOC</u>	<u>DESCRIPTION</u>
0701003	0021237	1	OR53	CARRIAGE PLATE
701003 (NEW)	0023098	4	4C27	GUIDE BLOCKS
SLIDING TABLE	0053633	1	OR26	CLAMP PLT WLDT
ASSY	0060300	16	ASF5	1/4-20X3/8SHCS
701003 (old)	0060302	2	ASF5	1/4-20X5/8SHCS
	0062370	10	1C17	1/4 LOCK WASHER
	-0085296	2	4C17	52250 CLAMP 225U
	0085692	2	8B17	SWIVEL PAD
0701101	0013551	2	3A26	SPCR PL DR
CHASSIS	-0013608	10	3A32	IDLR SPCR
	0013993	28	OR63	ROLL SHAFT
	0013994	2	4A03	1ST DRIVE SHAFT
	0013995	2	OR63	MAIN IDLER SPACER
	-0014137	10	4A19	IDLER GEAR
	-0014139	28	4A26	DRIVEN GEAR
	0014141	2	4A25	MAIN IDLER GEAR
	0014664	2	4A49	MN IDLR WSHR
	0021217	1	FLOR	MACHINE PLATE AUX
	0021218	1	FLOR	MACHINE PLATE AUX
	0021219	1	FLOR	MACHINE PLT GR SD
	0021220	1	FLOR	MACHINE PLT GR SD
	0022621	3	OR06	SPACER
	0022780	1	6A31	SPCR EXIT END
	0022831	1	OR53	CTR CONN SPCH MACH
	0027329	1	OR40	ENT RISER
	0038011	10	1C53	SPACER SHIM
	0039912	18	7A67	SPCR SHIM
	0040502	18	OR10	PILLOW BLK 88500
	0040516	10	7A72	PILLOW BLOCK
	0042002	10	8A04	LUBE BOLT 60260
	0053381	1	FLSK	EXT TBL 14 DES
	0053382	1	FLSK	ENT TBL 14 DES
	0060094	9	AS19	3/8-16X1.25HHCS
	0060097	16	AS20	3/8-16X1 3/4HHCS
	0060160	56	AS21	1/2-13X2-3/4HHCS
	0060243	24	AS22	5/8-11X2 HHCS
	0060246	2	AS22	5/8-11X3HHCS
	0062029	9	QL09	3/8 X 1/16
	0062071	56	AS34	17/32ID WSHR
	0062160	10	1C31	1-1/4 ID X 093
	0062363	25	QL09	3/8 LCK WSHR
	0062365	24	1C17	5/8 LCK WSHR
	0062366	10	1C17	3/4 LCK WSHR
	0062403	84	1C17	18WDRF KEY
	0062504	10	AS35	5100-125 RET RG
	0062506	2	AS35	5100-175 RET RG
	-0062510	34	AS35	5160-125 RET RG
	0062632	56	AS15	3/8X7/8 DWL
	0065201	6	1B21	1/8-27X3/8 SHPP
	-0066116	56	9A28	HJ202816 BRG
	0066117	2	9A29	HJ223016 BRG
	0066118	2	9A29	HJ283716 BRG
	0066122	10	9A29	HJ202820 BRG

(continued)

<u>COMPONENT</u>	<u>QTY</u>	<u>LOC</u>	<u>DESCRIPTION</u>
0066100	1	9A28	B1612 TORR BRG
0066174	2	9A32	CFH-1 CAM FOLLOWER
0066320	2	9A38	NTA1625 TORR BRG
0066322	4	9A39	TRA-1625 THRUST RA
0066332	4	9A39	NTA-1220 THRS BRG
0066339	8	9A39	TRA-1220 TORR RACE
0066594	4	1C06	AA-506-7 SLEEVE
0070960	2	3B27	5/8 OD X1 SPRING
0071039	2	3B33	DIE SPRING

