PWF Manual

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USING THE PRESSWATCH FORGING PRODUCTION MONITOR
SECTION 1

INTRODUCTION

These are OPERATING INSTRUCTIONs, not a technical manual. It will explain, in easy to understand terms, how to use the PWF tonnage monitor. Section 1 of this manual provides operating instructions for typical routine operations. Section 2 of the manual provides a more detailed discussion of the principles of operation and how to use the monitor in important ways.

It is not necessary to read this manual from cover to cover. Use it as a reference booklet. There is nothing to memorize. The basic operating instructions for using the monitor are printed near the instrument controls. However, you can learn to make the monitor do helpful tasks if you merely browse through this manual.

PWF MONITOR OVERVIEW

The PWF Monitor is designed specifically for forging operations. Based on Toledo Transducers popular PW Series tonnage monitors, it retains most of that series' powerful and convenient features while supporting additional functions which accommodate the specific needs of the forging industry.

The PWF monitors multiple press tonnages during the forming of a single part. The forming tonnage from up to four unique die stations can be displayed and each station has its own set of tonnage limits. Each set of tonnage limits is based on a benchmark value unique to the station so the convenience of AUTO-SET is preserved.

The PWF monitor displays the forming tonnage for each station sequentially. Station #1 shows the tonnage developed in the Buster operation. Station #2 shows the tonnage that is generated in the Blocker operation and so on up to four stations. Once the sequence is completed the forging monitor assumes that a new part is starting and returns to Station #1 again. The number of stations in the sequence can be varied by the alarm value adjustment controls inside the enclosure on the door. The RESET button on the front panel will clear an alarm condition and also interrupt the sequence returning the instrument to Station #1 for a new part. For an automated process the RESET can be triggered through the external reset input located on the power control board.

OPERATING INSTRUCTIONS

SETTING UP THE MONITOR FOR THE FIRST TIME

There are four types of operator and supervisor controls for this monitor:

1. **FUNCTION SELECTOR** . . . One outside control selects the operating condition of the monitor. This is the three-position function switch on the front panel.

   a) **SET-UP PRESS** position: If the press or tooling is being jogged or adjusted, the switch should be in the SET-UP (center) position. This is also the stand-by position of the switch.

   b) **MAKE NEW TARGET** position: When the press is running and making good parts you may put the switch in the NEW TARGET (right) position. This is the AUTO-TARGET automatic monitoring mode. The monitor will take a sample of the forming tonnage, calculate a new benchmark and store it in memory.

   c) **USE OLD TARGET** position: Suppose you stop the press and put the monitor into the SET-UP (center) position for any reason. Suppose you DON'T make any press or tooling adjustments that affect the forming tonnage. To keep the old benchmark you may put the switch to the OLD TARGET (left) position to retain the old target.

      NOTE . . If you make press adjustments that affect forming tonnage, you should put the switch back to the NEW (right) position to take a new tonnage sample and store a new benchmark.

2. **AUTOMATIC TARGET ALARM CONTROLS** . . . Four inside controls are used to set the operating tolerances of the monitor. Use the HIGH ALARM CONTROL to monitor for any forming tonnage that is too high. To set these controls, decide by what percentage the tonnage can increase without making a bad part or doing damage to the tooling.

   If you are not certain where to set the HIGH alarm control limits, just watch the red displays on the monitor. They will show you the percentage that the forming tonnage is changing from hit to hit in each station. Just set the HIGH alarm controls at a comfortable working tonnage. If you set the tolerances too small, the monitor will stop the press too often. If you set the tolerances too high, you might make some bad parts before the monitor stops the press.

   You will be better off setting the tolerances too small until you get some experience with using the monitor. However, due to the lower tolerances the monitor may shut the press down more often than you want. If that happens, and the parts are good, just set the tolerances to larger numbers.

   You may change the HIGH alarm controls even while the press is making parts and the function switch is in either the NEW or OLD TARGET position. As soon as you change the switches the monitor will automatically adjust the alarm trip points. Be careful if you are setting the controls to closer tolerances---you could stop the press.

