

Section I - Introduction

Purpose of Tying Machine

The primary purpose of the tying machine is to automatically tie mail, packages, cartons, piece parts, printed matter, newspaper, laundry, produce, meats, corrugated cardboard and miscellaneous materials and products requiring a secure wrap (figure 1). The tying machine ties almost everything that was previously wired, banded, taped, strapped, tied by hand in offices, factories and commercial establishments. The tying machine reduces tying time, employee effort and fatigue, reduces twine lint and waste, enables trained operators to make secure ties quickly, ties larger bundles with greater ease and efficiency and discourages tampering because the knot cannot be duplicated by hand tying.

General Description

The tying machine is made of steel, cast iron and high impact plastic construction. Heavy duty panels and guards completely enclose the moving parts of the tying machine to prevent accidental operator contact. However, the unique design of the tying machine still provides the operator with easy accessibility to maintenance points without the use of tools. For ease of mobility, caster wheels are used. A brake feature on each caster resists the movement of the tying machine when assigned a permanent position. The “ON-OFF” switch (used to supply electrical power) and a foot pedal (used to initiate the tying cycle) are within easy and comfortable reach of the operator. The material tying area consists of a front table, back table, and standard. A knotter head assembly, stringholder assembly, twine arm and drive assemblies comprise the tying cycle components.

Principles of Operation

Double Wrap One Way

With the tying machine power cord connected to an approved power source and the material to be tied properly positioned on the front table and the back table, the operator then places the “ON-OFF” switch in the “ON” position. Electrical ac power is then transferred by the switch to start the motor. The motor rotating at approximately 1725 rpm drives the pulley on the clutch via a V belt mechanically coupling the pulley assembly to the motor. At this time, the tying machine is considered to be in a locked condition until the operator applies toe pressure to the foot pedal to begin the wrapping and tying cycle. Depressing the foot pedal causes the trip cable to position the bell crank and kickout assembly so the kickout wedge slides free from the clutch fork assembly. Repositioning the kick-out wedge permits the lever clutch of the kickout mechanism to first pull away from the clutch kickout block on the main cam assembly and then is engaged by the clutch fork. As soon as this occurs, the clutch shaft becomes unlocked and starts to rotate which in turn drives a series of gears; main shaft, main gear and chain gear. As a result, the twine arm begins to swing around the package being tied pulling the twine from the twine cone pilot assembly, through the properly adjusted tension device and each threading guide. After the second swing of the twine arm, the drawslide is positioned to allow the twine to fall directly behind the stringholder button. The drawslide then pushes the twine from the stringholder button to the left side of the forward moving knotter body as viewed from the right hand side of the tying machine.

Section I – Introduction Continued

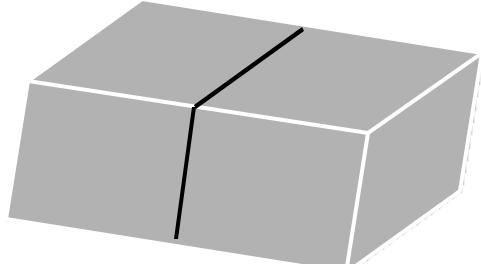
Simultaneously, the twine arm is continuing its arc and the knotter body turns counter clockwise opening the jaw for the two strands of twine which are wrapped around the knotter body assembly. The strands of twine are brought through the jaws and the jaws firmly lock. The knotter body assembly then moves towards its finished position and the stripper forces the twine strands off the knotter body jaws, into the tight part of the knot. As the two strands of twine are pulled into loops from the knotter body assembly jaws, the knifetrap moves forward and cuts a fresh end of twine and pushes the previously cut end of twine from behind the stringholder button. The knotter body assembly completes its movement to finished position and the knotter body assembly jaws open to release the loops completing the tying process.

The tied bundle is then removed from the tying machine.

Double Wrap Cross Tie

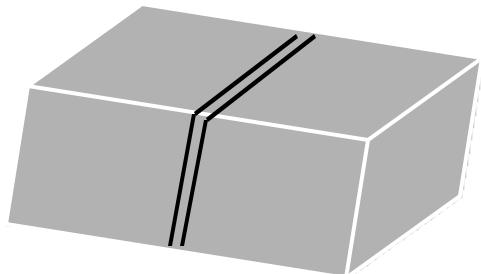
The double wrap cross-tie tying cycle (available on all models except 1991) operates in exactly the same manner as the double wrap one way tying cycle previously described above except that the twine arm rotates once around the bundle being tied then automatically stops. The operator properly repositions the bundle 90 degrees in a clockwise direction, again applies toe pressure to the foot pedal and the twine arm rotates around the bundle once more automatically completing the knot tying process. The bundle is crossed-tied in each direction with one strand of twine and is tied with one knot.

Basic Types of Different Wraps



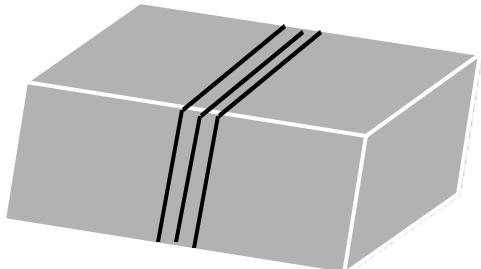
Single Wrap —

The arm carries the twine arm around once and the knot is formed.



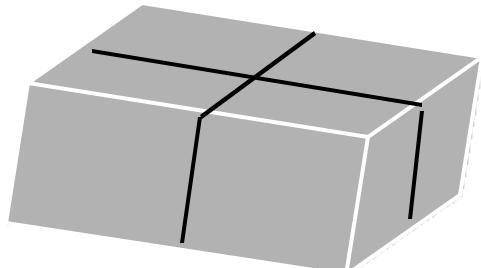
Double Wrap — One Way

Two wraps in one direction with one knot.



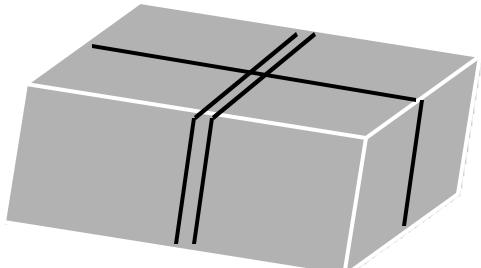
Triple Wrap — One Way

Three wraps in one direction with one knot.



