STRAIGHT-O-MATIC

MODEL 250

VERSION 2.0

INDEX

MODEL 250 STRAIGHT-O-MATIC MACHINE

Set-Up and Instruction Manual

The Model 250 Straight-O-Matic Machine is designed to straighten flat or irregularly shaped metal parts - stampings, bars, light forgings or castings - with or without offsets or projections, before or after heat treating. It performs at substantially higher production rates than required for hand or press straightening, and can be run by unskilled operators.

Parts can be out-of-straightness in varying amounts and at different locations, and will be brought within the same straightness tolerance. No measuring before or after is required, other than an occasional quality control check. The straightener action of the machine moves the parts beyond their elastic limit - and brings them back to a straight condition. In so doing, this also tends to stress relieve the parts so that they retain their straightness.

The patented Model 250 consists of a basic machine, with tooling made for the particular part to be straightened. The head of the machine is actuated by an offset rotary cam which transmits a reciprocal stroke to jaw inserts. Alternately opposed jaws in fixed positions provide the proper bending moment in ratio with the stroke of the moving jaws. A part is inserted between the jaws and a cycle is started by a push button or a foot switch . . . the part is overbent by a pre-set amount and returned to the desired straight center-line in one to two seconds.

This Manual covers set-up and operating instructions for the 16" Heavy Duty Model 250 Straight-O-Matic Machine. It can be used for the 7" Model as well, with a few minor differences.

I. INSTALLATION

A. Location

It is important that the machine be installed on a solid, level foundation, free from vibration. It is not necesary that it be bolted down.

B. Electrical

The main cam of the machine, which transmits the reciprocal motion to the tooling, is powered by a 3/4 H.P. 1140 RPM A.C. motor, (#1, Photo 1), normally 230 or 460 Volts, 3 phase, 60 Hertz, and wired to customer specifications. Controls are transformed to 115 V. Heaters supplied with the machine are appropriate to voltage specified at the time of purchase and should be changed if line voltage is changed. Electrical connecion is made to the panel (#1, Figure 1), which is equipped with a fused disconnect. Verify proper rotation of the motor per decal on motor housing.

C. Pneumatics

An air supply with a minimum I.D. of 3/8" should be supplied (#2, Figure 1). Shop air pressure of 60 lbs. is sufficient. Inside the main access door, the regulator in the FLR Unit controls the air pressure to the hydro-check unit.

II. LUBRICATION

Lubrication is provided to all wear points, some by an automatic oiling system and others by manual greasing. These are identified on the Lubrication Schematic (Dwg. 250C-113)

A. Automatic Oiling System

Locations on and around the cam inside the cabinet are lubricated by an automatic oiler (#2, Photo 1) through metered fittings. This should be periodically filled through the filler neck with Sunoco #90T-2, Lubriplate #4 or an equivalent oil.

Oil will drop from the various cam locations into an oil tray which should be drained when full.

B. Manual Greasing - Every 200 Hrs. of Operation

Two fittings, one at each end of rotating cam (and 180 apart - cam must be rotated to reach both). (A general purpose grease should be used for these locations.)

3. SET-UP AND OPERATION

When the Model 250 Straight-O-matic Machine is shipped from our factory, a set of tooling has been installed in it and adjusted properly for straightening a part. As well, the various adjustments inside the main access door have been made for the proper straightening of this part.

A. Tooling

The position of the moving slides has been set in the proper relationship with the fixed inserts by adjustment of the wedge and screw device at each end of the slide (Fig. 2). These slides and moveable inserts may be shifted slightly left or right of the central position. Turning the left screw clockwise and the right mating screw counter-clockwise the same amount, moves the wedges down on the left side and up on the right, causing the entire slide assembly to shift to the right. Opposite movement of the screws will shift the slide assembly to the left.

Important: These adjustments are critical to the proper lineup of the inserts when the tooling is in its rest position, and should only be made after all other settings and only by qualified personnel.

When more than one set of tooling is used for straightening different parts, the proper set of tooling can be installed easily in the machine with four socket screws. It is important not to change the adjustment of the wedge screws at the ends of the slides, and keeping them fixed will insure that the tooling is always ready for use.

B. Length of Stroke - "Scale Setting"

The distance that the tooling slides move, causing the bending action in the part, is determined by positioning the Scale Pointer (#3, Photo 1). This is done by loosening the two nuts holding the pointer and adjusting them to the desired scale setting and then retightening them, firmly, to maintain the pointer position during machine operation.

Generally speaking, it is desirable to achieve part straightness with a minimum amount of movement.

C. Specific Settings for Each Tool and Part

Prior to shipment of the machine, the proper settings for all of the foregoing adjustments were predetermined at the factory. These are as follows for the parts to be straightened in the tooling supplied with this machine. (See Page 4a).

D. Special Set-Ups

If you wish to straighten a different part than originally set up in the machine, or if the machine needs adjustment for changes in the parts, etc., the following steps are suggested:

1. Set the Scale Pointer at 1/4" and air pressure at 60 psi.

2. Start the machine and adjust the Hydro-Check Flow Control to allow an approximate 1.5 second cycle time. (Refer to #3, Page 4).

3. Insert the part in the tooling and cycle the machine.

4. Check the part for straightness. If straightness has not been achieved, increase the Scale Setting by 1/8" and recycle the part.