	<u>COMPONENT</u>	<u>QTY</u>	<u>LOC</u>	<u>DESCRIPTION</u>
0702902	0014557	1	1C56	STNR ROLL PIN
<u>TDC CLIP</u>	0015433	1	4C27	T1 FORM ROLL
	0015434	1	4C28	T2 FORM ROLL
	0015435	1	4C28	T3 FORM ROLL
	0015436	1	4C29	T4 FORM ROLL
	0015437	1	4C29	T5 FORM ROLL
	0015438	1	4C30	T6 FORM ROLL
	0015439	1	4C30	T7-A FORM ROLL
	0015440	1	4C31	T7-B FORM ROLL
	0015441	1	4C31	T8-A FORM ROLL
	0015442	1	4C32	T8-B FORM ROLL
	0015443	1	4C32	T-9 FORM ROLL
	0015444	1	4C33	T-10 FORM ROLL
	0015445	1	4C33	T-11 FORM ROLL
	0015446	1	4C34	T-12 FORM ROLL
	0015447	2	4C34	T-13 & T-14 ROLL
	0015448	1	4C35	B-1 FORM ROLL
	0015449	1	4C35	B-2 FORM ROLL
	0015450	1	4C36	B-3 FORM ROLL
	0015451	1	4C36	B-4 FORM ROLL
	0015452	1	4C37	B-5 FORM ROLL
	0015453	1	4C37	B-6 FORM ROLL
	0015454	1	4C38	B-7 FORM ROLL
	0015455	1	4C38	B-8 FORM ROLL
	0015456	1	4C39	B-9 FORM ROLL
	0015457	1	4C39	B-10 FORM ROLL
	0015458	1	4C40	B-11 FORM ROLL
	0015459	1	4C40	B-12 FORM ROLL
	0015460	2	4C41	B-13 & B-14 FRM RL
	0015461	28	OR75	ROLL SPACER
	0015462	1	4C32	STRAIGHTENER ROLL
	0027166	1	1C56	EXT STNR ARM SUPT
	0027167	1	1C56	EXT STNR ARM
	0027168	1	1C55	EXT STNR BAR
	0027169	1	1C55	EXT STNR BAR
	0027170	1	1C55	EXT STNR PAD
	0027180	2	1C55	SLIDE BRKT AUX
	0027182	1	1C56	SLIDE BRACKET
	0027183	1	1C51	SLIDE BRACKET
	0027184	2	1C56	SLIDE
	0027185	2	1C56	SLIDE BRACKET
	0027186	2	OR15	ENT GA BAR
	0027331	1	OR26	ENT GA BAR
	0031916	28	OR28	WSHR AUX ROLL
	0060090	2	AS19	3/8-16X3/4HHCS
	0060096	1	AS20	3/8-16X1 1/2 HHCS
	0060153	28	AS20	1/2-13X1 1/2HHCS
	0060305	2	QL08	1/4-20X1 1/4SHCS
	0060352	4	AS23	5/16-18X1SHCS
	0060357	10	AS23	5/16-18X1/2SHCS
	0060419	18	1B03	3/8-16X1-1/2 SHCS
	0060877	4	AS25	3/8-16X1 3/4 CB
	0060923	1	AS26	5/16-18X2 THB SCR
	0060964	6	AS26	1/4-20X3/4FH SCS
	0061101	1	AS28	5/16-18HN HVY SF

(continued)

<u>COMPONENT</u>	<u>QTY</u>	<u>LOC</u>	<u>DESCRIPTION</u>
0061120	4	AS28	3/8-16HN HVY SF
0062029	7	QL09	3/8 X 1/16
0062363	3	QL09	3/8 LCK WSHR
0062364	28	1C17	1/2 LCK WSHR
0062370	2	1C17	1/4 LOCK WASHER
0062403	28	1C17	18WDRF KEY
0062510	28	AS35	5160-125 RET RG
0062519	1	1C36	RET RING PLIERS
0066060	1	9A27	B1212 TORR BRG
0066332	1	9A39	NTA-1220 THRS BRG
0066339	2	9A39	TRA-1220 TORR RACE

	<u>COMPONENT</u>	<u>QTY</u>	<u>LOC</u>	<u>DESCRIPTION</u>
0709982				
<u>TDC II ROLLS-INBRD</u>	0014579	1	3C01	IDLER PIN 9-C
	0014580	1	3C02	IDLER PIN 8-9A
	0014581	1	3C02	IDLER PIN 10-C
	0014582	2	3C02	IDLR PIN 7-8B,8-9B
	0014583	1	3C02	IDLER PIN 7-8A
	0014584	1	3C02	IDLER PIN 14-C
	0014585	1	3C02	IDLER PIN
	0014966	10	4A58	SPACER
	0014967	4	3C02	SPACER
	0015201	1	4C44	14-C IDLER ROLL
	0015202	1	4C44	10C IDLER ROLL
	0015203	1	4C44	9C IDLER ROLL
	0015204	1	4C44	8-9A IDLER ROLL
	0015205	1	4C44	8-9B IDLER ROLL
	0015206	1	4C44	7-8B IDLER ROLL
	0015207	1	4C44	7-8A IDLER ROLL
	0015208	1	OR93	T1 FORM ROLL
	0015209	1	OR93	T2 FORM ROLL
	0015210	1	OR93	T3 FORM ROLL
	0015211	1	OR93	T4 FORM ROLL
	0015212	1	OR93	B1 BORM ROLL
	0015213	1	OR93	B2 FORM ROLL
	0015214	1	OR93	B3 FORM ROLL
	0015215	1	OR93	B4 FORM ROLL
	0015216	1	OR93	B5 FORM ROLL
	0015217	1	OR93	T5 FORM ROLL
	0015218	1	OR93	B6 FORM ROLL
	0015219	1	OR93	T6 FORM ROLL
	0015220	1	OR93	B7 FORM ROLL
	0015221	1	OR93	T7 FORM ROLL
	0015222	1	OR93	B8 FORM ROLL
	0015223	1	OR93	T8 FORM ROLL
	0015224	1	OR93	B9 FORM ROLL
	0015225	1	OR93	T9 FORM ROLL
	0015226	1	OR93	B10 FORM ROLL
	0015227	1	OR93	T10 FORM ROLL
	0015228	1	OR93	B11 FORM ROLL
	0015229	1	OR93	T11 FORM ROLL
	0015230	1	OR93	B12 & B13 FORM ROL
	0015231	1	OR93	T12 FORM ROLL
	0015232	1	OR93	B13-X FORM ROLL
	0015233	1	OR93	T13 FORM ROLL
	0015234	1	OR93	B14 FORM ROLL
	0015235	1	OR93	T14 FORM ROLL
	0015236	1	4C44	EXIT STR ROLL
	0021962	2	3C04	GUIDE BACK PLT
	0021963	2	3C04	CROSS BAR HANGER
	0021964	1	3C04	TAB HANGER 8-9
	0021965	1	7A09	CROSS BAR 7-8
	0021966	1	3C04	AFT 14 CROSS BAR
	0021967	1	3C04	IDLER MTG BAR STA9
	0021968	2	3C04	STA 7-8&8-9 HANGER
	0021969	2	6A87	IDLR MTG BAR
	0021970	1	3C04	SLIDE MOUNT 7-8

