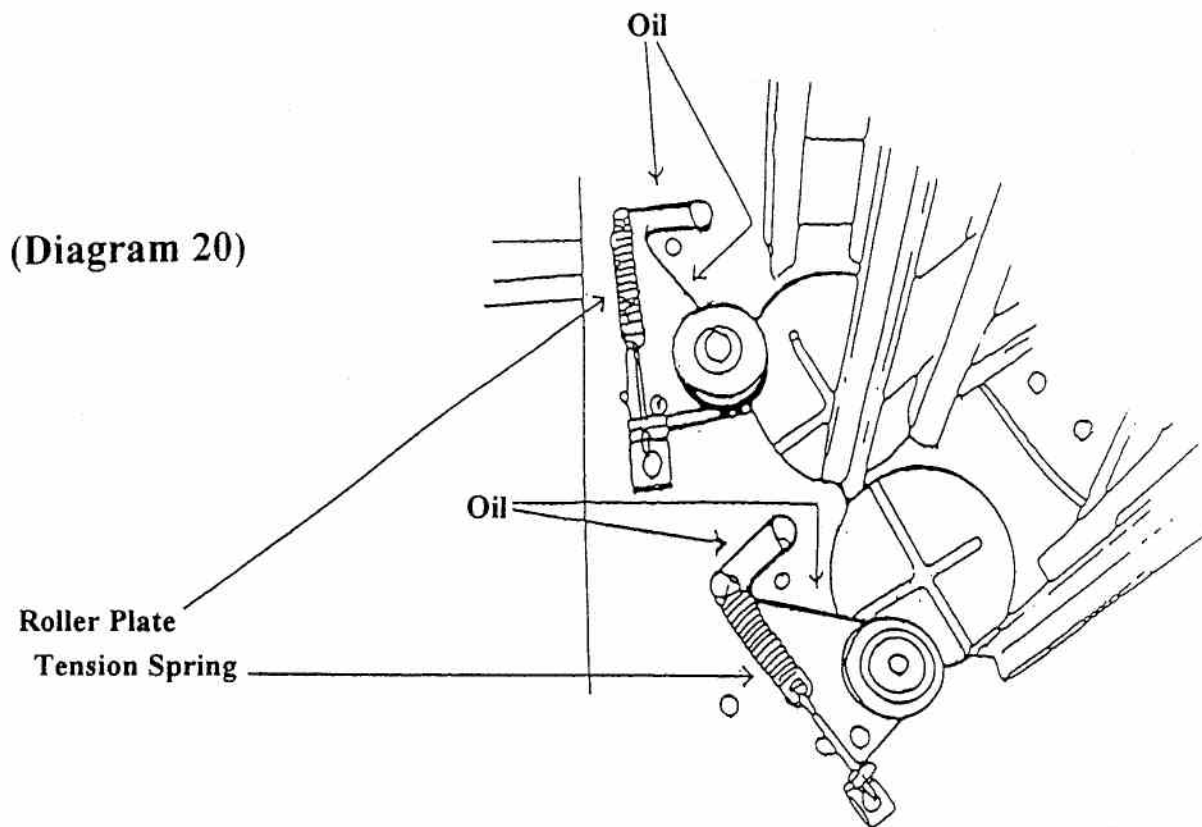


ROLLER PLATE MAINTENANCE



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

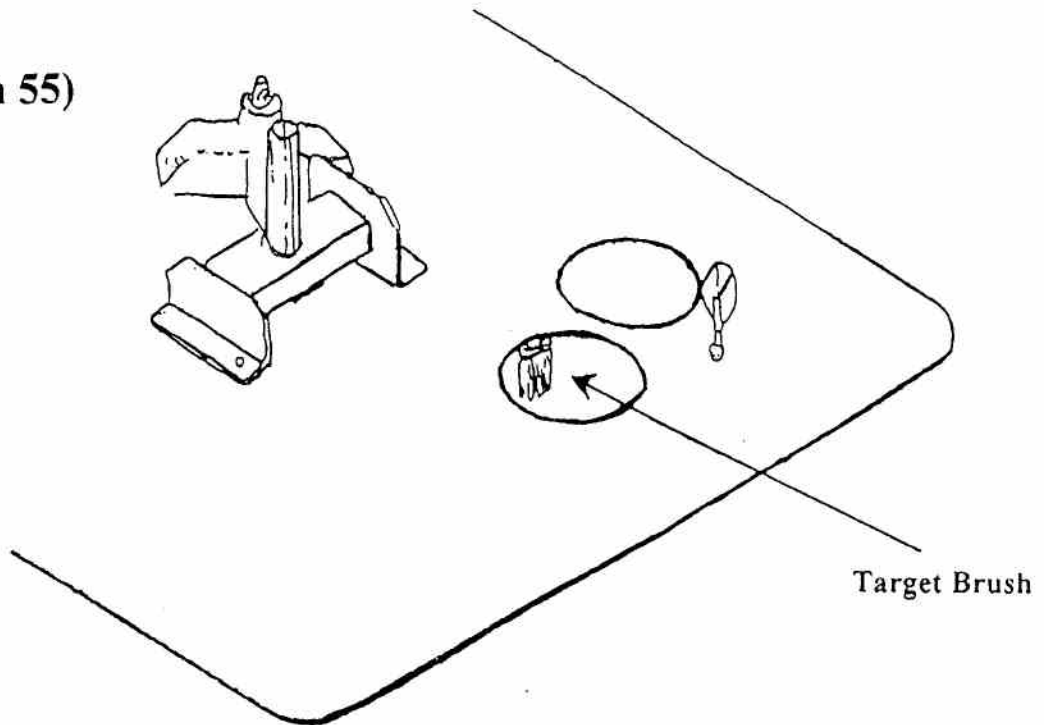
SOLUTION:

Place a *few* drops of light oil under the top edges of the roller plates. Be *not* to inspect the roller plates every three weeks by pulling back and forth on the wheel 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.

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

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 stop the throw arm 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 35.

CAUTION

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

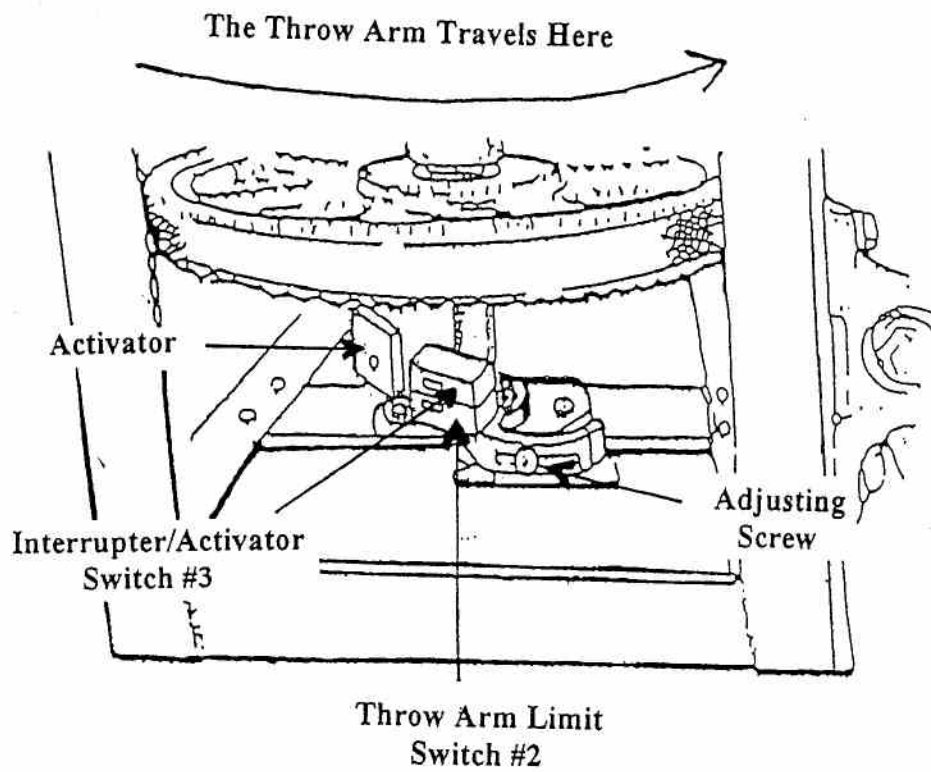
When the throw arm is FIRED, the arm will travel through the indicated danger area.

