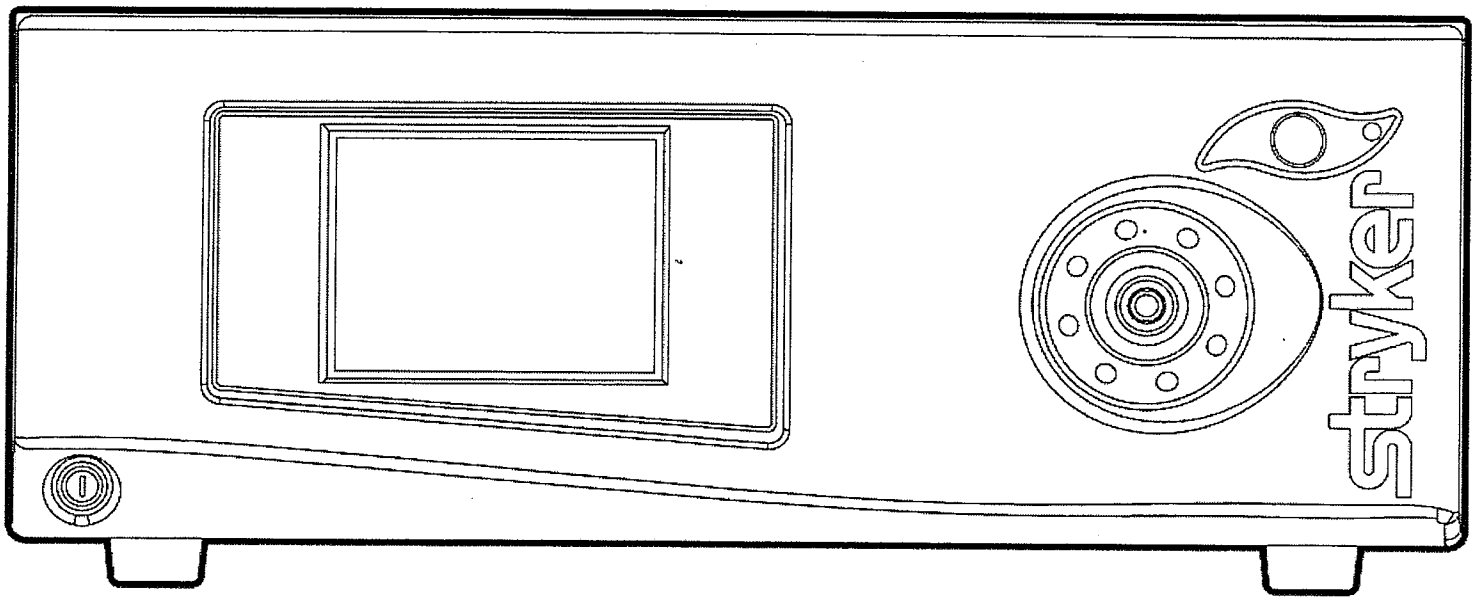
L9000 Light Source

REF 0220210000

stryker®

Service Guide



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Warnings and Cautions

Please read this manual and follow its instructions carefully. The words warning, caution, and note carry special meanings and should be carefully reviewed:

Warning	**Warnings indicate risks to the safety of the patient or user. Failure to follow warnings may result in injury to the patient or user.**
Caution	**Cautions indicate risks to the equipment. Failure to follow cautions may result in product damage.**
Note	Notes provide special information to clarify instructions or present additional useful information.

An exclamation mark within a triangle is intended to alert the user of special warnings or important operating and maintenance instructions in the manual.

A lightning bolt within a triangle is intended to warn of the presence of hazardous voltage. Refer all service to authorized personnel.

The incorrect use of any of the required tools and/or techniques may risk damage to the equipment or injury to the person carrying out the procedure, subsequent operators, or patient. Perform the repair ONLY if you have been specifically trained in the use of all pertinent equipment and techniques. Stryker Endoscopy cannot continue to guarantee compliance to UL, CSA, TUV, or other labeled safety standards if service is performed by anyone other than Stryker Endoscopy personnel.

IMPORTANT SAFETY NOTICE

Before operating or performing any maintenance or repairs on the L9000 Light Source, read the User Guide and Service Guide thoroughly and carefully. When using any light source, such as the L9000, fire and/or severe injury may result to the patient, user or inanimate objects, if the instructions in this manual are not followed.

All light sources, including the L9000, can generate significant amounts of heat at the scope tip, the scope light post, the light cable tip, and/or near the light cable adapter. Higher levels of brightness from the light source result in higher levels of heat.

To avoid the risk of burns and/or fire:

- Always adjust the brightness level of the camera and the monitor before adjusting the brightness level of the light source.
- Adjust the brightness level of the light source to the minimum brightness necessary to adequately illuminate the surgical site.
- Adjust the internal shutter of the camera higher in order to run the light source at a lower intensity.
- Avoid touching the scope tip or the light cable tip to the patient, and never place them on top of the patient, as doing so may result in burns to the patient or user.
- Never place the scope tip, the scope light post, the light cable adapter, or the light cable tip on the surgical drapes or other flammable material, as doing so may result in fire.
- Always place the light source in Standby mode whenever the scope is removed from the light cable or the device is unattended. The scope tip, scope light post, light cable adapter, and light cable tip will take several minutes to cool off after being placed in Standby mode, and therefore may still result in fire or burns to the patient, user, or inanimate objects.

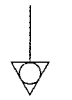
Warning **To avoid potential serious injury to the user and patient, and/or damage to this device, the user must note the following warnings:**

1. Carefully unpack this unit and check if any damage occurred during shipment. If damage is detected, refer to the "Service Options" section of this guide.
2. Read this operating manual thoroughly, especially the warnings, and be familiar with its contents before connecting and using this equipment.
3. Test this equipment prior to a surgical procedure. This unit was fully tested at the factory before shipment. Never use this equipment in the presence of flammable or explosive gases.
4. Avoid removing covers on the console; doing so may cause damage to electronics or electric shock.
5. Attempt no internal repairs or adjustments not specifically detailed in this operating manual.
6. Pay close attention to the care and cleaning instructions in this manual. Any deviation may cause damage.
7. Never sterilize the console, because the delicate electronics can not withstand this procedure.
8. Disconnect the control unit from the electrical outlet when inspecting the fuses.
9. Before each use, check the outer surface of the endoscope to ensure that there are no rough surfaces, sharp edges, or protrusions.
10. Avoid dropping the console, as it contains sensitive parts that are precisely aligned.
11. Ensure that readjustments, modifications, and/or repairs are carried out by persons authorized by Stryker Endoscopy.
12. Ensure that the electrical installation of the relevant operating room complies with the NEC and CEC guidelines.
13. To avoid the risk of electric shock, this equipment must only be connected to a supply mains with protective earth.
14. Multiple portable socket-outlets shall not be placed on the floor.

The warranty is void if any of these warnings are disregarded.

Symbol Definitions

In addition to the cautionary symbols already listed, other symbols found on the L9000 and in this manual have specific meanings that clarify the proper use and storage of the L9000. The following list defines the symbols associated with this product:



Equipotentiality

Protective Ground Earth

FireWire

Fuse rating

This symbol indicates that the waste of electrical and electronic equipment must not be disposed as unsorted municipal waste and must be collected separately. Please contact the manufacturer or other authorized disposal company to decommission your equipment.

Introduction

This manual is intended to be used as a service guide for Stryker repair technicians in the installation, maintenance, and repair of the Stryker L9000 Light Source. It is meant to be used in conjunction with the L9000 Light Source User Manual (1000-401-120) and does not replace existing documentation.

Service Options

Factory Service

Due to the complexity of the L9000 Light Source, Stryker recommends that any malfunctioning system be returned to Stryker Endoscopy for repair or replacement, where specialized equipment and technicians are available to perform repairs while maintaining full product quality and safety. If service is needed either during or after the warranty period:

1. Contact Stryker Endoscopy at 1-800-624-4422, or contact your local Stryker Endoscopy sales representative.
2. Package all the components carefully in the original shipping container, if possible.
3. Ship the L9000 Light Source, prepaid and insured, to:

   Stryker Endoscopy Customer Service
   Attention: Repair Department
   5900 Optical Court
   San Jose, California 95138

You may request a loaner unit during the repair period.

On-Site Service

Stryker Endoscopy accepts responsibility for the effects on safety, reliability, and performance of the equipment only if readjustments, modifications, and repairs have been carried out exclusively by a person specifically authorized by Stryker Endoscopy to do so.

On-site repair should be carried out only by qualified technicians with the proper test equipment listed in this manual, so that the safety of operators and patients is not compromised.

In no event shall Stryker Endoscopy be liable for incidental or consequential damages in connection with or arising from the performance or use of its products after unauthorized modification or repair.

Required Skills, Tools, and Components

The repair procedures described in this manual require a basic set of skills, tools, and replacement components.

Skills

Stryker recommends diagnostic and repair procedures be performed by authorized, qualified technicians with training or experience in the following:

- Basic electronics techniques
- Multimeter operation
- Oscilloscope operation
- Vectorscope operation
- Bio-Tek Safety Analyzer operation

Tools

Most of the procedures described in this manual can be performed using a basic tool kit that includes the items listed below.

