

Concrete Compression Testing Machines MC-400P & MC-500P



Rev: 07/2021

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 Dextron II or Dextron 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 technical@gilsonco.com

1.0 INTRODUCTION

Standard information displayed on the indicator during a test is peak load, rate of load, and Sample ID number, if entered. Information displayed after a test is peak load and average rate of load for the last 50% of the test.

1.1 Test Reports

Test reports can be optionally stored to memory, printed on an optional printer or downloaded to a computer with the optional Able Cable RS-232/USB cable. Details for all options can be found in the following pages.

2.0 THE KEYS & THEIR FUNCTIONS

HARD KEYS

2.1 Tare Key

Required at the start of each test.

Function: Clears and stores all displayed test values, sets indicator to start a new test.

To use: Press <TARE KEY>, wait until the words "TARE SUCCESSFUL" are displayed before beginning the test. See section 3.0 on how to perform a test and save test results.

2.2 Units Key

Function: Switches indicator between engineering force units of lb., kg, N and kN.

To use: Press <UNITS KEY> to toggle between force options. When required unit type is displayed, function is set.

NOTE: Rate of load function is fixed in selected force units per second.

2.3 Print Key

Function: The Print Key is a multiple function key used for transferring/printing stored test data, and entering numerical values to memory.

2.3.1 Test data transfer/print functions with required optional cables installed in the Indicator and connected to receiving unit.

To use: Press <PRINT KEY>, the transfer/print function is automatic. When function is complete you will be prompted to either SAVE or CLEAR stored test data. To save stored test data in memory press <SAVE F1> soft key. To clear test data from memory, press <CLEAR F4> soft key. NOTE: Before clearing stored test data from memory transfer or print stored data as cleared data is NOT retrievable.

2.3.2 Entering and Storing a numerical value into a data entry field.

To use: Open function <SAMPLE ID>. Use key pad to input required ID number. When set press <PRINT KEY> to store in memory.

Also used in calibration program to set a numerical value into a field, and select and accept a menu option.

2.4 Number Key

Function: The <NUMBER KEYS> are used to input a numerical value into a data entry field.

To use: Press <NUMBER> key to set required value.

2.5 Menu Key

Function: Opens and displays a list of four (4) menu options. They are Audit Trail, Configuration, (Calibration Program), Test Operation and Contrast (brightness) Adjustment. The Contrast Adjustment setting program is the only menu option for user adjustment. DO NOT attempt to enter any of the other displayed menu programs.

2.5.1 Audit Trail & Test Operation – **DO NOT ENTER**. Entering the program will effect the operation of the digital indicator.

2.5.2 Configuration (Calibration Menu) – **DO NOT ENTER**. Entering the program will **ERASE** the calibration settings stored in memory, and they cannot be restored. This menu is password protected. If you

inadvertently enter it you will be prompted to enter a password. Press <1> key and press <PRINT ENTER> key, and the indicator will return to its normal test operation screen.

2.5.3 Contrast - To use: Press <MENU KEY>, then press <DOWN ARROW ▼ G/N KEY> until menu item Contrast Adjustment is highlighted and reads “Less ← Contrast xx% → More”. To adjust the brightness setting, press <UNITS > ARROW KEY> to brighten contrast. Press the <TARE < ARROW KEY> to darken contrast. When required adjustment is set press Soft Key <F3 SAVE & EXIT MENU>.

2.6 UP ▲ ARROW/ZERO KEY

Function: Used to scroll back one menu line at a time to a previously displayed menu. Normally used in calibration procedure. This key is NOT to be used to zero the indicator.

To use: Press <UP ▲ ARROW/ZERO KEY> to return to a previously displayed menu. This key is NOT to be used to zero the indicator.

2.7 DOWN ▼ ARROW/G-N KEY

Function: Used to scroll forward on menu line at a time. This key is normally used when adjusting the display screen contrast and calibration procedure. This key is NOT to be used to set a Gross/Net tare function.

To use: Press <DOWN ▼ ARROW/G-N KEY> to scroll forward one menu line at a time until menu option is displayed. This key is NOT to be used to set a Gross/Net tare function.

SOFT KEYS

2.8 AUTO-STORE (F3) KEY

Function: Turns indicators memory function ON or OFF. When activated, automatically stores test results to memory at the end of a test. Auto-Store must be activated to use the Sample ID function.

To use: Press <AUTO-STORE (F3) KEY>. To turn function ON, press the <F4> key. To turn function OFF, press the <F1> key.

2.9 SAMPLE ID (F1) KEY

Function: Opens the indicators memory function and allows an individual sample ID number to be set and stored to memory automatically at the end of a test.

NOTE: Auto-Store must be activated for the ID function to operate.

To use: Press <SAMPLE ID (F1) KEY>. Use <NUMBER KEYS> to select and display ID numbers. Up to 25 digits can be set. If an incorrect number is set, press <BACK SPACE F3 KEY> to go back and cancel one number at a time. Continue to select ID number. When the correct ID number is displayed, press <PRINT/ENTER KEY> to set.

Pressing the <CANCEL F1 KEY> when setting an ID number clears all set numbers and displays the words “Entry Mode Cancelled”. Press <SAMPLE ID (F1) KEY> and follow procedure to enter and set ID number.

2.10 TEST RESET

Function: Allows a test in progress to be stopped and cancels sample ID number. Test data will not be stored in memory and display returns to idle mode.

To use: Stop the test by placing the control valve in its hold position. Press <TEST RESET F2 KEY> and test data is cleared. Shift the control valve to retract position and enter new test data.

3.0 TEST PLATEN INSTALLATION & REMOVAL

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.

Step 1:

From behind the machine, or from the front slightly to one side, one person uses both hands to lift the platen assembly to the bottom of the top crosshead. Insert the platen holding stem all the way into the 1 ½” diameter hole in the crosshead until the top of the platen makes full contact with the bottom of the crosshead.

Step 2:

The second person uses the 1/2” Allen wrench supplied to tighten the set screw located in the front of the top crosshead. Do not over-tighten the screw, damage may occur to the set screw threads.

Step 3:

Carefully inspect the platen to crosshead fit to ensure the platen is securely locked into the crosshead and there are no visible air gaps.

Use this procedure when removing and installing cylinder platens or other test platens. When installing spacers, insert the spacers first against the top crosshead, then install the platen into the spacer, using the same procedure.

4.0 TEST SETUP

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

Step 1:

The indicator 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 electrical voltage requirements for the indicator are listed on the 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 indicator's 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:

Verify that the correct Engineering Unit of weight measurement is selected. The current unit is displayed on the screen. Press <UNITS> key to toggle through options of lb, kg, N or kN.

Step 3: Auto-Store – If hard copy test documentation is required, turn Auto-Store function ON. Test results will be stored in memory automatically at the end of each test. See section 2.8.

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 section 2.3 Print Key function for instructions.

Step 5:

Set hydraulic loading control valve in its Retract position and switch hydraulic pump motor on. Insert and center test sample in testing machine.

Step 6:

Enter Sample ID number if required, press Sample ID soft key and enter ID number code, and press <PRINT> key to set.

Step 7:

To start test, use the hydraulic load control valve to advance the machines piston to the required starting position, normally a point when an air gap of 1/16" (1.5 mm) or less is between the top of the test sample and the bottom of the upper test platen. Place control valve in Hold position. Press indicators <TARE KEY> to remove all residual load values on indicators display screen. The Load and Rate of Load value lines will display "00" indicating it is ready to start. The indicator will also display the words "Tare Successful" and if used, the sample ID number will move to the right hand side of the display screen.

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 for the sample type and size you are testing.

Shift control valve lever to Full Advance position. At sample contact, the top load line of the screen will 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 second 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 the 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 20,000 lbs. (88 kN) 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 live Load will freeze and no longer increase in value. When the indicator detects that the load has fallen below the set sample break percentage, the screen will change and display the words "PEAK LOAD", indicating that the test sample has reached its maximum load value. Shift the control valve lever to the Retract position. The rate of load line will also change and display the words "Avg Rate of Load" and the corresponding value applied to the sample during the test. If the auto-store function is activated, the sample ID number will go blank indicating that all test data has been 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: Calibration should be performed by a certified calibration company. These instructions in this section are intended for use by experienced and certified calibration technicians. A load cell, equal to or greater than the capacity of the machine, is required for calibration.

5.0 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:

Press the "MENU" button on face of digital.

Step 4:

Use the down button and select "Configuration" and push print. Then enter the password and press print.

Step 5:

This displays the "SCALE CONFIGURATION" menu. "SCALES" will be highlighted.



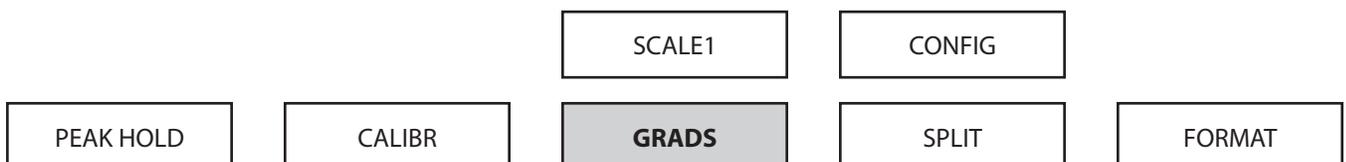
Step 6:

Press the down arrow key once. This displays the "SCALE1 CONFIGURATION" menu. "SCALE1" will be highlighted.