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

DANGER

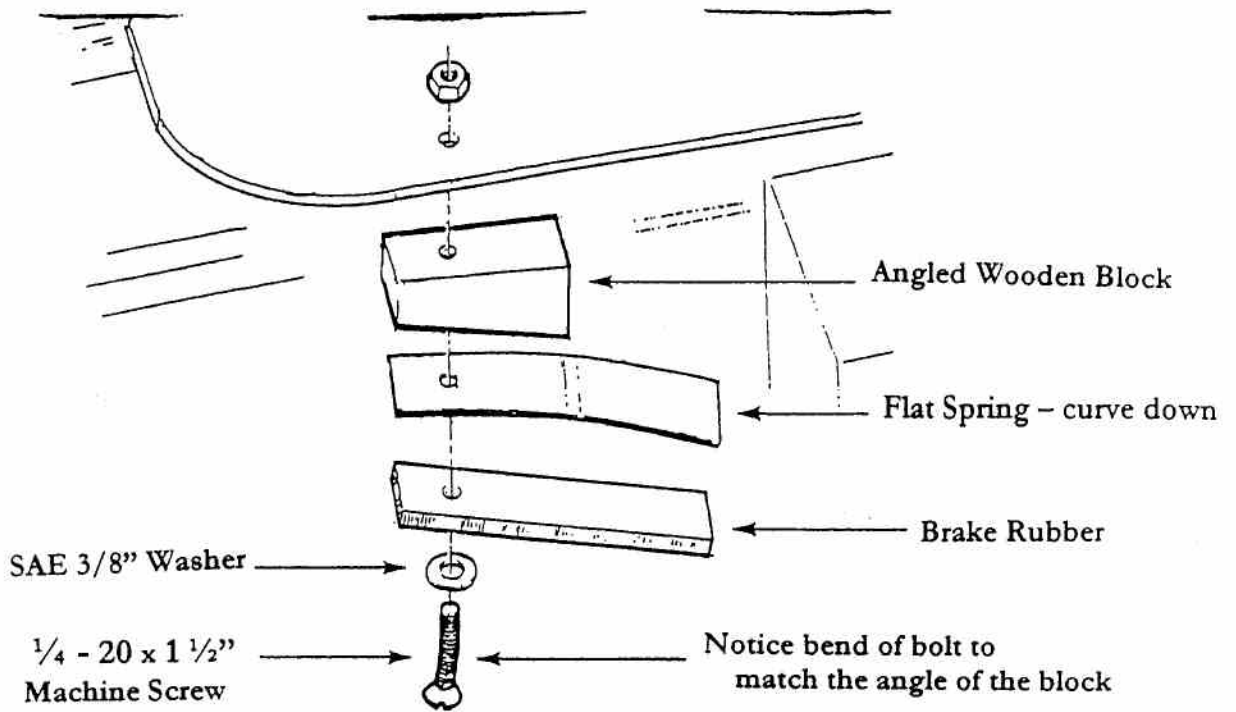
DANGER



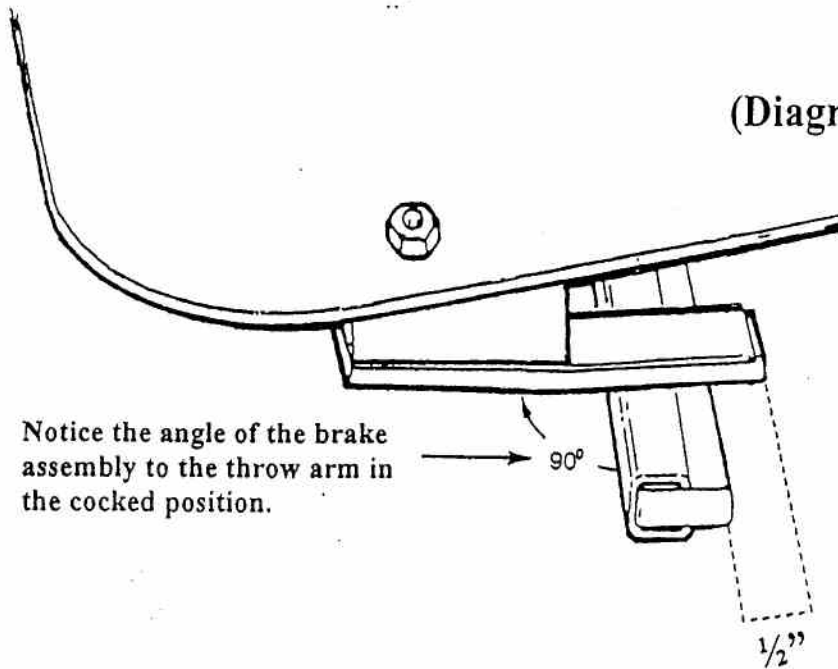
(Diagram 27)

ASSEMBLY OF THROW ARM BRAKE

(Diagram 31)



(Diagram 32)

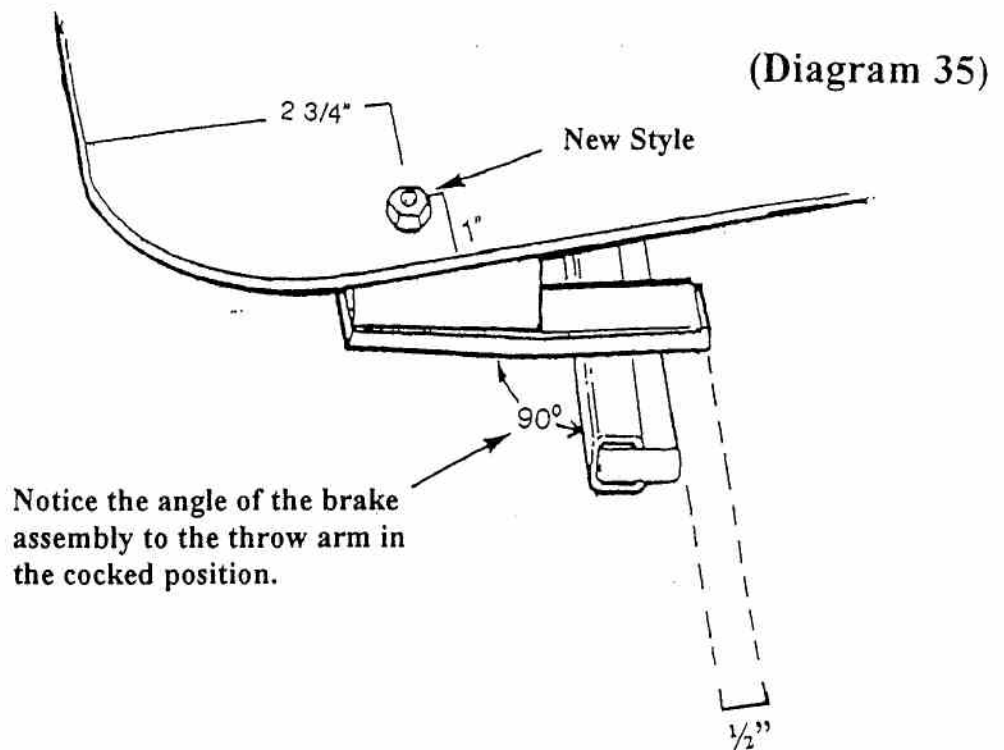


**The stopping position of the throw arm on the brake is approximately 1/2" behind the end of the brake

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 $\frac{1}{2}$ inch 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

NOTE: *Be sure that the power is off and the trap machine has been released. Never attempt to make any adjustments when the arm is cocked. Never stand in front of a cocked trap machine.*

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 of easier working conditions.
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

The plastic spacers slide onto the bolt easily. The rubber bushings are sometimes a tight fit; use a vise to put them on. One at a time, set the rubber bushings on the flat area of the vise and use a hammer to start the bolt into the bushing. Open the vise slightly more than the width of the bolt and carefully drive the bolt through the bushing. Make sure that the assembly of the spacers and bushings are snug against the head of the bolt. See Diagram 23.

