

ENGINEERING
TOMORROW



Crimp machine operator's manual

Danfoss **FT1390** crimp machine



FT1390 Crimp machine

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WARNING

Failure to follow Danfoss process and product instructions and limitations could lead to premature hose assembly failures, resulting in property damage, serious injury or death. Danfoss fitting tolerances are engineered to match Danfoss hose tolerances. The use of Danfoss fittings on hose supplied by other manufacturers and/or the use of Danfoss hose fittings supplied by other manufacturers, may result in the production of unreliable and unsafe hose assemblies and is neither recommended nor authorized by Danfoss.

Read and understand the operator's manual before attempting to operate any equipment.

Danfoss hereby disclaims any obligation or liability (including incidental and consequential damages) arising from breach of contract, warranty, or tort (under negligence or strict liability theories) should Danfoss hose, fittings or assembly equipment be used with the hose, fittings or assembly equipment supplied by another manufacturer, or in the event that product instructions for each specified hose assembly are not followed.

Safety Instructions

1. Prevent unauthorized operation. Do not permit anyone to operate this equipment unless they have read and thoroughly understand this manual.
2. Wear safety glasses.
3. Avoid pinch points. Do not rest your hand on the crimp ring. Keep your hands clear of all moving parts. Do not allow anyone, other than the operator, close to the equipment while it is in operation.
4. Maintain dies with care. Dies used in the ET4040/FT1390 crimp machine are hardened steel, offering the best combination of strength and wear resistance for long life. Hardened dies are generally brittle and care should be taken to avoid any sharp impact. Never strike a die with a hardened instrument.
5. Use only specified Danfoss products. Make hose assemblies using only Danfoss hose and fittings specified for this assembly equipment.
6. Verify correct crimp diameters. Check and verify correct crimp diameters of all fittings after crimping. Do not put any hose assemblies into service if the crimp diameters do not meet Danfoss crimp specifications.
7. Make sure all dies are completely in place, and the cage is positioned properly on the pressure plate
8. Do not over pressurize. Do not exceed the 10,000 psi hydraulic pressure supplied to the machine.
9. Die change. Do not insert/remove dies while the power is on or machine is in operation.
10. Secure the equipment to a stable work surface. Prior to operation, secure the crimp machine to a stable work surface to prevent the equipment from tipping. See pages 4-5 for mounting instructions.
11. Unplug the power supply when not in use.
12. Keep work area clean. Cluttered areas and benches invite accidents.

Specifications

Specifications

Electrical requirements

FT1390-115	110 to 120-Volt AC single phase 60 Hz circuit with a minimum of 25 amps
FT1390-230	208 to 230-Volt AC single phase 50/60 Hz circuit with a minimum of 15 amps

Crimp machine dimensions

Width	29 inches
Depth	28 inches
Height	45 inches
Weight	825 pounds

Production capacity

Danfoss braided and spiral hydraulic hoses up to 2" (-32).

Machine capability

1 & 2-wire Hydraulic Hose	sizes thru -32
Thermoplastic Hose	sizes thru -32 (Where Applicable)
100R5 hose	sizes thru -32
4 & 6-wire Hydraulic Hose	sizes thru -32

OTC Flat or OTC Beer Can Crimp

Note: Some hoses may require a positive back-stop. Check the PowerSource Crimp Spec tool for Crimp Specs prior to crimping.

Setup and installation

1. Mount your Danfoss FT1390 crimp machine to the floor using the holes provided in the corners of the crimp machine base.
2. Remove the plug from the hydraulic reservoir vent port and replace it with the vent cap that is supplied with the unit.
Caution: Failure to do so will cause cavitation and damage to the pumping mechanism. Hand tighten the vent cap.
3. **Caution:** Provide electrical service with a dedicated circuit (per the crimp machine electrical requirements) in order to eliminate the possibility of a low-voltage situation.
4. Never use an extension cord. Always plug the unit directly into the power outlet.

Loading and unloading die cages

To load the die cage, press and hold the RETRACT switch until the crimp cylinder reaches the “full retract” position and stops. The die cages may be inserted or removed in this position (See Figure 1). **Note:** To minimize cycle time during normal operation, the Danfoss FT1390 crimp machine can be programmed to stop retracting before it has fully retracted. This reduces the crimping cycle time. The die cage may not be able to be removed. Pressing and holding RETRACT will always bring the cylinder to the full retract position. See detailed instructions on page 6.

Caution: Figure 2 shows a die cage that is installed improperly. When inserted properly, the die cage is flush against the pressure plate. If the die cage is at an angle to the pressure plate, lift up and realign properly.

Operating the keypad (Figure 3)

1. The DISPLAY shows the three-digit setting that will determine the crimp diameter. The DISPLAY number itself is a relative number, not a crimp diameter. The ratio of crimp diameter change to the DISPLAY change is 1 to 1.

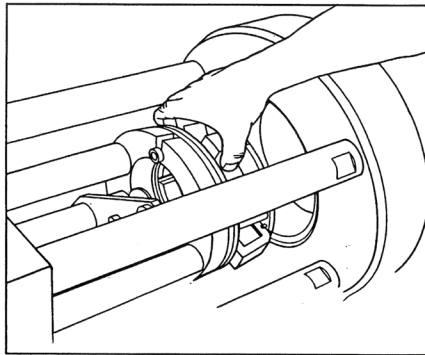


Figure 1

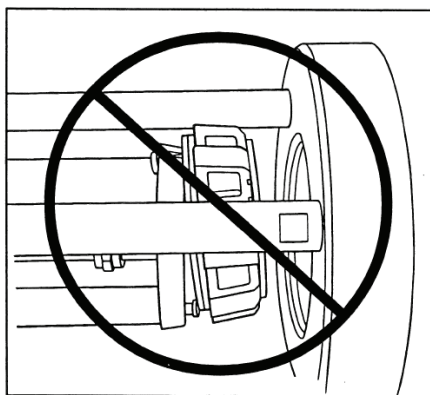


Figure 2

For example, if you crimp a fitting at a setting of 250, and the crimp diameter is .014 inch too large, you will need to decrease the DISPLAY by 014 to $(250-014) = 236$. A display of 236 should produce the correct crimp diameter.

2. The STORE button is used to store the DISPLAY reading in any of the 10 numbered keys. The green light next to the STORE button will illuminate when you are working in the STORE mode.
3. The ENTER button is used to put any three-digit number into the DISPLAY. The green light next to the ENTER button will illuminate when you are working in the ENTER mode.
4. The numbered keys have two functions:
 - a. In the ENTER mode, their numeric value is put into the DISPLAY.
 - b. In the STORE mode, they act as 10 different memory locations in which to store a DISPLAY setting.

