

Lesson: Introduction to the LTIII Automatic Transfer Switch

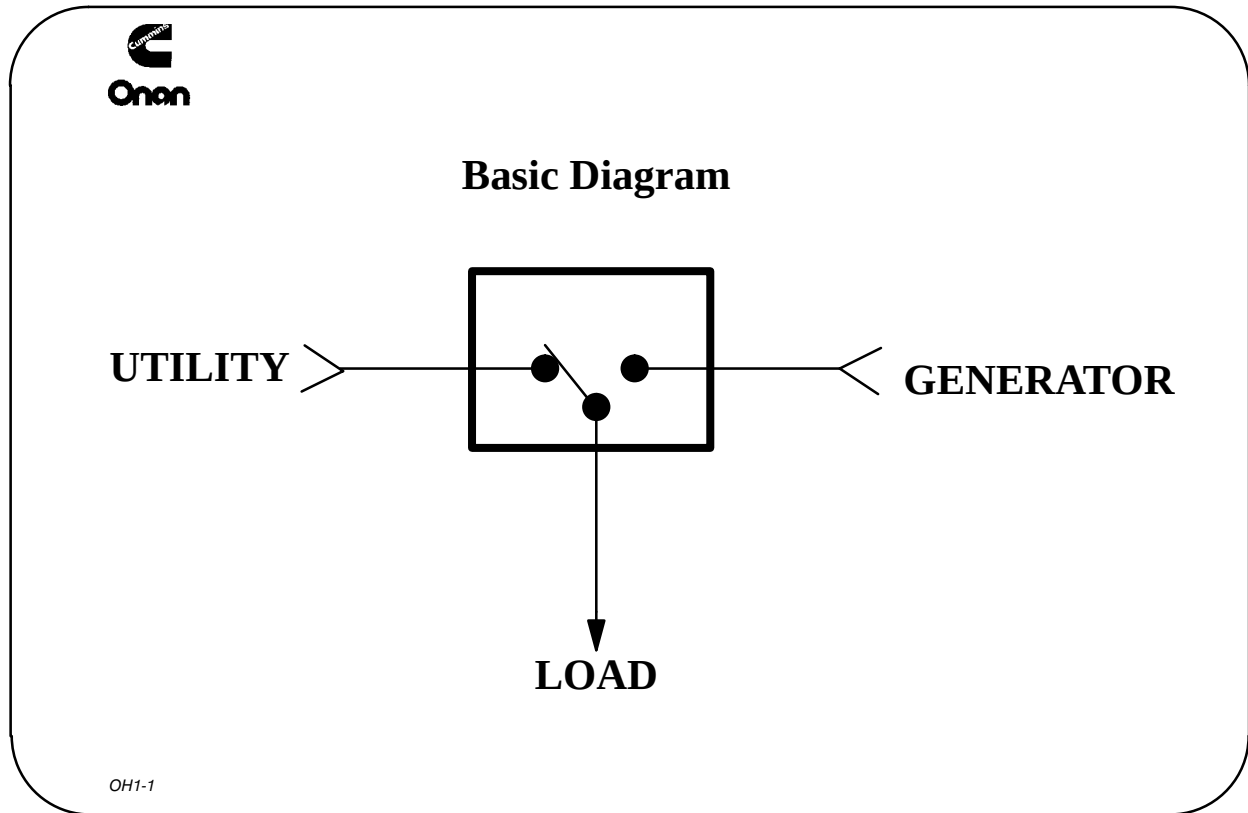
This lesson presents an overview of the LTIII Automatic Transfer Switch.

Objectives

After completing this lesson, you should be able to:

- Understand the basic functions of an automatic transfer switch.
- Identify the LTIII Automatic Transfer Switch by Model Number Identification.
- Locate and identify the major components and features of the LTIII Automatic Transfer Switch.
- Identify the differences between the LTIII Automatic Transfer Switch and the OTIII Automatic Transfer Switch.

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What is the Purpose of a Transfer Switch?

1. To provide a means for connecting an electrical load to either of two sources, while at all times isolating the two sources from each other.

What is an LTIII Automatic Transfer Switch?

2. The LTIII Automatic Transfer Switch is the Cummins/Onan latest contactor type load transfer device. It replaces the LTII model which is obsolete. The LTIII has been in production since May of 1996.

