



STITT Spark Plug Company

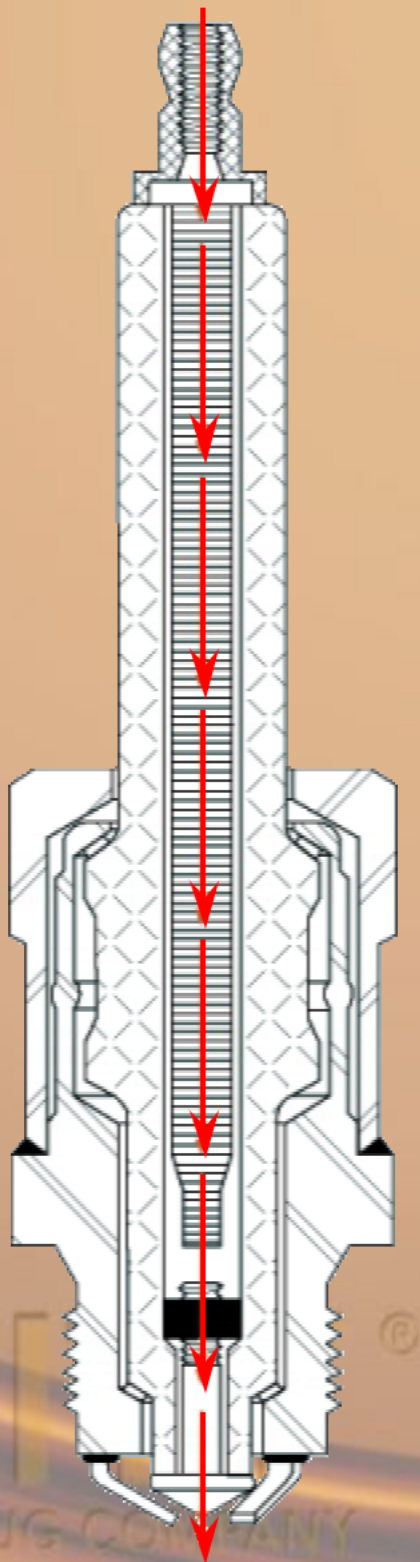
Spark Plug

101

Presented By
Ken Blanchard

STITT®
SPARK PLUG COMPANY

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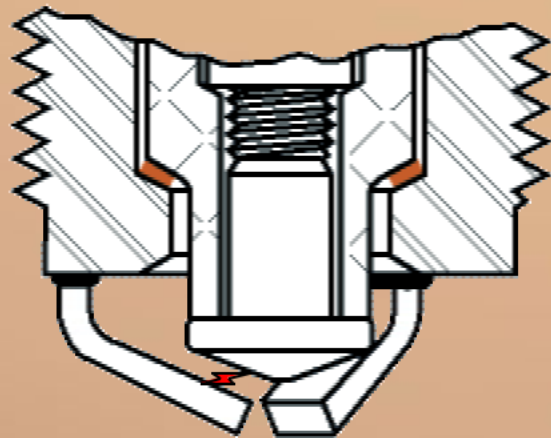


Electrical “Feed Through”

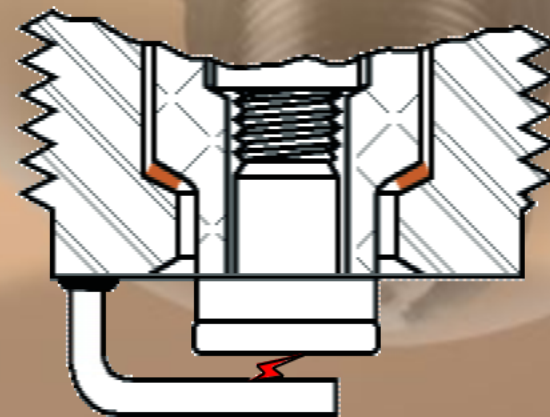
Purpose

To conduct the voltage and energy from the ignition system and transfer it in the form of an electrical arc across a set gap to ground inside the combustion chamber.

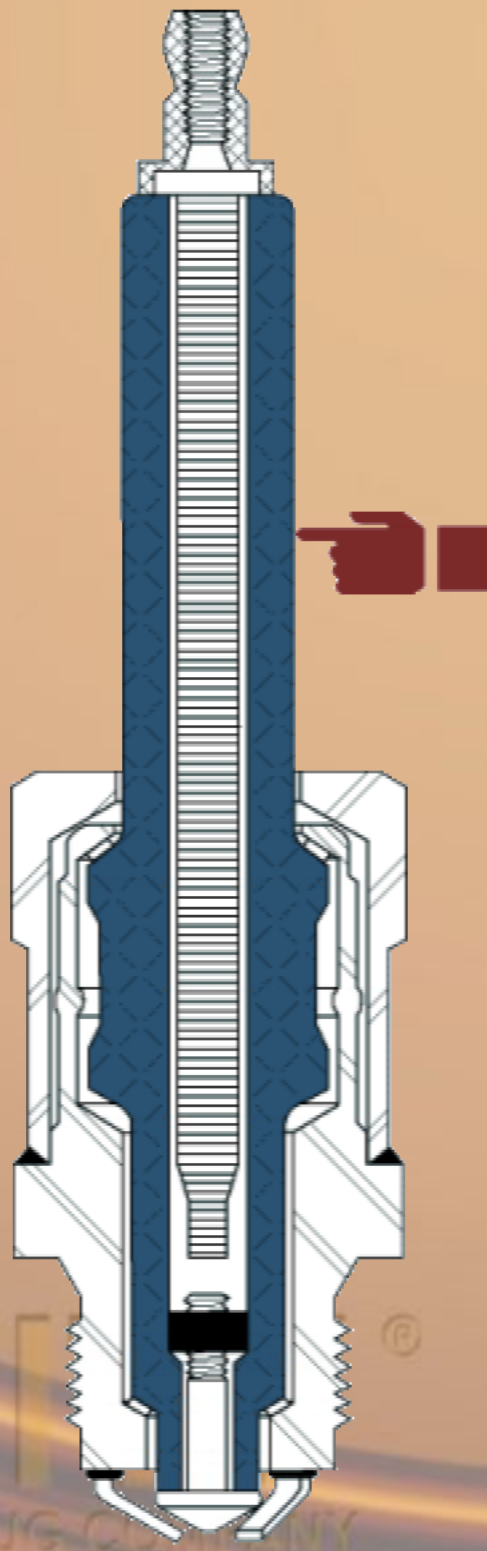
Energy is discharged in the combustion chamber as a timed event.



