

Engel Injection Molding Machine

ES 150 V-SERIES TIEBARLESS

Data Sheet

TECHNICAL SPECIFICATIONS - ES 150 V-SERIES TIEBARLESS INJECTION MOLDING MACHINE

CLAMP

| | | |
|-------------------------|---------|---------------|
| Clamp force | US tons | 150 |
| Clamp opening force | US tons | 9.8 |
| Clamp stroke (max.) | inches | 23.62 |
| Mold height (min - max) | inches | 9.84 - N/A |
| Daylight (min - max) | inches | 9.84 - 33.46 |
| Platen size (HxV) | inches | 33.46 x 27.56 |

See platen illustration below for
max. mold size applicable

| | | |
|--------------------------|--------|------|
| Hydraulic ejector stroke | inches | 5.90 |
| Hydraulic ejector force | tons | 6.9 |

INJECTION

| | | 650 | 650 | 650 |
|--------------------------------------|----------------------|------------|-----------------------------|-------|
| | | std. screw | other available screw sizes | |
| Screw diameter | mm | 50 | 40 | 45 |
| Screw diameter | inches | 1.969 | 1.575 | 1.772 |
| Shot size ¹⁺² | oz | 12.7 | 8.2 | 10.3 |
| Injection capacity | in ³ | 24.0 | 15.3 | 19.4 |
| Recovery rate ¹⁺² | oz/sec | 1.5 | 0.8 | 1.1 |
| Plasticizing capacity ¹⁺² | lbs/hr | 334 | 186 | 246 |
| Injection rate at max. press. | in ³ /sec | 10.1 | 6.5 | 8.2 |
| Injection rate (regenerative) | in ³ /sec | 13.6 | 8.7 | 11.0 |
| Injection velocity at max. press. | in/sec | 3.3 | 3.3 | 3.3 |
| Injection velocity (regenerative) | in/sec | 4.5 | 4.5 | 4.5 |
| Screw stroke | inches | 7.87 | | |
| Injection pressure (max.) | psi | 22011 | 30000 | 27173 |
| Injection pressure (regenerative) | psi | 16448 | 22418 | 20306 |
| Screw speed range (min=25) | rpm | 297 | | |
| Screw torque ³ | ft-lbs | 514 | | |
| Screw L/D ratio | | 20:1 | | |
| Nozzle stroke | inches | 13.78 | | |
| Nozzle force | US tons | 7.6 | | |

HYDRAULICS

| | | | | |
|--------------------------|--------|------|------|------|
| Pump capacity (required) | gpm | 24.2 | 24.2 | 24.2 |
| Oil reservoir capacity | US gal | 116 | | |

ELECTRICS

| | | | | |
|------------------------------|-------|--|------|------|
| Power supply available | volts | *460 incoming voltage / 460 volt heaterbands | | |
| Total rated horsepower | HP | 30 | 30 | 30 |
| Number of heat control zones | | 4+Nozzle | | |
| Total heating wattage | kw | 15.7 | 12.7 | 13.7 |

GENERAL

| | | | | |
|------------------------------------|--------|------------------|---|---|
| Dry cycle performance ⁴ | sec | 2.0 | | |
| Water requirements (max) | gpm | 6 | 6 | 6 |
| Machine dimensions (LxWxH) | inches | 221 x 71 x 89 | | |
| Machine weight | lbs | 28200 | | |
| Hopper capacity | lbs | 163 | | |
| Suitable Engel robots | | ERTLi 31, ERC 33 | | |

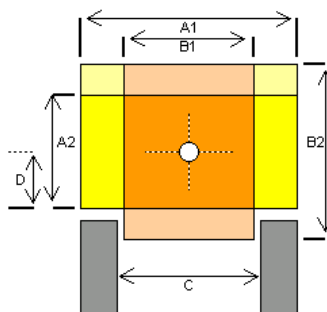
NOTES:

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
Issue: 01/29/2002



Platen Illustration

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

Maximum Mold Dimensions

| ES 150TL | (inches) |
|---------------------------------|---------------|
| A ₁ x A ₂ | 33.46 x 18.90 |
| B ₁ x B ₂ | 22.83 x 27.56 |
| C | 23.62 |
| D | 9.45 |

