BKM electronics

GILSON COMPANY, INC.

OPERATING MANUAL

Concrete Compression Testing Machines

MC-250PR • MC-300PR

Rev: 11/2021

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IMPORTANT – PLEASE READ BEFORE MOVING THIS MACHINE

WARNING!: This machine is extremely heavy and may be unstable until properly installed. Attempting to move or reposition it without using proper equipment and procedures may result in severe injury or death. Properly rigged lifting equipment of sufficient capacity must be used, the load must be secured, and lifting equipment operators must be qualified and knowledgeable in the use of the equipment.

IMPORTANT – PLEASE READ BEFORE OPERATING TESTING MACHINE

1. Inspect to see that no visual damage has occurred during shipping. If you see any damage, contact Gilson Company, Inc. right away.

2. Check the equipment you received with your packing list.

3. It is recommended that the machine be located in an area where the atmosphere is free from acidic or contaminating fumes, which could possibly accelerate corrosion to machine surfaces or electrical contacts.

4. Position the machine leaving sufficient space at the rear and sides for calibration or service work.

5. The machine should be leveled.

6. Clean off machined surfaces that have been coated with rust preventative using any suitable non-corroding safety solvent. Wipe machined surfaces with a clean, oil soaked rag to minimize rusting.

7. When adding or changing oil, use only Dexron II or Dexron III automatic transmission fluid.

NOTE: This machine has been operationally tested and calibrated at the factory. In order to fully comply with the requirements stated in ASTM C 39, the compression machine should be calibrated again "On original installation or immediately after relocation." Gilson does not provide calibration services directly, but can provide a list of calibrators in your area. Contact our Technical Department at **800.444.1508** or **techsupport@gilsonco.com.**

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FOREWORD

This section of the manual is designed to provide instructions on the set up of the i720 digital indicator. Please take a few moments to read through it and become familiar with the operation. If you require technical support, please contact Gilson Company, Inc. at 800.444.1508, or email **techsupport@gilsonco.com**

1.0 INTRODUCTION

Standard information displayed on the indicator are peak load, peak stress, rate of load and if activated, average rate of load applied to a sample during a test.

1.1 Options

Optional information is user selectable and will be included on the standard test report, if activated. Test report options are described in detail in Section 3.4 of this manual.

1.2 Test Reports

Test reports can be optionally stored to memory, printed on an optional printer or downloaded to a computer with an optional download program. Details for all options can be found in the following pages.

2.0 THE KEYS & THEIR FUNCTIONS

2.1 Setup Key

The <SETUP> key is a soft key, used to open and display a list of all menus for test setup functions.

2.2 Number Keys

The <NUMBER> keys are used to select and open an individual menu option and to input a numerical value into a data entry field.

2.3 Enter Key

The <ENTER> key is used to accept and set a numerical value into the data entry field of any menu option. It is also used in the calibration procedure.

2.4 CLR Key

The <CLR> key is used to backspace the cursor to erase an incorrectly set character in a data entry field, and allow additional data entry into the field.

2.5 Cancel Key

The <CANCEL> key is used to clear all characters in a data entry field and close a prompt without entry of data.

> **NOTE:** Data must be reset in cleared prompt for menu to function.

2.6 Sample ID Key

The <SAMPLE ID> soft key is used to open a prompt for entering an individual test sample identification code into memory.

2.7 Tare Key

The <TARE> key is used to set a new zero load status by nullifying all tare weight associated with floating the machines piston by moving it off its mechanical stops. It also clears displayed test results from the buffer and initializes the indicator for the next test.

> **NOTE:** Make sure all displayed test data is documented before pressing the <TARE> key as all displayed test data will be lost.

2.8 Arrow Keys

The <ARROW> keys are used when setting an alphanumeric sample identification code, changing time and date, and in the calibration program.

2.9 Time/Date Key

The <DATE & TIME> soft key is used to open the menu for changing the time and date.

HOW TO SET:

Press <SETUP> soft key to open option and display prompt. Press <TIME/DATE> soft key to display time and date on the screen. The characters values contained inside the highlighted box can be increased or decreased in value by pressing the Up/Down scroll <ARROW> keys. To move highlighted box press Right/Left scroll <ARROW> keys and repeat procedure to adjust values. When correct values are set press the <CANCEL> key to enter. Press the <EXIT> key to return to the testing screen.

2.10 Print Key

The <PRINT> key can be used to print a report of the current test displayed on the indicators screen.

NOTE: See print options in Setup Menu for additional Printing and Transfer functions.

3.0 THE SETUP MENU

Press the <SETUP> soft key to display setup menu options of:

1. Engineering Units
2. Sample Type
3. Sample Break
4. Test Report Options
5. Print Options
6. Rate Options
7. Peak Load

3.1 Engineering Units

Pressing the <1> key, Engineering Units from the main Setup Menu displays options:

1. Load
2. Stress
3. Size

Load Units – Press the <1> key to display menu options. To select required load unit press appropriate menu number key. Press <EXIT> key to return to Engineering Units menu.
Stress Units – Press the <2> key to display menu options. To select required stress unit press appropriate menu number key. Press <EXIT> key to return to Engineering Units menu.
Size Units – Press the <3> key to display menu options. To select required size unit press appropriate menu number key. Press <EXIT> key to return to Engineering Units menu.

To return to the Setup Menu, press the <EXIT> key.

3.2 Sample Type

Pressing the <2> key, Sample Type from the main Setup Menu displays options:

1. Cylinder
2. Cube
3. Beam Third Point
4. Beam Center Point
5. Cross Sectional Area
6. Cylinder Split in Tension

Press the <NUMBER> keys 1 through 6 to select the sample type and open the menu to set the required sample dimensions.

NOTE: Current dimensional settings will be displayed; if values are correct, press <EXIT> key to return to the Sample Type menu. To change displayed dimensional values press appropriate <NUMBER> key on the menu for prompt, which is displayed in a box on the lower left hand side of screen.

Example: Press <1> Cylinder, to select and open menu options <1> Diameter or <2> Length to change dimensional values. Press <1> key for diameter prompt, enter required values through <NUMBER> keys, press <ENTER> key to set values. Press <2> key for length prompt, enter required values through <NUMBER> keys, press <ENTER> key to set values. Press <EXIT> key to return to Sample Type menu.

NOTE: If a character was entered incorrectly, press the <CLR> key to backspace the cursor one character at a time, then enter correct character value and press <ENTER> key to set.

3.3 Sample Break

The Sample Break feature has two independent operating functions of Load Threshold value and Sample Break yield strength break percentage.

Load Threshold is the load value setting at which the Rate of Loading function becomes activated and is displayed on the indicators screen. Its factory default setting is 500lbs or metric equivalent. The threshold value setting should be set in the load unit type in which the indicator will be operated in: e.g. lb., kN, etc. See Section 3.1 "Engineering Units" load unit type, for setup instructions.

NOTE: The threshold function will not accept a load value setting below 100lbs or its metric equivalent.

Sample Break is defined as a percentage of sample yield strength and functions to define the end of a test. When activated the indicator will display both the peak load applied to the test sample and the samples peak stress value.

NOTE: The factory default setting is 50%.

HOW TO SET:

Press the <3> key Sample Break from the main Setup menu to display options of:

1. Load Threshold Value
2. Sample Break Percentage

Load Threshold – Press the <1> key to select and open prompt. Change the current value setting through <NUMBER> keys and press <ENTER> key to set.

Sample Break – Press the <2> key to select and open prompt. Change the current value setting through <NUMBER> keys and press <ENTER> key to set.

Example: If sample break percentage setting is 25% and the maximum peak load applied to the test sample is 100,000lb (444.8kN), the indicator will terminate the test when the internal load value falls below 75,000lb (333.6kN), or 25% of the applied peak load.

NOTE: Setting a low value percentage of 5% or less may cause the indicator to prematurely end a test.

3.4 Test Report Options

Pressing the <4> key Test Report Options from the main Setup menu will display the following list of report options:

1. Operator ID Number
2. Cylinder Break Type
3. Cylinder Correction Factor
4. Cylinder Cap Type
5. Sample Age
6. Sample Weight
7. Average Rate of Load
8. Auto Store

The test data for an option will be included on the standard test report if activated. The information listed on a Standard Test Report includes: Test Date, Time, Identification Code, Sample Type, Sample Length, Sample Area, Peak Load and Peak Stress.

Operator I.D. Number – Press the <1> key from the options menu to toggle between OFF/ON. When activated, at the prompt enter the Operator ID Number and press the <ENTER> key to set. Once set, the ID Number will be added to the test report until changed or toggled to OFF position.

Cylinder Break Type – Press the <2> key from the option menu to toggle between OFF/ON. When activated at the end of a cylinder test, a list of cylinder break type patterns as listed in ASTM C 39, part 7.4, Figure 2 will be automatically displayed. To select and store a break type, press appropriate menu <NUMBER> key to select and store.

Cylinder Correction Factor – Press the <3> key from the option menu to toggle between OFF/ON. When activated function automatically corrects peak stress value of a test cylinder to ASTM C 39, if cylinder length to diameter ratio is 1.75 or less. Function requires that the correct cylinder diameter and length must be entered into the cylinder sample type menu in order to function correctly. Cylinder diameter and length should be verified before the start of each test if option is activated.

NOTE: Option should be deactivated after conclusion of correction factor testing to eliminate the unnecessary storing and printing of empty data fields.

Cylinder Cap Type – Toggle option ON by pressing the <4> key from the option menu which displays the Cap Type option menu list. To set required type press appropriate <NUMBER> key, and the word "Selected" is then displayed on cap type menu line. Press <EXIT> key to set and return to Test Report menu.

To change selected cap type toggle option OFF and repeat procedure above.

Sample Age – Toggle option ON by pressing the <5> key from the option menu, which also displays the Age Units option menu list. To select required time units, press number <1> or <2> key and the word "Selected" is then displayed on age unit menu line. Press <EXIT> key to set and return to Test Report menu.

HOW IT FUNCTIONS:

After entering the Sample ID code at the start of a test, an age prompt D = Day, H = Hour will require user to enter a numerical Time Unit value. Press <NUMBER> keys to set required units, and press the <ENTER> key to store.

NOTE: The prompt will appear at the start of each test and will remain active until turned OFF.

Sample Weight – Press the <6> key from the option menu to toggle between OFF/ON. Press <EXIT> key to return to Test Report menu.

HOW IT FUNCTIONS:

After entering the Sample ID code at the start of a test, a Weight prompt will require user to enter a numerical value for sample weight. Press <NUMBER> keys to set required weight, and press <ENTER> key to store.

NOTE: The prompt will appear at the start of each test and will remain active until turned OFF.

Average Rate of Load – Press the <7> key from the option menu to toggle between OFF/ON.

HOW IT FUNCTIONS:

When activated, at the end of a test the Loading Rate applied to the test sample is averaged over the duration of the second half of the test, and is automatically displayed at the end of the test.

NOTE: Auto-store must be turned ON to store rate data to memory.

Auto-Store – Press <8> key from the option menu to toggle it between OFF/ON.

The Auto-Store Function must be activated in order to input a Sample Identification Code, and store it to memory along with all other test data information from optional test report functions which will be activated automatically at the start and end of a test.

Press the <EXIT> key to return to testing screen.

3.5 Print Options

Pressing the <5> key Print Options, from the Setup Menu displays a list of print and transfer options.

1. Print Last Test - Press the <1> key to print.
2. Print All Stored Tests - Press the <2> key to print.
3. Print Individual Test - Press the <3> key at the prompt, enter Sample ID Code and press <ENTER> key to print.
4. Send Last Test to PC - Press the <4> key to transfer.
5. Send All Stored Tests to PC - Press the <5> key to transfer.
6. Send Individual Test to PC - Press the <6> key. At the prompt enter Sample ID Code and press <ENTER> key to transfer.
7. Clear Transaction Database - Press <7> key. At the prompt, press the <YES> key to clear memory or press the <NO> key and <EXIT> key to return to menu without clearing memory.

Press the <EXIT> key to return to option menu.

NOTE: Printer and Transfer Program are optional and must be purchased separately. Please contact us for further information.

3.6 Rate Options

Pressing the <6> key Rate Options from the main Setup Menu will display options:

1. Load Minutes
2. Load Seconds
3. Stress Minutes
4. Stress Seconds

To select required monitoring type press appropriate <NUMBER> key. Press <EXIT> key to return to menu. During the test, the rate of loading will be displayed in the time units selected, and the load or stress in the unit previously selected in the Engineering Units option menu.

3.7 Peak Load

Load values are displayed on the top line of the indicators screen.

Peak Load Function – Pressing the <7> key from the main Setup menu toggles the peak hold function ON/OFF.

Peak Load ON – When activated, this function holds the maximum load value applied to the sample during a test on the indicators display screen until the <TARE> key is pressed at the start of a new test.

Peak Load OFF – This function deactivates the peak hold function and allows the displayed load value to decrease and return to a zero load value when the machines control valve is placed in the retract position.

> **NOTE:** The Peak Stress Hold function cannot be deactivated.

Press the <EXIT> key to return to testing screen.

4.0 HOW TO ENTER A SAMPLE IDENTIFICATION CODE

Sample Identifications can be stored in memory as either a numerical code or as an alphanumeric code. The indicator's Auto-Store function must be turned ON in order to enter an identification code and store it to memory.

HOW TO SET A NUMERICAL IDENTIFICATION CODE:

Press the <SAMPLE ID> key. At the prompt press the <NUMBER> key 0 through 9 to set required characters, which are displayed on the lower left hand side of the indicators screen. After all numbers are set, press the <ENTER> key to store.

If additional test report options are turned ON, user may be prompted to enter additional test data at this time. Example: Sample Age.

HOW TO SET AN ALPHANUMERIC IDENTIFICATION CODE:

Press the <SAMPLE ID> key. At the prompt press the Up Scroll <ARROW> key. The alphabet and position cursor are now displayed. Use the Scroll <ARROW> keys to position the cursor on the required character and press the <ENTER> key to set. To set a numerical character press <NUMBER> 0 through 9 key to set. Once required identification code is set, press Down <ARROW> key until cursor is positioned next to identification code and press <ENTER> key to store.

