

Engel Injection Molding Machine

TECHNICAL SPECIFICATIONS - ES 100 V-SERIES TIEBARLESS INJECTION MOLDING MACHINE

CLAMP

Clamp force	US tons	100
Clamp opening force	US tons	4.0
Clamp stroke (max.)	inches	17.72
Mold height (min - max)	inches	9.84 - N/A
Daylight (min - max)	inches	9.84 - 27.56
Platen size (HxV)	inches	27.95 x 22.05

See platen illustration below for max. mold size applicable

Hydraulic ejector stroke	inches	3.94
Hydraulic ejector force	tons	4.3

INJECTION

		std. screw	other available screw sizes		
Screw diameter	mm	40	30	35	45
Screw diameter	inches	1.575	1.181	1.378	1.772
Shot size ¹⁺²	oz	6.5	3.7	5.0	8.3
Injection capacity	in ³	12.3	6.9	9.4	15.5
Recovery rate ¹⁺²	oz/sec	0.9	0.5	0.8	1.2
Plasticizing capacity ¹⁺²	lbs/hr	200	118	183	265
Injection rate at max. press.	in ³ /sec	8.9	5.0	6.8	11.3
Injection rate (regenerative)	in ³ /sec	12.1	6.8	9.3	15.3
Injection velocity at max. press.	in/sec	4.6			
Injection velocity (regenerative)	in/sec	6.2			
Screw stroke	inches	6.3			
Injection pressure (max.)	psi	24143	30000	30000	21765
Injection pressure (regenerative)	psi	17763	30000	23200	16013
Screw speed range (min=25)	rpm	320 ⁵	420	420	320 ⁵
Screw torque ³	ft-lbs	325 ⁵	260	260	325 ⁵
Screw L/D ratio		17.5:1	23.3:1	20:1	15.6:1
Nozzle stroke	inches	9.84			
Nozzle force	US tons	5.3			

HYDRAULICS

Pump capacity (required)	gpm	24.0
Oil reservoir capacity	US gal	60

ELECTRICS

Power supply available	volts	*460 incoming voltage / 460 volt heaterbands
Total rated horsepower	HP	20
Number of heat control zones		3+Nozzle
Total heating wattage	kw	7.2

GENERAL

Dry cycle performance ⁴	sec	1.5
Water requirements (max)	gpm	6
Machine dimensions (LxWxH)	inches	165 x 56 x 77
Machine weight	lbs	14000
Hopper capacity	lbs	44
Suitable Engel robots		ERTLi 21, ERC 23

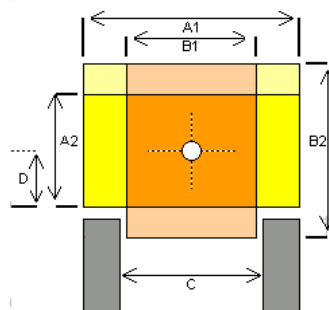
NOTES:

1. Based on polystyrene material.
2. Calculated
3. Can be increased.
4. Per Euromap 6 standard.
5. With high torque screw drive.

(N/A=Not Available, O/R=On Request, Std.=Standard)

*transformer option available

All data subject to change without notice
Per Rev. 9, 010925



Platen Illustration

With robot demolding,
use A1 x A2
With free drop,
use B1 x B2

Maximum Mold Dimensions

ES 100TL	(inches)
A ₁ x A ₂	27.95 x 14.18
B ₁ x B ₂	17.32 x 22.05
C	18.11
D	7.26

INCLUDED V-SERIES FEATURES

- Bi-metallic barrel (M3) for abrasion resistance
- Through hardened (S7) screw for abrasion resistance. Includes abrasion resistant 'Marathon' (R9B) screw tip assembly
- Air blow off with timer
- 6 channel closed waterflow control
- Machine levelling & vibration mounts
- Single hydraulic corepull
- 460 incoming voltage with 460 volt heaterbands
- SPI robot interface

STANDARD TIEBARLESS EQUIPMENT Injection

- 10 step injection speed profiling
- 10 step holding pressure profiling
- 5 step back pressure profiling
- 5 step screw speed profiling
- Digital screw speed (RPM) display
- Digital injection time monitoring
- Screw recovery time monitoring
- Boost cut-off: time, stroke, and hydraulic pressure dependent
- Automatic cushion monitoring and control
- Cold start protection
- Injection unit swivel
- Quick barrel change
- Precision linear bearings for carriage movement
- Hopper discharge chute
- Feedthroat prepared for water-cooling
- Feedthroat with thermometer
- Quick disconnects for heater bands
- Increased injection speed (regen. circuit, screen selectable)
- Programs for sprue break, decompression, and intrusion

Clamp

- SPI mold mounting and ejector pattern
- Multi-stroke hydraulic ejection, speed and pressure controlled
- Center ejector rod
- Mechanical safety dropbar
- 3 speed opening and closing
- Hydraulic, electric and electronic safety gate interlocks
- 5 speed/pressure/position mold protection on EC100 models

Hydraulics

- Closed loop injection speed, injection pressure and screw back pressure; via single 'smart' pump technology on EC100 controlled TL models.
- Fully proportional linearized hydraulic system
- Automatic calibration of proportional hydraulic valves and transducers
- Clogged filter indicator
- Closed loop oil temperature regulation with prewarming system
- Oil level indicator with level switch
- Pressure selector gauge

Controls, Electrics & Electronics

- Microprocessor control with high resolution flat color screen
- RISC Multiple processor architecture (distributed intelligence)
- Built-in disk drive for data up/down loading. Mold set-ups stored via machine CPU.
- Quick machine set-up via single screen
- Help text system
- Linear transducers for measurement of the clamp, injection, carriage and ejector positions
- Automatic cycle monitoring and analysis
- Digital display of all actual values
- Current function display
- Self-diagnostics, monitoring, alarm & calibration
- Automatic screen shut-off
- Automatic balancing of heat zones during warm-up
- Auto barrel stand-by temperature when machine in alarm condition
- Automatic reject selection
- US/metric units conversion
- User-defined programmable text pages. Keyboard optional.
- Self-tuning temperature controls
- History reporting of alarm conditions and set-up changes
- Resettable cycle and non-resettable hour counters
- Ventilated, filtered control panel
- Energy-efficient, totally enclosed fan cooled motor

General

- Easy access to motors, pumps and hydraulics
- Large, open drop area for automation
- Ergonomic design for operator ease and safety
- Optically isolated control system (protection from outside noise)
- Analog/digital conversion to minimize signal noise on linear pos. transducers.
- Manufactured to ANSI/SPI B151.1 safety regulations

ADDITIONAL OPTIONS AVAILABLE Injection Unit

- Ball check valve (for non-filled materials)
- Insulating blanket for barrel
- Hopper or drawer magnets

Clamp

- Additional corepull(s) and unscrewing
- Additional air blow off valve
- SPI safety key switch for clamp, ejector and core movement

