CLINTON'S MODEL 189
UNDERBED TRIMMER FOR SINGER 591

SERVICE MANUAL

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**THREAD TRIMMER SECTION**

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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 operator's 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 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 lock screw, adjust spring tension, tighten lock screw 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 is (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

<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>CAUSES</th>
<th>CORRECTIVE ACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Needle thread not cut. Bobbin thread is cut</td>
<td>Defective PC Board</td>
<td>Replace board</td>
</tr>
<tr>
<td></td>
<td>Movable blade missed needle loop</td>
<td>Check synchronizer timing to see that trimmer is fired at correct time</td>
</tr>
<tr>
<td></td>
<td>Binds in trimmer linkage</td>
<td>Locate and remove bind. A light bind would slow it enough to miss needle loop</td>
</tr>
<tr>
<td>Both threads not cut not picked up</td>
<td>Defective movable blade</td>
<td>Replace</td>
</tr>
<tr>
<td></td>
<td>Water in air lines</td>
<td>Check filter. Remove water from air lines</td>
</tr>
<tr>
<td></td>
<td>Defective solenoid air valve or air cylinder</td>
<td>Repair or replace</td>
</tr>
<tr>
<td></td>
<td>Defective PC board</td>
<td>Replace board</td>
</tr>
<tr>
<td></td>
<td>Binds in trimmer linkage</td>
<td>Locate and remove bind</td>
</tr>
<tr>
<td>Both threads picked up, not cut</td>
<td>Defective movable or stationary blade</td>
<td>Replace</td>
</tr>
<tr>
<td></td>
<td>Stroke misadjusted failing to reach cutting position</td>
<td>Readjust</td>
</tr>
<tr>
<td>Needle thread cut short</td>
<td>Pulloff cylinder improperly adjusted</td>
<td>Readjust</td>
</tr>
<tr>
<td>Long tail left on top side at start of sewing</td>
<td>Blower not operating causing thread to be trapped under presser foot. Operator not removing garment fast enough</td>
<td>Check blower circuit and flow control adjustment. If blower time is short readjust flow control to increase</td>
</tr>
<tr>
<td>Bobbin thread is cut short</td>
<td>Bobbin tension too tight</td>
<td>Loosen bobbin tension as much as possible</td>
</tr>
<tr>
<td></td>
<td>Bobbin thread slipped out of hook on case</td>
<td>Run Bobbin thread through hook</td>
</tr>
<tr>
<td></td>
<td>Bobbin case without hook being used</td>
<td>Replace with correct bobbin case</td>
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NOTE: ALL PARTS NOT IDENTIFIED ARE SUPPLIED BY SINGER. SEE SINGER PARTS MANUAL.
FOOTLIFTER ASSEMBLY - MANIFOLD ASSEMBLY
MODEL 189
80-0180-87
SINGER 591V

NOTE:
REMOVE THE CONNECTING ROD SWIVEL FROM THE LIFTER ARM AND TRANSFER IT TO THE LOWER BELL CRANK. RETAIN THE SWIVEL WITH 30-0618-01 ELASTIC STOP NUT.

REMOVE SPACER FROM UNDER THE HEAD OF THE PIVOT STUD AND PLACE IT BETWEEN THE LIFTER ARM AND THE MACHINE. THIS WILL SPAC THE ARM 1/8" FURTHER FROM THE MACHINE. IF ADDITIONAL CLEARANCE IS NECESSARY, USE 01-4379-01 SPACER AS REQUIRED. C'BORE LIFTER ARM EQUAL TO THE SPACERS USED. EACH SPACER IS .082 THICK.
TENSION RELEASE ASSEMBLY
MODEL 123, 137, 141, 189
80-0241-02

30-1248-01
FITTING
01-5757-02
CYLINDER BODY
30-1280-01
O-RING
01-5748-01
STUD
30-1249-01
CHECK SPRING
30-1252-01
TENSION DISC
30-1251-01
TENSION SPRING
30-1250-01
TENSION RELEASE
30-1253-01
TENSION NUT

