

**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 springed 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.

ShopRP Machining Co

## 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 runoff, 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.) 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 marling, 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:**

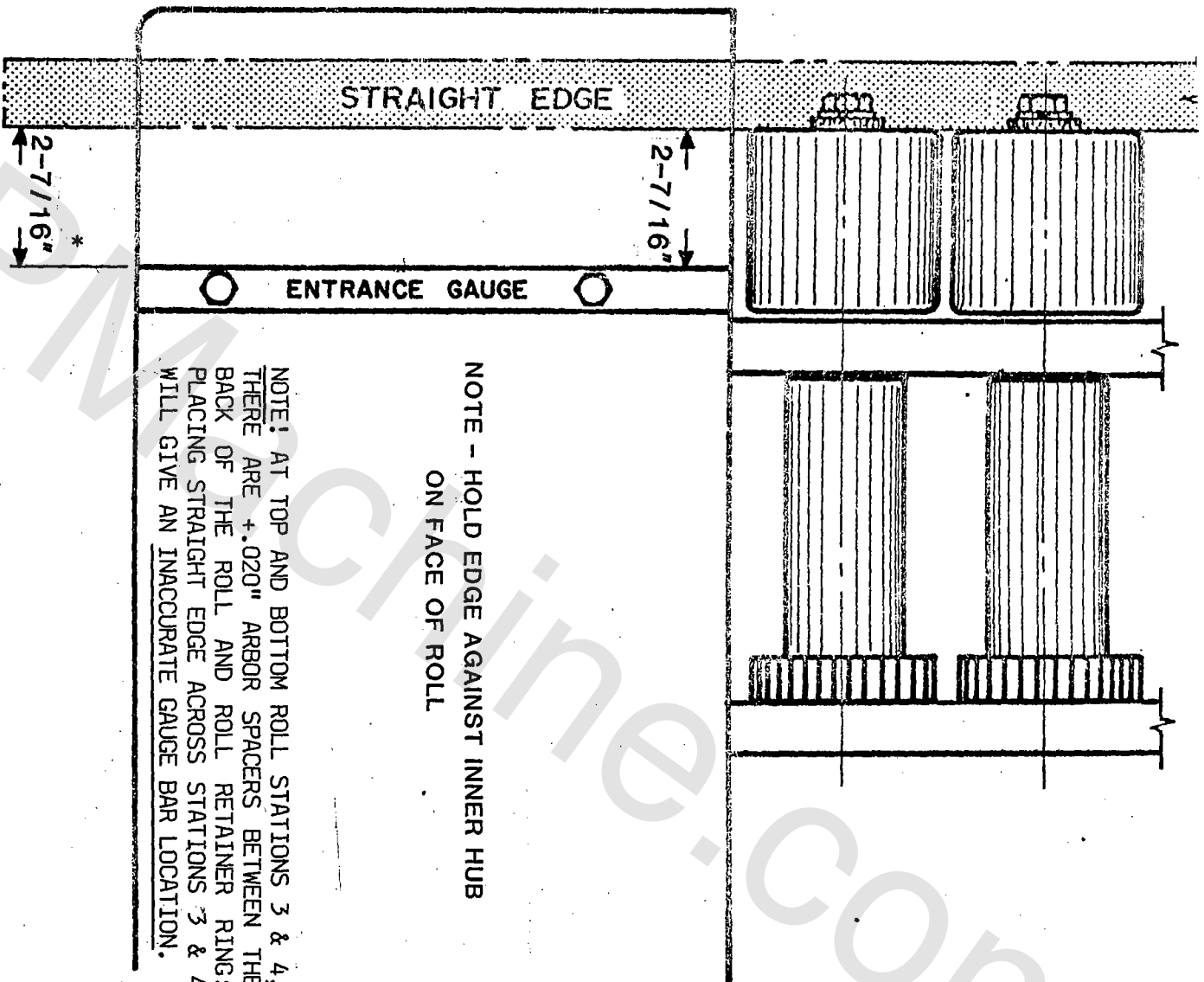
Standard Oil Co. ....Standard Viscous #3 or Polarine  
Tribol .....Molub Alloy #777-1  
Mobil Oil Co. ....Mobil Plex EP2

**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.



NOTE - HOLD EDGE AGAINST INNER HUB  
ON FACE OF ROLL

NOTE: AT TOP AND BOTTOM ROLL STATIONS 3 & 4,  
THERE ARE +.020" ARBOR SPACERS BETWEEN THE  
BACK OF THE ROLL AND ROLL RETAINER RING:  
PLACING STRAIGHT EDGE ACROSS STATIONS 3 & 4  
WILL GIVE AN INACCURATE GAUGE BAR LOCATION.

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.

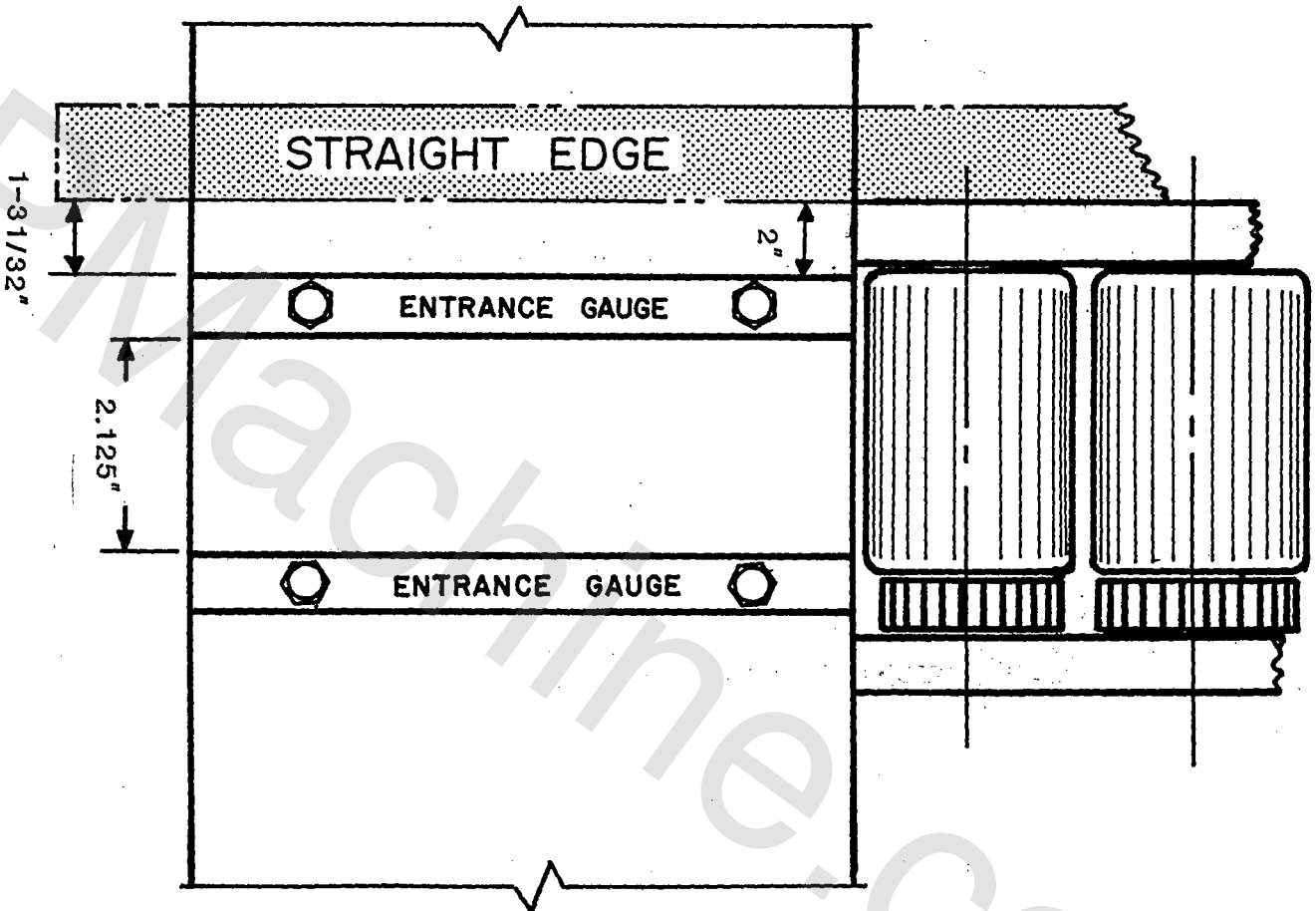
THE GIVEN GAUGE BAR SETTING IS STANDARD, AND CUSTOMER MAY VARY IT SLIGHTLY TO  
SUIT HIS NEEDS.