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

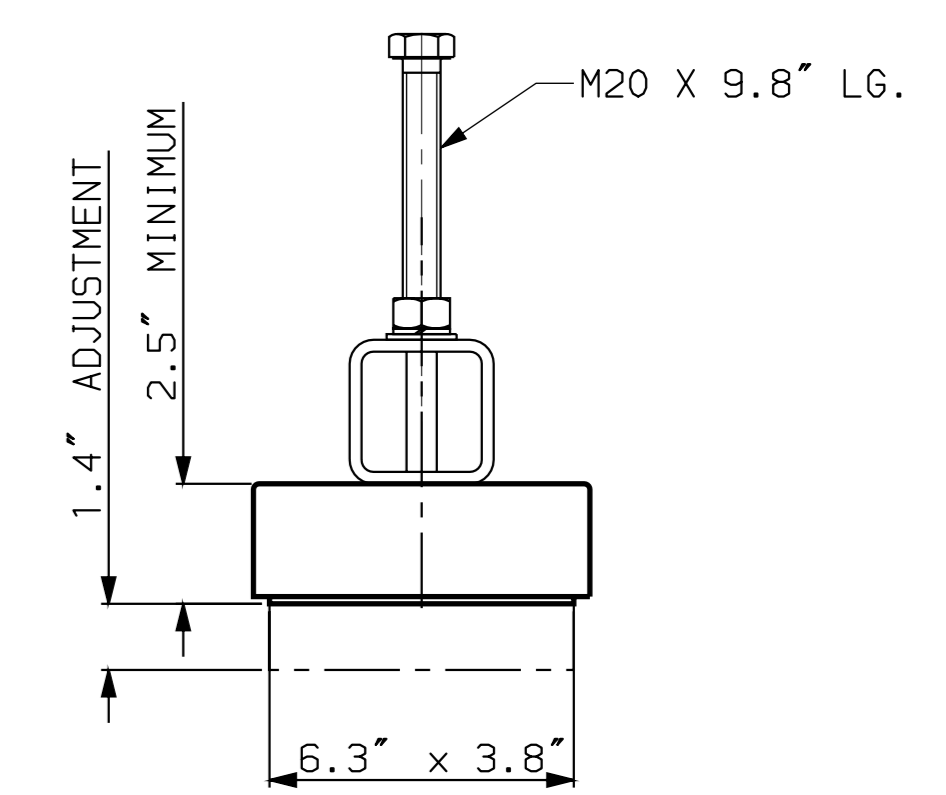
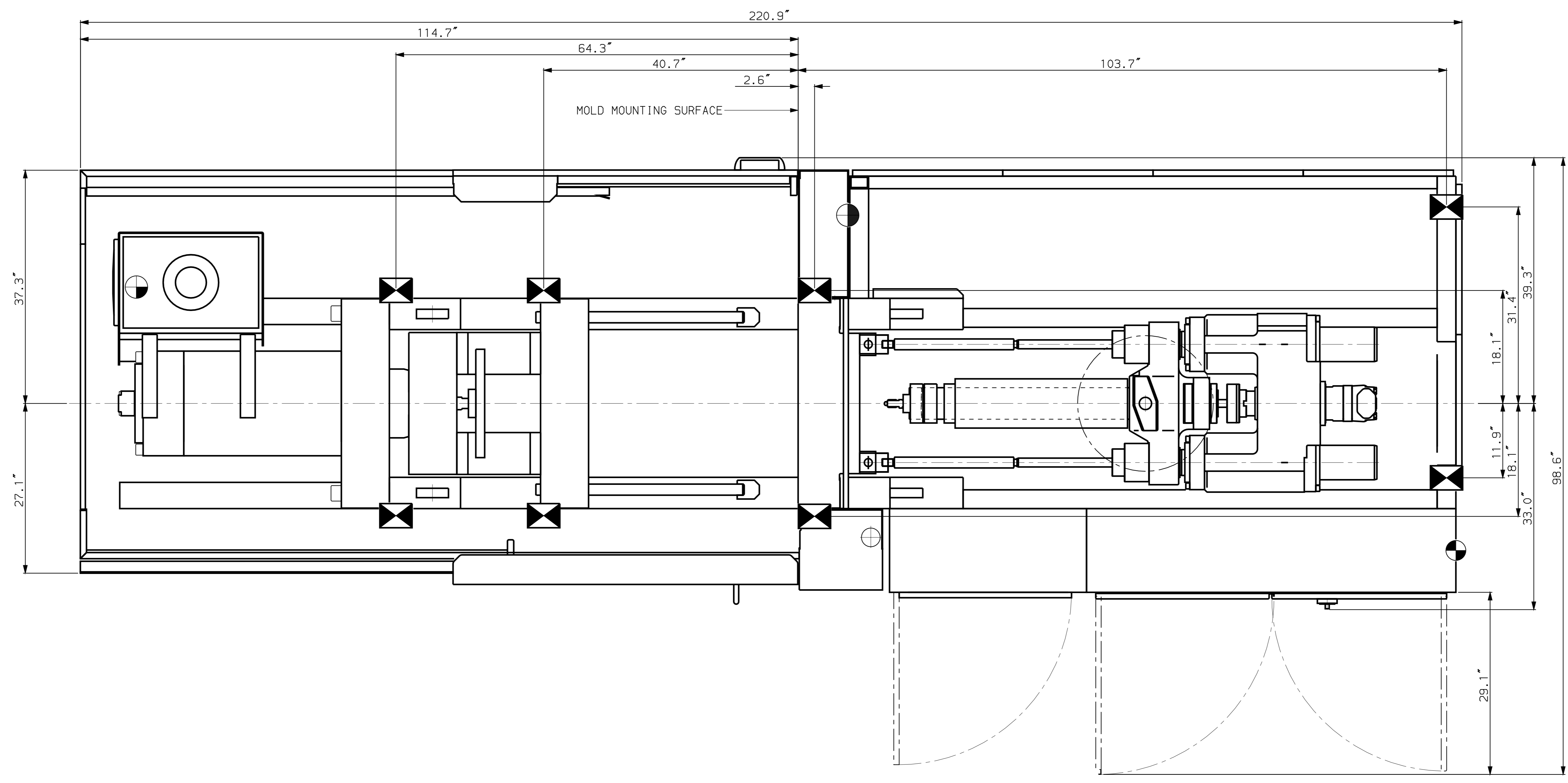
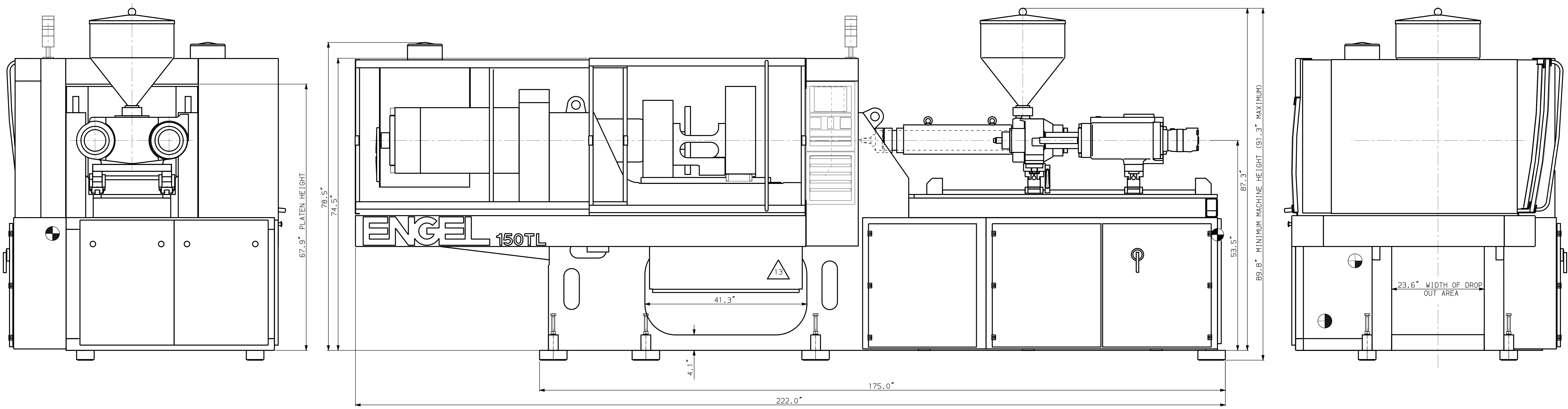
- Hot runner valve gate control (pneumatic)
- By-pass oil filtration