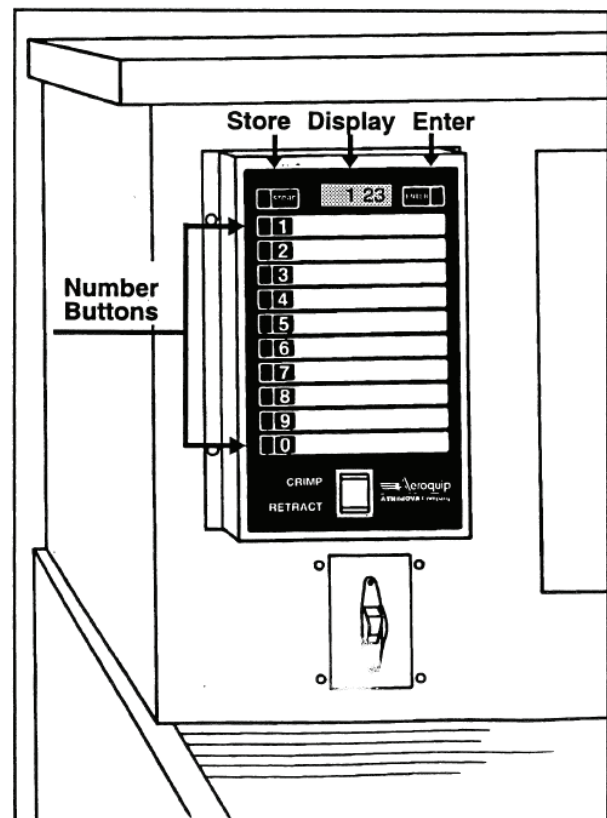


Figure 3 – Keypad

Operating Instructions

Entering a Number into the DISPLAY

1. Turn the power control switch below the keypad to the ON position. The DISPLAY will illuminate to show that the power is on.
2. Press the ENTER button. (The green light next to the ENTER button will illuminate.)
3. Press three number buttons. (If more than five seconds elapse between pressing the number buttons, the DISPLAY reverts back to its previous setting.) After the third number is pressed, the DISPLAY will remain and the green light next to the ENTER button will turn off.
4. The FT1390 is now ready to crimp to the DISPLAY setting.

Storing a Number from the DISPLAY as a Preset

1. Enter a three-digit number as described in the procedure above.
2. Press the STORE button. (The green light next to the STORE button will illuminate.)
3. Press and hold down any one of the 10 numerical buttons for three seconds. (After three seconds, the green light next to the pressed button will illuminate, indicating that the DISPLAY has been stored to that button.)

Recalling a Preset into the DISPLAY

1. Make sure that the STORE and ENTER lights are off. (If one is on, it will go off in five seconds if the keypad is left untouched.)
2. Press the numeric button that has the stored setting for a given hose and fitting style. That setting will then be seen in the DISPLAY, and the light next to the numeric button will illuminate.

Programmable Retract Stop*

1. Using the Crimp/Retract switch, place the cylinder in the position where you want it to stop during retraction.
2. Press and hold the ENTER button until the green light next to the button turns off (approximately three seconds). The cylinder will now automatically stop retracting at this position until another position is set or until the crimp machine is shut off.

Note: Pressing and holding the RETRACT switch will allow the cylinder to fully retract. This will not change or erase the programmable retract stop.

Note: Turning the crimp machine off and back on erases the programmable retract stop position.

Adjustable Backstop (Figure 4)

1. Turn off the power to the machine.
2. Insert the die cage.
3. Loosen the thumbscrew on the backstop.
4. Place the fitting against the locator cone. Pushing it too hard will compress the spring, which will affect the accuracy of the position.
5. Slide the backstop to the desired position.
6. Tighten the thumbscrew.
7. Turn the power on.

* In order to reduce cycle time this feature allows for limiting retraction of the cylinder. This is particularly helpful when assembling multiple hose assemblies.

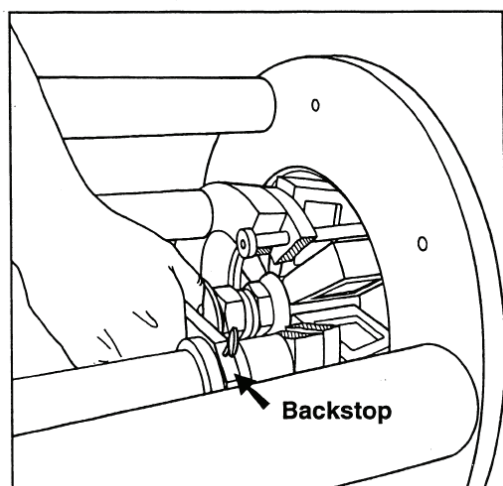


Figure 4

⚠ WARNING: Maintain clear distance from all moving parts.

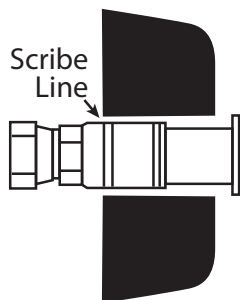
Crimping Procedure

Refer to the current Danfoss Crimp Specifications for complete and detailed crimp specification information for each hose and fitting style.

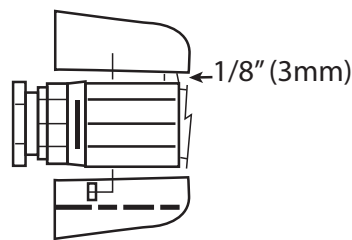
1. Retract the cylinder by pressing the RETRACT switch until the cylinder is fully retracted. Select the proper die cage from current Danfoss Crimp Specifications. Insert die cage onto the pressure plate.
2. Press the proper PRESET button or key in a value to the DISPLAY. (See page 5 for keypad operating instructions.)
3. Position the fitting in the crimp die set according to the corresponding figure shown in Figure 5.
4. To crimp the fitting, press the CRIMP switch or footswitch. The die cage will advance until the fitting is fully crimped (Figures 5 & 6). It will then automatically begin to retract, signifying that the crimp is complete. Release the crimp switch or footswitch. The cylinder will automatically retract and stop at the "full retract" position (or at the programmable retract position, if it has been set).

Hint: Retraction can be halted at any point by momentarily pressing the RETRACT switch or footswitch.

5. Verify the correct crimp diameter.



Crimp to scribe line



Full flat crimp

Procedure for determining a target setting

Enter the number "500" into the DISPLAY, and start the crimping process. If the dies crimp the fitting, measure the crimp diameter and decrease the DISPLAY setting by the same amount that you wish to decrease the crimp diameter. If the dies don't touch the fitting, lower the DISPLAY setting by 050 to "450" and crimp the fitting again. If that still isn't enough, continue to reduce the DISPLAY setting by 050 increments until the dies make contact with the fitting. Then, measure the crimp diameter and decrease the DISPLAY setting by the same amount that you wish to decrease the crimp diameter.

