MODEL CMP12
SHEAR CONTROLLER

REFERENCE MANUAL

Version 3.15

AMS APPLIED MICROSYSTEMS

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AMS APPLIED MICROSYSTEMS

INTRODUCTION

The CMP12 Shear Controller from *Applied Microsystems* is a result of over 10 years of experience in designing and manufacturing coil processing machine controls.

The CMP12 is an advanced length control system designed specifically for roll forming and cut-to-length lines. It is easily added to existing machines to maximize productivity and increase profits. The CMP12 stores up to 100 orders and maintains inventory records for up to 51 coils. It changes lengths on-the-fly and eliminates costly setup time for length changes.

The CMP12 can also communicate with a remote computer. From your office computer you can send orders directly to the CMP12, follow these orders through production, and get daily production and inventory reports.

The CMP12 is field-proven reliable and is backed by a one year warranty on parts and labor.

APPLICATIONS INCLUDE:

- Flying Cutoff Lines
- Hump Table Lines
- Stopping Lines with
   - Hydraulic Drives
   - Two Speed Motor Drives
   - D.C. Drives
   - Variable Frequency A.C. Drives
- Replacement of Flag Cutoff Systems
- Replacement of Outdated and Nonrepairable Electronic Length Control Systems.

GENERAL SPECIFI- CATIONS

Number of Jobs	100
Maximum Job Quantity	9999
Maximum Part Length	999.999 inches
Number of Coil Accumulators	51
Maximum Accumulator Capacity	999999 feet
Maximum Line Speed	500 feet/minute
Resolution	.012 inches with a 12 inch measuring wheel
Inputs	1. Jog forward 2. Jog reverse 3. Sheet detect 4. Shear complete 5. Run enable 6. Remote Shear 7. Remote Run
Outputs	1. Fast 2. Slow(die accel.) 3. Reverse 4. Shear 5. Forward 6. Run 7. Item Counter
RS-232 Serial Ports	1. Office Computer Link 2. Data Logging
Input Power	115 VAC ± 10%, 50-60 Hz @ 1 Amp, 5 to 24 VDC @ 1 Amp
Output Power	5 to 24 VDC open collector transistors, 5 amps maximum
Physical Size	7.25" high x 17.25" wide x 14" deep with a 1 inch mounting flange
Weight	29 pounds
Warranty	1 yr. on parts and labor

FRONT PANEL COMPONENTS AND DESCRIPTION

The front panel of the CMP12 consists of a CRT display, a keyboard, and six lighted, push-button switches. The CRT display allows the user to view an entire page of setup, job, coil, or status information at one time. The keypad and push-button switches allow for programming and running the CMP12.

PUSH-BUTTON SWITCHES

ACK

The ACKNOWLEDGE button is used to acknowledge that a message has been received on the display. When a message to the operator is sent by a remote computer, the screen is cleared and the message is displayed. As the message is displayed, the yellow ACKNOWLEDGE lamp will light indicating that a response is required. The message will continue to be displayed until the ACKNOWLEDGE button is pressed. No other messages can be transmitted until this button is pressed to assure that no messages are lost.

INC QTY

The INCREMENT QUANTITY button is used to increase the quantity of the job in process. This operation was designed to allow the operator to easily increase the quantity of a job when a piece has been scrapped. Every time this button is pressed, an additional part will be added to the job in process.

The red lamp is lit until the next shear, and the INC QTY button is ignored during this time. This means that the operator can increment the remaining quantity only once per shear cycle.

MANUAL SHEAR

The MANUAL SHEAR button is used to manually cycle the shear. The yellow lamp is lit when the shear is activated manually by the operator or automatically by the CMP12.

REMOTE DATA LINK

The REMOTE DATA LINK button lights when the office link computer is polling the CMP12. This button does not act as a switch.

When this blue lamp is lit, messages are being exchanged between the CMP12 and the Office Link computer. DO NOT REMOVE POWER from the CMP12 while the blue lamp is lit.

RUN
The RUN button is used to start the line after a job has been programmed. This green lamp is lit when the machine is running.

HALT
The HALT button is used to stop the machine. The red lamp is lit when the machine is halted.

KEYPAD
Information is entered into the CMP12 using the keypad on the front panel. Data is entered at the point where the cursor is located on the CRT screen. The cursor is a shaded rectangular box which prompts the operator to enter the required information.

ADD LINE
The ADD LINE key is used when programming jobs to insert a new line at the current cursor position.

DEL LINE
The DELETE LINE key is used when programming jobs to delete the line at the current cursor position.

NXT LINE
The NEXT LINE key is used when programming jobs to advance the cursor to the start of the next line.

*
The ASTERISK key is used to view the system status page which is used for diagnostic purposes. The system status page also allows for the operator to erase all setup and job data by entering the code 1984.

⇑
The UP ARROW key is used to move the cursor up one line.