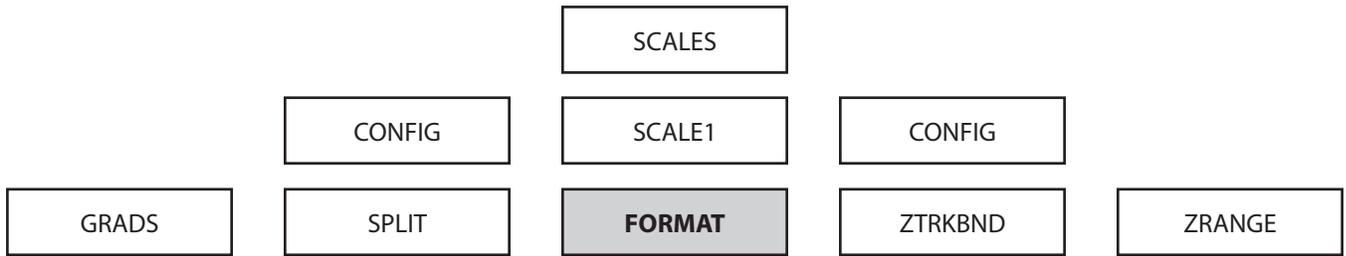
Step 7:

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



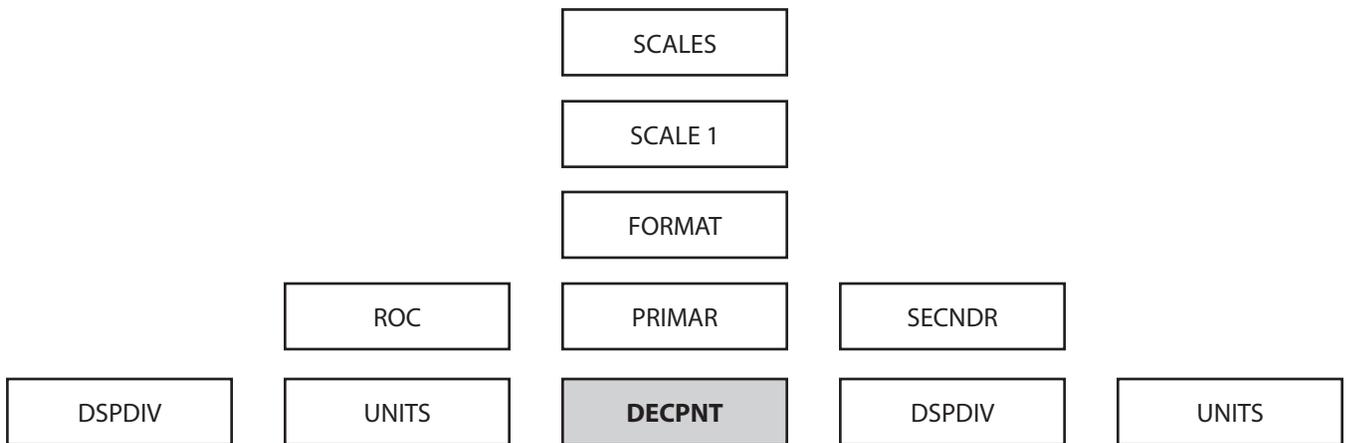
Step 8:

Press the right arrow key 2 times until "FORMAT" is highlighted.



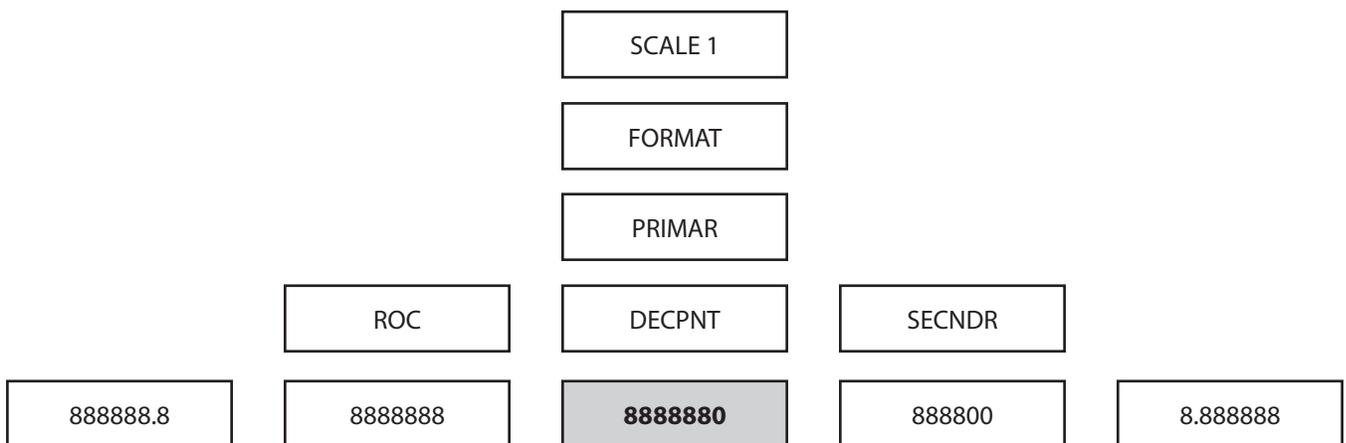
Step 9:

Press the down arrow key 2 times until "DECPNT" is highlighted.



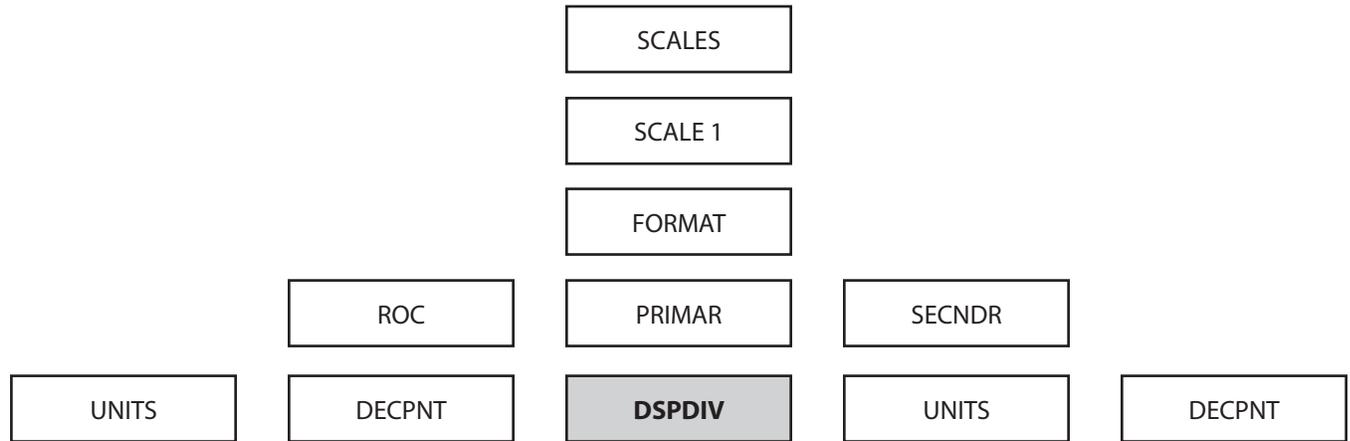
Step 10:

Press the down arrow key 1 time. Press the left or right arrow key until "8888880" is highlighted.



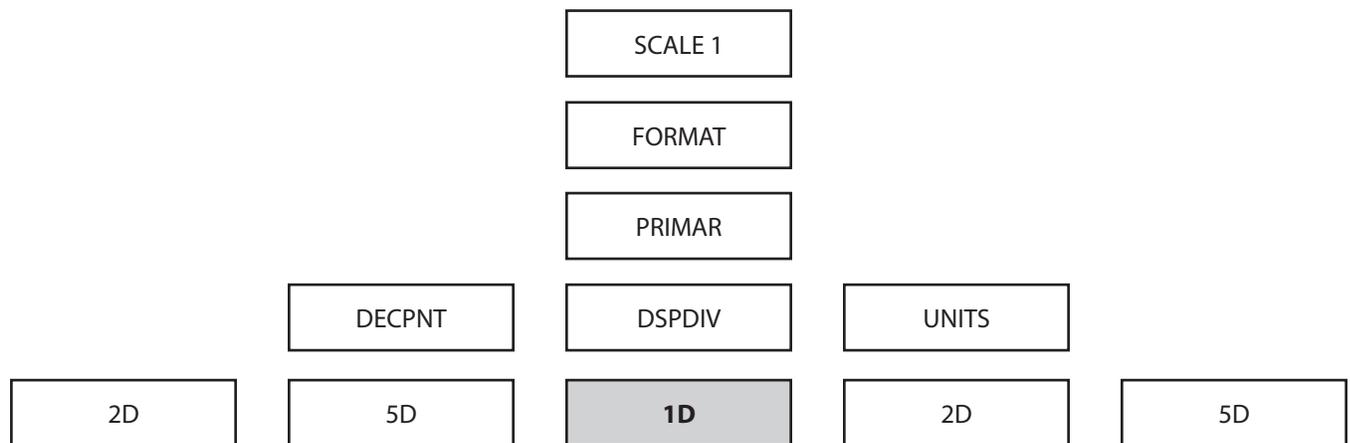
Step 11:

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



Step 12:

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



Step 13:

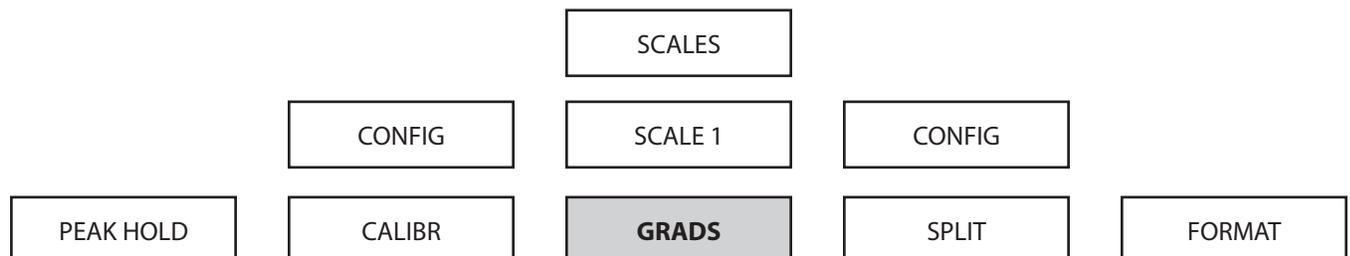
Press Up Arrow to Primary. Then press the left arrow to "ROC". Press down arrow twice to "DECPNT". Press down and set to 88888880. Press Print.

Step 14:

DSPDIV will be displayed, press down to set it to "1D" and press print.

Step 15:

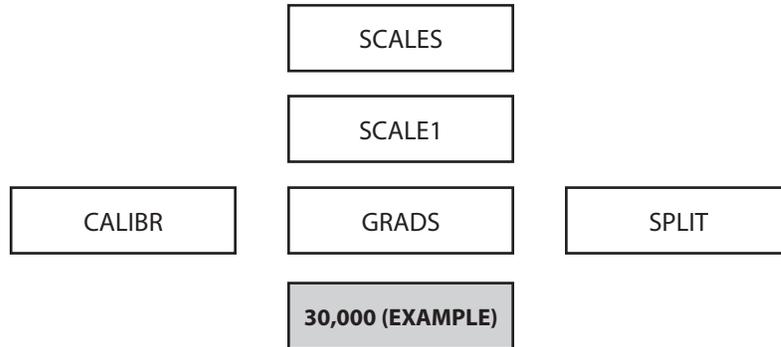
Press the print key. The display will shift back to the same as in step 10. Press the up arrow key 3 times until "FORMAT" is highlighted. Press the left arrow key 2 times until "GRADS" is highlighted.



