

HALL



CMH Manufacturing Co. is a family owned business located in Lubbock, Texas, USA and was founded in 1982, by Charles M. Hall. CMH produces the HALL line of foundry equipment with special emphasis on aluminum tilt pour gravity die-casting. CMH offers a full line of casting machines, rotary tables and peripheral work cell support equipment designed around the tilt pour principle. Tilt pouring reduces turbulence as molten metal enters the die cavity, provides shorter cycle times, and requires less metal for feeding systems. Aluminum castings produced in metal molds have a tighter dendrite structure than castings produced in other processes. In addition, aluminum castings are harder and have better pressure characteristics. Value added options, such as sand cores or cast-in ferrous inserts are quite simple.

CMH Manufacturing Co. uses the latest in CNC machining and computer aided engineering to meet customer needs. Software supported includes all Windows based programs, AutoCAD, Solidworks, MasterCAM, RSLogics 500, ControlLogix, and Rockwell PanelBuilder. CMH has a 51,100 sq. ft./4,750 sq. meter shop facility so large projects can be manufactured and drycycled on site prior to shipping to the customer.

CMH Manufacturing Co. has a proven track record of successfully starting up new casting operations in the USA, Canada, Mexico, China, India, and Australia. Services include design of manufacturing process, casting machines, rotary tables, furnaces, core machines, casting coolers, automatic saws, hydraulic power, and integrated control. CMH can provide training in all aspects of foundry operation with emphasis on the tilt pour process.

Although each HALL device is designed using proven engineering principles to be robust and function in the harsh foundry environment, the needs of maintenance personnel have not been forgotten. All regular maintenance can be carried out at ground level. Where maintenance access to the internal parts of the machine is required, removable panels and external doors make this a simple task. Extensive safety interlocks to doors and guarding, clutched drive and carefully positioned control consoles, coupled with light curtain protection for the operator in critical area, enhance our safety systems.

CMH casting equipment is ready to meet the expectations of a new breed of casting manufacturer and will help make you competitive in the new global market. We would appreciate the opportunity to serve your needs, whether you produce 50 or 50,000 parts per day.

C.M.H. MANUFACTURING

Manufacturers of **HALL**
Permanent Mold Machines

TELEPHONE (806) 744-8003 1320 HARVARD STREET LUBBOCK, TX 79403 FAX (806) 763-9146

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**TILT-POUR
PERMANENT MOLD
CASTING MACHINE**

HALL



SPECIFICATIONS

Clamping Pressure	28,875 lbs.	(13,098 kg.)
Max. Mold Size	24 x 26 in.	(61 x 66 cm)
Max. Mold Weight	900 lbs.	(410 kg.)
Ram Stroke	22 in.	(55.8 cm)
Daylight Opening	12 in.	(30.5 cm)
Pressure Height Center	8.5 in.	(21.6 cm)
Machine Weight	3,500 lbs.	(1,588 kg.)
Tilt Speed	7 sec.	

FEATURES

Low maintenance due to few moving parts: heavy duty, rugged, and dependable.

Frame open on 3 sides, plus front and bottom, to facilitate use of core pulls in 5 directions.

Twin cushioned tilt cylinders provide a smooth tilting motion from start to stop.

Twin ram cylinders provide a safety factor, as well as extra holding pressure and better clamping balance.

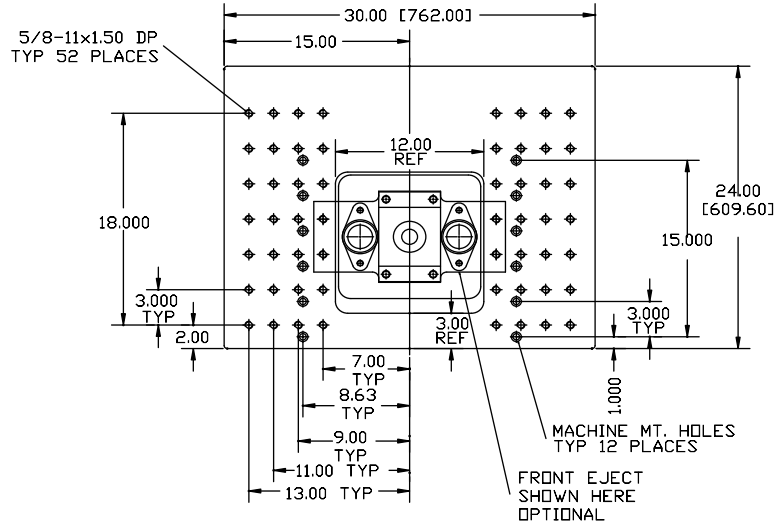
Hydraulic power units available in manual, automatic, or with programmable controllers: sized to facilitate all available accessories at low operating pressure.

OPTIONS

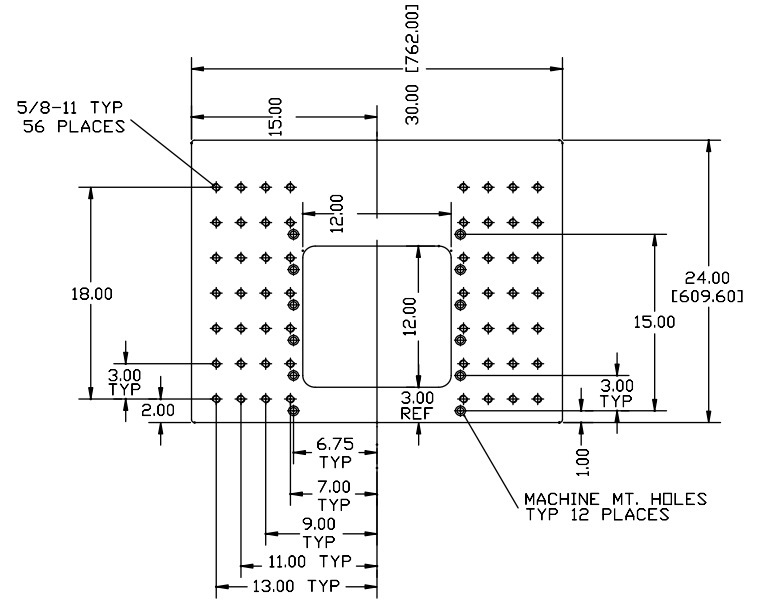
- 1) Tie Bars & Tie Bar Extensions
- 2) Manual Swing In Casting Catcher
- 3) Front Ejector
- 4) Proportional Tilt
- 5) Custom Platen Drilling or Sizes

C.M.H. MANUFACTURING CO. HALL Permanent Mold Machines

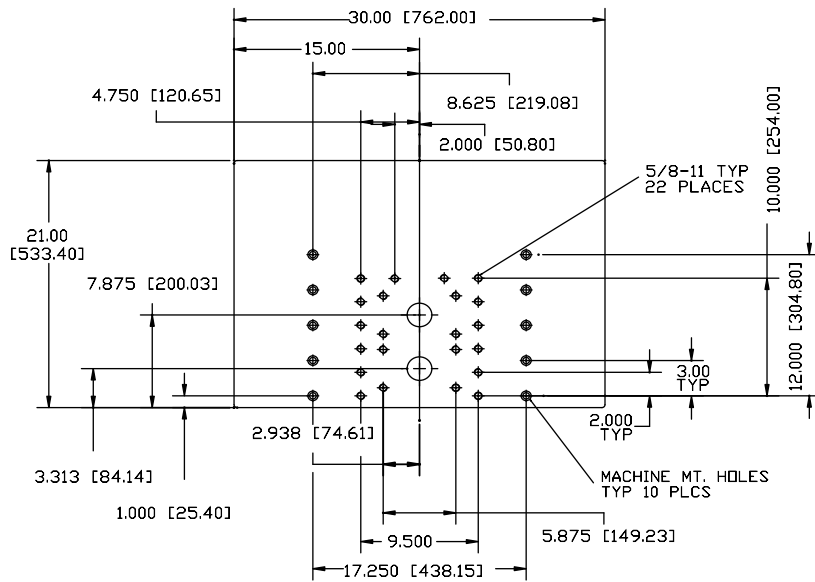
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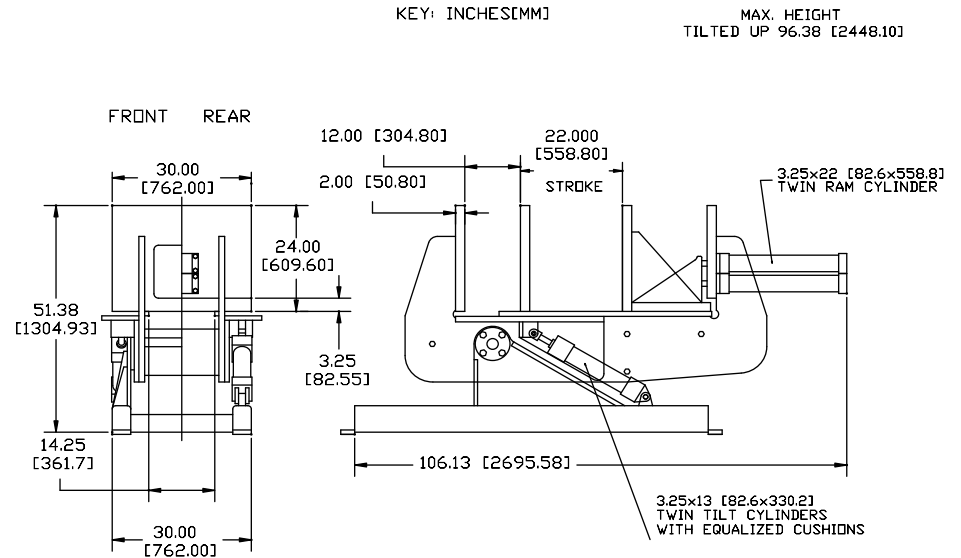
PLATEN, 2.00" FRONT



PLATEN, 2.00" MOVABLE



PLATEN, 2.00" REAR



3L

**TILT-POUR
PERMANENT MOLD
CASTING MACHINE**

HALL



SPECIFICATIONS

Clamping Pressure	37,700 lbs.	(17,100 kg.)
Max. Mold Size	34 x 34 in.	(86 x 86 cm)
Max. Mold Weight	2,500 lbs.	(1,136 kg)
Ram Stroke	24 in.	(61 cm)
Daylight Opening	15.75 in.	(40 cm)
Pressure Height Center	11.5 in.	(29.2 cm)
Machine Weight	5,650 lbs.	(2,568 kg.)
Tie Bar Size	2 in. dia.	(5.08 cm)
Tilt Speed (Min.)	7 sec.	

OPTIONS

- 1) Tie Bar Extensions
- 2) Manual Swing In Casting Catcher
- 3) Power Swing In Casting Catcher, When Used With Sub-Base
- 4) Proportional Tilt
- 5) Front Ejector
- 6) Custom Platen Drilling or Sizes

FEATURES

Low maintenance due to few moving parts. heavy duty, rugged, and dependable.

Frame open on 3 sides, plus front and bottom, to facilitate use of core pulls in 5 directions.

Twin cushioned tilt cylinders provide a smooth tilting motion from start to stop.

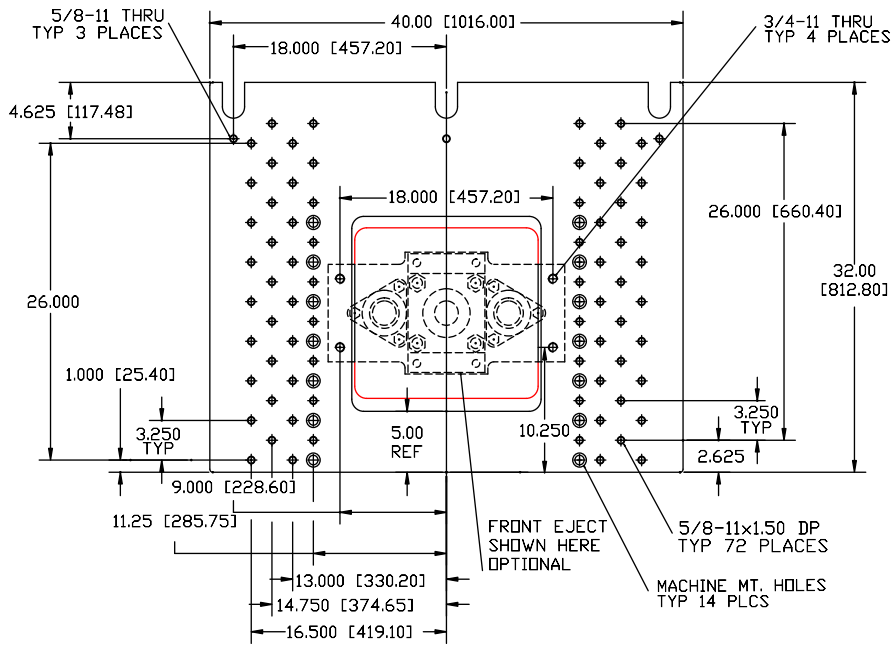
Twin ram cylinders provide a safety factor, as well as extra holding pressure and better clamping balance.

Hydraulic power units available in manual, automatic, or with programmable controllers. sized to facilitate all available accessories at low operating pressure.

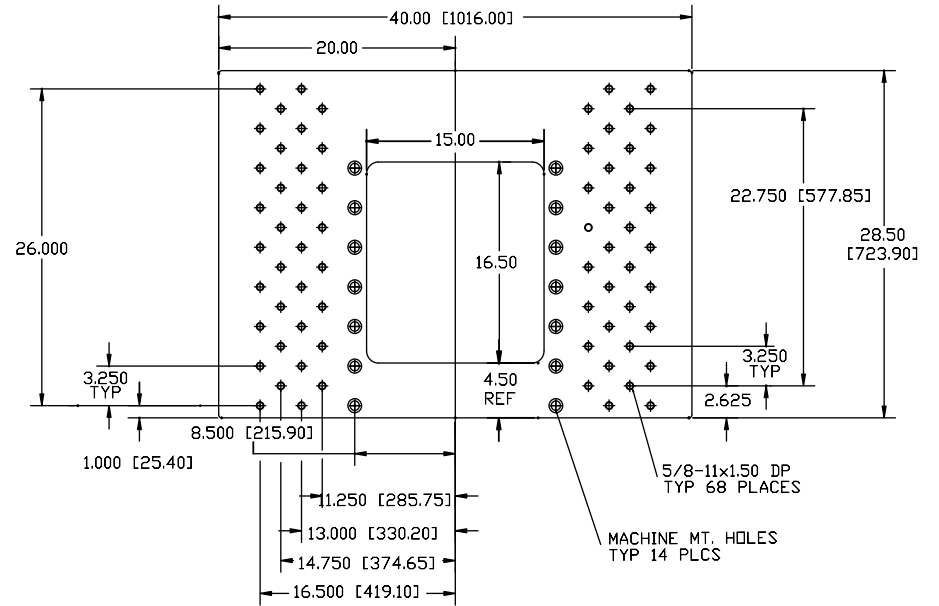
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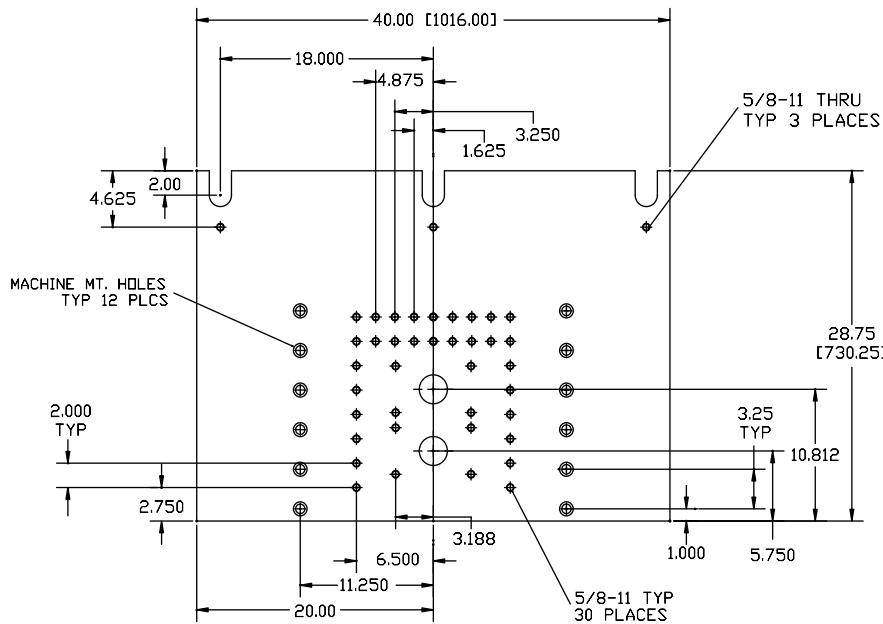
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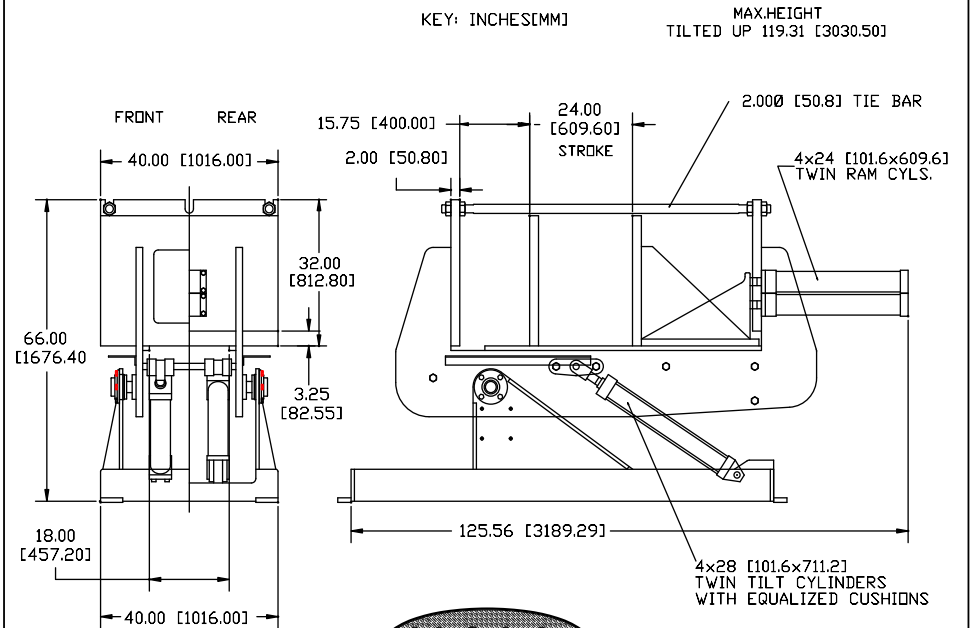
PLATEN, 2.00" FRONT



PLATEN, 2.00" MOVABLE



PLATEN, 2.00" REAR



KEY: INCHES[MM] MAX.HEIGHT TILTED UP 119.31 [3030.50]



Shown with optional
front eject.

SPECIFICATIONS

Clamping Pressure	58,900 lbs.	(26,717 kg.)
Max. Mold Size	36 x 38 in.	(91 x 97 cm)
Max Mold Weight	4,000 lbs.	(1,815 kg.)
Ram Stroke	30 in.	(76.2 cm)
Daylight Opening	17.50 in.	(44.5 cm)
Pressure Height Center	12.50 in.	(31.8 cm)
Machine Weight	8,150 lbs.	(3,697 kg)
Tie Bar Size	2 in. dia.	(5.08 cm)
Tilt Speed (Min.)	7 sec.	

OPTIONS

- 1) Tie Bar Extensions
- 2) Manual Swing In Casting Catcher
- 3) Power Swing In Casting Catcher
- 4) Proportional Tilt
- 5) Front Ejector
- 6) Custom Platen Drilling and Sizes

FEATURES

Low maintenance due to few moving parts:
heavy duty, rugged, and dependable.

Frame open on 3 sides, plus front and bottom,
to facilitate use of core pulls in 5 directions.

Twin cushioned tilt cylinders provide a smooth
tilting motion from start to stop.

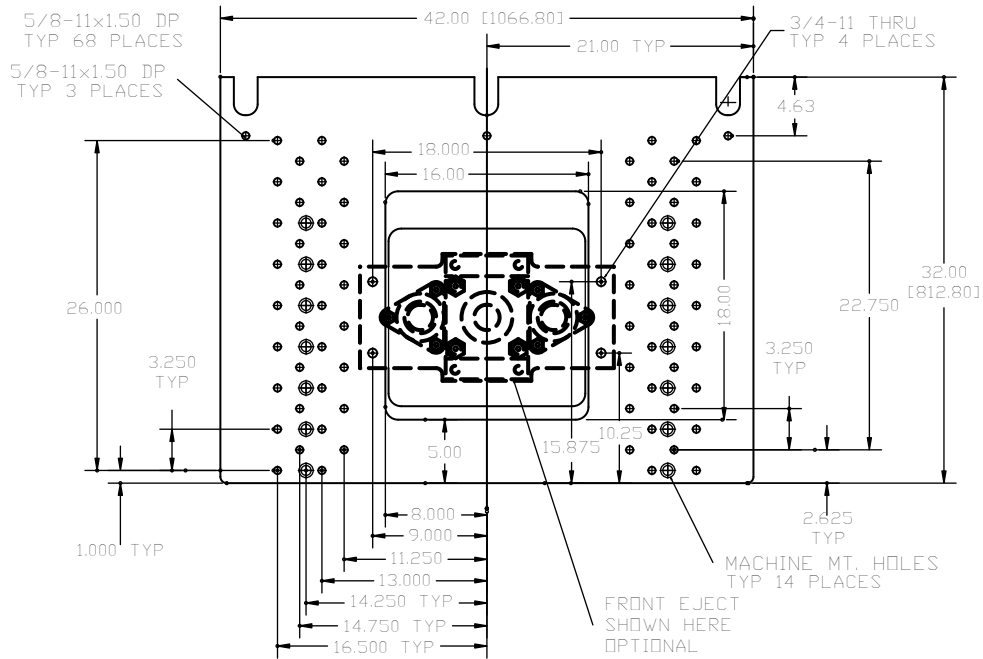
Twin ram cylinders provide a safety factor, as
well as extra holding pressure and better
clamping balance.