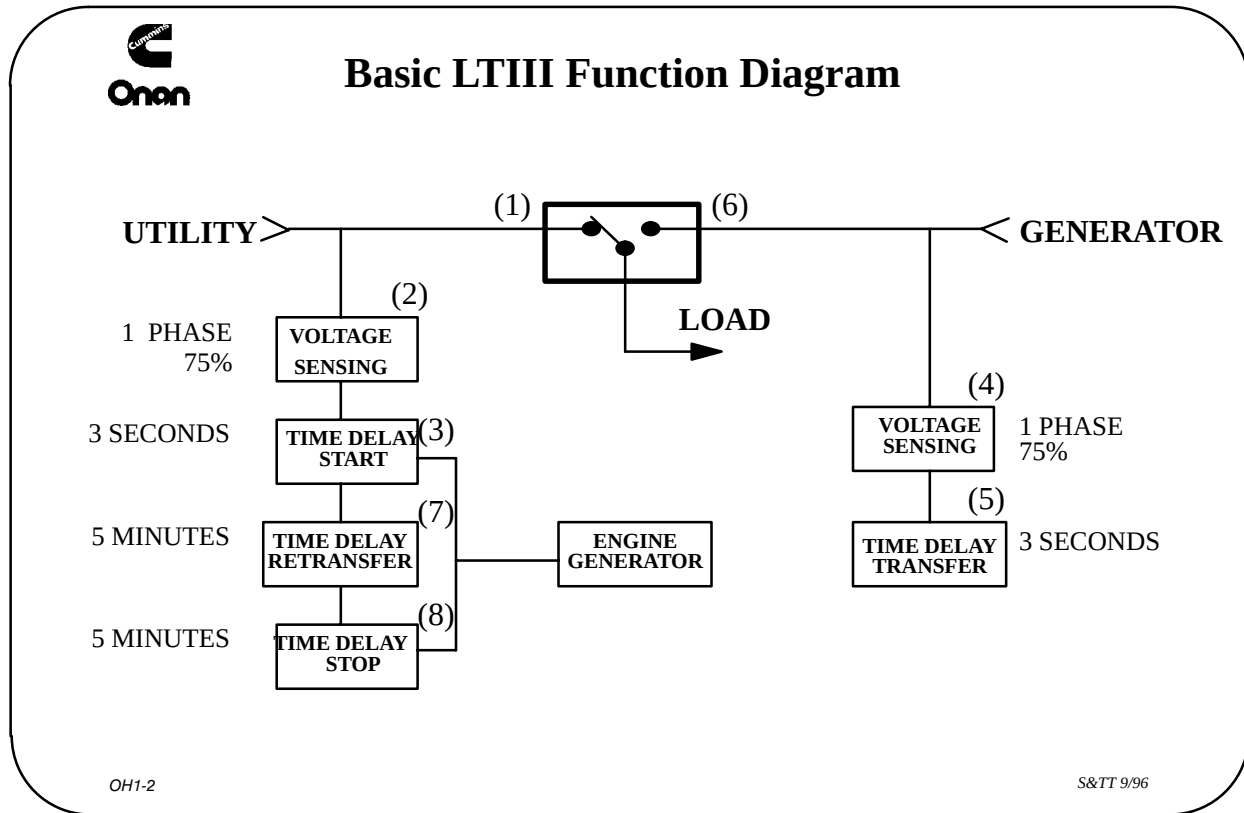
What does the LTIII Automatic Transfer Switch do?

3. It starts the generator set, transfers and retransfers the load, and stops the generator set automatically. It is designed for automatic operation applications only.

