

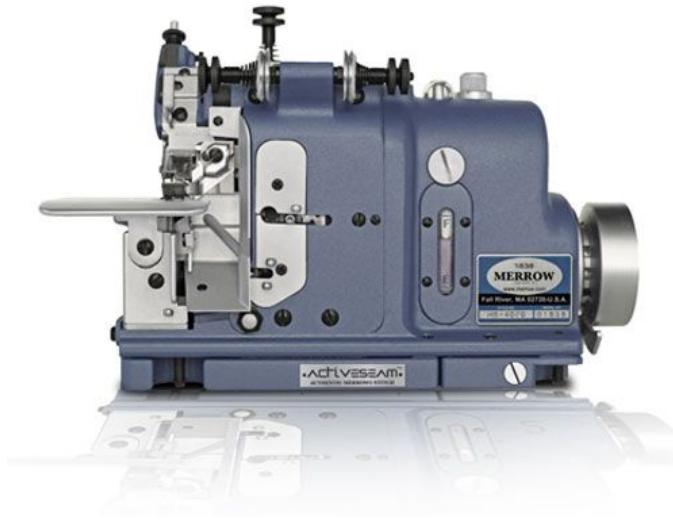
INSTRUCTIONS

FOR SETTING UP AND OPERATING

MERROW CLASS MB INDUSTRIAL SEWING MACHINES



Merrow Sewing Machine Company, Inc.
502 Bedford Street, Fall River, Massachusetts 02720 USA
TEL: 508 689 4095 FAX: 508 689 4098 WEB: www.merrow.com
www.activeseam.com



MODELS: MB-4DFO_2.1
MB-4DFO_2.2
MB-4DFO_2.3
MB-4DFO_2.4
MB-4DFO_2.7

DESCRIPTION:
THE MERROW MB-4DFO IS A DOUBLE NEEDLE, TWO OR THREE THREAD, SINGLE ROW DIFFERENTIAL FEED INDUSTRIAL SEWING MACHINE WITH CUTTERS, USED TO CREATE A FLAT OVERLOCK ACTIVESEAM STITCH ON KNITS, WOVENS, AND NONWOVENS.

OPERATING SPEED	5500 RPM
STITCH WIDTH	3/32"-5/32"
STITCH RANGE	10-40 spi
STANDARD NEEDLE	A0DF (65 Nm)
MERROW NEEDLE RANGE	A00DF-A5DF (60-110 Nm)
FEDERAL STITCH TYPE	521 ACTIVESEAM
MOTOR REQUIRED*	3450 RPM, 110/220 volt, 1/2HP
NUMBER OF THREADS	2 -3
RECOMMENDED OIL	Spindle Oil of 46 cst at 40° Celsius
NOISE LEVEL	80 dB
SHIPPING WEIGHT	38.58 lbs (17.5 kg)
SHIPPING CARTON DIMENSIONS:	L: 15 in (38.1 cm) / W: 12 in (30.48 cm) / H: 14 in (35.56 cm)
HARMONIZED CODE	8452290000

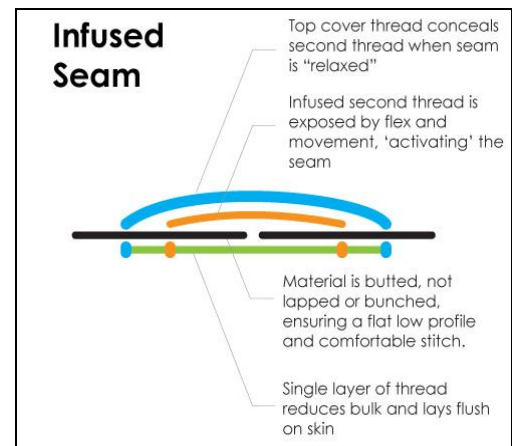
Sewing machine heads MB-4DFO_2.1, MB-4DFO_2.2, MB-4DFO_2.3, MB-4DFO_2.4, MB-4DFO_2.7 are intended for integration into sewing units. Applicable assembly and installation shall be done according to instructions provided by the manufacturer.

This book is published for the guidance of those persons responsible for the operation and maintenance of Merrow Class MB Overseaming, Overedging, and Hemming Activeseam machines. It contains diagrams and descriptive information concerning the most common adjustments necessary to assure maximum production of the highest quality. For individual problems consult your nearest Merrow distributor, or email support@merrow.com. Drawings in this book are shown without the needle guard for clarity. **NOTE: The machine should not be operated without a needle guard.** Parts and screws shown are common to class MB and MG machines. For a more complete reference use the "Descriptive List of Parts for Merrow Class MB, Class MG, and Class M Machines."

The Merrow Class MB machines are designed and constructed for continuous operation at high speed. Durability, maximum utility, and versatility are primary qualities of these machines. The machines feature an automatic lubrication system of advanced design and the finest precision parts. Manufacturing to extraordinarily close tolerances has reduced the noise level of class MB machines. The Merrow Class MB machines offer true quality through long life, exceptional dependability, and superb performance with a minimum of maintenance required.

The Class MB machines overseam and trim simultaneously and form one of the following Activeseam stitch formations: a two thread slim stitch; a two thread comfort stitch; or a three thread two needle infused stitch. Other variations exist to create micro, wide, and high pile Activeseam stitches. The Class MB machines may be used on a wide variety of weights of knitted, woven, and non-woven fabrics.

Merrow also makes other classes of industrial sewing machines including the Class 70, 71, and 72 Butted Seaming Machines, Class 17 and 18 Plain Crochet Machines, and Class MG Overseaming, Overedging, Hemming, and Shell Stitch Machines which are being used successfully by manufacturers throughout the world.



IMPORTANT: Always wear safety glasses when operating or adjusting the machine.

Class MB Activeseam® is a simple to produce alternative to flatlock stitching. Activeseam comes in a nearly infinite number of variations, from micro to wide, dense to elongated, 2D or 3D. Activeseam has captured the imagination of major brands around the globe and adds significant technical advantages over traditional stitching. With twice the stretch built into the seam, and a flat profile, Activeseam garments are extraordinarily comfortable and do not restrict athletic movement. When compared to a 6-thread flatlock seam with identical thread, fabric, and SPI, Merrow Activeseam 2 & 3-thread seams proved to be more than 30% stronger and had the ability to stretch (linear travel) 100% further.

MB-4DFO_2.1 (lightweight material)

MB-4DFO_2.2 (midweight material)

MB-4DFO_2.3 (footwear)

MB-4DFO_2.4 (medical compression garments)

MB-4DFO_2.7 (high lift material)

HOW TO ORDER

Please contact your nearest certified Merrow Distributor or contact the Merrow Sewing Machine Company, 502 Bedford Street, Fall River, MA 02720, U.S.A. Phone (508) 689 4095, Fax (508) 689 4098, Email support@merrow.com.

Descriptive literature and samples of stitches will be provided upon request.

THE MERROW STITCH LAB

Merrow offers a comprehensive stitch lab designed to sew sample seams on customer fabric and to solve stitch issues. Generally, our sample department is able to sew-off material within a few days of receipt. Please contact Merrow if you are interested in Stitch Lab Service.

MERROW FACTORY TRAINING

Come visit Merrow and learn how to service and support your Merrow Machine. We have trainings for ActiveSeam, Emblem, End-to-End Seaming and Merrow Stitch Design Development scheduled throughout the year. Trainings are designed for agents, mechanics, operators, designers, and plant managers. Please contact Merrow if you're interested - we would love to see you in Fall River!

MERROW WARRANTY INFORMATION

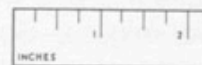
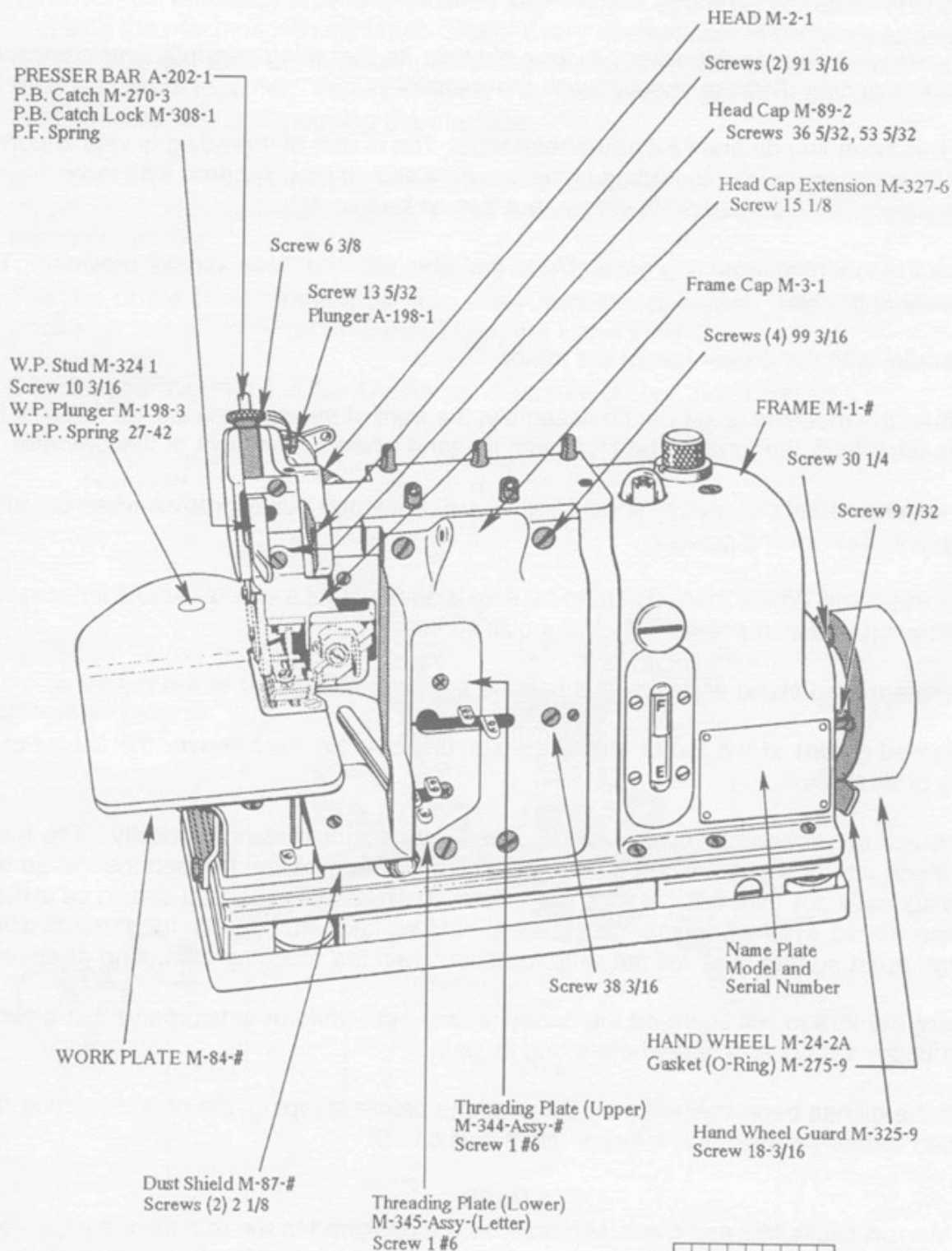
Behind every Merrow sewing machine is more than 170 years of sewing machine building experience. Quality control is at the heart of the manufacturing process; accordingly, Merrow (The manufacturer) warrants all machines for a 1-year Limited Warranty for all materials and assembly, and a 10-Year limited warranty for the machine frame and internal cams. Please contact Merrow for complete details.