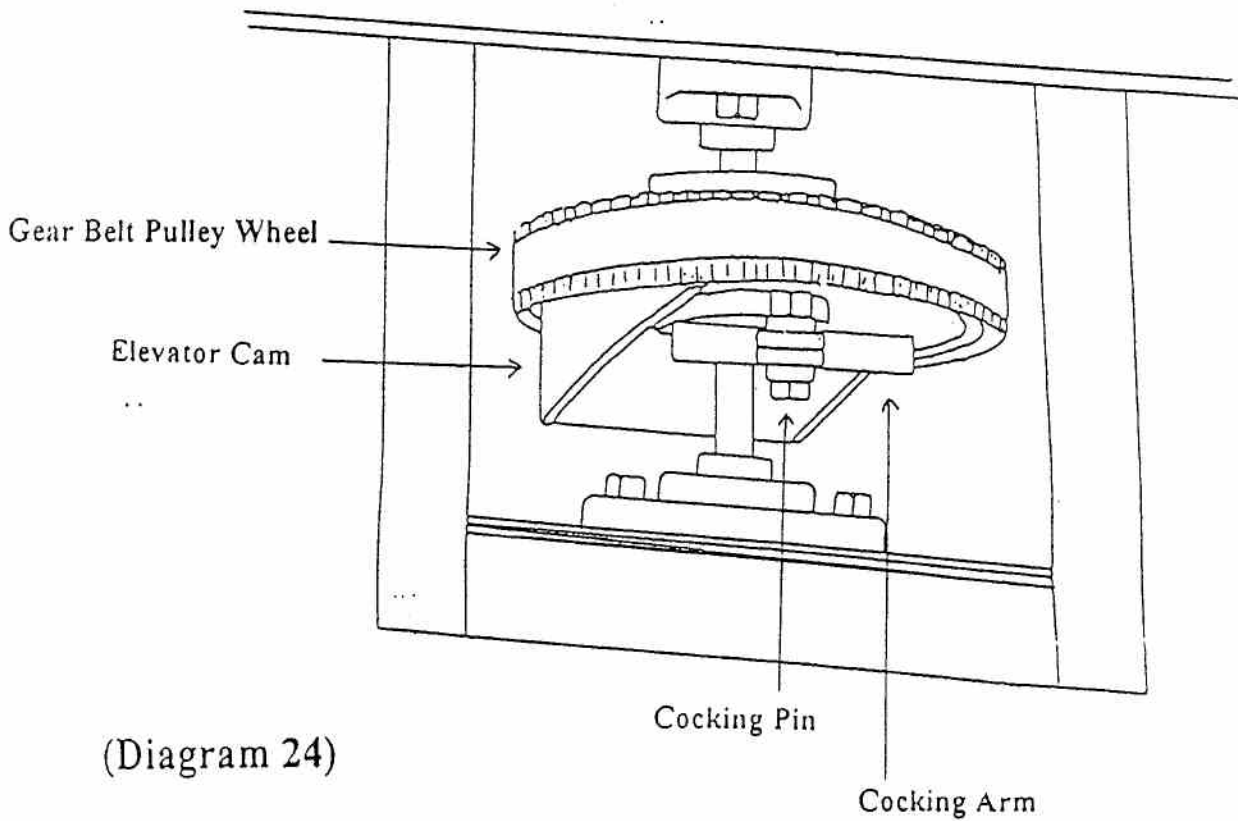
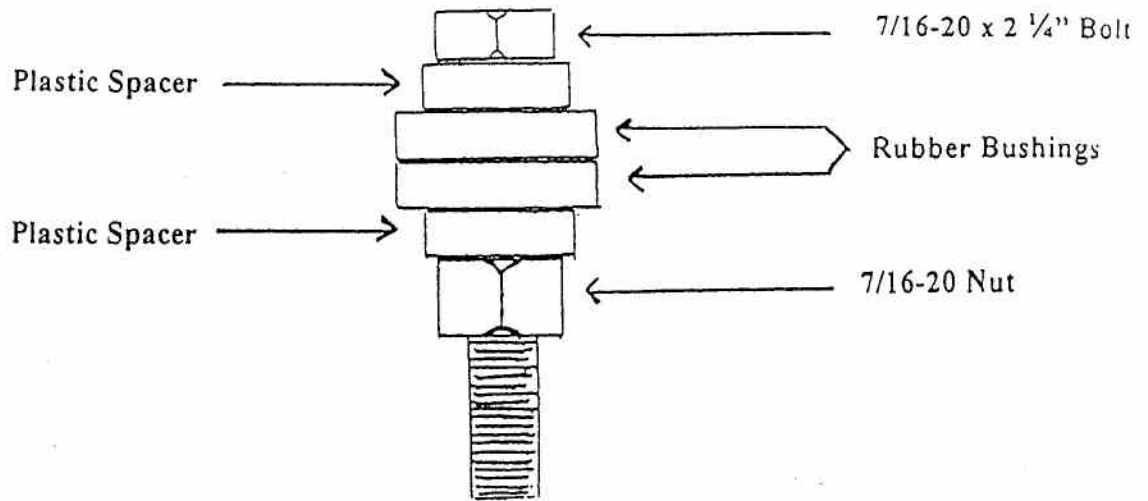
Turn the nut on by hand until it is snug against the spacer.

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

Now, tighten the nut against the wheel as tight as possible. See Diagram 24.

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

(Diagram 23)



(Diagram 24)

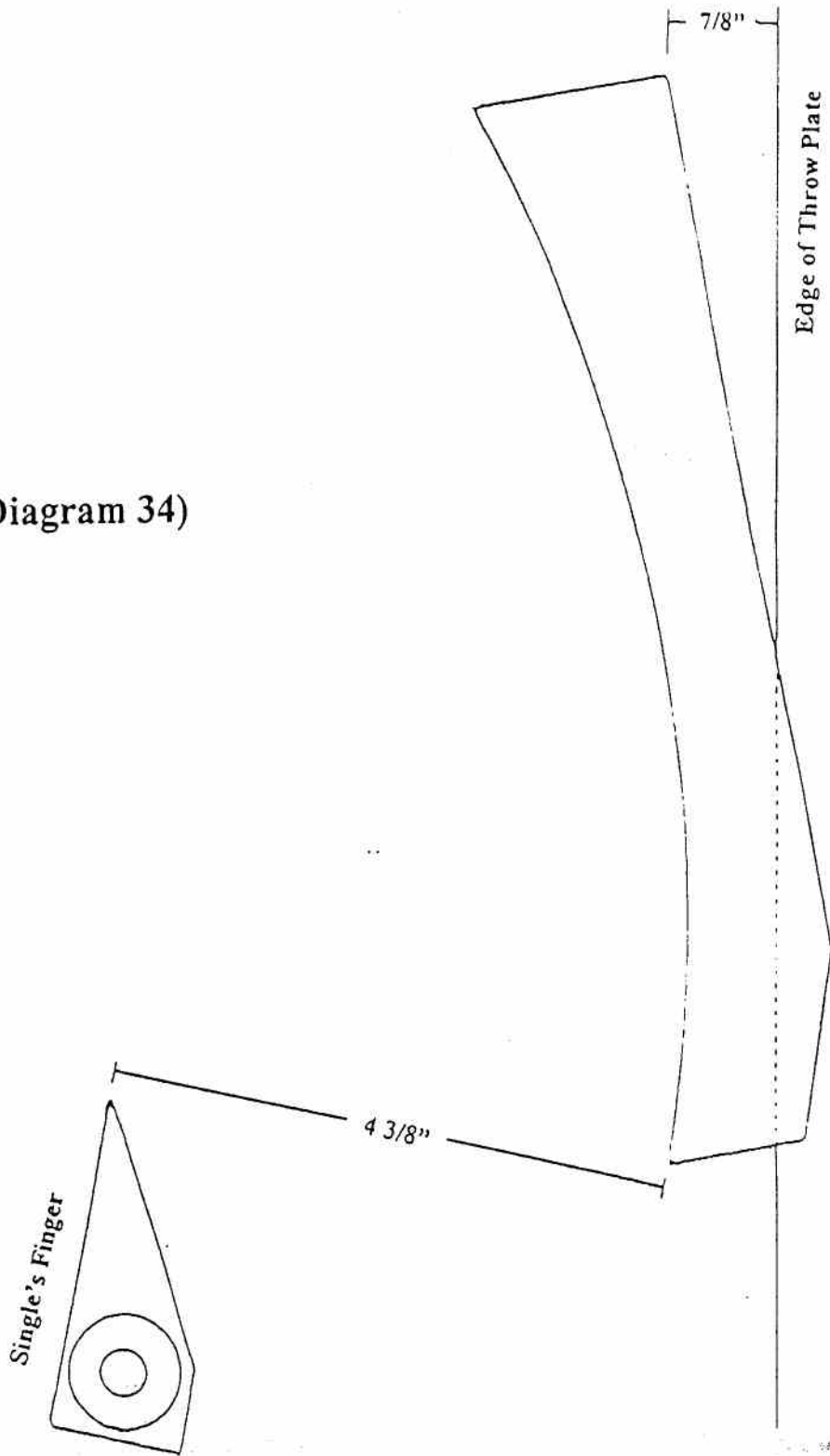
INSTALLATION OF THE "X" DOUBLES FINGER

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 $4 \frac{3}{8}$ " 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.

