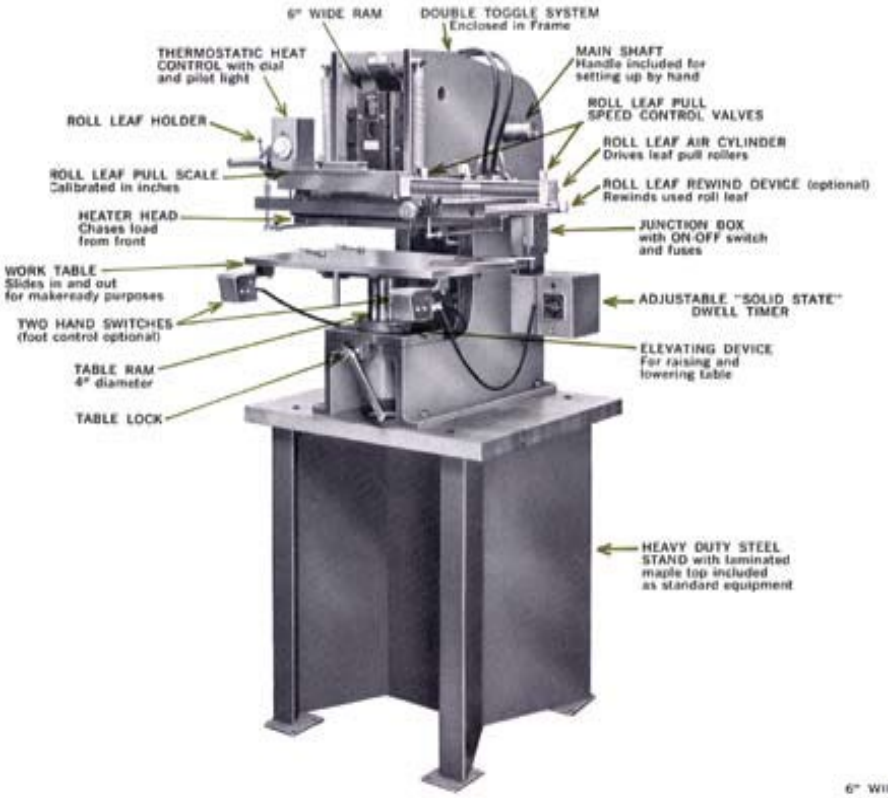
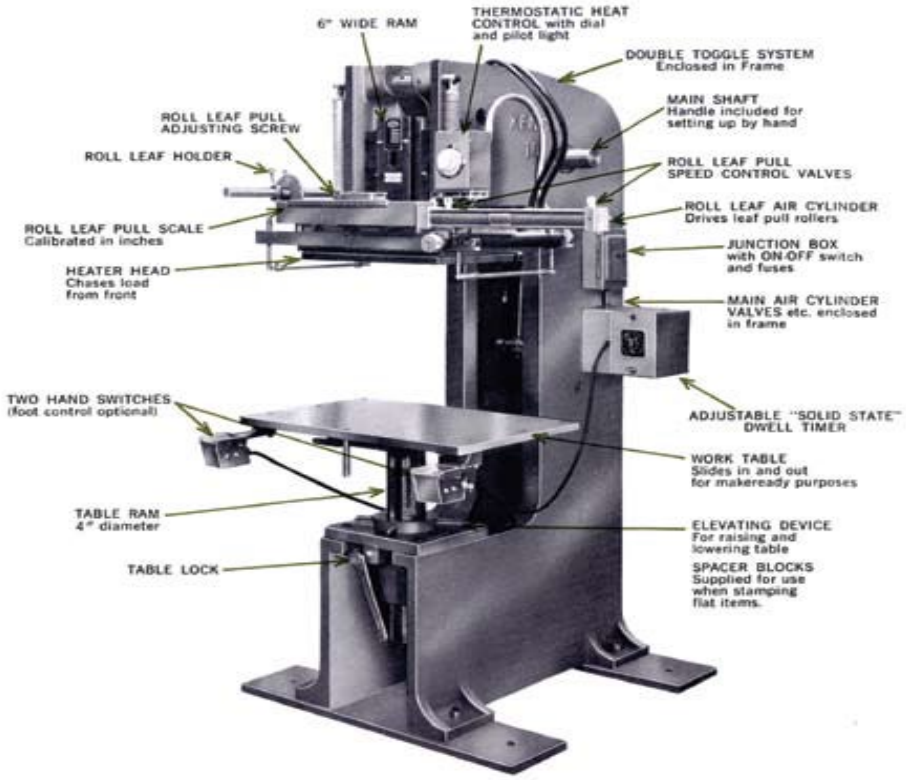
KENSOL 65H & 165H
PARTS AND INSTRUCTION MANUAL





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AFM Engineering, Inc.
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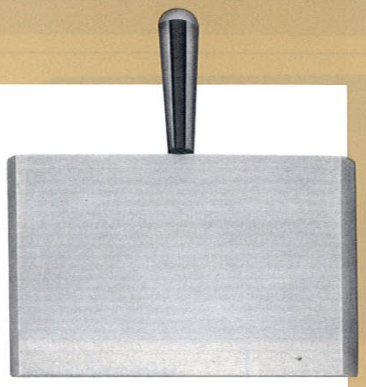
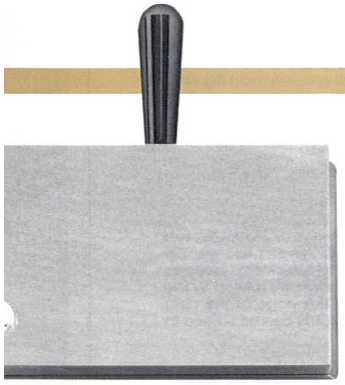
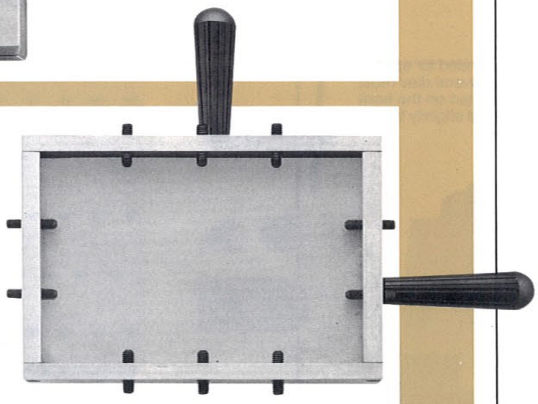
KENSOL TYPE AND DIE HOLDERS FOR VERTICAL PRESSES



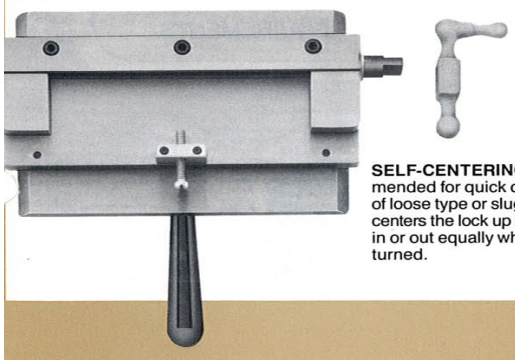
HEAD SLIDE - 3/8″ thick dove tail plate which is recommended for customers who use type high dies (.918 inches). Plate is normally drilled and countersunk with a clearance hole for screws that mate with drilled and tapped holes in the die.



HOT PLATE CHASE - 3/4″ thick ground steel (or aluminum) plate mounted onto a dove tail plate with a handle. This chase is recommended for mounting flat dies. Dies are mounted using screws, glue or die bonding film. Some customers drill and tap the plate with a hole pattern. The die maker uses a template of this pattern to drill clearance holes that match up with the mounting holes in the chase.



FOUR WALL LOCK UP CHASE - Recommended for large lock-ups of type high dies, slugs and loose type. Spacers are required to separate individual pieces of type where required, and metal or wood strips are used to separate lines. The complete lock-up is secured by tightening the set screws found in the side walls.



SELF-CENTERING PALLET - Recommended for quick change of several lines of loose type or slugs. Pallet automatically centers the lock up because the jaws travel in or out equally when removable crank is turned.

Kensol manufactures a complete range of type and die holders for use with our equipment. All Kensol vertical presses are equipped with an aluminum heater head that has a set of brass rails machined to accept a dovetail plate. The dovetail plate slides into the head between these brass rails and is secured by a head lock arrangement. The dovetail is machined to the dimensions of the heated platen. The various type and die holding devices are mounted onto this plate at the factory.

Kensol manufactures four standard type and die holders, namely; the head slide, hot plate chase, four wall lock up chase and self-centering pallet. These will satisfy most requirements. We have also developed quick change devices to speed up changeover time on short run work and special chases to meet unusual requirements.

The standard die holders are shown on the left side of this sheet and the special die holders on the reverse side. Special devices can be made to meet any requirement.

PRINTING ELEMENTS USED IN THE HOT STAMPING PROCESS

In general, the hot stamping industry uses printing elements in the form of loose type, single line slugs, and dies. These elements can be made of any material that will conduct heat; primarily steel, brass, copper, lead, zinc, magnesium, and silicone rubber. The choice depends upon length of run, hardness of item being stamped, uniformity of item's surface, and naturally, price. Type is usually manufactured to a height of .918″ (''type high''). Dies are supplied in height of from .08″ to .918″. Higher dies are available for special applications.

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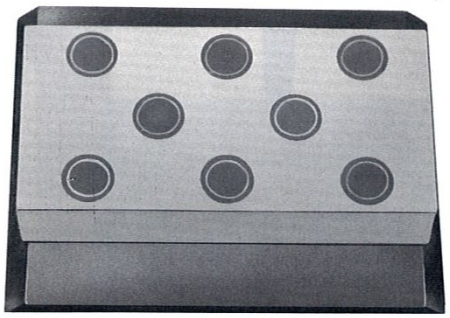
KENSOL SPECIAL DIE HOLDERS

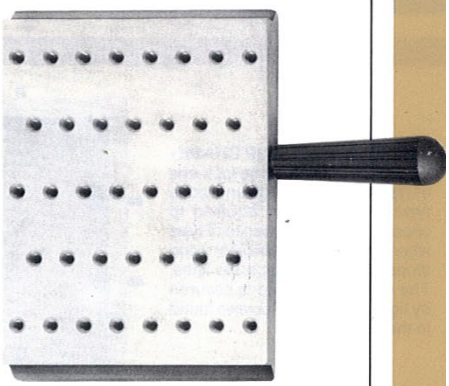


HONEYCOMB CHASE - Used to hold thin, inexpensive zinc or magnesium dies. Steel block contains a pattern of special type stepped holes which accept special grippers. The key provided forces the gripping edge of the clip against the edge of the die. If the die is slightly out of alignment, the clips can be shifted to align properly.

MAGNETIC CHASE - One inch thick ground steel block mounted onto a dove tail. Block contains magnetic inserts which will securely hold flat steel dies. Non ferrous dies (silicone rubber, magnesium, copper, brass) could be used if they are first mounted onto a steel plate.

CAM-O-LOCK CHASE - The Cam-O-Lock system is similar to the Honeycomb system, except, it is recommended for holding 1/4" thick dies (copper, brass or steel). The cams shown are rotated by the special key provided until the edge of the cam grips the edge of the die. Cams can be shifted to bring die into register.

THREE WAY ADJUSTABLE - Normally recommended for special systems such as multi-headed machines where several dies must be mounted in perfect register. Chase can be shifted on the front to back X axis, left to right Y axis as well as rotated slightly by adjusting set screws.



OTHER HOLDERS CAN BE DESIGNED AND MANUFACTURED TO MEET YOUR REQUIREMENTS.

KENSOL 65H & 165H PARTS AND INSTRUCTION MANUAL

KENSOL TROUBLE SHOOTING		
SYMPTOMS	POSSIBLE CAUSES	CORRECTIVE MEASURE
1. Press will not heat up at all	a. Power to machine "Off" Blown fuses in electrical supply	Check circuit breaker or fuse in supply line Look for cause of "Outage" (Correct Condition)
	b. Line cord not plugged in	Check if line cord plugged in Plug in
	c. Loose wire or loose connection Trucking may have loosened wiring	Check all connections and tighten (Rewire if Necessary) Check plug outlet
	d. Defective heater or heaters	Replace
	e. Defective thermostat or heat controller	Replace
	f. Broken thermocouple wire	Replace thermocouple
	g. Heaters not wired properly	Rewire
2. Press will not heat up to operating temperature	a. Blown fuse on 220 line	Check all lines- replace blown fuses
	b. Defective heater or heaters	Check all heaters- replace as needed
	c. Defective thermostat or heat controller	Replace
	d. Wrong voltage heaters	Replace with correct
	e. Possible interference from RF heat sealing equipment	Contact
3. Press overheats (Heating light on thermostat says "on")	a. Thermocouple defective	Replace thermocouple
	b. Defective thermostat or heat controller	Replace
	c. Thermocouple shorted or grounded (Wire Shorted)	Replace or reinsulate
	d. Thermocouple on probe not properly attached to heater head	Reconnect
	e. Possible interference from RF heat sealing equipment	Contact

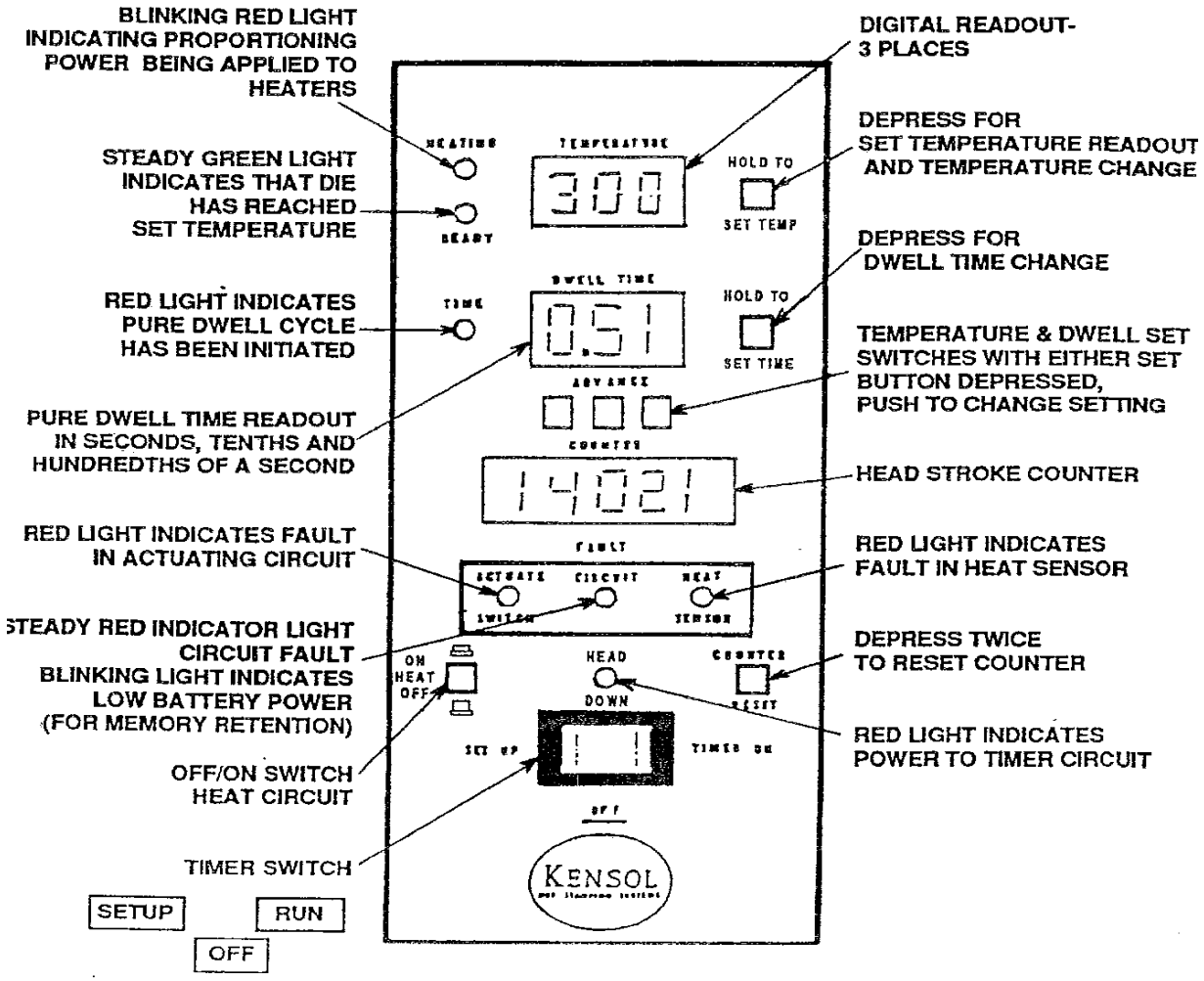
SYMPTOMS	POSSIBLE CAUSES	CORRECTIVE MEASURE
4. Head will not come down	a. Low or no air supply. (Not Enough Pressure)	40 psi minimum required. Pipe directly to FRL with line the same size as FRL input. Remove small "quick change" couplers
	b. Handswitch or flapper broken or bent, sticky or stuck	Loosen, remove bind, repair or realign
	c. Damaged microswitch, under flapper of handswitch	Remove and replace (Rewire if Necessary)
	d. Water in line	Drain system completely, as well as compressor Install refrigerator dryer
	e. Linkage frozen, ram frozen	Remove pins or links, polish, lubricate and replace (New Pins or Links, if Necessary). Re-adjust ram. See Instructions
	f. 4-way valve or main cylinder jammed due to lack of lubrication (Air Machine Only)	Remove, clean and polish Install kits if necessary Be sure to lubricate valve (Non Detergent Oil) Check lubricator, refill and reset
	g. No output from timer	Check timer plug (Replace timer, if Necessary)
	h. Solenoid defective	Replace
5. Head comes down and stays down	a. Broken spring in 4-way valve (Versa)	Replace spring and lubricate
	b. Short in timer, timer in setup position	Replace timer
	c. Linkage binding	Replace links or pins
	d. Bind in 4-way valve or main cylinder	Free frozen part, polish and lubricate
	e. Ram beginning to freeze	Adjust and lubricate See Instructions
	f. Flow control valve closed or clogged	Clean cut or replace
6. Head will not come all the way down	a. Jam in mechanical roll leaf attachment	Free jam-up, clean parts, polish, lubricate and reassemble
	b. Ram beginning to freeze	Adjust and lubricate See Instructions
	c. Adjustment not correct	Readjust (Carefully)

SYMPTOMS	POSSIBLE CAUSES	CORRECTIVE MEASURE
7. Head slams up om up stroke	a. Head check assembly out of adjustment	Adjust slowly for smooth action
	b. Flow controls reversed on reassembly after cleaning	Disassemble and reassemble correctly
	c. Leak in main cylinder	Rebuild or replace
	d. Badly worn linkage system	Replace linkage, lubricate on assembly
	e. Bind in ram or linkage	Remove. clean, polish Replace worn parts, lubricate on assembly
8. Machine sluggish both up and down	a. Speed Control valves closed too far	Re-adjust speed control valves
	b. Air line clogged	Clean out lines
	c. Small “quick change” couplers on the line (Air Starved)	Remove
	d. Air lines too small (more than 20 psi)	Repipe with correctly sized piping
	e. Air pressure too low in shop air lines	Check air compressor capacity (40 psi minimum)
	f. Valves clogged	Clean out, relubricate
	g. Muffler or exhaust clogged	Clean or replace
	h. Air line restricted (Too Many Couplers)	Repipe properly
	i. Ram too tight Occurs when temperature raised	Re-adjust ram for higher operating temperature
9. Blurry impression- Not sharp and clear	a. Die not mounted in center of ram	Remount properly
	b. Die or type holder not locked in tightly	Lock up die holder, replace chase if required
	c. Badly worn die	Replace with new die or artwork
	d. Part of fixture shifting	Remount or remake
	e. Head shifting due to too much play in ram	Adjust ram, replace if badly worn
	f. Wrong foil	Contact
	g. Dwell time too long or temperature too high	Re-adjust, one setting at a time until condition corrected

SYMPTOMS	POSSIBLE CAUSES	CORRECTIVE MEASURE
10. Inconsistent Impression, some deep, some light	a. Head/Table not level	Relevel See Instructions
	b. Inconsistent thickness of parts	Set toggle to accommodate part variations
	c. Bad makeready	Reset job in press, change “makeready”
	d. Fluctuating air pressure (Machine Air Starved)	Check air supply
	e. Improper dwell time (Time varies)	Check actuation of Head Shut Switch
	f. Head shut switch not making contact	Check cam setting Replace microswitch if necessary
	g. Dwell setting too short	Lengthen dwell time
	h. Dwell setting too long	Shorten dwell time
	i. Poor lubrication	Completely lubricate press
	j. Erratic timer	Replace timer
	k. Defective packing in 4-way valve or main cylinder (If Rebuilt)	Rebuild valve or cylinder
11. Erratic leaf pull: (Mechanically Operated Roll Leaf Attachment)	a. Roll leaf tension disc too tight	Re-adjust
	b. Bushings for knurled or rubber roller worn or not lubricated	Replace and lubricate properly
	c. Rack worn or bent	Replace
	d. Worn metal or rubber roller(s)	Replace worn roller(s)
	e. Knurled roller slipping on its shaft	Tighten set screws
	f. Defective clutch	Replace clutch
	g. Woodruff key in clutch missing	Replace
	h. Hand knob pressed against rack guide casting	Loosen
12. Erratic leaf pull: (Air Operated Roll Leaf Attachment)	a. Worn metal or rubber roller(s)	Replace worn roller(s)
	b. Knurled roller slipping on its shaft	Tighten set screws
	c. Defective clutch	Replace clutch

SYMPTOMS	POSSIBLE CAUSES	CORRECTIVE MEASURE
12. Erratic leaf pull: (Air Operated Roll Leaf Attachment)	d. Roll leaf tension disc too tight	Readjust
	e. Bushings for knurled or rubber roller worn or not lubricated	Replace and lubricate properly
	f. Air pull cylinder not returning all the way (Air Starved)	Check adjustment stops correct insufficient air flow
	g. Air pull cylinder moving too fast	Adjust speed valves
	h. Air pull 4-way valve defective Or delay valve packing defective	Rebuild valve or replace
	i. Air pressure too low (Below 40 psi)	Correct air supply
	j. Air leaks in cylinder or valves	Rebuild or replace
	k. Rack worn or bent	Replace
	l. Woodruff key in clutch missing	Replace
13. Leaf runs off to one side when pulling	a. Stripper bars are not parallel to head causing leaf not to "line up"	Reallign
	b. Stripper bar bowed	Replace
	c. Rollers are badly worn	Replace rollers
	d. Knurled or rubber roller bearings worn	Replace bearings
	e. One side of stripper striking item	Compensate for variation
14. Air leaking out of top or bottom of cylinder rods of main cylinder	a. Worn packing	Rebuild cylinder
	b. Piston seal lacking	Rebuild cylinder
15. Air leaking out of valve	a. Worn packing	Rebuild valve
	b. Valve not shifted full travel	Rebuild valve
	c. Bypassing in cylinder	Rebuild cylinder
16. Oil leaking out of mufflers	a. Incorrect adjustment of automatic lubricator	Re-adjust oil drop. Check! Use only Non Detergent Oil.
	b. Oil in lines coming from compressor	Check air supply. Install filter if necessary. (Probably Detergent Oil in Air Valves)
	c. Too much water in system	1. Add proper filter (Where Needed) 2. Drain filter and change filter element

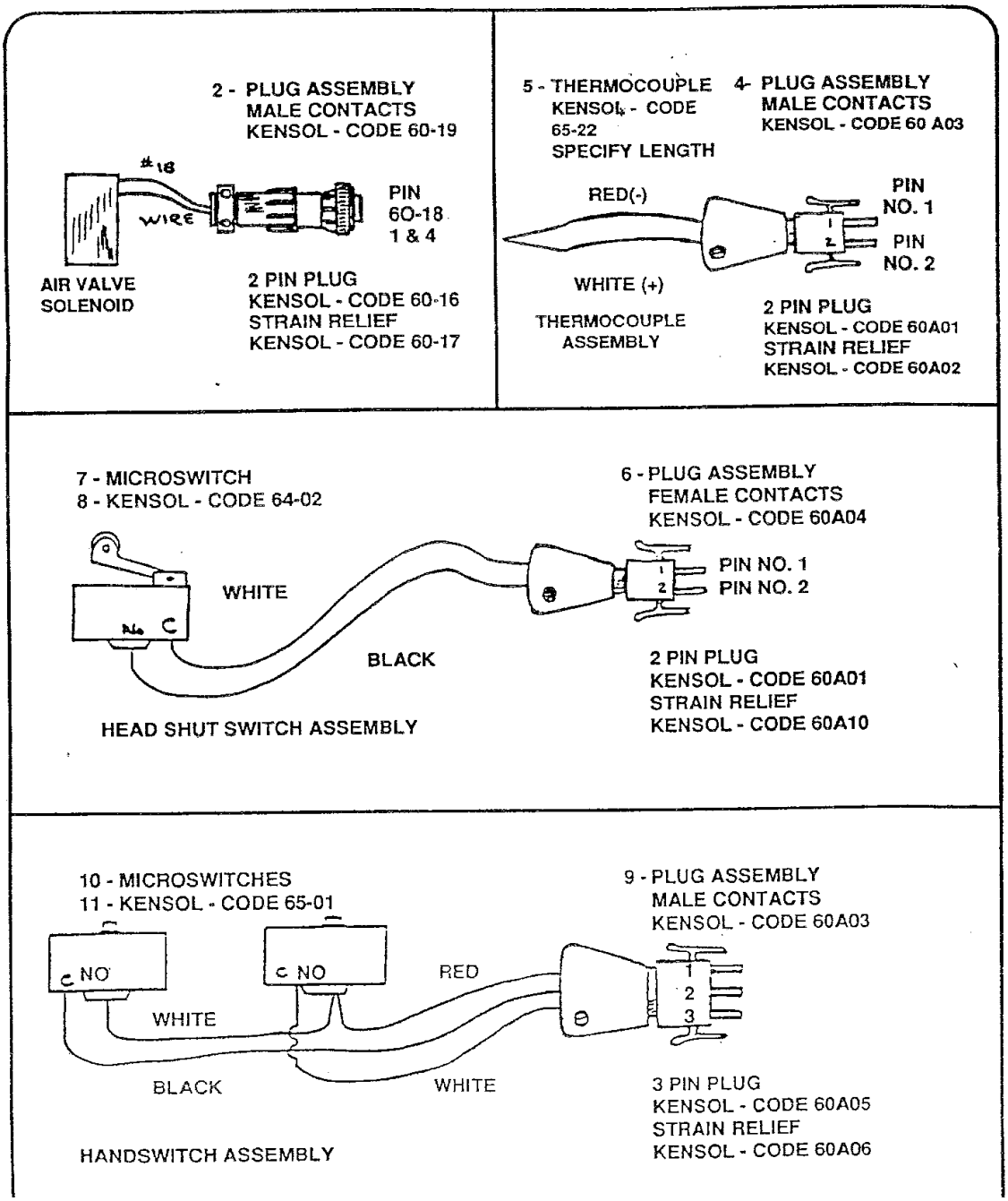
NEW KENSOL MICROPROCESSOR BASED DIGITAL TIMER / HEAT CONTROLLER



