





# **FB77WPCC/T04**

M-18 Iridium Industrial Spark Plug





### **FB77WPCC Design Evolution**

• Federal-Mogul/Champion was the first industrial ignition to market with a Pt alloy and Ir alloy dual precious metal product in 1988 and has been the global market leader for industrial ignition technology.

• The RB77WP was introduced in the late 1980's, it evolved into the RB77WPC, and then later became the RB77WPCC in the late 1990's.

 After 20+ years of production experience, over three million RB77WPCC's have been produced, servicing a global gas compression and generator market.

 In 2011, Federal-Mogul/Champion has taken the next step in the evolution to the FB77WPCC Iridium Spark Plug.

 The evolution of the FB77WPCC Iridium Spark Plug has been driven by advances in market/ application technologies and requirements. Increased engine thermal efficiencies/BMEP loads, higher operating temperatures, more corrosive fuels, and longer service life intervals have all paved the way to the new 'FB' design.



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### FB77WPCC Iridium Design Characteristics







#### **IFISS vs. Capsule Resistor**



IFISS offers tight resistance control across the entire temperature operating window, magnitudes improvement vs. capsule resistor

Specifically designed for industrial applications, IFISS is a fired in suppressor seal, which significantly improves both resistance and suppression capability over the life of the plug.





### **FB77WPCC Electrode Enhancements**

#### **Centre Electrode and Ground Electrode Temperature Comparisons**



RB77WPCC GE Cross Section

FB77WPCC GE Cross Section

**RB77WPCC** 

FB77WPCC

- Thin-walled and exposed Cu on new design provides cooler running temperature at centre electrode tip of 65-125°C.
- Core seal on IFISS design shows lower temperature of less than 50°C compared to RB77WPCC design
- 25% increase in cross section area (ground electrode) equates to less than 15°C cooler temperature at electrode tip and significantly improved heat transfer out.

GA EMEA



# **FB77WPCC Hot Lock Shell Seal**



• At 55MPa applied pressure the new hot-lock design shows a 40% reduction in core lift due to increased shell rigidity and pre-assembled load.

 Increased rigidity and pre-assembled load also provide a more consistent, evenly distributed, and higher compression load at the lower shell seat, resulting in improved sealing against combustion gases.



# **FB77WPCC Hot Lock Shell Seal**

#### Hot Lock vs. Sillment Shell Seal Comparisons





Hot Lock FB77WPCC

 At 69MPa applied pressure the new hot-lock design results display "zero" set after release of pressure compared to 0.0025mm lift measured from the Sillment design.



### **FB77WPCC Assembly Robustness**

#### Hot Lock vs. Sillment Shell Seal Comparisons – Shell Torque Strength



• Shell torque strength testing displayed the hot-lock design to be 25% stronger than the Sillment shell seal design at the smallest cross section. This improvement gives a more robust shell/assembly design allowing for a higher 'margin of error' over torque conditions during engine assembly/disassembly process.

### FB77WPCC Weld Process Enhancements



#### **Advanced Laser Welding Process**



**FB77WPCC** Ground Electrode – Cross Section and A Top View



**Current RB77WPCC** 

- Modulated Continuous Wave (SMCW) Laser Benefits
  - Consistent/uniform weld penetration and coverage
  - Improved bi-metal alloying through improved heat/energy control
  - Multi-configuration compatible (precious metal)
  - Fully automated
  - Weld parameter/input flexibility

# **FB77WPCC Longer Run Life**



#### FB77WPCC Service Life Advantage

FB77WPCC service life advantage is made possible through the key product improvement areas including;

> IFISS Core Technology
> Electrode Enhancements
> Hot Lock Shell Seal

Product validation via field testing has been completed on multiple OEM applications across the world running on various fuels including CNG, Bio, and Landfill.



### FB77WPCC/T04

T04 = 4 PACK Shipping Carton = 48 (12 x T04 pack)

PACK	BARCODE	Lmm	W mm	H mm	KG
1	0 37551 01235 0	130	34	33	0.119
4	0 37551 16156 0	136	35	138	0.475
48	100 37551 16156 7	292	228	152	5.704



