

ROPER WHITNEY

of ROCKFORD, Inc.

10M14-G

10 FOOT 14 Ga SHEAR

OPERATIONS MANUAL

ROPER WHITNEY of ROCKFORD, Inc.

2833 Huffman Blvd.

Rockford, IL 61103

(815) 962-3011

FAX: (815) 962-2227

www.roperwhitney.com

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CINCINNATI PRECISION MACHINERY 513-860-4133

10M14-G MECHANICAL SHEAR

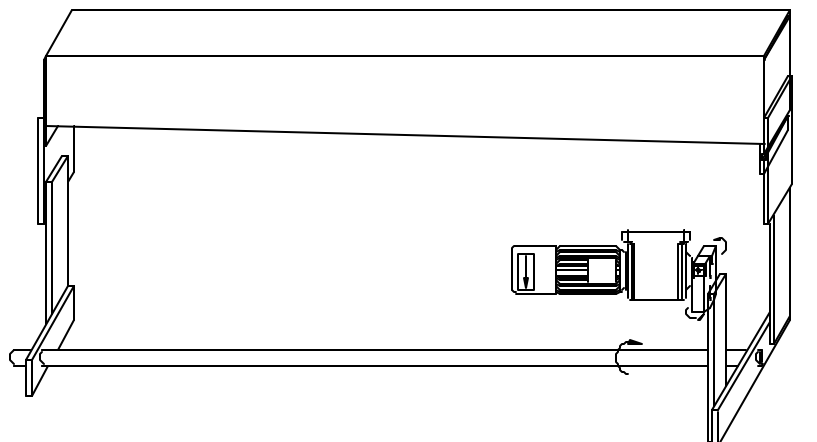
The ROPER WHITNEY 10M14-G mechanical shear is designed and tested to handle 14 gauge mild steel in 10-foot widths. The power drive is through a mechanical linkage with a 5HP motor brake and gear reducer. The cutting action can be set for single cycle or continuous cycle by means of a front mounted switch on the control box. All cutting is operator controlled by use of a foot-switch. The motor only operates when the foot-switch is actuated, thus reducing continuous electrical power drain in comparison to an "always on" running motor. The 10M14-G shear runs very quiet as a result of this motor actuation system. The shear blades are two edged, and upper and lower blades are interchangeable. The shear comes standard with a manual style backgauge that is offered either as a front or rear operated type gauging system.

Several optional features that are available include:

- 1.) full-length light beam
- 2.) front extension arms with drop stops
- 3.) front gauge bar to fit onto the front extension arms
- 4.) side squaring extension gauges in four foot increments up to 12-feet, with optional flip-type stops
- 5.) material support and cut-off return mechanism to the front of the shear
- 6.) DRO (digital read-out) powered backgauge
- 7.) NC (numerical controlled) programmable powered backgauge

The 10M14-G shear is ready for use upon uncrating -- no adjustments are required. All load bearings are steel-backed, lead impregnated, and self lubricating to provide rigid structural support, low maintenance and a long life. Overall the shear construction is of state-of-the-art heavy plate weldments that are machined with precision requirements to eliminate any need for adjustment upon its initial set-up and use. Blade clearance is factory set and adjustment, through the use of adjustment screws, is provided in the case of blade sharpening or blade replacement.

The following diagram shows the mechanical linkage as driven by the motor/brake gearbox:



10M14-G SPECIFICATIONS

Figure 1 (page 5) : Overall machine and floor mounting dimensions

Figure 2 (page 6) : Control panel with the location of the "ON/OFF" safety disconnect switch, the "PULL ON/PUSH OFF" power button, and the "CONTINUOUS CYCLE/SINGLE CYCLE/JOG" selector switch

Figure 3a (page 7) : Electrical panel layout

Figure 3b (page 8) : Electrical wiring diagram

The following are the specifications:

- | | |
|-----------------------|-------------------------------------------------|
| 1. Capacity | 14 Ga. mild steel
18 Ga. stainless steel (*) |
| 2. Shear width | 0-121.25 inches |
| 3. Shear depth | 0-24 inches |
| 4. Table depth | 15 inches |
| 5. Motor HP | 5 HP at 1700 RPM |
| 6. Cycle rate | 32 stroke per minute |
| 7. Standard voltages | 208/230/460 VAC, 3 PHASE, 60 HZ |
| 8. Approximate weight | 5500 lb. |

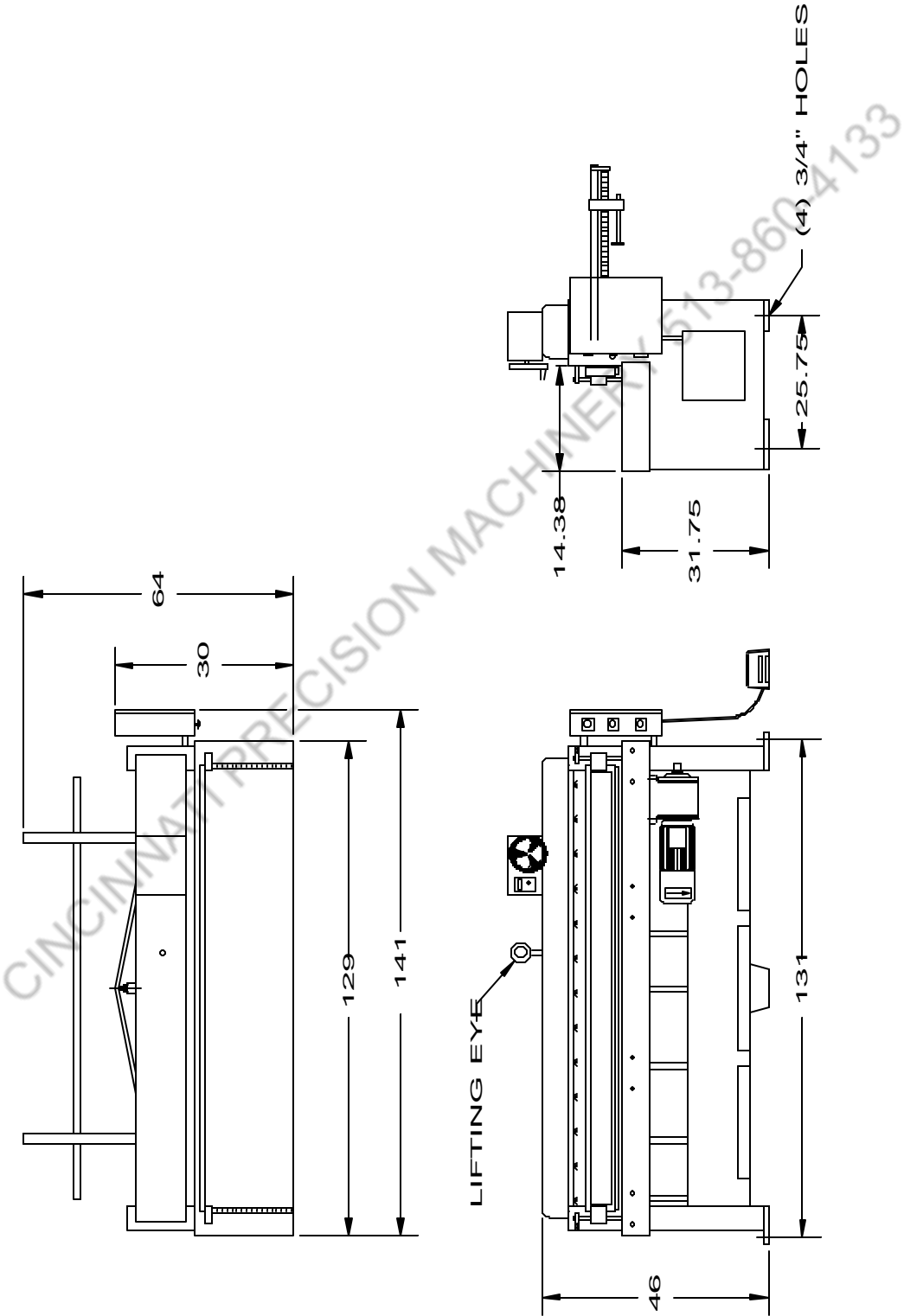
* Roper Whitney of Rockford, Inc. recommends the use of high carbon/high chrome blades for shearing stainless steel in production quantities. Note, that these high carbon/high chrome blades are standard on all 10M14 shears.

For more information contact the factory at (815) 962-3011.

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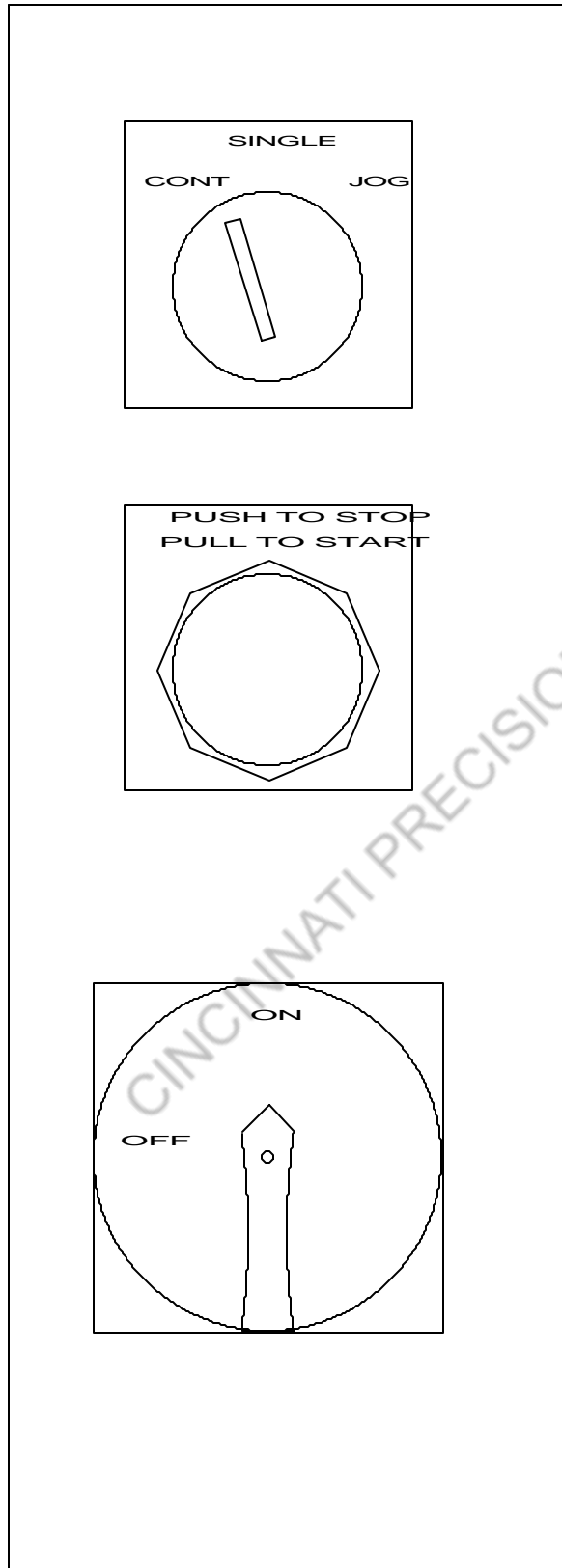
10M14-G PHYSICAL DIMENSIONS

Figure 1



OPERATOR'S CONTROL PANEL

Figure 2



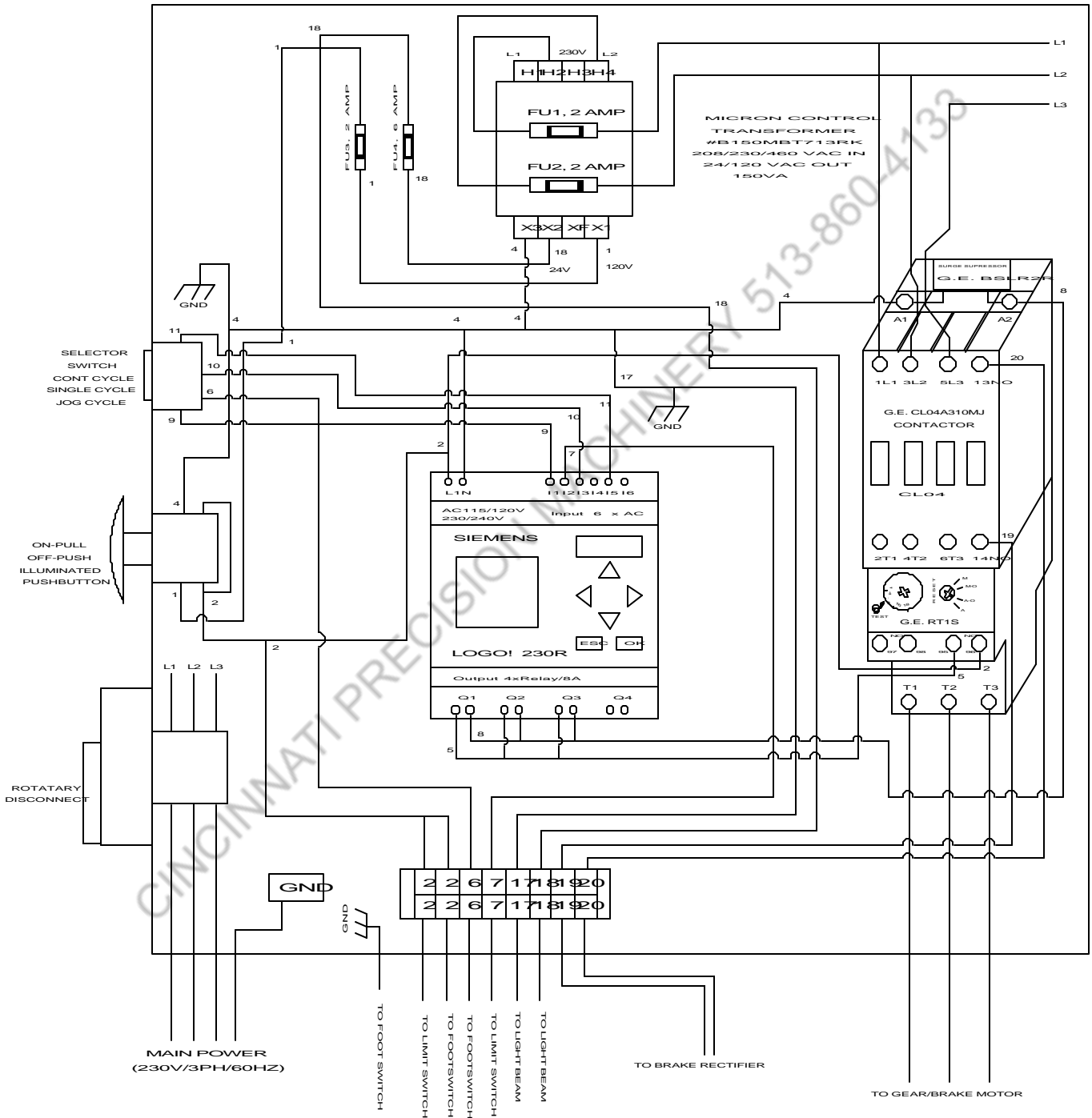
MODE OF OPERATION:
CONTINUOUS, SINGLE,
OR JOG ACTION SHEARING

PULL: TURN ON MACHINE
(ILLUMINATED RED WHEN ON)
PUSH: TURN OFF MACHINE
PUSH: EMERGENCY STOP

3-PHASE ELECTRICAL
POWER DISCONNECT SWITCH

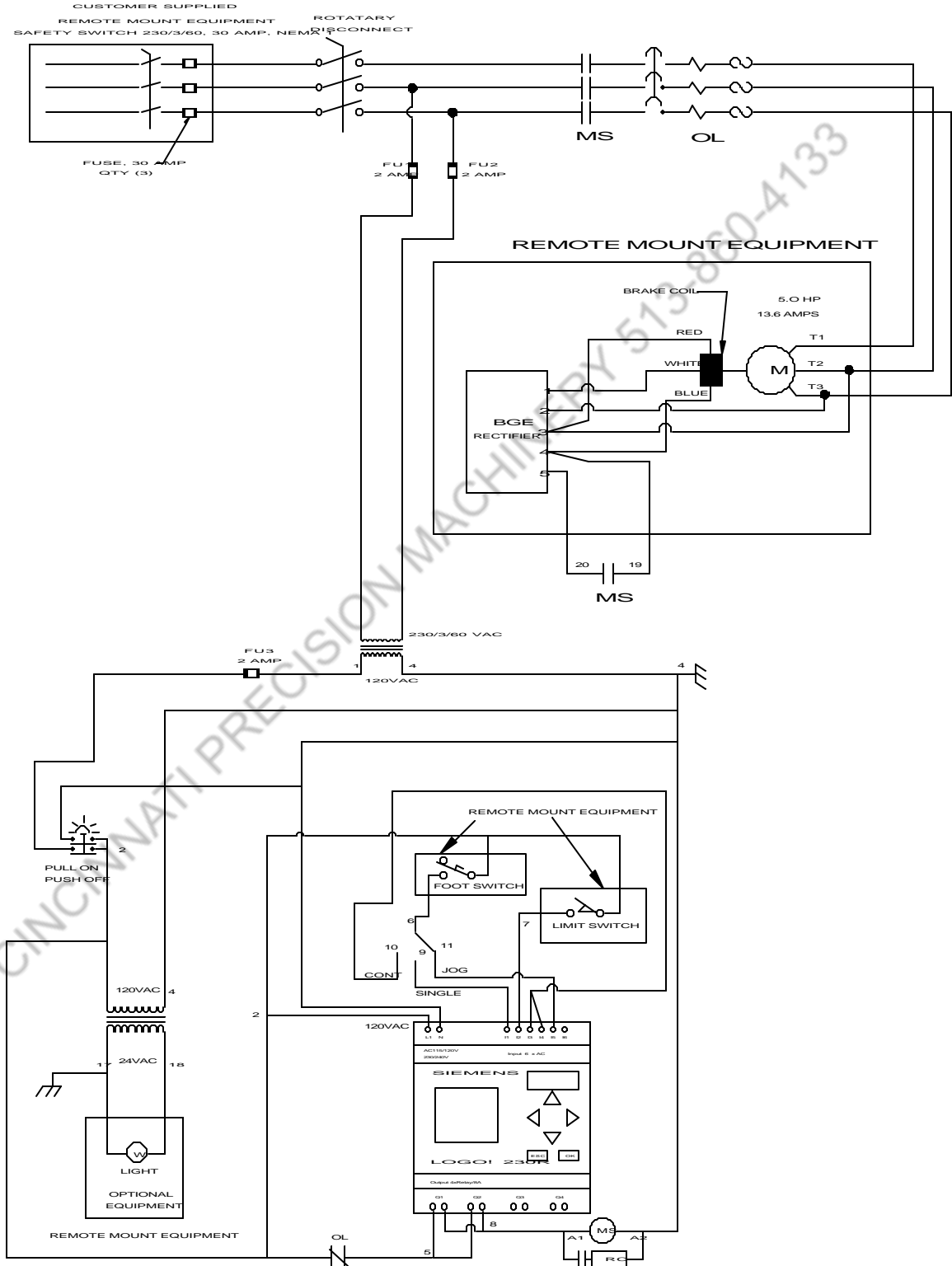
ELECTRICAL PANEL LAYOUT

Figure 3a



ELECTRICAL WIRING DIAGRAM

Figure 3b



ROPER WHITNEY of ROCKFORD, INC.
SAFETY RULES --- 10M14-G SHEAR

1. WARNING:

Electrical Danger -- Misuse or improper installation of machinery connected to a source of electricity may result in accidental shock that could cause injury or death. Installation must conform to National Electric Code (Article 250 - Grounding, etc.)

Electrical connections must be made by a trained and qualified electrician. Electrical characteristics shown on motor plate and control panel must match the power source; and all electrically powered equipment must be grounded.

2. WARNING:

Mechanical Danger -- Do not adjust the holddown; it is factory set for 3/16 inch gap and acts as the hand-guard. Do not exceed the work-piece material capacity -- otherwise serious damage will occur with your shear.

3. Machine to be operated by authorized personnel who have been trained by their supervisor with the working and safety features of the machine, and by reading and understanding the Operator's Manual.

4. Do not operate shear without reading this Operator's Manual and without proper supervisory instructions.

5. Perform all installation and set-up operations before applying power for electrical start-up.

6. Never operate machine with any guard removed; i.e., all required guarding to be installed and effective.

7. Never leave machine on or running unattended. When not in use, turn off all electrical power.

8. Never adjust machine with power on.

9. Avoid accidental start-up.

10. Do not use machine if servicing is required.
11. Use safety glasses and required protective tools.
12. Keep work areas clean and in proper order.
13. Be alert to all potential hazards.