The Microprocessor Switch MUST be left in the "OFF" (Mid Position) when Disconnecting or Connecting the Electricity or Removing Plug

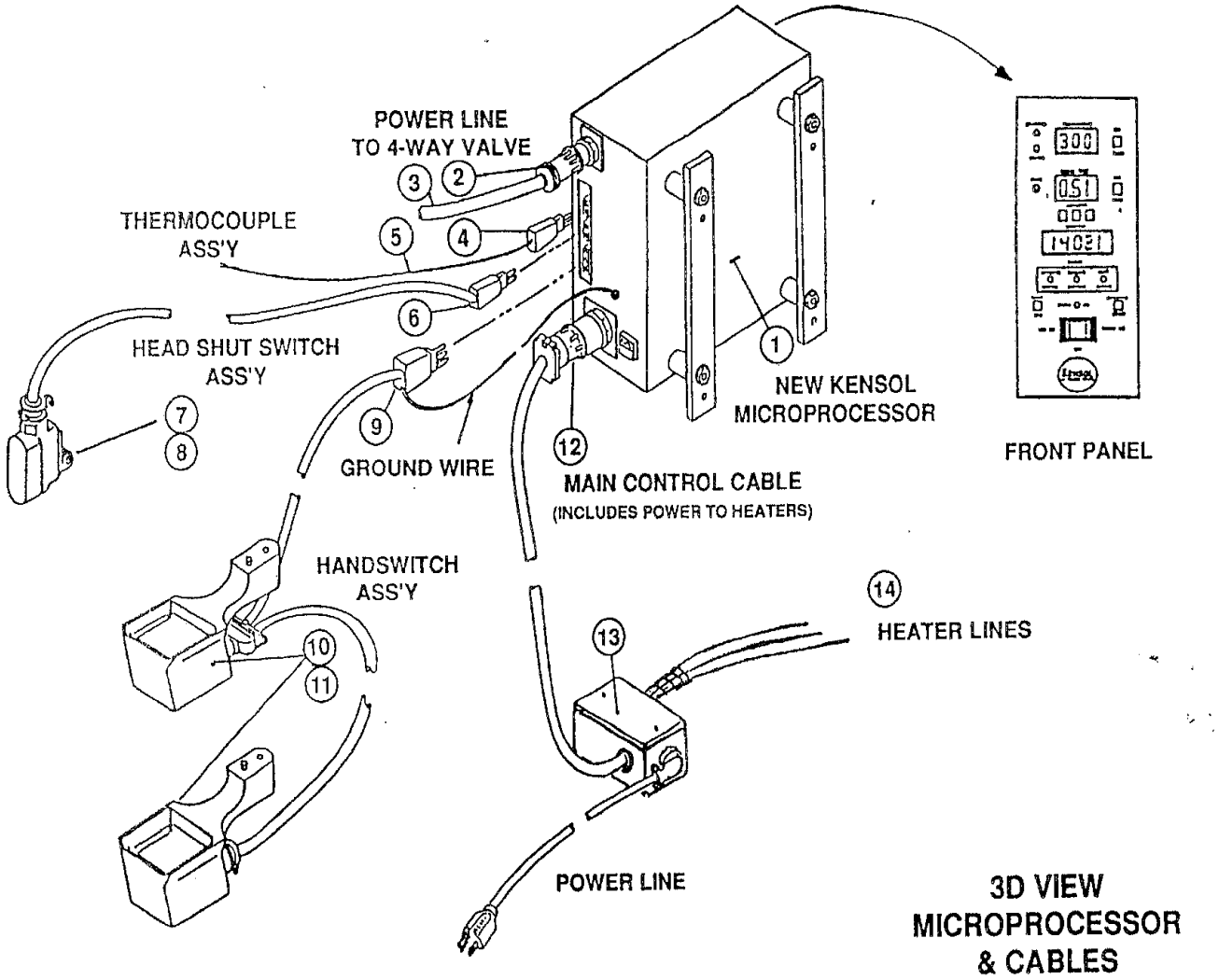
THE NEW KENSOL MICROPROCESSOR BASED DIGITAL TIMER/HEAT CONTROLLER WAS DESIGNED BY KENSOL TO MAINTAIN EXTREME ACCURACY IN TWO OF THE THREE VARIABLES OF HOT STAMPING, DWELL AND HEAT. THE THIRD VARIABLE, AIR PRESSURE, IS CONTROLLED BY A SEPARATE UNIT SUPPLIED WITH THE PRESS. INCLUDED IN THE UNIT IS AN ELECTRONIC STROKE COUNTER AND A FAULT LIGHT PANEL, WHICH AIDS IN TROUBLESHOOTING. THIS UNIT CAN BE ADAPTED TO EXISTING EQUIPMENT IN THE FIELD AFTER WIRING MODIFICATIONS ARE MADE.

NOTE! GUARANTEE VOID IF SEAL ON CABINET IS BROKEN - SEE: COPY OF SEAL



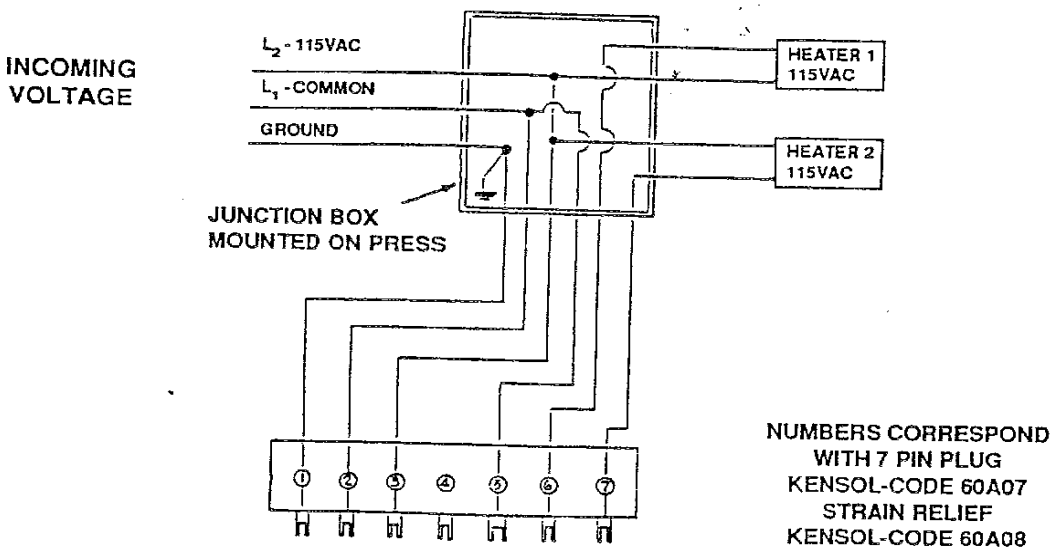
MICROPROCESSOR PLUG WIRING DIAGRAM

KENSOL 65H & 165H PARTS AND INSTRUCTION MANUAL

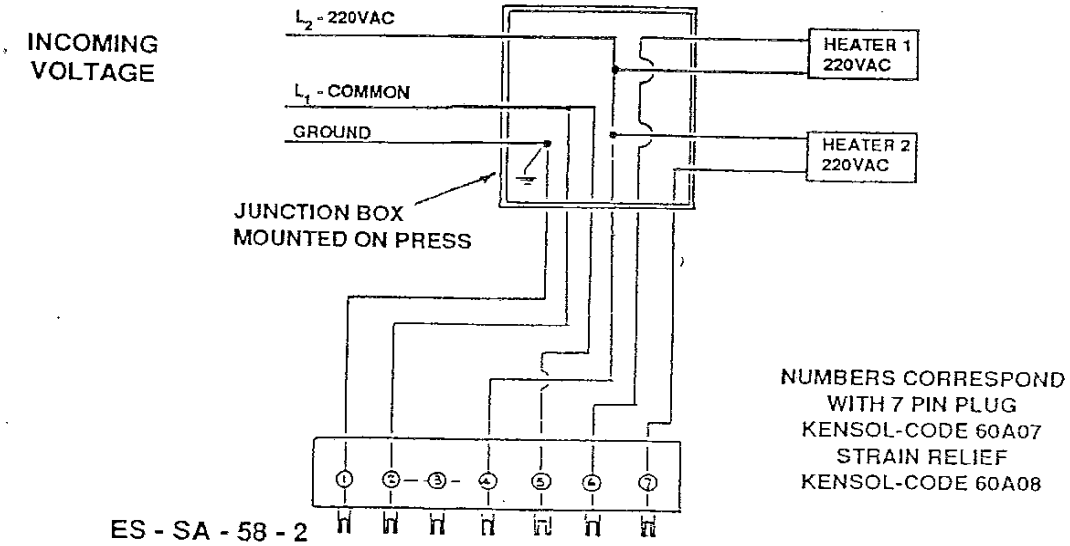


3D VIEW
MICROPROCESSOR
& CABLES

KENSOL - OLSENMARK PARTS SHEET MICROPROCESSOR ASSEMBLY FIG 89-MP1			
REF. NO.	PART NO.	DESCRIPTION	QUANT.
1	58A25	MICROPROCESSOR COMPLETE (SEALED UNIT)	1
2	60 19	PLUG ASSEMBLY COMPLETE CONTROL LINES TO 4 WAY VALVE	1
3	-	#18 WIRE- (SPECIFY LENGTH)	A/R
4	60A01	PLUG ASSEMBLY COMPLETE FOR THE THERMOCOUPLE LINE	1
5	65 20 58D05	THERMOCOUPLE WIRE ASSEMBLY (SPECIFY LENGTH)	A/R BY FT.
6	60A01	ASSEMBLY OF 4 & 5 ABOVE	1
7	64 02	PLUG ASSEMBLY COMPLETE FOR HEAD SHUT SWITCH	1
8	58 15	HEAD SHUT SWITCH (SWITCH ONLY)	1
9	60A05	HEAD SHUT SWITCH ASSEMBLY (SPECIFY LENGTH)	1
10	65 01	PLUG ASSEMBLY COMPLETE	1
11	53A 53B	HAND SWITCH ASSEMBLY (2 SWITCHES) INCLUDES 2 HOUSINGS SPECIFY WIRE LENGTH	1
12	60A07	PLUG, MAIN CONTROL CABLE, COMPLETE	1
13	72 04	JUNCTION BOX	1
14	-	POWER LINES TO HEATERS (PART OF EACH HEATER ASSEMBLY)	1

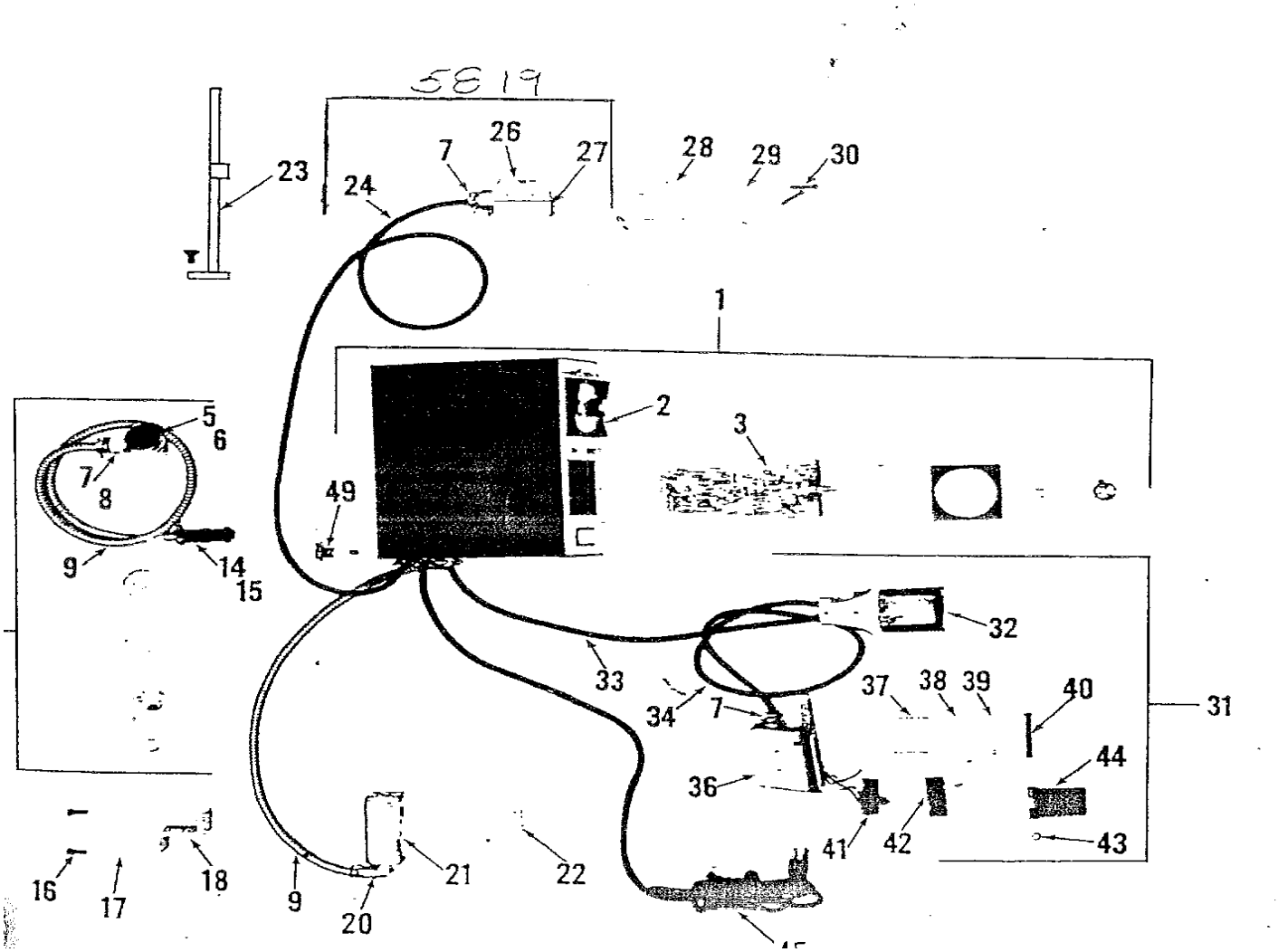


ES - SA - 58 - 1
110 VOLT CONFIGURATION



ES - SA - 58 - 2
220 VOLT CONFIGURATION

KENSOL 65H & 165H PARTS AND INSTRUCTION MANUAL



MAIN CONTROL UNIT

KENSOL 65H & 165H PARTS AND INSTRUCTION MANUAL

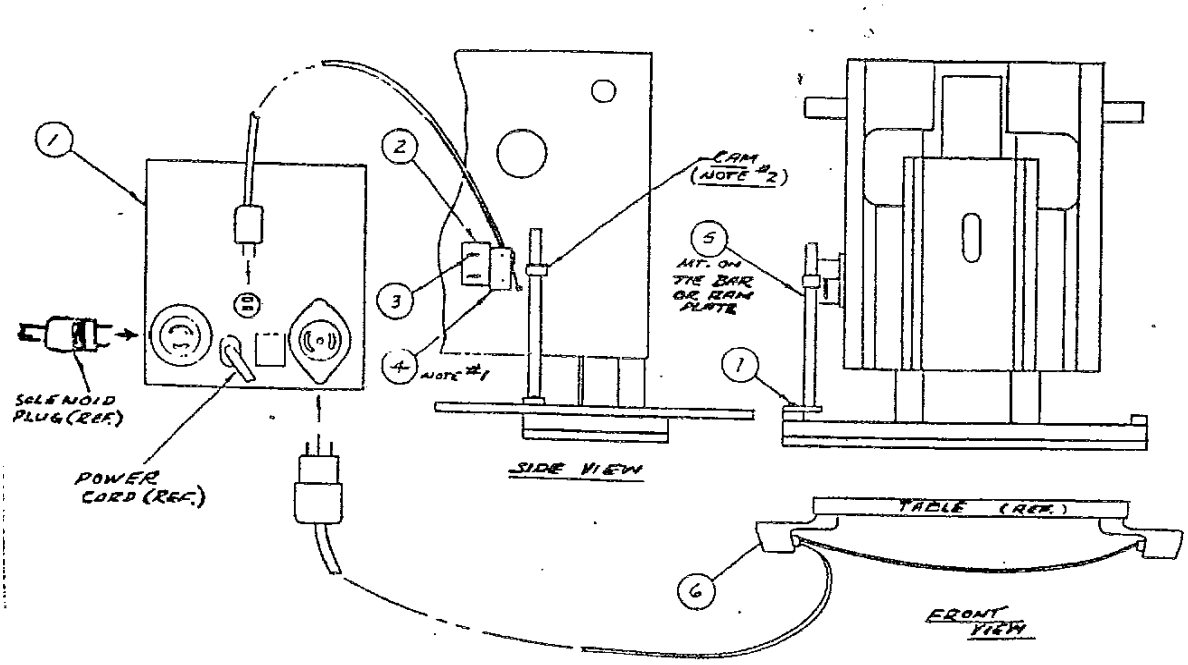
MAIN CONTROL UNIT, 24V SYSTEM, ALL STD. PRESSES

REFERENCE	PG-CODE	DESCRIPTION	QUAN ASSY
90-1A	58 13	MAIN CONT. AS, L.D. K16/25/36/KA	1
90-1B	58A03	MAIN CONT AS. HD, K16/25/36/KA	1
90-1C	58A01	MAIN CONT AS. LD, K65/110/156	1
90-1D	58A04	MAIN CONT AS. HD, K65/110/156	1
90-2A	58 07	MODULE ON-OFF TEMP CONT	1
90-2B	58 05	MODULE PROPORTIONAL TEMP CONT	1
90-3A	58 04	MODULE TIMER .25TO 10 SEC.	1
90-3B	58 06	MODULE TIMER .2 TO 5 SEC.	1
90-3C	58 14	MODULE TIMER .2 TO 2 SEC.	1
90-4	6 21	COIL & PLUG ASSY 24 VDC	1
90-5	25 26	COIL, 24V DC	1
90-6	25 07	COVER, HOUSING	1
90-7	69 09	CONNECTOR, 3/8 ROMEX	2
90-8	70 11	ANTI SHORTS, 16D FIBER (35/BAG)	1
90-9	71 15	GREENFIELD, EXTRA FLEX BX	3
90-14	60 16	PLUG, CPC	1
90-15	60 17	STRAIN RELIEF	1
90-16	239 03	SCREW, MACH., ALL TYPES	4
90-17	238 04	WASHERS, ALL TYPES	4
90-18	53 09	BRACKET, Z, THERMOSTAT (771C)	1
90-20	69 10	CONNECTOR, 3/8 90 DEG. ANGLE	2
90-21	70 23	BOX, 2-1/8X4X1 - 7/8 DEEP	1
90-22	71 23	COVER, BLANK, 2-1 8 X 4	1
90-23	186 01	TRIPPER ASSY., SWITCH, STD	1
90-24	74 23	WIRE, NEOPRENE	3

KENSOL 65H & 165H PARTS AND INSTRUCTION MANUAL

MAIN CONTROL UNIT, 24V SYSTEM, ALL STD. PRESSES

REFERENCE	PG-CODE	DESCRIPTION	QUAN ASSY
90-26	64 02	SWITCH STRAIGHT ROLLER	1
90-27	65 03	COVER, METAL SWITCH	1
90-28A	49 08	BRACKET, ASSY., T C SW (2X4, 2X6)	1
90-28B	186 19	BRACKET, HD. SHUT SWITCH, K25/27	1
90-28C	133 07	SPACER, 6X8/6X12 HD SHUT, K25/27	1
90-28D	186 09	BRACKET, HD. SHUT SWITCH, K36/50	1
90-28E	130 05	BAR, CENTERING, SMALL, 7”/ NO HOLE	1
90-28F	53 10	BRACKET, HD. SHUT SWITCH, K56/65	1
90-29	238 04	WASHERS, ALL TYPES	1
90-30	231 02	SCREW, MACH., ALL TYPES	2
90-31A	53B02	HAND SWITCH AS. K16/25/36/KA/56	1
90-31B	53B03	HAND SWITCH AS. K65/110/156/165	1
90-32	49 13	HOUSING ASSY., HANDSWITCH STD	1
90-33	74 21	WIRE, NEOPRENE	3
90-34	74 22	WIRE, NEOPRENE	3
90-36	49 17	HOUSING, HAND SWITCH	1
90-37	242 11	SCREW, MACH., ALL TYPES	2
90-38	238 01	WASHERS, ALL TYPES	2
90-39	238 10	NUT, ALL TYPES	2
90-40	49 18	PIN, LEVER HANDSWITCH	1
90-41	65 01	SWITCH, HAND SWITCH HOUSING	1
90-42	65 02	COVER, PLASTIC SWITCH	1
90-43	195 12	RING, EXT. GRIPPING	2
90-44	49 25	LEVER, HANDSWITCH	1
90-45	74 12	LINECORD MOLDED 16,3, 115V, 8 FT	1
90-49	67 19	FUSE, GLASS TUBE TIMER	1



NOTES:

1- ACTUATE ON "DOWN" STROKE - ITEM 4

2- THE CAM MUST BE ADJUSTED SO SWITCH - ITEM 4 - IS MADE WHEN DIE COMES INTO CONTACT WITH WORK.

CAUTION:

THIS SETTING MAY HAVE TO BE CHANGED WITH EACH SET-UP

ITEM	PART No	DESCRIPTION	QUANT.
1	58-25	TIMER	1
2	53-10	BRACKET	1
3	231-04	SCREW, 1/4-20 X 3/4	2
4	58-19	SWITCH ASS'Y	1
5	186-01	TRIPPER ASS'Y	1
6	53A04	HAND SWITCH ASS'Y	1
7	232-07	SCREW, 5/16-18 X 1 1/4	1

CONVERSION KIT

HEAD SHUT K65/165

KENSOL 65H & 165H PARTS AND INSTRUCTION MANUAL

ATTENTION!
KENSOL PRESS OPERATORS
IMPORTANT SAFETY PRECAUTIONS
To all Kensol Press Operators:
NEVER OPERATE A MACHINE WITHOUT SAFETY INSTRUCTIONS
IT IS THE FEDERAL OSHA LAW.

The head of the Kensol press is driven by either a hand lever or an air cylinder In order to perform Roll Leaf stamping, high pressure must be applied by the stamping die onto the work.

The **Standard Safety System** on a Kensol air operated power press is with **two hand electrical safety switches** at least 12" apart, concurrent operation which must be pressed within a one second interval, with an anti-tie down feature and a head shut safety switch. This eliminates the possibility of an operator beating the head's motion and being injured.

The operator must hold the two handswitches down until the head shuts on the work and the head shut switch operates the timer.

If an object to be stamped is smaller than the heater head, or tall in configuration, a manual slide or a power slide table should always be used for **outboard** loading and **unloading**.

A safety gate must be installed, and wired into the electrical safety circuit, so that machine will stop when the gate is either touched or removed. To restart the operation a reset button must be pressed.

A simple plastic safety gate can be installed to prevent the operator from accidentally placing the hand in the stamping area. Since **Kensol Stamping. Presses** can be used to mark and decorate articles of many sizes, shapes materials, it is impossible for the manufacturer to provide a universal safety gate.

A Suggested design (often used at Kensol) is shown on the accompanying page to help the purchaser fabricate a suitable device.

IMPORTANT SAFETY PRECAUTIONS (CONTINUED)

CAUTION!!

At no time should an operator place the hand directly beneath the stamping die. Any machine is a danger and all proper guards and gates must be in place and operating.

At no time should a **tie down** alternation be introduced to obtain faster production. This is unauthorized by the manufacturer and could result in injury.

All safety systems on equipment should be designed so that they will fail in the **safe mode** (FAIL SAFE) and not in the **unsafe mode**.

IMPORTANT

When setting up or repairing any **Kensol** air operated machine, the electrical power **must** be shut **off** and the air line completely disconnected.

There are many second person machine accidents in industry. **NEVER** operate a machine with a second person around the press power head and mechanism.

It is up to management to see that operators and second persons are protected with the proper safety systems and are instructed in their operation.

SAFETY CHECKS!!!

Every eight (8) hour shift - a **Safety Check** must be made on the press' safety circuit and the working cycle, because there is expirational life to switches, timers, electrical systems,etc.

Any machine can malfunction for one or several reasons beyond the control of a manufacturer. If the **press** does not function properly, - **Shut it "OFF" at once**. Call it to the attention of the supervisory personnel.

NEVER OPERATE A MACHINE WITHOUT SAFETY INSTRUCTIONS
IT IS THE FEDERAL OSHA LAW

The Hot Stamping
BASIC 7

Hot stamping foil and heat transfer decals are dry marking processes using heat and pressure.

1. HOT STAMPING FOILS and MULTICOLOR HEAT TRANSFER PRODUCTS

Hot stamping Foils are available in metallic silver, chrome, bronze, metalized, transparent or patterned multi-color designs such as woodgrains and metalized patterns. Holographic images and embossed fraction grading patterns are also available. Heat transfers are printed images using rotogravure, flexographic, and screen print techniques to produce individual in-register images as well as patterned images.

