Engel Injection Molding Machine

ES 60 V-SERIES TIEBARLESS Data Sheet

TECHNICAL SPECIFICATIONS - ES 60 V-SERIES TIEBARLESS INJECTION MOLDING MACHINE

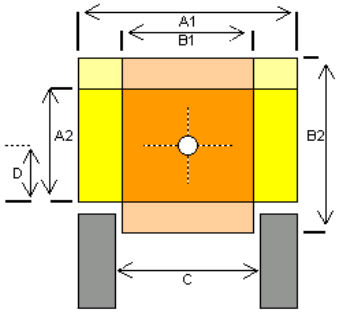
CLAMP				
Clamp force	US tons	60		
Clamp opening force	US tons	3.0		
Clamp stroke (max.)	inches	13.00		
Mold height (min - max)	inches	7.48 - N/A		
Daylight (min - max)	inches	7.48 - 20.47		
Platen size (HxV)	inches	25.60 x 16.93		
		See platen illustration below for		
		max. mold size applicable		
Hydraulic ejector stroke	inches	3.94		
Hydraulic ejector force	tons	3.5		
INJECTION		**200**		
		std. screw	other available screw sizes	
Screw diameter	mm	**30**	25	35
Screw diameter	inches	**1.181**	0.984	1.378
Shot size[1+2]	oz	**3.2**	2.2	4.4
Injection capacity	in³	**6.0**	4.2	8.2
Recovery rate[1+2]	oz/sec	**0.6**	0.4	0.9
Plasticizing capacity[1+2]	lbs/hr	**135**	88	209
Injection rate at max. press.	in³/sec	**5.6**	3.9	7.6
Injection rate (regenerative)	in³/sec	**8.5**	5.9	11.6
Injection velocity at max. press.	in/sec	**5.1**		
Injection velocity (regenerative)	in/sec	**7.8**		
Screw stroke	inches	**5.51**		
Injection pressure (max.)	psi	**30000**	30000	23505
Injection pressure (regenerative)	psi	**21040**	30000	15456
Screw speed range (min=25)	rpm	**480**		
Screw torque[3]	ft-lbs	**163**		
Screw L/D ratio		**20:1**	24:1	17.1:1
Nozzle stroke	inches	**7.87**		
Nozzle force	US tons	**3.2**		
HYDRAULICS				
Pump capacity (required)	gpm	16.1		
Oil reservoir capacity	US gal	57		
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	4.8		
GENERAL				
Dry cycle performance[4]	sec	1.5		
Water requirements (max)	gpm	6		
Machine dimensions (LxWxH)	inches	146 x 56 x 76		
Machine weight	lbs	9600		
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.

(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 60TL	(inches)
$A_1 \times A_2$	25.59 x 12.60
$B_1 \times B_2$	14.96 x 16.93
C	15.75
D	6.57

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

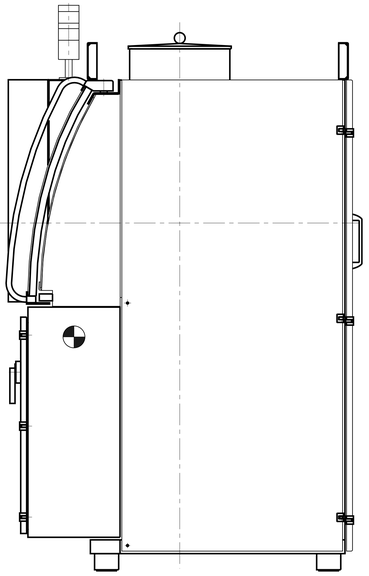
- Hot runner valve gate control (pneumatic)
- By-pass oil filtration

