

CLINTON'S MODEL 189

UNDERBED TRIMMER FOR SINGER 591

SERVICE MANUAL

40-0152-01



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I. GENERAL INFORMATION

A. INTRODUCTION

The air Operated Underbed Trimmer contains a trimming system that cuts both the needle and bobbin threads simultaneously. A movable and a stationary blade, mounted on the throat plate are used in combination to pick up and cut the threads.

Solid state electronics are used to sense the position of the needle and to trigger the trimming mechanism at the proper time as well as to control footlifting and backtacking operations.

B. APPLICATION

The underbed Trimmer/Positioner enables the operator to automatically control the position of the needle in or out of the work, thereby eliminating the need for hand positioning. In addition, the top and bottom threads are automatically cut beneath the throat plate after positioning. This eliminates the need for hand trimming.

C. TRIMMER COMPONENTS

The trimmer components, which can be either pre-installed on the sewing machine head and factory tested, or field installed, include:

1. Standard Components
 - a. Thread Cutter Assembly
 - b. Tension Release Assembly
 - c. Needle Thread Pulloff Assembly
 - d. Needle Thread Blower and Needle Cooler Assembly
 - e. Foot Lifter
 - f. Folder Opener
 - g. Solenoid Air Valve Control Unit

II. INSTALLATION

- A. Install the solenoid air valve assembly under the table as shown in drawing INS-1954.
- B. The treadle air valve is used in place of the treadle rods for the needle cooler. Refer to speed control installation on page 7.
- C. The folder opener air valve is installed as shown in (INS-1955). This should be placed in a position convenient to the operators right knee.
- D. Set the machine head in the table and install the "V" belt.
- E. Connect all electrical cables to the control box.
- F. Connect all air lines as shown in circuit diagram drawing INS-1939-1.
Note: Do not connect the air supply at this time.
- G. Thread the machine and sew on material being used for the operation.
- H. When heeling the treadle observe the 6 o'clock positioning of the thread across the hook. If it is not between 5 and 6 o'clock readjust as described under synchronizer timing page 11.
- I. Connect the air supply then sew and operate the trimmer. Refer to section III for air circuit operations and section IV for adjustments.

III. AIR CIRCUIT OPERATION

A. NEEDLE COOLER

Air is distributed throughout the circuit as shown in INS-1939-2. When the treadle is pushed forward for sewing the treadle valve is opened and air flows to the needle cooler tube.

B. TRIM VALVE AND PILOT VALVE

At the end of the sewing operation the brake is applied and the needle positioner is activated. The needle positioner will stop with the needle thread across the hook in the 6 o'clock position. The trim solenoid valve will energize. (See INS-1939-3). The trim cylinder operates. The pilot valve actuator is pressurized shifting the pilot valve. There is no air flow through the pilot valve since there is no pressure at the input.

The needle is raised to the up position and the trim valve is deenergized. (See INS-1933-4). The flow control in the pilot valve actuator circuit leaks the air slowly from the actuator keeping the valve shifted. Air is applied to the IN port through the NC port, now open, to the thread pulloff cylinder, tension release cylinder and throat plate blower tube.

The pilot valve returns (INS-1939-5). Air is applied to the trim cylinder to return the blade. The rate or speed of return is controlled by the flow control which controls the air exhausting from the trim cylinder. This control is used to minimize bobbin spin.

C. FOOTLIFT, FOLDER OPENER and THREAD BLOWER

While the treadle brake is still applied the foot lift solenoid valve will energize (see INS-1939-5). Air is applied to the foot lift cylinder and the folder opener. The folder can be operated independent of the footlifter at any time in the cycle with a knee operated air valve.

At the same time air is applied to the double pilot valve actuators. One actuator has a larger piston than the other. The larger piston will have more force than the smaller one at the same pressure. The air flow to the larger piston is restricted by the flow to the larger piston is restricted by the flow control. When air is first applied the smaller piston will shift the valve and open the port to the shuttle valve. Air will flow to the needle thread blower. Pressure is slowly increasing in the larger piston until it overcomes the other and shuts off the air supply to the blower.

IV. ADJUSTMENTS

A. TRIMMER

1. Cutter Assembly

In the cut position the cutting edge of the movable blade should pass the cutting edge of the stationary blade about 1/16". If adjustment is required loosen the lock nuts on the cylinder shaft and adjust as required.

The pickup position on the movable blade is controlled by the stroke length of the cylinder and proper positioning of the cutting edge as above.

2. Thread Pulloff and Tension Release

No adjustment is required for the Thread Pulloff and Tension Release assemblies for trimmer operations. If check spring adjustment is required for stitch formation, remove the assembly from the machine, loosen the stud lockscrew, adjust spring tension, tighten lockscrew and replace assembly.

B. THREAD PULLOFF CYCLE TIME

The flow control in this circuit determines the time these cylinders have to complete their stroke. Too much time will show a noticeable hesitation before return of the pulloff cylinder. If the time is short the cylinder will not complete its stroke. Turning in (cw) will increase time, turning out (ccw) will decrease time.

C. TRIM CYLINDER SPEED

Turning the flow control needle in (cw) will slow down the cylinder and reduce spin. Turning out (ccw) will increase cylinder speed. If cylinder speed is too slow the presser foot will rise before the thread is cut and the operator could start removing the garment too soon. If this happens the cylinder speed should be increased and some mechanical device such as star springs used in conjunction with the flow control to reduce spin.

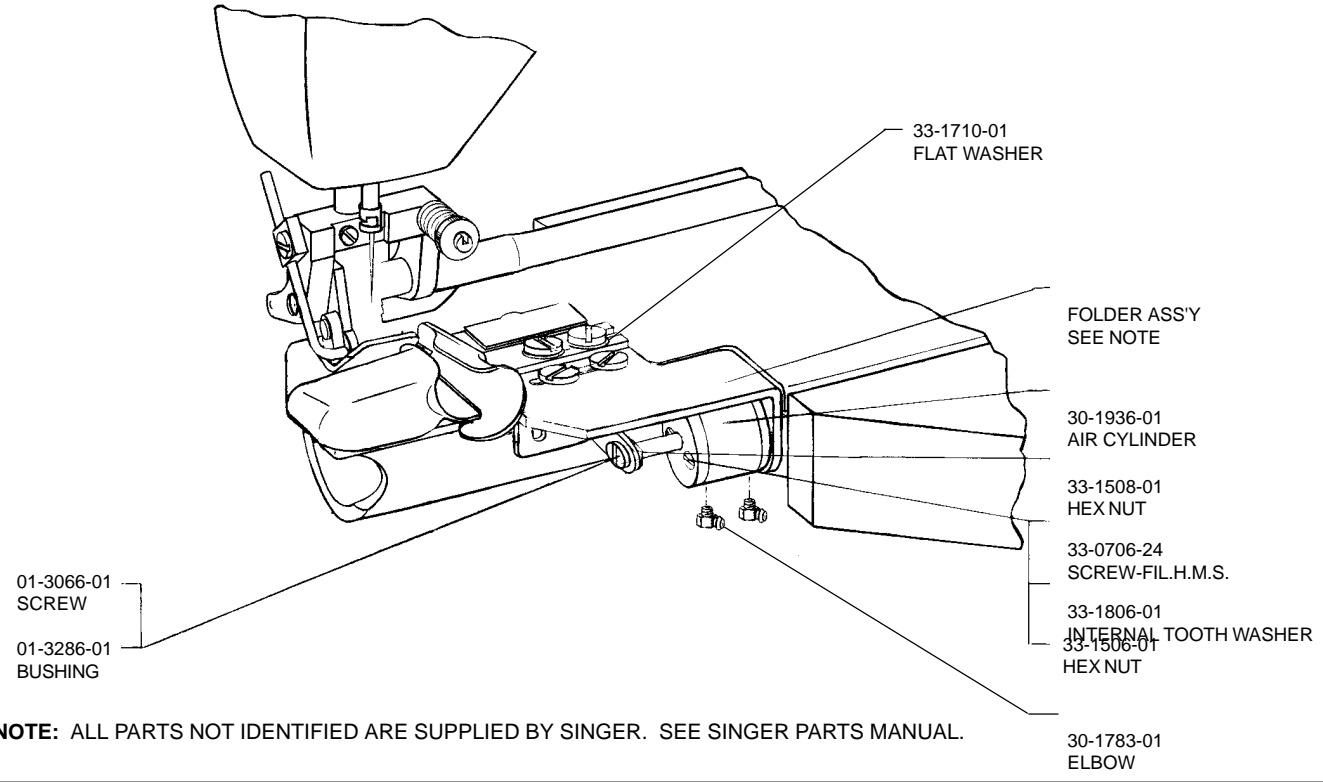
D. NEEDLE THREAD BLOWER BLAST TIME

The duration of this blast is controlled by the flow control mounted to the larger actuator. Turning in (cw) increases time turning out (ccw) decreases time. About one second is enough to give the operator time to remove the garment and blow the thread above the foot. Should the operator be delayed in removing the garment the thread will remain under the foot. If the foot is lowered and again raised the above sequence will repeat.