   NOTE . . Any time you make press adjustments that affect forming tonnage, you should put the switch back to the NEW TARGET (right) position to take a new tonnage sample and store a new benchmark.

3. **SETTING THE NUMBER OF STATIONS** . . . There are four inside switches which control HIGH alarms and TURN OFF STATION. These controls are used to set the number of stations required to form a single part entirely. For example, Station #1, 2, 3, for the BUSTER, BLOCKER and FINISHER would be activated to an alarm setting. Station #4 would be dialed to turn off station #4. Should for some reason Station #2 need to be turned off out of the sequence of three, a capacity alarm would be active for press protection. Refer to Section 2 of this manual for details on setting the controls.

4. **SUPERVISOR CONTROLS** . . . On the inside of the door are two switches labeled SUPERVISOR CONTROLS. Normally, both switches are in the UP position (on). One switch is for turning the TONS display off or on. The other switch is for disabling the external RESET button. Refer to Section 2 of this manual for details on when and how to use these switches.

USING THE PWF MONITOR FOR PRESS SETUP

1. Put the monitor function switch in the SET-UP (Center) POSITION. The red PERCENT CHANGE displays will turn off, the green TONS displays will remain on, and the automatic alarms will be disabled. Only the press overload (i.e., over capacity) alarms will operate. Any tonnage shown on the green displays will be the tonnage of the last hit in the NEW or OLD TARGET mode. Pressing the RESET button will not cause the displays to show zeroes but set the instrument to Station one and prepare it for a new billet. The yellow TONS display will update when the press is cycled.

2. If any displays are flashing it means there was an alarm. Press the RESET button to re-set tripped alarms and restart a part sequence starting with Station #1. Resetting the monitor may also be done remotely with the external reset input.

3. You may make a quick test to see if the monitor is working well. This test is NOT necessary every time you set up a new job. However, if you periodically make the test you will gain confidence in the instrument.

   With the press stopped and the function switch in the SET-UP (center) position, press and hold the button marked TEST SYSTEM CALIBRATION. The calibration numbers for the four corners of the press will be displayed. Compare them with the CAL numbers recorded for the press. Verify that they are correct within a few counts.

4. Make press adjustments and cycle the press. We suggest setting up the press for the lowest possible tonnage. The green TONS displays will show the tonnage of each die station.

   One or more displays will flash if the tonnage exceeds the trip point of the maximum-tonnage alarms. Push the RESET button to re-set tripped alarms and restart the part sequence at Station #1.

5. When the press setup is finished, decide if the HIGH ALARM CONTROLS must be changed inside the monitor. It is not necessary to change the alarm controls if the new press setup has similar tonnage tolerances to the previous job. If the alarm controls must be changed, refer to Section 2 of this manual to help you make decisions.

6. When the press is running and making good parts, turn the function switch to the AUTO TARGET position marked MAKE NEW TARGET. You will have first-hit protection at the alarm levels set on the ALARM controls. During a short series of press strokes, the monitor will calculate the average forming tonnage. It will then update the target tonnage it used when you first turned to the NEW target monitoring position.

7. If an alarm trips, one or more displays will flash and the press will stop. If the trouble does not need press adjustment, you may leave the function switch in the NEW position. For example, suppose the temperature of the billet wasn't just right. Cure the problem, push the RESET button, then start the press. Remember that pressing the RESET button restarts the sequence to Station #1.

   If the press needed adjustment, there is a good chance the forming tonnage will be different than it was before. The monitor should be put into the NEW position and then immediatly back to the NEW TARGET (right) position. This will force the monitor to calculate a new benchmark and replace the old one.

NOTE . . Although pressing the RESET button will re-set tripped alarms, the monitor CANNOT re-start the press. After the alarms are re-set, you must start the press in your normal way.