2. DIES and ROLLERS

Flat dies are commonly used, made from magnesium, copper, brass, and steel. Silicone rubber dies are also used. Large are coverage is achieved using silicone rubber rollers and heated steel rollers.

3. DIE SURFACE TEMPERATURE

Accurate temperature must be maintained on the face of the die. Metal dies are heated to temperatures that can range from 220°F to 380°F. Silicone rubber dies require approximately 100° more temperature to sustain the same die face temperatures in metal dies.

4.DWELL TIME:

An exact combination of heat and time (total heat) is required in order to transfer and adhere the hot stamping foil properly.

5.PRESSURE:

Hot stamping is a technique which uses the combination of heat (on the die face) and pressure (from the machine) to press against the hot stamping foil/transfer to transfer the image to the part to be decorated. An even distribution of pressure over the die face is necessary to produce satisfactory results.

6. TOOLING SUPPORT and MAKEREADY

Flat and level support must be maintained between the die and the part being decorated.
Inconsistent part tolerances can be overcome using various makeready materials like thick, hard paperboard, rubberized cork, urethane sheet and printer's offset blankets.

7. STRIPPING ACTION and CURE CYCLE:

Some foils and transfers, because of their construction, require special stripping action. Delayed removal of the foil for a split second to allow a cure or bond to the product being decorated is key to many successful jobs.

THE BASIC 7 ELEMENTS FOR ROLL LEAF STAMPING PERFECTION

1. ROLL LEAF 2. DIE 3. TEMPERATURE 4.TIME CYCLE 5.PRESSURE
6. MAKEREADY 7. STRIPPING ACTION

Hot stamping, gold stamping or roll leaf marking is making a surface with the proper roll leaf or heat transfer that gives the finish with adhesion and quality wear heat and pressure.

The quantity of heat transferred is controlled by the temperature on the face of the die, at a contact time cycle, transferred through the roll leaf carrier to the surface to be marked. The roll leaf is activated and fused, the heat is removed, the surface cures and the roll leaf is stripped.

The Basic 7 components can be varied and still control quality plus improve production. We must work for perfection in all the Basic 7 components so that we control quality and improve production. We must consider that the part being marked is reasonably (perfect) good quality and we will have a quality, profitable job.

We know all 7 Basic conditions will not be always perfect and they will vary. Usually when one or more conditions vary or become less than perfect, the job will still be acceptable and would maintain quality. We expect the material to be marked will be the same from batch to batch but we have found this is not true.

Many basics in roll leaf marking are taken for granted and accepted as quality. When no written standards have been established, there is no way to find and compare the problem and the results. Example: many plastic carts are painted and we are not stamping the basic plastic. This requires a roil leaf that will stamp on paint and plastic plus over stamp the roll leaf itself to salvage a poorly stamped part.

The customer with an old job and older equipment, decorating a part for many years must take into consideration the changes in base materials such as the plastic changes in the paint, changes in the roll leaf and other Basic changes.

A roll leaf product manufactured over a period of two to five years changes conditions and is not the same foil today because the chemicals producing the foil and the equipment and drying techniques used change because of E.P.A.

requirements.

The customer who has been using, the so called, same plastic for years will find out that the basic plastic used is not exactly the same and in fact, if he has at least two different sources the plastic surface is constantly different.

With these differences in mind and using older hot stamping equipment, we have to take into consideration the possible chances in the Basic 7. The roll leaf is slightly different, the die can be worn, the heat controller would not be as accurate as it was when new. The time cycle and the air flow into the machine affects the time, temperature and pressure cycle making it inaccurate.

Pressure applied in older, worn machine can vary greatly. The air system with a quick-change air coupler can cause the machine not to function in a uniform way because it is air starved and not operating with uniform pressure.

Makeready, the nest and the level bed on older equipment can be a problem because it can be out of level and the ram can be loose so that whatever accurate die you use, it is not parallel and registered. Roll leaf curing and stripping action comes into effect on certain difficult jobs when the removing or stripping of the foil after the substrate have cured to leave a quality clean impression.

The proper die pressure is needed in order to mark a product with quality.

Customers cheat when purchasing a hot stamping machine with insufficient pressure that is required. They then increase the temperature or use a longer time cycle so that they get a higher heat impression whereby they drive the impression into the surface with more heat. This usually causes the leaf to overflow the die area and lose definition and quality.

It is recommended to buy a more powerful machine for many reasons. With many years of machine use, the stronger machine will not wear as much as a weak machine that strains to its capacity and it will stand up better and longer with less problems and it will hold its accuracy.

All “C” frame type machines have some frame stretch, as maximum pressure is applied. With a slightly stronger machine, less frame stretch occurs under normal conditions so that the die under maximum pressure would be under better control and remain flat and accurate to the work surface.

An older machine wears and becomes loose. The ram must be readjusted under operating temperature, plus 25° so that the play in the head is removed and the head is revealed to the table.

Constant lubrication and maintenance on any equipment is important.

An older machine in good condition has great value. An older machine cab be upgraded and improved by adding the latest required two hand safety system plus add a late model heat controller plus replacing any worn parts.

All of these features do not produce quality work, unless the operator and supervision have been given the training and knowledge in quality control care so that the operator knows what adjustments are required in order to get the quality out of the roll leaf and the material to be stamped.

Quality control starts with management with quality materials and parts to be marked, quality roll leaf, dies and tooling.

To review the Basic 7 for quality control:

1. The roll leaf or the heat transfers should be the same from batch to batch in workability, color, sizing, thickness of carrier and should be out properly so that it does not tear or cause problems mechanically in the equipment.

2. The dies used should be in good condition, of good definition, accurate and mounted correctly for good heat control, metal to metal, so that the temperature can be accurately controlled.

3. Die temperature must be accurate during the production if the heat systems and controls are accurate.

4. Time or dwell of the die on the work must be accurate to transfer the heat and the roll leaf.

5. Pressure must be uniform on every cycle.

6. The tooling, nest or makeready must be accurate during the run and must support the die accurately to produce quality.
7. Stripping action of the roll leaf after the impression and lead is cured must be considered when stamping with some difficult roll leaf (such as chrome leaf) or heat transfers.

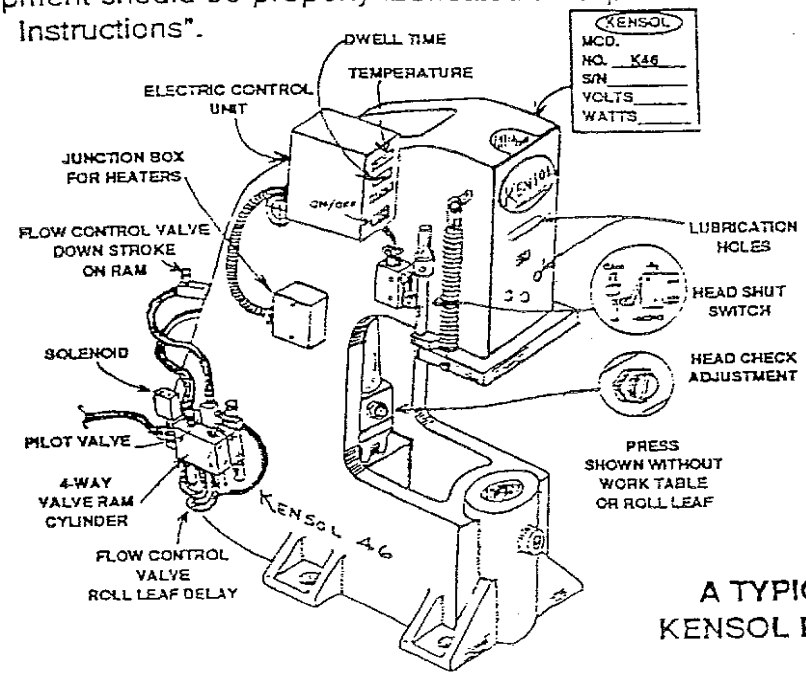
The roll leaf or heat transfers used today is a superior product from years ago from the film carrier used today to the chemical coatings, metalization and the sizing. OSHA (the federal Occupational Safety & Health Act) requires that an employer must have a healthy and safe environment for his employees. Any machine must be safe and it should be checked daily to see that the machine is functioning in a normal and safe manner with all the safety guards and gates in proper place and effective. If all the Basic 7 are under control, adjustments can be made in time, temperature, pressure in order to keep the job operating and produce quality profitable parts. The bottom line is quality and profits.

GENERAL TROUBLE SHOOTING PROCEDURES

FOR KENSOL

The Kensol Press was carefully manufactured with hign quality materials and components. However, over the long life of this equipment something may go out of order. If a problem arises, the solution should be found in these instructions.

Experience shows the primary cause of equipment failure to be poor maintenance. Equipment should be properly lubricated as explained in "Installation and Operating Instructions".



A TYPICAL KENSOL PRESS

In general, equipment failure can be broken down into two categories:

1. Mechanical failure.
2. Air or electrical component failure.

To determine cause of failure, heat the head to 300°, disconnect the air supply and insert the handle into the hole provided in the main shaft through the casting. On a press with mechanical pull roll leaf, set it for maximum pull.

Operate the press manually. If the press still binds, the problem is mechanical failure.

If the machine operates freely by hand, the problem is in the air or electrical system.

AIR FAILURE

AIR FAILURE MAY OCCUR IN:

—AIR CYLINDER

—PILOT VALVE

—4 WAY VALVE

—AIR CONTROLLING UNIT: FILTER, REGULATOR, LUBRICATOR (FRL)

HOW TO DIAGNOSE: AN AIR PROBLEM

GENERAL

AIR-CYLINDER, PILOT VALVE, 4-WAY VALVE

These components are considered as one complete assembly in troubleshooting. If the ram action of the press is erratic and the mechanical sections of the press and the dwell-timer have been eliminated as the cause of failure, the air assembly must be faulty. The complete assembly is either returned to Kensol for repair or disassembled and examined for:

1. Broken electrical connection in pilot valve.
2. Broken return spring in the 4-way valve.
3. Bind of the spindle in the four-way valve. This is usually caused by "O" ring expansion due to the use of oil containing additives. DETERGENT OIL MUST NOT BE USED.
4. Bypass of air around 4-way valve spindle or cylinder cups. Caused by the use of oil with additives used in the automatic lubricator.
5. Corrosion due to excessive water getting into the press.
6. Scoring of the walls of the cylinder.

AIR CONTROLLING UNIT

The air controlling unit consists of an air filter, regulator and a lubricator, called FRL. Any Failure of these parts is usually apparent. The air filter is designed to remove water from the air line. If excessive water is building up so that this has to be drained a few times each day, it is advisable to have an after-cooler installed on the compressor. Repair kits for these components are available through Kensol if you find that they are not functioning properly.

ELECTRICAL OR AIR FAILURE

Electrical Failure may occur in:

- THE FUSE
- HAND SWITCHES
- DWELL TIMER } MAIN CONTROL UNIT
- TEMPERATE CONTROL } MAIN CONTROL UNIT
- THE HEATERS
- THE THERMOCOUPLE
- SOLENOID OF THE 4 WAY AIR VALVE

HOW TO DIAGNOSE: AN ELECTRICAL PROBLEM

GENERAL

If it is determined after converting the press to hand operation that there is no mechanical failure, then the problem must be located in either an electrical or an air component.

1. FUSE

If the problem is obviously electrical, FIRST check the FUSE in the back of the electrical control unit (Microprocessor), First and always check for a blown FUSE in the back of The Microprocessor.

NOTE!

The warning concerning shutting down or starting press " THE MICRO-PROCESSOR SWITCH MUST BE LEFT IN THE 'OFF' (mid-position) WHEN DISCONNECTING OR CONNECTING THE ELECTRICITY OR REMOVING PLUG". IF NOT—THE FUSE WILL BLOW!!

2. HAND SWITCHES

Each hand switch housing contains a microswitch that is activated by a hand switch plate. The machine will not operate unless both switches are depressed at the same time. The hand switches are checked one at a time with an ohmeter. The timer must be "off" during this test. When the hand switch is operated, there should be no resistance across the terminals of the microswitch. The terminals of the microswitch are accessible through the bottom of the hand switch housing, and are protected by a plastic cover.

To remove this cover, loosen the two brass screws on the side of the housing, and gently pull the cover down through the bottom of the hand switch. The terminals of the microswitch may now be reached by the ohmeter probes. THE PLATES MUST BE LOOSE SO THE HAND-SWITCHES CAN RELEASE AND RESET THE TIMER.

3. **MAIN CONTROL UNIT**

If the hand switches are found to be working properly, and the cycle light on the electrical control unit functions incorrectly, then there is a faulty timer or thermostat circuit board.

The red light should "blink" as the heaters are coming up to set temperature (digital). Just before reaching temperature setting, the red light will turn "Off" and when correct temperature has been reached, the green ready light will turn "On".

If the microprocessor does not provide the sequence outlined above, replacement is necessary.

The dwell time is controlled by the MICROPROCESSOR. The time period starts when the HEAD SHUT TRIPPER SWITCH makes contact. This should occur when the "DIE" in the PRESS just makes contact with the "WORK".

The HEAD SHUT TRIPPER SWITCH must be checked to be sure it is operating properly, and the CAM is adjusted to the correct position.

If the timer does not provide the dwell time set on the digital timer, then replacement of the electrical control unit is necessary.

NOTE!

The warning affixed to the MICROPROCESSOR
["THE GUARANTEE VOID IF SEAL IS BROKEN"]

A copy of the yellow label is included. If it becomes necessary to return the MICROPROCESSOR follow the 6 steps carefully.
DO NOT OPEN the cabinet under any circumstances.

AIR CONTROLLING UNIT

The Air Controlling Unit consists of an air filter, regulator (with gauge) and a lubricator. Called "FRL."

Each has a specific function.

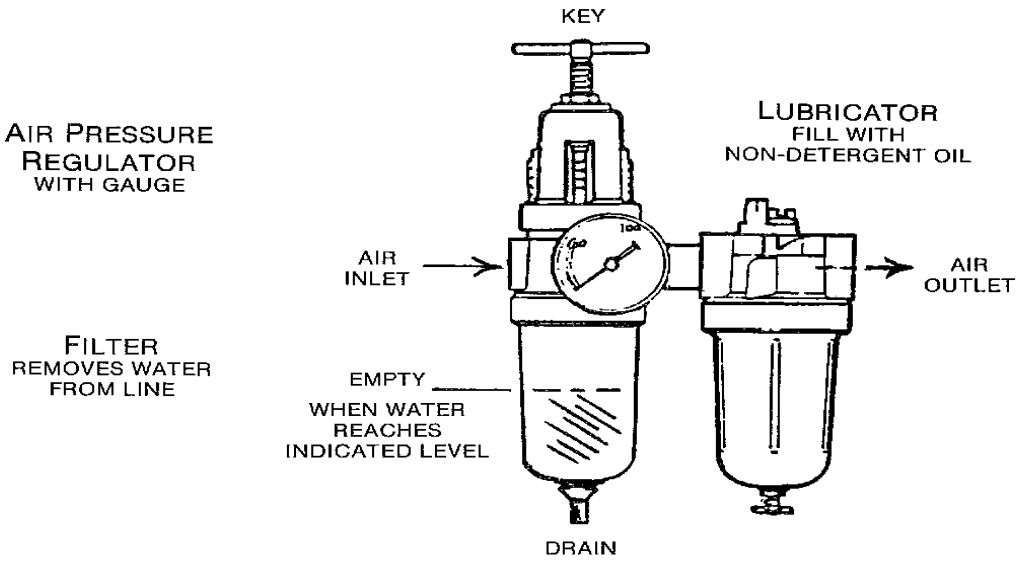


FIG. 7

FILTER: Filters out water and particles. Water must be drained on a regular basis. Replacement filter elements are available.

NOTE! Excess water in line requires an after-cooler on the compressor.

REGULATOR: Regulates air pressure to the press. KENSOL presses operate in the 50-100 psi range.

NOTE! Turning key to right increases the air pressure.

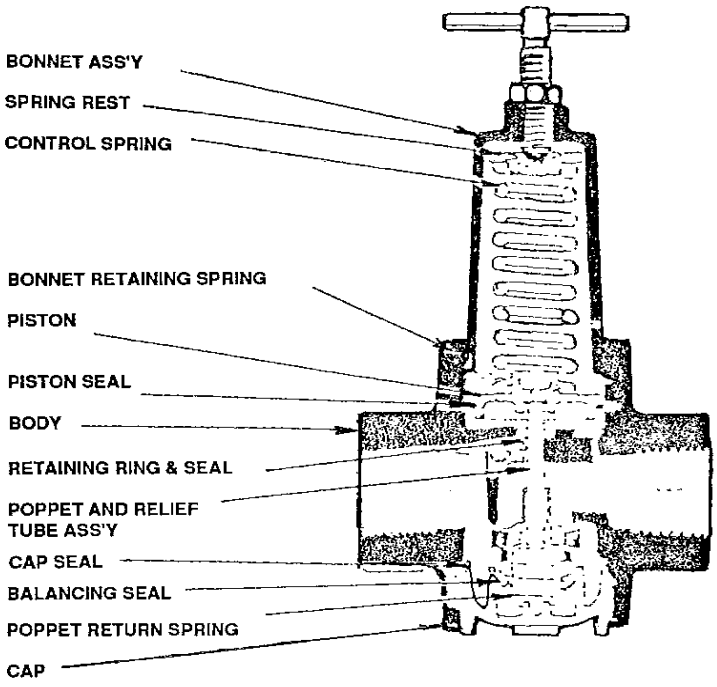
* LUBRICATOR: Keeps internal parts from binding. Use only nondetergent oil. Regulate drops to obtain 1 drop per 3 to 5 strokes of the press. Replace oil as necessary.

NOTE! Replacement components are available from KENSOL.

* Applies to Parker Series 16/17 Lubricator.
Prior to Feb. 1989 one drop of oil every 20 strokes was recommended.

REGULATOR

(AIR CONTROLLING UNIT)



OPERATION:

1. BEFORE TURNING ON AIR SUPPLY, TURN ADJUSTING HANDLE COUNTER-CLOCKWISE UNTIL COMPRESSION RELEASED FROM PRESSURE CONTROL SPRING. Then turn on air supply and adjust to desired secondary pressure by turning adjusting handle clockwise. This permits pressure to build up slowly, preventing any unexpected operation of the valve, cylinders, tools, etc., in the line. Adjustment to desired secondary pressure can be made only with primary pressure applied to the REGULATOR.

2. To lower secondary setting, always reset from a pressure lower than the final setting desired. For example: To lower the secondary pressure from 80 to 60 PSI, drop the secondary pressure to 50 PSI or less, then adjust upward to 60 PSI.

REGULATOR

(AIR CONTROLLING UNIT)

SERVICING:

NOTE: SHUT OFF AIR SUPPLY AND DE-PRESSURIZE THE UNIT. COMPLETELY VENT THE SUPPLY LINE.

1. To service the piston or control springs, turn the adjusting handle counter-clockwise until compression is released from pressure control spring.

   a. Remove bonnet by unscrewing bonnet from body and removing the control spring, piston, and piston seal.

   b. Clean and carefully inspect parts for wear and/or damage. If replacement is necessary, service kits are available.

   c. Lubricate the piston seal with a mineral base oil or silicone grease. DO NOT use synthetic oils such as esters.

   d. Install piston, piston seal, control spring, and adjusting screw pressure plate. Screw bonnet to body.

2. To service poppet and relief tube:

   a. Relieve all pressures as described in above NOTE.

   b. Remove cap by unscrewing from body (located opposite from control spring bonnet). Remove poppet relief tube and balancing spring.

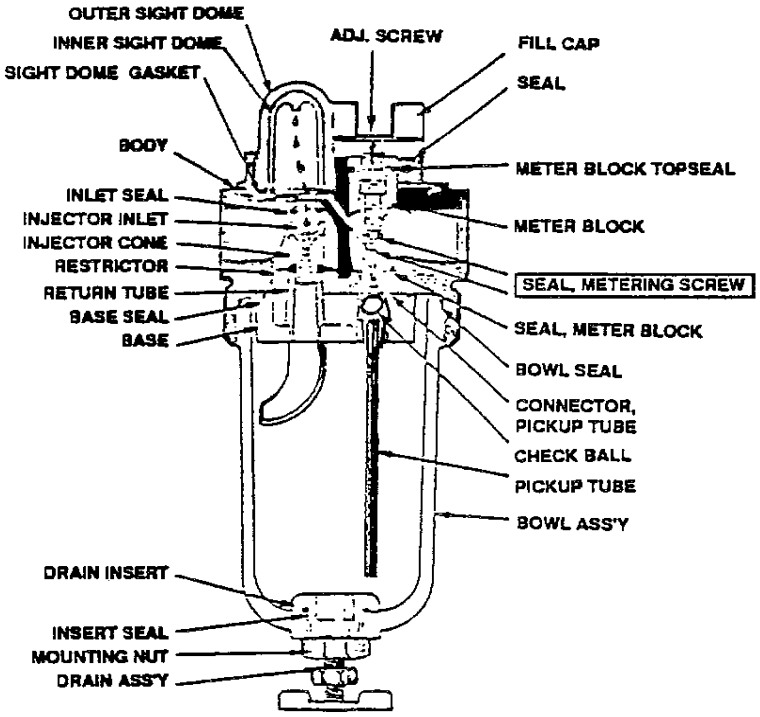
   c. Clean and carefully inspect parts for wear and damage. If replacement is necessary, service kits are available.

   d. Lubricate cap seal as in step 2c above, install in groove of cap and screw cap into body.

3. Turn on air supply and adjust to desired secondary pressure as described in step 1 in Operation.

LUBRICATOR

(AIR CONTROLLING UNIT)



OPERATION & SERVICE:

1. FILLING - Inlet pressure must be eliminated before fill cap is removed. Fill to fill line on the bowl with oil of 100 to 200 SSU viscosity at 100° F and an aniline point greater than 200° F - same as SAE No.10 (petroleum base hydraulic oils or spindle oils are good examples).

   DO NOT USE OILS WITH ADHESIVES OR TACKY ADDITIVES. COMPOUNDED OILS CONTAINING SOLVENTS GRAPHITE, SOAPS, OR DETERGENTS (automotive oils generally contain detergents) ARE NOT RECOMMENDED.

2. Replace the fill plug and seat firmly - excessive torque is not necessary. The lubricator is now ready for setting. Repressurize the Lubricator.

LUBRICATOR

(AIR CONTROLLING UNIT)

OPERATION & SERVICE: (Continued)

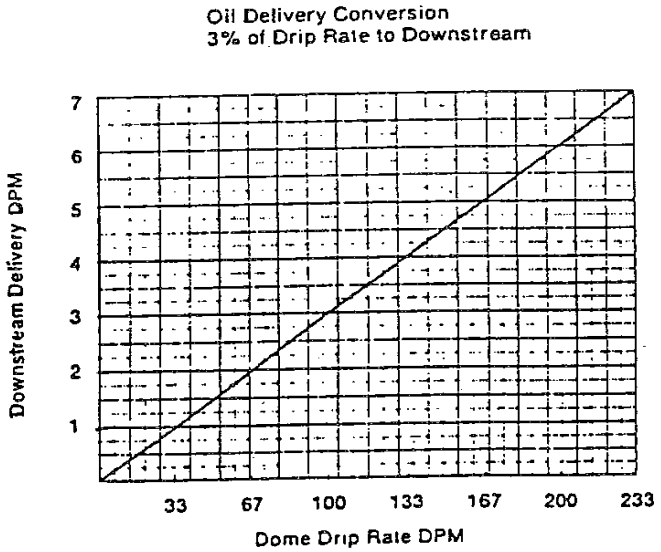
3. OIL DELIVERY ADJUSTMENT - To adjust oil delivery use a slotted screw driver to turn the adjusting screw in the top of the lubricator.

Leaner - Clockwise
Richer - Counter-Clockwise

By counting the number of drops per minute in the sight dome, you can adjust your requirements. Approximately 3% of the drops seen in the sight dome go downstream; adjust drip rate accordingly. Consult oil delivery conversion chart.

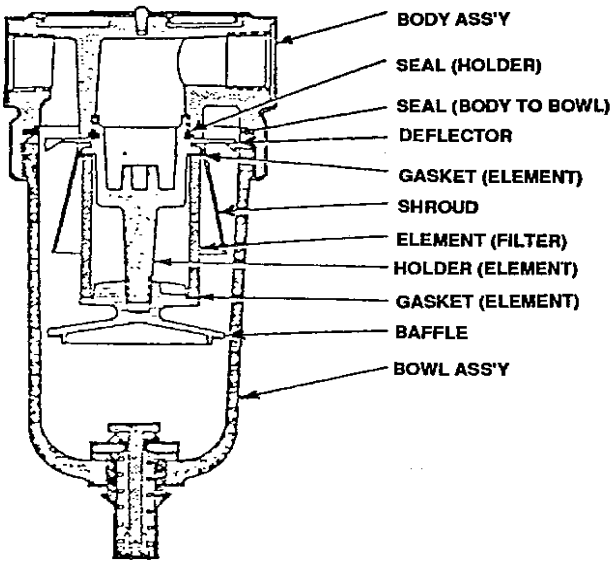
25 drops per minute equals one once per hour - Volume of oil passing through sight dome.

NOTE: This is a constant density type lubricator which delivers a constant ratio of oil to air flow. Therefore, if air flow increases or decreases, oil delivery will be adjusted proportionately. ONLY IF A DIFFERENT RATIO IS DESIRED SHOULD YOUR NEEDLE VALVE SETTING BE CHANGED AFTER YOUR INITIAL SETTING.



FILTER

(AIR CONTROLLING UNIT)



OPERATION & SERVICE:

1. Both free moisture and solids are removed automatically by the filter. There are no moving parts.

2. Manual drain filters must be drained regularly before the separated moisture and oil reaches the bottom of the lower baffle. Automatic drain models will collect and dump liquids automatically.

PUSH 'N' DRAIN

3. The filter element should be removed and replaced when the pressure differential across the filter unit is excessive.

4. To service the filter element; SHUT OFF AIR SUPPLY and depressurize the unit.

   a. Unscrew threaded bowl.