Hydraulic power units available in manual,
automatic, or with programmable controllers:
sized to facilitate all available accessories at
low operating pressure.

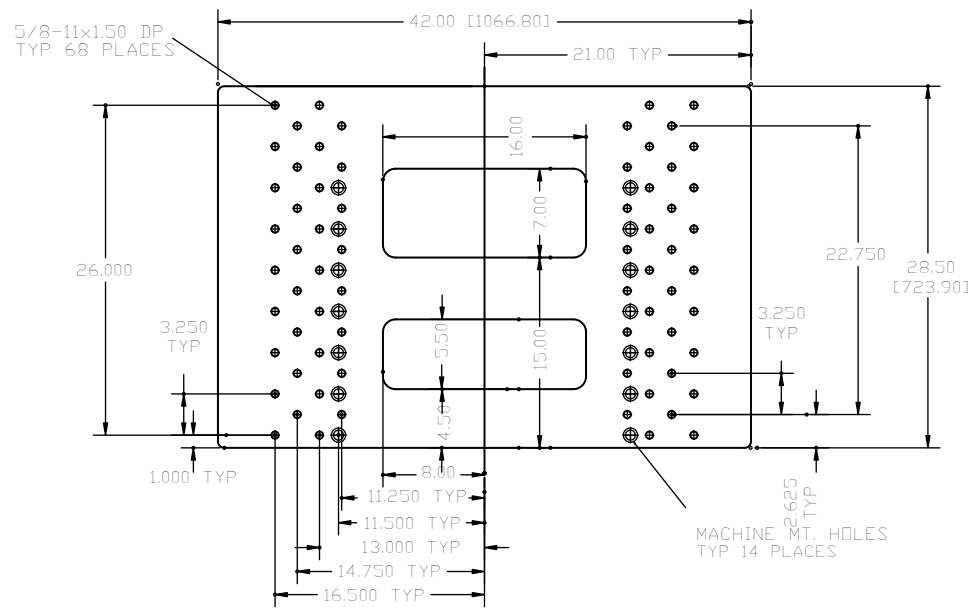
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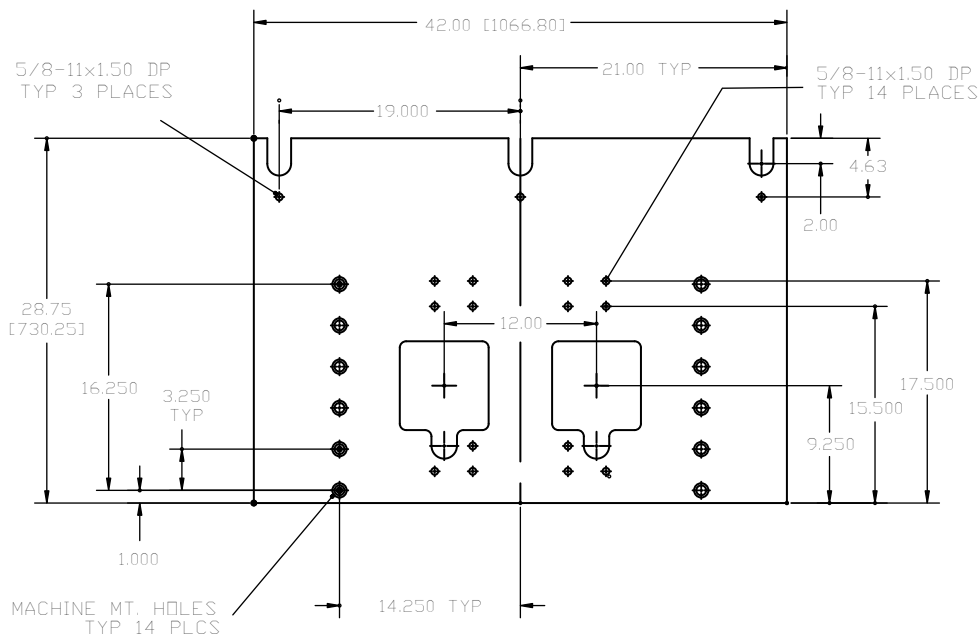
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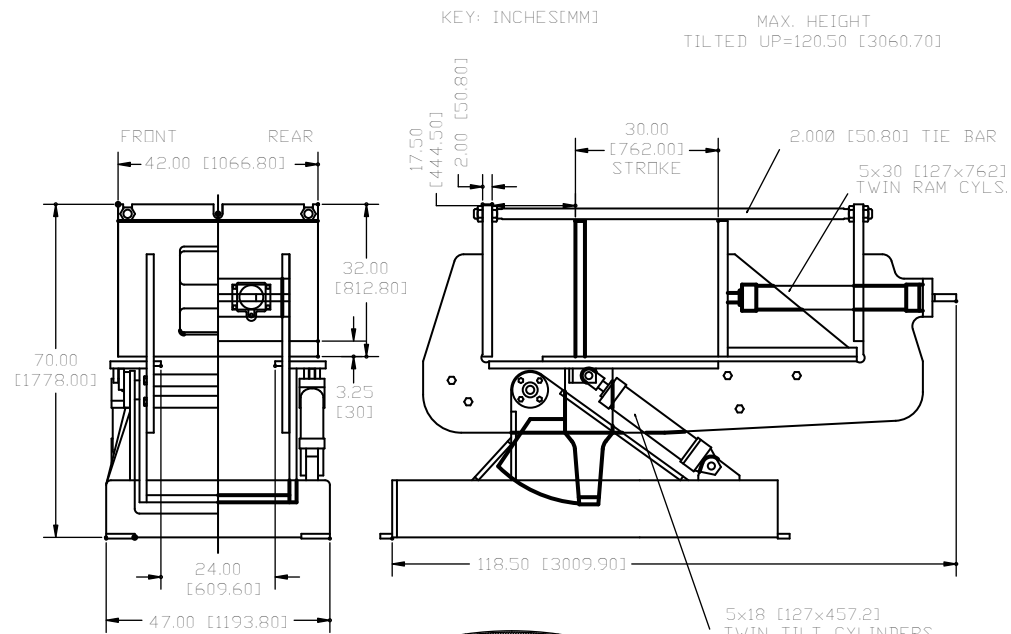
PLATEN, 2.00" FRONT



PLATEN, 2.00" MOVABLE



PLATEN, 2.00" REAR



PERMANENT MOLD MACHINES



SPECIFICATIONS

Clamping Pressure	58,900 lbs.	(26,717 kg.)
Max. Mold Size	40 x 42 in.	(102 x 107 cm)
Max. Mold Weight	4,000 lbs.	(1,812 kg.)
Ram Stroke	30 in.	(76.2 kg.)
Daylight Opening	16.50 in.	(42 cm)
Pressure Height Center	14 in.	(35.6 cm)
Machine Weight	9,800 lbs.	(4,445 kg.)
Tie Bar Size	2 in. dia.	(5.08 cm)
Tilt Speed (Min.)	7 sec.	

OPTIONS

- 1) Tie Bar Extensions
- 2) Manual Swing In Casting Catcher
- 3) Power Swing In Casting Catcher
- 4) Proportional Tilt
- 5) Front Ejector
- 6) Custom Platen Drilling or Sizes

FEATURES

Low maintenance due to few moving parts: heavy duty, rugged, and dependable.

Frame open on 3 sides, plus front and bottom, to facilitate use of core pulls in 5 directions.

Twin cushioned tilt cylinders provide a smooth tilting motion from start to stop.

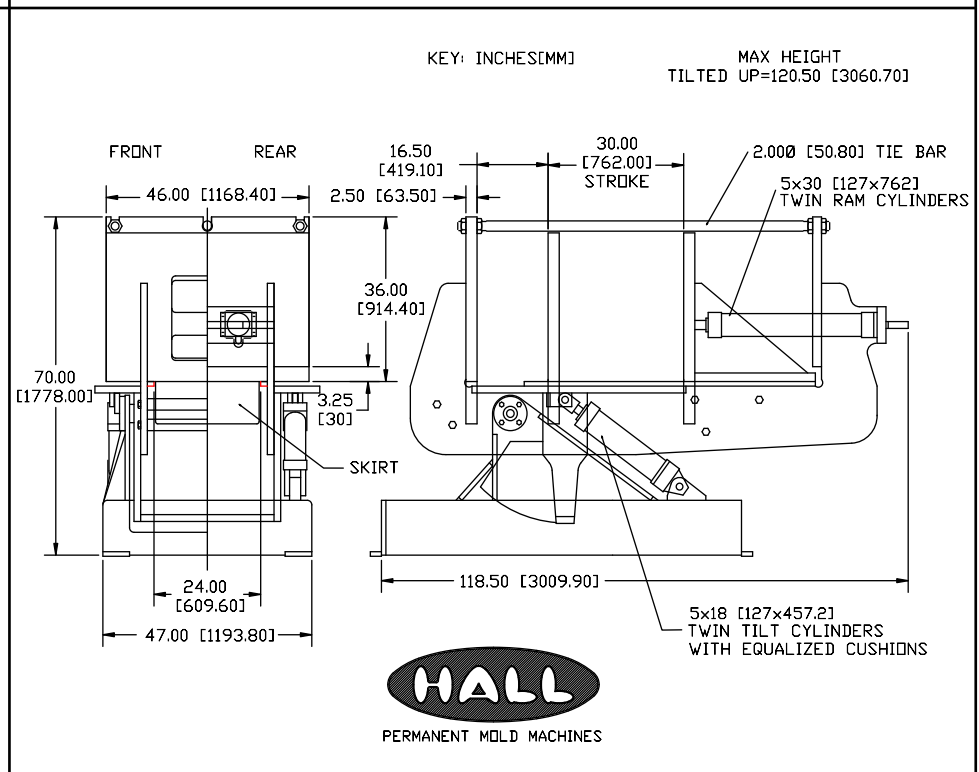
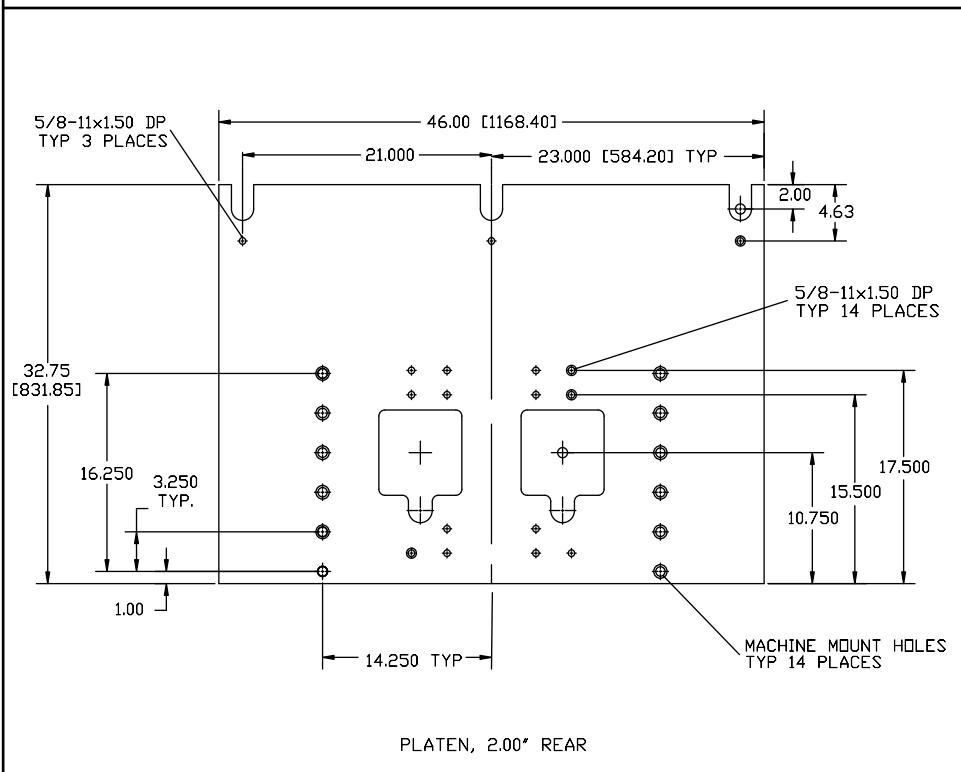
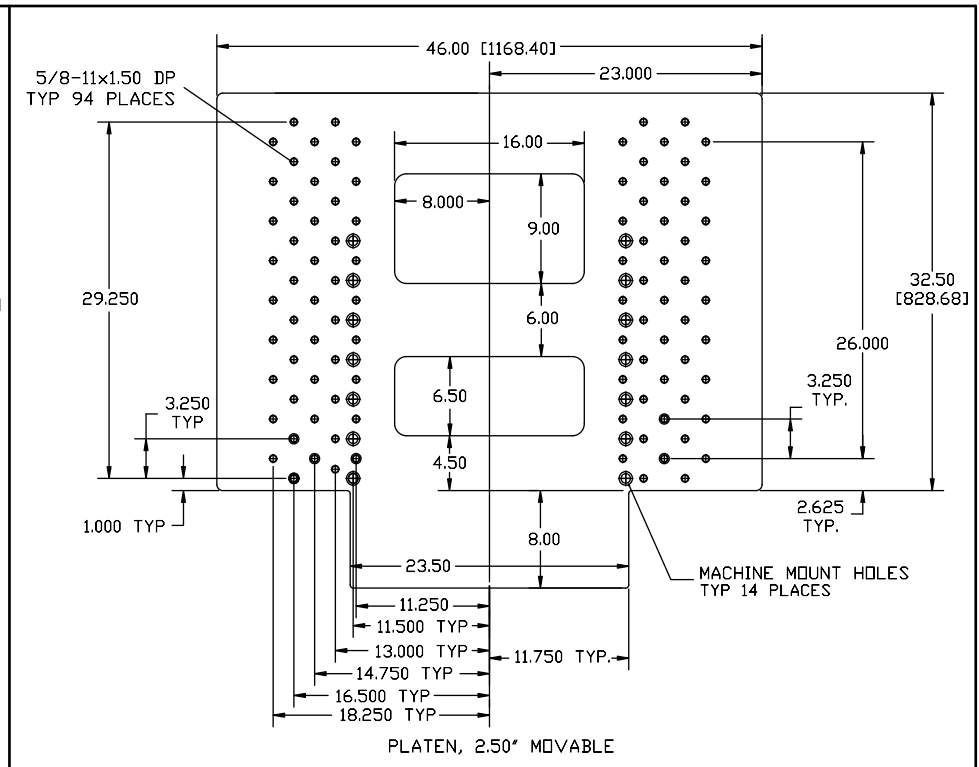
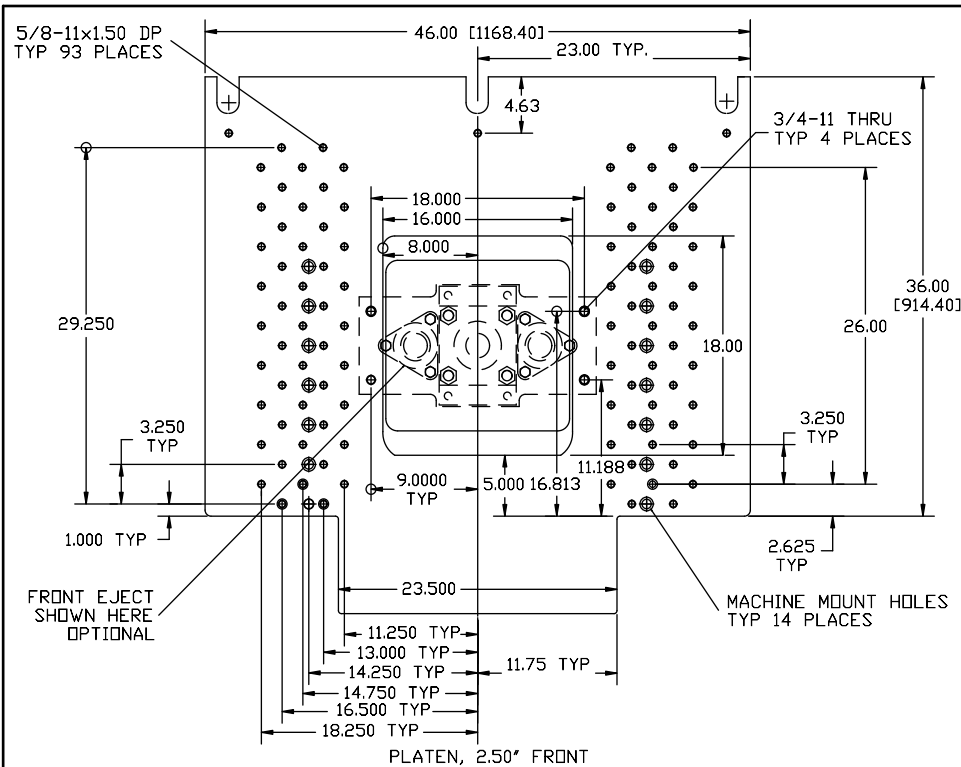
Twin ram cylinders provide a safety factor, as well as extra holding pressure and better clamping balance.

Hydraulic power units available in manual, automatic, or with programmable controllers: sized to facilitate all available accessories at low operating pressure.

C.M.H. MANUFACTURING CO. HALL Permanent Mold Machines

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**TILT-POUR
PERMANENT MOLD
CASTING MACHINE**

HALL



Shown with optional front eject and powered casting catcher.

SPECIFICATIONS

Clamping Pressure	60,000 lbs.	(27,216 kg.)
Max. Mold Size	48 x 62 in.	(122 x 158 cm)
Max. Mold Weight	8,000 lbs.	(3,629 kg.)
Ram Stroke	40 in.	(101.6 cm)
Daylight Opening	23.5 in.	(59.7 cm)
Pressure Height Center	20 in.	(51 cm)
Machine Weight	22,000 lbs.	(9,980 kg.)
Tie Bar Size	2.5 in. dia.	(6.35 cm)
Tilt Speed (Min.)	5 sec.	

FEATURES

Low maintenance due to few moving parts: heavy duty, rugged, and dependable.

Frame open on 3 sides, plus front and bottom, to facilitate use of core pulls in 5 directions.

Twin cushioned tilt cylinders provide a smooth tilting motion from start to stop.

Twin ram cylinders provide a safety factor, as well as extra holding pressure and better clamping balance.

Hydraulic power units available in manual, automatic, or with programmable controllers: sized to facilitate all available accessories at low operating pressure.

