

Installation • Safety • Maintenance

Manual



Singles To Doubles In Seconds!

Serial #: _____

Date: _____

“SW SERIES”

TABLE OF CONTENTS

Safety	i
Installation of The Trap Machine and Pump	1
Replacement of Turret	3
Mounting the Power Control Box	4
Connecting the Trap to the Power Source	4
How the PAT-TRAP® Automatic Doubles Machine Works	6
Turning Your PAT-TRAP® Machine “On”	10
Turning The PAT-TRAP® Machine “Off”	10
Loading The Pat-Trap Machine	10
PAT-TRAP® Singles	12
PAT-TRAP® Doubles	14
Adjustment for Doubles	14
PAT-TRAP® Wobble	16
Change Over To Wobble	16
Height Adjustment For Singles/Doubles on the Wobble	16
Setting Distance/Speed	17
Field-Angle Adjustment (Sliding Switch Bar Style)	18
Adjusting Height of Targets	19
Angle Adjustments	19
Installing Plastic Pinion Backstop, Spring and #4 Switch Bracket (Proximity Switch Style)	21
Adjusting Switch #4 (Proximity Switch Style)	21
Installing Plastic Pinion Backstop, Spring and #4 Switch Bracket (#4 Switch Style)	23

Adjusting the #4 Switch (#4 Switch Style)	25
Roller Plate Maintenance	26
Target Brush Maintenance	27
Target Guide Spring Position	28
Cold Weather Adjustment – Temperature/Release Time	29
Stopping the Throw Arm on the Brake	29
Adjusting Release Time & Correction Of Cycling Problem	29
Assembly of Throw Arm Brake	31
Throw Arm Brake Installation	32
Throw Arm Brake Maintenance	32
Throw Arm Backstop	33
Installation of Throw Arm	34
Installation of the “X” Doubles Finger	35
Disconnecting the Main Spring	37
Assembly/Installation of the Uni-Band (Main Spring)	38
Installation of Coil Spring	39
Removal of the Throw Arm/Turret Valve	40
Replacement of Oscillation Cylinder	41
Hydraulic Cylinder for Wobble	43
Throw Arm Shaft Bearing Maintenance	44
Procedure to Flush Hydraulic Oil	45
Pump Motor Maintenance	46
Wiring Guide For #2 and #3 Proximity Switches	47
Wiring Guide For Standard Shift Valve	48

Oscillation Soft Shift Valve Wiring Guide	49
Wiring Guide For Throw Arm/Turret Valve	50
Wiring Guide For #11 and #12 Proximity Switches	51
Hydraulic Cylinder For Wobble Wiring Guide	52
PAT-TRAP® Wiring Guide	53
Index	
Parts/Price List	

The PAT-TRAP®

NEVER STAND IN FRONT OF A TRAP MACHINE. THE TRAP MACHINE MUST BE TURNED OFF AND THE SPRING RELEASED BEFORE ENTERING THE TRAP HOUSE. NEVER ATTEMPT TO MAKE ANY ADJUSTMENT WHEN THE THROW ARM IS COCKED. IF YOU ARE UNFAMILIAR WITH THE TRAP MACHINE:

DO NOT TOUCH --- GET HELP

NEVER ATTEMPT TO LOAD THE TRAP WHEN IT IS COCKED. ALWAYS RELEASE THE TARGET FROM THE TRAP MACHINE.

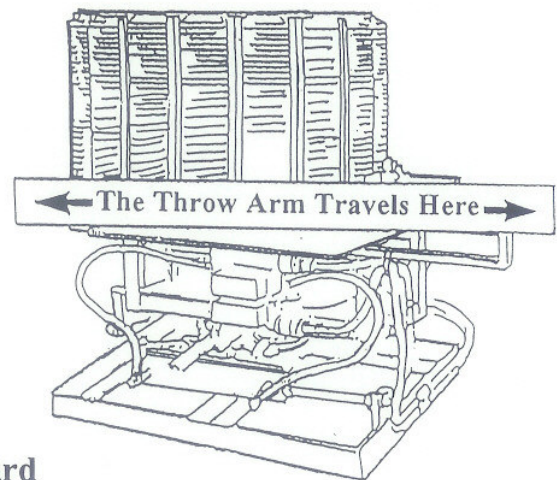
NEVER ADVANCE THE THROW ARM BY HAND WHEN THE ON/OFF/RELEASE SWITCH IS IN THE ON POSITION. THIS MAY DAMAGE THE MACHINE.

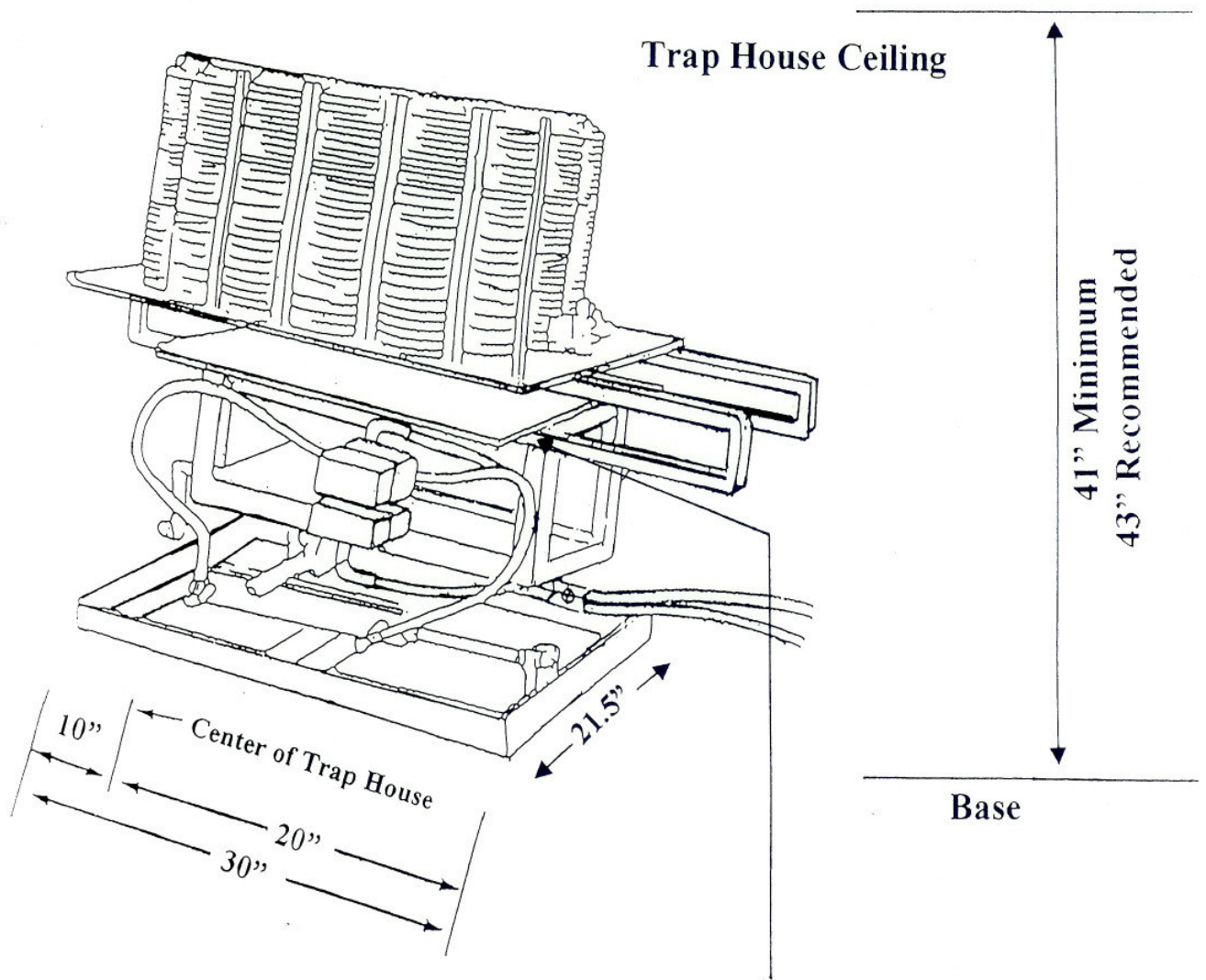
The target throw arm extends 4" beyond the plates. Keep away from the moving parts. Never stand in front of the trap machine.

When the machine is turned ON the throw arm will travel forward to the cocked position through the danger zone.

When the throw arm is fired, the arm will travel through the indicated danger area zone.

The throw arm can be fired by pushing the pullcord button. It can also be fired by hand --- by pushing the arm forward off the brake when the machine is either On or Off.





The Serial Number is stamped on the edge of the 1/4" steel plate.

(Diagram 90)

INSTALLATION OF THE TRAP MACHINE AND PUMP

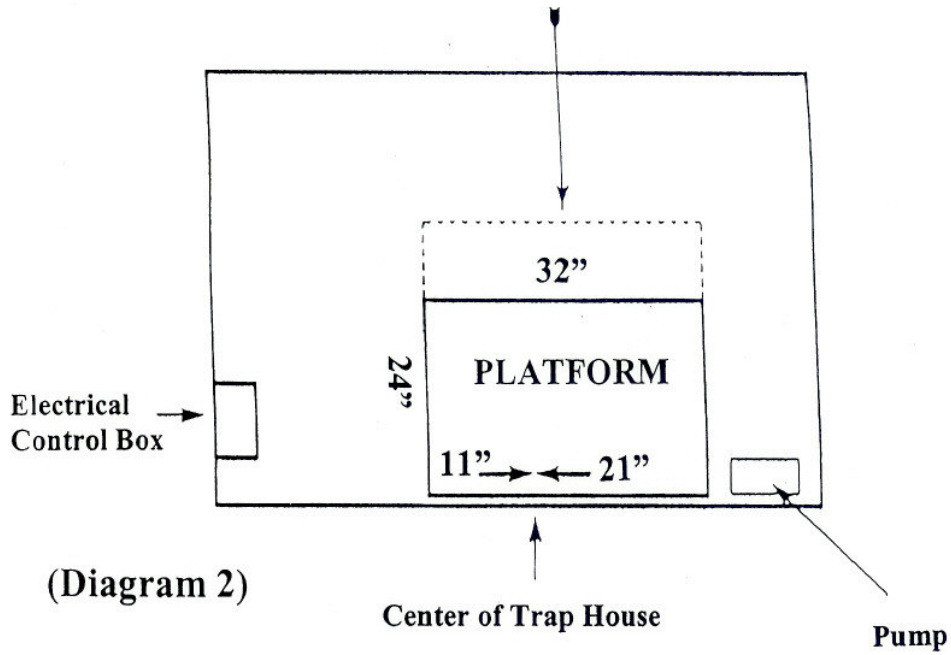
1. Place the trap machine in the trap house with the front of the machine as close as possible to the front wall. The platform which the trap machine sits on must be level. See Diagram 2. If necessary, the turret may be removed from the machine to place the trap into the house. See directions below.

2. The trap is to be set *off center* of the trap house. See Diagram 2.

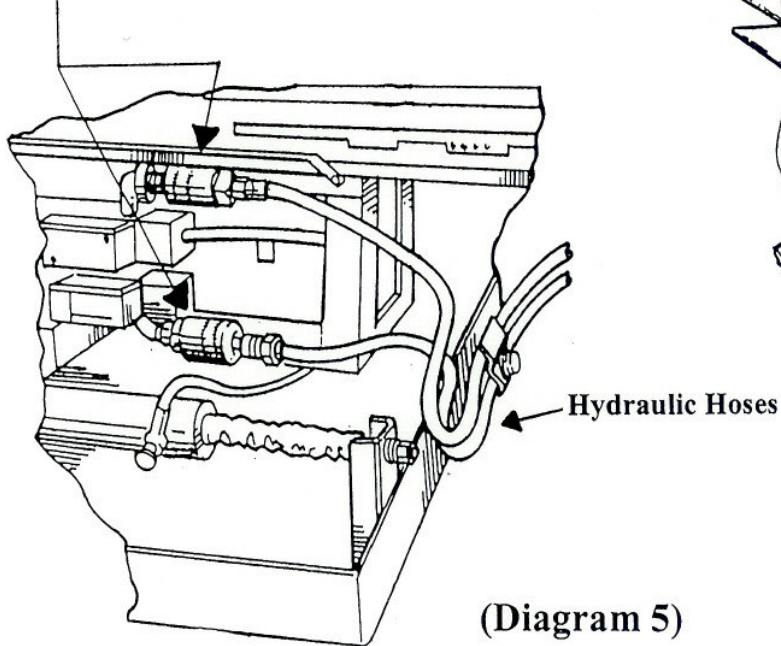
Measure and mark the center of the trap house. The front of the base is "marked" with a *notch* 10 inches in from the left facing the front of the machine. Set the machine so this line is now at the center of the trap house. The base of the trap machine should be set at 41 inches minimum from the ceiling; however, a setting of approximately 43 inches is best for loading targets.

3. Holes are provided in the corners of the base to secure the machine.
4. The pump reservoir is filled at the factory.
5. Place the pump on the floor on the left side of the trap house. See Diagram 2.
6. Connect the quick release fittings from the hydraulic hoses to the front of the trap machine. Slide back the outer sleeve of the female fitting while pushing onto the male fitting. Allow the female sleeve to slide forward to lock. Gently tug on the connections to ensure that they are securely fastened. See diagram 5.
7. To hold the hydraulic hoses in position, clamp to the right side of the machine approximately 3 feet (of hose) from the quick release fittings. Hoses must be positioned so they do not rub against each other or the wall of the trap house, when oscillating. See Diagram 6.

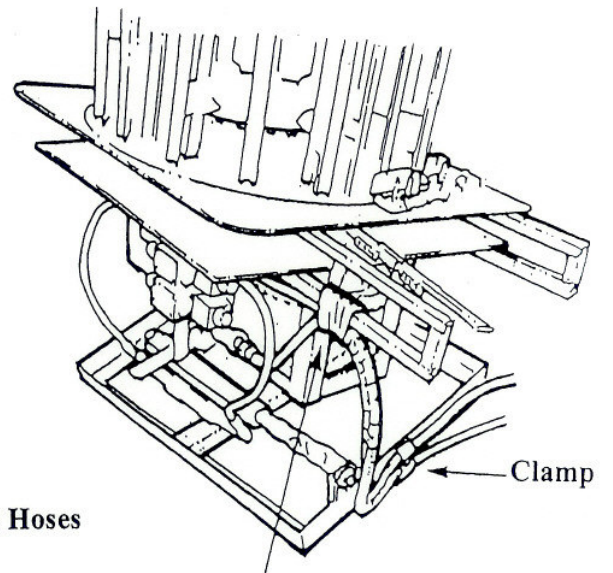
The platform can be extended back if you want a place to set targets or tools.



Quick Release Fittings
Hydraulic Male/Female Couplings
and O-Ring for Coupling



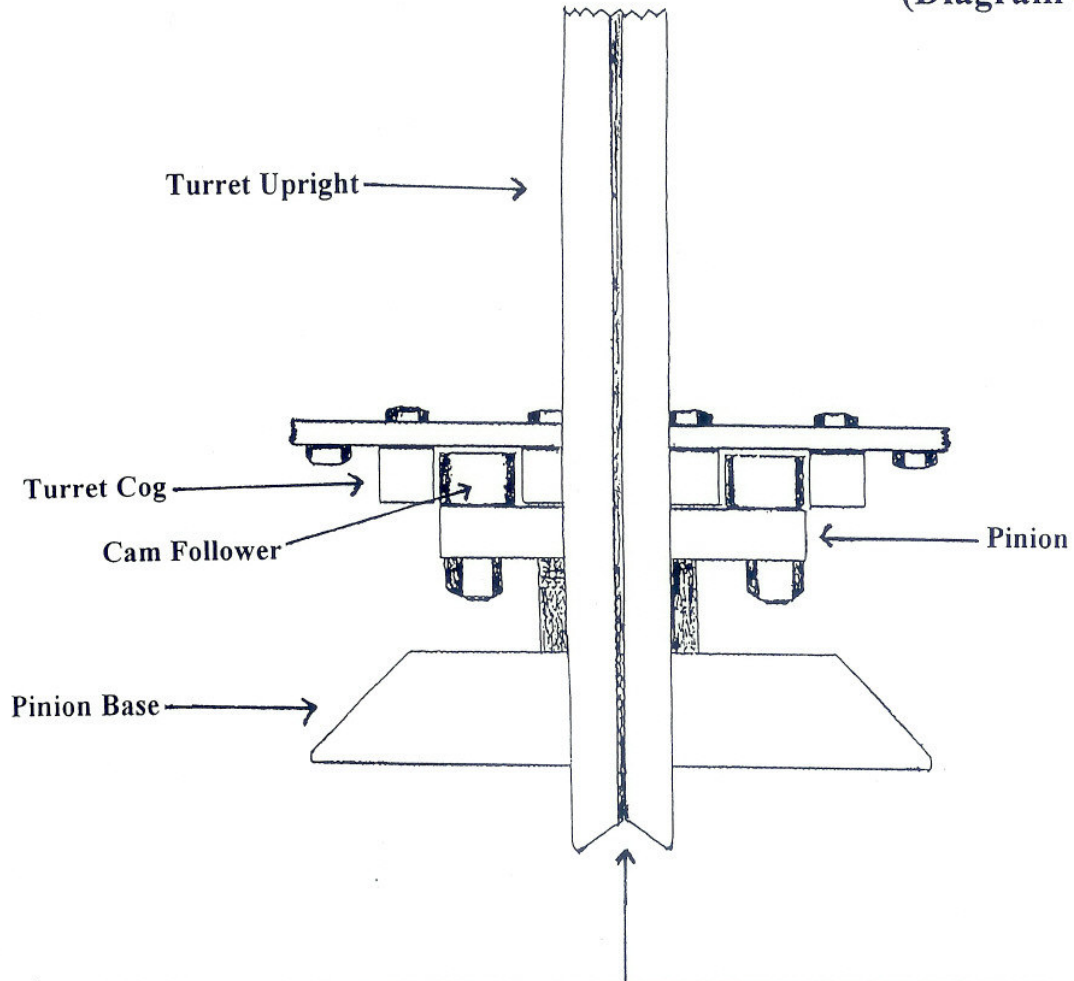
(Diagram 6)



REPLACEMENT OF THE TURRET

WARNING: To prevent damage to your machine the turret must be replaced the same way it was removed.

(Diagram 42)



Be aware that the turret upright will be aligned with the center of the pinion when the pair of cam followers are meshed with a pair of cogs

1. Observe how the cogs are meshed with the cam followers: i.e., the pair of cam followers have to mesh with a pair of cogs.
2. Two people, one on each side of the machine, must lift evenly to remove the turret. Place the machine inside the trap house. Replace the turret in the same way that it was removed.

MOUNTING THE POWER CONTROL BOX

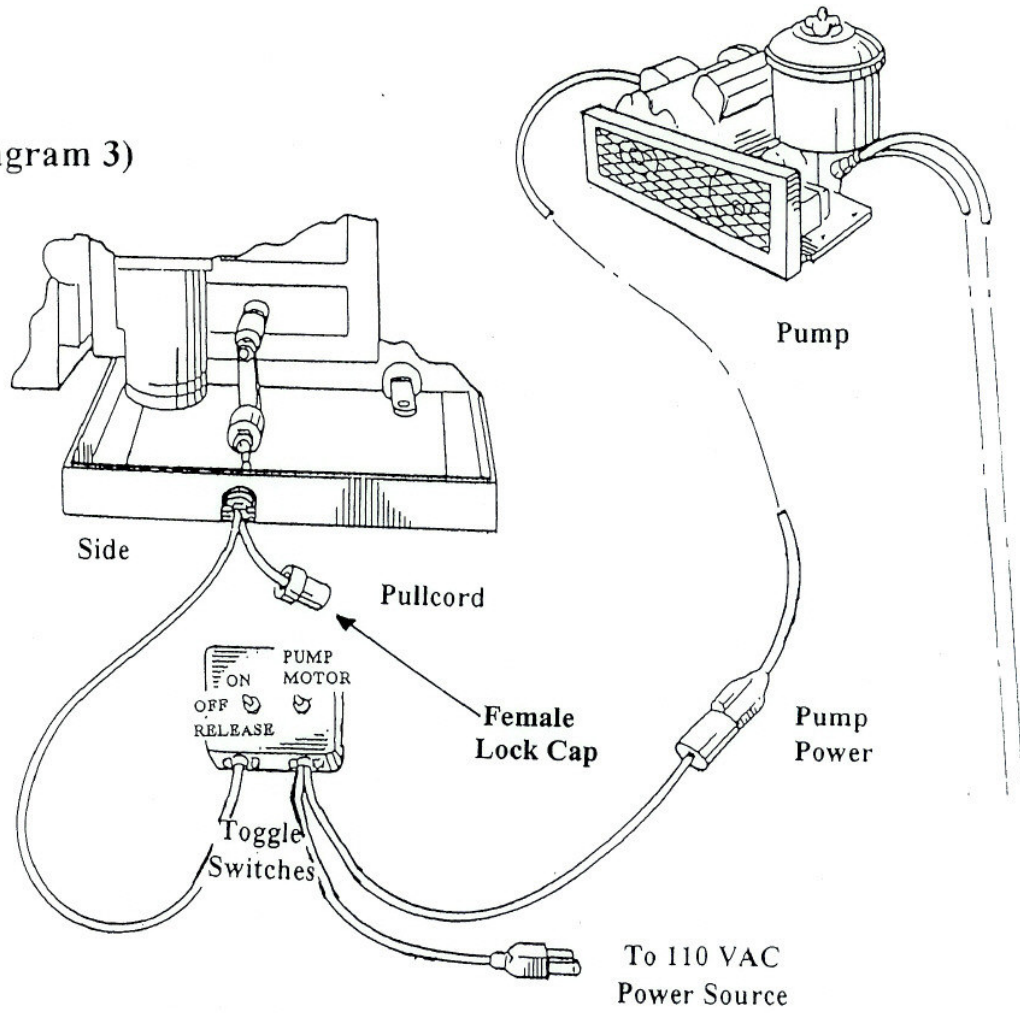
Mount the power control box just inside the trap house on the right wall near the ceiling of the trap house. This should be the side of the trap where personnel enter/exit the trap house. The power control box should be easily accessible so that it can be operated by placing your hand around the corner of the wall and not exposing your body to the front of the trap machine. The power control box will also be accessible to trap personnel when setting the machine for Doubles. Proper location of the control box is important to insure safety. *Never stand in front of a trap machine without having first released the target.* See Diagram 2.