Hydraulics

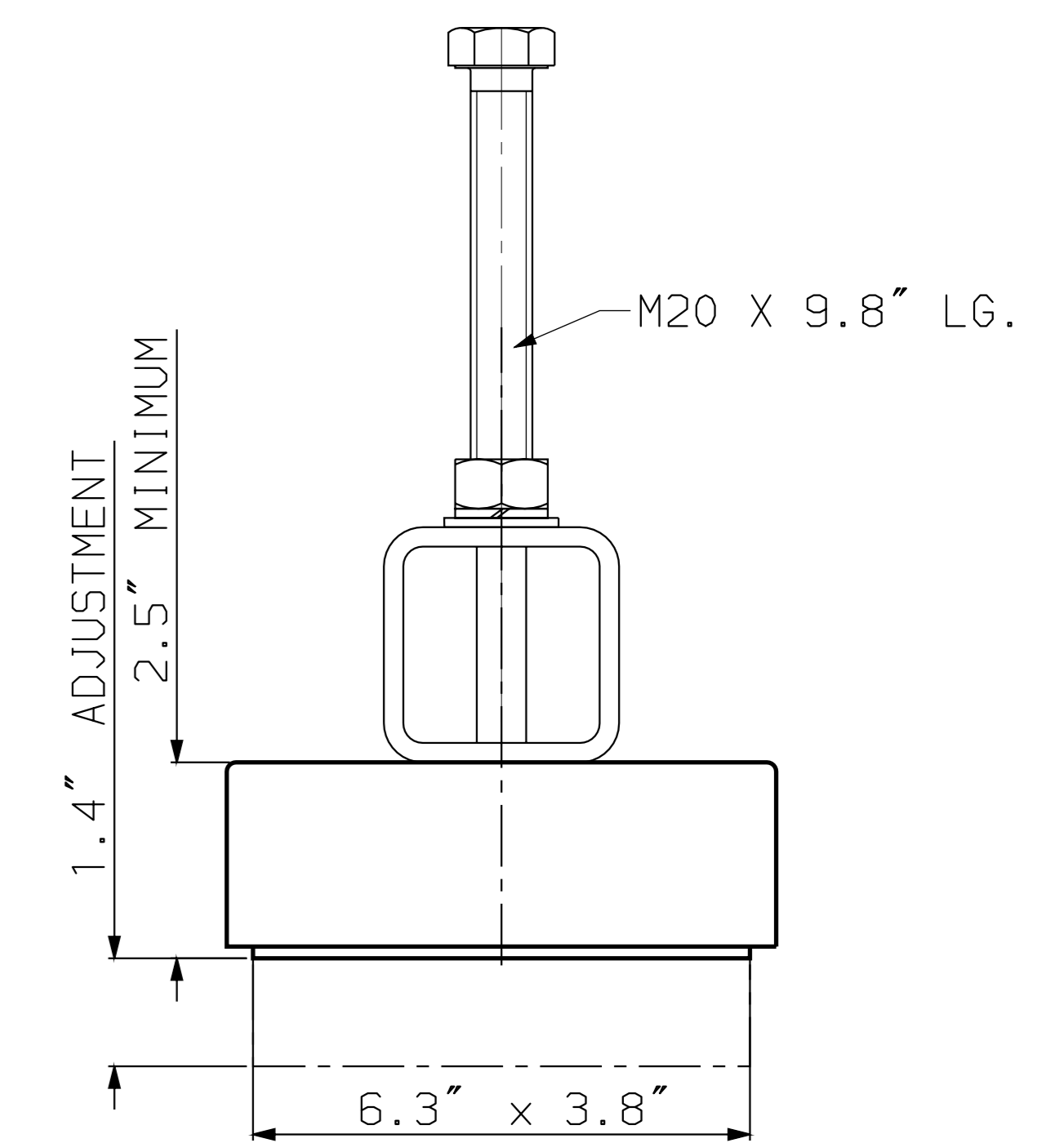
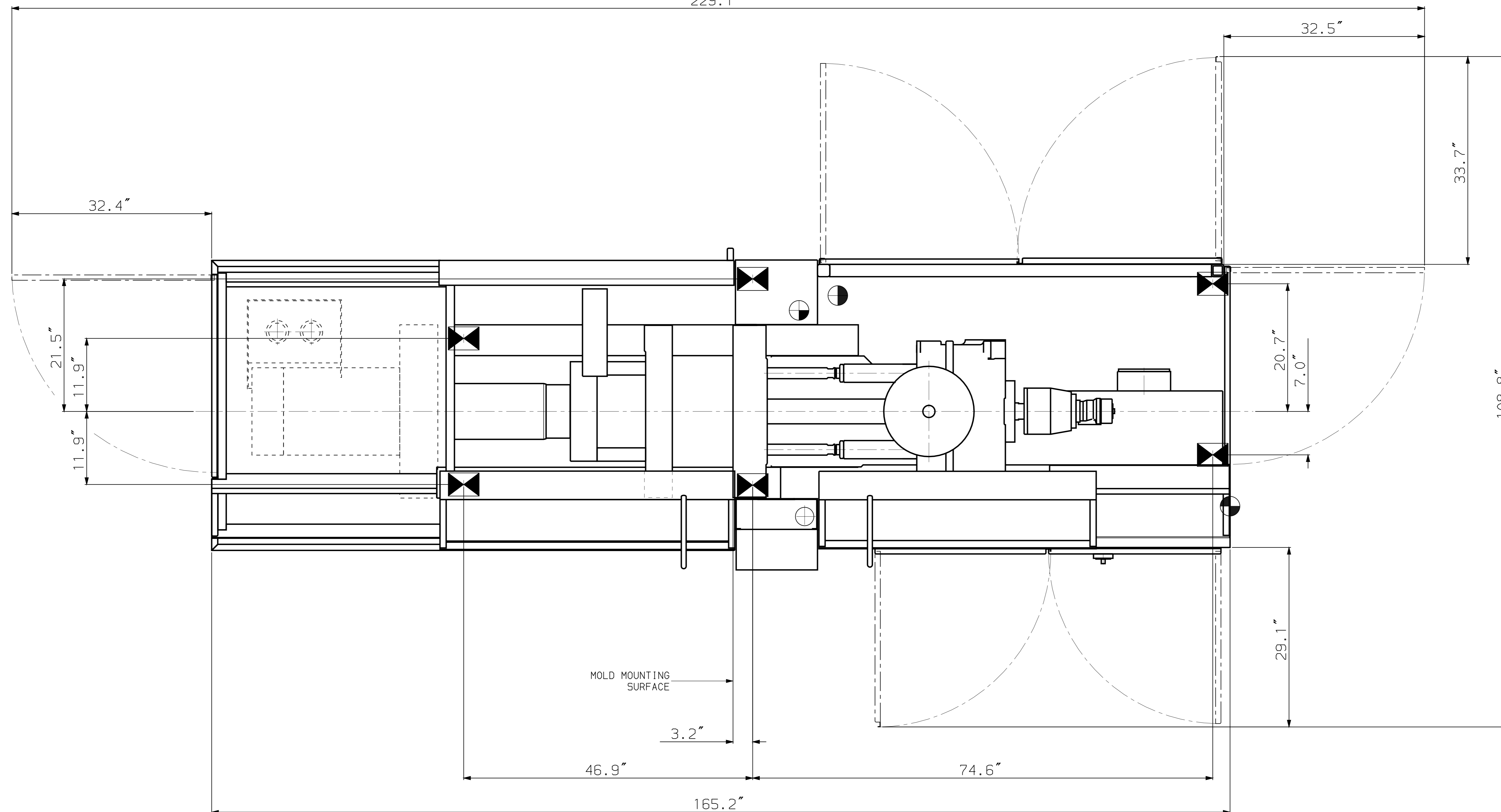
