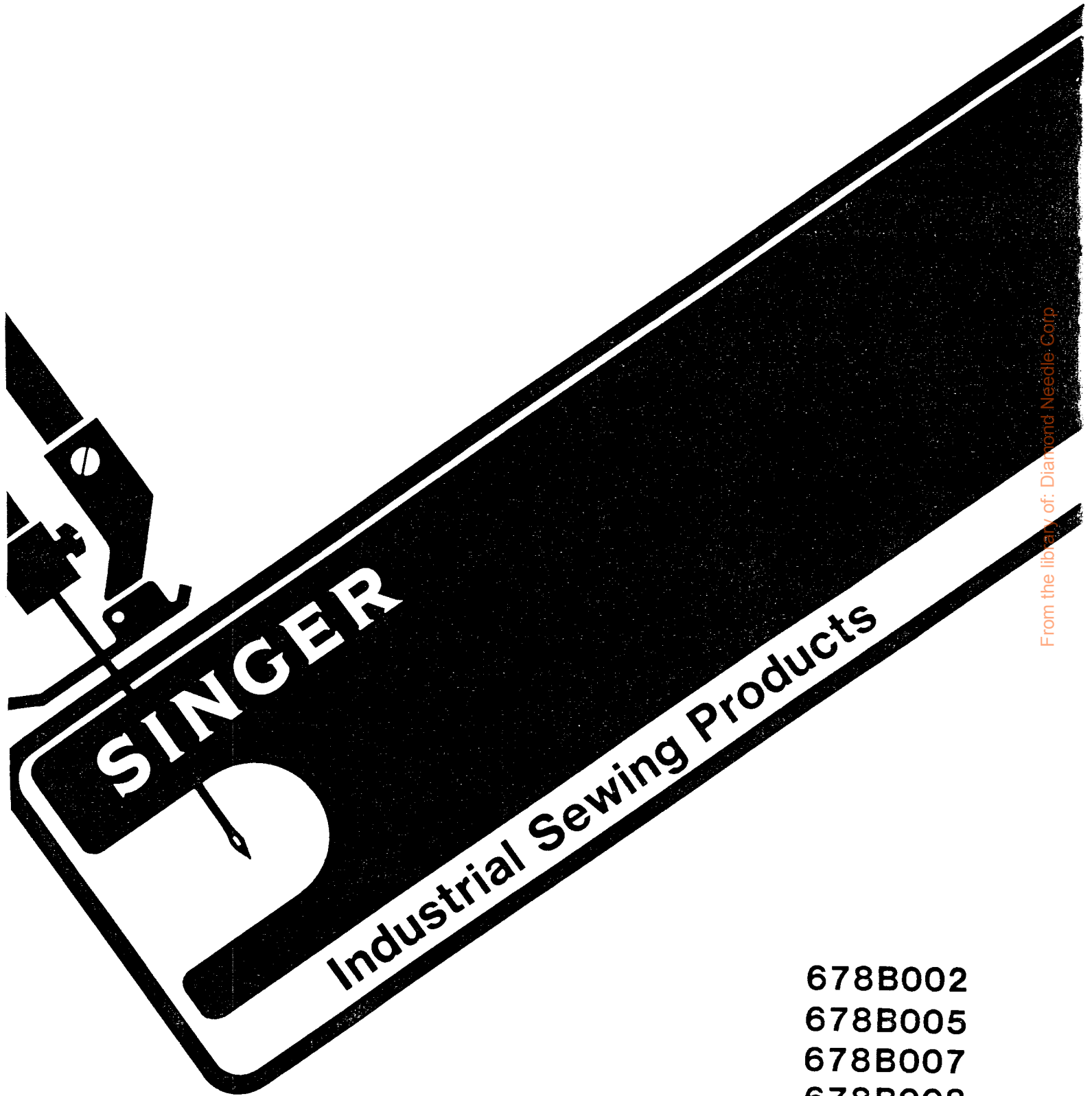


SINGER
678B002,B005,B007,B008

Service Manual and Parts List



From the library of: Diamond Needle Corp

- 678B002
- 678B005
- 678B007
- 678B008

IDENTIFICATION OF MACHINES

Each 678B machine is identified by a Variety number on a metal plate on the machine.

APPLICATION OF CATALOG

This catalog applies specifically to the standard Varieties of machines as listed herein. References to direction such as right, left, front, back, etc., are given from the operator's position while seated at the machine unless otherwise noted. Operating direction of handwheel is toward the operator.

VARIETIES OF MACHINES

Advanced High Speed, Two and Three Needle, One Looper, One Spreader, Offset and Tandem, Top Screw Adjusted Differential Feed Flat Bed Machines, Medium Throw, Needle Bearing Needle Bar Drive, Light Weight Presser Bar and Needle Bar Driving Mechanism, Single Reservoir, Enclosed Positive Automatic Lubricating System, Filtered Oil Return Pumps for Head and Base, Wakefield Bearings for Feed Rocker Shaft, Single Disc Looper Thread Take-up with an Adjustable Cast-off plate Support. Large Handwheel and Improved Belt Guard. Prepared for use with Knee Press for Presser Foot Lifter, Equipped with Disc Type Thread Tensions, Maximum Work Space to Right of Needle Bar 8 1/4 Inches (209.55 mm).

- 678B002 Three needle five thread interlock stitch, offset differential feed machine, for attaching cuffs in one operation to knitted undergarments, and similar operations on light to medium weight materials. Seam specification 605-FSa-1. Cat. 7284 needle. Standard Gauge No. 16 only. Maximum recommended speed 5500 R. P. M.
- 678B005 Two needle four thread interlock stitch, offset differential feed machine, for attaching collarettes to knitted undergarments and similar operations on light to medium weight material. Long length ribbed knit strip cut perpendicular to the wale or parallel with the wale. Constant strip tension, Seam specification 602-BSa-1. Cat. 7284 needle. Standard Gauge Nos. 8 and 12. Standard finished widths 3/4, 7/8, 1, 1 1/4 inches (19.05, 22.23, 25.40, 31.75 mm). Specify gauge and finished width. Maximum recommended speed 5500 R. P. M.
- 678B007 Three needle five thread interlock stitch, offset differential feed machine, for attaching collarettes to knitted undergarments and similar operations on light to medium weight material. Long length ribbed knit strip cut perpendicular to the wale or parallel with the wale. Constant strip tension. Seam specification 605-BSa-1. Cat. 7284 needle. Standard Gauge Nos. 14 and 16. Standard finished widths 3/4, 7/8, 1 and 1 1/4 inches (19.05, 22.23, 25.40, 31.75 mm). Specify throat plate, gauge, finished width and stitches per inch. Maximum recommended speed 5500 R. P. M.
- 678B008 Three needle five thread interlock stitch, tandem differential feed machine, for patch operations on flat and ribbed knit undergarments and similar operations on light to medium weight material. Seam specification 605-LSa-1. Cat. 7284 needle. Standard gauge No. 16 only. Maximum recommended speed 5500 R. P. M.

NEEDLES

The standard recommended needle for machines in this catalog is Cat. 7284 (available in sizes 10 to 18).

Selection of proper needle size is determined by the size of thread used. Thread should pass freely through needle eye to produce a good stitch formation.

ORDERING REPAIR PARTS

ILLUSTRATIONS

This catalog is arranged to simplify ordering replacement parts. Exploded views of various sections of the mechanism are shown on the left hand pages so that parts may be seen in their actual positions in the machine. On the right hand pages opposite the illustrations, the parts are listed with descriptions and the quantity of parts required in the particular view being shown.

Numbers in the first column are reference numbers only, indicating position of a part in the illustration. Do not use the reference numbers in ordering.

In the second column in the examples below are the part numbers as listed in this catalog. In the third column is the coded number to be ordered. The prefix "910" must be used. Additionally, letter suffixes generally are transposed as a prefix to the part number.

Components of sub-assemblies which can be furnished as replacements are indented under the description of the main sub-assembly.

The examples below show how to order using parts on Page 35 of this catalog to illustrate the instructions above:

<u>Ref. No.</u>	<u>Part No.</u>	<u>Order As</u>	<u>Description</u>	<u>Qty.</u>
1	56381-219	910-56381-219	Cloth Plate Lever -----	1
2	51281 AC	910-AC 51281	Spring -----	1
3	35772 H	910-H 35772	Washer -----	3
4	22760 A	910-A 22760	Screw -----	3
5	22845 B	910-B 22845	Screw -----	1

Where the parts for all machine varieties covered in this catalog are not the same, the difference will be shown in the illustrations or mentioned in the descriptions. When a part is used in all machines in this catalog, the variety number is not mentioned.

A numerical list of all parts shown in this catalog appears on Pages 46 and 47 to facilitate locating the illustration and description when the part number is known.

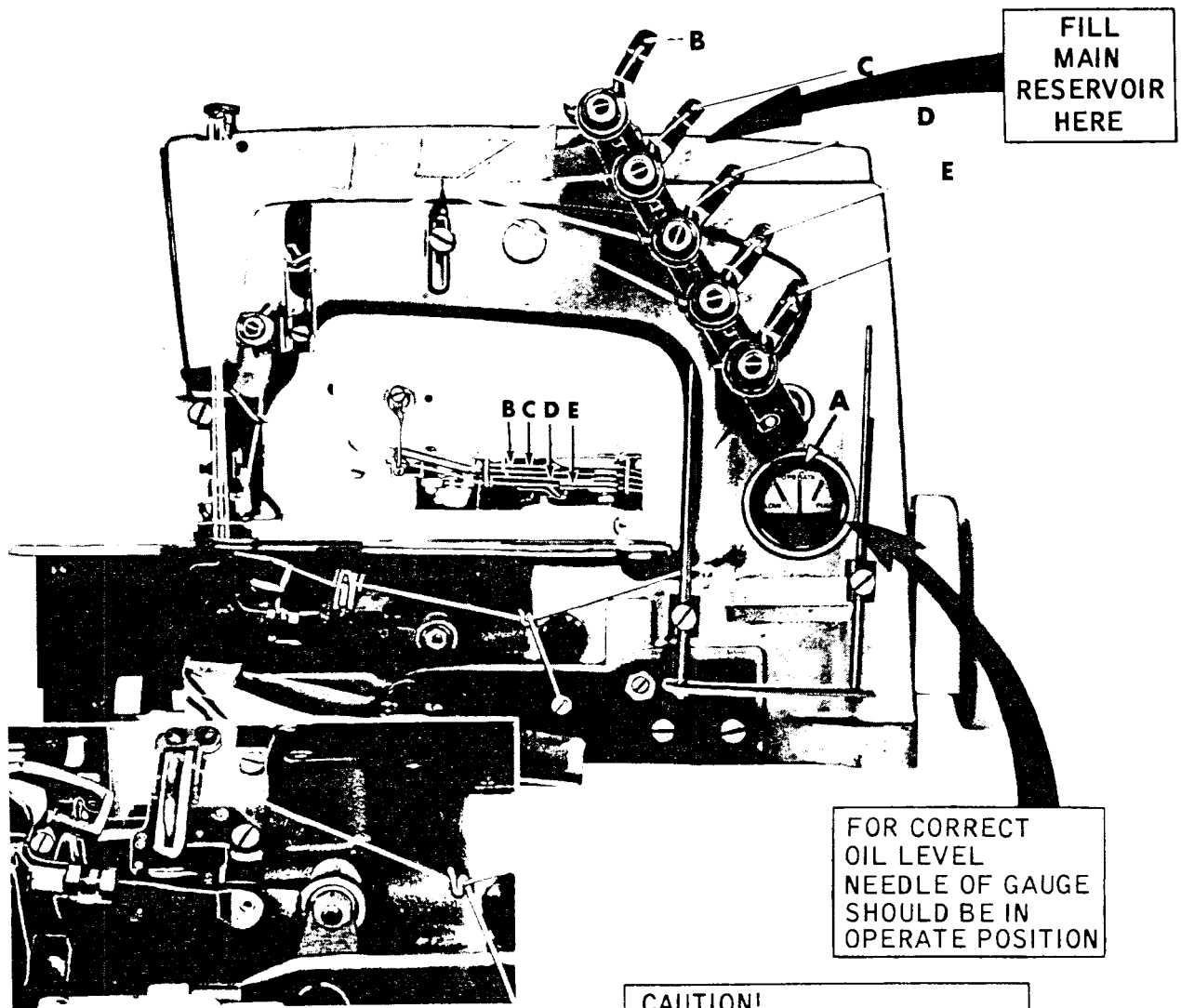


Fig. 1

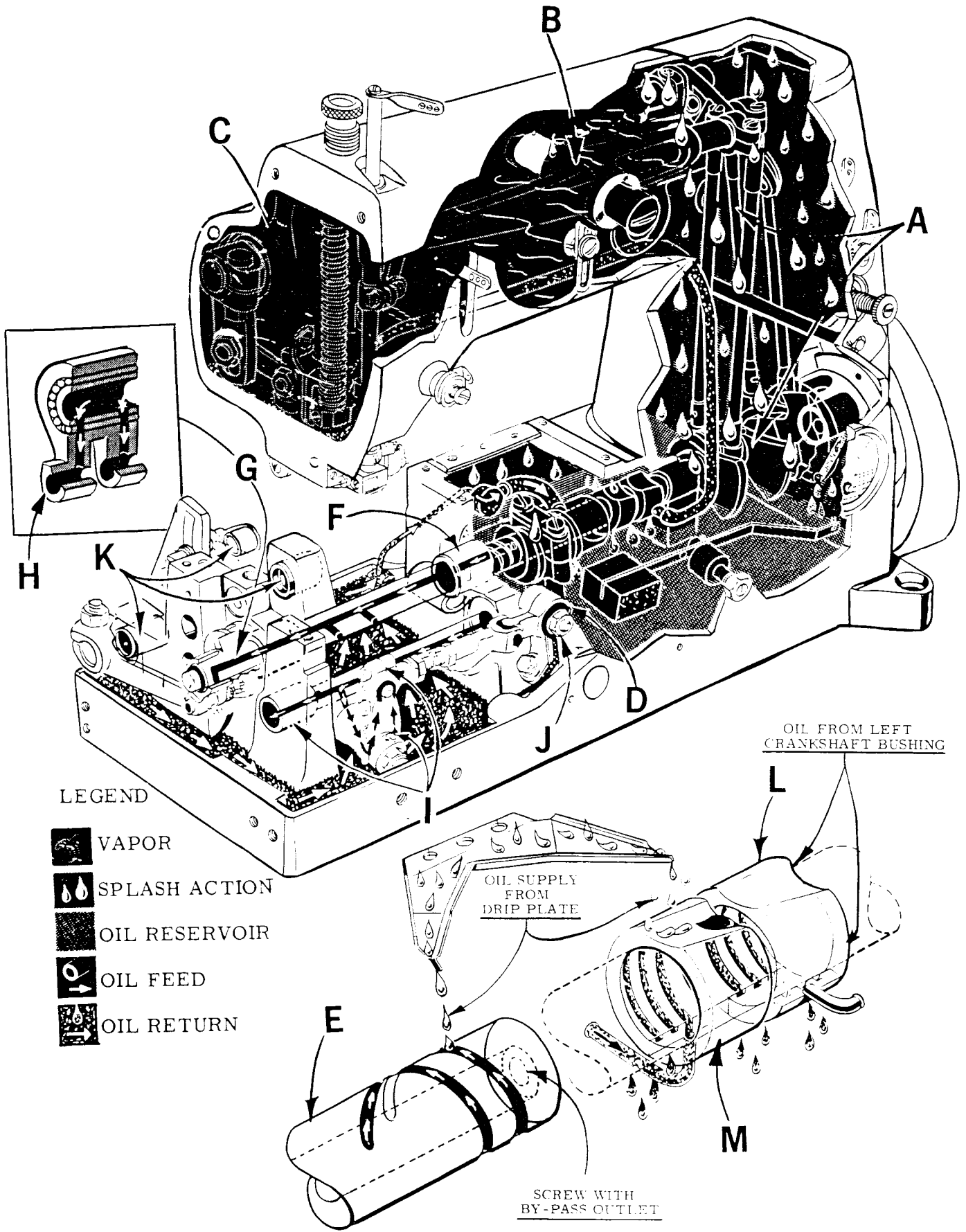
CAUTION!
 FILL ALL OIL RESERVOIRS
 BEFORE STARTING.
 MACHINE HAS BEEN DRAINED
 BEFORE SHIPPING.

THREADING AND OILING DIAGRAM FOR 678B Machines

Thread machine as indicated. The looper threading has been enlarged for clarity. The machine illustrated above is a three needle machine, but the two needle machines are threaded in substantially the same manner.

The oil has been drained from the machine before shipping and the reservoir must be filled before starting to operate. To fill machine with oil, remove plug screw in top cover and add oil until needle of oil gauge (A, Fig. 1) is on the black line, located to the right of "OPERATE" zone marked "FULL". Maintain oil level in "OPERATE" position and add oil when needle is to the black line located to the left of "OPERATE" zone marked "LOW". The machine is automatically lubricated and no oiling other than keeping the main reservoir filled is necessary. Use Singer Type C oil or equivalent.

Excessive oil in the main reservoir may be drained at the plug screw, located in the main frame to the left of the oil gauge.



