## Troubleshooting Guide: 355 Lights (24V)

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## Troubleshooting Chart

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<th>Symptom</th>
<th>Probable Cause</th>
<th>Check</th>
<th>Solution</th>
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<td>Light will not illuminate.</td>
<td>Light does not illuminate. ON / STANDBY switch is ON.</td>
<td>Bulb is burned out.</td>
<td>Inspect bulb.</td>
<td>Replace bulb.</td>
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<td>Facility circuit breaker is tripped.</td>
<td>Check facility circuit breaker.</td>
<td>Reset circuit breaker.</td>
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<td></td>
<td>Line fuse(s) blown.</td>
<td>Inspect fuses.</td>
<td>Replace fuse(s).</td>
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<td>Ceiling Mtd Lights</td>
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<td>Wall Mtd Lights</td>
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<td>Mobile Lights: (120V) (230V)</td>
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<td>Fuse holder malfunctioning.</td>
<td>Perform continuity check on fuse holder.</td>
<td>Replace fuse holder.</td>
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<tr>
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<td></td>
<td>Bulb socket is corroded resulting in bad connection.</td>
<td>Inspect / clean bulb socket.</td>
<td>Replace bulb socket.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ON / STANDBY switch malfunctioning.</td>
<td>Perform continuity check on switch.</td>
<td>Replace ON / STANDBY switch.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Transformer malfunctioning.</td>
<td>With the ON / STANDBY switch ON, check for 25-28 VAC across output leads of transformer.</td>
<td>If 25-28 VAC is not present, Replace transformer.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Damaged / disconnected wiring in the arm assemblies.</td>
<td>Perform continuity check on wiring from transformer to lighthead.</td>
<td>Repair / replace any damaged or disconnected wiring. (Wiring Diagrams)</td>
</tr>
<tr>
<td></td>
<td>Mobile Lights only:</td>
<td>AC inlet is malfunctioning.</td>
<td>Perform continuity check on AC inlet.</td>
<td>Replace AC inlet.</td>
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<td></td>
<td></td>
<td>Lighthead will not illuminate, or flashed intermittently when lighthead or arm assemblies are moved.</td>
<td>Damaged / disconnected wiring in the arm assemblies.</td>
<td>Repair / replace any damaged or disconnected wiring. (Wiring Diagrams)</td>
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<tr>
<td>Arm assemblies or lighthead does not rotate freely, or drifts when released.</td>
<td>Cross tube rotates (at ball pivot joint) too stiffly, or drifts when released.</td>
<td>Cross tube counterbalance out of adjustment.</td>
<td>Release tension from ball pivot joint and observe to see if the cross tube counterbalances correctly.</td>
<td>Cross tube counterbalance adjustment.</td>
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<td>Ball pivot joint tension out of adjustment.</td>
<td>Check for looseness / stiffness in joint.</td>
<td>Ball pivot joint tension adjustment.</td>
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<tr>
<td></td>
<td></td>
<td>Lamp tube does not rotate freely (at cross tube), or drifts when released.</td>
<td>Check for looseness / stiffness in joint.</td>
<td>Lamp tube brake adjustment.</td>
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<tr>
<td></td>
<td></td>
<td>Lighthead does not rotate freely (at lamp tube), or drifts when released.</td>
<td>Check for looseness / stiffness in joint.</td>
<td>Lighthead brake adjustment.</td>
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<tr>
<td>Ceiling Mtd Lights only:</td>
<td>Down tube does not rotate, or drifts when released.</td>
<td>Improper installation of ceiling plate. (Plate deflecting too much, or not level)</td>