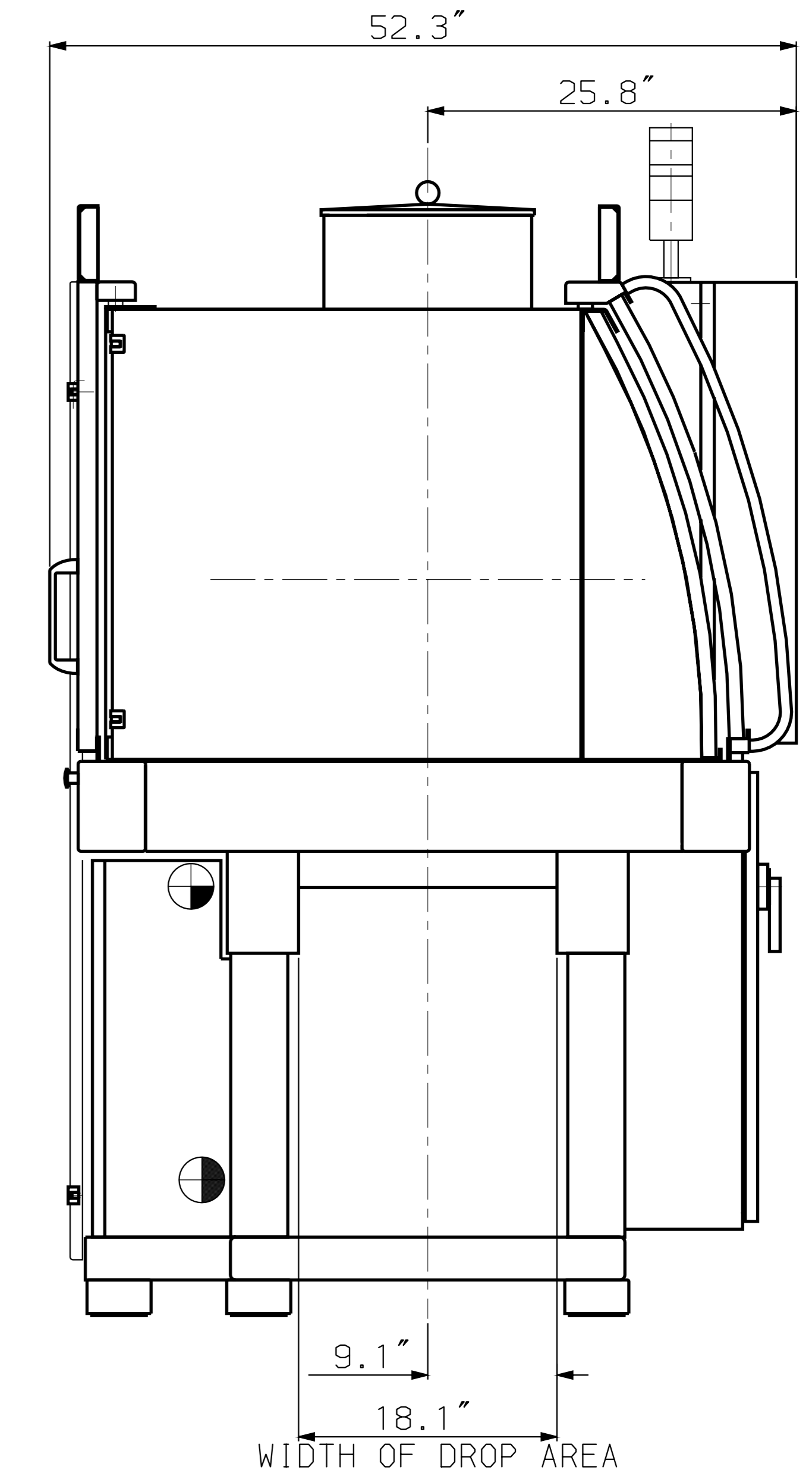
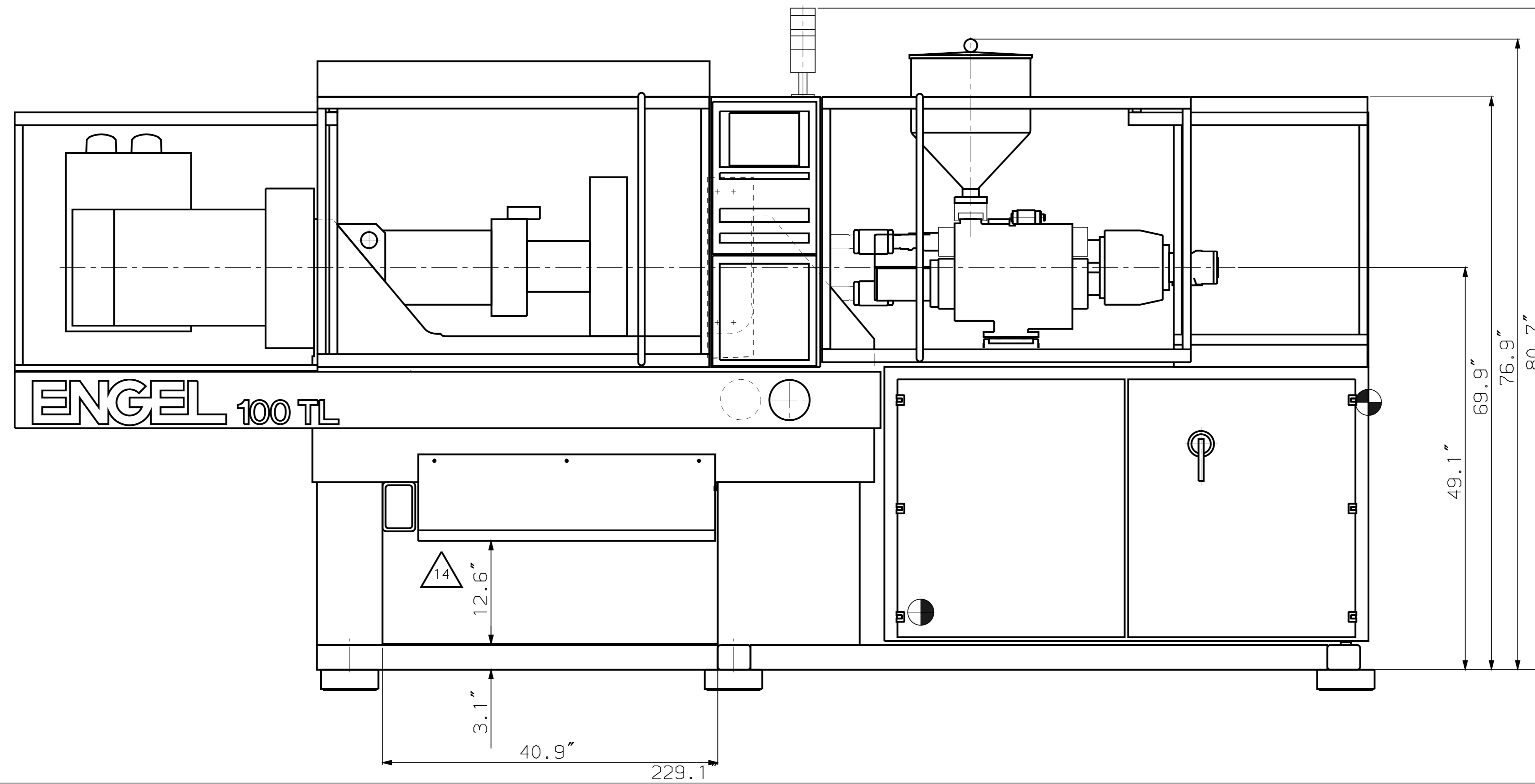
