



Scan by Zenith

040-0970-00

M38984, M34168

7603

## FAN ADDITION

For TEKTRONIX® 7603 Oscilloscopes

Serial Numbers B010100 - B368864

This modification kit contains the parts and instructions for installing a fan system in a standard 7603 Oscilloscope. The fan provides cooling for improved reliability, especially when high power consumption plug-ins are used in the mainframe.

## PARTS INCLUDED IN MODIFICATION KIT:

Quantity	Part Number	Description
1 ea		Assembly, fan motor/impeller (consisting of)
1 ea	147-0008-00	Motor, ac, shaded pole, 3200 rpm, 115V, 60Hz
1 ea	369-0037-01	Impeller, fan, axial, 3.5" dia bl, cw, plstc
1 ea		Assembly, wire (consisting of)
0.5 ft	175-0809-01	Wire, elec, strd, 18AWG, 300V rms, green/yellow
2 ea	210-0202-00	Terminal, lug, 0.146 id, locking
1 ea		Assembly, power switch knob/extension shaft (consisting of)
1 ea	384-1601-01	Extension, 8.265 L x 0.125 OD, A1
0.25 ft	162-0530-00	Insulation, sleeving, elec, heat shrink, blk
1 ea		Assembly, cover, scope, right (consisting of)
1 ea	390-0800-00	Cover, scope, right
1 ea	352-0084-02	Bushing, Trace Rotation
1 ea		Assembly, Bracket, power switch (consisting of)
1 ea	334-2332-00	Marker, ident, "DANGER: VOLTAGE IN THIS AREA"
1 ea	407-2600-00	Bracket, angle, power switch, A1
1 ea	129-0858-00	Spacer, post, 1.125 L with 6-32 int thd one end
0.25 ft	162-0530-00	Insulation, sleeving, elec, heat shrink, blk
4 ea	210-0457-00	Nut, pl, assem wa, 6-32 x 0.312
2 ea	210-0863-00	Washer, loop clamp, 0.187 id, stl
2 ea	210-1003-00	Washer, flat, 0.2 id x 0.036 thk
8 ea	211-0008-00	Screw, mach, 4-40 x 0.250, pnh, poz
2 ea	+211-0538-00	Screw, mach, 6-32 x 0.312, flh, 100 deg, poz
3 ea	+211-0559-00	Screw, mach, 6-32 x 0.375, flh, 100 deg, poz
12 ea	+211-0578-00	Screw, mach, 6-32 x 0.438, pnh, stl, poz
2 ea	212-0557-00	Screw, mach, 10-32 x 0.500, rdh, poz
1 ea	337-1756-00	Shield, elec, fan motor
1 ea	337-1757-00	Shield, elec, regulator
2 ea	343-0004-00	Clamp, loop, 0.312 id, plstc
1 ea	378-0811-00	Baffle, air
1 ea	390-0798-00	Cover, scope, bottom
1 ea	390-0799-00	Cover, scope, left

## PARTS INCLUDED IN MODIFICATION KIT: (continued)

Quantity	Part Number	Description
1 ea	441-1129-00	Chassis, scope, Regulator
1 ea		Cable, power switch, braided shld, with 4 quick disconnect terminals and 1 lug terminal
1 ea		Cable, rbn, 2-conductor, 26AWG with four term connectors, one 3-wire gray holder, one 2-wire gray holder
1 ea		Cable, rbn, 4-conductor, 26AWG with eight term connectors, two 4-wire brn holders
1 ea		Cable, rbn, 10-conductor, 22AWG, with twenty term connectors, two 10-wire blk holders
1 ea		Marker, identification

## INSTRUCTIONS:

## WARNING

Before proceeding, position the POWER switch to OFF, then disconnect the instrument from the power source.

- ( ) 1. Remove the two side covers and the bottom cover and discard.
- ( ) 2. Loosen the set screw securing the POWER knob/extension shaft to the metal shaft coupling.
- ( ) 3. Pull the POWER knob/extension shaft from the front panel and discard.
- ( ) 4. Unsnap the remaining metal shaft coupling/extension shaft assembly from the plastic shaft coupler on the power switch and discard.
- ( ) 5. Remove the screw securing the nylon standoff used to support the POWER knob/extension shaft and discard the screw and standoff.
- ( ) 6. Disconnect the four wires connected to the rear of the power switch (S1001) by pulling the plastic-covered connectors off the switch. If present, remove the screw and nut securing the power switch braided ground wire to the chassis (just in front of the power switch chassis bracket).
- ( ) 7. Depress the clips on the top and bottom of the power switch simultaneously and slide the switch forward out of the chassis bracket. Set the switch aside for later reassembly.
- ( ) 8. Remove the screw and nut securing the green-yellow ground wire from the low voltage power supply assembly to the chassis.