TO CHECK INSTRUMENT CALIBRATION

The following is a simple test if you have doubts about whether the monitor is still accurate:

1. Stop the press.

2. Turn the function switch to the SET-UP (center) position.

3. Press and hold the push button marked TEST SYSTEM CALIBRATION.

4. Read the numbers which are displayed and compare them to the calibration numbers which were recorded for the monitor. The numbers may be incorrect by a few tons and still not indicate a problem that needs immediate correction. The percent of difference between the recorded and displayed numbers will be about the percent of error in your tonnage measurements.

   For example, suppose the recorded calibration numbers were 100 tons per station. Suppose the monitor displayed calibration-check numbers of 95 tons per station. This is a 5% error. Your tonnage measurements will probably be off by about 5%.

NOTE . . Even though the calibration numbers are wrong, the AUTO-TARGET part of the monitor will still work well. That is because the AUTO-TARGET alarm set-points are referenced to the benchmark average tonnage and not to zero. For more details, refer to Section 2 of this manual.

TO RE-SET TRIPPED ALARMS

Push the front panel RESET button to re-set tripped alarms. Tripped alarms may be re-set with the monitor function switch in any one of the three positions. A tripped alarm will cause one or more displays to flash. The pattern of the flashing shows which station the problem occurred in and which alarm level caused press shutdown.

NOTE . . It is NOT necessary to memorize the meaning of the flashing pattern for routine monitoring. The flashing is an aid to troubleshooting forming problems. The pattern of flashing tells you which type of alarm tripped.

Perhaps the alarms cannot be re-set by pushing the RESET button. Perhaps the RESET button is disabled by the switch on the SUPERVISOR CONTROLS panel inside the instrument. In that case, the monitor may be opened to re-set the alarms on the supervisor control panel. Or, the TONNAGE DISPLAY switch may be turned to the ON (up) position.

THE ALARM FLASHING PATTERN

There are two alarm levels built into the monitor.

1. At the highest level are the maximum-tonnage alarms which are tripped by a press overload.

2. There are AUTO-TARGET automatic alarms which will trip if the forming tonnage deviates to much from the benchmark tonnage.

When the function switch is in either AUTO-TARGET mode (NEW or OLD TARGET) an alarm can cause the displays to flash either together or alternately. The pattern of flashing shows which station of the tooling had the off-tolerance tonnage and which alarm level was reached to cause press shutdown.

- **ONLY GREEN DISPLAYS ARE FLASHING**: Maximum tonnage press overload tripped. If the function switch is in the SET-UP position, only the green TONS lights will flash if there is an alarm. The red PERCENT lights are disabled in the set-up position.

- **ONLY RED DISPLAYS ARE FLASHING**: AUTO-TARGET forming tonnage alarm tripped. If the forming tonnage goes out of tolerance and trips an auto-target automatic monitoring alarm one or more red PERCENT displays will flash.

- **ALTERNATELY FLASHING DISPLAYS---GREEN, RED, GREEN, RED, ETC.**: Maximum-tonnage alarm tripped. Both the green and red displays will flash alternately if the tonnage goes high enough to trip a maximum-tonnage press overload alarm.

NOTE . . The green TONS displays will not flash if the tonnage display switch on the supervisor control panel inside the monitor is off (down).

SECTION 2
UNDERSTANDING THE PWF SERIES PRODUCTION MONITORS

INTRODUCTION

The following pages explain how the PWF monitors work. The PWF series tonnage monitors are very easy to understand and operate. In addition, they are very versatile and provide a broad range of helpful benefits. What you will find refreshing is the ease with which the monitor can be set up for both standard and special jobs. There are no keyboards to use. There is nothing to memorize. We made the monitor as automatic as possible. That doesn't mean that it has limited applications. It can do almost anything that can be done on any load monitor---and many things that others cannot do.

Your PWF monitor has two major features not found anywhere else: It displays tonnage change within 1% and shows the force necessary in each station of the tooling to form a part. These features are entirely new in process control for the forging industry. You will find these revolutionary features very valuable if you take a little time to get acquainted with them.

HOW THE FORGING MONITOR WORKS

PWF monitors have AUTO-TARGET automatic "benchmark" monitoring. They are simple to use and easy to understand. The instrument provides excellent press, tooling and product protection. It also provides unusual production information. It has many unique and exclusive features which are important to the production of formed parts. The PWF monitor is a simple instrument to learn and use. Operating instructions are printed near the controls.

