



Service Manual

LS 135/150 Examination Light

443194 Rev. B

Welch Allyn Medical Division
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Part No	Rev	Description	ECN #	Date	Approved
443194	A	New Release of LS 135 / LS 150 Exam Light Service Manual	5-44889	07/08/2002	DK/RS
443194	B	Changed Cautions and warnings Changed Section 4 Changed bubble numbers	5-45188	10/29/2002	DK

Drawings and/or illustrations and/or part numbers contained in this document are for reference purposes only. For current revisions call the Welch Allyn Customer Service phone number listed in Section 1 page 3.

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About the LS 135 Examination Light

The LS 135 examination light is a 35-watt halogen light that produces significantly whiter, brighter light than the ordinary gooseneck units. The dual intensity control switch allows you to instantly adjust light output to meet your exact requirements. A molded lexan light head does not conduct heat, keeping the luminaire cool to the touch. Multiple installation options include floor stand, table mount, wall mount and caster base.

About the LS 150 Examination Light

The LS 150 features a color corrected 50 watt lamp that delivers superior light quality across the variable spectrum for more accurate color rendition. The special designed light head keeps the luminaire cool to the touch even during multiple exams. The lamp has been offset at a 12 degree angle relative to the luminaire housing, allowing an unobstructed view of the field of interest.

Approvals



ETL listed
UL2601-1,
CSA C22.2 No. 601.1
IEC 60601-1, AS 3200.1
IEC 60601-1-2

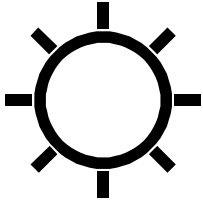


The CE mark on this product indicates that it has been tested to and conforms with the provisions noted within the 89/336/ECC Electromagnetic Compatibility Directive.



Australia EMC Framework Compliance

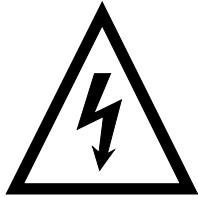
Cautions and Warnings



INTENSE LIGHT: Lamp is extremely bright. Do not stare at the lamp when in use. May be harmful to eyes.



CAUTION: Remove power cord from electrical outlet and allow lamp to cool 10 minutes before replacing with Welch Allyn lamp.



DANGER: Electric Shock Hazard. Refer servicing to qualified service personnel.



DANGER: Risk of explosion if used in the presence of flammable anesthetics.



HOT SURFACE: Lamp surface is hot. May be harmful to skin if touched.

NOTE: This product complies with current required standards for electromagnetic interference and should not interfere with other equipment or be affected by other compliant devices. As a precaution, avoid using this device in close proximity to other equipment.

Help Information

To assure correct operation and performance all service and repairs must be performed by fully trained and properly equipped personnel, using genuine replacement parts and correct procedures. Failure to do so will also invalidate the product warranty.

When calling, refer to the model number on the head of the Exam light.

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Incoming Inspection

NOTE: Use the following guidelines when unpacking the Exam Light from its shipping carton.

1. Before opening the Exam Light shipping carton, check for damage.
2. If damage is apparent, stop unpacking the carton and contract the shipping company for further instructions. If the carton is intact, unpack the Exam Light.
3. With the Exam Light out of its carton, check to see that all the items listed on the packing slip are in the shipping carton.
4. If an item is missing, first check the carton, then check with your receiving department. If necessary contact Welch Allyn at the Address and phone number shown in Section 1 .
5. Clean and disinfect by following the instructions printed in the Operator Manual.

NOTE: Perform all functional tests before and after servicing.

6. Operate the Exam Light to verify the customer complaint before making any changes to the unit. Call the customer if the complaint is unclear.
7. **If the unit has caused or is suspected of having caused an injury of any type: DO NOT DISASSEMBLE OR REPAIR THE UNIT IN ANY WAY. Contact Welch Allyn Customer Service immediately.**

Tools Required For Servicing Exam Light

Phillips Screw Driver
Standard Slip Joint Pliers
Needle Nose Pliers
Snap Ring Pliers
3/32 Hex Wrench
Pin removal tool
Digital MultiMeter

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Mechanical Checks:

1. Gooseneck - Replace if:
The shrink wrap is cracked/damaged or pulled back from either end.
The Gooseneck is damaged or kinked.
If it does not hold position - “droops” when checked in 4 directions.
2. Crush Rib Sleeve and Bushing: Replace if:
Damaged, cracked, or if o-rings are worn.
3. Head Rotation:
Position Head so it is parallel to the floor.
Rotate Head into several positions - it should hold in any position placed.
If it does not hold, replace the Bushing and o-rings on the Gooseneck.
4. If the reason for repair is due to rotation issues:
Turn on the unit & allow it to warm up 15 - 20 minutes, then check the rotation.
If it does not hold, replace the Bushing and o-rings on the Gooseneck.
5. Housings - Head or Base:
Replace any that have damage or cracks.
Check the Head housings for hairline cracks around the Bushing. Replace as needed.
6. Pole:
Replace any Poles that are bent.
7. Wire Harnesses/Connectors - Replace if:
Pinched, broken, or wire is exposed.

Electrical Checks:

The unit should NOT be plugged in at this time.

1. If Pole is **not** attached to the Base, check the wires at the both ends of the Pole, if wires appear not damaged, assemble Pole into the Base.
2. Check for damaged or pinched wires at the connection between the Pole and Gooseneck.
3. Plug in unit (**do not do this if any wires are damaged**). Turn on unit.

Lamp works:

1. Turn Switch off and on several times. Light should not flicker while turned on. If you are testing the LS 135 there should be an obvious change in light output between the low & high settings. Switch should be consistent.

Lamp does not work:

1. Turn off unit and **unplug it**. Check for blown or incorrect Lamp. Lamp should be 35W, 12V for the LS 135. Welch Allyn Part# 443069. Lamp should be 50 watt for the LS 150. Welch Allyn Part# 445013.
2. Check connections between Pole and Gooseneck, the Base and Pole, and the Head and the Gooseneck.
3. If lamp still does not light then turn off unit.
4. **Unplug** it check the fuses located in the base.
5. If unit still does not light, perform Floor Model Switch Function Test.

Floor Model Switch Function Test (LS 135 Only)

Note: For this test, Unit should be unplugged from outlet! A known good Lamp should be installed.

1. Disconnect Gooseneck Harness from Pole Harness.
2. Check for correct wire order: Pin 1 = Red, Pin 2 = Yellow, Pin 3 = White.
3. Set the meter to the lowest resistance setting.
4. Put one meter lead into the white wire pin and the other into the yellow wire pin.
5. Set the Switch on the Lamp Head to the low setting. The meter should read less than 1 ohm of resistance.
6. Set the Switch to the off position. The meter should read open.
7. Move meter lead from the yellow wire pin to the red wire pin.
8. Set the Switch on the Lamp Head to the high setting. The meter should read less than 1 ohm of resistance.
9. Set the Switch to the off position. The meter should read open.

NOTE: Disassembly of LS-135 Floor model.

1. Loosen the screw that secures the lamp nose assembly.



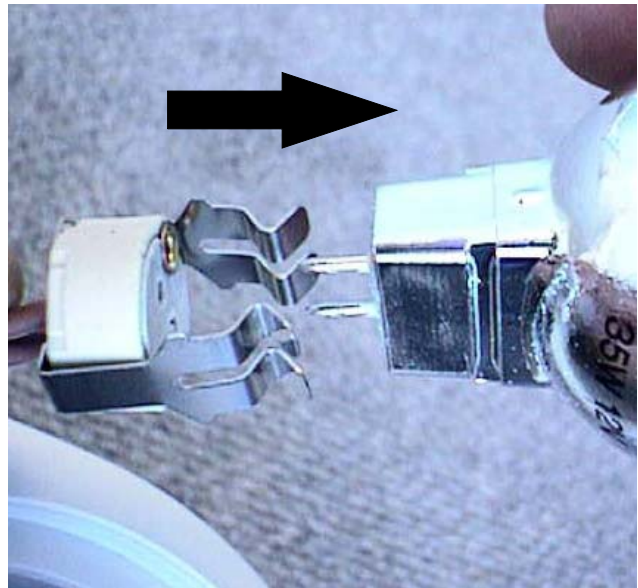
2. Lift lamp nose assembly.



3. Release the lamp retaining spring.



4. Unplug lamp.



5. Remove lamp head by removing 5 screws.



6. Remove lamp bottom housing.



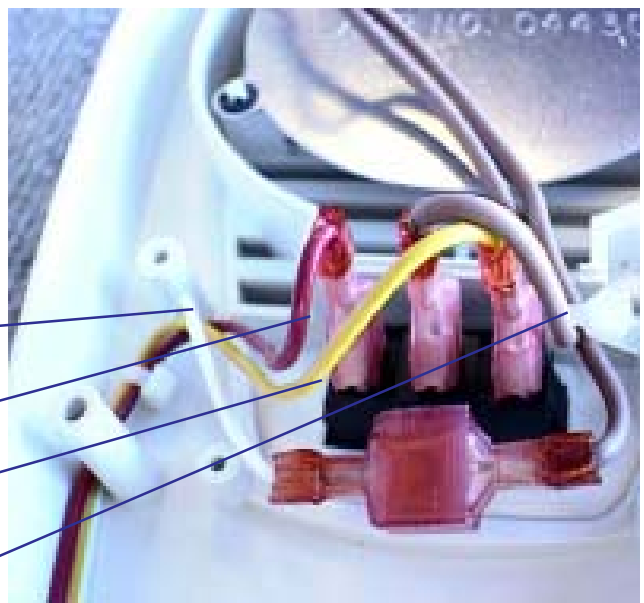
LS-135 Reassembly Note: Notice wire tie and placement of wire behind standoff.



7. To disassemble, disconnect wires and remove gooseneck from lamp head.

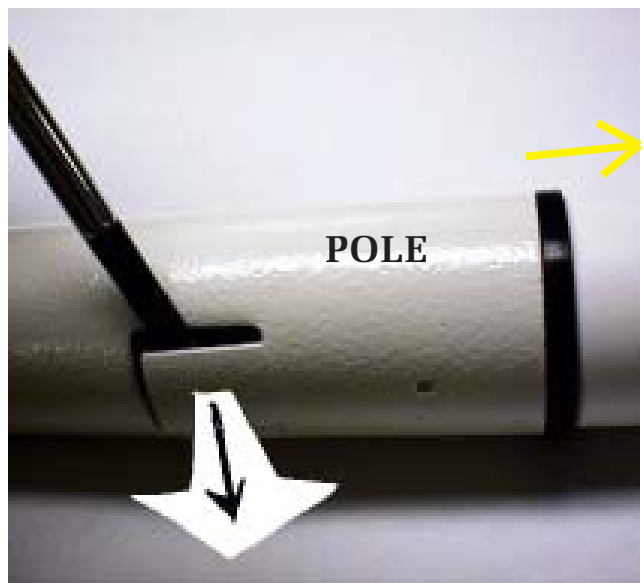
Reassembly Note:
NOTE: wire /switch connections and placement of wire behind standoff.