<td>Inspect ceiling plate. Check for level &amp; excessive flexing.</td>
<td>If ceiling plate is not level, readjust as necessary. If there is excessive flexing, support ceiling structure as necessary. (Refer to installation guide)</td>
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<tr>
<td>Wall Mtd Lights only:</td>
<td>Fixed arm does not rotate freely, or drifts when released.</td>
<td>Improper installation of wall mount plate, or fixed arm not level.</td>
<td>Inspect wall mount plate. Place a level on fixed arm.</td>
<td>Adjust fixed arm leveling screws as necessary. (Refer to installation guide)</td>
</tr>
<tr>
<td>Problem</td>
<td>Symptom</td>
<td>Probable Cause</td>
<td>Check</td>
<td>Solution</td>
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<tr>
<td>Arm assemblies can be rotated farther than specified.</td>
<td>Cross tube can be rotated more than 580° in one direction.</td>
<td>Ball pivot stop is broken.</td>
<td>Inspect ball pivot stop.</td>
<td>Replace ball pivot stop.</td>
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<tr>
<td></td>
<td>Lamp tube can be rotated more than 540° in one direction.</td>
<td>Lamp tube pivot stop is broken.</td>
<td>Inspect lamp tube pivot stop.</td>
<td>Replace Lamp tube pivot stop.</td>
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<tr>
<td></td>
<td>Lighthead can be rotated more than 180° in one direction.</td>
<td>Lighthead pivot bearing stop is broken.</td>
<td>Inspect lighthead pivot bearing.</td>
<td>Replace lighthead pivot bearing.</td>
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<tr>
<td>Ceiling Mtd Lights only:</td>
<td>Down tube can be rotated more than 580° in one direction.</td>
<td>Main pivot stop is broken.</td>
<td>Inspect pivot stop.</td>
<td>Replace main pivot stop.</td>
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<tr>
<td>Wall Mtd Lights only:</td>
<td>Fixed arm can be rotated more than 170° (collides with wall).</td>
<td>Stop screw missing / broken.</td>
<td>Inspect fixed arm stop screw.</td>
<td>Replace fixed arm stop screw.</td>
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<tr>
<td>Lighthead will not operate properly.</td>
<td>Lighthead assembly illuminates, but not at the proper intensity.</td>
<td>Bulb malfunctioning.</td>
<td>-</td>
<td>Replace bulb.</td>
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<td>Wrong input tap is being used on transformer, or facility voltage has changed since installation.</td>
<td>Check facility input voltage &amp; transformer input tap being used.</td>
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<td>Select proper transformer input tap based on facility voltage.</td>
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<td>Transformer malfunctioning</td>
<td>With the ON / STANDBY switch ON, check for 25-28 VAC across output leads of transformer.</td>
<td>If 25-28 VAC is not present,</td>
<td>Replace transformer.</td>
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<td></td>
<td>Bulb socket corroded resulting in bad connection, or high resistance.</td>
<td>Inspect / clean bulb socket.</td>
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<td>Replace bulb socket.</td>
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<td>IR filter is clouded or dirty.</td>
<td>Inspect IR filter.</td>
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<td>Clean IR filter.</td>
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<tr>
<td></td>
<td>Faceplate is clouded or dirty.</td>
<td>Inspect faceplate.</td>
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<td>Clean faceplate.</td>
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<tr>
<td>Mobile Lights only: Brake caster(s) will not lock.</td>
<td>Base moves when caster brakes are set.</td>
<td>Caster brakes are worn or malfunctioning</td>
<td>Inspect caster brakes.</td>
<td>Replace brake caster(s) as necessary.</td>
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Replacing the Bulb

