

HYDRAULIC PRESS MANUAL

Abstract

This document is the user manual of the manually operated hydraulic press. It includes a lot of chapters that discuss safety extensively. There is also a detailed potential hazards analysis.

Finally, the data sheet of both the pump and cylinder are attached with all the key dimensions in metric units.



Contents

Introduction.....	2
Identified Risks and Hazard	2
Pre-operational Safety	2
Operating Safety Precautions	3
Operating Safety Precautions	3
Safe Work Zones	4
Operating Procedures and Precautions.....	5
Job Safety Analysis	6
Job Hazard Analysis.....	8
Cylinder datasheet	10
Specifications	10
Dimensions.....	11
Pump datasheet.....	12
Specifications.....	12
Dimensions.....	13
Dimensions of the structure.....	14
Isometric view of the assembly.....	15

Hydraulic Press - Manual

Introduction | Risks & Hazards | Pre-operational Safety
Operating Safety | Maintenance | Operating Procedures



Introduction

The information contained in this SOP is general in nature. It is advised that operators are referred to the relevant manufacturer's manual for specific operating information.

The hydraulic press has variety of uses, ideal for removing and installing bushes, ball joints, bearings, gears, pulleys etc.

The hydraulic remand pump unit are also easily used for other pressing jobs outside in the workshop such as straightening or bending.

The press is supplied with a pressure gauge, two heavy duty pressing plates.



Identified Risks and Hazard

Specific hazards that may arise when using a hydraulic press include:

- Hands can become caught under the hydraulic remand work piece and sustain a crush injury.
- The work piece can be ejected under pressure and cause as tricking injury.
- The work piece can shatter causing fragments to cause puncture wounds and lacerations



Pre-operational Safety

The following safety checks and precaution should be carried out when preparing to set up, operate or maintain a hydraulic press:

Always gain a demonstration of the pressing operation from the supervisor before using the hydraulic press

Operators must obtain training and instruction in the safe and proper use of the hydraulic press.

Test the press before using. Pump the handle a few times lower the ram to halfway. If the ram does not begin to lower after a few pumps, check to make sure the release valve is tight. Release the valve to raise the ram.

Prepare the work are properly. The work area should be clean and free of scrap metal and other obstacles

Thoroughly inspect the press for damage or wear before each use. Briefly test the operation of the unloaded ram before using to press any job.

If the press is damaged or malfunctioning don't use it. Notify your supervisor.

Make sure all other persons are clear of the work area. Clear all obstructions from the work area around the press.

Ensure the press is situating on a solid, level floor surface. Uneven or sloped surfaces can create hazardous working conditions.

Safe Operating Procedures



Operating Safety Precautions

Don't exceed the working load limit of the press. This Press is intended For pressing, bending and straightening purposes only. Don't use for any other purpose.

Never use the press to compress springs or other objects that could be ejected from the press. Do not compress objects that could shatter.

The press is not a vice. No work should be under taken on the work piece while it is being held by the press. This would create a potentially hazardous situation.

Inspect the position of the press, plate and the plates, making sure they are centered and properly engaging the work piece.

Never put a part of your body between the hydraulic ram and the work piece.

Always wear safety glasses and a face shield.

Make sure all other persons keep clear of the work are at all times.

It is potentially dangerous for one person to insert the work piece while another person operates the press lever handle.

