

Engel Injection Molding Machine

ES 500
TOGGLE
Data Sheet

TECHNICAL SPECIFICATIONS - ES 500 TOGGLE INJECTION MOLDING MACHINE

CLAMP

Clamp force	US tons	500
Clamp opening force	US tons	60
Clamp stroke (max.)	inches	27.56
Mold height (min - max)	inches	11.81 - 33.94
Daylight (min - max)	inches	11.81 - 61.50
Platen size (HxV)	inches	48.82 x 47.24
Distance between tie bars (HxV)	inches	34.65 x 33.07
Tie bar diameter	inches	5.51
Hydraulic ejector stroke	inches	9.45
Hydraulic ejector force	tons	8.9

INJECTION **2550**

Screw diameter	mm	70	80	85
Screw diameter	inches	2.756	3.150	3.346
Shot size ¹⁺²	oz	38.7	50.5	57.1
Injection capacity	in ³	72.8	95.1	107.3
Recovery rate ¹⁺²	oz/sec	3.2	3.0	3.6
Plasticizing capacity ¹⁺²	lbs/hr	728	683	820
Injection rate at max. press. ³	in ³ /sec	19.0	24.9	28.1
Injection rate (regenerative) ³	in ³ /sec	22.4	29.2	33.0
Injection velocity at max. press. ³	in/sec	3.2		
Injection velocity (regenerative) ³	in/sec	3.8		
Screw stroke	inches	12.20		
Injection pressure (max.)	psi	30000	23751	21039
Injection pressure (regenerative)	psi	25521	20205	17898
Screw speed range (min=25)	rpm	262	175 ⁶	175 ⁶
Screw torque ⁴	ft-lbs	1305	1950 ⁶	1950 ⁶
Screw L/D ratio		20:1		
Nozzle stroke	inches	25.59		
Nozzle force	US tons	12.4		

HYDRAULICS

Pump capacity (required)	gpm	58.1
Oil reservoir capacity	US gal	204

ELECTRICS

Power supply available	volts	460 / 575 - 3PH / 60Hz
Total rated horsepower	HP	60
Number of heat control zones		4+Nozzle 4+Nozzle 5+Nozzle
Total heating wattage	kw	29.4 33.5 51.8

GENERAL

Dry cycle performance ⁵	sec	2.6
Water requirements (max)	gpm	12
Machine dimensions (LxWxH)	inches	349 x 88 x 102
Machine weight	lbs	45000/16000 ⁷
Hopper capacity	lbs	163
Suitable Engel robots		ERC 53 - 63

NOTES:

1. Based on polystyrene material.
2. Calculated
3. Can be increased with accumulator.
4. Can be increased.
5. Per Euromap 6 standard.
6. With high torque screw drive.
7. Split base - two piece shipping

(N/A=Not Available)

All data subject to change without notice
Per Rev. 22, 010807

ENGEL

STANDARD EQUIPMENT**Injection**

- Nitrided barrel and screw
- Non-return ring check valve
- 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 (switch-over by cavity pressure is optional)
- 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
- Increased wattage ceramic heater bands
- Quick disconnects for heater bands
- Increased injection speed (regenerative 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
- Heavy tie bars, large bearing surface support for moving platen
- Split base design
- Center ejector rod
- Mechanical safety dropbar
- 3 speed opening and closing
- Hydraulic, electric and electronic safety gate interlocks
- Automatic mold protection: self learning mold protection for optimum cycle time and set-up efficiency on CC100 models. (optional with EC100)
- Smooth, fast acting 5-point double toggle
- Adjustable support under moving platen
- Automatic central lubrication with pressure system protection
- Stationary platen prepared for water cooling
- 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 models; (via double 'smart' pump technology on CC100 controlled models)
- Independent ejector/core motion/carriage movement on CC100 controlled models (corepull hardware optional)
- Fully proportional linearized hydraulic system
- Automatic calibration of proportional hydraulic valves and transducers
- Closed loop oil temperature regulation with prewarming system
- Clogged filter indicator

Hydraulics (cont'd)

- Oil level indicator with level switch
 - Pressure selector gauge
 - Proportional clamp valve for accurate clamp positioning
- Controls, Electrics & Electronics**
- Microprocessor control with high resolution flat color screen
 - Micrograph plus for CC100 control (optional with EC100)
 - 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 & ejector positions
 - Networking capability via "Teleservice/Engel Monitoring System" ethernet connection on CC100 models. (optional on EC100 models)
 - 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
 - Additional screen selectable languages (Spanish/French) (other languages available upon request)
 - US/metric units conversion (A03 controls only)
 - 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 & 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 position transducers.
- Manufactured to ANSI/SPI B151.1 safety regulations

OPTIONAL EQUIPMENT**Injection Unit**

- Hardened screws and bi-metallic barrels
- Specialty screws and screw tips for a wide variety of applications
- LIM, Thermoset, PVC, PIM, Gas-inj., MuCell and other packages
- Smaller than standard injection units
- Increased wattage & air-cooled heaterbands
- Shut-off nozzles

Injection (cont'd)

- Electric screw drive for increased energy efficiency
- Insulating blanket for barrel
- Hopper or drawer magnets

Clamp

- Platen prepared for water cooling
- Mold locating ring on the moving platen
- Mold venting program
- Quick mold mounting systems (hydraulic or magnetic)
- Semi- or fully auto. mold change system
- Air blow-off valve
- Mold support assembly
- SPI safety key switch for clamp, ejector and core movement
- Extended tie bars
- Automatic clamp force control (std. with CC100)