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



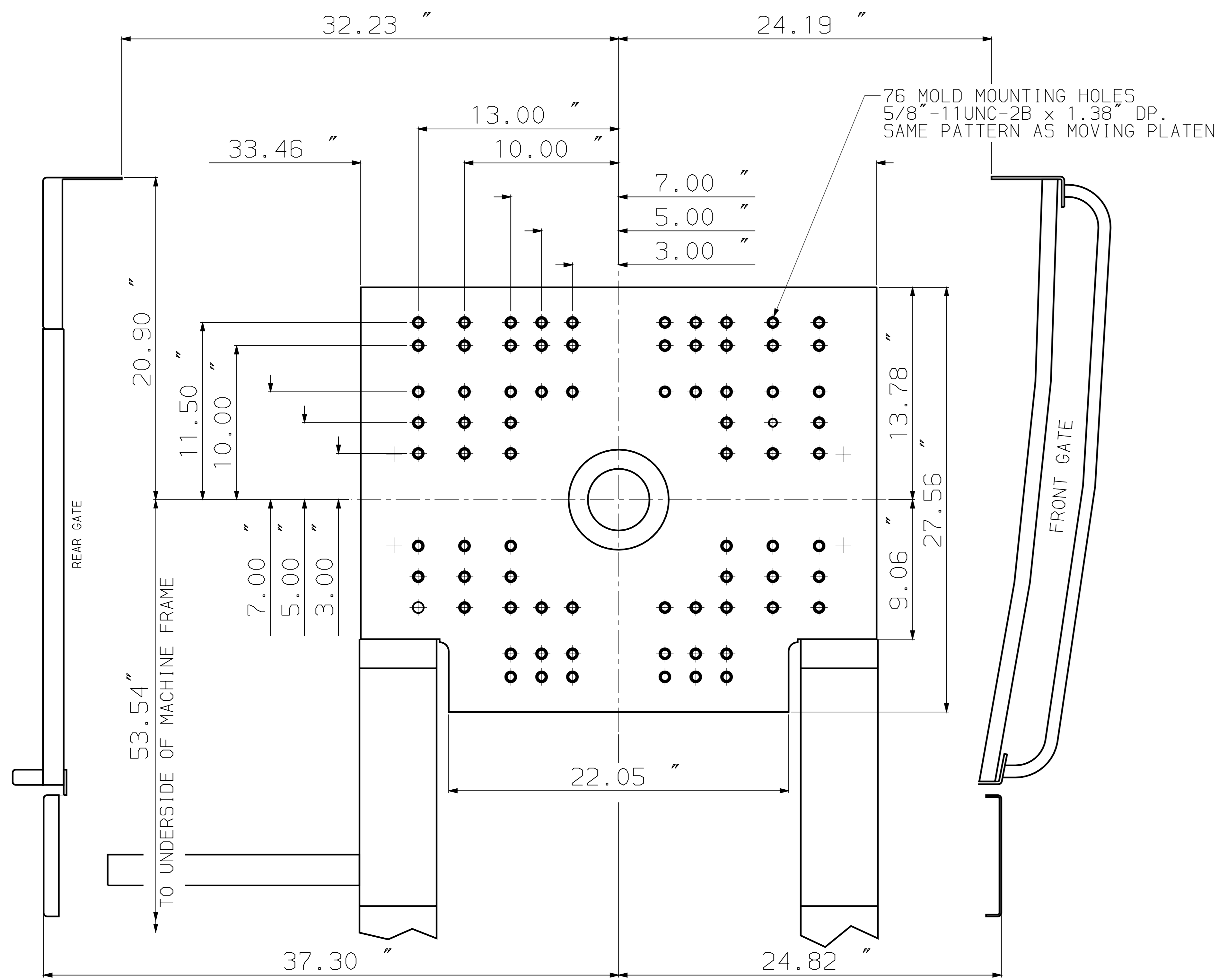
MACHINE MOUNT DETAIL
LOAD CAPACITY 6000 LBS.
SCALE 1:4