white wire
red wire
yellow wire
brown lamp socket wires



8. Use small flat blade screwdriver to pry the tabs of pole then pull gooseneck bushing out.

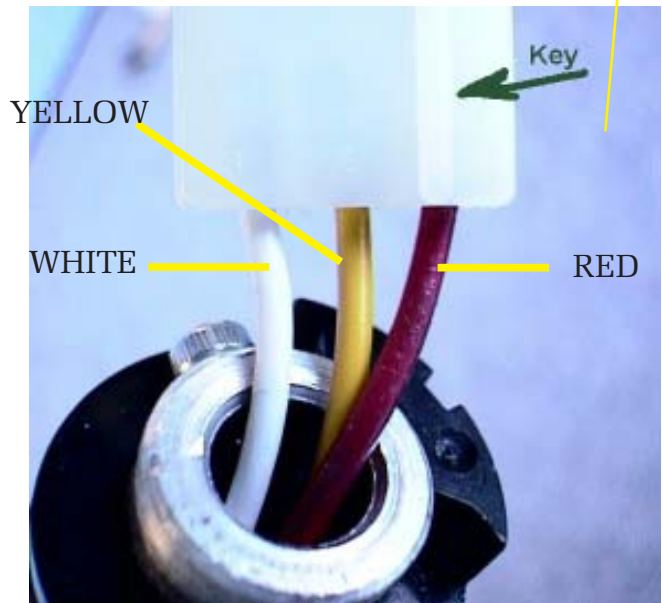
Reassembly Note: *Press the tabs back in with a blunt object. A screwdriver handle is shown below.*



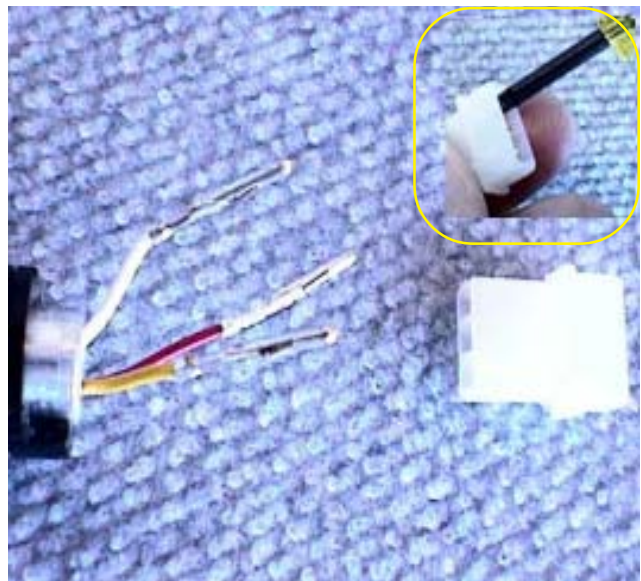
- 9. Gooseneck assembly can be disassembled as per the following steps.



Note: Colors of wiring harness on pole-end of gooseneck. Red wire is in 'key' side of connector.



- 10. Use pin removal tool to remove connector block.



11. Use 3/32" hex key to remove screw.



12. Pull bottom bushing away from flexible arm.

Note the o-rings on lower flex bushing.



13. Remove snap ring from upper flex bushing.



14. Remove upper bushing from flexible arm.



Note: View of completely disassembled gooseneck assembly and wire harness.



15. To remove pole from base, remove screw and bottom plate.



16. Disconnect ground.



17. Disconnect harness.

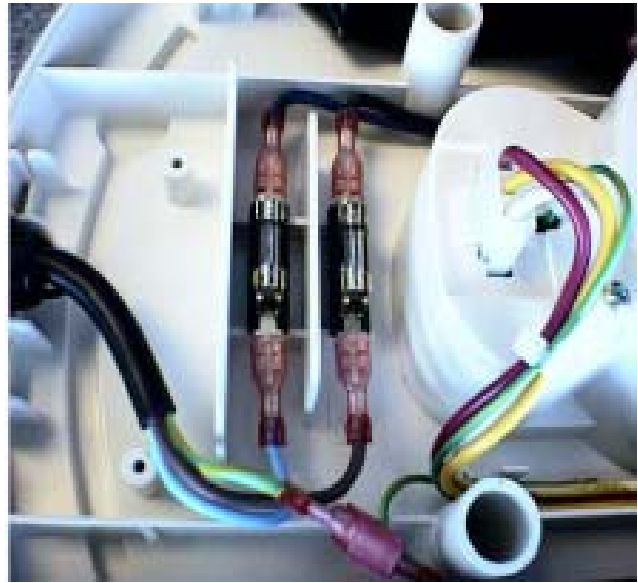


18. Remove 5 screws from base.
Remove top cover.



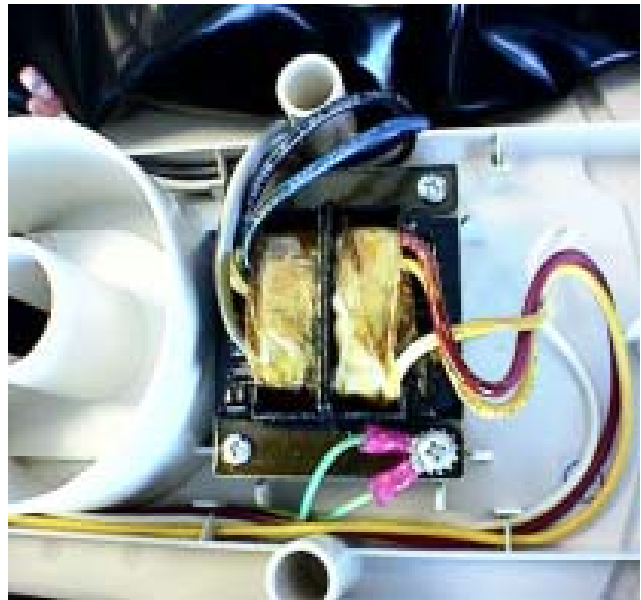
**NOTE: View of wiring and fuses:
(domestic LS-135 Pole Model)**

Model:	Application:	Fuse Part #
44300	DOM #6	236706-3114
44302	EUR	236706-3112
44303	JAP	488307-4
44304	UK	236706-3112
44306	AUST	236706-3112



**NOTE: View of transformer
(domestic LS-135 Pole Model):**

See APPENDIX C for wiring schematic of your country.



Reassembly Note:

Carefully align wires in groove to prevent damage to insulation when inserting pole in base.



NOTE: The 135 wall mount version of the exam lamp is similar to the 135 floor model. The heads are identical in every way. The major difference is the transformer module and one continuous cord running from it up to the head.

19. Remove phillips screw . Tilt nose up and remove. Unplug Lamp connector.



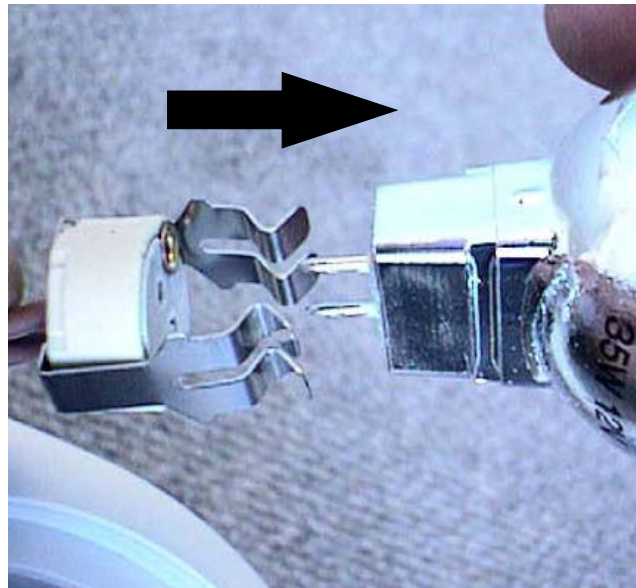
20. Lift lamp nose assembly.



21. Release the lamp retaining spring.



22. Unplug lamp.



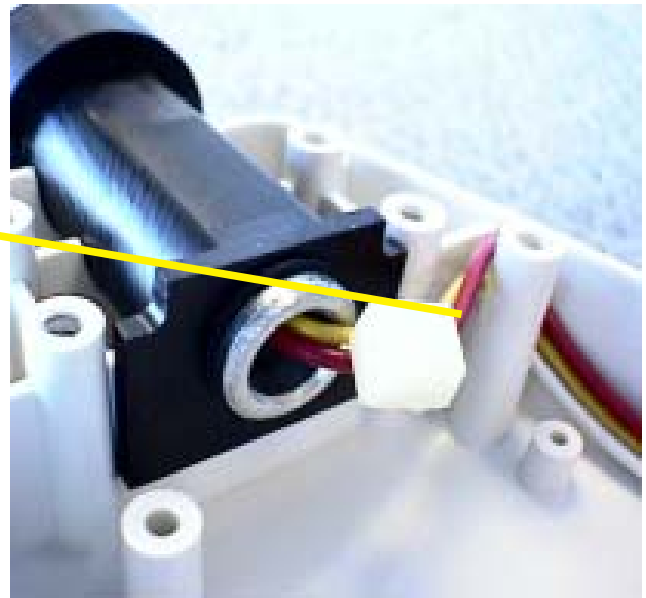
23. Remove lamp head by removing 5 screws.



24. Remove housing.



Note wire tie and placement of wire behind standoff.



25. To disassemble, disconnect wires and remove gooseneck from lamp head.

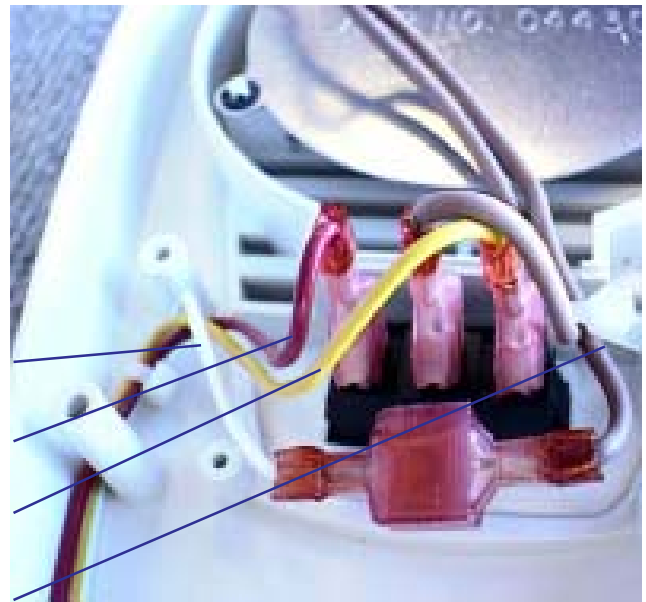
Reassembly Note:
NOTE: wire /switch connections and placement of wire behind standoff.

white wire

red wire

yellow wire

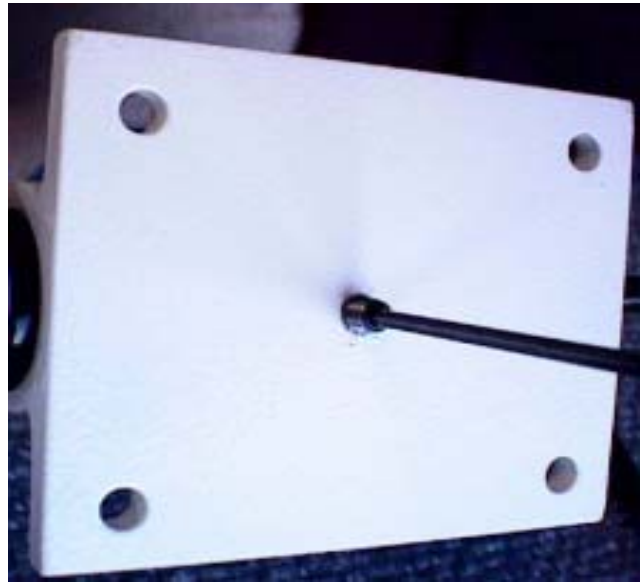
brown lamp socket wires



Note: For Reassembly of all floor and stand LS-135, Install switch according to this photo.



26. Remove the hex nut to remove mounting plate.



27. Remove bushing from mounting plate.



Note: The removal of bushing from wall mount bracket.



*Note: The **X** on bushing should be reinstalled toward mounting plate.*



Note: The wiring route to switch, transformer.