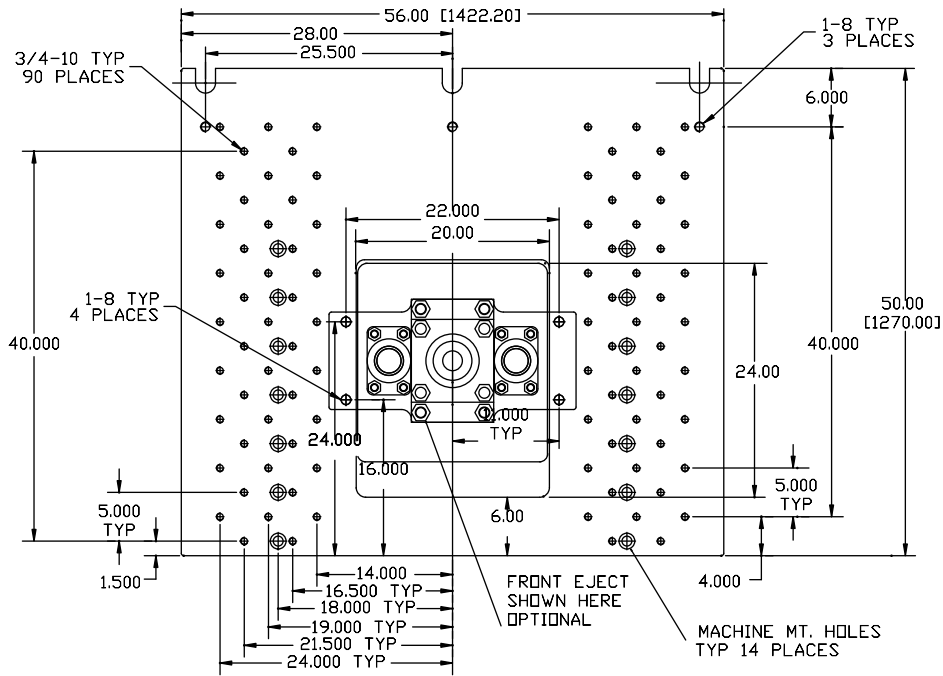
OPTIONS

- 1) Tie Bar Extensions
- 2) Manual Swing In Casting Catcher
- 3) Power Swing In Casting Catcher
- 4) Proportional Tilt
- 5) Front Ejector
- 6) Custom Platen Drilling and Sizes

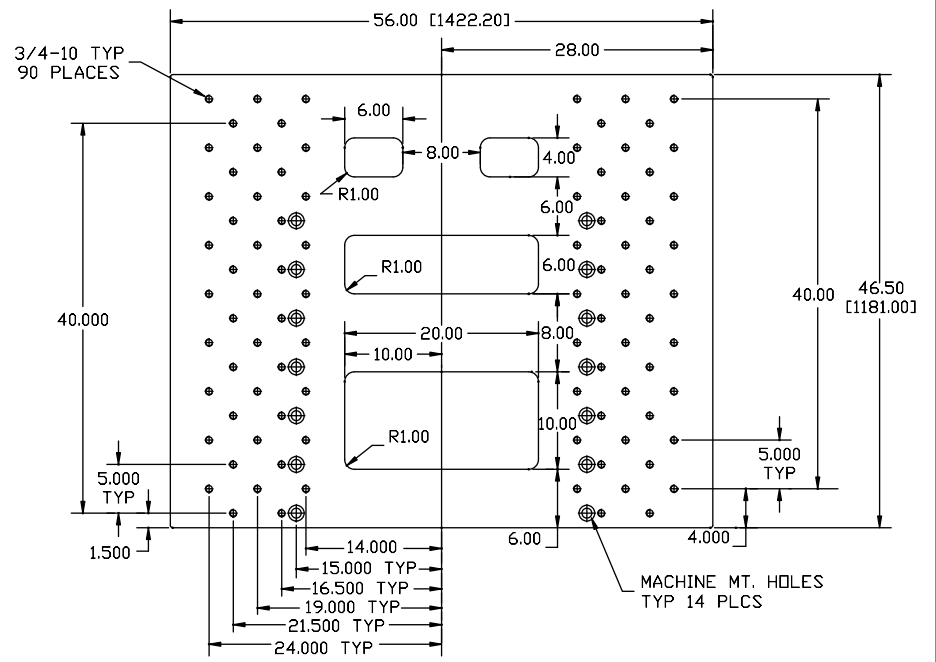
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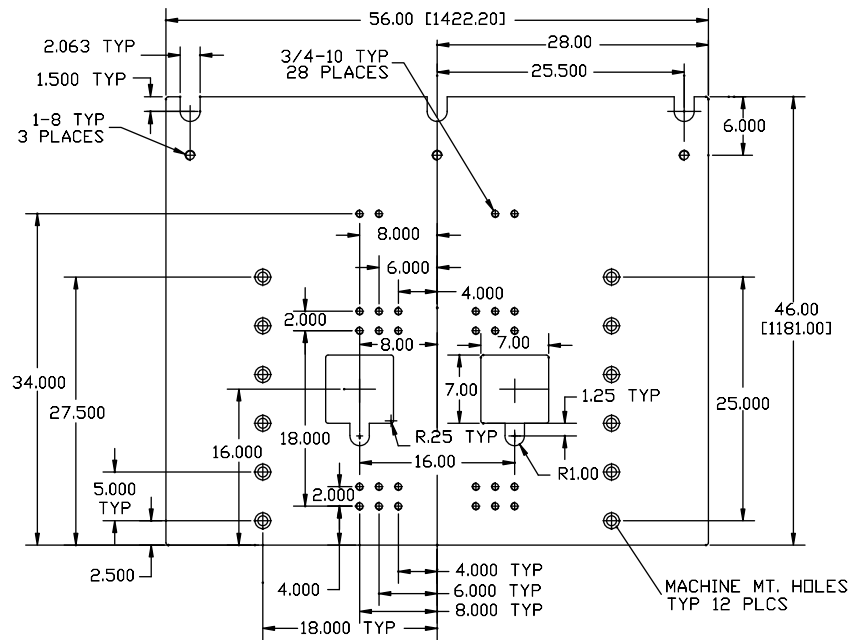
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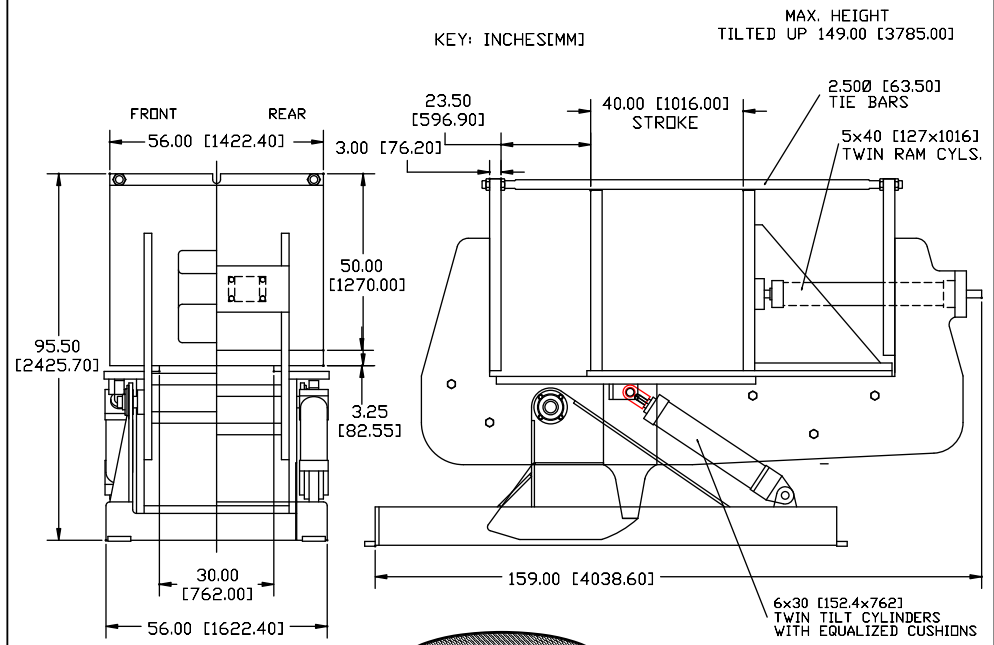
PLATEN, 3.00" FRONT



PLATEN, 3.00" MOVABLE



PLATEN, 3.00" REAR



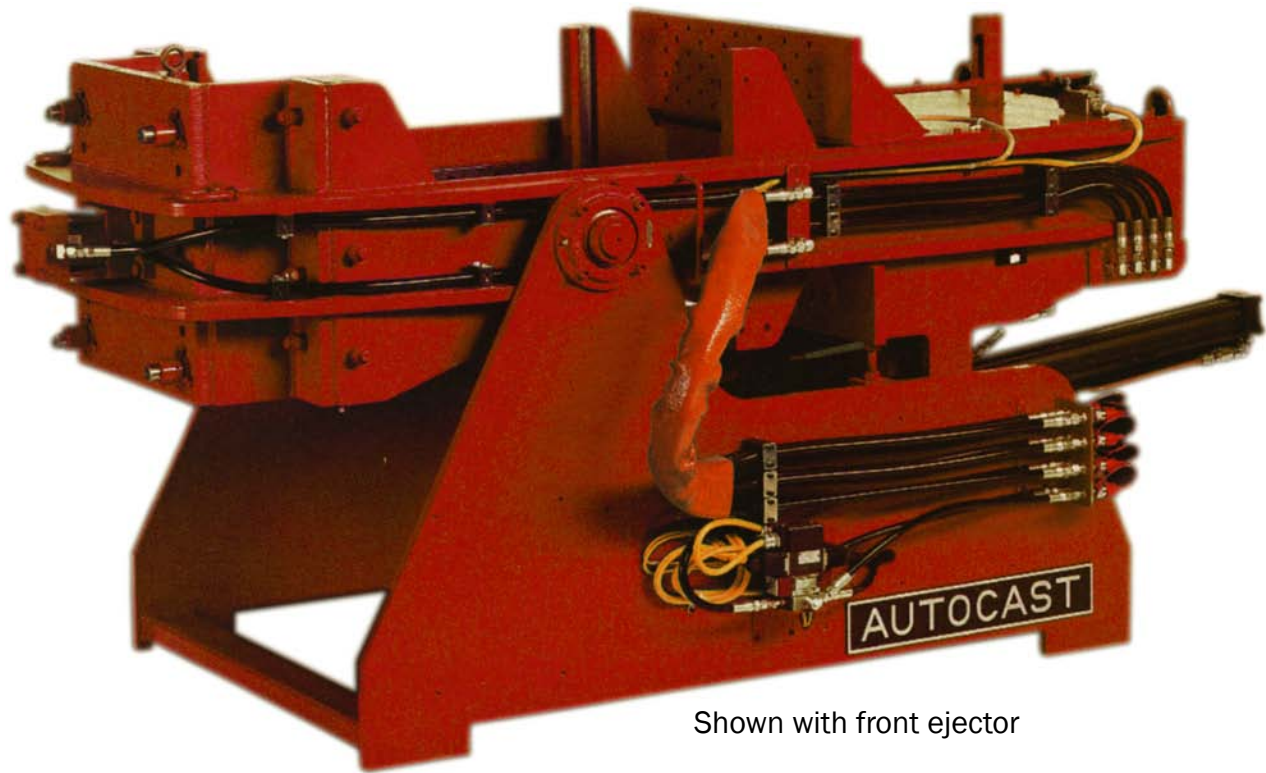
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PERMANENT MOLD MACHINES

AUTOCAST II

HALL



Shown with front ejector

SPECIFICATIONS

Clamping Pressure	12,000 lbs.	(5,445 kg.)
Max. Mold Size	25 x 36 in.	(63.5 x 91.5 cm)
Ram Stroke	20 in.	(50.8 cm)
Daylight Opening	13.5 in.	(34.3 cm)
Machine Weight	3,375 lbs.	(1,531 kg.)
Tilt Speed	7 sec.	

FEATURES

Low maintenance due to few moving parts: heavy duty, rugged, and dependable.

Center line ram pressure

Twin cushioned tilt cylinders provide a smooth tilting motion from start to stop.

Twin ram cylinders provide a safety factor, as well as extra holding pressure and better clamping balance.

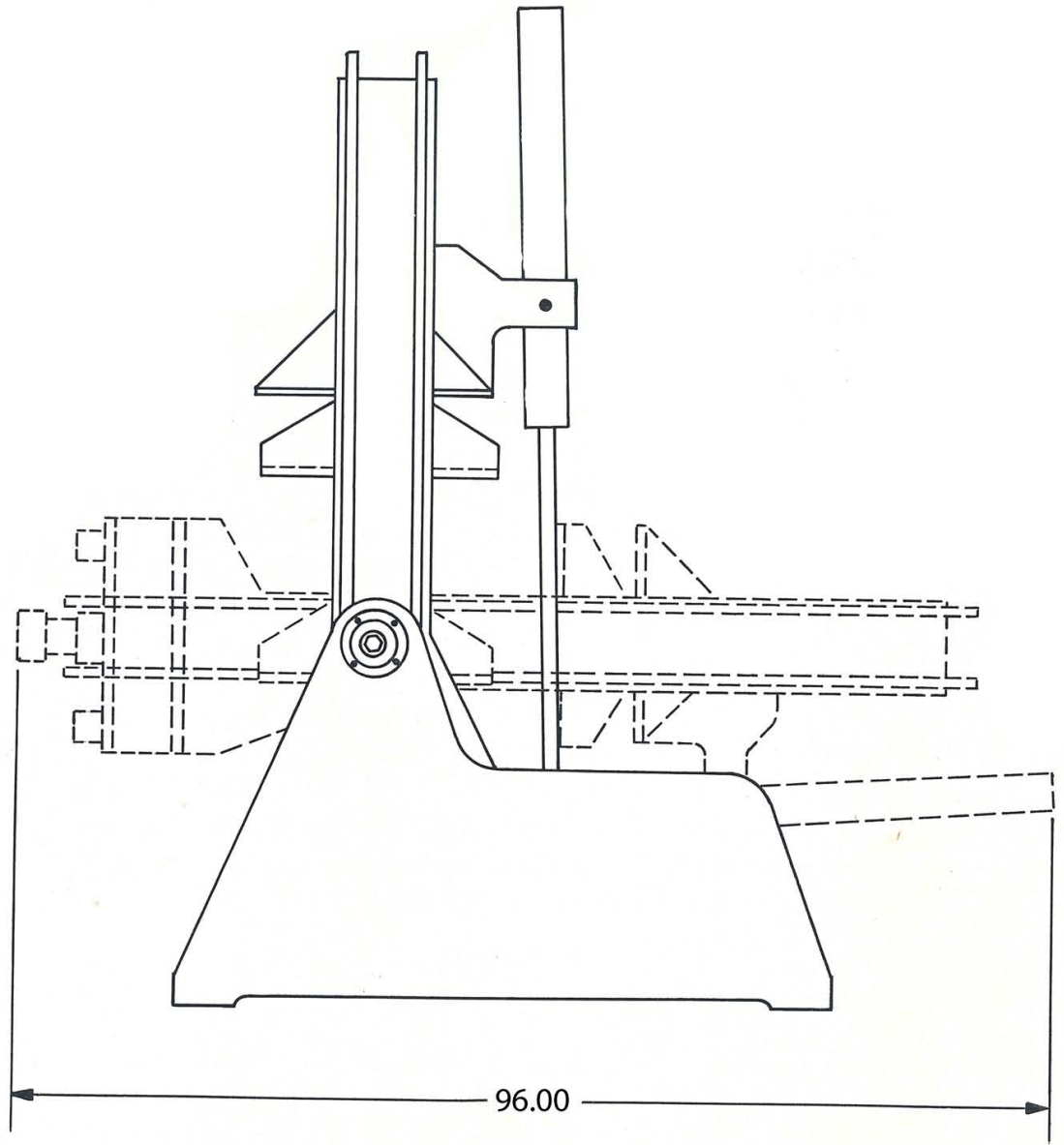
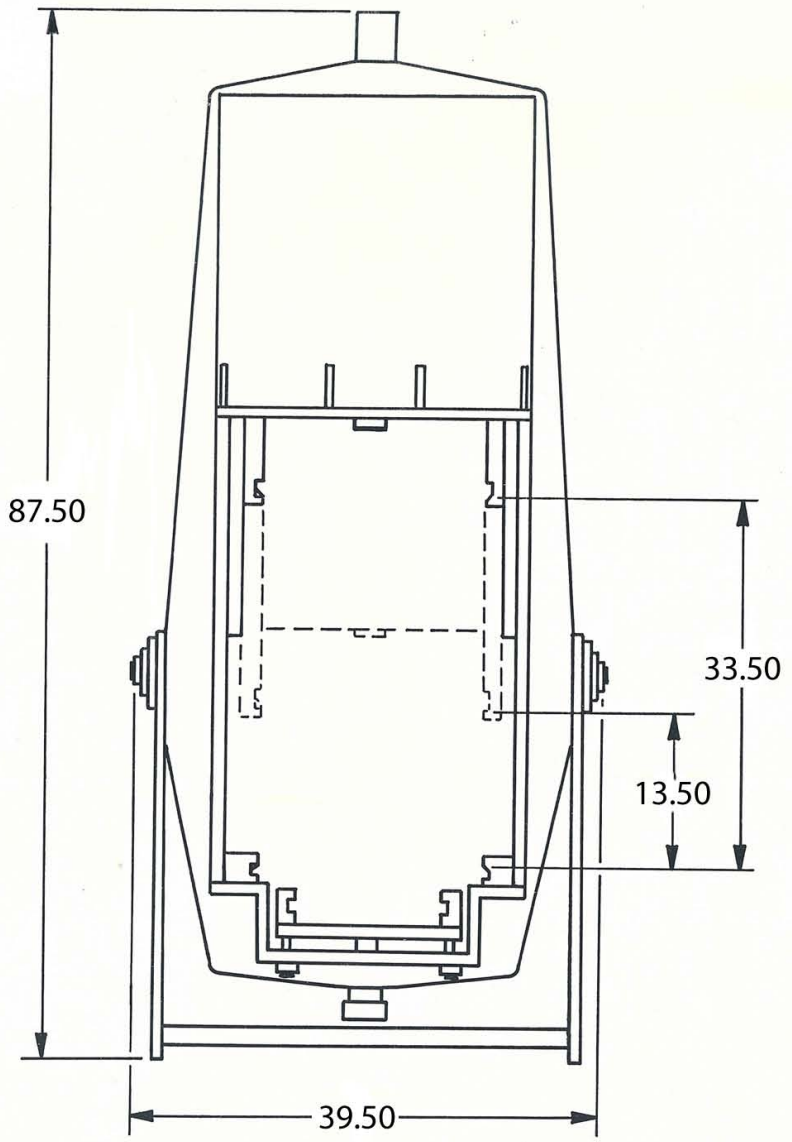
Hydraulic power units available in manual, automatic, or with programmable controllers: sized to facilitate all available accessories at low operating pressure.

OPTIONS

- 1) Front Ejector
- 2) Powered or Manual Swing in Casting Catcher

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With Optional Front Ejector



SPECIFICATIONS

Clamping Pressure	61,000 lbs.	(27,669 kg.)
Max. Mold Size	54 x 68 in.	(137 x 173 cm)
Max. Mold Weight	10,000 lbs.	(4,536 kg.)
Ram Stroke	36 in.	(91.5 cm)
Daylight Opening	27 in.	(68.5 cm)
Pressure Height Center	24.50 in.	(61 cm)
Machine Weight	23,000 lbs.	(10,432 kg.)
Tie Bar Size	2.50 in. dia.	(6.35 cm)
Tilt Speed (Min.)	25 sec.	

FEATURES

Roll-over design utilizes smaller floor footprint and allows pouring and ejection at different work stations, facilitating in-line work flow.

Low maintenance due to few moving parts: heavy duty, rugged, and dependable.

PLC/Touchscreen control, hydraulic power unit is sized to operate at a medium operating pressure.

Quad ram cylinders provide a safety factor, as well as extra holding pressure and better clamping balance.

Hydraulic ejector system available.

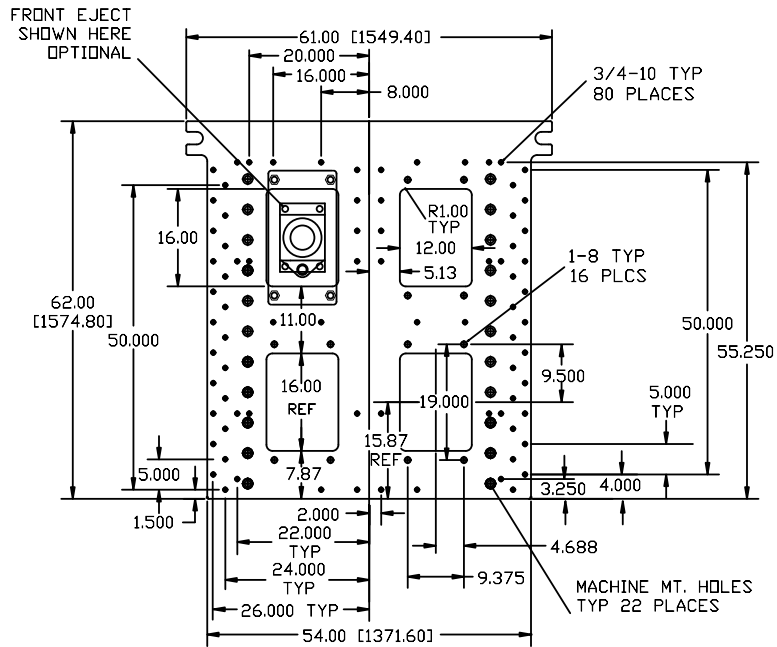
System can be interfaced with other devices such as **HALL** Robot Casting Catcher and automatic ladler.