Hydraulics

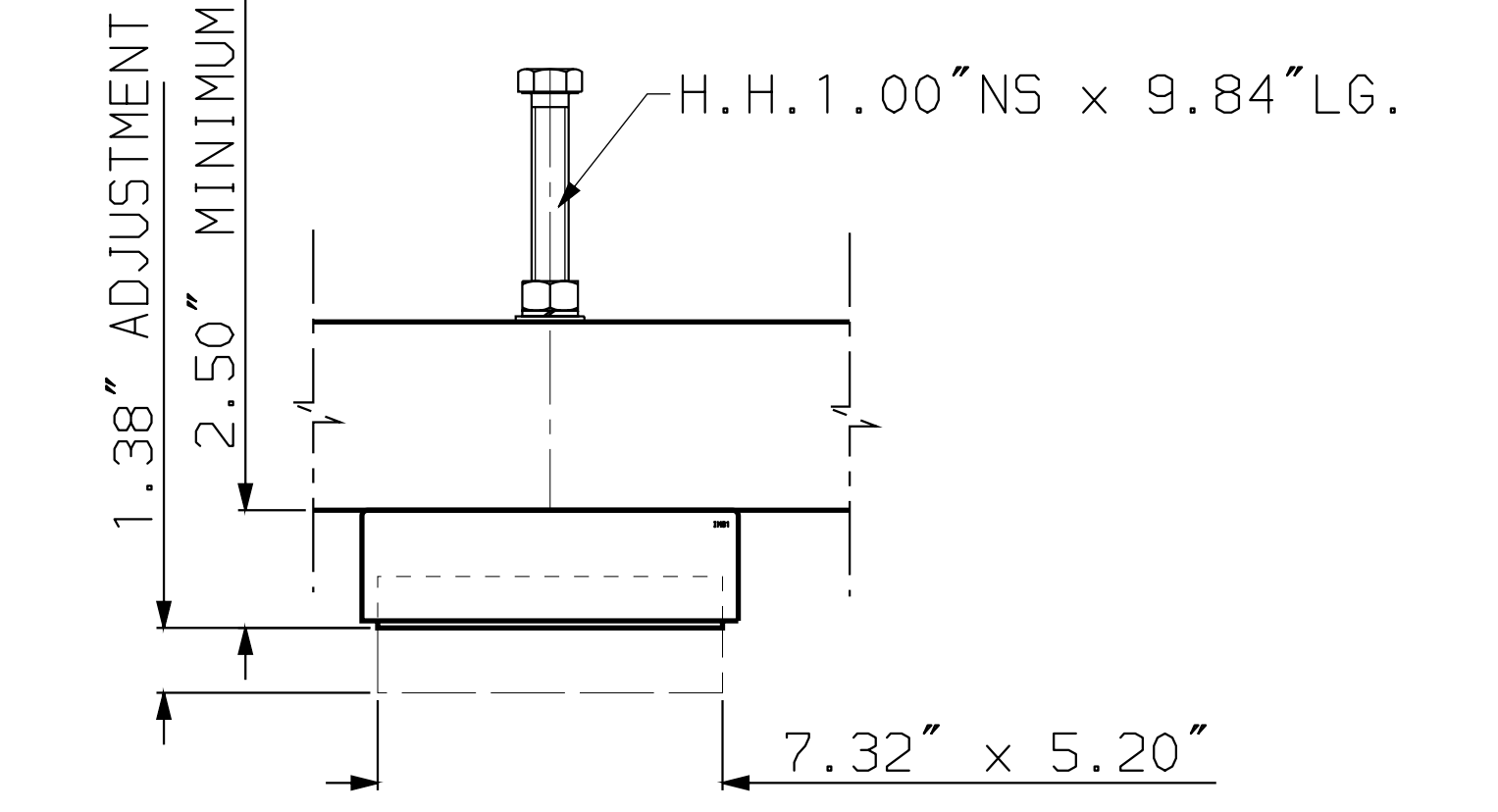
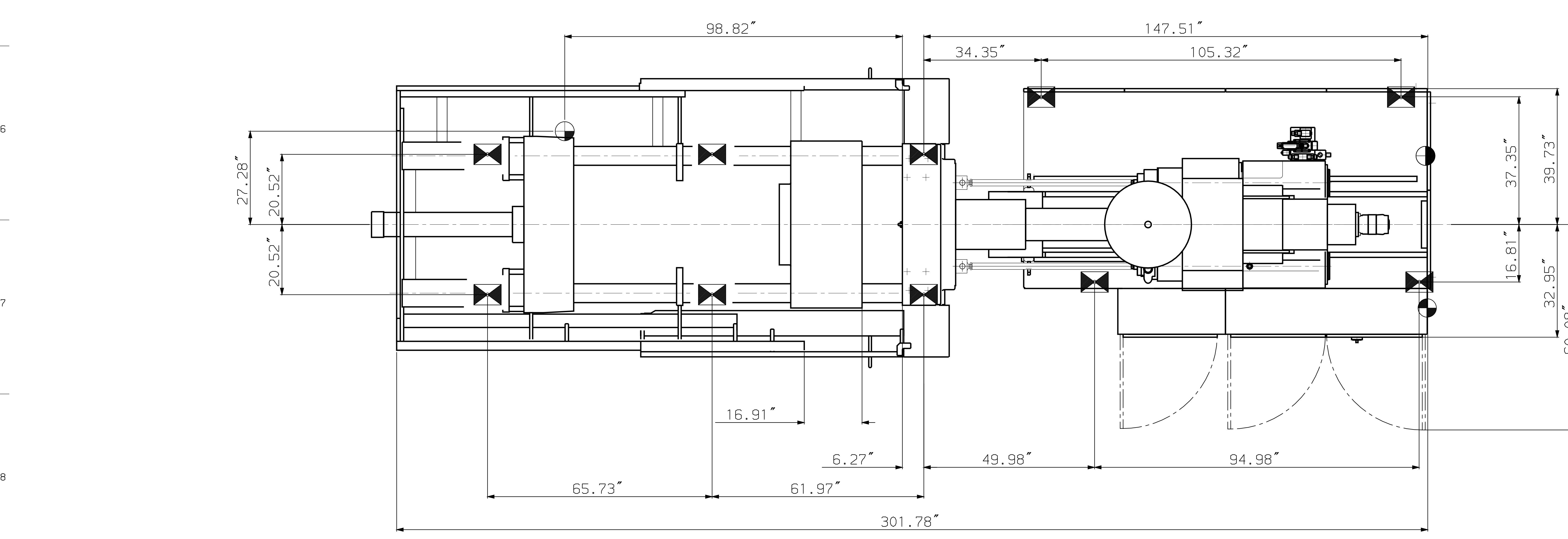
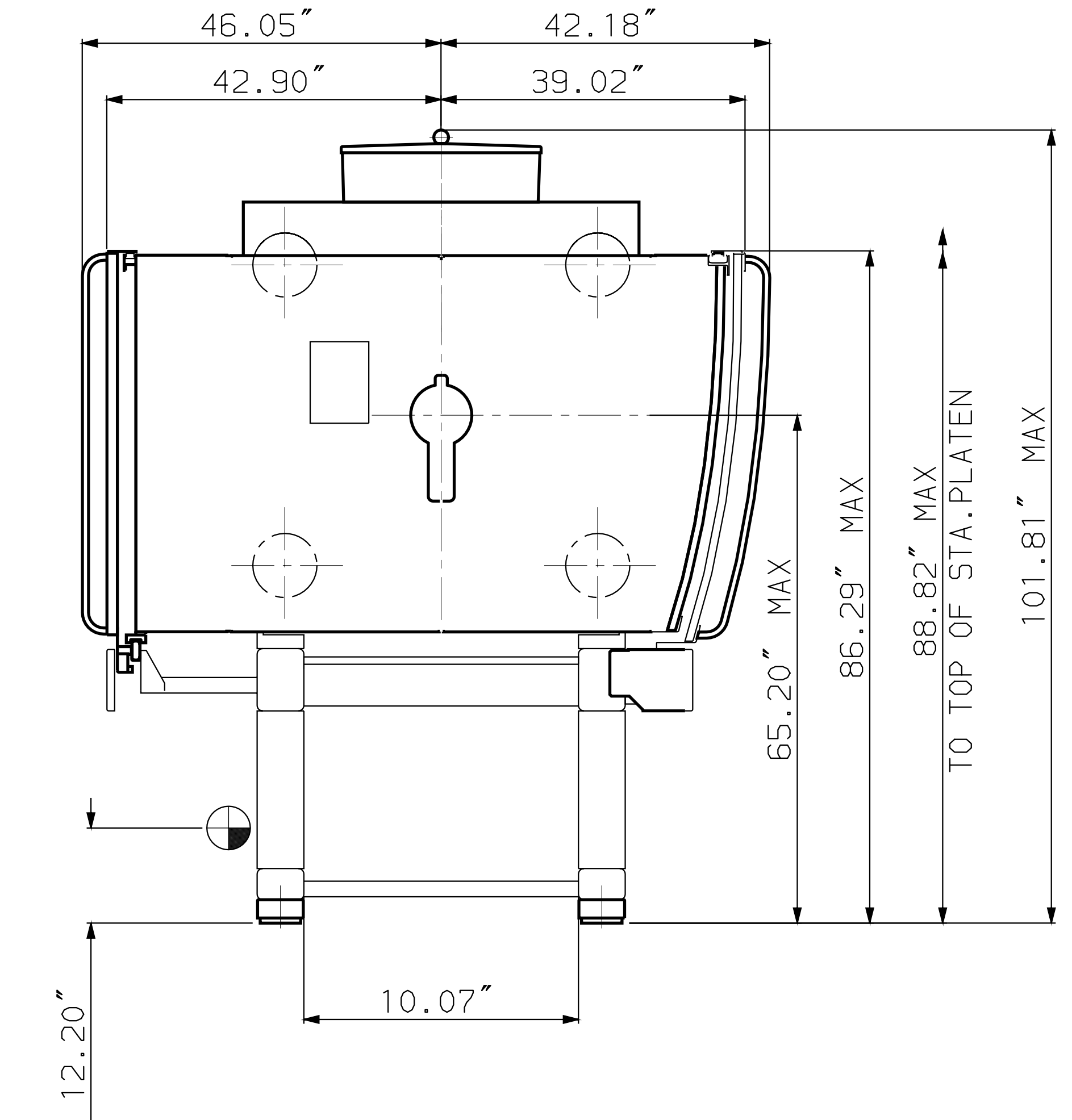
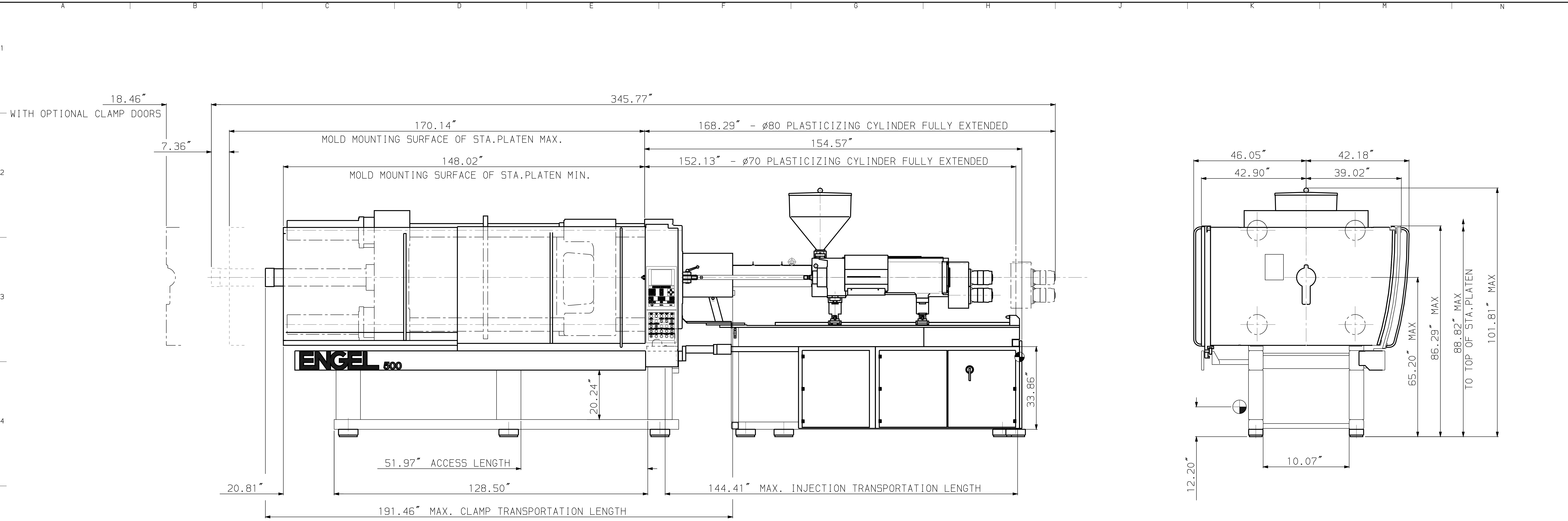
- Increased hydraulic drive for increased plasticizing and injection speeds
- Corepull(s) and unscrewing
- Hot runner valve gate control (pneumatic or hydraulic)
- Independent plasticizing
- High torque screw drive
- By-pass oil filtration
- Accumulator for increased inj. speed