FILTER

(AIR CONTROLLING UNIT)

OPERATION & SERVICE: **(Continued)**

b. Unscrew lower baffle and remove filter element and gaskets (2).

c. Clean all internal parts bowl and element before reassembling.

TO CLEAN POLYCARBONATE BOWLS USE MILD SOAP AND WATER ONLY!
DO NOT use cleansing agents such as acetone, benzene, carbon tetrachloride, gasoline, toluene, etc., which are damaging to this plastic. Bowl guards are recommended for use with polycarbonate bowls.

d. Install element and gaskets (2).

e. Attach lower baffle and tighten firmly.

f. Replace bowl seal, lubricate seal to assist in retaining it in position. Use only mineral base oils or grease, DO NOT use synthetic oils such as esters, and DO NOT use silicones.

g. Screw bowl into body.

MECHANICAL FAILURE

Mechanical failure may occur in:
-MECHANICAL PULL ROLL LEAF
-LINKS AND PINS
-RAM

HOW TO DIAGNOSE: A MECHANICAL PROBLEM

1. ROLL LEAF ATTACHMENT

If the press is equipped with a mechanical pull roll leaf attachment, disconnect it by moving the leaf pull adjusting block to the bottom of the slide. if the press now operates properly by hand, the problem lies in the roll leaf pull.

Press the levers located at either end of the rubber roller towards the head, separating the two rollers. If the rubber roller does not spin freely its bearings are binding. If the rubber roller does spin freely the bind is in the knurled roller bearings. Lubricate the bearings. Spin rollers by hand to be sure they are free.

2. LINKS AND PINS

Disconnect air. Remove the center pin (the pin joining five links) which allows all links to be moved by hand making it easier to locate a bind.

Once it is determined which area binds, the link should be removed from the pin and tapping the pin out through the side. Some pins are slip fit and are easily removed; others are press fit and should be driven out with a drift punch. Check for set screws in the top pin before attempting to remove it.

If a pin or link is scored it should be replaced. If not scored, the pins and links should be cleaned, greased liberally and reassembled.

3. RAM

If the press still binds after checking the mechanical roll leaf, links and pins as a source of trouble then the ram is binding.

If the roll leaf pull is mechanical, make certain it it disconnected when adjusting the ram fit t allow better judgment of the fit.

The fit should be free, but not sloppy. If sloppy, the head may twist and jam the roll leaf assembly or blur the impression.

Preheat the ram to 300°, to stimulate operating temperature.

Care must be taken to adjust the RAM fit properly. There are (2) set screws with lock nuts in the Upper Frame on the right hand side. (Operator facing machine) The (4) four cap screws holding the GIBS must be cracked loose so that adjustment can be made.

The adjustment involves working the handle up and down while changing the position of the set screws in the casting. Loosen one set screw at a time, and retighten it before going on to the next.

Expansion due to the heat generated affects the fit. Be sure to maintain 300° while adjusting.

Slightly loosen the locknuts and turn the set screws out while working the handle up and down. If this doesn't lessen the bind, repeat the procedure on the set screws. In some cases it may be necessary to loosen and reset the combination of the two set screws. Make sure all the locknuts are tightened after adjusting the set screws.

Be sure to tighten the (4) four cap screws holding the GIBS.

ADJUSTMENT OF RAM - KENSOL PRESSES

Test the ram on each press every six (6) months to be sure it is operating properly. Test and adjust a ram at the press operating temperature, for excessive play, or jamming.

If the press binds first check for other mechanical binding for the source of trouble rather than the ram. #1 the mechanical roll leaf and #2 the links and pins and then test the ram for binding and see that the ram is properly lubricated including the ram pin.

High temperature ram grease should be used. First remove the old ram grease but do not loosen the ram bolt or remove the ram to clean unless there are signs of wear.

If the press is equipped with a mechanical pull roll leaf attachment, disconnect it. If the press operates properly by hand, the binding problem lies in the mechanical roll leaf attachment.

If the rubber roller and the knurled roller of the roll leaf attachment does not spin freely its bearings are binding. If the rubber roller spins, the bind could be the knurled rubber bearings. Lubricate with oil and free or replace the bearing.

If the roll leaf attachment is mechanical, make certain it is disconnected when adjusting the ram fit.

The ram tests are done by reducing the presses air line to zero, putting the setup handle in the machine, bringing the head down by hand and try to shift the head in the stamping position. Tests done only after the head has been heated to operating temperature for three hours so that the ram and frame has expanded fully.

Adjusting the ram's fit should be done at the press' operating temperature plus 25 degrees. Example: if stamping with silicone rubber at 425 degrees F on the thermostat you should set the thermostat for 450 degrees F so that the complete ram and frame is expanded. The ram should then be checked to see if there is any play in the down or stamping position. If there is any play in the ram it should be adjusted before leveling the head. Move the head up and down and press the roll leaf adjustment on the left and right sides to try to cause the ram to bind.

We are not concerned with the head condition in the press' up position.

LINKS AND PINS BINDING

Tap each link to determine if they are loose or free.

Remove the center pin (the pin joining the five links) which allows all the links to be moved by hand making it easier to locate a pin and link that is bound up.

Lubricate the pins with 30W oil once a week.

A bound link should be removed from the pin by taking the lock ring clips off the ends of the pin and tapping the pin out to the side. Some pins are slip fit and are easily removed; other pins are press fit and should be driven out with a drift punch. The top pin is locked in place with a set screw on the frame. Before attempting to remove the top pin, unlock the screw.

Replace any worn links and pins.

The ram fit should be tight and free, not sloppy. If sloppy, the head may twist or slide and jam mechanical roll leaf assembly or blur the impression by the head twisting, shifting or skidding.

When adjusting the ram fit, there are four (4) set screws on the cap casting to set the gap inside of four (4) locknuts on older machines. Kensol K-36T ram caps have a special lock bolt with Allen head and locking nut. The ram cap is located right above the head, and faces the operator when he is standing in front of the machine. The ram adjustment involves working the handle up and down while changing the position of the gap set screws in the casting and the locking bolts.

If the ram is binding loosen one bolt at a time and test with the handle. Tighten the bolt back. If the bind is not freed, before going on to the next bolt if the loosening does not improve the problem.

If excess play (loose and sloppy) is in the ram; Start with the lower right hand lock nut, test by tightening each nut clockwise to eliminate the gap and play. If the ram is still loose and all bolts tight, slightly loosen each lockbolt and reset the gap set screw out (to the left) and retighten the bolts while testing the ram up and down manually on each adjustment.

In a drastic case where the ram gap is bad and cannot be adjusted, you must start the procedure all over again from a zero setting. Loosen all bolts and all gap set screws. Lock the head in place with no gap by tightening all lock bolts. The ram and cap will be locked at zero adjustment. Tighten the gap set screws (four) to the frame. All adjustments on the ram are at zero gap. Loosen the four lock bolts. Turn the gap set screws (four) in, to the right, on quarter turn. This will establish the new gap on all four corners. Tighten all corner bolts in turn about one quarter turn to draw the cap casting in to set the gap. Continue to tighten all four bolts (clockwise) until all bolts are tight and the ram doesn't bind. If the ram binds on a bolt adjustment back off that bolt a crack to free the bind and continue tightening the other three bolts until they are tight and not binding the ram. All set screws should be tight and all bolts tight without the head binding for a perfect fit.

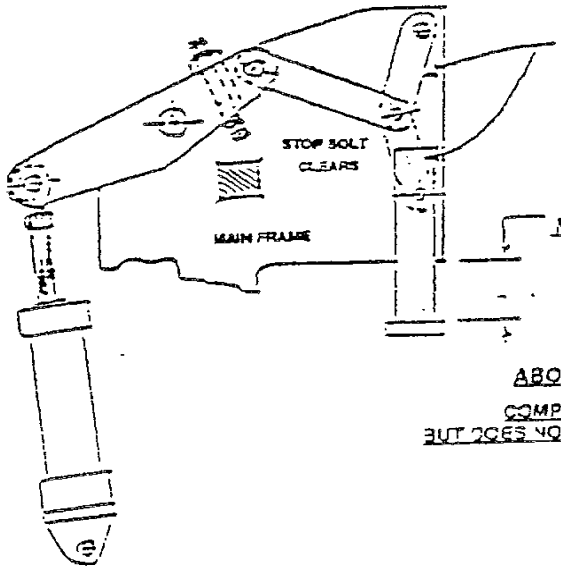
These adjustments are always cone by mechanically coerating the head up and down by hand when doing each tightening adjustment.

Check the head for level. See instructions.

Proper weekly lubrication is essential.

TOGGLE DIAGRAMS

OPERATION OF PRESS



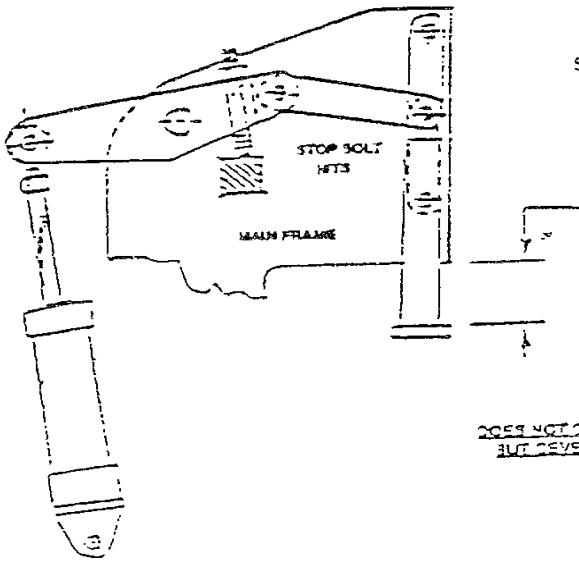
TOGGLE LINKS
PARTIALLY
STRAIGHTENED OUT

LESS THAN
MAXIMUM HEAD STROKE

ABOVE THE CENTER OF TOGGLE

COMPENSATES FOR ITEM VARIATIONS
BUT DOES NOT DEVELOP FULL PRESSURE AVAILABLE

FIG 39 - SK - 1A



TOGGLE LINKS
COMPLETELY
STRAIGHTENED OUT

MAXIMUM
HEAD STROKE

FULL TOGGLE

DOES NOT COMPENSATE FOR ITEM VARIATIONS
BUT DEVELOPES FULL MACHINE PRESSURE

FIG 39 - SK - 2A

B. Hooking Up Air Connections

The press requires compressed air delivered at a constant pressure of up to 100 P.S.I. The size of the compressor should match the production speed desired.
600 impressions/hr. requires 5 C.F.M. of air (1 H.P. Compressor)
1000 impressions/hr. requires 7.5 C.F.M. of air (1.5 H.P Compression)
1500 impressions/hr. requires 9 C.F.M. of air (2 H.P. Compression)
To deliver air to one press within 30 feet from compressor, use 3/4 inch galvanized price. For two or more presses, use 1 inch price. It is advisable to install an ordinary shut-off valve in this line for convenience and safety.
The air controlling unit consists of a Filter, Regulator and Lubricator.(FRL)
The Filter removes foreign matter and water from the air, the Regulator controls pressure, and the Lubricator drops oil into the airflow at regular intervals. The Lubricator should deliver about one drop of oil every 3-5 strokes. Operation and service of the controlling unit components are detailed in the diagrams located at the end of these instructions.
Connect the compressor to the hose connector on the Filter. (Hose is supplied for temporary hook up). Connect the Lubricator to the center hose connector on the cylinder valve assembly with neoprene hose.

C. Hooking Up Electricity

Different heads require different line voltages. Make sure the voltage delivered matches the voltage required on the nameplate of the press.
The “On-Off” set-up switch on the electrical control unit operates the timer only. The “SET TEMP” Button sets the head temperature required for the job. The “On-Off” switch should be in the “Off” position. The line cord must be unplugged when setting up the press or when the press is not in use.

II. OPERATION OF PRESS

A. Understanding toggle action - The press uses a toggle linkage to develop the high pressures needed for hot stamping. The nature of toggle action is to develop maximum force when the head reaches its maximum stroke (Full Toggle)
Referring to the toggle diagrams, Sketch A-1 shows the head meeting the work before reaching maximum head stroke. Sketch A-2 shows the head meeting the work at maximum head stroke, which exerts maximum pressure. If the table is set so that this occurs, and the work is then taken out and replaced by a part that is thinner than the first one, the head will exert no pressure on the thinner part. (The head cannot extend farther than maximum stroke.)
Important-
If work does vary in thickness adjust table so that imprint occurs just before toggle reaches maximum head stroke. This provides for work variations and also provides high working pressure.

B. Proper Air Pressure - The press should operate between 50 and 100 P.S.I. Operating above 100 P.S.I. will put excessive strain on the press and may cause damage to the air system.

If operated under 45 P.S.I. the press will become sluggish and erratic.
On DIRECT CYLINDER AIR PRESSES, The Air Pressure determines the WORKING PRESSURE on the part being stamped.

C. Hand Switches - The press is equipped with two hand switches that must be depressed at the same time to start the stamping cycle. The switches must be held down until the head meets the work. This ensures that the operators hands are out of the stamping area during the cycle. (An OSHA requirement)

D. Dwell Timer - The dwell timer regulates how long the head stays on the part. Different dwell times are needed or different types of roll lead or different applications. The dwell time is changed by simply setting the digital readout to the desired setting. Proper dwell information should be obtained from the roll leaf manufacturer.
The dwell timer starts when the Head Shut Tripper Switch trips the timer microswitch. The cam should trip the microswitch when the head makes contact with the part.
The set-up mode may be used when making adjustments on the machine. If the hand switches are pressed while the timer is in the set-up mode, the head will come down and stay down until the timer switch is turned "OFF."
The Microprocessor Switch MUST be left in the "OFF" (MID POSITION) when shutting down by Disconnecting Electricity or Removing Plug.

E. Temperature Control - The electrical control unit controls the temperature of the stamping head. The head is heated by heater cartridges that are contained in the head. The temperature is set by setting the digital readout to the desired temperature.
The Control Unit maintains the temperature by turning on the heaters until the head reaches the set temperature. When the heaters are on, the red "HEATING" light blinks. When the head is up temperature, the steady green "READY" lights indicates that the head has reached set temperature.
Heat and dwell time are used together to achieve the desired results. Different roll leafs require different temperature for proper release. In general, shorter dwell times require higher head temperatures. The roll leaf manufacturer will be able to tell your proper temperature for your roll leaf.
The Microprocessor Switch MUST be left in the "OFF" (MID POSITION) when shutting down by Disconnecting Electricity or Removing Plug.

F. Downstroke Speed Valve - The downstroke speed valve controls the speed of the head as it comes down to meet the work. There are two flow valves - each of which feed into an exhaust muffler. These values are located on the head operational cylinder at the rear of the machine. The top valve is the downstroke speed valve. To slow the head's downstroke, turn the valve clockwise. The adjustment is useful for prolonging the life of soft metal type or dies, or to prevent cracking brittle work. When changing downstroke speed, the pressure of the head on the part does not change.

G. The Head Check Feature - The head check feature prevents the head from slamming into the frame on the upstroke. Compressed air released through the valve assembly on the upstroke. At a certain point the air flow is reduced and bled out of the cylinder very slowly. This slows the upstroke before the head reaches the upper frame.
The head check adjustment is a screw and locknut on the face of the cylinder's bottom plate. If the head is slamming into the frame, loosen the locknut, and turn the screw in until the upstroke is smooth.

H. Roll Leaf Delay Valve - If the press is equipped with an air operated roll leaf mechanism, there is a flow valve attached to the 4-way valve that controls the ram cylinder. The flow valve is connected to a pivot valve (also a 4-way) that operated the roll leaf. The two 4-way valves are mounted parallel. By closing the flow valve, the roll leaf movement will be delayed. When the stamping cycle is complete, and the head moves off the work, the roll leaf cylinder will advance the roll leaf. If the advance occurs before the head is clear of the work the leaf may tear. The roll leaf delay valve delays the advance of the roll leaf until the head clears the work.
To adjust the delay, turn the flow valve to the right until it stops. This is the longest delay possible. During operation, slowly turn the valve to the left until the leaf pulls just after cleaning the work.

III. SETTING UP A JOB ON PRESS

IMPORTANT: Make sure all safety precautions have been followed and press has been properly lubricated before proceeding. Disconnect the air supply from the press, and insert the supplied handle in the cross shaft.

A. Locking Up Type or Dies - A fourwall chase, hot plate chase, or pallet can be purchased which slices into the head and is held tightly by a nut on the head lock. The pallet can hold several lines of type, type high dies, or linetype or ludlow slugs. The hot plate chase is used for larger type set-ups or dies. Larger dies are usually engraved on 1/4 inch or thinner metal and attached to the chase with screws, glue or die bonding film which can be purchased from Kensol.
To attach the die in the plate with die bonding film, slide the chase into the dovetail rails and tighten the locking nut on the head. Set the temperature at 350° and make sure that the timer switch is off.
Center the die under the head, face down, and place a piece of die bonding film, cut to size, on the back of the die. Bring the head down with the handle, and apply full pressure for 15-20 seconds. Raise the head and set the heat circuit switch of the control unit to “OFF.” The die should be held firmly in place.
To glue the die in place, LePage’s strength glue or fisn glue is used. Lock the chase into the head, set the temperature to 250°, and let it heat up to temperature.
Spread a thin layer of glue over the back of the die and place a piece of newspaper, cut to size, over that. Spread another layer of glue over the newspaper and center the die under the head. Bring the head down and apply full pressure for 1-2 minutes. The glue will dry, holding the die in place.

B. Making the Job Ready - During the stamping, work should never be placed directly on the steel table unless it has a lot of give, for example: (Cardboard) or if it is very thick for example:(a block of wood).
“Makeready” board should be placed on the table and held down with masking tape or work stops. Makeready can be cardboard or anything that is thick and yielding. This prevents the work from being crushed by the high pressure.
Guides must be used to assure stamping in the proper position on the work. This can be done with strips of cardboard or by cutting the shape of the work out of a sheet of cardboard and gluing the strips or cutout nest to the makeready with the opening in the proper place.
If, during production, there are sections of the mark that are too light those areas can be built up on the makeready board with tape until the mark is satisfactory.
Irregular plastic pieces, shaped wood, and other “hollow” work should be supported by a fixture to prevent crushing. Kensol can supply custom fixtures to order upon receipt of sample parts.

C. Roll Leaf - Different types of roll leaf are made for stamping different materials.
It is not important to use that proper roll leaf. It is recommended that the roll leaf be 1/2 inch wider that the type or die. Remove the outer disc and collar assembly from the roll leaf spindle and place the roll on the shaft, dull coated side down when pulled over the work. Put the disc and collar back on the shaft, apply light pressure to the spring and lock collar in place with thumbscrew.
Bring the leaf under the stripper bars, over the knurled roller, and down between the knurled and rubber rollers. The knurled and rubber rollers may be spread by means of the two levers at the ends of the rubber roller, wrap the end of the leaf around the rewind roller.
Loosen the thumbscrews on the disc collars and adjust the roll leaf under the die. Tighten the screws making sure there is enough tension on the roll to keep the leaf taut. If the roll leaf is not tight enough it will sag, and if it is too tight, it will tear. Stripper bars pull the roll leaf off the diet after the stamp has been made. The stripper bars should keep the roll leaf 1/4 of an inch away from the die and are held in the draw back arms with adjusting nuts. To adjust height of the stripper bars, loosen the top lock nut on the post, and turn the bottom nut clockwise to raise the bar, counter clockwise to lower the bar. Retighten the top lock nut. It is very important that the stripper bars be kept parallel to the table. If they are not parallel and even, the roll leaf will tend to crawl from one side to the other. The set screws in the guides permit these guides to be moved.

Roll leaf spacing mechanism. The spacing mechanism is used to vary the amount of roll leaf pulled on each stroke.
-Mechanical or Air operated Roll Leaf Pull.
If the press has a mechanical roll leaf pull, there is a slide clamp located on the end of the advancing rack. This slide clamp varies the amount of leaf pulled as it is moved on it slide arm. The clamp is moved by loosening its set screw, moving it on the arm, and retightening the screw. The leaf should be pulled 1/16th of an inch more than the length of the die. Bring the head down with the handle and back up again. If the roll leaf advances too much, slide the clamp down on the arm. If it doesn't advance enough slide the clamp up. This may have to be readjusted periodically.
If the press has an air operated roll leaf pull, the knurled roller is driven by an air operated rack. The length of leaf pull is governed by the position of a stop block on the shaft of the cylinder mount assembly. The stop block is next to a scale marked in inches. To set the amount of roll leaf pulled, loosen the set screw in the stop block and move it along the scale until it covers the desired number of inches, then tighten the set screw.
Note: Follow lubrication instructions for any roll leaf attachment.

D. Setting the table height. The air supply should still be disconnected, the timer switch off, and the temperature control set to zero.
If the articles to be stamped are all of the same thickness, the press can be operated at full head stroke which results in maximum pressure.
If the article being stamped vary in thickness. (For example: molded plastics, leather, etc.) the press will have to be operated so that the thinner pieced are not lower that the lowest head position.

D. Setting the table height (continued)
Lower the table as much as possible with the table elevating nut. Bring the head down with the handle until it is a its maximum head stroke. Leave
Raise the table until the work just touches the die, then bring the head back up.
If the articles to e stamped DO NOT vary in thickness, raise the table slightly to get the desired depth of stamping, and lock the table in place with the looking handle.
If the articles to be stamped DO vary in thickness, the table must be raised enough to reach the thinnest possible part and still give the proper depth of stamp.

E. Adjusting th tripper cam. The microswitch tripper post is located on the top of the head. The cam on the post trips the microswitch which signals the dweller timer.
Place the work on the table in the proper position for stamping. Bring the head down until the die touches work. At this head position, the cam should trip the microswitch. If it does not, loosen the set screw in the cam, move the cam to a position where it does trip the switch and retighten the set screw. This adjustment MUST be made whenever changing die or table height, usually with a charge in product or a new stamping die.
Having accomplished the “SETTING UP” properly The Kensol Press is ready to RUN.

IV. GETTING INTO PRODUCTION

The press should be mounted and lubricated properly and the safety gate. If needed installed and functioning. The work area should be well lit, and the operator should be comfortable.

Connect the air supply to the press and set the proper temperature and dwell time. The timer switch should be in the “ON” position. Remove the handle from the cross shaft and set the pressure with the regulator valve to 60 PSI. (pressure is shown on the gauge).
Put the work on the table and slide it under the head into stamping position. Operate the hand switches, remove the part and inspect the impression. If it is too light in certain areas of the impression, build up those areas on th makeready with tape.
If the impression is grainy, as when the transfer is not complete, the die is not hot enough, or dwell time is too short.
If the lettering or detail has run together, the die is too hot or the dwell time is too long.
If the impression is not deep enough, the pressure must be increased. If operation at maximum head stroke, the only way to increase the pressure is at the regulator on the air controlling unit. (DO NOT exceed 100 PSI)
If operating the press at less than maximum head stroke the pressure can be increased by lowering the table to toggle center. If the table cant be lowered and still compensate for variations in the size of the work, increase the air pressure at the regulator.
If the impression is too deep, the pressure must be dropped either by adjusting the table or using the valve on the pressure regulator.
If necessary, adjust the roll leaf delay valve as discussed previously.
Check each adjustment running a cycle and inspecting each impression. When the impression is satisfactory, and the press is operating properly begin regular production.