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FRONT VIEW

Instructions For Setting Up and Operating Merrow High Speed Trimming and Overseaming Machines, Class MB Activeseam

1. Upon removing the machine from its box observe its threading carefully and compare it with the threading diagram supplied with the machine.

Keep this threading diagram for future reference. The matter of threading is very important and if difficulty arises, the threading of the machine should be compared with the individual diagram supplied. Threading is simple, but it must be accurate.

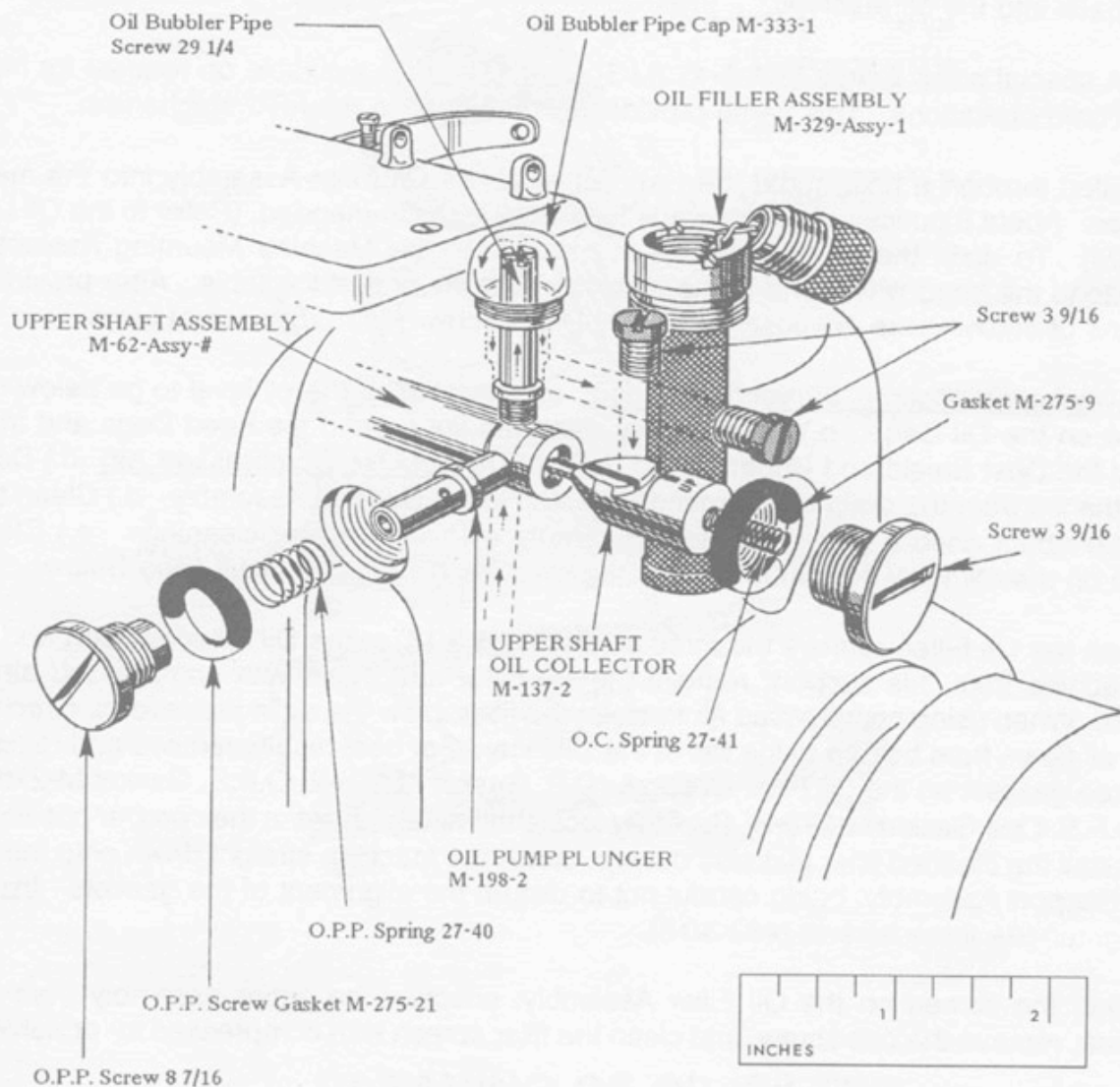
2. Secure the machine mounting assembly to the table with the three screws provided. This assembly should be:
 - (a) Parallel with the center line of the motor.
 - (b) When the machine is set on the assembly, the front of the machine will be three or four inches back from the front of the table with its hand wheel to the right of the operator.
 - (c) The hand wheel belt groove should line up with the motor pulley groove, when the motor pulley is in the running position.
3. Check the Hand Wheel (belt) Guard to be sure it does not hit the belt. Adjust if necessary; by removing screw, repositioning, and replacing screw.
4. Assemble thread stand and screw its base to the table at the rear of the machine.
5. The thread guides at the top of the thread stand should be directly over the center of the cones of thread.
6. The thread or yarn should be wound on cones, which should stand vertically. The thread from these cones should lead up to the Safety Cross Rod (8-52-J) through the thread eyes and diagonally downward to the machine. Note: The Safety Cross Rod should be installed with the thread eyes below the rod. Care should be taken to be sure the threads are far enough apart so that they will not whip together when the machine is running at speed.
7. Be sure the thread will come off the cones readily, with uniform tension and that it cannot catch under the cone or elsewhere along its path.
8. Since the oil has been drained from the machine before shipping, the main reservoir must be filled before the machine is used. (Note section 15)

SPEED

9. The Merrow Class MG and Class M machines are designed to run at a maximum speed of 5500 stitches per minute. Some work is efficiently handled at 5500 stitches per minute but it has been found that maximum efficiency for some operations is attained at a speed of about 5000 stitches per minute.

MOTOR

10. To obtain full efficiency the motor must be kept in good operating condition in order to start and stop the machine with minimum delay. Every attempt should be made to avoid driving the hand wheel from an oversize pulley, especially when the centers of both pulleys are relatively close together. Failure to avoid this situation can result in belt slippage and less control of starting and stopping the machine.
11. A V-Belt Hand Wheel with an effective pitch diameter of 2 1/8" is supplied with each machine. A standard 3/8" endless V-Belt is recommended to connect the Hand Wheel to the motor pulley.
12. The top of the hand wheel must turn away from the operator. The machine sews with clockwise rotation only (when viewed from the Hand Wheel).
13. Consult your nearest Merrow Distributor to assure proper motor set up.



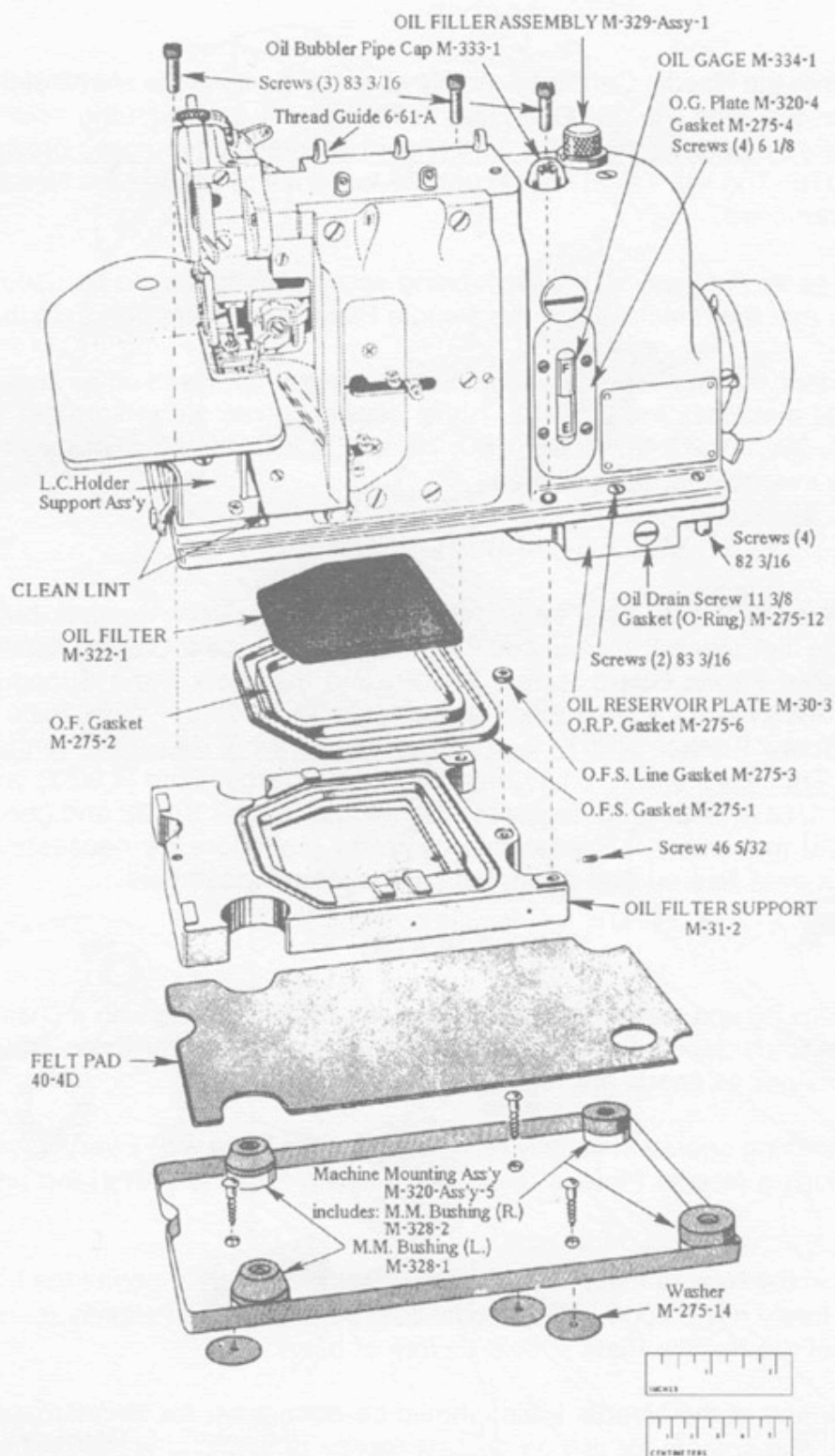
OILING PARTS

LUBRICATION

14. General: The lubrication system is entirely automatic, feeding oil to all bearing surfaces without the use of wicks. The path of the oil as it circulates through the machine is described as follows: Two Oil Pump Plungers are operated from eccentric grooves in the main shafts. The upper shaft pump draws oil from the main reservoir and forces it through the Oil Bubbler Pipe to the Oil Bubbler Pipe Cap. The oil then drains down through holes to the Upper Shaft Oil Collector and the correct amount of oil is fed into the Upper Shaft Assembly. Inside the Upper Shaft the oil is distributed through several successive oil holes and grooves to the bearing surfaces of the main shafts on the left end of the machine, the Needle Carrier Assembly, the Upper Cutter Carrier Assembly, and the Feed Mechanism. Some of the oil not fed into the Upper Shaft is forced along the outside of the Upper Shaft, down the face of the Cam Boss, and through holes in the Main Cams to lubricate the Cam Rolls and the Frame Cap bearings. The Needle Bearing for the Lower Shaft is oiled from the overflow oil from the lower shaft pump. All the oil in the machine drains down through the Oil Filter into the Oil Filter Support and is pumped from this support by the lower shaft pump back into the oil reservoir.

