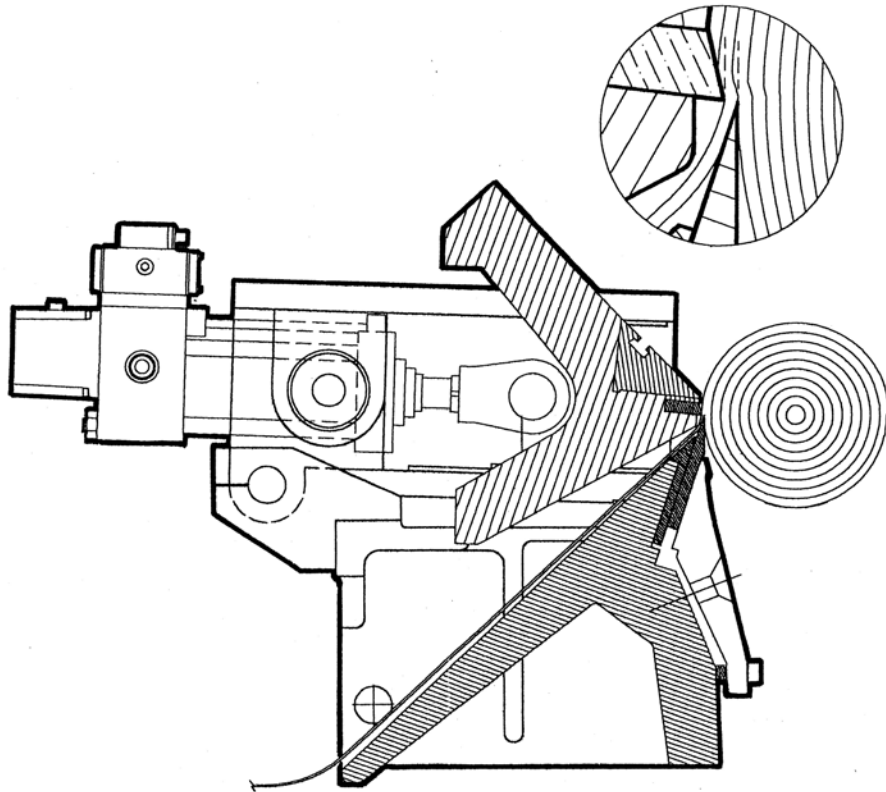


PRESSURE BAR SERVO HEAD SYSTEM
with "Float" Feature



CALVERT MANUFACTURING, INC.
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Why Purchase Calvert's "Servo Head" System?

Our existing customers – plywood plant management and operations personnel, enthusiastically describe "Servo Head's" features:

- Safety for operations personnel has been built into the system.
- Veneer target thickness has been reduced to the extent of .002" - .008" and thickness spread remains within \pm .001"- .002".
- Quality veneer is being produced at wider spreads of temperature than ever before. Acceptable veneer has been observed at temperature levels approaching mill room temperatures.
- Recovery increase includes a 3-5% increase in wide sheet production.
- Dryer production has increased 4-6% due to superior thickness control at the lathe. Dryer efficiency has improved by reducing under-dry at increased feed rates. Less veneer breakage and better moisture spreads have been observed.
- Metriguard acceptable veneer has increased 2-4%. Glue line performance has been enhanced due to improved veneer surface quality. Glue costs have been reduced over time because veneer is smooth and flat.
- Press times and pressures have been reduced due to more uniform panels.
- Finishing operations observe reduced sanding and patching while grade specialty products have increased.

Dependability of system electronics and mechanical components is great. Maintenance is simple, maintenance times have been reduced drastically and controls are user friendly making troubleshooting easy.

The ever-increasing demand for veneer to make plywood and wood products requires increased capabilities of the machinery being utilized. The lathes we use today are still the basic machines started up in the southeast over thirty-five years ago.

