

INSTRUCTION MANUAL

STRONG HIGHLIGHT IIA

Xenon Projection Console

Euro Models

72-00823 • 72-00824

72-00825 • 72-00826

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STRONG INTERNATIONAL

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PREFACE

THE STRONG HIGHLIGHT IIA Xenon Projection Console is designed and manufactured by Strong International for use in professional cinema presentation. The console lamphouse utilizes a horizontal xenon bulb as the light source, and incorporates an interference-coated deep ellipse nickel reflector mounted in a fixed position. A 12.8 inch reflector, with a working distance of 28-1/2 inches (72.4 cm), is recommended for units using bulbs rated from 1000 to 3000 watts. For higher wattage units (4000 watts and higher), a 14.5 inch reflector with a working distance of 33-1/8 inches (84.15 cm) is available. A 15 inch reflector, with a working distance of 33-1/8 inches (84.15 cm) can be used with any desired wattage.

LAMPHOUSE INSTRUMENTATION includes a DC ammeter to indicate the operating current of the bulb, and an elapsed time meter to record hours of bulb use. The rocker switch below the ammeter changes the meter reading to display the DC voltage at the arc. Indicator lights are provided on analog control models to show that AC power is energized, air flow is adequate, doors are secured, and bulb is ON.

A SIMPLIFIED CONTROL CIRCUIT ignites the xenon bulb using a DC Pulse Igniter Assembly. The igniter operates when provided high DC open circuit voltage normally developed by the xenon power supply at start-up, and requires no AC inputs.

SERVICE AND MAINTENANCE are accommodated by large access doors. Key locks assure access to authorized personnel only. Interlock switches at the rear and lamphouse access doors disable operation of the xenon bulb if these doors are opened during lamphouse operation.

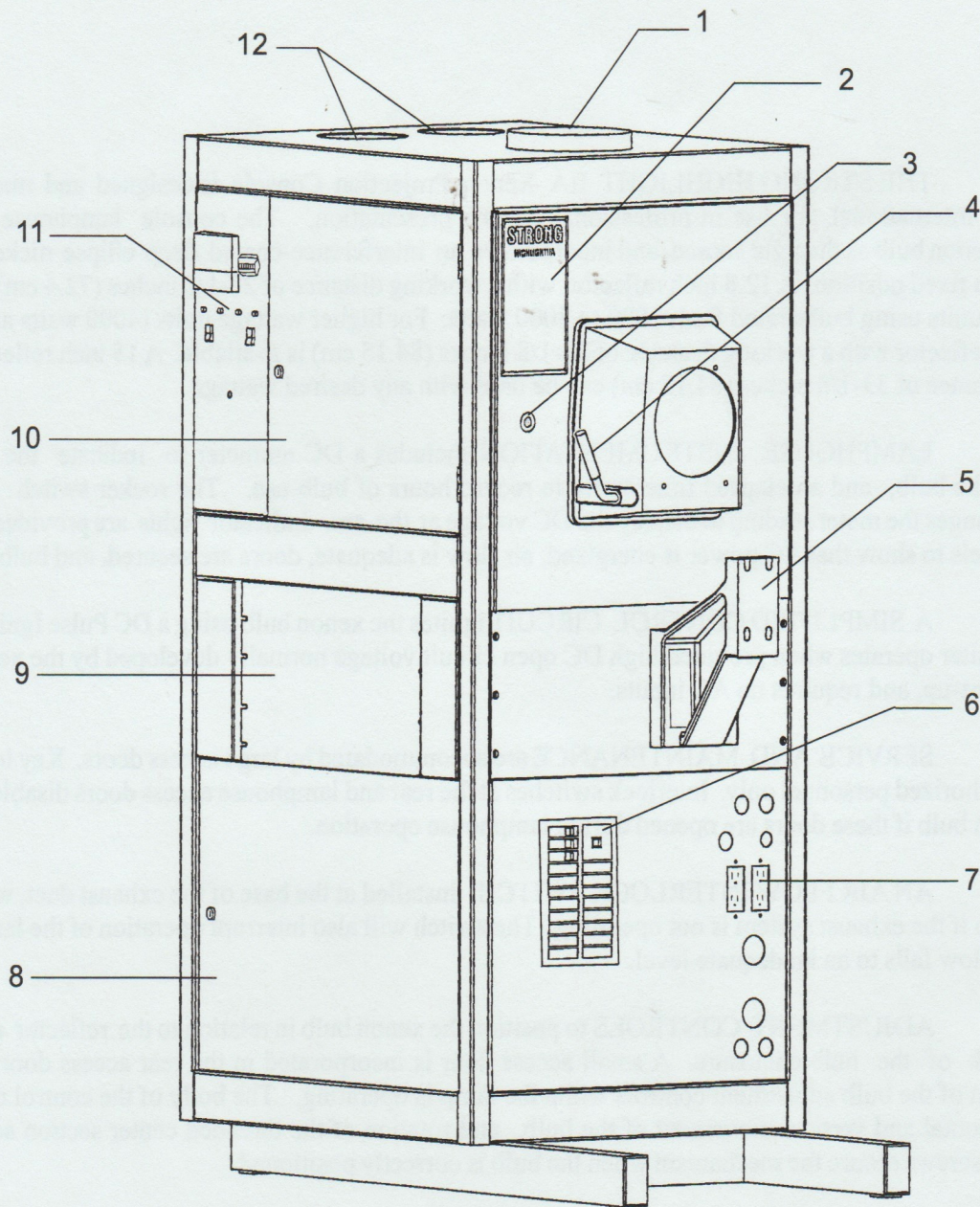
AN AIR FLOW INTERLOCK SWITCH, installed at the base of the exhaust duct, will prevent bulb ignition if the exhaust system is not operating. The switch will also interrupt operation of the lamphouse if exhaust air flow falls to an inadequate level.

ADJUSTMENT CONTROLS to position the xenon bulb in relation to the reflector are located on the back of the bulb enclosure. A small access door is incorporated in the rear access door to permit manipulation of the bulb adjustment controls while the lamp is operating. The body of the control mechanism allows horizontal and vertical movement of the bulb, and rotation of the threaded center section adjusts bulb focus. Lock screws secure the mechanism when the bulb is correctly positioned.

A MANUALLY OPERATED DOUSER permits shutting off the light to the projector. The douser is normally left in the OPEN position when the lamp is used in conjunction with an automation system. To prevent deterioration of the douser plate, do not operate the lamphouse for a prolonged period with the douser closed. Do not, under any circumstances, operate the lamphouse in excess of (25) minutes with the douser closed. Observe the HIGH TEMPERATURE warning on the lamphouse snood adjacent to the douser handle. Surface temperatures may reach hazardous levels when the bulb is operating.

SUPPORT EQUIPMENT (automation, amplifiers, sound processors, etc.) not supplied by Strong International is provided by the customer and must be UL Listed. This equipment is factory installed and pre-wired if so ordered by the customer. See the manuals supplied by the manufacturers of this equipment for information on operation and service.

HIGHLIGHT IIA CONSOLE



- | | |
|---------------------------------|--|
| 1. Exhaust Stack, 8 inch | 7. Convenience Outlet (optional) |
| 2. Name & Data Plate | 8. Access Door, Xenon Power Supply |
| 3. Arc Viewing Port | 9. Accessory Rack, 19 inch Centers |
| 4. Douser Handle | 10. Access Door, Lamphouse Compartment |
| 5. Soundhead/Projector Arm | 11. Lamphouse Instrument Panel |
| 6. Distribution Panel, AC Power | 12. Air Inlets, Lamphouse Cooling |

Leveling Feet (*not shown*) packed with Accessory Kit

RECEIVING & INSTALLATION

INSPECT THE SHIPMENT immediately and report any damage to the freight carrier. It is the responsibility of the consignee, not the shipper, to press damage claims. Strong International will provide shipping documents upon request.

MOVE THE CONSOLE on its base pallet as far as possible to its intended location. After removing the console from the pallet, install the four leveling feet and level the console to the booth floor. NOTE: If the booth floor is a soft material, such as linoleum, it is advisable to obtain four steel plates measuring approximately 4 inch x 4 inch x 1/4 inch (100 x 100 x 6.3mm) to place under the leveling pads to prevent "settling."

THE LEVELING FEET on the console are adjustable by loosening the locknut and raising or lowering the corner by turning the stud of the leveling foot with an end wrench. Retighten the locknut after leveling the console.

EACH CONSOLE is supplied with a soundhead spacer block to correctly position the projector aperture at the specified working distance from the center of the lamphouse reflector. The make and model of the soundhead and projector must be specified with the original equipment order to enable Strong International to supply the correct spacer block. The correct mounting hardware is supplied with the spacer block.

PROJECTOR - SOUNDHEAD MANUFACTURER	SPACER BLOCK PART NO.
Ballantyne (Model VII)	71229000
Simplex (5 Star)	71231000
Simplex Apogee	72-00773
Century (R3, MR3-E)	71231000
RCA 9030	71924000
Cinemeccanica V5	71722000
Cinemeccanica V8	23809000

USING THE CORRECT SPACER BLOCK and the soundhead mounting bolts provided, mount the soundhead to the projector mounting arm on the front of the console. This is most easily accomplished by starting the top two bolts, through the washers and spacer block, into the back of the soundhead casting. The soundhead can then be lifted into place, and the top two bolts into the soundhead casting lowered into the upper slotted holes in the projector mounting arm. In this manner, the mounting arm will bear the weight of the soundhead while the two bottom bolts are started.

TO AVOID CROSSTHREADING, and damaging the tapped holes, the soundhead mounting bolts should be screwed in fingertight as far as possible. Before tightening the bolts, check first the console, and then the projector mounting surface, for level.

RECEIVING & INSTALLATION (continued)

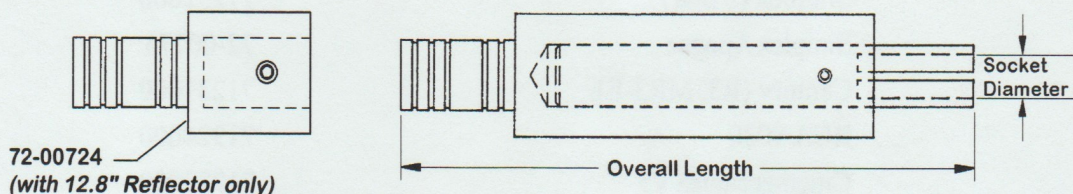
MOUNT AND ALIGN the projector in accordance with the manufacturer's instructions. The 115 V.AC supply to the framing light, or the framing light transformer, may be derived from the convenience outlet or any unused 115 V.AC terminals on auxiliary equipment.

THE FAN PANEL, located near the bottom of the off-operator side door, is equipped with a six-inch (15.2cm) blower for cooling a high wattage, high reactance xenon power supply. The blower is not required for low wattage or switching-type power supplies. Check the blower's electrical connections for good contact; vibration from shipping and handling may loosen these connections.

TWO SIDE COVERS for the lamphouse bulb enclosure are packaged with the Accessory Kit along with the (8) thumbscrews and tinnerman (press-on) nuts required to mount them (four on each side). It is recommended to wait until the bulb has been installed before mounting these covers. DO NOT operate the lamphouse with these covers removed; they are required to channel the air flow for proper bulb cooling.

CORRECT INSTALLATION of the desired xenon bulb in the Highlight IIA is determined by the length and socket diameter of the cathode support collet installed in the lamphouse. The collet installed is determined by the bulb model and type specified on the original equipment order. Open the lamphouse access door, remove the stainless steel bulb compartment cover, and examine the cathode support collet. Notify your Strong International Dealer if the collet installed is not appropriate to your desired xenon bulb.

AN ALUMINUM COLLET SPACER (Part No. 72-00724) is also required when using the 12.8 inch reflector. This spacer mounts to the back of the collet using a 10-32 x 1/4" set screw.



Bulb Wattage	Collet Part No.	Overall Length	Socket Diameter
2000 & below	24179000	5-5/16" (13.50cm)	.475" (12mm)
2000, 3000 "HS"	24201000	5-13/32" (13.73cm)	.312" (8mm)
2500 "HS"	24201000	5-13/32" (13.73cm)	.312" (8mm)
3000	24180000	4-1/2" (11.43cm)	.551" (14mm)
4000-4500 "HS"	24181000	4-13/32" (11.20cm)	.312" (8mm)
5000*	24433000	5-1/16" (11.20cm)	.710" (18mm)
5000-7000 "HS"	24181000	4-13/32" (11.20cm)	.312" (8mm)
3000-7000 "H/VC"	24180000	4-1/2" (11.43cm)	.551" (14mm)

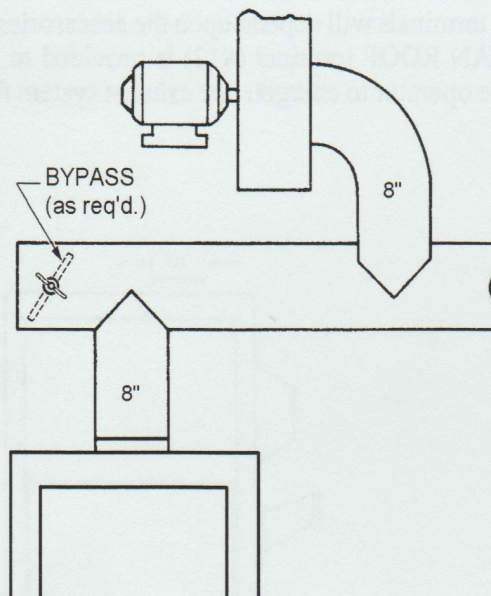
* for Osram XBO5000W/H OFR only; other 5 kW "HS" types are generally interchangeable with 4000, 4500 "HS" bulbs.