Double Wrap* — Cross Tie

One wrap in each direction with only one knot.



Triple Wrap** — Cross Tie

One wrap in one direction; Two wraps in other direction — with only one knot.

** Triple wrap cross tie additionally provides: (1) Three wraps in one direction if package is not turned between wrap cycles; (2) two wraps one way by tripping out the first wrap.

* Double wrap cross tie also provides: (1) two wraps in one direction if package is not turned between wrap cycles; (2) one way by tripping out the first wrap.

Section II - Preparation For Use

Uncrating instructions

1. Cut bands securing the carton to the skid.
2. Cut the bottom of the cardboard carton where it is secured to skid.
3. Carefully raise and remove the carton from the tying machine.
4. Carefully remove the steel strapping from the machine and then pull the tying machine away from the skid.
5. Remove the box in the twine container shipped with the tying machine containing four casters.
7. Using the casters shipped with the tying machine, insert a caster into the caster socket on each leg of the tying machine.

Note: The manual should be wrapped around the knotter at standard, along with the warranty card, certificate and spare knives. If any problems are encountered, contact your local B. H. Bunn Company Distributor.

Power requirements

The single-phase, 1/4 hp, 1725 rpm standard motor provided with your tying machine requires an external power source of 115 volts at 60 cycles. A standard three-prong electrical cord is provided with electric motor. If a three-prong receptacle is not available at the installation site, a three-prong adapter should be used with the electrical cord.

Tying Materials

The tying machine is adaptable to a wide range of tying materials ranging from natural fiber twines to synthetics which can replace wire and strapping in many applications. Be sure the twine or tape used is the proper type and size for the application and your Bunn machine. Each new or factory reconditioned Bunn Tying Machine is factory adjusted and set for a particular size and type of twine. Other sizes or types will require adjustments and may require internal part changes. The right Bunn Twine, tested and approved for Bunn Tying Machines, aids in maximum machine performance. Bunn Twine is of uniform size and strength, free of irregularities that cause mis-ties. It is strong and fray-resistant, with minimum linting characteristics.

A free sample folder showing actual twine samples and specifications is available through your local B. H. Bunn Company Distributor.

Conversion kits are available through your local B. H. Bunn Company Distributor when and if it ever becomes necessary to change to a different material – twine to tape or tape to twine. The twine container

Threading Procedures

Before the tying machine is shipped, it is threaded through each guide starting from the twine container to the stringholder button. To avoid threading problems in the future, you should become familiar with the threading sequence at this time.

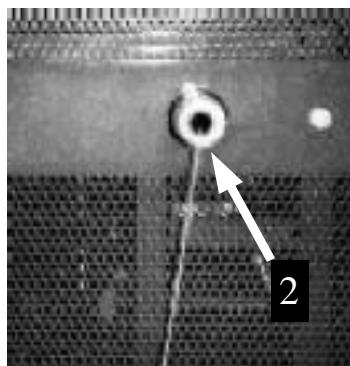
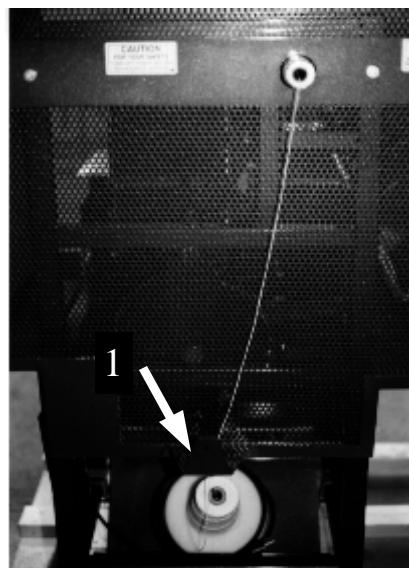
Complete threading of the tying machine can be avoided if the end of the twine or tape being used is caught before it leaves the twine container. To accomplish this, simply tie the end of the existing

twine or tape to the starting end of the new twine or tape with a square knot.

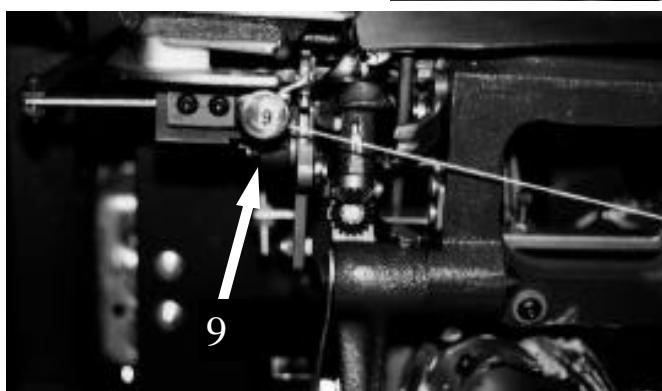
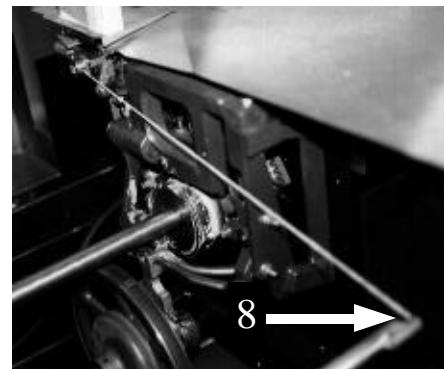
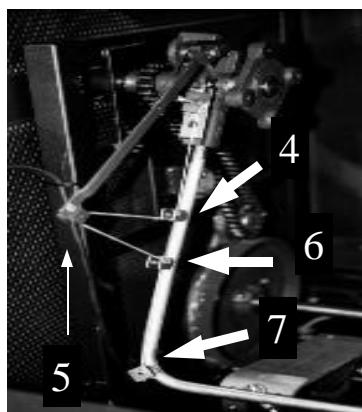
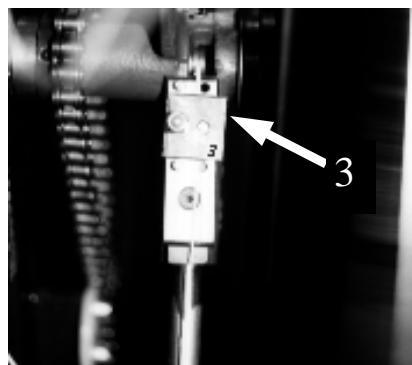
If the end of the twine or tape is not caught before it leaves twine container, the tying machine must be threaded as explained in the subsequent procedures.