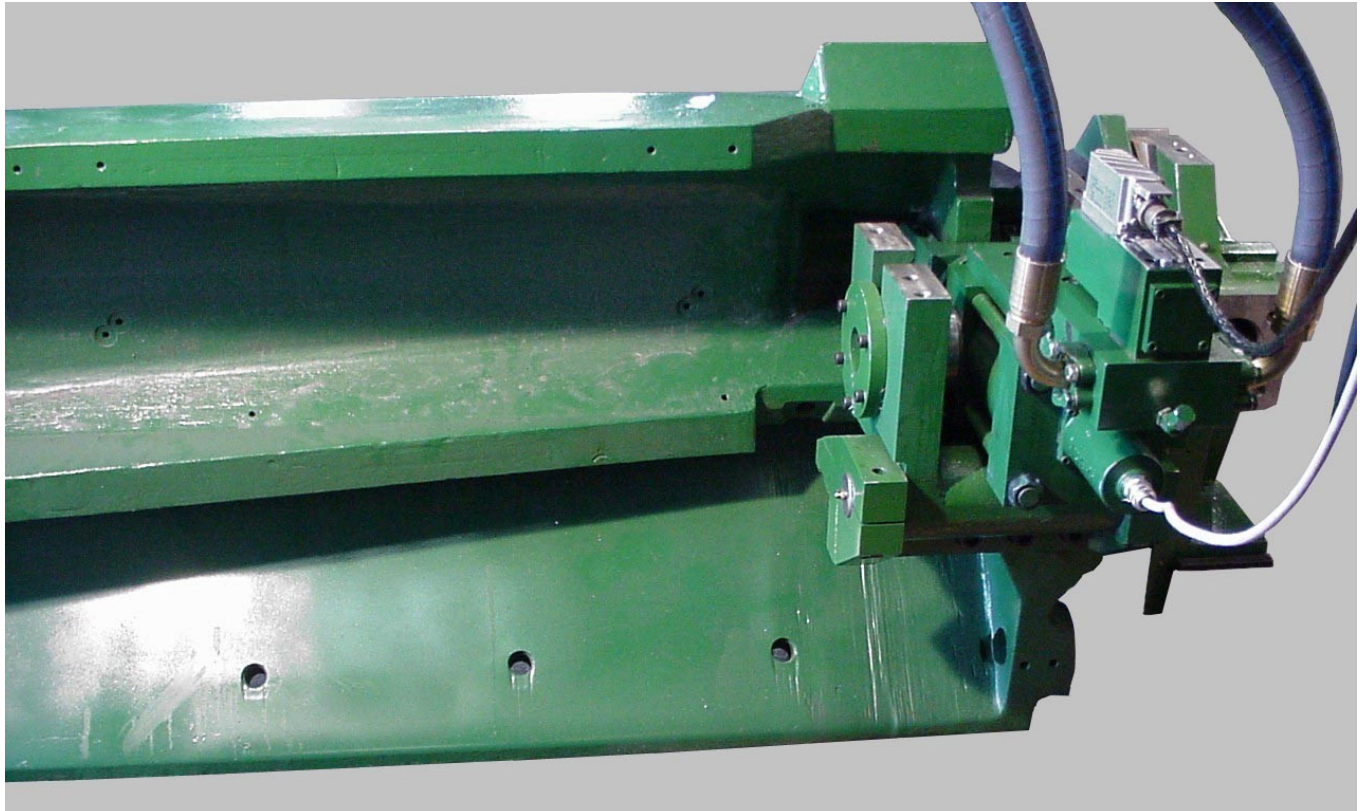
Upgrades such as the core drive backup roll and the big roller nose bar has provided increased torque capabilities. Increased demand on carriage movement has led to the demise of the air clutch—gearbox combination with advent of the digital drive—ball feed screws and the hydraulic/vector drives for the carriage. Due to the trend towards smaller diameters, dual spindles are replaced by rapid-cycling high speed spindles.

As core diameters got smaller the high-placed roller of the core drive became an increased factor in pressure loss with a heeling knife and a gap-step became essential. The gap-step feature is a far cry from a real solution.

The pressure adjustment mechanism is antiquated and creates a serious detriment to the peeling process, even if it's properly maintained. Beginning with the chain drive pressure adjustment motor with jog control through gap-step apparatus—to worm drives—pressure adjustment screw with its thrust bearing—eccentric shaft bearing—eccentrics and straps—ending with the hard bushed connection pin to the pressure bar casting.