\* 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

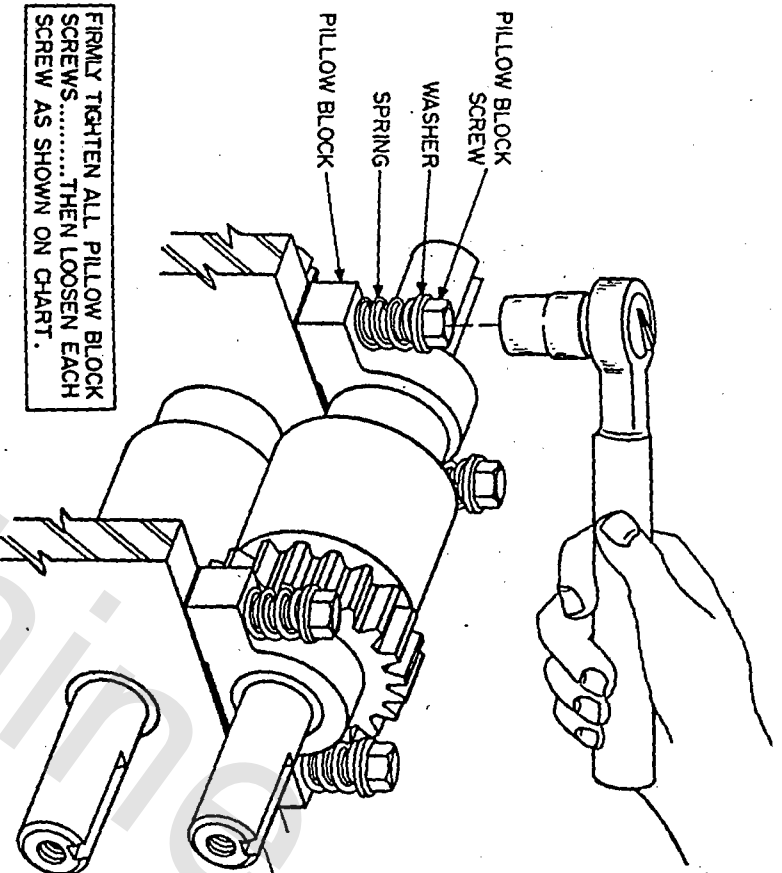


**OPTIONAL TDC CLIP ROLLS (INBOARD POSITION)**

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

ILLUSTRATION NO. 2

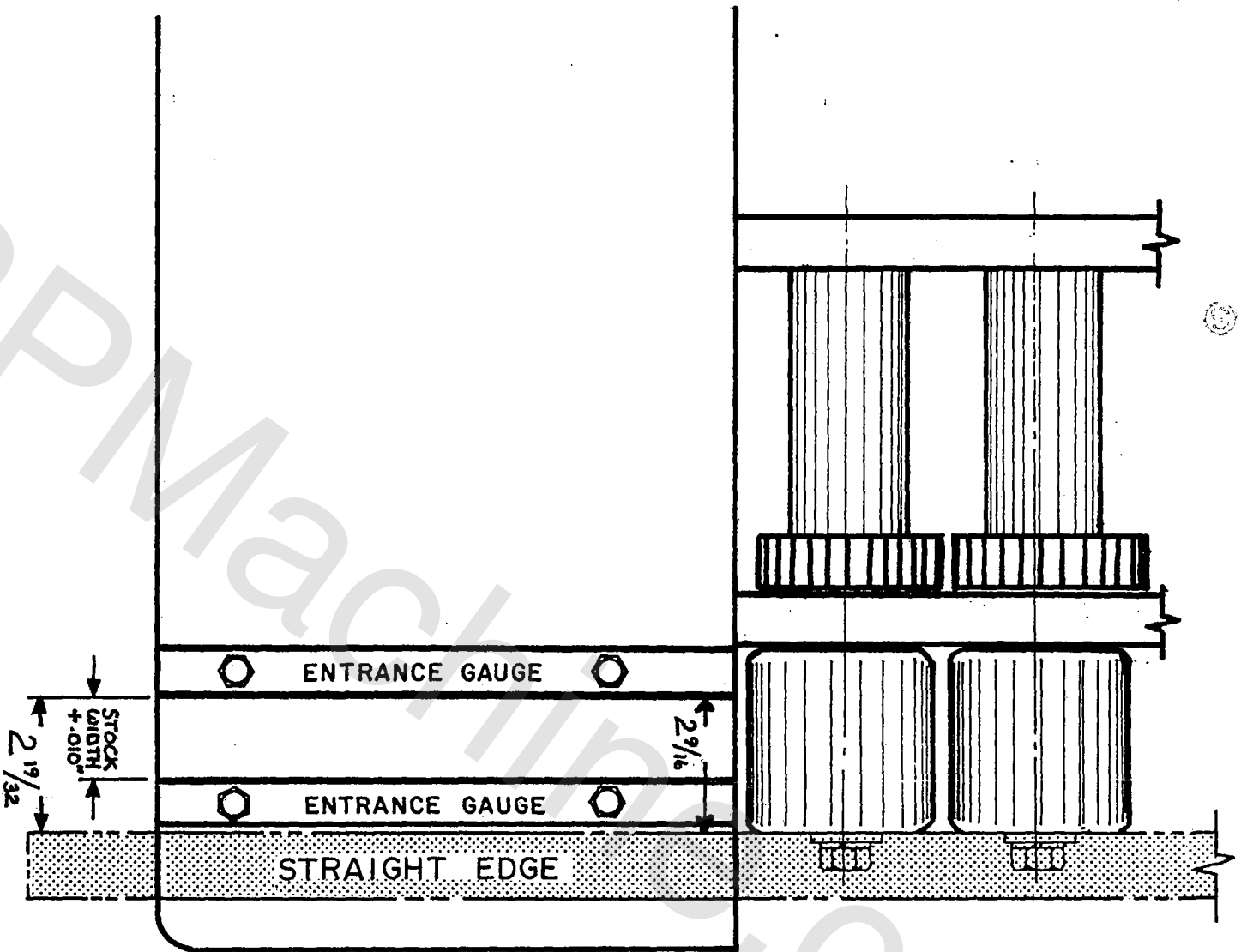


## PILLOW BLOCK SCREW TORQUE SETTINGS

STATION	LEFT SIDE	RIGHT SIDE
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