Multiple Electrode



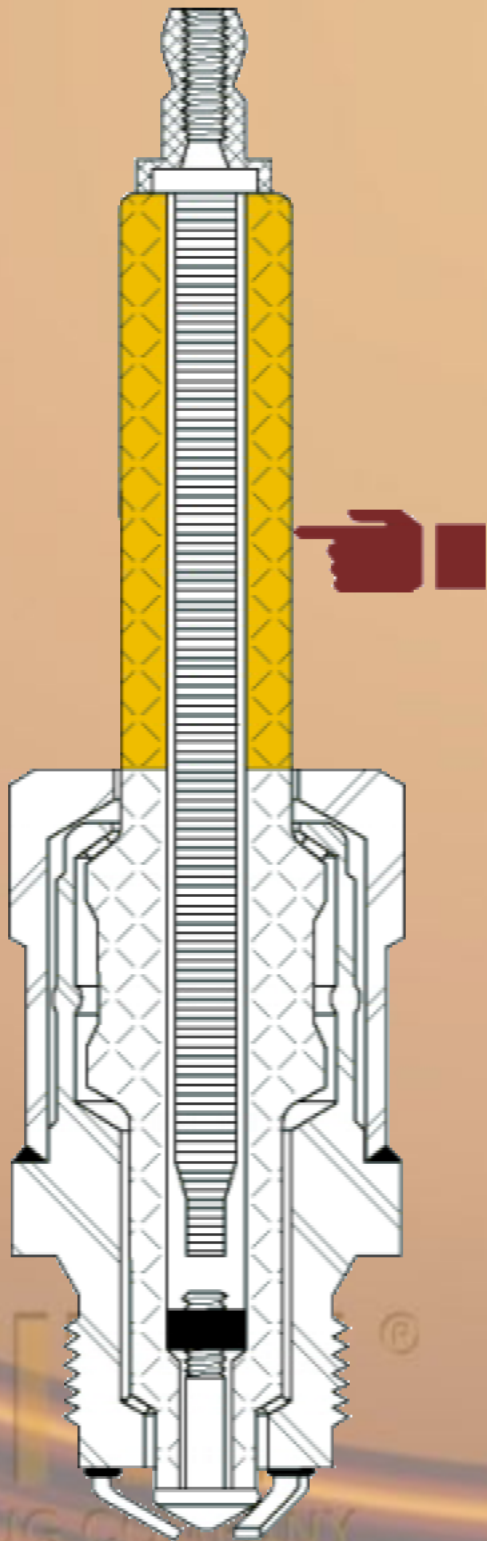
Single Electrode

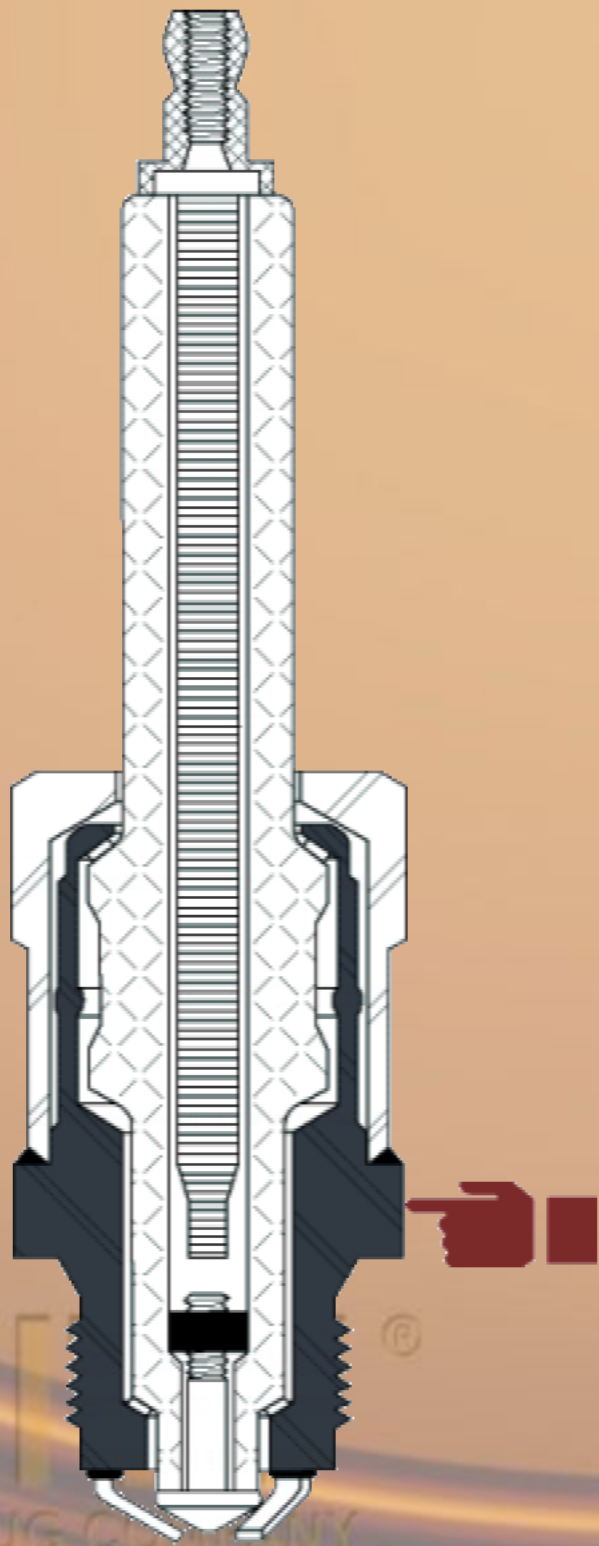


Ceramic Insulator



Flash-Over of Insulator

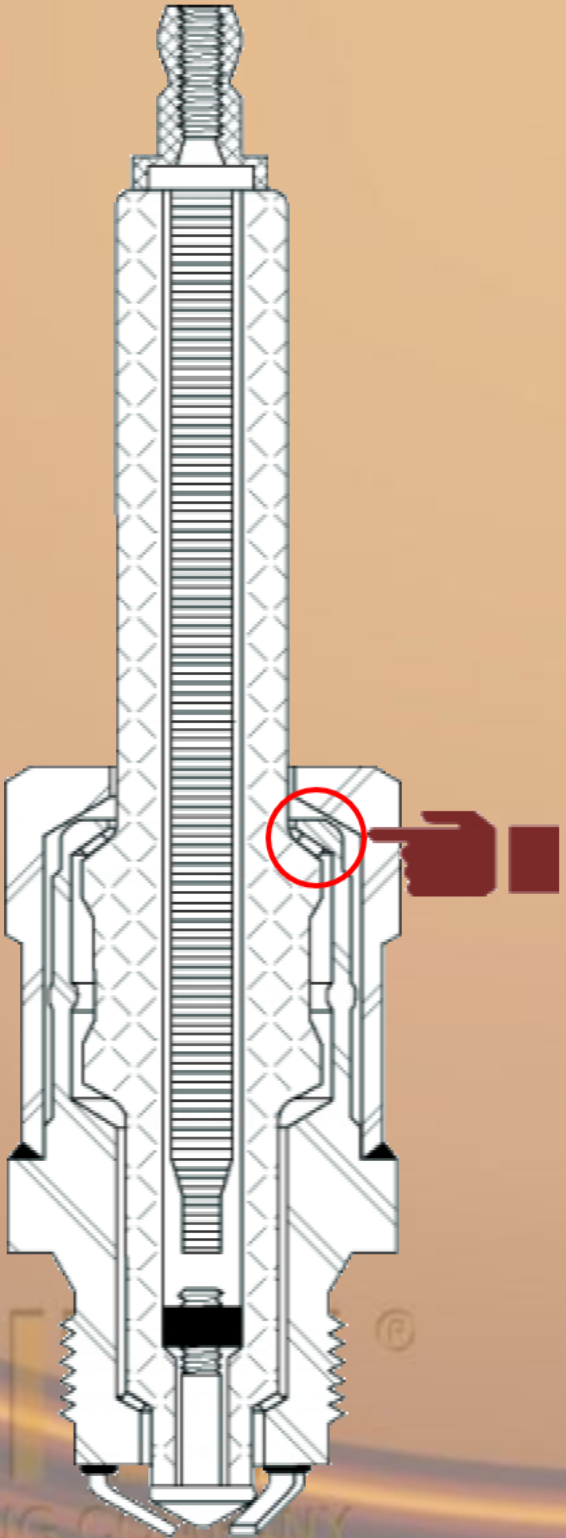




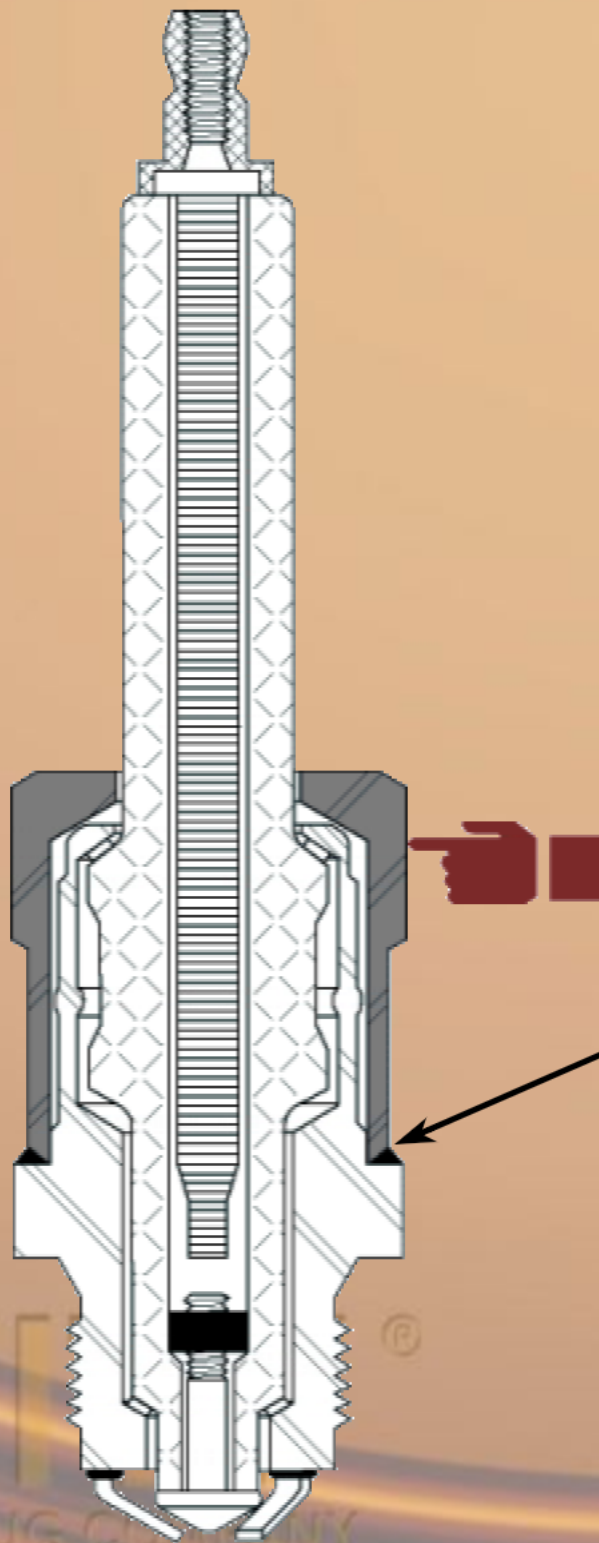
Steel Shell



Steel Shell Crimp

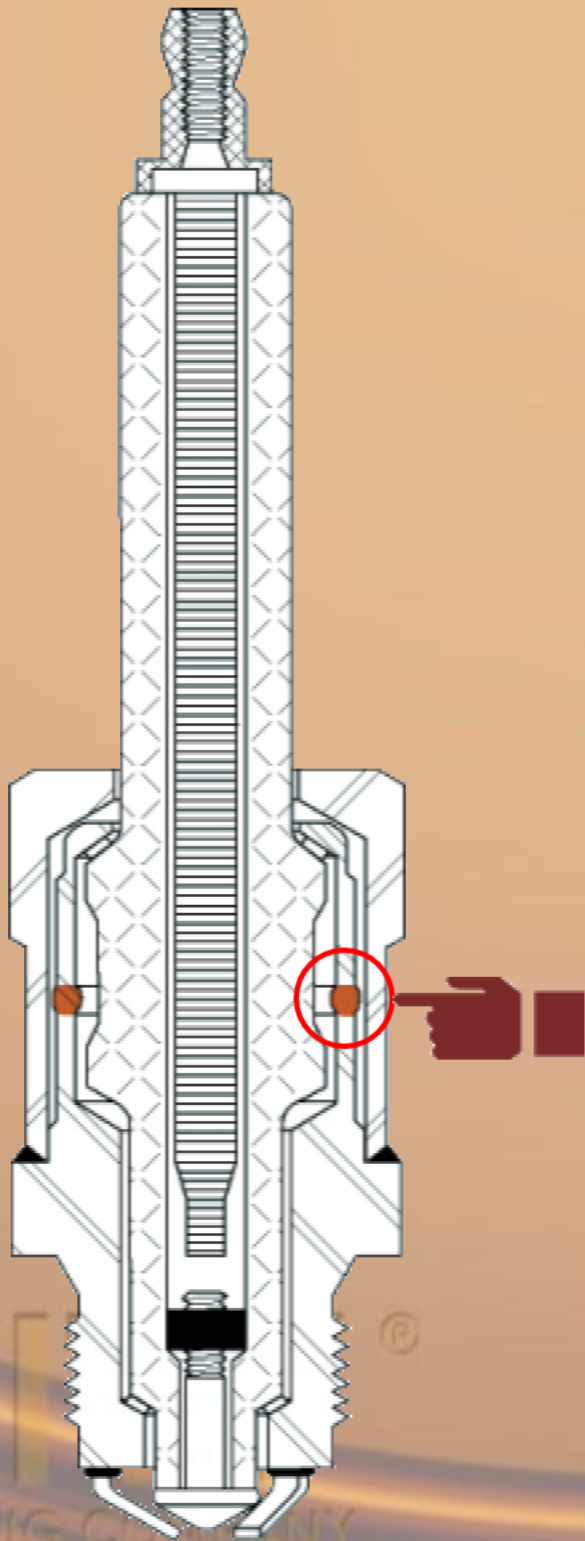