Basic tools	Advanced tools
• Phillips screwdriver	• Multimeter
• Allen wrench set	• Oscilloscope (20 Mhz or higher)
• Flathead screwdriver	• NTSC/Pal Vectorscope
• 8″ adjustable wrench	• Bio-Tek Model 601 PRO Safety Analyzer or equivalent current leakage tester
• Needlenose pliers	
• Color video monitor	
• Glass fuse puller	

Components

Certain replacement components are for in-house use only and will not be available to any non-Stryker entity.

Before any parts are purchased, an Indemnification Letter must be signed and submitted to Stryker Endoscopy, available from Customer Service at 1-800-624-4422.

Stryker reserves the right to incorporate improvements to the L9000 without notice and will inform customers of any significant upgrades. All updated parts will be fully interchangeable with older versions and will offer at least the same level of quality and performance.

For up-to-date information on upgrades to the product or to this manual, contact your Stryker representative.

Reference Documents

None of the in-house Manufacturing Assembly Procedures (MAPs), Quality Inspection Procedures (QIPs), specialty tools, jigs, or fixtures listed in this manual are available for purchase.

Product Description

The Stryker L9000 Light Source is a light-generating unit designed to illuminate surgical sites during endoscopic applications. The L9000 uses a LED module to generate light, which it delivers to the surgical site via a fiberoptic light cable.

The L9000 is compatible with all Stryker light cables, and, with the proper light cable and adapters, it can connect to most flexible or rigid endoscopes.

The L9000 is equipped with Electronic Scope Sensing Technology (ESST), a special safety feature that helps prevent accidental burns caused by a light cable that is not connected to the scope. When operated with an ESST light cable like a Safelight™, the L9000 senses when the scope and the light cable are separated and places the light source in Standby mode. In Standby mode, the L9000 will reduce light output to a minimum, preventing the light cable from generating excessive heat.

Technical Specifications

Electrical

Primary:	100 – 240 VAC, 50/60 Hz, 400 W
Fuses (2):	5.0A, 250V

Dimensions

Height:	4.75″ (12.1 cm)
Width:	12.5″ (31.8 cm)
Depth:	16.8″ (42.7 cm)
Weight:	16.0 lbs (7.3 kg)

Fiberoptic Cable Range

2mm – 6.5 mm diameter

Light Engine

Type: Red, Green, Blue LEDs Module

Operating Conditions

5 – 40°C
30 – 95% Relative Humidity

Transportation and Storage

-20°C – 60°C
10% – 75% Relative Humidity
700 – 1060 hPa

Classifications and Approvals

Complies with medical safety standards:

- IEC 60601-1:2005
- CAN/CSA C22.2 No.601.1-M90
- UL 60601-1: 2003

Complies with medical EMC standard:

- IEC 60601-1-2:2001

Class 1 Equipment

Type CF applied parts

Water Ingress Protection, IPX0 — Ordinary Equipment

Continuous Operation

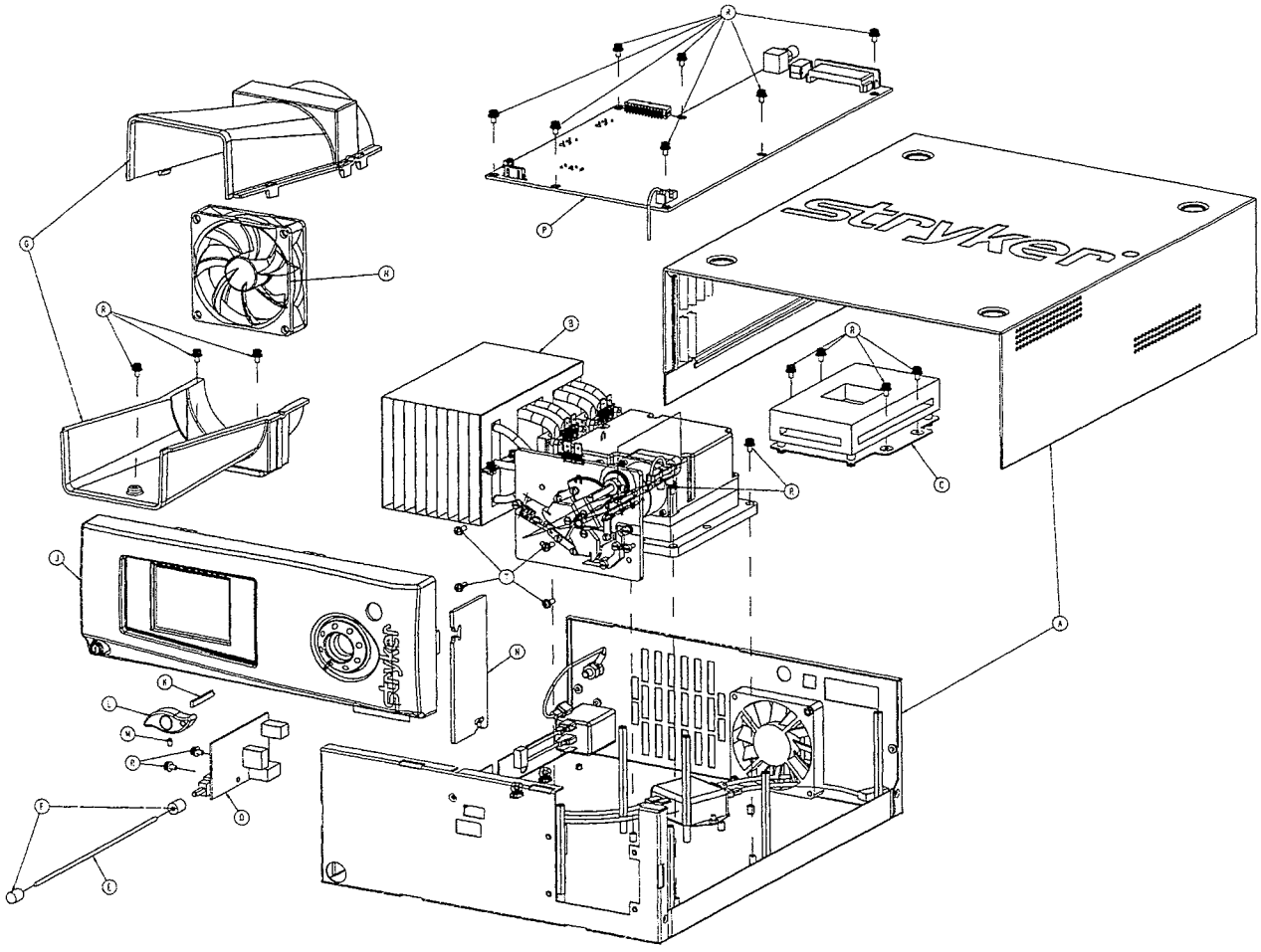
Patent Protection

U.S. #5,850,496; 6,110,107; and 6,689,050.
Other patents pending.

Please contact your local Stryker Endoscopy sales representative for information on changes and new products.

