

Please read and save these instructions. Read carefully before attempting to assemble, install, operate or maintain the product described. Protect yourself and others by observing all safety information. Failure to comply with instructions could result in personal injury and/or property damage! Retain instructions for future reference.



Generators

Description

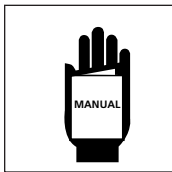
These generators are powered by air-cooled four cycle engines and designed to run at maximum RPM and give a continuous wattage as rated. On certain models, a low-oil level shutoff is provided to protect the engine. This feature is usually associated with extended run models.

Unpacking

When unpacking, inspect carefully for any damage that may have occurred during transit. Make sure any loose fittings, bolts, etc., are tightened before putting unit into service.

General Safety

1. Before starting or servicing any generator, read and understand all instructions. Failure to follow safety precautions or instructions can cause equipment damage and or serious personal injury. Engine instructions for these units are contained in a separate manual. Retain all manuals for future reference.

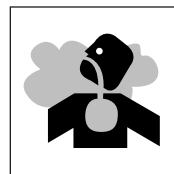


2. Never use this generator for any application other than that specified by the manufacturer. Never operate this generator under conditions not approved by the manufacturer. Never attempt to modify this generator to perform in any manner not intended by the manufacturer.
3. For maintenance and repairs, use only products and parts recommended by the manufacturer.

4. Be sure that the generator is properly grounded to an external ground path prior to operation. Refer to the section entitled "Grounding Instructions" for proper grounding procedures.
5. Be sure that the generator is operated only by persons who have read and understand these instructions.
6. Be sure that the generator is placed on a flat level surface prior to and during operation. The generator must not slide or shift during operation.
7. Keep all persons away from the generator during operation.
8. Do not allow persons wearing loose clothing or jewelry to start or operate the generator. Loose clothing or jewelry may become entangled in moving components, causing equipment damage and or personal injury.
9. Keep all persons away from parts that move or become hot during operation.
10. Be sure all powered devices are shut off prior to connecting them to the generator.
11. Keep the generator clean and well maintained at all times.

▲ WARNING

Never operate this generator in an explosive atmosphere or poorly ventilated area.



12. Be sure that all tools and appliances are in good repair and are properly grounded. Use devices that have three prong power cords. If an

extension cord is used, be sure that it has three prongs for proper grounding.

▲ WARNING *Do not operate this generator on wet surfaces or in the rain.*

13. Never operate the generator with damaged, broken or missing parts, or with any guarding components removed.

▲ DANGER *Shut off the generator engine and disconnect the spark plug wire before performing any service or maintenance to the unit.*

14. Use only unleaded fuel. Do not refill the fuel tank while the engine is running. Use precautions to prevent fuel spillage during refills. Be sure the fuel tank cap is securely in place before starting the engine. Clean up any spilled fuel before starting the engine. Allow engine to cool for at least two minutes before refueling.
15. This generator may be used for emergency stand-by service. In such cases, a manual transfer switch must be installed between the electric utilities meter and the electrical distribution box. This switch should be installed by a licensed electrician.

▲ CAUTION *Never mix oil with gasoline for this engine. This is a four cycle engine designed to run on pure gasoline. Oil is used for engine lubrication purposes only.*

Operation

PRE-OPERATION

1. Check engine oil level. Oil is NOT mixed with the gasoline, however adequate oil supply is necessary for proper engine lubrication. Refer to the Engine Manual for SAE, API and fill quantity specifications.

- Use of a Ground Fault Interrupter (GFI) is strongly recommended. Ground Fault Interrupters can significantly reduce the possibility of injury if an electrical short occurs. In order to install a GFI, the generator neutral wire must be internally grounded to the generator frame, and the frame must be properly grounded to the earth.

⚠ WARNING *A Ground Fault Interrupter may not be effective if used on a generator that is not grounded! Refer to the section entitled Grounding for proper steps to ground the generator.*

- When installing a GFI, be sure to follow all national and local regulations. If not sure of regulations or procedures, obtain assistance from a qualified (licensed or certified) electrical technician.

GROUNDING

- Use the ground terminal and wing nut on the generator frame to connect the unit to a suitable ground source. Securely fasten the end terminal of the ground wire to the ground terminal on the generator frame. Tighten the washer and wing nut on top of the ground wire end terminal.
- The ground wire should be made of #8 gauge wire. Do not use wire with a higher gauge number. Higher gauge numbers indicate thinner wire, which may not provide an adequate ground path.
- The other end of the ground wire must be securely fastened to an approved ground source.