Step 16:

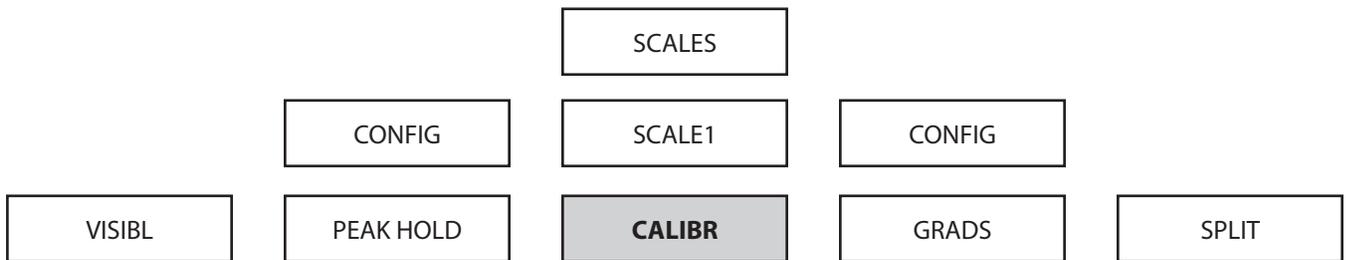
Press the down arrow key 1 time. Take the full scale of the testing machine and divide it by 10. Enter that number manually and press the print key.

Example: $300,000 \div 10 = 30,000$



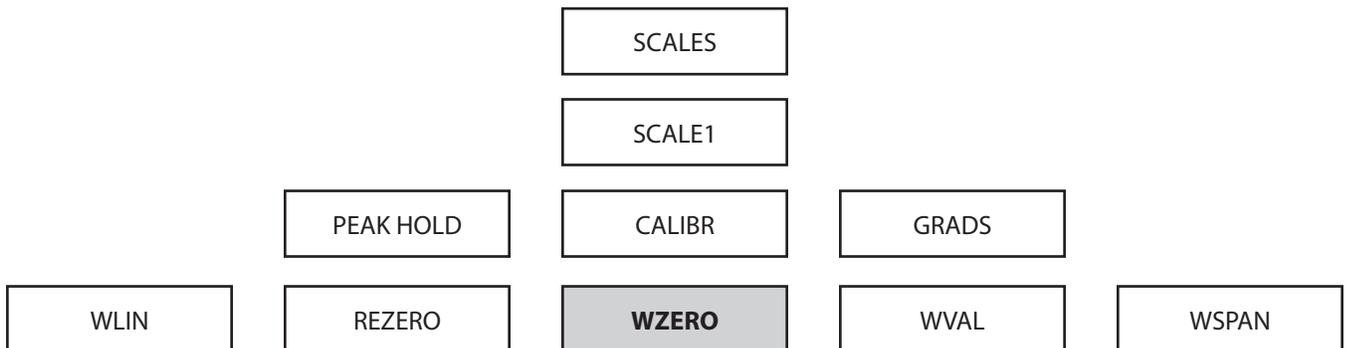
Step 17:

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



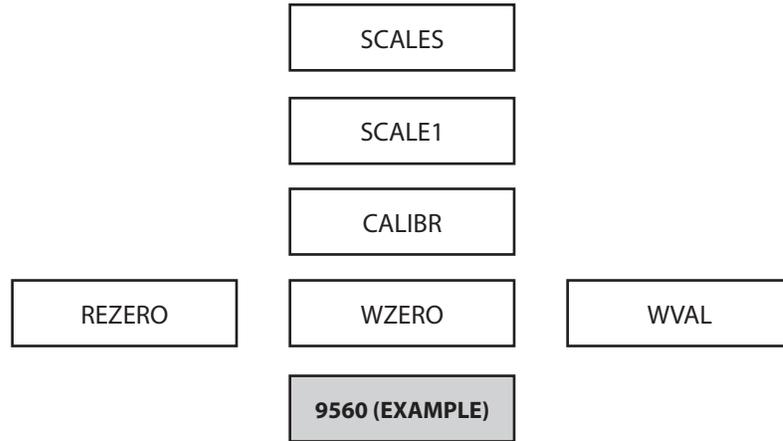
Step 18:

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



Step 19:

“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.

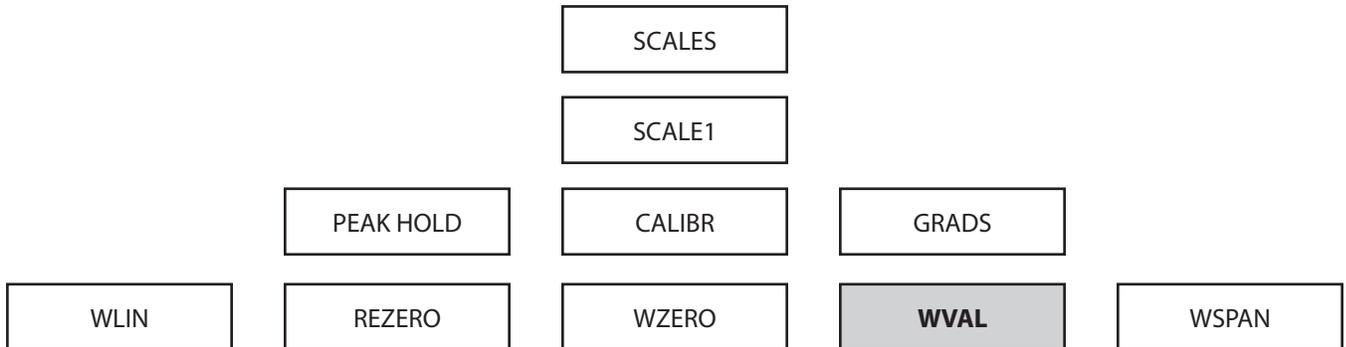


Step 20:

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.

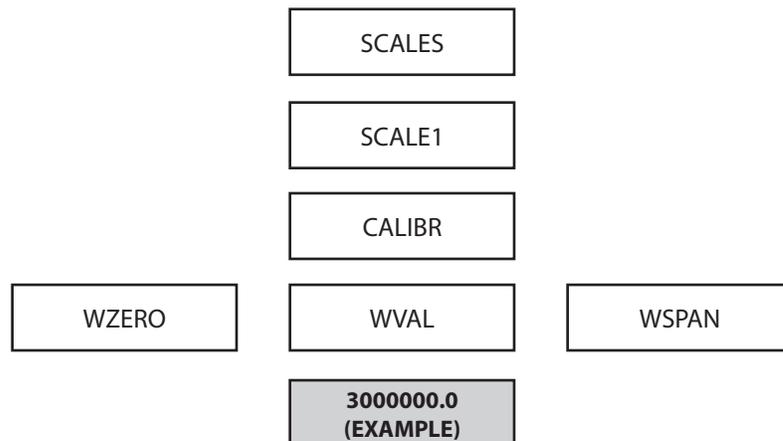
Step 21:

Press the Print key. This returns the display to the “DEADLOAD CALIBRATION” menu. “WVAL” is highlighted.



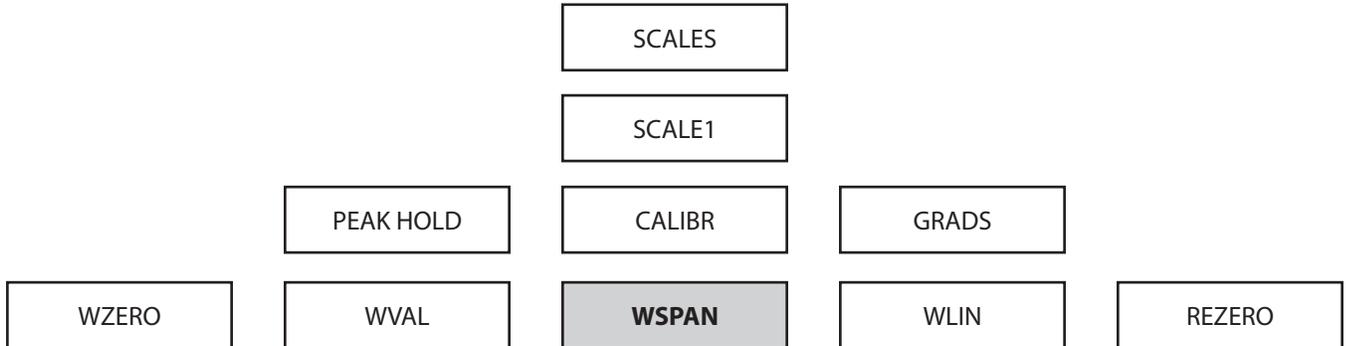
Step 22:

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



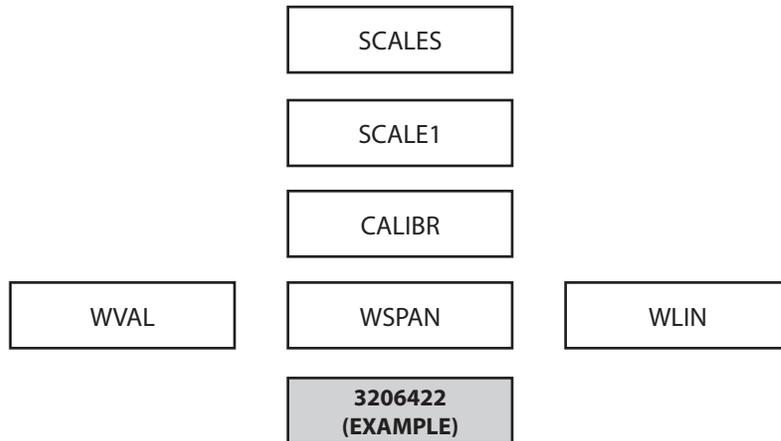
Step 23:

Use the keypad to enter the FULL SCALE or CAPACITY of the machine. Press the Print key to accept the value. The display will say "Value Accepted" and "WSPAN" will be highlighted.



Step 24:

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



Step 25:

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. Press Print.

Step 26:

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.

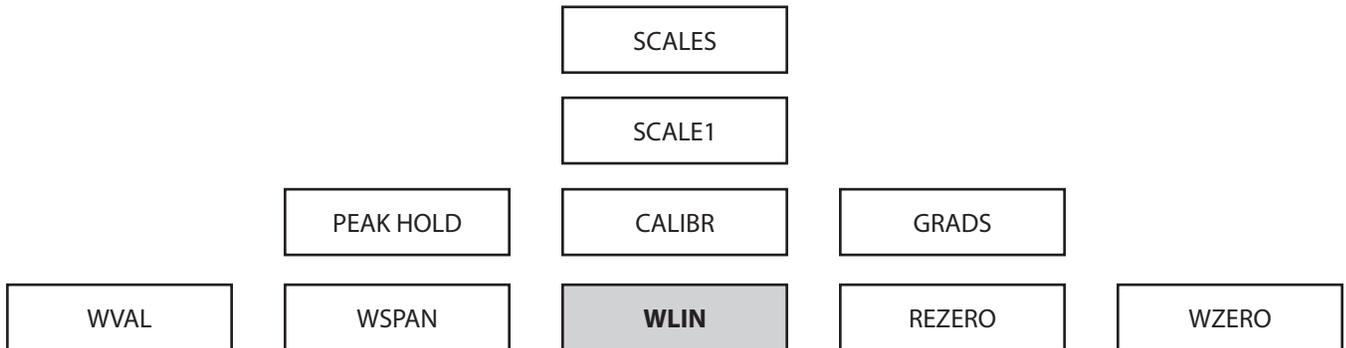
To verify calibration accuracy, load machine to specific load points and compare the reading on the Indicator with those of the load cell standard.

