USE: Residential

BACKUP GENERATOR CONNECTION REQUIREMENTS

1. PURPOSE

These electric service requirements include information for use by the Service Provider and customers for connection and operation of customer-owned backup generation. The requirements presented are to ensure the safety of both utility and customer personnel and property.

2. APPLICABILITY

This document applies to all single-phase residential backup generation operating as optional standby systems as defined by the National Electrical Code (NEC) Article 702. Emergency generation systems and legally required standby systems are more complex and will require individual review by Service Provider engineering.

3. DEFINITIONS

Optional Standby Systems: Those systems intended to supply power to public or private facilities or property where life safety does not depend on the performance of the system. These systems are intended to supply on-site generated power to selected loads either automatically or manually. (Definition verbatim from NEC Article 702.2)

Transfer Switch: Source transfer equipment which may be designed to be automatically or manually operated for the purpose of transferring electrical load from one power source to another.

Utility Isolation Disconnect: A means to isolate the utility from customer-owned generation grid back feed that is (1) installed and maintained by the customer, (2) a visible-open, manual gang-operated, load break device, and (3) capable of being locked in the visible-open position by a standard Service Provider padlock.

4. STANDARDS

All customer equipment shall conform to the nationally-recognized standards and recommended practices. These include, but are not limited to the following:

(a) NFPA 70 - National Electrical Code (NEC)

(b) UL 1008 - Standard for Safety, Transfer Switch Equipment

5. SERVICE PROVIDER DESIGN REVIEW AND APPROVAL

Prior to installation of customer generation facilities, customer shall submit a New Construction Application to the Service Provider Design Services Department for review and written approval. Application forms may be found on the Service Provider's website. Documentation to be furnished with the application includes transfer switch product documentation and an electrical one-line diagram depicting the connection of the transfer switch and generator in relation to the electrical service to the premise. Following approval, customer shall not remove, alter, modify, or change the equipment specifications and/or the electrical connection configuration. If the customer desires to make such changes or modifications, they must revise and resubmit plans describing the changes or modifications for approval.

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6. TECHNICAL REQUIREMENTS

a. Backup generators used to supply all. or part, of a customer's load during an emergency power outage shall be connected to the cusotmer's wiring through a double-throw, open-delayed transition (break-before-make) transfer switch specifically designed and installed for that purpose. For generation systems intended to serve the entire facility load, the transfer switch must be service-entrance rated.

b. Transfer switch operation mode may be either automatic or manual.

c. Transfer switch switching mechanism may be a contactor or a molded-case, or power-case, switch.

d. Regardless of transfer direction, utility to generator or generator to utility, the transfer switch shall always disconnect customer load from its supply prior to switching to the other supply source.

e. A dedicated disconnect switch with a visible-open air-gap shall be installed between the transfer switch and the utility source connection. Disconnect switch warning label shall be as shown in below Section 7.b.

f. The disconnect switch shall be installed in a readily accessible location to provide safe, easy, unrestricted, and unimpeded access for Service Provider personnel at all times. It shall be installed within 10 feet of the service entrance, unless Service Provider has been contacted and approved a Customer variance request to install it elsewhere. Any variance granted does not alter the requirement that the disconnect switch be readily accessible.

g. The disconnect switch shall be visible-open such that the switch blades, jaws, and the air-gap between them are clearly visible when the switch is in the "open" position and the front cover of the switch box is opened. The switch handle shall be capable of being locked in the "open" position by a standard Service Provider padlock with a 3/8" shank. The switch front cover shall be kept locked at all times by a Service Provider-furnished padlock. The front cover hasp shall be capable of accepting a 3/8" shank padlock, and shall not be field modified in any way.

h. The disconnect switch shall be installed securely on a rigid operating surface such as the side of a building, wall, or Unistrut rack so that operation of the switch handle does not cause movement or flexing of the switch enclosure. Mounting height shall be such that the center line of the switch handle is between 42 inches and 75 inches above final grade. Working space requirements are as per the NEC.

i. The disconnect switch shall be connected so that the blades (and any fuses present) are de-energized when the switch is in the "open" position in accordance with NEC Article 404.6(C). For a typical disconnect switch arrangement, this means that the switch blades will connect to the transfer switch while the switch jaws will connect to the source of utility supply.

j. If the disconnect switch connection to the source of utility supply is on the supply side of the main service disconnecting means, the disconnect switch must be fused. Fuses shall be sized based on voltage and current ratings of the generation system. The disconnect switch shall be rated to withstand the available fault current duty.

k. Means of connection of the transfer switch utility-fed circuit to the customer service panel must not void any listing agency approval for the service panel. For example, lifting the factory-installed wires connecting the meter socket to the main breaker in an all-in-one combination service panel is not allowed unless the panel manufacturer provides verification that such a modification will not compromise the panel listing. (See Figures 1 through 4 for sample one-line diagrams for allowed and disallowed systems.)