It is important to observe the various openings which are identified by numbered labels affixed to the machine which the twine or tape is to be threaded.

Never thread machine while motor is operating.



Place twine cone over cone pilot assembly. Press firmly until cone is seated on foam pad at bottom of twine container. Note: Cone pilot assembly is adjustable if cone does not seat properly. Grasping end of twine, thread through



Pull twine to right side of machine. While gently pulling the stringholder release lever, place the twine under stringholder button # 9. Pull twine up and over button shaft and release stringholder release lever. Pull the twine taunt to cut off excess twine.

Section III – Operation

Before Operation Checks

1. Turn “ON-OFF” switch to the “OFF” Position.
2. Check for proper threading.
3. Check if twine or tape cone is properly seated on foam pad of twine container.
4. Check twine running tension by pulling twine from end of twine arm assembly. A smooth easy running tension should be felt.
5. Visually check the tying machine for any mechanical defects or missing parts.

Tying Size Limitations

The capacity graph on the Model Characteristics Sheet at the front of the manual indicates the maximum height and width of the packages that can be tied. Bunn tying machines adjust automatically to handle most packages of varying sizes and shapes that are smaller than its maximum capacity.

Throat depth is the distance from the back of the back table to the twine line, or the maximum distance you can slide the package into the tying machine. The “throat” depth is also tabulated on the Model Characteristics Sheet.

One Wrap Operation

1. Stand in front of the tying machine at the operating position—the widest side of the fixed table.
2. Set the power switch to “ON” position.
3. Hold ends of the package between thumbs and forefingers of both hands and position package on tying machine table so that the right side of the package is butted against the standard and positioned over the gap between the front and back tables.
4. Depress foot pedal holding package firmly until tying cycle is completed. The tying cycle is completed after the twine arm makes the required wraps, one, two, or three.

NOTE

The tying machine automatically compensates for the

5. Remove package from tying machine.
6. Repeat steps 3 through 5 above for each package to be tied.
7. After all packages have been tied, set the “ON-OFF” switch to “OFF” position.

Cross Wrap operation

1. Stand in front of the machine at the operating position—the widest side of the fixed table.
2. Set “ON-OFF” switch to “ON” position.
3. Hold ends of package between thumbs and forefingers of both hands and position package on tying machine table so that right side of package is butted against the standard or notch in front table and positioned over gap between front and back tables.
4. Depress foot pedal holding package firmly until tying arm completes one revolution.
5. Turn package 90 degrees IN CLOCKWISE DIRECTION in tying machine.
6. Depress foot pedal (second time) holding package firmly until tying cycle is completed.
7. Remove package from tying machine.
8. Repeat steps 3 through 6 above for each package to be tied.
9. After all packages have been tied, set “ON-OFF” switch to “OFF” position.

After Operation Procedures

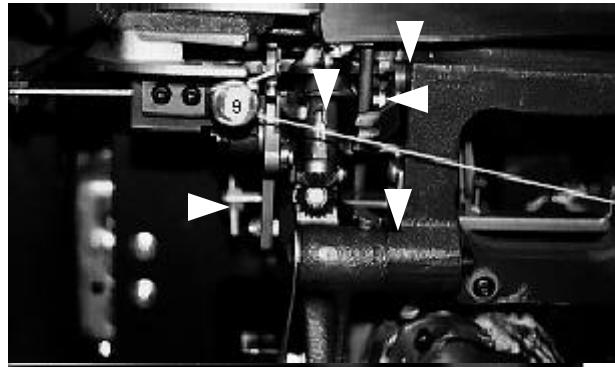
1. Check supply of twine or tape remaining in twine container. If supply is low tie the end of the existing twine or tape to the starting end of the new twine or tape with a square knot.
2. Clean any lint that may have collected in stringholder casting between the face and stringholder casting. Small tweezers can be used for this purpose.
3. Clean the machine by using an air compressor to blow the excess dust from the machine.
4. Check the knife blade for any knick or dull blade.

Section IV – Maintenance

Lubrication Requirements

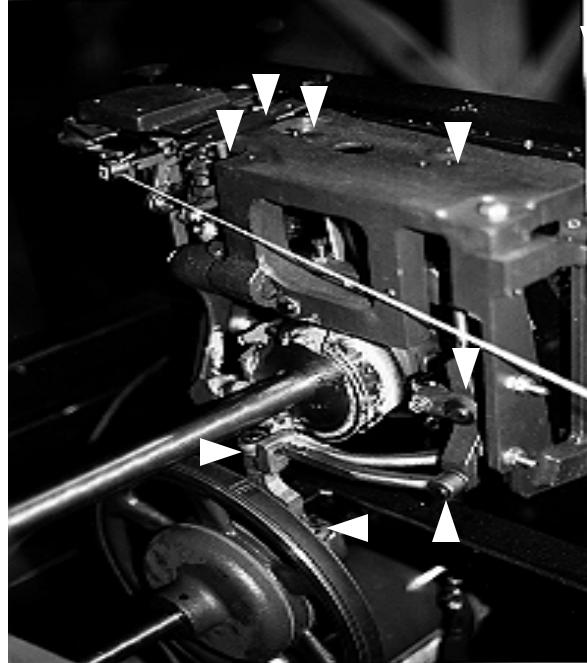
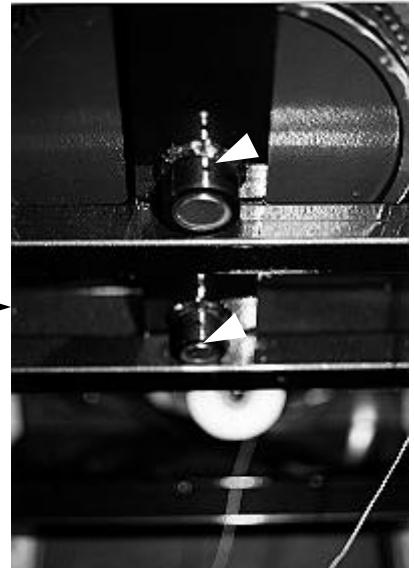
ARROWS IN PHOTOS IDENTIFY OIL HOLES AND LUBRICATION POINTS

Please refer to Lubrication / Maintenance for frequency.



