



Onan Corporation
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Minneapolis MN 55432
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Installation/Operator's Manual

901-0600 4-87

Opus 15, 35, and 45 Base Unit Converters

DESCRIPTION

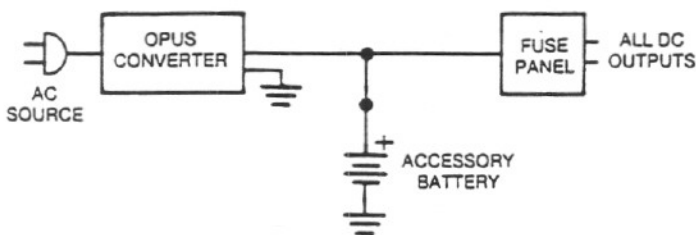
The Opus™ 15, 35, and 45 solid state converters convert 120 VAC to 12.5 VDC. Opus converters are designed to operate in a battery float electrical system or without a battery. In a battery float system (Figure 1), the battery is connected in parallel with the converter. The battery is charged by the converter and serves as a standby to assist in handling peak loads.

Opus base unit converters are intended for use in recreational vehicles. They are **not** intended to be used in marine applications.

The Opus 15 has a rated output of 15 amperes and is convection cooled. The Opus 35 and 45 converters have rated outputs of 35 and 45 amperes, respectively, and are cooled by forced air from an integral fan, which operates only during high-load conditions.

Opus converters are protected by self-resetting over-temperature cutout devices.

Opus converters are UL listed and CSA approved.



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FIGURE 1. BATTERY FLOAT SYSTEM

INSTALLATION

Mounting

The Opus converter is flush mounted from the base with four screws. The Opus 35 and 45 converters can be mounted in any position—including vertically on a wall or upside down on a ceiling. The Opus 15 can be mounted in any position other than upside down.

Mount the converter on a low-vibration surface and in a ventilated area.

⚠ WARNING *Ignition of explosive battery gases or other flammable materials can cause severe personal injury or death. Do not install the converter in compartments that contain batteries or flammable materials.*

⚠ CAUTION *Spilled beverages or dirt and moisture from the outdoors could damage or destroy the converter. Mount the converter where it will not be exposed to these hazards.*

See Figure 2 for dimensions.

Wiring

⚠ WARNING *Voltages and currents within the electrical system present a shock hazard that can result in severe personal injury or death. Wiring must be performed only by technically qualified personnel. Perform the wiring steps in the order given and take special care to avoid shorting the DC output or contacting the AC line.*

Perform wiring in accordance with applicable electrical codes.

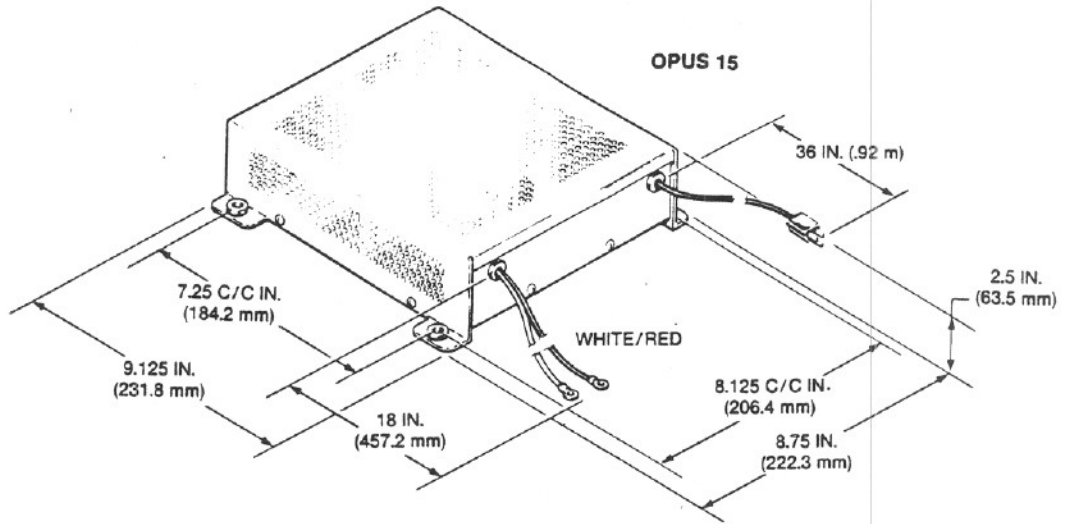
1. Disconnect the battery.

