

**Champion Ignition Exciter Model CH92133**  
**Competitive Analysis**



The Champion Aerospace Ignition Exciter Assembly, Model CH92133 is eligible by **FAA-PMA** for use on the Rolls-Royce Model 250 Series I, II, III & IV turbine engines as approved for replacement of the following exciter models:

**Rolls-Royce**

PN 6899093

PN 6895573

**Unison**

PN 10-614950-1

PN 10-387150-1

PN 49522

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## Champion Ignition Exciter Model CH92133

### Competitive Analysis

#### Ignition Exciter CH92133 Operational Performance Summary

<b>Input Power</b>	14-30 VDC 1.1A typical, 1.5A (max.)
<b>Operational duty cycle</b>	Continuous @ 185°F (85°C)
<b>Operational Temp. Range</b>	-54 to +121°C
<b>Spark Rate</b>	5 to 15 sparks/second (Input voltage dependent)
<b>Output voltage</b>	7kV minimum (8kV typical)
<b>Output waveform</b>	Unipolar, 40µs spark duration
<b>Stored energy</b>	1.4 joules nominal

#### Significant & Unique Qualities

- The exciter consists entirely of solid state circuitry with no “wear out” characteristics to ensure consistent performance and long life
- The exciter does not contain radioactive materials as these materials are not necessary for operational stability
- The exciter presents the same footprint, form and weight as the OEM part so that installation and the weight/balance of the airframe is not affected

#### Ignition Exciter CH92133 Environmental Qualifications

- Vibration tested to 35g for 9 hours, 3 axis (Sinusoidal)
- Shock tested to 30g, 3 axis (Saw-tooth impulse)
- High temperature endurance tested at 250°F (121°C) 300 hours
- Low temperature tested at -65°F (-54°C)
- Tested for continuous operation at 26,000 ft. (7,925 m) equivalent altitude
- EMC tested per RTCA/DO-160E, radiated and conducted emissions
- Durable, environmentally resistant polyurethane finish

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#### Comparison to the OEM ignition exciter – Design Features

##### Unison Ignition Exciter

PN 10-614950-1

Housing – Solder sealed

Weight – 1.4lbs

HV switch – Spark Gap

Life limited

Radioactive "Krypton 85"

Repairable – **No**

##### Champion Ignition Exciter

PN CH92133

Housing – **Welded**

Weight – 1.4lbs

Solid State Spark Gap (S<sup>3</sup>G™)

**Non-limited life**

**Radiation free**

Repairable – **Yes**

#### Performance Comparison to the OEM ignition exciter

(Based upon a comparison of five samples of each model)

<u>Characteristic</u>	<u>Unison Ignition Exciter</u>	<u>Champion Ignition Exciter</u>
Energy at the plug:	0.4 joules nominal	0.4 joules nominal
In-rush current at 14Vdc:	29A (peak)	26A (peak)
Input current at 29Vdc:	1.3A <sub>rms</sub> (typical)*	1.1A <sub>rms</sub> (typical)*
Spark rate at 14Vdc:	4.6 spk/sec.	5.6 spk/sec.
Spark rate at 29Vdc:	12.3 spk/sec.	12.1 spk/sec.
Time to first spark at 14Vdc:	215 msec. nominal	200 msec. nominal
Output current:	825A (peak)	805A (peak)
Output voltage:	11.3kV (peak)*	9.5kV (peak)*
Spark duration:	36µsec. Nominal	40µsec. Nominal
		*(see Waveforms)

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## Champion Ignition Exciter Model CH92133

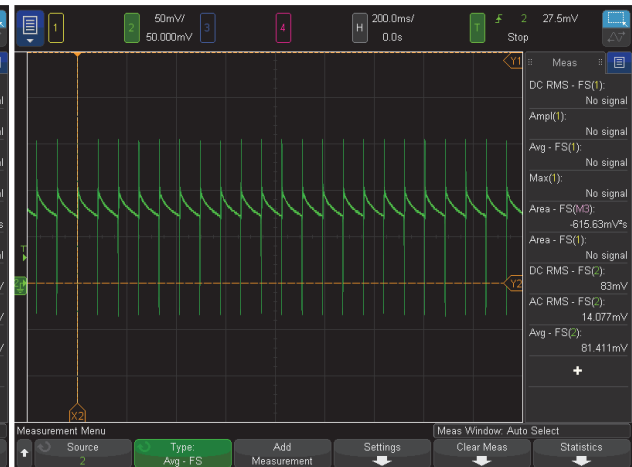
### Competitive Analysis

#### Input current waveform at 29Vdc:



#### **Unison PN 10-614950-1**

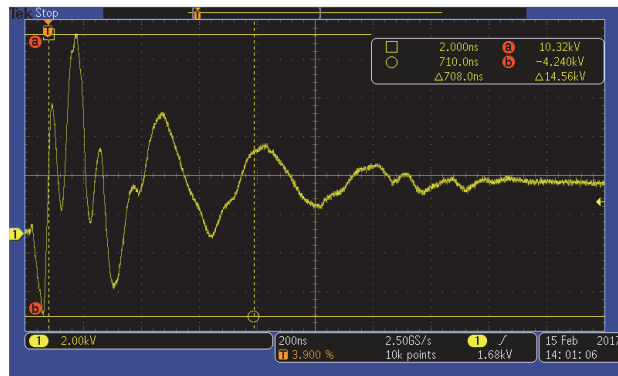
Continuous input current ripple is evident and results in higher AC<sub>rms</sub> current.