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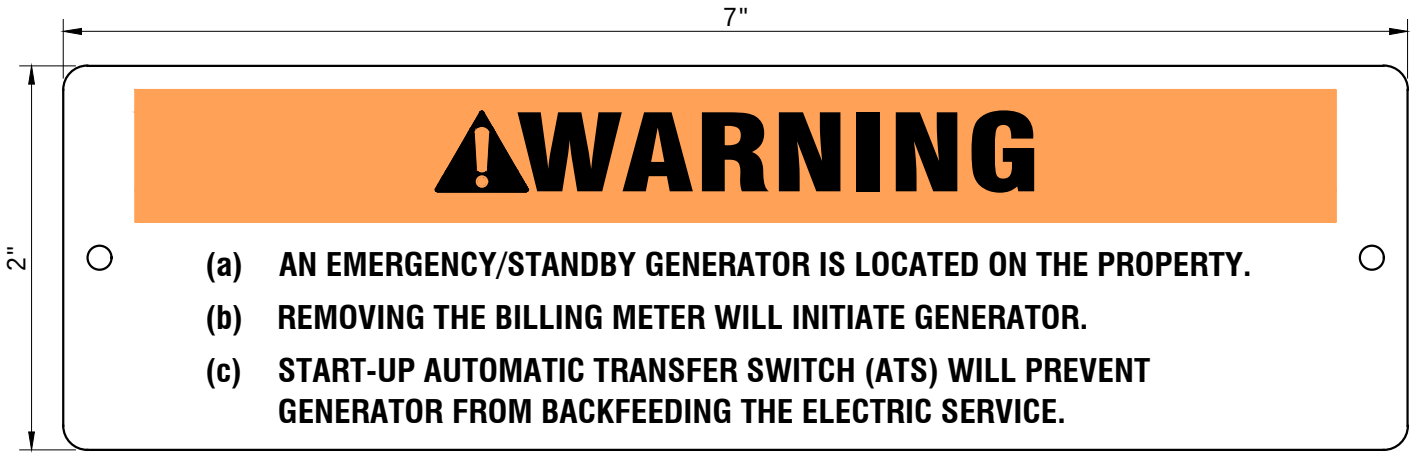
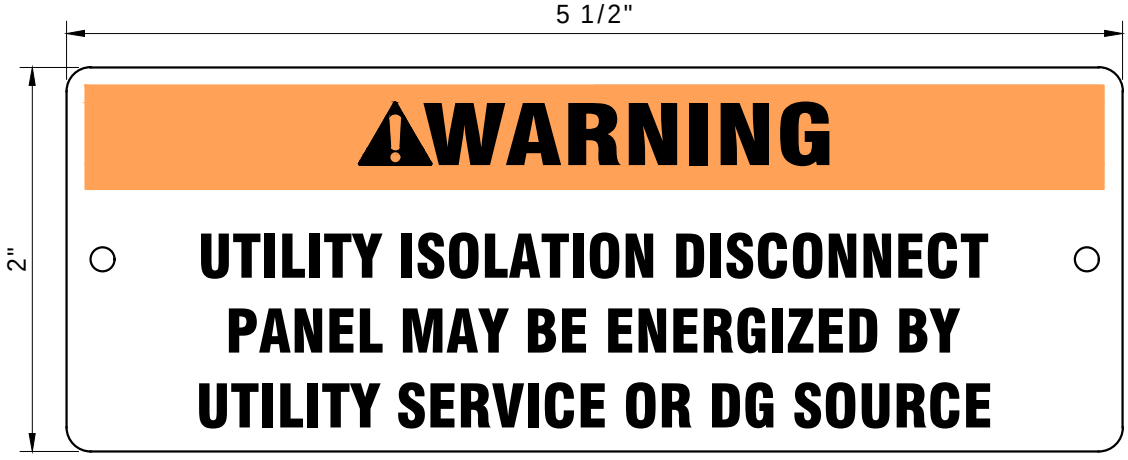
7. PLACARDS/ WARNING SIGNS

a. Backup generators that operate in open transition mode by means of an automatic transfer switch as described herein are required to include a warning sign located at the customer service entrance. The warning sign (LABEL 1) is available at Border States Electric. Customer will be responsible for purchase and installation. Inspection of sign installation will be completed by Design Services prior to energization of the system.