6.0 FIVE-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.

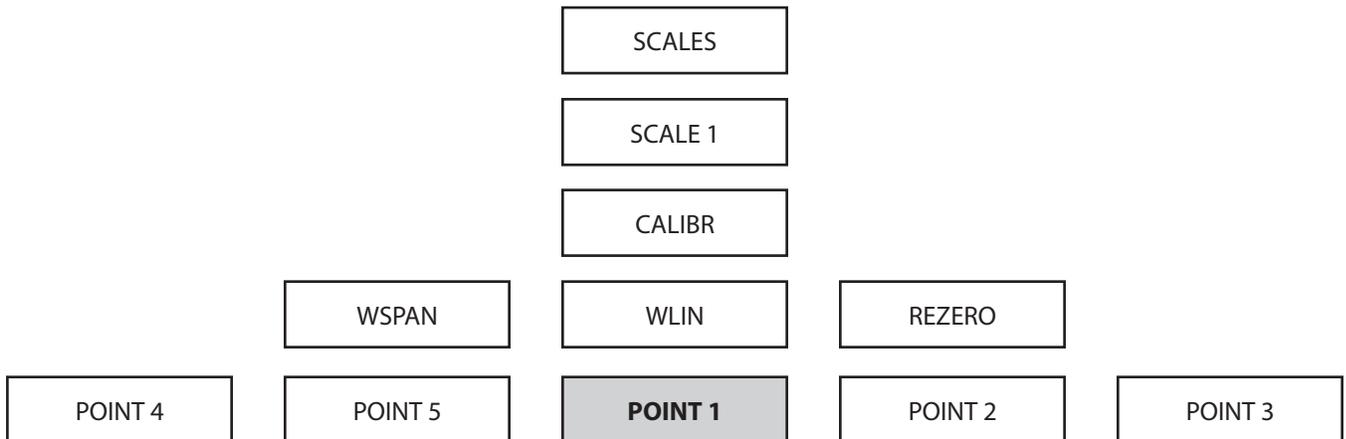
Step 1:

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



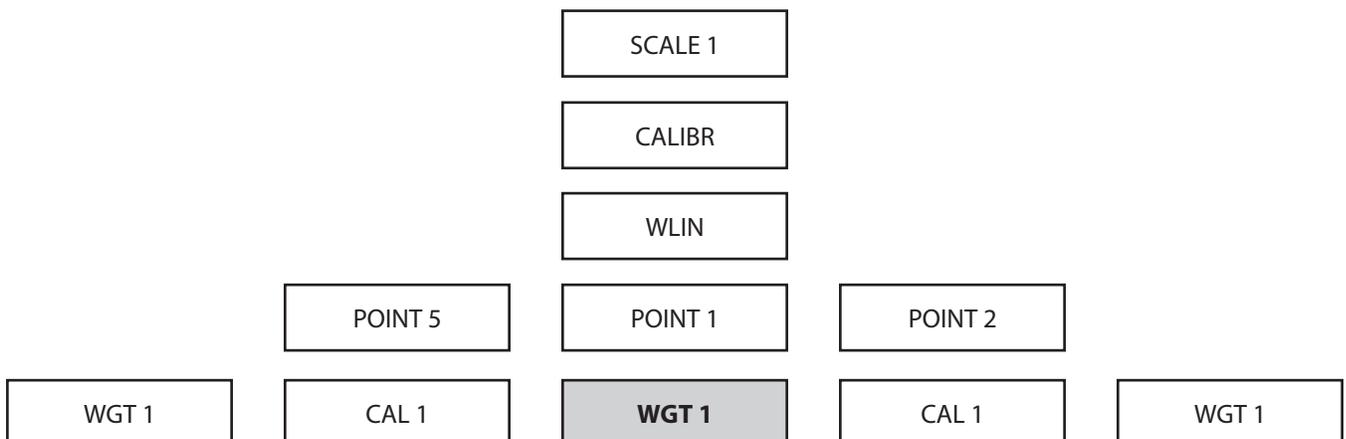
Step 2:

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



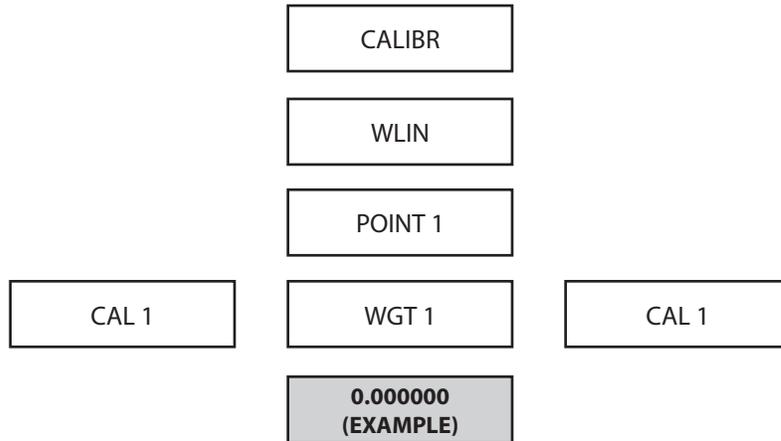
Step 3:

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



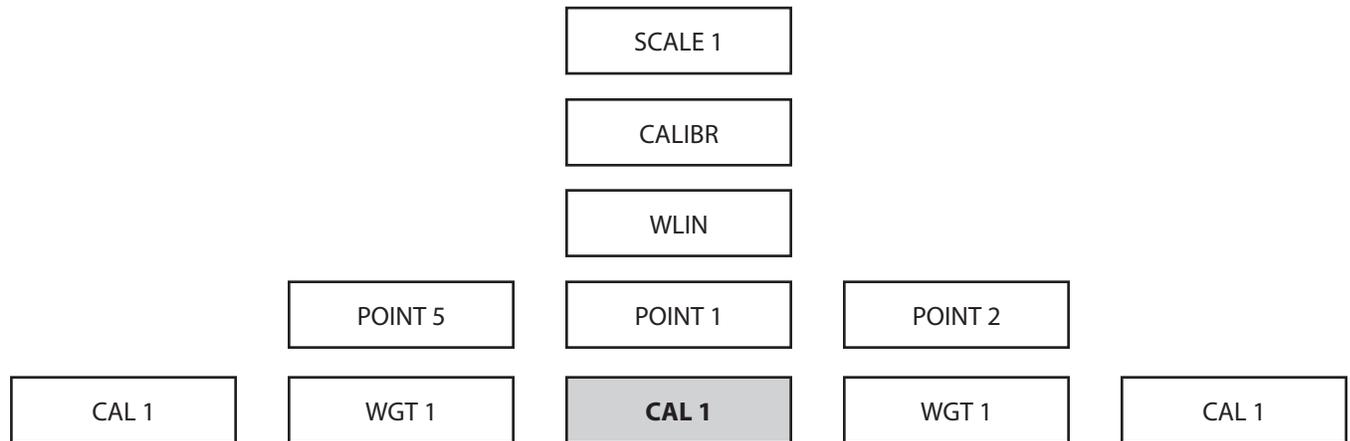
Step 4:

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



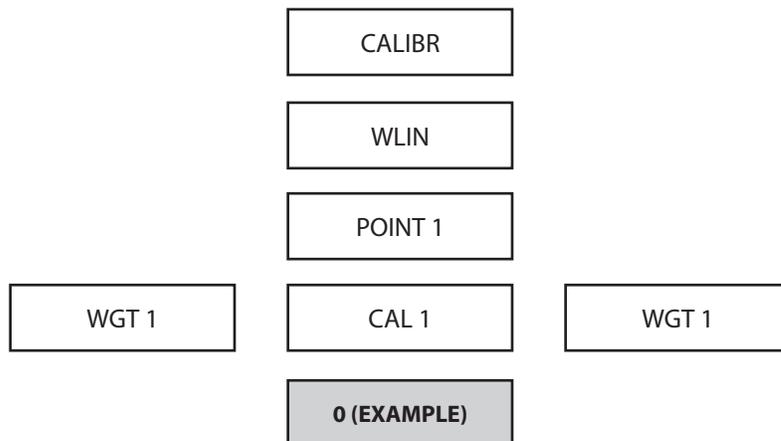
Step 5:

Using the Number keys, enter the value for the first calibration point. Press the Print 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

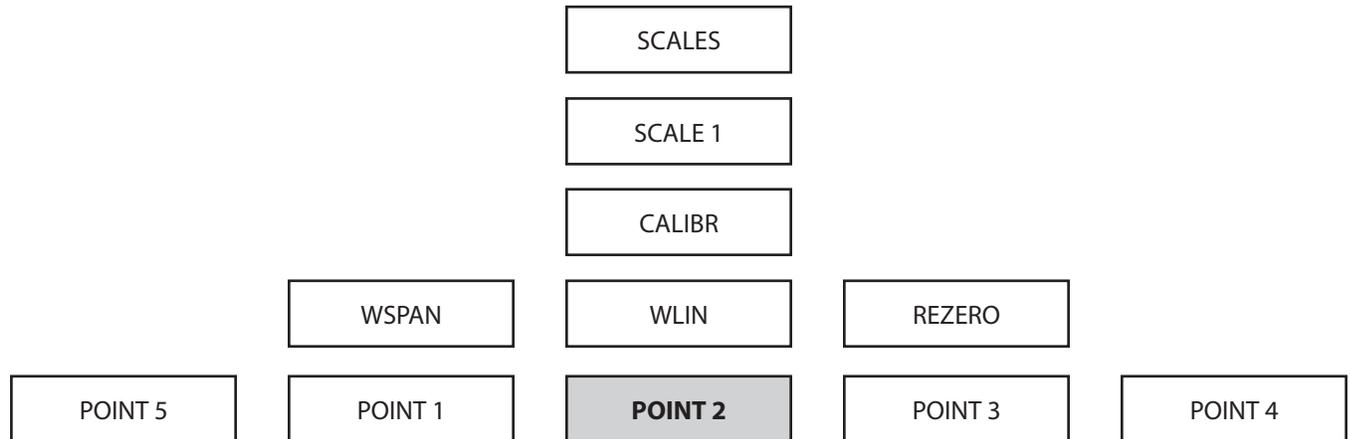


Step 7:

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.

NOTE: If "0" is reset in the span calibration, the 5-point linear calibration will be erased.

i720 CONTROLLER LICENSE AGREEMENT

This is a legal agreement between you, the end user, and Gilson Company, Inc. (The Company). By using the i720 Controller, you are agreeing to be bound by the terms of this agreement.

