

# RADIUS MASTER



## MODEL 911

**115 VAC**

## CORNER RADIUS MACHINE OWNER'S MANUAL



**ROPER WHITNEY OF ROCKFORD, INC.**

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CINCINNATI PRECISION MACHINERY 513-860-4133

## INTRODUCTION

This manual explains the principles and procedures needed to competently operate and maintain the Radius Master corner radius machines sold and serviced by the Roper Whitney of Rockford, Inc.

### **WARNING** **POTENTIAL FOR INJURY OR DEATH**

**The product described in this publication may employ or create conditions that could, through misuse, inattention, or lack of understanding, result in personal injury or death, or damage to the product or other equipment. It is imperative that personnel involved in the installation, operation, programming, and maintenance of this product understand the operation of the product and the contents of this and all supporting documents.**

It is strongly suggested that the novice operator and maintenance personnel read this manual in its entirety before attempting to operate or maintain the machine.

#### **TECHNICAL SUPPORT:**

Should any questions remain unanswered, our Field Service Technicians and in-house Product Support staff can provide you with assistance. Before calling for assistance, service, or parts, please have the following available:

The machine type and serial number - listed on the nameplate on the back of the cabinet.

A description of the problem.

A description of the operating conditions and setup.

Operating device, feature, and function status.

The manuals and prints provided with your system.

To obtain assistance, service, or parts please contact:

Roper Whitney of Rockford, Inc.

2833 Huffman Boulevard, Rockford, IL 61103

Phone: (815) 962-3011 Fax: (815) 962-2227

### **NOTE**

It may be required that you obtain service or parts through an authorized Roper Whitney distributor.

**ATTENTION BOXES:**

Attention boxes are used to alert you to hazards which could result in harm to you, others, or the equipment; remind you of important information to be considered. The following are examples and explanations of attention boxes used in this manual.

**WARNING**  
**TYPE OF HAZARD**

A warning box is used to emphasize that a hazardous environment that could cause personal injury or death exists in the equipment or may be associated with its use and that inattention to proper safety, operation or maintenance procedures could result in personal injury or death and damage to the equipment.

**CAUTION**

A caution box is used to emphasize that inattention to proper safety, operation, or maintenance procedures could result in damage to the equipment.

**NOTE**

A note box is used to call attention to information that is especially significant to understanding the subject matter, to provide important information, or to make a recommendation.

## **SAFETY PRECAUTIONS**

Although the system has been designed with safety in mind and is equipped with numerous safety features, no amount of design and features can replace an informed, proficient, safety-conscious attitude on your part. This chapter describes various safety precautions which must be observed when operating, and maintaining your machine. This chapter must not be considered all-inclusive on the subject of safety. Use this chapter as a guide to supplement safety precautions, warnings, and instructions in:

Other manuals about this machine

Local, plant, and shop safety rules and codes

Governmental safety laws and regulations

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## PERSONAL SAFETY

**DO:** Ensure that you know how to do the work in a correct, safe manner. Know the hazards associated with the work and how to protect yourself. If you are in any way uncertain about your job and the safe way to perform the work, ask your supervisor for instructions.

Notify your supervisor whenever you feel there is any hazard involving the equipment or the performance of your job.

Report all injuries or illness, regardless of severity, to your company's first aid or safety officer. Never attempt self-treatment.

Observe and follow safety instructions in your work area, paying special attention to posted warnings such as "NO SMOKING", "HIGH VOLTAGE", and "DANGER".

Use safety protective equipment. Always wear approved eye and hearing protection. Wear safety-toe shoes with slip-proof soles. Keep this safety equipment in good condition.

Avoid any pinch-points created by the movement of the machine's components.

**DO NOT:** Do not allow untrained and/or unauthorized personnel to service, operate, or conduct tests on the system.

Do not wear loose, hanging clothing or jewelry while operating or servicing the system.

Do not use compressed air for cleaning debris from yourself or your clothing.

Do not place speed above safety.

## TOOL SAFETY

**DO:** Use the proper tool and equipment for the task.

Inspect tools before each use to ensure that they are in proper working condition.

Maintain tools in their proper working condition.

Keep tools in their proper storage place when not in use.

Remove all hand tools such as wrenches, hammers, and diagnostic equipment from the machine immediately after each use.

Report defective tools to your supervisor and turn defective tools in for replacement.

Use hoists and cranes to lift heavy machine units, workpieces, or any other load too heavy for one person. Be sure loads are balanced.