Exercise: Terminology

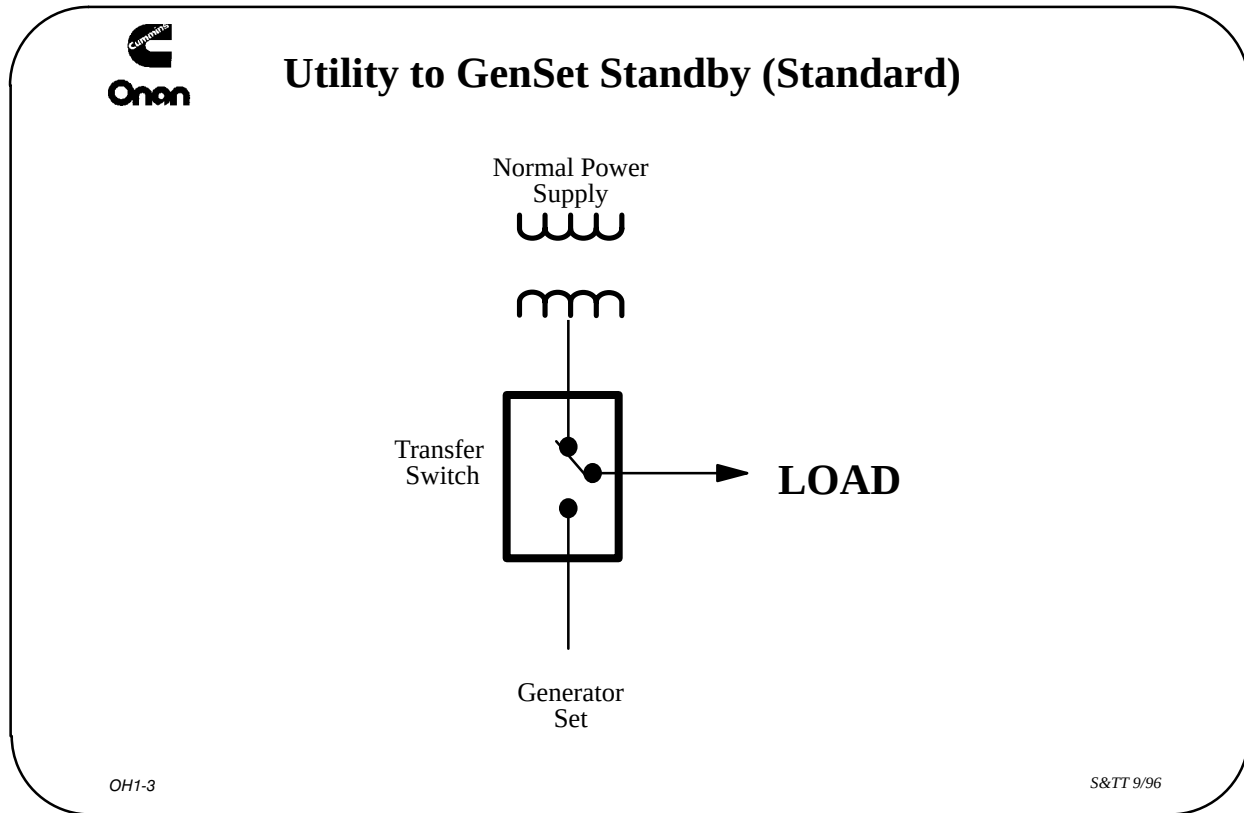
Fill in the blanks.

- _____:
- The primary source of electrical power to the load. Usually this is the utility.
- _____:
- The secondary (standby) source of electrical power to the load. Usually this is a generator set.
- _____:
- To move the transfer switch from source one to source two.
- _____:
- To move the transfer switch from source two to source one.



What are the six basic functions of an Automatic Transfer Switch?

- Sense** an interruption of normal power (source one).
- Automatic Start** of the generator set. The transfer switch initiates a start signal as a result of an exercise or test input or from a utility not available input.
- Automatic Transfer** of the load to the emergency source (source two). Once the transfer switch recognizes that the generator set is available, the load is transferred to the generator set.
- Sense** the return of source one.
- Automatic Retransfer** of the load to the normal source (source one). Once the transfer switch recognizes that the normal source is available, the load is retransferred to that source.
- Automatic Stop** of the generator set. After the load is retransferred to the normal source (source one), the generator set operates for a cooldown period then the start signal is removed, which stops the generator set.



LTIII Automatic Transfer Switches are used in what types of applications?