The pressure adjustment mechanism, viewed as a whole, is made up of multiple wear points and links that create slack effect. Calvert's "Pressure Bar Servo Head System" is almost completely free from random slack.

Calvert's new design completely eliminates some 79 wear points (see *photo below*) from the old arrangement while providing a very tight working situation with minimal maintenance.

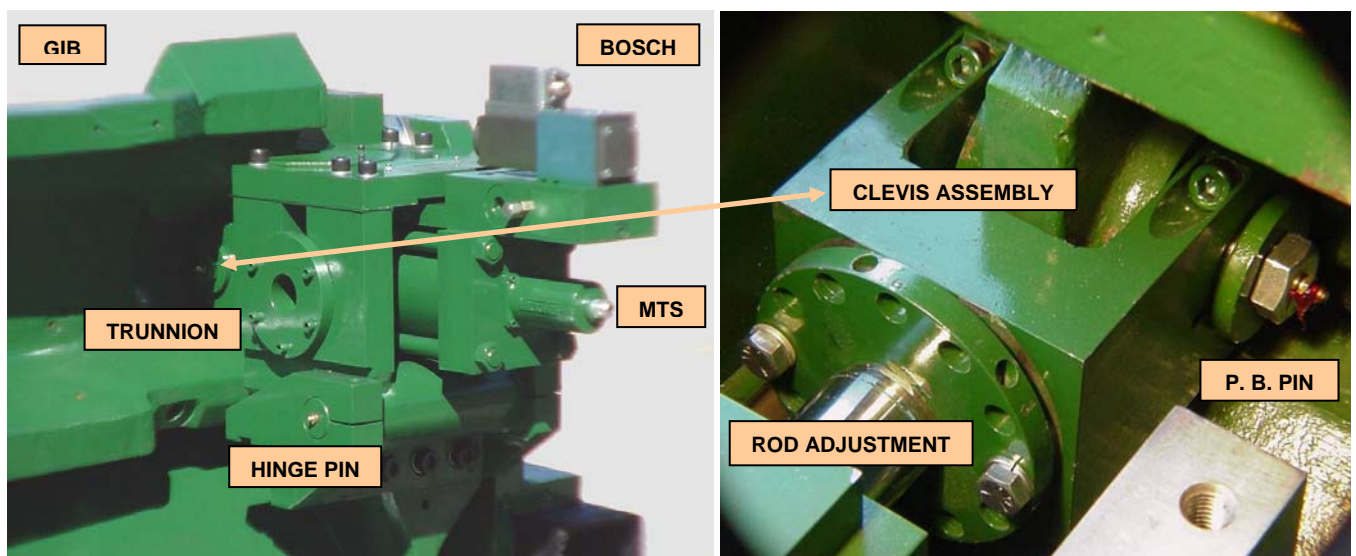


Built-in features include the accommodation for retrofit conditions, where existing attach points frequently carry wear. Calvert has provided a clevis incorporating an expandable pin to take up wear.

Most operational control of lathe functions are automatic, however allowances for adjustment have been incorporated such as the ability to increase or decrease pressure, open the head to full 3-inches and increase or decrease (skew) horizontal bar gap while maintaining correct peel thickness on—the—fly! Ease of operation is just one more of the keys to this system.

Calvert's "Pressure Bar Servo Head System" consists of the following items:

