

# Engel Injection Molding Machine

## INSERT 200H/55 US - VERTICAL CLAMP / HORIZONTAL INJECTION

### CLAMP

Clamp force	US tons	55
Clamp opening force	US tons	2
Clamp stroke (max.)	inches	11.81
Mold height (min - max)	inches	11.02 <sup>5</sup> - N/A
Daylight (min - max)	inches	11.02 <sup>5</sup> - 22.83
Platen size (HxV)	inches	21.65 x 13.23

### ROTARY TABLE

Rotary table diameter	inches	38.39
Mold pitch circle diameter	inches	20.87
Hydraulic ejector stroke	inches	5.0
Ejector penetration (above table)	inches	2.0
Hydraulic ejector force	US tons	1.3

### INJECTION 200

Screw diameter	mm	25	30	35
Screw diameter	inches	0.984	1.181	1.378
Shot size <sup>1+2</sup>	oz	2.2	3.2	4.4
Injection capacity	in <sup>3</sup>	4.2	6.0	8.2
Recovery rate <sup>1+2</sup>	oz/sec	0.4	0.6	0.9
Plasticizing capacity <sup>1+2</sup>	lbs/hr	88	135	209
Injection rate at max. press. <sup>3+4</sup>	in <sup>3</sup> /sec	3.9	5.6	7.7
Injection rate (regenerative) <sup>3+4</sup>	in <sup>3</sup> /sec	5.9	8.5	11.6
Injection velocity at max. press. <sup>3+4</sup>	in/sec	5.1		
Injection velocity (regenerative) <sup>3+4</sup>	in/sec	7.8		
Screw stroke	inches	5.51		
Injection pressure (max.) <sup>4</sup>	psi	30000	30000	23505
Injection pressure (regenerative) <sup>4</sup>	psi	19726	19726	15455
Screw speed range (min=25)	rpm	480		
Screw torque <sup>4</sup>	ft-lbs	163		
Screw L/D ratio		24:1	20:1	17.1:1
Nozzle stroke	inches	13.0		
Nozzle reach to mold center	inches	3.0		
Nozzle force	US tons	1.7		
Nozzle height (min-max) <sup>4</sup>	inches	5.0 - 12.0		

### HYDRAULICS

Pump capacity (required)	gpm	16.1
Oil reservoir capacity	US gal	106

### ELECTRICS

Power supply available	volts	230 / 460 / 575 - 3PH / 60Hz
Total rated horsepower	HP	30
Number of heat control zones		3+Nozzle
Total heating wattage	kw	4.8

### GENERAL

Water requirements (max)	gpm	6
Machine dimensions (LxWxH)	inches	129 x 106 x 118
Machine weight	lbs	15000
Hopper capacity	lbs	44
Suitable Engel robots		ERC 23, ERV 21

### NOTES:

1. Based on polystyrene material.
2. Calculated
3. Can be increased with accumulator.
4. Can be increased.
5. Smaller mold height settings optional

All data subject to change without notice  
Issue Date: 10/30/02

INSERT 200H/55 US  
VERTICAL CLAMP  
Data Sheet

ENGEL

## STANDARDS & OPTIONS

### 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 (80cc-330cc)
- Precision linear bearings for carriage movement
- Hopper discharge chute
- Feedthroat prepared for water-cooling
- Feedthroat with thermometer
- Quick disconnects for heater bands (80cc-330cc)
- Increased injection pressure (via regenerative circuit, screen selectable)
- Programs for sprue break, decompression, and intrusion
- Pneumatic purge shield
- Single-point nozzle height adjustment

#### Clamp

- Pneumatically actuated safety gate
- Rigid bridge-type frame
- Mechanical safety dropbar
- 3 speed opening and closing
- Hydraulic and electric safety gate interlocks
- Direct hydraulic clamp with integral quick close cylinder
- Precision linear bearings for platen stroke
- Moving platen prepared for water cooling
- 5 speed / pressure / position mold protection
- Hydraulic counterbalance circuit
- Automatic clamp force control

#### Rotary Table

- Rigid base plate for full table support
- Lifting table design for minimal wear
- Precise table positioning via "shot pin" locating mechanism
- Multi-stroke hydraulic ejection, proportional speed control, independent of injection/screw feed
- 2-position reciprocating 180 deg. table

#### 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

#### Hydraulics (continued)

- Oil level indicator with level switch
  - Pressure selector gauge
  - Pressure compensated variable displacement pumps
  - Energy efficient totally enclosed fan-cooled motors
- #### 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 via machine CPU
  - Quick machine set up via single screen
  - Linear transducers for measurement of the clamp, injection, carriage and ejector positions
  - Automatic cycle monitoring
  - Digital display of actual values
  - Current function display
  - Self-diagnostics, monitoring, alarms
  - Automatic screen shut-off
  - Automatic balancing of heat zones during warm-up
  - Auto barrel stand-by temperature when machine in alarm condition
  - Automatic reject signal
  - US/metric units conversion (instant changeover)
  - User-defined programmable text pages. Keyboard extra.
  - Self-tuning temperature controls
  - History reporting of alarm conditions and set-up changes
  - Resettable cycle and non-resettable hour counters
  - Interface port for external data carrier and calibration
  - Anti-tie down cycle start safety palm buttons
  - Pivoting cabinet for operator interface and display

#### OPTIONAL EQUIPMENT

##### Injection

- Hardened screws and bi-metallic barrels
- Specialty screws and screw tips for a wide variety of applications
- LIM, Thermoset, PVC, BMC, PIM, Gasmelt, MuCell and other packages
- Increased wattage & air-cooled heater bands
- Shut-off nozzles
- Insulating blanket for barrel
- Hopper or drawer magnets
- Automatic motorized nozzle height adjustment

##### Clamp

- 3 or 4 mold stations with rotary union for mold water cooling at table center
- Hydraulic quick mold mounting system (moving platen only)
- Safety key switch for entry during ejector and core movement

#### Clamp (continued)

- Air blow-off valve
- Infrared light curtain in place of safety gate
- Positive return of mold ejector
- Hydraulic ejector on moving platen
- Additional fixed ejector
- Hot fluid connections through rotary union at table center
- Corepull(s) and unscrewing control
- Mold venting program
- Reduced minimum mold height

#### Hydraulics

- Servo valve for closed loop injection speed, injection pressure, and screw back pressure control
- Increased hydraulic drive for increased plasticizing and injection speeds
- Accumulator system for increased injection speed or special functions
- Hot runner valve gate control (pneumatic or hydraulic)
- High torque screw drive
- By-pass oil filtration