ADVANCED FLATBED LUBRICATION SYSTEM

SUPPLY SYSTEM

<u>Figure Letter</u>	<u>Bearing or Machine Area</u>	<u>Method of Lubrication</u>
A.	Crankshaft drives, upper ball straps and crankshaft bearings.	Oil agitation as a result of extensions on needle lever connecting rods.
B.	Needle lever cross shaft bearing.	Oil trough (51282 AE) which is supplied by splash in column area.
C.	Head area (all mechanisms and bearings).	Mist as a result of splash in column.
D.	Looper drive crank, looper drive lever bearings.	Oil agitation as a result of splasher (56343 E) on bottom of looper drive connecting rod.
E.	Opposing Helical grooves in right end of mainshaft. Short groove prevents oil leakage from right mainshaft bearing.	Oil drip plate which accumulates splash in chamber.
F.	Right mainshaft bearing.	Supply grooves in right end of mainshaft.
G.	Left mainshaft bearing and all eccentric bearings located on mainshaft.	Oil supplied from hollow mainshaft and metered by felt plugs. Oil is introduced into center of shaft in the right mainshaft bearing area. Amount of lubricant in center of shaft controlled with by-pass hole in right end of mainshaft.
H.	Lower ends of connecting rods of mainshaft eccentrics.	Oil run-out from eccentric bearing supplies.
I.	Looper cone, right and left looper rocker shaft bearings, and left looper rod ball joint.	Supplied from hollow looper rocker shaft which contains 4 strands of yarn as a metering device.
J.	Right looper rod needle bearing joint.	Oil supplied from front base felt to lubricating plate (56393 K).
K.	Feed rocker shaft and upper feed rocker shaft bearings.	Self-lubricated bearings.

RETURN SYSTEM

<u>Figure Letter</u>	<u>Machine Area</u>	<u>Method of Return</u>
L.	Head	Felt pad in head collects oil. Return pump located on crankshaft and primed by oil from left crankshaft bearing.
M.	Base	Felt pad in base collects oil. Second return pump located on crankshaft and primed by oil drip plate which accumulates splash in looper drive chamber.

INSTRUCTIONS FOR MECHANICS

LUBRICATION

CAUTION! Oil has been drained from the main reservoir before shipment, so the reservoir must be filled to the proper level as indicated on oil gauge (A, Fig. 1) before beginning to operate. Run machine slowly for several minutes to distribute the oil to the various parts. Full speed operation can then be expected without damage.

RECOMMENDED OIL

Use Singer Type C oil or equivalent in the main reservoir. Fill main reservoir at plug screw in upper crank chamber cover (A, Fig. 2) and check oil level at gauge (B). Oil is maximum safe operating level when needle is to the black line, located to the right of "OPERATE" zone, marked "FULL". Oil should be added when needle is to the black line, located to the left of "OPERATE" zone, marked "LOW".

CAUTION! It is important that these machines not be over filled.

It is recommended that a new machine, or one that has been out of service for an extended period be lubricated as follows: Remove the head cover, clean out lint and directly oil the needle bar link and the needle bar. Replace head cover as no further hand oiling will be required. Run machine slowly for several minutes to distribute oil to the various parts.

For machines in operation check the oil for dirt and lint deposits at reasonable intervals. If dirty, change the oil. An oil change is recommended every 2000 operating hours. Oil may be drained from main reservoir by removing plug screw (C, Fig. 2) located below the cloth plate at front of the machine, or by removing the lower crank chamber cover, located at the back of machine.

NOTE: Looper avoid and feed lift eccentrics receive oil thru the mainshaft, so when assembling be sure oil holes in the eccentric line up with oil holes in mainshaft when spot screw is in time spot.

OIL GAUGE

The oil gauge is set at the factory to show the proper oil level in the reservoir. Should an adjustment become necessary, however, the following steps should be followed:

1. Place the machine upright on a level table or bench.
2. Remove the oil reservoir plug screw (C, Fig. 2) and tip machine forward to drain oil from the reservoir.
3. Make sure all oil is drained from main reservoir.

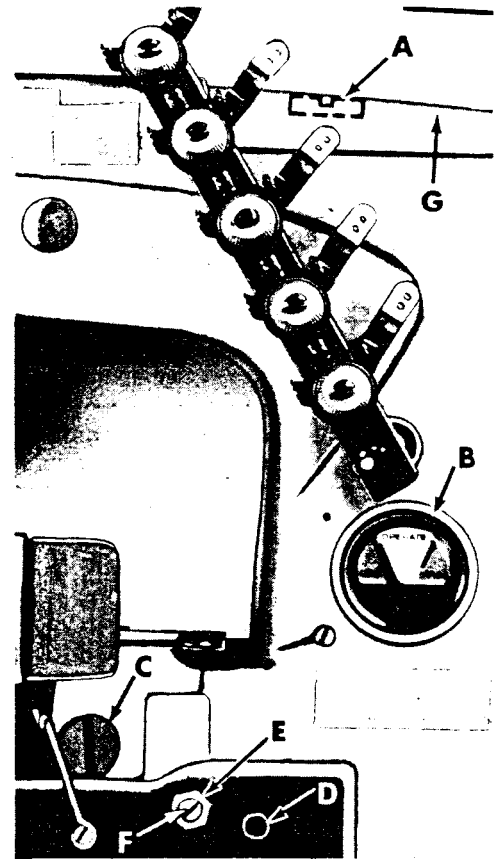


Fig. 2

OIL GAUGE (Continued)

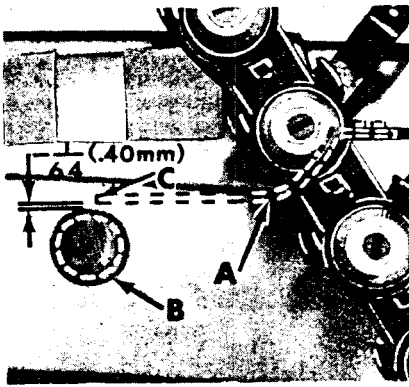


Fig. 3

4. Remove lower crank chamber cover, located at the back of the machine.
5. Fill main reservoir to a level even with the bottom contour of the knee press shaft bushing (D, Fig. 2).
6. Loosen lock nut (E) on calibrating screw (F), and turn the screw to the left or right until the gauge needle rests on the black line, located to the left of "OPERATE" zone, marked "LOW".
7. Tighten lock nut (E) and replace plug screw (C) and lower crank chamber cover.
8. Add oil so that gauge needle rests on the black line, located to the right of "OPERATE" zone, marked "FULL".

NEEDLE LEVER BEARING OILER

Remove the head cover and upper crank chamber cover (G, Fig. 2). Check position of needle lever bearing oiler (A, Fig. 3) located inside the arm casting, below the upper crank chamber cover, which lubricates the needle lever stud (B). Make sure it is tilted downwardly and that its delivery end (C) contacts the inside wall of the bed casting at the back, just above the notch of the needle lever shaft stop collar. (Do not allow the oiler to rest on the needle lever). Allow 1/64 inch (.40 mm) clearance as in Fig. 3.

ALIGNING THE NEEDLE BAR

Align the needle bar (A, Fig. 4) and set to height, using the proper test pins and test plate of the right gauge. See chart below.

<u>Machine Style</u>	<u>Test Plate No.</u>	<u>Right Test Pin No.</u>	<u>Left Test Pin No.</u>
673B002	698 BB-16	699 D	699 L
673B005	698 BB-8	699 R-8	699 L
673B005	698 BB-12	699 R-12	699 L
673B007	None	None	699 L
673B007	698 BB-16	699 D	699 L
673B003	698 BB-16	699 D	699 L

Insert test pin No. 699 L in the left seat of the needle holder and the proper right hand test pin (See Chart) should be inserted in the right needle seat. Now assemble test plate to machine using the throat plate attaching screws. The needle bar is located properly if the test pins align with the holes in the test plate and the height of the needle bar is correct when the shoulder of the test pins rest on the test plate, when the needle bar is at its lowest position.

ALIGNING THE NEEDLE BAR (Continued)

If test plate and test pins are not available, insert a new set of needles (Type and Size as required) and align the needle bar so the needles center in the needle holes of throat plate. To align needle bar, loosen needle bar clamp screw (B, Fig. 4) and turn bar as required. Tighten clamp screw.

SYNCHRONIZING LOOPER AND NEEDLE MOTIONS

Check the synchronization of the looper and needle motions, using gauge No. 21227 R as follows:

Insert the pin, which is included with the gauge, in the back hole in the looper rocker. Place the gauge plate on the throat plate seat using the throat plate screws for attaching. Place the shank of the indicator in the take-up wire hole in bed. Turn the handwheel in operating direction until the pin in the looper rocker contacts the edge of the gauge plate and set the indicator so that the left end of the pointer rests against the top of the needle bar and the right end of the pointer rests at "0". Tighten the set screw and note indicator reading. Turn the handwheel in the reverse direction until the pin again contacts the plate. If the motions are in synchronization, the pointer of the indicator will return to the same reading. A variation of one graduation on the scale is allowable. If the reading is higher on the scale when the handwheel is turned in the operating direction, the looper drive lever shaft will have to be moved to the rear. If the reading is lower, this shaft will have to be moved to the front.

NOTE: If gauge No. 21227 R is not available, synchronization may be checked as follows:

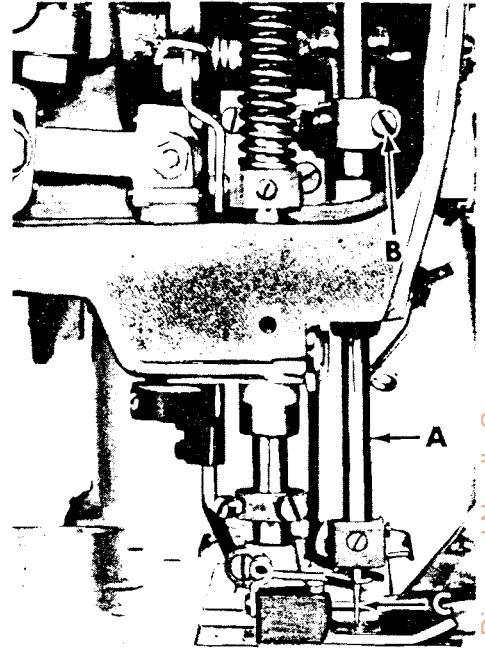


Fig. 4

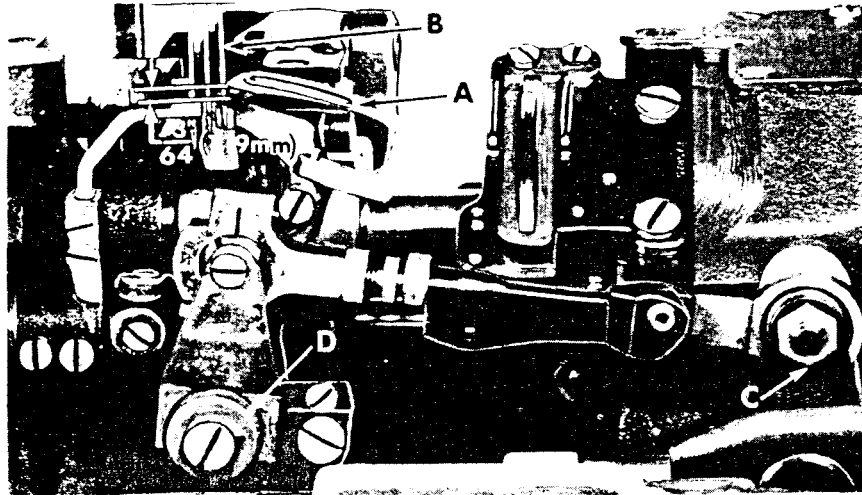


Fig. 5

Insert the looper in the looper rocker and turn handwheel in operating direction until the point of the looper (A, Fig. 5), moving to the left is even with the left side of right needle (B). Note the height of the eye of the needle with respect to the looper point, then turn handwheel in the reverse direction until the looper point again moves to the left, and is even with the left side of the right needle.

SYNCHRONIZING LOOPER AND NEEDLE MOTIONS (Continued)

If the motions synchronize, the height of the eye of the needle with respect to the looper point will be the same. A variation of .005 inch (.127 mm) is allowable. If the distance from the eye of the needle to the point of the looper is greatest when the pulley is turned in the operating direction, move the looper drive shaft synchronizing stud (A, Fig. 6) to the rear. Moving it in the opposite direction acts the reverse.

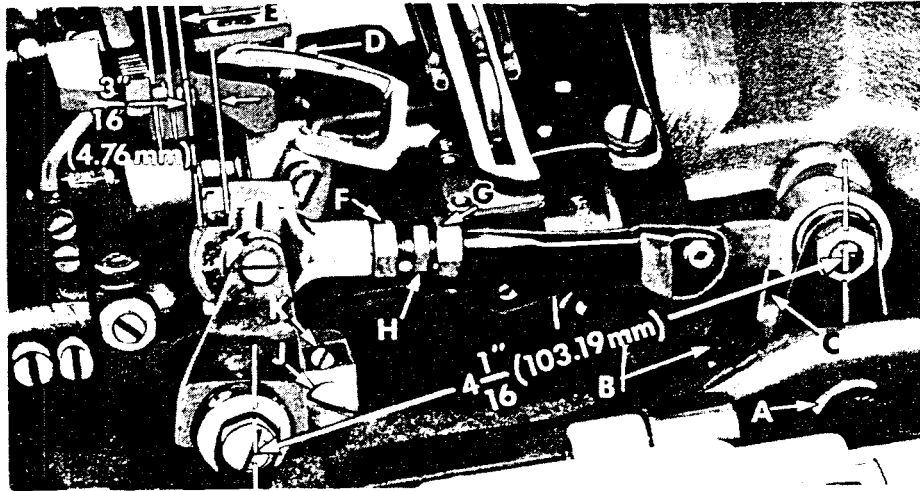


Fig. 6

Moving of the looper drive lever shaft synchronizing stud is accomplished as follows: Loosen the clamp screw (B, Fig. 6) of the looper drive lever (C). To move stud to rear (away from operator), a light tap with a small hammer, directly on the stud, is all that is required. To move stud forward (toward operator), remove the cloth plate, throat plate support, oil reservoir top cover and oil reservoir back cover, then, a light tap on the looper drive lever rocker shaft, toward the operator, is all that is required.

NOTE: Looper drive lever (C, Fig. 6) has an oil seal collar and an "O" ring between it and the bed casting. All end play must be removed from the looper drive lever rocker shaft by compressing the "O" ring until drive lever (C) and the oil seal collar make metal to metal contact with the bed casting. Tighten screw (B).

With the looper at the extreme right end of its travel, check the location of the center line of the right looper connecting rod bearing, using gauge No. 21227 CX. Remove nut (C, Fig. 5) and place hole in gauge over threaded stud. The left end of the gauge should locate against the right side of the looper rocker cone (D). If adjustment is necessary, loosen the clamp screw (B, Fig. 6) and reposition the looper drive lever (C) as required. Tighten clamp screw. If gauge is not available setting can be checked with a scale. The distance between the center line of the looper rocker cone and the center line of the looper lever stud should be 4 1/16 inch (103.19 mm) (Fig. 6), when looper is at the extreme right end of its travel. Refer to "NOTE" in above paragraph.

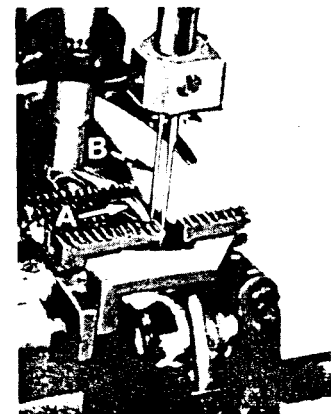


Fig. 7

SETTING THE LOOPER

Insert a new needle in the right needle seat, type and size as specified. If the looper gauge is 3/16 inch (4.76 mm), for example, set the looper (D, Fig. 6) so the distance from the center of the right needle (E) to the point of the looper is 3/16 inch (4.76 mm) when the looper is at its farthest position to the right. Looper gauge No. 21225-3/16 can be used advantageously in making this adjustment. Refer to chart below for needle Type, looper gauge setting and looper gauge number for the various styles of machines. If adjustment is required, loosen nut (F) (it has a left hand thread) and nut (G) on connecting rod (H), turn the connecting rod forward or backward to obtain the 3/16 inch (4.76 mm) dimension. Retighten both nuts, first nut (G) and then nut (F). Make sure the left ball joint is in vertical position and does not bind after adjustment.

Machine	Needle Type	Looper Gauge Setting	Looper Gauge Number
678B002-16	Cat. 7284	3/16" (4.76 mm)	21225-3/16
678B005-3	Cat. 7284	7/32" (5.56 mm)	21225-7/32
678B005-12	Cat. 7284	7/32" (5.56 mm)	21225-7/32
678B007-14	Cat. 7284	3/16" (4.76 mm)	21225-3/16
678B007-16	Cat. 7284	3/16" (4.76 mm)	21225-3/16
678B008-16	Cat. 7284	3/16" (4.76 mm)	21225-3/16

The looper is set correctly in line-of-feed, if, as it moves to the left, behind the needle, its point (A, Fig. 7) brushes, but does not pick at the rear of the needle (B).

If adjustment is necessary, loosen lock screw (J, Fig. 6) and turn stop screw (K) as required. Turning stop screw clockwise sets the looper to the rear and turning it counterclockwise acts the reverse.

Holding looper to the front while making this adjustment may prove helpful. Tighten lock screw (J) when setting is obtained and recheck the adjustment.

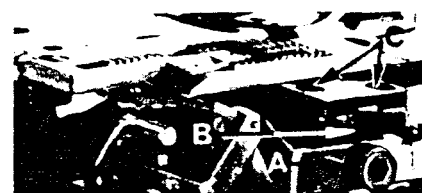


Fig. 8

SETTING HEIGHT OF NEEDLE BAR

The height of the needle (C, Fig. 4) is correct when the top of its eye is 3/64 inch (1.19 mm) (Fig. 5) below the underside of the looper, with the looper point flush with the left side of the needle. If adjustment is necessary, loosen screw (B, Fig. 4) and move needle bar (A) up or down as required and retighten screw. Care should be taken not to disturb the alignment of the needle bar when moving the needle bar either up or down.

The needles are to have equal clearance on the right and left sides of needle slots in throat plate.

