

curved needle

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CATALOG #9700 12/94

PBS 700

Blind Stitch Machine



INSTRUCTIONS, PARTS CATALOG
& SERVICE MANUAL

PSM PORTER®
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97 Rantoul Street, Beverly, MA 01915
(508)922-2611 • (800)343-8138 • FAX (617)599-7081

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5. Machine Model Number
6. Part Number or complete part description

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OPERATING INSTRUCTIONS

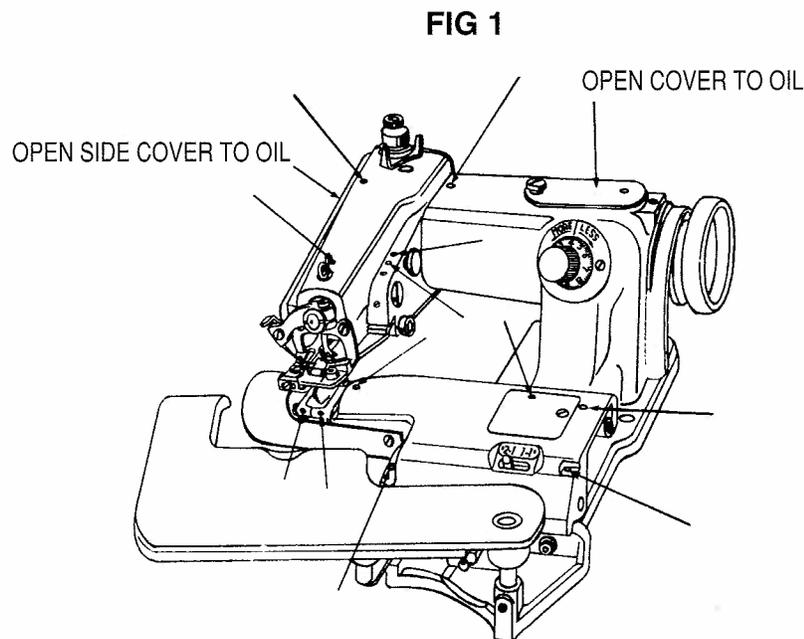
Handwheel Rotation and Speed

Turn handwheel only in direction away from operator for clockwise rotation. Be sure motor drive is wired up to obtain the same clockwise rotation. The recommended operating speed of a brand new machine is 1,800 to 2,000 stitches per minute. After a breaking-in period of several weeks and after the operator has become skilled in the operation of the machine, the speed can be increased up to 2200 stitches per minute.

Oiling and Maintenance (Fig. 1)

It is important not to operate the machine before oil of good quality has been dropped at all points shown in Fig. 1. When breaking in a new machine, oiling should be done sparingly several times a day. Thereafter, one oiling daily will be sufficient. After oiling, wipe machine carefully to avoid soiling of the material.

Do not operate machine without material under the presser foot. This will prevent damage to the needle and the feed dog as well as the feed plattens.



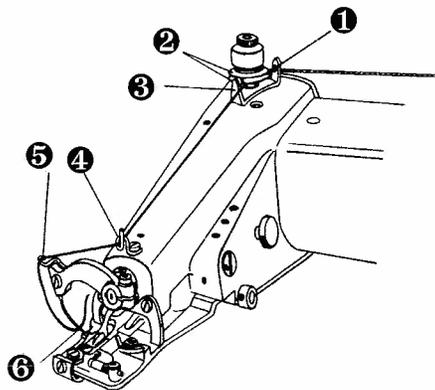
Threading Machine (Fig. 2)

Turn handwheel of machine in clockwise direction away from operator until needle lever reaches its furthest left hand position.

Draw thread from spool on thread stand and pass it through eyelet of rear thread guide ❶, then slide it between two tension discs ❷, and pass it over rear thread guide ❸, through eyelet of front thread guide ❹, then down through needle clamp hole ❺ and pass it from the underside of needle hole ❻. Leave thread about 5 cm (2 inches) past needle hole.

To thread needle at point ❻, swing front plate out of way and depress cylinder out of way with knee lifter, then hold thread between index finger and thumb. End of thread must be stub not feather edge.

FIG 2



Right
up like this



Wrong
Not like this



Adjusting Cam to Needle (Figs. 3, 4, 5, & 6.)

POWER OFF

Heel foot treadle to depress feed frame and turn handwheel away from operator (clockwise) until point of needle is at the left edge of cam slot (Fig.3). Release treadle.

If the cam is pressing up against needle (Fig. 4), turn dial "less" until a $1/32$ " clearance gap is between needle and cam (Fig. 5).

FIG 3

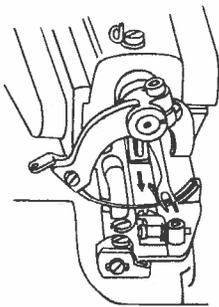


FIG 4

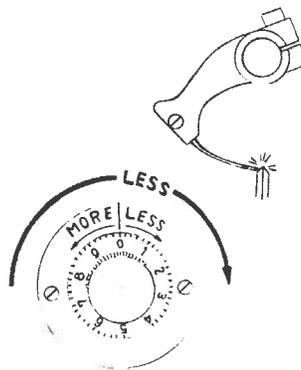
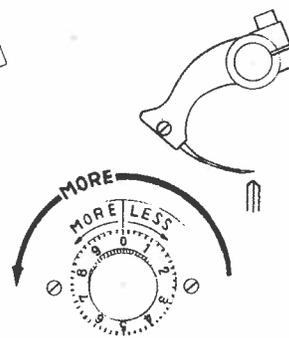


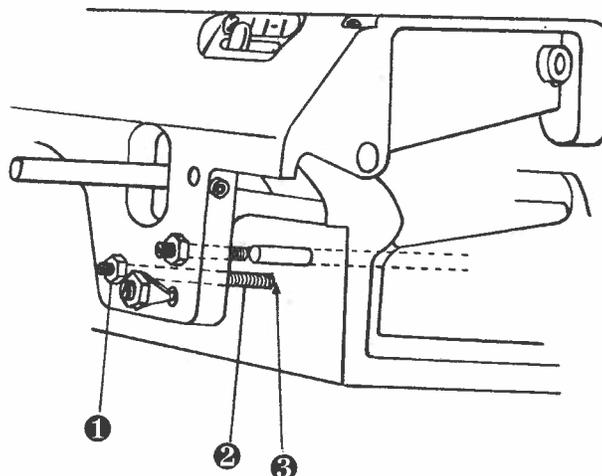
FIG 5



To prevent the operator from mistakenly adjusting cam too high with "more/less" dial, loosen nut at ❶ and turn threaded shaft ❷ clockwise until it just touches main casting ❸.

Secure nut to maintain position (Fig. 6).

FIG 6



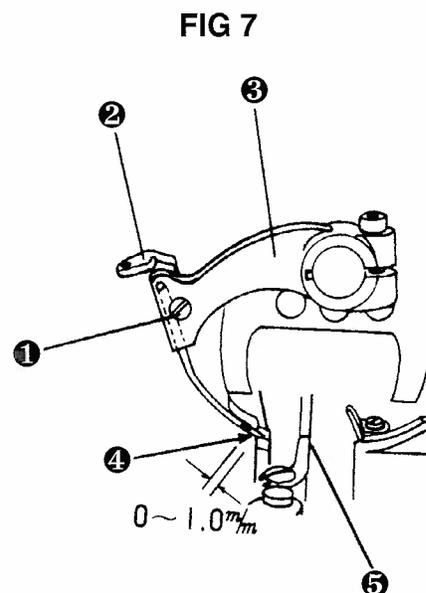
Replacing Needle (Fig.7)

Turn handwheel away from operator (clockwise) until needle reaches the end of its return stroke (extreme left hand position).

Remove old or defective needle by loosening needle clamp screw ①. Insert new needle into seat in needle clamp ② and needle lever ③ as far as it will go. Make sure hole of needle is 0-1.0 mm (0.04") on the left end of presser foot ④ and tighten needle clamp screw ①.

Turn handwheel slowly away from operator and observe movement of needle. The curved portion of the needle should bear slightly on the needle guide groove ⑤ in the left hand part of presser foot.

Always replace bent or blunt needles. They affect the satisfactory operation of machine.



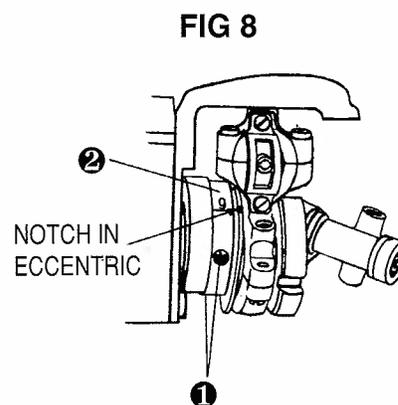
Needle Recommendation

Size #5-1/2

Regulating Stitch Length (Fig. 8)

Loosen screws ① in stitch regulating collar ② and turn collar ② until desired number is reached by indicator notch of eccentric. The larger the number by the notch, the longer the stitch. The smaller the number by the notch, the shorter the stitch. Tighten screws ① securely.

| | | | | |
|---------------------|---|-----|-----|---|
| Number on Collar | 5 | 6 | 7 | 9 |
| Stitch Length (SPI) | 5 | 4.2 | 3.6 | 3 |



NOTE: Due to the changing thicknesses of material passing between the cam and shoe area, an end result of 6-8 SPI will be satisfactory.

ADJUSTMENTS

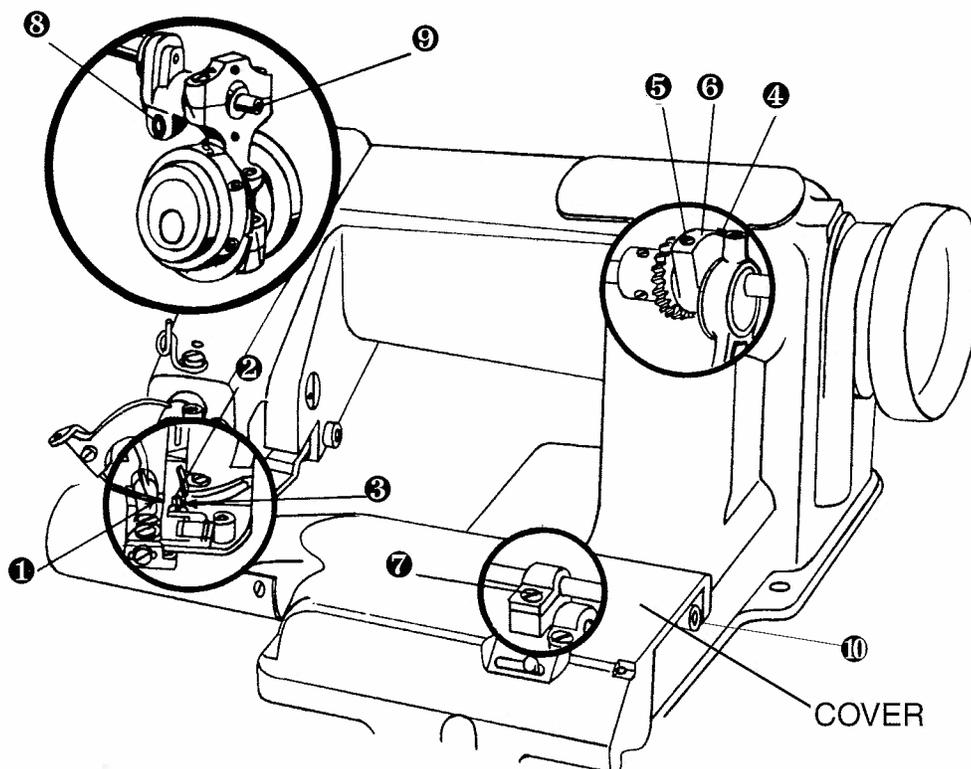
Proper Setting for Cam Connection (Fig. 9)

Turn handwheel away from operator (clockwise) until needle is on the down stroke. When needle reaches the right hand edge of needle guide **1**, Cam **2** should stop and should not move until the point of needle passes over cam to other side of presser foot opening **3**.

If cam moves, make the following adjustments: first open top cover plate and loosen screw **4** on eccentric **6**. Bring the point of needle back to the right hand edge of needle guide **1**. Then loosen screw **5**, keeping screwdriver in place. Move eccentric **6** forward to backward until cam is at the stop position, holding needle in position with handwheel while performing this operation. Tighten screw **5**.

If still not correct, readjust by loosening screw **5** again, change angle of eccentric **6** slightly forward or backward as needed and retighten screw **5**. When adjusted satisfactorily, be sure to tighten both screws **4** & **5** before putting machine into operation.

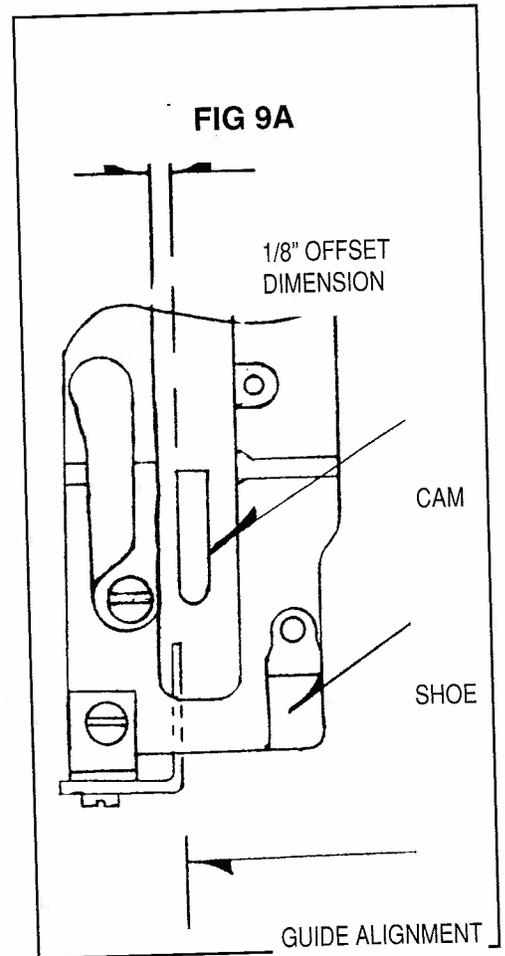
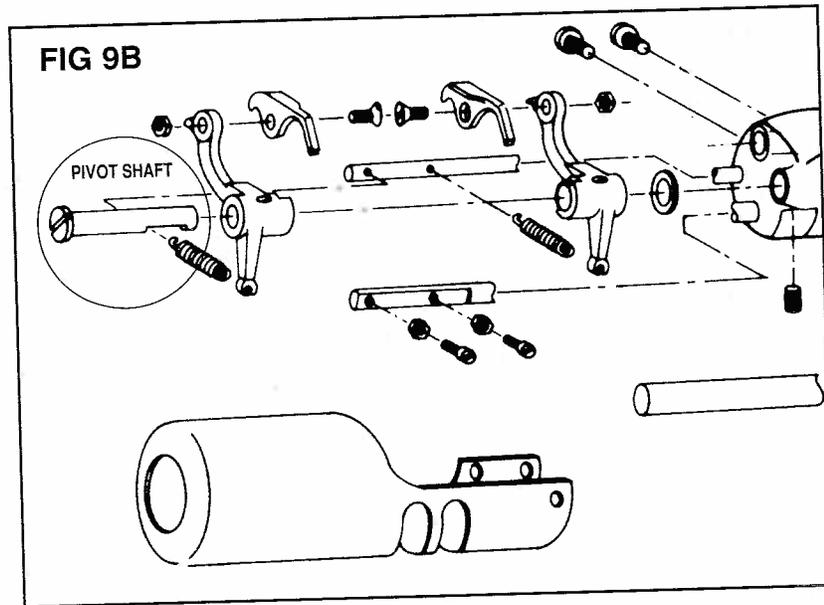
FIG 9



Setting Cam Shaft Offset (Figs. 9, 9A, & 9B)

Remove cover (Fig. 9) and loosen screw ⑦ on cam shaft drive collar and L.H. positioning collar (not shown). Loosen R.H. position collar ⑩ and slide cam shaft to dimension shown in (Fig. 9A). Then secure both L.H. and R.H. collars.

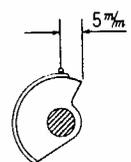
Fig. 9B shows the pivot shaft for the feed plattens. The shaft has a clearance slot for the travel stroke of the cam. Be sure there is no interference contact after performing the off-set adjustment.



Setting Cam Shaft Stroke (Fig. 9 & 9C)

When the point of needle is at the cam, open window plate, loosen screw ⑦ and adjust cam to be 5 m/m (13/64") between the center of needle and the end position of rib's forward movement as shown in Fig. 9C.

