Edgewater Machine Company Inc.

60 COMMERCE RD
CARLSTADT,NJ,07072 U.S.A.

Phone: 201-507-1771 Toll Free: 800-221-5818
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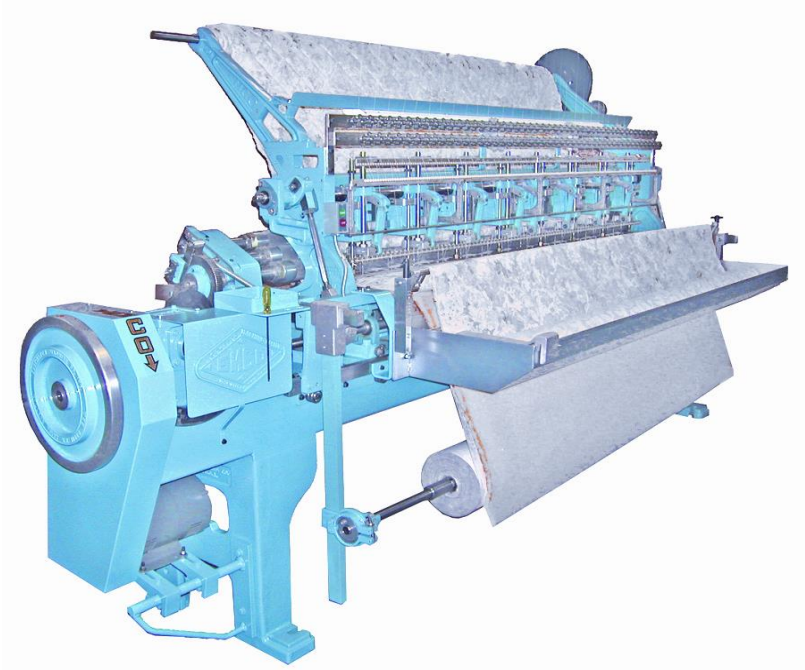
Email: sales@diamondneedle.com

The Emco High Speed Lockstitch Quilting Machine Installation and Operating Manual

Version 10.15



The Highest Quality Machines Built in America Since 1944

EMCO

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U.S.A.

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Instruction Manual Notice:

Emco products should be used only for the purpose and in the manner intended by their original design. It is recommended that no modifications be made to this product. Any modification of this product will void any expressed or implied warranty and will hold the user responsible.

Carefully read the instructions presented in the Emco Installation and Operating Manual. Actions should not be undertaken until all procedures described therein are thoroughly understood.

At the time of writing, this manual was complete and up-to-date. Due to continual design improvements, however, it is possible that the descriptions, specifications, etc. may vary from the product delivered to you. If there are any questions, please contact Edgewater Machine Company for clarification.

Comments concerning this manual and our equipment are welcomed and should be directed to our office for evaluation.

Important Precautionary Statements:

Read and Understand all of these safety precautions

before operating this machine.

Avoid Accidental Starting of the Machine

Only one start station is provided when machine leaves the factory. This station is mounted at the front of the machine. Installing additional start stations anywhere else (i.e. rear of machine), may result in serious injury to the operator(s). Only one operator should control the starting of the machine after checking to see that no one is servicing the machine at the rear or sides.

Safety Guards and Caution Labels

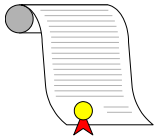
Safety guards are provided and should be kept in place at all times. Never wear loose clothing that could become tangled or caught in moving parts of the machine. Keep hands, and long hair clear of all moving parts of the machine. Never place any part of your body near moving parts of this machine. Be sure to read all caution labels and understand the instruction manual carefully before operating this equipment. Never operate or maintain this machine without proper instructions. Never alter any part of this machine. Removing guards or adding start stations would be done at your own risk!

It is the employer's responsibility to implement the above and also provide proper guards, devices or means that may be necessary or required for any particular use, operation, setup, or service to facilitate the safe use of this equipment.

If you have any questions regarding the safe use of this machine, contact our factory for further assistance.

Edgewater Machine Company, Inc.
13-20 131st Street
College Point, NY 11356 U.S.A.

Phone: 718-539-8200 Fax: 718-358-4648
Email: info@edgewatermachine.com
Website: www.edgewatermachine.com



Edgewater Machine Company Inc.
New Machine One Year Limited Warranty

Domestic Warranty

Edgewater Machine Co. warrants to the original purchaser, that our equipment, excluding software, disks and related documentation, will be free from defects in material and/or workmanship for one year from the date of delivery. During the warranty period, Edgewater Machine Co. will correct any defects in material or workmanship at no charge for materials. Electrical or electronic components are covered by the warranty of the original manufacturer, not Edgewater Machine Company, Inc.. Inquire for further details on these component warranties. Shipping of warranted parts must be paid by the customer. Any replacement parts shall be new or serviceable used parts, and are warranted for the remainder of the original warranty or thirty (30) days, whichever is longer. The warranty period is not extended as a result of purchasing any additional parts from us or upgrading your equipment. The original purchaser must promptly notify Edgewater Machine Co. in writing if there is a defect in material or workmanship. Written notice in all events must be received by Edgewater Machine Co. before expiration of the warranty period. This warranty is not transferable.

International Warranty

The warranty for international customers is the same as for customers within the United States, with the following exceptions: On all orders for replacement parts, the customer will be billed for the replacement parts and must pay for the part(s) and shipping costs before the part(s) are shipped. When the defective part(s) are returned to Edgewater Machine Co., Edgewater Machine Co. will credit the cost of the part(s) to the customer's account. Shipping charges are not credited. Edgewater Machine Co. is also not responsible for any customs fees, taxes or duty charges that may be incurred. The customer must pay all related charges or fees for shipping.

This One Year Limited Warranty covers normal use only. It does not warrant or cover:

* Damage during shipment to purchaser.
* Damage caused by disaster such as fire, water, wind, earthquake, or lightning.
* Damage caused by unauthorized attachment, alterations, modifications, or tampering.
* Defects caused by a failure of the purchaser to provide a suitable installation environment for the equipment.
* Damage caused by the use of the equipment for purposes other than those for which it was designed.
* Damage from improper maintenance.
* Damage caused by any other abuse, misuse, mishandling or misapplication.

Under no circumstances shall Edgewater Machine Co. be liable for any special, incidental, or consequential damages based upon breach of warranty, breach of contract, negligence, strict liability, or any other legal theory. Such damages include, but not limited to , loss of profits, loss of revenue, loss of use of the equipment or any associated peripherals, cost of capital, cost of substitute or replacement equipment, facilities or services, downtime, purchaser's time, the claims of third parties, including customers, and injury to property or personnel.

Disclaimer of warranties

The warranty stated above is the only warranty applicable to this equipment. All other warranties expressed or implied are hereby disclaimed. No oral or written information or advice given by Edgewater Machine Co., its agents or employees shall create a warranty or in any way increase the scope of this warranty. This disclaimer of warranties and limited warranty are governed by the laws of the state of New York.

Important Memo for Operators of the Emco Lockstitch Machines

When operating the Emco High Speed Multi-Needle Quilting Machine it is highly recommended that the unused shuttle holder sticks be removed from the machine. Only the shuttle holder sticks loaded with shuttles should be installed in the machine in the appropriate position to match the location of the needles installed. The shuttle holder sticks are numbered and can easily be returned to their appropriate positions when needed for different needle settings. The unused sticks should be kept in a box near the machine for future access.

The reasoning for removing the unused sticks is to eliminate excess weight being oscillated back and forth by the shuttle drive assembly. The excess weight removed from this drive assembly will result in less wear and longer component life for the machine.

Questions ? - Contact :

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Website: www.edgewatermachine.com

Table of Contents

Operation of the Machine continued: **Page**

Supplemental Section :

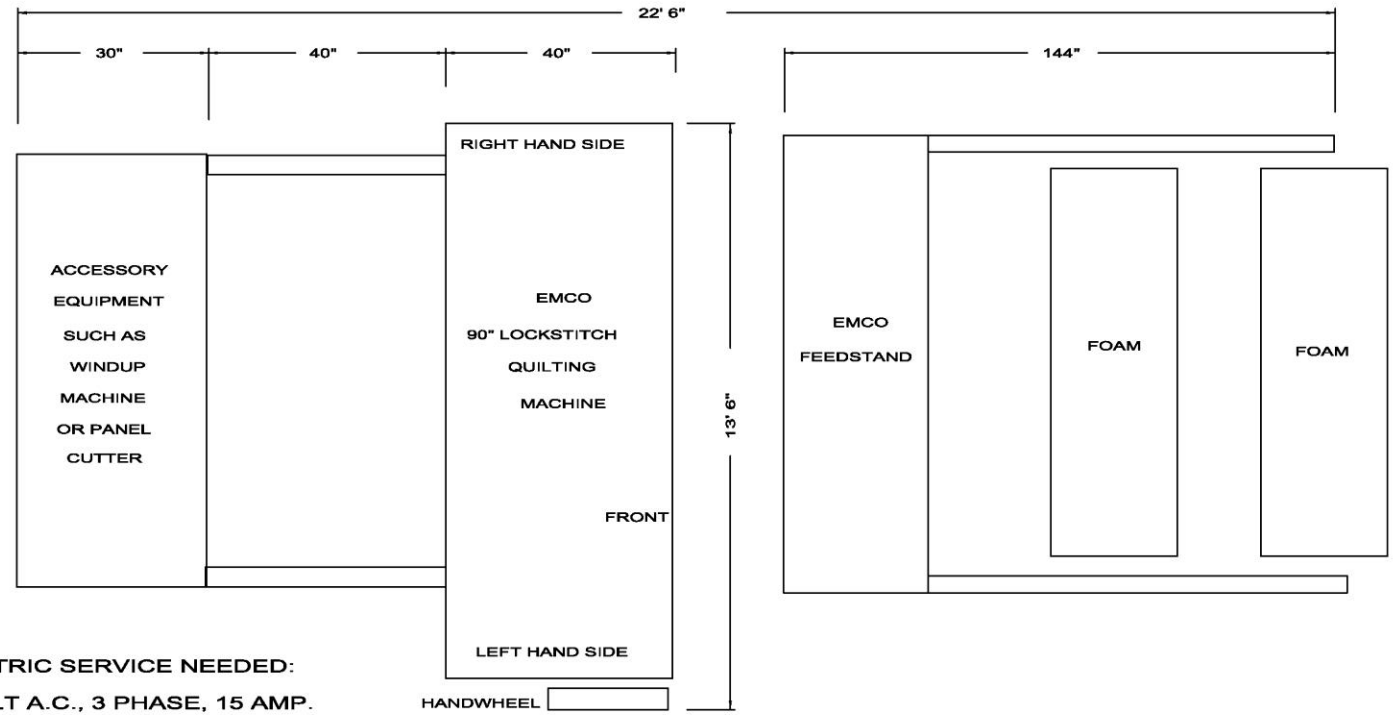
This section will be found at the end of this manual. It will contain revision material, updates, corrections or supplemental instructions for accessories. If there is no supplemental section or this section is empty, then no supplemental information has been issued.

Unpacking the Machine

When you receive your new machine, the machine will be shipped on either a skid platform or a combination skid and full box. If the machine is fully boxed you need to remove the roof and all sides of the box before going any further. Once the roof and sides are removed the machine is left fastened to just a skid platform. The machine should remain fastened to this skid platform until the machine and skid is installed in the final position for operation of the machine. The skid adds to the handling stability until the machine is aligned and positioned for proper operating clearance around the machine. Using a forklift of adequate size, preferably a forklift with at least 6000 lb. capacity or larger, you can lift the machine from under the table bed and transport the machine into the final position for set up. Another method to move the machine would be to use steel or wooden rollers under the skid platform, and roll the machine into position. If you do not have the proper equipment or materials for handling a machine of this nature, you should contact a reliable licensed and insured machine rigger to handle the moving and installation of the machine.

With the location of the machine double checked for adequate clearance and workability, you can now proceed to remove all accessory equipment and part boxes that are fastened to the base of the skid. Keep all parts and boxes nearby for preparation of machine setup.

When the skid platform is clear of all boxes and accessory equipment, the only item left fastened to the skid should be the machine itself. With the forklift positioned at the approximate center of the skid and the forks spread as far apart as allowed, the machine should be test lifted with the forks under the table bed of the machine.



ELECTRIC SERVICE NEEDED:
230 VOLT A.C., 3 PHASE, 15 AMP.
50/60 CYCLES, WITH A GROUND

THE EMCO 90" LOCKSTITCH QUILTER WITH ACCESSORIES FLOOR LAYOUT

EMCO

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COLLEGE POINT, NY 11356 U.S.A.
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DRAWING TITLE: Lockstitch Floor Layout			
SCALE: None	TOLERANCE: (INCHES) UNLESS OTHERWISE SPECIFIED	X.XX ±0.01 X.XXX ±0.002 ANGLE ±1°	
DATE: 08/10/05	DRAWN BY: Roy S.	PART #:	
REV. DATE: 08/29/05	FILE NAME: Lockstitch Floor Layout		

Aug 29 2005 - 6:44 am

This test lift is done to determine if the machine will be approximately level when the forklift raises the machine. The machine should not be lifted any more than just a few inches from the ground. We are only checking for proper balance of the machine. If the machine is leaning to one side or the other, the forklift should be repositioned until the machine is level as it is raised. If the machine is picked up approximately level then the machine and skid should be placed back down on the ground and the bolts that secure the machine to the skid should be released. Now raise the machine with the forklift only high enough to clear the skid platform. The skid can now be dragged out from under the machine and removed from the area. The machine should now be gently lowered to the floor.

An alternate method of removing the machine from the skid, would be to position the machine in place using rollers, and then cut holes large enough in the skid to allow

the use of a jack under each leg of the machine. The jack will be resting on the floor through the hole in the skid. Raise one end of the machine using the jack and cut and remove enough of the skid from this end of the machine, to allow the machine to be lowered to the floor. Use the same procedure on the other end of the machine.

Note: We do not recommend either of these procedures if you are not comfortable with handling a machine of this size. Please contact a qualified professional rigger to handle the set up of the machine if you have any doubts.

When the machine is resting on the ground, you can unpack the boxes and accessory equipment and lay the parts out for inspection and installation on the machine. Emco tries to leave as much of the machine assembled as possible. This makes for an easier installation for our customers. The only parts usually necessary to

be removed are the upper and lower arms and the feed trough when machines are fully boxed for shipment.

If your machine was shipped only on a skid platform then usually the feed trough, upper arms and lower (front) arms are still attached to the machine. If any of these parts need installing look for the colored paint markings and match the parts up accordingly with the matching marks on the machine.

Balancing the Machine to Prevent Vibration

When you have the upper arms attached to the machine, if so equipped, this is the time to check for proper balancing of the machine on the floor. Note the term ***balancing***. We use the term balancing because we do not want you to confuse balancing with leveling. Leveling refers to making an object perfectly level. However, leveling will not stop vibration from occurring. If a machine is perfectly level, it can still be unbalanced. This means that theoretically one leg of the machine could be off the ground and only the other three legs would be touching. In a case like this the machine, when started, would vibrate extensively and begin to creep across the floor. In order to balance a machine you must obtain equal weight on each of the four legs of the machine. If each leg of the machine is supporting approximately the same amount of weight then you can say the machine is balanced. This eliminates a vibration problem and allows you the freedom of not having to bolt the machine to the floor.

Here is the best method for balancing the machine. After the machine is in place and the upper arms or motorized back stand are attached, you should obtain a small quantity of roofing tar paper. The roofing tar paper used is usually called 15 lb. felt tar

paper. Do not confuse this with asphalt shingles. This tar paper is usually used under the roofing shingles on homes. Cut small pieces of this tar paper approximately 8" x 6" and place two layers of this tar paper under each foot of the machine. Using a jack or a forklift raise one end of the machine at a time approximately 1/4" off the ground and slide this double layer of tar paper under each foot. Be sure the floor is clean and free of dust and oil. Any dirt or oil accumulation under the foot of the machine will prevent the tar paper from doing the proper job intended.

Now, with two layers of tar paper under each foot of the machine, grasp the top of one of the upper arms with both hands and physically push and pull the upper arm forward and backward. Please note, if your machine is equipped with a motorized back stand, please jump to the next section marked **"Machines Equipped with a Motorized Back Stand"** .

The leverage obtained by pulling and pushing your weight against the upper arm is enough to rock the machine. This rocking motion should be checked by another person while you are trying to rock the machine. The second person should place his or her finger against the floor and foot of the machine. The finger should be touching the floor and foot of the machine at the same time so that if the leg of the machine moves in comparison to the floor you will be able to feel this movement. Each foot should be checked while the first person is pushing and pulling one of the upper arms. The procedure should be checked again by going to the other upper arm. Determine which legs of the machine had movement and jack that particular end of the machine again and add another layer of tar paper. Do this checking procedure repeatedly until no movement can be felt between the feet of the machine and the floor. This technique of balancing the machine using tar paper allows the machine to adhere itself to the floor.

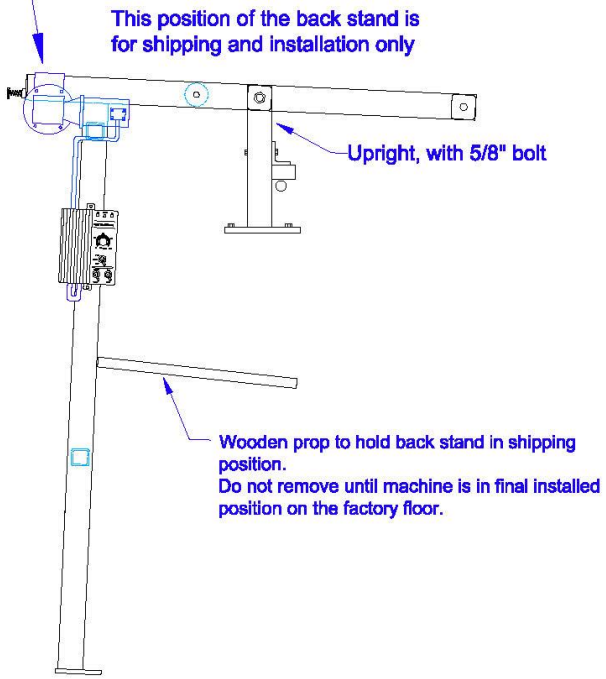
The weight of the machine settles into the tar paper and causes the feet of the machine to stick to the floor. You not only end up balancing the machine properly, but the machine glues itself to the floor thus eliminating the need for bolting the machine to the floor.

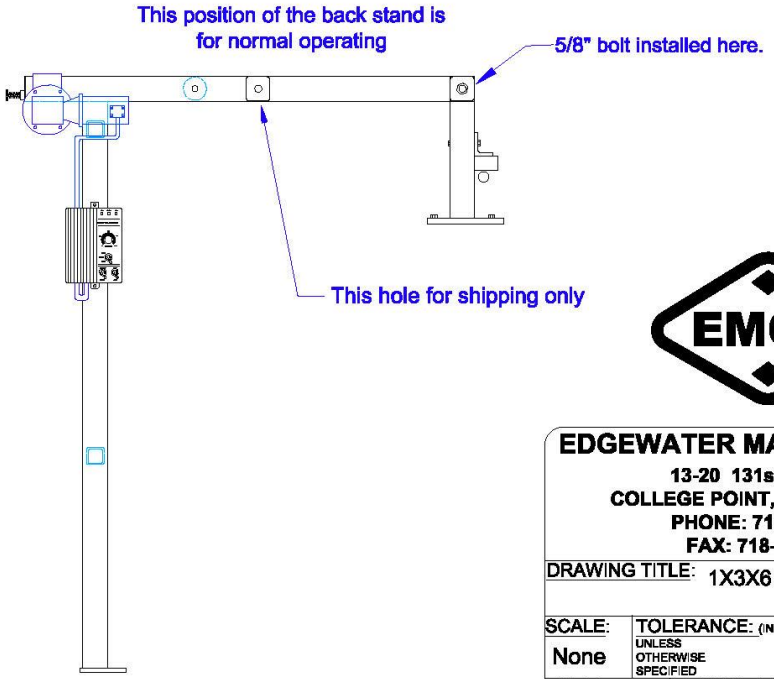
Machines Equipped with a Motorized Back Stand

In the event you have a motorized back stand, then you would not have the standard upper arms mentioned above. In this case you should have the double layer of tar paper under each of the four feet and have all accessories attached and secured, back stand included. After the electrical supply is connected to the machine and you are ready to run, then you can start the machine and immediately check the four feet of the machine by touching the floor and the foot of the machine at the same time with your finger. If you feel any movement or vibration from one of the feet, then this would be the foot that requires more tar paper. Stop the machine and jack the machine only high enough to slide another piece of tar paper under the foot. You should not have to raise the machine more then 1/4" with the jack to slide another piece of tar paper under the foot. Raising the machine higher would put an unnecessary strain on the back stand, if the machine is so equipped and this should be avoided.

Continue checking the feet of the machine after you shim with tar paper and then run the machine. If you still feel movement then follow the procedure again until no further movement is detected.

This is the way you will find the motorized back stand positioned when you receive the machine.
The back stand will be proped up using blocks against the quilting machine.
Leave these blocks in place until the machine is removed from the skid and placed in the final installed position on the floor of your factory. After the machine is balanced as per the instructions in the operating manual, then you can remove the wooden props and rest the back stand on the floor.
Then using several men to hold the back stand upright, remove the 5/8" bolt from the upright that secures the back stand to the machine. Then walk the back stand away from the machine until the first hole is aligned with the upright. Then re-install the 5/8" bolt and tighten securely.





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COLLEGE POINT, NY 11356 U.S.A.
PHONE: 718-539-8200
FAX: 718-358-4648

DRAWING TITLE:	1X3X6 Motorized Backstand for shipping		
SCALE: None	TOLERANCE: (INCHES) UNLESS OTHERWISE SPECIFIED	X.XX ±0.01 X.XXX ±0.002 ANGLE ±1°	
DATE: 01/10/07	DRAWN BY: Roy S.	CHECKED BY:	
REV. DATE: 07/30/07	FILE NAME: 1X3X6 Motorized Backstand for shipping		

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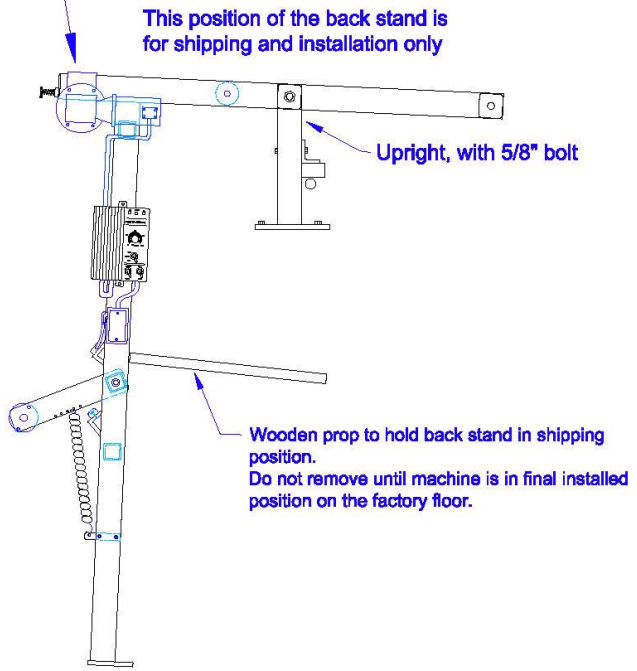

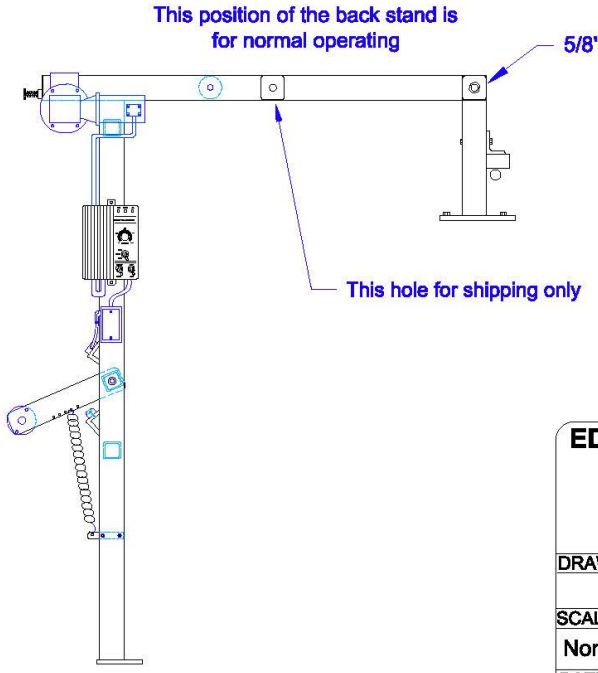

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PHONE: 718-539-8200
FAX: 718-358-4648

DRAWING TITLE:	1X3X6 Backstand for Embroidery Mach (Shipping)	
SCALE: None	TOLERANCE: (INCHES) UNLESS OTHERWISE SPECIFIED	X.XX ±0.01 X.XXX ±0.002 ANGLE ±1°
DATE: 01/10/07	DRAWN BY: Roy S.	CHECKED BY:
REV. DATE: 07/30/07	FILE NAME: 1X3X6 Backstand for Embroidery Mach (Shipping)	

Electrical Connection

A professional and licensed electrician should be the only person qualified to proceed with the electrical service connection to your new Emco quilting machine. The usual service necessary for the Emco quilting machine is 208-240 volt, three phase, 50/60 cycles, with a ground, and a current rating of 30 amps for a standard machine or possibly 50 amps for machines with computers or extra accessories, (check tags attached to the machine to be sure). Suitable gauge wire of at least 10 gauge or better, to the nearest main distribution panel in your factory is advisable. An isolated circuit with adequate fuse or circuit breaker protection is mandatory. Do not share fuse or circuit breaker protection with any other device in your factory. All rules and specifications must be followed by your electrician to suit your local electrical standards for your location.

The electrical connection for the Emco quilting machine can be found by observing the location of the tag or sticker signifying where the electrical service should be connected. This tag or sticker is usually found in one of two places. If this is a computerized machine the connection is inside the cabinet for the computer. There will be a tag usually fastened to a set of wires indicating to the electrician that this is where the electrical service should be connected. The electrician will have to install a knockout hole for the electrical service in a suitable location in the cabinet to access this connection. It is advisable that the electrical service be brought to either the top or side of the cabinet, whichever is appropriate to suit your needs. ***Caution, when drilling any holes in the cabinet, be sure the chips from drilling do not fall into any of the***

electrical components inside the cabinet resulting in possible short circuits and damage to the hardware.

The computer cabinet has its own safety switch and only needs circuit breaker protection or fuses at the opposite end of the electrical service where it connects to the main disconnect panel in your factory. The Emco computerized machines will correct for proper rotation of the main shaft. The electrician need not worry about proper phasing for rotation.

If your new Emco quilting machine is of the mechanical type without computer then the sticker or tag signifying the electrical connection point will usually be found on the rear of the quilting machine. On the rear of the machine there will be a motor starter box. This box will have the sticker or tag attached to show the electrical connection point to the electrician. These mechanical machines usually are wired for 208-240 volt 50/60 cycles, 3 phase with a ground. Voltages other than standard should be checked with the factory for availability and pricing.

It is the customer's responsibility to supply a 3 phase safety switch rated at 30 amps, (50 amps if machine equipped with accessories) or suitable circuit breakers capable of fault protection to suit your local electrical code.

Mechanical machines need to be checked for proper rotation of the main shaft handwheel after the electrical service is connected to the machine. The top of the handwheel should always revolve towards the front of the machine. There are usually arrows painted on the handwheel to indicate this. If the rotation of the handwheel is reversed then the electrician should interchange any two powers legs going into the motor starter box. Check again after rewiring.

If the customer has requested optional equipment or accessories for their new quilting machine then the electrician may find one or two pairs of yellow wires hanging from the rear of the quilting machine. These wires do not have current on them. They are from a normally open auxiliary contact switch(es) of which close when the machine is running and opens when the machine stops. Use the switch(es) to activate an optional windup machine.

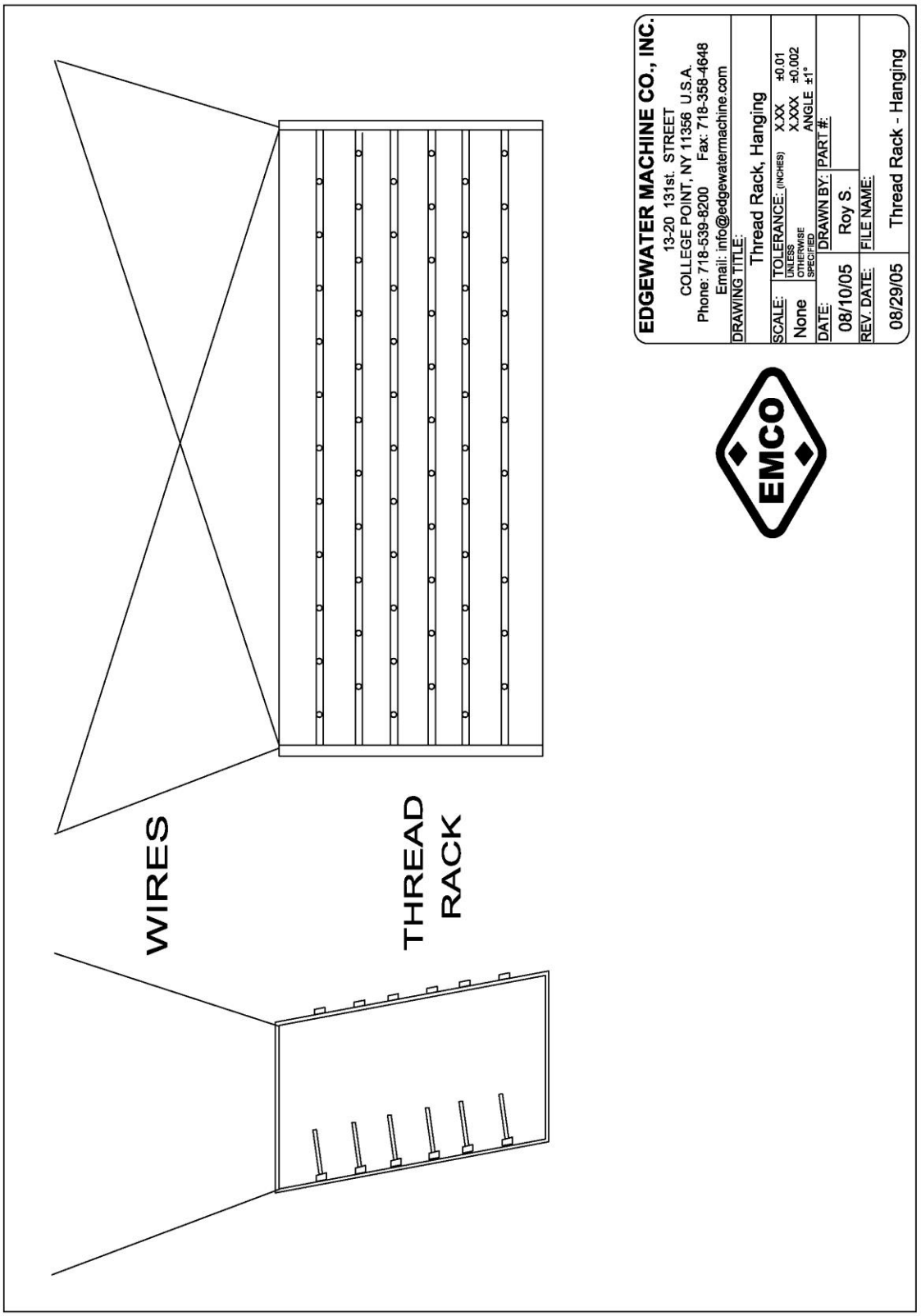
Any accessory equipment should have its own electrical service with proper fuse or circuit breaker protection.

Hanging the Thread Rack

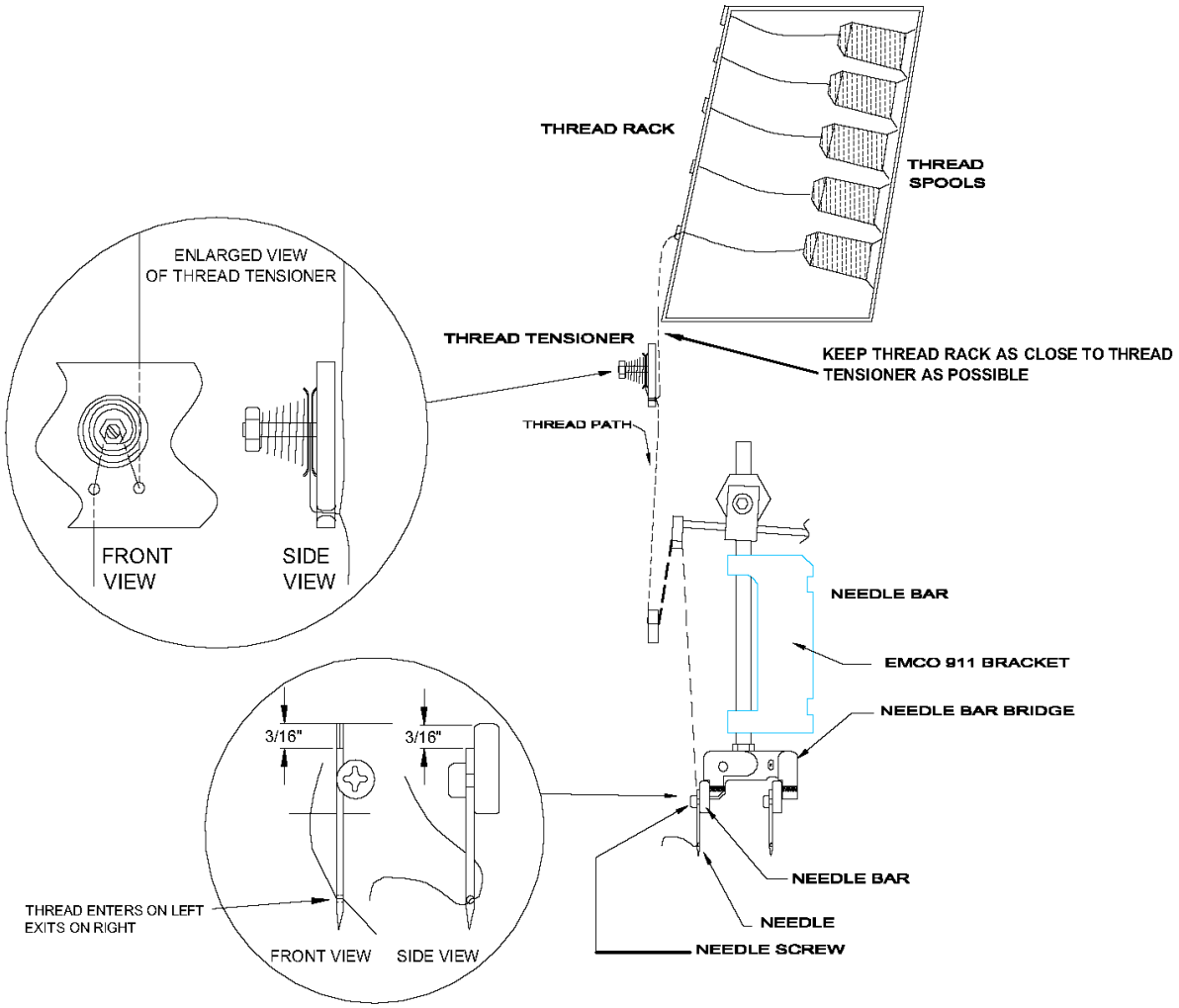
The thread rack supplied will hold more spools of thread then normally needed. This thread rack is large and needs to be hung from the ceiling of your factory. We suggest ***never*** securing the thread rack to the machine or machine accessories. The smallest amount of vibration from the machine can cause the spools of thread to shake loose thread from the spools. This would cause constant tangling of the thread going into the machine. It is always best to hang the thread rack from the ceiling of your factory using heavy galvanized wire or chain. The following drawing shows the typical method of crisscrossing the wire or chains to prevent the thread rack from swaying.

The thread rack should be low enough for the operator to reach the spools of thread easily. Another reason for keeping the thread rack close to the machine is to keep the distance the thread travels between the thread rack and the machine to a minimum. An excessive distance of uncontrolled thread can cause problems if a breeze blows the thread. The breeze will tangle the loose thread and these knots will snap the thread as the machine is running.

When adding spools of thread to the rack, try to align the spool of thread vertically with the needles installed in the machine. This helps the operator in threading the machine properly. After the spool of thread has been placed on the thread rack pin, the thread should come off the spool and passed through an eyelet directly in front of the spool of thread. Never run the thread to an eyelet other than the eyelet directly in front of the spool of thread. Any thread pulled on an angle from the thread spool will tangle and snag resulting in broken threads. Always run the thread as straight as possible to the needle without crossing over other threads or angling the threads to adjacent eyelets. See drawings in next chapters.