Safety Restraint

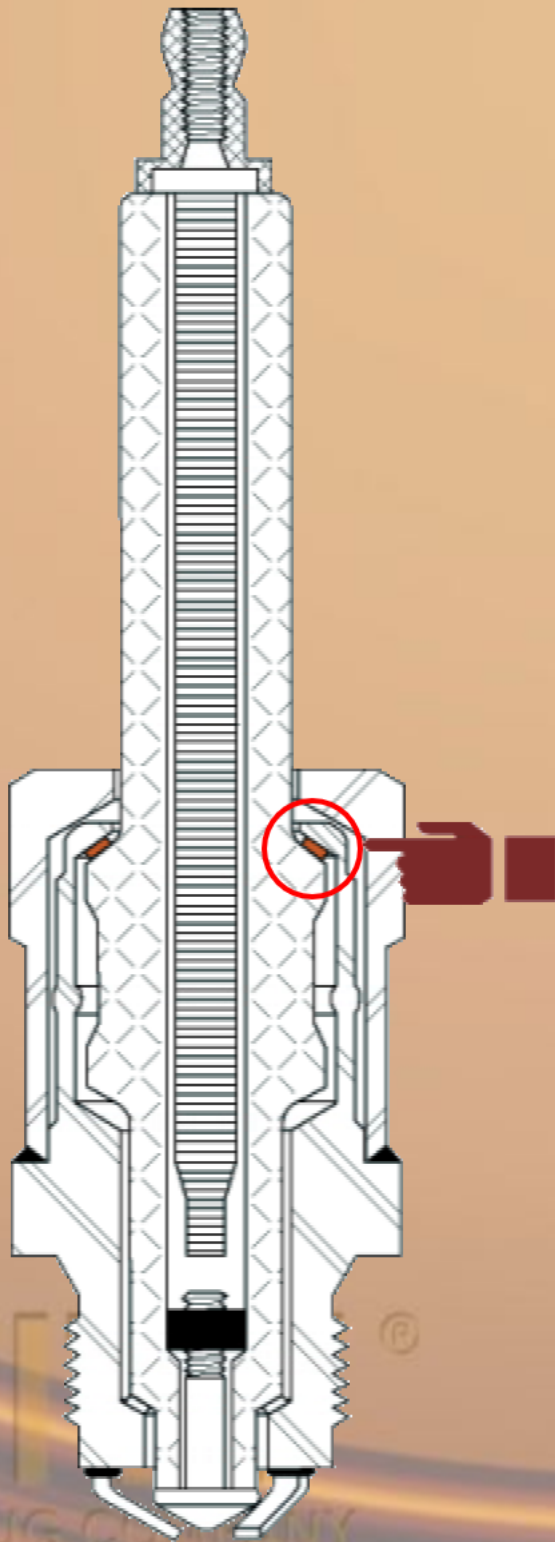


Restraint Welded to Shell

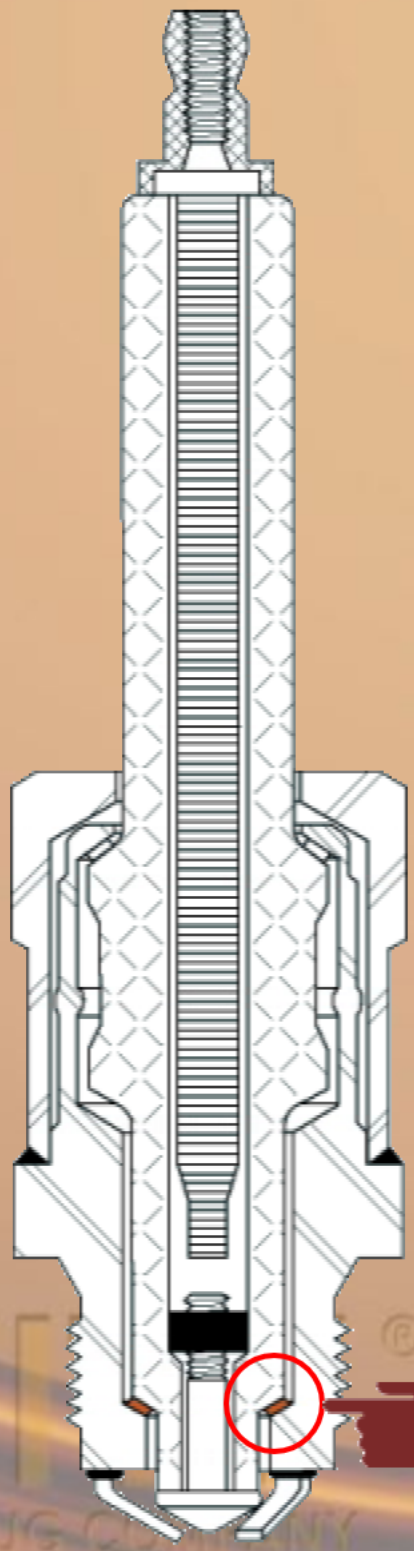
Shell Heat Collapse Ring



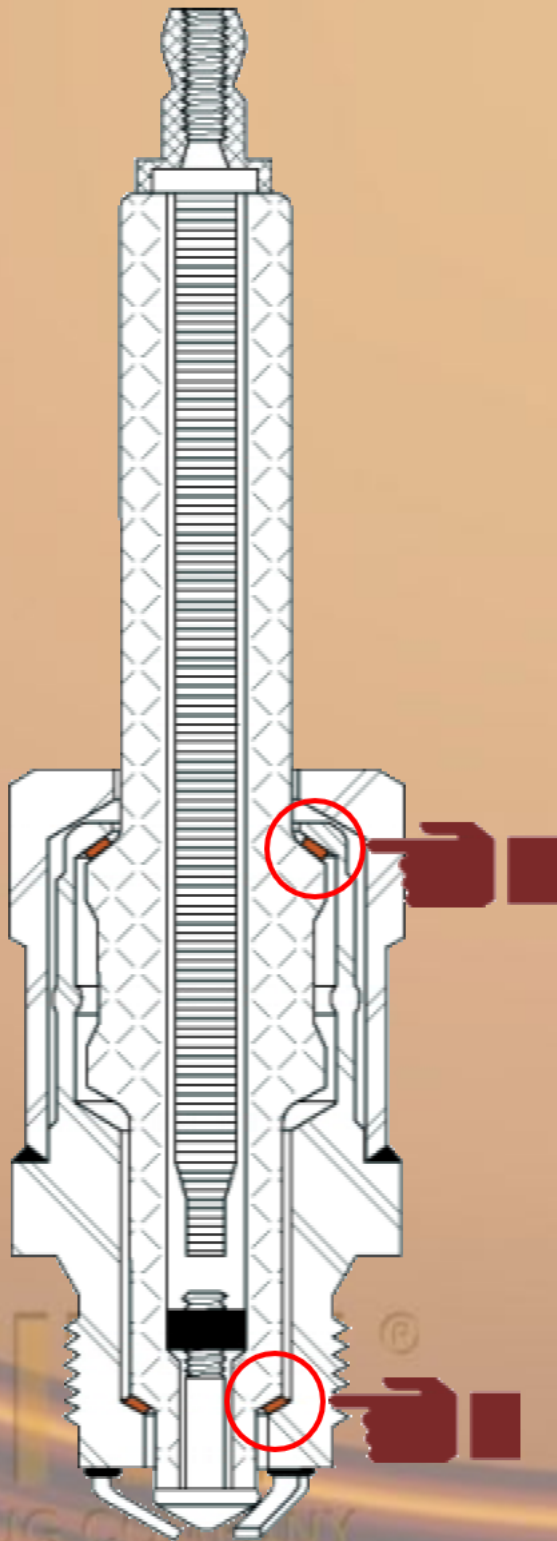
**Top Ceramic
To Steel Shell Seal**

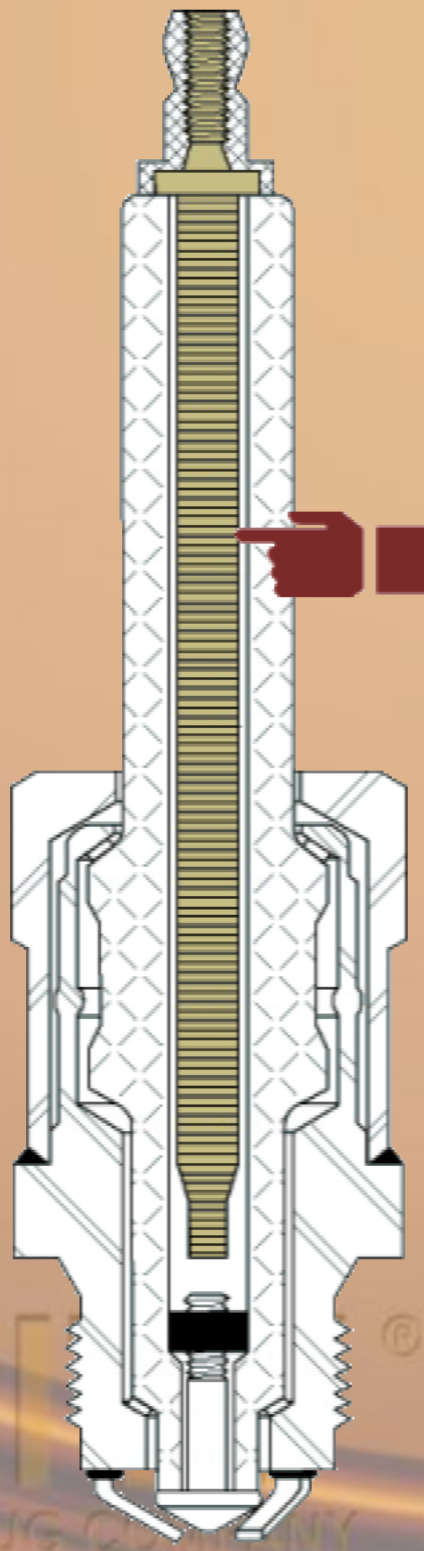


Bottom Internal Seat Gasket



