Venture's Technical Center - HID Troubleshooting Center

PROBLEM 1— LAMP WILL NOT START

1. POSSIBLE CAUSE: No Power to Ballast
CORRECTIVE ACTION:
Check fuses or other causes of power outages.

2. POSSIBLE CAUSE: Normal End of Lamp Life
CORRECTIVE ACTION:
Often the simplest procedure is to test the lamp in an adjacent fixture which is known to be operating properly and then replace as necessary. It should be kept in mind that series ballasts will occasionally extinguish the adjacent lamp if one is removed.

3. POSSIBLE CAUSE: Lamp Loose in Socket
CORRECTIVE ACTION:
Inspect the lamp to see if there is any indication of arcing at center contact button. Tighten lamp to seat it properly. If base is distorted and will not seat properly in the socket, replace lamp.

4. POSSIBLE CAUSE: Optical & Other Sensing Devices Inoperative
CORRECTIVE ACTION:
Replace sensing device. (Check this by covering sensing device to block out light while power is applied to fixture.)

5. POSSIBLE CAUSE: Defective or Improper Wiring
CORRECTIVE ACTION:

Examine wiring to ensure it conforms with wiring diagram on the ballast label. Check primary wiring to ballast and from ballast to socket to establish circuit continuity. Check connections to see that they are secure. Check for under-sizing of wire gauge, resulting in lowered voltage. Repair circuit.

6. POSSIBLE CAUSE: Voltage at Fixture Too Low
CORRECTIVE ACTION:
Measure line voltage at input of ballast. For most types of ballasts, measured line voltage should be within 10% of label rating. With many types of distribution systems, increased loading or demand decreases available voltage at the ballast primary. Therefore, ideally, a check should be made at full load. If tapped ballast, match ballast tap connection to supply voltage measured at ballast. Increase supply voltage if feasible. Verify that lamp to remote ballast distance is acceptable.

7. POSSIBLE CAUSE: Incompatible Ballasting
CORRECTIVE ACTION:
Correct ballasting is essential for dependable HID lamp operation. Any HID lamp will perform erratically or fail to start on an incorrect ballast. Make sure that the ballast label data agrees with the line voltage and lamp used. Incorrect ballasting will generally cause a lamp to fail prematurely.

8. POSSIBLE CAUSE: Defective Shorted Ballast
CORRECTIVE ACTION:
A shorted ballast will generally cause the seals at the end of the arc tube to rupture with an indicative blackening in the seal ring area. Shorted condition may be due to shorted capacitors, shorted leads or shorted winding. Replace components as required.

9. POSSIBLE CAUSE: Improper Lamp Operating Position (Metal Halide Only)
CORRECTIVE ACTION:
The operating position should agree with the lamp specifications. A BU-HOR lamp can be operated base up, vertical to, and including the horizontal, and BD can be operated base down, vertical to, approaching, but not including the horizontal. A lamp operated beyond the specified position may not start and degrade lamp performance if it does start.

10. POSSIBLE CAUSE: Lamp Has Been Operating: Cool Down Time Insufficient (Hot Restrike)
CORRECTIVE ACTION:
When HID lamps are operating and the supply voltage is cut or interrupted, the lamps will require a period of time to cool and re-establish optimum starting conditions. Bare mercury and metal halide lamps require from four to eight minutes cool down time. High pressure sodium lamps require approximately one minute to cool before restriking. In a luminaire, restart time varies with the degree of ventilation built into it, ambient temperature, and draft conditions. The time from cool to restartable condition can realistically range up to 20 minutes for mercury and metal halide lamps in tight luminaires.

11. POSSIBLE CAUSE: High Restrike Voltage (Metal Halide Only)
CORRECTIVE ACTION:
This condition is peculiar to the metal halide lamp. It does not occur with mercury. If the supply voltage to a metal halide lamp is interrupted during the warm up period, the subsequent restrike voltage (voltage required to restart the lamp) may be higher than that required for a lamp which has been allowed to stabilize (come up to full output normally) or to cool down to normal room temperature.

12. POSSIBLE CAUSE: Improper Ballast for Lamp Operating Conditions
CORRECTIVE ACTION:

Environmental conditions such as extreme temperatures, high humidity and other factors affect ballast operation. Check lamp environmental operating conditions against published performance.

13. POSSIBLE CAUSE: End of Ballast Life
CORRECTIVE ACTION:
The appearance or condition of a ballast may give a clue to whether it is good or not. If it is charred, it may have been subjected to sustained excessive heat. Swollen capacitors indicate trouble. Check with appropriate testers, ammeter, and voltmeter. Frequently, the failure mode of a ballast is capacitor failure with consequent low power factor operation and high current. This leads to overheating of the core and coil and eventual failure.