⚠ WARNING *Ignition of explosive battery gases can cause severe personal injury. Do not smoke while servicing batteries.*

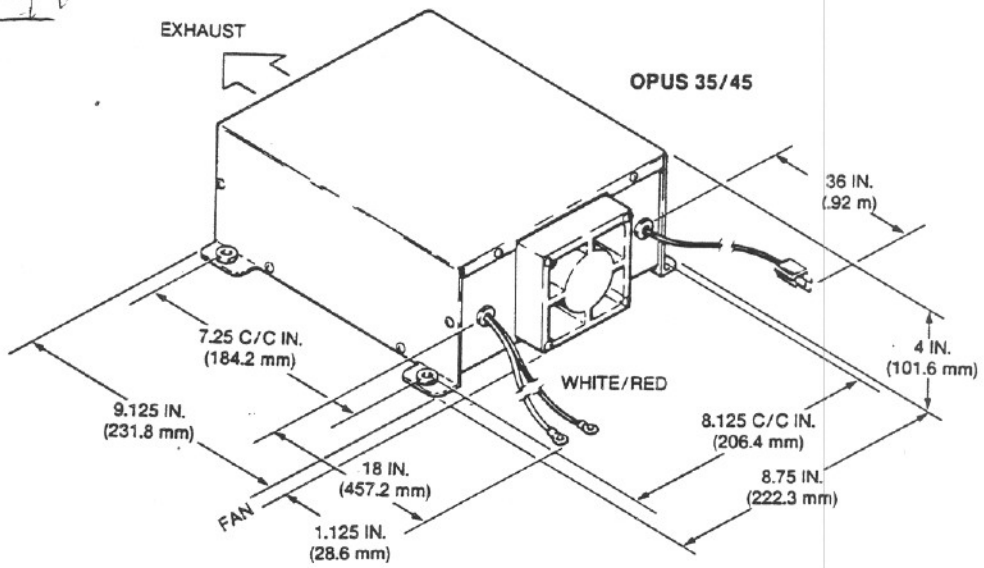
2. Connect the positive (red) DC output connector to the DC fuse panel. Connect the negative (white) DC connector to DC ground.
3. Connect the battery to the DC system.

⚠ CAUTION *Improper (reverse) connection of the battery to the electrical system will damage the converter. Observe correct polarity when making battery connections.*

4. Connect the chassis grounding lug on the converter to the vehicle ground. Use 8 gauge (AWG) stranded wire.
5. Plug the three-conductor AC plug into a protected (15 amp) AC outlet.



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ES-1694

NOTES:

1. All mounting holes are sized for #10 hardware.

FIGURE 2. MOUNTING DIMENSIONS

mechanical

Height	2.5 in. (63.5 mm)	4.0 in. (101.6 mm)
Width	8.75 in. (222.3 mm)	8.75 in. (222.3 mm)
Depth	9.125 in. (231.8 mm)	10.25 in. (260.4 mm)
Weight	4.5 lbs. (2.0 kg)	8 lbs. (3.6 kg)
Input Connector	3-conductor, 16 ga. AWG, 3 ft. (0.92 m) AC power cord	
Output Connectors	2 leads; 18 in. (457.2 mm) red: DC+, white: DC- Opus 15: 12 ga., Opus 35: 10 ga., Opus 45: 8 ga. AWG	

Electrical

AC Input Voltage	120 VAC
Input Frequency	60 Hz
DC Output Voltage	14.3 VDC \pm 2% @ 0.5 amps; 12.5 VDC \pm 3% @ rated output (Voltage at 0 amps will not exceed 22 VDC.)
Rated Output Current (Continuous)	Opus 15: 15 amps, Opus 35: 35 amps, Opus 45: 45 amps
Current Limit	Opus 15: 18 amps, Opus 35: 44 amps, Opus 45: 54 amps
Output Ripple	0.5 V pk-to-pk (47 Hz to 200 kHz)

WARNING electrical system present a shock hazard that could result in severe personal injury or death. Service must be performed only by technically qualified personnel.