Both Top and Bottom Seals

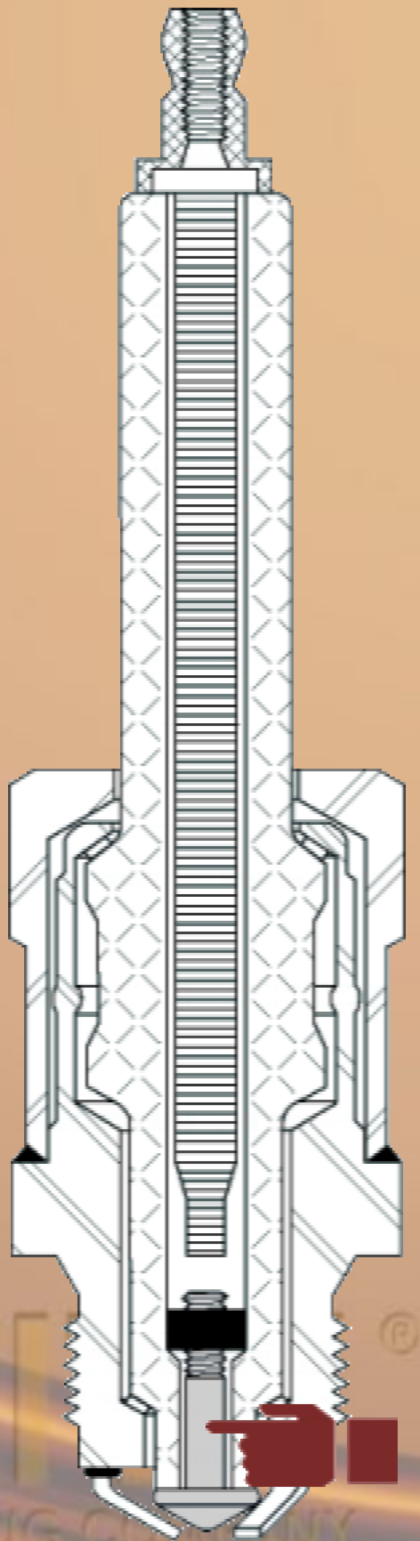




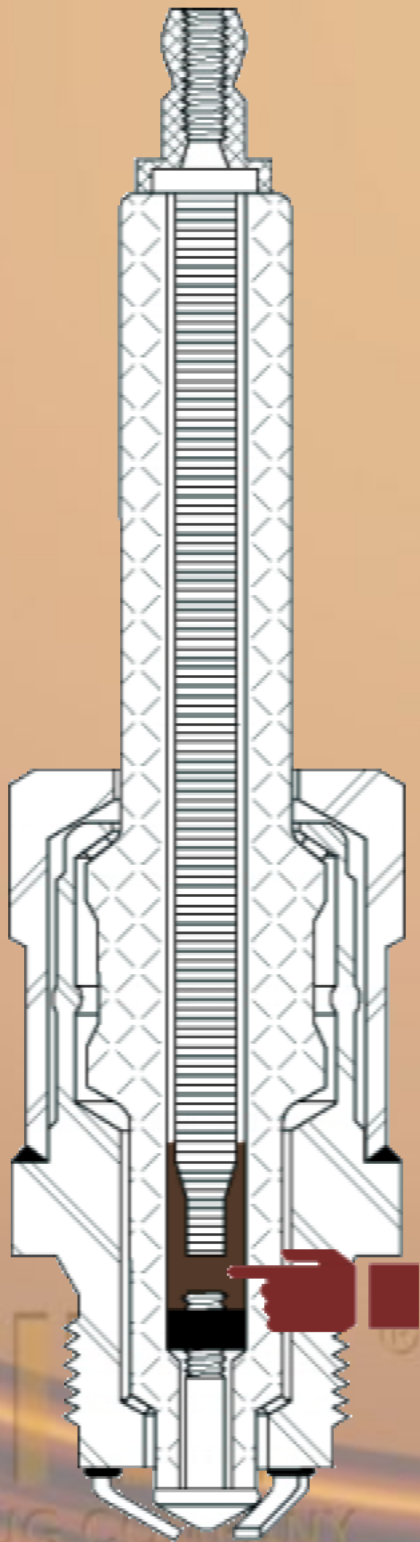
Steel Rod

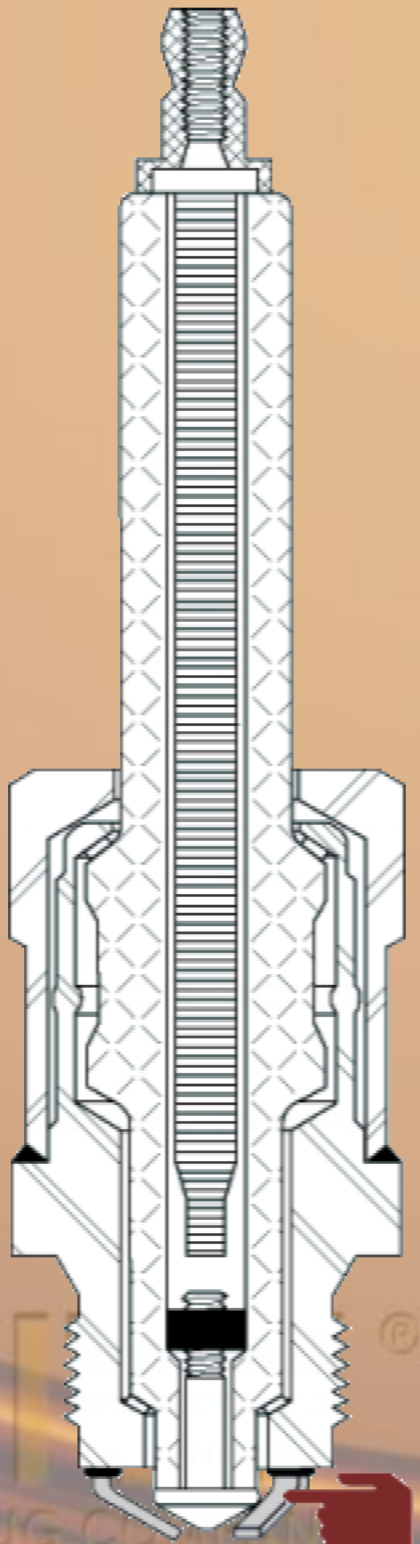


Nickel Center Electrode



**Copper Glass or
Resistor Bore seal**

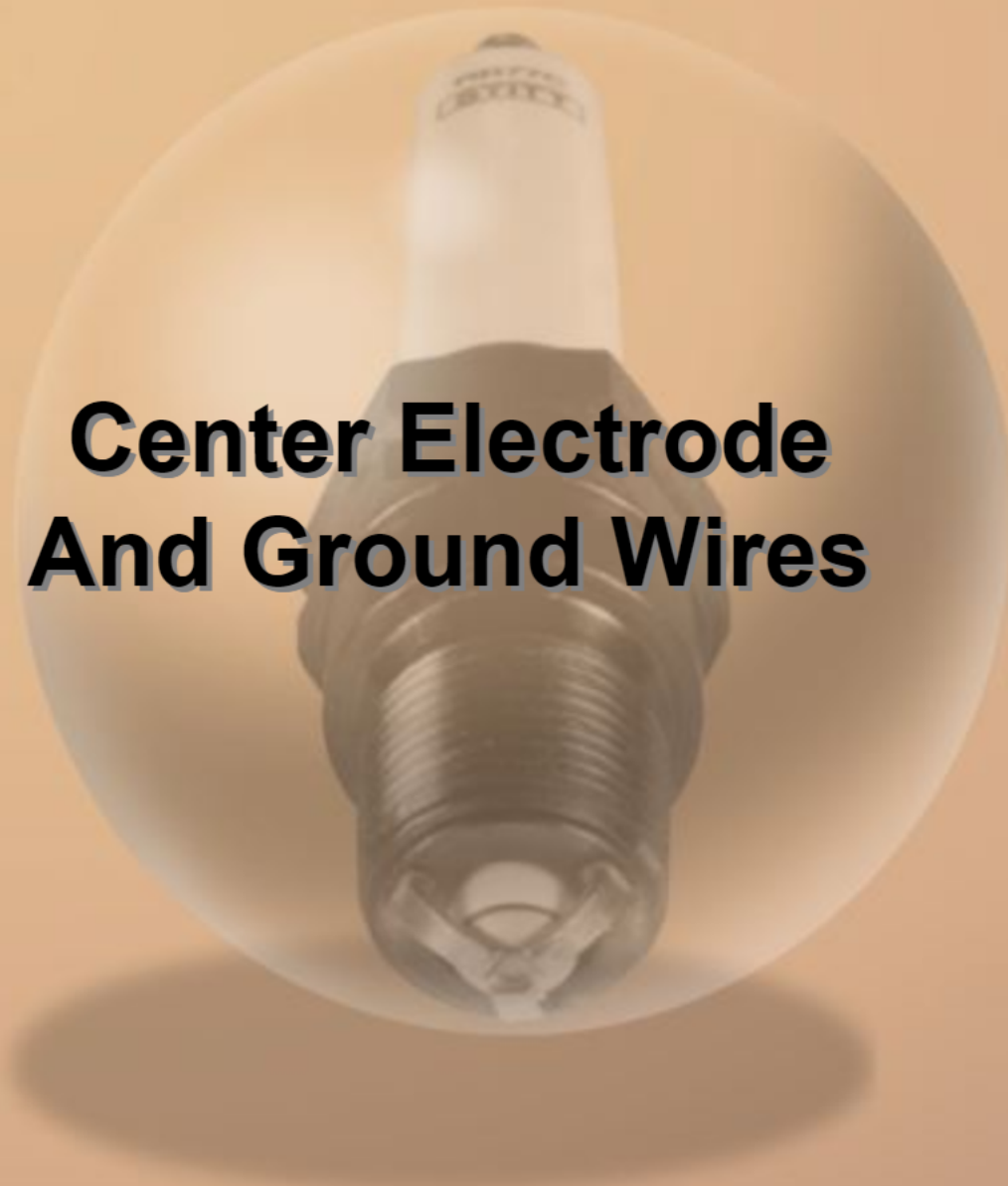
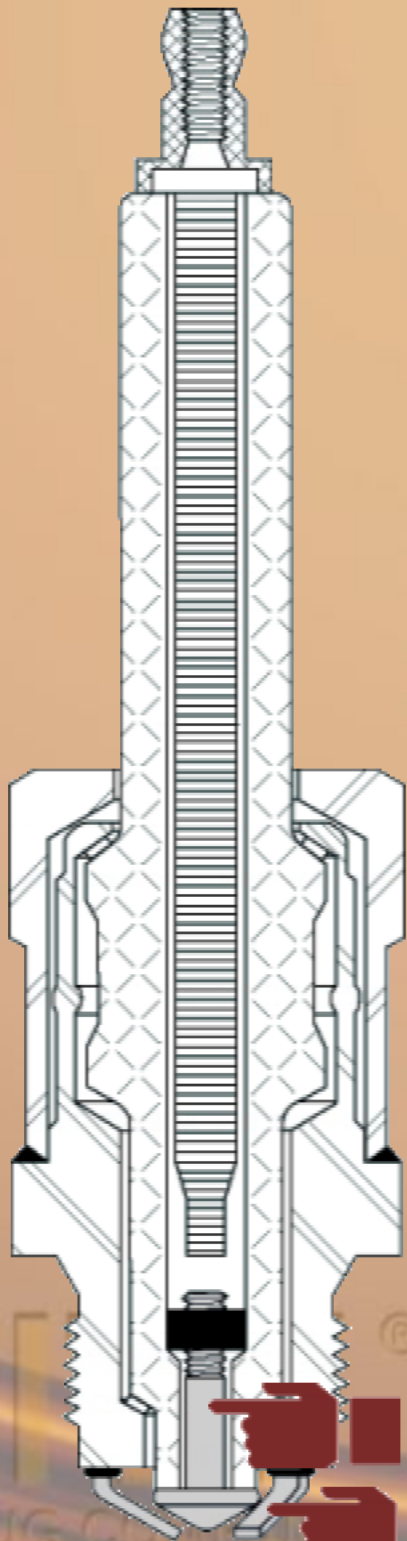


