



**INSTRUCTION MANUAL  
AND  
PARTS LISTS  
FOR  
HORIZONTAL AND VERTICAL  
MILLING MACHINES  
MODELS  
747 - 747VS - 847 - 860**

**WELLS-INDEX®**

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# FOREWORD

Your new Wells-Index Milling Machine was designed and manufactured to conform to our high standards of machine tool performance. It was built to conform to set of rigid specifications by trained workmen who take pride in the quality of their work. Each Wells-Index machine must pass a rigid series of final inspection tests including actual metal cutting operations before it is released for packing and shipping. In order that this machine may provide you with a long period of continuous and satisfactory service it is necessary that it be properly installed, operated and maintained, and this manual has been prepared to assist you in carrying out these functions. We urge you to study the contents of this manual and to be guided by the suggestions contained herein.



## Warranty

The A & D Machinery Company warrants this machine and all parts and equipment manufactured by them against defects of material or workmanship for a period of one year from the date of sale. The manufacturer's liability under this warranty shall be limited to replacing free of charge, F.O.B. Muskegon, Michigan, any such parts proved defective within the period of the warranty. The manufacturer will not be responsible for transportation charges or consequential damages. Parts which are claimed to be defective, but show tangible evidence of abuse will not be replaced on a no charge basis.

A & D Machinery Company reserves the right, at its own discretion, without notice, and without making similar changes in articles previously manufactured, to make changes in materials, design, finish, and/or specifications.

A & D Machinery Company makes no warranty with respect to electrical equipment or purchased parts other than the original manufacturer's warranties.



## DEFECTIVE PARTS

When so called defective parts are replaced, parts shipped out in replacement will be billed at regular prices, and will be shipped charges collect. The determining of credit to be allowed, if any, is left to the discretion of A & D Machinery Co. after receipt and inspection of parts. Parts to be replaced must be returned to Wells-Index within 60 days from the date of Wells-Index's replacement invoice or no credit will be granted.

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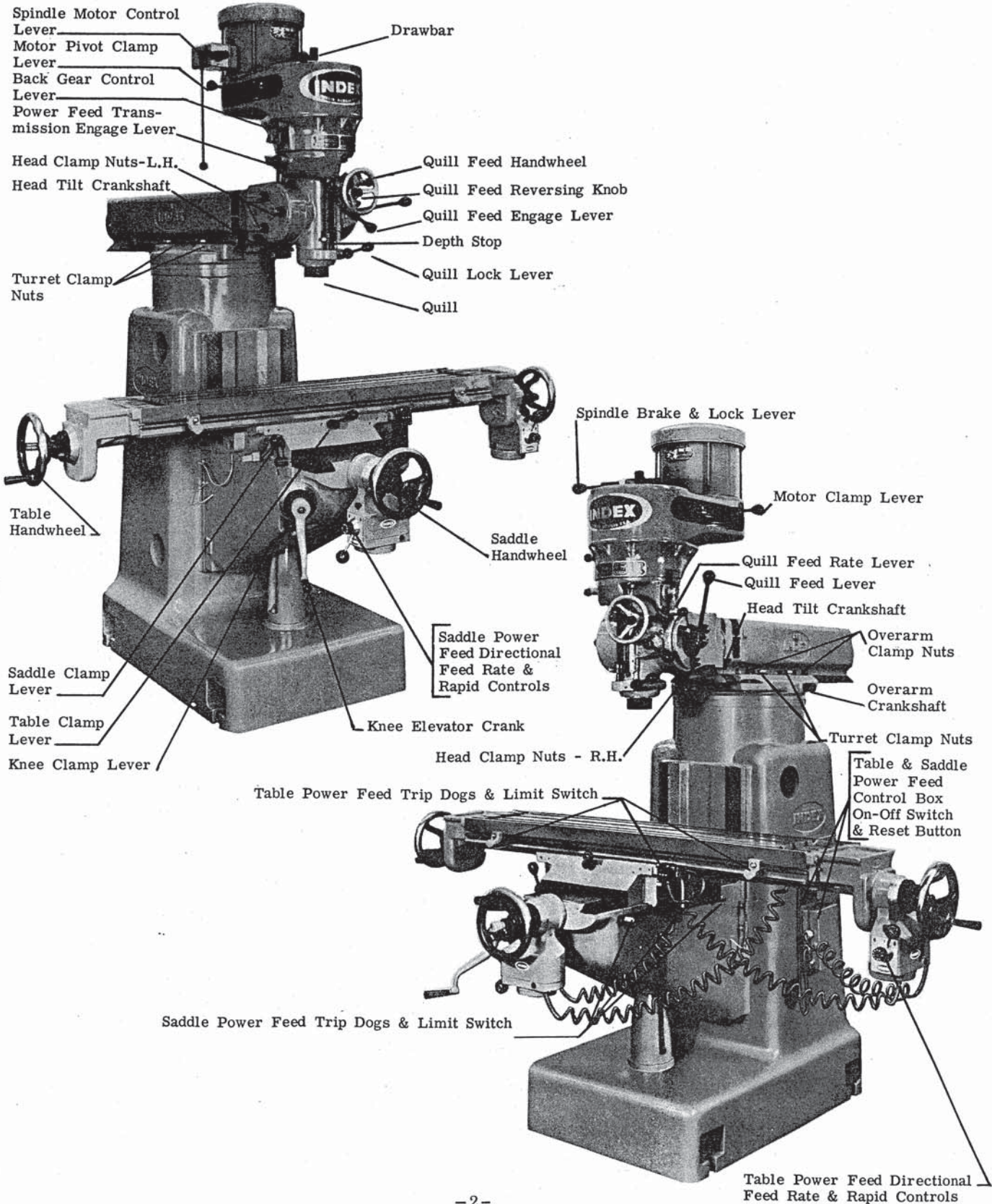
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# INSTRUCTION MANUAL

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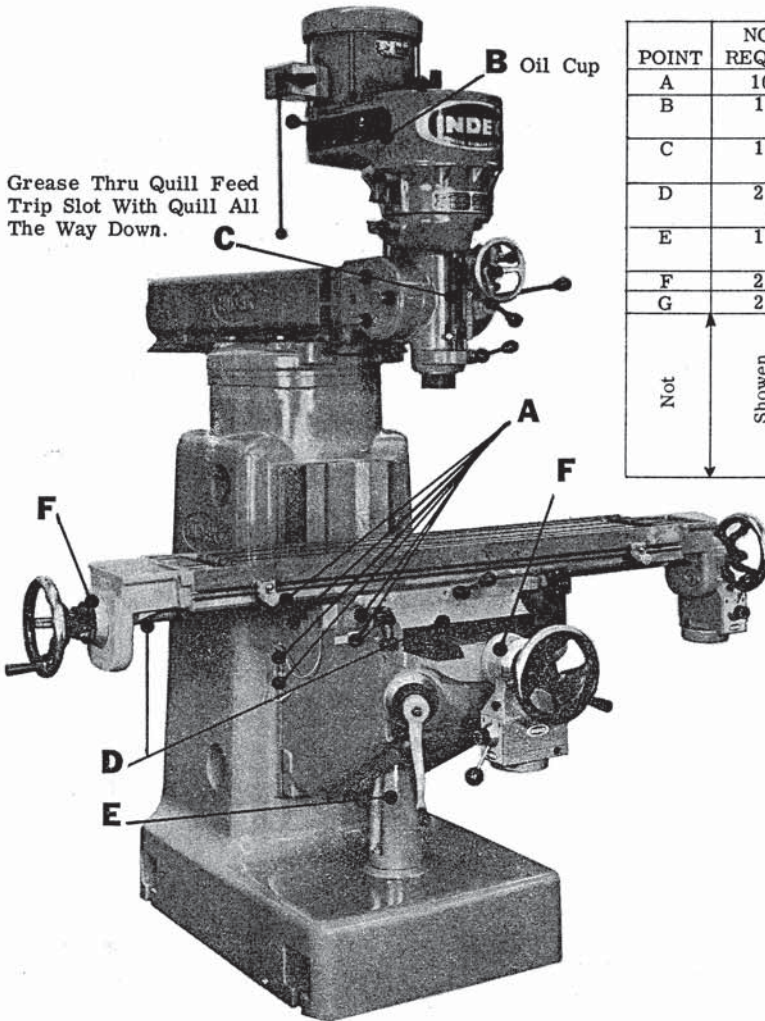
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## LOCATION OF CONTROLS & ADJUSTMENTS FOR INDEX MILLING MACHINES



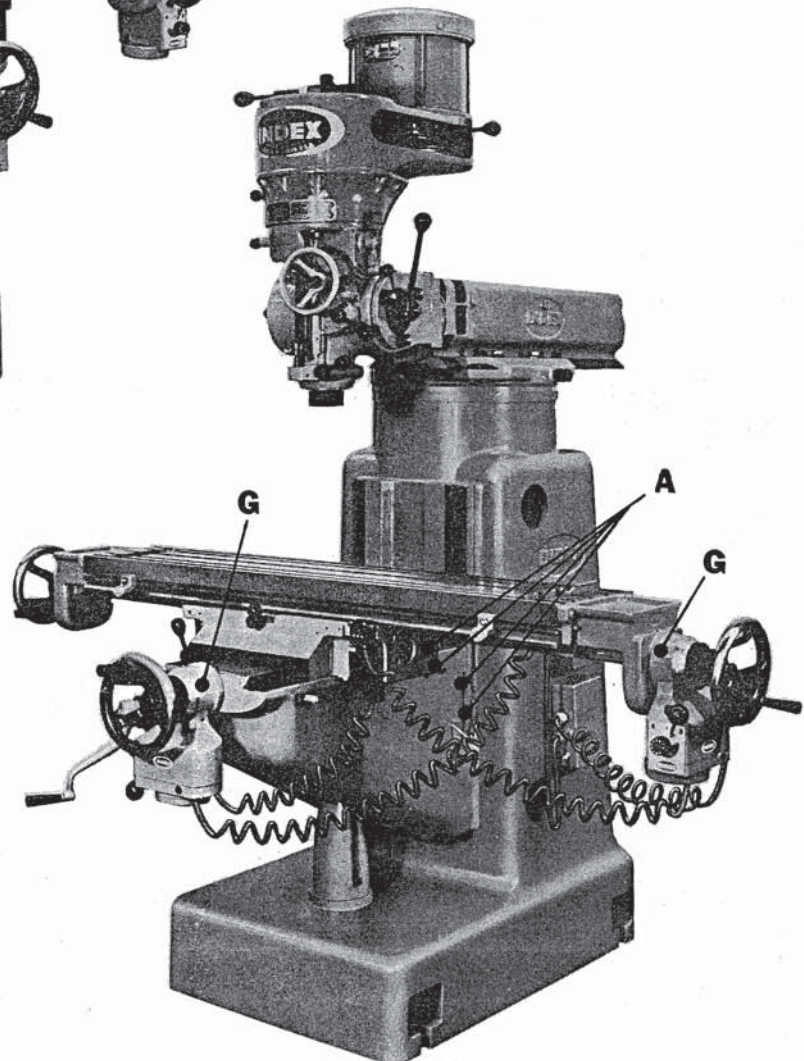
## II

## RECOMMENDED LUBRICATION FOR INDEX MILLING MACHINES



POINT	NO. REQ'D	NAME	MOBIL NO.	FREQUENCY
A	10	Ways	Vactra Oil #2	Weekly
B	1	Mill Head	Vactra Oil #2	Few Drops Twice Weekly
C	1	Spindle Spline	Mobil Grease Special	Weekly
D	2	Lead Screw	Mobil Grease Special	Weekly
E	1	Elev. Screw	Mobil Grease Special	Weekly
F	2	Lead Screw Brg's.	Mobilux Grease #2	6 Months
G	2	Table Feed Box	Mobilux Grease #2	Check Weekly
Not Shown		Spindle Bearings	Mobil Grease BRB Lifetime	When Re-Placing Brg.
		One-Shot Lube	Vactra Oil #2	Weekly
		Horizontal Drive Transmission	SAE #10 Motor Oil	Check Weekly
		Overarm Arbor Support	Vactra Oil #4	Daily

NOTE: Wipe Lube Fittings Clean Before Greasing.  
Do Not Overlubricate Ball Bearings.



## III. PRELIMINARY INFORMATION

### A. UNCRATING

Carefully remove the protective crating and skid so that the machine and parts are not marred, scratched or otherwise damaged. In the event of any damage in transit, notify our representative at once as well as the transportation company making final delivery. The machine should be lifted from the base of the crate by placing a sling under the overarm.

### B. SHORTAGES

Inspect the complete shipment carefully against the itemized packing list to make sure that all items are present. In the event damage or shortages are noticed they should be reported immediately to the delivering carrier and to the representative from whom the machine was purchased with a clear indication as to which parts have not been received.

### C. CLEANING

Thoroughly clean the rust preventive materials from the machine with gasoline, kerosene, or other suitable solvents. Do not move the table, saddle, knee or other moving parts until all of the sliding way surfaces have been well cleaned and lubricated. After cleaning, carefully move to a limit stop in one direction the table, saddle and knee, and clean and lubricate the exposed way surfaces. Then move each of these units to the opposite limit stop and similarly clean and lubricate the exposed way surfaces. Loosen the four bolts to unlock the overarm and move this forward and backward to the extreme position in order to clean and lubricate.

### D. FOUNDATION

For best performance it is important that the machine be placed on a solid foundation and that it be level. A solid concrete floor is desirable, but a firm wooden floor, free from vibration, may be suitable. If the machine is to be located on an upper floor or balcony it should be placed as close as possible to a strong supporting pillar or column.

### E. LEVELING

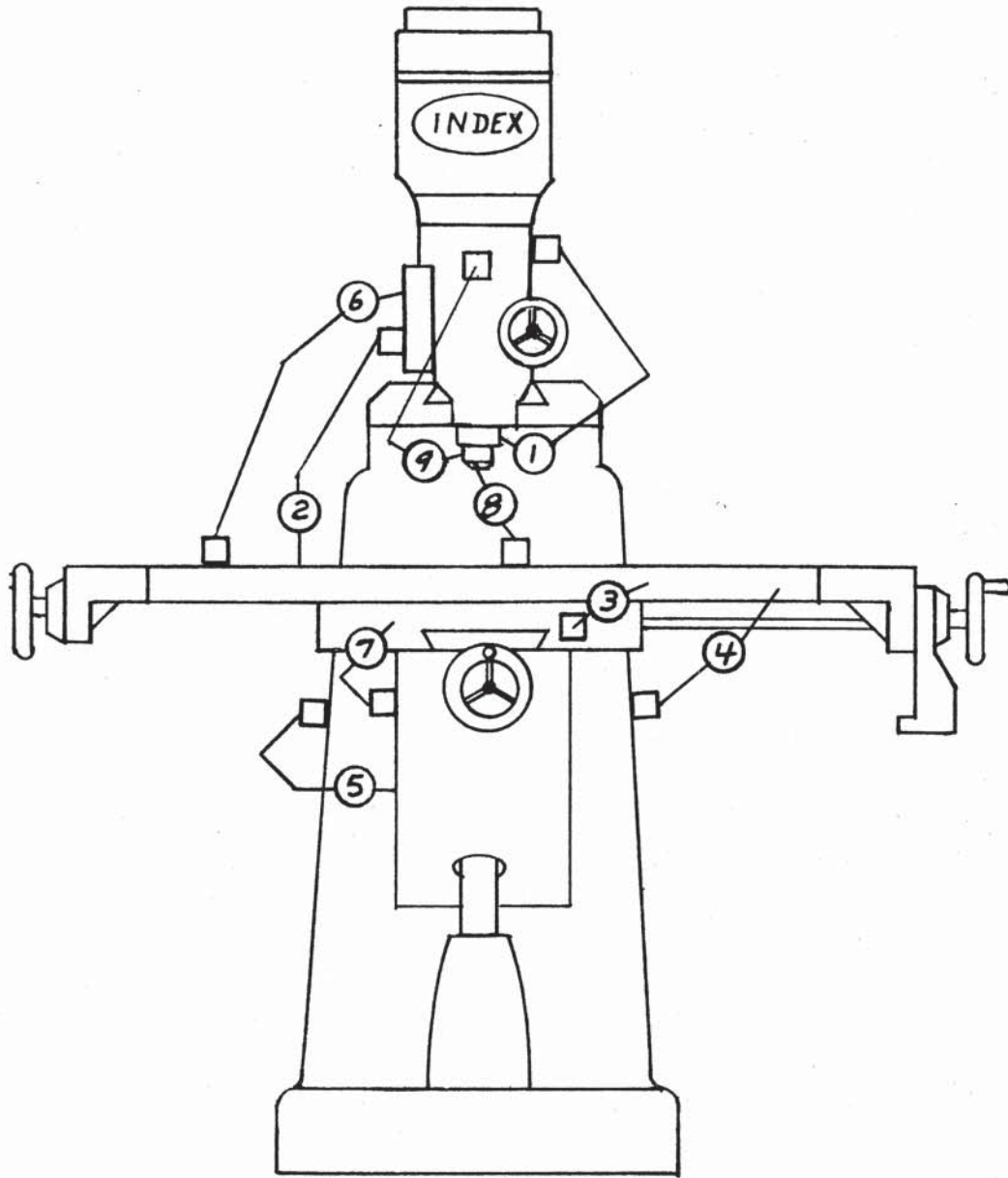
The machine is provided with four bolt holes, one at each corner of the base. Steel wedges or steel plates should be used for leveling. A good machinist's level should be used in the leveling process and the bubble should have adequate time to come to rest. The level should be placed both lengthwise and crosswise on the machine table.

### F. VERTICAL HEAD ON OVERARM (EXPORT ONLY)

When the machine leaves the factory the vertical head is positioned on the overarm with the spindle up and the motor down. Before operating the machine it is necessary that the head be returned to its normal operating position by loosening the 4-5/8 hexagonal nuts located at the head end of the overarm. It will then be possible to tilt the head into normal operating position by using a crank on the 1/2" stud located on the right side of the front end of the overarm. Because of the heavy overhung weight involved, the tilting of the head back to its normal position will be greatly facilitated if a second person can help push it into position. The head may then be trammed in as described in Section V, paragraph H-I.

### G. VERTICAL HEAD ON OVERARM

When the machine leaves the factory the vertical head it tilted back on the overarm. Before operating the machine it is necessary that the head be returned to its normal operating position and trammed in as described in Section V, paragraph H-I.



**FIGURE 1**  
**INDICATOR POSITION DRAWING**

## IV. ADJUSTMENTS

## A. PROPER GIB ADJUSTMENT PROCEDURE MUST BE DONE AFTER 40-HOURS ON NEW MILLS

Each 700 and 800 series of mills have three gibs. One at front dovetail of table; one on left dovetail of saddle, one on left dovetail of knee.

Each gib is supplied with two lock or adjustment screws.

The table gib has a lock screw on the right front of the saddle and the adjusting screw would be on the left front of the saddle.

The saddle gib lock screw is at the rear of saddle on the left side, the adjusting screw is at the front of the saddle on the left side.

Loosen the table gib lock screw several turns and tighten the adjusting screw until you feel the gib pressing against table dovetail, then snug up the lock screw, "never get this lock screw too tight as it will distort the gib".

Run the table back and forth and check for drag.

Repeat this adjustment for the saddle and the knee gib.

Now to check the gibs with an indicator, the following checks must be made: (See Figure 1 for reference)

1. With indicator mounted as in Position 3, the table gib can be tested for shake by pulling back and forth on the end of the table.

Anything over .0015 is too much, also the table should snap back to "0" each time.

2. To check the saddle gib, the indicator should be mounted as in Position 7 and the same tolerance should exit here.
3. The knee gib will be checked as in Position 5 by grasping the end of the table and lifting up and pushing down. Deflection here should not be more than .0003.

Now as a final check use Position 2 and run the table to its extreme right and left position. The indicator runout should not be more than .0015.

## B. QUILL FEED CLUTCH:

When the machine left the factory this clutch had been tested by drilling a 5/8" dia. drill in mild steel. After testing the clutch was then adjusted to a minimum setting. If in operation, larger pressures are developed which cause the clutch to "Ratchet" it may be well to readjust the clutch using the steps below. If still larger pressures are needed after readjusting, you may assist the Quill Feed by applying a downward pressure on the hand feed lever.

## PROCEDURE FOR ADJUSTING THE CLUTCH

1. In the rear of the head between the head and the adapter is a hex nut (100-002-906) with a No. 10-24 x 1/2 socket head cap screw for a lock.
  - a. First unscrew this lock screw until it is freely rotated with the fingers.
2. The minimum clutch tension is the position shown in the drawing. If more tension is desired, rotate the hex nut (100-002-906) up to 180 degrees from its present position, and relock the No. 10-24 socket head screw.
3. It may also be desirable to adjust the travel of the clutch plunger:
  - a. This is done by means of the 1/4-20 x 3/4 socket set screw immediately behind the (100-004-543) feed cam housing.
  - b. With the clutch disengaged tighten the set screw until a little roughness can be felt when moving the quill down by means of the hand lever.