> **NOTE:** If a mistake is made when entering an identification code character, press the <CLR> key to backspace the cursor one character at a time. Follow procedure to set correct character. Pressing the <CANCEL> key will clear all set characters. Repeat procedure to set and enter correct code.

5.0 TEST PLATEN INSTALLATION AND REMOVAL, 250 SERIES

Gilson compression machines are versatile and can be configured with optional equipment to perform many types of strength tests on a variety of concrete samples. It may be necessary to change the upper platen assembly to meet the requirements of certain ASTM and AASHTO test methods.

Gilson Concrete Compression Machines are shipped without the test platens installed. They are packaged separately in the shipping carton with the machine.

> **CAUTION:** Testing machine platens are heavy and can be difficult to handle. To prevent operator injury, two people are recommended when installing, removing, or changing this equipment. Please contact Gilson Technical Support with questions at techsupport@gilsonco.com or 800-444-1508.

Installation with Two People

1. Turn on the hydraulic pump and use the load control valve to advance the piston downward until the setscrew hole in the bottom front of the piston is fully visible.
2. Place the load control valve in the HOLD position.
3. Turn the hydraulic pump off.
4. Disconnect the compression machine from electrical power and lock-out the connection.
5. From behind the machine, or from the front slightly to one side, one person lifts the platen assembly to the bottom of the of the piston, inserting the platen holding stem all the way into the 1½" diameter hole in the piston.
6. The second person uses the supplied 3/8" Allen wrench to tighten the piston set screw until tight. Do not overtighten the screw, thread damage may occur.

7. Carefully inspect the fit between the platen and piston. Make sure that the platen is securely locked into the piston and that there are no visible gaps between them.

Users are strongly advised to use two people to install the machine platens. The following method should be used if only one person is available. Extra caution must be exercised to avoid possible injury.

1. Place a 6x12in concrete cylinder on the bottom platen, centered under the bottom crosshead of the compression machine.

2. Place the platen assembly on top of the concrete cylinder, making sure that it is centered under the piston.

3. Turn on the hydraulic pump and use the load control valve to slowly lower the piston, ensuring the platen holding stem aligns with the 1½" diameter hole in the bottom of the piston. Advance the piston down slowly until about 1½" of the holding stem is up inside the piston.

4. Place the load control valve in the HOLD position.

5. Turn the hydraulic pump off.

6. Disconnect the compression machine from electrical power and lock-out the connection.

7. Lift the platen until it makes full contact with the bottom of the piston.

8. Holding the platen in place with one hand, use the 3/8" allen wrench to tighten the piston set screw, being careful not to over-tighten it.

9. Carefully inspect the fit between the platen and piston. Make sure that the platen is securely locked into the piston and that there are no visible gaps between them

6.0 TEST SETUP

This section describes how to setup the indicator to conduct a test.

Step 1:
If the indicator is factory installed on a Gilson compression testing machine it should be ON when the machine is connected to an electrical power source. If display is dark, plug indicator power supply cord into outlet box located behind indicator on its frame mounting bracket.

The indicators electrical voltage requirements are listed on it serial number tag on the back of the indicator. If the indicator is being used as a retrofit installation, plug power supply cord into a wall outlet with electrical power supply source compatible with indicator. The indicators supply cord serves as the power disconnect. The power outlet supplying the indicator must be installed near the indicator and be easily accessible.

Allow the indicator to warm up for 15—20 minutes before beginning a test or calibrating it.

> **NOTE:** The indicator has **NO** ON/OFF switch. Normal procedure is to allow indicator to remain ON 24 hours a day.

Step 2:
Press <SETUP> key and verify that all menu option items are correctly set.

- Engineering Units – Check and set required counting units.
- Sample Type – Check and set sample type and dimensions.
- Sample Break – See Setup Menu Section 3.3 for instructions.
- Test Report Options – Set option menu items OFF/ON as required for test documentation on indicator screen and for hard copy test documentation.
- Auto-Store - Must be ON to store data to memory.
- Rate Options – Check and set required load rate units.
- Peak Load – Check and set peak load function ON.

Step 3:
Auto-Store – If required, turn option ON. Test results will be stored in memory automatically at the end of each test. See Section 3.4.

Step 4:
Clear stored test results IF your test documentation program requires clearing stored results from memory before storing new test data.

> **NOTE:** If stored test results are **IMPORTANT**, print or transfer before clearing as cleared data is non-retrievable. See Setup Menu option <5>, Section 3.5 Print Options for instructions.

Step 5:
Set hydraulic loading control valve in its Retract position and turn hydraulic pump on. Insert and center test sample in testing machine.

Step 6:
Sample ID Number – If required, press <SAMPLE ID> key and input required sample identification code and press <ENTER> key to set. User may be required to input optional test data at this time.

Step 7:
To start test, use hydraulic load control valve to advance the machines piston to the desired starting position, normally a point when an air gap of 1/16in (1.5mm) or less is between the top of the test sample and bottom of upper test platen. Place control valve in Hold position. Press indicators <TARE> key to remove all residual load values on indicators screen. The top load position line of the indicator will display all "0's" load value indicating it is ready to start. The indicator will display the following data on its display screen during a test:

Line 1: Sample load value
Line 2: Sample stress load value
Line 3: Rate of load being applied to the test sample

Step 8:
Many ASTM test procedures permit a higher rate of loading or a preload to be applied to a test sample at the beginning of a test. Review the applicable ASTM standard for the required Rate of Loading procedure for the sample type and size you are testing.

Shift control valve lever to Full Advance position. At sample contact, the top line of the screen will change and show a rapid increase in the load being applied to the test sample. When required preload value is reached, shift control valve lever to Metered Advance position.

The third line of the display is now showing the current live Rate of Loading being applied to the test sample. To adjust and set the required loading rate, slowly turn the knob on the control valve clockwise to decrease loading rate and counter clockwise to increase loading rate. All changes in loading rate are updated live on the display screen.

Once the required rate of loading has been established continue to monitor the display screen making any necessary adjustments to loading rate as needed.

NOTE: Because of the compressive nature of the materials used in unbonded pad caps, it may be difficult to set and maintain a controlled rate of loading with an applied load value of less than 20,000lb (88kN) when testing concrete cylinders.

Step 9:
End of Test – As the test samples ultimate load is being approached the rate of loading value will begin to decrease due to cracking in the test sample. Make no adjustments in the loading rate when this occurs.

As the test sample yields the displayed Load and Stress values will freeze and no longer increase in value, when the indicator detects that the load has fallen below the set sample break percentage. The samples peak load and stress values will be displayed and the displayed load rate will fall to a -0- value. After it has displayed a -0- value for several seconds, shift the control valve lever to the Retract position.

Step 10:
Information displayed at the end of a test:

Line 1: Peak Load Value
Line 2: Peak Stress Value
Line 3: Zero Load Rate
Line 4: If activated, Average Loading Rate

The indicators normal operating procedure at the end of a test may be affected by the activation of optional menu items. This will cause the indicator to request additional test data, which will require you to input the data before the final test results can be displayed and stored to memory.

If manually documenting test results, record information before starting a new test. When the <TARE> key is pressed, displayed test results will be **LOST.**

NOTE: A load cell equal to or greater than the capacity of the machine is required for calibration. Calibration should be performed by a certified calibration company.

7.0 CALIBRATION

7.1 Calibration

Step 1:
Allow digital to warm up for at least 20 minutes.

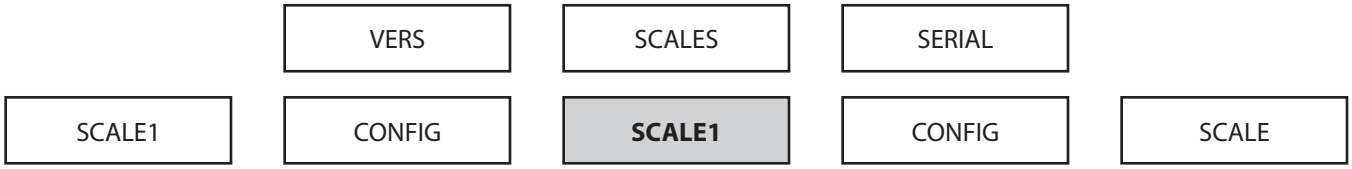
Step 2:
Before attempting to calibrate the machine, please verify the accuracy. All new machines are shipped from the factory with a calibration stored in the digital indicator.

Step 3:
Pivot the digital so that the bottom is facing you. Remove the large Phillips head screw located on the bottom left corner.

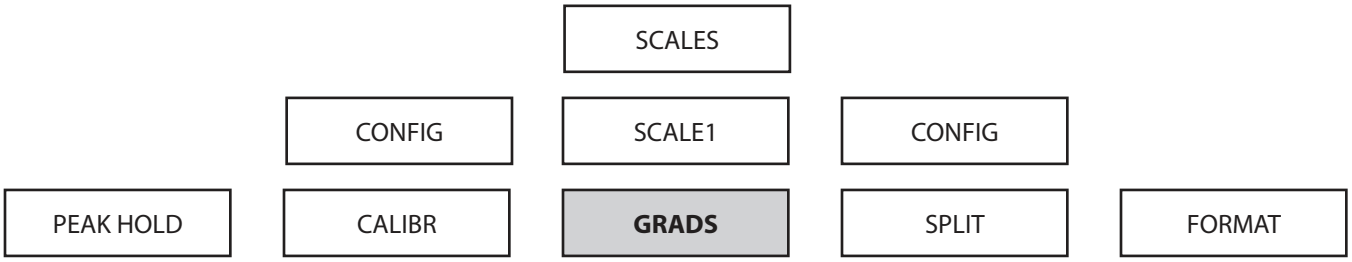
Step 4:
Using a pen or a small screwdriver, press the button located in the hole where the screw was just removed. This displays the "SCALE CONFIGURATION" menu. "SCALES" will be highlighted.

Step 5:
Press the down arrow key once. This displays the "SCALE1 CONFIGURATION" menu. "SCALE1" will be highlighted. For multi channel calibration, select Scale 1, Scale 2, Scale 3 or Scale 4 for calibration of that channel.

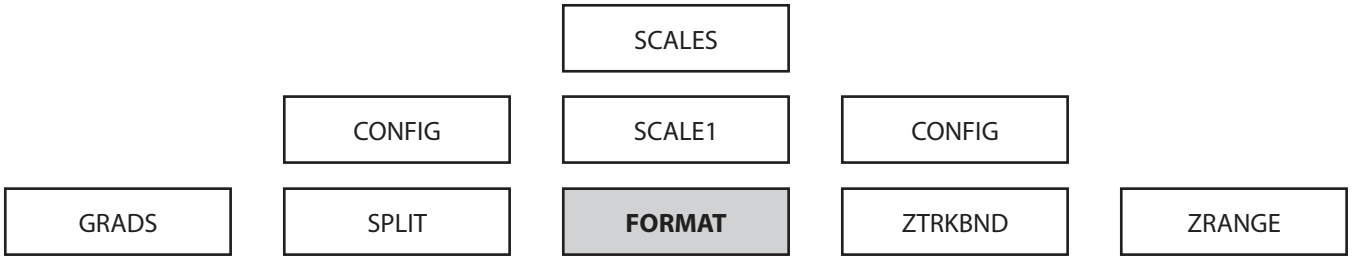
NOTE: The ID digital defaults to Scale 1 when you exit the calibration program. Select the proper channel with the arrow keys.



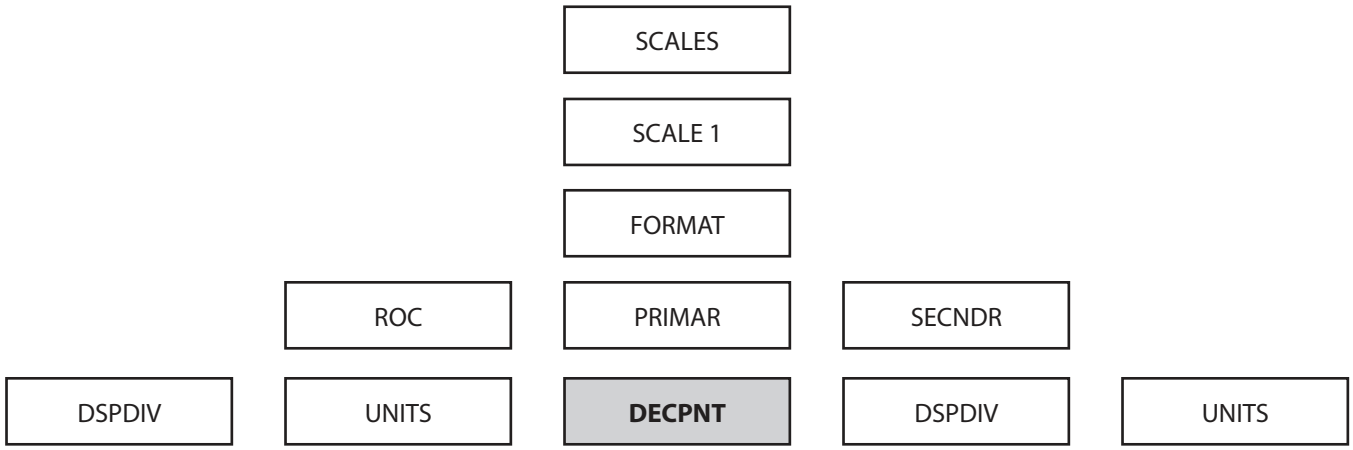
Step 6:
Press the down arrow key once. This displays the "FULL SCALE GRADUATIONS" menu. "GRADS" will be highlighted.