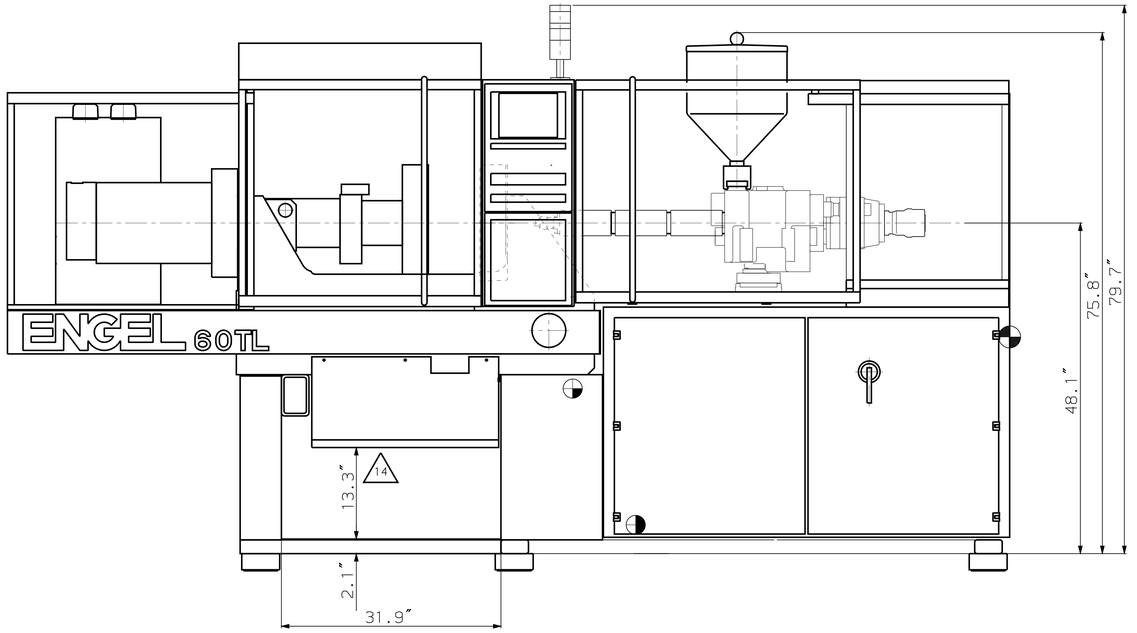
Controls, Electrics & Electronics

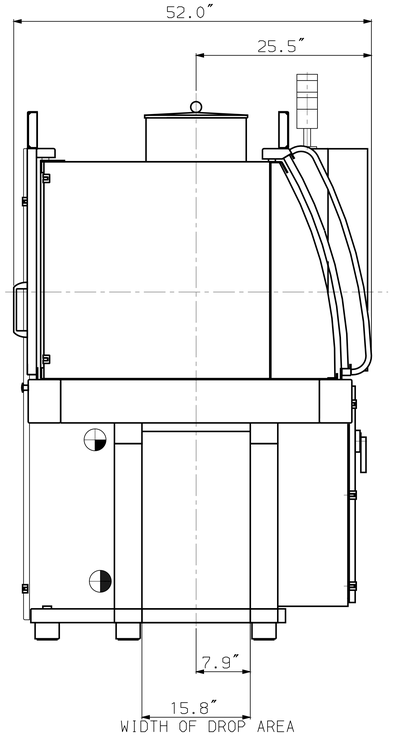
- Microplast and Microflow software pkgs.
- Micrograph for EC100 control
- Process data graphics and reports
- Magnetic security card access
- SPC (Quality Data Statistics)
- Automatic barrel/nozzle heat-up (7 day, 24 hour timer)
- ERC robot interface
- Host computer and SPI auxiliary device interface
- 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)