ABOUT BENCHMARK MONITORING

It is difficult to adjust a conventional load monitor every time a job is changed or the press is adjusted to a new tonnage. That is because there can be as many as eight different alarm trip points to calculate and as many as eight alarm-set controls to adjust. That is not the case with the PWF monitor. All calculating, memory storage, alarm adjustment, and comparing goes on automatically. Just turn the function switch to start the process.

The PWF series monitors use a simple but highly sophisticated method of setting alarm trip points for monitoring the forming tonnage.

After the press is adjusted and making good parts, the PWF monitor calculates the average forming tonnage and stores the result in memory. The stored average tonnage value becomes a benchmark against which all subsequent forming tonnages are compared. If the forming tonnage goes too high an alarm trips and can stop the press if so desired.

One thing you will need to decide is what percentage of tonnage change (tonnage tolerance) is acceptable. That percentage is set into the monitor by using the 2 ten-position HIGH AND LOW ALARM CONTROL switches. Fortunately, we find that most jobs on a particular press run with the same tonnage tolerance even though the actual tonnage may vary quite a bit. It is doubtful that you will need to change the tolerance percentage or the alarm controls very often.

SPECIAL FEATURES OF THE PWF SERIES PROCESS MONITORS

What is a process monitor? How is it different from a conventional load monitor? A process monitor is an instrument which is as automatic as possible and closely watches for working tonnage changes during the production run. While the press is making parts, the PWF monitor provides press/die/product protection. It also shows important information about the status of the job being run.

A conventional load monitor or tonnage meter is usually only a protective device. If the forming tonnage gets too high, alarms will trip and stop the press. Many conventional load monitors are of little use when you begin to monitor the working tonnage after the die setter leaves the press.

Most conventional load monitors have only press overload protection alarms. The salesmen say you can manually adjust them close to the working tonnage to get a measure of tooling protection. However, working tonnage alarms need careful adjustment from job to job and sometimes from hour to hour. Trying to make working tonnage alarm set-point adjustments on some load monitors is extremely difficult and frustrating. It isn't a pleasant job if you are busy and must do it often.

There are as many as eight alarm controls on a conventional four-channel tonnage monitor. Repeatedly adjusting that many controls generally creates problems for a busy operator or line supervisor. In defense, you might turn the HIGH alarms up to maximum. That certainly is not the way to protect the dies or the product.

To monitor processes continuously you need a way to make certain the working tonnage alarms are set properly for every job---without significant operator interaction. The PWF instrument needs almost no attention when changing jobs. Usually all that is necessary is to turn one switch.

PWF MONITOR FRONT PANEL CONTROLS AND FEATURES

GENERAL INFORMATION

The outside of the PWF instrument is an easy subject to discuss. The monitor has only two operator controls on the front panel---a function selector and an alarm reset button. The rest of the front panel is devoted to displaying information either at a glance or simply by pushing a button. Routine daily use of the monitor requires only easy decisions:

DECISIONS …

- Is the press being adjusted or jogged for test purposes? If so, the monitor should be in the SET-UP operating mode.

- Has the die setter finished press adjustments and are good parts being made? If so, it is time to change the monitor to the AUTOMATIC MONITORING mode by turning the function switch to the MAKE NEW TARGET position.

- Is it is necessary to stop and restart the press for some reason? The monitor may be left in the automatic mode if no significant press adjustments will be made.

- Was the monitor put into the set-up mode for press or tooling adjustments while the press was stopped? If the answer is yes, there are two choices:

    1. Suppose the press or tooling adjustment significantly changed the forming tonnage. The average tonnage benchmark may easily be updated by turning the function selector to the MAKE NEW TARGET position.

    2. Suppose the forming tonnage is the same as the old benchmark. If monitoring should be resumed with the old benchmark tonnage, turn the function selector to the USE OLD TARGET position (left).