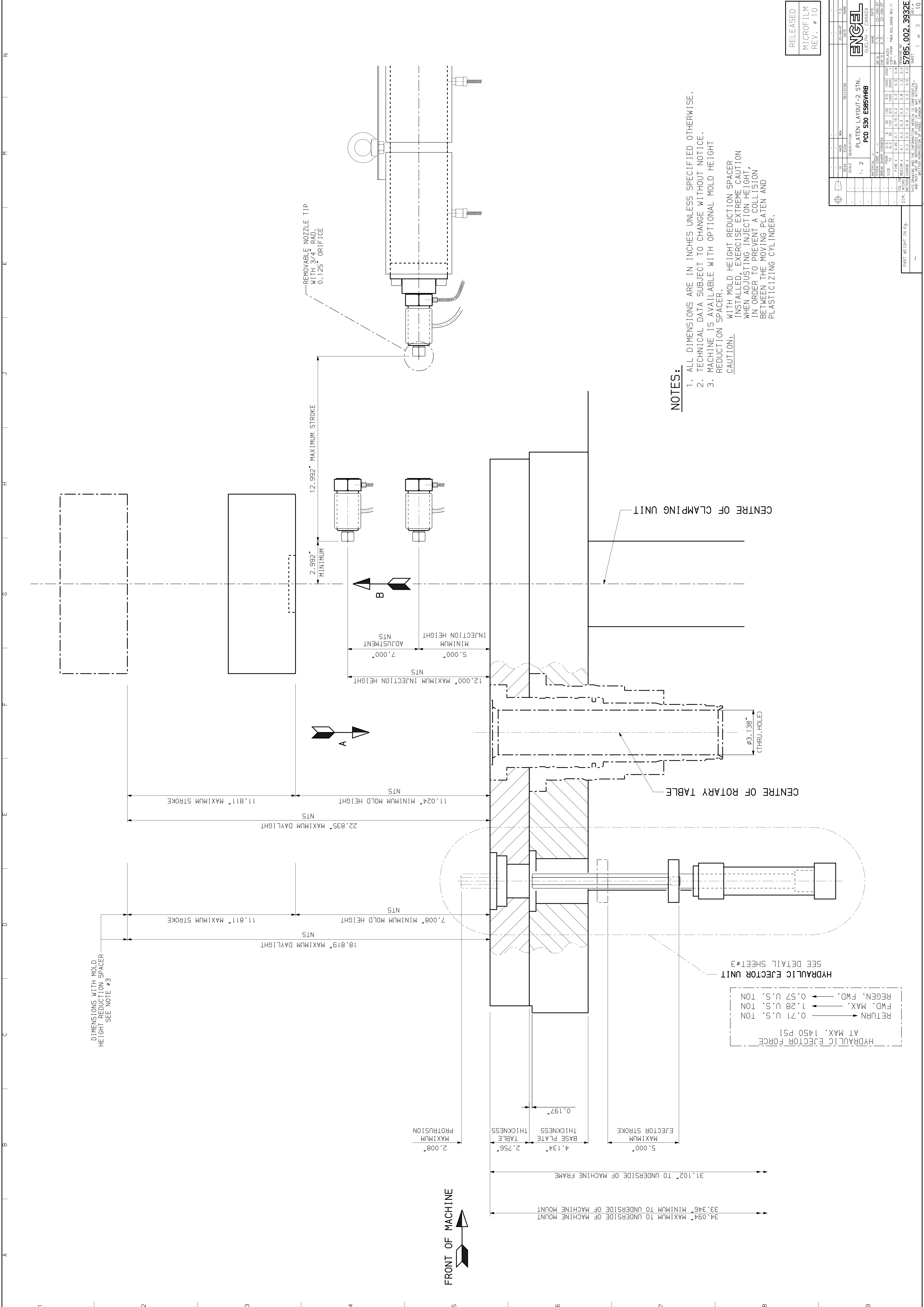
#### Controls, Electrics & Electronics

- CC100 Microprocessor control with high resolution color screen
- Microplast and Microflow software packages
- Process data graphics and reports
- 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 shut-down for "lights-out" operation (ghost-shift program)
- Hot runner PID temperature controls
- Melt temperature or pressure monitors
- Closed loop feedthroat cooling
- Cavity pressure dependent boost cut-off
- Graphics printer
- Power supply available: 230/460/575 volts, 3Ph/60Hz
- Ammeters for barrel and nozzle zones
- Electrical input for insert confirmation
- Electrical rotary commutator for mold temp. control connections at table center

#### General

- Machine levelling/vibration mounts
- Waterflow controls
- Special painting of machine to customer's specifications
- Alarm sounder in addition to standard alarm light
- Spare parts packages
- Engel robots
- Training programs





DIMENSIONS WITH MOLD HEIGHT REDUCTION SPACER SEE NOTE #3

HYDRAULIC EJECTOR FORCE AT MAX. 1450 PSI

RETURN → 0.71 U.S. TON  
 FWD. MAX. → 1.28 U.S. TON  
 REGN. FWD. → 0.57 U.S. TON

SEE DETAIL SHEET#3

HYDRAULIC EJECTOR UNIT

CENTRE OF ROTARY TABLE

CENTRE OF CLAMPING UNIT

**NOTES:**

1. ALL DIMENSIONS ARE IN INCHES UNLESS SPECIFIED OTHERWISE.
2. TECHNICAL DATA SUBJECT TO CHANGE WITHOUT NOTICE.
3. MACHINE IS AVAILABLE WITH OPTIONAL MOLD HEIGHT REDUCTION SPACER.

CAUTION: WITH MOLD HEIGHT REDUCTION SPACER INSTALLED, EXERCISE EXTREME CAUTION WHEN ADJUSTING INJECTION HEIGHT, IN ORDER TO PREVENT A COLLISION BETWEEN THE MOVING PLATEN AND PLASTICIZING CYLINDER.

RELEASED  
 MICROFILM  
 REV. # 10

NO.	REV.	DATE	BY	CHK'D	DESCRIPTION
1	1	22-JAN-97			PLATEN LAYOUT-2 STN.
2	2	22-JAN-97			PCD 530 ES65VHRB

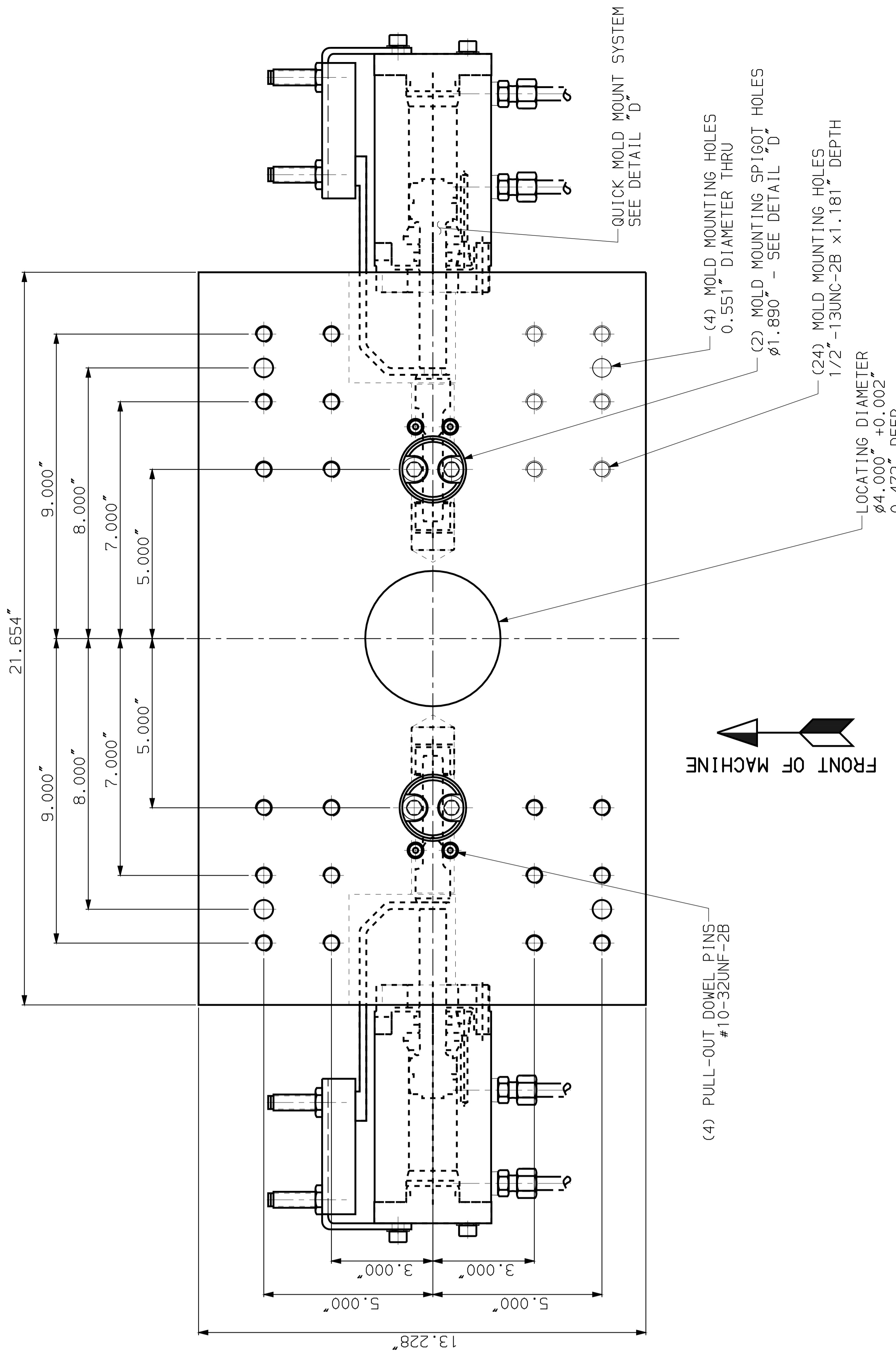
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2	22-JAN-97			PCD 530 ES65VHRB