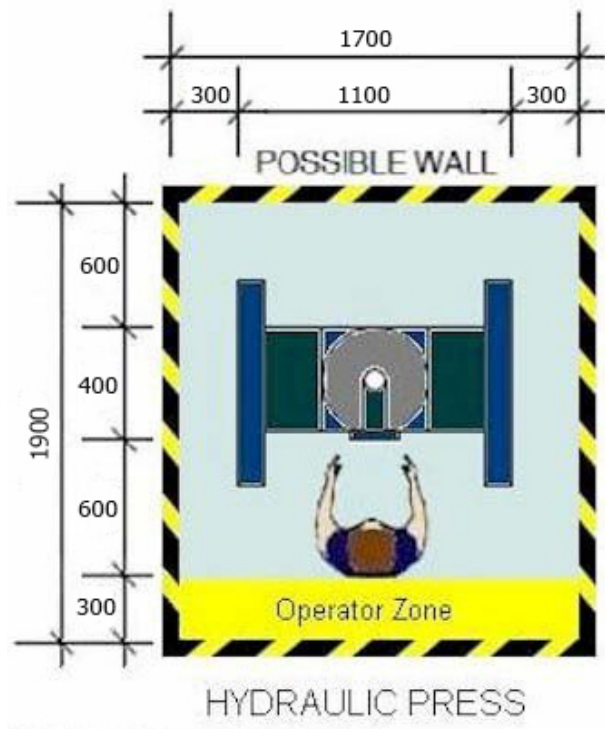


Operating Safety Precautions

The oil level of the press will need to be monitored and checked regularly. This and any addition of oil will be carried out as part of a maintenance schedule by a qualified person.

The press should be wiped clean with a cloth. Do not use solvents or abrasive cleaners as they may cause deterioration of the hydraulic seals.

Store the press with the pressure fully released. Remove the lever handle.



Safe Operating Procedures



Operating Procedures and Precautions

The lever handle is the pressure supply source and is manually operated with an up and down motion.

Always keep the release valve lever firmly closed when operating the press.

By turning the valve lever, to control the direction of the hydraulic flow, the ram can be adjusted into or out of the piston assembly.

It is advisable to raise the table one or two sets of holes rather than running the ram out to its limit of travel. Ensure the table is as close as possible to the ram and support pins are correctly positioned.

Adjust the press plate to the desired height. Consider a comfortable height for the operator and the distance of travel of the ram.

Lock the release valve lever. Slowly pump the handle until the press plate just begins to contact the work piece.

Inspect the position of the press plate, making sure they are centered and properly engaging the work piece.

Continue pumping the lever handle until the press has completed the required operation.

Watch the work piece position as the press is applying pressure. Be sure there is no danger of slipping off or 'forcing out' of the work piece. If there is, release the pressure and re-align the work piece.

On completion, release the pressure and be aware the work piece may move when pressure is released.

Safe Operating Procedures



Job Safety Analysis

Title	Work Task	Hazards	Controls
<p>Prewrite Tasks</p>	<p>Read over the operator's manual found here: http://www.dakecorp.com/uploads/pdfs/manuals/25H.pdf</p> <p>Don PPE (Safety glasses, leather or fabric gloves)</p> <p>Check the machine to ensure all hydraulic lines are good and pressure is relieved on the line before work starts</p> <p>Ensure parts are properly lubricated</p> <p>Ensure all parts are where they need to be and settings are proper for the job being performed</p>	<p>Pinch hazards from converging parts</p> <p>Hydraulic Fluid or Oil leaks</p> <p>Broken lines or pressure gauge</p> <p>Improper settings for job about to be performed</p> <p>Dropping material onto feet</p> <p>Lack of machine guards</p>	<p>Keep fingers out of any potential pinch zones and out of the way of moving parts</p> <p>Check lines and machine for any holes, puddles under the machine, or lack of oil or hydraulic fluid</p> <p>Check pressure gauge to see if it moves with the addition of pressure</p> <p>Make sure the machine is set to the proper specifications for the job being performed</p> <p>Steel toe shoes to mitigate injury from dropping material</p> <p>Add or adjust machine guards before doing any work</p>
<p>Using the press</p>	<p>Place and lock down the material that is about to be pressed</p> <p>Start moving lever up and down to get nose piece over desired area</p> <p>Continue to press until the desired outcome is achieved</p>	<p>Pinch hazards from moving parts</p> <p>Flying debris hazards from the pressure being put on the material being pressed</p> <p>Dropping/Falling material</p>	<p>Keep body parts away from press area while the machine is working</p> <p>Pay attention while working on the press</p> <p>Have machine guards in place and wear eye protection</p> <p>Steel toe shoes to protect feet from falling material</p>