5. Repeat Step #4 until the desired part straightness has been achieved.
   NOTE: As the Scale Setting is increased, it will be necessary to back off the Hydro-Check Flow Control (counter clockwise) to maintain a 1.5 second cycle time.

E. Operation

Electrical power is supplied to the machine by turning the disconnect switch to the "on" position.

Pushing the "start" button starts the cam drive motor.

Depressing the foot switch pedal causes the machine to make one complete cycle. NOTE: Holding the foot switch pedal down will cause the machine to cycle continuously.

With the proper tooling in place and machine adjustments set to the desired positions, the operator, standing to the front or side of the machine, inserts a part into the tooling and using the foot switch, cycles the machine.

After the machine has made one complete cycle and the tooling has returned to its rest position, the part is removed and another part inserted.

MODEL 250 STRAIGHT-O-MATIC MACHINE

Serial # 250-16-188

Part #_____	Part #_____
Tool #_____	Tool #_____
Inserts #_____	Inserts #_____
Scale:_____	Scale:_____
Part #_____	Part #_____
Tool #_____	Tool #_____
Inserts #_____	Inserts #_____
Scale:_____	Scale:_____
Part #_____	Part #_____
Tool #_____	Tool #_____
Inserts #_____	Inserts #_____
Scale:_____	Scale:_____

Some tooling is provided with optional "hold-down" fixtures for holding the part, firmly, in the plane opposite the movement.

These fixtures must be opened and closed as part of the loading and unloading sequence.

4. TROUBLE SHOOTING GUIDE

The following are possible causes and suggested remedies for any difficulties with the machine or its operation and results:

Part cracks or shows tool marks; easing pressure will not straighten part.	Over stressing	Reduce air pressure
Parts are straight but excessive breakage.	Parts brittle. Rockwell readings Rc 50 or higher.	Reduce cycle time or air pressure.
Results not uniform.	Inconsistent hardness or straightness of parts.	Increase stroke setting or increas air pressure.
Dimensional changes.	Owerworking part.	Reduce cycle time.
Cam Followers overheating.	Improper Lubrication	Check automatic lubricator and oil level.
	Tooling wedges too tight.	Adjust properly per Fig. 2.
Tooling slides moving when machine at rest.	Cam over greased.	Work excess grease by moving pull down lever up and down full stroke
	Clevis at end of pull-down lever out of adjust-ment.	Adjust so pin can be rotated by fingers, when pull-down lever is in "up" position.

MAINTENANCE

Check and fill oil reservoirs with Gulf #68 AW, Sunoco #90T-2 or Lubriplate #4 every 40 hours.

Drain drip pan when full, check every 40 hours.

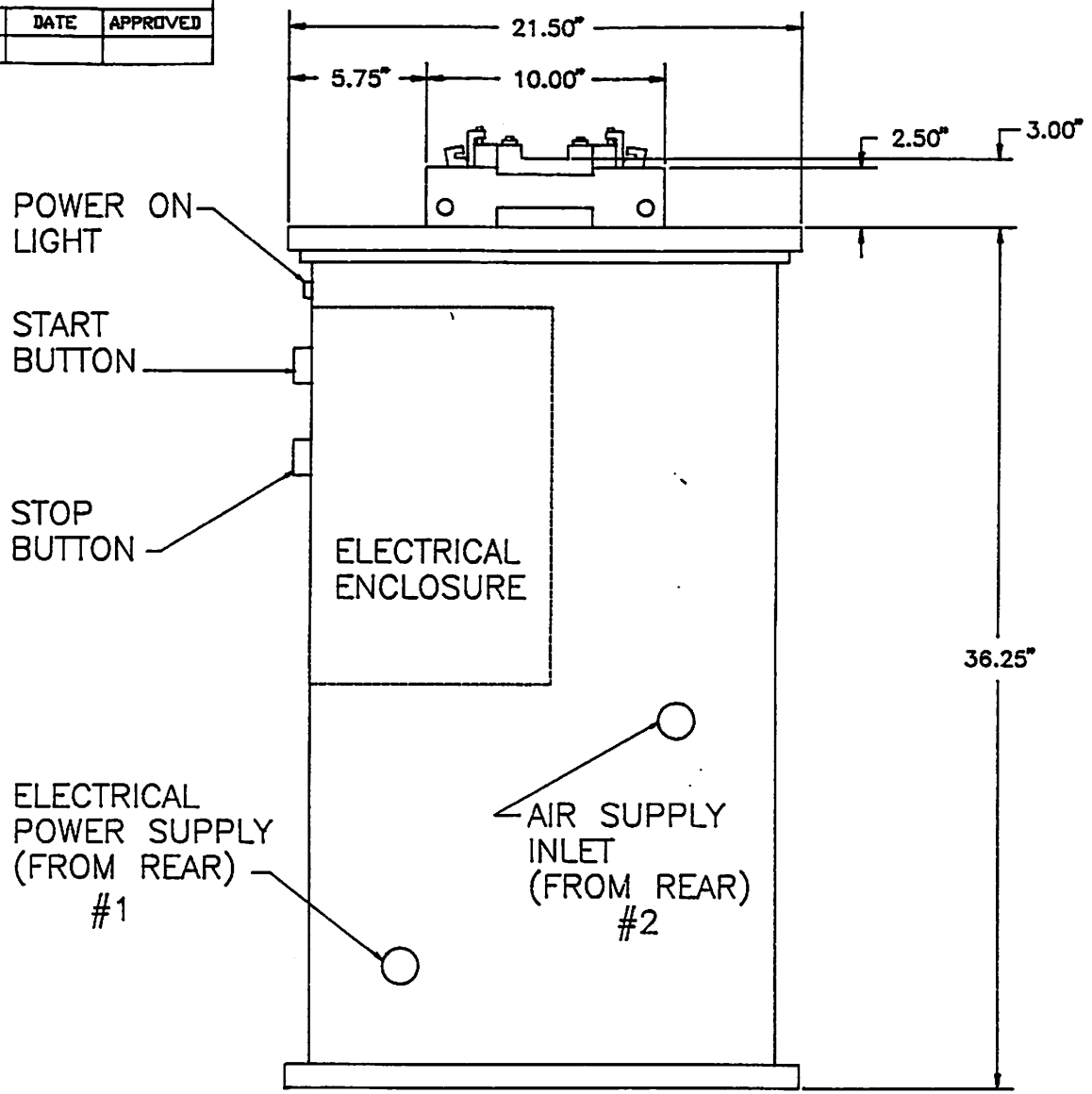
Set air lubricator to 1 drip per cycle, check weekly.