⇒
The RIGHT ARROW key is used to move the cursor right to the next column. If the cursor is positioned at the end of the current line, pressing the RIGHT ARROW key will advance the cursor to the start of the next line.

PAGE UP

The PAGE UP key is used to view the previous screen or page of data.

STAT

The STATUS key is used to view the status of the jobs currently programmed in the CMP12. Pressing the STAT key will position the cursor on the job in process.

⇓

The DOWN ARROW key is used to move the cursor down to the next line.

⇐

The LEFT ARROW key is used to move the cursor to the previous column. If the cursor is currently at the beginning of a data line, pressing the LEFT ARROW key will cause the cursor to be positioned at the end of the previous data line.

PAGE DN

The PAGE DOWN key is used to view the next screen or page of data.

SETUP

The SETUP key is used to enter the Setup Mode. This mode is used during installation to configure the CMP12 for the machine it will control. If the security key located on the front panel is in the locked position, data may be reviewed, but may not be changed.

JOB

The JOB key is used to enter the Job Mode. The Job Mode is used to program the job number, bundle number, item number, quantity, length, and coil number (if desired) for up to 100 jobs.

STOCK

The STOCK key is used to enter the manual stock adjustment mode. The operator can use this mode to make adjustments to a pending job because of a part or parts removed from stock to substitute for a part or parts to be made. This causes the remaining quantity of the matching job line (if any) to be decremented by the number reported as removed from stock. If this reduces the remaining quantity of the job line to zero (or less than zero), the status of that job line is automatically set to DONE.

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The Manual Stock Adjustment mode prompts the operator:

REMOVED FROM STOCK

JOB NUMBER	0 - 99999999
BUNDLE NUMBER	0 - 999
ITEM NUMBER	0 - 999
LENGTH OF PART	0 - 999.999
QUANTITY	0 - 9
ALL ENTRIES CORRECT?	YES/NO

The Job, Bundle, and Item numbers, the part length, and the quantity removed from stock are initially set to zero. Move the cursor with the UP and DOWN arrow keys to enter the correct values for the part or parts being removed from stock. When all entries are as desired, point to the ALL ENTRIES CORRECT? prompt and toggle the response to YES, and press ENT to register agreement with the displayed values. At this point a message is sent to the Office Link computer, and the part is removed from any matching unDONE job line.

COIL
The COIL key is used to view the totals of the length accumulators by coil number in the CMP12.

ENT
The ENTER key is used to store the values programmed in the CMP12.

CLR
The CLEAR key is used to erase an incorrect entry before the enter key has been pressed. The CLR key is also used to clear a coil accumulator in the Coil Mode. It is also neccesary to press the CLR key to clear any error messages from the screen.

The keys 0 thru 9 and the decimal point are used in entering the numerical values required for a specific data item.

SETUP LOCKOUT

The security lock switch located on the CMP12 front panel is provided to prevent unauthorized personnel from changing the setup values.

With the switch turned to LOCKED, the setup data may be reviewed, but cannot be changed. If an attempt is made to change this data with the security switch locked, an error message will be displayed.

BRIGHTNESS

Also located on the CMP12 front panel is a contrast control which the operator may adjust to suit the work environment in which the CMP12 is placed.

SETUP MODE

The Setup Mode is used when the CMP12 is installed. During installation, the Setup Mode is used to configure the controller for the line it is to control. The Setup Mode is entered by pressing the SETUP key. When the contoller is turned on, built in diagnostics check the memory for data retention. If an error is detected, the memory is cleared and the Setup Mode automatically entered on power-up indicating that this data must be re-entered.

The following setup values are entered in the order shown below. An explanation of each parameter is given.

ENCODER TO SHEAR DISTANCE
Enter the distance from the shear to the point where contact is made with the encoder wheel, or roller coupled to the encoder. The sheet detector switch must also be mounted at this precise spot, so that the switch closes as soon as the encoder begins to be moved by the incoming material. This value is used by the CMP12 to calculate scrap material reports to the Office Link computer.

CYCLES PER REVOLUTION
Enter the number of counts or pulses generated by one revolution of the encoder shaft. *Applied Microsystems* Model 256 Encoder generates 256 counts.

DISTANCE PER REVOLUTION
Enter the distance traveled with one revolution (or the circumference) of the encoder measuring wheel. *Applied Microsystems* encoder wheel circumference is 12 inches.

CORRECTION FACTOR
This parameter adjusts for any error between the length programmed and the actual length produced. Begin by setting this value to 100.000%. See page 28 for information on how to set the CORRECTION FACTOR for your particular machine.

FORWARD ENCODER ROTATION
Enter the proper direction to produce positive counting when the encoder wheel is turned in the direction of metal flow. Pressing any numbered key will toggle between CW and CCW, for clockwise and counter clockwise rotation. You should be facing the wheel to determine this.

UNITS OF MEASURE

Enter the desired units of measurement. Pressing any numbered key will toggle between ENGLISH (inches) and METRIC (millimeters).