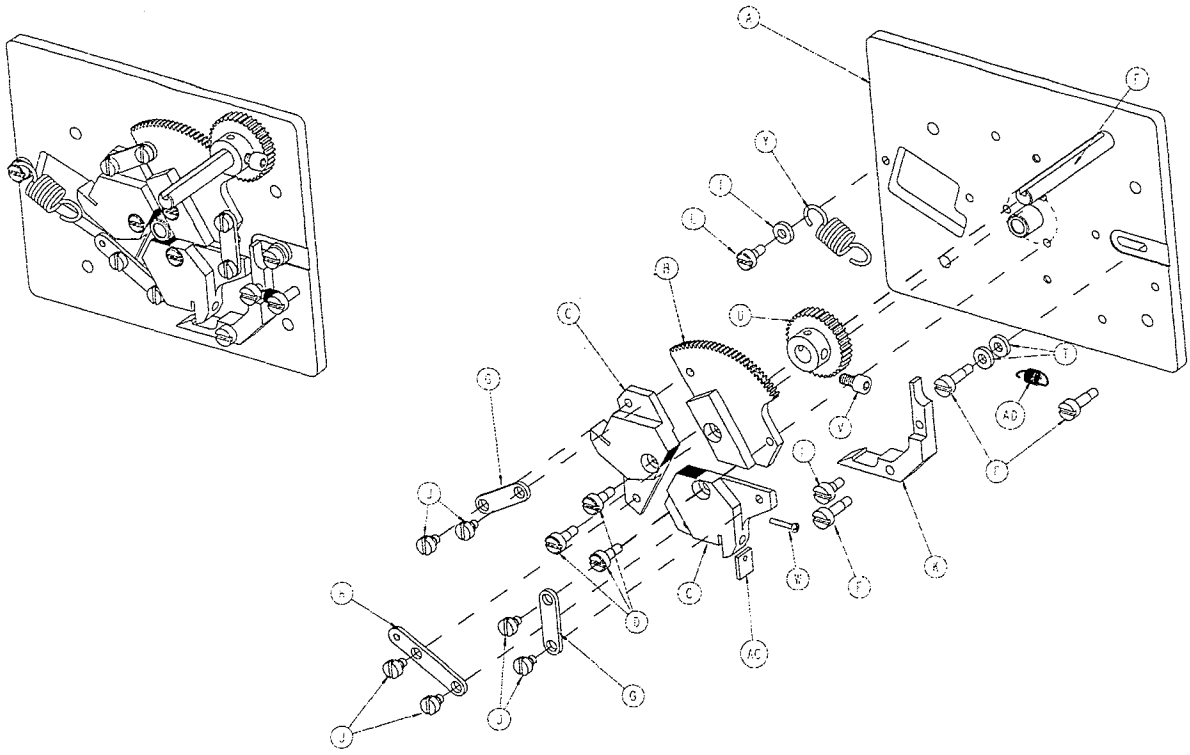
Device Diagrams

L9000 Light Source Console



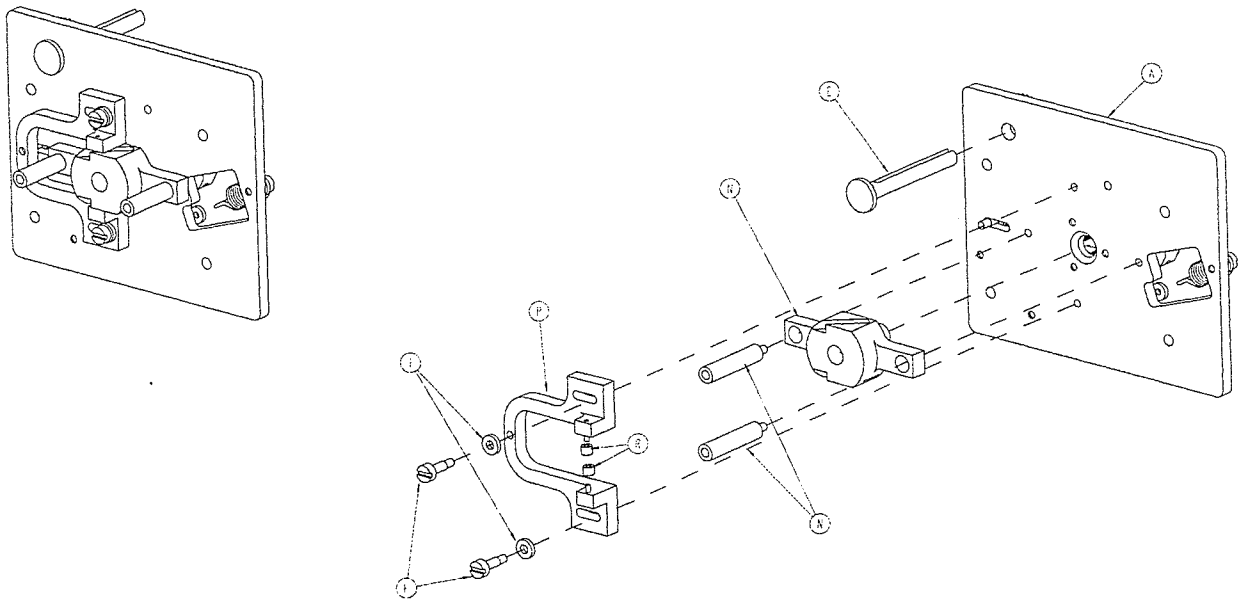
ITEM	PART NUMBER	DESCRIPTION	UM	QTY
A	105-209-802	ASSY, CHASSIS TRAY WITH COMPONENTS, L9000	EA	1
B	105-209-847	ASSY, LED MODULE WITH LIGHTPIPE AND JAW, L9000	EA	1
C	105-209-807	ASSY, POWER SUPPLY, L9000	EA	1
D	105-209-824	ASSY, L9000 AC INLET BOARD	EA	1
E	105-203-810	PUSH ROD, RF	EA	1
F	105-201-256	CAP, PUSH ROD	EA	2
G	105-210-631	ASSY, TOP AND BOTTOM DUCT, L9000	EA	1
H	105-209-871	FAN ASSY, 92MM X 25MM, 3-WIRE	EA	1
J	105-209-851	ASSY, FRONT PANEL, L9000	EA	1
K	105-210-469	KEY, JAW HANDLE, L9000	EA	1
L	105-203-554	JAW HANDLE, X7000	EA	1
M	103-539-002	SCREW, SET, #6 X 1/4 FLPT SS BLK	EA	1
N	105-209-857	SEPARATOR, L9000	EA	1
P	P10343	ASSY, L9000 MAIN BOARD	EA	1
R	105-207-102	6-32 X 5/16 PHILLIPS PAN SPLIT/FLAT WASHER SEMS	EA	20
T	105-192-441	SCREW, 6-32 X 0.375 PH PH EXT. SEMS	EA	4
U	105-209-865	CABLE ASSY, POWER SUPPLY/MAIN BOARD, L9000 (NOT SHOWN)	EA	1
V	105-209-866	CABLE ASSY, DIGITAL BOARD/LED CONTROL, L9000 (NOT SHOWN)	EA	1
W	105-209-870	CABLE ASSY, MAIN BOARD/FRONT BOARD, L9000 (NOT SHOWN)	EA	1
X	105-202-435	FUSE, 5A, 250V, 5MM X 20MM, SLO-BLO (NOT SHOWN)	EA	2
AA	1000-201-096	LABEL, WARRANTY VIOLATION (NOT SHOWN)	EA	1
AB	1000-207-905	LABEL, MODEL/SERIAL NUMBER, L9000 (NOT SHOWN)	EA	1
AC	105-210-516	RUBBER, HEAT SINK STANDOFF, L9000 (NOT SHOWN)	EA	2
AD	105-210-564	ADJUSTABLE WIRE CLAMP (NOT SHOWN)	EA	3
AE	105-210-672	BLACK DUCT TAPE (NOT SHOWN)	-	A/R
AF	105-210-559	CABLE ASSY, AC INLET BOARD/THERMAL SWITCH, L9000 (NOT SHOWN)	EA	1
AG	105-199-434	KAPTON TAPE (NOT SHOWN)	-	A/R
AH	105-192-839	SCREW,4-40 X 0.38 SOCKET HEAD (NOT SHOWN)	EA	2
AJ	105-199-497	WASHER, NYLON (NOT SHOWN)	EA	2
AK	105-180-110	NUT, 7/16 JAM BNC RA (NOT SHOWN)	EA	1
AL	105-180-111	WASHER, 7/16 LOCK BNCRA (NOT SHOWN)	EA	1

Jaw Assembly (Front)



ITEM	PART NUMBER	DESCRIPTION	QTY
A	105-206-303	JAW BASE, X8000	1
B	105-206-299	JAW/GEAR COMBINATION, X8000	1
C	105-206-300	JAW, X8000	2
D	105-206-302	SHOULDER SCREW, 4-40 x 3/16"	3
E	105-209-808	PINION SHAFT, L9000	1
F	105-207-459	SCREW,SHOULDER, 1/8 X 5/16, NYLON PATCH	5
G	105-170-081	ARM, Q4000	2
H	105-170-082	ARM, SPRING	1
J	105-170-090	BOLT, SHOULDER (SMALL)	6
K	105-199-490	LATCH, JAW, X7000	1
L	105-199-493	SHOULDER SCREW, 1/8 X 1/8	2
M	105-199-488	ACTUATOR, CABLE, X7000	1
N	105-209-805	STANDOFF, MOUNT, INTEGRATING ROD, 1.125	2
P	105-199-491	SLIDE, CABLE ACTUATOR	1
R	105-200-726	BUSHING, CABLE ACTUATOR, X7000	2
T	105-199-497	WASHER, NYLON	4
U	105-199-487	PINION, X7000	1
V	105-200-670	SCREW, #6-32 X .250 SOCKET HD CAP	1
W	105-195-879	SCREW, #0-80 X 3/16, PAN HD PHILLIPS	1
Y	105-199-547	SPRING, JAW, X7000	1
AA	104-909-001	GREASE, MOBIL 2B (NOT SHOWN)	A/R
AB	106-000-197	LOCTITE 290 (NOT SHOWN)	A/R
AC	105-200-702	LINER, JAW, X7000	1
AD	105-199-499	SPRING, JAW LATCH	1

Jaw Assembly (Back)



ITEM	PART NUMBER	DESCRIPTION	QTY
A	105-206-303	JAW BASE, X8000	1
B	105-206-299	JAW/GEAR COMBINATION, X8000	1
C	105-206-300	JAW, X8000	2
D	105-206-302	SHOULDER SCREW, 4-40 x 3/16"	3
E	105-209-808	PINION SHAFT, L9000	1
F	105-207-459	SCREW,SHOULDER, 1/8 X 5/16, NYLON PATCH	5
G	105-170-081	ARM, Q4000	2
H	105-170-082	ARM, SPRING	1
J	105-170-090	BOLT, SHOULDER (SMALL)	6
K	105-199-490	LATCH, JAW, X7000	1
L	105-199-493	SHOULDER SCREW, 1/8 X 1/8	2
M	105-199-488	ACTUATOR, CABLE, X7000	1
N	105-209-805	STANDOFF, MOUNT, INTEGRATING ROD, 1.125	2
P	105-199-491	SLIDE, CABLE ACTUATOR	1
R	105-200-726	BUSHING, CABLE ACTUATOR, X7000	2
T	105-199-497	WASHER, NYLON	4
U	105-199-487	PINION, X7000	1
V	105-200-670	SCREW, #6-32 X .250 SOCKET HD CAP	1
W	105-195-879	SCREW, #0-80 X 3/16, PAN HD PHILLIPS	1
Y	105-199-547	SPRING, JAW, X7000	1
AA	104-909-001	GREASE, MOBIL 28 (NOT SHOWN)	A/R
AB	106-000-197	LOCTITE 290 (NOT SHOWN)	A/R
AC	105-200-702	LINER, JAW, X7000	1
AD	105-199-499	SPRING, JAW LATCH	1

Basic Maintenance

Cleaning the L9000

Caution **Unplug the L9000 before cleaning the unit.**

1. As needed, clean the external surfaces of the L9000 using a cloth or sponge dampened with a mild detergent or disinfectant.
2. Clean and maintain the light cable according to the manufacturer's instructions.