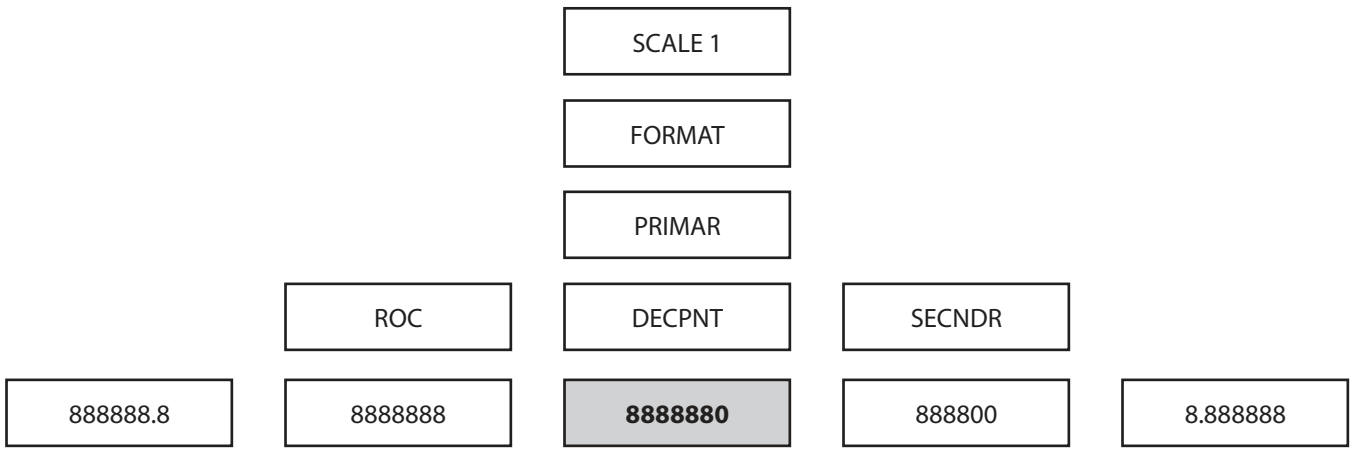
Step 7:
Press the right arrow key 2 times until “FORMAT” is highlighted.



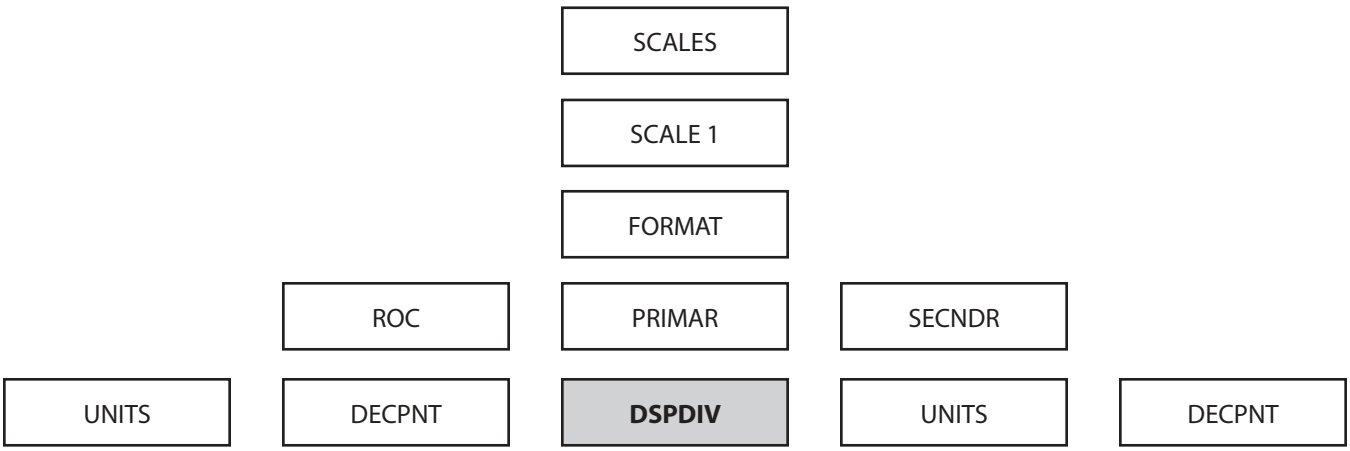
Step 8:
Press the down arrow key 2 times until “DECPNT” is highlighted.



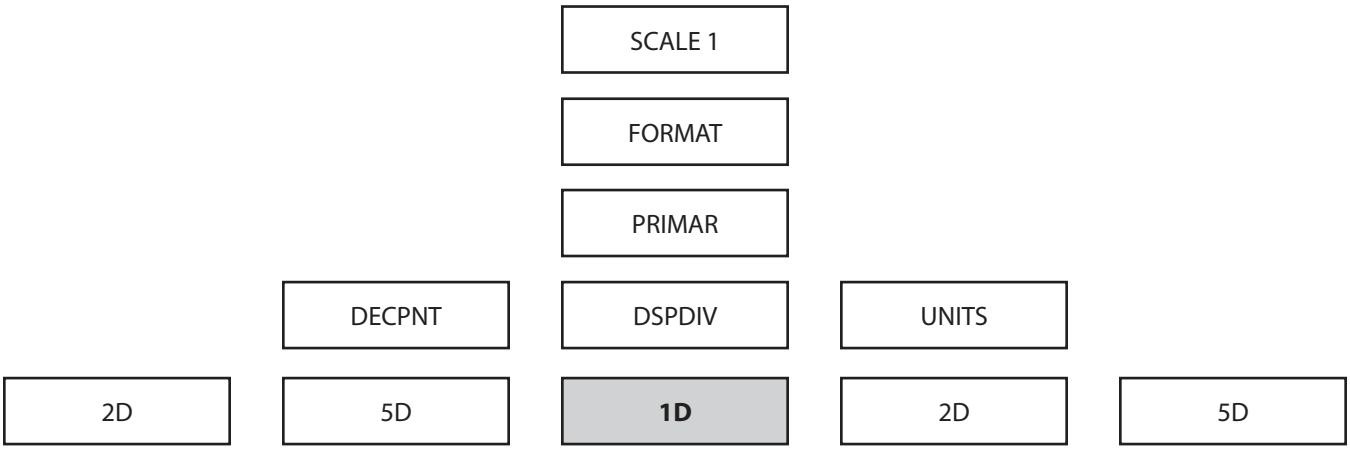
Step 9:
Press the down arrow key 1 time. Press the left or right arrow key until “8888880” is highlighted.



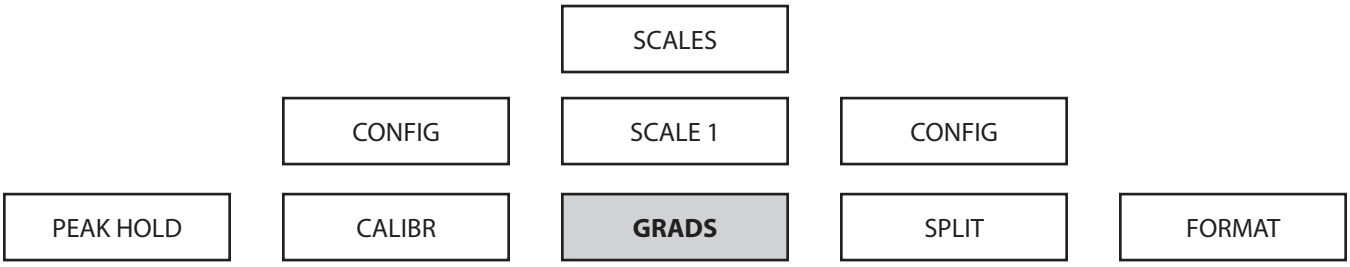
Step 10:
Press the enter key. The display will shift back to step 8. "DECPNT" should be highlighted. Press the right arrow key until "DSPDIV" is highlighted.



Step 11:
Press the down arrow key. Use the left or right arrow key until "1D" is highlighted.

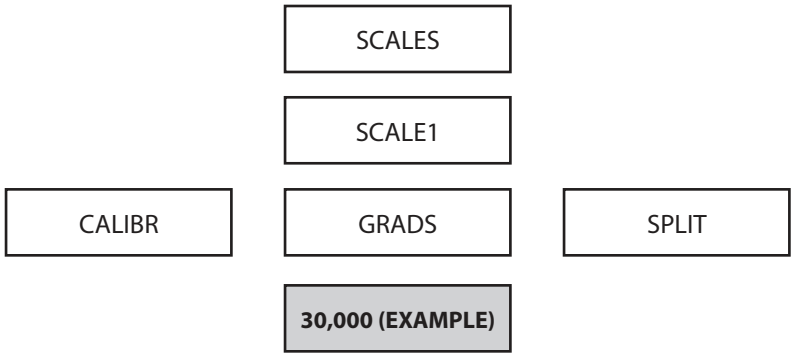


Step 12:
Press the enter key. The display will shift back to the same as in step 10. Press the up arrow key 2 times until "FORMAT" is highlighted. Press the left arrow key 2 times until "GRADS" is highlighted.

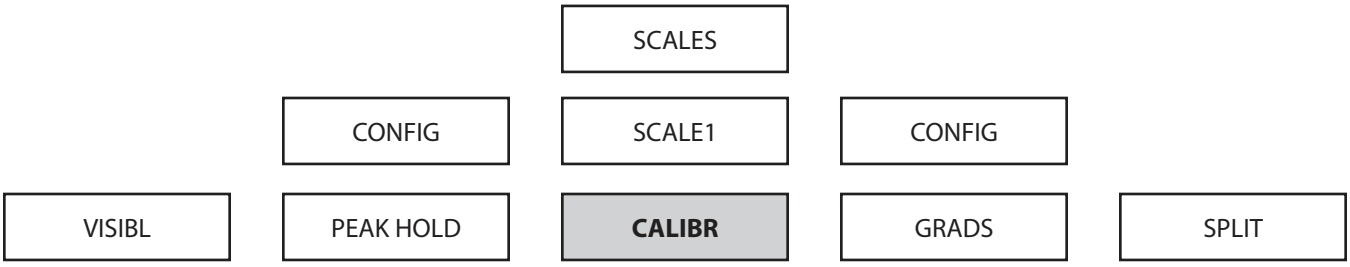


Step 13:
Press the down arrow key 1 time. Take the full scale of the testing machine and divide it by 10. Enter that number manually and press the enter key.

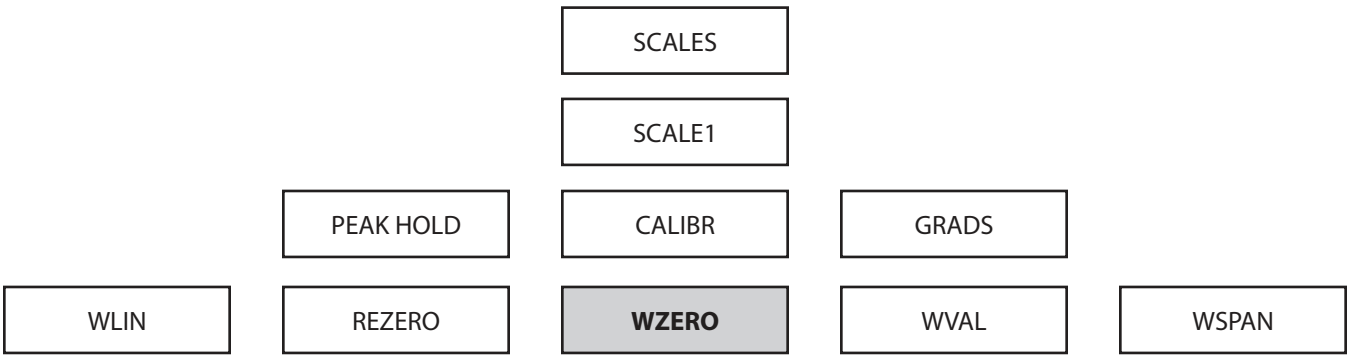
Example: 300,000 ÷ 10 = 30,000



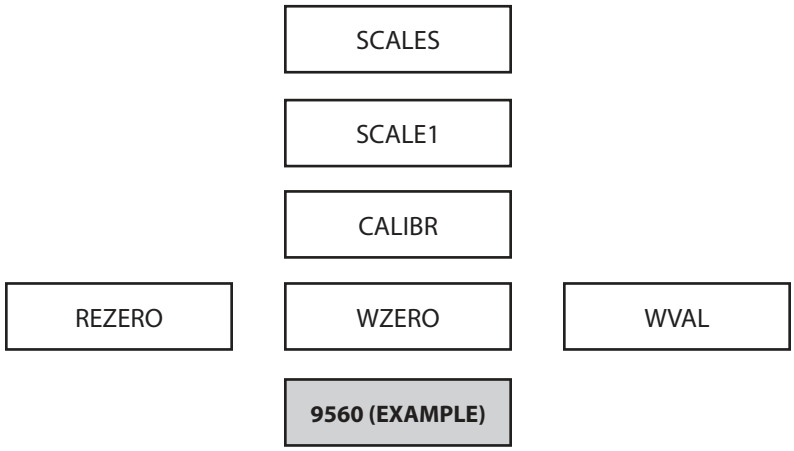
Step 14:
Press the left arrow key 2 times. "CALIBR" will be highlighted.



Step 15:
Press the down arrow key once. This displays the "DEADLOAD CALIBRATION" menu. "WZERO" is highlighted.

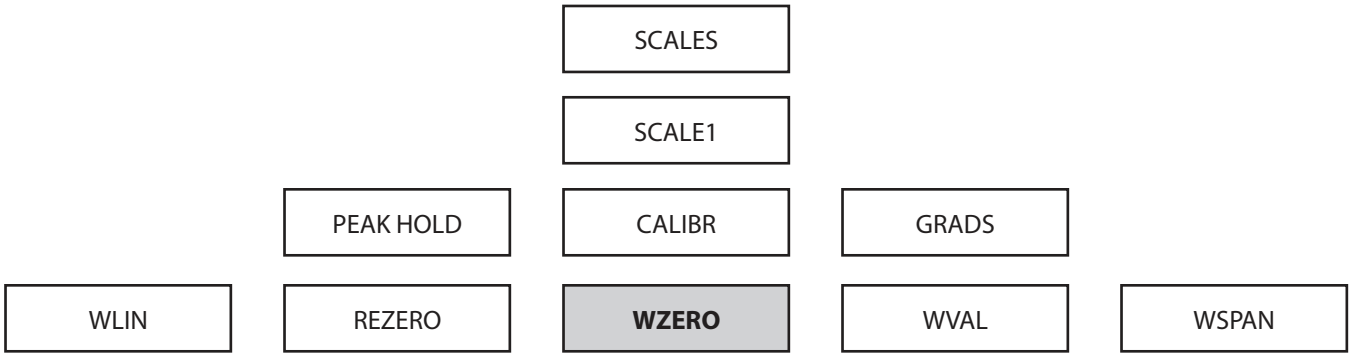


Step 16:
"WZERO" is where you set the ZERO calibration point. Press the down arrow key. The highlighted box represents the A/D count for ZERO load value.