- C. PROCEDURE FOR REMOVING AND REPLACING QUILL COUNTER-BALANCE SPRING (Extreme caution should be exercised in this operation and instructions followed closely as this spring is 11 foot long when unwound).
1. The safest way to perform this operation is to first drop the quill assembly (101-212-307) down until the rack on the quill clears the pinion on the (100-004-546) cross shaft.
    - a. This is performed by first removing the drawbar and the (100-027-771) vernier holder and then the two 5/16-18 x 7/8 socket heads in the (100-002-917) quill block.
    - b. Holding the left hand on the bottom of the spindle and the right hand on the hand feed lever (101-212-312) slowly run the quill down out of the head casting by rotating the hand lever counter-clockwise (When the quill rack clears the pinion, the quill is free to fall and the hand lever may unwind very rapidly causing a painful bruise if not held tight and unwound slowly).
  2. Referring to drawing H4-2 remove the two 7/16-14 x 2 socket head screws which hold the (100-007-100) plate to the (100-009-202) adapter.
  3. Remove the three 5/8 hex nuts which bolt the (100-007-100) plate to the head casting.
  4. Grasp the (100-007-100) in such a way that the thumb can be pressed against the (100-002-910) cover shown and gently pull the entire assembly away from the head.

It may be necessary to gently tap this plate with a soft hammer to break the initial contact with the head.

5. After this assembly is removed from the head and laid on a bench, very carefully lift the (100-002-910) cover off the spring by holding it in place and pulling the (100-002-909) coupling away from the assembly.
6. Very carefully pry the shield (100-002-911) away from the spring assembly.
7. Now the spring can be pushed out of the (100-004-542) housing from the bottom of the inside.
8. When the new spring is installed, it will have to be in the right direction so that the hook on the spring is in the same direction as the slot in the (100-002-909) coupling.
9. When the three 5/8 nuts are put back on, they should only be snugged up until the (100-007-100) plate is securely fastened to the (100-009-202) adapter by means of the two 7/16-14 x 1-1/2" socket head cap screws.
10. When the quill is replaced in the head, the counter-balance spring must be wound up tight by moving the hand lever (101-212-312) counter-clockwise to its limit and then engage the quill rack with the cross shaft pinion.

NOTE: This spring is not intended to return the quill to its upper position, it is merely to cancel out the weight of the quill assembly.

#### D. QUILL FEED TRIPS & DEAD STOP ADJUSTMENT:

Your Index Vertical Mill is provided with a means for setting an adjustable automatic feed trip device for the downward movement of the quill. Feed trip rod #100-002-961 actuates feed trip plunger #100-002-958 through feed trip arm #100-002-952 to disengage clutch. Disengagement occurs when quill feed trip key #100-002-917 contacts quick shift dial sleeve nut #100-002-763.

Downward feed adjustment is made by loosening knurled thumb screw #000-200-652 and repositioning quick shift dial sleeve nut #100-002-763.

#### E. DRIVE BELTS:

To provide the necessary slack for shifting of belt it is only necessary to loosen the motor clamp handle #100-002-955 (on right rear of pulley guard) and move motor forward. Increase belt tension by moving motor back and tightening motor clamp handle. To replace worn or broken belt remove 6 socket head screws from top of #111-212-002 drive pulley cartridge and lift off #111-212-002 cartridge. (2 tapped holes provided for jack screw, if required).

## F. SPINDLE BRAKE - VARIABLE SPEED HEAD

Refer to Drawing H2-2

TO ADJUST THE SPINDLE BRAKE:

1. Start the spindle.
2. Turn 1/4-20 set screw #880-004-072 in until you hear the brake rubbing, then back the set screw out just enough to stop rubbing. Lock in place with jam nut.
3. Turn complete brake handle ass'y. so that 111-218-204 shaft rotates clockwise until you hear the brake rubbing, then turn counter clockwise just enough to stop rubbing & allow the handle to be hanging down. If the handle is pointing up when properly adjusted, knock the 3/16" dia. spirol pin #880-045-153 out, reverse the handle 180 degrees & replace the 3/16" dia. pin, so that the handle is hanging down.

## V. OPERATION (See page 2 for location of various adjustments, handles and controls)

## A. VERTICAL SPINDLE

1. The spindle Start - Stop - Reverse Control is located at the upper left on the motor.
2. On the standard vee belt drive head the spindle brake lever is located at the top left of the pulley guard assembly. Move it to the left or right to engage the brake. After moving to the left or right this lever may be raised to maintain brake engagement and hold the spindle in a fixed radial position for tool changing.
3. On the variable speed drive head the spindle brake is located at the bottom left of the pulley guard. It is engaged by pulling the control lever out away from the pulley guard. This camming action actuates the caliper type brake and will hold it in engagement until the control lever is returned back to its normal position flush with the pulley guard.

CAUTION: Always be sure spindle brake is completely disengaged before attempting to start spindle rotation in either direction.

4. Spindle speeds on the standard vee belt drive are changed by changing the position of the vee belt connecting the motor pulley to the spindle pulley and by shifting the back gear lever (high, low, or neutral).

CAUTION: Always be sure spindle motor is running before attempting to move variable speed adjustment lever.

## B. BACK GEAR

The back gear lever (shift lever #100-002-900) is located on the upper left side of the head. The lever has 3 positions; high, low, and neutral. In the high (out) position, spindle drive is geared directly from spindle pulley to spindles (dog clutch #100-002-991 is in up position, in contact with drive cone pulley hub #100-002-999). In the low (in) position, spindle drive is geared through back gear #100-002-985 (dog clutch #100-002-991 is in down position, back gear #100-002-991 is in mesh with back gear #100-004-557).

NOTE: (1) Because of back gear construction, when machine is running in low speed range, spindle rotation is opposite to that of high speed range. Therefore, forward on reversing switch becomes reverse when in low speed range.

NOTE: (2) When shifting from neutral to high or low, turn spindle by hand while pushing back gear lever into position. This allows gears to line up in low speed and dog clutch to line up in high speed. When shifting into high it is imperative to have the spindle brake in the "brake on" position.

## C. POWER FEED TRANSMISSION ENGAGEMENT

The power feed engagement lever #100-002-900 is located directly below the back gear lever. This lever has 2 positions; "in", to engage spindle power feed transmission, and "out" to disengage spindle power feed transmission.

CAUTION: Always be sure spindle motor is stopped before attempting to move this lever to the "in" or engaged (upper) position.

NOTE: Disengage spindle power feed transmission when it is not being used. This will stop unnecessary wear on power feed worm gear.

#### D. QUILL

1. The quill may be locked in a given vertical location by turning the quill-clamp in a clockwise direction. Lever is located at bottom of right side of head.

CAUTION: Do not engage quill feed with quill-clamp lever fully tightened.

2. The quill (or spindle) hand feed lever #100-002-107 can be adjusted to any one of six operating positions by moving outwards (to the right) on the lever hub and rotating to the desired position. The hand feed lever is held on by a spring plunger and can be pulled off when not in use.
3. Any one of three power feeds (in either an upward or downward direction) may be selected by moving the feed shift lever, located on right side of head, to the desired feed (.0015", .003" or .006") per spindle revolution. A neutral position is provided between each of these feed settings. If power feed is not being used it is wise to place the feed shaft lever in one of the neutral positions. It may be somewhat easier to change the position of the feed selector lever when the spindle is rotating.
4. The fine feed handwheel #100-004-545 is placed in operating condition by locating the feed shift lever in a neutral position and engaging the power feed engaging lever #100-002-953. The fine feed handwheel is held on by a spring plunger and can be pulled off when not in use.
5. The knob on the shaft located in the center of the feed handwheel is used to select downfeed (pushed-in position), neutral (mid-position) or upfeed (pulled-out position) for either the power feed or the handwheel feed.

NOTE: Positions noted are for clockwise rotation of spindle. Counter clockwise rotation reverses these positions.

#### E. VERTICAL SPINDLE DRAWBAR

Use spindle brake to restrict spindle rotation when tightening or loosening drawbar.

1. To install collet or tool holder in spindle-first, remove drawbar by pulling it out of spindle from top. Then, place collet or tool holder into spindle. Put drawbar back into spindle and tighten into collet or tool holder, using discretion.
2. To remove tool from spindle-loosen drawbar 3 or 4 turns and tap on end to free tool.

CAUTION: Do not loosen drawbar less than 4 or more than 5 turns when removing tool. If drawbar is too loose, the threads may be stripped when tapping on end.

#### F. HORIZONTAL SPINDLE DRAWBAR

Use spindle brake located at back of machine to restrict spindle rotation when tightening or loosening drawbar. (Otherwise it is the same as the Vertical Spindle Drawbar)

#### G. HORIZONTAL SPINDLE:

1. Spindle direction is set by forward-reverse switch located on left side of column. (Otherwise it is the same as the Vertical Spindle - see paragraph V-A-3 & V-A-5).

#### H. HEAD:

1. Tilting of the head in a front to back plane (turret and overarm models) is readily accomplished by loosening the 3 nuts at the right hand side of the head (around the hand feed lever) and the 3 nuts on the left side of the head, and applying crank to forward head tilting worm stud #100-002-963, located at bottom rear of head--left side.

CAUTION: When returning head to vertical position, sweep the table with an indicator attached to spindle to make sure head is square to table.

2. To tilt head from side to side, loosen the hex nuts which clamp the head to the overarm or the machine column (whichever the case may be). Then tilt head the desired amount by applying crank to the sidewise tilting worm stud at the right to the rear of the spindle head.

CAUTION: When returning head to vertical position, sweep the table with an indicator attached to spindle to make sure head is square to table.

#### I. OVERARM OR RAM:

The back to front position of the head and overarm is readily changed by loosening the 4 hex nuts which clamp the overarm to the turret. Apply a crank to the overarm adjustment shaft extension and move to desired position.

#### J. TURRET (Vertical Mill):

To index the entire turret-overarm-head assembly loosen the 4 hex nuts, 2 on either side of the overarm which clamp the turret to the top of the column. Then swing the turret to the desired position and reclamp.

NOTE: It is highly recommended that all clamping nuts and bolts (turret to column, overarm to turret, head side-wise tilt and head forward-back tilt) be securely tightened before any machining cuts are taken. Always check these points before starting a cut. Also, when returning overarm to normal position, attach an indicator to the overarm, and slide the overarm in and out, with the indicator riding against a square, which has been squared to front of table to make sure overarm is square with table.

#### K. TURRET (Horizontal Mill):

1. The turret can be rotated on the column a full 360 degrees.
2. The locating pins are effective only when the ram is used with the overarm support for the horizontal spindle. The vertical spindle at this time would be at rear of machine. It may be necessary to tilt the vertical head slightly for clearance at the rear of the machine when the machine is set for horizontal milling with a long milling cutter arbor.

NOTE: It is highly recommended that all clamping nuts and bolts (turret to column, overarm to turret, head side-wise tilt and head forward-back tilt) be securely tightened before any machining cuts are taken. Always check these points before starting a cut.

Also, when returning overarm to position for vertical milling, attach an indicator to the overarm, and slide the overarm in and out, with the indicator sliding against a square which has been squared to front of table to make sure overarm is square with table.

3. The complete horizontal spindle, turret, overarm & arbor bearing may be positioned 30 degrees either side of normal horizontal milling position by loosening the four 5/8" hex. head screws (two on either side of the spindle, slightly below the C/L of the spindle) and swing the entire top unit to the desired angular position

## VI. PREVENTIVE MAINTENANCE

## A. INSPECTIONS:

1. Inspect taper of spindle for cleanliness and freedom from chips of foreign matter.  
Frequency - Each time tool holder is inserted.  
Inspection by machine operator.  
No special equipment required.
2. Inspect and adjust gibs of slide ways.  
Frequency - every 160 hours. More often if looseness is noted by operator.  
Inspection and adjustment by machine operator or machine maintenance man.  
No special equipment required other than allen wrench.  
(See gib adjustment instructions item IV-A)
3. Inspect for general cleanliness of machine, paying particular attention to keep dirt and chips from slide ways. Do not use air to remove such dirt and chips -- but wipe off ways or keep them covered. Flood ways with light oil and work slide movements back and forth to wash out foreign matter. Then re-lubricate machine according to lubrication instructions.  
Frequency - Constantly, as far as wiping off chips and dirt are concerned. Every 40 hours ways should be flooded with oil and cleaned as above.  
No special equipment required.
4. Inspect drive belts for wear, hard spots at splice, etc.  
Frequency - Every 40 hours.  
Inspection by machine operator or machine maintenance man.  
No special equipment required.
5. Inspect to see if vertical head is square with table, by mounting indicator on spindle and sweeping table.  
Frequency - Every 80 - 120 hours, or after head has been tilted.  
Inspection by machine operator or machine maintenance man.  
Special equipment required consists of (1) A short accurate arbor to insert in spindle. (2) A clamp for use in clamping a 6" bar to above arbor in a horizontal position. (3) 6" bar approximately 1/2" in diameter. (4) An accurate dial indicator to clamp to above 6" bar in position so when spindle is revolved by hand, nib of indicator in contact with table, sweeps table in a full circle and indicates out of squareness.

NOTE: Table is intentionally left .0005" high in front. This will gradually decrease as machine is used.

6. Inspect electrical equipment.  
Frequency - In accordance with standard plant policy.  
Inspection by machine maintenance man.  
No special equipment required.

## B. PARTS REPLACEMENT:

None except as indicated by wear or malfunction.  
Frequency or replacement only as above.

## VII TROUBLE SHOOTING

NOTE: Ordinarily trouble will not manifest itself except when actually working with machine.

1. Slide ways working hard or binding.
  - a. Cause - gibs out of adjustment, either too tight or too loose.  
in latter case causing gib to "wedge".  
Remedy - Adjust gibs.
  - b. Cause - Dirt in slide ways.  
Remedy - Wash out slide ways with light oil.

2. Chatter or vibration when cutting.
  - a. Cause-Dirt in spindle taper, causing bad fit between tool holder shank and spindle taper.  
Remedy - Replace shank or dress off burrs, if due to nicks or burrs.
  - b. Cause - Faulty shank on tool holder.  
Remedy - Replace shank or dress off burrs, if due to nicks or burrs.
  - c. Gibs poorly adjusted on slide ways, or dirty.  
Remedy - Adjust as in IV-A.
  - d. Work improperly clamped to table of machine.  
Remedy - Check for rocking or movement, and correct by proper clamping.
  - e. Improper grind on cutting tool.  
Remedy - Replace or re-grind tool.
  - f. Hard spot at splice of drive belts or worm belts.  
Remedy - Replace belts.
  - g. Spindle quill worn in quill head.  
Remedy - Tighten quill head lock slightly.
  - h. Incorrect spindle speed, table feed, or both.  
Remedy - Ordinarily increase spindle speed and/or increase or decrease feed to breakup vibration period. Experiment by using hand feed to feed table.
  - i. Drive pulleys worn in grooves or loose on shafts.  
Remedy - replace pulleys.
3. Boring or milling out of square or at an angle.
  - a. Cause - Head not properly aligned with table.  
Remedy - Check head for alignment and correct.
  - b. Work improperly set up; i.e. not square and flat.  
Remedy - Check and re-align work.
4. Failure to hold center distance when locating for boring.
 

Cause - Failure to take back-off tension on lead screw after coming up to indicator reading, causing table to "creep", or failure to lock up slide ways with same amount of tension after moving table to new position.

#### VIII. SPARE PARTS RECOMMENDED

SET OF DRIVE BELTS FOR ALL DRIVES; (See Parts List)

#### IX. SPECIAL MAINTENANCE

Should it become necessary to disassemble certain major elements of the machine the following suggestions may prove helpful.

- A. TO REMOVE VERTICAL SPINDLE PULLEY (Drive Cone Pulley), PULLEY BEARINGS; AND PULLEY BEARING SUPPORT:
  1. Refer to drawing H3-2
  2. Remove 6 socket head screws holding drive pulley cartridge #111-212-002 to pulley guard. (2 tapped holes provided in this part for jack screws if required).
  3. Lift out drive pulley cartridge (containing drive cone pulley, spindle bearings and spindle bearing support).
  4. Remove cartridge bearing lock nut #100-003-000.
  5. Put drive pulley cartridge in an arbor press, locating on bottom face of drive cone pulley #111-212-003. Drive out drive cone pulley hub #111-212-201. This frees drive cone pulley (spindle pulley).
  6. Remove cartridge bearing retaining plate #111-212-004 by removing 4 socket head screws.
  7. Flip drive pulley cartridge #111-212-002 over on arbor press and drive out bearings.

**B. TO REMOVE MILLING MACHINE TABLE & LEAD SCREW**

1. Remove handwheels #111-438-001, dials #111-346-008 & end plates #111-436-005 from each end of table.
2. Remove retaining cap #111-436-006 from left end.
3. If machine has a table power feed, disassemble by removing the bronze gear inside the power feed, (4) screws & R.H. end plate #111-436-005.
4. Disconnect end brackets #111-436-003 & #111-436-004 by removing 4 screws.
5. The table can now be removed by sliding in either direction.

**C. TO REMOVE SADDLE**

1. First remove the table, as in "B above.
2. Remove handwheel #111-438-001 & dial #111-346-008.
3. If machine has independent saddle power feed unit, disassemble by removing the bronze gear inside the power feed & 4 screws.  
Remove plate #111-346-003, replace the handwheel & turn until lead screw is free of nut.
4. Remove lead screw nut #111-436-012 shown on drawing #101-436-101. It may be necessary to pry the nut loose from two roll pins which position the nut.
5. The saddle can now be removed by sliding forward.

**D. PROCEDURE FOR REPLACING OIL SEAL IN BACK GEAR HOUSING OF ALL GEAR HEAD - MODELS 823 and IRD-125**

1. To make this job relatively simple, it is advisable to remove the spindle motor first. This is accomplished as follows after shutting off the power and moving the speed lever to 4200 RPM.
  - a. Remove the two 3/8" hex cap screws which hold the motor bracket to the pulley guard assembly (111-180-303).
  - b. Slide the motor forward toward the spindle as far as possible. Then by working the variable speed belt over the edge of the bottom sheave of the motor pulley, the motor will then be free of the belt.
  - c. The spindle motor can then be lifted off the pulley guard.
2. Now remove the 1/2-13" hex nuts (3) which holds the back gear housing to the top of the head.
3. Run the quill all the way to the bottom of its travel by means of the hand feed lever.
4. Now lift the entire assembly off the spindle spline and the top of the head, and lay onto a suitable work bench with the three studs in the at the top and the mounting surface for the spindle motor on the bottom.
5. Remove the eight 1/4-20" x 7/8" socket heads which hold the back gear assembly to the pulley guard assembly and lift the away from the pulley guard.
6. This exposes the driver shaft which can be removed by lifting out the back gear housing thus exposing the top side of the oil seal which can then be tapped out of the casting, being very careful not to damage the Fafnir 2815-INA bearing.
7. Now put the drive shaft back into the back gear housing and, being very careful, start the new oil seal back into the back gear housing with the lip of the inner race of the seal setting properly against the OD of the drive shaft.
8. Now, reassemble in reverse order.

## E. PROCEDURE FOR ELIMINATING SHAKE IN QUILL FEED HAND LEVER

Shake in the quill feed is usually caused by shipping vibration. The proper way to eliminate this is as follows:

1. Shift the speed range into the direct drive or up position on the back gear lever.
2. Run the spindle speed at approximately 1200 RPM with the quill fully retracted into the head casting.
3. Loosen the three 1/2" nuts which hold the back gear housing to the top of the head, thus allowing the back gear and pulley guard assembly to "float".
4. Then by snugging up the 1/2" nuts, preferably the front one first, the back gear assembly will tend to center itself. (NOTE: A little experimenting may have to be done if tightening the front nut first does not eliminate the shake).
5. In rare cases, the pulley guard housing could have been shaken out of line from the back gear housing.

In this case, the eight 1/4-20" x 7/8" socket heads which hold these two assemblies together will have to be loosened slightly and the unit allowed to center itself as explained in Step 4.

## F. PROCEDURE FOR CHANGING R-8 PIN 745, 747, 756, 757, 847, 856, 857, 760, 860, and 887

1. Loosen 10/32" socket set screw on the bottom and read of the quill body.
2. Unscrew the nut from the end of the quill using a spanner wrench.
3. Pull or pry the (100-002-974) brass retainer down over the taper end of the spindle thus exposing the head of the R-8 pin which can then be pulled out of the spindle.
4. Replace the pin and reassemble in reverse order.

## G. PROCEDURE FOR CHANGING HEADS 745, 747, 845, 847, 760, 860, and 887

CAUTION: Before loosening all four 5/8" nuts on front of overarm, have a sling on the head to prevent falling.

1. Remove motor from pulley guard for VSD, see Step 5.
2. Remove tilt shaft which will free up the worm gear and allow it to fall free of the overarm.
3. Remove three of the 5/8" hex nuts which hold the (100-009-202) adaptor to the front of the overarm.
4. Then after a hoist or sling is attached around the head or pulley guard, the remaining 5/8" nut may be loosened. (Caution: The head is then free to fall to either side.)
5. Then pull straight out on the head assembly to clear the (100-004-569) tilt gear and the (100-002-904) T-bolts.
6. Reassemble in reverse order.