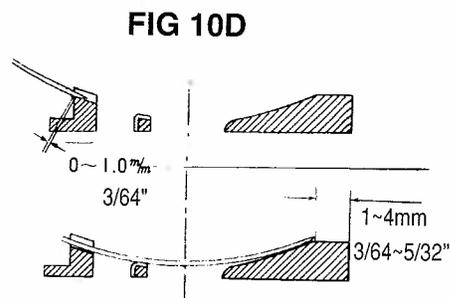
FIG 9C



Adjusting Needle Stroke to Presser Foot

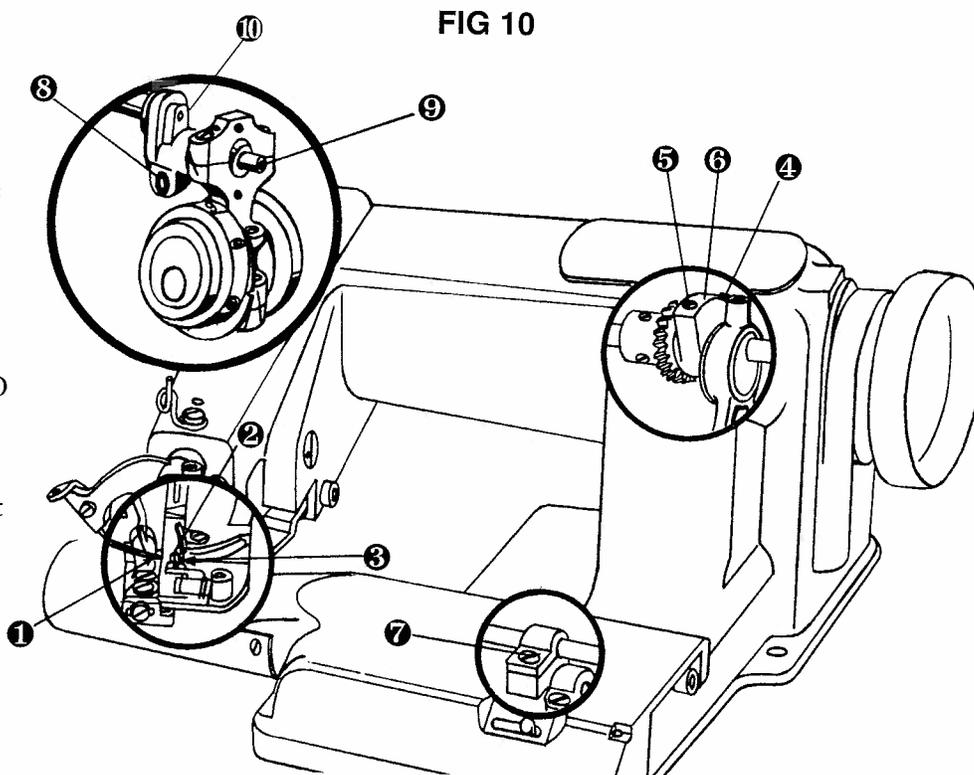
(Figs. 10 & 10D)

Turn handwheel away from operator (clockwise), bringing needle to the highest position at the left side. At this left point, the hole of needle should be 0 to 1.0 m/m (0.04") from the left hand edge of presser foot (Fig. 10D). And bring needle to the end of stroke at the right side. At this right point, the point of needle should be 1 to 4 m/m (3/64" to 5/32") from the right hand edge of presser foot (Fig. 10D).



To attain this, loosen eccentric ball screw **8** and turn eccentric ball **9** until needle reaches the above desired position (Fig. 10D). Be sure to repeat the above adjustment so that the both sides will be settled as per Fig. 10D.

If the dimensions of Fig. 10D cannot be achieved, loosen screw **8** and slide eccentric ball stud **9** in (closer to shaft **10** to increase stroke) or out (further away from shaft **10** to decrease stroke). Then repeat previous step to attain dimensions.



Adjusting Feed Dog (Figs. 11A & 11B)

Feed Dog should be 0.8 m/m (1/32") below presser foot and move in parallel with presser foot when the number of stitch length is at 5 (Fig. 11A).

Be sure the feed dog **1** clears the parts around feed dog **1** when the number of stitch length is 9, and secure feed dog set screws **2** firmly (Fig. 11B).

FIG 11A

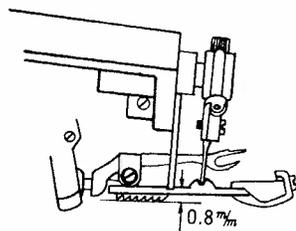
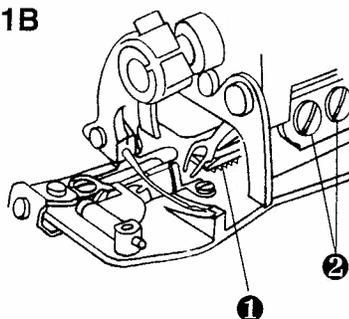


FIG 11B

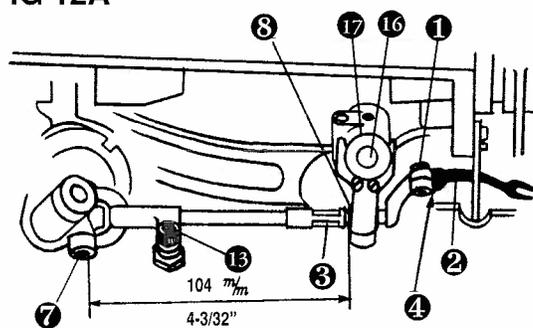


Adjusting Looper (Fig. 12A)

Replacement part #2200B. [Generic Polished]
Replacing Looper (Fig. 12A)

Loosen screw ① to take out looper ②. When putting new looper in, the shoulder of looper should touch the shoulder of looper rod ③ at point ①.

FIG 12A



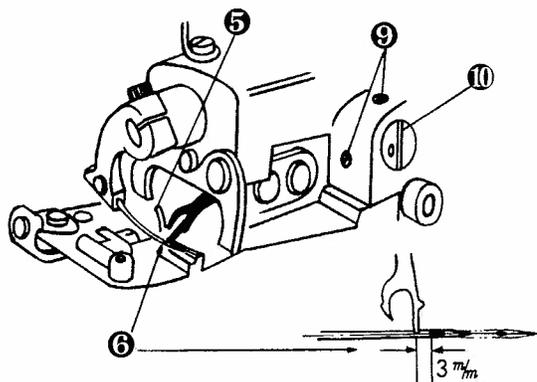
Adjusting Looper to Needle and Presser Foot (Figs. 12A, 12B & 12C)

Looper must clear the chaining finger ⑤ and clear needle, being just above the needle about the thickness of a sheet of paper at point ⑥.

Make sure the distance between right hand side of looper rod fork pin ⑦ and rear face of looper rod ball ⑧ is normally 104 m/m (4-3/32") (Fig. 12A).

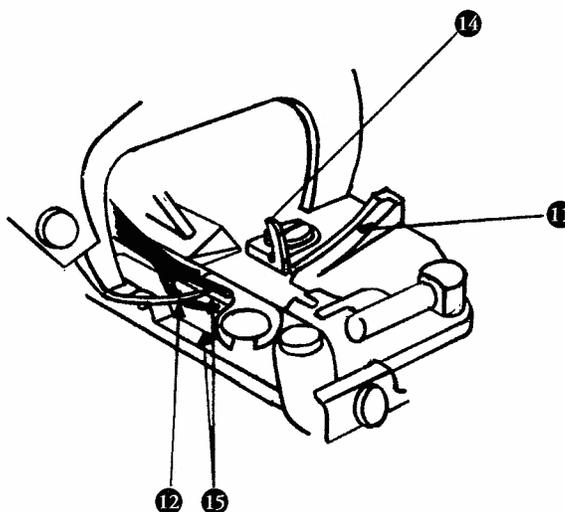
The long prong of the looper should be 3 m/m (1/8") from the left hand edge of needle hole when the long prong of the looper is on the center of the needle (Fig. 12B).

FIG 12B



If looper touches needle or presser foot at point ⑥, loosen screws ⑨ and turn the screwdriver slot in eccentric stud ⑩ by screwdriver. If looper is hitting needle, turn eccentric stud ⑩ clockwise. If looper touches presser foot at point ① and needle touches short prong of looper at point ⑫, loosen nut ⑬ by wrench. Then turn looper rod at point ③ downward, which will clear short prong of looper at point ⑫ and raise looper at point ⑪ (Figs. 12A & 12C). Be certain to tighten all screws after adjustments are made. By turning eccentric stud ⑩ clockwise or counterclockwise, it will raise or lower looper at points ⑪ and ⑫. NOTE: With eccentric stud ⑩, raise or lower looper on both sides ⑪ and ⑫. Turning looper rod ③, raise one side and lower the other side.

FIG 12C



Looper should clear chaining finger ⑤ and presser foot at point ⑬. Move eccentric stud ⑩ from left to right by loosening screws ⑨. This will get the desired clearance.

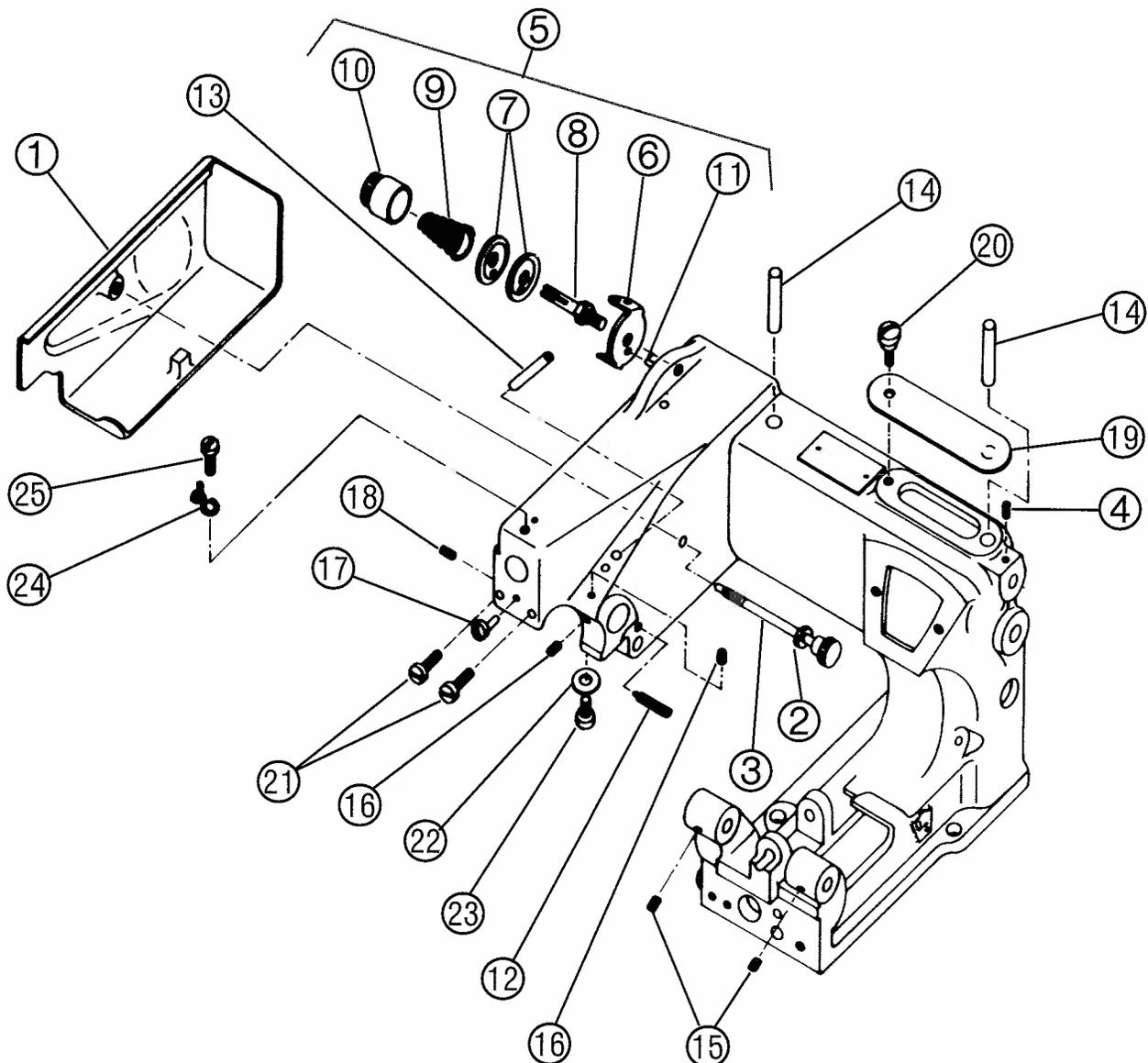
In case of the above adjustment, be sure that looper rod eccentric stud ⑬ is flush against looper and rod carrier ⑭ and does not have any play left or right. Secure by retightening screw ⑨ (Figs. 12B & 12C).

Troubleshooting

| Trouble | Cause | Inspection | Remedy | Page |
|-----------------------------|--|--|---|------|
| Thread break | Poor-quality thread | Thread quality | Use thread of good quality | / |
| | Too thin needle | Needle size | Replace with a thicker needle | 5 |
| | Needle installed incorrectly | Direction and position of needle | | 5 |
| | Needle, looper, presser foot, thread passage have defective | Flaw of Needle, looper, presser foot, thread passage | Smooth with sandpaper and polish with buff, or replace | / |
| | Thread tension too strong or weak | Thread tension control | Adjust to correct thread tension | / |
| Stitches skip | Wrong threading | Threading | | 3 |
| | Needle installed incorrectly | Direction and position of needle | | 5 |
| | Needle point defective | Needle point blunt or bent | Replace with a good needle | 5 |
| | Looper defective | Looper blunt or broken | Smooth with sandpaper and polish with buff, or replace looper | / |
| | Relative of needle and looper or clearance between needle and looper are wrong | Timing or clearance between needle and looper | | 9-10 |
| Needle break | Too thin needle | Needle size | Replace with a thicker needle | 5 |
| | Needle installed incorrectly | Direction and position of needle | | 5 |
| | Looper hit needle | Clearance between needle and looper | | 9-10 |
| Uneven stitch | Clearance between needle point and cam top too great | Height of cam | | 4 |
| Stitches too tight or loose | Thread tension too strong or weak | Thread tension control | Adjust to correct thread tension | / |
| Improper feeding | Feed dog installed incorrectly or worn out | Feed dog position or worn out | | 11 |

MAIN FRAME GROUP

| Ref # | Part # | Description | Qty | Ref # | Part # | Description | Qty |
|-------|---------|--------------------------------|-----|-------|---------|---------------------|-----|
| 1 | .700000 | Side Cover Assembly | 1 | 14 | .700120 | Wick, Oil | 1 |
| 2 | .700010 | Washer, Clamp Screw | 1 | 15 | .700130 | Screw, Set | 2 |
| 3 | .700020 | Screw, Side Cover | 1 | 16 | .700140 | Screw, Set | 1 |
| 4 | .700030 | Screw, Guard | 1 | 17 | .700150 | Pin, Presser Foot | 1 |
| 5 | .700040 | Thread Tension Regulating Assy | 1 | 18 | .700160 | Screw, Set | 1 |
| 6 | .700050 | Thread Guide | 1 | 19 | .700170 | Plate, Top Cover | 1 |
| 7 | .700060 | Disc, Thread Tension | 2 | 20 | .700180 | Screw, Top Cover | 1 |
| 8 | .700070 | Post, Thread Tension | 1 | 21 | .700190 | Screw, Bridge Mtg. | 2 |
| 9 | .700080 | Spring, Tension | 1 | 22 | .700200 | Washer, Clamp Screw | 1 |
| 10 | .700090 | Nut, Tension | 1 | 23 | .700210 | Screw, Clamp | 1 |
| 11 | .700095 | Pin, Spring | 1 | 24 | .700220 | Thread Guide | 1 |
| 12 | .700100 | Screw, Feed Lever Plate | 1 | 25 | .700230 | Screw, Thread Guide | 1 |
| 13 | .700110 | Tube, Oil | 1 | | | | |

