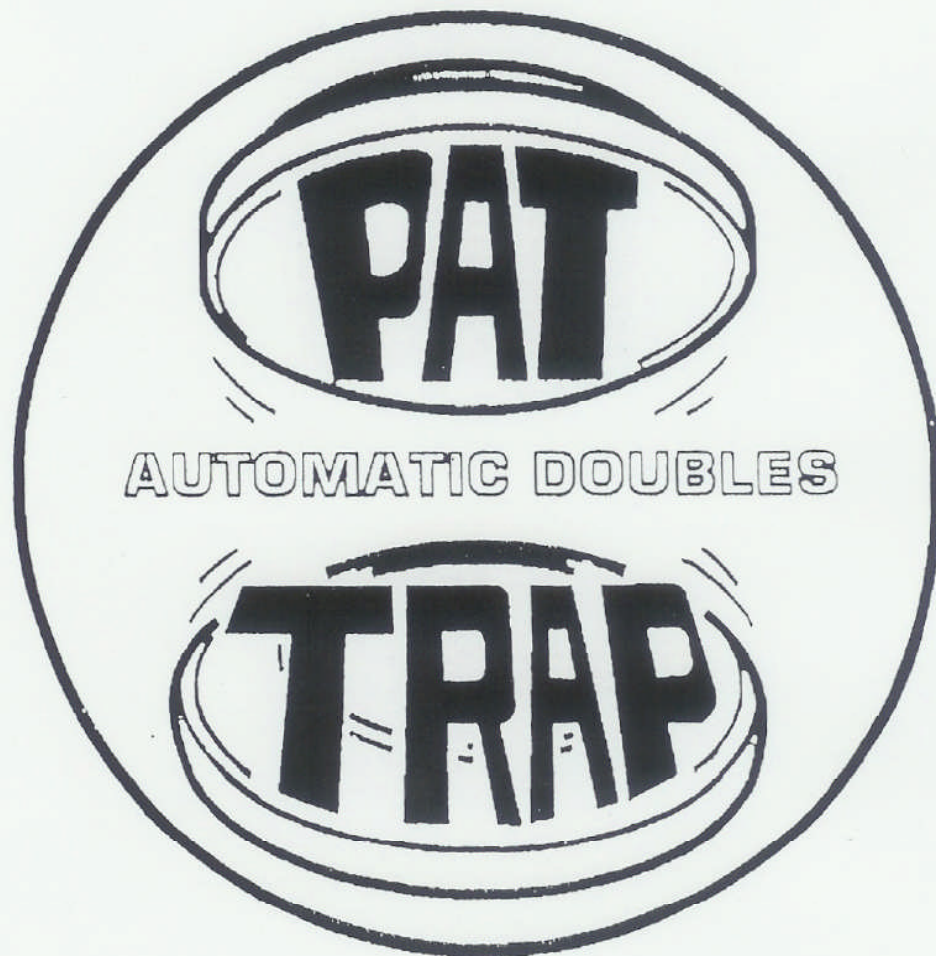


INSTALLATION - SAFETY - MAINTENANCE

Manual

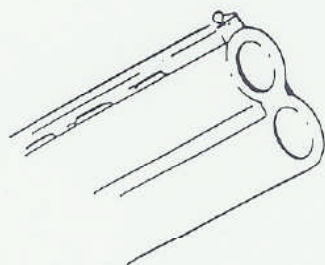


Singles To Doubles In Seconds!

Serial #: _____

Date: _____

SERIES "G"



WARNING

This Manual discloses details of a patented apparatus or device for throwing clay targets. The apparatus is clearly disclosed and claimed in our **U.S. Patent No. 5249563 and 6176229**. It is unlawful under United States Patent Law to practice; i.e. to make, use or sell a patented invention without the express permission of the owner/inventor thereof. Permission is expressly granted, only to the purchaser, or their designees and members of the household of the purchaser, **only to use**, the patented apparatus. The unauthorized making, using or selling of the patented apparatus constitutes patent infringement. It is the intent of the owner/inventor to prosecute infringers of the Patent to the full extent of all applicable laws.

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NOTES

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.

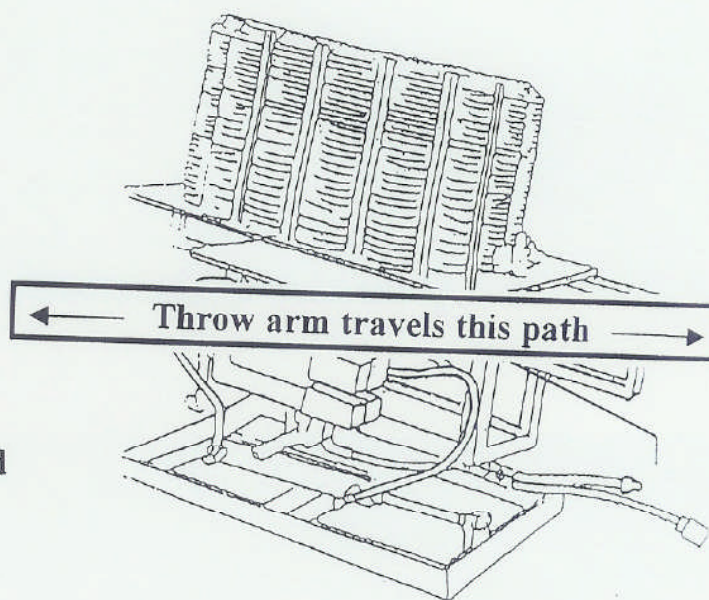
NEVER ADVANCE THE THROW ARM BY HAND WHEN THE ON/OFF/RELEASE SWITCH IS IN THE ON POSITION. THIS MAY DAMAGE THE MACHINE.

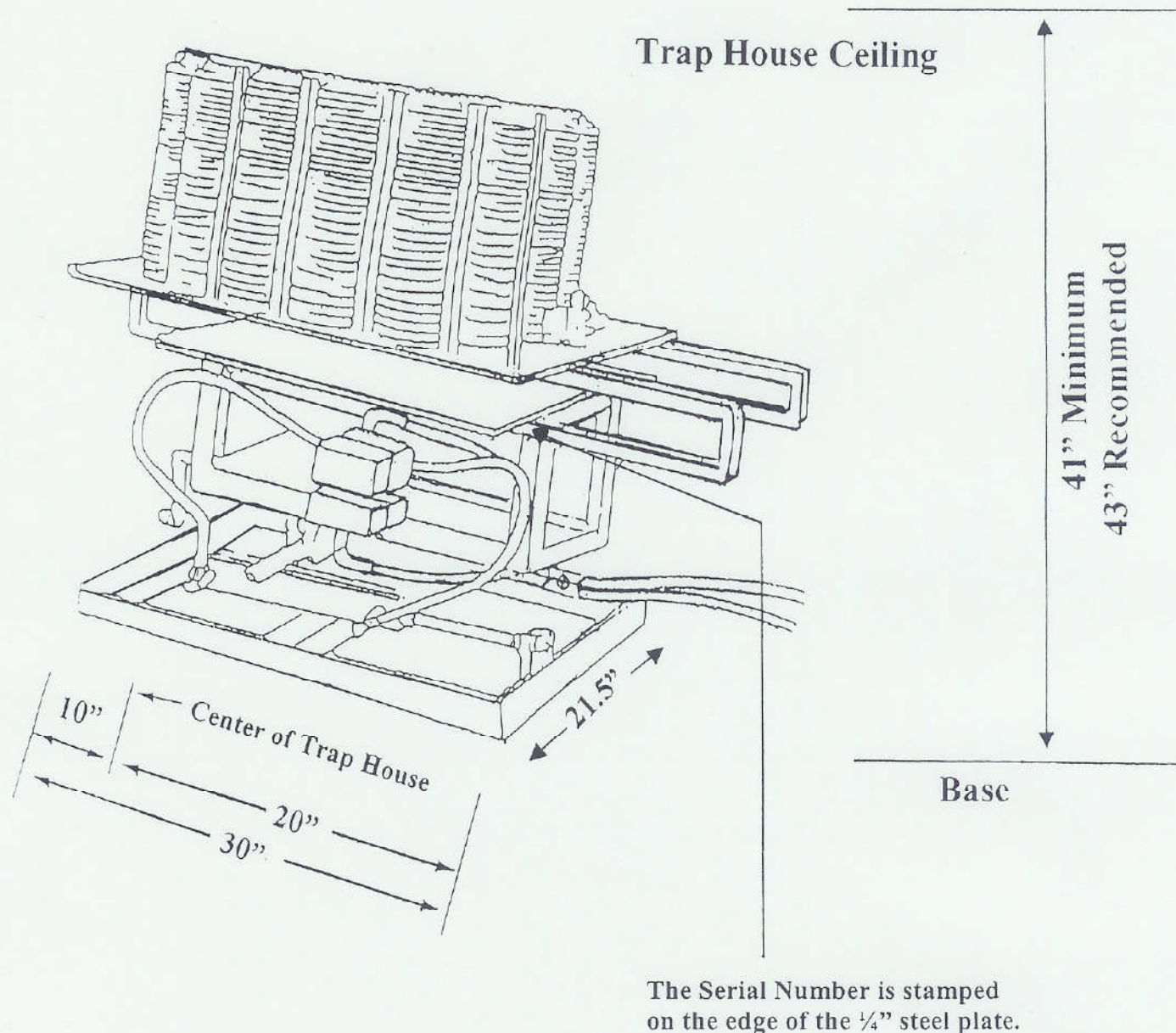
The target throw arm extends 4" beyond the plates. Keep away from the moving parts. Never stand in front of the trap machine.

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.





(Diagram 90)

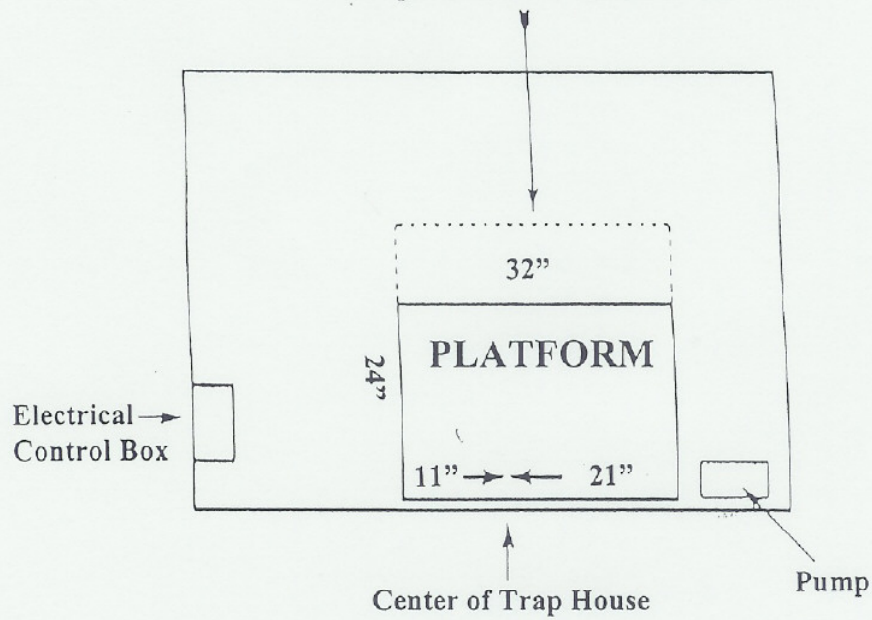
INSTALLATION OF THE TRAP MACHINE AND PUMP

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.
2. If necessary, the turret may be removed from the machine to place the trap into the house. Please refer to the directions below.

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 scratched line at 10" in from the left – facing the front of the machine. Set the machine so that this line is now at the center of the trap house. The base of the trap machine should be set at 41" minimum from the ceiling; however, a setting of approximately 43" is best for loading targets.
3. Holes are provided in the corners of the base to screw down/secure your 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. If not already connected, 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 check that they are securely fastened. See Diagram 5
7. To hold the hydraulic hoses in position, clamp to the rear 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

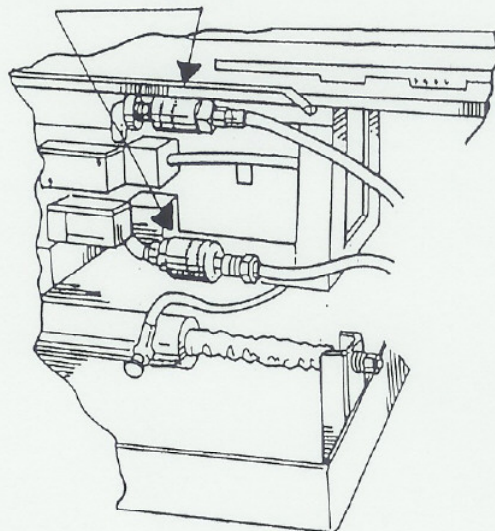
The platform can be extended back if you want a place to set targets of tools.



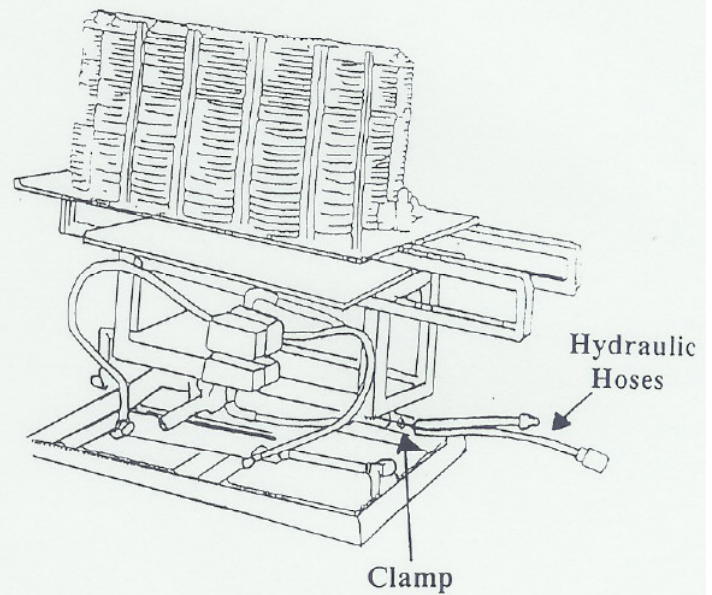
(Diagram 2)

(Diagram 99)

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



(Front)

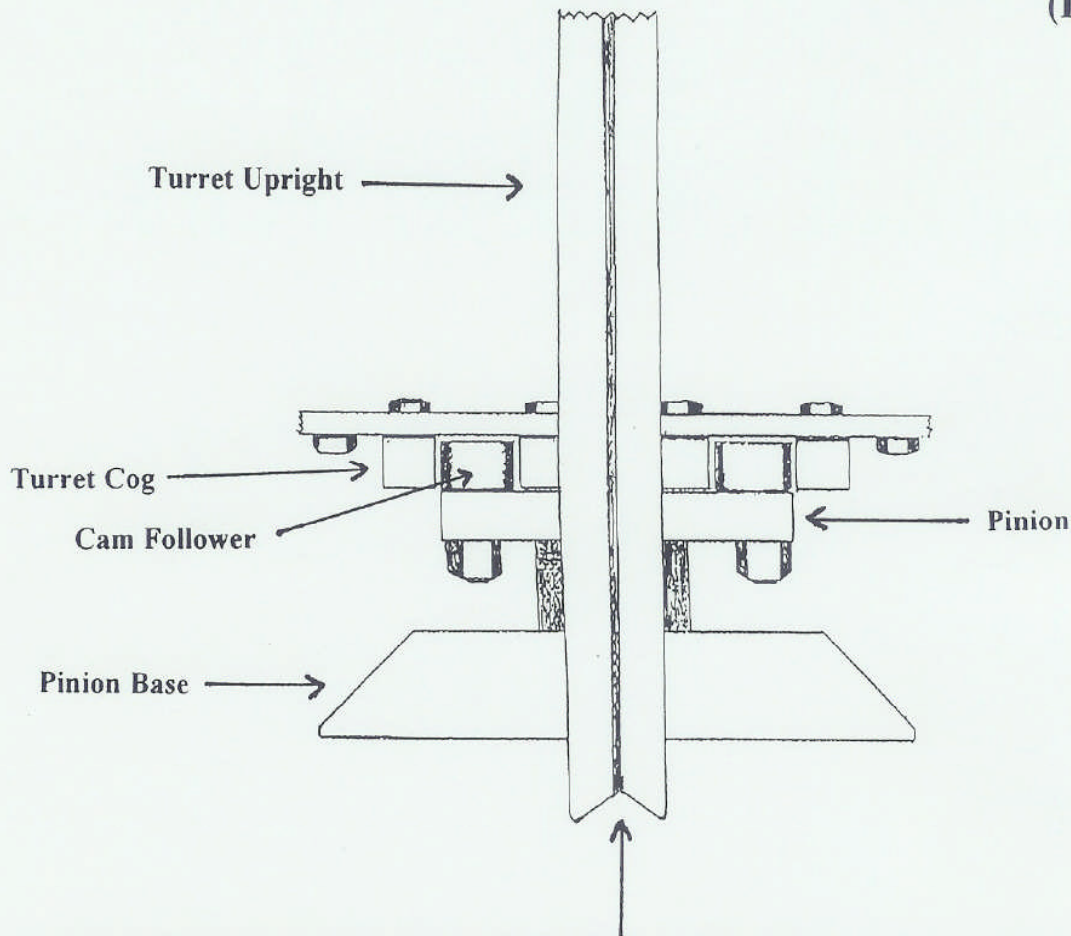


(Diagram 94)

REPLACEMENT OF THE TURRET

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

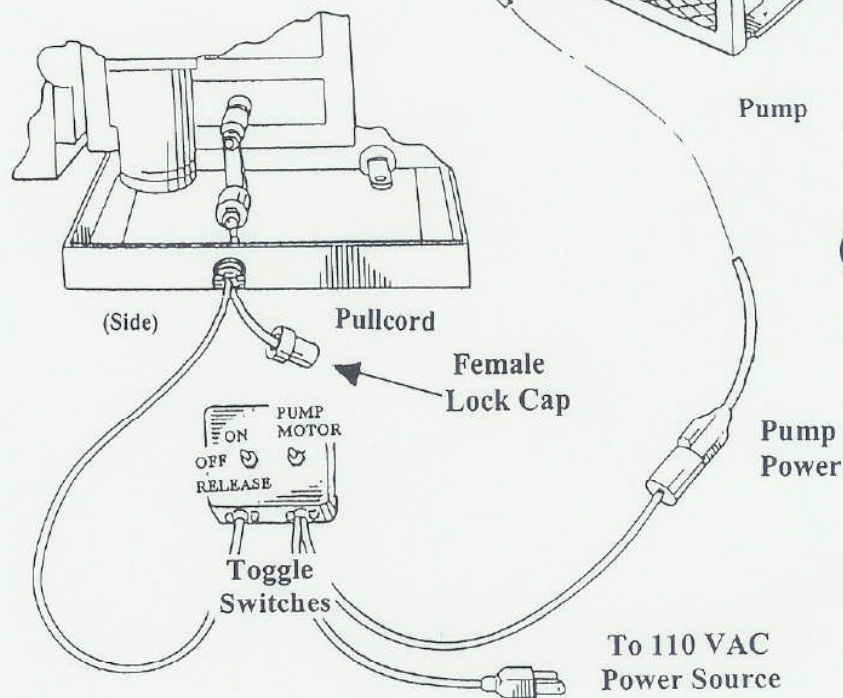
MOUNTING THE POWER CONTROL BOX

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. *Remember:* 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

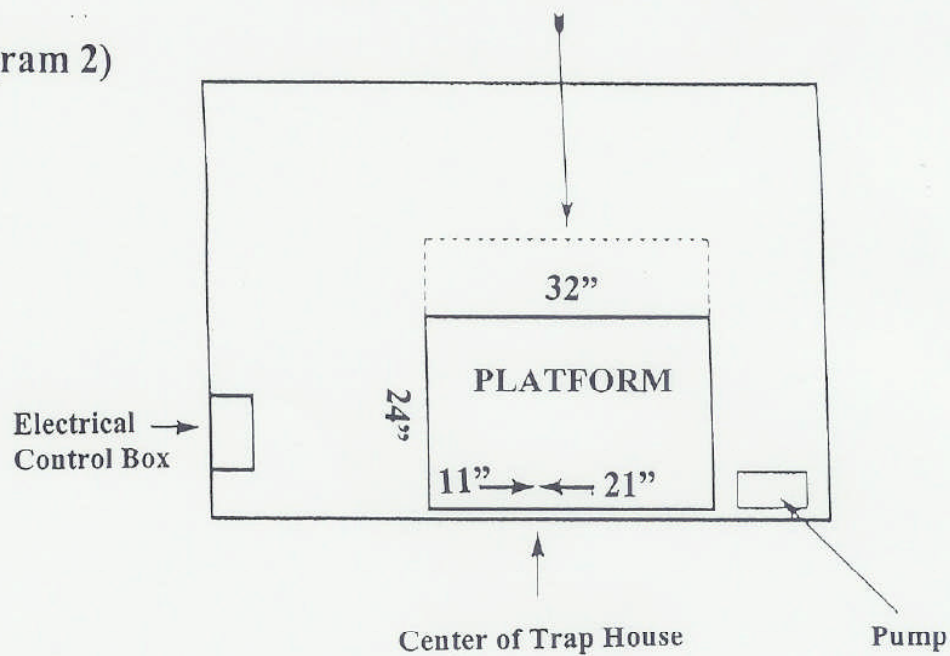
(Diagram 3)



(Diagram 4)

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

(Diagram 2)



HOW THE PAT-TRAP® AUTOMATIC DOUBLES MACHINE WORKS

Turn on the pump and the trap machine. The elevator rises to receive a target while the throw arm and turret advance. When a target is loaded, the elevator goes down and the throw arm advances the target until the Activator comes to the #2 and #3 switch bracket. The throw arm is now at the brake (in the cocked position) and the target is set. See Diagram 32

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 Diagrams 9 and 27

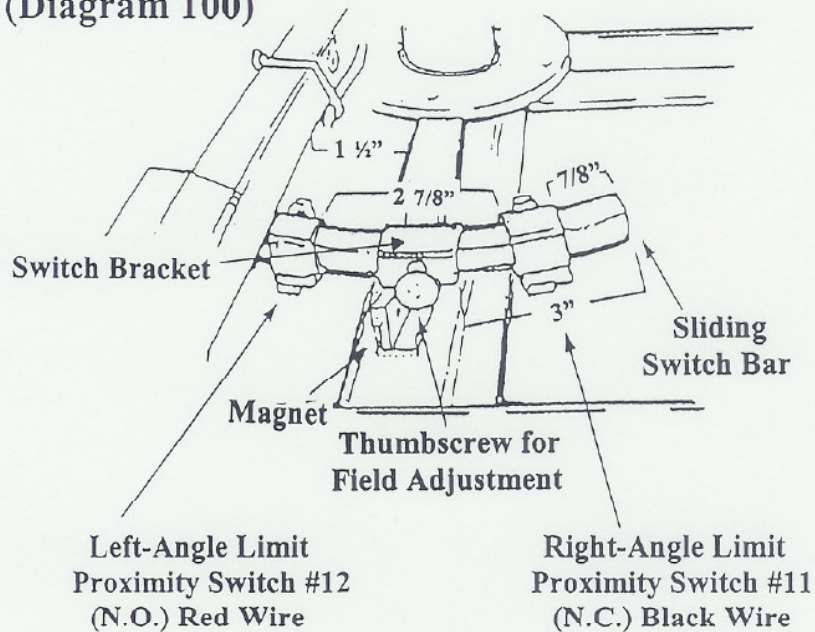
When the activator leaves Switches #2 and #3, the #2 switch closes and begins a new cycle of loading a target. The #3 switch also closes, which starts the oscillation interrupter for a pre-determined length of time*

* The machine oscillates to the left until Switch #12 comes to the magnet, activating Relay #2, causing the machine to change direction to the right. Switch #11 holds the Relay engaged until Switch #11 comes to the magnet, breaking the circuit which then disengages Relay #2 causing the machine to oscillate left. See Diagrams 25 and 100. The switching sequence is the *same for the wobble machine*. See Diagrams 51 and 52

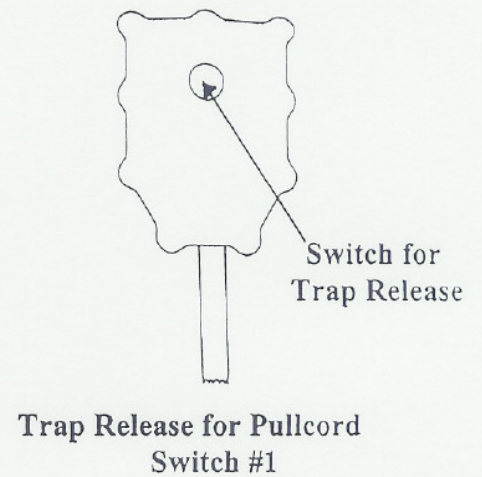
Switch #1	Trap release switch
Switch #2	Throw arm limit switch
Switch #3	Oscillation interrupter activator switch
Switch #11	Right-angle limit switch
Switch #12	Left-angle limit switch
Switch #11A	High-angle limit switch
Switch #12A	Low-angle limit switch

Field-Angle Adjustment
Up to Serial # 2739

(Diagram 100)

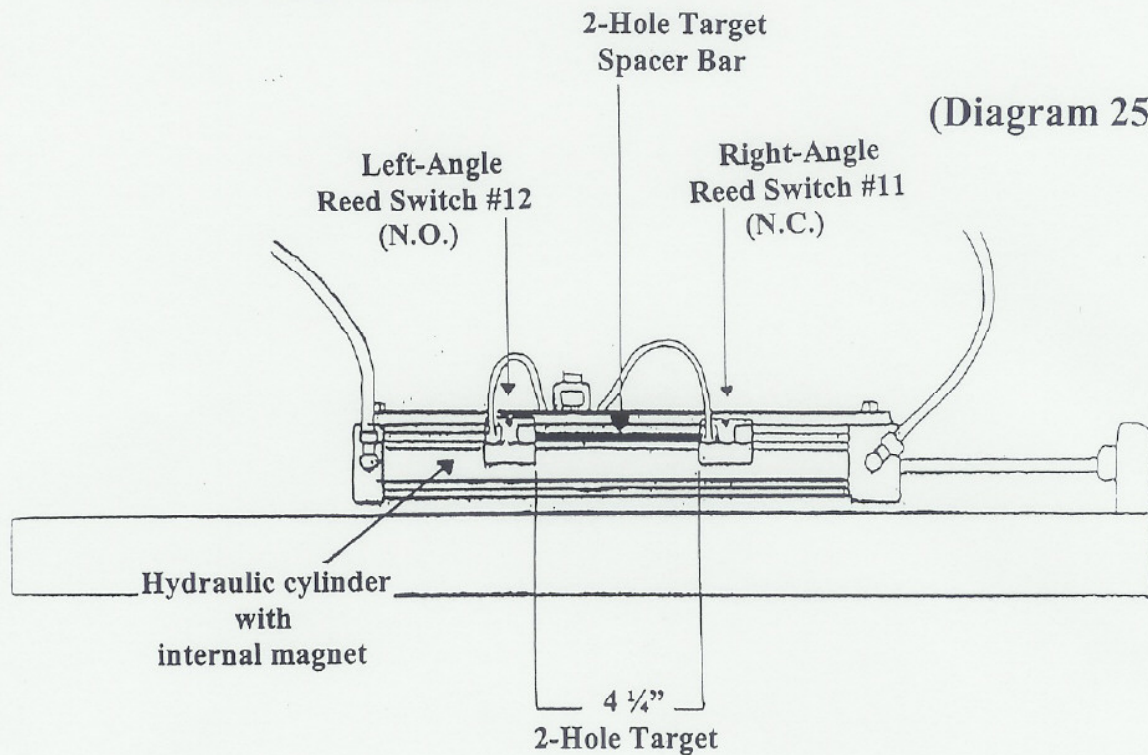


(Diagram 9)

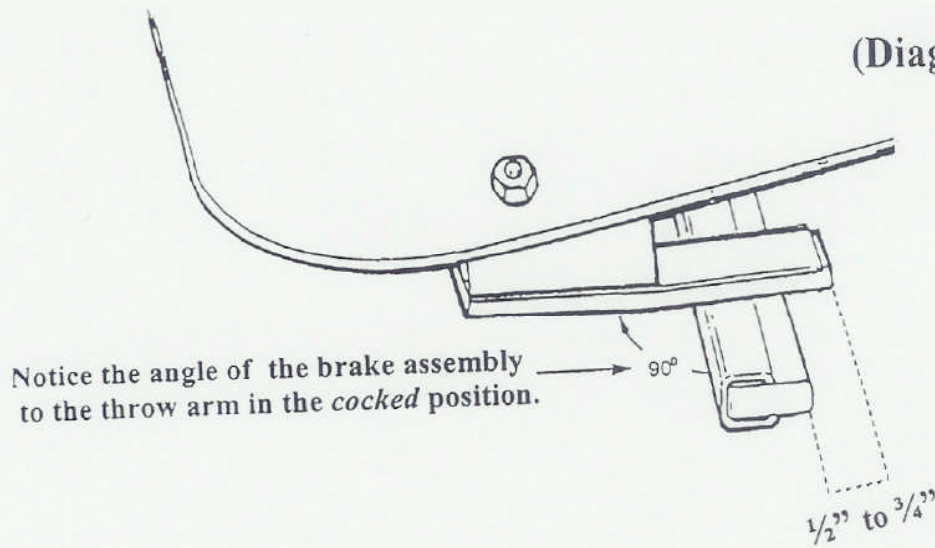


Field-Angle Adjustment
From Serial # 2740 ...