Check and adjust drive belt pair tension every 8 hours. Adjust to 1/2" deflection midway. Change belts when showing signs of wear, (i.e., cracking, glazing, etc.).

See Page 3 for Manual Greasing.

Keep tooling clean. Lubricate slides every 8 hours with light Machine oil.

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED



NEXT ASSY	USE ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES
FRACTIONS ± FRACTIONALS ± FINISH
.XXX ± .XXX
.XX ± .XX

MATERIAL:

T-DRILL INDUSTRIES, INC.
1740 CORPORATE DRIVE
NORCROSS, GA. 30093
PHONE (404)-923-0263
FAX NO. (404)-923-0712

DISK # 027
MACHINE: 250

DRAWN BY: C. CRUMP
CHECKED BY: D. PRUETT
APPD.BY:
MECH.
ELECT.
STDS.

T-DRILL

TITLE

SIZE	FSCM NO.	DWG. NO.	REV
A		250LL	01

SCALE: NTS DATE: 1/23/92 SHEET NO: 1 OF 1

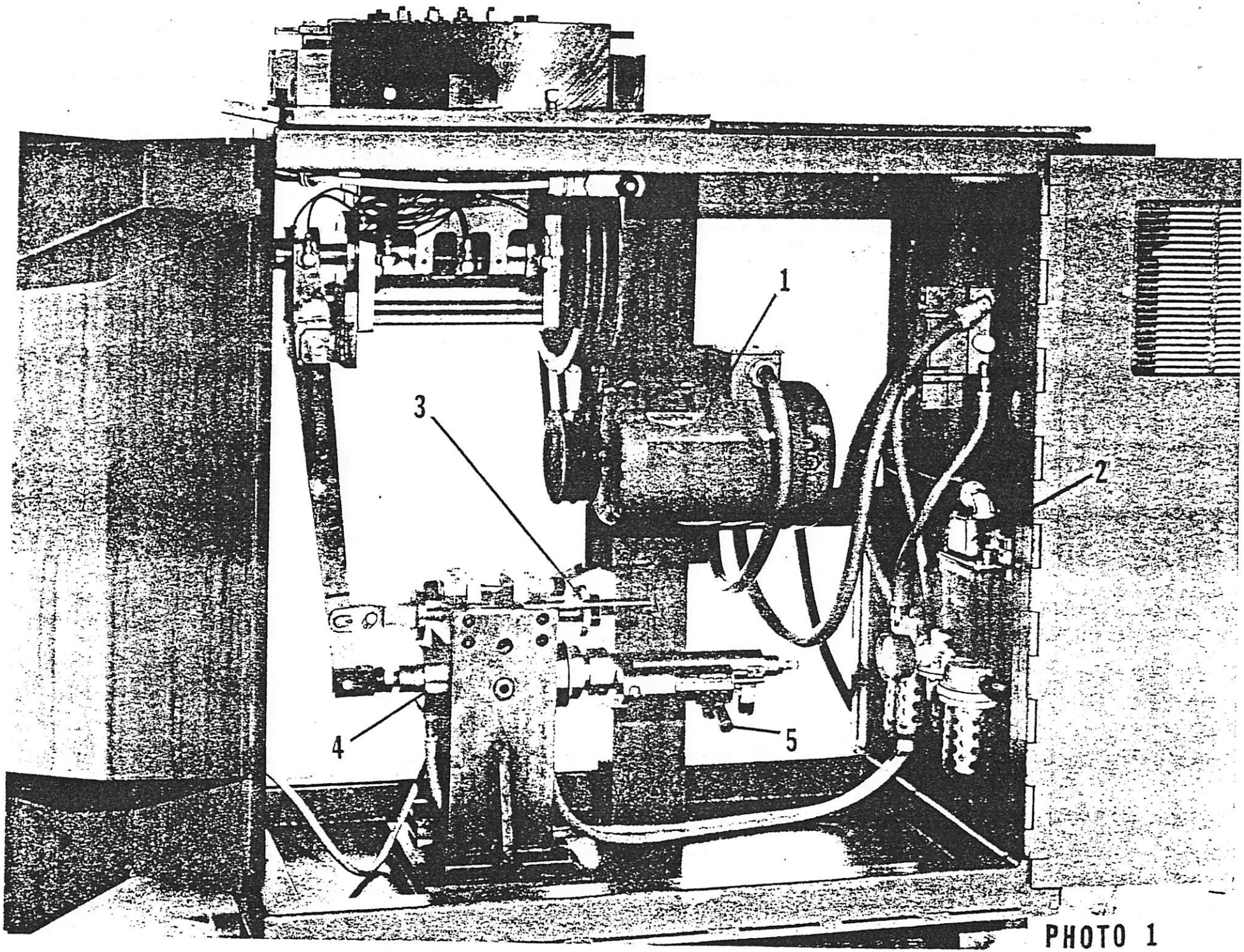
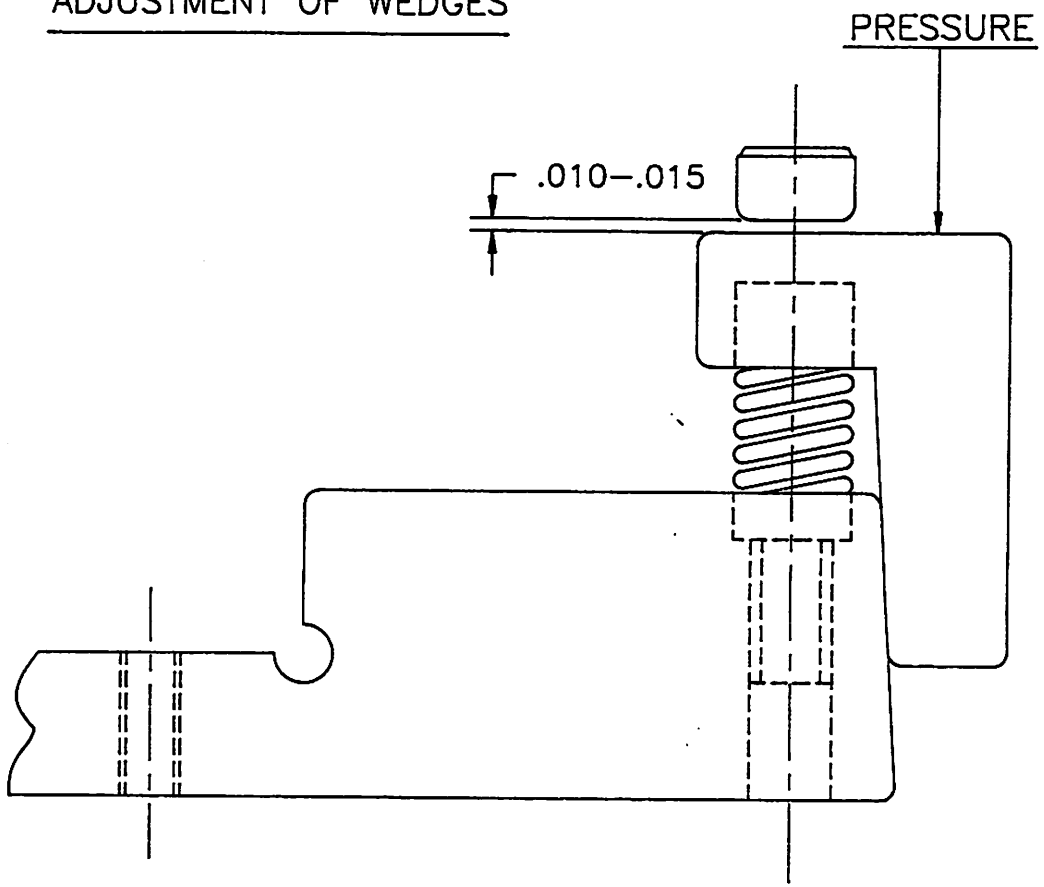


PHOTO 1

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED

ADJUSTMENT OF WEDGES



After the wedges are properly adjusted and downward pressure placed on them, there should be at least a .010" clearance between the top of the wedge and the bottom of the adjusting screw.

NEXT ASSY	USE ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES FRACTIONS ± FRACTIONAL ± FRAC-TOL .XXX ± .XXX-TOL .XX ± .XX-TOL

MATERIAL:

T-DRILL INDUSTRIES, INC.
1740 CORPORATE DRIVE
NORCROSS, GA. 30093
PHONE: (404)-925-0520
FAX NO: (404)-925-0522

DISK # 027

MACHINE: 250

DRAWN BY: C. CRUMP

CHECKED BY: D. PRUETT

APPD.BY:

MECH.

ELECT.

STDS.

