

Engel Injection Molding Machine

ES 250
TOGGLE
Data Sheet

TECHNICAL SPECIFICATIONS - ES 250 TOGGLE INJECTION MOLDING MACHINE

CLAMP

Clamp force	US tons	250
Clamp opening force	US tons	33
Clamp stroke (max.)	inches	20.08
Mold height (min - max)	inches	7.87 - 24.02
Daylight (min - max)	inches	7.87 - 44.09
Platen size (HxV)	inches	32.68 x 32.68
Distance between tie bars (HxV)	inches	22.44 x 22.44
Tie bar diameter	inches	3.54
Hydraulic ejector stroke	inches	5.91
Hydraulic ejector force	tons	6.8

INJECTION

		750	1050	1050	1050
Screw diameter	mm	45	50	55	60
Screw diameter	inches	1.772	1.969	2.165	2.362
Shot size ¹⁺²	oz	10.3	13.7	16.6	19.7
Injection capacity	in ³	19.4	25.8	31.2	37.1
Recovery rate ¹⁺²	oz/sec	0.9	1.2	1.6	2.0
Plasticizing capacity ¹⁺²	lbs/hr	197	268	349	441
Injection rate at max. press. ³	in ³ /sec	10.8	10.5	12.7	15.1
Injection rate (regenerative) ³	in ³ /sec	14.4	13.3	16.1	19.1
Injection velocity at max. press. ³	in/sec	4.4	3.4	3.4	3.4
Injection velocity (regenerative) ³	in/sec	5.8	4.4	4.4	4.4
Screw stroke	inches	7.87	8.46	8.46	8.46
Injection pressure (max.)	psi	30000	27695	22910	20518
Injection pressure (regenerative)	psi	22418	21805	18037	16154
Screw speed range (min=25)	rpm	238			
Screw torque ⁴	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	125

ELECTRICS

Power supply available	volts	208 / 230 / 460 / 575 - 3PH / 60Hz
Total rated horsepower	HP	40
Number of heat control zones		4+Nozzle
Total heating wattage	kw	13.7 15.7 16.7 18.7

GENERAL

Dry cycle performance ⁵	sec	1.9
Water requirements (max)	gpm	9
Machine dimensions (LxWxH)	inches	245 x 70 x 89
Machine weight	lbs	23000
Hopper capacity	lbs	163
Suitable Engel robots		ERC 43

NOTES:

1. Based on polystyrene material.
2. Calculated
3. Can be increased with accumulator.
4. Can be increased.
5. Per Euromap 6 standard.

(N/A=Not Available)

All data subject to change without notice
Per Rev. 22_010807
Updated 04/26/02

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 pressure (via 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
- Center ejector rod
- Mechanical safety dropbar
- 3 speed opening and closing
- Hydraulic, electric and electronic safety gate interlocks
- 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

Hydraulics

- Fully proportional linearized hydraulic system
- Automatic calibration of proportional hydraulic valves and transducers
- Clogged filter indicator
- Closed loop oil temperature regulation with pre-warming system
- 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
- 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 and 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
- 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)
- 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
- Increased wattage and air-cooled heaterbands
- Shut-off nozzles
- Insulating blanket for barrel
- Hopper or drawer magnets

Clamp

- Mold venting program
- Air blow-off valve
- Mold support assembly
- SPI safety key switch for clamp, ejector and core movement
- Automatic clamp force control