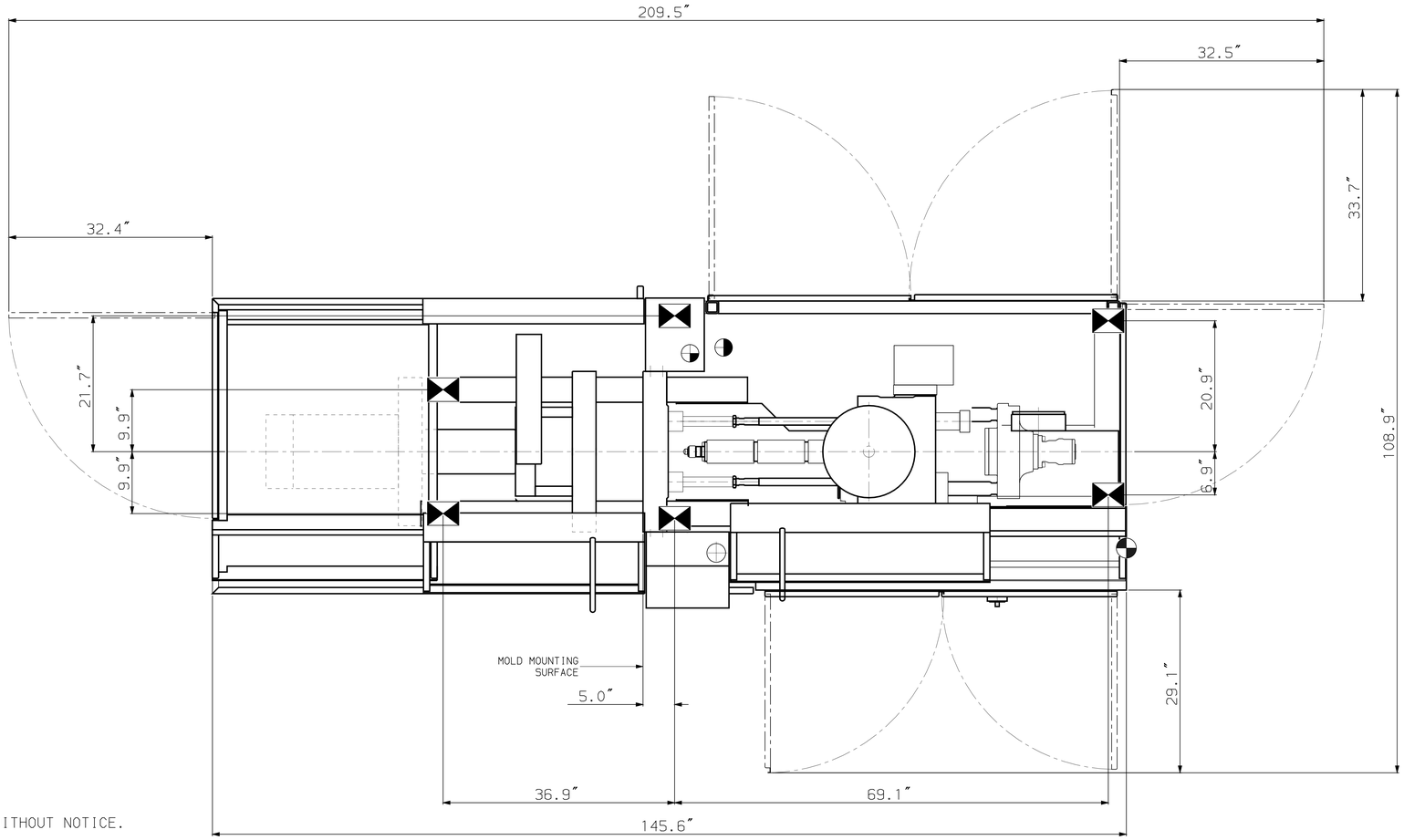
General Options

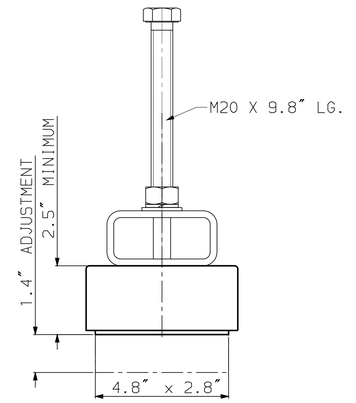
- Alarm bell in addition to alarm light
- Engel robots
- Training programs
- Spare parts packages