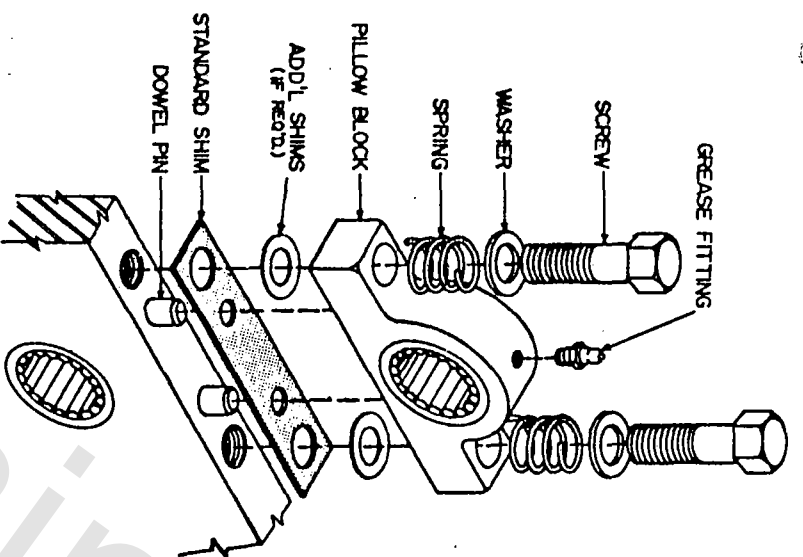
24, 22, and 20ga. - Fully tighten, then loosen 1/2 turn  
18 ga. - Fully tighten, then loosen 2-1/2 to 3 turns



CHECK POSITION OF ENTRANCE GAUGE BARS OFTEN.  
 BE SURE THAT ALL ENTRANCE GAUGE FASTENERS ARE KEPT TIGHT.

ILLUSTRATION NO. 4

ENTRANCE GAUGE SETTINGS

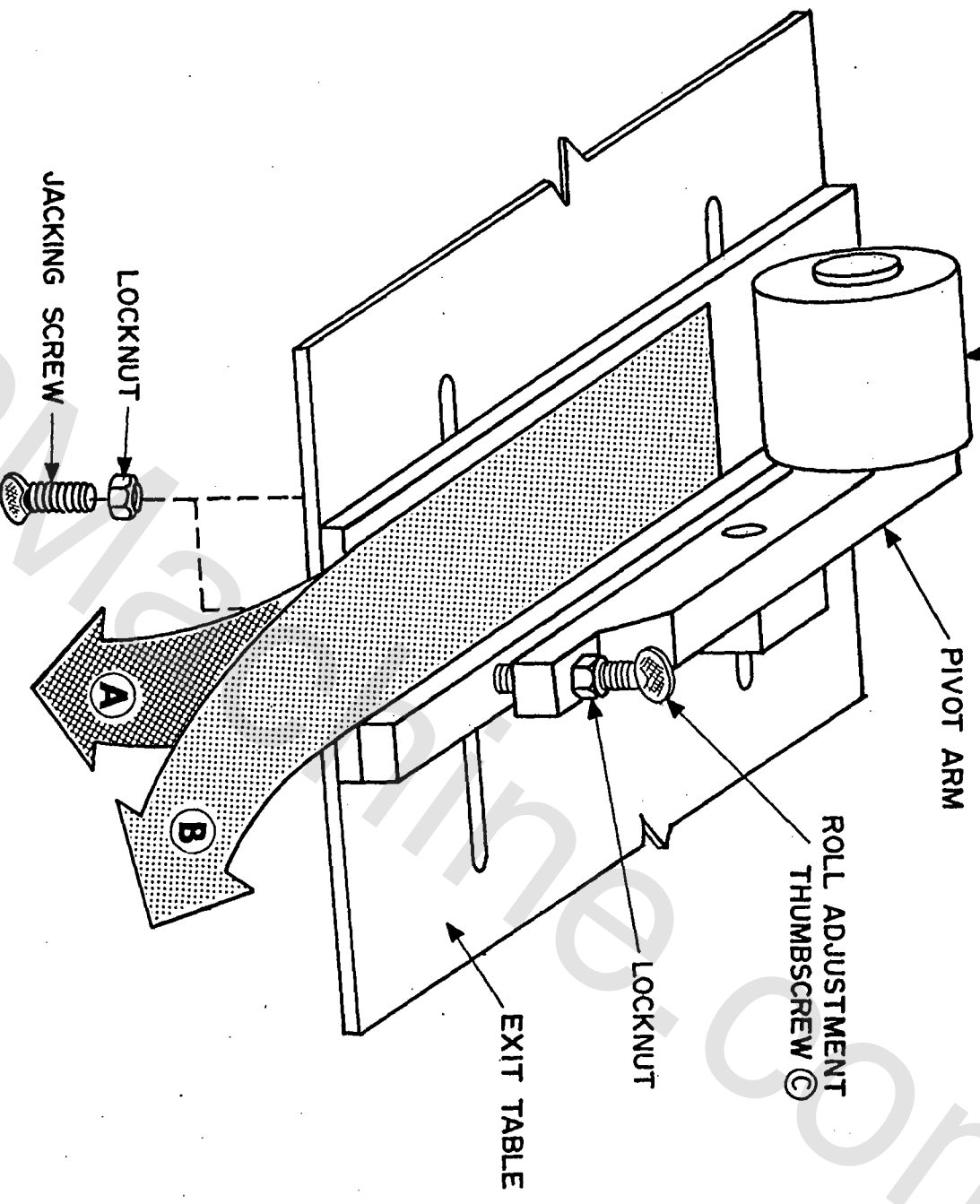


STATION	LEFT SIDE	RIGHT SIDE
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		

ILLUSTRATION NO. 5

PILLOW BLOCK SHIM SIZES AND LOCATIONS

# EXIT STRAIGHTENER ROLL



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:

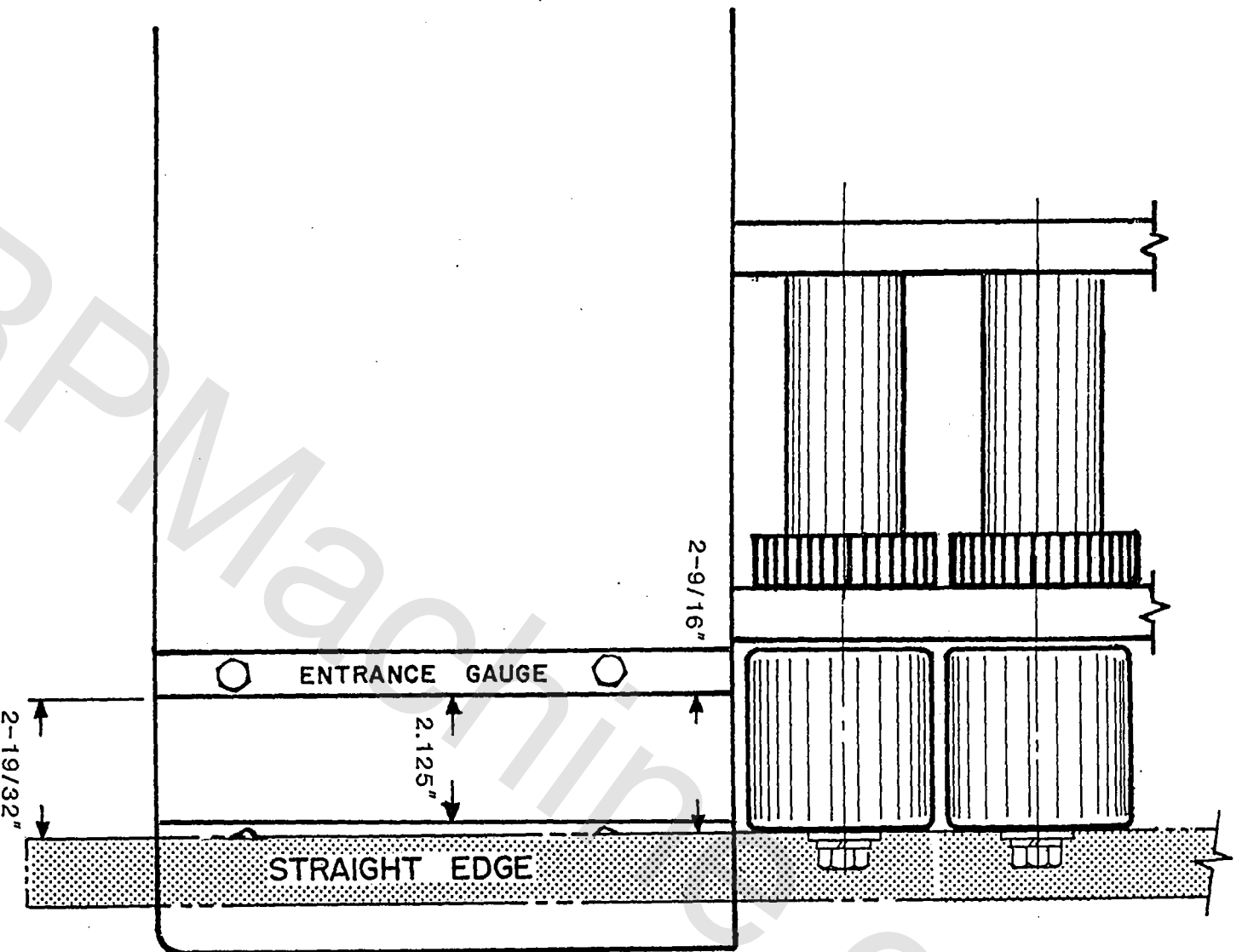
IF PART BOWS Laterally (A) OR (B) MOVE UNIT IN THE OPPOSITE DIRECTION OF THE BOW.

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 © THEN ADJUST BY TURNING THUMBSCREW. TIGHTEN LOCKNUT AFTER ADJUSTMENT IS MADE.

## EXIT STRAIGHTENER BASIC OPERATION DRAWING





## 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

## TROUBLE SHOOTING

Problem	Solution
<p>Metal slips in rolls.</p>	<p>A. Tighten pillow block screws or machine plate stud nuts in small increments to increase roll grip.</p> <p>B. If machine is equipped with idler rolls, adjust them to proper clearance.</p> <p>C. Inspect for worn rolls.</p> <p>D. Check if stock thickness is within the machine's capacity.</p>
<p>Metal sticks in rolls during forming.</p>	<p>A. Loosen pillow block screws or machine plate stud nuts in small increments to reduce roll grip.</p> <p>B. If machine is equipped with idler rolls, adjust them to proper clearance.</p> <p>C. Lubricate stock.</p> <p>D. Inspect for worn rolls.</p> <p>E. Check if stock thickness is within the machine's capacity.</p> <p>F. If running notched material, check for break out at notch.</p> <p>G. Check for slide mis-alignment (if slides are provided).</p>
<p>Profile is formed too loose.</p>	<p>A. Tighten pillow block screws or machine plate stud nuts in small increments to increase roll grip.</p> <p>B. If machine is equipped with idler rolls, adjust them to proper clearance.</p> <p>C. Inspect for worn rolls.</p> <p>D. Check if stock thickness is within machine's capacity.</p>

## TROUBLE SHOOTING

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

## 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.

**IDENTIFICATION CHART FOR TDC TOOLING**

	<u>Original</u>	<u>TDC90</u>	<u>TDC85</u> (Current)
Top #2 Roll	15483	15421	15421
Bottom #2 Roll	15498	15426	15426
Top #3 Roll	15482	15422	15422
Bottom #3 Roll	15497	15427	15427
Top #4 Roll	15481	15423	15423
Bottom #4 Roll	15496	15428	15428
Top #5 Roll	15480	15424	15424
Bottom #5 Roll	15495	15429	15429
Bottom #6 Roll	15494	15430	15430
5/6 Idler Roll (bottom)	15466	15431	15405
5/6 Idler Roll (top)	15465	15465	15404
Bottom #14A Roll	15565	15565	15565
Bottom #14B Roll	15566	15566	15403

**NOTE:** On some very old tooling, the Bottom #14 Roll is one piece. When Up-dating, both Segment "A" and Segment "B" must be replaced.