Example: If a display setting of "250" produces a crimp diameter of 1.004 inches, subtract the crimp specification (0.990 inches) from the diameter that you measured ($1.004 - 0.990 = 0.014$). Then, subtract "014" from the DISPLAY setting ($250 - 014 = 236$), and change the DISPLAY to "236." Crimp the fitting again, and measure the crimp diameter. If the crimp diameter is still too large, repeat this process.

Note: Record the setting for future reference.

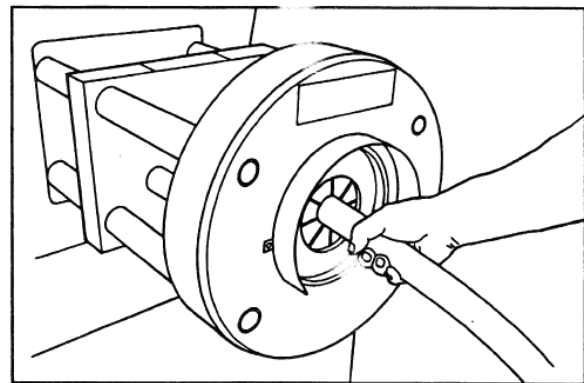


Figure 5

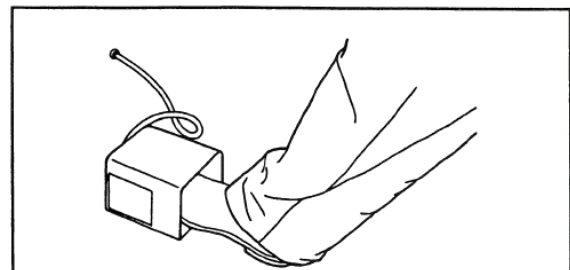


Figure 6

Calibration



WARNING: Maintain clear distance from all moving parts.

Calibration Procedure

The calibration procedure below will calibrate the Danfoss crimp machine to the original factory setting. While new machines are calibrated at the factory and will be ready to use upon receipt, this procedure should be followed if the crimp machine has been disassembled or has had components replaced. The procedure requires the use of an FT1307-200-M180 die cage and a -4 (TTC/Z Series) and a -8 (TTC/Z Series) fitting.

NOTE: While in the calibration mode, follow the instructions precisely, and press the keys deliberately. If a mistake is made, the calibration procedure must be started over by turning the machine off and then on again.

1. Insert an FT1307-200-M180 die cage.
2. Press the STORE and ENTER buttons simultaneously, and then release. Both button lights will now illuminate and will remain lit until the calibration procedure is finished.
3. Input the value of "210" using the keypad.
4. Center a TTC/Z Series -4 fitting (without a hose) in the die cage, holding the socket or fitting in place with a pencil or other suitable tool. Crimp the socket by pressing the crimp switch or footswitch until the machine retracts by itself, indicating a completed cycle. Allow the die cage to retract to the "full retract" position.
5. Using a micrometer, measure the crimp diameter. The preferred method is to use the average of the four pairs of indentations.
6. Locate the crimp diameter in Table A, below. Using the keypad, enter in the three-digit DISPLAY reading that corresponds to the crimp diameter.

Note: If your crimp diameter falls between the numbers shown in Table A, simply determine or interpolate the DISPLAY reading, since the numbers are a direct ratio.

Table A for -4

Crimp Display	Diameter Reading
0.670	170
0.680	180
0.690	190
0.700	200
0.710	210
0.720	220
0.730	230
0.740	240

Table B for -8

Crimp Display	Diameter Reading
1.070	570
1.080	580
1.090	590
1.100	600
1.110	610
1.120	620
1.130	630
1.140	640

7. Input in the value of "610" using the keypad.
8. Center a TTC/Z Series -8 fitting (without a hose) in the die cage, holding the socket or fitting in place with a pencil or other suitable tool. Crimp the socket by pressing the crimp switch or footswitch until the machine retracts by itself, indicating a completed cycle. Allow the die cage to retract to the full retract position.
9. Repeat steps 5 and 6 at left, using Table B for the -8 socket.
10. After the three-digit DISPLAY reading in Step 9 is entered, the machine will automatically exit the calibration mode.

Calibration Example

Crimp a TTC/Z Series -4, and measure the four crimp diameters around the socket. For example, the diameters measure .692, .693, .694 and .694 inches, to obtain the average diameter, add the four diameters, and divide that sum total by 4.

$$\frac{(.692 + .693 + .694 + .694)}{4} = \frac{2.773}{4} = 0.69325 = 0.693$$

(round to nearest thousandth)

Look at the crimp diameter column in Table A and find your average diameter. If it falls between two numbers, as this one does, interpolate the desired setting. In this case, you would enter 193. If your crimp diameter is .690, you would enter 190; if it is .697, you would enter 197.

Crimp a TTC/Z Series -8, and measure the four crimp diameters around the socket. This time, let's say that the diameters measure 1.113, 1.115, 1.114 and 1.115 inches. Obtain the average diameter by adding the four diameters and dividing that sum total by 4.

$$\frac{(1.113 + 1.115 + 1.114 + 1.115)}{4} = \frac{4.457}{4} = 1.11425 = 1.114$$

(round to nearest thousandth)

Look at the crimp diameter column in Table B and find your average diameter. If it falls between two numbers, as this one does, interpolate the desired setting. In this case, you would enter 614. If your crimp diameter is 1.110, you would enter 610; if it is 1.119, you would enter 619.

Maintenance Intervals

Die Cage Lubrication

Every 50 crimps	Relube sliding surfaces of dies
Every 500 crimps	Remove old grease and relube
Every 1000 crimps	Die cage maintenance

Crimp Ring Maintenance

Every 500 crimps	Remove old grease and relube
Every 2000 crimps	Remove old grease, inspect for wear or damage and relube if OK.

Cylinder Plate Bushing Maintenance

Every 2000 crimps	Remove old grease, inspect for wear or damage and relube if OK.
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Use PTFE lubricant
(Part Number: T-400-G 1.5 oz tube, FF91455 16 oz. can).

Maintenance Procedures

Machine Maintenance Procedure

1. Sliding surfaces must be kept free of dirt and other abrasive materials.
2. All exposed black metal surfaces should be coated occasionally with a light film of oil to prevent corrosion.
3. Periodically check the oil level in the fluid reservoir of the hydraulic power unit. Maintain the oil level according to the indicator on top of the reservoir. Add ENERPAC hydraulic oil as needed.

Note: Completely retract the crimp ring when checking the oil level.

Maintenance Procedure

Die Cage Maintenance Procedures

1. Lubricate the die cage. For maximum service, die surfaces require lubrication at 50-crimp intervals with PTFE lubricant.