## H. STEPS TO TAKE TO CHANGE MOTORS ON VARIABLE SPEED HEADS

1. Speed shift lever set at 4200 RPM.
2. Remove two 3/8-16" x 1-1/4" hex head cap screws which hold the motor to the pulley guard.
3. Slide motor as far as possible toward the spindle and work the belt over the motor pulley.
4. Remove motor from the pulley guard housing.
5. Remove pulley from defective motor and reassemble in reverse order.
6. It may be necessary to force the motor pulley flanges apart a little to facilitate slipping the belt over the pulley.



**I. INSTRUCTIONS FOR CHANGING SPINDLES IN THE FOLLOWING MODELS 745, 747, 756, 757, 845, 847, 856, 857, 760, 860, and 887.**

1. Remove drawbar.
2. Drop Knee and move saddle to rear so as to provide clearance for quill removal.
3. Remove (100-027-771) adjustable vernier blade holder.
4. Remove two 5/16-18" x 7/8 socket head cap screws in (100-002-917) quill feed trip key and remove key.
5. Put right hand on spindle feed handle arm and left hand on the bottom of the quill, and by moving the handle in a counter-clockwise direction, run the quill down until the rack on the quill clears the pinion on the cross shaft.
6. When this happens, the hand lever will unwind very rapidly. If released, it could cause injury. So it must be unwound slowly.
7. Let the quill slide down out of the head casting and put it in a vise, being sure to use brass or lead jaws in the vise.
8. Release the locking ear of the W-07 lock washer in the N-07 locknut or snap ring in the top of the quill and remove nut from the spindle (See Paragraph 11)
9. Remove front bearing retainer from quill after first releasing the 10/32 socket set screw in the lower rear of the quill.
10. Remove quill from the vise and strike spline or upper end of spindle against a solid piece of wood laying against a solid surface, such as the floor. The spindle and the two lower spindle bearings and spacers will then come out of the quill.
11. Replace new spindle and assembly in reverse order making very sure that the N-07 locknut is tight against the bearing.
12. When putting the quill back into the head casting, first start the quill into the bore of the casting by gentle pressure and care (do not force).
13. Line up the spline of the spindle with the spline of the (100-004-576) drive hub by turning the spindle after it goes up against the bottom of the (100-004-576) hub.
14. Next, wind the spindle feed handle counter-clockwise to the end of its spring tension and push quill up until rack of the quill engages the pinion of the cross shaft and use hand lever to raise quill up to the top of its travel.

**J. PROCEDURE FOR FREEING UP BACK GEAR TO DIRECT DRIVE 745, 756, 760, 845, 856, 747, 757, 860, 847, and 857**

This particular problem is usually caused by the (111-218-001) pulley guard being jolted out of line during shipment and can usually be remedied as follows:

1. Shift the back gear lever into the direct drive or upper range and set the speed at about 1500 RPM.
2. Loosen the eight 1/4-20" x 7/8" socket head cap screws which hold the belt guard to the back gear housing.
3. Turn on the spindle motor, move the belt guard a very slight distance in several directions. The dowel pin hole in the front of the pulley guard can be used with 1/4" allen wrench to move the pulley guard back and forth.
4. The pulley guard will actually tend to center itself if reasonable care is exercised when retightening the eight socket heads that hold the belt guard to the back gear housing.

## K. PROCEDURE FOR ELIMINATING CREEP IN VSD SHIFTER

1. Referring to drawing H2-2 variable speed drive sandwich assembly, at the extreme top of the head you will notice four 10/32" x 7/8" screws which hold the speed lever assembly to the cam housing.

These four screws keep enough tension on the cup washers to provide the proper friction between the shift lever and the housing to prevent creeping.

This creeping is easily remedied by snugging up these four screws.

## L. METHOD OF CHANGING PRESENT SPINDLE FOR OLDER TYPES WITH 2968, 2969, AND 2970 SPACERS

1. Remove N-07 locknut from top of spindle.
2. Loosen 10/32" lock screw from bottom of quill.
3. Remove quill nut by turning counter-clockwise.
4. Tap splined end of spindle on block of hard wood and spindle and two lower bearings will come out.
5. Discard spacer 2968.
6. Put 200-039 spacer on splined end of spindle against the thrust bearings of new spindle.
7. Press entire assembly in quill and install quill nut.
8. Install snap ring on top of spindle.
9. If old spindle bearings are used, discard spacers 2969 and 2970.

## M. PROCEDURE FOR CHANGING BRAKE SHOES ON VARIABLE SPEED HEAD ASSEMBLY

1. With spindle motor running shift spindle speed to highest RPM then remove spindle motor as described in paragraph "H".
2. Referring to drawing H2-2 in the service manual remove the speed shift lever by removing the four (4) socket head cap screws which hold it against the 111-218-205 ring.
3. Remove the six (6) 1/4-20" x 3/4" socket heads which hold the 111-218-003 cam housing to the pulley guard and remove housing from pulley guard.
4. Now by reaching thru the holes in the sides of the pulley guard the lower pulley sleeve can be worked up out of the pulley guard casting, thus exposing the brake shoes.
5. Now the 3/8" x 3-1/4" roll pins can be driven in to clear the brake shoes. (Note: The pins must be driven all the way to clear the pulley guard casting and fall free.)
6. Unscrew the 111-218-204 brake pull rod and remove old shoes.
7. Reassemble in reverse order making sure the cog belt is around the drive hub. This is made simpler if the cog hub is slowly rotated while being pushed or tapped down into its proper position.
8. After reassembly is completed, the shoes can be properly adjusted by first tightening the 1/4-20" x 1-1/4" socket set screw above the brake handle until the shoe makes contact with the outer race of the pulley and backing off to just clear. Then the 111-218-004 brake pull rod should be turned clock-wise until contact is made with the inner pulley race and then backed off to clear.

# INSTRUCTION MANUAL

# WELLS INDEX MILL

## N. PROPER WAY TO CHECK FOR POSSIBLE LOOSENESS OF QUILL IN HEAD CASTING AND FOR LOOSENESS OF SPINDLE IN QUILL HOUSING

Once in a while there is a complaint on what appears to be looseness in the head and or quill assembly.

In 99% of these cases this is caused by loose gibs and has nothing to do with the fit of the spindle and quill in the head casting.

However, in the event that a check is to be made, it should be done as in Figure 1, Position 1 & 9 with the indicator base mounted solidly on the head itself.

If a reasonable amount of force is applied to the spindle, a reading of up to .0005 is not out of line, with the Quill retracted.

## X RECOMMENDED "INDEX" SPEEDS FOR HIGH SPEED FAST SPIRAL END MILLS:

SIZE	TOOL STEEL AND FORGINGS	MACHINE STEEL C.R. STEEL	CAST IRON AND FREE CUTTING STEEL
1/8"	1675	2850	2850
3/16"	1000	1675	1675
1/4"	1000	1000	1675
5/16"	600	1000	1000
3/8"	600	600	1000
7/16"	600	600	600
1/2"	355	600	600
5/8"	355	355	600
3/4"	355	355	600
7/8"	210	355	355
1"	210	355	355

The foregoing should be regarded as approximate, as many factors control the efficient operation of end mills. Always keep cutters sharp, and a steady flow of oil or compound directly on the working point will allow much higher cutting speed. Keep rate of feed consistent with finish required.

# INSTRUCTION MANUAL

# WELLS INDEX MILL

## XI GENERAL SPEED RECOMMENDATIONS:

MATERIAL TO BE CUT	FEET PER MINUTE		
	ROUGH CUT	ROUGH AND FINISH	LIGHT AND FINISH CUT
Cast Iron-Soft-(Under 200 Brinnell)	70	80-90	120
Cast Iron-Med.-(200-300 Brinnell)	55	60-70	90
Cast Iron-Hard-(over 200 Brinnell)	40	50-60	70
Steel (Chrome Nickel 40-45 Shore)	30	40	50
Steel (Stainless)	60	80	90
Steel (Low Carbon)	80	90	140
Steel (High Carbon)	40	50	70
Bronze (Medium)	90	120	150
Bronze (Hard)	65	90	130
Brass (Hard)	100	150	200
Copper	150	200	300
Duraluminum	400	---	600
Aluminum	600	---	1000

## XII TABLE OF CUTTING SPEEDS AND FEEDS

FEET PER MINUTE	15	20	25	30	40	50	60	70	80	90	100
	DIAMETER, INCHES										
REVOLUTIONS PER MINUTE											
1/16"	917	1222	1528	1833	2445	3056	3667	4278	4889	5500	6112
1/8"	458	611	764	917	1222	1528	1833	2139	2445	2750	3056
3/16"	306	407	509	611	815	1019	1222	1426	1630	1833	2037
1/4"	229	306	382	458	611	764	917	1070	1375	1375	1528
5/16"	183	244	306	367	489	611	733	856	978	1100	1222
3/8"	153	204	255	306	407	509	611	713	815	917	1019
7/16"	131	175	218	262	349	437	524	611	698	786	873
1/2"	115	153	191	229	306	382	458	535	611	688	764
5/8"	91	122	153	183	244	306	367	428	489	550	611
3/4"	76	102	127	153	204	255	306	357	407	458	509
7/8"	65	87	109	131	175	218	262	306	349	393	437
1"	57	76	95	115	153	191	229	267	306	344	382
1-1/8"	50	67	84	102	136	170	204	238	272	306	340
1-1/4"	45	61	76	91	122	153	183	214	244	275	306
1-3/8"	41	55	69	83	111	139	167	194	222	250	278
1-1/2"	38	50	63	76	102	127	153	178	204	229	255
1-5/8"	35	47	58	70	94	118	141	165	188	212	235
1-3/4"	32	43	54	65	87	109	131	153	175	196	218
1-7/8"	30	40	50	61	81	102	122	143	163	183	204
2"	28	38	47	57	76	95	115	134	153	172	191

### **XIII      REPLACING VARIABLE SPEED BELT**

**(REFER TO DRAWING H2-2)**

#### **Turn Off Power To Mill**

- a.) Set speed lever to 4200 RPM
- b.) Remove drawbar
- c.) Shift to low range (back gear)
- d.) Remove two 3/8-16 hex head screws which hold the motor to pulley gear.
- e.) Slide motor forward as far as possible towards the spindle and move the belt down off the motor pulley.
- f.) Remove motor
- g.) Remove speed lever (Item 3) by removing the four socket head cap screws (Item 1); place to side with wavy washer (Item 8).
- h.) Remove six screws (Item 13) holding down the cam housing (Item 15).
- i.) Insert the two 3/8-16 hex head bolts that held the motor on into the jack screw holes on the cam housing and lift off the pulley guard.
- j.) Move the old belt out to the outer edge of the pulley; slide the top half of the pulley down and work the belt out of the pulley guard or cut it in half to remove it.
- k.) Fold up the new belt and work it down around the outer edge of the pulley into the pulley guard; pull the belt into the pulley all the way into the shaft; make sure the cam on Item 12 engages with the cam follower (Item 17); note there is a flat section on the cam (Item 12) which if engaged to the cam follower will result in the speed lever not changing speeds when moved.

- l.) Replace the cam housing with the six screws; position the slot to the front of mill, away from motor.
- m.) Replace the speed lever using the cup washers and screws removed with it along with the wavy washer.

Note: The tensioning of these screws dictates the ease of movement for the speed lever; too loose and the lever will always move to high speed; too tight and you cannot move the lever.

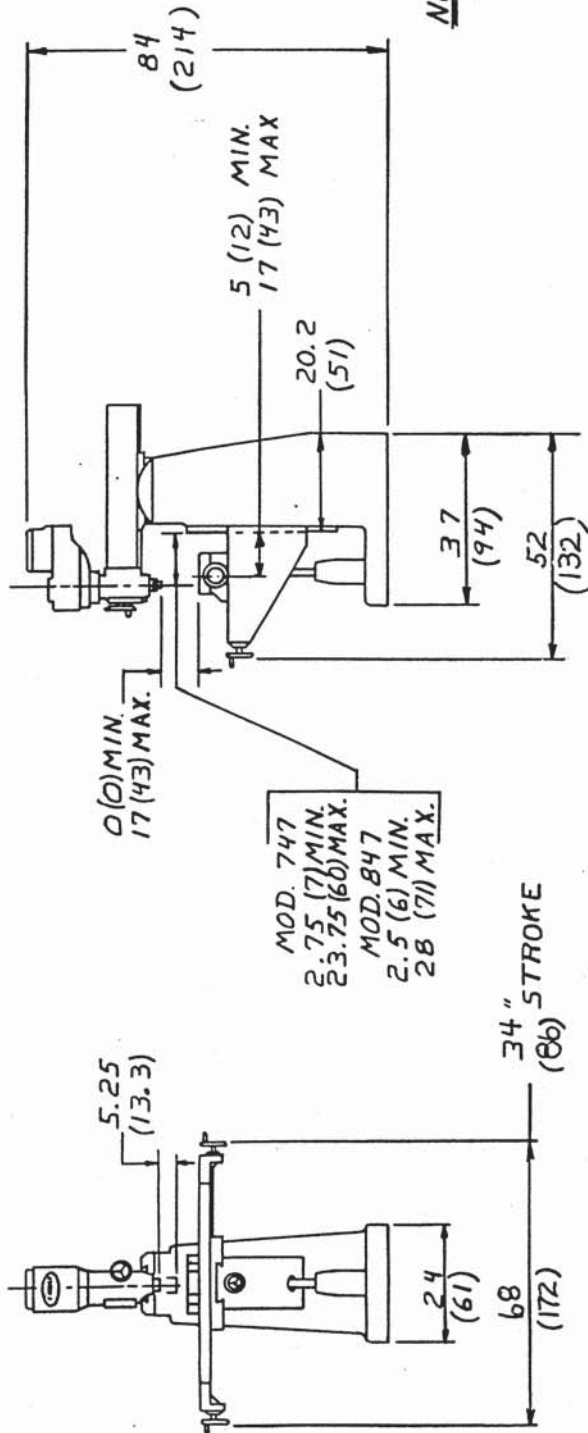
- n.) Place the motor in the pulley guard and work the belt into the pulley.
- o.) Slide the motor back and replace the hex head bolts.

## **XIV      REPLACING THE TIMING BELT**

### **(REFER TO DRAWING H2-2)**

Option: You can remove the motor to lighten the pulley guard assembly before proceeding. Refer to steps a through f in VSD belt replacement.

- a.) Remove drawbar and tooling
- b.) Shift into low range
- c.) Remove eight screws (Item 89)
- d.) Lift off pulley guard assembly; be careful to lift up and towards motor end to avoid damage to pulley flanges on pulley assembly (Item 68).
- e.) Lift off old belt (Item 69)
- f.) Place new belt in position move spindle up so the bottom edge of the belt just catches on the spindle spline to hold it in position.
- g.) Replace the pulley guard assembly; lowering the front edge first, let the timing pulley teeth, on the main pulley shaft (Item 25), catch on the new belt; lower the pulley guard down while lining up the spiral pin (Item 53) with its hole in the dust cover (Item 54); watch the flanges on the pulley assembly so you do not damage them.
- h.) Replace the eight screws and the motor, if removed.
- i.) Realign pulley guard to back gear housing using Procedures J, on page 15, and Procedure E, on page 14, of the manual, if needed.



**NOTE**  
ALL METRIC DIMENSIONS  
ARE IN CENTIMETERS (X X)

WELLS-INDEX CORPORATION - 1100 W. BROADWAY  
THREE RIVERS, MICHIGAN 49093

DESCRIPTION

FLOOR PLAN  
MODEL 847  
10 x 48 Table

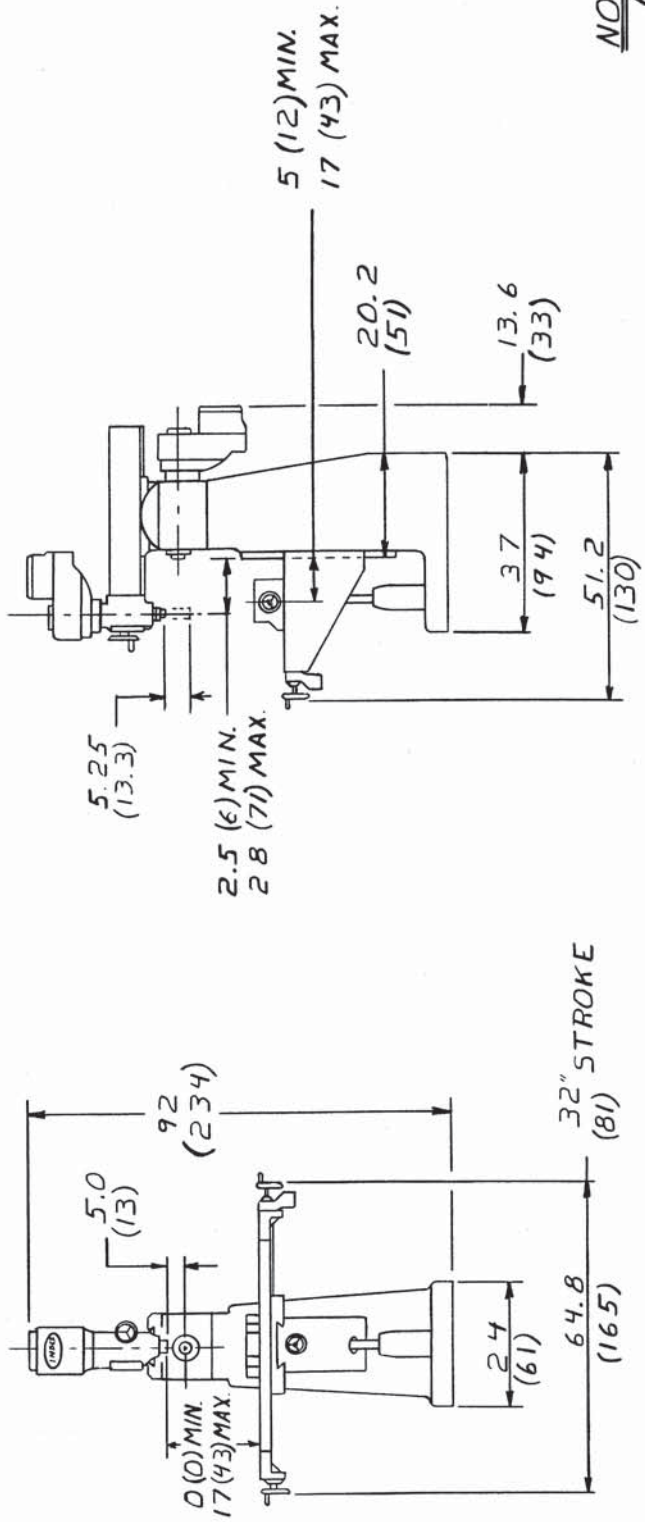
DATE

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DWG. NO.