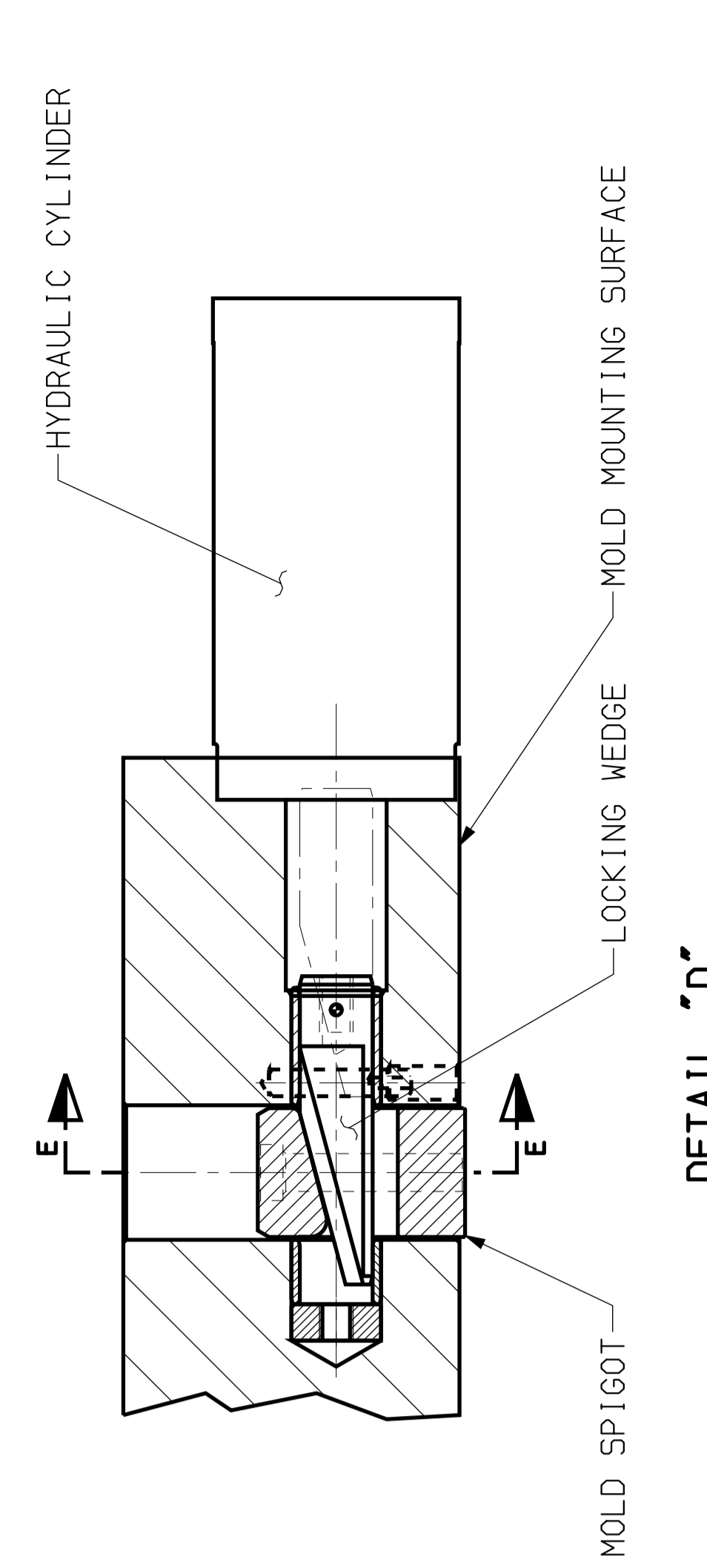
NO.	REV.	DATE	BY	CHK'D	DESCRIPTION
1	1	22-JAN-97			PLATEN LAYOUT-2 STN.
2	2	22-JAN-97			PCD 530 ES65VHRB

PART WEIGHT IN LBS.  
 —

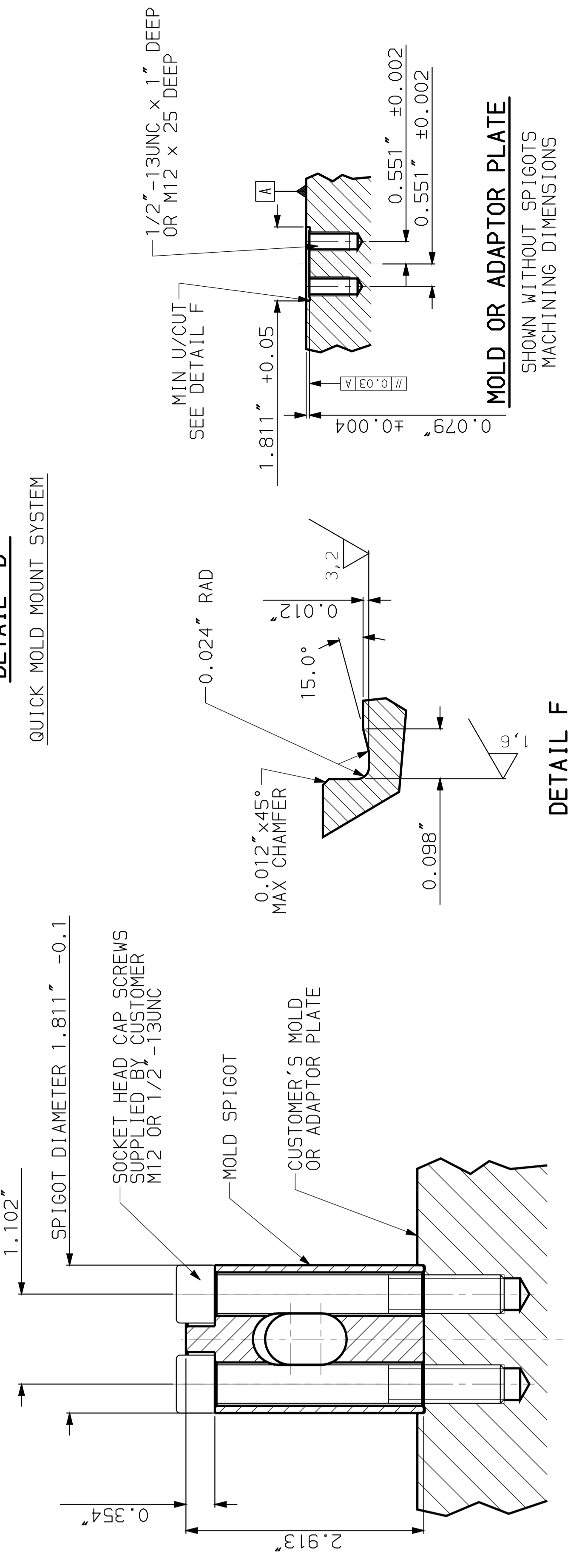
5785.002.9932E  
 SHEET 1 OF 3



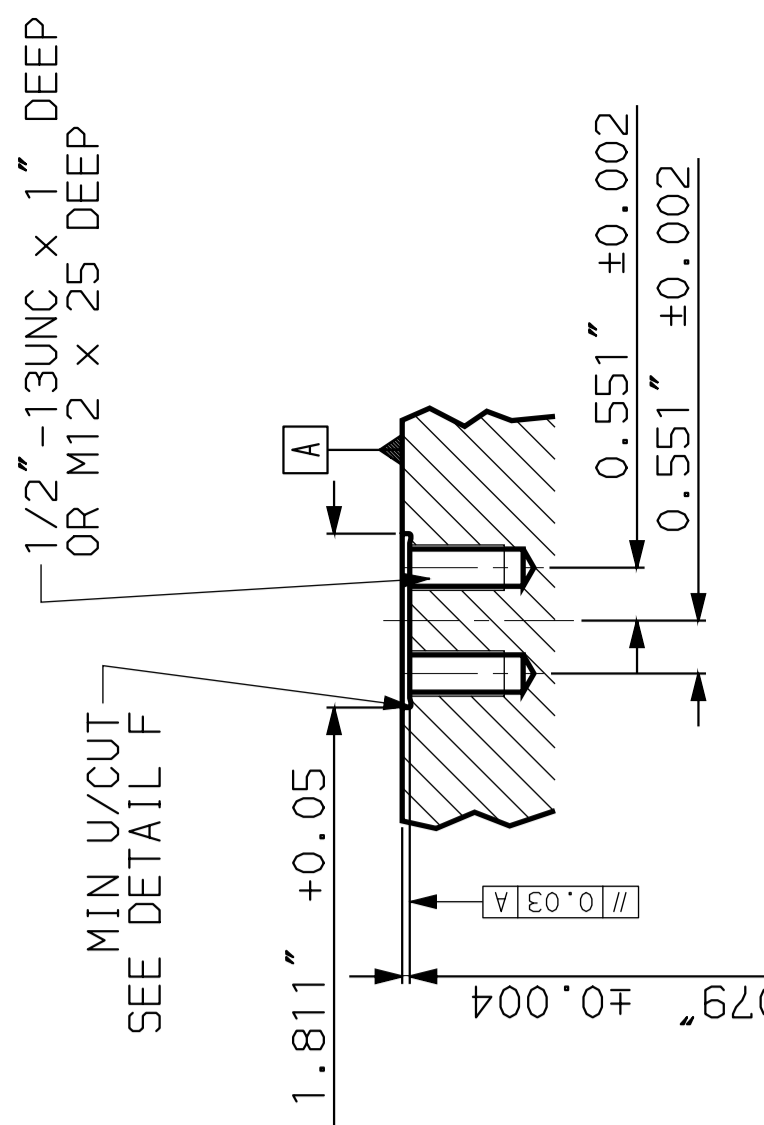
**"B" VIEW**  
VIEW AT MOLD MOUNTING SURFACE OF MOVING PLATEN  
OPTIONAL QUICK MOUNT SYSTEM