Note: A special oiling Frame M-1-A-11 (MG) or M-1-5 (M) is available on request for high needle time operations. This frame provides additional oil to the feed mechanism.

15. Oil is filled through a hole under the Cap Screw of the Oil Filler Assembly into the main reservoir. About 8 ounces of a high grade turbine oil is recommended. (Refer to the Oil List page 24) To drain the oil, remove the machine from the Machine Mounting Assembly and extend the hand wheel end of the machine over the end of the table. After providing a means of catching the oil, unscrew the Oil Drain Screw (#11 3/8) several turns.
16. The following precautions are recommended: a.) Never allow the oil level to go below the "E" line on the Oil Gage. b.) Occasionally clean the lint around the Feed Dogs and from behind the Dust Shield and Upper Fabric Guard. (Do Not Use Compressed Air) c.) Daily clean the lint from the drain slots around the L.C. Holder Support Assembly. d.) Clean the Oil Filter about once a year (See Below). Replace filter after four cleanings. e.) Clean screen on the Oil Filler Assembly if filling the machine becomes difficult (See Below).
17. To clean the Oil Filter: remove the three screws (#83 3/16) in the Oil Filter Support and lift the machine from this support; remove the Oil Filter and clean with compressed air or solvent. When using compressed air to clean the filter, blow the air in the reverse direction of the oil flow - from bottom to the top of the Oil Filter. For best results remove and replace the three gaskets on the Oil Filter Support. (O.F. Gasket M-275-2, O.F.S. Gasket M-275-1, and O.F.S. Line Gasket M-275-3) Carefully locate the new gaskets in their proper positions, and install the cleaned filter (flat side down). Lower the machine straight down onto the Oil Filter Support Assembly, being careful not to disturb the alignment of the gaskets. Install and tighten the three screws (#83 3/16).
18. To clean the screen on the Oil Filler Assembly: unscrew the entire assembly from the machine, remove the cap screw, and clean the filler screen with compressed air or solvent.



CLEANING OF OIL FILTER

NEEDLE

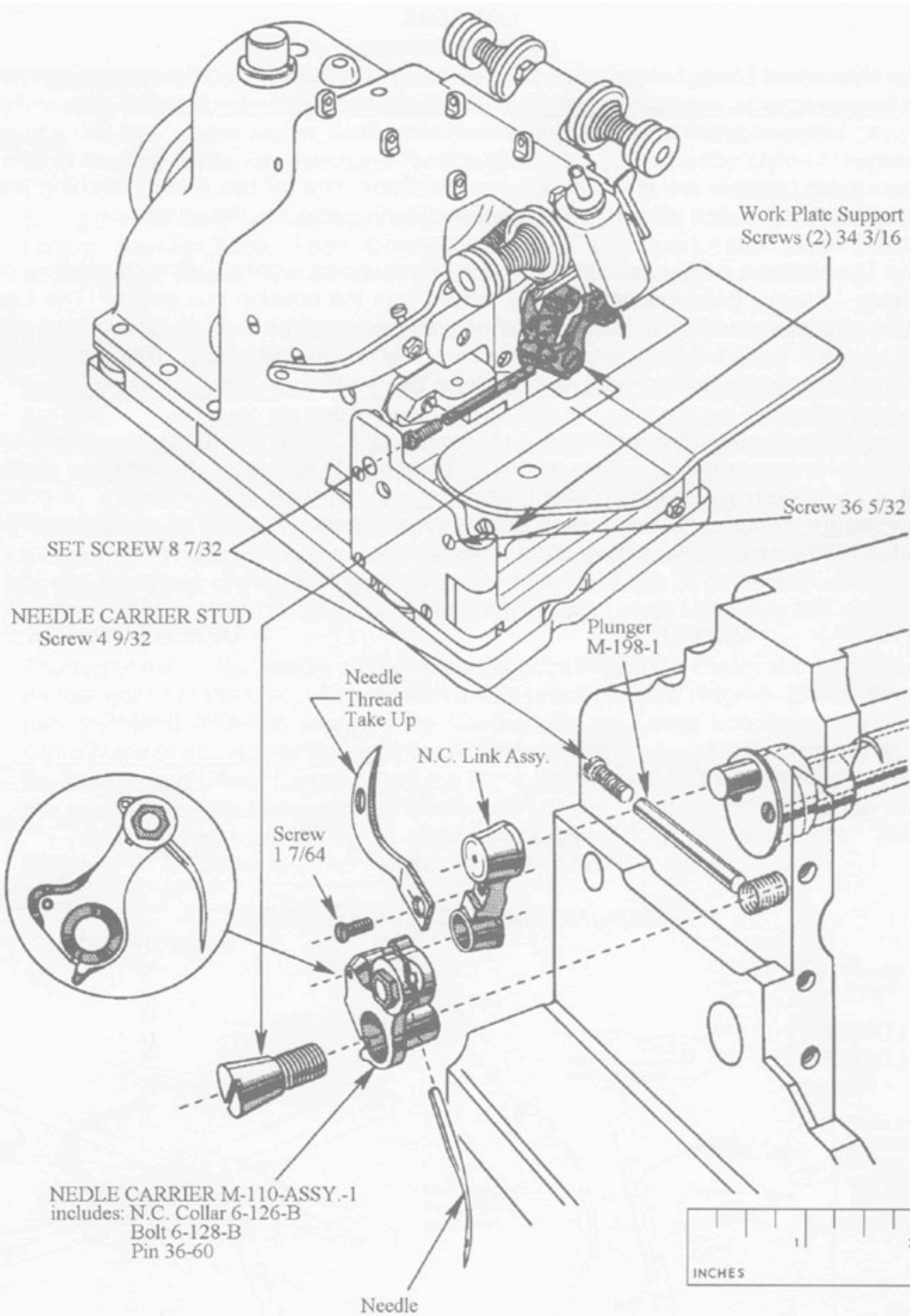
19. Set the Needle into the Needle Carrier Assembly so that the end of the shank of the Needle is in contact with the Stop Pin 36-60, and tighten the Nut 4 3/16 with the socket wrench firmly. The beveled portion of this Nut 4 3/16 should be against the recess provided in the N.C. Collar. NOTE: The Nut 4 3/16 should only be loosened to change the Needle; it does not have to be removed.
20. A Needle as large as practical for the work being accomplished should be used, but care should be taken that the needle slot in the Needle Plate is large enough to fit the Needle.
21. Self-setting needles, marked with the size number and letter "D", used on all styles of Class MG and Class M machines are available in the following sizes: (from smallest to largest) Nos. 000D, 00D, 0D, 1D, 2D, 3D, 4D, 5D, 6D, 7D, and 8D. Special needles in some of the above sizes are available for special uses.

NEEDLE CARRIER ASSEMBLY

22. The Needle Carrier Assembly must be perfectly free to swing upon its stud, but must not have any right to left (lateral) movement. To adjust the Needle Carrier Assembly: a.) Remove the Upper Fabric Guard (screw 7 5/32) and the Work Plate Support (remove screws 36 5/32 from Feed Cover Support and screws 34 3/16 from Work Plate Support). b.) Loosen Set Screw 8 7/32. NOTE: If loosening this screw is neglected, damage to the stud hole in the Frame will occur. c.) Tighten the Needle Carrier Stud (4 9/32) until it stops then back it out 1/12 of a turn (30 degrees). Tighten Set Screw 8 7/32 and check Needle Carrier for lateral movement. Repeat this complete procedure as necessary until the Needle Carrier moves free up and down, but has no lateral movement.

NEEDLE PLATE

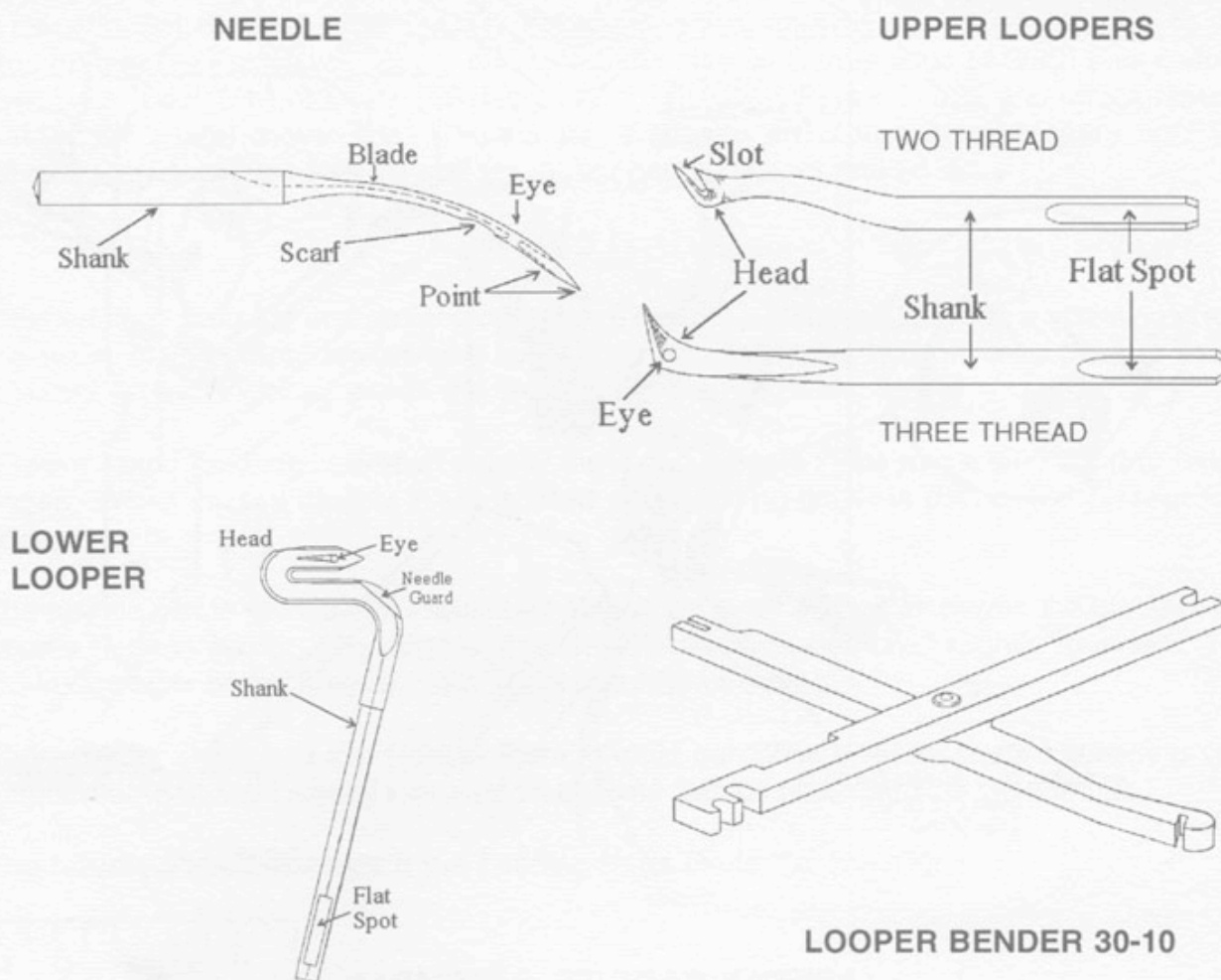
23. Most edging, seaming and serging operations require a Needle Plate with a chaining finger the width of the stitch desired and sufficiently long to permit two or three stitches to be retained on the finger as goods are fed through the machine.
24. A two-thread hemming operation usually requires a Needle Plate with a very short or "stub" finger. When such a Needle Plate is used, the chaining finger is part of the presser foot finger.
25. The needle slot in the Needle Plate must always be large enough to permit the blade of the needle to pass freely. The edge of this slot should be smooth and slightly rounded. The chaining finger of the Needle Plate should be free of burrs.
26. The working surface of the Needle Plate; should be corrugated for standard sewing with differential feed, and smooth for use on delicate fabrics requiring little differential.
27. The Needle Plate must match the Feeding Parts (Note Section 47).