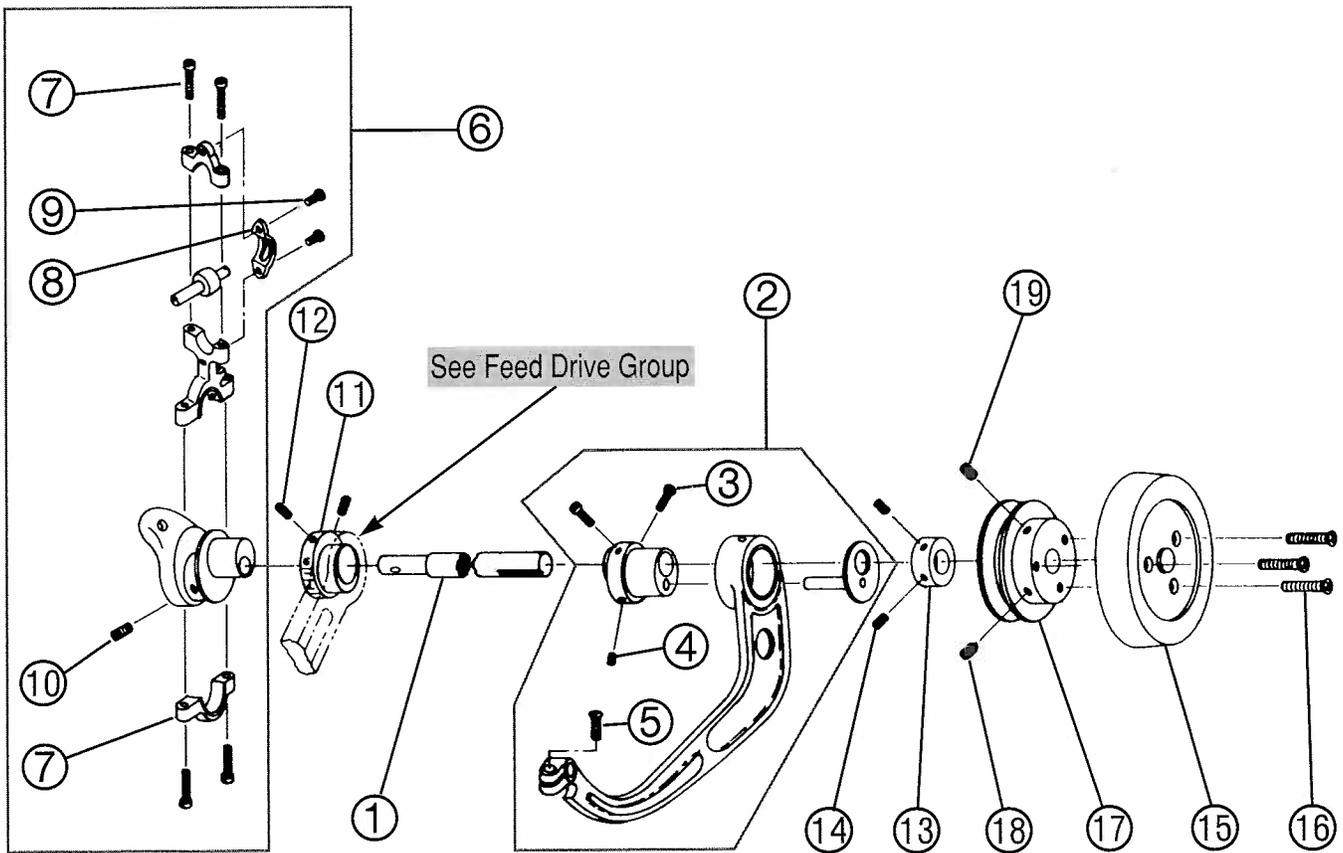


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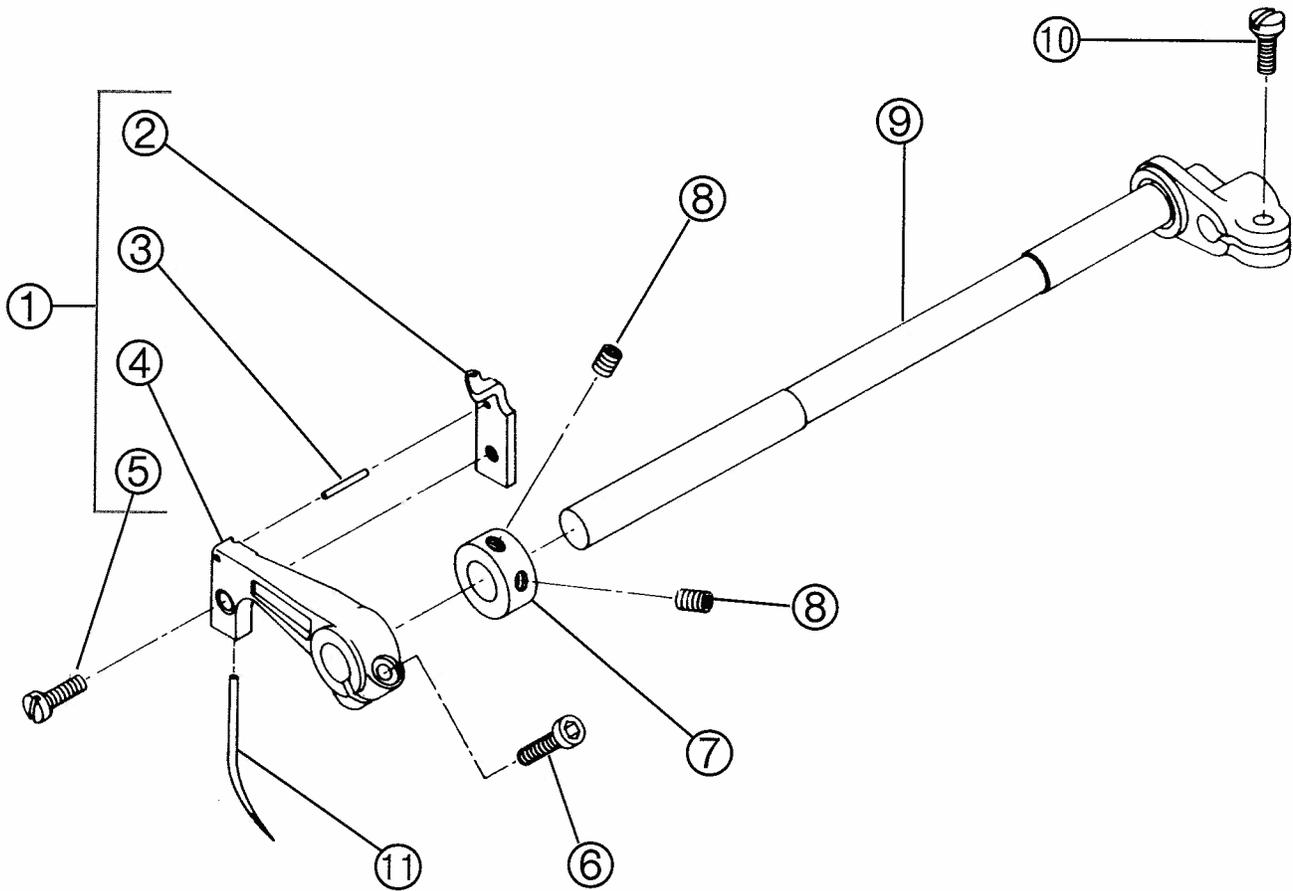
MAIN SHAFT GROUP

| Ref # | Part # | Description | Qty | Ref # | Part # | Description | Qty |
|-------|---------|--|-----|-------|---------|---------------|-----|
| 1 | .700240 | Main Shaft | .1 | 11 | .700620 | Stitch Collar | .1 |
| 2 | .700250 | Rib Connection Lever & Eccentric Ass'y | .1 | 12 | .700610 | Set Screw | .2 |
| 3 | .700260 | Screw Eccentric | .2 | 13 | .700360 | Collar Ass'y | .1 |
| 4 | .700270 | Screw For Stud | .1 | 14 | .700370 | Screw | .1 |
| 5 | .700280 | Screw, Clamp | .1 | 15 | .700380 | Handwheel | .1 |
| 6 | .700290 | Needle Connection Ass'y | .1 | 16 | .700390 | Screw | .3 |
| 7 | .700300 | Screw | .2 | 17 | .700400 | Pulley Ass'y | .1 |
| 8 | .700310 | Guard | .1 | 18 | .700410 | Screw | .1 |
| 9 | .700320 | Screw | .2 | 19 | .700030 | Screw | .1 |
| 10 | .700330 | Screw | .1 | | | | |



NEEDLE DRIVE GROUP

| Ref # | Part # | Description | Qty | Ref # | Part # | Description | Qty |
|-------|--------|--------------------|-----|-------|--------|--------------|-----|
| 1 | 700430 | Needle Lever Ass'y | 1 | 7 | 700490 | Collar Ass'y | 1 |
| 2 | 700440 | Clamp | 1 | 8 | 700160 | Screw | 2 |
| 3 | 700450 | Pin | 1 | 9 | 700510 | Shaft | 1 |
| 4 | 700460 | Lever | 1 | 10 | 700520 | Screw | 1 |
| 5 | 700470 | Screw | 1 | 11 | 700530 | PSM550 | 1 |
| 6 | 700480 | Screw | 1 | | | | |

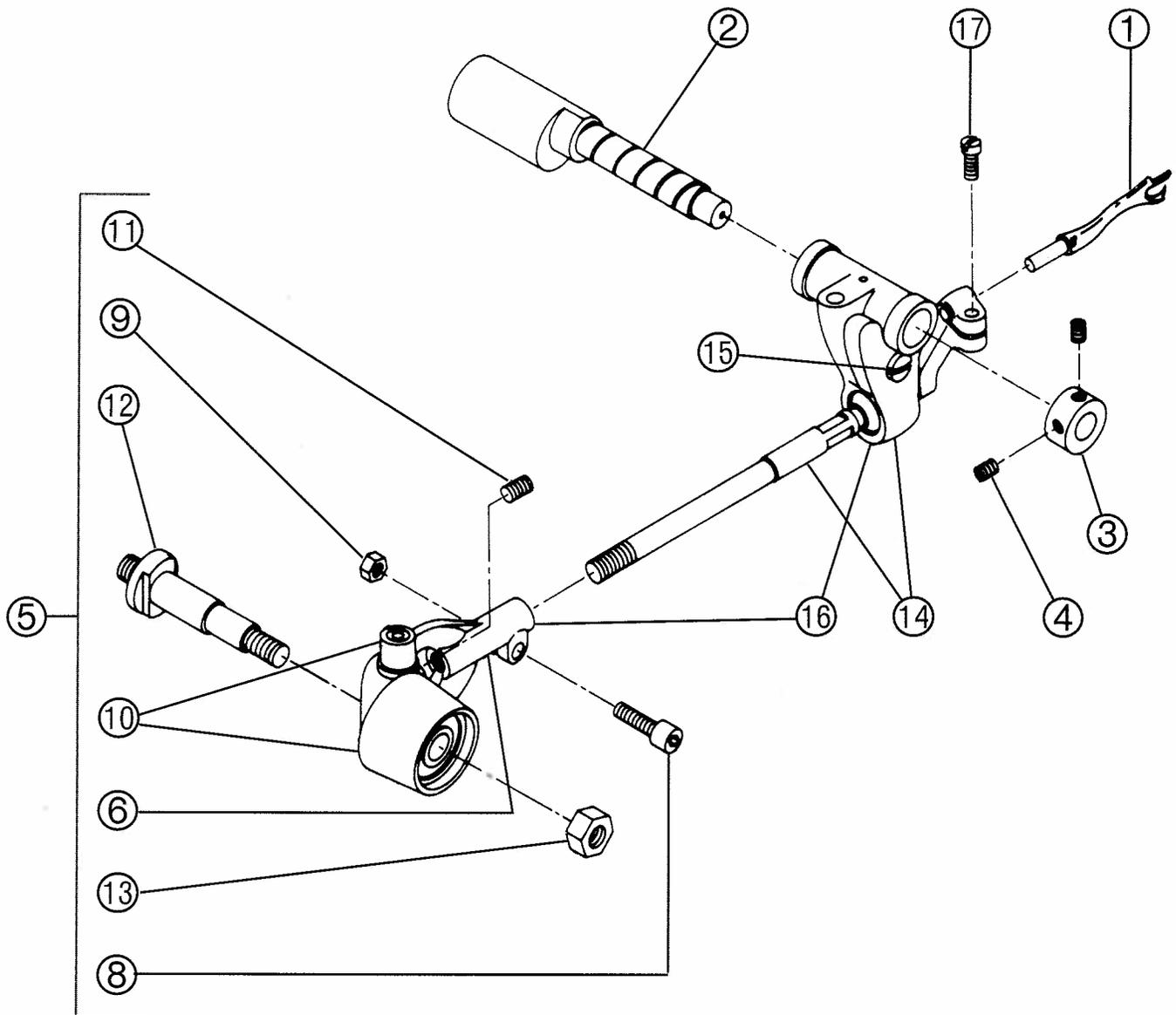


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LOOPER DRIVE GROUP

| Ref # | Part # | Description | Qty | Ref # | Part # | Description | Qty |
|-------|--------|--------------------------------------|-----|-------|--------|----------------------------------|-----|
| 1 | 700640 | Looper | 1 | 10 | 700720 | Looper Rod Sleeve Ass'y | 1 |
| 2 | 700650 | Stud, Looper Adjustment | 1 | 11 | 700730 | Screw | 1 |
| 3 | 700660 | Collar Ass'y | 1 | 12 | 700770 | Stud | 1 |
| 4 | 700580 | Set Screw | 1 | 13 | 700780 | Nut | 1 |
| 5 | 700670 | Looper Rod Fork, Sleeve & Stud Ass'y | 1 | 14 | 700740 | Looper Rod & Carrier Ass'y | 1 |
| 6 | 700680 | Fork | 1 | 15 | 700750 | Screw | 1 |
| 7 | 700690 | Pin | 1 | 16 | 700760 | Looper Rod, Fork & Carrier Ass'y | 1 |
| 8 | 700700 | Screw | 1 | 17 | 700765 | Screw | 1 |
| 9 | 700710 | Nut | 1 | | | | |

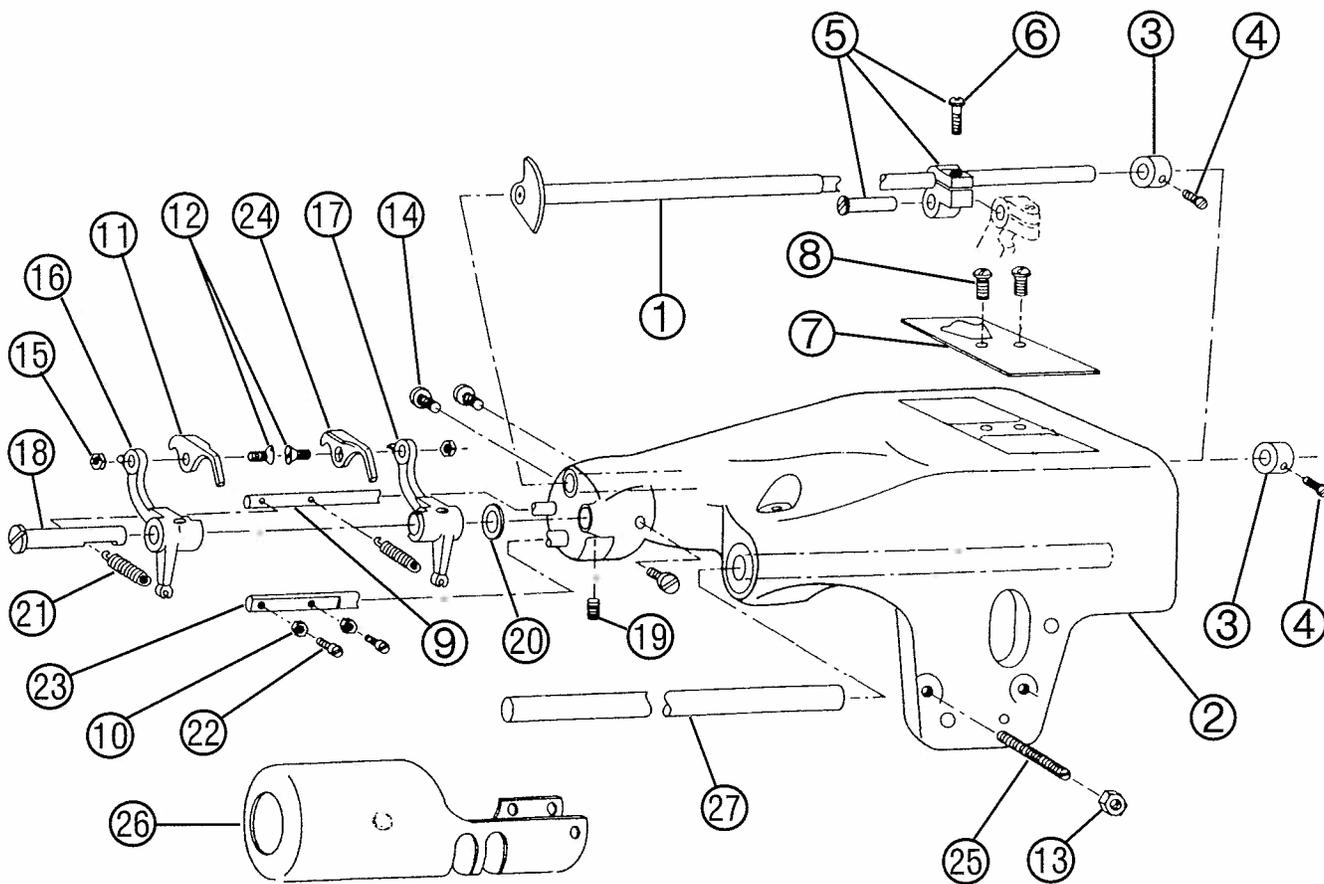


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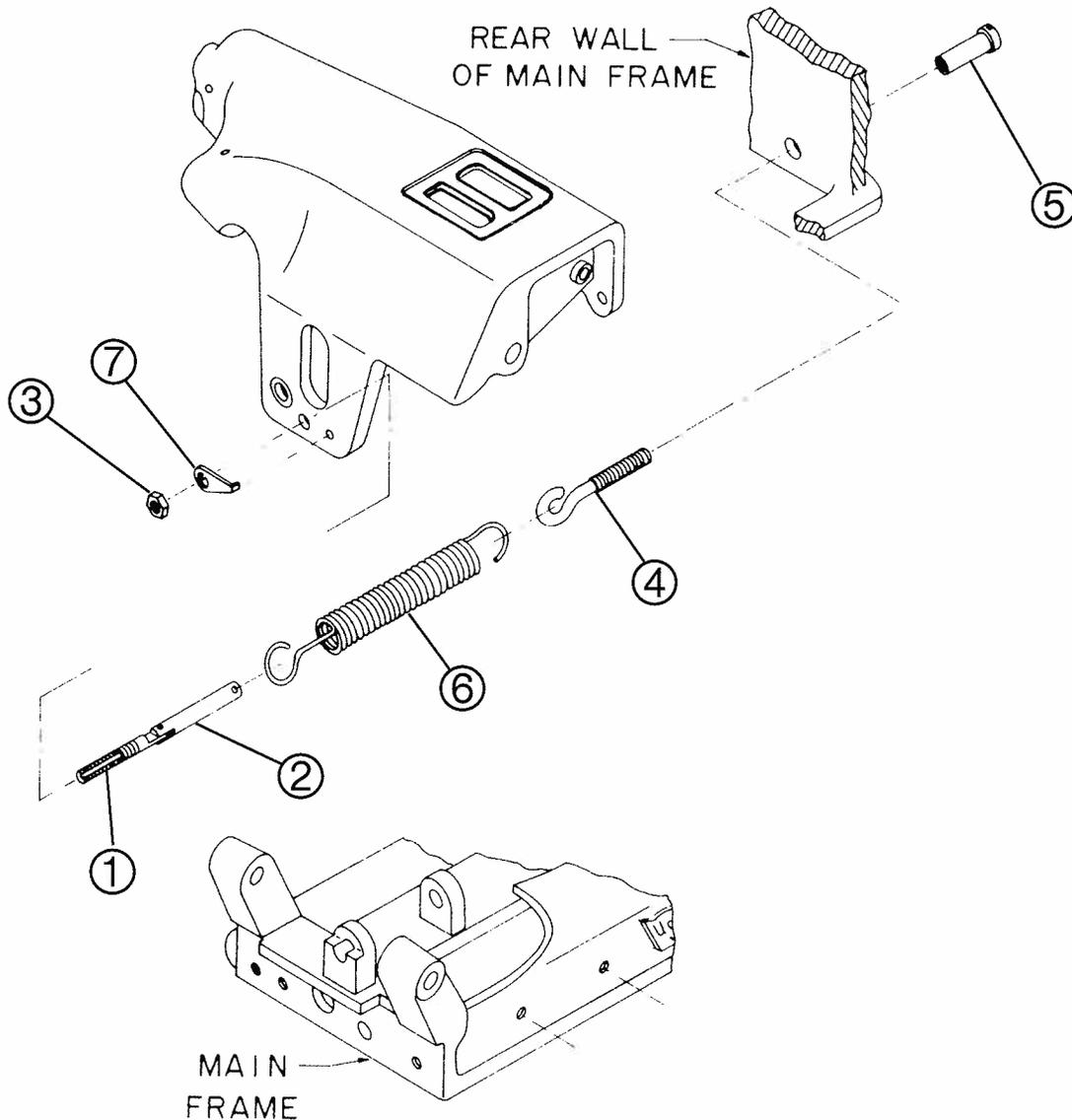
FEED FRAME GROUP 1