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

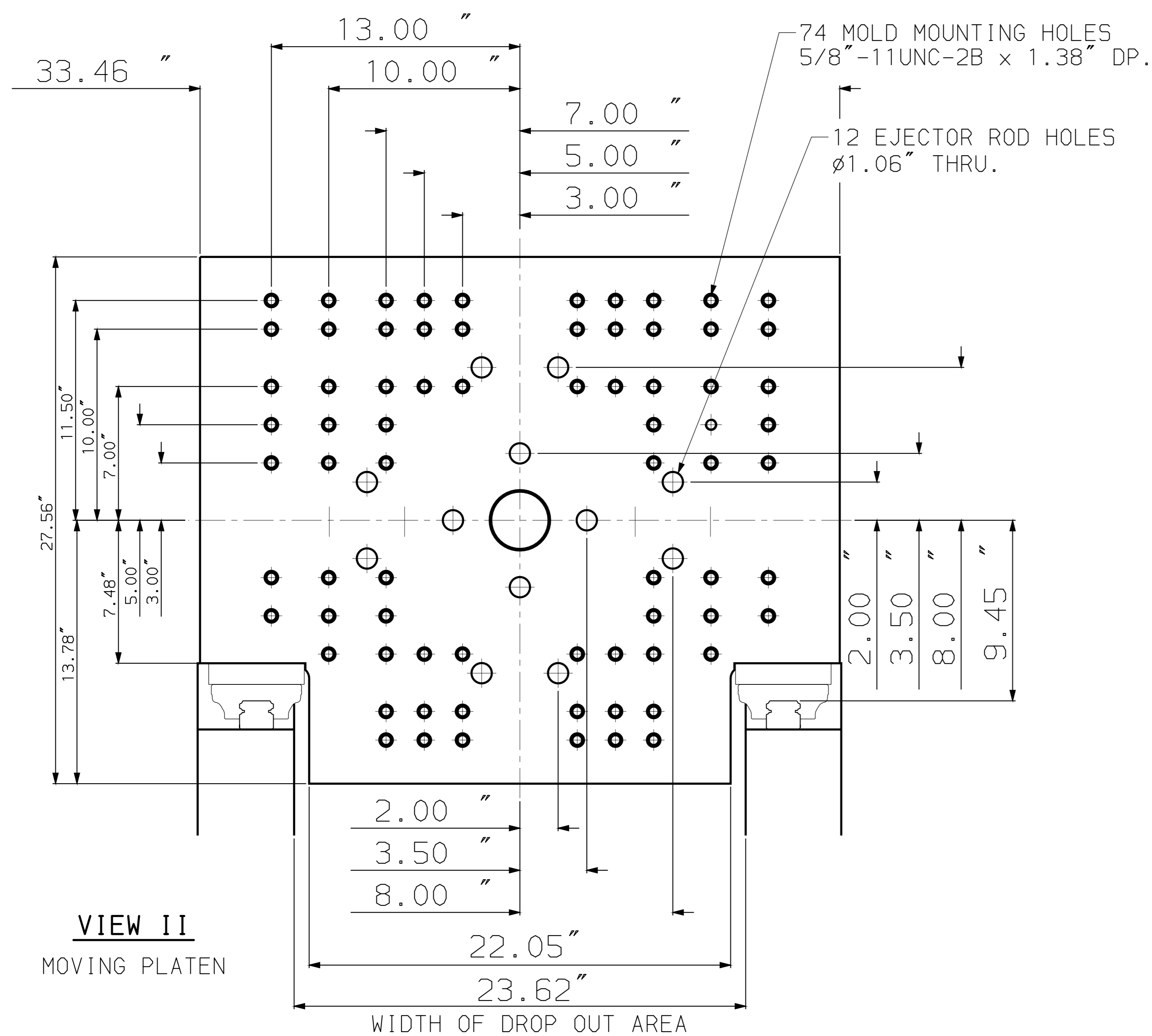
NOTES:
1. DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.
2. TECHNICAL DATA SUBJECT TO CHANGE WITHOUT NOTICE.