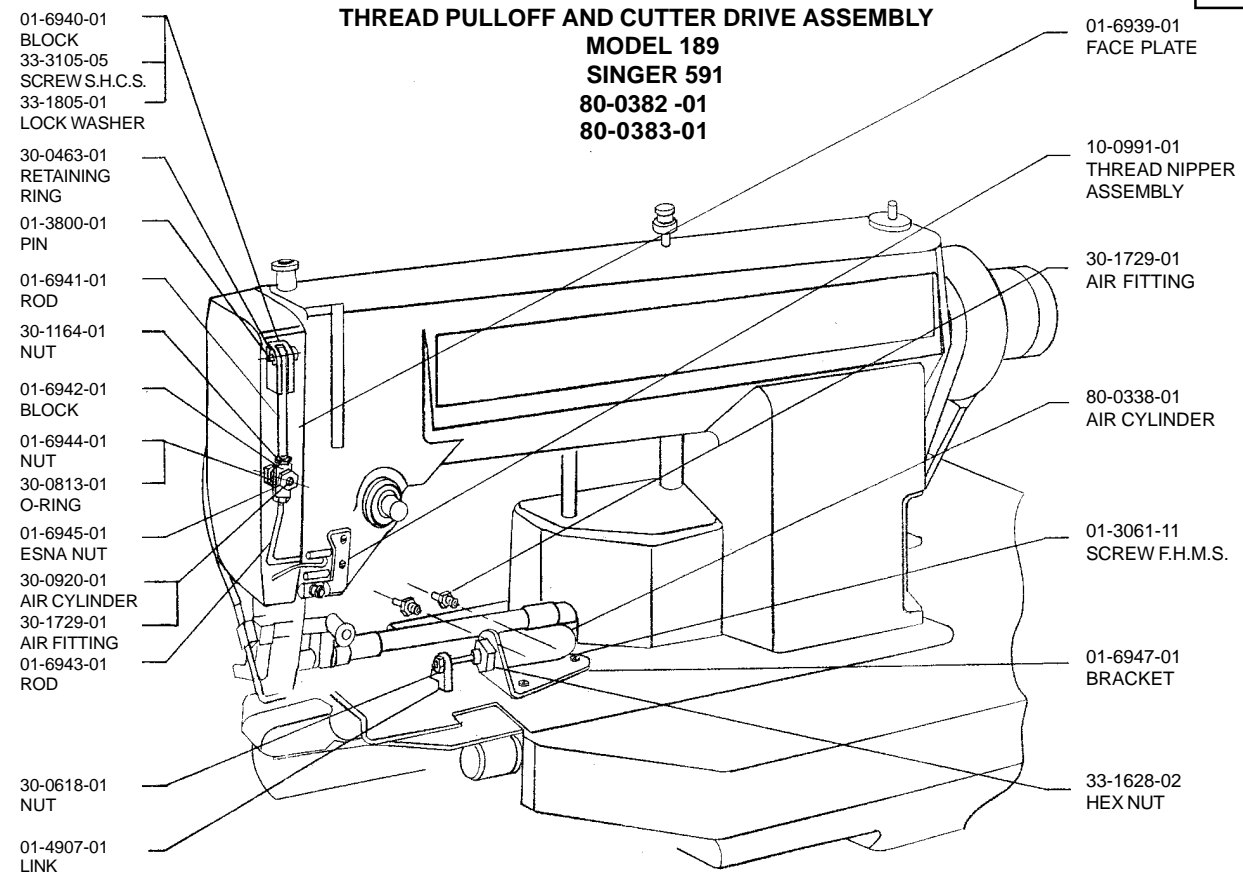
V. TROUBLE SHOOTING

PROBLEM	CAUSES	CORRECTIVE ACTION
Needle thread not cut. Bobbin thread is cut	Defective PC Board	Replace board
	Movable blade missed needle loop	Check synchronizer timing to see that trimmer is fired at correct time
	Binds in trimmer linkage	Locate and remove bind. A light bind would slow it enough to miss needle loop
Both threads not cut not picked up	Defective movable blade	Replace
	Water in air lines	Check filter. Remove water from air lines
	Defective solenoid air valve or air cylinder	Repair or replace
	Defective PC board	Replace board
	Binds in trimmer linkage	Locate and remove bind
Both threads picked up, not cut	Defective movable or stationary blade	Replace
	Stroke misadjusted failing to reach cutting position	Readjust
Needle thread cut short	Pulloff cylinder improperly adjusted	Readjust
Long tail left on top side at start of sewing	Blower not operating causing thread to be trapped under presser foot. Operator not removing garment fast enough	Check blower circuit and flow control adjustment. If blower time is short readjust flow control to increase
Bobbin thread is cut short	Bobbin tension too tight	Loosen bobbin tension as much as possible
	Bobbin thread slipped out of hook on case	Run Bobbin thread through hook
	Bobbin case without hook being used	Replace with correct bobbin case

FOLDER ASSEMBLY
MODEL 189
SINGER 591
80-0384-01

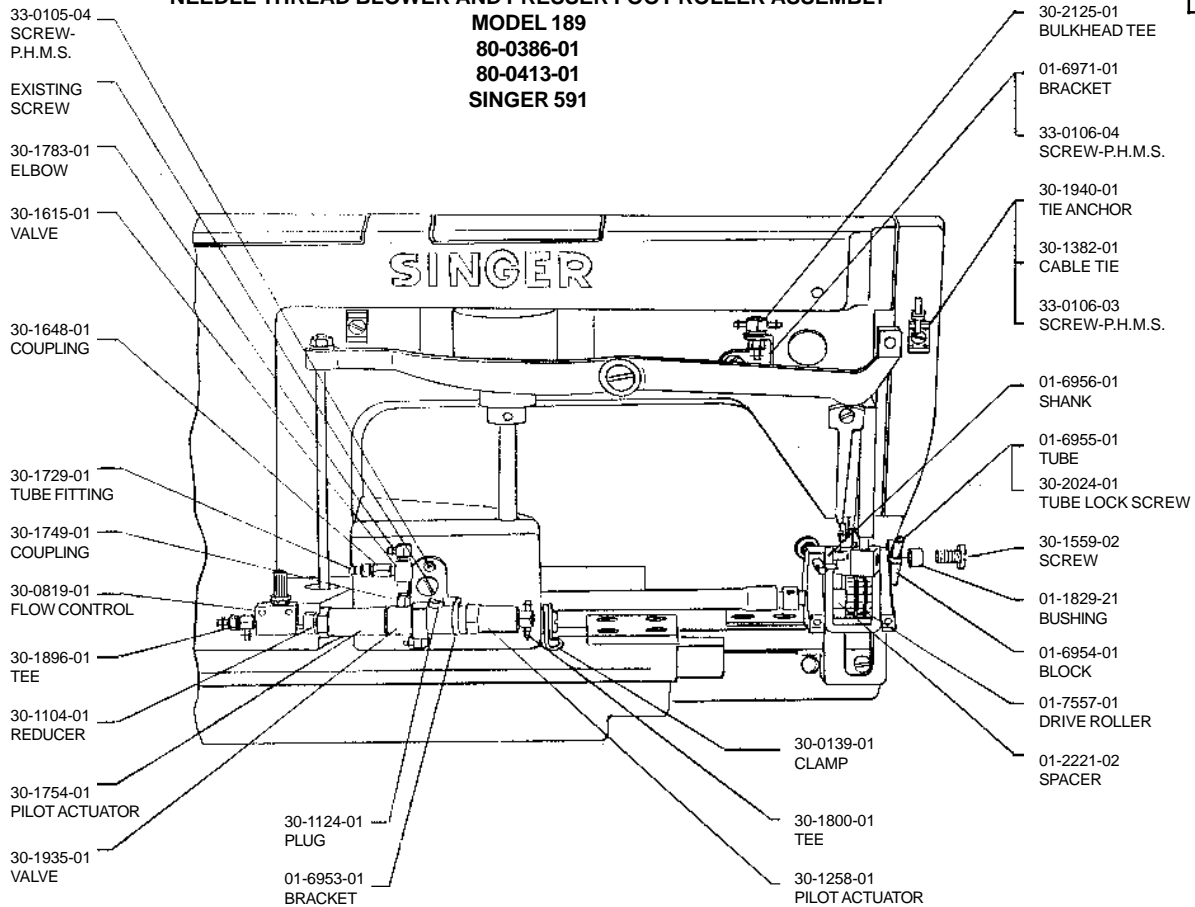


THREAD PULLOFF AND CUTTER DRIVE ASSEMBLY
MODEL 189
SINGER 591
80-0382 -01
80-0383-01



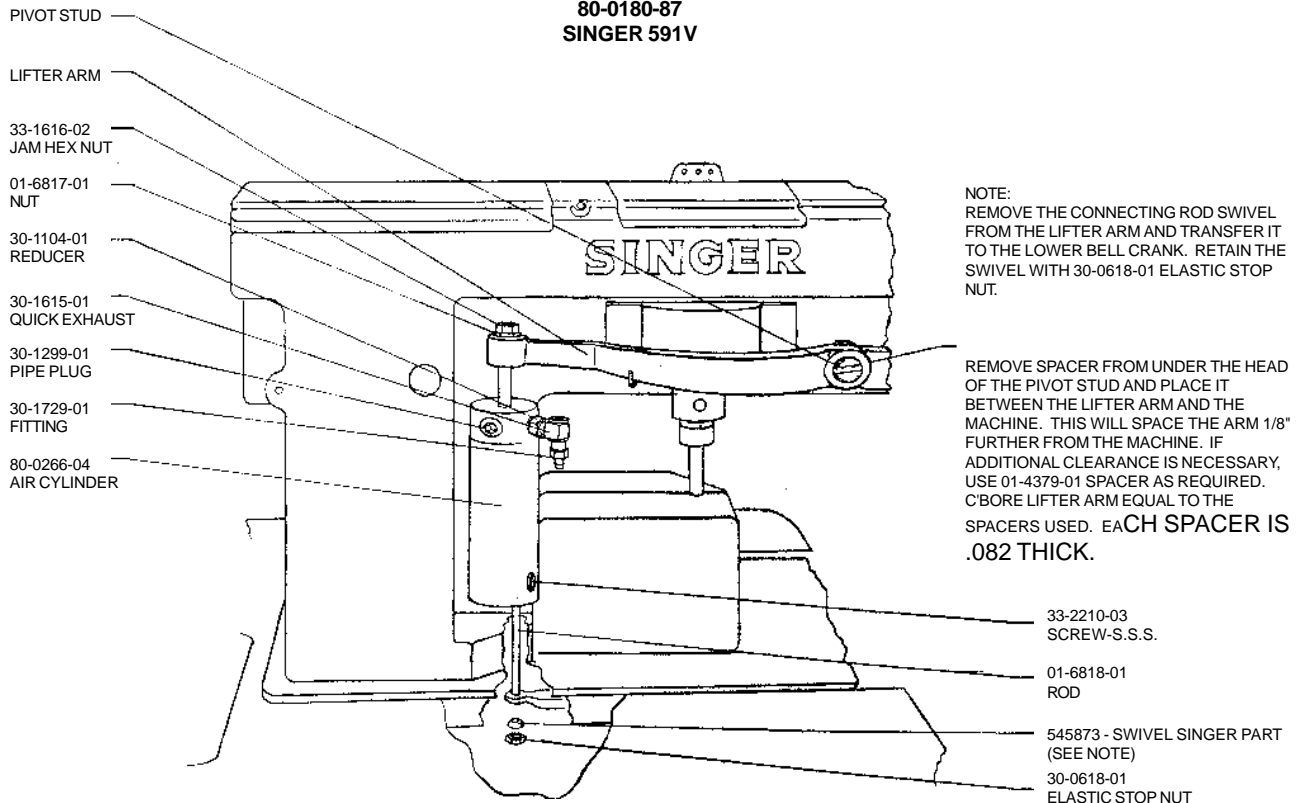
NEEDLE THREAD BLOWER AND PRESSER FOOT ROLLER ASSEMBLY