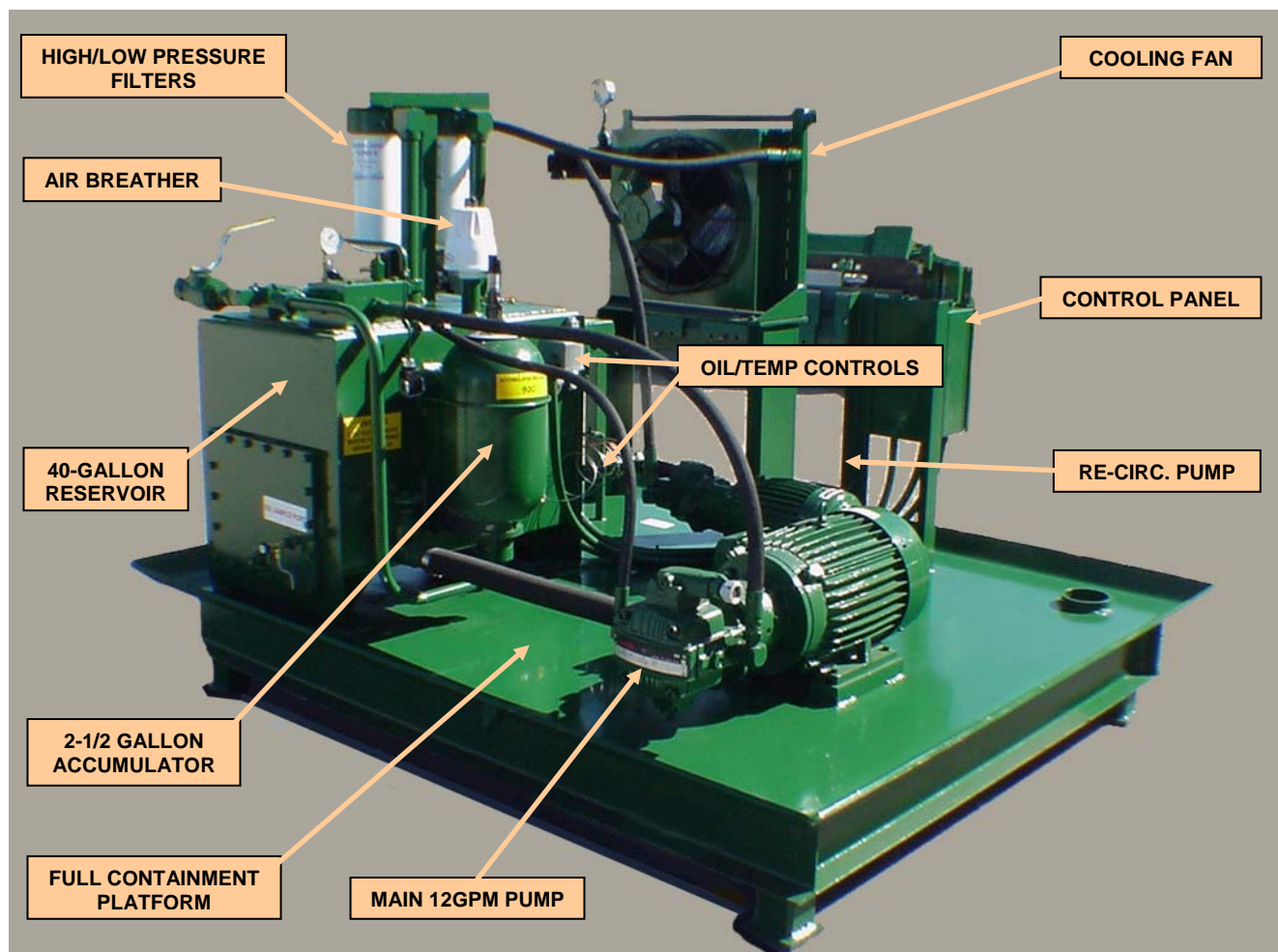
- ✓ One (1) Dogside and One (1) Tailside Actuator
 - Each trunnion mounted actuator utilizes a 5"-Bore, 3"-Stroke hydraulic cylinder, located on each end of the knife bar casting and designed to accurately maintain exact ($\pm .001$) horizontal bar gap required to effectively peel quality veneer at extremely accurate peel thickness
 - A clevis assembly complete with cylinder rod adjustment and pressure bar pin is utilized to minimize slack
 - Each actuator has a direct mounted "Rugged" Bosch Hydraulic NG-10 Direct Operated Servo Solenoid Valve, with spool positional feedback for optimal accuracy and speed
 - A digital MTS Temposonic Linear Displacement Transducer is mounted internally to each actuator for cylinder positional feedback
 - A Heavy-Duty Hinge Pin and Top Gib Plate (with shims) round-out each actuator assembly, making the total assembly extremely resistant to any form of slack



