

# Engel Injection Molding Machine

**ES 200**  
**V-SERIES TIEBARLESS**  
 Data Sheet

## TECHNICAL SPECIFICATIONS - ES 200 V-SERIES TIEBARLESS INJECTION MOLDING MACHINE

### CLAMP

Clamp force	US tons	200
Clamp opening force	US tons	9.8
Clamp stroke (max.)	inches	27.56
Mold height (min - max)	inches	9.84 - N/A
Daylight (min - max)	inches	9.84 - 37.40
Platen size (HxV)	inches	35.43 x 29.53

See platen illustration below for max. mold size applicable

Hydraulic ejector stroke	inches	5.90
Hydraulic ejector force	tons	6.9

INJECTION		1050	1050
		std. screw	other available screw sizes

Screw diameter	mm	55	60
Screw diameter	inches	2.165	2.362
Shot size <sup>1+2</sup>	oz	16.6	19.7
Injection capacity	in <sup>3</sup>	31.2	37.1
Recovery rate <sup>1+2</sup>	oz/sec	1.6	2.0
Plasticizing capacity <sup>1+2</sup>	lbs/hr	349	441
Injection rate at max. press.	in <sup>3</sup> /sec	12.7	15.1
Injection rate (regenerative)	in <sup>3</sup> /sec	16.1	19.1
Injection velocity at max. press.	in/sec	3.4	3.4
Injection velocity (regenerative)	in/sec	4.4	4.4
Screw stroke	inches	8.46	8.46
Injection pressure (max.)	psi	22910	20518
Injection pressure (regenerative)	psi	18037	16154
Screw speed range (min=25)	rpm	238	
Screw torque <sup>3</sup>	ft-lbs	813	
Screw L/D ratio		20:1	
Nozzle stroke	inches	13.78	
Nozzle force	US tons	7.6	

### HYDRAULICS

Pump capacity (required)	gpm	31.7
Oil reservoir capacity	US gal	116

### ELECTRICS

Power supply available	volts	*460 incoming voltage / 460 volt heaterbands	
Total rated horsepower	HP	40	
Number of heat control zones		4+Nozzle	
Total heating wattage	kw	16.7	18.7

### GENERAL

Dry cycle performance <sup>4</sup>	sec	2.0
Water requirements (max)	gpm	9
Machine dimensions (LxWxH)	inches	229 x 73 x 89
Machine weight	lbs	32000
Hopper capacity	lbs	163
Suitable Engel robots		ERTLi 31, ERC 33-43

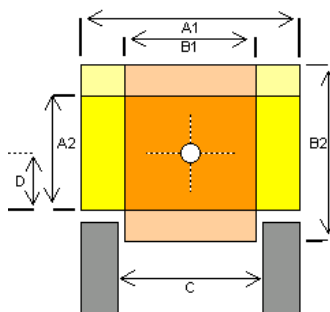
### NOTES:

- Based on polystyrene material.
- Calculated
- Can be increased.
- Per Euromap 6 standard.

(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 200TL	(inches)
A <sub>1</sub> x A <sub>2</sub>	35.43 x 21.34
B <sub>1</sub> x B <sub>2</sub>	24.41 x 29.53
C	25.2
D	10.67