CONNECTING THE TRAP TO THE POWER SOURCE

1. Check the power control box to confirm that the Motor and the On/Off/Release switches are in the *off position*. When both toggle switches are snapped downward they are in the off position. See Diagram 3.
2. Connect the pump to the power control box by plugging the pump motor into the outlet coming from the power control box. See Diagram 4.
3. The trap machine uses 110 volt AC power. Connect the trap machine to the power source using the plug from the power control box.
4. Connect the pullcord to the machine. The pullcord must have a male Bryant adapter (Winchester type pullcord). See Diagram 3.

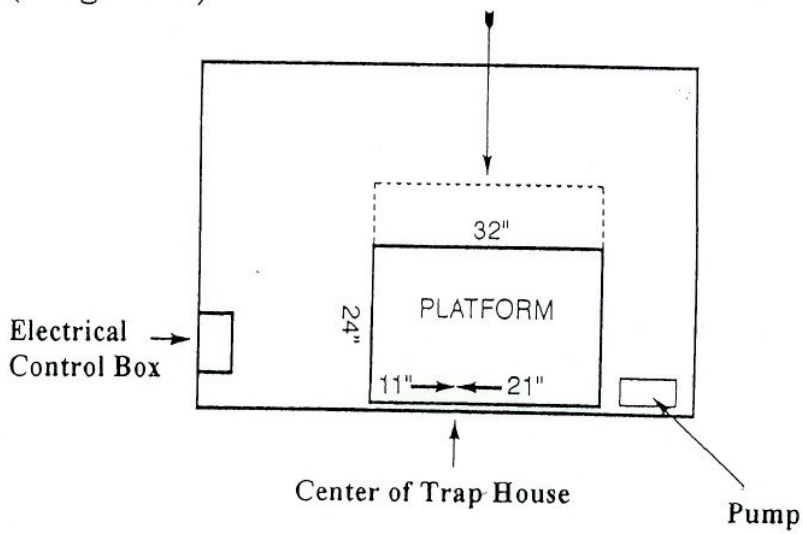
(Diagram 4)

(Diagram 3)



(Diagram 2)

The platform can be extended back if you want a place to set targets or tools.



HOW THE PAT-TRAP® AUTOMATIC DOUBLES MACHINE WORKS

Turn on the trap machine. The throw arm advances to a point where the activator comes to Switch #2 and stops the throw arm in the *cocked position*. See Diagram 78 and 80.

When the trap release switch is activated, Switch #1 overrides Switch #2; which then advances the throw arm off the throw arm brake causing the machine to fire. See Diagram 9.

As the activator leaves Switch #2, it passes Switch #3, which activates Relay #1, causing the elevator to go up, the turret to index and the oscillation interrupter/timer to start for a pre-determined length of time.*

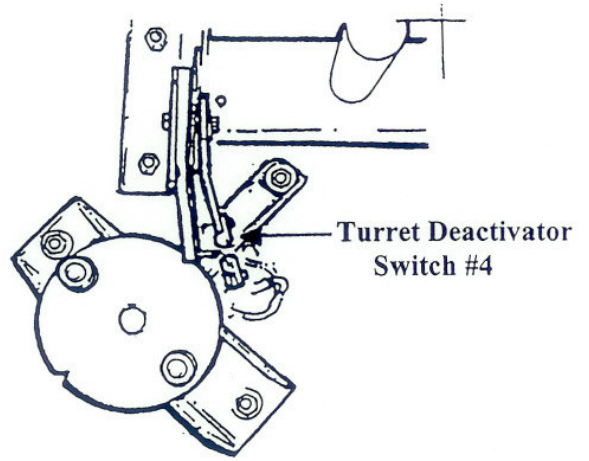
Switch #5 (Diagram 8), which is under the elevator, holds Relay #1 until Switch #4 (Diagram 7), which is under the turret, is activated. See Diagram 8/7.

Switch #4 is turned off when the turret is indexed and Relay #1 disengages and advances the throw arm to Switch #2 which then stops the throw arm in the cocked position. See Diagram 7.

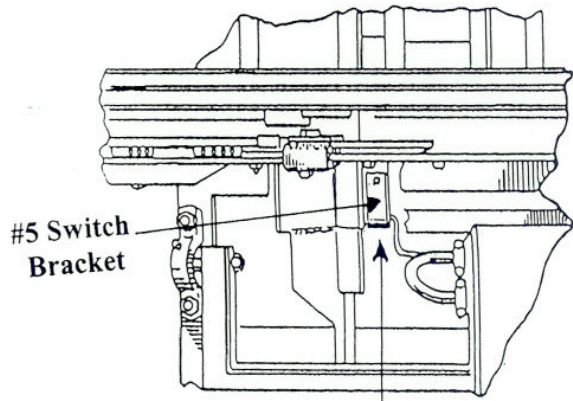
*The machine angles to the left until switch #12 comes to the magnet activating Relay #2, causing the machine to change directions to the right. Switch #11 holds the Relay engaged until switch #11 reaches the magnet, breaking the circuit which then disengages Relay #2 causing the machine to cycle left. The sequence is the same for switches 11A and 12A on the wobble machine. See Diagram 50 and 51.

Switch #1	Trap release switch
Switch #2	Throw arm limit switch (black wire) connected to the white and black wires
Switch #3	Turret activator switch (red wire) connected to the green and red wires
Switch #4	Turret deactivator switch
Switch #5	Elevator switch (red wire)
Switch #11	Right-angle limit switch (black wire)
Switch #12	Left-angle limit switch (red wire)
Switch #11A	High-angle limit switch (red wire)
Switch #12A	Low-angle limit switch (black wire)

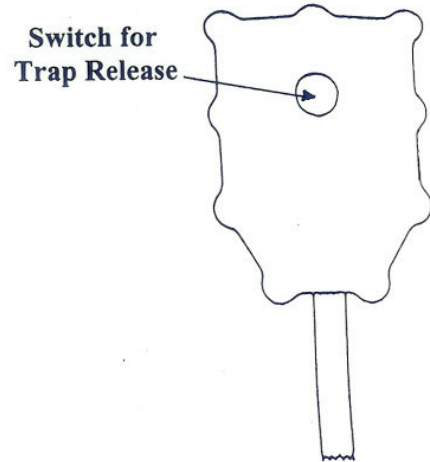
(Diagram 7)



(Diagram 8)

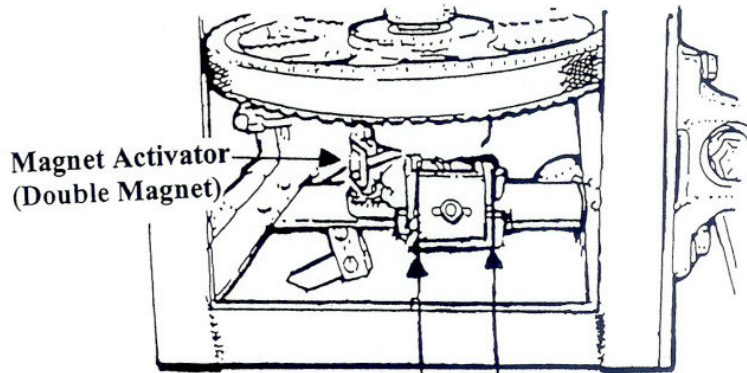


View from back of trap elevator
Proximity Switch #5
(N.O.) Red Wire



(Diagram 9)

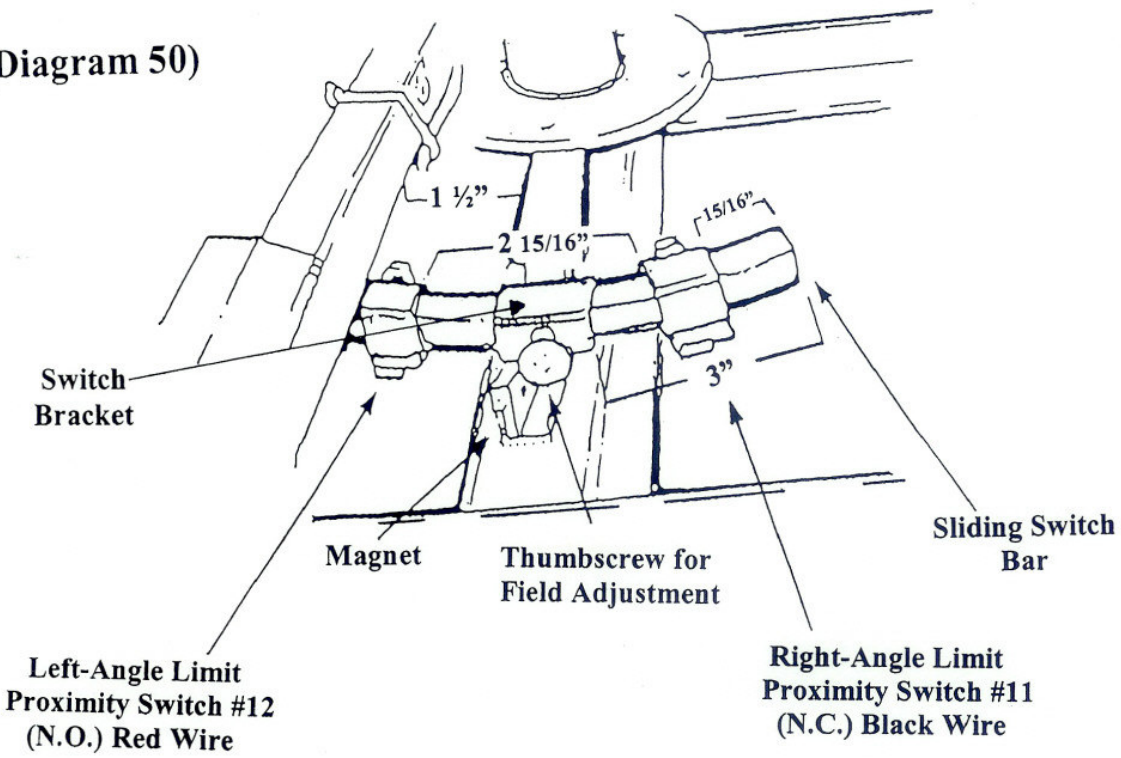
Trap Release for Pullcord
Switch # 1



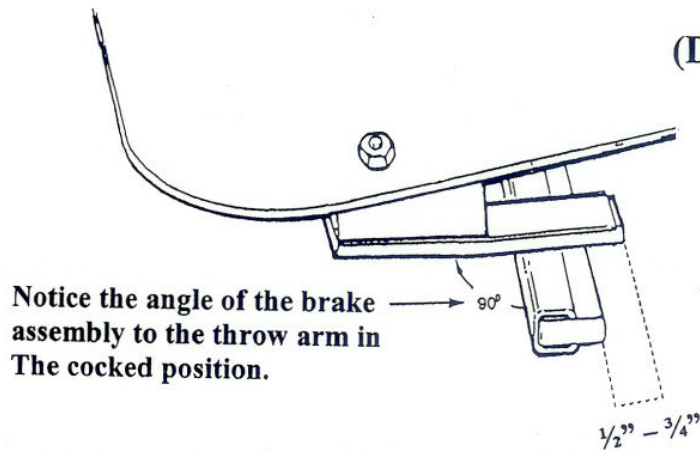
(Diagram 78)

Field-Angle Adjustment

(Diagram 50)

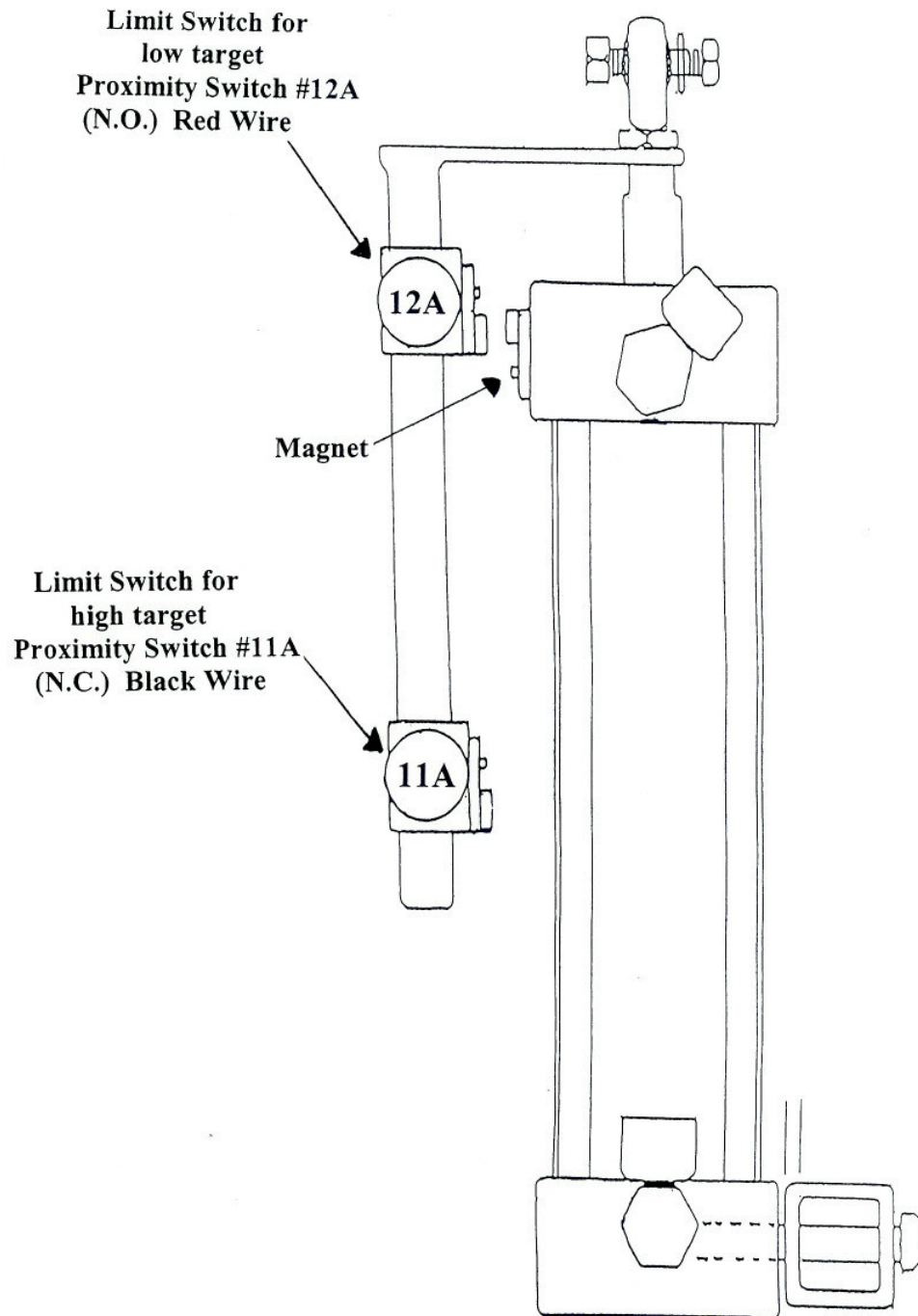


(Diagram 80)



**** The stopping position of the throw arm on the brake is approximately 1/2" to 3/4" behind the end of the brake, which is determined by the position of the #2 and #3 switch bracket.

(Diagram 51)



TURNING YOUR PAT-TRAP® MACHINE “ON”

1. Push the Pump Motor toggle switch *up* to the ON position. See Diagram 11.

IMPORTANT: Turn the motor switch ON *first* so that the hydraulic system is pressurized to prevent any air from entering the system. Allow the pump to warm up the hydraulic oil before operating the machine. In warm weather this will not matter. Colder temperatures may cause the throw arm to cycle repeatedly if the hydraulic oil is not warm. Please refer to the section: Cold Weather Adjustment Temperature/Release Time.

2. Push the On/Off/Release toggle switch *up* to the ON position.

TURNING THE PAT-TRAP® MACHINE “OFF”

1. Standing outside and to the side of the trap house; push the On/Off/Release toggle switch all the way *down* to release and then let go . The trap will throw the target and not cock the spring.
2. Push the Motor toggle switch *down* to the OFF position.

LOADING THE MACHINE

The PAT-TRAP® machine holds four (4) full cases of clay targets.

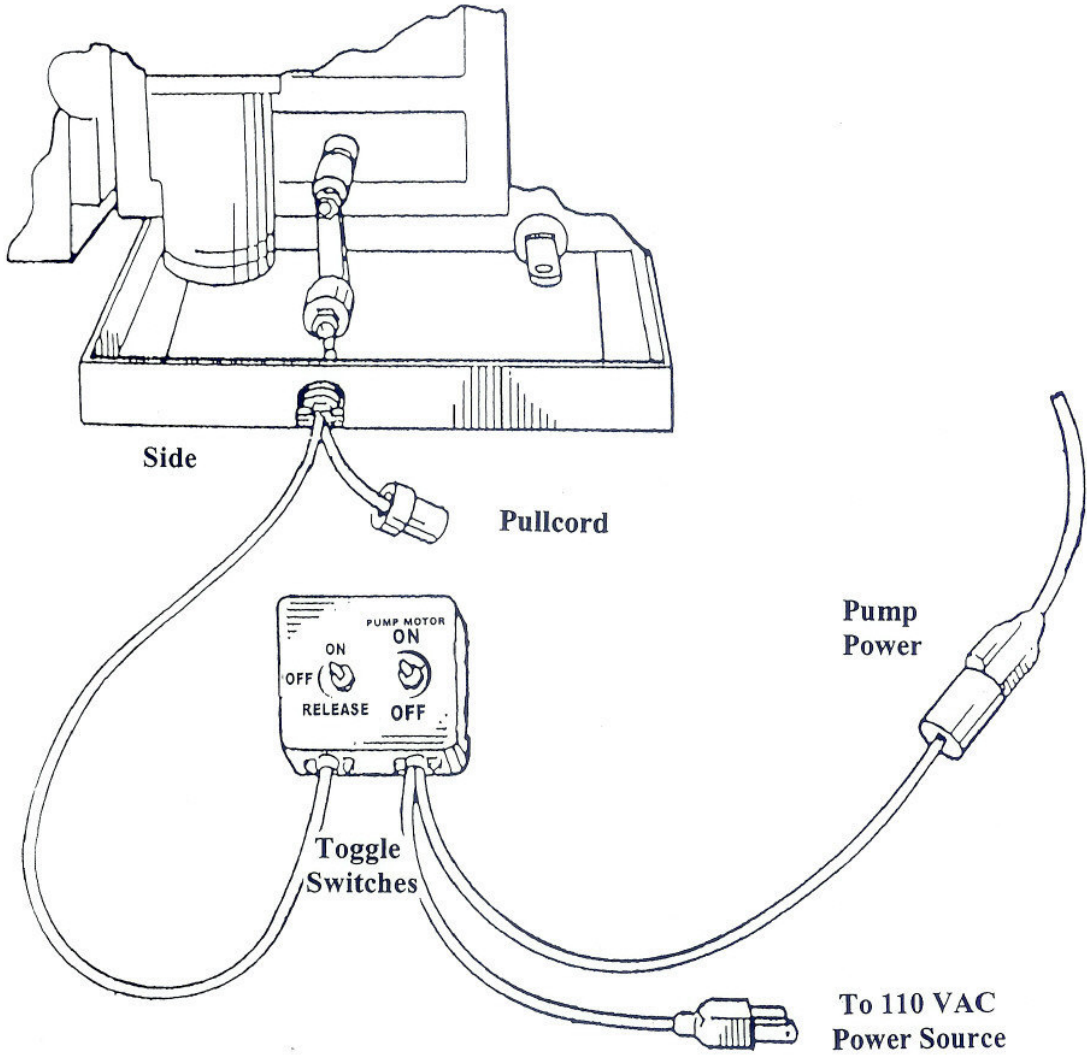
Never attempt to load the clay targets without first releasing the trap machine.