OPTIONS

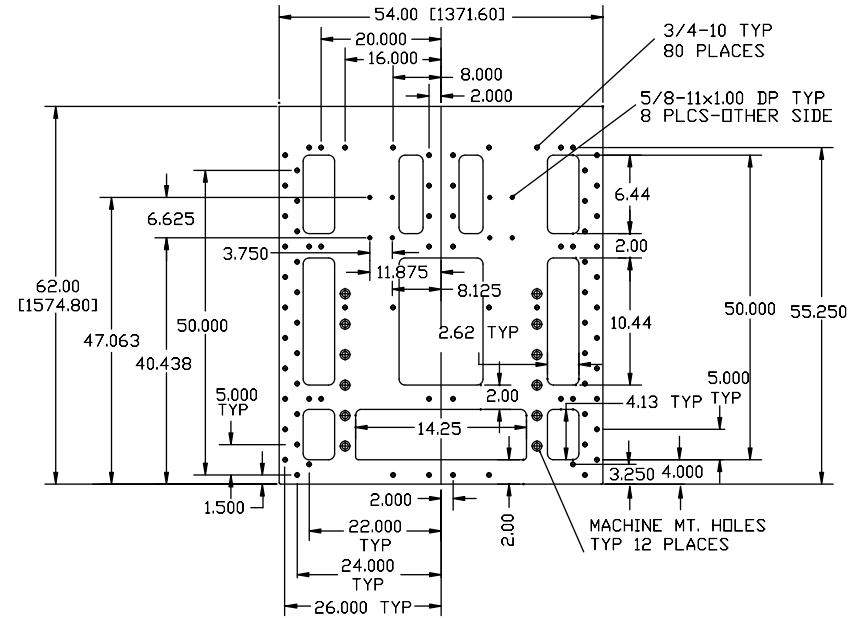
- 1) Front Ejectors Available as Single, Double or Quad Plate
- 2) Casting Catcher available as Left, Right, or Rear

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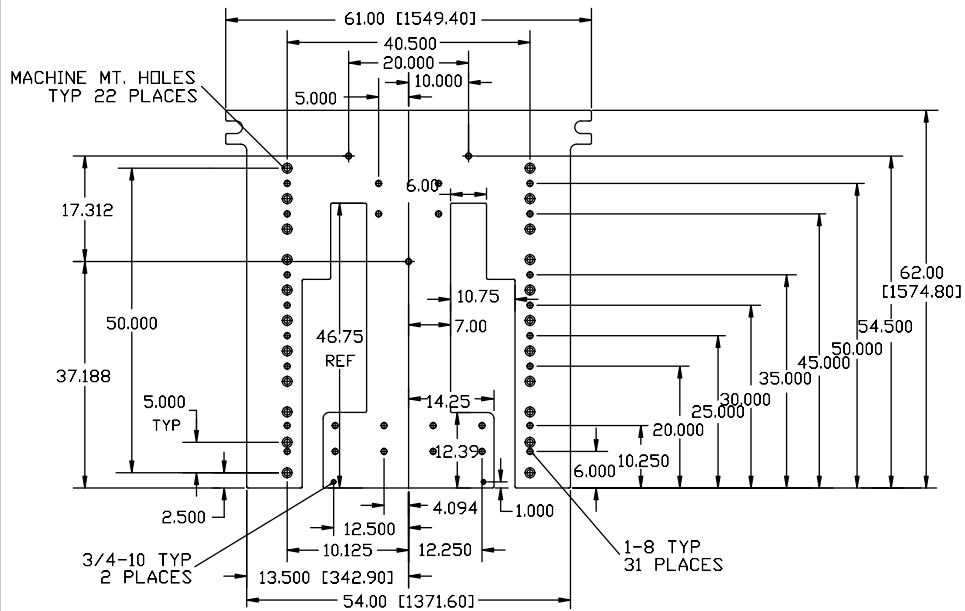
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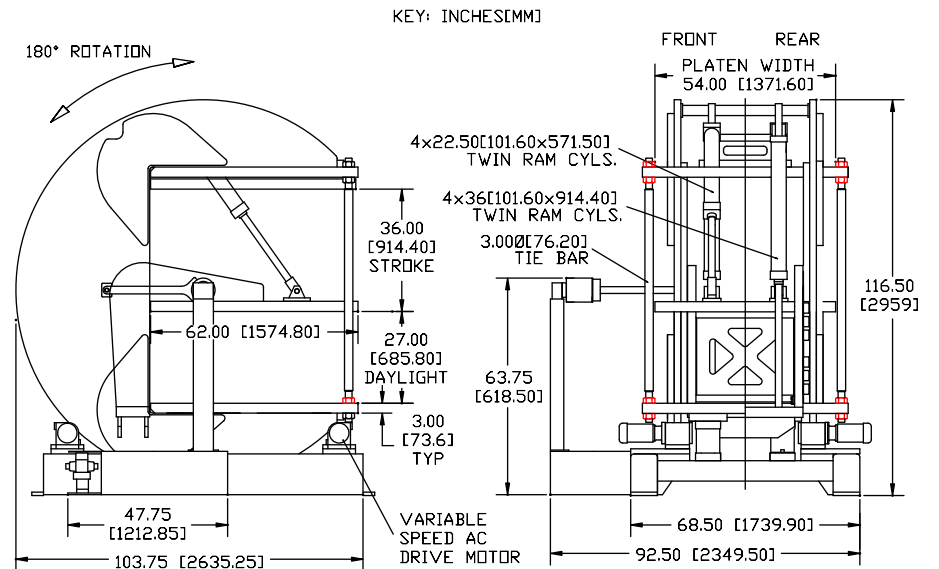
PLATEN, 3.00" FRONT



PLATEN, 3.00" MOVABLE



PLATEN, 3.00" REAR



RT-2

REVERSE TILTING
PERMANENT MOLD
CASTING MACHINE

HALL



EJECTION POSITION



POURING POSITION

SPECIFICATIONS

Clamping Pressure	47,130 lbs.	(21,378 kg.)
Max. Mold Size	21 x 20 in.	(53.4 x 51 cm)
Max. Mold Weight	900 lbs.	(409 kg.)
Ram Stroke	28 in.	(71.1 cm)
Daylight Opening	17.50 in.	(44.5 cm.)
Pressure Height Center	4.25 in.	(10.8 cm)
Machine Weight	4,500 lbs.	(2,042 kg.)
Tilt Speed (Min.)	7 sec.	

FEATURES

Low maintenance due to few moving parts: heavy duty, rugged, and dependable.

Unique design allows the mold to be poured while the parting line is perpendicular to the floor. The machine tilts the mold so that the parting line is parallel to the floor for solidification and ejection.

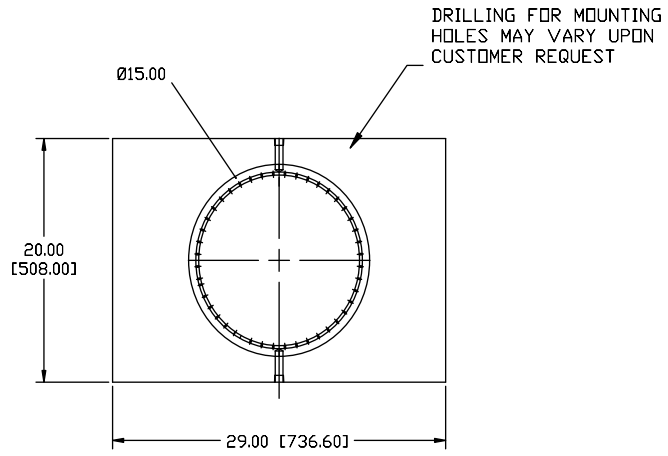
Cushioned tilt cylinder provides a smooth tilting motion from start to stop.

Twin ram cylinders provide a safety factor, as well as extra holding pressure and better clamping balance.

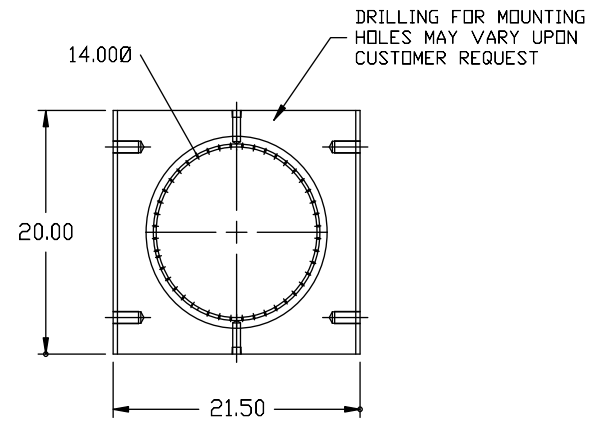
Integral lower eject is included.

C.M.H. MANUFACTURING CO. HALL Permanent Mold Machines

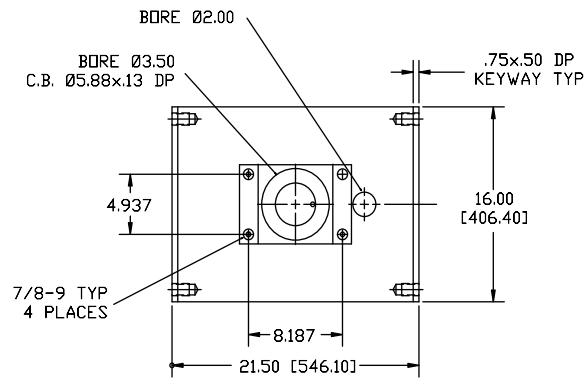
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PLATEN, 3.00' UPPER

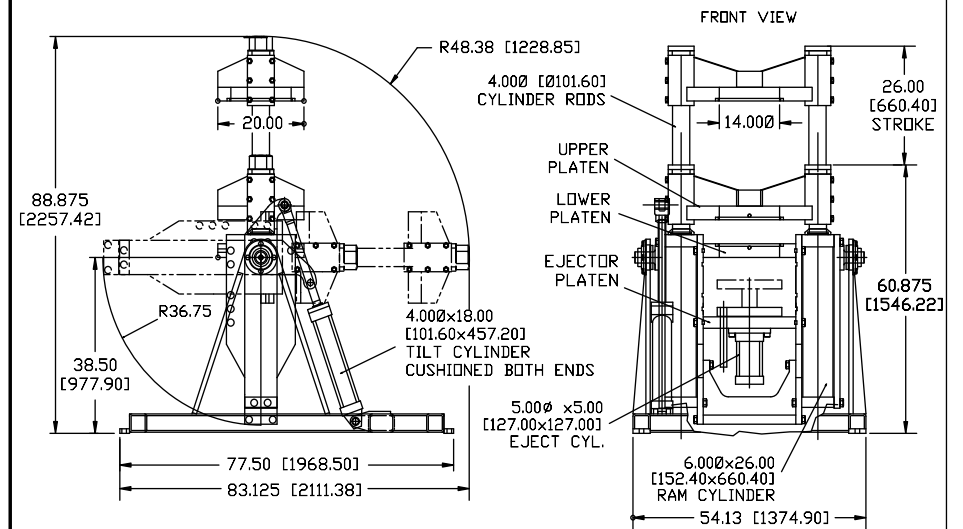


PLATEN, 3.00' LOWER



PLATEN, 2.50' EJECTOR

KEY: INCHES[M.M.]



HALL
PERMANENT MOLD MACHINES

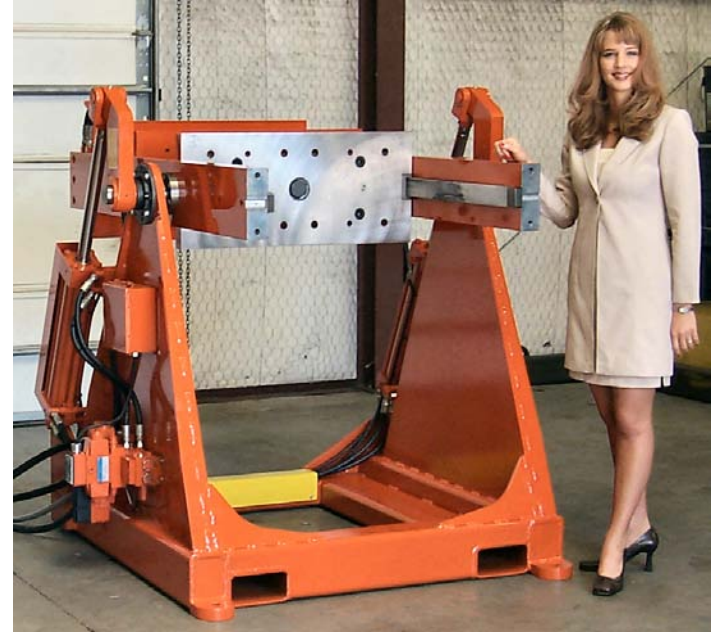
RT-3

REVERSE TILTING
PERMANENT MOLD
CASTING MACHINE

HALL



EJECTION POSITION



POURING POSITION

SPECIFICATIONS

Clamping Pressure	29,500 lbs.	(13,381 kg)
Max. Mold Size	33 20 in.	(84 x 51 cm)
Max. Mold Weight	1,800 lbs.	(816.5 kg.)
Ram Stroke	18 in.	(46 cm)
Daylight Opening	21 in.	(53.4 cm)
Machine Weight	3,800 lbs.	(1,724 kg.)
Tilt Speed (Min.)	7 sec.	

FEATURES

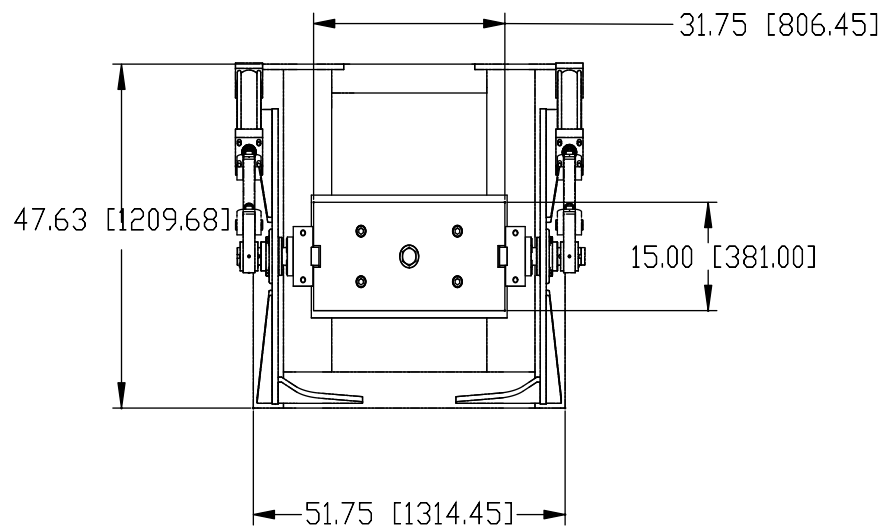
Low maintenance due to few moving parts, heavy duty, rugged, and dependable.

Unique design allows the mold to be poured while the parting line is perpendicular to the floor. The machine tilts the mold so that the parting line is parallel to the floor for solidification and ejection.

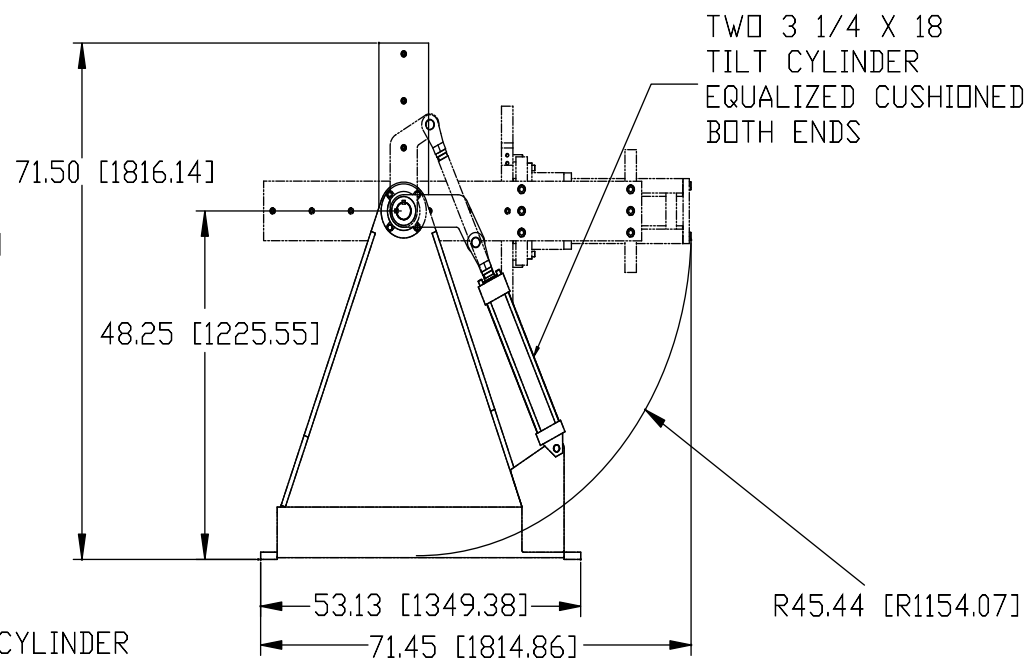
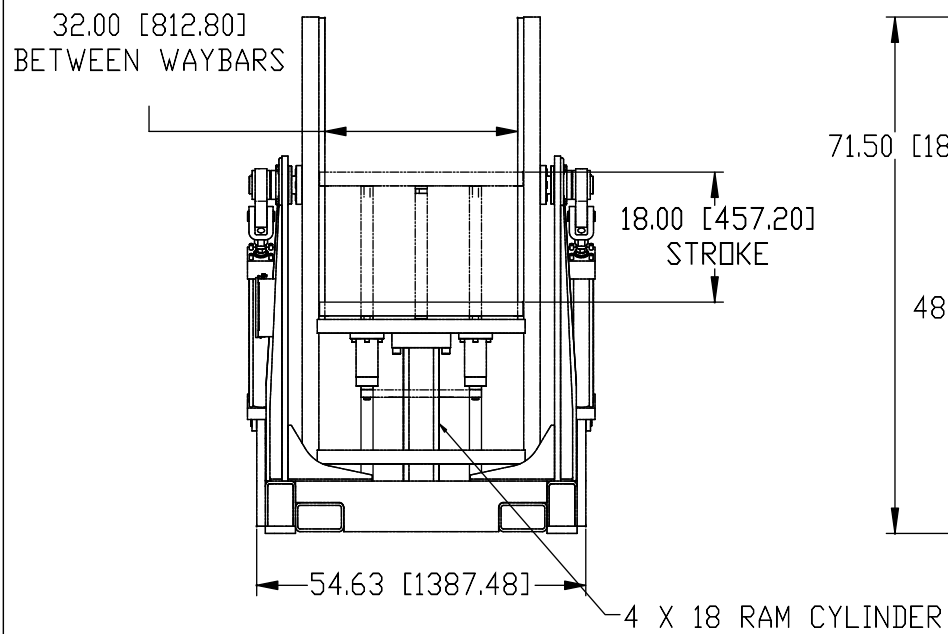
Cushioned tilt cylinders provides a smooth tilting motion from start to stop.

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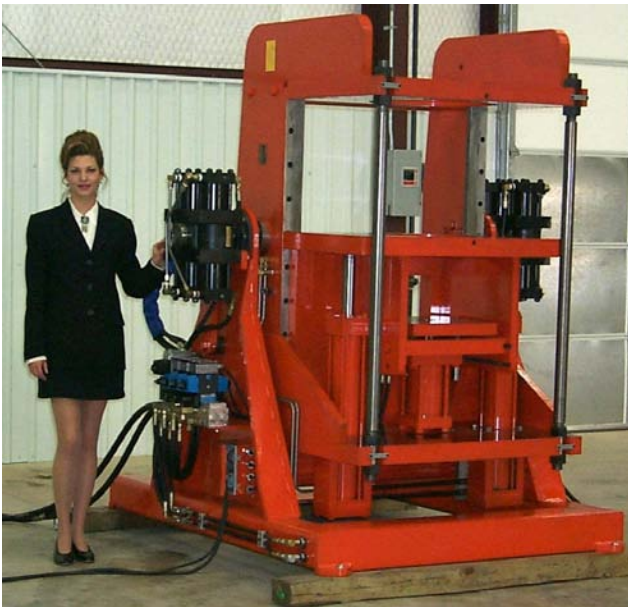


PERMANENT MOLD MACHINES

RT-4

REVERSE TILTING
PERMANENT MOLD
CASTING MACHINE

HALL



EJECTION POSITION



POURING POSITION

SPECIFICATIONS

Clamping Pressure	37,700 lbs.	(17,100 kg.)
Max. Mold Size	40 x 25 in.	(102 x 64 cm)
Max. Mold Weight	1,800 lbs.	(816.5 kg.)
Ram Stroke	24 in.	(61 cm)
Daylight Opening	6.25 in	(16 cm)
Machine Weight	8,900 lbs.	(4,037 kg.)
Tilt Speed (Min.)	7 sec.	

FEATURES

Low maintenance due to few moving parts:
heavy duty, rugged, and dependable.

Unique design allows the mold to be poured
while the parting line is perpendicular to the
floor. The machine tilts the mold so that the
parting line is parallel to the floor for solidification
and ejection.

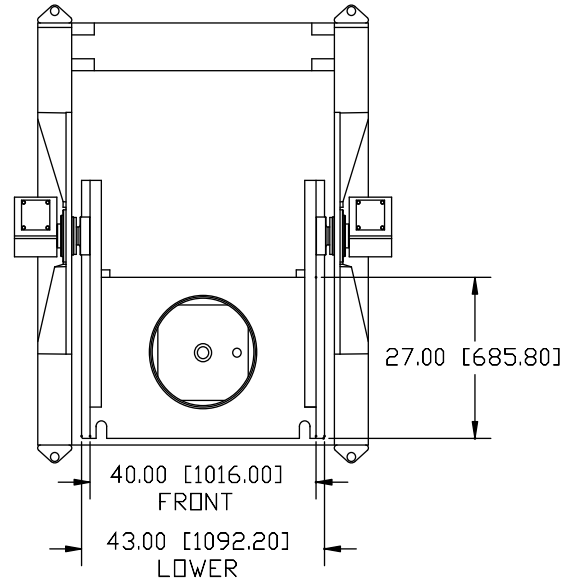
Cushioned actuators provide a smooth
tilting motion from start to stop.

Twin ram cylinders provide a safety factor, as well
as extra holding pressure and better clamping
balance.

Integral lower eject is included.