Title	Work Task	Hazards	Controls
Clean Up/Finish Work	<p>Remove the pressure from the press by twisting the relief valve. Make sure the gauge is reading 0 and all pressure is gone. This will free the material from the press and allow the worker to grab it</p> <p>Place the press back into its normal position and store parts in their proper location</p> <p>Doff PPE (gloves and safety glasses)</p>	<p>Pinch hazards from moving parts</p> <p>Hydraulic fluid/oil spill</p> <p>Line break from over pressurization</p> <p>Dropping/falling material</p>	<p>Ensure all steps are taken and pressure is off lines before putting hand into the work area</p> <p>Inspect lines after work to see if any leakage had occurred while line was pressurized</p> <p>Keep safety glasses and gloves on until all steps are complete</p> <p>Steel toe shoes to protect feet from falling material</p>
Training	Employees must have hands on training in the proper use of this piece of equipment.	Supervisor is to fill out the turn in the form to UNC-CH Environment, Health and Safety and 'Supervisor Led Training Form' for documentation of proper training	



Job Hazard Analysis

Hazard Type(s) Associated with Task or Assignment:		Check for Exposure:	Specific Hazard Exposure:	Check if Exposure Recommends or Requires a Style of PPE?
1	Impact <u>Example:</u> Person(s) can strike an object, or be struck by a moving or flying/falling object (e.g., fragments, chips, particles, sand, dirt/debris).	X	Potential exposure to flying fragments, particles, debris and other ejection hazards generated from hydraulic press operations (e.g., injuries to eyes, head, torso, and upper extremities)	X
2	Penetration or Cut <u>Example:</u> Person(s) can strike an object, be struck by an object, or fall upon an object or tool that would cut or otherwise break the skin.	X	Potential exposure to cuts and abrasions when handling metal pieces with rough or sharp edges (e.g., hand and finger injuries).	X
3	Crush or Pinch <u>Example:</u> An object(s) or equipment/machine may crush or pinch a body or body part	X	Potential exposure to crushing and pinching hazards from dropping metal pieces and fixtures (e.g., injuries to feet)	X
4	Chemical or Harmful Dust <u>Example:</u> Exposure to chemicals (i.e., hazardous substances and harmful physical agents), infectious agents from spills, splashing, physical contact, and/ or exposure to dusts, vapors, fumes, or gases that could cause illness, irritation, burns, asphyxiation, breathing/vision difficulty, sensitization, infection, or other toxic health effects (i.e., acute or chronic). Note: "May also have or create ignition potential."			
5	Heat <u>Example:</u> Exposure to radiant heat sources, sparks, and splashes or spills of hot material			
6	Light (optical) Radiation <u>Example:</u> Exposure to strong light sources, glare, or intense light exposure which is a byproduct or a process. Note: "This category may also include hazards presented from lack of light (e.g., working in dark spaces/areas)."			
7	Electrical Contact <u>Example:</u> Exposure, contact, or proximity to live or potentially live electrical objects.			
8	Ergonomic/ Human Factors <u>Example:</u> Working in cramped spaces, repetitive movements, awkward postures, vibration, heavy lifting, etc... Note: "This category may also include unique hazards presented from tasks that require demanding or challenging degrees of mental and/or physical effort to be exerted by an individual. See <u>Physical Effort Definition/Examples</u> category for further explanation of physical effort."	X	Potential exposure to repetitive movements, lifting light to moderately heavy loads, and bending/twisting (when moving metal pieces) (e.g., Muscular Skeletal Disorders)	
9	Environmental <u>Example:</u> Exposure to noisy environments, hot or cold work environments, poor weather conditions, working at a height, and any other conditions in the workplace that could cause danger, discomfort, and/or negative health effects.			

