

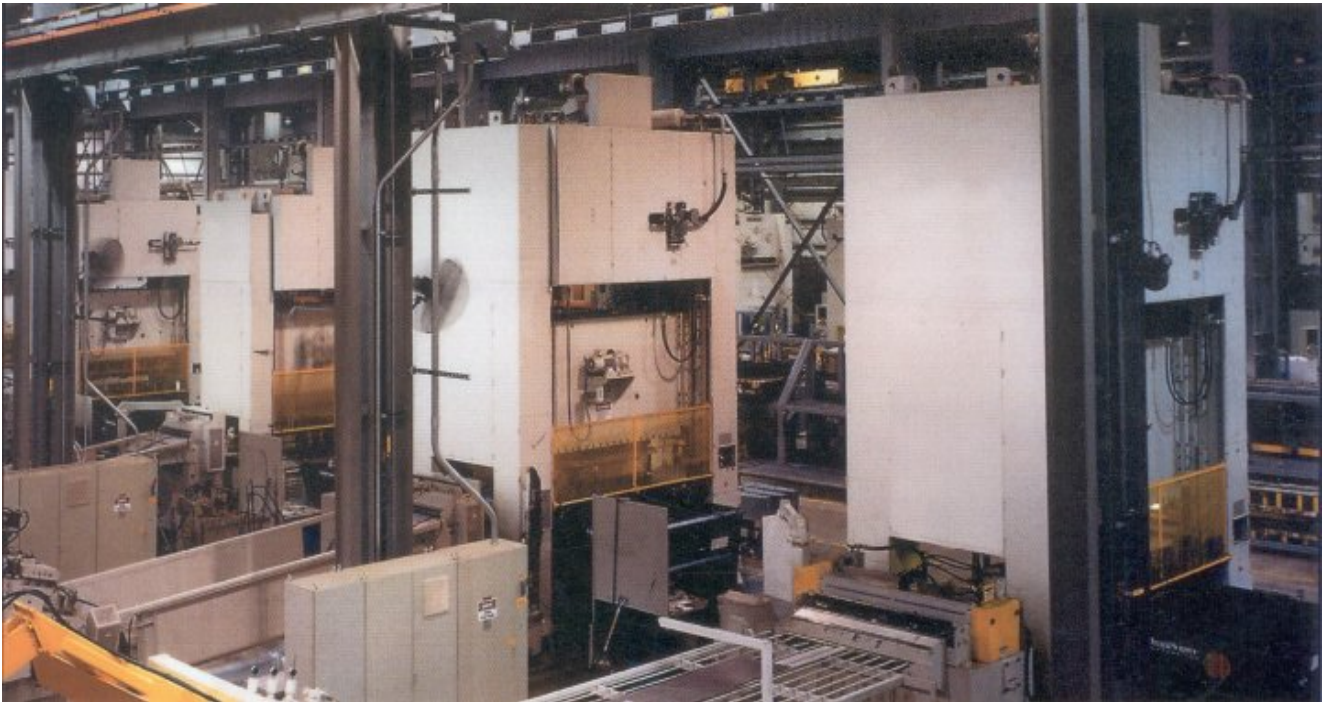
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Supplier of Industrial Brake Parts Since 1985

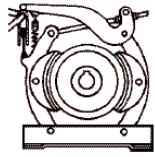
Gemco™

Fabrication Automation Capabilities

Stamping Press Control and Automation Solutions



*One Stop Shopping for the
Level of Automation You Need*



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Buy fully automated presses... or automate the presses you have.