(Diagram 25)

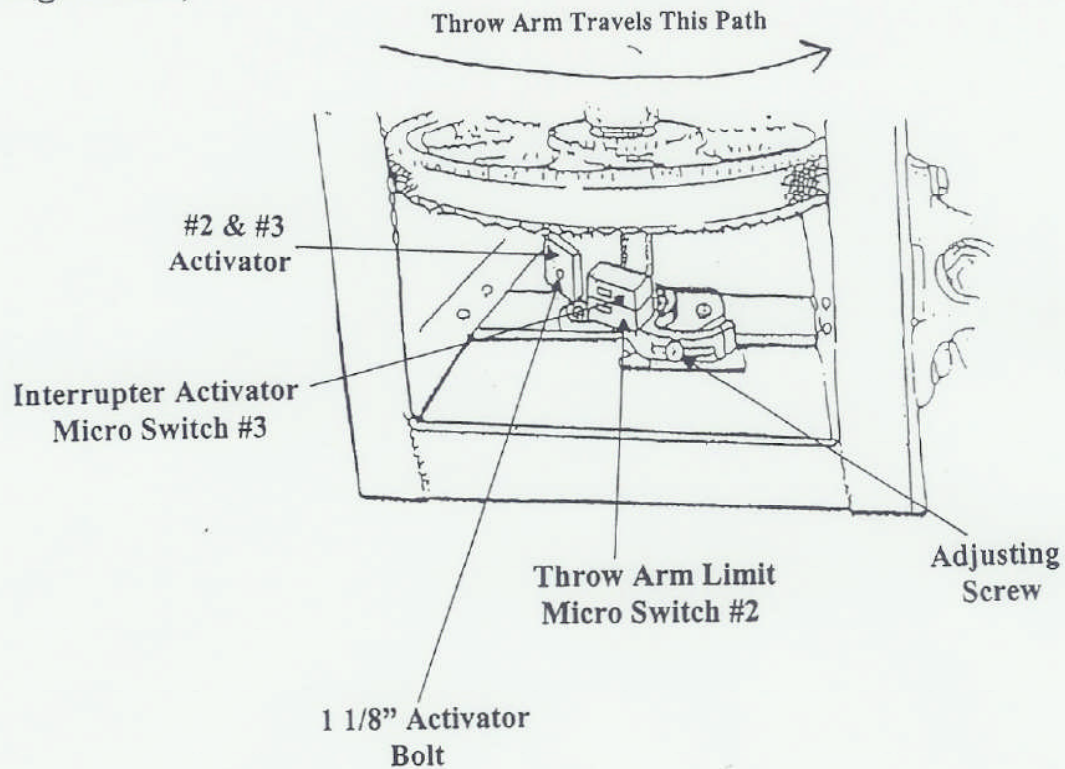


(Diagram 32)

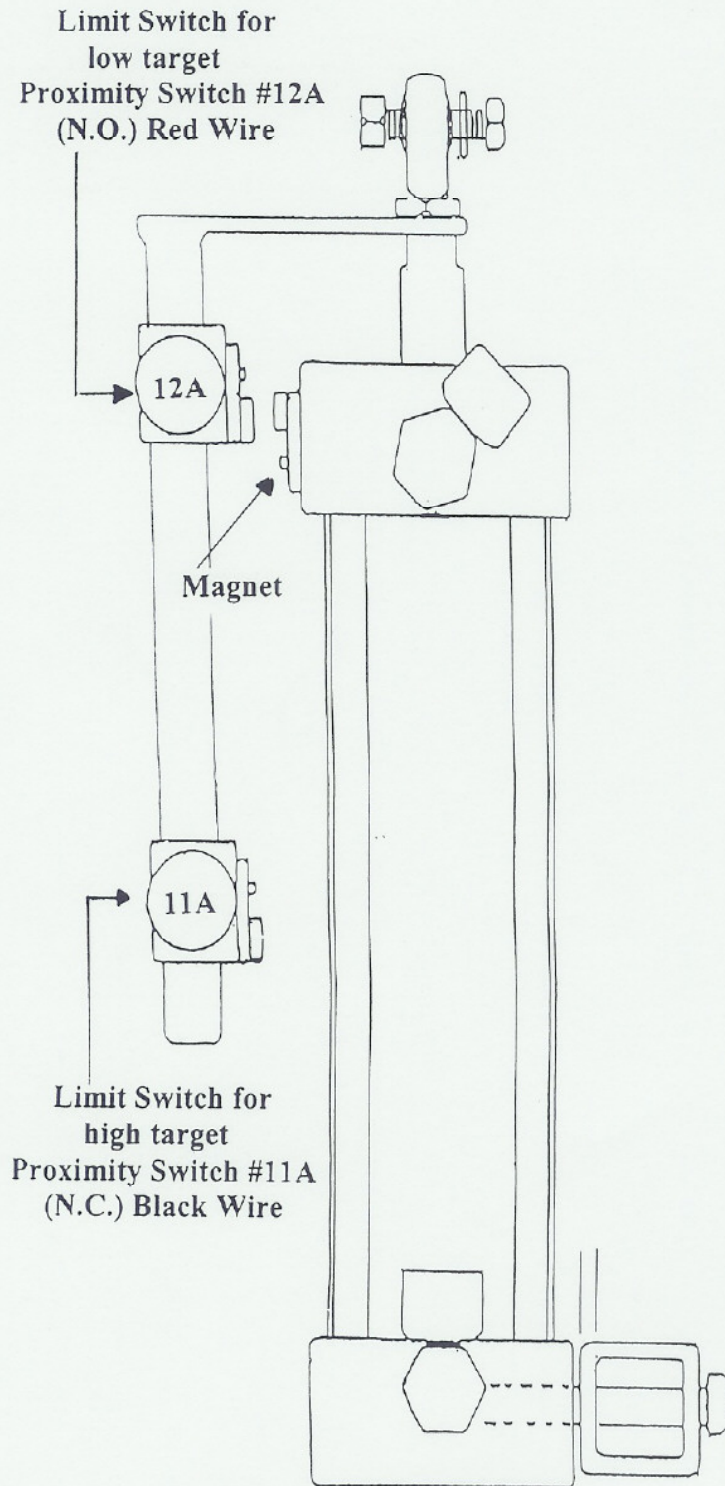


The stopping position of the throw arm on the brake is approximately $\frac{1}{2}''$ to $\frac{3}{4}''$ behind the end of the brake.

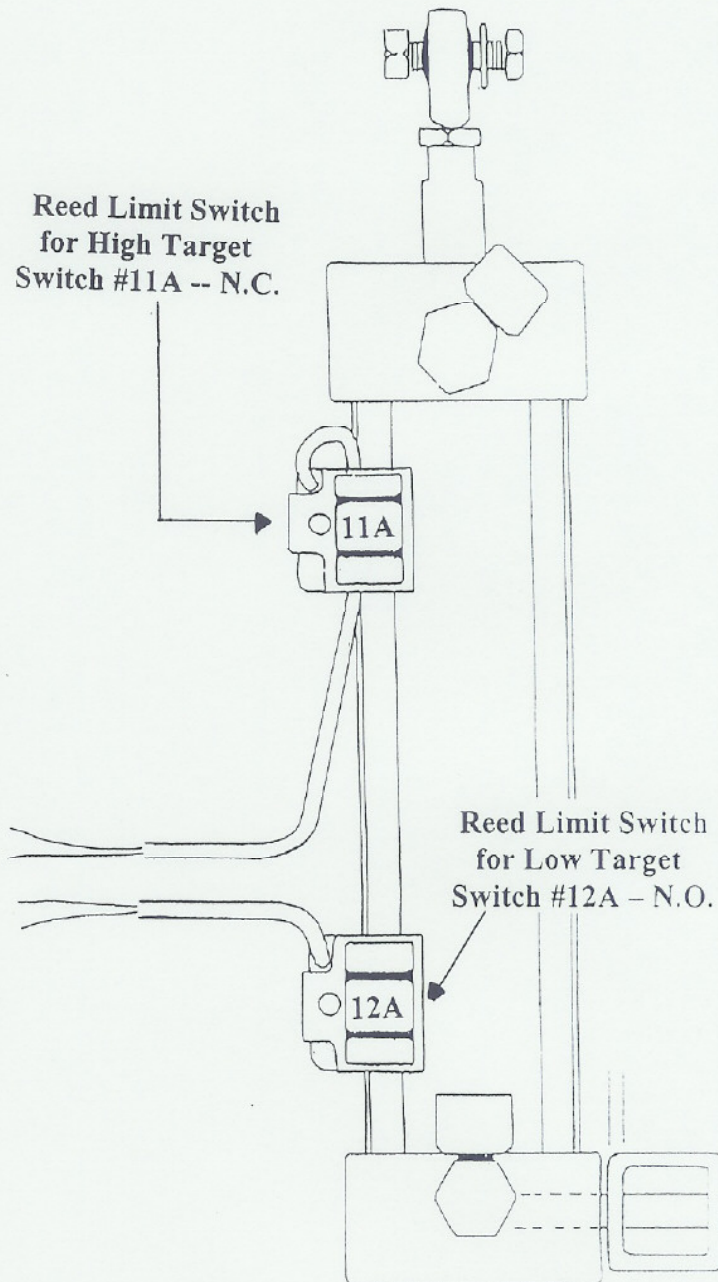
(Diagram 27)



Up To Serial #2804



(Diagram 51)



(Diagram 52)

TURNING THE 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. Cold 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 let go. The trap will throw the target and not cock the spring.
2. Push the Pump Motor toggle switch DOWN to the Off position.

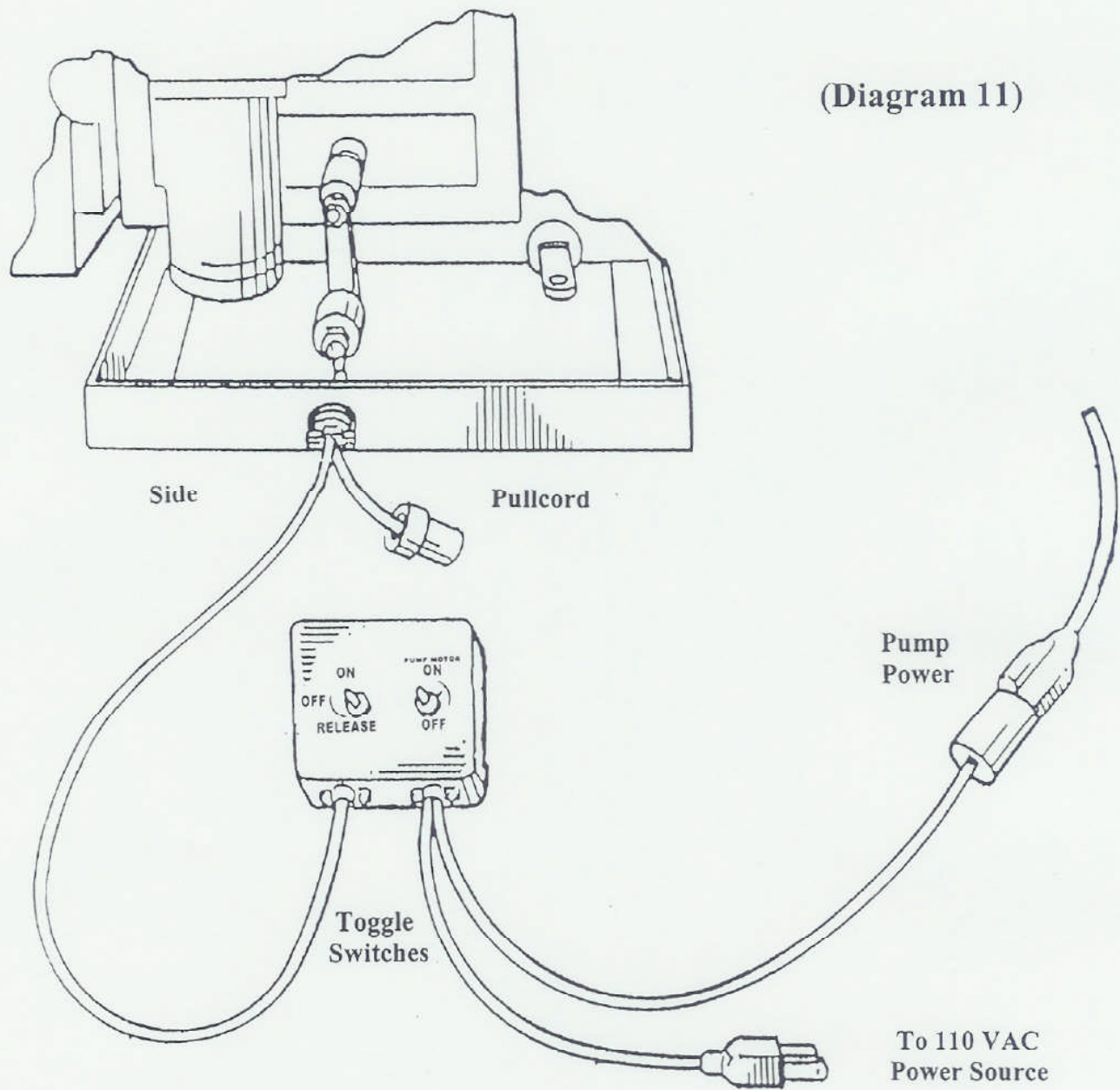
LOADING THE PAT-TRAP® MACHINE

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.

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)



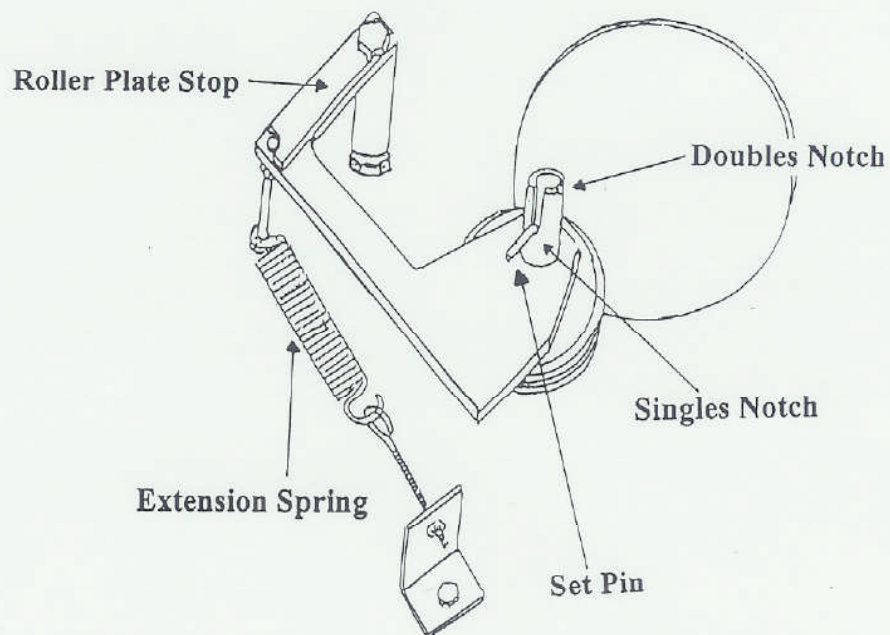
PAT-TRAP® SINGLES

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 of it.
2. For Serial numbers up to 2892: The lower roller must be turned so that the stamped "S" is facing upward. Slide the roller off, invert and replace the roller. See Diagram 12

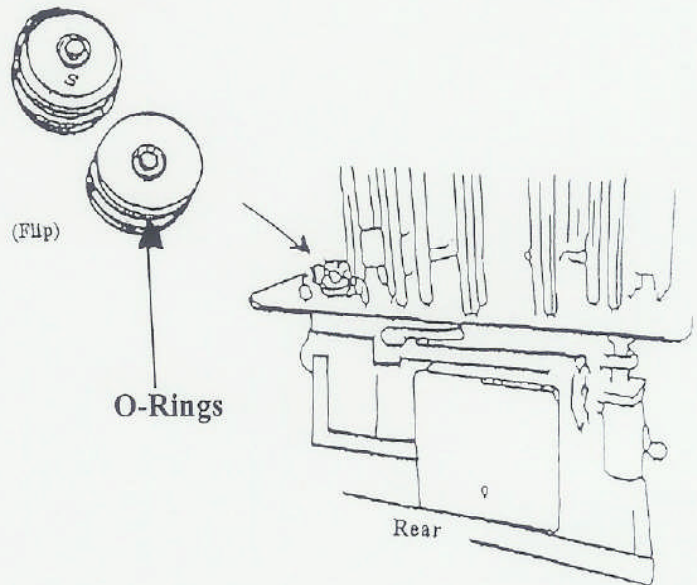
For Serial numbers beginning with G2893: Move the set pin to the lower notch. See Diagram 85
3. The spring tension can be adjusted by rotating the spring crank *clockwise to increase tension; counter-clockwise to reduce the tension*. When changing from Doubles to Singles, rotate the spring crank counter-clockwise the same number of turns that were used to increase the tension for Doubles --- approximately 10 rotations. See Diagram 13
4. 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 13
5. *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.*
6. Once out of the trap house, push the On/Off/Release toggle switch up to the ON position.

(Diagram 85)

From Serial #2893

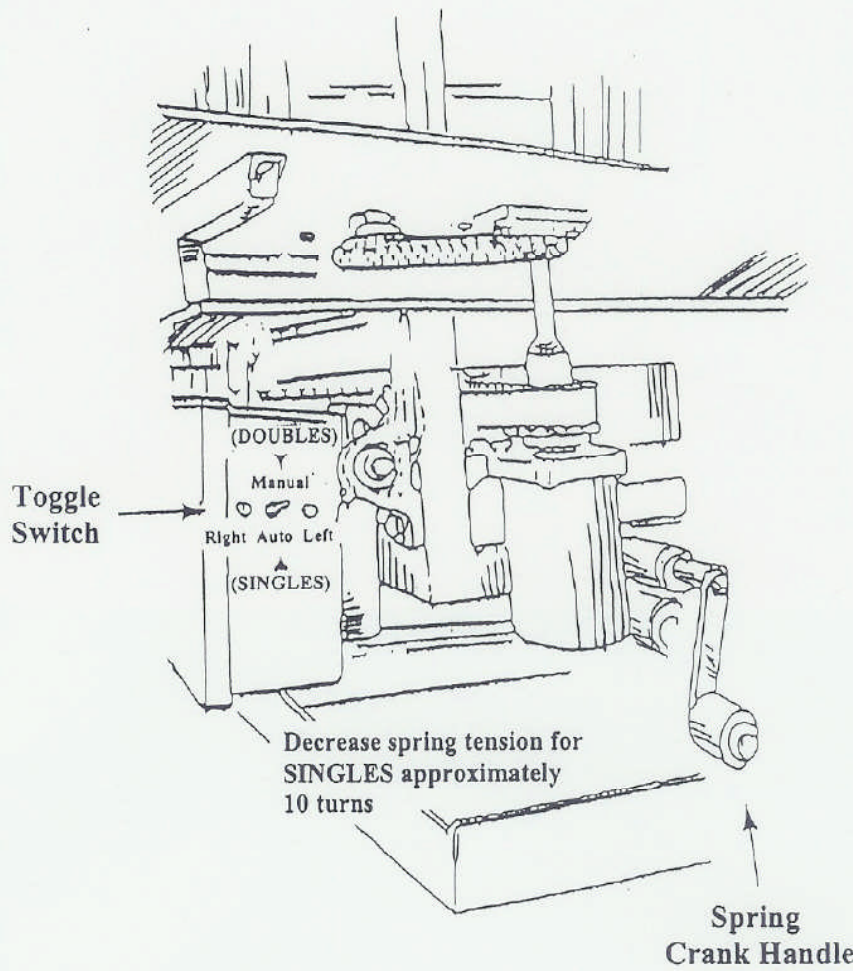


(Diagram 12)



Up to Serial #2892

Singes/Doubles
Roller



(Diagram 13)

PAT-TRAP® DOUBLES

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. See Diagram 93

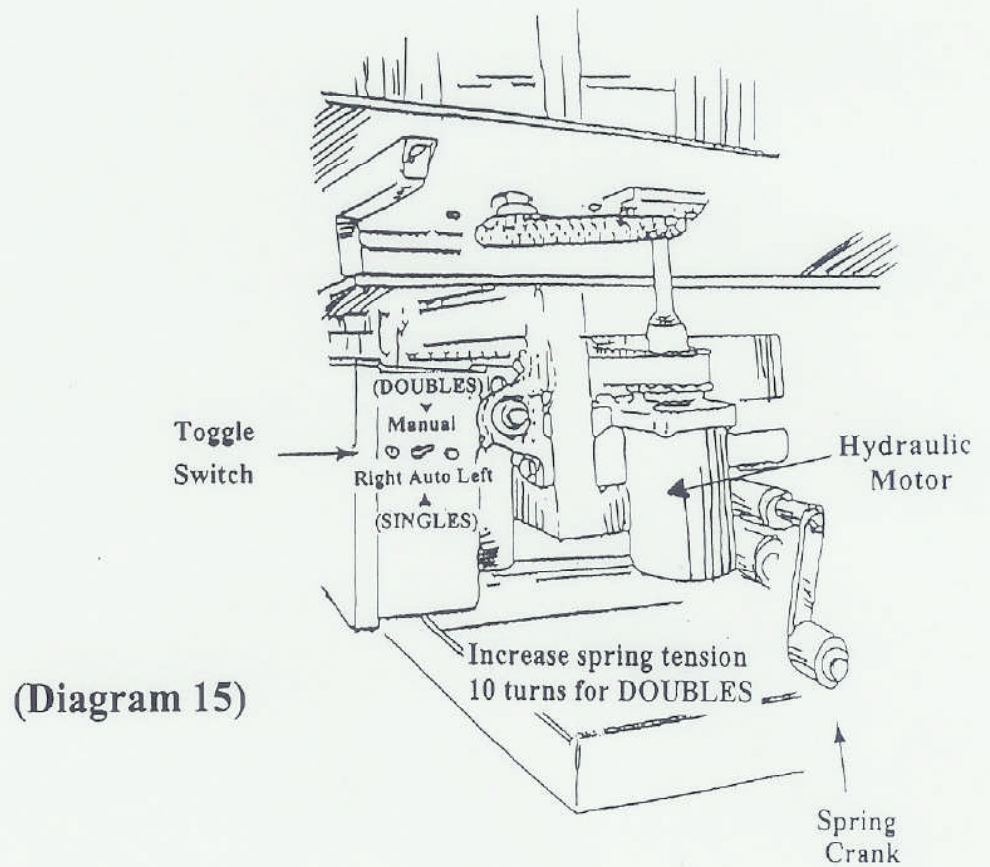
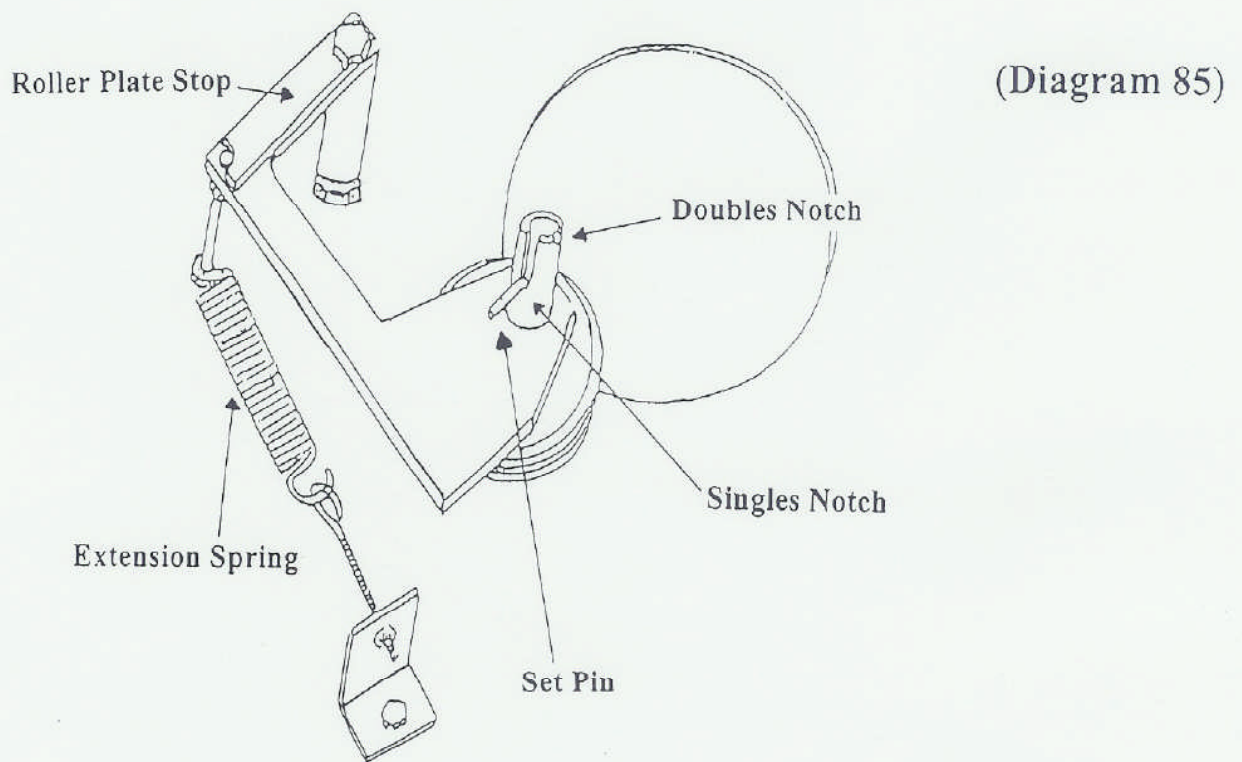
1. *Release the target.* The power to the pump motor can be left on.
2. Move the set pin to the upper notch. See Diagram 85
3. The spring tension must be *increased* to throw Doubles. Rotate the spring crank *clockwise* approximately 10 rotations from the Singles setting. See Diagram 15
4. On the trap 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. The trap machine must be *ON* to operate 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 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 in Owners Manual.