WIRES
THREAD RACK
EDGEWATER MACHINE CO., INC.
13-20 131st. STREET
COLLEGE POINT, NY 11356 U.S.A.
Phone: 718-539-8200 Fax: 718-358-4648
Email: info@edgewatermachine.com
DRAWING TITLE:
Thread Rack, Hanging
SCALE: None
TOLERANCE: (INCHES) UNLESS OTHERWISE SPECIFIED X.XX ±0.01 X.XXX ±0.002 ANGLE ±1°
DATE: 08/10/05
DRAWN BY: Roy S.
PART #:
REV. DATE: 08/29/05
FILE NAME: Thread Rack - Hanging
EMCO
Aug 29 2005 - 7:03 am

THE EMCO LOCKSTITCH QUILTER UPPER THREAD PATH



Drawing Objects are Not to Scale

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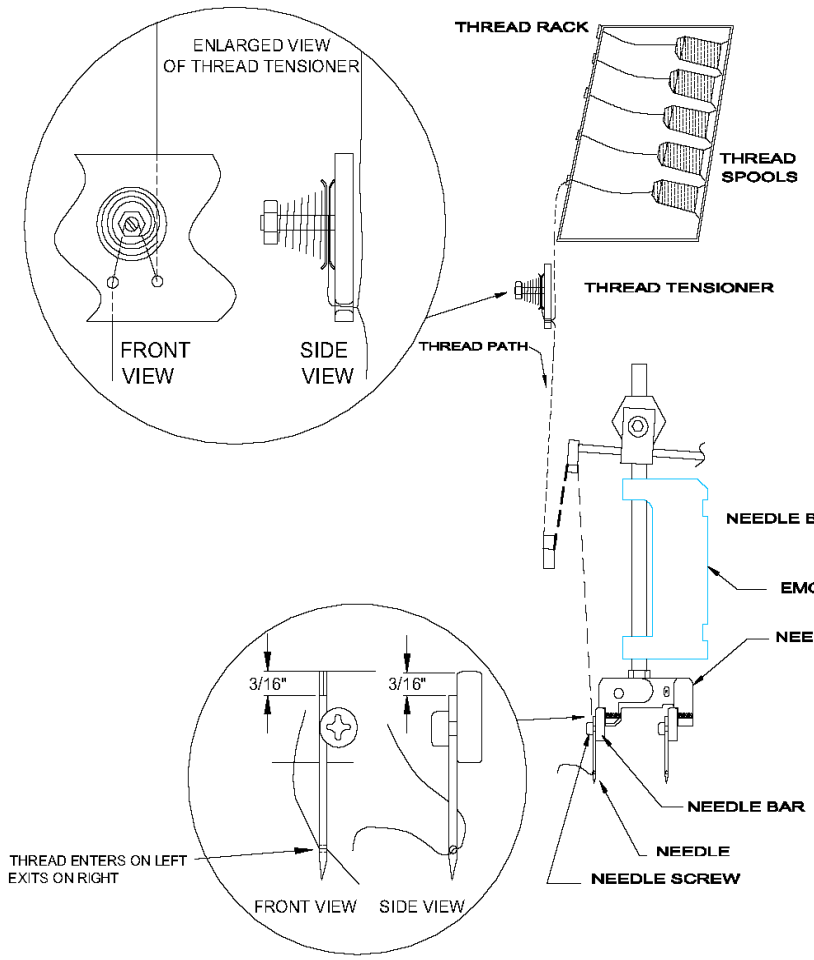
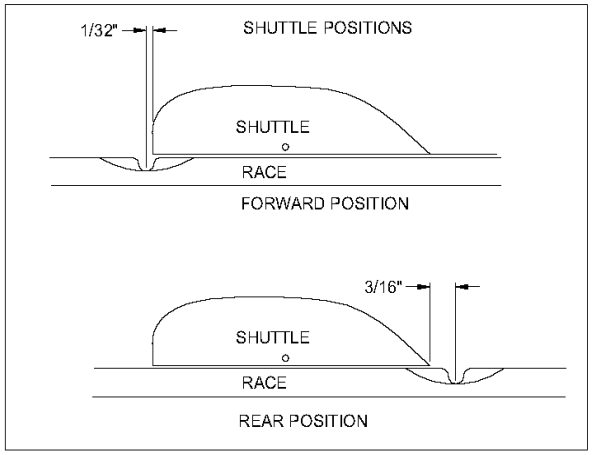
Email: info@edgewatermachine.com

DRAWING TITLE: Lockstitch Thread Path from Thread Rack to Needle		
SCALE: None	TOLERANCE: (INCHES) UNLESS OTHERWISE SPECIFIED	X.XX ±0.01 X.XXX ±0.002 ANGLE ±1°
DATE: 08/10/05	DRAWN BY: Roy S.	PART #:
REV. DATE: 10/22/14	FILE NAME: Lockstitch Thread Path from Thread Rack to Needle	

THE EMCO LOCKSTITCH UPPER THREAD PATH FOR MACHINES BUILT BEFORE 1995





Full Shuttle Stroke - $2\frac{3}{4}$ inches

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COLLEGE POINT, NY 11356 U.S.A.
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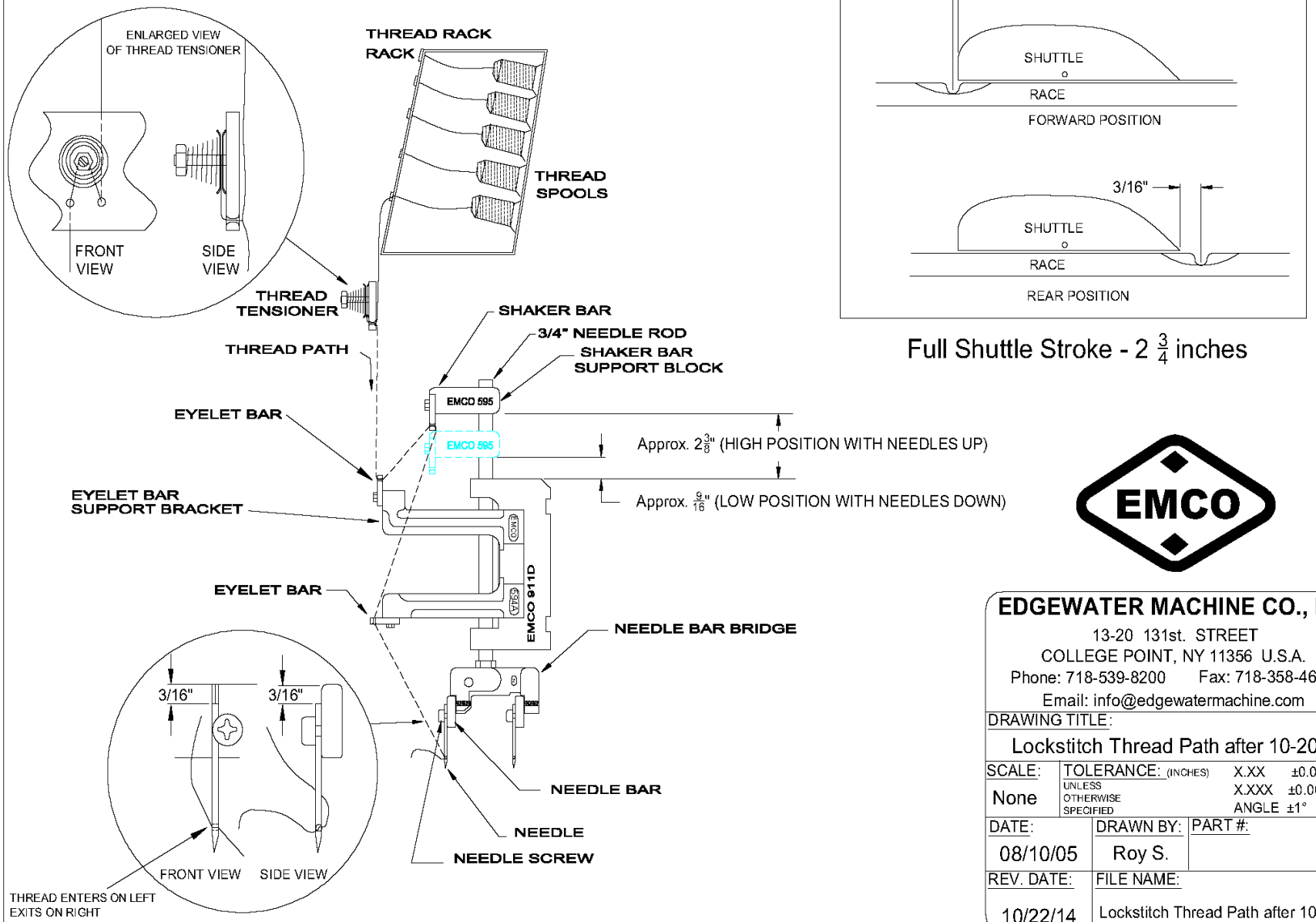
Email: info@edgewatermachine.com

DRAWING TITLE: Lockstitch Thread Path for machines before 1995		
SCALE: None	TOLERANCE: (INCHES) UNLESS OTHERWISE SPECIFIED	X.XX ±0.01 X.XXX ±0.002 ANGLE ±1°
DATE: 08/10/05	DRAWN BY: Roy S.	PART #:
REV. DATE: 10/22/14	FILE NAME: Lockstitch Thread Path for machines before 1995	

THE EMCO LOCKSTITCH UPPER THREAD PATH FOR MACHINES BUILT IN 1995 AND AFTER



Full Shuttle Stroke - 2 3/4 inches

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13-20 131st. STREET COLLEGE POINT, NY 11356 U.S.A. Phone: 718-539-8200 Fax: 718-358-4648 Email: info@edgewatermachine.com		
DRAWING TITLE: Lockstitch Thread Path after 10-2005		
SCALE: None	TOLERANCE: (INCHES) UNLESS OTHERWISE SPECIFIED	X.XX ±0.01 X.XXX ±0.002 ANGLE ±1°
DATE: 08/10/05	DRAWN BY: Roy S.	PART #:
REV. DATE: 10/22/14	FILE NAME: Lockstitch Thread Path after 10-2005	

Installation of Needles, Shuttles, and Adjusting the Shuttle Basket

Installation of Needles:

The standard needle used in the Emco High Speed Lockstitch Quilter is a size #160/23. Larger and smaller needles can be used depending on the type and density of the material being quilted. Consult our factory for recommendations on needle size and type if in question. The needles are placed according to the design required by you. There are either two or three needle bars on your machine. The needle bars have needle screws every inch across the length of the bars. Consulting our design pattern book will aid you in selecting the appropriate slots installation of the needles.

When installing the needles, notice the flat on the shank of the needle. This flat is the front of the needle and this is where the needle screw presses against. Slide the needle into the needle groove after loosening the needle screw. Adjust the position of the needle so that the top of the needle shank is approximately 3/16" down from the top of the needle bar. See next drawing.

When threading the needle remember to thread the needle from the left side and out the right side of the needle. Leave approximately 6 inches of trailing thread. This will prevent the thread from being pulled out of the needle before the first revolution of the machine allows the shuttle to catch the thread. The standard thread used for these machines is a #46B nylon or a P143 polyester top thread.

Always check for burrs on the needles whenever fixing a broken thread. A burr or a bent needle will cause skips or constant breakage of either the top or bottom threads.

Installation of the Shuttles

The shuttles used in the Emco High Speed Lockstitch machine is usually the large #10B shuttle. These shuttles can be obtain from our factory assuring you the right type and style for your Emco machine.

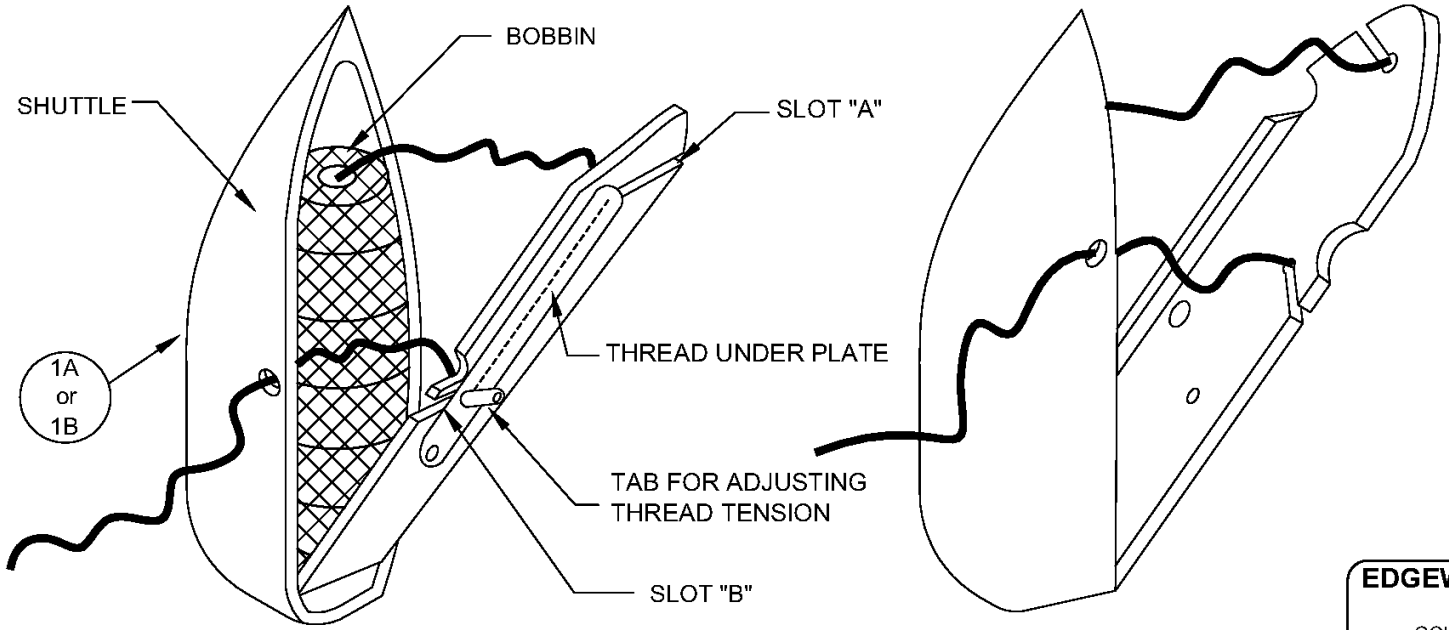
To load the shuttle, you select the appropriate shuttle stick from the rear of the machine, that corresponds to the position of a needle in the front of the machine. In other words, where ever you loaded a needle in the needle bar, that corresponding numbered position should be found in the rear of the machine. The shuttle stick is the carrier for the shuttles. If your machine is a three needle bar machine then you would find three shuttle baskets on each shuttle stick. If your machine is only a two needle bar machine then you would find two shuttle baskets on each stick. The shuttle basket is a type of nest for the shuttle to ride in. This nest holds the shuttle up against the walls that creates a path for the shuttle. These walls are called the shuttle's race. The races have a groove corresponding to each possible position of a needle. As a needle descends into this groove, it pulls the top thread with it. After reaching the bottom the needle moves upward approximately 1/4" to form a loop of thread. It is this loop of thread that the shuttle's pointed end catches. As the shuttle is propelled forward by the movement of the shuttle stick, the shuttle passes through the loop of top thread and passes out the front of the loop. This is how the lock stitch is formed.

The shuttle has a door in the bottom of the shuttle that can be pried open. Once opened the open cavity of the shuttle can accommodate the bobbin which will be loaded into the shuttle. The standard bobbin used is a #102-10W. A good quality bobbin such as supplied by American & Efird or Imperial Threads Inc. are recommended for this use. The bobbin will be wound with a thread hanging from the center of the bobbin spool.

Use this thread to thread the bobbin. Do not use the trailing thread from the outside windings of the bobbin. The thread coming out of one end from the center of the bobbin should be aligned with the point of the shuttle. The bobbin should be pushed into the cavity of the shuttle and leave the trailing thread from the center of the bobbin next to the point of the shuttle.

Now close the shuttle door half way. There are slots cut into the shuttle door that the thread should be pulled through. Pass the thread through the slot closest to the point of the shuttle first. Next pull the thread under the tensioning plate on the outside of the shuttle door. Continue pulling the thread under the plate and towards the next slot. Pulling the thread into the final slot and back down towards the inside of the shuttle. Leave a few inches of thread trailing out of the shuttle as you close the shuttle's door. The shuttle door ***must be closed*** until you hear a distinctive ***click***. If the shuttle's door does not click shut, then it did not close properly. A shuttle door that is not closed properly will open during the operation of the machine and will cause damage to the machine and shuttle. After the door is closed use a threading hook and pass it through the small hole in the side of the shuttle. Through this hole catch the trailing thread and pull it out through the hole opening. When pulling a few inches of thread from the shuttle, take notice of the tension on the thread. The thread can be tensioned by swinging the small tab on the door of the shuttle over the tensioning plate. The tensioning plate presses down on the thread as it passes under the plate. Swinging the small tab more on top of the plate increases the tension of the shuttle thread. Swinging the tab more off the plate decreases the tension on the thread. Adjusting the thread tension of the lower thread will require practice.

STEP 1- INSERT BOBBIN INTO SHUTTLE WITH LOOSE THREAD EXITING CENTER OF BOBBIN.
STEP 2- SLIDE THREAD INTO SLOT "A".
STEP 3- PULL THREAD UNDER TENTIONING PLATE TO SLOT "B".
STEP 4- INSERT THREAD THROUGH HOLE IN SIDE OF SHUTTLE.
STEP 5- PULL THREAD WHILE CLOSING COVER.
STEP 6- **"CAUTION"** DOOR MUST CLOSE WITH DEFINITE CLICK.
DOOR IS NOT CLOSED UNLESS CLICK IS HEARD.



TEM #	PART #	DESCRIPTION
1A	429-7	Small #7 Shuttle used on older machines
1B	429-10B	Larger #10B Shuttle used on newer machines

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DRAWING TITLE: Shuttle			
SCALE: None	TOLERANCE: (INCHES) UNLESS OTHERWISE SPECIFIED	X.XX ±0.01 X.XXX ±0.002 ANGLE ±1°	
DATE: 08/10/05	DRAWN BY: Roy S.	PART #: 429-7 or 429-10B	
REV. DATE: 07/31/09	FILE NAME: Shuttle		

There are some general rules to help guide the operator when adjusting the shuttle thread tension. Before loading the shuttle onto the shuttle stick, pull on the loose end of thread. If the loose end of thread is held and the shuttle released, the shuttle should hang from the thread. If it slides down, the tension is to loose and the tab on the tension plate should be swung over the plate more. If you pull the thread from the shuttle and it snaps or is difficult to pull, the thread is too tight and the tab on the tension plate should be swung off the plate more.

The ideal method is to run the machine and closely look at a sample of the stitching. The ideal situation is to have the interlocking top and bottom thread knot in the center of the material. If you find the top thread is tight and the bottom shuttle thread is loose, the knot will be pulled to the surface of the finished goods and you will be looking at the top thread laying on the goods with the bottom thread looping up and down through the material. However, if the reverse is true, the top thread loose and the bottom thread too tight, then the top thread will be looping through the material with the bottom thread laying on the back of the goods. These two examples will cause run backs in the thread when the finished goods are cut to size.

To achieve the least amount of run backs the top and bottom thread tension should be equalized to get the knot of thread in the center of the material being sewn. This helps hold the knot secure and prevents the knot from loosening. Practice and closely observing the finished stitch will help guide you to the proper tensions for both the top and bottom thread.

After setting the tension on the shuttle, the shuttle stick should be pulled from the rear of the machine. The stick will have baskets appropriate with respect to the needle

slots. If you have a needle positioned in the front needle bar, then the shuttle should be placed into the basket at the front of the stick. Needles positioned in the center or rear needle bars, should have the corresponding shuttles placed accordingly in the center or rear basket. As you place the shuttle in the basket remember to hold onto the trailing end of the shuttle thread. Using two hands hold the trailing end of the thread and the shuttle in one hand, and with the other hand slide the shuttle stick back into the machine. The stick should be inserted into the front shuttle holder bar. This bar has notches in the rear of the bar and a corresponding pin (stud) protrudes from the bottom of the shuttle stick. This pin will fit into the notch in the front shuttle holder bar. Once the stick is pushed fully forward, the rear of the stick also has a pin (stud) that fits into a hole in the rear shuttle holder bar. Push the stick downward while holding back the spring loaded locking mechanism on the end of the stick. With the rear pin in the rear shuttle holder bar, the locking mechanism, known as the slide lock, will prevent the stick from jumping free of the shuttle holder bar when the machine is running.

Now with the stick in place, pull on the trailing thread from the shuttle with quick jerking motions. You should here a clicking sound as you jerk on the thread. If you do not hear this sound the shuttle basket is holding the shuttle too tightly against the wall of the shuttle race. If the clicking sounds too sloppy, the basket is too loose and the shuttle basket needed adjusting. The shuttle basket has two fasteners holding the basket in place on the shuttle stick. These fasteners can be loosened and the basket adjusted accordingly. Ideally you want just a slight clicking sound when pulling on the thread.

Loading Material into Machine

When loading material into the machine it is always best to start with thin material. Heavy material is too difficult to get started. Using thin material, such as 1/4" or 3/8" foam, with the backing and ticking (top cloth), load these rolls onto the grip rollers provided with the machine. The grip rollers are aluminum and steel shafts that will hold rolls of material. These grip rollers have one way toggling knives attached to them. These knives allow you to slide the material onto the grip rollers and then if pulled in one direction the knives lock into the cardboard tubes of the material. This allows the operator to apply tension to these rolls using the tensioning brakes on the grip roller hooks found on the front arms of the machine and usually on the front feed stand if so equipped. Remember to check for locking of the grip roller into the tube in one direction. If the grip roller is inserted into the tube wrong, the tensioning brake will be holding the grip roller but the cardboard tube and material will be spinning freely.

If your machine is equipped with a front feed trough, the top cloth (ticking) can be placed into the feed trough instead of on a grip roller. The material is dropped into the feed trough and the material should be threaded through the tensioning bars on the top of the feed trough. See next drawing.

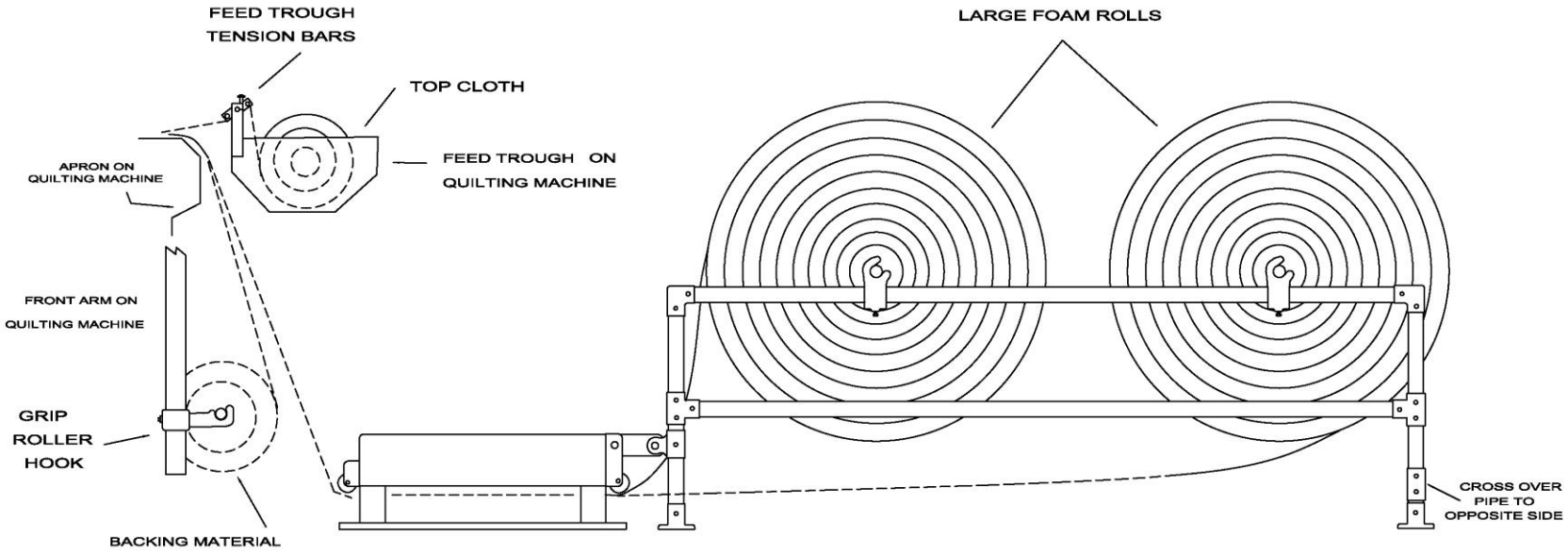
The backing material and top cloth should be stapled or taped together at their free ends. In other words pull the material right up to the front of the needle bars, and staple the ends together. Slide the two pieces of cloth into the machine, going under the presser foot plate. Be sure the handwheel is turned so that the needles are fully up. When the cloth has reached the rear of the machine, walk to the rear of the machine and guide the cloth into the gap between the first and second feed rolls. Tuck the material into this gap between the rollers so that it stays there on its own.

At this point you can either turn the handwheel forward, if you have a mechanical machine, or you can use the manual mode forward control for the feed rolls on the computerized machines. Consult the Emco Compustitch Computer manual for the proper procedure on using this function.

Turning the handwheel forward or using the forward feed on the computer will advance the material through to the second roller. Stop at this point and then guide the material into the gap between the second and third feed rolls. Again tuck the material into the rollers and stay clear of the moving parts before advancing the rollers forward. After the material emerges from around the third roller you can run enough out of the rollers to get the material up to the overhead rollers.

With this accomplished you can introduce the thin foam between the two materials now in the machine. Running the machine will pull the foam into the machine by itself. Heavier filling material (heavy foam) can now be sandwiched between the other materials and the machine will pull the heavy goods directly through the machine.

EMCO 2 ROLL FRONT FEED STAND AND WALKWAY



EMCO

EDGEWATER MACHINE CO., INC. 13-20 131st. STREET COLLEGE POINT, NY 11356 U.S.A. PHONE: 718-539-8200 FAX: 718-358-4648 EMAIL: info@edgewatermachine.com	SCALE: NONE	TOLERANCE: (INCHES) UNLESS OTHERWISE SPECIFIED	X.XX ±0.01 X.XXX ±0.002 ANGLE ±1°
	DATE: 04/01/02	DRAWN BY: Roy S.	PART #: 2550-2
DRAWING TITLE: Feedstand for 2 rolls	REV. DATE: 04/01/02	FILE NAME: Feedstand for 2 rolls.dwg	

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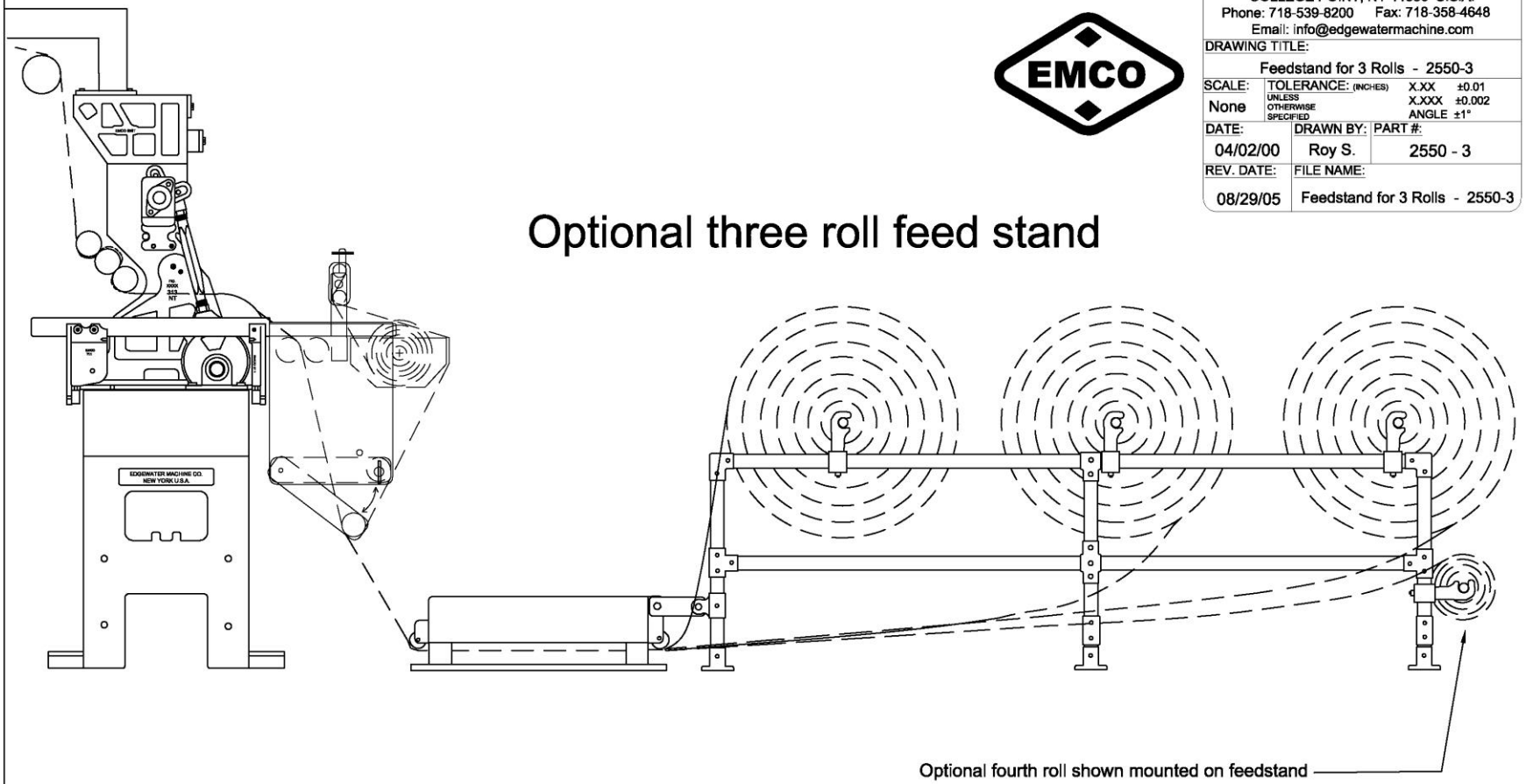
COLLEGE POINT, NY 11356 U.S.A.
Phone: 718-539-8200 Fax: 718-358-4648
Email: info@edgewatermachine.com

DRAWING TITLE:	Feedstand for 3 Rolls - 2550-3	
SCALE: None	TOLERANCE: (INCHES) UNLESS OTHERWISE SPECIFIED	X.XX ±0.01 X.XXX ±0.002 ANGLE ±1°
DATE: 04/02/00	DRAWN BY: Roy S.	PART #: 2550 - 3
REV. DATE: 08/29/05	FILE NAME: Feedstand for 3 Rolls - 2550-3	

Optional three roll feed stand



Optional fourth roll shown mounted on feedstand

Aug 29 2005 - 7:46 am

Installing a Design Cam

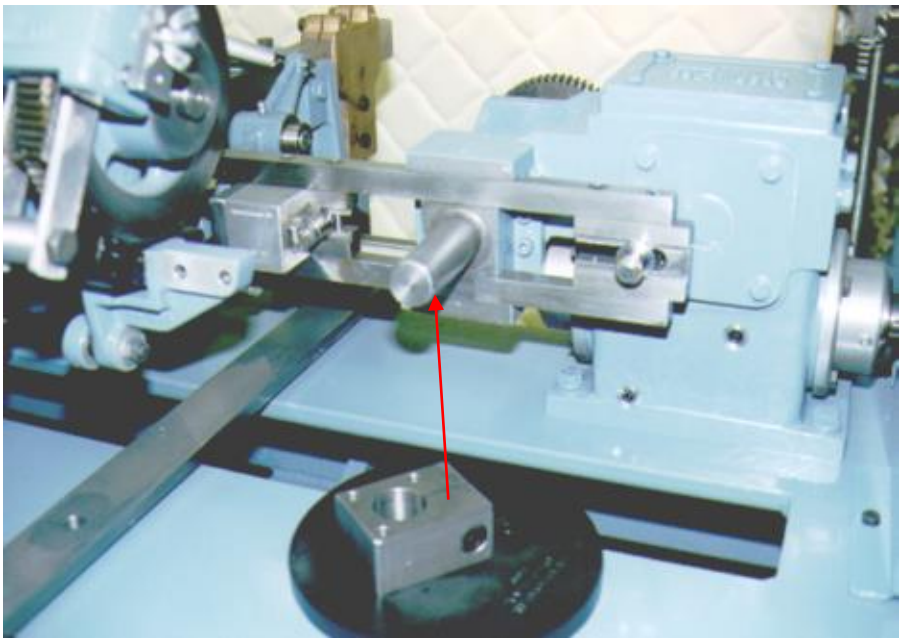
The design cam is a steel hardened cam shaped in various forms to produce numerous designs. This cam and cam hub fit onto the cam shaft of the gear box. See next drawing. If your machine is a computerized model, then consult the Emco Compustitch Computer manual for pattern selection.

The gear box's cam shaft is straddled by two cam rollers. These cam rollers are secured to a cam slide. The cam slide moves with the carriage as the cam revolves and pushes against the cam rollers. The left roller, when viewed from the rear of the machine, is a pretensioned roller. This roller is not adjustable. The opposite roller on the right, is an adjustable roller. On three needle bar machines (1x3x6), the cam slide has a removable cam slide block on the right side. This block is stamped with numbers 3 and 4. This block is adjustable for three inch throw cams and four inch throw cams. For the larger 12 inch repeat cams this block should be removed and the cam roller stud should be placed in the cam slide block to the right of this removable block.

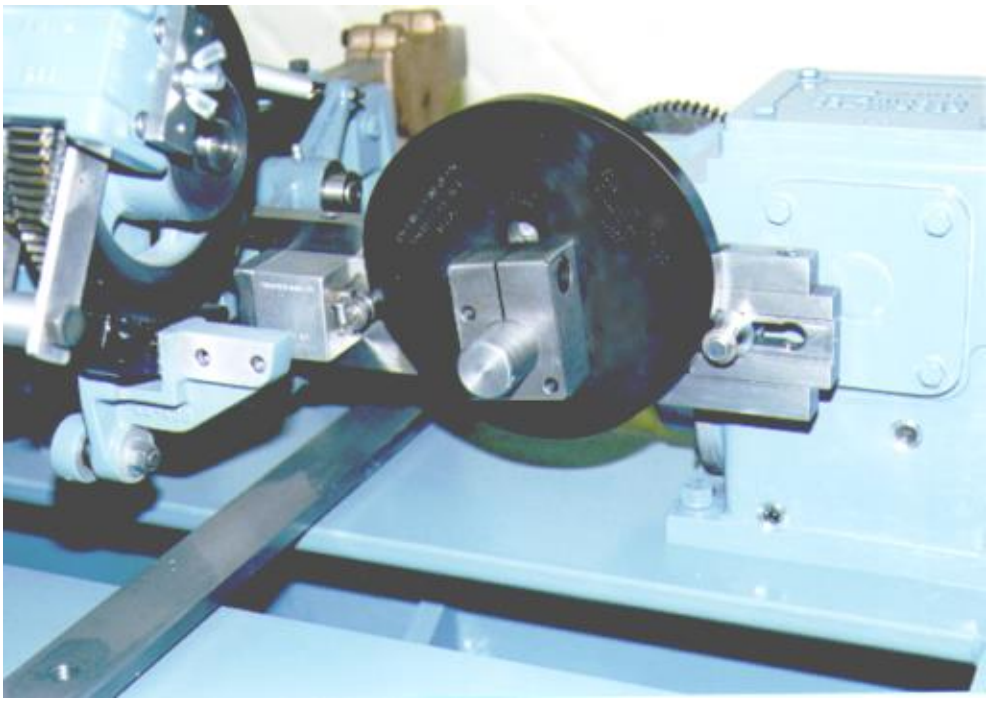
After sliding the cam onto the cam shaft, the cam should be revolved against the left pretensioned roller. While resting against the roller, use a 3/8" hex allen key to tighten the bolt on the squeeze hub of the cam. This squeeze hub tightens securely around the cam shaft to secure the cam in place.

With the cam secured, you should now adjust the adjustable cam roller against the cam. The roller is adjusted using a 3/4" open end wrench. Loosen the nut behind the roller and slide the roller towards the cam. Using a business card or something equivalent to the thickness of a business card, place the card between the roller and the cam. Now tighten the roller by using the 3/4" wrench on the nut behind the roller.

The roller should turn freely after removing the business card. The reason for this air gap is so that the cam is never given a chance to bind too tightly between the rollers.

