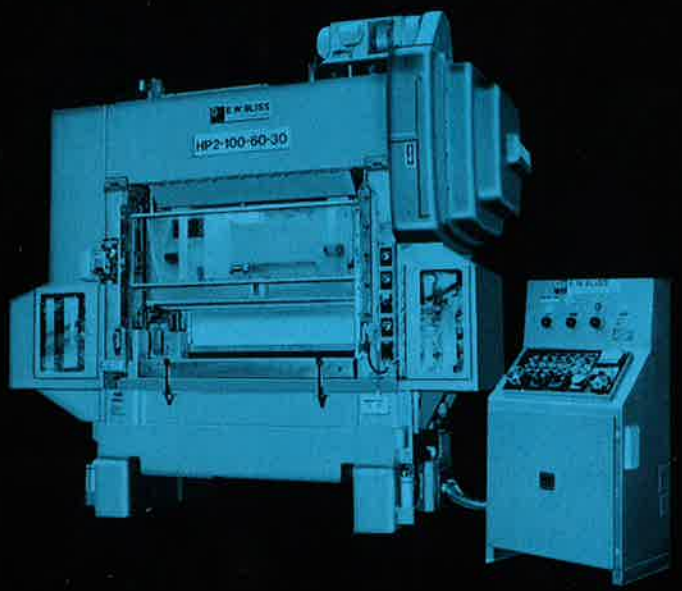
G.W BLISS

High Production Presses

CATALOG 600

CATALOG 600



BLISS SETS THE STANDARD OF VALUE

Bliss value starts with an engineering concept . . .

Bliss's pressbuilding experience far outdates that of all other builders. Even more important, this experience has gone hand in hand with sustained leadership. Since 1857, Bliss has pointed the way in improved press design, better materials, and refinements in manufacturing techniques. The modern Bliss HP2-Series Presses reflect Bliss's long experience and innovative posture in the field of high speed, automated mass production. Since Bliss introduced the first machines of this type, they have been consistently improved until today Bliss HP2 Presses are the fastest, most versatile progressive die machines in the world.

BLISS HP2

. . . defined by an exacting quality assurance program

Quality Assurance at Bliss is a three-part program: pre-production analysis of materials and processing techniques; in-process precision testing; and final inspection, including factory assembly and run-in prior to shipment.

Pre-production Quality Control involves metallurgical tests which determine that proper materials, processing procedures, and surface treatments are used.

In-process Quality Control combines physical checks with non-destructive examinations, such as Ultrasonic, Zyglo, Magnaflux, and laser beam alignment equipment.

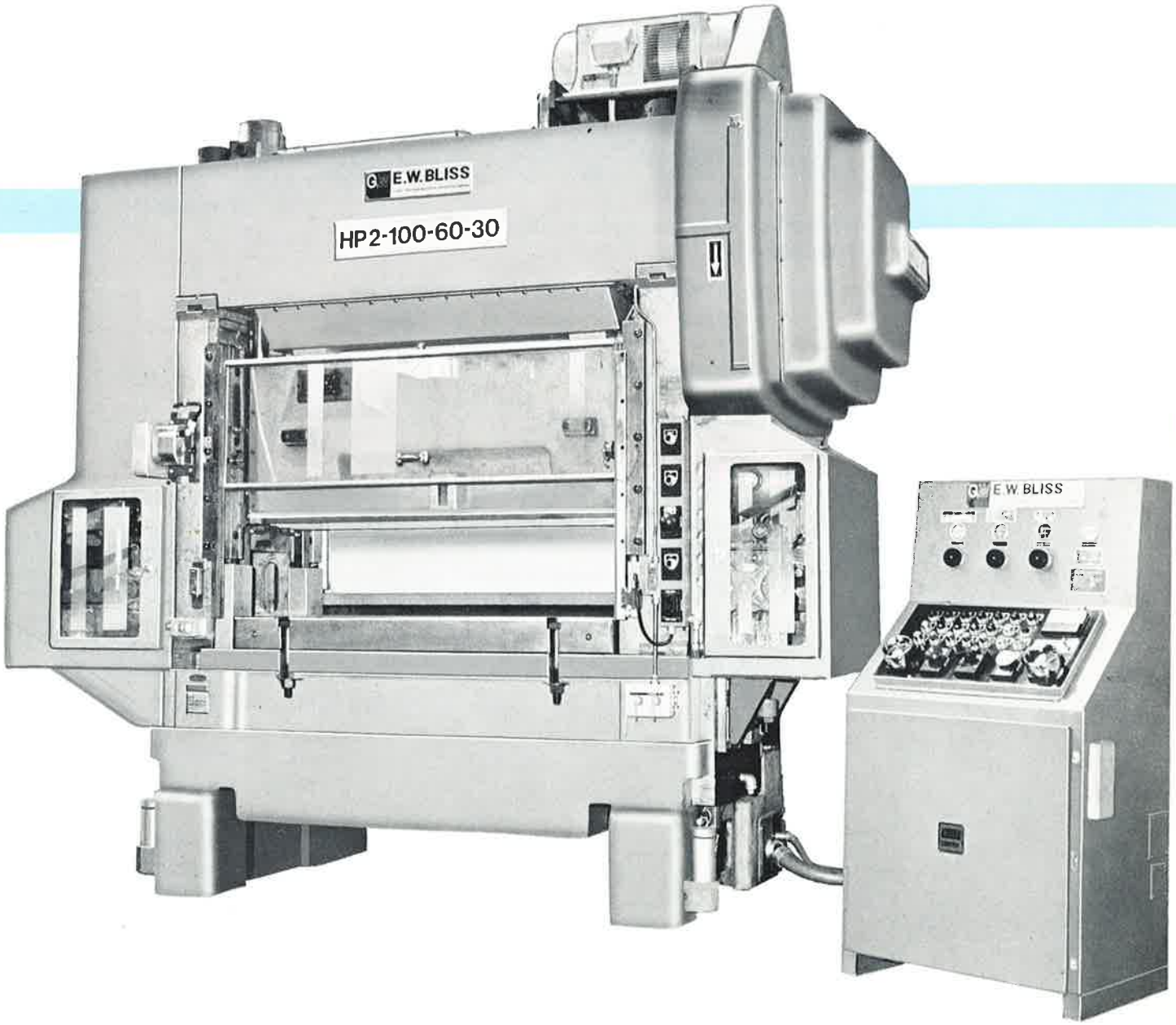
Process capability studies are regularly performed to assure sustained high quality of manufacturing operations.

Final inspection gives specific meaning to Bliss's motto: "The Standard of Value." In this ultimate test, each press is factory assembled and Customer Quality Assurance certifies that the unit conforms both to the customer's specifications and to Bliss's own exacting standards. In the case of HP2 Presses, criteria are especially exacting because of the close tolerances and extreme rigidity required for ultra-high speed operation.

Testing noise levels during a High Production press run-in. Recent federal legislation has heightened the interest in this aspect of press operation.

Precision measurement of critical dimensions. Major components are inspected throughout manufacture and during final assembly.

THE ULTIMATE IN PROGRESSIVE DIE PRESSES



BLISS HP2

Application

Bliss HP2 Presses are highly specialized production systems. They are designed specifically for use with progressive dies and roll feeds to produce parts requiring a series of precision stamping operations in one press. Beds and slides are wide and extremely rigid to provide proper left-to-right distribution of multiple die loading and the low deflection rating that is the key to maximum die life. Bearings are extra large and are located close to the crank cheeks to minimize shaft deflection. Two points of support help distribute the force evenly to the slide, which is guided throughout its stroke and adjustment range in 8-point gibbing to minimize the effects of off-center loading. Finally, provisions are made for rapid, accurate set up and changeover. These features include digital readout of shutheight, power slide adjustment, and push-button micrometer feed length adjustment from the floor while the press is running. In the new generation of HP2 Presses, every effort has been made to maximize production efficiency and, consequently, your profits.