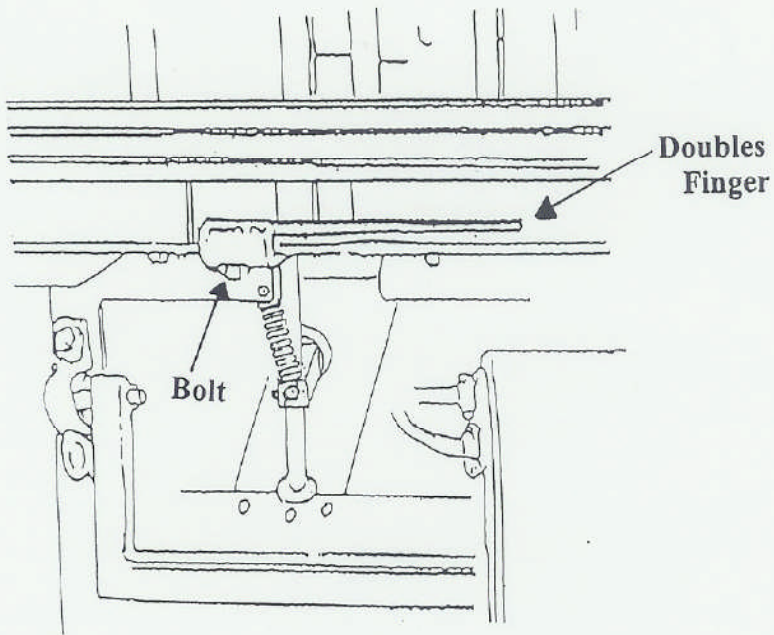
Use the Right or Left button to move the trap machine to the center..

5. *Before exiting the trap house, staying clear of the trap, reach over to the power control box and release the target.*
6. 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 need to be done the very first time the machine is used. Using a 7/16" wrench, loosen the bolt, move the Doubles Finger in 1/8" increments. Pull the Doubles Finger towards *self* to *lower* the height of the right target. Push *in* to *raise* the height of the right target. Tighten the bolt. See Diagram 17. Refer to the section for correct positioning of the Doubles Finger ("X" Finger).

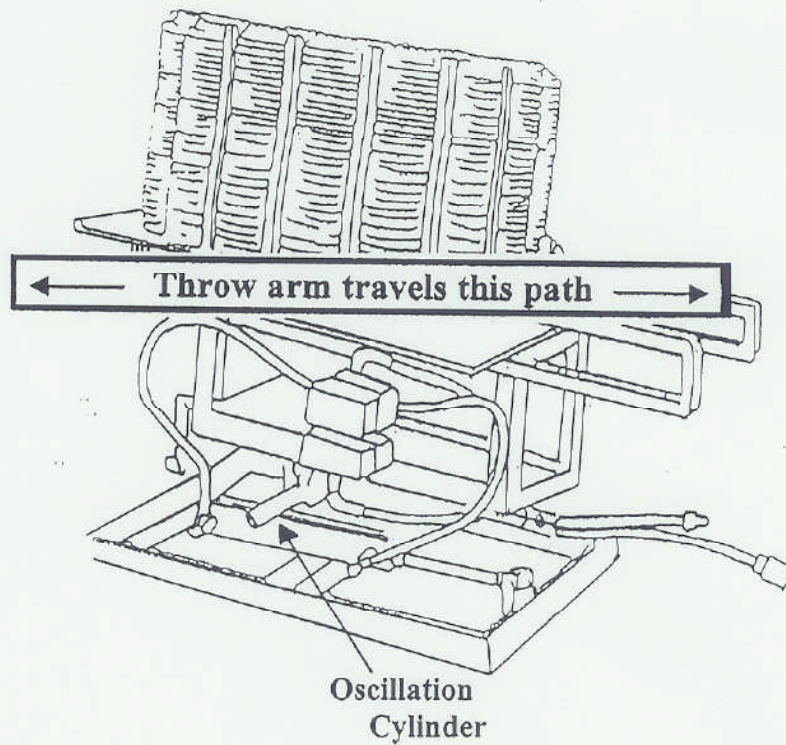




(Diagram 17)

DOUBLES Target Finger Adjustment

(Diagram 93)



PAT-TRAP® WOBBLE

The PAT-TRAP® with Wobble can be used in any of the following modes:

STATIONARY

X	Singles
X	Doubles

OSCILLATING HORIZONTAL

X	Singles
X	Doubles

OSCILLATING VERTICAL

X	Singles
X	Doubles

OSCILLATING HORIZONTAL/VERTICAL

X	Singles
X	Doubles

The PAT-TRAP® with Wobble has an interrupter for the horizontal and vertical modes.

NOTE: If the machine is located inside a trap house, oscillating doubles targets may hit the trap house walls.

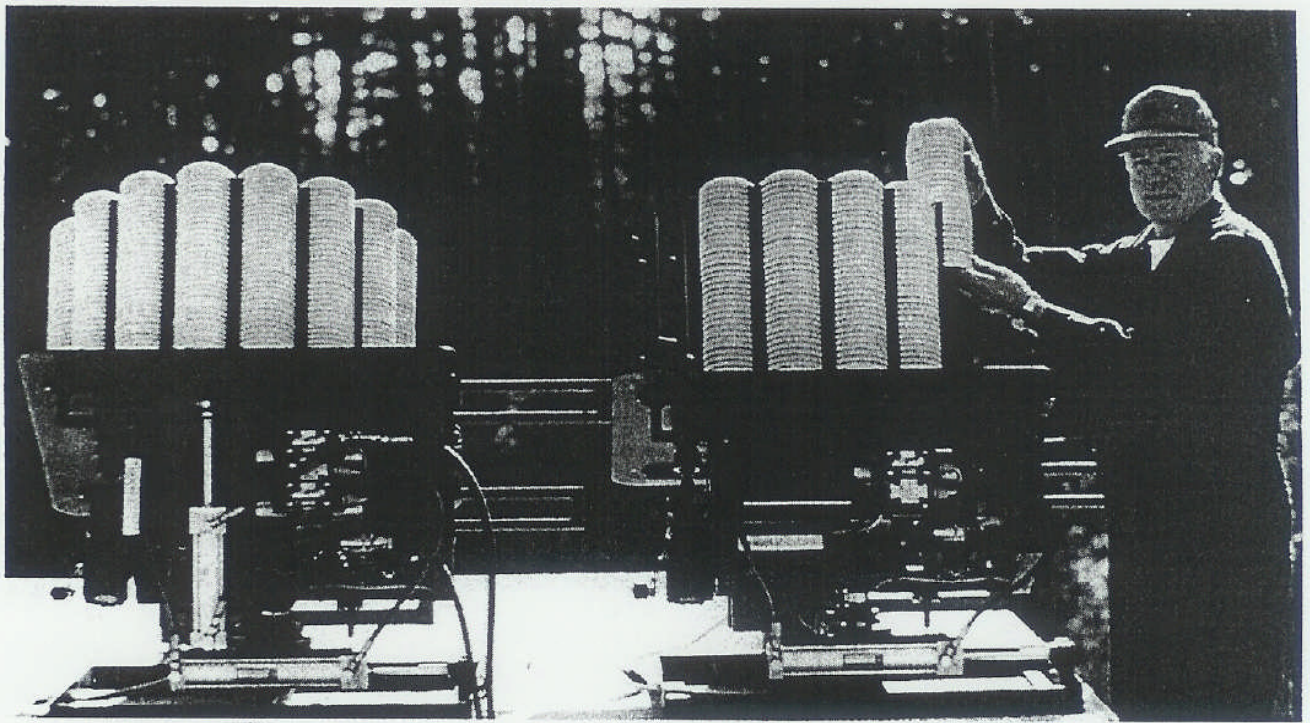
CHANGE OVER TO WOBBLE

Stand clear of the trap machine. Release the target. Use all safety procedures as stated in the previous “Singles” and “Doubles” section of this Manual.

The Oscillation Switch and the Wobbles Switch must be pushed down to the AUTO position on the trap machine electrical box. This engages the machine to the automatic horizontal/vertical oscillation mode.

HEIGHT ADJUSTMENT FOR SINGLES/DOUBLES WOBBLE

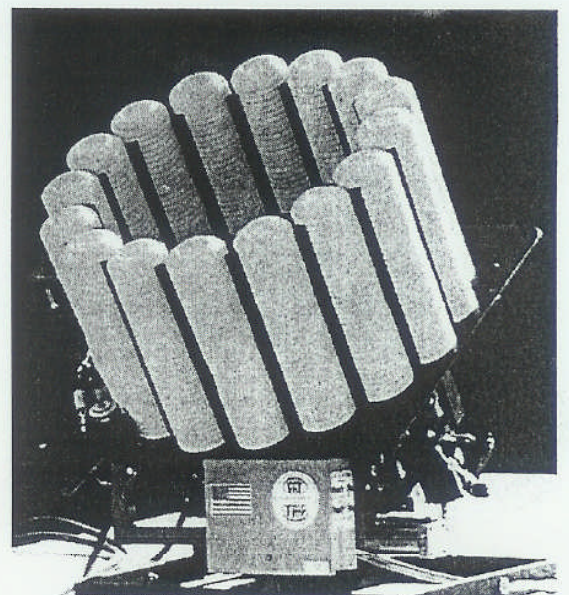
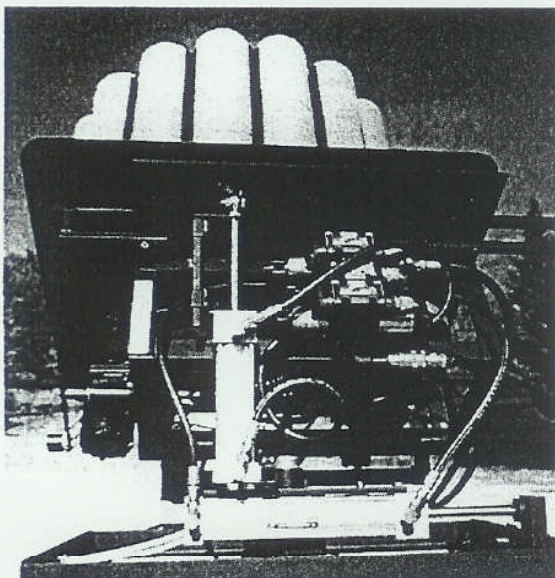
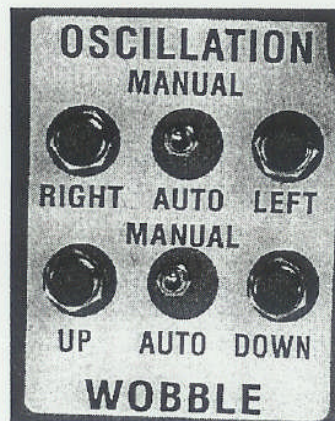
On the trap machine electrical box, the horizontal switch must be moved to the MANUAL position. For desired height, push UP switch to go up; push DOWN switch to go down.



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 with hold. The elastic lock-nut holds the spring at the set minimum tension.

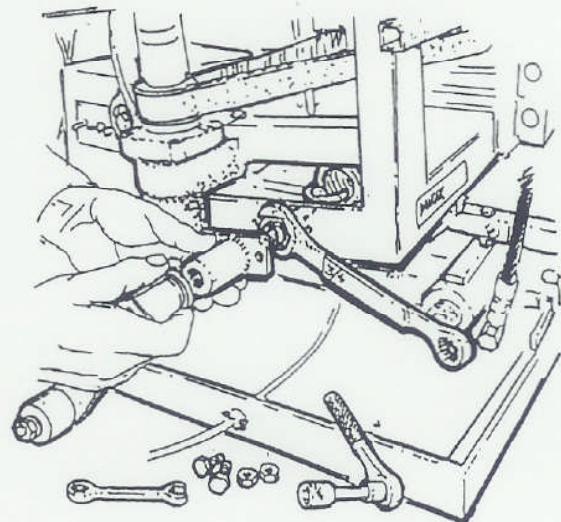
The standard minimum tension should be set so that the spring tension for a Singles target is as follows:

1. Remove the crank by rotating it counter clockwise
2. Remove the nylon washer
3. Remove the 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 proper/desired 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 the 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.

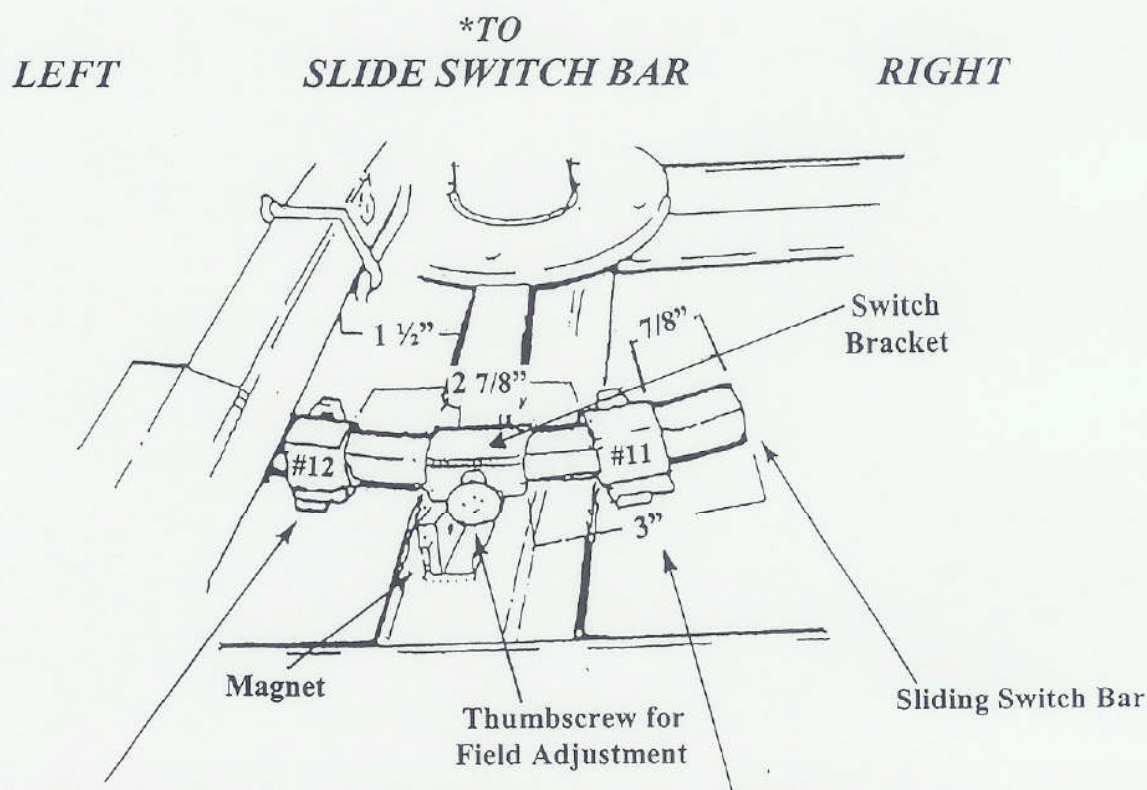
NOTE: Singles are always set first, then follow the procedures for Doubles as outlined in that section.

(Diagram 21)



FIELD-ANGLE ADJUSTMENT

Up to Serial #2739



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
---	--------------------------------------	--

(Diagram 101)

The measurements in the above diagram are approximate for 2-hole targets. A 2-hole target is equal to 5 7/8" travel of the hydraulic cylinder (from left to right). The 2 7/8" spread between the switch holders allows for approximately 5 7/8" of total hydraulic cylinder travel --- which equals a 2-hole target. 6 7/8" 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 to move the targets 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 MAKE ANY ADJUSTMENT WHEN THE THROW ARM IS COCKED.

ADJUSTING HEIGHT OF TARGETS

Up to Serial #2739

Tilt the table by pushing *up* on the front of the machine. The elevation cog can be positioned up or down. See Diagram 22.

ANGLE ADJUSTMENTS

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

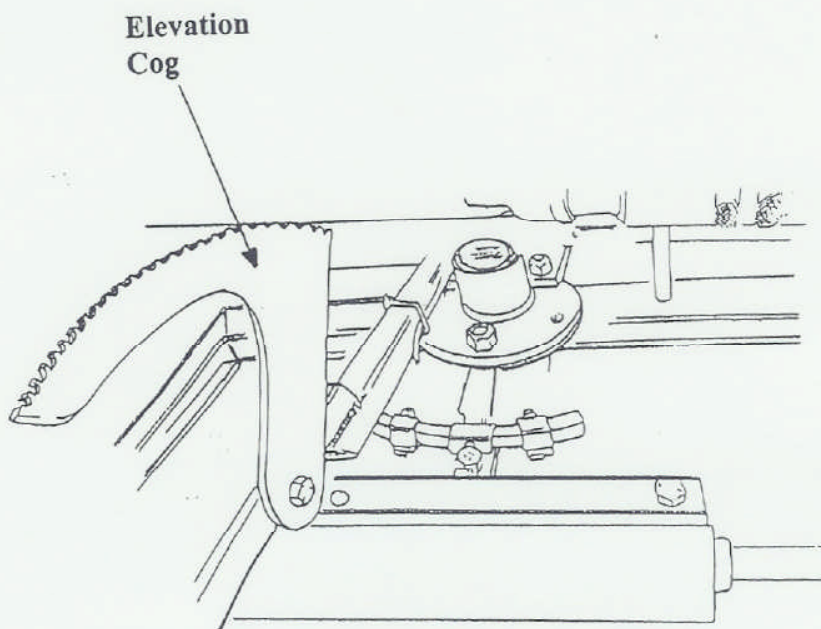
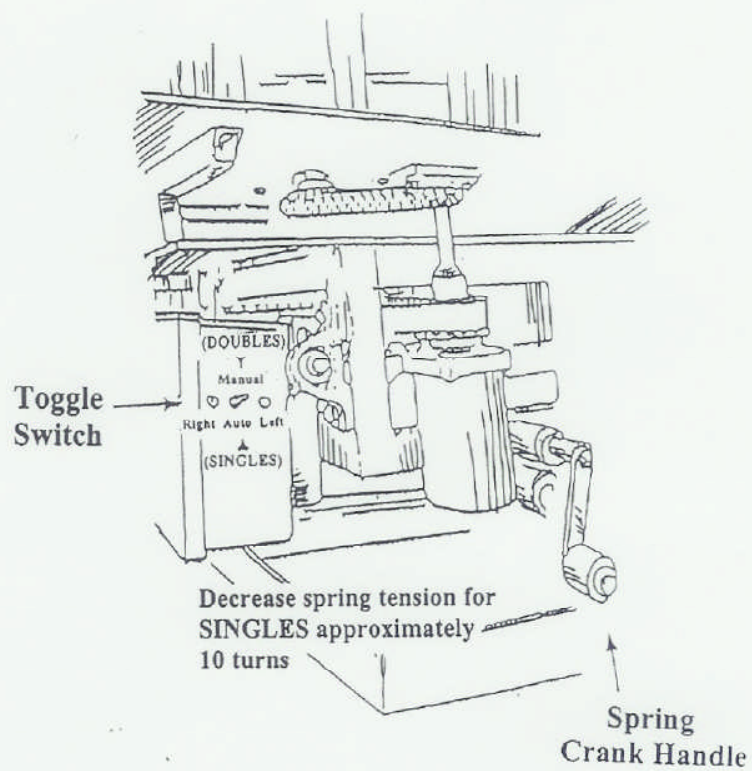
The measurements in Diagram 66 are for 2-hole targets. The 2 7/8" approximate spread between the switch holders allows for 5 7/8" of total hydraulic cylinder travel --- which equals a 2-hole target. 6 7/8" of travel equals a 3-hole target.

Loosen the screws. Slide the angle switch toward the "magnet" to *decrease* the angle. Slide the angle switch away from the "magnet" to *increase* the angle. Re-tighten the screws to hold the switch in place. See Diagram 53

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.

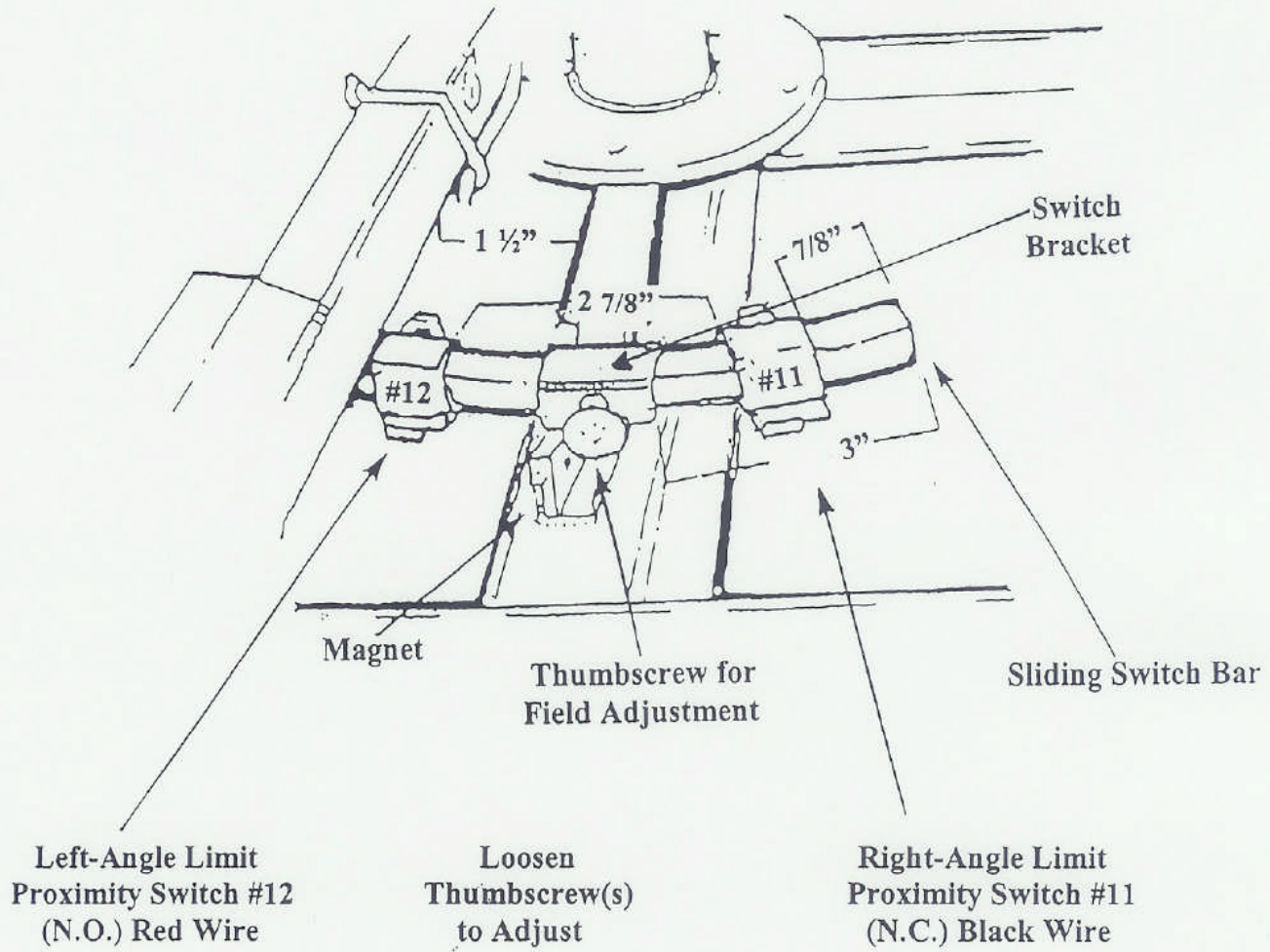
IMPORTANT: *Never increase the limit switches beyond the travel path of the cylinder. This may cause the hydraulic cylinder to "bottom out" and damage the cylinder.*

(Diagram 13)



(Diagram 22)

(Diagram 101)



ADJUSTING HEIGHT OF TARGETS

From Serial # 2740

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. See Diagram 22.

ANGLE ADJUSTMENTS

STRAIGHT-AWAY TARGETS

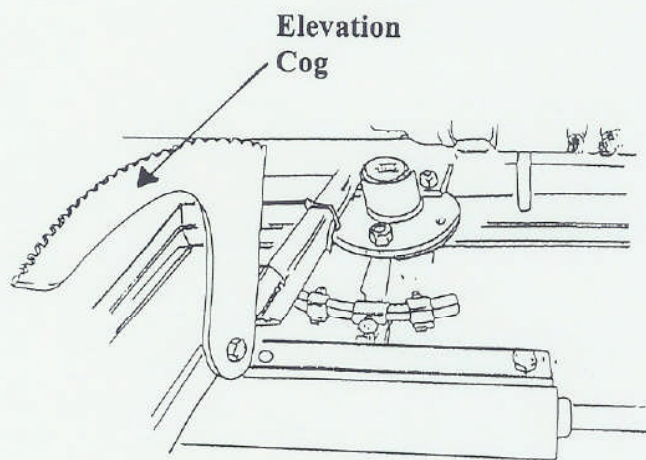
Set the toggle switch to the manual position. Use the right and left buttons to achieve Straight-Away Targets. See Diagram 13

2-HOLE TARGETS

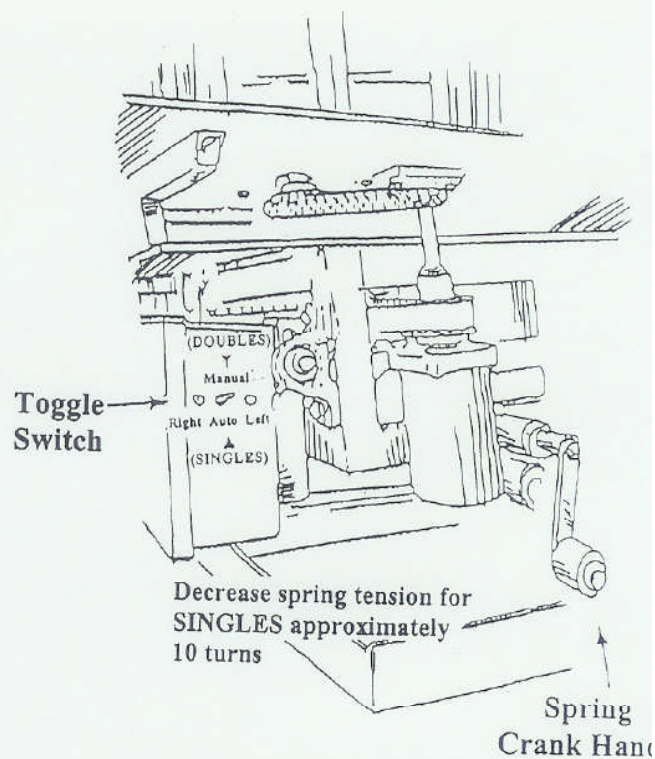
The measurement in Diagram 91 is for 2-Hole Targets. The 4 ¼" spread between the switches allows for 5 7/8" of total cylinder rod travel --- which equals a 2-Hole Target. A 5 ¼" spread between the switches allows for 6 7/8" of total cylinder rod travel --- which equals a 3-Hole Target.