- Has an alarm been tripped? If so, cure the problem and press the front panel RESET button.

DIGITAL DISPLAYS ON THE FRONT PANEL

The digital displays of the PWF are unique. They are very versatile but simple to understand. We use two colors. There is one green and one red digital display for each station of the die. There is a set of five green displays and a set of four red displays. The green PEAK TONS displays show the forming tonnage in each station of the die. The red PERCENT CHANGE displays show how much that forming tonnage has changed from the benchmark or average target tonnage. The green display in the center shows how many tooling stations are active and which one was use last. The active station is indicated by the flashing decimal point.

PERCENTAGE OF TONNAGE CHANGE

Most forging people agree that forming tonnage changes and product quality changes are related. Forgers using plain load monitors will often write down the setup tonnage (working/forming tonnage) on or near the monitor. During the production run someone will probably compare the current forming tonnage to the original setup tonnage. You can almost bet that in their mind they will roughly calculate the percent of tonnage change. The PWF monitor does that automatically for you and continuously displays the percent of tonnage change within 1%.

To avoid confusion, only the green TONS displays and die position are lighted during press setup. They are important to the die setter while he adjusts the tooling station to the lowest tonnage that will produce a quality part.

After the die setter is finished, and the instrument is automatically monitoring, the red PERCENT CHANGE numbers become very important. They continuously show how well the job is running.

The red percent change lights are ALWAYS on during automatic monitoring. The green TONS lights may be on or off, depending on a switch inside the monitor.

THE FUNCTION SELECTOR

The function selector is the three position switch on the front of the instrument. It selects the operating mode of the monitor---either SET-UP or AUTO-TARGET. This control will probably catch your attention because the operating instructions are printed right at each switch position.

- **SET-UP PRESS . . .** The center switch position is for SET-UP operation and is used by the die setter during tooling setup and adjustment. The only alarms that are operational are the maximum-tonnage overload protection alarms. All AUTO-TARGET automatic working tonnage alarms are inhibited in the set-up mode. This means the die setter won't need to reset alarms repeatedly (unless he continuously overloads the press).

- **MAKE NEW TARGET . . .** The right switch position of the function selector is the normal AUTO-TARGET automatic production monitoring mode. The monitor will erase the old target tonnage and calculate a new one.

  The maximum-tonnage press overload alarms will be operational. In addition, all AUTO-TARGET alarms become active and you have first-hit protection the instant the switch is turned to the NEW TARGET position. Then, after a series of press strokes, the monitor will re-calculate and update the average forming tonnage target.

- **USE OLD TARGET . . .** The left switch position is also for automatic monitoring. However, in this position you keep the old target. There will be cases where you want to go back to the set-up mode temporarily without losing the setup tonnage benchmark reference. The OLD TARGET switch position makes that possible. It will be as if you had never gone into the set-up mode if you turn the switch to the OLD TARGET position.

FRONT PANEL PUSH BUTTONS

There are seven sealed "membrane" type PUSH BUTTONS on the front panel. One of these is the alarm RESET button. The other six buttons are used to display a variety of information at any time. Any of the seven buttons may be pressed at any time without causing press shutdown if the function switch is in either the SET-UP or AUTO-TARGET position. However, pushing the TEST SYSTEM CALIBRATION button CAN stop the press if the function switch is in the SET-UP position.

- **TEST SYSTEM CALIBRATION** . . . Push this button to check the accuracy of the monitor system. We feel that anyone should be able to check instrument calibration quickly and easily. Checking calibration on most other monitors is a tricky job done inside the enclosure by technicians.

- **SHOW HIGH ALARM TONS**. . . Push the SHOW HIGH ALARM TONS button to display all HIGH AUTO-TARGET alarm trip points in both tons and in percent-of-tonnage-change.

  NOTE . . To display the trip-points of the maximum-tonnage alarms, push and hold the RESET button.

- **SHOW TONS DISTRIBUTION** . . . Push THE SHOW TONS DISTRIBUTION button to display the tonnage distribution on the frame of the press. Example you may want to see how the blocker station generates the load thru the press frame.