14. POSSIBLE CAUSE: Defective Ignitor
CORRECTIVE ACTION:
Insure that the lamp is good. Disconnect the ignitor and install a specified test lamp. If the test lamp lights, the ballast is good but the ignitor is not. Replace ignitor. If the test lamp does not light, the ballast has most likely reached its end of life.

15. POSSIBLE CAUSE: Mismatched Ignitor
CORRECTIVE ACTION:
Verify that the ballast and ignitor are matched according to the specifications. Replace if necessary.

16. POSSIBLE CAUSE: Lamp Defects
CORRECTIVE ACTION:
Common defects that require the lamp to be replaced include:

- Arc tube leak
- Open welds
- Probe or cathode moly electrolysis
- Diode or switch shorted
- Quartz devitrification around rod
- Sodium leak
- Open diode

PROBLEM 2—LAMP LIFE IS REDUCED

1. POSSIBLE CAUSE: Lamp Physically Damaged
CORRECTIVE ACTION:
Investigate the possibility of outer bulb damage from handling or transportation that may have cracked glass. If air enters outer bulb, arc tube may continue to burn for 100 hours before failure. Check to see if the bulb is broken where glass meets the base due to twisting lamp too firmly into socket or scoring of glass where socket inadvertently touches the lamp bulb. Look for broken arc tube or loose metal parts. A leak in the outer bulb will cause oxidation of the metal parts inside. In high pressure sodium, the dark gettering material in the neck of the bulb near the base will turn white or disappear. Replace lamp.

2. POSSIBLE CAUSE: Wrong Ballast
CORRECTIVE ACTION:
Make sure that the ballast label agrees with the line voltage and the installed lamp. The 1,000 watt Mercury lamp, for example, is made in the H34 (High Current) and the H36 (Low Current) types with

a separate ballast available for each type. If the H34 ballast is used with the H36 lamp or vice versa, the life of the lamp will be adversely affected and can destroy the ballast. A similar situation exists with S55, S56 and S63 150 watt high pressure sodium lamps.

3. POSSIBLE CAUSE: Lamp Operating in Incorrect Position
CORRECTIVE ACTION:
Either change positioning of fixture or replace lamp with one suitable for that position.

4. POSSIBLE CAUSE: Faulty Capacitor
CORRECTIVE ACTION:
To check capacitor, disconnect and discharge it. Then, using an ohmmeter, set to the highest scale, check for faults, 1) if meter reads low resistance initially and increases, capacitor is good. 2) if meter reads low resistance initially and remains the same, the capacitor is SHORTED and should be replaced. 3) if meter reads high resistance initially and remains the same, the capacitor is OPEN and should be replaced.

PROBLEM 3— LAMP FLICKERS OR CYCLES ON AND OFF

1. POSSIBLE CAUSE: Wrong Ballast
CORRECTIVE ACTION:
With mercury lamps, improper ballasting can cause flickering or erratic operation. With metal halide lamps, the effect is generally noticed in the startup period when the lamp ignites, starts to warm up and then extinguishes (cycling). This may be caused by improper voltage/current relationships delivered by ballast. Under certain conditions new lamps may “cycle”. Usually after three tries to start at 30 to 60 second intervals lamps will stabilize and operate normally.

2. POSSIBLE CAUSE: High Lamp Operating Voltage/Low Open Circuit Ballast Voltage
CORRECTIVE ACTION:
Measure lamp operating voltage. Measure ballast open circuit voltage. Replace as required.

3. POSSIBLE CAUSE: Variable Voltage
CORRECTIVE ACTION:
Heavy motor loads or welding appliances on line can cause flickering during operation. Remove lighting circuits from the circuits serving these devices. Provide voltage regulators. Check for loose connection. Use of Constant Wattage Isolated (CWI) ballasts not Constant Wattage Auto (CWA) can frequently help this situation.

4. POSSIBLE CAUSE: HPS Cycler
CORRECTIVE ACTION:
As a high pressure sodium lamp is burned for long periods of time, its operating voltage tends to increase. When this point is reached, the lamp will exhibit cycling on and off characteristics. This is normal end of life lamp. Replace the lamp after checking ballast open circuit voltage and lamp operating voltage.

PROBLEM 4—LAMP STARTS SLOWLY (ARC DOES NOT STRIKE WHEN SWITCH IS TURNED ON.)

1. POSSIBLE CAUSE: Hard Starter
CORRECTIVE ACTION:
A hard starter is a lamp which will not start rapidly. It may glow for extended periods of time destroying cathodes. It should be replaced after checking voltage and ballast.

PROBLEM 5— FUSES BLOW OR CIRCUIT BREAKERS OPEN ON LAMP START UP

1. POSSIBLE CAUSE: Overloaded Circuit
CORRECTIVE ACTION:
Rewire to accommodate starting current of lamp/ballast combination.