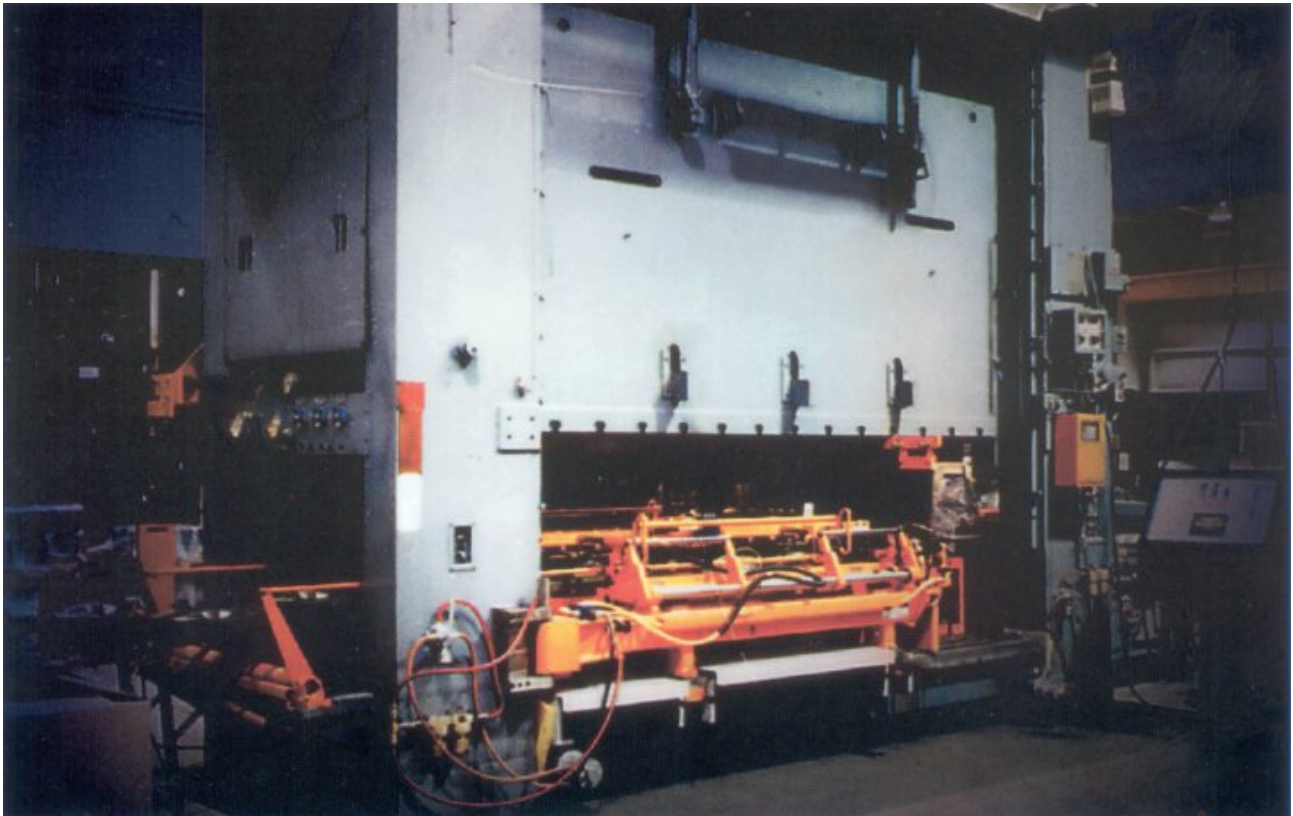
With batch-run manufacturing, JIT delivery and tighter product specifications, the decision is no longer should you automate, but rather how to automate your stamping presses to stay competitive.

Patriot, under our Gemco™ brand name, has been supplying control and automation solutions for mechanical presses for over 25 years. We have a unique product and system, mix that allows you to select the level of automation you need to stay profitable.

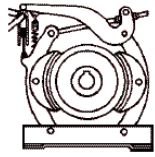
We have also discovered that automation without effective monitoring can be costly. Therefore, we have "damage control" products and system features that allow you to monitor your automated systems.

This brochure is divided into four sections:

- Press Control
- Press Automation Products
- Full Press Automation
- Damage Control



**Others supply you with what they have...
We deliver what you need.**



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Press Control

Challenge:

At the heart of most press control circuits is a cam switch providing an accurate and reliable indication of crankshaft position. Therefore, the challenge is to have the best, most rugged cam switch on your press.

Solution:

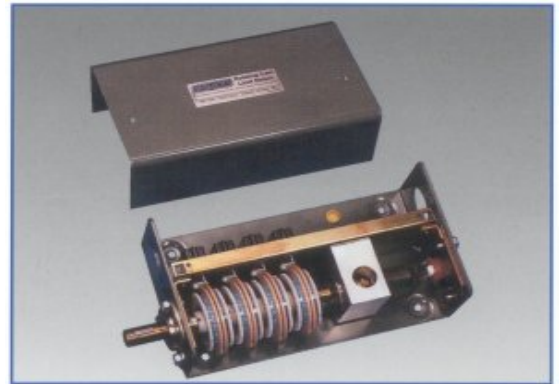
The Gemco Series 1980 Rotating Cam Limit Switch (An Industry Standard for Over 30 Years)

The Series 1980 Rotating Cam Limit Switch is an industry standard for cam directed press control systems. In fact, the majority of all the cam switches used on presses in the United States are Gemco cam switches. They are rugged, easy to install quick to adjust and field proven.