Caution **Do not use any abrasive cleaners. Do not allow any liquid to drip into the unit.**

Caution **Do not sterilize or immerse the L9000.**

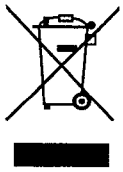
Replacing the Fuses

1. Unplug the light source from the AC outlet and remove the power cord from the rear of the unit.
2. Unlatch the fuse holder and remove the fuse(s).
3. Replace the fuse(s) with fuse(s) of the same value and rating.

Warning **To help avoid the risk of fire, use only 5.0A 250V fuses.**

4. Reinstall the fuse holder.

Disposing of the L9000



This product is considered electronic equipment. It must not be disposed of as unsorted municipal waste and must be collected separately. Please contact the manufacturer or other authorized disposal company to decommission your equipment.

Troubleshooting

Problem	Possible Solution
Jaw handle is loose	• See "Adjusting the Jaw Handle" section for instructions on repairing the jaw handle.
Jaw handle is cracked or rubs against the front panel	• See "Replacing Components" section 2.0 for instructions on replacing the jaw handle.
Power button does not light up after powering on the console	• See "Replacing Components" section 3.0 for instructions on replacing the power button LED.
Power button sticks when pushed	• See "Replacing Components" section 3.0 for instructions on replacing the power button itself.
LCD does not display when the console is powered on; or the touch screen buttons do not activate when pressed	• Make sure the front board is receiving power: 1. If the front board **is not** receiving power, but the main board is powered, check that the cable connector for the front board/main board cable is still securely attached to the main board. If the connector is broken, the L9000 should be returned to Stryker so the main board can be replaced and the LED module can be calibrated. 2. If the front board **is not** receiving power, but the main board is powered **and** the front board/main board cable connector is working, then replace the front board. See "Replacing Components" section 4.0 for instructions. 3. If the front board **is** receiving power, try reinserting the LCD connection to the front board. If the LCD still does not turn on, or if it has any obvious dead pixels or cracks, replace the LCD. See "Replacing Components" section 4.0 for instructions.
Console powers down because of an "E_" error	• Make sure the LED module fan is functioning. If not, refer to "Replacing Components" section 5.0 for instructions on replacing the LED module fan.
Console will not power on	• Check the fuses in the AC inlet filter: 1. Replace blown fuses with 5.0A, 250V 5x20mm slo-blo fuse; PN 105202435 2. If fuses are not blown, probe power lines on inside of unit when turned on. 3. If the AC inlet filter does not provide power to the AC inlet board, see "Replacing Components" section 6.0 for instructions on replacing the AC inlet filter.
Console continues to emit light after the light cable is removed; or the console does not resume from Standby mode after plugging in a light cable	• See "Replacing Components" section 7.0 for instructions on replacing the ESST sensor.

Problem	Possible Solution
Light output (when using Safelight™ cables) appears to flicker or works intermittently	• See "Replacing Components" section 7.0 for instructions on replacing the ESST contact.
Light output is no longer white	• The LED power contacts may be damaged or oxidized. Return the L9000 for repair and recalibration.

Error Code Definitions

The L9000 LCD displays error codes when one of the following conditions occur. Follow the recommended action to correct the error.

Code	Definition	Recommended Action
E-1	The LEDs have exceeded their recommended operating temperature.	Return the L9000 for repair.
E-2	All conditions are met for the LEDs to illuminate, yet it remains off.	Return the L9000 for repair.
E-3	The LEDs are kept off because the electronics fan is not working properly.	Return the L9000 for repair.
E-4	The LEDs are kept off because the heat pipe fan is not working properly.	Refer to "Repair/Replacement" section 5.0 for the procedure to replace the LED (heat pipe) fan.
E-5	All conditions are not met for the LEDs to illuminate, yet it remains on.	Return the L9000 for repair.

Repair/Replacement

The L9000 is a precision instrument that has been engineered and manufactured with great care to ensure the safety of operators and patients. In order to maintain the high level of safety and reliability required in devices of this nature, it is important to fully understand and comply with all required procedures set out herein.

If some part of a procedure is omitted or adequate equipment is not used, the safety and performance of the devices may be unknowingly compromised. If any of the procedures described in this manual are beyond the scope of the technician's training, consult the "Service Options" section of this guide for information on how to obtain service from Stryker Endoscopy.

Warning

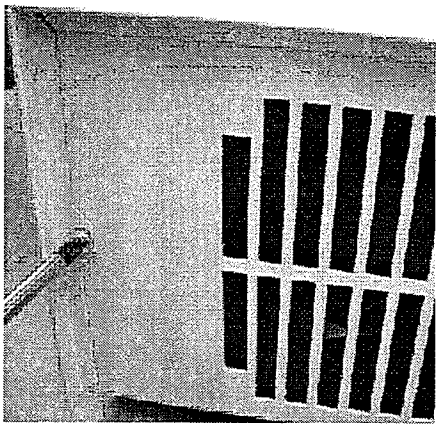
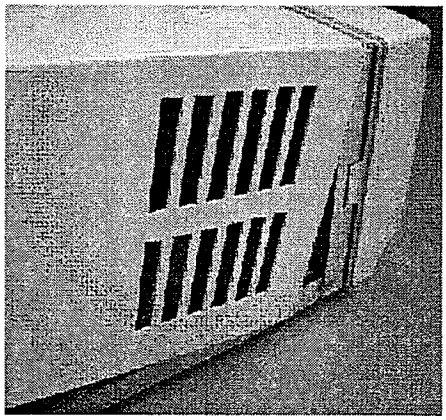
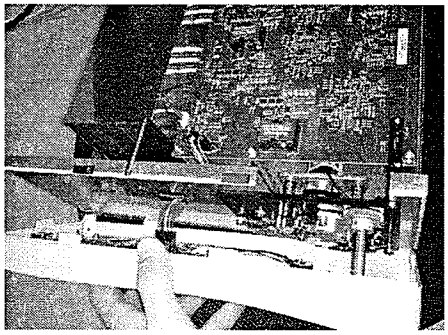
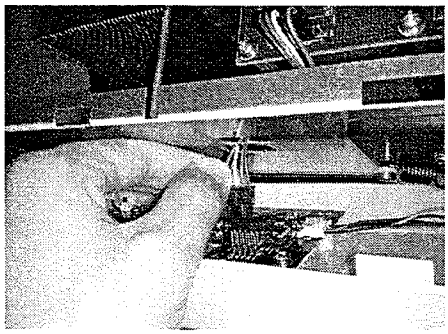
As with all AC powered devices, dangerous voltages are present. If adequate safety precautions are not taken, results may include damage to the equipment, personal injury, or death. It is imperative that these procedures are approached only by trained technicians with proper equipment after fully reading and understanding the steps involved.

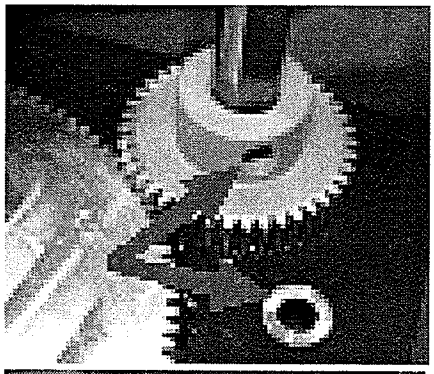
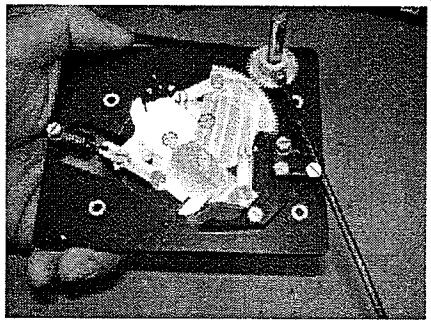
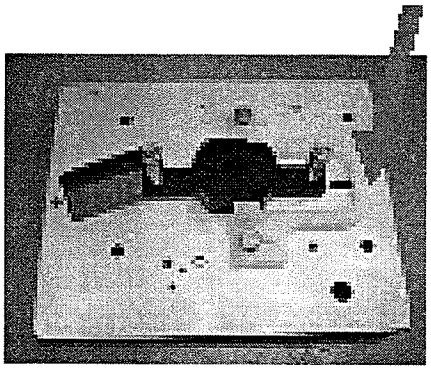
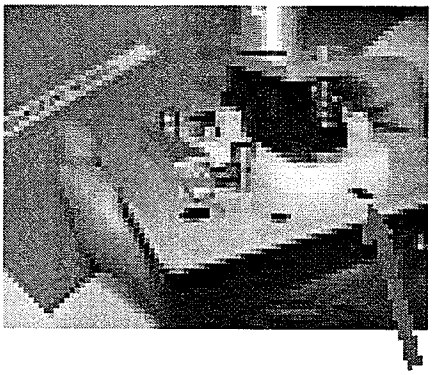
Caution On all steps in this procedure referring to application of Loctite, apply Loctite to threaded holes rather than to threads on the screws unless otherwise specified.