EXHAUST SYSTEM INSTALLATION

THE EXHAUST STACK of the Highlight IIA console lamphouse is designed to fit a eight-inch (200mm) diameter duct. This size ducting (rigid or flexible) must be used throughout the entire system and installed to eliminate any possibility of downdraft or rain dripping into the lamphouse. The exhaust blower must be capable of removing 300 cubic feet (8.5 cubic meters) of air per minute from a lamphouse operating a 1000 to 3000 watt bulb, and 500 cfm (14 cubic meters) if a larger bulb is used.

CORRECT EXHAUST AIR FLOW is not determined by the rating of the blower, but must be measured at the exhaust stack of the lamphouse. Static pressure caused by bends and long duct runs reduces actual air flow at the end of the run. If more than one console is installed in a common projection booth, the exhaust air flow must be measured at *each* individual console.

EXCESSIVE EXHAUST DRAFT, such as 600 cfm or more, should be avoided. Excessive draft may alter the overall cooling pattern of the xenon bulb. Should it be necessary to limit the air flow through the exhaust system, install bypasses rather than dampers. See the illustration below.



IF THE CONSOLE is replacing a carbon arc lamphouse, make certain that the exhaust system is thoroughly cleaned of all carbon ash or residue. Carbon ash, falling on a xenon bulb, will rapidly burn into the quartz bulb envelope and can possibly shorten bulb life.

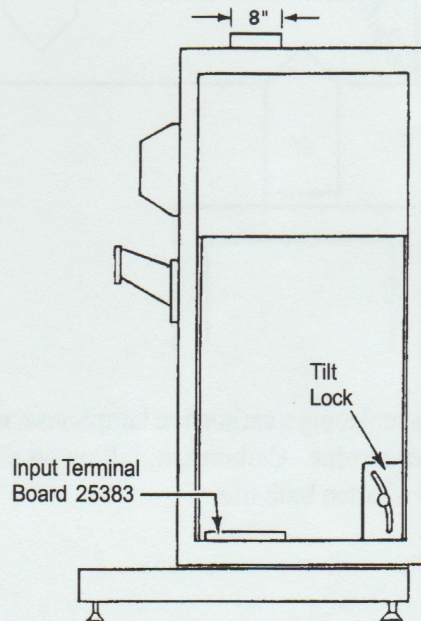
WIRING INSTALLATION

ALL INSTALLER CONNECTIONS to the Euro Model Highlight IIA Console are made to the main terminal board located behind the left (off-operator) door and blower panel toward the front of the unit adjacent to the xenon power supply.

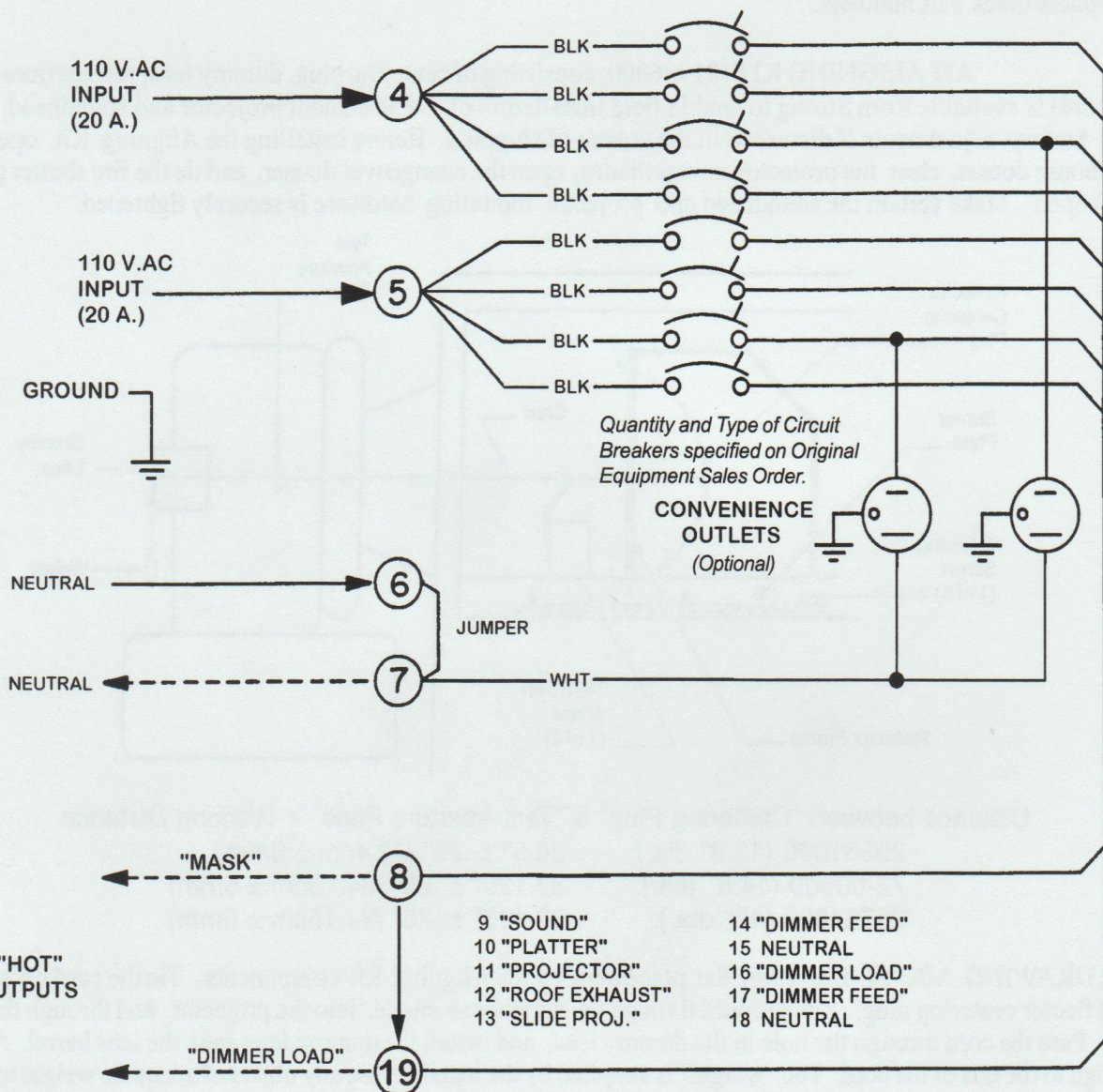
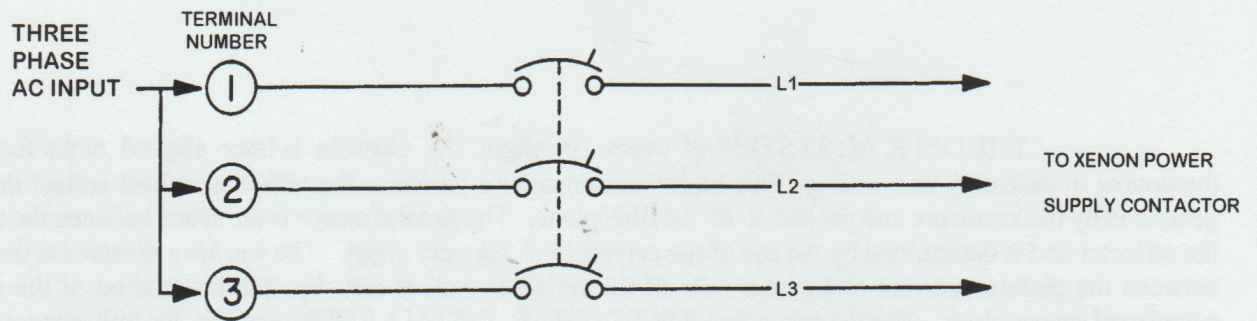
BECAUSE OF HIGH VOLTAGES impressed during the ignition cycle, the console *must* be grounded. Connect the ground wire to the grounding lug adjacent to the terminal board.

THE AC REQUIREMENT for the Highlight IIA is a four-wire three phase line (three phase plus neutral), with a separate earth ground. Voltage requirements are stamped onto the Name and Data Plate. All branch circuits are derived from this main input. The AC supply must be installed by a qualified electrician in conformance to local codes. Hardware, wire sizes and conduit types must comply with local codes. A readily accessible disconnect device shall be incorporated in the AC supply line to permit the operator to turn off all power to the console if required. Installer connections include three phase "hot" connections to Terminals 1, 2, and 3; 110 volt phase to Terminals 4 & 5, and a neutral connection to Terminal 6. See the following Installation Diagram.

AUTOMATION AND ACCESSORY CONNECTIONS are included on the same terminal board and connections to these added terminals will depend upon the accessories used. Terminals are clearly marked as to their functions. Note the FAN ROOF terminal (#12) is provided to permit interconnection of the exhaust system blower which allows the operator to energize the exhaust system from the console distribution panel.



INSTALLATION WIRING DIAGRAM

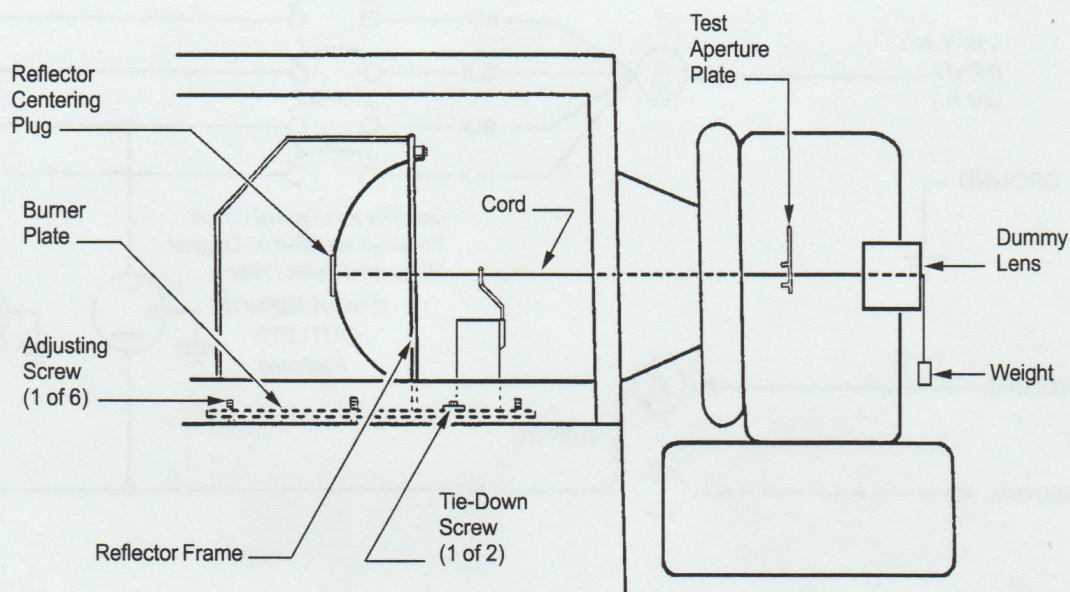


Rev. 05/03

OPTICAL ALIGNMENT

THE OPTICAL SYSTEM of every Highlight IIA Console is laser aligned at the factory in the course of assembly and testing. This alignment procedure positions the reflector to best collect the light generated by the xenon arc and project it to the film plane. The *focal distance* is the space between the arc and the reflector and is determined by the use of the correct bulb support collet. The *working distance* is the space between the picture aperture and center hole of the reflector and is set by the installation of the correct soundhead spacer block. See the preceding RECEIVING & INSTALLATION section for bulb support collet and spacer block part numbers.

AN ALIGNING KIT (81906000; consisting of centering plug, dummy lens, test aperture plate, and cord) is available from Strong to enable field installation of a replacement projector and soundhead, or to reset factory adjustments if disturbed in the course of shipping. Before installing the Aligning Kit, open the lamphouse douser, clear the projector shutter blades, open the changeover douser, and tie the fire shutter (when used) open. Make certain the soundhead and projector mounting hardware is securely tightened.