SETTING THE MAIN FEED DOG

The main feed dog should be set to rise the depth of a full tooth, or approximately 3/64 inch (1.19 mm) above the throat plate, at the highest point of travel. The feed dog should be centered in the slots of the throat plate at maximum feed travel.

To raise or lower the main feed dog, loosen Allen screw (A, Fig. 8) and adjust the feed dog holder (B) to set the feed dog at specified height. Retighten screw (A).

SETTING THE MAIN FEED DOG (Continued)

NOTE: A change of feed dog height will necessitate a check of the rear needle guard setting.

The main feed dog should have equal clearance on all sides of feed slots in the throat plate at maximum feed travel. To adjust the main feed dog across-the-line-of-feed, loosen screws (C, Fig. 8) and position feed dog as required. Retighten screws (C). To adjust main feed dog in-line-of-feed, loosen nut (A, Fig. 9) and move feed bar as required. Retighten nut.

SETTING THE DIFFERENTIAL FEED DOG

The differential feed dog should also be set to rise the depth of a full tooth above the throat plate, at the highest point of travel and center in the feed slots of the throat plate at maximum feed travel. In addition to this the teeth of the feed dog should be parallel to the top surface of the throat plate across the line-of-feed.

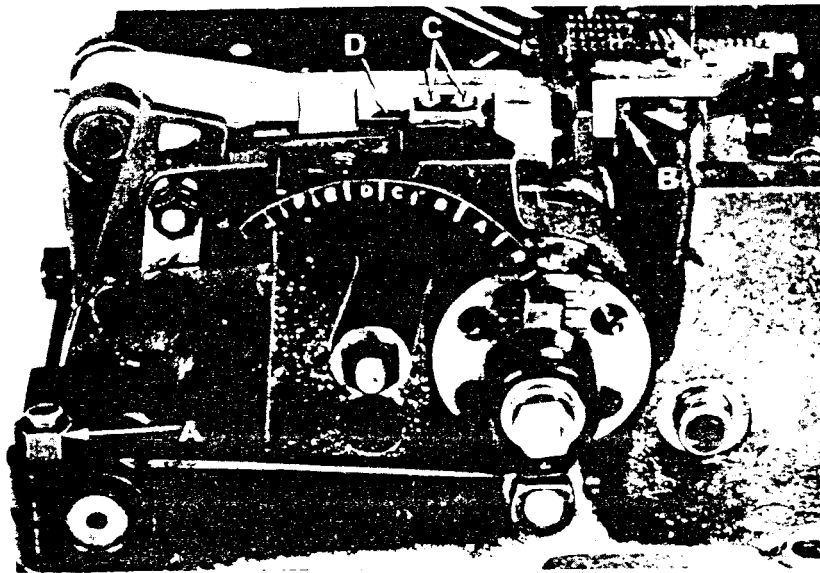


Fig. 9

To raise or lower the differential feed dog, loosen screw (B, Fig. 9) and set the feed dog at the required height. Retighten screw.

Loosen set screws (C, Fig. 9) and move the differential feed bar (D) forward or backward as required. The loosening of set screws (C) will also allow the differential feed bar (D) to be rotated, so the differential feed dog can be aligned parallel with the top surface of the throat plate, across-the-line-of-feed. Tighten screws securely.

NOTE: Turn machine by hand to make sure the differential feed dog has clearance through its cycle and does not contact the main feed dog at back end of its travel or the throat plate at the forward end of its travel.

SETTING THE DIFFERENTIAL FEED RATIO

The differential feed ratio is set by loosening screw (A, Fig. 10) and moving the selector slide (B) to the desired position. The screw and selector slide are accessible through the top of the cloth plate on the left side. Moving the differential feed selector slide (B) toward the front increases the amount of differential and moving it back decreases the differential feed. Retighten screw.

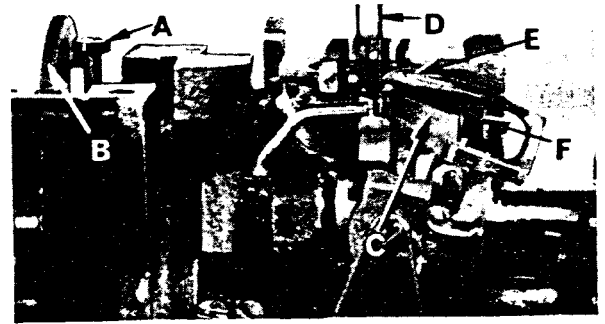


Fig. 10

This Class of machine has a stretching ratio of $3/4$ to 1 up to a gathering ratio of 2 to 1, depending on the length of stitch set at the main feed dog. Turn machine by hand, making sure the differential feed dog clears the main feed at the back end of its stroke.

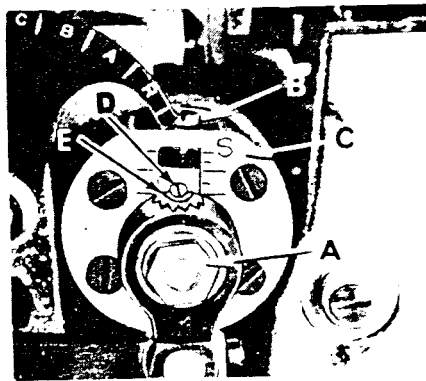


Fig. 11

CHANGING STITCH LENGTH

Set the stitch to the required length. This is accomplished by loosening locknut (A, Fig. 11) (it has a left hand thread) and turning the stitch adjusting screw (B). Turning screw (B) clockwise shortens the stitch and turning it in a counterclockwise direction lengthens the stitch. The head of the mainshaft (C) is marked with an "S" and an "L", moving the stitch regulating stud toward the "S" shortens the stitch and toward the "L" lengthens the stitch. Retighten locknut (A). To prevent destructive damage to the feed drive bearing, the Key screw (D) must engage the "U" shaped key slot in the ferrule (E).

NOTE: Any change in stitch length will necessitate a corresponding change in the rear needle guard setting and a check of the feed dog height.

SETTING THE REAR NEEDLE GUARD

Set the rear needle guard (C, Fig. 10) horizontally so that it does not quite contact the rear of the right needle (D) when at its most forward point of travel. A clearance of .005 inch (.127 mm) is permissible. It should be set as low as possible, yet have its vertical face approach within about $3/64$ inch (1.19 mm) of the needle, until the point of the looper (E), moving to the left, is even with the needle. To move needle guard merely loosen screw (F), move needle guard as required, and retighten screw. NOTE: Adjustment of the rear needle guard will necessitate a check of the main feed dog height.

SETTING FRONT NEEDLE GUARD

Set the front needle guard so that it pushes the left needle back toward the path of the looper as it moves behind the needle. The looper may brush but not pick at the left needle. It should be set as low as possible, yet have its vertical face push the left needle until the point of the looper is just past the left side of the left needle. The front needle guard should not contact the rear needle guard or right needle at any time. To move guard forward or backward, merely loosen screws (A, Fig. 12) move needle guard as required and retighten screws. To raise, lower or rotate needle guard, loosen screws (B), move guard and retighten screws after guard is properly set.

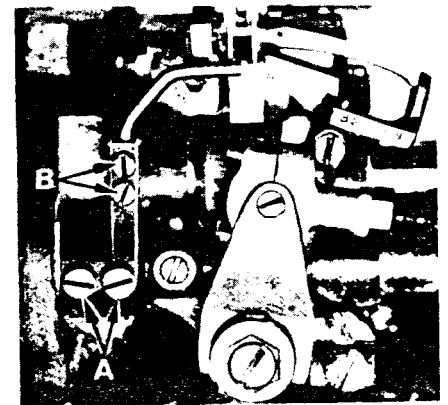


Fig. 12

NOTE: A change in stitch length WILL NOT require a change in front needle guard setting.

THREAD TENSION RELEASE

The thread tension release is set correctly when it begins to function as the presser foot is raised to within 1/8 inch (3.17 mm) of the end of its travel and is entirely released when the presser foot has reached its highest position.

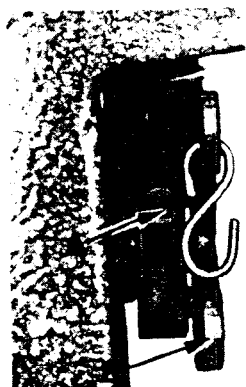


Fig. 13

If adjustment is needed, loosen tension release lever screw (A, Fig. 13), located at the back of the machine and move tension disc separator as required. Retighten screw. After adjustment there should be no binding at any point.

SETTING HEIGHT OF PRESSER BAR

The height of the presser bar (A, Fig. 14) is set correctly if it is possible to remove the presser foot when the foot lifter lever (B, Fig. 13) is fully depressed. Also there should be approximately 1/16 inch (1.59 mm) clearance between lower surface of the presser bar connection and guide (B, Fig. 14) and the bottom surface of head opening in the bed when the foot lifter lever is released and the presser foot resting on the throat plate, with the feed dog down below the throat plate.

If adjustment is needed, turn handwheel in operating direction until the needle bar is in the low position. Loosen screw (C), then, while holding presser foot down on the throat plate surface, pry up presser bar connection and guide with a screwdriver to obtain the 1/16 inch (1.59 mm) setting and retighten screw. Check setting by turning handwheel so that needle bar is in its high position and see if presser foot can be removed as mentioned in previous paragraph.

Set the presser bar collar (D, Fig. 14) so that the presser foot does not contact the spreader when raised.

SETTING THE SPREADER

Set the arc travel of the spreader, as listed below, by loosening nut (E, Fig. 14) and moving the connecting link (F) up or down to the desired amount of arc travel. Measurement of the spreader arc travel is made by placing a scale between the two extreme spreader arc travel points.

<u>Machine</u>	<u>Spreader Arc Travel</u>
678B002-16	11/16" (17.46 mm)
678B005-8	9/16" (14.29 mm)
678B005-12	5/8" (15.88 mm)
678B007-14	21/32" (16.67 mm)
678B007-16	11/16" (17.46 mm)
678B008-16	11/16" (17.46 mm)

Set the ball stud (G, Fig. 14) in the spreader holder carrier (H) square to the front of the bed when at the middle of its travel as viewed in Figure 14. This is accomplished by loosening nut (J) and moving the spreader rocker shaft arm (K) to position the carrier properly.

SETTING THE SPREADER (Continued)

With the needle bar in the up position, and the spreader (A, Fig. 15) at the left end of its stroke, the upper spreader point should extend $\frac{7}{32}$ inch (5.56 mm) to the left of the center line of the left needle. This is accomplished by loosening screws (A, Fig. 16) and rotating spreader holder (B) to position the upper spreader point. Retighten screws.

CAUTION: The spreader holder is also the lower thrust collar for the spreader shaft, so when tightening screws (A, Fig. 16) be sure to push down on the spreader shaft and up on the spreader holder.

The spreader should clear the left needle shank by $\frac{1}{64}$ to $\frac{1}{32}$ inch (.40 to .79 mm) and the bottom of the spreader should be $\frac{21}{64}$ inch (8.33 mm) above the throat plate (Fig. 15). To adjust, loosen screws (C, Fig. 16) and position spreader as required.

The left edge of the spreader thread guide (B, Fig. 15) should clear the right needle by approximately $\frac{3}{32}$ inch (2.38 mm) and be kept close to the top of the spreader. This is accomplished by loosening screws (C) and moving the guide as necessary.

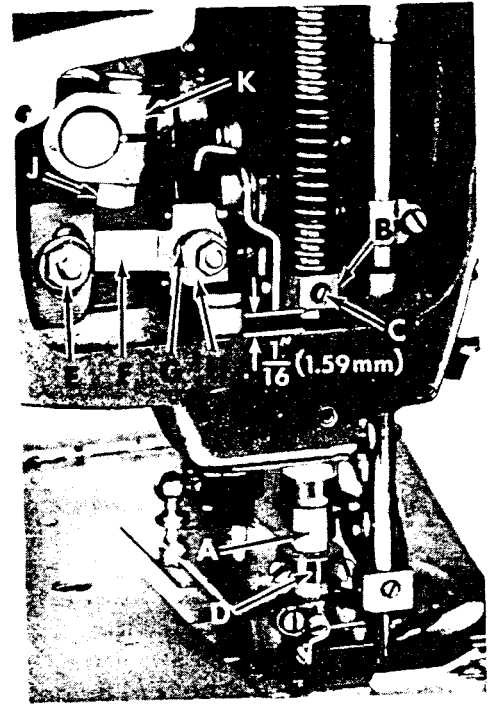


Fig. 14

THREADING

Thread machine as indicated in Fig. 1 and start operating on a piece of fabric.

THREAD TENSION

Pull the thread through the eyelets and set the left needle thread tension and center needle thread tension at 4 ounces (113.40 gr.) on 678B002, 007 and 008. Set the left needle thread tension at 3 ounces (85.05 gr.) on 678B005 only, and the right needle thread tension at 4 ounces (113.40 gr.) on all varieties.

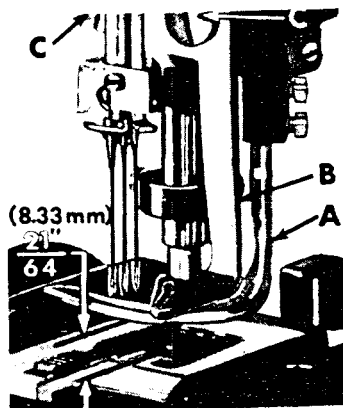


Fig. 15

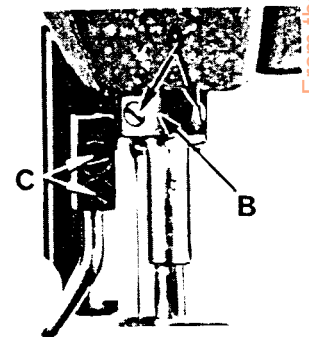


Fig. 16

Set the spreader thread tension at 1 ounce (28.35 gr.) on the upper thread tension. The adjusting nut below the needle lever thread eyelet should be set so that the tension on the spreader thread is $\frac{1}{2}$ ounce (14.18 gr.) or more, depending on the type of thread being used. This applies to all varieties.

The looper thread tension is set at 2 ounces (56.70 gr.) on all varieties. It is applied at the thread tensions located on the front of the machine just above the oil gauge.

SETTING THE NEEDLE AND SPREADER THREAD FRAME EYELETS

Set the needle thread frame eyelet (A, Fig. 17) 1 inch (25.4 mm) above the center of the mounting screw (B).

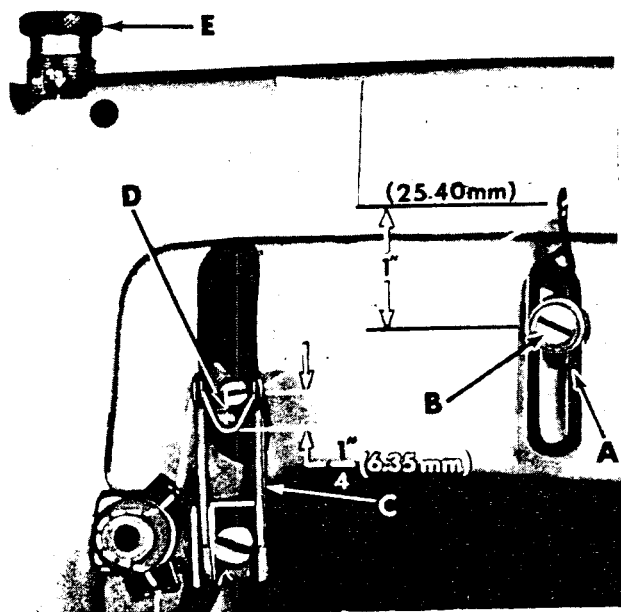


Fig. 17

SETTING LOOPER THREAD TAKE-UP

The looper thread take-up (A, Fig. 18) is not spotted on the main shaft and consequently, can be set to compensate for varying conditions. It is set correctly when the looper thread is just cast off the highest lobe of the take-up when the point of the left needle is clearly visible below the underside of the looper. The cast-off plate support (B) is adjustable, and its setting determines the amount of thread pulled off by the take-up. Moving support (B) up towards the bottom of its mounting screw slots (C) causes more thread to be pulled from the cones. Moving it down towards the top of its screw slots causes less thread to be pulled. The looper threads should just become taut as the loopers reach their extreme position to the left. Before tightening the two screws which secure support (B), center the looper thread take-up in the cast-off plate support (right

to left) by use of shims No. 39152 U-4 inserted between same. When take-up is centered, tighten two screws securing support (B) and remove shims.

SETTING SPREADER THREAD TAKE-UP

The "U" shaped eyelet (C, Fig. 17) should be set to allow the spreader thread to engage the bottom of the needle lever eyelet (D) by 1/4 inch (6.35 mm). Raising the eyelet makes a looser cover thread, lowering same makes a tighter cover thread.

PRESSER FOOT PRESSURE

Regulate the presser spring regulating screw (E, Fig. 17) so that it exerts only enough pressure on the presser foot to feed the work uniformly when a slight tension is placed on the fabric. This is the knurled screw, located directly behind the needle bar in the head of the machine. Turning it clockwise increases the pressure, counterclockwise acts the reverse.

TORQUE REQUIREMENTS

Torque (measured in inch-pounds) is a rotating force (in pounds) applied through a distance by a lever (in inches or feet). This is accomplished by a wrench, screwdriver, etc. Many of these devices are available, which when set at the proper amount of torque, will tighten the part to the correct amount and no tighter.

All straps and eccentrics should be tightened to 19-21 inch-pounds, (22-24 cm/kg) unless otherwise noted. All other nuts, bolts, screws, etc., should be tightened by hand as tightly as possible, unless otherwise noted.

The screws requiring a specific torque, will be indicated on the picture plates.