The following are ground sources approved by the National Electric Code. Other ground sources may be acceptable. Refer to the National Electric Code and local regulations for further ground source information. If not sure of regulations or procedures, obtain assistance from a qualified (licensed or certified) electrical technician.

EXTENSION CORDS							
MAXIMUM RECOMMENDED LENGTHS (IN FEET)							
Amps	Watts 120 V	Watts 240 V	#8 Wire	#10 Wire	#12 Wire	#14 Wire	#16 Wire
2.5	300	600		1000	600	375	250
5	600	1200		500	300	200	125
7.5	900	1800		350	200	125	100
10	1200	2400		250	150	100	50
15	1800	3600		150	100	65	
20	2400	4800	175	125	75	50	
25	3000	6000	150	100	60		
30	3600	7200	125	65			
40	4800	9600	90				

- An underground water pipe at least ten feet in length
- A non-corrosive underground pipe at least eight feet in length and 3/4 inch diameter
- A steel or iron underground rod at least eight feet in length and 5/8 inch diameter
- A non-ferrous rod at least eight feet in length, 1/2 inch in diameter, and approved for grounding purposes

Any rod or pipe used for grounding must be driven to eight feet deep or buried in the deepest possible trench.

STARTING

- Remove all electrical loads from the generator.
- Rotate fuel shut-off valve counter clockwise to enable fuel flow.
- Rotate the engine switch to the ON position.
- Adjust the choke lever as follows:
 - For cold engine, move the choke lever as far as possible to the left, choke fully ON, position.
 - For warm/hot engine, move the choke lever midway between the choke and run positions.
- Pull the starter rope with a brisk, smooth motion.

NOTE: Some models may be equipped with an electric starter. For models equipped with an electric starter, press the start button.

- After each start up, allow the engine to run for 2-3 minutes with no load.
- As the engine warms up and stabilizes, adjust the choke lever to the right, until the lever is positioned at the RUN label.

⚠ CAUTION *Engine speed is preset to provide proper output voltage. Never attempt to modify or adjust engine speed or output voltage.*

ENGINE BREAK-IN

After initial start-up, the engine should be broken in according to the manufacturer's instructions. Refer to the engine manual for the proper break-in procedure.

GENERATOR SHUT OFF

- Shut off and remove all electrical load devices from the generator.
- Allow the engine to run for 2-3 minutes with no electrical loads.
- Rotate the engine switch to the OFF position.
- Verify that the generator has completely stopped.
- Close the fuel supply valve.
- Allow the unit to cool before installing any covers.

LOAD DEVICES

1. All load devices and extension cords should use three prong terminals. Refer to the following chart for extension cord and cable size requirements.
2. Allow the engine to run for 2-3 minutes before applying any electrical loads.
3. The **120 volt receptacles** are rated for 15 amps and may be used in any combination of 120 volt loads and also with 240 volt loads through the 240 volt receptacles. The **240 volt receptacles** are rated for 20 amps and may be used in any combination of 240 volt loads and also with 120 volt loads through the 120 volt receptacles. The **120/240 volt twist lock receptacle**, found on some units, is rated for 20 amps and may be used in any combination of 120 volt and 240 volt loads.
4. Individual receptacles should not be loaded beyond the amperage rating.
5. Total combined load through any combination of receptacle must not exceed the rated load limits of the generator. Refer to the identification plate on the generator for amp and wattage specifications.
6. Always shut off and remove loads before starting or shutting off the generator engine.
7. When plugging multiple electrical load devices into the generator receptacles, be sure to connect and activate the highest power draw item first. Allow the generator engine to stabilize, then connect and activate the next highest power draw device. The smallest power draw device should be connected to the receptacle and activated last.

NOTE: Power draw can be calculated by multiplying volts and amps. The resulting number is wattage. Never exceed the posted maximum wattage for the generator or any individual receptacle. Refer to owner's manuals and product tags to determine the wattage of all electrical load devices.

ESTIMATED POWER USAGE (WATTS)

Load Device	Watts	Load Device	Watts
Air conditioner	2000-3000	Radio	50-200
Automatic washer	150-1500	Refrigerator	190-2000
Brooder	100+	Skillet	1200
Clothes dryer	5000-10,000	Space heater	600-4800
Coffee maker	400-700	Sump pump	400-3000
Electric drill (small)	225-1000	Television	200-500
Electric drill (large)	500-1000	Toaster	900-1700
Fan	40-200	Vacuum cleaner	200-300
Freezer	300-500	Water pump	1000-3000
Hot plate	330-1100	Water heater	1000-5000
Iron	500-1500	Small hand saw	1000-2000
Light bulb	As Rated	Large hand saw	1500-2500

If actual watt ratings are not available, the following chart may be used as a general guideline.

