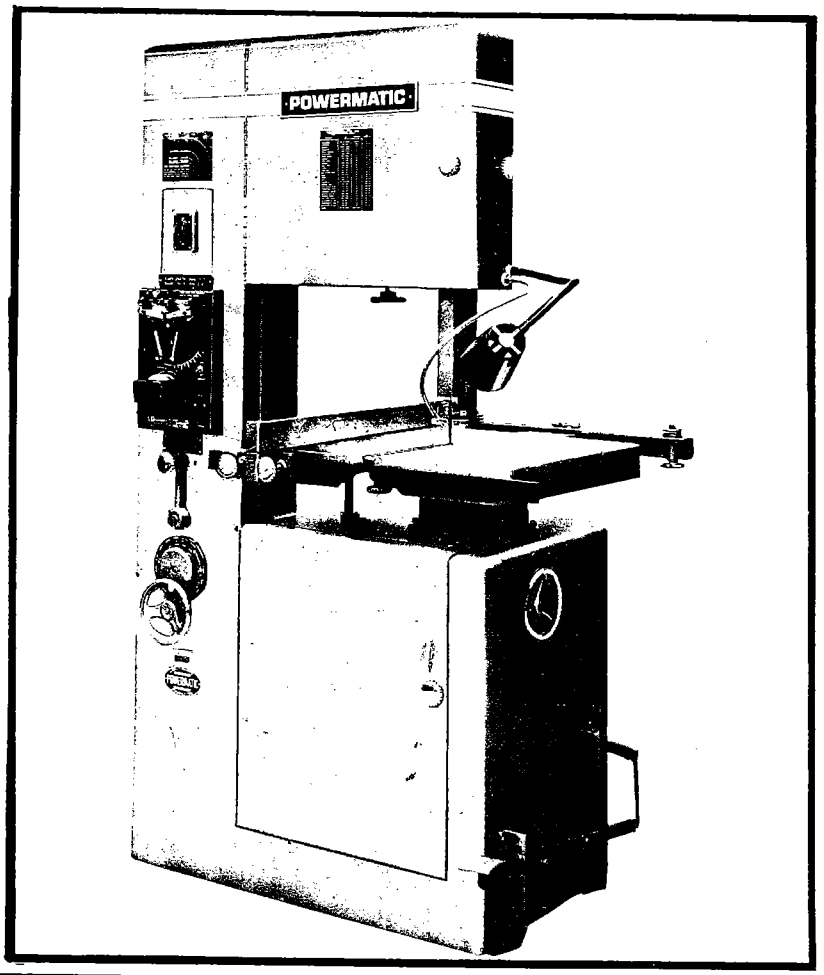
Model 87
20" (508mm) Band Saw

MAINTENANCE INSTRUCTIONS AND PARTS LIST



POWERMATIC®

Strength and performance right down the line.

POWERMATIC HOUDAILLE, INC.
McMinnville, Tennessee 37110

FOREWORD

SAFETY FIRST!

This manual has been prepared for the owner and those responsible for the maintenance of a Powermatic Model 87 Band Saw. It's purpose, aside from machine operations is to promote safety through the use of accepted operating practices. Read the safety and operating instructions thoroughly before operating the machine.

In order to obtain the maximum efficiency from your Powermatic Band Saw, follow all instructions in the operating and maintenance manuals carefully.

The specifications put forth in this manual were in effect at the time of publication. However, owing to Powermatic's policy of continuous improvement, changes to these specifications may be made at any time without obligation on the part of Powermatic Houdaille, Inc.

WARRANTY

This machine and its component parts have been carefully inspected and performance tested at various stages of production and each finished machine is subjected to a final inspection before shipment. We agree that for a period of eighteen (18) months or 3000 hours of use, whichever occurs first from date of delivery from our authorized dealer, to repair or replace, at our option, any machine (or component part thereof) proving defective within the above period, F.O.B. our plant, providing such machine (or component part) is returned prepaid to our plant, or to a designated service center of the undersigned, for our examination. This warranty does not include repair or replacement required because of misuse, abuse, or because of normal wear and tear. Nor does it include electrical motors and electrical components which are warranted by their manufacturer and which should be taken to their local authorized repair station for service. Cost of removal, shipment and reinstallation are not covered hereby. Further, we cannot be responsible for the cost of repairs made or attempted outside of our factory or designated service center without our authorization. No claims will be honored if Serial No. plate has been removed. **THIS WARRANTY IS MADE EXPRESSLY IN PLACE OF ALL OTHER WARRANTIES OR GUARANTEES, EXPRESS OR IMPLIED, WITH RESPECT TO FITNESS, MERCHANTABILITY, QUALITY OR OPERATIVENESS. THIS WARRANTY IS MADE ONLY TO THE ORIGINAL PURCHASER, AND BECOMES EFFECTIVE ONLY WHEN THE ACCOMPANYING CARD IS FULLY AND PROPERLY FILLED OUT AND RETURNED TO THE FACTORY WITHIN TEN (10) DAYS FROM DATE OF DELIVERY.**

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BAND SAW SAFETY INSTRUCTIONS

1. **Read, Understand, and Follow** the safety and operating instructions found in this manual. **Know** the limitations and hazards associated with this band saw. A safety rules decal is installed on each machine to serve as a reminder of basic safety practice.
2. **Grounding the Band Saw:** Make certain that the machine frame is electrically grounded and that a grounding lead is included in the incoming electrical service. In cases where a cord and plug are used, make certain that the grounding lug connects to a suitable ground. Follow the grounding procedure indicated by the National Electric Code.
3. **Eye Safety:** Wear an approved safety shield, goggles, or glasses to protect the eyes when operating the band saw.
4. **Personal Protection:** Before operating the machine, remove tie, rings, watch and other jewelry and roll up sleeves above the elbow. Remove all loose outer clothing and confine long hair. Protective-type footwear should be worn. Hearing protectors should be used where noise exceeds the level of exposure allowed in Section 1910.95 of the OSHA regulations. Do not wear gloves.
5. **Work Area:** Keep the floor around the machine clean and free of scrap material, chips, oil, grease, coolant, tools or accessories to minimize the danger of slipping or tripping. Be sure the table is free of all scrap, foreign material and tools before starting a cut. Powermatic recommends the use of anti-skid floor strips on the floor area where the operator normally stands and that each machine work area be marked off. Make certain the work area is well lighted and ventilated. Where dust or fumes present a hazard, provide a proper exhaust system. Provide for adequate work space around the machine.
6. **Guards:** Keep the machine guards in place at all times when the machine is in use. If removed for maintenance purposes, use extreme caution and replace the guards on completion of the maintenance task before using the band saw.
7. **Do Not Overreach:** Maintain a balanced stance and keep your body under control at all times. Do not overreach.
8. **Use Blades That Are In Good Condition:** Blades that are not sharp or have missing teeth can require excessive force or could break. Examine the backs of the blades. If it is rolled over, do not use the blade. Do not exceed 500 Surface Feet per Minute (2.54m/s) using high speed steel blades.
9. **Hand Safety:** Keep hands away from blade while it is in motion. Always adjust the guide bar to be as close to the top of the workpiece or fixture as possible to minimize blade exposure. Do not open upper or lower band saw door while machine is under power. Do not position hands on stock in line with the band saw blade.
10. **Wheel Rotation:** Be sure the band saw wheels rotate clockwise when under power.
11. **Machine Adjustments:** Make all adjustments with power off except wheel speed and feed rate.
12. **Machine Capacity:** Do not make any cuts requiring more power than is available on the machine. Do not exceed table carrying capacity of 500 lbs. (226.8kg) evenly distributed.
13. **Avoid Accidental Starts:** Make certain the motor switch is in the "off" position before connecting power to the band saw.
14. **Careless Acts:** Give the work you are doing your undivided attention. Looking around, carrying on a conversation and "horseplay" are careless acts that can result in serious injury.
15. **Job Completion:** If the operator leaves the machine area for any reason, the band saw should be turned off and come to a complete stop before his departure. In addition, if the operation is complete, he should clean the band saw and work area. Never clean the machine with the power "on" and never use the hands to clear chips or sawdust; use a brush.
16. **Disconnect the Machine:** Before performing any service or maintenance and when changing blades.
17. **Replacement Parts:** Use only Powermatic or factory authorized replacement parts and accessories; otherwise, the warranty will be null and void.

BAND SAW SAFETY INSTRUCTIONS (continued)

18. **Misuse:** Do not use this Powermatic band saw for other than its intended purpose. If used for other purposes, Powermatic disclaims any real or implied warranty and holds itself harmless for any injury which may result from such use.

    Do not equip your Powermatic band saw with a motor larger than 3hp (2.137kw) at 1800rpm. Doing so voids the warranty and Powermatic holds itself harmless from any injury that may result.

MACHINE SPECIFICATIONS

Table Size	24" (609mm) x 24" (609mm)
Table Tilt	45° R. – 15° L.
Throat, Blade to Column Guard	19-3/4" (501mm)
Maximum Work Thickness	12" (305mm)
Table Feed Force (optional)	0 – 60 lbs. (0 – 27.2kg)
Speed Range:	
Low (infinitely variable)	47 – 470 rpm
High (infinitely variable)	520 – 5200 rpm
Blade Width Capacity	1/8" – 1" (3 – 25mm)
Blade Length	149" – 152" (3785 – 3861mm)
Upper Wheel Adjustment	1-1/2" (38mm)
Band Saw Wheel Diameter	20" (508mm)
Main Drive Motor	2 or 3 hp (I.5 or 2.24kw)
Weight, Domestic Crated	1300 lbs. (590kg)

BELTS

LOCATION	POWERMATIC NO.	INDUSTRY NO.	NO. REQ.
Between Variable Pulleys	6077143	1922V426	1
Between Countershaft and Transmission	6077141	7M1180	3
Between Compressor and Motor (optional)	6077076	7M710	1

FOUNDATION LAYOUT

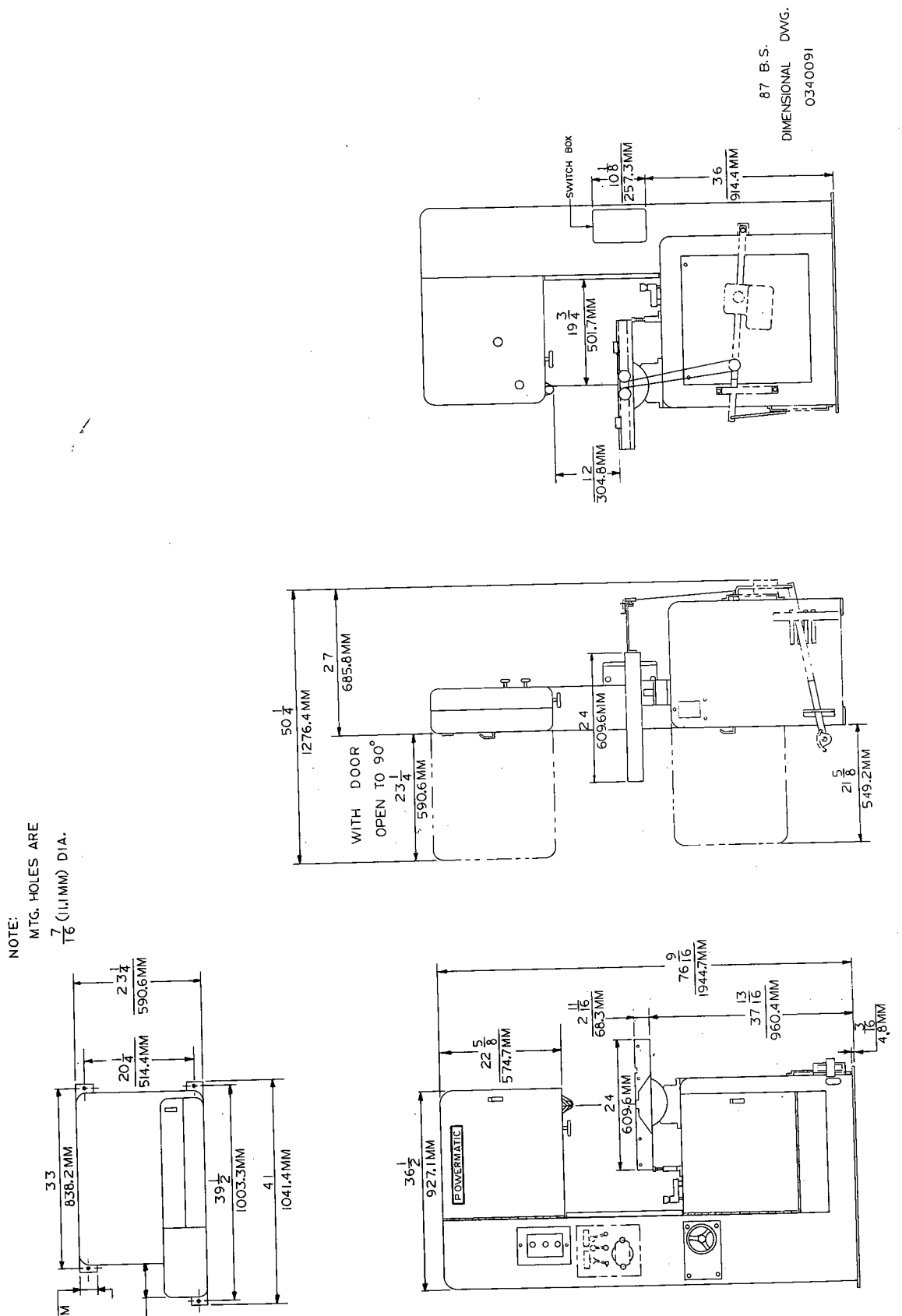


Fig. 1

LUBRICATION CHART

ITEM NO.	INTERVAL	ITEM & INSTRUCTIONS	RECOMMENDED LUBRICANT
1	Weekly	Variable Speed Sheaves – oil male hubs	SAE No. 10
2	Weekly	Air Compressor – on side	SAE No. 10
3	Monthly	Variable Speed Adjusting Screw	Fiske Co., Lubriplate No. 630A
4	Monthly	Band Tensioning Screw	Fiske Co., Lubriplate No. 630A
5	Monthly	Upper Wheel Slide	Fiske Co., Lubriplate No. 630A
6	Monthly	Variable Speed Adjusting Linkage Pivot Points	SAE No. 10
7	Monthly	Transmission. Fill Through Filler Plug (Drain and Flush every six months)	Mobil Vactra No. 1
8	Monthly	Upper Wheel Tilt Bracket Pivot Screws and adjusting screw	SAE No. 10
9	Monthly	Table Trunnion Surfaces, clean & regrease	Fiske Co., Lubriplate No. 630A
10	Monthly	Gearbox Shifter Detent Plunger	SAE No. 10
11	Monthly	Guide Post & Guide Post Clamp Screw	SAE No. 10
12	6 Months	Speed Dial Gears	Fiske Co., Lubriplate No. 630A

LOCATION PLANNING

Caution: Lift machine with fork lift truck under base. Do not lift through the throat opening. Net weight is 1100 lbs. (498.96kg), approximately. The machine should be located so that space is allowed for easy feeding and removal of material. Clearance should also be allowed behind the machine for servicing and in front for the opening of doors.

RECEIVING

Remove all protective coverings, crating, etc. carefully. Inspect the machine for broken or damaged parts. Any evidence of damage in transit should be reported to the trucking company which delivered the machine immediately. Four (4) holes are provided in the base for anchoring the machine to the floor.

Level the table and check to see that post is square to the table. Connect the leads of the line circuit into the starter on the back of the machine and check for proper direction of rotation as follows:

1. Shift machine into low range on transmission. To do this, manually rotate the bottom wheel, at the same time move shift lever to the left detent position.
2. Depress start button to start main drive motor and check rotation. The lower wheels should rotate clockwise. If not, disconnect machine from power source and change any two incoming leads in the starter usually mounted on the rear of the column of machine. Install a saw band and check to see that the band touches upper and lower backup bearings in saw guide and is centered on both top and bottom wheels. If it is not centered, see section on band saw lineup for proper alignment.

MODEL 87 FEATURES

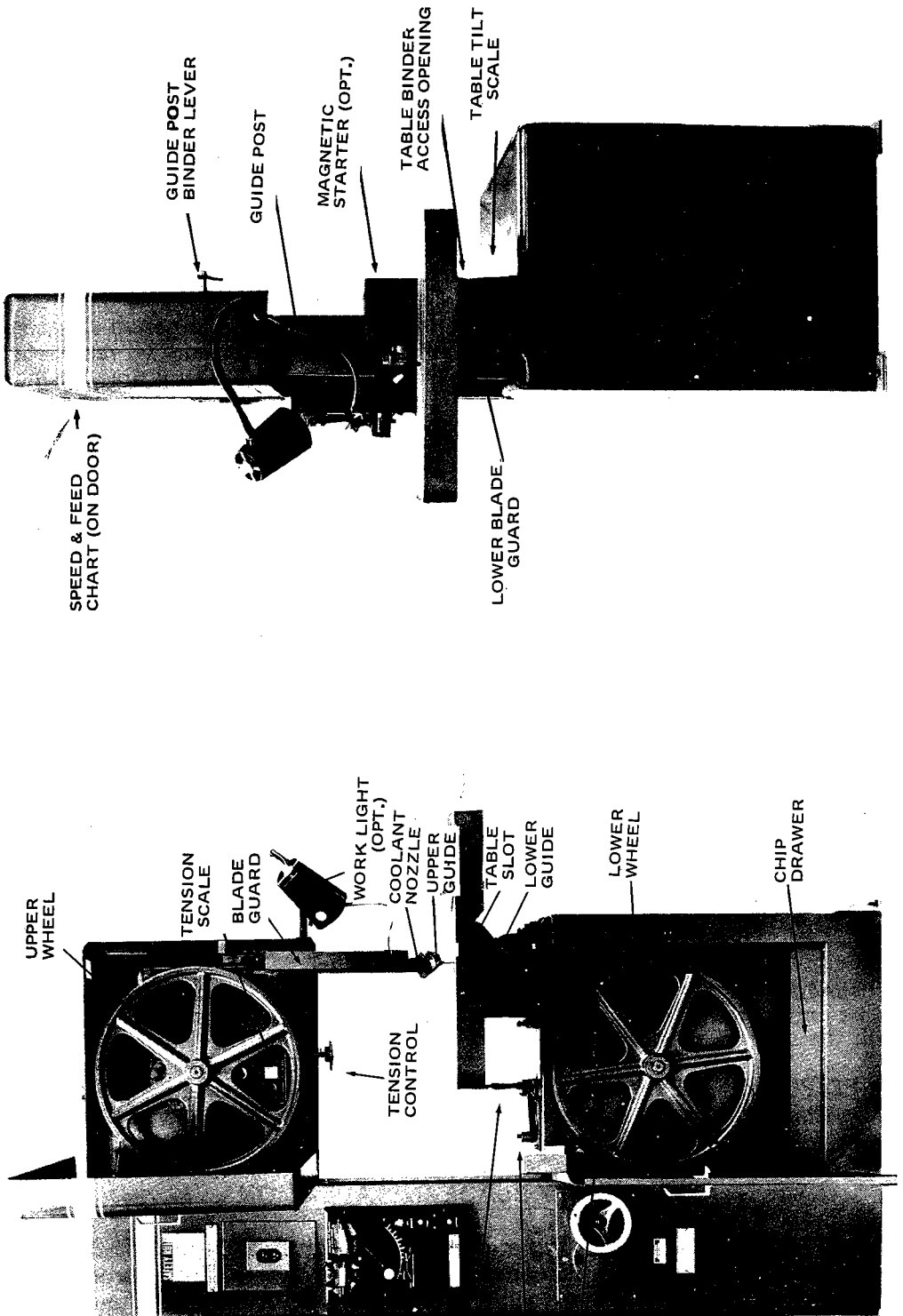
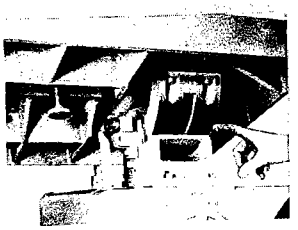


Fig. 2

MODEL 87 FEATURES AND CONTROLS

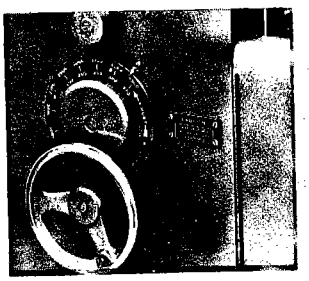
SPEED AND FEED CHART: The speed and feed chart mounted on the upper door of the saw enables the operator to quickly select the correct saw band, speed and feed rate on the chart for basic materials.

TABLE: A heavy duty table and trunnion assembly will hold 200 lbs (91.72kg) at any point or 500 lbs (226.8kg) evenly distributed. The table can be tilted 15° left or 45° right. Pointer and degree scale are attached directly to the trunnion and cradle to indicate the angle at which the table is set.



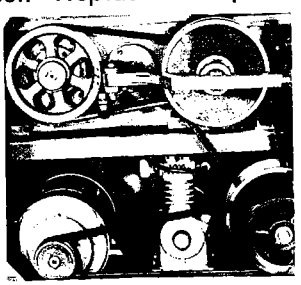
SAW WHEELS: The wheels are cast iron, dynamically balanced, centered and aligned so that the band will run at all times against backup bearings and centered on wheels. Tires are vulcanized to the wheels assuring no slippage and long wear. Should the tires become worn, Powermatic has an exchange policy where the wheels are returned for credit after the replacement wheels are received. To remove a wheel, loosen both setscrews and pull straight out. If the wheel has been in place for a long time, a wheel puller may be necessary. On replacement be sure to oil the shaft and hole to avoid rusting.

SPEED CONTROL: Variable speeds are selected through a column-mounted control wheel. An easy to change, easy to set shift lever is mounted on the cross member near the table. In low range, speeds are from 47 to 470 SFM (14.33 to 143.3 mpm) and in high range, from 520 to 5200 SFM (158.5 to 1585mpm). A speed dial is mounted on the column of the machine for direct reading of surface feet per minute (meters per minute). If the shift lever will not go into the detent position when changing range, rotate the lower wheel manually until teeth engage.



WHEEL BRUSHES: Check the wheel brushes occasionally. If they are worn so that they no longer contact the wheel face, loosen the adjusting screws and move the brush up to the wheel. Replace as required.

TRANSMISSION: Drain, flush, and refill after first month and thereafter at least every six months. Capacity is 3 quarts. Fill to the top of fill pipe, but do not over fill. Use Mobil No. 1 Vactra oil. Check for seal leaks around the shafts. Any rough operation, vibration, loud or unusual noises should be investigated immediately. It is recommended that the transmission be returned to the factory for repairs, or that repairs be made by a factory serviceman.



WARNING: Difficulties in shifting may be caused by wear or incorrect adjustment in the shifting linkage and this should be considered before repairing the transmission. It may be necessary to jog the band drive motor until the shift lever is fully engaged, Do not attempt to force the shift lever into position.

VARIABLE SPEED PULLEY: Every six months remove the pulley unit, and wash and clean with solvent. Re-oil and install. Check the variable pulley faces for scoring which could damage the belts.

MODEL 87 BLADE INSTALLATION

NOTE CAREFULLY: If the blade width to be installed is less than 1/2", use the 3/16" thick shim back of the upper guide and turn the step in the bar support for the lower guide towards the trunnion. Check the inserts for the correct width. The insert width should be slightly less than the distance from the back of the band to the bottom of the gullet. Change them if required and leave them pulled away from the band. Lower the upper wheel housing. Loosen both the insert clamp screws and remove the insert. Open both doors and post-mounted band guard. Loop the band over the upper wheel, feed it into the blade guard on the column and under the lower wheel. Using the band tension handwheel, put tension on the blade. Rotate the wheels by hand and watch how the band tracks on the wheels. Tilt the wheel if necessary to cause the band to run centered on the wheel. Check to see if the blade is against the upper and lower guide backup bearing. For proper operation the blade should be in firm contact with lower backup bearing and be in light contact or slightly clearing the upper backup bearing. If it is not, see section on band saw alignment and realign the machine.

MODEL 87 BLADE INSTALLATION (continued)

Increase tension to the setting for the blade width to be used. Slide one insert on each guide to be lightly against the blade and lock in position. Slide the other insert against the blade to give a slight drag and lock in position. Check this by pulling out on the band and checking the feel of the slight drag. Close the guide bar mounted blade guard and both doors before starting the band saw.