T-DRILL

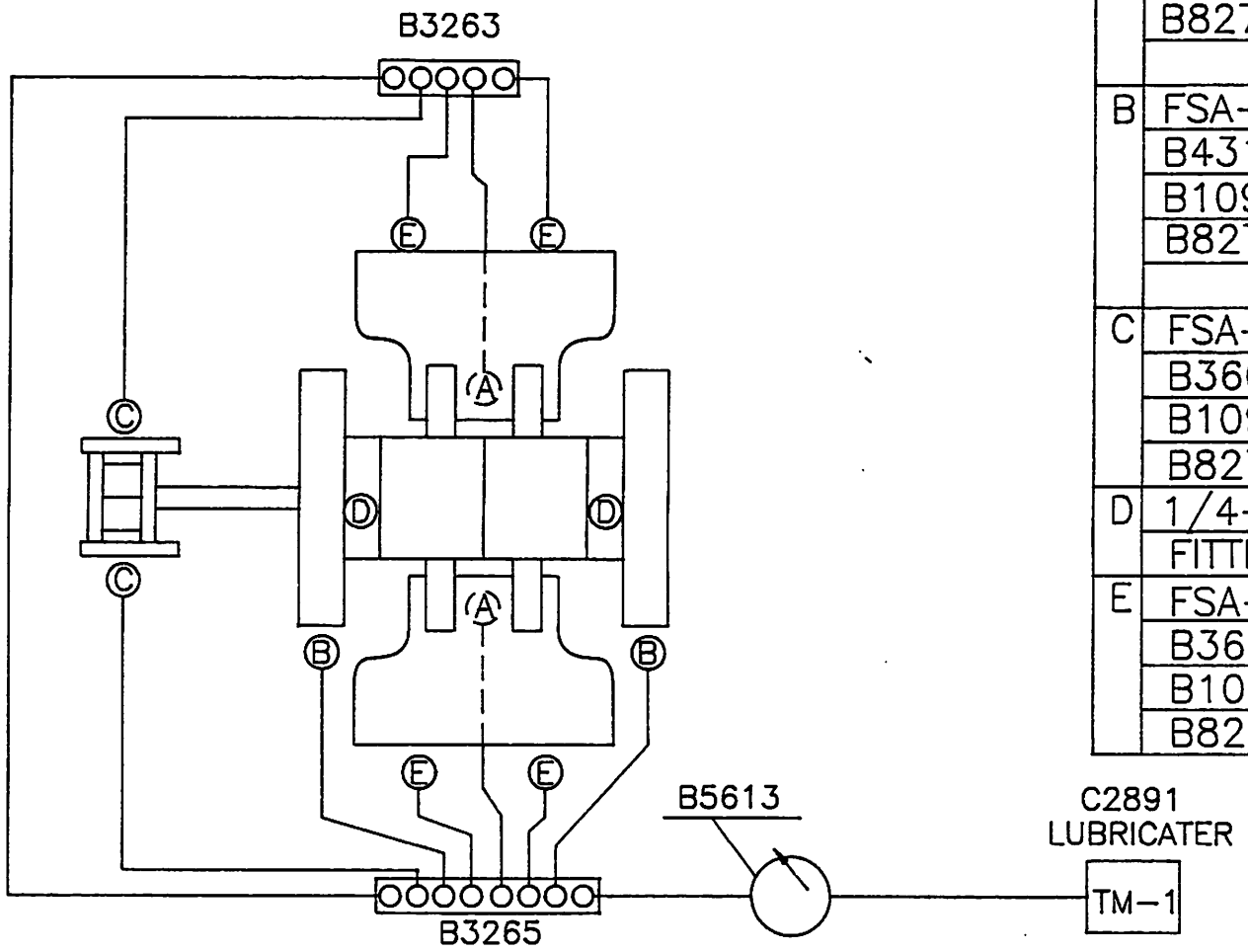
TITLE: ADJUSTMENT OF WEDGES

SIZE	FSCM NO.	DWG. NO.	REV
A		250WEDGE	01

SCALE: NTS DATE: 1/23/92 SHEET NO: 1 OF 1

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED

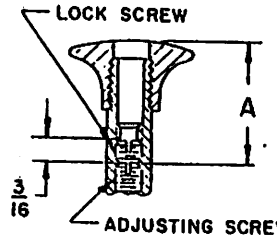
LUB PARTS	
A	FSA-00
	B3608
	BT095
	B8272
B	FSA-1
	B4311
	B1095
	B8272
C	FSA-1
	B3608
	B1095
	B8272
D	1/4-28 GREASE
	FITTING
E	FSA-2
	B3608
	B1095
	B8272



		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONS ± .XX ± .XXX ± .XX ± .XXX ± FRACTIONALS ± .XXX ± .XX ±	T-DRILL INDUSTRIES, INC. 1748 CORPORATE DRIVE NORCROSS, GA. 30093 PHONE: (404)-925-0328 FAX NO (404)-925-0912	DRAWN BY: C. CRUMP	T-DRILL
				CHECKED BY: D. PRUETT	TITLE: LUBRICATION SYSTEM
		MATERIAL:		APP'D BY:	
			DISK # 027	MECH.	SIZE: A / FSCM NO. / DWG. NO. 250C-113 / REV 01
			MACHINE: 250	ELECT.	SCALE: NTS / DATE: 1/23/92 / SHEET NO: 1 OF 1
NEXT ASSY	USE ON			STDS.	
APPLICATION					

OPERATION:
Lubricator Type TM-1 is a motor driven piston pump of spring-discharge type. The motor incorporates a gear reduction which determines the operating cycle of the pump piston. The cycle times available are shown in the table below.