<u>COMPONENT</u>	<u>QTY</u>	<u>LOC</u>	<u>DESCRIPTION</u>
0021971	1	7A03	CROSS BAR 9-10
0021972	1	7A03	IDLER MTG BAR 14
0021973	2	3C04	IDLER ROLL MTG BLK
0021974	1	3C05	GUIDE 11-12
0021975	1	3C05	GUIDE 10-11
0021976	2	3C05	SLIDE 10-11 & 11-12
0021977	2	3C05	GUIDE SHOE
0021978	1	3C05	GUIDE SHOE
0021981	1	OR07	CROSS BAR 10-11STA
0021982	1	7A09	CROSS BAR 11-12STA
0021983	1	3C05	CROSS BAR HGR10-11
0021984	1	3C05	IDLER MTG BAR ST10
0021987	1	3C05	STR BOTTOM BAR
0021988	1	3C06	STR SIDE BAR-EXIT
0021989	1	3C06	STR SIDE BAR-EXIT
0021990	1	3C06	SUPPORT BAR
0021991	1	3C06	PIVOT BAR
0021992	1	3C06	GUIDE SHOE 11-12
0022062	1	6A04	SUPPORT BAR
0022419	1	3C06	COLD SEAL SLIDE
0022665	2	3C07	SPCR PS10-11&11-12
0022666	2	3C07	SPCR G510-11&11-12
0022667	2	3C07	AFT 14 SPACER
0022668	2	3C07	SPCR 8-9
0022669	1	3C07	SPCR 7-8 P S
0022670	1	3C07	SPCR 7-8 G5
0022671	2	3C07	SPCR 9-10
0022682	1	4C22	VALVE RISER
0022742	2	6A19	COVER SUPPORT
0022743	2	6A31	COVER SUPPORT
0027142	4	1C51	IDLR BRKT RISER
0027328	1	OR35	ENT RISER AUX.
0027330	1	OR26	EXIT RISER
0027331	2	OR26	ENT GA BAR
0027332	1	OR39	ENT RISER
0036460	1	7A59	RELAY+PUT MTG BRKT
0036461	1	7A57	PROXSWTCH HLD BRKT
0053591	1	3C12	CROSS BAR 8-9 WLDT
0053622	1	OR05	ENT HLD DWN WLDT
0060014	1	ASF4	3/8-16X1 1/2 HHCS
0060309	2	QL08	1/4-20X1/2 SHCS
0060315	8	3C22	5/16-18X1-1/2 SHCS
0060316	8	3C22	5/16-18X3/4LG SHCS
0060322	6	3C23	3/8-16X3 SHCS NYLK
0060327	4	3C23	5/16-18X2-1/4SH NY
0060367	8	3C25	5/16-18X1-3/4 NYLK
0060392	6	ASF6	3/8X2-1/2 SHCS NYL
0060393	8	ASF6	3/8-16X1 SHCS NYLO
0060395	4	ASF6	5/16-18X1-1/4 SHCS
0060397	6	ASF6	5/16-18X1 SHCS NYL
0060404	2	AS24	3/8-16X1 1/4SHCS
0060406	4	AS24	3/8-16X2 NYLK SHCS
0060411	4	AS24	3/8-16X1 3/4SHCS
0060552	2	ASF8	1/4-20X3/4RHMS
0060570	2	ASF9	8-32X1/2RHMS