MODEL 87 TABLE AND BELT ADJUSTMENTS

TABLE STOP ADJUSTMENT: The table stop is factory set to position the table square with the blade and should not need adjustment. However, if the band saw is realigned for any reason, it will be necessary to reset the stop. Unlock the jam nut and screw the jackscrew a few turns down into the bracket so as to allow the table to go past the 0^{o} point. Adjust the guide bar to be close to the table with the trunnion unlocked and with a combination square, or similar gauge set on the table with the blade against the post, adjust the table to be square with the post using the jackscrew in the stop bracket. Relock the jam nut, swing the table away from and then back to the stop. Tighten the trunnion lock. Recheck to see if the table is still square with the guide post. Readjust if necessary. Check the position of the scale pointer and reposition if necessary. (See Fig. 3)

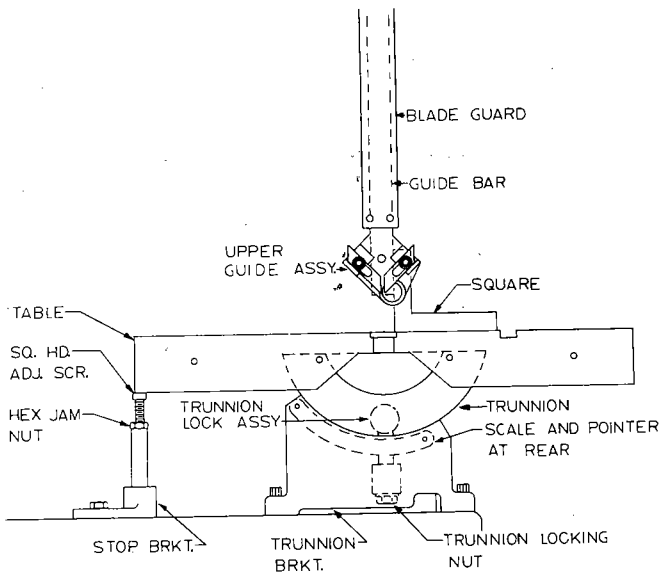


Fig. 3

BELT ADJUSTMENT: Shift the transmission into its neutral position. Remove the rear cover. The belts from the transmission to the countershaft can be tightened by means of a jackscrew in a lug welded to the upper shelf. With the four mounting screws snug but not tight, jack the countershaft bracket until the three belts between the transmission and the countershaft are properly adjusted. The type of belt used must be guitar string tight to operate properly. (See Fig. 4)

BELT ADJUSTMENTS, cont'd

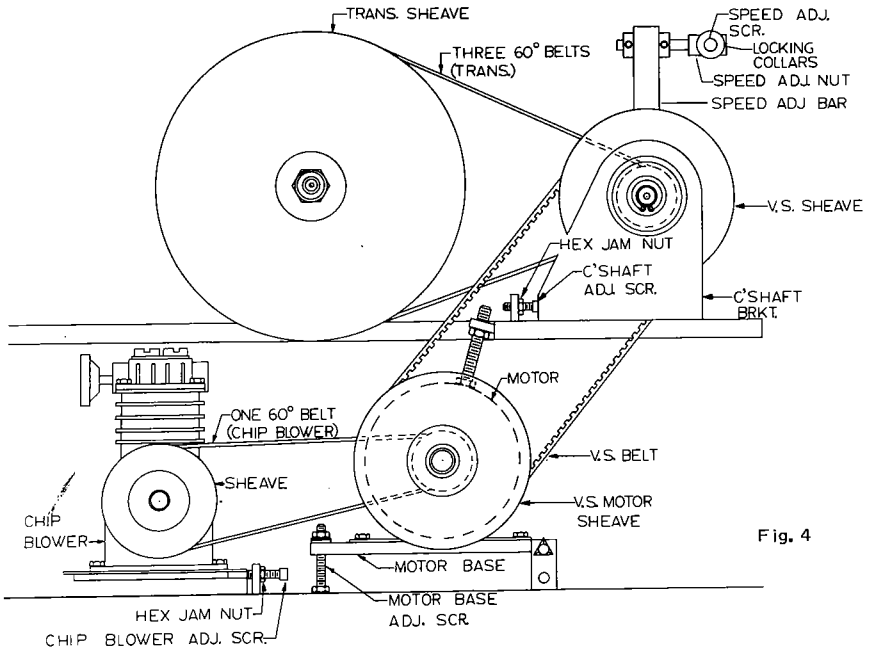


Fig. 4

The variable speed belt must be adjusted after the above belts are and must be readjusted whenever the above belts are readjusted. Loosen the stops on the speed control screw and move them away from the operating nut. Turn saw motor on and adjust speed control handle until the variable speed belt either bottoms out in the motor pulley or is flush with the outside diameter of the countershaft pulley. If the belt bottoms out before becoming flush with the outside diameter, raise the motor by adjusting the motor base with the jackscrew nuts. Continue raising the motor base and adjusting the speed control until the belt is flush with the outside diameter of the countershaft pulley and just slightly before bottoming out on the motor pulley. If the belt is flush with the countershaft pulley outside diameter and has not bottomed out, squeeze the belt halves together or pull out on the belt to cause the spring loaded side of the motor pulley to move back and lower the motor base until the belt is close to bottoming out on the motor pulley hub. Set the low speed stop on the speed adjusting nut and lock in place. Check the position of the information on the dial to see if the low speeds 47 and 520 line up with the pointer. If it does not, loosen the nut on the speed control handwheel shaft and push the shaft forward until the gearing disengages and the speed dial spins free. Adjust dial so that the low speeds 47 and 520 line up with the pointer. Retighten nut on the end of the speed control shaft making certain by rocking the dial that it is lined up to the nearest tooth and that the gears re-engage.

If the saw is equipped with an optional chip blower, belt tension is achieved by use of a jackscrew and jam nut working through an ear welded to the lower shelf. Back off on the jackscrew to install the belt and use it to tension the belt once it is installed. The type of belt used requires that it be guitar string tight for proper drive.

CAUTION: Make all adjustments except changing speed with the motor off. Adjust speed control handle to increase the speed until the variable speed belt is flush with the outside diameter of the motor pulley. Set the variable speed stop against the adjusting nut and lock in place. Put the rear cover back on.

MODEL 87 BAND SAW ALIGNMENT

One of the most important keys to succesful band sawing is the lineup of the saw. Your machine as received should be properly lined up ready to do your sawing operations. However, if it is not lined up or because of wheel wear or wheel replacement alignment has been disturbed, listed below are the steps to go through to realign the saw.

1. Check the distance from the column face to the lower wheel centerline. It should be 10-5/8".

MODEL 87 BAND SAW ALIGNMENT, cont'd

1. If it is not, loosen the four mounting screws bolting the transmission to the shelf and reposition it to the above deminsion. Snug the screws down.

2. Check the parallelism of the lower wheel to the cross member with a combination square. It should be parallel within 1/32". Make sure also that the lower wheel is not all the way back against the shoulder on the transmission shaft. Allow approximately 1/8" for the final adjustments. Check also that the wheel clears the chip brush bracket.

3. Check the location of the guide bar in the upper wheel housing. It should be 20-1/8" from the column over its entire length. If it is not, the guide bar will have to be relocated. Back off the two setscrews at the right hand side of the bracket and then loosen four mounting screws bolting the bracket to the upper frame. The two jackscrews in the welded ears below the bracket can be used to tip the bracket into parallelism with the column. If the guide bar is parallel but out of location, simply slide it over to get the 20-1/8" location for the full length of the bar. Snug down the three bracket mounting screws nearest to the adjusting jacks.

4. Check the location of the upper wheel centerline. It should be 10-5/8" from the column face. Readjust if necessary by using the opposing jackscrews in the upper wheel slide on each side of the wheel bracket. Leave enough clearance between the screws so that the bracket can pivot freely. Remove the table from the trunnion. Note any shims used and put the shims under the same screws when the table is reinstalled.

5. Install a 3/8" width blade. Check the upper guide. It should be mounted to the guide bar with a 3/16" shim. Check the lower guide bracket. The step should face away from the front side of the machine. With a long straight edge, check for parallelism of the wheels tilting the upper wheel and moving it on its shaft to check for parallelism. Note lower wheel may not be properly tilted causing the upper wheel to be too far back or forward. Adjust the lower wheel is required using the setscrews in the transmission mounting feet to tilt the lower wheel. If one side of the wheels is parallel and the other is not parallel, pivot the upper wheel housing with the jacking studs provided. Be careful not to lose the position of the wheel centerline and post location. After paralleling the wheels, spin the wheels clockwise and adjust the tilt to track the band in the center of both wheels. If the band can be centered on the upper wheel but is off center on the lower wheel, make sure the guides are not holding the band from centering. If they are, temporarily remove them. Spin the wheels counter-clockwise. The band should track the same in both directions if the wheels are parallel. If it does not track the same in both directions, parallelism of the wheels must be corrected.

6. Reinstall the upper guide if it was removed. Note the position of the blade relative to the wheel. If it is against the guide backup bearing and will not allow the blade to center, the upper wheel must be moved out. If it clears the backup bearing, the wheel will have to be moved back. Adjust the guide bar up and down and note whether the backup bearing and guide bar are parallel to the back of the band. If it is not, the bracket will have to be adjusted with the jackscrews to bring the post into line with the band. Check also on the side parallelism of the side of the guide bar to the band. With one of the inserts slightly clearing the band and the other well clear of the band, raise the guide post up and down to see if it moves parallel with the band. If it is not parallel, the bracket must be pivoted into alignment using the bottom jackscrews. Use care in adjusting all jackscrews so that proper locations are maintained and the wheels remain parallel. Note the back of the band should lightly contact or slightly clear (.015") the backup bearing, over the full travel of the guide post.

7. Lock the transmission and upper wheel bracket in place. Note prior to locking the extreme right hand screw of the upper wheel bracket, adjust the two set screws above and below it to be in light contact with the backup plate.

MODEL 87 BAND SAW ALIGNMENT, cont'd

8. Loosen the four mounting screws holding the trunnion to the frame cross member. Reinstall the lower guide and table. Locate the trunnion so that the band overlaps the backup by approximately .093" and is centered in the insert slot. Using a combination square, check the squareness of the table to the back of the guide bar and square the table to the back of the guide post using the jackscrews provided in the trunnion support bracket. Position the trunnion so that there is good contact between the back of the band and the backup bearing. Lock the trunnion bracket to the cross member.

9. Using the combination square on the table and against the side of the guide post, using the table stop at the left hand side of the table, square the table sidewise to the post. Lock the stop screw with the jam nut provided.

10. Tilt the table at 45^{o} to the right and check to be sure that the band clears the insert. If it does not clear, loosen the four screws that mount the table to the trunnion and readjust the table. Retighten the mounting screws and recheck both the 0^{o} and 45^{o} points for band clearance.

TROUBLE–SHOOTING AND SAWING HINTS

TROUBLE	POSSIBLE CAUSE	REMEDY
Table Tilt Does Not Hold Position Under Load	1. Tilt lock is not tightened. 2. Tilt lock mechanism is broken or worn.	1. Tighten tilt lock. 2. Replace.
Table Will Not Tilt.	1. Trunnion was not lubricated. 2. Trunnion is jammed.	1. Lubricate. 2. Disassemble and replace jammed parts.
Table Vibration (while sawing).	1. Incorrect band speed. 2. Incorrect choice of saw band pitch. 3. Worn or improperly adjusted saw guide inserts. 4. Worn saw guide back-up bearing.	1. Check speed and feed chart and correct speed for material. 2. Check speed and feed chart and change to correct blade. 3. Adjust or replace worn parts. 4. Replace worn parts.
Transmission Will Not Stay In Mesh	1. Broken roll pins in shift linkage. 2. Shift mechanism in transmission is jammed. 3. Sliding clutch jaws in transmission are jammed or damaged.	1. Replace roll pins. 2. Consult factory. 3. Consult factory.
Surface Finish On Work Tool Rough	1. Saw guide inserts are worn. 2. Saw band speed is too low. 3. Saw band pitch is too coarse.	1. Replace inserts. 2. Increase speed. 3. Change to finer pitch blade.
Saw Band Cutting Inaccurately.	1. Worn blade teeth. 2. Scale on work piece was not removed. 3. Work piece hardened by grinding to remove scale. 4. Incorrect saw band or insert alignment. 5. Post not square to table. 6. Incorrect band speed used. 7. Incorrect feed force used. 8. Saw guide on upper post not located close enough to work piece. 9. Incorrect choice of saw band. 10. Incorrect saw band tension.	1. Replace blade. 2. Remove scale. 3. Scrap work piece. 4. Realign saw. 5. Square post to table. 6. Use table and correct band speed. 7. Reduce feed force. 8. Relocate post as close to top of work piece or fixture as possible. 9. Use table and change to correct band. 10. Readjust tension.
Saw Band Teeth Stripping (usually caused by chip welding)	1. Saw band pitch too coarse for thin work section. 2. Work not held firmly. 3. Band speed too low.	1. Change band to finer pitch. 2. Change method of holding work. 3. Increase band speed.

TROUBLE–SHOOTING AND SAWING HINTS (continued)

TROUBLE	POSSIBLE CAUSE	REMEDY
Premature Saw Band Breakage (usually caused by teeth stripping.)	1. Saw band speed too low. 2. Feeding force too high. 3. Pitch of saw band too coarse. 4. Saw guide inserts and backup bearings not properly guiding band. 5. Band tension too high. 6. Defective weld.	1. Increase speed. 2. Decrease feed force. 3.Change band to finer pitch. 4. Check for worn inserts and backup ring and replace if required. 5. Reduce band tension. 6. See Welder Manual for instructions.
Premature Dulling of Saw Band	1. Not breaking in saw band on first few cuts. 2. Band speed too high, causing abrasion. 3. Saw band pitch too coarse. 4. Feed pressure too light. 5. Cutting rate too high. 6. Faulty material analysis. 7. Faulty material such as heavy scale, inclusions, hard spots, etc. 8. Saw band vibration. 9. Chipped tooth lodged in cut. 10. Chip welding.	1. Reduce feed pressure and speed on first cuts. 2. Reduce speed. 3. Change to finer pitch blade. 4. Increase pressure. 5. Reduce feed pressure. 6. Determine material and correct speed feed or blade as required. 7. Replace material. 8. Check for unbalance due to worn belt or parts. 9. Stop cut and remove lodged tooth. 10. Reduce speed.