Note: The wire color codes and orientation, strain relief, tie wrap to secure wires. See Appendix C “WIRING DIAGRAMS” for the correct voltage wiring connections. Each country has different voltage wiring connection.



NOTE: Complete parts package for LS150 table/wall mount.



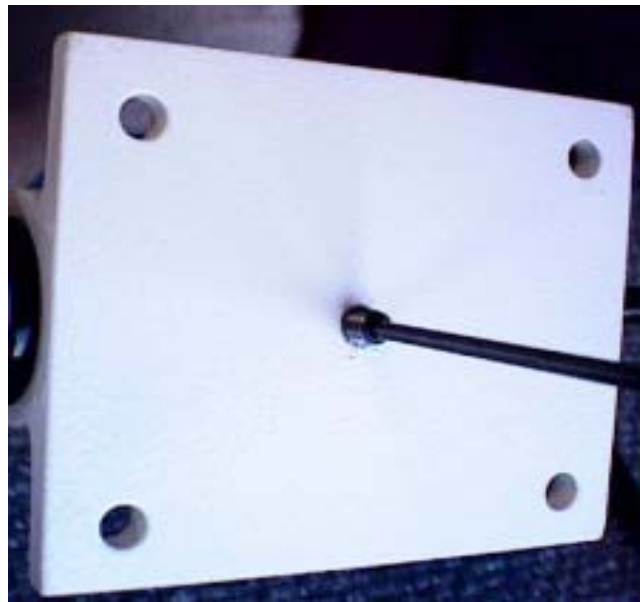
1. Completely unscrew to remove nose assembly from head.



NOTE: Notice wiring connections to power switch, PCB and wiring orientation.



2. Completely unscrew hex nut to remove flexible arm.



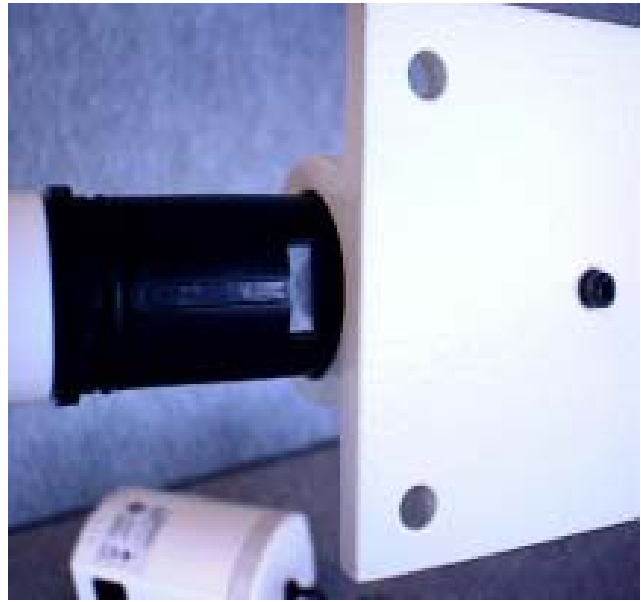
NOTE: Make sure bushing with ***X*** marks are reinstalled toward hex nut.



NOTE: Bushing with ***X*** indicator marks are attached toward mounting plate.



3. Remove bushing from mounting plate.



NOTE: Notice the wiring routing and wire connections.



NOTE: Disassembly of LS-150 Floor model.

1. Loosen the screw that secures the lamp nose assembly.



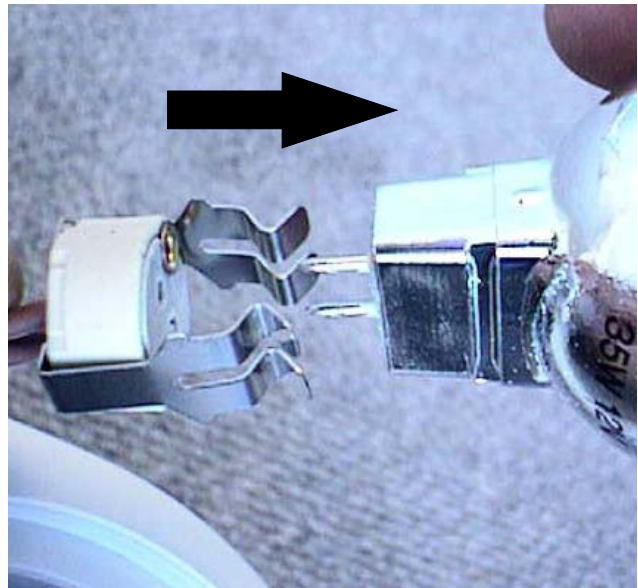
2. Lift lamp nose assembly.



3. Release the lamp retaining spring.



4. Unplug lamp.



5. Remove lamp head by removing 5 screws.



NOTE: Notice wiring connections to power switch, PCB and wiring orientation.

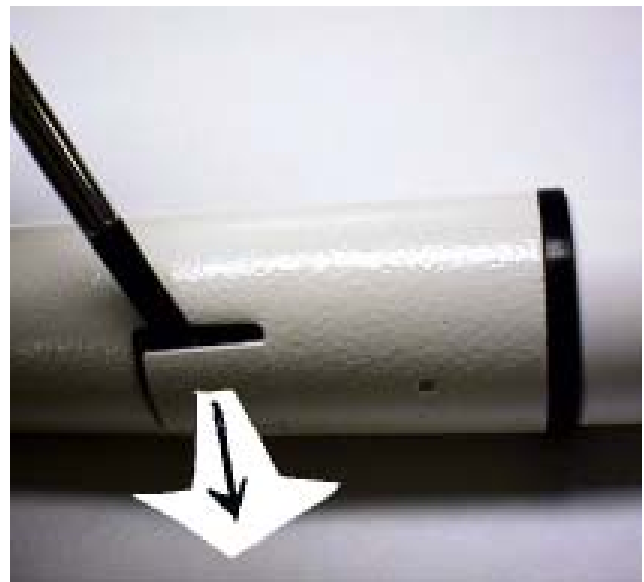


NOTE: Notice switch orientation.



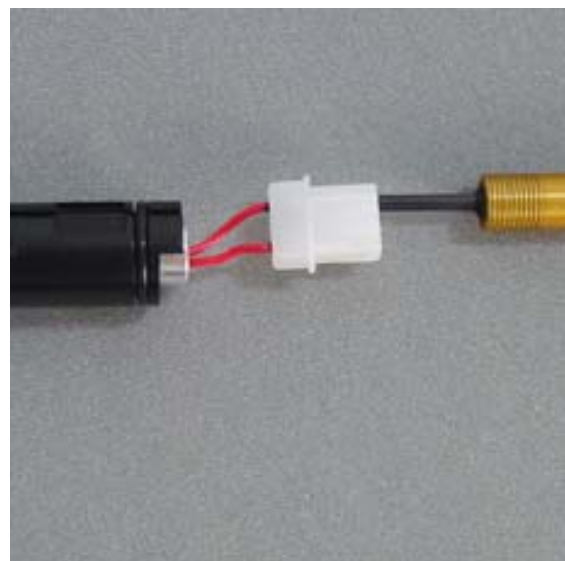
- 6. Use small flat blade screwdriver to pry the tabs of pole then pull gooseneck bushing out.

Reassembly Note: Press the tabs back in with a blunt object. A screwdriver handle is shown below.



- 7. Remove both pins from connector using a pin removal tool.

NOTE: There are two wires going to connector. Remember that they go in the outer channels of the connector.



NOTE: The gooseneck with wiring and connector removed.



8. Use 3/32" hex key to remove screw.



9. Remove snap ring from upper flex bushing.



- 10. Remove upper bushing from flexible arm.



- 11. To remove pole from base, remove screw and bottom plate.



- 12. Disconnect ground.



13. Disconnect harness.



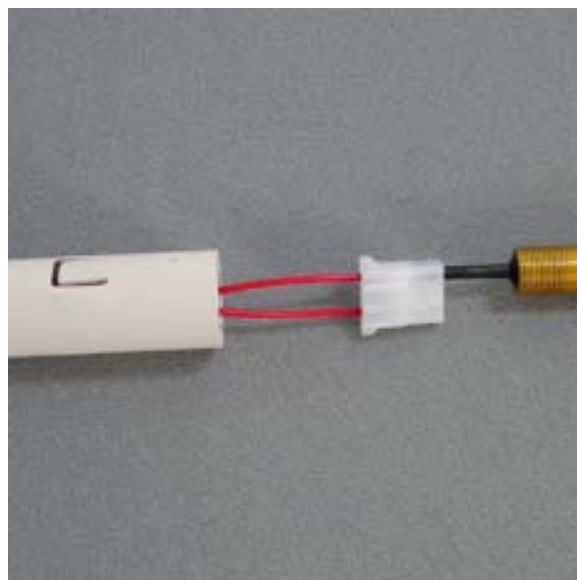
14. Pull bottom pole from base.

NOTE: When reassembling the pole back into the base, make sure wires fit into the base channel.



15. Remove both pins with a pin removal tool.

NOTE: The two red wires are to go in the two outer positions of the connector.



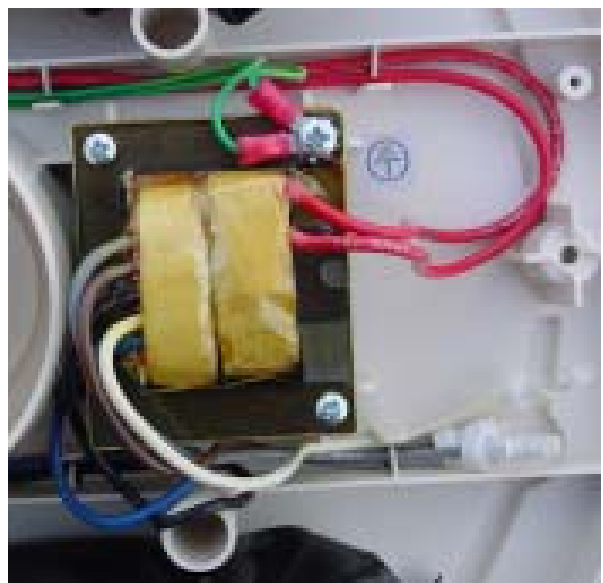
NOTE: The wire and connector removed from the pole



16. Remove 5 screws from base then remove top cover.

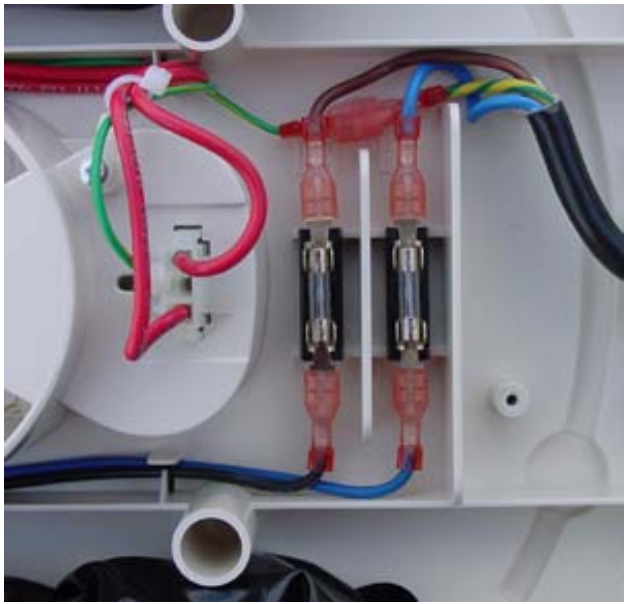


NOTE: Notice transformer and how wiring is routed in the base.



NOTE: Notice the fuses and connector and how the wiring is routed.