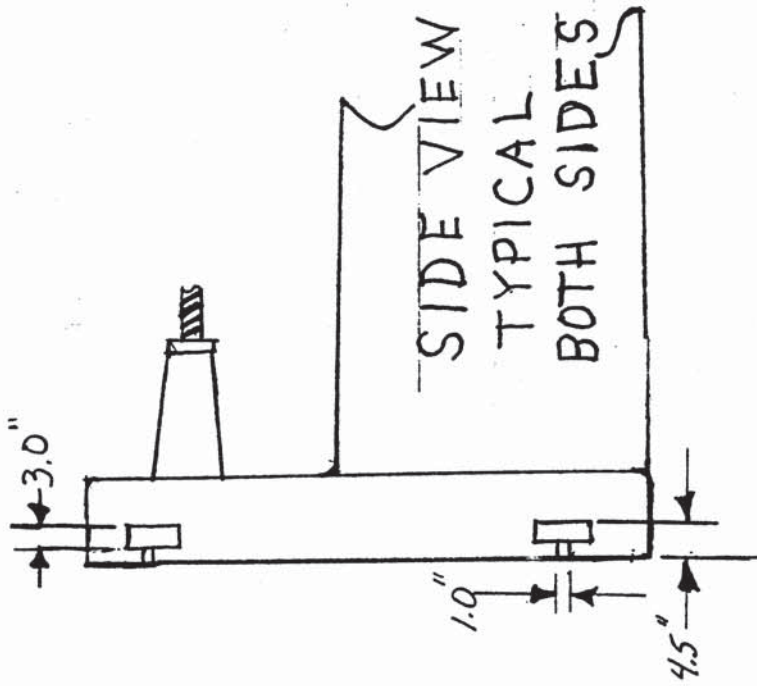
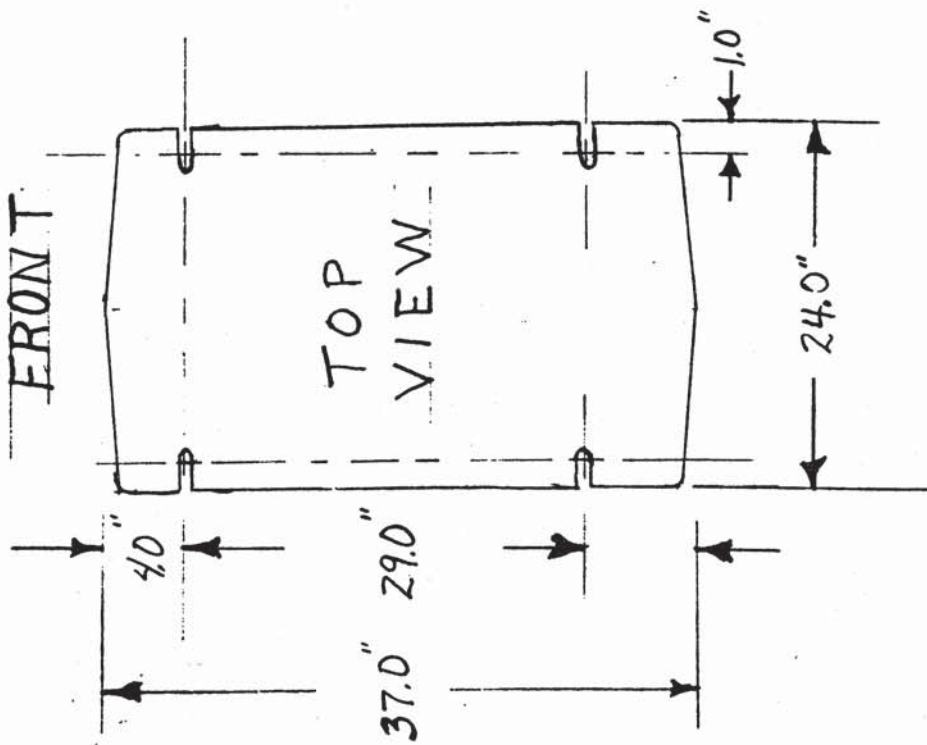
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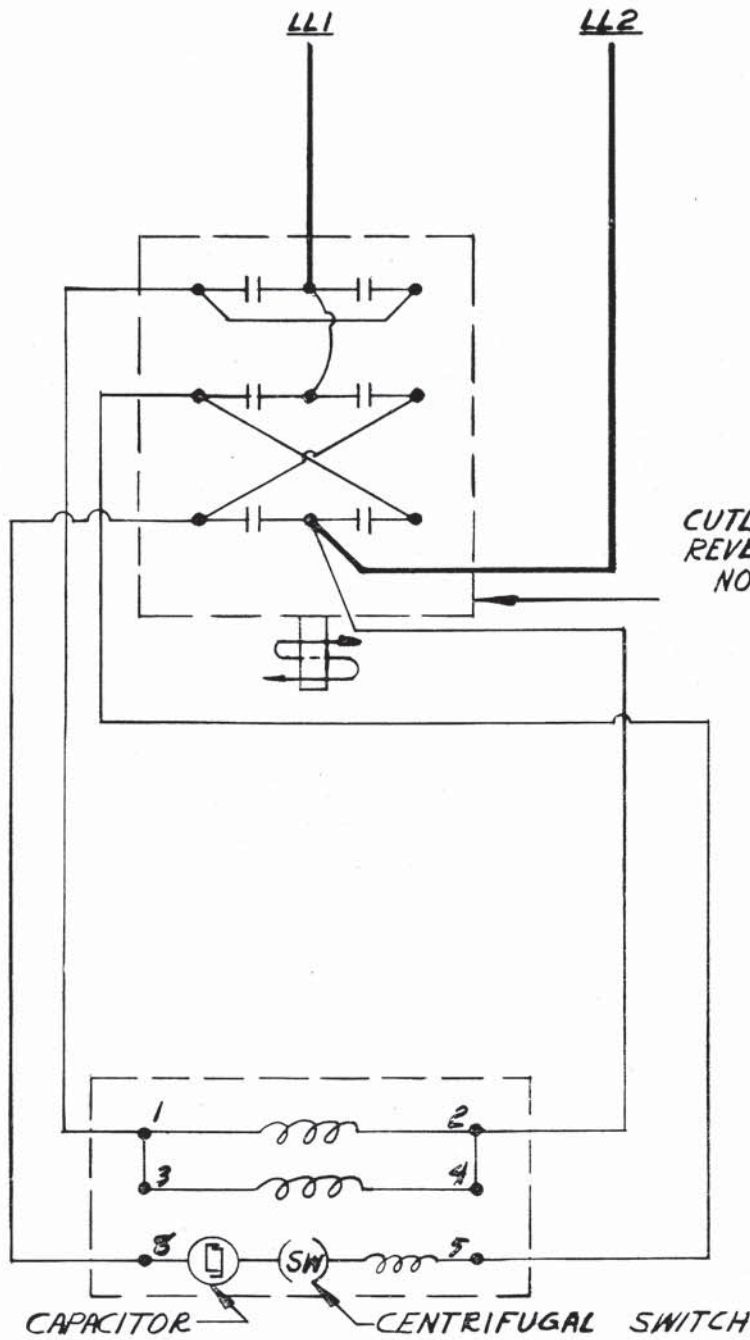


NOTE ALL METRIC DIMENSIONS ARE IN CENTIMETERS (XX)

WELLS-INDEX CORPORATION Three Rivers, Mich.	
FLOOR PLANER - Model 860	
B	900-012



MODEL 847+860
BOLT HOLE PAT.
A 900-012-



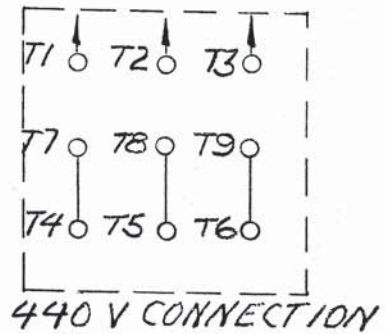
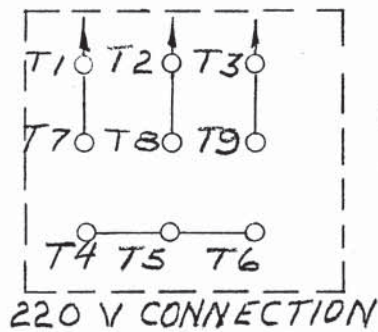
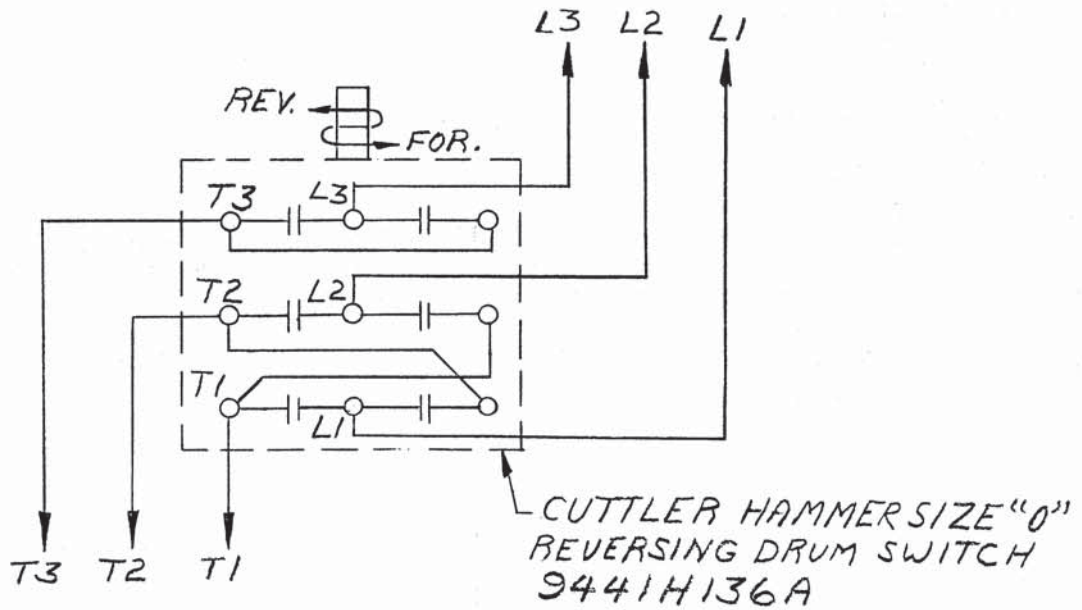
CUTLER-HAMMER SIZE "0"  
REVERSING DRUM SWITCH #9441H136A

NOTE:  
SAME AS DW6.2611 EXCEPT  
FOR NEW NEMA STD.

DOERR 1HP., 115/230 V.  
1740 RPM MOTOR TERMINAL  
BOX FR66, TEFCBB

TO REVERSE ROTATION,  
INTERCHANGE COIL LEADS  
5 AND 8.

<b>WELLS-INDEX CORPORATION</b>		
Three Rivers, Michigan		
WIRING DIAGRAM - 115 V., 60 CYC., SINGLE PHASE - 1 HP. - DOERR MTR. - NEW NEMA STD.		
WEF 10 OCT. 69	A	100003360



WELLS-INDEX CORPORATION  
Three Rivers, Michigan

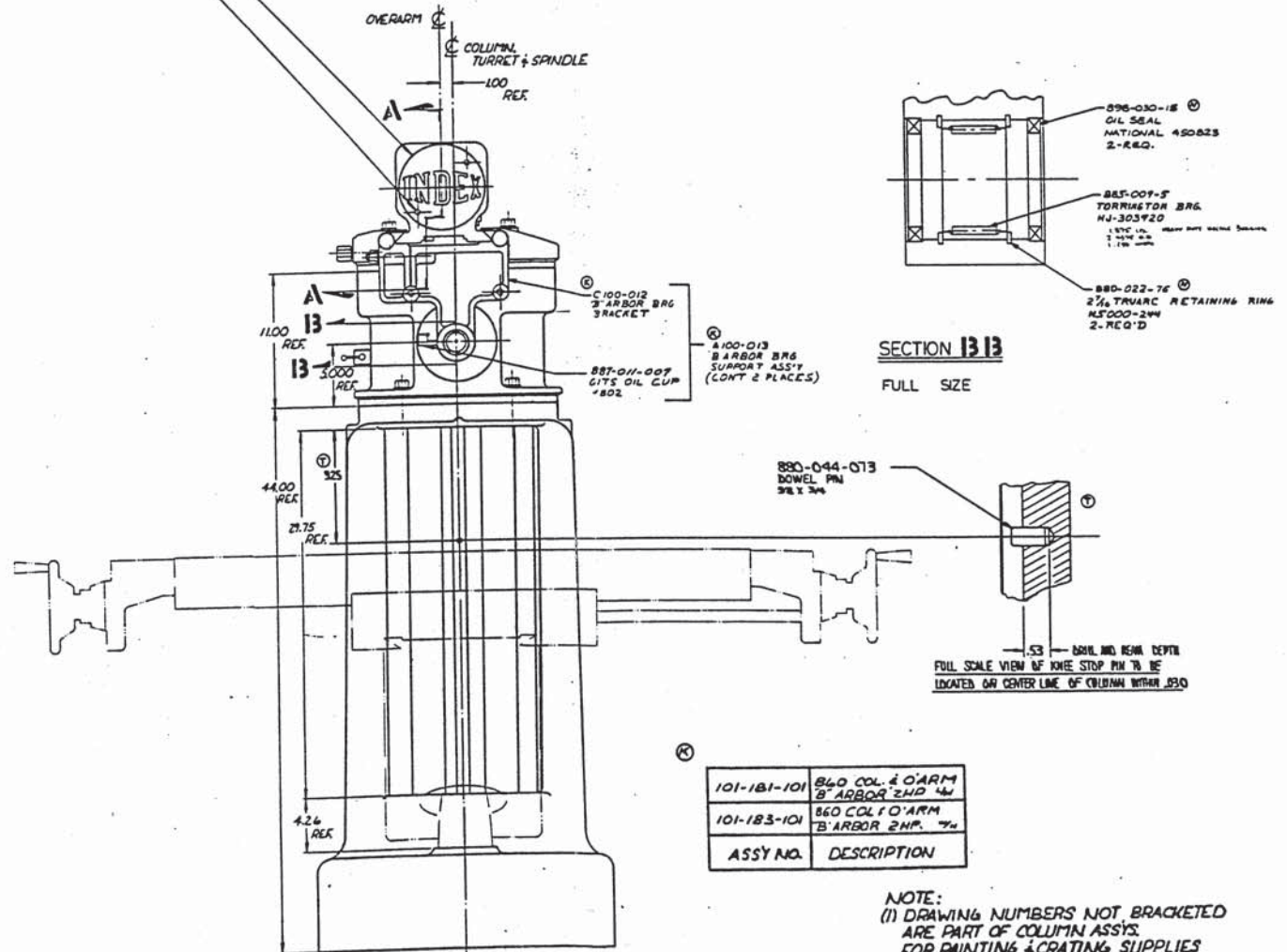
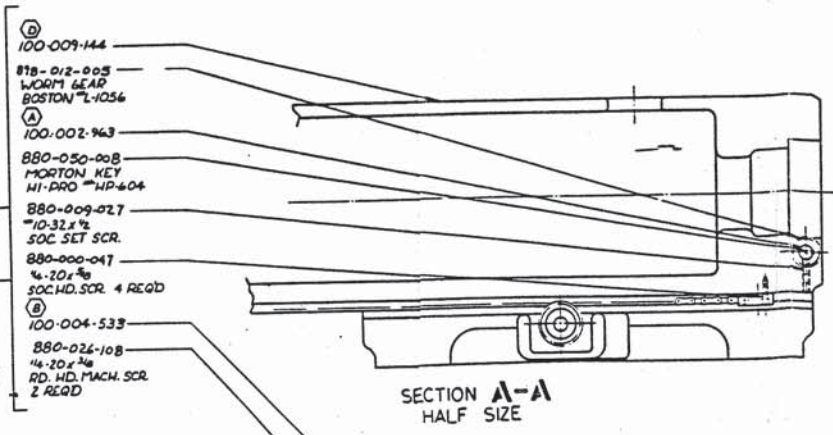
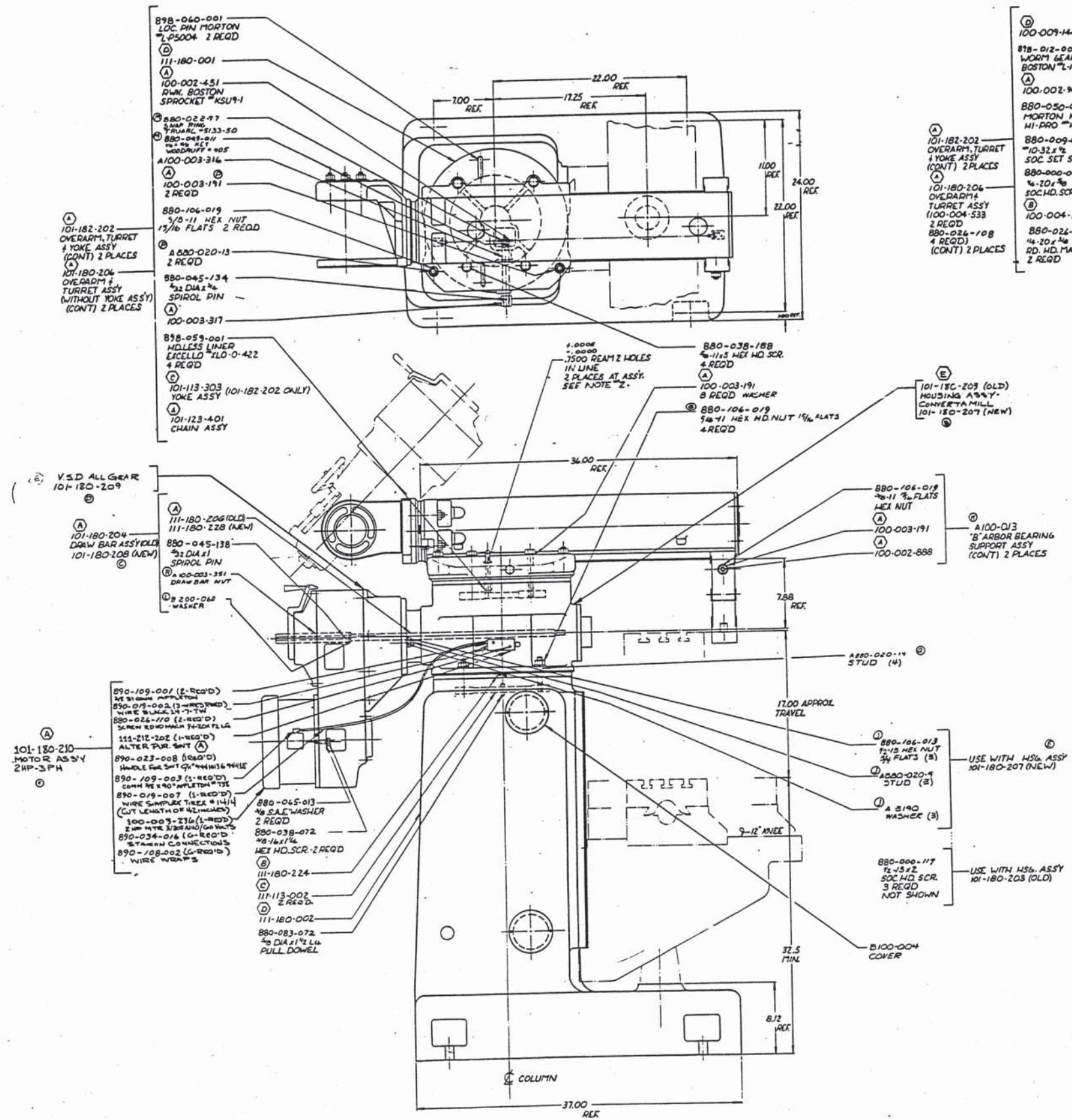
WIRING DIAGRAM FOR 220/440 V  
60 CY, 3 PH, 1 & 2 HP MOTOR  
45 MILL & 645

(CONNECTIONS FOR HEAD MOTOR)