Remember that devices which generate heat during operation such as heaters, incandescent light bulbs, motors and hair dryers have a higher power draw than devices which generate little heat during operation such as florescent bulbs, radios, and clocks.

Long power cords and extension cords also draw additional power. Keep cords at minimum possible length.

Refer to the chart provided for maximum limits for lengths of extension cords.

8. Circuit protection is provided by a circuit breaker. The circuit breaker opens when the generator load exceeds its maximum capacity or a short circuit occurs. If the circuit breaker opens, perform the following procedures to correct the problem:
 - a. Shut off and disconnect all electrical loads.
 - b. Attempt to determine the cause of the electrical problem - overloading or short circuit.
 - c. Do not use any devices that have short circuits. Avoid overloading the generator.
 - d. Press the circuit breaker pushbutton to reset the circuit breaker.

CAUTION *Repeated cycling of the circuit breaker indicates a problem and may cause damage to the generator or load devices. Do not operate the generator if repeated cycling of the circuit breaker occurs.*

LOW OIL SHUTDOWN

A low oil shutdown switch is provided to protect the engine and generator on most extended run models. When engine oil level drops too low for proper engine operation, the low oil shutdown switch causes the engine to shut off. If oil level is low when attempting to start the generator engine, the low oil level shutdown switch prevents the engine from starting. If engine does not start, check oil level.

NOTE: It is important to keep the generator unit on a level surface. The oil level shutdown switch can prevent the engine from starting even if oil level is sufficient, when the generator unit is placed on an uneven surface.

Installation for Stand-by Use

Precautions must be taken to prevent electrical back feeding into utility systems. This requires isolation of the electrical system. To isolate the electrical system, perform the following procedures:

1. Turn off the main electrical system switch prior to connecting the generator.

2. In accordance with national and local standards, a double throw transfer switch must be installed in the system.

⚠ WARNING *Always shut off main power prior to temporary connection of the generator to a building electrical system.*

⚠ WARNING *Installation of the generator as a backup electrical source must be performed by a qualified (licensed or certified) electrical technician.*

Maintenance

INFREQUENT USAGE

If the generator is used infrequently, starting difficulty may occur. To help prevent difficulty starting, the generator should be run for approximately 30 minutes per week.

STORAGE

If the generator is not to be used for extended periods of time, the

following prestorage procedures should be performed:

1. Make sure engine oil is filled to the proper level.
2. Drain all fuel from the tank, lines, carburetor and fuel valve.
3. Remove the spark plug, and pour approximately one teaspoon of oil into the spark plug hole.
4. Pull the starter cord several times to spread the oil throughout the cylinder.
5. Slowly pull the starter cord, until resistance is felt. This indicates that the piston is moving upward on the compression cycle, and the intake and exhaust valves are closed. (The piston pushes a small amount of air from the spark plug hole on compression.)
6. Use of anti-gumming agents in the fuel system can help prevent the build up of gum and varnish.

Whenever the generator is stored, be sure that the fuel shut-off valve is in the closed position.

Refer to the engine manual that accompanies this unit for instructions regarding maintenance of engine components.

⚠ WARNING *Never tamper with engine speed settings or generator frequency settings. Any governor adjustments should be made by qualified personnel only.*

Limited Warranty

1. **DURATION:** One year from the date of purchase by the original purchaser. Units used for rental or commercial purposes are warranted for 90 days from date of purchase.

2. **WHO GIVES THIS WARRANTY (WARRANTOR):**

The Campbell Group / A Scott Fetzer Company
100 Production Drive
Harrison, Ohio, 45030
Telephone: (513) 367-4811.

3. **WHO RECEIVES THIS WARRANTY (PURCHASER):** The original purchaser (other than for purposes of resale) of the Campbell Hausfeld product.

4. **WHAT PRODUCTS ARE COVERED BY THIS WARRANTY:** Any Campbell Hausfeld portable generator supplied or manufactured by Warrantor.

5. **WHAT IS COVERED UNDER THIS WARRANTY:** Defects on material and workmanship which occur within the duration of the warranty period.