MACHINE MOUNT DETAIL

LOAD CAPACITY 3000 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

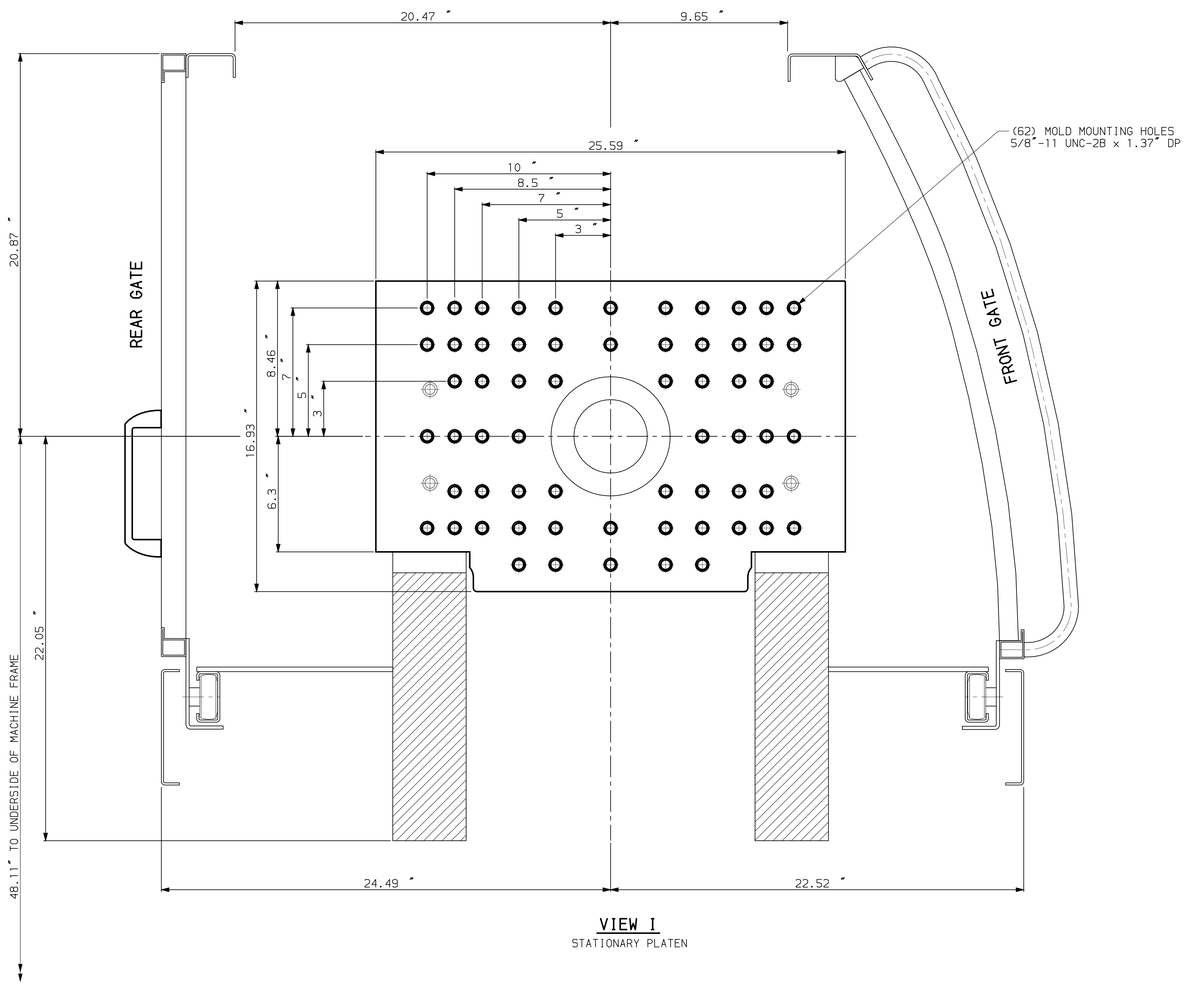
REV.	ECO#	REVISION	DATE	NAME
14	2-19868	UPDATED GUARD,BASE CLA., DIM 13.3" WAS 18.6"	10-MAY-01	LIXIU P.
13	2-2498	NEW STYLE ALARM LAMP & HEIGHT ADDED.	22-MAR-00	B.H./K.D.
12	12511	REVISED MACHINE MOUNTS	20-MAR-99	J.S./K.B.
11	0141	ENGEL REMOVED FROM ELE. CABINET	29-JAN-98	KWB
10	5451	NEW	14-NOV-96	KEARNEY

SIZE	FROM TO	0.5 6.0	6 30	30 120	120 315	315 1000	1000 2000	2000 >
DIM. TOL. IN MICRO METERS	FINE ±	0.05	0.1	0.15	0.2	0.3	0.5	0.8
	MEDIUM ±	0.1	0.2	0.3	0.5	0.8	1.2	2.0
	COARSE ±	0.2	0.5	0.8	1.2	2.0	3.0	4.0