On 35 and 45 amp converters, fan operation is governed by temperature. Fan operation does not necessarily indicate that there is a DC output, and cannot be used as a troubleshooting indicator.

WARNING Ignition of explosive battery gases can cause severe personal injury. To prevent electrical arcing at the battery, disconnect AC power before servicing batteries. Do not smoke while servicing batteries.

TROUBLESHOOTING

TROUBLE	POSSIBLE CAUSE	CORRECTIVE ACTION
No DC output (with or without a battery).	1. Blown DC fuse(s).	1. Correct possible overload and replace fuse(s).
No DC output (without battery).	1. No AC input. 2. Faulty converter.	1a. Plug in converter. 1b. Reset open AC circuit breakers. 1c. Restore utility or generator service. 2. Replace converter.
DC output drops out and automatically returns (without battery).	1. Thermal overload. 2. Faulty converter.	1. Check for and provide adequate cooling ventilation. 2. Replace converter.
Low DC output.	1. Faulty battery. 2. Faulty converter.	1. Replace battery. 2. Replace converter.

THERE IS NO OTHER EXPRESS WARRANTY.

IMPLIED WARRANTIES INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED TO PERIODS OF WARRANTY SET FORTH BELOW AND TO THE EXTENT PERMITTED BY LAW, ANY AND ALL IMPLIED WARRANTIES ARE EXCLUDED.

IN NO EVENT IS ONAN LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.

Note: Some states do not allow limitations on how long an implied warranty lasts, so the above limitations may not apply in every instance.

- (1) Onan warrants for the periods set forth below that goods manufactured or supplied by it will be free from defects in workmanship and material, provided such goods are installed, operated, and maintained in accordance with Onan's written instructions, and further provided, that installation inspection and initial start-up on commercial-industrial generator set or power system installations are conducted by an Onan Authorized Distributor or its designated representative.

CONSUMER PRODUCTS

- A. Goods used in PERSONAL, FAMILY and HOUSEHOLD applications are warranted for a period of one (1) year from date of purchase with the following exceptions:
- i. Goods designed for and used in a recreational vehicle and the Onan converter are warranted for a period of two (2) years from date of purchase.
 - ii. Goods designed for and used in Marine applications are warranted for a period of five (5) years or 2,000 hours, whichever occurs first, from date of purchase. Parts, labor, limited travel and removal and reinstallation are covered for the first year. Parts and labor are covered the second year or 2,000 hours and parts and labor on selected powertrain and generator parts for the remaining years or 2,000 hours. See your Onan distributor for details.
 - iii.* Residential standby power systems which are installed in the U.S. (must include Onan supplied generator sets, automatic transfer switch, exerciser and running time meter) are warranted for a period of five (5) years from date of initial start-up IF the system is registered with the Onan distributor. See your Onan distributor for details.