Hydraulics

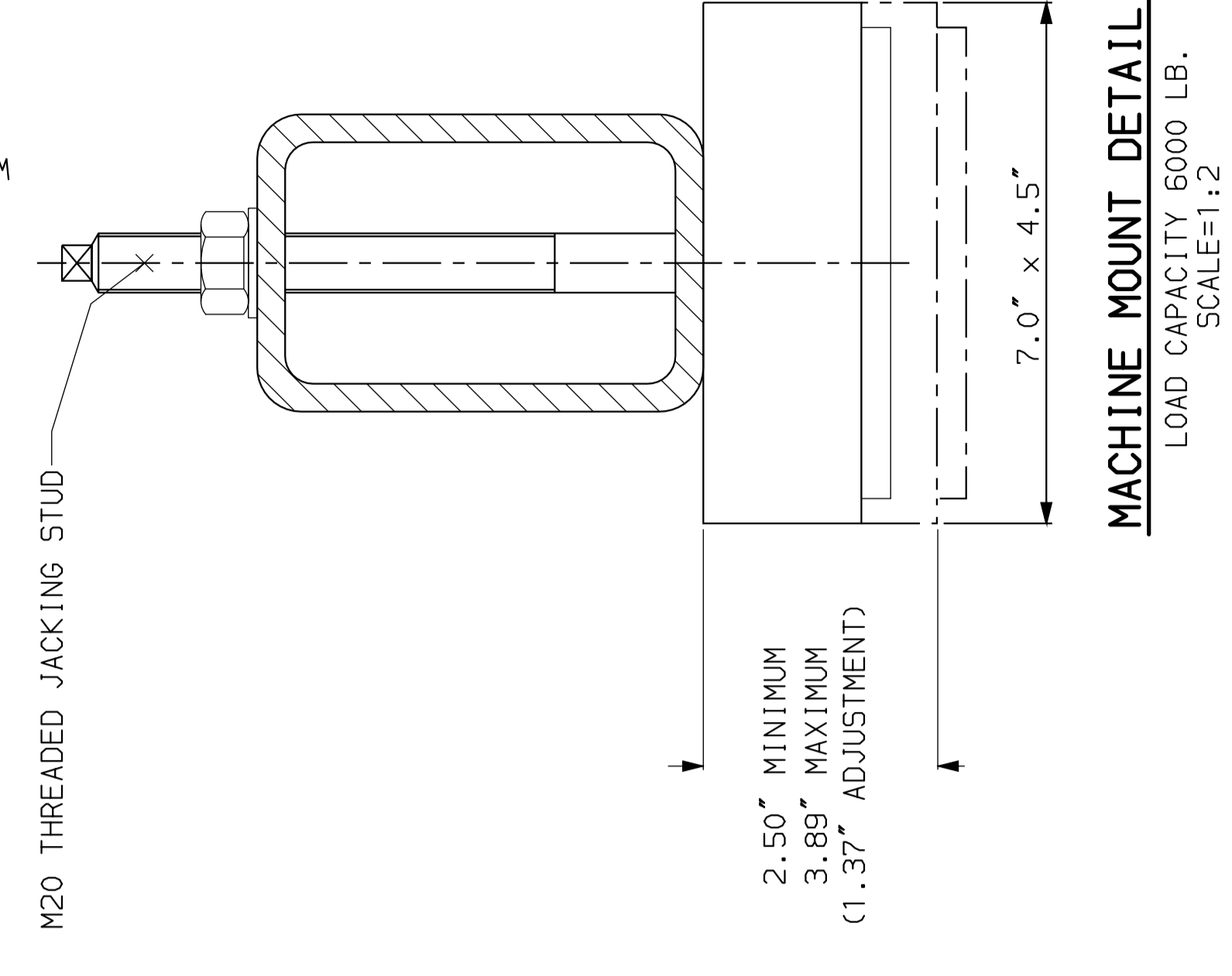
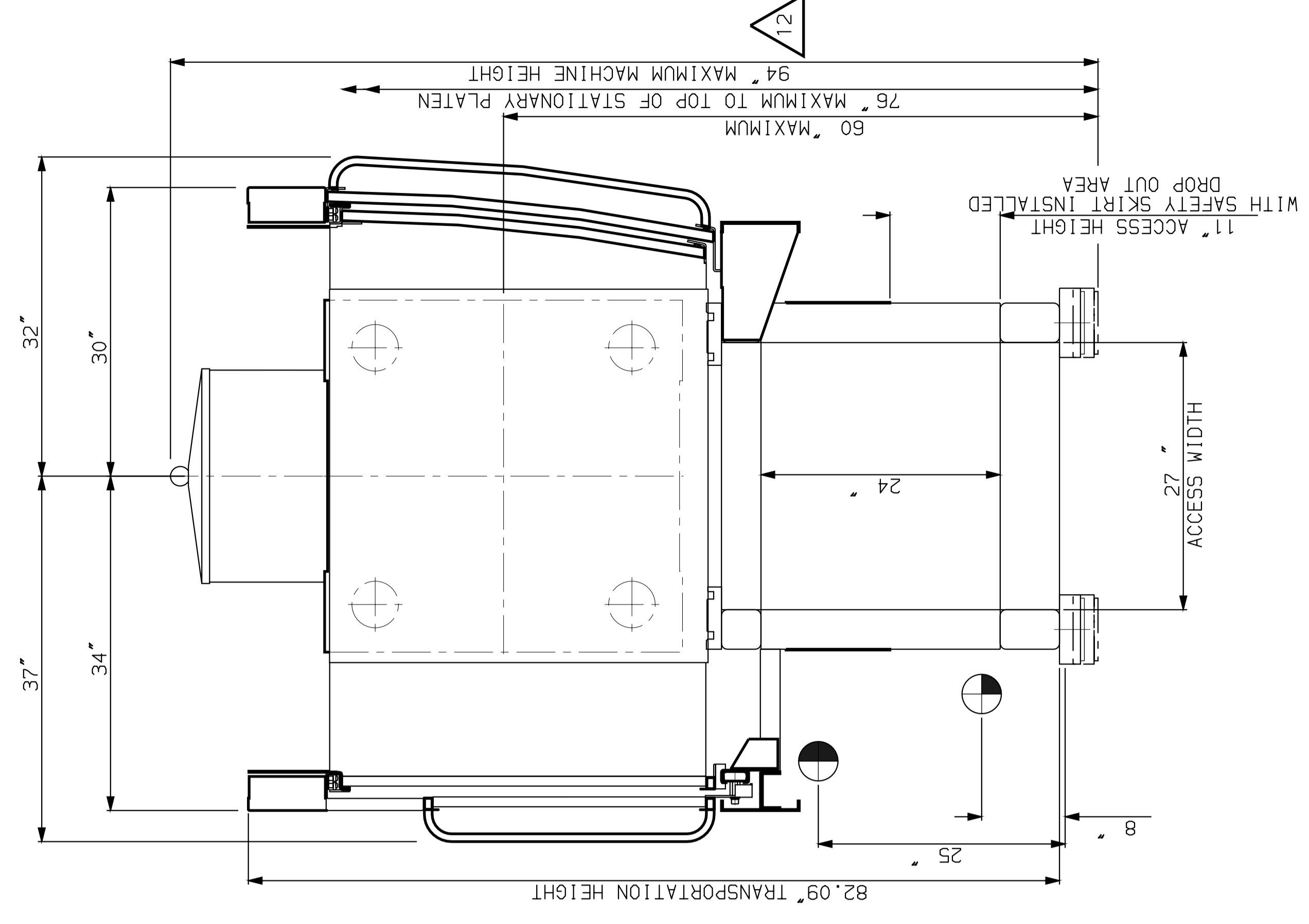
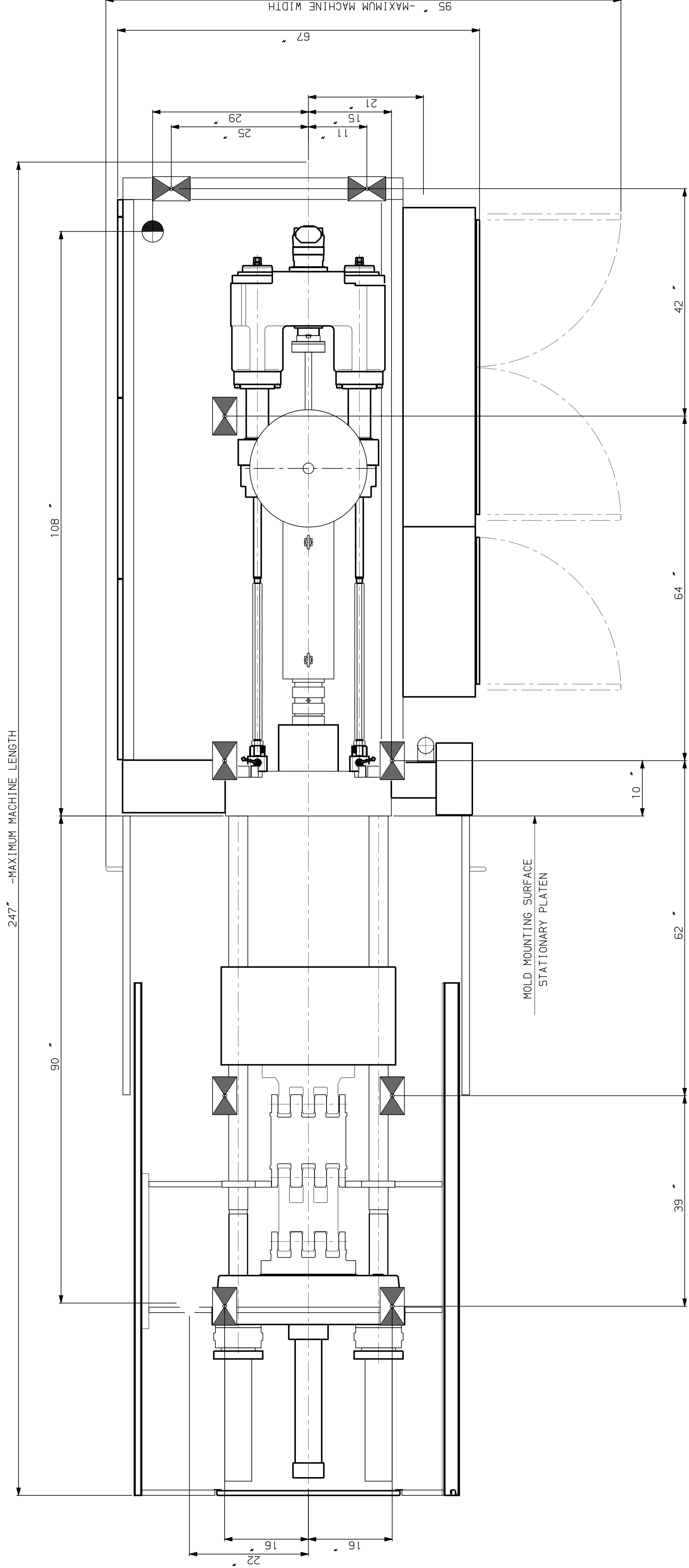