| Ref # | Part # | Description | Qty | Ref # | Part # | Description | Qty |
|-------|--------|-----------------------|-----|-------|--------|-------------------|-----|
| 1 | 700740 | Rib Shaft Assy | 1 | 15 | 700890 | Nut, Platten Lock | 2 |
| 2 | 700750 | Feed Frame Ass'y | 1 | 16 | 700890 | Bkt, L.H. Platten | 1 |
| 3 | 700760 | Collar Ass'y | 1 | 17 | 700900 | Bkt, R.H. Platten | 1 |
| 4 | 700770 | Set Screw | 1 | 18 | 700910 | Stud | 1 |
| 5 | 700780 | Rib Shaft Crank Ass'y | 1 | 19 | 700030 | Set Screw | 1 |
| 6 | 700790 | Screw | 1 | 20 | 700920 | Spacer | 1 |
| 7 | 700800 | Plate, Window | 1 | 21 | 700930 | Spring | 4 |
| 8 | 700810 | Screw, Plate | 2 | 22 | 700940 | Screw, Limit | 2 |
| 9 | 700820 | Post, Spring | 1 | 23 | 700950 | Post | 1 |
| 10 | 700830 | Nut | 2 | 24 | 700960 | Platten, R.H. | 1 |
| 11 | 700840 | Platten, L.H. | 1 | 25 | 900970 | Screw, Frame | 1 |
| 12 | 700850 | Screw, Platten | 1 | 26 | 700970 | Cylinder | 1 |
| 13 | 700860 | Nut | 1 | 27 | 700980 | Shaft, Rocker | 1 |
| 14 | 700880 | Screw, Cylinder | 3 | | | | |



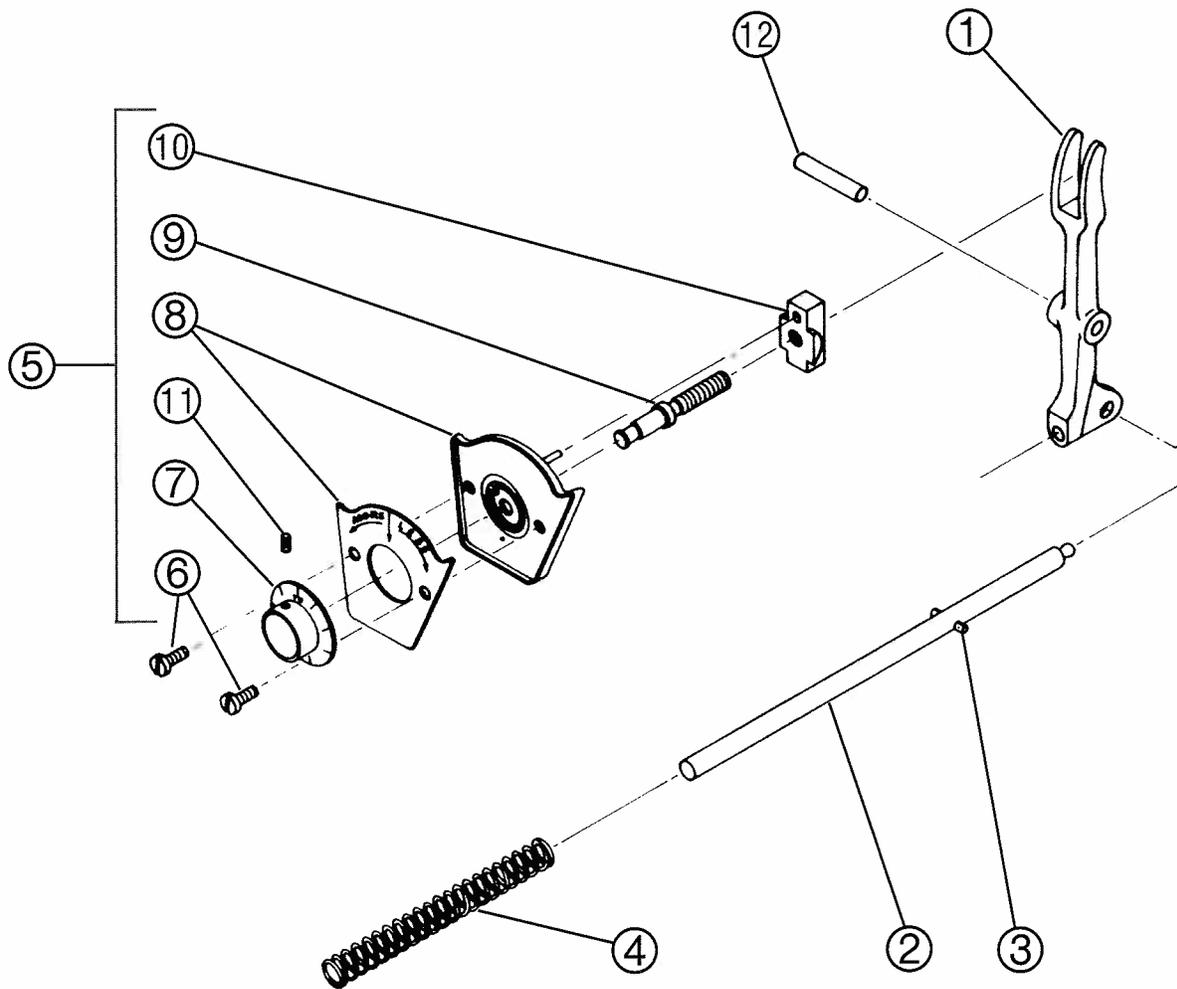
FEED FRAME GROUP 2

| Ref # | Part # | Description | Qty | Ref # | Part # | Description | Qty |
|-------|--------|------------------|-----|-------|--------|-------------|-----|
| 1 | 700990 | Spring Link Assy | 1 | 5 | 701020 | Nut, Spring | 1 |
| 2 | 701000 | Pin | 1 | 6 | 701030 | Main Spring | 1 |
| 3 | 700860 | Nut, Ret'ng | 1 | 7 | 701040 | Key | 1 |
| 4 | 701010 | Screw, Link | 1 | | | | |



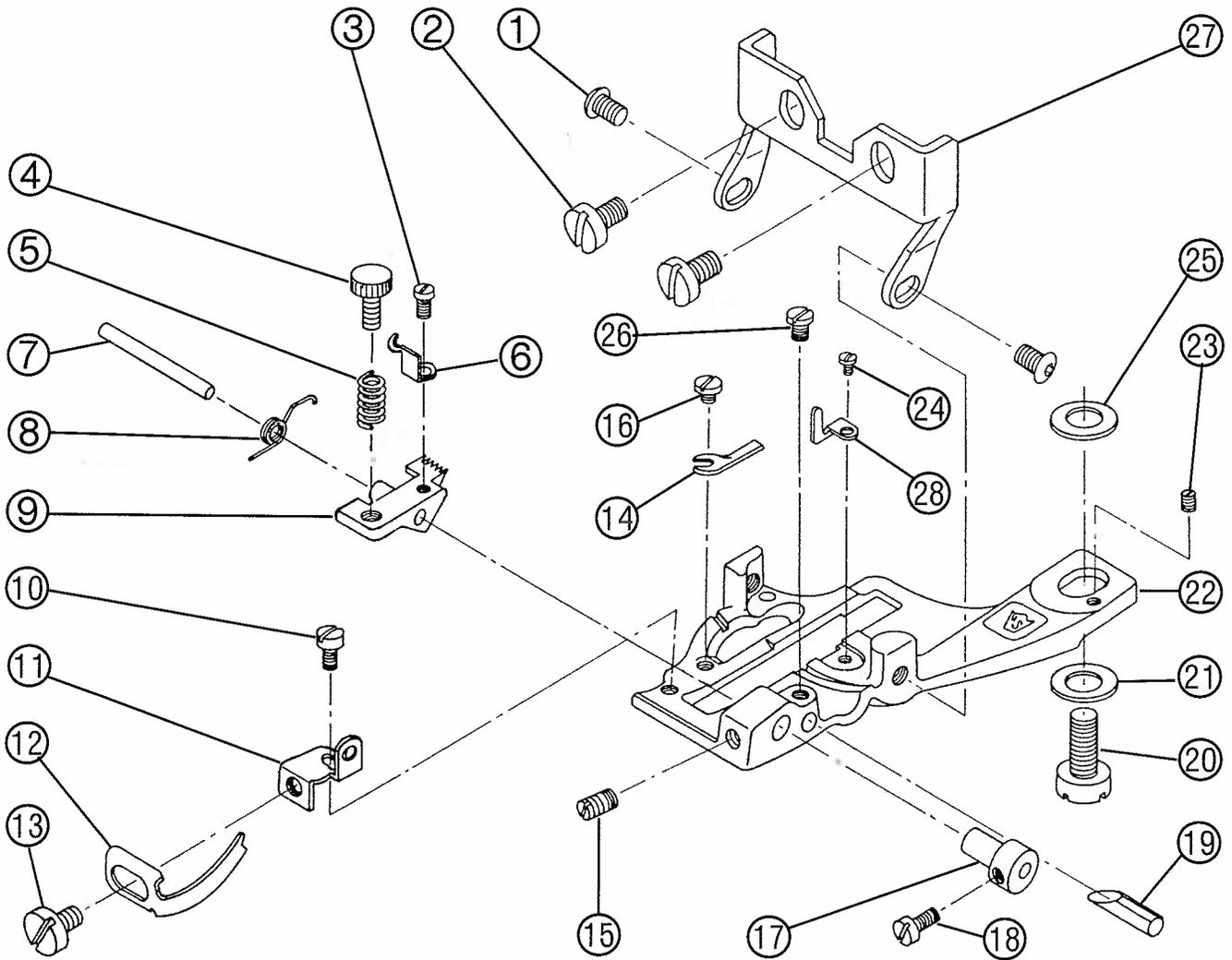
REGULATING GROUP

| Ref # | Part # | Description | Qty | Ref # | Part # | Description | Qty |
|-------|---------|------------------|-----|-------|---------|----------------------|-----|
| 1 | .701050 | Regulating Fork | 1 | 7 | .701110 | Dial & Ratchet Ass'y | 1 |
| 2 | .701060 | Push Rod Ass'y | 1 | 8 | .701120 | Dial Plate Ass'y | 1 |
| 3 | .701070 | Pin | 1 | 9 | .701130 | Screw | 1 |
| 4 | .701080 | Spring | 1 | 10 | .701140 | Shoe | 1 |
| 5 | .701090 | Regulator Ass'y | 1 | 11 | .701150 | Screw | 1 |
| 6 | .701100 | Screw, Regulator | 2 | 12 | .701160 | Pin | 1 |



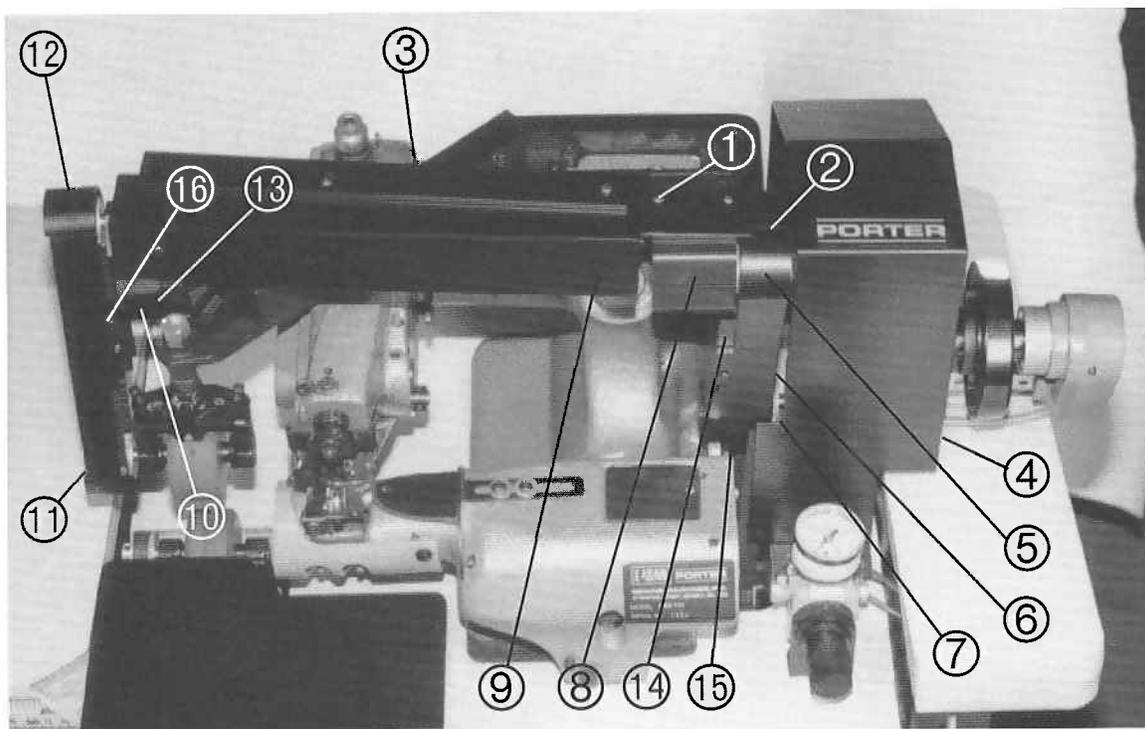
PRESSER FOOT GROUP

| Ref # | Part # | Description | Qty | Ref # | Part # | Description | Qty |
|-------|--------|--------------|-----|-------|--------|---------------|-----|
| 1 | 700190 | Screw | 2 | 15 | 701280 | Screw | 1 |
| 2 | 700810 | Screw | 2 | 16 | 701290 | Screw | 1 |
| 3 | 701170 | Screw | 1 | 17 | 701300 | Bushing | 1 |
| 4 | 701180 | Screw | 1 | 18 | 701310 | Screw | 1 |
| 5 | 701190 | Spring | 1 | 19 | 701320 | Wedge | 1 |
| 6 | 701200 | Spring | 1 | 20 | 700210 | Screw | 1 |
| 7 | 701210 | Shoe Pin | 1 | 21 | 700200 | Washer | 1 |
| 8 | 701220 | Spring | 1 | 22 | 701330 | Presser Foot | 1 |
| 9 | 701230 | Shoe | 1 | 23 | 701340 | Screw | 1 |
| 10 | 701240 | Screw | 1 | 24 | 701350 | Screw | 1 |
| 11 | 701250 | Anchor | 1 | 25 | 701360 | Washer | 1 |
| 12 | 701260 | Guide | 1 | 26 | 701370 | Screw | 1 |
| 13 | 700770 | Screw | 1 | 27 | 701380 | Bridge | 1 |
| 14 | 701270 | Needle Guide | 1 | 28 | 701390 | Chain Off Pin | 1 |