## NOTE

For instruments SN B010100 - B357055, the ground wire is attached to the side of the plug-in housing in front of the power switch chassis bracket. For instruments SN B357056 and above, the ground wire is attached to the top of the plug-in housing chassis near the standoff removed in step 5.

Refer to Fig. 1 in the Manual Insert section when performing steps 9 through 59.

- ( ) 9. Mount the power switch angle bracket ①, provided in the kit, on the plug-in housing as follows:
  - ( ) a. Align the mounting holes in the power switch angle bracket to coincide with the eighth and ninth holes in the second row of the plug-in housing.
  - ( ) b. Secure the bracket using two <sup>-0554-</sup> 6-32 x 0.375" flat head screws ② and two 6-32 nuts ③.

## NOTE

If the two unused (centermost) terminals of the power switch removed in step 7 are not protected with insulation, use the black sleeving insulation (provided in the kit) to cover the terminals. Heat the insulation to shrink it to size.

- ( ) 10. Insert the power switch into the mounting hole in the switch bracket and push in firmly until the switch locks into place.
- ( ) 11. Align the nylon standoff ④ (provided in the kit) over the fourth hole in the first row on the plug-in housing and secure it loosely with a 6-32 x 0.312" flat head screw ⑤.
- ( ) 12. <sup>-0532-</sup> Insert the new POWER knob/extension shaft ⑥ through the hole in the front panel, through the hole in the nylon standoff ④ and snap it into the plastic shaft coupler on the power switch.
- ( ) 13. Tighten the screw securing the nylon standoff, aligning the hole with the extension shaft to prevent binding.
- ( ) 14. Remove the three screws on each side of the lower rear chassis securing the low voltage power supply assembly in the instrument.
- ( ) 15. Slide the power supply assembly out the rear of the instrument until it can be set down on the work surface, guiding the interconnecting cables so they do not catch on other parts of the instrument.

- ( ) 16. Remove the screw and cable clamp assembly securing the power switch cable to the corner of the Rectifier circuit board. Retain the screw for later reassembly.
- ( ) 17. Unsolder the power switch cable wires from the Rectifier circuit board, noting the wire color codes and locations for later reassembly.
- ( ) 18. Remove the four screws securing the rear panel of the power supply (on instruments below SN B357056, the four screws also secure the four black plastic equipment legs).
- ( ) 19. If present, remove the screw securing the heat sink for Q835 to the power supply rear panel.
- ( ) 20. Gently pull the top of the power supply rear panel down to gain access to the thermal cut-off switch, S1000, located to the right of the power transformer on the chassis bottom.
- ( ) 21. Unsolder the gray-black-red wire from the thermal cut-off switch.
- ( ) 22. Remove the power switch cable (consisting of the wires unsoldered in steps 17 and 21) and discard.
- ( ) 23. Solder the gray-black-red wire in the new power switch cable ⑦ (provided in the kit) to the thermal cut-off switch.
- ( ) 24. Disconnect multi-pin connector P678 (a gray, two-conductor holder) from the Signal Output circuit board mounted on the power supply rear panel.
- ( ) 25. Disconnect the other end of the two-conductor cable from P998 on the Low Voltage Regulator circuit board and discard the cable.
- ( ) 26. Replace the cable just removed with the longer cable provided in the kit. Connect the gray, two-conductor holder to P678 on the Signal Output circuit board.
- ( ) 27. Dress the cable just connected and the gray-black-red wire connected previously through the slot in the Rectifier circuit board.
- ( ) 28. Secure the rear panel to the power supply assembly by performing the reverse of the procedure in steps 18 through 20, taking care that wires do not get pinched between the rear panel and the power supply chassis.
- ( ) 29. Solder the remaining wires in the new power switch cable to the Rectifier circuit board in the locations noted in step 17. The braided shield wires connect to the ground pad.
- ( ) 30. Secure the power switch cable to the Rectifier circuit board, using a plastic loop clamp ⑧, a metal loop clamp washer ⑨ (both provided in the kit) and the screw removed in step 16.
- ( ) 31. Instruments below SN B357056 only. Remove the screw in the upper left corner (adjacent to F814) used to secure the Rectifier circuit board. Using the screw just removed, fasten one lug terminal ⑩ of the 6" green-yellow wire provided in the kit to the Rectifier circuit board.