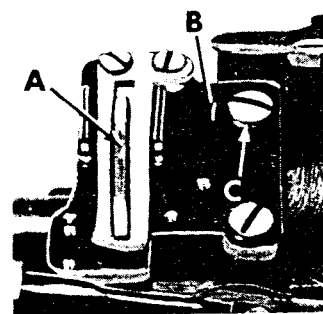
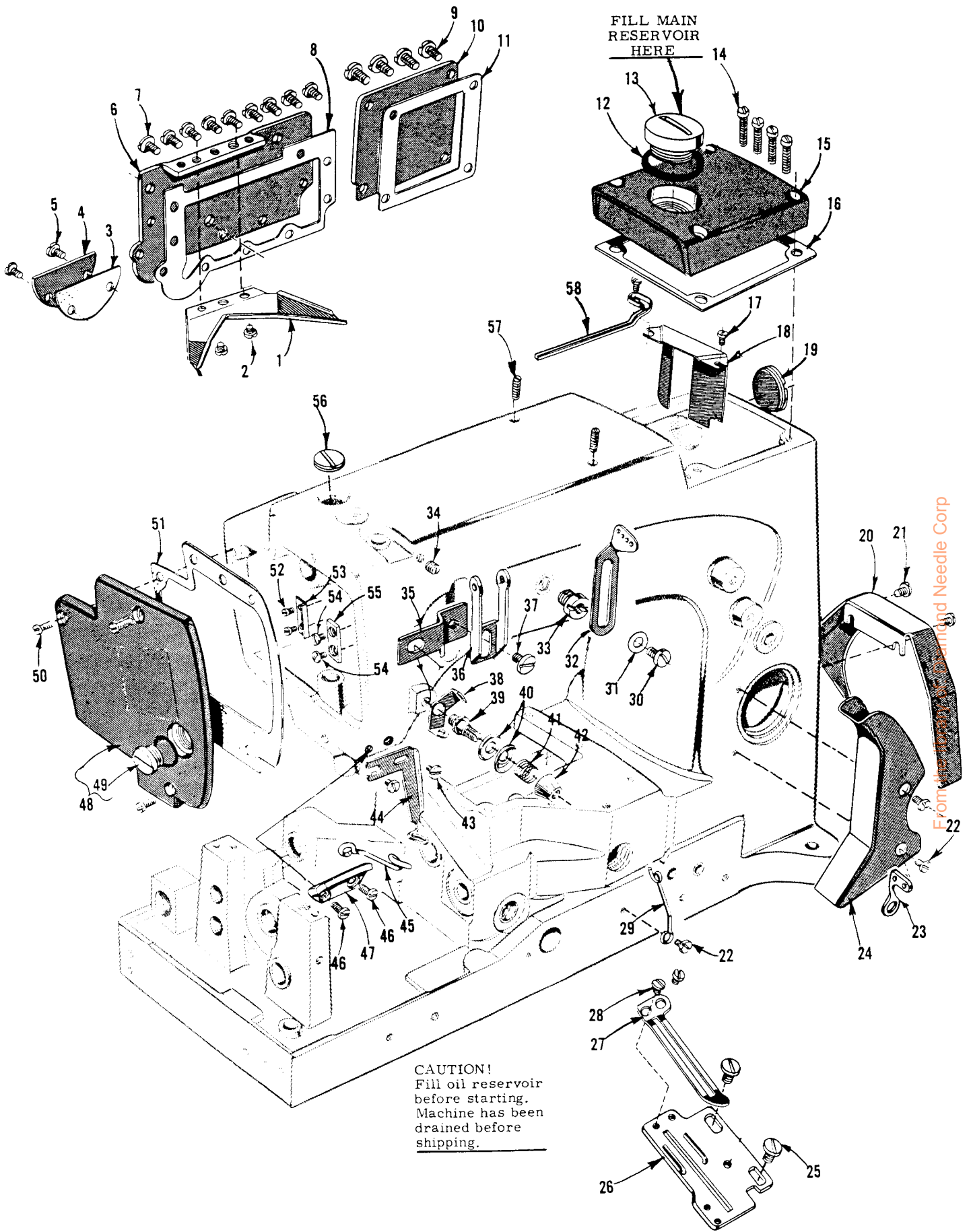


Fig. 18

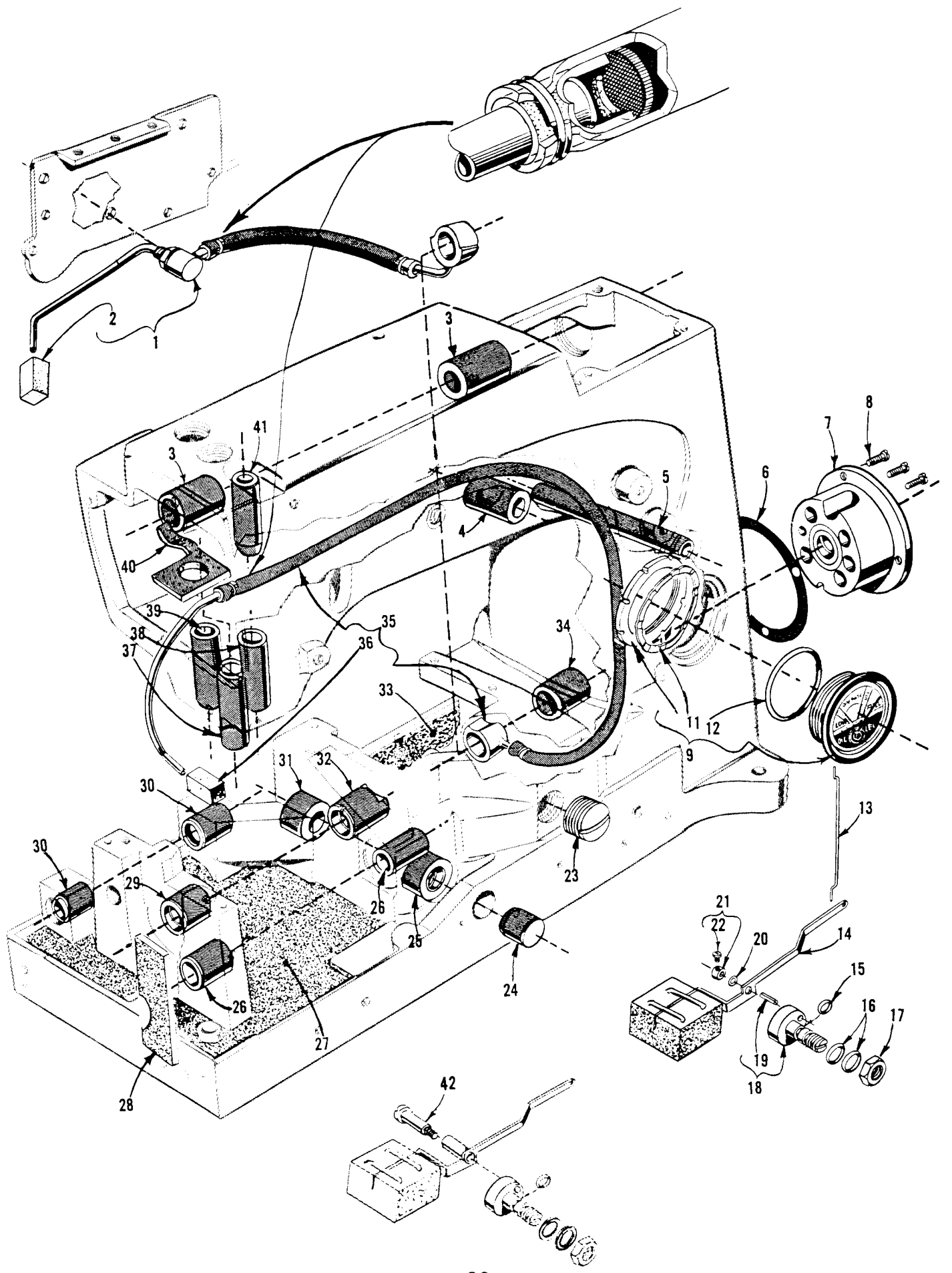


IMPORTANT: BEFORE ORDERING ANY PARTS BELOW, REFER TO THE DETAILED INSTRUCTIONS ON PAGE 4

MAIN FRAME, CAST-OFF PLATE AND MISCELLANEOUS COVERS

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Amt. Req.</u>
1	57882 E	Oil Drip Plate -----	1
2	357	Screw -----	2
3	56382 K	Gasket -----	1
4	56382 J	Looper Drive Shaft Reservoir Cover -----	1
5	22829	Screw -----	2
6	56382 F	Oil Reservoir Back Cover -----	1
7	22848	Screw -----	9
8	56382 L	Gasket -----	1
9	22548	Screw -----	4
10	56382 D	Crank Chamber Cover, lower -----	1
11	56382 E	Gasket -----	1
12	56382 M	Gasket -----	1
13	22733 E	Oil Filler Plug Screw -----	1
14	22541 C	Screw -----	4
15	56382 B	Upper Crank Chamber Cover -----	1
16	56382 C	Gasket -----	1
17	90	Screw -----	2
18	52882 Y	Baffle Plate -----	1
19	22539 S	Plug Screw -----	1
20	21375 AV	Belt Guard -----	1
21	22829	Screw -----	2
22	98 A	Screw, for 678B002 and 008 -----	3
-	98 A	Screw, for 678B005 and 007 -----	2
23	158 B	Looper Thread Eyelet -----	1
24	56391	Looper Thread Guard, for 678B002 and 008 -----	1
25	22569 D	Screw -----	2
26	57857	Cast-off Plate Support -----	1
27	57804	Cast-off Plate -----	1
28	28	Screw -----	2
29	52958 B	Looper Thread Eyelet -----	1
30	22848	Screw -----	1
31	20	Washer -----	1
32	51858	Needle Thread Frame Eyelet -----	1
33	22889 A	Adaptor Plug Screw -----	1
34	95	Plug Screw -----	1
35	57844 B	Spreader Thread Eyelet Mounting Plate -----	1
36	57858	Spreader Thread Pull-off Eyelet -----	1
37	22585 C	Screw -----	1
38	57844	Spreader Thread Guide -----	1
39	57892 A	Spreader Tension Post -----	1
40	80665 F	Spreader Tension Disc -----	2
41	57892 D-1	Spreader Tension Spring -----	1
42	57892 B	Spreader Tension Post Nut -----	1
43	22542	Screw -----	2
44	57844 A	Thread Guide -----	1
45	57944 A	Thread Eyelet -----	1
46	605 A	Screw -----	2
47	57944 B	Spreader and Needle Thread Guide -----	1
48	57882	Head Cover -----	1
49	22733 C	Plug Screw -----	1
50	22569 C	Screw -----	3
51	57882 B	Gasket -----	1
52	22564 B	Screw -----	2
53	57831	Presser Bar Connection Guide Plate, rear -----	1
54	22513	Screw -----	2
55	35731 A	Presser Bar Connection Guide Plate, front -----	1
56	22539 G	Plug Screw -----	1
57	22894 E	Screw -----	2
58	51282 AE	Needle Lever Bearing Oiler -----	1

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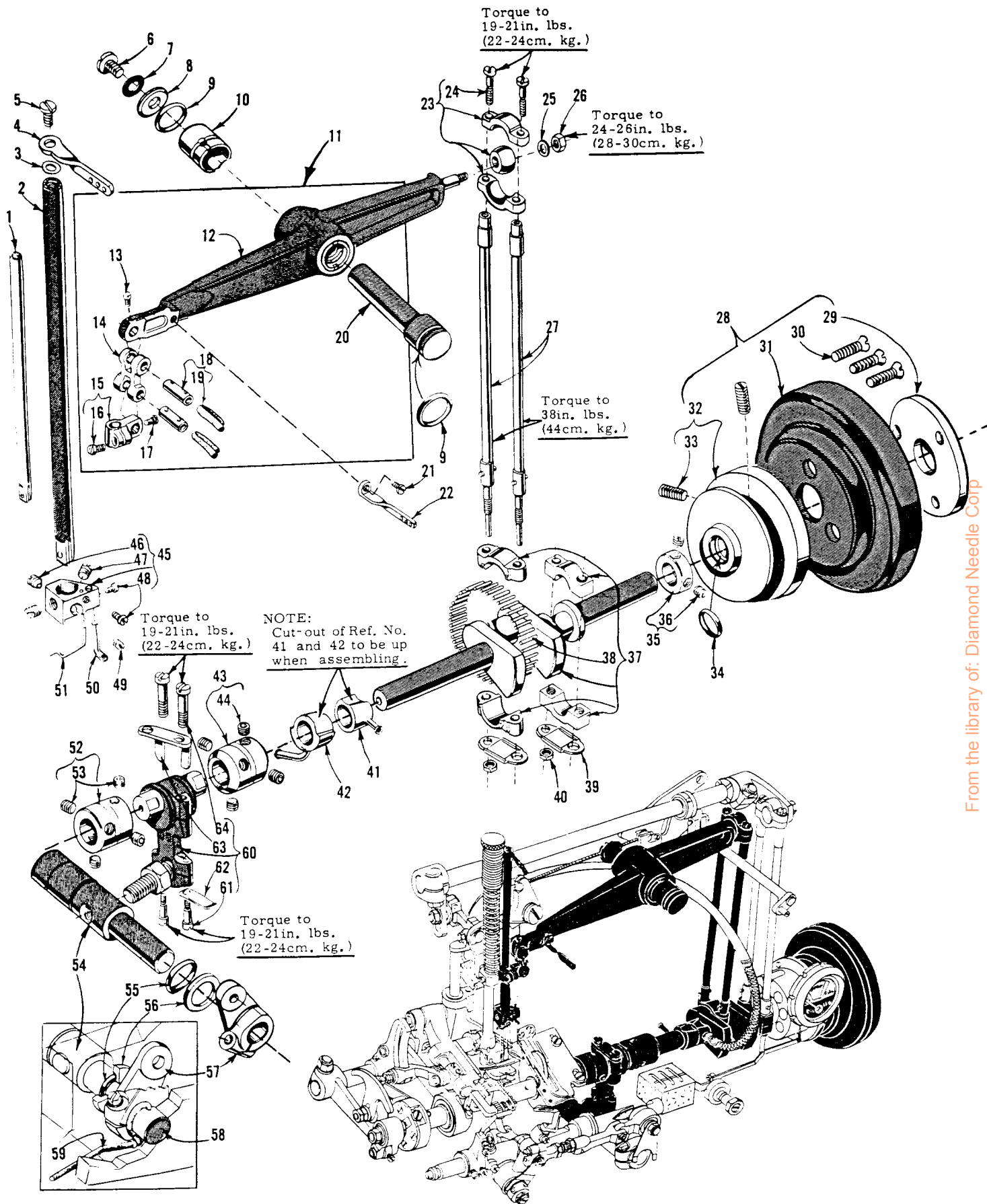
IMPORTANT: BEFORE ORDERING ANY PARTS BELOW, REFER TO THE DETAILED INSTRUCTIONS ON PAGE 4

MAIN FRAME, BUSHINGS, OIL GAUGE AND MISCELLANEOUS OILING PARTS

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Amt. Req.</u>
1	56393 AC	Base Oil Pump Assembly -----	1
2	666-214	Intake Felt -----	1
3	57849	Spreader Rocker Shaft Bushing -----	2
4	52883 R	Presser Foot Lifter Lever Bushing -----	1
5	21657 X	Release Lever Bushing -----	1
6	56390 E	Bushing Housing Gasket -----	1
7	57890	Crankshaft Bushing Housing -----	1
8	22569 B	Screw -----	3
9	63494 K	Oil Gauge Assembly -----	1
10	63494 F	Nut -----	1
11	63494 G	Spring Washer -----	1
12	660-455	"O" Ring -----	1
13	56394 B	Oil Gauge Connecting Rod -----	1
14	56394 C	Oil Gauge Float Lever Assembly -----	1
15	660-221	Oil Retaining Ring -----	1
16	61256 G	Washer -----	2
17	11635 B	Nut -----	1
18	56394 A	Oil Gauge Adjusting Shaft -----	1
* 19	426 B	Pin -----	1
* 20	27-527 Blk.	Washer -----	1
* 21	61494 G	Collar -----	1
* 22	604	Screw -----	1
23	22539 R	Plug Screw -----	1
24	52942 Y	Synchronizing Stud -----	1
25	52942 W	Looper Drive Lever Shaft Bushing, front -----	1
26	50-895 Blk.	Looper Rocker Shaft Bushing -----	2
27	56393 P	Base Felt, front -----	1
28	666-259	Felt -----	1
29	56390	Main Shaft Bushing, left -----	1
30	57836 B	Feed Rocker Shaft Bushing -----	2
31	57842 B	Looper Drive Lever Shaft Bushing, rear -----	1
32	56190	Main Shaft Bushing, middle -----	1
33	56393 Q	Base Felt, rear -----	1
34	56390 A	Main Shaft Bushing, right -----	1
35	57893	Head Oil Pump Assembly -----	1
36	666-214	Intake Felt -----	1
37	51257 AA	Presser Bar Bushing, lower -----	1
38	56354 C	Needle Bar Bushing, lower -----	1
39	57846	Spreader Holder Carrier Bushing -----	1
40	56393 W	Oil Attraction Felt -----	1
41	51154 E	Needle Bar Bushing, upper -----	1
42	22793	Screw -----	1

* Replaced by Ref. No. 42 on late model machines.

