

BASEWEST

Operating & Maintenance Manual

“Smart” Battery Power Unit, Escape Slide Lighting System

Model 790, 800, & 900 Series

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1.0 INTRODUCTION**1.1 Scope**

This manual covers the installation, test, and maintenance of the output regulated, non-rechargeable, alkaline-based Model 790, 800, and 900-Series escape slide lighting battery power units (batteries) for LED-based non-overwing escape slide lighting systems manufactured by BaseWest Inc., in the following part number formats:

- Model 790-Series (P/N 7-1089-201 & P/N 7-109X-201)
- Model 800-Series (P/N 7-08XX-201)
- Model 900-Series (P/N 7-09XX-201)

These devices are designed for installation on non-overwing aircraft evacuation slides and slide/rafts to provide power to integral escape slide lighting systems comprising light emitting diode (LED) luminaires. For specific instructions relative to operation and installation on a specific escape slide, please refer to the corresponding OEM escape slide or slide/raft manual. Batteries for overwing applications have differing activation switching means that are not covered in this manual.

1.2 Battery Type

The “smart” battery power units covered by this manual, hereinafter “battery(ies)”, contain non-rechargeable alkaline manganese dioxide “AA” and or “AAA” cells manufactured by Energizer® Battery Company. Information on these battery cells is available on the internet at the Energizer® website.

2.0 THEORY OF OPERATION**2.1 General Description**

Batteries covered by this manual comprise a series or series/parallel arrangement of AA and/or AAA cells connected to an electronic regulation circuit in a cylindrical package with integral switching means and wire leads provide power output and battery test.

Activation of the battery is accomplished upon inflation of the host device; an activating lanyard with a switch plug is installed in the switch end of the pack. This switch plug is captured by a retaining clip secured in a protective annulus. The switch plug, when installed, depresses the plunger of a normally open snap-action microswitch housed in the pack, rendering the battery power circuit OPEN, and the system OFF. The lanyard is short-rigged and tied-off, so that inflation and extension of the escape slide causes the switch plug to be pulled from the pack, allowing the microswitch to snap to the CLOSED circuit (ON) condition, providing power to the installed slide light harness. A nylon tie-cord is provided to secure the battery to its mounting on the escape slide structure.

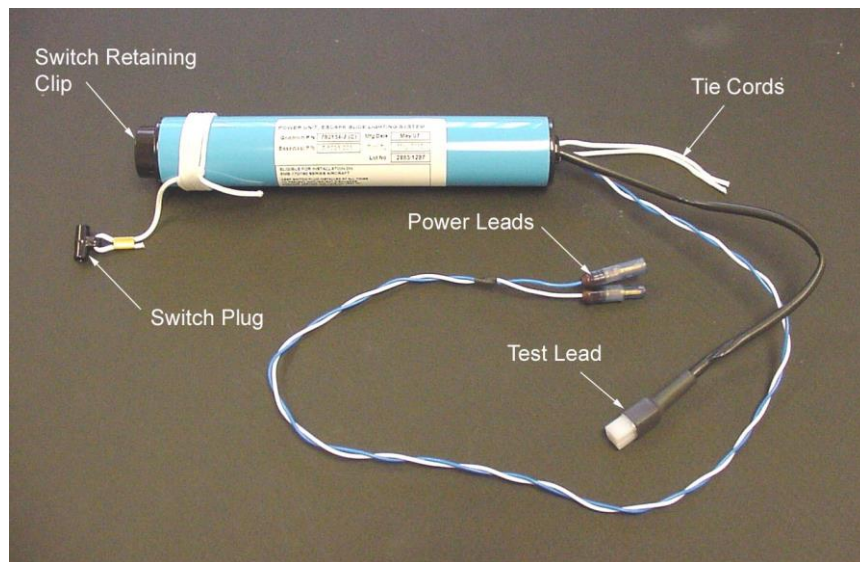


Fig. 1 General Battery Configuration

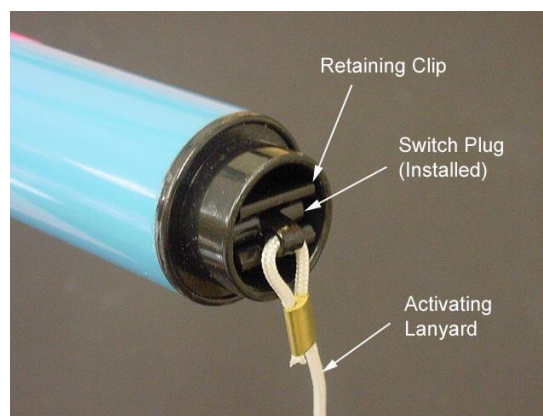


Fig. 2 Installation of Switch Plug in Retaining Clip

2.2 "Smart" Batteries

The "smart" series of batteries covered by this manual are designed by BaseWest specifically for use with LED-based escape slide lighting systems. They include electronic circuits which regulate battery output and provide for testing of the battery condition.