**MODEL 189
80-0386-01
80-0413-01
SINGER 591**

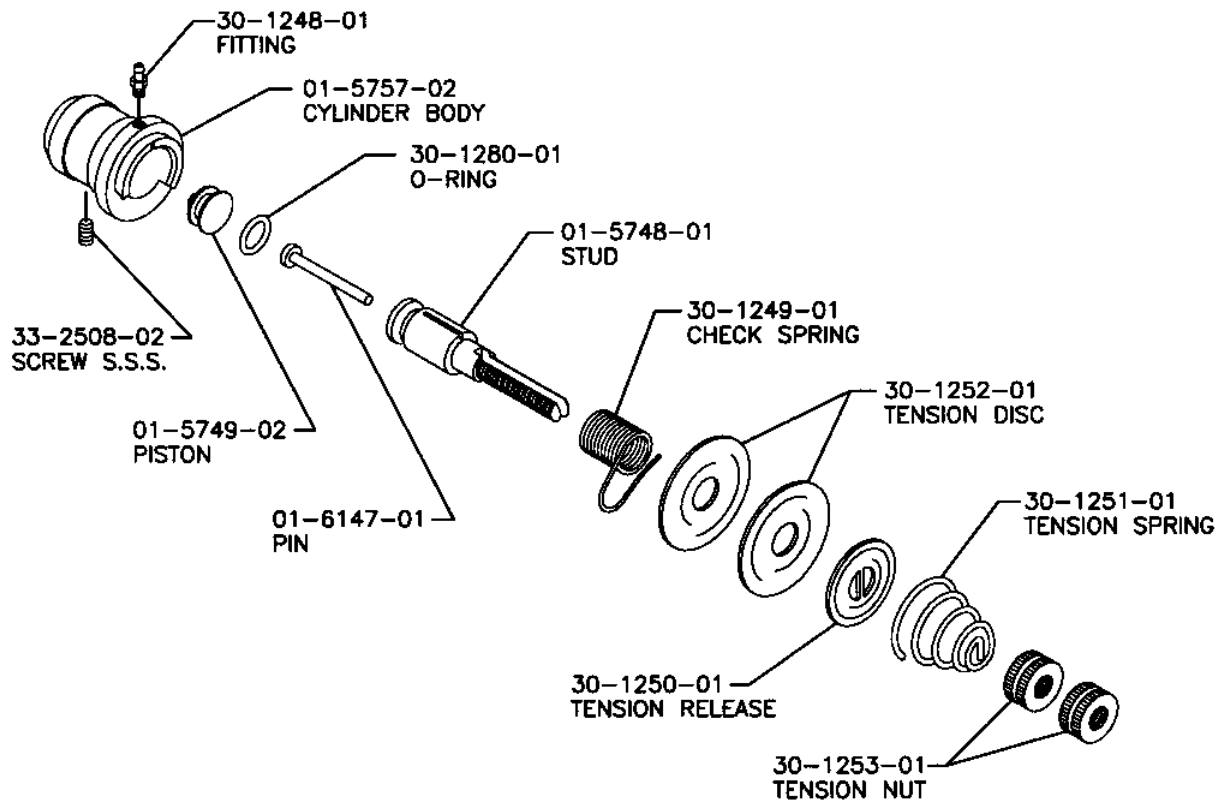


FOOTLIFTER ASSEMBLY - MANIFOLD ASSEMBLY

**MODEL 189
80-0180-87
SINGER 591V**

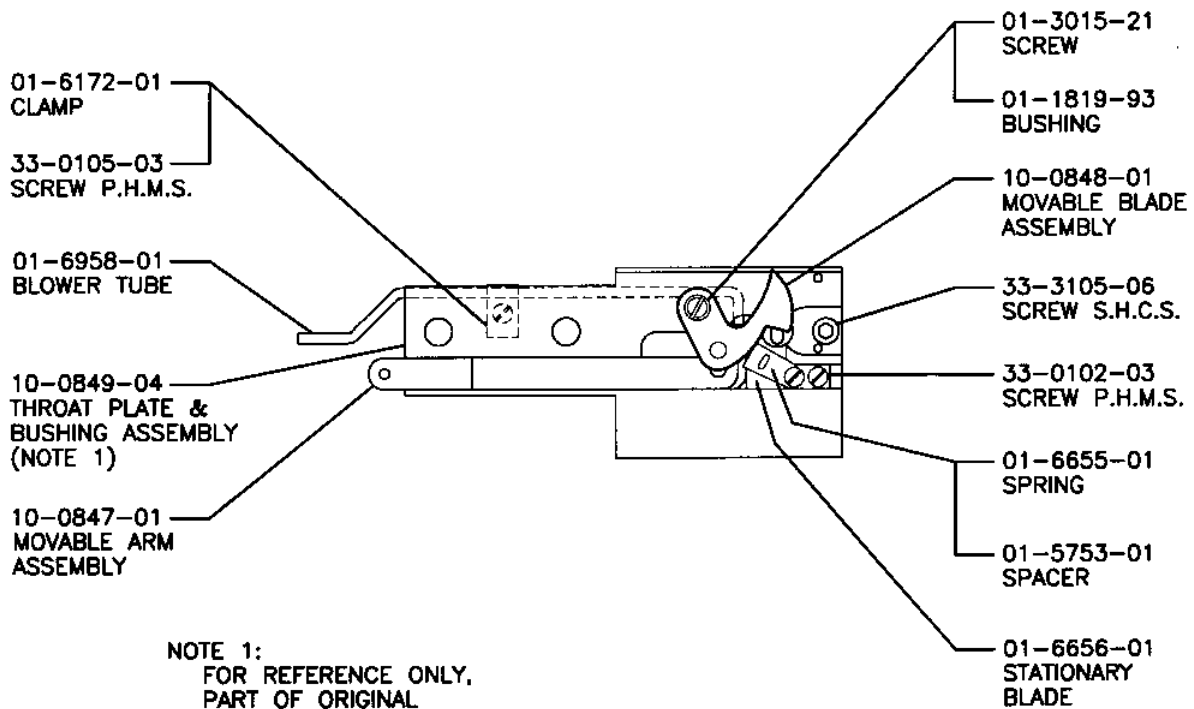


TENSION RELEASE ASSEMBLY
 MODEL 123, 137, 141, 189
 80-0241-02



INS-1016-1Q

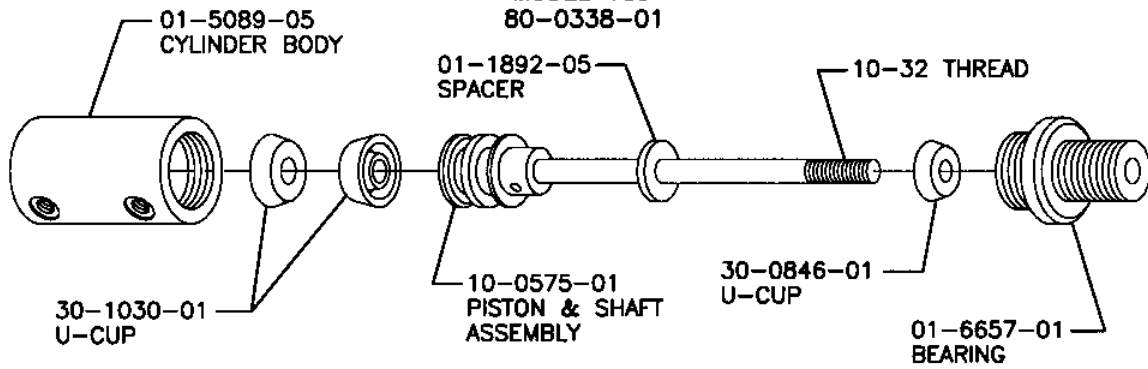
THROAT PLATE ASSEMBLY
 MODEL 189, SINGER 591
 80-0340-04



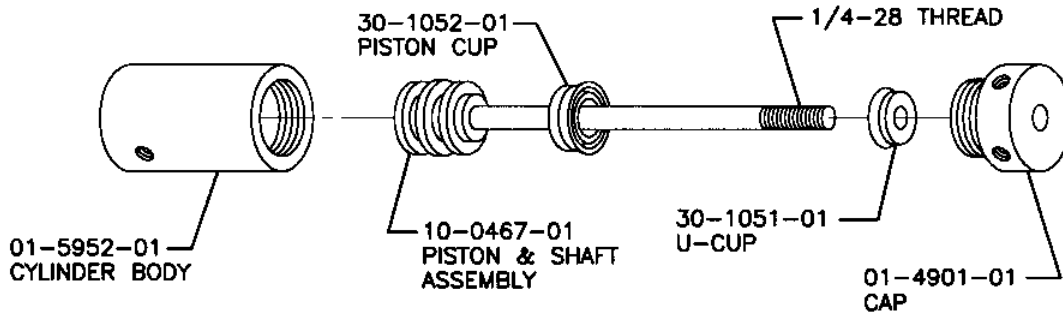
NOTE 1:
 FOR REFERENCE ONLY,
 PART OF ORIGINAL
 MACHINE ASSEMBLY.