Periodically remove PTFE residue that has built up on the sides of the dies and in the crimp ring during the crimping process. Do not allow contaminated PTFE to come into contact with the dies. (This can cause dies to stick to the crimp insert.) PTFE residue becomes contaminated with metal and plating chips and airborne contaminants, which can cause premature wear of the dies and crimp ring.

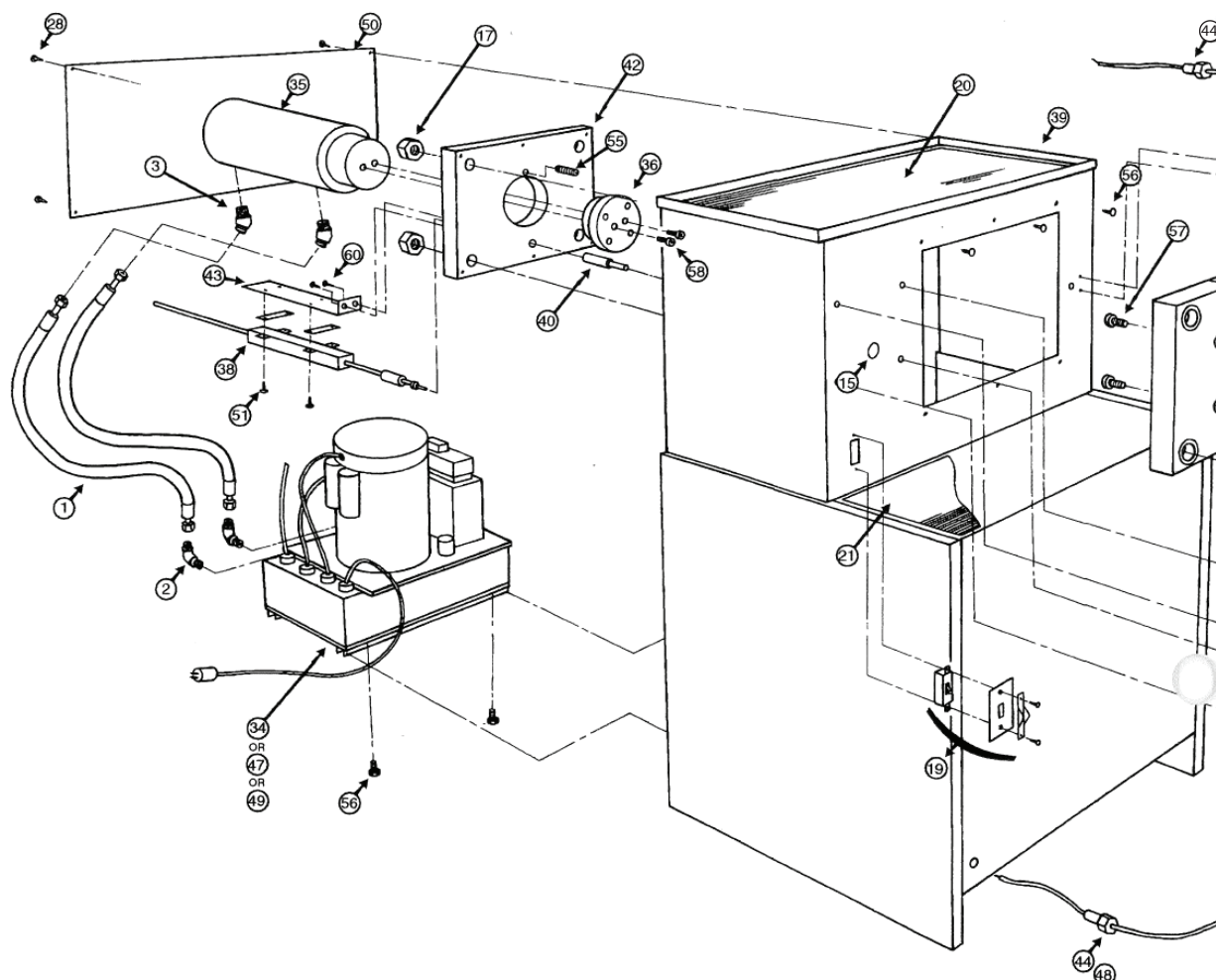
2. Die cage maintenance should be performed at 1000-crimp intervals or every six months, whichever occurs first. Die cages should be free of grease and debris and inspected for worn or damaged components.
 - a. The sliding surface of the dies should appear smooth with no apparent galling. Galled dies must be replaced. Individual dies in a cage can be replaced without replacing all dies.
 - b. Replace springs that show any sign of damage or collapse such as those which are shorter than the other springs.
 - c. The spring plate should appear smooth with no apparent galling. Galled spring plates must be replaced.
 - d. Inspect remaining components, and replace those that are badly worn.

Reassemble components, and liberally apply PTFE to the die surface which slides along the spring plate. Torque the die cage bolts to 50 in.-lbs.

Ensure that all dies slide in and out freely.

Warning: Removal of the cylinder and hydraulic power unit from a crimp machine that is not secured to the floor will cause reduced stability.