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INSTALLATION

RECEIVING

Immediately upon receiving the 10M14-G mechanical shear, check it very carefully for damage or loss of parts in transit. Report any loss or damage to the delivering carrier promptly to insure proper handling of your claim. Also contact your Roper Whitney of Rockford Dealer. Prior to uncrating your 10M14-G shear, read the instructions to remove and lift the shear. Note the "red" instruction tag attached to the lifting eye.

WARNING: Do not lift the shear with a "fork-truck" at any point on the shear structure, because serious damage will occur to the shear. The only permissible procedure is to lift at the ram by an "overhead sling" connected to an overhead crane or overhead lift of a "fork- truck". The "overhead sling" must be connected to the lifting ring which is passed through and bolted in position onto the ram assembly.

WARNING: Remove lifting ring after lifting, positioning, leveling and anchoring the shear to the floor is completed.

DO NOT OPERATE THE SHEAR WITH LIFTING RING INSTALLED!

LEVELING

WARNING: Shear must be removed from the shipping skid, and must be anchored securely to the floor. See lifting procedures of previously discussed Receiving Section. Reasonably level shear by referencing the table top in the length and depth directions. Leveling is accomplished with screws (owner supplied) installed in tapped 1/2-13 holes adjacent to each mounting hole.

CLEANING

WARNING: Machine electrical power must not be connected when cleaning transit shipment dirt. Clean machine thoroughly prior to connecting electrical power, and prior to running the shear. Despite precautions taken in preparing the shear for shipment, dirt and foreign material may accumulate on machine and other parts during transit, and can cause considerable damage unless thoroughly cleaned. It is extremely important to inspect and clean off any dirt and foreign material that may have accumulated. DO NOT attempt to blow dirt out or off with an air hose as this may force some foreign material into undesirable areas. Remove rustproofing compound with an acceptable solvent.

ELECTRICAL CONNECTIONS

WARNING:

Electrical Danger -- Misuse or improper installation of machinery connected to a source of electricity may result in accidental shock that could cause injury or death. Installation must conform to National Electric Code (Article 250) -- Grounding, etc.

Electrical connections must be made by a trained and qualified electrician. Electrical characteristics shown on motor plate and control panel must match the power source; and all electrically powered equipment must be grounded.

A fusible electric "disconnect" panel box must be installed for the line incoming three-phase electrical power. **CAUTION:** Motor direction must match the motor arrow. See Figure 4, below. Switch any two single-phase leads to reverse the motor rotation -- **WARNING:** Incoming three-phase electrical power must be turned off at the fusible "disconnect" panel box before reversing leads to reverse the motor direction.

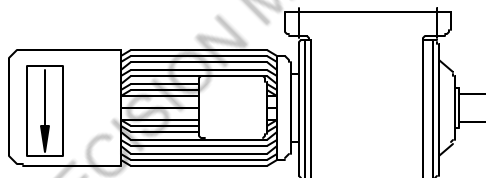


Figure 4

MAINTENANCE

The 10M14-G shear requires a minimum maintenance schedule. The rotating bearings are self-lubricating and require no maintenance. These are the bearings associated with the mechanical linkage pin connections, and the bearings between the actuator shaft and legs. The ram gib-guide bearings are made from bearing bronze, and have grease-pockets packed with bearing grease at the Factory. These are long-life bearings; however, if a problem occurs consult the Roper Whitney of Rockford, Service Department. The motor gear-box is grease packed and requires no maintenance.

CAUTION: The backgauge mechanism will require periodic oiling with standard machine lubricating oil, as needed, to insure smooth actuating.

OPERATING INSTRUCTIONS

WARNING -- Never operate, install blades, or perform maintenance work on your shear without proper supervision, instruction and without first reading and understanding the Operating Instructions in this manual.

NEVER OPERATE SHEAR WITH LIFTING EYE INSTALLED! REMOVE THE LIFTING EYE BEFORE OPERATING SHEAR!

This shear has been inspected and tested at the factory to cut full length stock of capacity gauge. **DO NOT EXCEED SHEARING CAPACITY LIMITS ON ANY LENGTH OF STOCK.** The shear is shipped with the blades properly adjusted, thus your shear is factory-set to shear the capacity materials. Refer to page 2 for the machine capacities.

CAUTION: Electrical connection must be made by a qualified electrician.

WARNING: Electrical characteristics shown on motor plate and control panel must match the power source; and electrically powered connections must be grounded. A fusible electric "disconnect" panel box must be installed for the line incoming three-phase electrical power.

CAUTION: Motor direction must match the motor arrow. See Figure 4. Switch any two single-phase leads to reverse the motor rotation.

WARNING: Incoming three-phase electrical power must be turned off at the fusible "disconnect" panel box before reversing leads to reverse the motor direction.

Operating Procedure:

A. Turn on electrical power by first switching MAIN disconnect to "ON" and then pulling start button -- see Figure 2. Be aware that the motor is not turned on -- but power is noted by the illuminated red light.

B. Set selector switch to either single cycle, continuous cycle mode or jog mode.

C: Set backgauge to desired width of cut.

D. Position work-piece sheet -- to insure square cut, use care to locate sheet positively against table side squaring gauge and backgauge stop.

E. Depress the foot-switch to shear the workpiece sheet. Foot-switch must remain depressed when in CONTINUOUS mode.

PLEASE READ THE FOLLOWING!!

WARNING: The 10M14-G shear is designed as a single action shear, and each stroke requires a repeat foot switch actuation. Once the foot switch has been tripped, the shear will make one complete stroke unless the stop button is pushed during the stroke.

USE EXTREME CAUTION: If the CONTINUOUS CYCLE mode is selected, the 10M14-G shear will continue to cycle as long as the operator maintains the footswitch in a depressed mode. If the operator releases the footswitch, the ram will finish its current cycle and stop in its up position. Pressing the stop button, at any time, will stop the ram.

NOTE: To reset after hitting the STOP push-button during a cycle, pull the START button out and press the footswitch.

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BLADE REPOSITIONING/REPLACEMENT PROCEDURE

The upper and lower blades are two edge blades that can be rotated 180° to provide a new cutting edge. Either when rotating blades or replacing them after regrinding, a procedure is applicable:

1. Refer to Figure 5.

2. **WARNING:** Turn off 3-phase incoming electrical power at the fuse-disconnect box and turn the MAIN disconnect to OFF before performing any blade service maintenance.

3. **CAUTION:** Ram must be in top rest position.

4. Set backgauge to extreme "out" position.

5. Remove holddown assembly (item 4) --

- a. Remove two 5/16 x 2-1/2 socket head cap screws (item 2) at each end of the holddown assembly, and remove the two rod holders (item 1).
- b. Remove two hex nuts (item 3) -- one at each end of the holddown assembly (item 4).
- c. Thread a lifting-eye (3/8-16 thread) into the center of the holddown assembly, (item 4). Using an overhead or portable lift crane gently lift holddown assembly upward off of rods and set safely aside. The upper blade area is now exposed for servicing.

6. Remove and reposition upper blade (item 7) --

- a. Use blocks of wood between upper blade and table blade (one piece at each end) to prevent blade from dropping.
- b. Remove all blade bolts (21 each, item 8) from upper blade (item 7) by working from ends to the center.

CAUTION: Wear gloves when handling blades and use care to prevent damage to blades. Avoid all contact with all other materials except wood when blades are removed from shear.

- c. Remove upper blade (item 7) and rotate forward 180°.
- d. With new cutting edge in position, replace all bolts (21 each, item 8), and work from center to the ends. Use a wood "pry-bar" to seat top of blade tight to ram blade seat.
- e. Tighten all bolts, working from center to the ends, very securely -- recommended tightening bolt torque of 40 ft/lb.

7. Remove and reposition lower blade (item 6) --

- a. Remove all blade bolts (21 each, item 5) from lower blade (item 6).

CAUTION: Wear gloves when handling blades and use care to prevent damage to blades. Avoid all contact with all other materials except wood when blades are remove from shear.

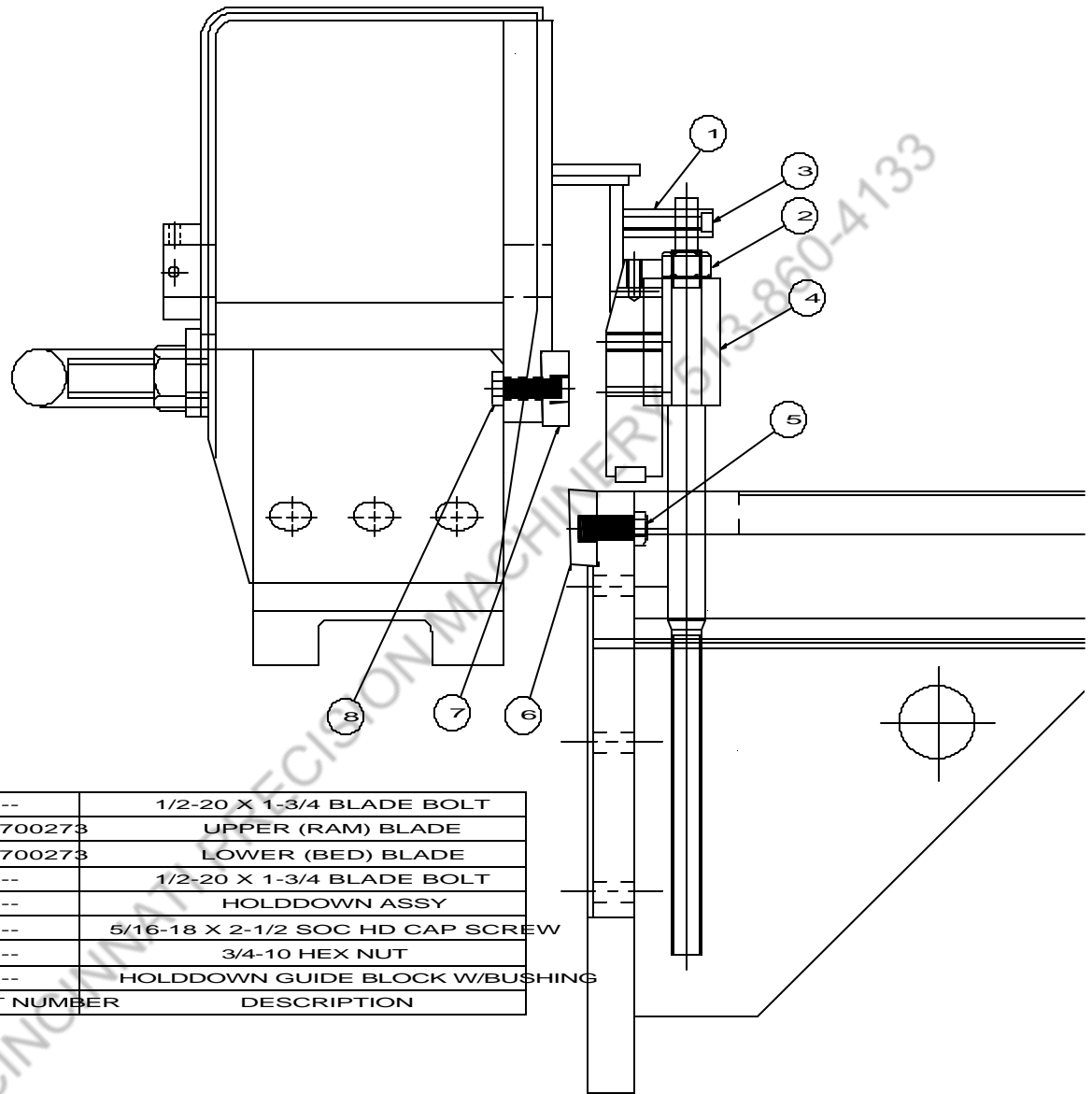
- b. Remove lower blade (item 6) and rotate forward 180°.
- c. With new cutting edge in position, replace all bolts (21 each, item 5), and work from center to the ends.

CAUTION: If blade is resharpened, shims may be required to position blade properly with respect to top of table.

Use a wood "pry-bar" to seat blade to bed/table blade seat, and work from center to the ends when tightening the bolts. Recommended tightening bolt torque of 40 ft/lb. .

8. Replace holddown after blade replacement in reverse order of disassembly per the procedure of step 5 of this section. Holddown must be replaced before any blade clearance adjustment is performed.

9. **WARNING:** Adjust blade clearance prior to shearing any material. Failure to do so may result in nicked blades or poor quality cuts. See the following section in this manual that defines the proper procedure.



8	21	----	1/2-20 X 1-3/4 BLADE BOLT
7	1	350700273	UPPER (RAM) BLADE
6	1	350700273	LOWER (BED) BLADE
5	21	----	1/2-20 X 1-3/4 BLADE BOLT
4	1	----	HOLDDOWN ASSY
3	4	----	5/16-18 X 2-1/2 SOC HD CAP SCREW
2	2	----	3/4-10 HEX NUT
1	2	----	HOLDDOWN GUIDE BLOCK W/BUSHING
ITEM	QTY	PART NUMBER	DESCRIPTION

Figure 5

BLADE CLEARANCE ADJUSTMENT PROCEDURE

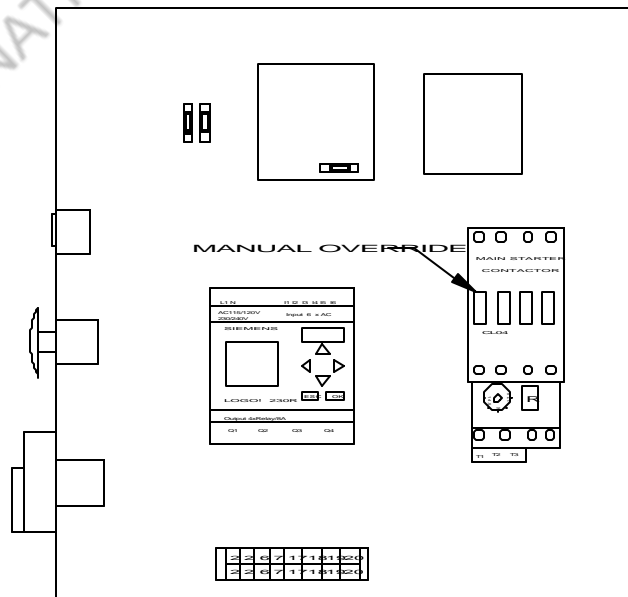
Blade adjustment is factory set to handle rated capacity materials and other various materials of varying thickness. When a blade is replaced, re-positioned or re-sharpened, though, the cutting clearance needs to be checked and adjusted to make sure that the blades do not interfere, and/or an acceptable sheared-edge is obtained.

WARNING: The electrical power must be turned off to measure the clearance.

Blade clearance is measured at the cutting edge between the upper and lower blades with a machinist feeler-gauge. It is extremely important that this important measurement be made only at the exact point which the blades cross! The blade clearance is .003 inch at each end and .001 inch in the middle. Lower the upper blade incrementally along the length of the lower blade by pushing the black manual over-ride button on the main starter contactor. Check the blade clearances every 12 inches or every bolt hole.

Turn the control box off by pushing the START/STOP button (red light is now off). Open the control-box door and push the black button on the motor contactor. See diagram below.

CAUTION: USE A NON-CONDUCTING ROD SUCH AS WOOD OR PLASTIC.



BLADE CLEARANCE ADJUSTMENT PROCEDURE, cont.

The blade adjustment is made with the ram adjustment screws as follows -- refer to Figure 6a.

1. *Warning:* Always set a larger clearance prior to running ram downward after the blades have been replaced, repositioned or re-sharpened. They must not hit! And holddown must be installed while performing the adjustment procedure.
2. Begin on the right hand side. Bring the ram down, as if checking the blade clearance, until the blades, items 1 and 2, just pass each other.
3. Loosen the (3) main bolts, item 5 (1-1/8" socket or wrench).
4. Increase blade clearance by first loosening jam-nut, item 4 (3/4" wrench) and then tightening the adjustment screw, item 3 (5/8" wrench).
5. Decrease blade clearance by first loosening jam-nut, item 4 and then loosening the adjustment screw, item 3.
6. Tighten jam-nut, item 4, when proper clearance is achieved. Finish by retorquing the (3) main bolts to 200 ft-lb.
7. "Jog" the ram down all the way. Repeat steps 3-6 on left hand end.
8. Bring the ram half way up. Increase clearance in the middle by loosening tension bar nut. Decrease clearance by tightening nut. See Figure 6b.
9. Recheck clearance on each end.

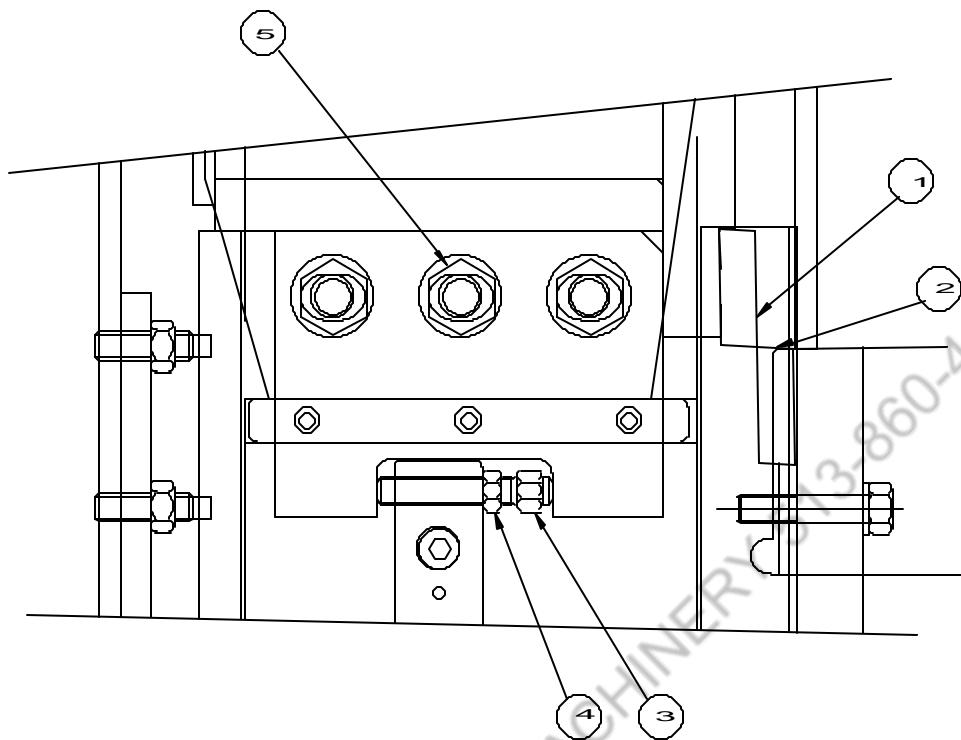


Figure 6a

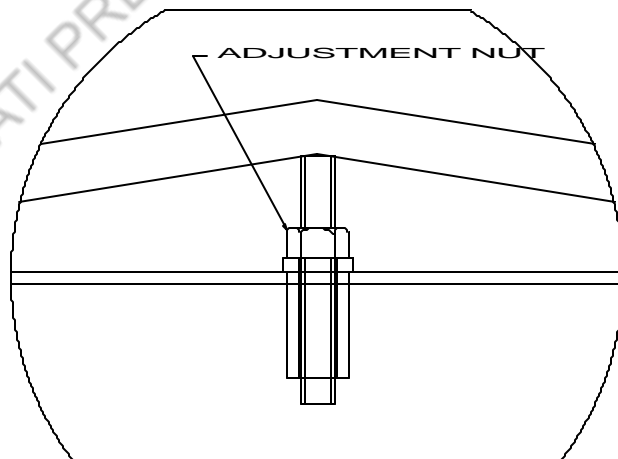


Figure 6b

SIDE EXTENSION SQUARING GAUGES

Part No. 273940042

The side extension squaring gauges are in 4-foot sections that can be assembled, with multiples, in 8 or 12 foot total gauge lengths. For most applications the four-foot section will be adequate. The four-foot sections are packaged in kit form with applicable scales for dimensional extension. The following kits are as follows:

1. Initial 4-foot, order P/N 273940042
2. Build-up 8-foot, order P/N 273940043
3. Build-up 12-foot, order P/N 273940044

Note that 8-foot length needs first two part numbers, and 12-foot length needs all the above part numbers.