**ENGEL**

### **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**

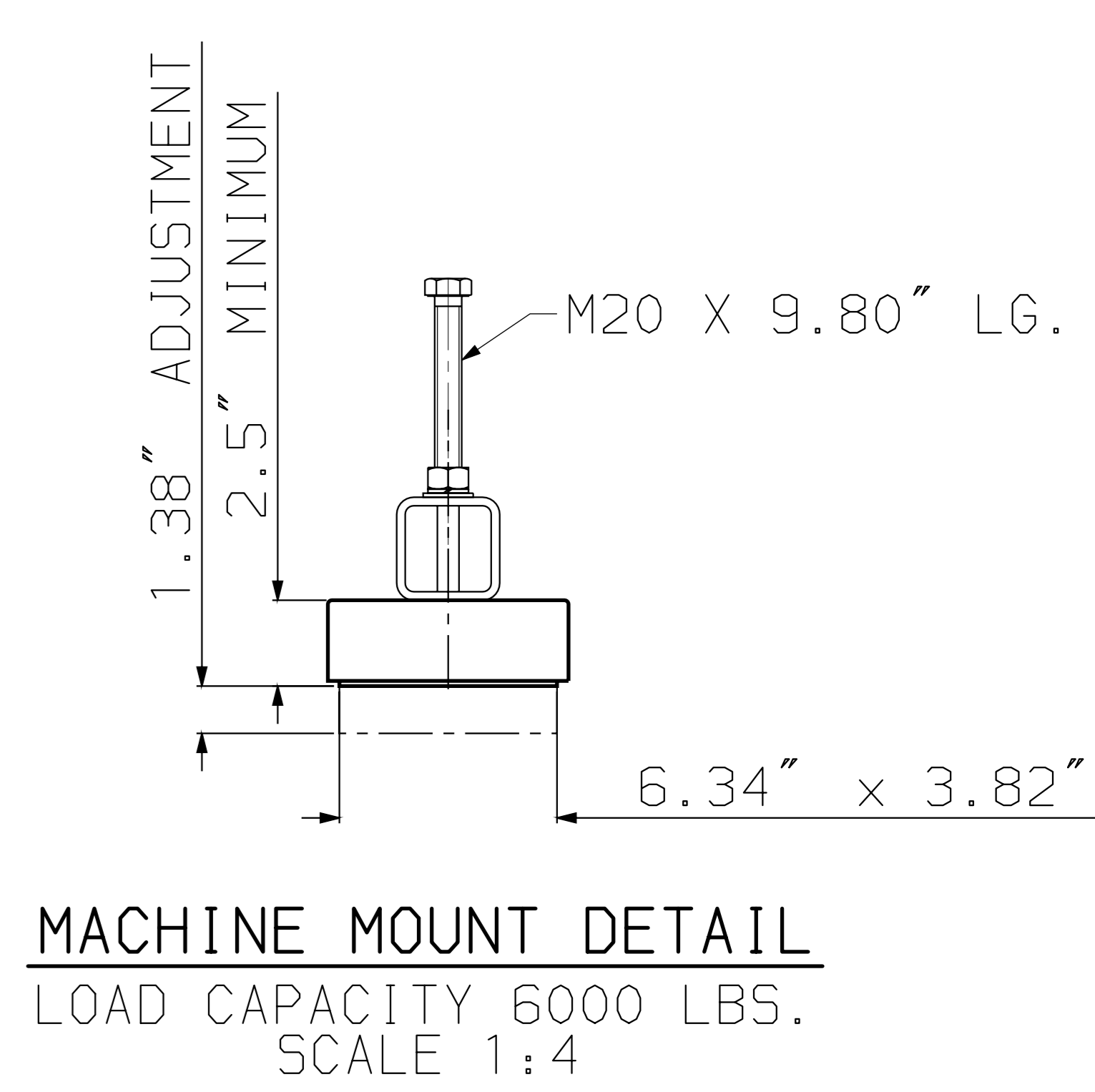
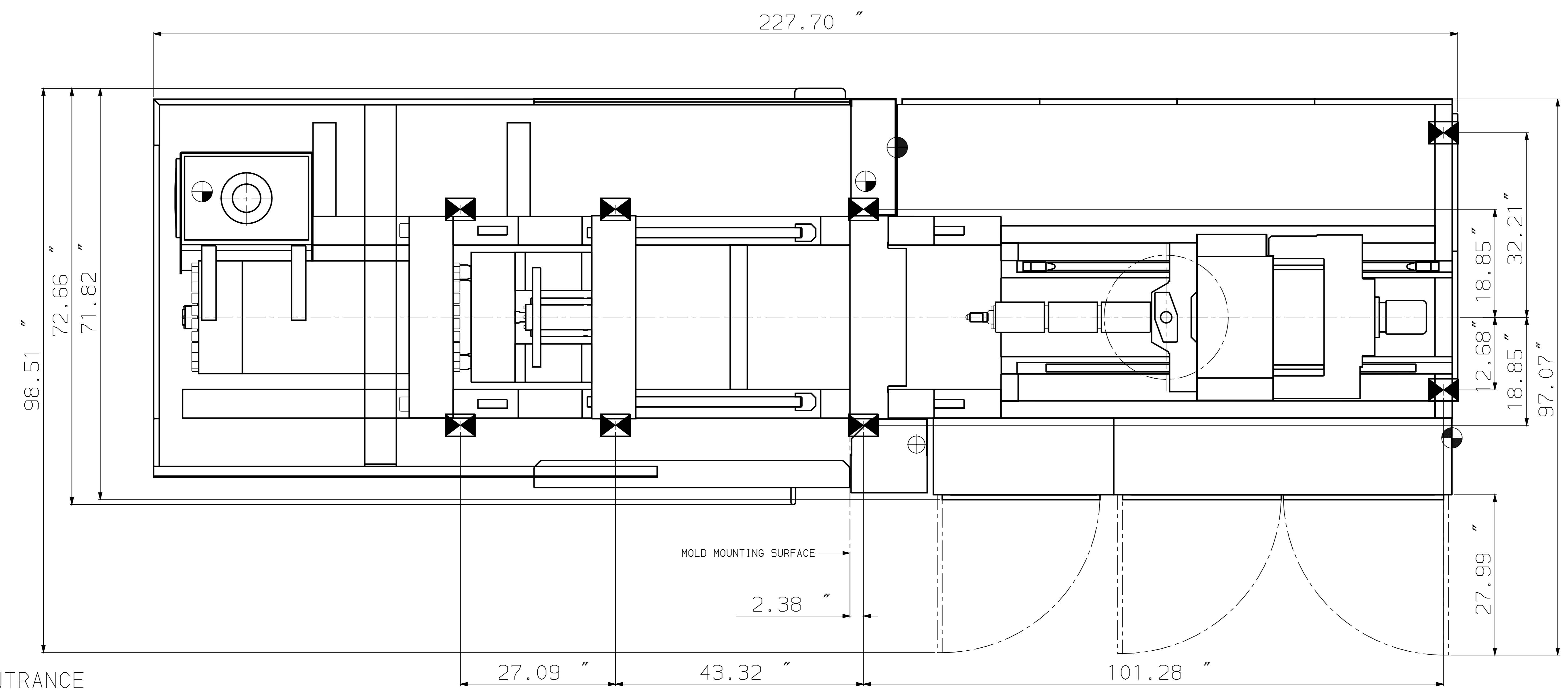
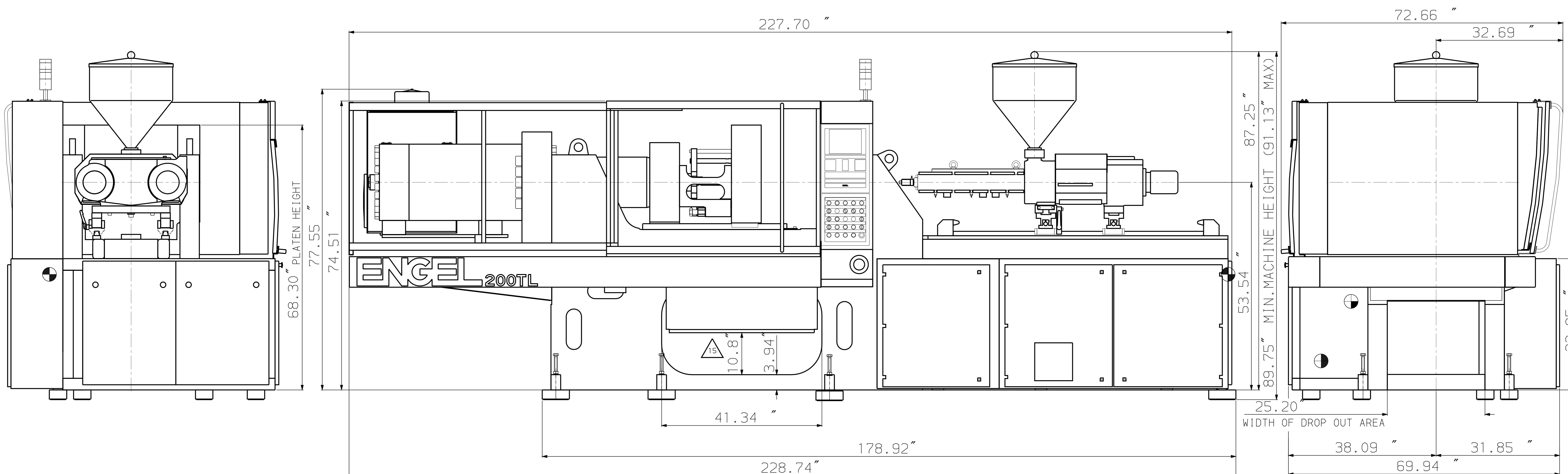
- Hot runner valve gate control (pneumatic)
- By-pass oil filtration