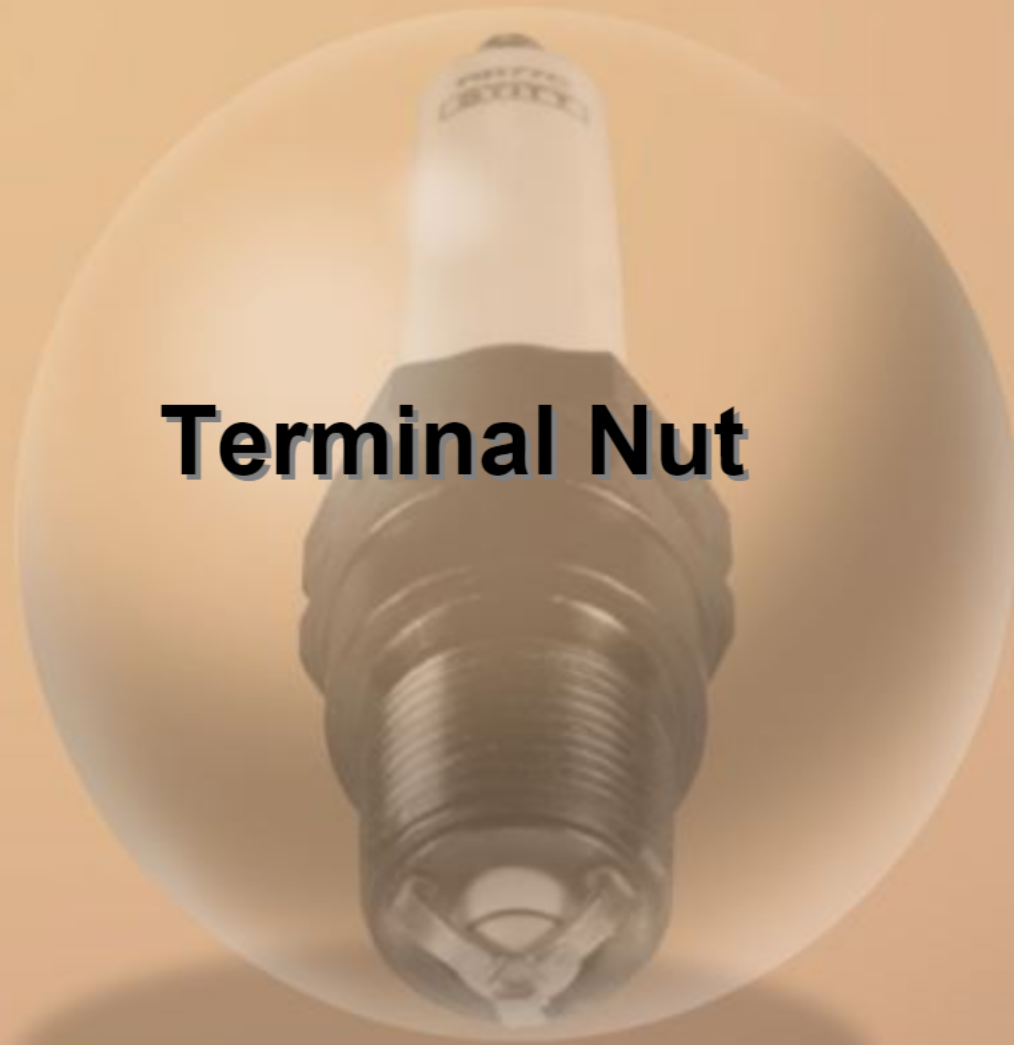
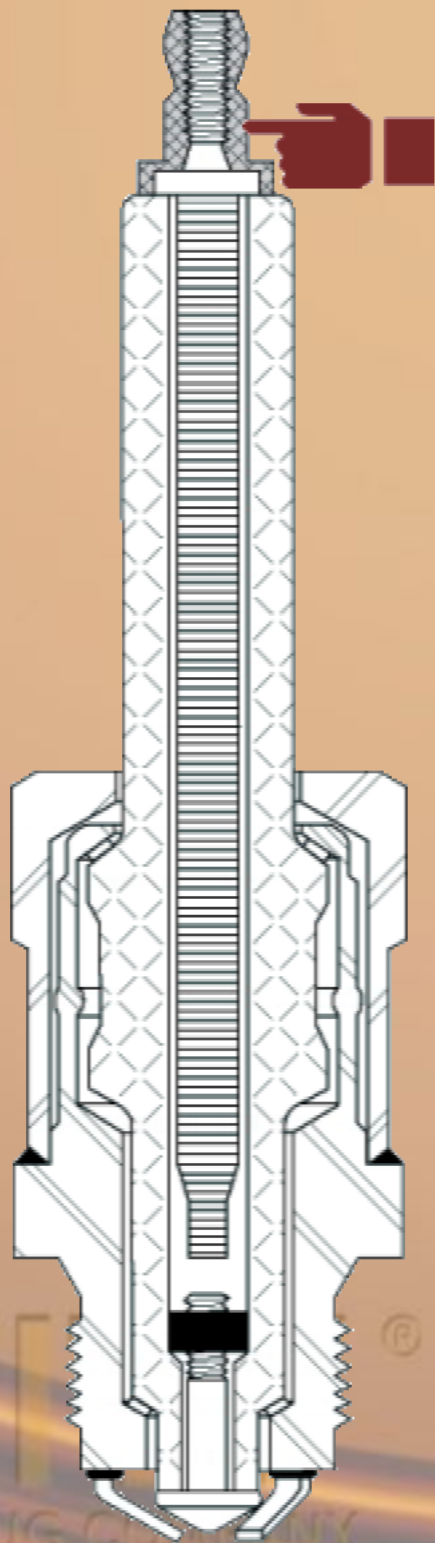


**Nickel
Ground Wires**



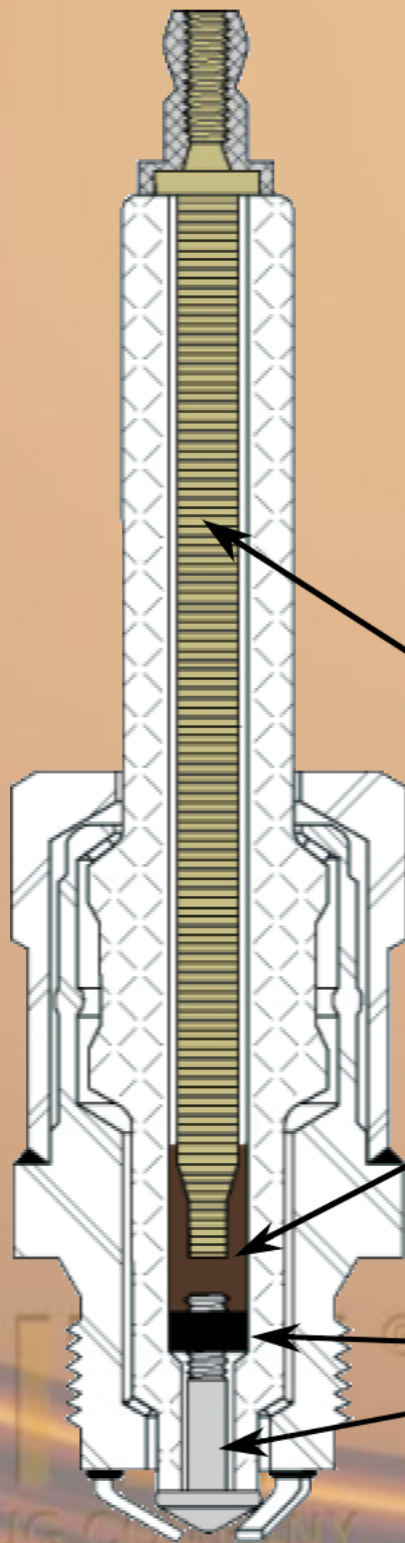
Center Electrode And Ground Wires





Terminal Nut

Schematic of Ceramic Insulator Construction

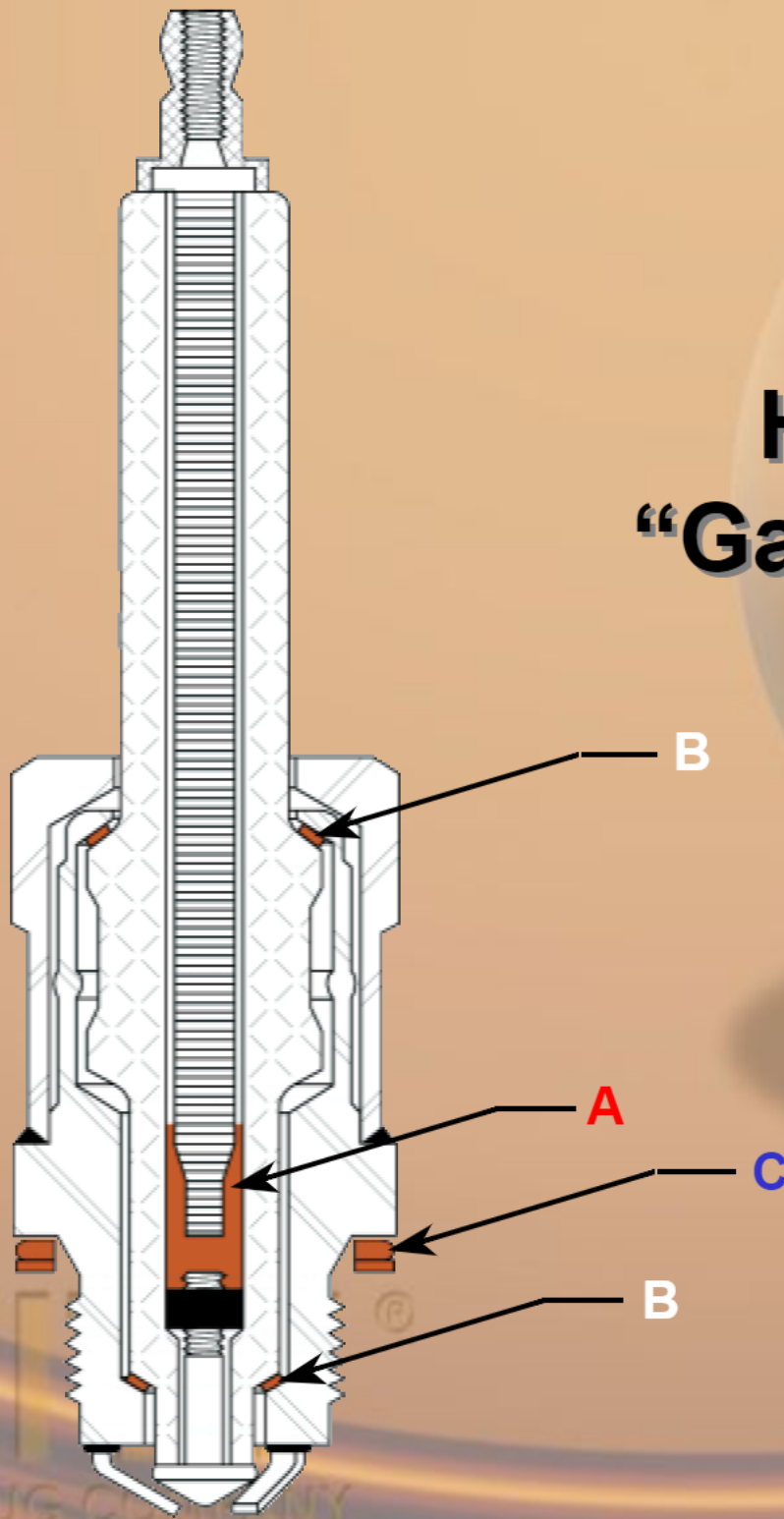


**Terminal Post / Center Insulator
Conducting Rod**

**High Temperature Copper and Borosilicate
Glass Non-Resistor or Borosilicate Glass
and Resistor Sealing Material**

**Nickel Center Electrode and Steel
Locking Nut**

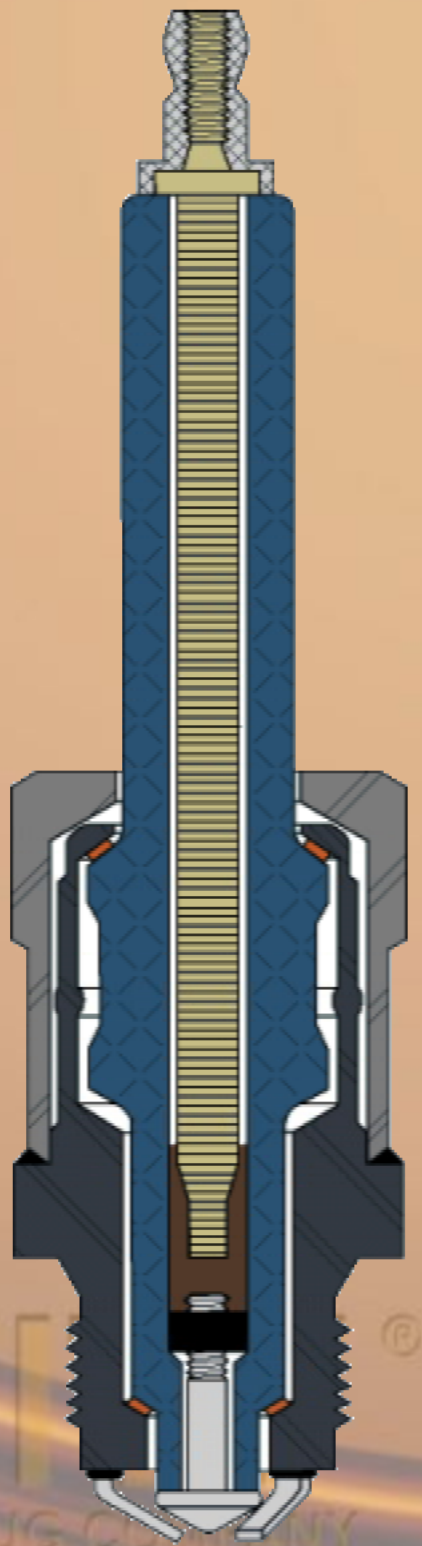
High Temperature “Gas-Tight Seal Zones”