POWER LINE FREQUENCY

For U.S. installations, enter 60 Hz. For overseas installations, enter 50 Hz. Pressing any numbered key will toggle the display between 50 Hz and 60 Hz.

DATE

Enter the current date as: month/day/year
The separators will be entered automatically if the month and/or day is a two digit number. Or they can be manually inserted by using the decimal point key. Once the date is set, it is automatically updated by the CMP12 and will not have to be changed.

TIME

Enter the time as: hours/minutes/am or pm

As with the date, the separator is automatically inserted when entering a two digit hours or minutes or can be manually inserted if entering a single digit hour or minutes by pressing the decimal point key. After the hours and minutes have been entered, press any numbered key to toggle the display between am and pm. As with the date, once the time is set the CMP12 will automatically keep the time.

MODE

Pressing any number key will toggle between AM/PM and 24 HR time display. This affects only the display at the top right corner of the video screen. The time is always entered in AM/PM format.

COIL METHOD

Pressing a numbered key will toggle between SPECIFIC and GENERIC. If SPECIFIC is entered you will be prompted in the Job Program mode to enter the coil number. If an item is completed and a different Coil Number is programmed for the next Item, the line will halt automatically and a message to change coils will be displayed.

 If GENERIC is entered you will be prompted with COIL #. After entering the Coil Number all of the remaining Items will be set for this Coil Number.

COIL-END POINT
Enter the distance in inches (or millimeters) from the shear to the point where the metal will be manually cut in order to change coils. The controller keeps track of how much metal is needed from the current coil, and automatically stops the line when the end of the required material reaches the COIL-END POINT.

ITEM HALT?
Enter NO to have the CMP12 proceed down the item list from one item to the next without stopping the line. Enter YES to have the CMP12 stop the line after each item is completed. If the CMP12 halts the line after each item, the RUN button must be pressed to begin the next item. Pressing any numbered key will toggle between YES and NO.

SHEAR SLUG SIZE
Enter the width of the slug (if any) removed by the shear.

SHEAR DWELL TIME
Enter the length of time that the shear output signal should remain on. If this time is set to zero, the shear output will remain on until the Shear Complete input is closed.

RESPONSE TO SPEED CHANGE
This parameter determines how often the CMP12 measures line speed and consequently, how quickly the CMP12 responds to changes in line speed. Enter FAST for a machine with an unstable line speed, SLOW for a machine with a very constant line speed, or MEDIUM for a machine with a varying line speed. It would be tempting to enter FAST for all machines but, due to the way in which the speed of the line is calculated, an error in length could result in entering FAST where SLOW is applicable.

MACHINE MODE
The machine can either run as a STOPPING or a NON-STOP line. If your line has to stop before making a shear, STOPPING should be entered. NON-STOP should be entered if a flying cutoff is used. STOPPING and NON-STOP lines operate differently and therefore the Setup Parameters are different for the two.

NON-STOP LINE
DIE ACCELERATOR REACTION TIME

This parameter allows you to enter a time in which the die is to start moving in order to get up to line speed and make the shear. Some machines do not require a time and a zero should be entered.

SHEAR REACTION TIME

This is the elapsed time from the moment the CMP12 generates the shear output signal to the time it takes for the shear to react and engage the material. Begin by setting this value to zero and refer to the Calibration Procedure on page 28 to calculate the SHEAR REACTION TIME for your machine.

DIE ACCELERATOR DWELL TIME

This dwell time is the time that the Die Accelerator output will stay on after the Shear is completed. In other words, the Die Accelerator output will turn on according to the Die Accelerator Reaction Time, stay on for twice the Shear Dwell Time (shear down and shear up) and turn off after the DIE ACCELERATOR DWELL TIME has elapsed. If your Die Accelerator Reaction Time is 0.0 second, the Shear Dwell Time is 0.1 second, and the Die Accelerator Dwell Time is 0.05 second, the Die Accelerator will be on for 0.25 sec.

STOPPING LINE
SLOWDOWN ADVANCE FACTOR

The SLOWDOWN ADVANCE FACTOR adjusts the slowdown distance according to line speed. The faster the line is running the longer the slowdown distance needs to be. Typical values would be small (2-4). If the line slows down very quickly the value could be large (8-10), allowing the line to run in fast speed longer. When zero is entered there is no slowdown distance adjustment, therefore Minimum Slowdown Distance is used.

MINIMUM SLOWDOWN DISTANCE

Enter the distance before the shear point that the metal should shift into Slow Speed.

LENGTH TOLERANCE

This is the length that a part can vary plus or minus and still be within the parts specifications. This length is checked after the Stopping Reaction Time has elapsed.

AFTER-SHEAR PAUSE TIME

Enter a delay time, if desired, to halt the line after each piece is cut before the line restarts. Entering a longer delay will increase the distance between parts as they come off the line.

STOPPING REACTION TIME

Enter the time it takes the line to go from Slow Speed to the Stopped position. See page 30 for information on how to calculate the proper time.