RELEASED
MICROFILM
REV. # 13

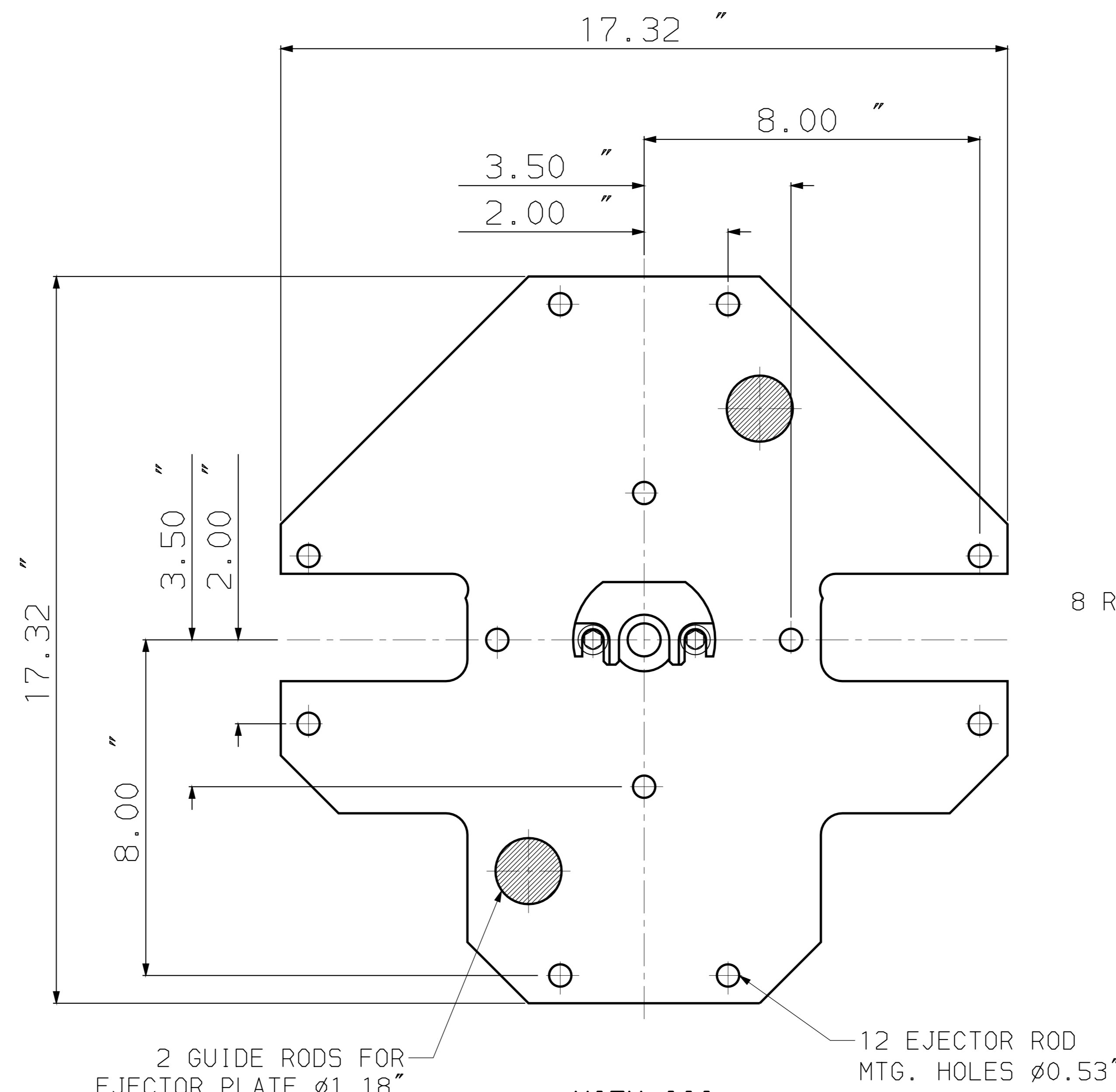
| | | | | |
|---|--------------------------------------|---|-----------|------------|
| 10 | 2-2000 | UPDATED GEOMETRY FOR SHARD/DROPOUT AREA | 20-MAR-01 | LEWIS, P. |
| 12 | 2-2499 | ALARM LAMP ADDED | 20-MAR-01 | B.H.A.L.D. |
| 11 | 12511 | REVISED MACHINE MOUNTS | 20-MAR-99 | J.S./K.B. |
| 10 | 1000 | NEW | 12-JUN-97 | KEARNEY |
| REV# | ECOM | REVISION | DATE | NAME |
| SCALE | DESCRIPTION | | | |
| 1: 9 | MAIN DIMENSIONS 150TL-650 | GUELPH - CANADA | | |
| MATERIAL | | DR. N. | NAME | DATE |
| OUTDOOR CODE | | DR. N. | KEARNEY | 17-JUN-97 |
| BREAK SHARP CORNERS | | DR. N. | KEARNEY | 17-JUN-97 |
| 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 | DR. N. | | |
| MEDIUM # | 0.1 0.2 0.3 0.5 0.8 1.2 2.0 | DR. N. | | |
| TOL. IN | | DR. N. | | |
| MICRO | | DR. N. | | |
| METERS | COARSE # 0.2 0.5 0.8 1.2 2.0 3.0 4.0 | DR. N. | | |
| 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. | | 8165.005.6073E SHEET 2 of 2 REV. # 13 | | |