<u>COMPONENT</u>	<u>QTY</u>	<u>LOC</u>	<u>DESCRIPTION</u>
0060573	4	ASF9	10-24X1-3/4RHMS
0060575	11	ASF9	10-24X3/8RHMS
0060650	1	AS10	5/16-18X5/16 SSS
0060662	7	1C23	5/16-18 X 5/16 SSS
0060923	1	AS26	5/16-18X2 THB SCR
0060964	6	AS26	1/4-20X3/4FH SCS
0061060	2	AS28	1/4-20 HN FIN
0061100	1	QL09	5/16-18 HN FIN
0061505	1	7B20	120V 2 WAY VALVE
0062000	2	AS32	1/4X062 WSHR
0062010	20	AS32	5/16X1/16 WSHR
0062030	7	QL09	3/8X3/32 WSHR
0062348	2	1C16	#8 WASHER
0062360	14	1C17	3/16 LCK WSHR
0062362	26	QL09	5/16 LCK WSHR
0062363	15	QL09	3/8 LCK WSHR
0062370	2	1C17	1/4 LOCK WASHER
0062799	4	ASF3	1/4-20 SEMS
0065126	1	QL08	1/8 X 1/4 NPT
0065340	3	1B25	MALE QUICK DISCONN
0065392	4	1B27	1/8NPTX3/16 CFMC
0065835	1	2B02	REGULATOR 162-2-M2
0066030	4	9A27	B168 O.H. TORR BRG
0066100	2	9A28	B1612 TORR BRG
0066112	4	9A28	B-1616 TORR BRG
0066320	5	9A38	NTA1625 TORR BRG
0066322	10	9A39	TRA-1625 THRUST RA
0066765	1	MOT	LSP SYSTEM SP164-2
0066767	2	1C10	M-023 NOZZLE ASSY
0066775	16	1C10	3/16ID PLASTIC TBE
0080481	2	5B28	BX CONN 1/2
0080544	6	7B16	18-2 CORD 250 FT
0080701	10	5B35	STEEL CLAMP
0080987	5	5B40	3/8 JIFFY CLAMP
0081087	1	5B55	ENCLOSURE-A8N64
0081088	1	5B55	ENC PANEL-A8N6P
0081370	1	6B05	EI1808TBOP NO PROX
0081371	1	6B05	ON-OFF TIMER+VAR
AA21031	1		STNR REF BAR
AA21033	1		STNR REF BAR

TROUBLE SHOOTING

Problem

Solution

Metal slips in rolls.

- A. Tighten pillow block screws or machine plate stud nuts in small increments to increase roll grip.
- B. If machine is equipped with idler rolls, adjust them to proper clearance.
- C. Inspect for worn rolls.
- D. Check if stock thickness is within the machine's capacity.

Metal sticks in rolls during forming.

- A. Loosen pillow block screws or machine plate stud nuts in small increments to reduce roll grip.
- B. If machine is equipped with idler rolls, adjust them to proper clearance.
- C. Lubricate stock.
- D. Inspect for worn rolls.
- E. Check if stock thickness is within the machine's capacity.
- F. If running notched material, check for break out at notch.
- G. Check for slide mis-alignment (if slides are provided).

Profile is formed too loose.

- A. Tighten pillow block screws or machine plate stud nuts in small increments to increase roll grip.
- B. If machine is equipped with idler rolls, adjust them to proper clearance.
- C. Inspect for worn rolls.
- D. Check if stock thickness is within machine's capacity.

TROUBLE SHOOTING

Problem	Solution
Profile is formed too tight.	<ul style="list-style-type: none">A. Loosen pillow block screws or machine plate stud nuts in small increments to reduce roll grip.B. If machine is equipped with idler rolls, adjust them to proper clearance.C. Check if stock thickness is within the machine's capacity.D. Check for material build-up on rolls.
Formed area runs-out on finished part.	<ul style="list-style-type: none">A. Adjust entrance gauge bars properly.B. Check if stock thickness is within the machine's capacity.C. Check pillow block adjustment on the side opposite of run-out.
Dimensions of profile are not to required specifications.	<ul style="list-style-type: none">A. If machine is equipped with idler rolls, adjust them to proper clearance.B. Adjust entrance gauge bars properly.C. Inspect for worn rolls.D. Check if stock thickness is within the machine's capacity.
Excessive marking appears on the finished part.	<ul style="list-style-type: none">A. Loosen pillow block screws or machine plate stud nuts in small increments to reduce roll grip.B. If machine is equipped with idler rolls, adjust them to proper clearance.C. Lubricate stock.D. Inspect for worn rolls.

TROUBLE SHOOTING

Problem

Solution

Excessive bow in finished part.

- A. Adjust the exit straightener unit.
- B. Check for material build-up on rolls.

Excessive twist in finished part.

- A. Adjust exit straightener unit.
- B. Inspect for worn rolls.

Material does not enter rolls smoothly.

- A. Adjust entrance gauge bars.
- B. Check if stock thickness is within the machine's capacity.
- C. Adjust entrance table top to align with passline height.

Machine labors excessively under load.

- A. Loosen pillow block screws or machine plate stud nuts in small increments to reduce roll grip.
- B. Check if stock thickness is within the machine's capacity.
- C. Check for material build-up on rolls.

CINCINNATI PRECISION MACHINERY 513-860-4133

WARNING

THIS EQUIPMENT IS DESIGNED TO BE OPERATED WITH ALL COVERS SECURED IN PLACE. OPERATION WITHOUT THESE SAFEGUARDS MAY RESULT IN CONDITIONS WHICH ARE HAZARDOUS TO THE OPERATOR AND OBSERVERS.

SAFETY GUIDELINES

Before operating the machine, study and follow the safety precautions in this section. These precautions are intended to prevent injury to you and your fellow workers. They cannot, however, cover all possible situations. Therefore, **EXERCISE EXTREME CAUTION** before performing any procedure or operation.

Safety Precautions Before Starting The Machine(s)

Protect yourself. Wear safety glasses. Do not wear loose clothing, neckties, or jewelry. If long sleeves must be worn, avoid loose cuffs and buttons. Tie back and contain long hair.

Keep your work area clean. Remove all scrap, oil spills, rags, tools and other loose items that could cause you to slip, trip and fall.