SHIFTING THE TARGET FIELD

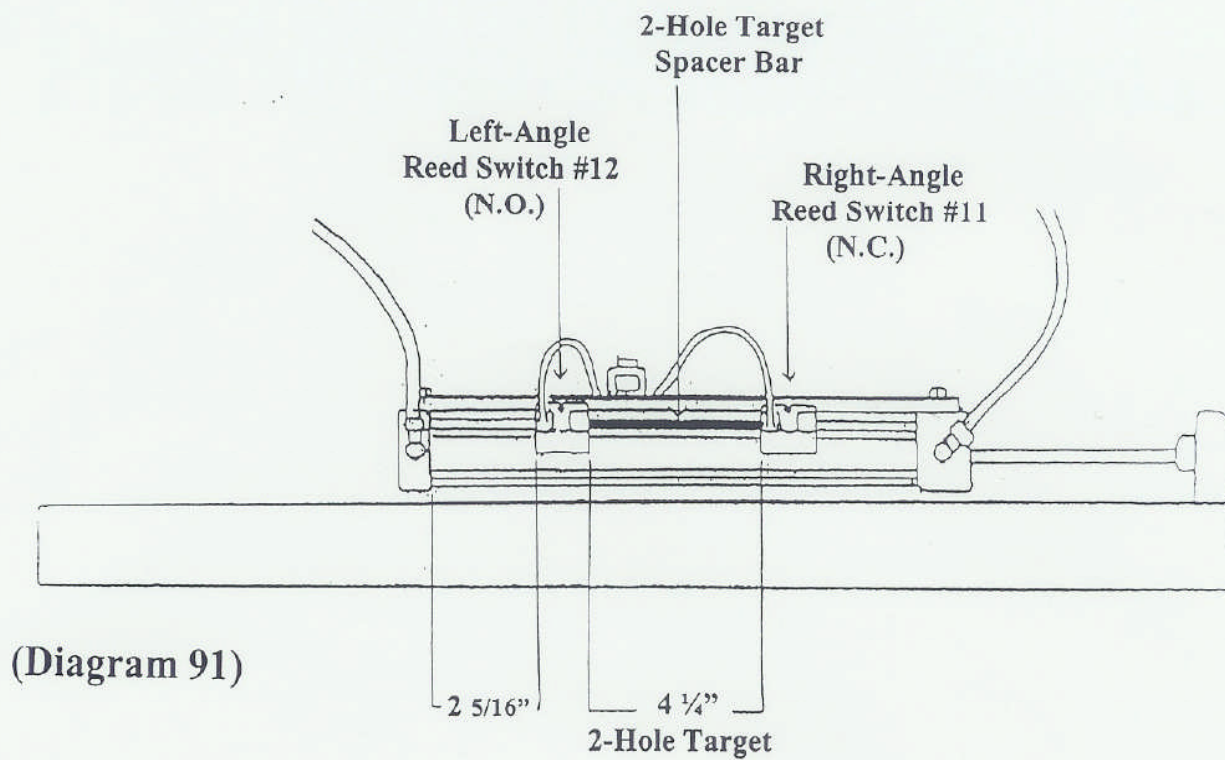
The 9/64" hex head set screws on the limit switches are already pre-set. A spacer bar that is 4 ¼" long is provided for setting a 2-Hole target field width. The field can be adjusted by sliding the limit switches in the direction you want to move the field; *TO MOVE THE FIELD TO THE RIGHT, SLIDE THE SWITCHES TO THE RIGHT AS YOU ARE FACING THE MACHINE.* Use the spacer bar to maintain the proper field width. The set screws are lightly set so that you can slide the limit switches without adjusting the set screws.



(Diagram 22)



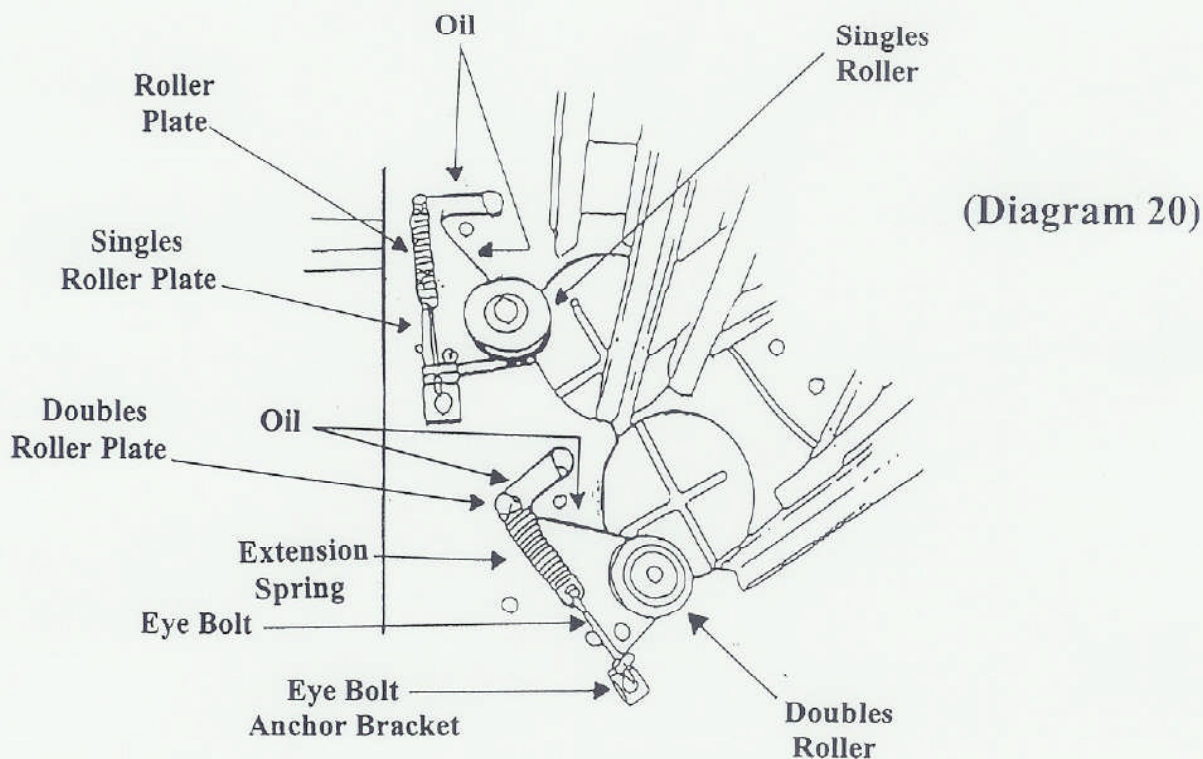
(Diagram 13)



(Diagram 91)

ROLLER PLATE MAINTENANCE

Up to Serial # 2892



NOTE: There needs to be enough spring tension to keep the stack of targets from slipping down past the target 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 top edges of the roller plates. Be sure to *inspect the roller plates every few weeks*: do this by pulling back and forth on the wheel while pressing down to see that they slide smoothly. Any excessive oil might 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.

POSITIONING OF THE ROLLER PLATES

From Serial # 2893

The roller plates must be positioned as shown in Diagram 81. The measurement to both of the roller plates is taken from the face of the kingpin shaft to the face of the roller shaft.

If an adjustment is necessary, then the roller plate stop will have to be turned until the roller plate stops at the given measurement.

To set the position of the roller plate stop:

1. Remove the extension spring
2. Adjust jam nut "A" so that when the nut "Y" is tightened the roller plate will pivot freely: with no more than 1/64" of up/down play between the roller plate shaft and jam nut "A".
3. Use an adjustable wrench to turn the roller plate stop to the correct position.
4. Hold back on the roller plate stop with the adjustable wrench while tightening the nut "Y". Torque nut "Y" to 35-40 ft/lbs.
5. Tighten jam nut "B" against nut "Y while holding back against the roller plate stop with the adjustable wrench. Torque jam nut "B" to approximately 15 ft/lbs.
6. Check for free pivot of the roller plate after tightening.
7. Check the measurement to each roller plate.
8. Reconnect the extension spring.

RETROFITTING OF THE ROLLER PLATES

If this a new installation (retro fit) to your machine, you will first have to drill out the two 1/4" holes to 3/8" for the roller plate shaft bolt. See Diagram 83 for location. If an adjustment is necessary, set a pair of large water pump pliers (channel lock) vertically against the roller plate shaft and carefully bend in the direction needed.

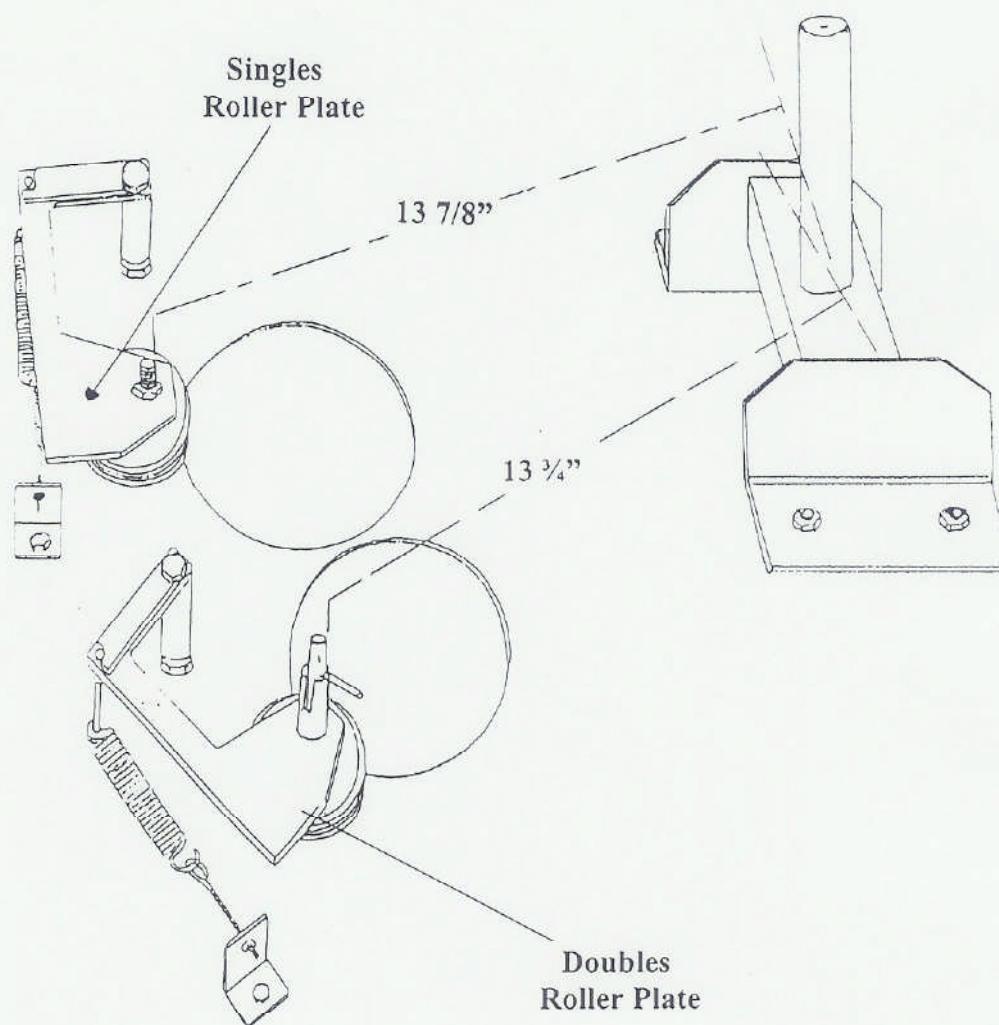
You will have to adjust the cant of both roller plates. Adjusting the cant needs to be made with the extension spring connected, and is the final step in the installation of the roller plate.

SETTING SINGLES/DOUBLES

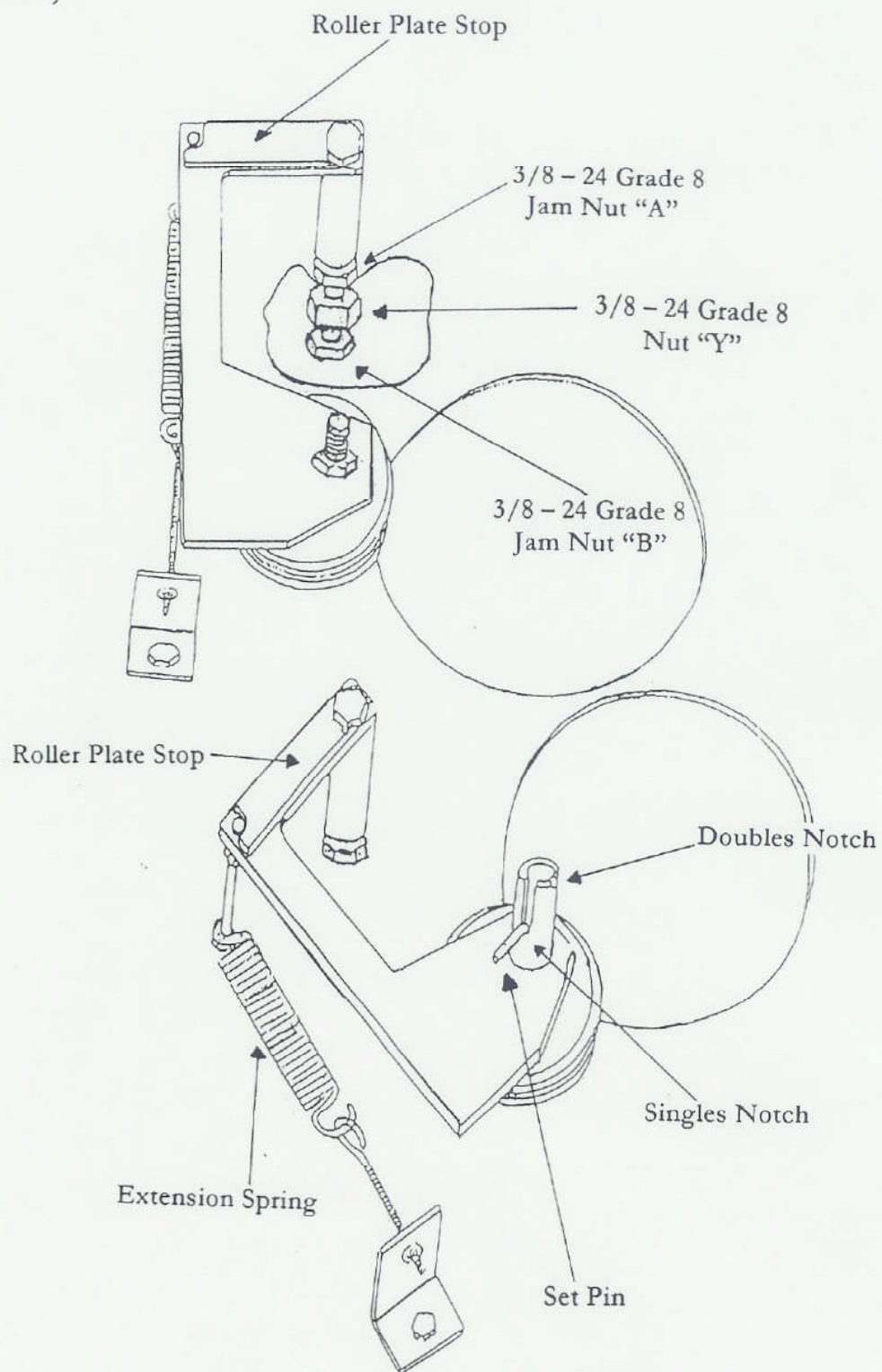
For Singles, move the set pin to the lower (Singles) notch.

For Doubles, move the set pin to the upper (Doubles) notch. See Diagram 82

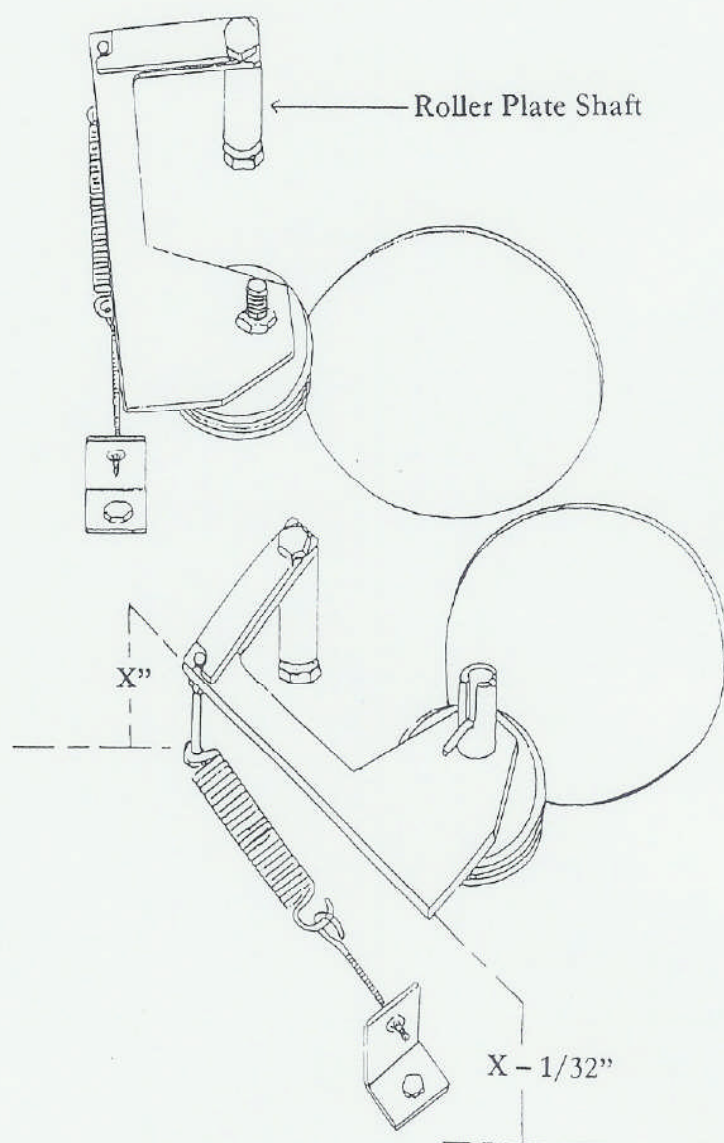
(Diagram 81)



(Diagram 82)

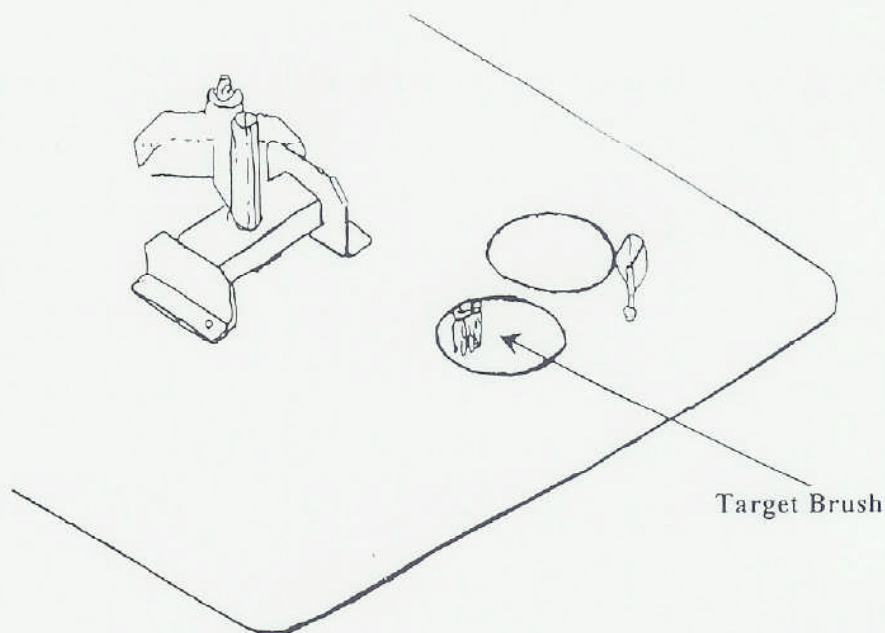


(Diagram 83)



TARGET BRUSH MAINTENANCE

(Diagram 55)



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 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 needs to be aligned within it's slot. Replace the brush when needed.

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

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.

In very cold weather, the pump motor should be turned on 30 to 60 minutes 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 (throwing targets).

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 cause the throw arm to stop too soon and cause slow pulls. Refer to the figure of the throw arm brake assembly for the proper stopping position of the throw arm. See Diagram 32

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 27

For proper stopping position of the throw arm on the brake, please refer to Diagram 32.

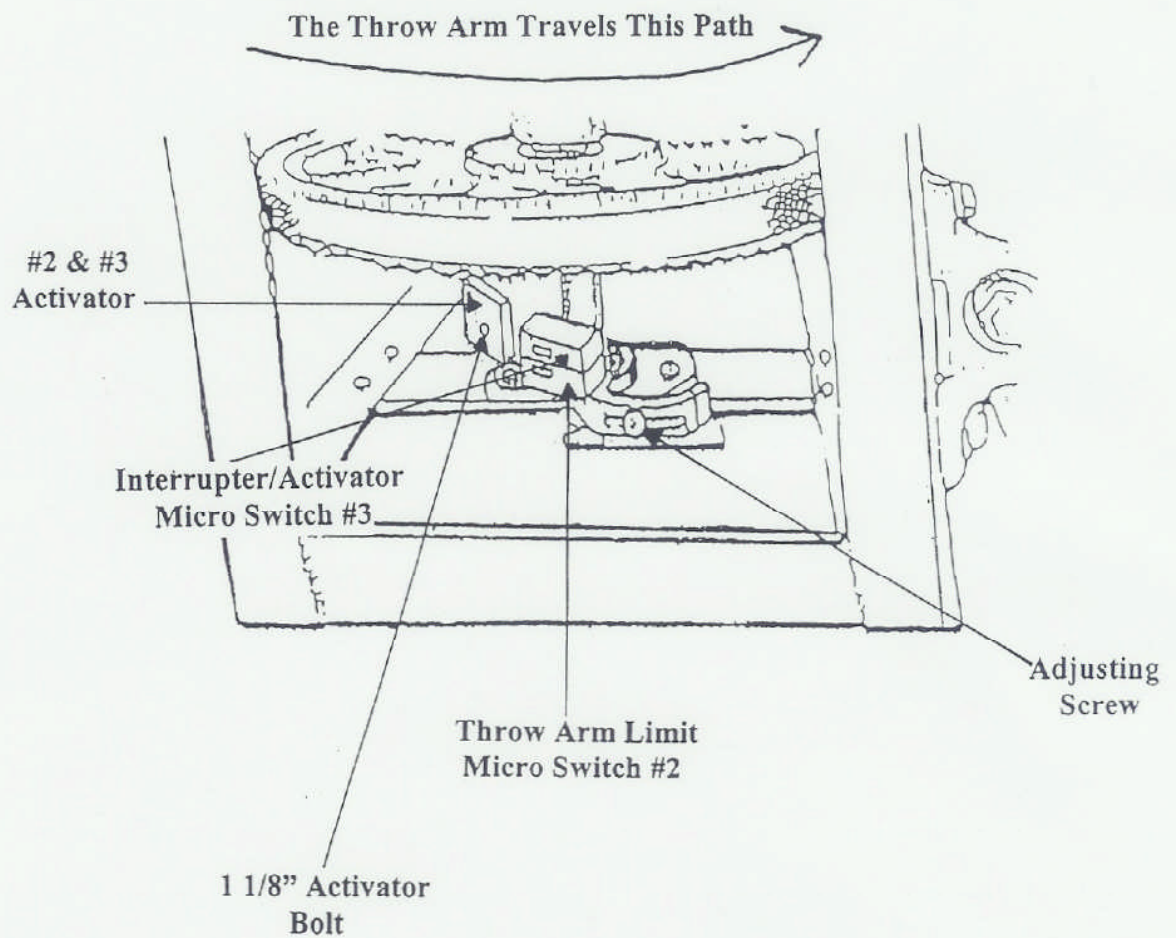
CAUTION

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

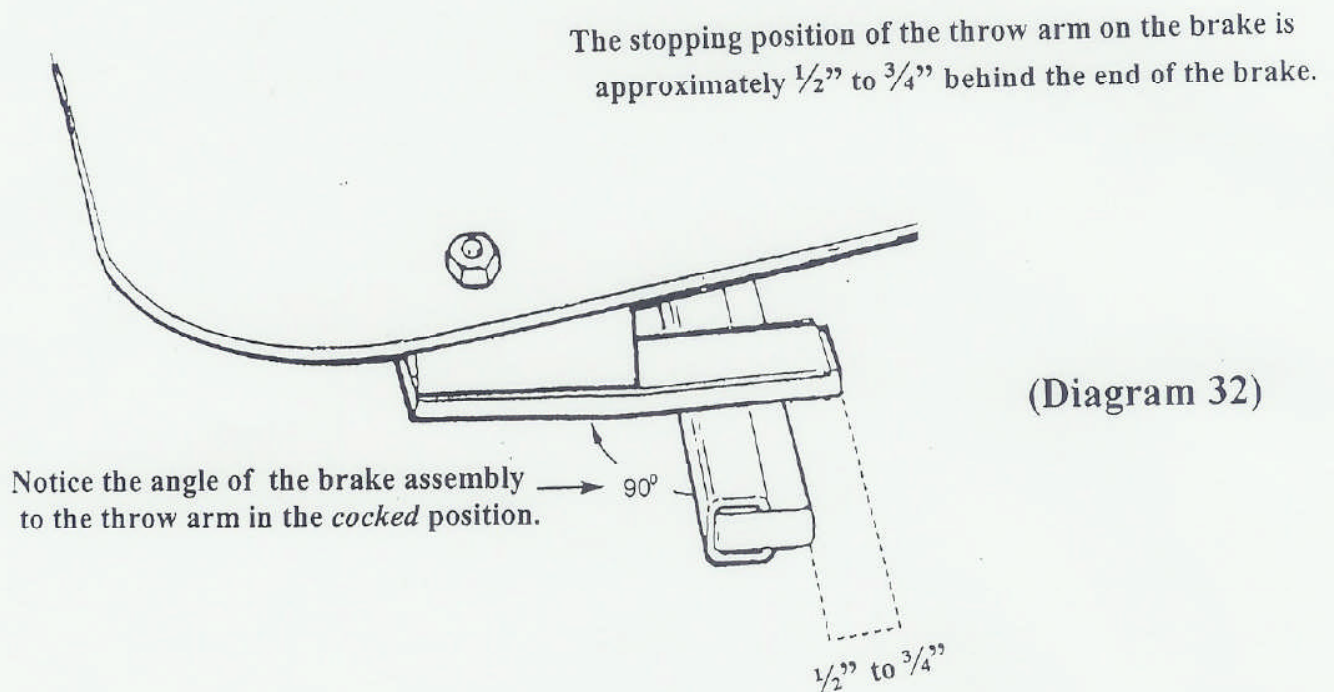
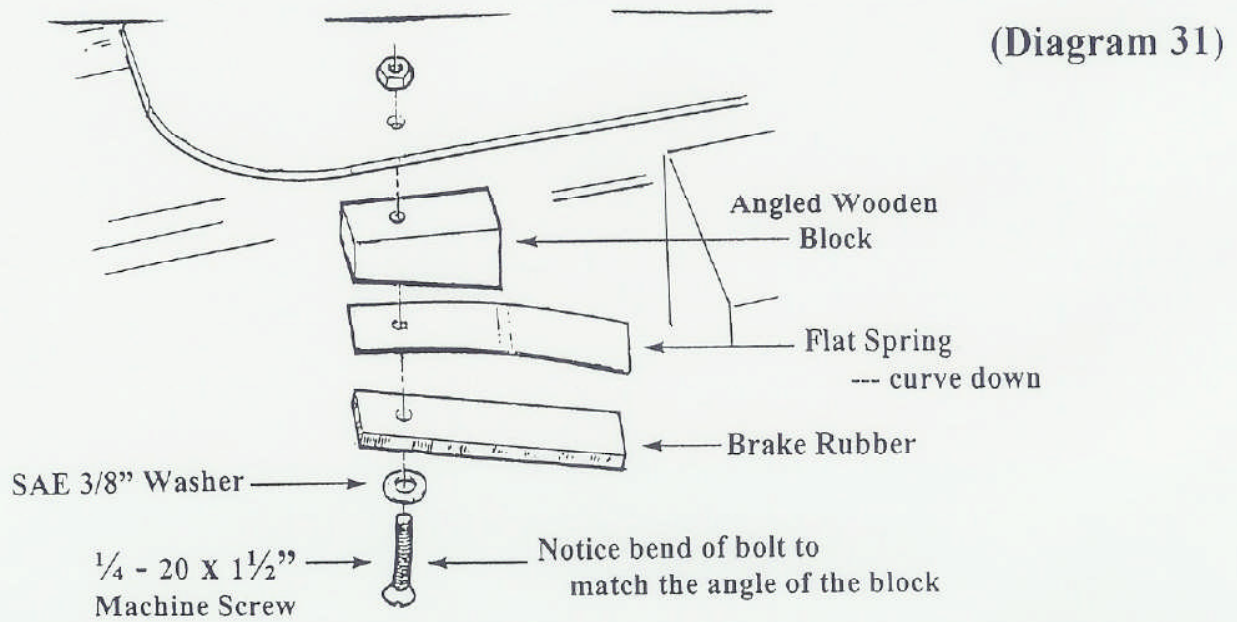
When the throw arm is FIRED, the arm will travel through the indicated danger area.