MODEL 87 TABLE STOP ADJUSTMENTS

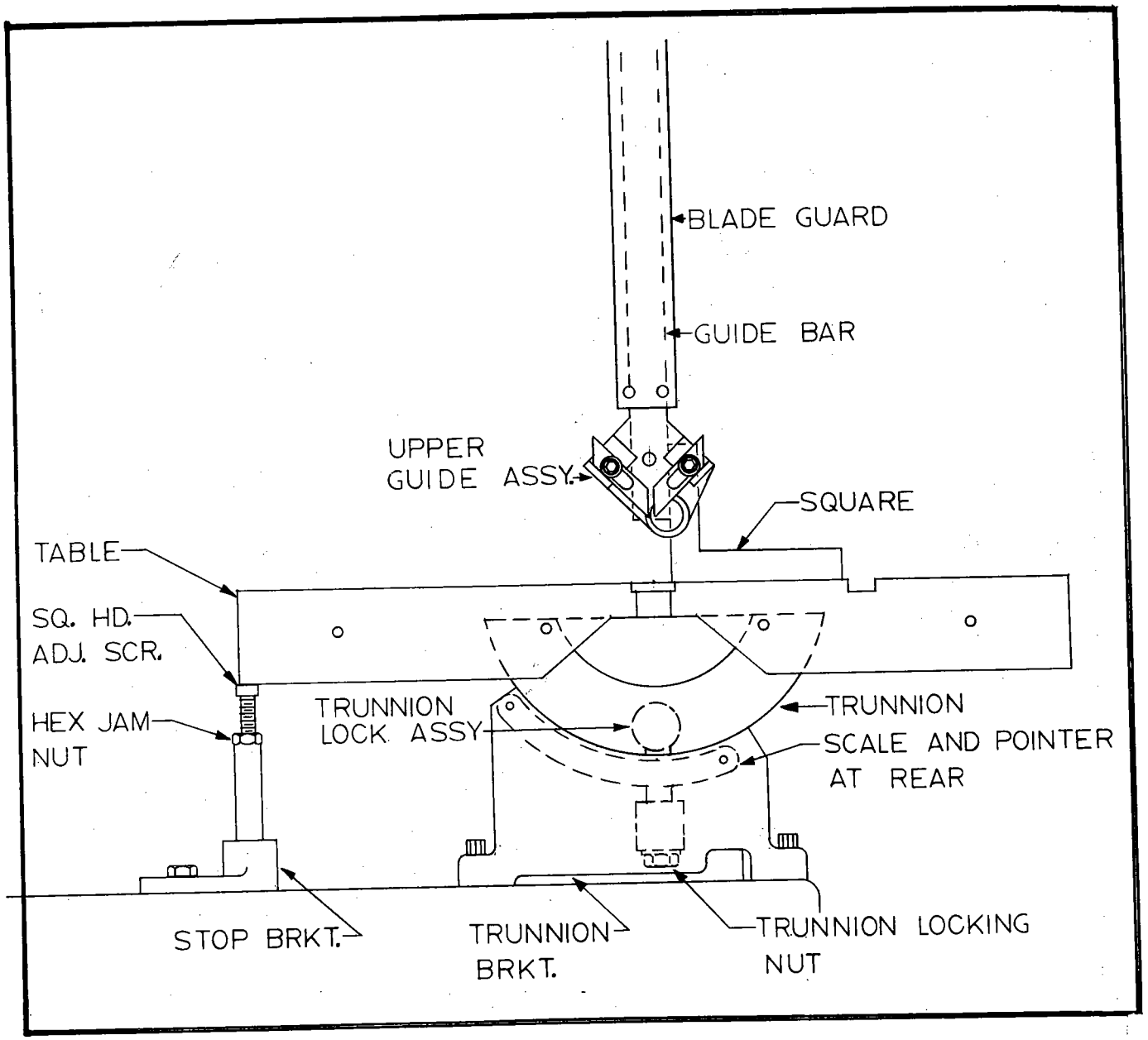


Fig. 5

MODEL 87 DRIVE BELT ADJUSTMENTS

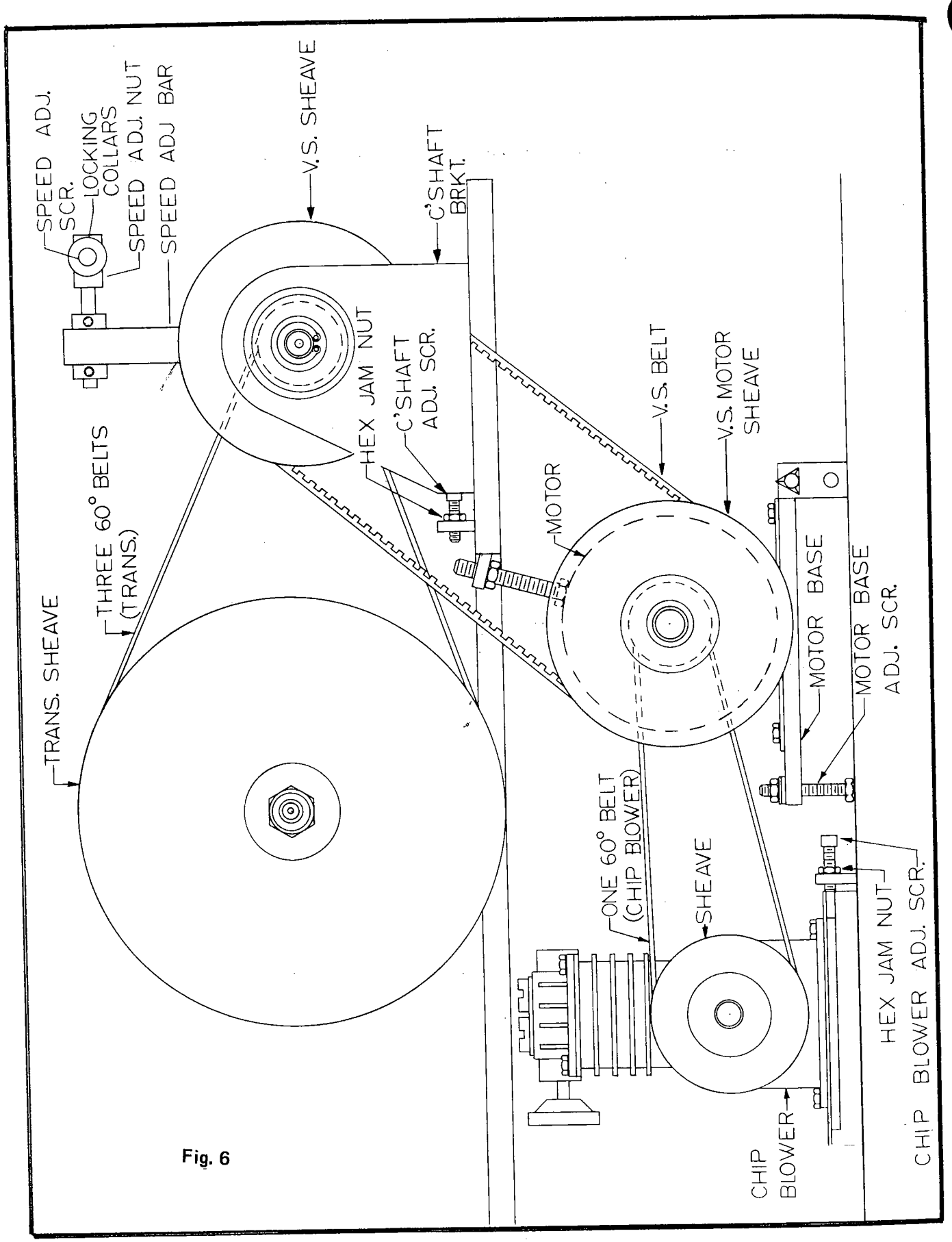


Fig. 6

MODEL 87 TRANSMISSION SHIFT LEVER ASSEMBLY

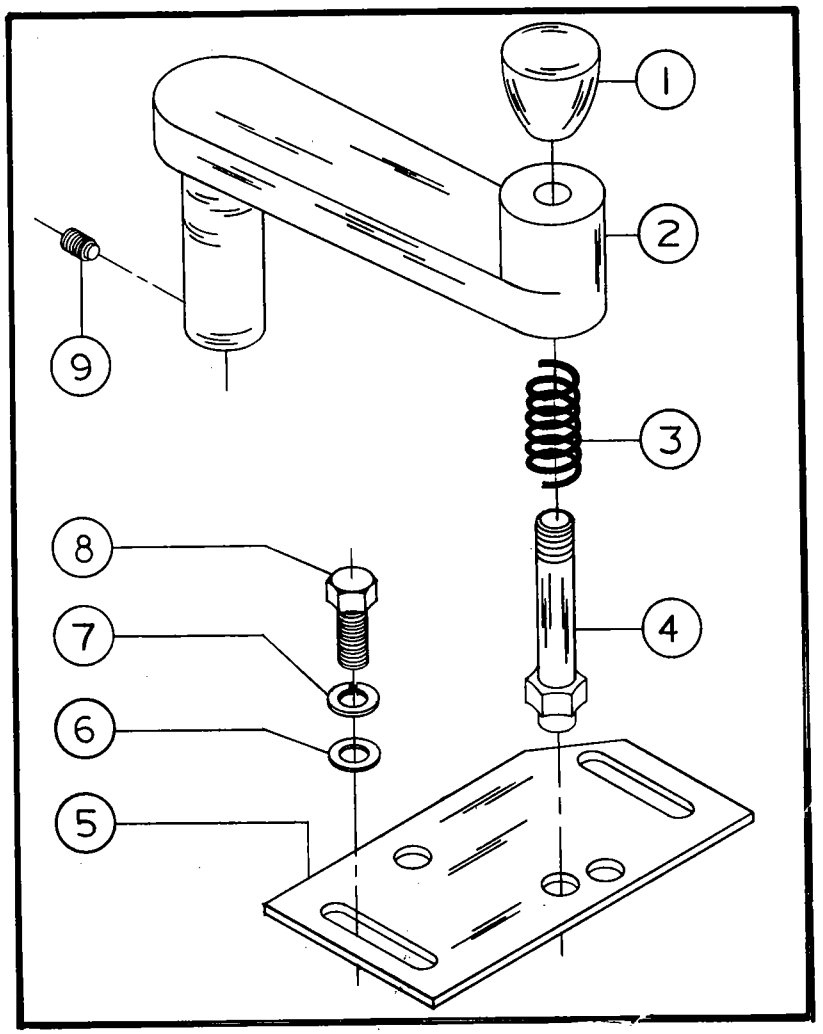


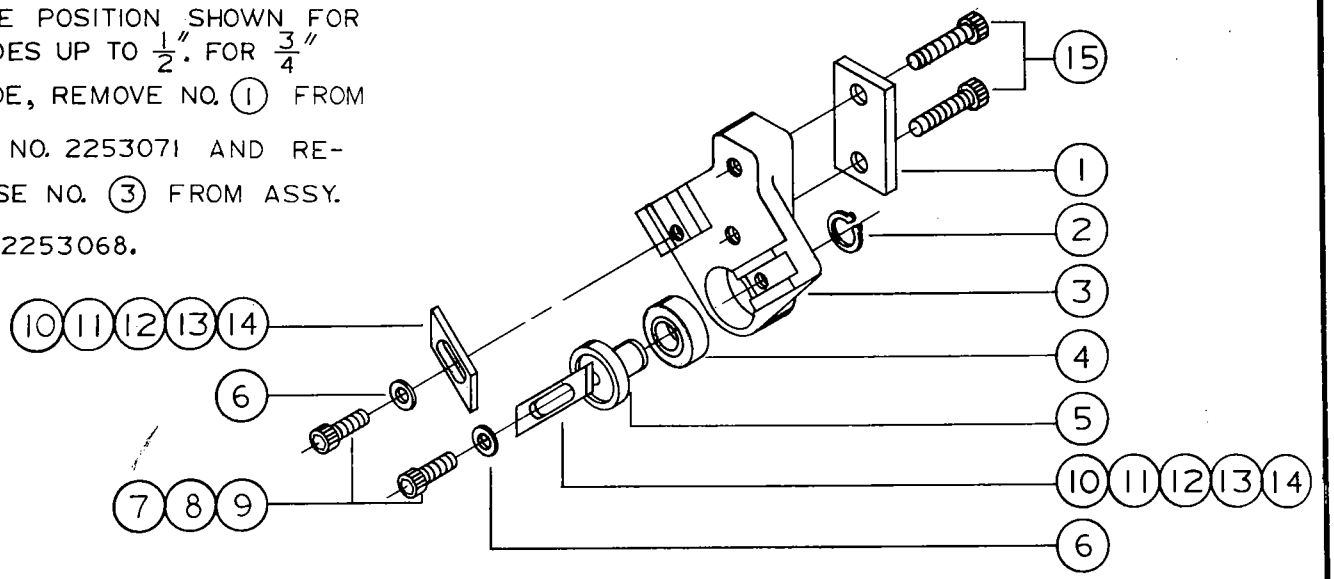
Fig. 7

MODEL 87 TRANSMISSION SHIFT LEVER ASSEMBLY PARTS LIST

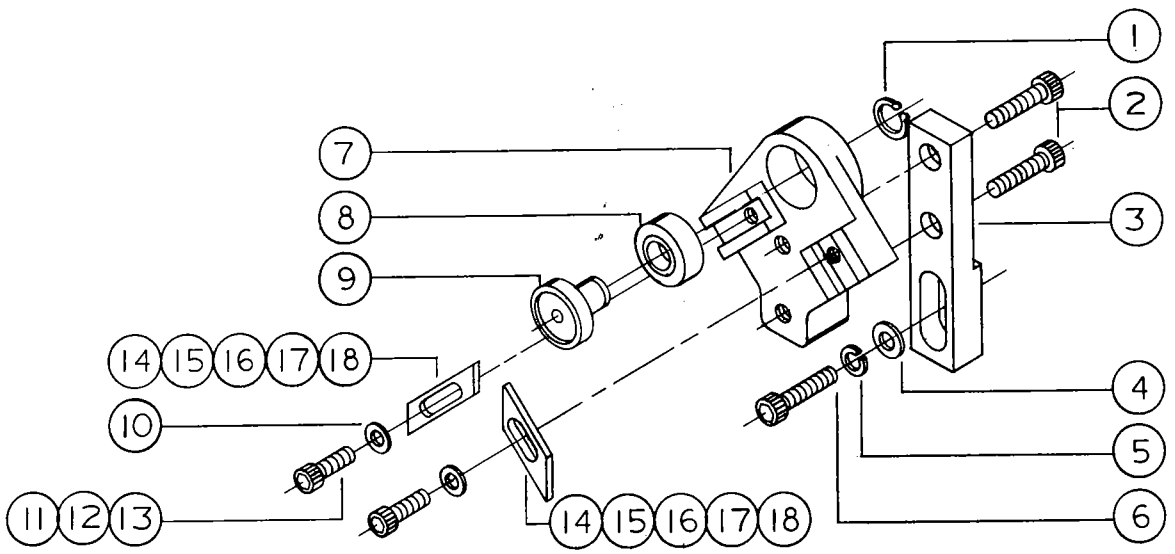
ITEM NO.	PART NO.	DESCRIPTION	QTY.
	2426014	LEVER, SHIFT ASSEMBLY (ITEMS 1 THRU 4)	
1	3406201	KNOB	1
2	3426052	LEVER, SHIFT	1
3	6813087	SPRING, COMPRESSION	1
4	3582093	PIN, SHIFT LOCKING	1
5	3595338	PLATE, SHIFT DETENT	1
6	6861101	WASHER, 1/4" FLAT	2
7	6861100	WASHER, 1/4" LOCK	2
8	6714127	SCR., HEX HD. CAP, 1/4–20 X 1/2"	2
9	6714004	SCR., SOC. HD. SET, 1/4–20 X 1/4"	2

MODEL 87 UPPER & LOWER GUIDE ASSEMBLIES

NOTE:
GUIDE POSITION SHOWN FOR BLADES UP TO $\frac{1}{2}$". FOR $\frac{3}{4}$" BLADE, REMOVE NO. (1) FROM ASSY NO. 2253071 AND REVERSE NO. (3) FROM ASSY. NO. 2253068.



UPPER GUIDE ASSY.
2253071



LOWER GUIDE ASSY.
2253068

Fig. 8

MODEL 87 UPPER & LOWER GUIDE ASSEMBLY PARTS LIST (STANDARD)

ITEM NO.	PART NO.	DESCRIPTION	QTY.
	2253071	GUIDE ASSY., 45° UPPER ((ITEMS 1 thru 9)	
1	3735049	SPACER, GUIDE BAR	1
2	6670016	RING, RETAINING, TRUARC No. 5100–39	1
3	3253040	GUIDE, 45°	1
4	6061017	BEARING, BALL, MRC 5200–SBK OR EQUIVALENT	1
5	3700045	SHAFT, BLADE GUIDE BACKUP	1
6	6813095	SPRING, BELLVILLE ASSOC. No. BO500–038, .255" I.D. X .500" O.D.	2
7	6714015	SCR., SOC. HD. CAP, 1/4–20 X 1/2" (W/INSERTS 3328216 & 7)	2
8	6714016	SCR., SOC, HD, CAP, 1/4–20 X 1, (W/INSERT 338220)	2
9	6714018	SCR., SOC., HD. CAP, 1/4–20 X3/4" (W/ INSERTS 3328218 & 9)	2
10	3328216	INSERT, 45°, 1/8" BLADE	2
11	3328217	INSERT, 45°, 1/4" BLADE	2
12	3328218	INSERT, 45°, 3/8" BLADE	2
13	3328219	INSERT 45°, 1/2" BLADE	2
14	3328220	INSERT 45°, 3/4" BLADE	2
15	6716013	SCR., SOC. HD. CAP, 3/8–16 X 1-3/4"	2
	2253068	GUIDE ASSY., 45° LOWER (ITEMS 1 thru 13)	
1	6670016	RING, RETAINING, TRUARC No. 5100–39	1
2	6716016	SCR., SOC. HD. CAP, 3/8–16 X 7/8"	2
3	3044203	BAR, LOWER GUIDE MOUNTING	1
4	6861301	WASHER, 3/8" FLAT	1
5	6861300	WASHER, 3/8" LOCK	1
6	6716013	SCR., SOC. HD. CAP, 3/8–16 X 1-3/4"	1
7	3253040	GUIDE, 45°	1
8	6061017	BEARING, BALL, MCR No. 5200–SBZZ, oe EQUIV.	1
9	3700045	SHAFT, BLADE GUIDE BACKUP	1
10	6813095	SPRING, BELLVILLE ASSOC. No. BO500–038, .225" I.D. X .500" O.D.	2
11	6714015	SCR., SOC. HD. CAP, 1/4–20 1/2" (W/INSERTS 3328216 &7	2
12	6714016	SCR., SOC. HD. CAP, 1/4–20 X 1" (W/INSERT3328220)	2
13	6714018	SCR., SOC. HD. CAP, 1/4–20 X 3/4" (W/INSERTS 3328218 & 9)	2

ITEM	PART NO.	DESCRIPTION	QTY.
14	3328216	INSERT, 45°, 1/8" BLADE	2
15	3328217	INSERT, 45°, 1/4" BLADE	2
16	3328218	INSERT, 45°, 3/8" BLADE	2
17	3328219	INSERT, 45°, 1/2" BLADE	2
18	3328220	INSERT, 45°, 3/4" BLADE	2

MODEL 87 RIP FENCE ASSEMBLY

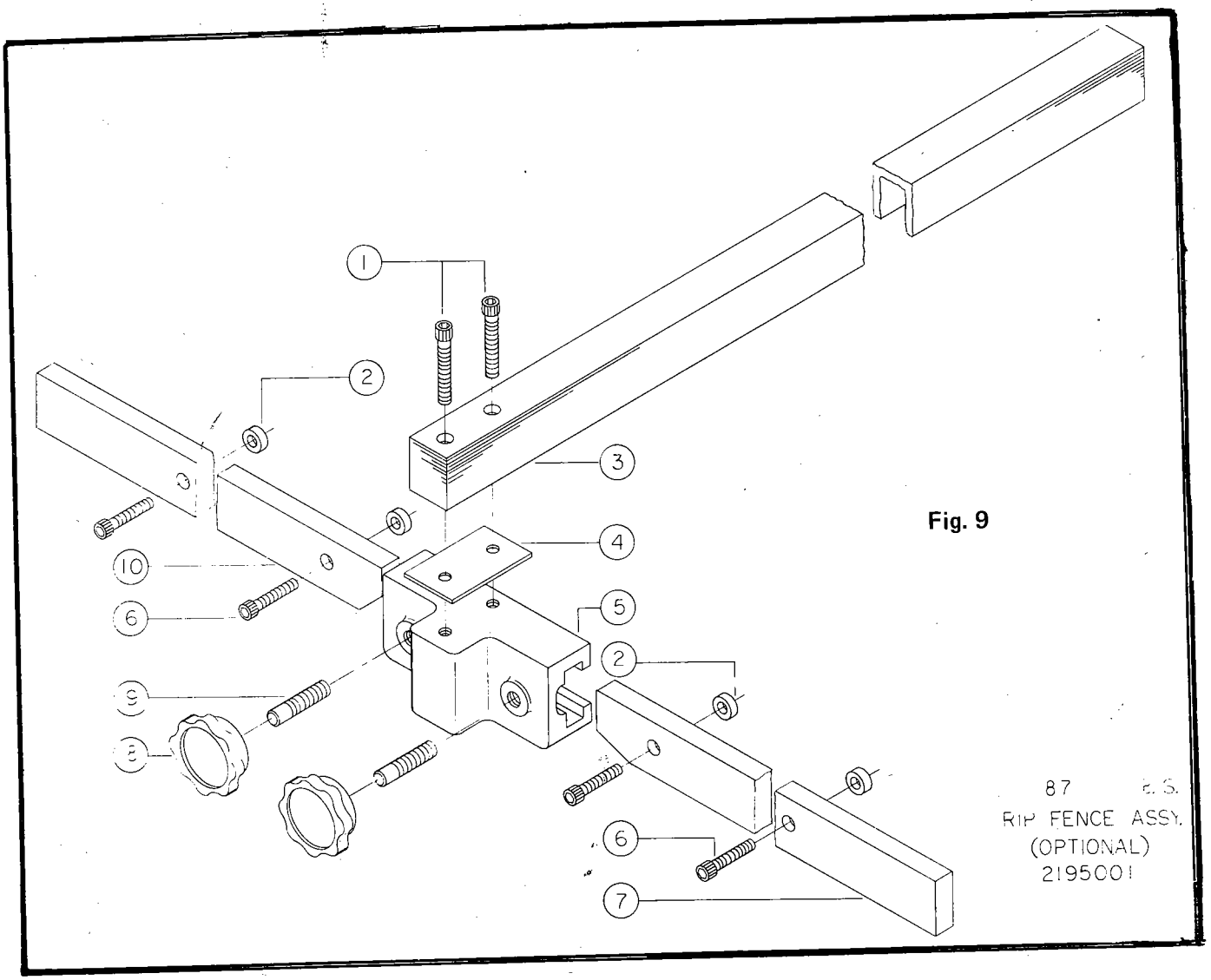


Fig. 9

MODEL 87 RIP FENCE ASSEMBLY PARTS LIST

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	6716014	SCR., SOC. HD. CAP, 3/8-16 X 2-1/2"	2
2	3735001	SPACER, FENCE BAR	4
3	3195002	FENCE, RIP	1
4	3722004	SHIM, RIP FENCE	1
5	3063046	BRACKET, RIP FENCE MOUNTING	1
6	6715020	SCR., SOC. HD. CAP, 5/16–18 X 1"	4
7	3044041	BAR, RIGHT HAND FENCE	1
8	3406017	KNOB	2
9	3695032	SCREW, LOCK	1
10	3044040	BAR, LEFT HAND FENCE	1

MODEL 87 COUNTERWEIGHT ASSEMBLY

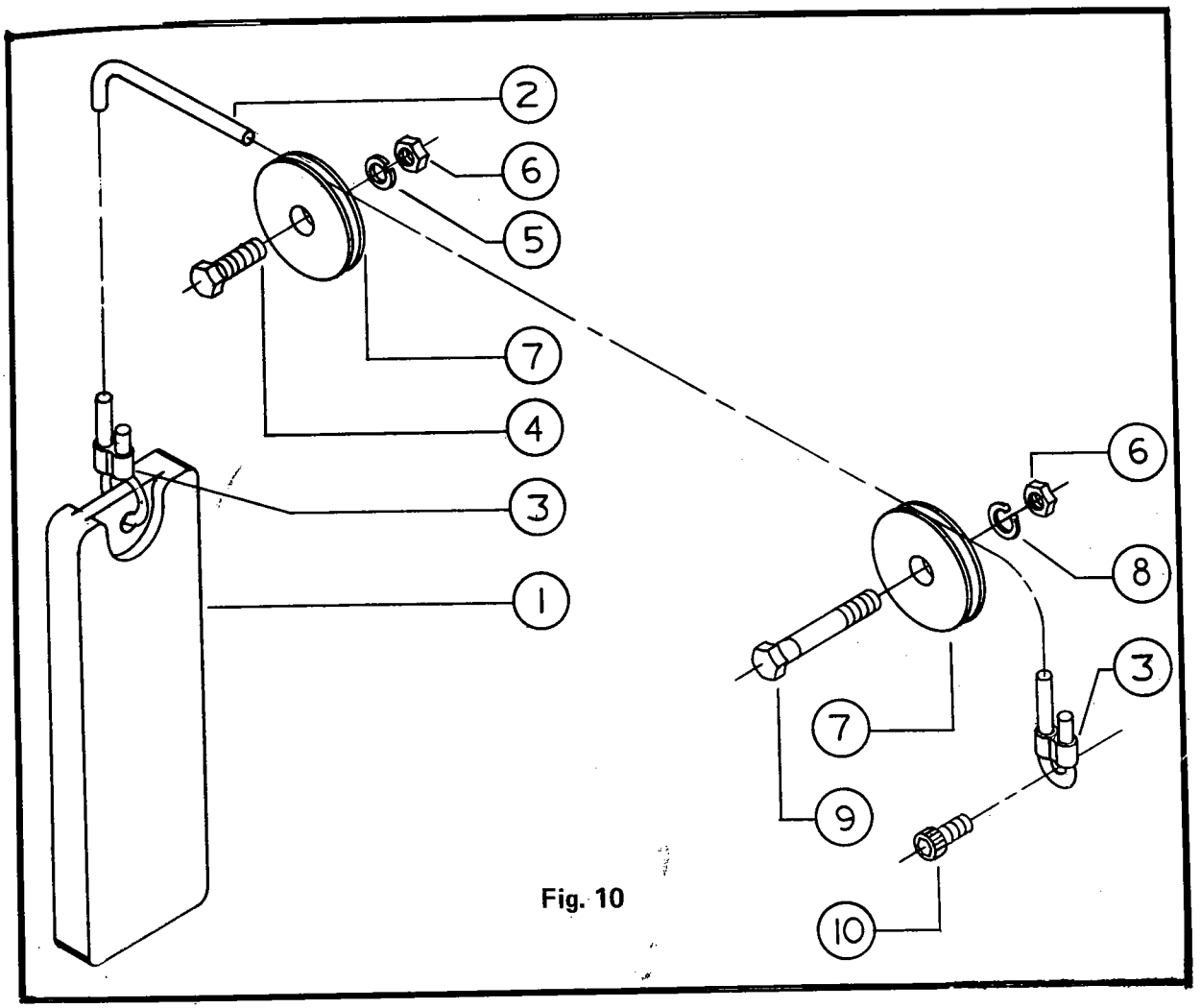


Fig. 10

MODEL 87 COUNTERWEIGHT ASSEMBLY PARTS LIST

ITEM NO.	PART NO.	DESCRIPTION	QTY.
	2103001	COUNTERWEIGHT ASSEMBLY (ITEMS 1 THRU 3)	
1	3044042	BAR, BALANCE WIEGHT	1
2	6102001	CABLE, AIRCRAFT, 1/16" DIA.	6'
3	6284104	FITTING, CABLE, OVAL SLEEVE	2
4	6718009	SCR., HEX HD. CAP, 1/2–13 X 1-1/4"	1
5	6861500	WASHER, 1/2" LOCK	1
6	6518008	NUT, HEX JAM, 1/2–13	2
7	3673031	ROLLER, GUIDE BAR WEIGHT	2
8	6670018	RING' RETAINING	1
9	3691035	SCR., GUIDE BAR ROLLER	1
10	6714015	SCR., SOC. HD. CAP, 1/4–20 X 1/2"	1

MODEL 87 MOTOR MOUNTING ASSEMBLY

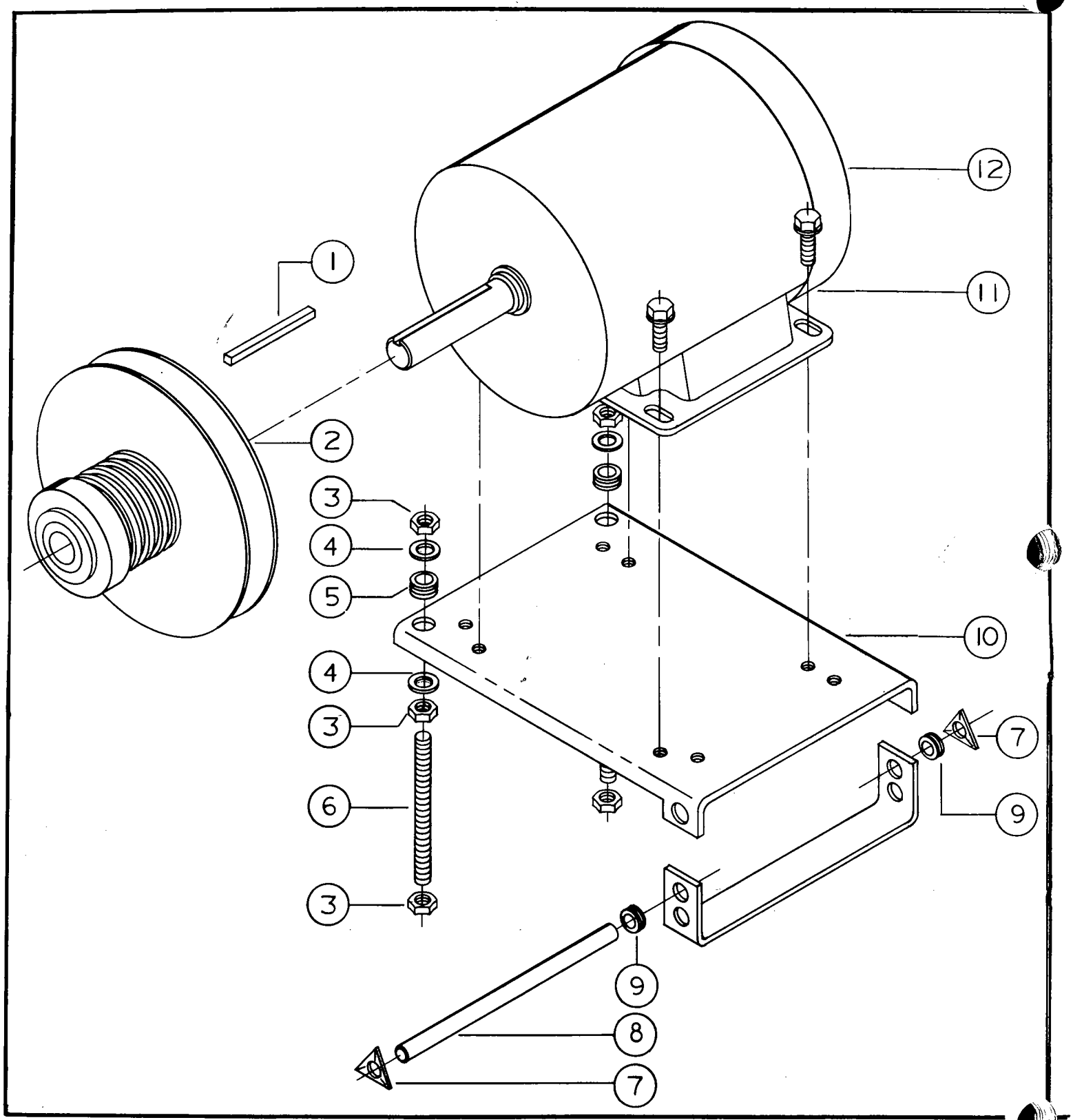


Fig. 11

MODEL 87 MOTOR MOUNTING ASSEMBLY PARTS LIST

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	3388013	KEY, 3/16 X 3/16 X 2-3/4"	1
2	2719083	SHEAVE ASSY., V.S. MOTOR	1
3	6515007	NUT, HEX, 5/16–18	6
4	6861201	WASHER, 5/16" FLAT	4
5	6336008	GROMMET, RUBBER ATLANTIC INDIA No. 2856 (ADJUSTING STUD)	2
6	3773301	STUD, MOUNTING BASE ADJUSTING	2
7	6670078	RING, RETAINING No. 5305–37	2
8	3584035	PIN, PIVOT	1
9	6336001	GROMMET, RUBBER ATLANTIC INDIA No. 896 (PIVOT)	2
10	2595016	PLATE ASSY., MOTOR MTG.	1
11	6715180	SCR., HEX WASHER HD., 5/16 –18 X 5/8"	4
12	6471603	MOTOR, 2 HP, 3 PH, 1800 RPM, 60 HZ, 230/460V, 145T, TEFC	
	6471616	MOTOR, 2HP, 3PH, 1800RPM, 60HZ, 575V. 145T, TEFC	
	6471617	MOTOR, 2HP, 3PH, 1800RPM, 60HZ, 200V, 145T, TEFC	
	6471627	MOTOR, 2HP, 1PH, 1800RPM, 60 HZ, 115/230V, 182, TEFC	
	6471916	MOTOR, 3HP, 3PH, 1800RPM, 60HZ, 208/230/440V, 182/184, TEFC	
	6471301	MOTOR, 1-1/2HP, 1PH, 1800RPM, 60HZ, 115/230V, 145T, TEFC	
	6471304	MOTOR, 1-1/2HP, 3PH, 1800RPM, 60HZ, 230/460V, 145T, TEFC	
	6471317	MOTOR, 1-1/2HP, 3PH, 1800RPM, 60HZ, 575V, 145T, TEFC	
	6471322	MOTOR, 1-1/2HP, 3PH, 1800RPM, 60HZ, 200V, 145T, TEFC	