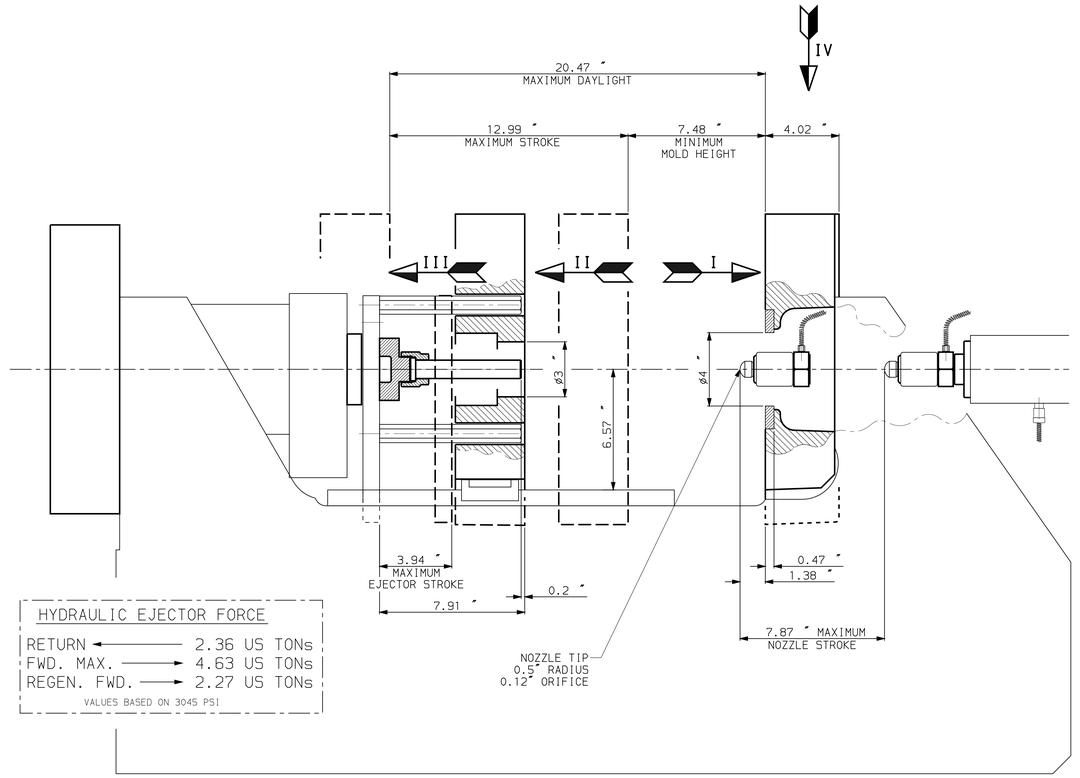
SCALE 1: 8
DESCRIPTION: MAIN DIMENSIONS ES060TL
MATERIAL –
STOCK CODE # –
BREAK SHARP CORNERS –
ENGEL GUELPH - CANADA