DISCHARGE VOLUME PER STROKE:
Adjustable - 0.2 cu. cm. minimum
1.0 cu. cm. maximum
Lubricator supplied set at maximum stroke, 1.0 cu. cm. discharge. For less delivery, remove lock screw, measure A, turn adjusting screw clockwise increasing A by B dimension.



B	DISCHARGE
.440	.2 cc
.330	.4 cc
.220	.6 cc
.110	.8 cc
0	1.0 cc

DISCHARGE PRESSURE RANGE: - 20 - 50 psi.
Discharge pressure will decrease as the number of Meter-Units in the system increases.

MOTOR:
BIJUR reserves the right to change motor size, mounting dimensions and manufacturer.
TYPE: - Continuous duty, single phase, synchronous induction timing motor for 50 and/or 60 cps.
VOLTAGE: - See table below.
WIRING: - For dual voltage motor only
115V SERVICE: Connect blue and white, insulate red
220V SERVICE: Connect blue and red, insulate white.
POWER CONSUMPTION: - 3 Watts

LIQUID LEVEL SWITCH:
Some models of this lubricator (see below) are equipped with a Liquid Level Switch. The Liquid Level Switch closes at high oil level. Switch will close at low level by inverting float. When switch is connected to a light or other indicating device, liquid level is monitored. Switch contact rating is 10 Watt maximum. Indicating device is not supplied by BIJUR.

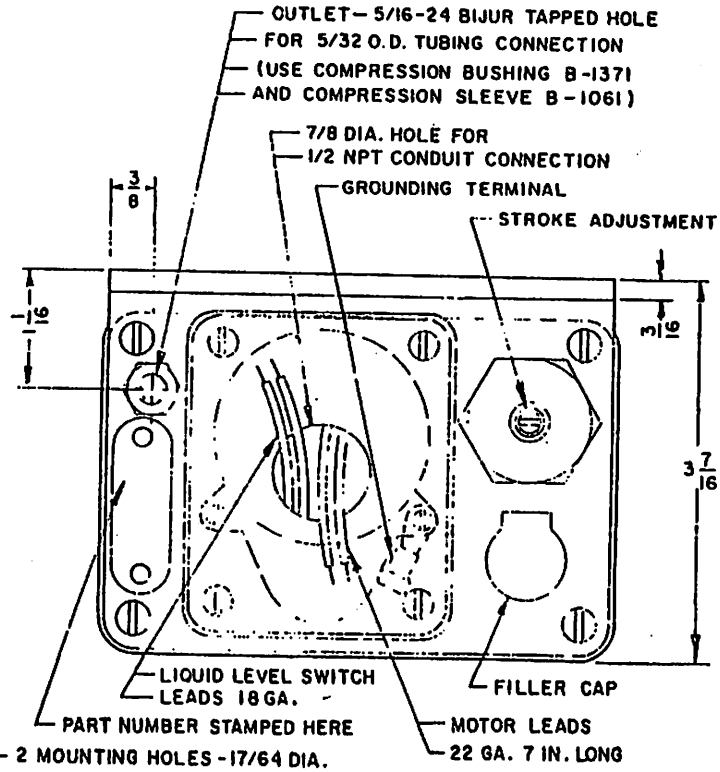
LUBRICATOR INLET FILTER
40 micron particle separation. It should be inspected periodically and cleaned or replaced as required.

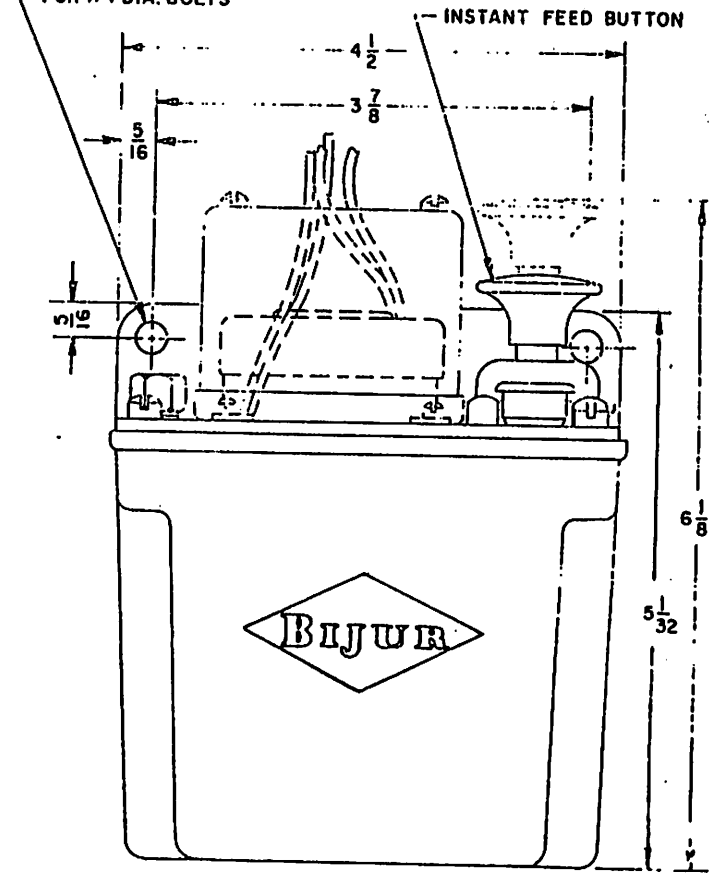
RESERVOIR CAPACITY: 1 Pint (475 cu. cm.)