KENSOL-OLSENMARK PARTS SHEET

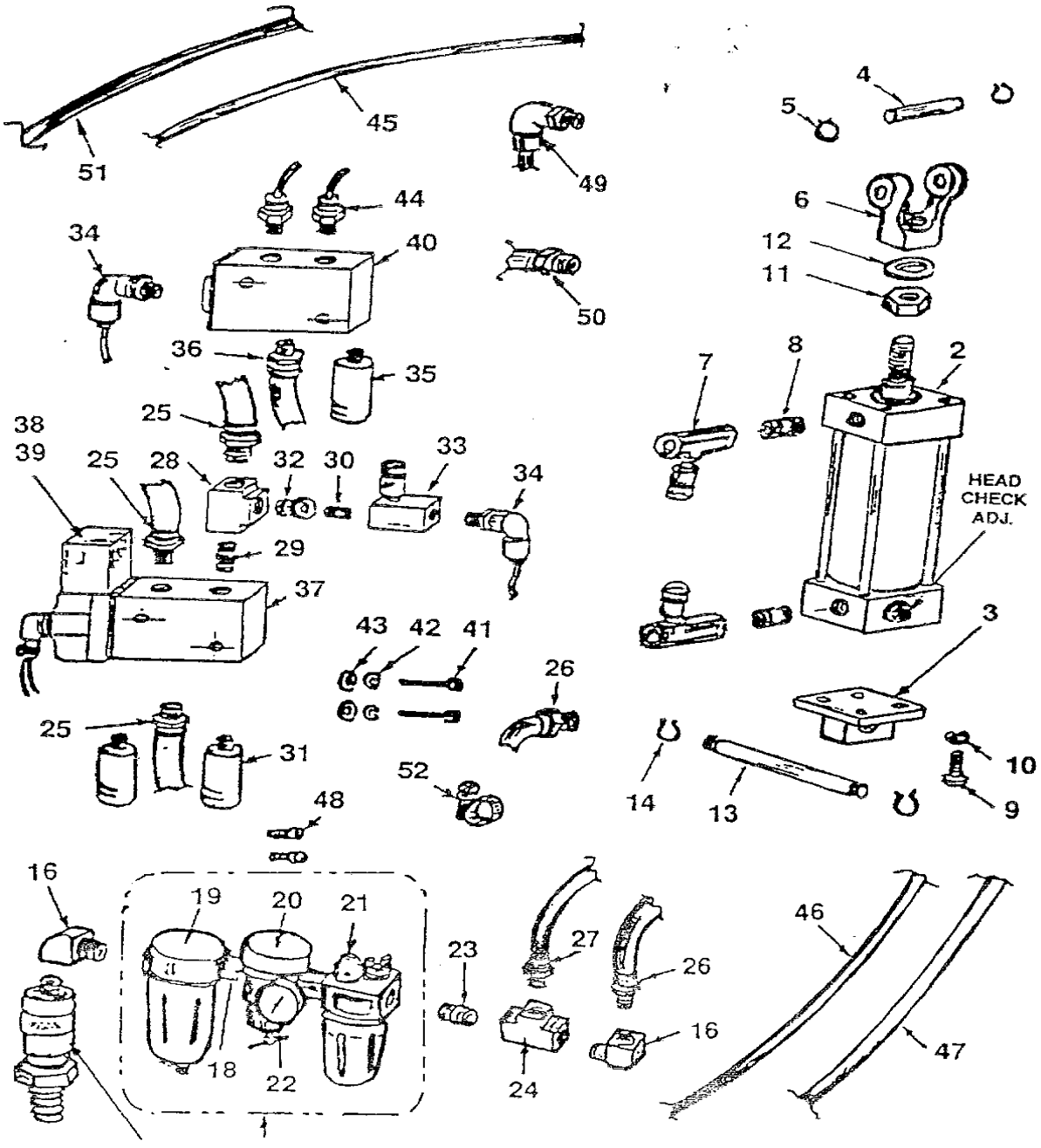
K65 & K165 PRESS-AIR SYSTEM

WHEN ORDERING PARTS, SUPPLY SERIAL NUMBER (FOUND ON NAME PLATE) AND YEAR PURCHASED WHENEVER POSSIBLE. WHEN ORDERING ELECTRICAL PARTS, BE SURE TO SUPPLY VOLTAGE USED, AND WHETHER USED ON A.C. OR D.C. LINE

FIG 89 - A 65

REF. NO.	PART NO.	DESCRIPTION	QUANT.
2	9 13	MAIN CYLINDER	1
3	7 28	EYE ASSEMBLY	1
4	5 11	PIN, UPPER CYLINDER	1
5	195 06	RINGS, "E"	2
6	7 14	YOKE	1
7	22 26	VALVE, SPEED CONTROL, 1/2"	2
8	33 24	NIPPLE, CLOSE, 1/2	2
9	236 16	SCREW, MACH., 1/2-20 X 3/4	4
10	238 08	WASHER 1/2"	4
11	238 24	NUT, HEX, CYL. ROD, 3/4-16	1
12	241 - 12	WASHER, LOCK 3/4	1
13	5 04	PIN, K65, CYLINDER	1
14	195 06	RINGS, "E"	2
15	23 19	VALVE, SLIDE, 1/2"	1
16	33 22	ELBOW, STREET, 1/2'	2
17	31A22	FRL ASS'Y - LESS GAUGE & BKT	1
18	31A23	BRACKET	1
19	31A25	FILTER	1
20	31A26	REGULATOR	1
21	31B01	LUBRICATOR	1
22	31A03	GAUGE	1
23	33 24	NIPPLE, CLOSE, 1/2"	1
24	33 23	TEE, 1/2"	1
25	33E05	CONNECTOR, PUSH LOK, 1/2 HOSE 3/8 NPT	3
26	33 17	CONNECTOR, PUSH LOK, 1/2 HOSE 1/2 NPT	3
27	33 21	CONNECTOR, PUSH LOK, 3/8 - 1/2 NPT	1
28	32 07	TEE, 3/8"	2
29	33A01	NIPPLE, CLOSE 3/8"	1
30	32 15	NIPPLE, CLOSE 1/8"	1
31	28A16	MUFFLER 3/8	2
32	32 14	BUSHING 3/8-1/8	1
33	22 23	VALVE, SPEED CONTROL 1/8"	1
34	33A24	ELBOW, SWIVEL, PUSH LOK 1/4 POLY-1/8 NPT	3
35	28A10	MUFFLER 1/4	2
36	33 18	CONNECTOR, PUSH LOK, 3/8 - 1/4 NPT	1
37	23A23	VALVE, IN LINE, SING. SOLENOID, 3/8" SOLENOID 24V.	1
40	23A17	VALVE, PILOT 4 WAY, 1/4"	1
41	231 13	SCREW, MACH., 1/4-20 X 2 3/4	2
42	238 04	WASHER, LOCK, 1/4"	2
43	238 04	WASHER, FLAT, 1/4"	2
44	33A22	CONNECTOR, PUSH LOK, 1/4 POLY - 1/4 NPT	2
45	28 09	TUBING, POLY FLO, BLACK 1/4"	A/R
46	28 27	HOSE, PUSH LOK, 3/8 - 200 PSI, BLACK	A/R
47	28A01	HOSE, PUSH LOK, 1/2 - 200 PSI, BLACK	A/R
48	231 02	SCREW, MACH. 1/4-20 X 1/2	2
49	69 10	CONNECTOR, 3/8, 90° ANGLE	1
50	32 26	CONNECTOR, HOSE, 1/2 HOSE - 1/2" NPT	1
51	63A14	TUBING, POLY, .350 ID	A/R
52	28 18	CLAMP, 3/8 & 1/2 HOSE	2

KENSOL 65H & 165H PARTS AND INSTRUCTION MANUAL



AIR SYSTEM
K65 & K165 PRESS

KENSOL-OLSENMARK PARTS SHEET

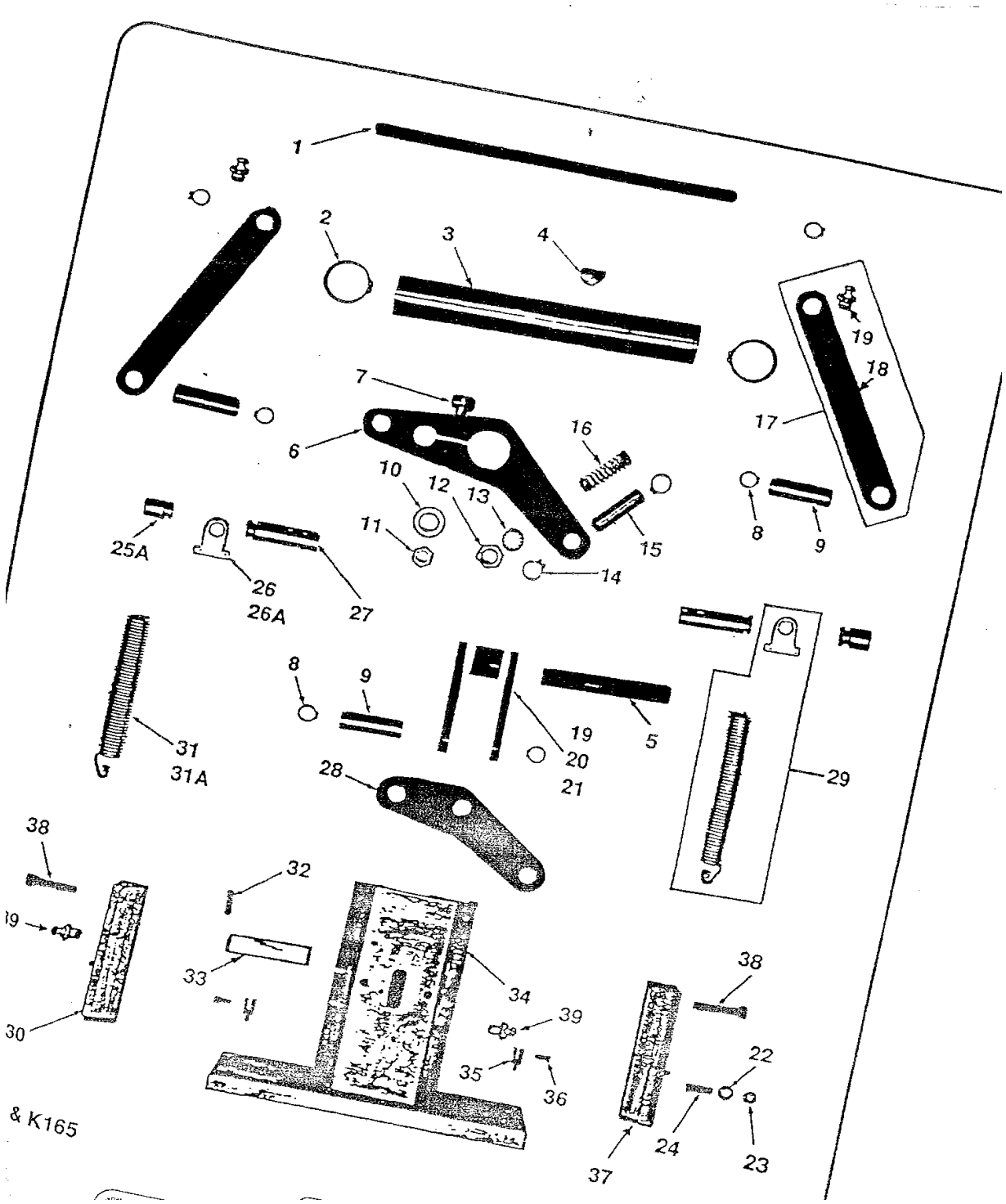
K65 & K165 RAM & LINK ASS'Y

WHEN ORDERING PARTS, SUPPLY SERIAL NUMBER (FOUND ON NAME PLATE) AND YEAR PURCHASED WHENEVER POSSIBLE. WHEN ORDERING ELECTRICAL PARTS, BE SURE TO SUPPLY VOLTAGE USED, AND WHETHER USED ON A.C. OR D.C. LINE

FIG 89 - MC 165

REF. NO.	PART NO.	DESCRIPTION	QUANT.
1	77 03	HANDLE	1
2	195 07	RING, EXTERNAL, MAIN SHAFT	2
3	101 10	SHAFT, MAIN (2" DIA X 14 1/8)	1
4	239 18	KEY, WOODRUFF 3/8 X 1 1/2	1
5	101 14	PIN, 1 X 6, CLASS N	1
6	101 01	ARM, LARGE TOGGLE, TEMP LP-65-2	1
7	237 25	SCREW, MACH. 5/8 - 18 x 3 LG	1
8	195 05	RING, EXTERNAL, K 50 & K60 PIN	6
9	102 07	PIN, TOGGLE, K65/KA	3
10	241 10	WASHER 5/8 I.D.	1
11	239 20	NUT, HEX 5/8 - 18	1
12	238 23	NUT, HEX 3/4 - 10	1
13	241 12	WASHER, LOCK 3/4 ID	1
14	195 06	RING, EXTERNAL K 36 PINS	2
15	5 11	PIN, K65, CYL. UPPER	1
16	101 18	SCREW, SET TOGGLE ADJ 3/4 - 10	1
17	101 22	LINK, ASS'Y	2
18	101 08	LINK, TOGGLE, 11 1/2" (9 7/8"C-C)	2
19	194 06	FITTING, GREASE, THRD.	8
20	101 24	LINK, RAM TOGGLE, 6" (4 1/2"C-C)	2
21	108 18	RAM LINK SPACER	1
22	238 06	WASHERS, 3/8 I.D.	2
23	238 18	NUT, HEX 3/8 - 16	2
24	233 07	SCREW, SET 3/8 - 16 x 1 1/2	2
25A	101 06	PIN, SPRING (AUXILIARY)	2
26	111 03	EYE, HEAD RAM, SPRING	2
26A	111 03	EYE, HEAD RAM, SPRING (AUX.)	2
27	101 13	PIN, SPRING, 1" DIA	2
28	101 04	TOGGLE ASS'Y	1
29	111 21	SPRING, ASS'Y, MAIN (STD)	2
30	108 12	GIB, HEAD RAM, L.H. (K65-6)	1
31	111 02	SPRING, MAIN RAM RETURN	2
31A	111 02	SPRING (AUX.) MAIN RAM RETURN	2
32	233 05	SCREW, MACH. 3/8 - 16 X 1	1
33	101 11	PIN (RAM) 4"	1
34	108 02	RAM ASS'Y	1
35	111 08	MOUNT, LOWER SPRING	2
36	231 02	SCREW, MACH. 1/4 - 20 X 1/2	2
37	108 11	GIB, HEAD RAM, R.H. (K65-6)	1
38	234 09	SCREW, MACH. 7/16 - 14 X 2	6
39	101 19	FITTING, GREASE, ST. DRIVE	4

KENSOL 65H & 165H PARTS AND INSTRUCTION MANUAL



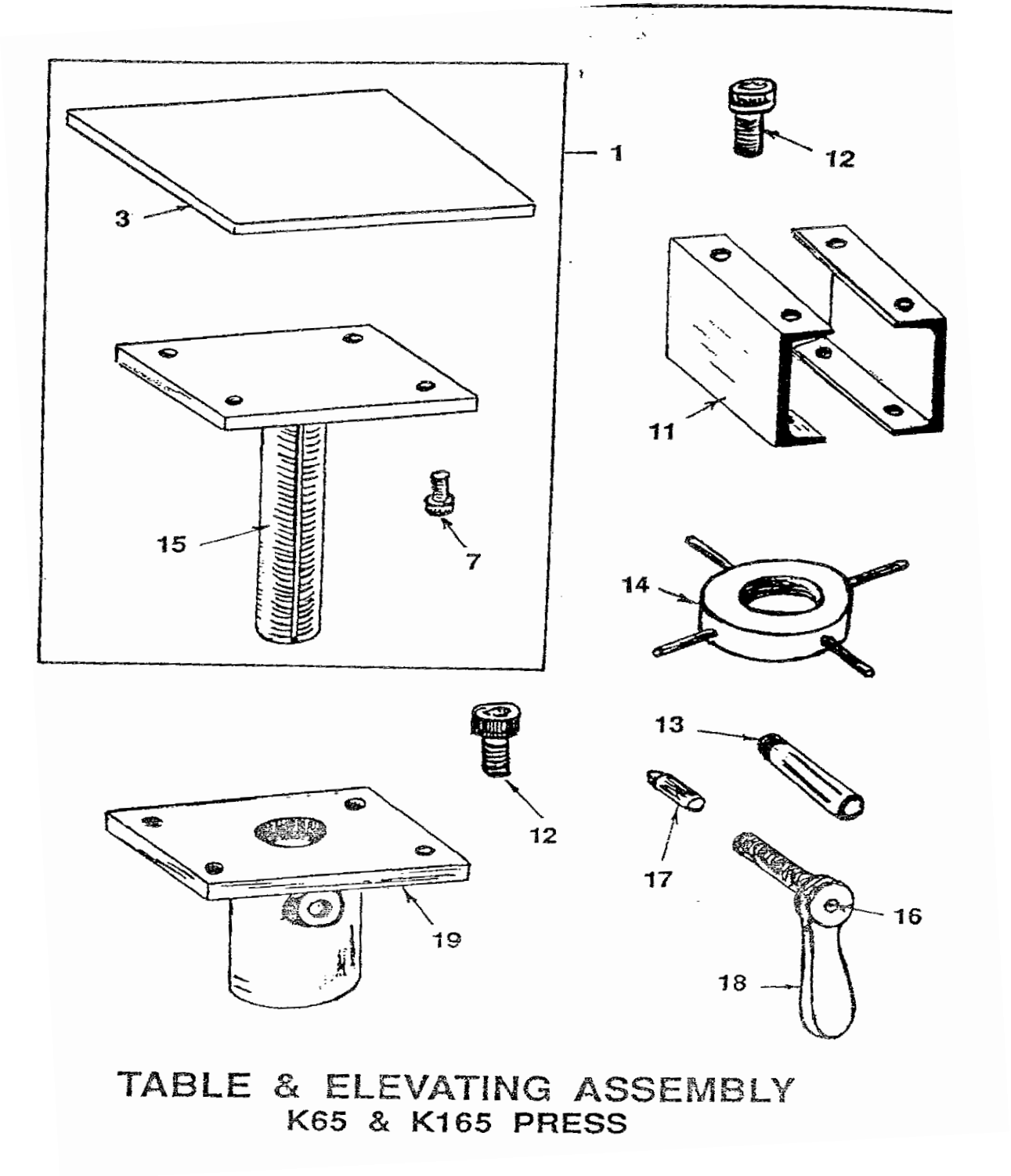


TABLE & ELEVATING ASSEMBLY
K65 & K165 PRESS

KENSOL - OLSENMARK PARTS SHEET
TABLE & ELEVATING ASSY - K65 & K165 PRESSES

REF. NO.	PART NO.	DESCRIPTION	QUANT.
5	233 09	SCREW, MACH 3/8 - 16 X 2	4
6	231 04	SCREW, MACH 1/4 - 20 X 3/4	9
7	93 03	WASHER, STOP STD	1
8	83 08	RAIL HEATING HEAD	1
9	93 05	KEY, BACK 6 X 8 D	1
10A	83 05	HEAD 6 X 8 D K36 KA	1
10B	83 06	HEAD 6 X 8 D K25 K27	1
10C	83 09	TRANSITE K 36 KA 1/4 X 5 X 10	1
10D	83 17	PLATE SPACER	1
10E	36 05	SLIDE 6 X 8 D HEAD	1
11	93 16	FRONT KEY 6 X 8 D	1
12	83 07	RAIL SET HT HD 6 X 8	2
13	93 02	STUD, LCOKING, HEATER HEAD	1
14A	83 03	HEAD ASSY K 36 KA	1
14B	83 04	HEAD ASSY K 25 27	1
15	93 01	RAIL, LOCKING SLIDE	1
16	92 26	NUT, BRASS HEX (FULL)	1
17A	55 07	HEATER 3/4 X 8 1/4 D 120V/500W	2
17B	55 09	HEATER 3/4 X 8 1/4 D 240 V/500W	2
18	93 25	WRENCH, HEAD LCOK, 7/8	1
19	230 18	SCREW, MACH 10 - 32 X 1/2	4
20A	82 25	HEAD ASSY, COMP K 36 KA/115	1
20B	83 01	HEAD ASSY, COMP K 36 KA/220	1
20C	82 26	HEAD ASSY, COMP K 25 K 27/115V	1
20D	83 02	HEAD ASSY, COMP K 25 27/220	1

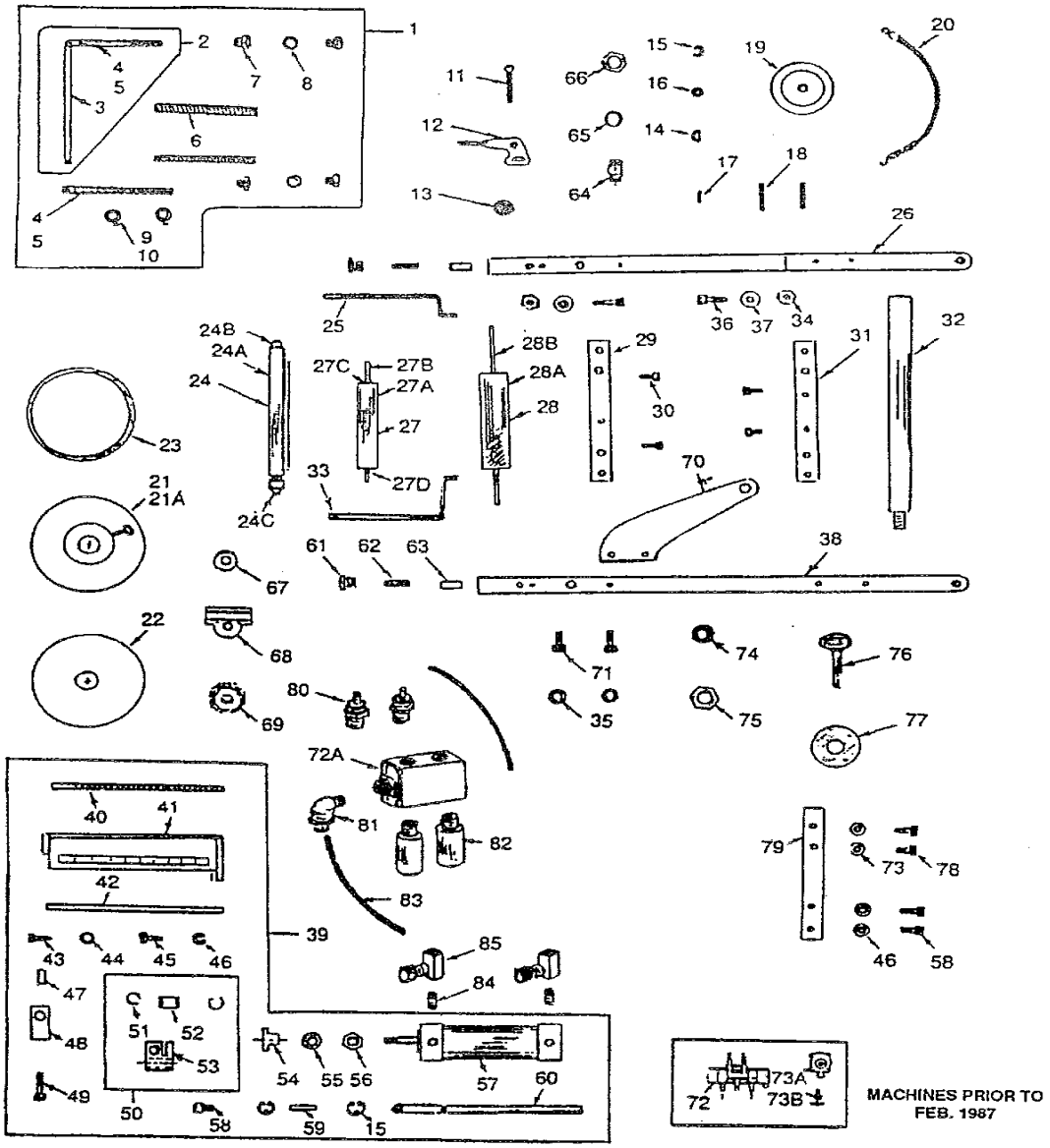
KENSOL - OLSENMARK PARTS SHEET
6 X 8 L 6 X 12 M S/S AIR PULL LEAF ASS'Y

REF. NO.	PART NO.	DESCRIPTION	QUANT.
* 1	144 13	BAR ASS'Y., COMP STRIPPER	2
2	148 17	STRIPPER BAR & POST ASS'Y	2
3	149 03	BAR, STRIPPER 8 3/4	2
4	15026	BAR, ADJ STRIPPER 5 1/2	4
5	240 04	PIN, ROLL 3/32 X 5/16	4
6	146 10	SPRING, STRIPPER 5"	4
7	145 10	NUT, ADJUSTING, STRIPPING	8
8	157A21	WASHER, SPRING	4
9	145 09	COLLAR, ROLL LEAF GUIDE	4
10	230 08	SCREW, MACH., 8-32 X 1/4	4
11	230 24	SCREW, MACH., 10-32 X 1 1/2	2
12	144 04	CAM, PAPER FEED	2
13	144 02	BUSHING, FLANGE, CAM, STD	2
14	239 11	KEY WOODRUFF	1
15	195 01	RING "E", RUBBER ROLLER	3
16	238 03	WASHER, #10	1
17	239 22	PIN, ROLL	2
18	124 10	PIN, FRICTION BELT	2
19	142 21	PULLEY, REWIND (STD)	1
20	150 15	BELT ASS'Y, FRICTION	1
21	145 05	DISC & COLLAR ASS'Y, 1000 FT	1
21A	231 08	SCREW, MACH., 1/4-20 X 1 1/2	1
22	150 19	DISC, 1000 FT. STD	1
23	143 21	RING "O" STD REWIND	1
* 24	138 10	BAR, REWIND, COMP. ASS'Y	1
24A	137 11	BAR, REWIND ASS'Y	1
24B	157A24	BEARINGS	2
24C	231 03	SCREW, BUTTON HEAD 1/4-20 X 5/8	2
25	143 16	BRACKET, REWIND L.H.	1
26A	123 02	ARM, DRAW, REAR 21"	1
26B	133 02	ARM, DRAW, REAR 24"	1
* 27	150 23	ROLLER ASS'Y, RUBBER, COMP	1
27A	154 02	ROLLER, RUBBER	1
27B	151 13	SHAFT, RUBBER ROLLER	1
27C	157A24	BEARINGS, RUBBER ROLLER	2
27D	195 01	RING "E"	1
* 28	155 02	ROLLER ASS'Y, KNURLED, COMP	1
28A	156 02	ROLLER, KNURLED	1
28B	145 17	SHAFT, KNURLED ROLLER	1
29A	123 04	BAR, TIE, LEFT HAND	1
29B	131 20	BAR, TIE, 6 X 8 6 X 12	1
30	232 04	SCREW, MACH., 5/16-18 X 3/4	4
31A	123 03	BAR, TIE, RIGHT HAND	1
31B	131 20	BAR, TIE, 6 X 8 6 X 12	1
32	148 02	BAR, ROLL LEAF 10 5/8	1
33	143 14	BRACKET, REWIND, UNIVERSAL	1
34	238 13	NUT, HEX 10-32	6
35	238 05	WASHERS, 5/16" ID	4
36	231 07	SCREW, MACH., 1/4-20 X 1 1/4	4
37	133 07	SPACER, 6 X 8 6 X 12	4
38A	123 01	ARM, DRAW, FRONT 21"	1
38B	133 01	ARM, DRAW, FRONT 24"	1
* 39	122 01	AIR PULL ASS'Y	1
40	124 11	SCALE, 20 TOOTH GEAR	1
41A	123 15	BRACKET ASS'Y, CYL MT	1
41B	125A05	SHIELD, ASS'Y, CYL FLAT	1
42	123 17	SHAFT 3/8 X 10	1
43	230 17	SCREW, MACH., 10-32 X 3/8	1
44	124 09	SPACER, STOP	1
45	231 16	SCREW, MACH.,1/4-28 X 1/2	4
46	235 04	WASHERS, LOCK 1/4 INT.	6
47	123 23	PIN, LOCK, STOP BLOCK	1
48	124 01	BLOCK STOP, PARALLEL SHAFT	1
49	233 05	SCREW., MACH.,3/8-16 X 1	1
50	124 03	SLIDE HOUSING ASS'Y	1