Features and Advantages

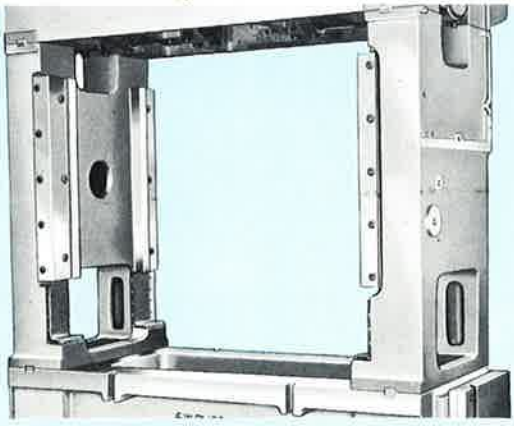
These features - - many of them exclusive - - reflect Bliss's continuing program of product improvement. They comprise, a checklist for the "standard of value" in progressive die machines. You owe it to yourself to evaluate each of them carefully against your own requirements before making your purchasing decision.

- **Increased stroke rate** - - current models feature a new slide and connection design in which weight is redistributed for higher speeds, minimum vibration, and reduced inertia.
- **Improved locking** - - a new slide adjusting lock provides precise, positive lock-up.
- **Shutheight indicator** - - provision is made on current models for factory or field mounting of a 5-digit readout of slide position.
- **Power Slide adjustment** - - air motorized adjustment of slide is standard on all but the HP2-25 model.
- **Improved ball-cap retainer** - - this new design was engineered to withstand the reverse shock-loading due to snap-through which occurs in high speed, blanking operations.
- **Improved ball cap bushing** - - provides even greater strength and resistance to deformation.
- **Higher speeds** - - the above improvements combine to permit significantly higher catalog-listed speeds . . . as much as 100% in some sizes.
- **One-piece ball joint connection** - - this exclusive Bliss design has demonstrated its superiority to wrist-pin and other types of connections in ease of maintaining close working tolerances by means of shimpack adjustment and in reduced snap-through movement.
- **Herringbone gears** - - all geared HP2 presses employ herringbone gearing as standard for minimum noise, vibration, and for maximum gear life.
- **Steel bolsters** - - all Bliss HP2's have steel bolsters for maximum strength.
- **Power unsticker** - - this exclusive Bliss feature is standard on all HP2's.
- **Counterbalances** - - air counterbalances are standard on HP2 presses. Mounted diagonally on two corners of the slide, they provide optimum suspension of the slide assembly. Counterbalance air pressure is adjustable to compensate for the weight of tooling.
- **Scrap chutes** - - openings are provided in both legs for scrap discharge or other operating accessories.
- **Counterweighted crankshafts** - - all non-geared HP2's have counterweighted cheeks on the crankshafts for dynamic balance at high speeds.
- **Control console** - - all air and electrical controls are console-mounted for operater convience and longer component life. All controls are in full compliance with the ANSI B11.1-1971 Code, as we interpret it.
- **Adjustable feed height** - - easy ratchet adjustment of roll feed height provides a pass-line compatible with a wide range of die sets.
- **Micro-in-motion feed length adjustment** - - this exclusive optional accessory permits adjusting the feed through its complete feed length range from the floor while feed and press are running. This feature saves hours of set-up time.
- **Ease of maintenance** - - all HP2's have automatic recirculating oil, square corner gibbing, and bronze slide wear strips. Outboard mounting of the motor sheave on geared presses permits changing belts without removing the backshaft. Clutch and brake linings can be changed without disassembling the clutch.

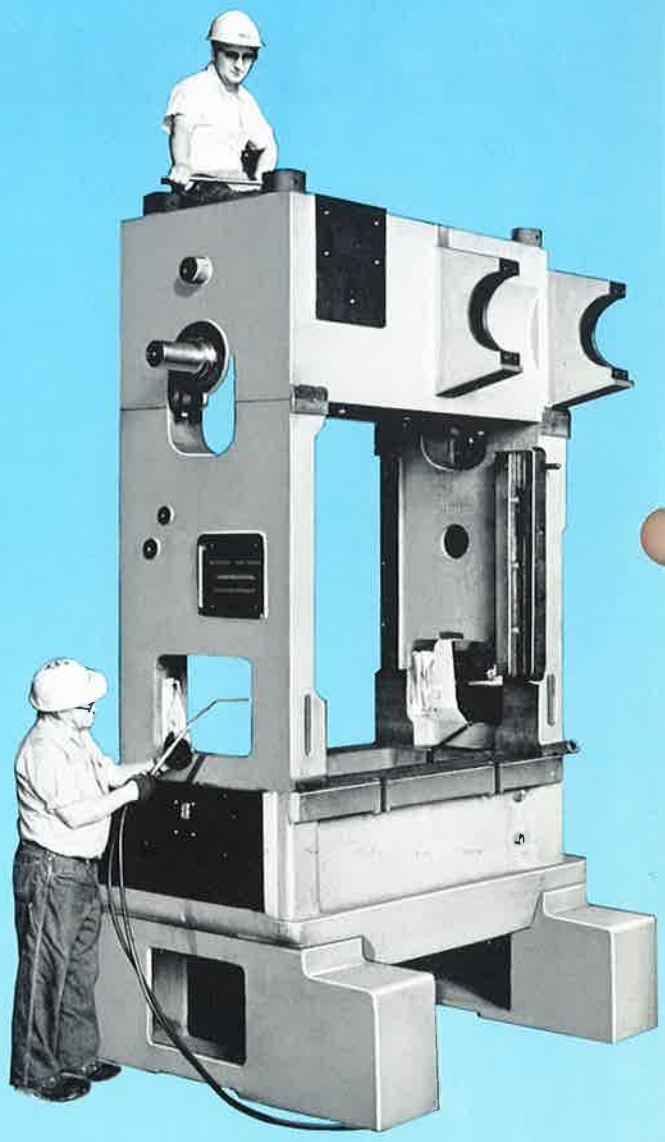
These features are the result of more than 35 years experience in building automatic progressive die presses.

The Frame

This standard bed shows the extra rugged construction of HP2 Presses. Beds are designed using formulas which take into account both shear and bending deflection to assure optimum die life. Standard deflection is held to .001" per foot measured between tie rod centers with the load distributed over the center two-thirds of the die space. Use of high grade cast Meehanite for the frame members, combined with four piece, pre-stressed tie rod construction, dampens vibration and provides maximum rigidity.



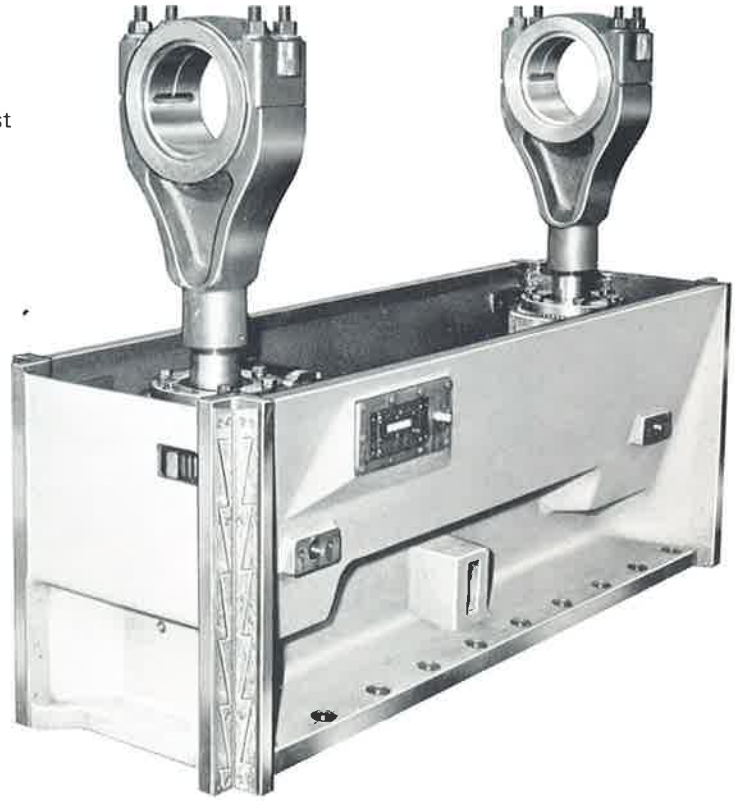
Heavy cast uprights are keyed to bed and crown and held in place by prestressed steel tie rods. Among other advantages, this type of construction helps keep noise levels low.