COMMERCIAL-INDUSTRIAL PRODUCTS

- B. Goods used in COMMERCIAL-INDUSTRIAL applications are warranted for a period of one (1) year from date of purchase with the following exceptions:
- i. Commercial-industrial stationary generator sets are warranted for a period of one (1) year from date of initial start-up.
 - ii. Rental and demonstrator units are warranted for a period of one (1) year from date of first rental or demonstration.
 - iii. Industrial Floodlighter generator sets are warranted for a period of two (2) years or 2,000 hours, whichever occurs first.
 - iv.* Commercial-industrial standby power systems which are installed in the U.S. (must include Onan supplied generator sets, automatic transfer switch, exerciser and running time meter) are warranted for a period of five (5) years from date of initial start-up IF the system is registered with the Onan distributor. See your Onan distributor for details.
- C. REPLACEMENT PARTS are warranted for a period of ninety (90) days and exclude labor charges.
2. Onan's sole liability and Owner's sole remedy for a failure of goods under this warranty and for any and all other claims arising out of the purchase and use of the goods, including negligence on the part of the manufacturer, shall be limited to the repair of the product by the repair or replacement, at Onan's factory at 1400 73rd Avenue NE, Minneapolis, Minnesota 55432, or to an Onan Authorized Distributor or its designated service representative, transportation prepaid.

Except as indicated below, this warranty does not include adjustments, travel time, mileage or labor for removal of Onan product from its application and reinstallation.

A. Adjustments

Onan will pay for minor external adjustments on consumer products for a period of ninety (90) days from date of purchase, provided such warranty labor is performed by an Onan Authorized Distributor or its designated service representative. Consumer products are those products used in personal, family and household applications. This includes Marine and Recreational Vehicle generators.

B. Removal and Reinstallation

Onan will pay the following stated labor at straight time only for warranty work requiring removal and reinstallation of Onan Products in the following applications, provided, such warranty labor is performed by an Onan Authorized Distributor or its designated service representative:

- i. On-Highway Recreational and Commercial Vehicle Applications - Up to a maximum of two (2) hours.
- ii. Marine product installations - for the first year - Up to a maximum of four (4) hours for all single and two cylinder engine powered Marine Generator Sets installed below-deck.
—Up to eight (8) hours for all, three, four and six cylinder engine powered Marine Generator Sets installed below-deck.

*Must be registered within thirty (30) days of initial start-up on Form No. 23-065, to be provided and completed by seller.

Onan Authorized Distributor or its designated service representative.

- ii. Industrial Floodlighter Generator Sets - Onan will for twelve (12) months after date of purchase, pay travel time up to two and one half (2.5) hours and mileage cost up to one hundred (100) miles for related warranty repairs, provided, such travel and repairs are performed by an Onan Authorized Distributor or its designated service representative.
- iii. Commercial-industrial Standby Generator Set, System Installations, and Residential Standby Systems - Provided the generator set or system is permanently wired in a stationary installation, Onan will for twelve (12) months after initial start-up, pay travel time up to two and one half (2.5) hours and mileage cost up to one hundred (100) miles on generator sets with kilowatt (kW) rating of seventeen and one half (17.5) or less, and up to six and one half (6.5) hours and mileage cost up to two hundred fifty (250) miles on generator sets with a kilowatt (kW) rating above seventeen and one half (17.5) and for transfer switches used with industrial standby generator set and system installations, for warranty repairs performed by an Onan Authorized Distributor or its designated service representative.