#### **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 1:4

- MACHINE MOUNT
- STD.ELE. UTILITY ENTRANCE
- AIR CONNECTION 3/8" NPT
- COOLING WATER CONNECTION IN & OUT 1" NPT

**NOTES:**  
1) DIMENSIONS ARE IN INCHES  
2) TECHNICAL DATA SUBJECT TO CHANGE WITH OUT NOTICE

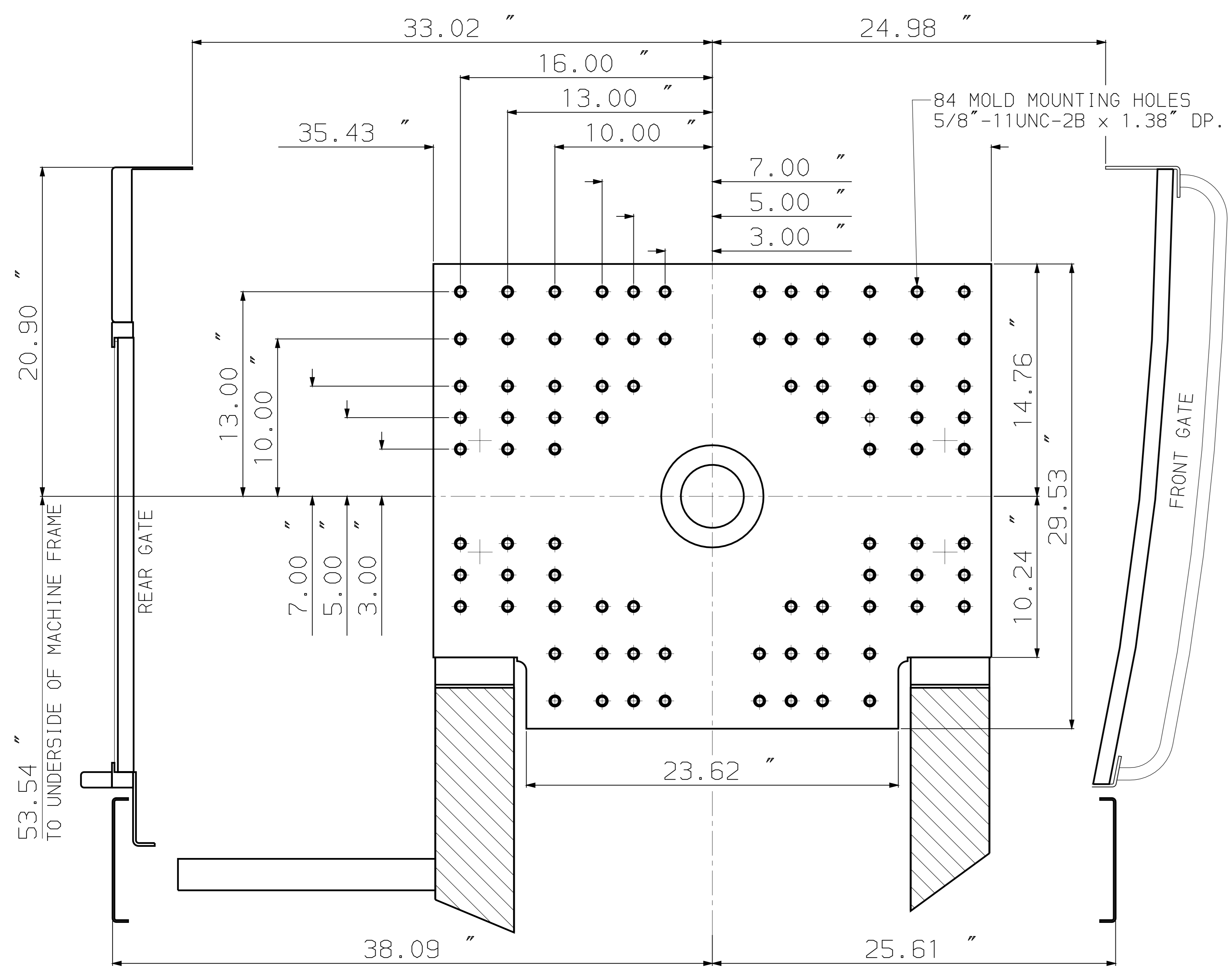
PART WEIGHT IN Kg.		8166.005.7446E	
-		SHEET 2 OF 2	

