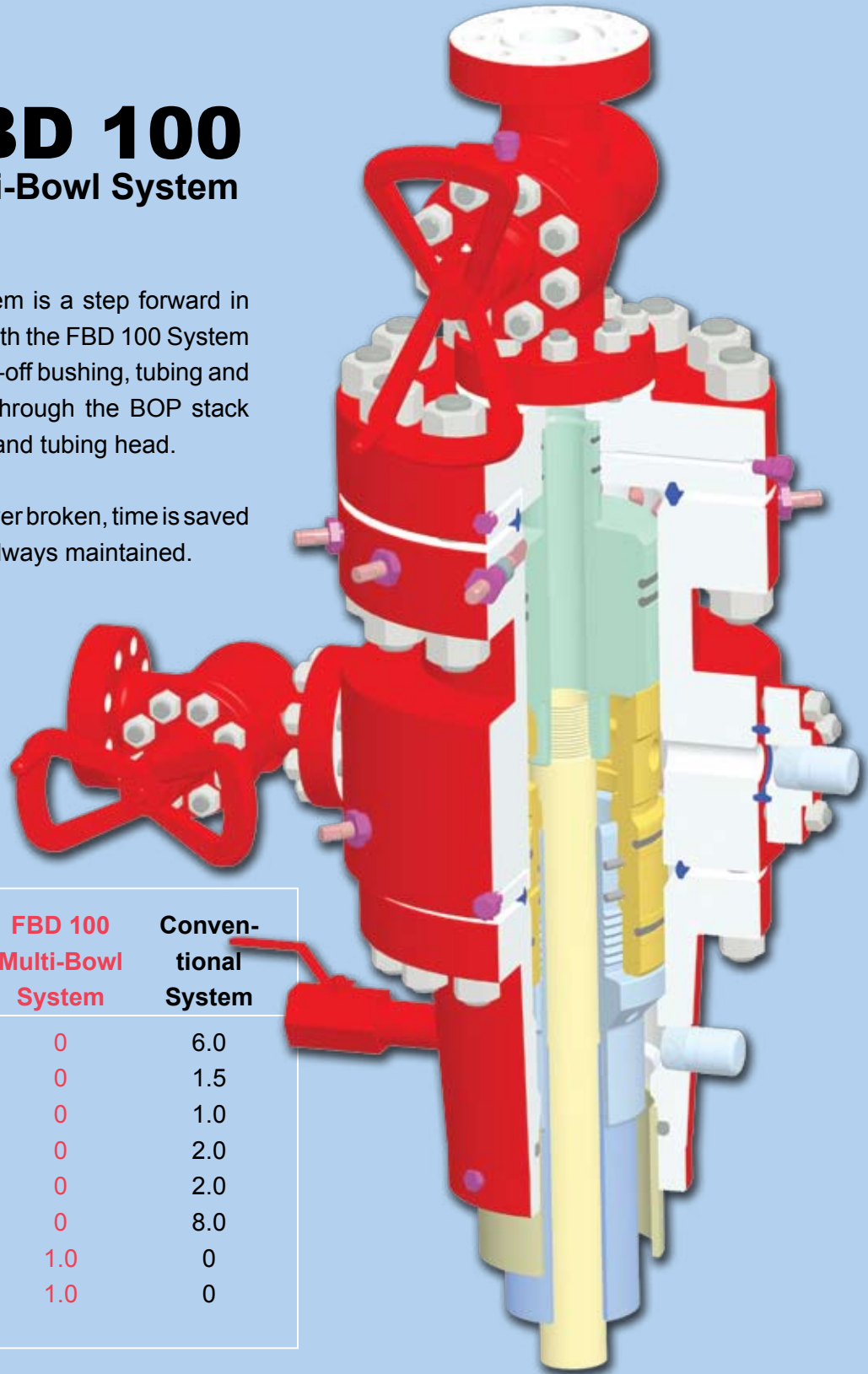




# FBD 100 Multi-Bowl System

The FBD 100 Multi-Bowl System is a step forward in drilling efficiency and safety. With the FBD 100 System the casing, casing hanger, pack-off bushing, tubing and tubing hanger can all be run through the BOP stack into a preassembled wellhead and tubing head.