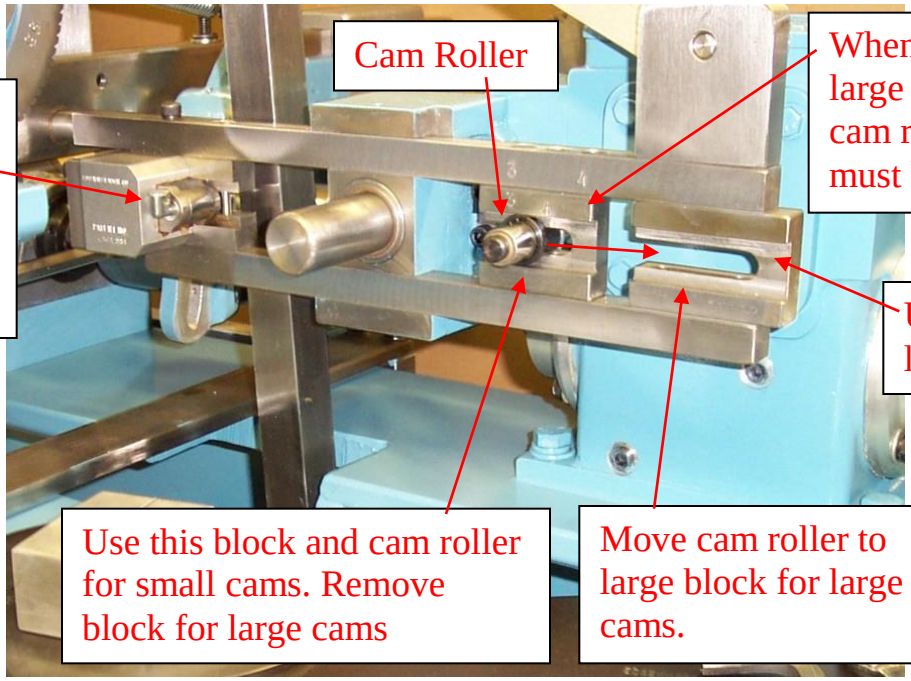


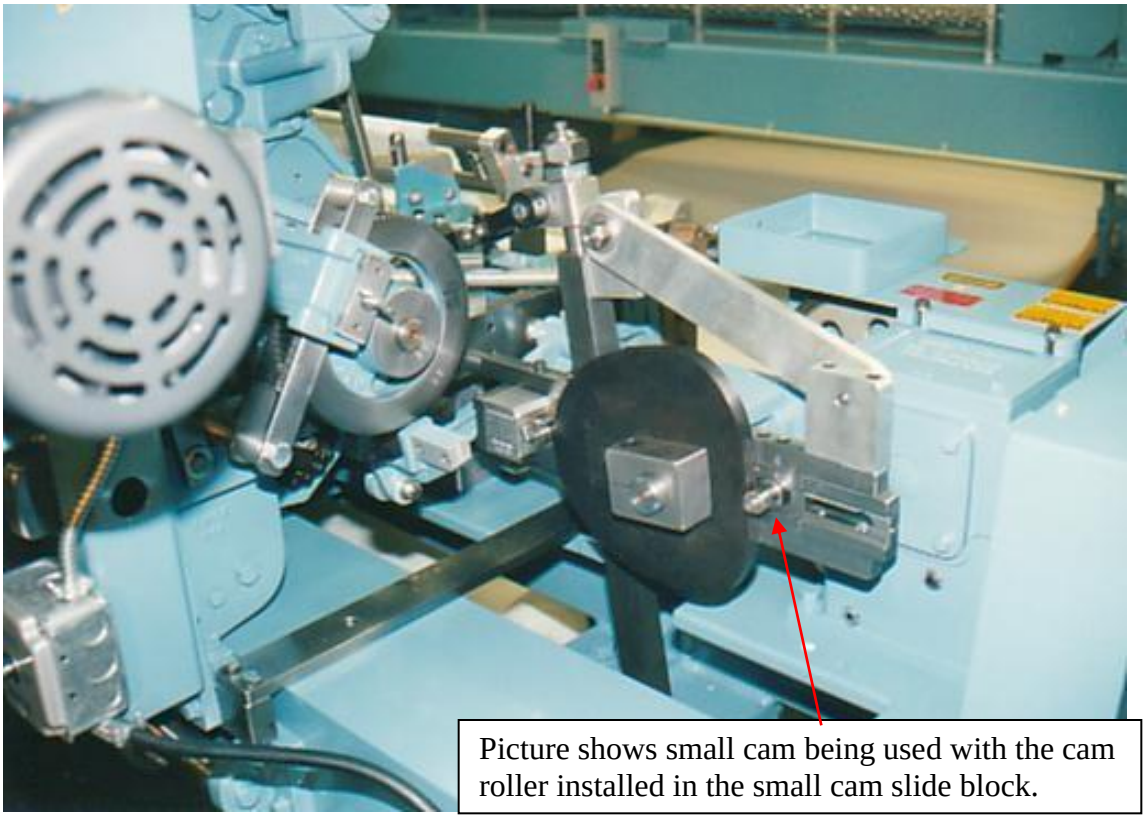
View of two needle bar (1 x 3) machine's Cam Shaft with Cam removed.



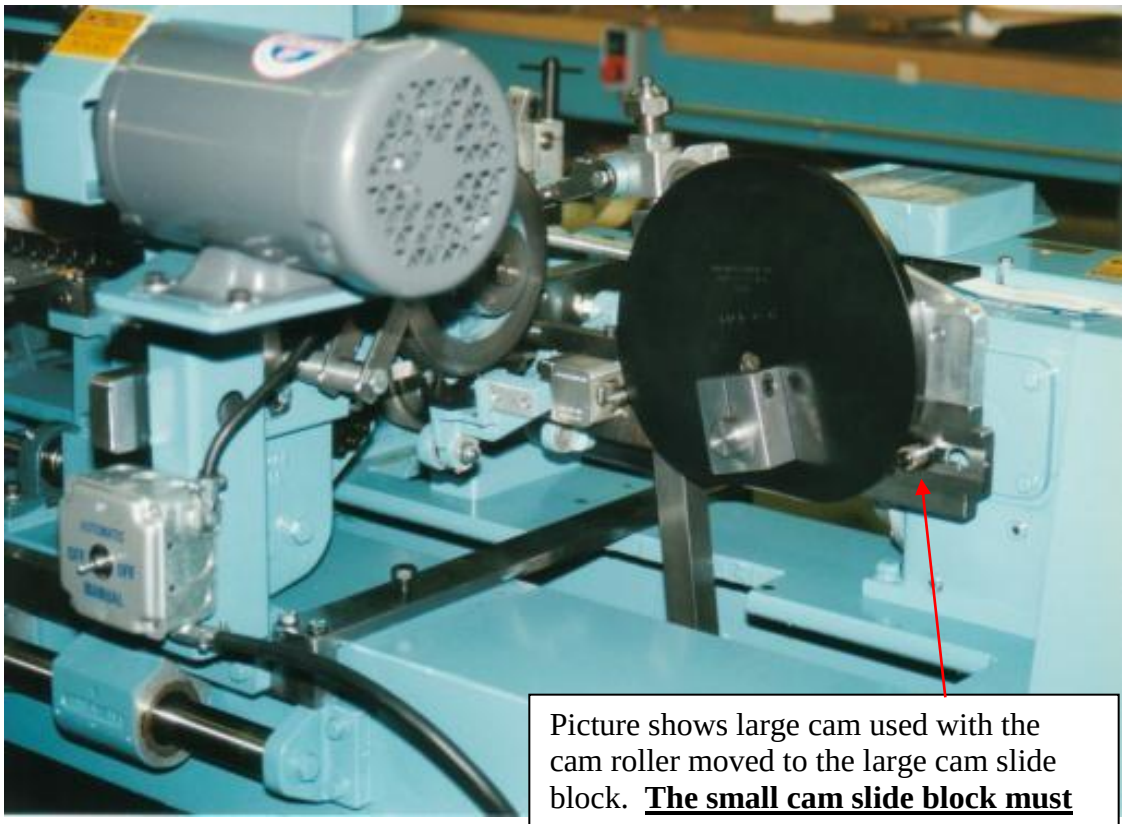
View of two needle bar (1 x 3) machine's Cam installed on Cam Shaft.

This view of the three needle bar machine's (1x3x6) Cam Slide shown with both cam slide blocks installed. The smaller block marked with numbers 3 and 4 on it, is for small cams. This small block **must be removed** when installing the larger 12 inch repeat design cams. The cam roller stud is then placed in the larger block to the right.





Picture shows small cam being used with the cam roller installed in the small cam slide block.



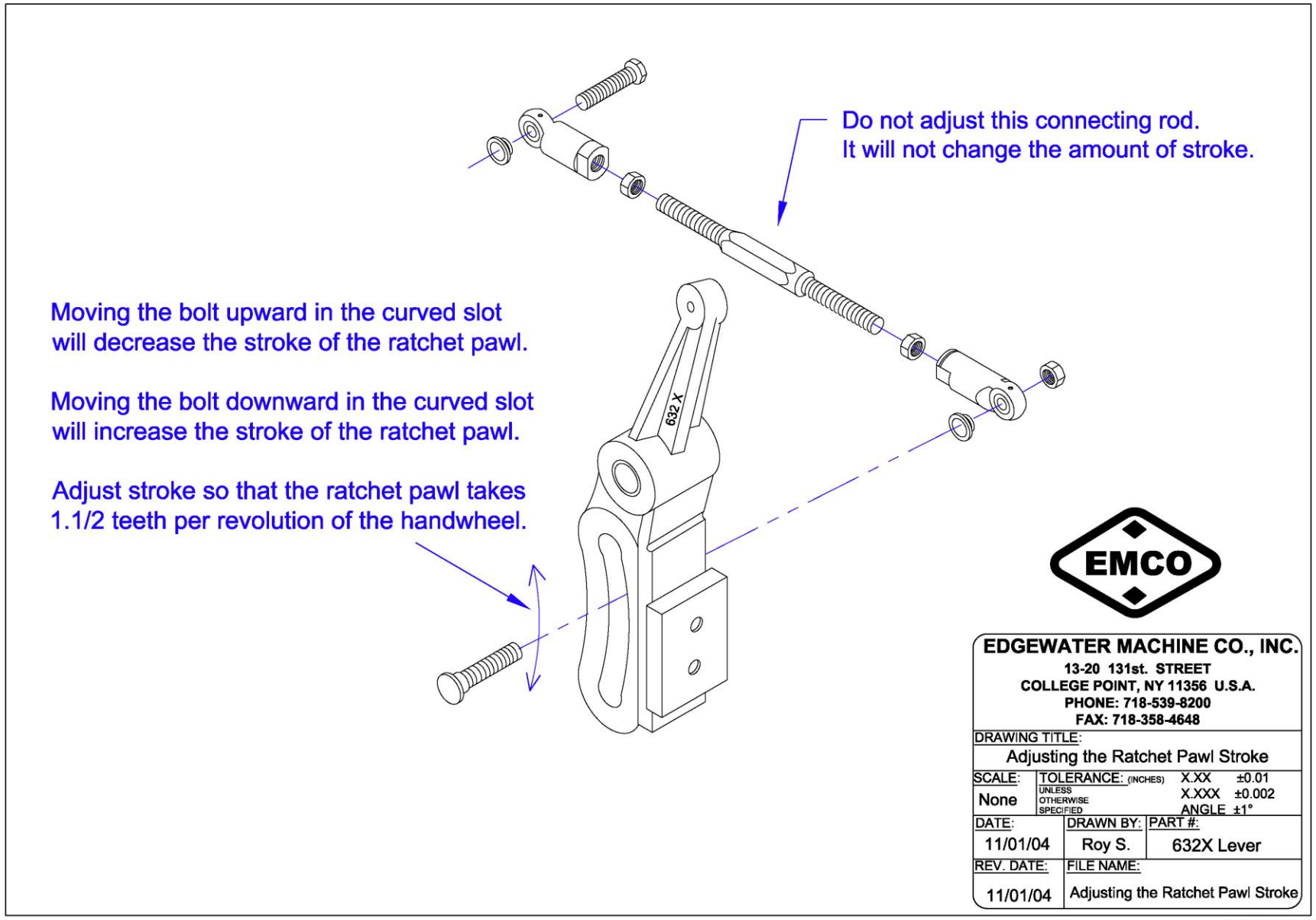
Picture shows large cam used with the cam roller moved to the large cam slide block. **<u>The small cam slide block must be removed.</u>**

Adjusting the Ratchet Motion

If your machine is a mechanically driven machine, then you have a ratchet indexing the feed rolls forward. The ratchet located on one end of the first feed roll is pushed forward by a lever (part #632X). This lever is propelled towards the rear of the machine by a barrel cam. The barrel cam is located on the main shaft of the machine. It is round in shape and is mounted off center from the main shaft. The eccentric design of this barrel cam pushes the 632X lever once per revolution of the main shaft. The lever in turn pushes a ratchet pawl against the surface teeth of the ratchet and indexes the ratchet forward one tooth per revolution of the main shaft. The combination of these parts makes up the drive train that propels the feed rolls forward and this pulls the cloth through the machine.

The #632X lever is designed with a curved slot. This slot is the means of adjusting the ratchet pawl to achieve 1.1/2 teeth advancement of the ratchet per revolution of the main shaft. This means, as the main shaft revolves one revolution the ratchet pawl being pushed by the barrel cam must slide back 1.1/2 teeth after pushing the ratchet forward. The reason the ratchet pawl must pull itself back 1.1/2 teeth is to give the most amount of dwell time possible to the sewing cycle of one stitch. If the ratchet pawl slid back only one tooth, the ratchet would again start to early on the next cycle. Never allow the ratchet pawl to engage more then one tooth at a time. If the ratchet pawl slid back two teeth the ratchet would be advanced too much and would cause a stitch two large for the machine to handle properly.

To adjust the amount of teeth being pushed, the curved slot in the 632X lever contains a 3/8" bolt securing a link to the slot. This link can be slid up or down in the lever's slot after loosening the 3/8" bolt. Moving the link upward in the slot will decrease


Do not adjust this connecting rod.
It will not change the amount of stroke.
Moving the bolt upward in the curved slot
will decrease the stroke of the ratchet pawl.
Moving the bolt downward in the curved slot
will increase the stroke of the ratchet pawl.
Adjust stroke so that the ratchet pawl takes
1.1/2 teeth per revolution of the handwheel.
632 X
EMCO
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PHONE: 718-539-8200
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DRAWING TITLE:
Adjusting the Ratchet Pawl Stroke
SCALE:
None
TOLERANCE: (INCHES) UNLESS OTHERWISE SPECIFIED
X.XX ±0.01
X.XXX ±0.002
ANGLE ±1°
DATE:
11/01/04
DRAWN BY:
Roy S.
PART #:
632X Lever
REV. DATE:
11/01/04
FILE NAME:
Adjusting the Ratchet Pawl Stroke
Aug 31 2005 - 8:16 am

the amount of teeth being advanced. Moving the link downward in the slot will increase the teeth being advanced per cycle of the main shaft.

Turn the handwheel slowly forward and watch the ratchet pawl push the ratchet forward. As you continue turning, the ratchet pawl will pull backward and slide itself over one tooth and then a 1/2 tooth more. This is the proper sequence you should see. If the ratchet pawl is not performing as described then adjust the link either up or down as discussed above.

On the ratchet brake you will find a ratchet brake clamp. This ratchet brake clamp can be adjusted by turning the wing nut on the side of the clamp by hand. This brake clamp is there to aid in pressing the brakes together against the ratchet as the brake lining begins to wear down. If the brake lining is worn and there is not sufficient pressure on the brake pads, the ratchet will begin to slip backwards and cause pattern distortion. Never apply too much pressure, only enough to aid the brake pads as they begin to wear.

Adjusting Stitches Per Inch (by changing gearing and ratchet)

When it is necessary to change the stitch count per inch in your sewing pattern, it can be accomplished by altering the gearing and ratchet tooth count to achieve your desired stitches per inch. The gearing is located under the cover on the gear box. Remove the cover and you will see three gears driving the cam shaft. The first gear on the left when standing in front of the machine is the driver gear. The middle gear is called the idler. And the gear on the right is the driven gear. These three gears make up part of the drive train turning the cam. There are other gears before these three, and they are the gears inside the gear box. The gears inside the gear box do not need altering to change the stitch count. The gears outside the gear box must be kept tightly meshed whenever you are adjusting or changing the gearing. If the gears are not tightly meshed, then premature wearing and failure will occur.

Whenever altering the gearing the ratchet must also be changed. The ratchet is secured using one set screw in the hub of the ratchet and is tightened down onto the shaft of the first feed roll. Loosen the set screw and pull the ratchet off the shaft. When installing a different ratchet, you must hold the ratchet pawl clear of the ratchet when sliding the new ratchet into place. Make sure the set screw of the new ratchet is aligned with the flat milled in the shaft of the feed roll. Tightening the set screw other then on the flat will cause the ratchet to chew up the shaft and you will not be able to remove the ratchet later on. Tighten the set screw securely after locating it over the milled flat.

The following chart will assist you in selecting the proper gearing and ratchet for the desired stitch count.

Gearing and Ratchet for Emco's Heavy Duty Mattress Machines with 3" Feed Rolls

Stitches Per 6 Inch Cam Cycle

	Change Gears			
Stitches/inch	**Driver**	**Idler**	**Driven**	**Ratchet**
4	40	50	42	66
5	40	50	48	75
6	40	50	54	85
7	40	50	60	95
8	40	50	66	104 or 105
9	40	50	70	110

Shaded row indicates standard setup.

Stitches Per 8 Inch Cam Cycle

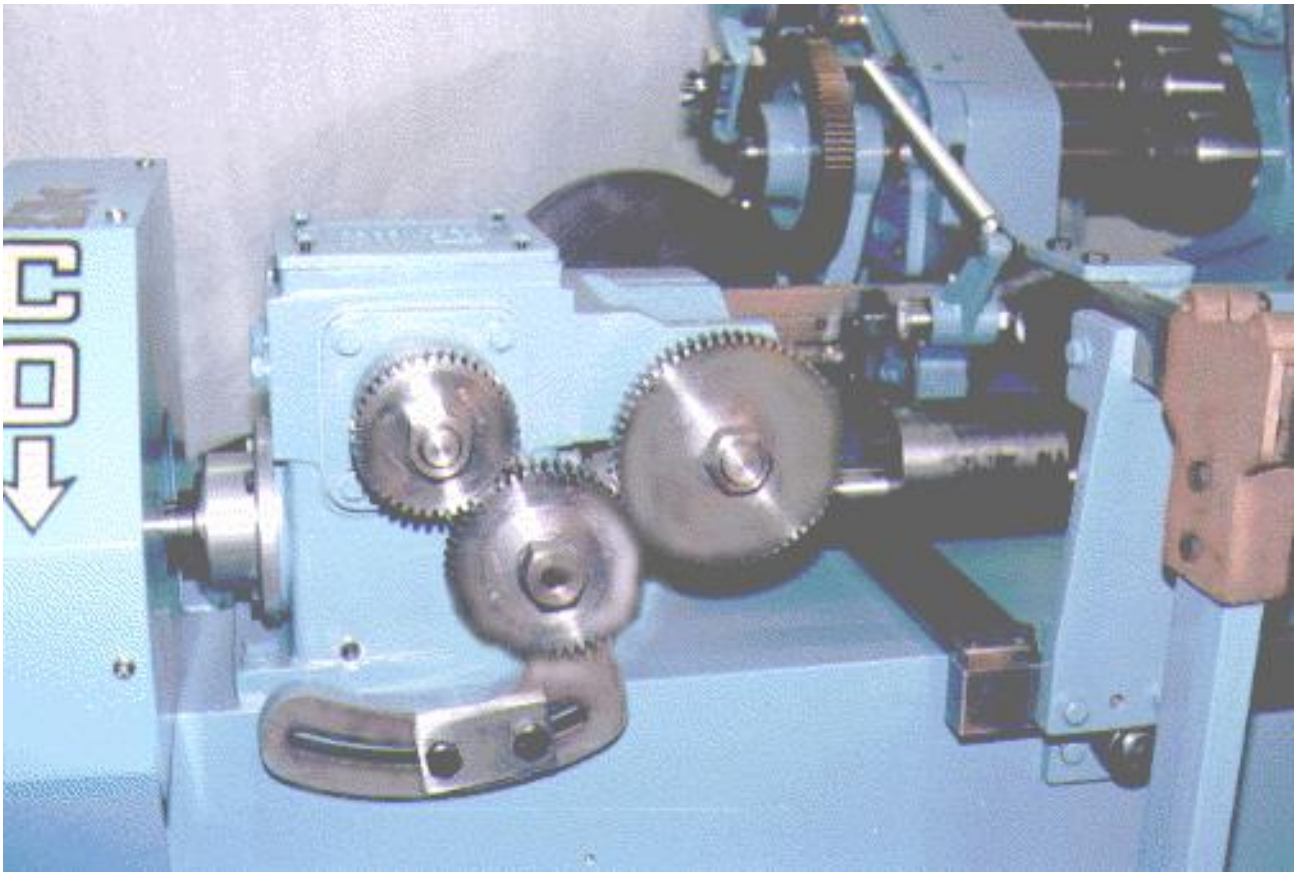
	Change Gears			
Stitches/inch	**Driver**	**Idler**	**Driven**	**Ratchet**
4	40	50	56	66
5	40	50	63	75
6	40	50	72	85
7	40	50	80	95
8	36	50	80	104 or 105
9	40	45	93	110

Shaded row indicates standard setup.

Stitches Per 12 Inch Cam Cycle

	Change Gears			
Stitches/inch	**Driver**	**Idler**	**Driven**	**Ratchet**
4	30	50	63	66
5	30	50	72	75
6	30	40	82	85
7	30	40	90	95
8	30	30	99	104 or 105
9	20	60	70	110

Shaded row indicates standard setup.



View of Change Gears on front of gear box.
Driver Gear on left - Idler Gear center - Driven Gear on right

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Ratchets Used For Straight (Channel) Stitching with 3 inch Feed Roll Machines

4 Stitches per inch - use a 38 Tooth Ratchet

5 Stitches per inch - use a 48 Tooth Ratchet

6 Stitches per inch - use a 57 Tooth Ratchet

7 Stitches per inch - use a 66 Tooth Ratchet

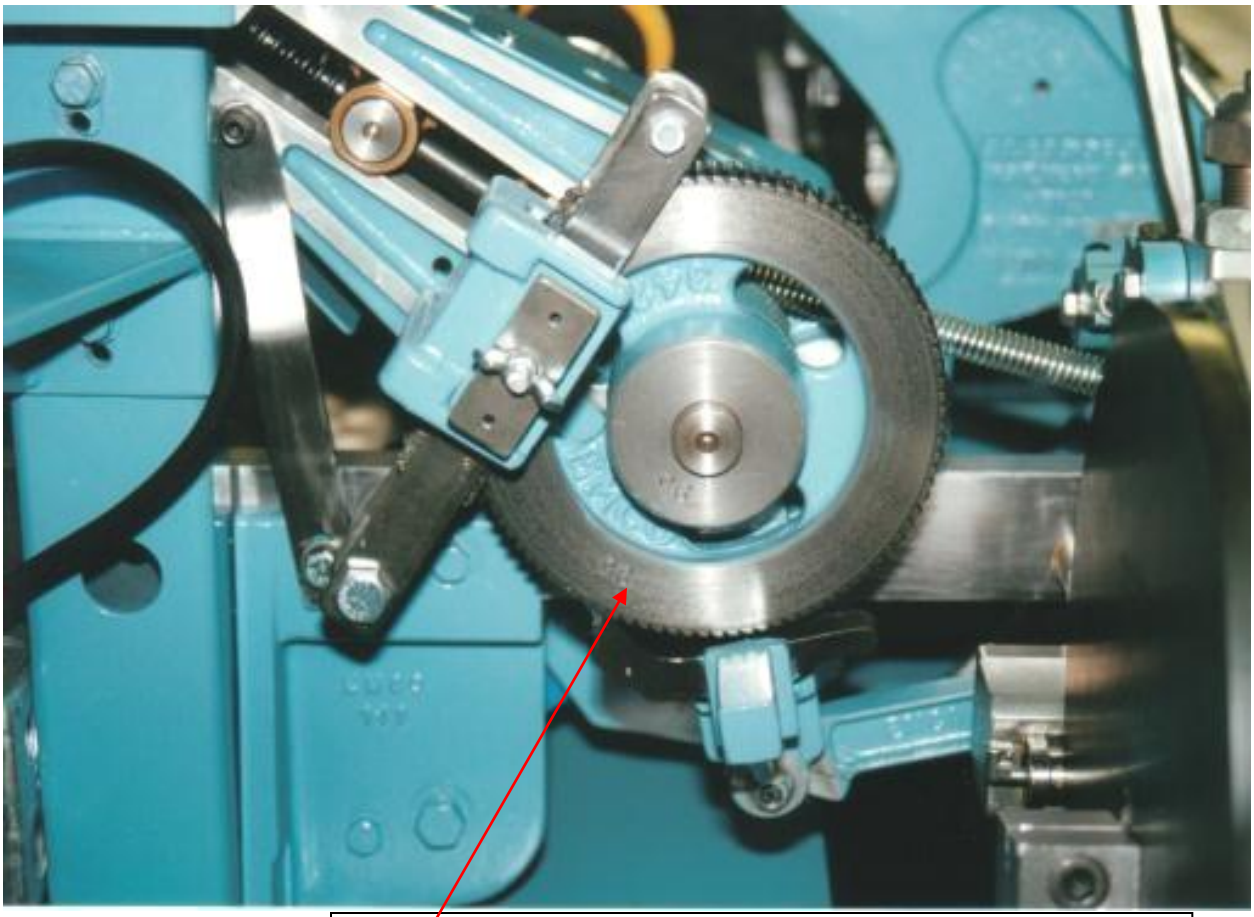
8 Stitches per inch - use a 75 Tooth Ratchet

9 Stitches per inch - use a 84 Tooth Ratchet

10 Stitches per inch - use a 93 Tooth Ratchet

11 Stitches per inch - use a 102 Tooth Ratchet

Note: For straight line (channel) stitching, the cam is removed from cam shaft, the proper ratchet is chosen and the ratchet pawl is adjusted to take 1.1/2 teeth per revolution of the handwheel.



Ratchet shown above. Choose the correct ratchet and gearing for the number of stitches required. Gearing and ratchet information can be viewed from the charts on the previous pages.

Adjusting the Presser Foot for Different Thicknesses

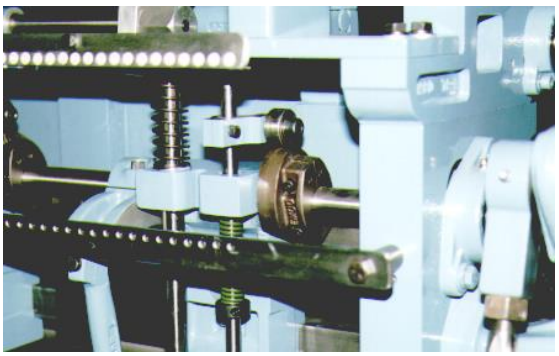
The presser foot is designed to compress the goods before and during the sewing of the goods in the quilting machine. The presser foot pushes down on the material in the machine and holds it compressed while the needles are sewing the goods together. As the needles leave the goods the presser foot raises and allows the goods to advance forward for the next stitch.

The presser foot was set by our factory for use with a range of thicknesses from 1/2" to 1". If the presser foot needs to be readjusted for thinner or thicker material the operator can make the necessary adjustments by resetting the height of the presser foot.

If your machine is equipped with presser foot cams (part #815), these cams raise the presser foot when the needles are up. Springs apply pressure downward onto the goods when the needles are down.

If your machine is equipped with posi-drive cams (part #931), that push the presser foot down, then a setting gauge (part# 932) must be used for the adjustment. This system uses the springs to return the presser foot to the up position.

Height Adjustment for the Presser Foot Equipped with #815 or Similar Cams



If the presser foot needs adjusting for thinner or thicker goods, the following procedure is the same. First, run the machine until the new thickness of goods is under the presser foot. If the goods are not covering the full width of the machine, in other words if the goods only

measure 84" across and this is a 90" machine, then any area under the presser foot not support by goods would cause the presser foot to be adjusted incorrectly. The presser foot needs to be supported fully by the goods in the machine. If the ends of the presser foot do not have material under them, then cut pieces of material the same thickness and temporally push them under the area of the presser foot that is not over the goods. The entire length of the presser foot must be evenly supported by the same thickness of goods.

Once the presser foot is fully supported, by the goods, then you can begin to make your adjustments. The needles need to be lowered into the goods by turning the handwheel until the needles are fully down. When the needles are fully down, the presser foot cams (part #815) will be rolled towards the front of the machine. This means the side of the cams will be pointing upward and the top of the cam will be pointed towards you. The presser foot lifters (ball bearing rollers part # 1107), located just above the cams are secured to the presser foot rods (either 1/2" or 5/8" rods) by one socket head cap screw in the lifter. This screw squeezes the lifter around the rod and holds the lifter securely in place on the rod. By loosening this screw the lifter can be adjusted up or down on the presser foot rod. Ideally you want to see an air gap of between 1/16" and 3/32" between the roller and the cam.

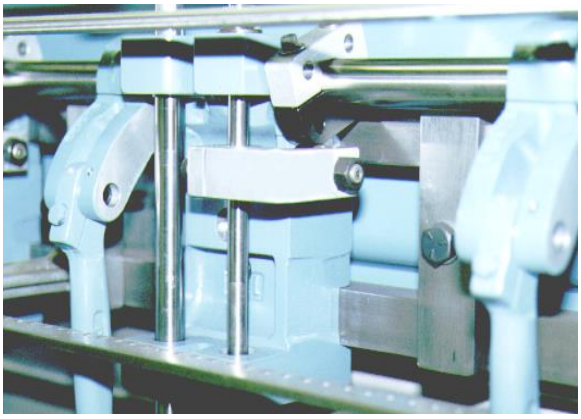
With the cams rolled forward the goods should be supporting the pressure of the presser foot. The lifters should all be loosened and lifted free of the cams. (Do not loosen or adjust the cams.) The presser foot should be resting completely on the goods. One at a time position the rollers over the cams by using a piece of steel approximately 1/16" thick between the roller and the cam. Lay this piece of steel on the side of the cam and then lower the roller onto the piece of steel. The roller should be

aligned parallel with the cam. If the roller is secured on an angle, the bearing and the cam will suffer premature wear. Keep the roller as straight as possible when tightening the screw. Secure each roller above each cam in the same manner. All of the rollers should be positioned so that they are straight and have an air gap of approximately 1/16" between the roller and the cam. If you are adjusting the presser foot for heavy goods then you should carefully check the lift of the presser foot when you are done. Carefully turn the handwheel to bring the needles to their highest position. The needles and presser foot will both be fully up. Check to be sure the point of the needles are not protruding below the surface of the presser foot plate. If the needles are allowed to extend lower then the presser foot when the needles are fully up, then the needles would be damaged, the goods could be torn, and the needle holes in the needle plates would also sustain damage if the machine were to be run in this condition. The needles must always be higher than the presser foot plate when the needles are fully up.

If the needles are protruding below the presser foot, then the stroke of the needles must be adjusted higher. In other words the needles must travel further up in order to clear the presser foot. For adjusting the stroke of the needles consult the chapter on needle bar adjustments.

If the needles when fully up do not extend below the presser foot plate then you are ready to run the machine. Turn the handwheel a few times first by hand to be sure there is nothing binding. If the handwheel turns smoothly then you are ready to run the machine.

Height Adjustment for the Presser Foot Equipped with #931 Posi-Drive Cams



If your machine is equipped with posi-drive presser foot cams (part #931) then a setting gauge (part #932) must be used for adjustments.

To adjust the setting of the Emco Posi-Drive Presser Foot, please refer to the next drawings. In the drawings note the location of the lower presser foot rod collar. ***Caution, this collar as well as the presser foot cam (#931) are set by the factory and should not be altered or moved. If the collar is ever moved, it must be set as per the drawing, using 1/2" spacers under the presser foot and using the center step on the setting gauge. If the cam is ever moved, re-adjust the cam so that the top of the cam is level when the needles are fully up and centered on the roller bearing mounted on the #930 lever under it.***

When adjusting the presser foot height, use the supplied gauge # 932 to set the height of the presser foot. There are three steps on the gauge. Select the step that closely matches the thickness of the material you are running. See next drawing. For example, when using foam or any filling material with a thickness of between 1" and 2" use the step on the setting gauge marked ***up to 2"***. This setting will allow the use of goods between approximate 1" through 2" in thickness. If you are running light work and need the presser foot lowered use the step on the gauge marked ***up to 1/4".***

To set the presser foot, the machine must be stopped and position the handwheel with the needles fully up. ***Whenever setting the presser foot, the needles must be up.*** Now insert the #932 setting gauge between the bottom of the 911 bracket and the presser foot collar, as shown in the next drawing. If the gauge does not slide

between the 911 bracket and the collar, you can rotate the handwheel forward and lower the needles slightly until the gauge slides into position. Then turn the handwheel backwards and raise the needles to their full upright position. Remember all settings are done with the needles fully up. With the setting gauge in place loosen the clamping screw in the presser foot rod lever (#930), and allow the presser foot to move upward so that the lower presser foot rod collar is pushed against the setting gauge. Let the pressure from the collar hold the setting gauge in place. Next align the presser foot rod lever with the cam so that the cam roller bearing is centered on the surface of the cam and the roller is running parallel with the cam. Now tighten the clamping screw in the presser foot rod lever.

You can now pull the setting gauge out and proceed with the next presser foot rod. Adjust all of the presser foot rods one at a time, starting from one end of the machine and proceeding to the other end. When finished check your work and then turn the handwheel of the machine slowly and check the movement of the presser foot. The presser foot should move smoothly up and down as you turn the handwheel. If there is any binding recheck what you have done and correct accordingly.

As a suggestion, you may want to order enough setting gauges for each of the presser foot rods. For example, if you have a 90” machine, you can order seven more or for a 64” machine you can order five more. By using a complete set of setting gauges on each presser foot rod your job of adjusting the presser foot height will be more accurate, quicker and easier rather than using just one gauge. Sometimes, when setting with only one gauge, the adjacent presser foot rod may cause the presser foot to stick in position rather than moving up or down parallel while you are setting the height of the presser foot. You can purchase more gauges from our factory.

If you are installing the Emco #931 Posi-Drive Cams for the first time

If you are installing the Emco #931 Posi-Drive cams for the first time on an older machine then follow these instructions.

Remove any old presser foot cams from the top rocker shaft of the machine and proceed to install the components of the new Posi-Down design as per the drawings shown on the following pages. The presser foot rod collars (2), spring, washer and presser foot rod lever #930, must be installed on each of the presser foot rods as per the drawing. And the #931 presser foot cam must be installed on the top rocker shaft as per the drawing. ***When installing and adjusting the Emco Posi-Down Presser foot system the needles must be fully up.***

The presser foot cam # 931 must be installed on the shaft with the top of the cam level, (with needles fully up). Position the cam on the shaft so that the roller bearing on the presser foot lever # 930, is centered on the cam and the roller bearing is positioned parallel with the cam. If the roller bearing is angled slightly instead of being centered and parallel with the cam, premature wearing of the cam surface will result quickly from the friction caused by the misalignment. You must assure the cam roller and the cam are perfectly parallel with each other and the roller bearing is riding in the center of the cam.

The other components, the collars (2), spring and washer should be assembled on the presser foot rod at the same time you installed the presser foot rod lever #930.

You must use 1/2 inch aluminum or steel gauging blocks under the presser foot as shown in the drawing. Under each of the presser foot rods, install a 1/2" block to support the presser foot level all the way across the machine. You must use multiple blocks. Do not use just one block and work across the machine. The presser foot must

be straight and level for the full width of the machine when installing this posi-down system.

If the presser foot is not laying flat on the gauging blocks or if the presser foot is warped or bent from years of use, it is recommended you make wooden wedges and press these wedges between the presser foot and the needle bars. Remember the needles must be fully up when installing or adjusting the presser foot and the presser foot must be flat and straight when resting on the 1/2 inch gauging blocks, so making wooden wedges and pushing them between the needle bars and the presser foot plate will aid you in keeping the needles fully up and the presser foot firmly down on the gauging blocks.

With the presser foot resting firmly on the gauging blocks and the components assembled on the presser foot rod you can start securing the components in place.

Starting with the lower presser foot collar as shown in the drawing, insert the setting gauge between the collar and bottom of the 911 bracket. The middle step on the setting gauge #932 should be used. The middle step is marked ***up to 1”***. Pinch the middle step between the collar and the bottom of the 911 bracket. Hold upward pressure on the collar and this will pinch the setting gauge while you set the collar. Tighten the collar on the presser foot rod securely. Once this collar is tightened, it should ***not*** be adjusted or moved in the future. The only adjustment that is ever made when changing the height of the presser foot is the position of the presser foot rod lever #930. Remember the collar is ***not*** to be moved in the future.

Leave the setting gauge #932 pinched between the collar and the bottom of the 911 bracket while you finish securing the other components. You can now set the top collar and spring pressure. As shown in the drawing, push the top collar downward until

you have 2 inches between the underside of the collar and the top of the 911 bracket. Secure the collar in place and check the measurement once more for accuracy.

Your last step is to secure the presser foot lever #930 in place under the cam. The cam #931 should already be level and in position as mentioned earlier, check this before proceeding. With the spring pressure set and the setting gauge still pinched between the lower collar and the under side of the 911 bracket, you can now set the presser foot lever under the cam. Make sure the roller bearing is centered against the cam and very importantly make sure it is parallel with the cam. Then hold upward pressure on the lever so that the roller bearing is tightly against the cam. Then tighten the clamping screw in the lever securely.