Make sure that hydraulic and pneumatic pressures are at specified levels before operating this equipment.

Be sure all guards and covers are in place.

Keep this equipment properly maintained.

Be alert for loose, worn or broken parts. Do not attempt to operate any machinery with such parts present or if the machinery is making unusual noises or actions.

Be sure that this Instruction Manual is kept near the machine so the operator can refer to it when necessary.

Be aware of the locations of the **Power Off** or **Emergency Stop** button in case of an emergency.

Safety Precautions While Operating The Machine(s)

Always be alert whenever operating any machinery.

Only one person should control the machine(s). Never allow anyone to operate the controls while you are working on this equipment. In addition to disconnecting power always use lock outs and warning signs to indicate that you are working on the machine(s).

Keep your hands and arms away from internal workings of the machinery when starting, running or stopping.

Never leave the work area while the equipment is in operation.

Continually observe the rollforming process and related equipment. If any unusual condition develops, immediately stop the machine.

When cleaning the machine or any of its components, do not use toxic or flammable substances. Do not perform any cleaning while the equipment is running.

Never over-ride or disable any safety switch or safety interlock.

Do not use an air hose to clean the machine(s). Air pressure may drive dirt and small chips into bearing surfaces or cause bodily injury.

Do not adjust any roll feature or perform work near the rolls while they are running.

Do not operate the rollformer unless all covers are in place.

Always turn off power to the machine(s) *at the main disconnect* before performing any maintenance or adjustments so accidental start-up or electrocution cannot occur.

Use extreme caution if maintenance or adjustments have to be performed with the power on and the machine in operation. Adjustments might include: jog setting the slides, idlers, or making timing determinations. **If maintenance or adjustments are made, first use the jog control to test the results.** It is recommended that another person be stationed near machine's Emergency Stop button to stop the equipment immediately if necessary.

Always shut off the power at the main disconnect switch before entering the electrical control box.

If any pneumatic or hydraulic feature is used, disconnect the main supply and exhaust pressure or bleed the lines to prevent cycling on retained pressure.

Avoid skin contact, prolonged breathing, or eye exposure to any stock lubrication fluid being used.

NOTE:

ALL INFORMATION IN THE FOLLOWING TDC MACHINE/ROLLSET INSTRUCTIONS SHOULD BE ACCURATE FOR ALL MATERIALS THAT MAY BE USED, AS LONG AS THEY ARE WITHIN THE PARAMETERS NOTED FOR THE PARTICULAR SET. IT SHOULD NOT BE NECESSARY TO RESET THIS MACHINE AS PART OF ITS ROUTINE OPERATION EXCEPT FOR THE RUBBER HOLD DOWN ROLLS, TENSIONS OF THE PILLOW BLOCK SCREWS AT STATION 14 DEPENDING ON THICKNESS OF STOCK TO BE USED, AND EXIT STRAIGHTENER OF THE LEFT OUTBOARD TDC ROLLS, RESET AS EXPLAINED IN TEXT. OTHER FACTORY SETTINGS SHOULD BE LEFT UNCHANGED.

THE DATA THAT FOLLOWS MERELY GIVES THE ORIGINAL SETUP SPECIFICATIONS SO THAT THE MACHINE AND ROLLS MAY BE CHECKED OCCASIONALLY, OR AS DIFFICULTIES ARISE, TO BE CERTAIN THAT NOTHING HAS MOVED OUT OF ITS FACTORY-SET ADJUSTMENT. IF SUCH A CHANGE IS FOUND, USE THIS INFORMATION TO RESTORE THE FEATURE INVOLVED TO ITS CORRECT SETTING.

MATERIAL SAFETY DATA SHEET

TOWER OIL & TECHNOLOGY CO.
205 WEST RANDOLPH STREET
CHICAGO, ILLINOIS 60606

PRODUCT NAME: TOWERKEM W-3130

CHEMICAL NAME: N/A

CHEMICAL FAMILY: SYNTHETIC MIXTURE

FORMULA: N/A

* N.F.P.A.	:
FIRE: 0	:
HEALTH: 1	:
REACTIVITY: 0	:

INFORMATION PHONE: (312) 346-0562

EMERGENCY PHONE: (312) 346-0562

I. PHYSICAL DATA

BOILING POINT: N/A

VISCOSITY: N/A

VAPOR PRESSURE (mm Hg): <0.01

VAPOR DENSITY (AIR = 1): >11

SOLUBILITY IN WATER: Miscible

EVAPORATION RATE: (BA = 1) Slower

SPECIFIC GRAVITY (WATER = 1): 1.03

PERCENT VOLATILE BY VOLUME: 62.5%

APPEARANCE AND ODOR: Medium amber liquid. Bland odor.

II. HAZARDOUS INGREDIENTS

MATERIAL	%	ACGIH TLV	OSHA PEL	CAS #
None	-	-	-	-

III. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: None

FLAMMABLE LIMITS- LOWER: N/A UPPER: N/A

EXTINGUISHING MEDIA:

N/A

SPECIAL FIRE FIGHTING PROCEDURES:

If near fire, cool containers with cold water to prevent rupture.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

None known

IV. REACTIVITY DATA

STABILITY: Stable

CONDITIONS TO AVOID: N/A

INCOMPATIBILITY: Strong oxidizing agents

HAZARDOUS DECOMPOSITION PRODUCTS:

Thermal (when water content has evaporated and residue is subjected to excessive heat) - carbon monoxide, carbon dioxide, possible hydrogen chloride and oxides of sulfur.