INS-1950C

AIR CYLINDER-DOUBLE ACTING
MODEL 189
80-0338-01

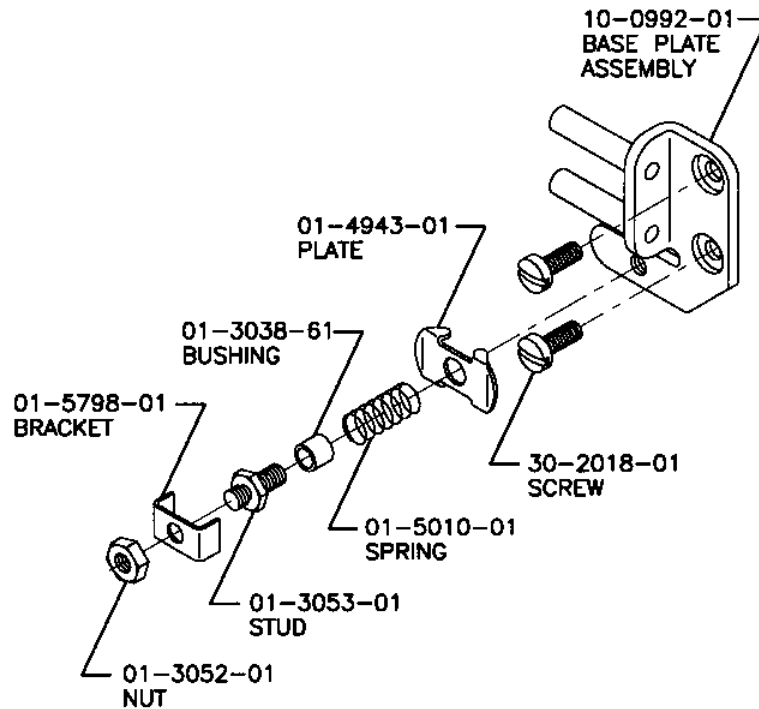


AIR CYLINDER-FOOTLIFTER
80-0266-04



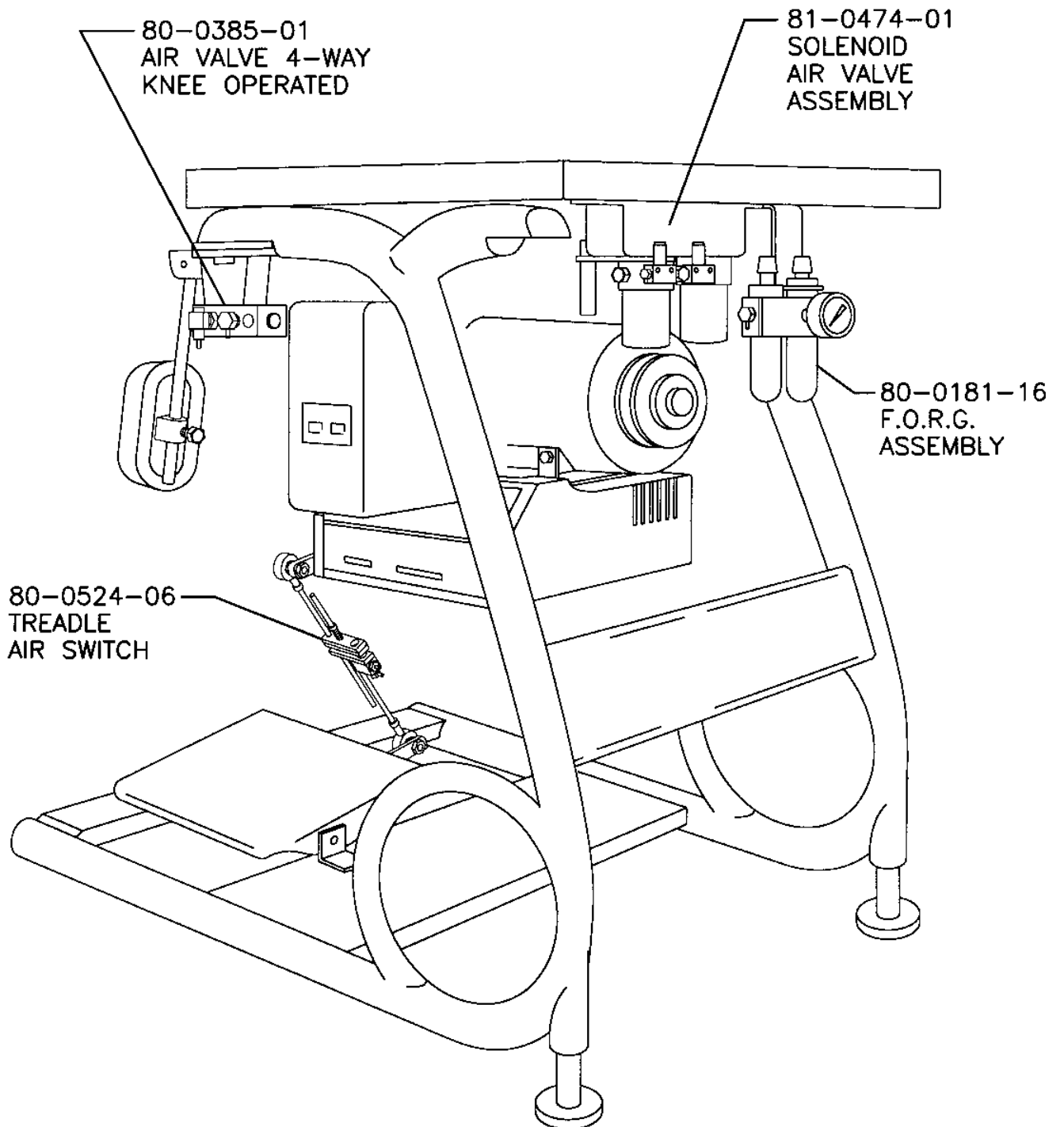
INS-1959C

THREAD NIPPER ASSEMBLY
MODEL 189 SINGER 591
10-0991-01

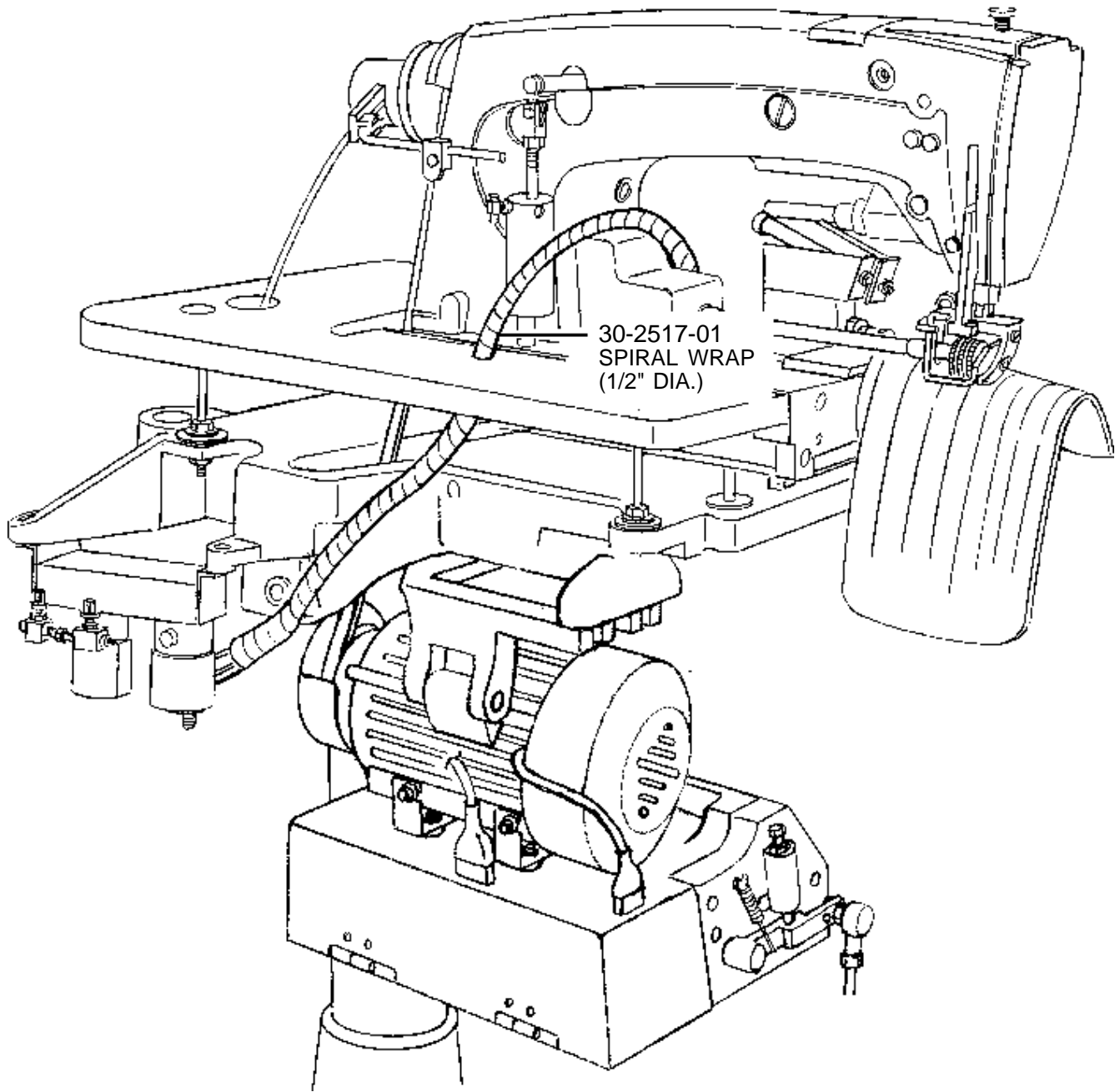


INS-1960-1B

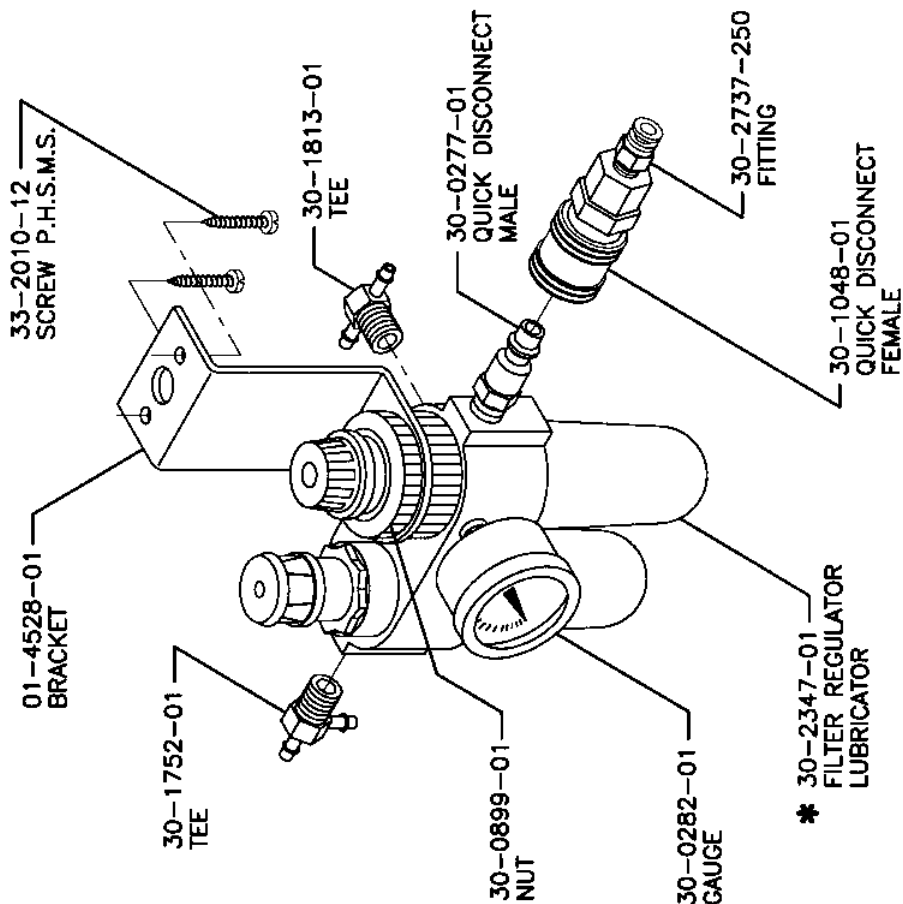
INSTALLATION OF AIR CONTROL & FOLDER OPENER AIR VALVE MODEL 189 SINGER 591



SPIRAL WRAP INSTALLATION
MODEL 189
UNION SPECIAL 63900