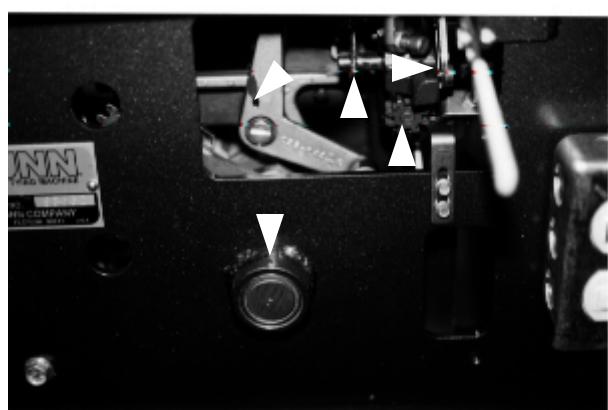
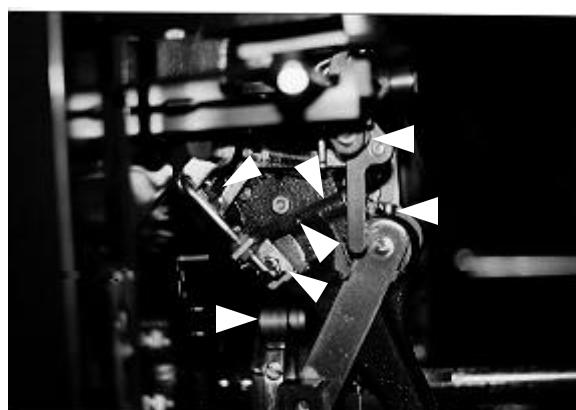
Knotter Head
Front

Rear
Main
shaft,
Clutch



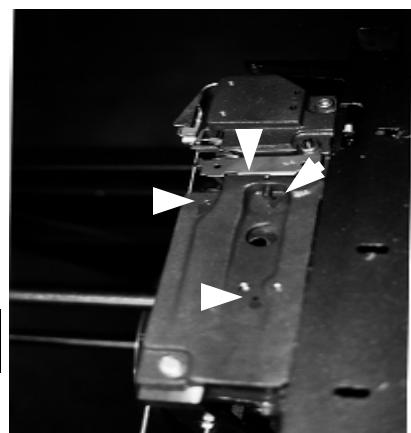
Main Table, Clutch
Fork, Kickout Wedge.

Knotter Head Side
View, Dual Tension,
Knife Trap



Front Frame
Main Shaft,
Drawslide
Lever

Main Table Top



Section IV – Maintenance

Introduction

A good preventative maintenance program is a major step forward to assure trouble-free tying machine operation. In order to be effective, routine inspection, lubrication and adjustment schedule must be established and followed.

For tying machines subjected to normal usage which is considered to be approximately 30 hours of operation weekly, the following maintenance and lubrication schedule should be followed. Substantial deviations from normal usage should require an adjustment in the indicated frequencies.

The Lubrication Requirement has frequencies of 50 and 150 hours. The following mechanical components should be checked daily: Stringholder button holes for lint or twine buildup, knife condition, V-belt tension, loose hardware and broken or weak knotter flat springs. The twine running tension should be checked on a monthly basis.

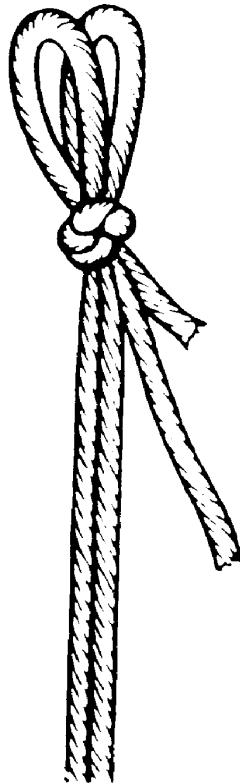
Any abnormal noises or loose components should be inspected and corrected. Power cord should be checked for fraying and the mo

LUBRICATION ITEM	Frequency	
Note: Apply several drops of SAE oil or equivalent unless otherwise specified. If necessary, refer to	30 Hours	90 Hours
Knotter Head Assembly		
1. Oil cup (Knotter Head Pivot).		
2. Two oil holes (encircled in red on machine).	X	
3. Between knotter lever and knotter head assembly.		X
4. Around diameter of knotter roller.	X	
5. Knotter lock plunger.		X
Stringholder Assembly		
1. Between knife trap pivot and knife trap lever assembly.	X	
2. Between knife trap shoulder screw and knife trap lever assembly.		X
Main Table Assembly		
1. Around diameter of drawslide lever assembly roller.		X
2. Between washer and drawslide lever.	X	
3. Between drawslide lever assembly and main table subassembly.		X
4. Into three oil holes (encircled in red on machine).	X	
5. Between stripper and main table subassembly so that stripper pivot pin is lubricated.		X
NOTE: Apply a liberal coat of recommended lubricant to the following unless otherwise specified.		
Drive Assembly		
1. Main gear cam surface.		X
2. Knotter rack assembly cam surface and teeth.	X	
3. Cam riser surface.		X
4. Knotter switch cam surface.	X	
5. Apply several drops SAE 10 oil to chain gear oil hole (encircled in red on machine).		X
6. Apply several drops of SAE 10 oil to the two oil cups.	X	
7. Apply several drops of SAE 10 oil to the back frame two oil holes (encircled in red on machine).		X
8. Main shaft (encircled in red on machine).	X	
9. Clutch shaft (encircled in red on machine).		X
10. Clutch fork pivot (encircle in red on machine).	X	

The Quality Knot Tells the Story

THIS IS A PERFECT KNOT

A perfect knot, like the illustration, has two long even loops extending out one side of the knot with one short and one long end, the body of the knot is tight and hard. The stripper should be on the line where the upper and lower jaws meet at the lip of the lower jaw and very little space between them as the stripper comes down to push the twine off of the knotter.



Important!

Your
BUNN PACKAGE TYING MACHINE
will tie perfect knots every time
when



B. H. Bunn Company

2730 Drane Field Road
Lakeland, FL 33811-1395
Phone 941/647-1555 Fax 941/686-BUNN
Toll Free 1-800-222-BUNN Website www.bunntyco.com

Section V Trouble Shooting

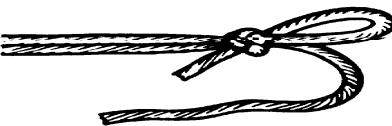
This section of the manual contains a Table of Trouble Shooting information for locating and correcting most of the troubles which develop in the tying machine.