Leave the On/Off/Release switch in the Release position. If the machine's target stalls are empty or the targets are below the rollers, load all the turret stalls except those in front of the rollers. Use the clutch to advance the turret until the target drops through the hole and the stalls ahead can be filled. Remove the dropped target from the machine, then fill the empty target stalls.

IMPORTANT

NEVER STAND IN FRONT OF A TRAP MACHINE. THE TRAP MACHINE MUST BE TURNED OFF AND THE SPRING RELEASED BEFORE ENTERING THE TRAP HOUSE. NEVER ATTEMPT TO MAKE ANY ADJUSTMENT WHEN THE THROW ARM IS COCKED.

(Diagram 11)

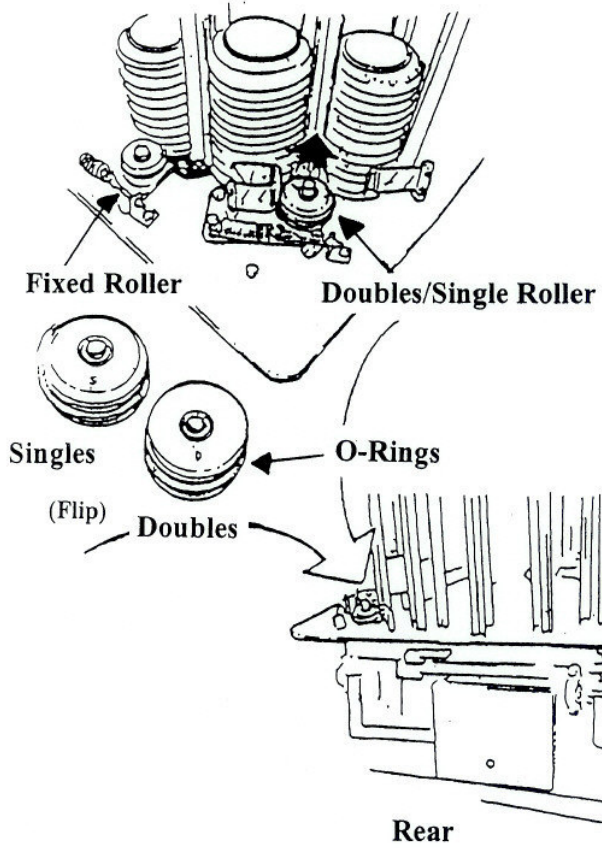


PAT-TRAP® SINGLES

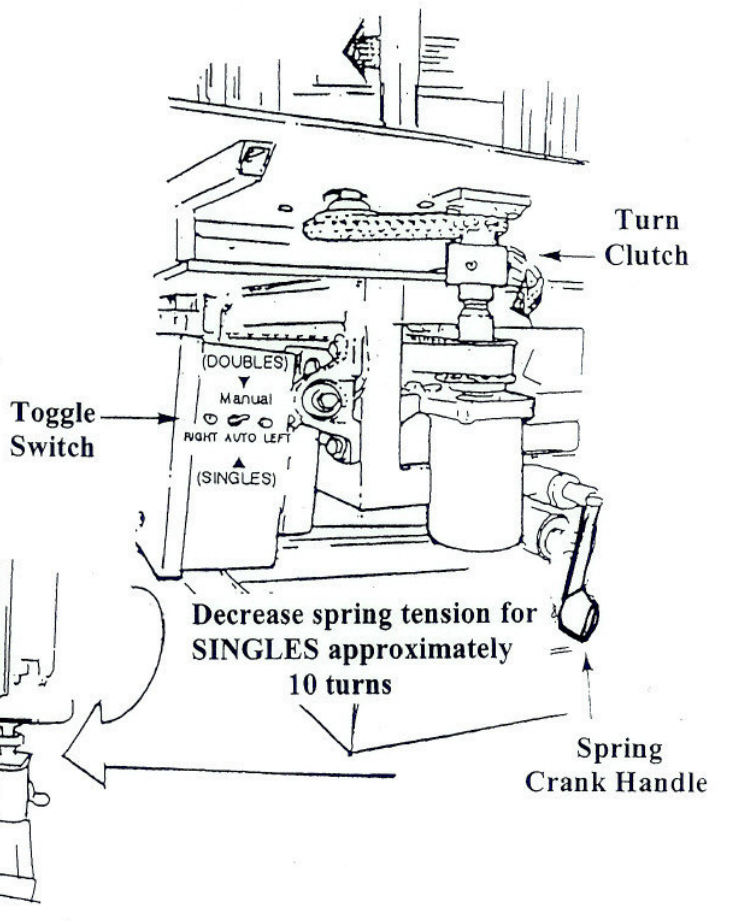
1. Standing clear of the trap machine, *release the target*. Push the On/Off/Release toggle switch all the way down to the release position and then let go.
2. Advance the turret ahead until the pressure is off the lower roller and targets. To advance the turret, turn the clutch *clockwise*. *Never push the turret directly or you risk damaging the turret*.
3. The lower roller must be turned so the stamped "S" is facing upward. Slide the roller off, invert and replace the roller. See Diagram 65.
4. Spring tension can be adjusted by rotating the spring crank *clockwise to increase tension, counter-clockwise to reduce tension*. If changing from Doubles to Singles, rotate the spring crank counter-clockwise the same number of turns that were used to increase the tension for Doubles, approximately 10 rotations. See Diagram 64.
5. On the trap machine electrical box, the toggle switch must be pushed down to the AUTO position. This will return the machine to automatic horizontal oscillation. See Diagram 64.
6. *Before exiting* the trap house, staying clear of the trap, reach over to the power control box and release the target to prevent accidental target release.
7. Once out of the trap house, push the On/Off/Release toggle switch up to the ON position.

(Diagram 63)

Align turret to change roller



(Diagram 64)



(Diagram 65)

PAT-TRAP® DOUBLES

IMPORTANT: BE SAFE --- Stay clear of the throw arm travel path and *never* stand in front of the trap machine. See Diagram 18

1. *Release the target.* The power to the pump motor can be left on.
2. Advance the turret ahead until the pressure is off the Doubles roller and targets. To advance the turret, turn the *clutch clockwise*. Never push the turret directly or you risk damaging the turret. See Diagram 15.
3. The lower roller must be turned so that the stamped "S" is facing downward. Slide the roller off, invert and replace the roller. See Diagram 71.
4. The spring tension must be increased to throw Doubles. Rotate the spring crank *clockwise* approximately 10 rotations from the Singles setting. See Diagram 15.
5. On the trap machine electrical box, the toggle switch must be pushed up to the MANUAL position. See Diagram 15. This will stop the automatic horizontal oscillation and will activate the Right and Left buttons. When the trap is ON, the throw arm is ready to fire. The throw arm can be fired by pushing the switch for the trap release (pullcord button). It can also be fired by hand --- by pushing the arm forward off the brake when the machine is either *on or off*. Staying clear of the trap machine, reach over to the power control box and turn the On/Off/ Release switch to the On position. See Diagram 3.

Use the *Right* or *Left* button to move the trap machine to the center.

6. *Before exiting* the trap house, staying clear of the trap, reach over to the power control box and *release* the target to prevent accidental target release.
7. Once out of the trap house, push the On/Off/Release toggle switch up to the On position.

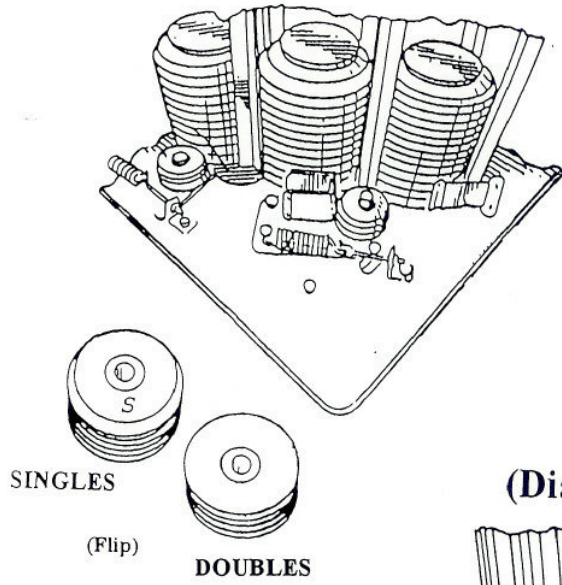
ADJUSTMENT FOR DOUBLES

The adjustment for Doubles should only have to be done the very first time the machine is used. Using a 7/16" wrench, loosen the nut, move the target finger in 1/8" increments. Pull the target finger toward *self* to lower the height of the right target. Push *in* to raise the height of the right target. Tighten the nut. See Diagram 89. Refer to the section for the correct positioning of the Double Finger ("X" Finger).

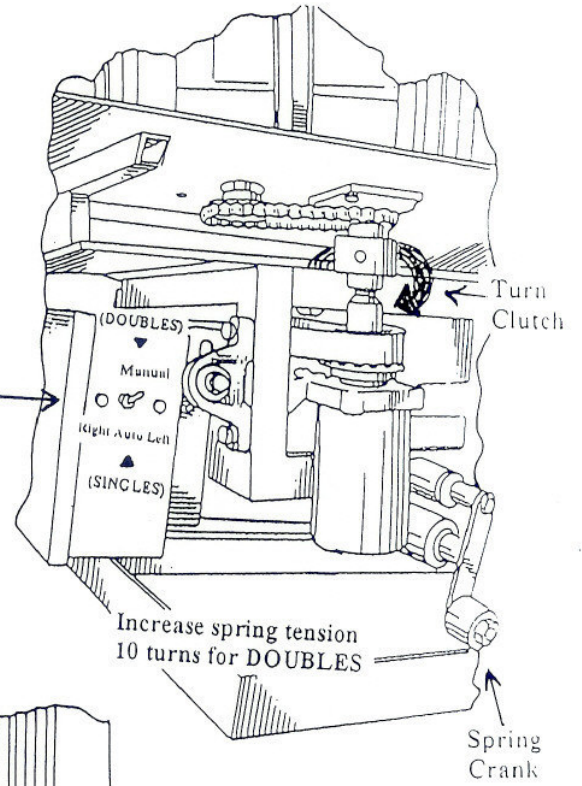
(Diagram 15)

(Diagram 14)

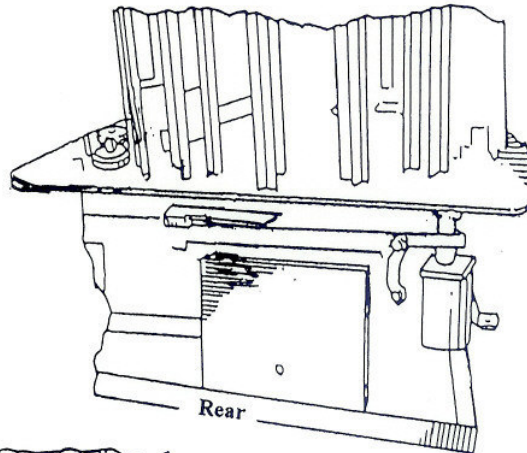
Align turret to change roller



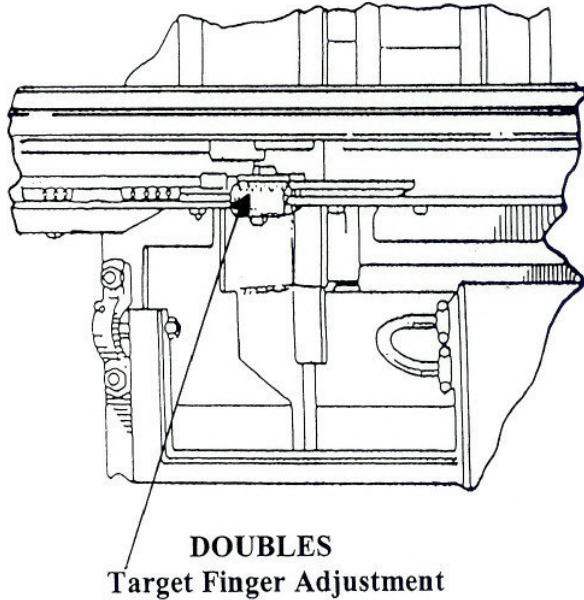
Toggle Switch



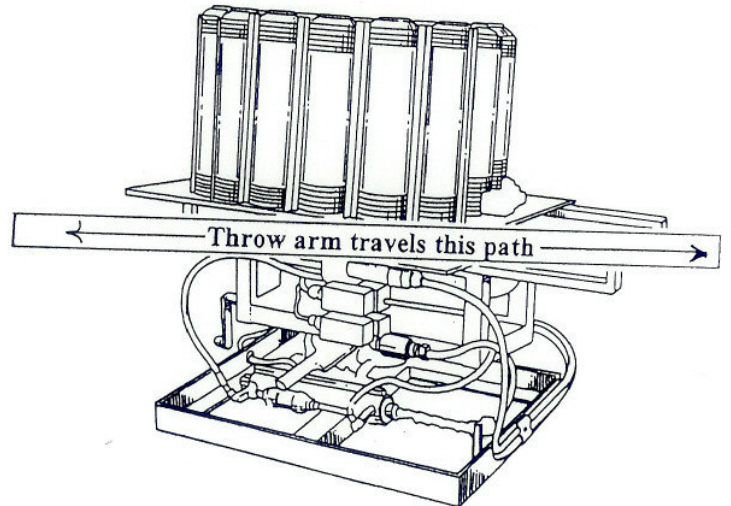
(Diagram 16)

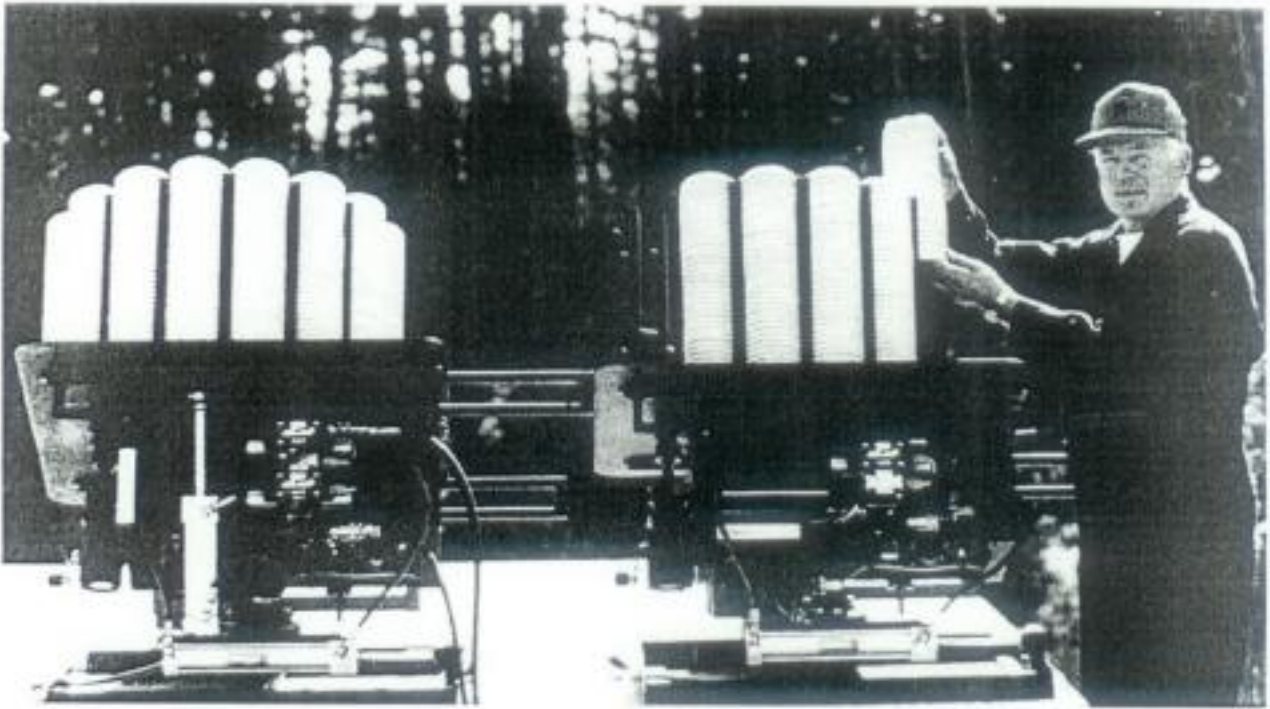


(Diagram 89)



(Diagram 18)

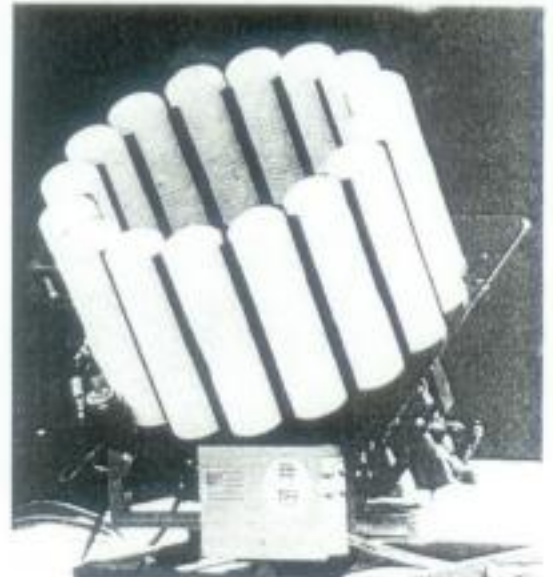
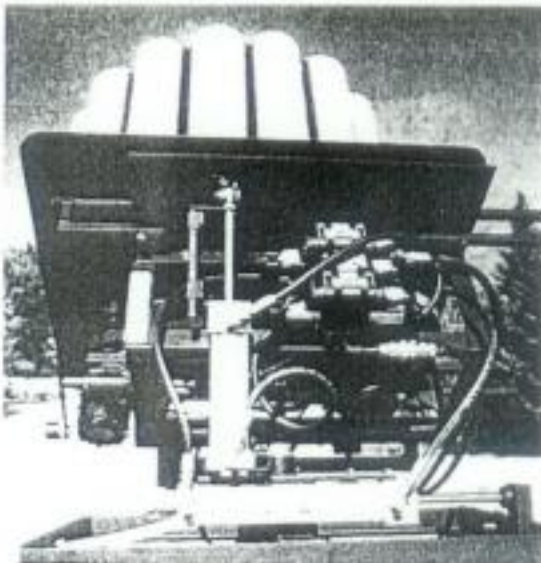




Pat-Trap® w/Wobble

Pat-Trap®

Stuart
Patenaude



SETTING DISTANCE/SPEED

Clockwise rotation of the crank *increases* the spring tension thus increasing the speed of the target and the distance it travels.

Counter-clockwise rotation of the crank *decreases* the spring tension. Continued counter-clockwise rotation will remove the tension from the crank and the spring tension lock-nut will hold. The elastic lock-nut holds the spring at the set minimum tension.

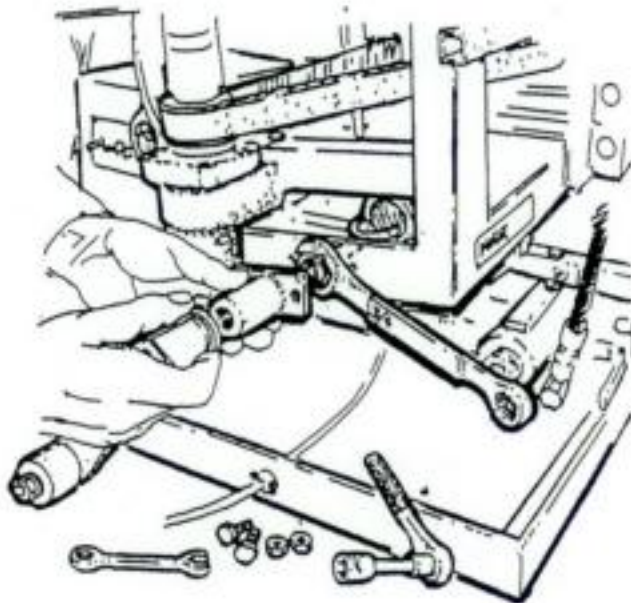
The standard minimum tension should be set so that the spring tension for a Singles target is as follows:

1. Remove the crank by rotating counter clockwise.
2. Remove the nylon washer,
3. Remove two (2) $\frac{1}{4}$ " bolts from the stand off collar.
4. Remove the stand off collar.
5. See the elastic lock-nut. Use a $\frac{3}{4}$ " wrench on this nut to adjust the distance/speed.
6. When the proper distance/speed is achieved, back off the elastic lock-nut three (3) turns.
7. Re-assemble the parts.
8. When the crank becomes snug, continue to turn three (3) more times for proper setting.