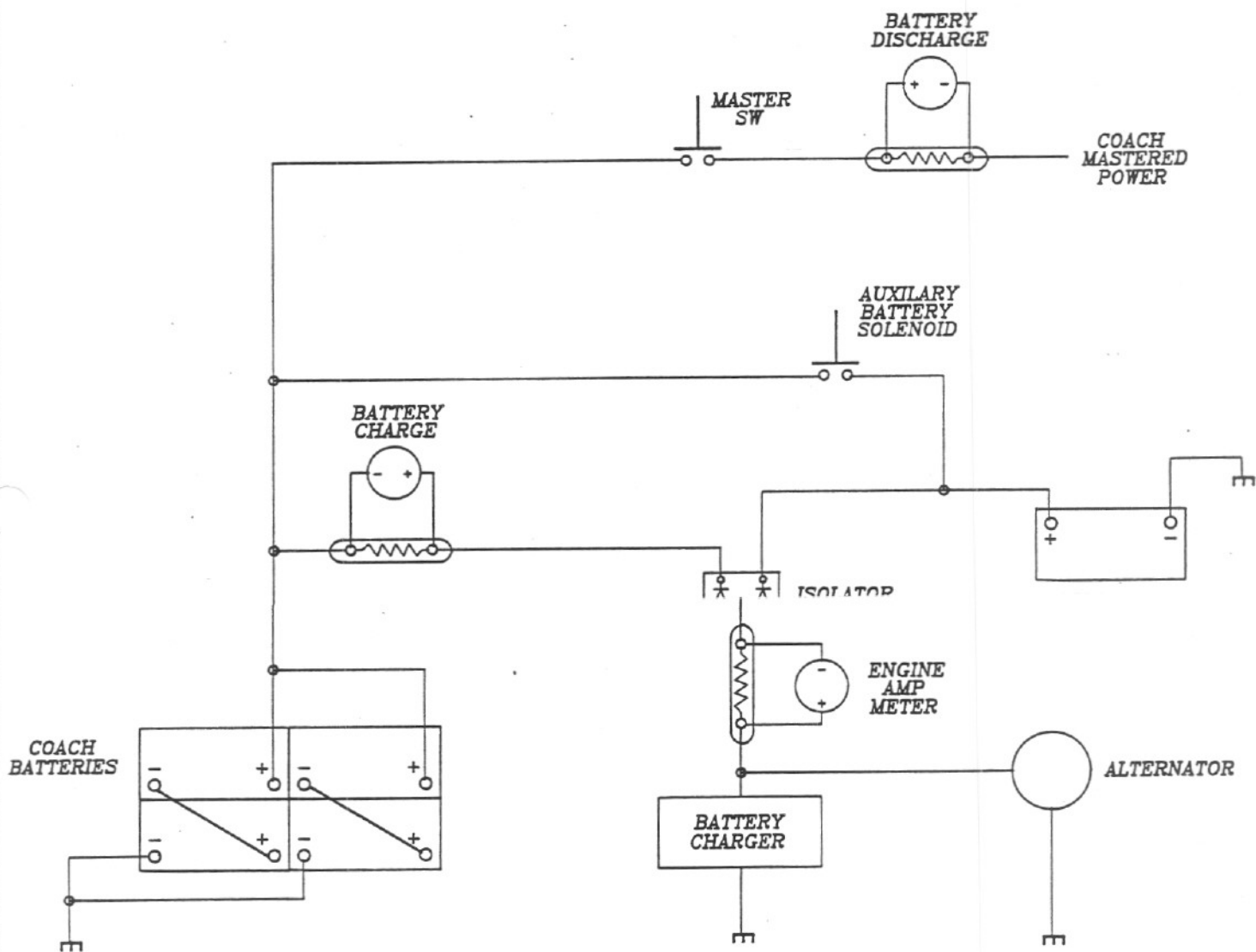
3. All claims must be brought to the attention of Onan or an Authorized Distributor or its designated service representative within thirty (30) days after discovery that goods or parts fail to meet this warranty.