See the repair parts lists for proper fuse according to your country.



Part #	Description	Bubble #
443051-1	WIRE FORM LAMP HOLDER	1
106108-20	O-RING,.114 X .070, EPDM 70D	2
106100-14	PHPS 8-32 X.375	3
445013	50 WATT LAMP W/COVER GLASS	4
443019-1	LAMP NOSE HSG. WHITE	5
443121	HEAT SHIELD, NOSE	6
443017-6	LAMP HSG, TOP LS150	7
488067-501	RECTIFIER BOARD	8
106124-13	#2 X 1/4 SCREW-PLASTITE	9
440029-1	SWITCH, POWER SPST	10
445043	M4.8X9.5 TAPPING, PAN, PH, SCREW	11
445020	LS 150 PLATE, FAN MOUNTING	12
445015	FAN	13
443078	RETAINING RING	14
761077-1	WIRE TIE	15
488073-502	WIRE HARNESS LAMP/REC.BOARD	16
106124-34	#4 X.375 PLASTITE PHPS	17
443083	WIRE TIE W/MOUNTING HOLE	18
445040	JUMPER	19
790007	COVER SCREW #6 X 1/2 LG	20
443018	LAMP HSG, BOTTOM	21
443103	PLATE, HEAT DIFFUSER	22
488077	Lamp Connector LS 135	23
443017-5	LAMP HSG, TOP LS-135	24
443032	SWITCH, SPOT POWER, 35W	25
443069	35 WATT LAMP	26
455508	Ground Label Base LS 135/150	27
106124-44	8-32 X .500" SCREW	28
443094-1	GROUND WIRE COVER PLATE	29
443189	CLOSED END SPLICE	30
443096-2	GROUND WIRE, MAIN	31
106124-43	#6X1.687 PL PAN, PHILLIP	32
445009-501	LS 150 TRANS. ASSY. 50 W DOM	33
483412	#8 EXTERNAL LOCKWASHER	34
443022-501	LS135 TRANS.ASSY, 35W DOM	35
445027	Plug 3 connector LS 135/150	36
440128	SCHURTER FUSE BLOCK	37
440009-1	LS 135/150 Floor Model Power Cord Assy. Domestic	38
440009-2	LS 135/150 Floor Model Power Cord Assy. Europe	38
440009-4	LS 135/150 Floor Model Power Cord Assy. UK	38
440009-6	LS 135/150 Floor Model Power Cord Assy. Aust.	38
745184	Strain Relief LS 135/150 Floor Model UK, Eur, Aust	39
443073-1	Strain Relief LS 135/150 Floor Model Domestic	39
443074	Plate Strain relief Domestic/Japan	40
745184	Plate Strain relief Eur/UK/Aust	40

Part #	Description	Bubble #
236706-3114	FUSE 500MA- Domestic	41
236706-3112	Fuse 315MA- Europe/United Kingdom	41
488307-4	Fuse 630MA- Japan	41
445010-1	TRANSFORMER, 50W	42
443071-1	TRANSFORMER, 35W	43
106130-11	RECEPTACLE,QUICK CONNECT 12-18	44
106124-41	SCREW,#6X1.375 PL.PAN/PHILLIPS	45
488307-3	FUSE-800 MA Domestic/Eur/Aust	46
236706-3117	Fuse 1A LS150- Japan	46
443167-1	CABLE ASSY, WALL MOUNT	47
745150	STRAIN RELIEF	48
443016	WEIGHT, LS150	49
441107	STRAP, TRANSFORMER	50
236733	FUSE DRAWER	51
488042	WIRE HARNESS,PWR MOD/GROUND	52
441124-503	TRANSFORMER HOUSING SET	53
236732	IEC CONNECTOR	54
711420-1	SELF TAPPING SCREW .50	55
443157	SLIT TUBING, CUT	56
440107	WALL MOUNT BRACKET	57
106113-10	10-32 X.312 HX DR SET SCREW	58
443059-501	GOOSENECK ASSY W/END BUSHINGS	59
106124-18	#8 X 1.25 SELF TAPPING SCREW	60
761076-0	POWER CORD, DETACH.(DOMESTIC/JAPAN)	61
761076-2	POWER CORD, DETACH.(EUROPE)	61
761076-4	POWER CORD, DETACH.(UNITED KINGDOM)	61
761076-6	POWER CORD, DETACH.(AUSTRALIA)	61
443014	BASE, TOP COVER	62
443153-1	POLE,POWDER COATED	63
443098	WIRE HARNESS BASE/GN 35W	64
443091	PLUG,MATE-N-LOCK (AMP)	65
488116	WIRE TIE	66
443043	CAP,3 CIRCUIT MATE-N=LOCK	67
443015	LS 135/LS150 BASE,BOTTOM	68
443105	O-RING .426 X .070	69
610068	RETAINING RING	70
443020	GOOSENECK BUSHING HEAD	71
440090-2	CRUSH RIB SLEEVE	72
106108-7	O-RING	73
440136	GooseNeck LS 135/150	74
482038	O-RING	75
106119-3	4-40 X .125 SHCS	76
443079-1	BASE COVER PLATE,PLATED	77
106100-56	1/4-20 X 1"PAN HEAD PHILLIPS	78
106106-4	EXTRNL LOCKWASHER	79

Part #	Description	Bubble #
443062-501	MOUNTING KIT,LS 135/LS 150	80
443085-501	GOOSENECK ASSY	81
445014-501	Fan Assembly, LS 150	82
488082	MOLEX CONNECTOR	83
443101	WIRESHARNESS, Goose neck LS 150 Floor	84
443190	CAUTION LABEL	85
445017	WIRE HARNESS,SW/RECT.BD.50W	86
106124-40	#6 X .625 PLASTITE LS 135/150 Base	87
445030	WIRE HARNESS,BASE/GOOSE NECK LS 150	88
443184-501	HARDWARE KIT, LS 135/150 WALL MOUNT	89
445021-501	WIRE HARNESS,GOOSENECK HD,50W	90
440078-4	STRAIN RELIEF	91

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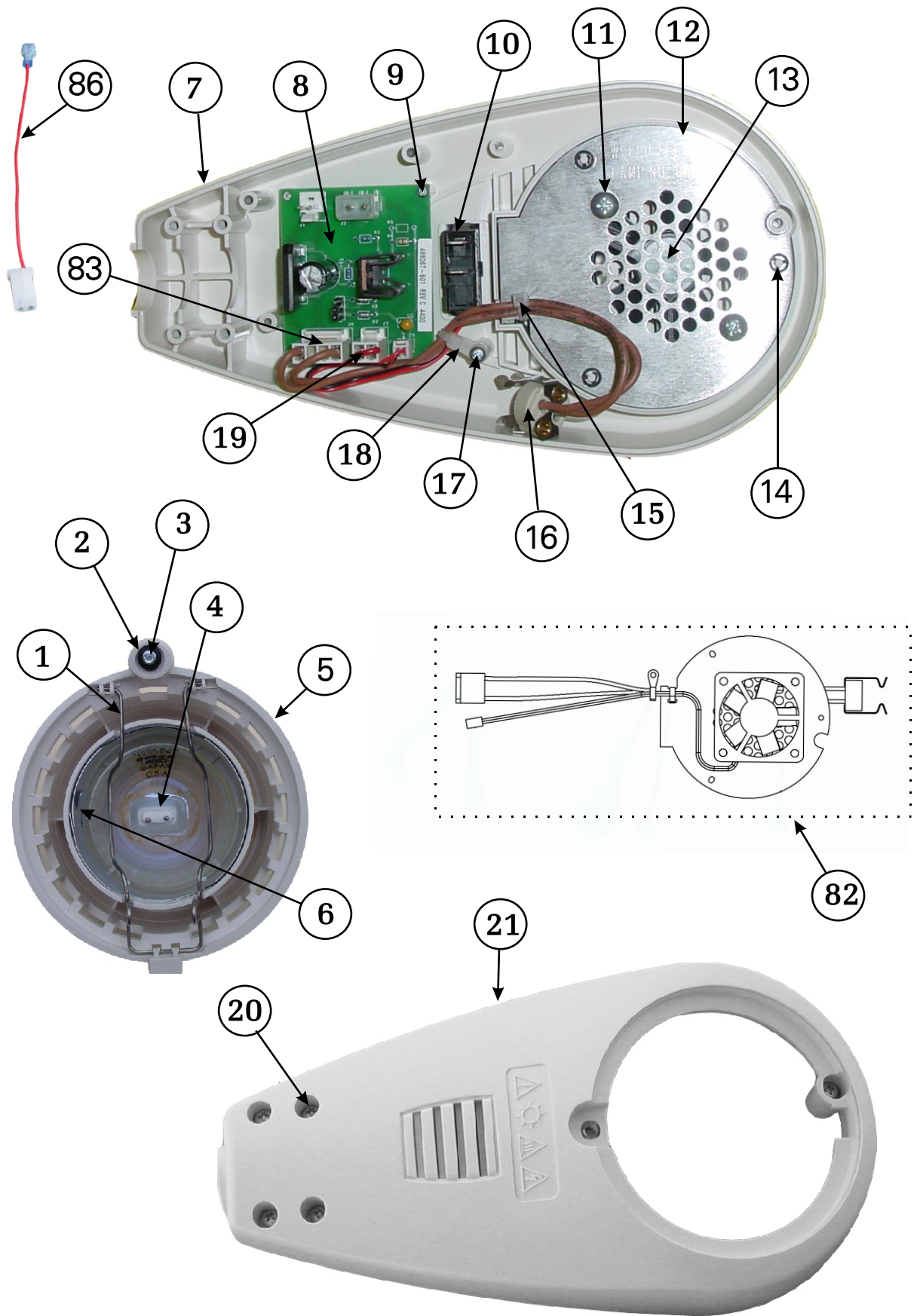