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



ASSEMBLY OF THROW ARM BRAKE



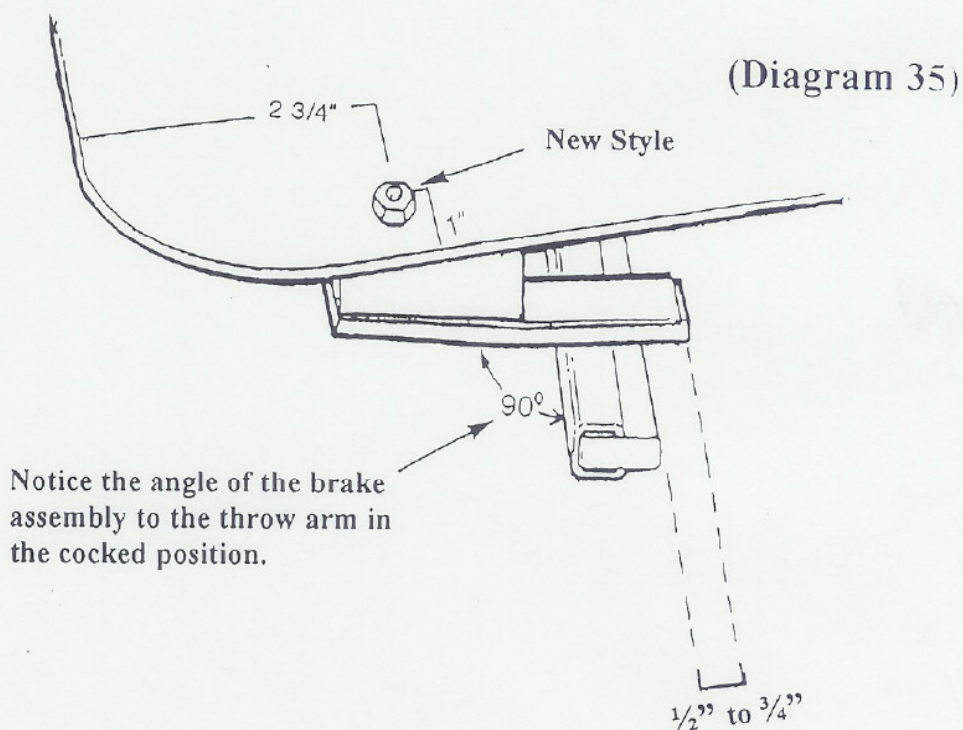
MAINTENANCE

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

INSTALLATION OF THE THROW ARM BRAKE

NOTE: Proper position of the throw arm brake depends upon the style of the throw arm being installed. On the "new style" throw arm the rubber is $\frac{1}{2}$ inch further ahead than the "old style". If installing an "old style" throw arm on a new machine you will have to drill a $\frac{1}{4}$ inch hole $\frac{1}{2}$ inch further back (left) of the existing 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 $\frac{1}{4}$ inch drill bit.
4. Install the brake assembly.



Notice the stopping position of the throw arm on the brake: approximately $\frac{1}{2}$ - $\frac{3}{4}$ inches behind the end of the brake.

MAINTENANCE

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

REMOVAL OF THROW ARM

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. Remove *and/or* disconnect the main spring. Refer to the Disconnecting The Uni-Band section in this manual.
2. Rotate the throw arm to a place where you can reach the nut. Use a 7/16th socket on ratchet with an extension to loosen the nut on the throw arm.
3. Move the arm to the area between the braces. Use a pry bar or a long screwdriver, place by the throw arm shaft and pry *up* on the throw arm to remove.

NOTE: The arm might come off more easily if you wiggle the arm, slightly, up and down while prying up.

4. Pry downwards to put on the new throw arm.

INSTALLATION OF THE 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 an easier working position.
3. Disconnect the main spring before working with the throw arm. Refer to the Disconnecting the Uni-Band section in this manual.

The height of the bottom of the throw arm rubber needs to be $\frac{1}{2}$ inch above the throw plate. (This measurement allows for $\frac{1}{32}$ ” between the lip of the target and the throw arm rubber.) The nut on the throw arm can be torqued a maximum of 15 ft/lbs.

With the *main spring disconnected*, check to be sure that there is $\frac{1}{32}$ ” but no more than $\frac{1}{16}$ ” of clearance between the target and the throw arm through the area that the target travels --- especially the area where the target leaves the throw plate surface. Also check to see that the finger on the throw arm scraper 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.

ASSEMBLY THROW ARM COCKING PIN

Slide the spacers and bushings onto the bolt as pictured in Diagram 23.

Turn the nut on by hand until it is against the spacer.

Screw the Cocking Pin Assembly into the bottom of the gear belt pulley wheel until the nut contacts the wheel.

Now, tighten the nut against the wheel as tight as possible (35-40 ft/lbs. torque) See Diagram 24.

IMPORTANT: Do not tighten the bolt against the nut because it will compress the rubber bushings and defeat their purpose.

GENERAL MAINTENANCE

The machine must be released and turned off before performing any work.

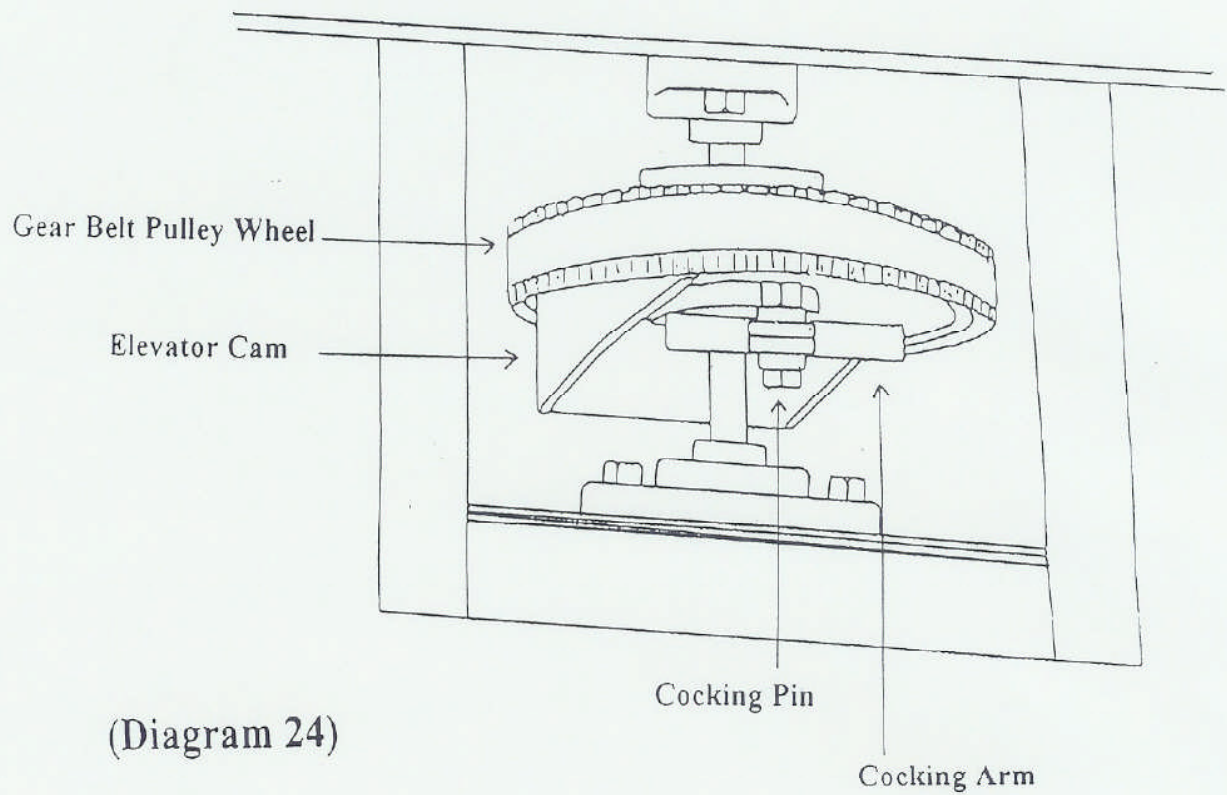
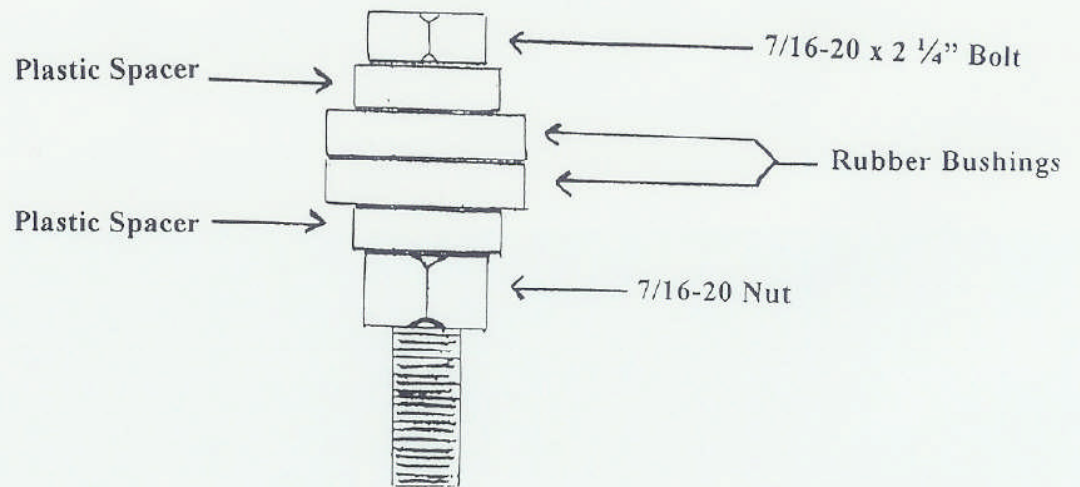
Rotate the bushings 90 degrees after approximately 40,000 to 50,000 throws (see counter).

The bushings should be easy to rotate by hand without having to loosen the bolt.

Replace the bushings if worn or cracked: approximately every 80,000 to 100,000 throws.

THE "G" SERIES MACHINES WITH A MAIN SHAFT CLUTCH SYSTEM DO NOT REQUIRE THIS MAINTENANCE (BEGINNING WITH SERIAL NUMBER G2842).

(Diagram 23)



(Diagram 24)

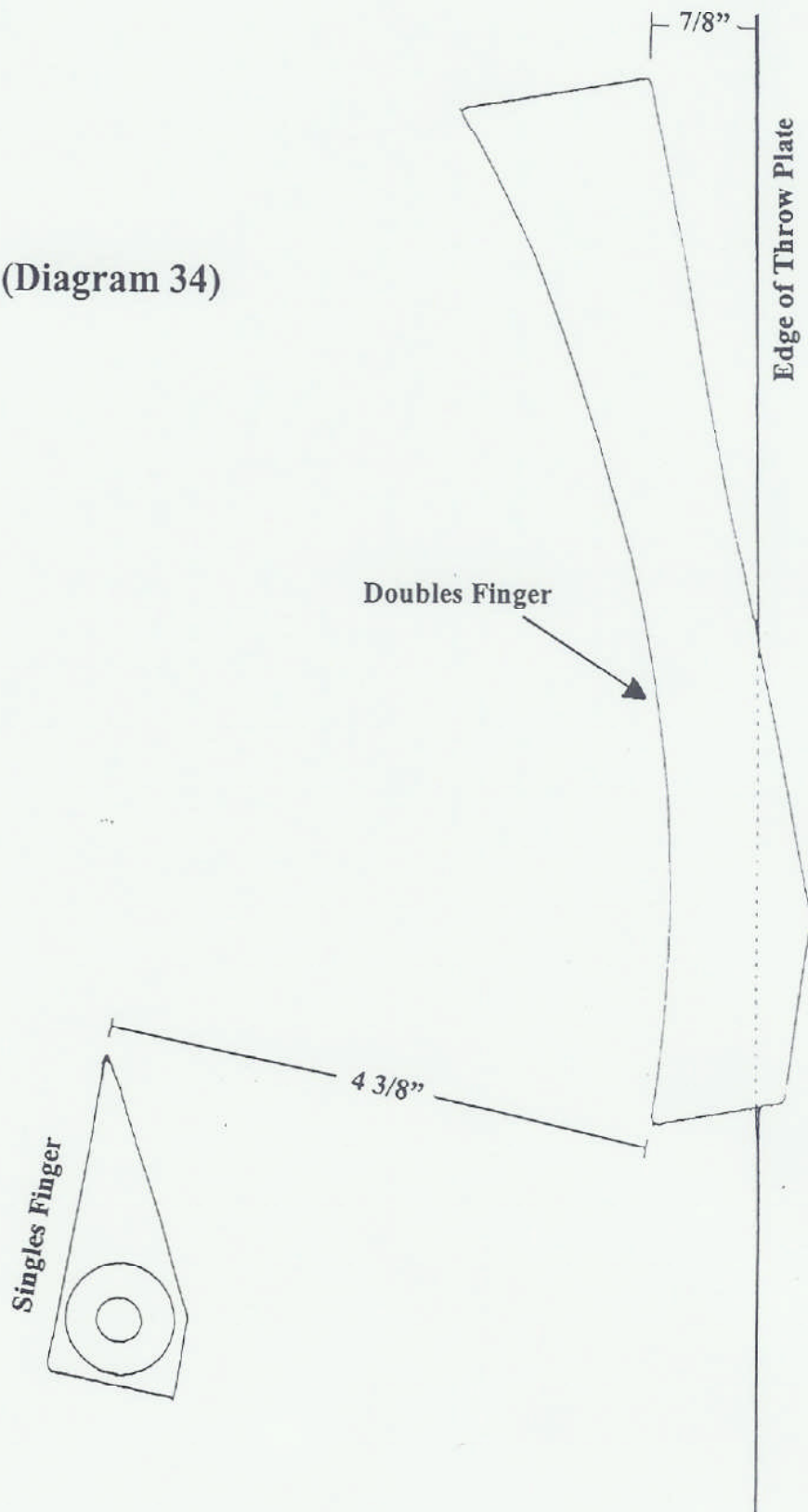
INSTALLATION OF THE "X" DOUBLES FINGER

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 Uni-Band (main spring) --- see appropriate 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.

POSITION OF DOUBLES "X" FINGER and SINGLES FINGER

(Diagram 34)



DISCONNECTING THE UNI-BAND (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.

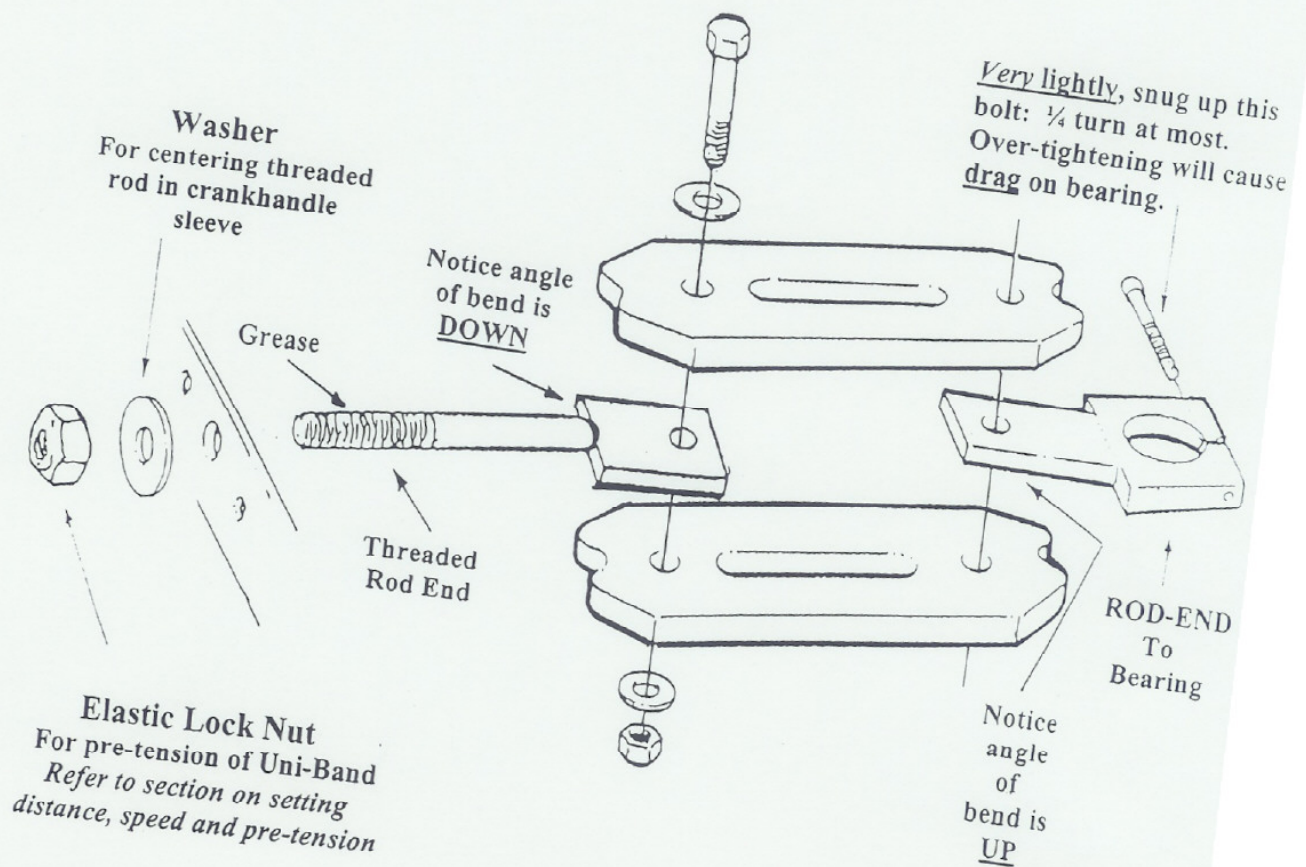
If your machine is a “G” series without a main shaft clutch system then follow these directions:

1. Release the throw arm and turn off the machine.
2. Reduce the main spring tension (unwind the crank handle).
3. You can now loosen the set screw on the connecting block of the Uni-Band. Pull back and down on the Uni-Band to remove it from the bearing. See Diagram 28. (If there is a high amount of pre-tension on the Uni-Band, you can create some slack by loosening the elastic lock-nut.)
4. The throw arm can now be freely moved around the throw plate.
5. Refer to diagrams 21 and 28, respectively, for re-assembly directions.

NOTE: When disconnecting the Uni-Bands from a *main shaft clutch system* please refer to *that section*.

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

TOP



(Diagram 28)

INSTALLATION OF MAIN SHAFT CLUTCH

1. Release the throw arm and turn off the machine.
2. Move the throw arm so that it is 6 ¾" from the right hand corner of the throw plate. See Diagram 61.
3. Clamp a vise-grip onto the throw plate with the throw arm at 6 ¾" to prevent the throw arm from moving forward.
4. See Diagram 62. Do not loosen the throw arm crank bolt.
5. Remove the crank handle, the crank handle stand-off collar, the elastic lock-nut and the 7/16" washer. Completely remove the existing Uni-Band assembly from the machine by loosening the rod-end bolt (5/32" hex head wrench). See Diagram 28. Pull down on the rod-end to remove. Remove the small (1 9/16" OD) bearing and the two washers from the bottom of the throw arm crank.
6. Remove the clutch from the rod-end of the new Uni-Band assembly. Align the keyed bushing with the throw arm crank and use the included 3/8 – 24 x 1½" Grade 8 bolt and one washer to fasten it. See Diagram 60. Hold back on the throw arm and torque the bolt to 35 ft/lbs. minimum -- 40 ft/lbs maximum.
7. Put the threaded rod-end through the hole in the frame, then pull the rod-end onto the clutch. Refer to Diagram 60 for proper positioning of the clutch within the rod-end (note 1/16" gap). Lightly snug up the rod-end to the clutch using a 5/32" hex head wrench, while keeping the rod-end level to the clutch.
8. Put the 7/16" washer onto the threaded rod-end. Then screw on the elastic lock-nut. Refer to the section in the manual on *Setting Distance and Speed*, regarding spring tension and adjustment of the elastic lock-nut. Once the proper distance and speed have been set, re-attach the crank handle, stand-off collar and the crank handle.
9. Remove the vise grip from the throw plate.
10. Inspect the hydraulic hoses to make sure that the rod-end does not rub against them.

WARNING: Do not work on the hoses when the throw arm is cocked. The throw arm must be released and the machine turned off when performing any work on the Pat-Trap®.

11. Begin normal operation of the machine.

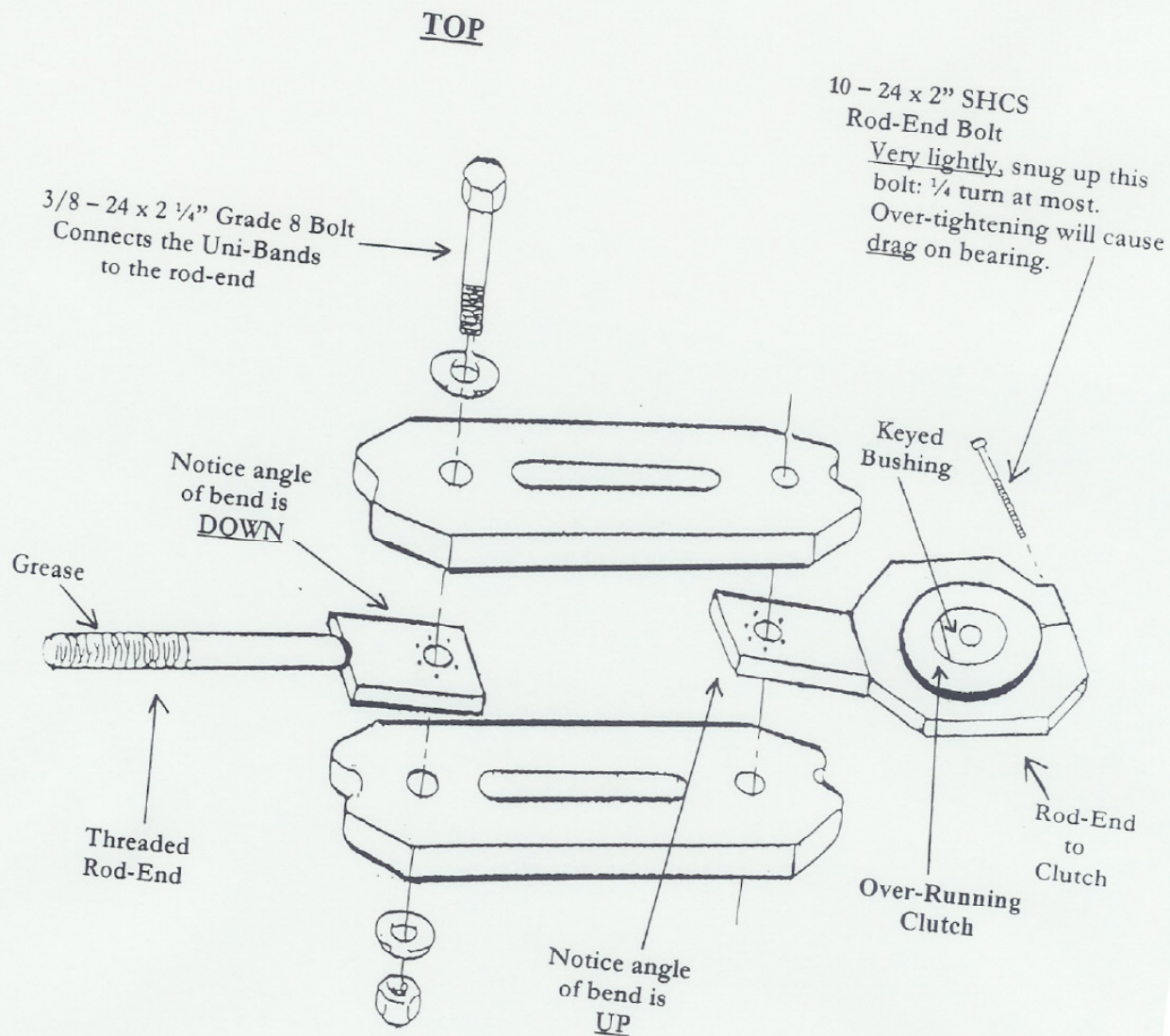
CHANGING A PAIR OF UNI-BANDS ON A MAIN SHAFT CLUTCH SYSTEM

1. Let off the crank handle tension.
2. Turn the machine on to cock the throw arm.
3. When the throw arm stops at the throw arm brake, turn the machine off without releasing the throw arm.
4. **WHEN THE THROW ARM IS COCKED, BE SURE TO STAND BEHIND THE TRAP AND STAY CLEAR OF THE THROW ARM.** To completely release the tension on the throw arm carefully, manually, release the throw arm by first looping a rope or cord around the end of the throw arm. Then, holding back on the rope at 90 degrees to the throw arm, slowly move the throw arm past the brake and guide it around to the front of the machine.
5. Move the throw arm so that it is 6 ¾" from the right hand corner of the throw plate. See Diagram 61
6. Clamp a vise-grip onto the throw plate with the throw arm at 6 ¾" to prevent the throw arm from moving forward.
7. See Diagram 62. Do not loosen the throw arm crank bolt.
8. Changing the Uni-Bands can be done without removing the threaded rod-end from the machine.
9. Remove the Uni-Band connecting bolts. Disconnect the rod-end from the clutch by loosening the rod-end bolt using a 5/32" hex head wrench; pull down on the rod-end to remove it. See Diagrams 59, 60 and 61
10. When re-assembling with the new pair of Uni-Bands, leave the 3/8 -24 x2 ¼" Grade 8 bolts slightly loose at first. Then, pull the rod-end onto the clutch. Refer to Diagram 60 for proper positioning of the clutch within the rod-end (note 1/16" gap). Lightly snug up the rod-end bolt using a 5/32" hex head wrench. Keep the rod-end level on the clutch. Refer to Diagram 59 for right side up.