Caution ESD Protection is required to perform this assembly. Failure to follow this procedure can cause undetectable damage to electrical components.

Adjusting the Jaw Handle

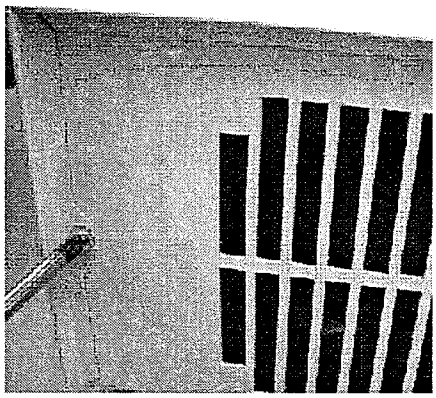
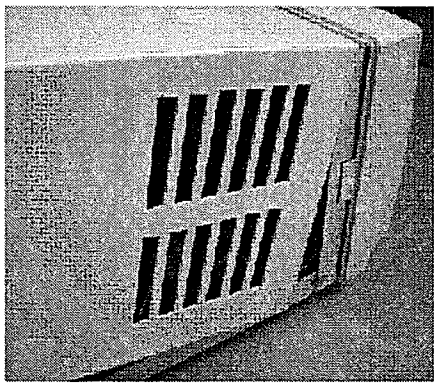
Note: Images show this process being conducted with the jaw removed from the console. However, the process should be completed with the jaw assembly still mounted in the unit.

Step	Task Description	Process Image	Tools	Parts
1	Unscrew the chassis cover from the chassis, then remove the BNC washer and nut from the shutter connector.		• #2 Phillips screwdriver • 9/16" socket	• BNC washer and nut
2	Remove the jaw handle and jaw handle key from the front panel. To do so, remove the #6-32 x 0.25" set screw.		• 1/16" Hex wrench	• #6-32 x 0.25" stainless steel black set screw
3	Remove the front panel by lifting the six tabs out of their slots in the chassis. Start with the tab on the right side, working across the top, and progress down the left side to the bottom. **Caution:** Unplug the front board power cable (that connects to the main board) to prevent damage from occurring to components.	 		

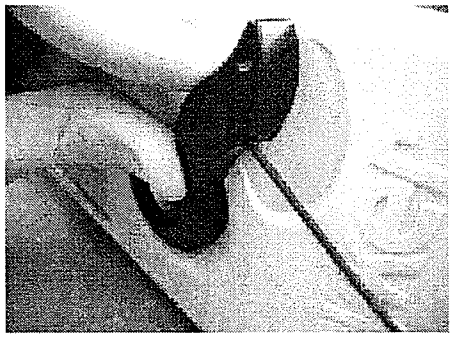
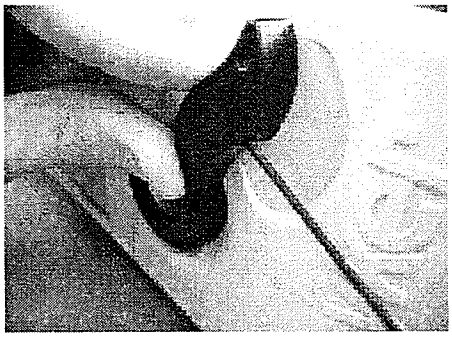
Step	Task Description	Process Image	Tools	Parts
4	Loosen the set screw in the pinion gear, then tighten the pinion gear/ shaft against the jaw plate until the handle no longer wobbles. Align the pinion gear to the jaw mounting screw as shown. Note: It is normal if the jaw plates and the jaw base have some play or wobble between them, as long as the shoulder bolts in the assembly are fully tightened.	 	• #2 Phillips screwdriver	• Pinion shaft (PN 105209808) • Pinion Gear (PN 105199487) • #6-32 x 0.25" socket head cap screw (PN 105200670)
5	Place the jaw key and jaw handle in the pinion shaft and open/lock the jaw. Remove the handle and key. Trigger the jaw by pressing gently on the white slide cable actuator on the back of the jaw. If there is too much friction and the jaw does not function smoothly, then repeat step 4 — allowing a small amount of play between the pinion gear and jaw plate. **WARNING**: Be careful of moving parts. Jaw components move quickly and with substantial force. Injury can occur if fingers are caught in the closing jaw.	 	• 7/64" hex wrench	

Replacing Components

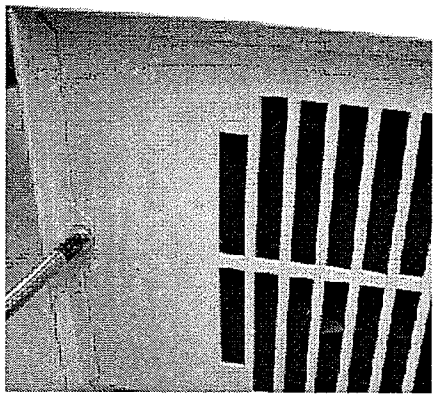
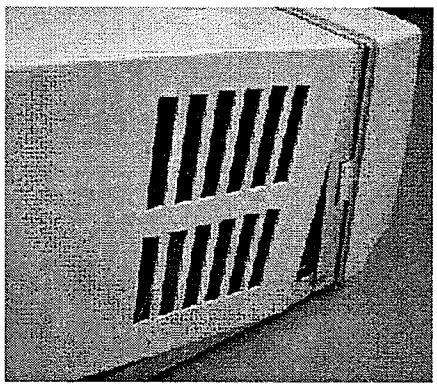
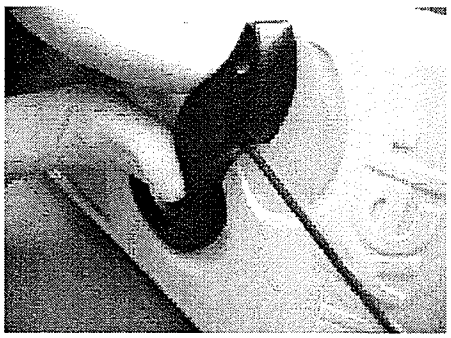
1.0 Chassis Cover

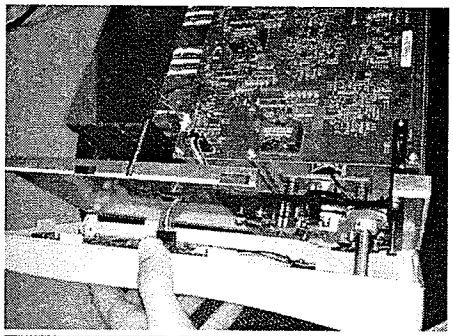
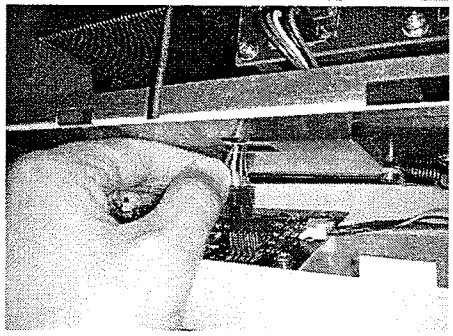
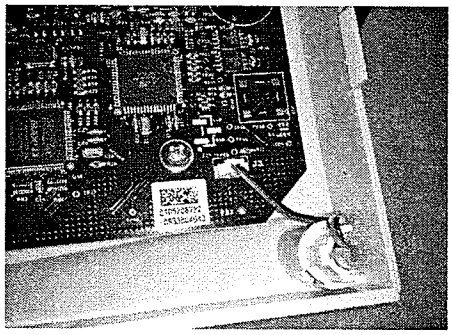
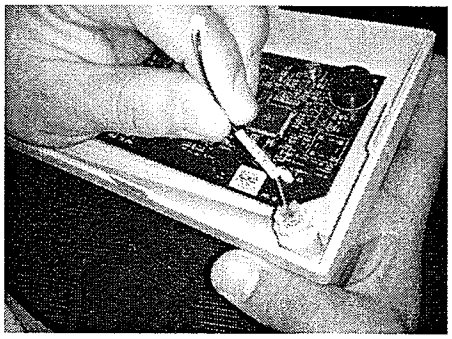
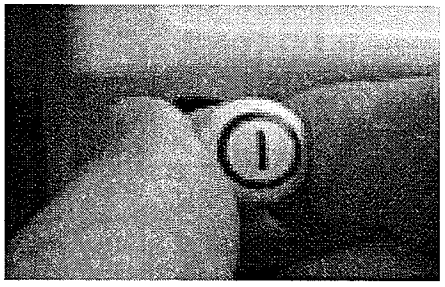
Step	Task Description	Process Image	Tools	Parts
1	Unscrew the chassis cover.		• #2 Phillips screwdriver	• #6-32 x 0.25" pan head screws • Chassis cover (PN 105209853)
2	Remove the chassis cover by sliding the back off the console about one inch and lifting up. Replace with a new chassis cover and reassemble in reverse order.		• #2 Phillips screwdriver	• #6-32 x 0.25" pan head screws