6. **WHAT IS NOT COVERED UNDER THIS WARRANTY:**

A. Implied warranties, including those of merchantability and FITNESS FOR A PARTICULAR PURPOSE ARE LIMITED TO ONE YEAR FROM THE DATE OF ORIGINAL PURCHASE. Some states do not allow limitations on how long an implied warranty lasts, so the above limitations may not apply to you.

B. ANY INCIDENTAL, INDIRECT, OR CONSEQUENTIAL LOSS, DAMAGE, OR EXPENSE THAT MAY RESULT FROM ANY DEFECT, FAILURE, OR MALFUNCTION OF THE CAMPBELL HAUSFELD PRODUCT. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

C. Any failure that results from an accident, purchaser's abuse, neglect or failure to operate products in accordance with instructions provided in the owner's manual(s) supplied with product.

D. Pre-delivery service, i.e. assembly, oil or lubricants, and adjustment.

E. Normal adjustments which are explained in the owner's manual(s) provided with the product, i.e. belts, pressure switch.

F. Items or service that are normally required to maintain the product, i.e. lubricants, filters and gaskets.

G. Electric motor and gasoline engine components are expressly excluded from coverage under this limited warranty. Such components should be returned by the purchaser to the original manufacturer or to its authorized repair stations for service.

7. **RESPONSIBILITIES OF WARRANTOR UNDER THIS WARRANTY:** Repair or replace, at Warrantor's option, products or components which have failed within duration of the warranty period.

8. **RESPONSIBILITIES OF PURCHASER UNDER THIS WARRANTY:**

A. Deliver or ship the Campbell Hausfeld product or component to the nearest Campbell Hausfeld Authorized Service Center. Freight costs, if any, must be borne by the purchaser.

B. Use reasonable care in the operation and maintenance of the products as described in the owner's manual(s).

9. **WHEN WARRANTOR WILL PERFORM REPAIR OR REPLACEMENT UNDER THIS WARRANTY:**

A. Repair or replacement will be scheduled and serviced according to the normal work flow at the servicing location, and depending on the availability of replacement parts.

B. If the purchaser does not receive satisfactory results from the Authorized Service Center, the purchaser should contact the Campbell Hausfeld Product Service Department (see paragraph 2).

This Limited Warranty gives you specific legal rights and you may also have other rights which vary from state to state.

Troubleshooting Chart

Symptom	Possible Cause(s)	Corrective Action
Alternator field is not energized	<ol style="list-style-type: none"> 1. Engine speed is too slow 2. Open, shorted, or incorrect wiring 3. Faulty capacitor 4. Open or shorted field windings 5. Open diodes 	<ol style="list-style-type: none"> 1. Adjust engine speed * 2. Referring to the wiring diagram, clean and reconnect all wiring * 3. Replace capacitor * 4. Test winding resistance, replace field winding if necessary * 5. Test diodes, replace if necessary *
Low output voltage with no load	<ol style="list-style-type: none"> 1. Engine speed is too slow 2. Open diodes 3. Faulty capacitor 4. Open or shorted field windings 	<ol style="list-style-type: none"> 1. Adjust engine speed * 2. Test diodes, replace if necessary * 3. Replace capacitor * 4. Test winding resistance, replace field winding if necessary *
High output voltage with no load	<ol style="list-style-type: none"> 1. Faulty capacitor 2. Engine speed is too fast 	<ol style="list-style-type: none"> 1. Replace capacitor * 2. Adjust engine speed *
Low output voltage under load	<ol style="list-style-type: none"> 1. Open diode 2. Engine speed too slow at full load 3. Excessive load applied 	<ol style="list-style-type: none"> 1. Test diodes, replace if necessary * 2. Adjust engine speed * 3. Reduce the applied load
Erratic output voltage	<ol style="list-style-type: none"> 1. Unbalanced engine 2. Dirty, corroded, or loose wiring connection 3. Unstable load applied 	<ol style="list-style-type: none"> 1. Refer to engine manual 2. Referring to the wiring diagram, clean and reconnect all wiring * 3. Remove all loads, then apply each one individually to determine which one is causing erratic function
Noisy operation	<ol style="list-style-type: none"> 1. Loose generator or engine bolt 2. Short circuit in generator field or load 3. Faulty bearing 	<ol style="list-style-type: none"> 1. Tighten all mountings 2. Test winding resistance, replace field winding if necessary * Test load devices for shorts. Replace defective load device. 3. Replace bearing

* These diagnostic and repair procedures should be performed by an authorized service center.