You have now finished one of the presser foot rod assemblies. You must repeat these steps for each presser foot rod across the machine. It is recommended that you use multiple setting gauges #932 across the machine as you proceed. Once you finish one assembly, leave the setting gauges in place as you proceed across the machine. Do not remove any setting gauges until the entire machine is complete. Then remove all setting gauges and blocks and slowly and gently rotate the handwheel forward and check for binding or interference from the parts you just installed. If the handwheel rotates freely then you did a good job and you are ready to run the machine.

If you need to raise or lower the presser foot height at this time, please follow the instructions in the chapter on adjusting the presser foot height. ***Please remember when installing the system for the first time, you must use the middle step on the setting gauge #932. Do not use any other step as this will cause binding of the components when you make future adjustments to the height of the presser foot.***

FOR THE EMCO 1X3 LOCKSTITCH MACHINE

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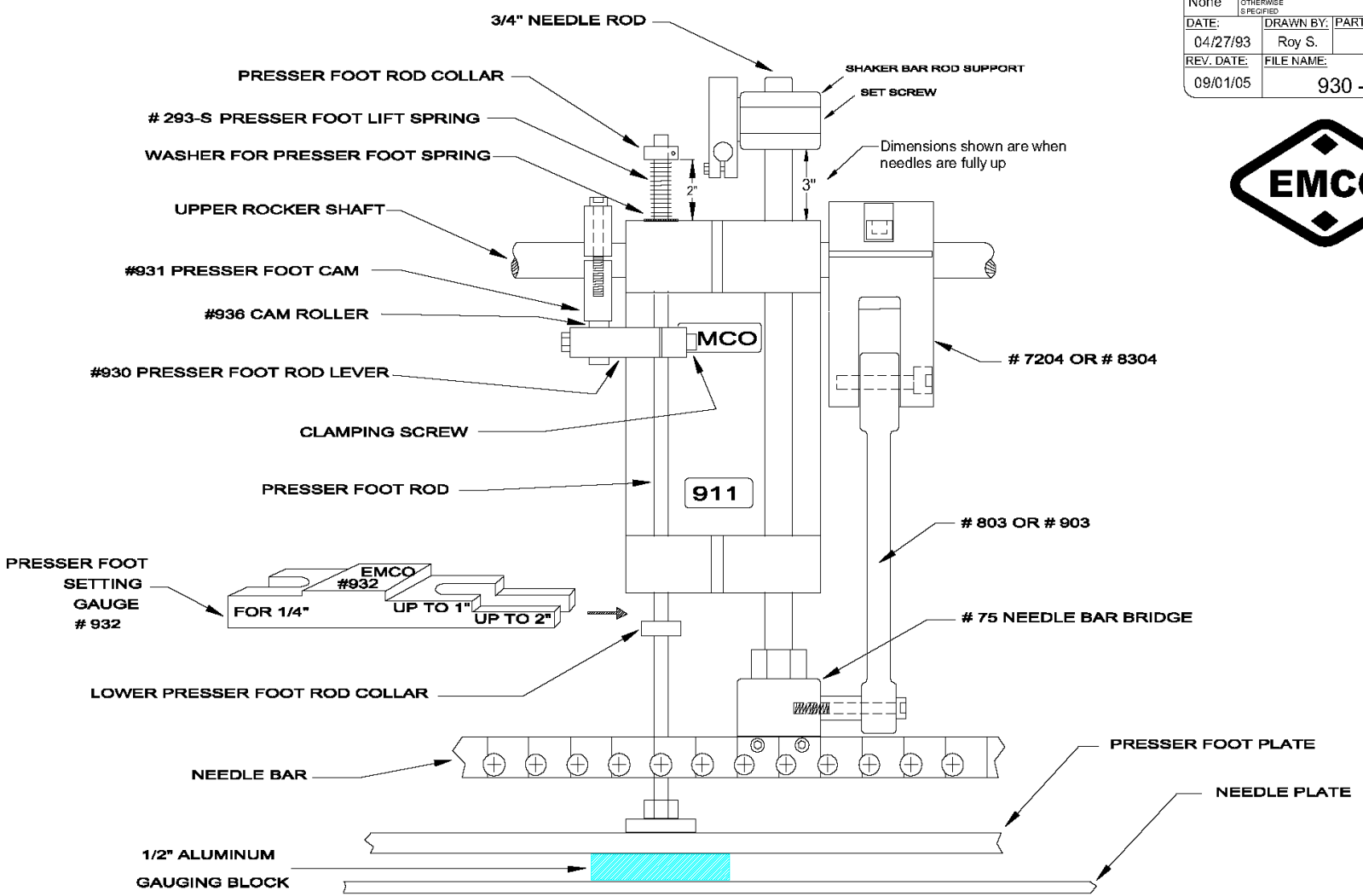
Email: info@edgewatermachine.com

DRAWING TITLE:		
Posi-Drive Presser Foot for the Emco 1x3 machine		
SCALE: None	TOLERANCE: (INCHES) UNLESS OTHERWISE SPECIFIED	X.XX ±0.01 X.XXX ±0.002 ANGLE ±1°
DATE: 04/27/93	DRAWN BY: Roy S.	PART #: 930-1x3
REV. DATE: 09/01/05	FILE NAME: 930 - 1x3	



FOR THE EMCO 1X3 LOCKSTITCH MACHINES BUILT AFTER JULY 2014

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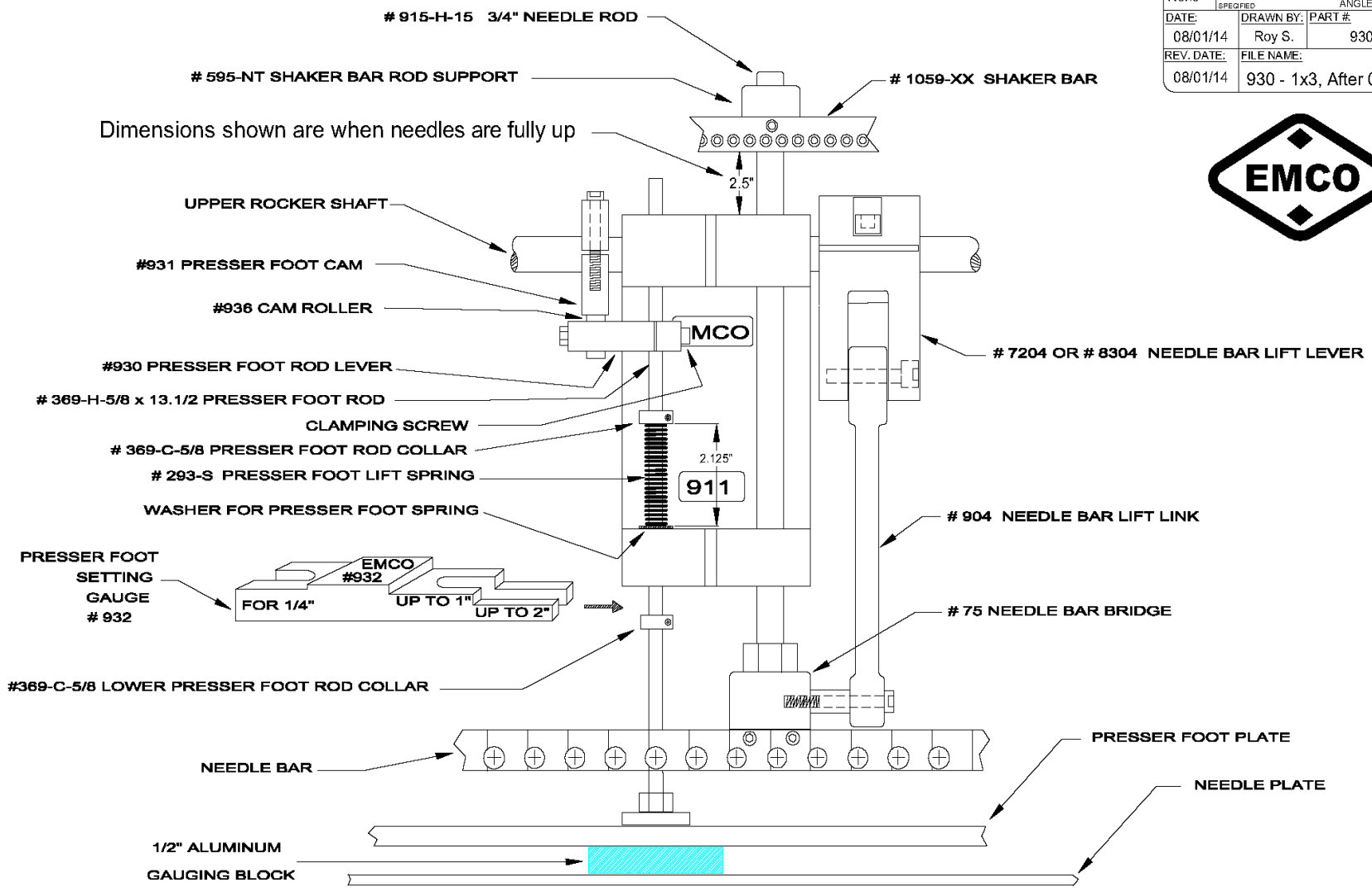
DRAWING TITLE: Posi-Drive Presser Foot for the Emco 1x3 machine			
SCALE: None	TOLERANCE: (INCHES) UNLESS OTHERWISE SPECIFIED	X.XX ±0.01 X.XXX ±0.002 ANGLE ±1°	
DATE: 08/01/14	DRAWN BY: Roy S.	PART #: 930-1x3	
REV. DATE: 08/01/14	FILE NAME: 930 - 1x3, After 07-2014		



FOR THE EMCO 1X3X6 LOCKSTITCH MACHINES

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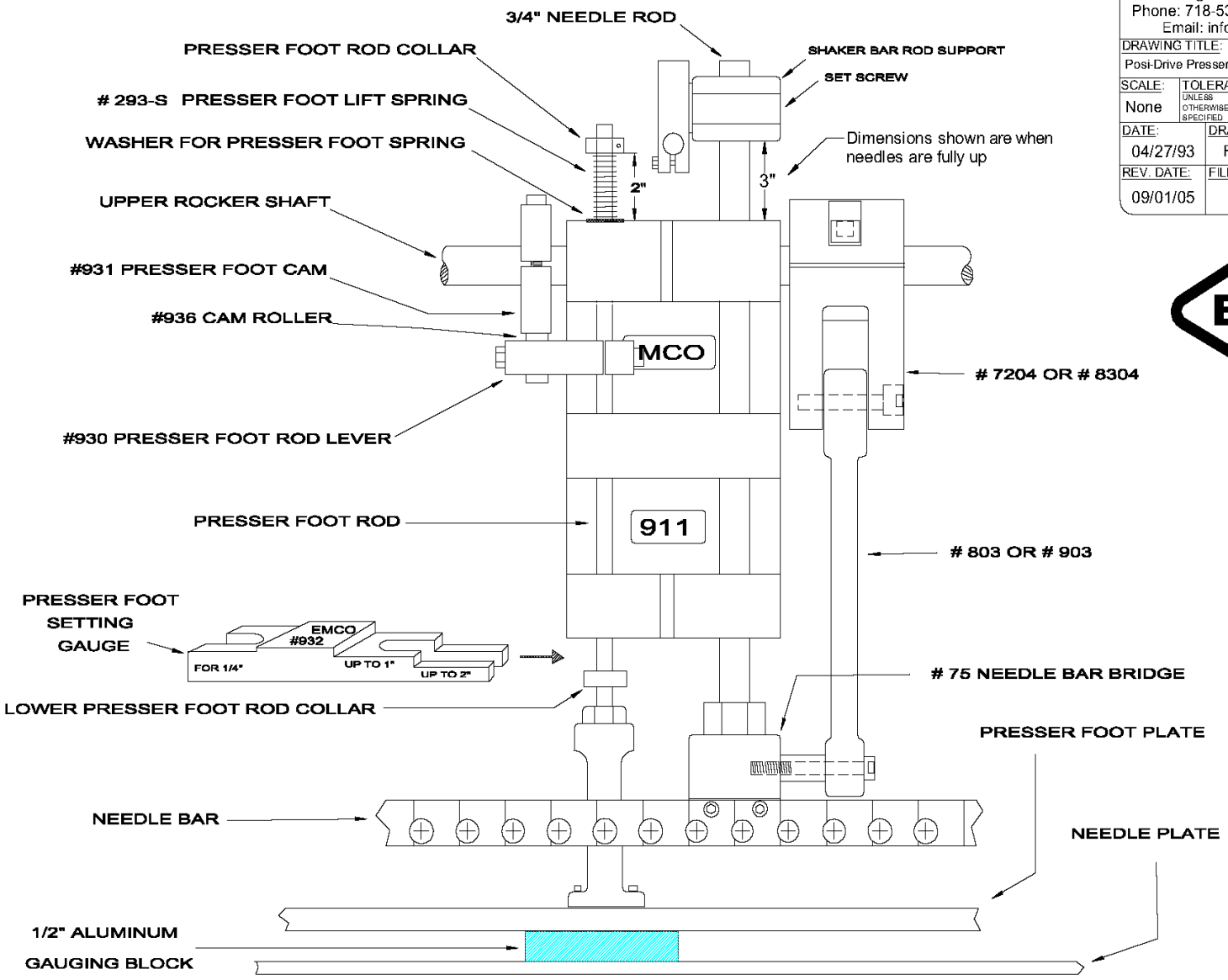
Phone: 718-539-8200 Fax: 718-358-4648
Email: info@edgewatermachine.com

DRAWING TITLE: Posi-Drive Presser Foot for the Emco 1x3x6 machine		
SCALE: None	TOLERANCE: (INCHES) UNLESS OTHERWISE SPECIFIED	X.XX ±0.01 X.XXX ±0.002 ANGLE ±1°
DATE: 04/27/93	DRAWN BY: Roy S.	PART #: 930-1x3x6
REV. DATE: 09/01/05	FILE NAME: 930 - 1x3x6	



Adjusting the Top Takeup Roller

The top takeup roller can be either a grip roller or a 4" drive roller on the upper arms of the machine. If the takeup roller is a grip roller, then you are winding the goods on the up arms of the machine. If this is the case the grip roller is usually driven by a belt on a large 15" pulley attached to the grip roller. This belt is tensioned by a moveable belt tensioner arm. The belt tensioner arm is swung against the belt to apply more or less tension as desired. If the belt tensioner arm is pressed too tightly against the belt then the belt will pull too excessively on the finished goods exiting the feed rollers. If the belt is made to loose the grip roller will not roll the goods properly. Adjusting the belt tensioner is a matter of visually looking at the finished goods coming from the feed rollers and checking the tension on the goods by patting your hand against the surface of the material. The tension you feel should equal the tension on the top cloth as it enters the machine. Ideally you want the same tension going into the machine as you have exiting the machine. This sets up the best control on the cloth possible. The feed rolls do not have to over work by fighting the pressure of unequal tension. If the top cloth going into the machine had a great deal more tension then the material exiting, than the feed rolls would have to pull much harder than they normally would have to if

the material tensions were equal. Having equal tension before the feed rolls and after yields the best sewing results and the least amount of wear on the machine.

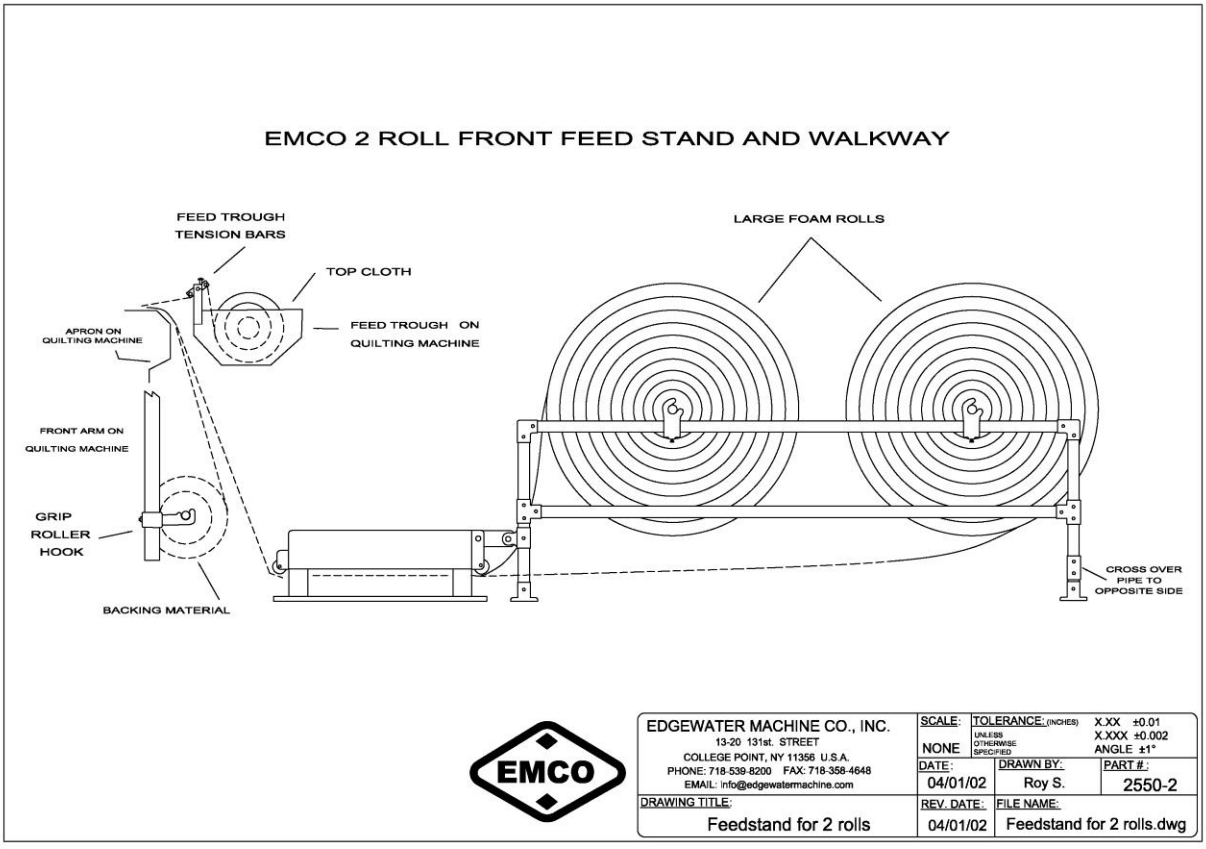
If the machine has a 4" drive roller instead of the grip roller then you have either a belt or an electric D.C. drive propelling the roller. If you have a belt then the same advice given above pertains to the adjustment of the belt.

If you have an electric D.C. drive the same tensioning between the cloth going into the machine and the material exiting the machine applies. The tensioning adjustment in this case is not a belt tensioner, but rather a potentiometer knob adjustment on the D.C. drive. The D.C. drive is configured as a torque drive not as a speed drive. This drive will pull tension on the cloth according to the amount of tension you dial into the drive. The speed of the drive is not controllable by the operator, but only by the drive. If the tension is slack in the goods exiting the machine the drive will accelerate the roller in order to take up the slack. When tension is felt by the drive the roller will automatically slow down and actually stop when the desired tension is reached. Increasing the dial on the drive will increase the tension and decreasing the dial's setting will decrease the tension. Again, always try to equal the tension on the front of the machine with the same tension on the rear of the machine.

Adjusting the Top Cloth, Foam, and Backing Material

The top cloth (ticking) should always be under tension upon entering under the presser foot plate. Without tension, the cloth would stretch diagonally from side to side as the carriage attempts to move the cloth laterally when trying to form the shape of the pattern. The looser the tension on the top cloth the more pattern distortion is possible when sewing.

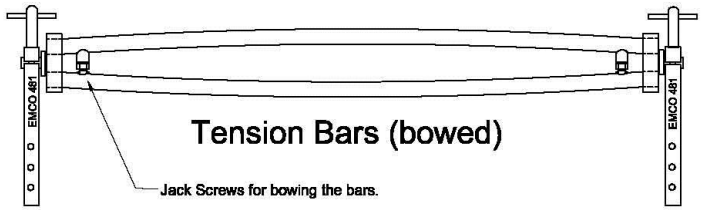
There are two basic methods for tensioning the top cloth before it enters into the machine. If your machine is equipped with a feed trough, then you would have a pair of tensioning bars mounted on top of the feed trough. The tensioning bars give the operator the convenience of threading the top cloth through the bars for tensioning. The tensioning bars can be turned to apply more tension. The more the bars are turned, the more friction is applied to the cloth as tension.



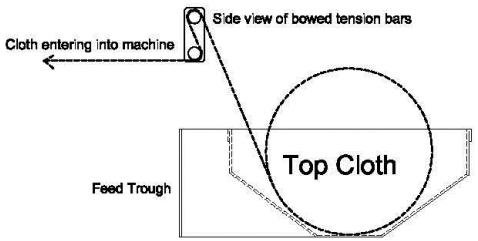
The positioning of the tension bars below shows the correct and incorrect method of rotating the tension bars.

If the tension bars are vertical this helps remove wrinkles and pleats. Example "A".
If the tension bars are rotated counter-clockwise past vertical to increase tension, this is correct.
It is the bow in the tension bars that helps to remove wrinkles and pleats. Example "B".

If the tension bars are rotated clockwise past vertical this is incorrect because it will
cause the top cloth to wrinkle or pleat inward because of the bow of the tension bars.. Example "C".

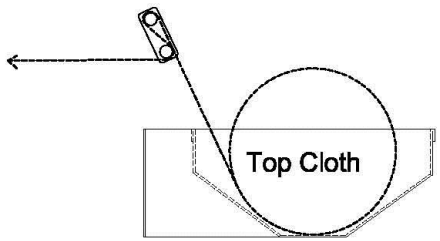


Vertical Position - Correct



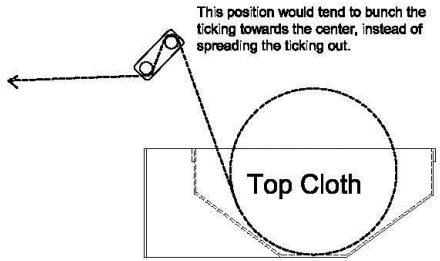
"A"

Rotated Counter Clockwise - Correct



"B"

Rotated Clockwise - Wrong



"C"

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DRAWING TITLE: Tension bar usage		
SCALE: None	TOLERANCE: (INCHES) UNLESS OTHERWISE SPECIFIED	X.XX ±0.01 X.XXX ±0.002 ANGLE ±1°
DATE: 07/20/04	DRAWN BY: Roy S.	PART #:
REV. DATE: 07/20/04	FILE NAME: Tension bar usage	

The second method of tensioning the top cloth is by using grip rollers and grip roller hooks. Grip rollers are designed to be slipped into the cardboard tube of the material being tensioned. The grip roller has one or more knives that will grip the cardboard tube in one direction only. This means, if the material is turned in one direction, the grip roller has no effect on holding the material under tension. If the same roll of material is turned in the other direction the material will be under the control of the grip roller. The grip roller is designed to be used with grip roller hooks and grip roller brakes. The grip roller hook is simply a aluminum hook attached to the front arms on the machine or on the arms of the feed stand, that will support the grip roller in place. The grip roller brake is attached to the side of the grip roller hook and works with a hub and collar on the grip roller to apply tension to the material. The more tension you apply to the grip roller brake the more tension in turn is applied to the material.

The grip roller when inserted into the cardboard tube of the material must be setup to grip the tube when the machine tries to pull on the material. If the tube spins freely even though brake tension is applied than you have inserted the grip roller incorrectly in the tube. Remove the grip roller and turn it around before reinserting it back into the cardboard tube.

If the top cloth, backing material, or the foam (filling material) is mounted on grip roller hooks, be sure the hooks are secured to the arms in a level manner. This means when you adjust the hooks up or down on the arms, it is important that the hooks be the same distance from the floor for each hook. If for example the top cloth is mounted on a pair of grip roller hooks then both hooks must be the same distance from the ground or the same distance from a reference point on the arm. If one hook is higher than the other, the cloth would track to one side. As the machine is running the cloth would

always pull itself to either the left or right side of the machine as the cloth is pulled into the machine. The leveling of the hooks will prevent the cloth from tracking to one side. This applies to any roll of material feeding into the machine. If the backing material or foam is not level as it feeds into the machine, the material will always track to one side.

The backing material is usually mounted on the front arms of the machine. By placing the backing on the front arms, the backing helps to guide the filling material (foam) into the machine. The backing should have tension held on the roll constantly. If the roll is allowed to go slack the backing material tends to wrinkle and does not help guide the foam into the machine.

The foam or filling material should have only minor tension applied to the roll. The grip roller, and brake combination are used only to keep the roll from free wheeling off the cardboard tube. Without a small amount of tension the roll would unwind itself and end up in a pile on the floor. If too much tension is applied to the filling material, the material becomes stretched and is sewn together with the other layers this way. After the material has left the quilting machine, the filling material would begin to relax back to its natural shape and wrinkles would appear in the finished product. Never apply more tension than it takes to keep the foam from free wheeling off the roll. Any excess tension beyond this will cause wrinkling in the finished quilt.

Adjusting the Needle Bar Height and Loop

The needle bar height is determined by various factors. The type of needle, the thickness of the goods being sewn and the height the presser foot is set at.

When the machine is sent from the factory, it is set using standard settings which usually satisfy most users. If your needs dictate a change in the height of the needle bar then adjustments must be made to the stroke of the needle bar and the amount of loop the needle bar produces.

The loop is a term which refers to the amount of travel the needle bar achieves after it reaches the bottom of its stroke and starts to rise for the first time. The amount of travel the needle bar rises after reaching the bottom, is called the loop. **This loop is usually 3/16" - 1/4" of rise for older machines equipped with # 7 - 8 shuttles, or 1/4" to 5/16" of rise for newer machines equipped with # 10 shuttles.** For example, (all further references will refer to the newer machines), the needle bar starting from the top position will travel to the lowest position for the first time and then the needle bar will rise at least 1/4" after reaching the bottom. This rise is the loop. Then the needle bar travels back down to the bottom of its stroke again before going back up to the top position.

On each side of the machine you will find a connecting rod that attaches the eccentric on the main shaft to the top rocker shaft lever. These connecting rods are your means of altering the needle stroke and loop timing along with this slotted lever at the top of the connecting rod. Whenever altering the adjustment on either the slotted lever or the connecting rod the other must also be adjusted. What this means is if you were to shorten the connecting rod or lengthen it, you must also adjust the position of

the stud in the slotted lever. Likewise if you were to move the stud in the slotted lever you would also have to adjust the connecting rod.

It is important to understand the reasons behind these rules. The connecting rod alters the position of the needle bar stroke. ***Shortening the connecting rod*** does two things. First it ***increases the amount of loop*** the needle bar attains. And second it ***lowers the top height of the needle bar***.

The reverse is also true. If you ***lengthen the connecting rod it decreases the amount of loop*** and at the same time ***raises the top height of the needle bar stroke***.

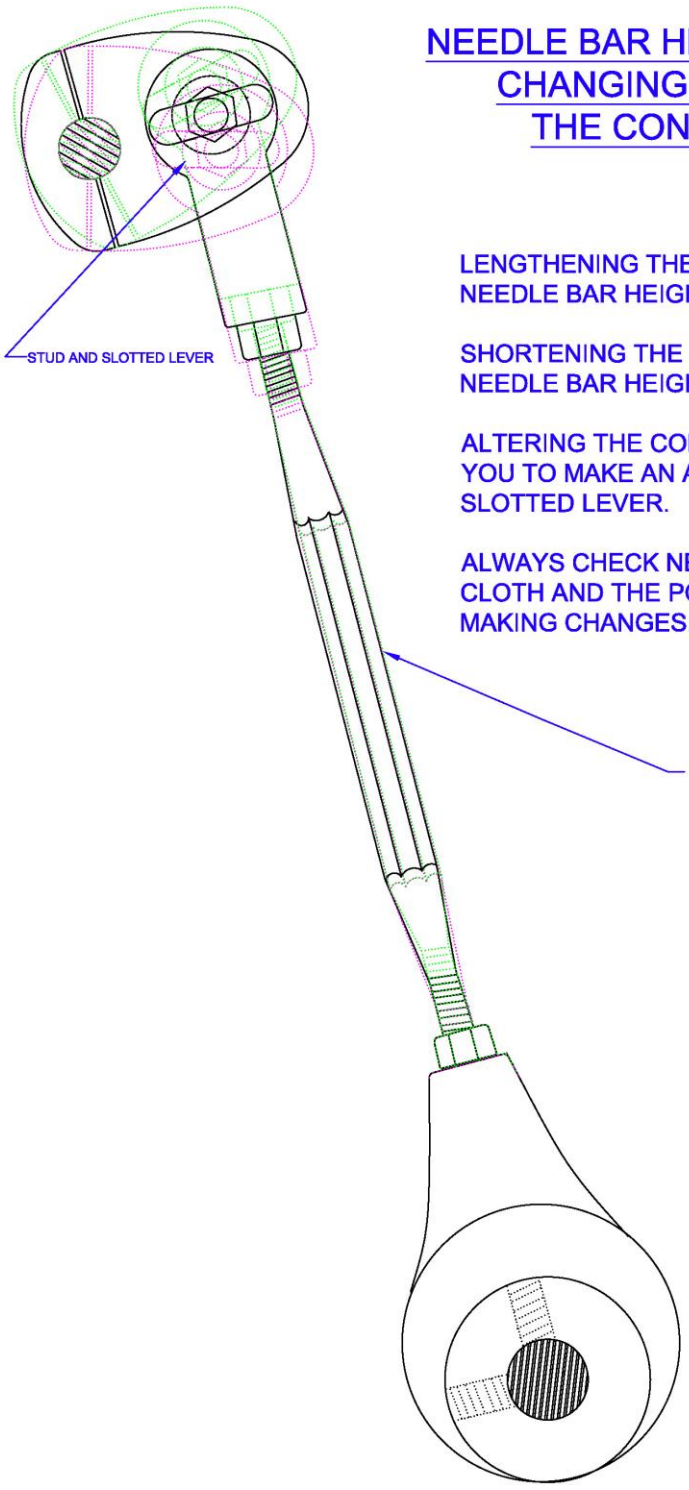
The next set of rules pertain to the amount of stroke. This means the distance the needle bar travels. If you loosen the stud in the slotted top lever and were to ***push the stud closer to the shaft***, it would ***increase the amount of stroke travel***. In other words it would not only cause the needle bars to travel higher but would also ***increase the amount of loop the needle bar attains***. ***Pulling the stud in the slotted lever away from the shaft*** does the opposite. It ***shortens the amount of needle bar stroke travel*** and ***decreases the amount of loop*** attained by the needle bar.

If you understand these rules you can alter the stroke travel and the loop movement for the needle bars.

Let's look at an example of how you might have to change the needle bar stroke to satisfy your requirements for heavier goods. If you were sewing standard work and had to change to extra heavy filling material here would be the steps to follow.

Let's assume you have read the chapter on altering the height of the presser foot and have already done this to accommodate the heavier goods. Now you find the needles are protruding down below the presser foot plate when the needles are fully up.

NEEDLE BAR HEIGHT ADJUSTMENT. CHANGING THE LENGTH OF THE CONNECTING ROD.



LENGTHENING THE CONNECTING ROD RAISES NEEDLE BAR HEIGHT, BUT THE LOOP IS DECREASED.

SHORTENING THE CONNECTING ROD LOWERS NEEDLE BAR HEIGHT, BUT THE LOOP IS INCREASED.

ALTERING THE CONNECTING ROD USUALLY REQUIRES YOU TO MAKE AN ADJUSTMENT ON THE STUD IN THE SLOTTED LEVER.

ALWAYS CHECK NEEDLE CLEARANCE BETWEEN THE CLOTH AND THE POINT OF THE NEEDLE AFTER MAKING CHANGES.

EMCO

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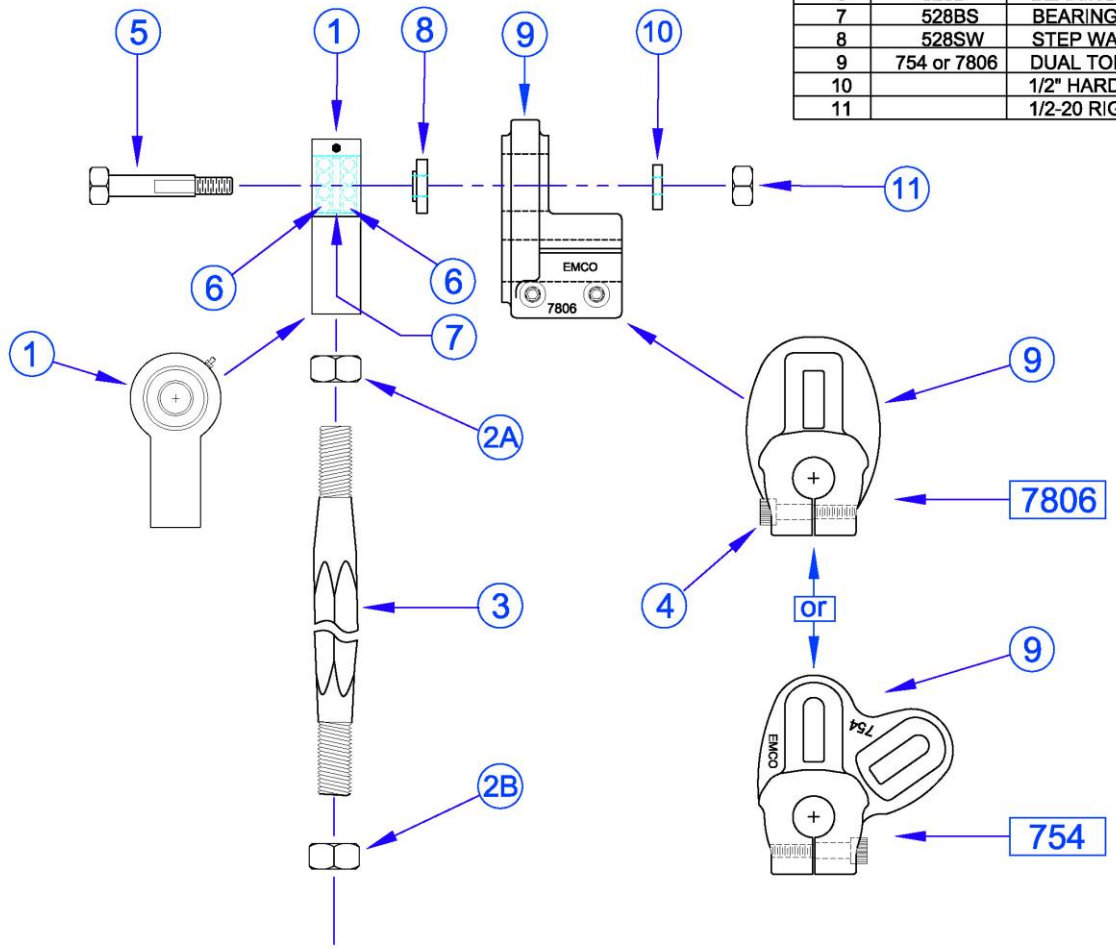
DRAWING TITLE: Needle Bar Height Adjustment		
SCALE: None	TOLERANCE: (INCHES) UNLESS OTHERWISE SPECIFIED	X.XX ±0.01 X.XXX ±0.002 ANGLE ±1°
DATE: 02/10/00	DRAWN BY: Roy S.	PART #:
REV. DATE: 09/01/05	FILE NAME: Needle Bar Height Adjustment	

Sep 01 2005 - 7:31 am

BILL OF MATERIAL

ITEM	PART No.	DESCRIPTION
1	528	TOP LINK, R.H. THREAD (SPECIFY THREAD TYPE: 5/8-18, 5/8-11, or 3/4-16)
2A	358N	RIGHT HAND NUT (SPECIFY THREAD TYPE: 5/8-18, 5/8-11, or 3/4-16)
2B	357N	LEFT HAND NUT (SPECIFY THREAD TYPE: 5/8-18, 5/8-11, or 3/4-16)
3	356N	NEEDLE DRIVE CONNECTING ROD (SPECIFY LENGTH AND THREAD TYPE) 5/8-18 THREAD - or - 5/8-11 THREAD - or - 3/4-16 THREAD
4		3/8-16 SOCKET HEAD CAP SCREW X 2" LONG, (2 REQUIRED)
5	415	STUD
6	528B	BEARING (2 REQUIRED)
7	528BS	BEARING SPACER
8	528SW	STEP WASHER, IMPORTANT: STEP ON WASHER MUST FACE BEARING
9	754 or 7806	DUAL TOP ROCKER SHAFT DRIVE LEVER (#754) OR SINGLE LEVER (#7806)
10		1/2" HARDENED WASHER
11		1/2-20 RIGHT HAND NUT



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DRAWING TITLE: 528 Top Link Assembly		
SCALE: None	TOLERANCE: (INCHES) UNLESS OTHERWISE SPECIFIED	X.XX ±0.01 X.XXX ±0.002 ANGLE ±1°
DATE: 06/05/06	DRAWN BY: Roy S.	PART #: 528
REV. DATE: 07/20/06	FILE NAME: 528 Top Link Assembly	

Jul 20 2006 - 1:16 pm

If this were the case the stroke of the needles must be increased in order to have the needles clear the presser foot plate.