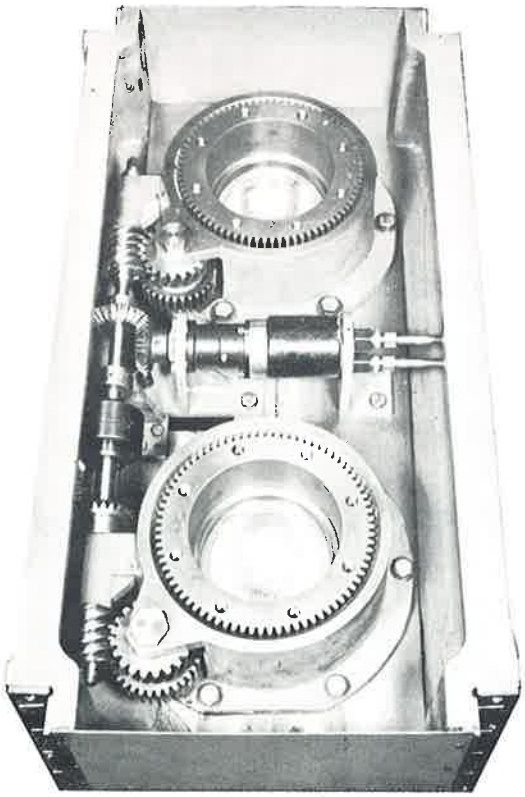


Massive, integrally cast feed mounting pads provide vibration dampening in a critical area and are adaptable to a variety of feeds. Leg openings facilitate piecepart or scrap removal. Four corner tie rods, shrunk in to a value equal to 200% of the rated press capacity, keep frame members always in compression, even under conditions of severe overload.

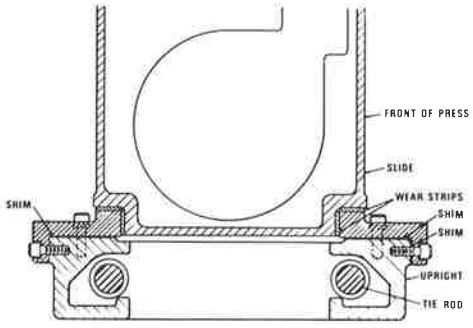
The Slide

Extremely accurate guiding of the slide is a must for high precision work and maximum tool life. The eight-point square corner gibbing of HP2's provides eight long, parallel guiding surfaces, preset at the Bliss factory with shims. They resist any tendency of the slide to cock under off-center loads. The slide is fitted with replaceable bronze wear strips. All gib adjusting points are readily accessible without removing major components. Motorized adjustment of the slide is standard on all HP2's except the small 25 ton machine.



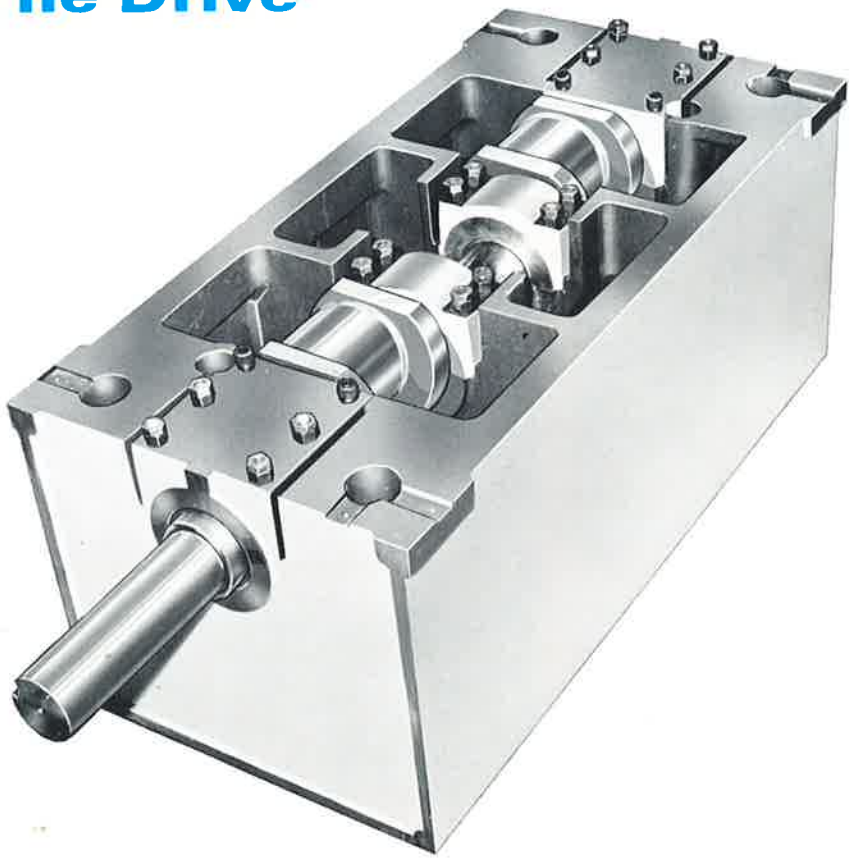


Another major component of high speed precision, besides accurate guiding of the slide, is slide-to-bed parallelism. HP2's guarantee this parallelism to .0005" per foot of slide face, front-to-back and left-to-right with a maximum allowance of .002". Large connection screws provide maximum rigidity. A new locking arrangement assures positive, drift-free lockup of the slide adjusting screws. The slide is counterbalanced to maintain upward tension on bearings so that the slide and tooling in effect "float" with zero clearance on the bearing surfaces in the direction of force. A one-piece ball joint connection in a bronze ball seat with shim adjustment gives smooth, efficient transfer of energy from shaft to slide. This design affords unusually large bearing surfaces and minimum snap-through movement.



Gib arrangement provides easy adjustment. Extremely close clearances are maintained between slide and gibs and positive locking is assured by means of flat and parallel shims.