- 1.0 License Grant. The Company hereby grants the end user a personal, nontransferable and non exclusive license to use one copy of the software/firmware and related documentation on a single indicating system.
- 2.0 Intellectual Property Rights. The Company is the sole owner of all right, title and interest to the i720 and all copyrights, trademarks, and trade secrets therein. United States copyright laws and international treaty provision protect The Company. Therefore, the end user must treat the software/firmware like any other copyrighted material and may not copy the written materials accompanying the i720.
- 3.0 Restrictions. This Agreement and the Licensed Software/Firmware may not be assigned, Sub-licensed or otherwise transferred by the Customer. The end user must not reverse engineer, decompile or disassemble the Licensed Software/Firmware or attempt to do so. The Licensed Software/Firmware may not be modified without the written consent of The Company.
- 4.0 Termination. The Company may terminate the license contained in this Agreement by written notice upon any breach of any term by the end user. Upon termination, the end user shall immediately return the i720 to the factory. Section 2.0 of this Agreement shall survive termination of this Agreement.
- 5.0 Purchases by Governmental Agencies. If the end user is a federal, state or local government agency or unit, then as a matter of contract, the end user will accord The Company and the Licensed Program the same rights The Company would have had under the Copyright Act of 1976, as amended.
- 6.0 Governing Law. This Agreement shall be governed by and construed in accordance with the laws of the State of Ohio.

STATEMENT OF WARRANTY

Gilson Company, Inc. warrants this concrete compression machine against defects in workmanship and materials for a period of 24 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. manufactured 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 Gilson Company's 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 of 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.

**HYDRAULIC CONTROL VALVE
&
HYDRAULIC PUMP SECTION**

7.0 HYDRAULIC CONTROL VALVE

7.1 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. The adjustment for increasing the rate of loading is to turn Knob No. 2 counter-clockwise, for decreasing the rate of loading turn Knob No. 2 clockwise. CAUTION: Do not over-tighten Control Knob No. 2.

For the testing of concrete cylinders to the requirements of ASTM C 39, the load must be applied at a constant rate within the range of 20 to 50 psi/sec. Knob No. 2 controls the rate of loading. Based on ASTM specifications, for a 6" diameter concrete cylinder, the loading rate should be 565 lbs/sec. to 1413 lbs/sec. or 34,000 lbs/min. to 84,000 lbs/min.

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

For analog (dial) gauge machines, a reading of 10,000 lbs. 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.

7.2 Full Advance Position

Placing control Handle No. 1 into the rapid advance position causes the piston to advance rapidly in a non-controlled rate of loading. 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 the premature failure of the specimen.

WARNING!

DO NOT ALLOW THE MACHINE TO TRAVEL BEYOND THE MAXIMUM PISTON STROKE TAG LOCATED ON THE FRONT OF THE LOAD FRAME, AS YOU WILL OVER-EXTEND THE HYDRAULIC RAM. SEVERE PERSONAL INJURY AND DAMAGE TO THE MACHINE MAY RESULT.

7.3 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.

7.4 Retract Position

Placing Control Handle No. 1 into the retract position releases all pressure in the hydraulic cylinder allowing the piston to retract to its 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.

7.6 Sequence of Operation

1. With the motor switched off, carefully center specimen in testing machine.
2. Turn Control Knob No. 2 clockwise to a snug position. Never over tighten.
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 not to overload or fail the specimen.**
6. Watch the gauge/digital display. 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

6.5 Control Valve

CONTROL VALVE

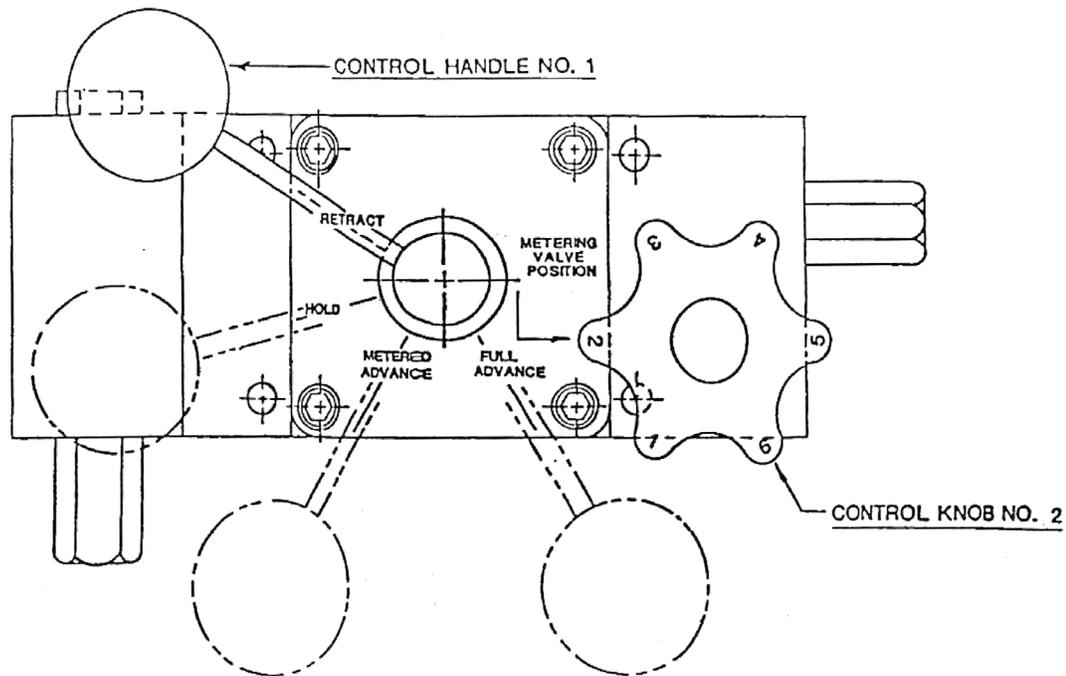


Figure 1

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 and then locked in position by tightening the thumbscrew located beneath the knob. For a 6" diameter specimen, the loading rate should be 565 lbs/sec. to 1413 lbs/sec. or 34,000 lbs/min. to 84,000 lbs/min.

7.7 Maintenance And Safety Precautions

7.7.1 Pump and Flow Control Valve

This two-stage hydraulic pump incorporates precision design and engineering features, which make it the most outstanding pump of its kind on the market. All moving parts are made from high-grade tool steel, heat treated, machined, ground and lapped to extremely close tolerances to assure efficient operation and long life. Peak efficiency for either continuous or intermittent operation is assured at the full range of pressures up to 10,000 psi. You will have uninterrupted, trouble-free service if you keep it clean and free of dust.

7.7.2 Safety Precautions

WARNING: To avoid possible personal 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 machines piston to return to its 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 Test Mark with your machine model number and capacity for replacement parts.

7.7.3 Hydraulic Fluid Level

- When checking the oil level, retract the machines hydraulic cylinder to its at rest position and disconnect the power supply. Clean the area around the filler plug and remove the plug.
- For machines supplied with 3/4 hp pump, maximum capacity is when the oil is 1 1/2" (38 mm) below the cover plate with the cylinder retracted.
- For machines supplied with 1/2 hp pump, maximum capacity is when the oil is 2" (50 mm) below the cover plate with the cylinder retracted.
- When adding oil, use only **Dextron 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 Dextron III Automatic Transmission Fluid.

7.7.4 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. Run piston out to its full travel several times to eliminate air from the system. This should be done with a concrete test cylinder in the machine. The pump is now ready to be put into regular operation.

7.7.5 MC-300, MC-400, and MC-500 O-Ring Replacement

The O-ring and backing seal system of the compression machine will wear with use and may eventually need to be replaced. In addition, the seals may be damaged if the piston is extruded too far out of the cylinder. See below to order parts from Gilson.

O-Ring Replacement Supplies Required

- Wrenches
- Clean Rags
- Extra-fine Emery Paper
- Dextron II or Dextron III Automatic Transmission Fluid (ATF)

Procedure

1. Disconnect and lockout the concrete compression machine from its electrical supply.
2. Place a rag under the hydraulic hose fitting for the flow control valve mounted on top of the hydraulic pump reservoir. Loosen the hydraulic hose fitting to break the air lock. Do not remove the hose.

CAUTION: The bottom platen and piston assembly is heavy and requires two people to safely remove and reinstall.

3. With two people, lift the bottom platen and piston upwards and STRAIGHT OUT of the cylinder. If the assembly is not kept level during this step, it will be very difficult to lift out. Turn the platen upside down, piston side up, and lay it on a soft towel or rag.
4. Wipe the inside of the cylinder out with a clean rag. There is a groove machined on the inside of the cylinder. With a small-blade screwdriver, carefully remove the black O-ring and white back-up ring from the groove. Clean out the O-ring groove with a clean rag.
5. Stretch the new O-ring and back-up ring over the piston for 4 – 5 minutes to shape them.
6. Push the new black O-ring into place BELOW the white back-up ring in the groove. Wipe the top half of the inside of the cylinder and O-ring with clean ATF oil.
7. Inspect the piston carefully. If there are scratches, buff them off with extra-fine emery paper. Thoroughly wipe down the piston to remove all dirt and dust. Coat the end of the piston with ATF oil.
8. With two people holding the bottom platen and piston assembly level, carefully lower it into the cylinder. If the piston is not aligned properly with the cylinder opening, it will be very difficult to reinstall.
9. Retighten the hydraulic fitting for the flow control valve: DO NOT OVER-TIGHTEN. Run the machine and check for leaks.

Contact Gilson Technical Support at techsupport@gilsonco.com or 800.444.1508 with any questions or problems.

Repair Parts

MODEL	DESCRIPTION	PART NUMBER
MC-300xx	7in O-Ring	RPMC-300-5
	7in Backup Ring	RPMC-300-6
MC-400xx	8in O-Ring	RPMC-400-2
	8in Backup Ring	RPMC-400-1
MC-500xx	9in O-Ring	RPMC-500-1
	9in Backup Ring	RPMC-500-4

7.7.6 Trouble Shooting

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. Run unit to work out air.
Same	Dirt in system causing valves to lock open.	Flush out entire oil system and fill with new oil.
Same	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 send the pump back to the factory or to 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 irreparable damage may result.