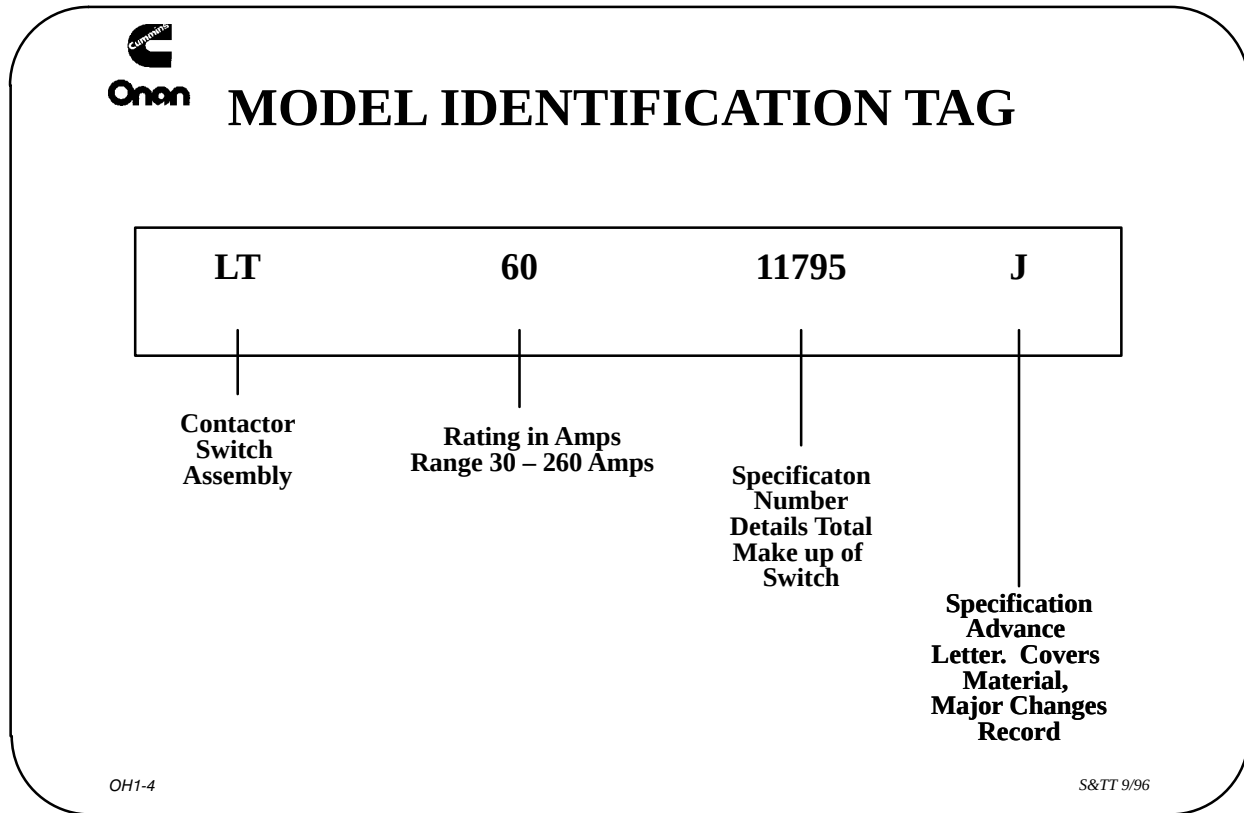
10. The LTIII Automatic Transfer Switch is designed to operate in emergency/standby applications as a Utility to Generator Set switch only.

Some common applications are:

- Home Standby
- Telecommunications
- Commercial

What are the available amp frame sizes of the LTIII Automatic Transfer Switch?

- 11.
- 30 Amps
 - 60 Amps
 - 100 Amps
 - 150 Amps
 - 200 Amps
 - 260 Amps



What is the model designation of the LTIII Automatic Transfer Switch?

12. **On spec J transfer switches**, the model number is made up of code segments that designate various features or options:

LT	60	11795	J
1	2	3	4

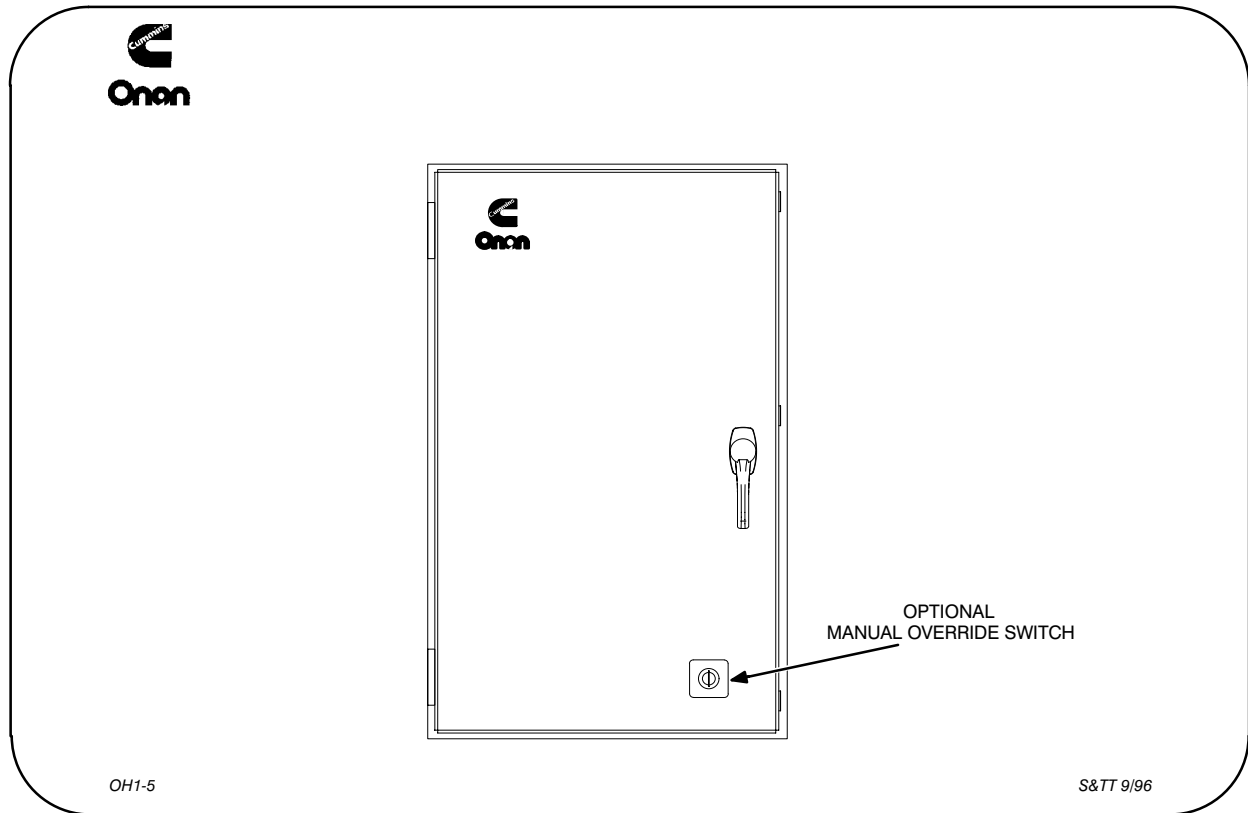
1. LT - 3-Pole Transfer Switch Series

2. Ampere Rating

30	150
60	200
100	260

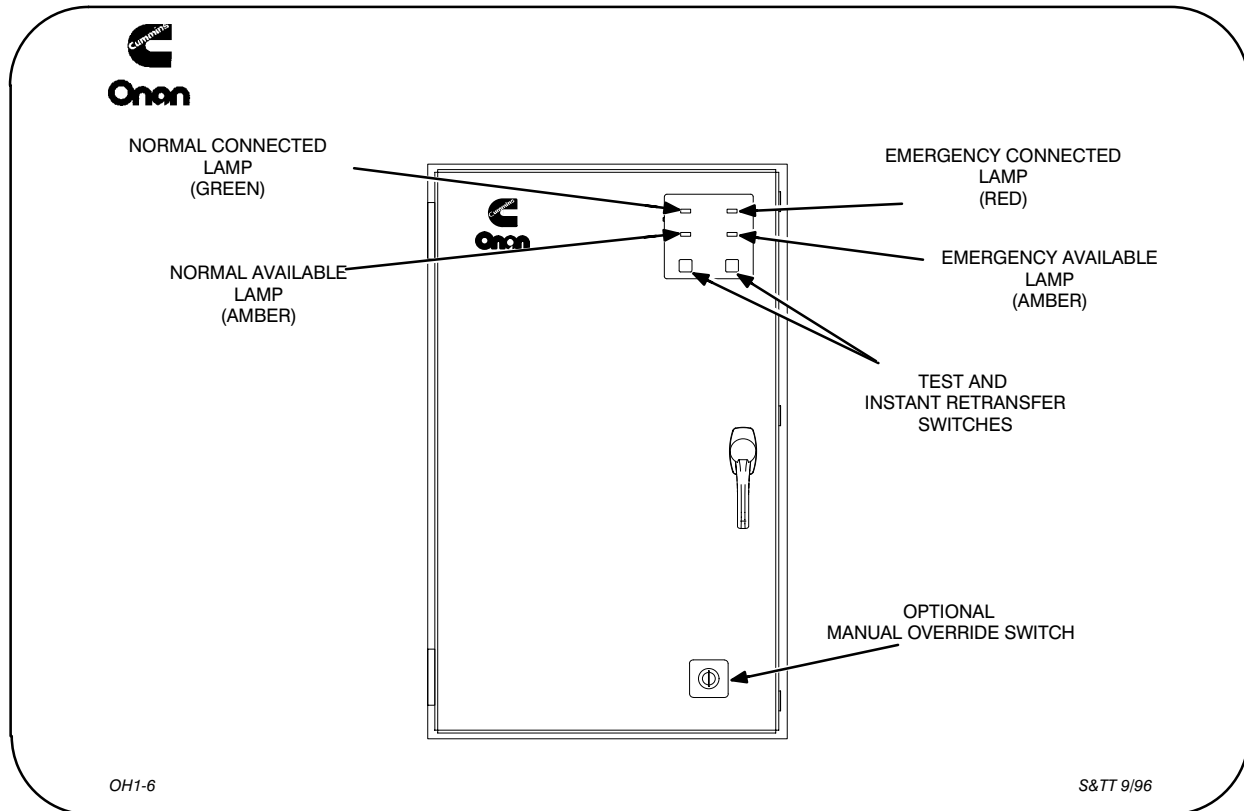
3. Sequentially assigned spec number - issued for each specific combination of accessories, voltages, frequency and standards codes.