**DO NOT:** Do not use broken, burned, mushroomed, or defective tools.

Do not strike two hardened steel surfaces together.

Never use a crane, hoist, or other lifting device to lift more than its rated capacity.

Do not use makeshift climbing aids as a substitute for a ladder.

## WORK AREA SAFETY

**DO:** Keep the work area well lighted, clean, neat, and orderly. Oils, water, or debris on the floor can cause someone to slip and fall.

Use only approved cleaning fluids.

Deposit trash, refuse, debris, and other waste in the proper refuse container. Combustible material must be kept in metal containers provided for that purpose.

Hazardous materials require special containers, handling, and disposal procedures. Follow your company's and governmental procedures for the proper identification, containment, storage, and disposal of waste materials.

Clear the work area of any hazardous obstructions that could result in injury.

Beware of protruding machine elements or assemblies.

**DO NOT:** Do not allow extension cords, hoses, or wires to be placed where they will create a tripping hazard.

Do not use explosive liquids such as gasoline as cleaning agents.

Do not dispose of any hazardous waste in "ordinary" refuse containers, on the ground, in sewers, streams, or waterways.

Do not use compressed air for cleaning debris or grit from yourself or the machine.



## MACHINE SETUP AND OPERATION SAFETY

**DO:** Read, understand, and follow all machine-mounted warning and instruction plates and signs.

Make sure safety guards, shields, barriers, covers, and protective devices are in place, connected, and functional before operating the system.

Visually and functionally inspect all tooling and system components before operating the equipment. Check for cracks, chips, burrs, overheating, and other evidence of failure.

Pay attention to the machine process during operation. Unusual noises or vibrations can indicate problems requiring immediate attention.

Shut off power to the system when cleaning or servicing the machine or when guards, shields, or protective devices are removed or otherwise made inoperable.

Remove debris and grit with a rake or brush - not your hands.

**DO NOT:** Do not remove, paint over, alter, or deface any machine-mounted warning and instruction plates and signs.

Do not override the safety features of the equipment.

Do not operate the machine in excess of its rated capacity.

Do not make adjustments, measure workpieces, or remove debris and grit until the machine has stopped moving and appropriate safety features are activated.

Do not brake or slow down moving equipment.

Do not use combustible fluids without adequate fire protection equipment.

## **MACHINE OPERATION AND MAINTENANCE**

The model 911 Radius Master is a footswitch operated, air over oil, ready standing, corner radius machine. Although the standard choice of radii meet most requirements, optional die sets are available. The Radius Master is designed to be functional, simple, safe, and easy to maintain.

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## SYSTEM FUNCTION

Initially the die springs hold the die shoes open. When shop air is hooked to the machine it flows through the air valve and into the return side of the cylinder. This force helps return the die shoe to the ready (open) position at the conclusion of the machine cycle.

The complete machine cycle is initiated when the operator loads a workpiece into a die opening that corresponds to the desired corner radius and activates the footswitch. The footswitch energizes a solenoid mounted on the air valve. The solenoid causes the air valve to shift 80-100 PSI of shop air from the ready side of the cylinder to the power booster which - through reduction and compression - multiplies the force on the hydraulic side by a ratio of 16 to 1. Hydraulic pressure then actuates the cylinder, which pulls the die shoe and blade through the workpiece. Force is maintained until the operator releases the footswitch. When the footswitch is released, the solenoid is de-energized and shop air flows back to the return side of the cylinder, raising the die shoe and blade to their ready position.

## SPECIFICATIONS:

Volts:	115 AC
Amps:	1.0
Air:	80-100 PSI
Capacity:	3/16"
Cutting Blades:	A2 Tool Steel
Standard Radii:	1/8, 3/16, 1/4, 5/16, 3/8, 7/16, 1/2, 5/8, 3/4, 7/8, 1
Height:	49"
Width:	32"
Shipping Weight:	345 lbs

## SYSTEM OPERATION

### SETUP:

Place the Radius Master in a well lit area that is free of debris and traffic hazards.

1. Uncrate the machine.
2. Plug the power cord into a standard 115 VAC outlet.
3. Connect the air supply to the inlet port on the right side of the machine.

### NOTE

This machine requires 80-100 PSI, filtered, lubricated air.

### OPERATION:

1. Turn on at the switch located on the front of the machine.
2. Place the workpiece on the table and slide it into the desired die opening.
3. While holding the part in place, activate the foot switch.