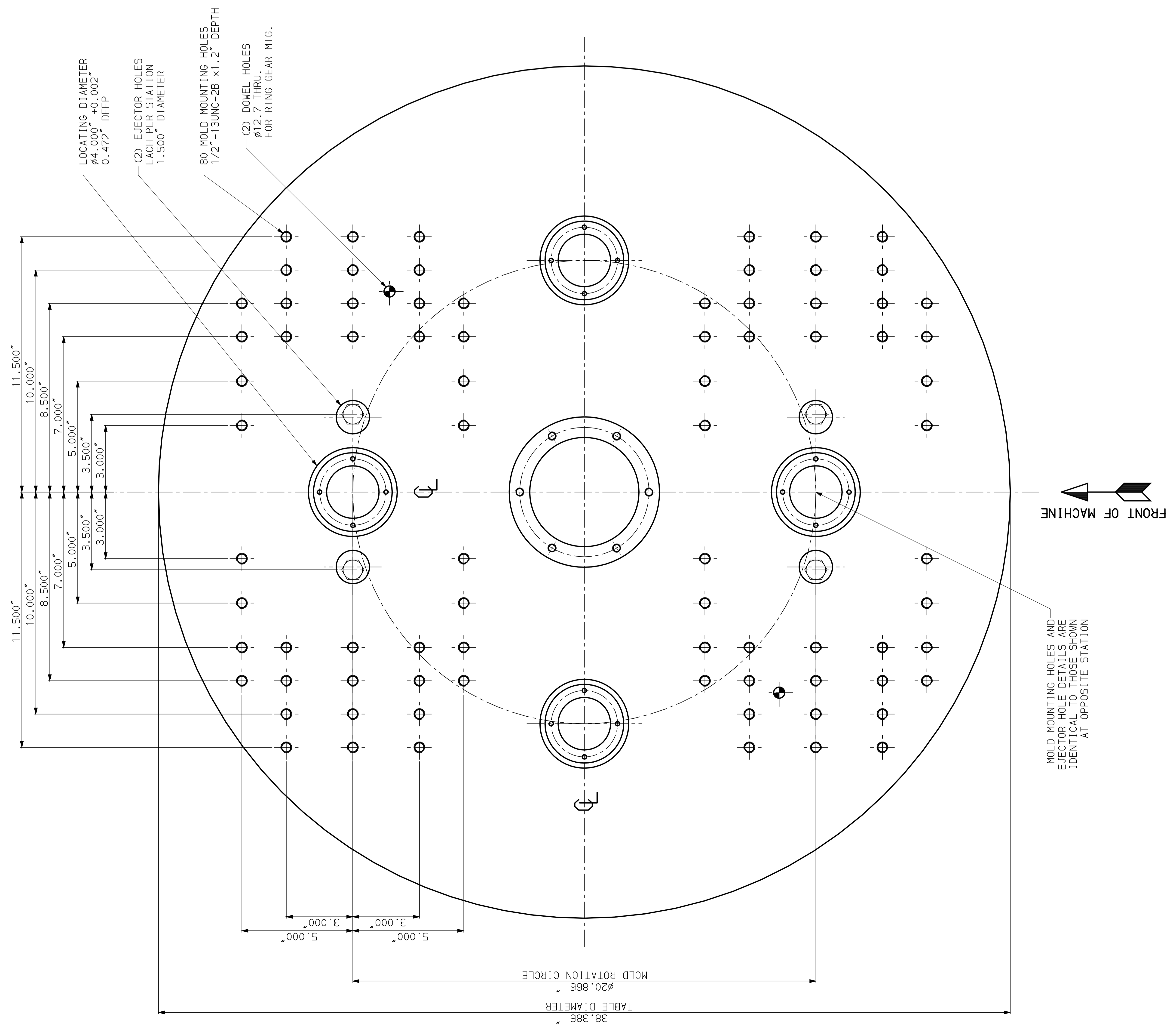
**DETAIL "D"**  
QUICK MOLD MOUNT SYSTEM



**SECTION E-E**  
SCALE 1:1  
QUICK MOLD MOUNT SPIGOT



**DETAIL F**  
UNDERCUT  
DIN 509-E0, 6x0,3



**"A" VIEW**  
VIEW AT TOP OF FOUR STATION TABLE

- NOTES:**
1. ALL DIMENSIONS ARE IN INCHES UNLESS SPECIFIED OTHERWISE.
  2. TECHNICAL DATA SUBJECT TO CHANGE WITHOUT NOTICE.
  3. 3.5" FOR STANDARD SPI EJECTOR HOLE PATTERN  
OPTIONAL ON REQUEST 3.25"