4. Specification letter - advances with production modification



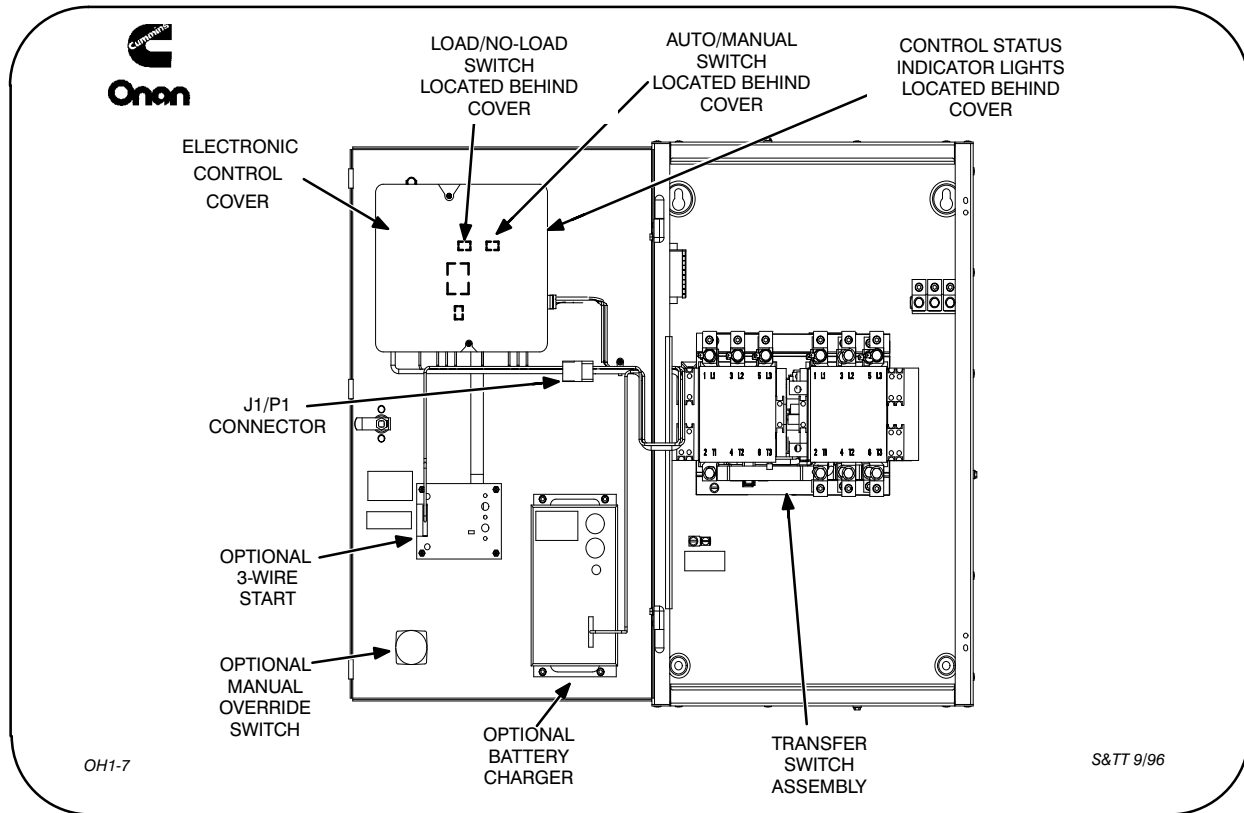
LTIII Control Package A enclosure

13. The Onan LTIII base model can be recognized by the absence of any indicator lights on the front door of the transfer switch enclosure.
14. Option **Manual Override Switch** allows the operator to override the electronic control to manually transfer to normal or emergency. The selected source must be available for transfer to the desired source to be successful.