Calvert's "Pressure Bar Servo Head System" also consists of the following items:

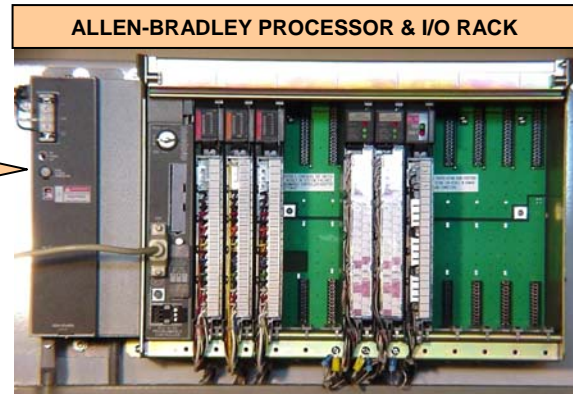
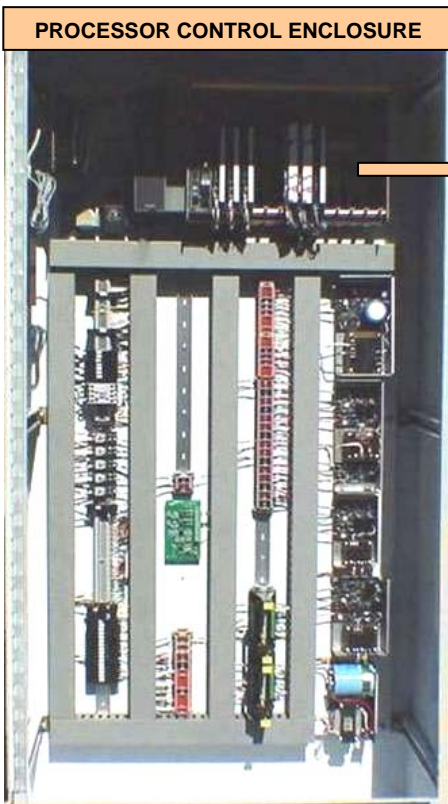
✓ **One Dedicated Hydraulic Power Unit**

- **A full containment platform with a 40 gallon reservoir**
- **A main pump (12gpm) supplying 1400psi**
- **A 1600psi relief**
- **A re-circulation pump (12gpm)**
- **A 2-1/2 gallon accumulator with dump valve**
- **High and low pressure filters providing the unit with clean oil**
- **A cooling fan, oil level, temperature controls and an air breather**
- **Portions of the header pipe and hosing is provided**



✓ **One Processor and Control Enclosure**

- **Allen-Bradley PLC Rack**
 - **Processor**
 - **AC-Input Modules**
 - **AC-Output Modules**
 - **QB Linear Displacement Modules**
 - **Analog Input Module**
- **Bosch Servo Amplifiers**
- **Power Supplies**
- **Modem**
- **Fuses, Control Relays, Terminal Blocks and Fan**
- **Software and Manual**