DOUBLES "X" FINGER

(Diagram 34)



DISCONNECTING THE UNI-BAND (MAIN SPRING)

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.

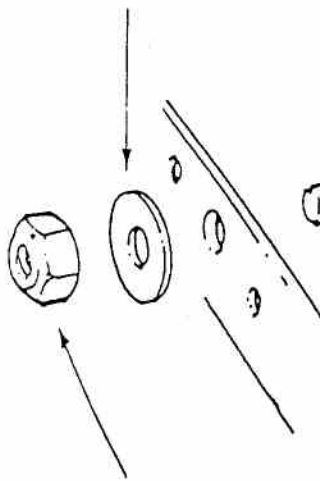
1. Release the throw arm and turn off the machine.
2. Reduce the main spring tension (unwind the crank handle).
3. You can now loosen the set screw on the connecting block of the Uni-Band. Pull back and down on the Uni-Band to remove it from the bearing. See Diagram 28. (If there is a high amount of 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 *see page 37.*

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

TOP

Washer
For centering threaded
rod in crankhandle
sleeve

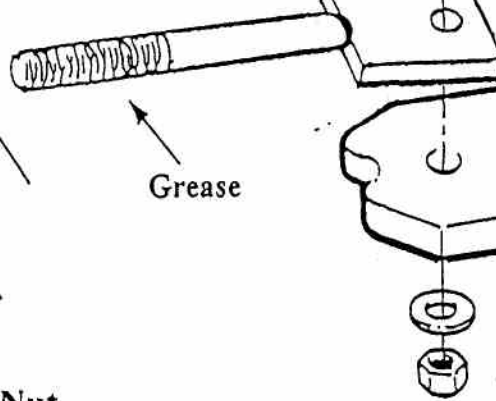


Elastic Lock Nut

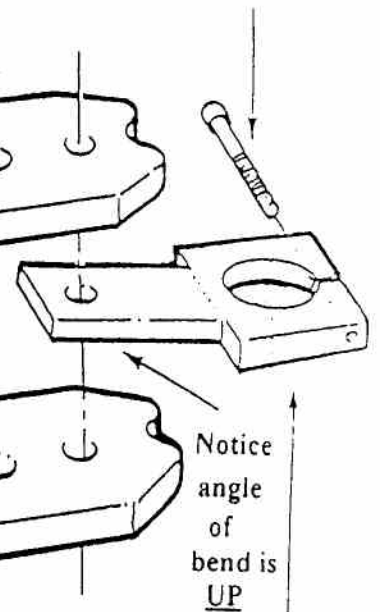
For pre-tension of Uni-Band
Refer to section on setting distance
and speed and pre-tension

Notice angle
of bend is
DOWN

Grease



Very lightly, snug up this
bolt: $\frac{1}{4}$ turn at most.
Over-tightening will cause
drag on bearing.



Notice
angle
of bend is
UP

ROD - END
to
Bearing

(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 $6\frac{3}{4}$ " 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 $6\frac{3}{4}$ " 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 ($1\frac{9}{16}$ " 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 $3/8 - 24 \times 1\frac{1}{2}$ " 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). Firmly tighten 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

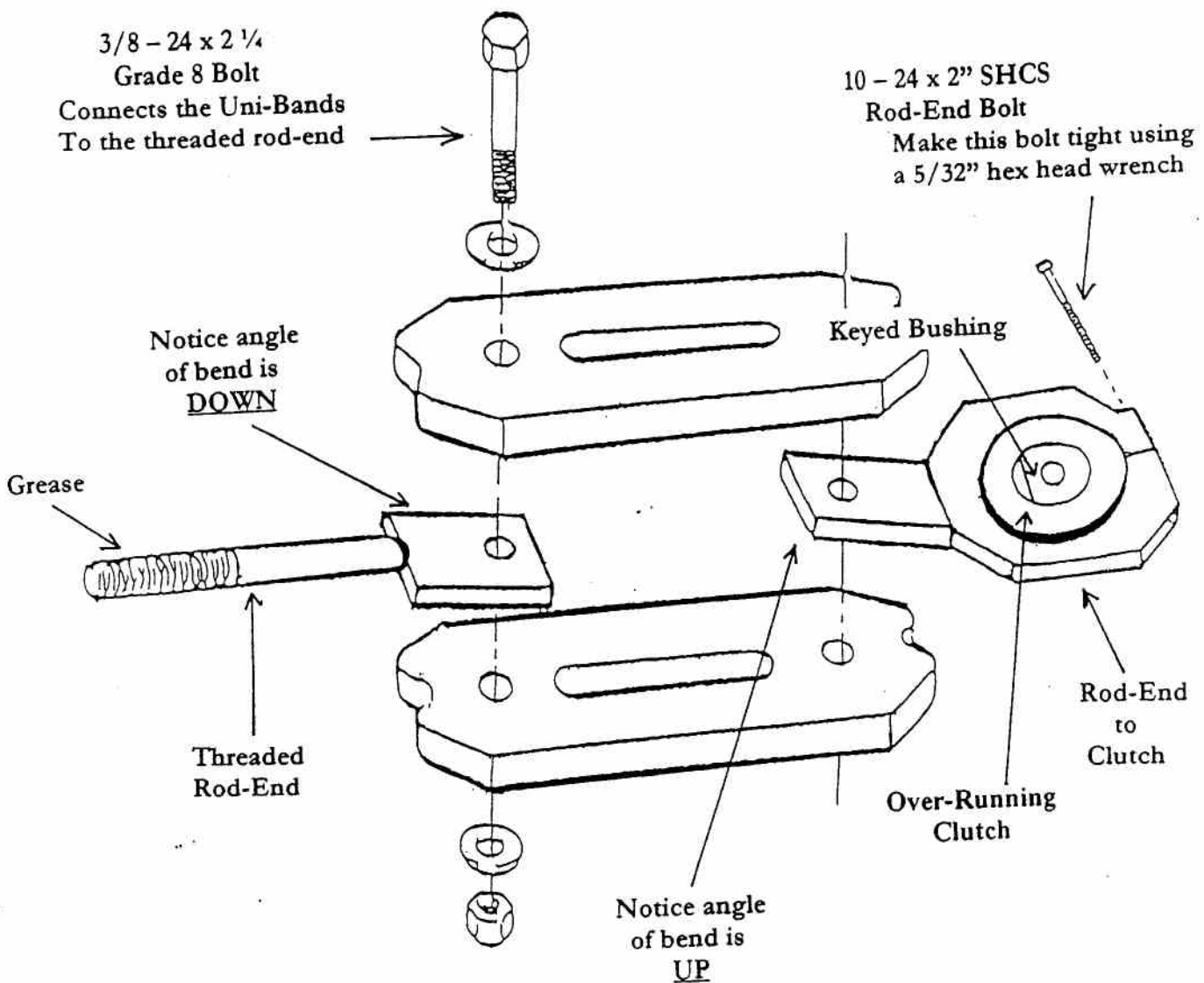
1. Let off the crank handle tension.
2. Turn the machine on to cock the throw arm.
3. When the throw arm stops at the throw arm brake, turn the machine off without releasing the throw arm.
4. **WHEN THE THROW ARM IS COCKED, BE SURE TO STAND BEHIND THE TRAP AND STAY CLEAR OF THE THROW ARM.** To completely 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). Firmly tighten 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.