C.M.H. MANUFACTURING CO. HALL Permanent Mold Machines

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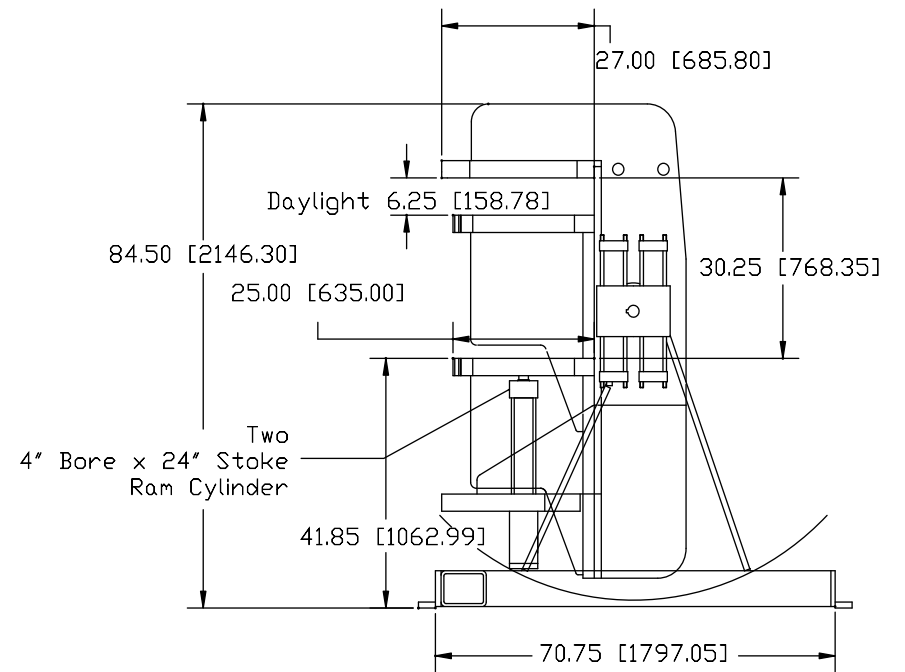
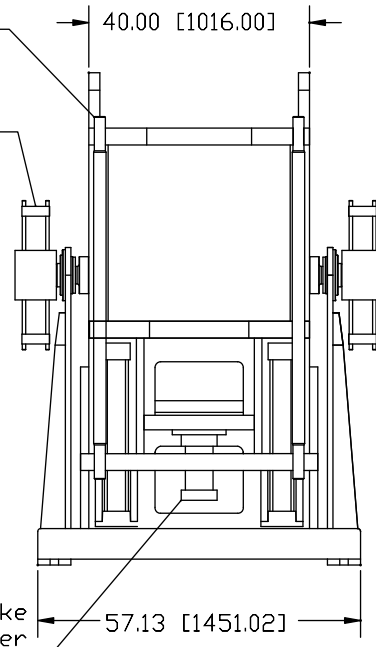


KEY: INCH [MM]

Two Ø2.00" Tie Bars

Two Dual Cylinder
90° Actuator

5.00" Bore x 6" Stroke
Ejector Cylinder



HCH-1

CYLINDER HEAD
MACHINE

HALL



SPECIFICATIONS

Clamping Pressure	37,500 lbs.	(17,010 kg.)
Ram Stroke	12 in.	(30.5 cm)
Ejection Pressure	29,000 lbs.	(13,154 kg)
Ejection Stroke	2 in.	(5.08 cm)
Machine Weight	9,000 lbs.	(4,082 kg)

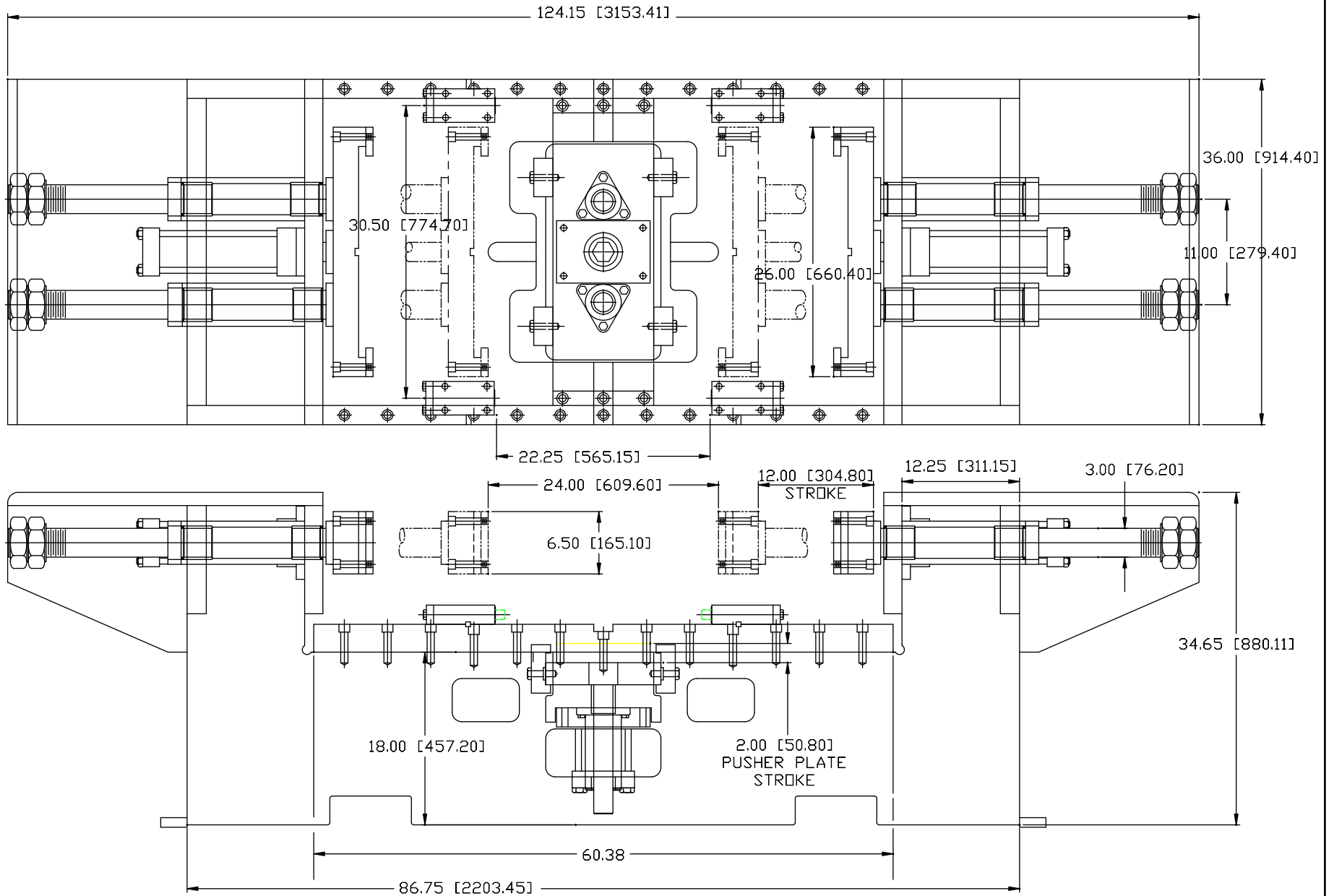
FEATURES

- Low maintenance due to heavy duty dependable design.
- Hydraulic mold clamping.
- Vacuum assisted mold venting.
- Can be set up as double side pull or quad side pull.
- Bottom ejection cylinder.

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CYLINDER HEAD
IN [MM]





FEATURES

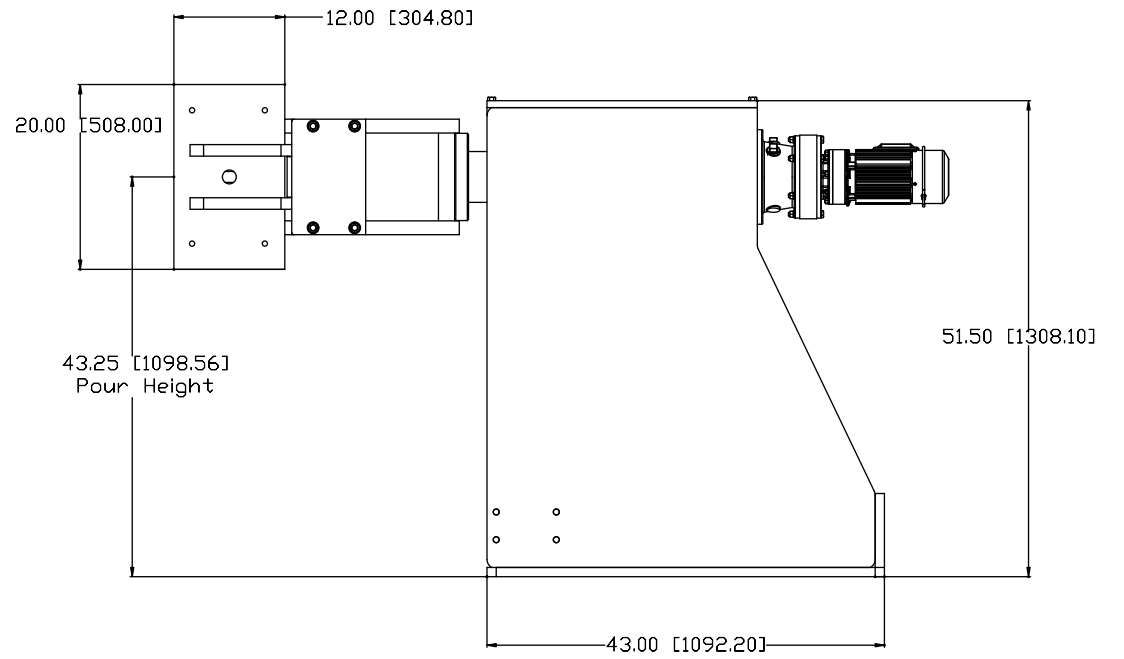
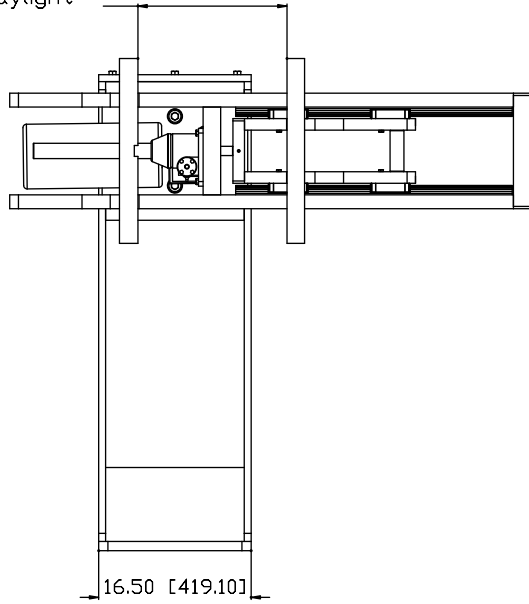
- * All electric. **NO** Hydraulics.
- * No pump noise. **NO** oil leaks .
- * 360° Rotation allows cores to be placed in mold at any angle.
- * Max mold wt. 300# (136 kg).
- * Max mold size 12" x 12" (30.5 x 30.5 cm).
- * Through the spindle water in and water out.
- * Rotary table or floor use.
- * Bottom fill gating.



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16.13 [409.65]
Daylight



PROGRAMMABLE TILT POWER UNITS

HALL

The **HALL** programmable tilt system is designed for applications that require variable tilt rates. Variable tilt rates can increase your profitability by:

- *Improving Yield
- *Improving Metal Flow
- *Reducing Air Entrainment in The Metal Stream
- *Reducing Inclusions
- *Reducing Turbulence as The Metal Enters The Mold



The system uses our time proven hydraulic power unit. Refer to Hydraulic Power Units pages for standard unit details. The system uses a PLC control and a touch screen operator interface. The unit can be configured to fit almost any application, but most systems are six valve. Normal circuits include tilt, ram, front eject, core, casting catcher in/out and casting catcher vertical movement. The proportional tilt valve is PLC controlled with feedback from a trunnion mounted potentiometer or optional ultra sonic sensor on the casting machine. Tilt rates are programmed by drawing the desired ramp curve on the touch screen with your fingertip. The PLC can store up to eight different ramps under a four digit code. All manual functions are included on the touch screen and touch screens are available in monochrome or color.

Start Screen



Set Up Screen



Auto Screen



Hand Operation Screen



Tilt Memory Screen



Tilt Ramp Screen



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SPECIFICATIONS

Size	Operation	Motor TEFC	Operating Pressure	Reservoir Capacity	Number of Valves	Cooler	Application
6 GPM (22.71 L)	MAN	5 HP	1000 PSI (6,894,757 Pa)	42 GAL (158.99 L)	2 or 3	N	2H or AUX
10 GPM (37.85 L)	MAN	7 ½ HP	1000 PSI (6,894,757 Pa)	42 GAL (158.99 L)	2 or 3	N	2H or 3L
10 GPM (37.85 L)	AUTO	7 ½ HP	1200 PSI (8,273,708.4 Pa)	50 GAL (189.27 L)	4	Y	2H or 3L
20 GPM (75.71 L)	MAN	15 HP	1500 PSI (10,342,135.5 Pa)	50 GAL (189.27 L)	3	N	3HS or 3L
20 GPM (75.71 L)	AUTO	15 HP	1500 PSI (10,342,135.5 Pa)	50 GAL (189.27 L)	4	Y	3HS or 3L
34 GPM (128.70 L)	AUTO	25 HP	1500 PSI (10,342,135.5 Pa)	70 GAL (264.98 L)	3 or 4	Y	6H
34 GPM (128.70 L)	AUTO	25 HP	1500 PSI (10,342,135.5 Pa)	70 GAL (264.98 L)	6 or 8	Y	Dual 2H, 3L or 3HS

FEATURES

Manual valves are 3-position, detent , and lever operated.

Automatic valves are solenoid, 3-position, and manifold mounted.

Easy access spin-on filters provides quick replacement.

Dual filtering - return line and kidney loop.

Total pumping unit is mounted on a lift-off top for easy access to the pump.

Aftercooler has separate pump for continuous circulation, filtration, and cooling of the fluid.

All pumps, valves, and hoses are designed for hydraulic oil and water glycol. Pumps are vertically mounted and submerged in the reservoir to improve suction characteristics and reduce noise level.

Extra ports are a available for auxiliary equipment such as the casting catcher and other accessory equipment.

Each automatic unit is wired for 3 phase, 240 or 480 VAC, 60Hz., and with a built-in control voltage transformer where applicable. Other power voltages are available on request.

The control console, with all controls, touchscreens, push buttons, etc., is mounted at optimum height for easy hands-on control in a NEMA 12 enclosure.

Automatic function provides override push button operators for tilting the machine up and down.

OPTIONS

When 5 or more timed functions are required (such as with a casting catcher), we recommend our automated programmable control option which can interface with most systems. We can provide programmable controllers for all functions upon request.

Special voltage wiring is also available.

Manual units are a available with more than 3 valves to meet your particular power and control requirements.

Custom designed units, which utilize the most up-to-date electronic and hydraulic technology to meet your needs, are our specialty.

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HYDRAULIC POWER UNITS

HALL

HALL power units are designed to operate each of our Permanent Mold Casting Machines with optional accessories in manual or automatic mode. Timing for pouring and cooling are controlled for repeat production without variance. The hydraulic pump is variable volume/pressure compensated, and coupled directly to the TEFC electric motor. Standard configuration is with 4 adjustable timed functions and 4 valves to control tilt and ram, as well as core pulls and /or ejectors. Our automatic control unit is a PLC controlled system which offers easy repair for any maintenance crew. The reservoir is fitted with an air cooled aftercooler and system includes a separate recirculating pump to reduce heat build up and maintain reasonable system temperatures under severe service conditions. This adds significantly to the pump life and reduces down time. We incorporate the latest and most innovative designs to increase your production and profits by reducing your labor.

10 GPM MANUAL



20 GPM AUTO



Custom Hydraulic Systems



Custom Hydraulic power units can be designed to fit your needs, regardless of size. Multipumps units are also available.



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FILTERS

HALL



STANDARD FILTERS

- ZLE-10 Return Filter
- ZLE-3 Loop Filter
- SE-10 Filler Breather Air Filter

ROTARY HIGH PRESSURE

NOT SHOWN HP-2675 High Pressure Filter Cartage

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SWING - IN CASTING CATCHERS

HALL



POWER SWING-IN CASTING CATCHER



MANUAL SWING-IN CASTING CATCHER

SPECIFICATIONS

FEATURES

	Table Size	Max. Weight
#2	26 x 32 in (66 x 81 cm)	150 lbs. (68 kg)
#3	26 x 41 in (66 x 104 cm)	200 lbs. (91 kg)
#6	36 x 51 in. (91 x 130 cm)	300 lbs. (136 kg)

HALL casting catchers increase production while reducing operator load. They are available as manual swing-in or fully automatic powered swing-in. The table height is optimized to allow the operator to inspect a casting while the next casting is cooling in the mold. The system utilizes minimal floor space and allows one operator to do the job safely with minimum effort. Tie bar extensions are required when using a swing-in casting catcher.

The table height on all swing-in casting catchers is adjustable in 1.5 inch increments.

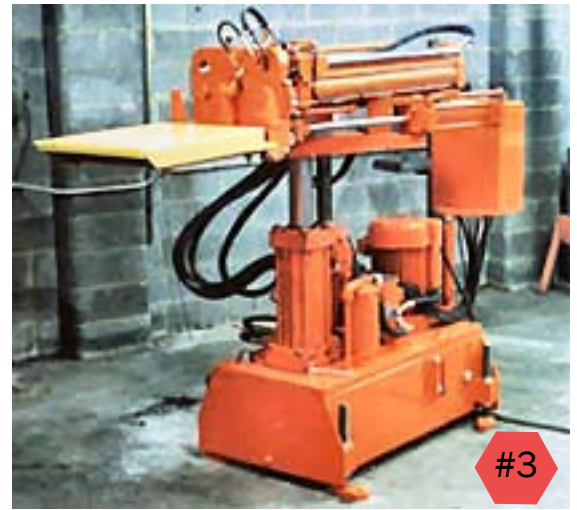
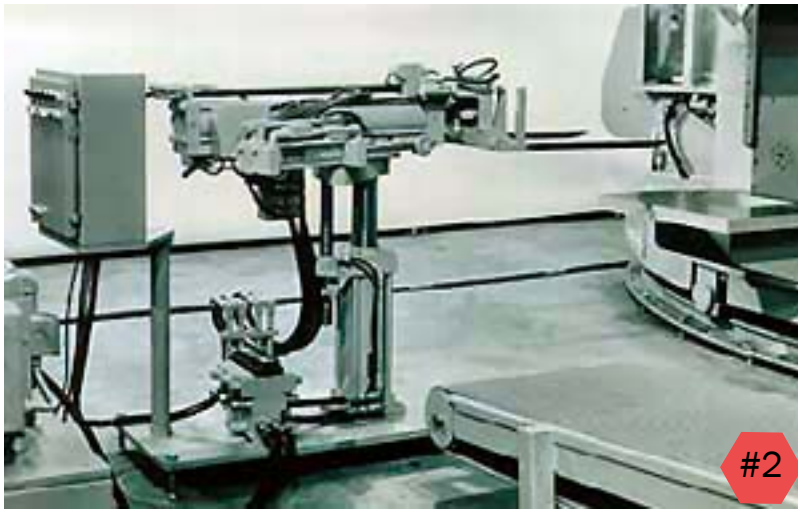
Rotary action of the powered casting catcher is from a hydraulic rotary actuator. The stroke of the vertical cylinder is eight inches.

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ROBOT CASTING CATCHERS

HALL



SPECIFICATIONS

FEATURES

#2

#3

	#2	#3
Cycle Time (Min.)	20 Sec.	25 Sec.
Capacity (Max)	100 lbs (45.36 kg)	200 lbs. (90.72 Kg)
Horizontal Stroke	12 in. (30.48 cm)	12 in. (30.48 cm)
Vertical Stroke	30 in. (76.2 cm)	36 in. (91.44 cm)
Rotate	90 degrees	90 degrees
Tilt	36 degrees	36 degrees

Number 2 Power Unit - 5 H.P., 15 GPM, 700 PSI, variable volume/pressure compensated pump, with return spin-on filter.

Number 3 Power Unit - 10 H.P., 34 GPM, 700 PSI, variable volume/pressure compensated pump, with return spin-on filter. Reservoir built into the unit.

Indexing Cooling Conveyor - Steel slider top, 1/2 x 1/2 x 24" wide galvanized flat wire belt, hydraulic direct motor drive, adjustable to 10 degrees, 24" overhang at each end for floor clearance and casting retrieval. Standard lengths are 12 ft., 18 ft., and 24 ft.

Control Console - Mounted on the robot unit, NEMA 12 enclosure programmable control for all functions, manual override and emergency stops are provided for safety, located at optimum height for operator control and visibility during all sequences.

Robot - Compact design in right or left hand configurations, forks are custom designed for each application, and precision machining provides accurate and trouble-free operation.

In keeping with our continued commitment to meet the needs of our customers and offer accessories that lend efficiency and increase production rate, we have developed our robot casting catchers. Ejected castings can be removed from the upper or lower mold halves with precision and placed on our indexing cooling conveyor, dropped into a tote box or a quench tank, depending on your requirements. Though the robot was originally designed for our rotary machines, it can interface equally well with any of our individual machine applications. Our robot is operated by an internal programmable controller and all strokes are set with adjustable limit switches. Each cylinder is cushioned on both ends providing a smooth transition of movement. The standard sequence of operation is to extend into the mold, lift or catch the casting, retract out of the casting machine, rotate 90 degrees, lower, tilt the forks to slide the casting onto the indexing/cooling conveyor and return to start. The conveyor indexing rate and spacing are adjustable with a timer. Optional applications for this robot include core setting, transfer to and from other processing equipment, etc.. An optional mechanical hand is also available.