- ( ) 32. Dress the power switch cable between the power supply and the Logic circuit board, over the Logic circuit board to the power switch previously installed.
- ( ) 33. Connect the power switch cable to the power switch as indicated in the exploded view of the switch.
- ( ) 34. Secure the lug terminal ⑩ <sup>*Fifth from right*</sup> on the cable shield wire to the plug-in compartment chassis at the sixteenth hole in the fourth row, using a 6-32 x 0.312 flat head screw ⑪ and 6-32 nut ⑫. On instruments SN B357056 and above, the green-yellow ground wire from the power supply (disconnected in Step 8) is also secured with this screw and nut. <sub>*- 0538 -*</sub>
- ( ) 35. Secure the power switch cable to the plug-in housing using a plastic loop clamp ⑬, metal loop clamp washer ⑭, 6-32 x 0.375" flat head screw ⑮, and a 6-32 nut ⑯. The screw is mounted through the 19th hole of the 4th row of holes in the plug-in housing. <sub>*- 0559 - 2nd from right*</sub>
- ( ) 36. Disconnect all multi-pin connectors from the A11 Low Voltage Regulator circuit board.
- ( ) 37. Remove the four screws (two on each side of the rear chassis frame) securing the Low Voltage Regulator assembly to the chassis and remove the assembly.
- ( ) 38. Remove the four screws securing the plastic shield covering the power transistors on the Low Voltage Regulator assembly and remove the shield. Discard the screws and the shield.
- ( ) 39. Remove and discard the twelve screws securing the six power transistors to the heat sink.
- ( ) 40. Remove the transistors and their associated mica insulators, noting their locations for later reassembly. Trim the transistor leads to 3/8".
- ( ) 41. Lift the heat sink from the Low Voltage Regulator circuit board and discard it.
- ( ) 42. Orient the Low Voltage Regulator circuit board with fuse F855 in the lower left corner (circuit board turned component side down).
- ( ) 43. Align the heat sink/fan bracket assembly ⑰ (fan bracket to the left) so the transistor sockets line up with the holes in the heat sink.
- ( ) 44. Install the mica insulators and transistors removed in step 40.

## NOTE

If necessary, apply a thin layer of silicone grease between the mica insulators and the new heat sink to ensure maximum heat transfer.

## WARNING

Handle silicone grease with care. Avoid getting silicone grease in the eyes. Wash hands thoroughly after use.

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- ( ) 45. Secure the transistors with the twelve 6-32 x 0.438" pan head screws (18) provided in the kit.
- ( ) 46. Slide the air baffle (19) into place on top of the four mounting tabs on the heat sink/fan bracket assembly (17). Be sure the fan cut-out is located directly below the mounting bracket for the fan.
- ( ) 47. Secure the air baffle with four 4-40 x 0.250" pan head machine screws (20) provided in the kit.
- ( ) 48. Position the fan motor/impeller assembly (21) under the fan mounting bracket with the fan impeller centered over the air baffle cut-out (motor winding toward mounting bracket).
- ( ) 49. Position the fan motor shield (22) over the fan mounting bracket with the open side of the shield facing the bracket.
- ( ) 50. Secure the fan motor and fan motor shield to the mounting bracket with the two 10-32 x 0.500" round head machine screws and two washers (23) provided in the kit.
- ( ) 51. If present, open the cable clamp mounted underneath the rear of the top center cabinet frame section and remove the cables from the clamp. This cable clamp will not be reused and may be removed if desired.
- ( ) 52. Replace the following cables with the longer cables provided in the kit:
  - ( ) a. Disconnect P890 (black ten-conductor holder) from the Rectifier circuit board and replace the cable with the new ten-conductor cable with black holders.
  - ( ) b. Disconnect P891 (black four-conductor holder) from the Rectifier circuit board and replace the cable with the new four-conductor cable with brown holders.
- ( ) 53. Secure the fan/Low Voltage Regulator assembly to the chassis with the four screws removed in step 37.
- ( ) 54. Dress the following cables through the upper slot in the air baffle and connect to the Low Voltage Regulator circuit board as indicated:
  - ( ) a. The eight-conductor cable with a red holder to connector labeled P962. If necessary, this cable may be dressed between the high voltage supply shield and the old switch bracket (instead of under the switch bracket) to gain the necessary length to reach the P962 connecting pins.
  - ( ) b. The eight-conductor cable with a brown holder to connector labeled P971.