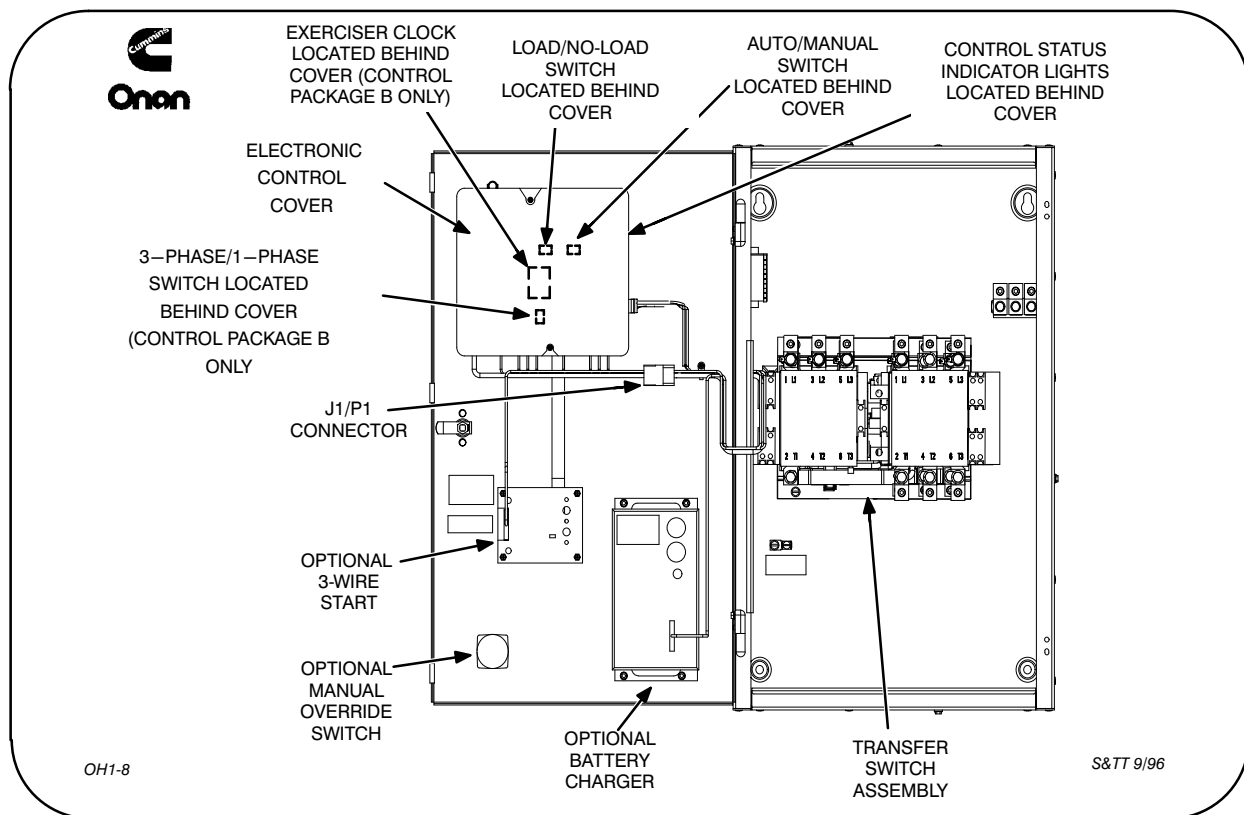
LTIII Control Package B enclosure

15. The LTIII Control Package B can be recognized by a membrane panel, which consists of four indicator lights and is located in the upper right corner of the cabinet door.
16. The **Test Switch** is a momentary test switch, which when depressed the genset will start and the load will transfer depending on the position of the with/without load switch.
17. The four **Indicator Lamps** are as follows:
 - *Green* Indicates that Normal source is connected to the load.
 - *Red* Indicates that Emergency source is connected to the load.
 - *Amber* Indicates that Normal source is available.
 - *Amber* Indicates that Emergency source is available.
18. Option **Manual Override Switch** allows the operator to override the electronic control to manually transfer to normal or emergency. The selected source must be available for transfer to the desired source to be successful.



Inside the LTIII Control Package A transfer switch

19. The **transfer switch assembly** is mechanically interlocked and magnetically held on the Line side.
20. There is no **Accessory Control Panel**. The control interfaces directly to Line voltages, unlike the OTIII which has a separate accessory control panel.
21. The **Control** is the brain of the automatic transfer switch. It is a single circuit board incorporating voltage sensing and time delays.
22. **Voltage Sensing** is single phase, undervoltage sensing only.
23. All **Time Delays** are fixed.
24. The **Genset Start Circuit** is a 2 wire start.
25. An 8 place **Terminal Block** is provided for customer connections.



Inside the LTIII Control Package B transfer switch

26. The **transfer switch assembly** is mechanically interlocked and magnetically held on the Line side. A factory option for magnetically held, both sides is available.
27. There is no **Accessory Control Panel**. The control interfaces directly to Line voltages, unlike the OTIII which has a separate accessory control panel.
28. The **Control** is the brain of the automatic transfer switch. It is a single circuit board incorporating voltage sensing and time delays.
29. **Voltage Sensing** undervoltage sensing only. The normal source has a 3ph/1ph selector switch. The emergency source is single phase sensing only.
30. All **Time Delays** are adjustable.
