



## ELSA-EA Super Tree III™

The Super Tree III™ Subsea Test Tree (SSTT) is used as a temporary master valve during well testing from a floating drilling vessel. It is installed in the blowout preventer (BOP) stack at the ocean floor.

The Super Tree III is comprised of two main sub-assemblies, allowing it to fit inside virtually any BOP. The tree allows added control features, such as double (lower and middle pipe rams) pipe ram closure on the ramlock section, and double shear rams on the handling sub above the latch head section.

The SSTT consists of two full-opening normally closed safety valves and a latch-release connection.

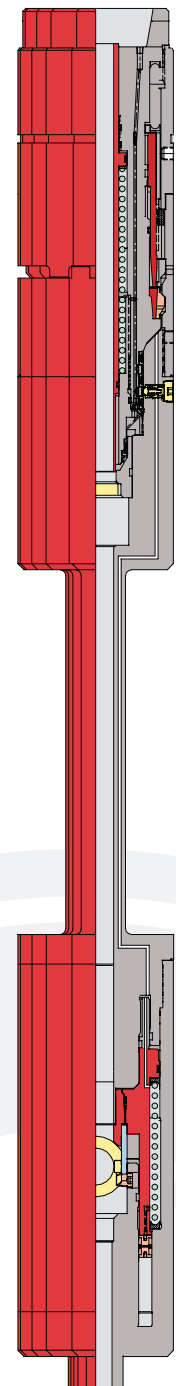
The valve section contains two tubing closures. Each closure operates independently of one another, and each relies on a single hydraulic source to hold it open. A normally closed flapper valve and a ball valve are closed by a nitrogen charge-assisted spring force. The nitrogen charge forces the ball to sever wireline or 2-in. OD, .125-in. wall-thickness coiled tubing if it is present. A short time delay between the nitrogen charge and ball/flapper closure allows severed wireline or coiled tubing to be pulled clear of the flapper before closure.

The latch section consists of a latch to the valve section, a flapper-operating piston, and molded seals.

The latch section is designed to quickly release the handling string from the SSTT in case of an emergency. It can also be used to quickly and easily reconnect to the valve-control system, re-establish hydraulic connections, and re-establish the connection to the handling string and the tubing string left in the hole. The latch can be operated by hydraulic pressure from the surface, or it can be operated by right-hand tubing rotation in the event of hydraulic failure of the latch line.

### Features & Benefits:

- Normally closed, fail-safe valve
- Releases quickly from the handling string in case of emergency
- Latch head section of 46.2 in. allows dual-pipe ram closure and dual-shear ram
- Functions as a safety device
- Maintains pump-through capabilities at all times
- Nitrogen dome charge chamber provides increased closing force and lessens the time required for closing
- Can unlatch under tension
- Redundant seal design
- Chemical injection at the valve body, further downhole to an injection sub, or to actuate a Sub-surface Safety Valve
- Capable of cutting 2-in., OD .125-in. wall-thickness coiled tubing



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### Operation

Below the Super Tree III, a fluted hanger supports the weight of the tubing on the wear bushing. The BOP ram sealing on the slick joint must be above the choke or kill line. This placement ensures surface monitoring of annulus pressure and permits circulation to be established at any time to kill the well in an emergency. The SSTT maintains pump-through features at all times.

A four-hose bundle transmits hydraulic-control pressure from the surface to the SSTT. The first hose is connected to one side of the ball and flapper pistons to control the opening of the downhole valves. The second hose is connected to the balance side of the ball and flapper pistons. It supplies hydrostatic balance to help close downhole valves and provides additional force to sever wireline or coiled tubing. The third hose is connected to the latch at the top of the SSTT and is used to quickly release or relatch from the handling string. The fourth hose controls a subsurface safety valve located below the SSTT and injects chemicals downhole or into the SSTT bore.

The SSTT contains a dual set of internal dynamic seals. The first set keeps well fluids within the SSTT its bore. If the first set of seals fail, the well fluids flow into the balance line, causing the SSTT to close. The fluid in the balance line is a signal to the operator that something is wrong. The operator maintains full control to continue the test or shut the valves. In the unlikely event that the second set of seals fail, the system is designed to shut in automatically, regardless of operator control. The SSTT continues to function as a safety device.

### Technical Specifications:

<b>P/N</b>	<b>617.10500</b>
OD in. (cm)	13.00 (33.02)
ID in. (cm)	3.00 (7.62)
End Connections	4 <sup>1</sup> / <sub>2</sub> - 4 ACME
Latched Head Section in. (cm)	46.2 (117.35)
Unlatched Head Section in. (cm)	24.0 (60.96)
Ramlock Section	5-in. OD 30-in. length
Ball Valve Section	33-in. length
Tensile Rating*lb (kg)	400,000 (181 000)
Working Pressure**psi (kPa)	10,000 (69 000)
Service	H <sub>2</sub> S
Temperature Range °F (°C)	0 to 300 (0 to 149)

\* The tensile strength value is calculated with new tool conditions. Stress area calculations are used to calculate tensile strength.

\*\* Pressure rating is defined as the differential pressure at the tool. (Differential pressure is the difference in pressure between the casing annulus and the tool ID.)