Gemco Series 1980R Rotating Cam Limit Switch with Series 1970 Drive-Check™

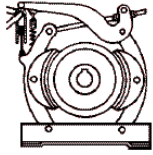
In addition to our cam switches, we are unique in supplying them with internal resolvers, encoders or tach generators to run auxiliary automation features. And our Series 1970 Drive-Check, used with our cam switches, automatically adjusts for chain stretch and alignment and monitors for chain breakage.



Gemco Series 1980R Rotating Cam Limit Switch with Resolver

Custom cam switch packages can include:

- 3 to 4 cams for top-stop, carry over and anti-repeat control circuit inputs
- Internal resolver for use by programmable limit switch or die protection module— electronically compatible with most PLS and die protection modules
- Internal tach generators or pulse encoders for use by the press control, brake monitor modules or VFD feedback on variable speed presses
- Encoders for positional or velocity feedback to PLC based pressline control systems
- DeviceNet option allows position and rpm data to be communicated on the DeviceNet network



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Press Automation Products

Challenge:

The goals for any press automation project is to reduce die change and setup time and to better manage, coordinate and synchronize automation hardware such as feeders, oilers, blowoffs, robotic arms, etc. for greater press efficiency and part quality. But you may not need a full automation package to achieve these goals.

The Patriot line of press automation products allow you to select the level of automation you need today, and the flexibility to add additional automation devices later.

Solution:

The Gemco Series 21 10 Shut Height Monitor (Reduce Die Change Time by Up To 40%)

The Shut Height Monitor gives you a highly accurate readout of shut height as you jog the shut height motor or manually adjust the shut height mechanism. Once proper shut height is determined, the readout can be recorded for use the next time the die is used in the same press, significantly reducing setup time and the number of test parts.

- Serial and parallel outputs for interface to supervisory control systems
- Decrease hit-to-hit downtime / reduce scrap



- Position repeatability of $\pm .001''$
- Resolver or LDT inputs
- All metal case, rugged construction
- Optional Analog or Digital outputs



Solution:

The Gemco Series 1996 Ram-Set™ (Reduce Die Change Time by Up To 60%)

The Ram-Set allows you to automate the shut height adjustment process. Once the shut height has been determined, the information can be stored in the Ram-Set's nonvolatile memory under a die code number. Simply enter the code and the shut height motor is activated, automatically setting the exact shut height for that die.

- Consistently sets shut height to $\pm .002''$
- Serial interface to supervisory control systems
- Store up to 500 die numbers /shut height values
- Interface to Gemco Series 2200 Automatic Counterbalance Control Panel
- For use on single and double action presses
- Absolute linear position feedback to $.001''$

Solution:

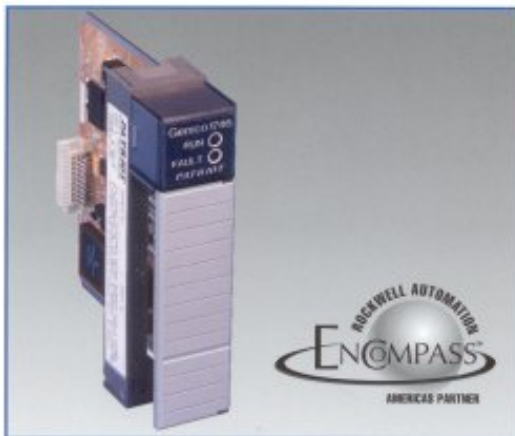
The Gemco Series 1746R & L Resolver & Transducer Module

The Series 1746R PLC Encoder Module is a resolver-based unit that incorporates Allen-Bradley licensed technology for complete compatibility with A-B Series 1746 I/O chassis. The unit monitors machine/position and delivers absolute position data at 12 bit (4,096 count) resolution to the SLC processor. Standard "Turns Counting" software allows a single turn resolver to be used in multi-turn applications like shut height monitor or control.

Brake monitoring in metal stamping applications.

In this configuration, automatic calculation of stop time and stop angle is transferred to the I/O image table. In addition, two programmable time limits are available to monitor maximum stop values: the first as a potential maintenance warning, and the second as an error if the press exceeds the programmed maximum acceptable stop time. Warning bits are transferred directly to the I/O image table.