The tying machine is generally trouble free. However, the tying machine suffers the usual wear and mis-adjustment from normal use. Careful inspection and accurate analysis of the symptoms listed in the

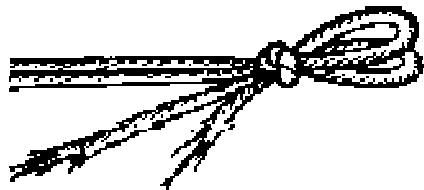
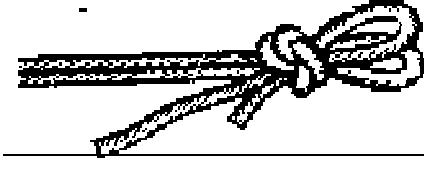
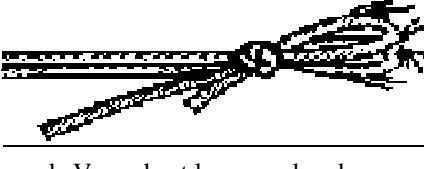
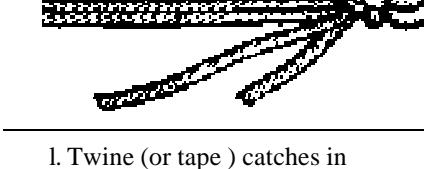
Table of Trouble Shooting Information will localize the trouble more quickly than any other method.

This manual cannot cover all possible troubles and deficiencies that may occur, therefore if a specific trouble is not covered herein, proceed to isolate the major component in which the trouble occurs and then isolate and correct the problem.

TABLE OF TROUBLE SHOOTING INFORMATION

TROUBLE	POSSIBLE CAUSE	CORRECTIVE ACTION
a. Tying machine will not operate with "ON-OFF" switch set to "ON" position.	Electric power cord not plugged into receptacle. Circuit breaker tripped.	Plug electric power cord into receptacle. Reset circuit breaker. If circuit breaker trips again, inspect and test for short in tying machine circuit or electric power cord. Correct defect as required.
	Broken or disconnected circuit wire.	Repair or replace broken wire.
	Faulty "ON-OFF" switch.	Replace defective "ON-OFF" switch.
b. Twine (or tape) breaks frequently in stringholder button.	Improper twine (or tape). Excessive stringholder button tension.	Use proper size of twine (or tape). Readjust stringholder button pressure.
c. Half or single loop on knot.	Piece of twine (or tape) wrapped around stringholder button shaft relieving tension on twine (or tape).	Depress and hold button release lever and remove bits of twine (or tape) using a small pair of tweezers. Then release the button release lever.
		
d. One loop knot that slipped out.	Excessive twine running tension.	Readjust to decrease twine running tension.
		
e. One long and one short loop.	Improper twine (or tape). One loop catching in back of knotter throat, improper knotter release adjustment.	Use proper size of twine (or tape). Readjust knotter release.
		

Trouble Shooting Information (cont.)

TROUBLE	POSSIBLE CAUSE	CORRECTIVE ACTION
f. Break in twine front of knot.	Friction along twine (or tape) path.	Remove edges from twine path in twine tension plate assembly, twine bracket, quill shaft, twine arm hub, twine arm elbow assembly, drawback lever and twine arm tip.
		
g. Ragged ends of twine at knot.	Dull or knicked knife blade.	If knife is excessively knicked, replace. If knives continue being knicked, lubricate knife trap pivot points to assure that knife trap does not stick, allowing knife to remain in path of drawslide.
		
h. Loose knots and loops slightly shorter than normal.	Loops release from knotter too soon, improper knotter release adjustment. Stripper too short.	Readjust knotter release. Replace stripper.
		
i. Short loops and tight knot.	Improper balance between twine running tension and stringholder button pressure.	Check stringholder button pressure. Readjust twine running tension.
		
j. Cut loop ends.	Stripper points shearing against side of knotter jaws when stripping.	Readjust stripper shear action, bend top front end of stripper down by tapping with a light hammer.
		
k. Very short loops and ends.	Knot slipping by stripper. Improper gap between stripper point and knotter. Knotter flat springs broken or weak.	Realign stripper point and knotter. Replace knotter flat springs.
		
l. Twine (or tape) catches in stripper	Stripper spring broken or weak.	Replace stripper spring.
m. Twine (or tape) pulls out of stringholder button.	Twine (or tape) improperly threaded.	Check stringholder button threading and rethread if necessary.

Section VI – Parts List

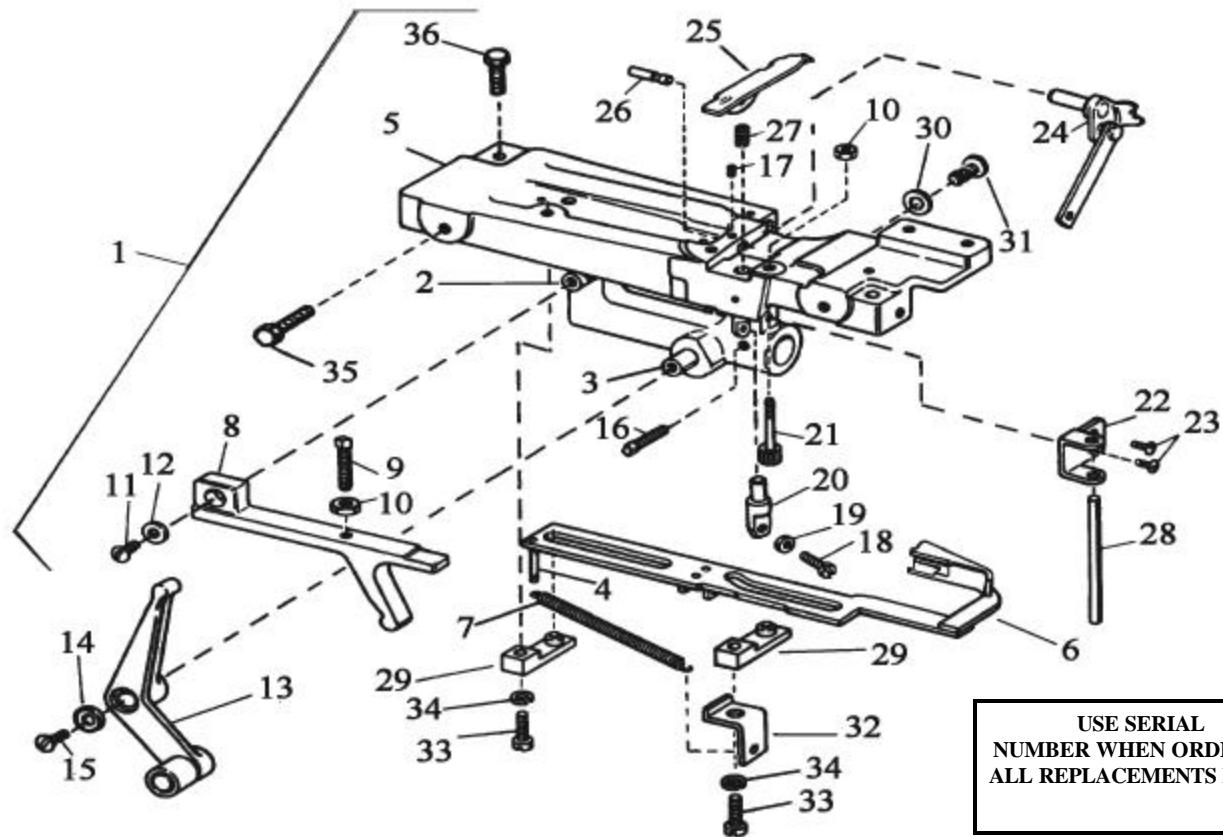
The tying machine is identified by the Model Characteristic Sheet and serial number stamped on the name plate located on the front frame of the machine.