FILTER, OILER, REGULATOR, GAUGE ASSEMBLY
80-0181-16

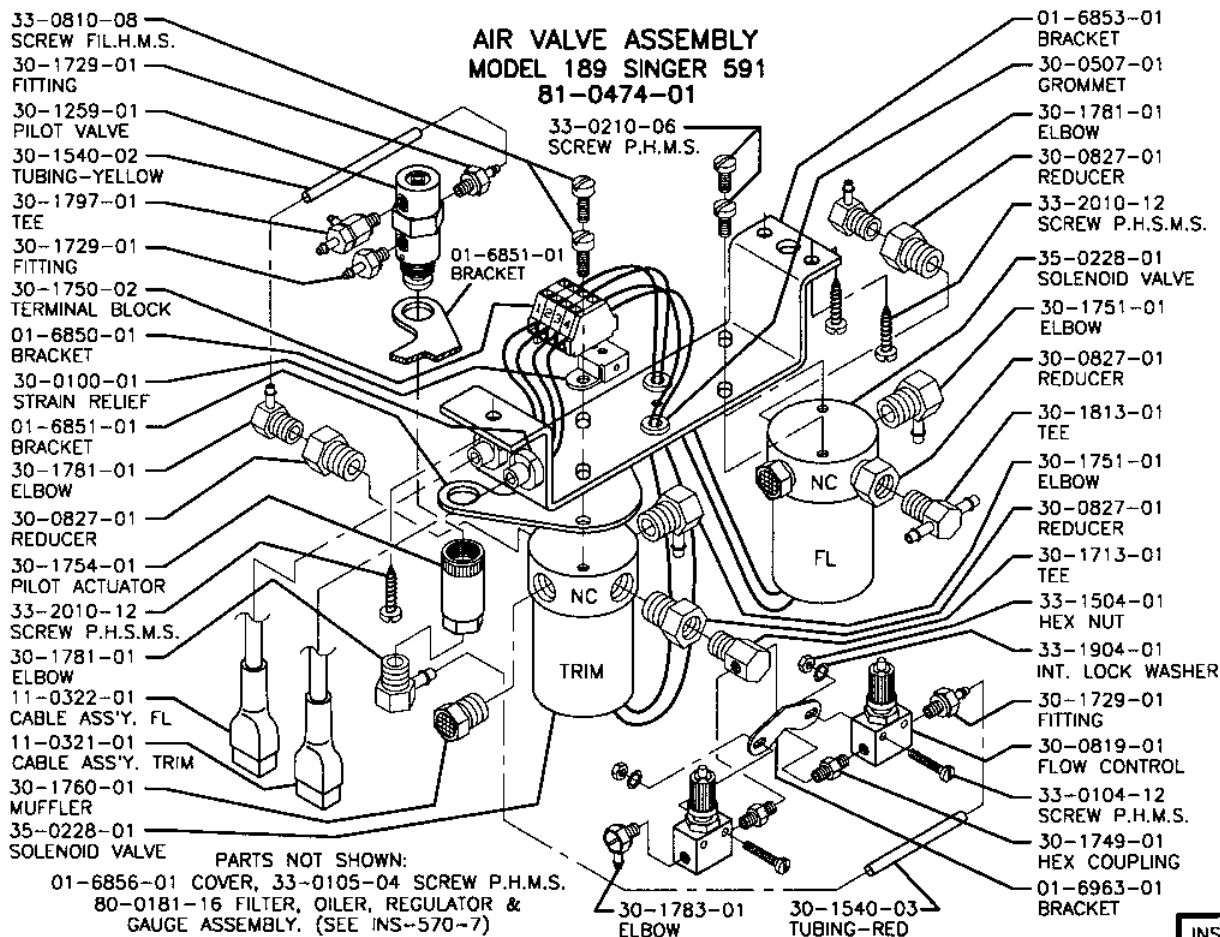


* 30-2347-01
FILTER REGULATOR
LUBRICATOR

* NOTE: SEE INS-DRAWINGS 2100-1 AND
2100-2 FOR SPARE PARTS

INS-570-7B

AIR VALVE ASSEMBLY
MODEL 189 SINGER 591
81-0474-01

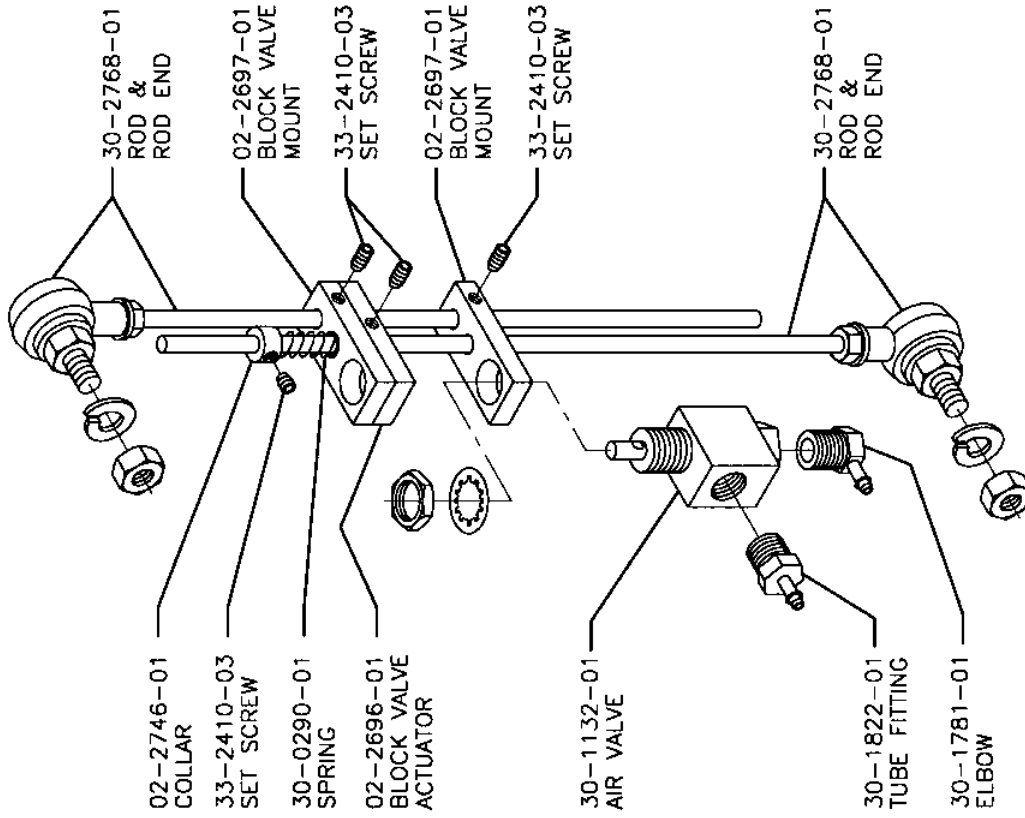


PARTS NOT SHOWN:

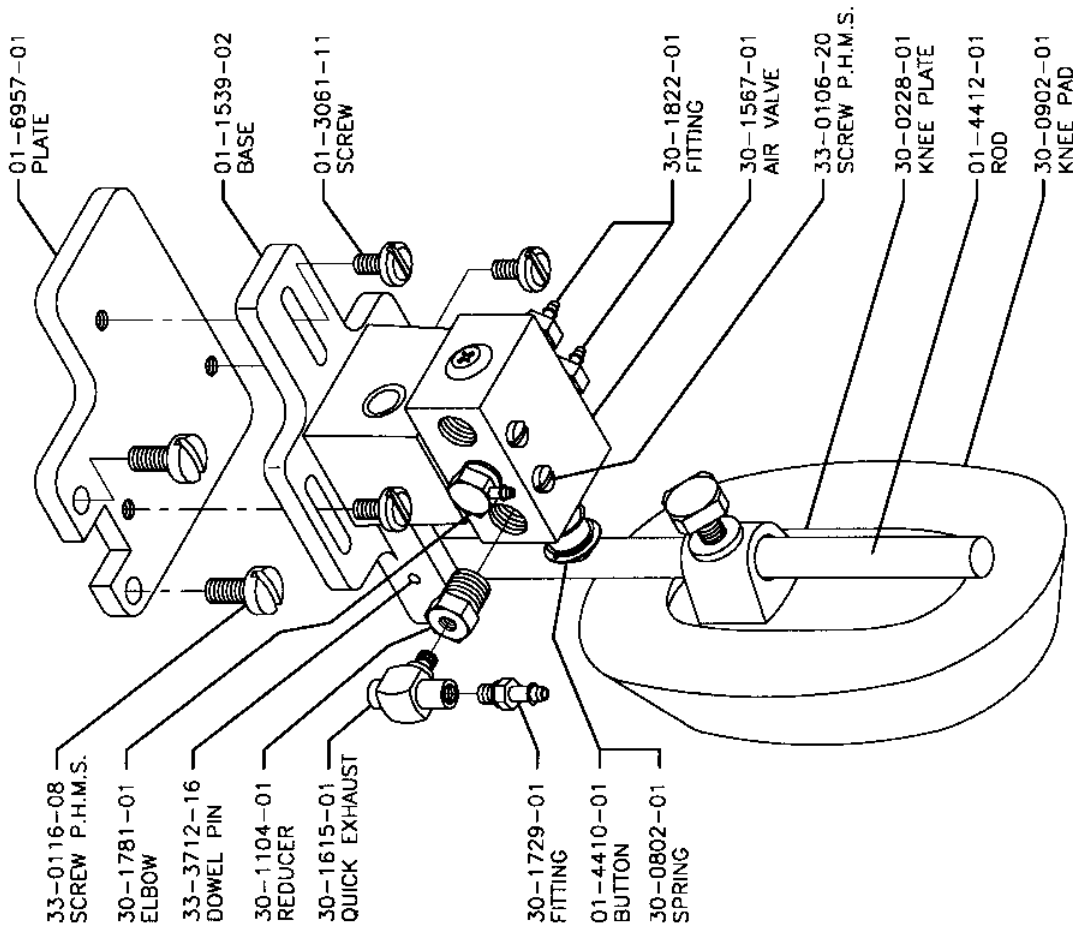
01-6856-01 COVER, 33-0105-04 SCREW P.H.S.M.S.
80-0181-16 FILTER, OILER, REGULATOR &
GAUGE ASSEMBLY. (SEE INS-570-7)