An optional flip-type stop for the side extension gauges is available. It can be ordered under P/N 273940046.

The extension gauge can mount to the shear table at either the right or left side. A leg is supplied to support the end of the gauge. There may be some manufacturing variations that will require adjustment of the scales, gauge height and squares. Allowances are provided for these adjustments.

For specific assembly instructions, refer to the instruction sheets enclosed with the kits.

FRONT EXTENSION ARMS

Part No. 273940006

The front extension arm kit includes two cast arms, T-bolts and nuts, and a 8-foot gauge bar. The arms are connected to the table with 7/16-14 machine bolts and lock washers (included in the kit), by using the two inner set of screw holes on the table front face.

LIGHT BEAM ASSEMBLY

Part No. 273940005

The light beam assembly fits onto the legs and is held with 1/4-20 screws. Electrical connections are made through the control box wall, and connected to terminal strip as shown in Figure 7.

WARNING: The electrical connections must be properly grounded by the Green wire, and the 24 volt AC black and white wires must be appropriately connected to the box per Figure 7.

When the electrical power is switched on at the Operator's control panel, the light-beam will automatically turn on. Thus, no special switching nor attention is required to turn on the light beam assembly.

Replacement 24V bulbs can be ordered under P/N 660000223.

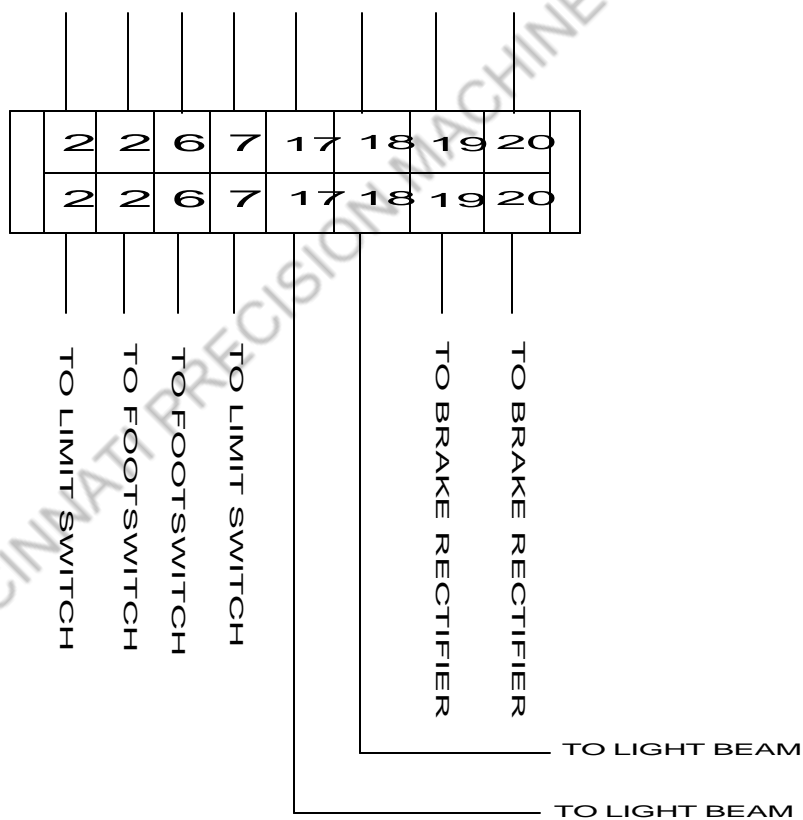


Figure 7

**REAR OPERATED-MANUAL
BACKGAUGE INSTRUCTIONS**

Part No. 273940002

The backgauge, commonly called a parallel gauge, will travel 24 inches by rotating the handwheel on the right hand cast carrier that's located on the carrier rack-rods. Holding vertical knobs are used to lock the backgauge in position. These knobs each are located on the cast carriers.

**FRONT OPERATED MANUAL
BACKGAUGE INSTRUCTIONS**

Part No. 273940000

The backgauge will travel 24 inches by rotating the handwheel located top of the ram. Adjacent to the handwheel is a mechanical counter which is calibrated in inches. The counter's reading is in absolute position of the backgauge from the cutting edge.

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FRONT MATERIAL RETURN PART NO. 273940004

The front material return is an optional item that, when shipped as separate components, can be assembled to the shear according to the following procedure:

1. Refer to Figure 8.

2. Attach pusher bar assemblies (items 1 & 2) to pre-tapped holes in bottom of ram using (4) spacers (item 3), (4) 3/8-16 x 2-1/2 long socket head cap screws, (4) 3/8 dia. flat washers, & (4) 3/8 dia. split lock washers.

Note: Pusher bar assembly (item 1) with shortest threaded push rod **must** be installed on left end of ram **only!**

See Figure 8.

3. Attach left & right side guard frames (items 5 & 6) to pre-tapped holes on shear legs using (8) 5/16-18 x 1" long socket head cap screws (item 7), (8) 5/16 dia. flat washers, & (8) 5/16 dia. split lockwashers.

Note: Left side guard frame (item 6) has detent plunger assembly (item 14) attached.

4. Attach back guard (item 8) to left & right side guards (items 5 & 6) using (4) 5/16-18 x 2-1/2" hex head machine bolts (item 9), (4) 5/16-18 nuts, (4) 5/16 dia. flat washers, and (4) 5/16 dia. split lockwashers.

5. Attach the material return frame assembly (item 10) to pre-drilled holes in left & right side guards using (2) 5/16-18 x 2-1/4 socket head cap screws (item 16), (2) bushings (item 12), (4) 5/16 dia. flat washers, (2) 5/16-18 x 1-3/4 socket head cap screws (item 11), (2) 5/16 dia. flat washers, (2) 5/16 dia. split lockwashers, (2) 5/16-18 nuts.

Note: Make certain bail rod spacer tube (item 17) is resting on **top** of shear material chute after assembly.

6. Refer to inset on Figure 8. Rotate torsion spring (item 18) toward back of machine until square shaped end is secured under return frame tube (item 19). Slip round tubing provided (item 13) over protruding straight end of torsion spring and continue bending toward the back of machine until it is beyond spacer (item 12). At this point shift end of spring behind spacer (item 12) and release pressure until protruding end of spring bears on spacer (item 12). Remove round tubing and repeat process on torsion spring at other end of material return frame (item 10) when finished, store tubing for future use.

7. Adjust pusher rod assemblies (item 20 & 21) down until they are in firm contact with bearings (item 15). Tighten all nuts at this position being sure that pusher plates (items 20 & 21) are parallel with left & right side guard frames (item 5 & 6).

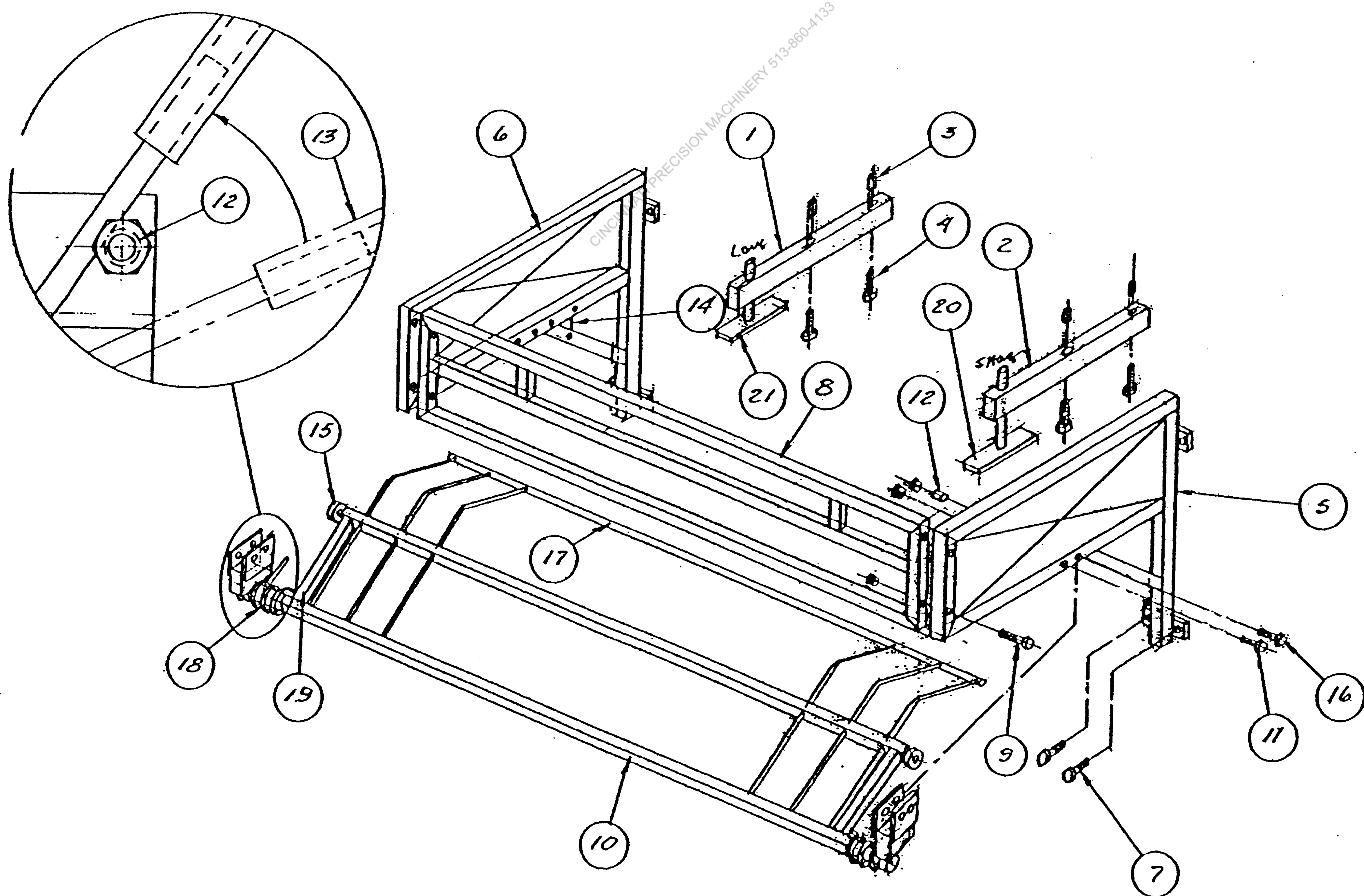
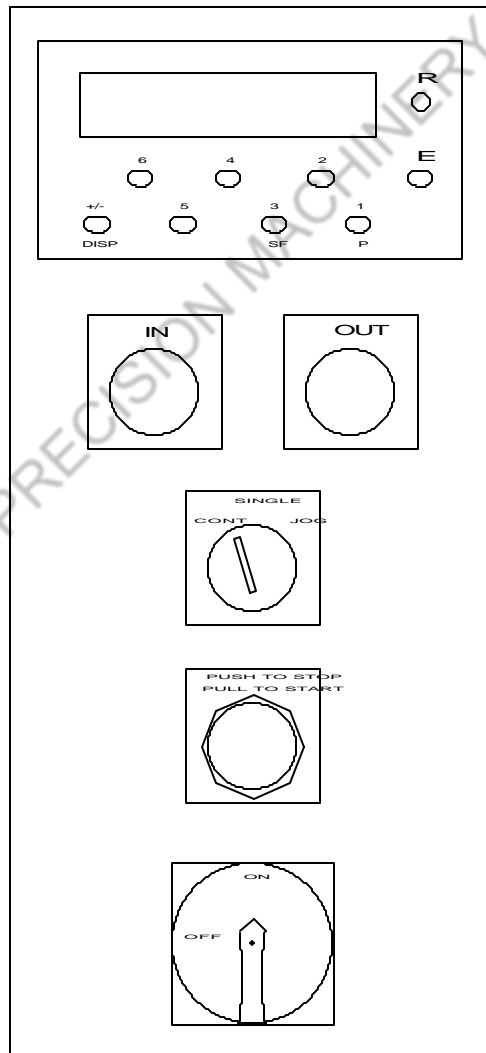


Figure 8

DRO BACKGAUGE PERFORMANCE SPECS

1. Power feed backgauge for quick in and out positioning.
2. Final position is set with hand wheel.
3. Large 6-digit LED display set at factory to read in inches. Metric display is possible.
4. 24" (in) backgauge travel.
5. Forward (IN) and reverse (OUT) over-travel switches to prevent backgauge crash.
6. Digital readout can be reset at anytime.
7. Guarding to protect backgauge assembly.



USING THE DRO BACKGAUGE

1. To operate the backgauge:

- a. Press and hold the “IN” button located on the control box to move backgauge in.
- b. Press and hold the “OUT” button located on the control box to move backgauge out.

NOTE: FORWARD AND REVERSE OVER-TRAVEL SWITCHES ARE INSTALLED TO PREVENT BACKGAUGE CRASHES.

- c. Use the jog buttons to power the backgauge close to the desired position. Then reach the final position by using the handwheel located on the backgauge drive motor. When moving backgauge out to a position always remember to take out any backlash by first moving past the final position and then coming back in. This will result in the most accurate gauging.

WARNING: KEEP HANDS AWAY FROM HANDWHEEL WHEN BACKGAGE IS MOVING.

2. To “zero” or reset the digital read out:

Manual reset to zero is accomplished by pressing the front panel button marked “R”. Also, be sure the backstop is all the way “home” to insure accurate gauging after resetting. Backgauge is considered “home” when the backstop is flush against the lower blade.

3. To adjust the Scale Factor:

The Scale Factor, “SF”, has been preset at the factory to obtain optimum accuracy. However, due to physical variances some adjusting may be necessary once the machine is set-up for use.

NOTE: The parameter programming has been disabled by a jumper wire between the “PGM. DIS.” terminal (#11) and the “COMM.” terminal (#9), located at the rear of the Red Lion Gemini counter.

NOTE: For convenience the terminal strip pulls away from the counter

NOTE: The Scale Factor or “SF” cannot be changed without first removing this jumper.

Pressing the “SF” button will display the current Scale Factor value. To change the value, press the push button directly below the particular digit until the desired value is obtained.

When finished press the “E” button to accept the new Scale Factor.

Adjust the “SF” value only slightly up or down and check the accuracy of the backgauge after each change. Continue adjusting “SF” value slightly until desired accuracy is achieved.

NOTE: *Value for “SF” should fall in the range of $0.4800 < SF < 0.5200$*

NOTE: Replace the jumper wire when finished.

DRO PROGRAMMING PARAMETERS

NOTE: All parameters for the GEMINI 1000 have been factory programmed and should not need changing or adjusting.

1. To access a parameter, press the push buttons that correspond to the parameter number code.
2. On the left hand side of the display will be the number code that was selected, and on the right hand side will be the value for that parameter.
3. To change the parameter value, press the push button (s) corresponding to the value desired, then press “E” to enter this value and return to the present counter display.

NOTE: The parameter programming has been disabled by a jumper wire between the “PGM. DIS.” terminal (#11) and the “COMM.” terminal (#9), located at the rear of the Red Lion Gemini counter.

NOTE: For convenience the terminal strip pulls away from the counter

NOTE: Programming parameters cannot be changed without first removing this jumper wire.

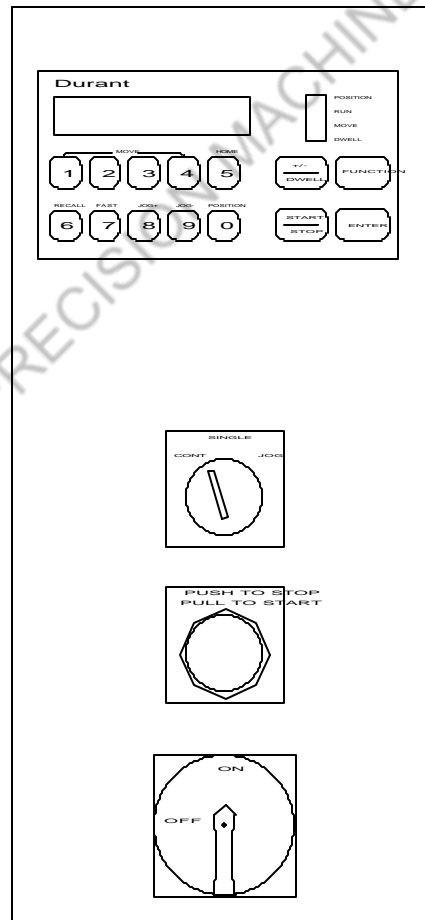
PRESET PARAMETER VALUES FOR DRO

<u>NUMBER CODE</u>	<u>PARAMETER VALUE</u>	<u>PARAMETER FUNCTION</u>
41	1	Sets unit to act as a counter
43	5	Quadrature counting of encoder
44	2	Double-edge counting
45	1	Scale multiplier of 1
46	-4	Decimal point position 000.000
51	1	Manual reset to zero
52	3	Terminate at manual reset
61	4	No right hand dummy zeros
66	1	Enable use of reset.

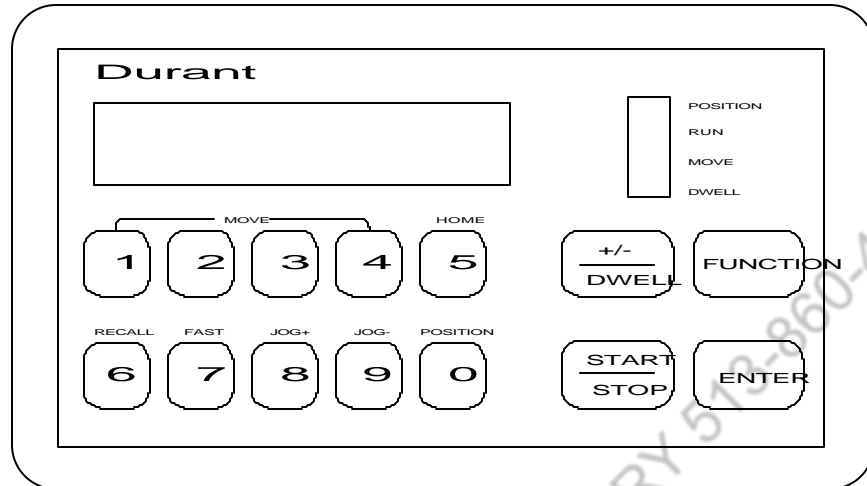
The "SF" parameter should be set to a value of 0.5000 or a value within its working range

NC GAUGE PERFORMANCE SPECS

1. 5 user-programmable preset moves
2. Large 6-digit LED display set at factory to read in inches. Metric display is possible.
3. High speed of 88 ipm and slow speed of 21.5 ipm
4. 24" (in) backgauge travel
5. Positioning either automatically or manually
6. Forward (IN) and reverse (OUT) over-travel switches to prevent backgauge crash.
7. Programmable decimal point
8. Programmable backlash
9. Programmable high and low limits
10. Optional password protection
11. Guarding to protect backgauge assembly.



PROGRAMMING THE NC BACKGAUGE

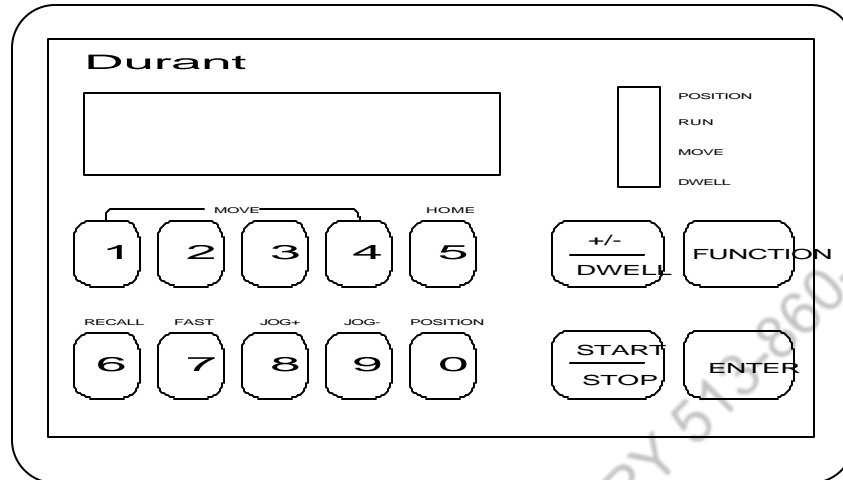


There are 5 Programmable Presets which are buttons 1-5.