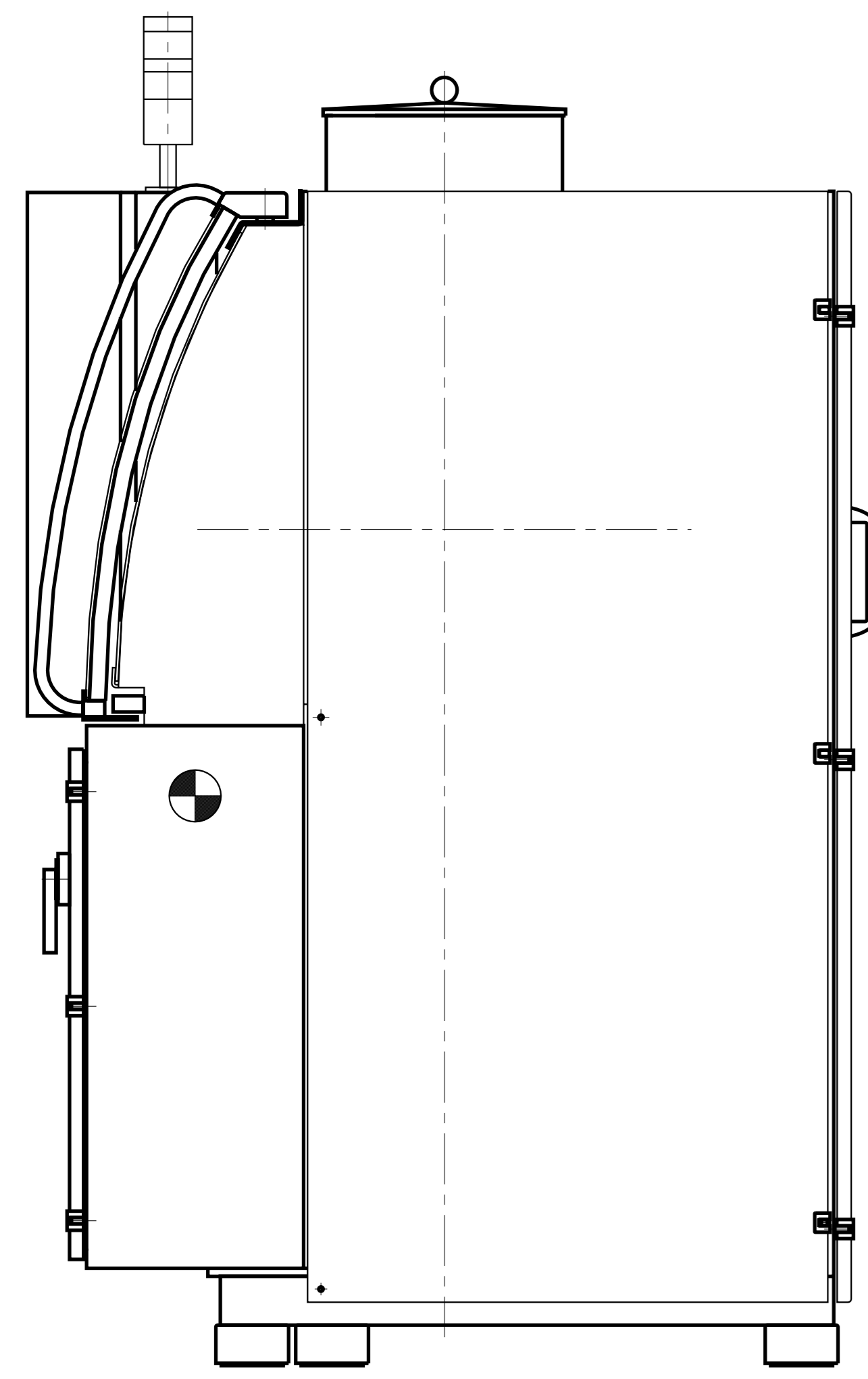
- Hot runner valve gate control (pneumatic)
- By-pass oil filtration