Controls, Electrics & Electronics

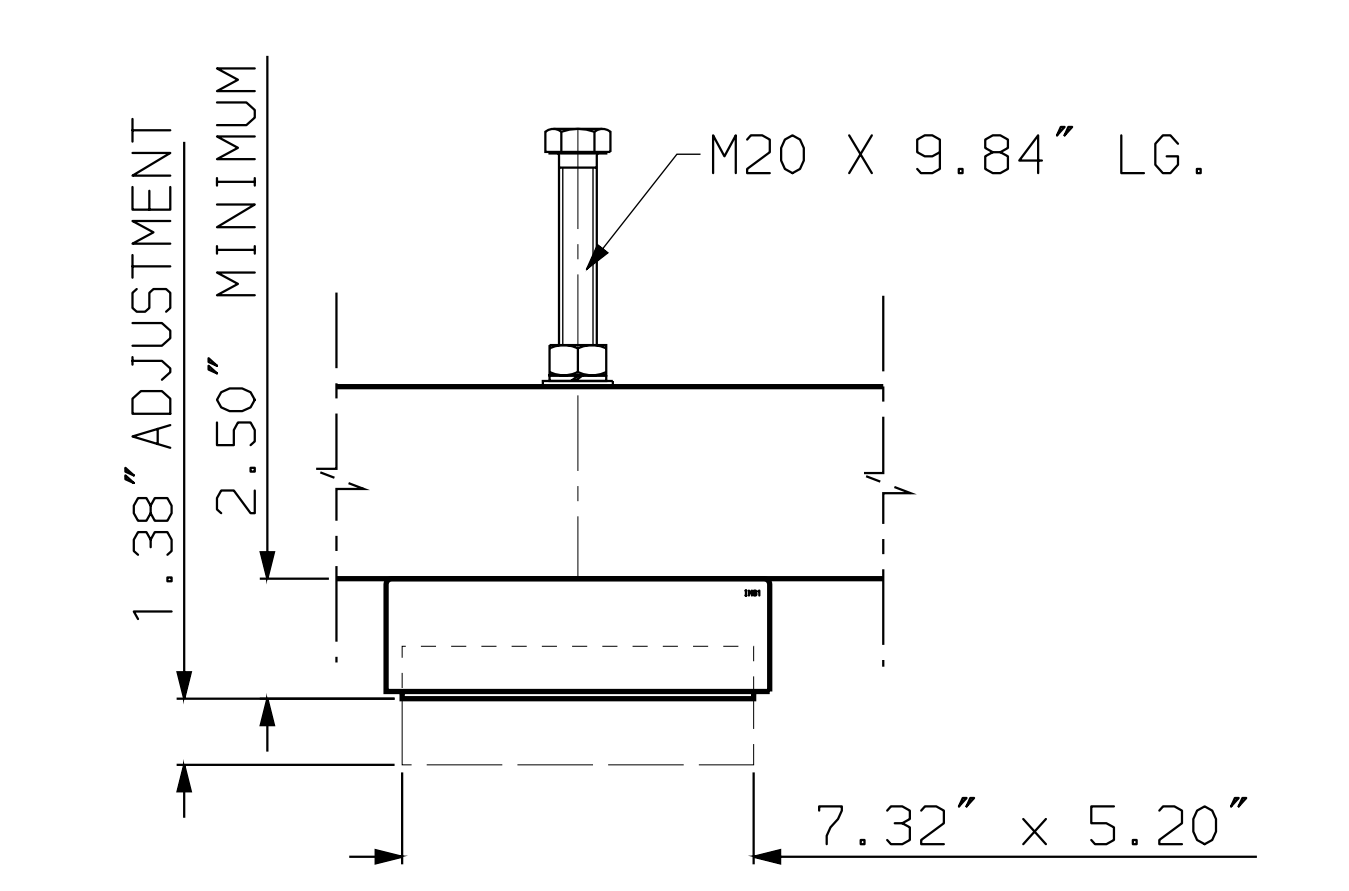
- CC100 microprocessor control with high resolution flat color screen.
- Microplast and Microflow software pkgs.
- Micrograph for EC100 Control (standard with CC100 Control)
- Process data graphics and reports
- Magnetic security card access
- SPC (Quality Data Statistics)
- Auto. barrel/nozzle heat-up (7 day, 24 hour time)
- Power factor capacitors
- Robot interface
- Auxiliary electrical outlets
- Host computer & SPI auxiliary device interface
- Automatic shutdown for "lights out" operation (ghost shift program)
- Hot runner PID temperature controls
- Melt temperature monitor
- Melt pressure monitor
- Closed loop feedthroat cooling
- Cavity pressure dependent boost cut-off (Kistler/RJG/Dynisco)
- Graphics printer
- Power supply available: 208 / 230 / 460 / 575 volts, 3Ph / 60Hz
- Ammeters for barrel and nozzle zones

General Options

- Machine levelling/vibration mounts
- Water manifolds and flow controls
- Special painting of machine to customer specs
- Multi-injection
- Alarm bell in addition to alarm light
- Air and water service routing
- Spare parts packages
- Engel robots
- Training programs
- Engel monitoring system