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SLIDE IN CASTING CATCHER

HALL



WITHOUT SELF CONTAINED PUMP



WITH SELF CONTAINED PUMP

SPECIFICATIONS

Cycle time (Min.)	20 sec..	
Capacity (Max)	100 lbs.	(45.36 kg)
Horizontal Stroke	12 in.	(304.8 mm)
Vertical Stroke	30 in.	(762.0 mm)

FEATURES

Produced for use with Rotary Table or individual machines - with or without power unit.

Both styles use aluminum bronze vertical way bars.

Linear ball bearings and 2.00" dia. induction hardened chrome plated way bars used for horizontal travel.

Use of hydraulic cylinders for vertical & horizontal travel.

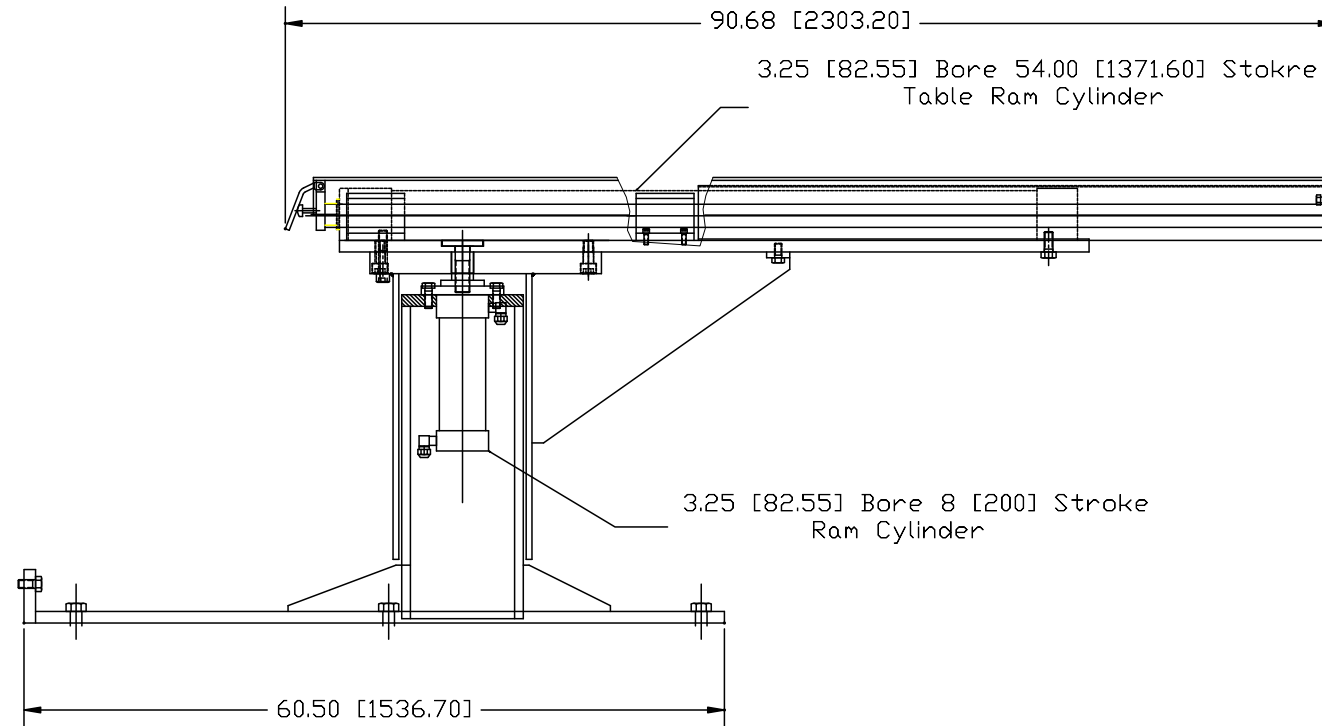
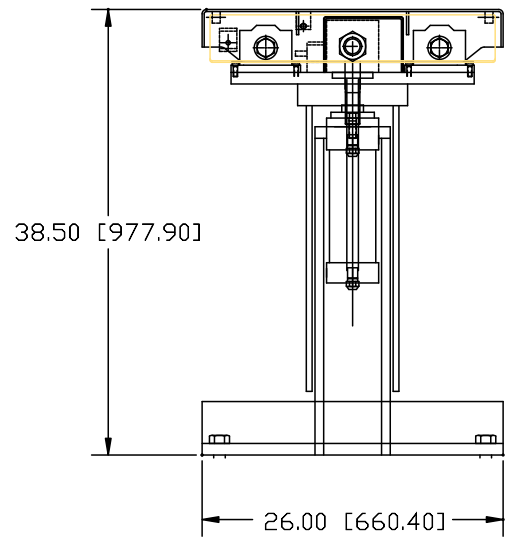
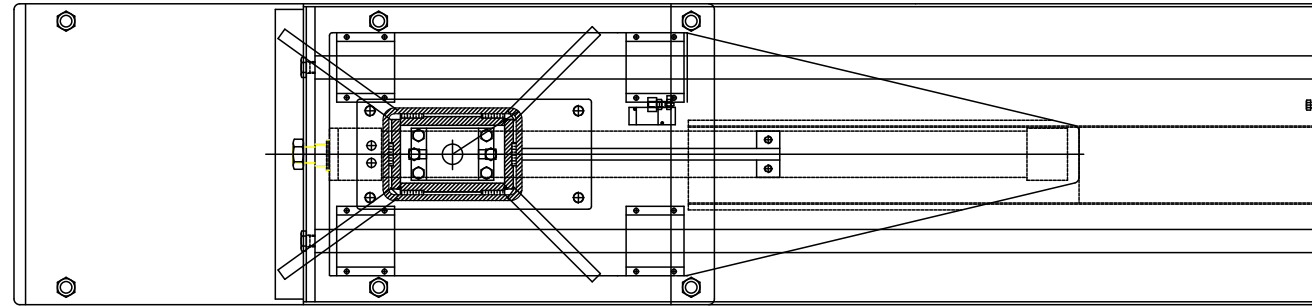
Vertical and horizontal travels are adjustable with on board limit switches.

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Slide In Casting Catcher
IN [MM]



5H

Casting Catcher

HALL

TABLE EXTENDED

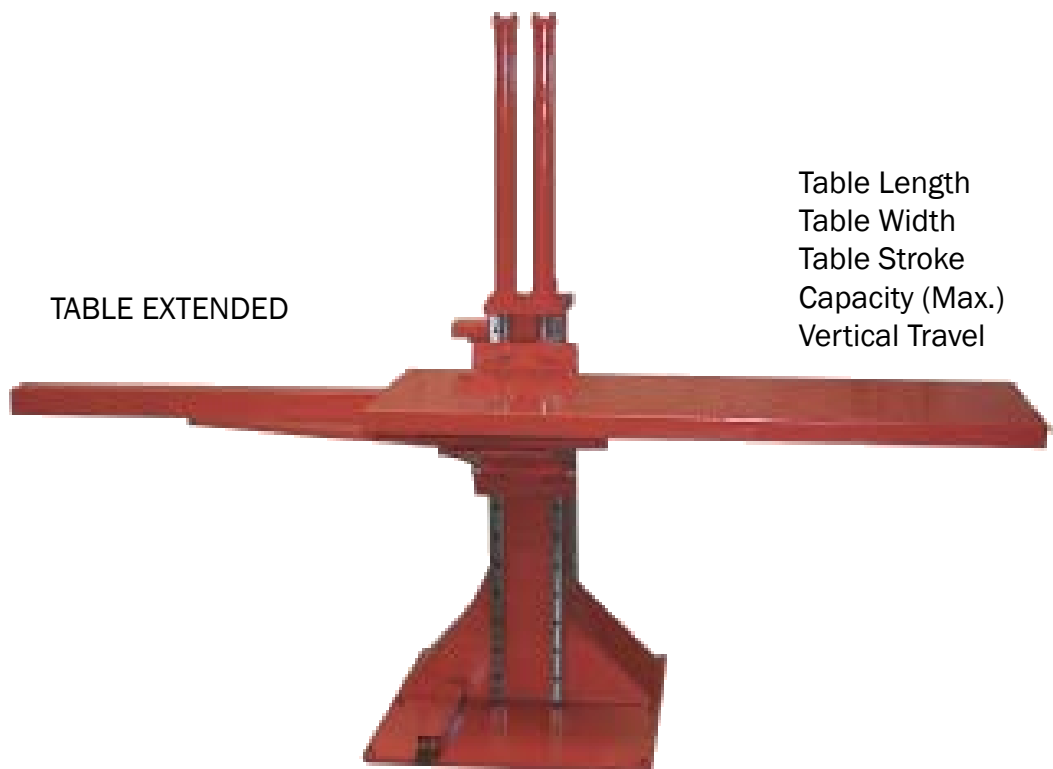


Table Length	114.5 in	(290.8 cm)
Table Width	44 in.	(111.7 cm)
Table Stroke	70 in.	(177.8 cm)
Capacity (Max.)	400 lbs.	(181.4 kg)
Vertical Travel	44 in.	(111.7 cm)

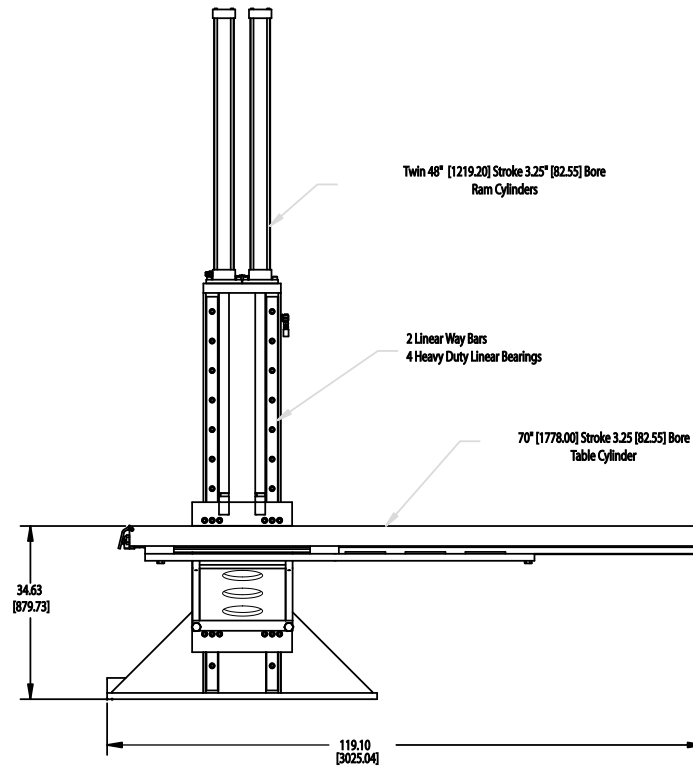
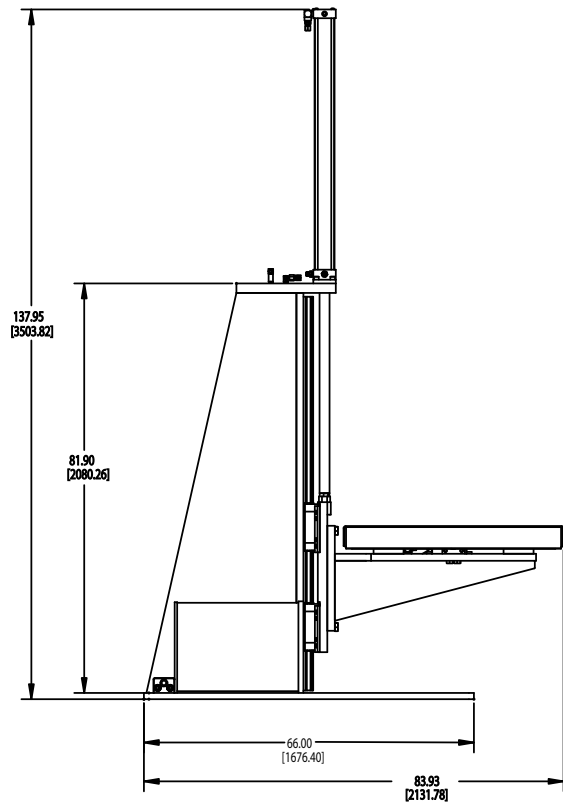
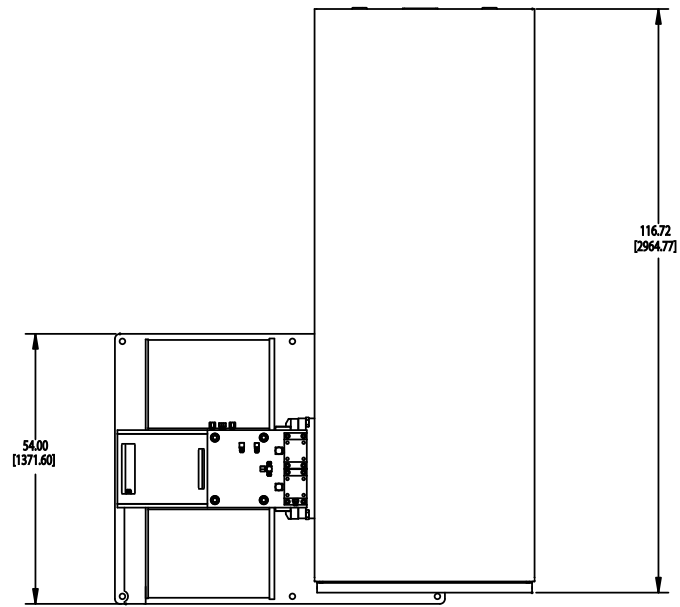
TABLE RETRACTED



C.M.H. MANUFACTURING CO. HALL Permanent Mold Machines

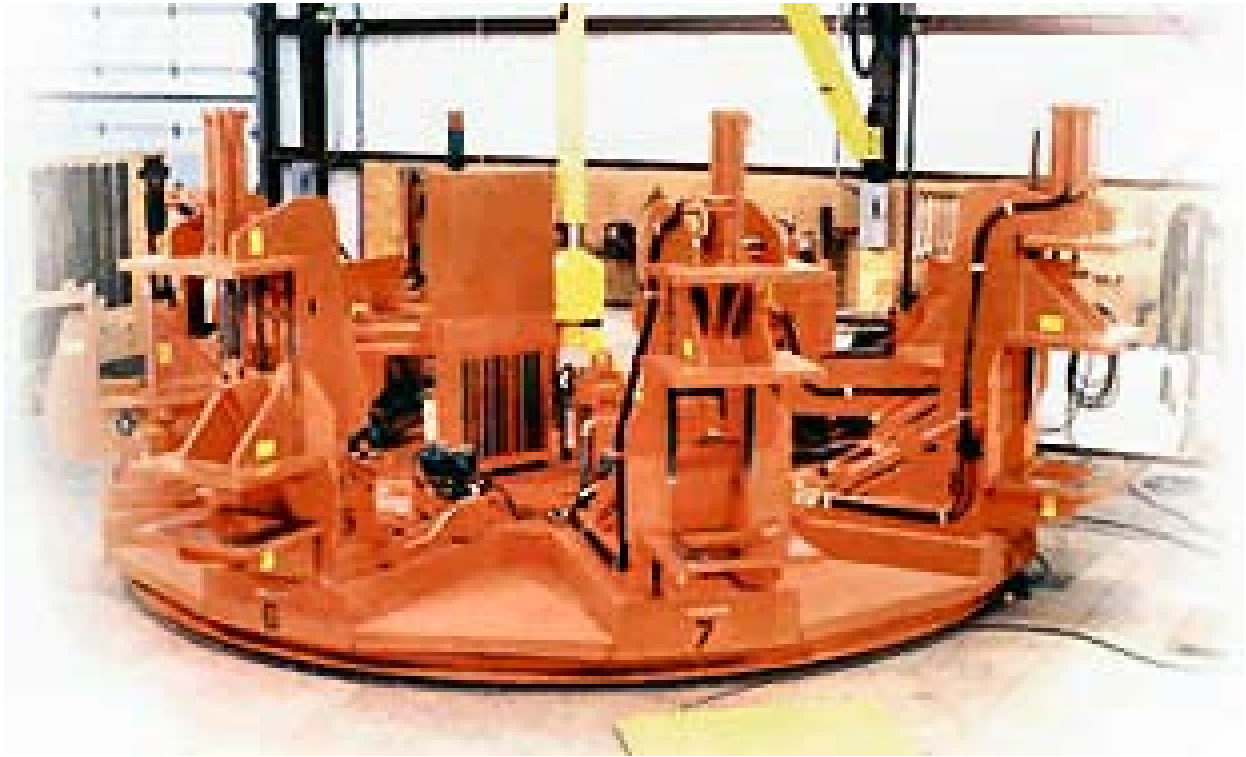
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5CCR Casting Catcher
IN [MM]



ROTARY CASTING MACHINES

HALL



TILT POUR ROTARY

The **HALL** Rotary Casting Machine advances permanent mold casting technology another step and makes it the most profitable approach for modern foundries today. This high production, completely automated system can meet your needs for large volume applications. We incorporate up to 12 of our standard casting machines (#2H, #3HS, #6H or RT machines) on one rotary table to reduce cycle time in each station to as little as 20 seconds.

As an example, based on our 8-station **HALL** #2H Rotary Table, we have calculated that eight seconds is necessary to index the table between stations without inertial forces affecting feed characteristics of castings. Assuming a three minute (180 second) cooling cycle, this rotary system will theoretically produce 120 cycles per hour.

At 83% of theoretical, it would be 100 machine cycles per hour. At 100 hours per week, this calculates out to 10,000 machine cycles per week. If there are two cavities, it will produce 20,000 parts per week. If you have a three and one-half minute cooling cycle, then multiply the above by .86. This will give a total production of nearly one million parts per year.

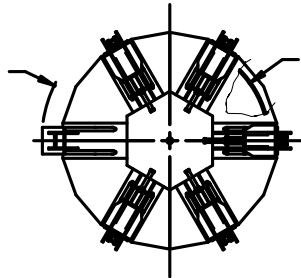
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ROTARY TABLE FEATURES

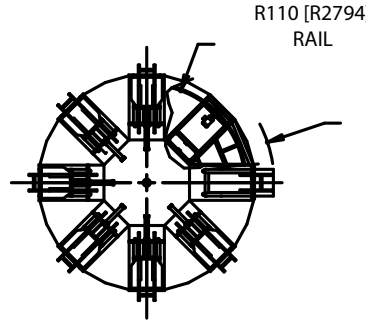
HALL

R144 [R3653]
MAX. CLEARANCE



6 STATION 2H

R111 [R2819]
RAIL



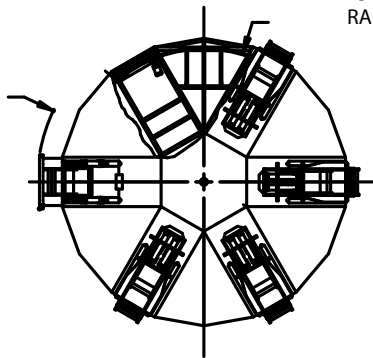
8 STATION 2H

R110 [R2794]
RAIL

R143 [R3630]
MAX. CLEARANCE

KEY: INCHES(MM)

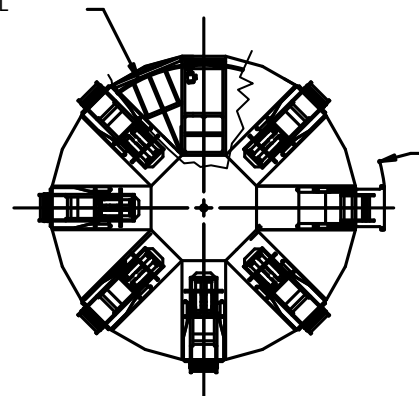
R187 [R4747]
MAX. CLEARANCE



6 STATION 3HS

R151 [R3835]
RAIL

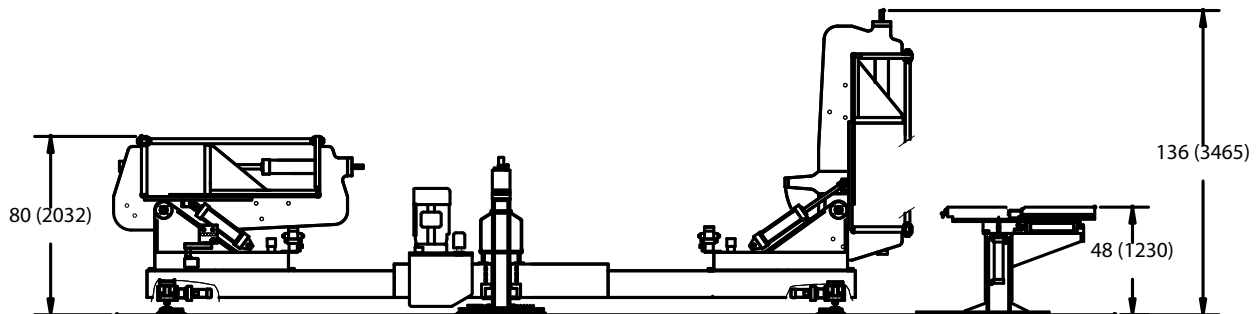
R162 [R4115]
RAIL



8 STATION 3HS

R204 [R5184]
MAX. CLEARANCE

COMMON ROTARY TABLE FOOTPRINT DIMENSIONS



TYPICAL 3HS ROTARY CROSS SECTION
WITH CASTING CATCHER

C.M.H. MANUFACTURING CO. HALL Permanent Mold Machines

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**SIX STATION
NON-TILTING
ROTARY**

HALL



SPECIFICATIONS

FEATURES

Clamping pressure	30,000 lbs.	(13,607.7 kg)
Max. mold size	16 x 24 x 30 in	(40.6 x 60.9 x 76.2 cm)
Max. mold weight	2000 lbs.	(907 kg)
Ram stroke	24 in.	(61 cm)
Daylight opening	16.5 in	(42 cm)
Machine weight	20,500 lbs.	(9,298.6 kg)
Ejection stroke	2 in.	(5 cm)

Indexing system uses a Geneva drive with an epicyclical gear motor and a variable frequency inverter. This allows smooth indexing and speed adjustment.