Personal Protective Equipment Requirements:	
Eyes & Face:	Safety Glasses with Side Shields or Goggles (Required when operating Hydraulic Press)
Head & Ears:	
Whole Body:	
Feet:	Safety Shoes (Required when operating Hydraulic Press)
Hands:	Leather Gloves (Required when handling metal pieces with rough or sharp edges)
Respiratory:	
Other:	

Other Control Measures or Requirements (Engineering & Administrative Controls):

#1) Impact Hazards: Before operating hydraulic press ensure dies and other accessories are positioned and secured correctly. Barrier guarding must be maintained on all hydraulic presses when there is a possibility of materials being ejected from the machine. It is recommended in most hydraulic press operations that the operator stand to the side of the machine; consult your supervisor if you have questions based on the task. **#8)**

Ergonomic Hazards: Personnel should receive Ergonomics training (including warning signs and conditions of ergonomic/human factors hazards). Make sure your grip and footing are secure when using hydraulic presses to prevent strains and slips. **Miscellaneous Considerations:** Operators of tools, equipment, and machinery should read and follow all Manufactures' recommendations/requirements (e.g., inspections, servicing/maintenance, safe usage, etc...). Any tools, equipment, or machinery found damaged, defective, or otherwise unsafe should immediately be removed from service and not used until repaired or replaced. Personnel should always consult their Supervisors on the selection and use of PPE for the tasks being performed.



Cylinder datasheet

Specifications



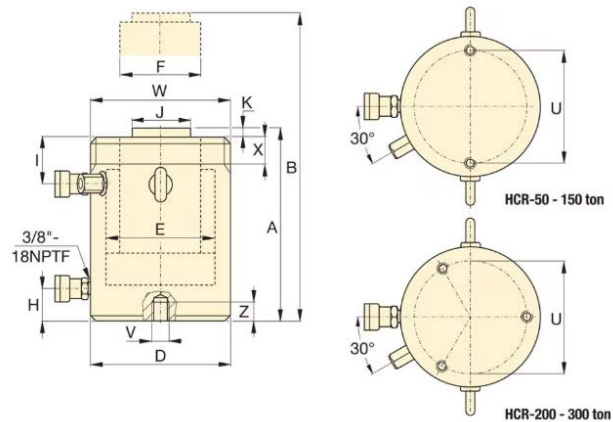
HCR5012, 550 kN Capacity, 300 mm Stroke, Double-Acting, High Tonnage Hydraulic Cylinder

Model: HCR5012 | ECCN: EAR99 | Harmonization: 8412210075
Series: HCR | Product Line: Industrial Tools

- Fast advance and retract
- 7% side-load resistance over full stroke
- Hardened surface resists side-loading and cyclic wear
- Weather protected, inside and out
- Upper and lower replaceable bearings enclose the cylinder plunger for support throughout the stroke
- Certified lifting eyes, base mounting holes and collar threads

Specification	Value
Maximum Operating Pressure (bar)	700
Capacity Class (tonnage)	50
Maximum Cylinder Capacity Advance (kN)	550
Stroke (mm)	300
Collapsed Height A (mm)	446
Extended Height B (mm)	746
Return Type	Double acting, Hydraulic return.
Plunger Type	Solid
Material	Steel
Cylinder Effective Area Advance (cm ²)	78.5
Oil Capacity Advance (cm ³)	2356
Oil Capacity Retract (cm ³)	1202
Side load Resistance of Maximum Capacity (percentage)	7%
Surface Treatment	Nitride
Coupler	CR400 Coupler
Weight (kg)	38

Dimensions



Dimension	Value
Collapsed Height A (mm)	446
Collapsed Height With Optional Tilt Saddle A1 (mm)	460
Optional Tilt Saddle Addition To Collapsed Height A1 (mm)	14
Extended Height B (mm)	746
Outside Diameter D (mm)	130
Cylinder Bore Diameter E (mm)	100
Plunger Diameter F (mm)	70
Base to Advance Port H (mm)	38
Top To Retract Port I (mm)	55
Saddle Diameter J (mm)	50
Saddle Protrusion from Plunger K1 (mm)	3
Saddle Maximum Tilt Angle Radius (degrees)	5
Base Mounting Holes Bolt Circle U (mm)	105
Base Mounting Holes Thread V	M12 x 1.75
Collar Thread Size W	M130 x 2
Collar Thread Length X (mm)	30
Base Mounting Holes Thread Depth Z (mm)	22