Illustration 1

LS 150 Head Assembly

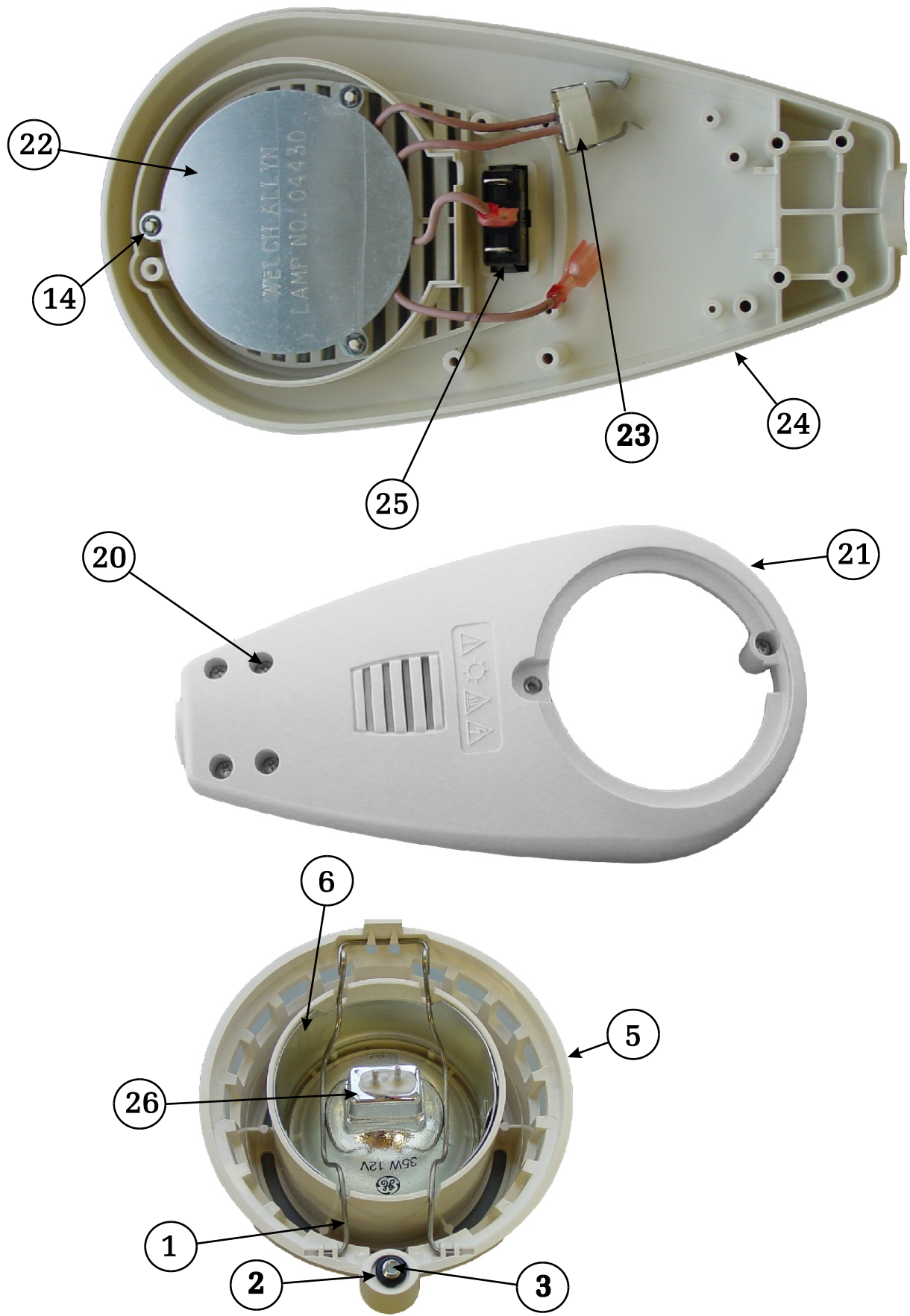


Illustration 2 LS 135 Head Assembly

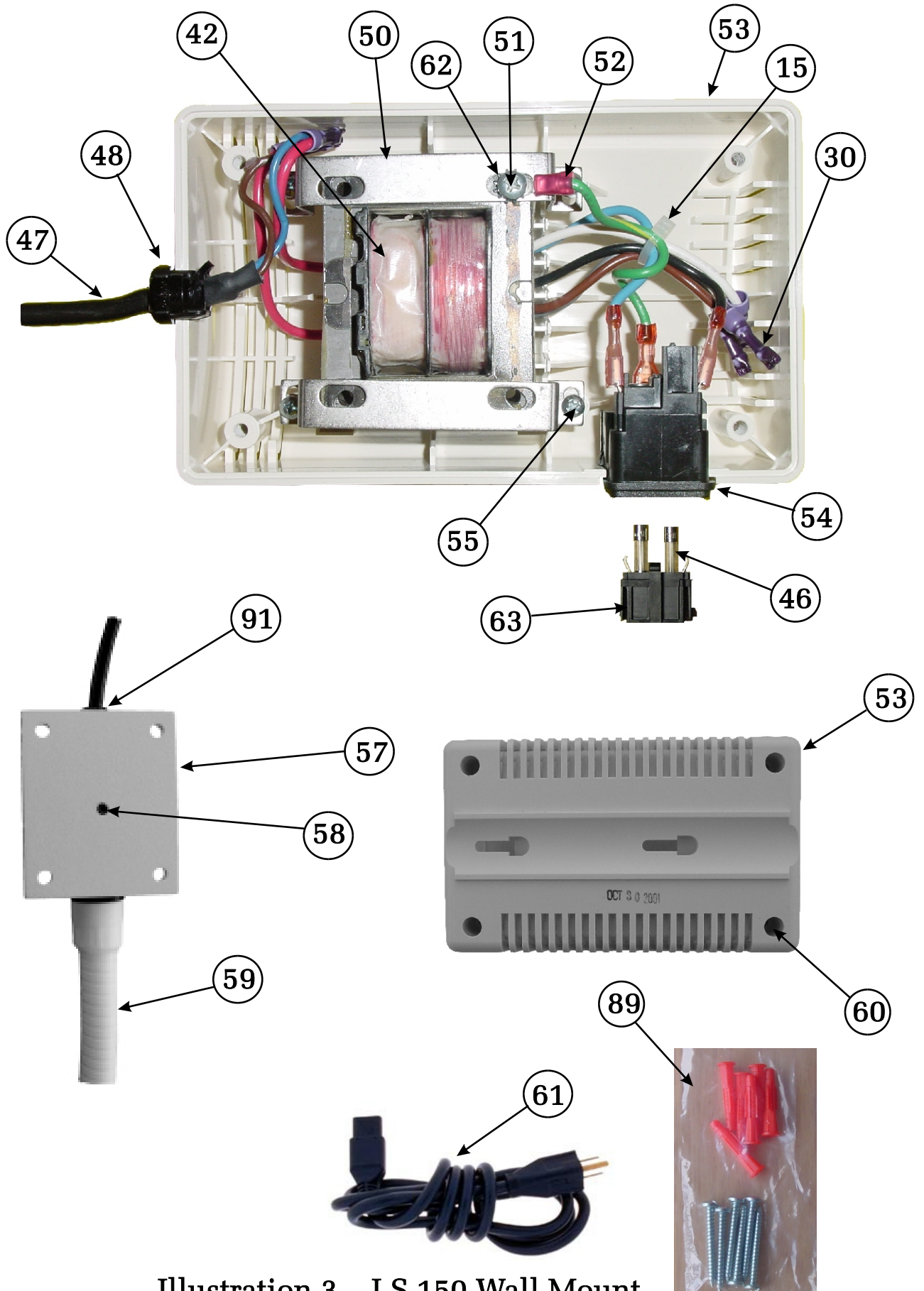


Illustration 3 LS 150 Wall Mount

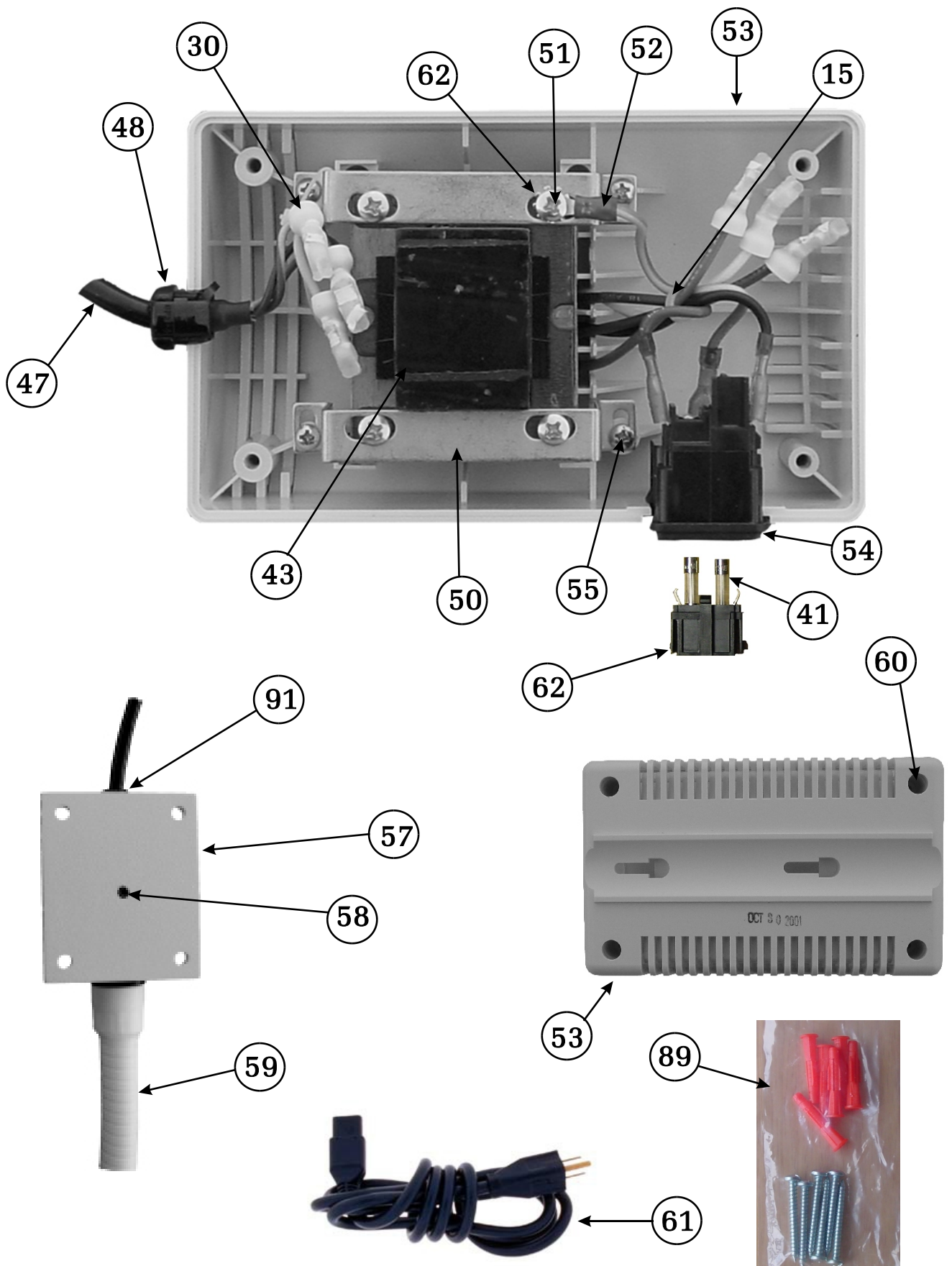