To increase the needle bar stroke in order to lift the needles higher you would have to push the stud in the upper rocker shaft lever inward toward the shaft. This requires a very minor move you would have to make to the stud. The stud movement in the lever is ***extremely*** sensitive. Pushing the lever inward even a few thousands of an inch has a significant effect on the stroke. It is always best to scribe around the washer under the nut holding the stud. By scribing a fine line around the washer you can put the stud back in its approximate position if you get confused and find what you have done does not work. After scribing around the washer loosen the nut holding the stud in place, but leave a little pressure on the nut so that it doesn't slide or move freely. What you ultimately want is to have the stud held in place snugly so that you can tap the nut with a small hammer or the edge of the wrench. You want to tap the nut inward just a small amount so that you can see that the washer has moved only slightly pass your scribe line. This means you have increased the stroke of the needle bar by moving the stud inward. Now tighten the nut on the stud securely.

Your next step is to check the loop of the needle bar. You would find the loop is in excess of the 1/4" motion. This is what occurs when you push the stud inward toward the shaft. You not only increase the needle bar stroke travel but you also increase the loop travel.

You will now have to decrease the loop travel by lengthening the connecting rod. Loosen the two lock nuts on the connecting rod and then turn the rod in the direction to lengthen it. Try small increments at a time by turning the connecting rod and then make

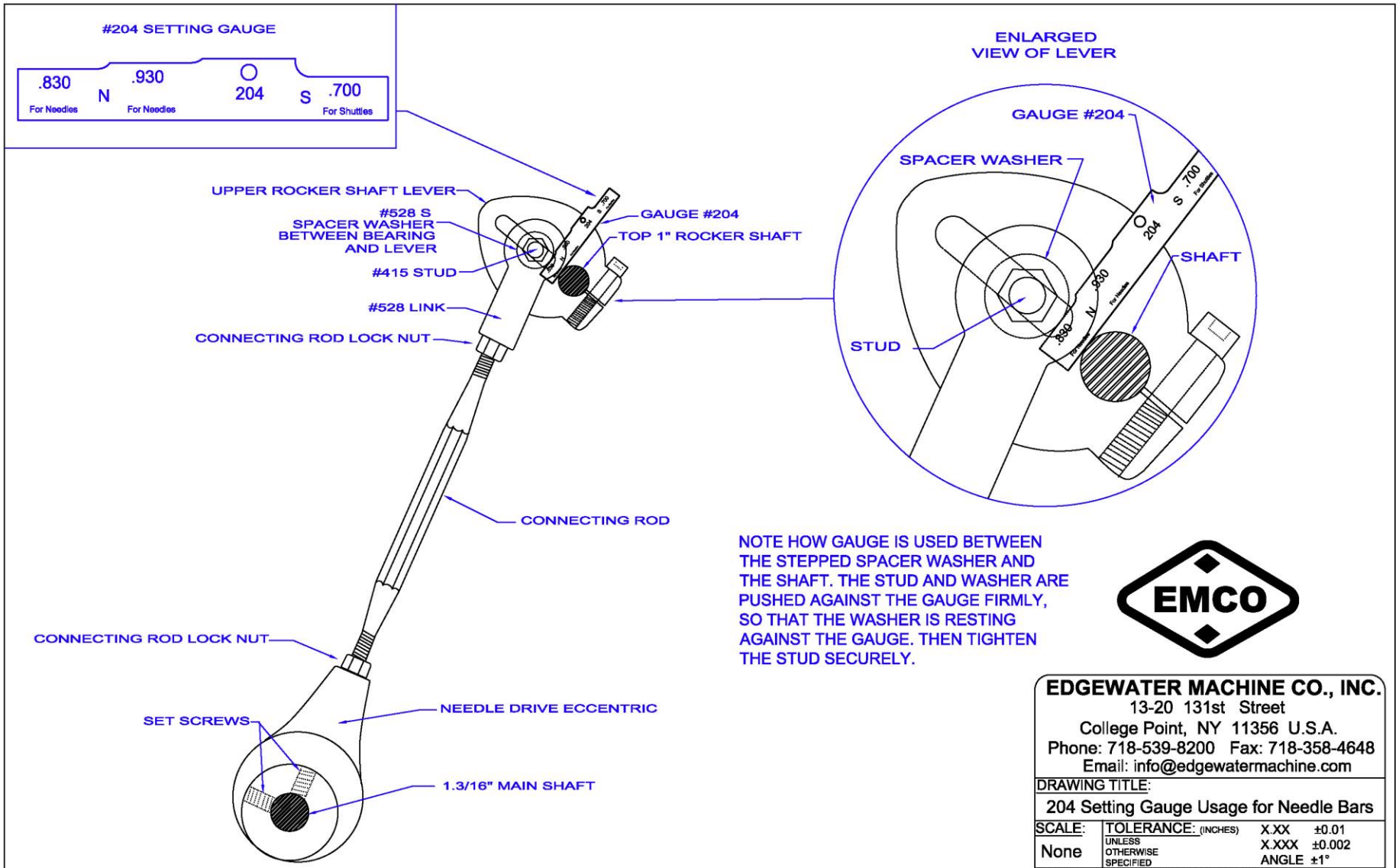
one revolution of the handwheel and test for the 1/4" loop. When you have obtained the mandatory 1/4" loop, tighten the lock nuts and test one more time to recheck.

You will now find the height of the needle bar has increased from where you left it after moving the stud inward. The needle bar always rises upward when lengthening the connecting rod. Check for proper needle clearance between the presser foot and the needle point. If the needle is now above the presser foot plate then you have finished the adjustment. If the needle point is still below the presser foot plate then you should continue the movement of the stud closer to the shaft until you are satisfied.

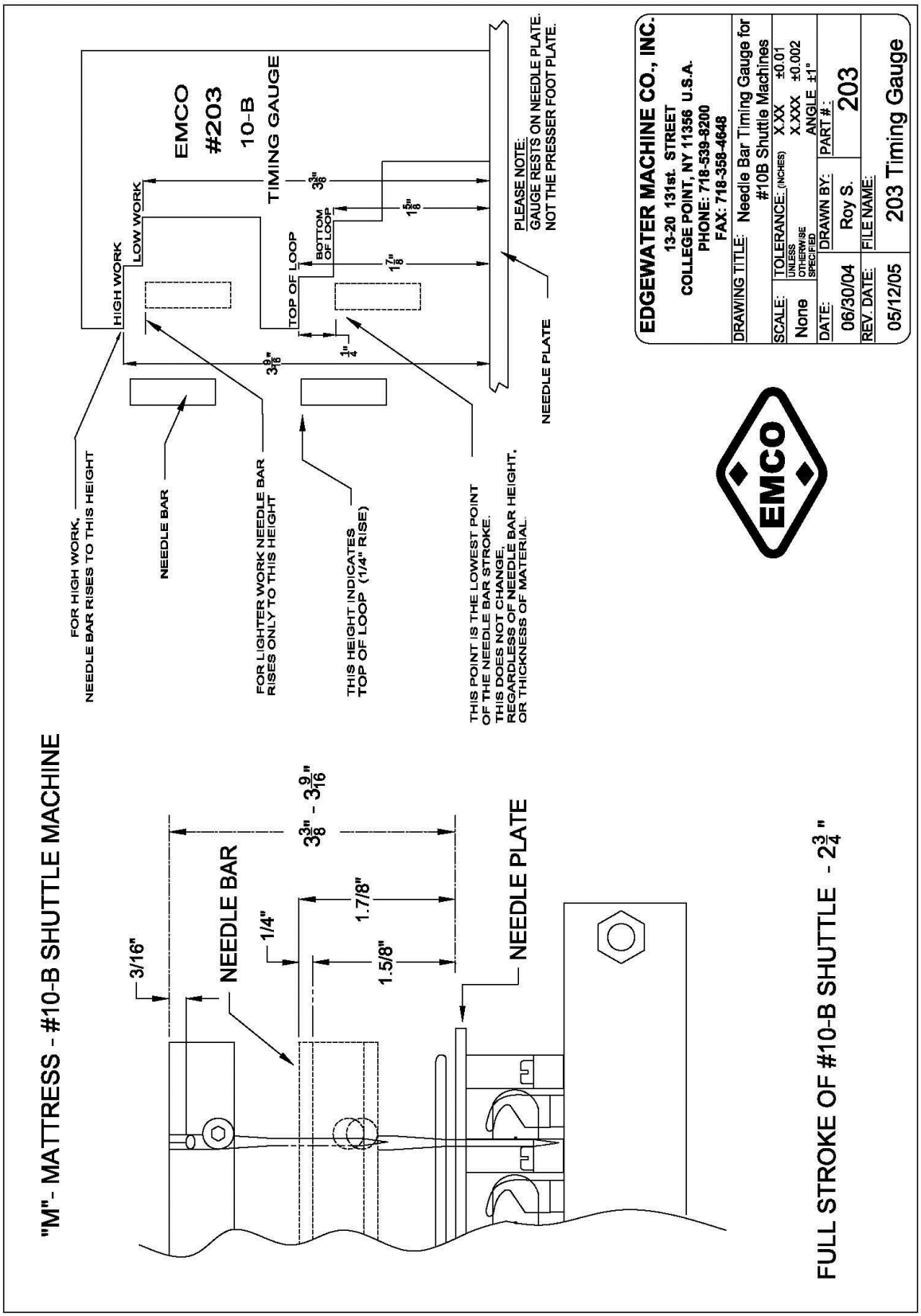
Always recheck the tightness of everything you have altered after finishing the adjustments. Leaving the nuts loose and running the machine can and will cause damage to the parts and the machine.

A helpful hint when adjusting your machine would be to make the modifications to only half of the machine first. Then test run the machine and if satisfied with the half of the machine you worked on, then proceed with the adjustments to the other side. This way if you need to return the side you worked on back to the original positions you can use the good side as a reference to work by.

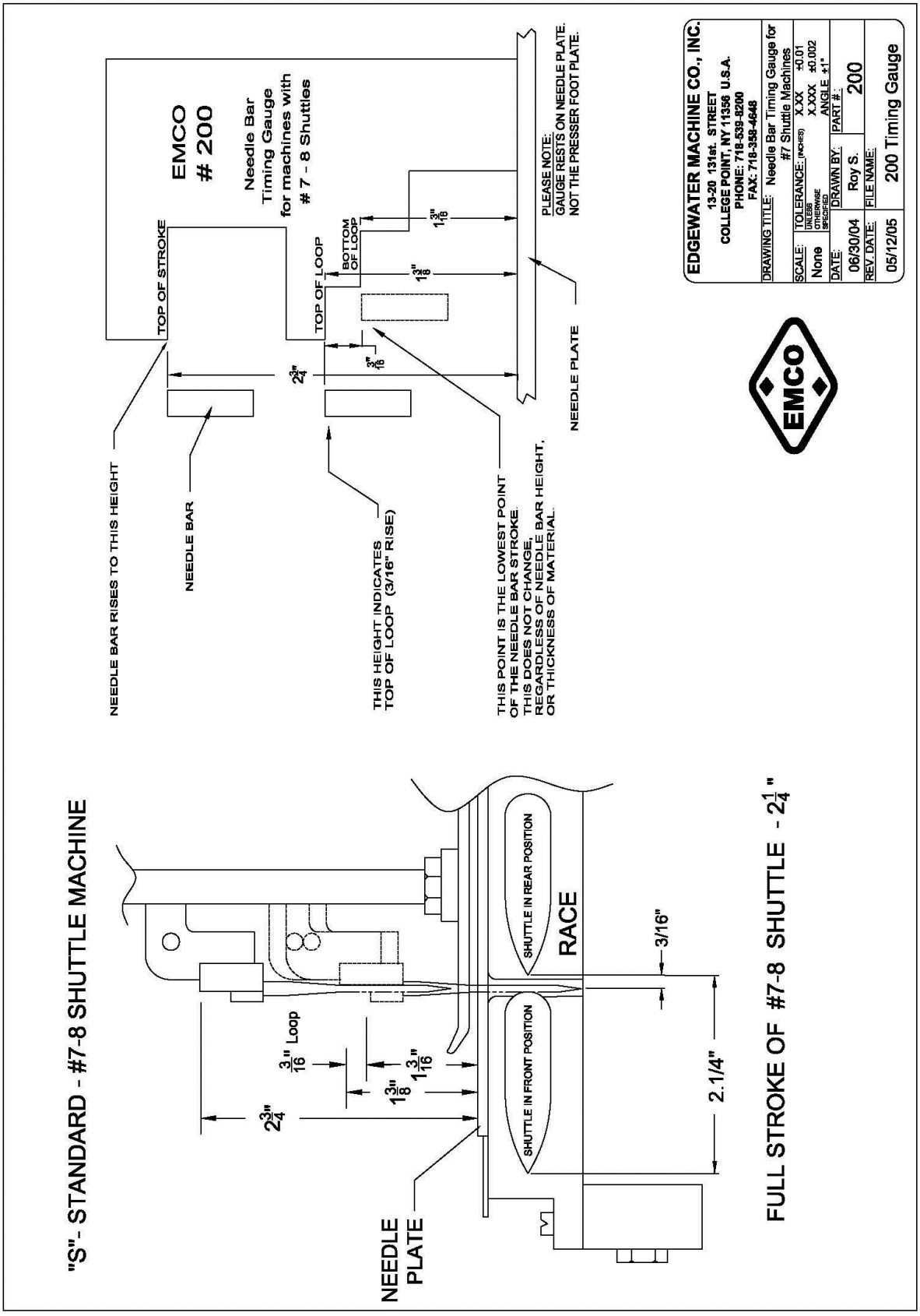
The following drawings will aid you in recognizing the parts we have talked about. The drawings show gauges being used in the timing adjustments. These gauges are to set the machine to average work specifications. If what you are altering is other than average then follow the procedure described above. If you have any questions about the procedure then contact our factory for assistance.



VIEW OF THE NEEDLE DRIVE ECCENTRIC, CONNECTING ROD, TOP LEVER, WITH STUD AND LINK.



View of timing gauge #203, for checking the stroke of the needle bar on machines with the large #10 shuttles.

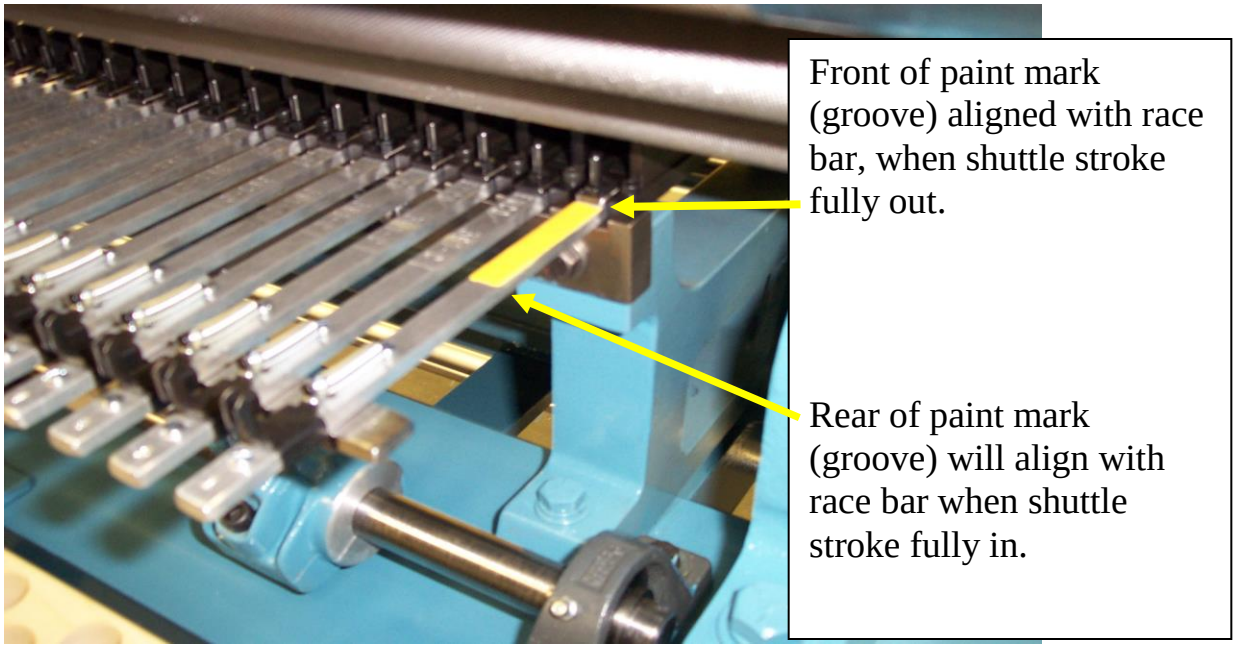


View of timing gauge #200, for checking the stroke of the needle bar on older machines using the smaller #7 shuttles.

Adjusting the Shuttle Timing

When you received your machine, you should have noticed the markings on the #1 shuttle stick. This shuttle stick is marked with either red or yellow paint and this marking represents the stroke of the shuttles. This shuttle stick has been marked with grooves at each end of the paint marking. These grooves will align with the end of the race or race bar when the stroke of the shuttles is either fully in or fully out.

If you were to watch the #1 shuttle stick as you turned the handwheel slowly, you would see when the shuttle stroke is fully in, the rear edge of the paint marking or rear groove in the shuttle stick, aligning itself with the end of the race or in other words



with the outer edge of the race bed bar.

The opposite is also true. When the shuttle stroke is fully out, the front of the paint marking or inner groove would be aligned with the race bed bar. This paint marking length or the distance between the grooves is the complete stroke of the shuttles. This shuttle stick is very important to adjusting the shuttle stroke of the machine. The shuttle

stick should be stored in a safe place and used only for checking the shuttle stroke. It is not recommended to be used as a standard shuttle stick. If the stick becomes worn out or damaged from misuse, you would be without the use of this stick. If you wish to check the shuttle timing, simply put the stick back into either half of the machine. It is best to compare both the left half and right half of the machine when checking the timing.

Also compare the left and right side of each half of the machine. This means you should check for misalignment in just the half you are working on. It is very possible if something jams the shuttle stroke that the one half of the machine could be working on a angle. For instance, if you were to place the #1 shuttle stick in the #1 location and found the stroke to look proper then you should also put the shuttle stick in the #41 location, (if this were a 84" machine as an example) , and you might find the stroke is off. This could mean that a shuttle stick was not inserted properly and may have caused a jam in this area. The result would cause this one half of the shuttle stroke to become askew or angled. If this were the case you would have to correct the alignment by loosening the driving levers and repositioning them square with the machine.

When checking the shuttle stroke with the #1 shuttle stick here are some guide lines to remember. If the shuttle stroke is to far out, and this means the inner groove or front of the paint marking is traveling farther out than it is suppose to, then the stroke must be moved inward. The opposite case would be if the shuttle stroke is traveling to far inward then the stroke would have to be brought further out.

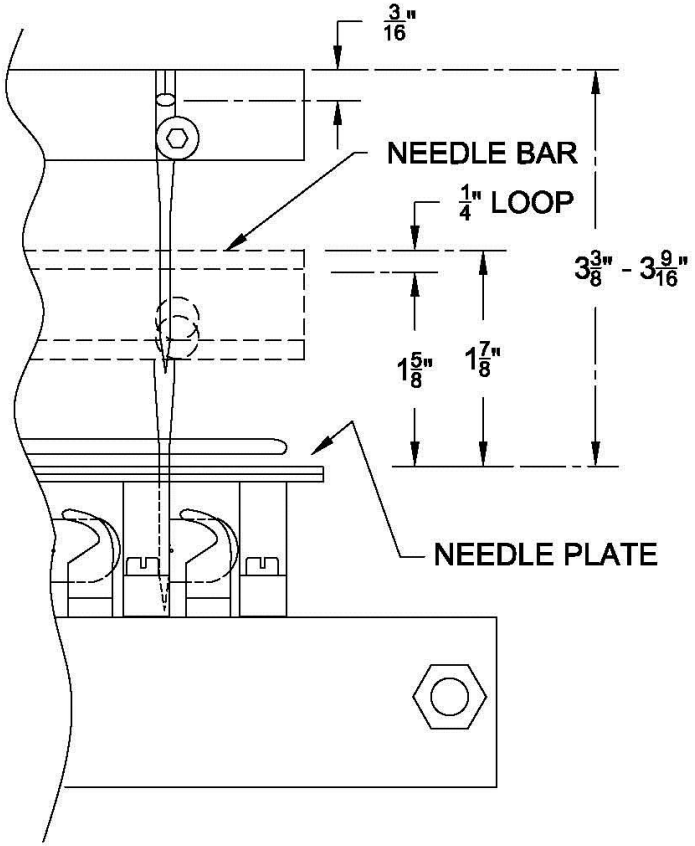
 # 7-8 Shuttle timing specifications:

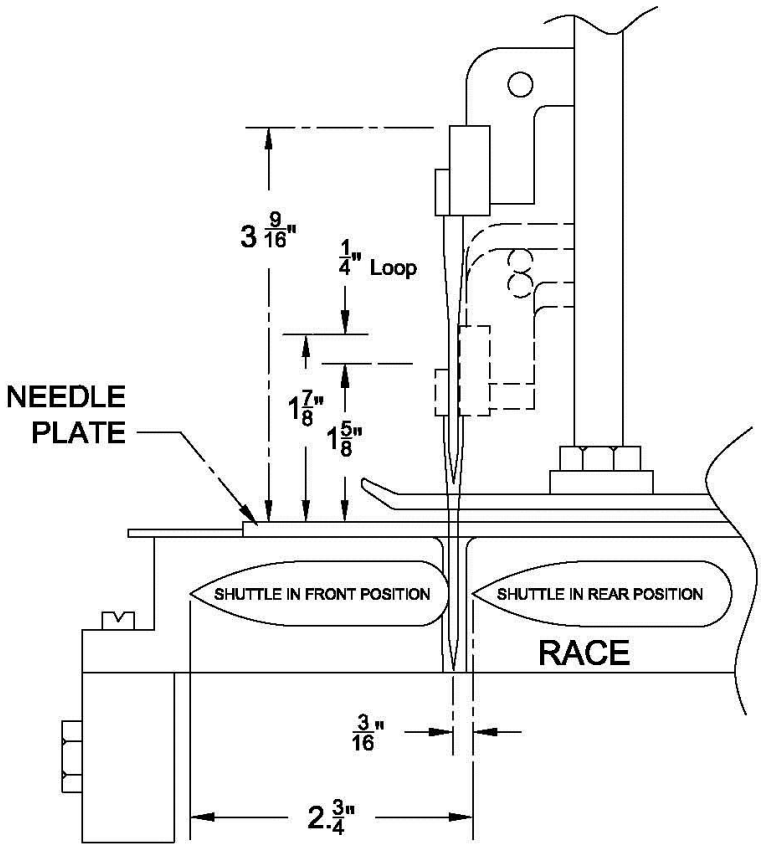
Full stroke of shuttles = 2.1/4 inches
Shuttles are fully back when pointed tip of shuttle is 3/16" from needle

 # 10 Shuttle timing specifications:

Full stroke of shuttles = 2.3/4 inches
Shuttles are fully back when pointed tip of shuttle is 3/16" from needle

"M"- MATTRESS - #10-B SHUTTLE MACHINE





FULL STROKE OF #10-B SHUTTLE - $2\frac{3}{4}$"

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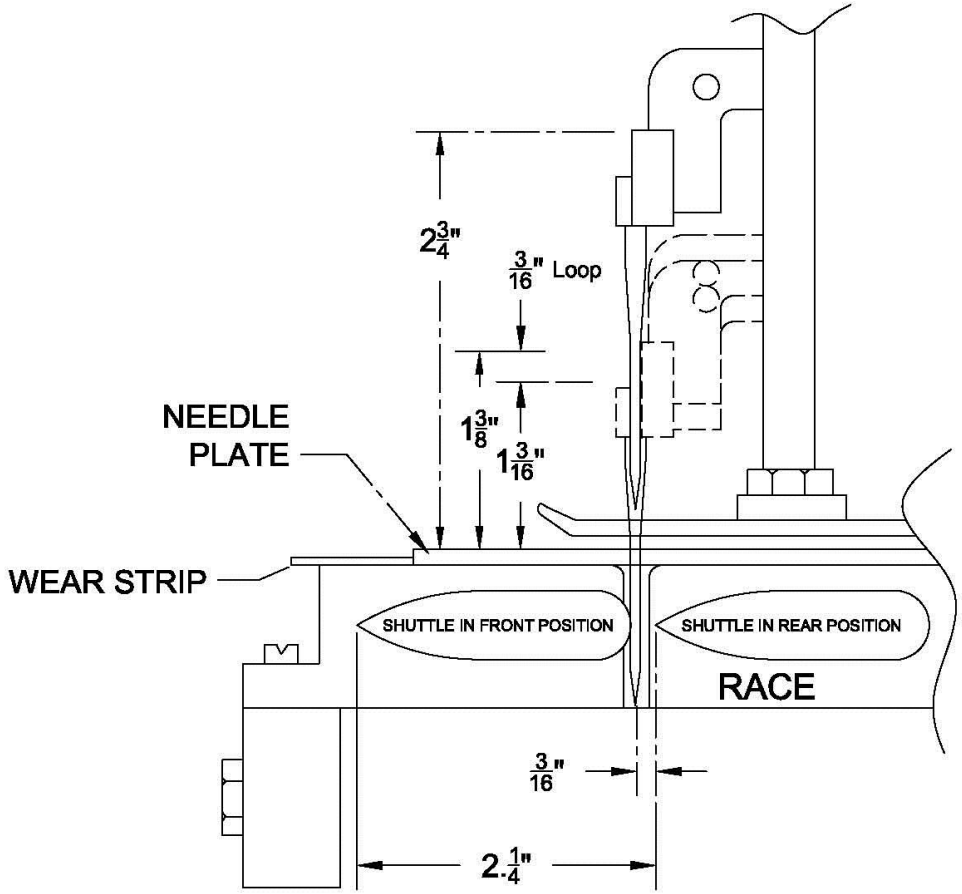
DRAWING TITLE: Needle and Shuttle Timing Positions for 10B Shuttles		
SCALE: None	TOLERANCE: (INCHES) UNLESS OTHERWISE SPECIFIED	X.XX ±0.01 X.XXX ±0.002 ANGLE ±1°
DATE: 04/26/99	DRAWN BY: Roy S.	PART #:
REV. DATE: 05/11/05	FILE NAME: NEEDLE-SHUTTLE-10B	

"S"- STANDARD - #7-8 SHUTTLE MACHINE



FULL STROKE OF #7-8 SHUTTLE - $2\frac{1}{4}$ "

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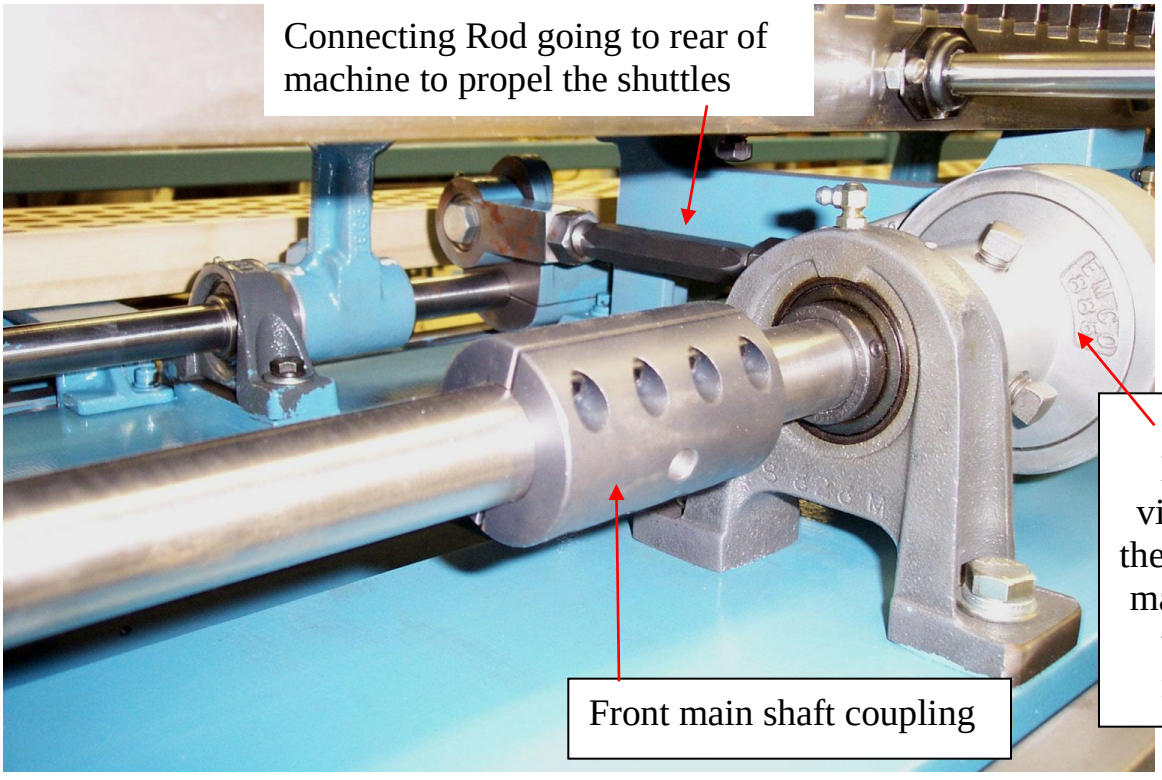
DRAWING TITLE: Needle and Shuttle Timing Positions for #7 Shuttles			
SCALE: None	TOLERANCE: (INCHES) UNLESS OTHERWISE SPECIFIED	X.XX ±0.01 X.XXX ±0.002 ANGLE ±1°	
DATE: 05/11/05	DRAWN BY: Roy S.	PART #:	
REV. DATE: 05/11/05	FILE NAME: Needle - Shuttle - #7		

Adjusting the Placement of the Shuttle Stroke

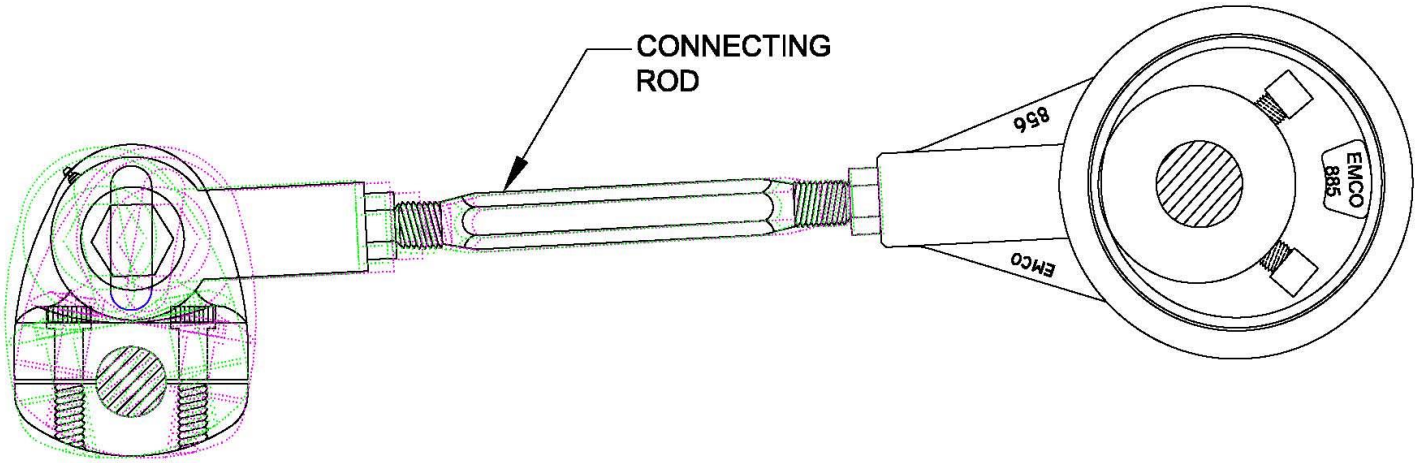
To accomplish this, use the connecting rod for placement of the shuttle stoke. Under the race bed of the area you are checking, you will find an eccentric mounted on the front main shaft. Connected to this eccentric will be a connecting rod joining the eccentric's motion to the rear rocker shaft of the machine. This connecting rod has lock nuts at each end of the rod. Both lock nuts must be loosened before adjusting this rod.

When adjusting this connecting rod, turning it inward would shift the shuttle stroke further in. Turning the connecting rod outward would shift the shuttle stroke further out. In no way does this adjustment effect the amount of stroke. This connecting rod can only adjust the placement of the stroke never the amount.

To summarize, the connecting rod is used only if the shuttle stroke is traveling to far inward or to far out. Shortening or lengthening the connecting rod would result in a new position for both the fully in position and the fully out.



Shuttle Stroke Positioning



Lengthening the connecting rod will move the shuttle stroke outward.
Shortening the connecting rod moves the shuttle stroke inward.

When the connecting rod is changed, it does not alter the amount of shuttle stroke. It only moves the stroke of the shuttles inward or outward.

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DRAWING TITLE: Shuttle Stroke Positioning		
SCALE: None	TOLERANCE: (INCHES) UNLESS OTHERWISE SPECIFIED	X.XX ±0.01 X.XXX ±0.002 ANGLE ±1°
DATE: 06/19/05	DRAWN BY: Roy S.	PART #:
REV. DATE: 06/19/05	FILE NAME: Shuttle Stoke Positioning	

Adjusting the amount of Shuttle Stroke

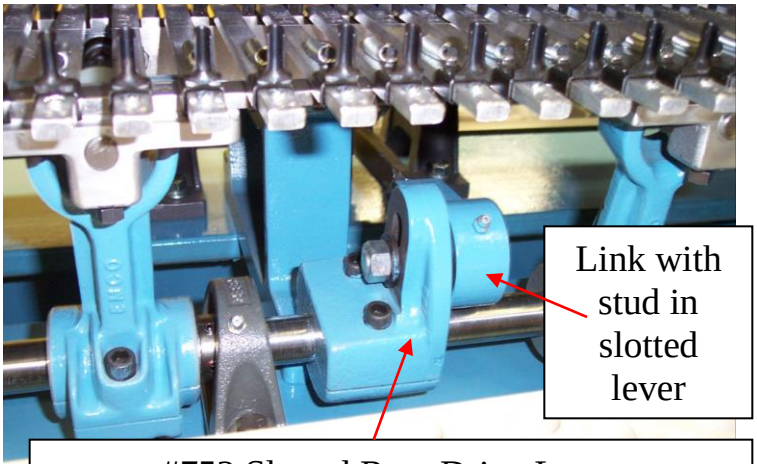
The next helpful hint to remember is for adjusting the amount of shuttle stroke travel. This is governed by the height of a stud and link in the rear drive lever on the rear rocker shaft of the shuttle drive.

This stud and link can be adjusted up or down in a slot on the rear lever. This adjustment of the stud in this slot is extremely sensitive. Moving the stud up or down a few thousands of an inch has quite an effect on the stroke of the shuttle. When the factory sets the shuttle stroke, a gauge is used to place the stud in the exact location in the slot. If you ever needed to fix the shuttle stroke after a mechanical breakdown or a possible jam of the drive mechanism, then you could experiment with the stud setting until you have the stroke proper or you could order the gauge (part # 204). If you don't have a gauge for setting the stroke of the shuttles, it is still fairly easy to adjust the stroke without one.

To adjust the stroke of the shuttles you first want to measure the length of the painted mark between the grooves of the #1 shuttle stick. This represents the length of the shuttle stroke. For a standard large #10 shuttle this length would be 2.3/4 inches long. Another way to determine the length of the shuttle stroke is to calculate the correct distance yourself. The shuttle rides past a slot on the race. This slot is the area where the needle falls into when the needles are down. This slot in the race allows the needle to be protected from the shuttle but at the same time helps to form the loop of thread necessary for the point of the shuttle to catch. A good way to view this slot is from under the machine. Looking up from under the machine you will be able to see the needles descend into slots in the races, if you have someone turn the handwheel slowly forward. When the needles are fully down notice how the shuttles ride to their furthest

rear position. When the shuttle rides past this slot in the fully back position, the point of the shuttle must be 3/16" behind the center of the slot. If you continue turning the handwheel, the needles would start to rise and the shuttles would then travel to their fully forward position. When the shuttle is in the fully forward position the rear edge of the shuttle must be 1/32" in front of the center of the slot. This distance between the two measurements represents the total stroke travel for the shuttles.