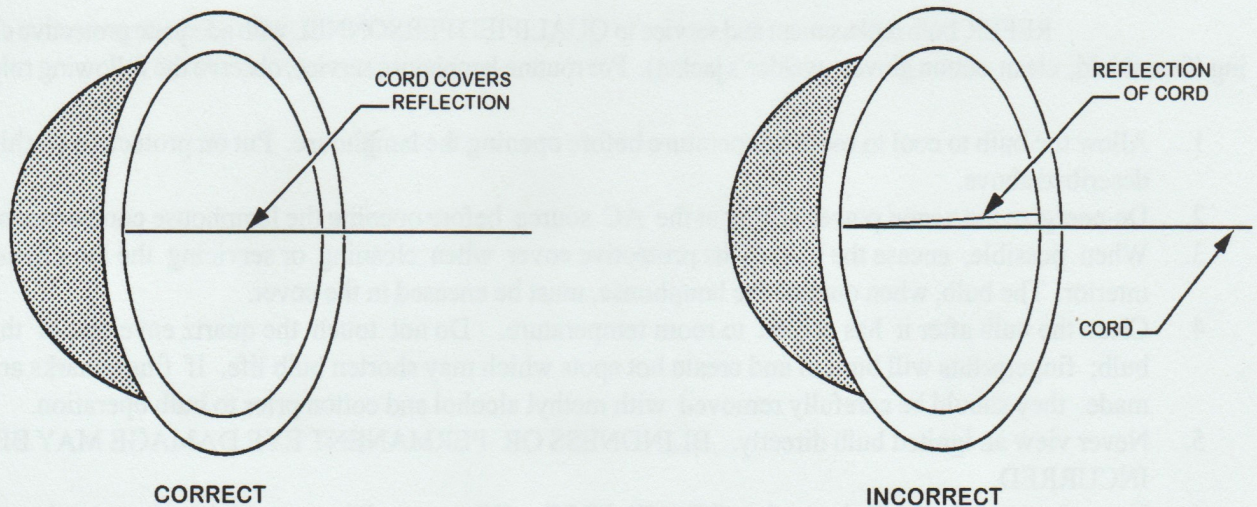
Distance between "Centering Plug" & "Test Aperture Plate" = *Working Distance*

25361000 (12.8" dia.):	28.5" ± .25" (72.4cm ± 6mm)
72-00500 (14.5" dia.):	33.125" ± .25" (84.15cm ± 6mm)
23754000 (15" dia.):	33.125" ± .25" (84.15cm ± 6mm)

THE DRAWING ABOVE illustrates the placement of the Aligning Kit components. Tie the cord off behind the reflector centering plug. Run the cord through the lamphouse snood, into the projector, and through the film trap. Pass the cord through the hole in the dummy lens, and install the dummy lens into the lens barrel. Attach a weight to the end of the cord. The "weight" is supplied by the installer; use any object of adequate weight to hold the cord taut. Insert the tabs of the test aperture plate into the film trap. Close the projector gate to secure the test aperture plate.

OPTICAL ALIGNMENT (continued)

LOOK INTO THE REFLECTOR and locate the reflection of the aligning cord. The unseen portion of the reflector can be viewed using a hand-held, plastic backed cosmetic mirror. When the reflector is correctly positioned, the actual cord will cover its own reflected image. If the reflected image is visibly offset from the cord, a degree of re-adjustment must be performed.



THE REFLECTOR FRAME is fixed to the lamphouse burner plate and requires no adjustment. The entire burner plate may be adjusted by loosening the (2) socket head tie-down screws and shifting the burner plate on its base plate. Alternately tightening and loosening the (6) headless adjusting screws will raise or lower the front, back, or either side of the burner plate. Carefully observe the string image while adjusting the burner plate. When the "correct" (single-string) image is seen, and the cord remains in the center of the test aperture plate, secure the (2) tie-down screws, and tighten the (6) adjusting screw lock nuts.

AN ADDITIONAL DEGREE OF ADJUSTMENT is available by repositioning the sound-head mounting arm. To adjust, loosen the (4) hex head mounting screws and alternately tighten or loosen the (6) headless set screws around the perimeter of the base of the casting (see Figure 1, Item 16) to move the arm. Retighten the (4) hex head screws upon completion of the adjustments.

REMOVE THE ALIGNING KIT COMPONENTS and restore operation of the projector fire shutter. Store the aligning kit parts in a secure location in the projection booth, as it may be necessary to again realign the optical system if a replacement reflector is installed.

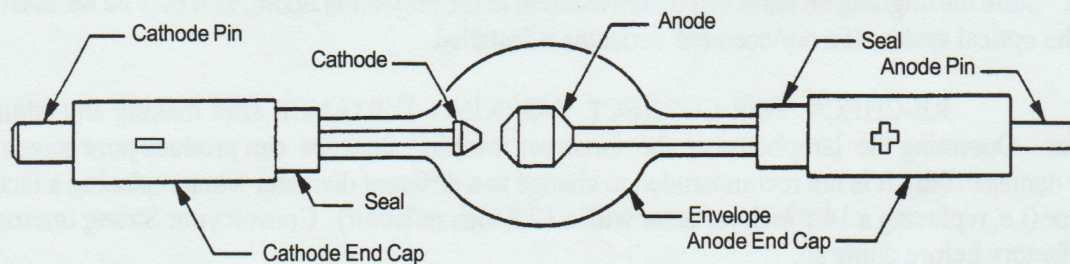
RE-CHECK FOR CORRECT WORKING DISTANCE after making any adjustment to the reflector. Operating the lamphouse at the incorrect working distance can produce poor screen illumination and/or damage film. It is not recommended to change to a different diameter when replacing a factory-installed reflector (i.e. replacing a 14.5 inch reflector with a 12.8 inch reflector). Consult your Strong International dealer or the factory before doing so.

SAFETY PROCEDURES

THE XENON BULB is highly pressurized. When ignited, the normal operating temperature of the bulb increases the pressure to a level at which the bulb may explode if not handled in strict accordance to the manufacturer's operating instructions. THE BULB is stable at room temperature, but may still explode if dropped or otherwise mishandled.

REFER bulb replacement and service to QUALIFIED PERSONNEL with adequate protective clothing (face shield, clean cotton gloves, welder's jacket). For routine lamphouse service, observe the following rules:

1. Allow the bulb to cool to room temperature before opening the lamphouse. Put on protective clothing described above.
2. De-energize the xenon power supply at the AC source before opening the lamphouse compartment.
3. When possible, encase the bulb in its protective cover when cleaning or servicing the lamphouse interior. The bulb, when outside the lamphouse, must be encased in the cover.
4. Clean the bulb after it has cooled to room temperature. Do not touch the quartz envelope of the bulb; fingerprints will burn in and create hot spots which may shorten bulb life. If fingermarks are made, they should be carefully removed with methyl alcohol and cotton prior to bulb operation.
5. Never view an ignited bulb directly. BLINDNESS OR PERMANENT EYE DAMAGE MAY BE INCURRED.
6. Use only xenon bulbs designated as OZONE FREE. When possible, vent the lamphouse exhaust to outside atmosphere.
7. Maintain the lamphouse blower in good operating condition. Keep the blower inlets clean for unrestricted air flow.
8. To insure maximum bulb life, operate the lamphouse blower and the exhaust system for at least ten minutes after extinguishing the bulb.
9. If returning a bulb for warranty adjustment, pack it in its original shipping container. Complete and return all required warranty information.
10. Dispose of expired bulbs that are beyond warranty in the following manner: Wrap the bulb tightly in several layers of canvas or heavy cloth. Place it on a hard surface and shatter the envelope with a sharp hammer blow. DO NOT place an unshattered bulb in an ordinary refuse container.
11. DO NOT PERMIT UNAUTHORIZED PERSONNEL TO PERFORM OR ATTEMPT ANY PHASE OF XENON BULB HANDLING OR SERVICE.



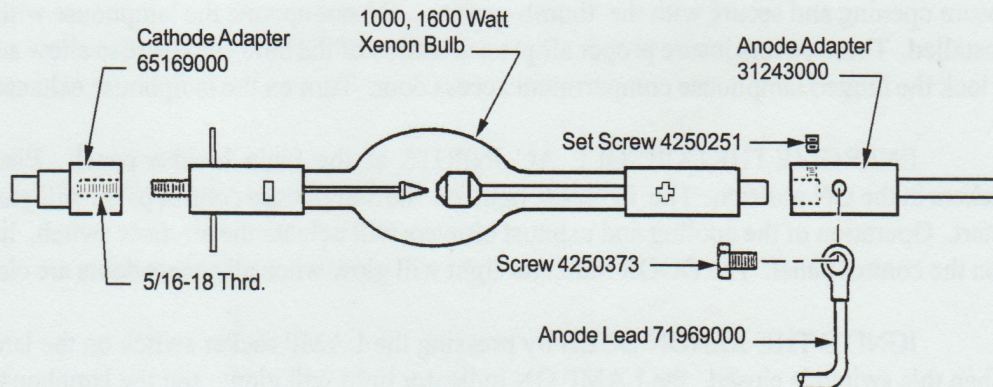
HIGHLIGHT IIA XENON BULBS

THE FOLLOWING XENON BULBS are approved for use in the Strong Highlight IIA Console. Bulbs not listed below must be certified by their manufacturer as being 100% interchangeable, and be classified as ozone-free. Dimesions of 5000 watt bulbs vary by manufacturer; *consult factory*.

<u>WATTAGE</u>	OSRAM® <u>Part No.</u>	Ltg. Technologies Int'l. <u>Part No.</u>	Christie <u>Part No.</u>
1000	XBO1000W/HS OFR	LTIX-1000W-HS	CSX10S
1600	XBO1600W/HS OFR	LTIX-1600W-HS	CSX16S
2000	XBO2000W/H OFR	LTIX-2000W-HC	CSX20R
2000 (short)	XBO2000W/HS OFR	LTIX-2000W-HS	CSX20SC
2500	XBO2500W/HS OFR	LTIX-2500W-HSC	CSX25SC
3000	XBO3000W/H OFR	LTIX-3000W-H	CSX30R
4000-4500	XBO4000W/HS OFR	LTIX-4500W-HS	CSX40SC
5000	XBO5000W/H OFR	LTIX-5000W-HS	CSX50SC
7000	XBO7000W/HS OFR	LTIX-7000W-HS	CSX70SC

BULB ADAPTERS are required for 1000 and 1600 watt "HS" bulbs only, and are supplied in the accessory kit only when these wattages are specified on the original equipment order. The adapters are designed for use with the standard 2000 watt bulb support collet 24179000 (12mm I.D. socket).

THE BRASS CATHODE ADAPTER is drilled and tapped 5/16-18 to accommodate the threaded cathode pin used on the 1000 and 1600 watt "HS" bulbs. When screwed onto the cathode pin, the adapter positions the arc at the correct focal point. The chromed anode adapter mounts to the pin of the anode end cap with a set screw, and the adapter stem rests in the bulb yoke in front of the reflector to support the front of the bulb. A lead is attached to the anode adapter to supply positive DC current.



ASSEMBLE THE ADAPTERS to the 1000 or 1600 watt bulb prior to removing the plastic protective covering. DO NOT apply mechanical stress to the quartz envelope. Firmly tighten all fasteners before installing the bulb and adapters into the lamphouse.

XENON BULB INSTALLATION & OPERATION



Only qualified and trained professional technical personnel are allowed to operate the equipment. Refer service and maintenance to trained personnel. Untrained personnel are not allowed in the projection booth during operation, service, or maintenance.



OBSERVE ALL SAFETY PROCEDURES when working around the xenon bulb. Leave the bulb in its protective plastic cover whenever possible, and remove immediately any fingerprints accidentally placed on the quartz envelope.

OPEN THE LAMPHOUSE COMPARTMENT ACCESS DOOR and dismount the cover plate from the inner xenon bulb enclosure. Set the cover plate and thumb screws aside. Slide the contact clamp on the igniter lead over the rear bulb socket.

CONNECT THE ANODE LEAD to the positive (+) end cap of the xenon bulb if the lead is not factory attached. Tighten the connection firmly to insure a secure electrical contact and to prevent overheating.

HANDLE THE BULB by the metal end caps only. Insert the bulb into the reflector, passing the cathode (-) end cap through the center hole in the back of the reflector. Seat the cathode pin into the socket of the rear bulb collet as far as possible to permit full focus travel. Rest the anode (+) end cap or anode adapter in the bulb support yoke in front of the reflector.

SECURELY TIGHTEN the socket head clamping screw in the igniter lead contact clamp. Make certain the cathode (-) pin is firmly secured to the socket of the bulb collet. Attach the terminal of the anode (+) lead to the stud of the binding post located adjacent to the front bulb support. Dress the anode lead in front of the support yoke to minimize shadows. Tighten the binding post hardware securely to insure good electrical conduction.

REMOVE THE PLASTIC COVER from the xenon bulb. Replace the access plate over the bulb enclosure opening and secure with the thumb screws. Do not operate the lamphouse without both covers securely installed. These covers insure proper air pressurization of the bulb enclosure to allow adequate cooling. Close and lock the hinged lamphouse compartment access door. Turn on the lamphouse exhaust system.

ENERGIZE THE CONSOLE AC INPUTS at the main breaker panel. Place the switching circuit breakers in the ON position. The POWER light on the lamphouse control panel will glow. The cooling fans will start. Operation of the cooling and exhaust blowers will actuate the air flow switch, lighting the AIR indicator on the control panel. The DOOR indicator light will glow when all access doors are closed and locked.

IGNITE THE XENON BULB by pressing the LAMP rocker switch on the lamphouse control panel. When this switch is closed, the LAMP ON indicator light will glow, and the lamphouse control circuit will energize the xenon power supply. When the initial high DC "no load" surge from the power supply reaches 130 volts, the DC Pulse Igniter will energize. The igniter will supply a high voltage pulse across the electrodes of the xenon bulb.

BULB INSTALLATION & OPERATION (continued)

THE HIGH VOLTAGE IGNITER PULSE, coupled with the high DC open circuit ("no load") voltage from the xenon power supply, will ignite the xenon bulb. A "cold" bulb will generally ignite after one pulse; a bulb still warm from prior operation may require two or three pulses. A short delay between ignition pulses, as power supply capacitors re-charge, is normal.

UPON IGNITION, the DC voltage will fall to the low sustaining level required for continuous operation. The DC Pulse Igniter ceases operation below 130 V.DC. Allow a minute for the current to stabilize, and check the ammeter for the operating current (amperage). The ammeter, located on the lamphouse control panel, constantly displays the DC current supplied to the xenon bulb. Pressing the AMP/VOLTS switch will momentarily display the DC arc voltage.