To set the #1 Preset:

1. Push the "1" button.
2. Push the "ENTER" button. The display shows the current value.
3. Key in desired position.
4. Push "ENTER" button again to store value. If the number falls out of the pre-programmed range then the number will flash on the screen. Repeat until value is in the correct range.
5. Follow steps 1-4 for remaining 4 presets.
6. Push "0" or "POSITION" button to display current position.

USING THE NC BACKGAUGE

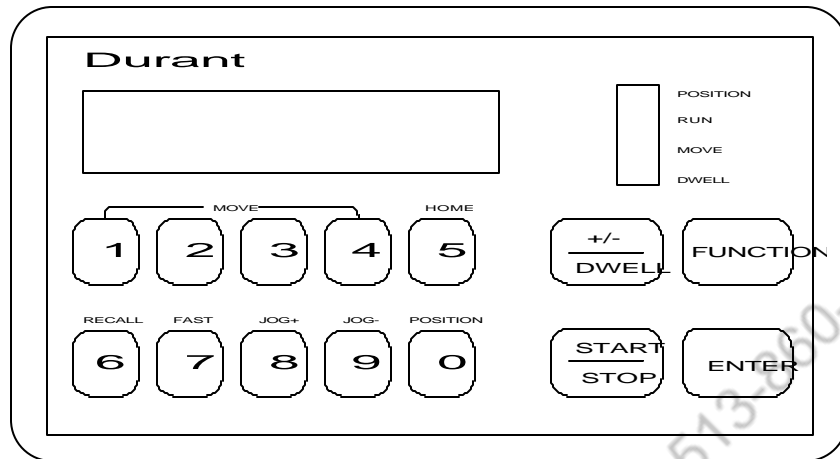


There are 5 programmable presets and also jog controls both "in" and "out" in either slow or fast speeds.

To jog the backgauge:

1. Push the "0" or "POSITION" button to verify that the current position is being displayed.
2. Pushing the "8" or "JOG+" button will cause the backgauge to move "out" or away from the operator in the slow speed mode.
3. Pushing the "9" or "JOG-" button will cause the backgauge to move "in" or towards the operator in slow speed mode.
4. Pushing the "7" or "FAST" button at the same time as either the "JOG+" or "JOG-" buttons will cause the backgauge to move in the direction chosen in fast speed mode.

USING THE NC BACKGAUGE



To move to the #1 Preset:

1. Push the "1" button.
2. Display shows what is programmed into "1".
3. Push the "START"/"STOP" button to start movement.
4. Backgauge will move to desired position.
5. If the "START"/"STOP" button is pushed before the destination is reached then the backgauge will stop at its current position. If pushed again, then the backgauge will proceed to the value set in preset "2". See 7. below.
6. To move to any of the other 4 presets follow steps 1-4 above but press the desired preset button instead of "1".

**NOTE: The "5" preset is not really a "HOME" preset.
It can be programmed just like the other presets 1-4.**

7. By pushing the "START"/"STOP" button without a specified preset number, the backgauge will move to the next preset value. If preset "1" was the last command for the backgauge to go to and the "START"/"STOP" button is pushed, the backgauge will go to preset "2". If the "START"/ "STOP" button is pushed again, the backgauge will go to preset "3", etc....

INTERNAL DURANT PARAMETERS

EXTRACTING FUNCTION CODES FROM DURANT CONTROLLER

1. Hit **FUNCTION** **ENTER**. Note that all four (4) LED's are flashing.
2. Hit **FUNCTION** **5** **ENTER**. The display will show the current value for this function code.
3. Press **ENTER**. The next code number will display briefly and then its value will remain on screen.
4. Continue pressing **ENTER** until all values are known.
5. Press **START/STOP** to exit.

CHANGING FUNCTION CODES IN DURANT CONTROLLER

1. Hit **FUNCTION** **ENTER**. Note that all four (4) LED's are flashing.
- 2a. Hit **FUNCTION** (**FUNCTION CODE**) **ENTER**. Note that all four (4) LED's are still flashing. If they are not, a password lock has been entered. The password can be displayed by pressing and holding in **FUNCTION** and **0** when power is first turned on.
- 2b. To enter password, hit **FUNCTION** **ENTER**. Enter password and hit **ENTER**. Display should show **00** and all LED's should be flashing.
3. Hit **FUNCTION** (**FUNCTION CODE**) **ENTER**. Enter new value. Accept it by pressing **ENTER**.
4. Repeat step three as necessary.
5. Press **START/STOP** to exit.

TO CHANGE CURRENT DISPLAYED POSITION

1. Hit **FUNCTION** **ENTER**. Note that all four (4) LED's are flashing.
2. Hit **FUNCTION** **65** **ENTER**. Input new current position.
3. Hit **ENTER** again.
4. Hit **START/STOP** to exit programming mode.

SHEAR

MODEL: 10M14

PARTS MANUAL

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CINCINNATI PRECISION MACHINERY 513-860-4133

10M14 SHEAR

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CINCINNATI PRECISION MACHINERY 513-860-4133

SECTION 1:

BASIC MECHANICAL

CINCINNATI PRECISION MACHINERY 513-860-4133

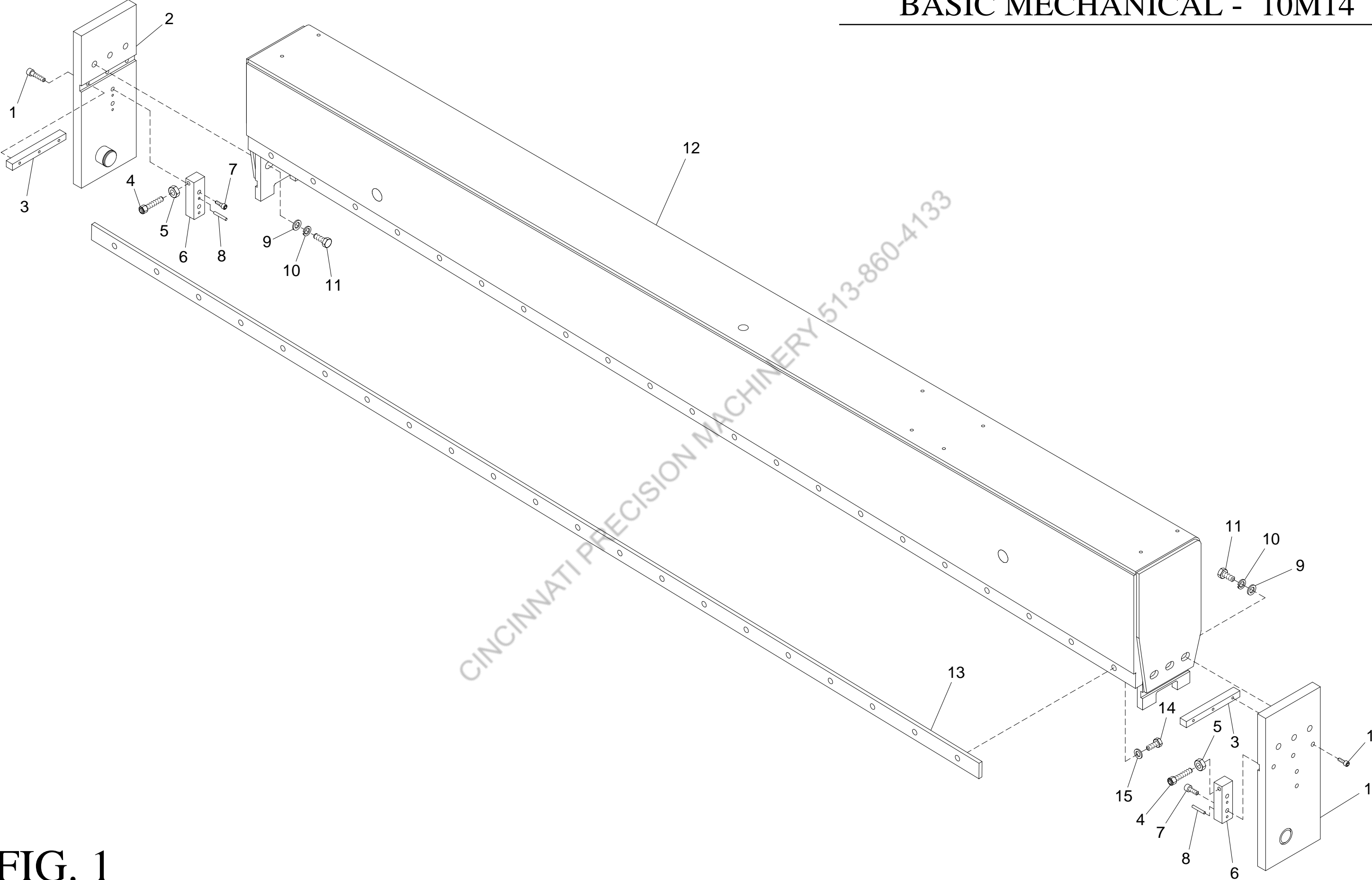


FIG. 1

RAM

ITEM	QTY	RW PART #	RW PART DESCRIPTION	ITEM	QTY	RW PART #	RW PART DESCRIPTION
1	6	611012133	5/16 X 1 SHC SCREW	9	6	678033110	3/4 FLAT WASHER
2	1	773000170	LH GIB PLATE	10	6	679033110	3/4 LOCK WASHER
3	2	773530176	KEY	11	6	603012416	3/4-10 X 2-1/2 HEX HEAD CAP SCREW
4	2	773650180	ADJUSTMENT SCREW	12	1	773610196	RAM
5	2	652023007	1/2-20 JAM HEX NUT	13	1	350700273	UPPER/LOWER HC BLADE
6	2	773180177	BLADE ADJUSTMENT BLOCK	14	21	602012277	1/2-20 X 1-3/4 HHC SCREW
7	4	611012275	1/2-13 x 1-1/2 SHC SET SCREW	15	21	679033107	1/2 LOCK WASHER
8	4	600063473	1/4 X 2 ROLL PIN	16	1	773000169	RH GIB PLATE

CINCINNATI PRECISION MACHINERY 513-250-4235

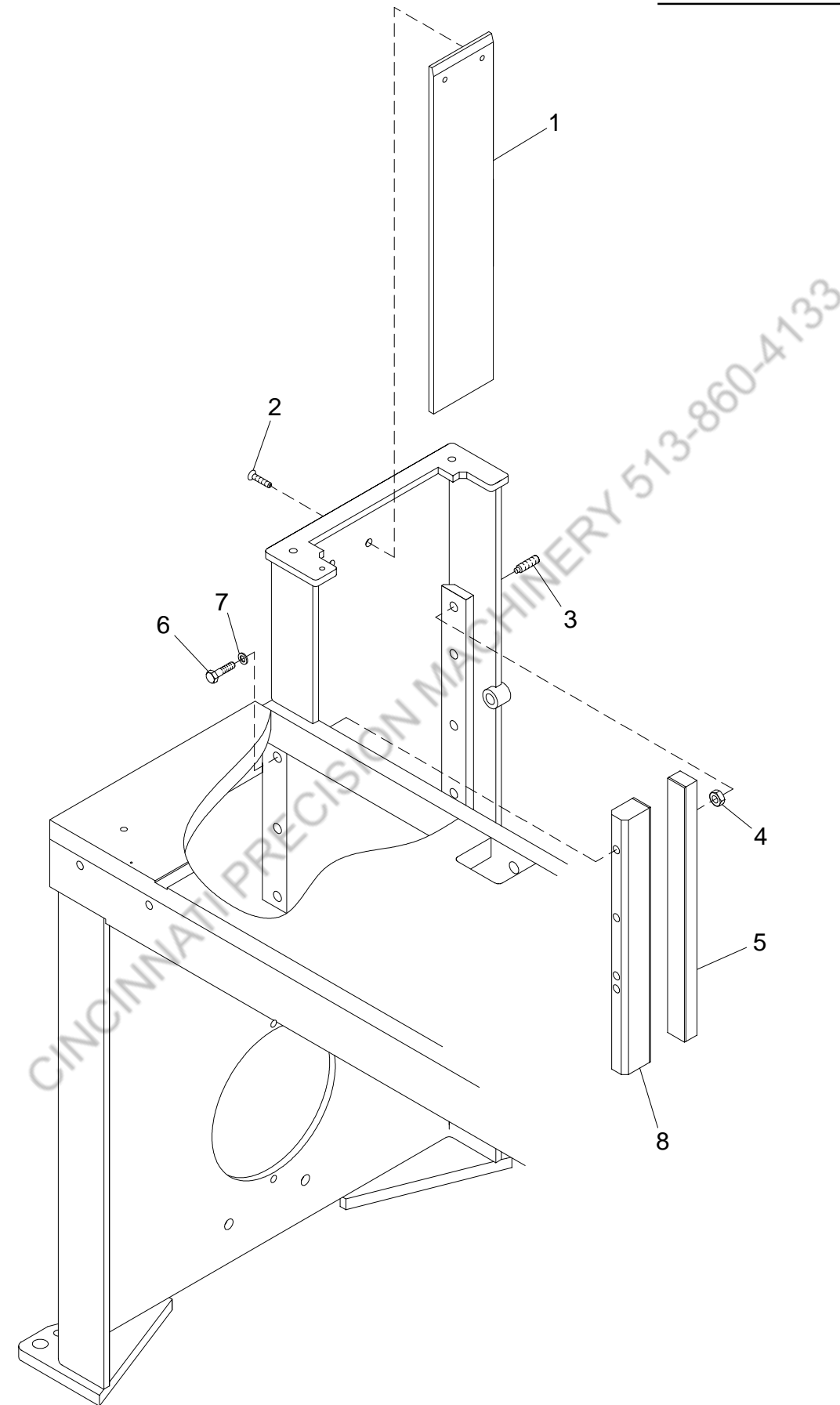


FIG. 2

RAM GUIDE

ITEM	QTY	RW PART #	RW PART DESCRIPTION
1	2	773000175	RAM END BEARING
2	4	613012173	3/8-16 X 3/4 SHF SCREW
3	8	690012660	1/2-20 X 2 FULL DOG POINT SHS SCREW
4	8	652023007	1/2-20 JAM HEX NUT
5	2	773400174	ADJUSTABLE GIB ASSEMBLY
6	6	601012275	1/2-13 X 1-1/2 HHC SCREW
7	6	679033107	1/2 LOCK WASHER
8	2	773400173	FIXED GIB ASSEMBLY

CINCINNATI PRECISION MACHINERY 513-550-4133

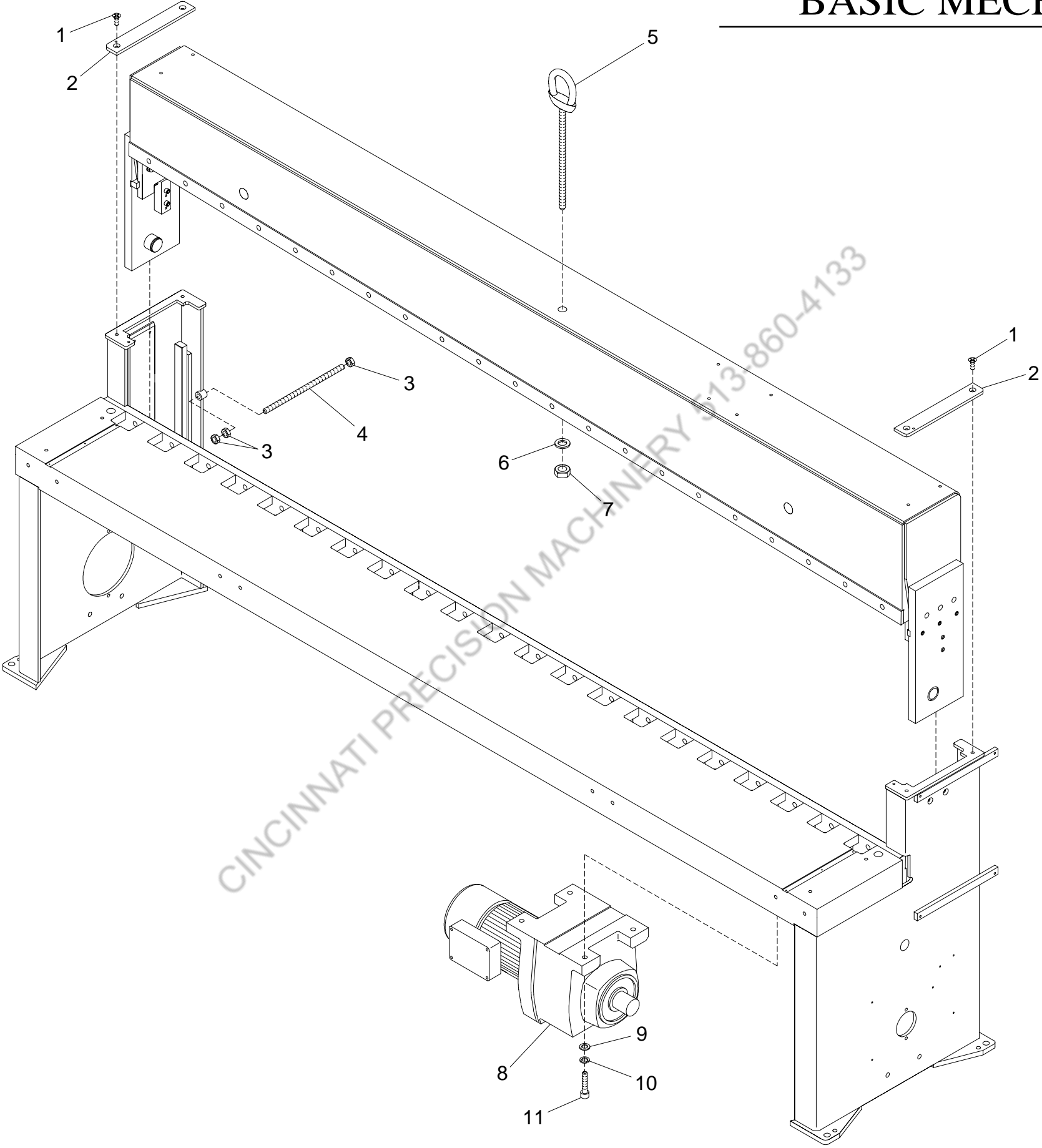


FIG. 3

RAM AND LEG

ITEM	QTY	RW PART #	RW PART DESCRIPTION
1	4	613012172	3/8-16 X 5/8 FLAT HEAD CAP SCREW
2	2	773180178	LEG TIE BAR
3	6	645023007	1/2-20 FULL HEX NUT
4	2	773030106	THREADED ROD
5	1	773000227	EYEBOLT ASSEMBLY
6	1	679033111	7/8-9 LOCK WASHER
7	1	643023011	7/8-9 HEX NUT
8	1	660011214	GEAR BRAKE MOTOR
9	4	678033109	5/8 FLAT WASHER
10	4	679033109	5/8 LOCK WASHER
11	4	601012376	5/8-11 X 3-1/4 HHC SCREW

DRIVESHAFT

ITEM	QTY	RW PART #	RW PART DESCRIPTION	ITEM	QTY	RW PART #	RW PART DESCRIPTION
1	1	773060046	LARGE BEARING PLATE	12	4	679033107	1/2 LOCK WASHER
2	5	601012175	3/8-16 X 1 HHC SCREW	13	4	643023007	1/2-13 FULL HEX NUT
3	5	679033105	3/8 LOCK WASHER	14	1	773820036	STIFFENER TUBE
4	4	601012275	1/2-13 X 1-1/2 HHC SCREW	15	1	660152638	A.B. LIMIT SWITCH
5	4	678033107	1/2 FLAT WASHER	16	2	611012065	#10-24 X 2-1/4 SHC SCREW
6	21	602012277	1/2-20 X 1-3/4 HHCS SCREW	17	1	673012659	SCREW CLAMP #AHS312A VLIER
7	21	679033107	1/2 LOCK WASHER	18	1	643023004	5/16-18 FULL HEX NUT
8	1	350700273	UPPER/LOWER HC BLADE	19	1	773060045	SMALL BEARING PLATE
9	2	773080083	SLEEVE BEARING	20	3	678033105	3/8 FLAT WASHER
10	1	773000035	ACTUATOR SHAFT ASSEMBLY	21	1	773200063	LIMIT SWITCH BRACKET
11	2	773720085	SHIM (AS REQUIRED)	22	2	600063455	3/16 X 1 ROLL PIN