MODEL 87 COUNTERSHAFT ASSEMBLY

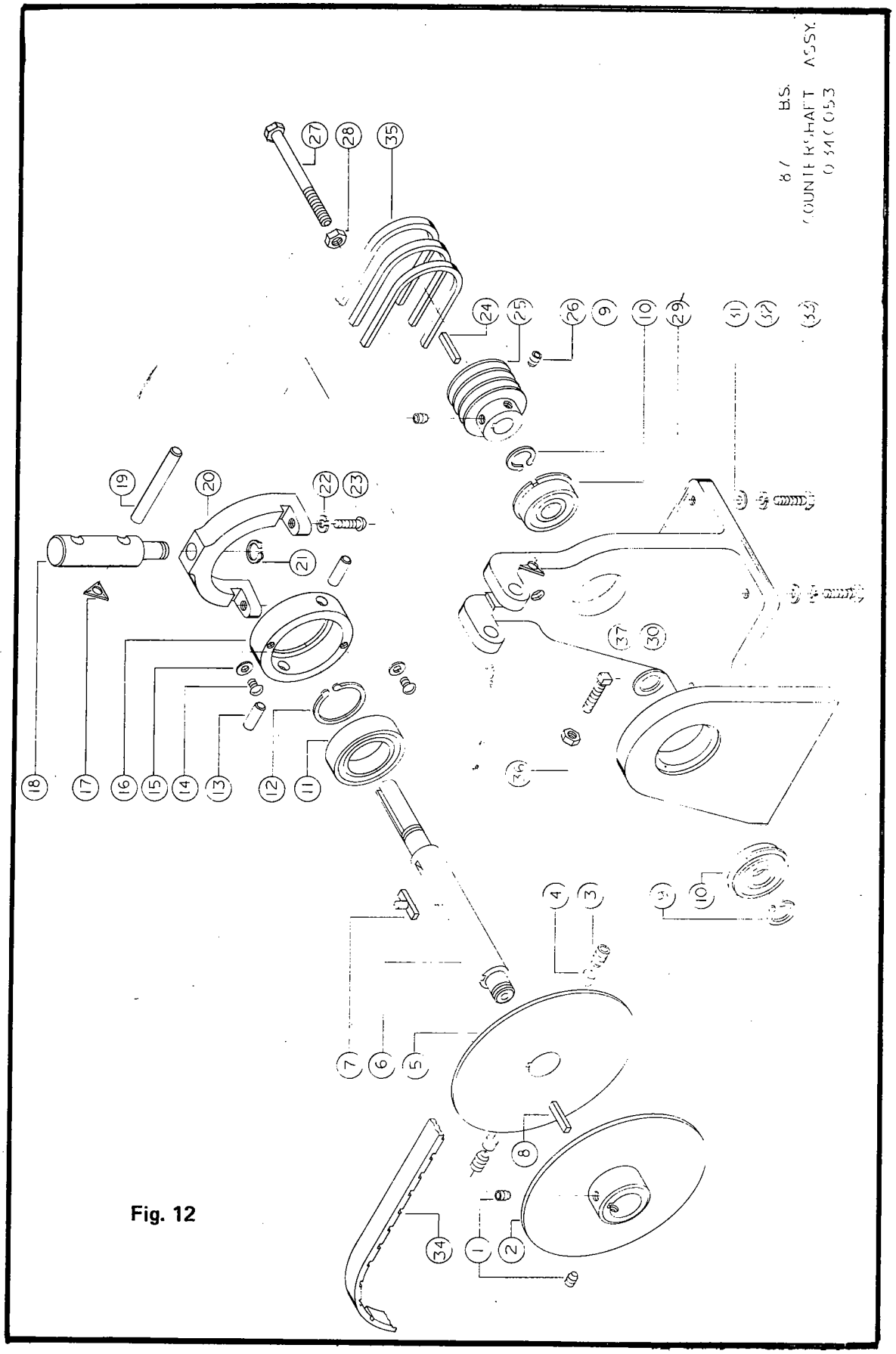


Fig. 12

MODEL 87 COUNTERSHAFT ASSEMBLY

ITEM NO.	PART NO.	DESCRIPTION	QTY.
	2705020	COUNTERSHAFT ASSY. (ITEMS 1 THRU 30)	
	2718004	SHEAVE ASSEMBLY CTRSFT., (ITEMS 1 THRU 8)	
1	6714008	SCR., SOC. SET, KNURLED CUP PT., 1/4–20 x 5/16"	2
2	3719181	SHEAVE, V.S., FIXED	1
3	6720037	SCR., SOC. SET, KNURLED CUP PT., 5/8"–11 x 3/4"	2
4	3598047	PLUG, BRASS	2
5	2719070	SHEAVE ASSY., V.S. SLIDING	1
6	3705019	SHAFT, COUNTER	1
7	3388069	KEY, TIT	1
8	3388068	KEY, C.F. STEEL, 3/16" x 1/4" x 1-3/16"	1
9	6670014	RING, RETAINING, TRUARC No. 5100-98	2
10	6060053	BEARING, BALL, MTC No. 205SZZG	2
11	6060098	BEARING, BALL, MRC No. 111KSZZ, TYPE KS	1
12	6070125	RING, RETAINING, TRUARC No. 5100–215	1
13	6623013	PIN, DOWEL, 5/16" x 1"	2
14	6710032	SCR., ROUND HD., MACHINE, No. 10–24 x 1/4"	2
15	6860800	WASHER, No. 10, FLAT	2
16	3096098	COLLAR, BEARING	1
17	6670078	RING, RETAINING, No. 5305–37	2
18	3044308	BAR, SPEED ADJUST.	1
19	3582091	PIN, PIVOT	1
20	3936012	YOKE, SPEED ADJUST.	1
21	6670008	RING, RETAINING	1
22	6860802	WASHER, No. 10 LOCK	2
23	6710125	SCR., ROUND HD., No. 10–24 X 1-1/8"	2
24	3388009	KEY, 3/16" SQ., x 1-3/4"	1
25	3717062	SHEAVE, COUNTERSHAFT	1
26	6714003	SCR., SOC., SET, CUP PT., 1/4–20 x 3/8"	2
27	6718089	SCR., HEX HD. CAP, 1/2–13 x 7" ADJUSTING	1
28	6518001	NUT, HEX, 1/2–13	1
29	3063415	BRACKET, COUNTERSHAFT	1
30	3735082	SPACER	1
31	6861301	WASHER, 3/8" FLAT	4
32	6861300	WASHER, 3/8" LOCK	4

MODEL 87 COUNTERSHAFT ASSEMBLY

ITEM NO.	PART NO.	DESCRIPTION	QTY.
33	6716031	SCR., HEX HD., 3/8–16 x 1	4
34	6077143	BELT, V.S. 1922V426	1
35	6077141	BELT, "V" 7M1180 (MATCHED SET OF 3)	1
36	6515007	NUT, HEX JAM, 5/16–18	1
37	6715092	SCR., SQ. HD. SET, 5/16–18 x 1-3/4"	1

MODEL 87 UPPER WHEEL HOUSING ASSEMBLY

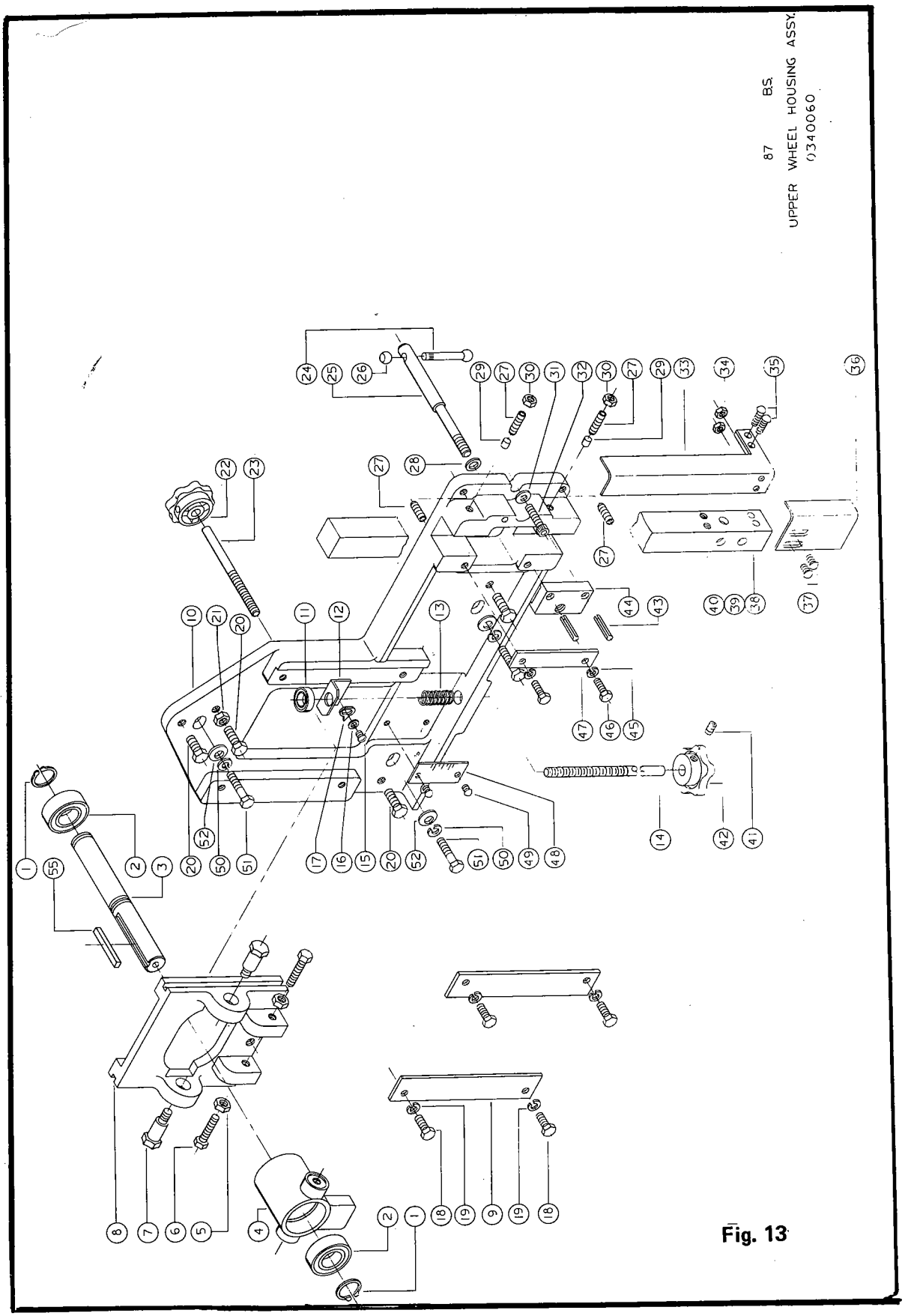


Fig. 13

MODEL 87 BODY ASSEMBLY

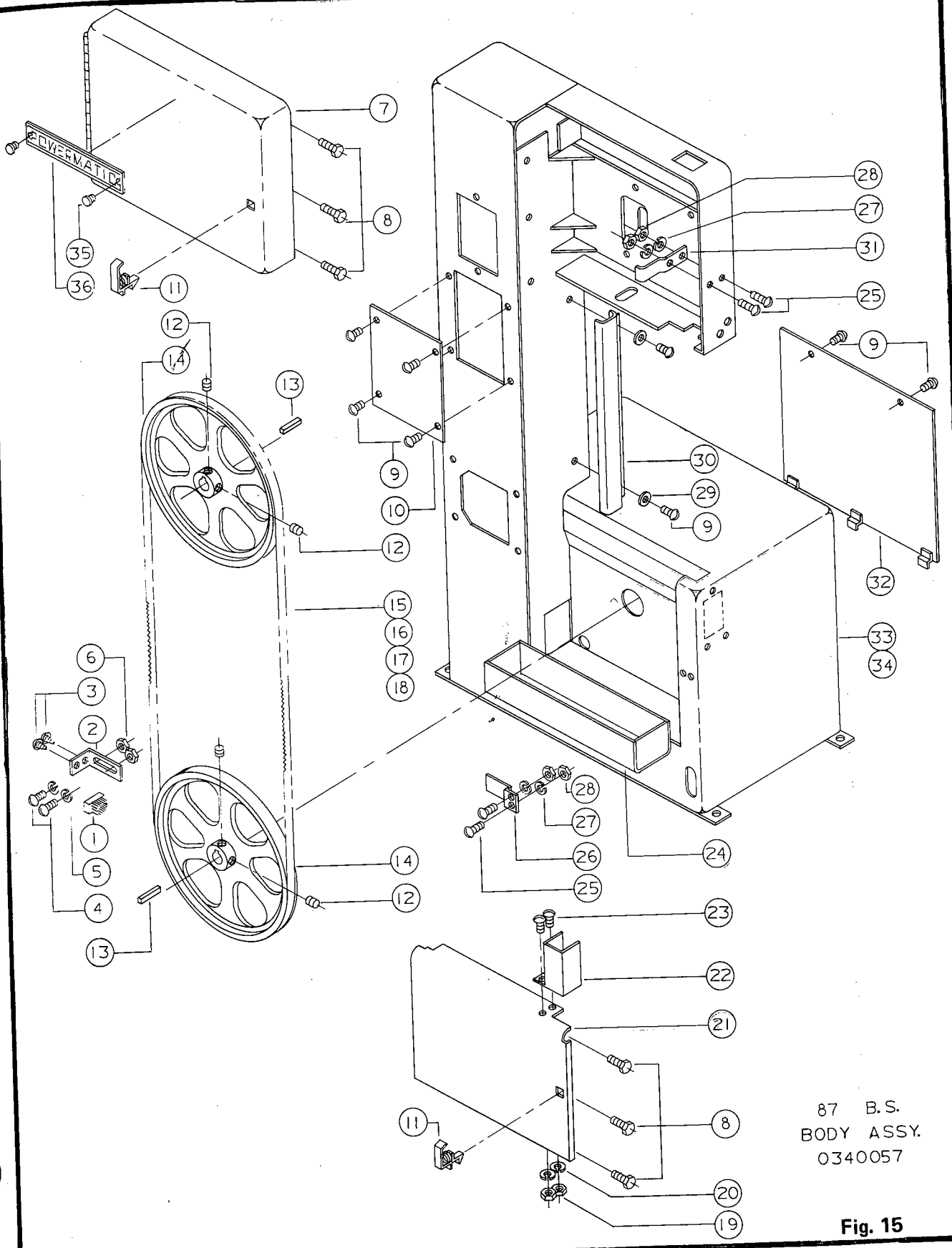


Fig. 15

MODEL 87 SPEED ADJUSTING CONTROL ASSEMBLY

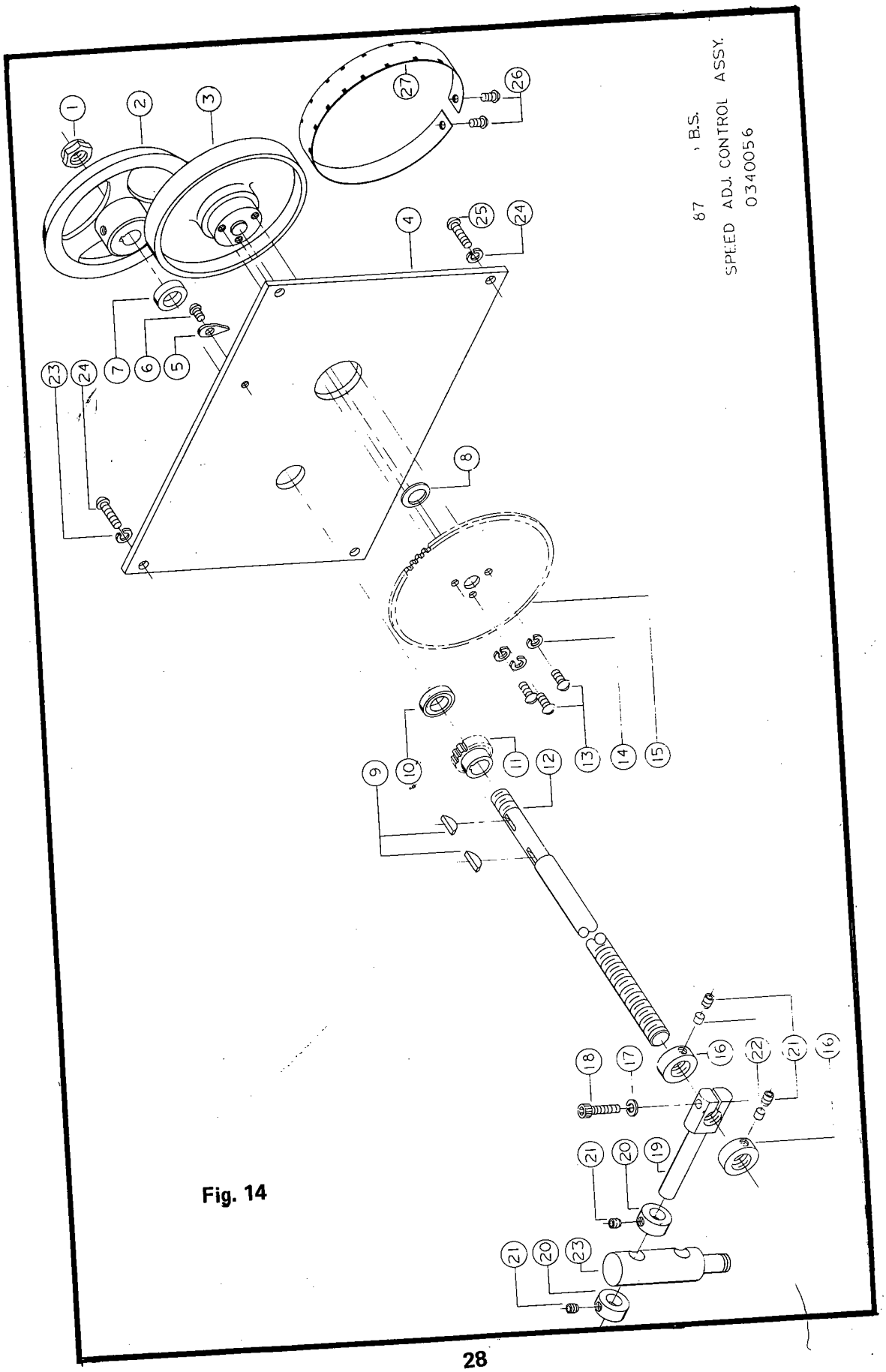


Fig. 14

MODEL 87 SPEED ADJUSTING CONTROL ASSEMBLY

ITEM NO.	PART NO.	DESCRIPTION	QTY
	2089006	CONTROL ASSEMBLY, SPEED ADJ. (ITEMS 1 THRU 22)	
1	6568010	NUT, FLEXLOC, 1/4–20 (THIN HT.)	1
2	3271049	HANDWHEEL, 6" DIA.	1
3	3148007	DRUM, SPEED DIAL	1
4	3595334	PLATE, SPEED ADJUSTMENT MOUNTING	1
5	3604001	POINTER	1
6	6705010	SCR., ROUND HD., MACH., No. 5–40 x 3/8"	1
7	6095175	BUSHING, BRONZE .503/.502 I.D. x .628/.627 O.D. x 1/4" (POWDERCRAFT No. PS–500-16)	1
8	6861508	WASHER, WAVY SPRING ASSOC. SPRING No. W2028–022	1
9	6420000	KEY, WOODRUFF No. 404	2
10	6064000	BEARING, THRUST No. 603-1/4	1
11	3237336	GEAR, SPEED DIAL	1
12	3701051	SHAFT, SPEED ADJUST.	1
13	6710033	SCR., ROUND HD. MACH. No. 10–24 x 3/8"	3
14	6860802	WASHER, No. 10 LOCK	3
15	3237314	GEAR, SPEED DIAL	1
16	3096099	COLLAR	2
17	6861100	WASHER, 1/4" LOCK	1
18	6714016	SCR., SOC. HD. CAP, 1/4–20 x 1"	1
19	3526083	NUT, SPEED ADJUSTMENT	1
20	3096061	COLLAR, PINION SHAFT	2
21	6714004	SCR., SOC. SET, CUP PT. 1/4–20 x 1/4"	4
22	3598028	PLUG	2
23	3044308	BAR, SPEED ADJUSTMENT	1
24	6861100	WASHER, 1/4" LOCK	4
25	6714063	SCR., ROUND HD. MACH., 1/4–20 x 1/2"	4
26	6747001	SCR., DRIVE, No. 4 x 4-1/4 (NICKEL PLATED)	2
27	3684259	SCALE, SPEED	1

MODEL 87 SPEED ADJUSTING CONTROL ASSEMBLY

ITEM NO.	PART NO.	DESCRIPTION	QTY

MODEL 87 UPPER WHEEL HOUSING ASSEMBLY

ITEM NO.	PART NO.	DESCRIPTION	QTY
	2730021	SLIDE ASSEMBLY (ITEMS 1 THRU 21)	
	2298029	HOUSING ASS'Y., UPPER SHAFT BRG. (ITEMS 1 THRU 4)	
1	6670096	RING, RETAINING, TRUAC No. 5160–118	2
2	6060014	BEARING, BALL, SKF No. 6206–2Rs	2
3	3700014	SHAFT, UPPER WHEEL	1
4	3298034	HOUSING, UPPER SHAFT BEARING	1
5	6516009	NUT, HEX JAM, 3/8–16	2
6	6716032	SCR., HEX HD., 3/8–16 x 1-1/2"	2
7	3058011	BOLT, UPPER WHEEL PIVOT	2
8	3063041	BRACKET, UPPER BEARING HOUSING MOUNTING	1
9	3244035	GIB, UPPER BEARING HOUSING SLEEVE	2
10	3064289	BRACKET, UPPER WHEEL HOUSING	1
11	6064000	BEARING, THRUST, NICE No. 603-1/4	1
12	3094011	CLIP, SPRING	1
13	6813061	SPRING,BAUMBACH No. S–62	1
14	3690029	SCREW, TENSION ADJ.	1
15	6706037	SCR., ROUND HD., 6–32 x 3/16"	1
16	6860600	WASHER, FLAT No. 6	1
17	3604004	POINTER	1
18	6716030	SCR., HEX HD., 3/8–16 x 3/4"	4
19	6861300	WASHER, 3/8" LOCK	4
20	6718010	SCR., HEX HD., CAP 1/2–13 x 1-1/2"	4
21	6518008	NUT, HEX, 1/2–13	1
	2690001	SCREW ASSEMBLY, TILT ADJUST. (ITEMS 22 THRU 23)	
22	3406018	KNOB	
23	3690028	SCREW, TILT ADJ.	1
	2695028	SCREW ASSEMBLY, GUIDE BAR LOCK (ITEMS 24 THRU 26)	
24	3268002	HANDLE	1
25	3692036	SCREW, GUIDE BAR LOCK	1
26	3406016	KNOB, HANDLE	1
27	6716093	SCR., SOC. SET, HALF DOG Pt., 3/8–16 x 1" Nylok	4
28	6861201	WASHER, 5/16" FLAT	1

MODEL 87 UPPER WHEEL HOUSING ASSEMBLY

ITEM NO.	PART NO.	DESCRIPTION	QTY
29	3598022	PLUG, PROTECTOR, 5/16" Dia. x 3/16" Lg.	2
30	6516009	NUT, HEX, 3/8–16	2
31	6861301	WASHER, 3/8" FLAT	1
32	6716015	SCR., SOC. HD. CAP, 3/8–16 x 1-1/2"	1
33	2250059	GUARD ASSEMBLY, BLADE (WELDMENT)	1
34	6510005	NUT, HEX, No. 10–24	2
35	6714114	SCR., RD., HD.,MACH., 1/4–20 x 3/8"	2
36	3720015	SHIELD, BLADE GUARD	1
37	6710034	SCR., RD. HD., No. 10–24 x 1/2"	2
40	3044102	BAR, GUIDE (87 B.S.)	1
41	6715013	SCR., SOC. SET, CUP PT, 5/16–18 x 3/8"	1
42	3271008	HANDWHEEL, 3-1/2"	1
43	6626029	PIN, SPRING, 3/16" DIA. x 1" LG.	2
44	3448030	LOCK, GUIDE BAR	1
45	6861100	WASHER, 1/4" LOCK	2
46	6714049	SCR., HEX HD. CAP, 1/4–20 x 3/4"	2
47	3481041	PLATE, GUIDE BAR MOUNTING	1
48	3684210	SCALE, TENSION	1
49	6747000	SCR., DRIVE, No. 4 x 3/16"	2
50	6861300	WASHER, 3/8" LOCK	3
51	6716124	SCR., HEX HD. CAP, 3/8–16 x 2-1/4"	3
52	3838203	WASHER, BEVEL	3
53	6715092	SCR., SQ. HD. SET, 5/16–18 x 1-3/4" (HORIZ. ADJ. NOT SHOWN)	2
54	6515007	NUT, HEX JAM, 5/16–18 (HORIZ. ADJ. NOT SHOWN)	2
55	3388020	KEY, 1/4 x 1/4 x 2"	1