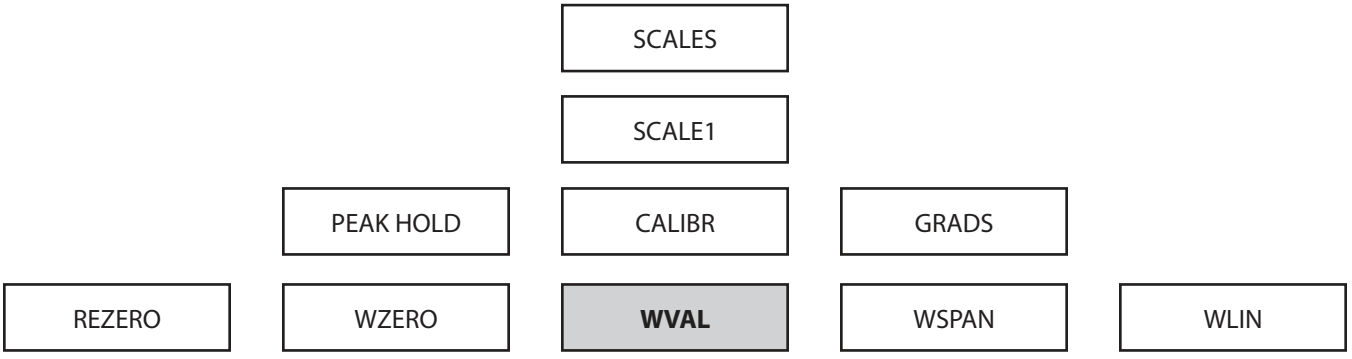


Step 17:
Float the piston approximately 3/16" (4.7 mm). Put the control valve in the metered advance position with the flow control valve open approximately half a turn. Press the "CALIBRATE" soft key along the bottom of the display. The display reads "CALIBRATING …" DEADLOAD CALIBRATION for several seconds. When the word "CALIBRATING…" disappears from the screen, a new A/D count will appear in the highlighted box. The Zero calibration point and corresponding A/D count have now been stored.

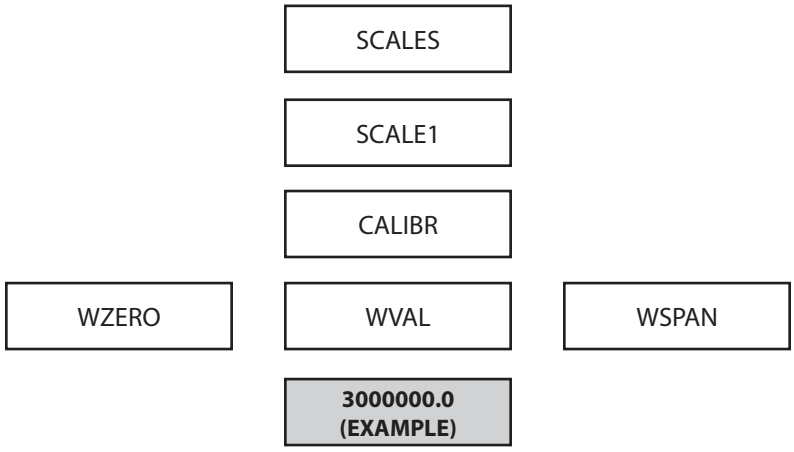
Step 18:
Press the Up Arrow key. This returns the display to the "DEADLOAD CALIBRATION" menu. "WZERO" is highlighted.



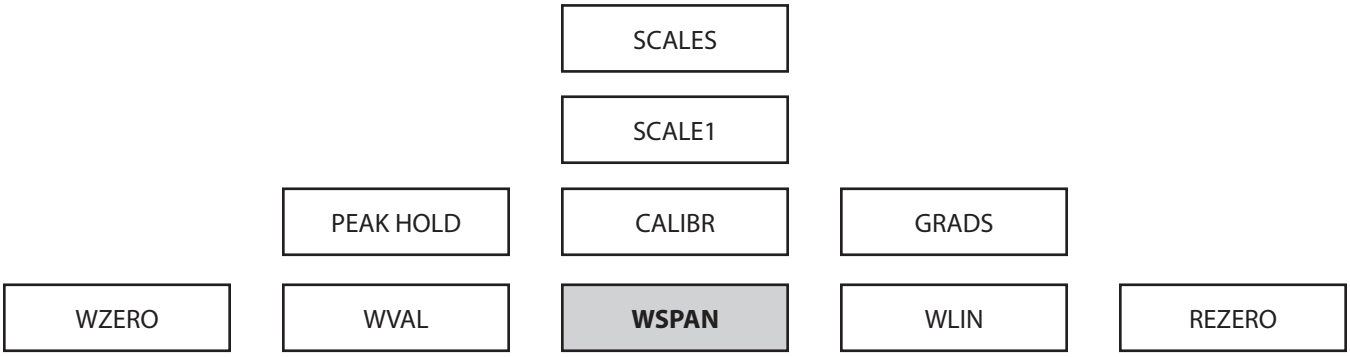
Step 19:
Press the Right Arrow key. "WVAL" is now highlighted.



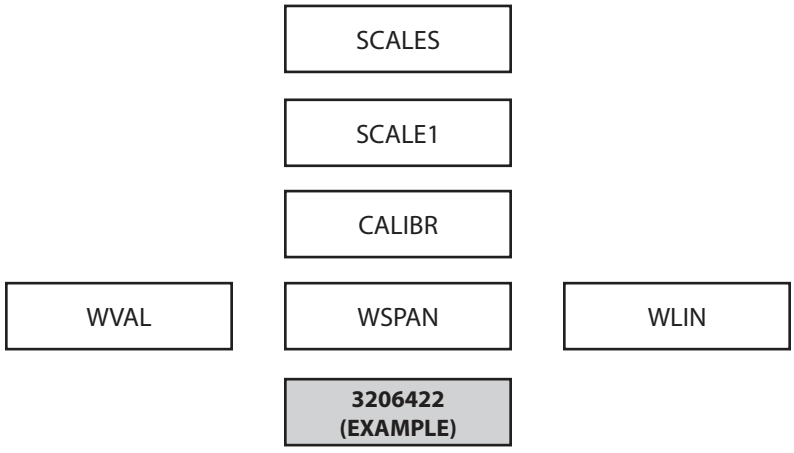
Step 20:
WVAL represents FULL SCALE or the capacity of the machine. To enter full scale, press the down arrow key.



Step 21:
Use the keypad to enter the FULL SCALE or CAPACITY of the machine. Press the Enter key to accept the value. The display will say "Value Accepted" and will shift to the "SPAN CALIBRATION" menu. "WSPAN" will be highlighted.



Step 22:
Press the Down Arrow key. The highlighted box represents the A/D count for FULL SCALE load value.



Step 23:
Run the machine up to full capacity. Once full capacity has been reached, press the "CALIBRATE" soft key along the bottom of the display. The display reads "CALIBRATING …" SPAN CALIBRATION for several seconds. When the word "CALIBRATING…" disappears from the screen, a new A/D count will appear in the highlighted box. The FULL SCALE calibration point and corresponding A/D count have now been stored.

Step 24:
Press the Up Arrow key until "SCALE 1" is highlighted. Press the Save and Exit soft key located along the bottom of the display. The display will now read "*STANDBY* SAVING CONFIGURATION", and then will return to the testing screen.

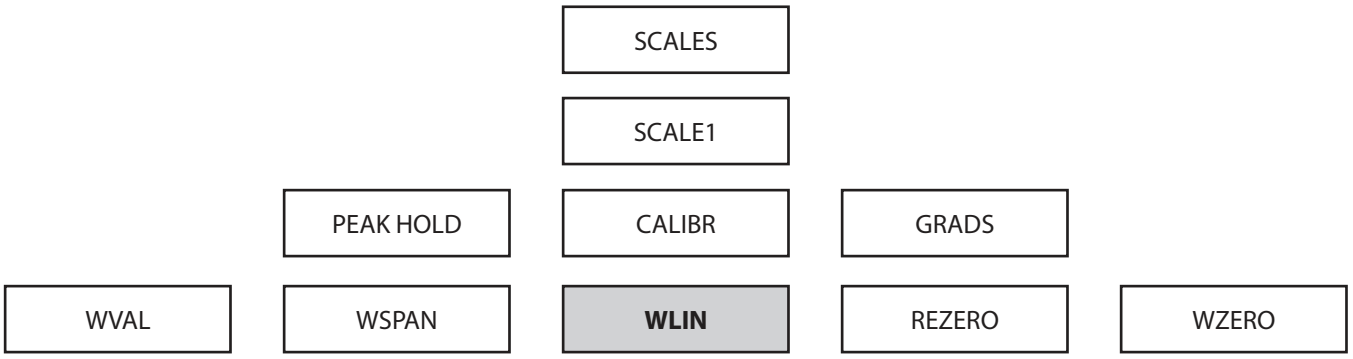
Done. Ready to verify calibration.

To verify calibration accuracy, load machine to specific load points and compare the reading on the Indicator with those of the load cell standard.

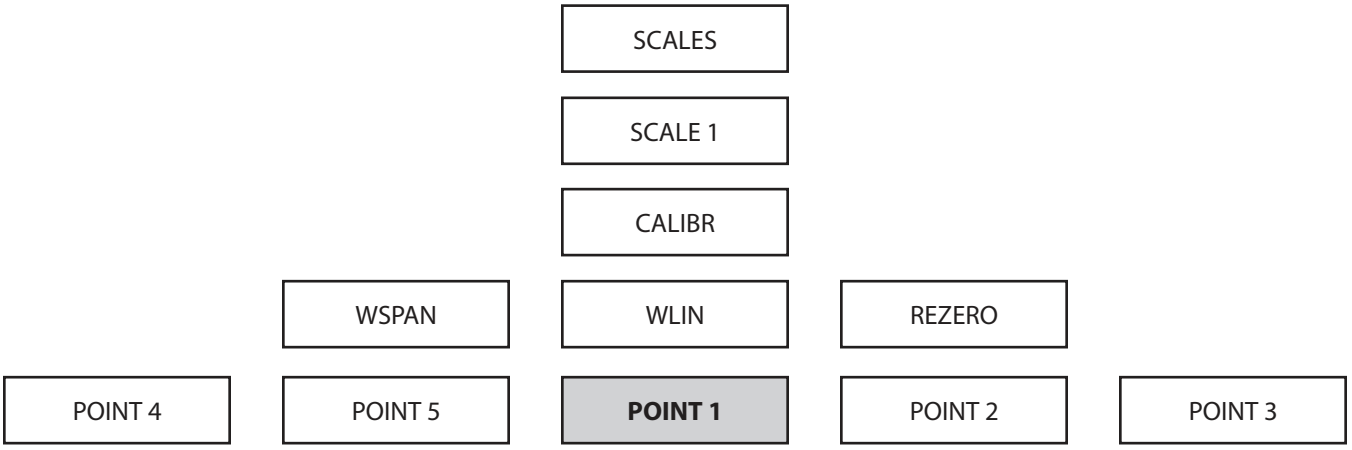
7.2 5-Point Linear Calibration

After setting "0" and FULL SCALE and verifying the calibration, adjustments to the calibration can be made in the 5 Point Linear Calibration program. To access the Linear Calibration program, repeat Calibration Instructions steps 1 through 7. "WZERO" will be highlighted.

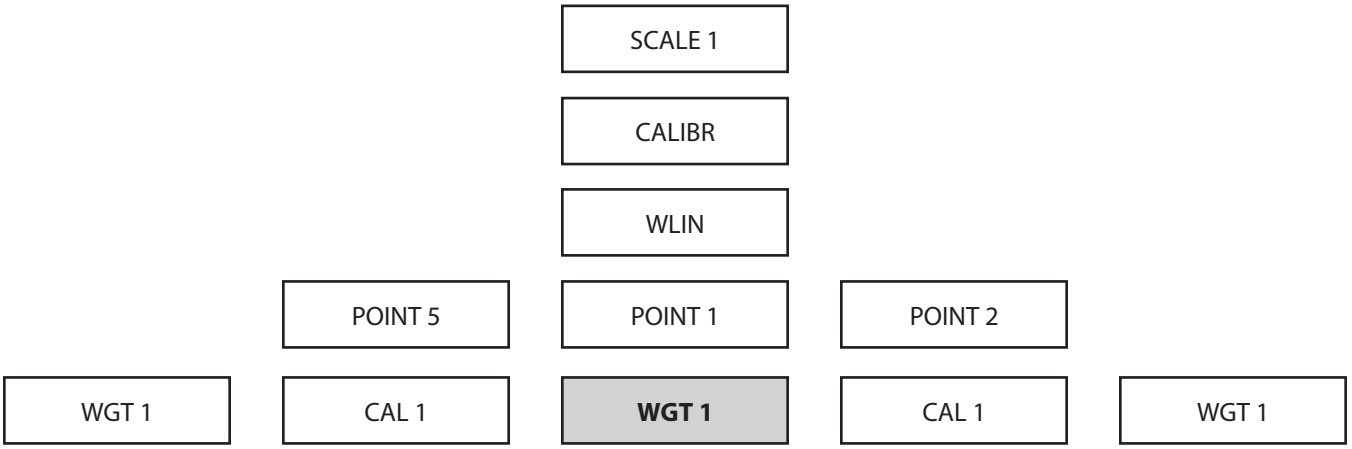
Step 1:
Press the Left Arrow key 2 times until 'WLIN" in highlighted.