Be sure to use both the model number and the serial number when requesting part information or when ordering replacement parts.

Using the complete equipment identifier (model number and the serial number) will ensure receipt of proper replacement part or parts.

If your tying machine is equipped with a frame extension or special modifications, please provide the information along with the complete model identifier when ordering replacement parts.

MAIN TABLE ASSEMBLY



Index Number	Part Number	Description	Qty Req	Index Number	Part Number	Description	Qty Req
1	008003	Main Table Assembly	1	19	100191	Nut, Jam Hex 1/4-28 NF	1
2	081014	Stud, Riser Lever	1	20	081056	Stud, Knotter Release	1
3	081013	Stud, Drawslide Lever	1	21	100710	Stud, Knotter Head Stop	1
4	100695	Pin, Drawslide Spring	1	22	083073	Guide, Riser Pin	1
5**	008009	Main Table Sub Assembly	1	23	100597	Screw, Pan Head, Self Tap 10-24 NC X 5/8 in	2
6	045034	Drawslide Assembly	1	24*	032035	Tip Up Assembly	1
7	074059	Spring, Drawslide	1	25*	052***	Stripper	1
8	032003	Riser Lever	1	26*	083071	Pin, Stripper Pivot	1
9	100124	Screw, Set Square Head Dog Point 1/4-20	1	27*	074006	Spring, Stripper	1
10	100150	Nut, Hex 1/4-20	2	28*	083060	Pin, Riser	1
11	100098	Screw, Round Head 10-24 NC x 3/8 in	1	29	070049	Drawslide Cap Assembly	2
12	100131	Washer, Flat 1/2 OD x 7/32 ID x 3/64 in Thick	1	30	100134	Washer, Drawslide Lever	1
13	032075	Lever, Drawslide	1	31	100566	Screw, Drawslide Lever	1
14	100019	Washer, Drawslide Lever	1	32	025288	Bracket, Drawslide Spring	1
15	100110	Screw, Flat Head Slotted 1/4-20 NC x 1/2 in	1	33	100104	Screw, Drawslide Cap, 1/4-20 x 1 Fillister Head	2
16	100596	Screw, Set Square Head Cup Point 1/4-20 x 3/4	1	34	100135	Washer, Split lock 1/4	2
17	100121	Screw, Set Socket Head Cup Point 8-32 x 1/4	1	35	100115	Screw, Hex Head 5/16-18 x 1	2
18	100018	Screw, Knotter Release Adjusting	1	36	100615	Screw, Hex Head 5/16-18 x 1-1/4	1

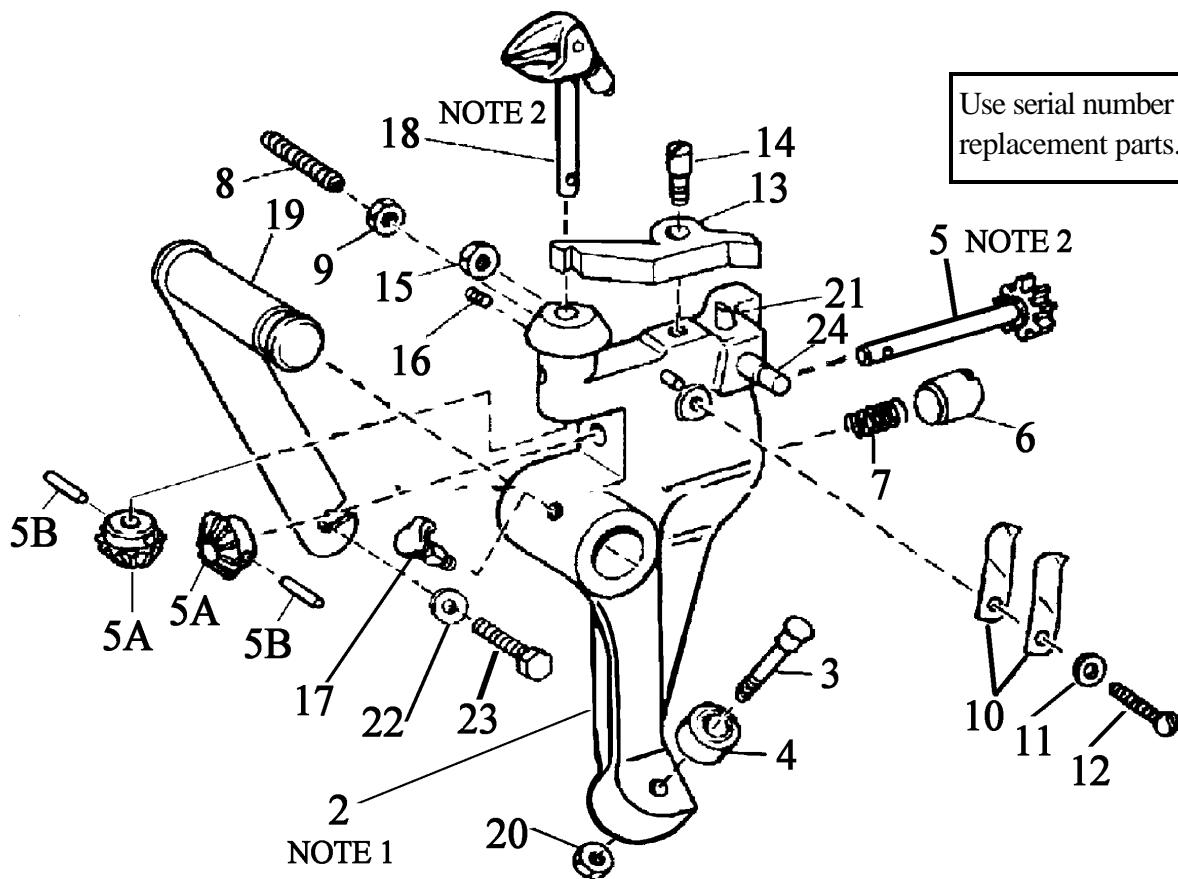
* Not Part of Assembly, Order Separately.