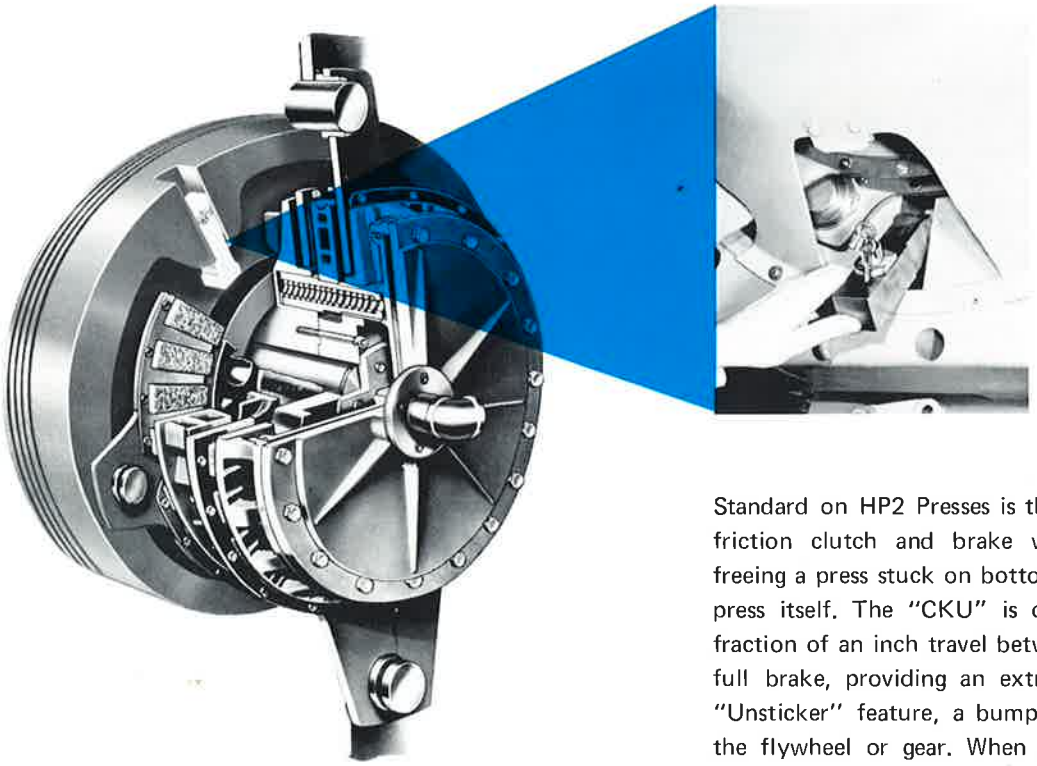
The Drive



HP2 crankshafts are SAE 1045 forged steel and are dynamically balanced. Counterweights are integrally forged parts of non-geared crankshafts for smooth, high speed operation; there is no chance of them shifting or loosening. Everything possible is done to eliminate or reduce to a minimum the vibration associated with high speed operation.

Long, precision bored, or hand scraped bearings distribute loads evenly. This type of precision helps minimize vibration and permits a less demanding requirement for mounting HP2 presses. Where other designs employ large masses of metal and heavy, reinforced and shock-mounted pads to absorb vibration, Bliss seeks to refine the degree of vibration at its sources by balanced design and precision workmanship.

The Clutch



Standard on HP2 Presses is the Bliss "CKU" combination air friction clutch and brake with exclusive "Unsticker" for freeing a press stuck on bottom, using flywheel energy of the press itself. The "CKU" is crankshaft-mounted, with short, fraction of an inch travel between full clutch engagement and full brake, providing an extremely fast action. To use the "Unsticker" feature, a bumper pin is inserted, as shown, in the flywheel or gear. When the press is turned over under power, the pin strikes against a lug on the clutch body to free a press stuck on or just past bottom dead center. Presses stuck just before bottom center are bumped in a reverse direction.

The Bliss Rotary Limit Switch is a high speed cam-operated device for adjusting desired top-stop position at different press speeds. This adjustment is made at the press from the floor and can be done while the press is running.

Controls

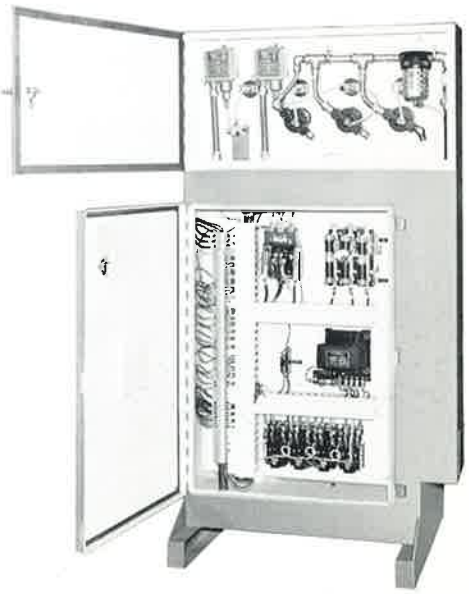
Standard HP2's are equipped with a convenient all-in-one console, in accordance with the ANSI B 11.1-1971 Code, as we interpret it. The console is connected to the press by flexible cable and can be located where it is most convenient. Air controls are located on the backboard of the console. Inside the console, extra space is provided for customer use as needed. All wiring is color-coded in accordance with the wiring diagram furnished with the press.

The basic unit is the Bliss 46HL console-mounted combination clutch and motor control. It consists of the following:

- Non-reversing main and lube motor starters
- Lube pump motor overload
- Fusible disconnect switch
- Control circuit transformer (110 v secondary)
- Bliss high speed adjustable-in-motion rotary limit switch with top-stop adjustment
- Double solenoid air valve with self-monitoring feature and exhaust muffler
- Clutch airline pressure switch
- Counterbalance airline pressure switch
- One auxiliary convenience outlet in press "Stop" circuit

Operator's controls mounted on the console:

- "Power On" pilot light
- Main and lube motor "Start" "Stop" buttons
- Motor drive variable speed control
- Tachometer for reading strokes per minute
- Lube indicator lights: Green "On"; Red "Fault"
- Lube reservoir level indicator light
- "Continuous" pre-set button
- Two hand "Run" buttons with ring-type guards and anti-tie-down provision
- One "Stop" button and one "Top Stop" button



Set-up controls mounted on the Console:

- Keylock mode selector switch with positions: "Off", "Inch", "Single stroke", and "Continuous"
- Keylock "Bar/Run" selector switch
- "Bar" actuator button
- Keylock selector switch for Bliss clutch "Unsticker"
- Unsticker block with electrical interlock and indicator light

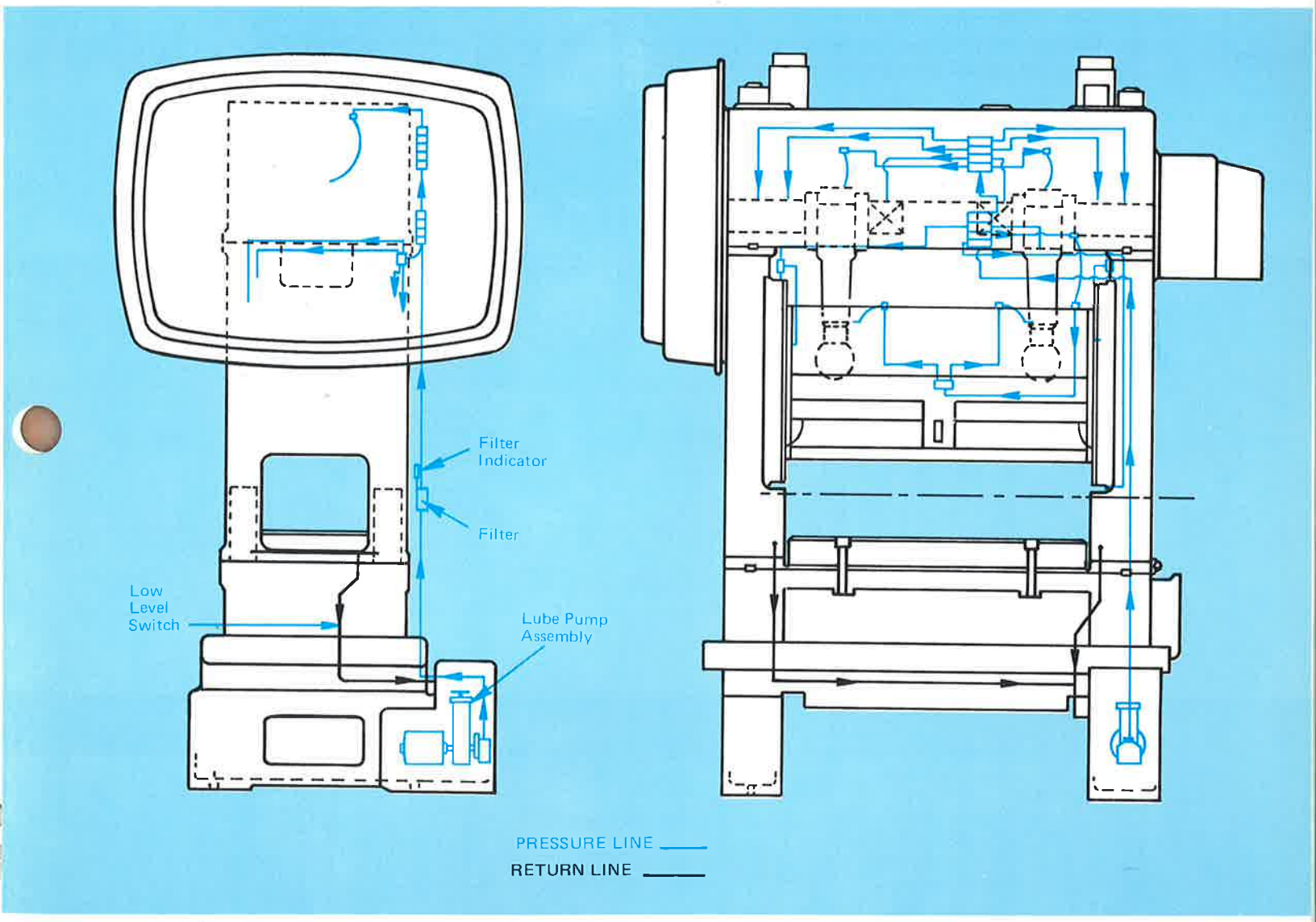
Air controls on the Console:

- Gage and valve for clutch
- Gage and valve for slide adjust motor
- Gage and valve for counterbalances

Press-mounted controls:

- Slide adjust "Raise/Lower" control.
- Two "Inch" buttons with ring-type guards and anti-tiedown provision
- Two "Stop" buttons - - one each on front and rear of press

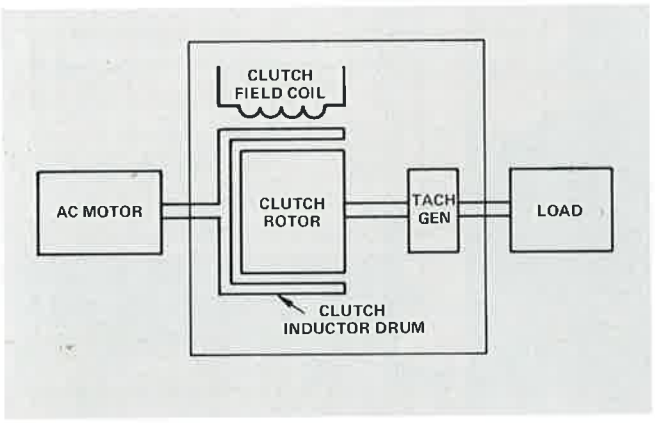
Lubrication



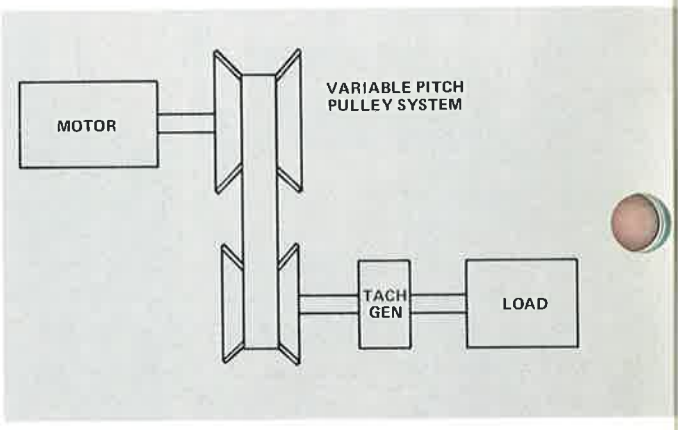
Automatic recirculating oil lubrication is standard on all HP2 Presses. It continually circulates clean, filtered lubricant to press bearing surfaces at a controlled rate. The system is self-monitoring and a pressure signal switch stops the press in the event of high pressure or loss of pressure. Start-up is also automatically delayed until adequate pressure is built up in the lubricating system. All lube lines are conveniently brought together in readily accessible banks of block fittings for easy inspection.

Variable Speed Drives

The purpose of variable speed drives is to "fine tune" the press speed to the particular job being done to obtain maximum efficiency and productivity from press and die. Variable speed drive is standard on Bliss HP2's. The customer may select either a mechanical or an eddy-current type of drive. The eddy-current drive provides speed adjustment from 0 to maximum but is characterized by a decreasing HP output as speed is reduced. The mechanical type of drive delivers virtually constant HP throughout its range but is usually limited to a 2:1 or 3:1 speed ratio. Stepless speed adjustments on both types of drive are made from the console while the press is running and the console-mounted tachometer gives accurate, direct reading of the speed in press strokes per minute. Lower cost single-speed drives are available on request.