**WARNING**
The maximum bulb wattage for this light is 100 Watts. There is a risk of fire if this limit is exceeded. Use Midmark part number: 002-0640-00.

**Caution**
- To prevent electrical shock, the light must be in STANDBY mode (ﷺ).
- Allow the light to cool before removing bulb.
- Move the lighthead away from the exam site to prevent contaminants from falling into the area.

**Equipment Alert**
Halogen bulbs are sensitive to body oils. Do not touch the glass portion of the bulb. If the glass portion of the bulb is handled, wipe with a clean soft lint-free cloth. Wipe with alcohol, then pat dry.

To replace bulb:
A) Turn light switch to STANDBY (ﷺ).
B) **Loosen** three screws on top of lighthead. (Do not attempt to remove these screws).
C) Separate top cap from lighthead housing.
D) Pull bulb out of bulb socket, then discard.
E) Grasp new bulb with a clean cloth, then insert into bulb socket.
F) Align three top cap screws with holes, then tighten screws.
Replacing the Fuses:  
Ceiling Mounted Lights

To replace fuses...
A) Turn light switch to STANDBY (O).
B) Remove four screws, then lower ceiling cover.
C) Using a flat-bladed screwdriver, rotate fuse cap counter-clockwise 1/4 turn, while pushing upward.
D) Pull fuse out of fuse cap to inspect.
E) Insert fuse into fuse cap.
F) Using a flat-bladed screwdriver, rotate fuse cap clockwise 1/4 turn, while pushing into fuse socket.
G) Install ceiling cover.

NOTE: There are two fuses on this light. After removing the fuse, inspect it to determine whether it is faulty.

Replacing the Fuses:  
Wall Mounted Lights

To replace fuses...
A) Turn light switch to STANDBY (O).
B) Remove bracket cover.
C) Using a flat-bladed screwdriver, rotate fuse cap counter-clockwise 1/4 turn, while pushing upward.
D) Pull fuse out of fuse cap.
E) Insert fuse into fuse cap.
F) Using a flat-bladed screwdriver, rotate fuse cap clockwise 1/4 turn, while pushing into fuse socket.
G) Install bracket cover.

NOTE: There are two fuses on this light. After removing the fuse, inspect it to determine whether it is faulty.
**Replacing the Fuses:**
**Mobile Lights (120V models)**

To replace fuses...
A) Turn light switch to STANDBY ( ).
B) Disconnect power cord from light.
C) Using a flat-bladed screwdriver, push in on locking tab, then pull fuse drawer out.
D) Pull fuses out of fuse drawer to inspect.
E) Insert fuses into fuse drawer.
F) Insert fuse drawer into AC inlet. (Push in until you hear a clicking sound).
G) Connect power cord.

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**Replacing the Fuses:**
**Mobile Lights (230V models)**

**Equipment Alert**
The voltage setting that appears in the window of the fuse drawer, must match the facility voltage. To adjust the voltage setting, refer to *Electrical Input Setting* procedure.

To replace fuses...
A) Turn light switch to STANDBY ( ).
B) Disconnect power cord from light.
C) Using a flat-bladed screwdriver, push in on two locking tabs, then pull fuse drawer out.
D) Pull fuses out of fuse drawer to inspect.
E) Insert fuses into fuse drawer.
F) Insert fuse drawer into AC inlet. (Push in until you hear a clicking sound).
G) Connect power cord.

**Equipment Alert**
Locking tabs are fragile. Pull gently to prevent damage.

To adjust *Electrical Input Setting*...
A) Pull out on two selector lock tabs, then pull voltage selector out of fuse drawer.
B) Rotate voltage selector until the correct setting aligns with the voltage window.
C) Insert voltage selector into fuse drawer.
**Ball Pivot / Cross Tube Counterbalance Adjustments**

**To release ball pivot tension...**
A) Slide sleeve up to expose opening.
B) Insert screwdriver into adjustment hole.
C) Move the screwdriver LEFT until tension is fully released.

**To adjust cross tube counterbalance...**
A) Remove cap from counterbalance.
B) Loosen / tighten the adjustment screw until the cross tube balances in horizontal position.
C) Install cap onto counterbalance.

**To adjust ball pivot tension...**
A) Insert screwdriver into adjustment hole.
B) Move the screwdriver LEFT / RIGHT to adjust tension setting (LEFT: decreases tension / RIGHT: increases tension)
C) Remove screwdriver, and check for desired tension. Repeat until desired tension is achieved.
D) Slide sleeve down, then install screw.
**Lamp Tube Brake Adjustment**

**To adjust lamp tube brake tension...**
A) Slide pivot sleeve up, then remove two screws.
B) Separate lamp tube from cross tube.
C) Loosen jam nut.
D) Loosen / tighten adjustment nut as necessary.
E) Hold adjustment nut in place, then tighten jam nut to 20-30 ft-lbs (27-40.7 N•m).
F) Reattach lamp tube / cross tube, secure with two screws.
G) Check for proper operation. Repeat if necessary.