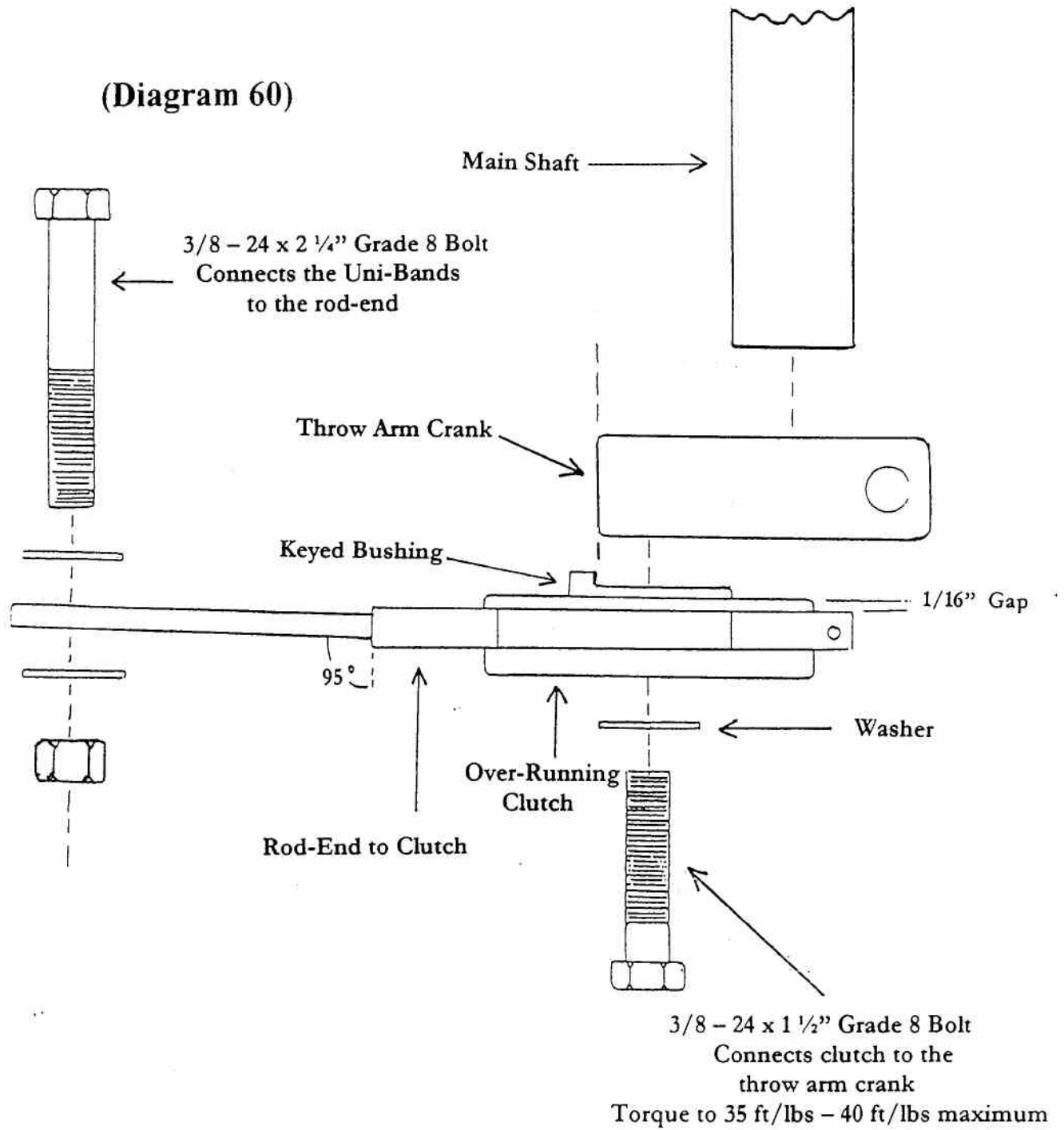
ASSEMBLY/INSTALLATION OF THE UNI-BAND (Main Spring) to the MAIN SHAFT CLUTCH

TOP

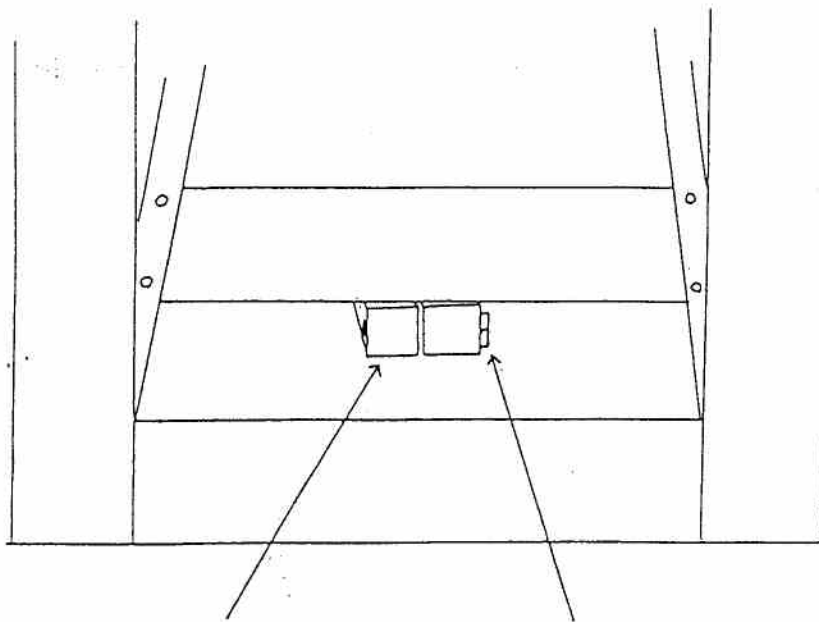
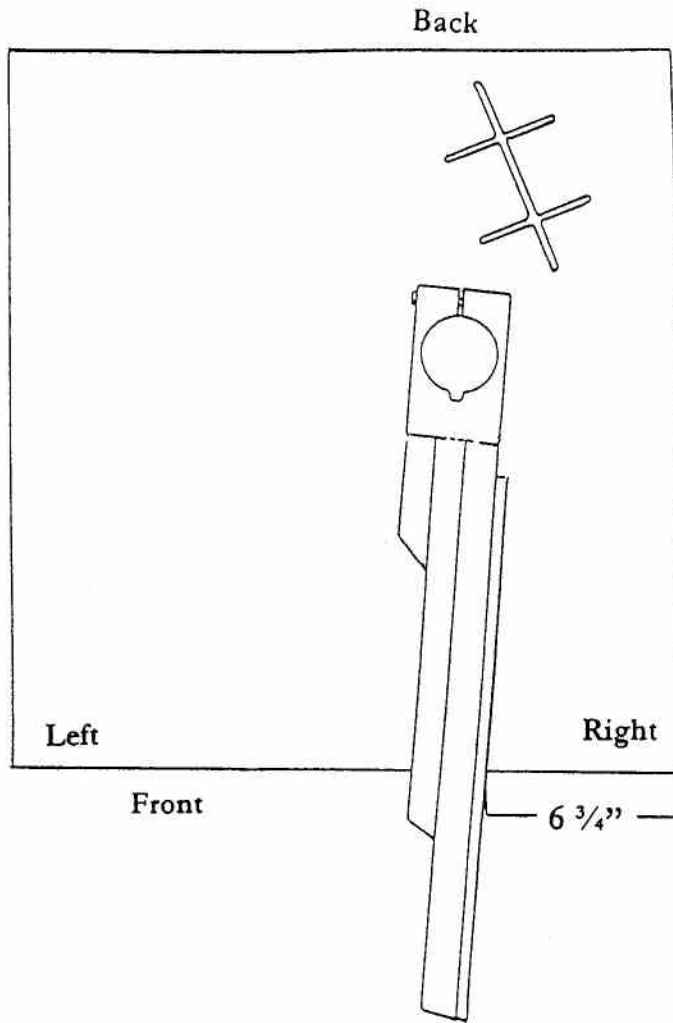