Pump datasheet

Specifications

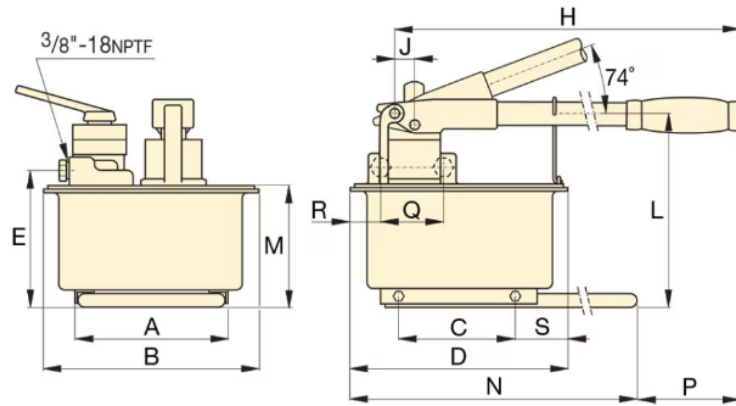


P464, Two Speed, ULTIMA Steel Hydraulic Hand Pump, 7423 cm³ Usable Oil, for use with Double-Acting Cylinders

Ultima Steel Hand Pumps are durable, portable, and highly efficient. Each model in the series features an all-steel construction, a chrome plated plunger, and a wiper system for long-lasting performance.

Specification	Value
Maximum Operating Pressure (bar)	700
Pressure Rating 1st Stage (bar)	14
Pressure Rating 2nd Stage (bar)	700
Cylinder Compatibility	Double-acting
Pump Type	Two Speed
Reservoir Capacity (cm ³)	7423
Usable Oil Capacity (cm ³)	7423
Maximum Flow at Rated Pressure	4.75 cm ³ /Stroke
Oil Displacement Per Stroke 1st Stage (cm ³)	126.20
Oil Displacement Per Stroke 2nd Stage (cm ³)	4.75
Maximum Handle Effort (kg)	49
Piston Stroke (mm)	38.1
Valve Operation	Manual
Power Source	Manual
Weight (kg)	27.7