#### **Champion PN CH92133**

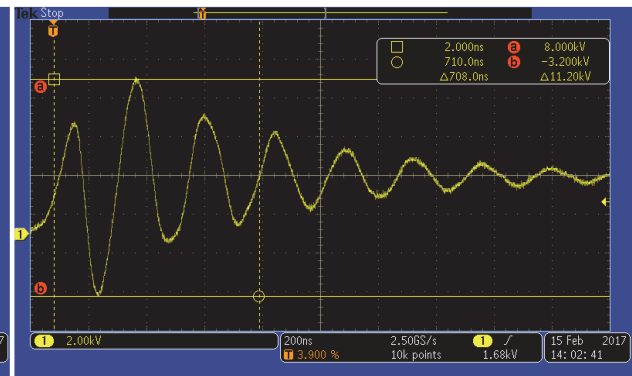
Reduced amplitude "peaks" with overall reduced ripple current.

#### Output voltage waveform (open circuit):



#### **Unison PN 10-614950-1**

High frequency of initial voltage transitions can produce inconsistent voltage peaks due to differing lead and igniter characteristics.



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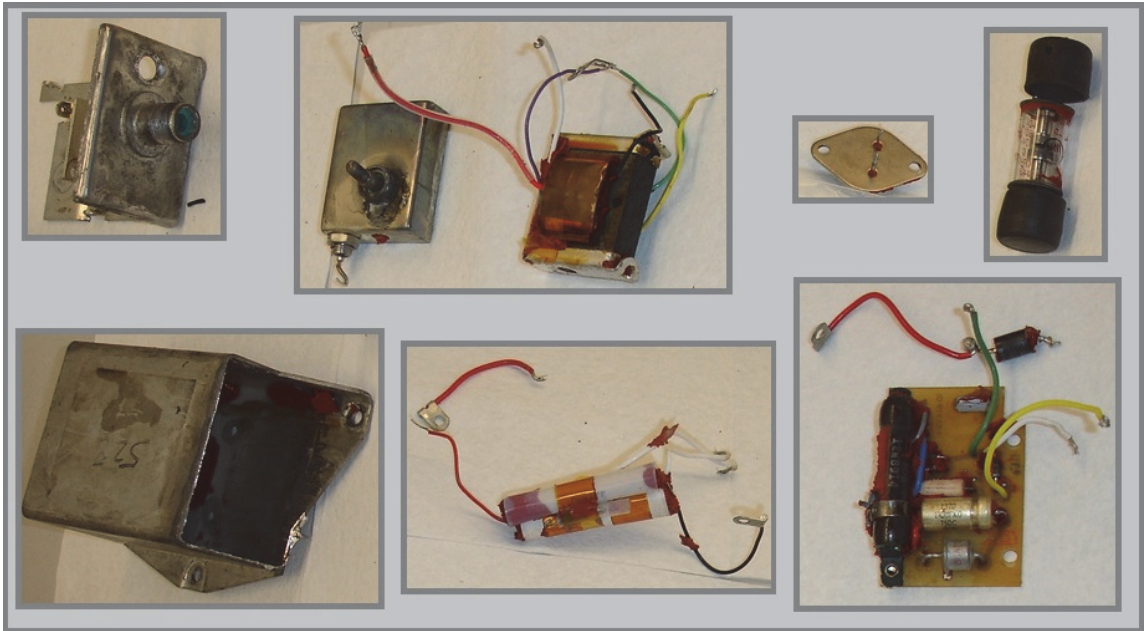
A "smooth" waveform, a result of the controlled switching action of the "S<sup>3</sup>G™"

produces improved output consistency and reduced dielectric failure potential.

### Champion Ignition Exciter Model CH92133

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#### Internal details of Unison Exciter PN 10-614950-1:



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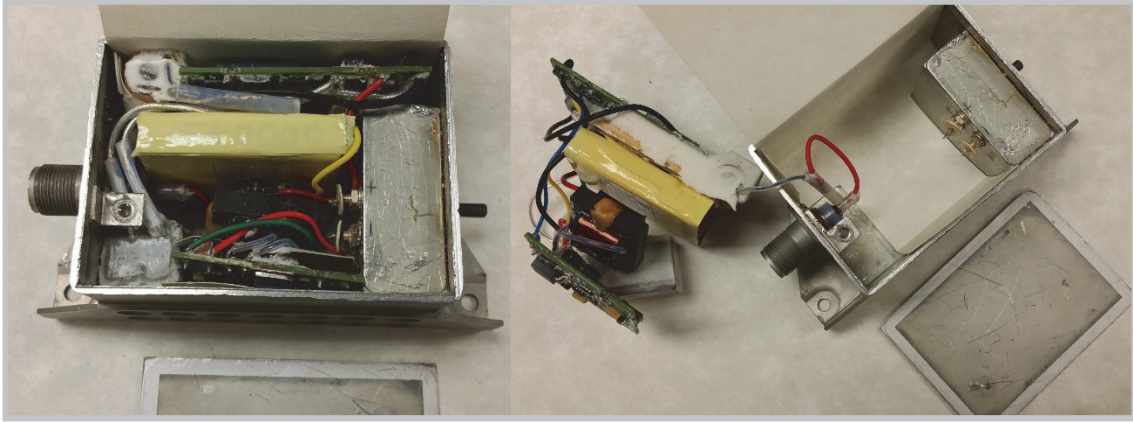
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