14 FEB 57 RJP

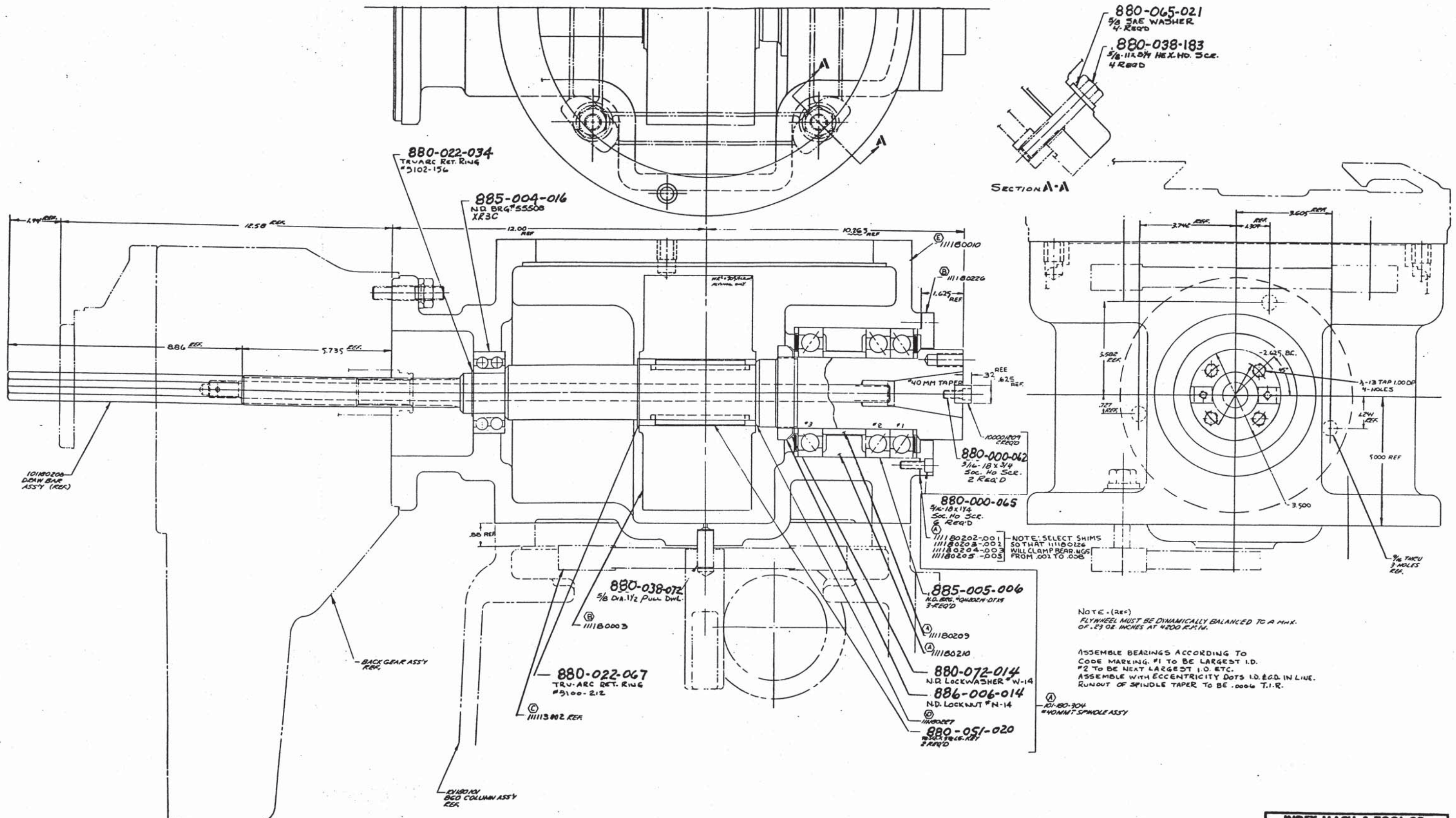
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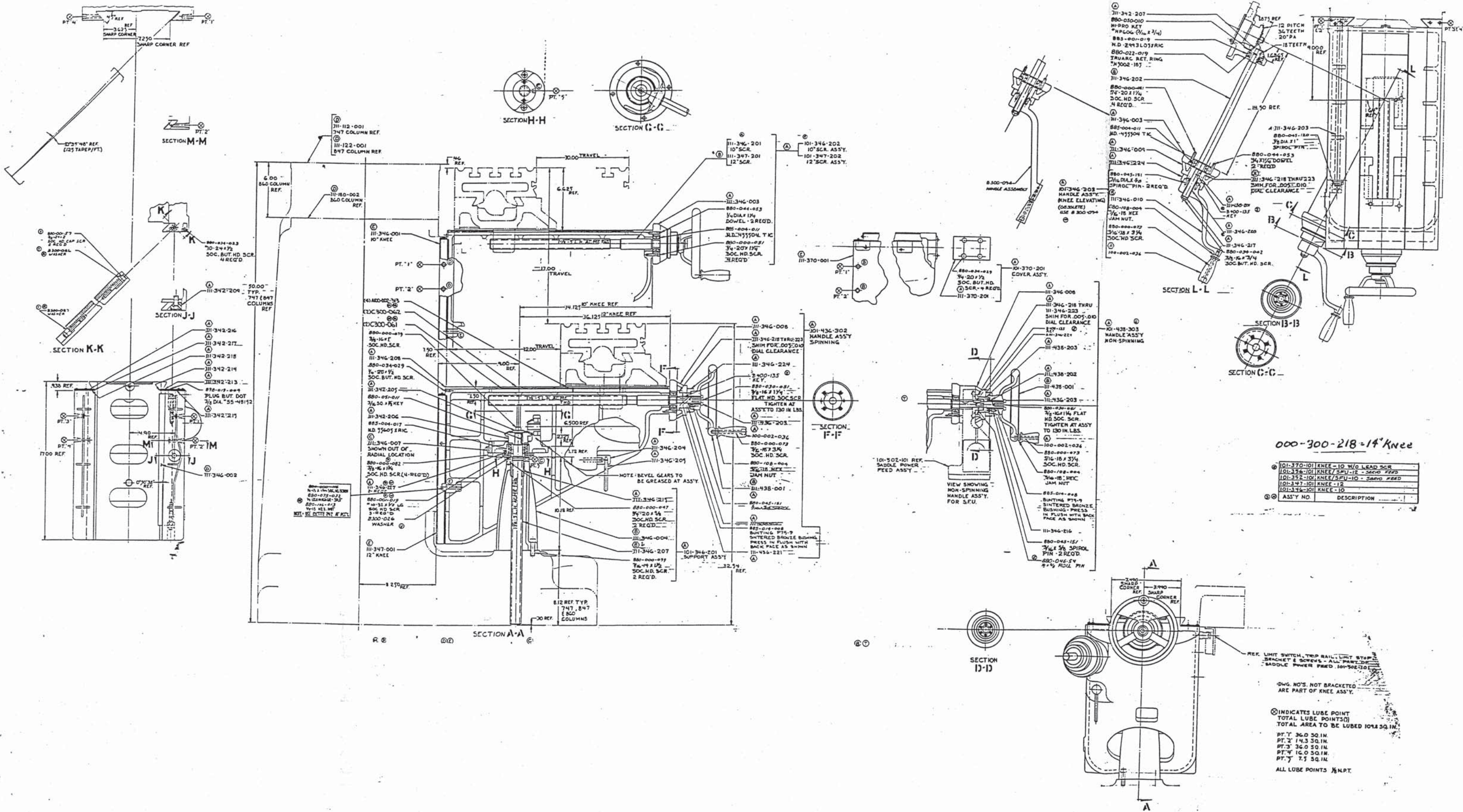




ASSY NO.	DESCRIPTION
101-181-101	860 COL. & O'ARM 'B' ARBOR 2ND 1/4"
101-183-101	860 COL. O'ARM 'B' ARBOR 2ND 7/8"

NOTE:  
 (1) DRAWING NUMBERS NOT BRACKETED ARE PART OF COLUMN ASSYS. FOR PAINTING & CRATING SUPPLIES SEE BILL OF MATERIAL.  
 (2) WITH OVERARM & TURRET & ARBOR SUPPORT IN CLAMPED CONDITION, SPINDLE TAPER & ARBOR SUPPORT BUSHING I.D. MUST BE CONCENTRIC WITHIN .0005 T.I.R.





000-300-218-14' Knee

ASSY NO.	DESCRIPTION
101-370-101	KNEE - 10 W/O LEAD SCR
101-356-101	KNEE / S.F.U - 12 - SADDLE FEED
101-352-101	KNEE / S.F.U - 10 - SADDLE FEED
101-347-101	KNEE - 12
101-341-101	KNEE - 10

DWG. NO'S. NOT BRACKETED ARE PART OF KNEE ASSY.

⊙ INDICATES LUBE POINT  
TOTAL LUBE POINTS: 10  
TOTAL AREA TO BE LUBED 104.5 SQ. IN.

PT. T 36.0 SQ. IN.  
PT. 2 14.3 SQ. IN.  
PT. 3 36.0 SQ. IN.  
PT. 4 16.0 SQ. IN.  
PT. 7 7.5 SQ. IN.

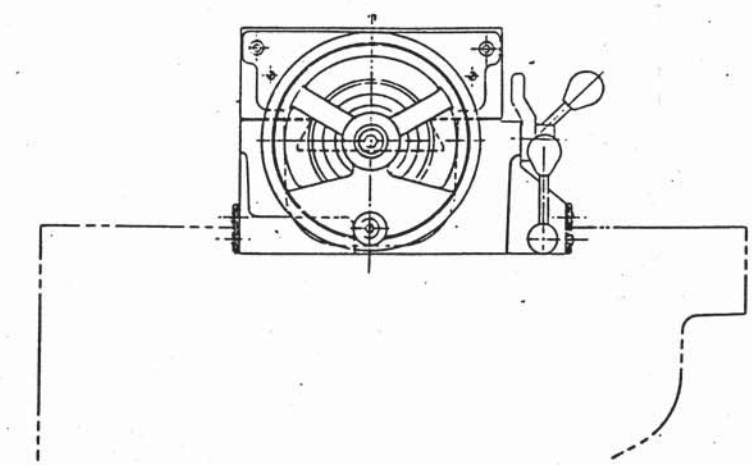
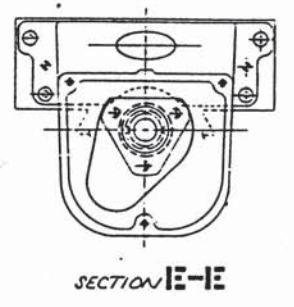
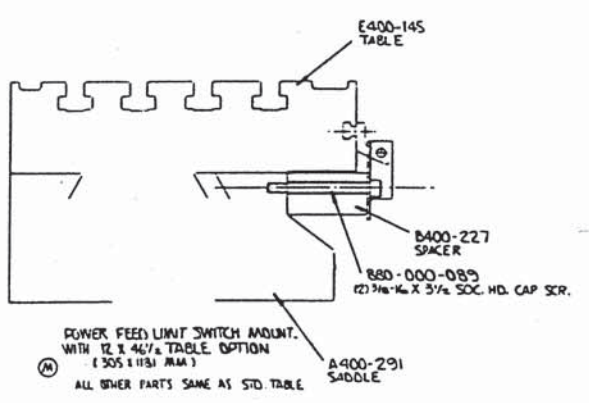
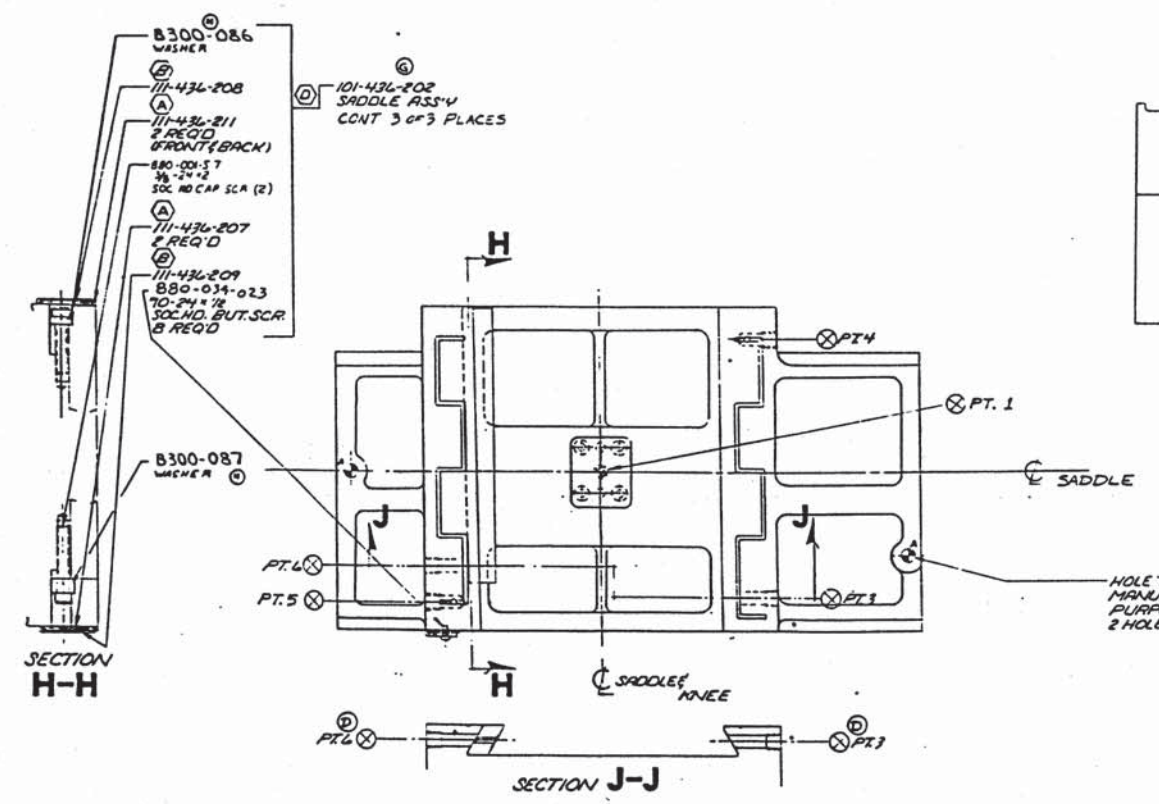
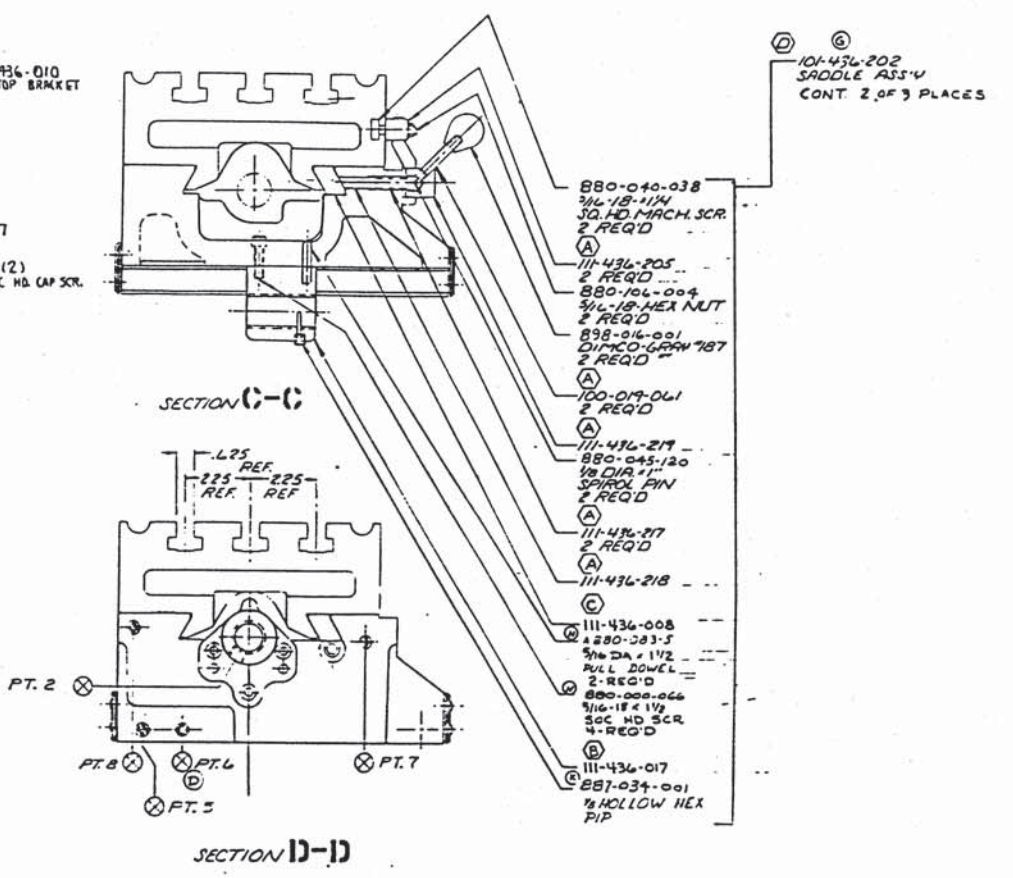
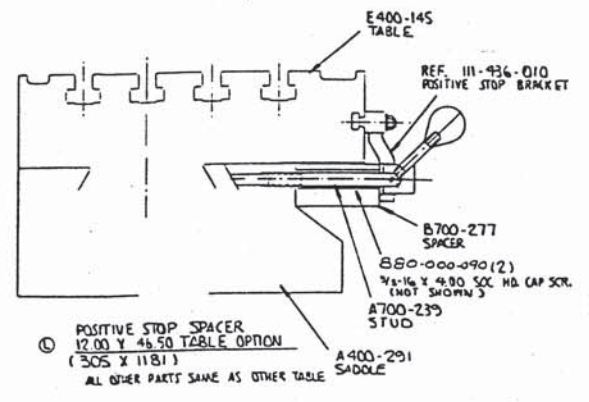
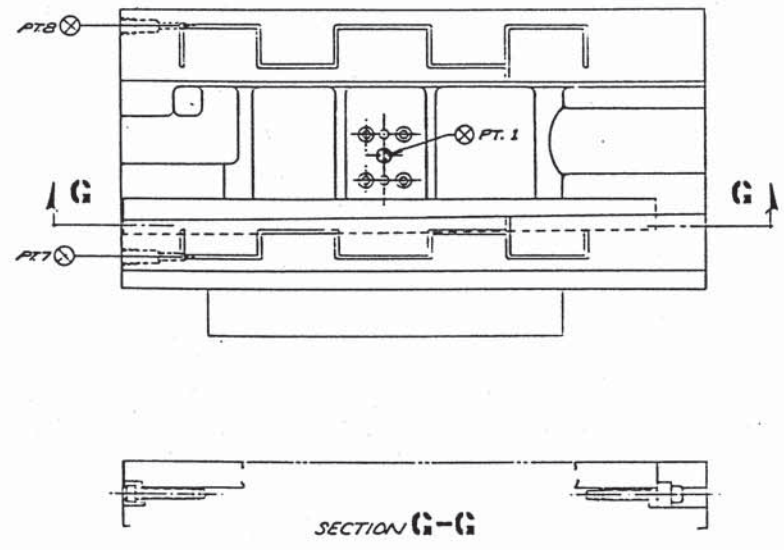
ALL LUBE POINTS 1/8 NPT.

WELLS-INDEX CORPORATION

KNEE ASSY

E 101-346-101

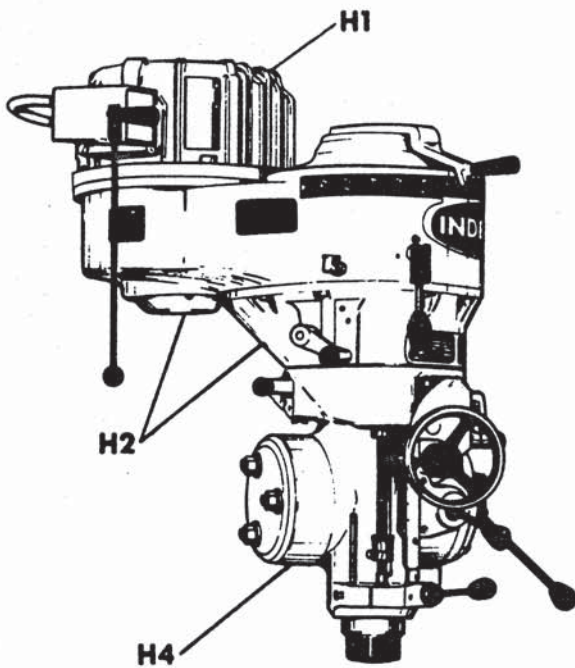




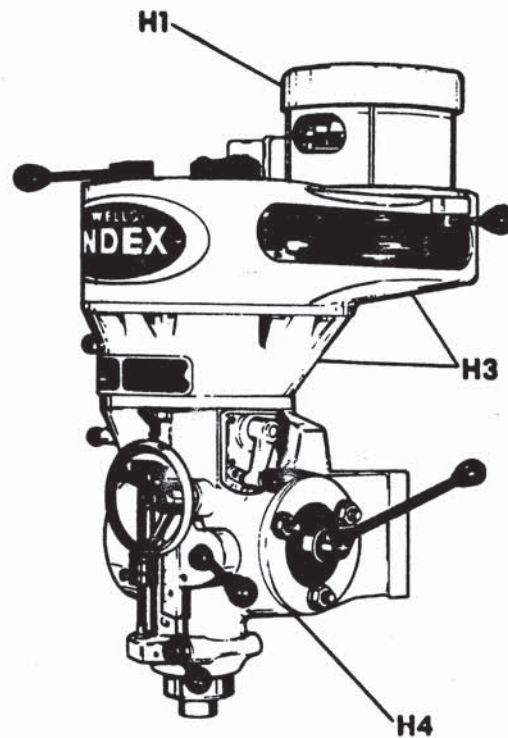


# HEAD ASSEMBLY

## Variable Speed Head



## Standard Head



H1 . . . . SPINDLE MOTOR

H2 . . . . VARIABLE SPEED SANDWICH ASSEMBLY

H3 . . . . STANDARD HEAD SANDWICH ASSEMBLY

H4 . . . . HEAD HOUSING ASSEMBLY

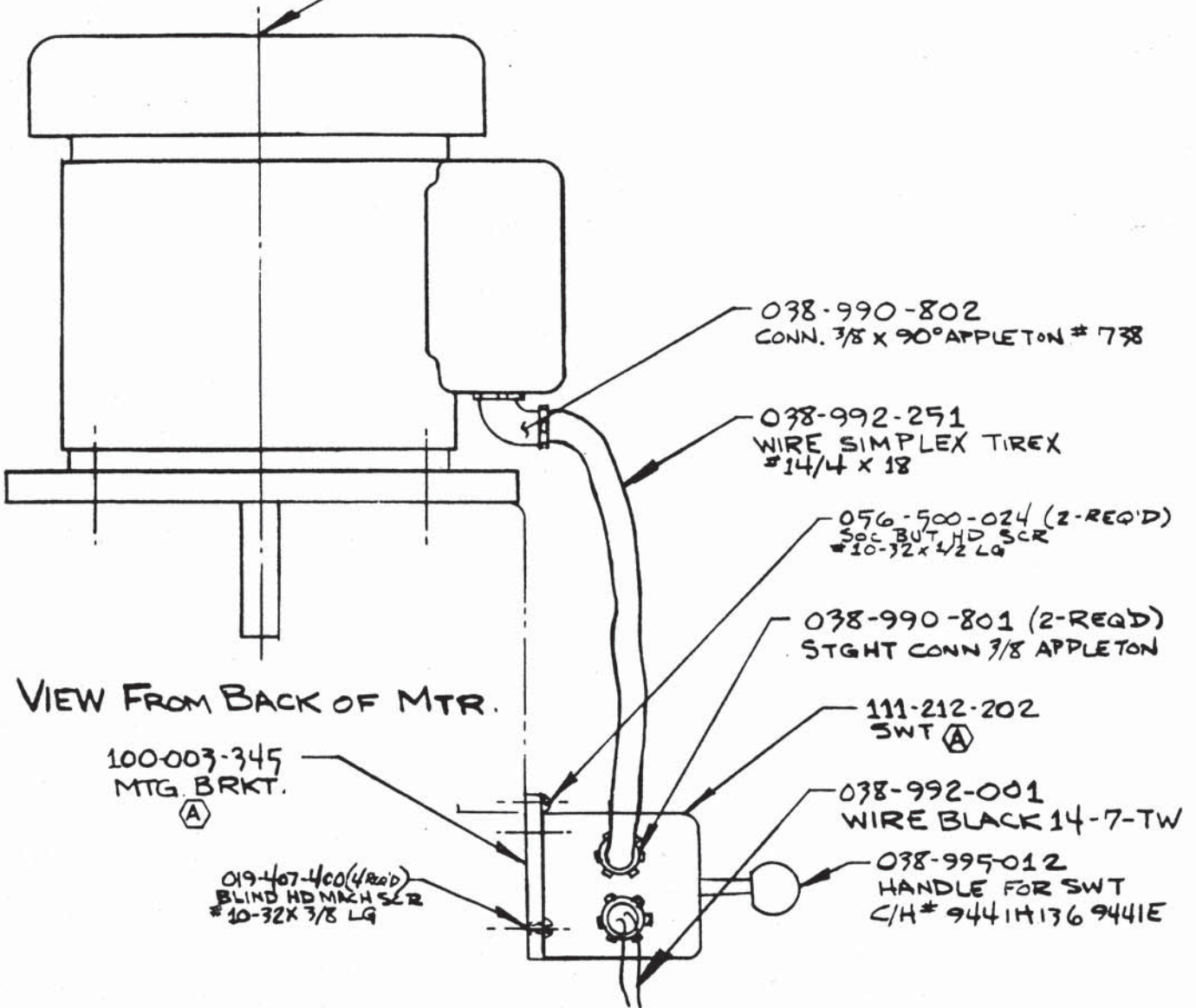
## SPINDLE MOTORS

H.P.	P.H.	VOLTAGE	HZ OR CYC	MOTOR NUMBER	SWITCH NUMBER
1	3	220/440	60	100-003-186	038-995-010
1	1	115/230	60	100-003-237	038-995-010
1.5	3	220/440	60	100-003-350	038-995-010
1.5	1	115/230	60	100-046-101	038-995-010
2	3	220/440	60	100-003-236	038-995-010
2	1	115/230	60	100-003-238	038-995-010
3	3	220/440	60	100-003-368	890-023-5