A. Center Insulator Bore Seal

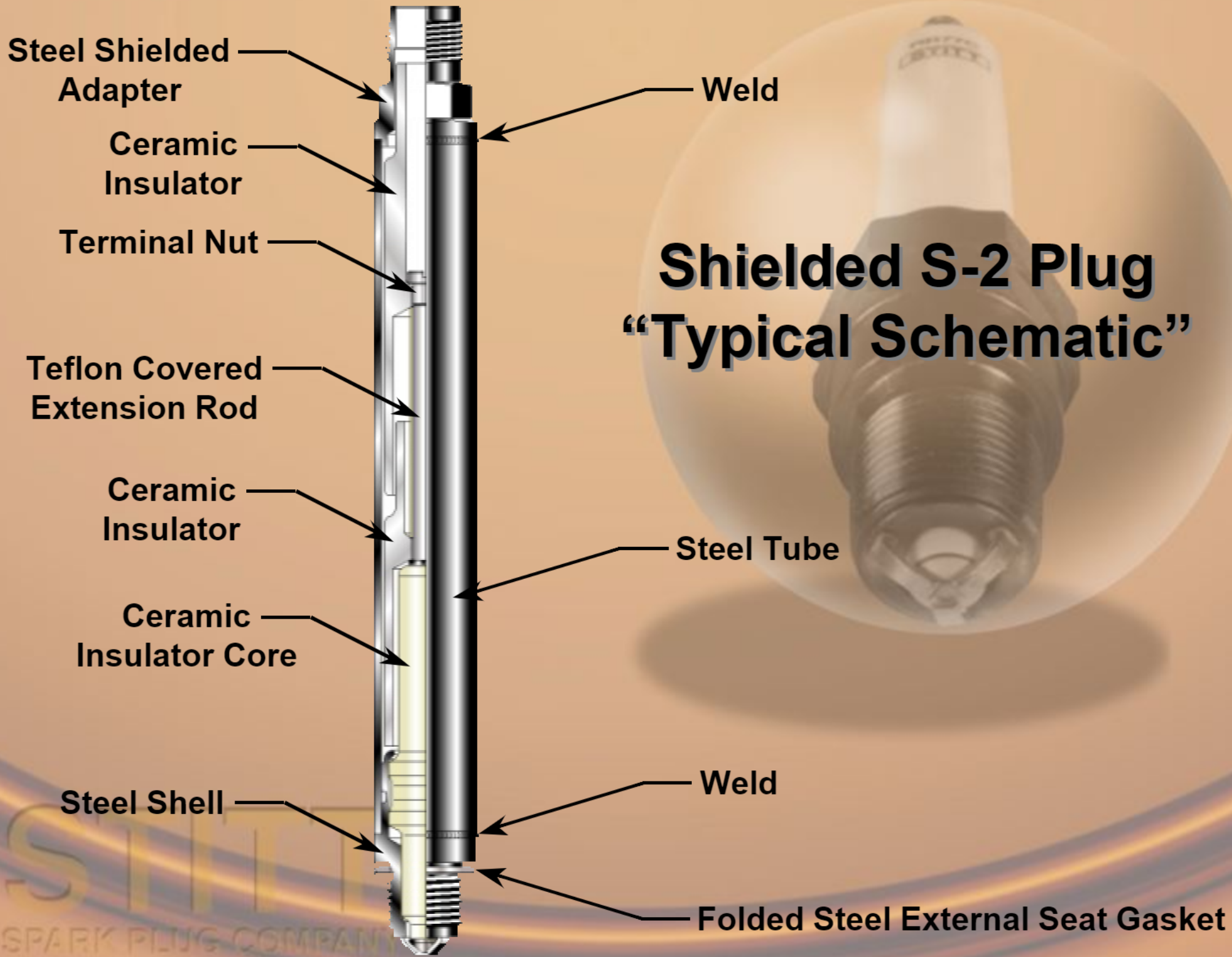
B. Bottom Internal Seat Gasket / Steel Shell To Insulator Seal Gasket

C. Folded Steel External Seat Gasket



Completed Spark Plug Schematic





Steel Shielded Adapter

Ceramic Insulator

Terminal Nut

Teflon Covered Extension Rod

Ceramic Insulator

Ceramic Insulator Core

Steel Shell

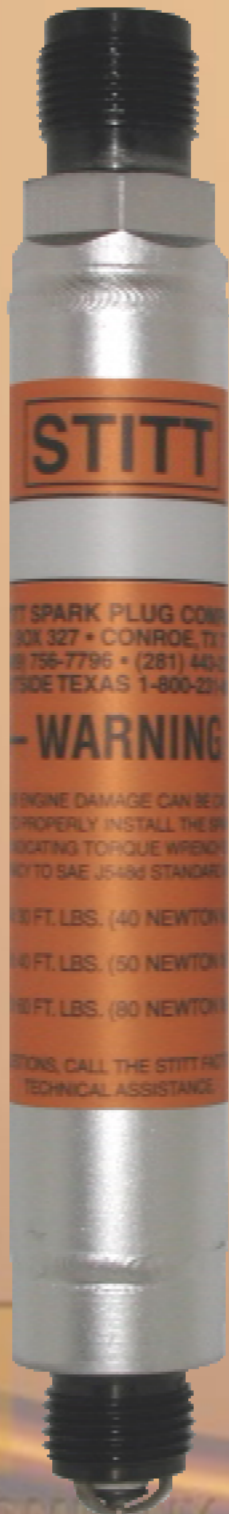
Weld

Steel Tube

Weld

Folded Steel External Seat Gasket

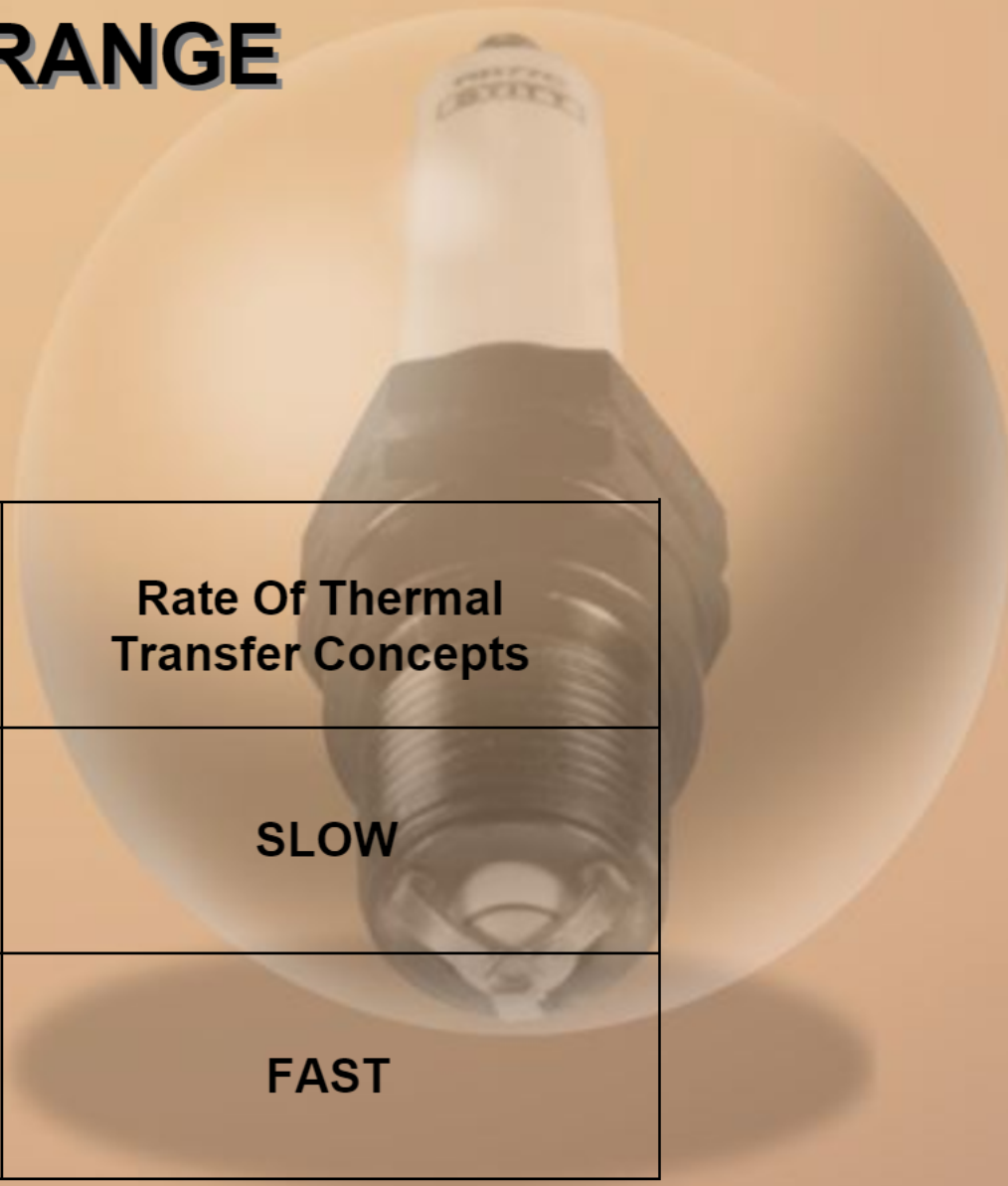
Shielded S-2 Plug "Typical Schematic"