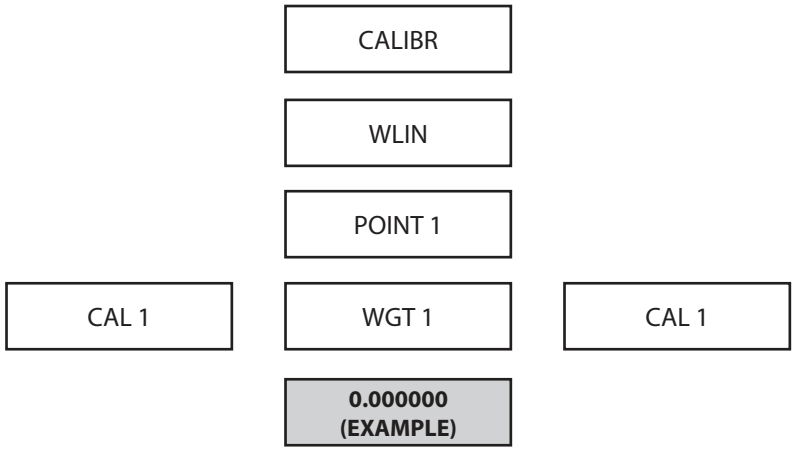
Step 2:
Press the Down Arrow key. "POINT 1" will be highlighted.



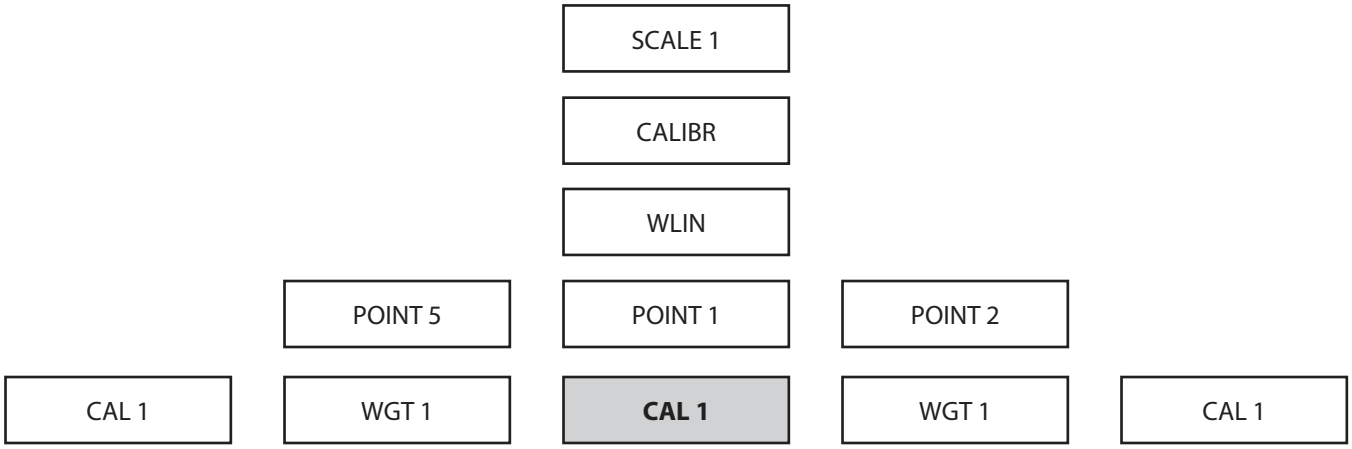
Step 3:
Press the Down Arrow key. "WGT 1" will be highlighted.



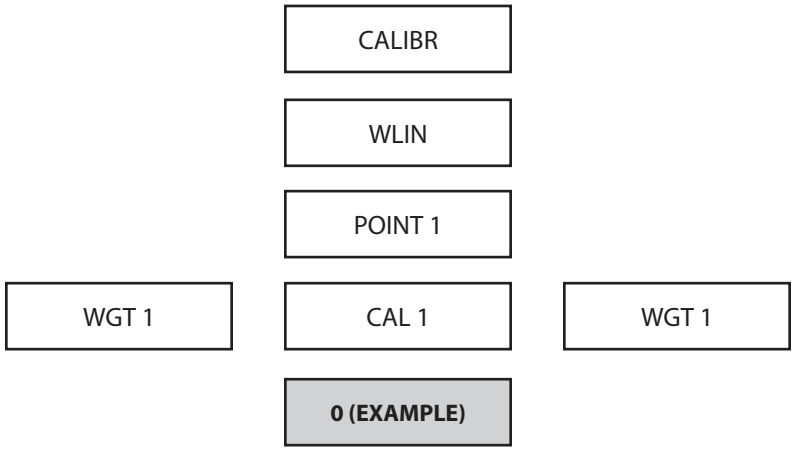
Step 4:
Press the Down Arrow key. The numbers in the highlighted box represent Point 1 value.



Step 5:
Using the Number keys, enter the value for the first calibration point. Press the Enter key to set the value. The display will read "Value Accepted" and "CAL 1" will be highlighted. Note: You can not use "0" or "FULL SCALE" as a value in the 5 Point Linear Calibration program.

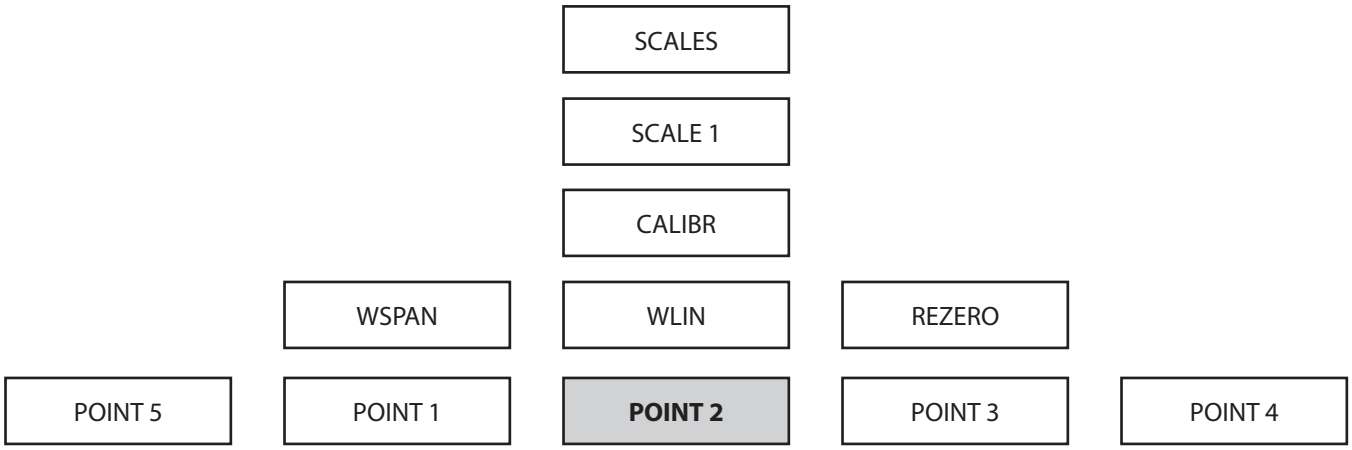


Step 6:
Press the Down Arrow key. The number in the highlight box represents the A/D count for point 1.



Step 7:
Advance the machine until you have a load applied to the machine that is equal to the number keyed in as point 1. Press the "CALIBRATE" soft key located along the bottom of the display. The display will say "CALIBRATING" LINEAR POINT 1. The number displayed in the highlighted box represents the new A/D count for point 1.

Step 8:
Press the Up Arrow key 2 times until "Point 1" is highlighted. Press the Right Arrow key to move to Point 2.



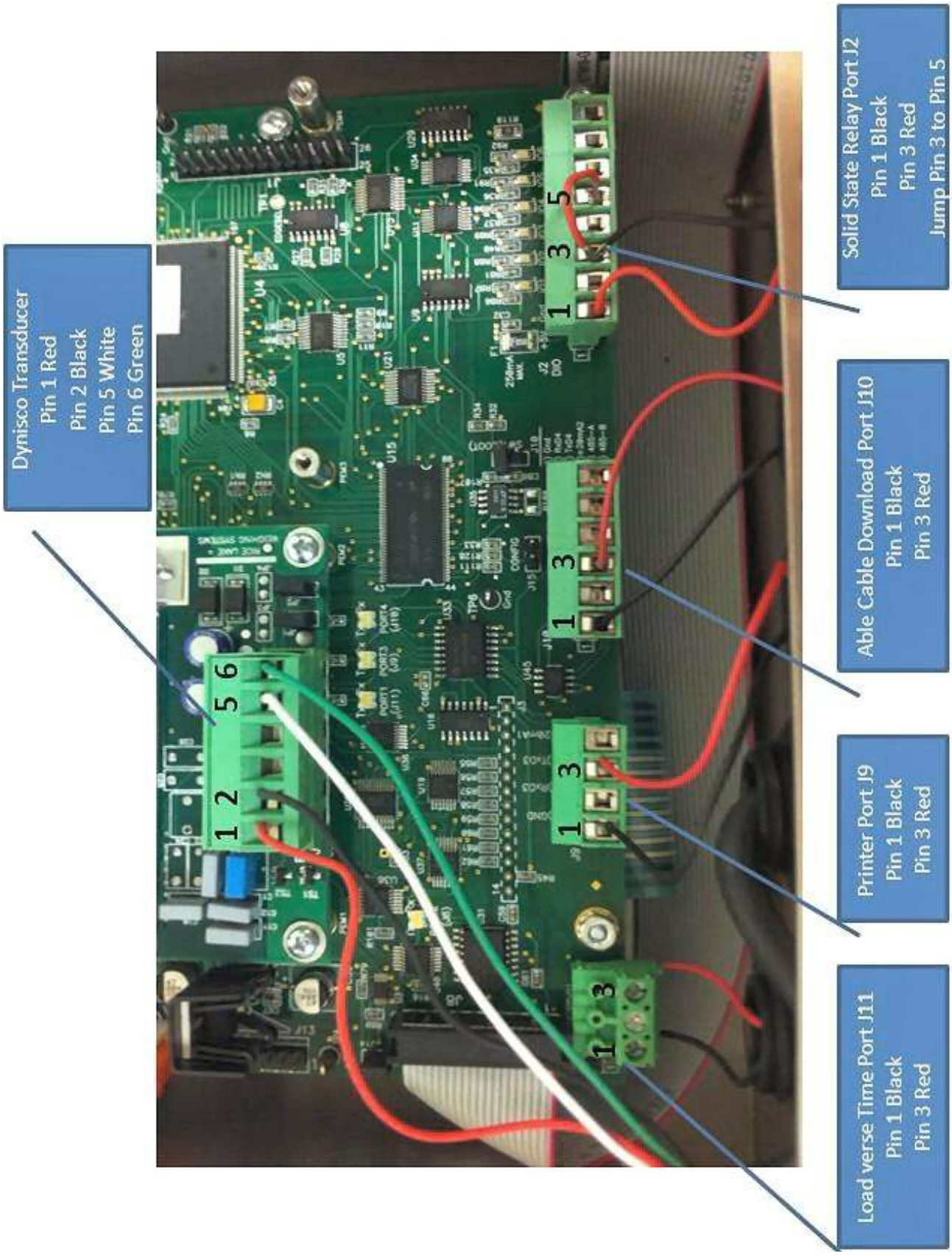
Step 9:
Repeat steps 3 through 8 to set points 2, 3, 4 and 5.

Note: "0" and FULL SCALE cannot be used in the 5 Point Linear Calibration Program.

Step 10:
After all 5 point have been stored, press the Up Arrow key until "SCALE 1" is highlighted, then press the "SAVE AND EXIT" soft key along the bottom of the display.

Step 11:
To verify calibration accuracy, load machine to specific load points and compare the reading on the Indicator with those of the load cell standard. To improve accuracy you can adjust any linear point up or down. Refer back to steps 3 and 4. Adjust the settings under "WGT 1" by slightly increasing or decreasing the value.

8.0 DATA CONNECTIONS



HYDRAULIC CONTROL VALVE
&
HYDRAULIC PUMP SECTION

9.0 HYDRAULIC CONTROL VALVE

9.1 Metered Advance Position

Placing Control Handle No. 1 (see Figure 1) into the metered advance position allows the operator to adjust the rate of loading through the use of Control Knob No. 2. To increase the rate of loading, turn Knob No. 2 counter-clockwise. To decrease the rate of loading, turn Knob No. 2 clockwise. **CAUTION: Do not over-tighten Control Knob No. 2.**

When testing concrete cylinders, the rate of loading must conform to ASTM C 39 specifications. For a hydraulically operated testing machine, the load must be applied at a constant rate within the range of 20—50psi/sec. Knob No. 2 controls the rate of loading. For 6in (150mm) diameter concrete cylinders, the loading rate should be 565—1,413lbs/sec., or 34,000— 84,000lbs/min.

On digital load indicating machines, please see Rate of Load in the digital manual.

For analog (dial) gauge machines, a reading of 10,000lbs on 10 seconds is a good average and is easily set through the use of Control Knob No. 2 and a watch with a second hand.

9.2 Full/Advance Position

Placing Control Handle No. 1 into the rapid advance position causes the piston to advance rapidly at an uncontrolled rate. This is normally used for pre-loading a specimen or rapidly advancing the piston to reduce the daylight opening between the specimen and the platen.

CAUTION: When pre-loading a specimen, watch the machine's load indicator to prevent overloading, or premature failure of the specimen may occur.

WARNING!

DO NOT ALLOW THE MACHINE TO TRAVEL BEYOND THE MAXIMUM PISTON STROKE TAG LOCATED ON THE FRONT OF THE LOAD FRAME. OVEREXTENDING THE HYDRAULIC RAM MAY RESULT IN DAMAGE TO THE SEALS AND WILL CAUSE THE UNCONTROLLED RELEASE OF HYDRAULIC FLUID UNDER PRESSURE.
See section on O-Ring Replacement for instructions to reseat an over-extended piston.

9.3 Hold Position

Placing Control Handle No. 1 into the hold position (see Figure 1) stops the loading of the specimen and holds the pressure on the specimen at that point.

9.4 Retract Position

Placing Control Handle No. 1 into the retract position releases all pressure in the hydraulic cylinder allowing the piston to retract to it's start position. It is not necessary to retract the piston fully between tests. A daylight opening that will allow the specimen to be inserted and removed is all that is required.