MODEL 87 BODY ASSEMBLY

ITEM NO.	PART NO.	DESCRIPTION	QTY
	2072001	BRUSH ASSY., LOWER WHEEL (ITEMS 1 THRU 3)	
1	3072002	BRUSH, WHEEL CLEANING	1
2	3064005	BRACKET, MOUNTING	1
3	6748002	SCR., RD. HD. WOOD No. 6 x 1/2", BLUED	2
4	6086014	BOLT, CARRIAGE, 1/4–20 x 3/4"	2
5	6861100	WASHER, 1/4" LOCK	2
6	6514001	NUT, HEX, 1/4–20	2
7	2136028	DOOR ASSY., UPPER (WELDMENT)	1
8	6715007	SCR., HEX WASHER HD. TAPTITE, 5/16–18 x 1/2"	6
9	6714114	SCR., RD. HD. MACH., 1/4–20 x 3/8"	8
10	3104035	COVER, WELDER CUTOUT	1
11	6440005	LATCH, DOOR (UPPER & LOWER)	2
12	6716003	SCR., SOC.,SET, CUP PT., 3/8–16 x 3/8"	4
13	3388020	KEY, 1/4 x 1/4 x 2"	2
14	2850003	WHEEL ASSY., UPPER & LOWER	2
15	6080021	BLADE, METAL CUTTING 3/8 x 151 x 14P (STD.)	1
16	6080020	BLADE, METAL CUTTING 1/4 x 151 x 14P (OPT.)	1
17	6080022	BLADE, METAL CUTTING 1/2 x 151 x 14P (OPT.)	1
18	6080103	BLADE, METAL CUTTING 3/4 x 151 x W/6P (OPT.)	1
19	6506001	NUT, HEX, No. 6–32	2
20	6860602	WASHER, No. 6 LOCK	2
21	2136029	DOOR ASSY., LOWER (WELDMENT)	1
22	3250287	GUARD, LOWER DOOR	1
23	6706038	SCR., RD.HD.MACH., No. 6–32 x 1/2"	2
24	2577001	DUST PAN ASSY (WELDMENT)	1
25	6710034	SCR., RD. HD. MACH. No. 10–24 x 1/2"	4
26	3420008	LATCH BLOCK, LOWER	1
27	6860802	WASHER, No. 10 LOCK	4
28	6510001	NUT, HEX, No. 10–24	4
29	6861101	WASHER, 1/4" FLAT	2
30	3250222	GUARD, BLADE COLUMN	1
31	3420009	LATCH BLOCK, UPPER	1
32	2136033	DOOR ASSY., MOTOR DR.)	1
33	2056020	BODY ASSY., 20" STD. MACHINE	1

MODEL 87 BODY ASSEMBLY

ITEM NO.	PART NO.	DESCRIPTION	QTY
34	2056025	BODY ASSY., BAND SAW 24" UNDER GUIDES	1
	2388056	KIT, PLATE, I.D., SPEED DECAL, ETC., (ITEMS 35 THRU 45)	
35	6680020	RIVET, ALUM., 5/32 x 1/4"	2
36	3312254	PLATE, I.D. POWERMATIC	1
37	3312228	PLATE, I.D. SERIAL NO. (NOT SHOWN)	1
38	6747001	SCR., DRIVE, No. 4 x 1/4" (NICKEL PLATED)(NOT SHOWN)	10
39	3330254	PLATE, INSTRUCTION SAW OPERATING	1
40	3330276	PLATE, INSTRUCTION BLADE LENGTH (NOT SHOWN)	1
41	3085203	CHART, BLADE SPEED & FEED SELECTION (NOT SHOWN)	1
42	3330233	PLATE, INSTRUCTION, CHANGE OF SPEEDS (NOT SHOWN)	1
43	3330283	PLATE, SAFETY (NOT SHOWN)	1
44	3684259	SCALE, SPEED (NOT SHOWN)	1
45	3330300	PLATE, SHIFT INSTRUCTION (NOT SHOWN)	1

MODEL 87 TABLE AND TRUNNION ASSEMBLY

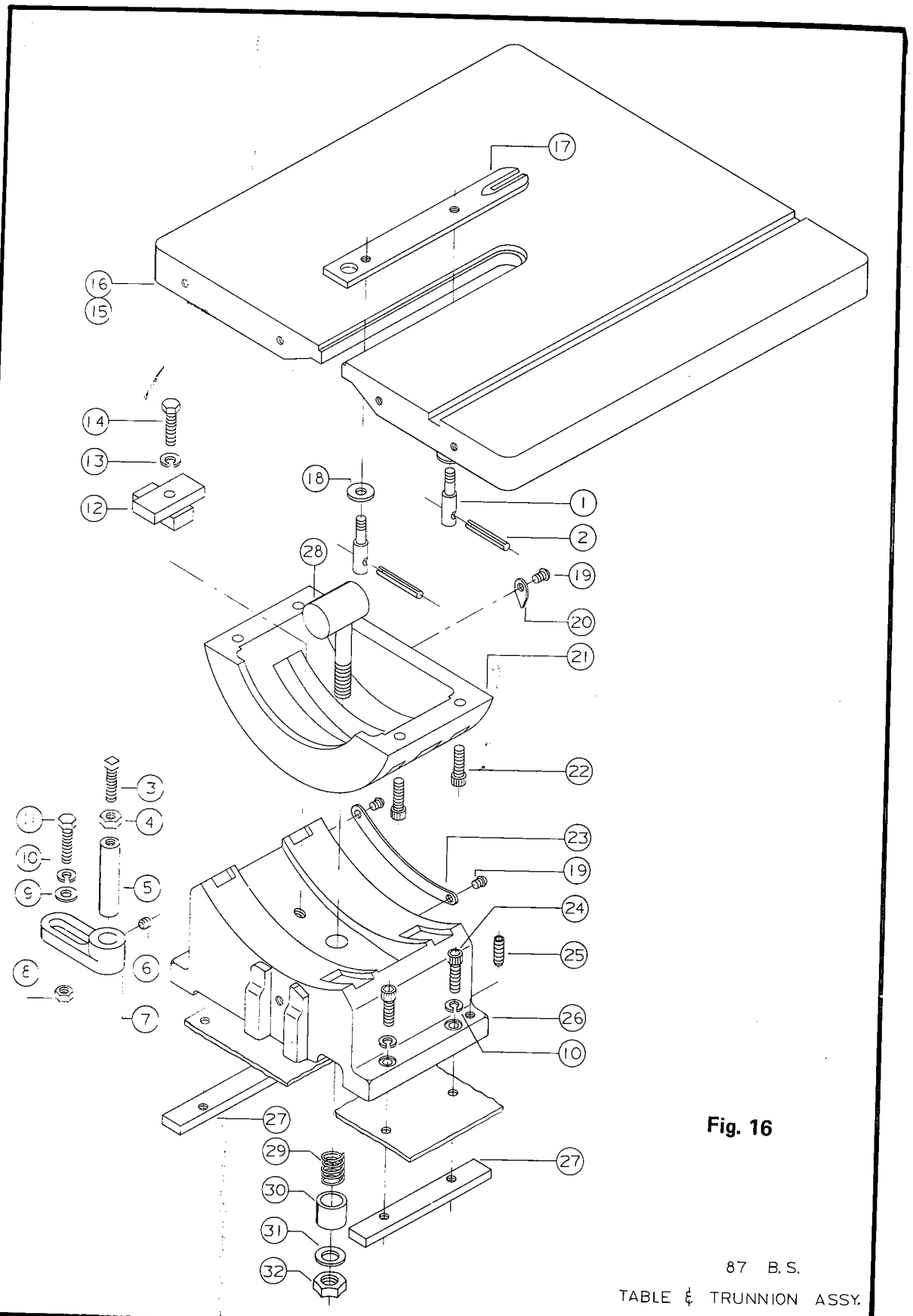


Fig. 16

MODEL 87 TABLE AND TRUNNION ASSEMBLY

ITEM NO.	PART NO.	DESCRIPTION	QTY
	2695033	SCREW ASSEMBLY, INSERT LOCK (ITEMS 1 & 2)	
1	3695205	SCREW, TABLE INSERT	1
2	6626033	PIN, SPRING, 3/16" DIA. x 2" Lg	1
	2761001	STOP ASSEMBLY, TABLE BRACKET (ITEMS 3 THRU 7)	
3	6716083	SCR., SQ., HD. SET, 3/8–16 x 1-3/4"	1
4	6516009	NUT, HEX JAM, 3/8–16	1
5	3583013	PIN, LOCATING, TABLE STOP BRACKET	1
6	6715016	SCR.,SOC. SET, CUP PT., 5/16–18 x 5/16"	1
7	3274011	HANGER, COMPOUND SHEAVE	1
8	6516001	NUT, HEX, 3/8–16	1
9	6861301	WASHER, 3/8" FLAT	1
10	6861300	WASHER, 3/8" LOCK	5
11	6716039	SCR., HEX HD. CAP 3/8–16 x 1-1/4"	1
12	2253025	GUIDE ASSY. TRUNNION	1
13	6861200	WASHER, 5/16" LOCK	1
14	6715044	SCR., HEX HD. CAP 5/16–18 x 2"	1
15	3797072	TABLE, BAND SAW (W.O. T–SLOT	1
16	379073	TABLE, BAND SAW W. T–SLOT	1
17	3328040	INSERT, TABLE	1
18	3837035	WASHER, 3/8" I.D. x 1-3/8" O.D. x 3/16" THICK	2
19	6747000	SCR., DRIVE No. 4 x 3/16"	3
20	3604001	POINTER	1
21	3810003	TRUNNION, TABLE TILTING	1
22	6716016	SCR., SOC. HD. CAP 3/8–16 x 7/8"	4
23	3684212	SCALE, TRUNNION TILT	1
24	6716017	SCR., SOC. HD. CAP 3/8–16 x 1-3/4"	4
25	6716100	SCR., SOC. SET, HALF DOG PT., 3/8–16 x 3/4"	2
26	3064070	Bracket, TRUNNION, TABLE TILTING	1
27	3044322	BAR, TRUNNION BRACKET MOUNTING	2
28	2440010	LOCK ASSY., TRUNNION	1
29	6813044	SPRING, COMPRESSION No. 12101	1

MODEL 87 TABLE AND TRUNNION ASSEMBLY

ITEM NO.	PART NO.	DESCRIPTION	QTY
30	3735054	SPACER, LOCKING	1
31	6861701	WASHER, 5/8" FLAT	1
32	6520011	NUT, HEX, 5/8–11 (Heavy)	1
33	3722019	SHIM, LAMINATED TRUNNION (NOT SHOWN)	AS REQ.
34	3722020	SHIM, TRUNNION (NOT SHOWN)	AS REQ.

MODEL 87 TRANSMISSION ASSEMBLY

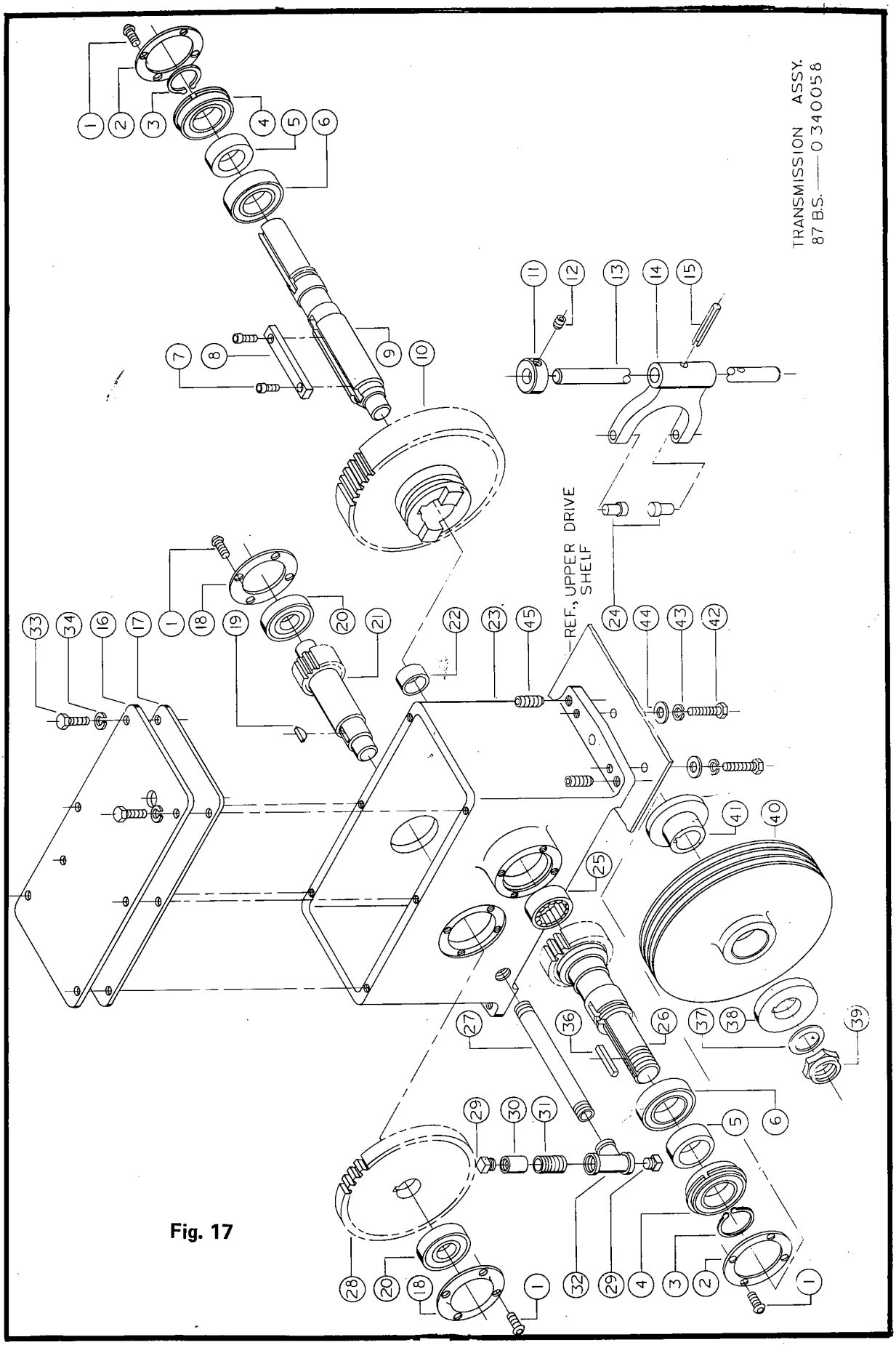


Fig. 17

MODEL 87 TRANSMISSION ASSEMBLY

ITEM NO.	PART NO.	DESCRIPTION	QTY.
		(ITEMS 1 THRU 35)	
	2805012	TRANSMISSION ASSEMBLY	
1	6714083	SCR., SOC.HD BUTTON 1/4–20 x 1/2"	16
2	3659016	RETAINER, BEARING	2
3	6670013	RING, RETAINING No. 5100–137	2
4	6060184	BEARING, BALL, FAFNIR, No. 207NPPG	2
5	3735077	SPACER, BEARING	2
6	6060185	BEARING, BALL, FAFNIR No. 207NPP	2
7	6710015	SCR., SOC. HD. CAP No. 10–24 x 1/2"	2
8	3388063	KEY, DRIVE	1
9	3700098	SHAFT, OUTPUT	1
10	3237335	GEAR, LOW SPEED DRIVEN	1
11	3096243	COLLAR	1
12	6715015	SCR., SOC, SET, CUP PT., 5/16–18 x 1/4"	1 1
13	3700097	SHAFT, SHIFTING	1
14	3936011	YOKE, SHIFTING	1
15	6626040	PIN, SPRING, 1/4 DIA. x 1-1/4" LG.	1
16	3800034	TOP, TRANSMISSION	1
17	3234022	GASKET, TRANSMISSION	1
18	3078078	CAP, BEARING	2
19	6420009	KEY, WOODRUFF No. 807	1
20	6060014	BEARING, BALL, SKF No. 6206–2RS	2
21	3705016	SHAFT, COUNTER	1
22	6063013	BEARING, INNER RACE TORRINGTON No. 1R–1212	1
23	3298367	HOUSING, TRANSMISSION	1
24	3582090	PIN, SHIFTING	2
25	6063041	BEARING, ROLLER TORRINGTON No. J–1612	1
26	3700099	SHAFT, INPUT	1
27	3509005	NIPPLE, PIPE, 1/2 NPT x 9"L	1
28	3237312	GEAR, INPUT DRIVEN	1
29	6638004	FITTING, PIPE, 1/2 NPT, PLUG	2
30	6634047	FITTING, PIPE, 1/2 NPT COUPLING	1
31	6634060	FITTING, PIPE, 1/2 NPT ALL THREAD CLOSE NIPPLE	1
32	6634072	FITTING, PIPE, 1/2 NPT "T" (STRAIGHT)	1
33	6714127	SCR., HEX HD. CAP, 1/4–20 x 1/2"	6
34	6861100	WASHER, 1/4" LOCK	6
35	6605018	OIL, TRANSMISSION MOBIL VACTRA No. 1	3qts.

MODEL 87 TRANSMISSION ASSEMBLY

ITEM NO.	PART NO.	DESCRIPTION	QTY.
36	3388066	KEY, FRICTION HUB	1
37	6863002	WASHER, BELLVILLE SPR.	1
38	3595333	PLATE, FRICTION	1
39	6576004	NUT, FLEXLOC, 1–14 (THIN HT.)	1
40	3719068	SHEAVE, TRANSMISSION	1
41	3301040	HUB, FRICTION	1
42	6716037	SCR., HEX HD. CAP, 3/8–16 x 2"	4
43	6861300	WASHER, 3/8" LOCK	4
44	3837035	WASHER, FLAT, STEEL 3/8 I.D. x 1-3/8 O.D. x 3/16" THICK	4
45	6718056	SCR., SOC. SET, 1/2–13 x 3/4"	4

MODEL 87 CHIP BLOWER KIT

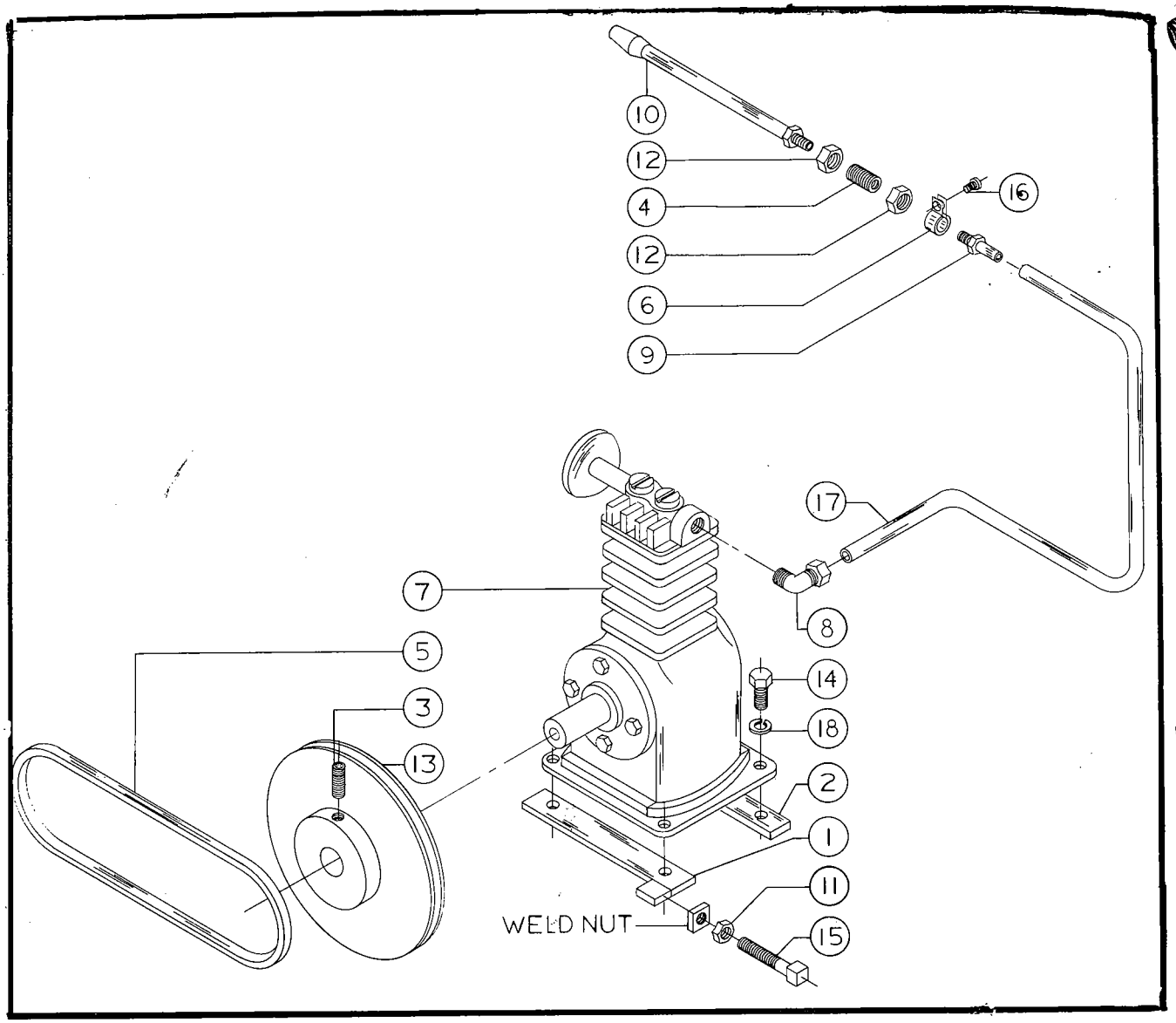


Fig. 18

MODEL 87 CHIP BLOWER KIT PARTS LIST MODEL 87 CHIP BLOWER KIT

ITEM NO.	PART NO.	DESCRIPTION	QTY.
	2395003	CHIP BLOWER KIT (ITEMS 1 THRU 18)	
1	2040036	BAR, COMPRESSOR MTG., ASSEMBLY	1
2	3044309	BAR, COMPRESSOR MTG.	1
3	6714000	SCR., SOC. HD. SET, 1/4–20 X 1/2" L.	1
4	3773216	STUD, MOUNTING	1
5	6077076	BELT, "V" 7M710	1
6	6122023	CLAMP, TUBE, TINNERMAN No. C-3053A-6, 3/8"	1
7	6134001	COMPRESSOR, SMITH No. 28	1
8	6284064	FITTING, TUBE, IMPERIAL EASTMAN No. KF04-04PS-90°	1
9	6284073	FITTING, TUBE, 1/4 I.D. TUBE X 1/8 NPT, No. MBS 300-1/8 X 27"	1
10	6498001	NOZZLE, 1/8–27 NPT	1
11	6515007	NUT, HEX JAM, 5/16–18 (BELT ADJUSTING)	1
12	6519004	NUT, HEX JAM, 9/16–12	2
13	6714000	SHEAVE, COMPRESSOR	1
14	6715032	SCR., HEX HD. CAP, 5/16–18 X 1" L.	4
15	6715092	SCR., SOC. HD. SET, 5/16–18 X3/4" L. (BELT ADJUSTING)	1
16	6746002	SCR., PAN HD. SELF TAPPING No. 8 X 3/8" L.	1
17	6833009	TUBE, BLACK PLASTIC, 3/8 O.D. X .075" WALL	8'
18	6861200	WASHER, LOCK, 5/16"	4