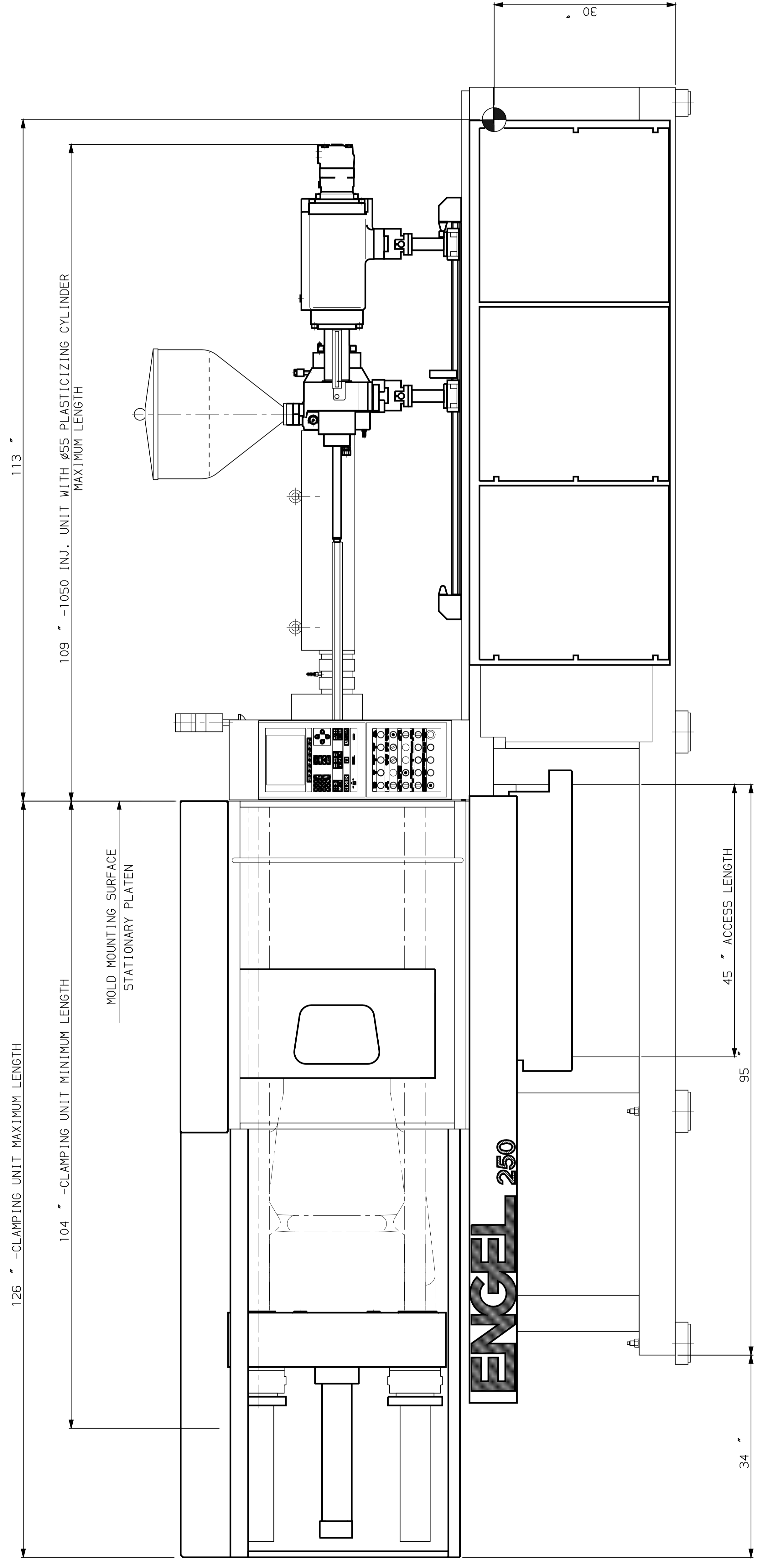
- Closed loop injection speed, injection pressure and screw back pressure via servo valve
- Increased hydraulic drive for increased plasticizing and injection speeds
- Extra pump for ejector/core "on-the-fly"
- Corepull(s) and unscrewing
- Hot runner valve gate control (pneumatic or hydraulic)
- High torque screw drive
- By-pass oil filtration