** Sub-Assembly includes Items 2, 3, 10, 17, 18, 19, 20, 21, 22, 23, 30 and 31.

*** Specify Type of Twine or Poly Tape Being Used.

(For 6-8-10 ply twine or 24/28 Poly tape use 052021, 12-16 Ply twine or 35 Poly tape use 052022)

KNOTTER HEAD ASSEMBLY



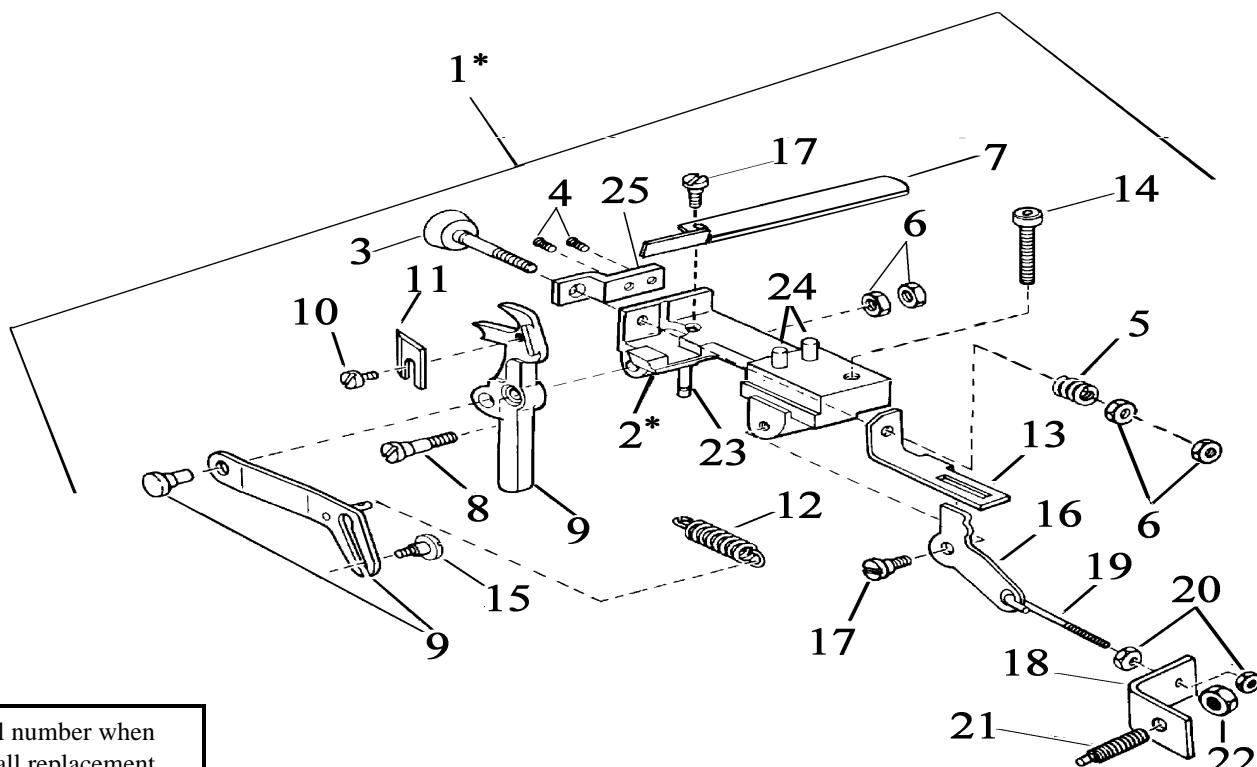
Use serial number when ordering all replacement parts.

Index Number	Part Number	Description	Qty Req	Index Number	Part Number	Description	Qty Req
1	017***	Knotter Head Assembly	1	13	032042	Lever, Knotter	1
2	017035	Knotter Head Sub- Assembly (Note 1)	1	14	100009	Screw, Shoulder Knotter Lever	1
3	081020	Knotter Head roller Stud	1	15	100143	Nut-Hex, 10-24	1
4	064008	Knotter Head Roller	1	16	100370	Screw, Set Socket Head Cup Point 10-24 x 5/16	1
5	020157	Star Wheel & Miter Gear Assembly (Note 2)	1	17	100701	Oil Cup	1
6	082003	Plunger, Knotter Lock	1	18	017***	Knotter Body & Miter Gear (Note 2)	1
7	074006	Spring, Knotter Lock	2	19	011004	Pivot, Knotter Head	1
8	100187	Screw, Set Knotter Lock 1/4-20 x 1 1/2 Half	1	20	100521	Nut, 5/16-18 Nylon Insert	1
9	100150	Nut, Hex Knotter Lock	1	21	100174	Pin, Roll	1
10	074013	Spring, Knotter Flat	2	22	100280	Washer, Flat	1
11	100131	Washer, Flat	1	23	100119	Screw-Hex 5/16 x 1/2	1
12	100092	Screw, Round Head 10-24 x 1 in Long	1	24	081022	Stud, Tip up Lever	1

*** Specify Type of Twine or Poly Tape Being Used

Note 1: Sub-Assembly includes Items 3,4,20,21 and 24 Note 2: Includes Items 5A and 5B