Whenever a SINGLES distance is to be set, back off the crank to neutral, crank back to snug, then give another three (3) turns for proper setting.

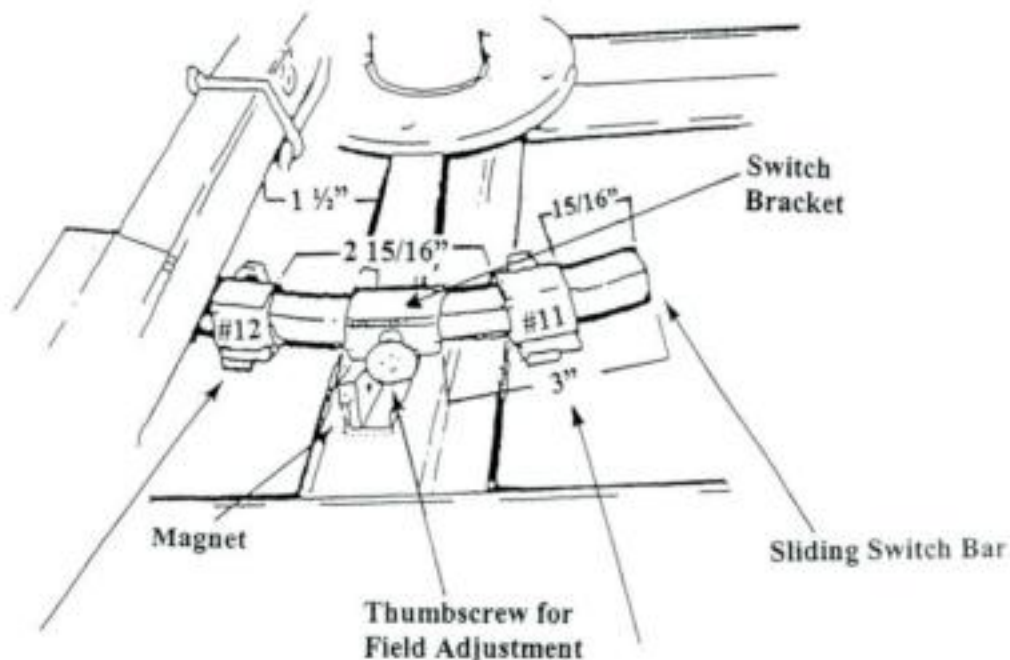
NOTE: SINGLES are always set first, then follow the procedures described for DOUBLES.

(Diagram 21)



FIELD-ANGLE ADJUSTMENT (Sliding Switch Bar Style)

(Diagram 66)



Left-Angle Limit Proximity Switch #12 (N.O.) Red Wire	Loosen Thumbscrew(s) to Adjust	Right-Angle Limit Proximity Switch #11 (N.C.) Black Wire
---	--------------------------------------	--

The measurements in the above diagram are for 2-hole targets. The 2 15/16" spread between the switch holders allows 5 7/8" of total cylinder rod travel --- which equals a 2-hole target. 7" of travel equals a 3-hole target.

If the flight-paths of both the right and left targets are too far to the left, slide the switch bar to the right. 1/8" will make a significant difference.

IMPORTANT: NEVER STAND IN FRONT OF A TRAP MACHINE. THE TRAP MACHINE MUST BE TURNED OFF AND THE SPRING RELEASED BEFORE ENTERING THE TRAP HOUSE. NEVER ATTEMPT TO MADE ANY ADJUSTMENT WHEN THE THROW ARM IS COCKED.

ADJUSTING HEIGHT OF TARGETS

IMPORTANT: NEVER STAND IN FRONT OF A TRAP MACHINE. THE TRAP MACHINE MUST BE TURNED OFF AND THE SPRING RELEASED BEFORE ENTERING THE TRAP HOUSE. NEVER ATTEMPT TO MAKE ANY ADJUSTMENT WHEN THE THROW ARM IS COCKED.

Tilt the table by pushing up on the front of the machine. The elevation cog can be positioned up or down. The elevation cog can be roughly adjusted by loosening the assembly and sliding it up or down. See Diagram 22

ANGLE ADJUSTMENTS

RELEASE THE TARGET BEFORE ENTERING THE TRAP HOUSE. NEVER ATTEMPT TO MAKE ANY ADJUSTMENT WHEN THE ARM IS COCKED. NEVER STAND IN FRONT OF A COCKED TRAP MACHINE.

First, set the STRAIGHT-AWAY target; then follow the procedure for the right and left angle adjustment for 2-hole targets.

STRAIGHT-AWAY TARGETS

Set the toggle switch to the MANUAL position. Use the right and left buttons to achieve STRAIGHT-AWAY TARGETS. See Diagram 13

2-HOLE TARGETS

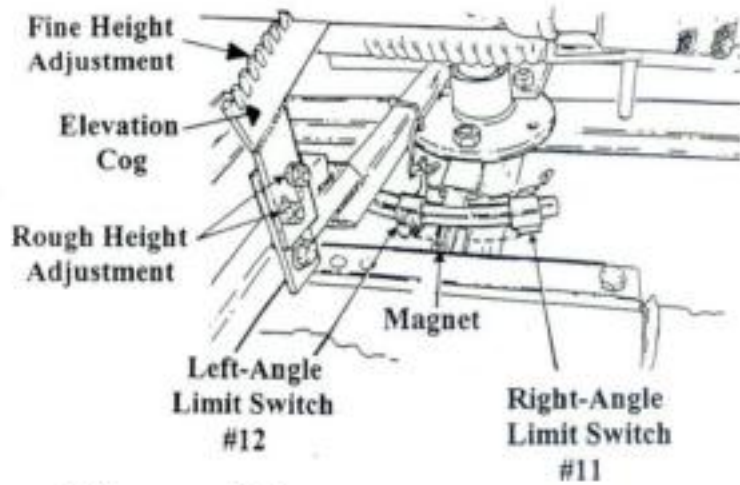
Loosen the thumbscrews. Slide the angle switch *toward the "magnet" to decrease the angle*. Slide the angle switch *away from the "magnet" to increase the angle*. See Diagram 67

Measure and set the switch approximately $1 \frac{3}{4}$ " from the "magnet" to the front edge of the right-angle limit switch. Re-tighten the thumbscrew to hold the switch in place. See Diagram 68

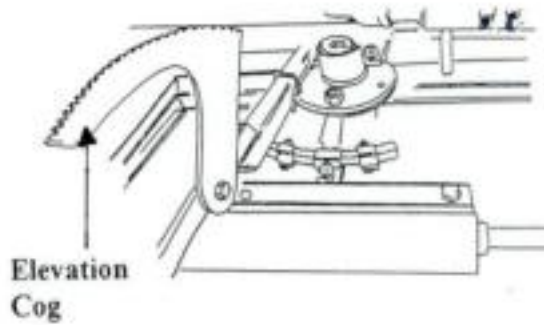
Do the same for the left-angle switch. The total travel path of the oscillating cylinder rod is $5 \frac{7}{8}$ ". $2 \frac{15}{16}$ " left of center and $2 \frac{15}{16}$ " right of center.

IMPORTANT: NEVER INCREASE THE LIMIT SWITCHES BEYOND THE TRAVEL PATH OF THE CYLINDER. THIS MAY CAUSE THE HYDRAULIC CYLINDER TO "BOTTOM OUT" AND DAMAGE THE CYLINDER.

"OLD STYLE" SWITCH ADJUSTMENT

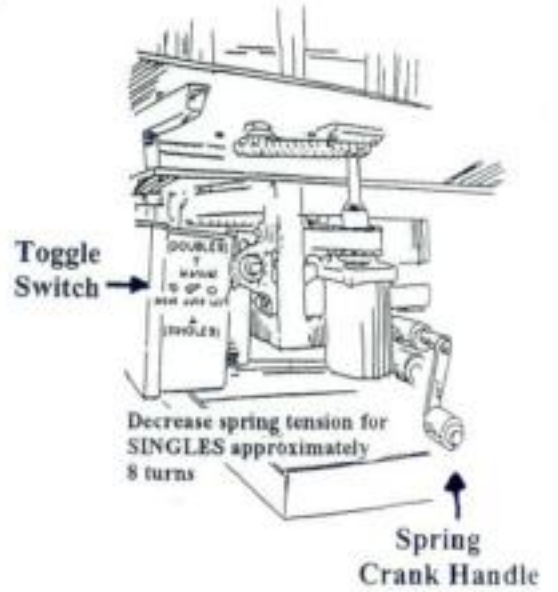


(Diagram 67)

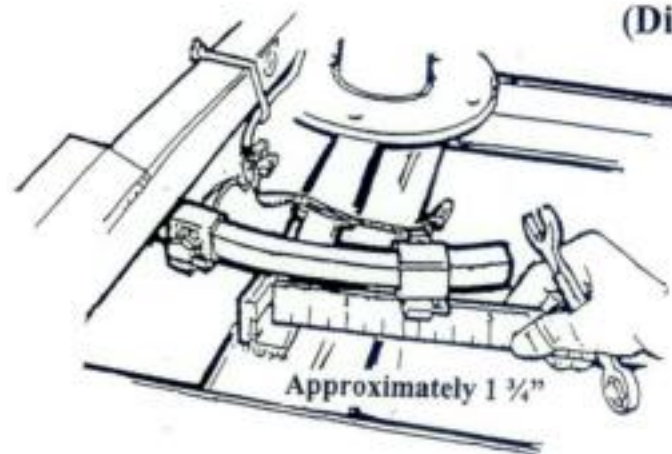


(Diagram 22)

(Diagram 13)



(Diagram 68)



INSTALLING PLASTIC PINION BACKSTOP, SPRING and #4 SWITCH BRACKET (Proximity Switch Style)

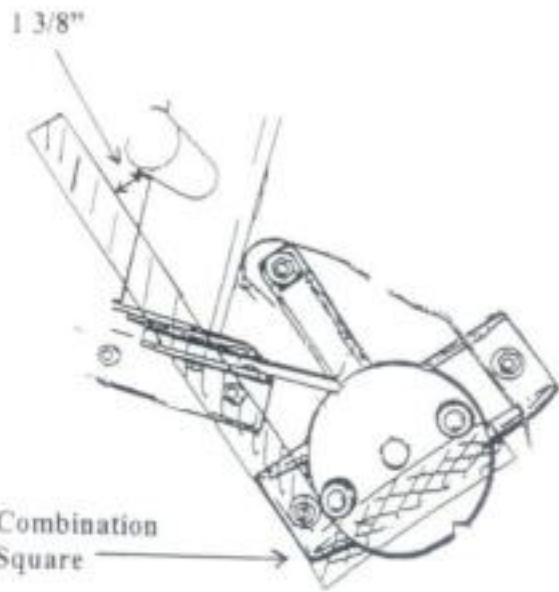
1. Remove the turret being careful not to loose the spacer washer between the kingpin base and the turret (most traps do not have a spacer washer).
2. Using the $\frac{1}{4}$ - 28 x 1 $\frac{1}{8}$ " bolt, install the backing, plastic and spring on to the kingpin base. See Diagram 70. To "time the turret" properly, use a combination square so that the pinion wheel's cam followers are up against the square and are at 90 degrees, at 1- $\frac{3}{8}$ " from the kingpin. See Diagram 69. Now, slide the plastic all the way into the notch. Tighten the bolt. Check to make sure the end of the spring is even with the end of the plastic.
3. Place the switch bracket on the kingpin base with the washer and nut. See Diagram 70. Set the switch so that the spring is as close to the switch as possible, because when the plastic backstop is out of the notch, the spring will bend in and move closer to the magnet. Use two $\frac{7}{16}$ " wrenches to tighten the nut, hold the head of the bolt so that the bolt doesn't spin when tightening the nut.

ADJUSTING SWITCH #4 (Proximity Switch Style)

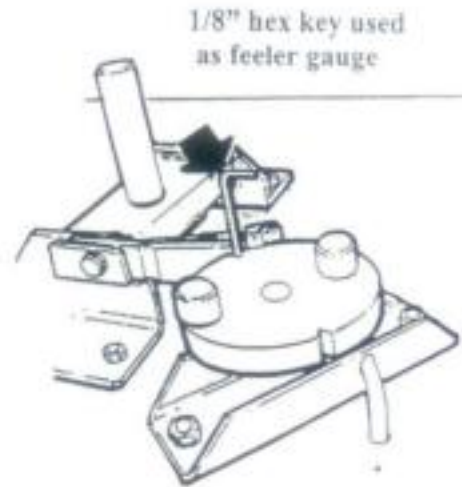
Turn the power off to the machine. Disconnect the power wires to the proximity switch*. Use an ohm meter (or continuity tester) to check when the switch is activated. Rotate the pinion wheel by turning the clutch by hand. The gap between the end of the plastic and the notch in the pinion wheel *must be* $\frac{1}{8}$ " when the switch is activated (when the switch closes). Use a $\frac{1}{8}$ " hex key as a feeler gauge to set the gap. See Diagram 26.

The correct setting is found by trail and error. Adjust the bracket by bending as necessary or use an adjusting screw. For example: If the turret does not stop indexing the gap is too little. Adjust by bending the bracket toward the front of the trap. See Diagram 26.

***NOTE: BE SURE TO DISCONNECT THE POWER WIRES; OR YOU MUST BLOCK THE ELEVATOR SWITCH BY PUTTING A STEEL RULER OR PUTTY KNIFE BETWEEN THE MAGNET AND THE PROXIMITY SWITCH.**

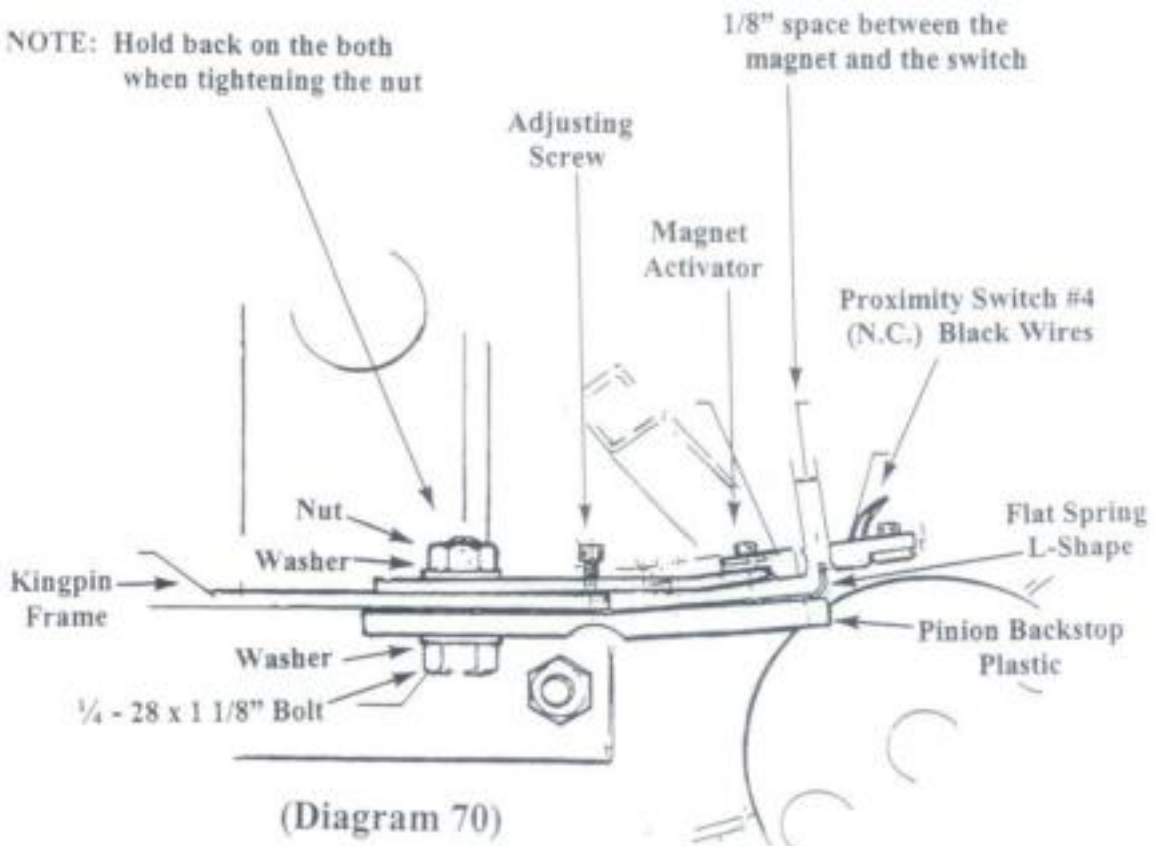


(Diagram 69)



(Diagram 26)

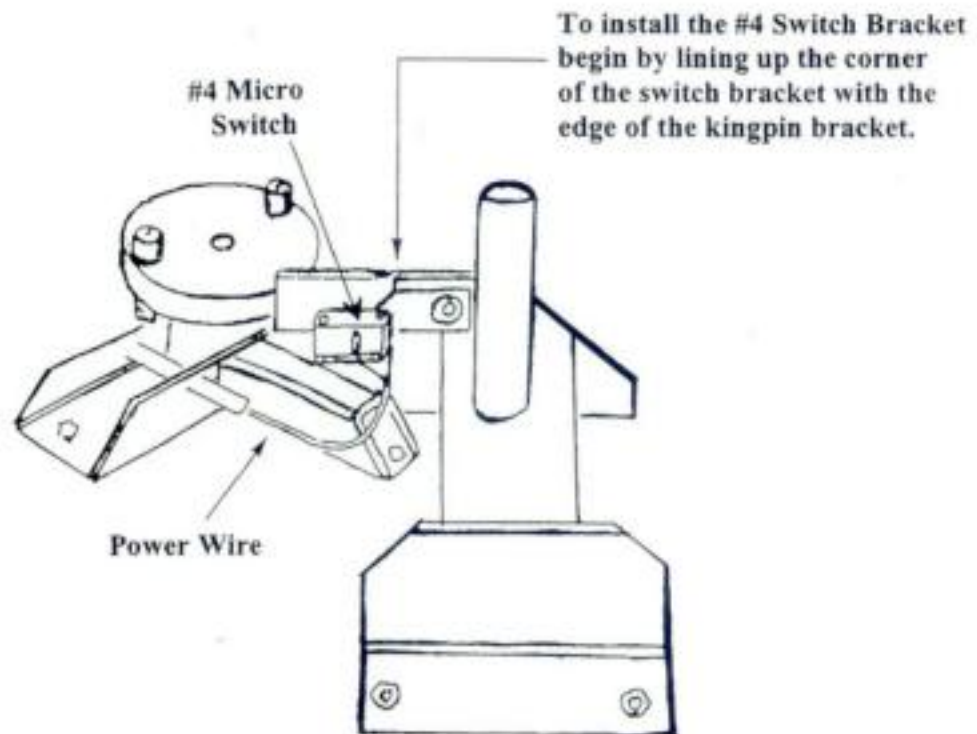
NOTE: Hold back on the both when tightening the nut



(Diagram 70)

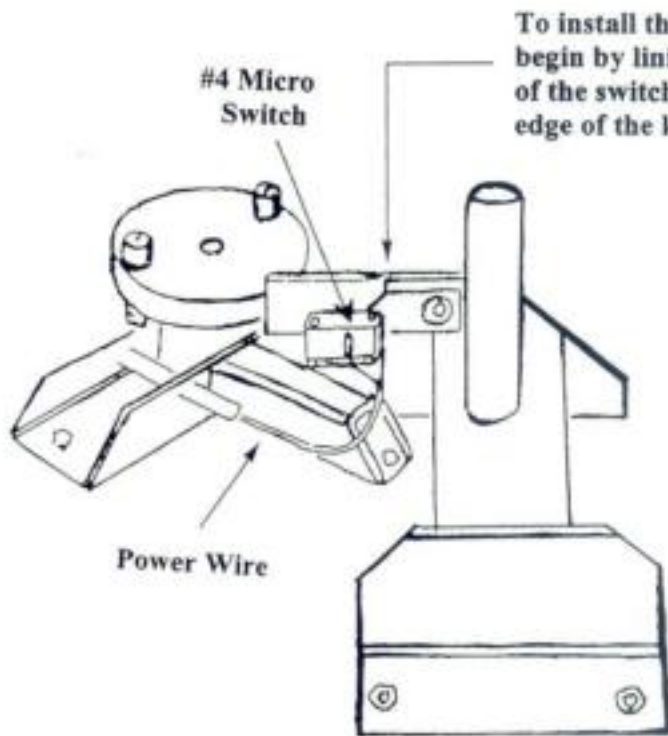
INSTALLING PLASTIC PINION BACKSTOP, SPRING and #4 SWITCH BRACKET (#4 Micro Switch Style)

1. Remove the turret being careful not to loose the spacer washer between the kingpin base and the turret (most traps do not have a spacer washer).
2. Using the $\frac{1}{4}$ - 28 x 1-1/8" bolt, install the backing, plastic and spring on to the kingpin base. See Diagram 72. To "time the turret" properly, use a combination square so that the pinion wheel's cam followers are up against the square and are at a 90 degree angle, at 1 3/8" from the kingpin. See Diagram 69. Now, slide the plastic all the way into the notch. Tighten the bolt.
3. Place the switch bracket on the kingpin base with the washer and nut. See Diagrams 72 and 73. Use two 7/16" wrenches to tighten the nut, hold the head of the bolt so that the bolt doesn't spin when tightening the nut.