NO.	REV.	DATE	BY	CHK'D	DESCRIPTION

SCALE	DESCRIPTION	PLATE LAYOUT-2 STN.
1:2	PCD 530 E865VHRB	

REVISION	DATE	BY	CHK'D

ITEM	QTY	UNIT	DESCRIPTION

DATE	BY	CHK'D	DESCRIPTION

NO.	REV.	DATE	BY	CHK'D	DESCRIPTION

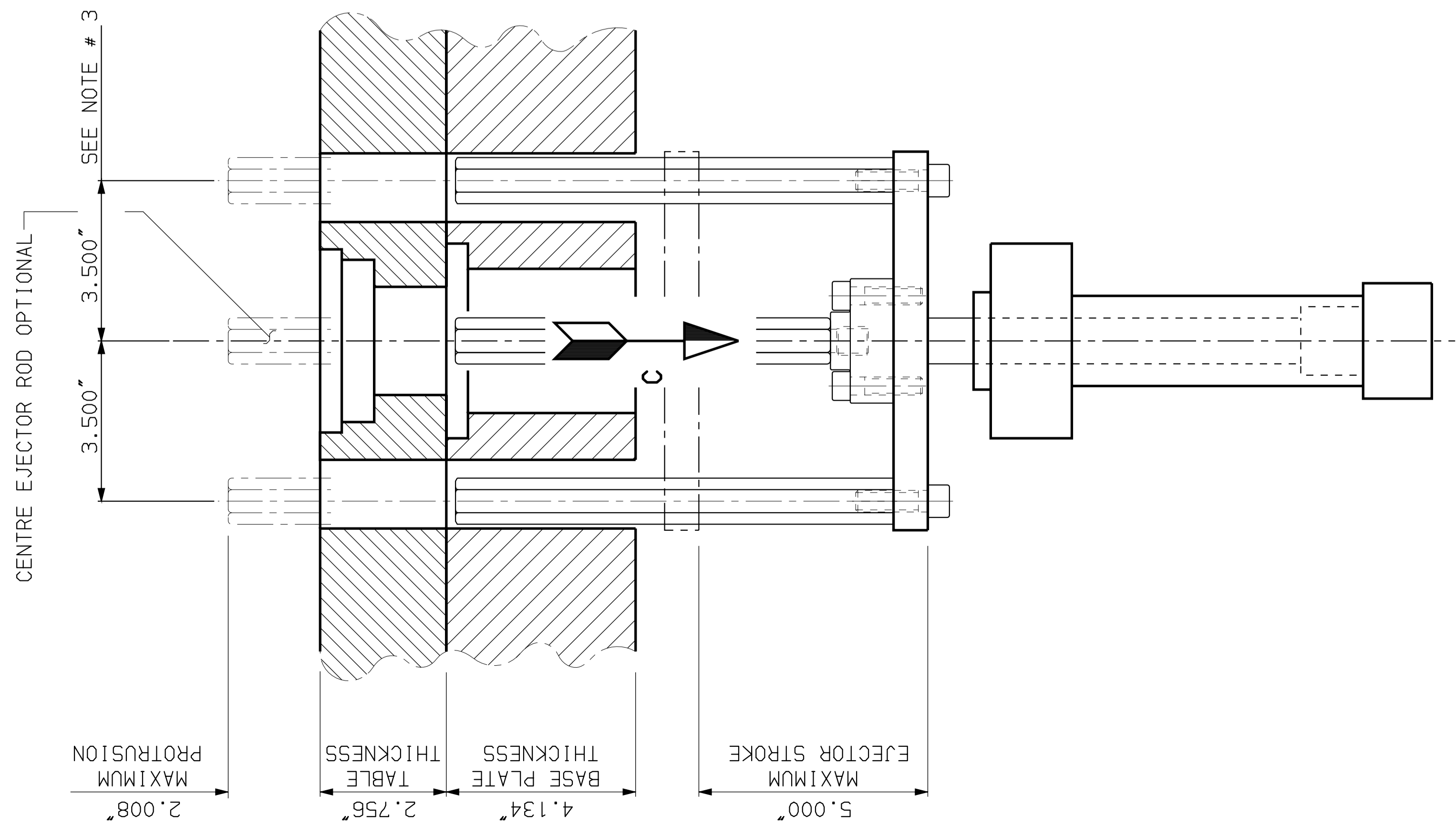
  

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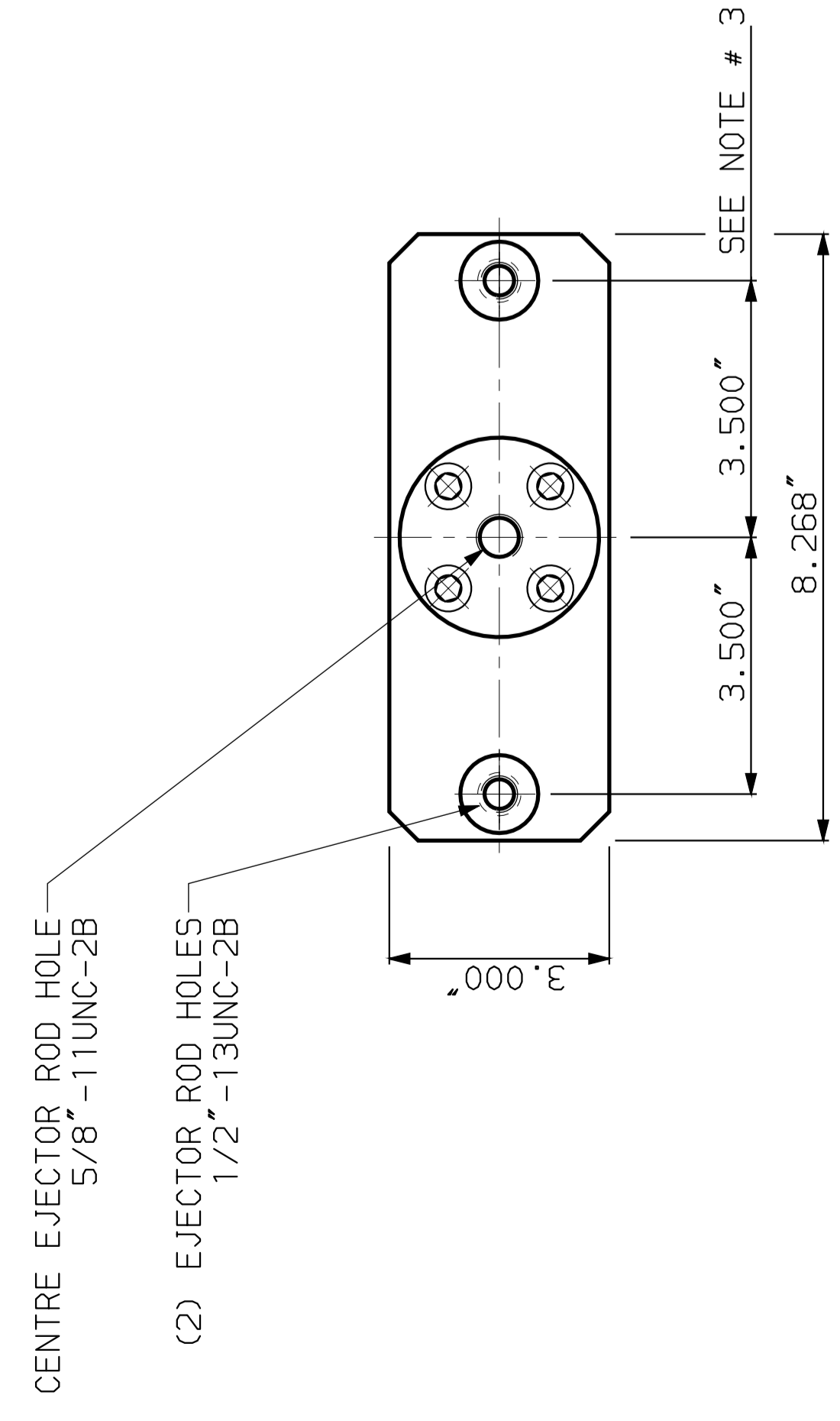
RELEASED  
MICROFILM  
REV. # 10

PART WEIGHT: IN LBS.  
—

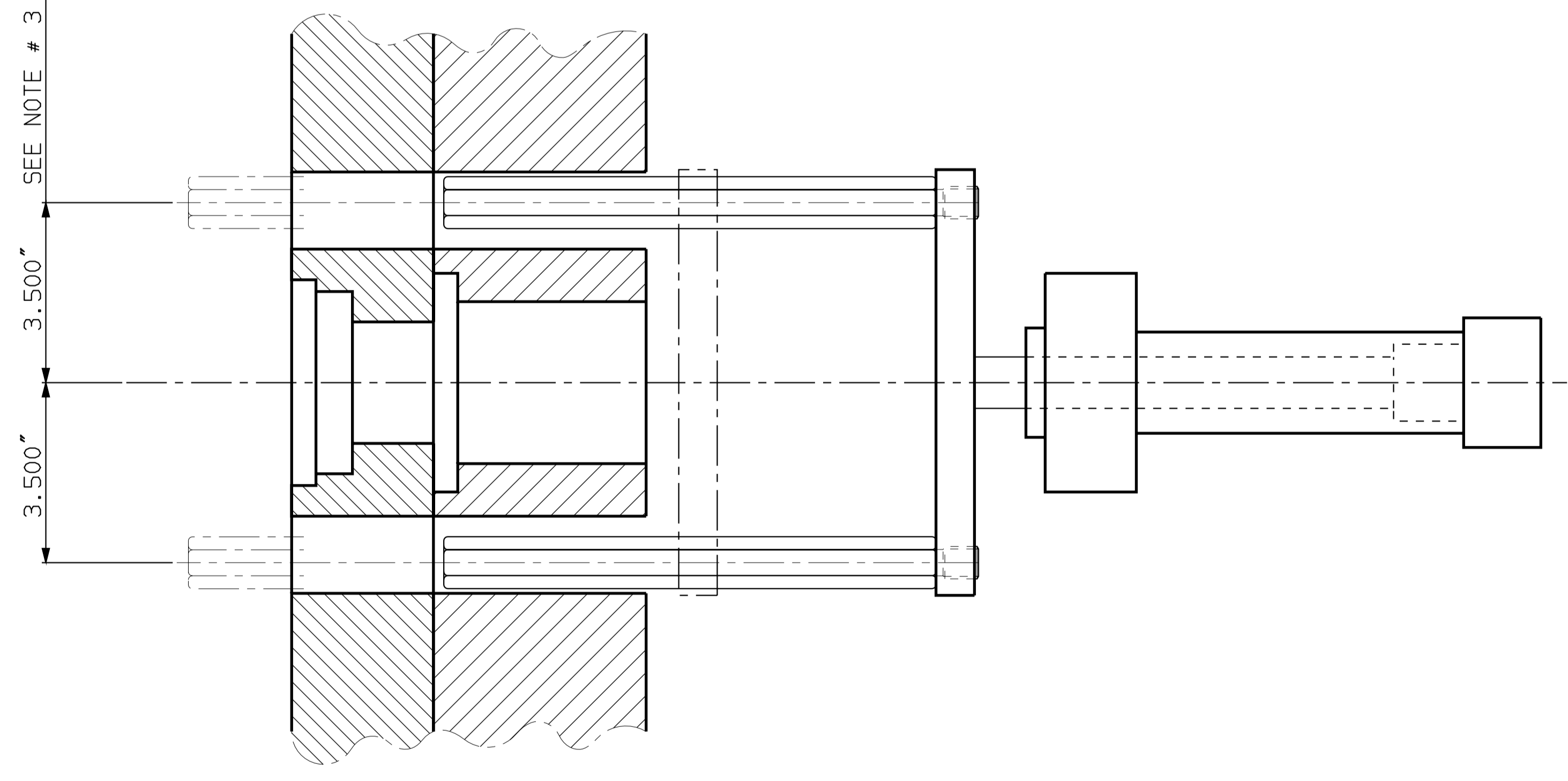
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SHEET 2 OF 3