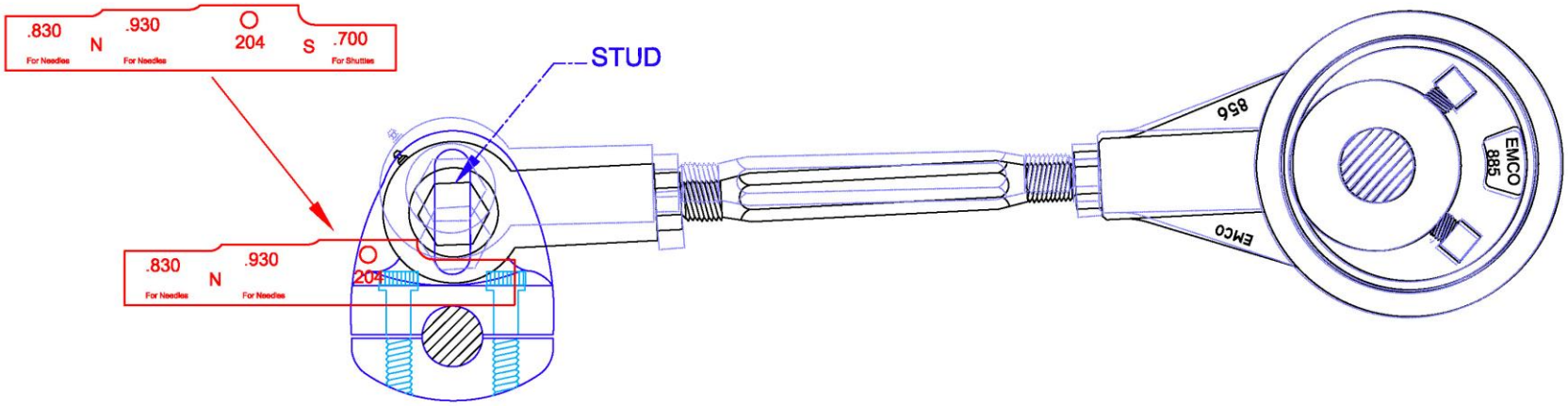
Using this derived measurement start to adjust the stroke of the shuttles by remembering these rules. ***If the stroke is greater than what is required then the stud must be raised in the slot in the rear drive lever***. However, ***if the stroke is less than what is required then the stud in the rear slotted lever must be lowered in the slot***. Move the stud only very small increments at a time. Remember that a few thousands of an inch has a large effect on the stroke. The best way to lower the stud is to loosen the nut on the stud only enough to take the extreme pressure off the nut. We want the stud to be snug with light pressure on the nut. This way you can tap the nut lower in the slot. When tapping the nut down, you can use the handle of the wrench to tap one of the flats on the hex of the nut, this way you can move the stud lower in small incremental moves. After tapping the nut lower, tighten up on the nut slightly and measure the stroke again by having someone turn the handwheel slowly. Measure the stroke length by taking the distance between the furthest rear position and the furthest forward position. This measurement should match the length of the painted mark



#752 Slotted Rear Drive Lever

Shuttle Stroke, changing the amount of stroke

The #204 timing gauge fits between the shaft and the step washer. The step washer is between the bearing and the lever.



Moving the stud downward in the slotted lever will increase the amount of shuttle stroke.

Moving the stud upward in the slotted lever will decrease the amount of shuttle stroke.

Moving this stud in the slotted lever does not change the position of the stroke, only the amount of stroke.

Caution: Moving the stud up and down is very sensitive. When the stud is moved even a few thousands of an inch, this makes a big change in the amount of stroke.

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DRAWING TITLE:	Shuttle Stroke, changing the amount of stroke		
SCALE: None	TOLERANCE: (INCHES) UNLESS OTHERWISE SPECIFIED	X.XX ±0.01 X.XXX ±0.002 ANGLE ±1°	
DATE: 06/19/05	DRAWN BY: Roy S.	PART #:	
REV. DATE: 06/19/05	FILE NAME: Shuttle Stroke, changing the amount of stroke		

on the #1 shuttle stick or in the absence of this stick, the distance you derived by watching the movement of the shuttle past the slot in the race. If the stroke is still to short, continue this procedure until the stroke is the proper length. If you suddenly find you have more then the proper amount then the stud is too low in the slotted rear lever. From this point we suggest loosening the nut and pulling the stud up higher. Then start the measuring procedure again until correct.

If you have a gauge for setting the shuttles, start by holding the gauge between the link and the slotted lever. Then slide the gauge between the spacer washer and the 1 inch rocker shaft. This is the same procedure when using a gauge on the needle drive link and lever as shown on page 60. The gauge you have may be double ended. One end is for the needle setting and the opposite end is for the shuttle drive setting. The end of the gauge for the needles is usually between .800" and .930". The shuttle end is usually between .690” - .700". When requesting a gauge from our factory, inform us of the model and serial number of the machine so that the proper gauge is sent to you.

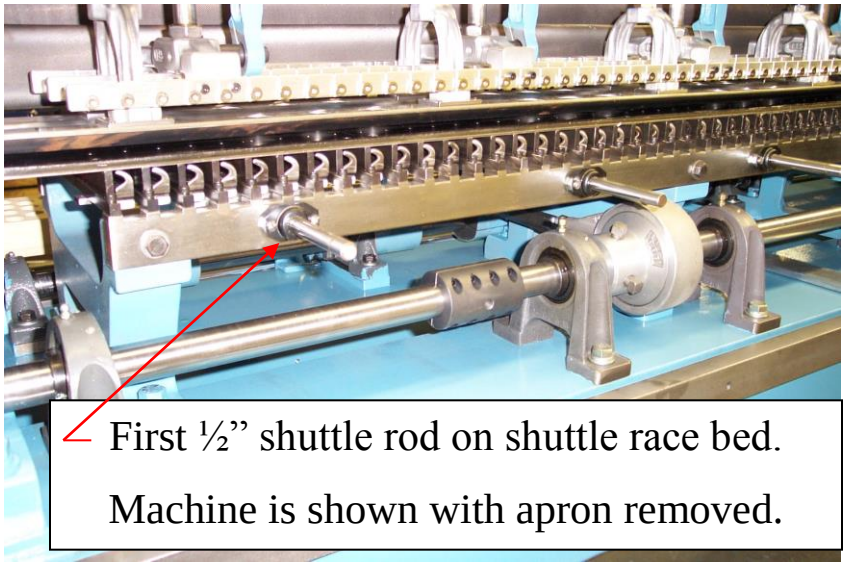
Use the shuttle end of the gauge to set the height of the stud in the rear lever. Once this is set you can then adjust the connecting rod as described earlier to position the proper shuttle stroke.

Adjusting the Timing Relationship between the Needles and Shuttles

The needles and shuttles must be timed in relation to each other in order for the shuttle to catch the loop formation of the top thread when the needle is in the loop cycle. This means the needle will form a loop of top thread and at a precise moment the shuttle catches this loop of thread and passes through it.

To achieve this the shuttles must be in a given timing relationship to the loop formation of the needles. To check or correct the timing of the shuttles you will need to have a helper assist in turning the handwheel while you are checking the shuttle movement.

Have someone turn the handwheel slowly forward starting with the needles at the top or fully up position. As the needles reach the bottom of their stroke for the first time, you should reach under the front apron of the machine and locate the nearest 1/2" shuttle rod. Follow along the front edge of the race bed bar until you feel the first 1/2" shuttle rod. Place your fingers on both the shuttle rod and the stationary retainer cap around the rod. By placing your finger in this manner it is easy to feel when the rod begins to move. It is this first movement of the shuttles coming forward that must be felt. As the handwheel is advanced slowly forward after the needles have reached their lowest position for the first time, the shuttles should start moving forward when the needles begin to raise up approximately 1/32" to 1/16".



First ½" shuttle rod on shuttle race bed. Machine is shown with apron removed.

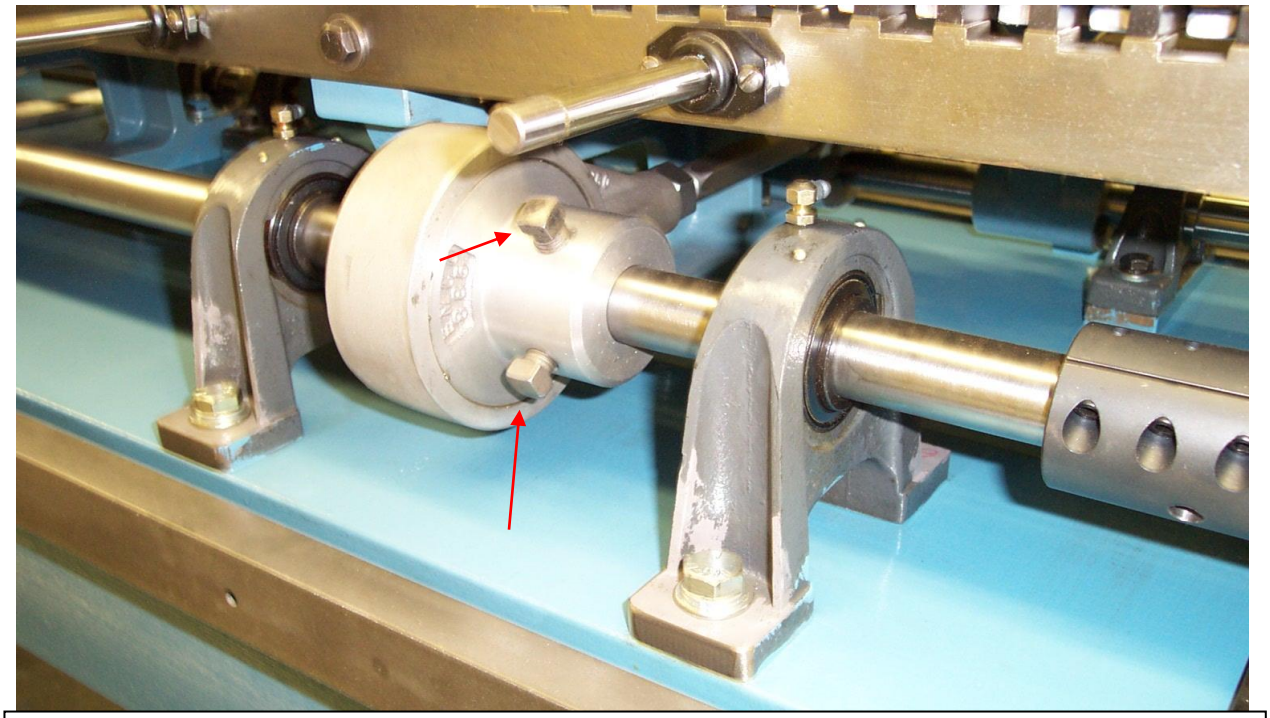
In other words the needles must begin their movement upward after reaching their lowest point the first time down and then after the needle bar starts to rise up 1/32” to 1/16”, at this exact moment the shuttles have to start moving forward.

If you wanted to look at the overall picture, the needles start their downward plunge into the cloth and at the same time the shuttles are moving toward the rear of the machine. The needles and shuttles both arrive approximately at the lowest and furthest back positions respectively at the same time. The shuttles will dwell slightly as the needles begin to rise approximately 1/32" to 1/16". At this precise time the dwell of the shuttles is over and the shuttles begin to move forward to catch the top thread loop formed by the needles. This is the ideal timing relationship between the needles and shuttles.

If the timing described is different than yours, the timing must be adjusted. When this timing is off, it is usually the leading cause of skip stitches.

To adjust this timing the shuttle eccentric must be advanced or retarded on the main shaft of the machine. To access this eccentric it is best if the apron on the front of the machine is removed for easier access. On this shuttle drive eccentric, there are two square head set screws. Using a 1/2" open end wrench loosen the set screws. You will have to have the handwheel turned and held in position while you follow this procedure. Turning the handwheel will give access to both the set screws. If the timing is only slightly off, it may be advisable to purchase from a local supplier, another set screw similar to one of these screws, and grind the point of the screw flat. Using a flat pointed screw, you will be able to make minor adjustments. Without a flat pointed screw, if you had to make a very slight adjustment, the screw would tend to fall back into the original set screw marks on the shaft. You would not be able to adjust carefully enough to achieve a small adjustment change. If the adjustment is other than minor a flat pointed screw won't be necessary. The original set screw would bite into a new location on the main shaft.

Let's assume you need only a slight adjustment. Replace one of the screws with a flat pointed screw. Pick the proper screw to replace when the needles are fully down and this would give you access to at least one screw when the shuttles are approximately in position. If you replace the wrong screw it may be out of reach while you try to make this adjustment. Using only the flat pointed set screw to work with, have the needles at their lowest point for the first time. Now instruct the person turning the handwheel to move the handwheel **very** slowly forward. When the needles have



View of the shuttle drive eccentric from the front of the machine, with the apron removed. You can see the square head set screws in the hub of the eccentric (arrows).

risen approximately 1/32" to 1/16" have him stop and hold the handwheel very steady. You at this point you should rotate the shuttle drive eccentric forward, this means the top of the eccentric is rolled towards the front of the machine, until the shuttles just barely begin to move forward. At this precise moment tighten the flat point set screw. With only this one screw tightened, have the handwheel rotated completely around for one revolution. Carefully watch as the needles reach their lowest point for the first time

and then rise 1/32" to 1/16". The shuttles if correctly timed should begin to move forward.

If the shuttles are too late in moving forward, in other words, if the needles rise up 1/8" or more before the shuttles start to move then the shuttles must be advanced further forward. Or if the shuttles move before the needles have risen 1/32" to 1/16" then the shuttles should be retarded backwards.

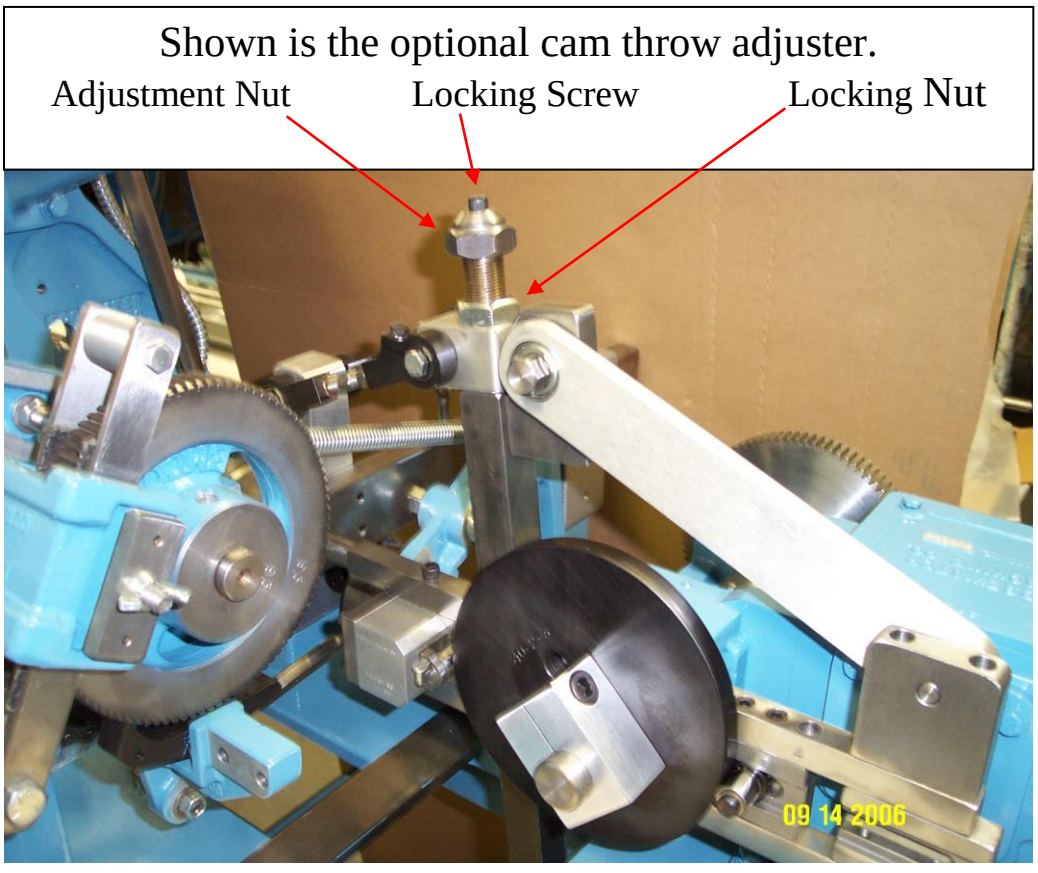
By using the flat pointed set screw only, if you have to reposition the eccentric several times the screw will not leave any extra marks on the main shaft. Once you arrive at the proper timing the second original set screw should be tightened securely and then the flat pointed set screw removed and replaced by the original set screw. Be sure both screws are securely tightened before running the machine.

When correcting both the right and left halves of the machine's shuttle timing, work only with one side at a time. Correct the one side and then run the machine. If you are pleased with the performance then adjust the second side of the machine to match the first.

Adjusting the Optional Cam Throw Adjuster

The optional cam throw adjuster can not be retrofitted out in the field. Extensive alterations would be required and we recommend that the adjuster be installed when the machine is originally built at our factory. This optional cam throw adjuster allows the operator to increase or decrease the amount of throw the cam advances the carriage per cycle of the cam. For example if a cam is designed to move the carriage 4" out and then 4" back in one complete cam cycle, then if required, the operator could increase by as much as 5/8" the motion of this cam. The cam adjuster could also decrease the cam motion if this is desired. Normally these cam adjusters are used for heavy goods. The heavier the goods the more they drag because of friction under the presser foot. This drag creates less movement in the cloth and the pattern ends up being narrower. By increasing the amount of throw the pattern can be adjusted back to a normal appearance.

Shown is the optional cam throw adjuster.

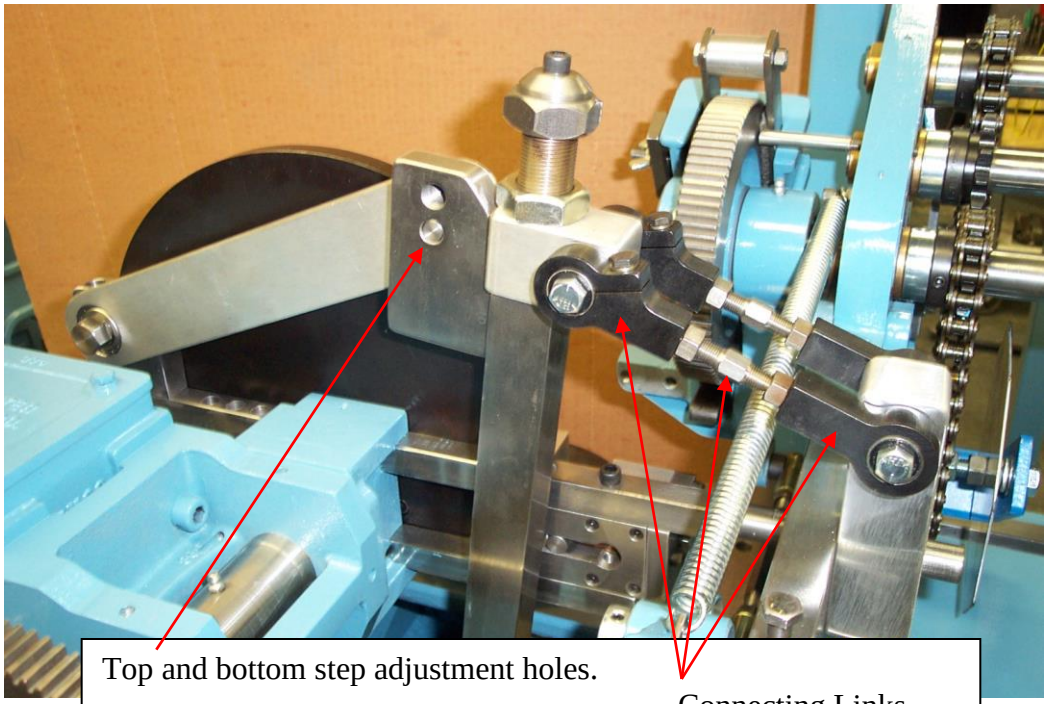


When using this adjuster, you will find two locking devices. The first is a socket head cap screw on top of the adjuster and the second is a locking nut slightly lower down. In between these two locking devices is the adjustment nut. This adjustment nut will raise or lower a block under the lock nut.

When the adjustment nut raises the block, the cam motion will be increased. If the adjustment is turned so the block is lowered, the cam motion will decrease. After altering the adjustment nut be sure to tighten both the locknut and the locking screw. Failure to tighten these locking devices will damage the components.

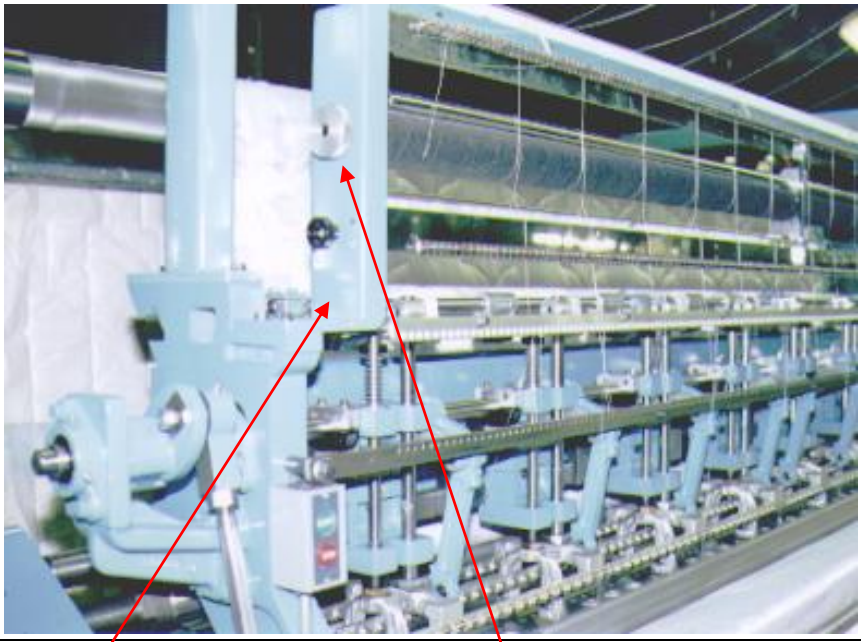
There is also one more adjustment. This is a step adjustment. As shown in the picture below, you will find two threaded holes in a block behind the adjustment nut. Either of these holes will work. However, the top hole is the step that decreases the overall amount of adjustment. For example, using the top hole will probably only give you a range of between plus or minus 1/4" throw. If you were to step down to the lower hole, this would change the range to probably 1/4" to 5/8" of increased throw. Most often you would probably be using the lower hole.

There are two identical connecting links connecting the cam throw adjuster to the carriage cross bar. ***NEVER*** adjusts these links. These are set at the factory and if adjusted differently would cause the carriage to bottom out against the end stops and possibly cause damage to the adjuster or any point in the cam drive mechanism.



Using the Optional Electronic Stop Motion Device

The electronic stop motion device will detect both top thread and bobbin breakage if used properly. The device has sensitive springs of which the thread passes through. These springs will be held slightly off a contact bar from the tension of the top thread. If the tension of the top thread goes slack, then the spring touches the contact bar and the machine will stop. The sensitivity of this device depends on the usage by the operator. The spring must be running fairly close to the contact bar. The contact bar is adjustable in a manner by swinging the bar farther or closer to the spring. The spring is held up by tensioning the threads uniformly with the black roller on the stop motion device. This black roller is a top thread tensioning device for all the top threads at once. There are individual tension springs for each thread, but they should never be used for adjusting the threads for sewing. These springs are factory set and are there only to hold tension on the thread for the contact spring. If the threads appear to be running to loose or to tight, then the operator should use the knob adjacent to the black roller on the left side of the stop motion device. This large aluminum knob if turned inward will increase the thread tension uniformly across the machine. If the knob is adjusted outward this would decrease the thread tension.



Electronic Stop Motion Device.

One very important note, ***the black roller must always be turning*** when the machine is running. If the black roller stops even though the machine is running, then the aluminum knob for the black roller has been tightened too much. If the black roller is spinning to aggressively, then the knob needs to be tightened slightly more.

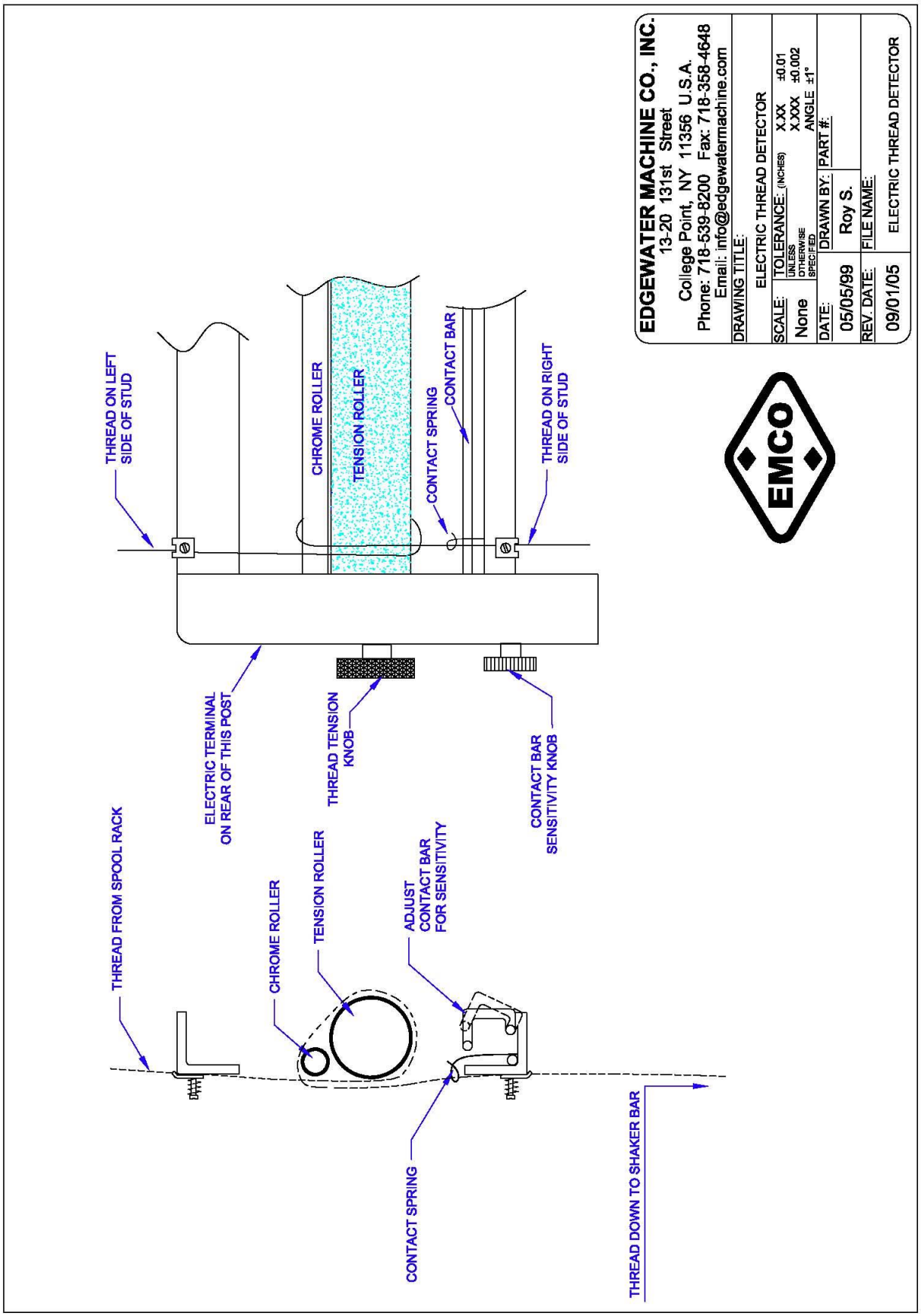
Ideally you want the black roller turning while the machine is running and the contact spring should be as close to the contact bar as possible without touching.

To thread the stop motion device the thread should enter on the left side of one of the small tension springs on the top of the device. Simply hook the thread around the left side of the spring. Then pass the thread down to the black roller and rap the thread around the roller, passing in front of the roller, under the roller, up behind the roller and then over the small free running roller just above the black roller. Continue the thread down to the lower tension springs but this time use the next spring to the right of the one at the top. Hook the thread behind this spring on the right side of the spring.

Let's review using this example. The top thread is hooked behind the right side of spring #11. Then route the thread in front, under and behind the black roller. When the thread comes up the back of the black roller, then pass it over the small free running roller just above the black roller. From here run the thread down to spring #12 and hook it behind this spring.

Your next step is to pull up one of the contact springs in line with the thread and hook the spring around the thread. The thread should now be holding up the spring. Your final step would be to adjust the contact bar by swinging it up behind the contact spring. Keep this bar close but do not let it touch the spring.

After the threads have all been routed through the stop motion device, they should then be passed through the stationary eyelet bar on the machine, then the


EDGEWATER MACHINE CO., INC.
13-20 131st Street
College Point, NY 11356 U.S.A.
Phone: 718-539-8200 Fax: 718-358-4648
Email: info@edgewatermachine.com
DRAWING TITLE:
ELECTRIC THREAD DETECTOR
SCALE: None
TOLERANCE: (INCHES) UNLESS OTHERWISE SPECIFIED X.XX ±0.01 X.XXX ±0.002 ANGLE ±1°
DATE: 05/05/99
DRAWN BY: Roy S.
PART #:
REV. DATE: 09/01/05
FILE NAME: ELECTRIC THREAD DETECTOR
EMCO
THREAD ON LEFT SIDE OF STUD
CHROME ROLLER
TENSION ROLLER
CONTACT SPRING
CONTACT BAR
THREAD ON RIGHT SIDE OF STUD
ELECTRIC TERMINAL ON REAR OF THIS POST
THREAD TENSION KNOB
CONTACT BAR SENSITIVITY KNOB
THREAD FROM SPOOL RACK
CHROME ROLLER
TENSION ROLLER
ADJUST CONTACT BAR FOR SENSITIVITY
CONTACT SPRING
THREAD DOWN TO SHAKER BAR

shaker bar and finally down to the needles. Consult the chapter on threading the top thread. When all the threads are threaded in the same manner, you are ready to run the machine.

While the machine is running you can first adjust the aluminum knob to control the turning of the black roller. As mentioned earlier, this roller must turn. Slowly tighten the knob until the roller is almost stopped. Then back it off so that the roller is continually turning as the machine pulls the thread into the needles. The contact springs should be bouncing slightly up and down as the thread is pulled. If you experience one or two threads that are too loose and this causes the contact spring to bounce to aggressively then you should tighten the individual springs above and under the black roller for those particular threads. Normally the springs should not be touched, but if you find some contact springs bouncing too much then adjust the springs. Finally, you can set the contact bar as close as you can to the contact springs. If you get to many false alarms, meaning the machine is stopping too often and there is no broken thread then the bar is too close. If the machine does not stop when you have a bobbin thread breakage, then the bar is too far away from the contact springs.

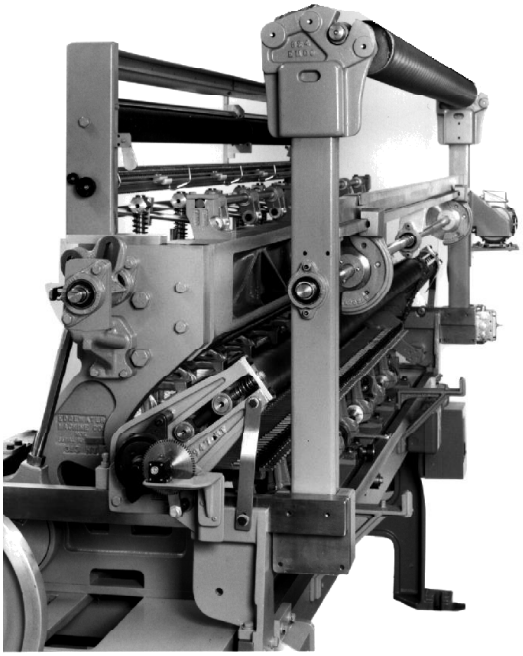
The stop motion device is not fool proof and is usually as reliable as the operator controlling it. There will be times when the top thread might drag with the material and even though the thread is not in the eye of the needle. This will happen when the sensitivity is not set sensitive enough. Think about what is happening to the thread is this does occur. The other threads are being pulled through the cloth and the shuttle has to pass through a loop of this top thread. Let's assume for argument sake that the threads that are sewing are using approximately 3/4" of thread per stitch. The one

thread that is not in the eye of the needle and is simply being pulled along with the cloth can't possibly be using 3/4" of thread per stitch. This thread is being pulled but not at the same rate as the others. This is where the sensitivity of setting the spring contacts and contact bars comes into play. If the contact bar is too far from the springs, then the loose thread's contact spring will be bouncing more aggressively than the others but won't touch the contact bar. If the contact bar is brought closer to the springs, then when a spring begins to bounce more then the others the machine will stop.

Practice using the stop motion device correctly. If you are sloppy at setting the sensitivity of the device then you will find it will not work properly for you.

Using the Optional Trimming Knife Attachment

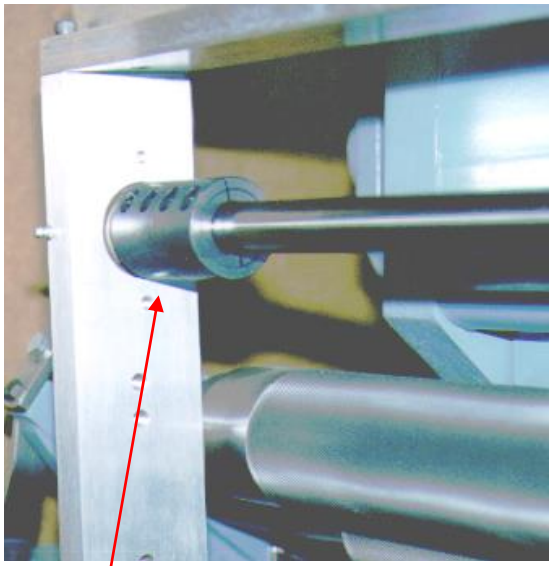
The optional trimming knife attachment is fastened on the rear carriage of the machine. The knives are used in conjunction with combination cloth guides and guards. These combination guides and guards will guide the cloth into the knives and also guard the knife. At all times keep the knives covered by these guards. The only time the knives should be exposed without guards are when you are moving the knives or sharpening them. The guards hook easily onto the frame of the attachment. The knives are removable from the shaft of the attachment by use of couplings on each end of the knife shaft.



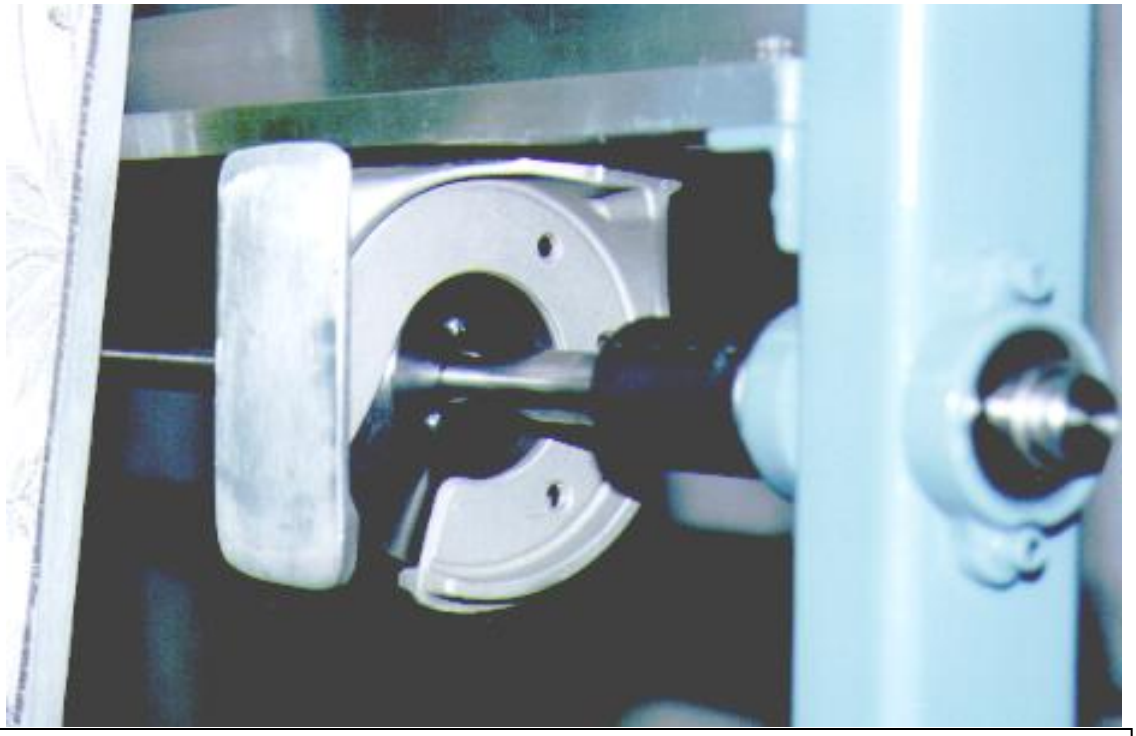
Trimming Knife Attachment shown on the rear of machine, with optional top following roller

These couplings allow the operator the convenience of adding or removing knives from the shaft without having to pull the shaft out of the attachment.