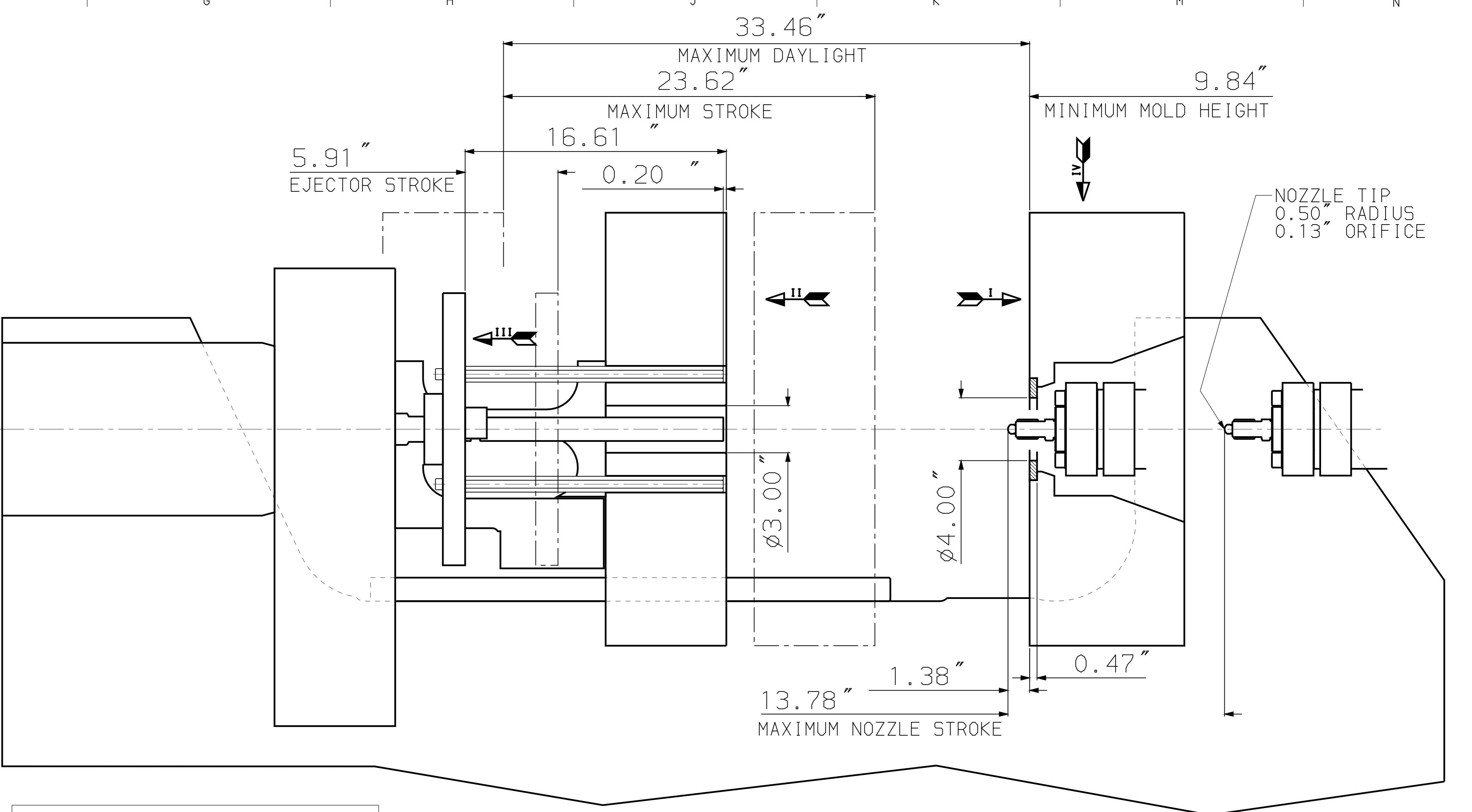
VIEW I
STATIONARY PLATEN



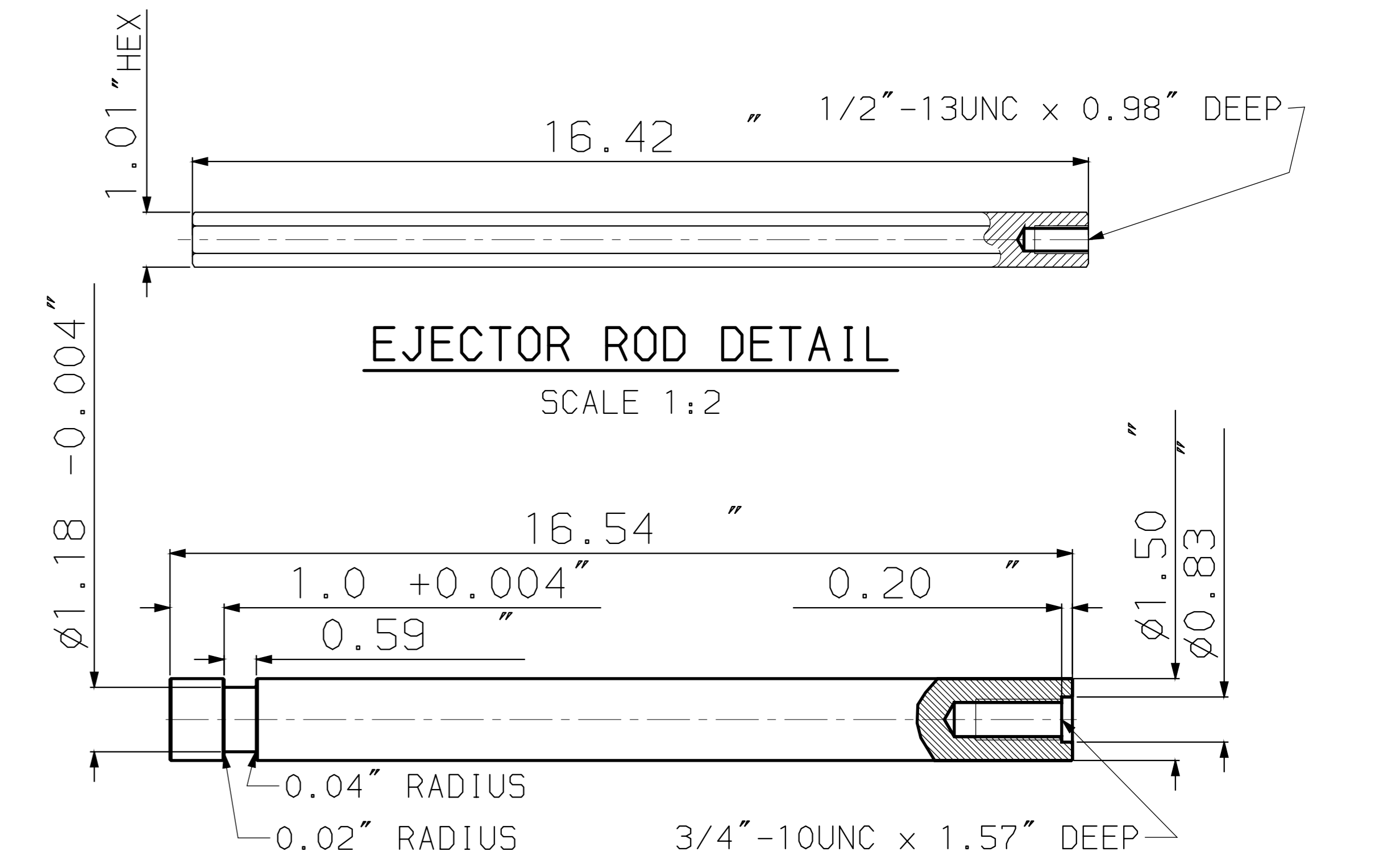
VIEW II
MOVING PLATEN



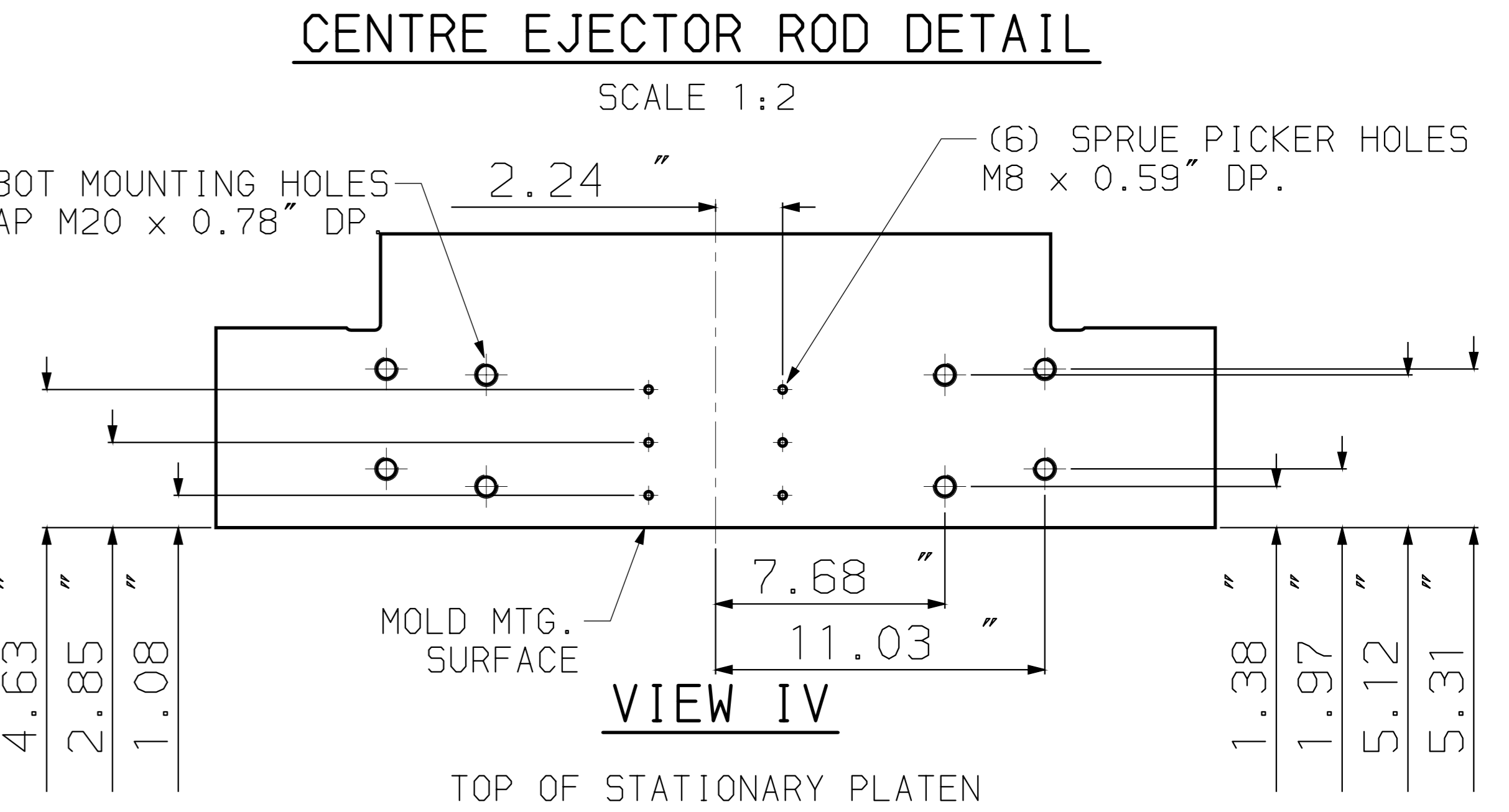
VIEW III
EJECTOR PLATE
SCALE 1:2



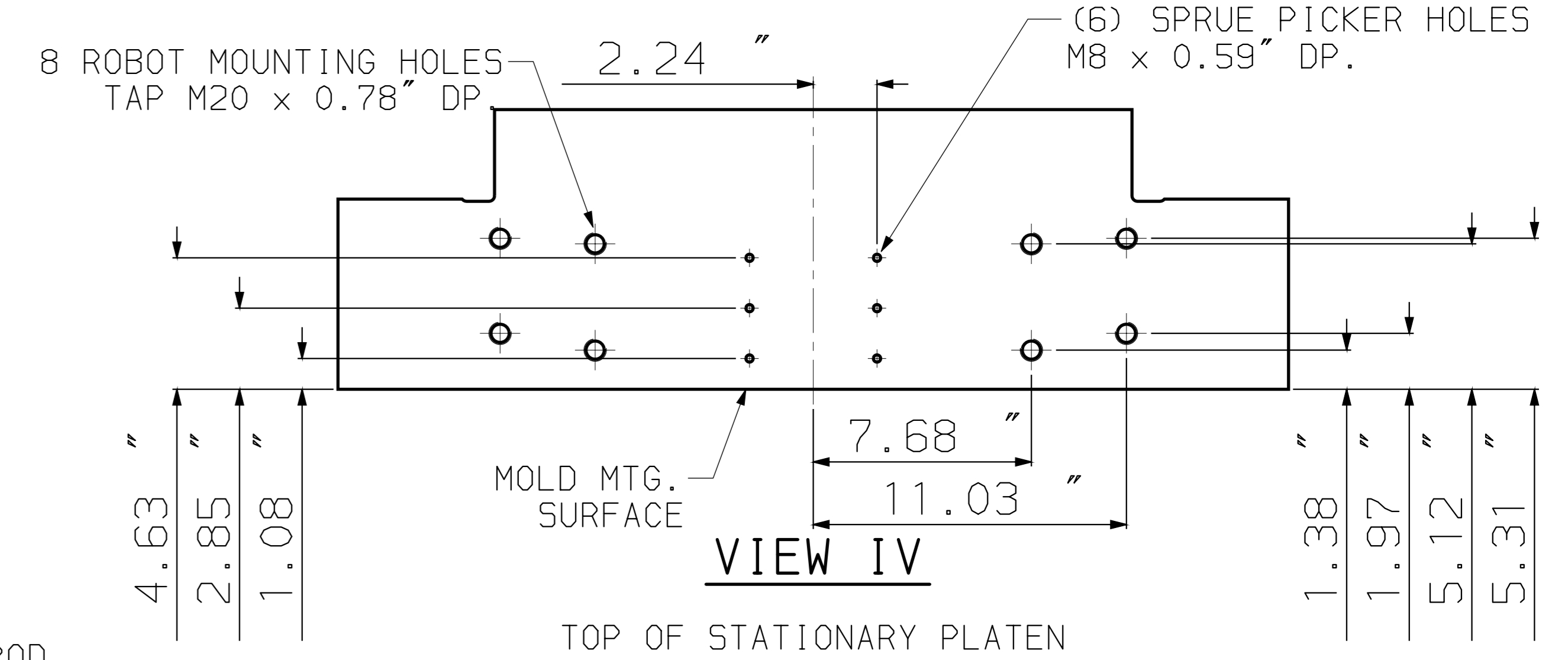
HYDRAULIC EJECTOR FORCE
 RETURN ← 3.27 US TONS
 FWD. MAX. → 6.92 US TONS
 REGEN. FWD. → 3.64 US TONS
 VALUES BASED ON 2320 psi



EJECTOR ROD DETAIL
SCALE 1:2



CENTRE EJECTOR ROD DETAIL