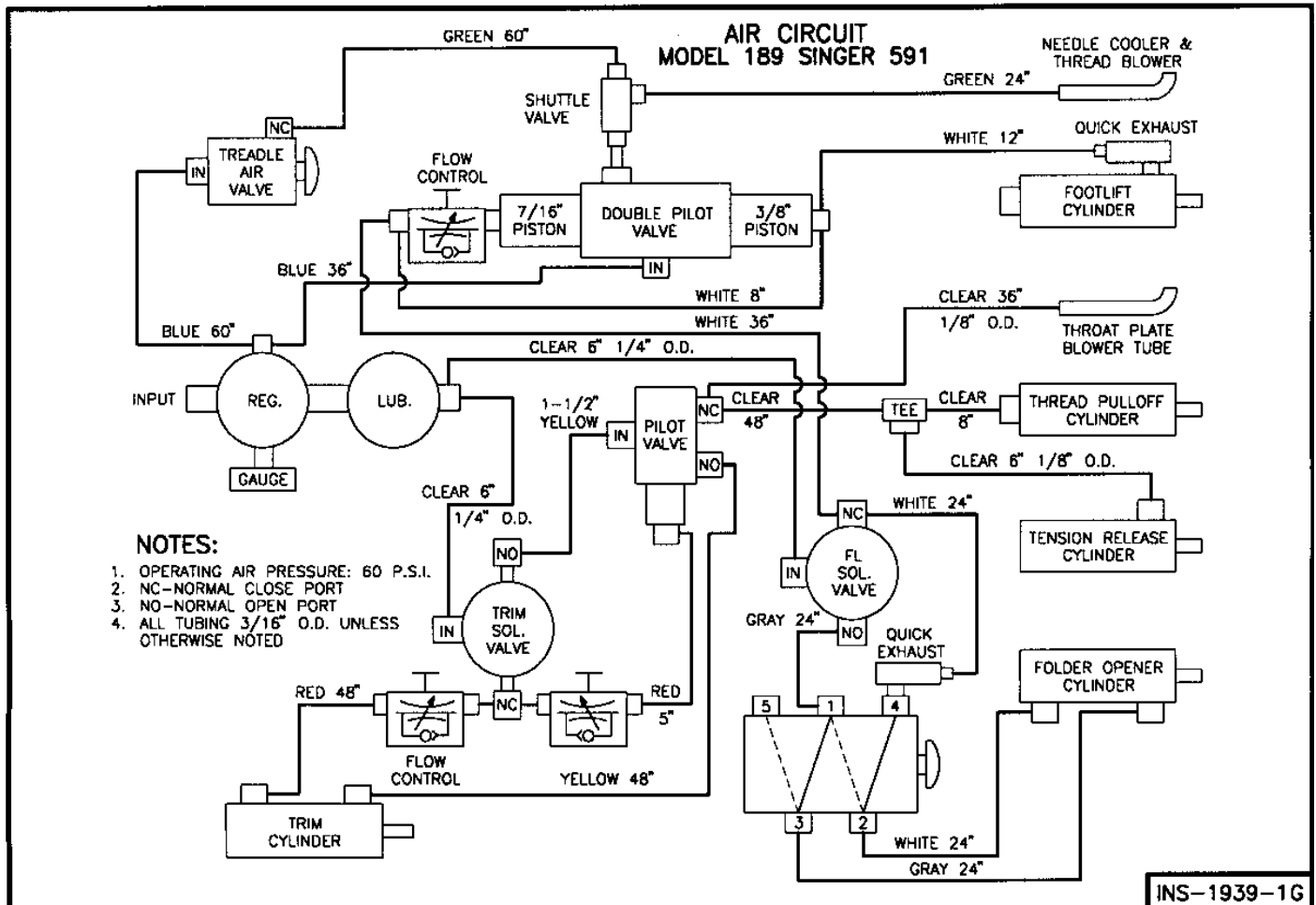
INS-1945-1F

TREADLE AIR SWITCH
TOE ACTION-3/16 TUBING
80-0524-06



AIR VALVE 4 WAY KNEE OPERATED
80-0385-01

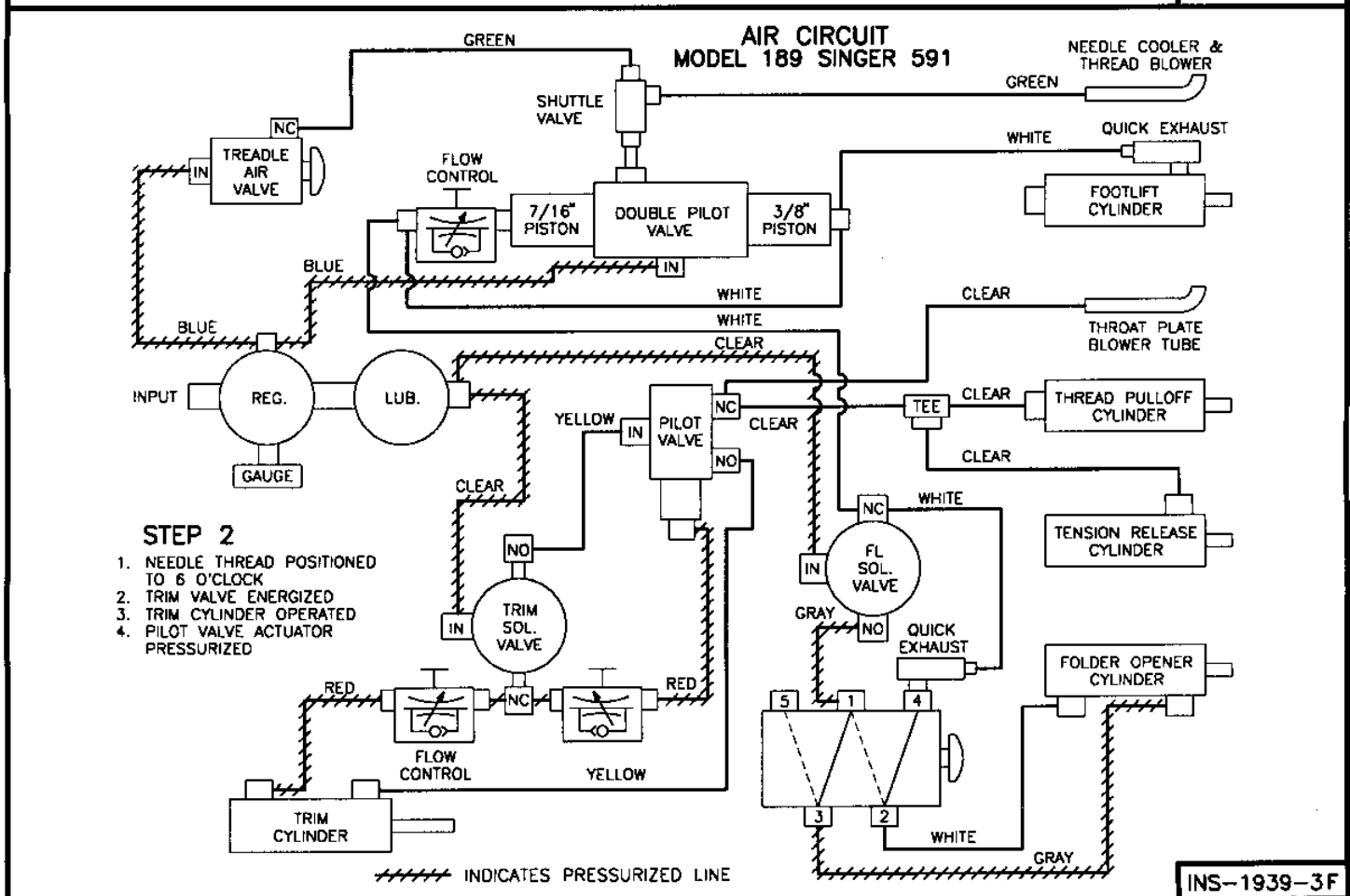
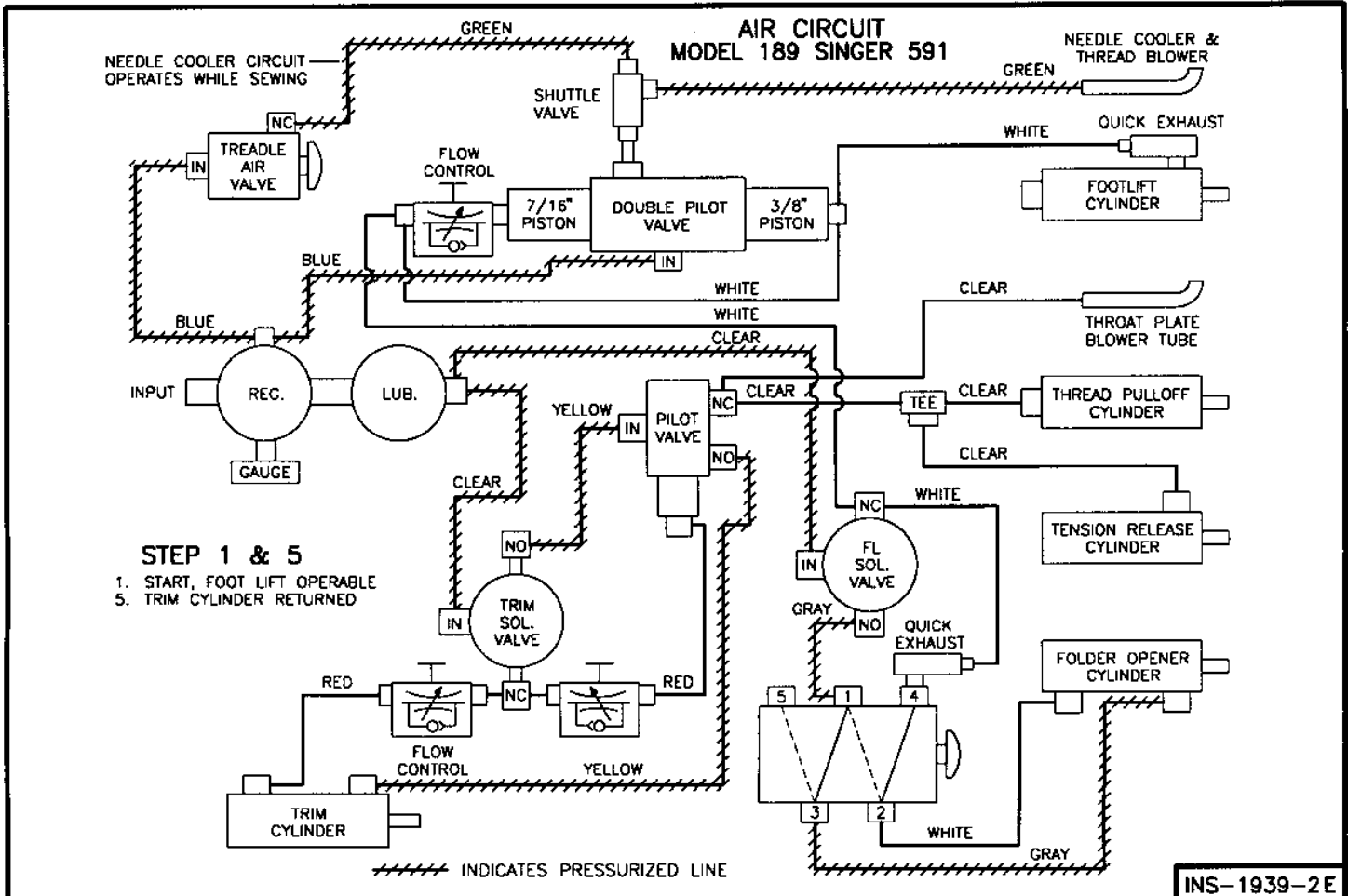