Illustration 4 LS 135 Wall Mount

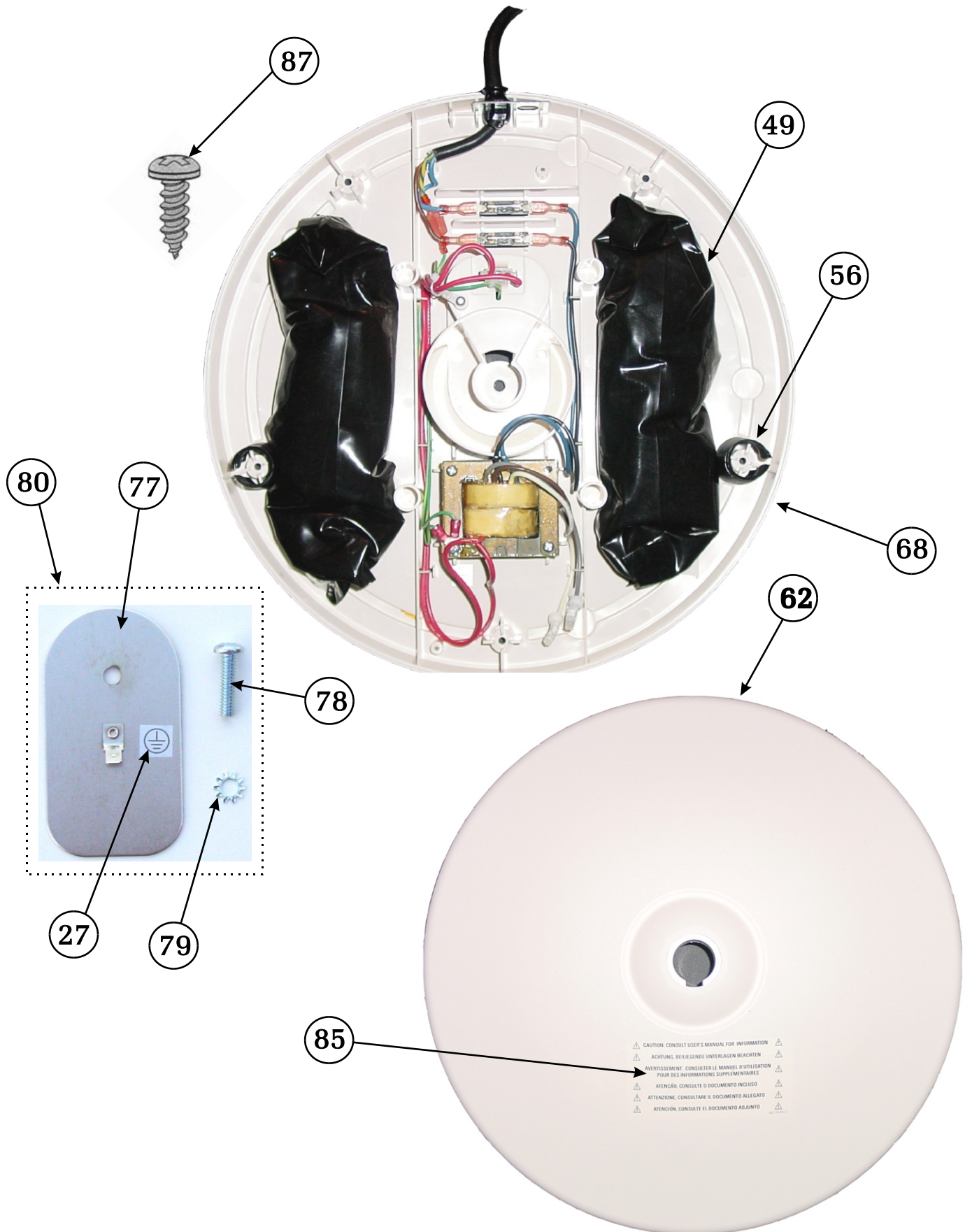


Illustration 5 LS 135/150 Floor Base Assembly

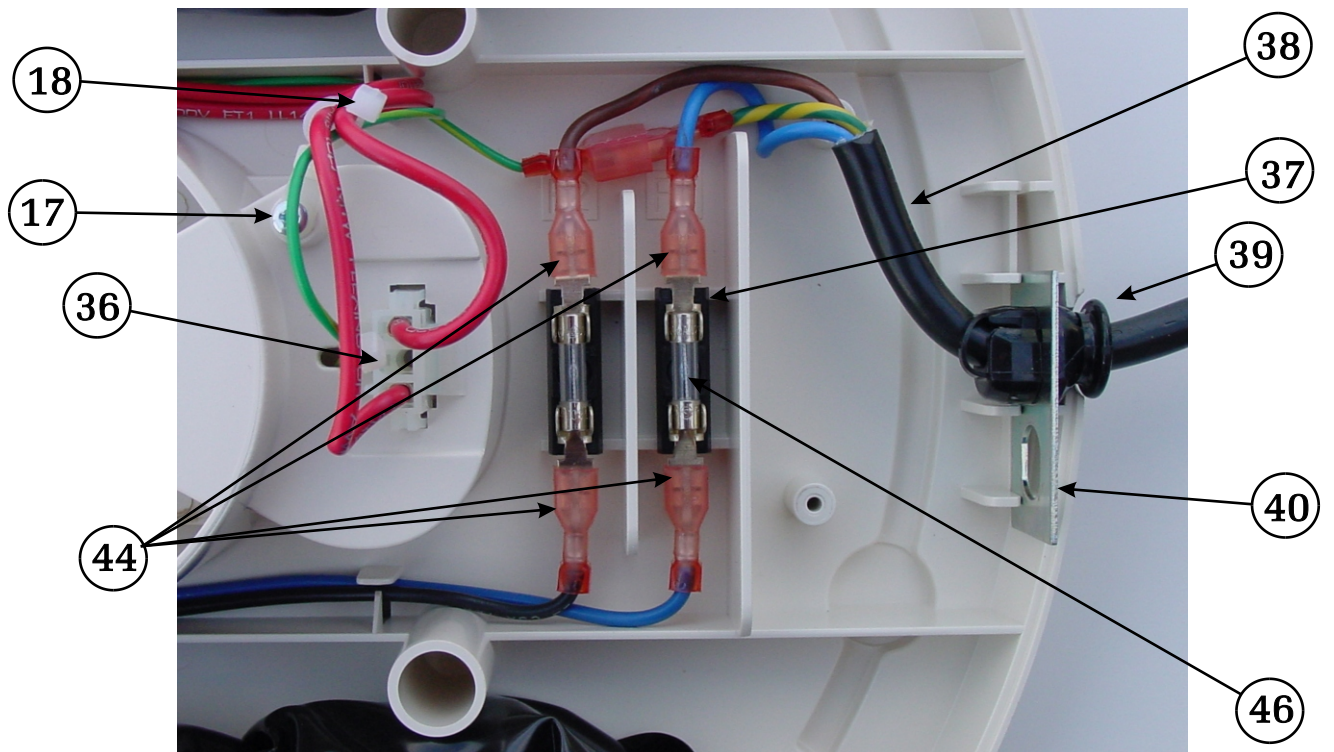
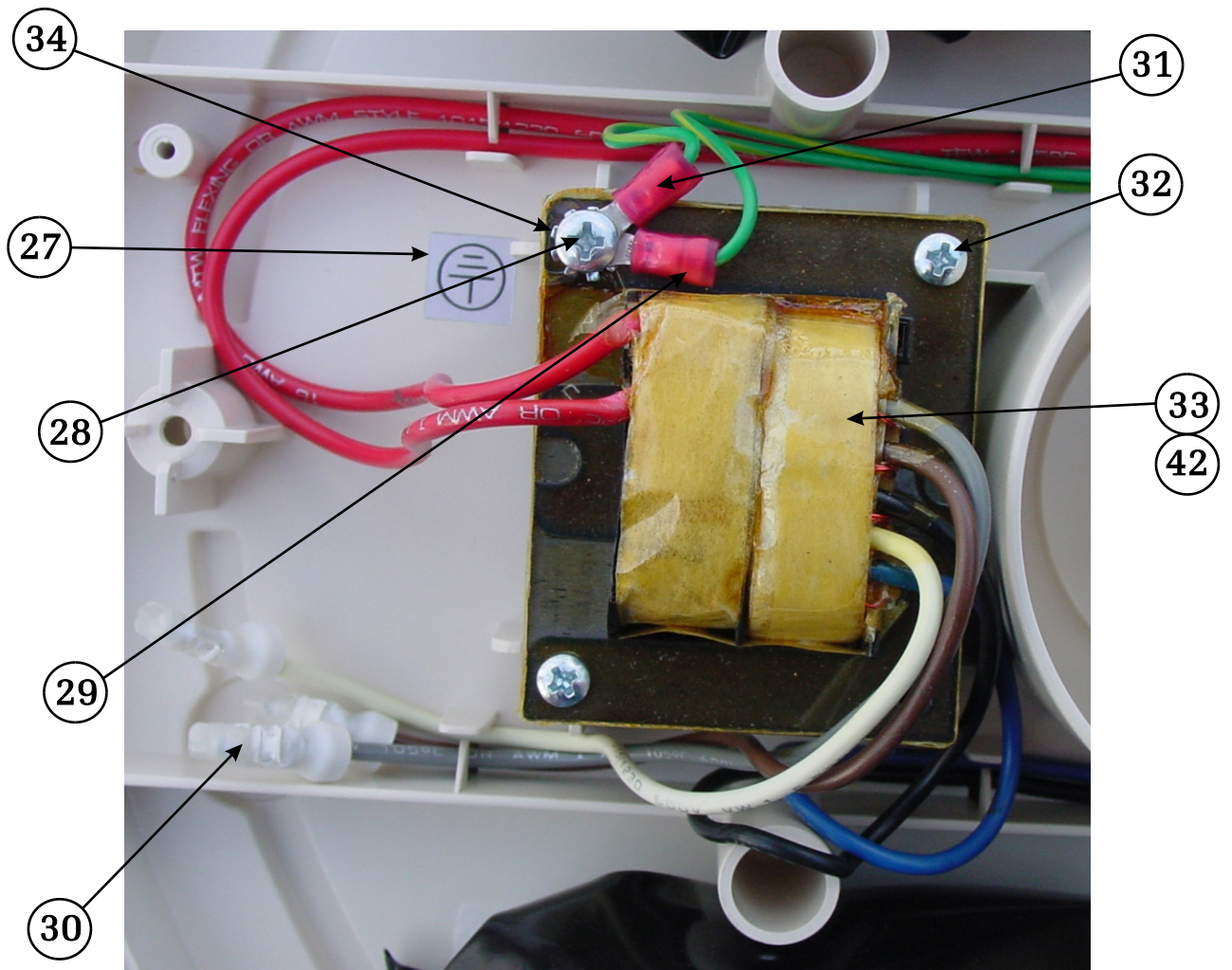