REF. NO.	PART NO.	DESCRIPTION	QUANT.
51	195 10	RING, INTERNAL	2
52	125 05	BUSHING, BALL,AIR PULL	1
53	124 02	HOUSING, SLIDING, AIR PULL	1
54	124 05	CONNECTOR,CYL TO HOUSING	1
55	238 06	WASHER, 3/8 ID	1
56	238 18	NUT, HEX 3/8 - 16	1
57	9 02	CYLINDER, AIR PULL	1
58	231 02	SCREW, MACH., 1/4-20 X 1/2	2
59	124 04	PIN, RACK & HOUSING	1
60	146 14	RACK ASS'Y 6 X 8	1
61A	144 05	NUT, RETAINER, STD. SPRING	2
61B	144 06	NUT, RETAINER, REWIND SPRING	2
62	145 12	SPRING, TENSION, RUBBER ROLLER	2
63	145 11	BEARING, TENSION, RUBBER ROLLER	2
64	157A23	BEARING	2
65	144 01	BEARING, RETAINER	2
66	145 15	NUT, LOCK	2
67	150 09	CLUTCH ASS'Y 20 TOOTH RH	1
68	131 18	GUIDE, RACK & GEAR, 20 TOOTH STD	1
69	157A01	KNOB, MANUAL ADVANCE	1
70	124 06	BRACKET, ROLL LEAF	1
71	232 06	SCREW, MACH., 5/16-18 X 1	2
72	22 04	VALVE, PILOT, ROLL LEAF PRIOR 2/87	1
72A	23A17	VALVE, PILOT, ROLL LEAF	1
73A	23 24	VALVE, SPEED CONTROL, PRIOR 2/87	1
73B	23 05	VALVE, SPEED CONTROL, PRIOR 2/87	1
74	238 08	WASHER 1/2" ID	1
75	238 20	NUT, HEX 1/2-13	1
76	231 12	SCREW, MACH., 1/4-20 X 2 1/2	1
77	145 07	COLLAR, ROLL LEAF	1
78	232 24	SCREW, MACH 1/4-20 X 2 1/2	2
79	124 08	BRACKET, VALVE	1
80	33A22	CONNECTOR, ST 1/4 PRESTO LOCK	2
81	33A24	CONNECTOR, 90° SWIVEL P/L	1
82	28A10	MUFFLER, 1/4	2
83	28 09	TUBING, POLY-FLO 1/4	A/12
84	32 15	NIPPLES, CLOSE 1/8 NPT	2
85	22 23	VALVE, SPEED CONTROL 1/8	3

* - DENOTES COMPLETE ASSEMBLIES

KENSOL 65H & 165H PARTS AND INSTRUCTION MANUAL

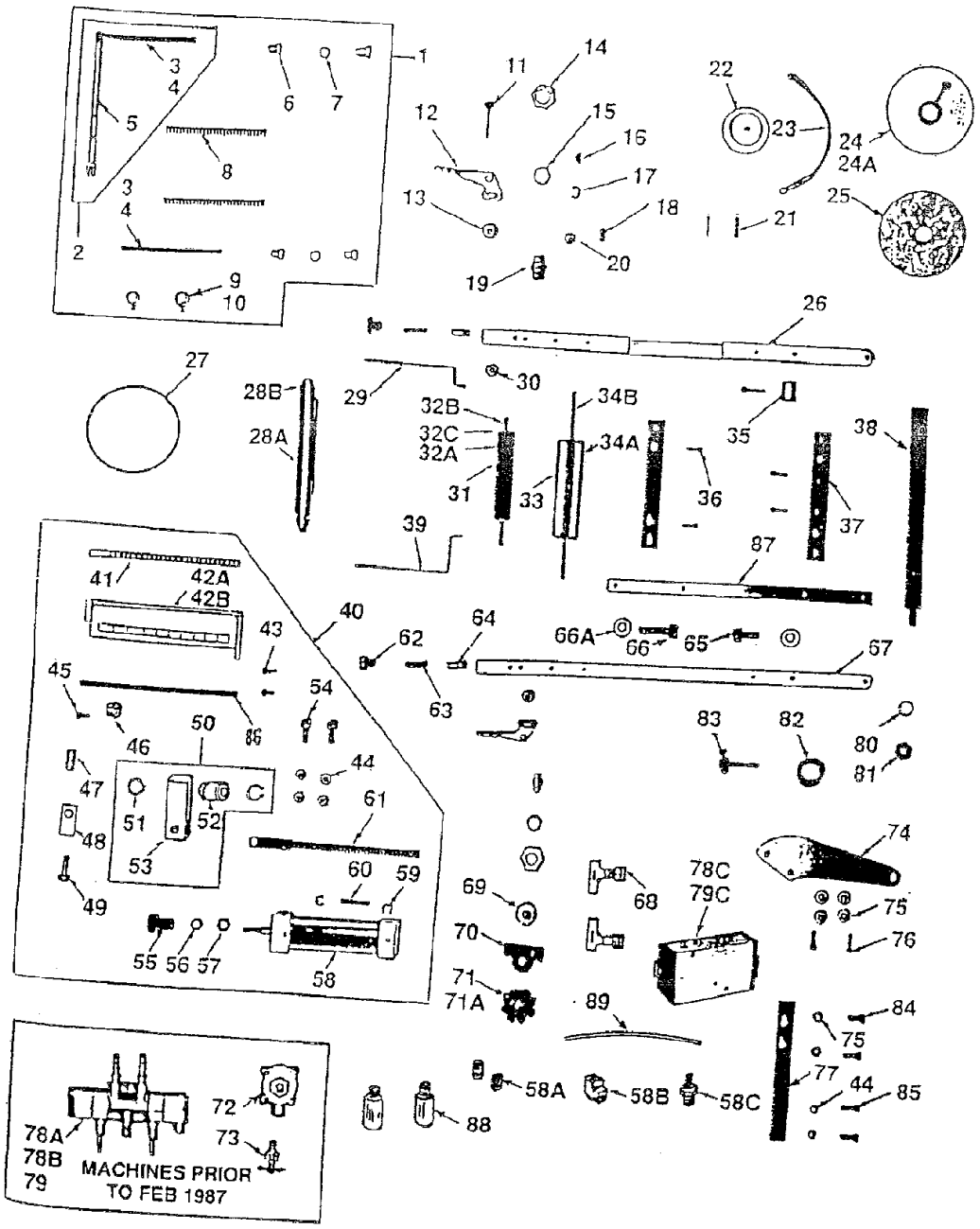


6 X 8 L 6 X 12 M
S/S AIR PULL ROLL
LEAF ASSEMBLY

KENSOL - OLSENMARK PARTS SHEET
9 X 12 R S/S AIR PULL LEAF ASS'Y

REF NO.	PART NO.	DESCRIPTION	QUANTITY
1	144 14	STRIPPER BAR ASS'Y COMP	1
2	148A05	STRIPPER BAR & POST ASS'Y	2
3	150 03	BAR, ADJ, STRIPPER	4
4	240 04	PIN, ROLL 3/32 X 5/16	2
5	149 06	BAR, STRIPPER	2
6	145 80	NUT, ADJUSTING,STRIPPING	8
7	157A21	WASHER, SPRING	4
8	146 10	SPRING, STRIPPER	4
9	145 09	COLLAR, ROLL LEAF GUIDE	4
10	230 08	SCREW, MACH 8- 32 X 1/4	4
11	230 24	SCREW, MACH 10 - 32 X 1 1/2	2
12	144 04	CAM, PAPER FEED	2
13	144 02	BUSHING, FLANGE, CAM, STD	2
14	145 15	NUT, LOCK	2
15	144 01	BEARING RETAINER	2
16	239 11	KEY, WOODRUFF	1
17	195 01	RING "E ", RUBBER ROLLER	2
18	239 22	PIN ROLL 1/8 X 1/4	2
19	157A22	BEARING	2
20	238 03	WASHERS, #10	2
21	124 10	PIN, FRICTION BELT	1
22	142 21	PULLEY, REWIND, STD	1
23	150 15	BELT ASS'Y, FRICTION	1
24	145 05	DISC & COLLAR ASS'Y, 1000 FT	1
24A	231 08	SCREW, MACH, 1/4 - 20 X 1 1/2	1
25	150 19	DISC, 1000 FT, STD	1
26	133 02	ARM, DRAW, REAR 24"	1
27	143 21	RING "O", STD REWIND (BUNA) 15"	1
28A	138 15	BAR ASS'Y, REWIND	1
28B	157A 24	BEARINGS	2
29	143 15	BRACKET, REWIND, R.H.	1
30	238 13	NUT, 10 -32 HEX	2
➔31	151 03	ROLLER ASS'Y, RUBBER	1
32A	154 07	ROLLER, RUBBER	1
32B	151 18	SHAFT, RUBBER ROLLER	1
32C	157A24	BEARINGS, RUBBER ROLLER	2
➔33	155 07	ROLLER ASS'Y, KNURLED	1
34A	146 07	ROLLER, KNURLED	1
34B	145 22	SHAFT, KNURLED ROLLER	1
35	131 03	SPACER	4
36	231 21	SCREW, MACH 1/4 - 28 X 1 1/4	4
37	132 14	BAR, TIE	2
38	148 05	BAR, ROLL LEAF, 12 7/8	1
39	143 14	BRACKET, REWIND, UNIVERSAL	1
40	122 25	AIR PULL ASS'Y	1
41	124 11	SCALE, 20 TOOTH GEAR	1
42A	129 12	MOUNT ASS'Y, CYLINDER	1
42B	125A05	SHIELD ASS'Y, CYLINDER FLAT	1
43	230 08	SCREW, MACH 8 - 32 X 1/4	2
44	238 04	WASHERS 1/4 ID	4
45	230 17	SCREW, MACH 10 -32 X 3/8	1
46	124 09	SPACER, STOP	1
47	123 23	PIN, LOCK, STOP BLOCK	1
48	124 01	BLOCK, STOP, PARALLEL SHAFT	1
49	233 05	SCREW, MACH 3/8 - 16 X 1	1
50	129 21	SLIDING HOUSING ASS'Y	

REF NO.	PART NO.	DESCRIPTION	QUANTITY
51	195 09	LOCK RING, EXT	2
52	125 27	BUSHING, BALL, STEEL	1
53	125 28	HOUSING, SLIDING	1
54	231 04	SCREW, MACH 1/4 - 20 X 3/4	2
55	185 10	CONNECTOR, CYLINDER ROD	1
56	238 06	WASHER 3/8	1
57	238 18	NUT, HEX 3/8 - 16	1
58	9 05	CYLINDER, AIR PULL	1
58A	32 15	CLOSE NIPPLE	2
58B	33 02	ELBOW	1
58C	33 03	CONNECTOR	2
59	195 01	RING "E ", RUBBER ROLLER	3
60	124 04	PIN, RACK & HOUSING	1
61	146 15	RACK ASS'Y	1
62	144 06	NUT, RETAINER, REWIND SPRING	2
63	145 12	SPRING, TENSION, RUBBER ROLLER	2
64	145 11	BEARING, TENSION, RUBBER ROLLER	2
65	256 20	SCREW, MACH 5/16 - 18 X 1 1/2	2
66	232 11	SCREW, MACH 5/16 - 18 X 2 1/4	2
66A	238 05	WASHER 5/16 ID	4
67	133 01	ARM, DRAW, FRONT 24"	1
68	22 23	VALVE, SPEED CONTROL, 1/8	3
69	150 08	CLUTCH ASS'Y, 20T LH	1
70	131 18	GUIDE, RACK & GEAR 20T, STD	1
71	157A 01	KNOB, MANUAL ADVANCE	1
71A	230 17	SCREW, MACH 10 -32 X 3/8	1
72	23 24	VALVE, SPEED CONTROL, PRIOR TO 2/87	1
73	23 05	VALVE, SPEED CONTROL, PRIOR TO 2/87	1
74	130 08	BRACKET, ROLL LEAF	1
75	238 05	WASHERS 5/16	4
76	232 06	SCREW, MACH 5/16 - 18 X 1	2
77	124 08	BRACKET, VALVE	1
78C	23A 17	VALVE, PILOT	1
79C	PS 2018	KIT, VALVE REPAIR	1
78A	22 04	VALVE, PILOT, ROLL LEAF, PRIOR TO 2/87	1
78B	22 05	VALVE, ROLL LEAF	1
79	22 09	PLATE, SUB	1
80	238 08	WASHER 1/2" OD	1
81	238 20	NUT, HEX 1/2 - 13	1
82	145 07	COLLAR, ROLL LEAF	1
83	231 12	SCREW MACH 1/4 - 20 X 2 1/2	1
84	232 24	SCREW, MACH 5/16 - 24 X 3/4	2
85	231 02	SCREW, MACH 1/4 - 20 X 1/2	2
86	123 18	SHAFT 3/8 X 12	1
87	133 12	BRACKET, MOUNTING GUARD	1
88	28A10	MUFFLER 1/4	1
89	28 09	TUBING, POLY - FLO 1/4	2
			A/R



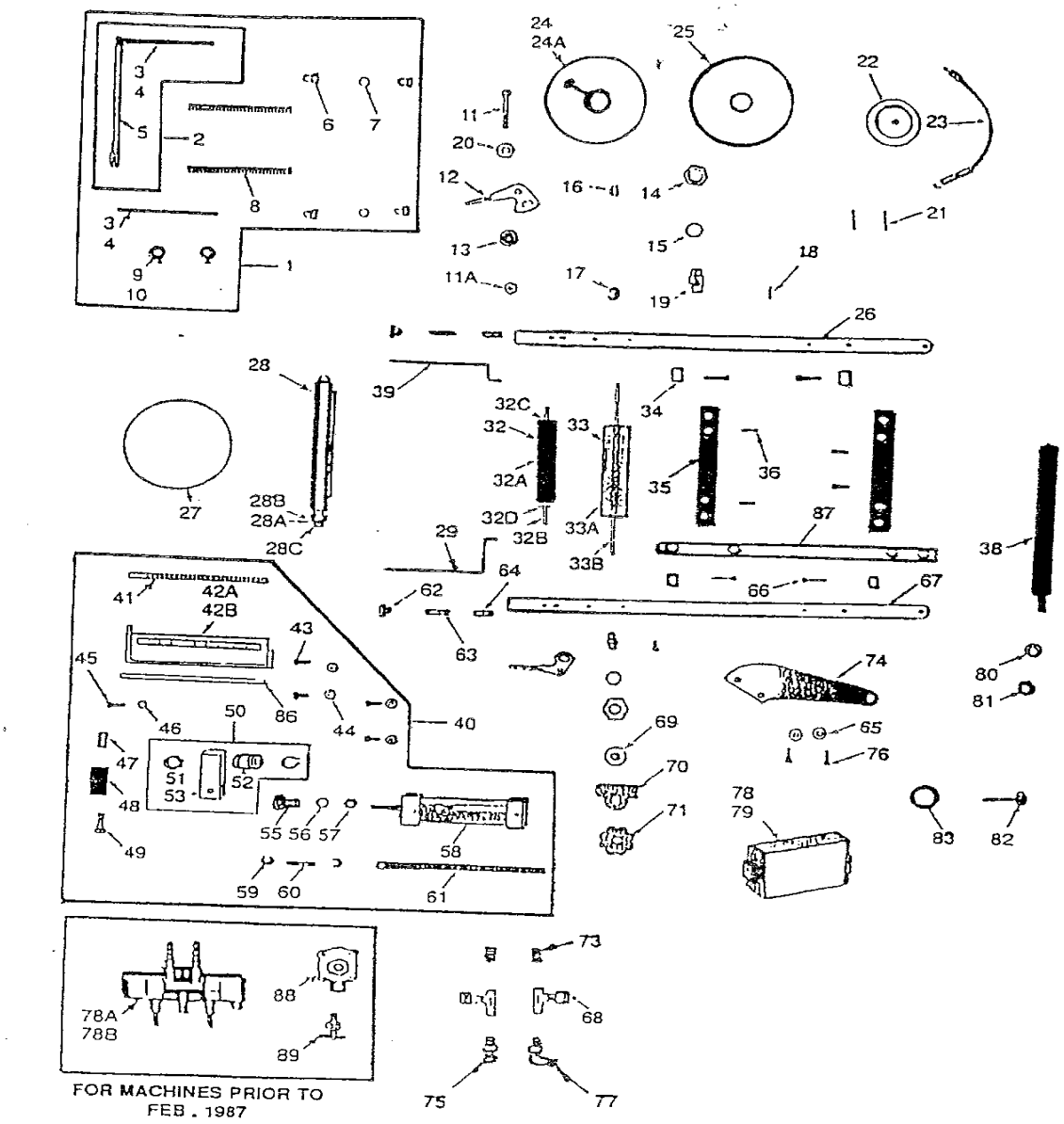
9 X 12 R S/S AIR PULL
ROLL LEAF ASS'Y

KENSOL - OLSENMARK PARTS SHEET
10 X 15 P S/S AIR PULL LEAF ASS'Y

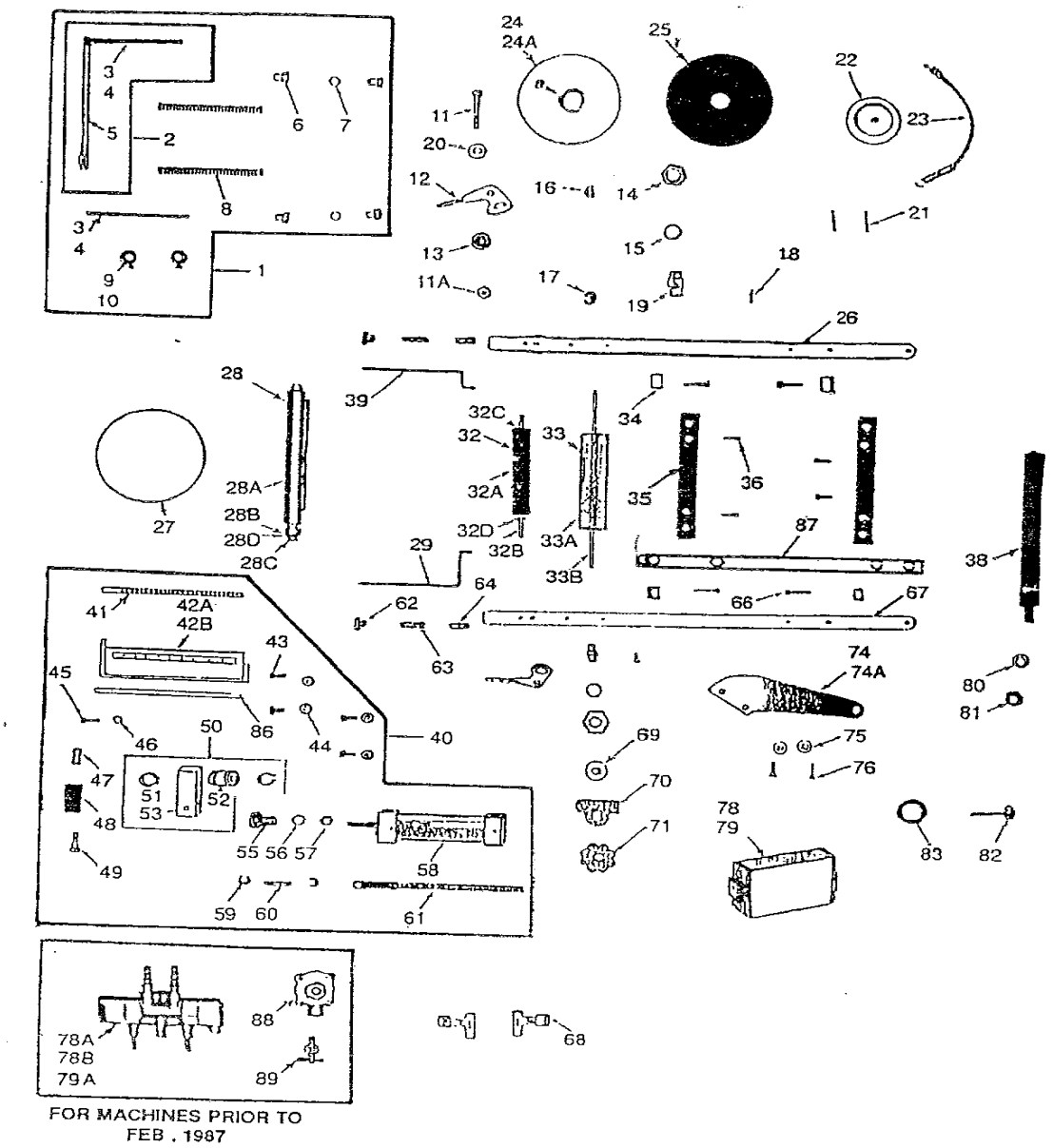
REF. NO.	PART NO.	DESCRIPTION	QUANT.
* 1	144 12	STRIPPER BAR ASS'Y COMP	2
2	148 16	STRIPPER BAR & POST ASS'Y	2
3	150 03	BAR, ADJUSTABLE STRIPPER 61/2"	4
4	240 04	PIN, ROLL 3/32 X 5/8	4
5	149 07	BAR, STRIPPER 13 1/4"	2
6	145 10	NUT, ADJUSTING STRIPPER	8
7	157A21	WASHER, SPRING	4
8	146 10	SPRING, STRIPPER 5"	4
9	145 09	COLLAR, ROLL LEAF GUIDE	4
10	230 08	SCREW, MACH., 8-32 x 1/4 BR	4
11	230 24	SCREW, MACH., 10-32 x 11/2	2
11A	238 13	NUT, HEX 10-32	2
12	144 04	CAM, PAPER FEED	2
13	144 02	BUSHING, FLANGE CAM, STD.	2
14	145 15	NUT, LOCK	2
15	144 01	BEARING, RETAINER	2
16	239 11	KEY, WOODRUFF	1
17	195 01	RING "E", RUBBER ROLLER	2
18	239 22	PIN, ROLL 1/8 X 1/4	2
19	157A22	BEARING	2
20	238 03	WASHER #10	6
21	124 10	PIN, FRICTION BELT	2
22	142 21	PULLEY, REWIND, STD.	1
23	150 15	BELT, ASS'Y, FRICTION	1
24	145 05	DISC & COLLAR ASS'Y, 1000 FT	2
24A	231 08	SCREW, MACH, 1/4 - 20 x 11/2	2
25	150 19	DISC, 1000 FT STD.	2
26	133 02	ARM, DRAW, REAR 24"	1
27	143 21	RING "O", STD, REWIND 15"	1
* 28	138 12	BAR, ASS'Y, REWIND "P"	1
28A	157A24	BEARING, BALL	2
28B	231 04	SCREW, BUTTONHEAD 1/4 - 20 x 3/4	2
28C	238 04	WASHER, 1/4 ID	2
29	143 15	BRACKET, REWIND	1
* 32	150 25	ROLLER ASS'Y, RUBBER	1
32A	150 04	RUBBER ROLLER	1
32B	151 15	SHAFT, RUBBER ROLLER	1
32C	157A24	BEARING, BALL	2
32D	195 01	RING "E"	1
* 33	155 04	ROLLER ASS'Y, KNURLED	1
33A	156 04	KNURLED ROLLER SUB ASS'Y	1
33B	145 19	SHAFT, KNURLED ROLLER	1
34	131 03	SPACER	4
35A	133 10	TIE BAR 65/165	2
35B	133A02	TIE BAR 46/157	2
36	231 21	SCREW, MACH 1/4 - 28 x 1 1/4	4
38	148 06	BAR, ROLL LEAF, 14 - 3/8	1
39	143 14	BRACKET, REWIND, UNIVERSAL	1
* 40	122 04	AIR PULL ASS'Y	1
41	124 11	SCALE, 20 TOOTH GEAR	1

* COMPLETE ASSEMBLY

REF. NO.	PART NO.	DESCRIPTION	QUANT.
42A	129 11	CYLINDER MOUNT ASS'Y	1
42B	125A07	SHIELD ASS'Y, CYL. FLAT	1
43	231 16	SCREW, MACH, 1/4 - 28 x 1/2	4
44	238 04	WASHER, 1/4 ID	4
45	230 17	SCREW, MACH, 10-32 x 3/8	2
46	124 09	SPACER, STD	1
47	123 23	PIN, LOCK, STOP BLCK	1
48	124 01	BLOCK, STOP, PARALLEL SHAFT	1
49	233 05	SCREW, MACH 3/8 -16 x 1	1
50	124 27	SLIDING HOUSING ASS'Y	1
51	195 09	LOCK RING, EXT	2
52	125 27	BUSHING	1
53	125 28	HOUSING, SLIDING	1
55	185 20	CONNECTOR, CYL ROD	1
56	238 06	WASHER 3/8 ID	1
57	238 18	NUT, HEX 3/8 -16 NC	1
58	9 08	CYLINDER, AIR PULL	1
58A	32 15	CLOSE NIPPLE	2
58B	33 02	ELBOW	1
58C	33 03	CONNECTOR	1
59	195 01	RING "E"	1
60	124 04	PIN RACK & HOUSING	1
61	146 17	RACK ASS'Y 10x15 P, 12x24 N	1
62	144 06	NUT, RETAINER REWIND SPRING	2
63	145 12	SPRING, TENSION RUBBER ROLLER	2
64	145 11	BEARING, TENSION RUBBER ROLLER	2
65	238 05	WASHER 5/16	4
66	232 12	SCREW, MASH 5/16 - 18 x 2 1/2	4
67	133 01	ARM, DRAW, FRONT 24"	1
68	22 23	VALVE, SPEED CONTROL 1/8	2
69	150 08	CLUTCH ASS'Y 20T LH	1
70	131 18	GUIDE, RACK & GEAR 20T	1
71	157A01	KNOB, MANUAL ADVANCE	1
73	32 15	CLOSE NIPPLE 1/8	2
74	130 08	BRACKET, ROLL LEAF	1
75	33A 25	CONNECTOR, ST 1/8 x 1/4	1
76	232 06	SCREW, MACH 5/16 -18 x 1	2
77	33A 24	SWIVEL, 90° 1/8 x 1/4	1
78	23A 17	VALVE, PILOT	1
78A	22 04	VALVE, PILOT, ROLL LEAF	1
78B	22 05	VALVE, ROLL LEAF	1
79	PS2018	KIT, VALVE REPAIR	1
80	238 08	WASHER 1/2 ID	1
81	231 12	SCREW, MACH 1/4 -20 x 2 1/2	2
82	238 20	NUT, HEX 1/2 -13	1
83	145 07	COLLAR, ROLL LEAF	2
86	123 20	SHAFT 3/8 x 15 1/2	1
87	133 12	BRACKET MOUNTING, GUARD	1
88	23 24	VALVE, DELAY	1
89	23 05	VALVE, SPEED CONTROL	1