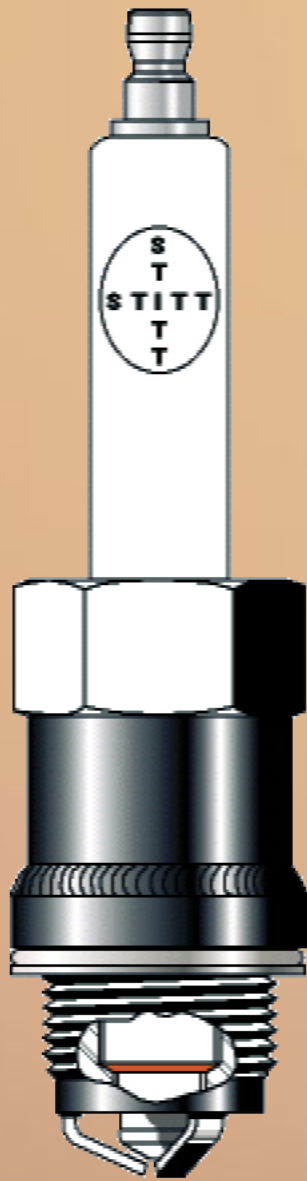
Typical S-2 Style Spark Plug



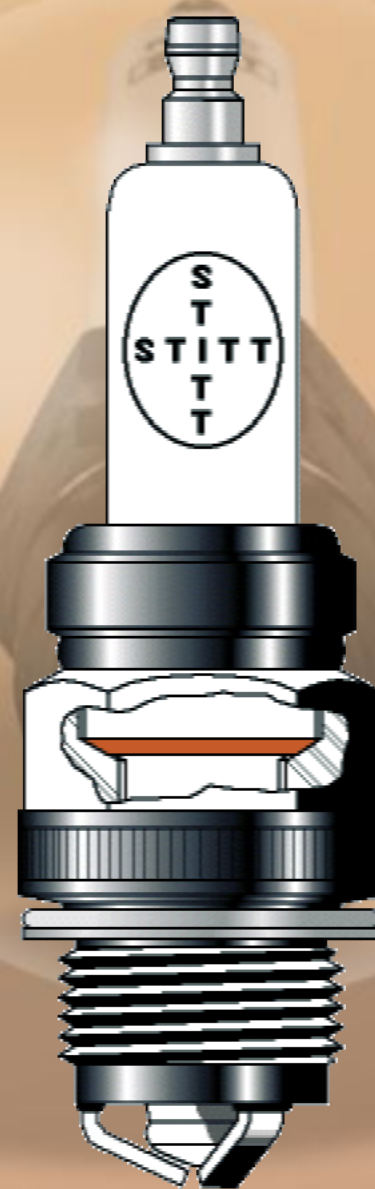
HEAT RANGE



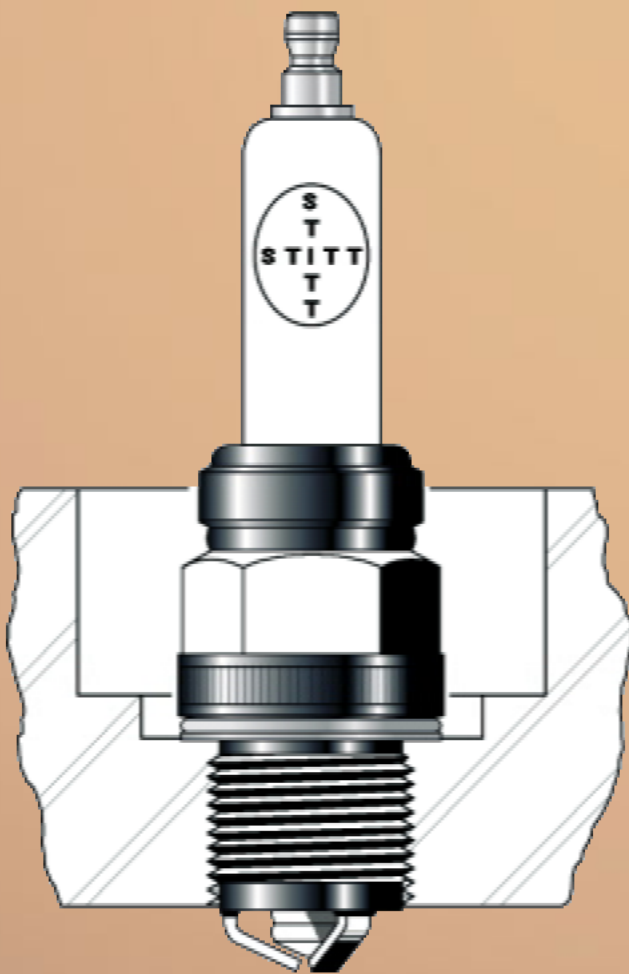
Historical Heat Range Expressions	Rate Of Thermal Transfer Concepts
HOT	SLOW
COLD	FAST



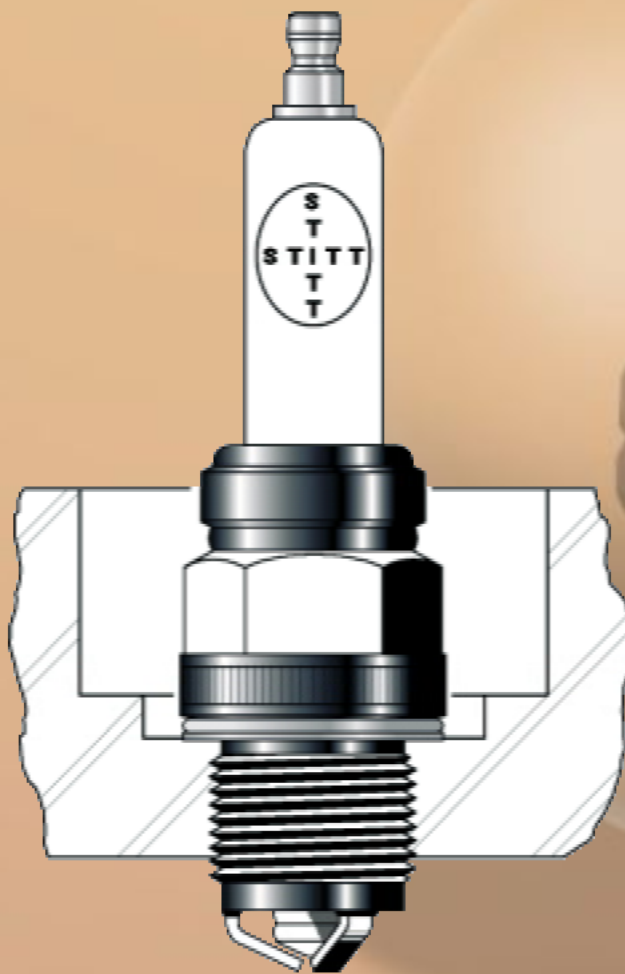
Low Seat Spark Plug
“Cold Heat Range”



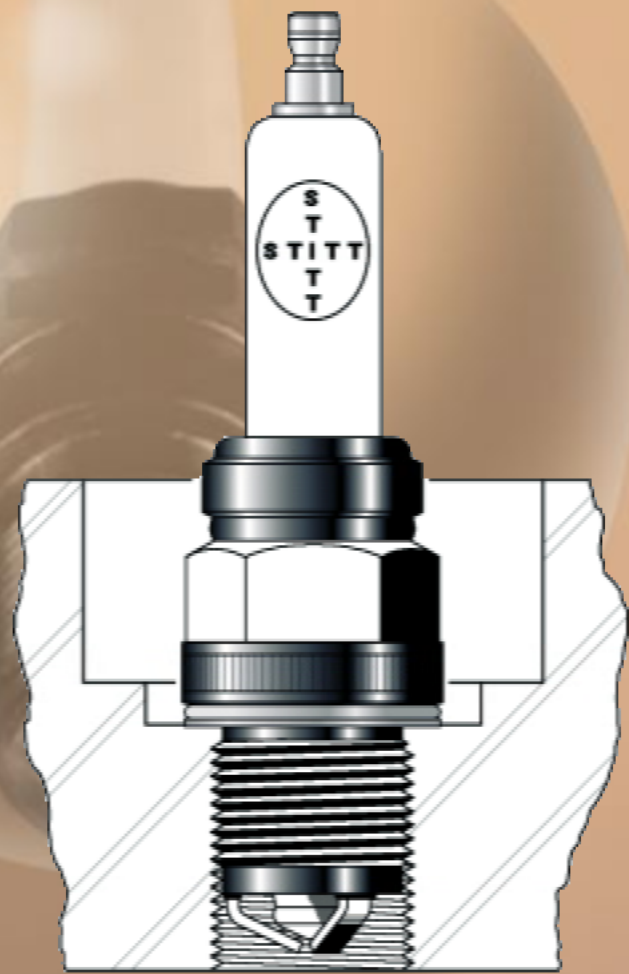
High Seat Spark Plug
“Hot Heat Range”



**Proper Spark Plug
Reach In Port**



**Spark Plug Reach
To Long In Port**



**Spark Plug Reach
To Short In Port**

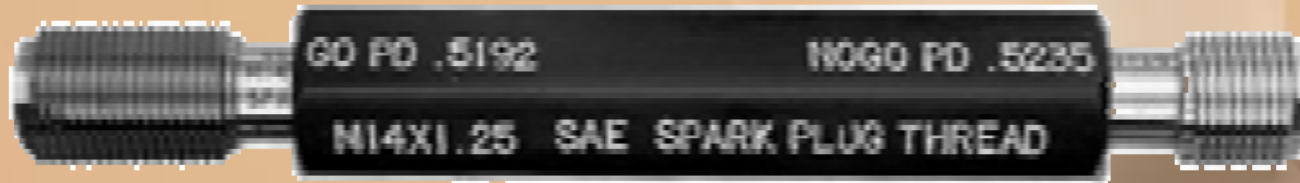
SPARK PLUG THREAD SIZES

Society Of Automotive Engineers

STANDARDS FOR SPARK PLUGS, J548d

Spark Plug Thread Size	Major Diameter		Pitch Diameter		Minor Diameter	
	Max.	Min.	Max.	Min.	Max.	Min.
14mm x 1.25mm - plug	13.868mm (0.5460")	13.741mm (0.5410")	13.104mm (0.5159")	12.997mm (0.5117")	12.339mm (0.4858")	
		14.034mm (0.5525")	13.297mm (0.5235")	13.188mm (0.5192")	12.692mm (0.4997")	12.499mm (0.4921")
18mm x 1.5mm - plug	17.955mm (0.7069")	17.803mm (0.7009")	16.980mm (0.6685")	16.853mm (0.6635")	16.053mm (0.6320")	
		18.039mm (0.7102")	17.153mm (0.6753")	17.026mm (0.6703")	16.426mm (0.6467")	16.266mm (0.6404")
7/8" - 18 - plug	22.225mm (0.8750")	22.017mm (0.8668")	21.295mm (0.8384")	21.191mm (0.8343")	20.493mm (0.8068")	
		22.225mm (0.8750")	21.412mm (0.8430")	21.308mm (0.8389")	20.851mm (0.8209")	20.698mm (0.8149")