a) All "Smart" Batteries

- Regulated outputs from this circuitry remain relatively constant throughout the useful discharge life of the smart battery.
- Testing of a complete escape slide lighting system (a battery connected to a lighting harness) is accomplished by connecting the battery's test lead to a Model TS-420 test set. With this connection two types of tests can be performed: (a) a voltage test of the battery cell stack under a selectable load, or (b) an electrical current test of the connected LED harness with power pro-

vided by a regulated 5VDC power supply within the TS-420 through the battery power leads.

b) Model 790-Series Batteries Only

- Power is only available to the power leads only if a load is connected to the battery at the instant the activating switch is pulled. If the load is permanently disconnected from an activated smart battery, the battery will immediately deactivate and can only be re-activated if the switch plug is re-inserted and pulled again. This smart battery design feature is intended to discourage inadvertent activation or electrical shorting when the battery is not connected to the slide lighting system.

2.3 Schematic

The Model 790-Series batteries utilize a linear mode regulation circuit, and the Model 800- and 900-Series provide output regulation through a switch-mode regulator. The figures below provide schematics for each of the non-overwing batteries.

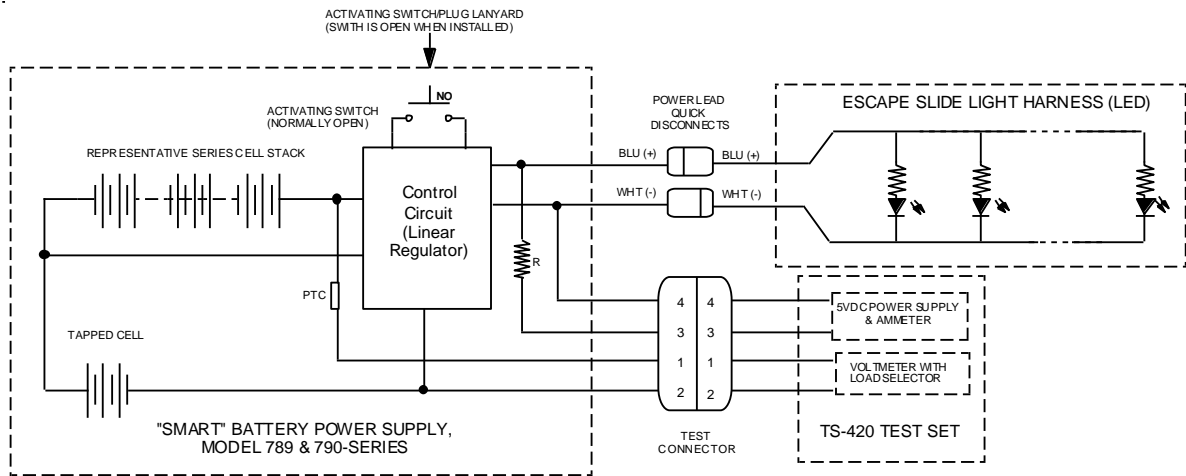


Fig. 3 Model 790-Series Battery (Linear Regulator)

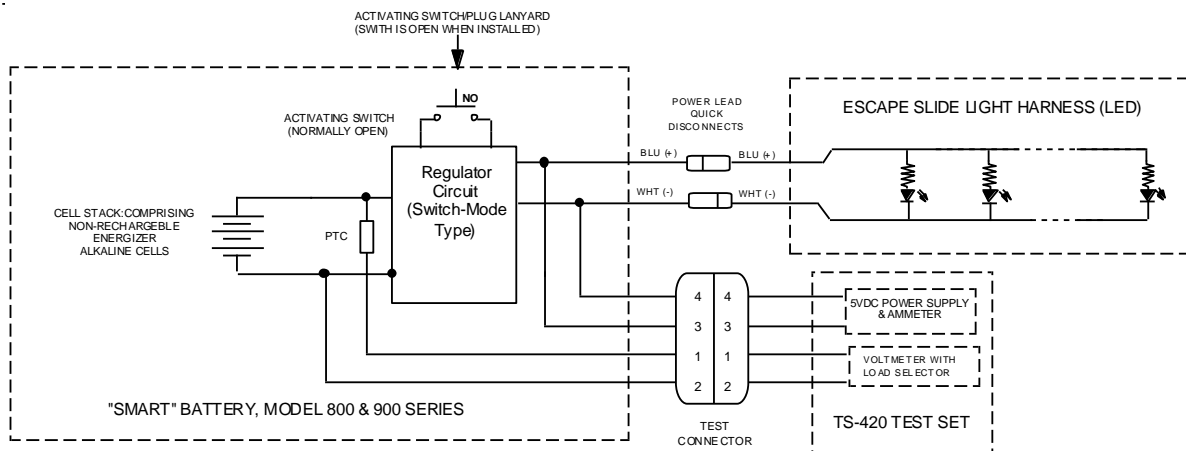


Fig. 4 Model 800- and 900-Series Battery (Switch Mode Regulator)