RELEASED  
MICROFILM  
REV. # 15

REV.	ECO	DESCRIPTION	DATE	BY	CHK'D
15	2-204X	UPDATED GEOMETRY FOR GUARD BASE DROPOUT AREA	28-MAY-01	LIVIA P.	
14	P-249B	ALARM LAMP ADDED	22-MAR-00	B.H.A.L.D.	
13	12810	REVISED MACHINE MOUNTS	20-MAR-99	J.S.P.A.B.	
12	0140	TEXT INCREASED X 2	23-JAN-98	HAB	
11	8421	TITLE REVISION	12-JUN-97	REARNEY	
10	8503	NEW	02-MAY-97	S. LYSSY	
9	8504	NEW			

SCALE	DESCRIPTION	DATE	BY	CHK'D
1: 9	MAIN DIMENSIONS ES200TL-1050			

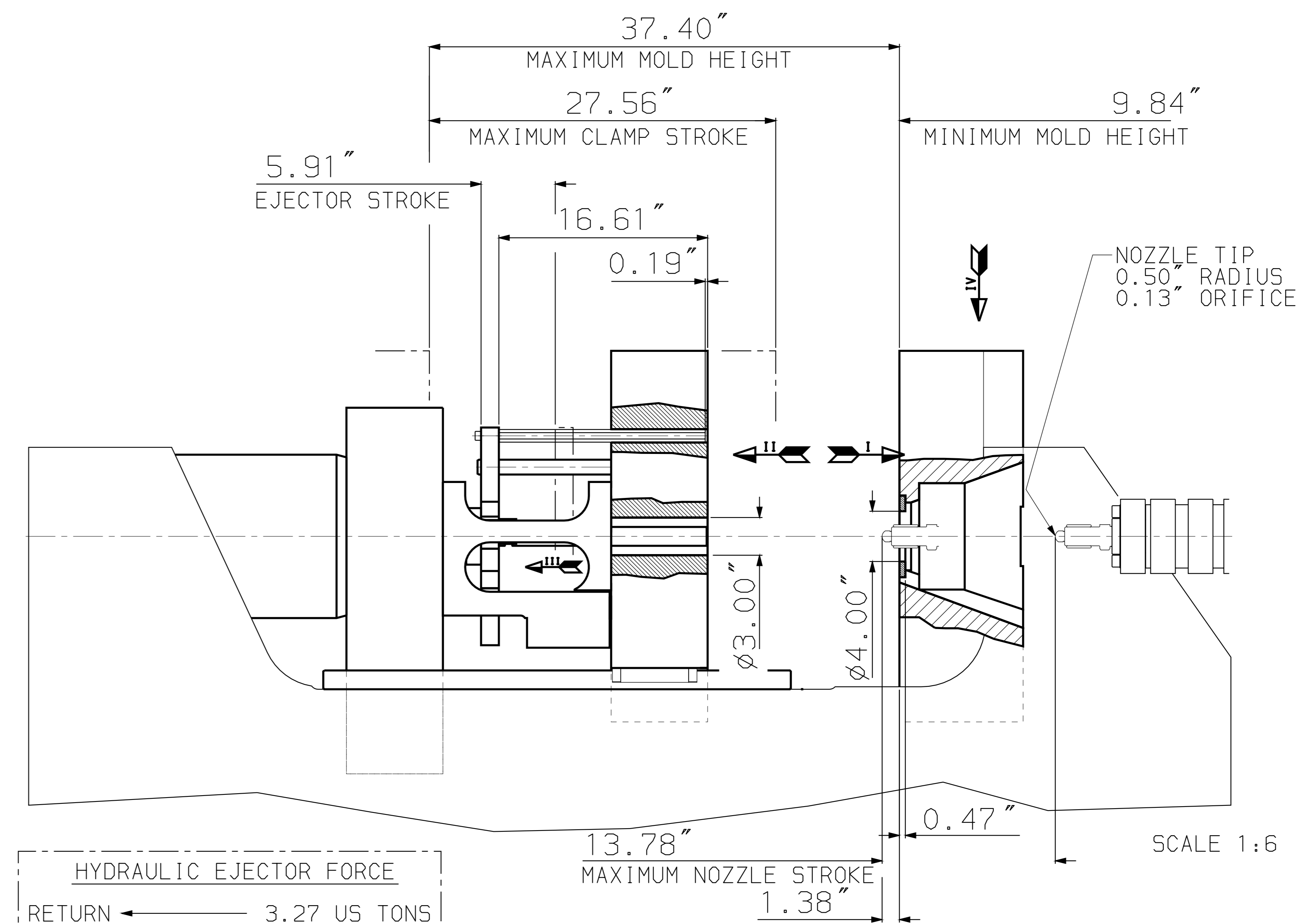
MATERIAL		GUELPH - CANADA	
-		-	
DIN		-	
FROM		-	
TO		-	
FINE #		-	
MEDIUM #		-	
COARSE #		-	