ADJUST THE XENON POWER SUPPLY as required to provide the correct DC output to the bulb. Directions for adjusting the DC output of the xenon power supply are included in the separate Instruction Manual furnished with the power supply. Do not exceed the maximum current specified for the rated wattage of the bulb. See the warranty information packaged with the bulb and comply with the manufacturer's recommendations. The following figures may serve as a guideline to complete installation; in the event of conflict, the bulb manufacturer's figures should prevail.

Bulb Wattage	Nominal Current	DO NOT EXCEED
1000	50 A.	58 A.
1600	65 A.	70 A.
2000	75 A.	90 A.
2500	90 A.	100 A.
3000	95 A.	100 A.
4000	130 A.	150 A.
5000	145 A.	155 A.
7000*	150 A.	160 A.

* Minimum Aperture: 70mm. Radiant Energy levels will damage 35mm prints.

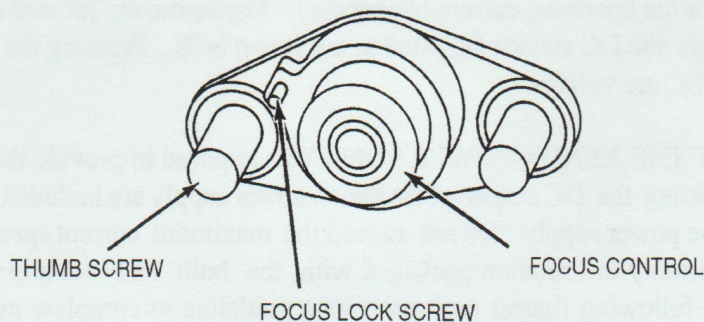
A NEW BULB is normally operated at or slightly below the "nominal" current level. As the bulb ages, the quartz envelope will darken and the light output will decrease. To restore the light output, the operating current can be gradually increased to, but not exceeding, the bulb's maximum current. Because of manufacturing tolerances on xenon bulbs, one lamp in a two-machine booth may operate at a slightly higher or lower current setting than the other to balance the light on the screen.

ONCE OPERATING at its correct current setting, the xenon bulb must be positioned inside the reflector to project its optimum light field. The bulb positioning mechanism is mounted to the back of the bulb enclosure inside the lamphouse compartment, and is accessible through the small hinged opening in the access door at the rear of the console.

BULB INSTALLATION & OPERATION (continued)

THE CENTER SECTION of the control is a threaded member that focuses the bulb in relation to the reflector. Turning this adjustment moves the bulb in only one plane, into or away from the reflector. Clockwise rotation moves the bulb away from the reflector. The small knurled screw to the left of this section can be tightened to lock the focusing mechanism, after the following procedures have been completed.

BULB ADJUSTMENT CONTROLS



THE THUMB SCREWS on either side of the focusing control lock the horizontal and vertical adjustment mechanism in position. The thumb screws are spring-loaded to apply a degree of tension between the mechanism housing and the back of the bulb enclosure.

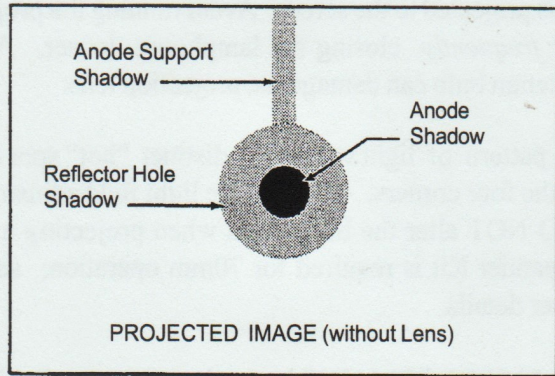
REMOVE THE PROJECTION LENS and the (optional) heat filter, start the projector motor and open the lamphouse douser. Since a xenon light source can be focused to a small, intense spot at the projector trap, do not operate the lamp with the douser open without first starting the projector motor.

THE IMAGE projected to the screen, without the projection lens, is that of the center hole of the reflector, and the shadow of the anode (the larger of the two electrodes in the xenon bulb). The projection of the anode shadow will appear on the screen as a darker spot surrounded by the grey area of the reflector center hole.

TURN THE CENTER FOCUSING SECTION of the bulb positioning control until the smallest black spot obtainable is focused on the projection screen. It may be best to run this adjustment both directions to permit positive identification of the spot. The position of the spot may be to the right, left, top or bottom of the screen, and not necessarily at the center.

LOOSEN the two thumb screws, one on either side of the focusing section just enough to permit manual movement of the complete assembly. The bulb adjustment control will now move about these two thumb screws, and as this control is shifted, the smooth shadow of the electrode can be seen extending beyond the projected hole in the reflector. The electrode shadow must be centered in the projected hole of the reflector.

BULB INSTALLATION & OPERATION (continued)



MOVE THIS CONTROL SECTION around the two thumb screws until the black spot is as round as possible to project. The two thumb screws are spring-loaded to apply a degree of tension to the control section. It may be necessary to again adjust the focus control to define a sharp spot. If the bulb adjustment control is at its extreme limit of travel (left-to-right or top-to-bottom), shut off the lamp, allow the bulb to cool, and open the lamphouse door. Remove the stainless steel bulb enclosure cover and loosen the set screw securing the front bulb yoke. Re-position the yoke left-to-right or up-and-down to compensate.

THE FRONT BULB SUPPORT YOKE is adjustable and is factory-set to accommodate the end cap diameter of the xenon bulb specified on the sales order. A height of 3-1/8 to 3-1/4 inch is normal for most commonly used bulbs, but bulbs with larger diameter end caps (i.e. PerkinElmer 4500 and 7000 watt models) may require setting the yoke as low as three inches. See the illustration on the following page. To adjust the yoke position, loosen the set screw in front of the yoke, and raise or lower the yoke as required. A hex nut is provided to lock the height once selected. Re-tighten the set screw when finished.

AFTER THE BLACK SPOT is as even around the outside as possible to project, and centered in the shaded area as shown above, tighten the two thumb screws to lock the adjustment section. This adjustment has now centered the projected image of the electrode shadow and the hole in the reflector on the aperture and screen. If the spot raises or lowers as the focus screw is turned, it is necessary to re-adjust the front bulb yoke as instructed above.

TO ALLOW FOR MANUFACTURING TOLERANCES in overall bulb length and/or fabrication of the inner bulb enclosure, an additional degree of fine adjustment is available by changing the position of the snap ring(s) retaining the bulb support collet in its bearing. Use this feature only if the proper focal position cannot be gained by use of the focus screw.

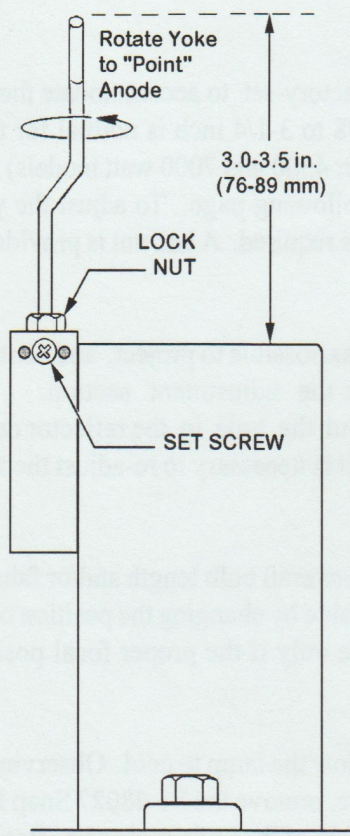
TO REPOSITION THE COLLET, extinguish the bulb and allow the lamp to cool. Observing all safety precautions, remove the xenon bulb. From the rear of the bulb enclosure, remove the 21-48027 Snap Ring (see Detail drawing, Figure 3 Parts List) and withdraw the collet from the inside of the bulb enclosure. Position the inner snap ring as required, re-install the collet, and secure the outer snap ring. The front bulb yoke may also be moved forward or back; additional holes are provided on the top of the air duct.

IF THE PROJECTED IMAGE is not centered on the screen as illustrated above, move the console or adjust the tilt to correct. The right tilt lock screw is illustrated as Item 30 on Parts List, Figure 1. It is necessary to open the off-operator side blower panel to access the left tilt lock.

BULB INSTALLATION & OPERATION (continued)

REPLACE THE PROJECTION LENS and install a CinemaScope aperture plate. Turn the center focus adjustment until the desired light distribution is projected to the screen. Avoid running the projector in this manner for an extended period of time without *frequently* closing the lamphouse douser. When projecting a beam without running film, the heat from the xenon bulb can damage the projection lens.

THE IDEAL "FLAT" FIELD denotes a pattern of light without a distinct "hot" spot in the center of the screen, and only a slight reduction of light in the four corners. Perform the light field adjustments using the 35mm CinemaScope aperture plate, and DO NOT alter the bulb focus when projecting a non-anamorphic ("flat") 35mm print. An optional Beam Expander Kit is required for 70mm operation; see the following section entitled "70mm OPERATION" for further details.



IF A "HOT" SPOT REMAINS in an otherwise even field, turn the LAMP switch OFF and allow the xenon bulb to cool. Open the lamphouse access door. Loosen the set screw locking the position of the bulb support yoke, and move the yoke to "point" the anode end cap of the bulb away from the hot spot. It may also be necessary to reset the height of the yoke, again "pointing" away from the hot spot. Close and lock the access door, and re-ignite the xenon bulb. Repeat the manipulation of the bulb adjustment controls to establish an even field of light, and tighten the set screw.

TO EXTINGUISH the xenon bulb, turn the LAMP rocker switch on the lamphouse control panel to its OFF position. The LAMP ON indicator light will extinguish. Leave the console power ON to permit the blowers to operate and cool the bulb. Allow the blowers to operate for at least ten minutes after turning off the xenon bulb. A forced-air cooling period is required by xenon bulb manufacturers in order to comply with bulb warranty requirements.

MOST XENON BULBS generally will continue to perform well beyond their stated warranty life. However, *no credit* will be allowed by the bulb manufacturer for reflectors damaged in the event of an explosion after the bulb has exceeded its warranty period. This should be considered when determining the proper time for bulb replacement.

UPON REPLACING THE XENON BULB, it will be necessary to repeat only the bulb alignment procedures outlined above. Adjustments detailed in the OPTICAL SYSTEM ALIGNMENT section are required only when a reflector is replaced.

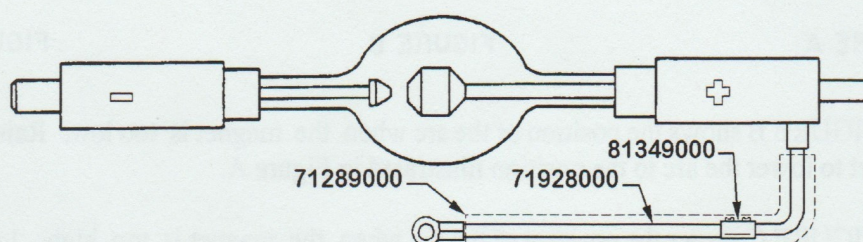
BULB INSTALLATION & OPERATION (continued)

BULB ROTATION:

MOST XENON BULB MANUFACTURERS recommend and/or require rotation of a horizontal bulb at 50% of its warranted life. Refer to the manufacturer's warranty information packaged with the xenon bulb for specific requirements.

TO ROTATE THE BULB, loosen the socket screw in the cathode clamp and remove the anode lead terminal from the positive binding post. Rotate the bulb 180 degrees, re-attach the anode lead terminal, and tighten the cathode clamping screw.

IF THE BULB'S ANODE LEAD is too short to reach the binding post from the rotated position, an anode lead extension with fittings is available from Strong International dealers. Order (1) each of Lead Extension 71928000, Splice Connector 81349000, and Insulation Tubing 71289000.



AFTER ROTATION, adjust the xenon power supply to increase operating current to or just below the maximum level specified for the bulb. Project a white light to the screen to check for an even field and correct the bulb positioning as required. Operate the xenon bulb at this higher current level for one or two performances, and then return the power setting to its previous level. Temporary operation of the bulb at high current following bulb rotation will restore the cathode tip and enhance ignition at the new arc position.

BULB WARRANTY RETURNS:

RECORD THE HOURS of xenon bulb operation on the bulb record card on the back door of the unit. Return bulbs upon which a warranty claim is being made to the theatre equipment dealer through whom the bulb was purchased. Pack the bulb in its original shipping carton with the protective cover over the bulb. Complete and enclose all warranty forms supplied by the bulb manufacturer.

WARRANTY CREDIT will *not* be allowed if the bulb failure is related to mishandling, incorrect installation, faulty supporting equipment, or abuse.

REFLECTORS damaged by a bulb explosion should be forwarded to the *bulb* supplier for warranty adjustment. Include an invoice copy authenticating the cost of the replacement reflector.

ARC STABILIZING MAGNET ADJUSTMENT

THE ARC STABILIZING MAGNET is located on the lamp base plate below the reflector. This magnet is preset at the factory and should not require adjustment.

IF IT SHOULD BECOME NECESSARY to adjust the magnet, the following procedure must be followed. Observe all bulb safety procedures when working in the lamphouse compartment.

THE NORMAL ARC, when viewed through the arc viewing port, will appear as in Figure A. This represents the correct magnet position.