**Lighthead Brake Adjustment**

**WARNING**
Screws securing lamp tube / lighthead must installed properly. Failure to do so may allow lighthead to fall, resulting in injury.

**To adjust lighthead brake tension...**
A) Slide pivot sleeve back, then remove two screws.
B) Separate lamp tube from lighthead.
C) Loosen jam nut.
D) Loosen / tighten adjustment nut as necessary.
E) Hold adjustment nut in place, then tighten jam nut to 20-30 ft-lbs (27-40.7 N•m).
F) Reattach lamp tube / lighthead, secure with two screws.
G) Check for proper operation. Repeat if necessary.
Lighthead Removal / Pivot Bearing Replacement

**WARNING**
Disconnect power to the light before performing the following procedure. Failure to comply may result in electric shock.

**Step 1: Remove lighthead pivot bearing.**
A) Disconnect power to light.
B) Slide pivot sleeve back, then remove two screws.
C) Separate lamp tube from lighthead, disconnect two wires.
D) Remove two nuts, washers, and pivot bearing.

**WARNING**
Screws securing lamp tube / lighthead must be installed properly. Failure to do so may allow lighthead to fall, resulting in injury.

**Step 2: Install lighthead pivot bearing.**
A) Install pivot bearing and washers as shown in illustration.
B) Install two nuts, but do not tighten at this time.
C) Loosen / tighten adjustment nut as necessary.
D) Hold adjustment nut in place, then tighten jam nut to 20-30 ft-lbs (27-40.7 N•m).
E) Connect two wires.
F) Reattach lamp tube / lighthead, secure with two screws.
G) Check for proper operation. If necessary, separate lighthead, and loosen / tighten adjustment nut.
Lamp Tube Pivot Stop Replacement

WARNING
Disconnect power to the light before performing the following procedure. Failure to comply may result in electric shock.

Step 1: Remove lamp tube pivot stop.
A) Disconnect power to light.
B) Slide (lamp tube) pivot sleeve back, then remove two screws.
C) Separate lamp tube from lighthead, disconnect two wires.
D) Slide (cross tube) pivot sleeve back, then remove two screws.
E) Separate lamp tube from cross tube.
F) Cut two connectors off of wires coming out of the lamp tube.
G) Pull two wires out of lamp tube.
H) Remove two nuts, washers, pivot bearing, and pivot stop.

WARNING
Screws securing lamp tube / lighthead must installed properly. Failure to do so may allow lighthead to fall, resulting in injury.

Step 2: Install lamp tube pivot stop.
A) Install pivot stop, pivot bearing, & washers as shown in illustration.
B) Install two nuts, but do not tighten at this time.
C) Feed two wires thru lamp tube, then install two connectors.
D) Connect two wires from lamp tube to lighthead.
E) Reattach lamp tube / lighthead, secure with two screws.
F) Loosen / tighten adjustment nut as necessary.
G) Hold adjustment nut in place, then tighten jam nut to 20-30 ft-lbs (27-40.7 N·m).
H) Reattach lamp tube / cross tube, secure with two screws.
I) Check for proper operation. If necessary, separate cross tube, and loosen / tighten adjustment nut.
Cross Tube Removal / Installation

**WARNING**
Disconnect power to the light before performing the following procedure. Failure to comply may result in electric shock.

The cross tube / lighthouse is very heavy. To prevent injury, use an assistant for the following procedure.

To remove cross tube...
A) Disconnect power to light.
B) Remove screw, then slide pivot sleeve up.
C) While supporting cross tube / lighthouse, remove two screws, then separate cross tube from down tube.
D) Disconnect two wires and remove cross tube.

**WARNING**
Screws securing cross tube **must** be installed properly. Failure to do so may allow lighthouse to fall, resulting in injury.

To install cross tube...
A) Connect wires as shown.
   (Install new wire connectors if necessary)
B) Insert cross tube into down tube. (Do not pinch wires).
C) Secure cross tube with two screws. (See NOTE)
D) Refer to ‘Ball Pivot Tension Adjustment’ if necessary.
E) Slide pivot sleeve down, secure with screw.