NEEDLE CARRIER ASSEMBLY

LOOPERS

28. The Upper and Lower Loper must co-operate with the Needle in order for sewing to occur. Before making any Loper adjustments, always change to a new Needle. A new Needle may solve your problem, without further adjustments.
29. The Upper Loopers are made in two general forms, one for two thread stitching and the other for three thread stitching. Adjustment of both forms are the same.
30. The Loopers are nearly self setting, but they may need slight bending to achieve proper setting. Always bend Loopers slightly farther than the position you desire. The Loopers have a tendency to spring back to their original (pre-bent) position, if you don't bend them far enough. Loopers are designed to be bent only in the shank area. The point areas are hardened to prevent wear, and do not take a bend well.
31. To bend the Loopers, we recommend Merrow Loper Bender 30-10. Some people use the shank of a screwdriver, or pliers to do the bending. Please note: If pliers are used, they must be smooth surfaced to prevent damage to the surface of the Loopers. A good light is recommended for visibility when setting the Loopers. A piece of white paper placed behind the Loopers also makes them more visible.

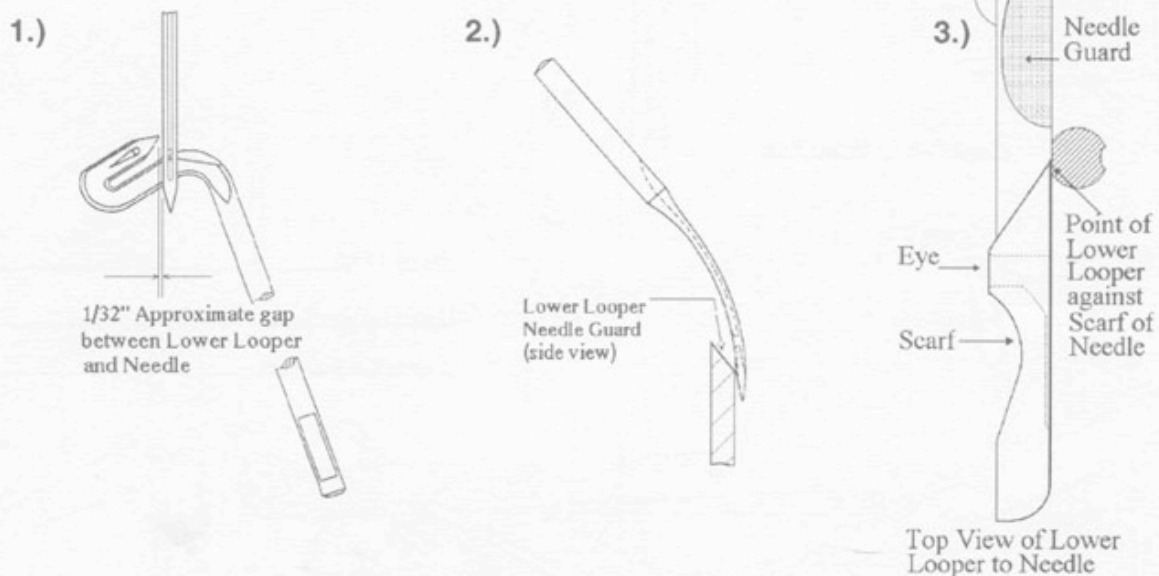


LOOPER SETTING

The following instructions are designed to give you a general knowledge of Looper setting. You should be able to make any Merrow Class MG or M machine sew after following these instructions. Specific styles will require further "fine tuning" to get the ideal looper setting. Talk to your local Merrow Sales representative for tips on setting your specific style of machine.

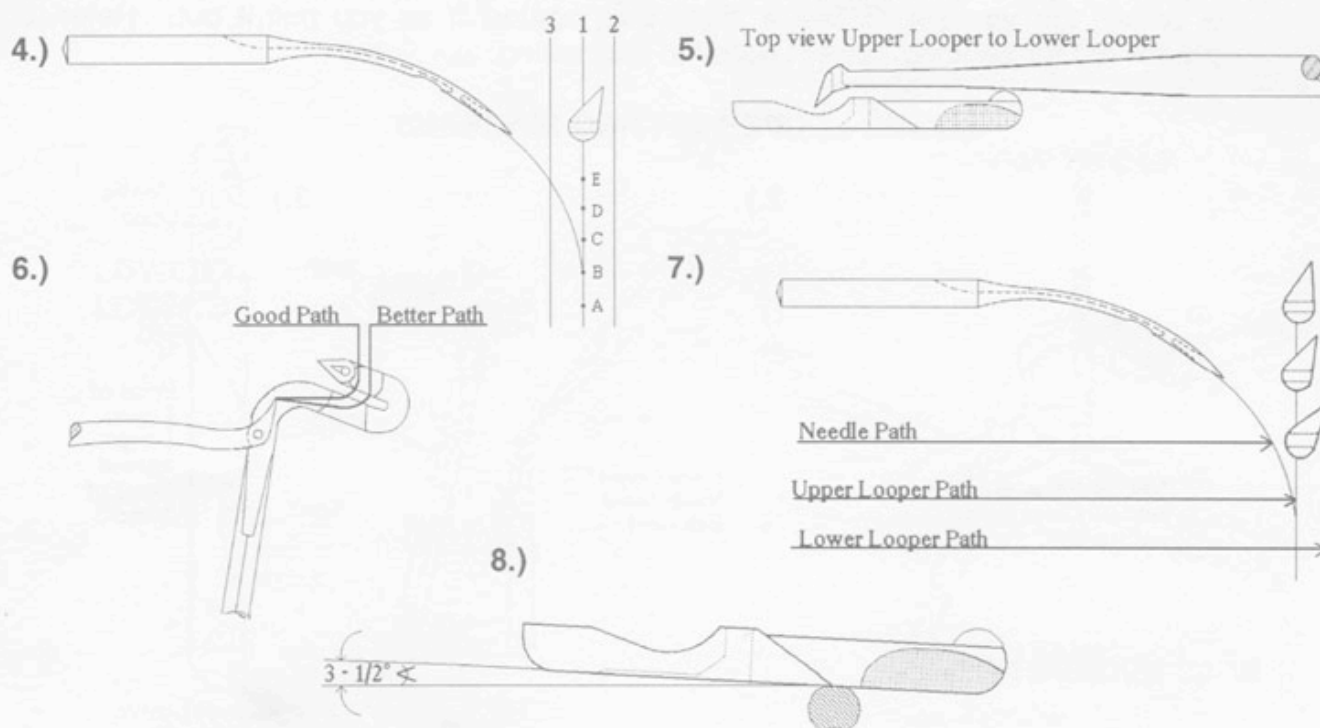
32. a. Swing the Presser Foot Assembly out, and remove the Needle Plate. Remove the Lower Looper Thread Tube, Feed Dogs, Fabric Guard (Upper), and Dust Shield for accessibility. Loosen Set Screws 1 7/32, 100 3/16 and remove Loopers.
- b. Insert Lower Looper into the Lower Looper Carrier. Push it down until it stops. Tighten Set Screw 1 7/32 against the flat spot on the shank of the Looper. Note: Before inserting new Looper, make sure the hole in the Looper Carrier and the area around it are clean. If you push dirt into the hole, the Looper will stick out too far and become hard to adjust properly. If this has happened, remove the Frame Cap (Section 50) and clean out Looper Carriers from the opposite end with a wire or pipe cleaner.
- c. Turn the Hand Wheel so that the Needle is at its furthest downward position (see diagram 1). The distance between the point of the Lower Looper and the Needle should be the thickness of the hook end of your Merrow Tweezers 37-225-C, or about 1/32 of an inch (.035). Refer to diagram "A" for bending the Lower Looper to this setting.
- d. The top corner of the needle point (where the point meets the blade) should contact the needle guard of the Lower Looper with a little pressure. (See diagram 2) To gage this, turn the Hand Wheel to separate the Needle from the Lower Looper. Insert a small scrap piece of note-paper (this is approximately 3 thousandths of an inch thick) between the Needle and Lower Looper. Turn the Hand Wheel back so that just the thickness of the paper is caught between the Needle and Looper. You should be able to remove the paper, but you should feel a slight drag against it as you pull it out. Refer to diagram "B" for bending Lower Looper to this setting.