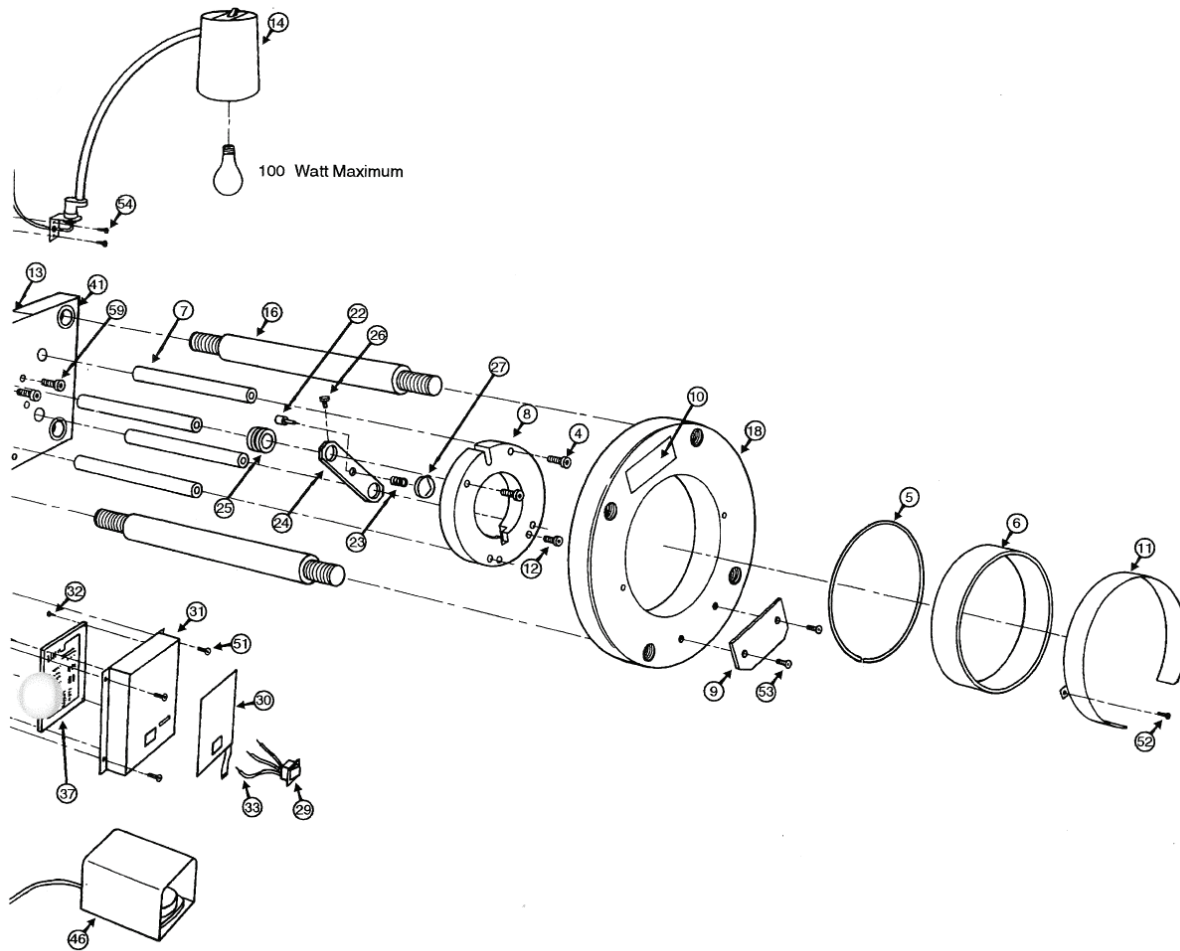
Crimp Machine Components



Detail	Part Number	Description	Qty
1	FK8687GGG0320	Hose Assembly	2
2	FF2032T0606S	90° Adapter (may have all 45° adapters)	2
3	FF2093T0606S	45° Adapter	2
4	FF9339-08-24S	1/2-13 X 1.50 SHCS	4
5	FT1289-2-2-14	Retaining Ring	1
6	FT1289-2-2-15	Crimp Ring Insert	1
7	FT1289-3-13	Push Rod	4
8	FT1289-3-15	Pressure Plate	1
9	FT1289-3-46	Plate	1
10	FT1289-3-60	Caution Decal	1
11	FT1289-3-62	Guard	1
12	FT1303-3-76	Shoulder Bolt	2
13	FT1330-3-64	Attention Decal	1
14	FT1330-3-68	Work Lamp	1
15	FT1330-3-7	Rubber Grommet	1
16	FT1340-2-2-19	Tie Bar	4

Detail	Part Number	Description	Qty
17	FT1340-2-2-20	Nut	4
18	FT1350-2-2-2	Crimp Ring	1
19	FT1340-2-5-1	Motor Starter Switch	1
21	FT1340-3-4	Backstop Assembly (includes Details 22 through 27)	1
22	FT1340-3-4-1	Shoulder Bolt	1
23	FT1340-3-4-2	Spring	1
24	FT1340-3-4-3	Locator Plate	1
25	FT1340-3-4-4	Bronze Bushing	1
26	FT1340-3-4-5	Thumb Screw	1
27	FT1340-3-4-6	Locator Cone	1
28	FT1360-3-8	1/4-20 X .38 BHCS	4
29	FT1380-3-3	3-Position Switch	1
30	FT1380-3-6	Key Pad	1
31	ET4020C-0001/ FT1380-3-7	Electrical Enclosure	1
32	FT1380-3-18	#4-40x.188 lg. SHCS	4

Crimp Machine Components



Detail	Part Number	Description	Qty
33	FT1380-3-31	Insulated Wire	3
34	FT1390-3-1	Hydraulic Power Unit 115VAC 60HZ	1
35	FT1390-3-2	Hydraulic Cylinder	1
36	FT1390-3-3	Cylinder Adapter	1
37	FT1390-3-4	Control Card	1
38	FT1390-3-5	Transducer (includes clips and rod adapter)	1
39	ET4040C-0004/ FT1390-3-6	Base (includes electrical box)	1
40	FT1390-3-7	Transducer Rod Extension	1
41	FT1390-3-8	Push Block	1
42	FT1390-3-9	Cylinder Mounting Plate	1
43	FT1390-3-10	Transducer Bracket	1
44	FT1390-3-14	Compression Connector	3
45	FT1390-3-15	Compression Connector	1
46	FT1390-3-16	Foot Switch	1

Detail	Part Number	Description	Qty
47	FT1390-3-17	Hydraulic Power Unit 208-240VAC 50/60HZ	1
48	FT1390-3-18	Locknut	4
50	FT1390-3-6-2	Rear Panel	2
51	222003-1-8-6S	#8-32 X .38 SHCS	8
52	FF9339-0108-06S	#8-32 X .38 BHCS	2
53	FF90258-0110-06S	#10-32 X .38 FHCS	2
54	FF9156-0110-08S	#10-32 X .50 BHCS	2
55	FF9197-06-08S	3/8-16 X .50 SHSS	1
56	222003-6-12S	3/8-16 X 0.75 SHCS	10
57	222003-6-40S	3/8-16 X 2.50 SHCS	4
58	222003-8-56S	1/2-13 X 3.50 SHCS	2
59	222003-6-32S	3/8-16 X 2.00 SHCS	4
60	222003-1-10-6S	#10-24 x .38 SHCS	2

Troubleshooting tips

Remember: The electric motor only runs during the crimping process. The motor energizes when the crimp/retract switch or footswitch is pressed and de-energizes when the cylinder has retracted.