b. The utility isolation disconnect switch installed between the transfer switch and the utility supply source shall be required to include a warning sign located at the disconnect switch. The warning sign (LABEL 2) is available at Border States Electric. Customer will be responsible for purchase and installation. Inspection of sign installation will be completed by Design Services prior to energization of the system.



LABEL 1



LABEL 2

USE: Residential

BACKUP GENERATOR CONNECTION REQUIREMENTS

CONFIGURATION FOR 100% BACKUP- REVENUE METER WITH SEPARATE LOAD CENTER

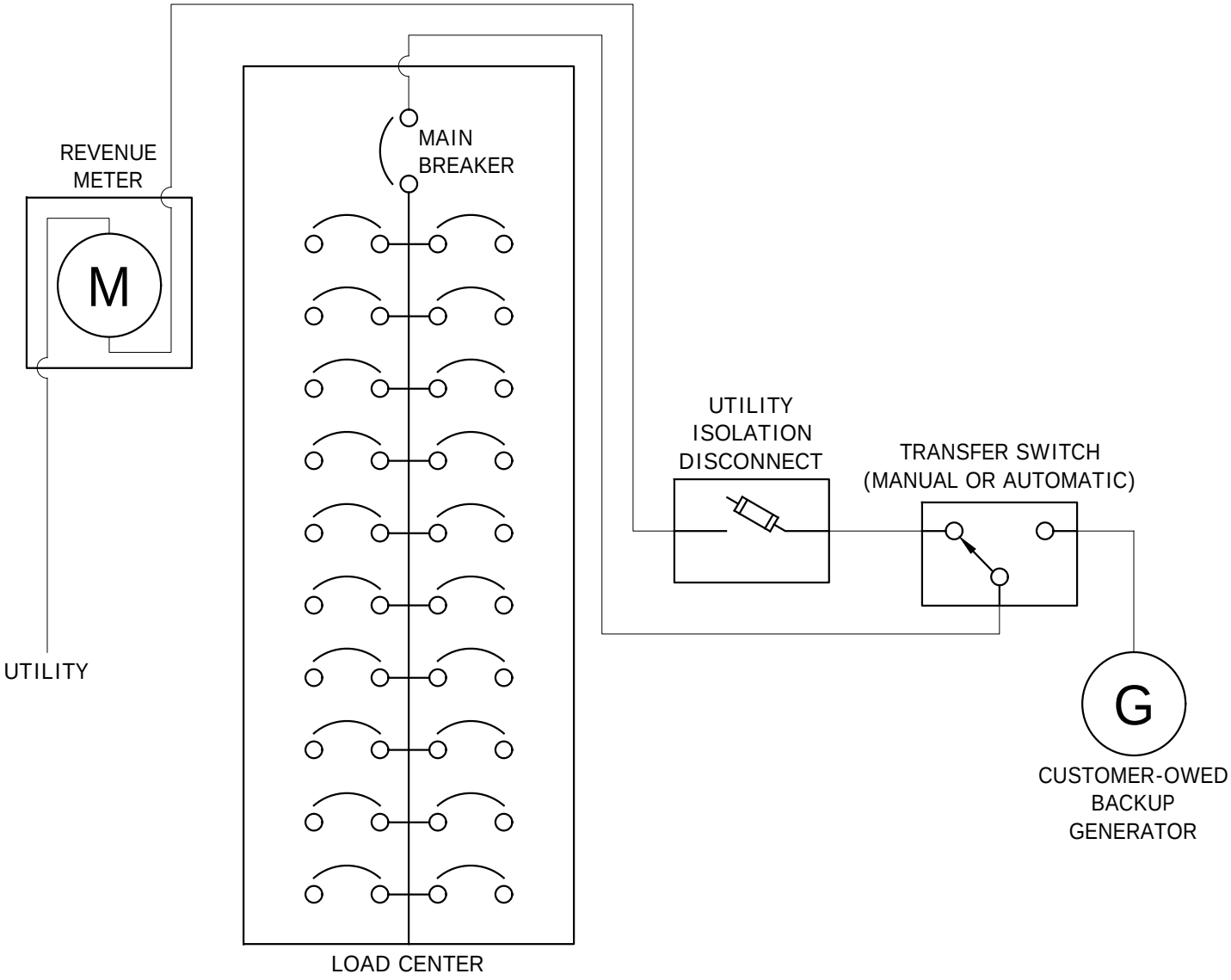


FIGURE 1

USE: Residential

BACKUP GENERATOR CONNECTION REQUIREMENTS