## MAINTENANCE

### SCHEDULE:

The Radius Master is designed to provide years of service with minimal maintenance. There are only two routine maintenance procedures required to ensure dependable performance.

1. Drain the air filter monthly.
2. Check and fill the hydraulic fluid semiannually with Mobil DTE 25.

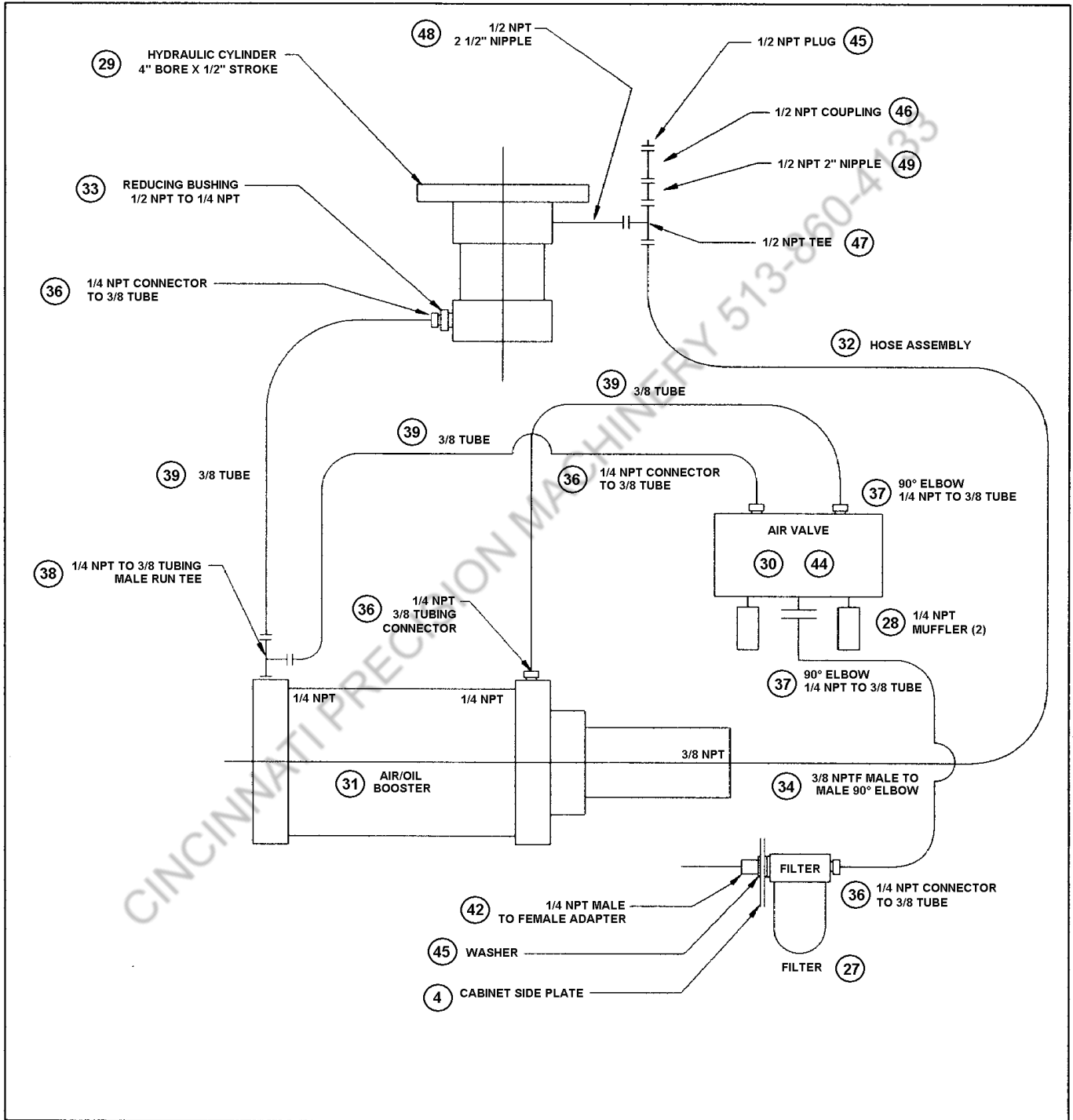
### FILL PROCEDURE:

A loss of power or erratic action of the upper head may indicate low hydraulic fluid. Cutting power is achieved by transmitting high pressure oil from the booster to the upper portion of the hydraulic cylinder. Use the following procedure for checking the oil level if necessary.