LOWER LOOPER SETTING DIAGRAMS



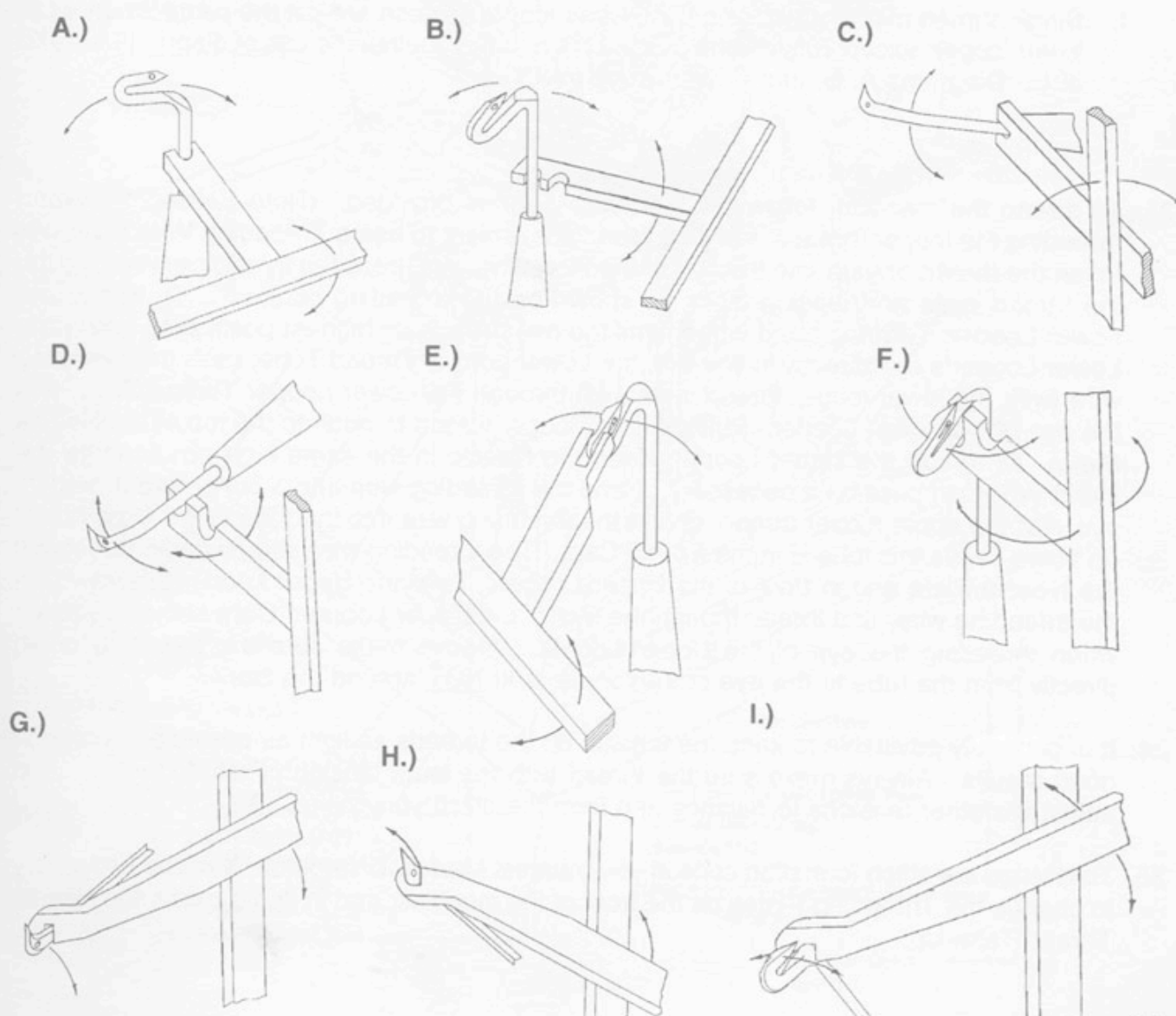
- e. Turn the Hand Wheel slightly, until the point of the Lower Loooper arrives behind the Needle. The point of the Lower Loooper should contact the rear surface of the Needle, but it should not deflect the Needle. (See diagram 3) The note-paper gage used above, also works here. If you are using "scarfed" Needle, the point of the Lower Loooper should still contact, but not deflect the Needle. Generally a Lower Loooper is set tighter to a "scarfed" Needle than a standard Needle. Refer to diagram "E" to adjust the point of the Lower Loooper to the Needle.
- f. Insert Upper Loooper into the Upper Loooper Carrier as far as it will go. Tighten Set Screw 100 3/16 against the flat spot on the shank of the Loooper. (See note above in section "b")
- g. Gently turn Hand Wheel over. The Upper Loooper should be far enough back that the Needle passes just behind the head. It should also be far enough forward that its point passes through the scarf, just behind the eye of the Lower Loooper. Look for interference (contact) between the Upper Loooper and Needle, or the Upper Loooper and Lower Loooper. The Upper Loooper should not contact either the Needle or Lower Loooper. If there is contact, adjust the Upper Loooper to clear the one it is contacting. If it is contacting both, adjust the Upper Loooper to clear the one with the most interference first.
- h. To adjust the clearance of the Upper Loooper refer to bending diagrams "C" and "D". Moving the Upper Loooper from path 1 to path 2 or 1 to 3 (diagram 4) will increase or decrease the clearance between the Upper Loooper and the Needle. It will also do the opposite to the clearance between the Upper Loooper and the Lower Loooper. For example, if moving from path 1 to path 3 increases your clearance between the Upper and Lower Loooper, it will also decrease your clearance between the Upper Loooper and the Needle.

UPPER LOOOPER SETTING DIAGRAMS



- i. Adjusting the Upper Looper (Diagram 4) along path 1 through points a, b, c, d, and e will change the clearance between the Upper Looper and the Needle. (Bending diagram C) Raising and lowering the Upper Looper affects the clearance by changing the timing of the meeting of the Upper Looper and the Needle. Bending the Upper Looper along this path will also change the meeting place of the point of the Upper Looper and the rear of the Lower Looper. The point of the Upper Looper should fall in the scarf of the Lower Looper right behind the eye. (See diagram 5 and 6) The point of the Upper Looper should not contact the Lower Looper. To determine if there is contact, place the tip of your left index finger on the exposed shank of the Lower Looper. Turn the Hand Wheel slowly while holding your finger to the Looper, if there is contact you will feel it. Adjust and recheck until the contact disappears.

LOOPER BENDING DIAGRAMS

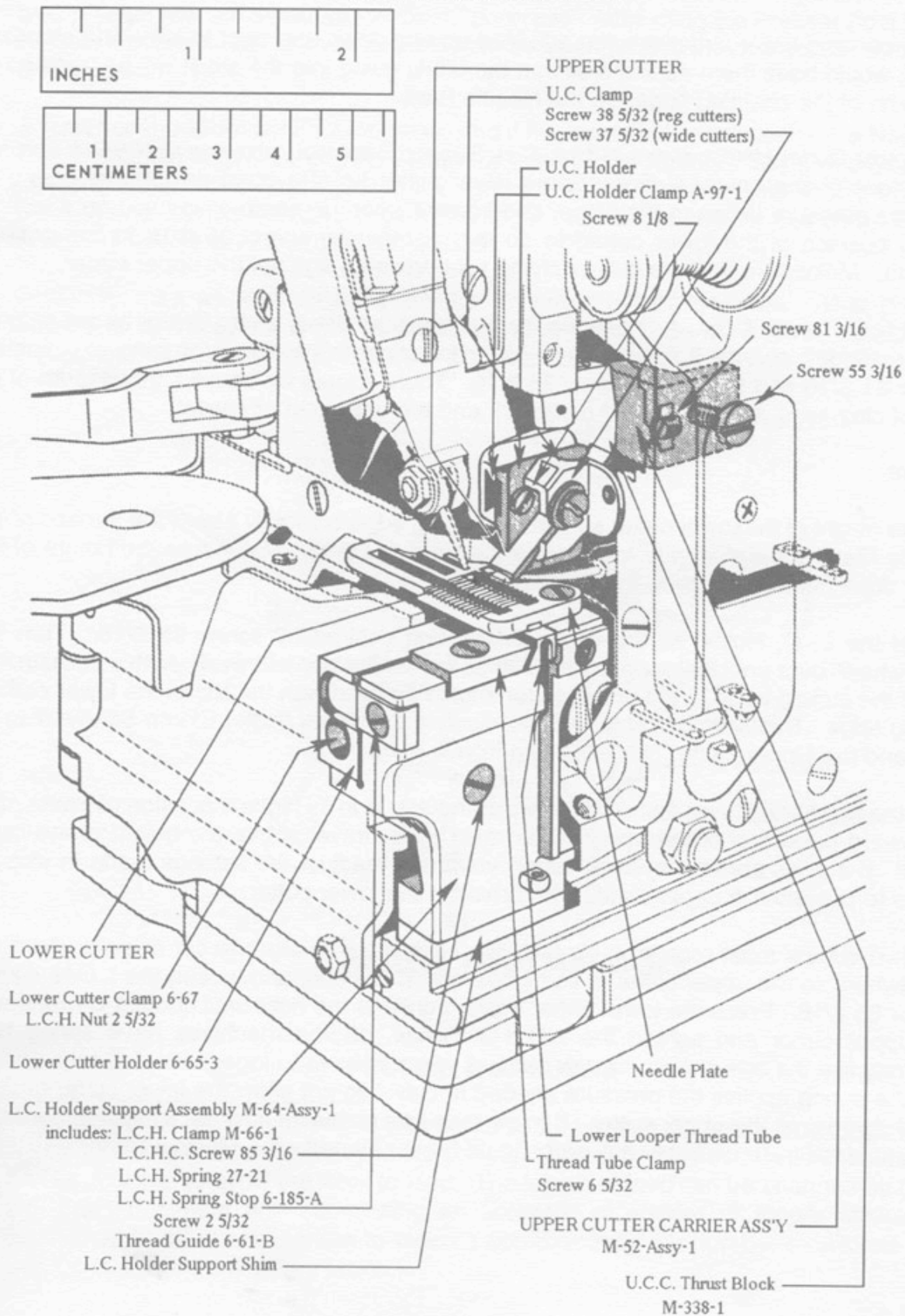


- j. At this point your Loopers should be reasonably set and working with each other and the Needle. Two more adjustments can be made, but they are generally not necessary. Diagram 8 shows the angle of the Lower Looper, this is pre-set at 3-1/2 degrees. Following bending diagram F, you can increase or decrease this angle to affect the clearance between the point of the Upper Looper and the rear of the Lower Looper. Diagram 7 shows rotating the head of the Upper Looper. (bending diagram G or H) This maintains the clearance between the Needle and the Upper Looper, while bringing the point of the Upper Looper closer to or farther away from the Lower Looper.
- k. When setting two needle machines like MG-4D-67's follow the above steps, except set the loopers to the inside needle. The angle of the Lower Looper may have to be reduced to 2-1/2 degrees from 3-1/2 degrees to bring the point closer to the outside needle while remaining close to the inside needle. If the Upper Looper is blind (no eye) set it as high as possible making sure the point still clears the eye of the Lower Looper. This presents a wider open loop of thread for both needles to penetrate. If the Upper Looper is eyed it may be necessary to set the point lower to keep the thread loop open for needle penetration. It is more common to have to follow head rotation diagrams G and H when setting the Upper Looper for two needle style machines.
- l. Single thread machines have a blind lower looper. These are set the same as an eyed lower looper, except rotating the point to the needle requires the use of diagram I instead of E. Diagrams A, B, and F can still be used.