- **SHOW TARGET TONS** . . . Push this button to show the stored target tons for each station of the tooling. This is important if you want to know the original setup tonnage.

- **SHOW AVERAGE TONS**. . . this button will diplay the average tonnage in each station of the tool (ie., the last 100 hits).

- **RESET AVERAGE TONS TO ZERO**. . . Clears average to zero so a fresh sample can be taken of up to 9999 parts.

- **ALARM RESET BUTTON** . . . Push this button to re-set all tripped alarms. The alarm RESET button is unique. A supervisor may disable it if he wants to.
  Usually the RESET button is active and will re-set all tripped alarms during routine monitoring. However, suppose a supervisor wants to be called every time there is a press shutdown. He may disable the outside RESET button and make the inside one active. Tripped alarms may be re-set from the SUPERVISOR CONTROLS panel inside the monitor.

  NOTE . . Even if the RESET button is disabled for automatic monitoring it will ALWAYS be active for the die setter if he needs it in the set-up mode.

TO SHOW MAXIMUM-TONNAGE ALARM TRIP POINTS

Press and hold the RESET button to display the trip points of the maximum-tonnage press-overload alarms.

ANALYTICAL SIGNAL OUTPUTS

Technical people can use an oscilloscope or strip chart recorder to observe how the forming tonnage changes throughout the press stroke. It is surprising how easy it is to spot forming problems when you see the tonnage wave shape drawn on paper.

There are two covered signal output jacks on the front of the monitor. An oscilloscope or strip chart recorder may be plugged into these jacks to watch the analog tonnage signal from the sensors. This allows press or tooling problems to be analyzed rather easily. The signal from the sensors faithfully represents the tonnage changes in the press frame. It is usually called the "track" signal. It is amplified but otherwise not altered.

FEATURES INSIDE THE ENCLOSURE

INTRODUCTION

The monitor is inherently electrically safe with the door open. Any potentially dangerous voltages are well covered. Critical adjustments and controls are located inside compartments, away from the fingers of curious people. There is no reason for anyone but a technician to remove the compartment covers or make technical adjustments.

A digital display printed circuit board is mounted on the back of the enclosure door. There is a metal cover over that circuit board. On the metal cover are four ten-position switches. All four of the switches control the AUTO-TARGET alarm trip points and how many tooling stations are active. Full operating instructions are printed near the controls. Anyone with the authority to make routine decisions about the press operation can very easily use the four control selectors.

A VARIETY OF ALARM LEVELS

The PWF series monitors have several types of alarm levels built in:

- **MAXIMUM-TONNAGE ALARMS** . . . The maximum-tonnage alarms are for press-overload protection. They are the highest level alarms in the instrument. One or more alarms will trip if the tonnage on any press corner exceeds the safe capacity of the press. Some forging people have different ideas about the safe capacity and the rated capacity of their presses. Some want the press overload alarms to trip higher or lower than the rated capacity of the press.

  There are some forgers who intentionally and regularly work their presses above the rated press capacity. That, of course, is their privilege. However, press manufacturers say the press is vulnerable to excess wear or damage if the rated capacity is exceeded.

  Maximum tonnage alarms are factory set during calibration at the capacity of the press, however, The trip points of the Forging Monitors maximum-tonnage alarms may be changed. It is merely a matter of changing some small selector switches inside the monitor.

- **AUTO-TARGET BENCHMARK ALARMS**. These are automatic alarms which are the lowest level alarms in the monitor. They are for closely monitoring the working tonnage of the press. These alarms are for tooling and product protection.
  There is a HIGH alarm for each station off the tooling. They are automatically adjusted to the appropriate tonnage whenever the function switch is put into either the NEW or OLD TARGET.

  After the press is adjusted, the monitor calculates and remembers the ideal forming tonnage (the target/benchmark). The monitor then measures the forming tonnage of each tooling station as the part moves from the BUSTER, BLOCKER, and FINISHER. The forming tonnage is compared to the stored average target tonnage benchmark. One or more AUTO-TARGET alarms will trip if the tonnage change exceeds pre-selected tolerances which were set into the TARGET ALARM panel.

