

### PRODUCT OVERVIEW:

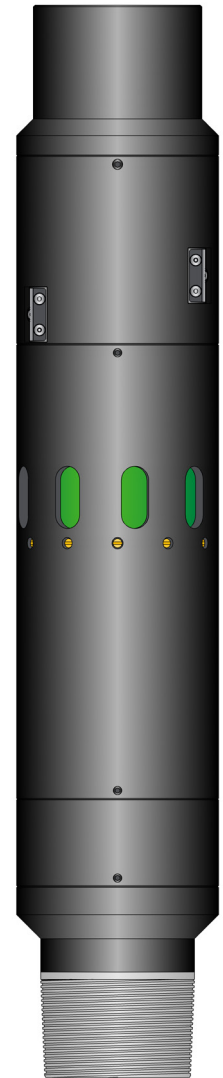
The Zone Starter Cycling Toe Initiation Valve is a pressure activated sleeve designed to work as an annular communication device between the well bore and the formation. The Zone Starter allows operators to test their casing to any desired pressure in order to ensure well bore integrity prior to activating the sleeve. It is also designed to eliminate the risk of premature opening due to high pumping pressures while circulation or cementing.

The Zone Starter can be used in cemented or open hole applications. The primary function is to create an initial flow path to pump balls, plugs or perforation guns to depth, eliminating the need for an initial coil tubing run. Additionally, the Zone Starter can be used as the primary stage for stimulating or fracturing operations, either as a single sleeve or in a multiple sleeve configuration.

Its purpose built design allows for up to 2 pressure cycles which must exceed a predetermined initiation pressure. Each pressure cycle can be held for any duration of time without the risk of opening the valve. The valve then opens at a low pressure during the bleed down of the second pressure cycle. This is ideal for scenarios where formation break down is not desired or a Diagnostic Fracture Injection Test is to be performed. It also ensures that well bore casing integrity has been maintained.

### FEATURES:

- Short & slim design.
- Torque through the tool during make-up and while RIH.
- Friction reducer coating on piston prevents cement bonding.
- Once activated, sleeve is locked in open position.
- Eliminates costly TCP run.
- Complementary dual cartridge design enhances tool reliability.
- Sleeve activation independent of differential pressure.
- Adjustable initiation pressure eliminates possibility of premature activation during pumping operations.
- Ability to pressure cycle up to 2 times prior to opening with no time constraints.
- Low final opening pressure.
- Choose from multiple flow configurations to meet specific frac' requirements.
- Full 360° flow access.
- Up to 360°F (180°C) temperature rating.
- Standard and premium thread connections available.



Zone Starter Gen III Technical Specifications																
Absolute/ burst Pressure Rating		Size		ID		OD		Thread Connection	*Initiation Pressure		**Standard Flow Configuration Area		Tensile Capacity		Collapse Pressure	
psi	MPa	in	mm	in	mm	in	mm		psi	MPa	in <sup>2</sup>	mm <sup>2</sup>	lbf	DaN	psi	MPa
20k	137.89	5.500	139.70	4.800	121.92	7.250	184.15	Box x Pin API or Premium	8k	55.16	2.000	1290.32	657k	249k	10k	68.94
		-	-						-	-						
		6.000	152.40						13k	89.63	Full Flow	Full Flow				

\*Available in a variety of initiation pressures in 500 psi increments

\*\*Additional flow configurations available upon request

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**PRODUCT TEST SUMMARY**

**TESTING OBJECTIVE:**

The objective of the following test was to validate the 5.500" 20k Zone Starter Cycling Toe Initiation Valve (40-461-55XX-XXX) to 20,000 psi at 360°F (182°C).

**TESTING OVERVIEW:**

The Zone Starter was installed inside of a test housing in order to apply backside pressure to the tool and simulate down hole conditions. Test caps were then installed and the tool and test housing were filled with test fluid. After high pressure lines were attached to the tool, the test assembly was wrapped in thermal insulation and heated to 182°C (360°F). Temperature was allowed sufficient time to stabilize prior to testing.

Test Parameters	
Temperature:	360 °F
Internal Pressure:	20,000 psi
External Pressure:	5,000 psi
Shear Pin:	12,000 psi
O-Rings:	Viton



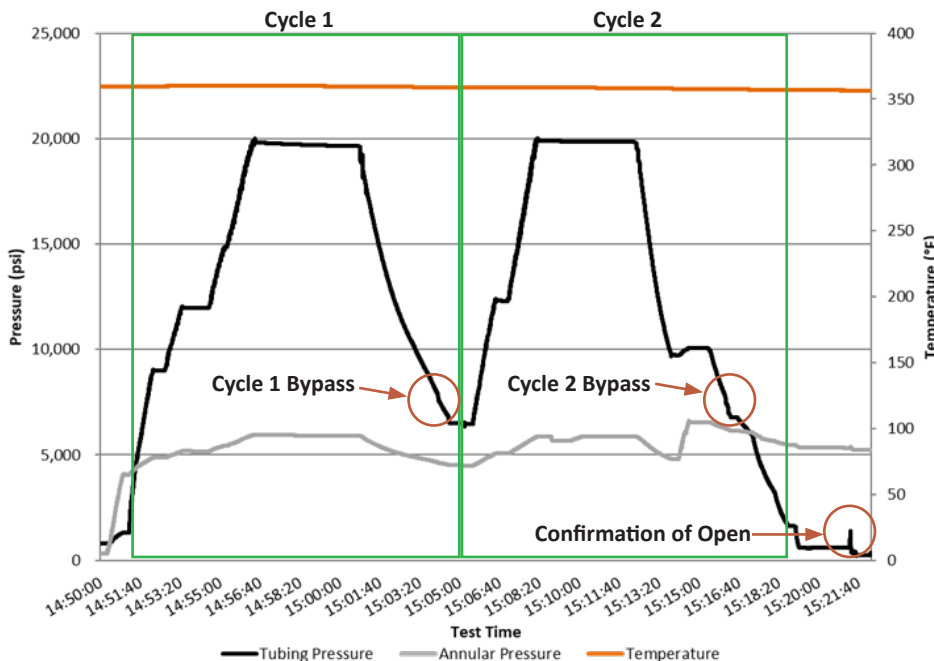
Test Assembly



Test Heating Unit

**TESTING SUMMARY:**

Testing of the Zone Starter Cycling Toe Initiation Valve (40-461-55XX-XXX) was successful to 20,000 psi at 360°F. The tool was cycled twice and opened on the bleed down of the second cycle. Prior to commencing cycle 1, 5,000 psi of backside pressure was applied to the tool. Pressure was then applied to the tool to shear the break pin and initiate the first cycle. After a 5 minute test at 20,000 psi, pressure was bled to 6,500 psi to simulate wellbore hydrostatic pressure on the tool. Tubing pressure was then increased in order to shear the break pin and initiate the second cycle. After another 5 minute test at 20,000 psi, pressure was bled off and the tool was opened. Because of the small volume of fluid used for testing in the WellBoss test facility, additional pressure was applied to the tool following cycle 2 to confirm the sleeve had in fact opened. The test chart can be seen below, cycle bypass pressures were retrieved from the testing raw data.



Test Summary	
Average Temperature:	359 °F
Cycle 1	
Max Pressure:	20,000 psi
Bypass Pressure:	6,825 psi
Cycle 2	
Max Pressure:	20,000 psi
Bypass Pressure:	7,247 psi