10 X 15 P S/S AIR PULL
ROLL LEAF ASSEMBLY



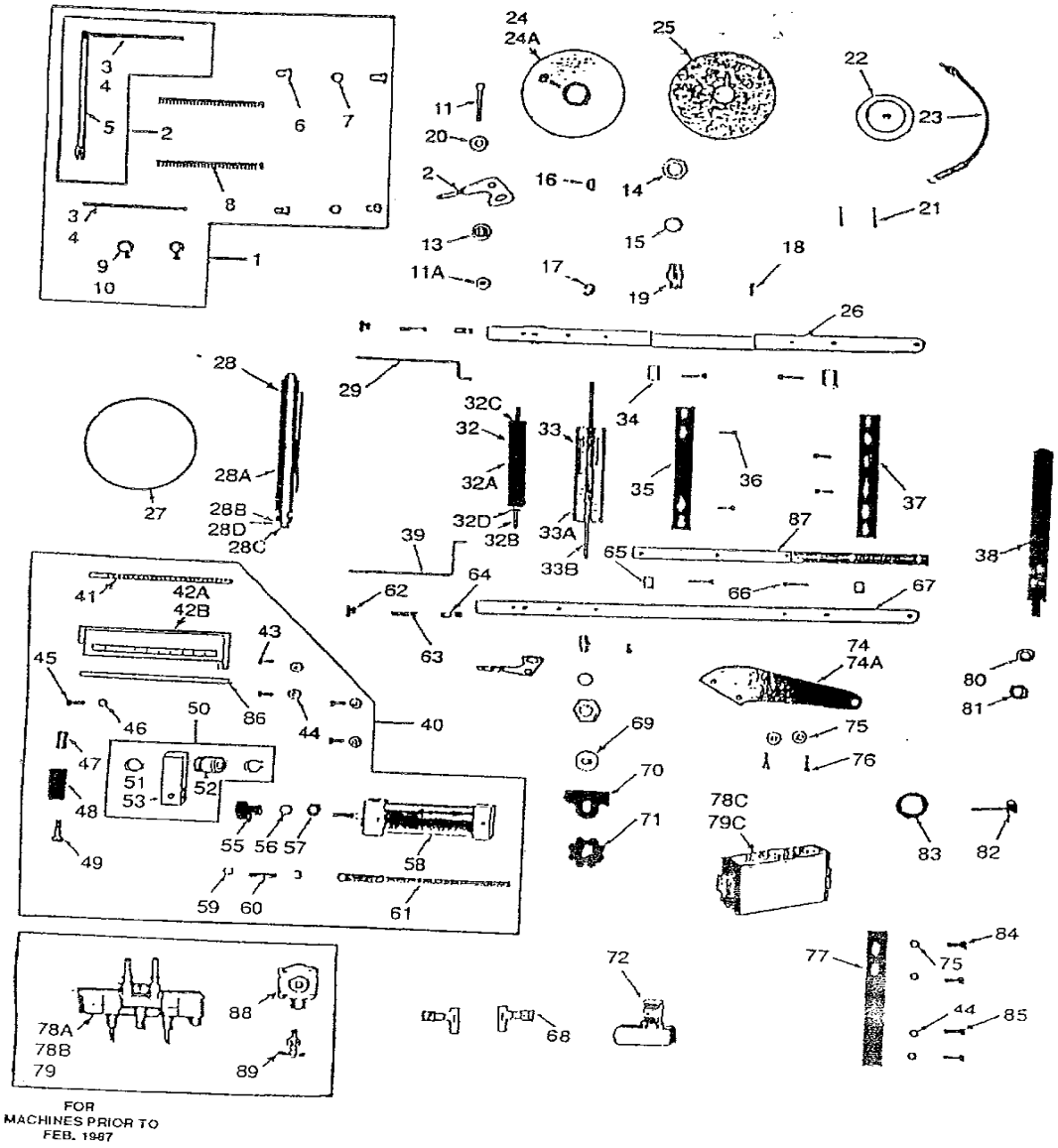
12 X 18 Q S/S AIR PULL
ROLL LEAF ASSEMBLY

KENSOL - OLSENMARK PARTS SHEET
12 X 18 Q S/S AIR PULL LEAF ASS'Y

REF NO.	PART NO.	DESCRIPTION	QUANT.
★ 1	144 15	STRIPPER BAR ASS'Y COMP 12 X 18	2
2	148 19	STRIPPER BAR & POST ASS'Y	2
3	150 03	BAR, ADJUSTABLE STRIPPER 5"	4
4	240 04	PIN, ROLL 3/32 X 5/8	4
5	149 15	BAR, STRIPPER 14 1/2	2
6	145 10	NUT, ADJUSTING, STRIPPING	8
7	157A21	WASHER, SPRING	4
8	146 10	SPRING, STRIPPING 5"	4
9	145 09	COLLAR, ROLL LEAF GUIDE	4
10	230 08	SCREW, MACH., 8-32 X 1/4 BR	4
11	230 24	SCREW, MACH., 10-32 X 1 1/4	2
11A	238 13	NUT, HEX. 10-32	2
12	144 04	CAM, PAPER FEED	2
13	144 02	BUSHING, FLANG, CAM, STD.	2
14	145 15	NUT, LOCK	2
15	144 01	BEARING, RETAINER	2
16	239 11	KEY, WOODRUFF	1
17	195 01	RING, "E" RUBBER ROLLER	2
18	239 22	PIN, ROLL 1/8 X 1/4	2
19	157A22	BEARING	2
20	238 03	WASHER #10	6
21	124 10	PIN, FRICTION BELT	2
22	142 21	PULLEY, REWIND, STD.	1
23	150 15	BELT ASS'Y FRICTION	1
24	145 05	DISC & COLLAR ASS'Y 1000 FT.	1
24A	231 08	SCREW, MACH., 1/4 -20 X 1 1/2	1
25	150 19	DISC, 1000 FT. STD.	1
26	133 05	ARM, DRAW, REAR 12 X 18	1
27	143 21	RING "O" , STD, REWIND, 15"	1
★ 28	138 13	BAR, ASS'Y. REWIND 12 X 18 Q	1
28 A	157A24	BEARING, BALL	2
28B	231 04	SCREW, BUTTONHEAD 1/4-20 X 3/4	2
28C	238 04	WASHER, 1/4 ID	2
29	143 15	BRACKET, REWIND R H	1
★ 32	151 04	ROLLER ASS'Y, RUBBER	1
32A	154 08	ASS'Y RUBBER ROLLER 14 7/8"	1
32B	151 19	SHAFT, RUBBER ROLLER 17"	1
32C	157A24	BEARING, BALL	2
32D	195 01	RING "E"	1
★ 33	15508	ROLLER ASS'Y, KNURLED	1
33A	15608	ASS'Y, KNURLED ROLLER	1
33B	146 07	SHAFT KNURLED ROLLER	1
34	131 03	SPACER	4
35	133 15	BAR, TIE 14 1/2 65/165	2
36	231 21	SCREW, MACH., 1/4-28 X 1 1/4	4
38	129A06	BAR, RL 12 X 18	1
39	143 14	BRACKET, REWIND, UNIVERSAL	1
★ 40	122 05	AIR PULL ASS'Y 12 X 18 Q LR	1
41	124 12	SCALE, 14 TOOTH GEAR	1
42A	129 10	CYLINDER MOUNT ASS'Y	1
42B	125A06	SHIELD ASS'Y, CYL, FLAT	1
43	231 16	SCREW, MACH., 1/4-28 X 1/2	4
44	238 04	WASHERS 1/4 ID	4
45	230 17	SCREW, MACH., 10-32 X 3/8	2
46	124 09	SPACER, STD.	1
47	123 23	PIN, LOCK, STOP BLOCK	1
48	124 01	BLOCK, STOP, PARALLEL SHAFT	1
49	233 05	SCREW, MACH., 3/8-16 KT	1
50	124 27	SUDING HOUSING ASS'Y	1

REF NO.	PART NO.	DESCRIPTION	QUANT.
51	195 09	LOCK RING, EXT	2
52	125 27	BUSHING, BALL, STEEL	1
53	125 28	HOUSING, SLIDING	1
55	185 20	CONNECTOR,CYLINDER ROD	1
56	238 06	WASHER 3/8 ID	1
57	238 18	NUT, HEX 3/8 -16 NC	1
58	906	CYLINDER, AIR PULL, QA	1
58 A	32 15	CLOSE NIPPLE	2
58 B	33 02	ELBOW	1
58C	33 03	CONNECTOR	1
59	195 01	RING "E"	1
60	124 04	PIN RACK & HOUSING	1
61	146 16	RACK ASS'Y 12 X 18 QA	1
62	144 06	NUT, RETAINER REWIND SPRING	2
63	145 12	SPRING, TENSION RUBBER ROLLER	2
64	145 11	BEARING, TENSION RUBBER ROLLER	2
66	232 12	SCREW, MACH., 5/16 -18 X 2 1/2	4
67	133 06	ARM, DRAW, FRONT 12 X 18	1
68	22 23	VALVE, SPEED CONTROL 1/8	2
69	150 06	CLUTCH ASS'Y 14T L.H.	1
70	121 19	GUIDE, RACK & GEAR 14T	1
71	157A01	KNOB, MANUAL ADVANCE	1
74	130 08	BRACKET, ROLL LEAF	1
74A	129A03	BRACKET, ROLL LEAF, DROP IN BAR	1
75	238 05	WASHERS, 5/16 -10	4
76	232 06	SCREW, MACH. 5 1/6-18 X 1	2
78	23A17	VALVE, PILOT	1
78A	22 04	VALVE, PILOT, ROLL LEAF	1
78B	22 05	VALVE, ROLL LEAF	1
79	PS 2018	KIT, VALVE REPAIR	1
79A	22 09	PLATE, SUB.	1
80	238 08	WASHER 1/2"ID	1
81	231 12	SCREW, MACH, 1/4-20 X 2 1/2	1
82	238 20	NUT, HEX., 1 1/2-13	1
83	145 07	COLLAR, ROLL LEAF	1
86	123 20	SHAFT 3/8 X 13 1/2	1
87	133 12	BRACKET MOUNTING, GUARD	1
88	23 24	VALVE, DELAY	1
89	23 05	VALVE, SPEED CONTROL	1

★ - DENOTES COMPLETE ASSEMBLY

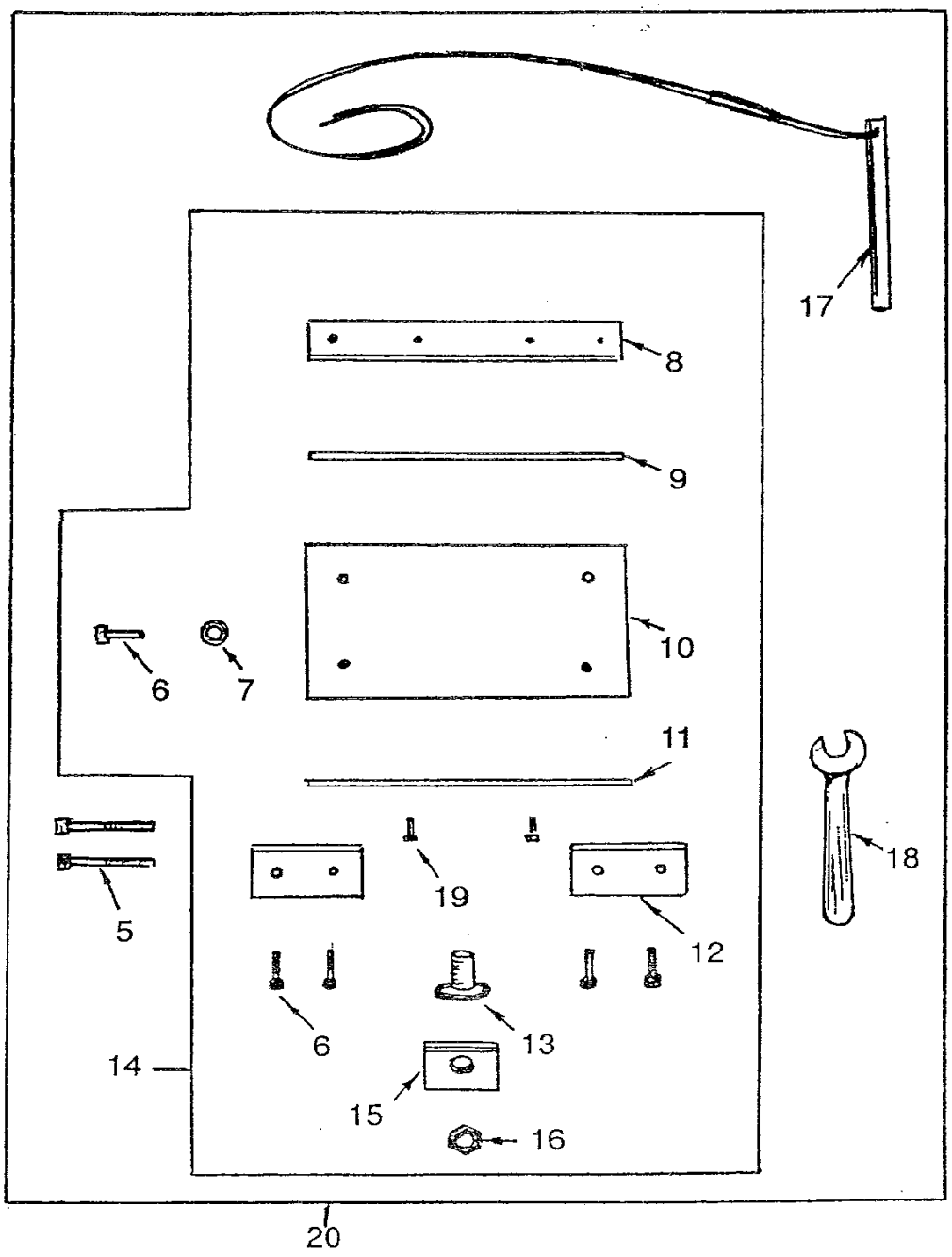


12 X 24 S/S AIR PULL
ROLL LEAF ASSEMBLY

KENSOL - OLSENMARK PARTS SHEET
12 X 24 S/S AIR PULL LEAF ASS'Y

REF NO.	PART NO.	DESCRIPTION	QUANT.
* 1	144 22	BAR ASS'Y, COMP 12 X 24N	2
2	148 26	STRIPPER, BAR & POST ASS'Y	2
3	150 26	BAR, ADJUSTABLE STRIPPER	4
4	240 04	PIN, ROLL 3/32 X 5/16	4
5	149 20	BAR, STRIPPER 16 1/2"	2
6	145 10	NUT, ADJUSTING, STRIPPING	8
7	157A21	WASHER, SPRING	4
8	146 09	SPRING, STRIPPER 3"	4
9	145 09	COLLAR, ROLL LEAF GUIDE	4
10	230 08	SCREW, MACH., 8-32 X 1 1/4 BR	4
11	230 24	SCREW, MACH., 10-32 X 1 1/4	2
11A	238 13	NUT, HEX, 10-32	2
12	144 04	CAM, PAPER FEED	2
13	144 02	BUSHING, FLANGE, CAM STD.	2
14	145 15	NUT, LOCK	2
15	144 01	BEARING, RETAINER	2
16	239 11	KEY, WOODRUFF	1
17	195 01	RING, "E", RUBBER ROLLER	2
18	239 22	PIN, ROLL 1/8 X 1/4	2
19	157A22	BEARING	2
20	238 03	WASHER #10	6
21	124 10	PIN, FRICTION BELT	2
22	142 21	PULLEY, REWIND, STD.	1
23	150 15	BELT ASS'Y, FRICTION	1
24	145 05	DISC & COLLAR ASS'Y, 1000 FT.	1
24A	231 08	SCREW, MACH., 1/4-20 X 1 1/2	1
25	150 19	DISC, 1000 FT, STD	1
26	133 15	ARM, DRAW, REAR 12 X 24	1
27	143 21	RING, "O", STD REWIND, 15"	1
* 28	137A01	BAR ASS'Y, REWIND 12 X 24	1
28A	138 01	BAR, SUB ASS'Y	1
28B	157A24	BEARING, BALL	2
28C	231 04	SCREW, BUTTON HEAD 1/4-20 X 3/8	2
28D	238 04	WASHER 1/4" ID	2
29	143 15	BRACKET, REWIND R.H.	1
* 32	151 26	ROLLER ASS'Y, RUBBER	1
32A	154 20	ASS'Y RUBBER ROLLER 14 7/8	1
32B	151 25	SHAFT, RUBBER ROLLER 17	1
32C	157A24	BEARING, BALL	2
32D	195 01	RING "E"	1
33	155 19	ROLLER ASS'Y, KNURLED	1
33A	156 19	ASS'Y, KNURLED ROLLER 14 23/32	1
33B	146 25	SHAFT,KNURLED ROLLER 20 1/8"	1
34	133 09	SPACER, 12 X 18 RT. REAR	2
35A	133 18	BAR, TIE 16 1/2, N, KA 56/155	1
35B	133 23	BAR, TIE 16 1/2, N, K65/K165 R.H.	1
36	231 21	SCREW, MACH., 1/4-28 X 1 1/4	4
37A	133 19	BAR, TIE 16 1/2, N, KA 56/156	1
37B	133 24	BAR,TIE 16 1/2, N, K65/165 L.H.	1
38	129A04	BAR, 12 X 24	1
39	143 14	BRACKET,REWIND, UNIVERSAL	1
* 40	122 24	AIR PULL ASS'Y 12 X 24 N L.R.	1
41	124 12	SCALE, 14 TOOTH GEAR	1
42A	129 11	CYLINDER, MOUNT ASS'Y	1
42B	125A07	SHIELD ASS'Y, CYL, FLAT	1
43	231 16	SCREW, MACH., 1/4-28 X 1/2	4
44	238 04	WASHERS 5/16 ID	4
45	230 17	SCREW, MACH., 10-32 X 3/8/	2
46	124 09	SPACER, STOP	1
47	123 23	PIN, LOCK, STOP BLOCK	1
48	124 01	BLOCK, STOP, PARALLEL SHAFT	1
49	233 05	SCREW, MACH., 3/8-16 X 1"	1
50	129 21	SLIDING HOUSING ASS'Y	1
51	195 09	LOCK RING, EXT.	2
52	125 05	BUSHING BALL, STEEL	1
53	129 15	HOUSING, SLIDING	1
55	185 10	CONNECTOR, CYLINDER ROD	1
56	238 06	WASHER, 3/8 ID	1
57	238 18	NUT, HEX, 3/8-16 N.C.	1
58	9 08	CYLINDER, AIR PULL	1
58A	32 15	CLOSE NIPPLE	2
58B	33 02	ELBOW	1
58C	33 03	CONNECTOR	1
59	195 01	RING "E" RUBBER	2
60	124 04	PIN, RACK & HOUSING	1
61	146 17	RACK, ASS'Y 12 X 24 NA	1
62	144 06	NUT, RETAINER,REWIND SPRING	2
63	145 12	SPRING, TENSION, RUBBER ROLLER	2
64	145 11	BEARING, TENSION, RUBBER ROLLER	2
65	133 08	SPACER, 12 X 24 N FRONT	1
66	232 12	SCREW, MACH., 5/16-18 X 2 1/2	4
67	133 16	ARM, DRAW, FRONT 12 X 24	1
68	22 23	VALVE, SPEED CONTROL, 1/8"	2
69	150 05	CLUTCH ASS'Y 14T LH	1
70	121 19	GUIDE, RACK & GEAR, 14 TOOTH	1
71	157A01	KNOB, MANUAL ADVANCE	1
72	22 23	VALVE, SPEED CONTROL 1/4"	2
74	130 08	BRACKET, ROLL LEAF	1
74A	129A03	BRACKET, ROLL LEAF, DROP IN BAR	1
75	238 05	WASHERS 5/16 I.D.	4
76	232 06	SCREW, MACH., 5/16-18 X 1	2
77	124 08	BRACKET, VALVE	1
78C	23A17	VALVE,PILOT	1
79C	PS 2018	KIT, VALVE REPAIR	1
78A	22 04	VALVE, PILOT, ROLL LEAF, PRIOR TO 2/87	1
78B	22 05	VALVE, ROLL LEAF PRIOR TO 2/87	1
79	22 09	PLATE, SUB. PRIOR TO 2/87	1
80	238 08	WASHER, 1/2"ID	1
81	231 12	SCREW, MACH., 1/4-20 X 2 1/2	1
82	238 20	NUT, HEX, 1/2 - 13	1
83	145 07	COLLAR, ROLL LEAF	1
84	232 24	SCREW, MACH., 5/16-24 X 3/4	2
85	231 02	SCREW, MACH., 1/4-20 X 1/2	2
86	123 20	SHAFT, 3/8 X 15 1/2	1
87	133 12	BRACKET, MOUNTING GUARD	1
88	23 24	VALVE, DELAY PRIOR TO 2/87	1
89	23 05	VALVE, SPEED CONTROL PRIOR TO 2/87	1

* - DENOTES - COMPLETE ASSEMBLY



6 X 8 D SIDE LOAD
HEATER HEAD ASS'Y

KENSOL - OLSENMARK PARTS SHEET

6 X 8 D SIDE LOAD HEATER HEAD ASS'Y

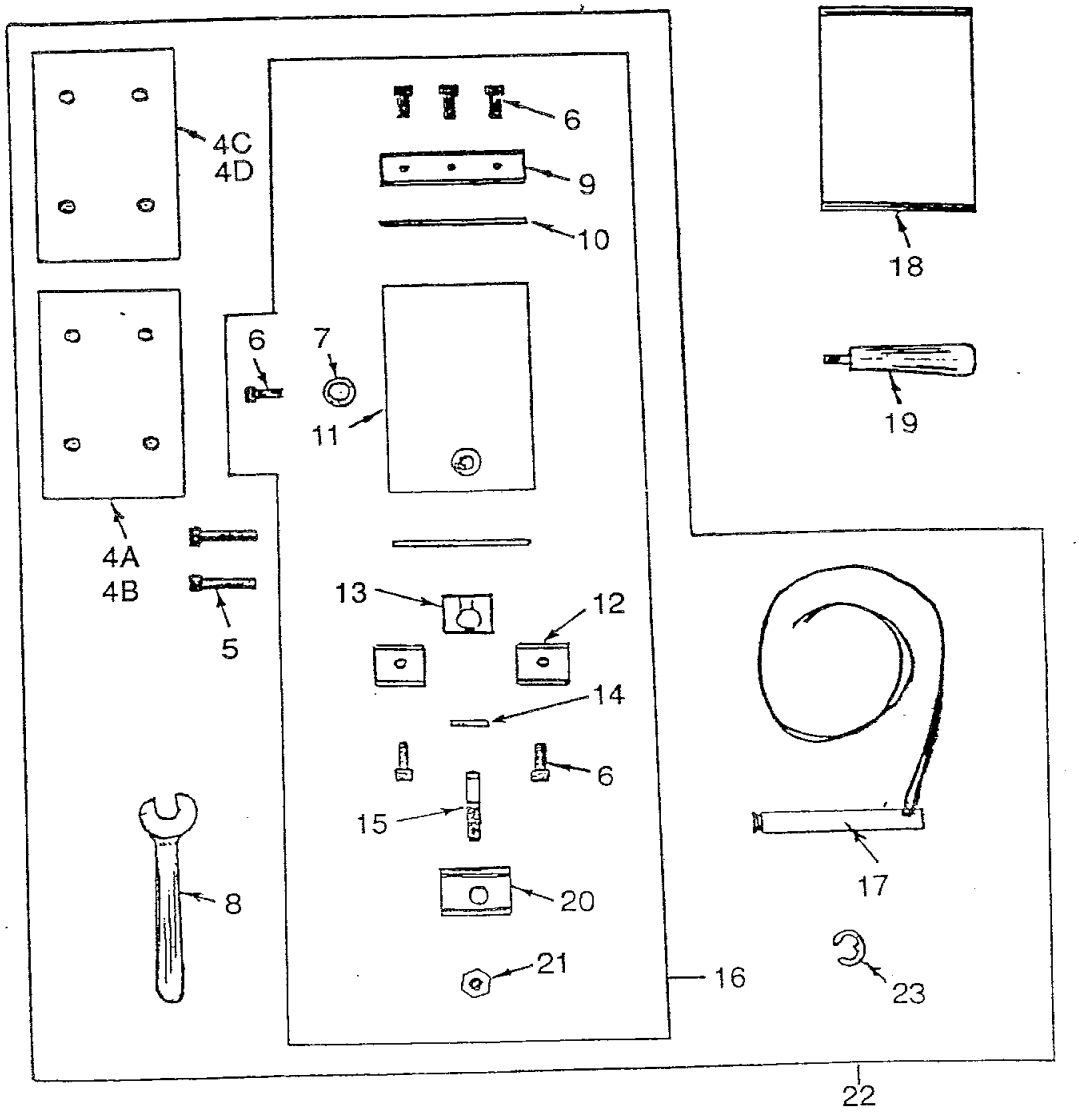
REF. NO.	PART NO.	DESCRIPTION	QUANT.
5	233 09	SCREW, MACH 3/8 - 16 X 2	4
6	231 04	SCREW, MACH 1/4 - 20 X 3/4	9
7	93 03	WASHER, STOP STD	1
8	83 08	RAIL HEATING HEAD	1
9	93 05	KEY, BACK 6 X 8 D	1
10A	83 05	HEAD 6 X 8 D K36 KA	1
10B	83 06	HEAD 6 X 8 D K25 K27	1
10C	83 09	TRANSITE K 36 KA 1/4 X 5 X 10	1
10D	83 17	PLATE SPACER	1
10E	36 05	SLIDE 6 X 8 D HEAD	1
11	93 16	FRONT KEY 6 X 8 D	1
12	83 07	RAIL SET HT HD 6 X 8	2
13	93 02	STUD, LCOKING, HEATER HEAD	1
14A	83 03	HEAD ASSY K 36 KA	1
14B	83 04	HEAD ASSY K 25 27	1
15	93 01	RAIL, LOCKING SLIDE	1
16	92 26	NUT, BRASS HEX (FULL)	1
17A	55 07	HEATER 3/4 X 8 1/4 D 120V/500W	2
17B	55 09	HEATER 3/4 X 8 1/4 D 240 V/500W	2
18	93 25	WRENCH, HEAD LCOK, 7/8	1
19	230 18	SCREW, MACH 10 - 32 X 1/2	4
20A	82 25	HEAD ASSY, COMP K 36 KA/115	1
20B	83 01	HEAD ASSY, COMP K 36 KA/220	1
20C	82 26	HEAD ASSY, COMP K 25 K 27/115V	1
20D	83 02	HEAD ASSY, COMP K 25 27/220	1