Variable Speed Drive - Eddy Current Type

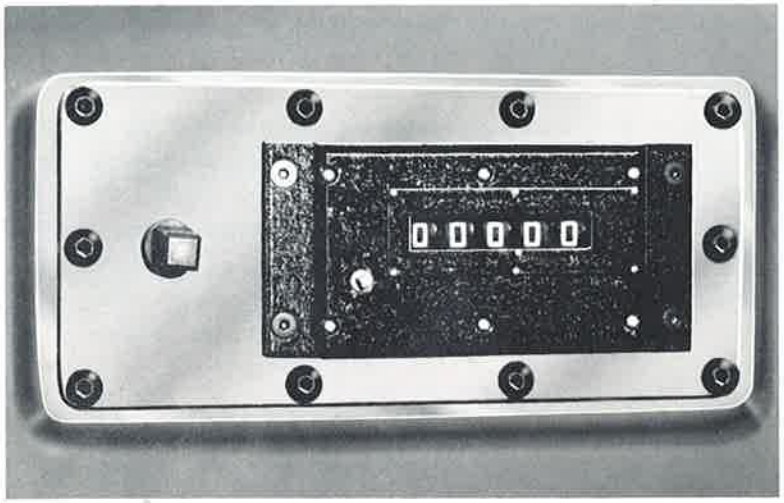


Variable Speed Drive - Mechanical Type

AVAILABLE STANDARD SPEED RANGES FOR VARIOUS PRESS STROKES

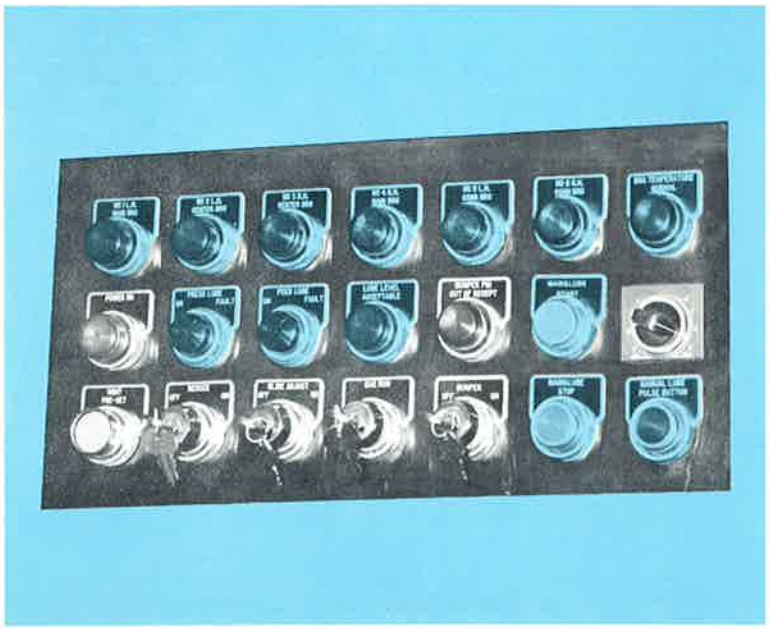
TONNAGE	DRIVE	BED WIDTH	LENGTH OF STROKE 1/2	3/4	1	1-1/2	2	2-1/2	3	4	5	6	7	8	10
25	FW	18, 24, 30	250-750	220-660	200-600	150-450	125-375	---	---	---	---	---	---	---	---
60	FW	24, 30, 36	---	200-600	160-480	140-420	120-360	110-330	90-270	---	---	---	---	---	---
	FW	48	---	---	140-420	120-360	110-330	90-270	80-240	---	---	---	---	---	---
	GRD	ALL	---	---	---	---	---	---	---	90-180	90-180	90-180	---	---	---
100	FW	36, 42	---	180-540	160-480	130-390	110-330	100-300	90-270	---	---	---	---	---	---
	FW	48, 60	---	---	130-390	110-330	100-300	90-270	80-240	70-210	---	---	---	---	---
	GRD	ALL	---	---	---	---	---	---	70-140	70-140	70-140	70-140	---	---	---
150	FW	42, 48	---	---	200-400	175-350	150-300	130-260	125-250	100-200	---	---	---	---	---
	FW	60, 72	---	---	---	150-300	120-240	100-200	90-180	90-180	---	---	---	---	---
	GRD	ALL	---	---	---	---	---	---	---	60-120	60-120	60-120	---	---	---
200	FW	42, 48	---	---	---	175-350	150-300	130-260	125-250	100-200	---	---	---	---	---
	FW	60, 72	---	---	---	150-300	120-240	100-200	90-180	90-180	90-180	80-160	---	---	---
	GRD	ALL	---	---	---	---	---	---	---	60-120	60-120	60-120	---	---	---
250	FW	ALL	---	---	---	175-350	150-300	130-260	125-250	100-200	90-180	---	---	---	---
	GRD	ALL	---	---	---	---	---	---	50-100	50-100	50-100	50-100	50-100	50-100	---
300	FW	ALL	---	---	---	175-350	150-300	130-260	125-250	100-200	90-180	---	---	---	---
	GRD	ALL	---	---	---	---	---	---	50-100	50-100	50-100	50-100	50-100	50-100	---
400	FW	ALL	---	---	---	175-350	150-300	125-250	120-240	100-200	90-180	75-150	---	---	---
	GRD	ALL	---	---	---	---	---	---	---	45-90	45-90	45-90	45-90	45-90	45-90

Shutheight Indicator



Provision is made on every HP2 for the addition of a modular 5-digit shutheight indicator which reads in inches, to three decimal places, the position of the slide. This feature can be furnished as an extra on new presses or added in the field at any time. It speeds setup and protects the press against faulty adjustments by enabling the operator quickly to return the slide to a pre-determined position when re-setting a given die.

Lube Monitors

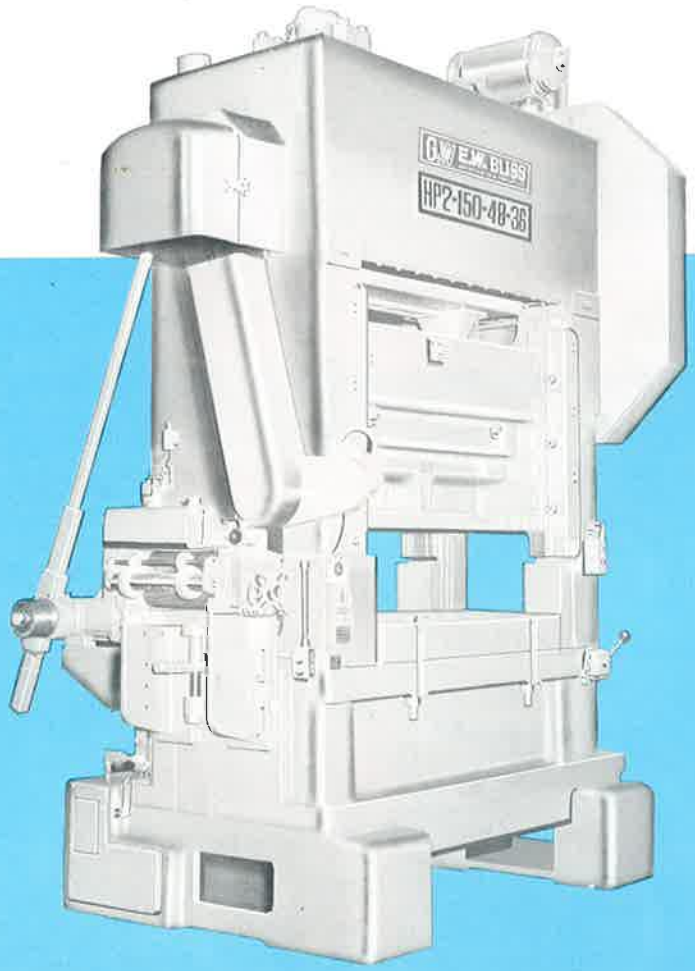


Besides the standard "Lube On", "Lube Fault", and "Low Level" indicator lights on the console, other lube monitoring systems are available as options. One of these provides an indicator light on the console for each major bearing to warn of high temperature build-up and its location in the press. Another option is a broken line indicator system which also shuts the press down when a line is broken.

OPTIONAL EQUIPMENT

Feeds

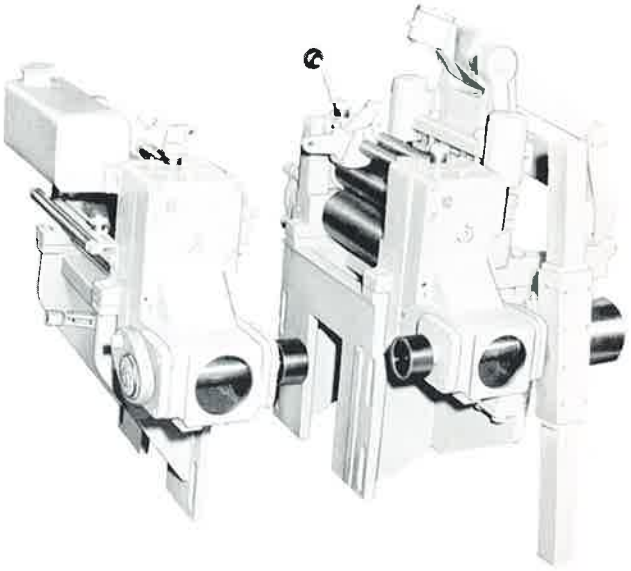
A wide range of options is available in feed equipment to help you get the most from the capability of the machine in terms of your own class of work. Basically, roll feeds are of two types: single roll feeds and double roll feeds. Single roll feeds can either push or pull the stock through the dies and are usually used where the scrap is cut up in the die. Double roll feeds maintain positive control of the strip at both entry and exit ends of the dies and are usually equipped with a scrap shear. Feed drives are either rack-and-pinion or lever-type. Model "R" rack-and-pinion drives are preferred for longer feed lengths and for a wide range of feed length adjustment. Model "L" lever-type drives are used for shorter feed lengths and higher speed ranges. A special cam-type drive is also available where a positive fixed feed length is desired. In this drive, feed length is determined by feed roll diameter. Bliss engineers will gladly discuss with you the type of feed and drive best suited to your applications.