HAZARDOUS POLYMERIZATION: Will not occur

CONDITIONS TO AVOID: N/A

V. HEALTH HAZARD DATA

TLV (THRESHOLD LIMIT VALUE): 5mg/m³ as oil mist in air.

EFFECTS OF OVEREXPOSURE-

ACUTE:

Prolonged skin exposure may cause irritation and inflammation. Low order of oral toxicity.

CHRONIC:

Skin irritation from prolonged or repeated exposure may result in development of dermatitis.

CARCINOGENICITY:

None of the constituents of this product have been identified as possible or proven carcinogens by NTP, IARC or OSHA.

EMERGENCY FIRST AID PROCEDURES-

INHALATION: N/A

INGESTION: Do not induce vomiting. Call physician.

EYE CONTACT: Flush with water for 15 mins. or until irritation subsides.

SKIN CONTACT: Wash with warm water and mild soap.

VI. SPILL AND LEAK PROCEDURES

IF MATERIAL IS RELEASED OR SPILLED:

Contain spill and transfer to suitable containers or soak up in absorbent medium. Finally, flush area with cold water. If product enters sewer, notify Authorities.

WASTE DISPOSAL:

Employ contract service. Disposal procedure must be in accordance with Local, State and Federal Regulations.

VII. SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: N/A

VENTILATION-

LOCAL EXHAUST: N/A

SPECIAL: N/A

MECHANICAL (GENERAL): N/A

OTHER: N/A

PROTECTIVE GLOVES: Chemical resistant

EYE PROTECTION: Splash goggles, face shield

OTHER PROTECTIVE EQUIPMENT:

Use impervious apron if skin contact is likely to be prolonged.

VIII. SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING:

Keep containers closed when not in use. Protect from freezing temperatures. Avoid heating above 120F for long periods. Do not mix with nitrite-containing materials - may form nitrosamines, which have caused cancer in some lab animals

PERSONAL HYGIENE - Wash thoroughly before meals and at end of work periods. Launder or dry-clean soiled clothing before reuse.

* HAZARD RATINGS: 4 = EXTREME 3 = HIGH 2 = MODERATE
 1 = SLIGHT 0 = INSIGNIFICANT

ND = NOT DETERMINED NA = NOT APPLICABLE < = LESS THAN > = GREATER THAN

The above information is based on data available to us and believed correct. However, no warranty is expressed regarding the accuracy of these data, the results of their usage, or the hazards connected with the use of this material. Since this product may be applied under conditions unfamiliar to us or beyond our control, we claim no responsibility for the results of its use.

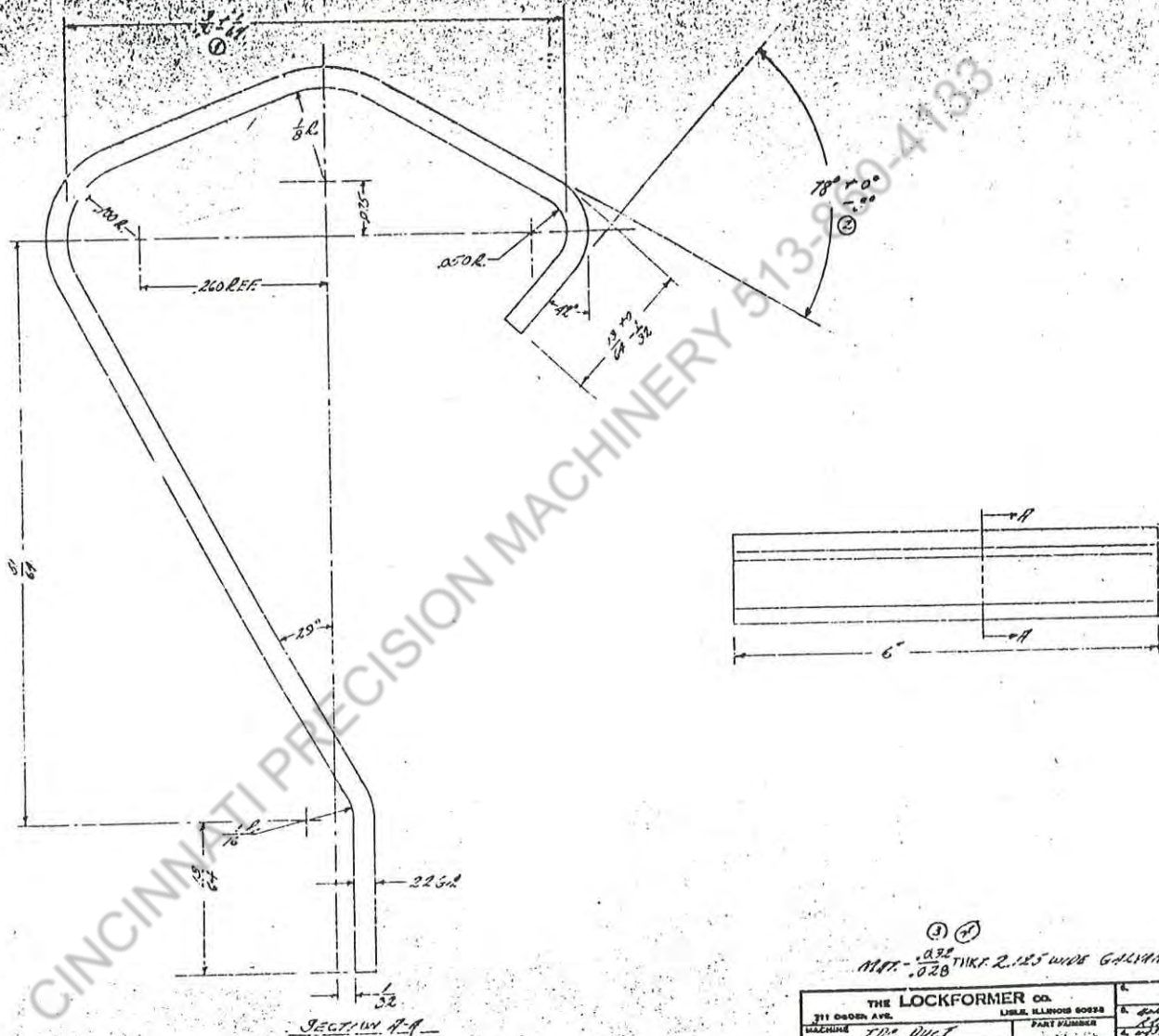
TOWER OIL & TECHNOLOGY CO.