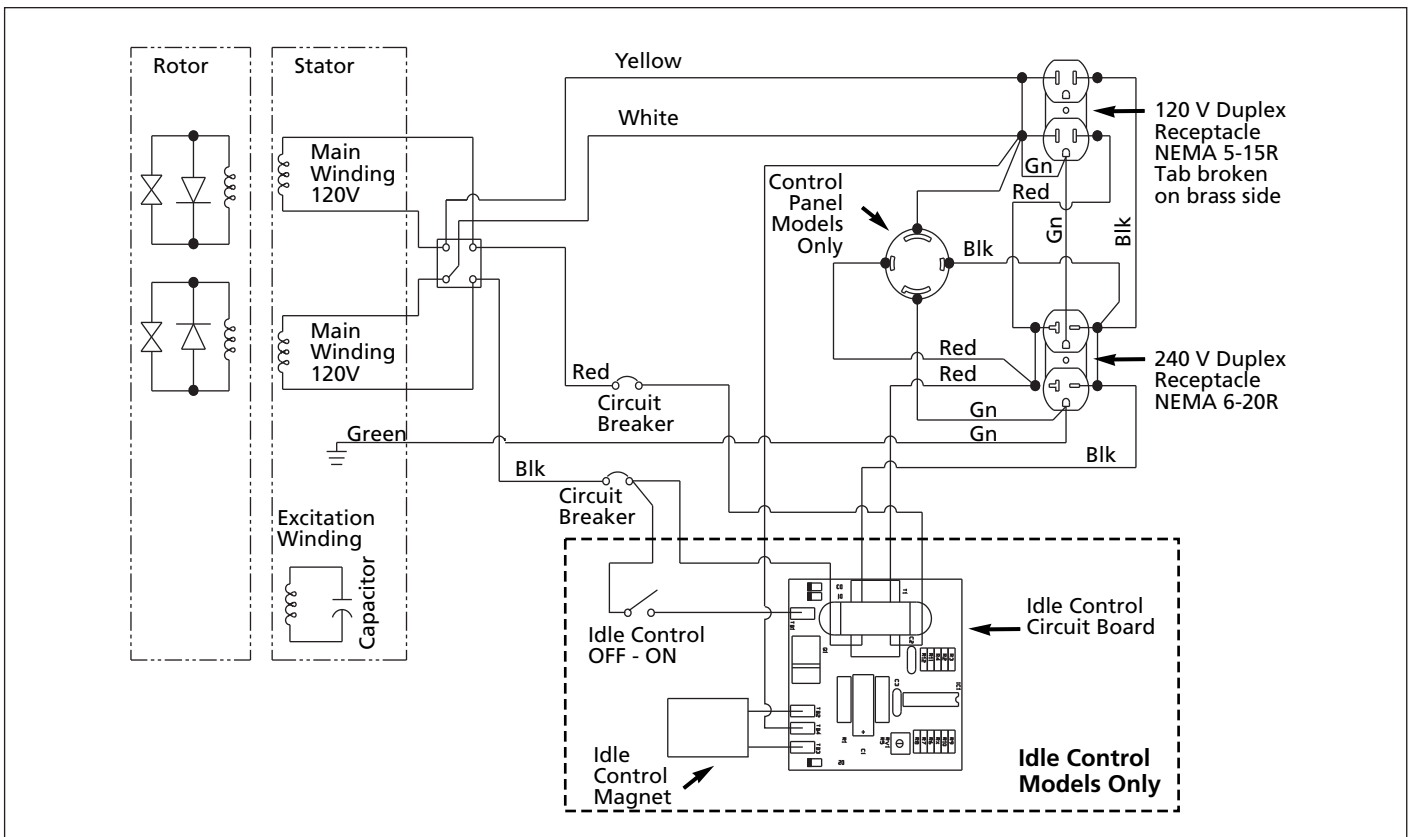


Figure 1 - Generator Wiring Diagram For Dual Voltage Models

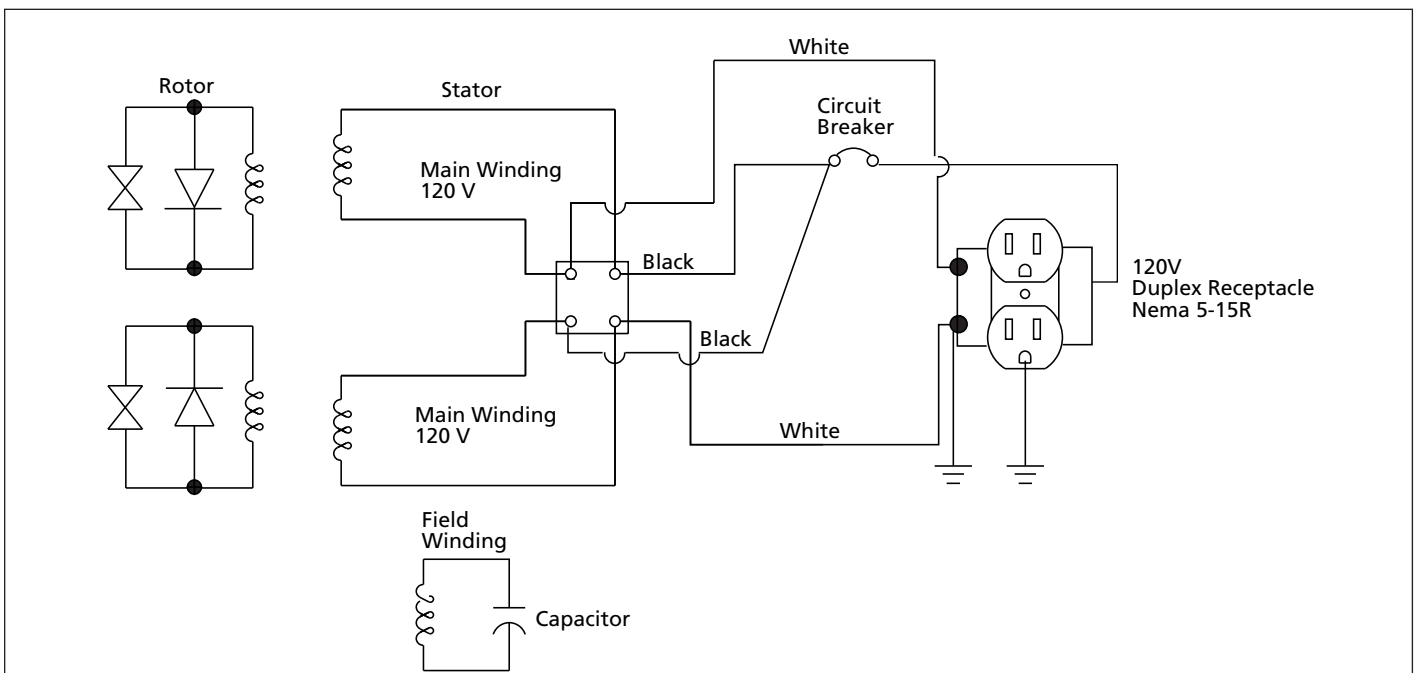


Figure 2 - Generator Wiring Diagram For Single Voltage Models

TESTING GENERATOR DIODES

The following method eliminates the need to disconnect the diodes from the generator wiring.

1. Use a 12 Volt battery and automotive lamp (Type 5001) to test the diodes in the generator.
2. Connect the battery and lamp as shown in Figure 3.