1. Remove cylinder rod screw, located at the top center of the upper die shoe.
2. Remove table.
3. Remove 1/2 NPT pipe plug, located in the top portion of "T" fitting.
4. Fill fitting with Mobile DTE 25 (or equivalent) to mid-point of fitting threads. Replace plug and tighten securely.
5. Extend and retract the cylinder rod several times, noting the length of stroke. Any air in the system will rise to the top of the fitting. Re-check the oil level, and again securely tighten the plug. Repeat this process until the oil level remains constant and the cylinder stroke is approximately 1/2 inch.
6. Check all connections for leak, and then replace the table. Install the screw into the cylinder rod end, and adjust the die set opening to 3/16 inches.

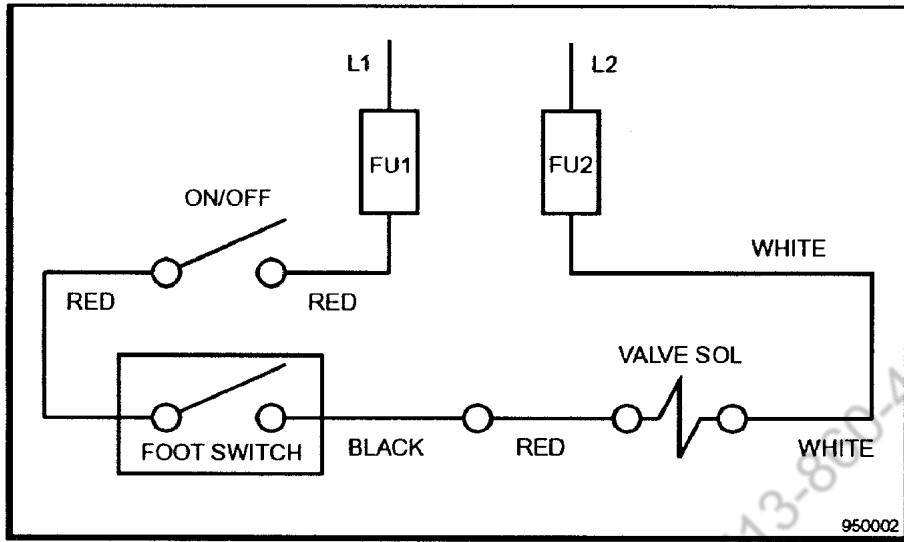
MACHINE HYDRAULICS AND PNEUMATICS

HYDRAULIC AND PNEUMATIC SCHEMATIC

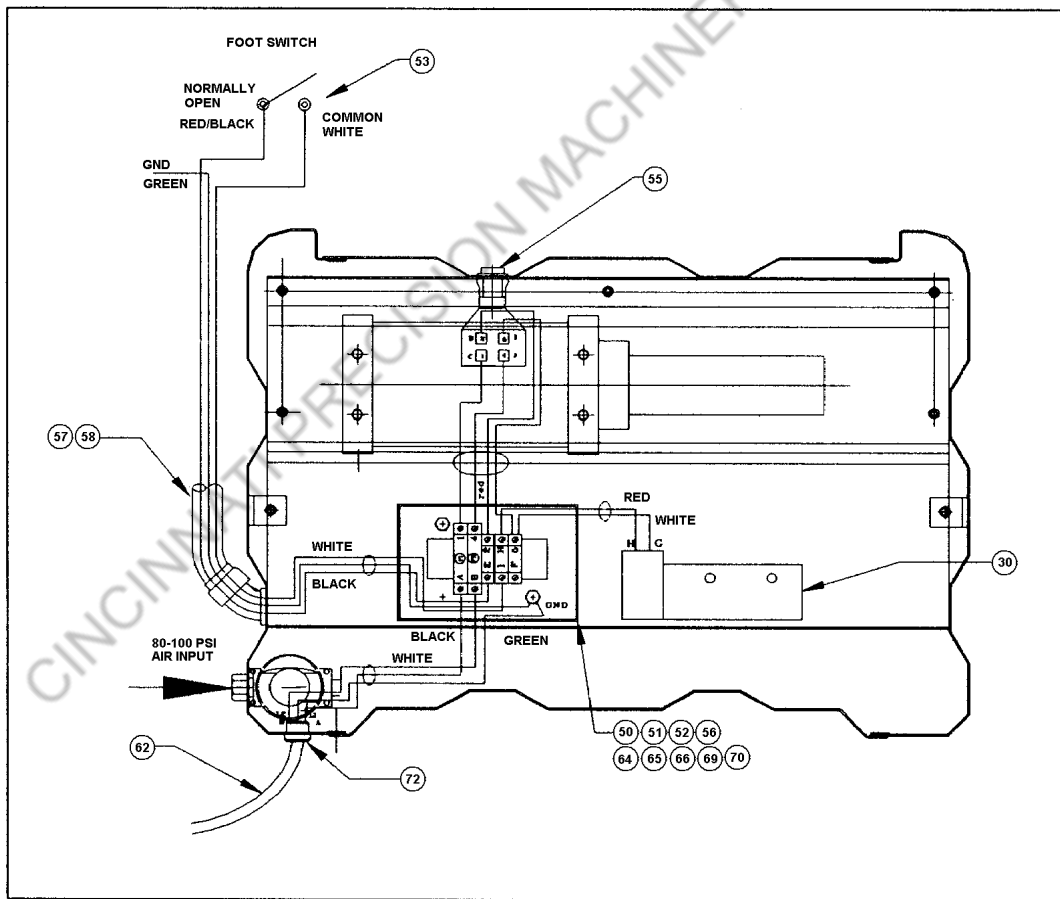


Note: Number's refer to parts list on page 17.