(Diagram 59)

(Diagram 60)



(Diagram 61)



(Diagram 62)

Throw arm crank
(Back view)

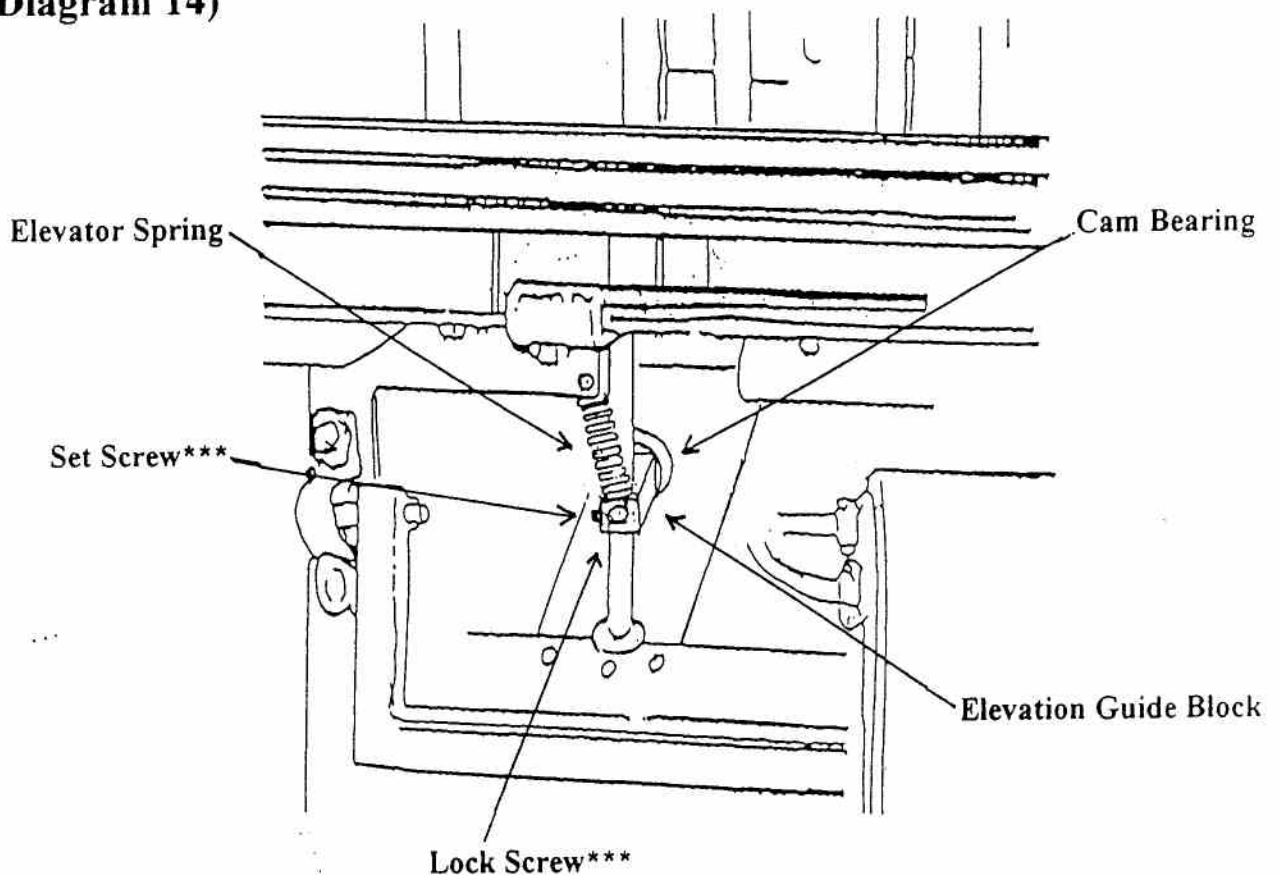
DO NOT LOOSEN *or* REMOVE

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.

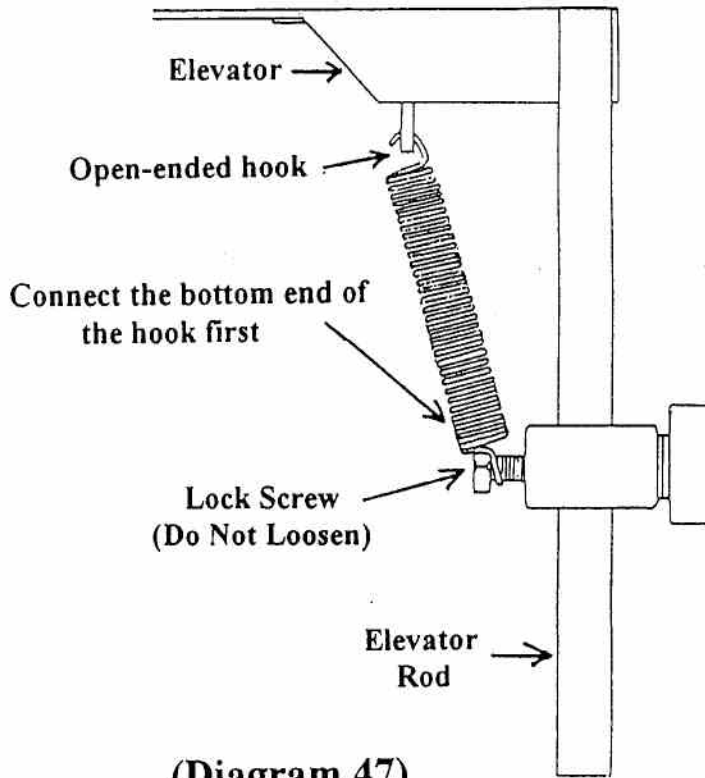
1. Turn the machine on.
2. Fire the throw arm and then turn the machine off as soon as the elevator goes up. (When the cam leaves the cam bearing.)
3. If disconnecting the spring: remove the top end first.
4. If connecting the spring: connect the bottom end first. Refer to Diagrams 47 or 48,

(Diagram 14)