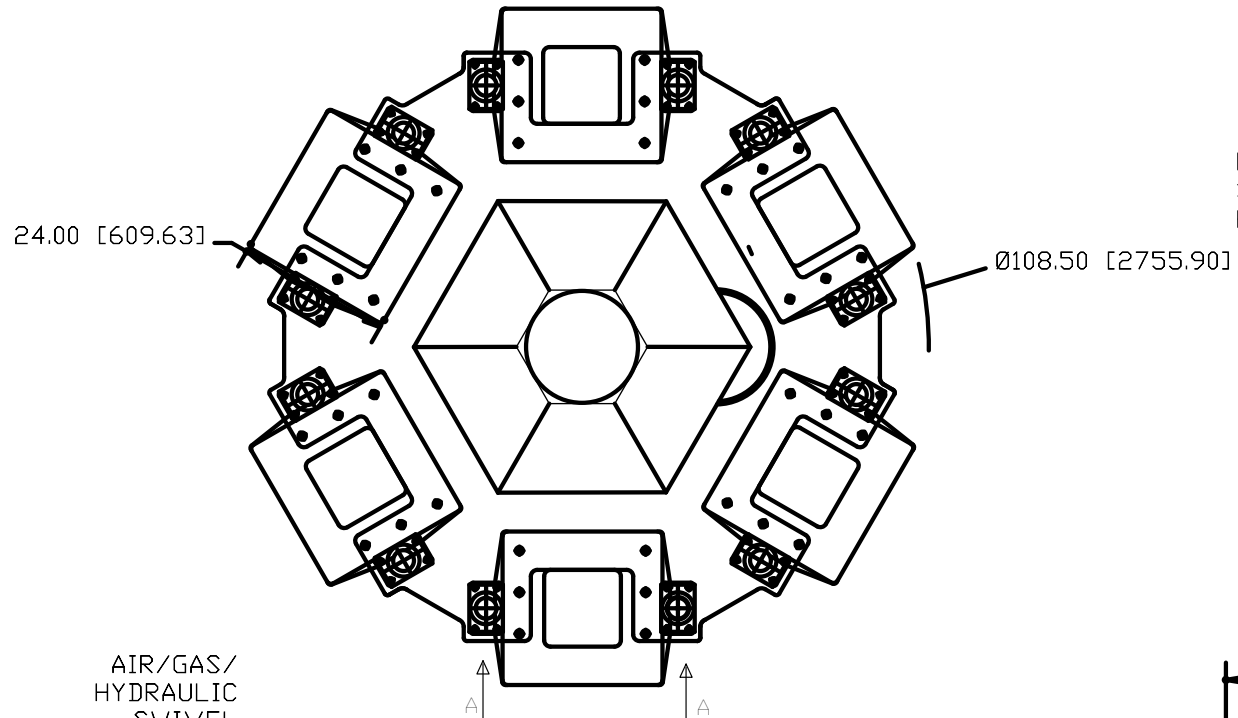
Control utilizes the Allen Bradley SLC series PLC and a color touch screen.

Easily interfaces with ladler or casting catcher.

C.M.H. MANUFACTURING CO. HALL Permanent Mold Machines

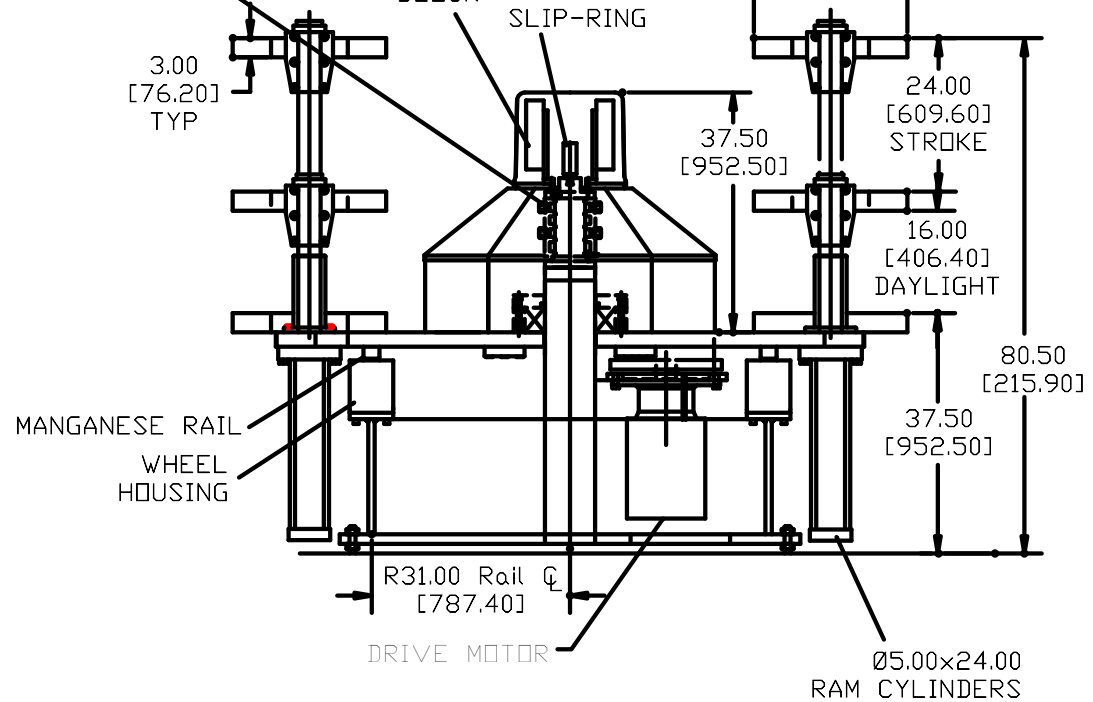
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NTS
SIX STATION ROTARY
KEY: INCH [MM]

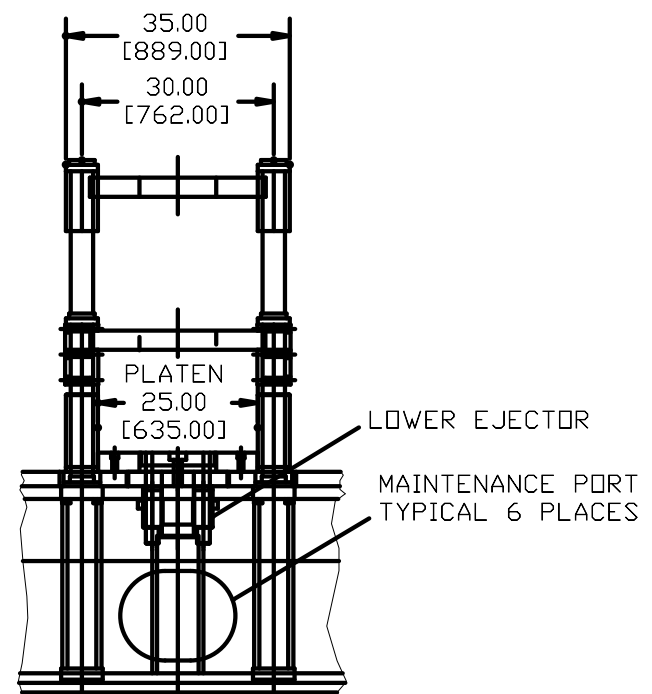


AIR/GAS/
HYDRAULIC
SWIVEL

I/O
BLOCK
MERCURY
SLIP-RING



DETAIL A-A



LOWER EJECTOR

MAINTENANCE PORT
TYPICAL 6 PLACES

Ø5.00x24.00
RAM CYLINDERS

CASTING COOLING TOWER

HALL



SPECIFICATIONS

Estimated Input Temp.	900°f	(482°C)
Estimated Output Temp	100°f	(38°C)
Air Flow	32,000 cfm	(906 cmm)
Time in Cooling Zone (At 2 Cycles Per Minute)	17 Min.	

FEATURES

- Heat is contained within the walls of the machine.
- Vertical design minimizes floor space requirement.
- Minimize casting damage during the cooling cycle.
- Operation is light curtain protected.
- Loading/unloading stations are at ergonomically friendly positions.
- Easy maintenance access.

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INCH {MM}

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221 [5,607.05]

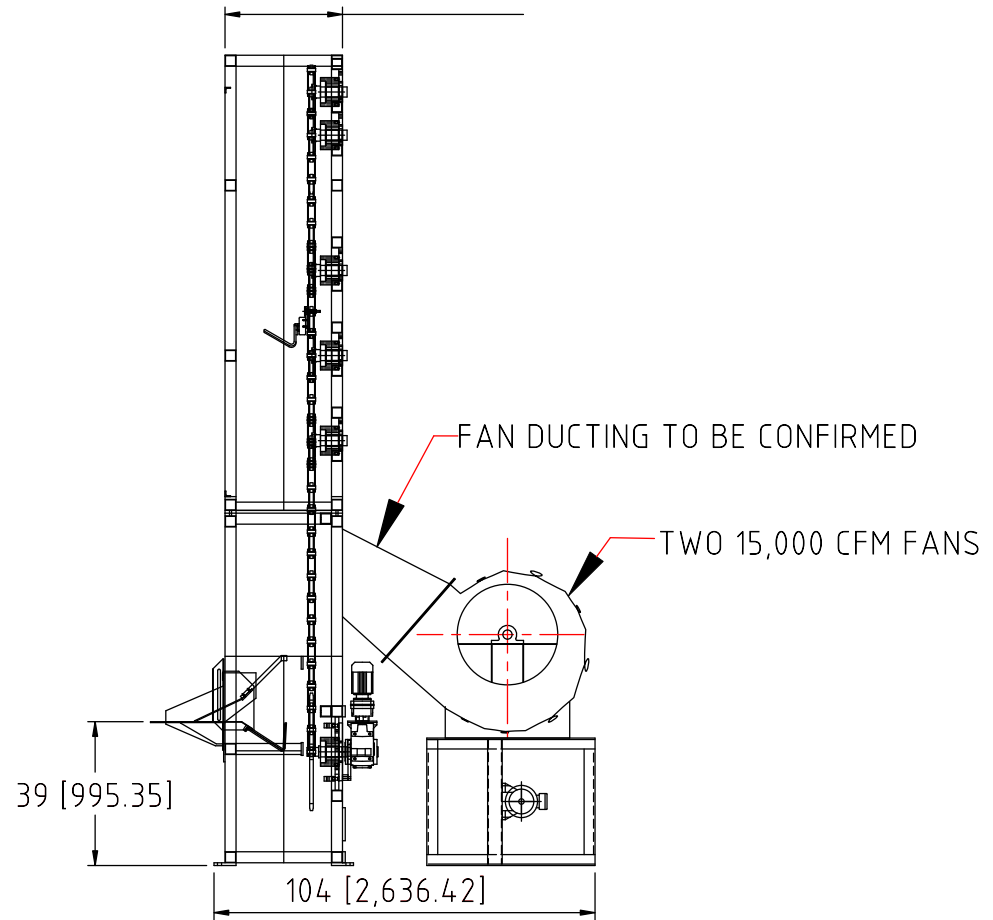
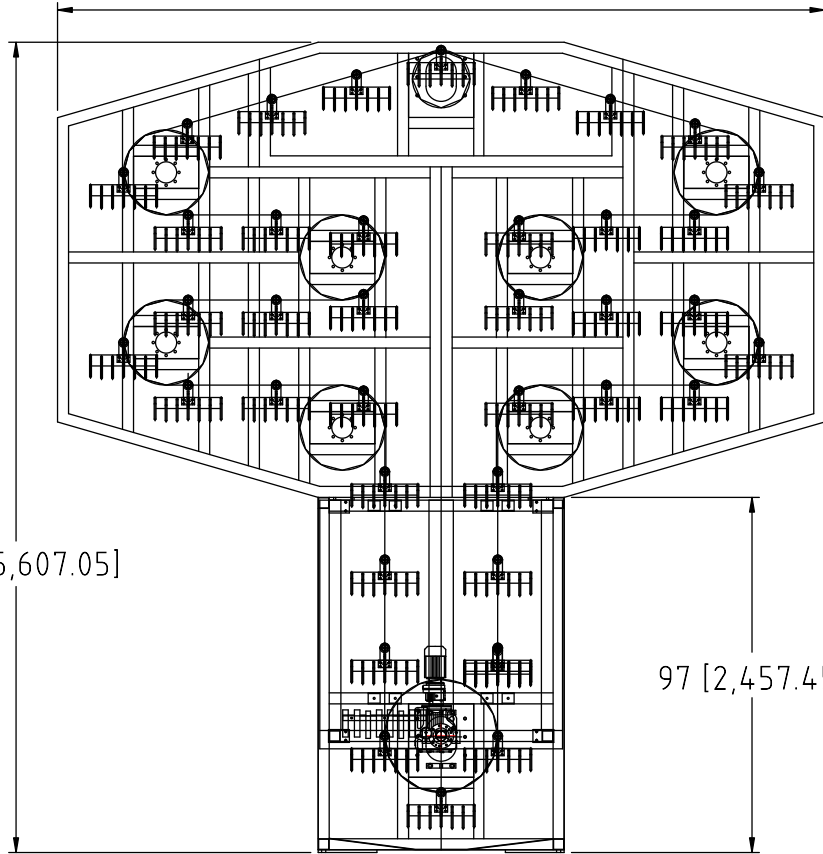
97 [2,457.45]

39 [995.35]

104 [2,636.42]

FAN DUCTING TO BE CONFIRMED

TWO 15,000 CFM FANS



AUTOMATIC SAWING MACHINE

HALL



SPECIFICATIONS

Horsepower 25 HP Motor
Blade Size 12" Dia.
Blade Speed @ 60 HZ 11,000 ft/min.
Functions: Inspection, Sawing, Sorting

Eight station indexing rotary table provides for loading, risergaging, engraving, sawing, ejection/sorting , and fixture cleaning.

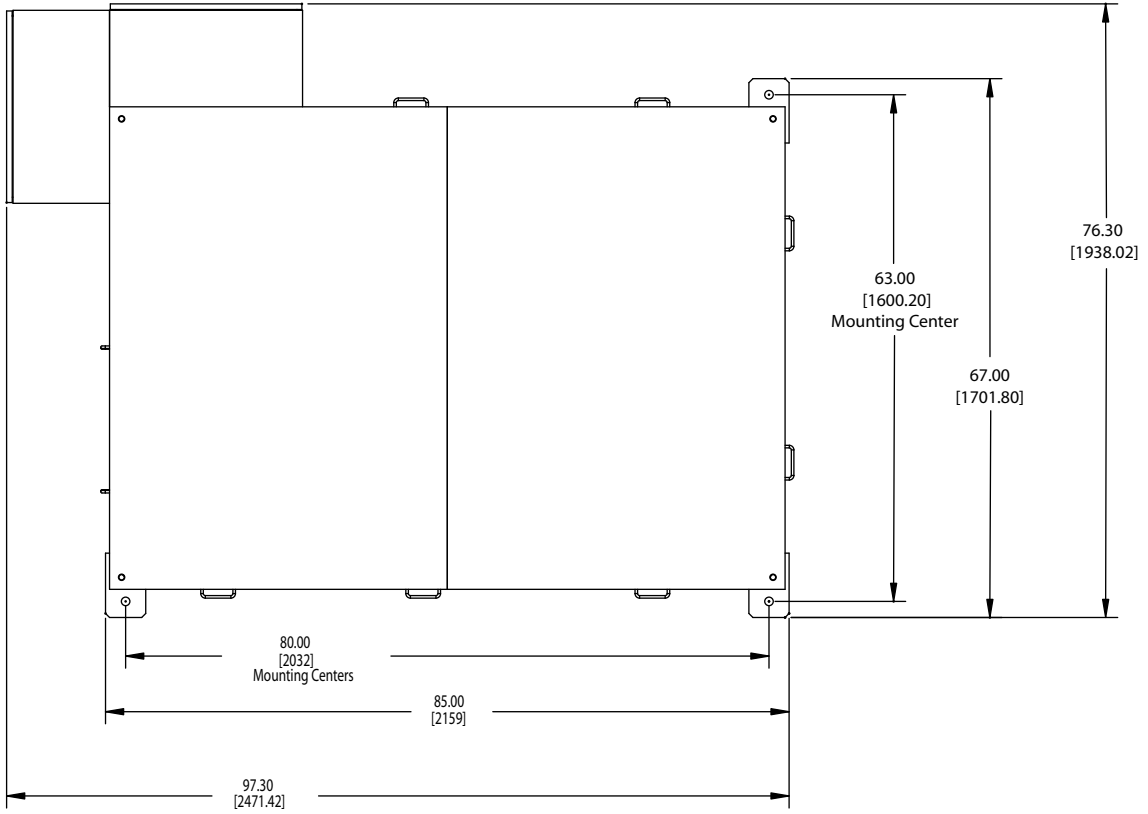
FEATURES

In keeping with our continued commitment to meet the needs of our customers and offer accessories that increase efficiency and reduce production costs we, have developed the Automatic Sawing Machine. Although each casting's sawing requirements are different, CMH has the capability to design and build a system to fit your needs.

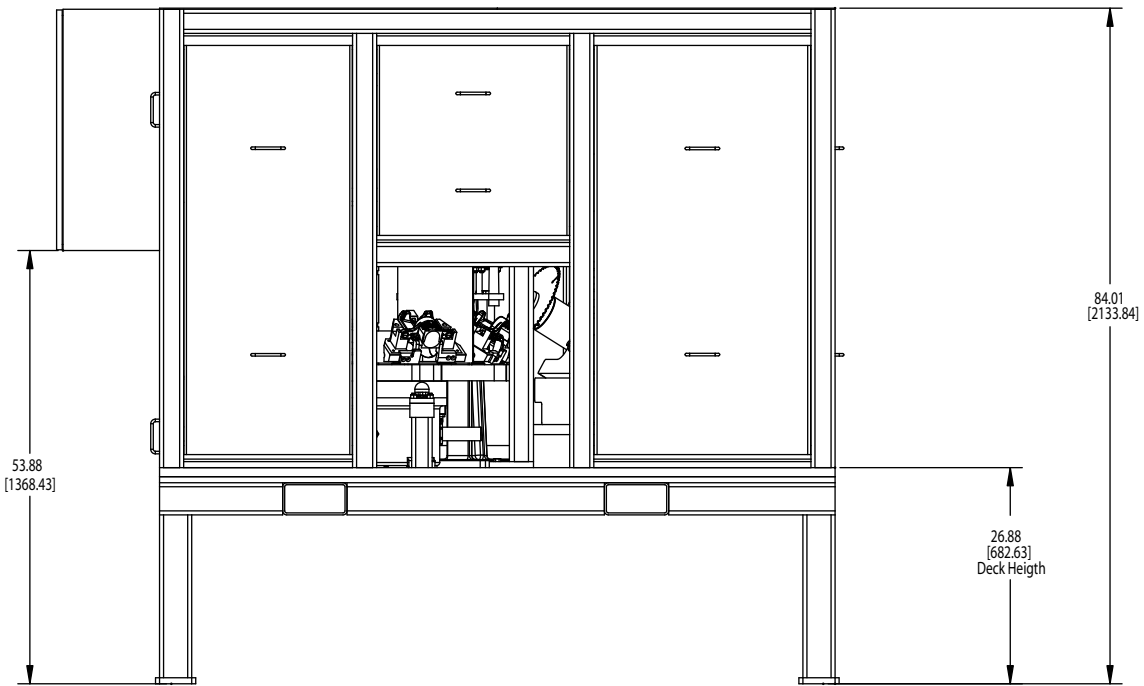
The **HALL** Automatic Sawing Machine is designed and constructed to handle the rigors of the foundry environment. The main structure is fabricated of heavy wall structural steel and key components are cast iron to reduce vibration.

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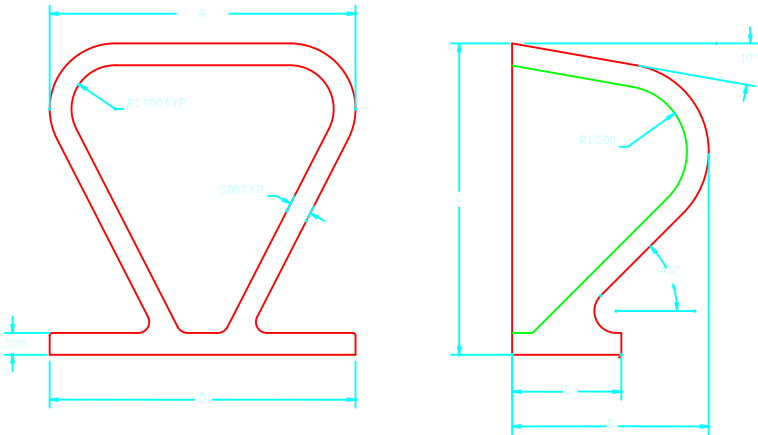
Key
Inch [mm]



POURING CUPS

HALL

Pouring cups are made from 30 class gray iron. The pouring angle is 45°, so that mold filling is complete at 45° of machine tilt. Whether used with **HALL** programmable tilt or standard tilt, these cups produce quality permanent mold castings.