SYSTEM: Use Meter-Units Type F

SYSTEM LIMITATION:
For System Ø Limitation see "Engineering Manual".
Viscosity Range 150 to 8000 SSU at operating temperature

WHEN ORDERING SPECIFY:
Name, Symbol and Part Number such as:
LUBRICATOR TM-1 C-2731



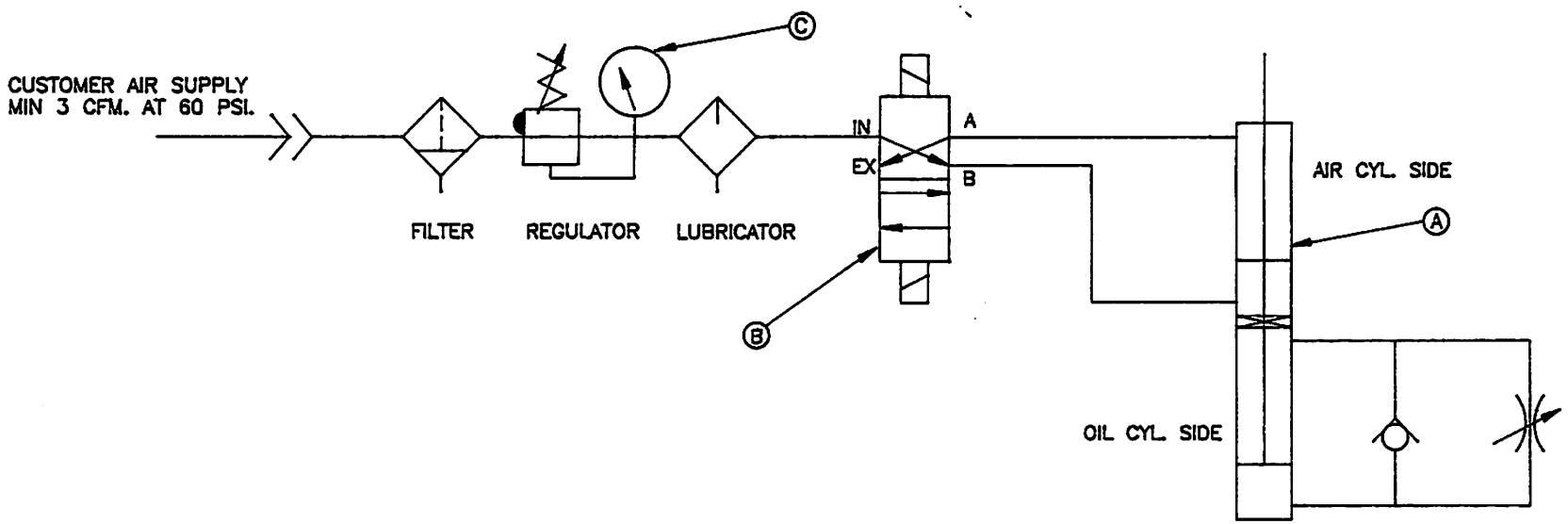


VOLTS	LUBRICATOR CYCLE TIME IN MINUTES		PART NUMBER WITHOUT LIQUID LEVEL SWITCH		PART NUMBER WITH LIQUID LEVEL SWITCH	
	50cps	60cps	BIJUR		BIJUR	
115V	145	120	C-2731		C-2889	
	72	60	C-2739		C-2890	
	18	15	C-2741		C-2891	
	9	7.5	C-2803		C-2896	
220V	9	7.5	C-2774		C-2897	
	145	120	C-2763		C-2892	
	72	60	C-2764		C-2893	
	18	15	C-2765		C-2894	
115/220	2.4	2	C-2798		C-2895	

AH
JK
HD
ED
AI

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED

	PART #	DESCRIPTION	QTY
A	250-C-101	CYLINDER ASSEMBLY	1
B	250-C-116	SOLENOID VALVE	1
C	250-C-117	FRL	1



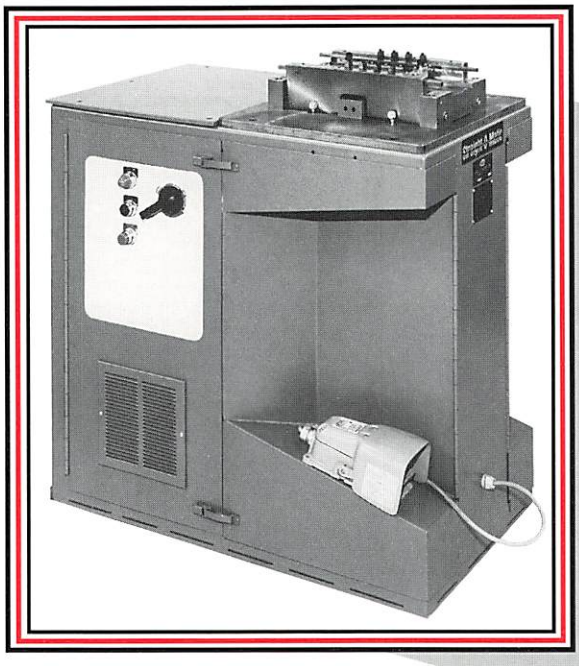
		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES FRACTIONS ± .XXX ± .XX ±	T-DRILL INDUSTRIES, INC. 1740 CORPORATE DRIVE NORCROSS, GA. 30093 PHONE (404)-925-0520 FAX NO (404)-925-0512	DRAWN BY: C. CRUMP	**T-DRILL**
		MATERIAL:		CHECKED BY: D. PRUETT	TITLE: PNEUMATICS
				APPD.BY:	
			DISK # 027	MECH.	SIZE: A; FSCM NO.; DWG. NO.: 250WEST; REV: 01
NEXT ASSY	USE ON		MACHINE: 250	ELECT.	SCALE: NTS; DATE: 1-20-92; SHEET NO: 1 OF 1
APPLICATION				STDS.	