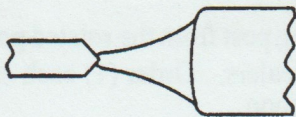


FIGURE A

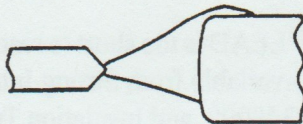


FIGURE B

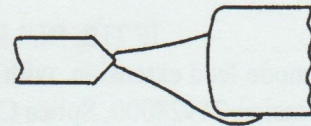


FIGURE C

FIGURE B shows the position of the arc when the magnet is too low. Raise the magnet on its adjustment bracket to lower the arc to the position illustrated in Figure A.

FIGURE C shows the position of the arc when the magnet is too high. Lower the magnet to raise the arc to the position illustrated in Figure A.

THE MAGNET must always be installed with the longest portion of the magnet nearest the bulb, and with the SOUTH (S) pole pointing to the operator side access door. Reversing the magnet will cause bulb flicker, and may inhibit bulb ignition.

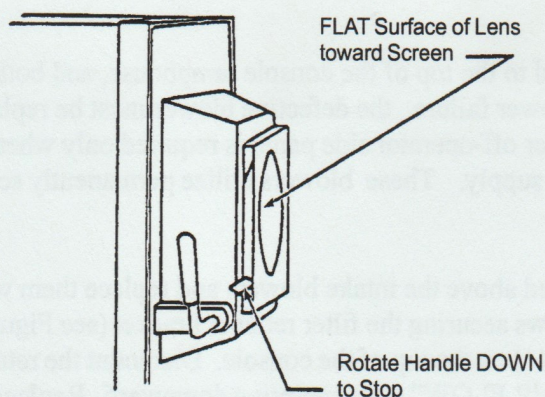
IN NEW EQUIPMENT, the magnet is normally in the center of the adjustment range. Changes in the magnet position are required only to correct an improperly burning arc (Figure B or C).

ANY REPLACEMENT MAGNET should first be installed in the center position of the adjustment range. Raise or lower the magnet as required to center the arc as illustrated in Figure A.

70mm OPERATION

BECAUSE OF THE LARGER APERTURE AREA of a 70mm projector, it is necessary to add a beam expander lens to insure proper coverage of the screen. The Beam Expander Kit No. 40959000 is factory installed when ordered with new equipment, or may be added to an existing installation at a later date.

THE KIT consists of a lens holder (81847000) which mounts to the front casting of the lamphouse with three 1/4-20 x 1-1/8" hex head screws (4251120) and three 1/4" washers (4257102), a lens assembly (81848000), and a nose cone (40960000). The sheet steel nose cone mounts to the lens holder weldment with three 6-32 x 1/8" pan head screws (4060120).



ALL CONSOLE front castings are drilled and tapped to accommodate field installation of the Beam Expander Kit. The nose cone can be trimmed with tin snips to fit as required without disturbing the required working distance between the lamphouse reflector and the projector aperture.

THE 70mm LENS is inserted as illustrated *only* for 70mm operation; DO NOT insert the lens for 35mm projection.

MINOR REFOCUSING of the bulb may be required after insertion of the beam expander lens. Prior to projecting the 70mm film, project a white light to the screen with the projector running. Adjust the center threaded section of the bulb adjustment mechanism until the desired light distribution is projected to the screen. Again, avoid running the projector in this manner for a prolonged period without *frequently* closing the douser to cool the projection lens.

THE BEAM EXPANDER LENS should be cleaned periodically with lens tissue and a lens cleaning solution suitable for coated projection lens.

THE WELDED LENS HOLDER 81847000, as illustrated above, can also be used with a Heat Filter & Ring Assembly (Part No. 72-00504) when running 35mm prints. This optional heat filter may be desirable if a high wattage bulb (4500-6000 watt) is routinely used for 35mm projection. Install the ring with the coated surface of the filter glass facing the bulb; do not insert the heat filter until the xenon bulb positioning adjustments have been completed.

MAINTENANCE



WARNING: OPEN AC DISCONNECT BEFORE SERVICING UNIT.



THE STRONG HIGHLIGHT IIA CONSOLE requires very little maintenance to keep it in good working order. Routine cleaning of the equipment is the most important element, and cleaning intervals are determined by the dirt and dust conditions at the installation site.

THE REFLECTOR should be cleaned with a soft, clean, dry cotton cloth every two weeks. If excessively soiled, a commercial liquid glass cleaner may be used. *Use no abrasives.* Exercise extreme care not to scratch or fingermark the coated surface.

TWO SIX-INCH BLOWERS are mounted to the top of the console lamphouse, and both are required for proper lamphouse cooling. In the event of a blower failure, the defective blower must be replaced immediately. An additional blower at the bottom of the lower off-operator side panel is required only when the console uses a high wattage, high reactance xenon power supply. These blowers utilize permanently sealed bearings and require no lubrication.

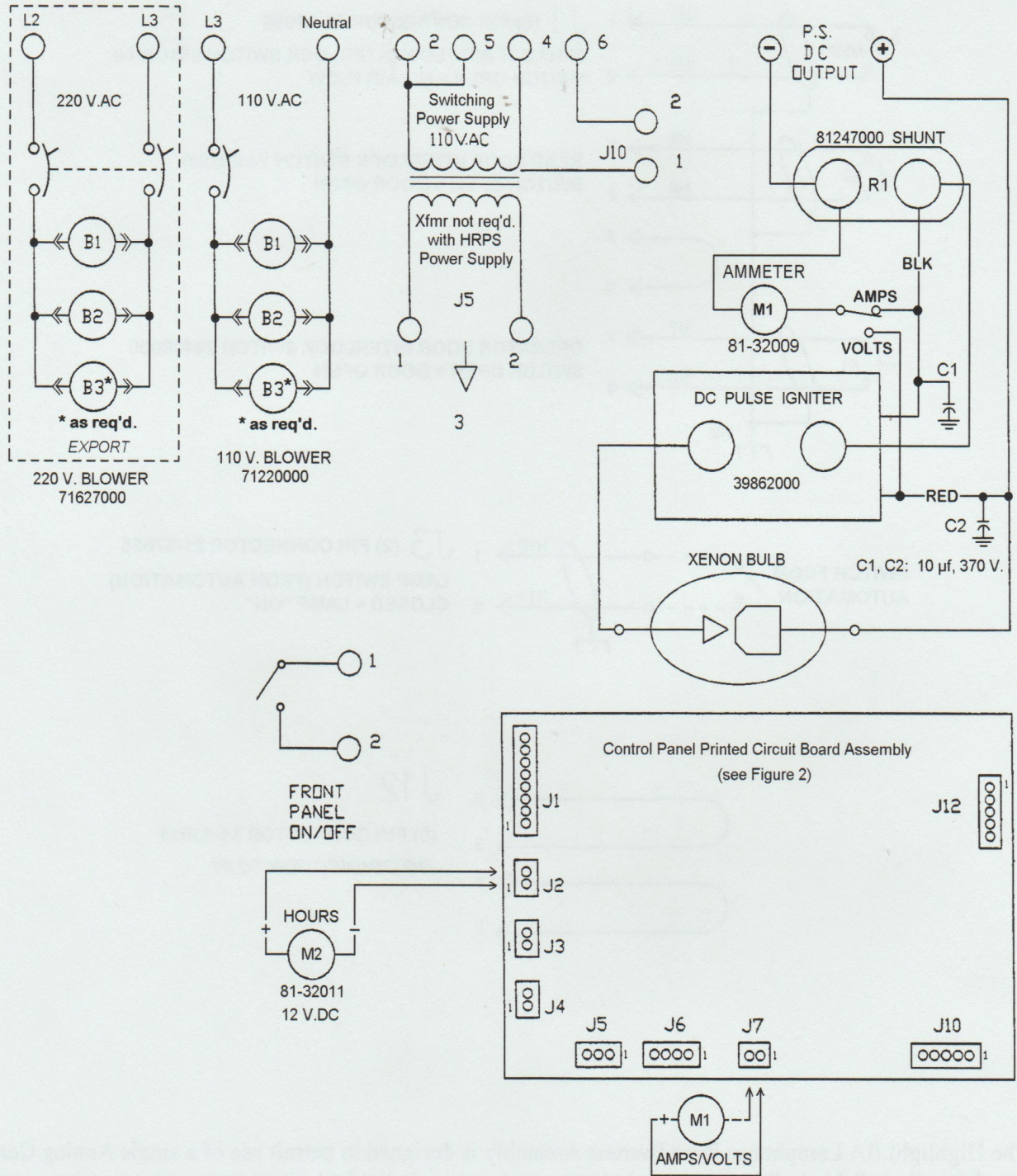
INSPECT THE TWO AIR FILTERS located above the intake blowers and replace them when dust accumulation inhibits free air flow. Loosen the (2) screws securing the filter retainer bracket (see Figure 1, Item 42) at the rear of the filter housing box (Figure 1, Item 41) on the top of the console. Dismount the retainer bracket and remove the filters. Install new filters with the "AIR FLOW" arrow pointing downward. Replace the retainer bracket and secure the (2) screws.

CHECK ALL ELECTRICAL CONNECTIONS periodically for tightness. Particular attention should be given to the DC connections at the bulb, the shunt, and the positive binding post.

THE BULB should be checked regularly for presence of dirt or foreign material on the envelope. Dirt or foreign material must be removed from the bulb immediately, or they will burn into the quartz envelope and shorten bulb life. NOTE: Observe all safety procedures when working around the bulb.

THE INSIDE of the lamphouse compartment and all blower intakes should be cleaned periodically, depending on the dust conditions at each installation. Keep all air inlet and outlet grilles clean and free from obstructions. After cleaning, replace both bulb enclosure access plates and secure with the thumb screws. Do not operate the lamphouse without both covers securely installed. These covers insure proper air pressurization of the bulb enclosure to allow adequate cooling of the bulb and reflector.

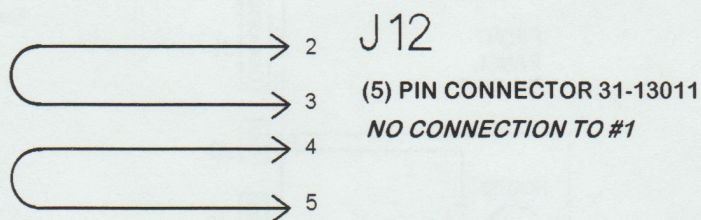
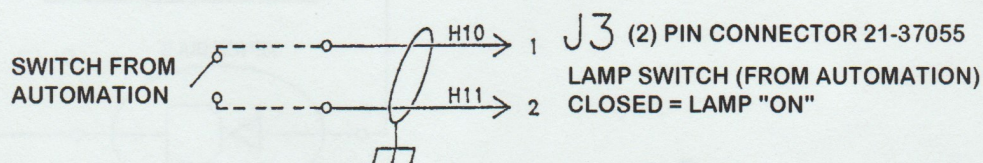
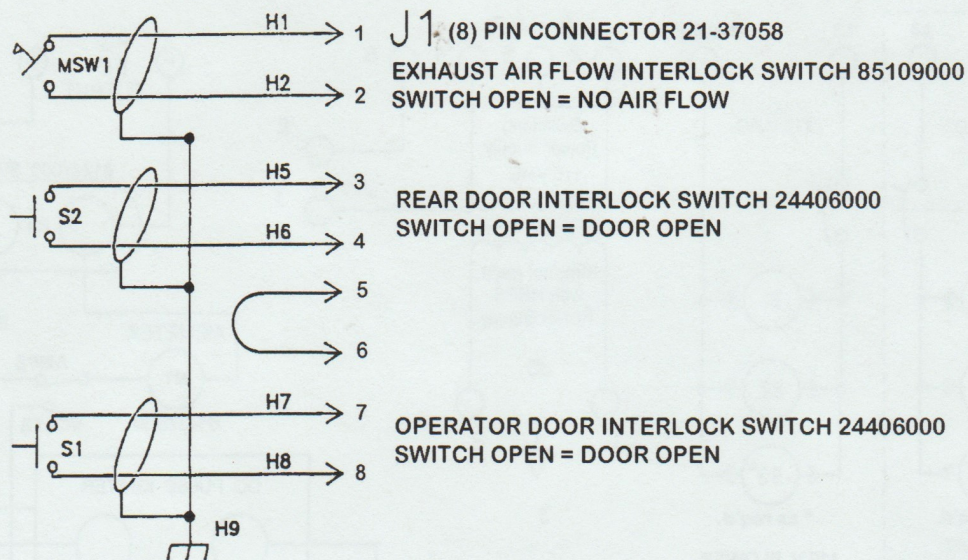
HIGHLIGHT IIA LAMPHOUSE