CLAMP BASE MACHINE MOUNT DETAIL
LOAD CAPACITY 12000 LBS.
SCALE 1:4



INJECTION BASE MACHINE MOUNT DETAIL
LOAD CAPACITY 12000 LBS.
SCALE 1:4

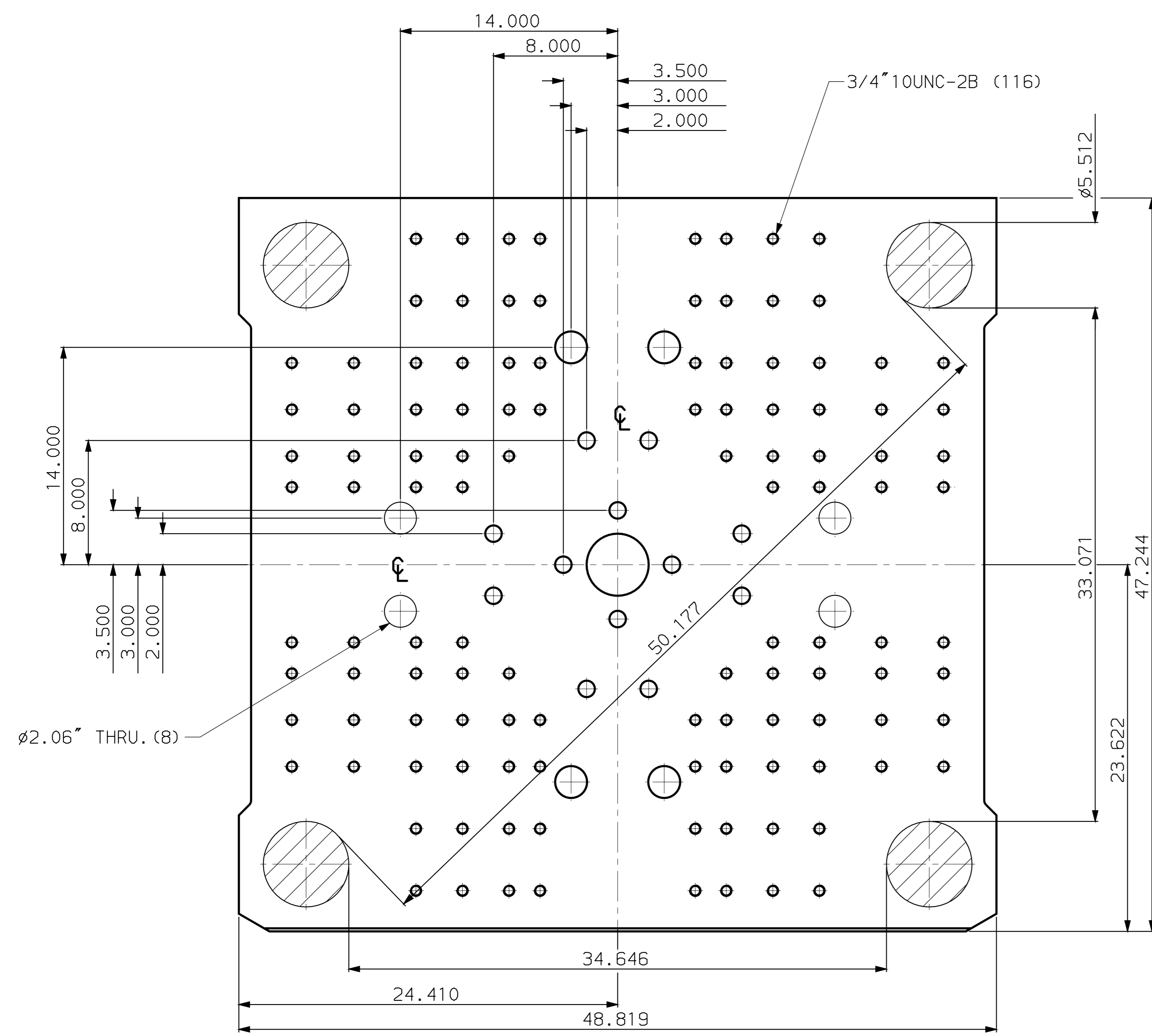
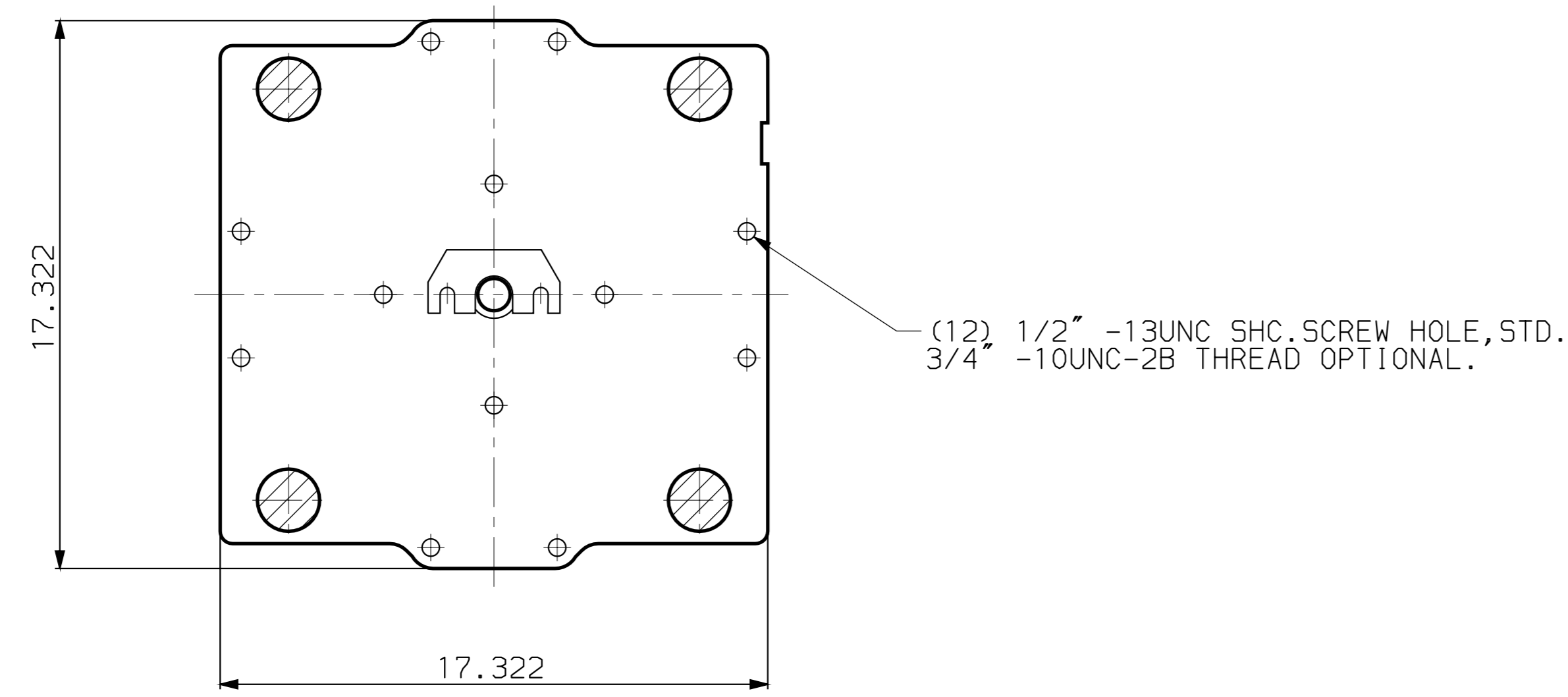
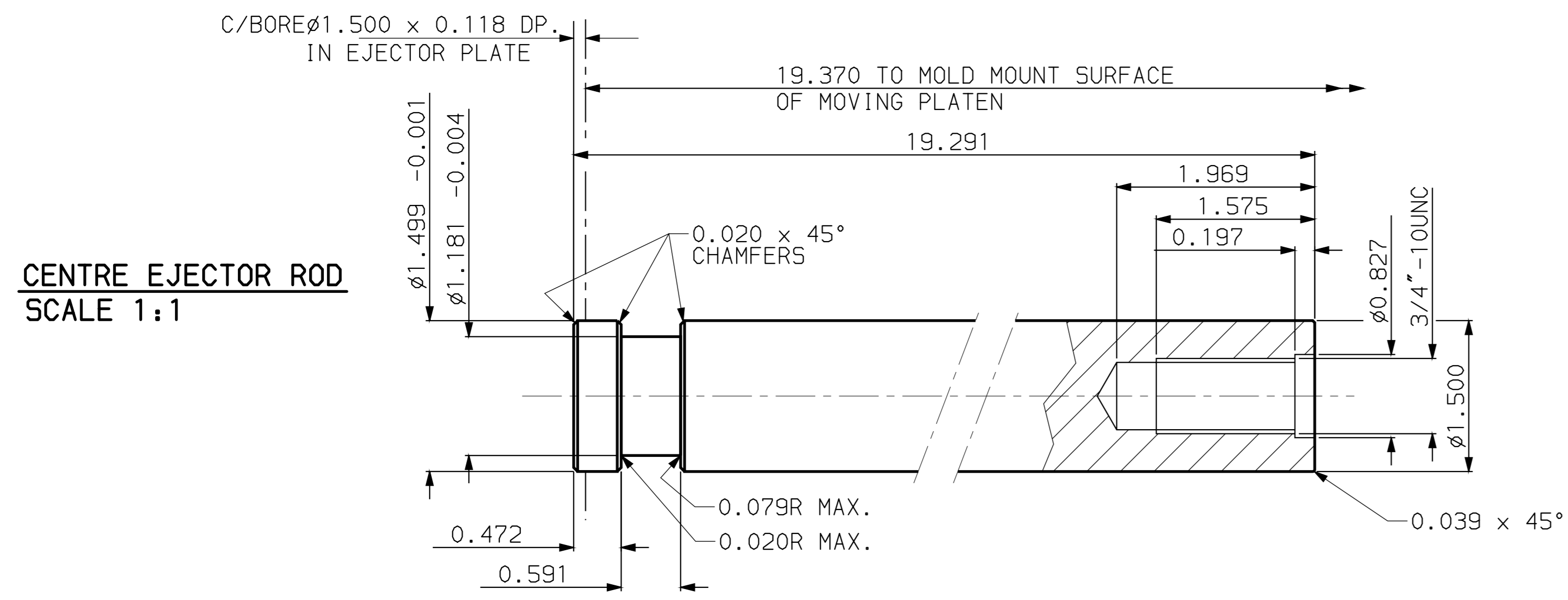
NOTES:

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

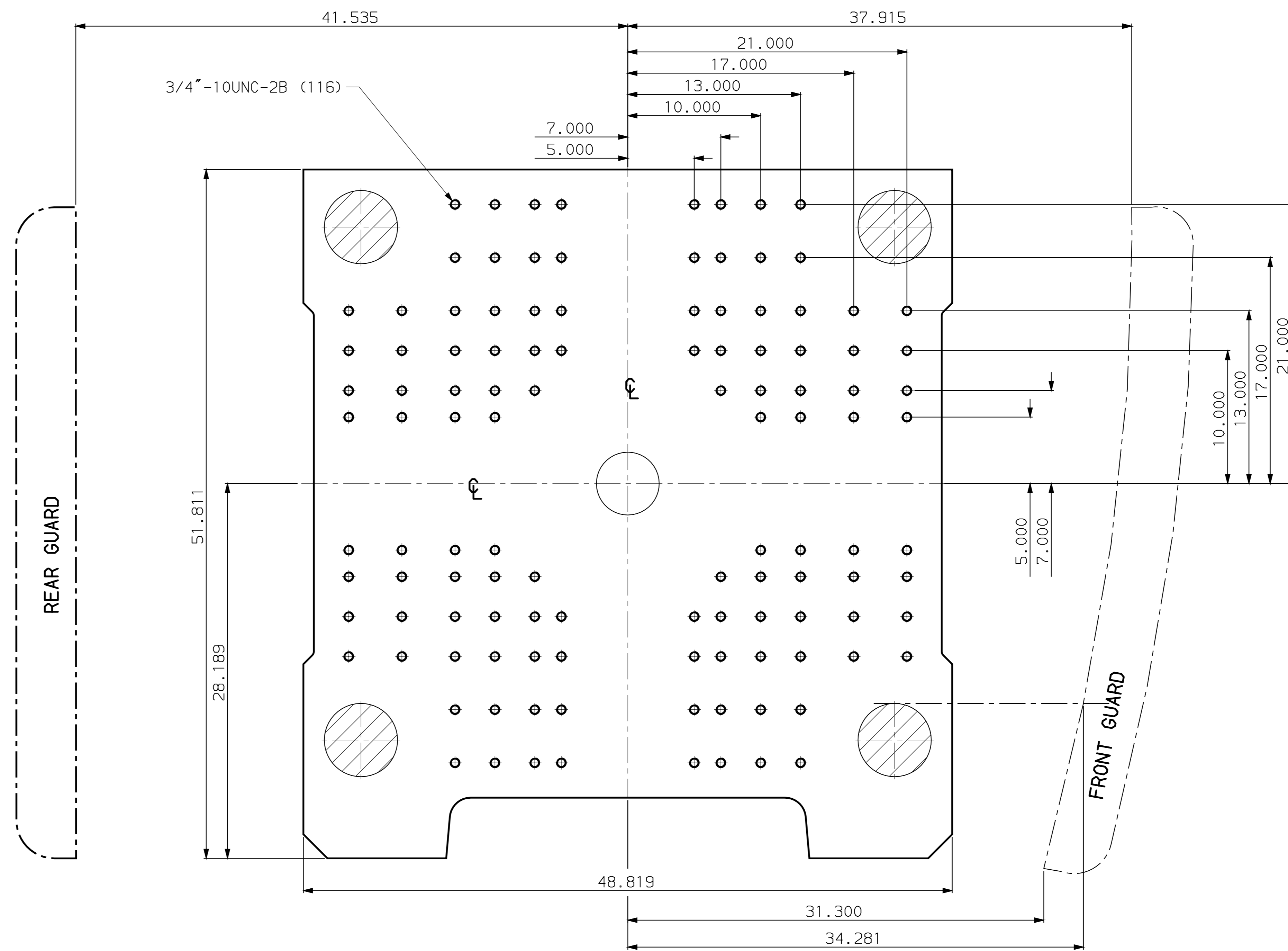
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- STD.ELE.UTILITY ENTRANCE
- AIR CONN.-3/8\"/>