JUNE 28, 1988

Duribbon 88-4065 Cold Sealant contains the following chemical which is subject to the Environmental Protection Agency (EPA) Superfund Amendments and Reauthorization Act (SARA) Title III Section 313 - Toxic Chemical Release Reporting requirements:

<u>Name</u>	<u>CAS Reg. No.</u>	<u>Percentage</u>
1,1,1 Trichloroethane (Methyl Chloroform)	71-55-6	Approx. 35%

21187

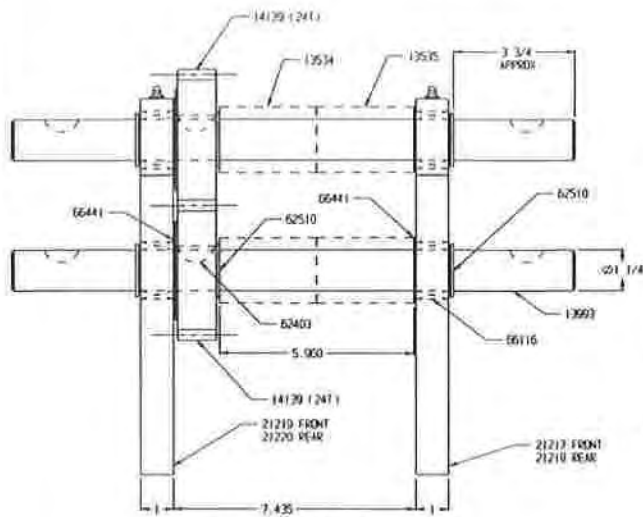


CINCINNATI PRECISION MACHINERY 513-989-4133

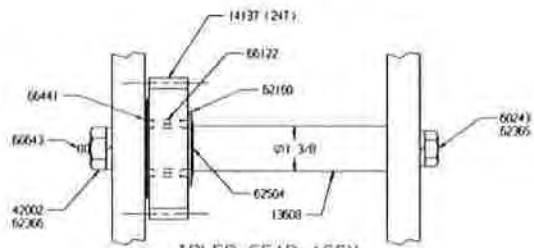
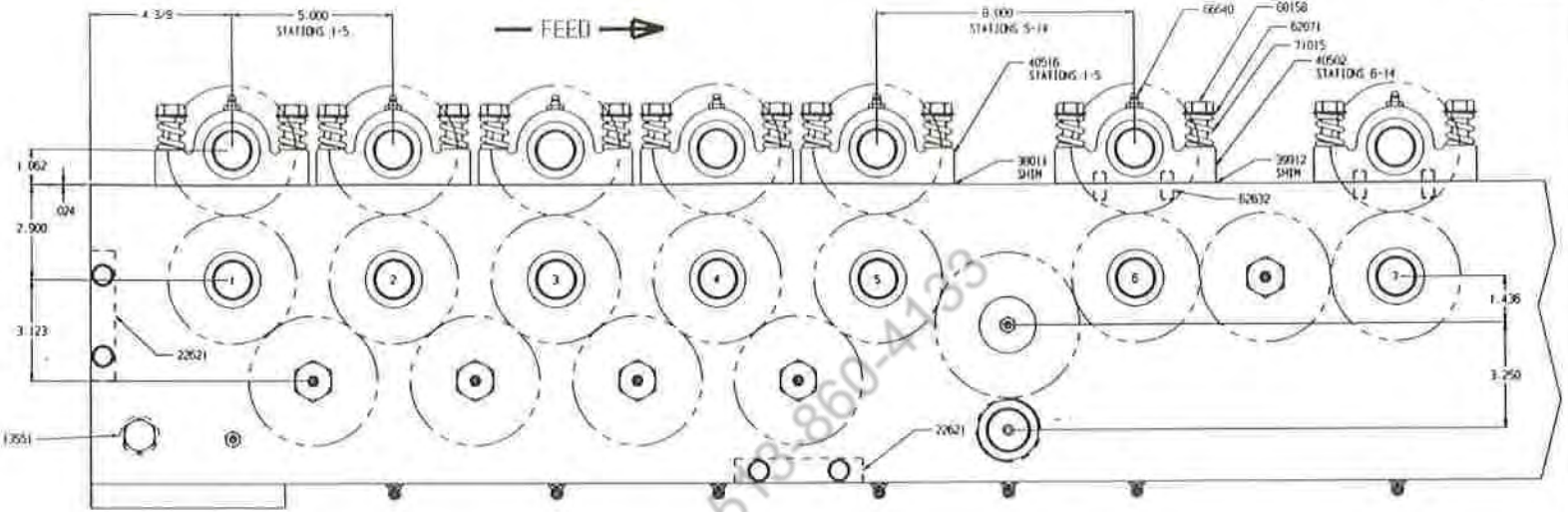
③ ④
 MAT. ^{A32} .020 THK 2.125 WIDE GALVANIZED STR.