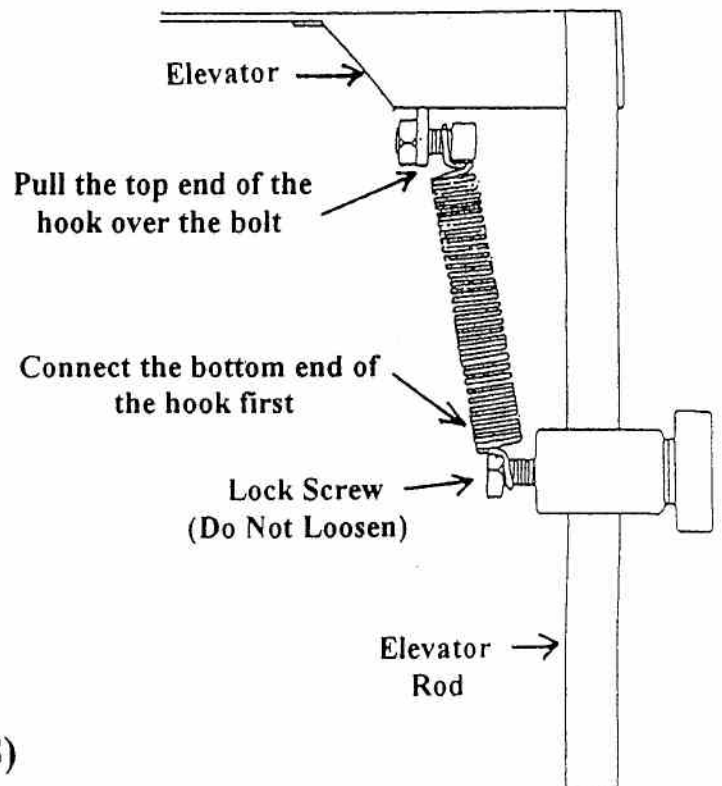
ELEVATOR SPRING CONNECTION

Up to Serial # 2804



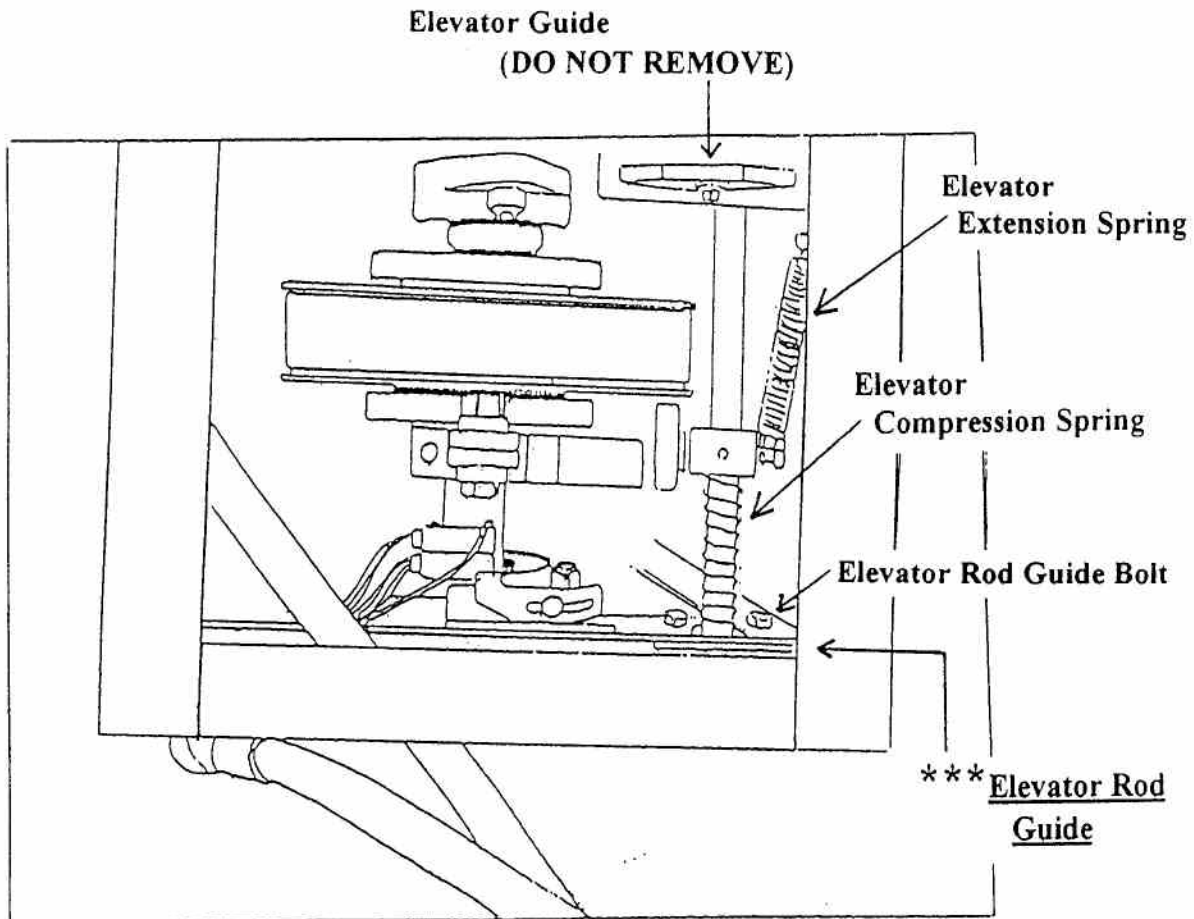
(Diagram 47)

From Serial # 2809



(Diagram 48)

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.

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
N. O. Switch #12A
(Red Wire)

Magnet

Switch Bar Bracket

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

***KEEP GLUE OUT OF CYLINDER BLOCK

Apply Locktite glue to the threads in the area indicated.

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 1/4" Bolt

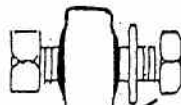
(Diagram 37)

HYDRAULIC CYLINDER FOR WOBBLE

From Serial # 2805

Jam Nut

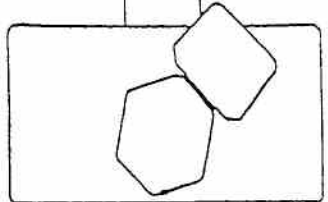
Tighten against the switch bar bracket while keeping the switches parallel to the magnet



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.



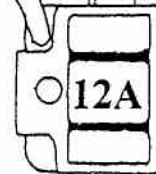
(Diagram 33)

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



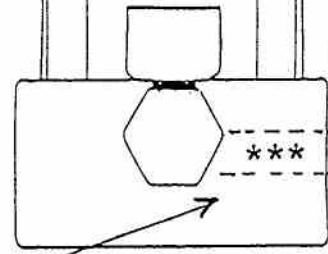
***KEEP GLUE OUT OF CYLINDER BLOCK

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

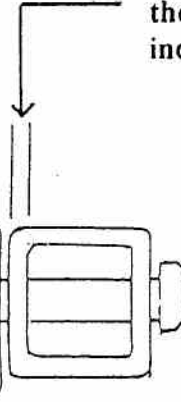


Apply Loctite glue to the threads in the area indicated.

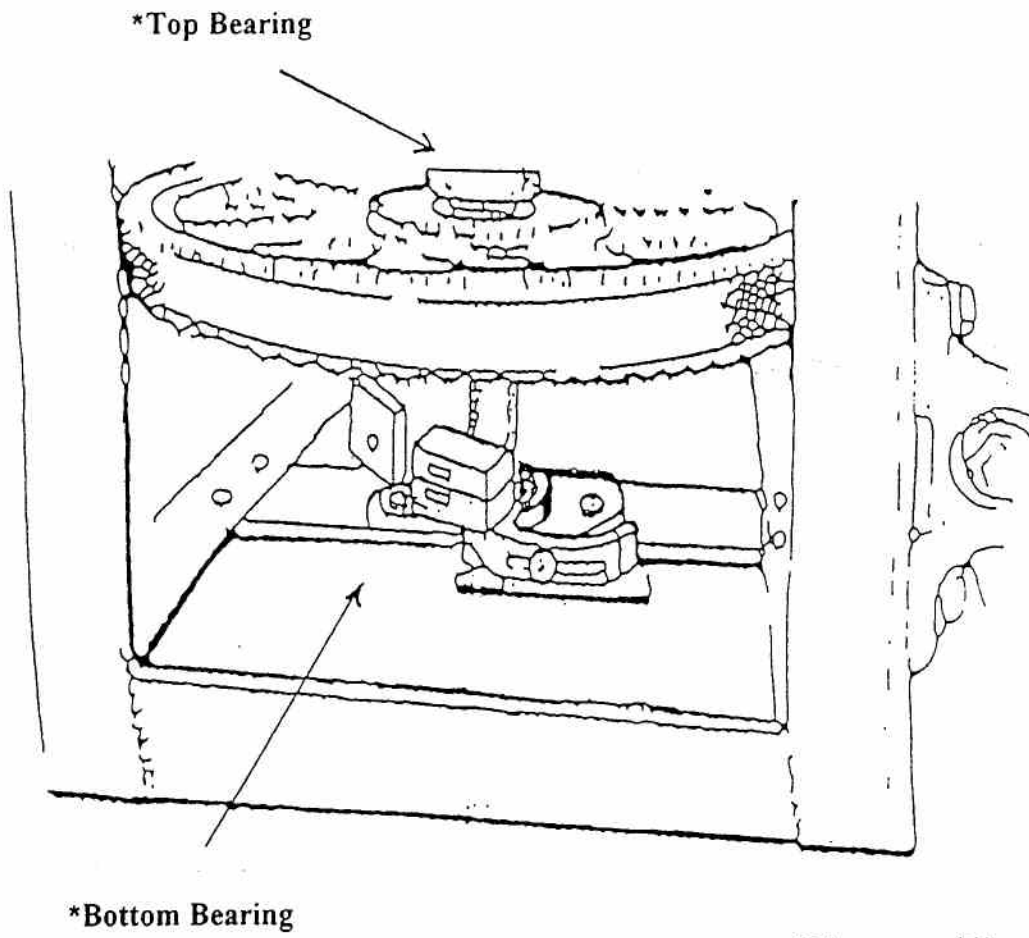
Grease the cylinder block once every two - five years (as needed). The grease fitting is on the backside of the cylinder.