3. If the diodes are operating properly, the lamp illuminates brightly when the battery polarity is correct, and goes dim when battery polarity is reversed.
4. If there is no change in lamp brightness when polarity is reversed, the diodes must be replaced.

CAUTION For testing of rotor, stator, or field windings, consult an authorized service center.

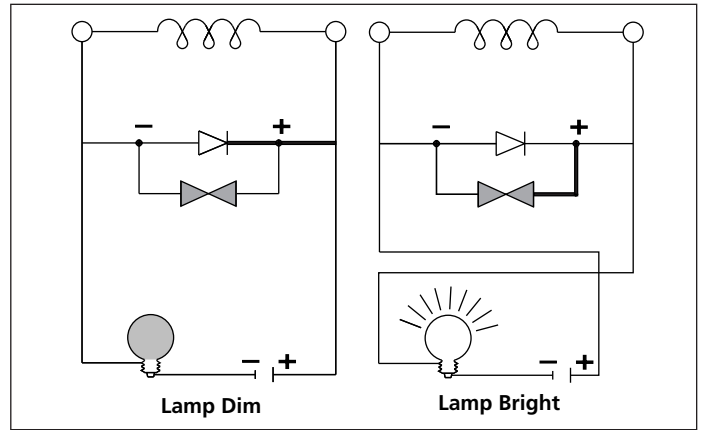


Figure 3 - Diode Test Procedure