ALTERNATE CONFIGURATION FOR 100% BACKUP- REVENUE METER WITH SEPARATE LOAD CENTER

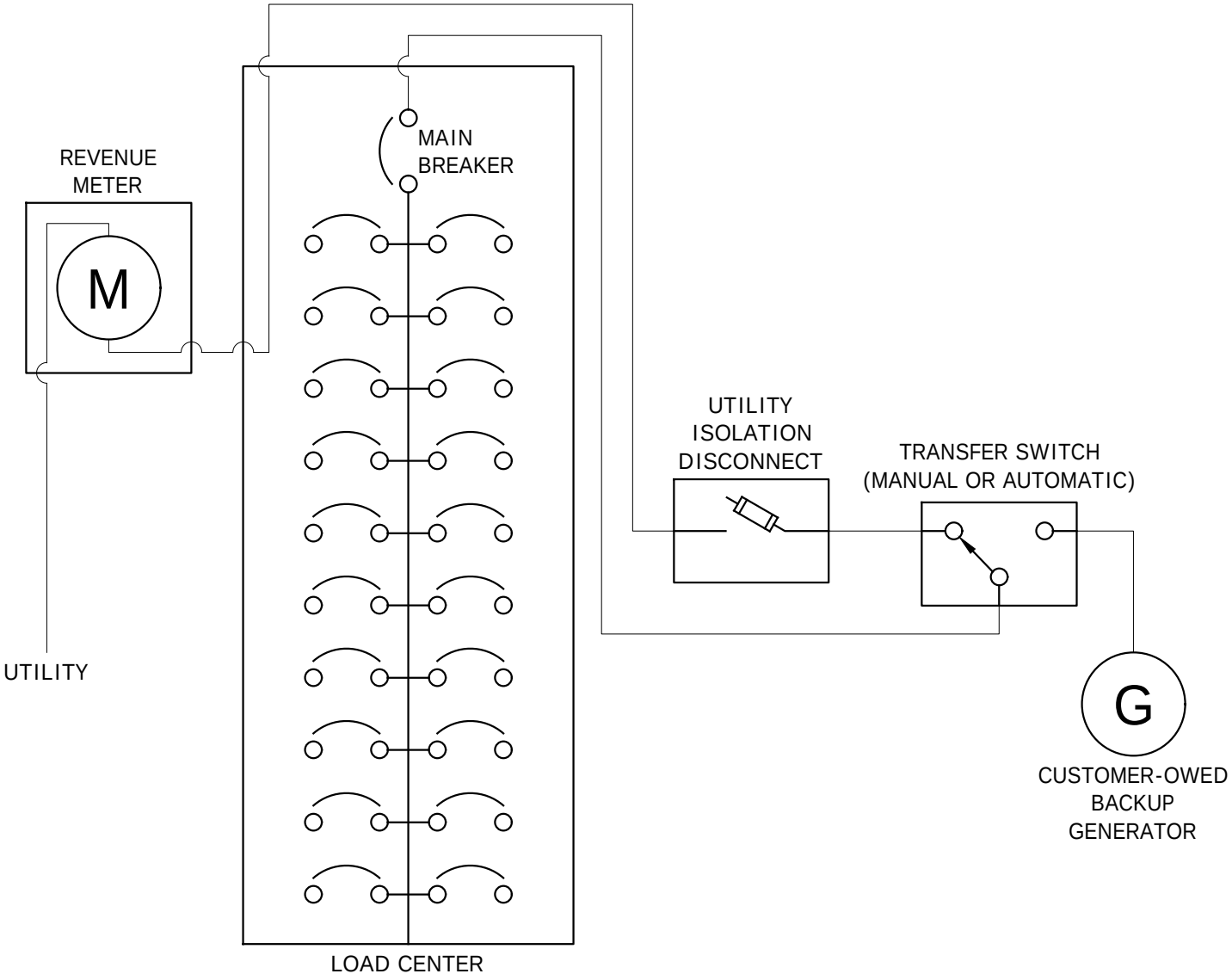


FIGURE 2

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BACKUP GENERATOR CONNECTION REQUIREMENTS

CONFIGURATION WITH BACKUP LOADS PANEL

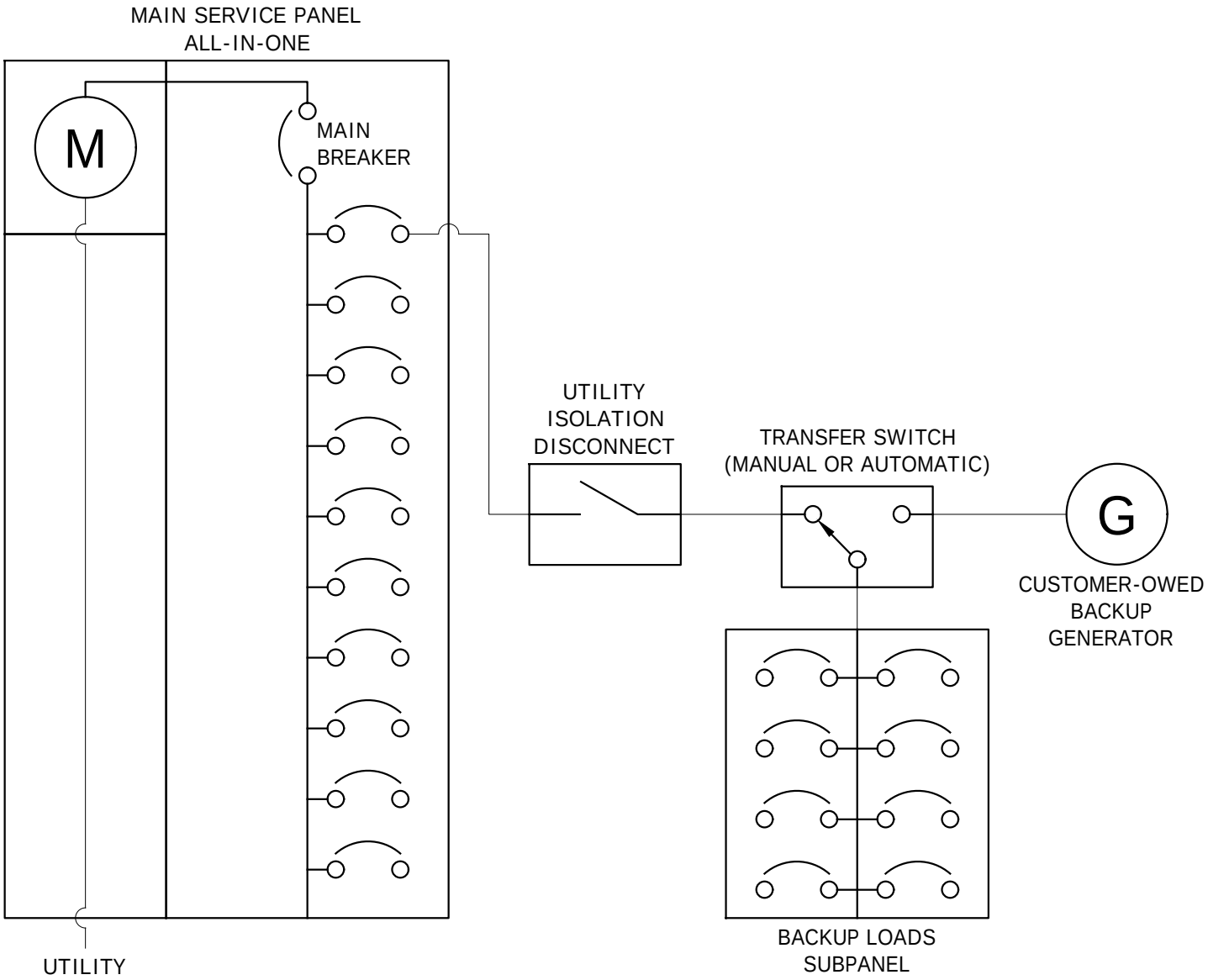

FIGURE 3