- ( ) 55. Dress the following cables through the lower slot of the air baffle and connect to the Low Voltage Regulator circuit board as indicated:
  - ( ) a. The six-conductor cable with a brown holder to connector labeled P901.
  - ( ) b. The eight-conductor cable with a black holder to connector labeled P900.
  - ( ) c. The ten-conductor cable with a black holder to connector labeled P980.
  - ( ) d. The four-conductor cable with a brown holder to connector labeled P981.
  - ( ) e. The two-conductor cable with a gray, three-conductor holder to connector labeled P998.
- ( ) 56. Dress the fan motor wires down to the right rear corner of the Rectifier circuit board and connect as follows:
  - ( ) a. Solder one fan motor wire to the unused pad adjacent to the slot in the Rectifier circuit board.
  - ( ) b. Solder the other fan motor wire to the remaining unused pad.
- ( ) 57. Slide the Low Voltage Power Supply into the instrument being careful not to catch the wires on the instrument. Secure the supply with the six screws removed in step 14.
- ( ) 58. Instruments below SN B357056. Secure the free end of the green-yellow wire ⑨ (fastened to the Rectifier circuit board in step 31) to the chassis using the screw and nut removed in step 8.
- ( ) 59. Install the new regulator shield ⑳ using the four 4-40 x 0.250" pan head screws ㉕ provided in the kit.
- ( ) 60. Refer to the Calibration Section in the instruction manual and perform any necessary checks and adjustments.
- ( ) 61. Install the new covers (two sides and one bottom) included in the kit. The side cover with the TRACE ROTATION bushing mounts on the right side of the instrument (as viewed from the front).

Remove the protective backing from the identification marker included in the kit and place it in a clear area on the regulator shield.

For future reference, fasten the attached Instruction Manual Modification Insert in your Instruction Manual.