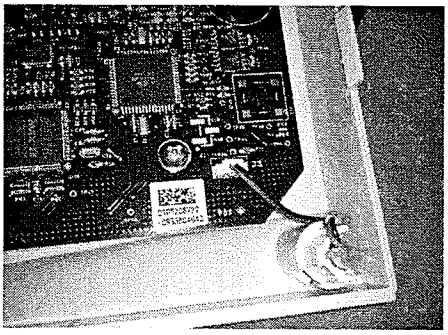
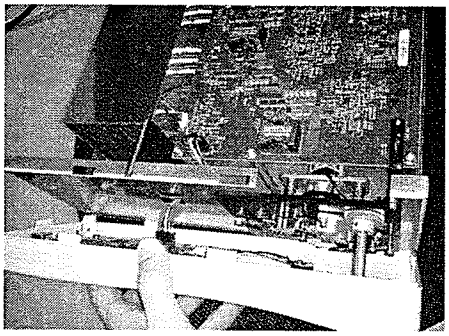
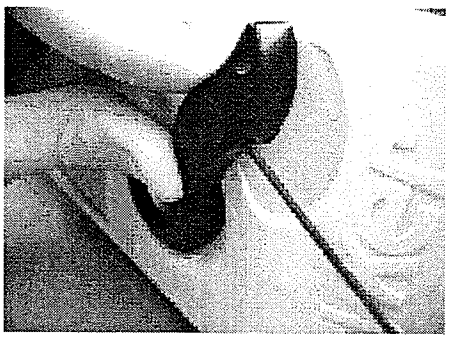
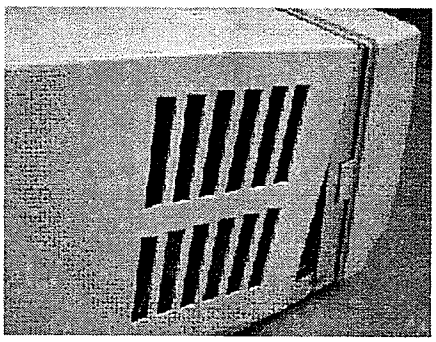
2.0 Jaw Handle

Step	Task Description	Process Image	Tools	Parts
1	Unscrew the set screw holding the jaw handle in place, then remove the handle from the jaw handle key and pinon shaft as shown.		• 1/16" hex wrench	• #6-32 x 0.25" stainless steel black set screw • Jaw handle (PN 105203554) • Jaw handle key (PN 105210469)
2	Place small amount of Loctite 222 on the set screw of the new jaw handle, then place the jaw handle on the jaw handle key and pinon shaft as shown. Screw the handle into place until it is secure. **Caution**: Make sure the Loctite does not get on the plastic of the jaw handle, or damage can occur.		• 1/16" hex wrench • Loctite 222	• #6-32 x 0.25" stainless steel black set screw

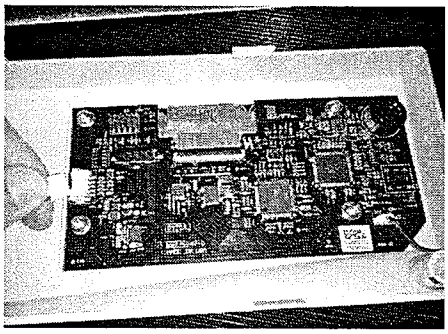
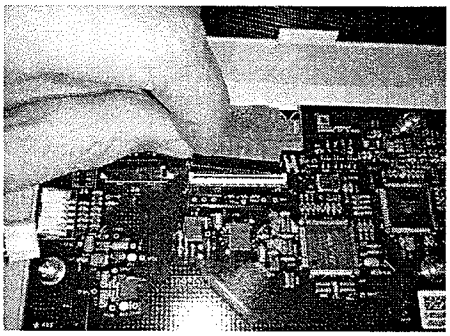
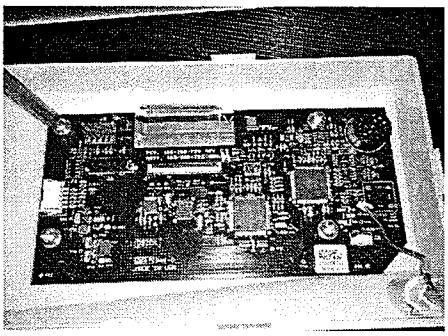
3.0 Power Button/LED

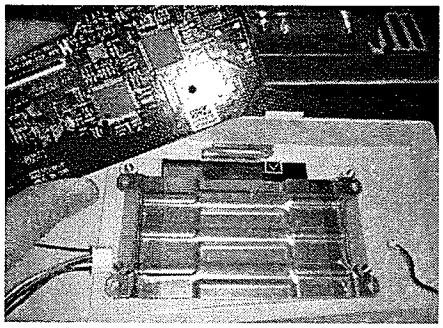
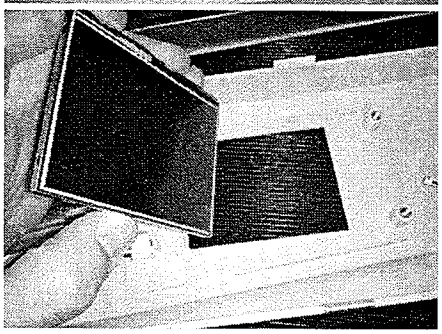
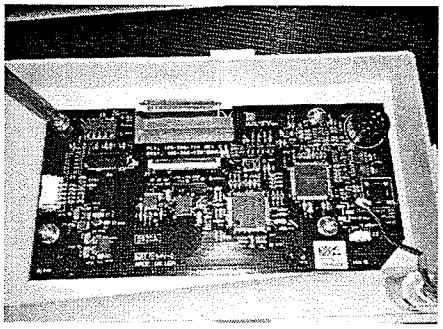
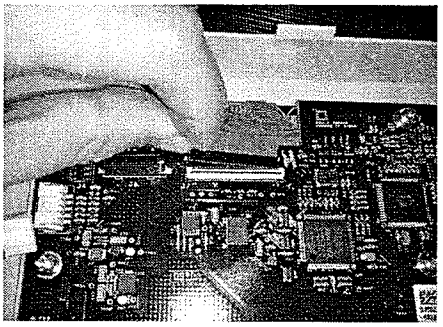
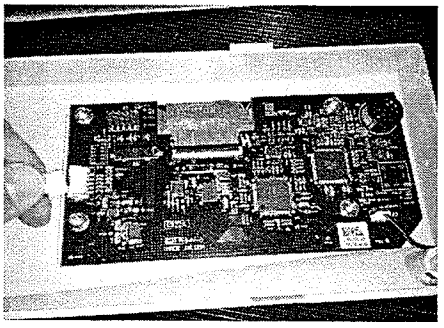
Step	Task Description	Process Image	Tools	Parts
1	Unscrew the chassis cover.		• #2 Phillips screwdriver	• #6-32 x 0.25" pan head screws • Chassis cover (PN 105209853)
2	Remove the chassis cover by sliding the back off the console about one inch and lifting up.			
3	Remove the jaw handle from the jaw handle key and pinon shaft as shown.		• 1/16" hex wrench	• #6-32 x 0.25" stainless steel black set screw • Jaw handle (PN 105203554) • Jaw handle key (PN 105210469)
4	Remove the jaw handle key from the pinion shaft groove.			

Step	Task Description	Process Image	Tools	Parts
5	Remove the front panel by lifting the six tabs out of their slots in the chassis. Start with the tab on the right side, working across the top, and progress down the left side to the bottom. **Caution**: Unplug the front board power cable (that connects to the main board) to prevent damage from occurring to components.	 		• Front panel (PN: 105209803) • Front board power cable (PN:105209870)
6	Unplug the power button LED from the front board.			• Front board power button LED (PN 105208767) • Front board (PN 105208722)
7	Pull the 3mm LED from the rear of the power button, then follow the instruction below: • If you are replacing the power button LED, replace it with a new LED and **proceed to step 9**. • If you are replacing the power button itself, **proceed to step 8**.			
8	Depress the two lips that latch the power button onto the inside of the front panel, then remove the power button. Replace it with a new power button by seating the button on top of the spring, pushing until the two lips latch the button securely.			• Power button (PN 10501226) • Power button spring (PN 105201327)