MODEL 87 ELECTRICAL SCHEMATIC, MANUAL CONTROL

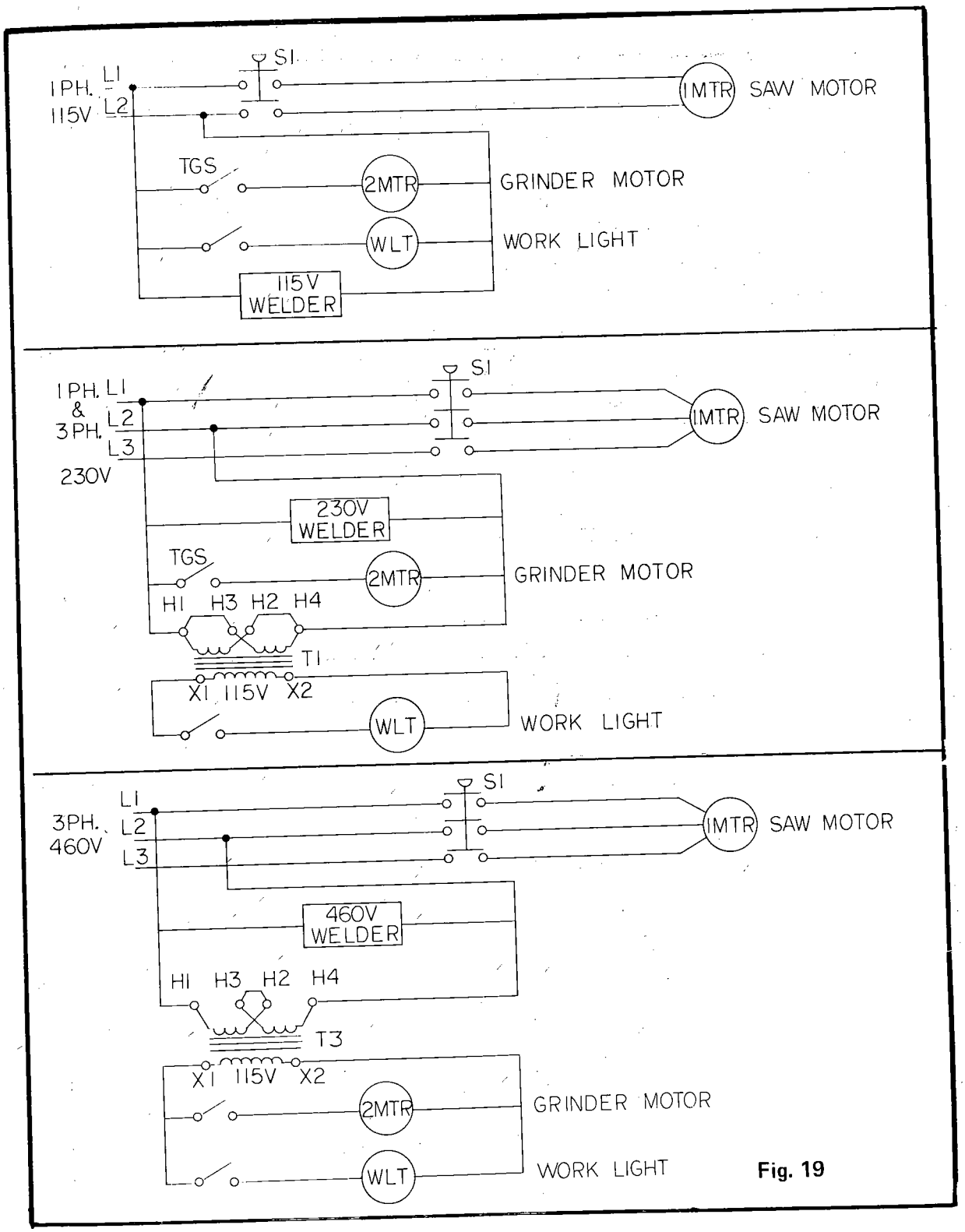


Fig. 19

MODEL 87 ELECTRICAL SCHEMATIC, MAGNETIC CONTROL

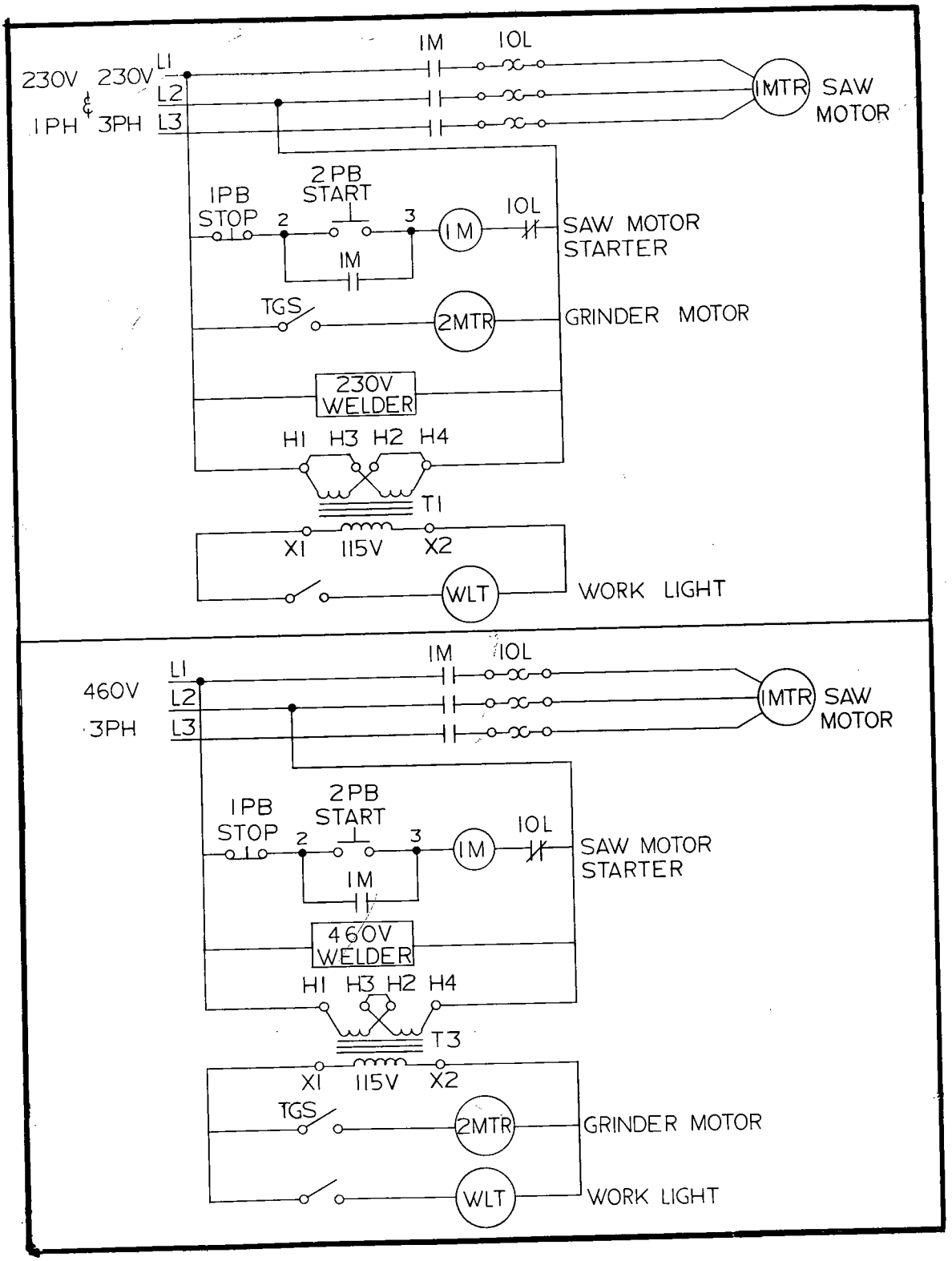


Fig. 20

MODEL 87 ELECTRICAL SCHEMATIC
MAGNETICS WITH LOW VOLTAGE CONTROL

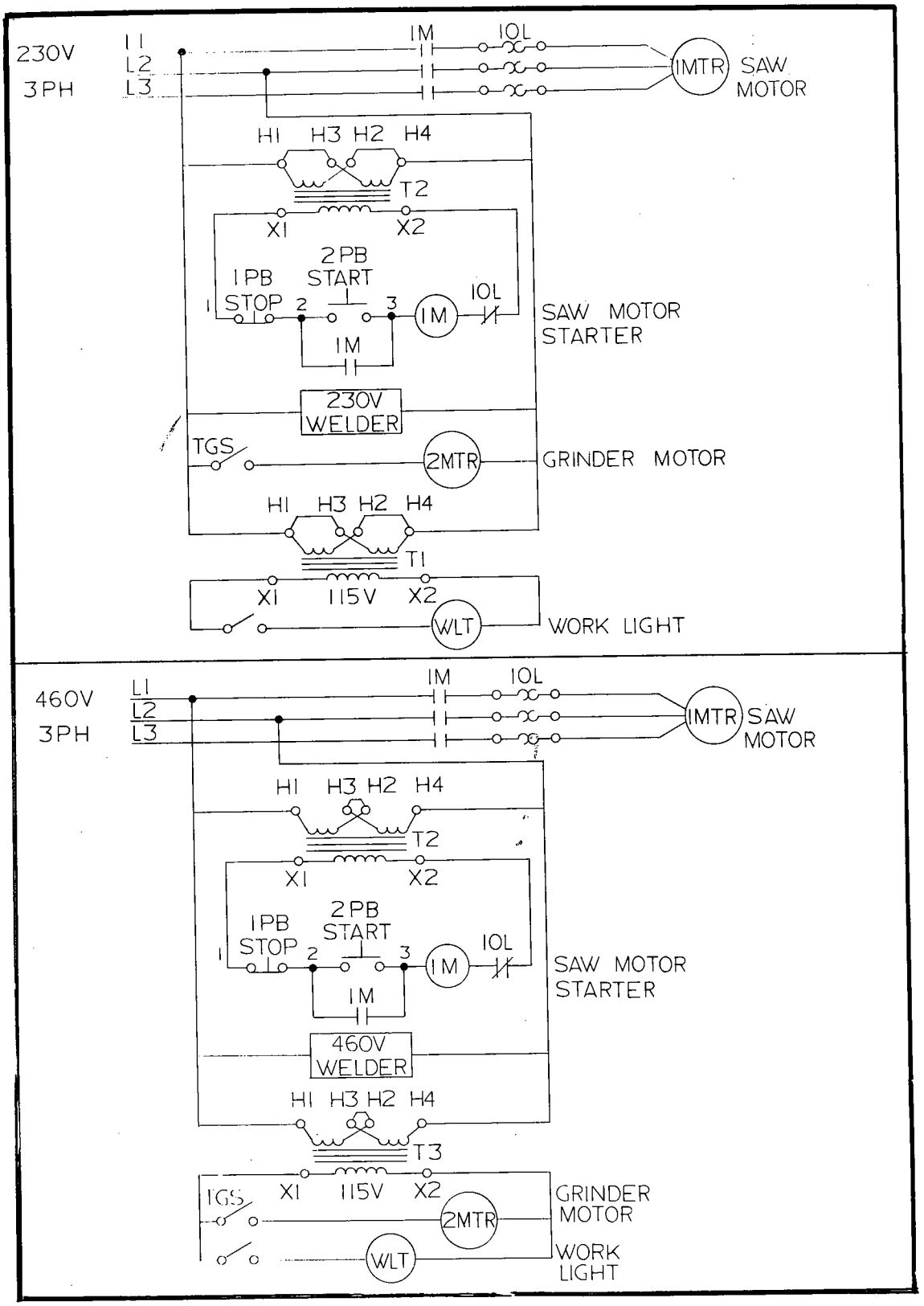


Fig. 21

ELECTRICAL SCHEMATICS PARTS LIST
FIGS. 15, 16 AND 17

REF.	QTY.	POWERMATIC NO.	MFG. DESCRIPTION
S1	1	(3PH) 6821135	SWITCH, FURNAS 12BA34P
		(1PH) 6821134	SWITCH, FURNAS 12BA24P
1PB 2PB	1	6821014	SWITCH, FURNAS B-2873 1B
2MTR	1	6470000	MOTOR, ELEC, 1/6HP., 1PH., 3600RPM, 115/230V
TGS	1	6821045	SWITCH, TOGGLE, CH #7561K1
WLT	1	6448003	LIGHT, WORK, MOFFIT #VL18-PNC-ENP
T1	1	6831006	TRANSFORMER, 230/460-115V, 100VA
T3		6831008	TRANSFORMER, 230/460-115V, 500VA
T2	1	6831068	TRANSFORMER, 115/230-24V, 50VA
		6831069	TRANSFORMER, 230/460-24V, 75VA
		6831070	TRANSFORMER, 230/460-115V, 50VA
1M	1	(1PH) 6816105	STARTER, MAG., FURNAS #14CF12BA7
		(3PH) 6816112	STARTER, MAG., FURNAS #14CF32BC71
1M WITH XMR	1	6816119	STARTER, MAG. W/XMR, 1PH, 24V, FURNAS #14CF107013
		6816138	// // // 1PH, 115V, // #14CF107017
		6816123	// // // 3PH, 24V, // #14CF32BJ71BD
		6816127	// // // 3PH, 115V, // #14CF32BA71BD
WELDER	1	2846001	WELDER, POWERMATIC, 115 V
		2846002	// // 230V
		2846006	// // 460V

87 B.S.
0940110
PARTS LIST FOR ELEC.
SCHEMATIC DWG NO.S
0940107-MAN. CONT.
0940108-MAG. CONT.
0940109-MAG. W/LOW V. CONT.

Fig. 22

MODEL 87 BAND FILE ATTACHMENT (OPTIONAL)

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	6710016	SCR., SOC. HD. CAP, 10–24 X 5/8"	2
2	3064282	BARCKET, FILE GUIDE	2
3	3328054	INSERT, TABLE BAND FILING	1
4	3044204	BAR, FILE ATTACHMENT MOUNTING	1
5	6716016	SCR., SOC. HD. CAP, 3/8–16 X 7/8"	2
6	3253026	GUIDE, FILE, 1/4" ONLY	1
7	3253027	GUIDE, FILE, 3/8" ONLY	1
8	3253028	GUIDE, FILE, 1/2" ONLY	1
	2028040	COMPLETE BAND FILE ATTACHMENT CONSISTS OF ITEMS 1,2,3,4,5,6	
	2028041	COMPLETE BAND FILE ATTACHMENT CONSISTS OF ITEMS 1,2,3,4,5,7	
	2028042	COMPLETE BAND FILE ATTACHMENT CONSISTS OF ITEMS 1,2,3,4,5,8	

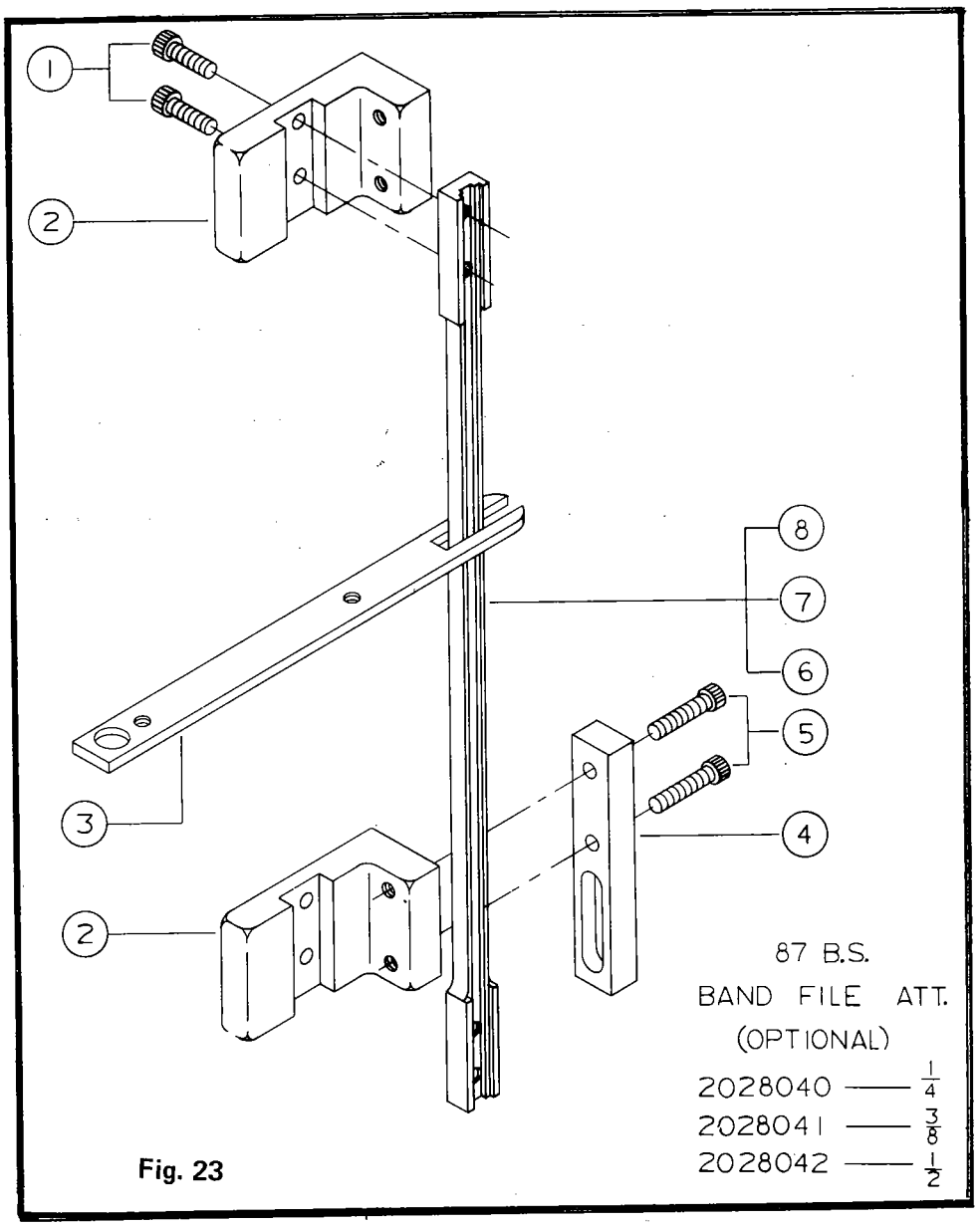


Fig. 23

MODEL 87 GUIDE ASSEMBLY, 90°
(OPTIONAL)

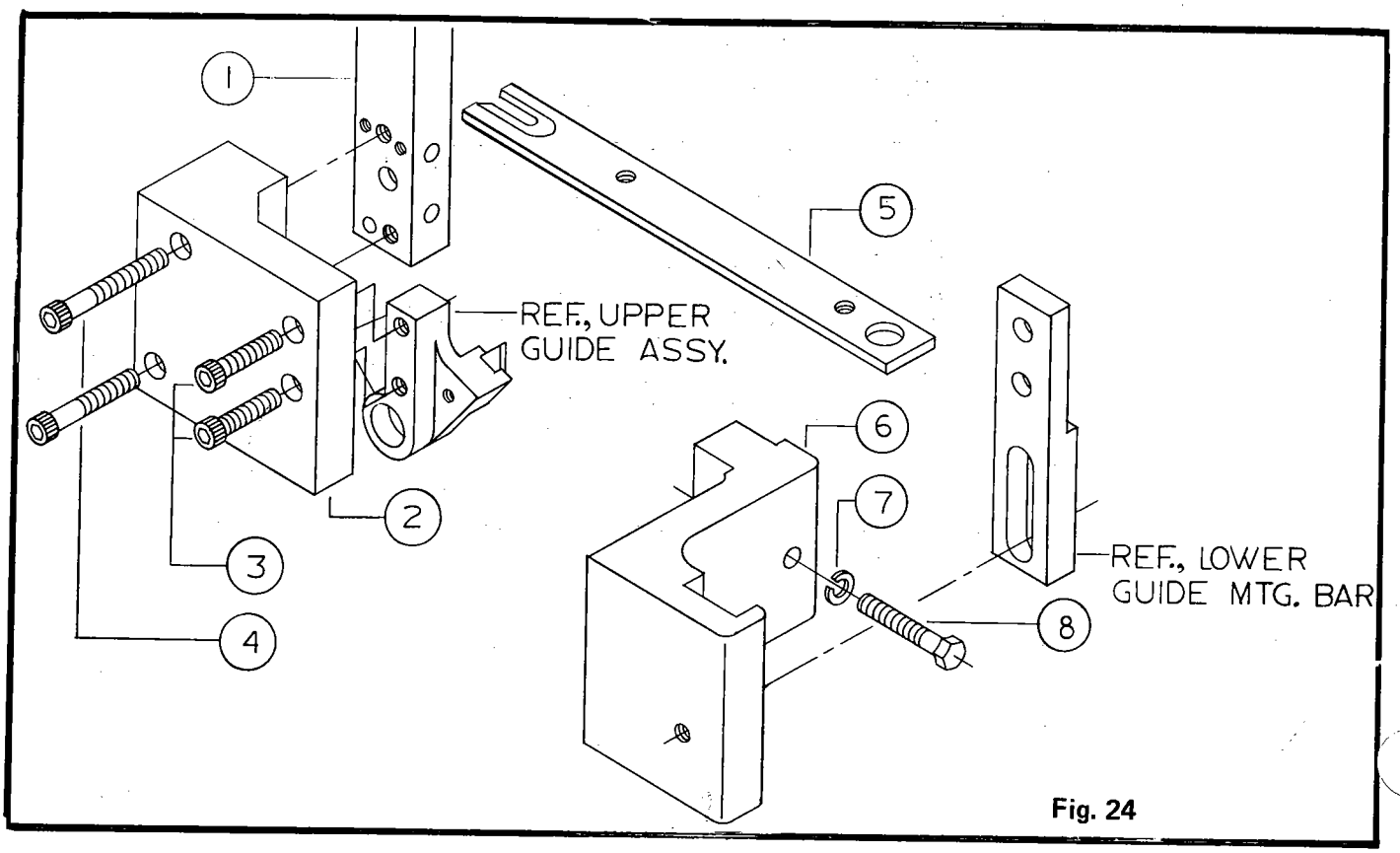


Fig. 24

MODEL 87 CLAMP ASSEMBLY BLADE FILING
(OPTIONAL)

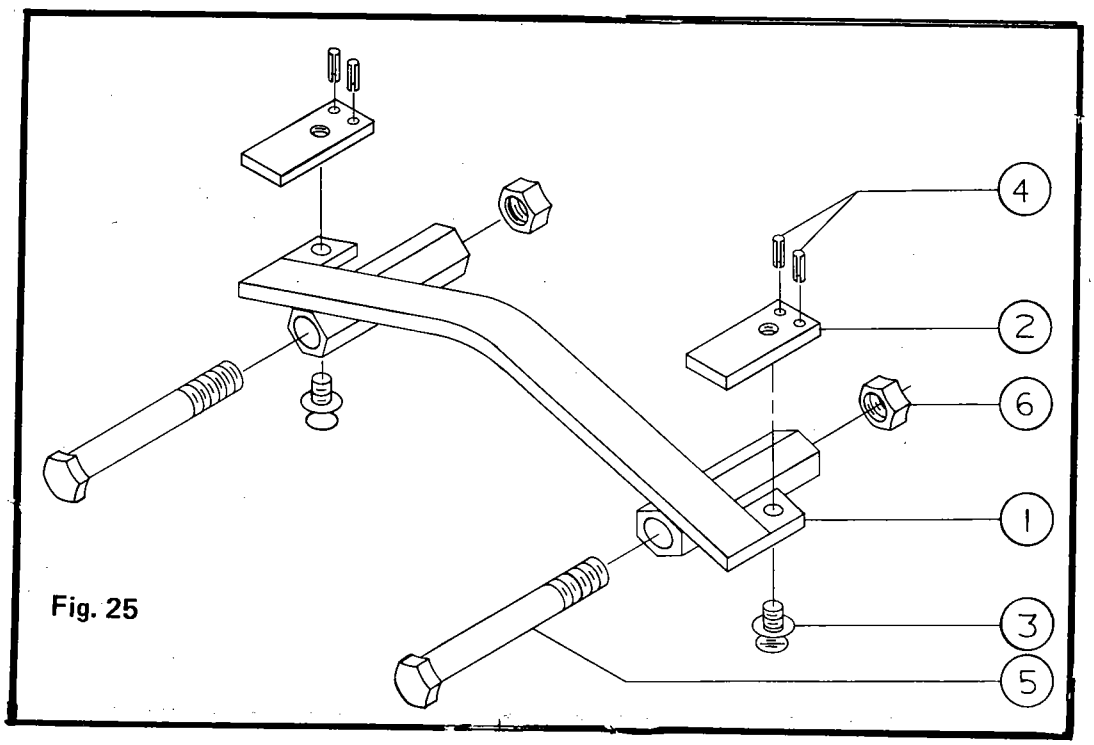


Fig. 25

MODEL 87 GUIDE ASSEMBLY, 90° PARTS LIST

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	3044211	BAR, GUIDE, 90° TWIST	1
2	3062031	BRACKET, UPPER GUIDE MOUNTING 90° TWIST	1
3	6716012	SCR., SOC. HD. CAP, 3/8–16 X 1"	2
4	6716024	SCR., SOC. HD. CAP, 3/8–16 X 2-1/4"	2
5	3328063	INSERT, TABLE, 90° TWIST	1
6	3062033	BRACKET, LOWER GUIDE MTG., 90° TWIST	1
7	6861300	WASHER, 3/8" LOCK	1
8	6716124	SCR., HEX HD. CAP, 3/8–16 X 2-1/4"	1