Controls, Electrics & Electronics

- CC100 microprocessor control with high resolution flat color screen.
- Networking capability via "Teleservice/Engel Monitoring System" ethernet connection on CC100 models. (optional on EC100 models)
- Microplast and Microflow software pkgs.
- Micrograph Plus high resolution analog display software
- Process data graphics and reports
- Magnetic security card access
- SPC (Quality Data Statistics)
- Automatic barrel/nozzle heat-up (7 day, 24 hour timer)
- Power factor capacitors
- Robot interface
- Auxiliary electrical receptacles
- Host computer and 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
- 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 specifications
- Multi-injection
- Alarm bell in addition to alarm light
- Air and water service routing
- Spare parts packages
- Engel robots
- Training programs
- Engel monitoring system



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

LEGEND
 [Symbol] -MACHINE MOUNT
 [Symbol] -STD. ELE. UTILITY ENTRANCE
 [Symbol] -COOLING WATER CONN. IN & OUT 3/4" NPT.
 [Symbol] -AIR CONN. -3/8" NPT.

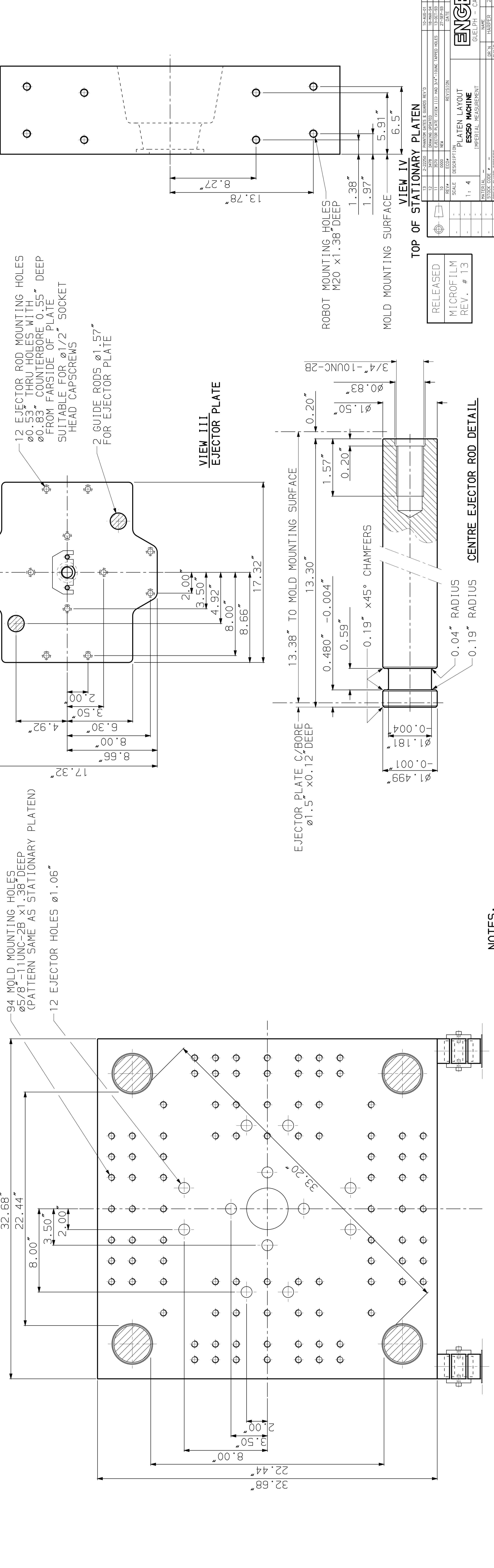
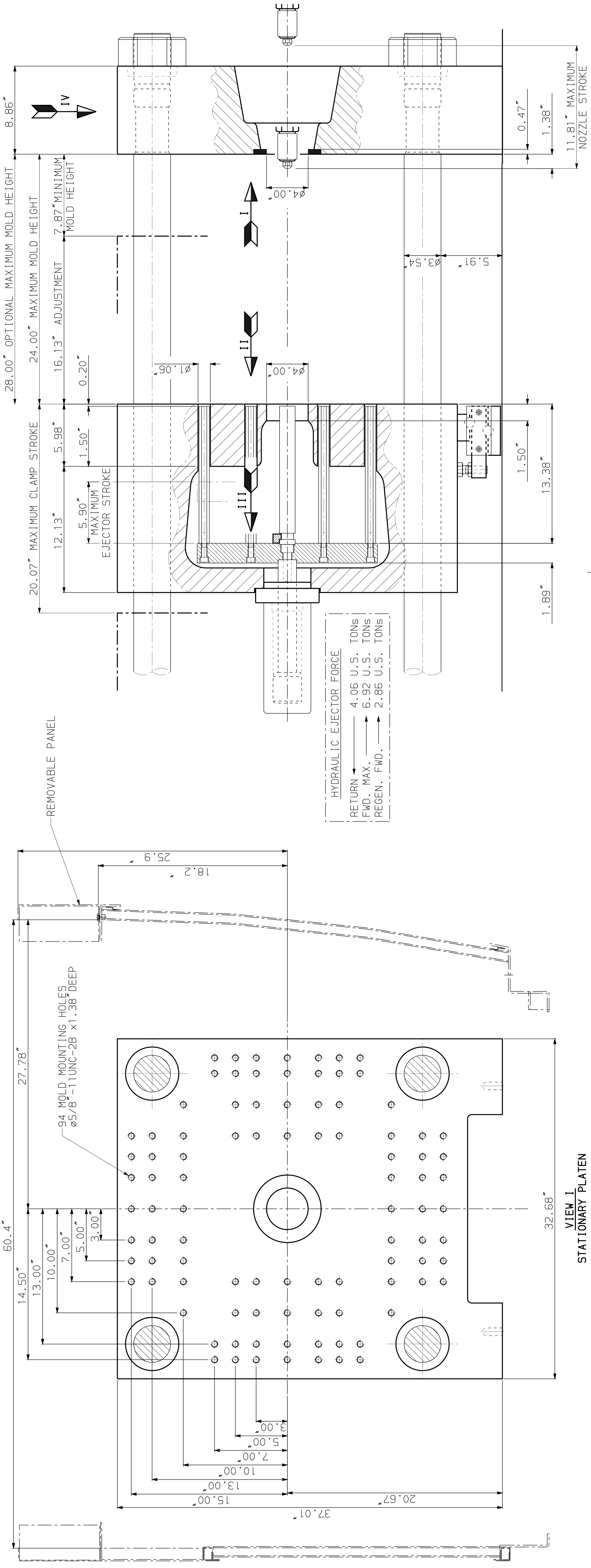
RELEASED
 MICROFILM
 REV. # 12