4. THIS WARRANTY SHALL NOT APPLY TO:

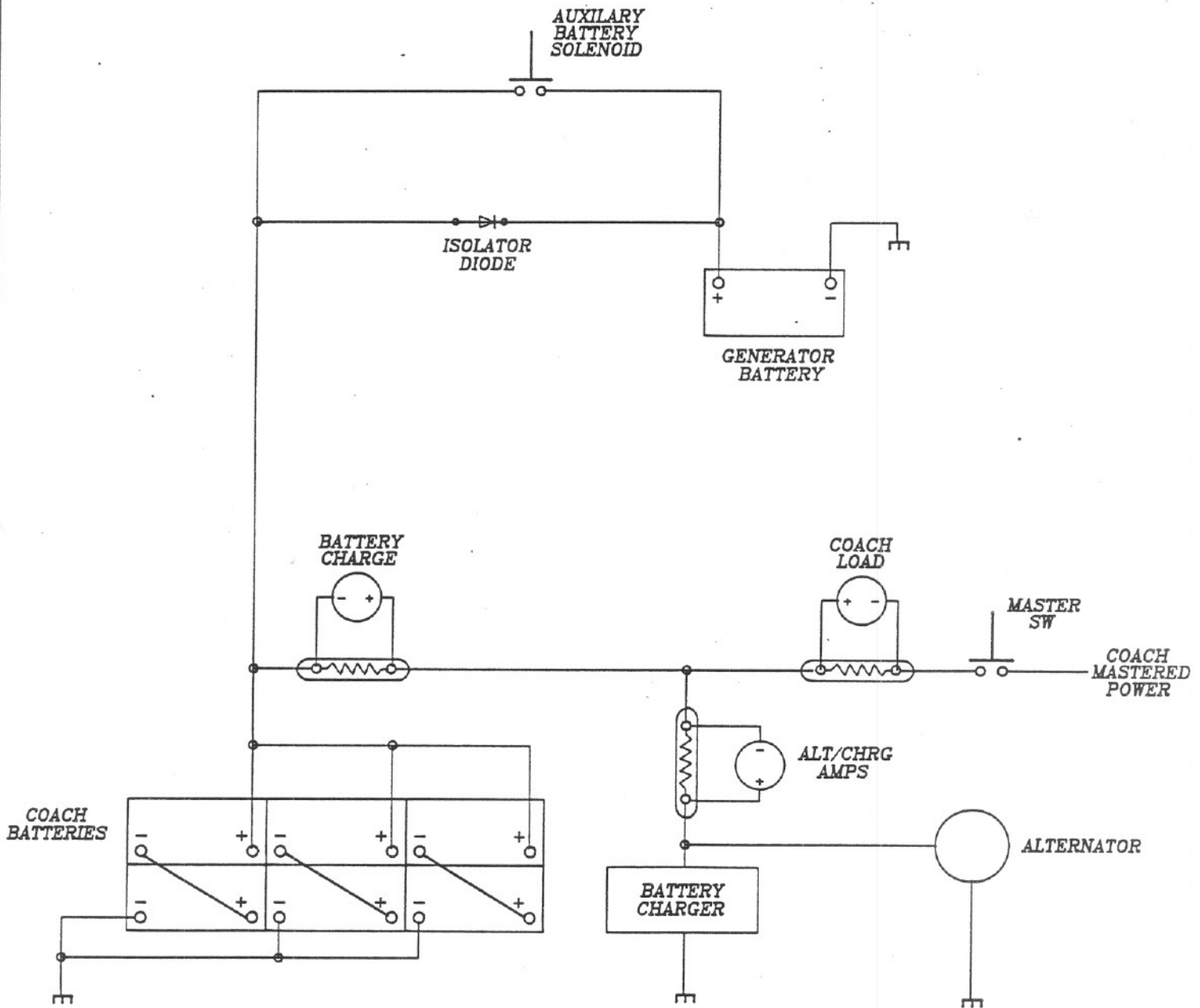
- a. Cost of maintenance, adjustments, installation and start-up, except as specifically included in paragraph 2a.
- b. Failures due to normal wear, accident, misuse, abuse, negligence or improper installation, or lack of reasonable and necessary maintenance.
- c. Products which are altered or modified in manner not authorized by manufacturer in writing.
- d. Failure of goods caused by defects in the system or application in which the goods are installed.
- e. Telephone, telegraph, teletype or other communication expenses.
- f. Living and travel expenses of persons performing service, except as specifically included in Section 2.
- g. Rental equipment used while warranty repairs are being performed.
- h. Overtime labor requested by purchaser.
- i. Optional engine coolant heaters after the first year.
- j. Starting batteries.

No person is authorized to give any other warranties or to assume any other liabilities on Onan's behalf, unless made or assumed in writing by an officer of Onan, and no person is authorized to give any warranties or assume any other liability on behalf of Seller unless made or assumed in writing by Seller.