Align the Uni-Bands as follows: See diagrams 59, 60 and 61

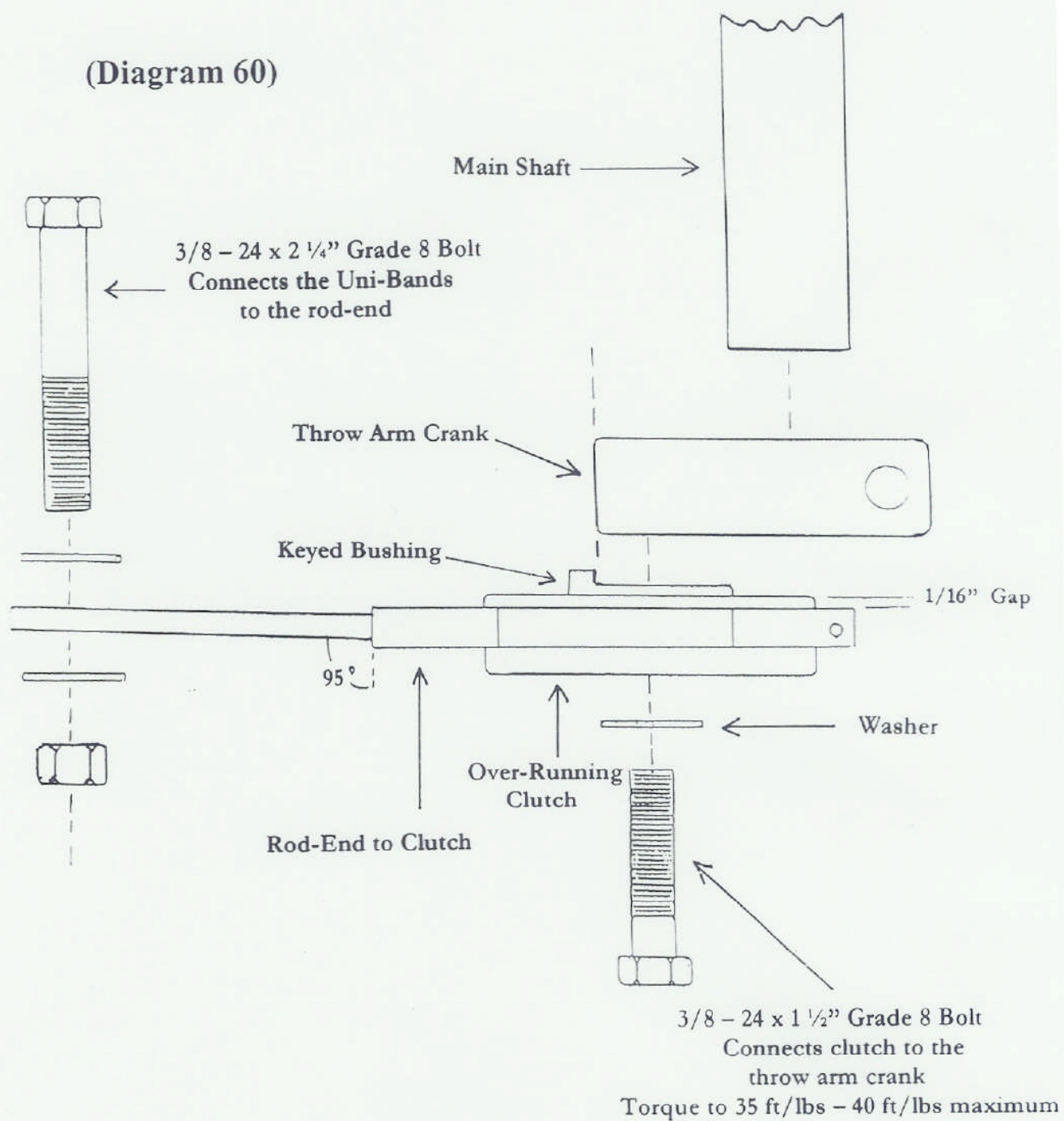
- A. Keep the clamp in front of the throw arm at 6 ¾" (Step 2)
 - B. With the rod-ends and Uni-Bands in alignment to one another, torque the bolts to 10 ft/lbs.
 - C. Tension the Uni-Bands with ten turns of the crank handle.
 - D. Use two 9/16" wrenches. Hold back on the bolt head (on top) while tightening the nut (on bottom)
 - E. Put equal pressure on both of the wrenches and torque the bolts to 35 ft/lbs minimum – 40 ft/lbs maximum
11. Remove the vise grip from the throw plate.
 12. Refer to the section on *Setting Distance and Speed*, regarding minimum spring tension and adjustment of the elastic lock-nut.
 13. Begin normal operation of the machine.

ASSEMBLY/INSTALLATION OF THE UNI-BAND (Main Spring) to the MAIN SHAFT CLUTCH

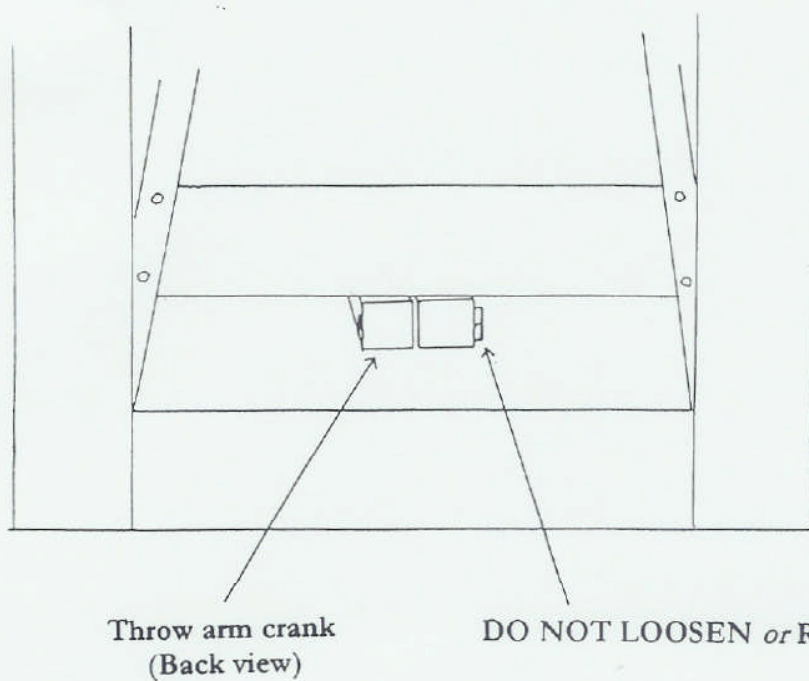
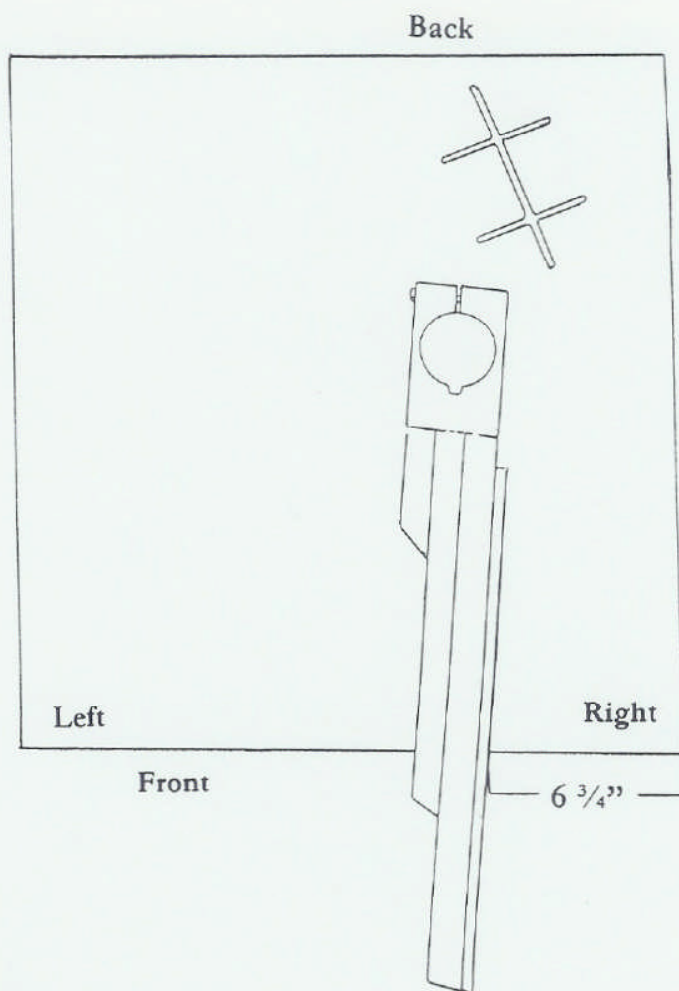


(Diagram 59)

(Diagram 60)



(Diagram 61)



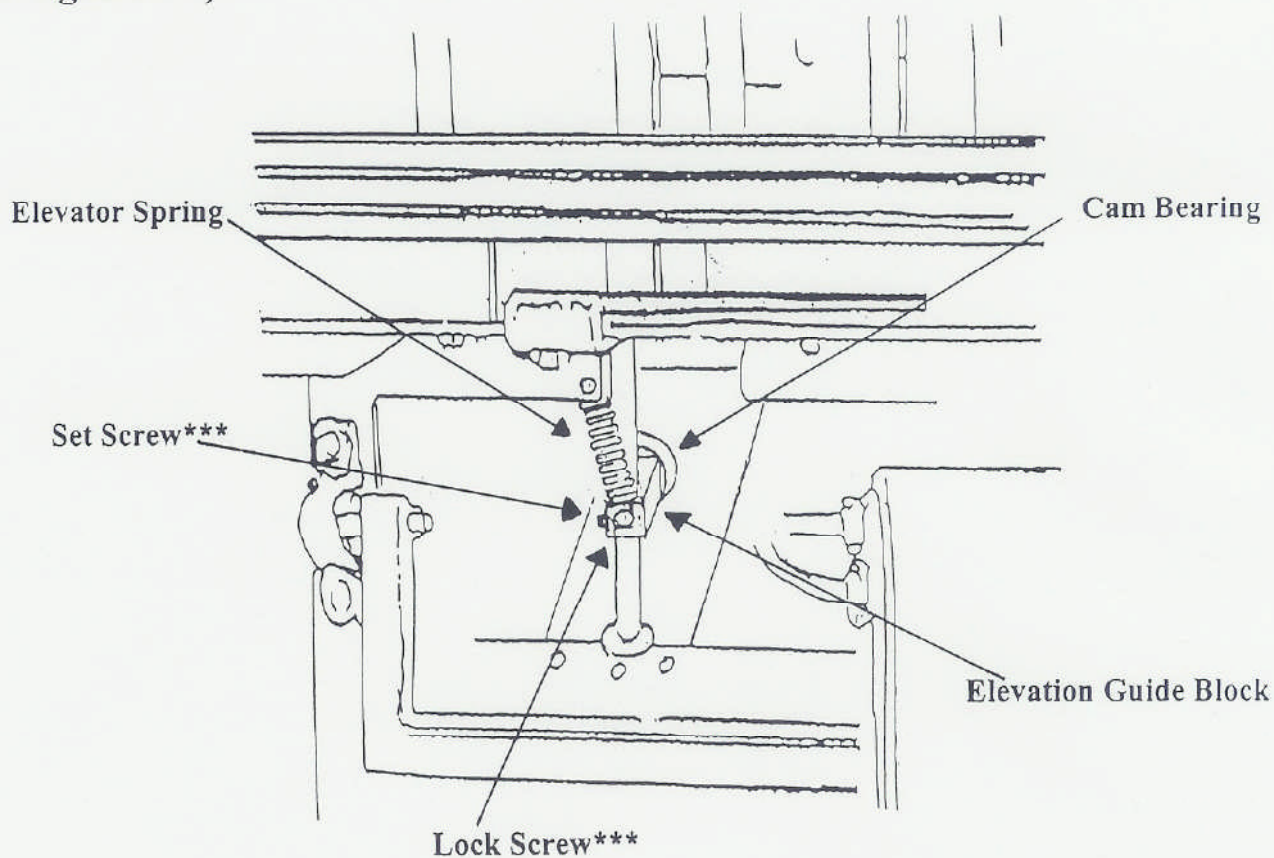
(Diagram 62)

REPLACEMENT OF THE ELEVATOR SPRING

*****IMPORTANT:** Do not loosen or remove either the lock screw that the bottom of the spring hooks onto or the set screw. The screws are holding the bearing block in position so that the bearing is in alignment with the cam.

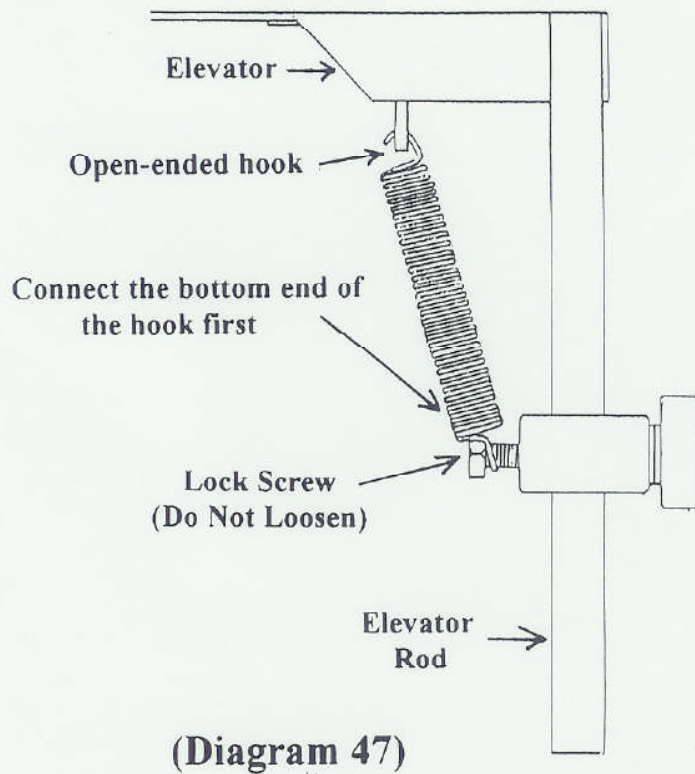
1. Turn the machine on.
2. Fire the throw arm and then turn the machine off as soon as the elevator goes up. (When the cam leaves the cam bearing.)
3. If disconnecting the spring: remove the top end first.
4. If connecting the spring: connect the bottom end first. Refer to Diagrams 47 or 48,

(Diagram 14)

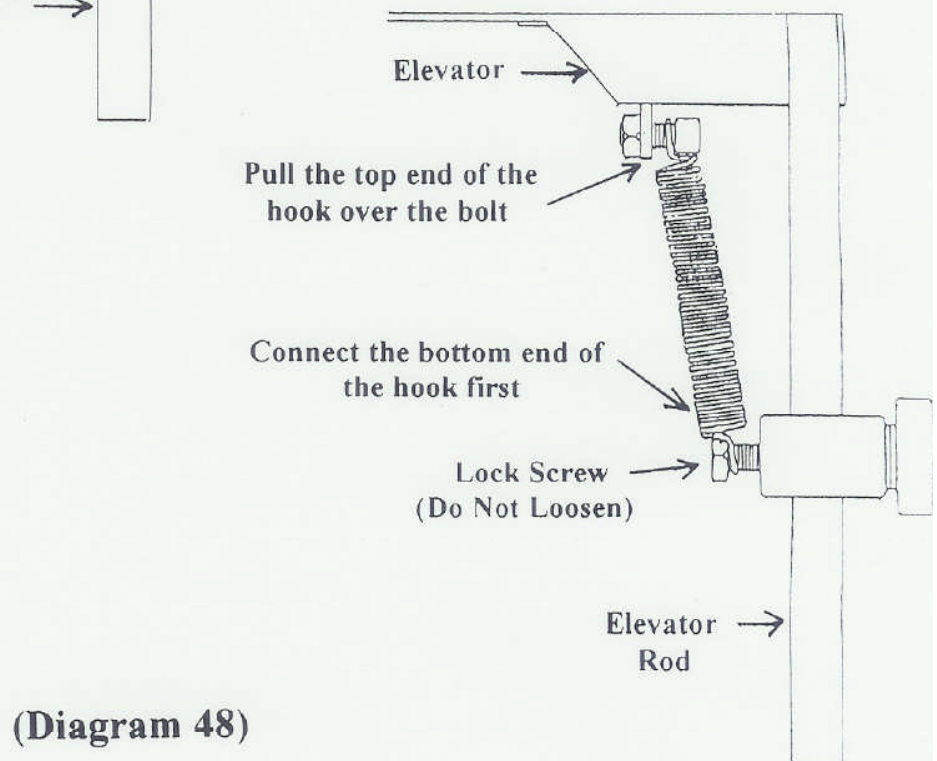


ELEVATOR SPRING CONNECTION

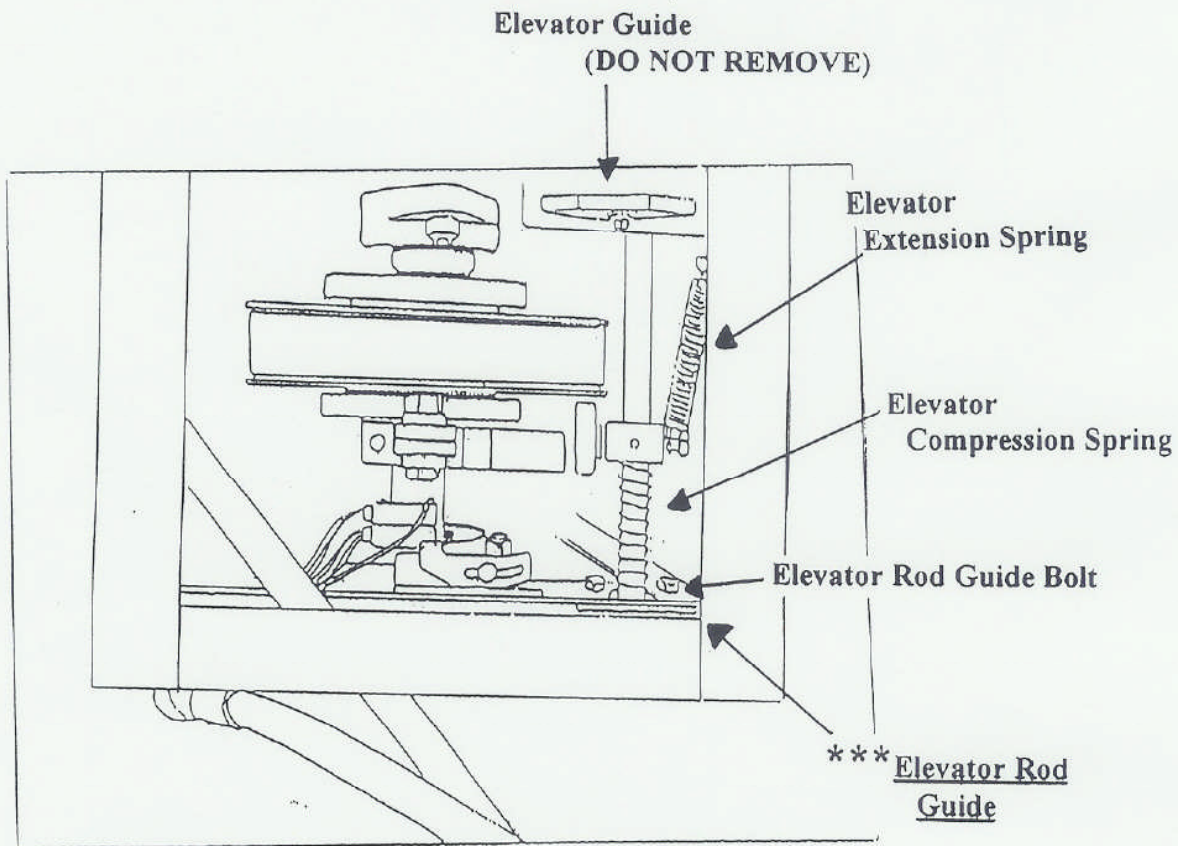
Up to Serial # 2804



From Serial # 2809



INSTALLATION OF THE ELEVATOR COMPRESSION SPRING



(Diagram 54)

1. Turn the machine on. As soon as the elevator goes up, turn the machine off.
2. Remove the two elevator rod guide bolts (7/16" wrench)
3. Remove the *** ELEVATOR ROD GUIDE (This must be replaced the same way as it was found).
4. Put the compression spring on over the elevator rod.
5. Replace the Elevator Rod Guide
6. Fasten the two bolts only slightly snug; over tightening will deform the material and possibly cause the guide to tighten against the rod.

THE TARGET ELEVATOR MAINTENANCE

The elevator guides keep the elevator centered in the slots of the throw plate. The guides are set into position so that they are 1/32" away from the ends of the elevator wings. It is important that the elevator has free play between the guides so that the spring can pull the elevator up. See Diagram 105.

PROBLEMS AND SOLUTIONS

Rust or target dust accumulation on the elevator:

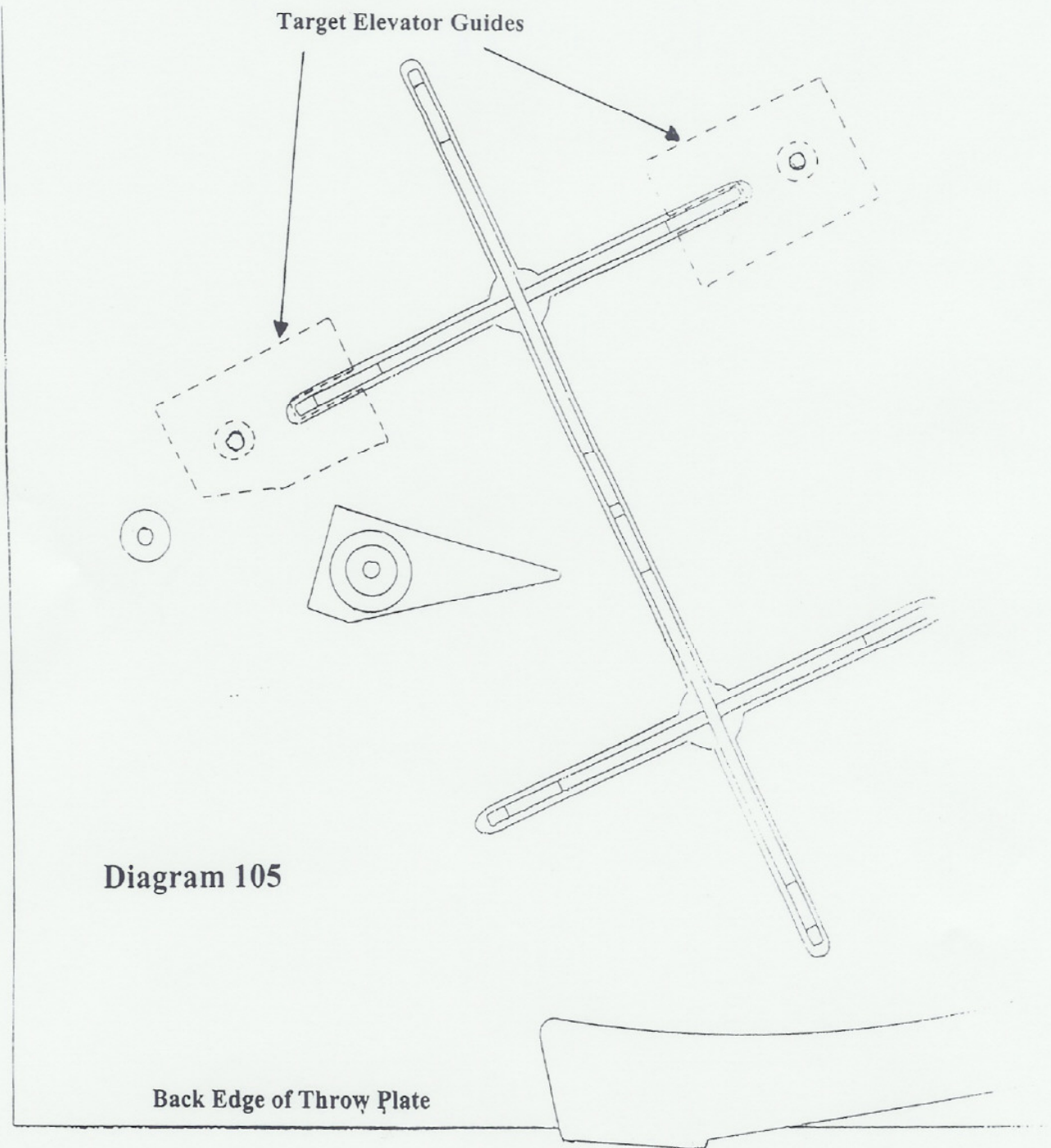
This could cause the elevator to get stuck part of the way up. The symptom of this could be broken targets or targets being thrown to the extreme right. Scrape or sand the elevator surface in the area of the guides.

The elevator is sticking against the guides. The guides might be too tight.

To check the free travel of the elevator, begin with the machine/throw arm released and turned off. Turn the machine on for ½ a second and then shut off. The cam should be off of the elevator bearing and the elevator should be all of the way up. Disconnect the elevator extension spring. With your hand on the elevator rod you should be able to move it up and down and notice a small amount of free play back and forth.

If there is some drag against the guides, then a guide can be moved out by lightly tapping against the end of the left hand elevator wing using a light hammer. This will cause the right hand wing to move the right hand elevator guide away. If you move the guide too far you will have to reposition it. To do this, use a 7/16" wrench to loosen the guide bolt and move it back into place.