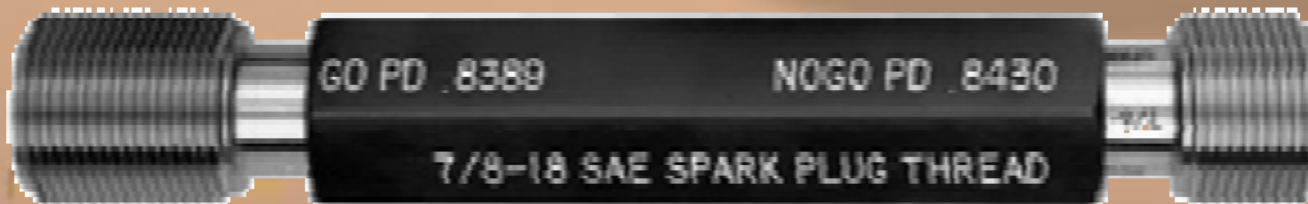
Go / No-Go Gages



14mm x 1.25 SAE Spark Plug Thread Go / No-Go Gage

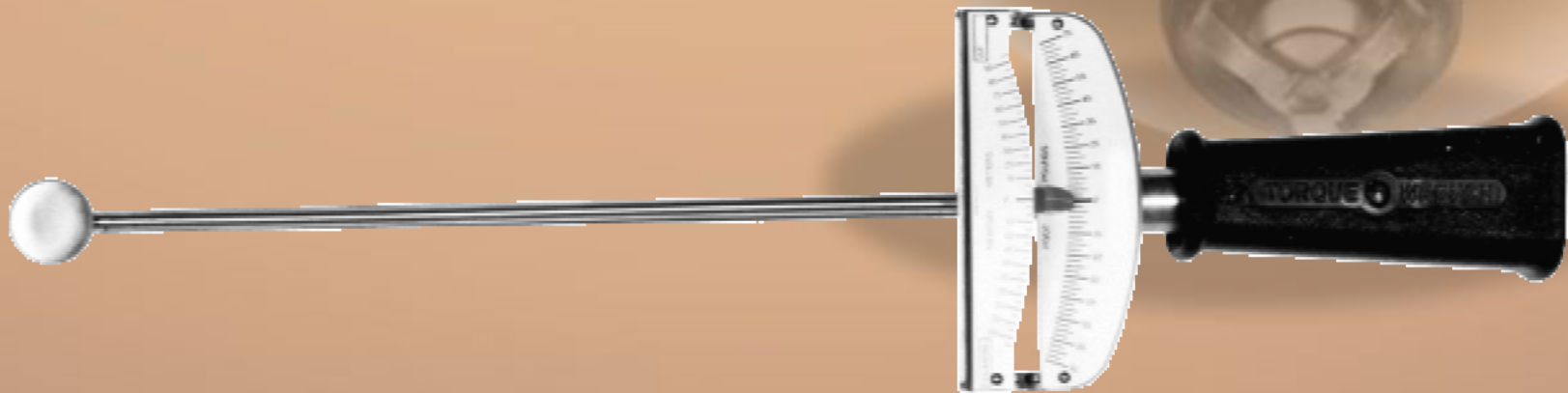


18mm x 1.5 SAE Spark Plug Thread Go / No-Go Gage



7/8" - 18 SAE Spark Plug Thread Go / No-Go Gage

STITT Spark Plug Company strongly recommends that only a balance-beam style torque wrench be used to achieve proper torque values.




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TORQUE VALUES

Society Of Automotive Engineers

STANDARDS FOR SPARK PLUGS, J548d

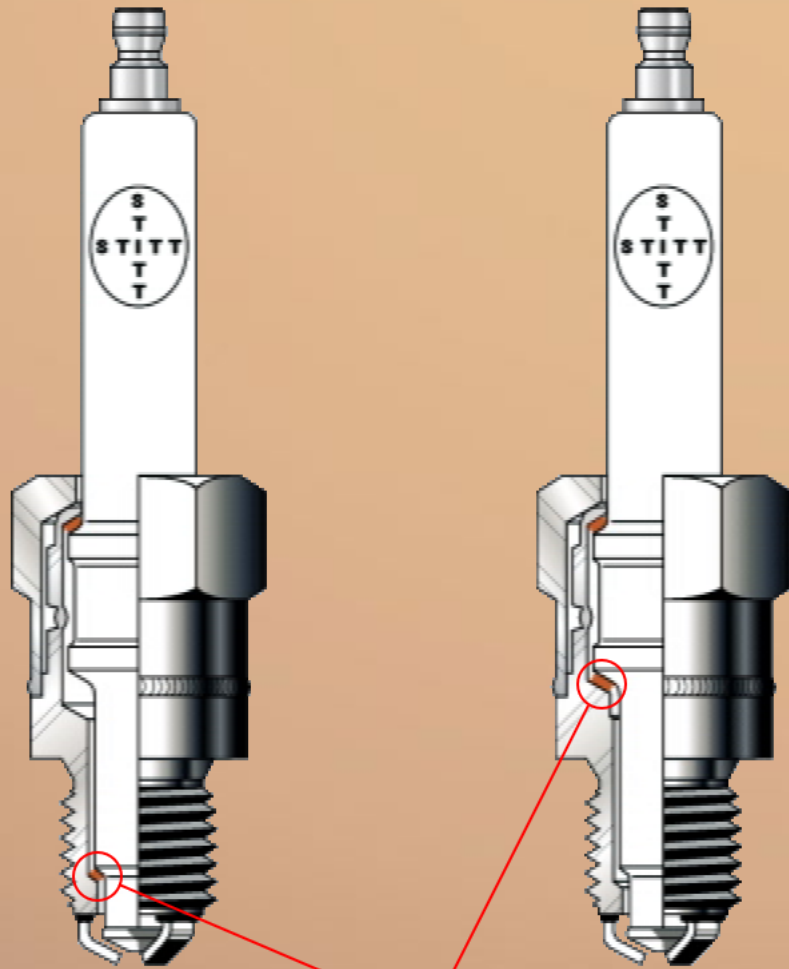


Spark Plug Thread Size	Required Installation Torque	
	Cast Iron Cylinder Head	Aluminum Cylinder Head
7/8" - 18 (FS - 78 External Seat Gasket)	50 - 60 ft. lbs. 68 - 81 Newton Meters	
18mm x 1.5mm (FS - 18 External Seat Gasket)	32 - 38 ft. lbs. 43 - 52 Newton Meters	28 - 34 ft. lbs. 38 - 46 Newton Meters
14mm x 1.25mm (FS - 14 External Seat Gasket)	26 - 30 ft. lbs. 35 - 40 Newton Meters	15 - 22 ft. lbs. 20 - 30 Newton Meters

MAXIMUM TORQUE LIMITS

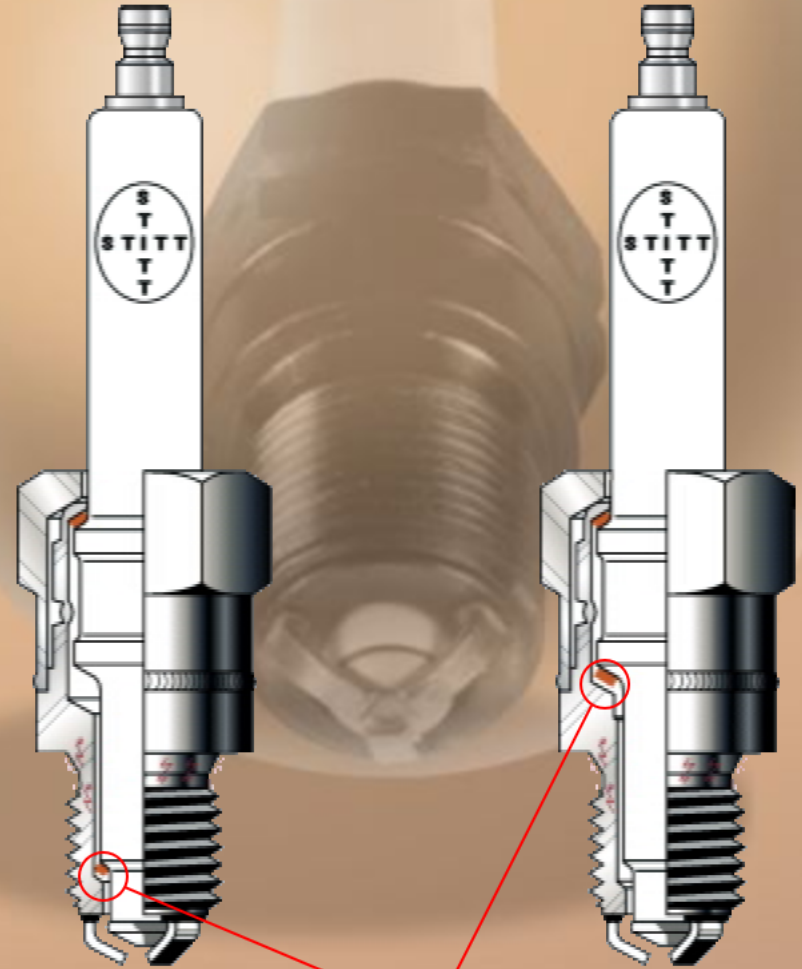
Spark Plug Thread Size	Torque Should Not Exceed
7/8" - 18	85 ft. lbs.
18mm x 1.5mm	65 ft. lbs.
14mm x 1.25mm	45 ft. lbs.

Normal Torque



Shell Torqued Properly. Seat Gasket Remains Tight. No Leakage.

Over Torqued



Shell Stretched Away From Internal Seat Gasket Causing Leakage.



Proper Thread Lubricant Application



Improper Thread Lubricant Application

Folded Steel Gaskets



FS-14
14mm x 1.25 mm



FS-18
18mm x 1.25 mm



FS-78
7/8" - 18

SPARK PLUG 101

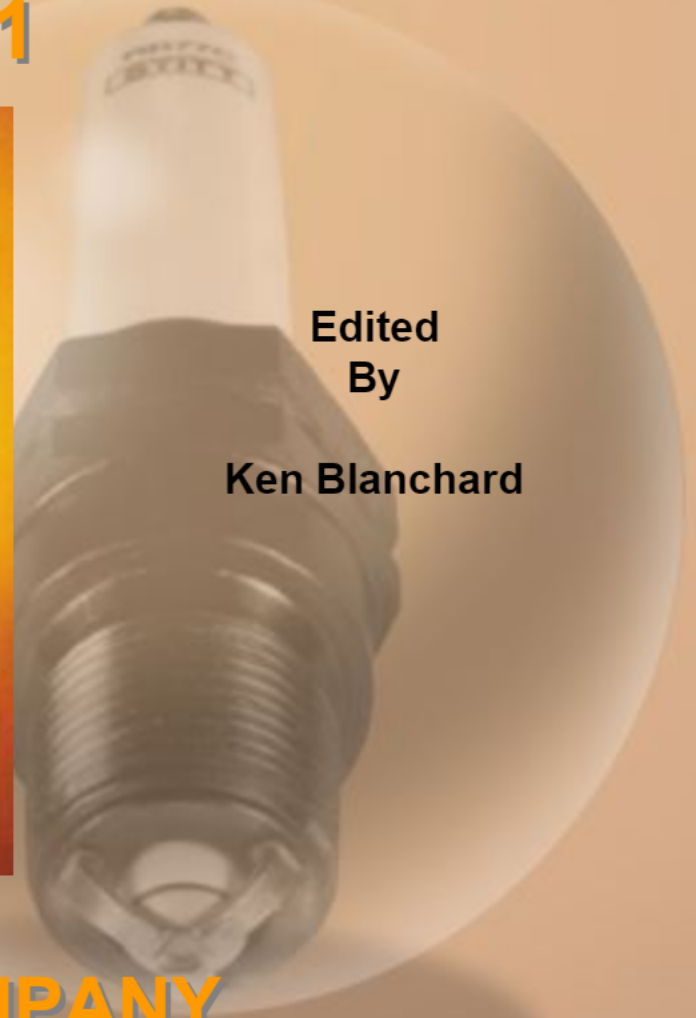
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Edited
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