Controls, Electrics & Electronics

- Microplast and Microflow software pkgs.
- Micrograph for EC100 control
- Process data graphics and reports
- Magnetic security card access
- SPC (Quality Data Statistics)
- Automatic barrel/nozzle heat-up (7 day, 24 hour timer)
- ERC robot interface
- Host computer and SPI auxiliary device interface
- Automatic shutdown for "lights out" operation (ghost shift program)
- Closed loop feedthroat cooling
- Graphics printer
- Machine transformers for 230 / 575 incoming voltages (installation not included)

General Options

- Alarm bell in addition to alarm light
- Engel robots
- Training programs
- Spare parts packages



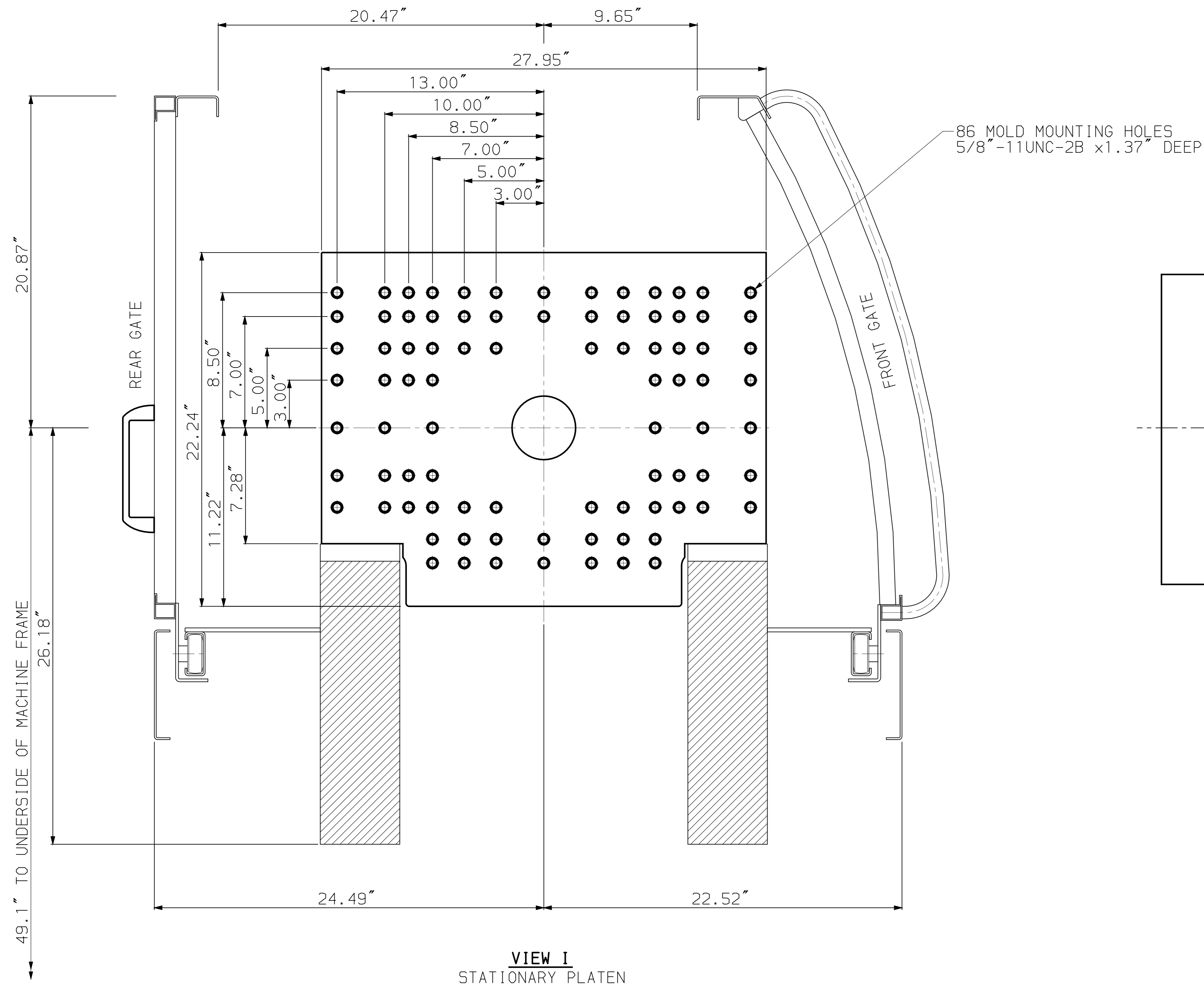
MACHINE MOUNT DETAIL
LOAD CAPACITY 6000 LBS.
SCALE 1:2

- MACHINE MOUNT
- STD.ELE.UTILITY ENTRANCE
- AIR CONNECTION 1/4"NPT.
- COOLING WATER CONNECTION IN & OUT 1"NPT.

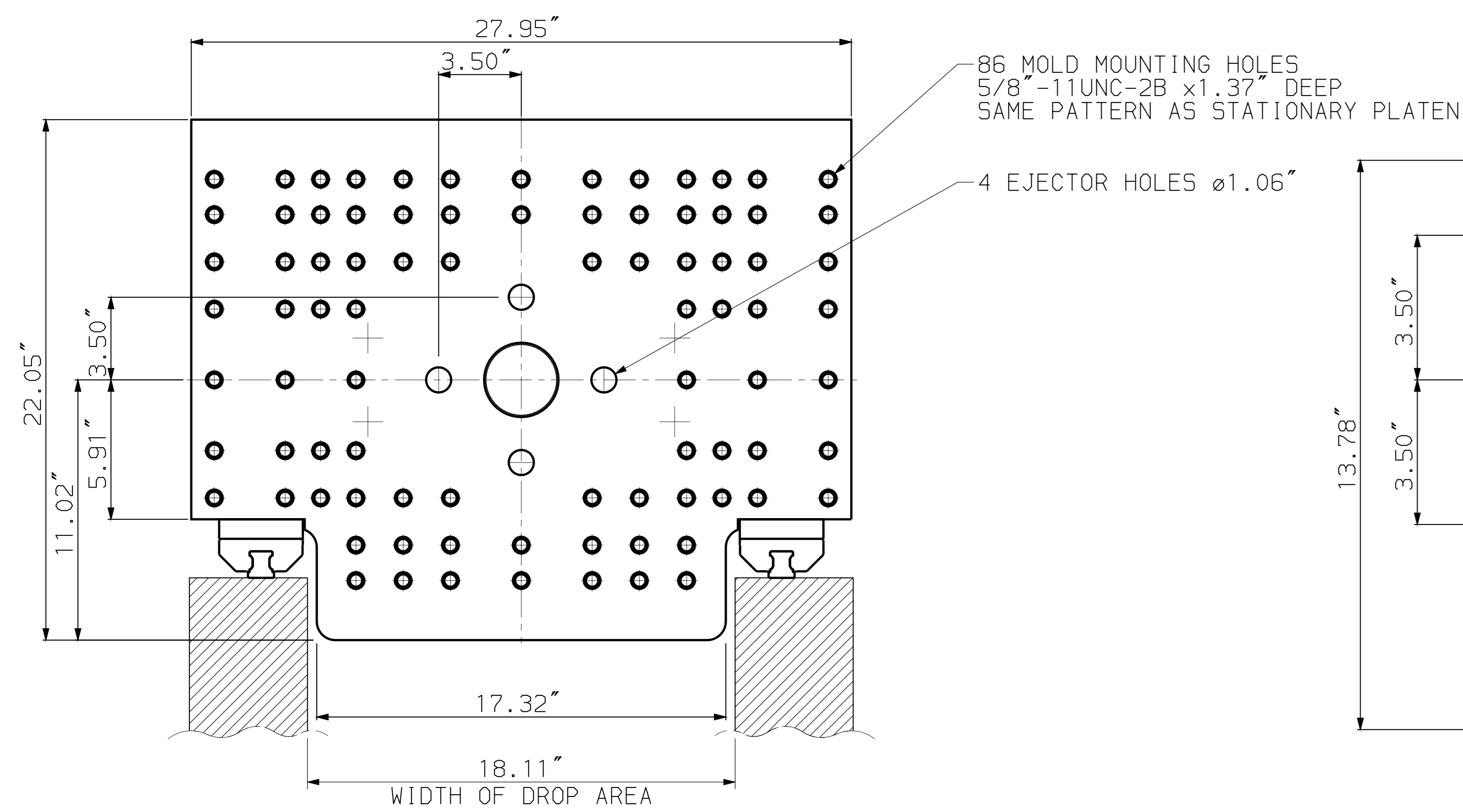
NOTES:
1) DIMENSIONS ARE IN INCHES.
2) TECHNICAL DATA SUBJECT TO CHANGE WITHOUT NOTICE.