	NAME	DATE
DR'N	KEARNEY	14-NOV-96
CHK'D	KWB	14-NOV-96

REPLACES COPY FROM –
BM –
DRAWING NO 5860.005.0711E
SHEET 2 OF 2
REV.# 14



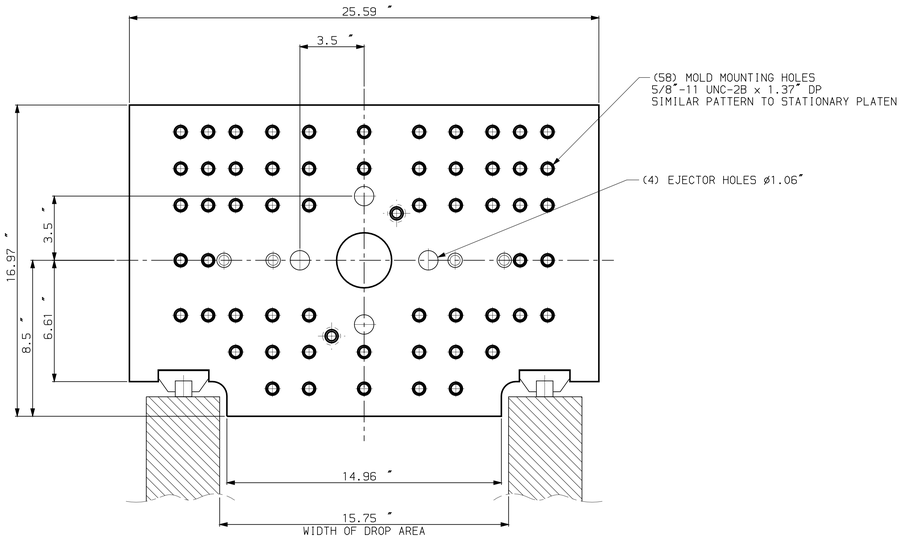
VIEW I
STATIONARY PLATEN



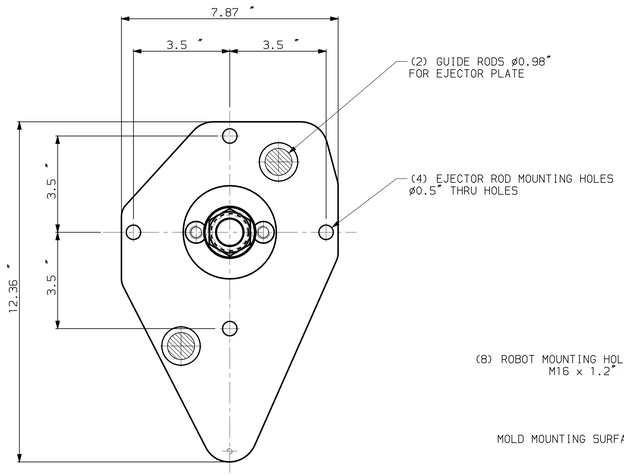
HYDRAULIC EJECTOR FORCE

RETURN	←	2.36 US TONs
FWD. MAX.	→	4.63 US TONs
REGEN. FWD.	→	2.27 US TONs

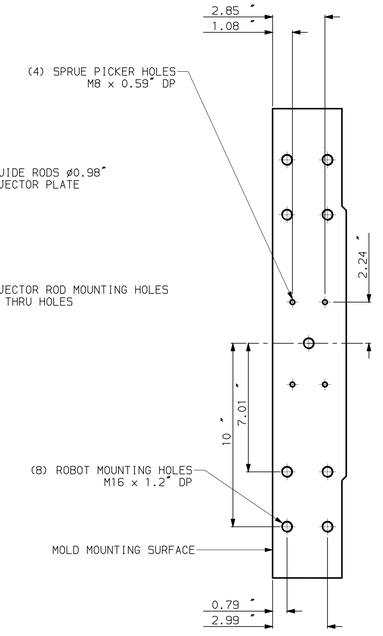
VALUES BASED ON 3045 PSI



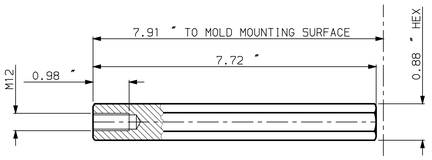
VIEW II
MOVING PLATEN



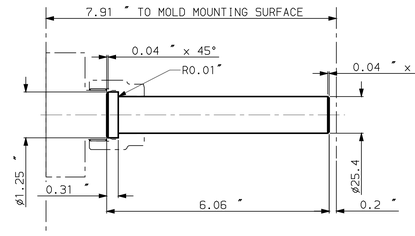
VIEW III
EJECTOR PLATE
SCALE 1:2



VIEW IV
TOP OF STATIONARY PLATEN



EJECTOR ROD DETAIL
SCALE 2:3



CENTRE EJECTOR ROD DETAIL
SCALE 2:3

NOTE:

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

RELEASED
MICROFILM
REV. # 0

PART WEIGHT IN Kg.
–

REV#	ECO#	REVISION	DATE	NAME
0	2-21352	NEW RELEASE	27-JUN-01	C.DA MAREN

SCALE 1: 3 | DESCRIPTION: PLATEN LAYOUT, **ES60TL MACHINE** | ENGEL GUELPH – CANADA

MATERIAL –
STOCK CODE # –
BREAK SHARP CORNERS –

	NAME	DATE
DR'N	C.DA MAREN	27-JUN-01
CHK'D	A.DAMETTO	27-JUN-01

SIZE	FROM TO	0.5 6.0	6 30	30 120	120 315	315 1000	1000 2000	2000 >
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	MEDIUM ±	0.1	0.2	0.3	0.5	0.8	1.2	2.0
	COARSE ±	0.2	0.5	0.8	1.2	2.0	3.0	4.0

REPLACES
COPY FROM 5860.002.8067E-REV.11
BM

DRAWING NO 5860.002.6803E

SHEET 2 OF 2 | REV.# 0