STRINGHOLDER AND KNIFE TRAP ASSEMBLY



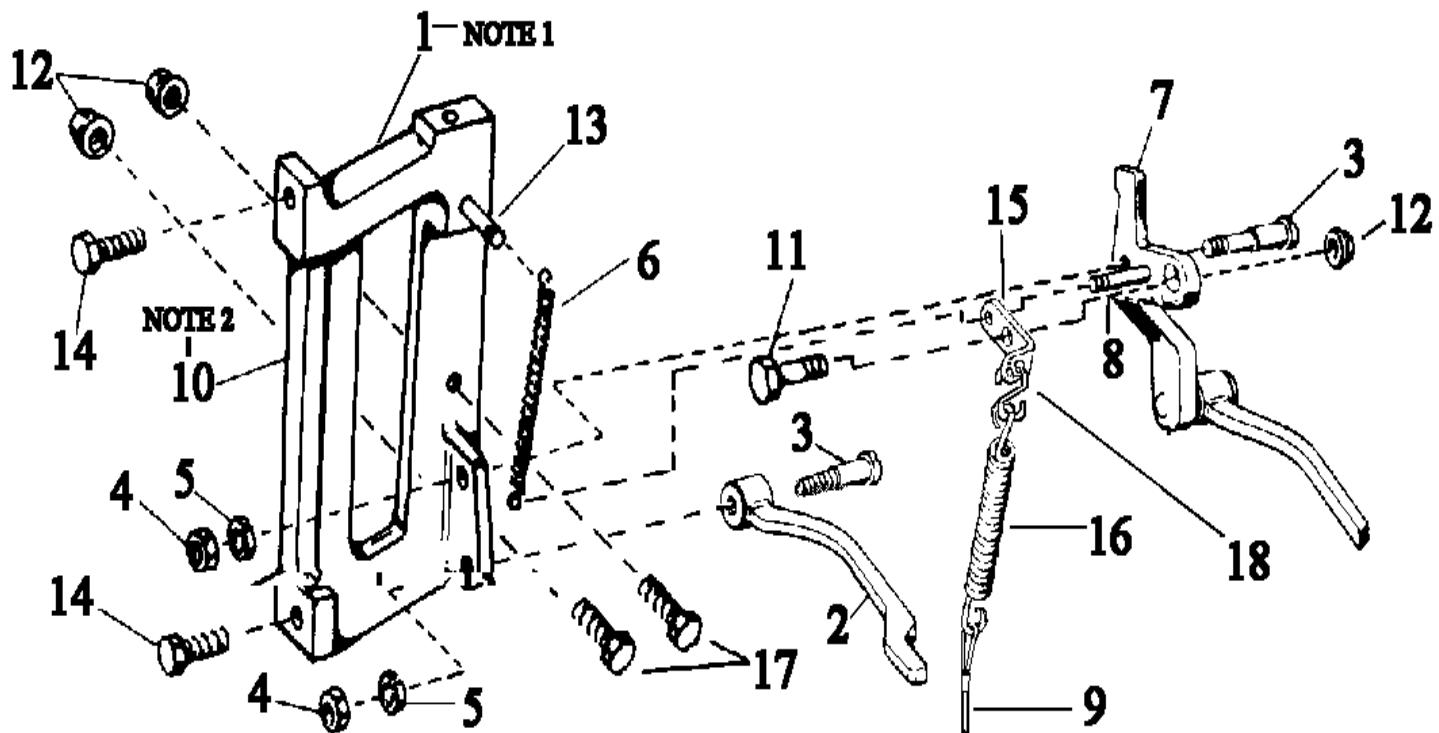
Use serial number when
ordering all replacement
parts.

Index	Part	Qty	Index	Part	Qty
1*	030*** Stringholder Assembly	1	13	030084 Lever, Slide	1
2	030*** Stringholder and Pins Sub Assembly	1	14	100565 Screw, Socket Head Cap	1
3	030147 Button, Stringholder	1	15	100011 Screw, Knife Trap Shoulder	1
4	100489 Screw, 10-32	2	16	030083 Pivot, Dual Tension	1
5	074*** Spring, Stringholder button	1	17	100088 Screw, Pivot	2
6	100144 Nut, Hex 10-32	4	18	030085 Angle, Dual Tension	1
7	032218 Lever, Button Release	1	19	030086 Link, Dual Tension	1
8	100646 Screw, Knife Trap Pivot	1	20	100146 Nut, hex 12-24 X 20 ESNA	2
9	032159 Knife Trap & Lever Assembly	1	21	100187 Screw, Set Half Dog Point 1/4-20 X 1	1
10	100090 Screw, Binder Head 8-32 x 1/4	1	22	100188 Nut, Hex 1/4 X 20	1
11	021009 Knives, Package of 10	1	23	100158 Pin, Groove	1
12	074011 Spring, Knife Trap	1	24	100569 Pin, Groove	2
			25	030*** Face, Stringholder	1

* Assembly does not include items 14, 15, 18, 19, 20, 21 and 22, Order Separately

*** Specify Type of Twine or Tape Being Used

MAIN TABLE SUPPORT AND KICKOUT ASSEMBLY



Use serial number when ordering
all replacement parts.

Index	Part	Qty	Index	Part	Qty		
1	084014	Main Table Support and Kickout Assembly	1	10	084048	Main Table Support Sub Assembly	1
2	032018	Lever, Clutch Kickout	1	11	100450	Screw, Hex Head 1/4-20 X 1	1
3	100005	Screw, Trip	2	12	100286	Nut, flanged Hex Head 1/4-20	3
4	100151	Nut, Hex Head 1/4 - 28	2	13	100503	Pin, Groove 3/16 x 1 1/2	1
5	100135	Washer, Split Lock	2	14*	100273	Screw, Hex Head 5/16-18 X 5/8 "Whiz Loc"	2
6	074054	Spring, Trip Return	1	15	011034	Trip Extension	1
7	011007	Bell Crank and Kickout Wedge Assembly	1	16*	074050	Spring, Trip Cable	1
8	100158	Pin, Groove 3/16 X 1	1	17	100238	Screw, Hex Head 1/4-20 X 1 1/4	2
9*	011022	Cable, Clutch Trip	1	18*	100690	S-Hook	1

* Not part of assembly. Order separately

Note 1: Includes item 13. Note 2: Includes items 12, 13 & 17