NOTE: During continuous operation of the machine, the Flow Control Valve will go through a significant temperature rise. This is not a cause for alarm, as the temperature rise will not affect the operation of the testing machine.

9.5 Figure 1: Control Valve

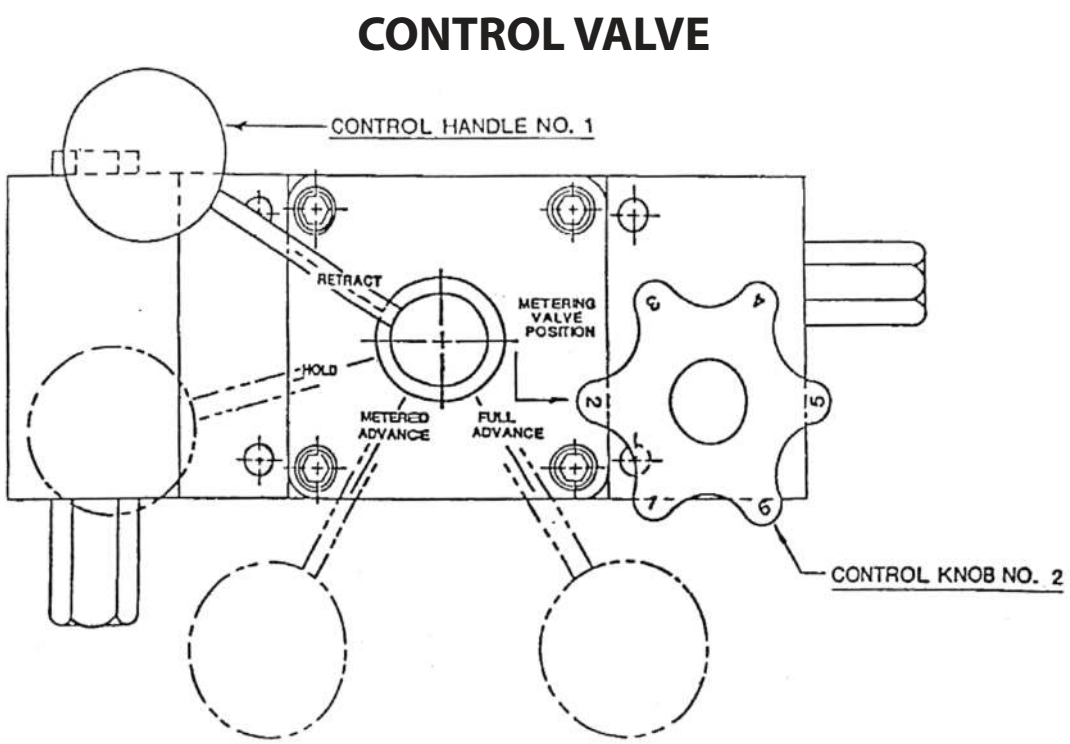


Figure 1

9.6 Sequence of Operation

1. With Pump Motor switched OFF, carefully center specimen in testing machine.

2. Turn Control Knob No. 2 clockwise to a snug position. Never over tighten. (If Knob No. 2 has already been adjusted as in Section 6.1, this step may be skipped until a specimen of different size is tested.

3. Position Valve Control Handle No. 1 to a "metered advance" position.

4. Switch on pump motor.

5. If a preload of the specimen is desired, position Valve Control Handle No. 1 to "full advance". **Caution is required to avoid overload or failure of the specimen.**

6. Watch the display closely. When the desired preload has been attained, move the Valve Control Handle No. 1 to the "metered position".

7. To increase the rate of loading, turn Control Knob No. 2 counter-clockwise. To decrease the rate of loading, turn Control Knob No. 2 clockwise.

8. To hold pressure at any desired point, position Valve Control Handle No. 1 to the "hold" position.

9. To release pressure so that the platen will return after a test has been completed, position Valve Control Handle No. 1 to the "retract" position.

10. For repetitive testing of identical specimens, Control Knob No. 2 can be preset with a stopwatch, then locked in position by tightening the thumbscrew located beneath the knob.

9.7 Maintenance & Safety Precautions

9.7.1 Hydraulic Pump & Flow Control Valve

This two-stage hydraulic pump incorporates precision design and engineering features. Peak efficiency for either continuous or intermittent operation is assured at the full range of pressures up to 10,000psi. You will have uninterrupted, trouble-free service if you keep it clean and free of dust.

9.7.2 Safety Precautions

WARNING!: To avoid possible injury:

- Disconnect the pump from its electrical supply before performing maintenance or repair procedures.
- Repairs and maintenance should be performed in a dust-free area by a qualified technician.
- Should a hydraulic hose ever rupture, burst or need to be disconnected, immediately shut off the pump and shift the control valve to the retract position to release all pressure and allow the machine piston to return to the at-rest position. Cycle the control valve twice to its retract position to make sure all pressure is released. **Never attempt to grasp a leaking hose under pressure with your hands. The force of escaping fluid could cause serious injury.**
- Do not subject the machines hydraulic hoses to potential hazard such as fire, extreme heat or cold, sharp surfaces or heavy impact. Do not allow the hose to kink, twist, curl or bend so tightly that oil flow within the hose is blocked or reduced.
- Periodically inspect the hoses for wear because any of these conditions can damage the hose and possibly result in personal injury. Should a hose need replaced, contact Gilson Company, Inc. with your machine model number and capacity for replacement parts.

9.7.3 Hydraulic Fluid Level

- When checking the oil level, fully retract the machines hydraulic cylinder to the at-rest position and disconnect the power supply. Clean the area around the filler plug and remove the plug.

- For machines supplied with 3/4hp pump, maximum capacity is when the oil is 1-1/2in (38mm) below the cover plate with the cylinder retracted.

- For machines supplied with 1/2hp pump, maximum capacity is when the oil is 2in (50mm) below the cover plate with the cylinder retracted.

- When adding oil, use only **Dexron III Automatic Transmission Fluid**. To fill, insert a clean funnel with filter, add oil slowly being careful not to overfill the pump. Check oil level when finished and remove any oil if pump is overfilled. Check to see that the breather-hole in the filler cap is open to prevent the build up of excessive air pressure in the reservoir, and to assure that the cylinder retracts smoothly, then replace filler cap.

- The frequency of oil changes will depend upon the general working conditions, severity of use and overall cleanliness and care given to the testing machine and the hydraulic pump. An air hose should never be used to clean the machine or pump as it will blow dust into the hydraulic system and cause damage to the hydraulic pump and load control valve. The oil should be changed at least every three hundred (300) hours of use under severe working conditions, where dust contamination of the oil is quite likely to happen. When changing the oil drain, flush and refill the reservoir with Dexron III Automatic Transmission Fluid.

9.7.4 How to Operate the Pump

1. Make sure all valve and hose fittings are tight. Plug in electric motor.

2. Set valve in the retract position, set switch on run, and let pump idle for a few minutes.

3. Place a concrete test cylinder in the machine and run piston out to its full travel several times to eliminate air from the system. The pump is now ready to be put into regular operation.

9.7.5 Hydraulic Piston O-Ring Replacement

Supplies Required

- Wrenches
- Clean rags
- Extra fine emery paper
- Dexron II or Dexron III

Procedure

1. Remove the spherically seated cylinder platen out of the piston. Remove the lower platen off the bottom crosshead.

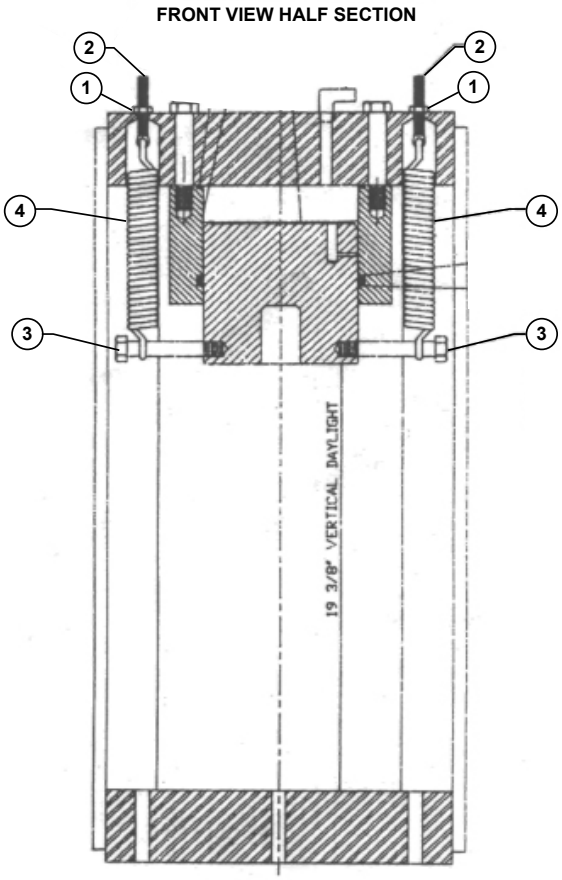
2. Place a 6x12in concrete cylinder inside the load frame. You will use it to set the piston on.

3. Place a rag under the hydraulic hose fitting on the flow control valve mounted on top of the pump.

4. Loosen the hydraulic hose fitting. You do not need to remove the hose, just loosen it to break the air lock.

5. On the top of the machine, loosen the 3/8in nuts (Part 1) to the end of the tension rod threads (Part 2) and stop. Refer to Figure 1 on page 2.

CAUTION: Do not remove the nuts.



6. Place one hand on each bolt (Part 3) and push the piston down about 2in. Remove both bolts (Part 3) out of the piston return springs (part 4).

7. Put the bolts back into the piston. Carefully, with one hand on each bolt, push the piston out of the cylinder. Set it on top of the concrete cylinder and then carefully remove it from the load frame.

CAUTION: Be careful not to drop the piston.

8. Wipe out the inside of the cylinder with a clean rag.

9. Look up inside the cylinder for a groove cut in the side of the cylinder. Insert a small blade screwdriver into the groove and carefully remove the white back-up ring and black O-ring.

10. Use a clean rag to clean out the o-ring groove.

11. Stretch the black O-ring over the piston to shape it for easier insertion into the cylinder.

12. Push the new o-rings into the cylinder. Place the black O-ring ABOVE the white back-up O-ring in the same groove.

13. Make sure the O-rings are fully seated in the groove.

14. Wipe the bottom half of the cylinder and new o-ring with clean Dexron II or Dexron III.

15. Inspect the piston for scratches. If any are present, buff them off with extra fine emery paper, then wipe clean.

16. Clean the piston with a clean rag then coat the end of the piston with Dexron II or Dexron III.

17. Center the piston over the cylinder opening. Keeping it level, re-install the piston into the cylinder.

NOTE: If you don't keep the piston level, it will be very hard to get it back inside the cylinder.

18. Place a block of wood or similar under the piston to hold it up inside the cylinder.

NOTE: Do not hold the piston up with anything that can damage it.

19. Remove both bolts (Part 3) out of the piston. Place the bolts through the ring on the end of the return springs (Part 4) and put them back into the piston. Tighten the bolts.

20. On the top of the machine, tighten both 3/8in nuts (Part 1). Alternate tightening equally, about 1/2in of thread each time until the nuts are tight and the piston has been pulled all the way back into the cylinder.

21. Check each bolt to see that you have an equal amount of thread used on each nut rod.

22. Re-tighten the hydraulic hose fitting on the flow control valve.

NOTE: Do not over-tighten the hydraulic hose fitting. Tighten it and then run the machine. Re-tighten it until it stops leaking.

23. Run the machine and check for leaks.

Call Gilson Technical Support with any questions or problems at 800-444-1508

Repair Parts

Model	Description	Part Number
MC-250	6in O-ring	RPMC-250-4
	6in split backup O-ring	RPMC-250-5

9.7.6 Troubleshooting

Correcting Minor Hydraulic Problems

The hydraulic unit should be observed constantly for out of the ordinary performance and unusual noises. If any of these are present, shut off pump and take corrective steps immediately to avoid possible expensive repairs later on. Some of the most common minor problems and their remedies are listed:

PROBLEM	CAUSE	REMEDY
Improper advance or return.	Air in circuit, oil supply low.	Add oil.
Improper advance or return.	Dirt in system causing valves to lock open.	Flush out entire oil system and fill with new oil.
Improper advance or return.	If trouble is not cleared up by above remedies, trouble may be due to dirty or plugged up strainer screen.	Drain oil. Next remove pump base cover and clean or replace screen.

CAUTION: Do not operate pump without screen, as particles of dirt will be sucked into pump and valve mechanisms, seriously damaging valve seats.

PROBLEM	CAUSE	REMEDY
Unable to reach pressure.	Same as above.	Same as above.
Necessary to add oil often.	Oil leaks.	Check for broken lines, loose fittings or connections.
Noise in hydraulic system.	Air in system. Low on Oil.	Add oil. Run pump to work out air.

