These suggestions are intended to serve as a guide in determining the possible cause of the problem and to suggest corrective maintenance procedures. If a large percentage of lamps fail to operate in a new installation, it will generally be found that operating conditions are causing the trouble. In this case, the entire electrical installation should be checked thoroughly. Because high voltages are common in HID lighting systems, it is recommended that only qualified personnel attempt to make electrical measurements or take corrective measures and that they use reasonable caution in doing so.

Lamps
(Normal End of Life)
1. Mercury and Metal Halide lamps at end of life tend to emit low light output along with intermittent starting. There will be some blackening on the ends of the arc tube and some erosion of the electrode tips.
2. High Pressure Sodium lamps tend to cycle off and on at the end of life. This is a result of the lamp requiring more voltage from the ballast to stabilize and operate than the ballast can provide, thus the lamps cycle off and on. At this point the HPS lamp could have blackening on the ends of the arc tubes and possibly a brownish color on the outer envelope which is sodium deposits.
3. Low Pressure Sodium lamps retain their light output at end of life; however, starting becomes intermittent, then impossible. There will be some blackening on the end of the arc tube.

(Lamps Will Not Start)
1. Check lamp—possible wrong wattage or voltage lamp installed. Verify lamp source and wattage are being installed in conjunction with information on ballast nameplate.
2. Verify that lamp is properly seated in socket and retighten if necessary. **Caution**: Tightening too much may cause lamp to break.
3. Check voltage supply—incoming voltage for reactor and high reactance ballast should be with 5% and all others should be within 5% of designated voltage.
4. Replace with a known good lamp.

(Lamps Cycle)
1. This could be caused by normal end of life with High Pressure Sodium lamps. Replace lamp.
2. Verify proper wattage and voltage of the lamp being installed.
3. Heavy motor loads could be the problem. It is always advisable to remove lighting circuits from those circuits servicing heavy and/or pulsing loads. Heavy motor loads can consume so much power that the lamp will not have enough voltage to sustain its operation.
4. If this is an outdoor application equipped with a photocell, there may be a defective photocell. Replace the photocell with a shorting cap, if the lamp remains on, the photocell is defective. If the lamp still cycles, the lamp is probably defective or the wrong lamp/ ballast combination has been used.

Low Light Output
1. Check voltage supply.
2. If unit is equipped with a multi-tap ballast, verify the electrical connection is on the proper voltage tap.
3. Check for loose electrical connection on capacitors. Verify capacitor is wiring properly within the circuit.
4. Incorrect or defective capacitor—replace capacitor.

Visual Inspections
Before any components are checked internally in the fixture, make a visual inspection of the lamp, electrical system and components.

(Lamps–Check for:)
1. Cracks in the outer envelope and broken arc tubes.
2. Cracks or seal leakage where envelope meets base.
3. Blackening at ends of arc tubes.
4. Leaker (sodium deposits inside envelope).
5. Correct light source and wattage used in conjunction with proper ballast.
6. Correct orientation of Lamp Base Up (BU) or Base Down (BD).

(Electrical System Check)
1. Check ballast for insulation or coil damage.
2. Check leads for loose connection, disconnected or pinched wires.
3. Check multi-tap ballast to make sure incoming line voltage is on proper tap of ballast. (120V to 120V tap, etc.)
4. Swollen top or rupture in capacitor.
5. Check to see that capacitor rating agrees with capacitor rating on ballast label.

(Ignitor)
(For High Pressure Sodium and low wattage Metal Halide only. This component is used as a starting aid only.)

Note: Never attempt to measure the voltage pulse of the ignitor (2500 volts). Attempting to measure this could destroy your measuring instrument.

1. Check fixture with a known operating lamp. If lamp starts the ignitor is good.
2. Install a known operating ignitor. If the lamp starts the original ignitor was bad or miswired. If the lamp fails to start, check the ignitor accordingly:

   a. For 35 watt thru 150 watt HPS with a 55 volt lamp, insert a 120 volt incandescent lamp in the socket. If the lamp burns, the ignitor should be replaced.
   b. For 150 watt thru 400 watt HPS with a 100 volt lamp, place a mercury lamp of comparable wattage in the fixture. If the lamp burns, the ignitor should be replaced.
   c. For 1000 watt HPS check the ignitor by replacing the original ignitor with a known operating ignitor.

(Capacitor)
1. Disconnect capacitor from circuit.
2. The capacitor should be discharged by shorting between the terminals.
3. Set the ohmmeter to the highest resistance scale and check the capacitor. There should be one of three results:
   a. If a low resistance is measured on the ohmmeter and gradually increases, the capacitor is operable.
   b. If a high resistance is measured on the ohmmeter and does not decrease, the capacitor is open and should be replaced.
   c. If a low resistance is measured on the ohmmeter and does not increase, the capacitor is shorted and should be replaced.

(Ballast)
Check ballast assembly for burned components. Check for loose electrical connections. If the ballast has problems, it is possible that one of the following could be the problem.

1. If the system is an older system, it could be normal end of life for the ballast.
2. Check lamp source and wattage to make sure it corresponds with ballast label ratings. If the light source and wattage are mismatched with the ballast, it can lead to premature end of life for the ballast.
3. If the ballast is located in an extremely high ambient temperature, it can overheat the ballast.
4. It is possible that a voltage surge damaged the ballast.
5. A shorted or open capacitor can damage the ballast. Also, check the capacitor rating on the ballast label with the capacitor to insure that the two match.
6. The ballast can become inoperative when the capacitor is wired wrong or if the wiring is shorting against the housing.

To determine if ballast is supplying proper starting voltage to the lamp the open circuit voltage must be verified. See table below for proper measurements per lamp source and wattage.

ANSI Lamp Wattage	Wattage	Open Circuit Voltage (Approximate)
Mercury		
H38	100W	225
H39	175W	225
H37	250W	225
H33	400W	225
H36	1000W	375
Metal Halide		
M98	70W	230
M90	100W	275
M102	150W	275
M57	175W	300
M58	250W	280
M59	400W	300
M47	1000W	400
M48	1500W	420
High Pressure Sodium		
S62	70W	110
S54	100W	110
S55	150W	110
S56	150W	190
S66	200W	190
S50	250W	190
S67	310W	190
S51	400W	190
S52	1000W	400

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