* Custom sizes & specials are available on request

Part Number	Aluminum Capacity	A	B	C	D	E	Unit Weight
CUP-15	1.5 lbs. (0.68kg)	4.38 (11.13cm)	3.38 (8.59cm)	5.50 (13.97cm)	5.00 (12.70cm)	2.50 (6.35cm)	6.8 lbs. (3.1kg)
CUP-20	2.0 lbs. (0.91kg)	5.13 (13.03cm)	3.63 (9.22cm)	5.88 (14.94cm)	5.00 (12.70cm)	2.50 (6.35cm)	7.5 lbs. (3.4kg)
CUP-30	3.0 lbs. (1.36kg)	6.13 (15.57cm)	4.00 (10.16cm)	6.50 (16.51cm)	7.00 (17.78cm)	2.50 (6.35cm)	10.5 lbs. (4.8kg)
CUP-40	4.0 lbs. (1.82kg)	6.75 (17.15cm)	4.38 (11.13cm)	6.88 (17.48cm)	7.00 (17.78cm)	2.50 (6.35cm)	11.8 lbs. (5.4kg)
CUP-50	5.0 lbs. (2.27kg)	7.00 (17.78cm)	4.50 (11.43cm)	7.13 (18.11cm)	7.00 (17.78cm)	2.50 (6.35cm)	12.5 lbs. (5.7kg)
CUP-60	6.0 lbs. (2.72kg)	8.25 (20.96cm)	4.88 (12.40cm)	7.63 (19.38cm)	7.00 (17.78cm)	2.50 (6.35cm)	15.0 lbs. (6.8kg)
CUP-90	9.0 lbs. (4.09kg)	9.00 (22.86cm)	5.50 (13.97cm)	8.38 (21.29cm)	7.00 (17.78cm)	2.50 (6.35cm)	18.0 lbs. (8.2kg)
CUP-120	12.0 lbs. (5.46kg)	9.63 (24.46cm)	6.00 (15.24cm)	9.25 (23.50cm)	7.00 (17.78cm)	2.50 (6.35cm)	20.4 lbs. (9.3kg)
CUP-150	15.0 lbs. (6.82kg)	10.88 (27.64cm)	7.00 (17.78cm)	9.50 (24.13cm)	7.00 (17.78cm)	2.50 (6.35cm)	24.0 lbs. (10.9kg)
CUP-200	20.0 lbs. (9.09kg)	10.00 (25.40cm)	6.75 (17.15cm)	11.63 (29.54cm)	9.00 (22.86cm)	4.50 (11.43cm)	36.0 lbs. (16.3kg)
CUP-250	25.0 lbs. (11.36kg)	10.00 (25.40cm)	6.75 (17.15cm)	12.88 (32.72cm)	9.00 (22.86cm)	4.50 (11.43cm)	40.5 lbs. (18.4kg)
CUP-300	30.0 lbs. (13.63kg)	10.00 (25.40cm)	6.75 (17.15cm)	14.25 (36.19cm)	9.00 (22.86cm)	4.50 (11.43cm)	44.2 lbs. (20.0kg)
CUP-400	40.0 lbs. (18.18kg)	10.00 (25.40cm)	6.75 (17.15cm)	18.50 (46.99cm)	9.00 (22.86cm)	4.50 (11.43cm)	59.0 lbs. (26.8kg)
CUP-600	60.0 lbs. (27.27kg)	11.38 (28.91cm)	7.00 (17.78cm)	17.50 (45.09cm)	11.00 (27.94cm)	4.50 (11.43cm)	61.5 lbs. (27.9kg)
CUP-800	80.0 lbs. (36.36kg)	16.00 (40.64cm)	7.00 (17.78cm)	17.50 (44.45cm)	15.00 (38.10cm)	4.50 (11.43cm)	78.5 lbs. (35.6kg)

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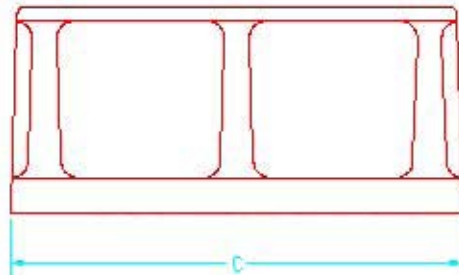
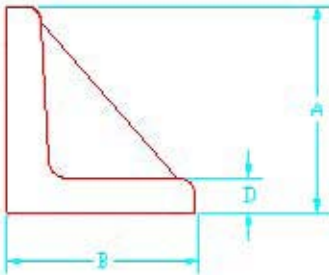
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BACK PLATES

HALL

Back plates are made from 30 class gray iron and are designed to be used with **HALL** pouring cups.



Part Number	Cup Capacity	A	B	C	D	Unit Weight
CUP A-15	1.5 - 2.0 lbs. (0.7 - 0.9 kg)	2.50 (6.35cm)	2.00 (5.08cm)	4.50 (11.43cm)	.25 (0.64cm)	2.4 lbs. (1.1kg)
CUP A-30	3.0 - 9.0 lbs. (1.4 - 4.1 kg)	3.00 (7.62cm)	2.75 (6.99cm)	6.63 (16.84cm)	.50 (1.27cm)	5.5 lbs. (2.5kg)
CUP A-120	12 - 25 lbs. (5.4 - 11.3 kg)	4.25 (10.80cm)	3.25 (8.26cm)	7.63 (19.38cm)	.50 (1.27cm)	9.0 lbs. (4.1kg)
CUP A-300	30 - 60 lbs. (13.6 - 27.2 kg)	6.13 (15.57cm)	3.25 (8.26cm)	9.25 (23.50cm)	.50 (1.27cm)	15.0 lbs. (6.8kg)

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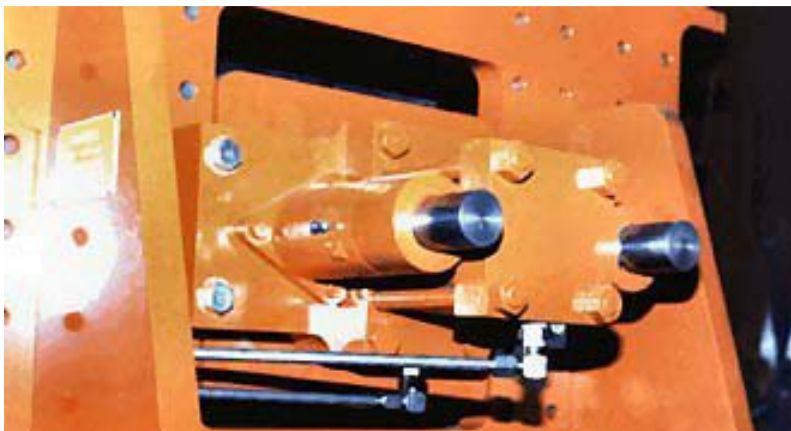
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TIE BAR EXTENSIONS



Extend tie bars up or out to clear irregular shaped or odd sized molds. Available 12" high for the #2 series or 15" high for the #3 and #6 series.

FRONT EJECTOR



Ejects parts or operates core pulls from the stationary platen. Special modifications are available.

	#2	#3	#6
Bore	4 in (10.16 cm)	5 in (12.70 cm)	5 in (12.70 cm)
Force	18,000 lbf (80,068.0 N)	30,000 lbf (133,446.6 N)	60,000 lbf (266,893.32 N)
Stroke	2 in (5.08 cm)	2 in (5.08 cm)	3 in (7.62 cm)

VACUUM ASSISTED MOLD VENTING



HALL casting machines can be equipped with vacuum assisted mold venting. The heart of the system is the air driven vacuum pumps. These pumps can be plumbed to the coreprints in your mold to aggressively remove core gasses in semi-permanent mold casting. The cycle can be managed by the **HALL** PLC control.

TEST BAR MOLD

FEATURES

- * Complies with ASTM B108-02
- * CNC machined from class 30 gray iron.
- * Optional digital temperature read out available.
- * Portable
- * Weight 150 lbs. (68 kg)



SPECTROGRAPHIC COUPON MOLD

FEATURES

- * CNC machined from A36 steel
- * Heat dissipating handle
- * Homogeneous element distribution within the sample
- * Depressed center to aid lathe machining
- * Easy sample removal
- * Portable
- * Weight 7 lbs (3 kg)



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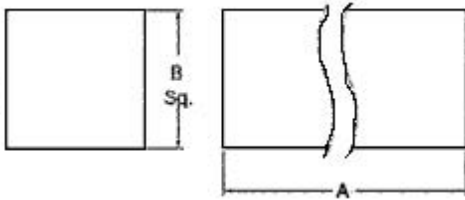
MOUNT RAILS & SPACERS

HALL



Do you have existing molds that run on a mount rail machine? **CMH** can adapt our time proven #6H to run these molds with more stroke and ejection clearance than the standard machines. See #6H for machine specifications.

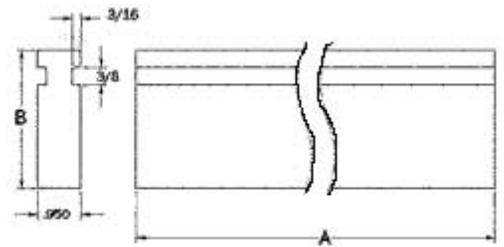
REPLACEMENT MOUNT RAILS AND SPACERS



Key Mount Rail

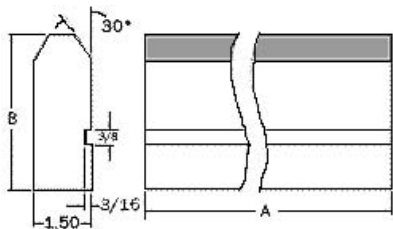
Product Number	A	B	Unit Weight
KEY-30	29 7/8in (75.88cm)	3/8in (0.95cm)	1.3lbs (0.58kg)
KEY-40	39 7/8in (101.28cm)	3/8in (0.95cm)	1.7lbs (0.77kg)

* Mold mount rails and keys are designed for mounting permanent molds in
 30 x 30in (76.2 x 76.2cm)
 36 x 36in (91.45 x 91.45cm)
 42 x 42in (106.68 x 106.68cm)
 48 x 60in (121.92 x 152.4cm)
 tiltpour casting machines.



Spacer Mount Rail

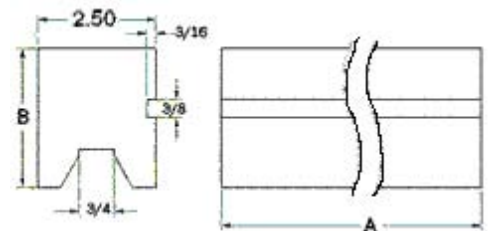
Product Number	A	B	Unit Weight
SPACER-30	29 7/8in (75.88cm)	3.0in (7.62cm)	24lbs (10.8kg)
SPACER-40	39 7/8in (101.28cm)	3.0 (7.62cm)	32lbs (14.5kg)



Top Rail

* Rails are ground and machined on all surfaces.

Product Number	A	B	Unit Weight
TRAIL-30	29 7/8in (75.88cm)	4.0in (10.1cm)	48lbs (21.7kg)
TRAIL-40	39 7/8in (101.28cm)	4.0in (10.1cm)	64lbs (29kg)



Bottom Rail

Product Number	A	B	Unit Weight
BRAIL-30	29 7/8in (75.88cm)	3.0in (7.62cm)	54lbs (24.5kg)
BRAIL-40	39 7/8in (101.28cm)	3.0in (7.62cm)	74lbs (33.5kg)

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VAC-U-CHECK

HALL

Hydrogen is our friend or foe. Depending on the type of casting you produce, hydrogen absorption by molten aluminum can be helpful or harmful.

With the **HALL** VAC-U-CHECK you are assured a quick, simple, economical, and accurate method of monitoring the hydrogen level in your melt.

A vacuum solidified sample exaggerates the hole size, making the analysis of gas in the sample easy to determine by visual methods or by using the specific gravity formula.

The use of a VAC-U-CHECK unit is simple. Dip a 1/4 pound molten aluminum sample from your furnace. Place the sample in the vacuum chamber for solidification. After the sample is cool, saw it in half for a visual inspection or weigh the sample in air and water to determine the true specific gravity.

Should your castings be at the premium level, a minimum amount of gas is required. If you are producing a commercial casting, a small amount of gas can be helpful in reducing shrinkage, thus simplifying gating, risering, chill usage, and improving yield. See the samples above and note shrinkage difference in the sample solidified in air.

Contact us for more information.

SOLIDIFIED IN
VACUUM



SOLIDIFIED
IN AIR



Low Gas
0.1%
2.60 SG



Moderate Gas
5.7%
2.38 SG



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LUBRICANTS

HALL



CMH recommends that you lubricate your waybars weekly with a dry lubricant such as Dri-Slide. Dri-Slide is a formulation of Molybdenum Disulfide and Graphite with rust and corrosion inhibitors.

Technical Data

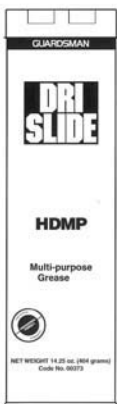
Appearance	Black Liquid
Carrier	Mineral Spirits
Peak Temp.	1000°F (538° C)
Low Temp.	-20°F (-29°C)
Specific Gravity	0.86
Flash Point	114°F (45.6°C)
Wt. Per Gallon US	7.1 lbs. (3.2 kg)

Features

- No oily or greasy residue
- Wide temperature range
- Contains corrosion inhibitor
- Low viscosity carrier
- Contains no ozone depleters
- Available in plastic bottles or aerosol can.



Packing	Product #	Qty. Per Case	Shipping Wt.
4 fl.oz. (118.3 ml) Bottle	DSL 201	12	4 lbs. (1.8kg)
4 fl.oz. (118.3 ml) Bottle/Needle	DSL 250	12	5 lbs. (2.3kg)
5 1/4 (155.3 ml) oz. Aerosol	DSL 903	12	7 lbs (3.2kg)
32 oz. (0.95 L) Metal Can	DSL 321	12	27 lbs (12.2kg)
1 Gal. US (3.8 L) Metal Can	DSL 325	6	49 lbs. (22.2kg)



CMH Recommends that bearings be lubricated with a lithium detergent grease. Dri-Slide HDMP grease is a lithium complex grease with molybdenum disulfide added. NLI grade 2. Temperature range 0° to 300°F (-17.8 to 149°C). Available in 14 1/2 oz. (428.81 ml) cartridges. Six cartridges per case. Shipping weight is 7 lbs (3.1 kg) per case. (Name brand might be substituted due to availability)

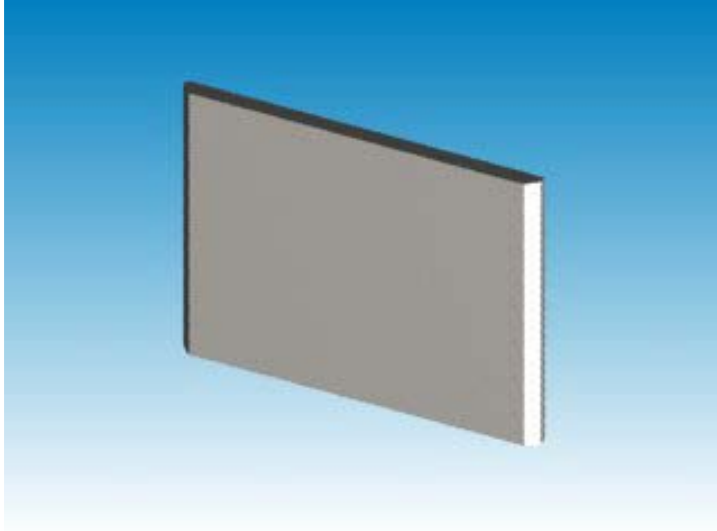
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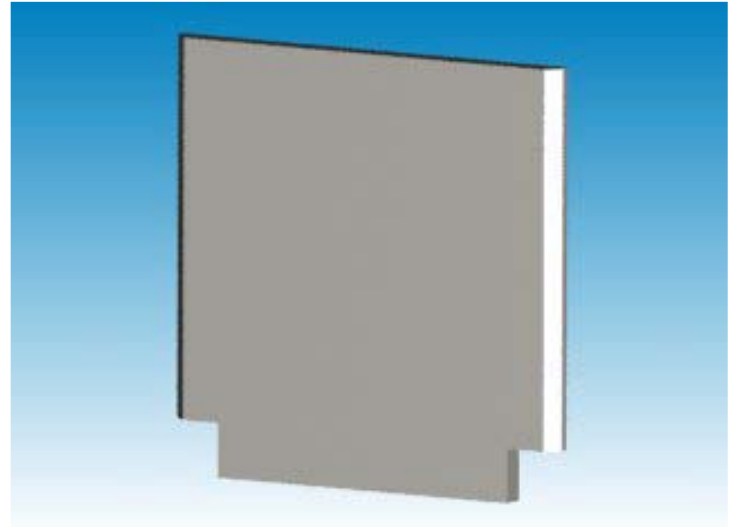
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MOUNT PLATES

HALL



Standard

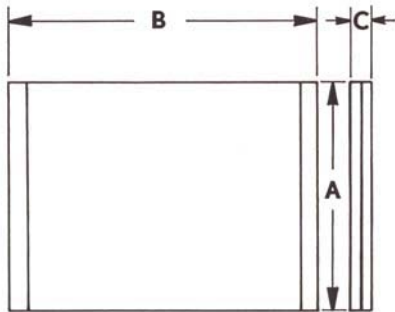


Oversized

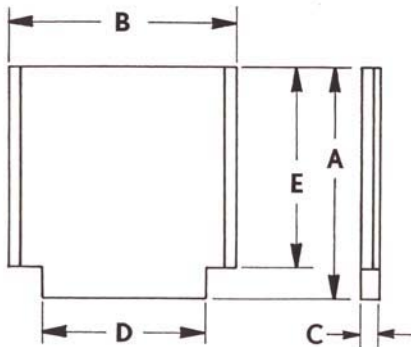
Standard size Mount Plates are used for mounting permanent molds. However, if larger size mount plates are needed we suggest you consider our oversize mount plates which are designed for "extra long" molds.

Oversize Mold Mount Plates should be used when additional mold mounting surface is needed above or below standard mount plates.

Mold Mount Plates are fully machined and ground on all surfaces from carbon steel plate.



Product Number	Machine Size	A	B	C	Unit Weight
95986	8 x 12in (20.32 x 30.48cm)	8in (20.32cm)	11 7/8in (30.16cm)	3/4in (1.91cm)	19.2lbs. (8.7kg)
95987	12 x 18in (30.48 x 45.72cm)	12in (30.48cm)	17 7/8in (45.40cm)	1in (2.54cm)	60lbs (27.2kg)
95988	18 x 24in (45.72 x 60.96cm)	18in (45.72cm)	23 7/8in (60.64cm)	1 1/4in (3.18cm)	156lbs (70.8kg)
95992	24 x 30in (60.96 x 76.20cm)	24in (60.96cm)	29 7/8in (75.88cm)	1 1/4in (3.18cm)	254lbs (111.1kg)
95898	12 x 18in (30.48 x 45.72cm)	12in (30.48cm)	17 7/8in (45.40cm)	1 1/2in (3.81cm)	93lbs (42.1kg)
82335	18 x 24in (45.72 x 60.96cm)	18in (45.72cm)	23 7/8in (60.64cm)	1 1/2in (3.81cm)	171lbs (77.6kg)



Product Number	Machine Size	A	B	C	D	E	Unit Weight
95991	12 x 18in (30.48 x 45.72cm)	12in (30.48cm)	17 7/8 (45.40cm)	1in (2.54cm)	12in (30.48cm)	15in (38.10cm)	86lbs (39kg)
95989	18 x 24in (45.72 x 60.96cm)	18in (45.72cm)	23 7/8in (60.64cm)	1 1/4in (3.18cm)	18in (45.72cm)	21in (53.32cm)	181lbs (82.1kg)
95993	24 x 30in (60.96 x 76.20cm)	24in (60.96cm)	29 7/8in (75.88cm)	1 1/4in (3.18cm)	24in (60.96cm)	27in (65.88cm)	307lbs (139.2kg)
86722	12 x 18in (30.48 x 45.72cm)	12in (30.48cm)	17 7/8 (45.40cm)	1 1/2in (3.81cm)	12in (30.48cm)	15in (38.10cm)	129lbs (58.5kg)
82336	18 x 24in (45.72 x 60.96cm)	24in (60.96cm)	23 7/8in (60.64cm)	1 1/2in (3.81cm)	18in (45.72cm)	21in (53.32cm)	236lbs (107kg)

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HALL



CMH Manufacturing Co. uses the latest in CNC machining and computer aided engineering to help us meet our customers demanding needs. Software supported includes:

- * AutoCAD
- * Solidworks
- * Control Logix
- * MasterCAM
- * RSLogix 500
- * Rockwell Panel Builder

Our current facility utilizes 51,100 sq. ft./4,750 sq meters of manufacturing space.

We can provide design, engineering and manufacturing services for everything from a single casting machine to a complete foundry, including your molds and coreboxes.



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