RELEASED
MICROFILM
REV. # 14

14	2/19/00	UPDATED GUARD/BASE CL.A.FRONT BR.	30-APR-01	LEVI P.
13	0000000000	DATE EXTENSION & NEW STYLE ALARM LAMP ADDED.	20-MAR-00	B.J.L.A.D.
12	0251	REVISED MACHINE POINTS	20-MAR-99	Z.S.A.B.
11	0141	ENGEL REMOVED FROM ELE CABINET	27-JAN-98	KMB
10	5451	NEW	14-NOV-95	KEARNEY
REV#	ECOM	REVISION	DATE	NAME
SCALE	DESCRIPTION			
1: 8	MAIN DIMENSIONS ES100TL			
MATERIAL		NAME	DATE	
STOCK CODE		DR. N.	KEARNEY	14-NOV-95
BREAK SHARP CORNERS		CHK. D.	KEARNEY	14-NOV-95
SIZE	FROM 0.5 6 30 120 315 1000 2000	REPLACES		
	TO 8.0 30 120 315 1000 2000	COPY FROM		
FINE #	0.05 0.1 0.15 0.2 0.3 0.5 0.8	DRKING NO		
MEDIUM #	0.1 0.2 0.3 0.5 0.8 1.2 2.0	DRKING NO		
COARSE #	0.2 0.5 0.8 1.2 2.0 3.0 4.0			
DIM. MICRONS		5890.005.0710E		REV. #
		SHEET		14
		2 of 2		