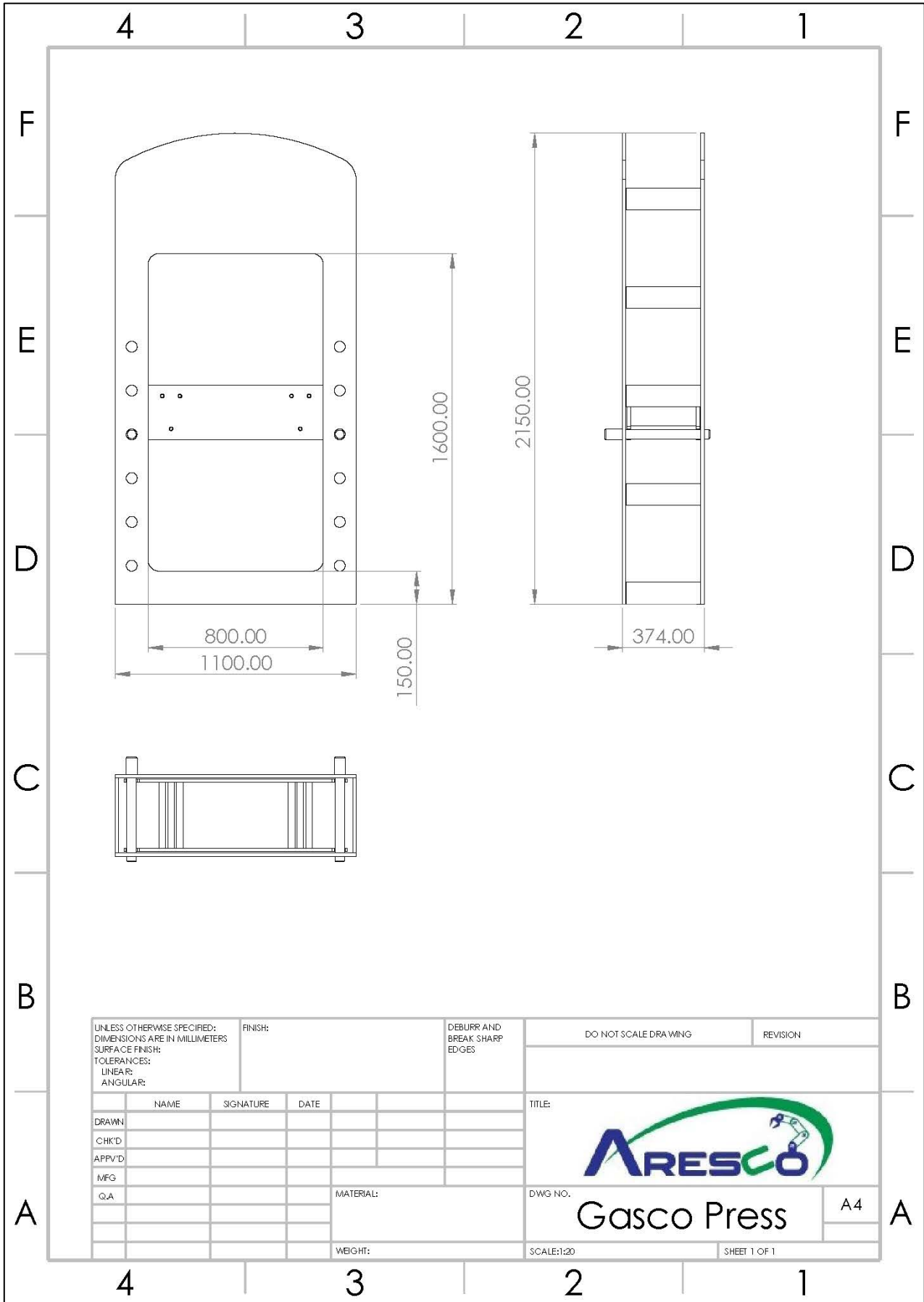
Dimensions




Dimension	Value
Dimension A (mm)	210
Dimension B (mm)	308
Dimension C (mm)	163
Dimension D (mm)	320
Dimension E (mm)	195
Dimension H (mm)	671
Dimension J (mm)	25
Dimension L (mm)	270
Dimension M (mm)	175
Dimension N (mm)	650
Dimension P (mm)	92
Dimension Q (mm)	89
Dimension R (mm)	68
Dimension S (mm)	80