DJH:cs



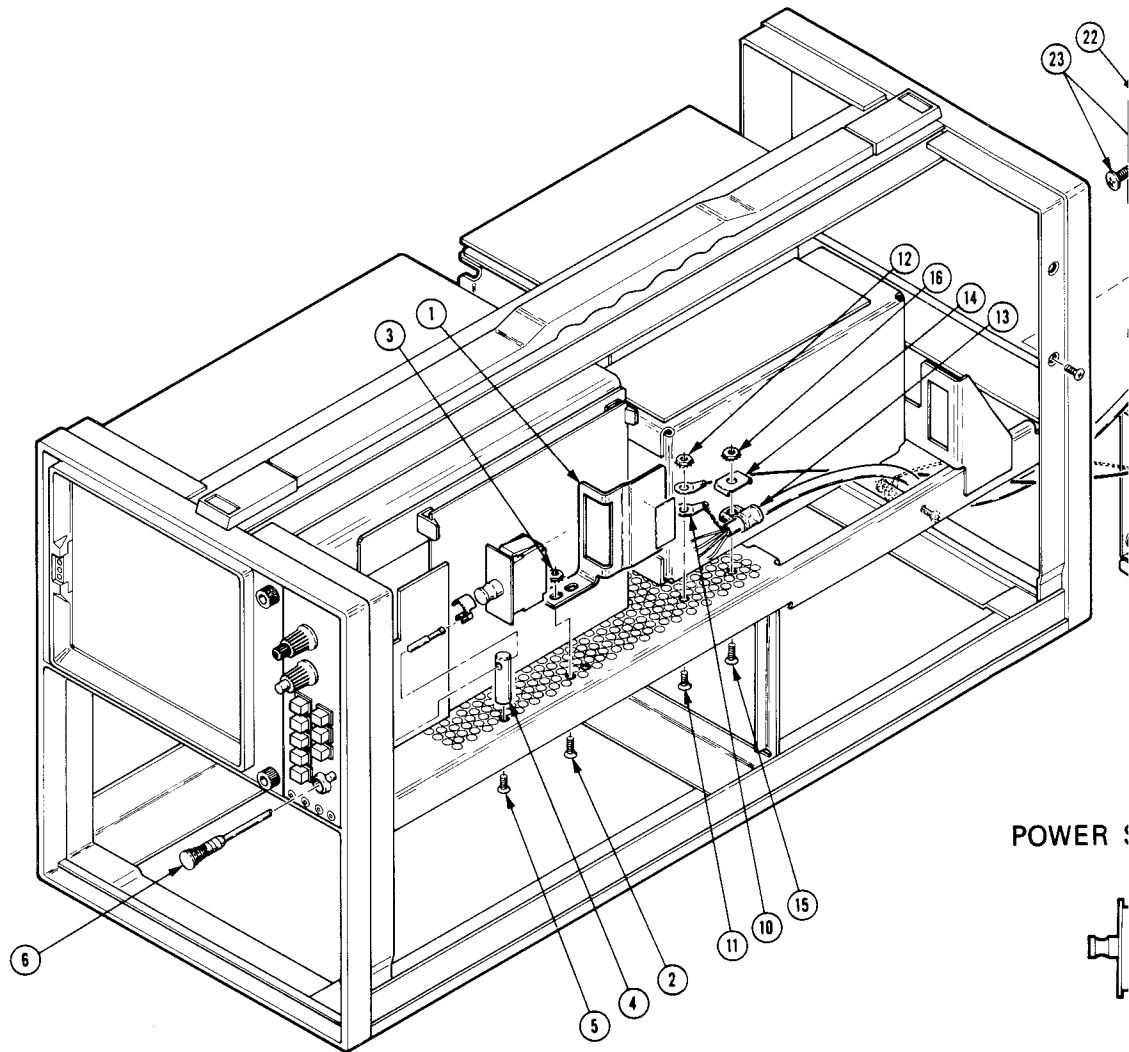
## REPLACEABLE MECHANICAL PARTS

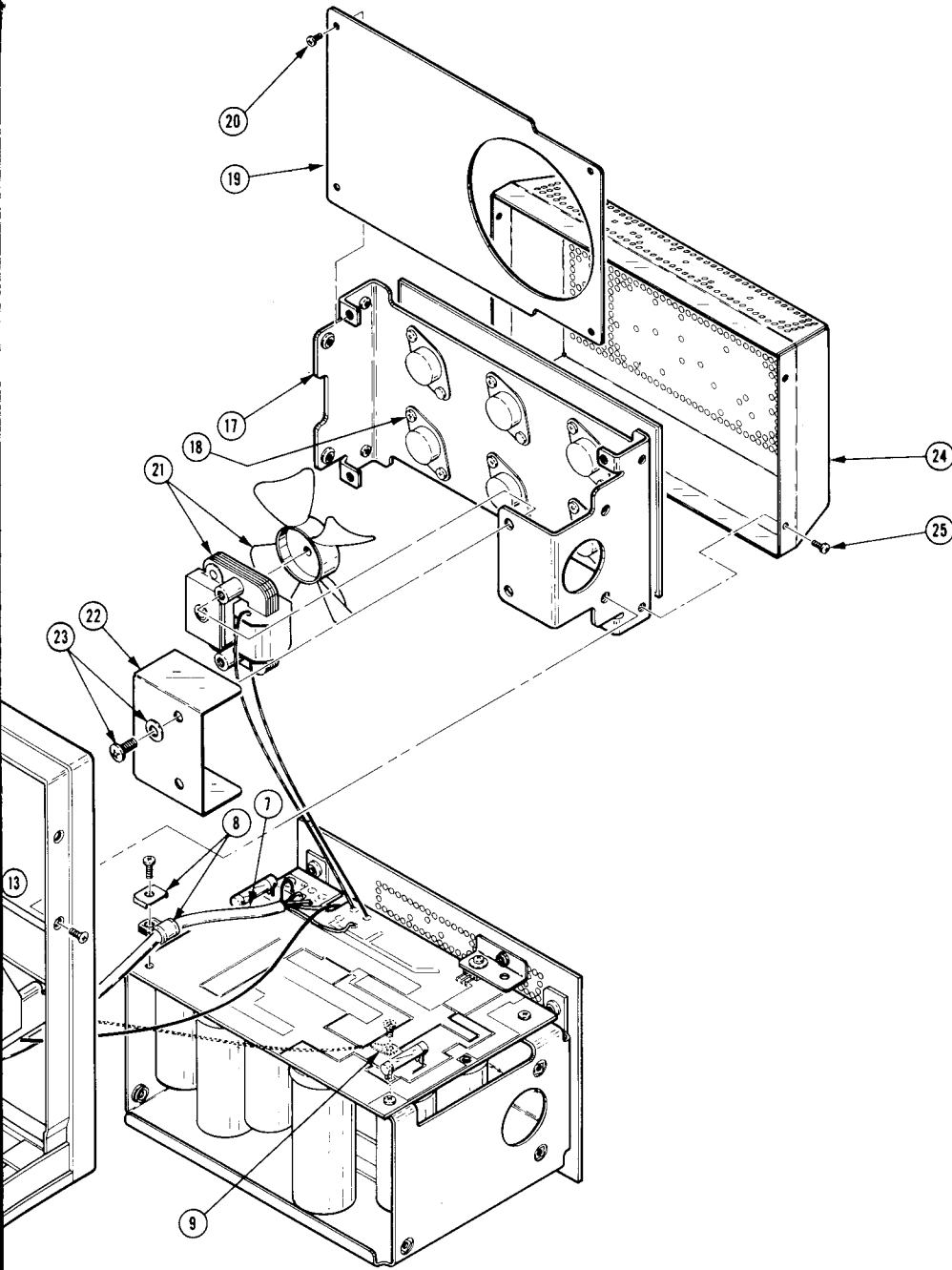
Index No.	Quantity	Part Number	Description
1	1 ea	407-2600-00	Bracket, angle, power switch, Al
	1 ea	334-2332-00	Marker, ident, "DANGER..."
2	2 ea	211-0559-00	Screw, mach, 6-32 x 0.375, flh, 100 deg, poz
3	2 ea	210-0457-00	Nut, pl, assem wa, 6-32 x 0.312
4	1 ea	129-0858-00	Spacer, post, 1.125 L with 6-32 int-thd, nylon
5	1 ea	211-0538-00	Screw, mach, 6-32 x 0.312, flh, 100 deg, poz
6	1 ea	384-1601-01	Extension, 8.265 L x 0.125 od, Al
	0.25 ft	162-0530-00	Insulation, sleeving, elec, heat shrink, blk
7	1 ea		Cable, power switch, 4 conductor, shielded
8	1 ea	210-0863-00	Washer, loop clamp, 0.187 id, stl
	1 ea	343-0004-00	Clamp, loop, 0.312 id, plstc
9	0.5 ft	175-0809-01	Wire, elec, strd, 18AWG, 300V rms, green/yellow
	2 ea	210-0202-00	Terminal, lug, 0.146 id, locking
10	1 ea	210-0202-00	Terminal, lug, 0.146 id, locking
11	1 ea	211-0538-00	Screw, mach, 6-32 x 0.312, flh, 100 deg, poz
12	1 ea	210-0457-00	Nut, pl, assem wa, 6-32 x 0.312