2.4 Limitations

- 2.4.1 The batteries covered by this manual are designed only for use with escape slide lighting systems specifically identified by the escape slide manufacturer's component maintenance manual (CMM). No other use of the batteries is intended or authorized.
- 2.4.2 The batteries covered by this manual comprise non-rechargeable AA and/or AAA alkaline cells, manufactured by Energizer® Battery Company. The user is encouraged to refer to Energizer technical publications on these cells for specific information regarding limitations, usage, storage, and disposal.
- 2.4.3 Any battery can pose a potential fire, explosion, or burn hazard. The user is encouraged to refer to Energizer technical publications on these cells for specific information regarding limitations, usage, storage, and disposal.

3.0 **INSTALLATION, RIGGING & OPERATION**

3.1 General

Install these batteries in accordance with escape slide manufacturer's component maintenance manual (CMM) procedures. The following information is provided as general guidance only.

3.2 Rigging

Secure the end of the activating lanyard to the escape slide structure and route it to the battery in accordance with the escape slide manufacturer's CMM. Fully seat the switch plug (located on the end of the activating lanyard) into the clip at the switch end of the battery per Fig. 2. DO NOT safety-tie switch plug in place.

3.3 Packing

Care must be taken during the packing process to ensure that sufficient slack is provided in the activating lanyard to ensure that folding, packing, and compression will not inadvertently place sufficient tension on the activating lanyard to cause it to pull from the retaining clip in the end of the battery; such a condition will result in inadvertent activation of the lighting system within the slide pack and premature depletion of the battery.

Take care to avoid placing the battery in a location that will result in bending stresses, or point load compression against hard surfaces (e.g., bottles or regulators) within the pack that could compromise the battery.

3.4 Operation

The battery, when properly installed, secured and rigged in accordance with the escape slide manufacturer's instructions, will operate automatically upon inflation of the escape slide. The activating lanyard is "short-rigged" to the escape slide such that the activating switch plug will be pulled from the battery when the escape slide is inflated.

4.0 TESTING**4.1 General**

BaseWest escape slide light systems are designed to be tested with BaseWest's Model TS-420 series test set. Refer to the escape slide manufacturer's CMM and BaseWest Technical Manual No. 25-60-41 for specific instructions regarding set-up and use of the TS-420 series test set. The following general instructions are for guidance only.