8.0 VALVE ASSEMBLY



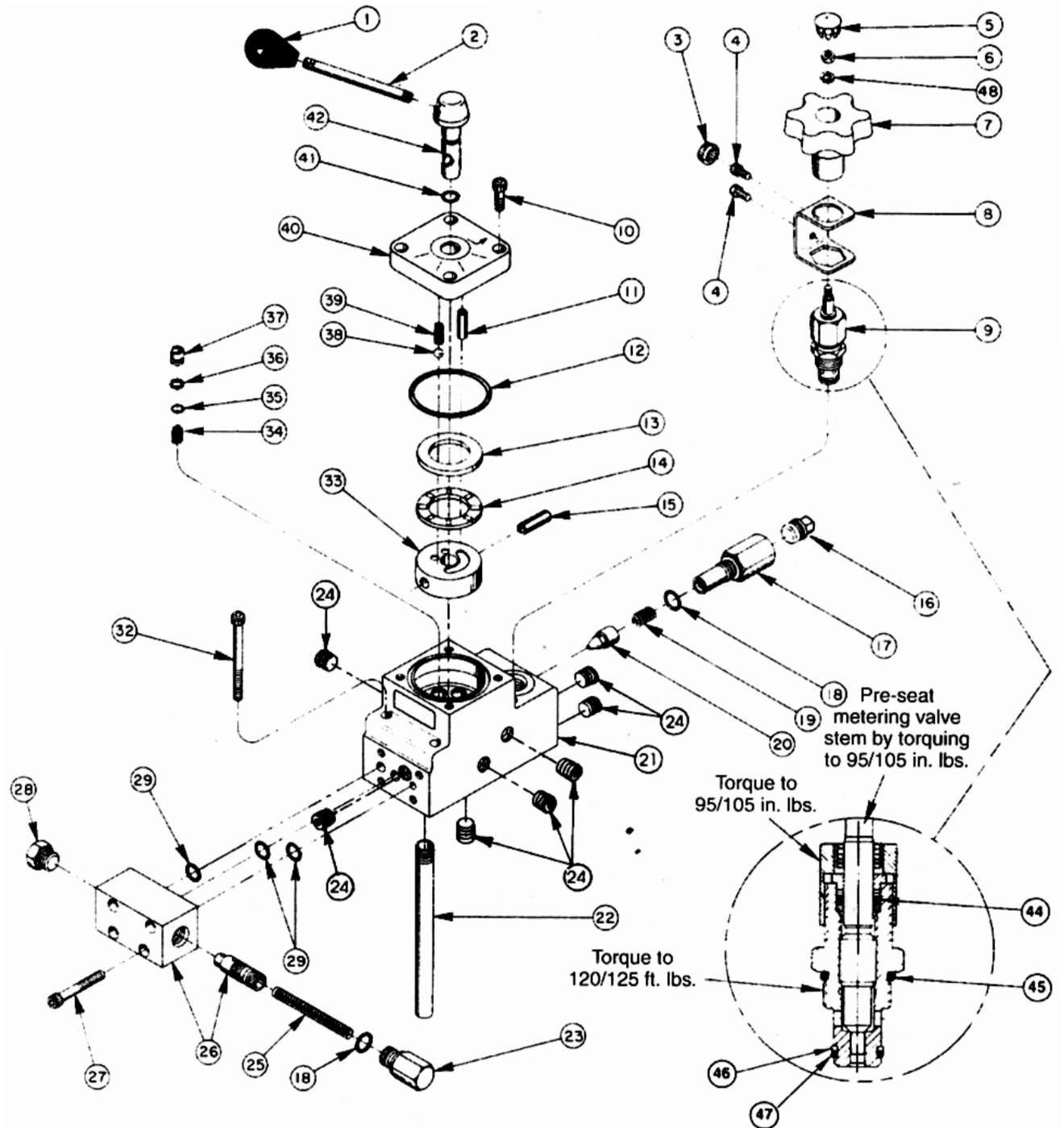
SPX Corporation
5885 11th Street
Rockford, IL 61109-3699 USA

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

8.1 Valve Diagram

MANUAL VALVE ASSEMBLY

MODEL B, 4-POSITION, 3-WAY
VOLUME/FLOW CONTROL --- PRESSURE COMPENSATED



8.2 Valve Parts List



NOTE: Tighten nut with valve in open position. Line up No. 1 on knob with arrow on decal when valve is closed (CW Rotate).

NOTE: Due to the complexity of this valve and the testing of it, a repair kit is not available.

Item No.	Part No.	No. Req'd	Description
1	250885	1	Knob
2	21639	1	Stud
3	207382	1	Plastic Knob (on 3482-0008, 9609, & 60916, 420247-SATEC & 64529-HOGEN)
4	11434	2	Soc. Hd. Cap Screw (#10-24 x 1/2 Lg.; on 3482-0008, 9609 & 60916, 420247-SATEC)
5	11455	1	Snap Plug
6	11010	1	Machine Nut (#10-32 UNF; See note below)
7	44708	1	Valve Knob
8	302956	1	Locking Bracket (on 3482-0008, 9609 & 60916, 420247-SATEC)
9	302938	1	Flow Control Valve
10	10008	4	Soc. Hd. Cap Screw (1/4-20 x 3/4 Lg.; Torque to 100/120 in. lbs.)
11	11916	1	Roll Pin (1/4 dia. x 7/8 Lg.)
12	11229	1	O-ring (2-3/8in x 2-3/16" x 3/32)
13	11227-1	1	Bearing Race
14	11228	1	Thrust Bearing
15	10496	1	Roll Pin (5/16 dia. x 1in Lg.)
16	11127	1	Plug (3/8 NPTF)
17	302939	1	Adapter (Torque to 30/40 ft. lbs.)
18	10300	2	O-ring (.468 I.D. x .078 cs)
19	10425	1	Compression Spring (3/8 O.D. x 3/4 Lg.)
20	20771	1	Poppet
21	64528	1	Valve Body
22	212998	1	Drain Line (NOTE: Used only when pump-mounted)
23	204748	1	Spring Retainer Fitting (Torque to 30/40 ft. lbs.)
24	15130	7	Pipe Plug (1/16 NPTF)
25	207404	1	Compression Spring (5/16 O.D. x 2-7/16in Lg.)
26	302953	1	Spool & Body Assembly (Consists of 44704 & 44705 which must be ordered as a set)
27	10022	4	Soc. Hd. Cap Screw (Torque to 100/120 in. lbs.)
28	11953	1	Plug (O-ring included; Torque to 30/40 ft. lbs.)
29	10269	3	O-ring (3/8 x 9/16 x 3/32)
32	10855	4	Soc. Hd. Cap Screw (1/4-20 x 2-3/4in Lg.)
33	44686	1	Rotor
34	10446	4	Compression Spring (19/64 O.D. x 7/16 Lg.)
35	10266	4	O-ring (1/4 x 3/8 x 1/16)
36	12184	4	Backup Washer (Teflon)
37	207381	4	Shear Seal
38	10375	1	Steel Ball (1/4 dia.)
39	16320	1	Compression Spring (1/4 O.D. x 3/4 Lg.)
40	201814	1	Valve Body Cap
41	10268	1	O-ring (3/8 x 1/2 x 1/16)
42	207380	1	Valve Stem
44	10267	1	O-ring (7/16 x 5/16 x 1/16)
45	10527	1	O-ring (13/16 x 0.644 x 0.087)
46	15500	1	Backup Washer (9/16 x 7/16 x 0.048)
47	12098	1	O-ring (9/16 x 7/16 x 1/16)
48	10241	1	Lockwasher

Any service repair must be done by Power Team Service Repair Department.

9.0 ELECTRIC HYDRAULIC PUMP

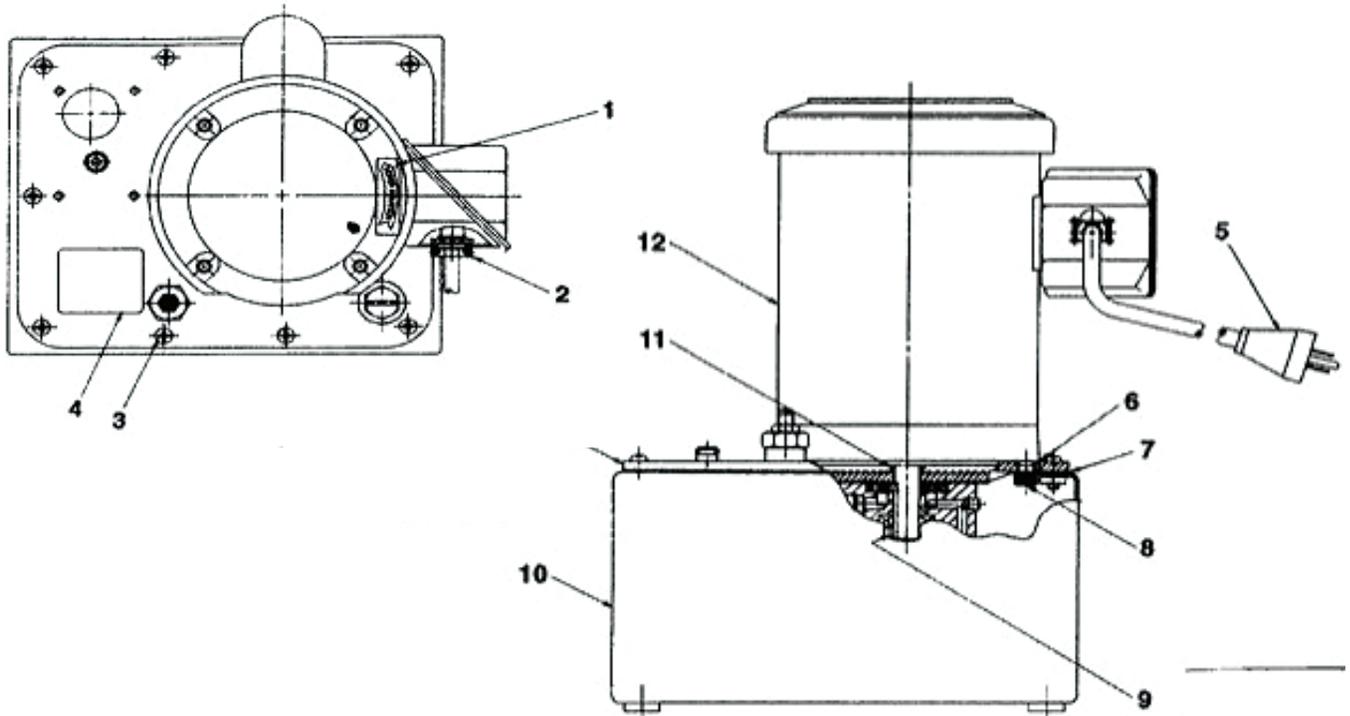


SPX Corporation
5885 11th Street
Rockford, IL 61109-3699 USA

Tech. Services: (800) 477-8326
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9.1 Pump Diagram