To use these couplings simply remove the knife guards and slide the knives to the center of the attachment. Then loosen the screws in the couplings and slide the first



Coupling shown on trimming attachment knife shaft.



View of the combination guard and cloth guide covering the knife blade.

coupling inward about 2 inches. This should clear the stub shaft coming out of the side column of the trimming attachment. Then loosen the screws on the other coupling. Be careful from this point. As you slide the coupling inward the knife shaft will pivot on the center bearing holding the knife shaft. This would allow the knife shaft to tilt in either direction and possibly end up with the knives sliding off the shaft. Cautiously hold on to the shaft as you slide this coupling inward. The shaft is now free to pivot on the center bearing. Carefully pivot the shaft only enough to allow room to slide the coupling and knives off the shaft for removing knives or adding knives. After the knives have been removed or added, reverse the procedure to reinstall the couplings.

As soon as the two couplings are secured space the knives accordingly along the knife shaft and then immediately cover them with the knife guards. **NEVER** leave the

knives exposed. Even if the machine is not running someone could walk or bump into them.

The trimming attachment comes standard with a three position switch. The switch is marked AUTO / OFF / MANUAL. In the OFF position the trimming attachment will not run. Whenever the operator performs any maintenance or adjustments to the knives or any components of the trimming attachment the switch must be in the OFF position.

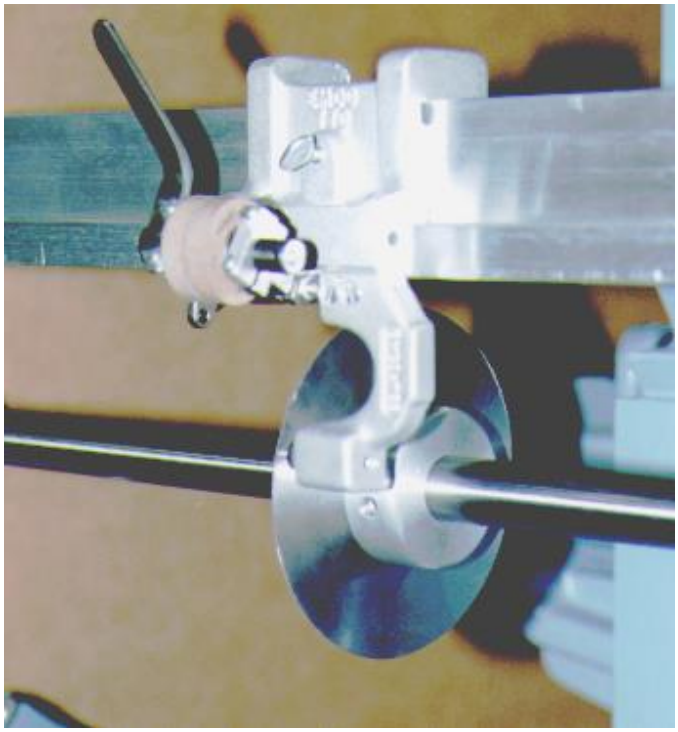
The AUTO position for the switch is used when the quilting machine is running and you want the trimming attachment to start and stop whenever the quilter starts and stops. In this position the trimming attachment gets power from the motor starter of the quilting machine. When the motor starter is activated to run the quilter the same contacts in the motor starter control the trimming attachment. This switch position is safer for the operator because the cutting knives will stop spinning when the quilting machine stops running. Typically the quilter is stopped for maintenance, reloading material, reloading shuttles, or for cleaning. And it is always safer to have the cutting knives stopped when working on or around the quilting machine.

The MANUAL position on the switch is used primarily for sharpening the cutting knives. The quilting machine and the trimming attachment should be turned OFF first before the operator is prepared to use this MANUAL position of the switch. Never leave the switch in the MANUAL position when operating the quilting machine. This would result in personnel being injured if he or she would come into contact with a spinning knife blade that was left running while the quilting machine was left unattended.

This MANUAL switch setting is used when the operator needs to sharpen the cutting knives. The operator first should make sure there are no other personnel around the area near the knives. Then the operator should remove only one knife guard at a time and position the knife sharpener over the blade to be sharpened. Please see the chapter in this manual for the proper use of the knife sharpener. With the knife sharpener in position and ready to use, the operator then turns the switch to MANUAL and the knives will spin. While the knives are spinning, the operator should sharpener the blade and when finished, immediately turn OFF the switch and replace the guard over the blade. Never leave knife blades uncovered. Always have the guards in place over the knife blades and properly adjusted to avoid injury to personnel.

Using the Knife Sharpener

The trimming attachment also comes with a knife sharpener. This sharpener can be positioned over a knife after removing the knife guard. The machine and the trimming attachment must be turned off so that you can align the sharpener over the knife. The sharpener has a brass tipped set screw extending from a small curved arm. Place this screw gently against the side of the knife and secure the sharpener with the top thumb screw.



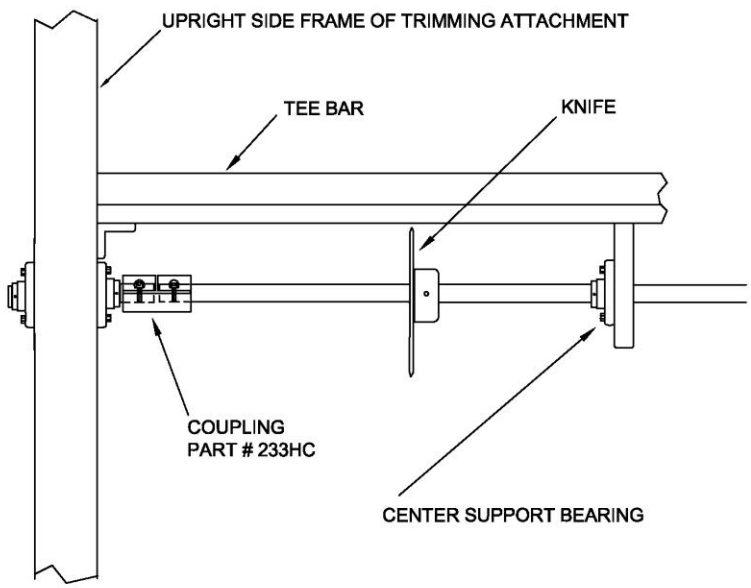
View of the knife sharpener over the blade.

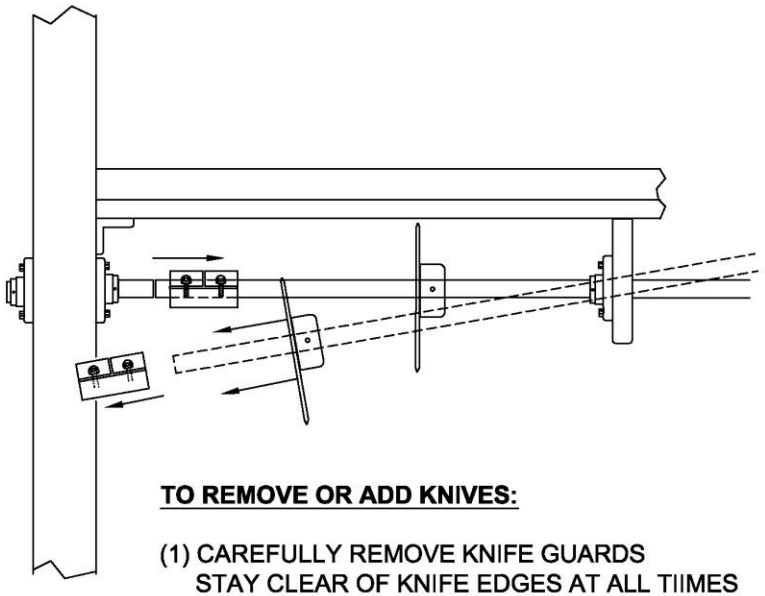
Now check as you swing the sharpening stones downward onto the knife. The stones should straddle the knife, one on each side of the blade, and if light pressure is held downward on the stones, both stone wheels should have friction against the blade. If only one stone has friction and the other is spinning free, then the stones are not straddling the knife correctly. Reposition the sharpener until both stones have friction against the knife. If necessary readjust the brass tipped set screw in the curved arm to align the two stones over the knife blade. Again, the stones should have equal friction against the knife blade if gentle downward pressure is used to make contact with the stones and the knife blade.

Now turn on the manual switch on the trimming attachment. This will spin the knife shaft without the quilting machine running. As the knife is spinning, slowly bring the sharpening stones downward against the knife blade. The stones will begin to rotate as the knife rotates. Stop the knives when you think the blades are sharp and immediately restore the guard over the knife blade after sliding the sharpener to the side. The sharpener can be stored right on the trimming attachment frame. Simply keep it off to one of the extreme sides on the top bar of the frame.

When running the attachment the switch controlling the knives should always be set in the "Auto" position if using the trimming attachment. This position will automatically start and stop the knives when the quilting machine is started and stopped. **Never** leave the switch in the MANUAL position. This setting would result in serious injury if personnel were to come in contact with a spinning knife blade.

VIEW OF EMCO TRIMMING ATTACHMENT
LEFT SIDE OF TRIMMING ATTACHMENT SHOWN WITH GUARDS REMOVED

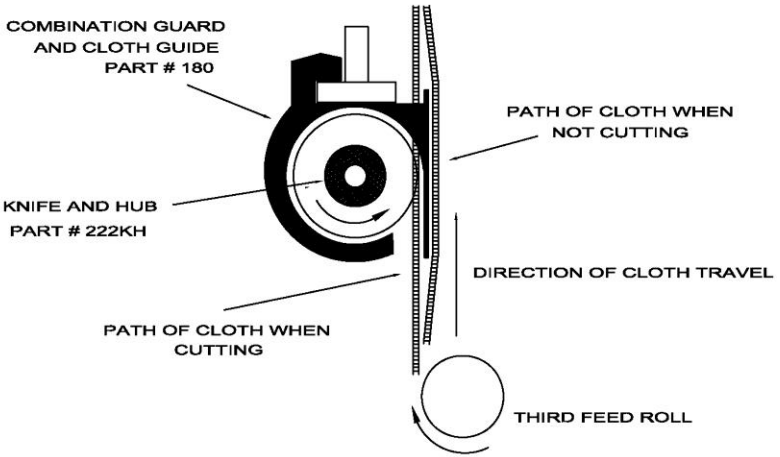




TO REMOVE OR ADD KNIVES:

(1) CAREFULLY REMOVE KNIFE GUARDS
STAY CLEAR OF KNIFE EDGES AT ALL TIIMES
(2) LOOSEN COUPLING AND KNIVES
(3) SLIDE COUPLING TOWARD CENTER OF MACHINE
(4) SWING SHAFT AS SHOWN ABOVE
(5) SLIDE COUPLING OFF SHAFT
(6) REMOVE OR ADD KNIVES AS DESIRED
(7) REINSTALL COUPLING TO JOIN SHAFTS
(8) POSITION KNIVES AND SECURE
(9) ALWAYS REPLACE KNIFE GUARDS WHEN FINISHED

SIDE VIEW OF KNIFE WITH GUARD INSTALLED



EDGEWATER MACHINE CO., INC.
13-20 131st. STREET
COLLEGE POINT, NY 11356 U.S.A.
PHONE: 718-539-8200
FAX: 718-358-4648

DRAWING TITLE:	TRIM WITH UPWARD CLOTH TRAVEL	
SCALE: None	TOLERANCE: (INCHES) UNLESS OTHERWISE SPECIFIED	X.XX ±0.01 X.XXX ±0.002 ANGLE ±1°
DATE: 11/05/02	DRAWN BY: Roy S.	CHECKED BY:
REV. DATE: 11/26/03	FILE NAME: TRIM WITH UPWARD CLOTH TRAVEL	

Using the Motorized Backstand

The motorized backstand is standard equipment on three needle bar 1x3x6 quilting machines. Optional on 1x3 two needle bar machines. The backstand is used as a canopy behind the quilting machine, to allow the operator access to the shuttle area, by routing the cloth over the head of the operator.

This backstand uses a D.C. motor drive to pull tension on the finished cloth exiting the feed rolls of the quilting machine. Constant tension is always necessary to prevent pattern distortion while the quilting machine is running. This motorized backstand utilizes a torque controlled motor and pulling rollers to accomplish the constant tension. The control box on the backstand is configured for pulling tension, (torque), and not for speed. The potentiometer on the control is used for setting the desired amount of pulling tension, not speed.

If slack in the cloth were to develop between the feed rolls and the backstand, the control box, if properly set, would accelerate the pulling of the cloth until tension on the material is sensed. Once tension is applied, the control box would then slow the pulling tension to match the speed of the quilting machine. This is how the control box maintains the tension on the cloth.

Set the switches on the control box as follows: The start / stop switch should be set to Start. This turns the power ON. The Forward / Off / Reverse switch set to Forward. And the Run / Off / Jog switch set to the middle OFF position. The potentiometer can be set anywhere from 30 to 60 as a recommended setting. The operator should adjust this potentiometer to maintain proper tension on the cloth at all times. If slack is developing in the cloth the potentiometer should be increased.

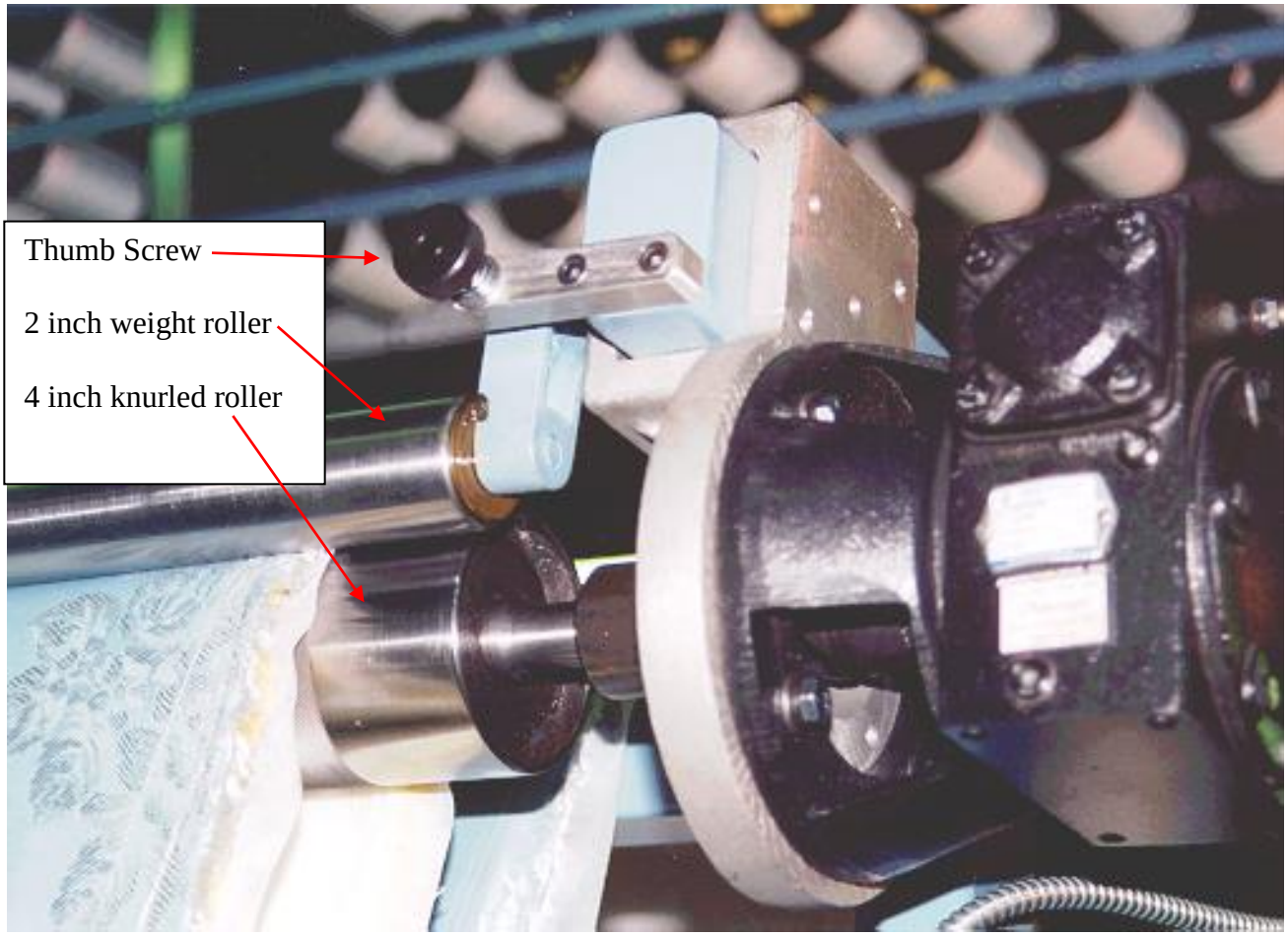
If too high a setting is used the pulling roller on the backstand will start to spin continuously even if the cloth is not traveling fast enough. This high setting, causing the roller to spin, will result in premature wearing of the knurling on the pulling roller. Always adjust the tension just high enough to keep the roller turning at the same speed as the cloth travel. Do not set the potentiometer too high and let the roller spin freely at high speed.

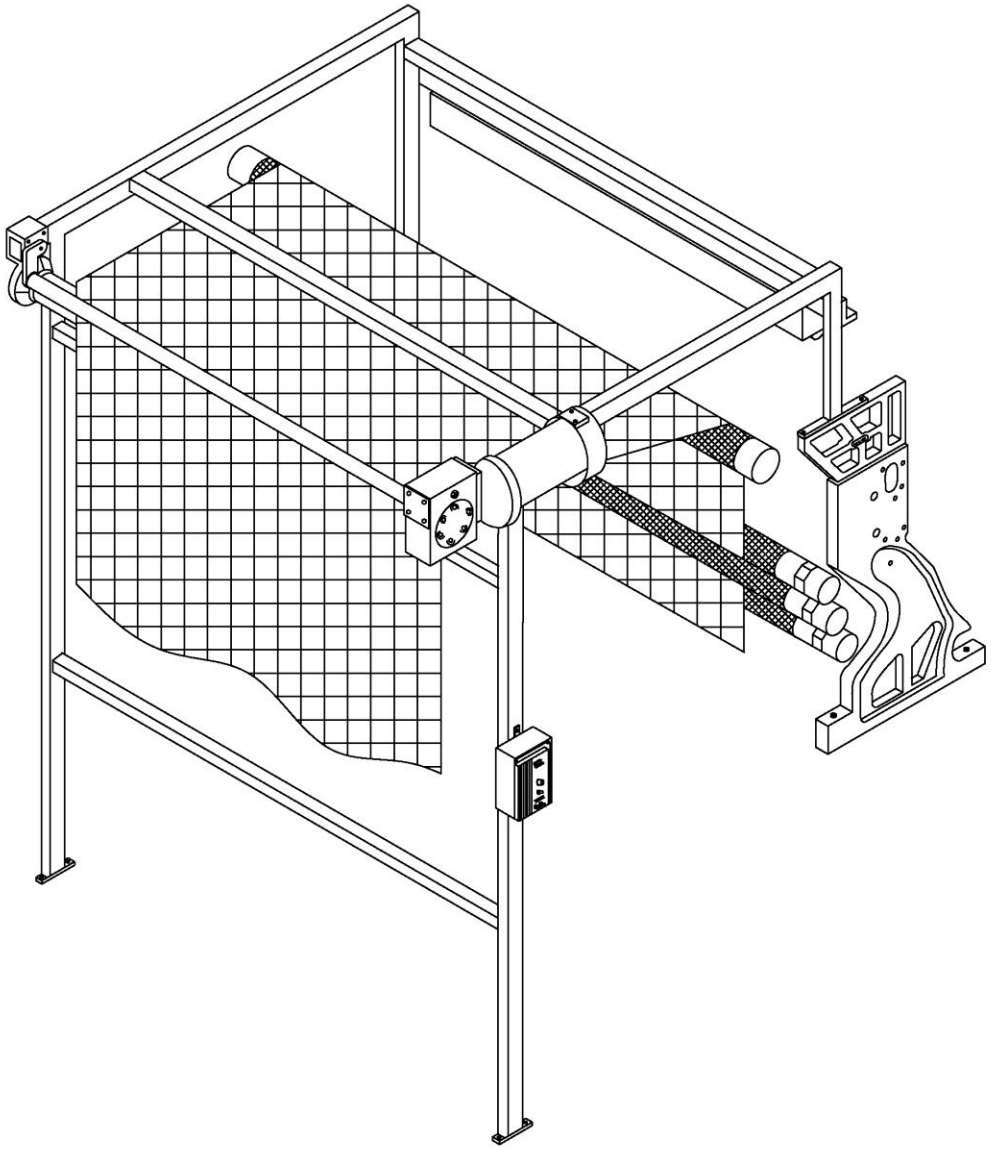
The Run / Jog switch can be used if the quilting machine is stopped and you wish to remove slack in the cloth or need to backup the cloth. The jog switch is a momentary switch that the operator can switch ON as long as the switch is held in that position. When released the switch springs back to the OFF position and the pulling motor will stop. The other position of the switch is the RUN position. In this position the motor and rollers will run continuously. Do not leave the switch in this position for continuous use with the quilting machine. The quilting machine will automatically start and stop the backstand rollers if the switch is not in the run position. Leave this switch in the middle position for automatic operation.

The Forward / Reverse switch is used to set the direction of cloth travel. Normally the Forward direction is chosen. If the operator needs to disable the drive, the switch can be set in the OFF or middle position and if the operator needs to back up the cloth, the switch can be set in the reverse position and the jog switch used to temporarily backup the cloth.

The backstand has guide roller(s) to direct the cloth travel and it also has a knurled 4 inch pulling roller and a 2 inch weight roller. The 4 inch knurled roller does the actual pulling of the cloth and the weight roller applies downward pressure on the cloth

to keep the cloth pressed against the 4 inch roller. The two inch roller has near each end of the roller large thumb screws to apply extra pressure to the roller. The operator should adjust these screws equally when adding pressure to the two inch roller. If running thin goods through the machine, the operator can add a little pressure to the screws. If running heavy goods through the machine the operator should back off the pressure on the screws.



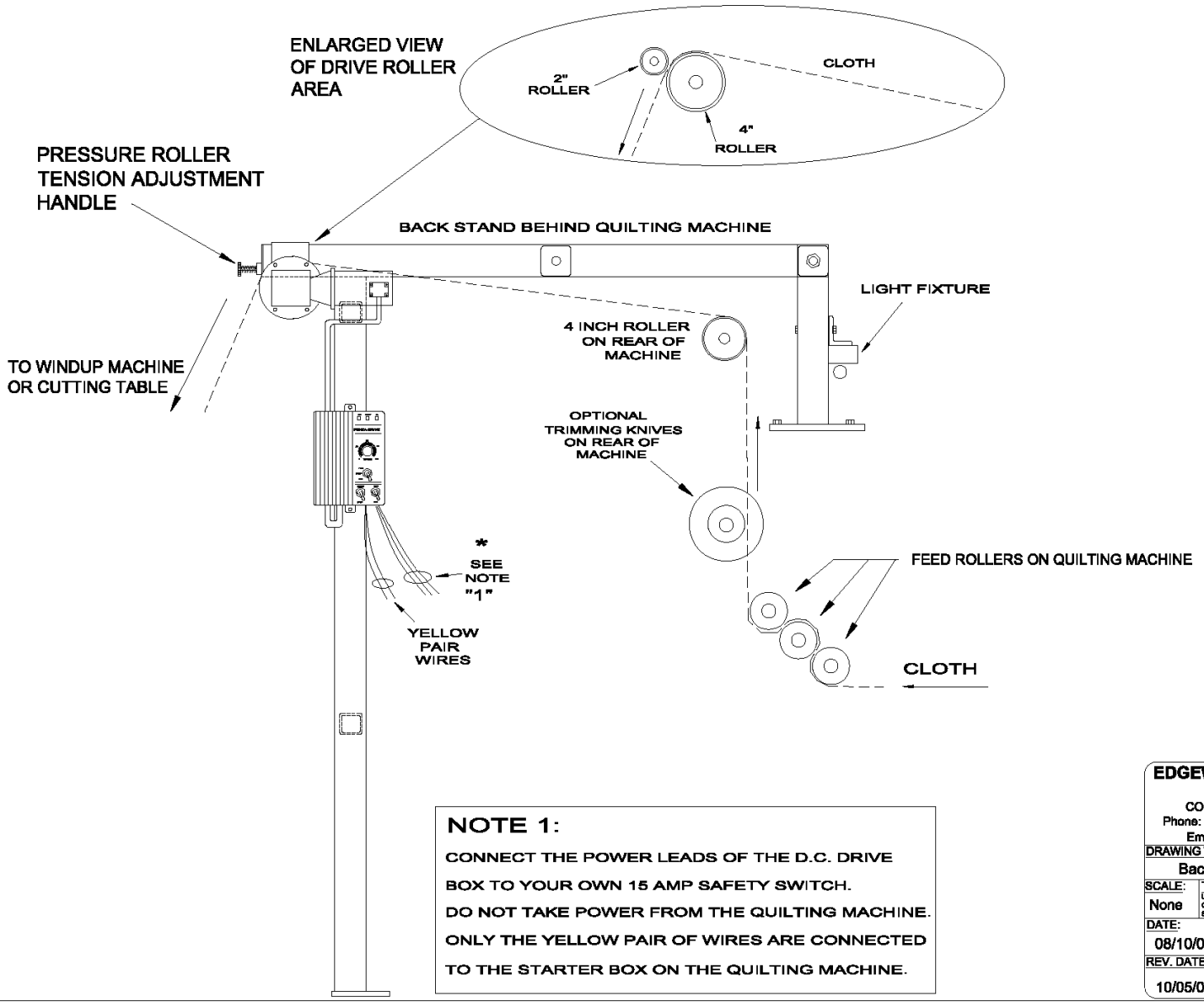


MOTORIZED BACK STAND FOR 1 X 3 X 6 MACHINES

EMCO

EDGEWATER MACHINE CO., INC.
13-20 131st. STREET
COLLEGE POINT, NY 11356 U.S.A.
PHONE: 718-539-8200
FAX: 718-358-4648

DRAWING TITLE: MOTORIZED BACK STAND FOR 1 X 3 X 6 MACHINES		
SCALE: NONE	TOLERANCE: (INCHES) UNLESS OTHERWISE SPECIFIED	X.XX ±0.01 X.XXX ±0.005 ANGLE ±1°
DATE: 8/30/99	DRAWN BY: M.M.P.	CHECKED BY:
REV. DATE: 01/14/00	FILE NAME: 3DMOTORIZED BACK STAND	



NOTE 1:

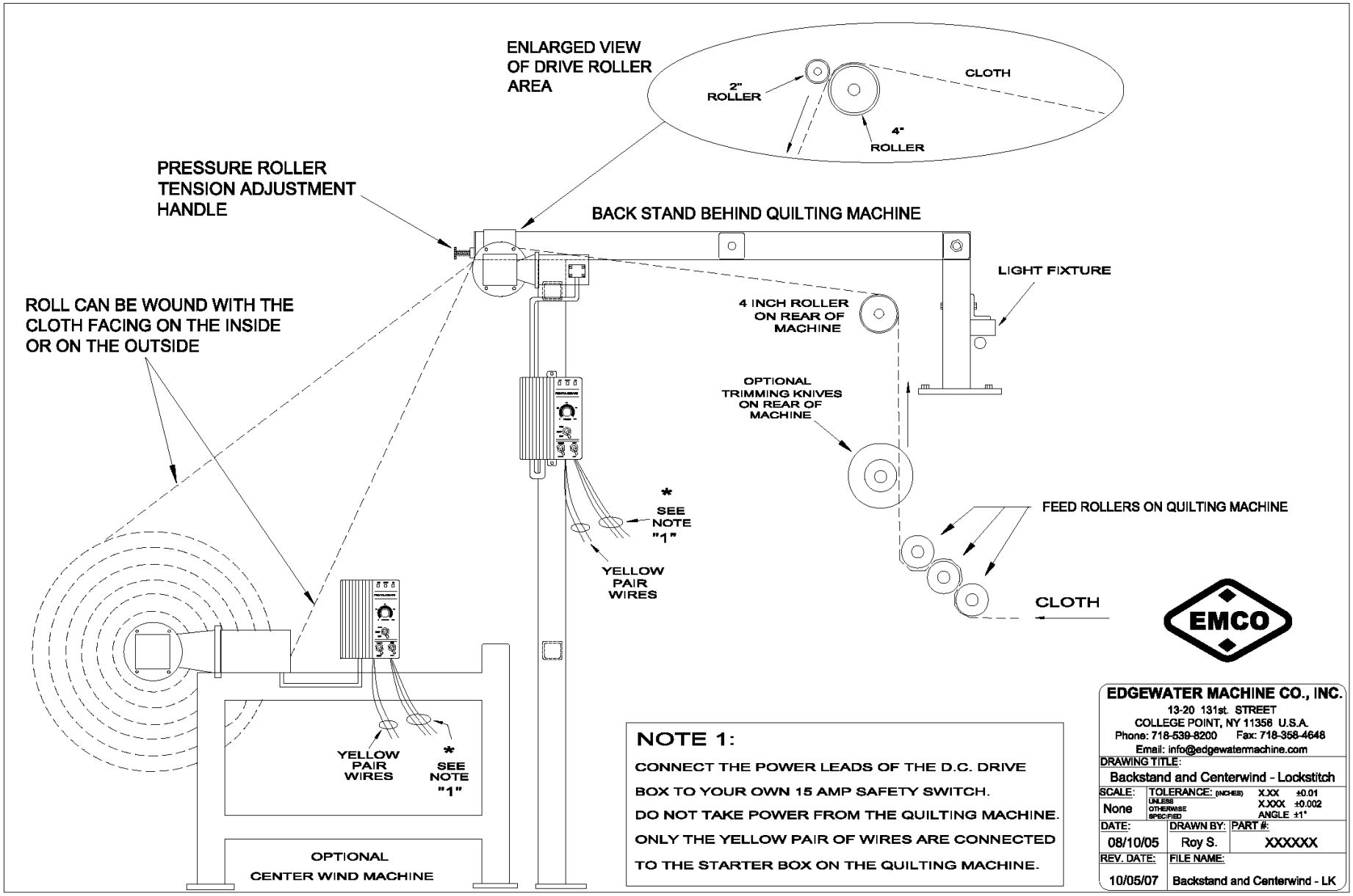
CONNECT THE POWER LEADS OF THE D.C. DRIVE BOX TO YOUR OWN 15 AMP SAFETY SWITCH.
DO NOT TAKE POWER FROM THE QUILTING MACHINE.
ONLY THE YELLOW PAIR OF WIRES ARE CONNECTED TO THE STARTER BOX ON THE QUILTING MACHINE.

EMCO

EDGEWATER MACHINE CO., INC.
13-20 131st. STREET
COLLEGE POINT, NY 11356 U.S.A.
Phone: 718-539-8200 Fax: 718-358-4648
Email: info@edgewatermachine.com

DRAWING TITLE: Backstand for 1x3x6 - Lockstitch		
SCALE: None	TOLERANCE: (INCHES) UNLESS OTHERWISE SPECIFIED X.XX ±0.01 X.XXX ±0.002 ANGLE ±1°	
DATE: 08/10/05	DRAWN BY: Roy S.	PART #: XXXXXX
REV. DATE: 10/05/07	FILE NAME: Backstand for 1x3x6 - LK	

Oct 05 2007 - 7:17 am



NOTE 1:

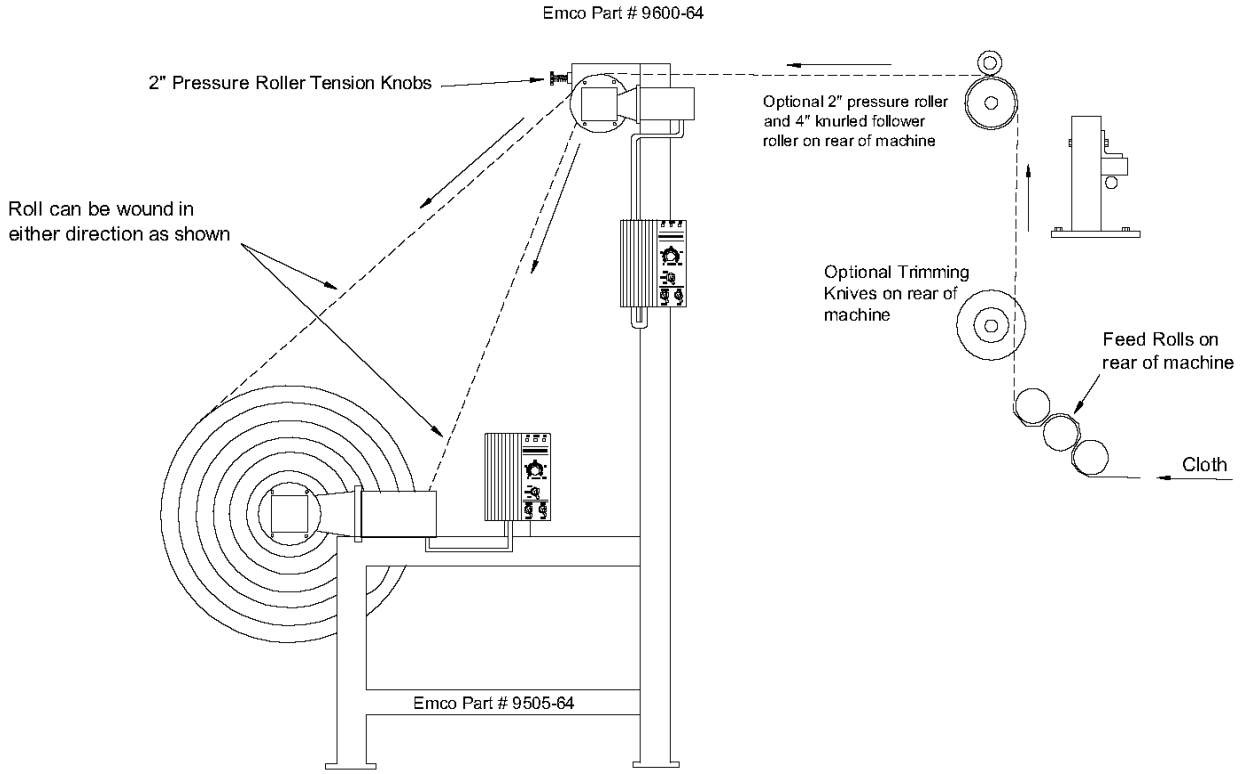
CONNECT THE POWER LEADS OF THE D.C. DRIVE BOX TO YOUR OWN 15 AMP SAFETY SWITCH.
DO NOT TAKE POWER FROM THE QUILTING MACHINE.
ONLY THE YELLOW PAIR OF WIRES ARE CONNECTED TO THE STARTER BOX ON THE QUILTING MACHINE.

EDGEWATER MACHINE CO., INC.
13-20 131st. STREET
COLLEGE POINT, NY 11356 U.S.A.
Phone: 718-539-8200 Fax: 718-358-4648
Email: info@edgewatermachine.com

DRAWING TITLE: Backstand and Centerwind - Lockstitch		
SCALE: None	TOLERANCE: (INCHES) UNLESS OTHERWISE SPECIFIED	X.XX ±0.01 X.XXX ±0.002 ANGLE ±1°
DATE: 08/10/05	DRAWN BY: Roy S.	PART #: XXXXXX
REV. DATE: 10/05/07	FILE NAME: Backstand and Centerwind - LK	

Oct 05 2007 - 7:11 am

Optional Motorized Back Stand mounted on Center Wind Machine



Optional Center Wind Machine
combined with motorized back stand.

EDGEWATER MACHINE CO., INC.
13-20 131st. STREET
COLLEGE POINT, NY 11356 U.S.A.
PHONE: 718-539-8200
FAX: 718-358-4648

DRAWING TITLE: Center Wind Machine with Backstand		
SCALE: None	TOLERANCE: (INCHES) UNLESS OTHERWISE SPECIFIED X.XX ±0.01, X.XXX ±0.002, ANGLE ±1°	
DATE: 02/07/13	DRAWN BY: Roy S.	PART # : 9505 & 9600
REV. DATE: 08/01/14	FILE NAME: Center Wind Machine with Backstand	

If your machine is equipped with this type of control, follow these instructions.

OPERATING INSTRUCTIONS FOR THE PENTA POWER DRIVE MODEL KBPC-240D - D.C. DRIVE TENSION CONTROL

Automatic Operation set controls as follows:

Start/Stop switch - push switch upward to turn power ON.
Forward/Reverse switch - set to forward.
Run/Jog switch - set to middle position.

The percentage potentiometer should be adjusted between 40-80 depending on the amount of tension required for your application.

With these switches set as described above, the control will operate automatically whenever the quilting machine is started and stopped.

Note: *If this control is interfaced with Emco's computerized quilters, check the Disable/Enable, Input/Output screen on the computer to be sure all boxes are enabled. If the Aux. Output box is disabled this control will not function automatically.*

Be sure to check the Emco wiring schematic for the correct connection of the power and signal wires. Failure to connect the wires as shown in our schematic will void the warranty.