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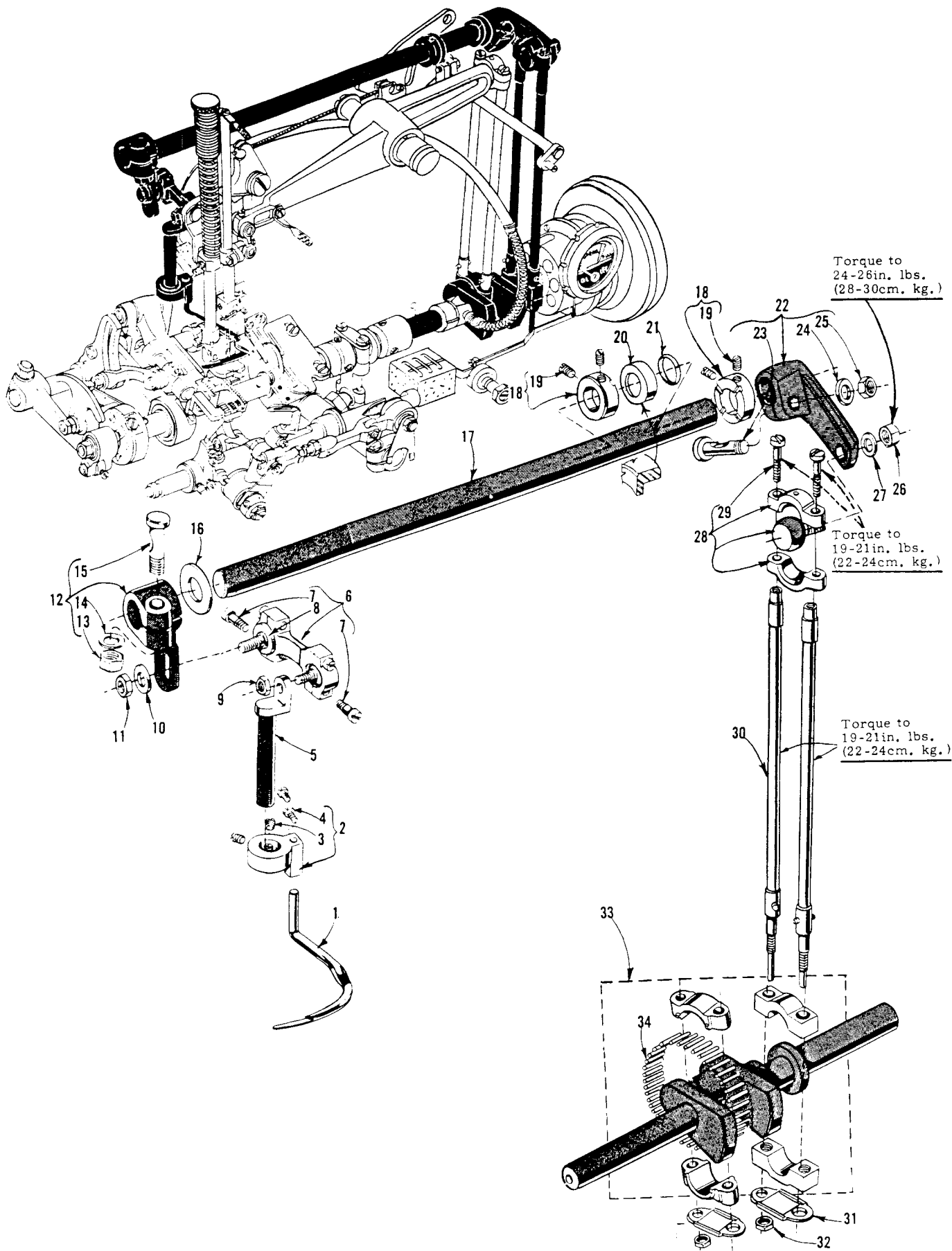


IMPORTANT: BEFORE ORDERING ANY PARTS BELOW, REFER TO THE DETAILED INSTRUCTIONS ON PAGE 4

CRANKSHAFT, NEEDLE LEVER, NEEDLE BAR AND LOOPER DRIVING PARTS

Ref. No.	Part No.	Description	Amt. Req.
1	52817 E-8	Needle Bar, marked "BG-8", for No. 8 gauge, 678B005,	1
	52717 E-12	Needle Bar, marked "EJ-12", for No. 12 gauge, 678B005	1
2	52817-14	Needle Bar, marked "BD-14", for No. 14 gauge, 678B007	1
	52817-16	Needle Bar, marked "BD-16", for No. 16 gauge on 678B002, 007 and 008	1
3	27-435 Blk.	Needle Bar Eyelet Lockwasher	1
4	56958 A	Needle Bar Thread Eyelet	1
5	22768	Screw	1
6	22586 R	Screw	1
7	51250 F	Gasket	1
8	51250 D	Washer	1
9	660-212	Oil Seal Ring	2
10	51150	Needle Lever Thrust Collar	1
11	29348 Y	Needle Lever Assembly	1
12	56315	Needle Lever	1
13	77	Screw	1
14	56354 A	Needle Bar Link	1
15	51254 J	Needle Bar Connection	1
16	22562 A	Screw	1
17	22564	Screw	1
18	51054	Link Pin	2
19	666-149	Felt Wick	1
20	56350 A	Needle Lever Stud	1
21	22768	Screw	1
22	56958	Needle Lever Thread Eyelet	1
23	29066 R	Needle Lever Connecting Upper Ball Joint Assembly	1
24	22559 G	Screw	2
25	51216 N	Washer	1
26	51216 P	Nut	1
27	56316	Needle Lever Connecting Rod	2
28	57821 A	Handwheel Assembly	1
29	61321 L	Retaining Plate	1
30	22574	Screw	3
31	57821	Handwheel	1
32	56321 H	Pulley	1
33	22894 AB	Screw	2
34	660-202	"O" Ring	1
35	57847	Thrust Collar	1
36	95	Screw	2
37	29476 MN	Crankshaft Assembly, .910 inch (23.11 mm) throw	1
38	51216 M	Needle Bearing	28
39	56316 C	Connecting Rod Guide	2
40	12934 A	Nut	2
41		Head Oil Pump Assembly, (See Ref. No. 1 - Page 21)	1
42		Base Oil Pump Assembly, (See Ref. No. 35 - Page 21)	1
43	52943 L	Looper Drive Lever and Crankshaft Connection, right	1
44	22894 X	Screw	4
45	57818-8	Needle Holder	1
46	89	Spot Screw	1
47	88 B	Set Screw	2
48	22738 F	Screw	2
49	28 C	Screw, for center needle, for 678B002, 007 and 008	1
50	41076 D	Spreader Thread Eyelet	1
51	57842	Needle Thread Guide	1
52	56343 D	Looper Drive Lever Crank Connection, left	1
53	22894 X	Screw	4
54	52942 A	Looper Drive Lever Rocker Shaft	1
55	660-202	Oil Seal Ring	1
56	56342 B	Oil Seal Collar	1
57	56342	Looper Drive Lever, marked "A"	1
58	52942 Y	Synchronizing Stud	1
59	CL21	Oil Wick	1
60	29105 AJ	Looper Driving Lever Crank Assembly	1
61	22559 A	Bearing Cap Screw, lower	2
62	56343 E	Oil Splasher	1
63	56343 C	Ball Joint Guide Fork	1
64	22587 K	Bearing Cap Screw, upper	2

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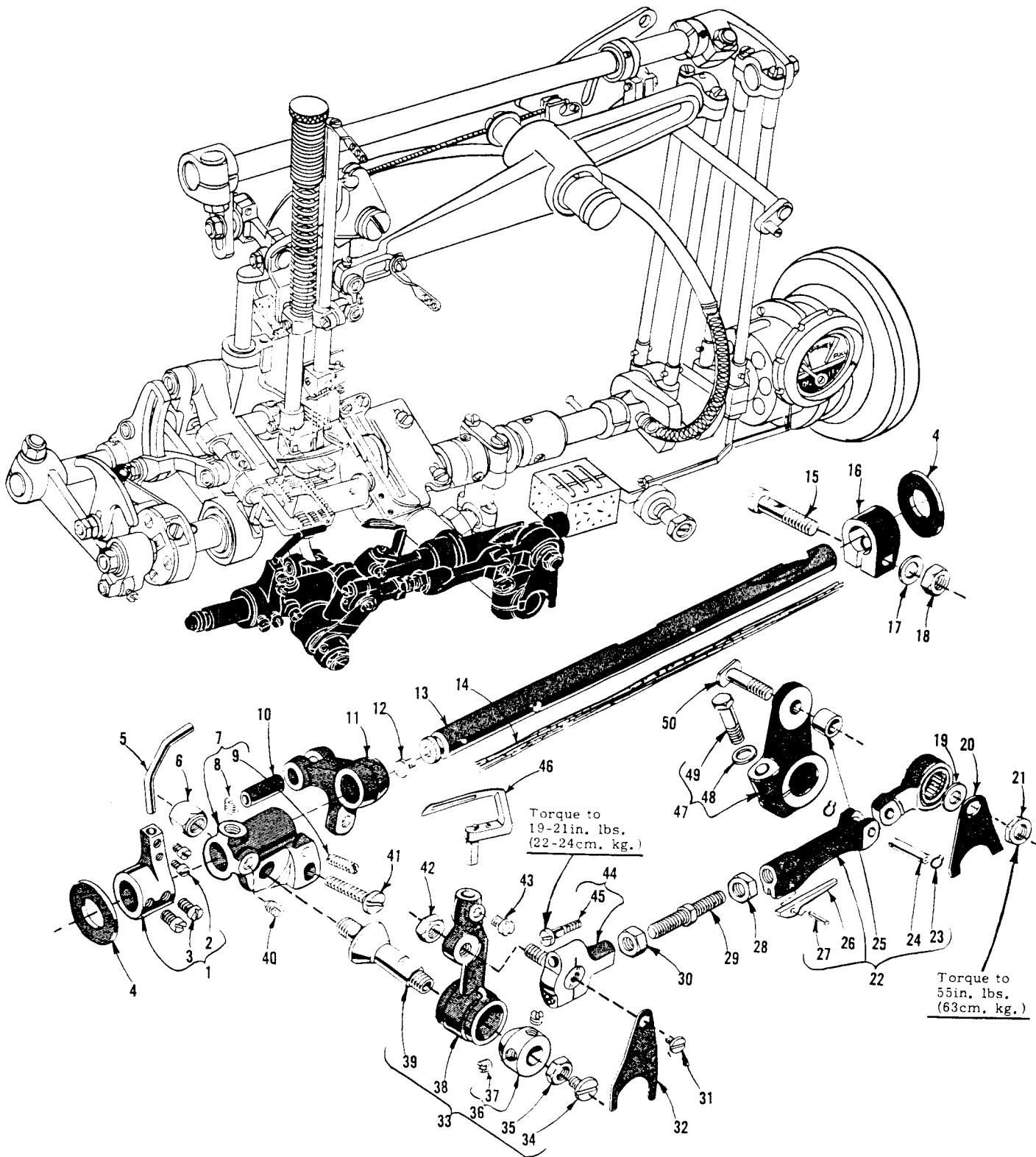


IMPORTANT: BEFORE ORDERING ANY PARTS BELOW, REFER TO THE DETAILED INSTRUCTIONS ON PAGE 4

SPREADER AND SPREADER DRIVING MECHANISM

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Amt. Req.</u>
1	57845 A	Spreader, marked "J" -----	1
2	57846 A	Spreader Holder -----	1
3	22547 D	Screw -----	2
4	77 A	Screw -----	2
5	57847 A	Spreader Holder Carrier -----	1
6	57848 B	Carrier Connecting Rod Assembly -----	1
7	97 A	Screw -----	4
8	57835 F	Ball Washer -----	1
9	12934 A	Nut-----	1
10	61434 G	Washer -----	1
11	12538	Nut-----	1
12	57849 A	Spreader Rock Shaft Arm -----	1
13	55235 E	Nut -----	1
14	6042 A	Washer -----	1
15	55235 D	Locking Stud -----	1
16	57849 C	Thrust Washer -----	1
17	52849	Spreader Rock Shaft -----	1
18	57847	Spreader Rock Shaft Thrust Collar -----	2
19	95	Screw -----	2
20	56342 B	Oil Seal Collar -----	1
21	660-202	Oil Seal Ring -----	1
22	57852	Spreader Rock Shaft Lever -----	1
23	55235 D	Locking Stud -----	1
24	6042 A	Washer -----	1
25	55235 E	Nut-----	1
26	18	Nut-----	1
27	39543 P	Washer -----	1
28	52952 B	Spreader Connecting Rod Ball Joint, upper -----	1
29	22559 G	Screw -----	2
30	56316	Spreader Drive Connecting Rod -----	2
31	56316 C	Connecting Rod Guide -----	2
32	12934 A	Nut-----	2
33	29476 MN	Crankshaft Assembly, .910 inch (23.11 mm) throw -----	1
34	51216 M	Needle Bearing -----	28

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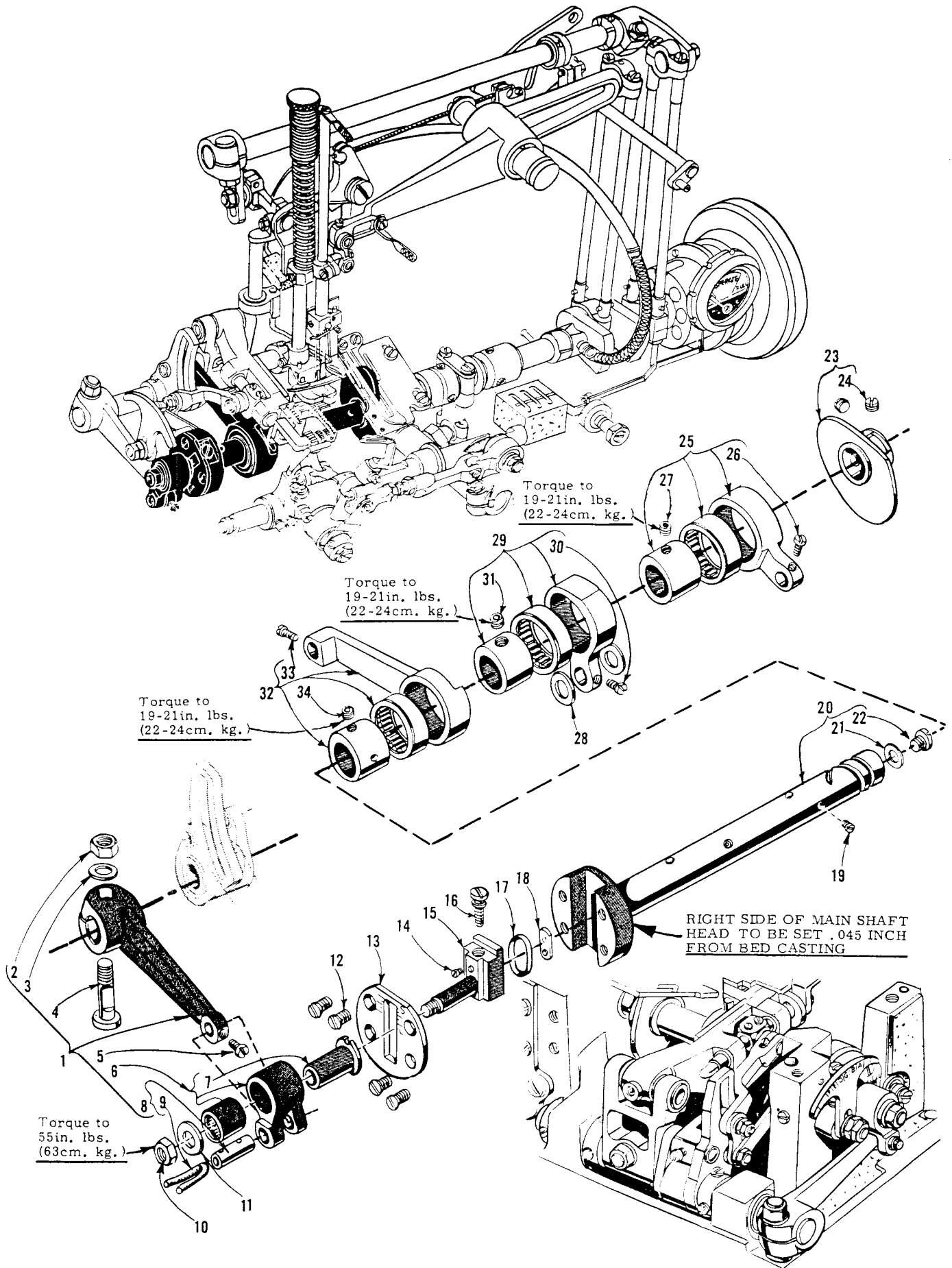


IMPORTANT: BEFORE ORDERING ANY PARTS BELOW, REFER TO THE DETAILED INSTRUCTIONS ON PAGE 4

LOOPER ROCKER AND CONNECTING ROD PARTS

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Amt. Req.</u>
1	52825 D	Front Needle Guard Holder -----	1
2	22563	Screw -----	2
3	33174 B	Screw -----	2
4	51244 L	Thrust Washer -----	2
5	57725 B	Front Needle Guard -----	1
6	57846 B	Looper Rocker Cone Stud Nut -----	1
7	57744 A	Looper Rocker Frame -----	1
8	98	Set Screw -----	1
9	719	Stop Screw -----	1
10	51236 A	Looper Avoid Link Pin -----	1
11	56344 B	Looper Rocker Shaft Arm -----	1
12	22513	Screw -----	1
13	57744	Looper Rocker Shaft -----	1
14	WO-3	Columbia Yarn (4 strands, 8 inches long)-----	-
15	55244 G	Looper Rocker Shaft Collar Stud -----	1
16	51244 N	Looper Rocker Shaft Clamp -----	1
17	51216 N	Washer -----	1
18	18	Nut -----	1
19	20	Washer -----	1
20	56393 K	Looper Connecting Rod Ball Joint Oiler, right -----	1
21	18	Nut -----	1
22	56341 M	Looper Connecting Rod Jointed Section, right -----	1
23	660-310	Truarc Ring -----	2
24	56341 E	Hinge Pin -----	1
25	56341 F	Ferrule -----	1
26	56341 G	Spring -----	1
27	50-458 Blk.	Spring Pin -----	1
28	18	Nut, right hand thread -----	1
29	57840	Looper Connecting Rod -----	1
30	269	Nut, left hand thread -----	1
31	87 U	Screw -----	1
32	56393 J	Looper Connecting Rod Ball Joint Oiler, left -----	1
33	29192 Z	Looper Rocker Assembly -----	1
34	22829	Lock Nut Screw -----	1
35	258 A	Lock Nut -----	1
36	15465 F	Looper Rocker Cone -----	1
37	88	Screw -----	2
38	57713	Looper Rocker, marked "W" -----	1
39	51745	Looper Rocker Cone Stud -----	1
40	96	Screw -----	1
41	22874	Looper Rocker Frame Lock Screw -----	1
42	18	Nut -----	1
43	73	Screw -----	1
44	57841	Looper Connecting Rod Ball Joint, left -----	1
45	22729 C	Screw -----	2
46	52708 B	Looper -----	1
47	56342	Looper Drive Lever, marked "A" -----	1
48	51242 M	Washer -----	1
49	22882 C	Screw -----	1
50	52942 R	Looper Lever Stud -----	1