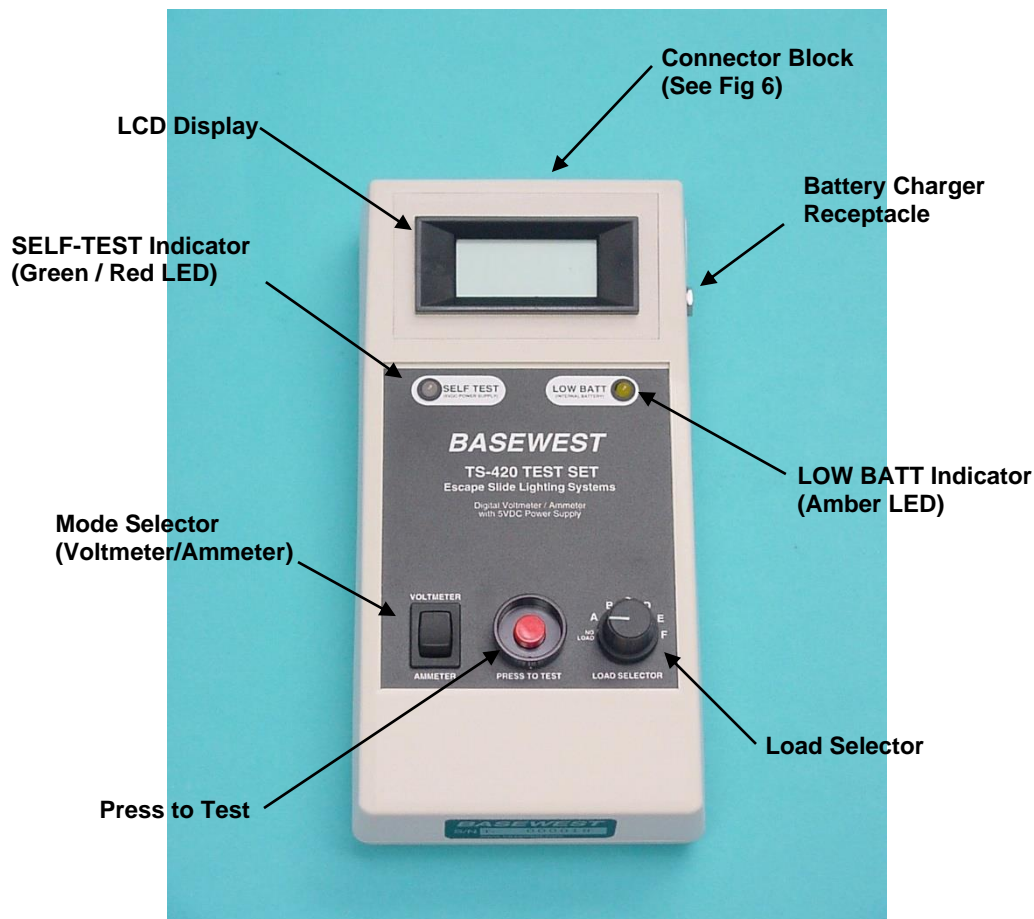


Figure 5. TS-420 General Arrangement

4.2 Battery Test

This test is designed to verify the serviceability of the battery only. This test may be used for receiving inspection, pre-installation and pre- or post-packing tests.

- (a) Set the TS-420 Mode Selector to "Voltmeter", and Load Selector to setting specified by the slide manufacturer's CMM (A through F).
- (b) Connect battery test lead to the center receptacle on the test set's connector block.
- (c) Ensure the activating switch plug is fully seated in the battery's switch end cap.

- (d) Press down the RED "Press to Test" button and hold for 3-5 seconds to observe and record the battery voltage. Compare this reading to acceptance limits noted in the slide manufacturer's CMM.
- (e) After the voltage reading is taken, release the "Press to Test" button and disconnect the battery test lead from the test set.



Figure 6. TS-420 Connector Block Arrangement

4.3 Battery and LED Harness System Test

This section provides a functional test of a connected battery and LED harness system in a pre-pack condition when the LED harness can be observed. This test is not conducted while connected to the TS-420 test set.

- a) Ensure the battery power lead is properly connected to the escape slide light harness in accordance with slide manufacturer instructions.
- b) With the escape slide laid out fully and the LED harness luminaires visible (inflated or non-inflated), pull the activating switch plug from the battery. Observe that the LED harness luminaires function properly. IMMEDIATELY reinstall the switch plug to de-activate the lighting harness.

NOTE: If the system fails to operate properly, re-install the activating switch plug into the battery, and verify that the power lead connectors are properly engaged into the mating connectors on the LED lighting harness. Repeat the test.

CAUTION: PROLONGED OPERATION OF THE LIGHTING HARNESS WITH THE INSTALLED BATTERY CAN DEplete THE BATTERY BEYOND SERVICEABLE LIMITS.

4.4 LED Harness Test through Connected Battery

Functional testing of LED harness alone may be conducted before or after packing with the battery connected to the LED harness. This test requires the TS-420 test set. Follow instructions in the slide manufacturer's CMM. The following guidance is provided:

NOTE: Power to the LED harness is provided by a power supply within the TS-420 test set and not the battery itself. This IS NOT a test of the serviceability of the battery.

- a) Ensure the activating switch plug is fully seated in the switch retaining clip.
- b) Ensure the battery power lead is properly connected to the slide light harness.
- c) Connect the battery test lead connector to the center receptacle on the TS-420 connector block.
- d) Set the TS-420 Mode Selector switch to “Ammeter”.
- e) Press and release the “Press to Test” button and record the current (mA) on the TS-420’s display. Refer to the slide manufacturer’s CMM for acceptable current levels.

NOTE: In the “Ammeter” mode, the TS-420 will remain ON for approximately 20 seconds and turn OFF automatically. Power can be interrupted at any time after the readings are recorded by removing the battery test connector from the test set.

5.0 MAINTENANCE

5.1 General

BaseWest's slide lighting batteries are non-repairable, life-limited devices. Repairs are not authorized.

5.2 Storage

The batteries should be stored inside in a dry, protected area within a temperature range of -40°C to +60°C (-40°F to +140°F). Always store the battery with the activating switch plug/lanyard in place. Do not expose the power lead contacts to contact with conductive materials, or to contact with each other. Maintain connector housings on power lead wires at all times.

5.3 Service Life

The batteries covered by this manual are approved for a seven (7) year service life from date of manufacture. The slide manufacturer may specify adjustment of this service life down to five (5) years for certain batteries. Battery nameplates are marked with replace-by dates per slide manufacturer instructions.

Care should be taken to use batteries on a first-in-first-out inventory rotation basis to maximize available service life.

6.0 ACCESSORIES

The TS-420 test set and certain test and calibration cables are available from BaseWest. TS-420 operating and calibration manuals (25-60-41 and 25-60-42) are available upon request, or may be downloaded from the BaseWest website at www.basewest.com.