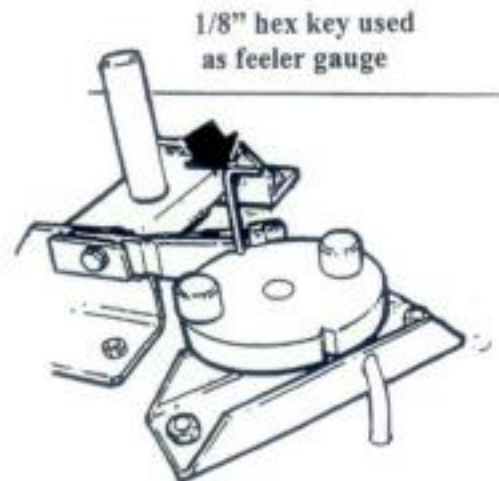
(Diagram 73)

ADJUSTING THE #4 SWITCH (#4 Micro Switch Style)



(Diagram 73)

To install the #4 Switch Bracket begin by lining up the corner of the switch bracket with the edge of the kingpin bracket.



(Diagram 26)

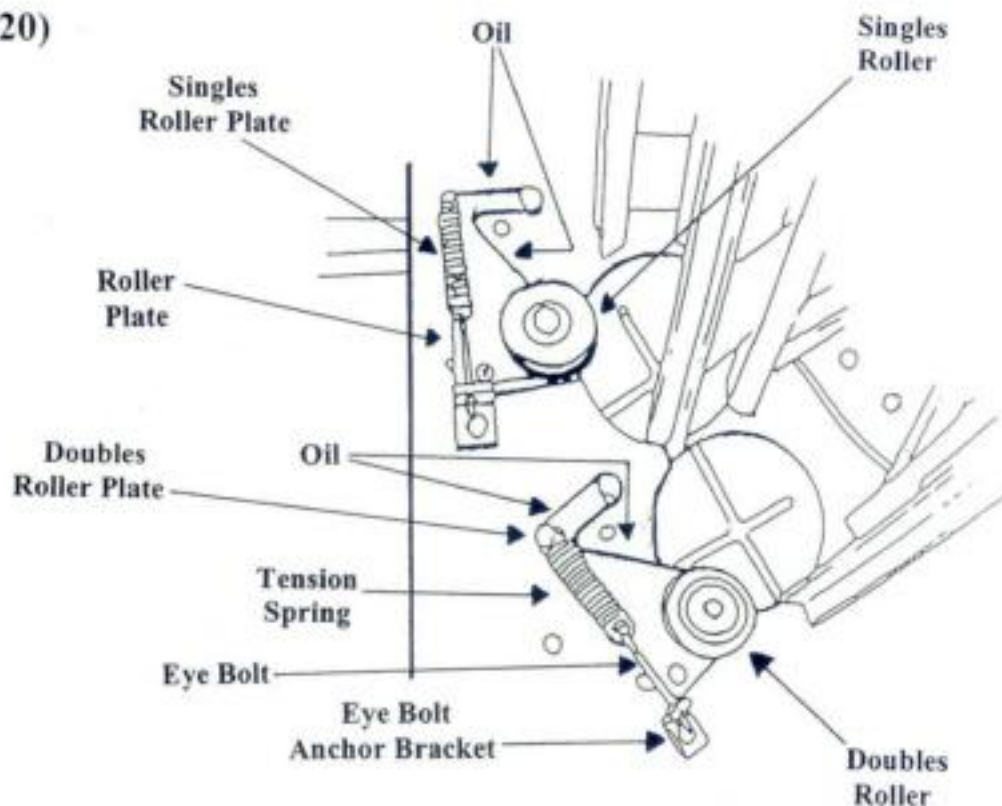
Turn the power off to the machine. Disconnect the power wires to the roller switch. Use an ohm meter (or continuity tester) to check when the switch is activated. Rotate the pinion wheel by turning the clutch by hand. The gap between the end of the plastic and the notch in the pinion wheel *must be* 1/8" when the switch is activated (when the switch closes). See Diagram 15. Use a 1/8" hex key as a feeler gauge to set the gap. See Diagram 26.

Slide the switch bracket *toward* the pinion wheel to close the gap; slide *away* from the pinion to open the gap. If there is not enough slot to adjust for the 1/8" gap, the bracket can be bent: bend *IN* toward the flat spring to close the gap. See Diagram 72. Bend *AWAY* from the flat spring to open the gap.

NOTE: You can hear this switch "click" when it closes while setting the 1/8" gap.

ROLLER PLATE MAINTENANCE

(Diagram 20)



NOTE: There needs to be enough spring tension to keep the stack of targets from slipping down past the rollers. The tension is pre-set at approximately fourteen (14) pounds.

PROBLEM:

1. Dropping Doubles while in Singles mode.
2. Breaking Targets

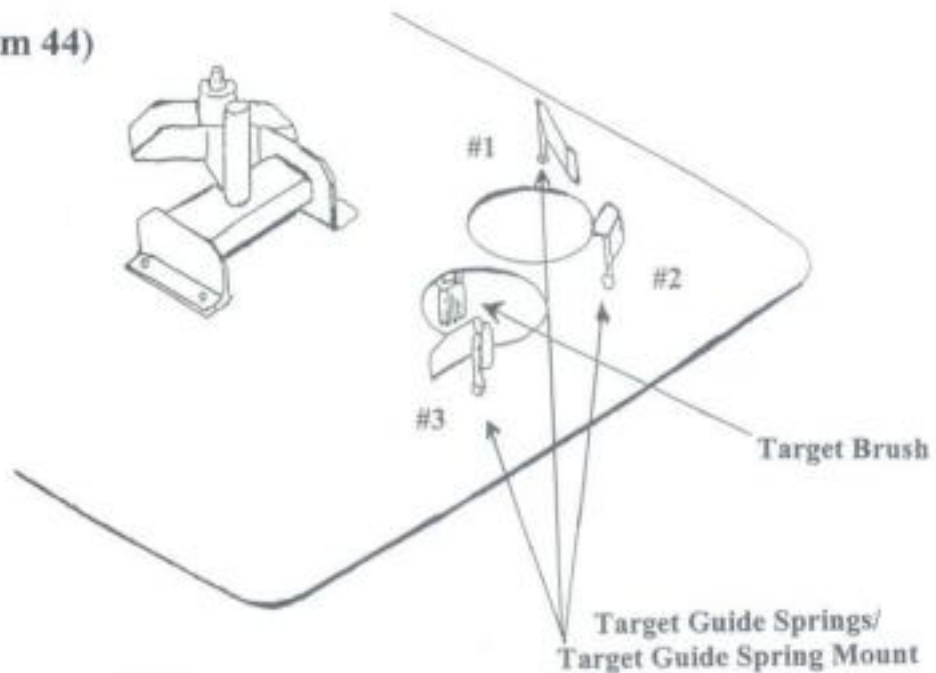
SOLUTION:

Place a *few* drops of light oil under the edges of the roller plate. Be sure to inspect the roller plates every three weeks by pulling back and forth on the roller to see that they slide smoothly. Any excessive oil will drop down onto the throw arm and brake causing the machine to cycle.

DO NOT USE sprays such as RemOil, WD-40 or other such oils as they may dissolve the clay target dust. Use 3 & 1 oil or a synthetic lubricant with teflon --- such as Super Lube.

TARGET BRUSH MAINTENANCE

(Diagram 44)



PROBLEM:

1. Breaking targets
2. Targets being thrown further to the right

SOLUTION:

It may be time to change the target brush. (When the target brush becomes worn out, the target can be bumped ahead *and/or* slide down the throw plate. This can cause either the target to break or be thrown further to the right.)

PURPOSE:

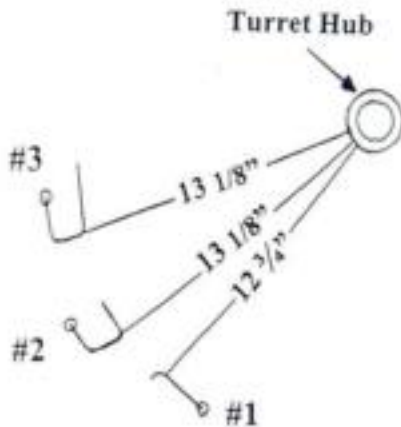
The purpose of the target brush is to hold the singles target against the throw arm when the throw arm advances to the cocked position.

MAINTENANCE:

When the brush begins to "flair out", loosen the screw and turn the brush 180 degrees. The brush(s) needs to be aligned within it's slot. Replace the brush when needed.

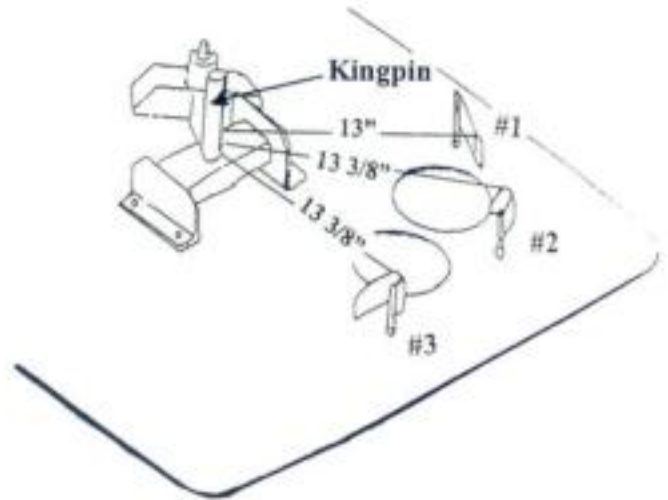
TARGET GUIDE SPRING POSITION

with TURRET ON



(Diagram 56)

with TURRET OFF



(Diagram 84)

Measuring to the Guide Spring(s) with the turret off: from the face of the kingpin measure 13" to Spring #1. Measure 13 3/8" to Springs #2 and #3. See Diagram 84.

Measuring the Guide Spring(s) with the turret on: remove the targets from the appropriate column. A tape measure easily fits underneath the turret. Measure 12 3/4" from the face of the turret hub to Spring #1. Measure 13 1/8" to Springs #2 and #3. See Diagram 56

Also note that the Guide Spring mounting bolt is tilted back slightly, so that the top of the Guide Spring is further away from the targets than the bottom.

If the Guide Spring(s) needs to be replaced, use a 7/64" hex drive wrench to remove the two socket cap screws. Then pull the spring out of the mounting bolt slot.

The spring can be changed without removing the mounting bolt. You will have to remove the roller plate extension spring to gain access to the socket cap screws.

COLD WEATHER ADJUSTMENT TEMPERATURE/RELEASE TIME STOPPING THE THROW ARM ON THE BRAKE

In very cold weather, the pump motor should be turned on one-half to one hour *before* operating time to warm up the hydraulic oil. If the On/Off/Release switch is turned on too soon, the machine will keep cycling.

Extreme temperature changes may affect the stopping position of the throw arm. Very cold temperature may cause the machine to keep cycling by itself. Very warm weather may stop the throw arm too soon and cause slow pulls. Refer to the figure of the throw arm brake assembly for proper stopping position of the throw arm. See Diagram 80.

ADJUSTING RELEASE TIME & CORRECTION OF CYCLING PROBLEM

There are two switches on the left side of the trap machine which are mounted on a bracket. Loosen the thumb screws *or* with a hex key, loosen the set screw. Move the switch bracket by increments of 1/16" to the left (toward the front of the trap house) to *stop cycling* – or lengthen the throw time --- causing the arm to stop further back on the brake.

To *shorten* the throw time, move the switch bracket to the right --- toward the back of the trap house --- causing the throw arm to stop further forward on the brake. See Diagram 74

For proper stopping position of the throw arm on the brake, please refer to Diagram 80

CAUTION

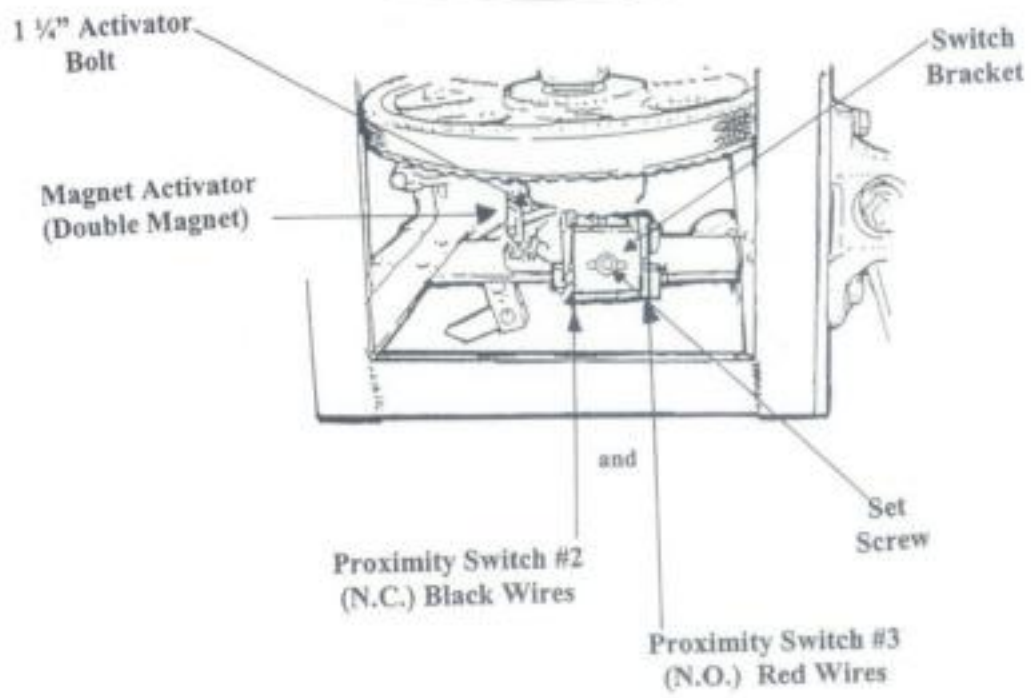
When the machine is turned ON the throw arm will travel forward to the cocked position through the danger zone.

When the throw arm is FIRED, the arm will travel through the indicated danger area.

The throw arm can be fired by pushing the pullcord button. It can also be fired by hand, by pushing the arm forward off the brake when the machine is either ON or OFF.

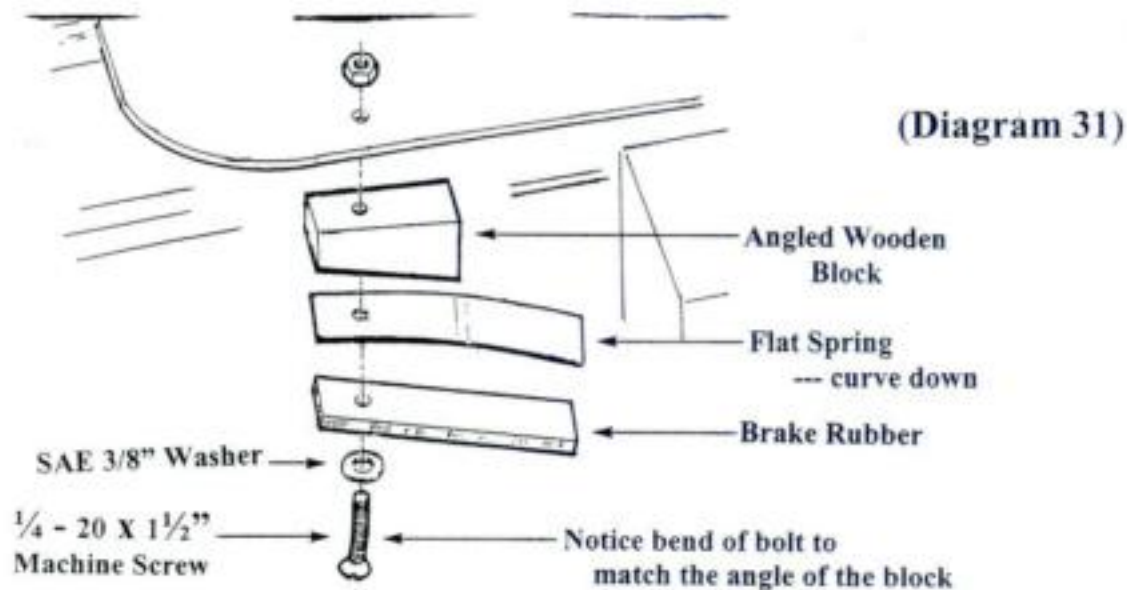
DANGER

The Throw Arm Travels This Path

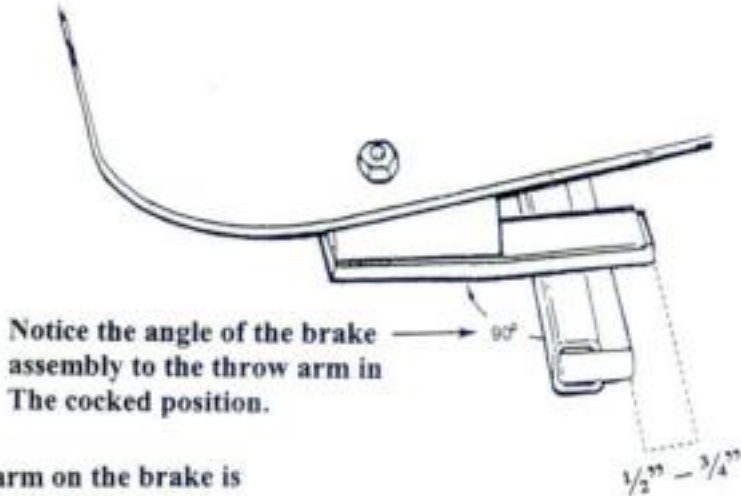


(Diagram 74)

ASSEMBLY OF THROW ARM BRAKE



(Diagram 80)



**** The stopping position of the throw arm on the brake is approximately 1/2" to 3/4" behind the end of the brake, which is determined by the position of the #2 and #3 switch bracket.

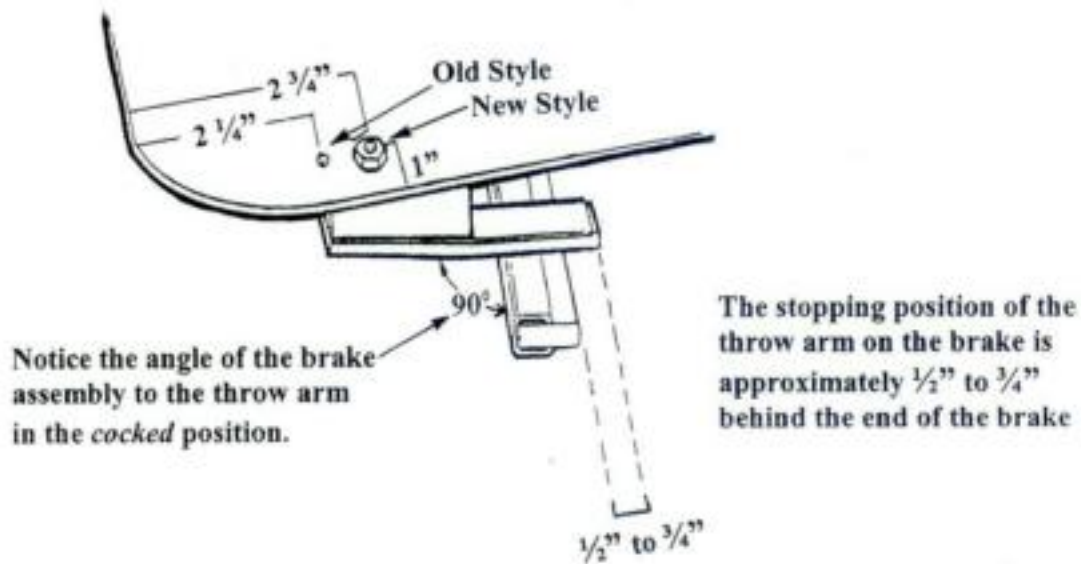
**Keep surfaces dry where the throw arm contacts the brake rubber.
Replace the brake rubber when it begins to wear out.**

THROW ARM BRAKE INSTALLATION

NOTE: Proper installation of your throw arm brake depends upon the style of the throw arm being installed. The "new style" throw arm rubber is $\frac{1}{2}$ " further ahead than the "old style". You may need to drill a new hole. Please refer to the diagram below.