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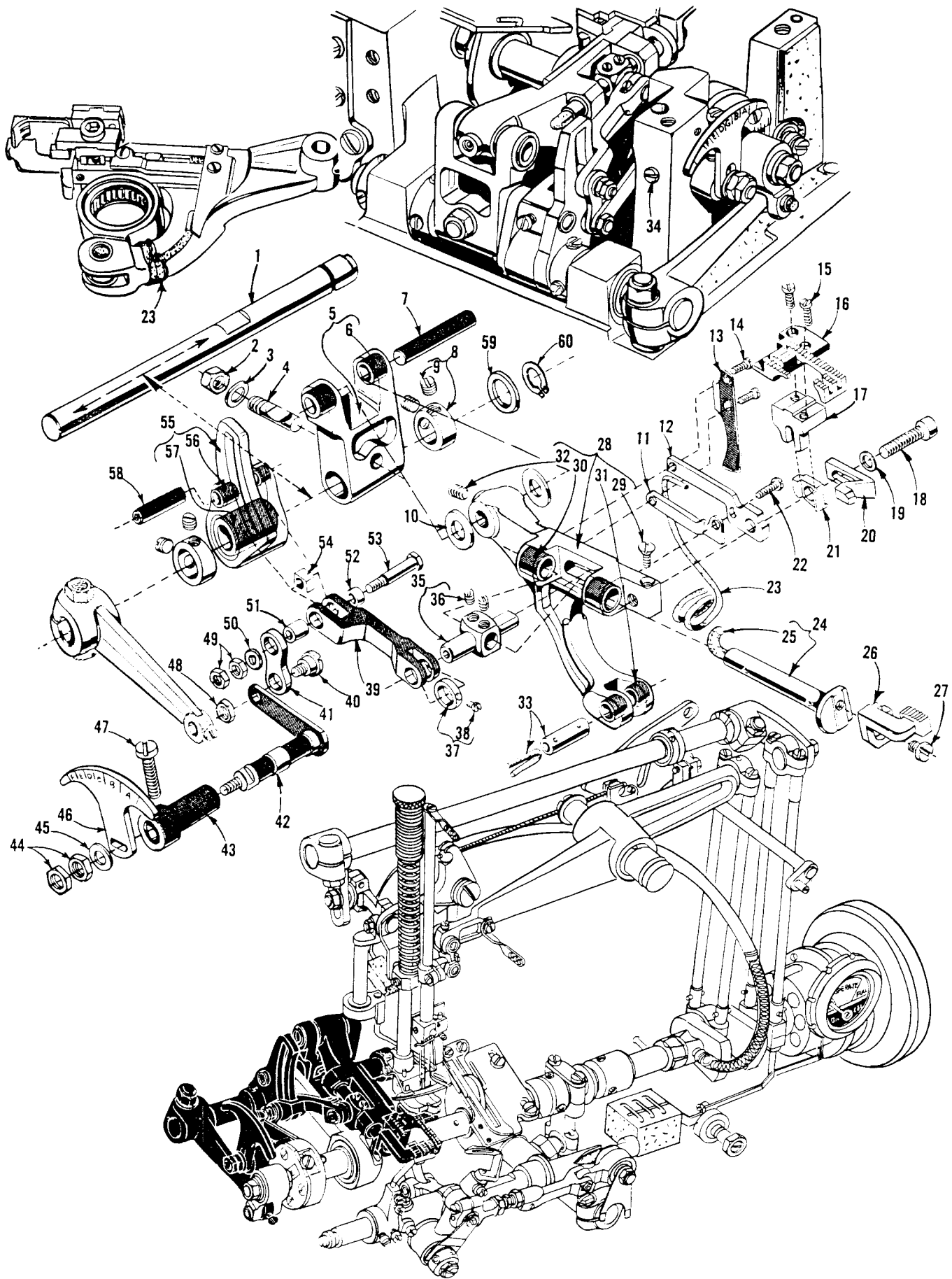


IMPORTANT: BEFORE ORDERING ANY PARTS BELOW, REFER TO THE DETAILED INSTRUCTIONS ON PAGE 4

MAIN SHAFT, TAKE-UP AND FEED DRIVING PARTS

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Amt. Req.</u>
1	29476 ND	Feed Rocker Arm and Feed Crank Link Sub-Assembly -----	1
2	55235 E	Nut -----	1
3	6042 A	Washer -----	1
4	55235 D	Locking Stud -----	1
5	22768 B	Screw, for link pin-----	1
6	56336 B	Feed Crank Link Assembly -----	1
7	56336 C	Feed Crank Link Ferrule-----	1
8	51054	Feed Crank Link Pin-----	1
9	666-149	Oil Wick-----	1
10	269	Nut, left hand thread-----	1
11	21657 E	Washer-----	1
12	22525 A	Screw-----	4
13	56322 C	Main Shaft Head Plate-----	1
14	22798 C	Screw-----	1
15	56336	Feed Crank Stud, marked "A"-----	1
16	22543 A	Stitch Regulating Screw-----	1
17	660-269 B	Quad Ring-----	1
18	56336 D	Feed Crank Stud Insert-----	1
19	22801	Screw, for take-up-----	1
20	57822 A	Main Shaft-----	1
21	56322 B	Gasket-----	1
22	22891 B	Oil Flow Regulating Screw-----	1
23	57823	Looper Thread Take-up-----	1
24	22580	Screw-----	2
25	29476 NM-062	Looper Avoid Eccentric Assembly, .062 inch (1.58 mm) throw-----	1
26	77	Screw-----	1
27	22894 AA	Screw-----	1
28	39543 N	Thrust Washer, for feed bar-----	2
29	29476 NM-072	Feed Lift Eccentric Assembly, .072 inch (1.83 mm) throw-----	1
30	77	Screw-----	1
31	22894 AA	Screw-----	1
32	57836 E	Differential Feed Connecting Rod, .080 inch (2.03 mm) throw-----	1
33	22768 B	Screw-----	1
34	22894 AA	Screw-----	1

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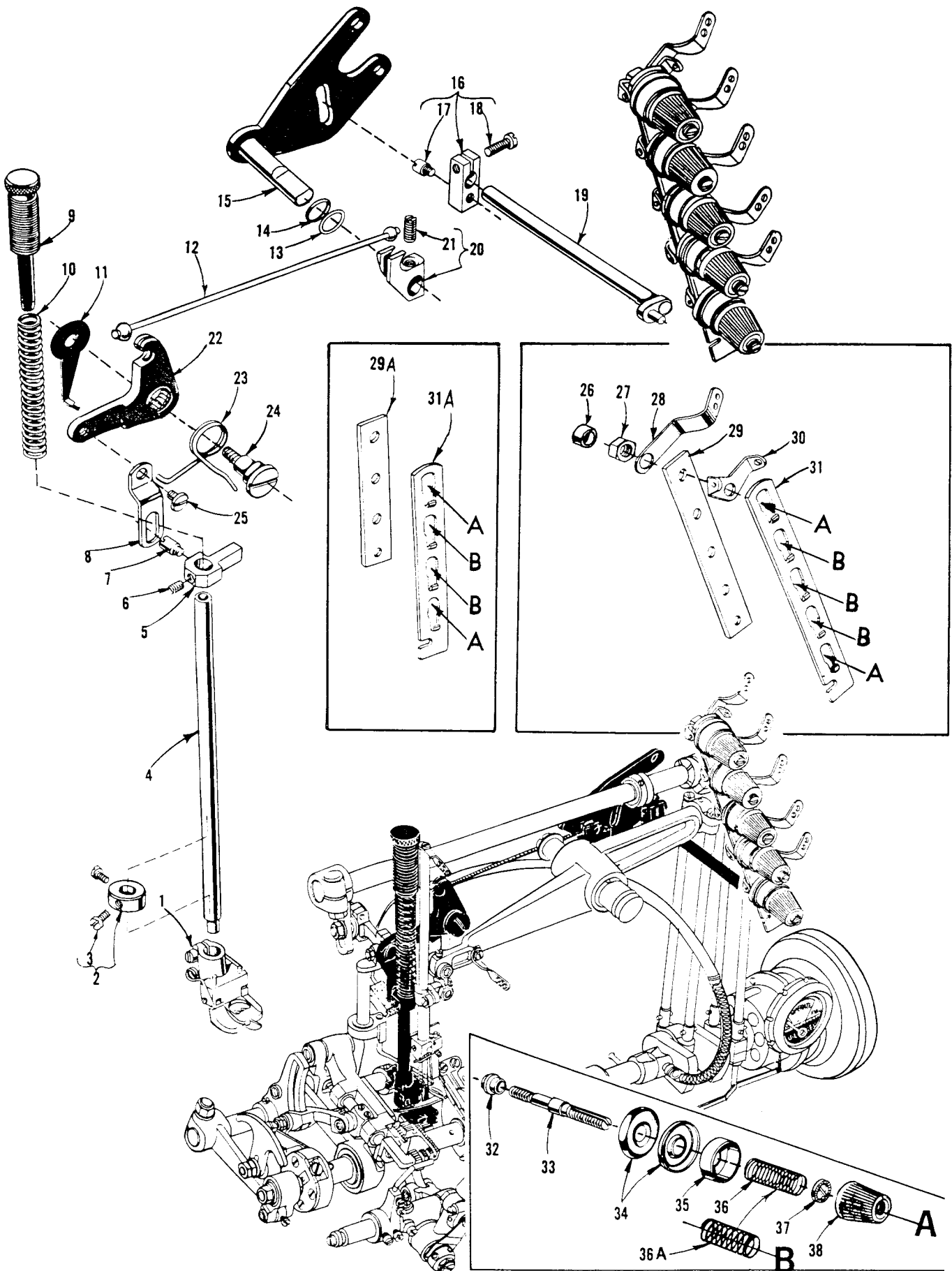


IMPORTANT: BEFORE ORDERING ANY PARTS BELOW, REFER TO THE DETAILED INSTRUCTIONS ON PAGE 4

DIFFERENTIAL FEED MECHANISM

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Amt. Req.</u>
1	57835	Main Feed Rocker Shaft, lower -----	1
2	55235 E	Nut -----	1
3	6042 A	Washer -----	1
4	57836 D	Locking Stud -----	1
5	57836 C	Main Feed Rocker -----	1
6	57836	Bushing -----	2
7	57834 B	Main Feed Rocker Shaft, upper -----	1
8	56335 D	Collar, for lower main feed rocker driving shaft -----	2
9	98	Screw -----	2
10	61341 J	Thrust Washer, for feed bar -----	2
11	57837 D	Differential Feed Bar Guide Plate -----	1
12	57853	Feed Dog Holder Support -----	1
13	57834 C	Oil Wick Retainer -----	1
14	22593	Screw -----	2
15	22593	Screw, for main feed dog -----	2
16		Main Feed Dog (See Pages 39, 41) -----	1
17	52853	Feed Dog Holder, for all except 678B007, all gauges -----	1
-	52853 A	Feed Dog Holder, for 678B007, all gauges -----	1
18	22653 B-14	Screw -----	1
19	51235 G	Washer -----	1
20	52825 B	Rear Needle Guard, marked "FW", for all except 678B005 -----	1
-	52825 F	Rear Needle Guard, for 678B005 -----	1
21	52925 D	Needle Guard Holder -----	1
22	22635 E-24	Screw -----	1
23	CL21	Oil Wick -----	2
24	57834 A	Differential Feed Bar -----	1
25	CL21	Oil Wick -----	1
26		Differential Feed Dog (See Pages 39, 41) -----	1
27	90	Screw -----	1
28	57834 F	Main Feed Bar -----	1
29	22637 P-24	Feed Dog Height Adjusting Screw -----	1
30	57834 D	Bushing -----	2
31	57834 G	Bushing -----	2
32	22651 CB-4	Screw -----	1
33	51236 A	Link Pin -----	1
34	22597	Set Screw -----	1
35	57837 E	Driving Link Guide -----	1
36	22743	Screw -----	2
37	57837 F	Differential Driving Link Collar -----	1
38	22738 B	Screw -----	1
39	57835 B	Intermittent Differential Feed Bar Driving Link -----	1
40	22758 E	Screw, for differential control lever and link -----	1
41	57835 D	Differential Feed Control Lever Link -----	1
42	57835 C	Differential Feed Control Lever -----	1
43	57837 C	Differential Feed Control Lever Bushing -----	1
44	9937	Nut -----	2
45	69 H	Washer -----	1
46	57835 E	Differential Feed Control Indicator -----	1
47	22874 K	Lock Screw -----	1
48	12934 A	Nut -----	1
49	907	Nut -----	2
50	80265	Washer -----	1
51	57837	Differential Feed Link Sleeve, left -----	1
52	57837 A	Differential Feed Link Sleeve, right -----	1
53	22868 B	Differential Feed Regulating Screw -----	1
54	57836 F-40	Sliding Block, marked "N", .2540 inch (6.452 mm) wide -----	1
	57836 F-45	Sliding Block, marked "P", .2545 inch (6.464 mm) wide -----	1
	57836 F-50	Sliding Block, marked "R", .2550 inch (6.477 mm) wide -----	1
55	57806-040	Stretch Differential Feed Rocker, .040 inch (1.016 mm) throw -----	1
56	56334 R	Bushing -----	2
57	57836 A	Bushing -----	1
58	57836 G	Differential Feed Drive Rocker Shaft -----	1
59	41391	Washer -----	1
60	660-438	Retaining Ring -----	1

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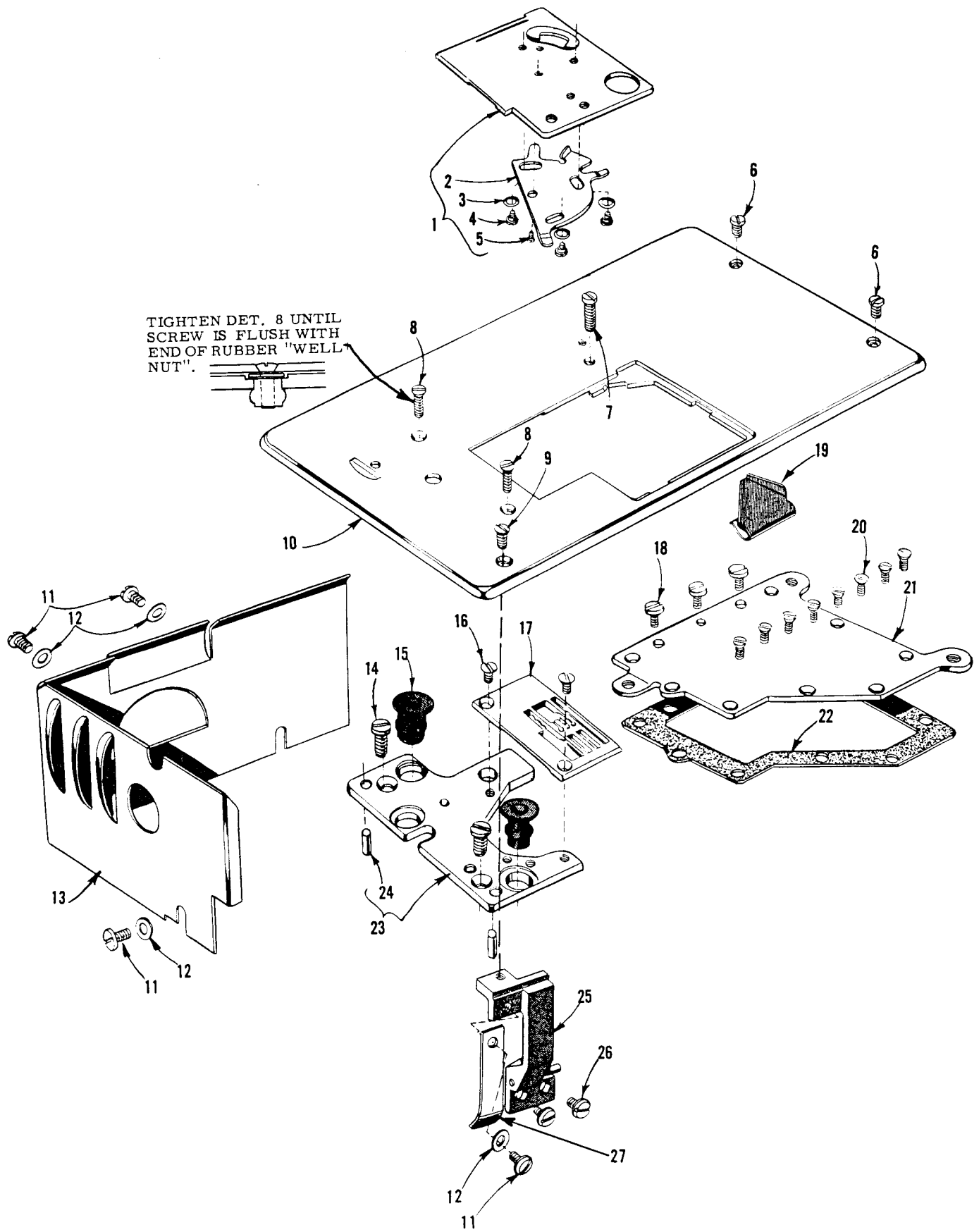