JOB MODE

The Job Mode is entered by pressing the JOB key. The Job Mode may be entered whether the line is running or halted. This enables the operator to program the first few jobs, start the line, and then program the rest of the jobs while the line is running.

The CMP12 will run the jobs in the order that they appear on the job screen. To add a job in the middle of the job list or delete a job entirely, use the ADD LINE and DEL LINE keys.

When the JOB key is pressed, the CMP12 will place the cursor on the first available job line.

The **JOB NO.** programmed can be any number from 0 to 99999999. The same JOB NO. may be used to program several BDLS and ITEMS.

The **BDL** (bundle) may be programmed from 0 to 999 and defaults to 1 upon entering a new JOB NO. The CMP12 automatically halts the machine when the bundle number changes.

The **ITEM** programmed can be any number from 0 to 999. Different items may have the same item number though in practice the operator will usually want to assign each individual item a different item number. Items that have a READY status are run in the order that they appear on the screen and not in item number order.

The **QUANTITY** programmed can be any number from 1 to 9999. A quantity of zero will cause the CMP12 to ignore the item entirely.

The **LENGTH** programmed can be any number greater than zero but less than 999.999 inches.

Trailing zeros to the right of the decimal point are automatically added after a length entry has been made, so it is not necessary to enter any trailing zeros to the right of the decimal point.

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The **COIL** number is used to designate which coil should be used for that job. The CMP12 maintains inventory records for up to 51 coils. If a 52nd coil is entered while programming a job, the CMP12 will flash an error message showing that all 51 coil accumulators are being used and will prompt the operator to press the CLR key to clear the error.

The **STAT** column displays the status of the job. The status of a job can be READY (ready to run), WORK (in process), DONE (job completed), or SKIP (skip this job).

The **JOB TOT** is the total feet or meters that is programmed so far that particular Job Number.

After an item is programmed, the cursor will advance to the next line. If this line is the next available line, the CMP12 will increment the item number automatically and copy the coil number from the previous line to the current line. This provides for faster data entry on runs where the same coil will be used for more than one item.

The minimum amount of data required to program an item includes the Item, Qty and Length. After this data is entered, the word READY will appear in the STAT column indicating that the item is ready to run.

There may be times when the next item must be skipped in order to run an urgent item. To skip an item, position the cursor in the STAT column and press any numbered key to toggle the display between READY and SKIP. Press ENT to enter your choice.

Up to 100 items can be programmed in the CMP12. If the item list is full, new parts may be entered only after an item has been completed or an existing item deleted.

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CURSOR POSITIONING

Items will be run in the order that they appear in the item list. The item order may be altered by inserting or deleting items using the ADD LINE or DEL LINE keys.

To insert an item, position the cursor anywhere on the line where you want the new item to be inserted and press the ADD LINE key. The CMP12 will move all items in the item list down one line. If the item list is full of ready to run items, it is not possible to insert a item line and an error message will be displayed. If the CMP12 is not in a reset condition, no lines may be added above the current item being processed by the machine. If an item is completed, and the operator wishes to run the same item again, the quantity need only be entered again; this will restore the item to the READY status. This can only be done when the CMP12 is in the reset condition.

To delete a line item, place the cursor anywhere on the line to be deleted and press the DEL LINE key. The CMP12 will delete the line and move the entire item list up one line. If the item to be deleted is currently in work, the item cannot be deleted since it is being processed. An attempt to delete an item currently in work will result in no action taken on the item list.

STATUS MODE

Pressing the STAT key causes the CMP12 to enter the Status Display mode. The screen is similar to the Job programming screen, with these four important differences.

1. The Quantity Left is displayed for each item(line).

2. The Job Total Footage is not displayed.

3. No editing is permitted.

4. The current WORKing item (or the NEXT item if halted) is highlighted.

SALVAGE MODE

When the coil runs out, the CMP12 automatically enters the Salvage mode. The operator can use this mode to reduce the quantity of a pending job because of a part or parts salvaged from the end of the coil. This causes the Remaining Quantity of the matching job line (if any) to be decremented by the number reported as removed from stock. If this reduces the remaining quantity of the job line to zero (or less than zero), the status of that job line is automatically set to DONE.

The Salvage mode prompts the operator:

SALVAGED FROM END OF COIL	
JOB NUMBER	0 - 99999999
BUNDLE NUMBER	0 - 999
ITEM NUMBER	0 - 999
LENGTH OF PART	0 - 999.999
QUANTITY	0 - 9
ALL ENTRIES CORRECT?	YES/NO
AVAILABLE LENGTH	0 - 999.999

The Job, Bundle, and Item numbers, the part length, and the quantity being salvaged are initially set to zero. Move the cursor with the UP and DOWN arrow keys to enter the correct values for the part or parts being salvaged. When all entries are as desired, point to the ALL ENTRIES CORRECT? prompt and toggle the response to YES, and press ENT to register agreement with the displayed values. At this point a message is sent to the Office Link computer, and the part is removed from any matching unDONE job line.