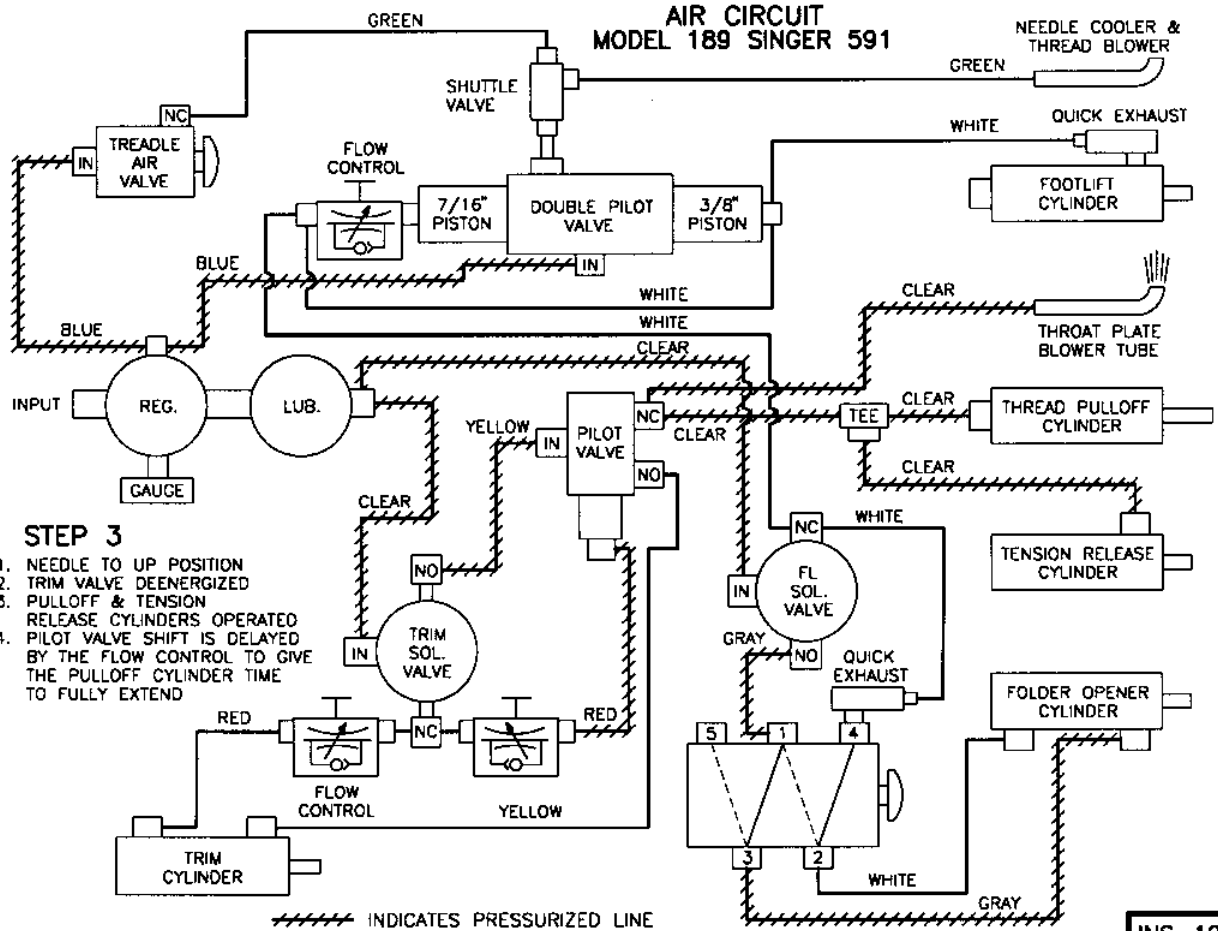
TUBING LIST

1/4" O.D.-3/16" I.D. TUBING	3/16" O.D. TUBING	1/8" O.D. TUBING
30-0287-01 RED 30-0287-02 YELLOW 30-0287-03 WHITE 30-0287-04 GREEN 30-0287-05 BLUE 30-0287-06 GRAY 30-0287-07 ORANGE 30-0287-08 PURPLE 30-0287-09 BLACK	30-1540-01 CLEAR 30-1540-02 YELLOW 30-1540-03 RED 30-1540-04 WHITE 30-1540-05 BLUE 30-1540-06 GREEN 30-1540-07 ORANGE 30-1540-08 BLACK 30-1540-09 GRAY 30-1540-10 BROWN	30-1134-01 CLEAR 30-1134-02 YELLOW 30-1134-03 RED 30-1134-04 BLACK 30-1134-05 BLUE 30-1134-06 GREEN 30-1134-07 ORANGE 30-1134-08 WHITE 30-1134-09 GRAY
1/4" O.D.-1/8" I.D. TUBING	SPIRAL WRAP	
30-2102-01 CLEAR	30-2517-01 1/2" DIA.	

WHEN PURCHASING TUBING SPECIFY LENGTH REQUIRED IN FEET

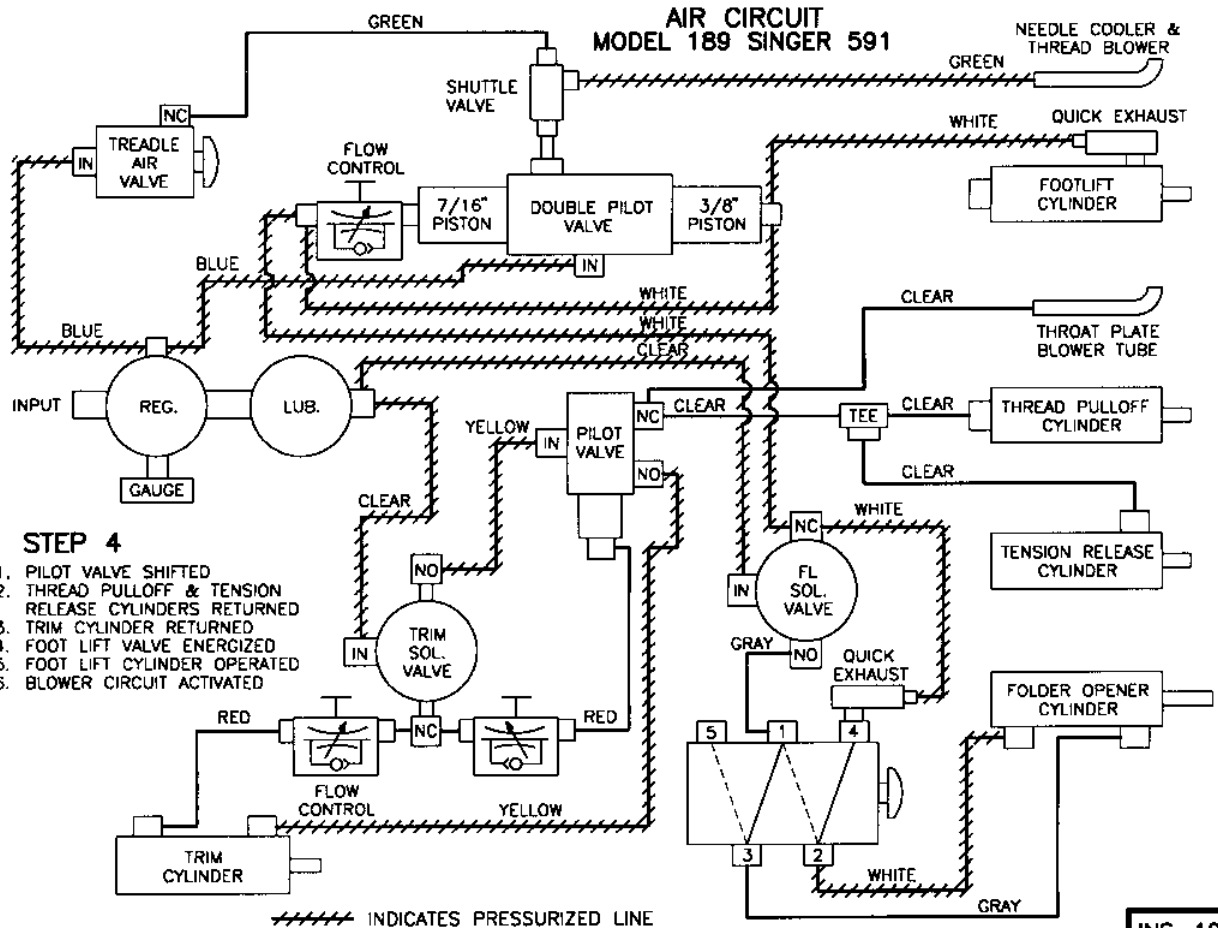


**AIR CIRCUIT
MODEL 189 SINGER 591**



INS-1939-4 F

**AIR CIRCUIT
MODEL 189 SINGER 591**



INS-1939-5 F

FILTER/REGULATOR

OPERATION

AIR ENTERS THE INTEGRAL FILTER/REGULATOR UNIT AND IS DIRECTED DOWNWARD THROUGH A SET OF LOUVERS (10) TO IMPART A WHIRLING ACTION. THIS CENTRIFUGAL ACTION CAUSES LIQUID PARTICLES TO BE SEPARATED FROM THE AIR STREAM AND SETTLE TO THE BOTTOM OF THE BOWL. ACCUMULATED LIQUID IS DRAINED MANUALLY (15).

AIR THEN PASSES THROUGH THE SINTERED BRONZE FILTER ELEMENT (11) WHERE SMALLER SIZE FOREIGN PARTICLES ARE REMOVED.

THE CLEAN AIR PASSES THROUGH THE VALVE (5,6,7,8) OF THE REGULATOR AND IS CONTROLLED TO A PRESSURE, DETERMINED BY THE ADJUSTMENT OF THE REGULATOR. PRESSURE IS INCREASED BY ROTATING THE KNOB CLOCKWISE, OR DECREASED BY ROTATING THE KNOB COUNTERCLOCKWISE.

CAUTION: THIS MINIATURE INTEGRAL FILTER/REGULATOR SHOULD NOT BE USED IN APPLICATIONS WHICH MAY EXCEED 250 PSIG. DURING MAINTENANCE PERIODS, INSPECT AND CLEAN EACH PART CAREFULLY, USING ONLY CLEAR, WARM WATER OR KEROSENE. DO NOT USE SOLVENTS AS THE POLYCARBONATE BOWL MAY BE DAMAGED.

MAINTENANCE:

REGULATOR SECTION: DISASSEMBLE THE REGULATOR SECTION AS FOLLOWS: TURN OFF AIR SUPPLY. TURN THE ADJUSTING KNOB COUNTERCLOCKWISE TO RELIEVE COMPRESSION ON THE REGULATING SPRING (2). UNSCREW THE BONNET (1), REMOVE THE REGULATING SPRING (2), AND PISTON ASSEMBLY (4). UNSCREW THE VALVE SEAT (5) WITH A 3/8" SOCKET AND REMOVE THE VALVE ASSEMBLY (7) AND VALVE SPRING (8).

CLEAN AND INSPECT EACH PART FOR WEAR OR DAMAGE. REPLACE IF NECESSARY.

CAUTION: WHEN REASSEMBLING, VALVE SEAT (5) SHOULD NOT BE TIGHTENED TO MORE THAN 4 TO 6 INCH POUND TORQUE. BONNET ASSEMBLY (1) SHOULD BE TIGHTENED 50 TO 60 INCH POUNDS TORQUE.

MANUAL DRAIN FILTER SECTION: TO SERVICE THE FILTER SECTION SHUT OFF THE AIR PRESSURE. UNSCREW BOWL ASSEMBLY (14) AND REMOVE "O" RING (9) UNSCREW STUD (13) AND FROM THE STUD REMOVE FILTER ELEMENT (11), LOUVER (10) AND GASKETS (12). THE FILTER ELEMENT SHOULD BE CLEANED PERIODICALLY WITH KEROSENE AND BLOWN OUT WITH COMPRESSED AIR.

AFTER CLEANING, INSPECT EACH PART CAREFULLY, REPLACE ANY DAMAGED PARTS. WHEN REASSEMBLING, TIGHTEN STUD (13) TO 5 TO 10 INCH POUNDS TORQUE.

LUBRICATOR

CAUTION: THIS UNIT HAS A POLYCARBONATE BOWL.

1. BE SURE IT IS NOT MOUNTED WHERE TEMPERATURES OF 125 FOR MORE WILL BE NEAR IT, OR ON A LINE WHERE AIR PRESSURE EXCEEDS 150PSI.
2. BEWARE OF CONDITIONS, FUMES AND FLUIDS THAT WILL HARM THE TRANSPARENT BOWL.
3. TO CLEAN BOWL, RINSE OR WIPE WITH A PETROLEUM SOLVENT ONLY, SUCH AS KEROSENE, OR HOUSEHOLD DISHWASHER DETERGENT.
4. DO NOT USE NEAR, OR CLEAN WITH SUCH MATERIALS AS ACETONE, ALCOHOL, BENZENE, DIOXANE, ETHYL ACETATE, LACQUER THINNER, TOLUENE, CHLORIDE, CARBON TETRACHLORIDE, ALKALIES, AMINES, ESTERS, KETONES AND AROMATIC HYDROCARBONS.
5. DO NOT INSTALL ON A COMPRESSED AIR LINE WHERE THE COMPRESSOR IS LUBRICATED WITH, OR THE AIR CONTAINS, A SYNTHETIC, FIRE-RESISTANT LUBRICANT.