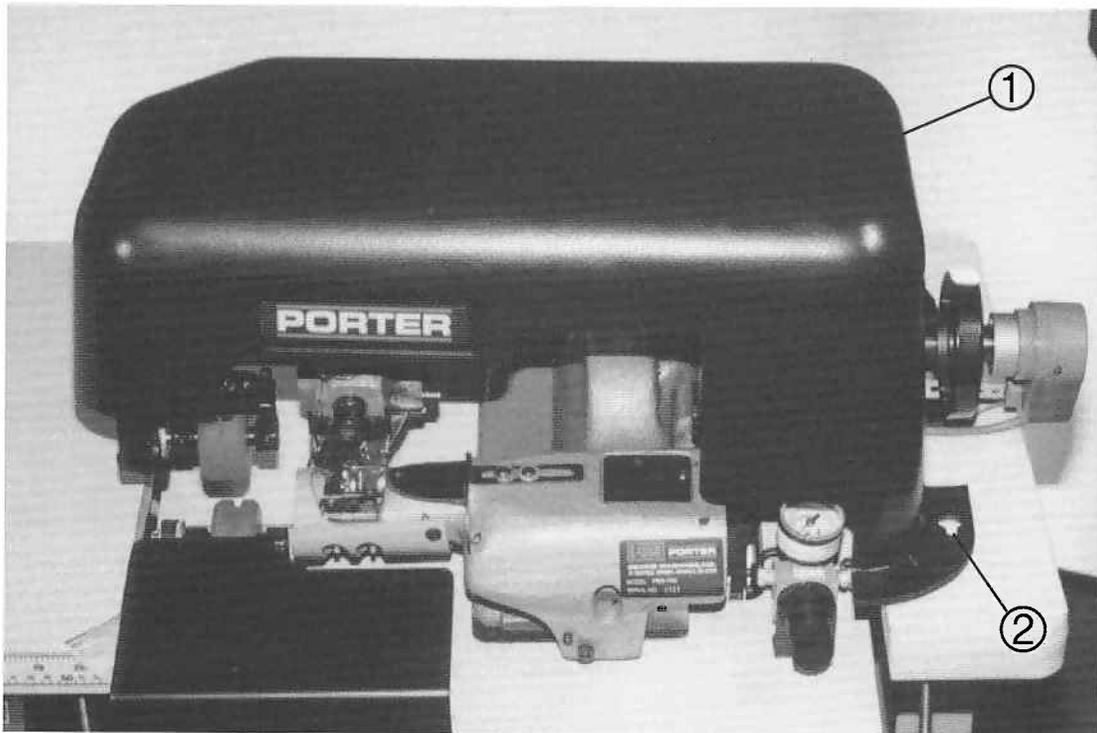
COVERS

| Ref # | Part # | Description | Qty | Ref # | Part # | Description | Qty |
|-------|--------------|-----------------------|-----|-------|---------------|--------------------------|-----|
| 1 | .BHCS440X1/4 | .Screw | .4 | 9 | .BSC-3 | .Guard-Main Shaft | 1 |
| 2 | .BSC-10 | .Bracket Right | .1 | 10 | .BSC-2 | .Bracket Pulley Cover | 1 |
| 3 | .BSC-11 | .Cover, Shaft-Rear | 1 | 11 | .BSC-8 | .Left Shield Belt | 1 |
| 4 | .BSC-1 | .Hand Wheel Cover | 1 | 12 | .BHCS6-32X1/4 | .Screw | .4 |
| 5 | .BSC-7 | .Large Shield Pulley | 1 | 13 | .BHCS6-32X3/8 | .Screw | .5 |
| 6 | .BSC-9 | .Top Right Belt Guard | 1 | 14 | .BSC-6 | .Bottom Right Belt Guard | 1 |
| 7 | .BSC-4 | .Small Shield Pulley | .3 | 15 | .BSC-5 | .Left Belt Bracket | 1 |
| 8 | .BSP-20 | .Gear Box Cover | 1 | 16 | .SHCS6-32X1/4 | .Screw | .2 |



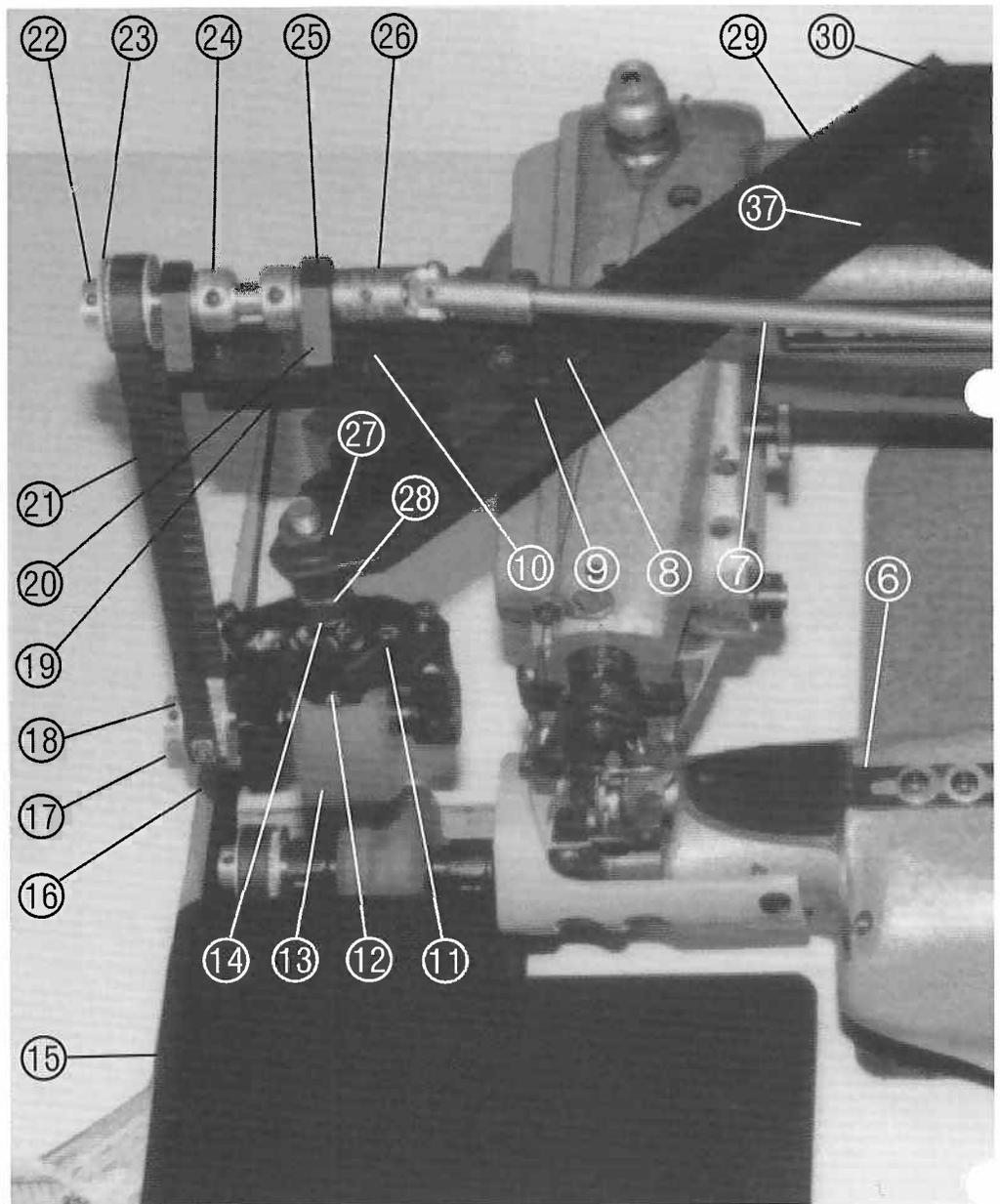
ALTERNATE COVER

| Ref # | Part # | Description | Qty |
|-------|-----------------|--------------------------------------|-----|
| 1 |BSC-30 |Blindstitch Cover | 1 |
| 2 |TS-1" |Taping Screws | 2 |

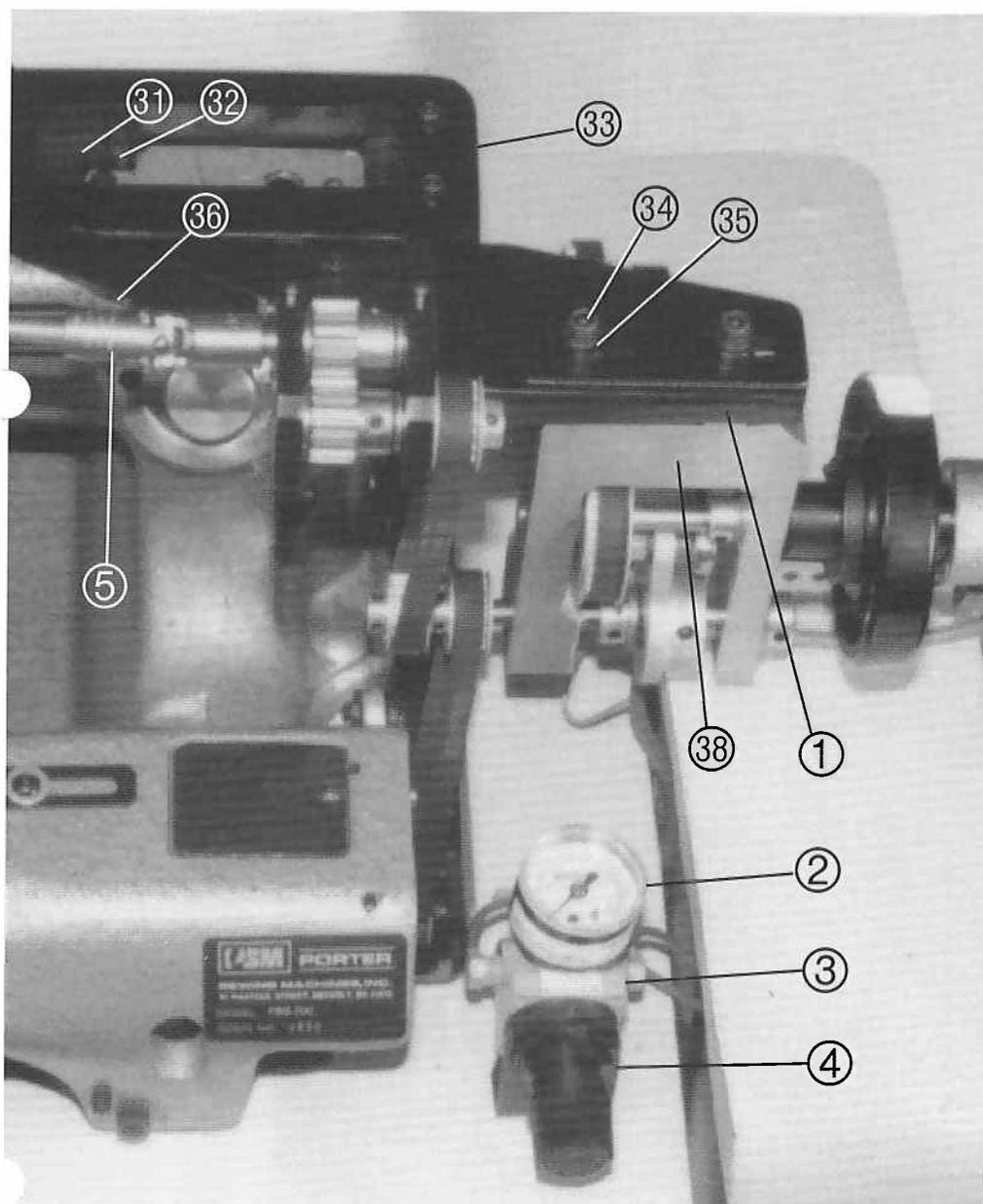


PULLER ASSEMBLY

| Ref # | Part # | Description | Qty | Ref # | Part # | Description | Qty |
|-------|---------------|----------------------|-----|-------|---------------|--------------------|-----|
| 1 | BS-209 | Spacer | 1 | 11 | .3011 | Yoke | 1 |
| 2 | .1611A | 0-30 PSI Guage | 1 | 12 | BS-233 | Yoke Bracket Shaft | 1 |
| 3 | CO-401-DOO | Air Regulator | 1 | 13 | .5283 | Top Roller | 1 |
| 4 | .93191 | Bracket | 2 | 14 | BS-204 | Yoke Support | 1 |
| 5 | BSP-17 | Adj. Universal Joint | 1 | 15 | BS-317 | Cloth Plate | 1 |
| 6 | PBS700-EGH | Cloth Guide | 1 | 16 | 3/8-16X2-1/2 | Stud | 1 |
| 7 | BSP-22 | Shaft | 1 | 17 | BSP-21 | Shaft | 1 |
| 8 | BSP-03 | Support | 1 | 18 | BSP-25 | Pulley | 11 |
| 9 | BSP-04 | Block | 2 | 19 | .SHCS8-32X3/4 | Screw | 2 |
| 10 | .SHCS8-32X1/2 | Screw | 2 | 20 | BSP-02 | Housing | 1 |

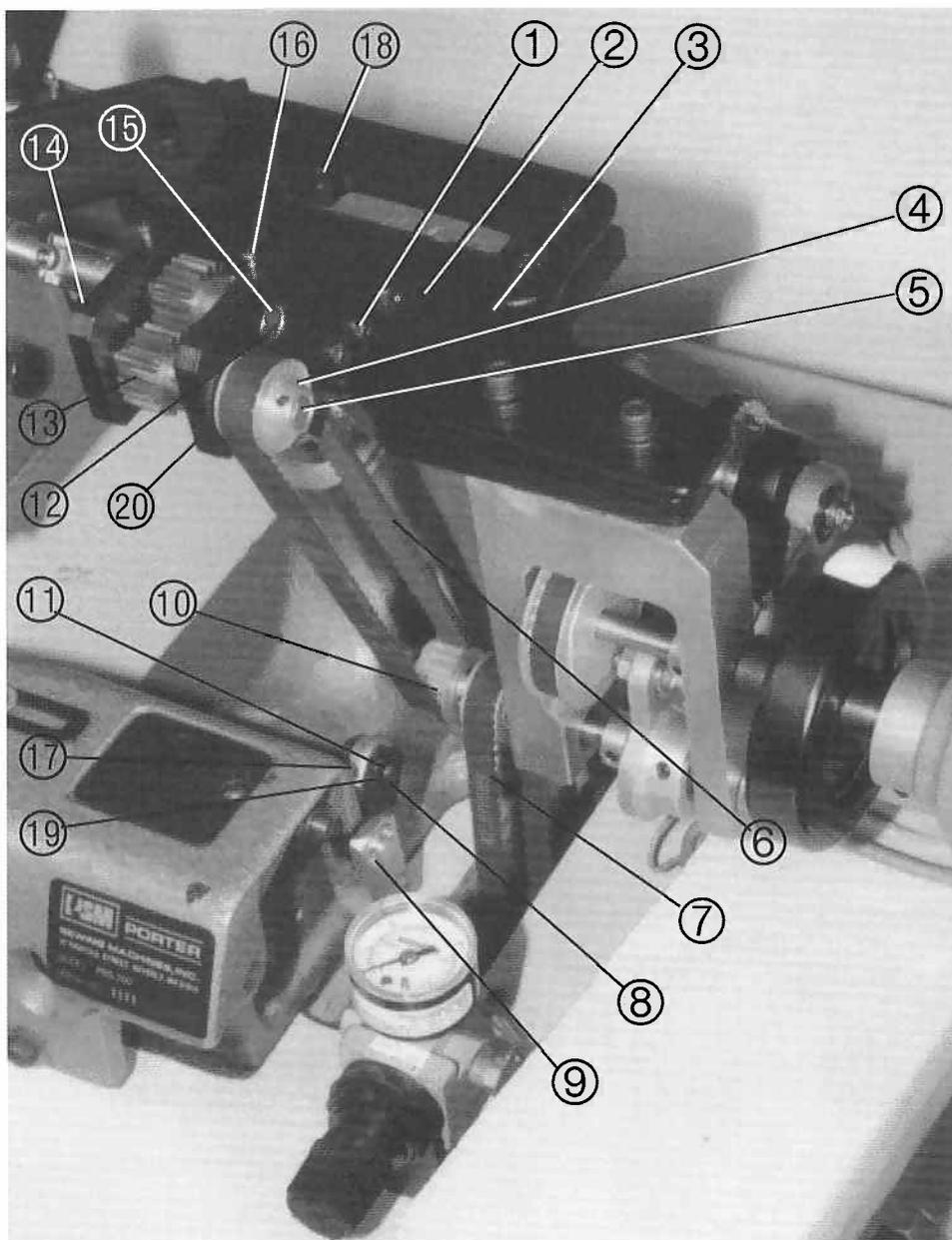


| Ref # | Part # | Description | Qty | Ref # | Part # | Description | Qty |
|-------|-----------------|-----------------|-----|-------|------------------|---------------------|-----|
| 21 | .375RPP5 | Belt | 1 | 31 | BS-216 | Adapter Mtg Bracket | 1 |
| 22 | BSP-06 | Shaft | 1 | 32 | SHCS10-32X1/2 | Screw | 4 |
| 23 | BSP-24 | Pulley | 4 | 33 | BSP-10 | Mounting Bracket | 1 |
| 24 | SC37 | Collar | 2 | 34 | SHCS1/4-20X1-3/4 | Screw | 2 |
| 25 | FB68-3-1/4 | Bearing | 6 | 35 | FU1/4-Black | Washer | 4 |
| 26 | BSP-05 | Universal Joint | 1 | 36 | Exp 1/8X5/8 | Pin | 2 |
| 27 | HN3/8-16 | Nut | 3 | 37 | BSP-01 | Support | 1 |
| 28 | SS1/4-28X3/8 | Screw | 2 | 38 | BS207 | Support | 1 |
| 29 | BS-206 | Stiffener | 1 | | | | |
| 30 | SHCS10-32X1-1/4 | Screw | 2 | | | | |