THREADING

- 33. To thread the machine, follow the threading diagram provided. (Note Section 1) When threading the looper threads, it will be found convenient to use a Threading Wire (37-318). Insert the thread or yarn into the eye of the threading wire, pass the threading wire through the thread eyes and tension discs as shown on the threading diagram. To thread the Lower Looper: Turn the hand wheel until the needle is in its highest position to locate the Lower Looper's eye directly in line with the Lower Looper Thread Tube; pass the threading wire (with the lower looper thread in its eye) through the Lower Looper Thread Tube, and the eye of the Lower Looper. Pull the lower looper thread through to the top of the Needle Plate. To thread the Upper Looper: Keep the Needle in the same high position, turn the Hand Wheel to position if necessary. Bend the threading wire into a curve and thread its eye with the upper looper thread. Insert the threading wire into the tube in the Dust Shield (in some cases this tube is in the Frame Cap). The threading wire should come out above the Needle Plate and in front of the Upper Looper. Take the Upper Looper thread out of the threading wire, and thread through the eye of the Upper Looper. Care should be taken when threading the eye of the Upper Looper. Always make sure the thread is going directly from the tube to the eye of the looper, and NOT around the looper.
- 34. It is generally advisable to keep the tension on the threads as light as possible to produce good results. Always make sure the thread with the least tension is still controlled, then adjust the other tensions to balance and form the stitch you desire.
- 35. To change the stitch formation consult your nearest Merrow Distributor. It will be necessary to change the Threading Plates on the front of the machine, and in some cases the Needle Thread Take-Up.

CUTTER MECHANISM



UPPER AND LOWER CUTTER

General

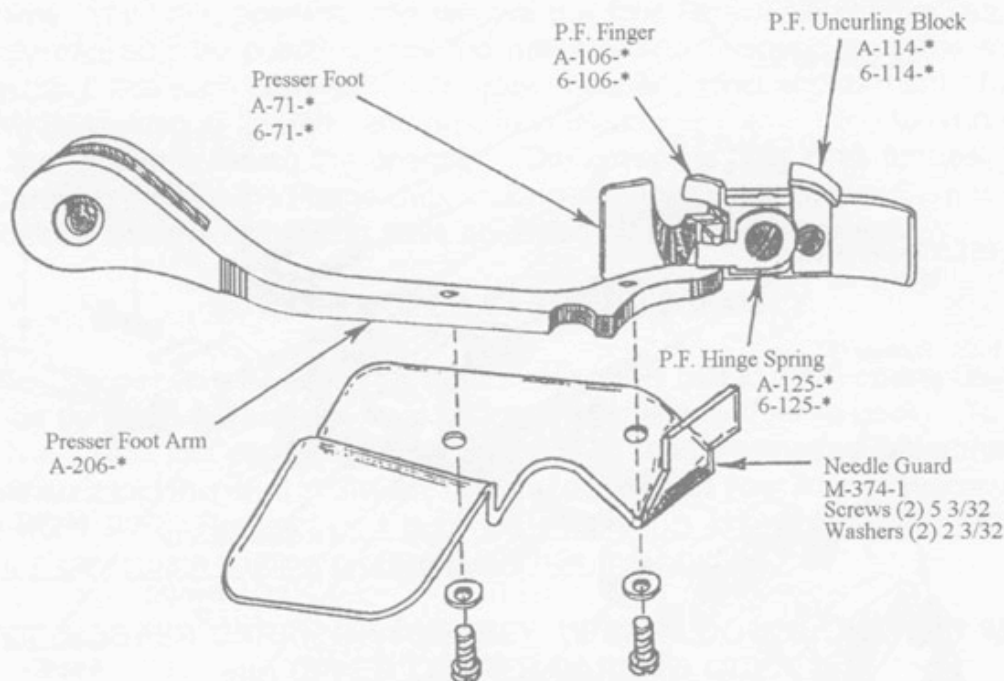
36. The upper and lower cutter may be adjusted up and down and right to left. The standard setting would have them adjusted so that the fabric going into the stitch will be trimmed to the width of the chaining finger on the Needle Plate.
37. The Lower Cutter Holder slides in the L.C.H. Support Assembly allowing right to left (lateral) movement of the Lower Cutter. Some lower cutter holders have an internal spring to maintain pressure between the Upper and Lower Cutter. In some cases you may wish to fix the position of the lower cutter; to do this, tighten the screw 85 3/16 at the desired position. Make sure you are only applying light pressure against the upper cutter.
38. The U.C.C. Thrust Block supports the force against the upper cutter carrier by the cutters. After extended service it may be necessary to adjust this block by means of Adjusting Screw 81 3/16 and the clamp screw 55 3/16. There should be about 1 thousandth of an inch of clearance between the thrust block and the upper cutter carrier.

Adjustment

39. Set the height of the lower cutter so that the cutting edge is slightly above the surface of the Needle Plate and tighten the lower cutter clamp nut 2 5/32. Make sure the height of the blade does not interfere with the Presser Foot.
40. Clamp the L. C. Holder to the width of trimming desired by screw 85 3/16. Turn the Handwheel over until the upper cutter is in its lowest position of travel. At this position, the top of the cutting edge of the upper cutter should be even with the top of the lower cutter's cutting edge. This setting is obtained by adjusting the Upper Cutter Clamp Screw 37 or 38 5/32 and the Upper Cutter Holder Clamp Screw 8 1/8.
41. Turn the handwheel over again until the upper cutter is in its highest position of travel. The downward projection of the upper cutter must never travel above the height of the lower cutter. If it goes above the lower cutter, you must readjust the settings made in step 40 above to prevent the upper cutter from breaking the lower cutter.
42. The two cutters must remain in contact with each other in order to cut cleanly. Turn the Handwheel so the upper cutter in its highest travel position, and loosen the L.C.H. Clamp Screw 85 3/16. Press the lower cutter holder lightly to the right until contact is made with the upper cutter and tighten the L.C.H.C. Screw. Some machines have spring type supports like the one shown; on this support you only have to loosen the L.C.H.C. Screw, and the spring applies the pressure needed to cut. Do not allow the lower cutter to push to tightly against the upper cutter. If more than light pressure is required to make a clean cut, the blades are probably dull and should be sharpened on a Merrow Cutter Grinder.

PRESSER FOOT AND PRESSER FOOT FINGER

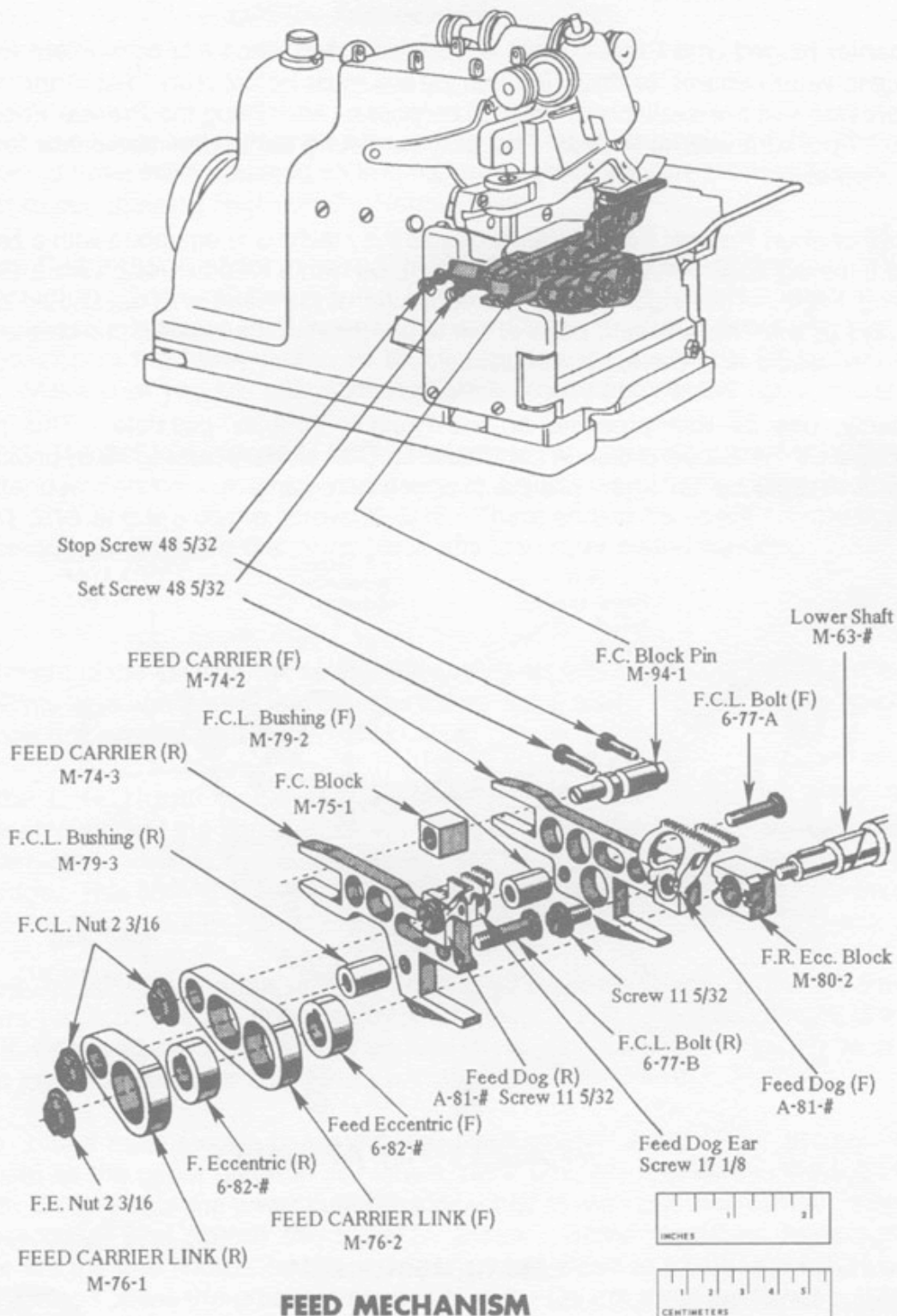
43. The center hinged type Presser Foot is generally used since it is convenient for seaming, or edging where seams or thick and thin places must be crossed. Rigid and rear hinged type presser feet are available for special purposes. After lifting the Presser Foot Latch, the Presser Foot Arm with its Presser Foot may be swung out to provide access to the needle and loopers.
44. A "stub" or short Presser Foot Finger is used if the machine is equipped with a Needle Plate with a chaining finger. A long P.F. Finger is used with a Needle Plate with a stub or short chaining finger. The finger guards the right side of the needle. This should be adjusted sideways so that the left hand edge of the finger (next to the needle) just clears the needle when the needle is in the full down position.
45. Ordinarily, use as little pressure on the Presser Foot as possible. This pressure is adjustable by the Screw 6 3/8. A set Screw 13 5/32 holds Screw 6 3/8 in position so your adjustment does not change while the machine is running.



PRESSER FOOT ASSEMBLY

FEEDING MECHANISM

46. Feed Dogs are normally provided with either coarse or fine cut teeth, single row or double row, depending on the material you are sewing. Generally the Feed Dogs should be set as low as practical to allow the work to feed. The length of feed can be changed by removing the Feed Eccentric and substituting an eccentric of shorter or longer stroke. Feed Eccentrics (6-82-#) are marked to indicate approximately the number of stitches per inch produced at the edge of the fabric.



47. The Feed Dog and Needle Plate must match each other and it may be necessary to change Feed Dogs to prevent interference with the Needle Plate when very few stitches per inch are used.