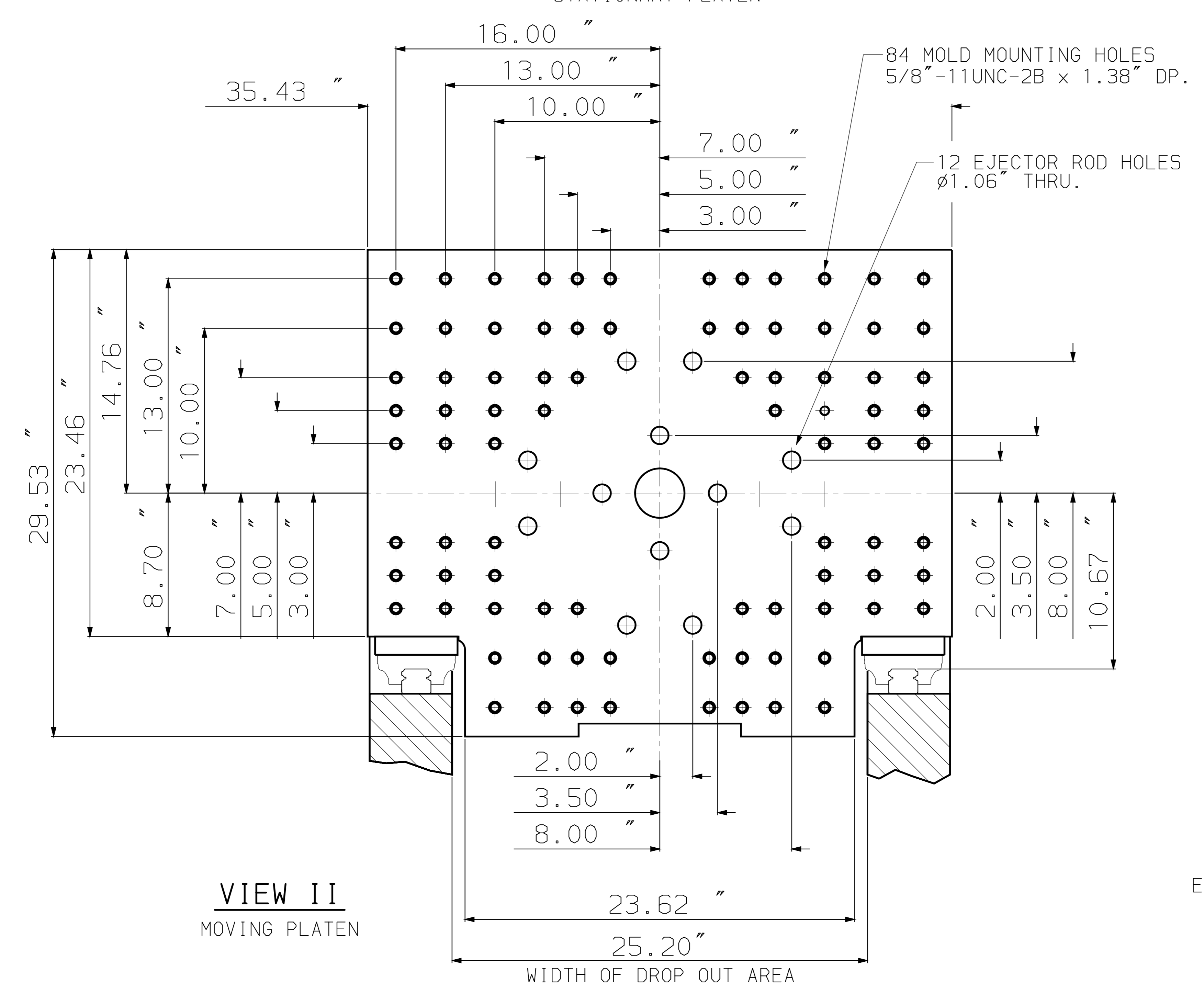
VIEW I  
STATIONARY PLATEN

HYDRAULIC EJECTOR FORCE	
RETURN	3.27 US TONS
FWD. MAX.	6.92 US TONS
REGEN. FWD.	3.64 US TONS

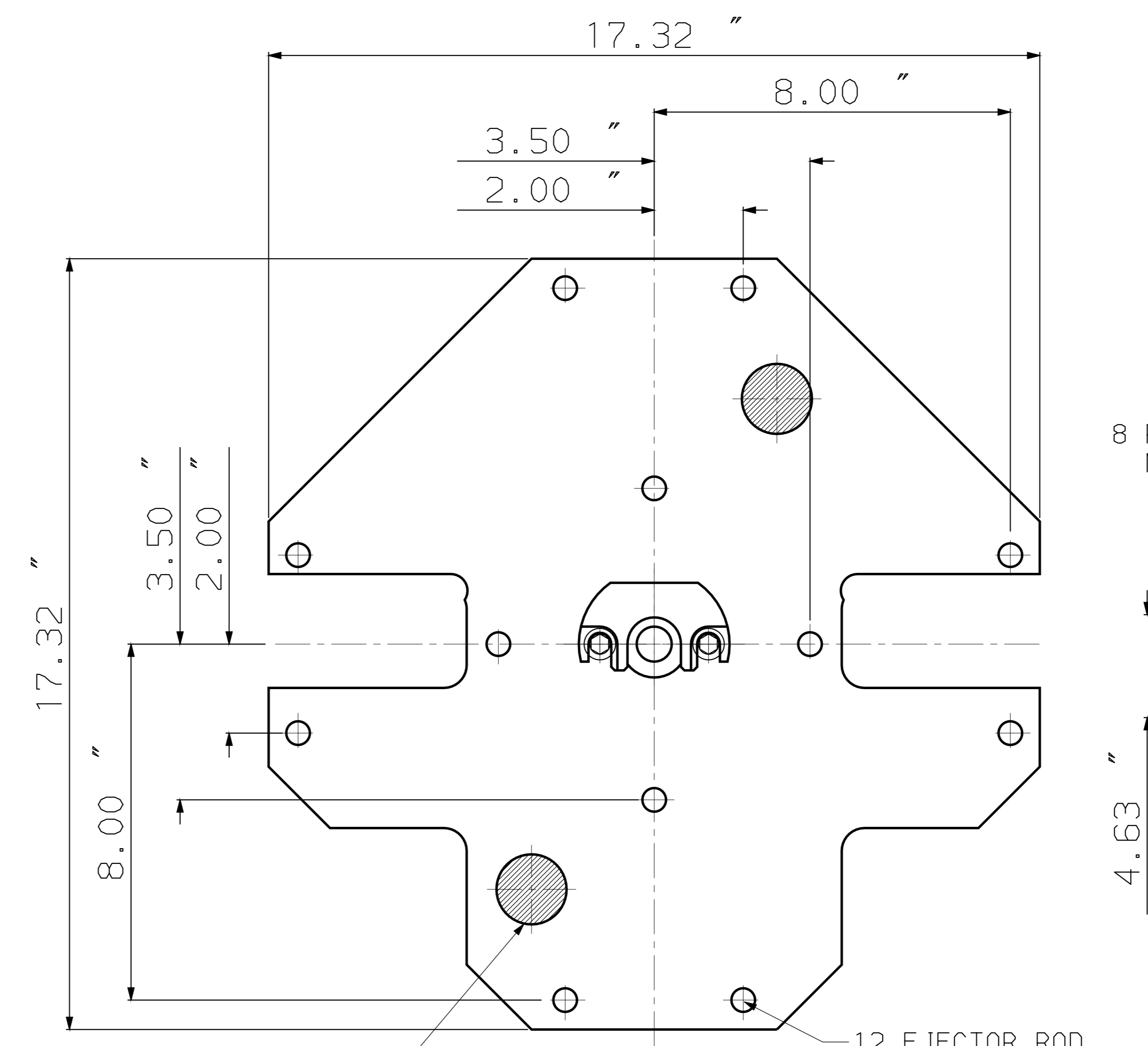
VALUES BASED ON 2320 psi



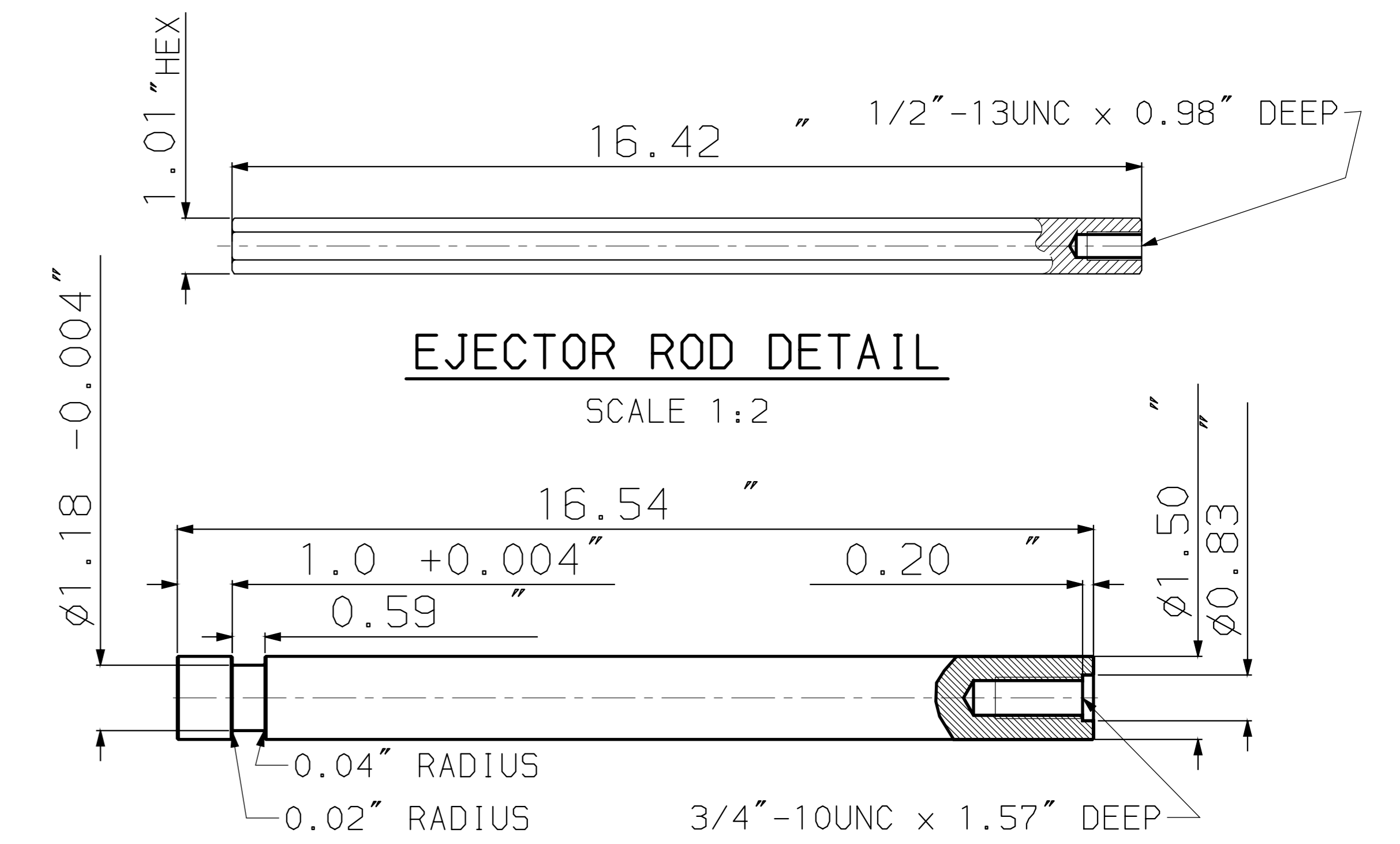
SCALE 1:6



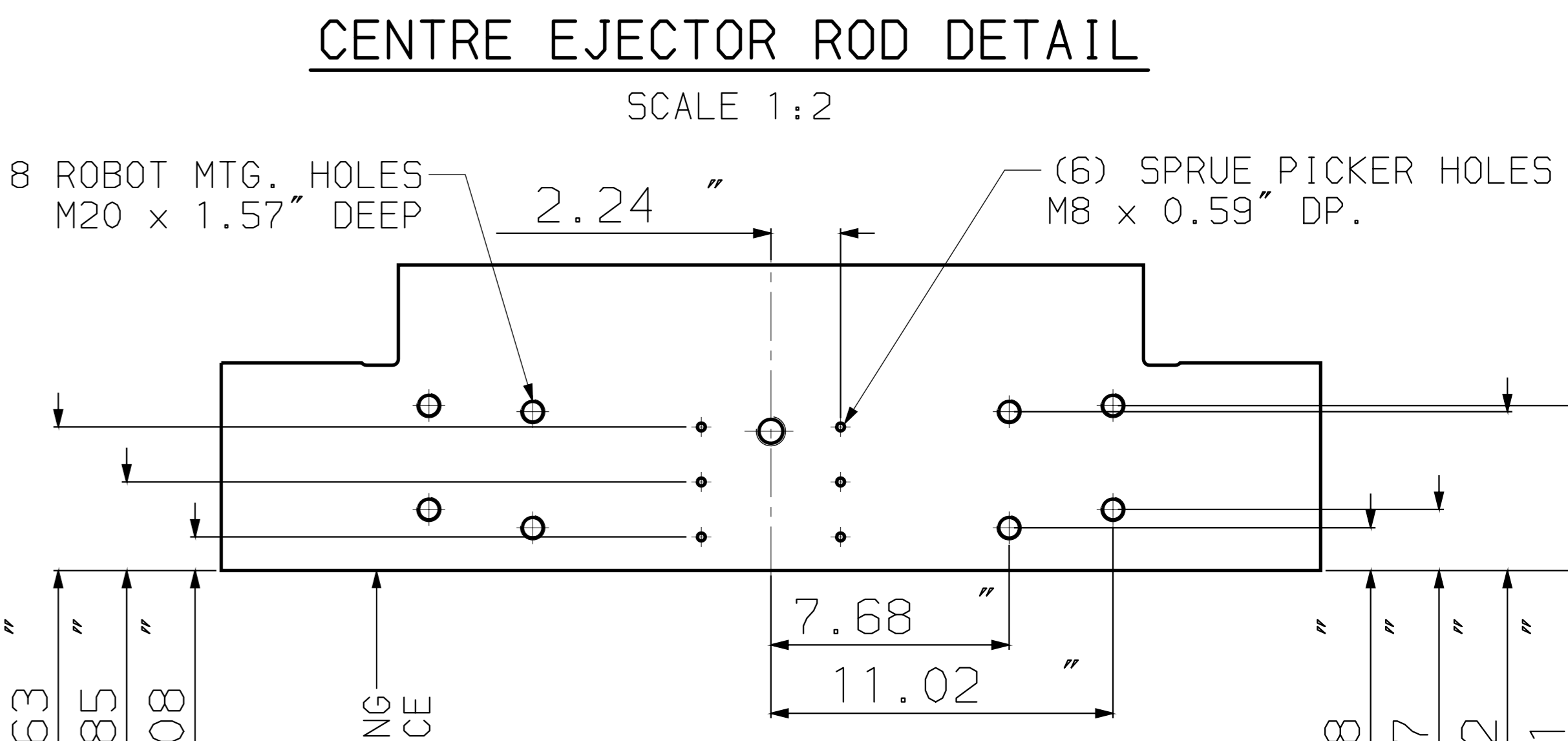