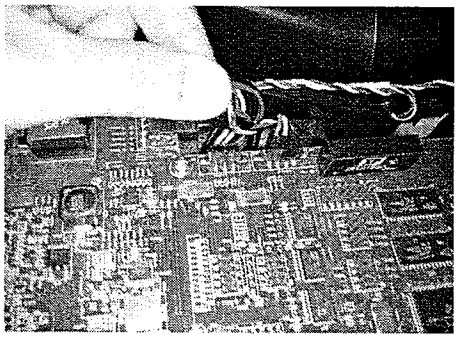
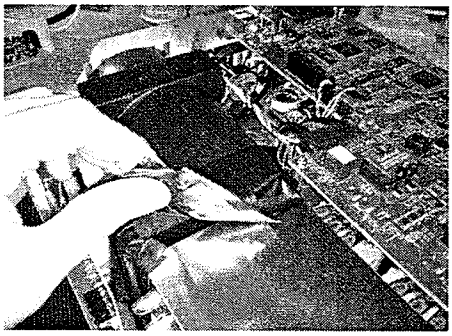
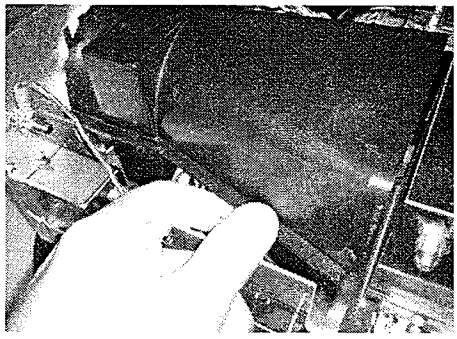
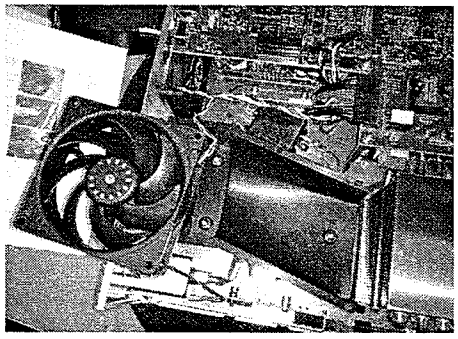
Step	Task Description	Process Image	Tools	Parts
9	Plug the power button LED back into the display board.			
10	Reconnect the front board power cable to the front board, then reconnect the front panel tabs in the reverse order they were removed. **Caution**: Be careful not to damage the front board connector on the chassis cover when reassembling.			
11	Insert the jaw handle key into the pinion shaft groove.			
12	Place small amount of Loctite 222 on the set screw of the new jaw handle, then place the jaw handle on the jaw handle key and pinon shaft as shown. Screw the handle into place until it is secure. **Caution**: Make sure the Loctite does not get on the plastic of the jaw handle, or damage can occur.		• 1/16" hex wrench • Loctite 222	• #6-32 x 0.25" stainless steel black set screw
13	Replace the chassis cover by sliding the back onto the unit and pushing forward, until the cover catches the front tabs and fits snugly in place. Screw in the chassis cover to complete the procedure. **Caution**: Be careful not to damage the front board connector on the chassis cover when reassembling.		• #2 Phillips screwdriver	• #6-32 x 0.25" pan head screws

4.0 LCD/Front Board

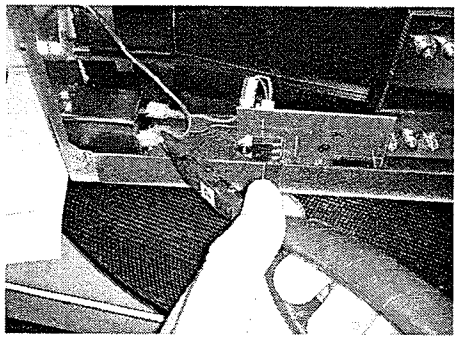
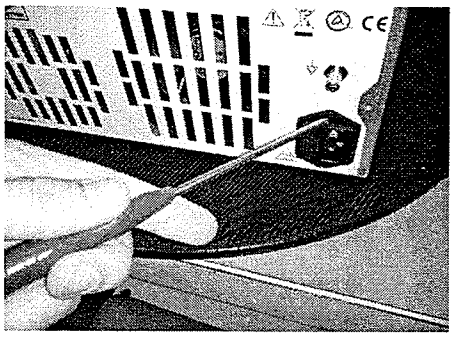
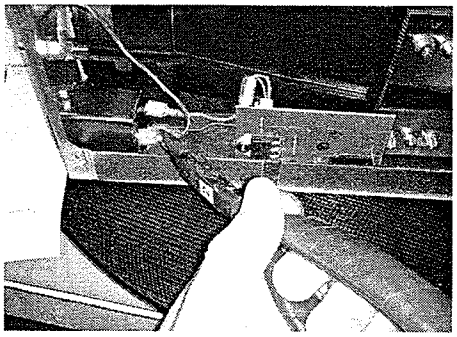
Step	Task Description	Process Image	Tools	Parts
1	Complete steps 1-6 from component replacement procedure 3.0, "Power Button/LED."			
2	Unplug the ESST sensor connector from the front board.			• ESST sensor (PN 105210538) • Front board (PN 105208722)
3	Unplug the LCD from the front board by flipping up the black tab that locks the flex connector in place.			• 3.5" LCD touch screen (PN P10526)
4	Unscrew the four screws that hold the front board in place.		• #2 Phillips screwdriver	• #6-32 x 5/16" pan split/flat washer screws

Step	Task Description	Process Image	Tools	Parts
5	Remove the damaged component – either the LCD or the front board – and replace it with a new component. **Caution**: If you are replacing the LCD, make sure the LCD is seated correctly in the plastic frame on the back side of the front panel. Improper positioning may cause the touch screen to crack.	 		
6	Reassemble the front panel in reverse order. When reassembling the front panel, make sure the LCD flex connector is seated correctly in its connector before latching it in place with the black locking tab. If the LCD flex connector is not seated correctly, the screen will not boot up when the unit is powered on. **Caution**: If the touch screen is not seated properly in the frame when the front board is screwed in place, the touch screen can crack.	  		
7	To complete the unit, complete steps 9-13 from component replacement procedure 3.0, "Power Button/LED."			

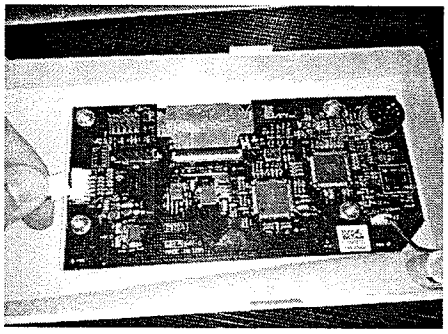
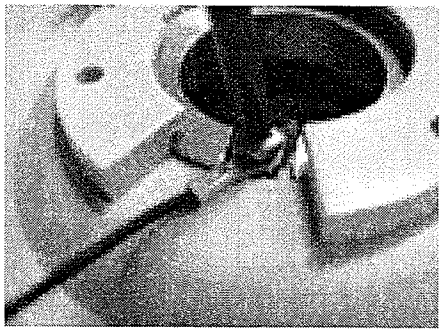
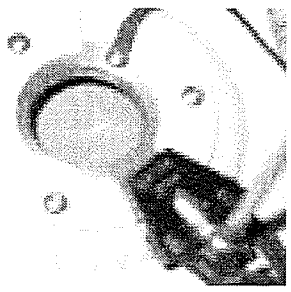
5.0 LED (Heat Pipe) Fan

Step	Task Description	Process Image	Tools	Parts
1	Remove the chassis cover as described in component replacement procedure 1.0, "Chassis Cover."			
2	Unplug the LED fan from the main board (reference designator J25).			• L9000 main board (PN P10343) • LED fan (PN 105209871)
3	Remove the duct tape from the L9000 fan duct/LED heatsink.			• Black duct tape (PN 105210672)
4	Remove the top half of the fan duct. Loosen the six tabs that hold the two duct halves together at the sides.			• Fan duct top (PN 105209855) • Fan duct bottom (PN 105209854)
5	Remove the broken fan and replace it with a new one. **Note**: Ensure the fan wires are resting in the groove at the bottom half of the duct, and that the label faces out the back of the chassis.			•LED fan (PN 105209871)
6	Reassemble the LED fan assembly in reverse order, then replace and screw in the chassis cover.		• #2 Phillips screwdriver	• #6-32 x 0.25" pan head screws

6.0 AC Inlet Filter

Step	Task Description	Process Image	Tools	Parts
1	Remove the chassis cover as described in component replacement procedure 1.0, "Chassis Cover."			
2	Loosen the AC inlet board by unscrewing the two screws at the bottom. Lift up slightly and move the board to the right. This will help prevent accidental damage while the AC inlet filter is removed.		• #2 Phillips screwdriver	• AC inlet board (PN 105209824)
3	Remove the power cables from the AC inlet filter with needle nose pliers. **Caution:** Gently wiggle the pliers back and forth to slowly loosen the power cables. Pulling the cables straight off or with force can cause the pliers or cables to hit the AC inlet board and cause damage.		• Needle nose pliers	• AC inlet filter (PN 105209869) • AC inlet filter ground (PN 105182034)
4	Unscrew the AC inlet filter from the back of the chassis. Remove and replace with a new filter.		• #1 Phillips screwdriver	
5	Reattach cables in the order they were removed. The cables should be positioned as follows: • brown cable: horizontal on top • blue cable: horizontal on bottom • green (ground) cable: vertical in the center.			
6	Move the AC inlet board back to its original position and secure it with two screws.		• #2 Phillips screwdriver	
7	Replace and screw in the chassis cover to complete the procedure.		• #2 Phillips screwdriver	• #6-32 x 0.25" pan head screws

7.0 ESST Sensor/Contact

Step	Task Description	Process Image	Tools	Parts
1	Complete steps 1-6 from component replacement procedure 3.0, "Power Button/LED."			
2	Unplug the ESST sensor connector from the front board.			• ESST sensor (PN 105210538) • Front board (PN 105208722)
3	Unscrew the ESST contact from the ESST ring. Insert the Safelight™ cable into the metal ring and check that the metal jacket on the cable is in physical contact with the ESST contact (the small metal tab attached to the ring). Check for continuity of the ESST sensor cable (pictured right). • If the contact is working, **proceed to step 4.** • If the contact is not working, replace it with a new one, then **proceed to step 5.** **Caution:** Be careful not to bend or damage the contact during installation.			• ESST contact (PN 105207648)
4	Unscrew the ESST sensor from the front panel, then replace it with the new one. Reattach the ESST sensor connector to the front board.			• ESST sensor (PN 105210538) • #4-20 x 3/8" thread forming screw (PN 105206946)
5	To complete the unit, complete steps 9-13 from component replacement procedure 3.0, "Power Button/LED."			