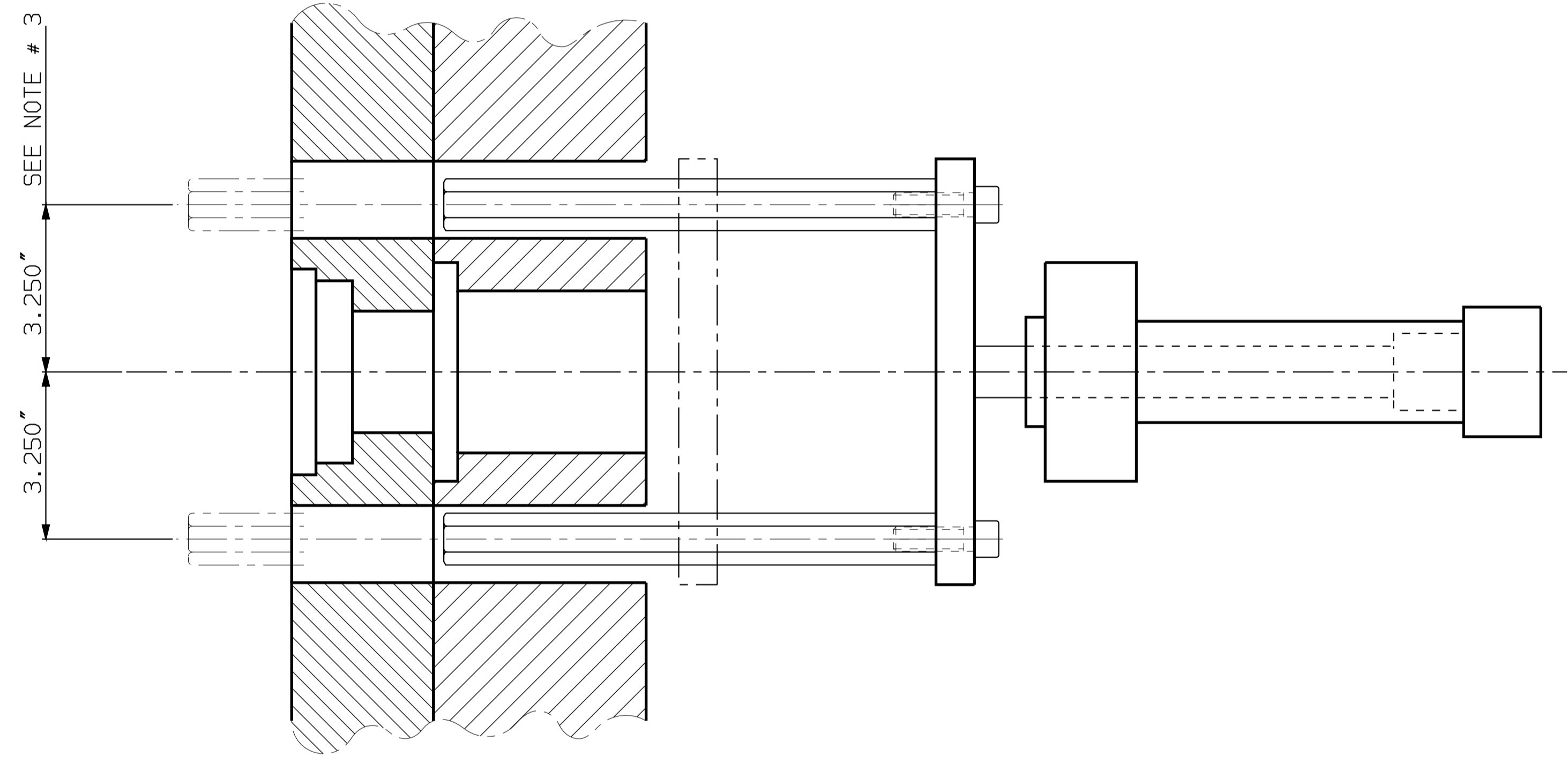
**STANDARD HYDRAULIC EJECTOR UNIT**  
3.5" EJECTOR CENTRES AS PER SPI