The Series 1746L PLC Encoder Module is a magnetostrictive linear displacement transducer (LDT) based unit that incorporates Allen-Bradley licensed technology for complete compatibility with A-B Series 1746 I/O chassis. The unit monitors machine position and delivers absolute position data to the SLC processor in inches to 0.001" or in millimeters to 0.01mm and velocity data. All power for the LDT's is supplied directly from the 1746 Encoder Module. Other features include position freeze, movement fault detection and programmable overtravel limits for use in pressroom shut height monitoring.



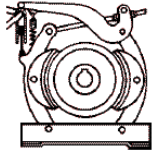
Solution:

The Gemco Series 1995B PLS with Brake Monitor



Designed exclusively for press operations, the resolver based Series 1995B PLS gives you six programmable output relays directly from the back of the keypad module and is expandable to 30 outputs. This system is used to synchronize feeders, oilers, blowoffs, robotic arms or any other automation features to press crank shaft position. In addition, it has continuous brake monitoring that complies with OSHA requirements.

- **Programmable motion detect output relay**
- **Programmable speed compensation automatically advances or retards output on variable speed presses**
- **Brake monitor provides continuous visual indication of stopping time and relay output when max. stop time is exceeded**
- **Fault-check, self diagnostics monitor: resolver, micro processor, interconnecting cables**
- **The linear displacement transducer version is ideal for hydraulic press automation**



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Full Press Automation

Challenge:

Full press automation means different things to different businesses. How do you find an automation system that is comprehensive, but can also be customized to your press operations, at a price you can afford?

Solution:

**The Gemco Series 1992 Press-Set™
(Full Press Automation at 1/3 the Cost of
the Competition)**

The resolver based Series 1992 Press-Set Automation Controller is a modular design that allows you to select features and options to reach the level of automation your business needs to stay competitive. The Series 1992 has a 16 channel programmable limit switch and 12 programmable and 3 static die protection inputs.

Features:

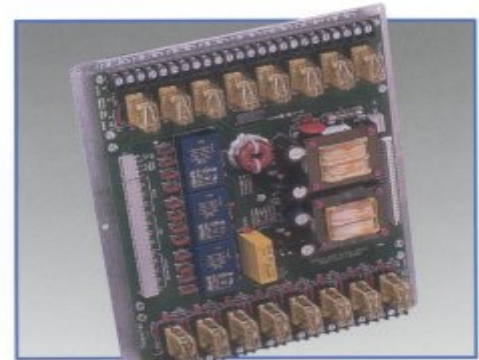
- 200 job setup storage for immediate recall of limit switch, die protection, shut height, counterbalance and feeder setup parameters based on die code number
- Stroke, batch and total counters
- Brake monitor continuously displays stopping time and provides relay output if max. stop time is exceeded
- Speed compensation advances/retards selected outputs as press speeds vary
- Fail-safe control relays conform to OSHA specifications for use as inputs to press control circuits
- Serial interface to supervisory control systems

Options

- Automatic Shut Height Monitor or Control
 - Rugged Magnetostrictive LDT Sensor
 - Universal LDT Mounting Bracket
 - Cable Termination Kit
- Interface to Gemco Series 2200 Automatic Counterbalance Control Panel
- Serial interface to most coil feeders for automatic setup of feeder operating parameters.



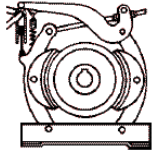
Press-Set Automation Controller



Press-Set Relay Output Board



Rugged Gemco Resolver



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OSHA uses our Semelex™ Safetimeter™... shouldn't you?

Challenge:

OSHA requires that press stopping time, as well as related operator safety device position and operation be monitored on a periodic basis.

Solution:

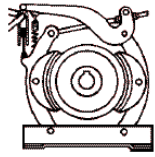
Gemco Series 1999 Semelex Safetimeter (Portable, Fast, Accurate)

Press setup demands that the operator safety devices be properly set and tested to OSHA standards. Our portable Semelex Safetimeter is designed to be taken to the press to test operator safety devices. It is the same unit OSHA uses when they make tests in your facility.