**NOTE:** There are three holes in ball pivot bearing. Two holes are larger with coarser threads. Use these two holes to secure cross tube. The other hole is pivot sleeve screw.
**Down Tube Removal / Installation**

*(Ceiling Lights)*

**Step 1: Remove cross tube / lighthead.**
Refer to: “Cross Tube Removal / Installation”.

**Step 2: Remove down tube.**
A) Remove four screws and ceiling cover.
B) Remove two screws, then separate down tube.
C) Pull two wires up thru down tube.

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**WARNING**
Screws securing down tube must installed properly. Failure to do so may allow lighthead to fall, resulting in injury.

**To install down tube / ceiling cover...**
A) Install down tube, then secure with two screws*.
   Tighten screws to 40 to 50 in-lbs (4.5 to 5.6 N•m)
   (* apply removable threadlocking adhesive to screws)
B) Position ceiling cover, then secure with four screws.
Main Pivot Stop Replacement
(Ceiling Lights)

Step 1: Remove cross tube.
Refer to: “Cross Tube Removal / Installation”.

Step 2: Remove down tube.
Refer to: “Down Tube Removal / Installation”.

Equipment Alert
Strain relief knot must be above the groove pin.
Be sure that groove pin is between two wires, and that wires do not get pinched when pin is installed.

Step 3: Replace main pivot stop.
A) Using a punch, remove groove pin.
B) Remove washer, pivot housing, and pivot stop.
C) Inspect two stop pins. Replace pin(s) if damaged.
D) Install main pivot stop, pivot housing, and washer onto shaft.
E) Install groove pin.

Step 4: Install down tube.
Refer to: “Down Tube Removal / Installation”.

Step 5: Install cross tube / lighthead.
Refer to: “Cross Tube Removal / Installation”.
**Ball Pivot Repair**

**Step 1: Remove cross tube.**
Refer to: “Cross Tube Removal / Installation”.

**Step 2: Remove ball pivot assembly.**
A) Insert screwdriver into adjustment hole.
B) Move the screwdriver LEFT until tension is fully released.
C) Cut wire connectors from two wires.
   (Preserve as much wire length as possible)
D) Using a punch, remove groove pin.

![Adjustment Hole]

**Step 3: Disassemble the ball pivot.**
A) Remove retaining ring and washer from ball pivot shaft.
B) Using a punch, remove groove pin. (see NOTE)
C) Disassemble ball pivot components from shaft / housing.
D) Inspect pivot bearing for excessive wear.
   Replace if necessary.

**NOTE:** Groove pin has serrations on one end. Do not drive serrations thru ball pivot shaft.

**Step 4: Assemble the ball pivot.**
A) Install pivot bearing, washers, and cam as shown.
B) Install groove pin.
C) Install washer, then secure with retaining ring.

![Diagram of Ball Pivot Repair]
**Ball Pivot Stop Replacement**

**Step 1: Disassemble the ball pivot.**
Refer to: “Ball Pivot Repair”.

**Step 2: Replace ball pivot stop.**
A) Remove two flange bearings.
B) Disassemble shaft / housing components.
C) Inspect stop pin. Replace if necessary.
D) Install pivot stop (with raised portion facing UP), housing, and brake onto shaft.
E) Install two flange bearings into shaft.

**NOTE:** Groove pin has serrations on one end. Do not drive serrations thru ball pivot shaft.

**Step 3: Assemble the ball pivot.**
Refer to: “Ball Pivot Repair”.

**Pivot Stop** (raised portion UP)

**Stop Pin** (replace if damaged)
Cleaning the Faceplate / IR Filter

WARNING
Disconnect power to the light before performing the following procedure. Failure to comply may result in electric shock.

To clean the faceplate / IR filter...
A) Remove eight screw and the faceplate assembly.
B) Do NOT touch the IR filter, the clear faceplate, or the interior surface of the reflector with bare fingers.
C) Use a can of compressed air to clean the inside of the lighthead.