IMPORTANT: INSTALLATIONS INSTRUCTIONS FOR LUBRICATORS.

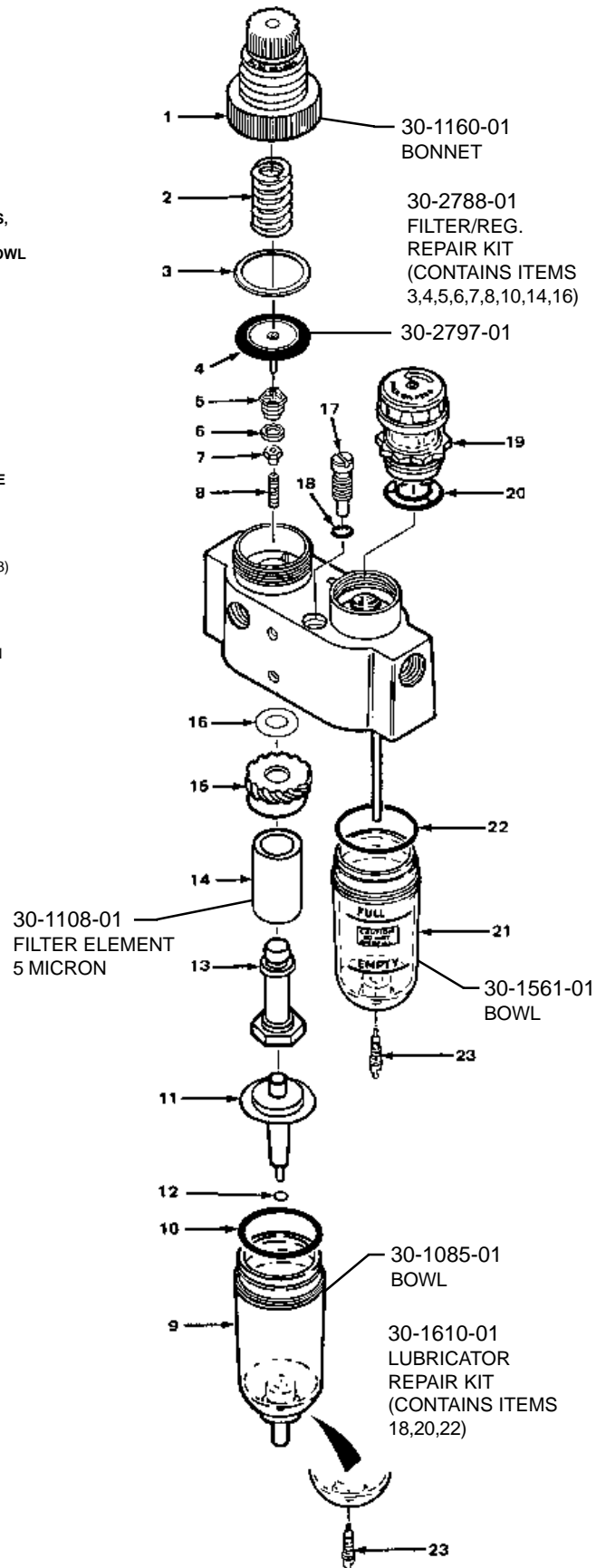
WHERE AND HOW TO INSTALL:

1. INSTALL AS CLOSE AS FEASIBLE TO EQUIPMENT TO BE LUBRICATED WITH AIR FLOWING IN AND OUT PORTS SO MARKED.
2. TO FILL THE LUBRICATOR, TURN OFF AIR PRESSURE, REMOVE BOWL AND FILL.
3. POUR IN ONLY CLEAN OIL. SAE 10 OR LIGHTER USUALLY IS BEST, NEVER USE ONE OF THE FOLLOWING OILS: CELLULUBE #150 AND #220, KANO KROIL, KEYSTONE PENETRATING OIL #2 OR PYDRAUL AC.
4. AS SOON AS AIR PRESSURE REBUILDS INSIDE THE BOWL, OIL WILL DRIP THROUGH THE SIGHT GAUGE. CONTROL THE RATE OF OIL ENTERING THE AIR STREAM BY TURNING THE ADJUSTMENT SCREW DOWN TO GIVE LESS OIL AND UP TO GIVE MORE OIL. THIS IS A UNIQUE LUBRICATOR. YOU ADJUST THIS TYPE SO THAT WHILE THE SMALLEST AMOUNT OF AIR IS FLOWING THROUGH IT YOU GET THE DESIRED AMOUNT OF OIL FOR THAT FLOW. THE MORE THE AIR FLOW INCREASES, THE MORE OIL YOU WILL NEED AND THE MORE YOU WILL GET AUTOMATICALLY.

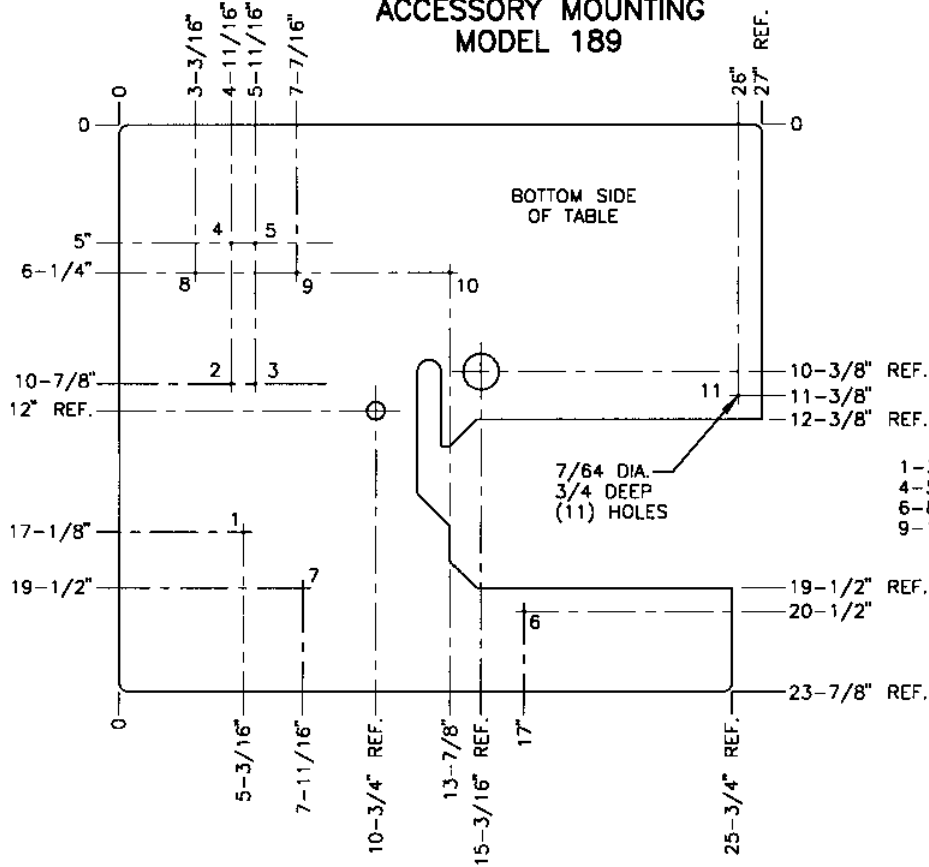
HOW TO MAINTAIN:

1. PERIODICALLY CLEAN ADJUSTING SCREW NEEDLE VALVE AND SEAT BY SWISHING A CLEANER AND BLOWING OFF WITH AIR.
2. DRAIN OFF ANY CONTAMINANTS OR WATER IF THEY SETTLE IN THE BOTTOM OF THE BOWL.

FILTER, REGULATOR, AND LUBRICATOR 30-2347-01

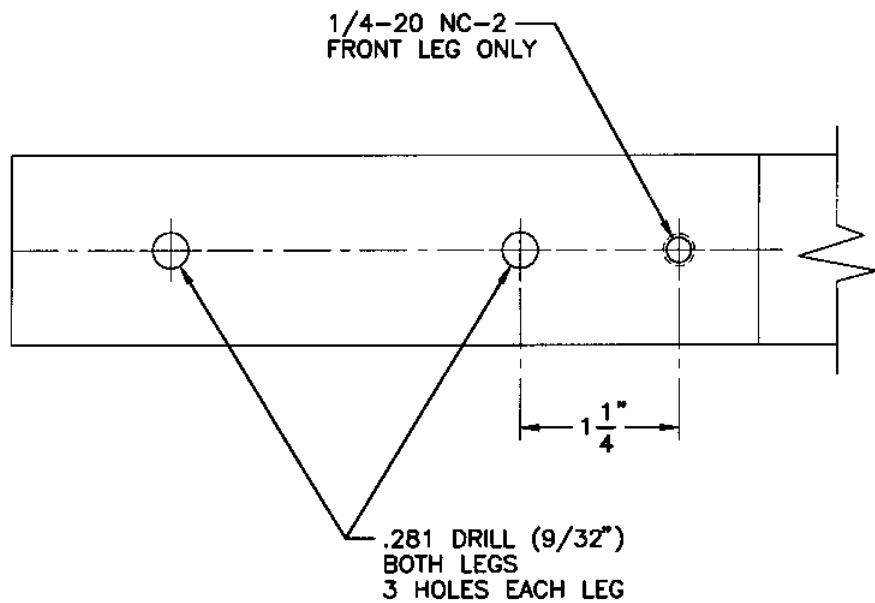


**SINGER 591 TABLE
ACCESSORY MOUNTING
MODEL 189**

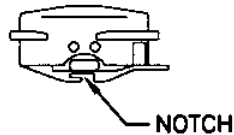


INS-2004A

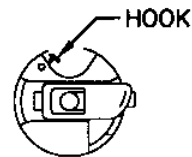
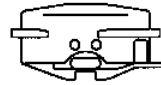
REWORK-SINGER TABLE LEGS



INS-2005A

BOBBIN CASE AND BOBBIN CASE BASESINGER 591V
MODEL 189BOBBIN CASE BASE
FOR HOOK NO. 544784BOBBIN CASE
540735 SINGER NO.

BOBBIN CASE BASE

BOBBIN CASE
147149 SINGER NO.
30-1281-01 CLINTON NO.

HOOK NO. 544784 IS NORMALLY SUPPLIED BY SINGER FOR THE 591V MACHINE. THIS HOOK IS SUITABLE FOR USE WITH THE CLINTON MODEL 189 THREAD TRIMMER. THE NOTCH IN THE BASE WILL POSITION THE BOBBIN THREAD PROPERLY FOR PICK UP BY THE THREAD TRIMMER MOVABLE BLADE.

IF A BASE WITHOUT THE NOTCH IS USED, AS IN THE RIGHT HAND DRAWING, THEN SINGER BOBBIN CASE 147149 MUST BE USED. THE THREAD MUST PASS THROUGH THE HOOK TO POSITION THE BOBBIN THREAD FOR PICK UP.

WITHOUT ONE OF THE ABOVE COMBINATIONS, THE BOBBIN THREAD WILL NOT BE PICKED UP FOR TRIMMING.

INS-2007A