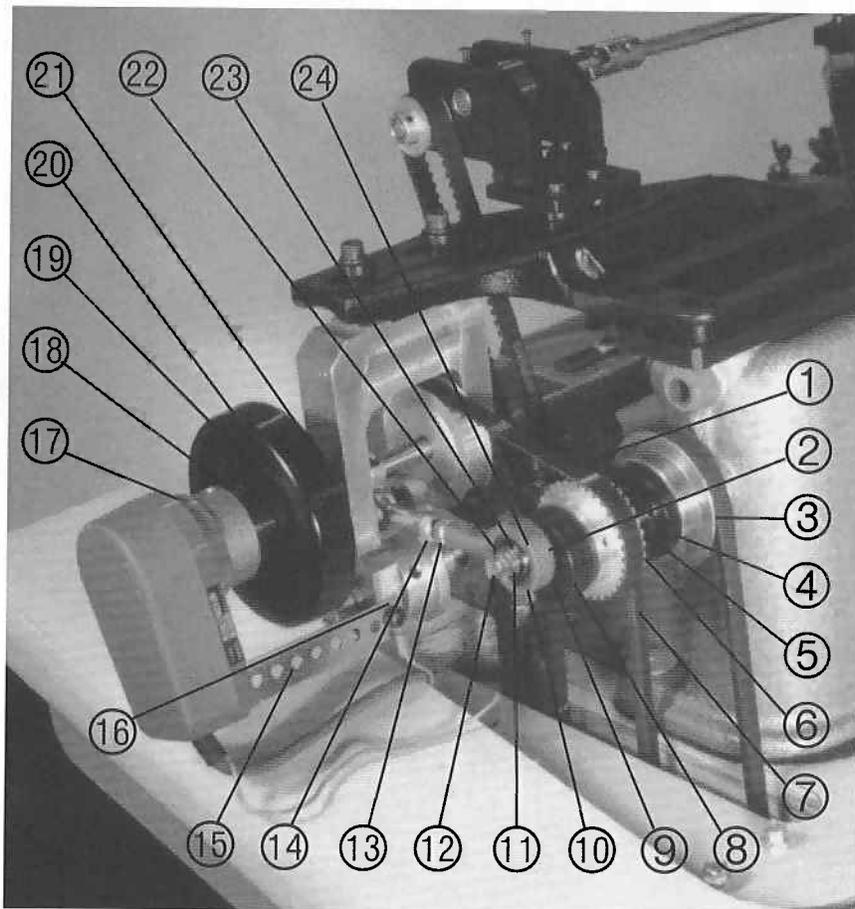
DRIVE ASSEMBLY (FRONT)

| Ref # | Part # | Description | Qty | Ref # | Part # | Description | Qty |
|-------|---------------|------------------|-----|-------|-----------------|------------------------|-----|
| 1 | .SHCS8-32X3/8 | Screws | 4 | 11 | BHCS8-32X3/8 | Screws | 2 |
| 2 | .BSP-14 | Base | 1 | 12 | BSP-18 | Shaft U-Joint | 1 |
| 3 | .BSP-15 | Adjustment Plate | 1 | 13 | YA-18-3/8 | Spur Gear | 2 |
| 4 | .BSP-21 | Pulley | 4 | 14 | BSP-13 | Side Plate Assy | 2 |
| 5 | .BSP-19 | Shaft | 1 | 15 | FBG8-3-1/4 | Bearing | 4 |
| 6 | .450RPP5 | Belt | 1 | 16 | .SHCS8-32X1-1/2 | Screw | 2 |
| 7 | .425RPP5 | Belt | 1 | 17 | .6072K21 | 1/4 28 Male Ball Joint | 1 |
| 8 | .BS-500 | Yoke | 1 | 18 | .FW1/4-Black | Washer | 2 |
| 9 | .D231-1 | Rod Clevis | 1 | 19 | BS-501 | Pin Yoke | 1 |
| 10 | .BSP-24 | Pulley | 4 | 20 | BSP-16 | Nut Plate | 1 |



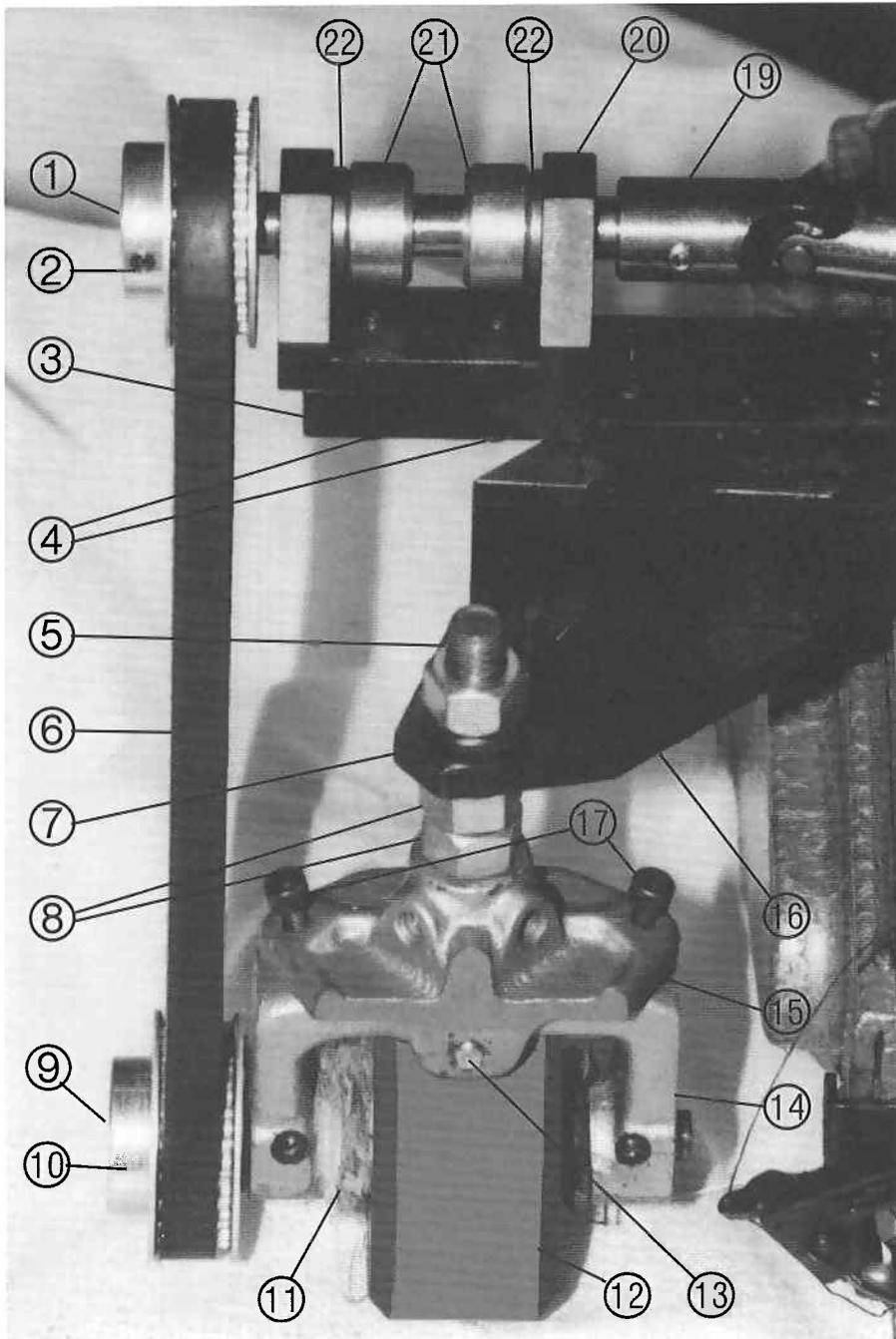
DRIVE ASSEMBLY (REAR)

| Ref # | Part # | Description | Qty | Ref # | Part # | Description | Qty |
|-------|--------------|---------------------|-----|-------|----------------|-------------------------|-----|
| 1 | GR3070037 | Belt | 1 | 13 | HN1/4-28 | Nut | 2 |
| 2 | 3007 | Rod End | 1 | 14 | 2993 | Push Rod | 1 |
| 3 | 30320 | Pulley | 1 | 15 | K11M40740080 | Positioner Holder | 1 |
| 4 | BS-244 | Drive Flange | 1 | 16 | BHCS10-32X1/4 | Screw | 1 |
| 5 | SHCS8-32X3/4 | Screw | 3 | 17 | XCK-22 | Synchronizer Positioner | 1 |
| 6 | BS-213 | Pulley | 1 | 18 | 1412 | Positioner Adapter | 1 |
| 7 | 41-V | Belt | 1 | 19 | FHCS8-32X1-1/4 | Screw | 3 |
| 8 | BS-304 | Ecc. Drive Hub | 1 | 20 | BS-256 | Handwheel | 1 |
| 9 | BS-306 | Ecc. Drive Retainer | 1 | 21 | BS-258 | Handwheel Adapter | 1 |
| 10 | SHCS8-32X3/8 | Screw | 4 | 22 | 38KLL | Bearing | 1 |
| 11 | PC5-4 | Washer | 1 | 23 | BS-306 | Bushing | 1 |
| 12 | HN10-32 | Nut | 1 | 24 | HHCS10-32X1 | Screw | 1 |



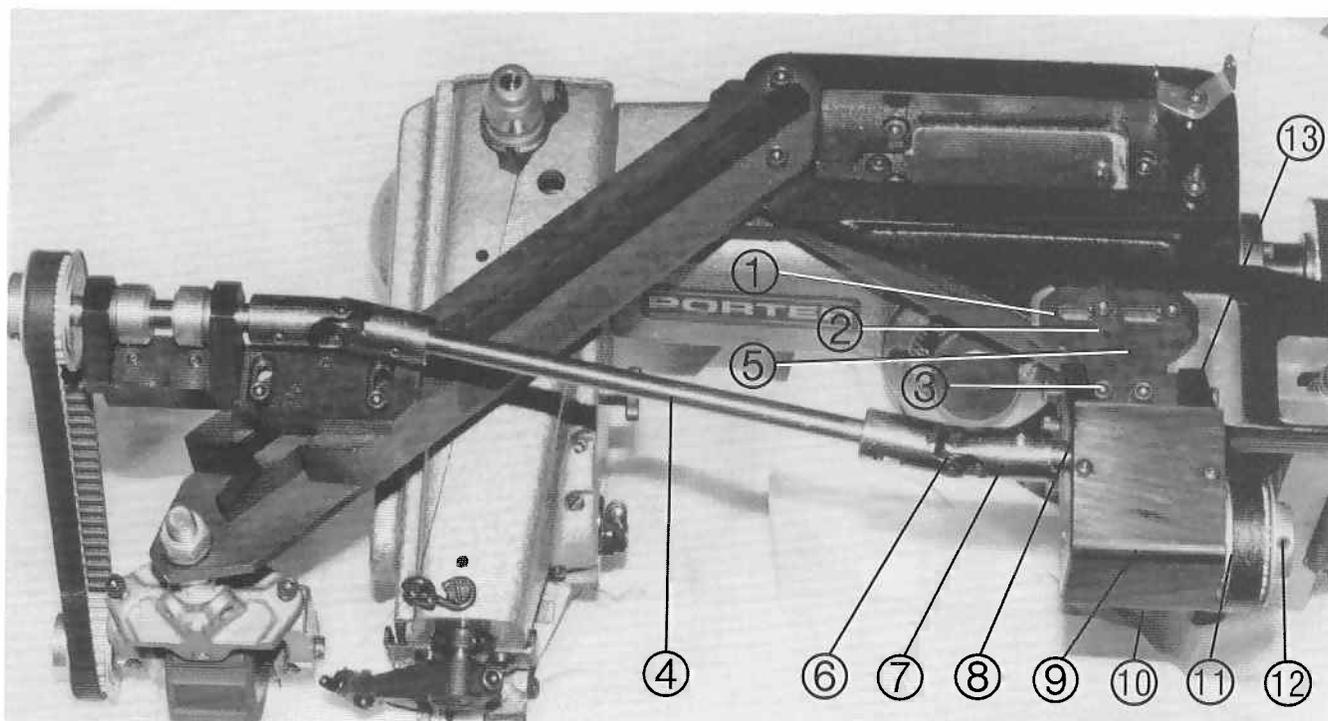
UPPER PULLER

| Ref # | Part # | Description | Qty | Ref # | Part # | Description | Qty |
|-------|--------------|------------------|-----|-------|----------------|-----------------|-----|
| 1 | BSP-06 | Shaft | 1 | 12 | BS-5283 | Roller | 1 |
| 2 | BSP-24 | Pulley | 4 | 13 | BS-233 | Pin | 1 |
| 3 | BSP-03 | Support | 1 | 14 | .3011 | Yoke | 1 |
| 4 | SHCS8-32X5/8 | Screw | 2 | 15 | BS-204 | Yoke Support | 1 |
| 5 | 3/8-16X2-1/2 | Stud | 1 | 16 | BSP-04 | Block | 2 |
| 6 | .375RPP5-9 | Belt | 1 | 17 | SHCS8-32X1/2 | Screw | 2 |
| 7 | BSP-10 | Mounting Bracket | 1 | 18 | SHCS8-32X1-1/2 | Screw | 2 |
| 8 | HN3/8-16 | Nut | 3 | 19 | BSP-05 | Universal Joint | 1 |
| 9 | BSP-21 | Pulley Shaft | 1 | 20 | BSP-02 | Housing | 1 |
| 10 | BSP-25 | Pulley | 4 | 21 | SC37 | Collar | 2 |
| 11 | BS-405 | Spacer | 2 | 22 | FB683X1/4 | Bearing | 2 |



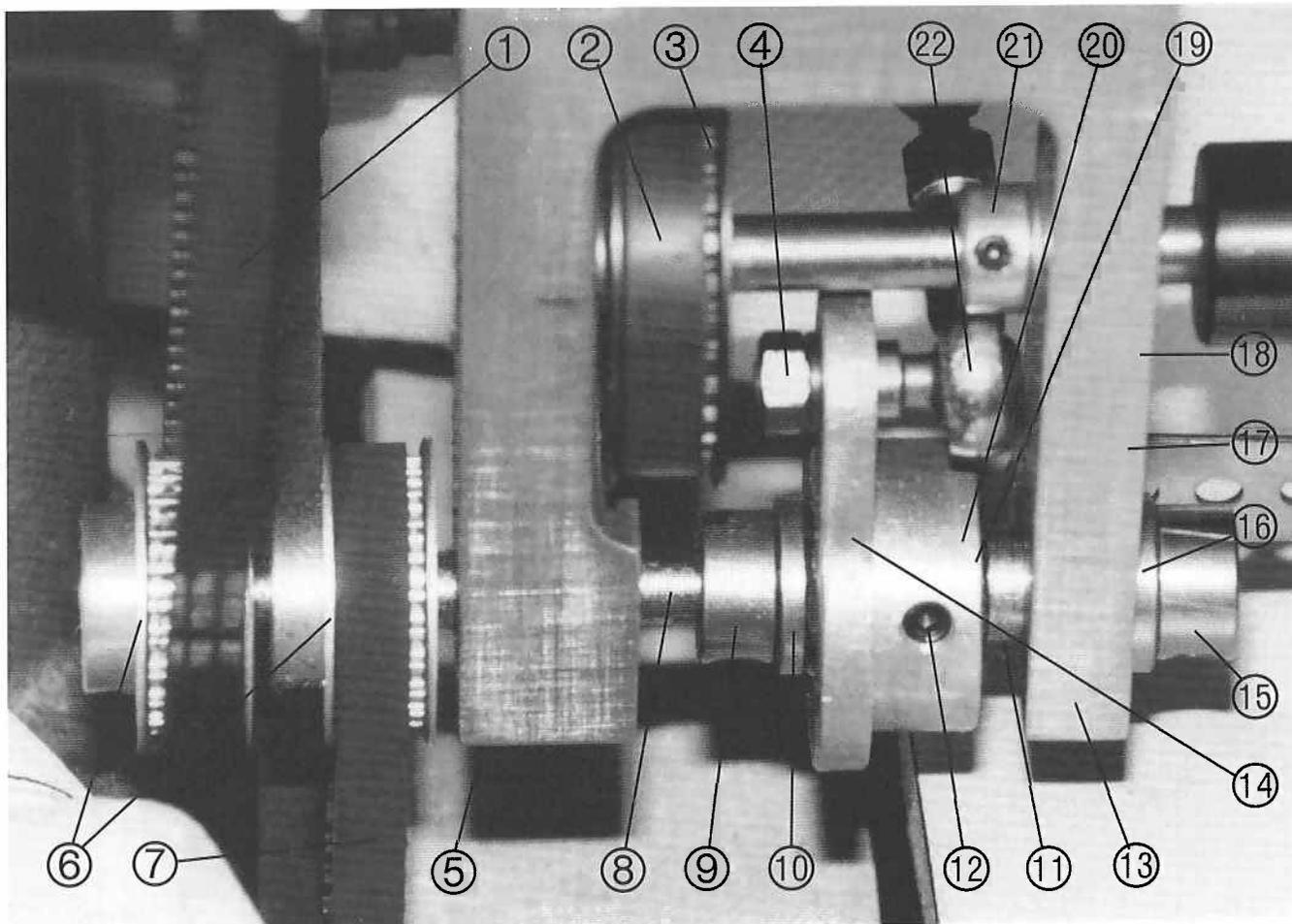
PULLER SHAFT

| Ref # | Part # | Description | Qty | Ref # | Part # | Description | Qty |
|-------|---------|---------------|-----|-------|------------|-------------------|-----|
| 1 | .BSP-16 | .Nut Plate | 1 | 8 | .BSP-12 | .Side Plate Left | 1 |
| 2 | .FW1/4 | .Block Spacer | 1 | 9 | .BSP-20 | .Cover | 1 |
| 3 | .BSP-14 | .Base | 1 | 10 | .YA-18-3/8 | .Spur Gear | 2 |
| 4 | .BSP-22 | .Shaft | 1 | 11 | .BSP-19 | .Shaft | 1 |
| 5 | .BSP-15 | .Adj. Plate | 1 | 12 | .BSP-24 | .Pulley | 4 |
| 6 | .BSP-17 | .U-Joint | 1 | 13 | .BSP-11 | .Side Plate Right | 1 |
| 7 | .BSP-18 | .Shaft | 1 | | | | |