MODEL 87 CLAMP ASSEMBLY BLADE FILING PARTS LIST

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	2042003	BASE ASSY., MOUNTING POST (WELDMENT)	1
2	3092014	CLAMP, SAW BLADE	2
3	6715066	SCREW, THUMB	2
4	6626002	PIN, SPRING, 1/8 X 3/8"	4
5	6716149	SCR., HEX HD. CAP, 3/8–16 x 3-1/2"	2
6	6516001	NUT, HEX, 3/8 –16	2

MODEL 87 HAND FEED ASSEMBLY (OPTIONAL)

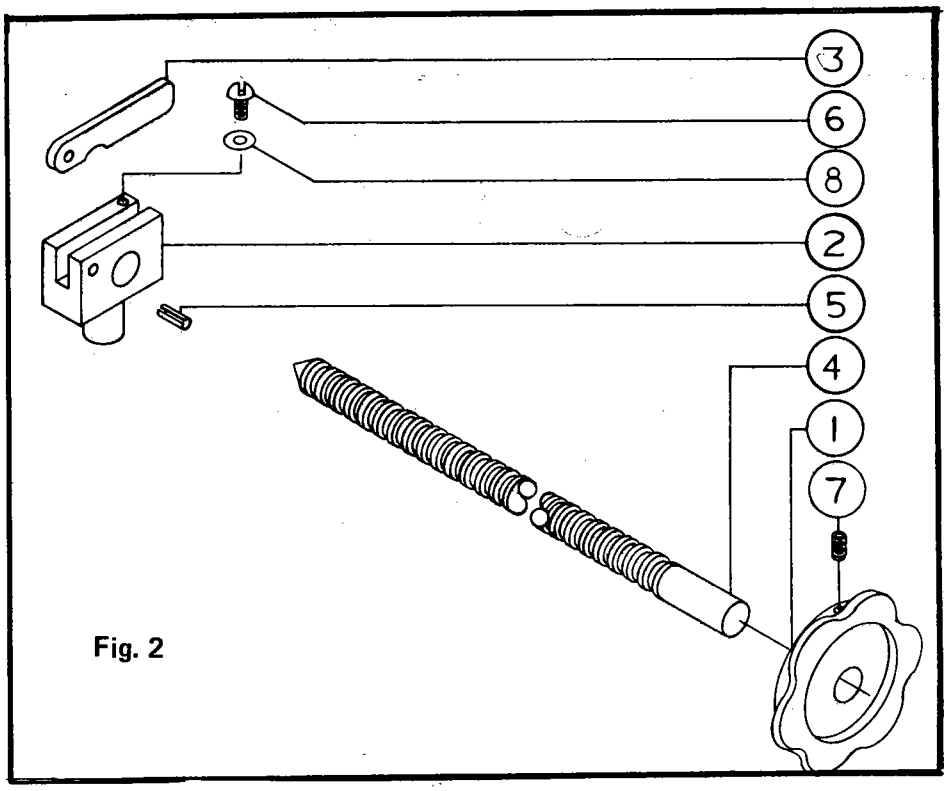


Fig. 2

MODEL 87 CIRCLE CUTTING ATTACHMENT (OPTIONAL)

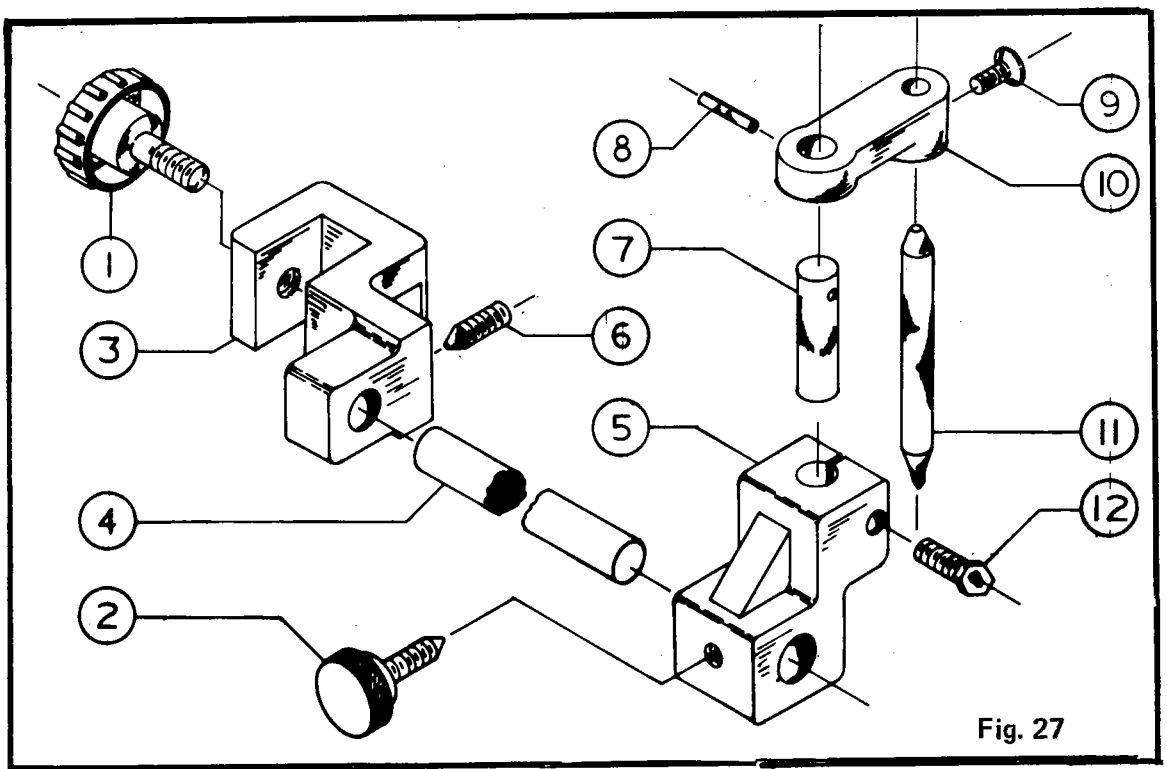


Fig. 27

MODEL 87 HAND FEED ASSEMBLY PARTS LIST

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	3271009	HANDWHEEL, 3-1/2 X .627"	1
2	3529001	NUT, HAND FEED SCREW, 3/4 X 1-1/4 X 3-3/4"	1
3	3581003	PAWL, HAND FEED NUT, .050 X 5/8 X 1-7/8"	1
4	3692002	SCREW, HAND FEED, 5/8 X 13-3/4"	1
5	6626004	PIN, SPRING, 1/8 X 3/4" L	1
6	6706035	SCREW, ROUND HD., 6–32 X 1/4" L	1
7	6715016	SCREW, SOC. SET, CUP, 5/16–18 x 5/16" L	1
8	6860600	WASHER, STEEL, FLAT, No. 6	1

MODEL 87 CIRCLE CUTTING ATTACHMENT PARTS LIST

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	2406002	KNOB ASSEMBLY	1
2	2406004	KNOB ASSEMBLY	1
3	3064054	BRACKET, CLAMP	1
4	3044016	BAR, GUIDE	1
5	3064056	BRACKET, ADJUSTING	1
6	6716117	SCR., SLOT HD., CONE PT., 3/8–16 X 1-1/2"	1
7	3583002	PIN, LOCATING PIVOT	1
8	6626032	PIN, SPRING, 3/16 X 1-1/4 X 3/4" L	1
9	6715106	SCREW, THUMB, 5/16–18 x 3/4" L	1
10	3289006	HOLDER	1
11	3604007	POINTER	1
12	6715034	SCR., HEX HD. CAP, 5/16–18 X 1-1/4" L	1

MODEL 87 BLADE CUTTER ASSEMBLY (OPTIONAL)

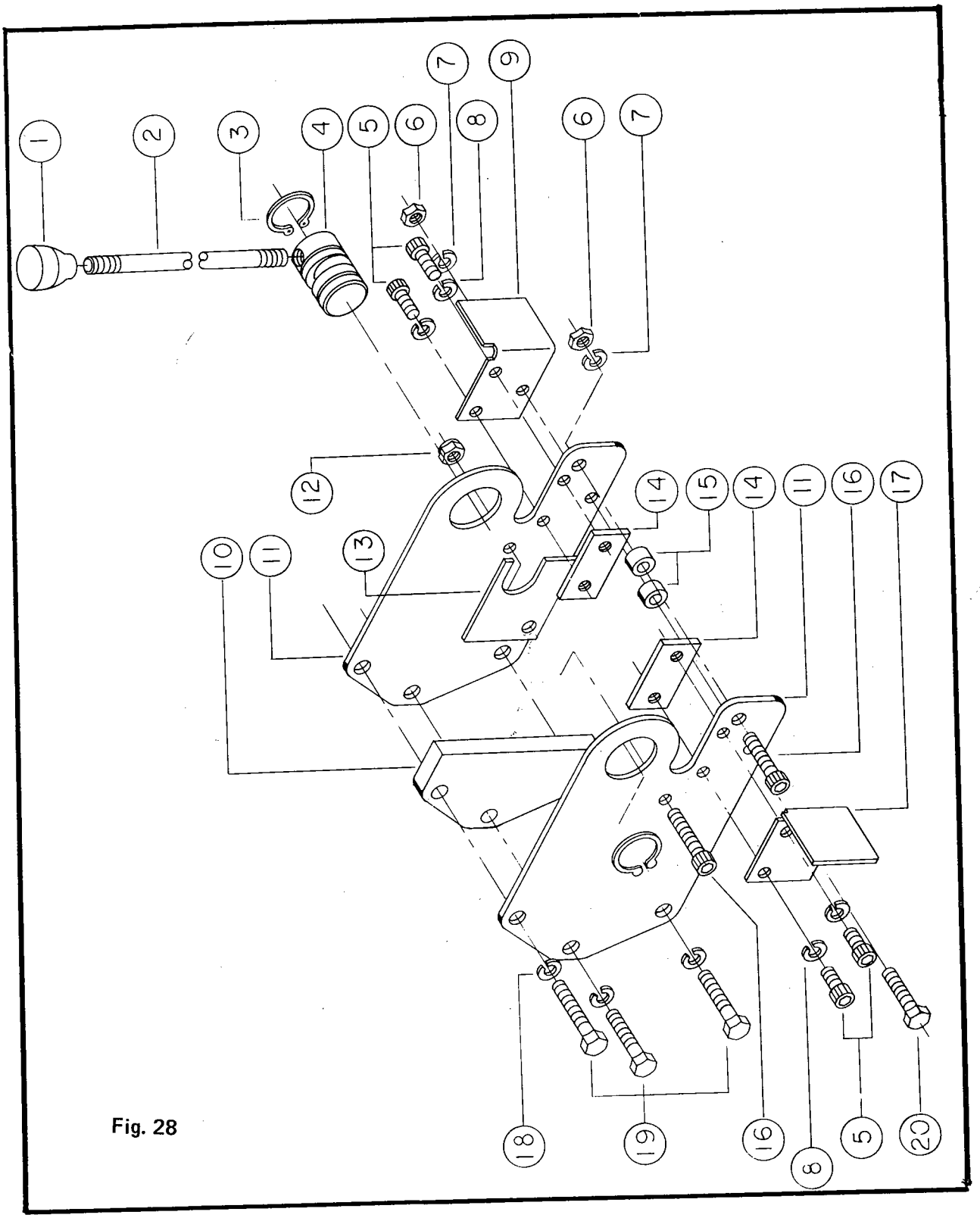


Fig. 28

MODEL 87 BLADE CUTTER ASSEMBLY PARTS LIST

ITEM NO.	PART NO.	DESC DESCRIPTION	QTY.
1	3407201	KNOB, TEARDROP	1
2	3670030	ROD, CAM OPERATING, BLADE CUTTER	1
3	6670005	RING, RETAINING, TRUAC No. 5100-100	2
4	3076004	CAM, BLADE CUTTER	1
5	6710014	SCR., SOC. HD. CAP, No.20–24 X 3/8"	4
6	6514008	NUT, HEX JAM, 1/4–20	2
7	6861100	WASHER, 1/4" LOCK	2
8	6860802	WASHER, No. 10 LOCK	4
9	3215004	FLANGE, BLADE CUTTER, RIGHT HAND	1
10	3042008	BASE, BLADE CUTTER SPACING	1
11	3595015	PLATE, SIDE	2
12	6514002	NUT, HEX LOCK, 1/4–20	1
13	3052001	BLADE, CUTTER, SLIDING	1
14	3052002	BLADE, CUTTER, STATIONARY	2
15	3735014	SPACER, INSIDE, BLADE CUTTER	2
16	6714016	SCR., SOC. HD. CAP, 1/4–20 X 1"	2
17	3215001	FLANGE, BLADE CUTTER, LEFT HAND	2
18	6861200	WASHER, 5/16" LOCK	3
19	6715034	SCR., HEX HD. CAP, 5/16–18 X 1-1/4"	3
20	6714048	SCR., HEX HD. CAP, 1/4–20 X 1"	1

MODEL 87 BAND POLISHING ATTACHMENT (OPTIONAL)

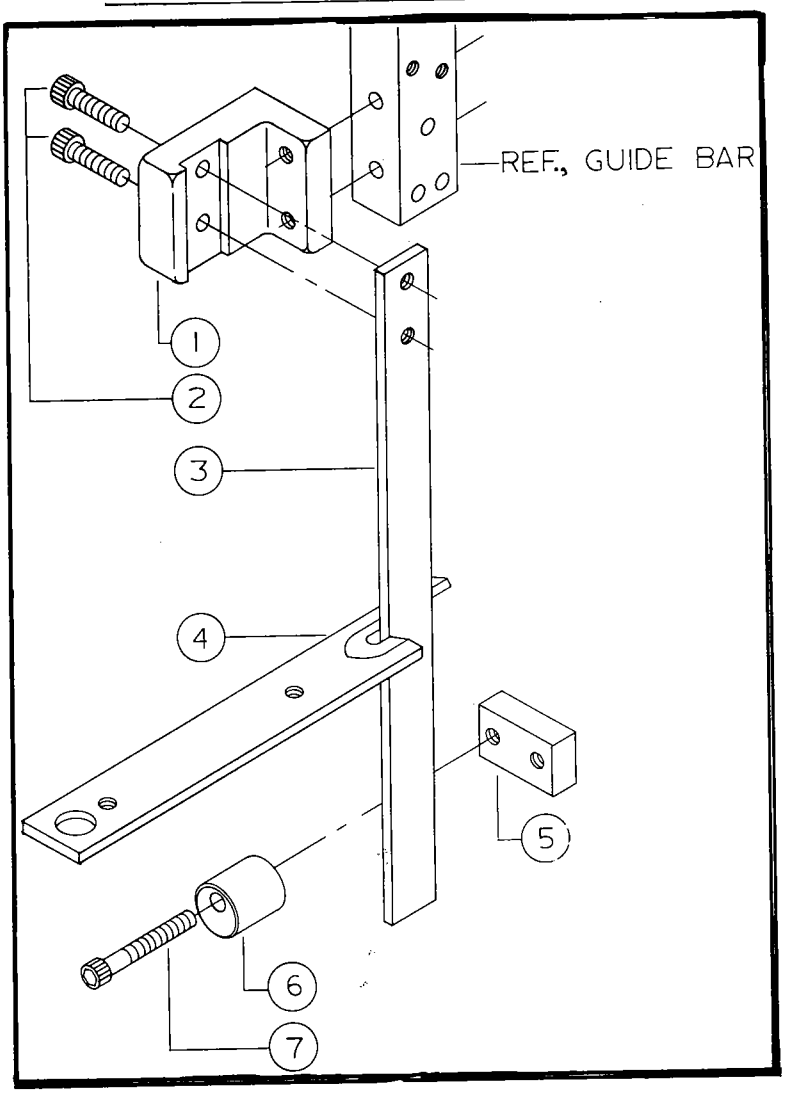


Fig.29

MODEL 87 DUST CHUTE ASSEMBLY (OPTIONAL)

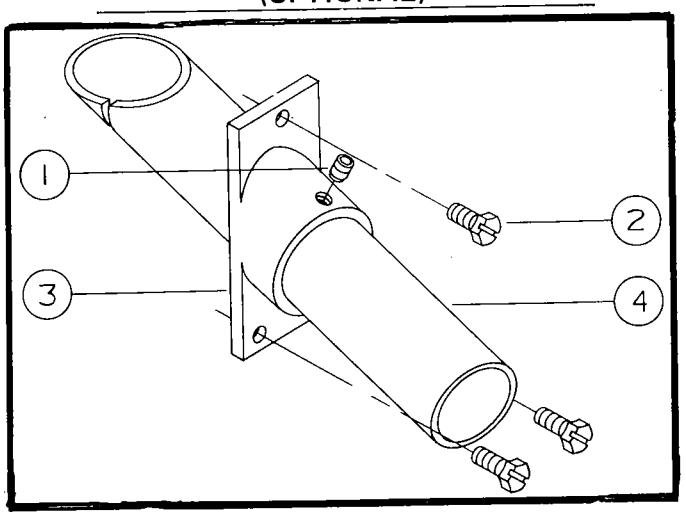


Fig. 30

MODEL 87 BAND POLISHING ATTACHMENT PARTS LIST

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	3064280	BARCKET, UPPER POLISHING GUIDE	1
2	6710016	SCR., SOC. HD. CAP, 10–24 X 5/8"	2
3	3595288	PLATE, BACKUP	1
4	3328064	INSERT, BAND SAW TABLE	1
5	3063426	BRACKET, LOWER POLISHING	1
6	3157005	ECCENTRIC, BAND POLISHING ATT.	1
7	6716019	SCR., SOC. HD. CAP, 3/8–16 X 2"	1
	2028063	COMPLETE BAND POLISHING ATT. CONSISTS OF 1 EACH OF ABOVE PARTS	

MODEL 87 DUST CHUTE ASSEMBLY PARTS LIST

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	6714004	SCR., SOC. SET, CUP PT., 1/4–20 X 5/8"	1
2	6746031	SCR., HEX SLOTTED HD., SELF-TAPPING 10–24 X 5/8"	3
3	3064314	BEACKET, EXHAUST MOUNTING	1
4	3589031	PIPE EXHAUST	1
5	0340030	DRAWING FOR EXHAUST CHUTE ASSEMBLY MOUNTING	1
	2397031	COMPLETE DUST CHUTE ASSEMBLY CONSISTS OF 1 EACH OF ABOVE PARTS	

MODEL 87 POWER FEED ATTACHMENT (OPTIONAL)

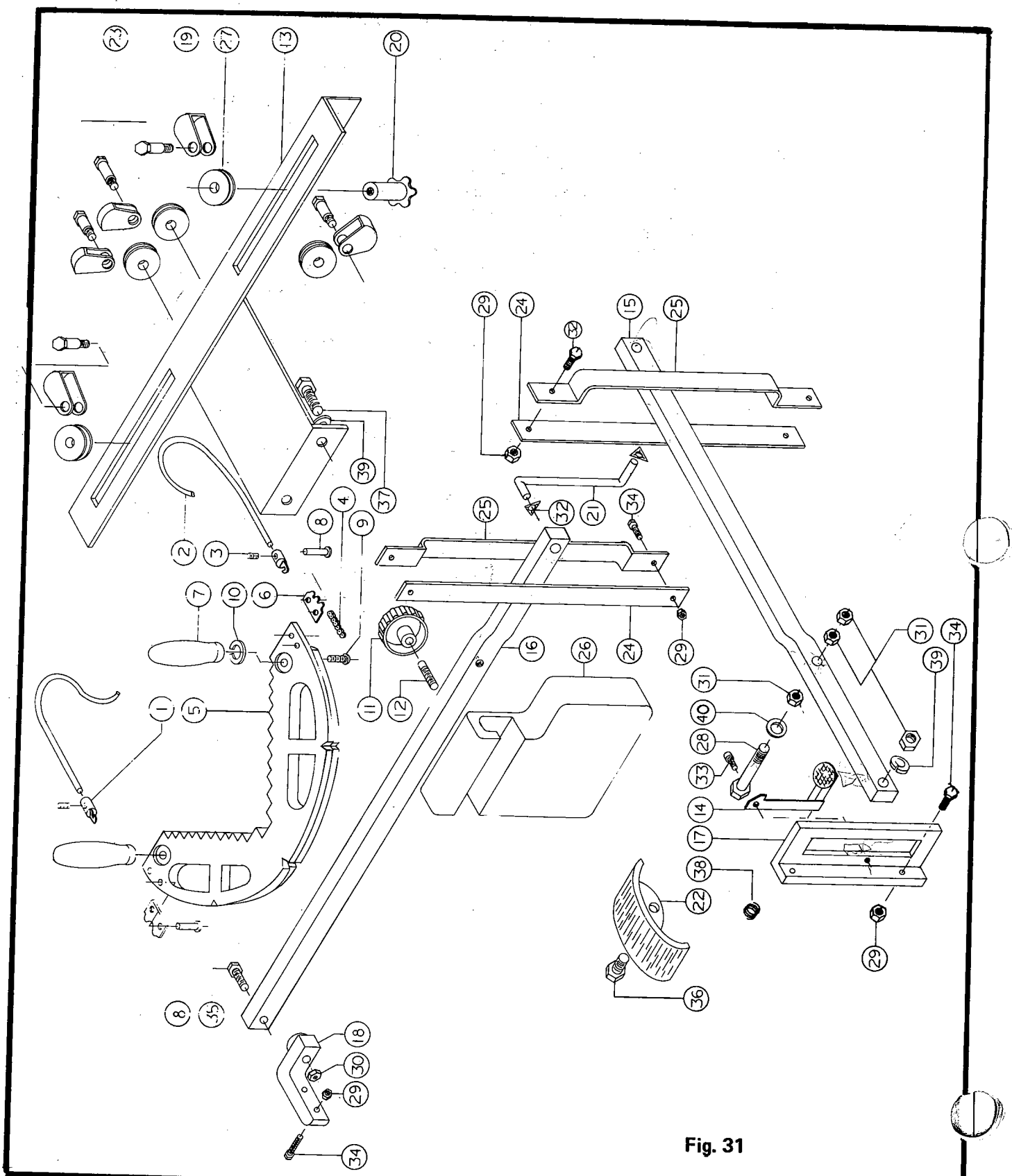


Fig. 31

MODEL 87 POWER FEED ATTACHMENT PARTS LIST

ITEM NO.	PART NO.	DECSRIPTION	QTY.
	2253026	GUIDE ASSY., MATERIAL (ITEMS 1 THRU 10)	
	2077001	CABLE ASSY., MATERIAL GUIDE LONG (ITEMS 1 THRU 3)	
1	3295001	HOOK, CHAIN	2
2	3077003	CABLE, AIRCRAFT, 1/8" DIA. X 8" L	1
3	6714004	SCR., SOC. SET, CUP PT., 1/4–20 X 1/4" L	2
4	3083022	CHAIN, ROLLER, No. 65–1-1/2P X 48" L	1
5	3253030	GUIDE, MATERIAL	1
6	3688001	SEGMENT, TOOTH	2
7	6350007	HANDLE	2
8	6680008	RIVET, FLAT HD., 3/16 X 5/8" L	4
9	6765010	SCREW, BUTTON HD. CAP, 5/16–24 X 3/4"	2
10	6861200	WASHER, 5/16" LOCK	2
	2695002	SCREW, LOCK ASSY. (ITEMS 11 & 12)	
11	3406017	KNOB	1
12	3695019	SCREW, LOCK	1
13	2063002	BRACKET ASSY., POWERFEED (WELDMENT)	1
14	2587001	LOCK ASSY., PEDAL (WELDMENT)	1
15	3044038	BAR, PEDAL	1
16	3044060	BAR, WEIGHT	1
17	3062005	BRACKET, ANGLE	1
18	3065003	BRACKET, PIVOT	1
19	3250009	GUARD, WHEEL	5
20	3406025	KNOB, POWERFEED	2
21	3445004	LINK, CONNECTING	1
22	3587002	PEDAL, FOOT	1
23	3697202	SCREW, SHOULDER	5
24	3770013	STRIP, GUIDE	2
25	3770014	STRIP, GUIDE	2
26	3848008	WEIGHT	1
27	3850001	WHEEL, POWERFEED	5
28	6086022	BOLT, TAP, 1/2–13 x 2-3/4" L	1
29	6514001	NUT, HEX, 1/4–20	9
30	6516001	NUT, HEX, 3/8-16	1
31	6518001	NUT, HEX, 1/2–13	4
32	6670078	RING, RETAINING, TRUARC No. 5305-37	2
33	6714040	SCR., FIL. HD., 1/4–20 X 1-1/2" L	2
34	6714048	SCR., HEX HD. CAP, 1/4–20 X 1" L	7
35	6716037	SCR., HEX HD. CAP, 3/8–16 X 2" L	1
36	6718012	SCR., HEX HD. CAP, 1/2–13 x 2" L	1
37	6718015	SCR., HEX HD. CAP, 1/2–13 X 1" L	2
38	6813002	SPRING, COMPRESSION, No. 1-101	1
39	6861500	WASHER, 1/2" LOCK SPRING	3
40	6861501	WASHER, 1/2" FLAT	1