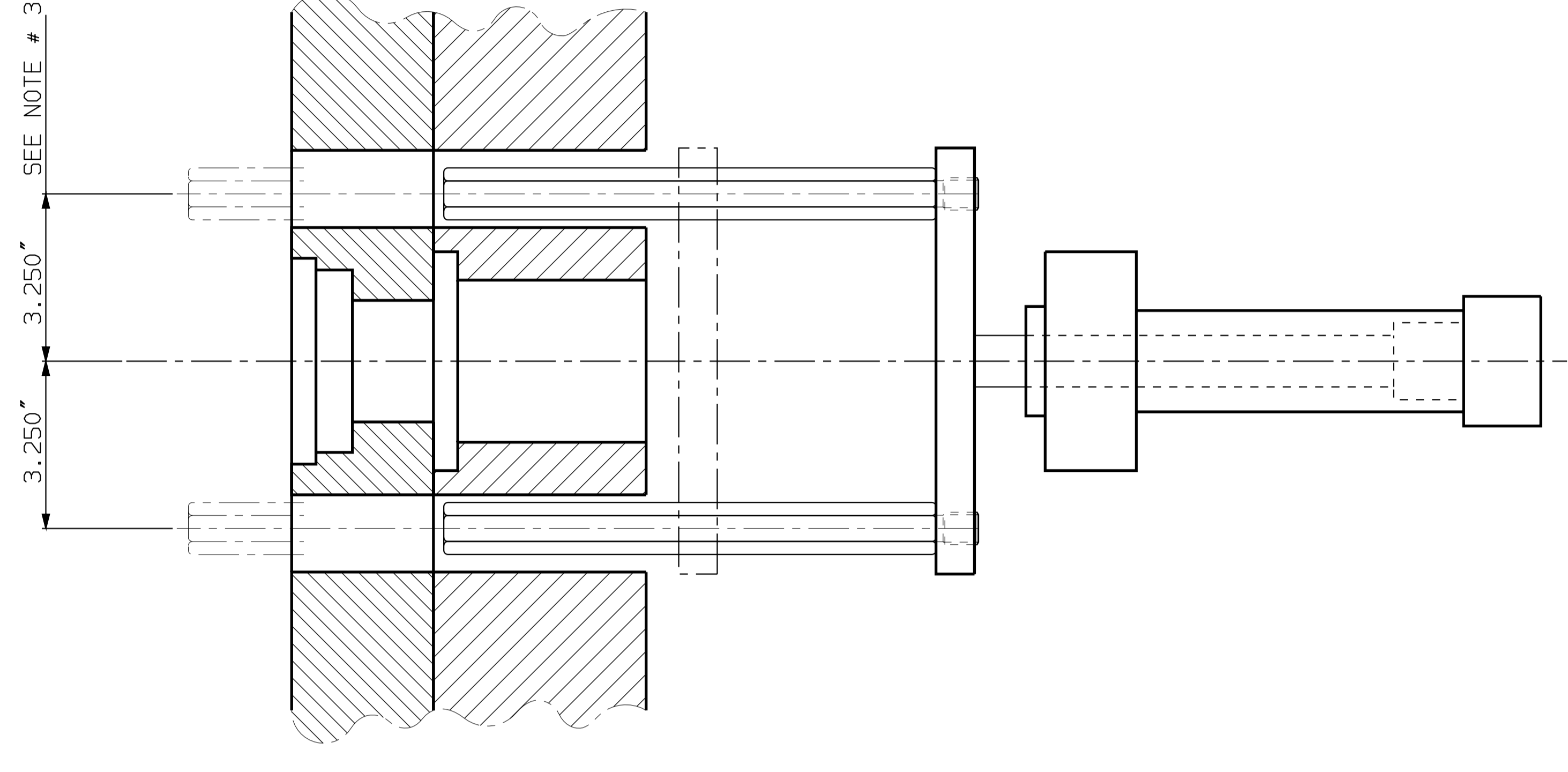
**"C-C" VIEW**  
VIEW AT EJECTOR PLATE



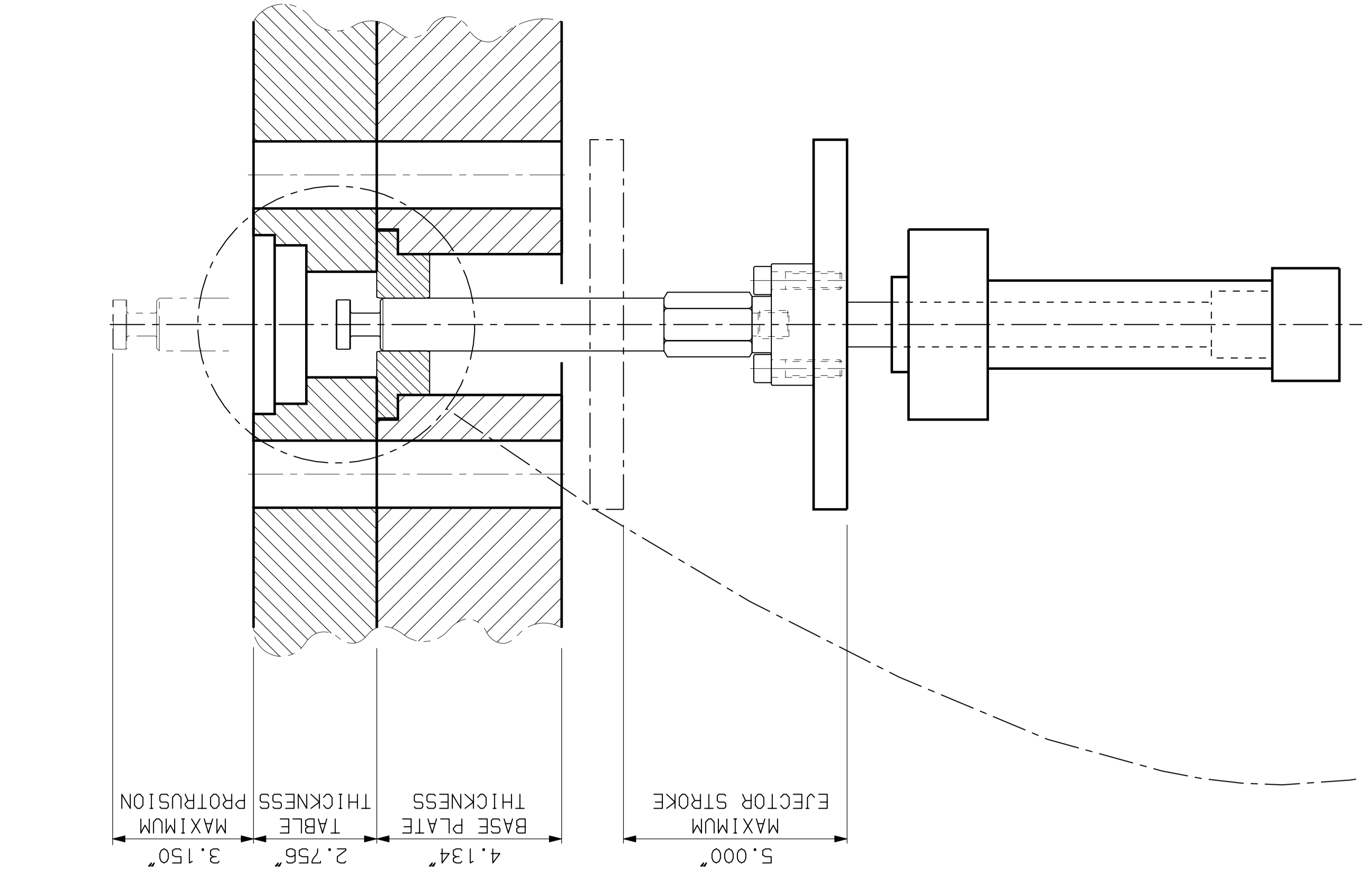
**OPTIONAL HYDRAULIC EJECTOR UNIT**  
3.5" EJECTOR CENTRES  
5/8"-11UNC EJECTOR RODS



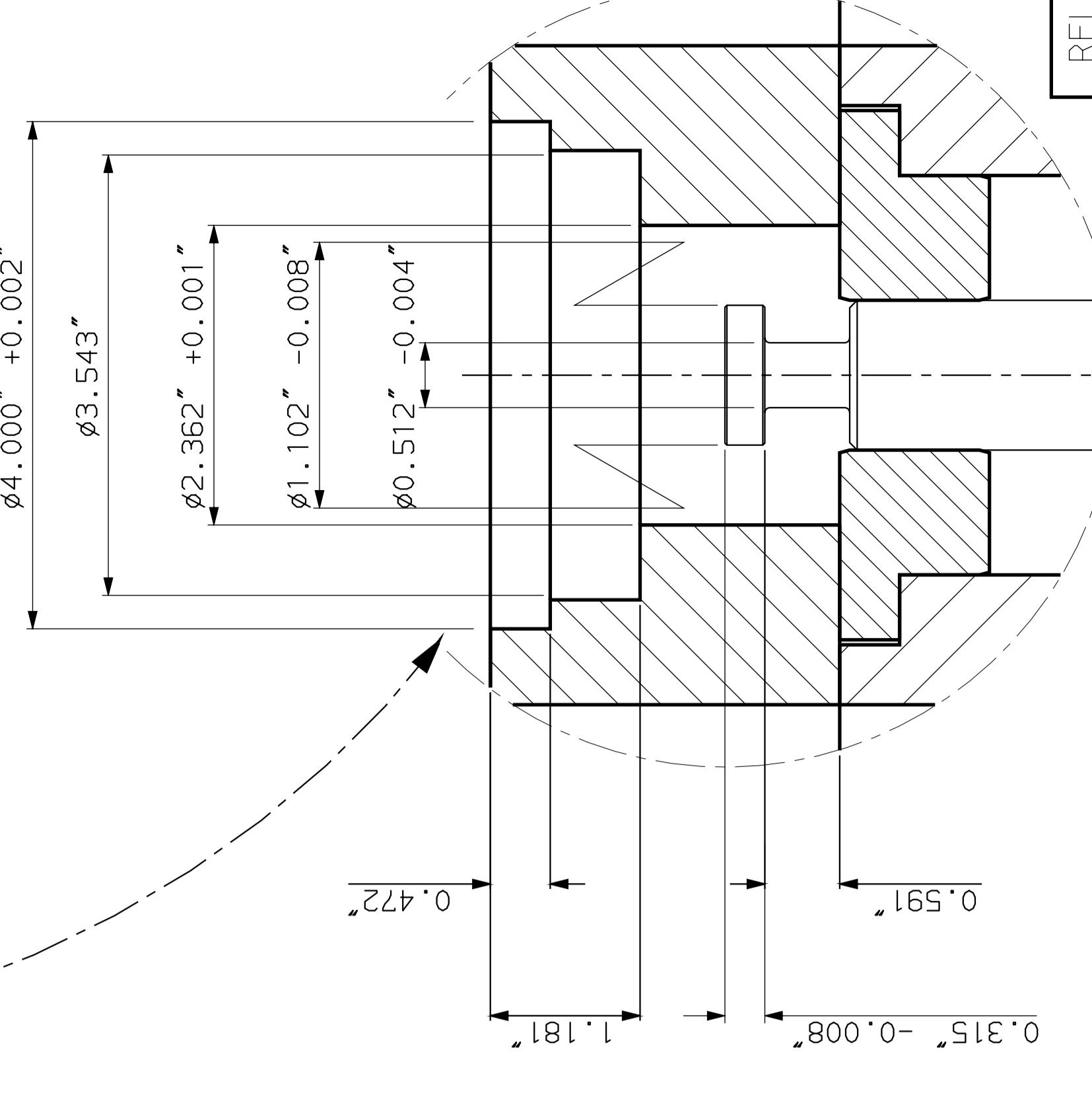
**SPECIAL HYDRAULIC EJECTOR UNIT**  
3.25" EJECTOR CENTRES  
5/8"-11UNC EJECTOR RODS