Xenon Bulb Ignition and Monitor Circuit

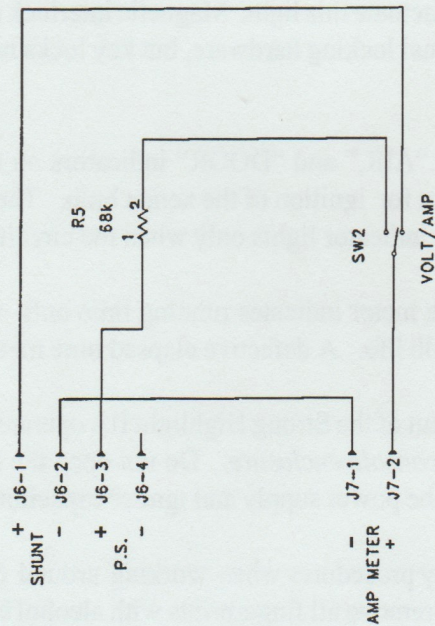
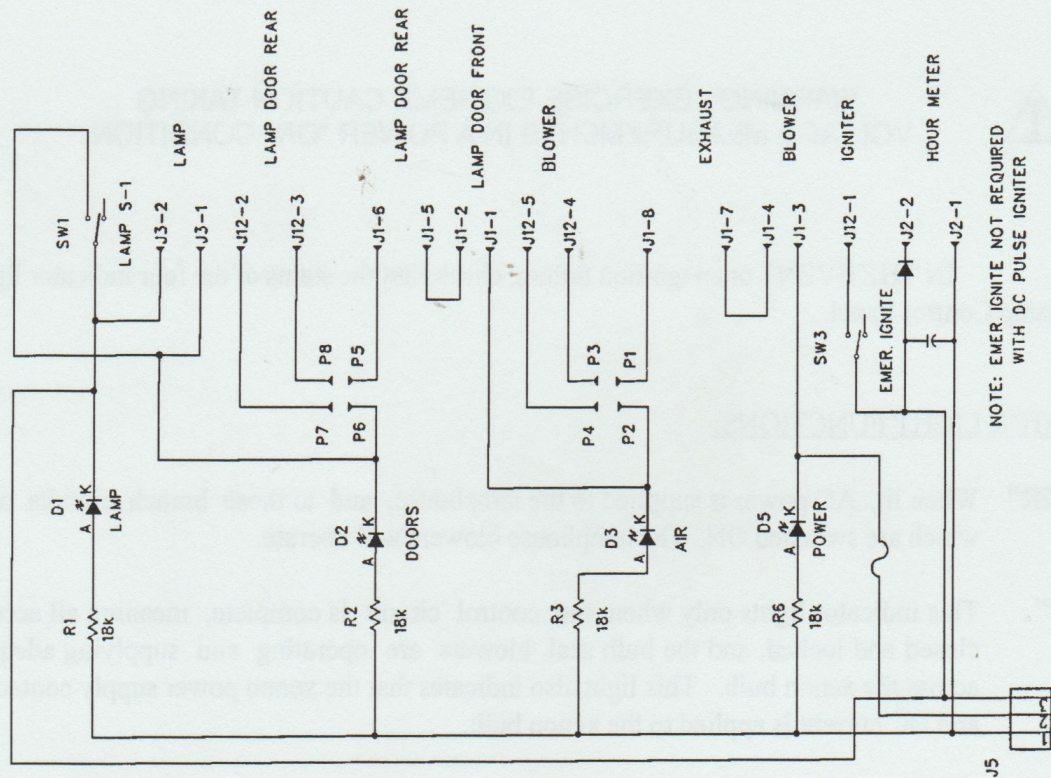
LAMPHOUSE WIRE HARNESS

Assembly No. 72-00595



The Highlight IIA Lamphouse Wire Harness Assembly is designed to permit use of a single Analog Control Panel for all available bulb wattages and power supply types. Individual component parts (switches, etc.) of the 72-00595 Wire Harness are available as replacement parts.

LAMPHOUSE CONTROL PANEL



See Figure 2 for Parts List.

TROUBLESHOOTING



WARNING: EXERCISE EXTREME CAUTION TAKING VOLTAGE MEASUREMENTS IN A POWER "ON" CONDITION.



IN THE EVENT of an ignition failure, check first the status of the four indicator lights mounted to the Lamp Control Panel.

INDICATOR LIGHT FUNCTIONS:

- "POWER"** When lit, AC power is supplied to the lamphouse, and to those branch circuits of the console which are switched ON. The lamphouse blowers will operate.
- "LAMP"** This indicator lights only when the control circuit is complete, meaning all access doors are closed and locked, and the bulb seal blowers are operating and supplying adequate air flow across the xenon bulb. This light also indicates that the xenon power supply contactor is pulled, and DC current is applied to the xenon bulb.
- "AIR"** Closure of the air flow switch, indicating adequate ventilation, will light this L.E.D. This air flow switch is located at the exhaust stack opening.
- "DOOR"** The (2) door interlock switches, at the operator lamphouse access doors and at the rear door, must be closed to actuate this light. Magnetic interlock switches, as used on the Highlight IIA, do not require additional locking hardware, but key locks must be secured to insure switch closure.

The "POWER," "AIR," and "DOOR" indicators on the control panel must all be lighted to indicate that conditions are correct for ignition of the xenon bulb. The MAIN LINE circuit breaker must be in the ON position. The "LAMP" indicator lights only when the circuit for bulb ignition is complete.

The elapsed time meter indicates running time only when the xenon bulb is operating. This provides an accurate record of bulb life. A defective elapsed time meter will not prevent bulb ignition.

The control circuit of the Strong Highlight IIA operates on 115 V.AC. *Exercise extreme caution when taking readings inside the console enclosure.* Do not open the lamphouse enclosure until the bulb has cooled to room temperature and the power supply and igniter capacitors have drained for (10) minutes.

Observe all safety procedures when working around the xenon bulb. If the quartz envelope of the bulb is accidentally touched, remove all fingerprints with alcohol before igniting the bulb.

TROUBLESHOOTING (continued)

NORMAL OPERATION:

The igniter operates from the high DC open circuit voltage furnished by the xenon power supply when energized. The 115 V.AC control circuit (5 & 6), which is energized when interlock and air flow switches are closed, and the LAMP ON closure is completed, actuates the power supply contactor. The igniter then generates the high voltage RF pulse to bridge the bulb arc gap. This RF pulse, and the high open circuit ("no load") DC voltage, are necessary to ignite the bulb.

There will be a distinct buzzing sound at the moment the xenon bulb ignites. This is caused by the spark gap in the igniter, and the high voltage arc between the bulb electrodes.

A short delay (two to three seconds) between contactor closure and the ignition pulse is not abnormal. This delay allows power supply capacitors to charge. A similar delay between strikes is normal in the event multiple ignition pulses are needed; a "warm" bulb, or an old bulb nearing expiration, sometimes require more than one pulse before ignition is sustained.

When the bulb ignites, the DC voltage drops to normal bulb operating range. The DC pulse igniter ceases operation at voltages below 130 V.DC.

VISIBLE INDICATIONS OF MALFUNCTION:

1. No "POWER" light. Check main circuit breaker or fuse; check AC supply at source.
2. No "AIR" light. Check bulb seal blowers; replace, repair, clean or lubricate as required. Check air vane switch (0 Ohms between COM and NO contacts when actuated).
3. No "DOOR" light. Side or rear access doors open or unlocked. Defective interlock switch; check with ohmmeter for complete closure.
4. No "LAMP" light. Assuming all other indicator lights are ON, check for loose or missing connection in the 5 & 6 circuit; failure in automation circuit.

Bulb Fails to Ignite

1. No DC current. Switch MAIN LINE breaker ON.
2. Low DC "no load" voltage from xenon power supply. Check no load voltage by holding VOLTAGE switch and pressing "LAMP" switch. Repair or replace xenon power supply if DC "no load" voltage does not reach at least 140 V.DC.
3. Defective xenon bulb. Check for damaged or scorched electrodes, discolored quartz envelope or end caps. Replace if defective.
4. Faulty igniter. Arc at igniter spark gap should be audible, and arc across bulb electrodes should be visible through arc viewing port. Repair or replace.

TROUBLESHOOTING (continued)

Bulb Fails to Ignite (continued)

5. DC output level too low. Increase power supply output to rated bulb current.
6. Faulty automation contact. If the lamp ignites by means of the "LAMP" switch, but fails to ignite automatically, check automation controller.
7. Loose or faulty terminal connection. Visually inspect connections, particularly in AC circuit (5 & 6) and all DC connections.
8. Ignition pulse arcing to ground. Dress all igniter and bulb leads away from grounded metal lamphouse components.

Bulb Goes Out During Operation

1. Blocked bulb seal blower intake filter or defective blower motor. Clean or replace.
2. Air flow switch sticking or faulty. Clean or replace.
3. Exhaust system malfunction. Check for correct exhaust blower operation; unobstructed air flow through all ducting.
4. Overheated thermal switch in xenon power supply. Check for unobstructed air flow through power supply; loose DC connection(s).
5. Faulty automation contact. If lamp operates normally in "manual" mode (using "LAMP" switch), check automation controller relay.
6. Faulty xenon bulb. Check for damaged electrodes, darkened envelope, instability in operating current or voltage. Replace if defective.
7. Phase loss or unstable AC source. See xenon power supply manual; most Strong switching power supplies feature *Phase Loss Detection* and *Brown-Out Protection* circuits.

Excessive Light Flicker

1. Defective xenon bulb. Check for cracked and/or sagging electrode.
2. Arc stabilization magnet missing or reversed. Replace or correct.
3. Projector shutter mis-timed. See projector manual.
4. Rectifier diode open or shorted (high reactance power supply). Replace as required.
5. Excessive ripple in power supply DC output. Consult factory.

Reduced Light Output

1. Normal bulb aging. Increase current. Do not exceed maximum current rating specified by xenon bulb manufacturer.
2. Defective bulb. Check for discoloration or premature darkening of envelope.
3. Bulb defocused or misaligned.

TROUBLESHOOTING (continued)

Noise in Theatre Sound System During Bulb Ignition or Operation

1. Defective RF suppression capacitor(s). See Figure 3, Items 21 & 29; check with capacitor tester and replace if defective.
2. Console or sound system not correctly grounded. Connect to adequate earth ground.

Excessive Heat at Film Trap (Film Burning)

1. Xenon bulb misfocused. Focus bulb for even field using CinemaScope aperture plate; do not "hot spot" the center of the screen.
2. Dichroic coating on reflector peeled. Replace reflector.
3. Excessive bulb wattage. DO NOT EXCEED 4500 watts for 35mm projection unless heat filter(s) are installed. Forced-air or water-cooled 35mm film traps *do not* reduce the high *radiant energy* levels generated by 7000 watt xenon bulbs. Bulb wattages in excess of 4500 watts are normally for use with 70mm and larger apertures ONLY.



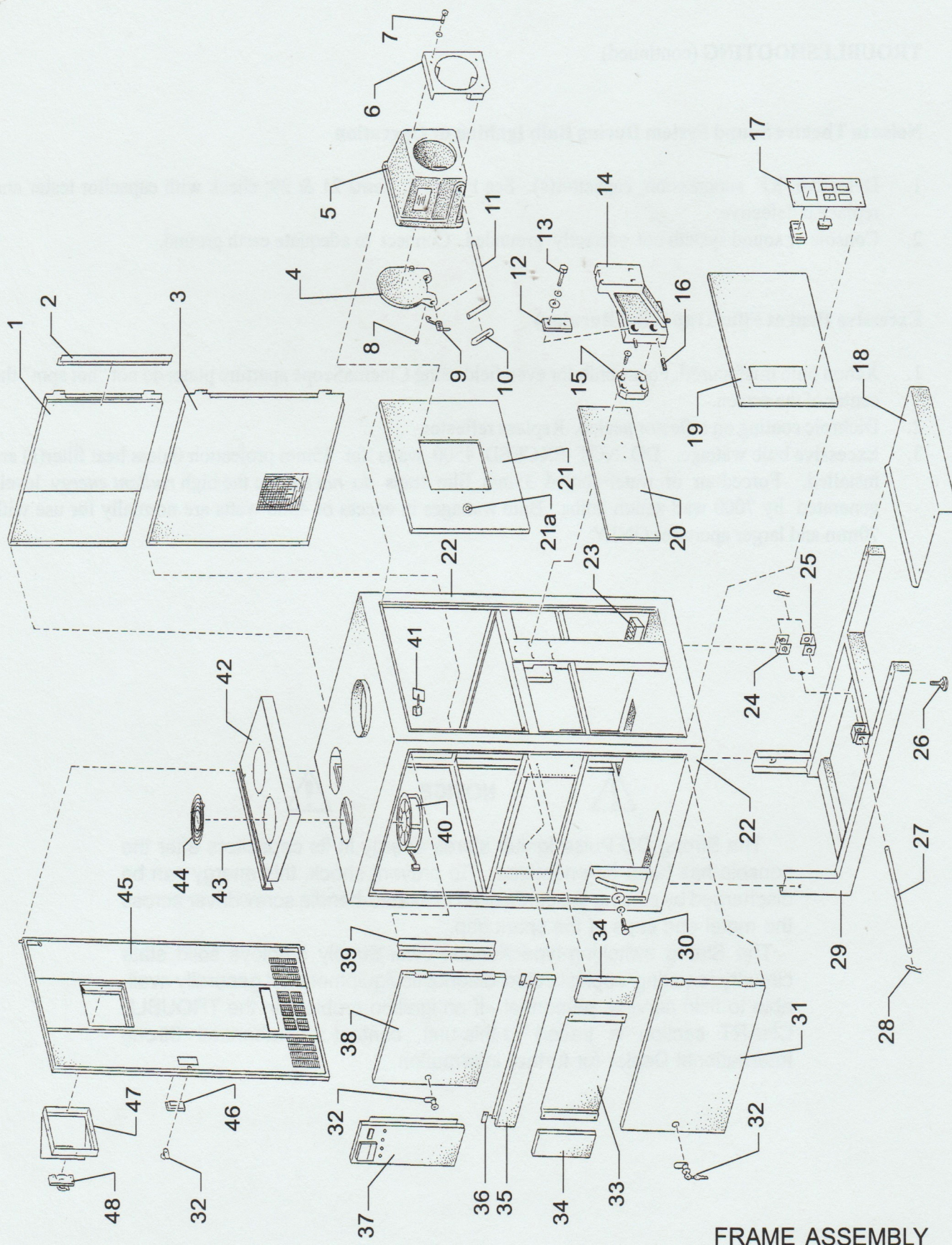
NOTICE



The Strong DC Pulse Igniter stores energy in its capacitors after the console has been de-energized. To prevent shock, this energy can be discharged by placing the blade of an insulated-handle screwdriver across the metal end caps of the spark gap.