1. Stand back from the machine. Release the target and turn off the machine.
2. Remove the brake assembly.
3. Measure the placement of the hole, if necessary. Drill a new hole using a $\frac{1}{4}$ " drill bit.
4. Install the brake assembly.

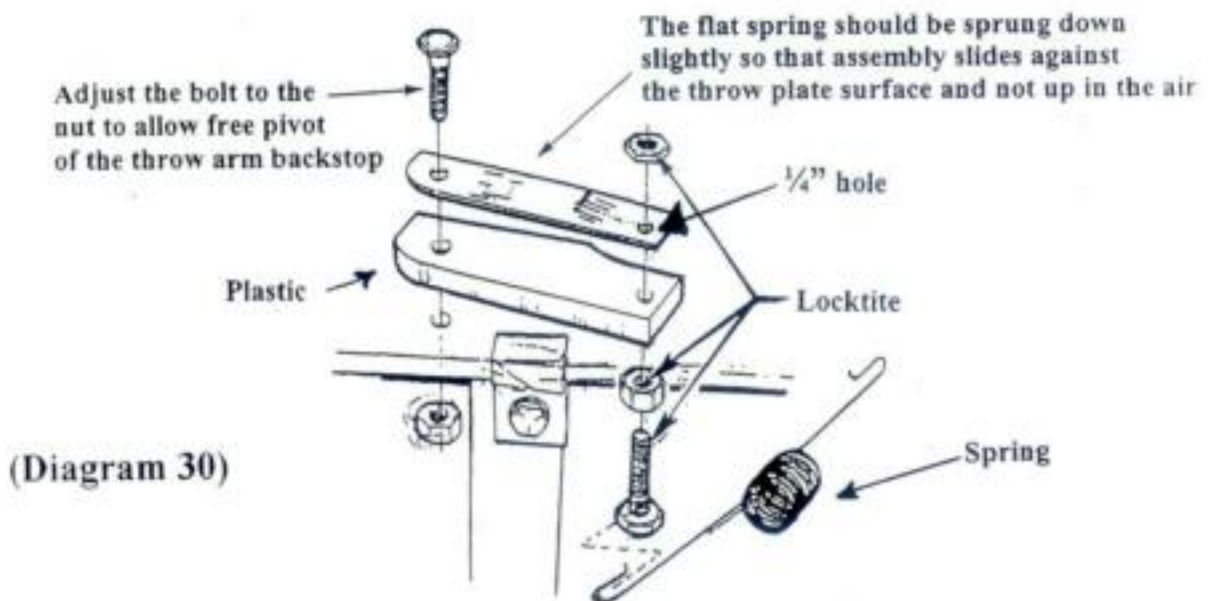
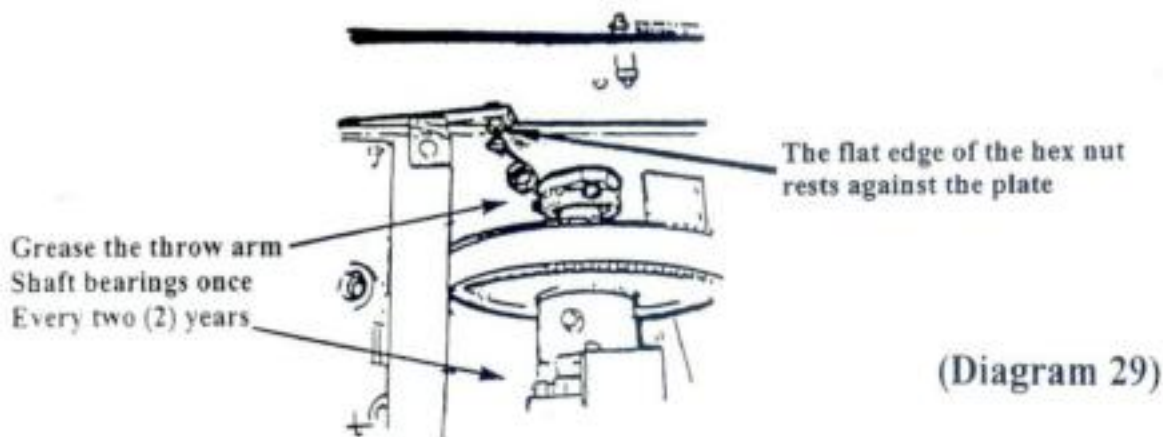
(Diagram 75)



MAINTENANCE

Keep surfaces dry where the throw arm contacts the brake rubber.
Replace the brake rubber when it begins to wear out.

THROW ARM BACKSTOP



If you are only replacing the "plastic", align the flat spring so that it is 1/16" inside the edge of the plastic. Use a vise grip to clamp the two together onto the throw plate and drill with a 1/4" drill bit.

When assembling the throw arm backstop, LOCKTITE glue must be used as pictured above. See Diagram 30

The purpose of the throw arm backstop is to minimize the cycle-time for the loading of targets for SINGLES.

INSTALLATION OF THROW ARM

1. Release the throw arm. *Never* attempt to work on your machine while it is in the cocked position.
2. Turn off the machine and “drop” the machine to the lowest elevation for easier working conditions.
3. Disconnect the main spring *before* working with the throw arm. Refer to the section for guidelines to disconnect the main spring.

With the main spring disconnected, check to see that the height of the bottom of the throw arm rubber is $\frac{1}{2}$ ” above the throw plate. (This measurement allows for $\frac{1}{32}$ ” clearance between the lip of the target and the throw arm rubber.) Set a target on the throw plate against the throw arm and check the clearance between the two. The best place to check this is the area where the target leaves the throw plate. The nut on the throw arm can be torqued a maximum of 15 ft/lbs.

Check to see that the throw arm has clearance where it passes by the “doubles” finger. If necessary, the “doubles” finger can be bent down using a pair of water pump pliers. A screwdriver can be used between the “doubles” finger and the throw plate to pry it up.

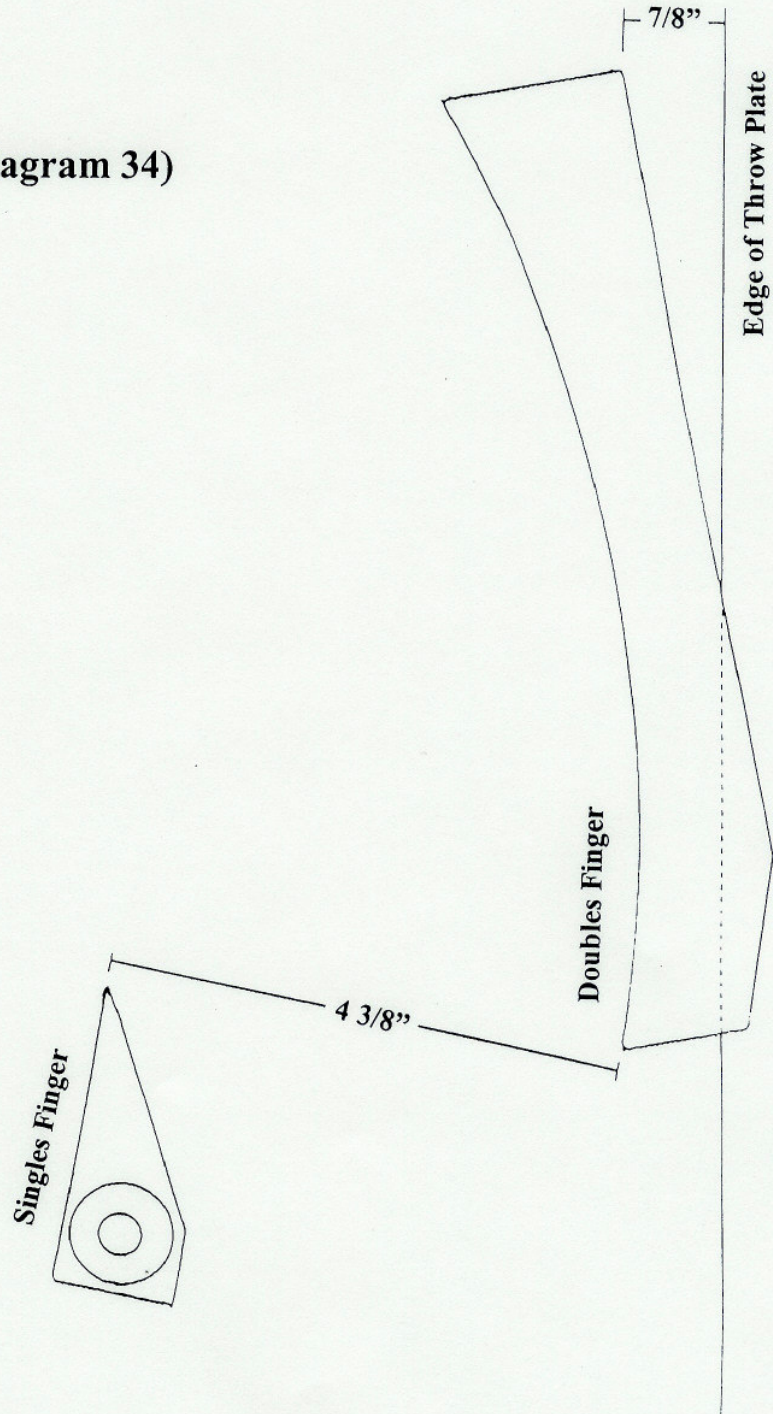
INSTALLATION
of the
“X” DOUBLES FINGER

1. Release the throw arm and turn off the machine.
2. Remove the old Doubles Finger and replace with the “X” Doubles Finger.
3. Set the “X” Doubles Finger so that the right-hand end measures $7/8$ ” up from the bottom edge of the throw plate. Tighten the bolt. This is the approximate position of the Doubles Finger for level double targets. See Diagram 34.
4. Loosen the nut on the Singles Finger and move the Singles Finger downwards so that the right-hand tip of the Singles Finger measures $4\ 3/8$ ” from the left-hand end of the “X” Doubles Finger. When tightening the nut, hold back on the Singles Finger so that it does not rotate upwards.
5. Check to see that the throw arm clears the “X” Doubles Finger.
 - A. Reduce the main spring tension --- unwind the crank handle
 - B. Disconnect the main spring --- refer to that section in this Manual
 - C. Move the throw arm manually past the brake and through the area of the “Doubles Finger” to check clearance. Water-pump pliers can be used if the Doubles Finger needs to be bent downwards. A long screwdriver can be used if the “Doubles Finger” needs to be pried upwards.

Presuming the machine is sitting on a level platform, with no wind; these directions should yield a level pair of DOUBLES.

**DOUBLES
'X'
FINGER**

(Diagram 34)



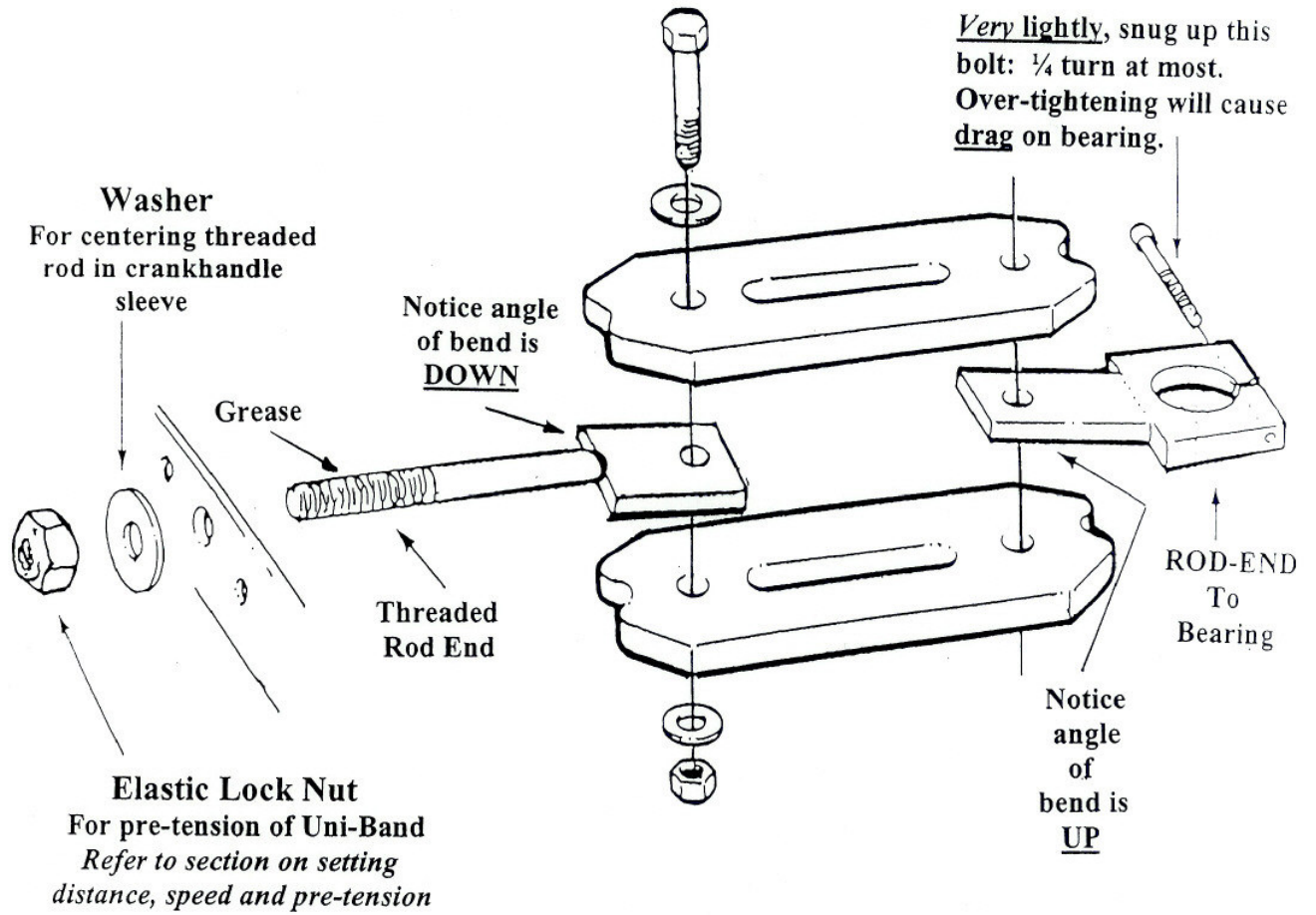
DISCONNECTING THE MAIN SPRING

IMPORTANT: NEVER STAND IN FRONT OF A TRAP MACHINE. THE TRAP MACHINE MUST BE TURNED OFF AND THE SPRING RELEASED BEFORE ENTERING THE TRAP HOUSE. NEVER ATTEMPT TO MAKE ANY ADJUSTMENT WHEN THE THROW ARM IS COCKED.

1. Release the throw arm and turn off the machine.
2. Reduce the main spring tension (unwind the crank handle).
3. Move the throw arm forward (by hand) to the throw arm brake.
4. Loop a cord or rope around the end of the throw arm. While holding tension on the cord, against the throw arm, *slowly* guide the throw arm around to the front of the machine. Be aware that the throw arm is being pulled by the main spring as soon as the throw arm goes past the brake. A pair of gloves is recommended to prevent the cord from slipping through your hands. Remove the cord when finished. The intention here is to move the arm to opposite the cocked position; which is the short point of the throw (or neutral).
5. If your machine has a *Uni-Band*, you can now loosen the set screw on the connecting block. Pull back and down on the Uni-Band to remove it from the bearing. See Diagram 28.
6. The throw arm can now be freely moved around the throw plate.
7. If your machine has a *coil spring*, you can pull the coil end over the hook with a large screwdriver. *Or* you loosen the elastic lock nut on the threaded rod to create some slack.
8. Refer to diagrams 21 and 28 for re-assembly directions.

**ASSEMBLY/INSTALLATION
OF THE
UNI-BAND (Main Spring)**

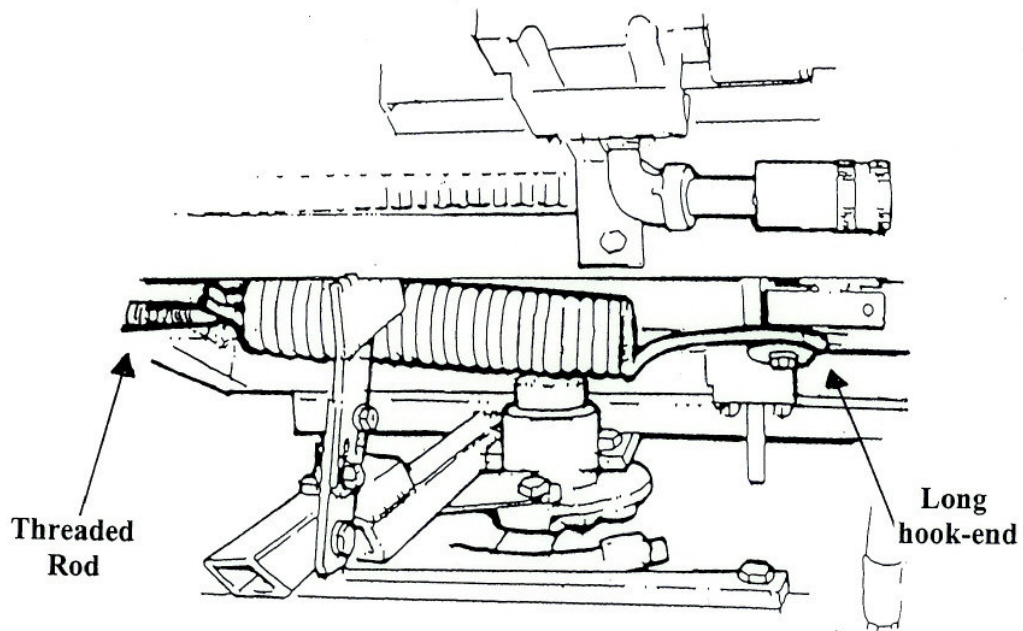
TOP



(Diagram 28)

INSTALLATION OF COIL SPRING

(Diagram 36)



Place the long hook-end around the throw crank bearing with the *coils facing up* so that the top of the coils are higher than the long hook-end, and the long hook-end is open toward the back of the machine.

REMOVAL OF THE THROW ARM/TURRET VALVE

IMPORTANT: NEVER STAND IN FRONT OF A TRAP MACHINE. THE TRAP MACHINE MUST BE TURNED OFF AND THE SPRING RELEASED BEFORE ENTERING THE TRAP HOUSE. NEVER ATTEMPT TO MAKE ANY ADJUSTMENT WHEN THE THROW ARM IS COCKED.