PART WEIGHT IN LBS.
 -

12	20-MARCH-00	REV. A/D	ENGL	250	1000000000
11	10-NOV-99	REV. C	ENGL	250	1000000000
10	08-NOV-99	REV. B	ENGL	250	1000000000
9	01-JAN-99	REV. A	ENGL	250	1000000000
8	01-JAN-99	REV. A	ENGL	250	1000000000
7	01-JAN-99	REV. A	ENGL	250	1000000000
6	01-JAN-99	REV. A	ENGL	250	1000000000
5	01-JAN-99	REV. A	ENGL	250	1000000000
4	01-JAN-99	REV. A	ENGL	250	1000000000
3	01-JAN-99	REV. A	ENGL	250	1000000000
2	01-JAN-99	REV. A	ENGL	250	1000000000
1	01-JAN-99	REV. A	ENGL	250	1000000000

12 20-MARCH-00 REV. A/D ENGL 250 1000000000
 11 10-NOV-99 REV. C ENGL 250 1000000000
 10 08-NOV-99 REV. B ENGL 250 1000000000
 9 01-JAN-99 REV. A ENGL 250 1000000000
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 3 01-JAN-99 REV. A ENGL 250 1000000000
 2 01-JAN-99 REV. A ENGL 250 1000000000
 1 01-JAN-99 REV. A ENGL 250 1000000000

SCALE: 1:10
 DESCRIPTION: MAIN DIMENSIONS
 ES250-1050 INJ.
 IMPERIAL MEASUREMENTS
 9025-005.9561E
 2 OF 2



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REV.	DATE	DESCRIPTION	BY	CHK'D
1	12/15/03	ISSUE FOR PRODUCTION
2	01/20/04
3	03/10/04
4	05/10/04	...	...	...
5	07/10/04	...	...	...
6	09/10/04	...	...	...
7	11/10/04	...	...	...
8	01/10/05	...	...	...
9	03/10/05	...	...	...
10	05/10/05	...	...	...
11	07/10/05	...	...	...
12	09/10/05	...	...	...
13	11/10/05	...	...	...

RELEASED
MICROFILM
REV. # 13

TOP OF STATIONARY PLATEN

ROBOT MOUNTING HOLES
M20 x 1.38" DEEP

MOLD MOUNTING SURFACE

VIEW IV
6.5"

13.78"

8.27"

1.38"

1.97"

5.91"

11.81" MAXIMUM STROKE

0.47"

1.38"

28.00" OPTIONAL MAXIMUM MOLD HEIGHT

24.00" MAXIMUM MOLD HEIGHT

7.87" MINIMUM MOLD HEIGHT

16.13" ADJUSTMENT

0.20"

20.07" MAXIMUM CLAMP STROKE

5.98"

1.50"

12.13"

5.90" MAXIMUM EJECTOR STROKE

1.50"

1.89"

13.38"

1.06"

Ø1.06"

Ø4.00"

Ø3.54"

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