Illustration 6 LS 150 Base Assembly

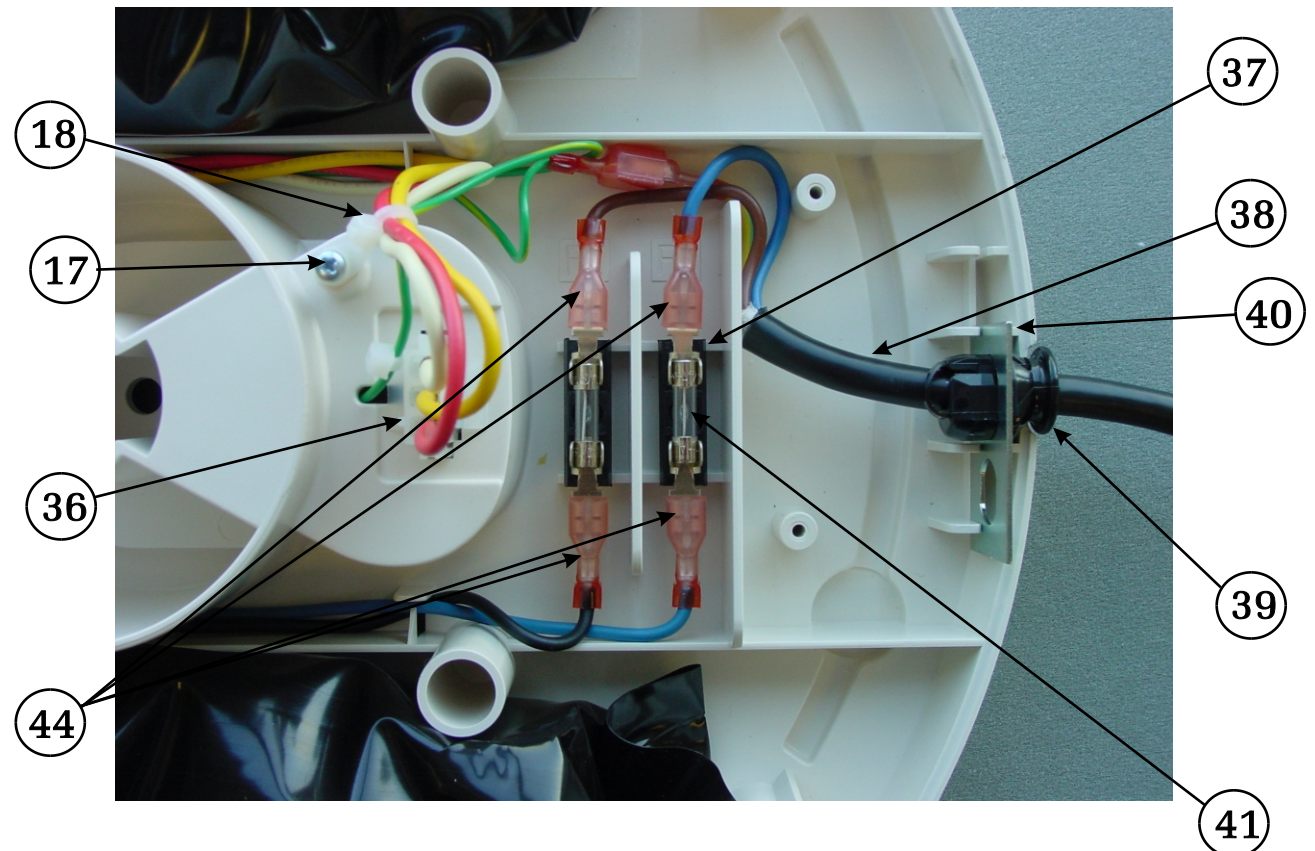
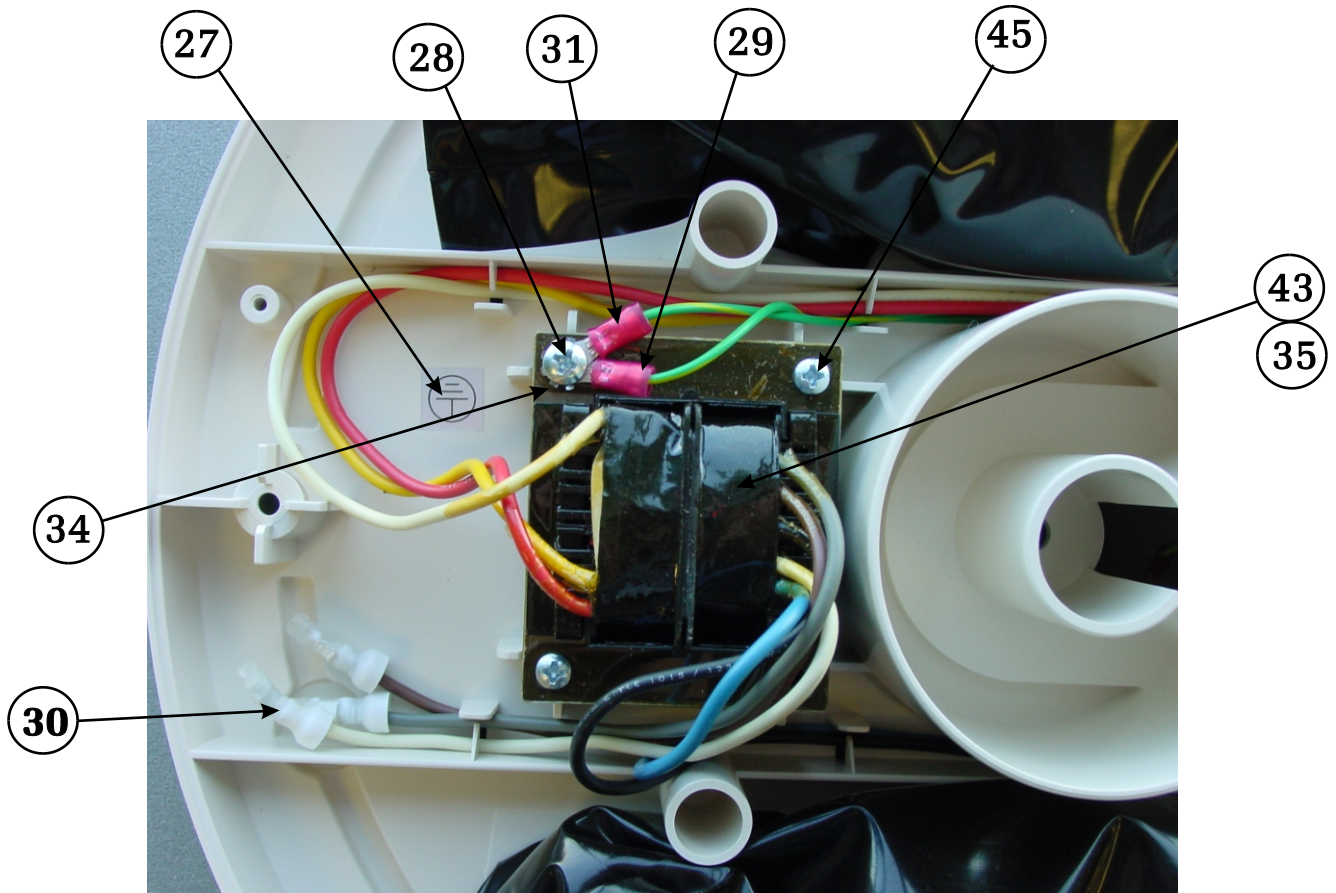


Illustration 7 LS 135 Base Assembly

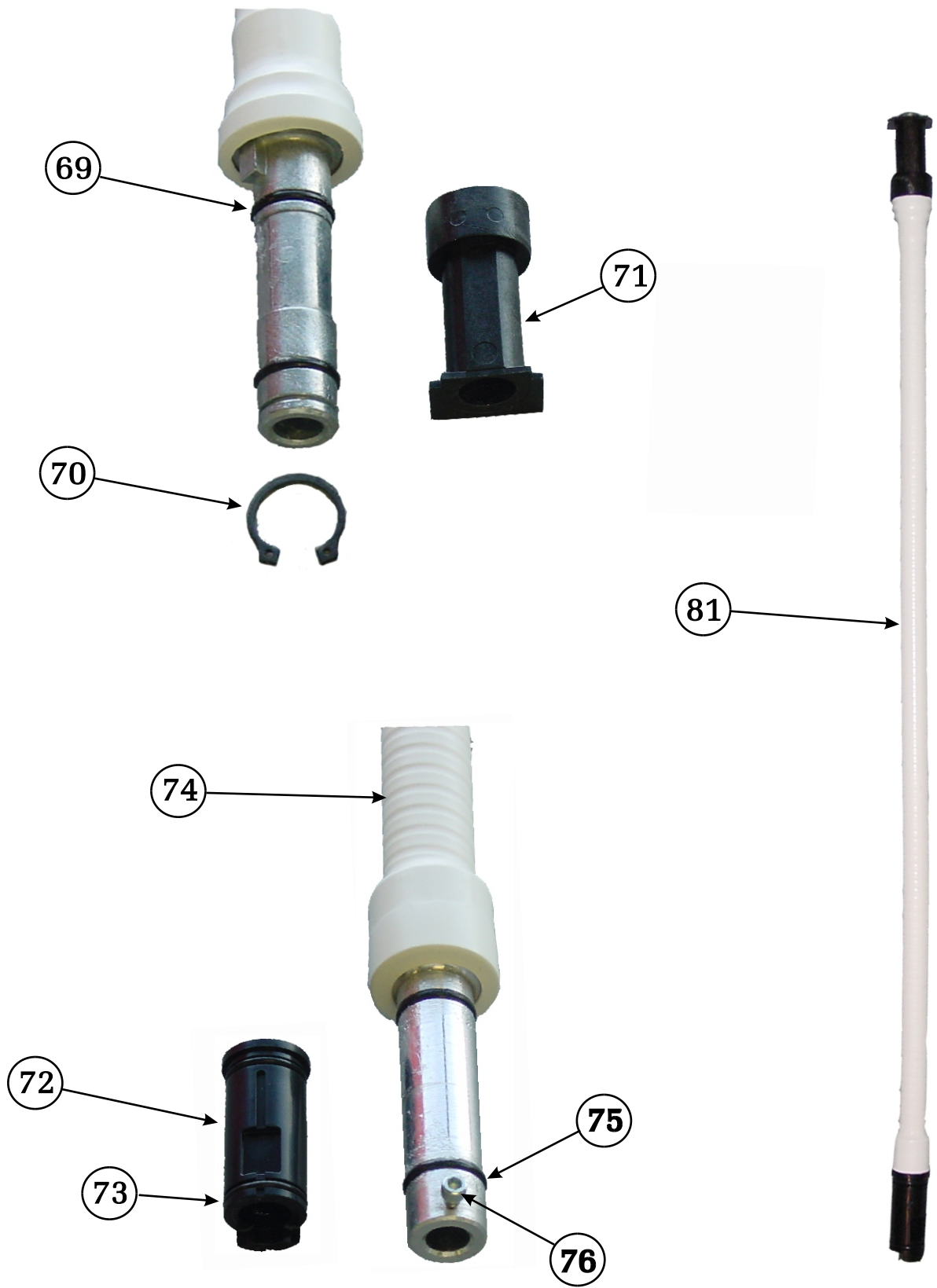


Illustration 8 LS 135/150 Goose Neck Assembly

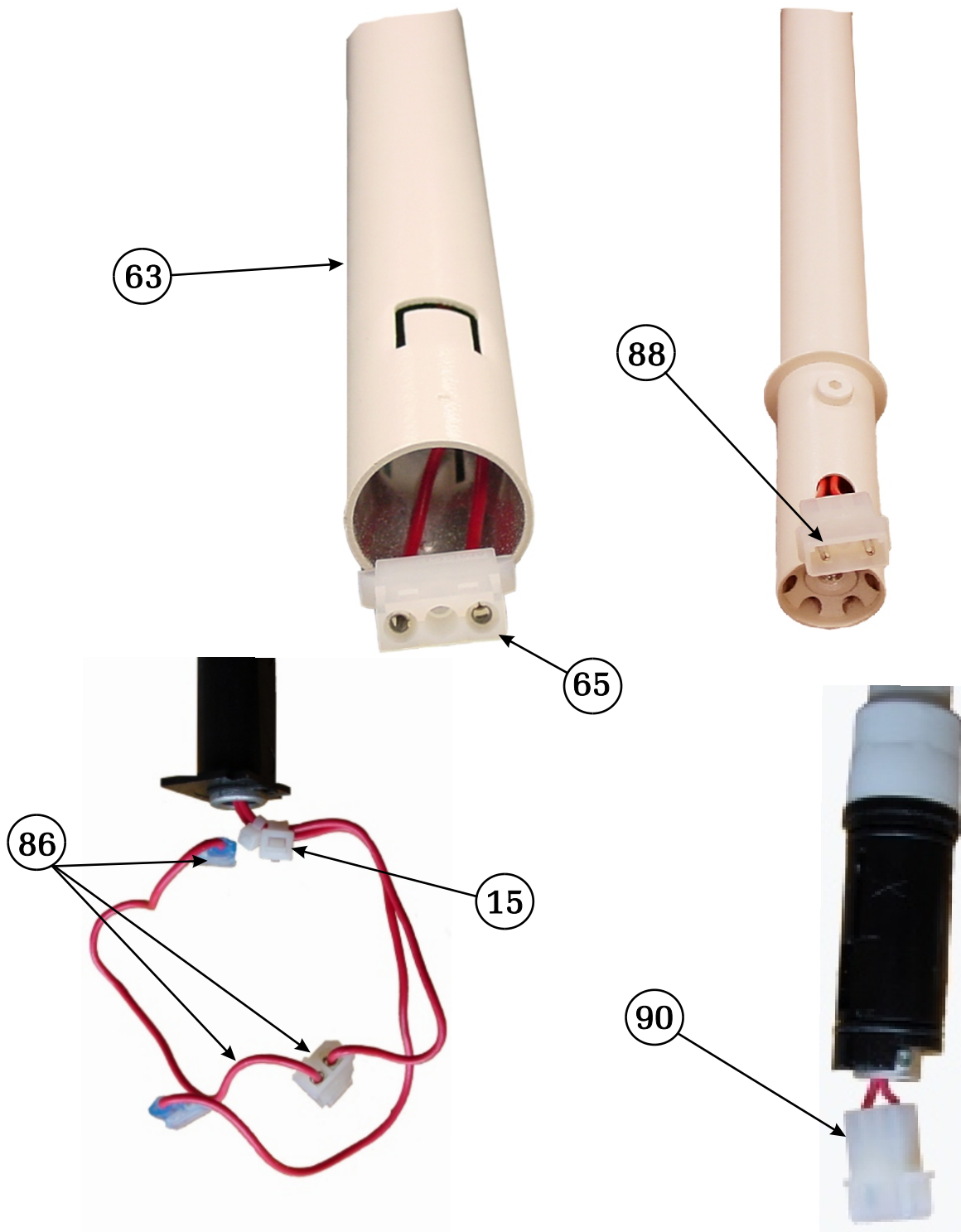


Illustration 9 LS 150 Table (Goose Neck, Pole Assembly)