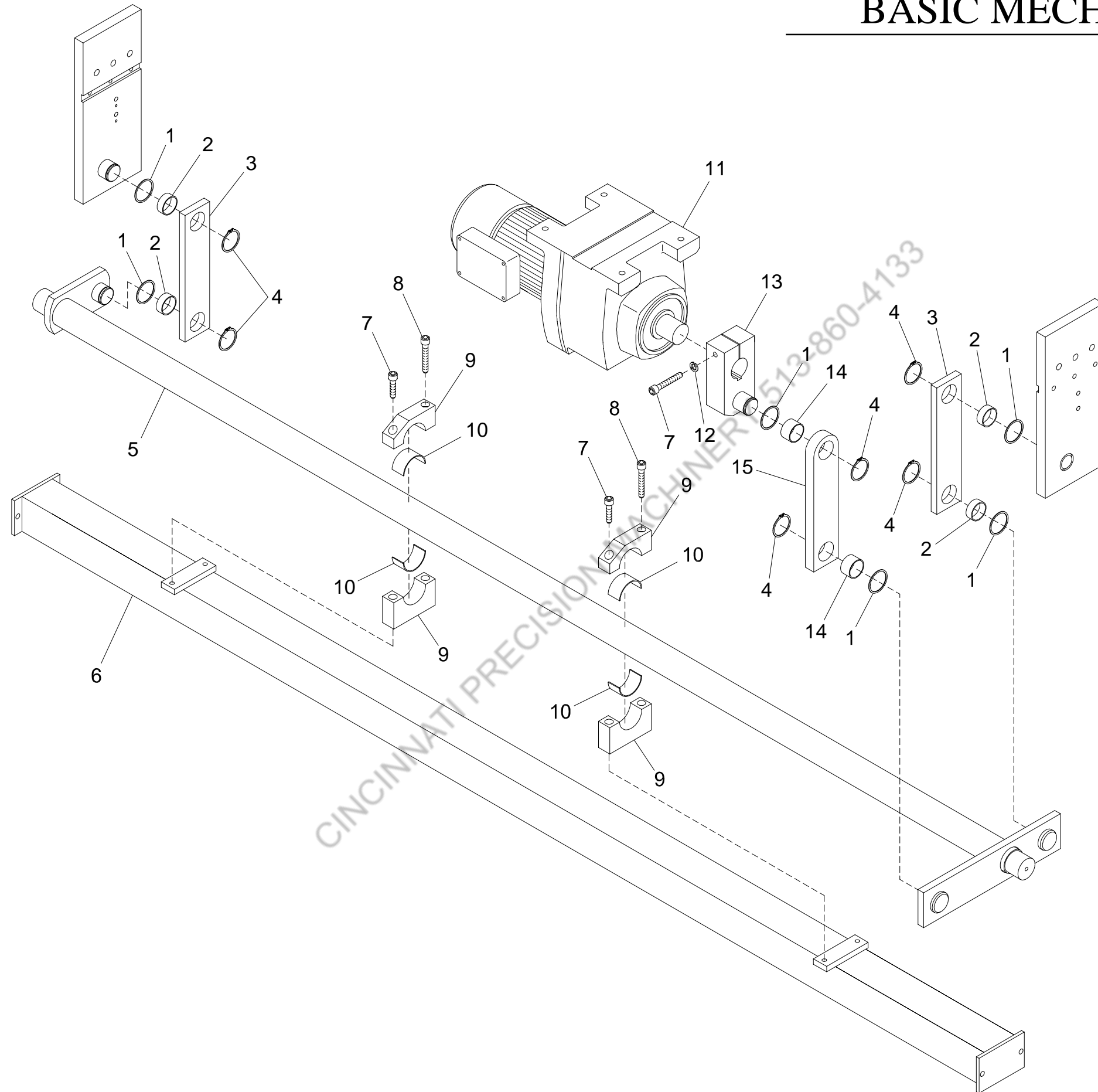


FIG. 5

DRIVESHAFT

ITEM	QTY	RW PART #	RW PART DESCRIPTION	ITEM	QTY	RW PART #	RW PART DESCRIPTION
1	6	773630080	SPACER	9	2	773130039	BEARING BLOCK
2	4	773080081	SLEEVE BEARING	10	2	773080110	SLEEVE BEARING
3	2	773030043	ACTUATOR TO RAM LINK	11	1	660011214	GEAR BRAKE MOTOR
4	6	600164316	RETAINING RING (#5100-175)	12	1	679033107	1/2 LOCK WASHER
5	1	773000035	ACTUATOR SHAFT ASSEMBLY	13	1	773000150	GEARBOX LINK ECCENTRIC ASSEMBLY
6	1	773820036	STIFFENER TUBE	14	2	773080082	SLEEVE BEARING
7	3	611012287	1/2-13 X 4 SHC SCREW	15	1	773030149	GEARBOX DRAG LINK
8	2	611012292	1/2-13 X 5-1/4 SHC SCREW				

CINCINNATI PRECISION MACHINERY

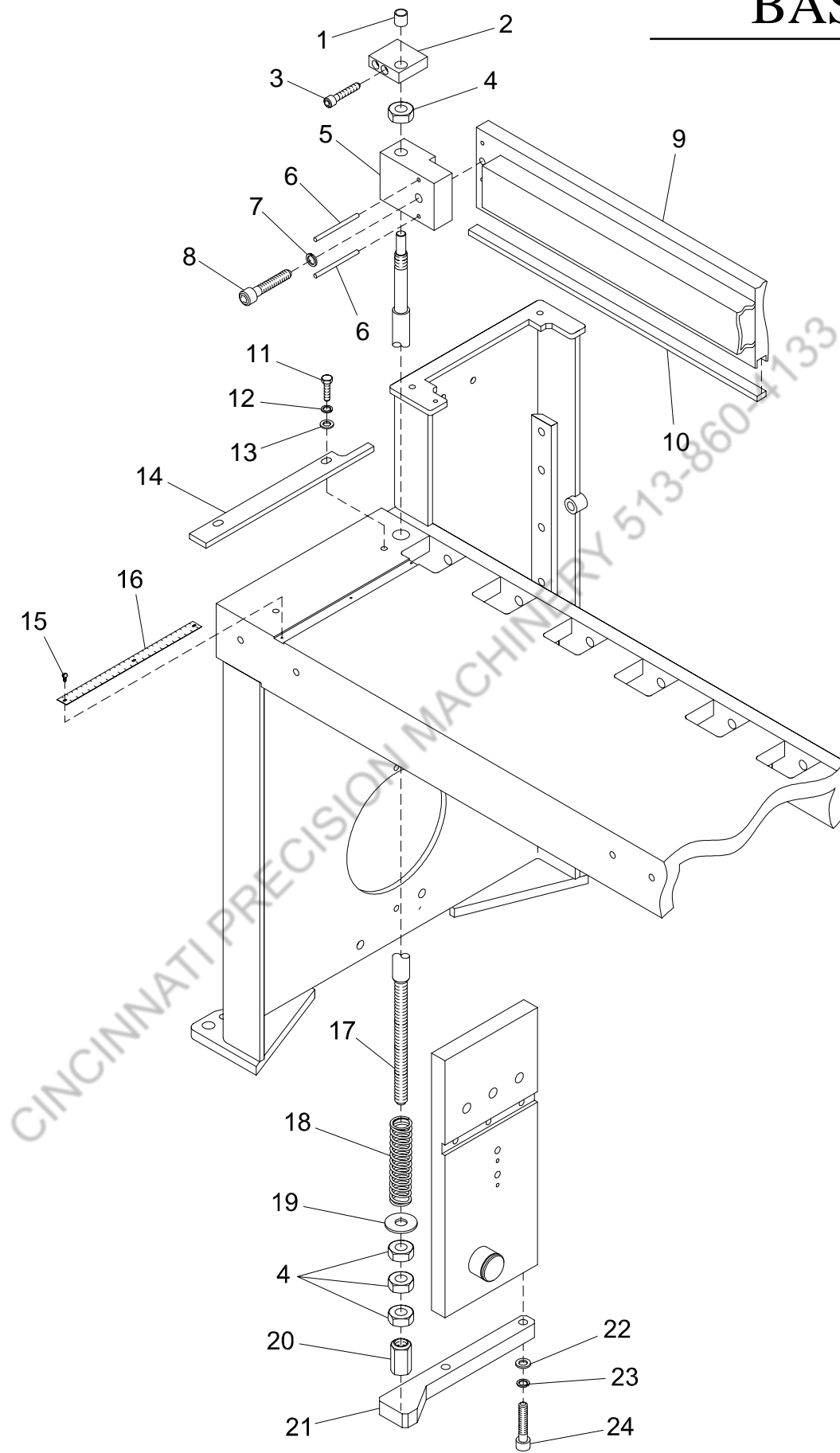


FIG. 6

BED SIDE ASSEMBLY

ITEM	QTY	RW PART #	RW PART DESCRIPTION	ITEM	QTY	RW PART #	RW PART DESCRIPTION
1	2	673194679	BRONZE BUSHING	13	4	678033105	3/8 FLAT WASHER
2	2	773130049	BUSHING BLOCK	14	2	773030144	BED SQUARING BAR
3	4	611012143	5/16-18 X 2-1/2 SHC SCREW	15	6	607012643	#4-40 X 1/4 PAN HEAD SCREW
4	8	643023010	3/4-10 FULL HEX NUT	16	2	673000425	BED SCALE
5	2	773130048	UPPER HOLD-DOWN GUIDE BLOCK	17	2	773030044	HOLD-DOWN GUIDE SHAFT
6	4	600063473	1/4 X 2 ROLL PIN	18	2	673184615	HELICAL COMPRESSION SPRING
7	2	678033107	1/2 FLAT WASHER	19	2	678033110	3/4 FLAT WASHER
8	2	611012282	1/2-13 X 2-3/4 SHC SCREW	20	2	773560041	HOLD-DOWN ADJUSTMENT NUT
9	1	773010195	HOLD-DOWN BAR	21	2	773030047	HOLD-DOWN RELEASE BAR
10	1	673000431	URETHANE STRIP	22	4	678033107	1/2 FLAT WASHER
11	4	601012177	3/8-16 X 1-1/4 HHC SCREW	23	4	679033107	1/2 LOCK WASHER
12	4	679033105	3/8 LOCK WASHER	24	4	621012277	1/2-13 X 1-3/4 SSC SCREW

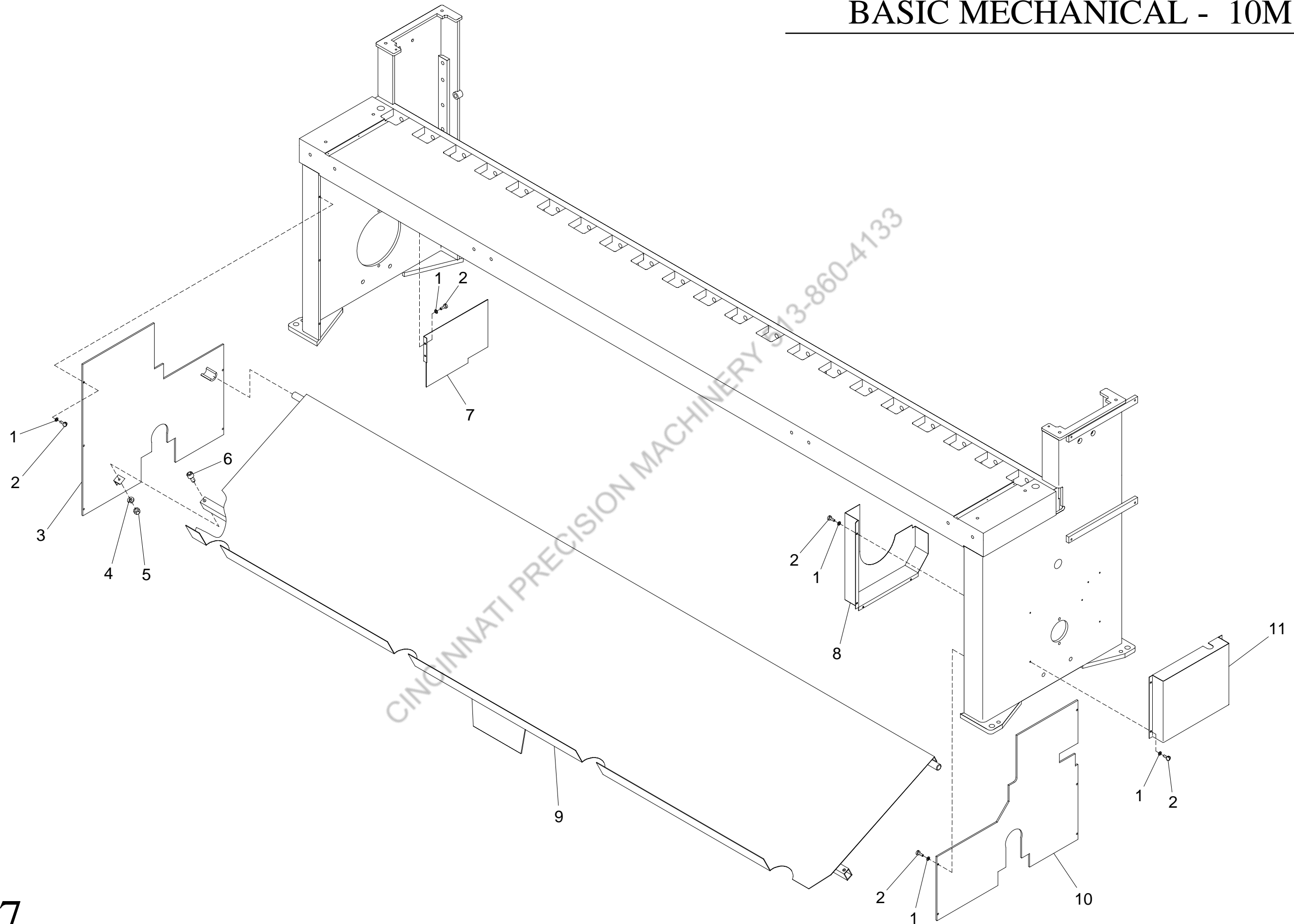


FIG. 7

GUARDS

ITEM	QTY	RW PART #	RW PART DESCRIPTION
1	22	679033102	#10 LOCK WASHER
2	22	609012053	#10-24 X 5/8 RHM SCREW
3	1	773440197	LEFT LEG GUARD
4	2	679033103	1/4 LOCK WASHER
5	2	643023003	1/4-20 FULL HEX NUT
6	2	611012084	1/4-20 X 3/8 SHC SCREW
7	1	773440198	LEFT LEG GUARD
8	1	773440075	GEAR BOX GUARD
9	1	773380059	MATERIAL RETURN WELDMENT
10	1	773440071	RIGHT LEG GUARD
11	1	773220084	LIMIT SWITCH COVER

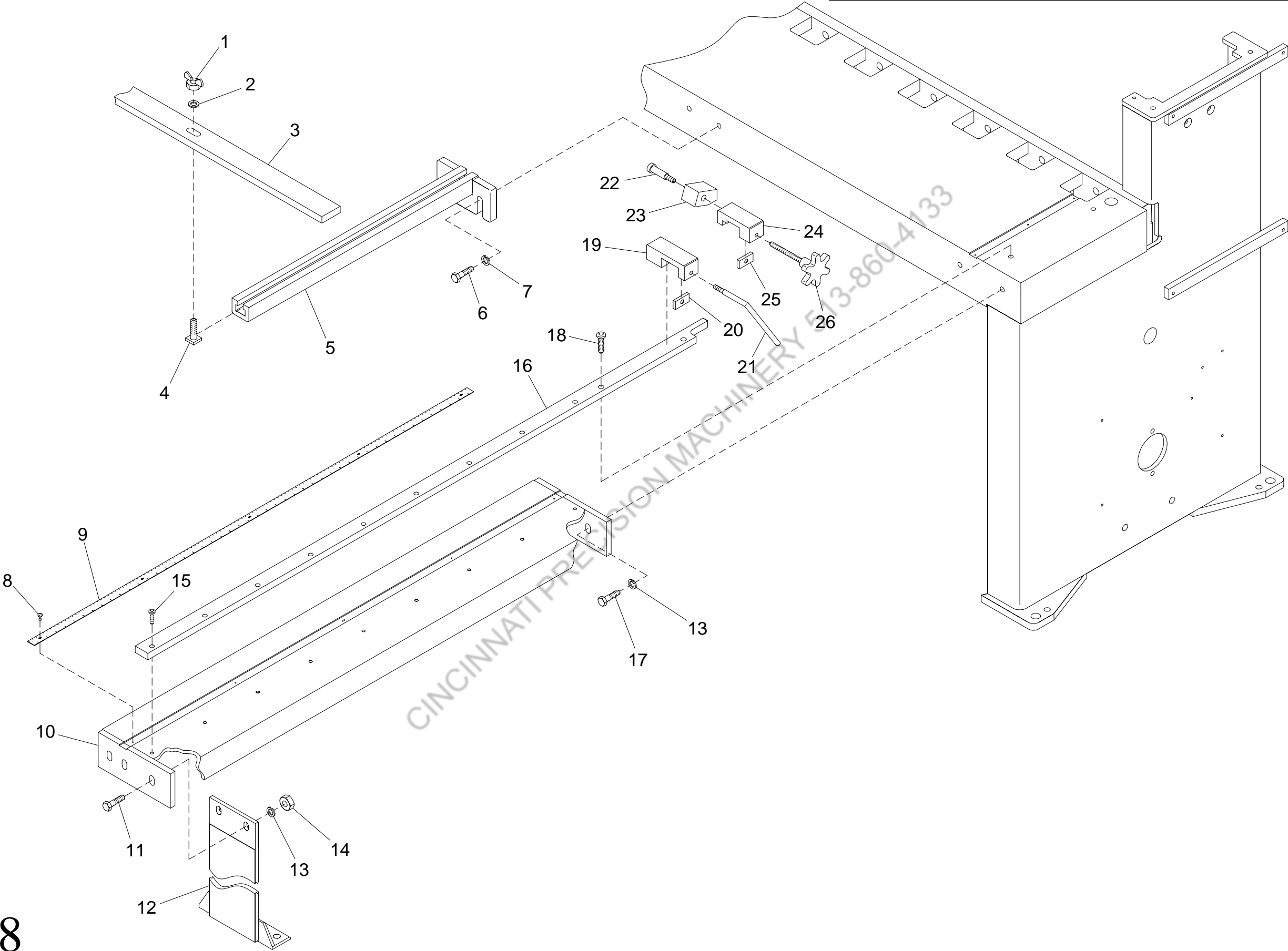


FIG. 8

FRONT AND SIDE EXTENSIONS

273940006 - 25" FRONT EXTENSION

ITEM	QTY	RW PART #	RW PART DESCRIPTION	ITEM	QTY	RW PART #	RW PART DESCRIPTION
1	2	673023007	1/2-13 WING NUT	5	2	762030035	FRONT ARM
2	2	678033107	1/2 FLAT WASHER	6	4	601012225	7/16-14 X 1-1/4 HHC SCREW
3	1	773420020	FRONT GAUGE	7	4	679033106	7/16 LOCK WASHER
4	2	762160036	SQUARE HEAD TEE BOLT				

273940042 - SIDE EXTENSION 16"-63"

ITEM	QTY	RW PART #	RW PART DESCRIPTION	ITEM	QTY	RW PART #	RW PART DESCRIPTION
8	5	607012643	#4-40 X 1/4 PAN HEAD SCREW	15	9	615012133	5/16-18 X 1 SHB SCREW
9	1	673000441	SCALE, 16" - 63"	16	1	773420143	GAUGE BAR
10	1	773420202	GAUGE HOLDER	17	2	601012225	7/16-14 X 1-1/4 HEX BOLT
11	2	601012231	7/16-14 X 2 HEX BOLT	18	2	615012175	3/8-16 X 1 SHB SCREW
12	1	773140145	SUPPORT LEG	19	1	773130026	FIXED STOP
13	4	679033106	7/16 LOCKWASHER	20	1	773010025	CLAMP
14	2	643023006	7/16-14 HEX NUT	21	1	773030027	LOCKING LEVER

273940046 - OPTIONAL FLIP STOP FOR SIDE EXTENSION

ITEM	QTY	RW PART #	RW PART DESCRIPTION	ITEM	QTY	RW PART #	RW PART DESCRIPTION
22	1	673012370	1/2 DIA X 1-1/2 LG WITH 3/8-16 THD SHOULDER BOLT	25	1	773010025	CLAMP STRIP
23	1	773420214	STOP	26	1	673356351	LOCKING HANDLE
24	1	773420213	GUIDE				

SECTION 2:

ELECTRICAL AND CONTROLS

CINCINNATI PRECISION MACHINERY 513-860-4133

CINCINNATI PRECISION MACHINERY 513-860-4133

ELECTRICAL AND CONTROLS - 10M14

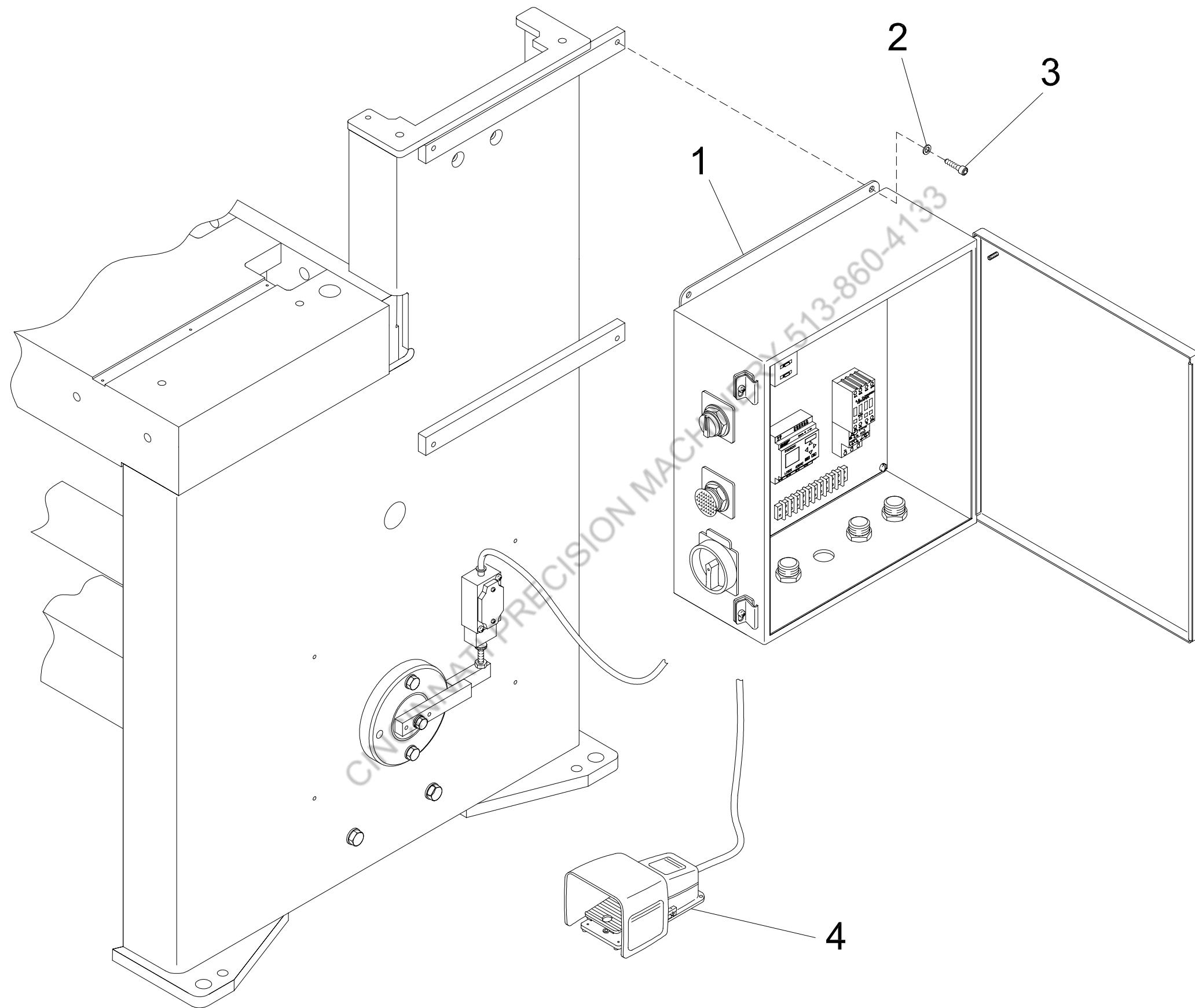


FIG. 1

FRONT OPERATED PANEL

ITEM	QTY	RW PART #	RW PART DESCRIPTION
1	1	660193190	230V STD PANEL
2	4	679033103	1/4 LOCK WASHER
3	4	611012088	1/4-20 X 5/8 SOC HD CP SCREW
4	1	660092104	FOOT SWITCH (LM #511-BO)

CINCINNATI PRECISION MACHINERY 513-860-4133

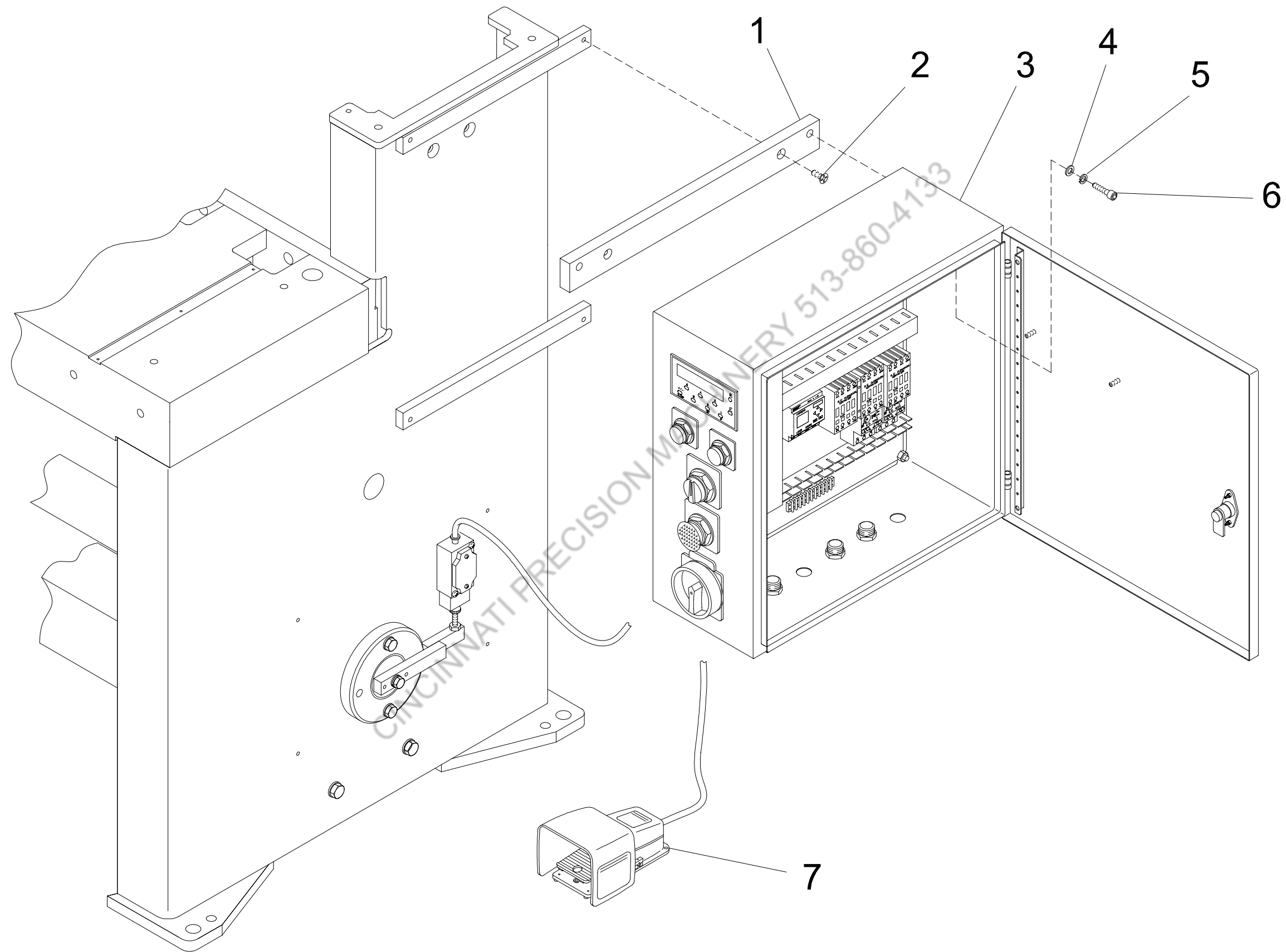


FIG. 2

DRO PANEL

ITEM	QTY	RW PART #	RW PART DESCRIPTION
1	2	773180216	ELECTRIC PANEL SUPPORT MOUNTING BRACKET
2	4	613012089	1/4-20 X 3/4 SOC HD FLAT SCREW
3	1	660193193	DRO 230V PANEL
4	4	678033103	1/4 FLAT WASHER
5	4	679033103	1/4 LOCK WASHER
6	4	611012130	5/16-18 X 5/8 SOC HD CP SCREW
7	1	660092104	FOOT SWITCH (LM #511-BO)

CINCINNATI PRECISION MACHINERY 513-660-4133

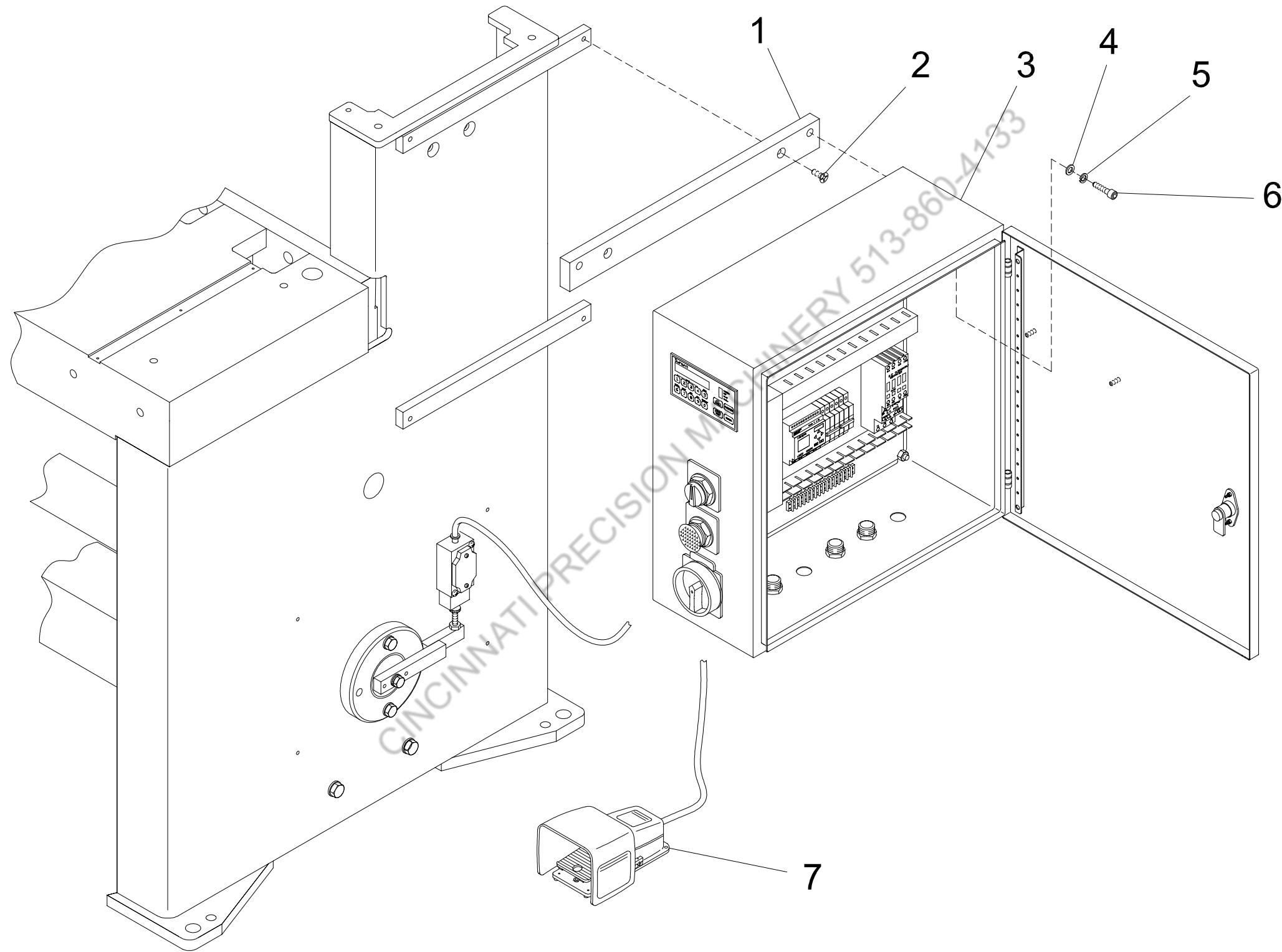


FIG. 3

NC PANEL

ITEM	QTY	RW PART #	RW PART DESCRIPTION
1	2	773180216	ELECTRIC PANEL SUPPORT MOUNTING BRACKET
2	4	613012089	1/4-20 X 3/4 SOC HD FLAT SCREW
3	1	660193196	NC 230V PANEL
4	4	678033103	1/4 FLAT WASHER
5	4	679033103	1/4 LOCK WASHER
6	4	611012130	5/16-18 X 5/8 SOC HD CP SCREW
7	1	660092104	FOOT SWITCH (LM #511-BO)

CINCINNATI PRECISION MACHINERY 513-860-4133

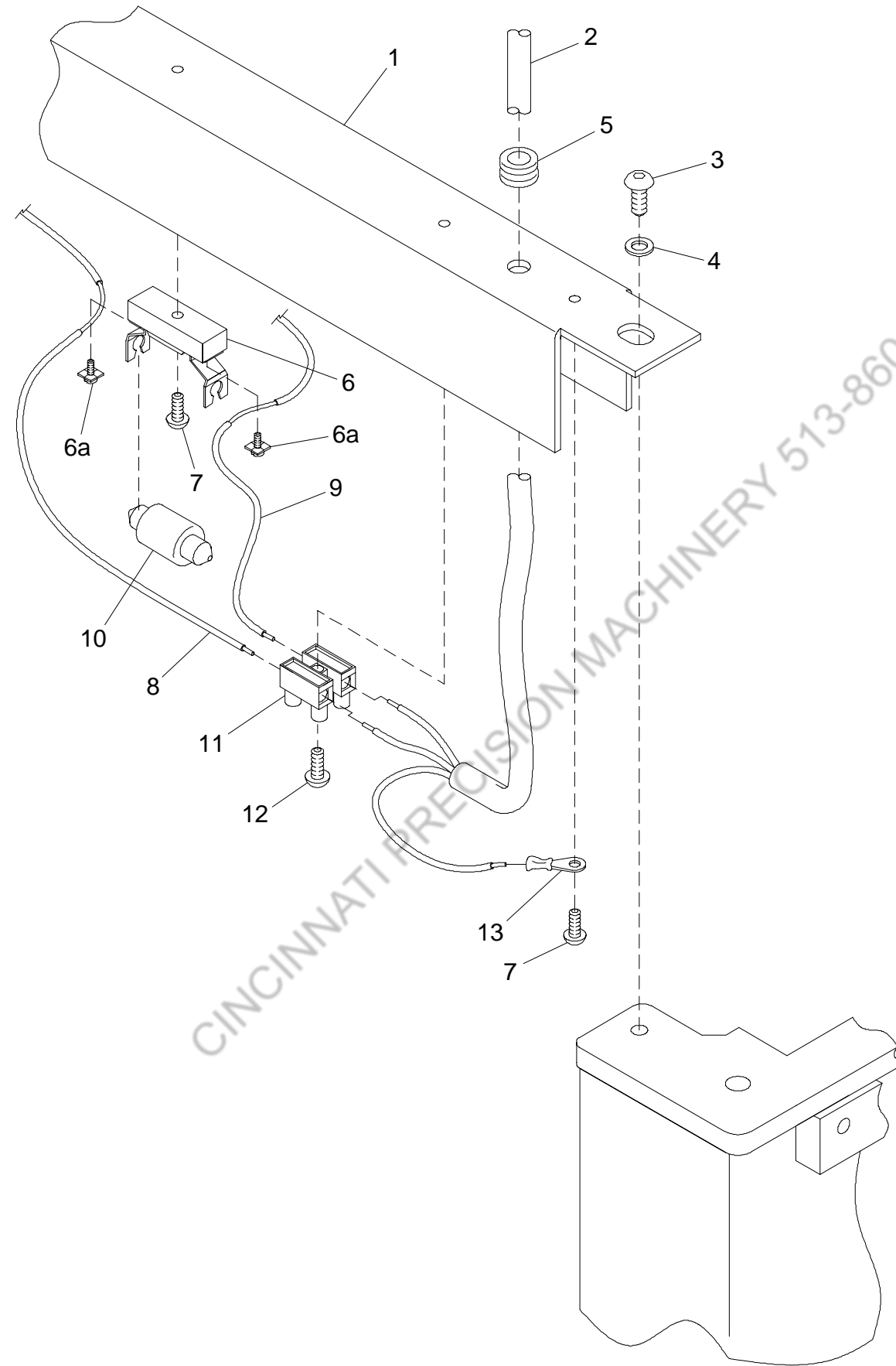


FIG. 4

LIGHT ASSEMBLY

ITEM	QTY	RW PART #	RW PART DESCRIPTION
1	1	773140053	LIGHT FRAME
2	1	660000022	WIRE-CORD #16/3 TYPE SJ
3	2	615012084	1/4-20 X 3/8 SOCKET HEAD BUTTON SCREW
4	2	678033103	1/4 FLAT WASHER
5	1	600000378	RUBBER GROMMET #9600K33
6	10	660000224	LAMP SOCKET
7	11	609012003	#6-32 X 3/8 RHM SCREW
8	1	660000225	SOLID 16 GA. WHITE WIRE
9	1	660000226	SOLID 16 GA. BLACK WIRE
10	10	660000223	LAMP (FESTOONE)
11	1	660000227	TERMINAL STRIP
12	1	607012005	#6-32 X 1/2 FM SCREW
13	1	660182900	16 GA. RING TERMINAL

SECTION 3:

BACKGAUGE
AND MATERIAL RETURN

CINCINNATI PRECISION MACHINERY 513-860-4133

CINCINNATI PRECISION MACHINERY 513-860-4133

BACKGAUGE AND RETURN - 10M14

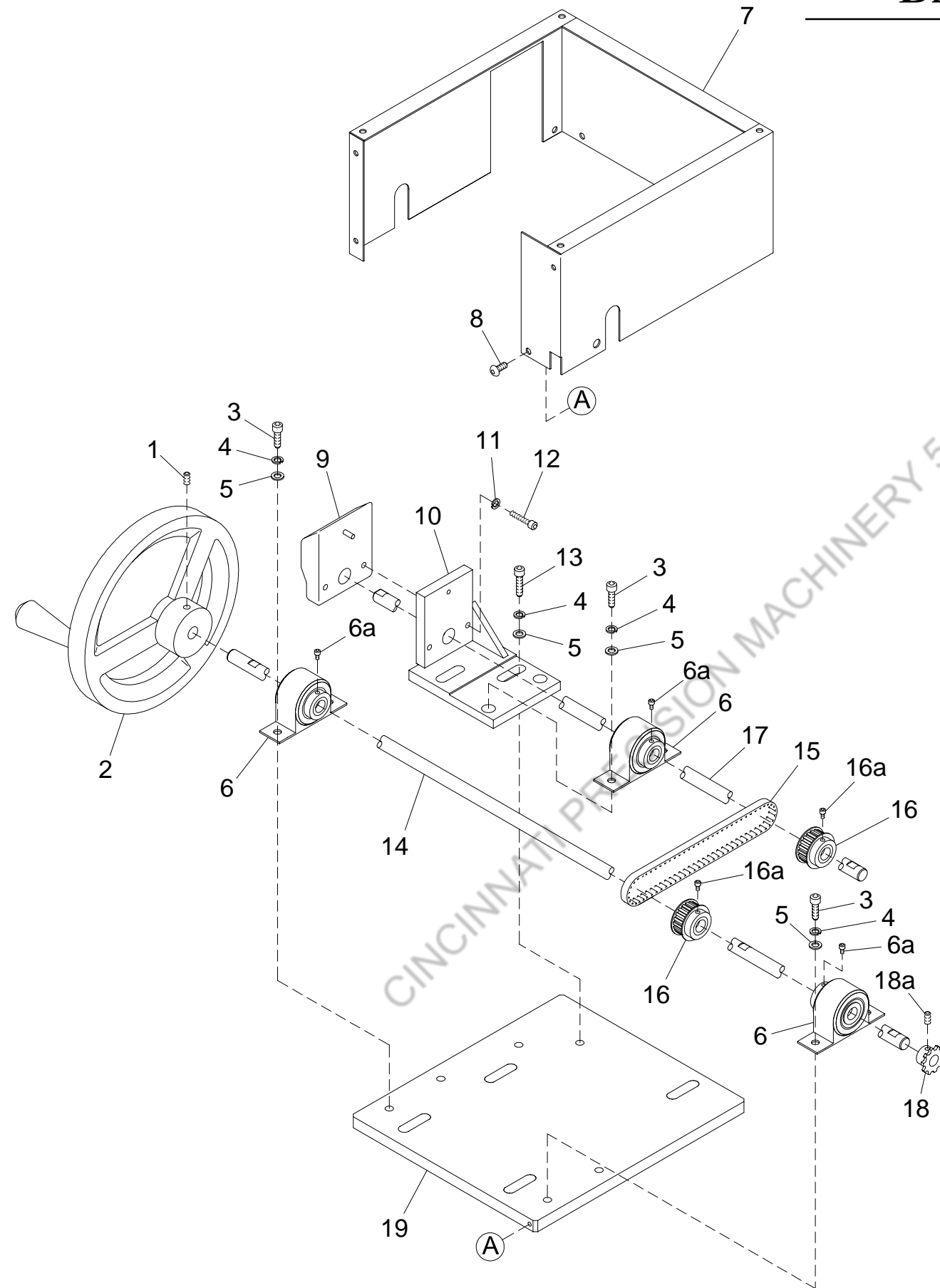


FIG. 1

FRONT OPERATED COUNTER

ITEM	QTY	RW PART #	RW PART DESCRIPTION	ITEM	QTY	RW PART #	RW PART DESCRIPTION
1	2	621012086	1/4-20 X 1/2 SSCP SCREW	11	2	679033102	#10 LOCK WASHER
2	1	773000108	HANDWHEEL	12	2	612012054	#10-32 X 3/4 SHC SCREW
3	6	611012131	5/16-18 X 3/4 SHC SCREW	13	2	611012133	5/16-18 X 1 SHC SCREW
4	8	679033104	5/16 LOCK WASHER	14	1	773680014	DRIVE SHAFT
5	8	678033104	5/16 FLAT WASHER	15	1	673265324	BROWNING GEARBELT #160XL025
6	3	673315805	PILLOW BLOCK WITH BEARING	16	2	673275435	GEARBELT PULLEY
7	1	773440018	GUARD	17	1	773680015	COUNTER SHAFT
8	5	615012026	#8-32 X 3/8 SHB SCREW	18	1	673285515	SPROCKET, .500 I.D.
9	1	673000371	COUNTER 250AM-X00.20(50)CCW1/2	19	1	773060017	COUNTER MOUNTING PLATE
10	1	773200016	COUNTER MOUNTING BRACKET				

BACKGAUGE AND RETURN - 10M14

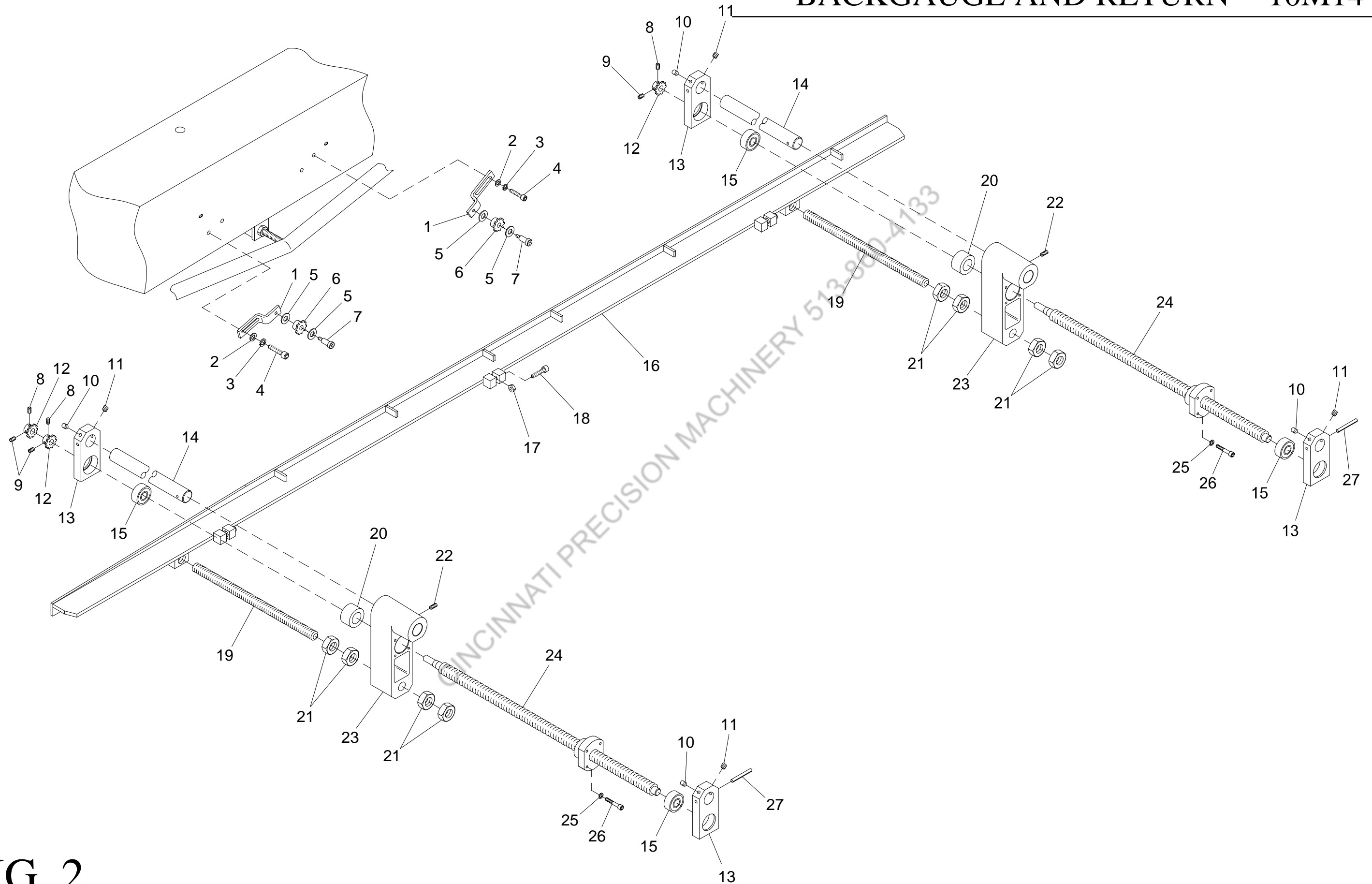


FIG. 2

FRONT OPERATED BACKGAUGE

ITEM	QTY	RW PART #	RW PART DESCRIPTION	ITEM	QTY	RW PART #	RW PART DESCRIPTION
1	2	773200021	IDLER BRACKET	15	4	673204725	BEARING, SKF#6304_2RSI
2	4	678033104	5/16 FLAT WASHER	16	1	773130232	BACKGAUGE STOP (NEW)
3	4	679033104	5/16 LOCK WASHER	17	3	649023005	3/8-16 JAM HEX NUT
4	4	611012133	5/16-18 X 1 SHC SCREW	18	3	611012183	3/8-16 X 2 SHC SCREW
5	4	633033137	1/2 SILICON BRZ. FLAT WASHER	19	2	773030000	BACKGAUGE HOLDER ROD
6	2	673285514	IDLER SPROCKET .500 I.D.	20	2	773080006	GUIDE BUSHING
7	2	642012656	1/2 X 1 SHOULDER SCREW	21	8	649023012	1-8 JAM HEX NUT
8	3	625012084	1/4-20 X 3/8 DOG POINT SOCKET SET SCREW	22	2	621012084	1/4-20 X 3/8 SSCP SCREW
9	3	621012086	1/4-20 X 1/2 CUP POINT SOCKET SET SCREW	23	2	773130009	GUIDE BLOCK
10	4	625012130	5/16-18 X 5/8 DOG POINT SOCKET SET SCREW	24	2	600000396	ACME SCREW/NUT ASSEMBLY
11	4	621012128	5/16-18 X 1/2 CUP POINT SOCKET SET SCREW	25	8	679033103	1/4 LOCK WASHER
12	3	673285513	SPROCKET, .625 I.D.	26	8	611012095	1/4-20 X 1-1/2 SHC SCREW
13	4	773010003	BEARING MOUNT	27	2	600063497	1/4 X 2-3/4 ROLL PIN
14	2	773680001	BACKGAUGE SUPPORT SHAFT				

BACKGAUGE AND RETURN - 10M14

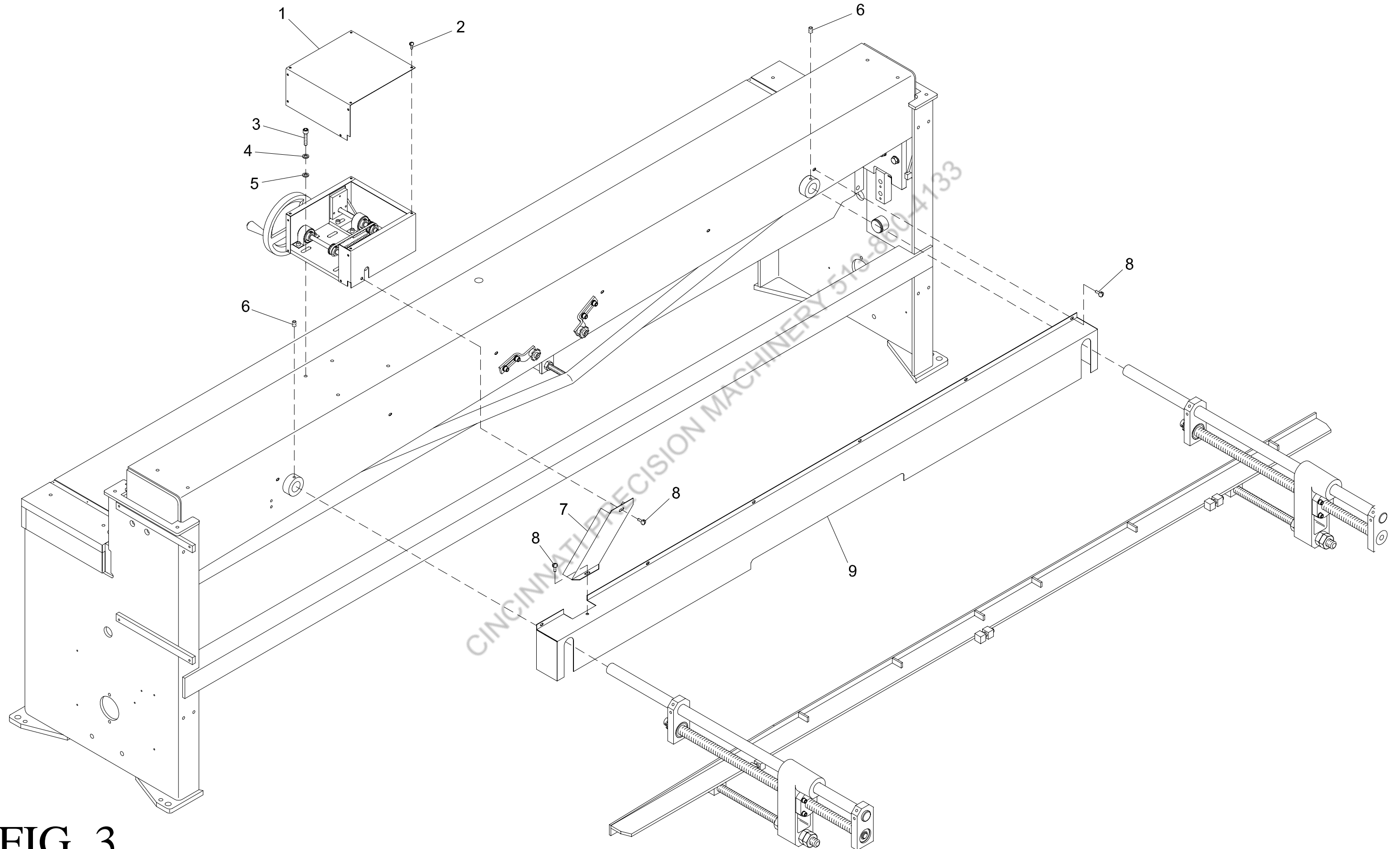


FIG. 3

FRONT OPERATED BACKGAUGE ATTACHMENT

ITEM	QTY	RW PART #	RW PART DESCRIPTION
1	1	773220019	GUARD COVER
2	7	615012026	8-32 X 3/8 SHB SCREW
3	4	611012137	5/16-18 X 1-1/2 SHC SCREW
4	4	679033104	5/16 LOCK WASHER
5	4	678033104	5/16 FLAT WASHER
6	4	621012128	5/16-18 X 1/2 SSCP SCREW
7	1	773440022	UPPER CHAIN GUARD
8	8	615012086	1/4-20 X 1/2 SOCKET HEAD BUTTON SCREW
9	1	773440023	LOWER CHAIN GUARD

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DRO/NC BACKGAUGE

ITEM	QTY	RW PART #	RW PART DESCRIPTION	ITEM	QTY	RW PART #	RW PART DESCRIPTION
1	2	773200021	IDLER BRACKET	20	2	773080006	GUIDE BUSHING
2	4	678033104	5/16 FLAT WASHER	21	8	649023012	1-8 JAM HEX NUT
3	4	679033104	5/16 LOCK WASHER	22	2	621012084	1/4-20 X 3/8 SSCP SCREW
4	4	611012133	5/16-18 X 1 SHC SCREW	23	2	773130009	GUIDE BLOCK
5	4	633033137	1/2 SILICON BRZ. FLAT WASHER	24	1	600000432	SCREW/NUT ASSEMBLY, NC/DRO MODEL
6	2	673285514	IDLER SPROCKET .500 I.D.	25	8	679033103	1/4 LOCK WASHER
7	2	642012656	1/2 X 1 SHOULDER SCREW	26	8	611012095	1/4-20 X 1-1/2 SHC SCREW
8	3	625012084	1/4-20 X 3/8 DOG POINT SOCKET SET SCREW	27	1	600000396	ACME SCREW/NUT ASSEMBLY
9	3	621012086	1/4-20 X 1/2 CUP POINT SOCKET SET SCREW	28	2	600063497	1/4 X 2-3/4 ROLL PIN
10	4	625012130	5/16-18 X 5/8 DOG POINT SOCKET SET SCREW	29	1	773010190	BEARING MOUNT - DRO
11	4	621012128	5/16-18 X 1/2 CUP POINT SOCKET SET SCREW	30	1	773200154	ENCODER BRACKET - DRO
12	3	673285513	SPROCKET, .625 I.D.	31	2	679033103	1/4 LOCK WASHER
13	3	773010003	BEARING MOUNT	32	2	611012088	1/4-20 X 5/8 SHC SCREW
14	2	773680001	BACKGAUGE SUPPORT SHAFT	33	4	609012003	#6-32 X 3/8 ROUND HEAD SCREW
15	4	673204725	BEARING, SKF#6304_2RSI	34	4	678033100	#6 FLAT WASHER
16	1	773130232	BACKGAUGE STOP (NEW)	35	1	649023005	3/8-16 JAM HEX NUT
17	3	649023005	3/8-16 JAM HEX NUT	36	1	773680199	ENCODER SHAFT - DRO/NC
18	3	611012183	3/8-16 X 2 SHC SCREW	37	1	660386621	ENCODER COUPLING
19	2	773030000	BACKGAUGE HOLDER ROD	38	1	660000068	ENCODER WITH CABLE (200 PPR)

BACKGAUGE AND RETURN - 10M14

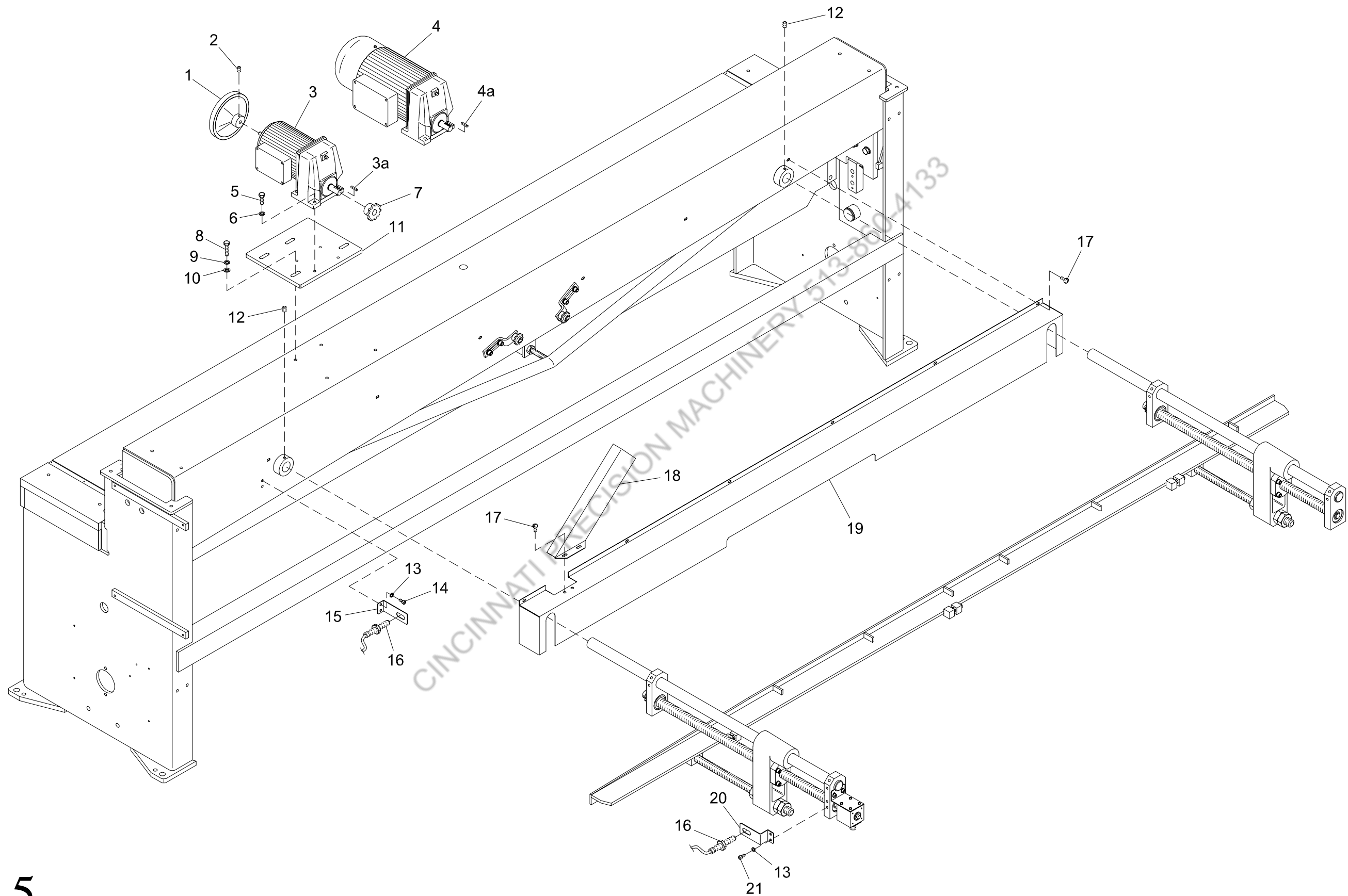
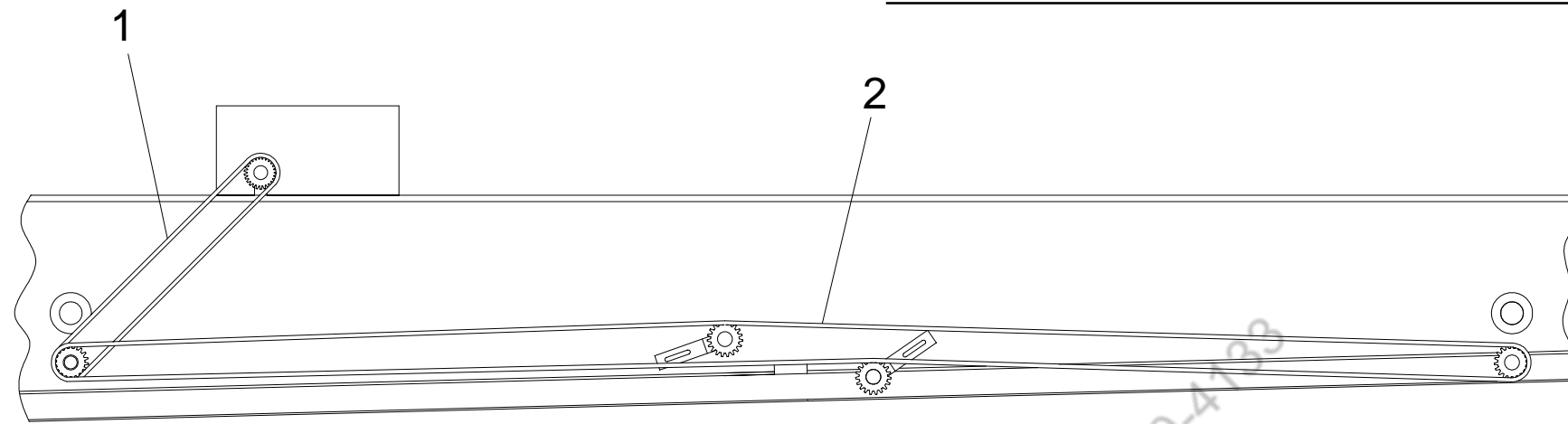