2. POSSIBLE CAUSE: High Momentary Transient Current
CORRECTIVE ACTION:
Can be caused by reactor or autotransformer ballasts which draw high initial currents. Use current protective devices incorporating time delay elements. If these fail, change ballast as its characteristics will affect lamp life.

PROBLEM 6—LAMP LIGHT OUTPUT LOW

1. POSSIBLE CAUSE: Normal Light Output Depreciation Throughout Life
CORRECTIVE ACTION:
Refer to maintenance characteristics of lamp in technical publications comparing light output vs. burning time. If depreciation is within published range, replace lamp.

2. POSSIBLE CAUSE: Incorrect Voltage
CORRECTIVE ACTION:
Check ballast label to see if rating designation conforms to lamp rating description. Correct if necessary. Check line voltage at ballast and set ballast tap to voltage reading. If not tapped, check ballast voltage range against input voltage. Check wiring connections for voltage loss points. Check socket contact point. Use CWI ballast.

3. POSSIBLE CAUSE: Incorrect Ballast Output
CORRECTIVE ACTION:
Check ballast output to determine if it conforms to lamp requirements. If voltage and current do not stabilize in five to ten minutes warm-up time, ballast output is incorrect and adjustment should be made. Check capacitor wiring, if visibly available, to determine if capacitors are properly wired.

4. POSSIBLE CAUSE: Dirt Accumulation
CORRECTIVE ACTION:
Check and clean lamp and luminaire. Establish maintenance program.

5. POSSIBLE CAUSE: Faulty Capacitor
CORRECTIVE ACTION:
Check capacitor rating to specification. Measure capacitance to specification using capacitance meter. Replace capacitor if necessary.

PROBLEM 7—ARC TUBE BECOMES BLACKENED OR SWOLLEN EARLY IN LIFE
LAMP/ARC TUBE MAY SHOW SIGNS OF SCORCHING

1. POSSIBLE CAUSE: Over-wattage Operation Improper Ballasting
CORRECTIVE ACTION:
Check for possibility that lamp is operated on ballast designed for higher wattage lamp. Over-wattage operation can cause premature blackening. Check ballast label against lamp specification.

2. POSSIBLE CAUSE: Excessive Current or Shorted Capacitor(s)
CORRECTIVE ACTION:
Check voltage at ballast. Check for possibility of current or voltage surges which can damage arc Voltage tube or seals or burn up connecting ribbons inside outer tube. Check for shorted capacitors and replace ballast if shorts are found.

3. POSSIBLE CAUSE: Reflector Problem
CORRECTIVE ACTION:
Reflector design may refocus radiant energy directly on the arc tube or other parts of the lamp causing overheating. Limits for allowable voltage rise due to fixture effect are listed in High Pressure Sodium Engineering Bulletins. If this is suspected, the luminaire should be tested in a laboratory.

4. POSSIBLE CAUSE: “Glow State” Operation
CORRECTIVE ACTION:
Under certain lamp and/or ballast operating conditions, lamps will go into a partial discharge (dim glow) which will darken arc tube and cause short life. Replace lamp and check ballast.

PROBLEM 8—DIFFERENCE IN LAMP COLORS

1. POSSIBLE CAUSE: Normal Maintenance
CORRECTIVE ACTION:
In addition to the normal decrease in light output or brightness, a color shift can occur as lamps age. Spot replacement of failures with new lamps may show very noticeable differences in lamp colors. A group relamping program minimizes this problem.

2. POSSIBLE CAUSE: Wrong Lamp Color
CORRECTIVE ACTION:
Check etch on lamps which appear different to see that they are actually the same color. Replace with correct color lamp.

3. POSSIBLE CAUSE: Range of Manufacturing Tolerances
CORRECTIVE ACTION:
Due to tolerance ranges from manufacturers, slight differences in color can be corrected by grouping those of similar color.

4. POSSIBLE CAUSE: Variations in Luminaires
CORRECTIVE ACTION:
Variations in the surface or finish of the reflectors and/or lenses can introduce color differences. Interchange lamps to check on possible luminaire differences. Dirty fixtures can also create differences, emphasizing the importance of adequate maintenance.

5. POSSIBLE CAUSE: Variations in the Environment
CORRECTIVE ACTION
In common with luminaire variations, color differences in ceilings, walls, floors and furnishings as well as other sources of illumination in the area can affect the appearance of the lamp color.

6. POSSIBLE CAUSE: Faulty Capacitor
CORRECTIVE ACTION
Check capacitor rating to specification. Measure capacitance to specification, using capacitance meter. Replace capacitor if necessary