RELEASED
MICROFILM
REV. # 2

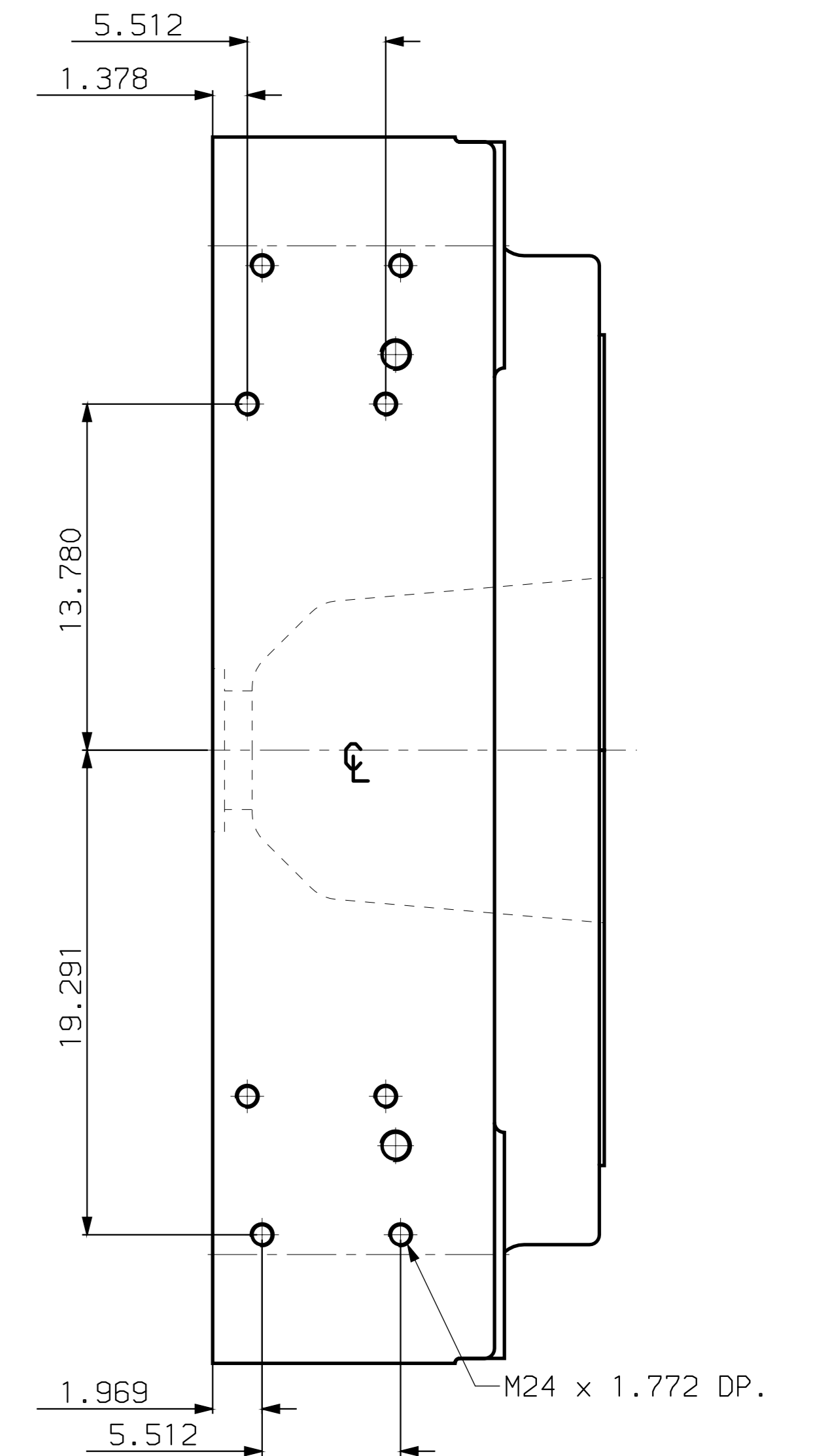
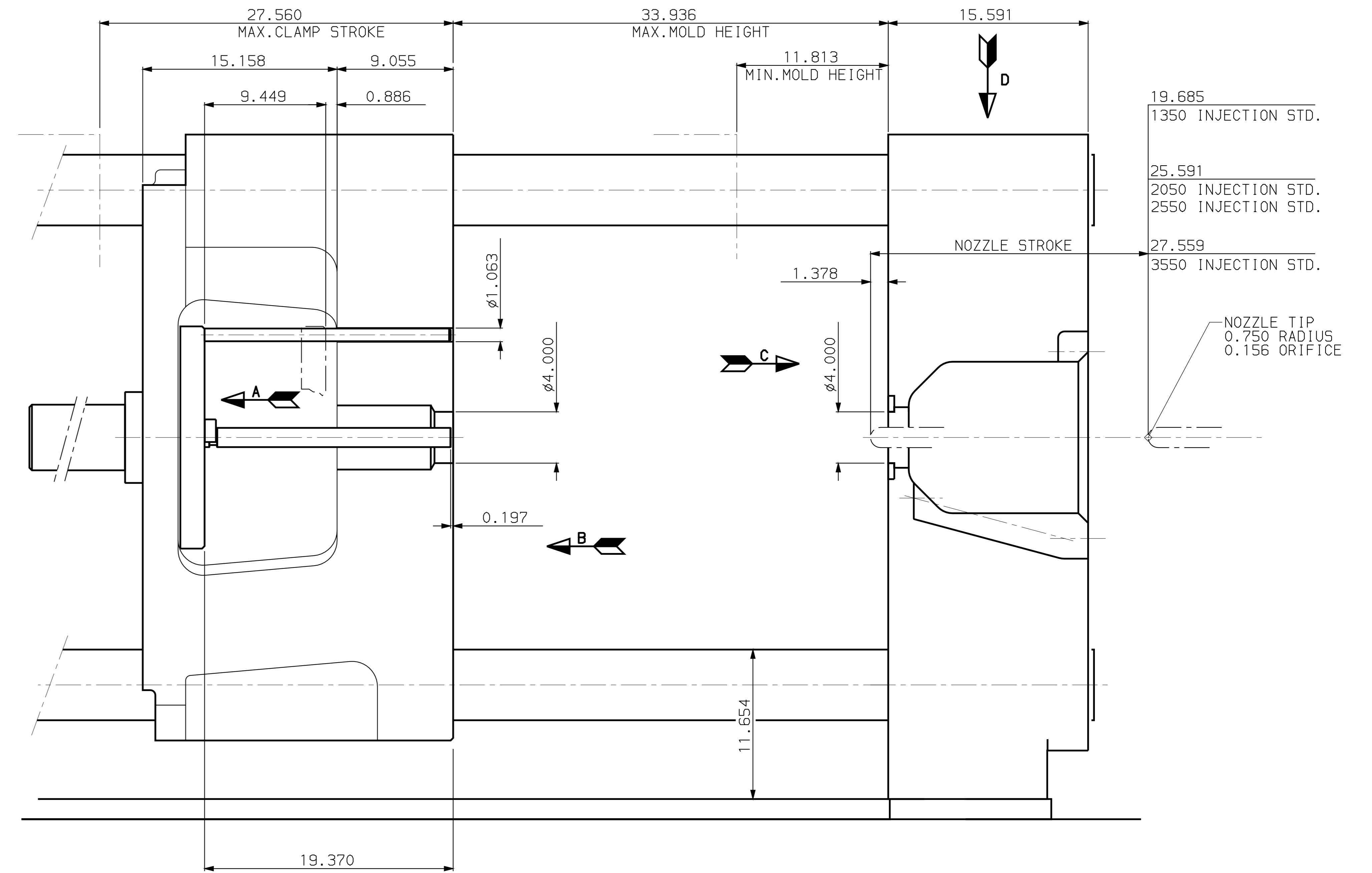
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0	2-2274	NEW	26-SEP-99	2.5					
REV#	ECOM	REVISION	DATE	NAME					
SCALE	DESCRIPTION								
1: 10	MAIN DIMENSIONS	ES50076-2050INJ. SPLIT BASE							
MATERIAL	NAME	DATE							
DRUCK CODE #	DR-11	J-35	29-JUL-00						
BREAK SHARP CORNERS	FORM 01	J-24	29-JUL-00						
FROM	0.5	6	30	315	1000	2000	REPLACES		
SIZE	10	4.0	30	315	1000	2000	COPY FROM		
FINE #	0.05	0.1	0.15	0.2	0.3	0.5	0.8	1.2	
MEDIUM #	0.1	0.2	0.3	0.5	0.8	1.2	2.0	4.0	
COARSE #	0.2	0.5	0.8	1.2	2.0	3.0	4.0		
DIM. METER								DRAWING NO.	9785.005.9759E
PART WEIGHT IN Kg.								SHEET	2 of 2
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.								REV. #	2



VIEW B
MOVING PLATEN



VIEW C
STATIONARY PLATEN



VIEW D

ALL DIMENSIONS ARE IN INCHES.

REV	DATE	BY	CHKD	DESCRIPTION	REV	DATE	BY	CHKD	DESCRIPTION
10	11-99	NEW				01-JUL-99	RAM		
11	03-00	REV				30-JUN-99			
12	03-00	REV				30-JUN-99			
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100	03-00	REV				30-JUN-99			

PART WEIGHT IN Kg. 9050.002.8322E
SHEET 2 OF 2 REV. 10

RELEASED
MICROFILM
REV. # 10

ENGEL
GUELPH - CANADA