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



THROW ARM SHAFT BEARING MAINTENANCE

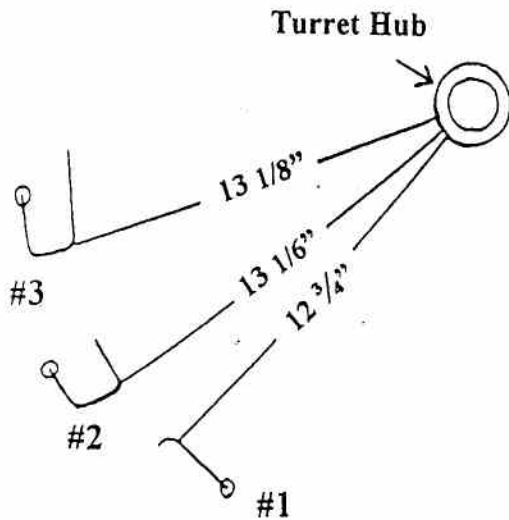


(Diagram 41)

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

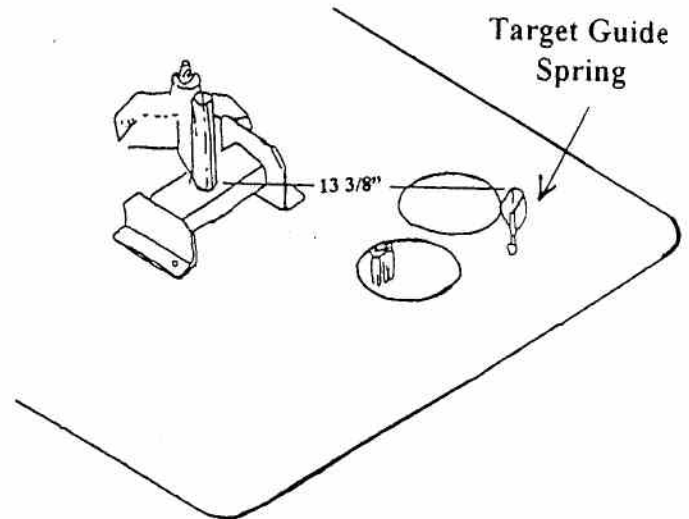
TARGET GUIDE SPRING POSITION

Up to Serial # 2729



(Diagram 56)

From Serial # 2730...



(Diagram 19)

Measuring to the Guide Spring(s) with the turret off: from the face of the king pin 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 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 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.

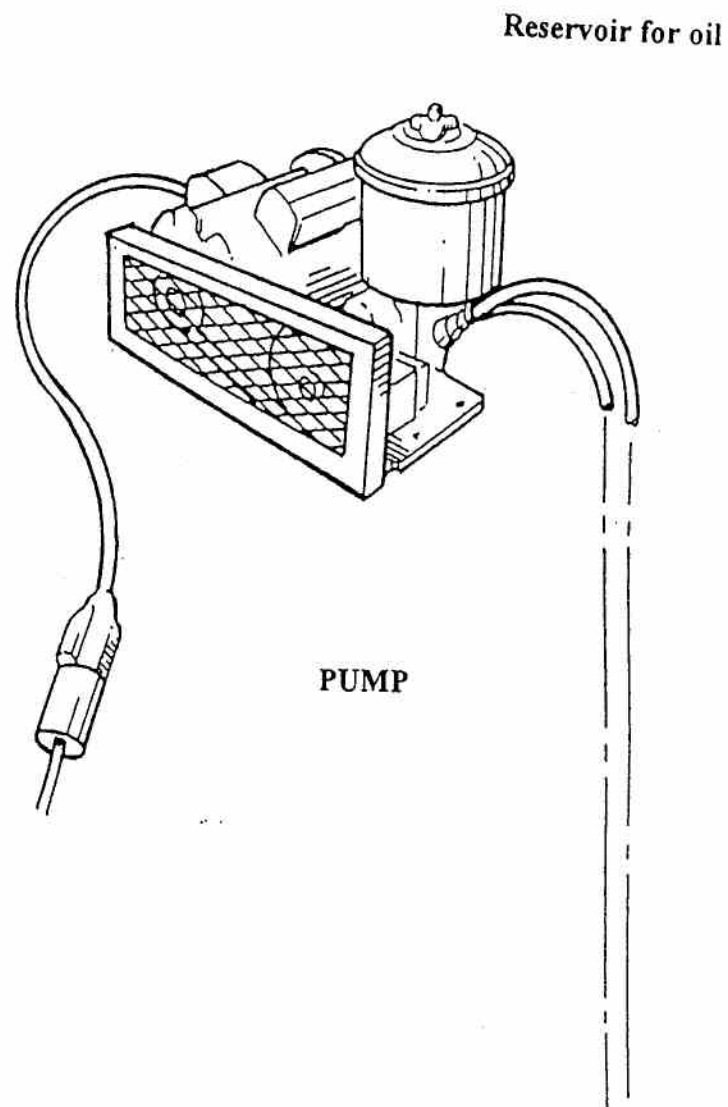
NOTE: Beginning with PAT-TRAP® # G2730, Target Guide Springs #1 and #3 are no longer used.

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-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



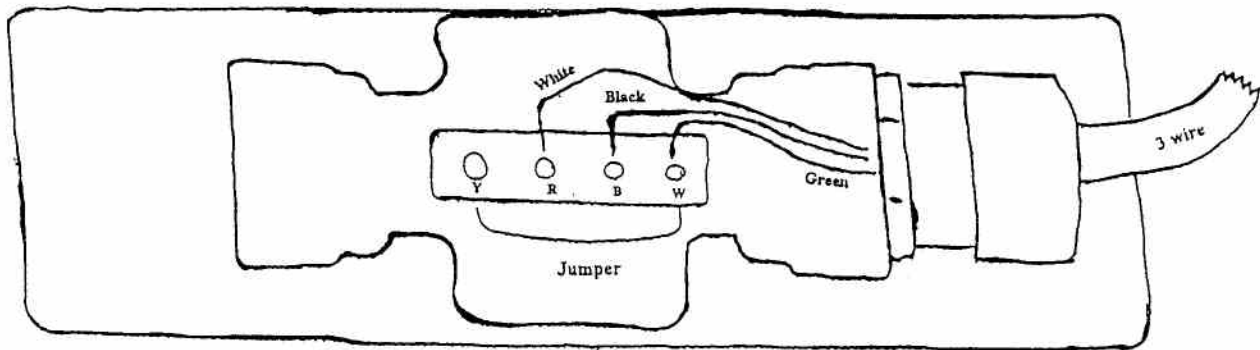
(Diagram 38)

For pump motor fluid use: Mobil 1: OW-30

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 8)

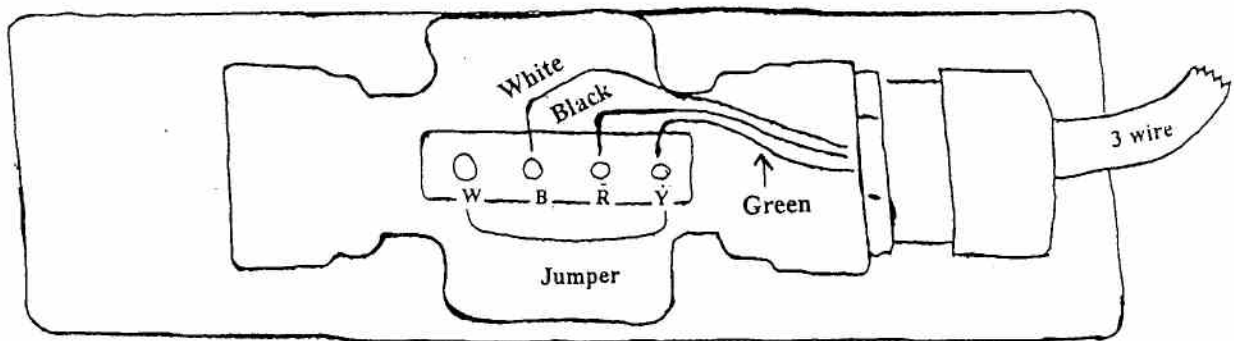
1. The Black Wire goes to the Black terminal
2. The White Wire goes to the Red terminal
3. The Green Wire goes to the White terminal
4. The Jumper Wire goes from the Yellow terminal to the White terminal

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