48. Machines designated by the letter "D" in the style marking contain a differential or gathering feed. The differential feed contains two separate Feed Dogs, with Separate Feed Carriers and separate Feed Eccentrics. This separation allows the front Feed Dog to be set up to travel farther than the rear Feed Dog. This gathers the fabric and prevents it from being stretched or lengthened while it is being sewn. The difference in the throw of the two Feed Eccentrics creates the "differential" feed. The difference between the two can be very little or quite large depending on the number of stitches per inch you desire and on the elasticity (stretch) of the fabric.
49. On certain fabrics it may be desirable to tilt the Feed Mechanism. To make this adjustment loosen the Set Screw 48 5/32, then slowly turn the Feed Carrier Block Pin to the desired location and tighten the set screw. When the screw slot in the F.C. Block Pin is level with the base of the machine, the feed dogs will be in their standard position. It is never necessary to remove the Set Screw 48 5/32.

FRAME CAP ASSEMBLY

50. To remove the Frame Cap Assembly, remove the Dust Shield, Needle Plate, and the Upper and Lower Loopers. Turn the Hand Wheel until the Lower Looper Carrier Assembly is at its extreme right-hand position, and remove the four Screws 99 3/16. The Frame Cap Assembly can now be pulled toward the operator and removed from the machine. To reassemble, place each Cam Roll on its proper Looper Carrier and oil them. Turn the Hand Wheel while looking at the left-hand groove in the Lower Cam. Stop turning when the oil hole in the groove is facing the operator. The groove is now in its furthest travel to the right. Carefully replace the Frame Cap, making sure the Lower Looper Carrier is in its right-hand position and the Cam Rolls have not fallen off the looper carriers.

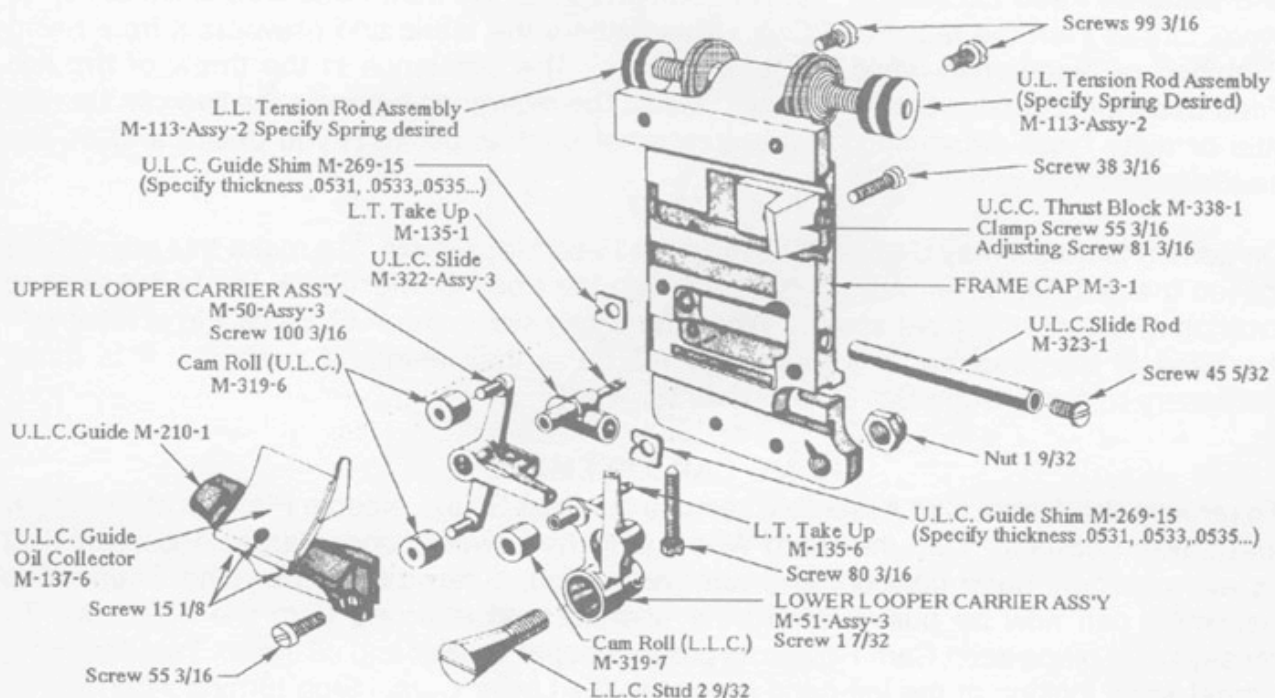
LOWER LOOPER CARRIER ASSEMBLY

51. The Lower Looper Carrier Assembly must swing freely (left to right) on the Stud 2 9/32, but it must be tight enough to have very little side movement (front to back). To adjust this, loosen Nut 1 9/32 just enough that the Stud 2 9/32 can be turned. Tighten (or loosen) the Stud 2 9/32. Hold this stud in the position you desire with your screwdriver and tighten the locking Nut 1 9/32. Remember, it is better to have this assembly slightly loose. If this is too tight it can create binding problems and hurt the machine.

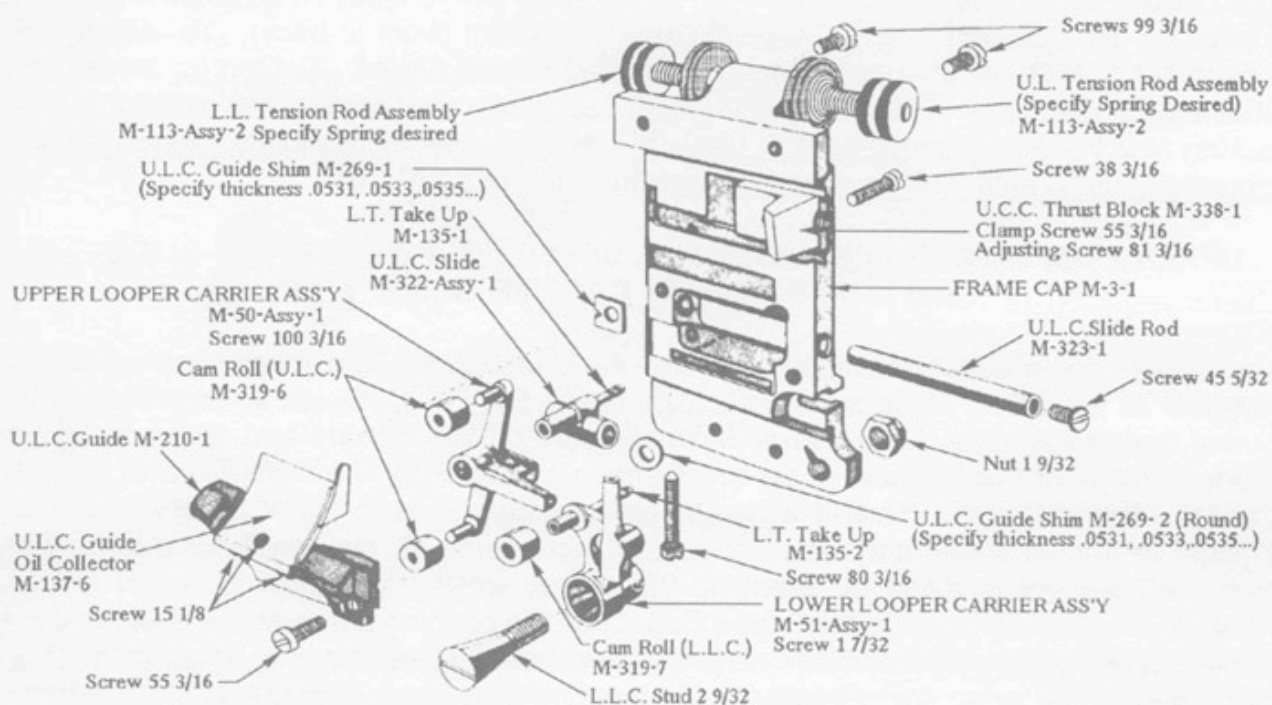
UPPER LOOPER CARRIER ASSEMBLY, UPPER LOOPER CARRIER SLIDE and UPPER LOOPER CARRIER GUIDE

52. The Upper Looper Carrier Assembly pivots on the U.L.C. Slide. The assembly must be free to travel its full stroke along the U.L.C. Slide Rod. The U.L.C. Guide limits the side play during the stroke. The U.L.C. Guide Shims (square on MG, square and round on M) are made in different thicknesses, to set the distance between the U.L.C. Guide and the U.L. Carrier. The shims are marked with a number which stands for its thickness in inches. Thicker or thinner shims may be purchased in increments of two ten thousandths of an inch. Adjustment is made by changing the shims, smaller to tighten larger to loosen. After refastening the guide to the Frame Cap, gage the opening between the guide and the carrier with a piece of feeler steel. There should be a gap of about 1 thousandth of an inch between the guide and the looper carrier and between the looper carrier and the frame cap.

Frame Cap Assembly - Class MG



Frame Cap Assembly - Class M



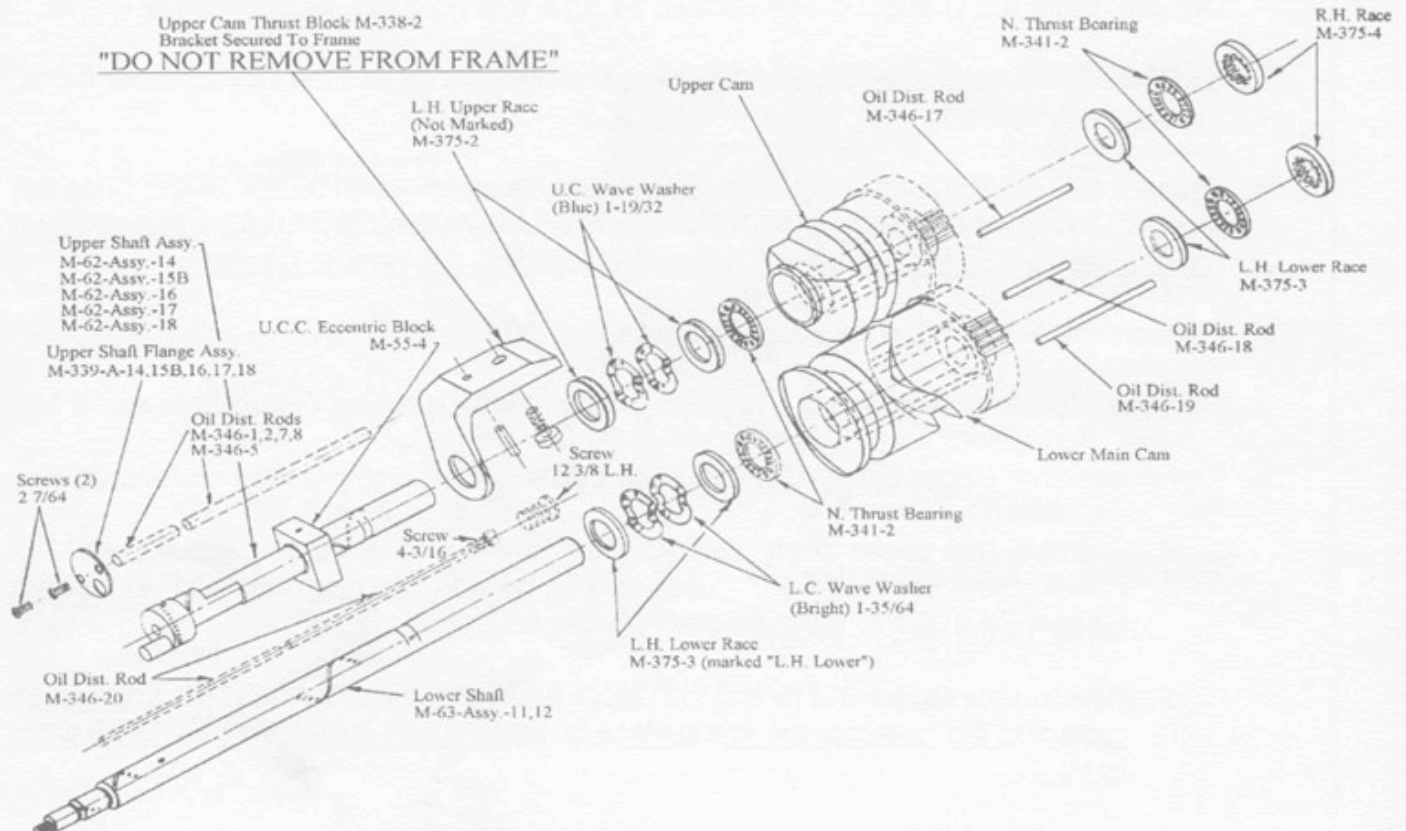
53. The above mentioned adjustment of the U.L.C. Guide is made at the factory when the machine is built. Most machines will run four or five years without needing readjustment, unless an accident damages one of the parts.
54. The pointed set screw 80 3/16 holds the U.L.C. Slide Rod and its tapered Screw 45 5/32 into the Frame Cap. When replacing the U.L.C. Slide Rod, turn the Screw 80 3/16 into the spot hole on the rod just enough to prevent the rod from turning. Tighten the Screw 45 5/32, then tighten down Screw 80 3/16.
55. The Cam Rolls for the Upper Looper Carrier (M-319-6) are different from the Cam Rolls on the Lower Looper Carrier (M-319-7). If the Upper and Lower Looper seem to be very loose, these rolls may be worn out. To replace simply follow the previous instructions on Frame Cap removal.