Manual Operation set the controls as follows:

Start/Stop switch - push switch upward to turn power ON.
Forward/Reverse switch - set as desired for direction of travel
Run/Jog switch - hold in jog position for momentary running or set switch to run for continuous running.

Use these switch settings for Manual Operation whenever it is necessary to remove slack in the cloth or for reversing momentarily.

Note: *The potentiometer is not used as a speed control, but rather as a torque control. The unit will adjust its own speed. Faster when there is slack and slower when tension is applied. The potentiometer allows you to add more or less tension to the cloth.*

If your machine is equipped with this type of control, follow these instructions.

OPERATING INSTRUCTIONS FOR THE BRONCO II SECO CONTROL - MODEL 163

Automatic Operation set controls as follows:

Start/Stop switch - set to stop

Run/Jog switch - set to jog

Forward/Reverse switch - set to forward

The percentage potentiometer should be adjusted between 40-80 depending on the amount of tension required for your application.

With these switches set as described above, the Seco Control will operate automatically whenever the quilting machine is started and stopped.

Note: *If this control is interfaced with Emco's computerized quilters, check the Disable/Enable, Input/Output screen on the computer to be sure all boxes are enabled. If the Aux. Output box is disabled this control will not function automatically.*

Manual Operation set the controls as follows:

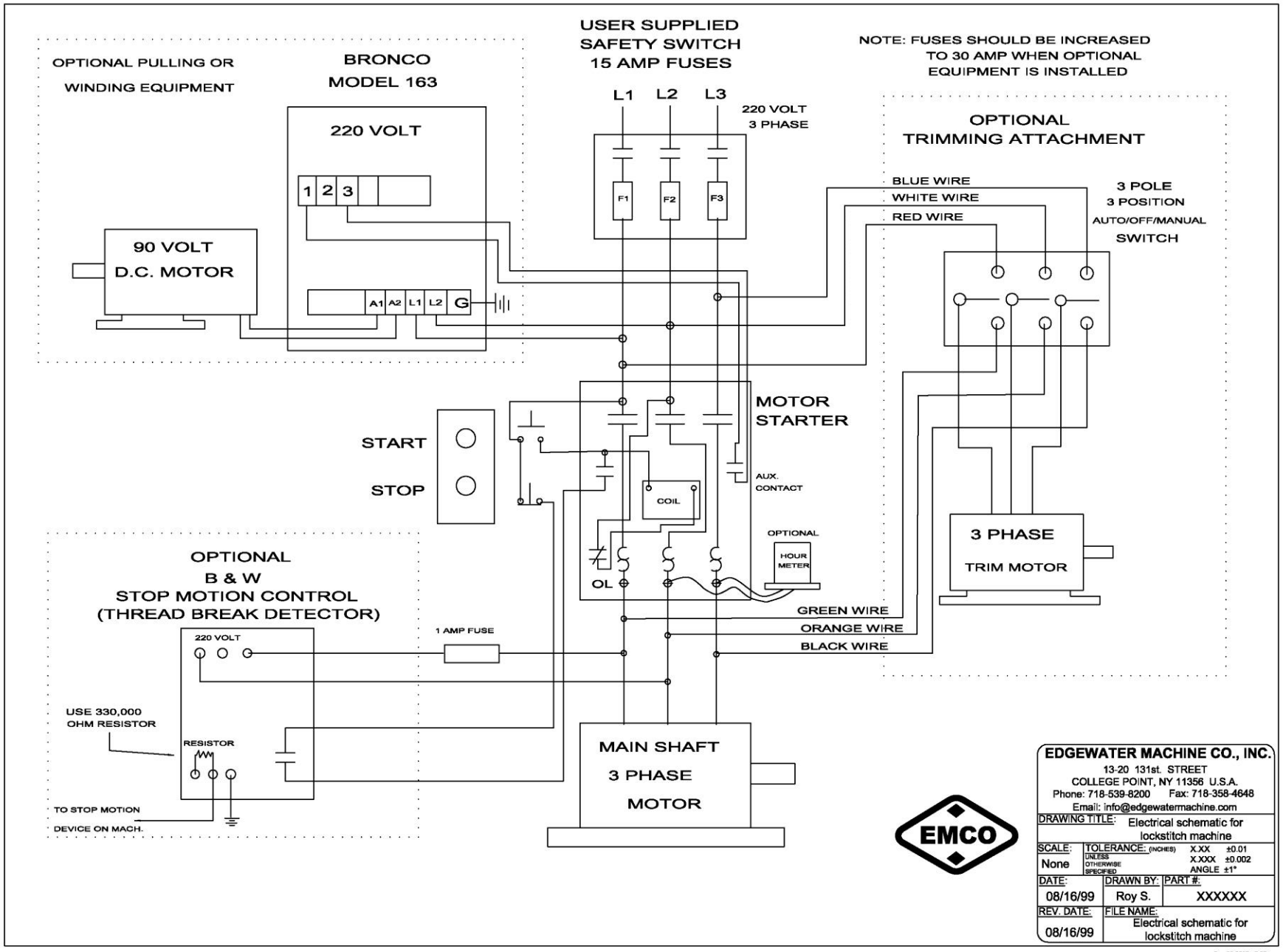
Run/Jog switch - set to jog

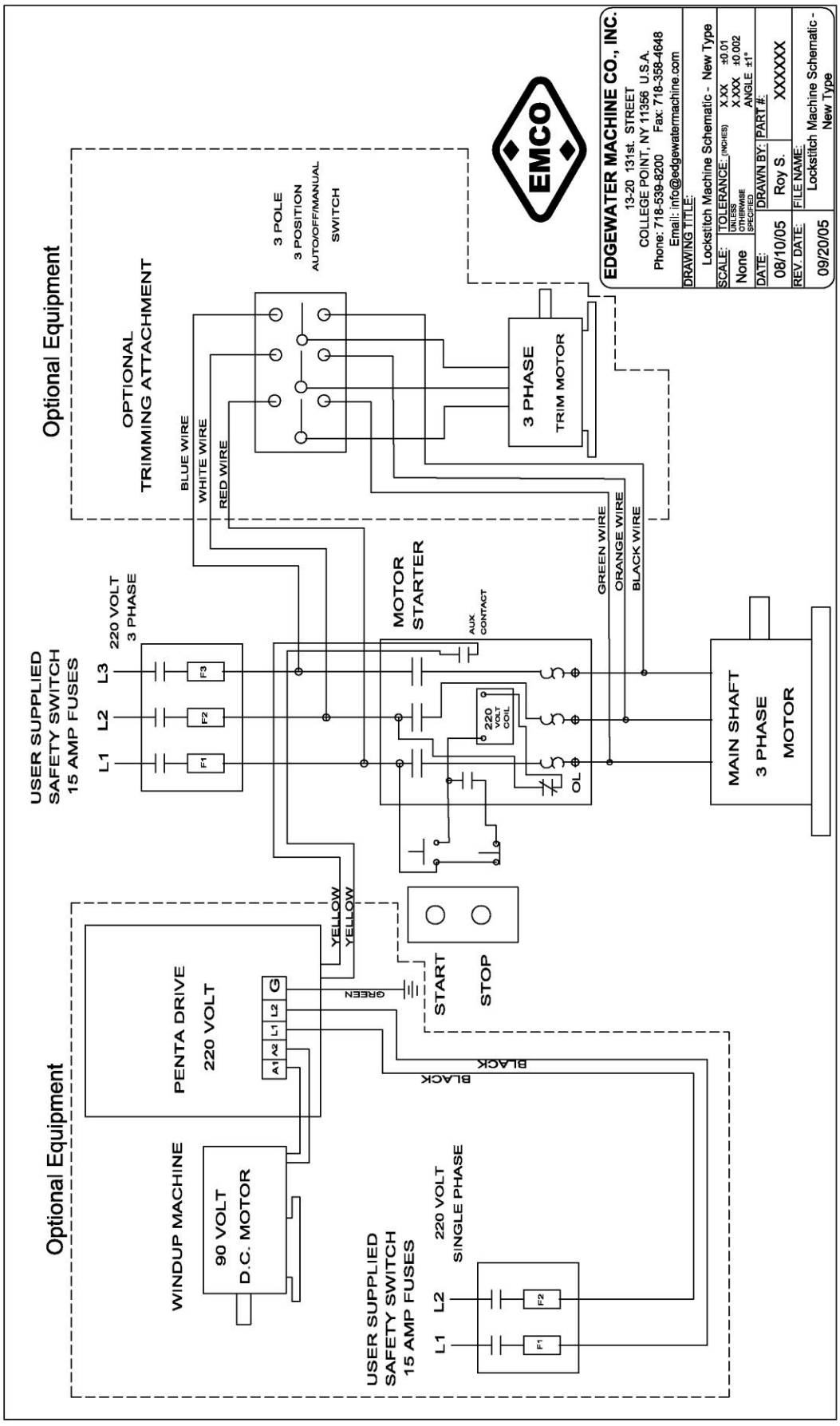
Forward/Reverse switch - set as desired for direction of travel

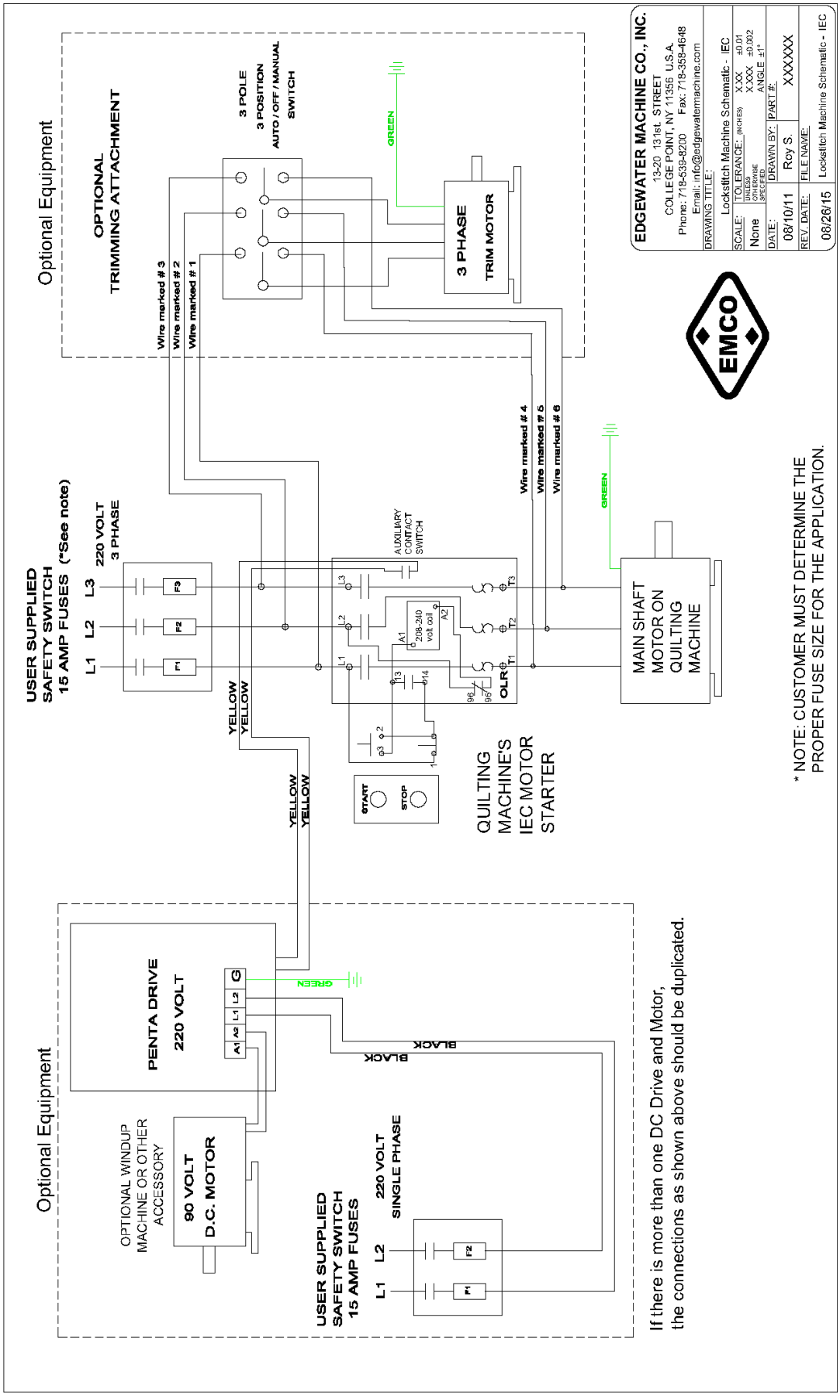
Start/Stop switch - hold in start position as long as you wish the control to run. When released the control will stop.

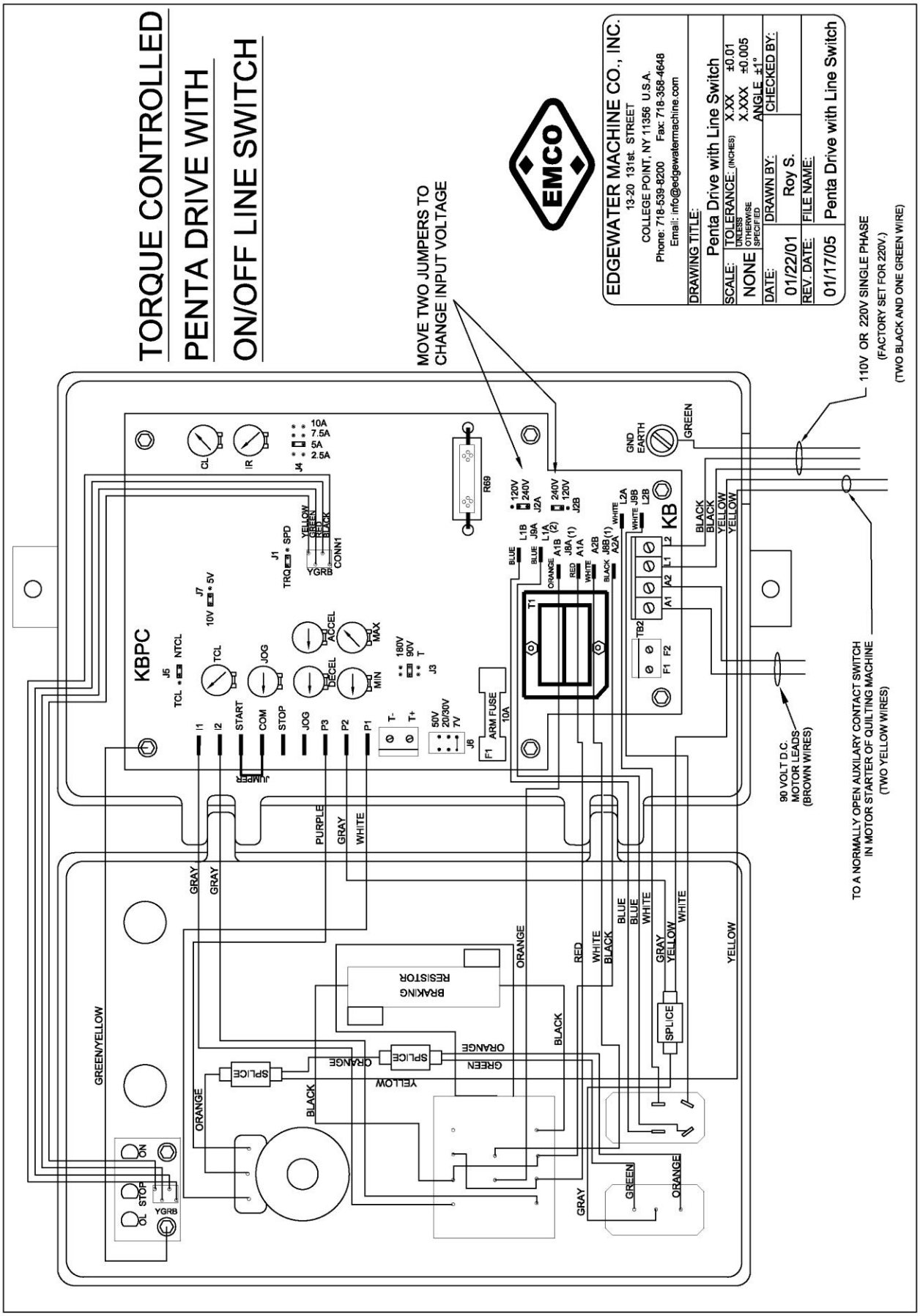
Use these switch settings for Manual Operation whenever it is necessary to remove slack in the cloth or for reversing momentarily.

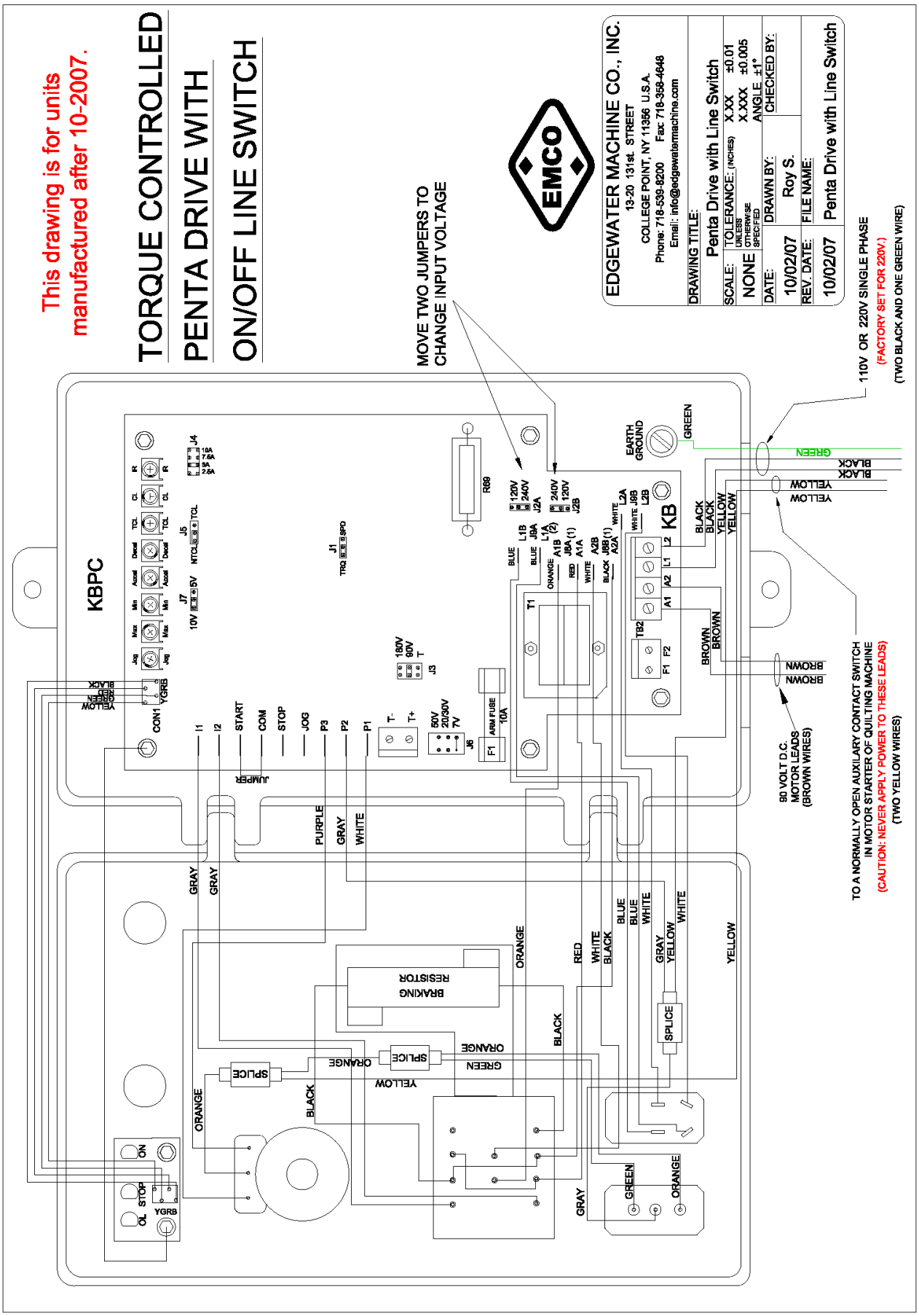
Note: *the potentiometer is not used as a speed control, but rather as a torque control. The unit will adjust its own speed. Faster when there is slack and slower when tension is applied. The potentiometer allows you to add more or less tension to the cloth.*


USER SUPPLIED
SAFETY SWITCH
15 AMP FUSES
NOTE: FUSES SHOULD BE INCREASED
TO 30 AMP WHEN OPTIONAL
EQUIPMENT IS INSTALLED
OPTIONAL PULLING OR
WINDING EQUIPMENT
BRONCO
MODEL 163
220 VOLT
1 2 3
90 VOLT
D.C. MOTOR
A1 A2 L1 L2 G
L1 L2 L3
220 VOLT
3 PHASE
F1 F2 F3
OPTIONAL
TRIMMING ATTACHMENT
BLUE WIRE
WHITE WIRE
RED WIRE
3 POLE
3 POSITION
AUTO/OFF/MANUAL
SWITCH
MOTOR
STARTER
START
STOP
AUX.
CONTACT
COIL
OL
OPTIONAL
HOUR
METER
3 PHASE
TRIM MOTOR
GREEN WIRE
ORANGE WIRE
BLACK WIRE
OPTIONAL
B & W
STOP MOTION CONTROL
(THREAD BREAK DETECTOR)
220 VOLT
1 AMP FUSE
USE 330,000
OHM RESISTOR
RESISTOR
TO STOP MOTION
DEVICE ON MACH.
MAIN SHAFT
3 PHASE
MOTOR
EMCO
EDGEWATER MACHINE CO., INC.
13-20 131st. STREET
COLLEGE POINT, NY 11356 U.S.A.
Phone: 718-539-8200 Fax: 718-358-4648
Email: info@edgewatermachine.com
DRAWING TITLE: Electrical schematic for lockstitch machine
SCALE: None
TOLERANCE: (INCHES) UNLESS OTHERWISE SPECIFIED X.XX ±0.01 X.XXX ±0.002 ANGLE ±1°
DATE: 08/16/99
DRAWN BY: Roy S.
PART #: XXXXXX
REV. DATE: 08/16/99
FILE NAME: Electrical schematic for lockstitch machine
Sep 20 2005 - 7:27 am


EDGEWATER MACHINE CO., INC.
13-20 131st. STREET
COLLEGE POINT, NY 11356 U.S.A.
Phone: 718-539-8200 Fax: 718-358-4648
Email: info@edgewatermachine.com
DRAWING TITLE: Lockstitch Machine Schematic - New Type
SCALE: None
TOLERANCE: (INCHES) UNLESS OTHERWISE SPECIFIED X.XX ±0.01 X.XXX ±0.002 ANGLE ±1°
DATE: 08/10/05
DRAWN BY: Roy S.
PART #: XXXXXX
REV. DATE: 09/20/05
FILE NAME: Lockstitch Machine Schematic - New Type
Sep 20 2005 - 7:34 am
EMCO
Optional Equipment
OPTIONAL TRIMMING ATTACHMENT
BLUE WIRE
WHITE WIRE
RED WIRE
3 POLE
3 POSITION
AUTO/OFF/MANUAL
SWITCH
3 PHASE
TRIM MOTOR
GREEN WIRE
ORANGE WIRE
BLACK WIRE
USER SUPPLIED
SAFETY SWITCH
15 AMP FUSES
220 VOLT
3 PHASE
L1 L2 L3
F1 F2 F3
MOTOR
STARTER
AUX
CONTACT
220
VOLT
COIL
OL
MAIN SHAFT
3 PHASE
MOTOR
YELLOW
YELLOW
GREEN
START
STOP
BLACK
PENTA DRIVE
220 VOLT
A1 A2 L1 L2 G
WINDUP MACHINE
90 VOLT
D.C. MOTOR
USER SUPPLIED
SAFETY SWITCH
15 AMP FUSES
220 VOLT
SINGLE PHASE
L1 L2
F1 F2


Optional Equipment
OPTIONAL
TRIMMING ATTACHMENT
3 POLE
3 POSITION
AUTO / OFF / MANUAL
SWITCH
Wire marked # 3
Wire marked # 2
Wire marked # 1
GREEN
3 PHASE
TRIM MOTOR
EDGEWATER MACHINE CO., INC.
13-20 131st. STREET
COLLEGE POINT, NY 11356 U.S.A.
Phone: 718-539-8200 Fax: 718-359-4648
Email: info@edgewatermachine.com
DRAWING TITLE:
Lockstitch Machine Schematic - IEC
SCALE: None
TOLERANCE: (INCHES) UNLESS OTHERWISE SPECIFIED
X.XX ±0.01
X.XXX ±0.002
ANGLE ±1°
DATE: 08/10/11
DRAWN BY: Roy S.
PART #: XXXXXX
REV. DATE: 08/26/15
FILE NAME: Lockstitch Machine Schematic - IEC
EMCO
USER SUPPLIED
SAFETY SWITCH
15 AMP FUSES (*See note)
220 VOLT
3 PHASE
L1 L2 L3
F1 F2 F3
YELLOW
YELLOW
AUXILIARY
CONTACT
SWITCH
A1
208-240
volt coil
A2
L1 L2 L3
T1 T2 T3
13 14
95 96
OLR
Wire marked # 4
Wire marked # 5
Wire marked # 6
GREEN
MAIN SHAFT
MOTOR ON
QUILTING
MACHINE
START
STOP
QUILTING
MACHINE'S
IEC MOTOR
STARTER
* NOTE: CUSTOMER MUST DETERMINE THE
PROPER FUSE SIZE FOR THE APPLICATION.
Optional Equipment
PENTA DRIVE
220 VOLT
A1 A2 L1 L2 G
GREEN
BLACK
BLACK
OPTIONAL WINDUP
MACHINE OR OTHER
ACCESSORY
90 VOLT
D.C. MOTOR
USER SUPPLIED
SAFETY SWITCH
15 AMP FUSES
L1 L2
220 VOLT
SINGLE PHASE
F1 F2
If there is more than one DC Drive and Motor,
the connections as shown above should be duplicated.


TORQUE CONTROLLED
PENTA DRIVE WITH
ON/OFF LINE SWITCH
EDGEWATER MACHINE CO., INC.
13-20 131st. STREET
COLLEGE POINT, NY 11356 U.S.A.
Phone: 718-539-8200 Fax: 718-358-4648
Email: info@edgewatermachine.com
DRAWING TITLE:
Penta Drive with Line Switch
SCALE: NONE
TOLERANCE: (INCHES) UNLESS OTHERWISE SPECIFIED X.XX ±0.01 X.XXX ±0.005 ANGLE ±1°
DATE: 01/22/01
DRAWN BY: Roy S.
CHECKED BY:
REV. DATE: 01/17/05
FILE NAME: Penta Drive with Line Switch
MOVE TWO JUMPERS TO CHANGE INPUT VOLTAGE
110V OR 220V SINGLE PHASE
(FACTORY SET FOR 220V.)
(TWO BLACK AND ONE GREEN WIRE)
90 VOLT D.C. MOTOR LEADS (BROWN WIRES)
TO A NORMALLY OPEN AUXILIARY CONTACT SWITCH IN MOTOR STARTER OF QUILTING MACHINE
(TWO YELLOW WIRES)
KBPC
KB
BRAKING RESISTOR
ARM FUSE 10A
SPLICE
GREEN/YELLOW
ORANGE
BLACK
GRAY
PURPLE
WHITE
YELLOW
RED
BLUE
GREEN


This drawing is for units manufactured after 10-2007.
TORQUE CONTROLLED
PENTA DRIVE WITH
ON/OFF LINE SWITCH
MOVE TWO JUMPERS TO CHANGE INPUT VOLTAGE
EMCO
EDGEWATER MACHINE CO., INC.
13-20 131st. STREET
COLLEGE POINT, NY 11356 U.S.A.
Phone: 718-539-8200 Fax: 718-358-4648
Email: info@edgewatermachine.com
DRAWING TITLE:
Penta Drive with Line Switch
SCALE: NONE
TOLERANCE: (INCHES) UNLESS OTHERWISE SPECIFIED
X.XX ±0.01
X.XXX ±0.005
ANGLE ±1°
DATE: 10/02/07
DRAWN BY: Roy S.
CHECKED BY:
REV. DATE: 10/02/07
FILE NAME: Penta Drive with Line Switch
110V OR 220V SINGLE PHASE
(FACTORY SET FOR 220V.)
(TWO BLACK AND ONE GREEN WIRE)
KBPC
KB
CON1
J1
J2A
J2B
J3
J4
J5
J6
J7
J8A
J8B
T1
TB2
R68
F1
ARM FUSE 10A
EARTH GROUND
GREEN
BLACK
YELLOW
BROWN
90 VOLT D.C. MOTOR LEADS (BROWN WIRES)
TO A NORMALLY OPEN AUXILARY CONTACT SWITCH IN MOTOR STARTER OF QUILTING MACHINE
(CAUTION: NEVER APPLY POWER TO THESE LEADS)
(TWO YELLOW WIRES)
START
COM
STOP
JOG
JUMPER
BRAKING RESISTOR
SPLICE
ON
STOP
OL
YGRB
GRAY
PURPLE
WHITE
ORANGE
BLUE
RED
BLACK
GREEN
YELLOW

Lubrication Schedule for the Emco Lockstitch Machine

(The examples given below are for the average 84" - 90" machines. Larger or smaller machines may contain different quantities of components)

The following items should be greased as indicated using a lithium soap grease which is compatible with multi-purpose grease readily available from local suppliers.

All main shaft pillow block bearings on table bed including bearings in gear box:
(Note: these are revolving bearings) Grease every month.

All rocker shaft pillow block and flange bearings on table bed and upper structures:
(Note: these are the bearings with shafting that reciprocates back and forth. It does not make a full revolution.)
Grease every month.

The four eccentrics on the main shaft, two for the shuttles and two for the needles:
Grease every month.

The four drive links (#528), two driving the shuttle rocker shafts and two driving the upper rocker shafts for the needles:
Grease every month.

The eight #911 Needle rod brackets: Grease every month.

Cam shaft on gear box: Grease every month.

Ratchet levers (2 grease fittings): Grease every month.
(part #'s - 632X & BB408)

Apron slide support strip: grease when performing scheduled greasing of the main shaft pillow blocks. Apron should be removed for cleaning and lubrication maintenance.

Barrel cam on main shaft. (Barrel cam pushes ratchet lever to index the ratchet.)
Apply a film grease on cam every month.

Miscellaneous parts: Trimming knife attachment.
Motorized back stands.
Windup machines.
Intermittent top takeup drive bearings.

The above parts should be checked and greased every month or more often depending on usage.

The following items should be oiled using a good grade SAE #40 weight oil.

(The examples given below are for the average 84" - 90" machines. Larger or smaller machines may contain different quantities of components.)

The eight (#1816NT) take up levers on the 3/4" shaft above the #911 brackets. (new machines do not have these parts) Oil - one drop daily.

The eight needle rods and eight presser foot rods have at least two bushings per rod. Oil - one drop daily.

The eight needle bar lift links. Oil - one drop daily.
(On new machines these parts do not require oil.)

The ratchet pawl on part # BB408 . Oil - one drop daily.

Change gears on front of gear box. Oil - a few drops daily.

Cam slide and cam rollers. Oil - a few drops daily.

Feed roll bushings, three bushings on each end of the three feed rolls. Oil - one drop daily.

Feed roll chain drive. Oil - a few drops daily.

Carriage support roller bearings. Oil - a few drops weekly

Carriage linear support rods (1.5" hardened rods). Clean and apply a film of oil weekly to the linear support rods.

The eight shuttle rods should be coated with a film of oil where the rods pass through the bushings. You will also find felts at each bushing that you can apply a drop of oil to daily.

Besides the daily maintenance of lubrication, it is important to keep the machine as clean as possible. Allowing a build up of starch dust and/or thread to accumulate on rollers, bearings, or bushings will shorten the components life. The sewing thread will damage bearings, and the starch dust will absorb the lubrication right out of the bearing. In general keep the machine as clean as practical by removing loose thread from components and using compressed air to blow the starch dust from the machine.

Questions on lubrication? Contact:

Edgewater Machine Company, Inc.
13-20 131st Street
College Point, New York, 11356 U.S.A.
Phone: 718-539-8200 Fax: 718-358-4648

Trouble Shooting Tips

When looking for answers to the following problems refer to the table of contents for the appropriate section or page to review for the topic in question.

Breakage of Thread:

1 - Needles may be set incorrectly, either to high or to low.
2 - Machine may be threaded incorrectly.
3 - Tensions on either top or bottom thread may be too tight.
4 - Thread may be too weak, poor quality, incorrect for application. Thread should be left twist.
5 - A sharp burr may exist either on the needle, presser foot, needle plate, shuttle, or shuttle basket. Dirt and rust between needle plate and shuttle race.
6 - Incorrect threading of the shuttle.
7 - Shuttle basket may be too tight holding the shuttle against the race.

Breaking of Needles:

1 - Needles may be too low in needle bar.
2 - Feed rollers may be pulling the cloth at the wrong time.
3 - Wrong needles.
4 - Presser Foot set too high.

Loops or Loose Stitches:

1 - Tension on top or bottom thread may be too loose.
2 - Sharp edge on either the shuttle holder, shuttle basket, shuttle, needles, needle plates or presser foot plate.

Skipped Stitches:

1 - *Needle may be bent, incorrectly installed on needle bar, or worn down too short.*

If the needle is suspect to causing any problems, the easiest test is to replace the needle with a new one. Needles do wear down and as the length of the needle becomes too short, the sewing characteristics change enough to effect skipped stitches. When installing needles be sure the flat of the shank is towards the front of the machine. The needle screw must press down on this flat to allow for proper rotational alignment of the needle.

2 - *Needle may be too high or too low on needle bar.*

The top of the needle must be 3/16" down from the top of the needle bar. If the needle is too high or too low the shuttle will miss picking up the loop formation resulting in skipped stitches.

3 - *Wrong type needle.*

The standard needle for the Emco Lockstitch machine is a size 23 needle. Lighter or heavier needles may be used to accommodate different types of material to be sewn. Consult our factory for advice on choosing the right needle for your job.

4 - *Shuttle timing incorrect.*

If the shuttles do not approach the needle forming the loop at the precise time the shuttle will either miss the loop or cut through the thread resulting in either skipped stitches or broken top threads. To adjust the timing of the shuttles in relation to the needles see page 52 in this Emco Lockstitch Operating Manual.

5 - *Loop is not sufficient.*

Insufficient loop formation especially in heavy goods will result in skipped stitches. The standard mandatory loop size is a minimum of 1/4" loop formed by the needle bar. Heavier goods or difficult to sew material will require as much as 5/16" loop. To adjust loop formation see “Adjusting the Needle Bar Loop” in the Emco Lockstitch Operating Manual.

6 - *Ticking materials with rubber coatings will not sew correctly.*

Residue of the coating will deposit itself on the needles and other parts of the machine. This residue prevents the formation of the loop, resulting in skipped stitches. We highly recommend that this material **not** be used in the Emco quilting machines. The rubber coating leaves sticky deposits on all surfaces that it comes in contact with. This coating actually attracts moisture and will cause rusting of the needle plates and especially the presser foot plate. Part damage will occur with results that will cause even common ticking to sew incorrectly. **Do not** use the rubber coated tickings in the Emco quilting machines.

7 - *Needle bar may be bent or twisted.*

If the needle bar is not perfectly straight the needle would cause the needle to enter the needle plate on a slight angle. This results in the shuttle not intercepting the loop being formed by the needle.

Pattern Distorted:

1 - Feed rolls may not be pressed together sufficiently.
2 - Cloth tension on front of machine may be more then on the top take up roller or windup machine. Keep tension on front cloth and material exiting the rear of machine the same. Without sufficient tension on backing and ticking pattern will distort.
3 - Cam roller may be set too loose.
4 - Change gears on front of gear box may be set too loose or damaged.
5 - Presser foot either too high or too low.
6 - Ratchet may not be taking the proper number of teeth (1.1/2 - 1.3/4).
7 - Ratchet brake not tight enough, feed rolls slipping backwards.
8 - Ratchet swing arm hanging up. Not swinging freely. Bearings worn or damaged.
9 - Exposed foam extending further out than backing or ticking. Ticking and backing must cover foam completely.
10 - Material bumping up against side stands when carriage moves cloth side to side.
11 - Top take-up V-belt pulling to much tension. Loosen belt. Belt should slip.

Random Loops of thread on top of material:

This occurs when the needles are lifting too high above the material when the needles are fully up. The full stroke of the needles is too large. To correct this condition the stroke of the needles must be decreased. Remember when changing the stroke size, the loop formation must be checked after adjusting the stroke. See section on ***Adjusting the Needle Bar height, and loop*** in this manual.

Feed Roll Chain Skipping over the feed roll sprockets:

This occurs when there is too much tension being pulled on the cloth after it leaves the feed rolls. If you have a "V" belt intermittent drive on the upper arms, relax the tension on the "V" belt. If you have a electric motor pulling on the finished goods, decrease the tension so as not to pull the finished goods to quickly.