UTE Straight-O-Matic®

MODEL 250 STRAIGHTENING SYSTEM

FOR FLAT PARTS, FORGINGS, STAMPINGS AT HIGH RATES–TO CLOSE TOLERANCES

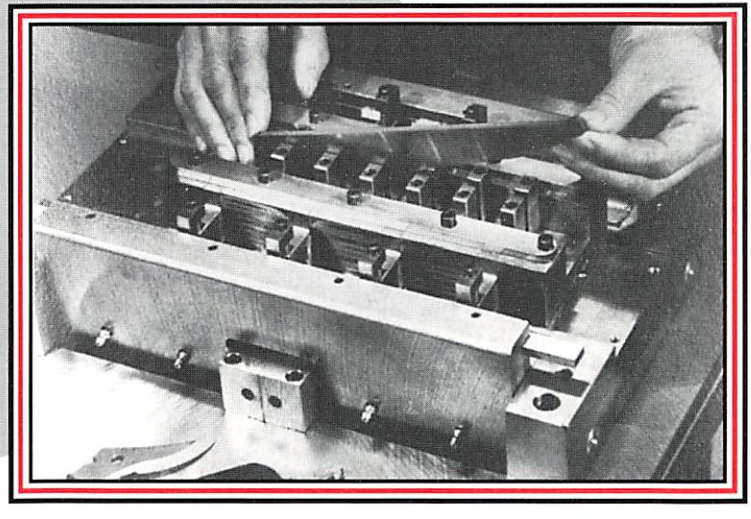
Model 250



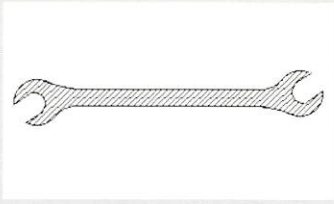
The heads of these machines are actuated by offset rotary cams which transmit a reciprocal stroke to jaw inserts. Alternately opposed jaws provide bend in ratio with the stroke of the moving jaws. A part is inserted between the jaws, and a cycle is started by a push button. The part is over-bent by a pre-set amount and returned to the desired straight center line in one to two seconds.

Model 250 Tooling straightens parts up to 16″ long with a section modulus of approximately 0.0051.

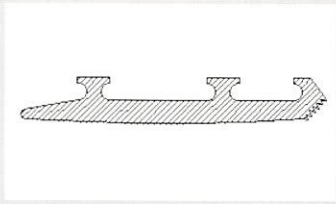
Model 250 Tooling



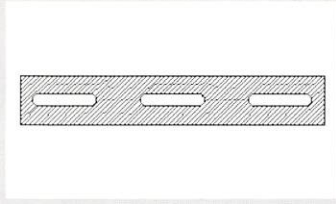
STRAIGHTENING EXAMPLES



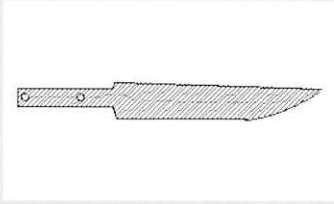
Wrench



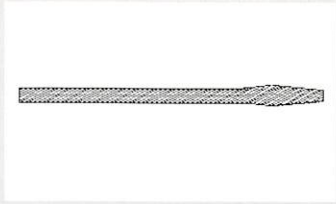
Skate Blade



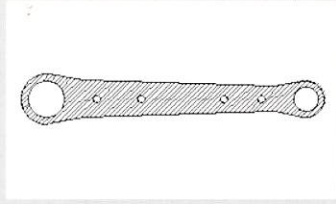
Scraper



Knife



Screwdriver



Ratchet Wrench

MACHINE SPECIFICATIONS

Capacity:	Length to 16" (410mm)
Production Rate:	400 to 800 Parts Per Hour
Physical Description:	Length 35" (900mm) Width 22" (560mm) Height 38" (965mm) Weight 1,000 lbs. (455kg)
Electrical:	3/4 HP Motor 230/460 Volts 3 PH, 60 HZ Controls, 115 Volts Fused Disconnect
Pneumatic/Hydraulic:	60 PSI (4 Bars) No Hydraulics

Machines can be quoted with feeders and other types of automation.

UTE Straight-O-Matic®

3204 Hanover Drive • Johnson City, Tennessee 37604
Telephone/Fax: (615) 282-0640 / 1-800-727-4672