TRAP TOP VIEW



LUBRICATION MAINTENANCE

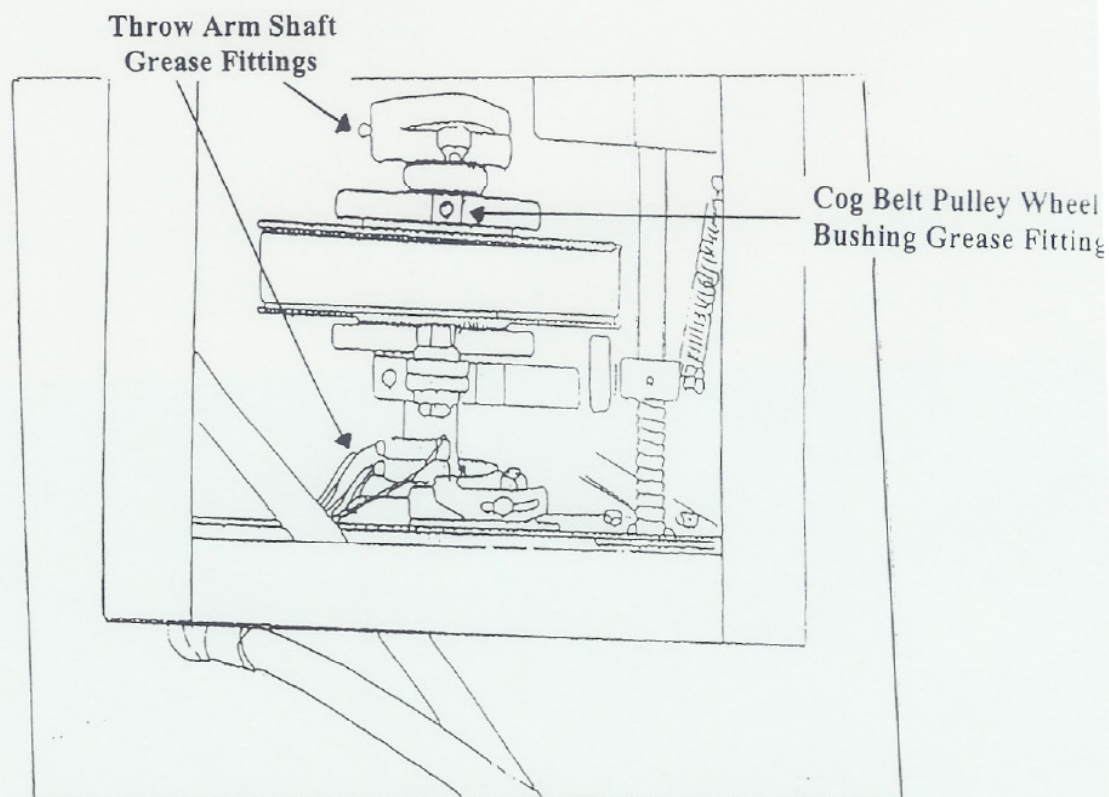


Diagram 103

Apply grease to these fittings once a year using Mobil EP1 grease. EP1 is a light weight grease. A heavier grease will gum-up and not perform the job.

HYDRAULIC CYLINDER FOR WOBBLE

Up to Serial # 2804

JAM NUT

Tighten against the switch bar bracket while keeping the switches parallel to the magnet

3/8 - 24 x 1 1/4" Bolt

"Spacer" for the Rod End Bearing

Be sure that the spacer is evenly set against the bearing before tightening the bolt.

Limit Switch for low target
Proximity Switch #12A
(N.O.) Red Wires

Magnet

Switch Bar Bracket

Limit Switch for high target
Proximity Switch #11A
(N.C.) Black Wires

***KEEP GLUE OUT OF CYLINDER BLOCK

Apply Locktite glue to the threads in the area indicated.

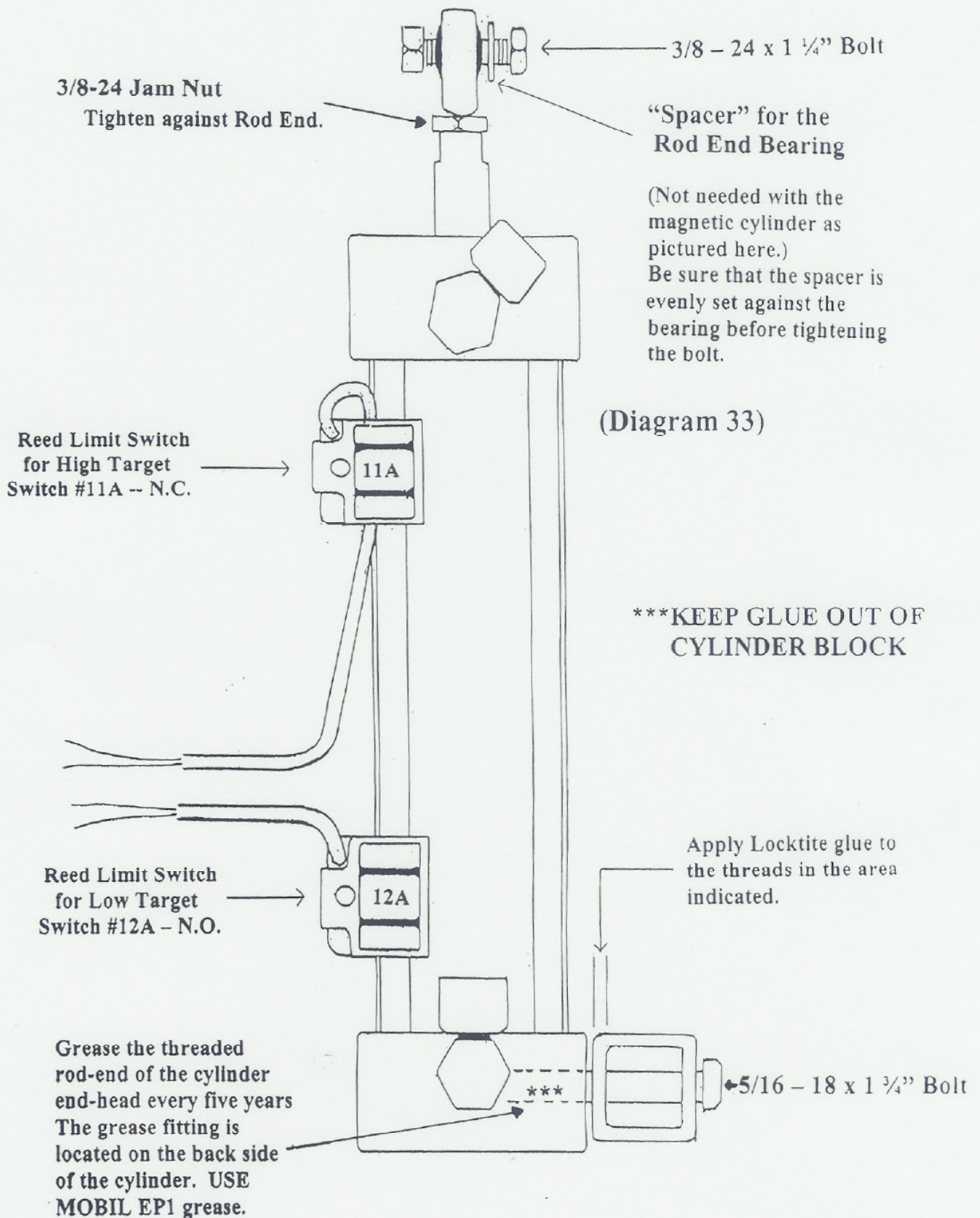
(Diagram 37)

Grease the cylinder block once every two-five years (as needed). The grease fitting is on the backside of the cylinder.

5/16 - 18 x 1 3/4" Bolt

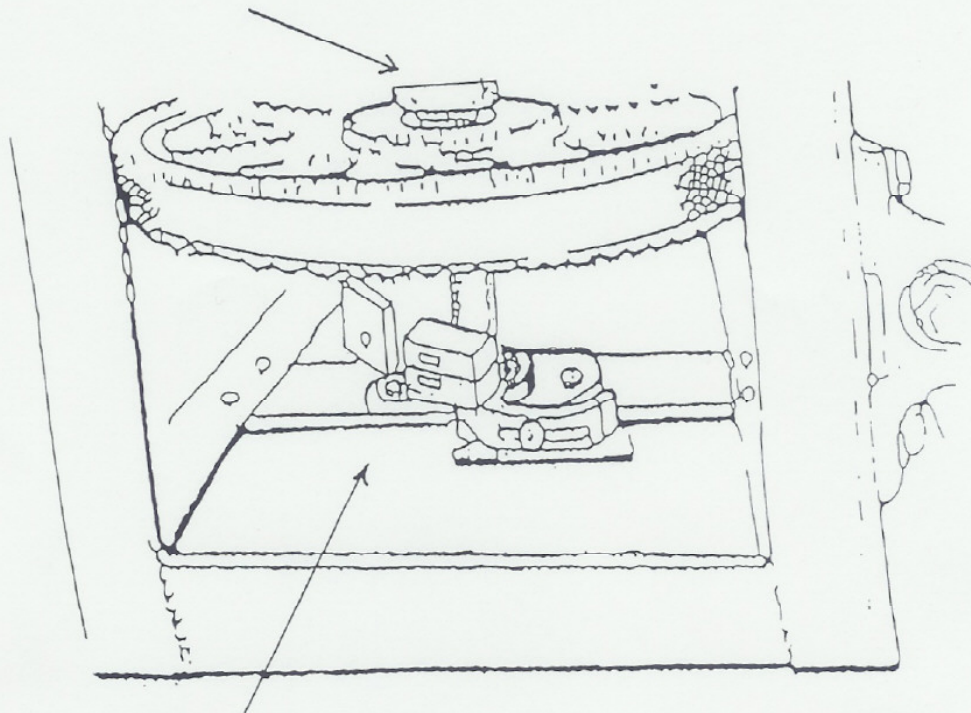
MAGNETIC HYDRAULIC CYLINDER FOR WOBBLE

From Serial # 2805



THROW ARM SHAFT BEARING MAINTENANCE

*Top Bearing



*Bottom Bearing

(Diagram 41)

*Grease both the top and bottom throw arm shaft bearings
every 1 ½ to 2 years.

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 bolt using a 13 mm 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 hushing 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 92

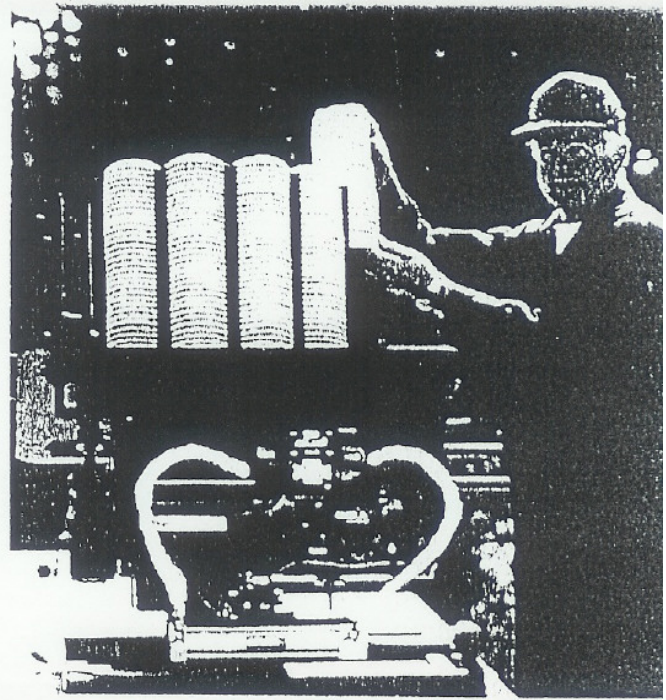
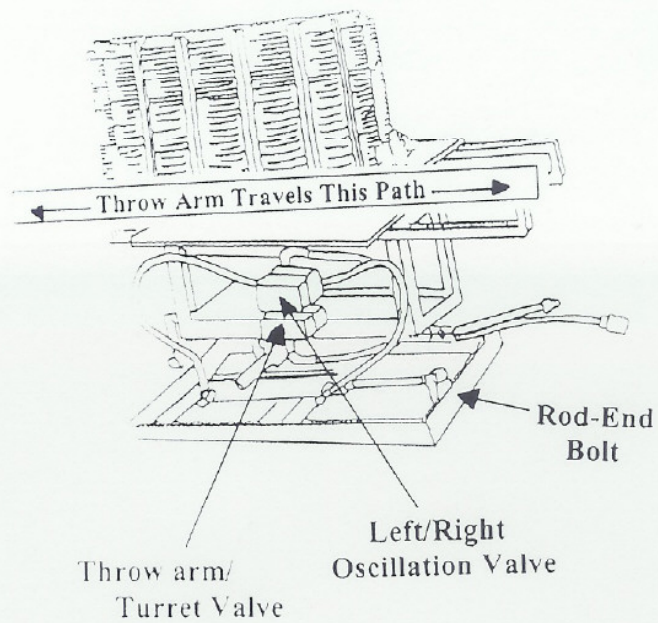


Diagram 90

Notice the angle of the hydraulic hose fittings

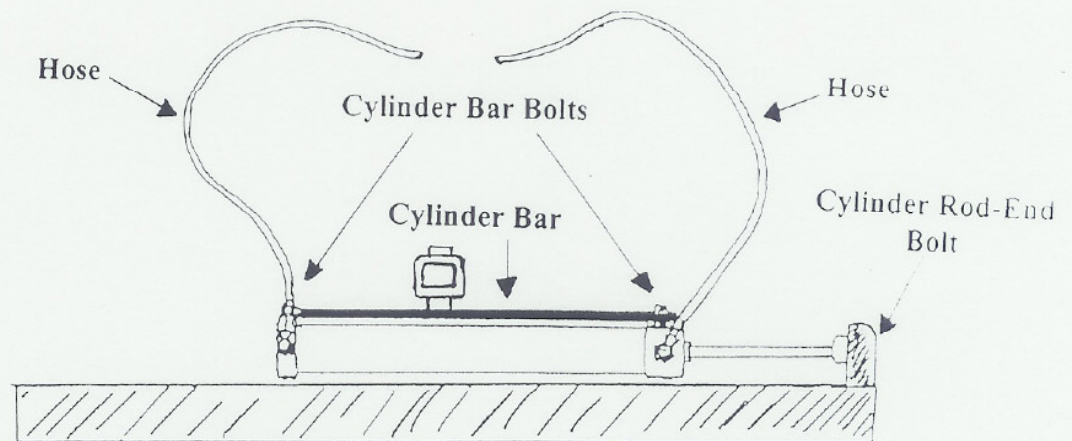
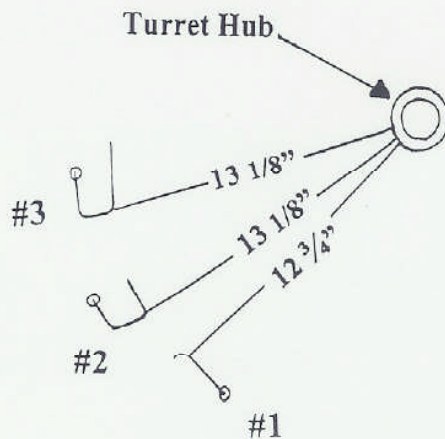


Diagram 95

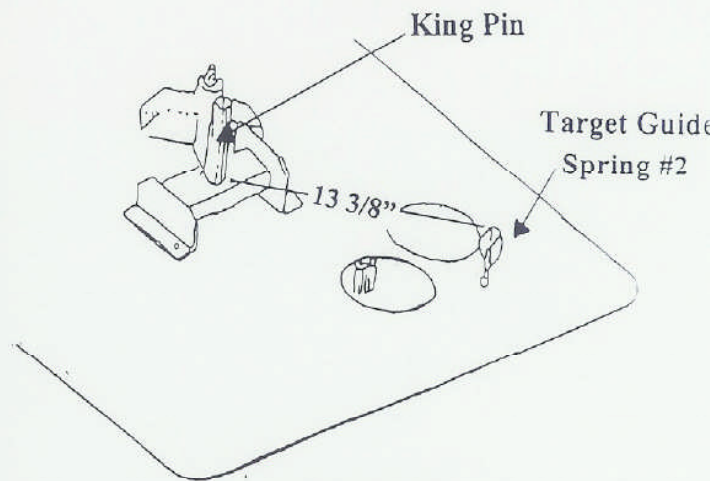
TARGET GUIDE SPRING POSITION

Up to Serial # 2729
(Turret ON)



(Diagram 56)

From Serial # 2730...
(Turret OFF)



(Diagram 19)

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 19

Measuring to 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 1/4" 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 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 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.

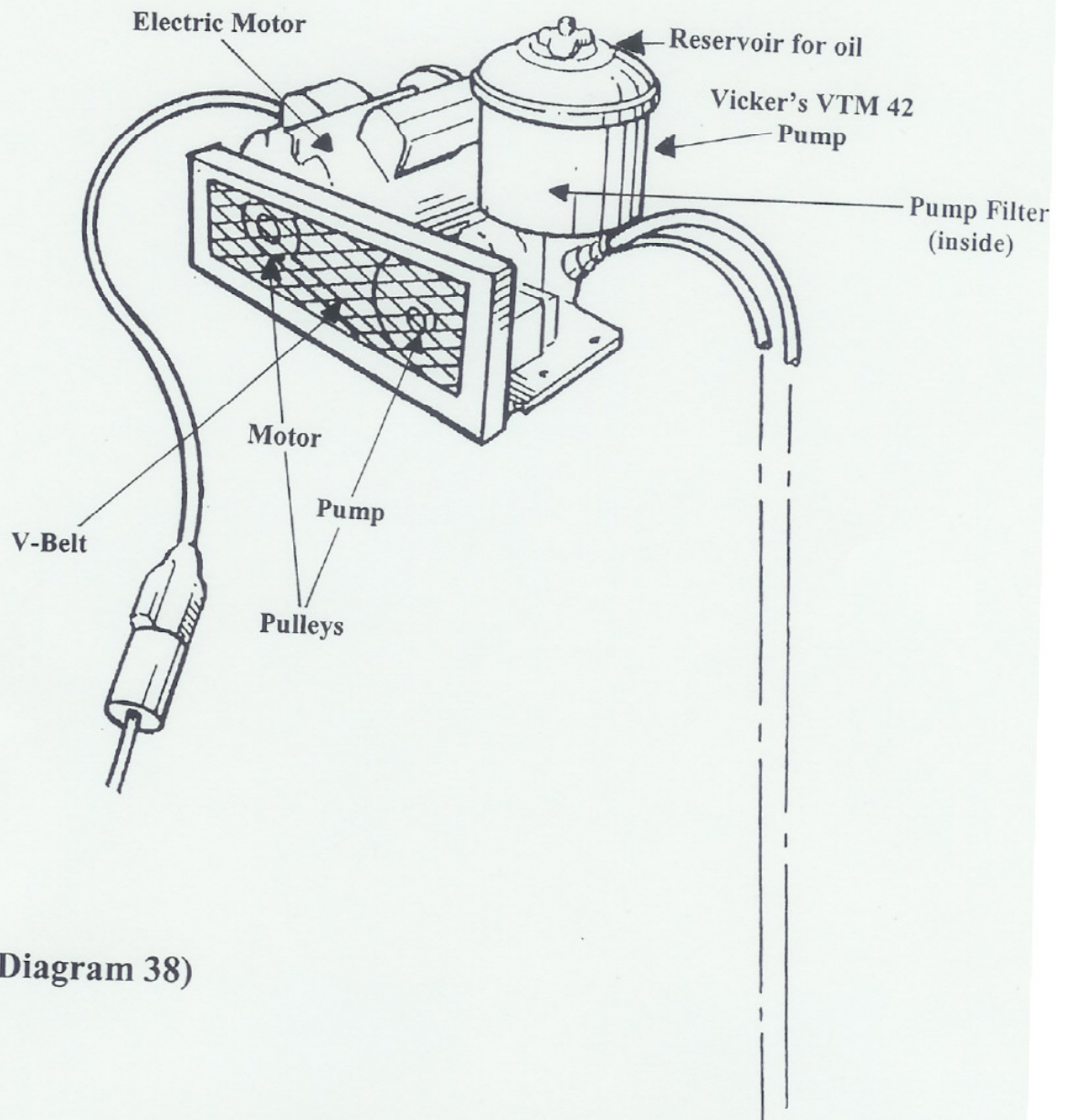
NOTE: Beginning with PAT-TRAP® # G2730, Target Guide Springs #1 and #3 are no longer used.

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-20.
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



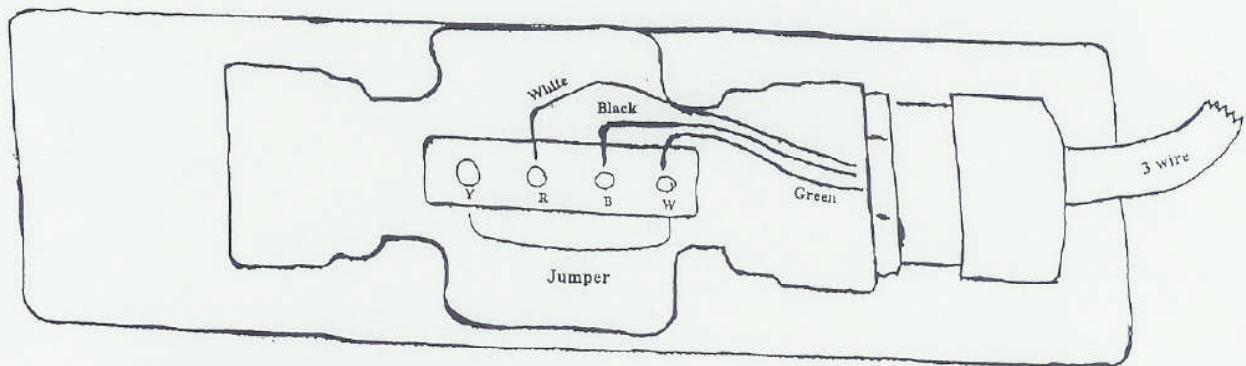
(Diagram 38)

For pump motor fluid use: **Mobil 1: O-W-20**

OSCILLATION SOFT SHIFT VALVE WIRING GUIDE Up to Serial # 2609

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 Soft Shift Valve on a PAT-TRAP® is as pictured:



Parker Soft Shift Valve

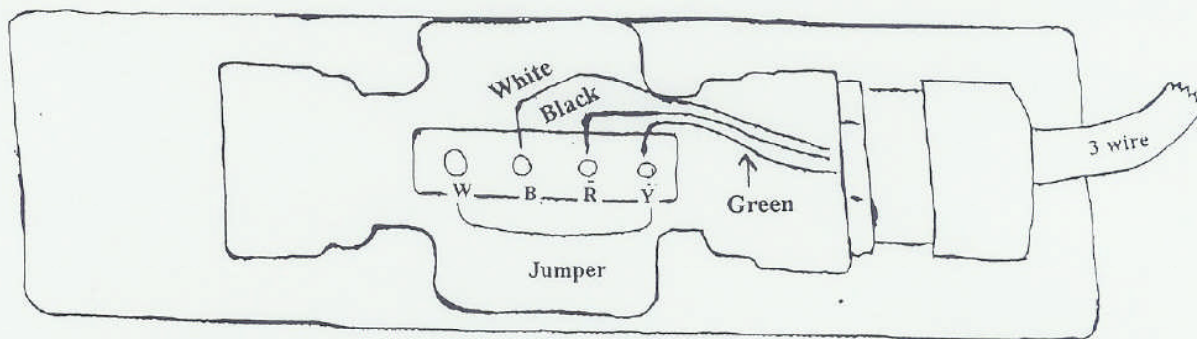
(Diagram 45)

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

OSCILLATION SOFT SHIFT VALVE WIRING GUIDE From Serial # 2610

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 Soft Shift Valve on a PAT-TRAP® (beginning with PAT-TRAP® #G2610) is as pictured:



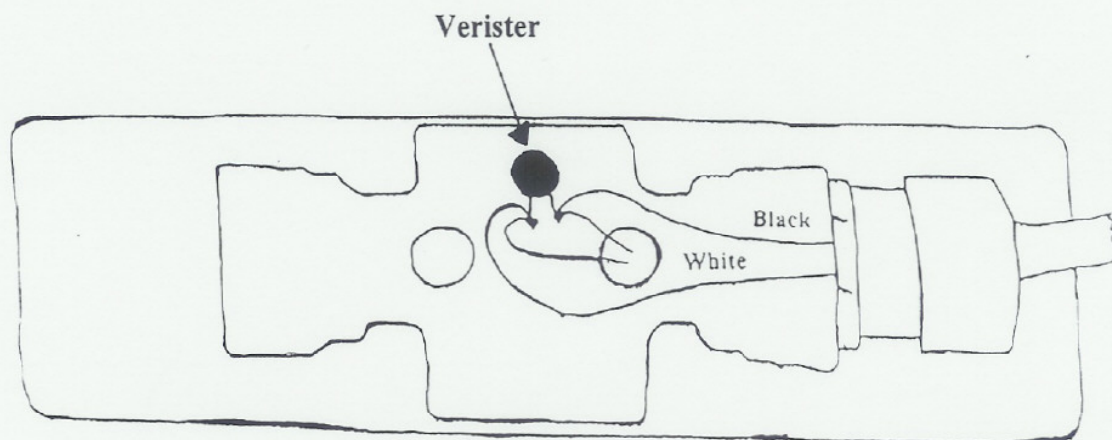
Parker Soft Shift Valve

(Diagram 58)

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

THROW ARM/TURRET VALVE WIRING GUIDE "G" Series

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

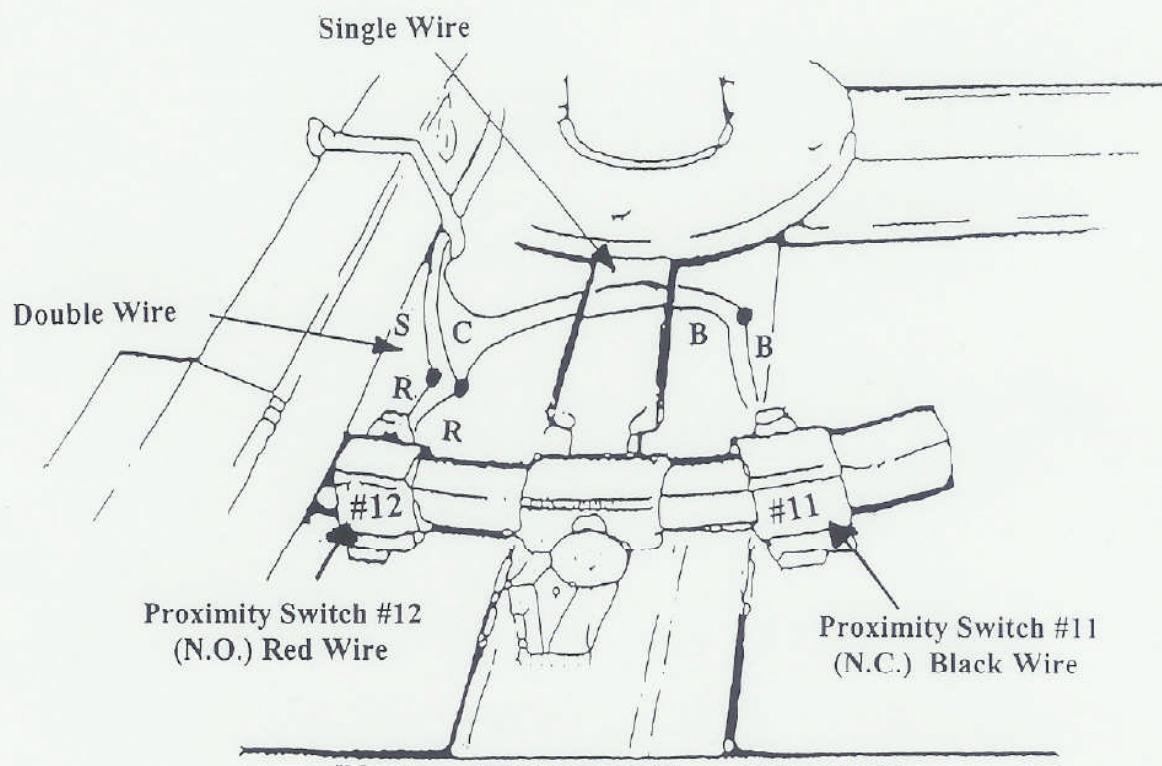


Parker Standard

(Diagram 43)