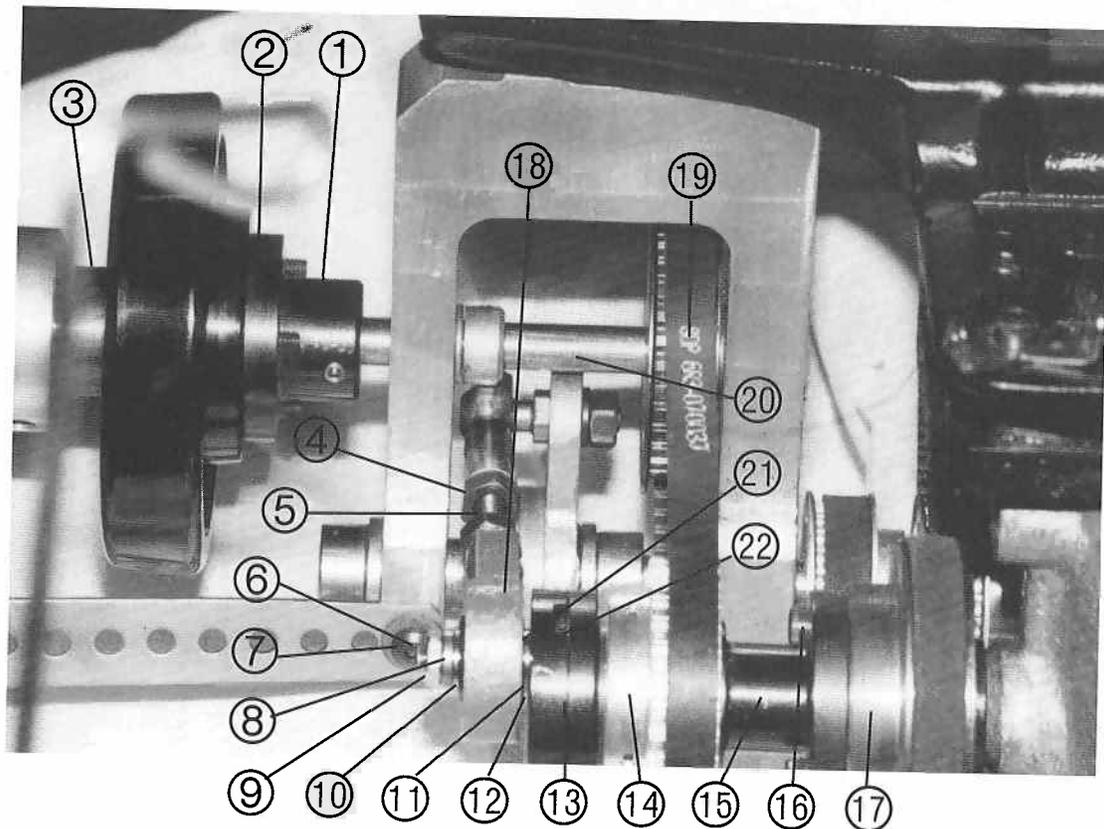
GEARBOX (FRONT)

| Ref # | Part # | Description | Qty | Ref # | Part # | Description | Qty |
|-------|-------------|----------------|-----|-------|--------------|-------------------|-----|
| 1 | 450RPP5-9 | Belt | 1 | 12 | SS1/4-28X1/4 | Screw | 2 |
| 2 | GR3070037 | Belt | 1 | 13 | BH68 | Bearing | 1 |
| 3 | 6C32H3712 | Pulley | 1 | 14 | .3006 | Clutch Arm | 1 |
| 4 | HN1/4X28 | Nut | 1 | 15 | CS5-4 | Collar | 2 |
| 5 | RCB061014FS | Clutch Bearing | 2 | 16 | CD3-5 | Washer | 2 |
| 6 | BSP-24 | Pulley | 2 | 17 | BS-207 | Support | 1 |
| 7 | 425RPP5-9 | Belt | 1 | 18 | B7-43 | Bearing | 2 |
| 8 | BSP-23 | Shaft | 1 | 19 | BS-303 | Bushing | 1 |
| 9 | CS5-4 | Collar | 2 | 20 | RCB061014FS | Clutch Bearing | 2 |
| 10 | CD3-5 | Washer | 2 | 21 | BS-228 | Collar | 1 |
| 11 | SS-2-74 | Spacer | 1 | 22 | .6072K31 | Female Ball Joint | 1 |



GEARBOX (REAR)

| Ref # | Part # | Description | Qty | Ref # | Part # | Description | Qty |
|-------|----------------|--------------------|-----|-------|--------------|---------------------|-----|
| 1 | BS-258 | Handwheel Adaptor | 1 | 12 | BS-305 | Ecc. Drive Retainer | 1 |
| 2 | FHCS8-32X1-1/4 | Screw | 3 | 13 | BS-304 | Ecc. Drive Hub | 1 |
| 3 | 1412 | Positioner Adaptor | 1 | 14 | BS-213 | Pulley | 1 |
| 4 | HN1/4-28 | Nut | 2 | 15 | BS-244 | Dirve Flange | 1 |
| 5 | 2993 | Push Rod | 1 | 16 | SHCS8-32X3/4 | Screw | 4 |
| 6 | BHCS10-32X1/4 | Screw | 1 | 17 | 3032U | Pulley | 1 |
| 7 | HHCS10-32X1 | Screw | 1 | 18 | 3007 | Rod End | 1 |
| 8 | 38KLL | Bearing | 1 | 19 | GR3070037 | Belt | 1 |
| 9 | HN10-32 | Nut | 1 | 20 | BS-281 | Hand Wheel Shaft | 1 |
| 10 | PC5-4 | Washer | 1 | 21 | HHCS10-32X1 | Screw | 1 |
| 11 | BS-306 | Bushing | 1 | 22 | SHCS8-32X7/8 | Screw | 4 |

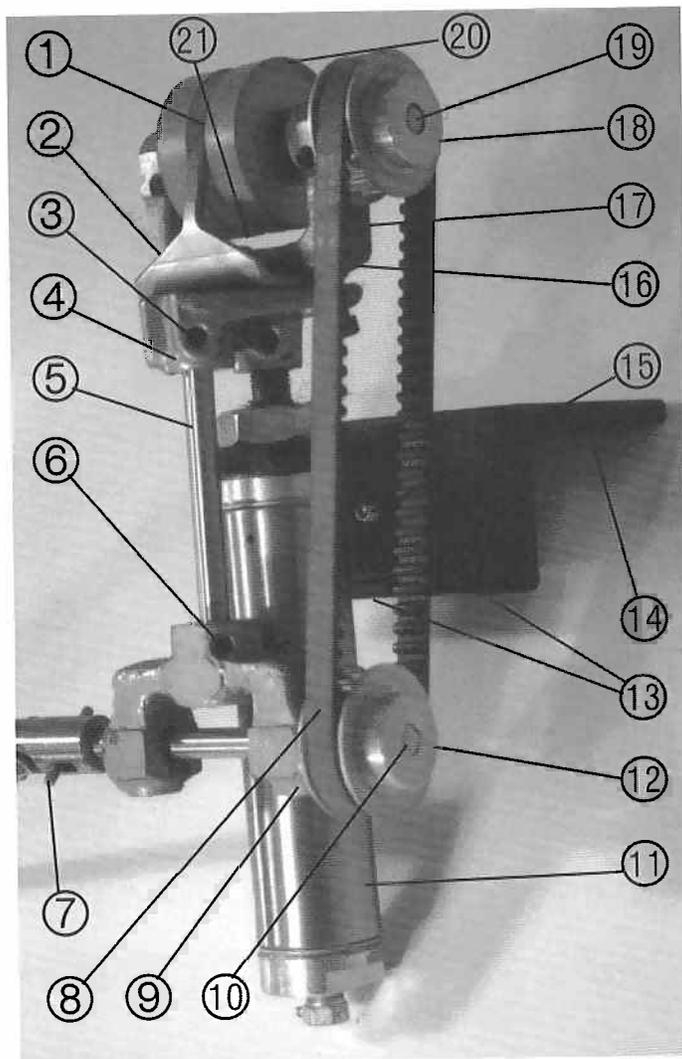


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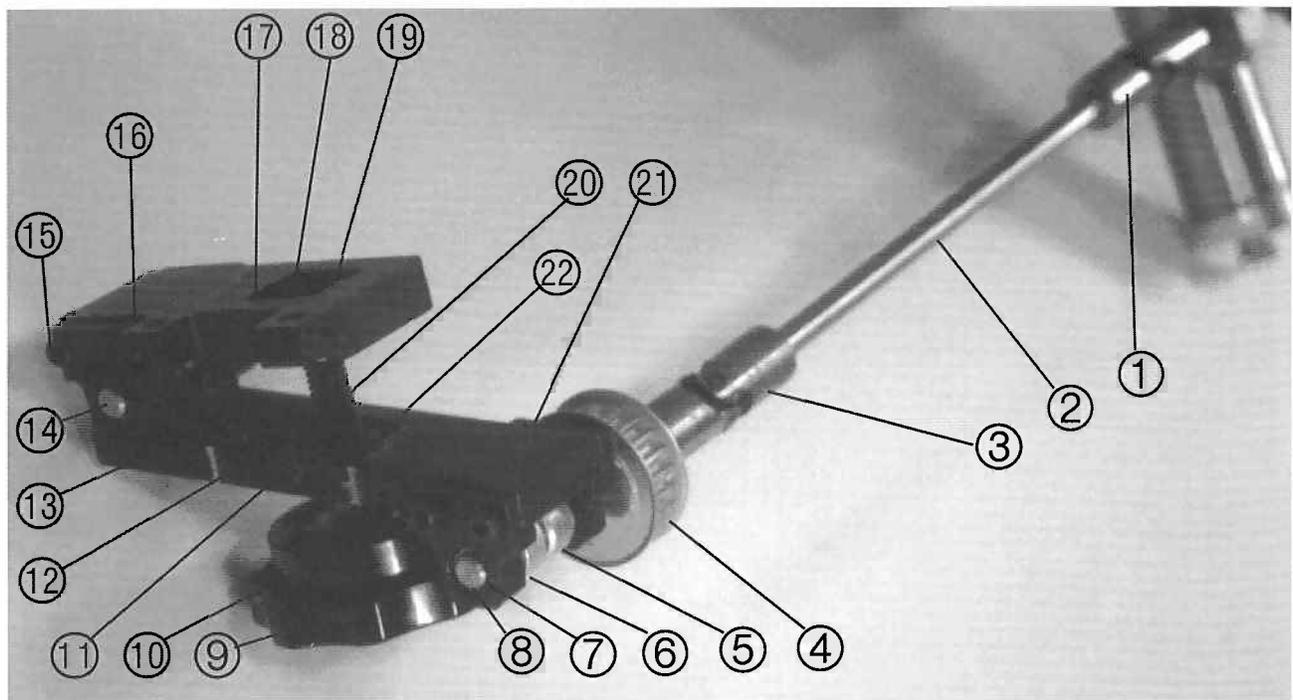
LOWER PULLER

| Ref # | Part # | Description | Qty | Ref # | Part # | Description | Qty |
|-------|--------------|-----------------------|-----|-------|---------------|--------------------|-----|
| 1 | .5284 | Grooved Roller | 1 | 12 | BSp 25 | Pulley | 2 |
| 2 | BS 316 | Lower Roller Stripper | 1 | 13 | SHCS 1/4x1 | Screws | 2 |
| 3 | SS1/4 28x3/8 | Screws | 6 | 14 | BS 201 | Mounting Bracket | 1 |
| 4 | BS 203 | Yoke Bracket | 1 | 15 | BS 202 | Cylinder Support | 1 |
| 5 | BS 234 | Yoke Pivot Shaft | 1 | 16 | BS 233 | Yoke Bracket Shaft | 1 |
| 6 | SS1/4 28x3/8 | Screws | 6 | 17 | .3011 | Yoke | 1 |
| 7 | exp1/8x5/8 | Pin | 1 | 18 | BSp 25 | Pulley | 4 |
| 8 | .400 Rpp 5-9 | Timing Belt | 1 | 19 | BS 239 | Shaft | 1 |
| 9 | BS 232 | Yoke | 1 | 20 | BS 405 | Spacer | 2 |
| 10 | BS 238 | Shaft | 1 | 21 | SHCS 8-32x3/8 | Screws | 2 |
| 11 | .122NR | Air Cylinder | 1 | | | | |



LOWER DRIVE ASSEMBLY

| Ref # | Part # | Description | Qty | Ref # | Part # | Description | Qty |
|-------|-----------|------------------|-----|-------|----------------|----------------|-----|
| 1 | .BS-236 | .Universal Joint | 1 | 12 | .BS-246 | .Alignment Nut | 1 |
| 2 | .BS-237 | .Shaft | 1 | 13 | .SHCS8-32X5/8 | .Screw | 2 |
| 3 | .BS-235 | .Universal Joint | 1 | 14 | .BS-252 | .Shaft | 1 |
| 4 | .BSP-25 | .Pulley | 4 | 15 | .BS-251 | .Hinge | 1 |
| 5 | .CS53 | .Collar | 2 | 16 | .BS-248 | .Base | 1 |
| 6 | .BS-247 | .Shaft Support | 4 | 17 | .BS-245 | .Block | 1 |
| 7 | .B7-38 | .Bearing | 4 | 18 | .CD1-3 | .Washer | 2 |
| 8 | .BS-254 | .Shaft | 1 | 19 | .Q1-25 | .Snap Ring | 1 |
| 9 | .6044K31 | .Knob | 1 | 20 | .BS-255 | .Adj. Screw | 1 |
| 10 | .HN3/8X16 | .Nut | 1 | 21 | .SHCS8-32X3/8 | .Screw | 8 |
| 11 | .BS-249 | .Pulley Plate | 1 | 22 | .EDSS10-32X3/8 | .Screw | 4 |

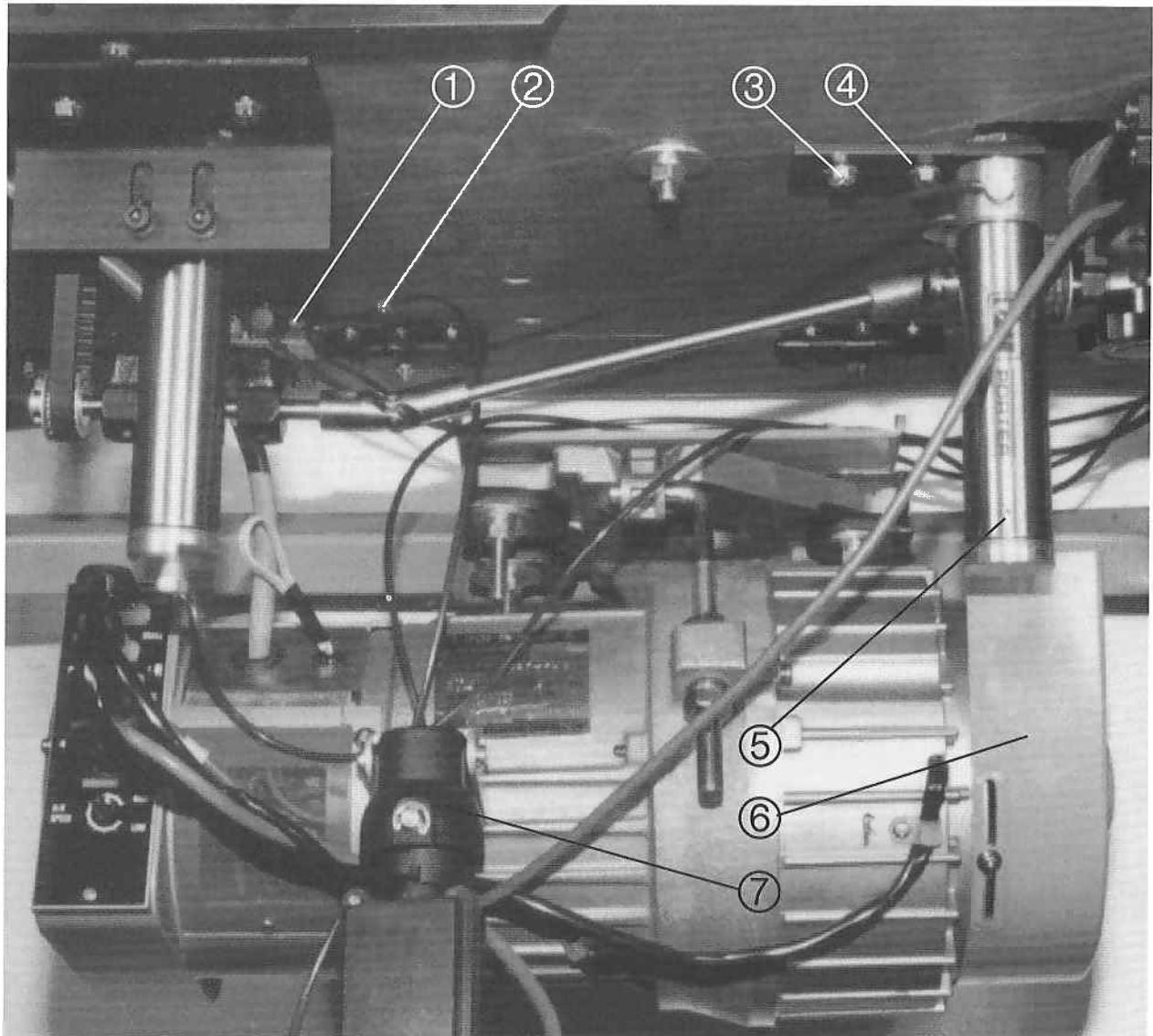


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UNDER TABLE

| Ref # | Part # | Description | Qty | Ref # | Part # | Description | Qty |
|-------|---------|---------------------|-----|-------|---------|--------------|-----|
| 1 | LTV-110 | Air Manifold | 1 | 5 | .122R | Cylinder | 1 |
| 2 | T-1 | Air Tub Fitting 1/8 | 1 | 6 | .614720 | Belt Guard | 1 |
| 3 | TS1-1/4 | Taping Screw | 4 | 7 | LKCL2 | Air Accuator | 1 |
| 4 | BS-263 | Cylinder Bracket | 1 | | | | |