MODEL 87 MITER GAUGE ASSEMBLY (OPTIONAL)

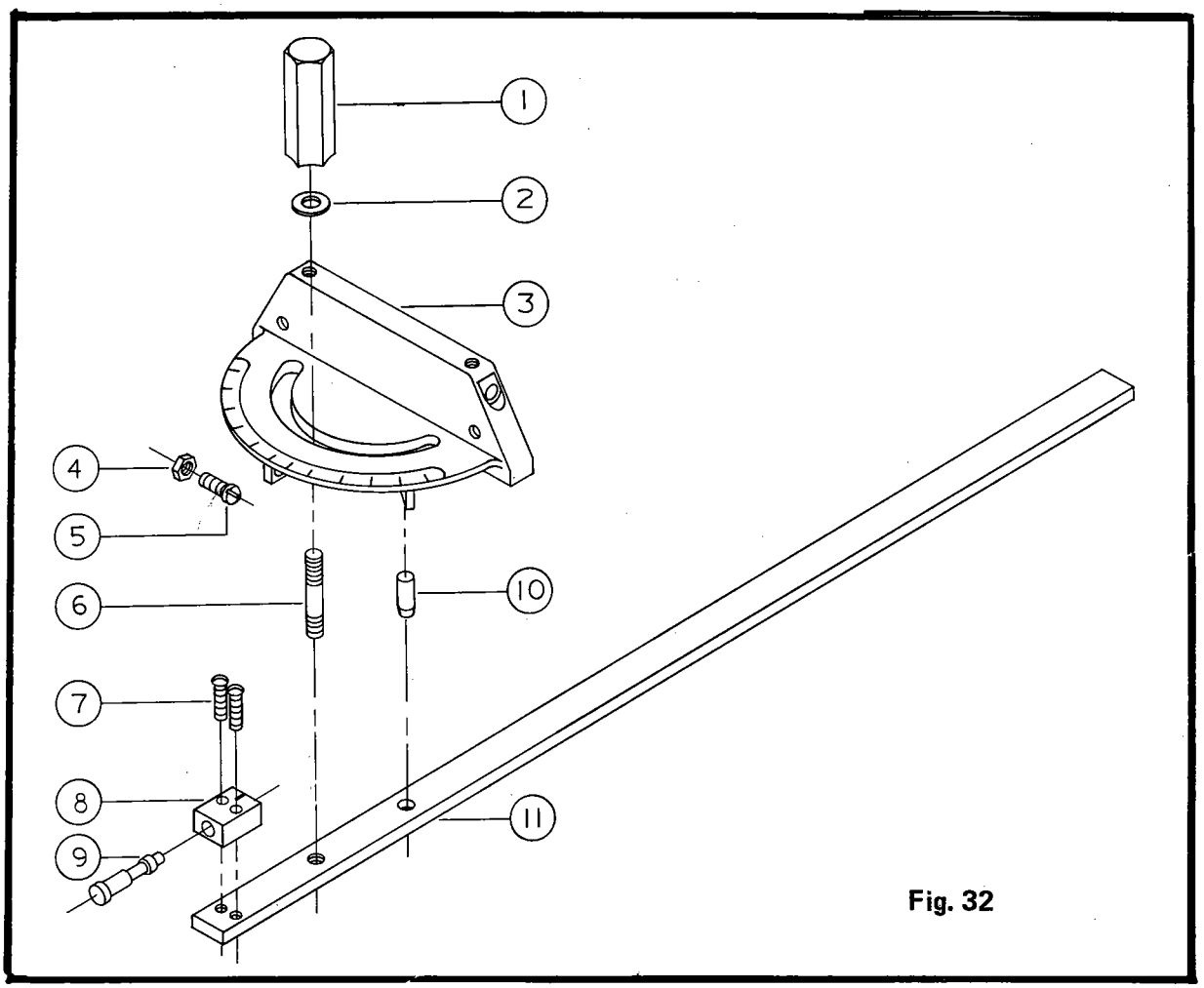


Fig. 32

MODEL 87 STOP ROD ASSEMBLY (OPTIONAL)

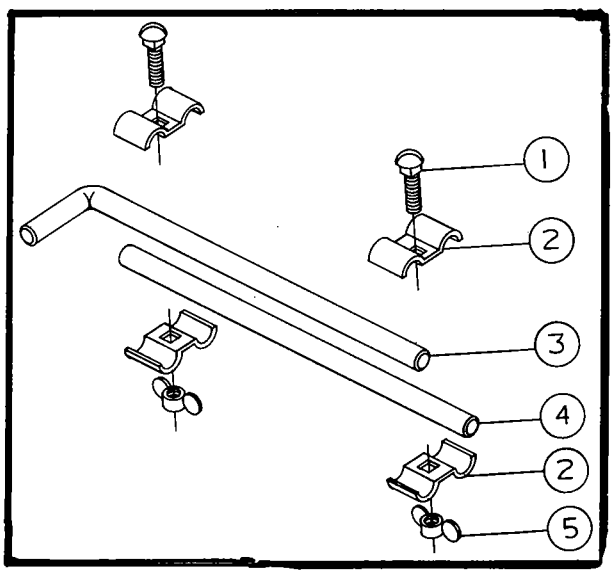


Fig. 33

MODEL 87 MITER GAUGE ASSEMBLY PARTS LIST

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	3268050	KNOB, MITER	1
2	6861101	WASHER, FLAT, 1/4"	1
3	3230007	GAUGE, MITER	1
4	6506003	NUT, HEX, No. 6–32 (PLATED)	3
5	6706094	SCR., RD. HD. MACH., 6–32 x 1/2"	3
6	3695220	SCREW, LOCK	1
7	6706041	SCR., RD. HD. MACH., 6–32 X 3/4"	2
8	3055101	BLOCK, POINTER	1
9	3582097	PIN, STOP	1
10	6623012	PIN, DOWEL, 1/4 X 1"	1
11	3044312	BAR, MITER GAUGE	1

MODEL 87 STOP ROD ASSEMBLY PARTS LIST

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	6086000	BOLT, CARRIAGE, No. 10-24 X 3/4"	2
2	3092001	CLAMP	4
3	3670002	ROD, STOP (90^0 BEND)	1
4	3670003	ROD, STOP (STRAIGHT)	1
5	6510002	NUT, WING, No. 10-24 (ZINC PLATED)	1

MODEL 87 – 45° TWIST GUIDE ASSEMBLY (OPTIONAL)

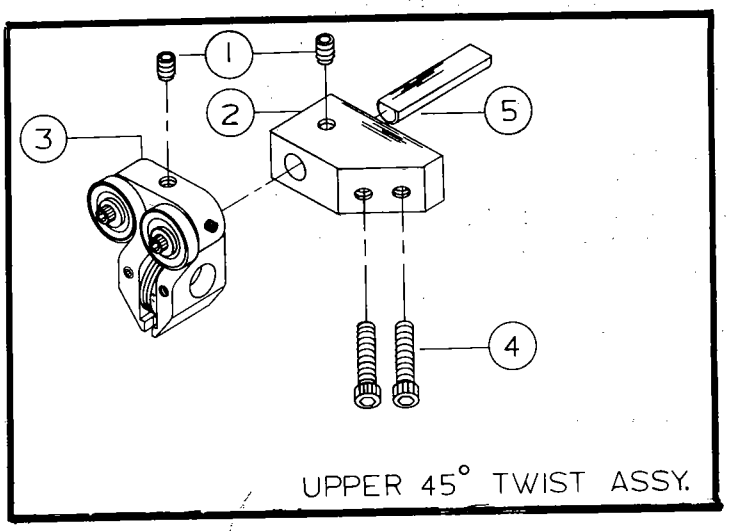


Fig. 34

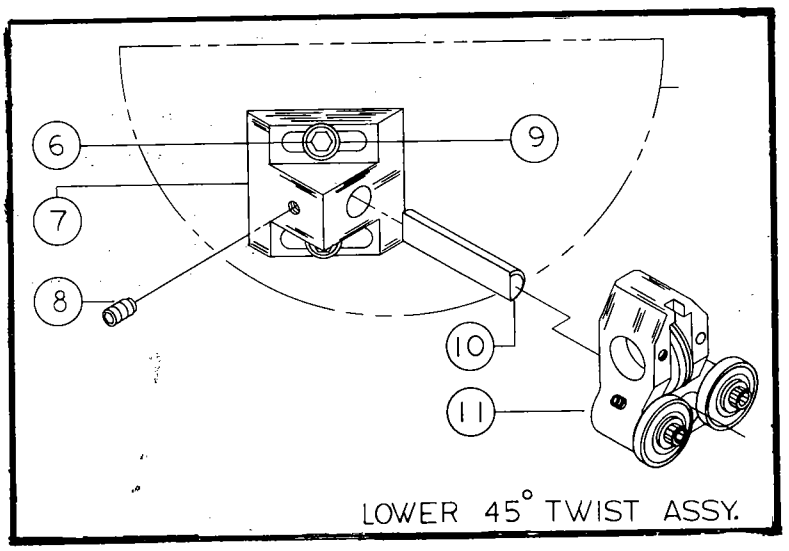


Fig. 35

MODEL 87 – 45° TWIST GUIDE ASSEMBLY PARTS LIST

ITEM NO.	PART NO.	DESCRIPTION	QTY
	2253049	Guide Assembly, 45° Upper (Items 1 Thru 5)	
1	6714159	Scr., Soc. Set, 1/4–20 x 3/8"	2
2	3064211	Bracket, Upper Guide Mounting	1
3	6339002	Guide, Band Saw	1
4	6715027	Scr., Soc. Hd. Cap, 5/16–18 x 1-3/4"	2
5	3582028	Pin, Dowel, 7/16 x 2-1/2"	1
	2253054	Guide Assembly, 45° Lower (Items 6 Thru 11)	
6	6715020	Scr., Soc. Hd. Cap, 5/16–18 x 1"	2
7	3064212	Bracket, Lower Guide Mounting	1
8	6714159	Scr., Soc. Set, 1/4–20 x 3/8"	2
9	6861201	Washer, 5/16" Flat	2
10	3582027	Pin, Dowel, 7/16 x 2-5/8"	1
11	6339002	Guide, Band Saw	1

SHOWN IN THE FOLLOWING FIGURES ARE SOME OF THE TYPICAL OPERATIONS PERFORM-ON BAND SAWS.

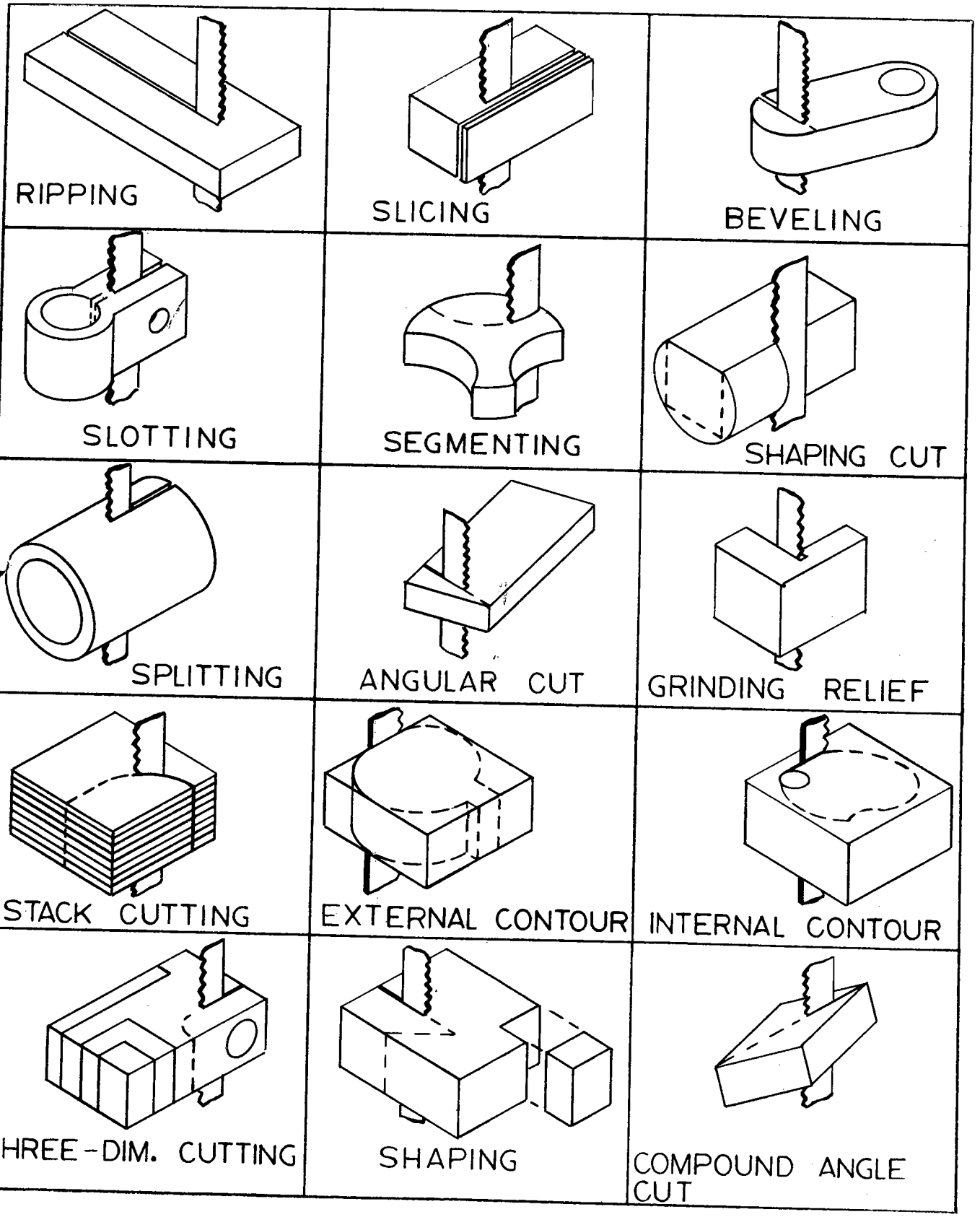
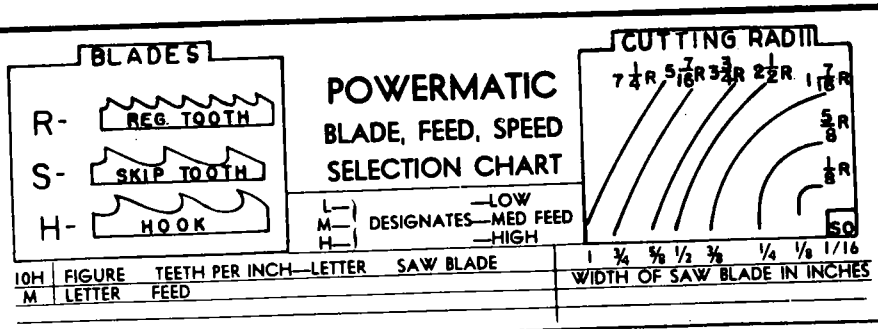


Fig. 30

SPEED AND FEED CHART



ALL FIGURES BELOW ARE A STARTING GUIDE

	MATERIAL	BLADE PITCH WORK THICKNESS & FEED				REG BLADE SPEED WORK THICKNESS				HSS BLADE SPEED WORK THICKNESS				COOLANT	POLISHING SPEED WORK THICKNESS				FILING SPEED WORK THICKNESS			
		1/2	1	3	6 & OVER	1/2	1	3	6 & OVER	1/2	1	3	6 & OVER		1/2	1	3	6 & OVER	1/2	1	3	6 & OVER
STEEL	1015 1035	10R/M	8R/H	4H/H	3H/H	175	175	150	150	350	350	300	275	YES	4500	4000	3500	3000	120	110	100	90
	1065 1095	10R/M	8R/H	4H/H	3H/H	125	100	80	80	200	200	200	160	YES	4500	4000	3500	3000	120	100	90	80
	1320 1345	10R/M	8R/H	4H/H	3H/H	125	100	80	70	150	150	150	100	YES	3000	2500	2000	2000	120	100	80	80
	2317 2345	10R/M	8R/H	4H/H	3H/H	100	100	80	80	150	150	150	125	YES	3500	3000	2500	2000	90	70	60	50
	3115 3150	10R/M	8R/H	4H/H	3H/H	125	100	80	80	180	180	180	150	YES	3000	3000	2500	2000	70	70	50	40
	4017 4068	10R/M	4H/H	4H/H	3H/H	130	115	90	90	180	180	180	150	YES	3500	3000	2500	2000	60	50	40	30
	4130 4150	10R/H	8R/H	4H/H	3H/H	110	85	60	60	175	175	160	130	YES	3500	3000	2500	2000	60	50	40	30
	4317 9850	10R/H	8R/H	4H/H	3H/H	90	65	50	50	170	170	170	130	YES	3000	3000	2500	2500	50	50	40	40
	4608 4821	10R/M	8R/H	4H/H	3H/H	100	80	60	60	175	175	175	150	YES	3500	3000	2500	2000	60	50	40	40
	6117 6152	12R/H	8R/H	4H/H	3H/H	110	90	60	50	210	210	175	140	NO	3500	3000	2500	2000	60	50	40	40
	9255 9262	10R/H	6R/H	3H/H	3H/H	125	100	60	60	170	170	170	130	NO	3000	2500	2000	2000	60	50	50	40
H.S. TOOL STEEL	H-12 H-13	10R/M	8R/H	4H/H	3H/H	80	70	60	50	220	180	140	100	NO	3000	2500	2500	2000	60	50	40	40
	M-2, M-3	10R/M	8R/H	4H/H	3H/H	90	70	50	50	100	100	80	70	NO	3000	2500	2500	2000	60	50	40	30
	T-4 T-5	10R/M	8R/H	4H/H	3H/H	90	70	60	50	125	100	80	60	NO	3000	2500	2500	2000	50	40	40	30
DIE STEEL	D7	10R/M	8R/H	4S/H	3S/H	60	60	60	60	90	90	75	60	NO	3000	2500	2000	2000	60	50	40	30
	01 02	10R/M	8R/H	4S/H	3S/H	125	100	75	75	200	200	200	175	NO	3000	2500	2000	2000	70	60	50	50
	W1	10R/M	8R/H	4S/H	3S/H	125	100	75	75	225	225	200	175	YES	3000	2500	2000	2000	60	50	40	40
STAINLESS STEEL	302 304	10R/H	8R/H	6R/H	4H/H	80	80	80	70	125	125	100	100	YES	3000	2500	2000	2000	60	50	40	40
	303 416	10R/H	8R/H	6R/H	3H/H	100	100	70	70	175	150	125	125	YES	3500	3000	2500	2000	90	80	70	60
	316 420	10R/H	8R/H	6R/H	3H/H					90	90	90	70	YES	3000	2500	2000	2000	60	60	50	50
	321 347	10R/H	8R/H	6R/H	3H/H					90	90	90	70	YES	3000	2500	2000	2000	60	60	50	50
	430 446	10R/H	8R/H	6R/H	3H/H					90	90	90	70	YES	3000	2500	2000	2000	60	60	50	50
	440 443	10R/H	8R/H	4H/H	3H/H	125	125	100	75	125	125	100	100	YES	3500	3000	2500	2000	70	60	50	40
ALUMINUM	2014 2018	10R/L	6R/L	4H/M	3H/H	2700	2500	2300	2100					YES	4500	4000	3500	3000	190	160	130	100
	2024 5052	10R/L	6R/L	4H/M	3H/H	4500	4500	4500	4500					YES	4500	4000	3500	3000	200	180	170	160
	6061 6063	10R/L	6R/L	3H/M	3H/H	4500	3800	3200	2600					YES	4500	4000	3500	3000	190	160	130	100
	DIE CAST	10R/L	6S/L	4H/M	3H/H	1000	700	400	400					YES	4500	4000	3500	3000	130	120	110	100
COPPER ALLOY	MANG. BRONZE	10R/M	8R/M	4S/H	3S/H	900	800	600	400					YES	4500	4000	3500	3000	100	80	70	60
	SILICON BRONZE	14R/M	10R/M	6R/H	3S/H	900	800	600	350					YES	4500	4000	3500	3000	90	80	70	60
	PHOSPHOR BRO.	6R/L	3S/L	3S/M	3S/M	3000	2500	2000	1500					NO	3500	3000	2500	2000	90	80	70	60
	ALUMINUM BRO.	14R/M	10R/M	6R/M	3S/H	900	600	400	300					YES	4500	4000	3500	3000	80	70	60	50
	BERYLLIUM #25	10R/L	6R/L	3S/M	3S/H	2500	1600	1200	800					YES	4500	4000	3500	3000	110	90	80	70
NI-ALLOY	MONEL	10R/M	8R/H	6R/H	3H/H					90	90	80	60	YES	2500	2500	2000	2000	50	50	40	40
	INCONEL	10R/M	8R/H	6R/H	6R/H					70	60	50	50	YES	3000	2500	2000	2000	50	50	40	40
CASTING	GRAY CAST IRON	14R/M	10R/H	6R/H	3S/N	140	130	100	100					NO	4500	4000	3500	3000	120	110	80	60
	CAST STEEL	14R/M	10R/H	6R/H	4S/H	135	125	110	100					NO	4500	4000	3500	3000	120	100	90	80
	DUCTILE IRON	14R/M	10R/H	6R/H	4S/H	130	120	100	80					NO	4500	4000	3500	3000	120	100	90	80
	MEEHANITE	14R/M	10R/H	6R/H	3S/H	135	125	110	100					NO	4500	4000	3500	3000	120	100	90	80
	TITANIUM ALLOY	10R/M	10R/H	6R/H	3S/H	100	80	60	60					YES	2500	2000	2000	1500	50	40	40	30
	MAGNESIUM	10R/L	6R/L	4H/M	3H/H	4500	4000	3500	3500					YES								
	ZINC	8R/L	4S/M	3S/M	3S/H	2600	2000	1500	1000					YES								
NON METAL	CARBON	10R/L	6R/L	3S/M	3S/M	4000	3000	3000	2000					NO								
	MICA	32R/L				800								NO								
	ASBESTOS	8R/L	6R/L	3S/M	3S/M	3500	3000	3000	3000					NO	3500	3000	2500	2500	130	90	70	50
	HARD RUBBER	10R/L	8R/L	6R/M	2S/H	4500	4000	3500	3000					YES								
PLASTICS	FORMICA	14R/M	10R/M	4H/H	4H/H	3000	2500	2000	1500					NO	4500	4000	3500	3000	180	170	160	150
	MASONITE	10R/L	4S/L	3S/M	3H/M	4500	4000	3500	3000					NO								
	MICARTA	14R/M	10R/M	4H/H	3H/H	3000	2500	2000	1500					NO	4500	4500	4000	4000	110	90	80	70
	PLEXIGLAS	10R/L	6R/L	3S/M	3S/M	3500	3000	2500	1800					NO	3500	3000	2500	2500	170	150	120	120
	PAPER	14R/L	10R/L	4S/L	3S/M	4500	4000	3000	2800					NO								

Fig. 31