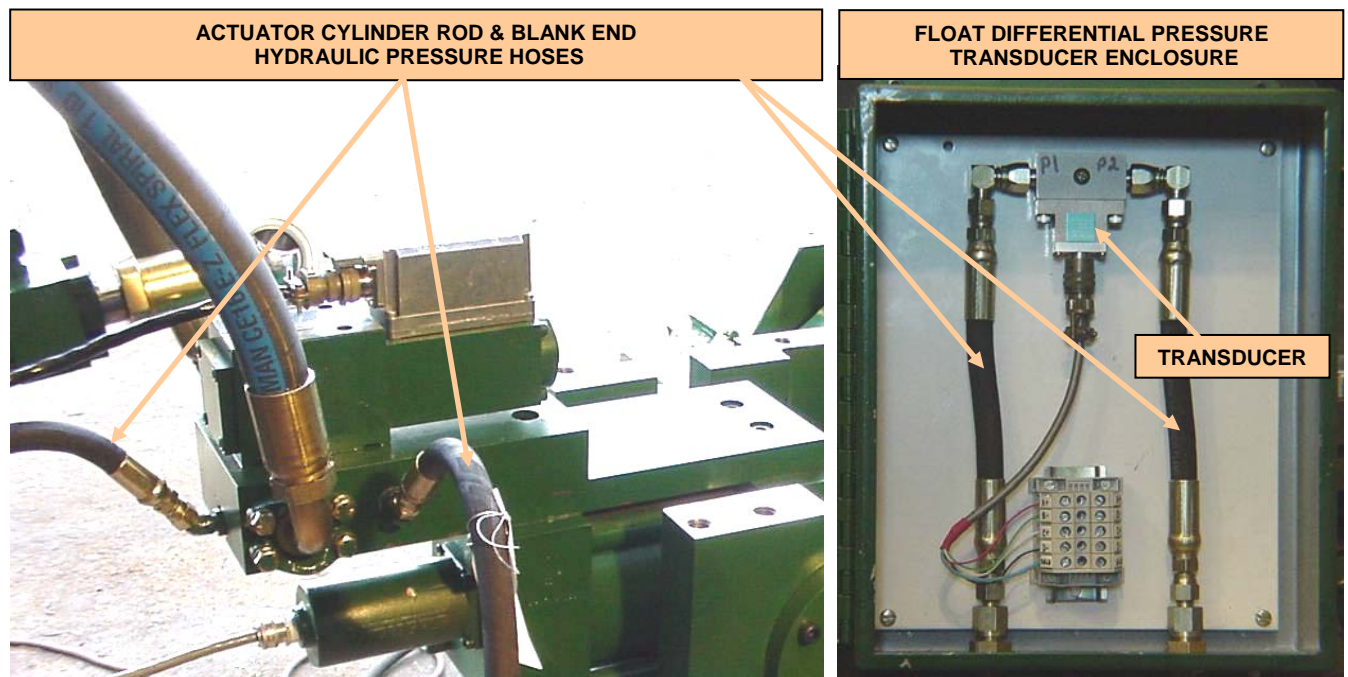
Calvert's "Float" Feature

"Float" is best described as the measurement of the differential pressure on the blank and rod ends of the servo actuator and the automatic adjustment of the actuator position according to that measurement. The differential pressure is expressed in pounds per lineal inch or "PLI."

A high resolution transducer provides a feedback signal according to PLI of an actuator to the A-B PLC processor and the software positions the cylinders according to this feedback.

If a block is dense, the PLI will be higher than a softer wood. Via the transducer and software, if the PLI increases beyond a set window the actuators will open the horizontal bar gap to maintain the proper peel thickness.

Consequently, should the PLI drop below satisfactory levels, the actuators would close the horizontal bar gap to maintain the proper peel thickness.



Additional Customer Comments

Calvert enjoys hearing comments from our customers, especially after installations have been performed, because production personnel have had time to understand the full effects the system offers. Below are just a few random comments:

- **Probably the best installation we have experienced. The main installation began on Friday and we were in production by the following Monday morning.**
- **There are virtually no “slabs” in the head because of the ability to open the lathe head to full 3-inches.**
- **Blocks, whether too cold or hot, peel out smoother. Core spin-outs have been reduced by 50%.**
- **Veneer has fewer splits in ribbons and lays flat all the way to core limit.**
- **Normal maintenance times for changing brass dropped from 14-hours to 2-hours and from twice a year to only once.**
- **Clippers run in high speed more often and there are less jam-ups at the stackers. Loads are much more uniform.**
- **Redry is less with “float” veneer and there are fewer dryer plug-ups.**

Since 1996, Calvert has installed servo head systems for flat bars and big bar applications. Below are some of the installations that cover soft and hard wood applications:

Manthei, Inc., Petoskey, MI

Weyerhaeuser Company, Dierks, AR

International Paper Co., Springhill, LA (2)

Hood Industry, Beaumont, MS

Georgia Pacific Corp., Warm Springs, GA

International Paper Co., Gurdon, AR (2)

Columbia Forest Products, Craigsville, WV

Hood Industry, Wiggins, MS



Calvert Manufacturing, Inc. will be glad to answer any questions our customers may have regarding this application or any of our other applications and products.

Please, give us a call Monday through Friday, 7:00AM to 4:30PM Eastern.



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