31. The **Genset Start Circuit** is a 2 wire start.
32. The **Exercise Clock** is a 7 day exercise clock with a with/without load selection switch.

What are some differences/similarities between the LTIII and OTIII transfer switch?

33. Both switches utilize integrated, electronic voltage sensing and time delay functions.
34. Both switches utilize a transformer assembly module that conditions the line voltage to a usable level for the electronic voltage sensing and time delay circuitry. The OTIII transformer assembly is a separate assembly from the PowerSentry Control, whereas the LTIII transformer assembly is located on the control board.
35. LTIII voltage sensing and time delay functions are integrated into one circuit board as opposed to the OTIII PowerSentry control. The PowerSentry control has a mother board with three daughterboards. The daughterboards consist of a time delay module, and a dedicated voltage sensing module for each source.
36. The LTIII control provides single phase voltage sensing only for the emergency source. The OTIII has switch selectable single or three phase sensing for both the normal and emergency sources.
37. The OTIII utilizes a linear actuator as the transfer mechanism, whereas the LTIII is contactor based with closing coils and open coils (optional for emergency source) in each contactor.
38. The OTIII is available in amp frame sizes of 40 – 3000 amps and it is available for the following applications:
 - Utility to Utility
 - Utility to Genset
 - Genset to Genset
39. The OTIII is applicable for industrial applications and is used as the automatic portion of the Cummins/Onan Bypass and Isolation transfer switch.
40. The LTIII automatic transfer switch is not available with a meters.

Activity or Exercise Title

1. What is the purpose of an automatic transfer switch?
2. List 3 LTIII features that are available with Control Package B.
 - a.
 - b.
 - c.
3. List 3 LTIII features that are available with Control Package A.
 - a.
 - b.
 - c.
4. The Membrane touch panel provides what features?
 - a.
 - b.
 - c.
 - d.
 - e.
 - f.
5. The optional Manual Override Switch provides what feature?
6. The LTIII transfer switch ranges from 30 – 3000 amps? T or F
7. List the six basic functions of an automatic transfer switch.
 - a.
 - b.
 - c.
 - d.
 - e.
 - f.