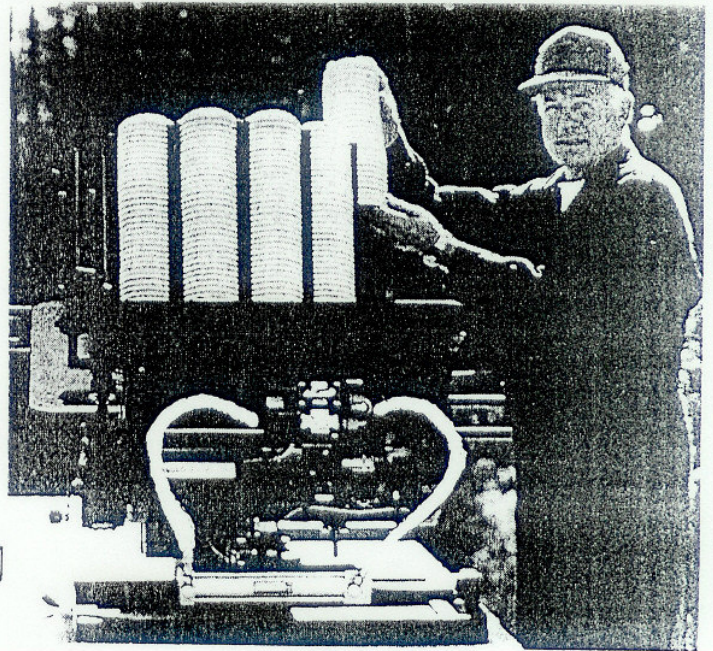
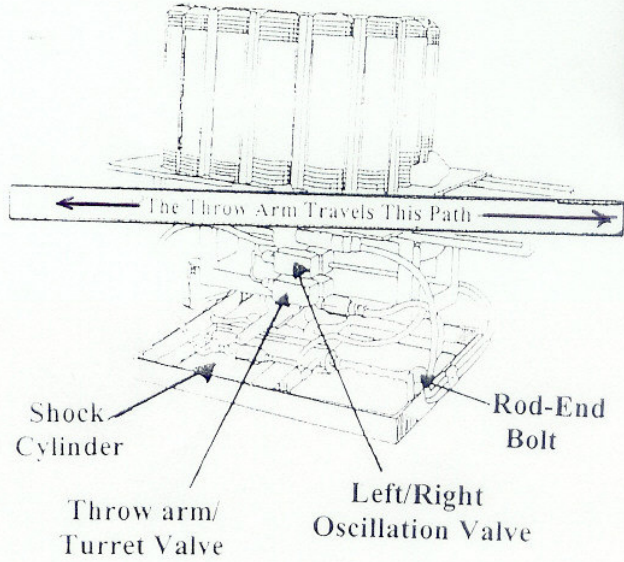
1. Release the throw arm and turn off the machine.
2. Reduce the main spring tension (unwind the crank handle).
3. Move the throw arm forward (by hand) to the throw arm brake.
4. Loop a cord or rope around the end of the throw arm. While holding tension on the cord, against the throw arm, *slowly* guide the throw arm around to the front of the machine. Be aware that the throw arm is being pulled by the main spring as soon as the throw arm goes past the brake. A pair of gloves is recommended to prevent the cord from slipping through your hands. Remove the cord when finished. The intention here is to move the arm to opposite the cocked position; which is the short point of the throw (or neutral).
5. The valve can now be removed with minimal loss of oil.

REPLACEMENT OF OSCILLATION CYLINDER

TOOLS: 9/16" wrench (ratchet or speedy wrench will help), 13 mm or 1/2" wrench, 5/8" and 11/16" wrenches (or adjustables)

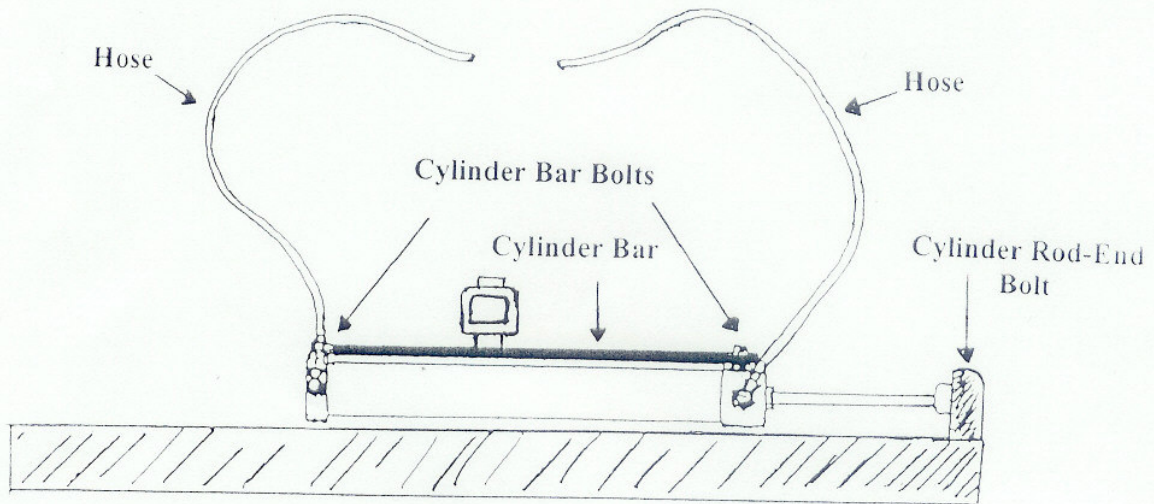
1. Stand back, release the throw arm and turn off the machine.
2. Loosen the cylinder bar bolts with a 9/16" wrench.
3. Remove the cylinder rod-end using a 13mm or 1/2" wrench on the milled end of the rod and a 9/16" wrench on the rod-end bolt. (Do not lose the bushings or bushing caps.)
4. Remove the cylinder bar bolts
5. Now that the cylinder is free, remove the hoses.
6. When putting on the new cylinder, first secure the cylinder to the cylinder bar.
7. Tighten the rod-end bolt to the cylinder rod, making sure that the bushings and bushing caps are in place.
8. Make sure that the cylinder bar bolts are tight.
9. Connect the hoses. When tightening, make sure that the hoses are turned slightly away from the frame of the machine. This is done so that the hoses won't rub against the machine when at the extreme left and right angle limits.
10. After installing the new cylinder, turn on the machine. Put the Auto/Manual switch into the manual position. Push the left button and run the cylinder to the end. Push the right button and run the cylinder to the end. Now the air is out of the cylinder. Move the cylinder back to center and begin normal operation.

(Diagram 88)



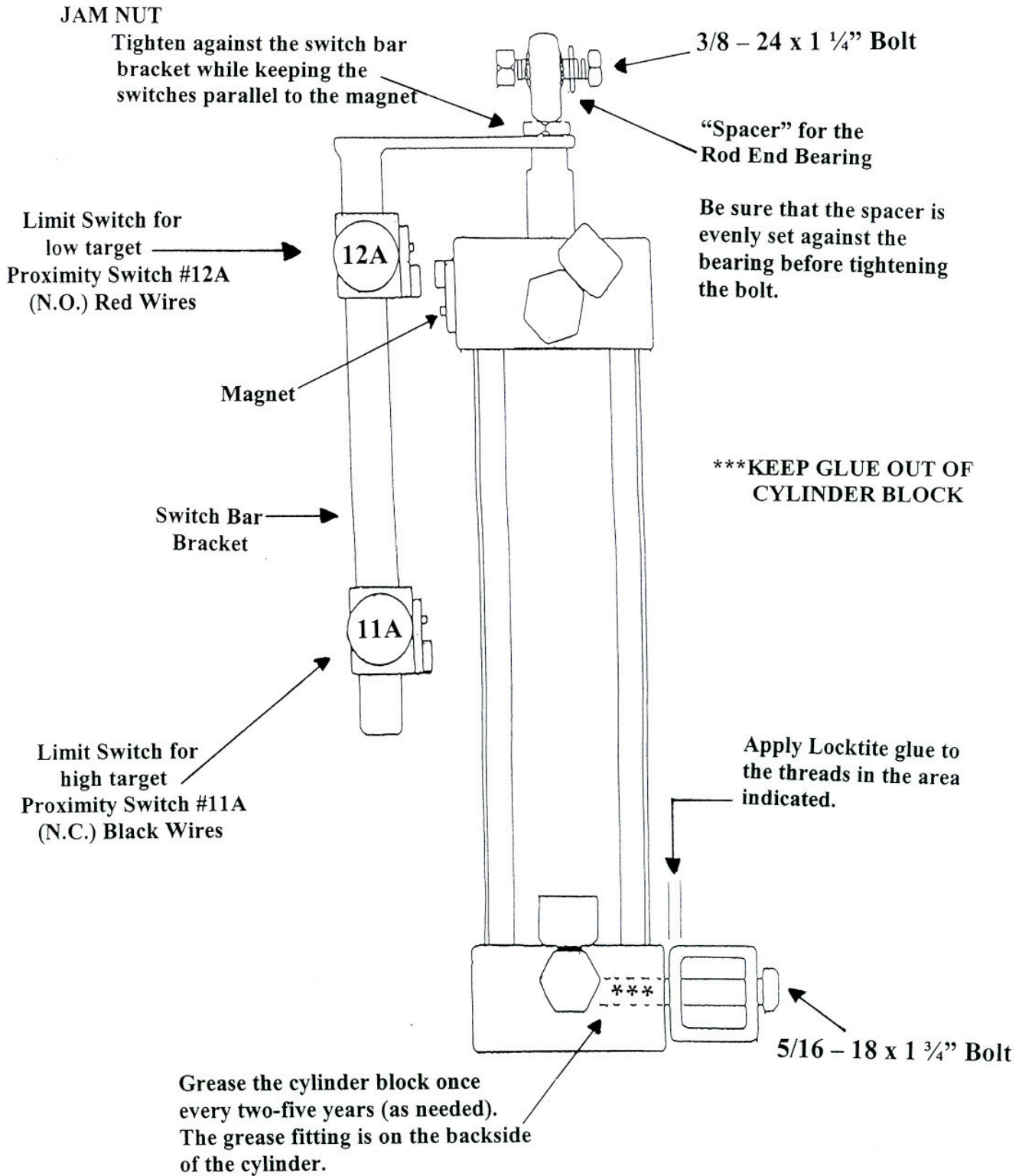
Notice the angle of the hydraulic hose fittings.

(Diagram 87)



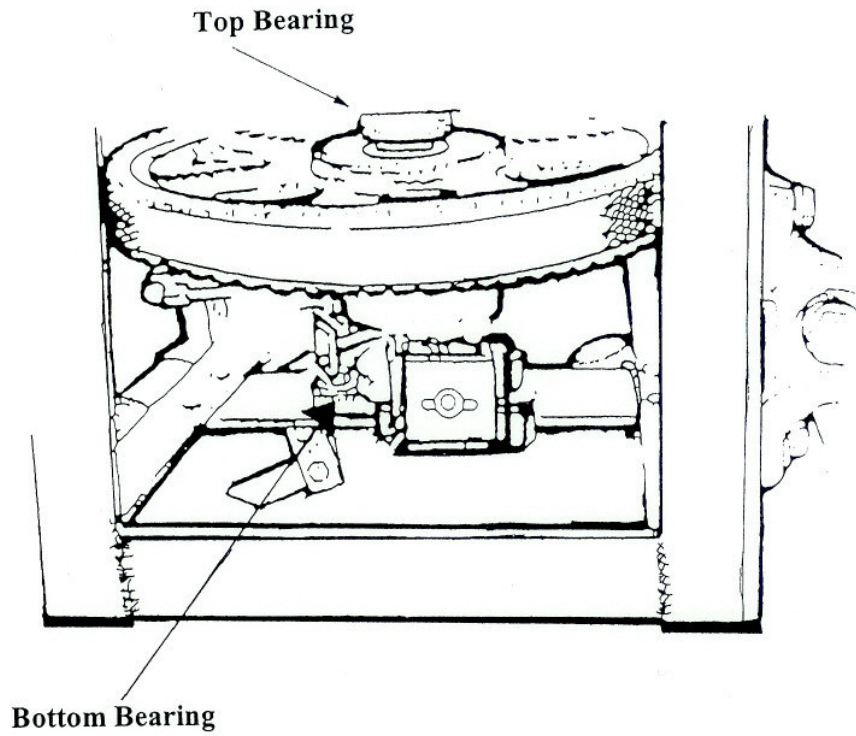
(Diagram 86)

HYDRAULIC CYLINDER FOR WOBBLE



(Diagram 37)

THROW ARM SHAFT BEARING MAINTENANCE



(Diagram 79)

*Grease *both* the top and bottom throw arm shaft bearings every one and one half to two years.

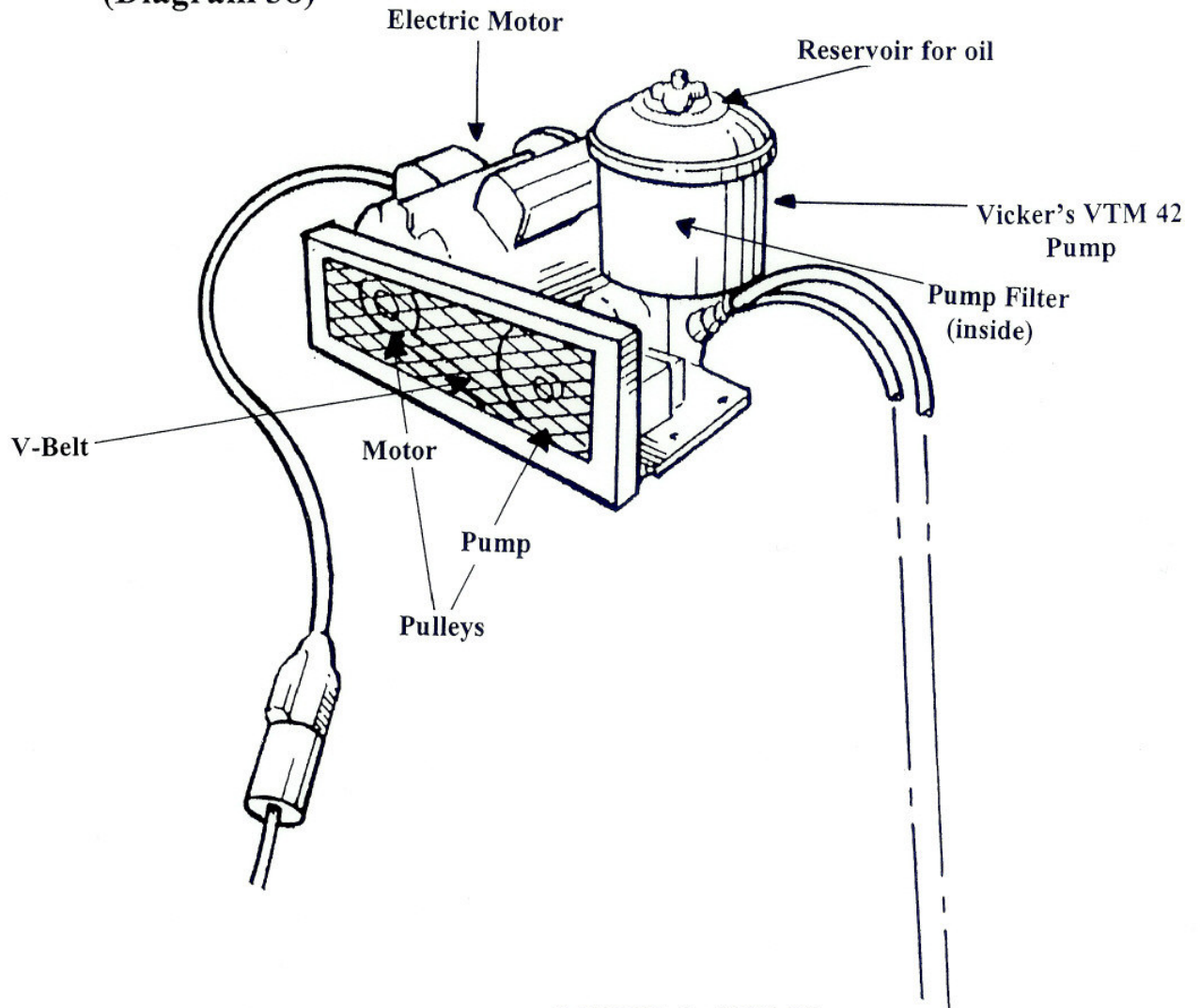
PROCEDURE TO FLUSH HYDRAULIC OIL

Please read completely before proceeding.

1. Remove the targets from the machine.
2. Turn the machine on, press the RIGHT oscillation button and oscillate all the way to the right until the cylinder bottoms-out.
3. Leave the throw arm in the cocked position and turn the machine off.
4. Stand clear of the throw arm and disconnect the return-line hose (the bottom coupling).
5. A male coupling with three or four feet of hose now needs to be connected to the bottom coupling to direct the flow of oil into a pail.
6. The throw arm should still be in the cocked position. Turn the pump on and run until drained. Then take the disconnected return-line hose and hold at full length above the pump and depress the ball valve to drain the oil from the hose. NOTE: You need to use the tip of your thumb or a screwdriver when depressing the ball so that the hose isn't blocked.
7. Leaving the throw arm in the cocked position, turn off the pump.
8. Fill the tank with new oil. USE --- MOBIL 1: OW-30.
9. The next steps require having the pull cord release switch in your hand. First, turn the on/off/release switch ON.
10. Depress the pull cord button.
11. Turn the pump switch ON. The throw arm will fire and the turret will index.
12. Turn OFF the pump switch IMMEDIATELY when the throw arm has re-cocked.
13. Press the LEFT oscillation button and hold *in* while turning the pump switch ON. As soon as the cylinder bottoms-out, turn the pump OFF.
14. Re-connect the return-line hose. (See instruction 4)
15. The machine is now full of oil. Fill the tank to within one inch of the top.

PUMP MOTOR MAINTENANCE

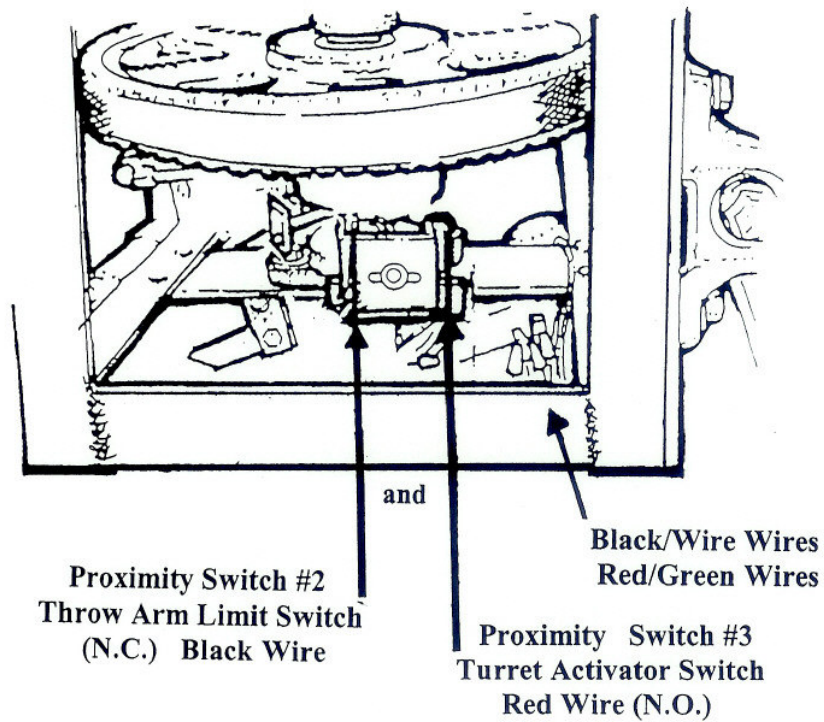
(Diagram 38)



For pump motor fluid use: **MOBIL 1: OW-30**

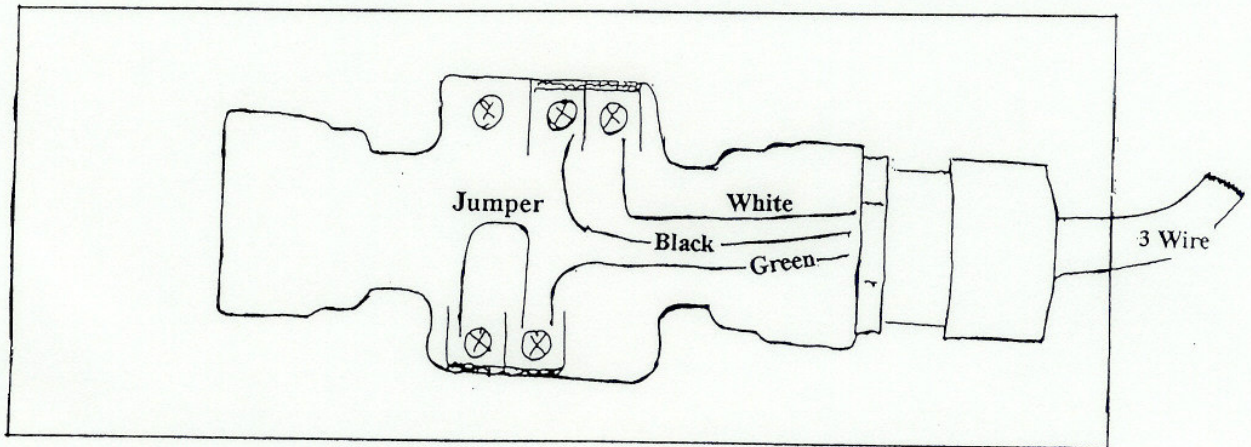
**WIRING GUIDE
FOR
#2 and #3 PROXIMITY SWITCHES**

(Diagram 39)



1. The #2 switch *black wires* go to the Black and White Wires.
2. The #3 switch *red wires* go to the Red and Green Wires.