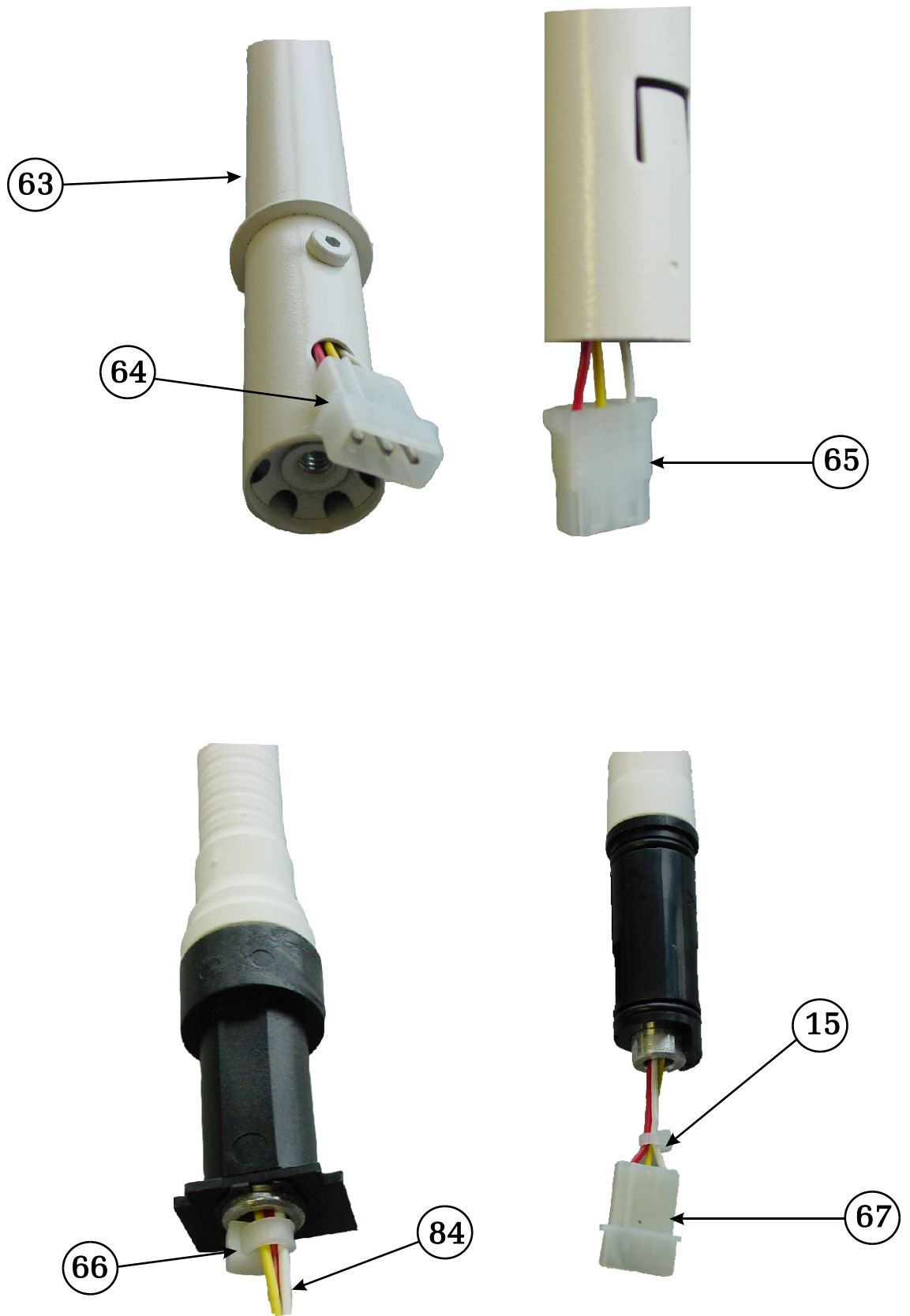
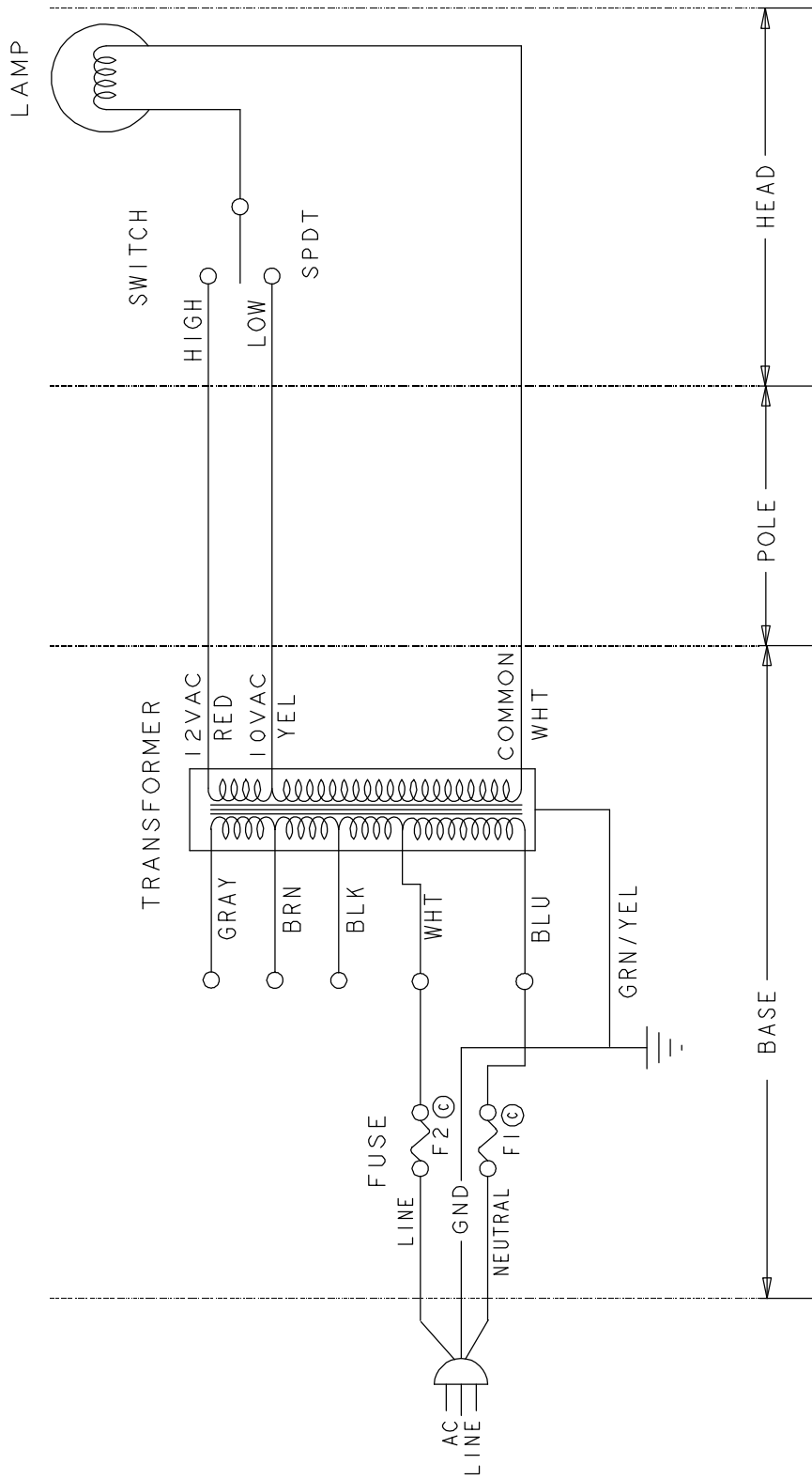
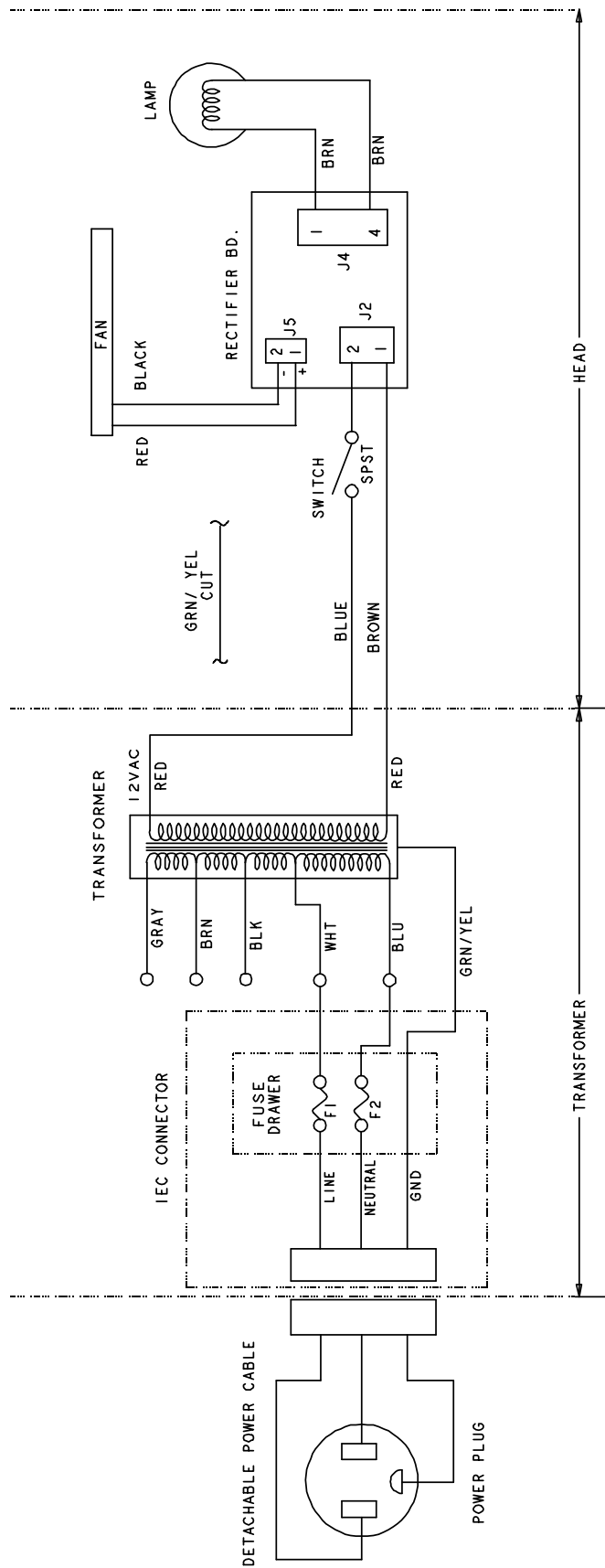


Illustration 10 LS 135 Floor (Goose Neck, Pole Assembly)





TRANSFORMER PRIMARY	
BLU	- COMMON
WHT	- 100V TAP
BLK	- 120V TAP
BRN	- 230V TAP
GRAY	- 240V TAP