ELECTRIC HYDRAULIC PUMP



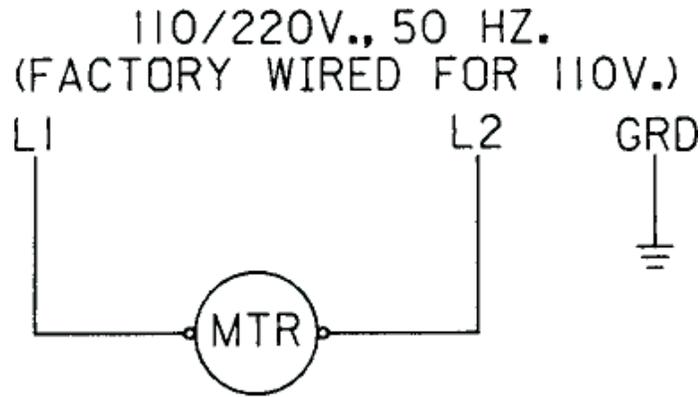
9.2 Pump Parts List

PARTS LIST

Item No.	Part No.	No. Req'd	Description
1	202504	1	Rotation Decal
2	211240	1	Connector
3	10177	10	Machine Screw (1/4-20 X 3/4 Lg.)
4	46758	1	Nameplate Decal
5	21051	1	Cord Set (12/3 STO)
6	42576BK2	1	Motor Base Gasket
7	40164	1	Gasket
8	15187	4	Cap Screw (3/8-16 UNC X .625 Lg.; Torque to 90/100 in. lbs.)
9	214097	1	Key
10	40063BK2	1	Reservoir
11	213674	1	Shaft Seal
12	44793	1	Electric Motor

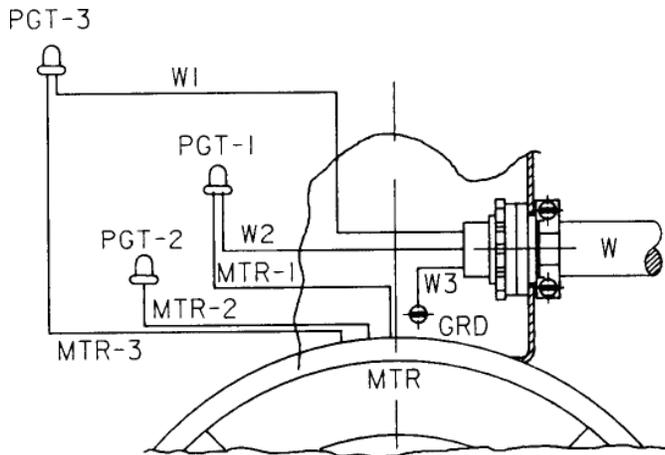
9.3 Electrical Schematic

ELECTRICAL SCHEMATIC



9.4 Wiring Diagram

WIRING DIAGRAM



! WARNING

To help avoid personal injury, all electrical work must be done by a qualified electrician.

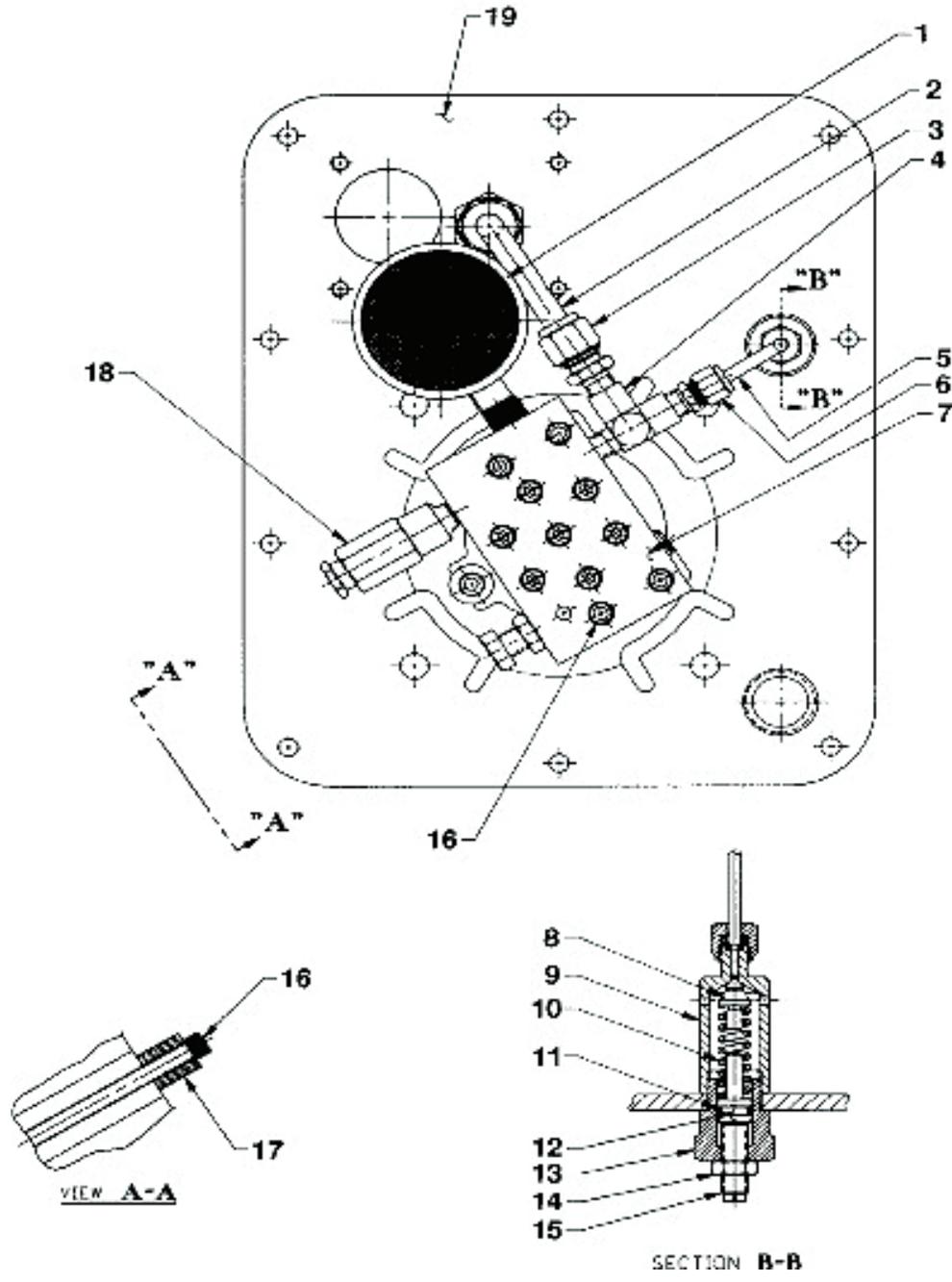
North American & International Color Codes

Conductors	North American	International
Line	Black	Brown
Neutral	White	Blue
Ground	Green	Green/Yellow

9.5 Basic Pump Assembly

9.5.1 Bottom View

BOTTOM VIEW

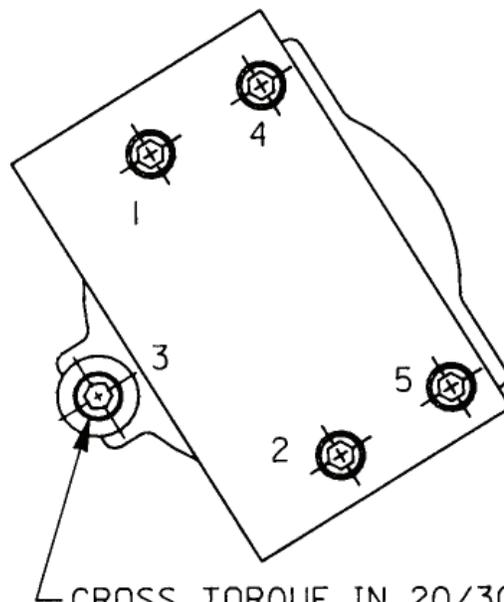


9.5.2 Parts List and Bolt Tightening Sequence

PARTS LIST

Item No.	Part No.	No. Req'd	Description
1	29682	1	Strainer - Filter
2	214930	1	Oil Line Tube
3	12696	1	Straight Fitting
4	18969	1	Tee Fitting
5	214868	1	Pressure Regulator Tube
6	11173	1	Straight Fitting
7	351410	1	High Pressure Pump Ass'y (On pumps built after 2-1-97)
8	21046	1	Valve Stem
9	22361	1	Valve Body
10	10495	1	Compression Spring
11	10268	1	O-ring (1/2 X 3/8 X 1/16)
12	21306	1	Spring GuideN
13	21305	1	Valve Cap
14	10386	1 </td <td>Hex Jam Nut</td>	Hex Jam Nut
15	22362	1	Valve Adjusting Screw
16	15642	5	Soc. Hd. Cap Screw (1/4-20 UNC X 1/2 Lg.;Torque to 55/65 in. lbs.)
17	214720	1	Spacer
18	21278	1	Valve Relief
19	47404	1	Reservoir Cover

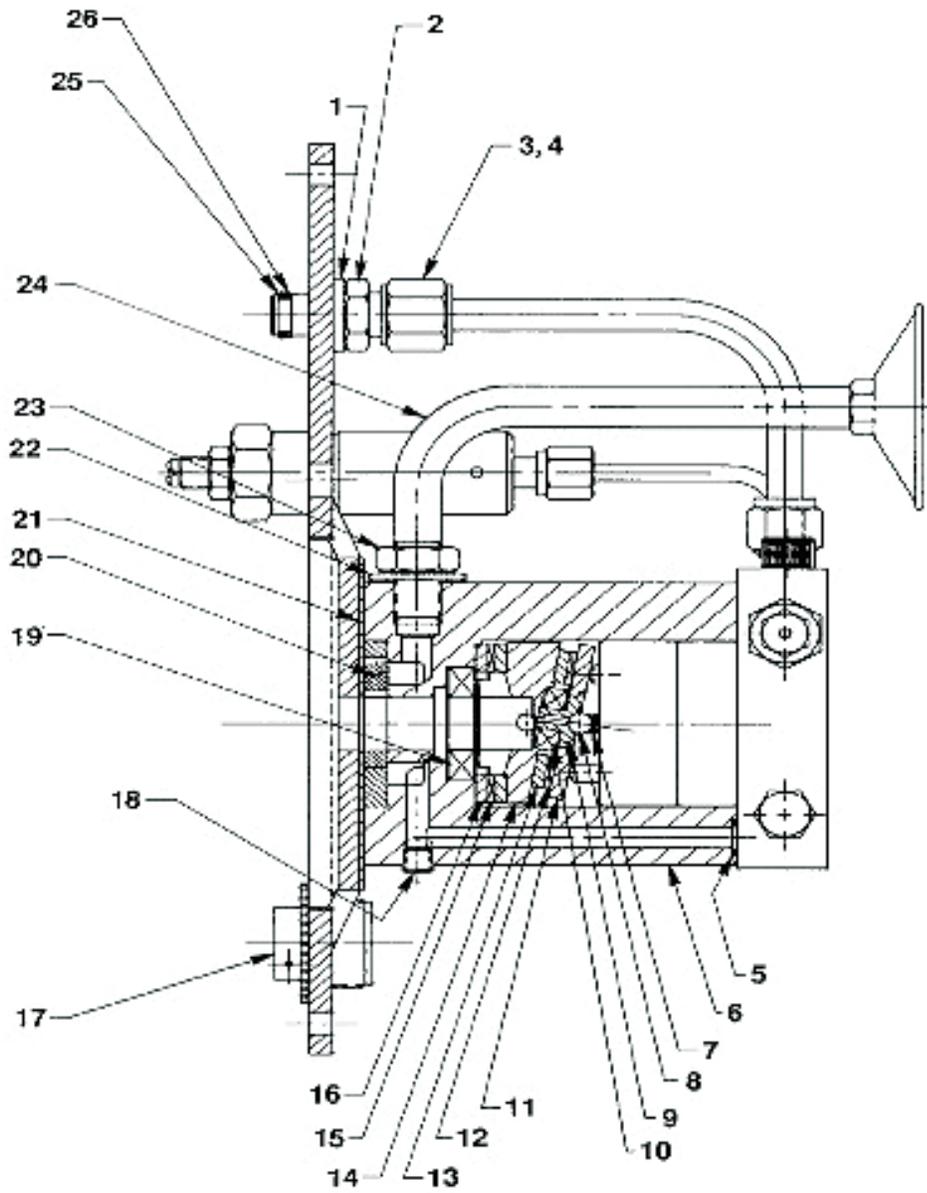
BASIC BOLT TIGHTENING SEQUENCE



CROSS TORQUE IN 20/30 IN. LBS. INCREMENTS IN ORDER SHOWN.