The line labelled AVAILABLE LENGTH is for display only, and does not permit editing by the operator. This is the maximum length which can be salvaged, and is equal to the length past the shear plus the encoder-to-shear distance. If the operator attempts to salvage more than this amount, an error message is displayed, and no message is sent. The operator is then given another chance to salvage a valid length of material.

The operator should ALWAYS finish with the Salvage mode before continuing to load another coil of material. If the coil switch closes while the Salvage screen is still displayed, a message is sent to the Office Link computer indicating that plant operations were performed out of the proper sequence.

RUN MODE

The Run Mode is used to actually produce the parts programmed. The mode is entered by pressing the RUN button and is exited when the HALT button is pressed.

RESET CONDITION

The CMP12 completes a part when it cycles the shear at the trailing edge of that part. There are times, however, when an initial leading edge shear is required in order to produce a good first part. This condition is called the reset condition. A reset condition occurs under any of the following conditions:

- The MANUAL SHEAR button is pressed, or the Remote Shear input is closed.

- All programmed items have been run.

- When proceeding to the next item a coil number different from the coil just run is encountered.

- The SHEET DETECT input opens indicating the present coil has run-out.

When the CMP12 enters the Run Mode, it searches the item list looking for an item with a NEXT status. If a next item is not found a NO VALID JOBS TO PROCESS message will be displayed. During the processing of an item, the status column of the item will contain the word WORK, indicating that the item is currently being processed.

After an item is completed, the CMP12 will automatically change the item status to DONE. If the Run Mode is exited by pressing the HALT button, the item status will display NEXT so that when RUN is pressed again the Item that was currently running will continue where it left off.

The ITEM COUNTER output is turned on for 0.5 second at the completion of each line item. If a counting device is connected to this output, it will keep track of the number of line items produced.

If the ITEM HALT parameter in the Setup Mode is set to YES, the CMP12 will automatically halt the line after each item is completed. To run the next item in the job list, press the RUN button.

The CMP12 keeps track of the amount of material required to produce all job lines programmed with the current coil number (SPECIFIC COIL MODE). When the tail end of the required length reaches the COIL-END POINT, the line is automatically stopped, and a message is flashed on the display screen, to alert the operator that a coil change is needed.

CURRENT CONTROLLER STATUS

The current controller status may be seen at any time by observing the first three lines of the CRT screen. These lines contain the following data:

- The coil number currently being used.

- The current footage of the coil currently being used.

- The total footage run since the totalizer was cleared.

- The current line speed in Feet per Minute.

- The quantity programmed for the current Job line item.

- The quantity left of the current Job line item.

- The current date and time.

- The programmed length of the part in process.

- The distance moved since the last shear.

This section of the CRT screen is continuously updated by the CMP12.

After completing an item and before beginning the next, the CMP12 checks several parameters to see if a reset condition is needed. One of these parameters is a different coil number than the previous item. Since a different coil number indicates that a coil change is necessary, the CMP12 will assume a reset is required. Upon encountering this condition, the CMP12 will prompt the operator to load a new coil so that any further parts fabricated will be tabulated on the new coil indicated.

COIL MODE

The CMP12 is capable of storing information on 51 different coils of material. This information can be reviewed by pressing the COIL key. The CRT will display the following information:

- Current coil on line
- Coil number
- Total length run

Coils are created in the coil table through the Job programming mode. Upon encountering a new coil number, the CMP12 will create a place for the coil in the next available position in the coil table. If the coil table is full, a COIL STORAGE IS FULL message will be displayed and the coil number will have to be re-entered.

To clear a coil, press the COIL key to enter the Coil Display mode, move the cursor to the FOOTAGE of the coil to be cleared, and press the CLR key. The coil currently in use cannot be cleared.

ERROR MESSAGES

The CMP12 is capable of detecting certain programing errors and will report these errors by flashing an error message on the fourth line of the CRT screen. These errors must be acknowledged and cleared by pressing the CLR key. A list of possible errors and an explanation of each are as follows:

CORRECTION RANGE: 90% TO 110%
This error message is displayed when an attempt is made to program the correction factor outside of the range of 90% to 110%.

DISTANCE RANGE: 1" to 25"
This error message is displayed when an attempt is made to program the distance per revolution outside the range of 1" to 25".

COUNT RANGE: 100 to 1200
This error message is displayed when an attempt is made to program the counts per revolution outside the range of 100 to 1200.

RANGE: 0 to 60 SEC.
This error message is displayed when an attempt is made to program the after-shear pause time to greater than 60 seconds.

RANGE: .000 to .255 SEC.
This error message is displayed when an attempt is made to program a reaction time to greater than .255 second.

ILLEGAL TIME ENTERED
This error message is displayed when an attempt is made to program an invalid time-of-day: hours must be from 1 through 12, minutes from 0 through 59. Time is always programmed in AM/PM mode.