NOTE

FOR WIRING DIAGRAM SEE A SIZE DWG NR 100-003-360  
 USE (4) WIRE WRAPS TYPER SCOTCHLOCK INDEX NR 038-992-402  
 USE (8) STA-KONS T&B 14-8 B-339-008 INDEX NR 038-991-502

For Motor No. - See Chart H1



038-990-802  
 CONN. 3/8 X 90° APPLETON # 738

038-992-251  
 WIRE SIMPLEX TIREX  
 #14/4 X 18

056-500-024 (2-REQ'D)  
 Spc BUT HD SCR  
 #10-32 X 1/2 LG

038-990-801 (2-REQ'D)  
 STGHT CONN 3/8 APPLETON

111-212-202  
 SWT (A)

038-992-001  
 WIRE BLACK 14-7-TW

038-995-012  
 HANDLE FOR SWT  
 C/H # 9441H136 9441E

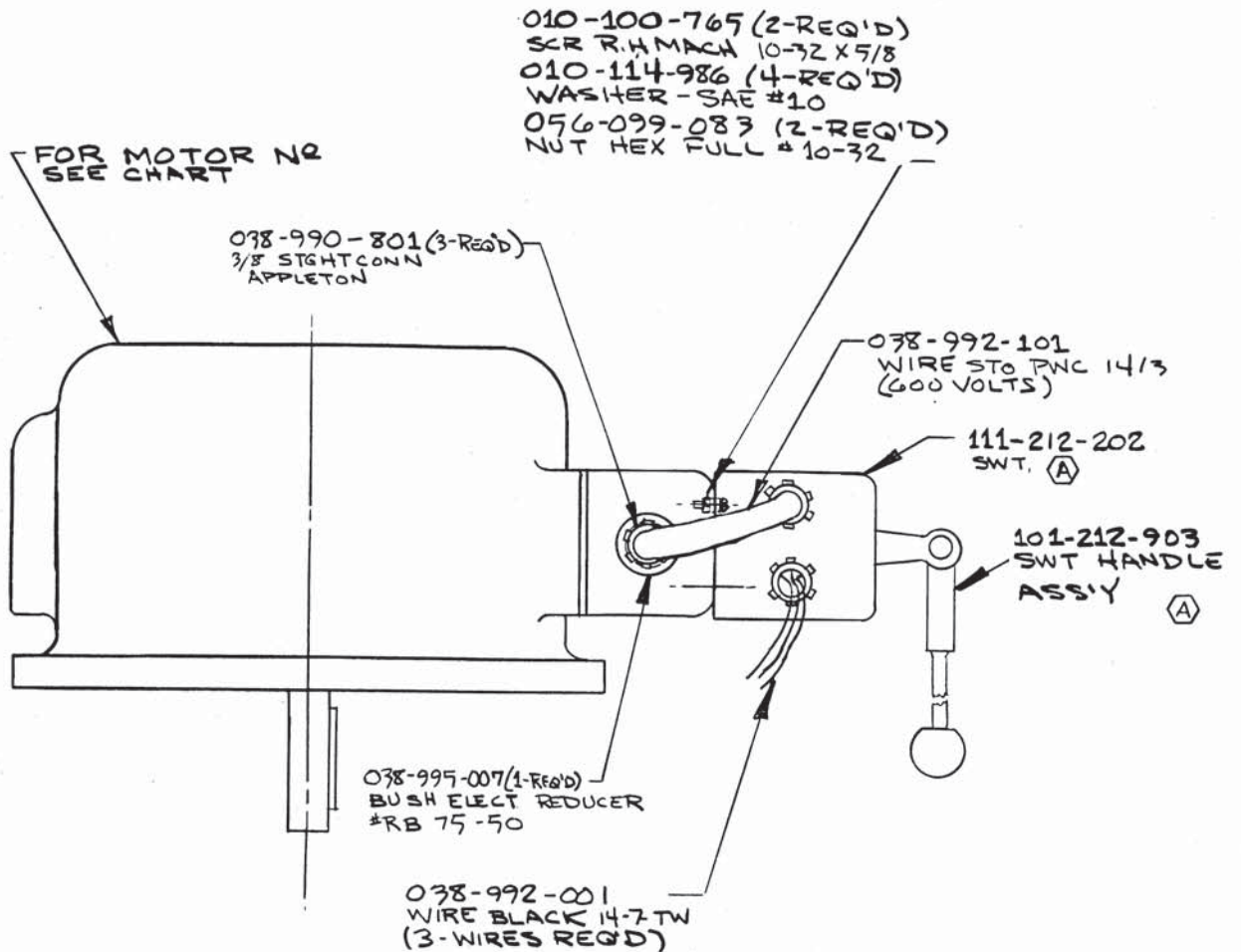
VIEW FROM BACK OF MTR.

100-003-345  
 MTG. BRKT.  
 (A)

019-467-400 (4 REQ'D)  
 BLIND HD MACH SCR  
 #10-32 X 3/8 LG

WELLS-INDEX CORPORATION	
1 H.P. 1PH MOTOR ASS'Y	
B	101-672-101

MOTOR ASSY NO	DESCRIPTION	MOTOR NO	WIRING DIAGRAM NO
B-101-671-101	2HP 1800 RPM 3PH 220-440V/60	A-100-003-236	A-100-002-032
A-101-673-101	1 1/2 HP 1800 RPM 3PH 220-440V/60	A-100-003-350	A-100-002-032
A-101-674-101	2HP 3600 RPM 3PH 220-440V/60	A-100-003-364	A-100-002-032

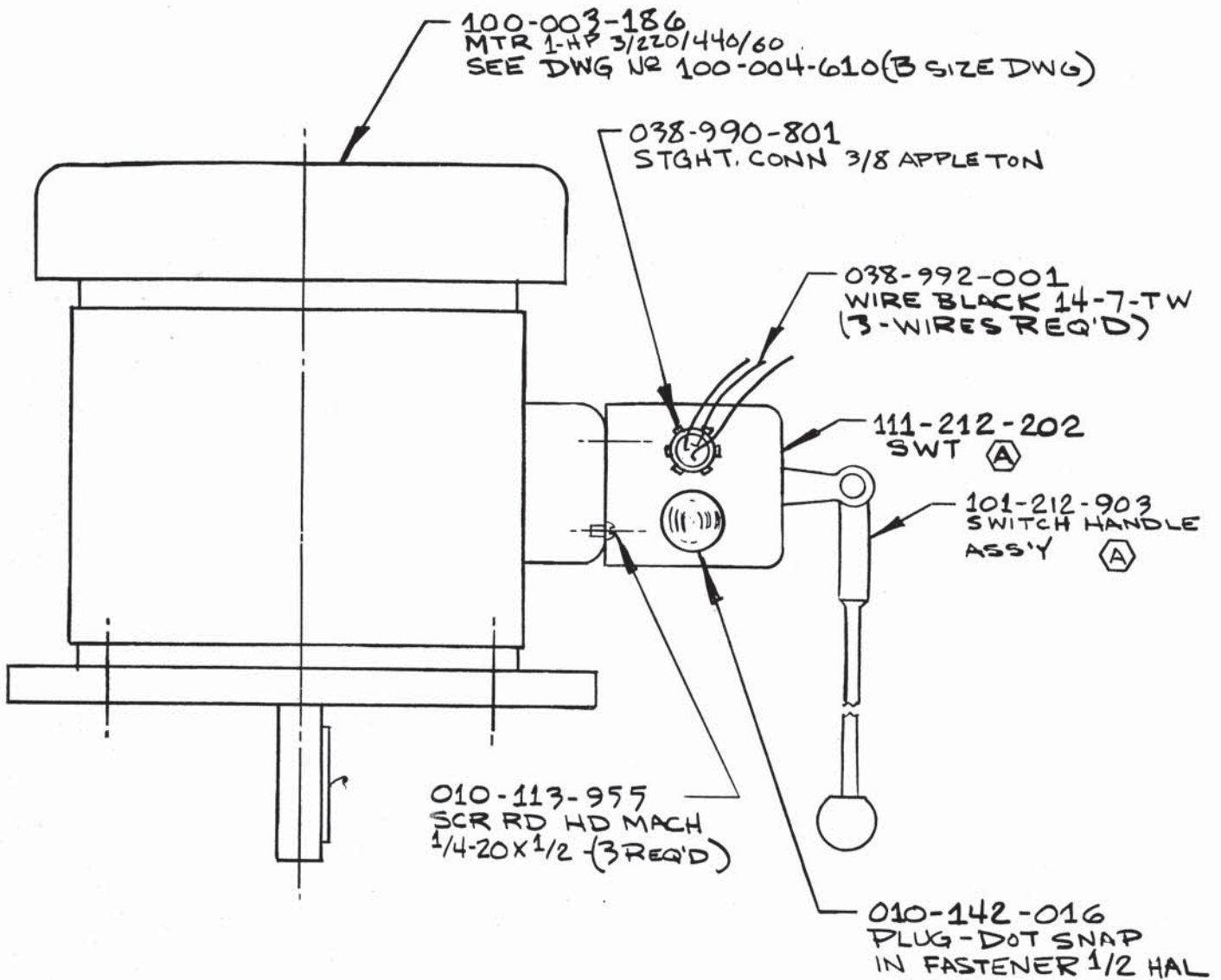


VIEW FROM BACK OF MOTOR

NOTE !

USE (6) STAGION CONNECTIONS  
INDEX NO 038-991-502 &  
ALSO USE (6) WIRE WRAP  
CONNECTIONS INDEX NO  
038-992-402

WELLS-INDEX CORPORATION	
2 H.P. MOTOR ASSY	
B	101-671-101



VIEW FROM BACK OF MOTOR

NOTE !

WIRING DIAGRAM NR 100-002-092  
USE (6) STAKON CONN. INDEX NR  
038-991-502 & ALSO USE (6)  
WIRE WRAPS NR 038-992-401

WELLS-INDEX CORPORATION	
1HP 3PH MOTOR ASS'Y	
B	101-670-101

VARIABLE SPEED DRIVE SANDWICH ASSEMBLY

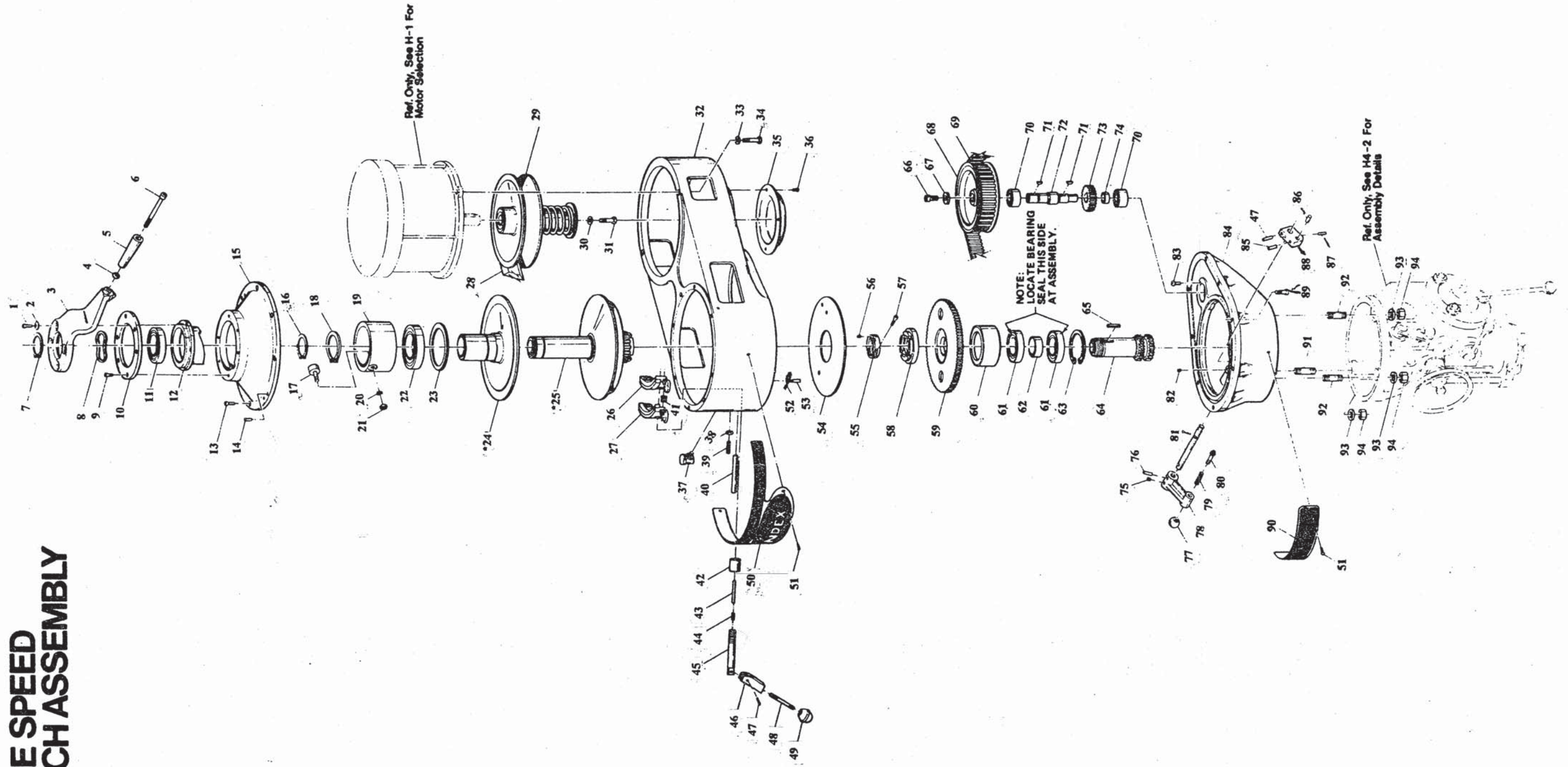
MODELS 747, 847, & 887

SYM.	QTY.	PART NO.	DESCRIPTION	SYM.	QTY.	PART NO.	DESCRIPTION
1	4	880-003-014	#10-32 x 7/8 Soc. Button Hd. Nylok Sc.	56	1	880-005-033	#10-32 x 1/4 Soc. Set Screw
2	8	880-071-001	Cup Washer	57	1	880-001-011	#6-40 x 1/2 Soc. Hd. Cap Screw
3	1	111-218-002	Speed Adjuster Lever	58	1	100-002-991	Clutch Dog
4	1	880-108-004	5/16-18 Hex Jam Nut	59	1	100-004-557	Back Gear
5	1	100-002-036	Handle	60	1	100-002-989	Back Gear Bearing Bushing
6	1	880-000-071	5/16-18 x 2-3/4 soc. Hd. Cap Screw	61	2	885-001-027	Bearing
7	2	880-022-047	Retaining Ring	62	1	100-003-313	Spacer
8	1	880-067-004	Washer Wavey	63	1	880-022-021	Retaining Ring
9	6	880-000-048	1/4-20 x 5/8 Soc. Hd. Cap Screw	64	1	100-004-576	Drive Hub
10	1	111-218-003	Speed Adj. Retainer Cap	65	1	880-051-019	5/16 Sq. x 7/8 Key
11	1	885-001-030	Bearing	66	1	880-002-077	3/8-16 x 3/4 Soc. Hd. Cap Screw
12	1	111-218-004	Speed Adjuster Cam	67	1	880-073-002	Washer
13	6	880-000-048	1/4-20 x 3/4 Soc. Hd. Cap Screw	68	1	101-212-414	Timing Gear Assembly
14	2	880-083-002	5/16 Dia. x 1 Pull Dowel	69	1	898-014-001	Timing Belt
15	1	111-218-003	Cam Housing	70	2	885-004-010	Bearing
16	1	880-022-046	Retaining Ring	71	2	880-049-009	Key
17	1	885-011-001	Cam Follower	72	1	111-212-205	Back Gear Shaft
18	1	880-022-048	Retaining Ring	73	1	100-002-985	Back Gear
19	1	111-218-208	Speed Adj. Brq. Housing	74	1	100-002-986	Back Gear Spacer
20	1	880-099-009	Shakeproof Lockwasher	75	1	880-009-023	#10-32 x 3/16 Soc. Set Screw
21	1	880-108-005	5/16-24 Hex Jam Nut	76	1	880-045-157	3/16 x 1 Spirol Pin
22	1	885-001-035	Bearing	77	1	898-016-003	Knob
23	1	880-022-009	Spirolox Ref. Ring	78	1	100-002-900	Shift Lever
*24*	1	101-218-401	Upper Pulley Face Assembly	79	1	898-001-013	Spring
*25*	1	101-218-402	Lower Pulley Face Spindle Assembly	80	1	100-002-919	Shift Lever Plunger
26	1	101-218-403	Brake Assembly (Inside)	81	1	100-002-994	Back Gear Shift Shaft
27	1	101-218-404	Brake Assembly (Outside)	82	1	880-014-029	1/4-20 x 3/8 Soc. Set Half Dog Screw
28	1	898-015-024	VSD Belt	83	1	880-064-041	1/4-20 x 1/2 Truss Hd. Screw
29	1	101-218-406	Motor Pulley Assembly	84	1	111-212-005	Back Gear Housing
30	1	880-065-011	5/16 Washer	85	1	880-045-116	1/8 Dia. x 3/4 Spirol Pin
31	1	880-002-065	5/16-18 x 1-1/4 Soc. Hd. Cap Nylok Sc	86	1	100-003-196	Pin
32	1	111-218-001	Belt Guard	87	1	880-020-005	1/4-20 x 1-1/2 Soc. Set Screw
33	2	880-065-013	3/8 Washer	88	1	100-002-992	Back Gear Shift Arm
34	2	880-038-073	3/8-16 x 1-1/2 Hex Hd. Cap Sc	89	8	880-000-049	1/4-20 x 7/8 Soc. Hd. Cap Screw
35	1	111-218-201	Cover	90	1	111-218-212	Spindle Speed Plate
36	4	880-034-029	1/4-20 x 1/2 Soc. Button Hd. Sc	91	1	880-020-012	Stud
37	1	887-011-006	Oil Cup	92	2	880-020-005	Stud
38	1	880-108-001	1/4-20 Hex Jam Nut	93	3	100-003-190	Washer
39	1	880-004-072	1/4-20 x 1-1/4 Soc. Set Sc	94	3	880-106-013	1/2-13 Hex Nut
40	2	880-045-243	3/8 Dia. x 3-1/4 Roll Pin				
41	2	898-001-014	Spring				
42	1	111-218-202	Brake Adj. Bushing				
43	1	111-218-213	Brake Rod				
44	1	898-001-009	Spring				
45	1	111-218-204	Pull Brake Rod				
46	1	100-003-002	Brake Handle				
47	2	880-045-153	3/16 Dia. x 3/4 Spirol Pin				
48	1	100-002-955	Feed Control Handle				
49	1	898-016-008	Knob				
50	1	111-218-203	Speed And Name Plate				
51	6	880-110-018	#4 x 5/16 Drive Screw				
52	1	898-021-005	Pipe Cleaner				
53	1	880-045-158	3/16 x 1-1/8 Spirol Pin				
54	1	100-004-559	Stamping Cover				
55	1	100-003-006	Hub Drive Nut				