- Checks press stopping time and calculates safe distance for safety devices



- System accessories allow testing of safety device response time as part of setup
- Comparison of down stroke and upstroke stop times can verify counter balance adjustment
- Essential to properly set up light curtains, safety mats, hand controls and other initiation interlocks



Other Pressroom Products & Accessories

Gemco Series 952 BlueOx™ Digital LDT

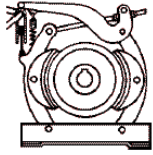
- Industry's toughest transducer - 2,000 G hammer strikes without false signaling
- 30 G random vibration test without false signaling
- Resolution to .001"
- Repeatability to .001% of full stroke Up to 144" in 0.1" increments

TRANSDUCER MOUNTING:

The proper mounting of the linear displacement transducer is critical to insure proper operation of the system. While no hard and fast rule applies to mounting the transducer the following should be considered: A) The transducer should be mounted between a fixed portion of the ram (typically above the wrist pin on straight side presses) and the slide (holding the magnet). Because of variations from press to press, the transducer/magnet mounting brackets are not provided. These brackets should be made from cold rolled steel and configured such that, 1) sufficient clearance from the crown to the top of transducer is seen when the ram is at top dead center, 2) the slide bracket is no closer than 2" from the bottom of the transducer hex with the slide at its uppermost point, 3) that the linear transducer is as perpendicular to the press bed as possible and that brackets are aligned so as not to rub or side load the linear transducer when the slide is being adjusted, 4) that sufficient clearance for the linear transducer guide tube is provided when the slide is at its uppermost point.

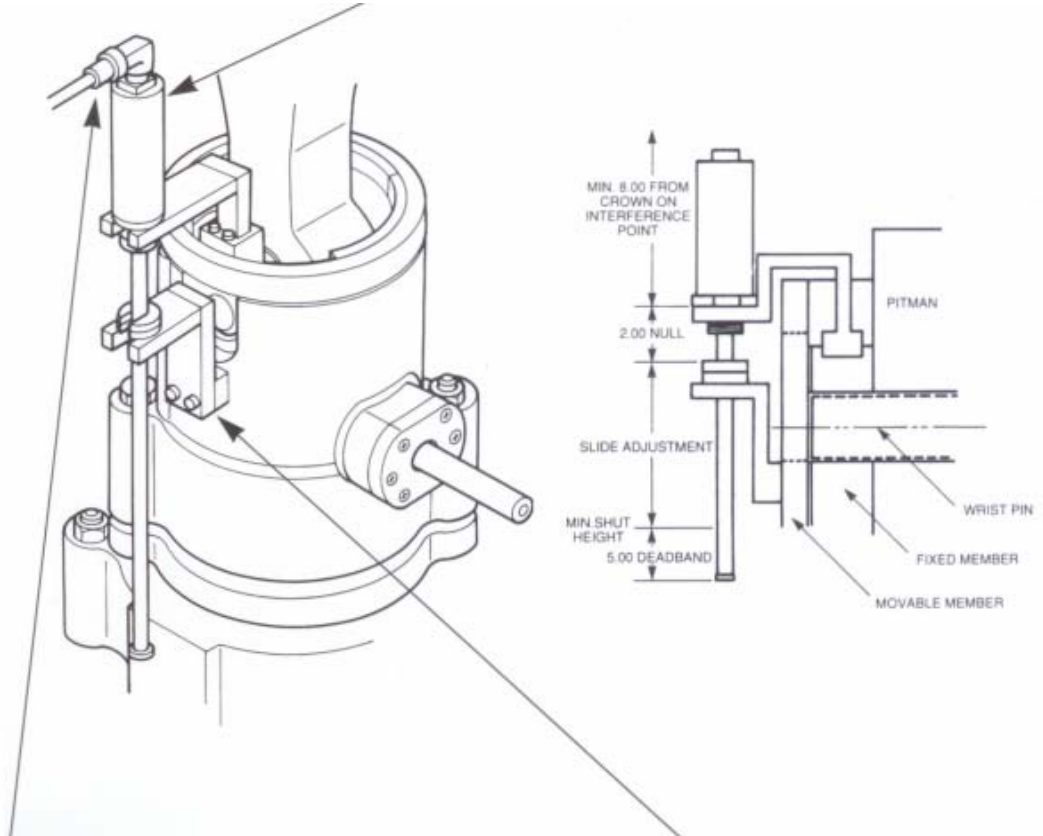
The cable termination kit should be installed such that the flexible cable between the linear transducer and the junction box is as closely aligned as possible and that the junction box has clearance when the ram is at its uppermost point.





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Cable Termination Kit
Catalog Number
SD0482700L25

Junction box mounts on crown of press. Coiled cable protects and controls cable connection to the linear transducer mounted on upper arm



Universal Transducer Mounting Bracket
Catalog Number SD0441300

Simplifies mounting of linear displacement transducer between upper pitman arm and ram.