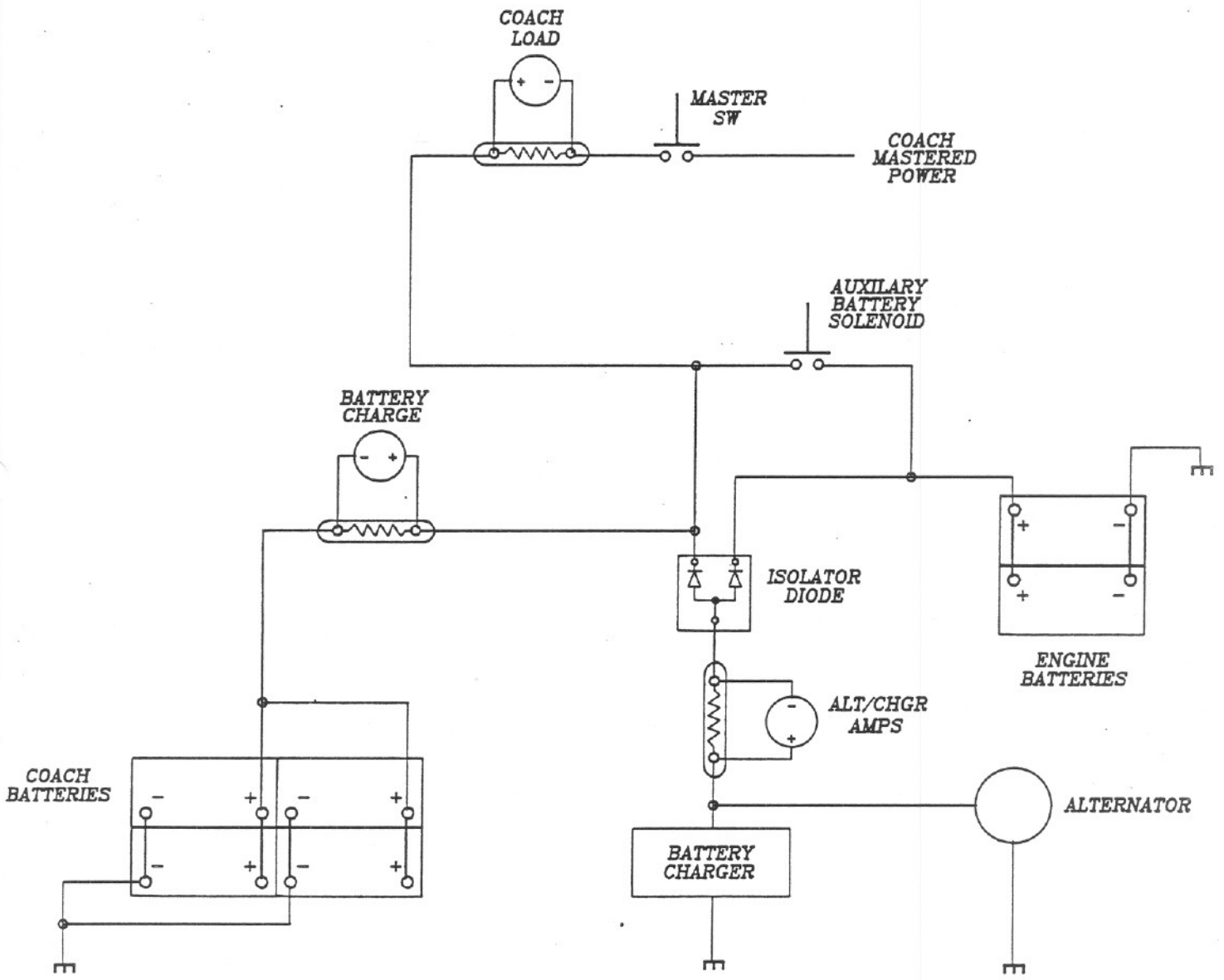
5. This warranty gives the user specific legal rights, and the user may also have other rights which vary from state to state.



CHARGING DIAGRAM #2



CHARGING DIAGRAM #1



CHARGING DIAGRAM #3