Symptom	Possible	Cause Corrective Action
Pump will not start	<ul style="list-style-type: none"> No power or wrong voltage 	<ul style="list-style-type: none"> Make sure that the unit is plugged in. Make sure that the power voltage is correct. Check for loose wires on the circuit board. Check for loose wires on the CRIMP switch.
Motor stalls under load	<ul style="list-style-type: none"> Low voltage 	<ul style="list-style-type: none"> Verify that the branch circuit conforms to the electrical specifications on Page 4 of this manual. Remove any extension cords.
Electric valve will not operate	<ul style="list-style-type: none"> No power or wrong voltage Low voltage 	<ul style="list-style-type: none"> Check for loose wires on the circuit board. Check for loose wires on the CRIMP switch. Make sure that the power voltage is correct.
Pump fails to build pressure	<ul style="list-style-type: none"> External leak in system Internal leak in pump Internal leak in valve Internal leak in system component 	<ul style="list-style-type: none"> Wipe away spilled oil, and locate the source of leak. If the hose assembly is leaking, tighten or replace it. If the pump or cylinder is leaking, refer to the ENERPAC Repair Parts Sheets. Slight oil seepage of the cylinder is normal.
Pump builds less than full pressure	<ul style="list-style-type: none"> Relief valve set low External system leak Internal leak in pump Internal leak in valve Internal leak in system component 	<ul style="list-style-type: none"> Refer to the ENERPAC Repair Parts Sheets possible adjustment or leak age repair.
Pump builds full pressure, but cylinder does not move	<ul style="list-style-type: none"> Tie rods may be binding Flow to cylinder blocked 	<ul style="list-style-type: none"> Replace the tie rods. Refer to the ENERPAC Repair Parts Sheets.
Cylinder will not return	<ul style="list-style-type: none"> Valve malfunction Restricted/blocked Tie rods may be binding 	<ul style="list-style-type: none"> Refer to the ENERPAC Repair Parts Sheet for valve or cylinder repair. Replace the tie rods. and repair or replace them if necessary. Lubricate the die cage per the maintenance procedures on Page 9. Lubricate the tie rod bushings per the maintenance procedures on Page 9..
Crimp diameters change	<ul style="list-style-type: none"> Incorrect hose/fitting combination Incorrect die cage Die cage or crimp insert damage Transducer is loose Loose crimp machine components External damage to crimp machine Insufficient lubrication on dies 	<ul style="list-style-type: none"> Verify the correct hose/fitting combination. Verify the correct die cage. Repair or replace the damaged components. Tighten the transducer and brackets, and then reclaimable them if necessary. Tighten any loose bolts or screws Lubricate the die cage per the maintenance procedures on Page 9. Lubricate the tie rod bushings per the maintenance procedures on Page 9.
DISPLAY blinks	<ul style="list-style-type: none"> Loose or broken wires 	<ul style="list-style-type: none"> Tighten any wires that may have become loose on the circuit board, pump electrical enclosure, or CRIMP switch.

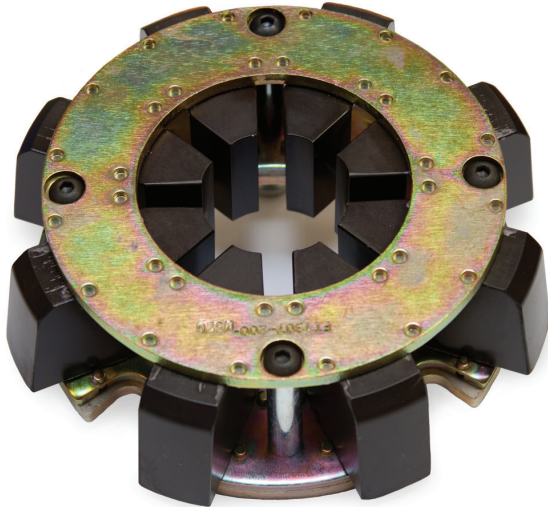
If the symptom appears to be solely pump or cylinder related, refer to the ENERPAC Repair Parts Sheets.

Any electrical checks must be done by a qualified electrician.

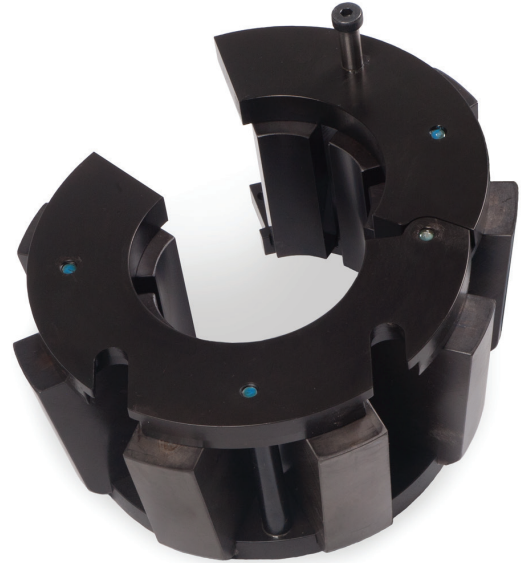
Refill oil reservoir with ENERPAC premium hydraulic oil only (ENERPAC P/N H-F-101).