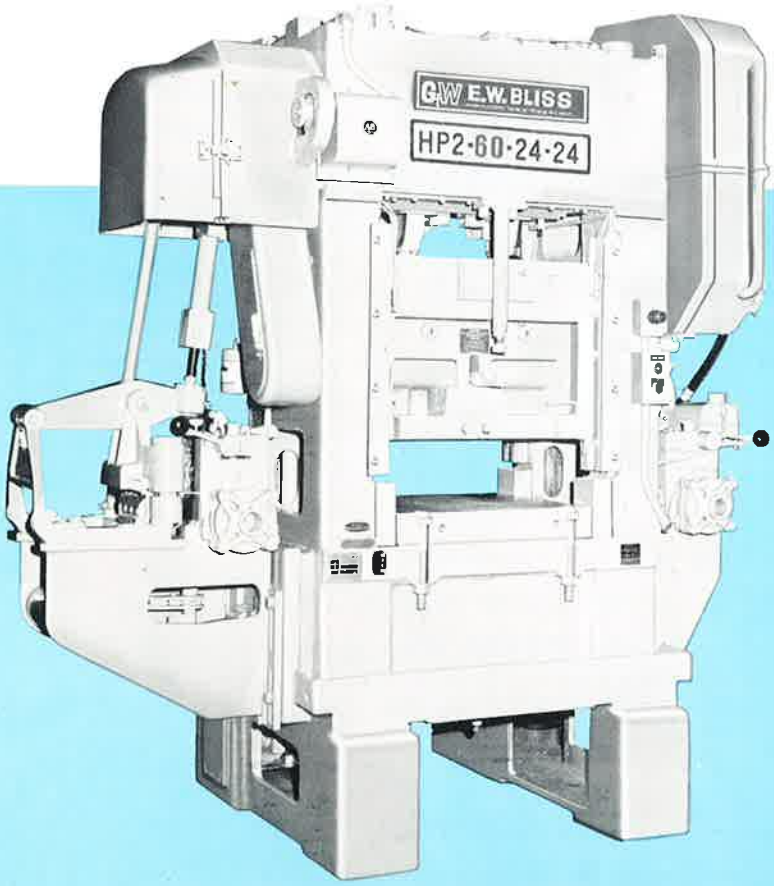


HP2 Press with single roll feed. Feed covers were removed for this photo.

BLISS HP2

Speed of production is not the only reason for the expanding interest in automated feeding. More uniform productivity, better tool design, reduced clutch wear, and improved quality control are among the other reasons for preferring continuous, automated operation. Moreover, automation substantially reduces hazards to the operator in the die area and simplifies compliance with the ANSI B 11.1-1971 Safety Code which is now incorporated into law. For a more complete description of Bliss Roll Feeds, write for Catalog 400.

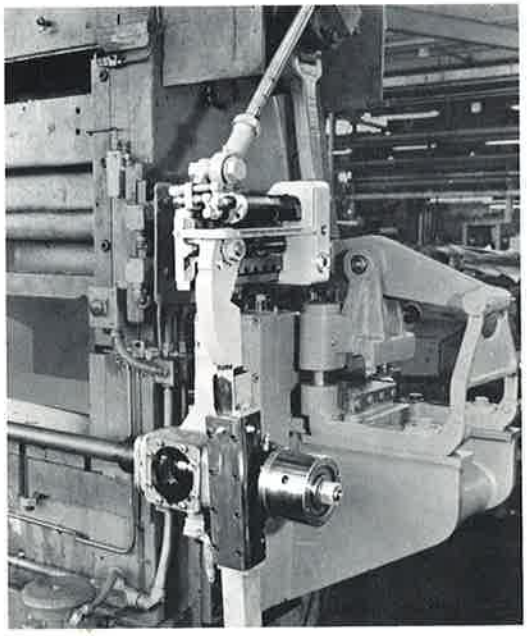


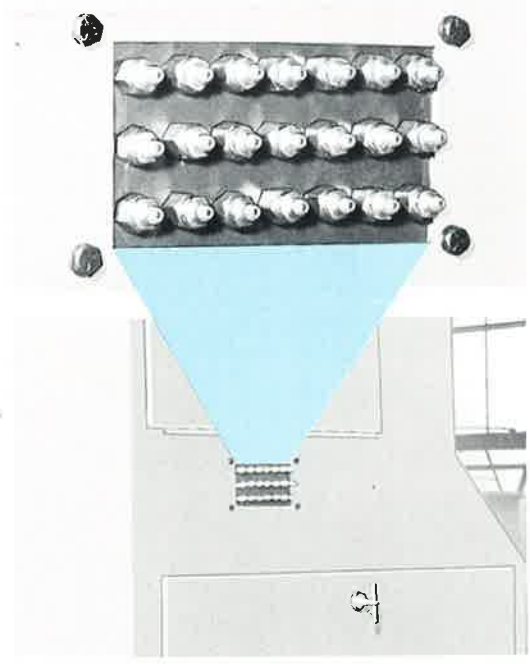


HP2 Press with double roll feed, and scrap shear. Feed covers were removed for this photo.

Feed Accessories

Many accessories are available for Bliss Roll Feeds to assure maximum production rates and quality control in your operation.





Bliss Type "G" Roll Feeds are fully enclosed in accordance with our interpretation of the ANSI B 11.1-1971 code. To facilitate servicing, all lubrication lines are brought outside the covers to common headers at the left and right sides of the press.

- Powered-in-motion Micro Feed Length Adjustment - - permits remote push-button feed length adjustments over the full range with press and feed running. Adjustment is from the floor and is self-locking.
- Compensating gearing - - for feeding thick stock.
- Stock buckle detector - - senses the path of the stock into the first die and stops the press if an irregularity exists.
- Counterweighted throw blocks - - dynamically balance the moving mass for very high speed operation.
- Stock oiler rolls - - apply die lubricant automatically by means of metering valves and a reservoir.
- Spray-type automatic stock oilers.
- Anti-backup rolls and catenary support rolls — prevent reflex movement of the stock when feed rolls are open and assure proper angle of stock into the entering rolls.
- Special roll finishes - - chrome plated, diamond milled, sand blasted, or coated.
- Special feed lengths longer than standard.
- Low inertia rolls for special high speed operations.
- Shear-type, press-actuated scrap cutter with four-edged tool steel shear blades.
- Power run-in - - powered rolls start the new strip into the dies.
- Water cooled brakes - - for high speed operations.
- Slide feeds and other special feeding devices.
- Special arrangements for front-to-back feeding.

Visuload®

Press Tonnage Indicator

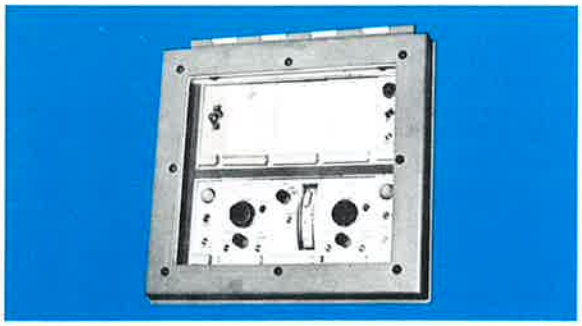
4 Channel Instrument

WHAT IT IS . . .

The Bliss Visuload System consists of a solid state instrument of either two or four channel configuration and the corresponding two or four sensor units for direct reading of press loading and load distribution in per cent of rated capacity. Sensors are bolted permanently to the press frame. The portable, plug-in amplifier unit contains the controls and meter.

Load sensors are full-bridge force transducers, steel encapsulated and factory sealed against dust, moisture, and stray electric fields. They are mounted to the press using a simple jig and portable drill. They are factory calibrated, tested, and balanced for complete interchangeability. Initial calibration can be made with either static or dynamic loading.

These instruments are completely portable and one unit can serve an entire line of presses.



BlissPak, Console Mounted

BlissPak™

For permanent installation, Bliss offers the "BlissPak", a more sophisticated monitoring system in a choice of mounts and enclosures. In addition to the functions of the Visuload System, BlissPak has the capability of actuating an overload alarm and stopping the press. It can also be made to measure and indicate such parameters as vibration, displacement, SPM, and temperature.

WHAT IT CAN DO FOR YOU . . .