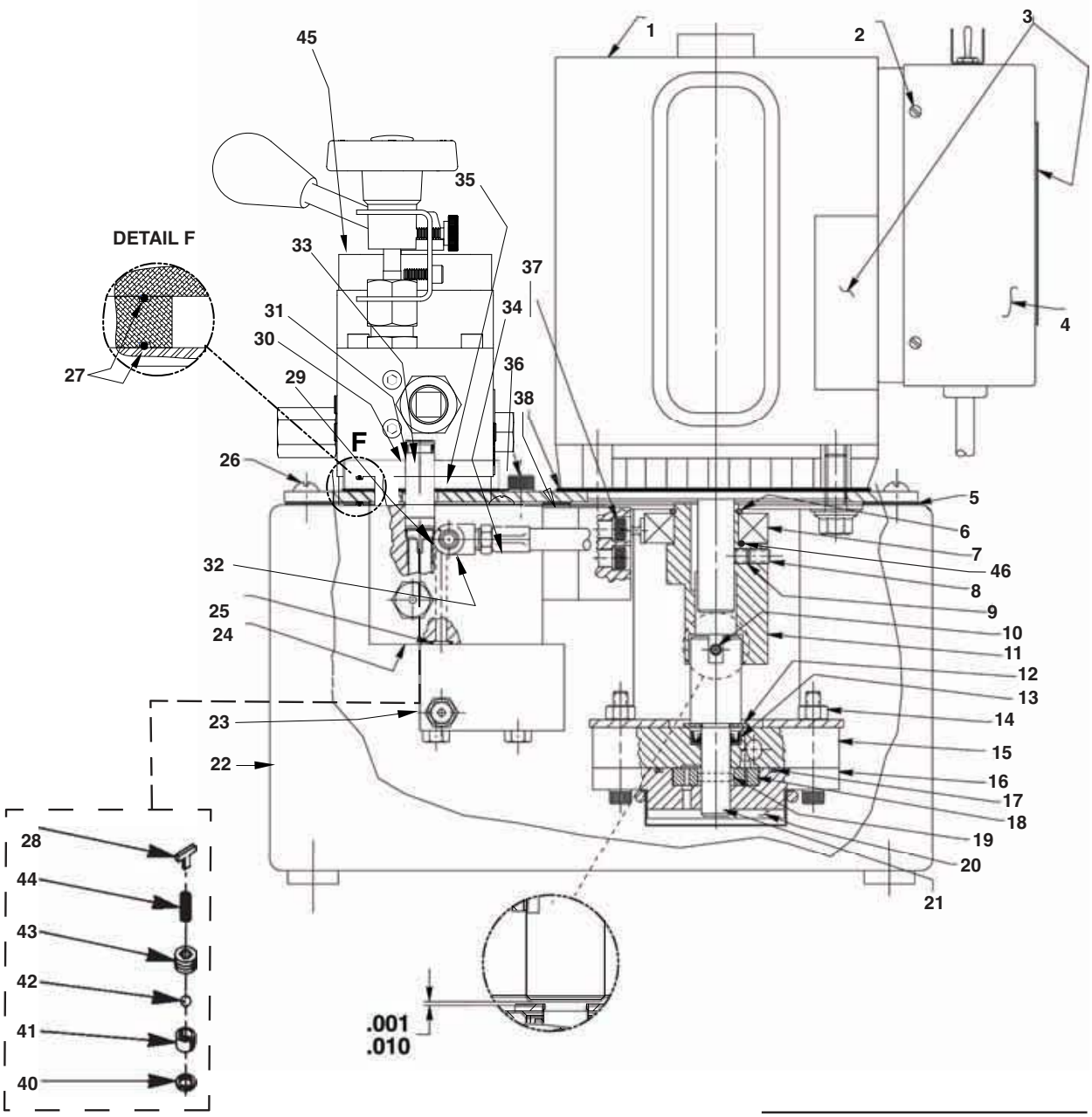
If the above corrective measures fail to make the pump function properly, it is recommended that you notify Gilson Company, Inc. or a qualified service representative. Under no conditions allow unqualified personnel to attempt to repair the pump, particularly the pump block unit or control valve unit, as serious and irreparable damage may result.

10.0 ELECTRICAL HYDRAULIC PUMP

SPX POWER TEAM®
SPX Corporation
5885 11th Street
Rockford, IL 61109-3699 USA
Tech. Services: (800) 477-8326
Fax: (800) 765-8326

10.1 Pump Diagram

ELECTRIC HYDRAULIC PUMP
Model B



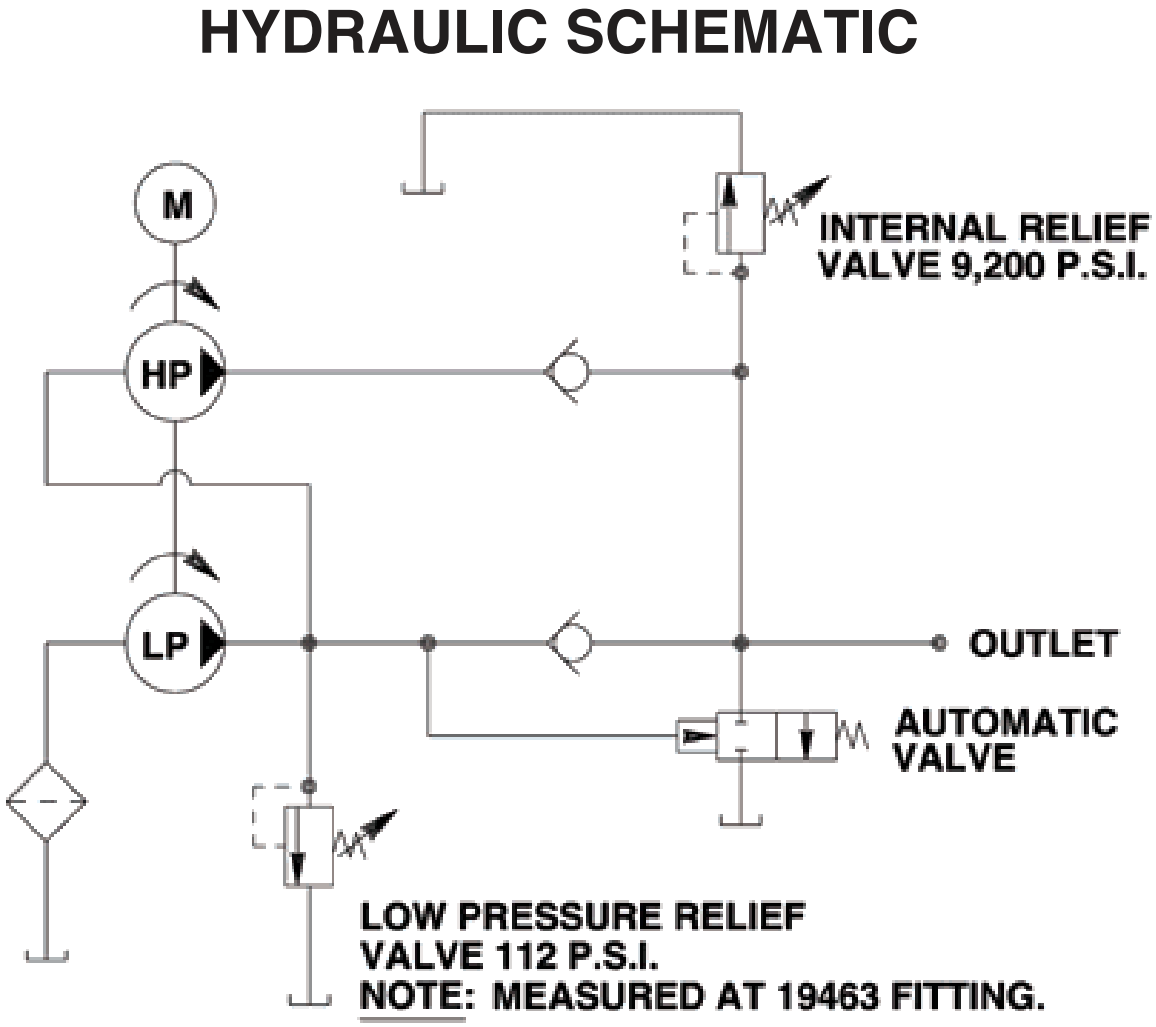
10.2 Pump Parts List

SPX POWER TEAM®

Item No.	Part No.	No. Req'd	Description
1	58196WH2	1	Electric Motor (For PE17-FORN & PE17-TEST)
	303912	1	Electric Motor (For PE17N-TEST)
2	11141	4	Machine Screw (#6-20 X 3/8 Lg.)
3	*200188	1	Decal (IMPORTANT portion is on electric motor; **WARNING** portion is on control box cover)
4	42576WH2	1	Control Box Cover (For PE17-FORN & PE17-TEST)
	42576BK2	1	Control Box Cover (For PE17N-TEST)
5	*40164	1	Gasket
6	209798	1	Retaining Ring
7	209805	1	Ball Bearing
8	10519	1	Set Screw (1/4-20 UNC X 3/8 Lg.; Torque to 60/80 in. lbs.)
9	10136	1	Set Screw (1/4-20 UNC x 1/4 Lg.; Torque to 60/80 in. lbs.)
10	10973	1	Slotted Spring Pin (**NOTE:** Locate slot as shown.)
11	45596	1	Eccentric
12	12595	1	Washer (1-1/8 X 1/2 X .077 Thk.)
13	*304830	1	Oil Seal
14	10199	2	Hex Nut (1/4-20 UNC)
15	61170	1	Housing
16	61169	1	Gerotor Housing
17	*10922	1	O-ring (2-1/8 X 1-15/16 X 3/32)
18	304826	1	Gerotor
19	209794	1	Gerotor Drive Pin
20	21846	1	Filter Support
21	304835	1	Drive Shaft
22	40063GY15	1	Reservoir (2 gal.; For PE17-FORN)
	40063BK2	1	Reservoir (2 gal.; For PE17-TEST & PE17N-TEST)
23	52167	1	Block
24	61167	1	Body
25	*10266	1	O-ring (3/8 X 1/4 X 1/16)
26	10177	10	Mach. Screw (1/4-20 UNC X 3/4 Lg.)
27	*18669	2	O-Ring
28	209795	1	Outlet Ball Stop
29	10427	1	Pressure Plug (1/8 NPTF)
30	*10268	2	O-ring (1/2 X 3/8 X 1/16)
31	*11863	2	Backup Washer (1/2 X 3/8 X 1/16)
32	19463	1	Tee
33	209809	1	Coupling
34	304819	1	Hose Assembly
35	52165	1	Manifold
36	10030	1	Cap Screw (5/16-18 UNC X 3/4 Lg.; Torque to 220/240 in. lbs.)
37	10022	4	Screw (1/4-20 UNC X 1-1/2 Lg.; Torque to 180/200 in. lbs.)
38	351060	1	Gasket
39	2007916	1	O-Ring
40	•*10442	1	Copper Washer (1/4 Bolt)
41	•*209787	1	Replaceable Seat
42	•*12223	1	Steel Ball (3/16 Dia.)
43	209797	1	Hollow Lock Screw (7/16-20 UNF-3A; Torque to 110/130 in. lbs.)
44	*14431	1	Compression Spring
45	64529	1	Valve
46	2007916	1	O-Ring

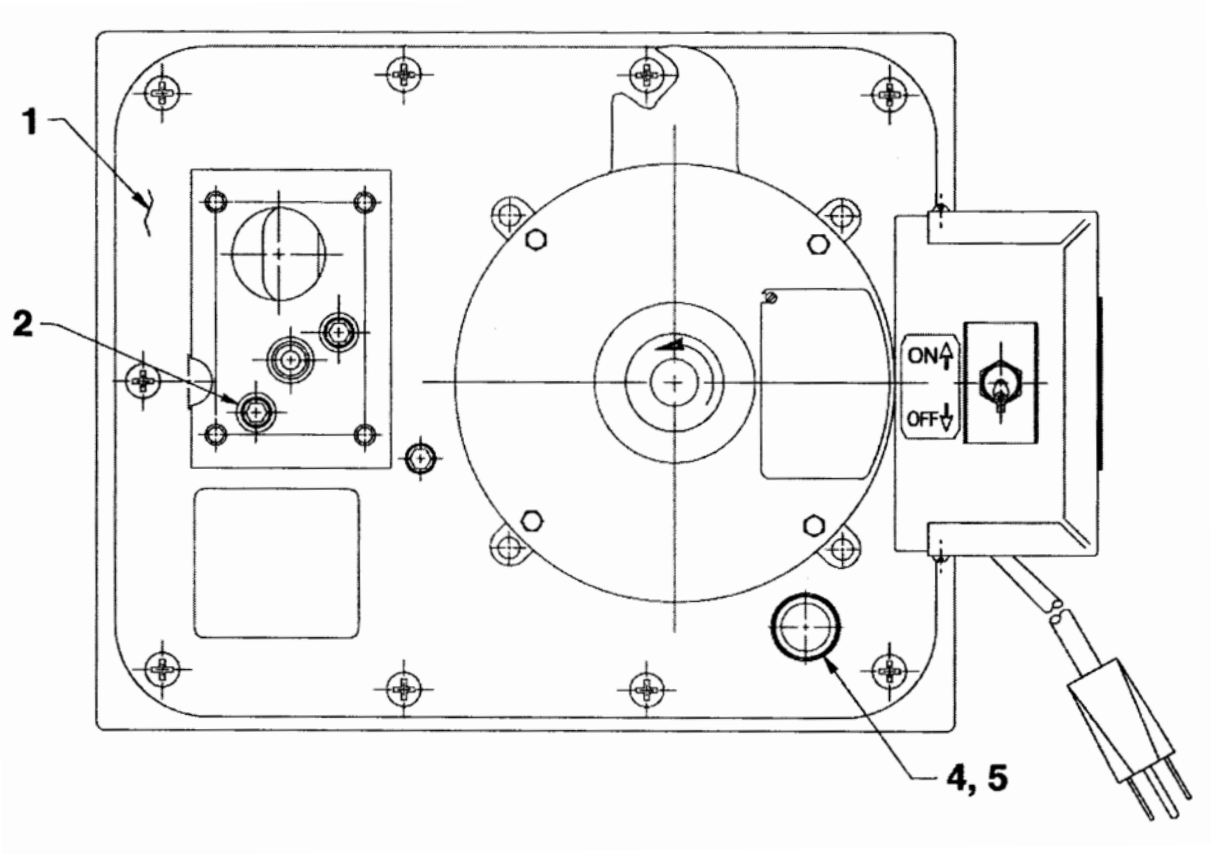
Part numbers marked with an asterisk (*) are contained in Repair Kit No. 300430.