**ELECTRICAL SCHEMATIC**



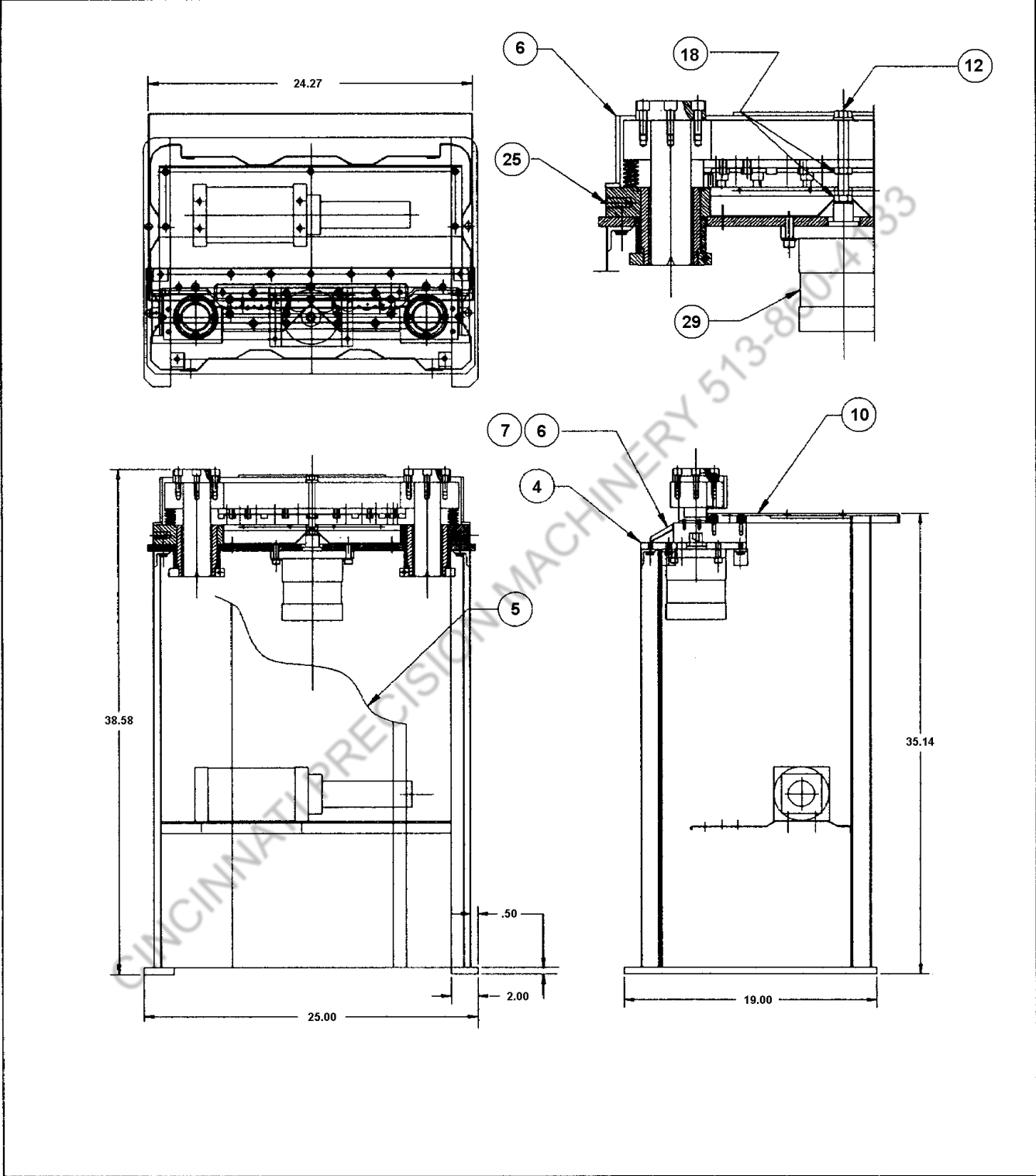
**ELECTRICAL SCHEMATIC**



**WIRING DIAGRAM**

NUMBERS REFER TO PARTS LIST ON PAGE 17

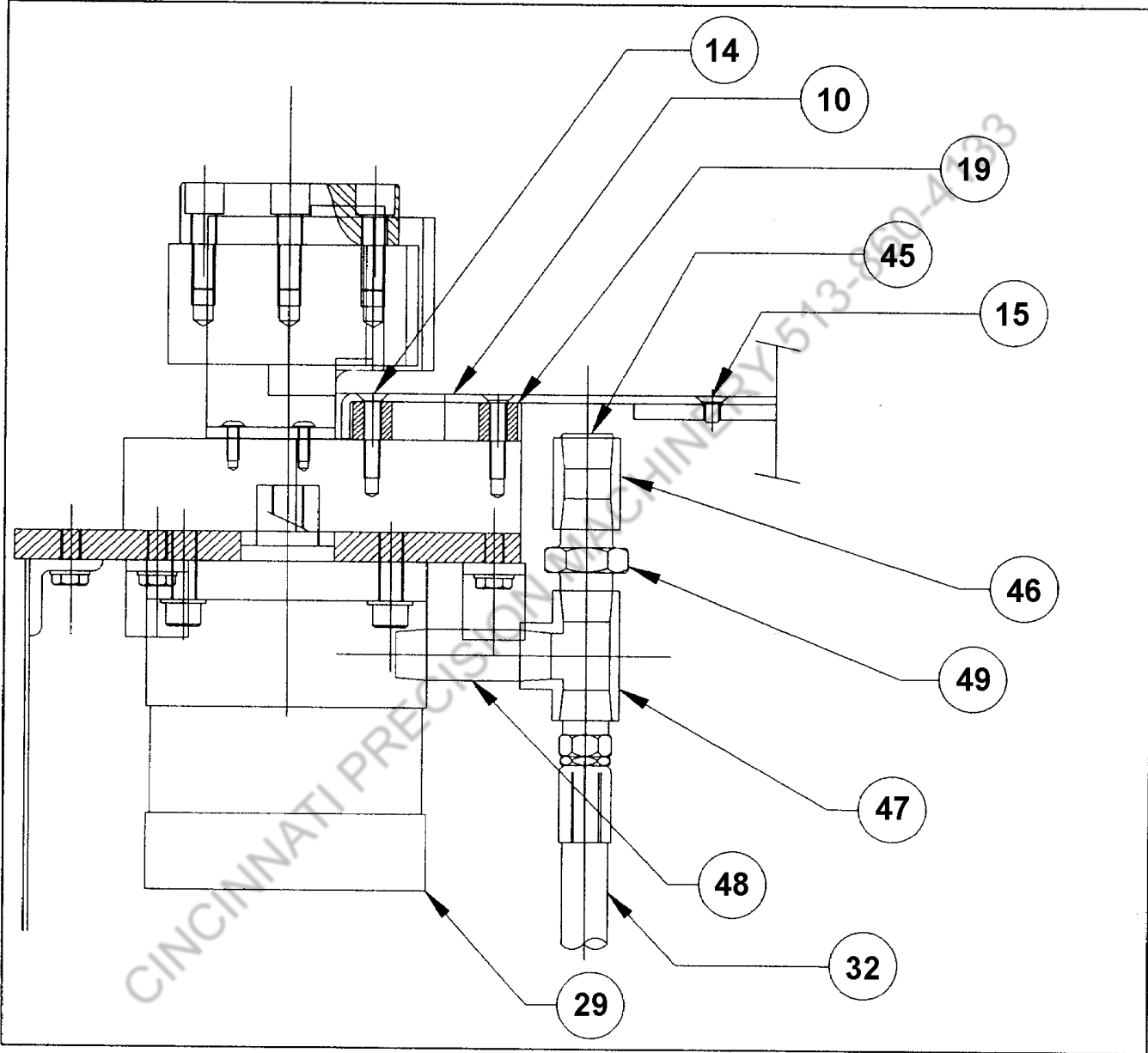
ASSEMBLY DRAWING