FT1390 die cage combinations

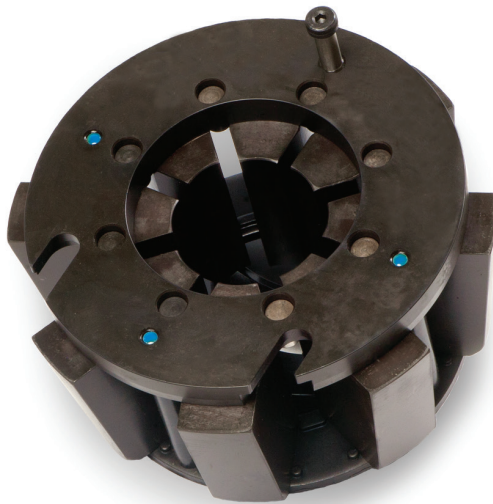
FT1307- 200 - MXXX



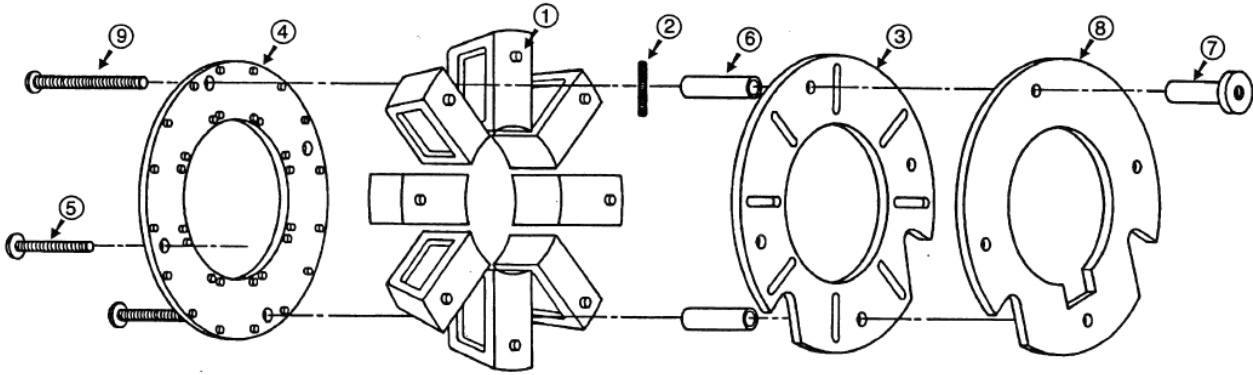
FT1390 - 200 - XXX



FT1209 - 200 - XXX

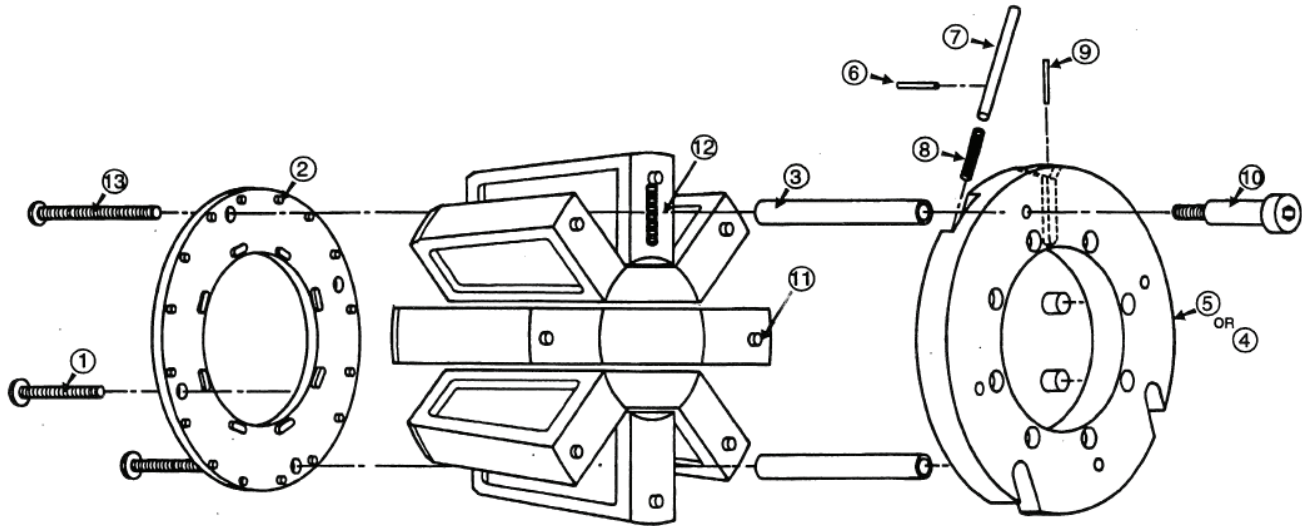


FT1307 die cage parts breakdown



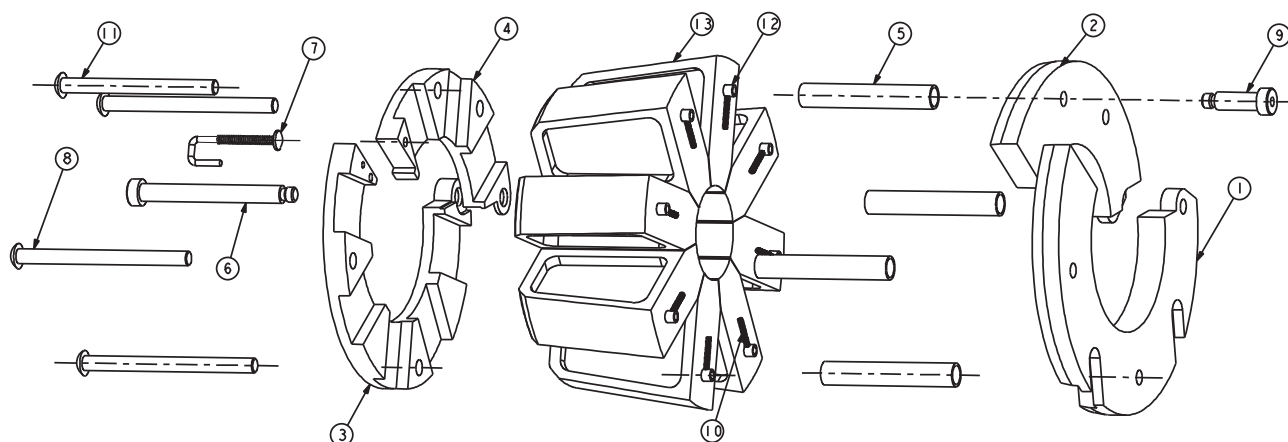
Detail	Qty	Part Number	Description
1	8 pc	21057-7	Roll Pin .25 dia x .62 long
2	8 pc	FT1209-2-9-7	Spring
3	1 pc	FT1307-2-9-3	Spring Plate
4	1 pc	FT1307-2-9-4	Front Plate
5	3 pc	FT1307-2-9-5	BHCS 5/16-18 x 2.56 long
6	4 pc	FT1307-2-9-7	Spacer
7	1 pc	FT1307-2-9-7	Nut
8	1 pc	FT1307-2-9-8	Back Plate
9	1 pc	FT1307-2-9-10	BHCS 5/16-18 x 3.00 long

FT1209 die cage parts breakdown



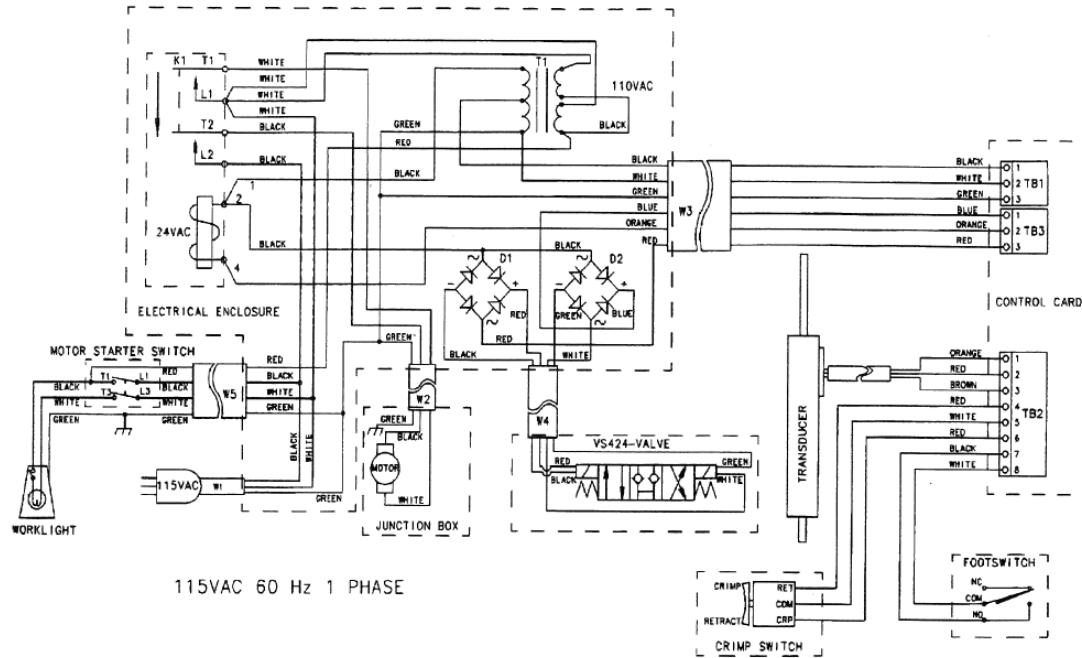
Detail	Qty	Part Number	Description
1	3 pc	FT1209-2-9-1	BHCS 5/16-18x3.90 long
2	1 pc	FT1209-2-9-2	Front Plate
3	4 pc	FT1209-2-9-3	Spring Plate
4	1 pc	FT1209-2-9-4	Back Plate Assembly (Details 5 through 9)
5	1 pc	FT1209-2-9-4-1	Back Plate
6	2 pc	FT1209-2-9-4-2	Roll Pin .09 dia x .50 long
7	2 pc	FT1209-2-9-4-3	Rod
8	2 pc	FT1209-2-9-4-4	Spring
9	2 pc	FT1209-2-9-4-5	Roll Pin .125 dia x .75 long
10	1 pc	FT1209-2-9-5	Shoulder Screw
11	8 pc	21057-7	Roll Pin .25 dia x .62 long
12	1 pc	FT1209-2-9-7	Spring
13	1 pc	FT1209-2-9-8	BHCS 5/16-18 x 3.50 long