ILLEGAL DATE ENTERED
This error message is displayed when an attempt is made to program an illegal date: the month must be from 1 through 12, and the date no greater than the number of days in the selected month.

SECURITY SWITCH LOCKED
This error message is displayed when an attempt is made to change any setup or system status value with the security switch locked.

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ENTER NEW COIL NUMBER

This message is displayed when a new coil is loaded into the machine. When you have entered the correct digits, press ENT to register your selection.

NO VALID JOBS TO PROCESS

This error message is displayed when an attempt is made to start the line when no job has been programmed.

NOT ALLOWED WHILE RUNNING

This error message is displayed when an attempt is made to clear the controller's memory while the line is running.

POSITION OUT OF TOLERANCE

This error message is displayed in STOPPING mode when the material has stopped outside the programmed tolerance. Proceed by jogging the material into position, then press CLR and RUN. You also probably need to adjust the tolerance or stopping reaction time. See the calibration section for details.

LOAD NEW COIL

This error message is displayed when the item about to be run has a different coil number than that of the previous item. This is applicable to the SPECIFIC coil method only.

THAT COIL NUMBER IS IN USE

This error message is displayed when an attempt is made to clear the footage of the current coil.

COIL STORAGE IS FULL

This error message is displayed when an attempt is made to add a new coil number when there are already 51 numbers stored. Make some room by deleting coil numbers no longer needed.

METAL IS PAST SHEAR POINT

This error message is displayed when an attempt is made to start the line with the material positioned past the point at which the next shear is to be made. Jog the material back, then press CLR and RUN.

MESSAGE STORAGE IS FULL

This error message is displayed when an attempt is made to start the line (which would cause a message to be generated) while the message storage is already full. Request the operator of the Office Link computer to poll the CMP12 for its messages before you continue. If this is not possible, you must turn off the USE OFFICE LINK? switch (system status mode) before the line will start.

STANDARD INPUTS

The CMP12 is equipped with six inputs. These inputs are switch closures to the negative side of the 24VDC power supply and should not have any voltage source applied. These inputs are supplied through use of the 3448-7 switch/input cable. The inputs and their functions are as follows:

JOG FORWARD
The JOG FORWARD input is used to move material in the forward direction while the CMP12 is in the halt mode. The CMP12 will continue to move material as long as the JOG FORWARD input is closed. Material movement will stop when the input is opened. This input is mainly used to load material into the machine.

JOG REVERSE
The JOG REVERSE input is used in the same manner as the Jog Forward input except that it is used to move material in the reverse direction. This switch would be used to change a coil by backing the material out of the machine.

SHEET DETECT
The SHEET DETECT input is used to indicate, to the CMP12, the presence of material loaded into the machine. This input is used to indicate that a coil has been changed and thus causes a system reset.

SHEAR COMPLETE
The SHEAR COMPLETE input is used when the Shear Actuation Time in the Setup Mode is set to zero. When this parameter is set to zero, the CMP12 will activate the shear output until it senses that the SHEAR COMPLETE input is closed. This provides the user with the ability to ensure that the shear has completed a full down stroke. After sensing the closure of the SHEAR COMPLETE switch, the CMP12 will turn the shear output off.

REMOTE RUN
The REMOTE RUN input is used to configure systems that have an external Run input and do not wish to use the front panel Run switch. Hardwire this input closed and the front panel Run switch will not function. Only the external Run Enable input will start the line. If the REMOTE RUN switch is open, then the front panel Run switch will start the line. The Run Enable input will not start the line in this mode.

REMOTE SHEAR

The REMOTE SHEAR input duplicates the function of the panel-mounted REMOTE SHEAR button; whenever the input is momentarily closed while the line is halted, the shear will cycle, and the controller will be reset.

RUN ENABLE

When the Remote Run Input is open, the RUN ENABLE input will act as a Run Inhibit in that the line will not start if it is open and will halt if it opens while running. When the Remote Run Input is closed, the RUN ENABLE input should be wired for a remote run circuit.

STANDARD OUTPUTS

The CMP12 is equipped with six standard outputs which are open collector transistors that have a maximum rating of 5 amperes. These can drive 24VDC relays or most 24VDC solenoids directly. The outputs from the CMP12 can be considered as a switch to the negative side of the 24VDC power supply. A description of the outputs and their functions are as follows:

FAST
The FAST output is on when the line is in high speed.

SLOW (DIE ACCEL)
When in the Stopping Mode the SLOW(DIE ACCEL) output is on when the line is in slow speed. When in the Non-Stop Mode the SLOW (DIE ACCEL) output is used to activate the die accelerator.

REVERSE
The REVERSE output is on only when the machine is being jogged in reverse.

SHEAR
The SHEAR output is used to activate the shear.

FORWARD
The FORWARD output is on when the line is moving in the forward direction.

RUN
The RUN output is on when the line is running, regardless of what other operations are being performed.