**SPECIAL HYDRAULIC EJECTOR UNIT**  
3.25" EJECTOR CENTRES  
5/8"-11UNC EJECTOR RODS



**OPTIONAL EJECTOR PLATE POSITIVE RETURN UNIT**  
"TEE" STYLE EJECTOR ROD



RELEASED  
MICROFILM  
REV. # 10

REV.	DATE	BY	CHK'D	DATE
1	12-22-87			
2	12-22-87			
3	12-22-87			
4	12-22-87			
5	12-22-87			
6	12-22-87			
7	12-22-87			
8	12-22-87			
9	12-22-87			
10	12-22-87			

SCALE	DESCRIPTION	REVISION	DATE
1:2	PLATEN LAYOUT-2 STN.		
1:2	PCD 530 ES65VHRB		

REVISION	DATE	BY	CHK'D	DATE
1	12-22-87			
2	12-22-87			
3	12-22-87			
4	12-22-87			
5	12-22-87			
6	12-22-87			
7	12-22-87			
8	12-22-87			
9	12-22-87			
10	12-22-87			

SIZE	FROM	TO	QUANTITY
1/2"	0.315	0.315	1000
3/8"	0.375	0.375	1000
1/4"	0.4375	0.4375	1000
3/16"	0.500	0.500	1000
1/8"	0.5625	0.5625	1000
3/32"	0.625	0.625	1000
1/16"	0.6875	0.6875	1000
3/64"	0.750	0.750	1000
1/32"	0.8125	0.8125	1000
3/128"	0.875	0.875	1000
1/64"	0.9375	0.9375	1000
3/256"	1.000	1.000	1000
1/128"	1.0625	1.0625	1000
3/256"	1.125	1.125	1000
1/128"	1.1875	1.1875	1000
3/256"	1.250	1.250	1000
1/128"	1.3125	1.3125	1000
3/256"	1.375	1.375	1000
1/128"	1.4375	1.4375	1000
3/256"	1.500	1.500	1000
1/128"	1.5625	1.5625	1000
3/256"	1.625	1.625	1000
1/128"	1.6875	1.6875	1000
3/256"	1.750	1.750	1000
1/128"	1.8125	1.8125	1000
3/256"	1.875	1.875	1000
1/128"	1.9375	1.9375	1000
3/256"	2.000	2.000	1000
1/128"	2.0625	2.0625	1000
3/256"	2.125	2.125	1000
1/128"	2.1875	2.1875	1000
3/256"	2.250	2.250	1000
1/128"	2.3125	2.3125	1000
3/256"	2.375	2.375	1000
1/128"	2.4375	2.4375	1000
3/256"	2.500	2.500	1000
1/128"	2.5625	2.5625	1000
3/256"	2.625	2.625	1000
1/128"	2.6875	2.6875	1000
3/256"	2.750	2.750	1000
1/128"	2.8125	2.8125	1000
3/256"	2.875	2.875	1000
1/128"	2.9375	2.9375	1000
3/256"	3.000	3.000	1000
1/128"	3.0625	3.0625	1000
3/256"	3.125	3.125	1000
1/128"	3.1875	3.1875	1000
3/256"	3.250	3.250	1000
1/128"	3.3125	3.3125	1000
3/256"	3.375	3.375	1000
1/128"	3.4375	3.4375	1000
3/256"	3.500	3.500	1000
1/128"	3.5625	3.5625	1000
3/256"	3.625	3.625	1000
1/128"	3.6875	3.6875	1000
3/256"	3.750	3.750	1000
1/128"	3.8125	3.8125	1000
3/256"	3.875	3.875	1000
1/128"	3.9375	3.9375	1000
3/256"	4.000	4.000	1000
1/128"	4.0625	4.0625	1000
3/256"	4.125	4.125	1000
1/128"	4.1875	4.1875	1000
3/256"	4.250	4.250	1000
1/128"	4.3125	4.3125	1000
3/256"	4.375	4.375	1000
1/128"	4.4375	4.4375	1000
3/256"	4.500	4.500	1000
1/128"	4.5625	4.5625	1000
3/256"	4.625	4.625	1000
1/128"	4.6875	4.6875	1000
3/256"	4.750	4.750	1000
1/128"	4.8125	4.8125	1000
3/256"	4.875	4.875	1000
1/128"	4.9375	4.9375	1000
3/256"	5.000	5.000	1000

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1	12-22-87			
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SIZE	FROM	TO	QUANTITY
1/2"	0.315	0.315	1000
3/8"	0.375	0.375	1000
1/4"	0.4375	0.4375	1000
3/16"	0.500	0.500	1000
1/8"	0.5625	0.5625	1000
3/32"	0.625	0.625	1000
1/16"	0.6875	0.6875	1000
3/64"	0.750	0.750	1000
1/32"	0.8125	0.8125	1000
3/128"	0.875	0.875	1000
1/64"	0.9375	0.9375	1000
3/256"	1.000	1.000	1000
1/128"	1.0625	1.0625	1000
3/256"	1.125	1.125	1000
1/128"	1.1875	1.1875	1000
3/256"	1.250	1.250	1000
1/128"	1.3125	1.3125	1000
3/256"	1.375	1.375	1000
1/128"	1.4375	1.4375	1000
3/256"	1.500	1.500	1000
1/128"	1.5625	1.5625	1000
3/256"	1.625	1.625	1000
1/128"	1.6875	1.6875	1000
3/256"	1.750	1.750	1000
1/128"	1.8125	1.8125	1000
3/256"	1.875	1.875	1000
1/128"	1.9375	1.9375	1000
3/256"	2.000	2.000	1000
1/128"	2.0625	2.0625	1000
3/256"	2.125	2.125	1000
1/128"	2.1875	2.1875	1000
3/256"	2.250	2.250	1000
1/128"	2.3125	2.3125	1000
3/256"	2.375	2.375	1000
1/128"	2.4375	2.4375	1000
3/256"	2.500	2.500	1000
1/128"	2.5625	2.5625	1000
3/256"	2.625	2.625	1000
1/128"	2.6875	2.6875	1000
3/256"	2.750	2.750	1000
1/128"	2.8125	2.8125	1000
3/256"	2.875	2.875	1000
1/128"	2.9375	2.9375	1000
3/256"	3.000	3.000	1000
1/128"	3.0625	3.0625	1000
3/256"	3.125	3.125	1000
1/128"	3.1875	3.1875	1000
3/256"	3.250	3.250	1000
1/128"	3.3125	3.3125	1000
3/256"	3.375	3.375	1000
1/128"	3.4375	3.4375	1000
3/256"	3.500	3.500	1000
1/128"	3.5625	3.5625	1000
3/256"	3.625	3.625	1000
1/128"	3.6875	3.6875	1000
3/256"	3.750	3.750	1000
1/128"	3.8125	3.8125	1000
3/256"	3.875	3.875	1000
1/128"	3.9375	3.9375	1000
3/256"	4.000	4.000	1000
1/128"	4.0625	4.0625	1000
3/256"	4.125	4.125	1000
1/128"	4.1875	4.1875	1000
3/256"	4.250	4.250	1000
1/128"	4.3125	4.3125	1000
3/256"	4.375	4.375	1000
1/128"	4.4375	4.4375	1000
3/256"	4.500	4.500	1000

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1/8"	0.5625	0.5625	1000
3/32"	0.625	0.625	1000
1/16"	0.6875	0.6875	1000
3/64"	0.750	0.750	1000
1/32"	0.8125	0.8125	1000
3/128"	0.875	0.875	1000
1/64"	0.9375	0.9375	1000
3/256"	1.000	1.000	1000
1/128"	1.0625	1.0625	1000
3/256"	1.125	1.125	1000
1/128"	1.1875	1.1875	1000
3/256"	1.250	1.250	1000
1/128"	1.3125	1.3125	1000
3/256"	1.375	1.375	1000
1/128"	1.4375	1.4375	1000
3/256"	1.500	1.500	1000
1/128"	1.5625	1.5625	1000
3/256"	1.625	1.625	1000
1/1			