13	1 ea	343-0004-00	Clamp, loop, 0.312 id, plstc
14	1 ea	210-0863-00	Washer, loop clamp, 0.187 id, stl
15	1 ea	211-0559-00	Screw, mach, 6-32 x 0.375, flh, 100 deg, poz
16	1 ea	210-0457-00	Nut, pl, assem, wa, 6-32 x 0.312
17	1 ea	441-1129-00	Chassis, scope, Regulator (fan bracket)
18	12 ea	211-0578-00	Screw, mach, 6-32 x 0.438, pnh, stl, poz
19	1 ea	378-0811-00	Baffle, air
20	4 ea	211-0008-00	Screw, mach, 4-40 x 0.250, pnh, poz
21	1 ea	147-0008-00	Motor, ac, shaded pole, 3200 rpm, 115V, 60Hz
	1 ea	369-0037-01	Impeller, fan, axial, 3.5" dia bl, cw, plstc
22	1 ea	337-1756-00	Shield, elec, fan motor
23	2 ea	212-0557-00	Screw, mach, 10-32 x 0.500, rdh, poz
	2 ea	210-1003-00	Washer, flat, 0.2 id x 0.036 thk
24	1 ea	337-1757-00	Shield, elec, regulator
25	4 ea	211-0008-00	Screw, mach, 4-40 x 0.250, pnh, poz

## PARTS NOT SHOWN:

1 ea	390-0798-00	Cover, scope, bottom
1 ea	390-0799-00	Cover, scope, left
1 ea	390-0800-00	Cover, scope, right
1 ea	352-0084-02	Bushing, Trace Rotation

Fig. 1 7603 FAN ADDITION





**POWER SWITCH WIRING**