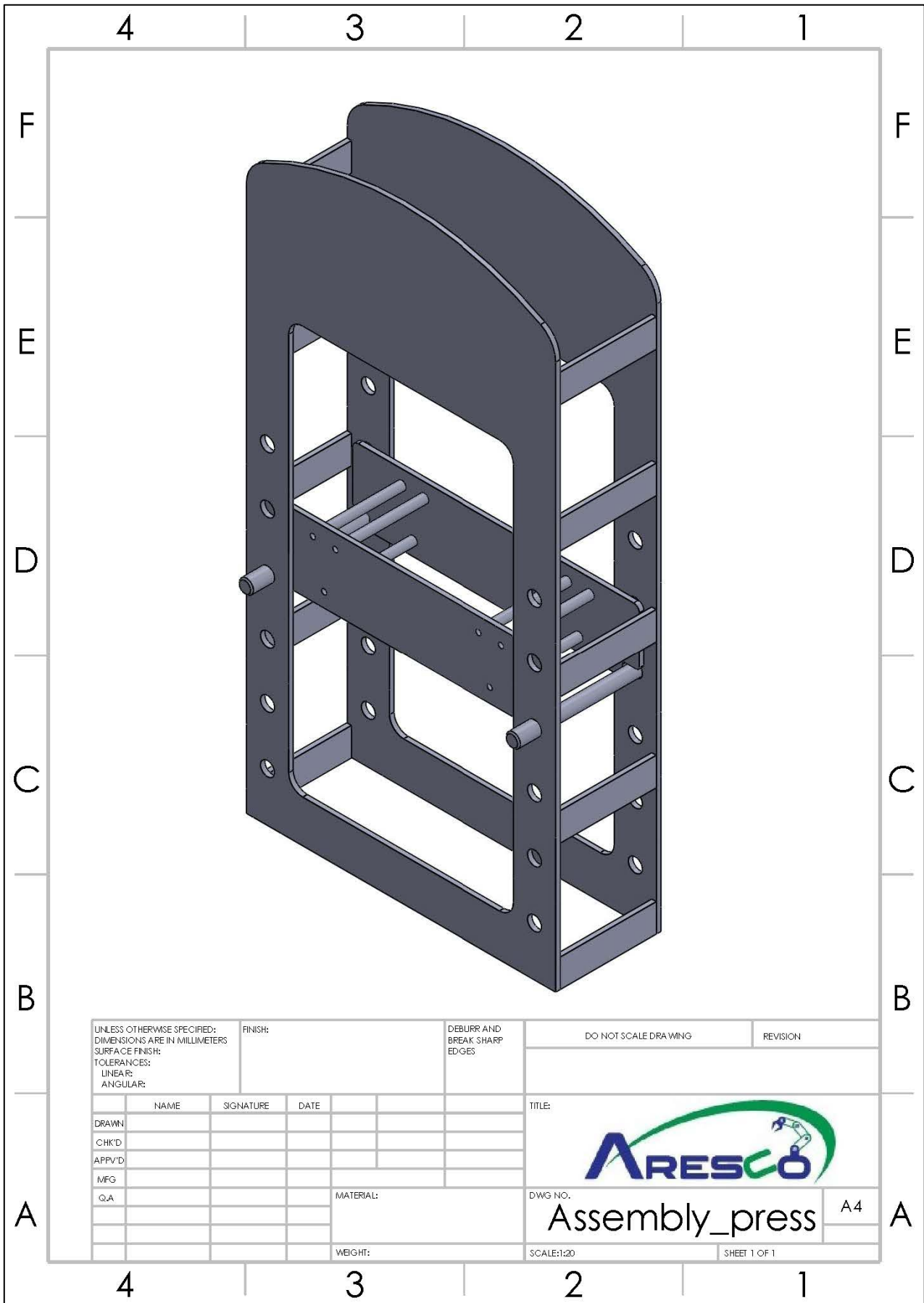
Dimensions of the structure




UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS SURFACE FINISH: TOLERANCES: LINEAR: ANGULAR:			FINISH:		DEBURR AND BREAK SHARP EDGES		DO NOT SCALE DRAWING		REVISION	
DRAWN			SIGNATURE		DATE		TITLE:		 Gasco Press	
CHK'D										
APPV'D										
MFG										
QA										
			MATERIAL:				DWG NO.		A4	
			WEIGHT:				SCALE:1:20		SHEET 1 OF 1	



Isometric view of the assembly



UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS SURFACE FINISH: TOLERANCES: LINEAR: ANGULAR:		FINISH:		DEBURR AND BREAK SHARP EDGES		DO NOT SCALE DRAWING		REVISION	
DRAWN		SIGNATURE		DATE		TITLE:		 DWG NO. Assembly_press A4 SCALE:1:20 SHEET 1 OF 1	
CHK'D									
APPV'D									
MFG									
QA									
				MATERIAL:					
				WEIGHT:					