\*\*\*NOTE 24+25 OPT. 000-200-410 Upper & Lower Pulley Face Assembly



# VARIABLE SPEED SANDWICH ASSEMBLY

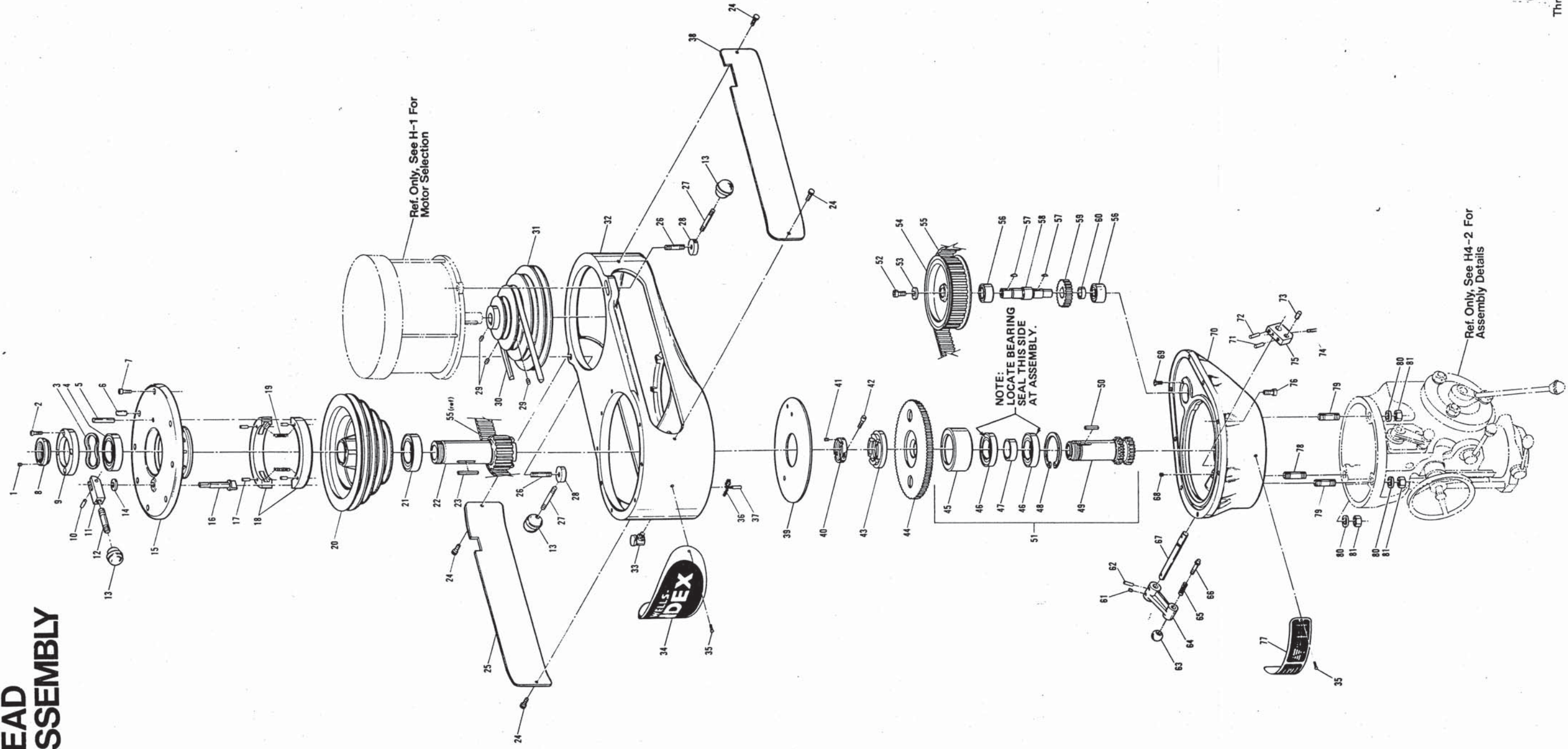


## STEP PULLEY SANDWICH ASSEMBLY

FOR MODEL 747

SYM	QTY	PART NO.	DESCRIPTION	SYM	QTY	PART NO.	DESCRIPTION
1	1	880-005-033	10-32 x1/4 Soc Set Screw	56	2	885-004-010	Bearing
2	4	880-000-048	1/4-20x3/4 Soc Hd Cap Screw	57	2	880-049-009	Key
3	1	880-067-004	Wavey Washer	58	1	111-212-205	Back Gear Shaft
4	1	885-001-031	Bearing	59	1	100-002-985	Back Gear, 24 Teeth
5	1	880-045-238	3/8 x 2 Spirol Pin	60	1	100-002-986	Back Gear Spacer
6	2	880-083-001	5/16 x 3/4 Pull Dowell	61	1	880-009-023	#10/32 x 3/16 Soc Set Screw
7	6	880-000-046	1/4 - 20 x 1/2 Soc Hd Cap Screw	62	1	880-045-157	3/16 x 1 Spirol Pin
8	1	100-003-000	Cartridge Bearing Lock Nut	63	1	898-016-003	Knob
9	1	111-212-004	Cartridge Bearing Retainer	64	1	100-002-900	Shift Lever
10	1	880-045-153	3/16 x 3/4 Spirol Pin	65	1	898-001-013	Spring
11	1	100-003-002	Brake Handle	66	1	100-002-919	Shift Lever Plunger
12	1	100-003-338	Brake Handle Stud	67	1	100-002-994	Back Gear Shift Shaft
13	3	898-016-008	Knob	68	1	880-014-029	1/4-20 x 3/8 Half Dog Soc Set Screw
14	1	100-003-339	Brake Washer	69	1	880-064-041	1/4-20 x 1/2 Truss Head Screw
15	1	111-212-002	Drive Pulley Cartridge	70	1	111-212-005	Back Gear Housing
16	1	100-002-995	Brake Cam	71	1	880-045-116	1/8 x 3/4 Spirol Pin
17	4	880-046-007	1/16 x 9/16 Roll Pin	72	1	880-045-153	3/16 x 3/4 Spirol Pin
18	1	100-004-558	Brake	73	1	100-003-196	Pin
19	2	898-001-017	Spring	74	1	880-006-066	1/4-20 x1-1/2 Soc Set Screw
20	1	111-212-003	Drive Cone Pulley	75	1	100-002-992	Back Gear Shaft Arm
21	1	885-002-032	Bearing	76	8	880-000-049	1/4-20 x 7/8 Soc Head Cap Screw
22	1	111-212-201	Drive Cone Pulley Hub	77	1	100-003-008	Spindle Speed Plate
23	1	880-051-017	1/4 Square x 1-3/4 Key	78	1	880-020-012	Stud
24	4	880-076-026	Knurled 1/4-20 x 3/8 Screw	79	2	880-020-005	Stud
25	1	100-003-004	Left Guard	80	3	100-003-190	Washer
26	2	100-002-997	Stud	81	3	880-106-013	1/2-13 Hex Nut
27	2	100-002-995	Feed Control Handle				
28	2	100-002-982	Motor Lock Nut				
29	3	880-004-067	1/4-20 x 1/2 Soc Set Screw				
30	1	898-015-024	VSD Belt				
31	1	100-007-111	Motor Pulley				
32	1	111-212-001	Pulley Guard Housing				
33	1	887-011-006	Oil Cup				
34	1	100-004-525	Name Plate				
35	4	880-110-018	#4 x 5/16 Drive Screw				
36	1	898-021-005	Pipe Cleaner				
37	1	880-045-158	3/16 x 1-1/8 Spirol Pin				
38	1	100-003-003	Right Guard				
39	1	100-004-559	Stamping Cover				
40	1	100-003-006	Hub Drive Nut				
41	1	880-005-033	#10-32 x 1/4 Soc Set Screw				
42	1	880-001-011	#6-40 x 1/2 Soc Hd Cap Screw				
43	1	100-029-911	Clutch Dog				
44	1	100-004-557	Back Gear , 96 Teeth				
45	1	100-002-989	Back Gear Bearing Bushing				
46	2	885-001-027	Bearing				
47	1	100-003-313	Spacer				
48	1	880-022-021	Snap Ring				
49	1	100-004-576	Drive Hub				
50	1	880-051-019	5/16 Square x 7/8 Key				
51	1	101-212-401	Back Gear Bushing Assembly				
52	1	880-002-077	3/8-16 x 3/4 Soc Head Cap Screw				
53	1	880-002-002	Washer				
54	1	101-212-414	Timing Gear Assembly				
55	1	898-014-001	Timing Belt				

# STANDARD HEAD SANDWICH ASSEMBLY



SYM	QTY	PART NO.	DESCRIPTION	SYM	QTY	PART NO.	DESCRIPTION
1	2	880-026-039	6-32 x 1/4 Round Hd Machine Screw	51	4	880-110-018	Drive Screw
2	1	100-002-765	6 Inch Scale	52	2	880-000-099	7/16-14 x 1-1/2 Soc Hd Cap Screw
3	1	100-002-957	Feed Disengage Cam	53	1	100-003-164	Spacer
4	1	100-002-954	Feed Engage Latch	54	1	100-002-963	Tilting Worm Shaft
5	1	898-001-012	Spring	55	4	880-050-008	Key
6	1	100-002-959	Feed Engage Dog	56	1	100-009-202	Yoke
7	1	100-002-960	Feed Trip Spacer	57	1	100-004-544	Front Tilt Worm Gear
8	1	100-004-453	Feed Lock Housing	58	1	100-003-230	Front To Back Scale
9	2	880-000-050	1/4-20 x 1 Soc Hd Cap Screw	59	3	880-020-001	Stud
10	1	100-002-958	Feed Trip Plunger	60	10	100-003-191	Washer
11	1	880-014-029	1/4-20 x 3/8 Soc Set Scr Half Dog Nyloc	61	10	880-106-019	Nut
12	1	100-001-232	Spring	62	2	880-035-009	10-32 x 1/4 Soc Button Head Screw
13	1	885-016-004	1/4 Dia. Steel Ball	63	1	880-013-023	10-32 x 3/16 Half Dog Soc Set Screw
14	1	100-002-956	Feed Control Cam	64	1	100-002-903	Tilting Worm Cover
15	1	100-002-955	Feed Control Handle	65	1	898-012-006	Worm Gear
16	2	898-016-008	Knob	66	4	100-002-904	Tec Bolt
17	1	100-002-961	Feed Trip Rod	67	2	880-045-216	5/16 x 1 Spirol Pin
18	1	880-022-028	Ret. Ring	68	1	100-004-569	Side Tilt Worm Gear
19	1	100-002-762	Quick Shift Dial Sleeve	69	1	101-212-411	Feed Fork Assembly
20	1	000-200-652	Thumb Screw Assembly	70	1		DRAW BAR ASSEMBLY -- SEE CHART
21	1	100-002-763	Quick Shift Dial Sleeve Nut	71	1	100-002-945	Gear
22	3	100-002-625	Nylon Slug	72	2	880-064-041	1/4-20 x 1/2 Truss Head Screw
23	1	100-002-807	Feed Trip Rod Collar	73	1	101-212-410	Feed Shaft Assembly
24	1	880-045-120	1/8 x 1 Spirol Pin	74	1	885-004-010	Bearing
25	1	880-045-058	5/64 x 3/8 Spirol Pin	75	1	100-009-201	Head Housing
26	1	898-033-007	Pin	76	1	880-014-029	1/4-20 x 3/8 Hlf Dog Nyloc Soc Set Scr
27	1	100-002-964	Reverse Feed Knob	77	1	885-001-002	Bearing
28	1	880-022-030	Snap Ring	78	1	100-002-926	Worm gear
29	***	100-033-401	Shim .003	79	1	880-051-002	1/8 x 7/16 Key
29	***	100-033-402	Shim .005	80	1	880-051-003	1/8 x 3/4 Key
29	***	100-033-403	Shim.010				
29	***	100-033-404	Shim .015	81	1	100-002-931	Gear Feed Shaft
30	1	100-004-545	Handwheel	82	2	100-002-927	Gear
31	2	880-052-001	Ball Plunger	83	1	100-002-928	Gear
32	1	880-045-110	1/8 x 3/8 Spirol Pin	84	1	100-002-929	Spacer
33	1	100-002-965	Handwheel Bushing	85	1	100-002-930	Gear
34	2	880-051-010	3/16 x 3/4 Key	86	***	100-020-301	.003 Shim
35	1	887-034-003	Plug	86	***	100-020-302	.005 Shim
36	2	885-013-006	Thrust Washer	86	***	100-020-303	.010 Shim
37	1	885-012-010	Thrust Bearing	86	***	100-020-304	.015 Shim
38	1	880-113-023	Elastic Stop Nut	87	3	885-001-008	Bearing
39	2	100-002-919	Shift Lever Plunger	88	***	100-031-951	.005 Shim
40	2	898-001-013	Spring	88	***	100-031-952	.010 Shim
41	2	100-002-900	Shift Lever	88	***	100-031-953	.015 Shim
42	2	898-016-003	Knob	88	***	100-031-954	.020 Shim
43	2	880-045-157	3/16 x 1 Spirol Pin	88	***	100-031-955	.032 Shim
44	4	880-009-023	10-32 x 3/16 Soc Set Screw	88	***	100-031-956	.062 Shim
45	1	100-002-920	Feed Take Off Shaft	89	1	100-002-925	Feed Change Plunger
46	1	898-019-001	Plug	90	2	880-045-076	3/32 x 3/8 Spirol Pin
47	2	880-045-193	1/4 x 3/4 Spirol Pin	91	2	100-002-942	Feed Change Key
48	1	100-002-921	Feed Take Off Arm	92	2	100-002-479	Feed Key Spring
49	4	880-045-153	3/16 x 3/4 Spirol Pin	93	1	885-001-019	Bearing
50	1	100-003-231	Side To Side Scale	94	1	100-002-933	Feed Change Shaft
				95	1	100-002-937	Gear

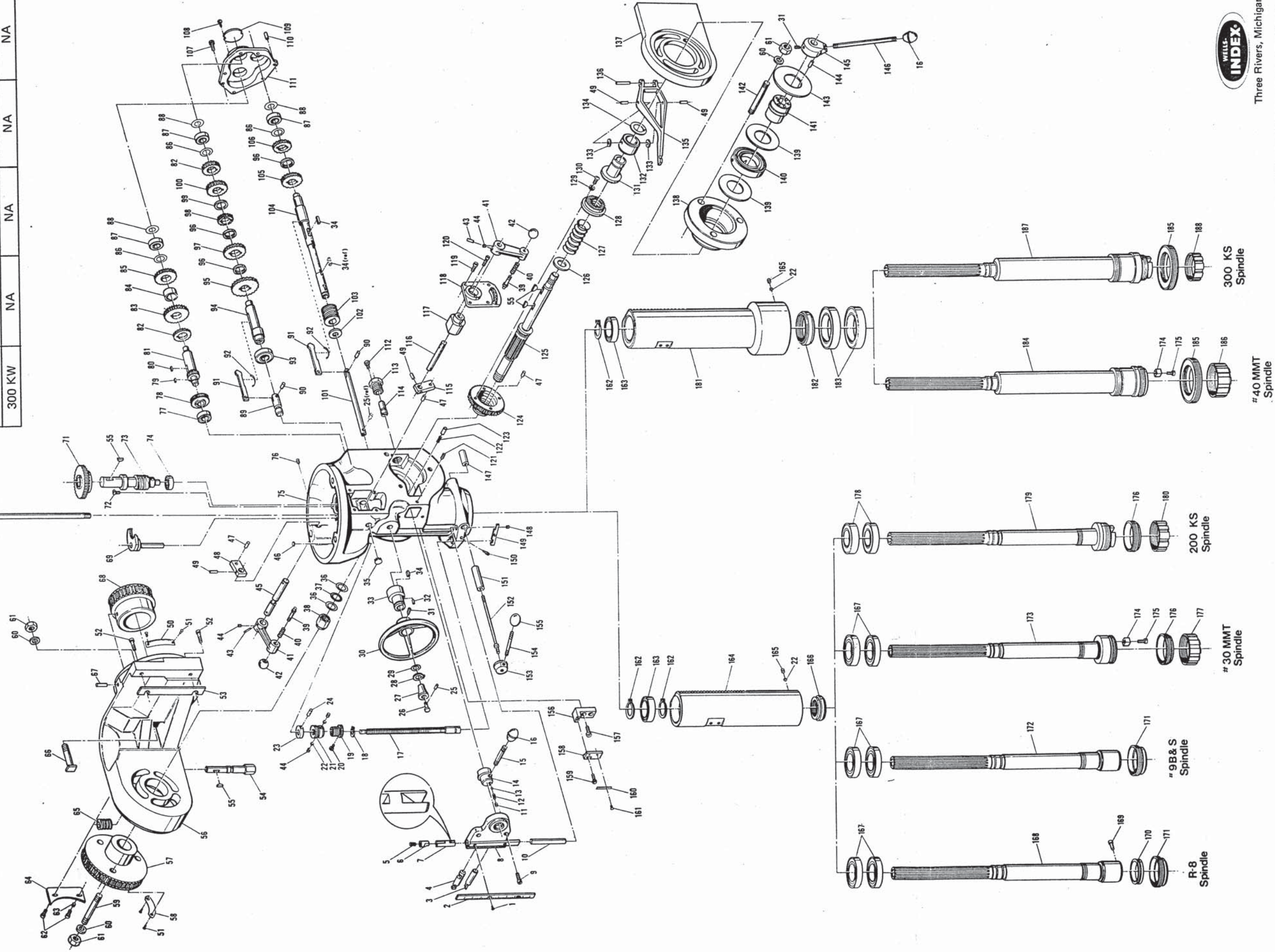
\*\*\* AS REQUIRED

SYM	QTY	PART NO.	DESCRIPTION	SYM	QTY	PART NO.	DESCRIPTION
96	3	100-002-429	Washer	151	1	100-002-950	Quill Lock Front Clamp
97	1	100-002-936	Gear	152	1	000-200-271	Quill Lock Screw
98	1	100-002-935	Gear	153	1	111-346-204	Knee Lock Handle Screw
99	1	100-023-821	Spacer	154	1	100-019-061	Lock Screw Handle
100	1	100-002-934	Gear	155	1	898-016-001	Knob
101	1	100-002-944	Feed Reverse Rod	156	1	100-002-917	Quill Key
102	1	885-013-003	Thrust Washer	157	2	880-000-063	5-16 x 7/8 Soc Hd Cap Screw
103	1	898-012-008	Gear	158	1	100-027-771	Adjusting Vernier Holder
104	1	100-002-941	Handwheel Shaft	159	1	000-200-651	Thumb Screw Assembly
105	1	100-002-939	Gear	160	1	100-002-764	Vernier
106	1	100-002-940	Gear	161	2	880-026-002	2-56 x 3/16 Machine Screw
107	5	880-000-046	1/4-20 x 1/2 Soc Hd Cap Screw	162	2	880-022-042	Snap Ring
108	6	880-034-017	8-32 x 3/8 Button Hd Cap Screw	163	1	885-001-024	Bearing
109	3	100-003-220	Cover Plate	164	1	000-200-008	Quill
110	2	880-044-050	1/4 x 3/4 Dowel Pin	165	1	880-011-019	10-32 x 3/16 Nyloc Flt Point Soc Set Scr
111	1	100-007-101	Gear Box Cover	166	1	886-000-008	Lock Nut
112	1	880-000-036	10-24 x 1/2 Soc Hd Cap Screw	167	2	885-008-002	Lower Spindle Bearing Pair
113	1	100-002-906	Clutch Adjustment Eccentric	168	1	000-200-014	R-8 Spindle Non Spaced Bearings
114	1	100-002-905	Clutch Adjusting Pivot	169	1	100-002-975	R-8 Key
115	1	100-002-924	Feed Change Arm	170	1	100-002-974	R-8 Ring
116	1	100-002-923	Feed Change Lever Shaft	171	1	000-200-007	Lower Bearing Retainer R-8 or #9B&S
117	1	100-002-981	Feed Change Bushing	172	1	000-200-006	#9B&S Spindle
118	1	000-200-272	Feed Shift Plate	173	1	000-200-011	#30 MMT Spindle
119	4	880-001-017	10-32 x 3/8 Soc Hd Cap Screw	174	2	111-214-201	#30 MMT Spindle Key
120	2	880-001-019	10-32 x 5/8 Soc HD cap Screw	175	2	880-000-030	8-32 x 3/4 Soc Hd Cap Screw
121	1	880-014-032	1/4-20 x 3/4 Nyloc Half Dog Soc Set Scr	176	1	000-200-012	Lower Bearing Retainer #30 MMT
122	1	898-001-011	Spring	177	1	895-039-001	#30 Nut Assembly
123	1	100-002-916	Clutch Lever Plunger	177A	1	150-120-101	#30 Spanner Wrench
124	1	100-004-540	Worm Gear	178	1PR	885-008-002	Lower Spindle Bearing
125	1	100-004-546	Cross Shaft	179	1	895-020-003	#200 Kwik Switch Spindle
126	1	100-002-908	Cross Shaft Washer	180	1	895-022-008	#200 Kwik Switch Lock Nut Assembly
127	12	880-069-002	Disc Spring	180A	1	898-022-008	#200 KS Spanner Wrench
128	1	100-002-915	Drive Clutch	181	1	100-007-179	#40 Quill
129	4	880-065-008	#12 SAE Washer	182	1	886-000-013	Bearing Lock Nut
130	4	880-034-028	1/4-20 x 3/8 Button Hd Cap Screw	183	1PR	885-008-001	Bearing
131	1	100-002-912	Driven Clutch	184	1	100-007-180	#40 Spindle
132	1	100-002-913	Clutch Collar	185	1	100-004-615	Lower Bearing Retainer
133	2	880-065-006	#10 SAE Washer	186	1	895-039-002	#40 MMT Lock Nut Assembly
134	1	880-022-004	Retaining Ring	186A	1	150-120-108	#40 MMT Spanner Wrench
135	1	100-002-901	Clutch Lever	187	1	895-020-002	#300 Kwik Switch Spindle
136	1	880-045-202	1/4 x 1-5/8 Roll Pin	188	1	895-020-005	#300 KS Lock Nut Assembly
137	1	100-007-100	Yoke Support Plate	188A	1	898-022-007	#300 KS Spanner Wrench
138	1	100-004-542	Clamp				
139	2	100-002-911	Counterbalance Shield				
140	1	101-212-406	Counterbalance Spring Assembly				
141	1	100-002-909	Feed Handle Coupling				
142	3	100-002-907	Right Hand Clamp Stud				
143	1	100-002-910	Spring Cover				
144	2	880-045-155	3/16 x 7/8 Spirol Pin				
145	1	000-200-073	Handle				
146	1	000-200-074	Arm				
147	1	100-002-948	Quill Lock Clamp				
148	1	880-006-040	8-32 x 1/2 Nyloc Soc Set Screw				
149	1	100-002-952	Feed Trip Arm				
150	1	100-002-953	Feed Trip Arm Pivot				