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CONFIGURATION FOR 100% BACKUP, ALL-IN-ONE COMBINATION PANEL

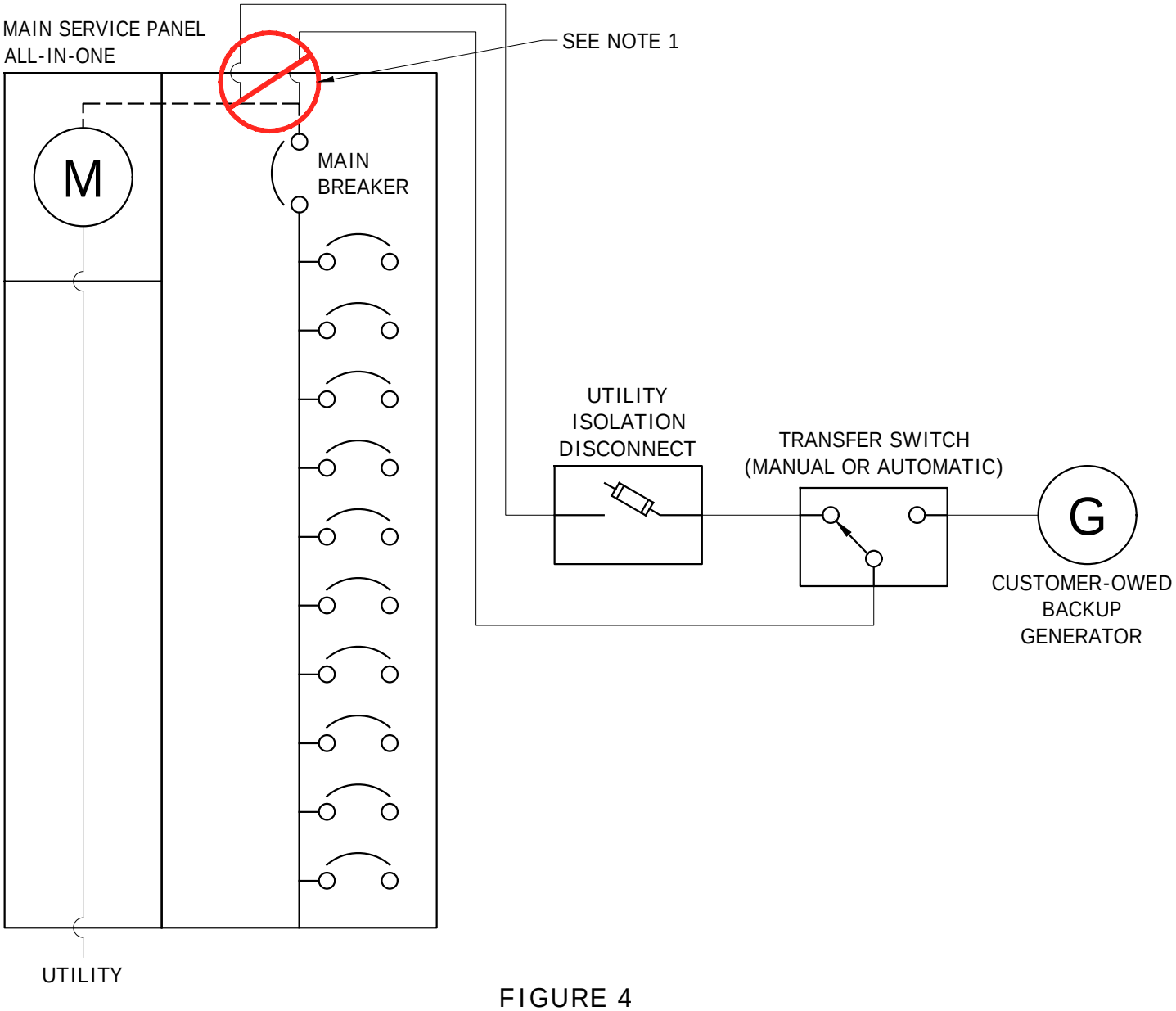

FIGURE 4

NOTE:

1. THE LIFTING OF FACTORY-INSTALLED JUMPERS BETWEEN METER AND MAIN BREAKER OR ANY PANEL MODIFICATION IS NOT ALLOWED WITHOUT MANUFACTURER VERIFICATION THAT THIS DOES NOT VOID PANEL LISTING.