REMOVAL OF THE UPPER AND LOWER MAIN SHAFTS AND CAMS

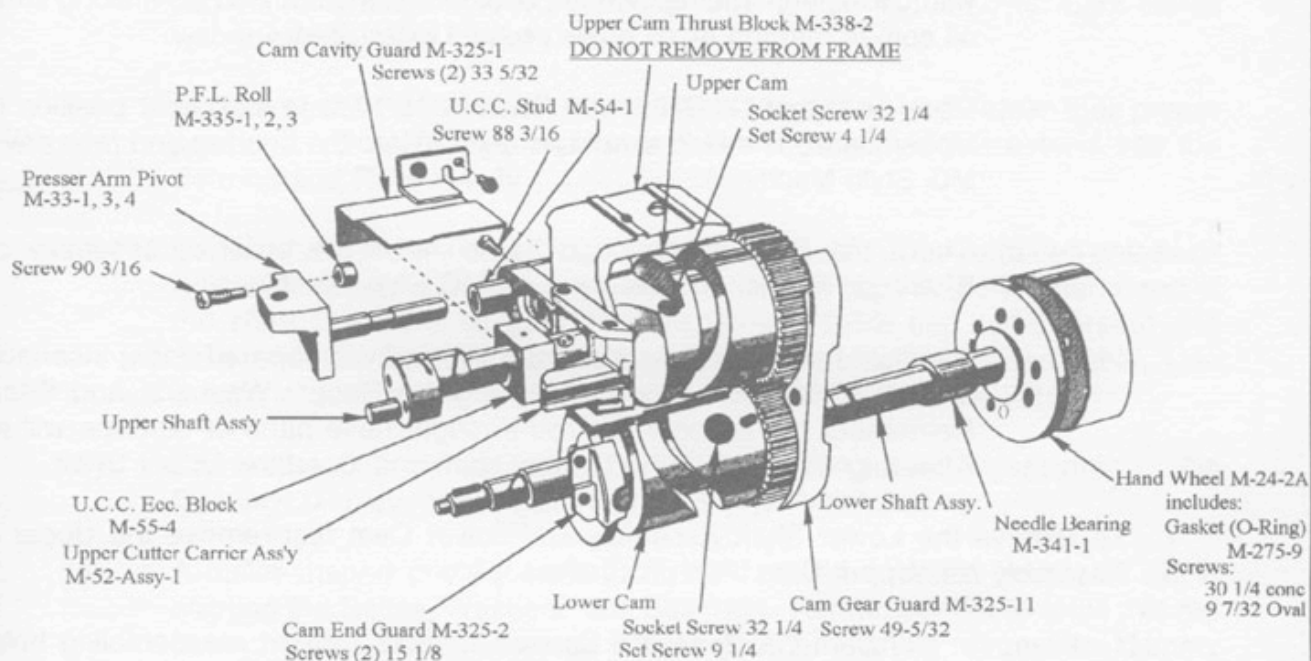
56. In order to remove the main shafts and cams proceed as follows:
(Note: It is not necessary to drain the oil from the machine.)
 - a. After swinging the Presser Foot Assembly and Feed Cover out of the way for accessibility, remove the Fabric Guard (upper), Needle Plate and Lower Looper Thread Tube from the machine.
 - b. Remove the Feed Eccentric Nut 2 3/16 and the F.C. Link Nut 2 3/16 (forward). Then remove the Feed Carrier Link (r) and Feed Eccentrics.
 - c. Remove the Work Plate Support by removing Screw 36 5/32 (Needle Carrier Assembly Drawing page # 11) and the two Screws 34 3/16 that hold the support to the Frame.
 - d. Slide the Feed Carriers off the Feed Raising Eccentric Block and the Feed Carrier Block. Remove the blocks.
 - e. Loosen the Set Screw 8 7/32, then remove the Needle Carrier Stud 4 9/32. Slide the Needle Carrier Assembly and the Needle Carrier Link Assembly off the machine. Note: refer to section 22 for adjustment when reassembling the Needle Carrier.
 - f. Remove the Frame Cap as described in section 50.
 - g. Remove the Cam Gear Guard Screw 49 5/32 and the Cam End Guard Screws 15 1/8.
 - h. To remove the Upper Shaft Assembly and Upper Main Cam, proceed as follows:
 1. Remove the upper shaft pump parts (Screw 8 7/16, Spring 27-40, and Oil Pump Plunger M-198-2). Be careful when handling the O.P.P. Screw Gasket (M-275-21), damage can result in leaking oil.
 2. Remove the Screw 3 9/16 and the Upper Shaft Oil Collector M-137-2. Note: when replacing the collector the top surface is marked "up" (see Oiling Parts diagram page 7).

3. Remove the Socket Screw 32 1/4 and loosen the Set Screw 4 1/4 in the Upper Cam. When reassembling first tighten the Socket Screw 32 1/4 into the spot hole on the Upper Shaft, then tighten the Set Screw 4 1/4.
4. Pull the Upper Shaft Assembly out. The shaft may stop about 1/2 inch out when the eccentric cut on the shaft meets the Upper Cutter Carrier Eccentric Block. To remove the shaft fully, pull on the shaft while moving the Upper Cutter Carrier up and down. This process will have to be repeated to get the Upper Shaft all the way back in when reassembling. Note: If the shaft is "frozen" to its bearings it may be necessary to use a rod to loosen it. Always use a soft rod between 1/4" and 3/8" diameter. Damage can occur if a larger rod is used. Be careful not to force the rod through the Races, Washers, and Bearings or damage may result.
5. To remove the Upper Cam, screw in Extractor M-155-Assy-1 into the Upper Cam Socket Screw hole 32 1/4. Pull the Extractor and Upper Cam out of the machine. On MG Style machines you will also be removing Races, Washers, and Bearings as you pull the Cam out. This will include: Left Hand Upper Race M-375-2 (2), Upper Cam Wave Washer 1 19/32 (2), Left Hand Lower Race M-375-3 (2), Lower Cam Wave Washer 1 35/64, and Needle Thrust Bearing M-341-2 on the left hand side. Needle Thrust Bearing M-341-2 and Right Hand Race M-375-3 and M-375-4 on the right hand side.
6. Do not remove the Upper Cam Thrust Block M-338-2 from the Frame.

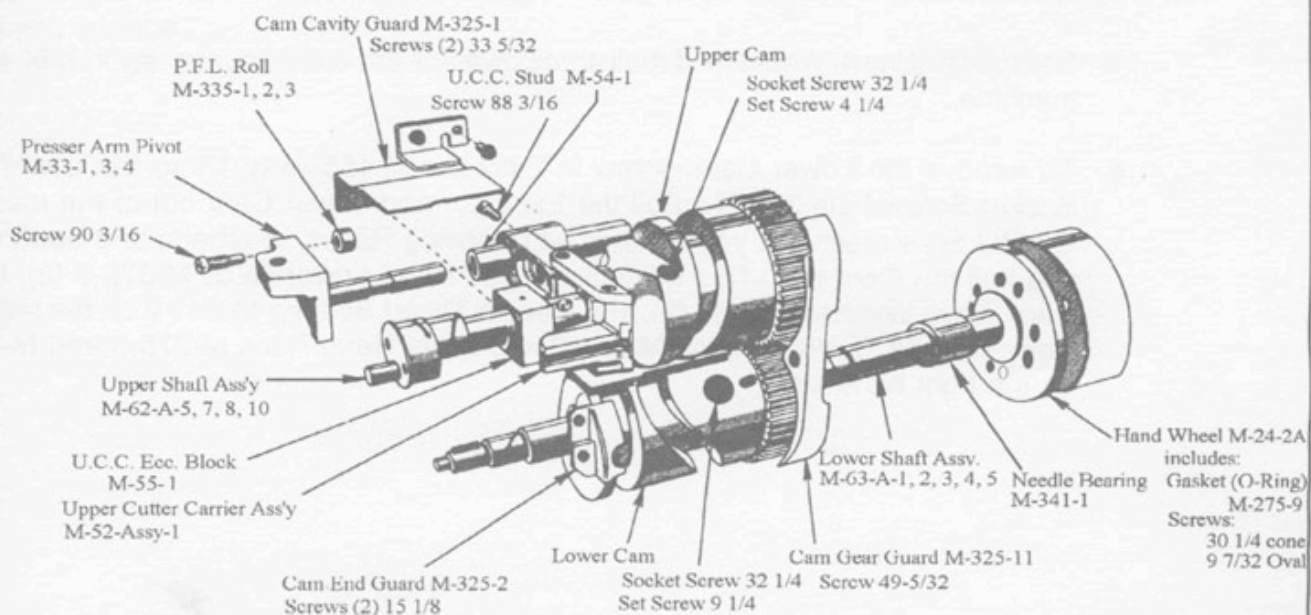
MG Main Bearing Assembly M-Assy-9



Main Cams - Main Shafts Class MG



Main Cams - Main Shafts Class M



NOTES

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