# HEAD HOUSING ASSEMBLY

TABLE FOR SELECTING DRAWBAR PART NUMBER

Spindle Taper	Std.	V.S.	R. Angle	Wrench
R-8	A101-213-203	A101-003-353	A200-066	NA
No. 9 B & S	B200-015	B200-016	A200-070	056-002-002 3/8 Sq.
30 MMT	A101-214-203	A101-003-354	A-200-067	NA
40 MMT	NA	A101-003-373	NA	NA
200 KW	NA	NA	NA	NA
300 KW	NA	NA	NA	NA



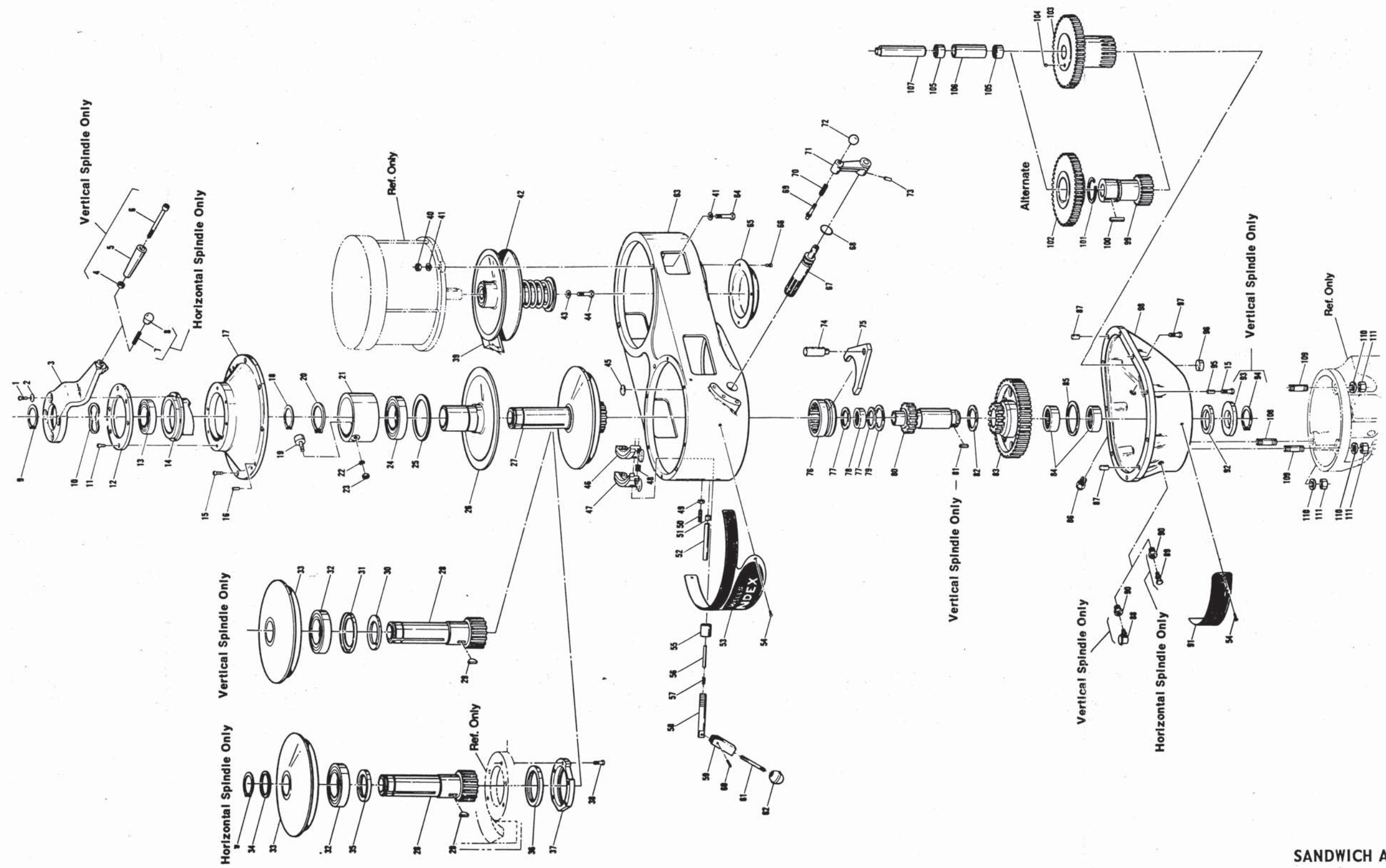
Three Rivers, Michigan

ALL GEAR SANDWICH ASSEMBLY

USED ON CNC & 860 MODELS

SYM.	QTY.	PART NO.	DESCRIPTION	SYM.	QTY.	PART NO.	DESCRIPTION
1	4	880-003-014	10-32 x 1 Soc But. Hd Nyloc Screw	56	1	111-218-213	Brake Rod
2	8	880-071-001	Cup Washer	57	1	898-001-009	Spring
3	1	111-218-002	Speed Adjuster Lever	58	1	111-218-204	Brake Pull Rod
4V	1	880-108-004	5/16-18 Jam Nut	59	1	100-003-002	Brake Cam Handle
5V	1	100-002-036	Handle	60	1	880-045-153	3/16 x 3/4 Roll Pin
6V	1	880-000-071	5/16-18 x 2-3/4 Soc Hd Cap Screw	61	1	100-002-955	Handle
7H	1	880-004-084	5/16-18 x 1 Set Screw	62	1	898-016-008	Knob
8H	1	898-016-001	Knob	63	1	111-180-009	Belt Guard (Horiz. 000-200-250)
9	2	880-022-047	Retaining Ring	64	2	880-038-075	3/8-16 x 2 Hex HD Screw
10	1	880-067-004	Wavy Washer	65	1	111-218-201	Cover
11	6	880-000-047	1/4-20 x 5/8 Soc HD Cap Screw	66	4	880-034-029	1/4-20 x 1/2 Soc But Hd Screw
12	1	111-218-205	Speed Adjuster Retainer Cap	67	1	111-180-214	Shift Rod
13	1	885-001-030	Bearing	68	1	898-005-020	O-Ring
14	1	111-218-004	Speed Adjuster Cam	69	1	100-002-919	Shift Lever Plunger
15	6	880-000-048	1/4-20 x 3/4 Soc Hd Cap Screw	70	1	898-001-013	Spring
16	2	880-083-002	5/16 x 1 Pull Dowel	71	1	100-002-900	Shift Lever
17	1	111-218-003	Cam Housing	72	1	898-016-003	Knob
18	1	880-022-043	Retaining Ring	73	1	880-045-157	3/16 x 1 Spirol Pin
19	1	885-011-001	Cam Follower	74	1	111-180-213	Shift Shaft
20	1	880-022-048	Retaining Ring	75	1	111-180-212	Yoke
21	1	111-218-208	Speed Adj, Bearing Housing	76	1	111-180-219	Shifter Gear
22	1	880-099-009	Lockwasher	77	2	886-003-014	Seal
23	1	880-108-005	5/16-18 Jam Nut	78	1	885-009-011	Bearing
24	1	885-001-035	Bearing	79	1	000-200-198	Bronze Washer
25	1	880-022-009	Retaining Ring	80	1	000-200-071	Drive Gear
26	1	101-218-401	Upper Pulley Face Assembly	81V	1	111-180-218	Key
27	1	101-180-401	Lower Pulley Face Assembly	82	1	000-200-057	Turcite Washer
28	1	111-180-223	Sheave Shaft	83	1	111-180-008	Gear
29	1	880-050-010	Key	84	2	885-009-008	Bearing
30V	1	000-200-085	Spacer	85	1	000-200-369	Turcite Washer, Large
31V	1	886-001-042	Seal	86	1	887-031-001	Sight Gauge
32	1	885-001-036	Bearing	87	2	880-083-001	5/16 x 3/4 Pull Dowel
33	1	111-180-222	Lower Sheave	88	1	880-011-006	Oil Cup
34H	1	000-200-084	Shim	89	1	898-045-002	Air Vent
35H	1	000-200-213	Spacer	90	1	887-000-001	Reducing Bushing
36H	1	898-030-016	Seal	91	1	111-218-212	Name Plate With Instructions
37H	1	000-200-214	Seal Retainer	92	1	898-030-021	Seal
38H	5	880-001-018	10-32 x 1/2 Soc HD Cap Screw	93V	1	000-200-076	Slinger
39	1	898-015-024	VSD Belt	93V	1	112-201-233	Gear For IRD Model 125 Only
40	2	880-106-007	3/8-16 Nut	94V	1	880-022-071	Retaining Ring
41	4	880-065-013	3/8 Washer	95	1	880-044-043	3/16 x 1 Dowel Pin
42	1	101-218-406	Motor Pulley Assembly	96	1	898-019-013	Cap plug
43	1	880-065-011	5/16 Washer	97	7	880-000-047	1/4-20 x 7/8 Soc Hd Cap Screw
44	1	880-002-065	5/16-18 x 1-1/4 Soc Hd Cap Screw	98	1	112-201-009	Back Gear Housing
45	1	898-019-012	Plug	99H	OPT.	111-180-006	Gear & Shaft {May Be Used
46	1	101-218-403	Inside Brake	100H	OPT.	111-180-215	Key In Place Of
47	1	101-218-404	Outside Brake	101H	OPT.	880-022-066	Ret. Ring Part
48	2	898-001-014	Spring	102H	OPT.	000-200-077	Number 000-200-003}
49	1	880-106-001	1/4-20 Nut	103	1	000-200-003	Nylon Gear
50	1	880-004-072	1/4-20 x 1-1/4 Soc Set Screw	104	1	885-016-002	Ball
51	2	111-180-231	Plug	105	2	885-009-007	Bearing
52	2	880-045-243	3/8 x 3-1/4 Roll Pin	106	1	000-200-056	Spacer
53	1	111-180-203	Name & Speed Plate	107	1	111-180-216	Gear Shaft
54	6	880-110-018	Drive Screw	108	1	880-020-012	Stud
55	1	111-218-202	Bushing	109	2	880-020-005	Stud
				110	3	100-003-190	Washer
				111	3	880-106-013	Hex Nut

NOTE: V = USED ON VERTICAL ONLY  
 H = USED ON HORIZONTAL ONLY  
 NO LETTER AFTER SYM. IS USED ON BOTH



SANDWICH ASSEMBLY





SYM.	REQ'D.	PART NO.	DESCRIPTION	SYM.	REQ'D.	PART NO.	DESCRIPTION
1	2	054-000-041	Snap Ring (Truarc #5100-137)	19	1	895-020-006	Spindle #200 Kwik Switch
2	1	072-000-407	Bearing (Fafnir #9107 KDD)	20	1	895-020-4	Locknut Assembly #200 Kwik Switch
3	1	D-200-233	Quill	20A	1	898-022-8	Spanner Wrench #200 Kwik Switch
4	1	056-306-077	Screw 10-32 x 316 Soc. Set Flt. Pt. Nylloc	21	1	D-200-235	Quill #40
5	2	100-002-625	Slug, Nylon	22	1	886-000-13	Bearing Lock Nut (Whittet-Higgins #BH-13)
6	1	886-000-8	Nut BH-08 Self Locking Nut	23	1 Pair	885-008-1	Bearing Ball (Barden #113 HDL)
7	2	071-344-008	Bearing N. D. QOLO8DTL3AP6	24	1	D-200-234	Spindle #40
8	1	D-200-323	Spindle R-8	25	1	100-004-615	Retainer Front Bearing
9	1	100-002-975	Key #R-8	26	1	056-525-028	Locknut Assembly #40 MMT
10	1	100-002-974	Ring #R-8	26A	1	150-120-108	Spanner Wrench #40 MMT
11	1	B-200-007	Retainer Front Bearing #9B and S and R8	27	1	895-020-007	Spindle #300 Kwik Switch
12	1	D-200-325	Spindle #9B and S	28	1	895-020-5	Locknut Assembly #300 Kwik Switch
13	1	D-200-232	Spindle #30 MMT Quick Change	28A	1	898-022-7	Spanner Wrench #300 Kwik Switch
14	2	111-214-201	Key #30 MMT Quill Assembly				
15	2	019-421-617	Screw #8-32 x 3/4 Soc. Hd. Cap.				
16	1	B-200-012	Retainer Front Bearing #30 MMT				
17	1	056-525-027	Locknut Assembly #30 MMT				
17A	1	150-120-101	Spanner Wrench #30 MMT				
18	1 Pair	885-008-2	Bearing Ball (Barden #108 HDL)				

# WELLS-INDEX®

McLaren Automation & Machine Tool, LLC

701 W. Clay Avenue

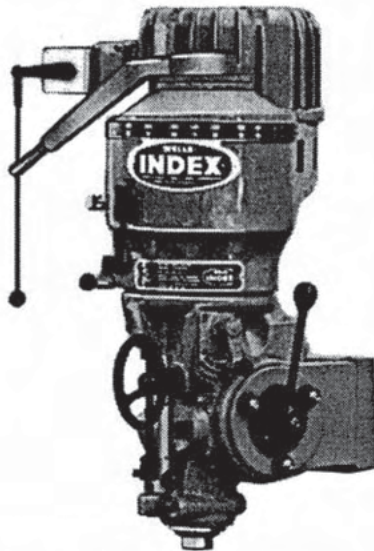
Muskegon, Michigan 49440-1064

Phone (231) 759-0950 Fax (231) 728-7456

www.wells-index.com • sales@wellsindex.com

## SERVICE BULLETIN

NEW OR REBUILT HEAD VARIABLE SPEED SANDWICH ASSEMBLIES



- A completely rebuilt unit includes a 90 day parts warranty.
- A completely new unit carries a (1) one year parts warranty.
- Used on models 747, 847, and 860 vertical milling machines.
- Available with #9 B&S or R-8 spindle.
- #30 MMT, #40 MMT, #200 and #300 Kwik-Switch spindles - available at additional charge.
- Prices are as follows (all rebuilt units require head and sandwich assembly in exchange):

### NEW

- |                  |                                       |
|------------------|---------------------------------------|
| (A) <b>P.O.R</b> | (Includes new motor pulley and motor) |
| (B) <b>P.O.R</b> | (Includes new motor pulley only)      |

### REBUILT EXCHANGE

- |                  |  |
|------------------|--|
| (A) <b>P.O.R</b> | (Includes a motor pulley and drawbar. Does not include new motor.) |
| (B) <b>P.O.R</b> | (Lower head assembly only. Includes new drawbar.)                  |
| (C) <b>P.O.R</b> | (Upper head assembly only. Includes motor pulley.)                 |

**NOTE: On all rebuilt units, the exchange unit must have all major castings in usable condition.**



**Wells - Index**

**McLaren Automation & Machine Tool, LLC**

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Muskegon, Michigan 49440-1064

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## **SERVICE BULLETIN**

**FACTORY REBUILD PROGRAM  
WELLS-INDEX MILLING MACHINES**

### **INCLUDES THE FOLLOWING:**

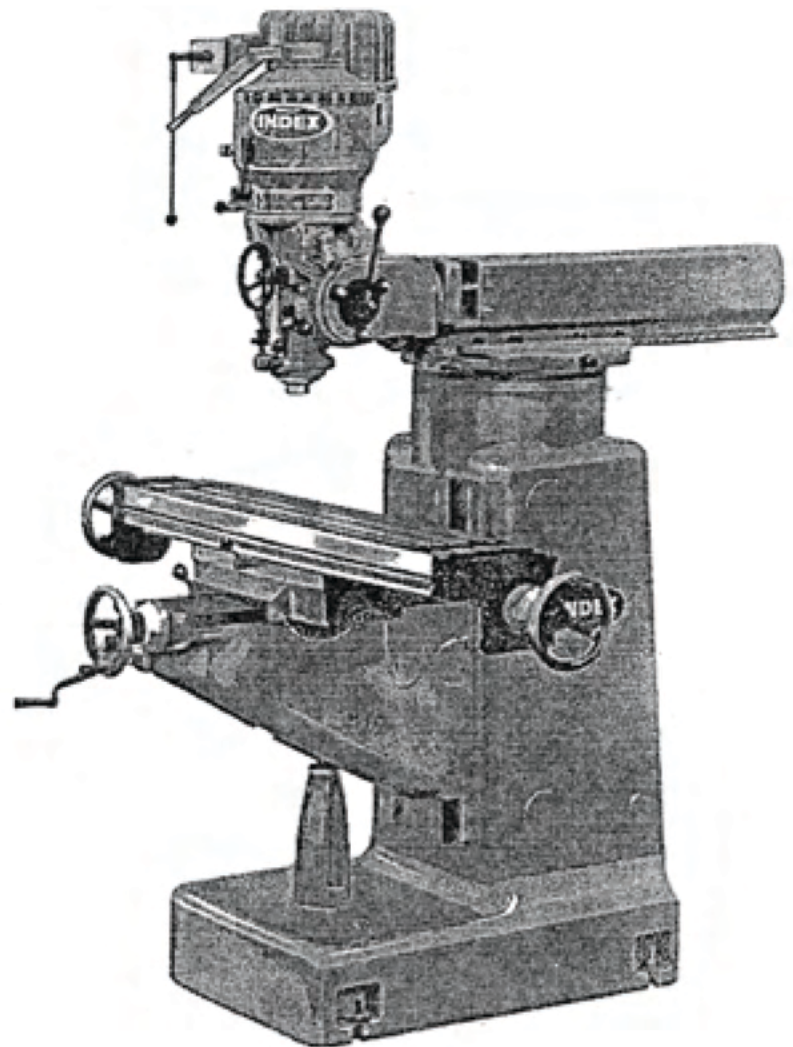
1. Completely Rescrape Ways
  2. Re-grind Table Top
  3. New Table Screw & Nut
  4. New Saddle Screw & Nut
  5. New Knee Screw & Nut
  6. Refit Quill
  7. New Bearings Throughout Unit
  8. New Drive Belts
  9. Re-grind Spindle Taper
  10. New Drawbar
- Includes milling machine Models 745, 747, 845, 847, and 887.
  - One-year warranty on all parts and workmanship.

### **NOT INCLUDED:**

1. Freight To and From Muskegon
2. Electricals ( Including Power Feeds)
3. Strip and Rechrome Ways
4. Repainting

### **FACTORY INSTALLED OPTIONS:**

- Power Feeds
- Digital Readouts
- Power Drawbar
- Riser Blocks
- Variable Speed Heads
- Chip Pan Flood Coolant System



*Bridgeport series 1*

Call factory for quotes on other Standard Models, CNC Mills, and Convert-A-Mills.