15565 IS SEGMENT REQUIRED  
 ONLY IF BOTTOM #14 IS ONE PIECE

Bottom 5/6  
 IDLER SPACING

2.030"

2.016"

2.055"

**709893**  
TDC

Item Number	Item Description	Quantity
701009	TDC SLIDING TABLE,CAM TYPE	1
701101	CHASSIS 14 DES	1
701209	TRANSMISSION,14 DES,90 FPM	1
701306	STAND,14 STA. DES,TDC	1
701405	SHEET SUPPORT 14 STA. TDC DES	1
701510	COVERS,14 STA. TDC DES	1
702708	ELECT.,10 HP,230/3/60,	1
702709	ELECT.,10 HP,460/3/60	1
702907	TDC INBOARD SPCR	1
702941	TDC 85 DES LH AUX	1
AA71221	A-1, TDC SHOP TOOL,IPI	1

**701001**  
TDC CORNER CRIMP WRENCH

Part Number	Description	Quantity
AA71221	A-1, TDC SHOP TOOL,IPI	1

**701009**  
TDC SLIDING TABLE,CAM TYPE

Part Number	Description	Quantity
23098	GUIDE BLOCKS	4
60300	SHCS,1/4-20 x 3/8	4
60308	SHCS,1/4-20 x 2-3/4	4
62370	WSHR,LOCK,1/4,MED	4
62683	PIN,ROLL,1/8 x 1-1/4	1
62707	PIN,ROLL,1/4 x 1-1/2,LG	1
62715	PIN,ROLL,3/16 x 1-1/2#59-040-187	1
62886	PIN,ROLL,3/16 x 2,#59-040-187-	1
66459	BRG,DU-10,3/4 x1-1/4 x 1/16	3
66461	BRG,AA-839-13,3/4 x 7/8 x1	2
AA13340	CAM SHAFT	1
AA21058	CARRIER PLATE	1

701009

CONTINUED

Part Number	Description	Quantity
AA21059	PIVOT BRKT	2
AA35830	SHIM PLATE	1
AA35831	SHIM PLATE	1
AA51810	HANDLE WLDT.	1
AA55120	ASSY, TDC SLIDER	0
AA55121	14 STA. TDC DES SHEET SUPRT/	0
AA71159	SHAFT COLLAR #SC75 3/4 x 1-1/4	1

701101

CHASSIS 14 DES

Part Number	Description	Quantity
13551	SPCR PL DR	2
13608	IDLR SPCR	10
13993	ROLL SHAFT	28
13994	1ST DRIVE SHAFT	2
13995	MAIN IDLER SPACER	2
14137	IDLER GEAR	10
14139	DRIVEN GEAR	28
14141	MAIN IDLER GEAR	2
14664	MAIN IDLER WSHR	2
21217	MACHINE PLATE AUX	1
21218	MACHINE PLATE AUX	1
21219	MACHINE PLT GR SD	1
21220	MACHINE PLT GR SD	1
22621	SPACER	4
22831	CTR CONN SPCH MACH	1
27329	ENT RISER	1
32918	LUBE BRKT	1
38011	SPACER SHIM	10
39912	SPACER SHIM	18
40502	PILLOW/BLOCK 88500	18
40516	PILLOW/BLOCK	10
42002	LUBE BOLT 60422	10
51545	CHASSIS DETAILS	0
53381	EXT TBL 14 DES	1

701101  
CONTINUED

Part Number	Description	Quantity
53382	ENT TBL, 14 DES	1
58160	CHASSIS DETAILS	0
60091	HHCS,3/8-16,1	8
60097	HHCS,3/8-16,1-3/4	14
60158	HHCS,1/2-13,2-1/2,HT.TREATED	56
60243	HHCS,5/8-11,2	14
60246	HHCS,5/8-11,3	2
60470	SHCS,5/8-11 x 1-1/4	2
62029	WSHR,FLAT,3/8,7/8,1/16	8
62030	WSHR,FLAT,3/8,1,3/32	8
62071	WSHR,FLAT,17/32,1,1/16	56
62160	WSHR,FLAT,STL 1-1/4,2-1/4,.093	10
62363	WSHR,LOCK,3/8,MED	23
62365	WSHR,LOCK,5/8,MED	24
62366	WSHR,LOCK,3/4,MED,HARDENED & GRD	10
62403	KEY,WDRF,#18	28
62504	RETAINING RING,5100-125,TRU-AR	10
62506	RETAINING RING,5100-175,TRU-AR	2
62510	RETAINING RING,5160-125 TRU-AR	84
62632	PIN,DWL,3/8 x 7/8	56
65201	PLG,PIPE,1/8-27 x 1/4,SKT HD	6
66116	BRG,NDL,HJ202816,1-1/4 x 1-3/4 x 1	56
66117	BRG,NDL,H,J223016,1-3/8 x 1-7/8 x 1	2
66118	BRG,NDL,HJ283716,1-3/4 x 2-5/16	2
66122	BRG,NDL,1-1/41x-3/4 x 1-1/4,HJ	10
66126	BRG,NDL,1-3/4x2-5/16 x 1-1/4	2
66441	ERG,THRS,TT-2006,1-1/4 x 2 x 1/16	66
66460	BRG,DU-20,1-3/8 x 2-1/4 x 1/16	2
66472	BRG,DU-26,1-3/4 x 2-3/4 x 1/16	6
66600	CONN,FEM,886L,1/4 x 1/8	2
66621	ELBW,BRASS,#89LB4 x 2-1/4T,W//8	2
66640	CONN,GREASER,1610,#163B,	38
66643	CONN,GREASER,#205010,1/4-28	10
66644	CONN,#161 3B,1/8,90DEG	24
66700	TUBE,NYLAFLOW,1/4"POLYPENCO	96
71015	SPRG,COMP,9562	56



**701209**

TRANSMISSION

14 STATION TDC 90 FPM

Part Number	Description	Quantity
43027	SPRKT,D50B20,1-5/8B,W/ SS&KW	1
50609	TRANSMISSION ASSY	0
53533	CHN TIGHTNR MTG IBRK	1
54591	CHN TIGHTNR MTG BKT	1
60091	HHCS,3/8-16,1	4
60888	BOLT,CARRDG,1/2-13X2-1/4	4
61160	NUT,1/2-13,HEAVY S.F.	4
62030	WSHR,FLAT,3/8,1,3/32	4
62057	WSHR,FLAT,1/2,1-3/8,3/32	4
62363	WSHR,LOCK,3/8,MED	4
62364	WSHR,LOCK,1/2,MED	4
62437	KEY,STRT,3/8,3/8,3-1/4	1
62488	KEY,STRT,5/16,5/16,2 3/8	2
62761	TENSIONER,CHAIN DR.DATSQ,N2	2
70757	CHAIN,#D-50,OFFSET LINK	2
70768	CHAIN,#50-2,CONN LINK	2
72228	SPRKT,D50P20,W/PI-1 3/8" BUSHNG	2
72279	SPRKT,IDLER,HND50BIT,#50	2
72755	SPROCKET,D50P20,1-5/8" BORE	1
73018	CHAIN,#50-2,100',1920P PERIOO'	296

**701306**

STAND 14 STATION

DES TDC

Part Number	Description	Quantity
51866	STAND WELDMENT	1
60966	BOLT,EYE,WIRE,1/4-20 x1-1/2,	1

**701405**  
 SHEET SUPPORT

Part Number	Description	Quantity
14151	SPACER	4
21768	SUPRT BAR	2
21769	ROLL MTG BAR	1
22040	SUPPORT BAR	1
24182	SLIDE RISER	5
51135	MISC,WELDMENT, TABLE, 14 DES	1
58175	SHEET SUPRT ASSY	0
60091	HHCS, 3/8-16, 1	6
60302	SHCS, 1/4-20, 5/8	8
60402	SHCS, 3/8-16 x1	3
60409	SHCS, 3/8-16 x 2-1/4	5
60457	SHCS, 1/2-13 x 2-1/4, NYLOCK	8
62000	WSHR, FLAT, 1/4, 9/16, .062	8
62029	WSHR, FLAT, 3/8, 7/8, 1/16	9
62363	WSHR, LOCK, 3/8, MED	9
62370	WSHR, LOCK, 1/4, MED	8
85975	ROLL, CUSHION, FINNED, W/STUD MTG	8