ITEM COUNTER
The ITEM COUNTER output is turned on for 0.5 second whenever the controller finishes producing the parts on one Job item line. This output is provided to trigger an optional customer-supplied item counter.

The state of all the outputs can be observed at any time by viewing the system status page. For more information see the section titled System Status.

REMOTE DATA LINK

The CMP12 is equipped with a serial port which gives it the ability to communicate with an external host computer. This communication link gives the host computer the ability to poll the CMP12 for messages. These messages consist of current operations of the CMP12. The host computer is polling the CMP12 when the Remote Data Link on the front panel is lit.

For information concerning the communications standard used, see the CMP12 Remote Data Link Specification.

LENGTH
CALIBRATION

When installing the CMP12 controller, the value of the Correction Factor and the Shear Reaction Time must be determined experimentally and programmed in the Setup Mode. After this is done, parts of any length can be produced without any further adjustments. Because these two Setup parameters are interative, it is very important that the procedure below be followed in the order presented.

DETERMINING THE CORRECTION FACTOR

1 Begin with the Correction Factor set at 100.000% and the Shear Reaction Time set to zero. Load the machine with material through the shear.

2 Program a job of 11 pieces at 120 inches long.

3 Press the Manual Shear button on the controller. The shear will activate and the length past the shear displayed on the CMP12 will read zero.

4 Run this job of 11 pieces and discard the first piece. Then carefully measure the remaining 10 pieces to the nearest 64th of an inch.

5 Add these 10 lengths together which will be called the Sum. The Correction Factor is the calculated with the following formula:

Correction Factor = 120,000 / Sum

For example, if the sum was 1201.250 inches the new Correction Factor would be calculated as follows:

Correction Factor = 120,000 / 1201.250

Correction Factor = 99.896

6 Enter the new Correction Factor into the CMP12 and continue by determining the Shear Reaction Time.

DETERMINING THE SHEAR REACTION TIME (For Flying Cutoffs)

1 Set the line to run at the top line speed and program a job of 2 pieces at 120 inches long.

2 With material under the shear, press the MANUAL SHEAR button to activate the shear.

3 Run this job of 2 pieces and note the line speed displayed on the controller when the trailing edge of the second piece is sheared. Carefully measure these 2 pieces. The first piece should be longer than the second, and the second piece should be 120 inches long.

4 The Shear Reaction Time is then calculated as follows:

Shear Reaction Time = 5 x Difference / Speed

Where Difference is the difference between the lengths of the 2 pieces in inches, and Speed is the line speed in feet per minute.

For example, if the measured difference between the 2 pieces is 3.50 inches and the display showed a line speed of 120 feet/minute, the Shear Reaction Time would be calculated as follows:

Shear Reaction Time   = 5 x 3.50 / 120

                           = 5 x 0.029

                           = 0.145

5 Enter the calculated Shear Reaction Time into the CMP12.

The CMP12 is now properly calibrated and it will not be necessary to change the values for these two setup parameters for different lengths or line speeds. The only time you will need to change the Shear Reaction Time is when a different die set is installed on the press. It will not be necessary to change the Correction Factor.

DETERMINING THE STOPPING REACTION TIME (For Stopping Machines)

Setting this parameter involves trial and error. Start with a Length Tolerance of 0.000 and a Stopping Reaction time of 0.001 and run the line. When it is supposed to shear, the line will stop and you will get an error message, Position Out Of Tolerance. The metal will have gone past the shear point. Increase the Stopping Reaction Time by 0.010, back the material up and run it again. Do this until the material shears within specifications. This procedure is to be done with caution. The shear will fire when the line stops within the Length Tolerance.

SYSTEM STATUS

The SYSTEM STATUS page is used for diagnostic purposes and is viewed by pressing the * key. This page is continuously updated and contains the status of all input and output ports of the CMP12 system as well as the status of the remote driver.

INPUT STATUS LINE

The INPUT STATUS LINE contains information on each of the 7 inputs. If the status below the header is ON, then the corresponding input is closed. Each abbreviation is explained below.

J-FWD - Jog Forward

J-REV - Jog Reverse

METAL - Sheet Detect

S-COM - Shear Complete

R-SHR - Remote Shear

ENABLE - Run Enable

REMOTE - Remote Run

OUTPUT STATUS LINE

The OUTPUT STATUS LINE contains information about each of the 7 outputs. If the status below the header is ON then the corresponding output is on.

FORWARD

REVERSE

FAST

SLOW (DIE ACCEL)

RUN

SHEAR

COUNT

OFFICE LINK AND PRINTER LINES

This is the status of the 2 serial ports controlled by the CMP12. Serial port 1 connects the CMP12 controller to a remote computer that can be used to poll the CMP12 to get data on the actions performed. Serial port 2 connects a printer to the CMP12 for a hard copy of the actions performed. The information line for the serial ports contains the following titles. The explanation of each is below.

RRDY

Receive Ready - The CMP12 is ready to receive a character.