10.3 Hydraulic Schematic Diagram



10.4 Top View & Parts List

TOP VIEW



PARTS LIST

Item No.	Part No.	No. Req'd	Description
1	66218BK	1	Cover Plate
2	10030	2	Cap Screw (5/16-18 UNC x 3/4 Lg.)
4	20937	1	Vent Cap
5	200415	1	Rubber Gasket

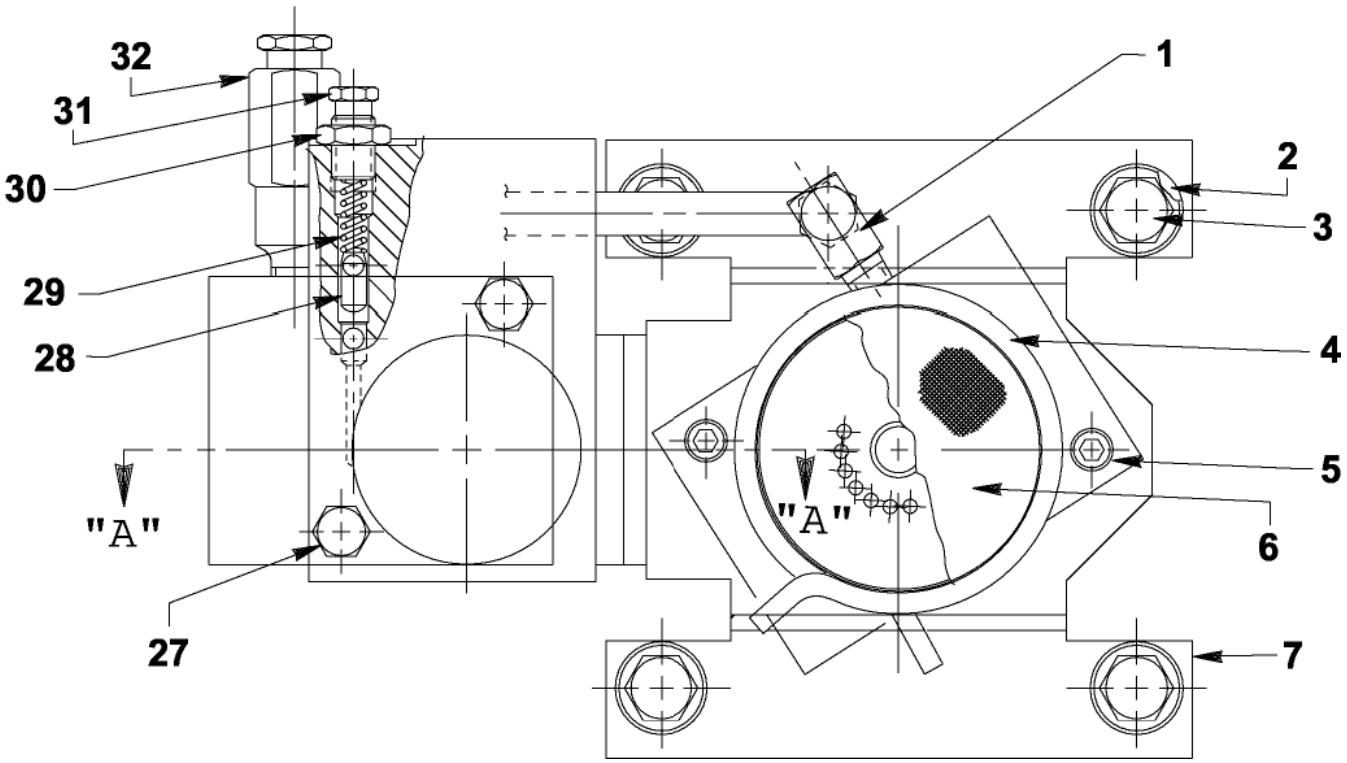
Refer to any operating instructions included with this product for detailed information about operation, testing, disassembly, reassembly, and preventive maintenance.

Items found in this parts list have been carefully tested and selected. **Therefore: Use only genuine Power Team replacement parts!**

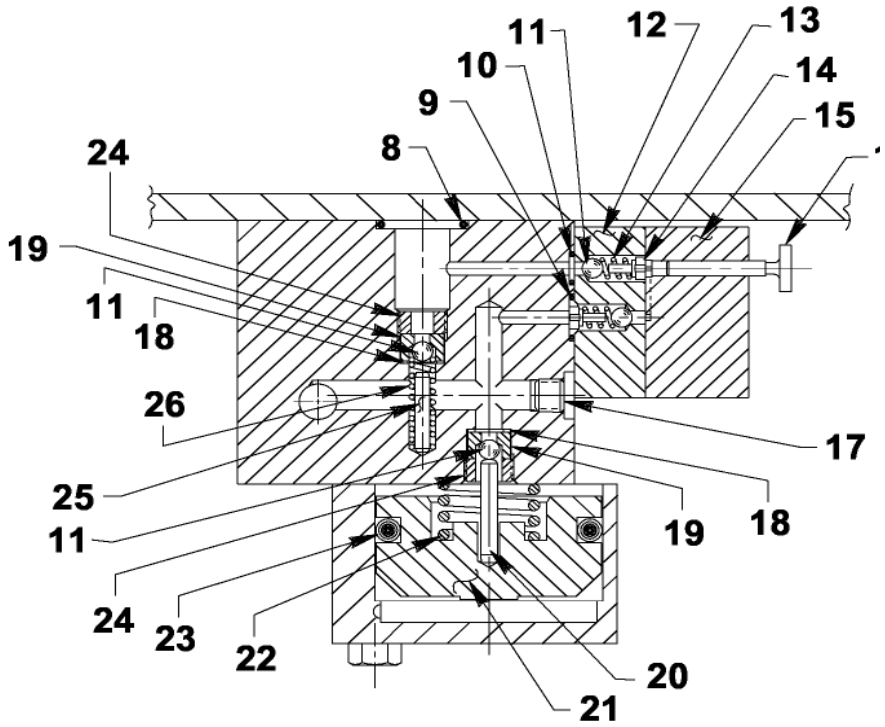
Additional questions can be directed to our Technical Services Department.

10.4.1 Bottom View & Section A-A

BOTTOM VIEW & SECTION A-A



SECTION A-A



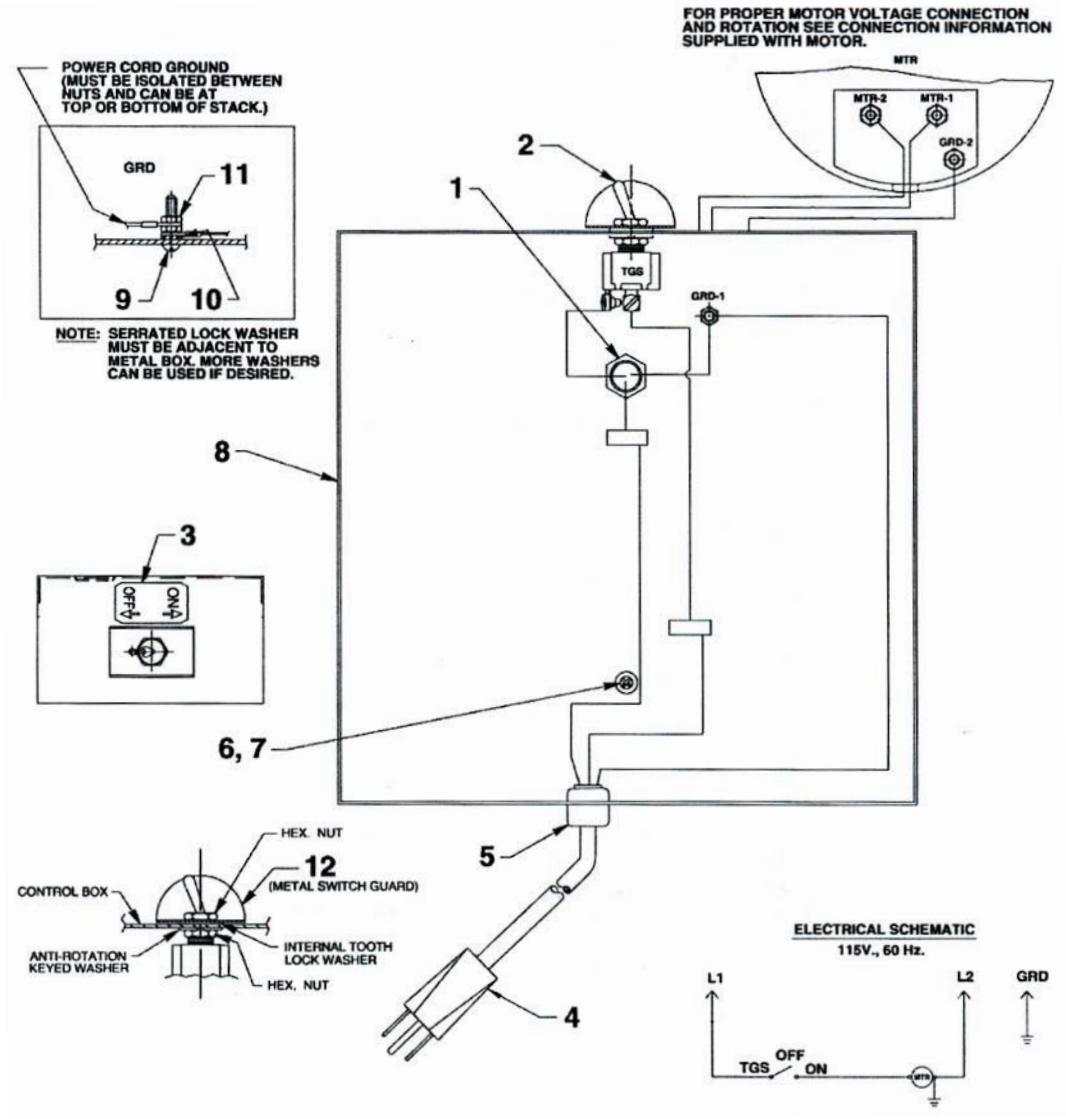
10.4.2 Bottom View Parts List

Item No.	Part No.	No. Req'd	Description
1	14440	1	90° Elbow Fitting
2	10258	4	Washer (For 3/8 bolt)
3	213663	4	Cap Screw (3/8-16 UNC x 1in Lg.); (Torque to 230/250 in. lbs.)
4	11461	1	Hose Clamp
5	10854	2	Cap Screw (1/4-20 UNC x 1-3/4 Lg.); (Torque to 60/80 in. lbs.)
6	21608	1	Filter
7	52174	1	Pump Mounting Bracket
8	*10273	1	O-ring (13/16 x 5/8 x 3/32)
9	*14763	1	O-ring (7/16 x 5/16 x 1/16)
10	*10265	1	O-ring (5/16 x 3/16 x 1/16)
11	*12223	4	Ball (3/16 Diameter)
12	45559	1	Block
13	*10445	2	Compression Spring (5/32 O.D. x 3/4 Lg.)
14	24549	2	Ball Guide
15	45560	1	Block
16	304820	1	Piston
17	15130	1	Plug (1/16 NPTF)
18	*10442	2	Washer (3/8 x 1/4 x 1/32)
19	*209787	2	Replaceable Seat
20	211843	1	Dowel Pin (**NOTE:** Install with radius end out.)
21	46063	1	Piston
22	*16346	1	Compression Spring (1in O.D. x 7/8 Lg.)
23	*10283	1	O-ring (2in x 1-5/8 x 3/16)
24	209797	2	Hollow Lock Screw (7/16-20 UNF-3A; Torque to 180/200 in. lbs.)
25	12149	1	Pin
26	*16057	1	Compression Spring (3/16 O.D. x 1in Lg.)
27	13037	2	Cap Screw (1/4-20 UNC x 2in Lg.); (Torque to 40/50 in. lbs.)
28	15156	1	Pin
29	*11221	1	Compression Spring (1/4 O.D. x 1in Lg.)
30	10386	1	Nut (3/8-24 UNF)
31	*29786	1	Valve Adjusting Screw
32	21278-88	1	Relief Valve Assembly (Set at 8,900/9,500 PSI)

Part numbers marked with an asterisk (*) are contained in Repair Kit No. 300430.

10.4.3 Motor Control Assembly & Parts List

MOTOR CONTROL ASSEMBLY



PARTS LIST

Item No.	Part No.	No. Req'd	Description
1	11202	1	Nipple
2	12301	1	Toggle Switch
3	205409	1	On/Off Label Decal
4	24733	1	Cord Set
5	15993	1	Strain Relief Bushing
6	252253	1	Screw (#8-32 x 1/2 Lg.)
7	12355	1	Washer (For #8 bolt)
8	42575WH2	1	Electrical Control Box (For PE17-FORN & PE17-TEST)
8	42575BK2	1	Electrical Control Box (For PE17N-TEST)
9	10167	1	Screw (#10-24 UNC x 3/4 Lg.)
10	11108	1	Lock washer (#10 External Tooth)
11	10197	2	Nut (#10-24 UNC)
12	35206	1	Metal Switch Guard

11.0 TECHNICAL SUPPORT & POWER TEAM SERVICE CENTERS

If a problem should occur with your testing machine:

Call Gilson Company, Inc. Technical Support line at 800.444.1508 (8AM - 5PM EST) Monday - Friday or email us at techsupport@gilsonco.com

SPX POWER TEAM®

SPX Corporation
5885 11th Street
Rockford, IL 61109-3699 USA

Tech. Services: (800) 477-8326
Fax: (800) 765-8326
www.powerteam.com

12.0 STATEMENT OF WARRANTY

STATEMENT OF WARRANTY

Gilson Company, Inc. warrants new compression testing machines manufactured by Gilson Company, Inc. against defects in workmanship and materials for a period of 12 months from the original date of shipment, provided the equipment has been properly installed, maintained and operated in accordance with installation and operating instructions. This limited and exclusive remedy does not cover normal wear and tear. The Gilson Company, Inc. product must be free from accident, damage by fire, water or act of God to be eligible for warranty.

Gilson Company, Inc. will repair, replace or credit, at our option, defective product or component parts. When repair can be accomplished by exchange of a component part, the customer may be required to remove the part or modular component and install the exchanged part.

Warranty does not cover expenses, either direct or indirect, that may arise from the use or the inability to use Gilson Company, Inc. products, or the secondary owner in the event of resale.

Products not manufactured by Gilson Company, Inc. will carry the warranty of the original manufacturer. Under no circumstances shall Gilson Company, Inc. be liable for any injury, loss, or damages, whether direct or indirect, incidental or consequential, arising out of the use of, or inability to use the products described herein.

This exclusion of liability for loss or damages, whether direct or indirect, incidental or consequential, shall apply to all claims whether sounding in contract, warranty, tort including both negligence and strict liability, or any other basis of liability.