The Strong switching-type Xenon Power Supply employs solid state circuitry requiring sophisticated diagnostic equipment not generally available to field service personnel. If an ignition problem in the TROUBLE CHART section is traced to this unit, contact an authorized Strong International Dealer for further information.

FIGURE 1



FRAME ASSEMBLY

PARTS LIST

Figure 1

<u>Item</u>	<u>Part No.</u>	<u>Description</u>
1	72-00594	Access Door Assembly, Off-Operator Side
2	23938000	Light Baffle
-	4060379	Mounting Screw, 6-32 x 3/8" Hex Head
3	72-00592	Off-Operator Side Door Assembly
-	71220000	Blower, 6" Round Frame, 115 V.AC, 50/60 Hz.
-	71627000	Blower, 6" Round Frame, 230 V.AC, 50/60 Hz. (Export)
		<i>Side Door Blower required with High Wattage Power Supplies only.</i>
4	81148000	Douser Plate Casting
-	81234000	Rubber Bumper, Douser Plate
5	71252000	Casting, Douser Housing
-	4110311	Mounting Screw, 10-24 x 5/16" Pan Head
-	4110621	Mounting Screw, 10-24 x 5/8" Pan Head
6	81847000	Beam Spread/Heat Filter Holder (optional)
-	81848000	Beam Spread Lens, 70mm (not shown; optional)
-	72-00504	Heat Filter Assmbly (not shown; optional)
7	4251120	Screw, 1/4-20 x 1-1/8" Hex Head
8	81432000	Shoulder Screw (atttachs Plate to Shaft)
9	81187000	Torsion Spring, Douser Shaft
10	45150A00	Handle Grip, Douser Shaft
11	81433000	Douser Cross Shaft & Handle
12	71240000	Adjustment Slide Bar
13	4371505	Bolt, 3/8-16 x 1-1/2" Hex Head
-	4377001	Split Lockwasher, 3/8"
-	4377103	Flatwasher, 3/8"
14	71226000	Soundhead Mounting Arm
15	71221000	Nut Plate, Mounting Arm
-	4312250	Mounting Screw, 5/16-18 x 2-1/4" Flat Socket Head
16	4371504	Set Screw, Arm Positioning (6 req'd.)
17	25381000	Circuit Breaker Panel (less components)
-	24346000	Circuit Breaker, 20 A. 1 Phase
-	24348000	Circuit Breaker, 15 A. 1 Phase
-	24347000	Circuit Breaker, 10 A. 1 Phase
-	24345000	Circuit Breaker, 5 A. 1 Phase
-	24380000	Buss Bar
-	24381000	Filler Plug (as req'd.)
-	4100371	Panel Mounting Screw, 10-32 x 3/8" Bind Head
-	4107001	Lockwasher, #10
18	71331000	Cover , Base Legs
19	71155000	Lower Front Cover
		61-61001 Circuit Breaker, 30 A. 3 Phase
		25036000 Mounting Panel for 61-61001
		81-61041 Circuit Breaker, 50 A. 3 Phase
		25399000 Mounting Panel for 81-61041

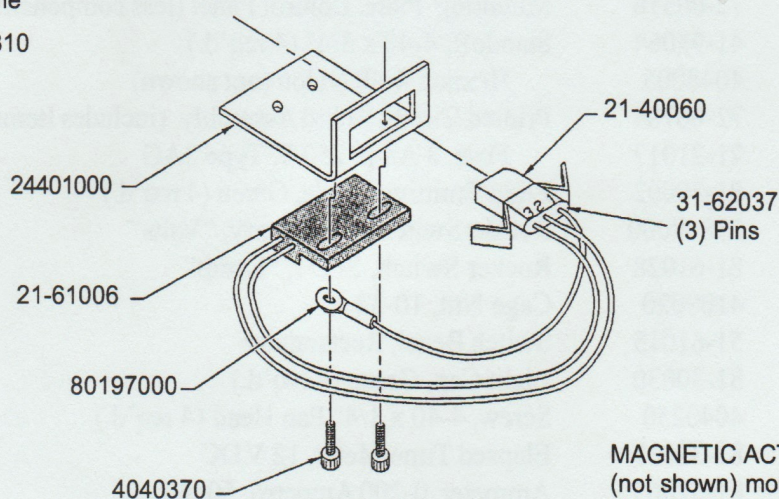
FIGURE 1 Parts List (continued)

<u>Item</u>	<u>Part No.</u>	<u>Description</u>
20	71225000	Soundhead Arm Mounting Plate
-	4251002	Screw, 1/4-20 x 5/8" Socket Head
-	4258001	Hexnut, 1/4-20
-	4257000	Lockwasher, 1/4" Split Ring
21	72-00530	Lamphouse Front Panel, Welded Assembly
-	4100503	Mounting Screw, 10-32 x 1/2" Bind Head
-	4107001	Lockwasher, #10
-	41-70003	Flatwasher, #10
21a	48930000	Arc Viewing Port
22	72-00522	Console Frame, Welded Assembly
23	25383000	Terminal Board Assembly
24	71254000	Upper Bracket, Pivot Shaft
-	4250623	Screw, 1/4-20 x 5/8" Hex Head
25	71134000	Lower Bracket, Pivot Shaft
-	4250623	Screw, 1/4-20 x 5/8" Hex Head
26	71184000	Leveling Foot (4 req'd.)
27	71199000	Pivot Shaft
28	01783000	Hitch Pin (2 req'd.)
29	71998000	Console Base, Welded Assembly
30	4501000	Tilt Lock Screw, 1/2-13 x 1" (2 req'd.)
-	4627100	Flatwasher, 5/8"
31	72-00587	Power Supply Access Door & Hinge Assembly
-	4100503	Mounting Screw, 10-32 x 1/2" Bind Head
-	4108001	Hexnut, 10-32
-	4107001	Lockwasher, #10
-	4107101	Flatwasher, #10 SAE
32	71284000	Cam Lock & Keys
33	24292000	Filler Panel, 10.5" x 19"
-	4100509	Mounting Screw, 10-32 x 1/2" Truss Head, Black Oxide
34	24241000	Filler Bracket (2 req'd.)
-	4100625	Mounting Screw, 10-32 x 5/8" Hex Head
35	72-00701	Cover Panel
36	71260000	Mounting Tab (2 req'd.)
-	4100371	Mounting Screw, 10-32 x 3/8" Pan Head
37	72-00597	Control Panel Assembly (see Figure 2 for components)
38	72-00556	Lamphouse Access Door & Hinge Assembly
-	4100503	Mounting Screw, 10-32 x 1/2" Bind Head
-	4108001	Hexnut, 10-32
-	4107001	Lockwasher, #10
-	4107101	Flatwasher, #10 SAE

FIGURE 1 Parts List (continued)

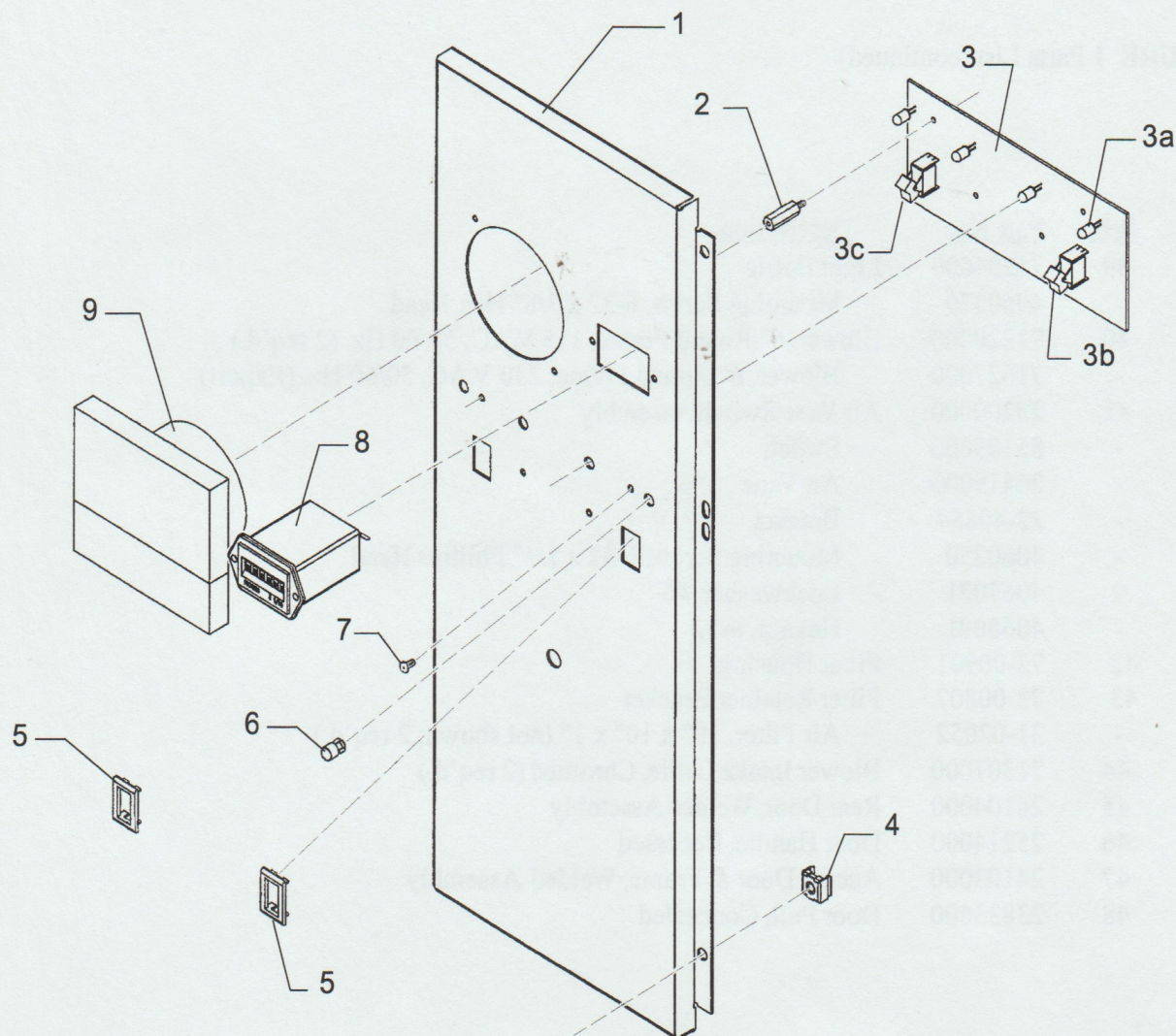
<u>Item</u>	<u>Part No.</u>	<u>Description</u>
39	71204000	Light Baffle
-	4060379	Mounting Screw, 6-32 x 3/8" Hex Head
40	71220000	Blower, 6" Round Frame, 115 V.AC, 50/60 Hz. (2 req'd.)
-	71627000	Blower, 6" Round Frame, 230 V.AC, 50/60 Hz. (Export)
41	25200000	Air Vane Switch Assembly
-	85109000	Switch
-	24419000	Air Vane
-	22-40854	Bracket
-	4060250	Mounting Screw, 6-32 x 1/4" Phillips Head
-	4067001	Lockwasher, #6
-	4068001	Hexnut, 6-32
42	72-00901	Filter Housing
43	72-00807	Filter Retainer Bracket
-	31-02052	Air Filter, 10" x 10" x 1" (not shown; 2 req'd.)
44	71307000	Blower Intake Grille, Chromed (2 req'd.)
45	24104000	Rear Door, Welded Assembly
46	25214000	Door Handle, Recessed
47	24103000	Access Door & Frame, Welded Assembly
48	23833000	Door Pull, Concealed

DOOR INTERLOCK
SWITCH ASSEMBLY 24406000
mounts to Console Frame
Mounting Screw: 4080310



MAGNETIC ACTUATOR 21-61007
(not shown) mounts to Door
(2) Hex Spacers 31-98002 req'd. for
Rear Door