AUTO-TARGET ALARM TRIP POINT SELECTORS

There are four ten-position HIGH ALARM CONTROL switches on the rear of the enclosure door. They control the trip points of the HIGH AUTO-TARGET alarms and select the number of stations of the tooling in use.

The AUTO-TARGET alarm trip points may be set 5%, 10%, 15%, 20%, 25%, 40%, 60%, or 80% over the average-tonnage (target tonnage) benchmark. Most customers usually set these selectors at perhaps 15%, 20% or 25% and let them alone.

For example, suppose that a bad part would be made if the tonnage went 30% higher than the original target tonnage. You would probably select a safe +20% for your AUTO-TARGET high alarm trip points. Therefore, when a working tonnage alarm trips it only means that an OFF-TOLERANCE tonnage level occurred before a bad part was made.

Each alarm selector switch has the position "TURN OFF STATION". This function enables the die setter to select the appropriate number of stations for a particular job. If for instance there are three stations to a job, IE: BUSTER, BLOCKER, & FINISHER the set up man would adjust the AUTO-TARGET alarm setting for STATION 1,2, and 3, leaving station 4 turned OFF. The same would hold true if the job had only 2 stations in the tooling then in this case Stations 3 & 4 would be turned to the OFF position.

In the event that a station would need to be disabled in the middle of a job it may be disabled by switching the control to the "OFF" position. This disables the channel but does not remove it from the sequence. For example, if the blocker station was having a recurring problem and needed to be bypassed, that station could be turned to the OFF position providing overloads but not tooling protection.

SUPERVISOR CONTROLS

The PWF has two toggle switches mounted on a SUPERVISOR CONTROLS panel inside the enclosure. These controls help supervisory or technical people to control the process more closely.

- One toggle switch controls whether the green tonnage displays are lighted when the monitor is in either the NEW or OLD TARGET automatic monitoring mode. The supervisor can turn off the green TONS displays to prevent possible confusion. Some customers may prefer to display only the percentage of tonnage change during automatic process monitoring.

NOTE . . The green TONS displays are ALWAYS operational in the SET-UP mode.

- The second toggle switch controls whether the front panel RESET button is active or not active. The supervisor can disable the outside RESET button if he wants to know every time there is a press stoppage. He will be called to re-set tripped alarms. They can be re-set from inside the enclosure.

TEST SYSTEM CALIBRATION

When your monitor was installed, it was probably matched to the press by what is called press calibration. The press was forced to work near its rated tonnage capacity by impacting on calibrated load cells. Then, the monitor was adjusted to display the proper amount of the impact tonnage. When that was done, special calibration numbers were read from the monitor. These numbers were written on a label inside the monitor for future reference.

The monitor will not display the proper calibration numbers if something in the system changes significantly. You may check the calibration of the monitor whenever the function selector is in the SET-UP position. Merely stop the press and push the TEST SYSTEM CALIBRATION button. Read the CAL numbers from the displays.

NOTE . . The TEST SYSTEM CALIBRATION button is active only in the SET-UP mode. It is disabled in the NEW and OLD TARGET modes to prevent accidental press shutdown during the production run. CAUTION . . Make certain the press is stopped when you check the calibration in the SET-UP mode. If not, you may stop the press and get incorrect CAL numbers.

Special calibration numbers for each press corner show up on the green tonnage displays as long as you hold the button. Compare these numbers to the ones recorded by the technician during the press calibration. If each calibration number is right, the monitor is still accurately calibrated and is running properly.

There might be a slight difference between the displayed numbers and the recorded CAL numbers. The amount of difference approximately represents the error in the system. For example, suppose there is a 5% difference. That means there would be about a 5% error in the tonnage displayed.

An error in the displayed calibration numbers does not affect the accuracy of the AUTO-TARGET alarms. They are referenced to the target tonnage and not to the tonnage span of the monitor. The AUTO-TARGET alarms work on percent-of-tonnage-change and not on calibrated tonnage.