9.5.3 Pump Assembly Side View

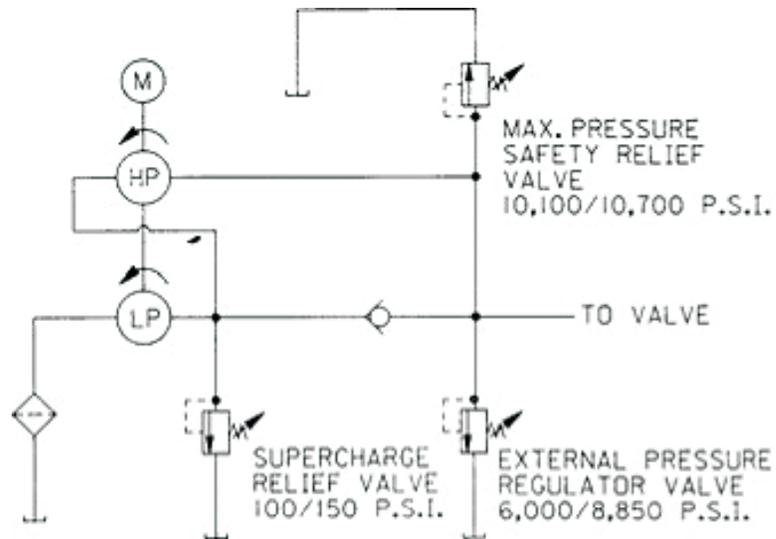
PUMP ASSEMBLY SIDE VIEW



9.5.4 Pump Assembly Parts List

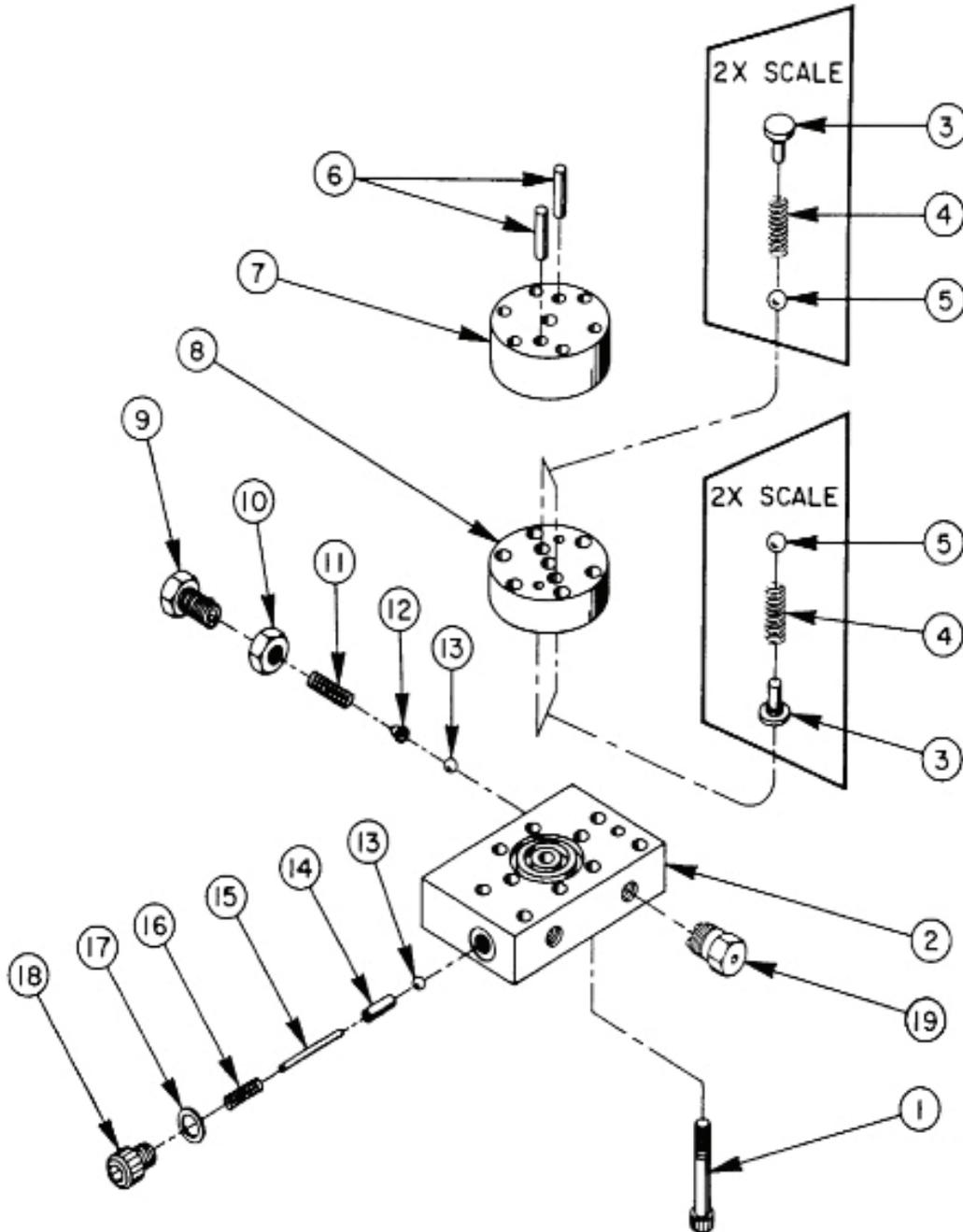
Item No.	Part No.	No. Req'd	Description
1	21484	1	Washer
2	214882	1	Valve Connector (Note: Torque valve connector [214882] to 20/30 ft. lbs. into coverplate [47404]; hold valve connector [214882] and torque tube nut [10431] to 40/50 ft. lbs.)
3	10430	1	Sleeve Tube (For 3/8 tube)
4	10431	1	Tube Nut (5/8-18 UNF)
5	10267	1	O-ring (7/16 X 5/16 x 1/16)
6	52883	1	Body Pump
7	16320	1	Compression Spring
8	10375	1	Steel Ball (1/4" dia.)
9	23547	1	Top Plate Bearing
10	11814	1	Ball Bearing
11	23548	1	Top Plate Bearing
12	15431	1	Needle Thrust Bearing
13	15432	1	Needle Thrust Race Bearing
14	35271	1	Angle Plate
15	11228	1	Needle Thrust Bearing
16	11227	2	Needle Thrust Race Bearing
17	213706	1	Filler Cap
18	11084	1	Pipe Plug (1/16 NPTF; Torque to 35/45 in. lbs. oiled)
19	15695	1	Ball Bearing
20	15693	1	Gerotor Set
21	307296	1	Wear Plate
22	213709	1	Seal Washer (Turn on - Do not push on)
23	10390	1	Hex Jam Nut
24	213686	1	Intake Tube
25	10268	1	O-ring (1/2 X 3/8 X 1/16)
26	11863	1	Backup Washer (Teflon)

9.5.5 Hydraulic Schematic



9.5.6 High Pressure Pump Assembly

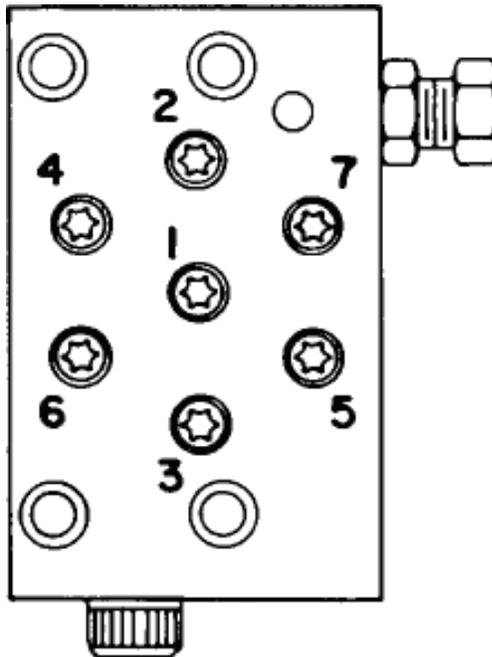
HIGH PRESSURE PUMP ASSEMBLY



9.5.7 High Pressure Pump Assembly Parts List

Item No.	Part No.	No. Req'd	Description
1	*16747	7	Torx Drive Cap Screw (1/4-28 X 1-3/4 Lg.; See diagram below)
2	*36912	1	Pump End Plate
3	*24549	4	Valve Guide
4	*10445	4	Compression Spring (.161 O.D. X 23/32 Lg.)
5	*12223	4	Steel Ball (3/16 dia.)
6	*20775	2	Piston (7/32 dia.)
7	*41006	1	Pump Barrel
8	*41007	1	Valve Head
9	29786	1	Adjusting Screw
10	10386	1	Jam Nut (3/8-24 UNF)
11	11454	1	Compression Spring (1/4 O.D. X 5/8 Lg.)
12	200796	1	Adapter, Spring & Ball
13	10375	2	Steel Ball (1/4 dia.)
14	201998	1	Sleeve
15	12571	1	Roll Pin (1/8 dia. X 1-3/8 Lg.)
16	14431	1	Compression Spring (3/16 O.D. X 3/4 Lg.)
17	12042	1	Copper Washer (9/16 X 3/8 X 1/32)
18	29690	1	Cap Screw (Torque to 180 in. lbs.)
19	306957	1	Air Bleed Valve

9.5.8 High Pressure Bolt Tightening Sequence



NOTE: Assemble in sequence shown. Lubricate under head and on threads. Torque to 170 in. lbs.

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

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

11.0 WARRANTY STATEMENT

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