TRDY
Transmit Ready - The CMP12 is ready to transmitt a character.

DCD
Data Carrier Detect - The input is received by the CMP12 from either the remote computer or a downstream unit. This signal will go high if a DCD signal is sent by an on-line unit.

NCTS
Not Clear To Send - This signal sent by the remote computer or downstream unit when they have received a similar signal from the CMP12. If this input is high, there are no units on-line.

FRAM
Received Framing Error - The last character received by the CMP12 was improperly framed by stop and start bits. This results in a faulty message and the message must be repeated.

OVRN
Overrun - This error flag indicates that characters were lost by the CMP12. This condition also results in a faulty message and the message must be repeated.

PRTY
Parity Error - Parity is a method of checking for a correctly received message. If an error was encountered in transmission this flag will be set.

IRQ
Interrupt Request - This status flag indicates that the CMP12 is receiving data and is requesting service from the microprocessor to process the message.

USE OFFICE LINK?
Press any key to toggle between YES and NO. Select YES if an external computer is used. Select NO if an external computer is not used. Press ENT to enter your choice.

CLEAR TOTALIZER?
Press any key to toggle between NO and YES. If you select YES, the footage totalizer at the top of the display screen will be cleared to zero.

CLEAR ALL MEMORY?

The RESET CODE parameter displayed in the lower right-hand corner is used to clear the memory of the CMP12 controller. By entering the code 1984, all job and setup data will be erased. In normal operation this function would not be often used. If the memory is cleared, all setup and job data will have to be re-entered before operation can continue.

HELP

- My display is blank!

Check that you have 115VAC applied to the CMP12. Adjust the brightness control knob.

- My CRT is wavy!

Check the value of Power Line Frequency in the set up mode, to make sure that the value entered matches the line frequency. (Enter 60HZ for U.S. operation)

- The CRT is displaying funny characters!

The memory may have been partially lost, press the * key and at the bottom enter yes for CLEAR ALL MEMORY. Make sure your setup values have been recorded before you do this.

- The CMP12 is not communicating with the office computer!

Check the cable to make sure it is plugged in. The cable should be plugged into the top serial communications port on the back of the CMP12.

- The shear fires but does not competely shear the metal!

Adjust your Shear Dwell Time longer so it will have time to fully shear the metal.

- My line will not run!

If you are using the Remote Run, check to make sure the Remote Input is jumpered with the gray and pink wires on the 3448-7 cable tied together. With these wires jumpered, the Run Enable input functions as a remote run input and the Run button on the front panel is disabled.

If you are not using Remote Run, check that the Run Enable Input is wired so that it closes before the Run button is pressed. The Run Enable works as a safety interlock.

- I push the Run button and it lights but the line is not running!

Check to make sure that your outputs are wired correctly.

- My line is running but the CMP12 is not counting!

Check the 2148 encoder cable connections to make sure it is properly installed.Check the cable itself for kinks.

- The CMP12 is counting backwards!

Go to the Setup Mode to Forward Encoder Rotation and change your setting.

SETUP DATA

ENCODER TO SHEAR DISTANCE   0 - 999.999 inches   _____

CYCLES PER REVOLUTION   100 - 1000   _____

DISTANCE PER REVOLUTION   1.000 - 25.000 inches   _____

CORRECTION FACTOR   90.000 - 110.000%   _____

FORWARD ENCODER ROTATION CW or CCW   _____

UNITS OF MEASURE   ENGLISH(inches)

                              or METRIC(millimeters)   _____

POWER LINE FREQUENCY   50 or 60Hz   _____

DATE   MONTH/DAY/YEAR   _____

TIME   HOUR/MINUTES/AM,PM   _____

COIL METHOD   SPECIFIC or GENERIC   _____

COIL #   0 - 999999   _____

COIL-END POINT   0 - 9999 inches   _____

ITEM HALT?   YES or NO   _____

SHEAR SLUG SIZE   0 - 999.999 inches   _____

SHEAR DWELL TIME   0 - 9.999 seconds   _____

RESPONSE TO SPEED CHANGE   SLOW, MEDIUM, OR FAST   _____

MACHINE MODE   NON-STOP or STOPPING   _____

NON-STOP MACHINE

DIE ACCELERATOR REACTION   0 - .255 second   _____

SHEAR REACTION TIME   0 - .255 second   _____

DIE ACCEL DWELL TIME   0 - 60.000 seconds   _____

STOPPING MACHINE

SLOWDOWN ADVANCE FACTOR 0 - 10   _____

MINIMUM SLOWDOWN DIST.   0 - 999.999 inches   _____

LENGTH TOLERANCE   0 - 999.999 inches   _____

AFTER-SHEAR PAUSE TIME   0 - 60 seconds   _____

STOPPING REACTION TIME   0 - .255 second   _____

JOB SHEET

JOB NO.	BDL	ITEM	QTY.	LENGTH	COIL	JOB TOT.