PART NUMBERS REFER TO PARTS LIST ON PAGE 17

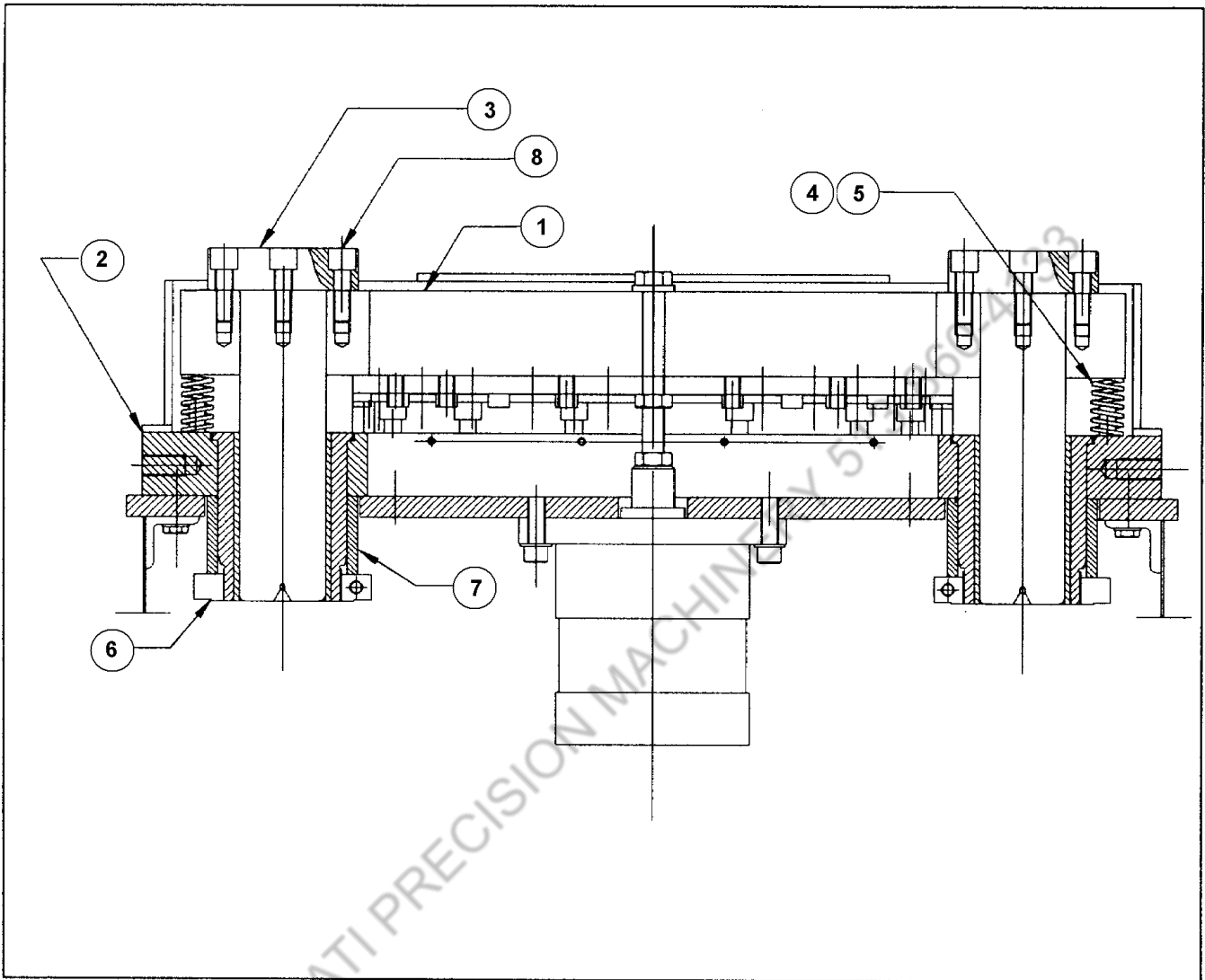


HYDRAULIC FILL AND PARTS



NUMBERS REFER TO PARTS LIST ON PAGE 17

**DIE ASSEMBLY DRAWING**



ITEM	PART NUMBER	DESCRIPTION	QTY
1	788320100	Upper Die Shoe	1
2	288940004	Lower Die Shoe Assembly	1
3	788160101	Guide Pin	2
4	688184593	Springs, Die Set	4
5	600063487	Roll Pin	4
6	688000494	Clamp Nut	2
7	788260103	Pin Insert Collar	2
8	611012177	Socket Head Cap Screw	8