- Reads directly the total press load, or individual sensor loading, in per cent of rated press capacity.
- Reads "Peak" dynamic load, and retains this indication up to 30 minutes.
- Reads directly the static load in a press stuck on bottom.
- Indicates - - by extent of overload, or sudden change in load reading - - the likelihood of damage to press members, such as a stretched tierod.
- Enables early detection of changes in stock thickness, loss of die lubrication, or alteration of metal characteristics.
- Indicates pressure increase due to tool wear - - helps to schedule outages for die maintenance on an optimum basis.
- Facilitates operation of press within rated capacity - - prolongs press and die life.
- Speeds set-up to previously established optimum conditions of loading and load distribution.
- Reads the change in pressure resulting from each adjustment of the connection screw.
- Output jack allows use of chart recorder for tracking load exerted throughout each stroke of the press so that a permanent record of operating conditions can be made for each job.

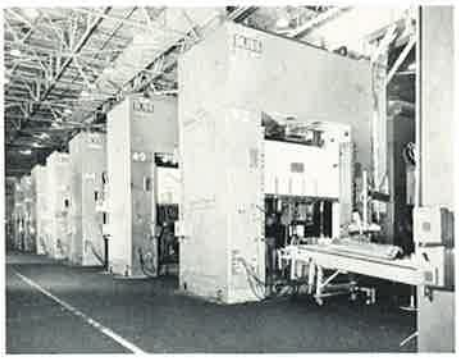
THE ULTIMATE IN PROGRESSIVE DIE MACHINES

BLISS PRESS NO.	HP2-25	HP2-60
CAPACITY TONS **AIR CLUTCH TYPE**	**25** **SU**	**60** **CKU**
Strokes per minute with standard stroke* Non-geared press	220-660	140-420
Single geared press	—	90-180
Motor drive HP Mechanical drive	5	7-1/2
Eddy current drive	7-1/2	10
Semi-ecc. shaft dia main brg.	2-1/2	4
Stroke of slide-standard*	3/4	1-1/2
Optional maximum	2	6
Adjustment of slide	2	3
Type adjustment	Manual	Air Motor
Bolster thickness	2-1/4	3-1/2
Distance bolster to slide, SDAU	5-1/2	11
Opening in uprights, FB	7	13
Bolster and slide RL	18	24
Slide FB	8	15
Bolster and bed FB	14	24
Bed opening RL x FB	15 x 7	19 x 9
Weight of press, approx.	6,000	15,500
Bolster and slide RL	24	30
Slide FB	12	15
Bolster and Bed FB	18	24
Bed opening RL x FB	18 x 7	25 x 9
Weight of press, approx.	6,600	17,000
Bolster and slide RL	30	36
Slide FB	12	15
Bolster and bed FB.	18	24
Bed opening RL x FB	24 x 7	31 x 9
Weight of press, approx.	7,500	18,000
Bolster and slide RL	—	48
Slide FB	—	15
Bolster and bed FB.	—	24
Bed opening RL x FB	—	43 x 9
Weight of press, approx.	—	21,500
Recommended Bliss Feed Feed number	R-24-6	R-35-8
Capacity	6" x .090	8" x .125
Width of rolls	6-1/4	8-1/2
Diameter upper roll	2.4	3
Diameter lower roll	4	5
Feed length		
with lever drive	0-3	0-4
with rack & pinion	0-6	0-8
Feed level over bolster	1-1/2 – 3-1/2	3-1/2 – 6-1/2
Horizontal adjustment of scrap cutter	1	1-1/2

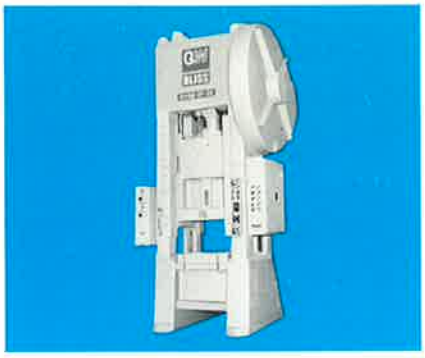
* Refer to table for: speeds with optional strokes weights are for geared presses except for HP2-25.

BLISS HP2

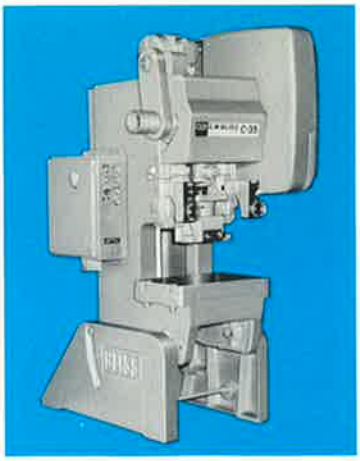
HP2-100	HP2-150	HP2-200	HP2-250	HP2-300	HP2-400
100 CKU	150 CKU	200 CKU	250 CKU	300 CKU	400 CKU or SU
130-390 70-140	150-300 60-120	130-260 60-120	125-250 50-100	125-250 50-100	100-200 45-90
15 15	20 25	25 30	30 40	40 50	— 75
5 1-1/2 6 3 Air Motor 5 12 17	6-1/2 2 6 4 Air Motor 6 18 20	7 2-1/2 6 4 Air Motor 6-1/2 18-1/2 25	7-1/2 3 8 6 Air Motor 7 21 27	8 3 8 6 Air Motor 7 21 27	9 4 10 6 Air Motor 8 22 32
36 18 30 30 x 15 28,500	42 24 36 36 x 18 46,000	42 30 36 36 x 20 55,000	48 36 42 42 x 25 80,000	48 36 42 42 x 25 83,000	48 36 48 42 x 25 105,000
42 18 30 36 x 15 31,000	48 24 36 42 x 18 49,000	48 30 36 42 x 20 60,000	60 36 42 54 x 25 87,000	60 36 42 54 x 25 90,000	60 36 48 54 x 25 115,000
48 18 30 42 x 15 33,000	60 24 36 54 x 18 52,000	60 30 36 54 x 20 66,000	72 36 42 66 x 25 94,000	72 36 42 66 x 25 97,000	72 36 48 66 x 25 125,000
60 18 30 54 x 15 35,000	72 24 36 66 x 18 55,000	72 30 36 66 x 20 72,000	— — — — —	— — — — —	84 36 48 72 x 25 135,000
R-35-12 12" x .094 12-1/2 3 5	R-40-15 15" x .110 15-1/2 3.5 6.5	R-40-18 18" x .093 18-1/2 3.5 6.5	R-48-24 24" x .109 24-1/2 4 8	R-48-24 24" x .109 24-1/2 4 8	R-48-24 24" x .109 24-1/2 4 8
0-4 0-8 3-1/2 – 6-1/2 1-1/2	— 0-12 6-9 1-1/2	— 0-12 6-9 1-1/2	— 0-18 7-11 3	— 0-18 7-11 3	— 0-18 7-11 3



STRAIGHT SIDE ECCENTRIC PRESSES



STRAIGHT SIDE
ONE POINT PRESSES



INCLINABLE PRESSES

other Bliss presses

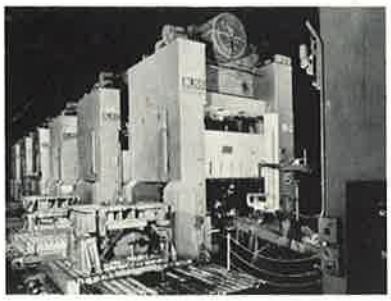
KNUCKLE JOINT PRESSES

SINGLE AND MULTIPLE ACTION
UNDER-DRIVEN PRESSES

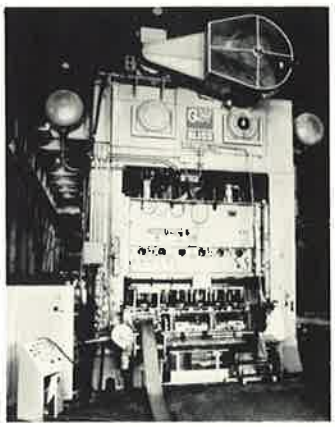
STRAIGHT SIDE
WELDED FRAME PRESSES

POWERBAR PRESSES

WELDING PRESSES



ROLLING BOLSTER PRESSES



TRANSFER FEED PRESSES

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