FT1390 die cage parts breakdown

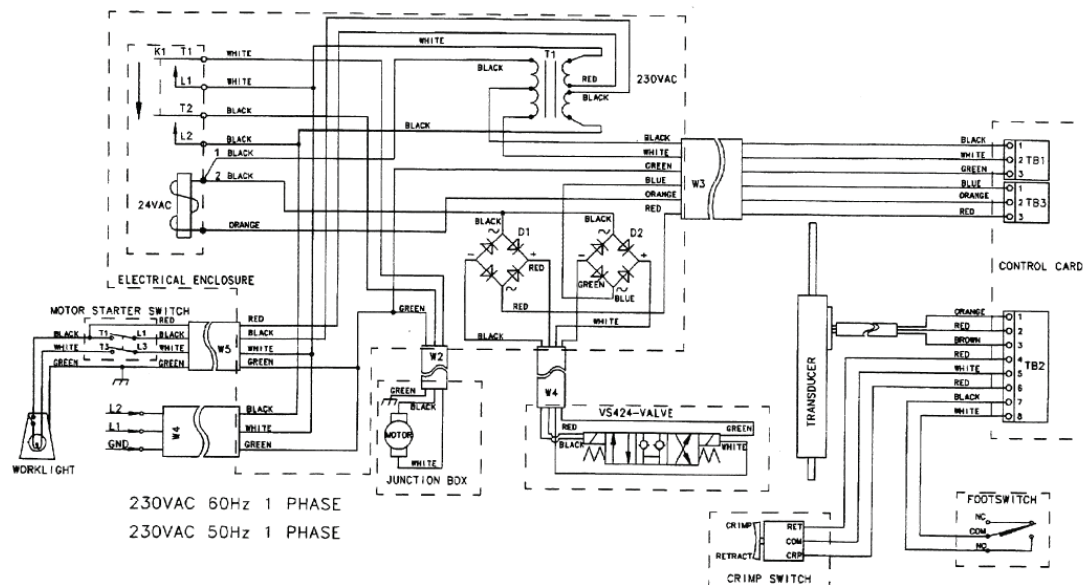


Detail	Qty	Part Number	Description
1	1 pc	FT1309-2-9-1	Back Plate (Bottom)
2	1 pc	FT1309-2-9-2	Back Plate (Top)
3	1 pc	FT1309-2-9-3	Front Plate (Bottom)
4	1 pc	FT1309-2-9-4	Front Plate (Top)
5	4 pc	FT1309-2-9-5	Spacer
6	1 pc	FT1309-2-9-6	3/8" dia. Sh. ScREW (Alter)
7	1 pc	FT1309-2-9-7	Latch Assembly
8	3 pc	FT1209-2-9-1	BHCS 5/16-18 x 99 (3.90) long
9	1 pc	FT1209-2-9-5	Shoulder Screw (Alter)
10	8 pc	FT1209-2-9-7	Spring; Assoc. #C0240-033-1750 (SS)
11	1 pc	FT1209-2-9-8	BHCS 5/16-18 x 88.9 (3.50) long
12	8 pc	21057-7	Roll Pin; 6.3 (250) x 15.7 (.620) long
13	8 pc		Crimp Dies

Electrical Schematic for ET4040/FT1390-115 (115V model)



Electrical Schematic for ET4040/FT1390-230 (230V model)

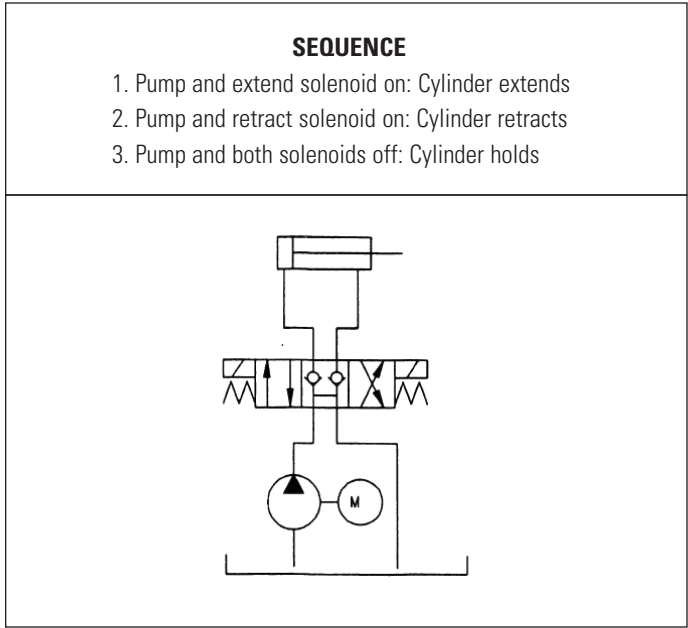


Electrical schematics

Terminal Detail	Pin Number	Voltage	Wire Color	Description
TB1	1	+12V AC	Black	From transformer
TB1	2	+0V AC	White	From transformer
TB1	3	None	Green	To earth ground
TB2	1	+4.04V DC	Orange	To transducer
TB2	2	+4.04 to 0.04V DC*	Red	To transducer
TB2	3	+0.04V DC	Brown	To transducer
TB2	4	+5V DC	Red	Crimp switch
TB2	5	0V DC	White	Switch common
TB2	6	+5V DC	Red	Retract switch
TB2	7	+5V DC	Black	Footswitch
TB2	8	0V DC	White	Footswitch common
TB3	1	+24V AC	Blue	To retract solenoid
TB3	2	+24V AC	Orange	To motor contractor
TB3	3	+24V AC	Red	To advance solenoid

*The voltage at TB2 pin 2 varies between 4.04V DC and 0.04V DC, depending on the position of the cylinder.

Hydraulic schematic



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