**701510**  
 COVERS

Part Number	Description	Quantity
26993	CVR HEX SPCR SUPT	4
27129	CTR CVR HEX SUPRT	2
51849	SHEET SUPPORT/SIDE GUARD WELD.	1
51851	TOP GUARD WELD	2
51862	GUARD FRAME WELD	1

**702708**  
ELECTRICALS  
230/3/60

Part Number	Description	Quantity
50558	WRING DIAG.	0
80214	SWITCH,PB,#55503,W/#40903	1
80457	CABLE,LIQUATITE,3/4"1,300'COIL	50
80488	CONN,LTO,#5253,3/4",90DEG	2
80601	TERMINAL,RING TONGUE,C-26, OR	9
81519	BLK,STA-KON,D8-14,T&B D71	4
82044	WIRE,#8THHN,BLACK,19 STRAND	216
82125	CONNECTOR,0.37511-0.5" DIA.,	1
82143	LOCKNUT,REVERE PART NO:BL50,	3
84071	GEARMOTOR,IOHP,SK32-132M4-VL	1
84235	WIRE,8 GA,STRND,MTW	72
84340	SEALING RING 1/2" REVERE PN:52	3
84720	PANEL,TDC-DES ELEC.230/3/60	1
85228	DECAL,CAUTION SHOCK HAZARD	1
85244	LABEL RISK OF ELECTRICAL	1

**702709**  
ELECTRICALS  
460/3/60

Part Number	Description	Quantity
50561	WRING DIAG.	0
80214	SWITCH,PB,#55503,W/#40903	1
80457	CABLE,TIQUATITE,3/4,300' COIL	50
80488	CONN,LIQ,#5253,3/4"1,90DEG	2
80601	TERMINAT,,RING TONGUE,C-26, OR	9
80729	WIRE,MTW,IOGA,.BLACK(6000"SPL)	216
81519	BLK,STA-KON,D8-14,T&B D71	4
82108	WIRE,10 GA,STRND,MTW	72
82125	CONNECTOR,0.37511-0.5" DIA.,	1
82143	LOCKNUT,REVERE PART NO:BL50,	3
84071	GEARMOTOR,10HP,SK32-132M4-VL	1
84340	SEALING RING 1/2" REVERE PN:52	3
84721	PANEL,TDC-DES ELEC. 480/3/60	1
85228	DECAL,CAUTION SHOCK HAZARD	1
85244	LABEL RISK OF ELECTRICAL	1

702902  
TDC CLIP  
MTDAUX

PARTS LIST PAGE7

Part number	Description	Quantity
14557	STNR ROLL PIN	1
15433	T 1 FORM ROLL	1
15434	T 2 FORM ROLL	1
15435	T 3 FORM ROLL	1
15436	T 4 FORM ROLL	1
15437	T 5 FORM ROLL	1
15438	T 6 FORM ROLL	1
15439	T 7-A FORM ROLL	1
15440	T 7-B FORM ROLL	1
15441	T 8-A FORM ROLL	1
15442	T 8-B FORM ROLL	1
15443	T 9 FORM ROLL	1
15444	T 10 FORM ROLL	1
15445	T 11 FORM ROLL	1
15446	T 12 FORM ROLL	1
15447	T 13 & T 14 ROLL	2
15448	B 1 FORM ROLL	1
15449	B 2 FORM ROLL	1
15450	B 3 FORM ROLL	1
15451	B 4 FORM ROLL	1
15452	B 5 FORM ROLL	1
15453	B 6 FORM ROLL	1
15454	B 7 FORM ROLL	1
15455	B 8 FORM ROLL	1
15456	B 9 FORM ROLL	1
15457	B 10 FORM ROLL	1
15458	B 11 FORM ROLL	1
15459	B 12 FORM ROLL	1
15460	B 13 & B 14 FRM RL	2
15461	ROLL SPACER	28

702902  
CONTINUED

PARTS LIST PAGE 8

Part Number	Description	Quantity
15462	STRAIGHTENER ROLL	1
27166	EXT STNR ARM SUPT	1
27167	EXT STNR ARM	1
27168	EXT STNR BAR	1
27169	EXT STNR BAR	1
27170	EXT STNR PAD	1
27180	SLIDE BRKT AUX	2
27182	SLIDE BRACKET	1
27183	SLIDE BRACKET	1
27184	SLIDE	2
27185	SLIDE BRACKET	2
27186	ENT GA BAR	1
27331	ENT GA BAR	1
31916	WSHR AUX ROLL	28
50324	EXT STNR ASSY	0
50325	SLIDE ASSY	0
60090	HHCS, 3/8-16, 3/4	2
60096	HHCS, 3/8-16, 1-1/2	1
60152	HHCS, 1/2-13, 1-1/4	28
60305	SHCS, 1/4-20 x 1-1/4	2
60352	SHCS, 5/16-18 x 1	4
60357	SHCS, 5/16-18 x 1/2	10
60877	BOLT, CARRDG, 3/8-16 x 1-3/4	4
60921	SCR, THUMB, 5/16-18 x 2, CAD PLATED	3
60964	FHSCHS, 1/4-20 x 3/4	6
61101	NUT, HEX, 5/16-18, HEAVY S.F.	1
61120	NUT, HEX, 3/8-16, HEAVY S.F.	4
62029	WSHR, FLAT, 3/8, 7/8, 1/16	7
62363	WSHR, LOCK, 3/8, MED	3
62364	WSHR, LOCK, 1/2, MED	28
62370	WSHR, LOCK, 1/4, MED	2
62403	KEY, WDRF, #18	28
62487	KEY, STRT, 1/4, 1/4, 2/78	2
62510	RETAINING RING, 5160-125 TRU-AR	28
66060	BRG, NDL, B-1212, 3/4 x 1 x 3/4	1
66332	BRG, NTA-1220, 3/4, x 1/4 x .078	1
66339	BRG, TRA-1220, .752 x 1.240 x .030	2