**WIRING GUIDE
FOR
STANDARD SHIFT VALVE**



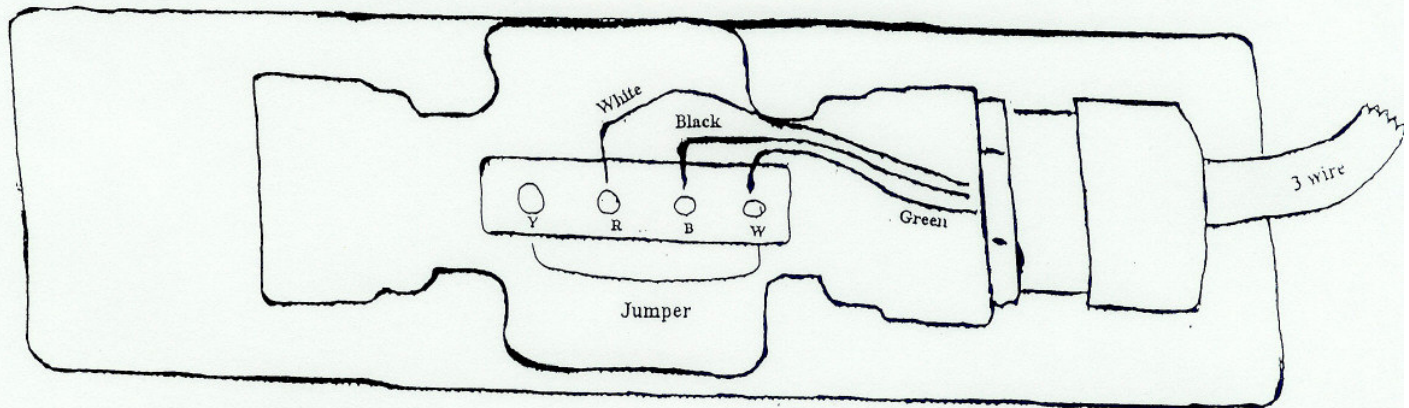
Rexroth Valve

(Diagram 76)

OSCILLATION SOFT SHIFT VALVE WIRING GUIDE

The top valve on a standard PAT-TRAP®
The top *and* bottom valves on a PAT-TRAP® WOBBLE
(The middle valve on the Wobble *is NOT* a soft shift valve)

The guide for wiring the Parker Soft Shift Valve on a standard PAT-TRAP® is as pictured:



Parker Soft Shift Valve

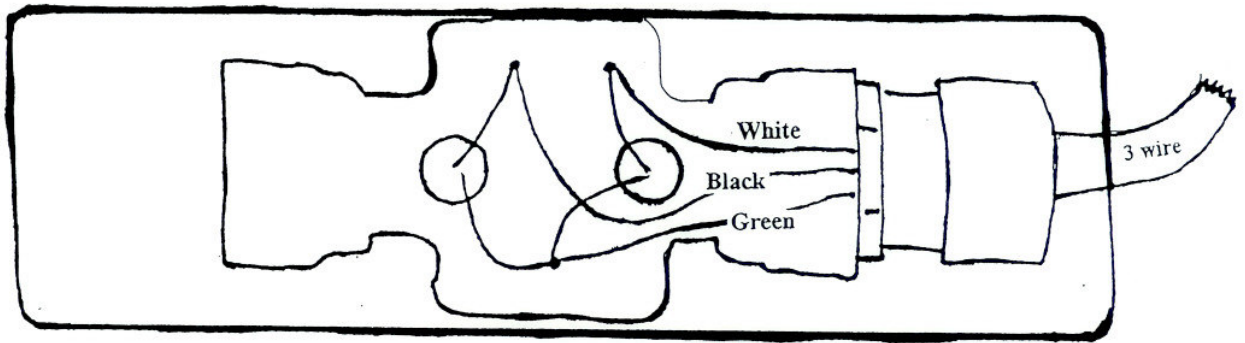
(Diagram 45)

The guide for wiring the Parker Soft Shift Valve on a PAT-TRAP® *WOBBLE* is as follows:

1. The Black Wire goes to the Red terminal
2. The White Wire goes to the Black terminal
3. The Green Wire goes to the Yellow terminal
4. The Jumper Wire goes from the Yellow terminal to the White terminal

**WIRING GUIDE
FOR
THROW ARM/TURRET VALVE**

**The bottom valve on a standard PAT-TRAP®
The middle valve on a PAT-TRAP® WOBBLE**

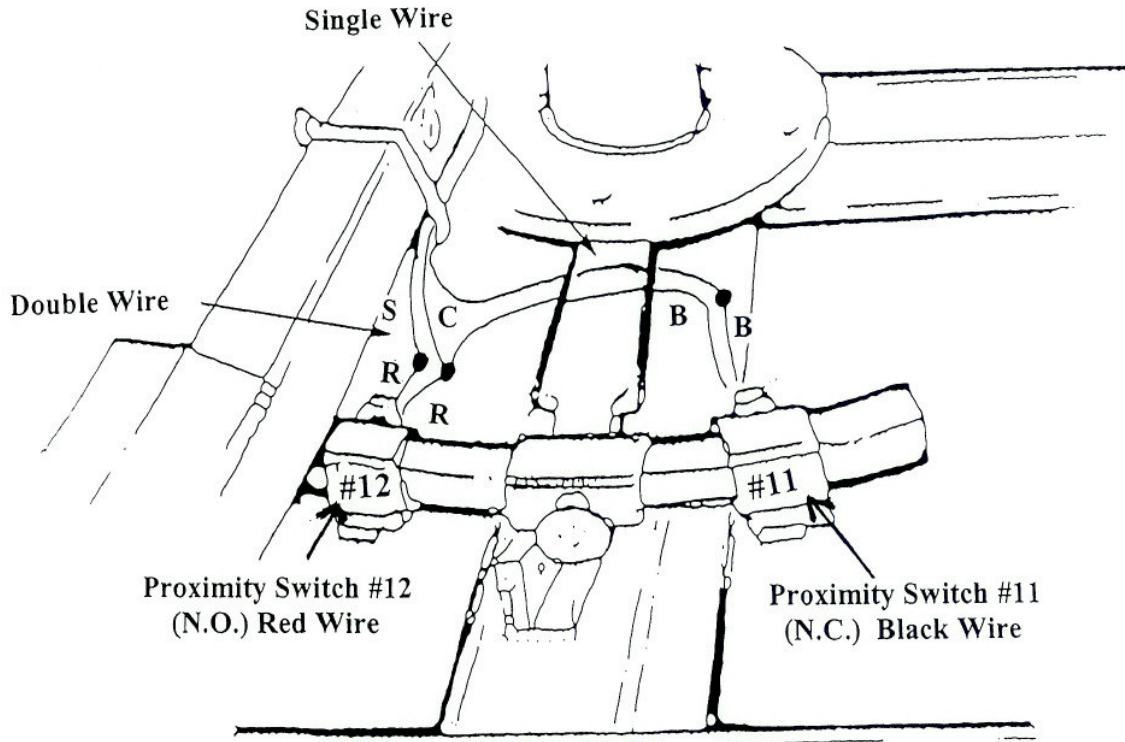


Parker Standard

(Diagram 77)

NOTE: Release the throw arm and turn off the machine.

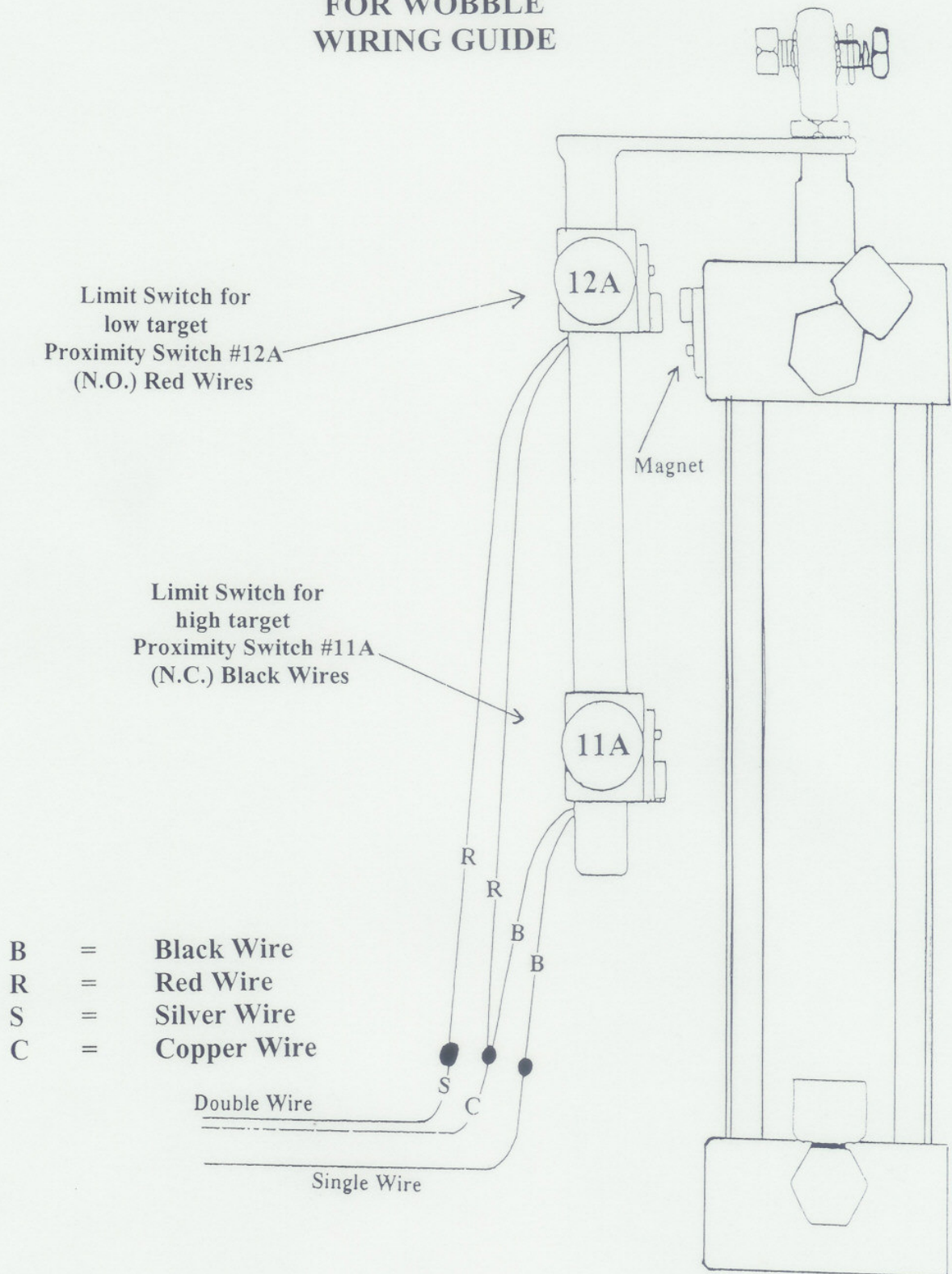
**WIRING GUIDE
FOR
#11 and #12 PROXIMITY SWITCHES**



(Diagram 40)

- B = Black Wire**
- R = Red Wire**
- S = Silver Wire**
- C = Copper Wire**

HYDRAULIC CYLINDER FOR WOBBLE WIRING GUIDE



(Diagram 46)

INDEX

Adjustment(s)

Angle	19
Cold Weather	29
Distance/Speed	17
Doubles	14
Field-Angle (Sliding Switch Bar Style)	18
Height of Target	19
“Old Style” Switch	20
Release Time	29
Switch #4 (Proximity Switch Style)	21
Switch #4 (#4 Micro Switch Style)	25
Wobble	16

Assembly

Throw Arm Brake	31
Uni-Band (Main Spring)	38
Backstop, Throw Arm	33
Bearing, Bottom	44
Bearing, Shaft	33
Bearing, Top	44
Brake Rubber	31
Brake, Throw Arm Installation	32
Brake, Throw Arm Assembly	31
Change from Singles to Doubles	12
Cocked Position	8, 31, 32
Coil Spring	39
Cold Weather	29
Connecting Power Source	4
Cycling (Problem)	29

Diagrams

#1	.....	ii
#2	.....	2, 5
#3	.....	5
#4	.....	5
#5	.....	2
#6	.....	2
#7	.....	7
#8	.....	7
#9	.....	7
#11	.....	11
#13	.....	20
#14	.....	15
#15	.....	15
#16	.....	15
#18	.....	15
#20	.....	26
#21	.....	17
#22	.....	20
#26	.....	22, 24, 25
#28	.....	38
#29	.....	33
#30	.....	33
#31	.....	31
#34	.....	36
#36	.....	39
#37	.....	43
#38	.....	46
#39	.....	47
#40	.....	51
#42	.....	3
#44	.....	27
#45	.....	49
#46	.....	52
#50	.....	8
#51	.....	9
#56	.....	28
#63	.....	13
#64	.....	13
#65	.....	13
#66	.....	18
#67	.....	20
#68	.....	20
#69	.....	22, 24
#70	.....	22
#72	.....	24
#73	.....	23, 25

Diagrams, continued

#74	30
#75	32
#76	48
#77	50
#78	7
#79	44
#80	8, 31
#84	28
#86	42
#87	42
#88	42
#89	15
Disconnecting the Main Spring	37
Distance/Speed	17
Double Magnet	7, 30
Doubles	14
Adjustments	14
Doubles "X" Finger	36
Electrical Box, Placement	2, 5
Elevation Cog	20
Fine Height Adjustment	20
Flat Spring	22, 24, 31
Flush Hydraulic Oil	45
Hydraulic Cylinder For Wobble	43, 52
Hydraulic Hoses	2
Hydraulic Male/Female Couplings	2

Installation

Coil Spring	39
PAT-TRAP®	1
Plastic Pinion Backstop, Spring and #4 Switch Bracket	
- Proximity Switch Style	21
- #4 Micro Switch Style	23
Throw Arm	34
Throw Arm Brake	32
Uni-Band (Main Spring)	38
“X” Doubles Finger	35

Limit Switches

# 2 (Black Wire)	7, 30, 47
# 3 (Red Wire)	7, 30, 47
#4 (Black Wires)	22
# 11 Right-Angle (Black Wire)	8, 18, 51
# 12 Left-Angle (Red Wire)	8, 18, 51
# 11A High-Target (Black Wire)	9, 43, 52
# 12A Low-Target (Red Wire)	9, 43, 52

Loading the PAT-TRAP®	10
-----------------------------	----

Magnet	8, 18
--------------	-------

Magnet Activator (Double Magnet)	7, 22, 30
--	-----------

Main Spring, Disconnecting	37
----------------------------------	----

Maintenance

Flushing Hydraulic Oil	45
Hydraulic Cylinder For Wobble	43
Pump Motor	46
Roller Plate	26
Target Brush(s)	27
Throw Arm Brake	32
Throw Arm Shaft Bearing	44

Micro Switch #4	23, 24, 25
-----------------------	------------

Mounting Power Control Box	4
----------------------------------	---

O-Ring for Hydraulic Coupling	2
-------------------------------------	---

OFF, How to turn	10
------------------------	----

Oil, How to Flush	45
-------------------------	----

ON, How to turn	10
Oscillation Cylinder, Replacement of	41
Oscillation Soft Shift Valve	49
PAT-TRAP®	
Doubles	14
How It Works	6
Installation	1
Loading	10
Serial #	ii
Singles	12
Turn OFF	10
Turn ON	10
Wobble	16
Pinion Backstop, Plastic	22, 24
Power Control Box	
Connecting	4
Mounting	4
Placement	2, 5
Power Source Connection	4
Proximity Switches (Sensors)	
#2 (Black Wire)	6, 7, 30, 47
#3 (Red Wire)	6, 7, 30, 47
#4	6, 7, 22
#5	6, 7
#11 Right-Angle (Black Wire)	6, 8, 18, 51
#11A High Target (Black Wire)	6, 9, 43, 52
#12 Left-Angle (Red Wire)	6, 8, 18, 51
#12A Low Target (Red Wire)	6, 9, 43, 52
Pullcord	5, 11
Pullcord Button (Trap Release)	7
Pump Motor	46
Flushing Hydraulic Oil	45
Placement	2, 5
Quick Release Fittings	2

Removal/Replacement

Throw Arm/Turret Valve	40
Turret	3
Replacement of Oscillation Cylinder	41
Roller Plate Maintenance	26
Rough Height Adjustment	20
Serial Number	ii
Shaft Bearings	33
Singles	12
Singles Finger	36
Sliding Switch Bar	8, 18
Soft Shift Valve	47
Speed/Distance	17
Spring Crank	15, 20
Standard Shift Valve	48
Stopping of Throw Arm	29
Switch Bracket # 4	23, 25
Switch Bracket #5	7

Switches

#1	7
#2	7, 30
#3	7, 30
#2 and #3 Wiring Guide	47
#4 – Proximity Switch Style	21
#4 – #4 Micro Switch Style	23, 25
#5	7
#11 and #12 Wiring Guide	51
#11A	9, 43, 52
#12A	9, 43, 52

Switches, continued

“Old Style” Switch	20
Roller Switch	24
Toggle Switch	5, 11, 13, 15, 20
Trap Release	7

Target Brush Maintenance	27
--------------------------------	----

Target Guide Spring Position	28
------------------------------------	----

Targets

Angle Adjustment	19
Height Adjustment	19
Setting Speed and Distance	17

Temperature/Release Time	29
--------------------------------	----

Throw Arm

Backstop	33
Brake, Assembly	31
Brake, Installation	32
Installation	34
Limit Switch #2 and #3	7
Shaft Bearing	42
Stopping	29
Throw Arm/Turret Valve	40, 48
Travel Path	i, 15, 30, 42

Toggle Switch	5, 11, 13, 15, 20
---------------------	-------------------

Trap House/PAT-TRAP® Dimensions	ii, 2, 5
---------------------------------------	----------

Trap Release for Pullcord	7
---------------------------------	---

Turret

Advance	12, 14
Cam Follower	3
Cog	3
Deactivator	7
Removal/Replacement	3
Upright	3

Uni-Band	38
----------------	----

Valves

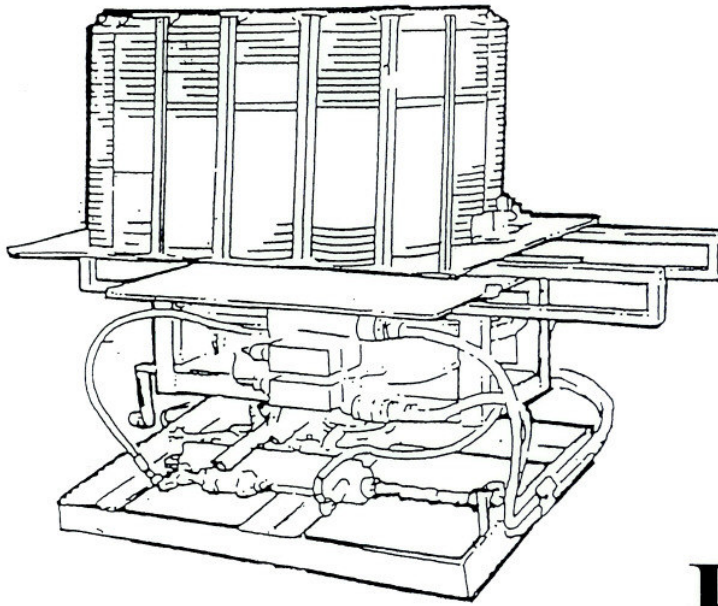
Soft Shift, Oscillation	49
Standard Shift	48
Throw Arm/Turret	50

Wiring Guide

Hydraulic Cylinder For Wobble	52
Oscillation Soft Shift Valve	49
PAT-TRAP®	53
Standard Shift Valve	48
#2 and #3 Switches	47
#11 and #12 Switches	51
Throw Arm/Turret Valve	50

Wobble

Change over to	16
Height Adjustment	16
Hydraulic Cylinder	43
“X” Doubles Finger	35



U.S. PATENT(s): 5249563, 6176229

Pat-Trap®

AUTOMATIC DOUBLES

Manufactured by:

Pat-Trap, Inc.
110 Western Avenue
Henniker, New Hampshire 03242

Telephone: (603) 428-3396 Fax: (603) 428-7340

Pat-Trap, Inc. warrants the PAT-TRAP® Automatic Doubles machine against defects in material or workmanship for a period of one year from the date of the original purchase; and agrees to repair *or*, at our option, replace any defective unit without charge.

IMPORTANT: This warranty does not cover transportation costs. Nor does it cover any damage resulting from accident, misuse or abuse, and any modifications or alterations including attaching the unit to other than the recommended receptacle or voltage.

**NO RESPONSIBILITY IS ASSUMED FOR ANY SPECIAL,
INCIDENTAL OR CONSEQUENTIAL DAMAGES.**

Rev. 10/01