VIEW II  
MOVING PLATEN



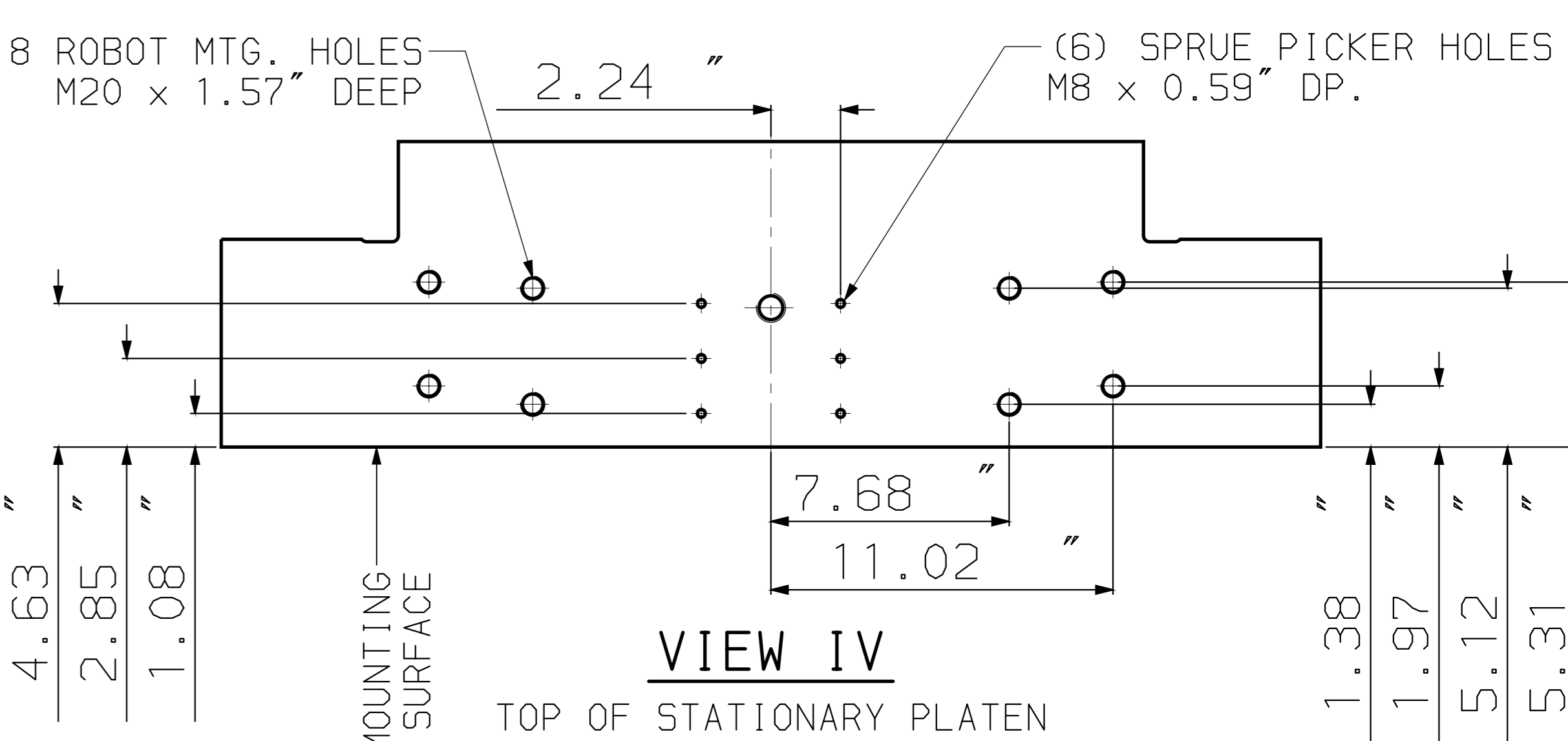
VIEW III  
EJECTOR PLATE  
SCALE 1:2



EJECTOR ROD DETAIL  
SCALE 1:2



CENTRE EJECTOR ROD DETAIL  
SCALE 1:2



VIEW IV  
TOP OF STATIONARY PLATEN

- NOTES:
1. DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED
  2. TECHNICAL DATA SUBJECT TO CHANGE WITHOUT NOTICE

RELEASED  
MICROFILM  
REV. # 11

REV.	DATE	BY	CHKD.	REVISION
11	12-DEC-97	KMB		TEXT ENLARGED
10	12-DEC-97	KMB		NEW

SCALE	DESCRIPTION	DATE	NAME
1:4	PLATEN LAYOUT ES200TL-1050		

MATERIAL	DR. N.	NAME	DATE
BRK SHARP CORNERS		KEARNEY	12-DEC-97

SIZE	FROM	TO	315	1000	2000	REPLACES
10	0.5	6	30	120	315	8166.002.748E REV.11

DIM.	TOL. IN	METERS	COARSE	FINE	MEDIUM	DRYING NO.
10	0.1	0.2	0.3	0.5	0.8	2.0

PART WEIGHT IN Kg. 8166.002.4309E

THIS DRAWING AND THE INFORMATION HEREIN IS CONFIDENTIAL AND MUST NOT BE REPRODUCED OR USED IN ANY WAY WITHOUT WRITTEN PERMISSION OF ENGEL CANADA INC.

SHEET 2 OF 2 REV. # 11