**702905**  
TDC II ROLLS-INBOARD  
W/LSP STOCK LUBE

Part Number	Description	Quantity
14579	IDLER PIN 9-C	1
14580	IDLER PIN 8-9A	1
14581	IDLER PIN 10-C	1
14582	IDLER PIN 7-8B,8-9B	2
14583	IDLER PIN 7-8A	1
14584	IDLER PIN 14-C	1
14585	IDLER PIN	1
14966	SPACER	10
14967	SPACER	4
15201	14-C IDLER ROLL	1
15202	10 C IDLER ROLL	1
15203	9 C IDLER ROLL	1
15204	8-9 A IDLER ROLL	1
15205	8-9 B IDLER ROLL	1
15206	7-8 B IDLER ROLL	1
15207	7-8 A IDLER ROLL	1
15208	T1 FORM ROLL	1
15209	T2 FORM ROLL	1
15210	T3 FORM ROLL	1
15211	T4 FORM ROLL	1
15212	B1 FORM ROLL	1
15213	B2 FORM ROLL	1
15214	B3 FORM ROLL	1
15215	B4 FORM ROLL	1
15216	B5 FORM ROLL	1
15217	T5 FORM ROLL	1
15218	B6 FORM ROLL	1
15219	T6 FORM ROLL	1
15220	B7 FORM ROLL	1
15221	T7 FORM ROLL	1
15222	B8 FORM ROLL	1
15223	T8 FORM ROLL	1
15224	B9 FORM ROLL	1
15225	T9 FORM ROLL	1
15226	B10 FORM ROLL	1
15227	T10 FORM ROLL	1

702905  
CONTINUED

PARTS LIST PAGE 10

Part Number	Description	Quantity
15228	B11FORMROLL	1
15229	T11FORMROLL	1
15230	B12 & B13 FORM ROL	1
15231	T12 FORMROLL	1
15232	B13-xFORMROLL	1
15233	T13 FORMROLL	1
15234	B14 FORMROLL	1
15235	T14 FORMROLL	1
15236	EXIT STRROLL	1
21962	GUIDE BACKPLT	2
21963	CROSS BAR HANGER	2
21964	TAB HANGER 8-9	1
21965	CROSS BAR 7-8	1
21966	AFT 14 CROSS BAR	1
21967	IDLER MTG BAR STA9	1
21968	STA 7-B&S-9 HANGER	2
21969	IDLR MTG BAR	2
21970	SLIDE MOUNT 7-8	1
21971	CROSS BAR 9-10	1
21972	IDLER MTG BAR 14	1
21973	IDLER ROLL MTG ELK	2
21974	GUIDE 11-12	1
21975	GUIDE 10-11	1
21976	SLIDE 10-11 &11-12	2
21977	GUIDE SHOE	2
21978	GUIDE SHOE	1
21981	CROSS BAR 10-11STA	1
21982	CROSS BAR 11-12 STA	1
21983	CROSS BAR HGR10-11	1
21984	IDLER MTG BAR ST10	1
21987	STR BOTTOM BAR	1
21988	STR SIDE BAR-EXIT	1
21989	STR SIDE BAR-EXIT	1
21990	SUPPORT BAR	1
21991	PIVOT BAR	1
21992	GUIDE SHOE 11-12	1
22665	SPCR PS10-11&11-12	2
22666	SPCR GS10-11&11-12	2

702905  
CONTINUED

PARTS LIST PAGE 11

Part Number	Description	Quantity
22667	AFT 14 SPACER	2
22668	SPCR 8-9	2
22669	SPCR 7-8 P S	1
22670	SPCR 7-8 GS	1
22682	VALVE RISER	1
22742	COVER SUPPORT	2
22743	COVER SUPPORT	2
24182	SLIDE RISER	2
27186	ENT GA. BAR	1
27328	ENT RISER AUX.	1
27330	EXIT RISER	1
27331	ENT GA. BAR	1
27332	ENT RISER	1
36460	RELAY+PUT MTG BRKT	1
36461	PROXSWTCH HLD BRKT	1
53591	CROSS BAR 8-9 WLDT	1
53622	ENT HLD DWN WLDT	1
53846	SLIDE GDE ASSY 10-11	0
53847	SLIDE GDE ASSY 11-12	0
55803	TDCII SPRAY LBASY	0
58904	14. IDLER ASSY	0
58905	8-9 IDLER ASSY	0
58906	7-8 IDLER ASSY	0
58907	ON STA 9 IDLER ASY	0
58908	ON STA 10 IDLER AS	0
58909	EXIT STRN, ASSY	0
58910	12-13GDE SHOE ASSY	0
58911	13-14 GD SHOE ASSY	0
59295	SCHEMATIC	0
60091	HHCS, 3/8-16, 1	4
60096	HHCS, 3/8-16, 1-1/2	1
60109	HHCS, 3/8-16, 3	4



702905  
CONTINUED

Part Number	Description	Quantity
60350	SHCS,5/16-18 x 3/4	14
60352	SHCS,5/16-18 x 1	4
60353	SHCS,5/16-18 x 1-1/4	2
60358	SHCS,5/16-18 x 1-3/4	22
60402	SHCS,3/8-16 x 1	8
60407	SHCS,3/8-16 x 1-1/2	8
60409	SHCS,3/8-16 x 2-1/4	6
60552	RHMS,1/4-20 x 3/4	2
60570	RHMS,8-32 x 1/2	3
60573	RHMS,10-24 x 1-3/4	4
60575	RHMS,10-24 x 3/8	10
60651	SSS,5/16-18 x 3/8	1
60662	SSS,5/16-18 x 5/16	7
60877	BOLT,CARRDDG,3/8-16 x 1-3/4	2
60885	BOLT,CARRDDG,3/8-16 x 2-1/2	2
60921	SCR,THUMB,5/16-18 x 2,CAD PLATED	5
60964	FHSCHS,1/4-20 x 3/4	6
61060	NUT,1/4-20,FINISHED	2
61101	NUT,HEX,5/16-18,HEAVY S.F.	5
61120	NUT,HEX,3/8-16,HEAVY S.F.	6
61505	VALVE,8262G2,12OV,2 WAY,	1
62000	WSHR,FLAT,1/4,9/16,.062	2
62010	WSHR,FLAT,5/16,1,1/16	20
62013	WSHR,FLAT,5/16,5/8,1/8	22
62027	SHIM,3/8,3/4,.082	2
62029	WSHR,FLAT,3/8,7/8,1/16	14
62360	WSHR,LOCK,#10MED	14
62362	WSHR,LOCK,5/16,MED	26
62363	WSHR,LOCK,3/8,MED	21
62370	WSHR,LOCK,1/4,MED	2
62403	KEY,WDRF,#18	78
62551	STUD,3/8-16,7,THRD BOTH ENDS	4
65041	NPL,1/2,SCH80	1
65126	BSHG,1/8 x 1/4,STL,HEX	1
65340	QUICK DISCONN,MALE, 11659	1
65392	CONN,MALE,68C-32,1/8 NPT x 1/8	4
65835	REGULATOR W/GAUGE,1/8"NPT	1