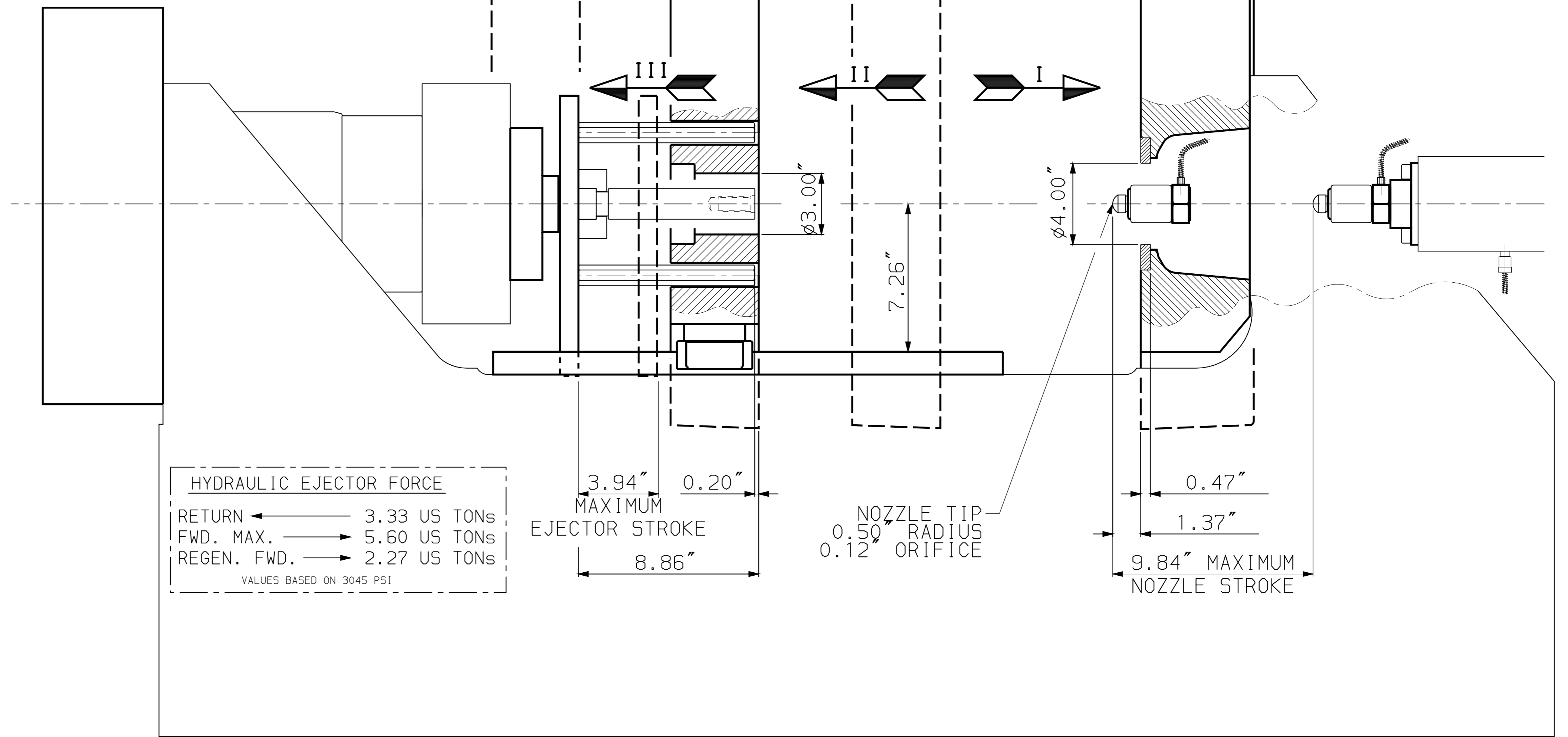
VIEW I
STATIONARY PLATEN



VIEW II
MOVING PLATEN

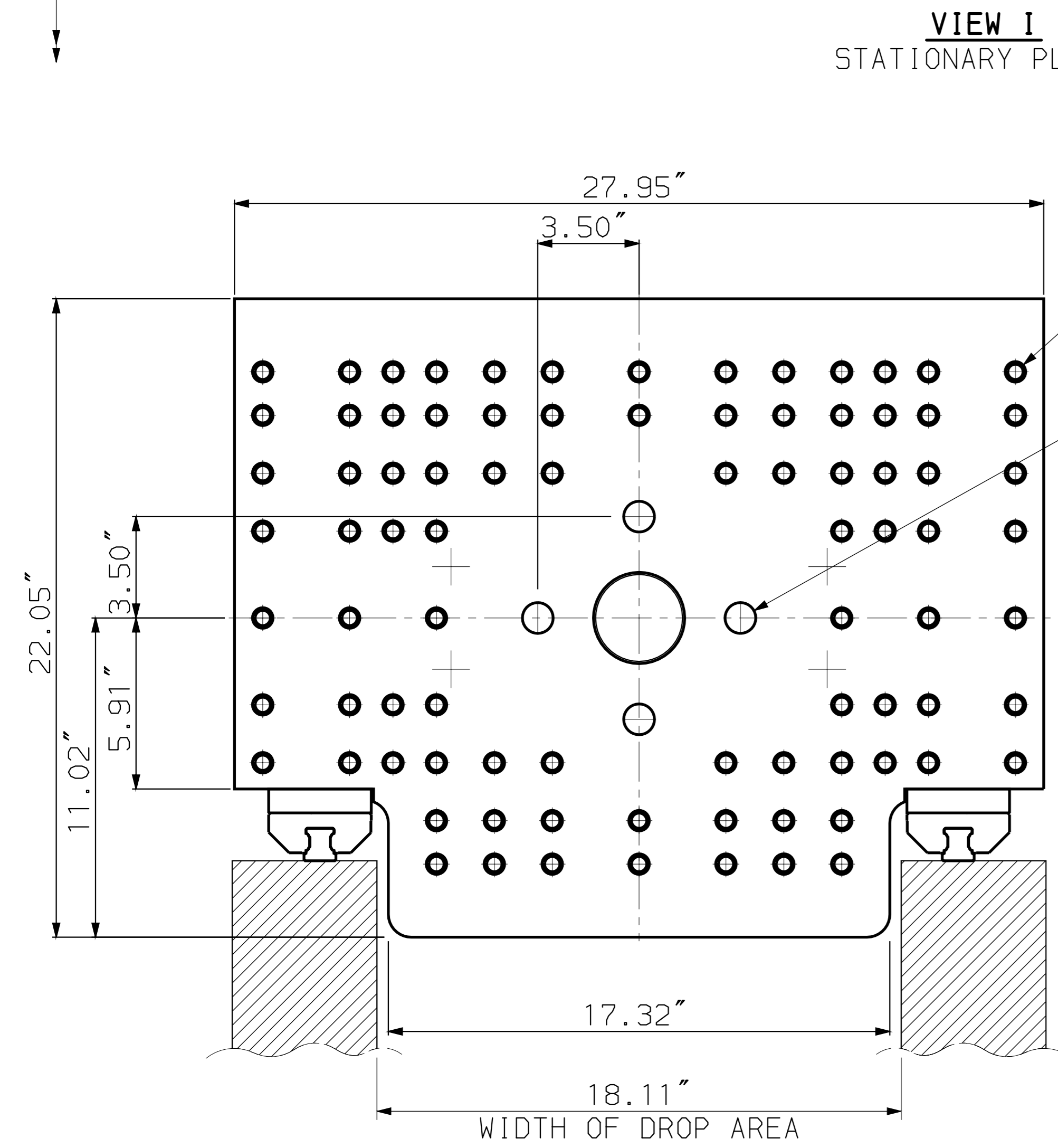
NOTE:

1. DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.
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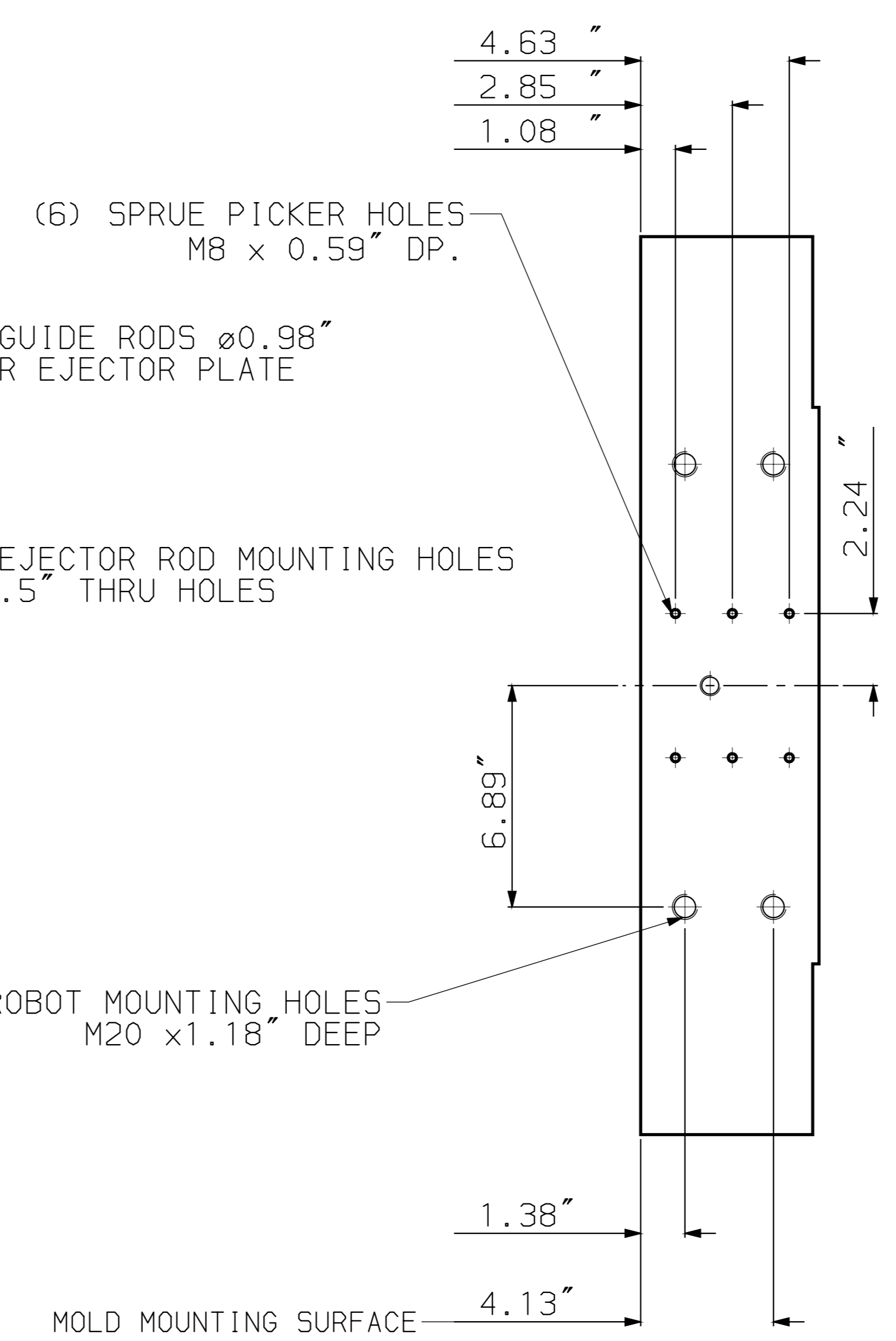