## PARTS LIST

ITEM	PART NO.	DESCRIPTION	QTY
1	688346187	Decal, Warning	1
2	350700293	Blade, Lower	1
3	350700294	Blade, Upper	1
4	788060076	Cabinet Assembly	1
5	788140070	Door, Rear Panel	1
6	688000475	Guard (Lexan)	1
7	788000060	Chip Ramp L.H.	1
8	788000061	Chip Ramp R.H.	1
9	688346620	Label "On-Off"	1
10	788090079	Table	1
11	600346160	Label, Caution	1
12	788160069	Bolt, Die Cylinder	1
14	688012367	Screw, Socket Flat Head 1/4-20 x 1.0	6
15	688012368	Screw, Socket Flat Head 1/4-20 x 3/8	6
16	611012173	Screw, Socket Head Cap 3/8-16 x 3/4	4
17	679033105	Washer, Lock	4
18	652023007	Nut, Hex Jam 1/2-20	2
19	788000081	Spacer, Table	5
20	688346254	Label, Radius Master	1
21	688346255	Warning Decal	1
22	679033103	Washer, Lock 1/4	8
23	615012053	Screw, Socket Head Button 10-24 x 5/8	4
24	611012367	Screw, Socket Head Cap 5/8-11 x 1/2	2
25	288940005	Die Assembly	1
27	669234407	Filter	1
28	669000051	Muffler, Exhaust	2
29	669011011	Hydraulic Cylinder	1
30	669122992	Valve, Air	1
31	669000054	Booster, Air/Oil	1
32	669041760	Hose Assembly, Hydraulic	1
33	669021216	Reducing Bushing 1/2 NPT to 1/4 NPT	2
34	669021217	Male/Male Elbow 06 x 06 NPTF to 37° Elbow	1
36	669021157	Connector Male 3/8 Tube to 1/4 NPT	6
37	669021158	Elbow, Male 3/8 Tube to 1/4 NPT	4
38	669024119	Male Run Tee 1/4 NPTF Run to 3/8 Tube	1
39	669041744	Tube, Poly Flow Black 3/8	80"
40	669021160	Plug, Hex Head 1/4 NPT	1
41	669072302	Hyd Fluid Mobile DTE 25	4 Gal
42	669021199	Adaptor Male/Female 1/4 NPT	1

## PARTS LIST

ITEM	PART NO.	DESCRIPTION	QTY
44	611012065	Screw, Socket Head Cap #10-24 x 2 1/4	2
45	669021155	Plug, Hex Head 1/2 NPT	1
46	669021219	Coupling, Pipe 1/2 NPT	1
47	669021220	Tee, Pipe 1/2 NPT	1
48	669021221	Nipple 1/2 NPT x 2 1/2	1
49	669021222	Nipple 1/2 NPT x 2.0	1
50	660000321	Din Rail	1
51	660000318	Fuse Terminal Block	2
52	660051757	Fuse, 1A 5mm x 20mm	2
53	660092104	Switch, Foot Anti-Trip	1
54	660172726	Reducer, Threaded	1
55	660082103	Switch, Rocker W/Tabs	1
56	660102200	Enclosure	1
57	660182920	Sealtite, 1/2 Liqueatite Type E.F.	4 ft
58	660172716	Connector Straight Sealtite 1/2	2
62	660000022	Cord, Power Supply	8 ft
63	660182933	Terminal-Ring Toung	1
64	660182932	Terminal-Quickslide	4
65	660000319	Terminal Block	3
66	660000320	End Cover	1
68	660000061	Plug, 3-Wire Cord	1
69	660000015	Wire-White, #14 Gauge Stranded	As Req.
70	660000014	Wire-Red, #14 Gauge Stranded	As Req.
71	660182937	Plastic Tubing, Black - 3/8"	48"
72	660172727	Cord Grip	1