702905

PARTS LIST PAGE 13

CONTINUED

Part Number	Description	Quantity
66030	BRG,ND-L, B-168,1 x 1-1/4 x 1/2	12
66100	BRG,NDL,B-1612,1 x 1-1/4 x 3/4	3
66320	BRG,NDL,THRS,NTA-1625	8
66322	BRG,TRA-1625,1.002 x1552 x .030,	16
66765	MISC,SOL LSP SYSTEM,SP164-2,	1
66775	TUBE,PLASTIC,LSPM-902,3/16"ID	192
80441	CABLE,LIQUITTE,1/2",500'	20
80492	CONN,ELBW,#5242,1/2",45DEG	2
80701	CLAMP,STL,551S,1/4"	4
80987	CLAMP,JIFFY,3/8	6
81050	WIRE,16GA,MTW,WHITE,STRND	60
81051	WIRE,16GA,MTW,RED,STRNDED	60
81370	SWITCH,PROX#NBB5-18GM-60-WS	1
81371	TIMER,OFF/ON+RHEOSTATE(2)	1
81856	WIRE,MTW,16AWG,GRN/YELLOW	60
82124	CONNECTOR,0.125"-0.375"DIA.,	1
82125	CONNECTOR,0.375"-0.5"DIA.,	1
82143	LOCKNUT,REVERE PART NO:BL50,	3
84264	GROMMET,FLEX,FP,SIZE"B"POLY	3.63
84298	TERM BLK,END SECT 118368.16	1
84340	SEALING RING 1/2" REVERE PN:52	2
84350	MOUNT,CARD,#8,GRAYBAR, TM258-C	3
84422	CONTACT BLOCK NO AB#800E-ZX10	1
84423	MOUNTING LATCH AB#800E-AZL	1
84433	SWITCH OPERATOR,2 POS,SELECT	1
AA20690	SLIDE, TDC 11	1
AA21031	STNR REF BAR	1
AA21033	STNR REF BAR	1

**702907**  
INBOARD SPACER

Part number	Description	Quantity
13534	SPACER	28
13535	SPACER	28

**702917**  
TDC - 90  
LH AUX ROLLS

Part Number	Description	Quantity
14553	IDLR PIN AT 5-6	1
14554	IDLR PIN AT 5-6	1
14555	PIN AT 12-13,13-14	2
14556	PIN AT 12-13,13-14	2
15421	T2 TDC-90 FRM ROLL	1
15422	T3 TDC-90 FRM ROLL	1
15423	T4 TDC-90 FRM ROLL	1
15424	T5 TDC-90 FRM ROLL	1
15426	B2 TDC-90 FRM ROLL	1
15427	B3 TDC-90 FRM ROLL	1
15428	B4 TDC-90 FRM ROLL	1
15429	B5 TDC-90 FRM ROLL	1
15430	B6 TDC-90 FRM ROLL	1
15431	5-6 IDLR TDC-90	1
15463	SPRING RET.WSHR.	2
15465	IDLR ROLL AT 5-6	1
15467	IDLR ROLL AT 12-13	1
15468	IDLR ROLL AT 12-13	1
15469	IDLR ROLL AT 13-14	1
15470	IDLR ROLL AT 13-14	1
15471	T14 FORM ROLL	1
15472	T13 FORM ROLL	1

702917

CONTINUED

PARTS LIST PAGE 15

Part Number	Description	Quantity
15473	T12FORM ROLL	1
15474	T11 FORM ROLL	1
15475	T10 FORM ROLL	1
15476	T9 FORM ROLL	1
15477	T8 FORM ROLL	1
15478	T7 FORM ROLL	1
15479	T6 FORM ROLL	1
15484	T1 FORM ROLL	1
15487	B13 FORM ROLL	1
15488	B12 FORM ROLL	1
15489	B11 FORM ROLL	1
15490	B10 FORM ROLL	1
15491	B9 FORM ROLL	1
15492	B8 FORM ROLL	1
15493	B7 FORM ROLL	1
15499	B1 FORM ROLL	1
15565	B14-A FORM ROLL	1
15566	B14-B FORM ROLL	1
22741	IDLER STOP	1
27133	IDLR BRKT AT 12-13	1
27134	IDLR BRKT AT 13-14	1
27135	IDLR BRKT END CAP	1
27136	IDLR BRKT	1
27138	IDLR BLOCK	2
27139	IDLR BRKT BLOCK	1
27140	IDLR BRKT BLOCK	1
27142	IDLR BRKT RISER	4
27144	IDLR BRKT AT 5-6	1
27145	SLIDE AT 5-6	1
27146	SLIDE BRKT AT 5-6	1
27152	IDLR BRKT CRSS BAR	2
27153	IDLR BRKT CRSS BAR	1
27154	IDLR MTG BAR 13-14	2
27155	END CAP 12-13 & 13-14	2
27156	IDLR RLL BLCK 13-14	2
27157	BEARING BLOCK	2
27158	IDLR BLOCK TOP CAP	1
27159	IDLER BRCT RISER	1
27160	IDLER BRCT RISER	1
27186	ENT GA. BAR	1

702917  
CONTINUED

PARTS LIST PAGE 16

Part Number	Description	Quantity
27199	STNR,MTG,BAR,L.H.	1
27200	STNR,RLL HOLDER LH	1
31916	WSHR AUX ROLL	28
50319	DUCT EXIT STNR	0
50321	IDL R ASSY AT 12-13	0
50322	IDL R ASSY AT 13-14	0
50313	IDLER ASSY 5-6	0
60005	HHCS, 1/4-20, 3/4	2
60315	SHCS, 5/16-18 x 1-1/2, NYLOCK	10
60316	SHCS, 5/16-18 x 3/4, NYLOCK	4
60317	SHCS, 5/16-18 x 2, NYLOCK	5
60352	SHCS, 5/16-18 x 1	2
60353	SHCS, 5/16-18 x 1-1/4	2
60354	SHCS, 5/16-18 x 1-1/2	2
60367	SHCS, 5/16-18 x 1-3/4	1
60392	SHCS, 3/8-16 x 2-1/2	2
60395	SHSC, 5/16-18 1-1/4	6
60397	SHCS, 5/16-18 x 1, NYLOCK	4
60406	SHCS, 3/8-16 x 2, NYLOCK	12
60419	SHCS, 3/8-16 x 1-1/2, NYLOCK	2
60901	BOLT, STRIPPER, 5/16 x 1-1/2	4
61100	NUT, HEX, 5/16-18 FINISHED	6
62057	WSHR, FLAT, 1/2, 1-3/8, 3/32	4
62403	KEY, WDRF, #18	28
62485	KEY, STRT, 1/4, 1/4, 4	1
62510	RETAINING RING, 5160-125 TRU-AR	28
62620	PIN, DWL, 5/16 x 3/4	2
62765	BOLT, STRIPPER, 1/2 x 1-1/4	2
66030	BRG, NDL, B-168, 1 x 1-1/4 x 1/2	1
66060	BRG, NDL, B-1212, 3/4 x 1 x 3/4	4
66100	13RG, NDL, B-1612, 1 x 1-1/4 x 3/4	1
66174	ERG, CAM FOLLLOWER, CFH-1, 1" DIA.	2
66320	BRG, NIDL, THRS, NTA-1625	2
66322	BRG, TRA-1625, 1.002 x 1.552 x .030,	4
66332	BRG, NTA-1220, 3/4, x-1/4 x .078	4
66339	ERG, TRA-1220, .752 x 1.240 x .030	8
66594	BRG, SLEEVE, 5/16 x 1/2 x 1/2 AA506-7	4
70960	SPRG, 06M10, 5/8 OD, 1	2
71039	SPRG, DIE, 06M15, 5/8 OD, 1.5LG	2