INDEX

| Part # | Page | Ref # | Part # | Page | Ref # | Part # | Page | Ref # | Part # | Page | Ref # |
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| 122NR | 32 | 11 | 700100 | 16 | 4 | 700560 | 16 | 3 | 700910 | 18 | 18 |
| 122R | 34 | 5 | 700100 | 13 | 12 | 700570 | 16 | 5 | 700920 | 18 | 20 |
| 1412 | 31 | 3 | 700110 | 13 | 13 | 700580 | 17 | 4 | 700930 | 18 | 21 |
| 1412 | 27 | 18 | 700120 | 13 | 14 | 700580 | 16 | 6 | 700940 | 18 | 22 |
| 1611A | 24 | 2 | 700130 | 13 | 15 | 700590 | 16 | 7 | 700950 | 18 | 23 |
| 2993 | 31 | 5 | 700140 | 13 | 16 | 700600 | 16 | 8 | 700960 | 18 | 24 |
| 2993 | 27 | 14 | 700150 | 13 | 17 | 700610 | 14 | 12 | 700970 | 18 | 26 |
| 3/8-16X2-1/2 | 28 | 5 | 700160 | 15 | 8 | 700610 | 16 | 9 | 700980 | 18 | 27 |
| 3/8-16X2-1/2 | 24 | 16 | 700160 | 13 | 18 | 700620 | 14 | 11 | 700990 | 19 | 1 |
| 3006 | 30 | 14 | 700170 | 13 | 19 | 700620 | 16 | 10 | 701000 | 19 | 2 |
| 3007 | 27 | 2 | 700180 | 13 | 20 | 700630 | 16 | 11 | 701010 | 19 | 4 |
| 3007 | 31 | 18 | 700190 | 21 | 1 | 700640 | 17 | 1 | 701020 | 19 | 5 |
| 3011 | 32 | 17 | 700190 | 13 | 21 | 700650 | 17 | 2 | 701030 | 19 | 6 |
| 3011 | 24 | 11 | 700200 | 13 | 22 | 700660 | 17 | 3 | 701040 | 19 | 7 |
| 3011 | 28 | 14 | 700200 | 21 | 21 | 700670 | 17 | 5 | 701050 | 20 | 1 |
| 30320 | 27 | 3 | 700210 | 21 | 20 | 700680 | 17 | 6 | 701060 | 20 | 2 |
| 3032U | 31 | 17 | 700210 | 13 | 23 | 700690 | 17 | 7 | 701070 | 20 | 3 |
| 375RPP5 | 25 | 21 | 700220 | 13 | 24 | 700700 | 17 | 8 | 701080 | 20 | 4 |
| 375RPP5-9 | 28 | 6 | 700230 | 13 | 25 | 700710 | 17 | 9 | 701090 | 20 | 5 |
| 38KLL | 27 | 22 | 700240 | 14 | 1 | 700720 | 17 | 10 | 701100 | 20 | 6 |
| 38KLL | 31 | 8 | 700250 | 14 | 2 | 700730 | 17 | 11 | 701110 | 20 | 7 |
| 400 Rpp 5-9 | 32 | 8 | 700260 | 14 | 3 | 700740 | 17 | 14 | 701120 | 20 | 8 |
| 41-V | 27 | 7 | 700270 | 14 | 4 | 700740 | 18 | 1 | 701130 | 20 | 9 |
| 425RPP5 | 26 | 7 | 700280 | 14 | 5 | 700750 | 18 | 2 | 701140 | 20 | 10 |
| 425RPP5-9 | 30 | 7 | 700290 | 14 | 6 | 700750 | 17 | 15 | 701150 | 20 | 11 |
| 450RPP5 | 26 | 6 | 700300 | 14 | 7 | 700760 | 18 | 3 | 701160 | 20 | 12 |
| 450RPP5-9 | 30 | 1 | 700310 | 14 | 8 | 700760 | 17 | 16 | 701170 | 21 | 3 |
| 5283 | 24 | 13 | 700320 | 14 | 9 | 700765 | 17 | 17 | 701180 | 21 | 4 |
| 5284 | 32 | 1 | 700330 | 14 | 10 | 700770 | 18 | 4 | 701190 | 21 | 5 |
| 6044K31 | 33 | 9 | 700360 | 14 | 13 | 700770 | 17 | 12 | 701200 | 21 | 6 |
| 6072K21 | 26 | 17 | 700370 | 14 | 14 | 700770 | 21 | 13 | 701210 | 21 | 7 |
| 6072K31 | 30 | 22 | 700380 | 14 | 15 | 700780 | 17 | 13 | 701220 | 21 | 8 |
| 614720 | 34 | 6 | 700390 | 14 | 16 | 700780 | 18 | 5 | 701230 | 21 | 9 |
| 6C32H3712 | 30 | 3 | 700400 | 14 | 17 | 700790 | 18 | 6 | 701240 | 21 | 10 |
| 700000 | 13 | 1 | 700410 | 14 | 18 | 700800 | 18 | 7 | 701250 | 21 | 11 |
| 700010 | 13 | 2 | 700430 | 15 | 1 | 700810 | 18 | 8 | 701260 | 21 | 12 |
| 700020 | 13 | 3 | 700440 | 15 | 2 | 700810 | 21 | 2 | 701270 | 21 | 14 |
| 700030 | 14 | 19 | 700450 | 15 | 3 | 700820 | 18 | 9 | 701280 | 21 | 15 |
| 700030 | 18 | 19 | 700460 | 15 | 4 | 700830 | 18 | 10 | 701290 | 21 | 16 |
| 700030 | 13 | 4 | 700470 | 15 | 5 | 700840 | 18 | 11 | 701300 | 21 | 17 |
| 700040 | 13 | 5 | 700480 | 15 | 6 | 700850 | 18 | 12 | 701310 | 21 | 18 |
| 700050 | 13 | 6 | 700490 | 15 | 7 | 700860 | 18 | 13 | 701320 | 21 | 19 |
| 700060 | 13 | 7 | 700510 | 15 | 9 | 700860 | 19 | 3 | 701330 | 21 | 22 |
| 700070 | 13 | 8 | 700520 | 15 | 10 | 700880 | 18 | 14 | 701340 | 21 | 23 |
| 700080 | 13 | 9 | 700530 | 15 | 11 | 700890 | 18 | 15 | 701350 | 21 | 24 |
| 700090 | 13 | 10 | 700540 | 16 | 1 | 700890 | 18 | 16 | 701360 | 21 | 25 |
| 700095 | 13 | 11 | 700550 | 16 | 2 | 700900 | 18 | 17 | 701370 | 21 | 26 |

| Part # | Page | Ref # | Part # | Page | Ref # | Part # | Page | Ref # | Part # | Page | Ref # |
|---------------|------|-------|---------|------|-------|----------------|------|-------|------------------|------|-------|
| 701380 | .21 | .27 | BS-263 | .34 | .4 | BSP-17 | .24 | .5 | HN1/4X28 | .30 | .4 |
| 701390 | .21 | .28 | BS-281 | .31 | .20 | BSP-17 | .29 | .6 | HN1/4-28 | .27 | .13 |
| 93191 | .24 | .4 | BS-303 | .30 | .19 | BSP-18 | .29 | .7 | HN10-32 | .27 | .12 |
| 900970 | .18 | .25 | BS-304 | .31 | .13 | BSP-18 | .26 | .12 | HN10-32 | .31 | .9 |
| B7-38 | .33 | .7 | BS-304 | .27 | .8 | BSP-19 | .26 | .5 | HN3/8-16 | .28 | .8 |
| B7-43 | .30 | .18 | BS-305 | .31 | .12 | BSP-19 | .29 | .11 | HN3/8X16 | .33 | .10 |
| BH68 | .30 | .13 | BS-306 | .31 | .11 | BSP-20 | .22 | .8 | HN3/8-16 | .25 | .27 |
| BHCS4-40X1/4 | .22 | .1 | BS-306 | .27 | .23 | BSP-20 | .29 | .9 | K11M40740080 | .27 | .15 |
| BHCS6-32X1/4 | .22 | .12 | BS-306 | .27 | .9 | BSP-21 | .26 | .4 | LKCL2 | .34 | .7 |
| BHCS6-32X3/8 | .22 | .13 | BS-316 | .32 | .2 | BSP-21 | .24 | .17 | LTV-110 | .34 | .1 |
| BHCS8-32X3/8 | .26 | .11 | BS-317 | .24 | .15 | BSP-21 | .28 | .9 | PBS700-EGH | .24 | .6 |
| BHCS10-32X1/4 | .31 | .6 | BS-405 | .32 | .20 | BSP-22 | .24 | .7 | PC5-4 | .31 | .10 |
| BHCS10-32X1/4 | .27 | .16 | BS-405 | .28 | .11 | BSP-22 | .29 | .4 | PC5-4 | .27 | .11 |
| BS-201 | .32 | .14 | BS-500 | .26 | .8 | BSP-23 | .30 | .8 | Q1-25 | .33 | .19 |
| BS-202 | .32 | .15 | BS-501 | .26 | .19 | BSP-24 | .29 | .12 | RCB061014FS | .30 | .5 |
| BS-203 | .32 | .4 | BS-5283 | .28 | .12 | BSP-24 | .28 | .2 | RCB061014FS | .30 | .20 |
| BS-204 | .28 | .15 | BSC-1 | .22 | .4 | BSP-24 | .25 | .23 | SC37 | .28 | .21 |
| BS-204 | .24 | .14 | BSC-10 | .22 | .2 | BSP-24 | .30 | .6 | SC37 | .25 | .24 |
| BS-206 | .25 | .29 | BSC-11 | .22 | .3 | BSP-24 | .26 | .10 | SHCS1/4-20X1-3/4 | .25 | .34 |
| BS-207 | .25 | .38 | BSC-2 | .22 | .10 | BSP-25 | .24 | .18 | SHCS1/4X1 | .32 | .13 |
| BS-207 | .30 | .17 | BSC-3 | .22 | .9 | BSP-25 | .28 | .10 | SHCS10-32X1/2 | .25 | .31 |
| BS-209 | .24 | .1 | BSC-30 | .23 | .1 | BSP-25 | .33 | .4 | SHCS10-32X1-1/4 | .25 | .30 |
| BS-213 | .27 | .6 | BSC-4 | .22 | .7 | BSP-25 | .32 | .18 | SHCS6-32X1/4 | .22 | .16 |
| BS-213 | .31 | .14 | BSC-5 | .22 | .15 | BSP-25 | .32 | .12 | SHCS8-32X1/2 | .28 | .17 |
| BS-216 | .25 | .31 | BSC-6 | .22 | .14 | CD1-3 | .33 | .18 | SHCS8-32X1/2 | .24 | .10 |
| BS-228 | .30 | .21 | BSC-7 | .22 | .5 | CD3-5 | .30 | .10 | SHCS8-32X1-1/2 | .26 | .16 |
| BS-232 | .32 | .9 | BSC-8 | .22 | .11 | CD3-5 | .30 | .16 | SHCS8-32X1-1/2 | .28 | .18 |
| BS-233 | .32 | .16 | BSC-9 | .22 | .6 | CO-401-DOO | .24 | .3 | SHCS8-32X3/8 | .27 | .10 |
| BS-233 | .28 | .13 | BSP-01 | .25 | .37 | CS5-4 | .30 | .9 | SHCS8-32X3/8 | .33 | .21 |
| BS-233 | .24 | .12 | BSP-02 | .24 | .20 | CS5-4 | .30 | .15 | SHCS8-32X3/8 | .32 | .21 |
| BS-234 | .32 | .5 | BSP-02 | .28 | .20 | CS53 | .33 | .5 | SHCS8-32X3/8 | .26 | .1 |
| BS-235 | .33 | .3 | BSP-03 | .24 | .8 | D231-1 | .26 | .9 | SHCS8-32X3/4 | .27 | .5 |
| BS-236 | .33 | .1 | BSP-03 | .28 | .3 | EDSS10-32X3/8 | .33 | .22 | SHCS8-32X3/4 | .31 | .16 |
| BS-237 | .33 | .2 | BSP-04 | .28 | .16 | EXP1/8X5/8 | .25 | .36 | SHCS8-32X3/4 | .24 | .19 |
| BS-238 | .32 | .10 | BSP-04 | .24 | .9 | EXP1/8X5/8 | .32 | .7 | SHCS8-32X5/8 | .28 | .4 |
| BS-239 | .32 | .19 | BSP-05 | .28 | .19 | FB68-3-1/4 | .25 | .25 | SHCS8-32X5/8 | .33 | .13 |
| BS-244 | .31 | .15 | BSP-05 | .25 | .26 | FB683X1/4 | .28 | .22 | SHCS8-32X7/8 | .31 | .22 |
| BS-244 | .27 | .4 | BSP-06 | .25 | .22 | FBG8-3-1/4 | .26 | .15 | SS-2-74 | .30 | .11 |
| BS-245 | .33 | .17 | BSP-06 | .28 | .1 | FHCS8-32X1-1/4 | .31 | .2 | SS1/4-28X1/4 | .30 | .12 |
| BS-246 | .33 | .12 | BSP-10 | .28 | .7 | FHCS8-32X1-1/4 | .27 | .19 | SS1/4-28X3/8 | .32 | .3 |
| BS-247 | .33 | .6 | BSP-10 | .25 | .33 | FU1/4-Black | .25 | .35 | SS1/4-28X3/8 | .32 | .6 |
| BS-248 | .33 | .16 | BSP-11 | .29 | .13 | FW1/4 | .29 | .2 | SS1/4-28X3/8 | .25 | .28 |
| BS-249 | .33 | .11 | BSP-12 | .29 | .8 | FW1/4-Black | .26 | .18 | T-1 | .34 | .2 |
| BS-251 | .33 | .15 | BSP-13 | .26 | .14 | GR3070037 | .30 | .2 | TS-1" | .23 | .2 |
| BS-252 | .33 | .14 | BSP-14 | .26 | .2 | GR3070037 | .31 | .19 | TS1-1/4 | .34 | .3 |
| BS-254 | .33 | .8 | BSP-14 | .29 | .3 | GR3070037 | .27 | .1 | XCK-22 | .27 | .17 |
| BS-255 | .33 | .20 | BSP-15 | .26 | .3 | HHCS10-32X1 | .27 | .24 | YA-18-3/8 | .26 | .13 |
| BS-256 | .27 | .20 | BSP-15 | .29 | .5 | HHCS10-32X1 | .31 | .7 | YA-18-3/8 | .29 | .10 |
| BS-258 | .27 | .21 | BSP-16 | .29 | .1 | HHCS10-32X1 | .31 | .21 | | | |
| BS-258 | .31 | .1 | BSP-16 | .26 | .20 | HN1/4-28 | .31 | .4 | | | |

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Measurement Conversion Chart

| MM | APPROXIMATE INCH | | MM | APPROXIMATE INCH | | MM | APPROXIMATE INCH | |
|------|------------------|---------|------|------------------|---------|-------|------------------|---------|
| | FRACTION | DECIMAL | | FRACTION | DECIMAL | | FRACTION | DECIMAL |
| 0.1 | | .004 | 3.4 | | .134 | 6.7 | 17/64 | .264 |
| 0.2 | | .008 | 3.5 | | .138 | 6.8 | | .268 |
| 0.3 | 1/64 | .012 | 3.6 | 9/64 | .142 | 6.9 | | .272 |
| 0.4 | 1/64 | .016 | 3.7 | | .146 | 7.0 | | .276 |
| 0.5 | | .020 | 3.8 | | .150 | 7.1 | 9/32 | .280 |
| 0.6 | | .024 | 3.9 | | .154 | 7.2 | | .283 |
| 0.7 | | .028 | 4.0 | 5/32 | .157 | 7.3 | | .287 |
| 0.8 | 1/32 | .032 | 4.1 | | .161 | 7.4 | | .291 |
| 0.9 | | .035 | 4.2 | | .165 | 7.5 | 19/64 | .295 |
| 1.0 | | .039 | 4.3 | | .169 | 7.6 | | .299 |
| 1.1 | | .043 | 4.4 | 11/64 | .173 | 7.7 | | .303 |
| 1.2 | 3/64 | .047 | 4.5 | | .177 | 7.8 | | .307 |
| 1.3 | 3/64 | .051 | 4.6 | | .181 | 7.9 | 5/16 | .311 |
| 1.4 | | .055 | 4.7 | | .185 | 8.0 | | .315 |
| 1.5 | | .059 | 4.8 | 3/16 | .189 | 8.1 | | .319 |
| 1.6 | 1/16 | .063 | 4.9 | | .193 | 8.2 | | .323 |
| 1.7 | | .067 | 5.0 | | .197 | 8.3 | 21/64 | .327 |
| 1.8 | | .071 | 5.1 | | .201 | 8.4 | | .330 |
| 1.9 | | .075 | 5.2 | 13/64 | .205 | 8.5 | | .335 |
| 2.0 | 5/64 | .079 | 5.3 | | .209 | 8.6 | | .339 |
| 2.1 | | .083 | 5.4 | | .213 | 8.7 | 11/32 | .343 |
| 2.2 | | .087 | 5.5 | | .217 | 8.8 | | .346 |
| 2.3 | | .091 | 5.6 | 7/32 | .220 | 8.9 | | .350 |
| 2.4 | 3/32 | .094 | 5.7 | | .224 | 9.0 | | .354 |
| 2.5 | | .098 | 5.8 | | .228 | 9.1 | 23/64 | .358 |
| 2.6 | | .102 | 5.9 | | .232 | 9.2 | | .362 |
| 2.7 | | .106 | 6.0 | 15/64 | .236 | 9.3 | | .366 |
| 2.8 | 7/64 | .110 | 6.1 | | .240 | 9.4 | | .370 |
| 2.9 | | .114 | 6.2 | | .244 | 9.5 | 3/8 | .374 |
| 3.0 | | .118 | 6.3 | | .248 | 9.6 | | .378 |
| 3.1 | | .122 | 6.4 | 1/4 | .252 | 9.7 | | .382 |
| 3.2 | 1/8 | .125 | 6.5 | | .256 | 9.8 | | .386 |
| 3.3 | | .130 | 6.6 | | .260 | 9.9 | 25/64 | .390 |
| 20.0 | 25/32 | .787 | 50.0 | 1-31/32 | 1.968 | 80.0 | 3-5/32 | 3.150 |
| 30.0 | 1-3/16 | 1.181 | 60.0 | 2-23/64 | 2.362 | 90.0 | 3-35/64 | 3.543 |
| 40.0 | 1-37/64 | 1.575 | 70.0 | 2-3/4 | 2.756 | 100.0 | 3-15/16 | 3.937 |