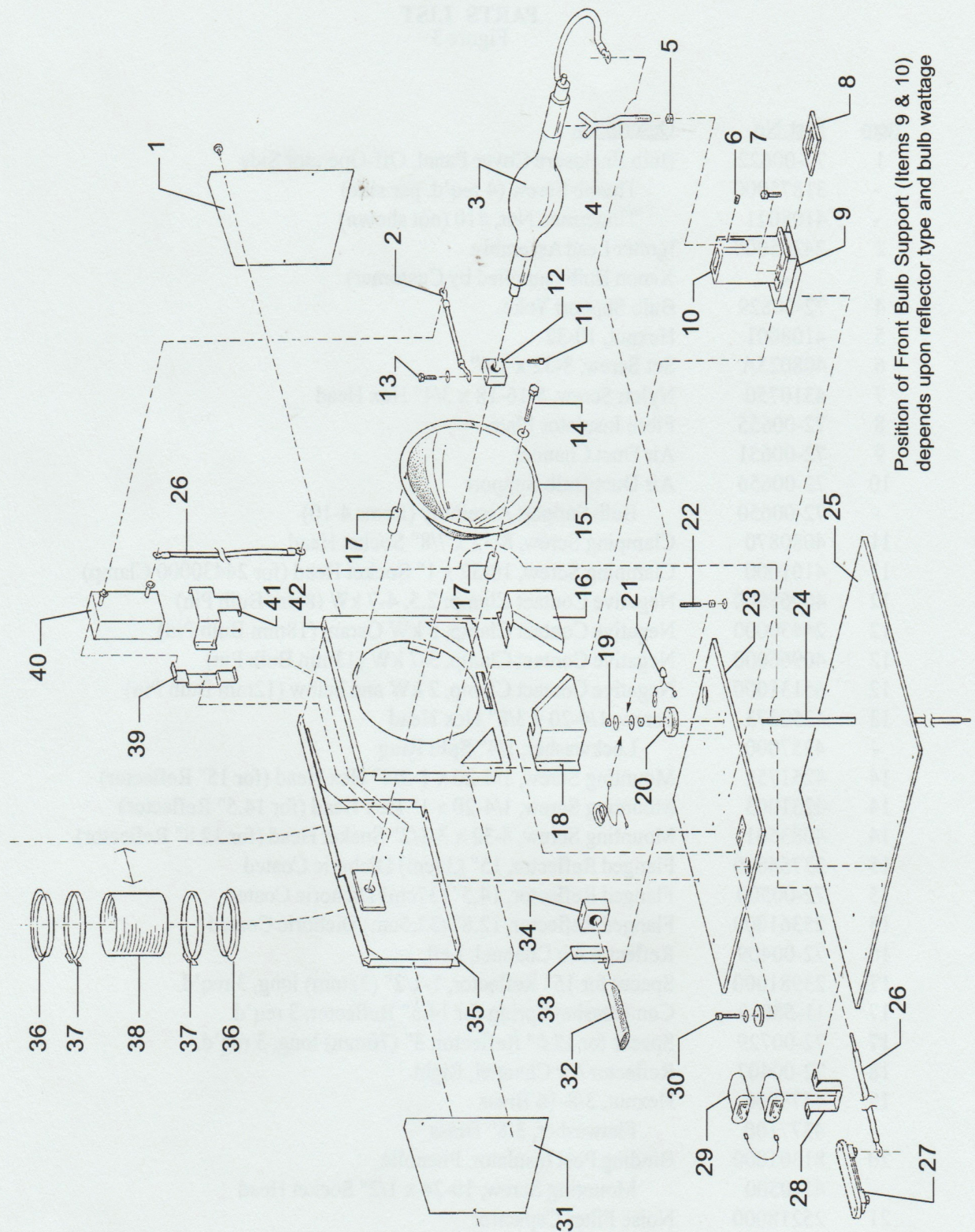
FIGURE 2



Item	Part No.	Description
1	72-00518	Mounting Plate, Control Panel (less components)
2	41-98064	Standoff, 4-40 x 3/4" (4 req'd.)
-	4048005	Hexnut, 4-40 Nylon (not shown)
3	72-00784	Printed Circuit Board Assembly (includes Items 3a,3b,3c)
-	21-21017	Fuse, 3 Amp. 250 V. Type 3AG
3a	81-30002	Light Emitting Diode, Green (4 req'd.)
3b	23868000	Rocker Switch, Momentary; "Volts"
3c	81-61028	Rocker Switch, SPDT, "Lamp"
4	4108020	Cage Nut, 10-32
5	51-61015	Switch Bezel, Rectangular
6	81-30030	Light Cap, Green (4 req'd.)
7	4040250	Screw, 4-40 x 1/4" Pan Head (4 req'd.)
8	81-32011	Elapsed Time Meter, 12 V.DC
9	81-32009	Ammeter, 0-200 Amperes, 50 mV.

LAMPHOUSE CONTROL PANEL (72-00597)

FIGURE 3



Position of Front Bulb Support (Items 9 & 10)
depends upon reflector type and bulb wattage

HIGHLIGHT IIA LAMPHOUSE

PARTS LIST

Figure 3

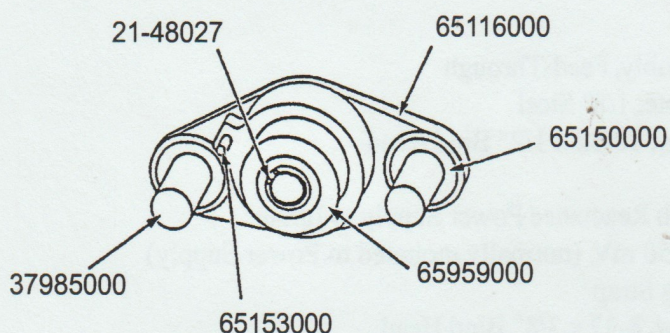
<u>Item</u>	<u>Part No.</u>	<u>Description</u>
1	72-00622	Bulb Enclosure Cover Panel, Off-Operator Side
-	31875000	Thumb Screw (4 req'd. per side)
-	4108021	Tinnerman Nut, #10 (not shown)
2	24265000	Igniter Lead Assembly
3	---	Xenon Bulb (supplied by Customer)
4	72-00829	Bulb Support Yoke
5	4108001	Hexnut, 10-32
6	408025A	Set Screw, 8-32 x 1/4"
7	4310750	Nylon Screw, 5/16-18 x 3/4" Hex Head
8	72-00655	Fibre Insulator Plate
9	72-00651	Air Duct Channel
10	72-00656	Air Duct/Bulb Support
-	72-00650	Bulb Support Assembly (Items 4-10)
11	4080870	Clamping Screw, 8-32 x 7/8" Socket Head
11	4101000	Clamping Screw, 10-32 x 1" Socket Head (for 24430000 Clamp)
12	40965000	Negative Contact Clamp; 2.5, 4-7 kW (8mm Bulb Pin)
12	24430000	Negative Contact Clamp, 5 kW Osram (18mm Bulb Pin)
12	40966000	Negative Contact Clamp, 3-7 kW (13mm Bulb Pin)
12	65131000	Negative Contact Clamp, 2 kW and below (12mm Bulb Pin)
13	4250373	Screw, 1/4-20 x 3/8" Hex Head
-	4257000	Lockwasher, 1/4" Split Ring
14	4251751	Mounting Screw, 1/4-20 x 1-3/4" Hex Head (for 15" Reflector)
14	4251003	Mounting Screw, 1/4-20 x 1" Hex Head (for 14.5" Reflector)
14	4083501	Mounting Screw, 8-32 x 3-1/2" Socket Head (for 12.8" Reflector)
15	23754000	Flanged Reflector, 15" (38cm) Dichoric Coated
15	72-00500	Flanged Reflector, 14.5" (37cm) Dichoric Coated
15	25361000	Flanged Reflector, 12.8" (32.5cm) Dichoric Coated
16	72-00409	Reflector Air Channel, Left
17	23981000	Spacer for 15" Reflector, 1-1/2" (38mm) long, 3 req'd.
17	11-58013	Compression Spring for 14.5" Reflector, 3 req'd.
17	72-00729	Spacer for 12.8" Reflector, 3" (76mm) long, 3 req'd.
18	72-00407	Reflector Air Channel, Right
19	4378006	Hexnut, 3/8-16 Brass
-	4377100	Flatwasher, 3/8" Brass
20	81301000	Binding Post Insulator, Phenolic
-	4110500	Mounting Screw, 10-24 x 1/2" Socket Head
21	25218000	Noise Filter Capacitor
22	4311752	Burner Plate Adjusting Screw, 5/16-18 x 1-3/4" Headless (6 req'd.)
-	4318001	Lock Nut, 5/16-18 Hex
23	72-00573	Lamphouse Burner Plate, 1/4" Aluminum

FIGURE 3 Parts List (continued)

<u>Item</u>	<u>Part No.</u>	<u>Description</u>
24	24263000	Positive Lead Assembly, Feed-Through
25	72-00610	Lamphouse Sub Plate, 1/8" Steel
-	4100503	Mounting Screw, 10-32 x 1/2" Bind Head
-	4108001	Hexnut, 10-32
26	72-00618	Negative Lead, High Reactance Power Supply to Igniter
27	81247000	Shunt (R1), 200 A. 50 mV. (normally mounted to Power Supply)
28	76208000	Capacitor Clamping Strap
-	4080375	Mounting Screw, 8-32 x 3/8" Bind Head
29	76323000	RF Suppression Capacitor (2 req'd.)
30	4311750	Tie-Down Screw, 5/16-18 x 1-3/4" Socket Head (2 req'd.)
-	23912000	Fender Washer
31	72-00623	Bulb Enclosure Cover Panel, Operator Side
-	31875000	Thumb Screw (not shown)
-	4108021	Tinnerman Nut, #10 (not shown; 4 req'd. per side)
32	00M15315	Arc Stabilization Magnet
33	72-00626	"L" Bracket, Magnet Clamp
-	4080310	Mounting Screw, 8-32 x 5/16" Pan Head
34	81137000	Magnet Clamp
-	408025A	Set Screw, 8-32 x 1/4"
35	72-00340	Bulb Enclosure, Rear
36	65898000	Hose Mount, 6" (4 req'd.)
37	81-10010	Hose Clamp (4 req'd.)
38	72-00738	Air Duct Hose, 6" Diameter x 12" Long (2 req'd.)
39	72-00624*	Igniter Mounting Bracket, Inner
-	4250503	Mounting Screw, 1/4-20 x 1/2" Hex Head
-	4257000	Lockwasher, 1/4" Split Ring
-	4258001	Hexnut, 1/4-20
40	39862000*	DC Pulse Igniter
-	39875000	Igniter Case & Coil, Potted Assembly
-	62-87004	Igniter Printed Circuit Board Assembly
41	72-00625*	Igniter Mounting Bracket, Outer
-	4250503	Mounting Screw, 1/4-20 x 1/2" Hex Head
-	4257000	Lockwasher, 1/4" Split Ring
-	4258001	Hexnut, 1/4-20
42	72-00515	Reflector Frame for 15" Reflector
42	72-00525	Reflector Frame for 14.5" Reflector
42	72-00526	Reflector Frame for 12.8" Reflector

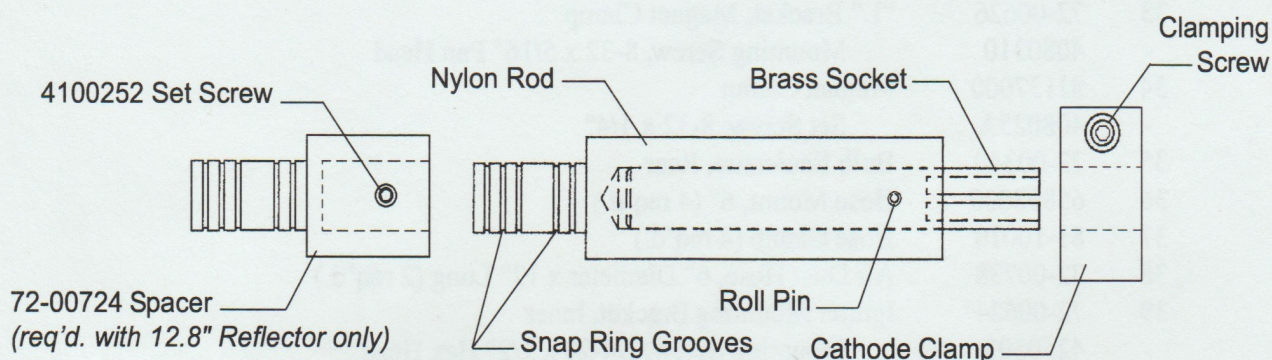
* Standard components - see Parts List furnished separately for *optional* AC Igniters

65827000 BULB ADJUSTMENT MECHANISM



Part No.	Description
37985000	Thumb Screw (2 req'd.)
15010000	Compression Spring (2 req'd.)
65116000	Casting, Adjustment Mechanism
65150000	Fender Washer (2 req'd.)
65153000	Focus Lockscrew
65154000	Nylon Locking Ball
65959000	Focus Screw & Bearing Assembly
21-48027	Snap Ring, Collet Retaining

REAR BULB SUPPORT COLLET ASSEMBLY



Bulb Wattage	Collet Part No.	Overall Length	Socket Diameter	Clamp Part No.	Clamping Screw
2000 & below	24179000	5-5/16" (13.50cm)	.475" (12mm)	65131000	4080870
2000, 3000 "HS"	24201000	5-13/32" (13.73cm)	.312" (8mm)	40965000	4080870
2500 "HS"	24201000	5-13/32" (13.73cm)	.312" (8mm)	40965000	4080870
3000	24180000	4-1/2" (11.43cm)	.551" (14mm)	40966000	4080870
4000-6000 "HS"	24181000	4-13/32" (11.20cm)	.312" (8mm)	40965000	4080870
5000*	24433000	5-1/16" (12.85cm)	.710" (18mm)	24430000	4101000
7000 "HS"	24181000	4-13/32" (11.20cm)	.312" (8mm)	40965000	4080870
3000-7000 "H/VC"	24180000	4-1/2" (11.43cm)	.551" (14mm)	40966000	4080870

* for Osram XBO5000W/H OFR only; other 5 kW "HS" types are generally interchangeable with 4000, 4500 "HS" bulbs.

Bulb Adapters required for 1000 and 1600 watt bulbs only. See preceding HIGHLIGHT IIA XENON BULBS section for adapter Part Numbers.

XENON BULB RECORD

LAMPHOUSE TYPE _____ MACHINE NO. _____

WATTAGE _____ NOM. CURRENT _____ AMPS. MAX. CURRENT _____ AMPS.

BULB	DATE LAMPHOUSE HOURS
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[illegible]