HYDRAULIC EJECTOR FORCE	
RETURN	3.33 US TONS
FWD. MAX.	5.60 US TONS
REGEN. FWD.	2.27 US TONS

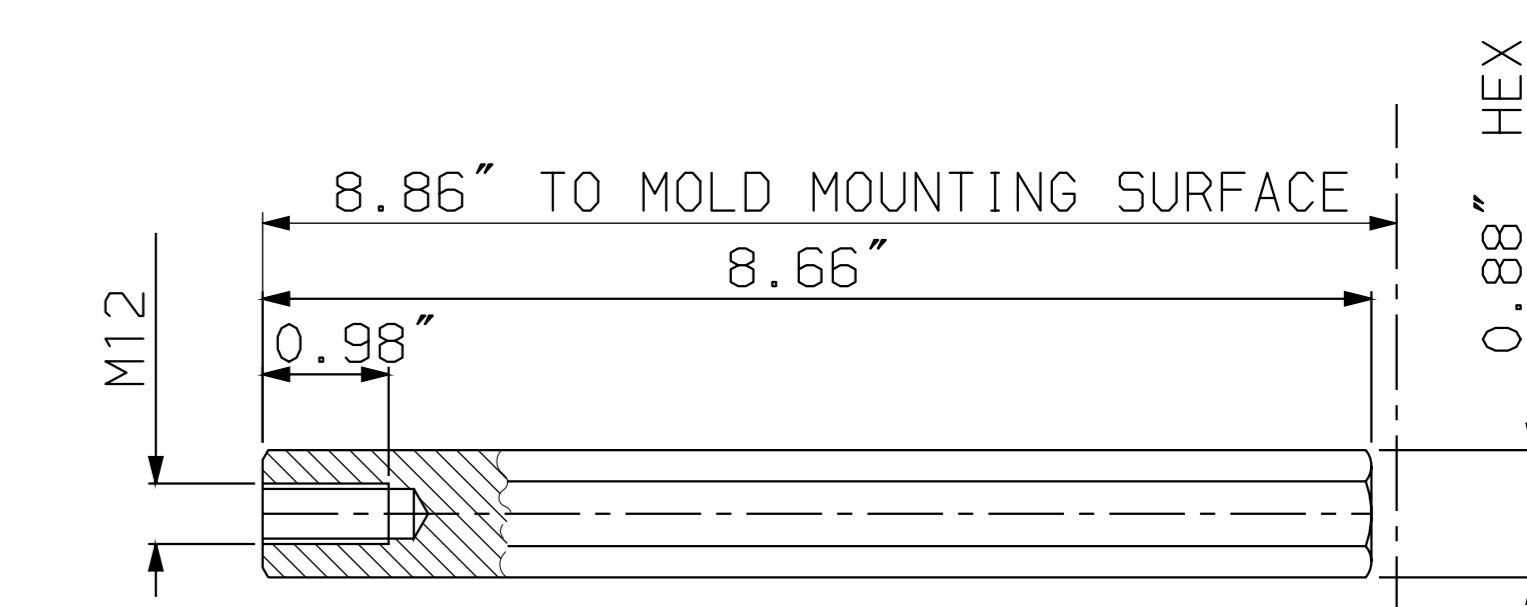
VALUES BASED ON 3045 PSI



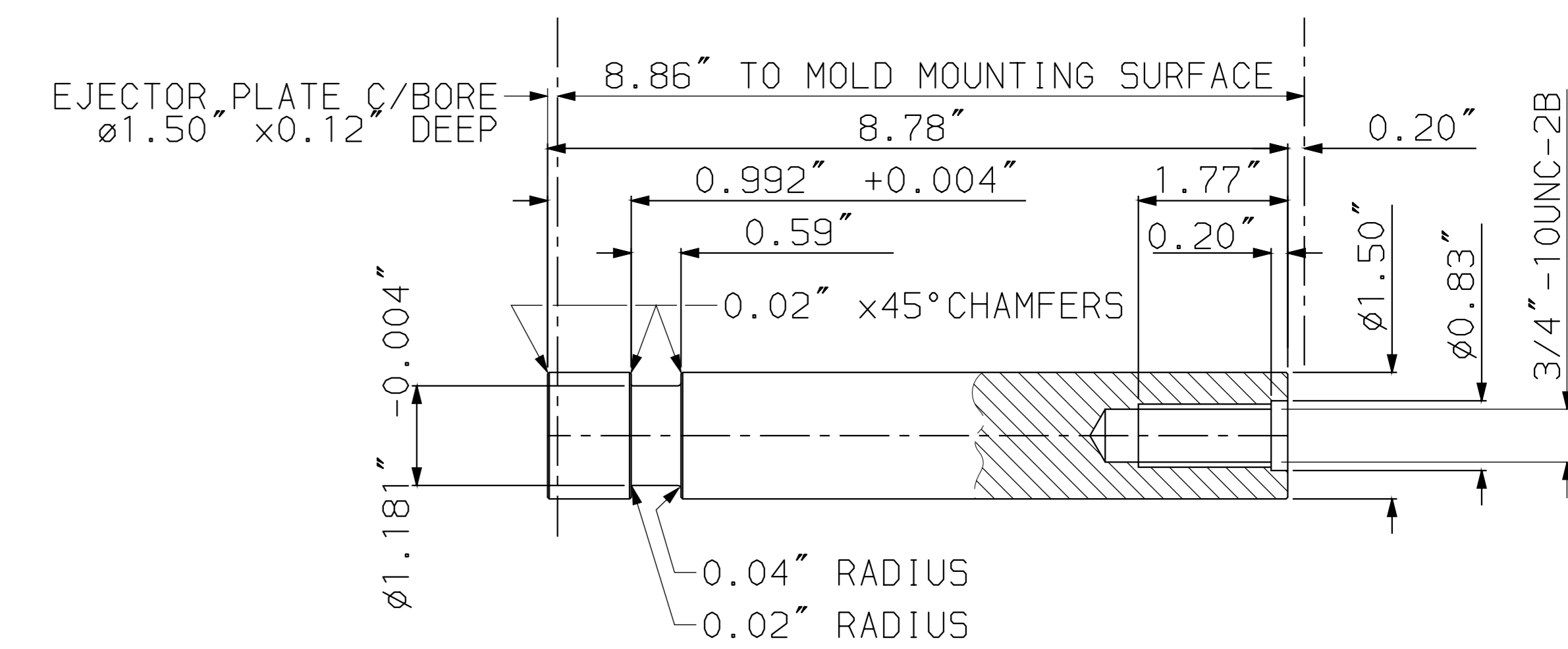
VIEW III
EJECTOR PLATE
SCALE 1:2



VIEW IV
TOP OF STATIONARY PLATEN



EJECTOR ROD DETAIL



CENTRE EJECTOR ROD DETAIL

RELEASED
MICROFILM
REV. # 10

REV.	DATE	DESCRIPTION	BY	CHKD.	APP'D.
10	15-SEP-98	PLATEN LAYOUT	KEARNEY		
9	15-SEP-98	ESTOOL MACHINE			
8					
7					
6					
5					
4					
3					
2					
1					

SCALE: 1:3.5
DESCRIPTION: PLATEN LAYOUT
ESTOOL MACHINE
IMPERIAL MEASUREMENT

MATERIAL: 3045
DIN: 3045
SIZE: 10
DIM. MICRO: 0.1, 0.2, 0.3, 0.5, 0.8, 1.2, 2.0, 3.0, 4.0
DIM. METERS: 0.2, 0.5, 0.8, 1.2, 2.0, 3.0, 4.0

PART WEIGHT IN Kg. 5890.002.0946E

ENGEL
GUELPH - CANADA

SHEET 2 OF 2