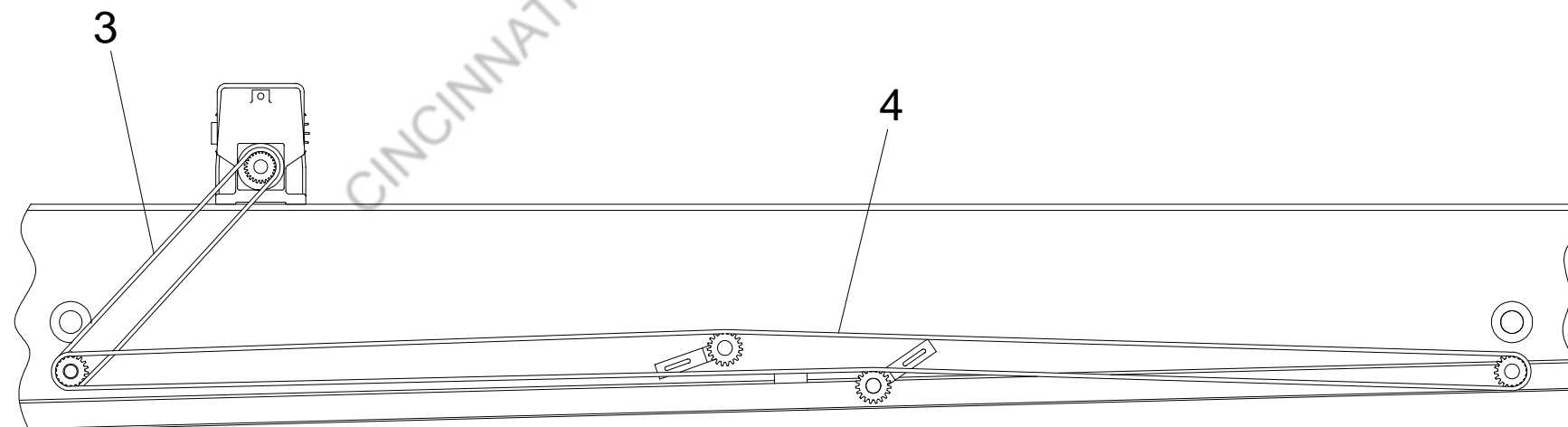
FIG. 5

DRO/NC BACKGAUGE ATTACHMENT

ITEM	QTY	RW PART #	RW PART DESCRIPTION	ITEM	QTY	RW PART #	RW PART DESCRIPTION
1	1	773000223	MOTOR HANDWHEEL - DRO	12	4	621012128	5/16-18 X 1/2 SSCP SCREW
2	2	621012086	1/4-20 X 1/2 CUP POINT SET SCREW	13	4	678033103	1/4 FLAT WASHER
3	1	660011110	MOTOR AND GEAR BOX - DRO	14	2	611012088	1/4-20 X 5/8 SHC SCREW
4	1	660011171	MOTOR AND GEAR BOX - NC	15	1	773200189	FRONT OVERTRAVEL BRACKET - NC/DRO
5	4	601012133	5/16-18 X 1 HHC SCREW	16	2	660152632	A.C. PROX SENSOR
6	4	679033104	5/16 LOCK WASHER?	17	8	615012086	1/4-20 X 1/2 SOCKET HEAD BUTTON SCREW
7	1	773000222	B/G MOTOR SPROCKET NC/DRO	18	1	773440230	UPPER CHAIN GUARD - NC/DRO
8	4	611012137	5/16-18 X 1-1/2 SHC SCREW	19	1	773440228	LOWER CHAIN GUARD - NC/DRO
9	4	679033104	5/16 LOCK WASHER	20	1	773200155	REAR OVERTRAVEL BRACKET - NC/DRO
10	4	678033104	5/16 FLAT WASHER	21	2	615012084	1/4-20 X 3/8 SOCKET HEAD BUTTON SCREW
11	1	773060186	MOTOR MOUNT PLATE - NC/DRO				



Rear View of Ram with Handwheel Assembly



Rear View of Ram with NC/DRO Assembly

FIG. 6

CHAINS

RAM WITH HANDWHEEL ASSEMBLY

ITEM	QTY	RW PART #	RW PART DESCRIPTION
1	1	673000373	ROLLER CHAIN 156 LINKS 39" LONG
2	1	673000372	ROLLER CHAIN 730 LINKS 182.50" LONG

RAM WITH NC/DRO ASSEMBLY

ITEM	QTY	RW PART #	RW PART DESCRIPTION
3	1	673000405	CHAIN WITH CONNECTING LINK - NC/DRO - 47" LONG
4	1	673000372	ROLLER CHAIN 730 LINKS 182.50" LONG

BACKGAUGE AND RETURN - 10M14

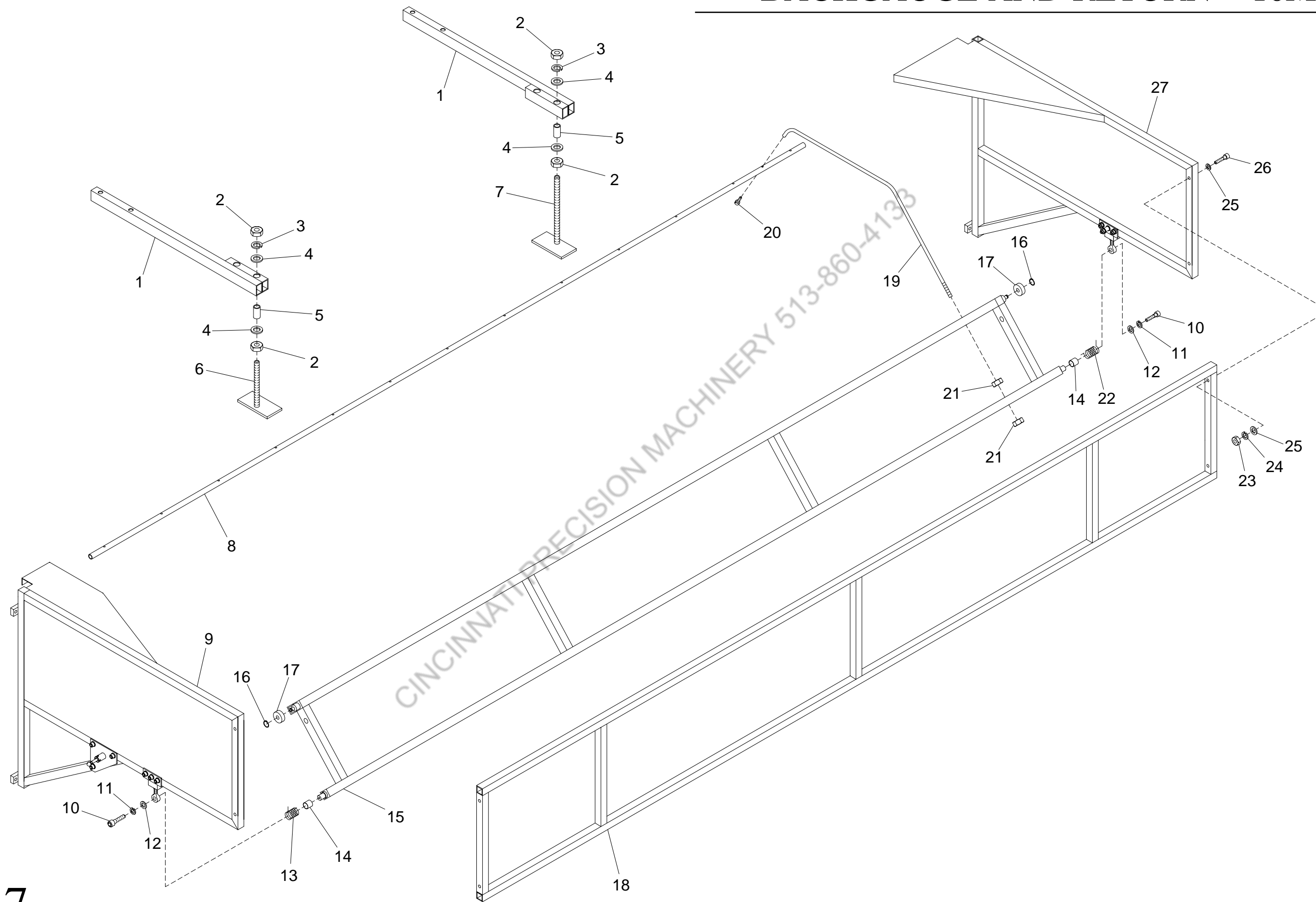


FIG. 7

MATERIAL RETURN

ITEM	QTY	RW PART #	RW PART DESCRIPTION	ITEM	QTY	RW PART #	RW PART DESCRIPTION
1	2	773180192	SUPPORT TUBE	15	1	773000099	BAIL
2	4	643023009	5/8-11 FULL HEX NUT	16	2	673164325	RETAINING RING TRU-ARC #5100-39
3	2	679033109	5/8 LOCK WASHER	17	2	600204727	BEARING (SKF# 6000-2RS)
4	4	678033109	5/8 FLAT WASHER	18	1	773140234	REAR FRAME (NEW DESIGN)
5	2	773630191	STAND OFF SPACER	19	14	773030088	MATERIAL RETURN ROD
6	1	773030164	SHORT STANDOFF POST	20	14	673012662	#10-24 X 3/8 LG. PAN HD. SCREW
7	1	773030163	LONG STANDOFF POST	21	28	643023005	3/8-16 FULL HEX NUT
8	1	773000089	SEPARATOR ROD	22	1	673184609	LEFT SPRING
9	1	773140052	RIGHT FRAME	23	4	643023004	5/16-18 FULL HEX NUT
10	2	611012095	1/4-20 X 1-1/2 SHC SCREW	24	4	679033104	5/16 LOCK WASHER
11	2	679033103	1/4 LOCK WASHER	25	8	678033104	5/16 FLAT WASHER
12	2	678033103	1/4 FLAT WASHER	26	4	611012139	5/16-18 X 1-3/4 SHC SCREW
13	1	673184608	RIGHT SPRING	27	1	773140051	LEFT FRAME
14	2	773180096	TUBE SUPPORT				

BACKGAUGE AND RETURN - 10M14

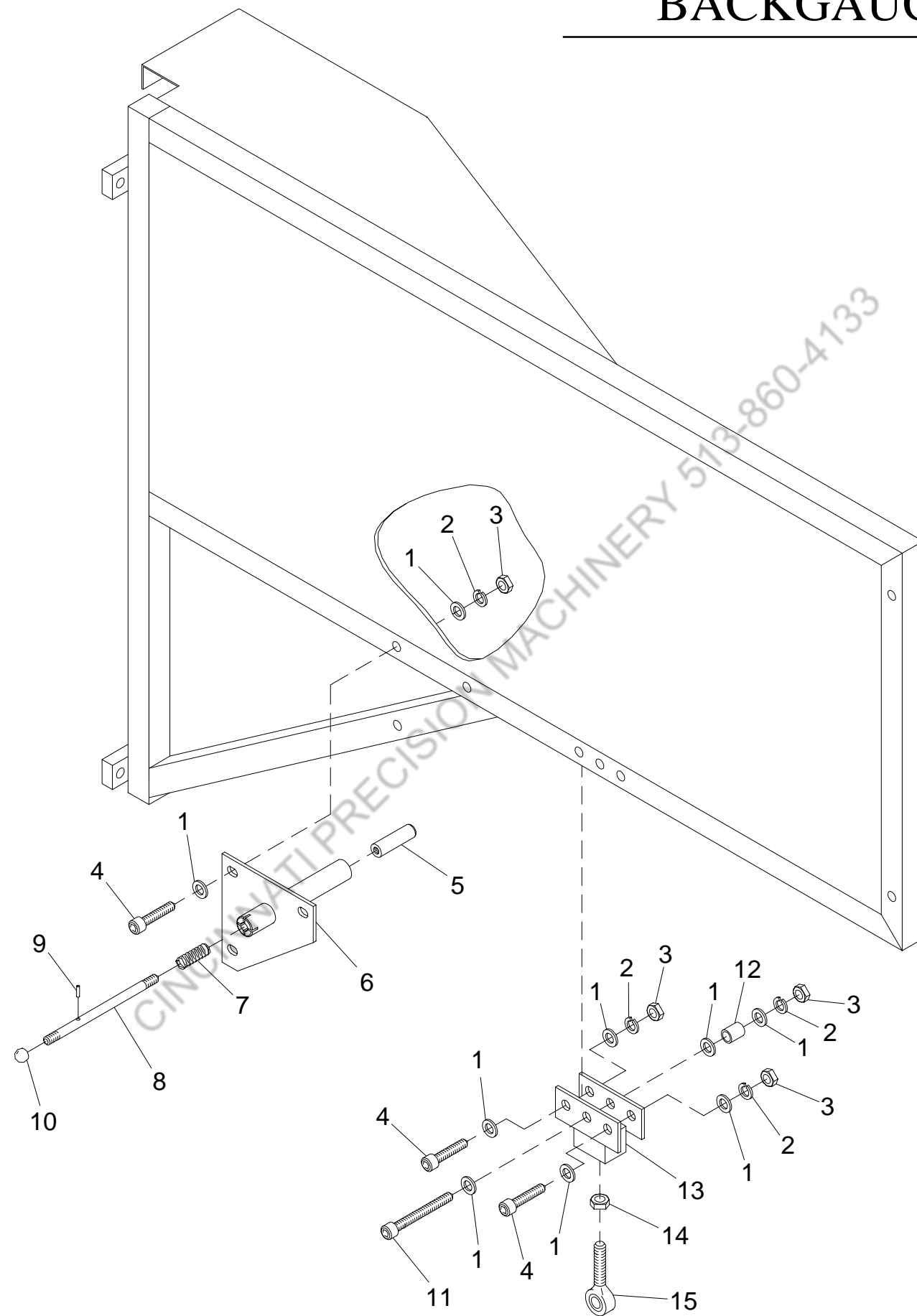


FIG. 8

MATERIAL RETURN - EXPLODED VIEW

ITEM	QTY	RW PART #	RW PART DESCRIPTION	ITEM	QTY	RW PART #	RW PART DESCRIPTION
1	18	678033104	5/16 FLAT WASHER	9	1	600063435	ROLL PIN 1/8 X 3/4
2	9	679033104	5/16 LOCK WASHER	10	1	673356346	JERGENS NOB #31308
3	9	643023004	5/16-18 FULL HEX NUT	11	2	601012143	5/16-18 X 2-1/2 HHC SCREW
4	7	611012139	5/16-18 X 1-3/4 SHC SCREW	12	2	773820093	TUBE
5	1	773160102	LOCK OUT PIN	13	2	773200054	BAIL BRACKET
6	1	773000101	DETENT PLATE	14	2	645023009	5/8-18 FULL HEX NUT
7	1	673184610	COMPRESSION SPRING #C0-480-055-3000	15	2	673000382	ROD END BEARING #6072K25
8	1	773030103	THREADED LOCK ROD				

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BACKGAUGE AND RETURN - 10M14

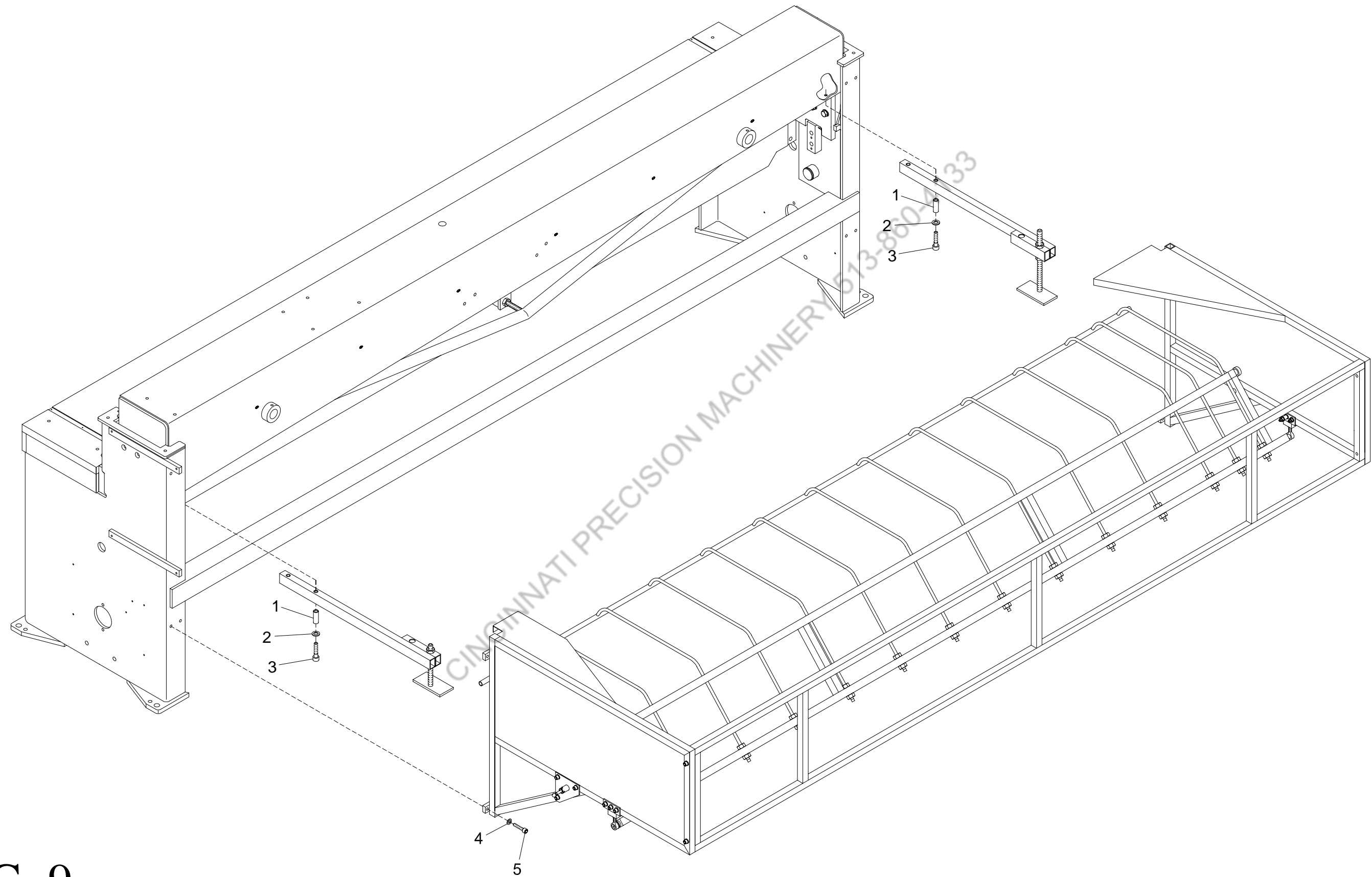


FIG. 9

MATERIAL RETURN ATTACHMENT

ITEM	QTY	RW PART #	RW PART DESCRIPTION
1	4	773630104	STAND OFF SPACER
2	4	678033105	3/8 FLAT WASHER
3	4	601012184	3/8-16 X 2-1/4 HHC SCREW
4	8	679033104	5/16 LOCK WASHER
5	8	611012133	5/16-18 X 1 SHC SCREW

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