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

01-6172-01
CLAMP
33-0105-03
SCREW P.H.M.S.
01-6958-01
BLOWER TUBE
10-0849-04
THROAT PLATE & BUSHING ASSEMBLY (NOTE 1)
10-0847-01
MOBILE ARM ASSEMBLY

01-3015-21
SCREW
01-1819-93
BUSHING
10-0848-01
MOBILE BLADE ASSEMBLY
33-3105-06
SCREW S.H.C.S.
33-0102-03
SCREW P.H.M.S.
01-6655-01
SPRING
01-5753-01
SPACER
01-6656-01
STATIONARY BLADE

NOTE 1:
FOR REFERENCE ONLY.
PART OF ORIGINAL MACHINE ASSEMBLY.
INSTALLATION OF AIR CONTROL &
FOLDER OPENER AIR VALVE
MODEL 189 SINGER 591

80-0385-01
AIR VALVE 4-WAY
KNEE OPERATED

81-0474-01
SOLENOID
AIR VALVE
ASSEMBLY

80-0181-16
F.O.R.G.
ASSEMBLY

80-0524-06
TREADLE
AIR SWITCH
SPIRAL WRAP INSTALLATION
MODEL 189
UNION SPECIAL 63900

30-2517-01
SPIRAL WRAP
(1/2" DIA.)
TUBING LIST

1/4" O.D. - 3/16" I.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 |

3/16" O.D. TUBING

| 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 |

1/8" O.D. TUBING

| 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**

**STEP 1 & 5**
1. START, FOOT LIFT OPERABLE
5. TRIM CYLINDER RETURNED

**STEP 2**
1. NEEDLE THREAD POSITIONED TO 6 O'CLOCK
2. TRIM VALVE ENERGIZED
3. TRIM CYLINDER OPERATED
4. PILOT VALVE ACTUATOR PRESSURIZED

**INDICATES PRESSURIZED LINE**
AIR CIRCUIT
MODEL 189 SINGER 591

STEP 3
1. NEEDLE TO UP POSITION
2. TRIM VALVE DEENERGIZED
3. PULLOFF & TENSION
   RELEASE CYLINDERS OPERATED
4. PILOT VALVE SHIFTS IS DELAYED
   BY THE FLOW CONTROL TO GIVE
   THE PULLOFF CYLINDER TIME
   TO FULLY EXTEND

STEP 4
1. PILOT VALVE SHIFTS
2. THREAD PULLOFF & TENSION
   RELEASE CYLINDERS RETURNED
3. TRIM CYLINDER RETURNED
4. FOOT LIFT VALVE ENERGIZED
5. FOOT LIFT CYLINDER OPERATED
6. BLOWER CIRCUIT ACTIVATED

INDICATES PRESSURIZED LINE
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:


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, ETHER 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 KROL, KEYSTONE PENETRATING OIL #2 OR PYDRAUL AC.


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.

From the library of: Superior Sewing Machine & Supply LLC
SINGER 591 TABLE
ACCESSORY MOUNTING
MODEL 189

BOTTOM SIDE
OF TABLE

7/64 DIA.
3/4 DEEP
(11) HOLES

1-3 SGL. VALVE ASS'Y.
4-5 T.O.R.O.
6-8-A111 7/16 PLASTIC CLAMP
9-10 7/8 PLASTIC CLAMP

REWORK—SINGER TABLE LEGS

1/4-20 NC-2
FRONT LEG ONLY

.281 DRILL (9/32")
BOTH LEGS
3 HOLES EACH LEG

From the library of: Superior Sewing Machine & Supply LLC
BOBBIN CASE AND BOBBIN CASE BASE
SINGER 591V
MODEL 189

BOBBIN CASE BASE
FOR HOOK NO. 544784

BOBBIN CASE
540735 SINGER NO.

NOTCH

BOBBIN CASE BASE

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

HOOK

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.