IMPORTANT: BEFORE ORDERING ANY PARTS BELOW, REFER TO THE DETAILED INSTRUCTIONS ON PAGE 4

THREAD TENSION AND LIFTER LEVER PARTS

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Amt. Req.</u>
1		Presser Foot (See Pages 39, 41) -----	1
2	52888 B	Presser Bar Stop Collar -----	1
3	22562	Screw -----	2
4	51257 K	Presser Bar -----	1
5	51257 M	Presser Bar Connection and Guide -----	1
6	531	Screw -----	1
7	22892 E	Screw -----	1
8	56383 A	Lifter Lever Link -----	1
9	56356	Presser Spring Regulator -----	1
10	51256 C	Presser Spring -----	1
11	57893 B	Head Oil Tube Clamp -----	1
12	56383 W	Lifter Lever Cable -----	1
13	39552 C	Washer -----	1
14	660-207	Oil Seal Ring -----	1
15	51283 H	Lifter Lever -----	1
16	21657 Y	Tension Release and Lifter Lever Shaft Connection ---	1
17	402	Screw -----	1
18	22596	Screw -----	1
19	21657 W	Tension Release and Lifter Lever Shaft -----	1
20	56383 X	Lifter Lever Connection -----	1
21	74 E	Screw -----	1
22	56383 Y	Lifter Lever Bell Crank -----	1
23	56383 D	Lifter Lever Bell Crank Spring -----	1
24	22557 G	Screw -----	1
25	22758 C	Screw -----	1
26	57892 E	Auxiliary Tension Post Support, for 678B002, 007 and 008 -----	1
27	43266	Nut -----	2 or 3
28	51491 C	Thread Lead-in Guide -----	4 or 5
29	52992 A	Tension Post Support, for 678B002, 007 and 008 ---	1
29A	56382 X	Tension Post Support, for 678B005, all gauges -----	1
30	51292 D	Tension Thread Eyelet -----	4 or 5
31	21657 AM-5	Tension Disc Separator, for 678B002, 007 and 008 ---	1
31A	21657-4	Tension Disc Separator, for 678B005, all gauges -----	1
32	51292 A	Tension Post Ferrule -----	4 or 5
33	56392 E	Tension Post -----	4 or 5
34	109	Tension Disc -----	8 or 10
35	56392 F	Spring Shield -----	4 or 5
36	51292 F-1	Tension Spring, looper and spreader -----	2
36A	51292 F-5	Tension Spring, needle -----	2 or 3
37	39592 AK	Tension Spring Ferrule -----	4 or 5
38	39592 Z	Tension Nut -----	4 or 5

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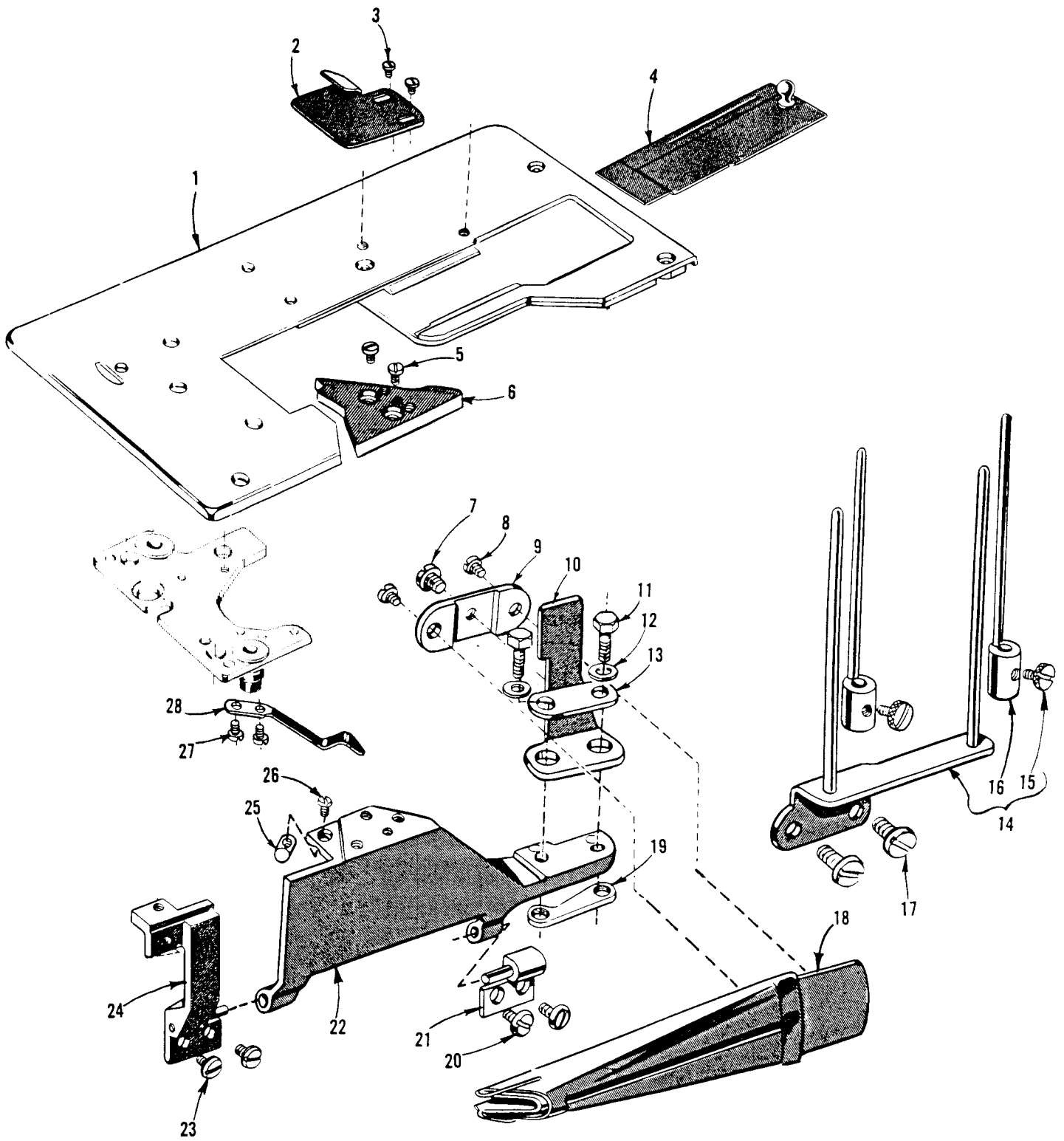


IMPORTANT: BEFORE ORDERING ANY PARTS BELOW, REFER TO THE DETAILED INSTRUCTIONS ON PAGE 4

CLOTH PLATE, MISCELLANEOUS COVERS AND SUPPORTS

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Amt. Req.</u>
1	56381-219	Cloth Plate Cover, for 678B002 and 008 -----	1
2	51281 AC	Cloth Plate Cover Spring -----	1
3	35772 H	Washer -----	3
4	22760 A	Screw -----	3
5	22845 B	Pivot Screw -----	1
6	22839 C	Screw -----	2
7	22839 E	Screw -----	1
8	22526 C	Screw -----	2
9	22526 D	Screw -----	1
10	57801	Cloth Plate, for 678B002 and 008 -----	1
11	22848	Screw, for end and back cloth guard, for 678B005 and 007 -----	4
12	20	Washer, for 22848-----	4
13	51282 AH	End and Back Cloth Guard, for 678B005 and 007 -----	1
14	22839	Screw, for throat plate support -----	2
15	660-313	Well Nut -----	2
16	87	Screw, for throat plate-----	2
17		Throat Plate (See Pages 39, 41)-----	1
18	22585 A	Screw -----	3
19	52703 A	Edge Guide, for 678B002 -----	1
20	22524	Screw -----	8
21	56382 G	Oil Reservoir Top Cover -----	1
22	56382 H	Gasket -----	1
23	57880	Throat Plate Support-----	1
24	51280 J	Dowel Pin -----	2
25	57882 C	Cover Support Post-----	1
26	22848	Screw -----	2
27	57882 G	Front Cloth Guard, for 678B005 and 007 -----	1

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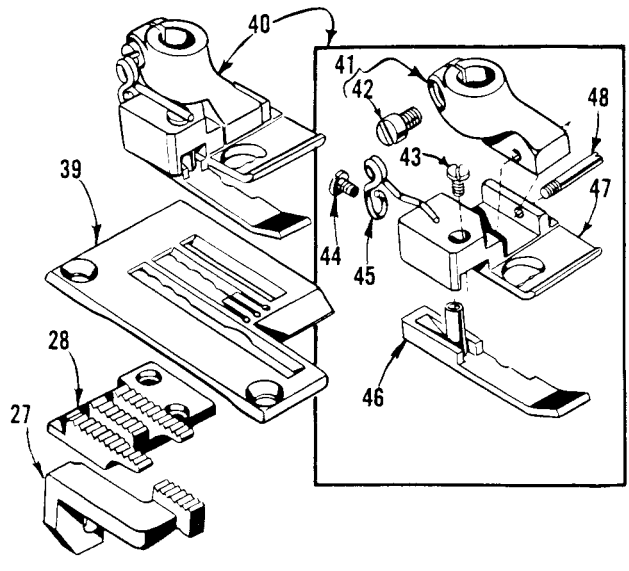
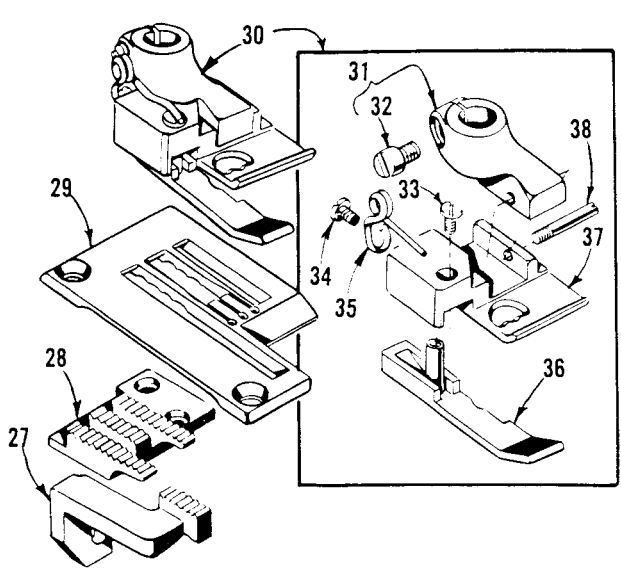
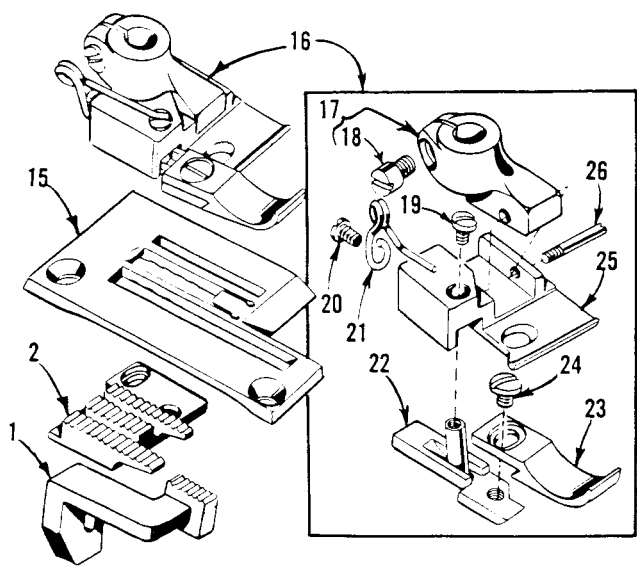
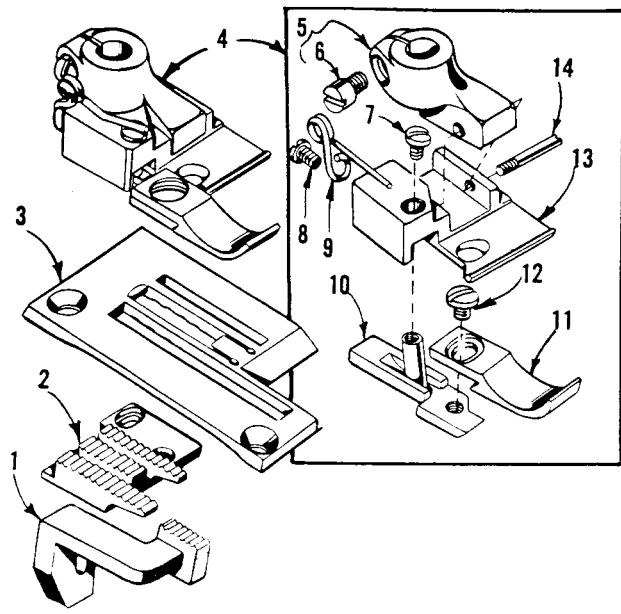
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CLOTH PLATE, ATTACHMENTS AND ATTACHING BRACKETS
FOR 678B005 and 007 ONLY, UNLESS OTHERWISE SPECIFIED

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Amt. Req.</u>
1	57801 A	Cloth Plate -----	1
2	23133 L	Edge Guide -----	1
3	22561	Screw -----	2
4	57802 A	Cloth Plate Slide Cover -----	1
5	90	Screw -----	2
6	57764 A	Folder Support Platform-----	1
7	25 S	Screw -----	1
8	25 CC	Screw -----	2
9	23432	Folder Clamp -----	1
10	52864 N	Folder Support Bracket -----	1
11	T38	Screw -----	2
12	53634 C	Washer -----	2
13	23425 V	Washer Plate -----	1
14	23439 D	Strip Tension-----	1
15	188 D	Screw -----	2
16	23439 E	Adjustable Pin -----	2
17	22548	Screw, for strip tension -----	2
18	23406 N-3/4	Folder, for 678B005 U-3/4 and 007-3/4; strip size 1 1/2 inches (38.10 mm), finish size 3/4 inch (19.05 mm), strip capacity 5/64 inch (1.98 mm) -----	1
-	23406 N-7/8	Folder, for 678B005-7/8 and 007-7/8; strip size 1 3/4 inches, (44.45 mm), finish size 7/8 inch (22.23 mm), strip capacity 5/64 inch (1.98 mm) -----	1
-	23406 N-1	Folder, for : 678B005-1 and 007-1; strip size 2 inches (50.80 mm),finish size 1 inch (25.40 mm), strip capacity 5/64 inch (1.98 mm) -----	1
-	23406 N-1-1/4	Folder, for 678B005-1-1/4 and 007-1-1/4; strip size 2 1/2 inches (63.50 mm), finish size 1 1/4 inches (31.75 mm), strip capacity 5/64 inch (1.98 mm) -----	1
19	57864	Clamp Plate-----	1
20	22848	Screw -----	2
21	57885	Swinging Cover Hinge, right -----	1
22	57764 B	Folder Support Hinged Bracket-----	1
23	22848	Screw, for all Styles -----	2
24	57882 C	Support Post, for all Styles -----	1
25	57885 A	Hinged Bracket Spring Pin -----	1
26	22564	Screw -----	1
27	90	Screw -----	2
28	43281 K	Hinged Bracket Spring-----	1

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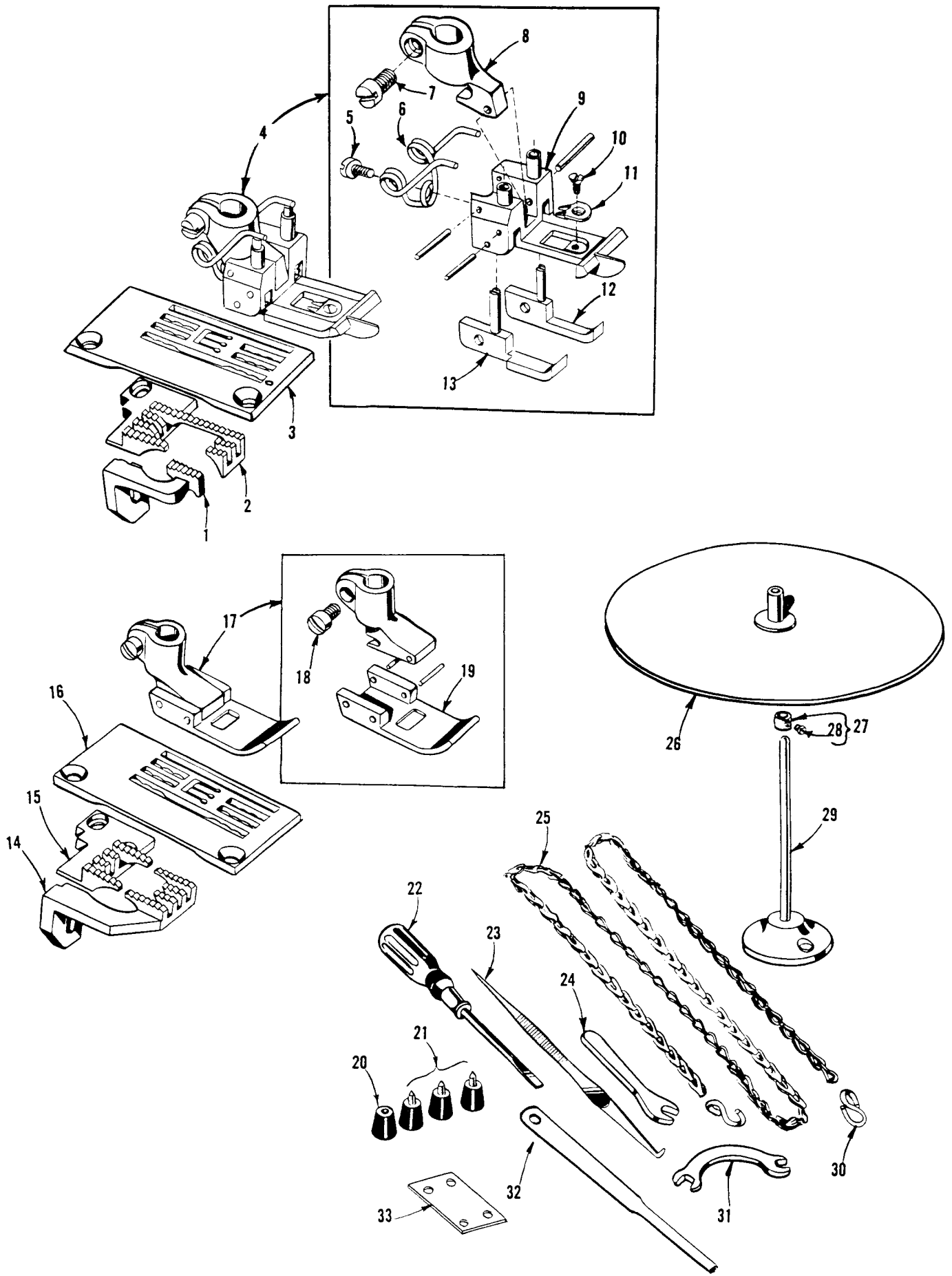