SCALE 1:2



VIEW IV
TOP OF STATIONARY PLATEN

NOTES:
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RELEASED
 MICROFILM
 REV. # 11

| | | | | |
|---|-------------------------|---------------|-----------|----------------|
| 11 | 041 | TEXT ENLARGED | 27-JAN-88 | KMB |
| 10 | SKB | NEW | 02-DEC-87 | KEARNEY |
| REV# | ECOM | REVISION | DATE | NAME |
| SCALE | DESCRIPTION | | | |
| 1: 4 | PLATEN LAYOUT 150TL-650 | | | |
| MATERIAL | NAME | DATE | | |
| STOCK CODE | DR. N. | KEARNEY | 02-DEC-87 | |
| BREAK SHARP CORNERS | CHK. D. | LAB | 02-DEC-87 | |
| FROM | 0.5 | 6 | 30 | 120 |
| SIZE | 10 | 4.0 | 30 | 120 |
| FINE | 0.05 | 0.1 | 0.15 | 0.2 |
| MEDIUM | 0.1 | 0.2 | 0.3 | 0.5 |
| COARSE | 0.2 | 0.5 | 0.8 | 1.2 |
| | 2.0 | 3.0 | 4.0 | |
| DIM. TOL. IN | | | | |
| METERS | | | | |
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| | | | | REV. # 11 |