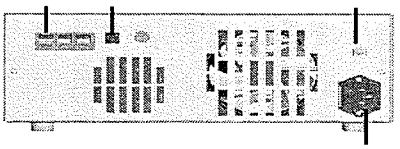
Final Testing and Inspection

Tools Needed

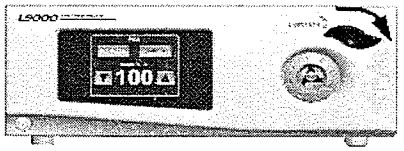
- Torque wrench
- Fiberoptic light cable
- Arthroscopes
- SIDNE® voice activation system
- 6 ft. serial USB cable
- Bio-Tek safety analyzer
- 240V transformer
- 120V transformer

Cosmetic Inspection

1. Replace the front panel, chassis, and chassis cover to fit snugly with no visible gaps.
2. Check that the logos and printing on the back panel are clear.



3. Check that the logos and printing on the front panel are clear. The jaw handle should turn freely in the direction shown, without rubbing against the front panel.



4. All connectors should be properly oriented with no visible gaps.
5. All surfaces should be smooth and free of scratches or dents.

Power on Test

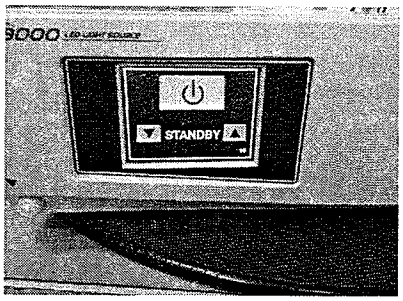
1. Connect the L9000 to the 120V power supply.
2. Push the power button and verify that the console powers on.
3. Insert the light cable in the jaw, and press the activate button to bring the light source out of Standby mode. Confirm that the LED lights up.

Fan Test

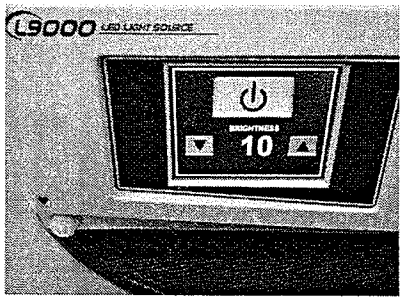
1. Verify that both fan labels face out, and when the power is turned on that the fans blow out the back of the console.

Front Panel Functional Test

1. While the light source is turned on, the display should read "Standby". There should be a brightness display on the bottom right corner of the LCD display.



2. Press the up/down button on the LCD to increase/decrease the brightness number in the bottom right corner. The light source should not come out of Standby mode.
3. Press the Run/Standby button on the LCD. The light source should go into Run mode. The brightness percentage should be the same as the number previously in the bottom right corner.

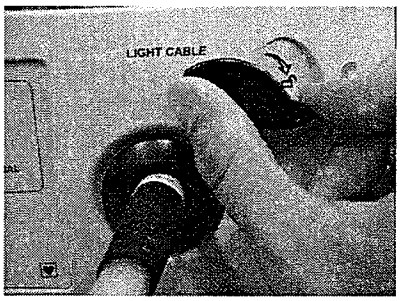


Brightness step-up/down

1. Press the up/down button on the LCD multiple times to change the brightness all the way from either 0 to 100% or 100% to 0%. The brightness display should increase or decrease without skipping.

Jaw Test

1. Remove the light cable by turning the knob clockwise on the jaw assembly. The jaw should lock open. Verify that the bulb turns off and the light source goes into Standby mode.



Hi-Pot/Di-Electric Breakdown Test

1. Energize the Hi-Pot tester and adjust the test voltage to 1.8 kV.
2. Plug the test fixture into the back of the unit.
3. Connect the alligator clip to the ground post of the unit.
4. Touch the positive (red) probe to the Hi-Pot test fixture and press test on the Hi-Pot tester for 1 second.

Note — Always check the Hi-Pot tester for proper functionality prior to use by hitting the test butoon and touching the leads. The Hi-Pot tester should emit the "fail" alarm.

Caution — **Do not test the unit for more than 1 second or internal damage can occur.**

Warranty and Return Policy

Product Warranty

Stryker Endoscopy warrants all products, subject to the exceptions provided herein, to be free from defects in design, materials and workmanship and to substantially conform to the product specifications contained in the documentation provided by Stryker Endoscopy with the products for a period of one year from the date of purchase (the "Warranty Period"). This warranty shall apply only to the original end-user purchaser of products directly from Stryker Endoscopy or a Stryker Endoscopy authorized distributor. This warranty may not be transferred or assigned without the express written consent of Stryker Endoscopy.

If a valid warranty claim is received within the Warranty Period, Stryker will, in its sole discretion: (1) repair the product at no charge, (2) replace the product at no charge with a product that is at least functionally equivalent to the original product, or (3) refund the purchase price of the product. In any event, Stryker's liability for breach of warranty shall be limited to the replacement value of the defective or non-conforming part or component.

This warranty does not apply to: (1) products that have been misused, neglected, modified, altered, adjusted, tampered with, improperly installed or refurbished; (2) products that have been repaired by any person other than Stryker Endoscopy personnel without the prior written consent of Stryker Endoscopy; (3) products that have been subjected to unusual stress or have not been maintained in accordance with the instructions in the user manual or as demonstrated by a Stryker Endoscopy representative; (4) products on which any original serial numbers or other identification marks have been removed or destroyed; or (5) products that have been repaired with any unauthorized or non-Stryker components, including replacement lamps.

If Stryker determines in its reasonable discretion that the claimed defect or non-conformance in the product is excluded from warranty coverage as described hereunder, it will notify the customer of such determination and will provide an estimate of the cost of repair of the product. In such an event, any repair would be performed at Stryker's standard rates.

Products and product components repaired or replaced under this warranty continue to be warranted as described herein during the initial Warranty Period or, if the initial Warranty Period has expired by the time the product is repaired or replaced, for thirty (30) days after delivery of the repaired or replaced product. When a product or component is replaced, the item provided in replacement will be the customer's property and the replaced item will be Stryker's property. If a refund is provided by Stryker, the product for which the refund is provided must be returned to Stryker and will become Stryker's property.

The inspection, testing, acceptance or use of the products and services furnished hereunder shall not affect Stryker's obligation under this warranty, and such warranty shall survive inspection, test, acceptance and use.

Notwithstanding the above, the following products are warranted for a period of ninety (90) days from the date of purchase: Scopes, Associated Scope Hardware, Fiber Optic Cables, Laparoscopic Instruments, VCRs, Monitors, and Printers; replacement light bulbs are warranted for a period of sixty (60) days from the date of purchase.

TO THE FULLEST EXTENT PERMITTED BY LAW, THE EXPRESS WARRANTY SET FORTH HEREIN IS THE ONLY WARRANTY APPLICABLE TO THE PRODUCTS AND IS EXPRESSLY IN LIEU OF ANY OTHER WARRANTY BY STRYKER, EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. EXCEPT AS SPECIFICALLY PROVIDED IN THIS WARRANTY AND TO THE EXTENT PERMITTED BY LAW, STRYKER IS NOT RESPONSIBLE FOR INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM ANY BREACH OF WARRANTY OR UNDER ANY OTHER LEGAL THEORY.

Return Policy

Stryker Endoscopy values customer relationships and strives for satisfaction in purchases made by our customers. Therefore, we offer a return policy for most products. Under this policy, customers may return purchased products to Stryker Endoscopy, within 90 days of customer's receipt of the product, for a credit or a refund of the purchase price paid, less shipping and handling and applicable restocking fees. Products that fail after the first 90 days may be covered by and are subject to the terms of applicable product warranty. Sterile products may not be returned for credit or refund unless they are in their original, unopened packaging or if they are in breach of the applicable warranty.

Restocking Fees: Unless the product is defective or the return is the direct result of a Stryker Endoscopy error, a restocking fee of 10% may be charged on all returned products.

A Returned Merchandise Authorization (RMA) number must be obtained from Stryker Endoscopy before returning product. To obtain an RMA number, please contact Stryker Endoscopy Customer Service at 1.800.624.4422.

Please send any returned products to:

Stryker Endoscopy
Attn: Returns
5900 Optical Court
San Jose, CA 95138, USA

With the return, please include the following:

1. RMA number
2. Purchase order number
3. Original invoice number
4. Name, address, and account number (of the organization returning the product)
5. Itemized list of the items being returned
6. Reason for the return
7. Product Experience Report/Complaint number, if applicable

Please carefully package the product being returned. Credit will not be given for items that are damaged in return shipment due to inadequate packaging.

Stryker Endoscopy does not accept any COD returns. Return shipping costs are borne by the customer unless Stryker Endoscopy specifically agrees otherwise.

Please clean and sterilize all potentially contaminated products prior to returning them to Stryker Endoscopy. It is unlawful to transport bio-contaminated products through interstate commerce, unless they are properly packaged and labeled as such. Stryker Endoscopy reserves the right to destroy contaminated product at the customer's expense and charge the customer for a replacement unit.

If a return does not comply with these terms, Stryker Endoscopy reserves the right to destroy the product at the customer's expense. Any replacement would be at the customer's expense.