IMPORTANT: BEFORE ORDERING ANY PARTS BELOW, REFER TO THE DETAILED INSTRUCTIONS ON PAGE 4

FEED DOGS, THROAT PLATES, PRESSER FEET

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Amt. Req.</u>
1	5026 A	Differential Feed Dog, for 678B005 -----	1
2	52805 F-8	Main Feed Dog, for 678B005 -----	1
3	52824 F-8	Throat Plate, for No. 8 gauge, 678B005 -----	1
4	52820 H-8	Presser Foot, for No. 8 gauge, 678B005 -----	1
5	13130 B	Presser Foot Shank-----	1
6	91	Screw -----	1
7	73 A	Screw -----	1
8	605	Screw -----	1
9	11534	Spring-----	1
10	52830 C	Yielding Section -----	1
11	52830 D	Adjustable Guide -----	1
12	22561	Screw -----	1
13	52830 H-8	Presser Foot Bottom -----	1
14	22799 B	Hinge Screw -----	1
15	52824 F-12	Throat Plate, for No. 12 gauge, 678B005 -----	1
16	52820 H-12	Presser Foot, for No. 12 gauge, 678B005 -----	1
17	13130 B	Presser Foot Shank-----	1
18	91	Screw -----	1
19	73 A	Screw -----	1
20	605	Screw -----	1
21	11534	Spring-----	1
22	52830 C	Yielding Section -----	1
23	52830 D	Adjustable Guide -----	1
24	22561	Screw -----	1
25	52830 H-12	Presser Foot Bottom -----	1
26	22799 B	Hinge Screw -----	1
27	52826 K	Differential Feed Dog, for 678B007 -----	1
28	52805 K	Main Feed Dog, for 678B007 -----	1
29	52824 K-14	Throat Plate, for No. 14 gauge, 9 to 12 S. P. I., 678B007 -----	1
	52828 K-14	Throat Plate, for No. 14 gauge, 13 to 16 S. P. I., 678B007 -----	1
30	52820 K-14	Presser Foot, for No. 14 gauge, 678B007 -----	1
31	13130 B	Presser Foot Shank-----	1
32	91	Screw -----	1
33	73 A	Screw -----	1
34	605	Screw -----	1
35	11534	Spring-----	1
36	13130 A	Yielding Section -----	1
37	52830 K-14	Presser Foot Bottom -----	1
38	22799 B	Hinge Screw -----	1
39	52828 K-16	Throat Plate, for No. 16 gauge, 678B007 -----	1
40	52820 K-16	Presser Foot, for No. 16 gauge, 678B007 -----	1
41	13130 B	Presser Foot Shank-----	1
42	91	Screw -----	1
43	73 A	Screw -----	1
44	605	Screw -----	1
45	11534	Spring-----	1
46	13130 A	Yielding Section -----	1
47	52830 K-16	Presser Foot Bottom -----	1
48	22799 B	Hinge Screw -----	1

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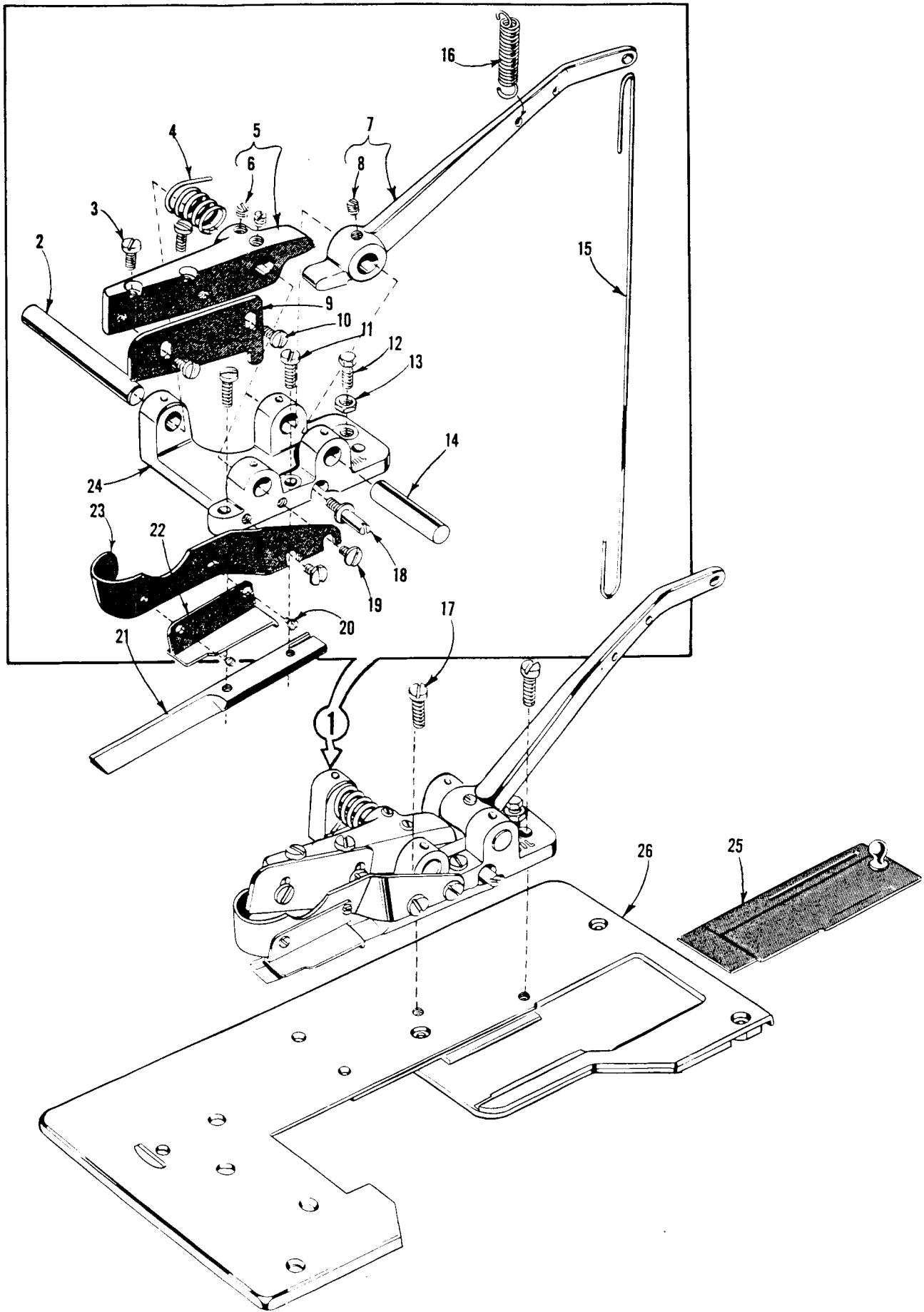


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FEED DOGS, THROAT PLATES, PRESSER FEET AND ACCESSORIES

Ref. No.	Part No.	Description	Amt. Req.
1	57726	Differential Feed Dog, marked "ES", for 678B002	1
2	57805	Main Feed Dog, marked "QA", for 678B002	1
3	57824 E-16	Throat Plate, for 678B002	1
4	57820-16	Presser Foot, for 678B002	1
5	605	Screw	1
6	79633	Spring	1
7	91	Screw	1
6	G65-134	Presser Foot Shank	1
9	57830-16	Presser Foot Bottom, marked "BR"	1
10	22716 A	Screw	1
11	G52897 A-16	Stitch Tongue, marked "WH"	1
12	57830 A	Yielding Section, right	1
13	57830 B	Yielding Section, left	1
14	52826 H	Differential Feed Dog, marked "EE", for 678B008	1
15	52805 X-16	Main Feed Dog, marked "PU", for 678B008	1
16	52824 X-16	Throat Plate, for 678B008	1
17	52820 X-16	Presser Foot, for 678B008	1
18	91	Screw	1
19	52830 X-16	Presser Foot Bottom	1
20	51295 A	Isolator	1
21	51295 B	Isolator	3
22	21207 A	Screwdriver, 1/8 inch (3.18 mm) diameter blade, length overall 4 3/8 inches (111.13 mm)	1
23	660-240	Thread Tweezers	1
24	21388	Wrench, single end, 3/8 inch (9.53 mm) opening	1
25	421 D-34	Treadle Chain, 32 3/64 inches (813.99 mm) long	1
26	21169 E	Binding Holder Disc, for 678B005 and 007	1
27	161	Binding Holder Stop Collar, for 678B005 and 007	1
28	88	Screw	1
29	21169 F	Binding Holder Base, for 678B005 and 007	1
30	660-264	"S" Hook	2
31	21388 W	Wrench, double end, curved, 9/32 inch (7.14 mm) opening	1
32	23279 D	Folder Threader, for 678B005 and 007	1
33	39152 U-4	Shim, for adjusting cast-off plate support	2
-	28604 R	Can of Oil, 16 fluid ounces,	1
-	21201	Screwdriver, 9/64 inch (3.57 mm) diameter blade, length overall 7 11/16 inches (195.26 mm), for 678B005 (not shown)	1
-	660-457	Dust Cover (not shown)	1

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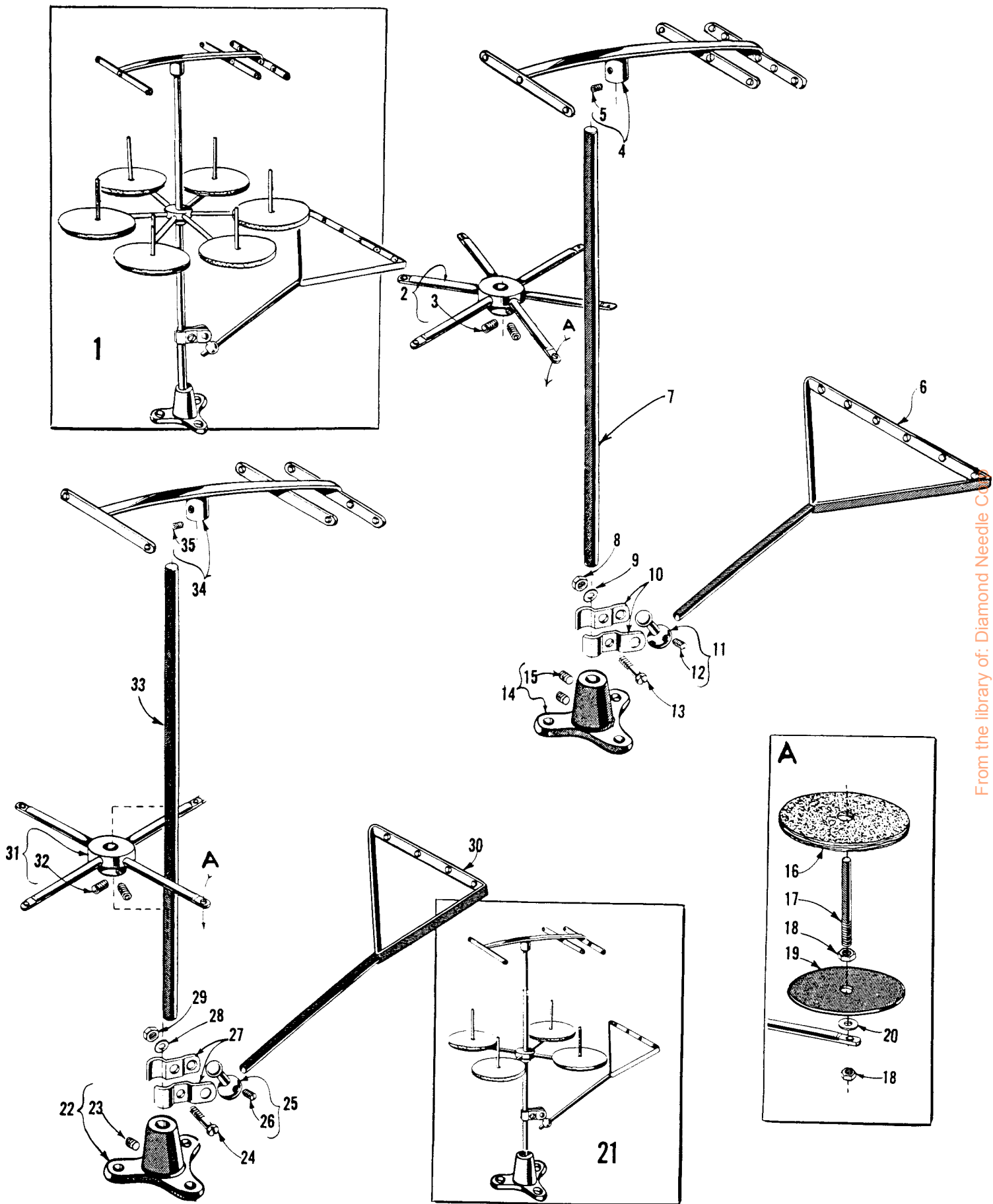
IMPORTANT: BEFORE ORDERING ANY PARTS BELOW, REFER TO THE DETAILED INSTRUCTIONS ON PAGE 4

TAPE CLIPPER ASSEMBLY

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Amt. Req.</u>
*1	29486 A	Tape Clipper Assembly-----	1
2	52875 F	Shaft -----	1
3	93	Screw -----	2
4	52875 G	Spring -----	1
5	52875 E	Upper Knife Holder -----	1
6	95	Screw -----	2
7	52875 A	Operating Lever -----	1
8	95	Screw -----	1
9	52875 D	Upper Knife -----	1
10	22528	Screw, for upper knife -----	2
11	22596	Screw, for lower knife -----	2
12	22852	Screw -----	1
13	12538	Nut -----	1
14	52875 B	Shaft -----	1
15	52875 K	Operating Wire -----	1
16	51283 G	Spring -----	1
17	136	Clipper Mounting Screw -----	2
18	15447 A	Adjusting Screw -----	1
19	22829	Screw -----	2
20	604	Screw, for cloth guide plate -----	2
21	52875 C	Lower Knife -----	1
22	52875 J	Cloth Guide Plate -----	1
23	52875 H	Knife Guard -----	1
24	52875	Frame -----	1
25	57802 A	Cloth Plate Slide Cover, for 678B005 and 007 -----	1
26	57801 A	Cloth Plate, for 678B005 and 007 -----	1

* Available as an optional extra.

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THREAD STAND PARTS

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Amt. Req.</u>
1	21101 H-6	Thread Stand Assembly, for 678B002, 007 and 008 -----	1
2	21114 D-6	Spool Seat Support -----	1
3	22651 CD-5	Screw -----	2
4	21114 H-6	Eyelet Support -----	1
5	22651 CD-4	Screw -----	1
6	21114 S-6	Lead Eyelet -----	1
7	21104 B-24	Thread Stand Rod -----	1
8	21104 H	Nut -----	1
9	652-16	Washer -----	1
10	21114 U	Lead Eyelet Ball Split Socket -----	2
11	21114 T	Lead Eyelet Socket Ball -----	1
12	22651 CD-4	Screw -----	1
13	22810	Screw -----	1
14	21114 A	Thread Stand Base -----	1
15	22651 CD-4	Screw -----	1
16	21104 V	Spool Support Pad -----	4 or 6
17	21114 W	Spool Pin -----	4 or 6
18	258 A	Nut -----	8 or 12
19	21114	Spool Seat Disc -----	4 or 6
20	652-16	Washer -----	4 or 6
21	21101 H-4	Thread Stand Assembly, for 678B005 -----	1
22	21114 A	Thread Stand Base -----	1
23	22651 CD-4	Screw -----	1
24	22810	Screw -----	1
25	21114 T	Lead Eyelet Socket Ball -----	1
26	22651 CD-4	Screw -----	1
27	21114 U	Lead Eyelet Ball Split Socket -----	2
28	652-16	Washer -----	1
29	21104 H	Nut -----	1
30	21114 S-4	Lead Eyelet -----	1
31	21114 D-4	Spool Seat Support -----	1
32	22651 CD-5	Screw -----	2
33	21104 B-24	Thread Stand Rod -----	1
34	21114 H-4	Eyelet Support -----	1
35	22651 CD-4	Screw -----	1

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