THE LOCKFORMER CO.		LIBER, ILLINOIS 60522	
311 GARDEN AVE.		LIBER, ILLINOIS 60522	
MACHINE	TOP DUCT	PART NUMBER	21187
PART NAME	TOP CLIP	DATE	2-7-83
DESIGNED BY	416	DATE	1-8-83
CHECKED BY	416	DATE	1-8-83
REVISIONS		REVISIONS	

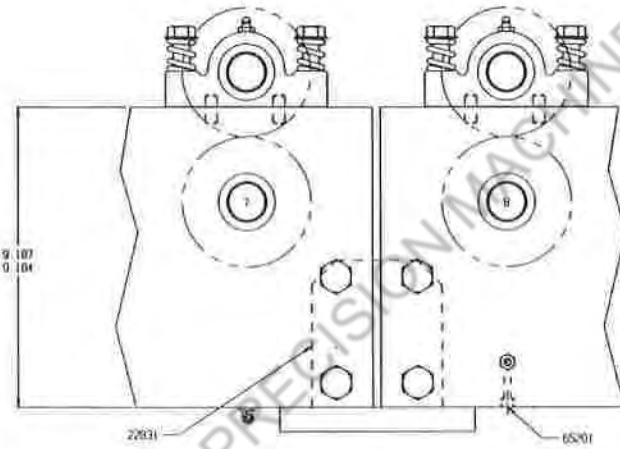
FILE NO.	416	REV. NO.	1	DATE	1-8-83	REVISIONS	
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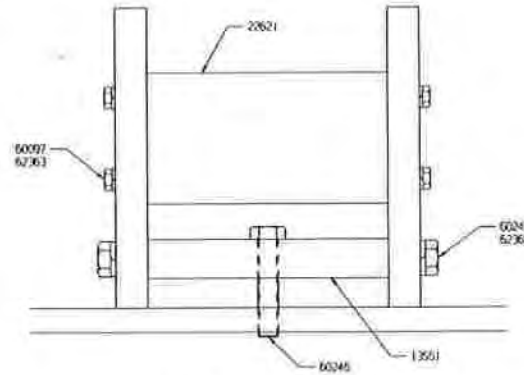
ROLL SHAFT ASSY.
EXIT VIEW



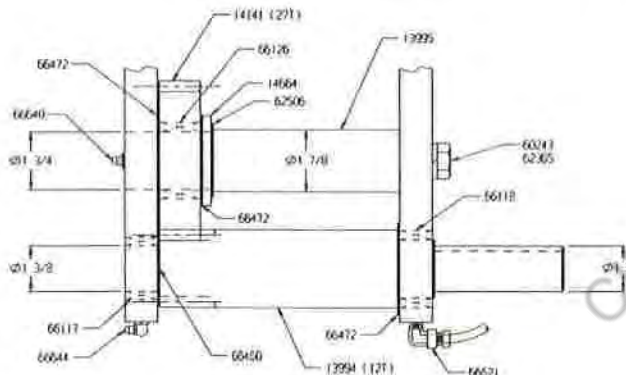
IDLER GEAR ASSY.
EXIT VIEW



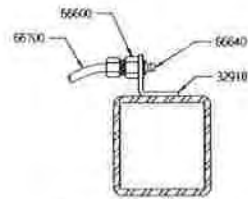
CENTER SPACER ASSY.



ENT./EXIT SPACER ASSY.



MAIN IDLER GEAR ASSY. &
1st DRIVE SHAFT ASSY.
EXIT VIEW



LUBE BRACKET ASSY.

BY	DATE	REV.	DESCRIPTION
DE LOCKFORMER 14 STA. TOE DES.		CD LEAD, ALUMINUM BRASS PART NUMBER 58160	
PART NAME CHASSIS DETAILS		PART NUMBER 58160	QUANTITY 1 200 4 5 2002 1 200 4 5 2002 1 200 4 5 2002
DESIGNED R. SIMON	DRAWN R. SIMON	DATE 5-10-02	REVISIONS