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

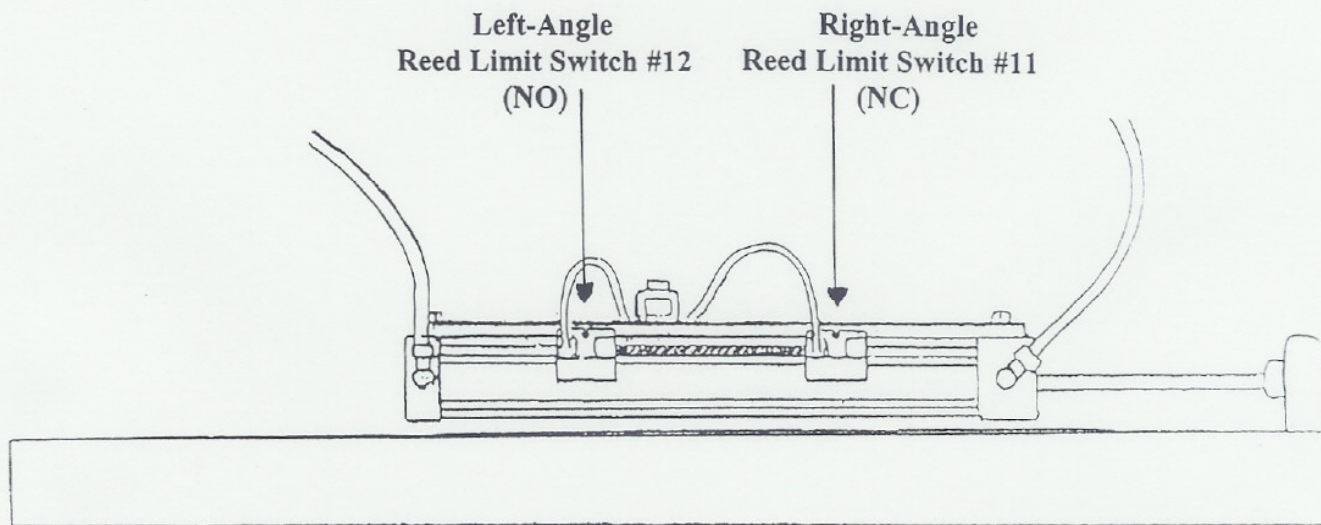
WIRING GUIDE
#11 and #12 SWITCHES
Up to Serial # 2739



(Diagram 40)

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

WIIRING GUIDE
#11 and #12 SWITCHES
From Serial # 2740



(Diagram 57)

CONNECTIONS TO THE #2 RELAY

SWITCH # 11 (NC):

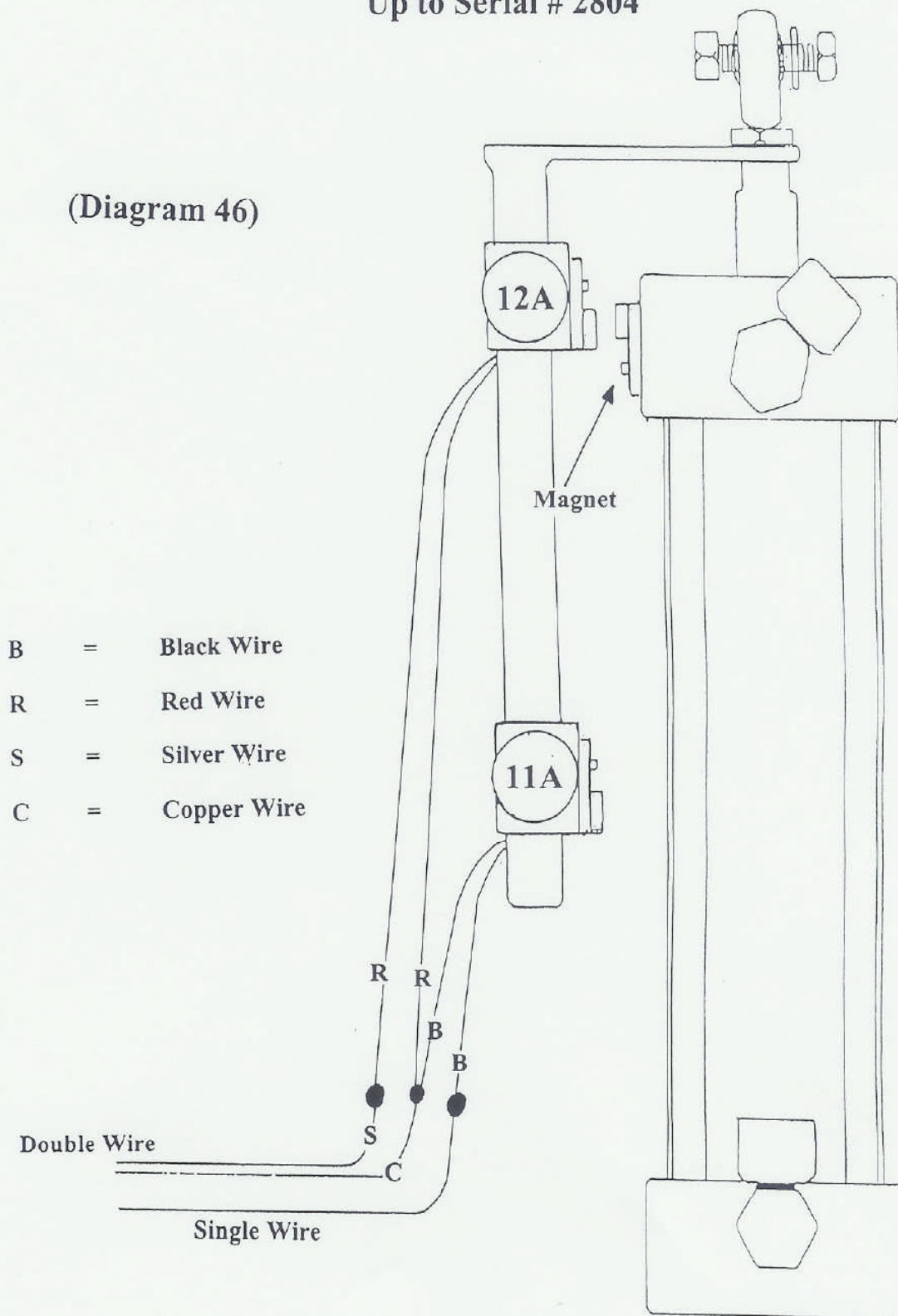
Red wire to pin #3
Black wire to pin #2

SWITCH # 12 (NO):

Red wire to pin # 1
Black wire to pin # 2

HYDRAULIC CYLINDER FOR WOBBLE WIRING GUIDE Up to Serial # 2804

(Diagram 46)



HYDRAULIC CYLINDER FOR WOBBLE
WIRING GUIDE
From Serial # 2805 ...

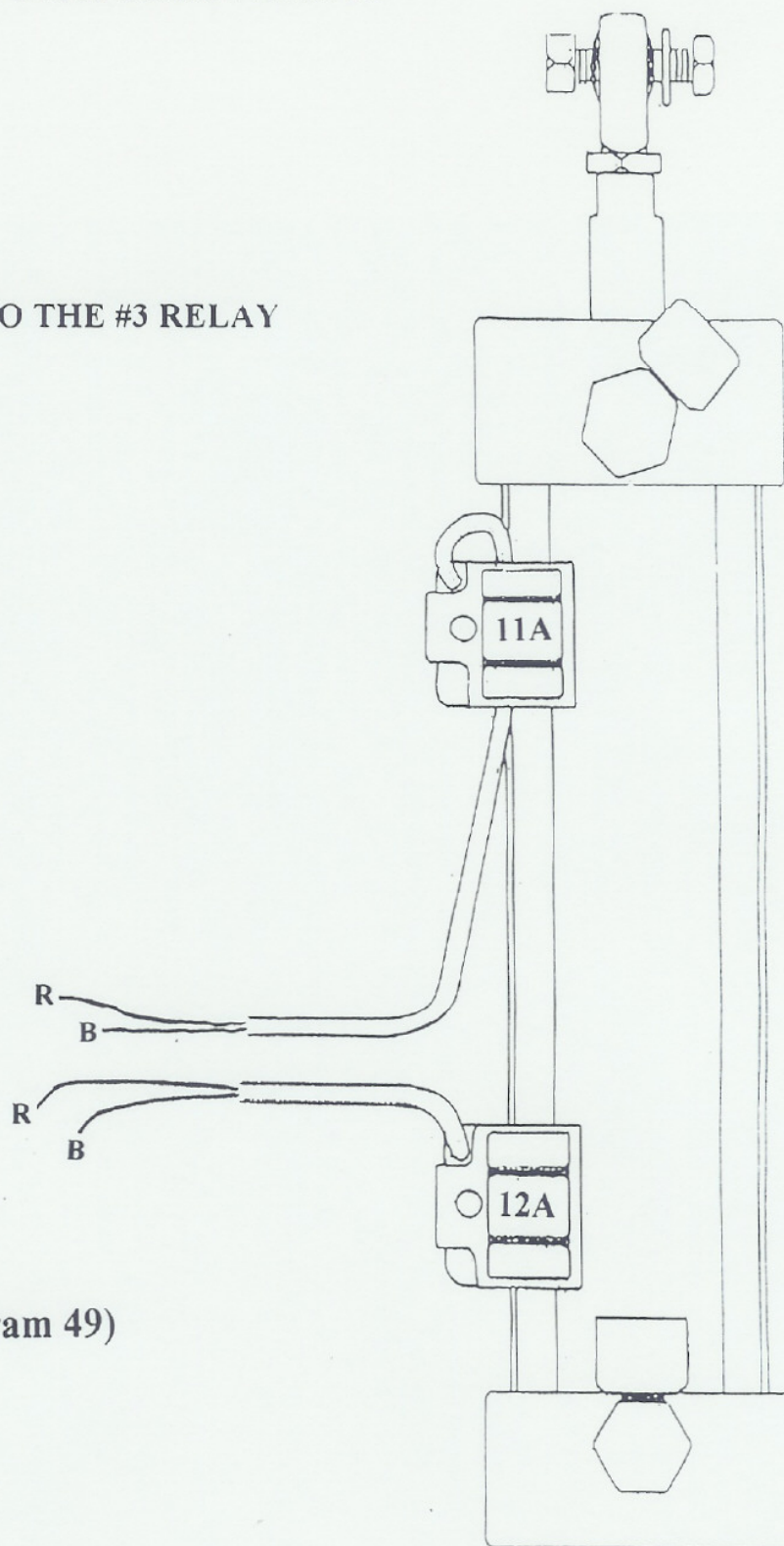
CONNECTIONS TO THE #3 RELAY

SWITCH #11A (NC):

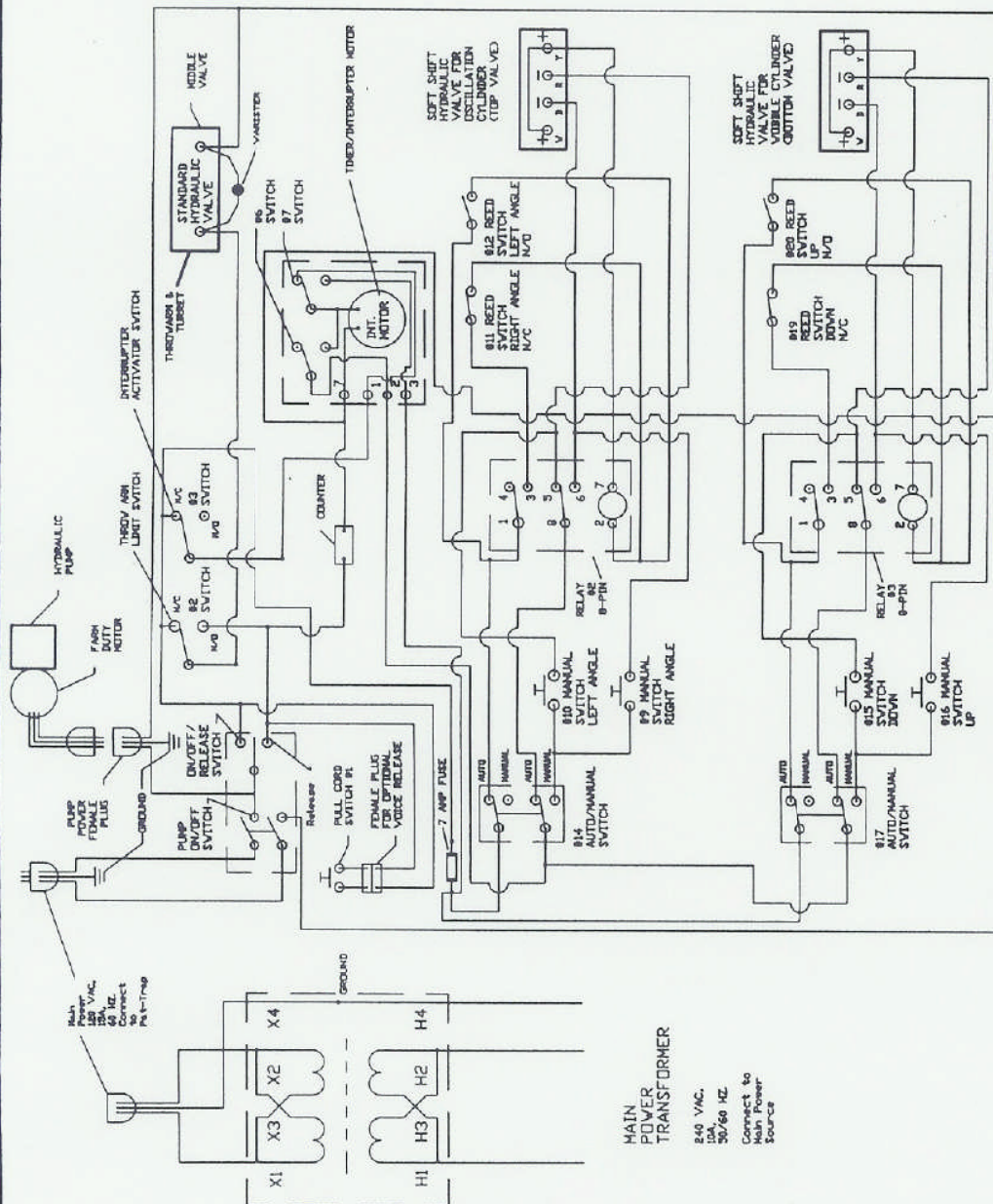
Red wire to pin #3
Black wire to pin #2

SWITCH #12A (NO):

Red wire to pin #1
Black wire to pin #2



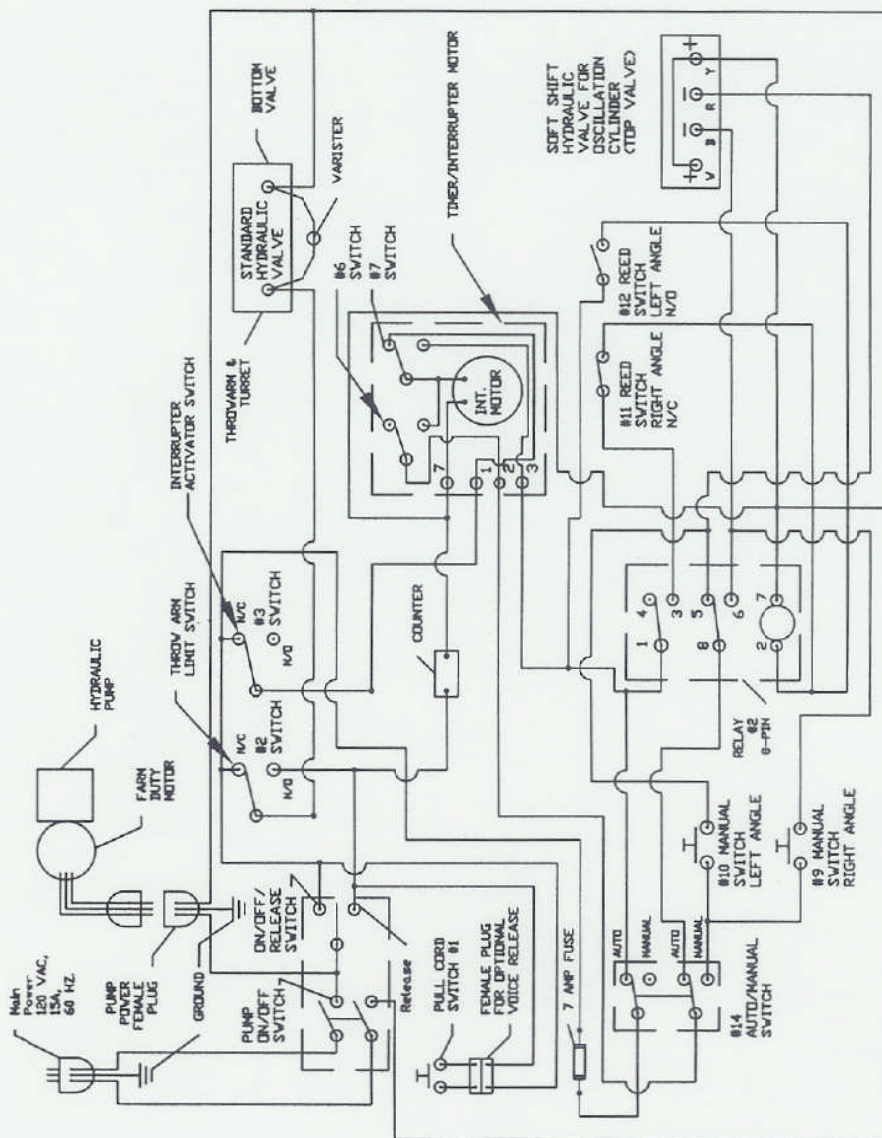
(Diagram 49)



Pat Trap Automatic Doubles

G-Series Wobble Wiring Diagram - 240 VAC

DRAWN BY	RNB	DATE	04-07-2004	SCALE	NTS
CHECKED BY		DATE		SHEET	1
PART NUMBER	G-W088LE-240V	REVISION		OF	1



Pat Trap Automatic Doubles

G-Series Wiring Diagram - 120 VAC

DRAWN BY	RNB	DATE	04-07-2004	SCALE	NTS
CHECKED BY		DATE		SHEET	1
PART NUMBER	STANDARD TRAP	REVISION		OF	1

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SW = SW SERIES

Pat-Trap, Inc

G = G SERIES

NUMERICAL PARTS/PRICE LIST

May 10, 2005

PART #	DIAG. #	DESCRIPTION	RETAIL
9012*	86	Oscillation Cylinder, Cylinder	\$246.00
9012M*		Oscillation Cylinder with Magnetic Activator	\$246.00
9013*	37	Oscillation Cylinder - WOBBLE	\$246.00
9013M*	46	Oscillation Cylinder - WOBBLE w/Magnetic Activator	\$246.00
9014		SEE: SP110	
9017		3/8" Hydraulic Hose to Cylinder	\$12.00
9023*	60	Singles Finger, Plastic	\$6.00
9024*	22	Elevation Cog	\$28.00
9025*	34	X Doubles Finger	\$28.00
9026*	32, 80	Throw Arm	\$128.00
9026A		SEE: SP120	
9026-B		Throw Arm Rubber, Repair	\$20.00
9027*	31	Throw Arm Brake Rubber	\$6.00
9027A*	31	Throw Arm Brake Flat Spring	\$6.00
9027B		SEE: SP150	
9028-SW*	36	Coil Spring (Main Spring)	\$49.00
9029*	28	Uni-Band -- Threaded Rod (Main Spring)	\$40.00
9029A*		OBSOLETE	
9029B-G*	59	Uni-Band Rod End to Clutch	\$78.00
9029C		One Way Bearing for Clutch System	\$125.00
9029D		OBSOLETE	
9030-SW*	36	Coil Spring Anchor Bolt, Threaded Rod	\$24.00
9031*	21	Main Spring Crank Handle	\$33.25
9031B		Nylon Washer	\$6.00
9032*	28	Uni-Band/Pair (Main Spring)	\$49.00
9033*		OBSOLETE	
9034-G*	60	Main Shaft Clutch Assembly	\$175.00
9035-G*	23	Cocking Pin Assembly	\$19.00
9036-G*	23	Cocking Pin Bushings/Pair	\$6.00
9037-G*	23	Cocking Pin Spacers/Pair	\$6.00
9039-SW*	30	Throw Arm Backstop, Complete	\$35.00
9040-SW*	30	Throw Arm Backstop Spring	\$6.00
9040A-SW*	30	Throw Arm Backstop Bolt W/NUT 1/4-28	\$6.00
9040B-SW*	30	Throw Arm Backstop Plastic	\$12.00
9040C-SW*	30	Throw Arm Backstop Flat Spring	\$3.00
9041*	44, 55	Target Brush	\$6.00
9048*	15	Hydraulic Motor	\$225.00
9060*	43, 76	Single Solenoid Valve	\$145.00
9060-SW		Double Solenoid Valve	\$145.00
9061*	45, 58	Hydraulic Soft Shift Valve - Horizon./Wobble Oscillation	\$220.00
9076-SW	54	Elevator Guide Rod	\$45.00

*** PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE/PRICE DOES NOT INCLUDE SHIPPING

PART #	DIAG. #	DESCRIPTION	RETAIL
9077-G*	54	Elevator Spring(s) -- Extension	\$6.00
9078-G*	54	Elevator Spring(s) -- Compression	\$6.00
9095*	44	Target Guide, Spring Mount	\$14.00
9096*		OBSOLETE	
9097-SW*	44	Target Guide Spring #1	\$10.00
9098*	19, 44	Target Drop Guide Spring #2	\$10.00
9099-SW*		OBSOLETE	
9100*	20	Extention Spring/Roller Plates	\$3.00
9101*	20	Eye Bolt	\$1.00
9102*	20	Eye Bolt Anchor Bracket	\$3.00
9104*	12, 65	O Ring(s)/Roller	\$0.50
9105*	20	Singles Roller Plate	\$100.00
9106*	20	Doubles Roller Plate	\$125.00
9106A		Roller Plate Bushing	\$6.00
9107*	20	Doubles/Singles Roller	\$95.00
9107A*	20	Singles Roller	\$95.00
9108-SW		Bronze Roller Bushing	\$4.45
9123-SW*	72	Pinion Backstop Flat Spring	\$6.00
9123A-SW*	70	Pinion Backstop Flat Spring (L-Shape)	\$6.00
9123B-SW*	72	Pinion Backstop, Plastic	\$6.00
9123C-SW		OBSOLETE	
9124-SW*	72	#4 Micro Switch	\$6.00
9125-SW*	73	#4 Switch Bracket, Micro Style Complete	\$33.25
9127-SW*	8	#5 Switch Bracket	\$4.00
9129		OBSOLETE	
9129A	38	Pump Filter	\$22.50
9130	38	5" Pulley for Pump	\$19.00
9131	38	Electric Motor	\$156.00
9132	38	Pulley for Electric Motor	\$4.50
9133	38	V-Belt	\$7.50
9134	38	Mobil I: O-W-30, Quart	\$6.00
9135	38	Mobil I: O-W-20/5W-20, Quart	\$6.00
9138	38	Pump Unit, Complete	\$725.00
9139	5	8' High Pressure Hydraulic Hose, 3/8"	\$25.00
9140-SW	5	8' Hydraulic Hose Return, 3/8"	\$10.00
9141-G	5	8 1/2' Hydraulic Hose Return, 3/8"	\$10.00
9142	5	O-Ring for Female Hydraulic Coupling	\$1.50
9144	5	Hydraulic Coupling, Female	\$14.50
9145	5	Hydraulic Coupling, Male	\$8.00
9146		90 Degree Long Adaptor to Hydraulic Hose	\$6.00
9147-G		42" High Pressure Hydraulic Hose, 3/8"	\$14.00
9148-G		54" High Pressure Hydraulic Hose, 3/8"	\$14.00
9149		Hose Clamp	\$18.00
9198		Valve Wire (3-Wire)	\$1.50
9200		Counter	\$30.00
9201		Male Connector for Pullcord	\$15.25
9202*	3 & 4	Female Lock Cap Connector for Pullcord	\$20.50

*** PRICES ARE SUBJECT TO CHANGE WITHOUT NOTIC/PRICE DOES NOT INCLUDE SHIPPING

PART #	DIAG. #	DESCRIPTION	RETAIL
9207		Fuse (7 AMP)	\$1.00
9208		Relay #2 10 AMP (8-Pin)	\$13.00
9209-SW*	78	Double Magnet	\$12.00
9209A-SW*	74	#2 & #3 Switch Bracket	\$133.00
9209B-G*		#2 & #3 Switch Bracket	\$133.00
9210-SW*	74	1 1/4" Activator Bolt for # 9209-SW	\$8.00
9210A-G*	27	1 1/8" Activator Bolt for # 9210B-G	\$8.00
9210B-G*	27	#2 & #3 Activator	\$10.00
9211*	100	Proximity Switch (N/C Black Wires)	\$8.50
9212*	100	Proximity Switch (N/O Red Wires)	\$8.50
9212A		OBSOLETE	
9213-G*	10	Micro Switch #2 and #3 with wire leads	\$8.00
9214-SW		Relay #1 (11-Pin)	\$22.50
9215*	66, 53	Magnet (Hamlin)	\$4.50
9216		Interrupter	\$48.00
9217-SW		Solid State Relay	\$49.00
9218*		Push Button Manual for Left/Right	\$6.00
9219*	15	Toggle Switch Auto/Manual	\$6.00
9220	11	Switch, On/Off	\$9.00
9221*	11	Switch On/Off/Release	\$15.00
9222-G*	91	Reed Switch for Angle Limit - N/O - Magnetic Cylinder	\$39.00
9223-G*	91	Reed Switch for Angle Limit - N/C - Magnetic Cylinder	\$39.00
9300		SEE: SP160	
9301	42	Upright	\$24.00
9302		Side Loader, Upright	\$49.00
9303		Side Loader, Upright Top Piece	\$24.00
9304		Turret Bushing Cap	\$1.00
9305*	50	Switch Bracket for Angle Limit Switch	\$33.25
9320		Pullcord, Complete	\$100.00
9321	9	Trap Release for Pullcord	\$45.40
9322	9	Switch for Trap Release	\$10.00
9400		"SW Series" Manual -- Green	\$8.00
9400-G		"G" Series Manual -- Red	\$8.00
9425		Singles Score Pad(s) -- 50 sheets	\$3.00
9430		Doubles Score Pad(s) -- 50 sheets	\$3.00
9500		Pat-Trap Hat	\$5.00
P		Parts Kit -- G Series	\$75.00
PSK		Parts Kit -- SK Series	\$75.00
PSW		Part Kit -- SW Series	\$75.00
R		Retro-Fit SW Series to G Series	\$3,600
CVR		Canterbury Voice Release	\$1,995.00
WR		Wireless Release	\$250.00
MISC		Miscellaneous Item -- Specify	
WARRANTY		Warranty Item -- Specify	

*** PRICES ARE SUBJECT TO CHANGE WITHOUT NOTIC/PRICE DOES NOT INCLUDE SHIPPING