KENSOL 65H & 165H PARTS AND INSTRUCTION MANUAL

KENSOL - OLSENMARK PARTS SHEET

6 X 8 L FRONT LOAD HEAD ASS'Y

REF. NO.	PART NO.	DESCRIPTION	QUANT.
4A	83 09	TRANSITE, 1/4 X 5 X 10	1
4B	83 25	TRANSITE, INSUL, 3/8 X 6 X 14	1
4C	83 11	PLATE, SPACER	1
4D	83 24	PLATE, ADAPTER	1
5	233 10	SCREW, MACH., 3/8 - 16 X 2 1/4	4
6	231 04	SCREW, MACH., 1/4 - 20 X 3/4	7
7	93 03	WASHER, STOP, STD	2
8	93 25	WRENCH, HEADLOCK, 7/8	1
9	83 23	RAIL	1
10	93 09	KEY, BACK, 6 X 8 L	2
11A	86 07	HEAD, 6 X 8 L K25, 27	1
11B	86 08	HEAD, 6 X 8 L K36, 50, 60	1
11C	86 09	HEAD, 6 X 8 L K65, 165	1
12	83 22	RAIL	2
13	93 22	HOUSING, STUD	1
14	240 15	PIN, ROLL	1
15	93 24	STUD, LOCKING	1
16A	86 04	HEAD ASSY K36	1
16B	86 05	HEAD ASSY K65, 165	1
16C	86 06	HEAD ASSY COMP 25,27 / 115	1
17A	56 16	HEATER, 3/4 X 6 240/500	2
17B	56 15	HEATER, 3/4 X 6 120/500	2
18	36 11	SLIDE, 6 X 8 L HEAD	1
19	42 07	HANDLE, 5/16 - 18 STUD	1
20	93 01	RAIL, LOCKING SLIDE	1
21	92 26	NUT, BRASS, HEX	1
22A	86 01	HEAD ASSY, COMP, K36,KA /115	1
22B	86 02	HEAD ASSY, COMP, K65, 165 /115	1
22C	86 03	HEAD ASSY, COMP, K25, 27 /115	1
22D	86A 01	HEAD ASSY, COMP, K36, KA /220	1
22E	86A 02	HEAD ASSY, COMP, K65, 165 /220	1
22F	86A 03	HEAD ASSY, COMP, K25, K27 /220	1
23	195 11	RING, "E", HEATER	2



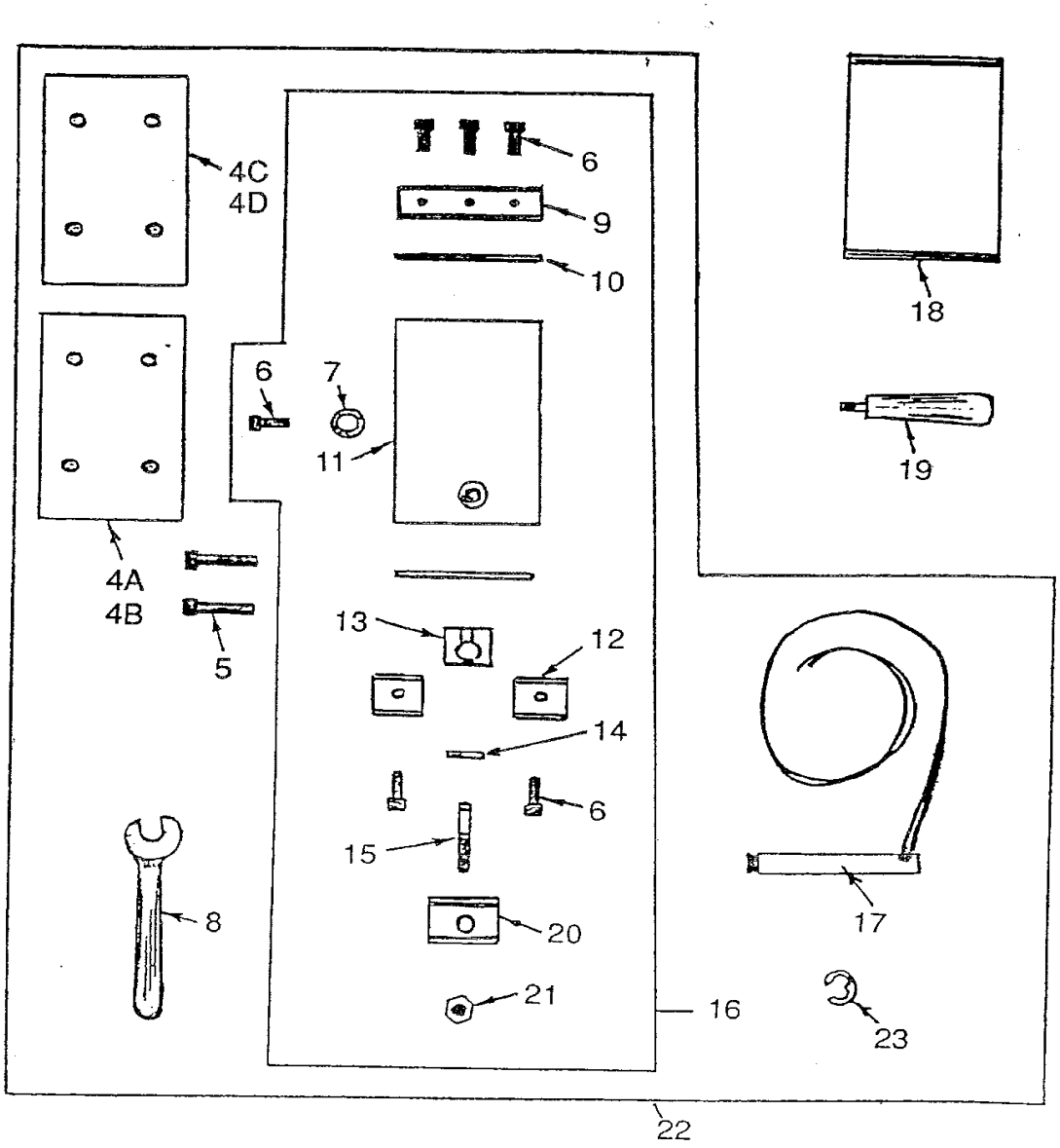
6 X 8 L FRONT LOAD
HEAD ASS'Y

KENSOL 65H & 165H PARTS AND INSTRUCTION MANUAL

KENSOL - OLSENMARK PARTS SHEET

6 X 12 FRONT LOAD HEAD ASS'Y

REF. NO.	PART NO.	DESCRIPTION	QUANT.
4A	83 09	TRANSITE, K36, KA, 1/4 X 5 X 10	1
4B	83 25	TRANSITE, INSUL, K165, 3/8 X 6 X 14	1
4C	83 11	PLATE, SPACER	1
4D	83 24	PLATE, ADAPTER (K65)	1
5	233 10	SCREW, MACH., 3/8 - 16 X 2 1/4	4
6	231 04	SCREW, MACH., 1/4 - 20 X 3/4	7
7	93 03	WASHER, STOP, STD	2
8	93 25	WRENCH, HEADLOCK, 7/8	1
9	83 23	RAIL	1
10	93 09	KEY, BACK, 6 X 8 L	2
11A	86 07	HEAD 6 X 12 K36, 50, 60	1
11B	86 08	HEAD 6 X 12 K65, 165	1
11C	86 09	HEAD 6 X 12 K25, 27	1
12	83 22	RAIL	1
13	93 22	HOUSING, STUD	1
14	240 15	PIN, ROLL, 3/16 X 1	1
15	93 24	STUD, LOCKING	1
16A	86 04	HEAD ASSY- 6 X 12 M	1
16B	86 05	HEAD ASSY- 6 X 12 M	1
16C	86 06	HEAD ASSY- 6 X 12 M	1
17A	56 16	HEATER, 3/4 X 6 1/2 240/500	3
17B	56 15	HEATER, 3/4 X 6 1/2 120/500	3
18	36 11	SLIDE, 6 X 12 M HEAD	1
19	42 07	HANDLE, 5/16 - 18 STUD	1
20	93 01	RAIL, LOCKING SLIDE	1
21	92 26	NUT, BRASS, HEX, FULL	1
22A	86 01	HEAD ASSY, COMP, K36/ KA /115	1
22B	86 02	HEAD ASSY, COMP, K65/ 165 /115	1
22C	86 03	HEAD ASSY, COMP, K25/ 27 /115	1
22D	86A 01	HEAD ASSY, COMP, K36/ KA /220	1
22E	86A 02	HEAD ASSY, COMP, K65/ 165 /220	1
22F	86A 03	HEAD ASSY, COMP, K25/ K27 /220	1
23	195 11	RING, "E", HEATER	3



6 X 12 M FRONT
LOAD HEAD ASS'Y

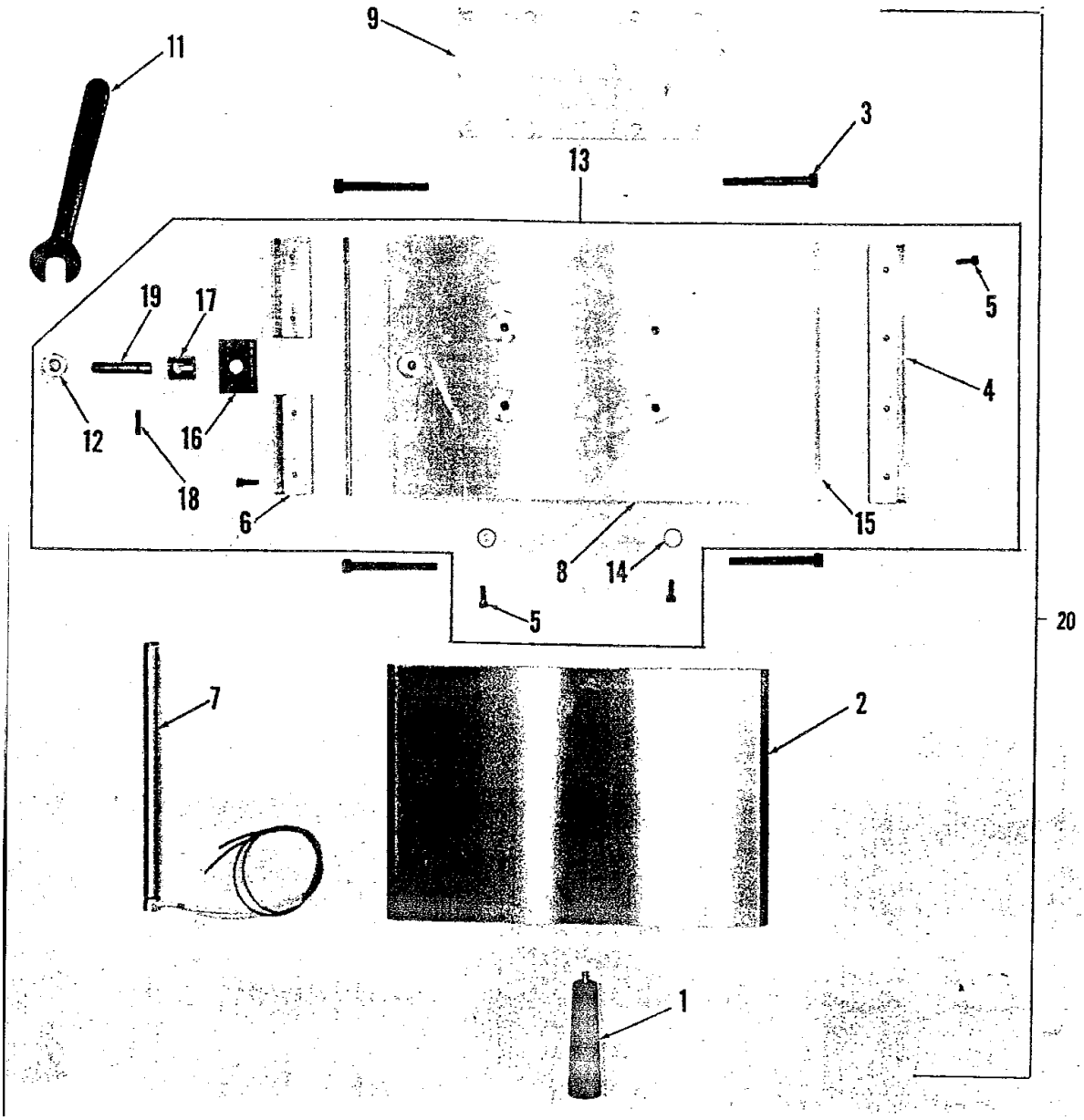


FIG 33 (REV A)
10 X 15 P, FRONT LOAD
HEAD

KENSOL - OLSENMARK PARTS SHEET
10 X 15 FRONT LOAD HEAD ASSY

REF. NO.	PART NO.	DESCRIPTION	QUANT.
33- 1	42 07	HANDLE, 5/16-18 STUD	1
33- 2	36 14	SLIDE, 12X18Q HEAD	1
33- 3A	233 15	SCREW, MACH., ALL TYPES	3
33- 3B	233 16	SCREW, MACH., ALL TYPES	1
33- 4	87 18	RAIL, REAR	1
33- 5	231 04	SCREW, MACH., ALL TYPES	10
33- 6	87 19	RAIL, FRONT	2
33- 7A	55 12	HEATER, 3/4 X 12- 1/2, Q, 120V/800W	7
33- 7B	55 13	HEATER, 3/4 X 12- 1/2, Q, 240V/800W	7
33- 8A	87 17	HEAD, 2” X 12” X 18-1/2”	1
33- 8B	87A18	HEAD, 2” X 12-1/8” X 18-5/8”	1
33- 9A	83 09	TRANSITE, K36,KA,1/4 X 5 X 10	1
33- 9B	83 25	TRANSITE, INSUL. K 165, 3/8 X 6 X 14	1
33- 11	93 25	WRENCH, HEAD LOCK, 7/8	1
33- 12	92 26	NUT, BRASS HEX (FULL)	1
33- 13A	87 16	HEAD ASS., K-65 & 165	1
33- 13B	87A19	HEAD ASSY., K-56 & 156	1
33- 14	93 03	WASHER, STOP, STD.	2
33- 15	93 13	KEY, BACK, 12 X 18	2
33- 16	93 01	RAIL, LOCKING SLIDE	1
33- 17	93 22	HOUSING, STUD	1
33- 18	240 15	PIN, ROLL	1
33- 19	93 24	STUD, LOCKING	1
33- 20A	87 07	HEAD ASSY, COMP .K A, 115VC/115VH	1
33- 20B	87 08	HEAD ASSY, COMP .K 65, 115VC/115VH	1
33- 20C	87 25	HEAD ASSY, COMP .K A, 220VC/220VH	1
33- 20D	87 26	HEAD ASSY, COMP .K56, 220VC/220VH	1

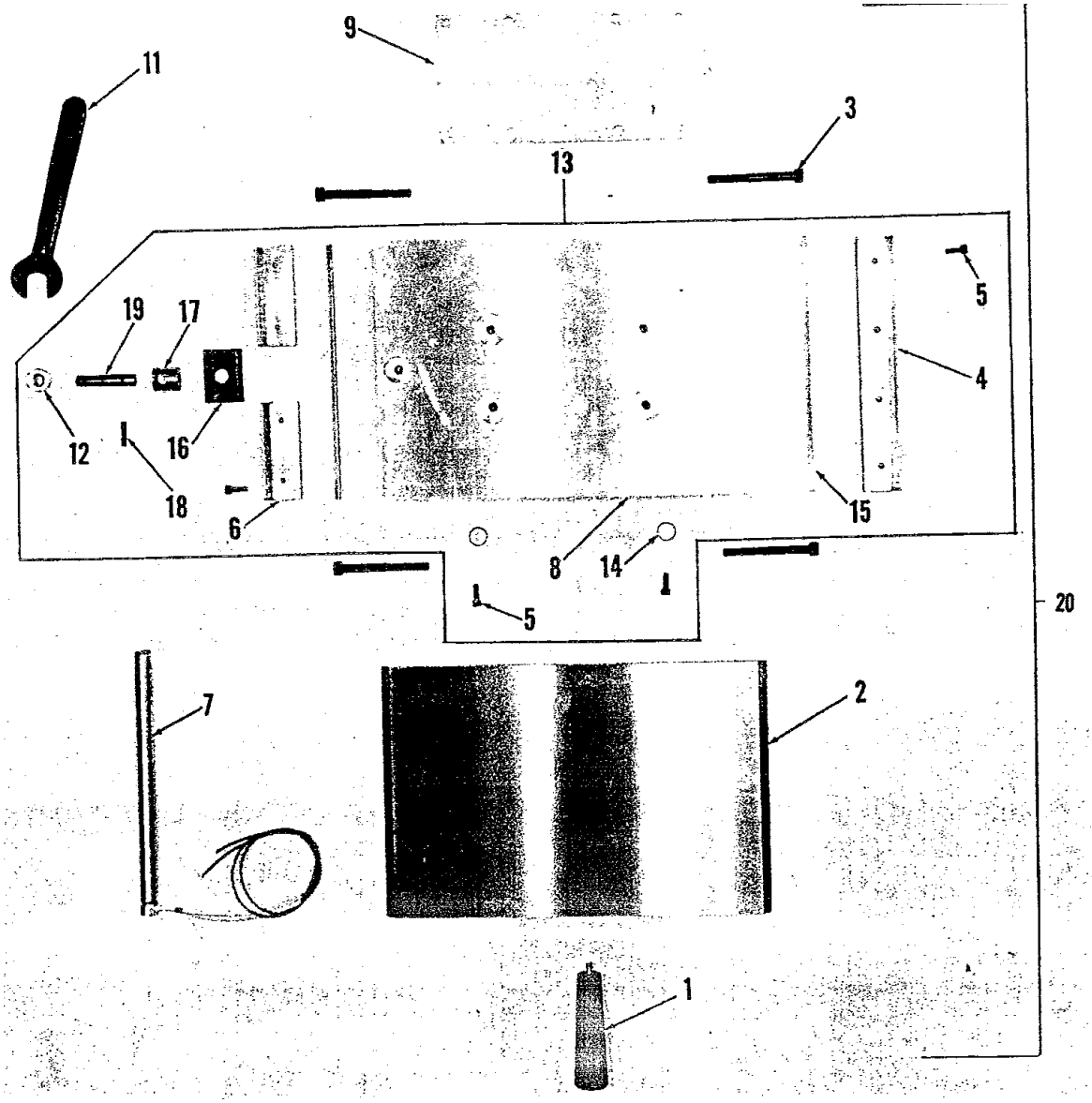
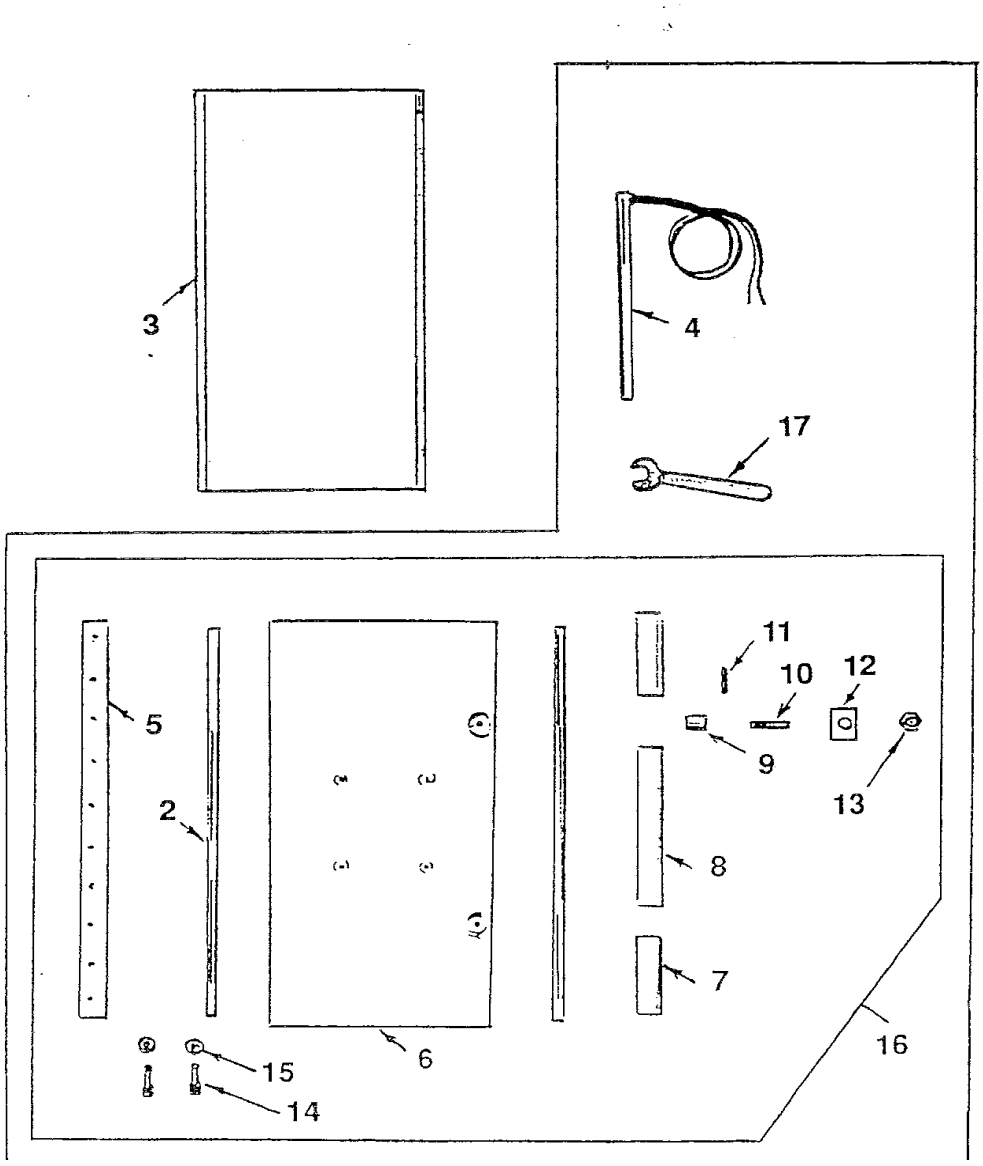


FIG 33 (REV A)
12 X 18 Q, FRONT LOAD
HEAD

KENSOL - OLSENMARK PARTS SHEET
12 X 18 FRONT LOAD HEAD ASSY

REF. NO.	PART NO.	DESCRIPTION	QUANT.
33- 1	42 07	HANDLE, 5/16-18 STUD	1
33- 2	36 14	SLIDE, 12X18Q HEAD	1
33- 3A	233 15	SCREW, MACH., ALL TYPES	3
33- 3B	233 16	SCREW, MACH., ALL TYPES	1
33- 4	87 18	RAIL, REAR	1
33- 5	231 04	SCREW, MACH., ALL TYPES	10
33- 6	87 19	RAIL, FRONT	2
33- 7A	55 12	HEATER, 3/4 X 12- 1/2, Q, 120V/800W	6
33- 7B	55 13	HEATER, 3/4 X 12- 1/2, Q, 240V/800W	6
33- 8A	87 17	HEAD, 2” X 12” X 18-1/2”	1
33- 8B	87A18	HEAD, 2” X 12-1/8” X 18-5/8”	1
33- 9A	83 09	TRANSITE, K36,KA,1/4 X 5 X 10	1
33- 9B	83 25	TRANSITE, INSUL. K 165, 3/8 X 6 X 14	1
33- 11	93 25	WRENCH, HEAD LOCK, 7/8	1
33- 12	92 26	NUT, BRASS HEX (FULL)	1
33- 13A	87 16	HEAD ASS., K-65 & 165	1
33- 13B	87A19	HEAD ASSY., K-56 & 156	1
33- 14	93 03	WASHER, STOP, STD.	2
33- 15	93 13	KEY, BACK, 12 X 18	2
33- 16	93 01	RAIL, LOCKING SLIDE	1
33- 17	93 22	HOUSING, STUD	1
33- 18	240 15	PIN, ROLL	1
33- 19	93 24	STUD, LOCKING	1
33- 20A	87 15	HEAD ASSY, COMP .65, 165/220V HTR	1
33- 20B	87A09	HEAD ASSY, COMP .56, 156/220V HTR	1



12 X 24 N SIDE LOAD

KENSOL - OLSENMARK PARTS SHEET

12 X 24 N SIDE LOAD HEAD ASS'Y

REF. NO.	PART NO.	DESCRIPTION	QUANT.
1	87A01	HEAD ASSY COMP 65/165 220V HTR	1
2	93 07	KEY, BLACK 12 X 24 N	2
3	36 25	SLIDE 12 X 24 N HEAD 1/2 X 13X 24	1
4A	56 25	HEATER 3/4 X 12 1/2 N 120/950	6
4B	56 26	HEATER 3/4 X 12 1/2 N 240V/950W	6
5	87 18	RAIL, REAR	2
6A	87A03	HEAD 2 X 12 1/2 X 24	1
6B	87A05	TRANSITE, INSUL 3/8 X 12 1/2 X 24	1
7	87 19	RAIL, FRONT	2
8	87A04	RAIL, CENTER	1
9	93 22	HOUSING, STUD	2
10	93 24	STUD, LOCKING	2
11	240 15	PIN, ROLL 3/16 X 1	2
12	93 01	RAIL, LOCKING SLIDE	2
13	92 26	NUT, BRASS HEX (FULL) 1/2 - 13	2
14	231 04	SCREW, MACH 1/4 - 20 X 3/4	20
15	93 03	WASHER, STOP, STD H-SA-3-1	2
16	87A02	HEAD ASSY	1
17	93 25	WRENCH, HEAD LOCK, 7/8	1