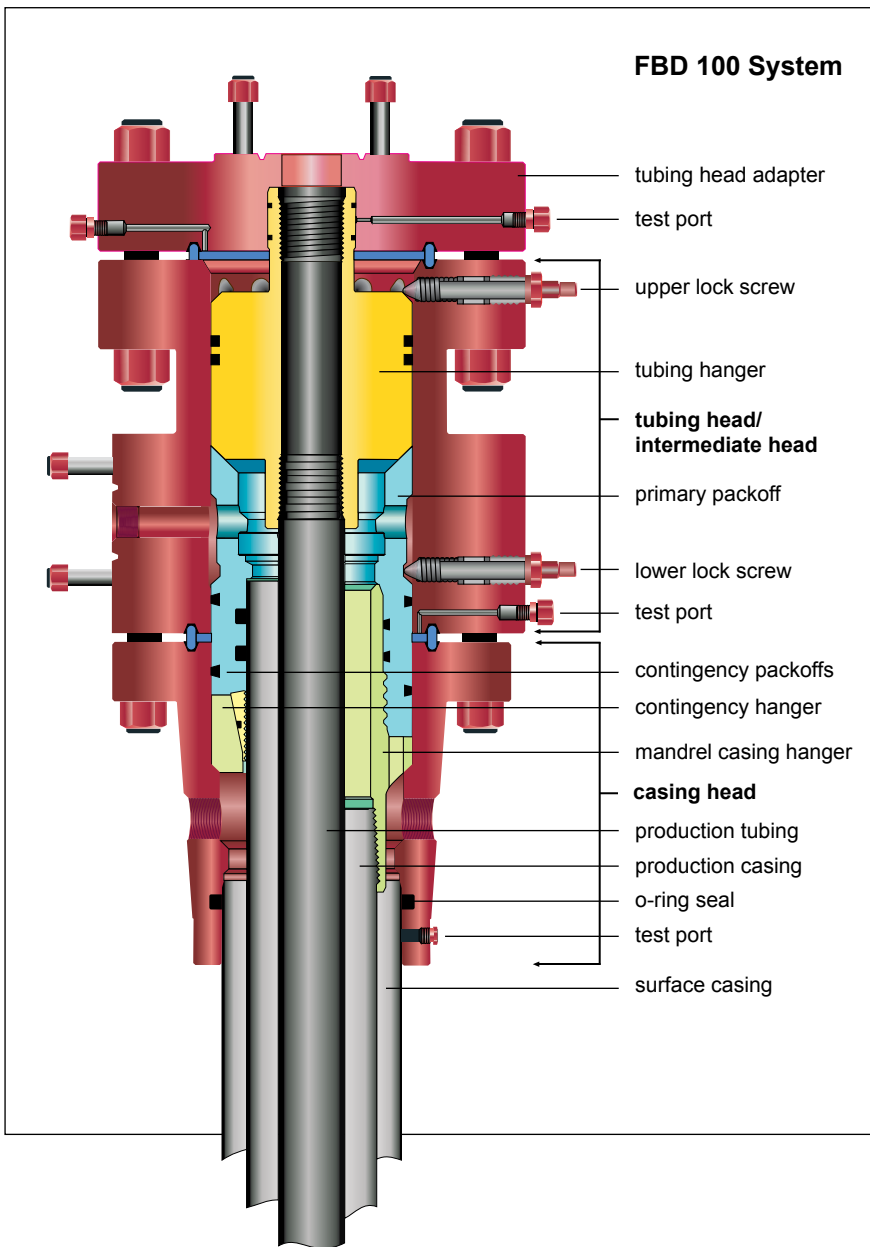
Since the BOP connection is never broken, time is saved and well control and safety is always maintained.



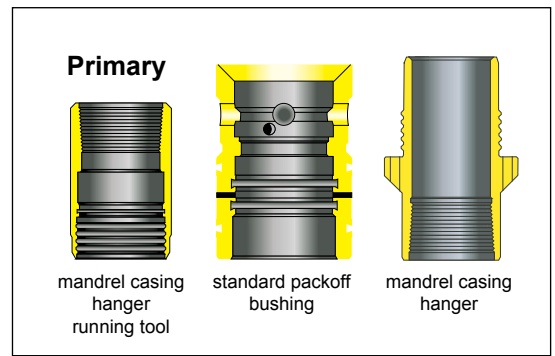
<b>Time Savings</b>	<b>FBD 100 Multi-Bowl System</b>	<b>Conventional System</b>
Wait on cement	0	6.0
Break BOP stack	0	1.5
Set manual casing slips	0	1.0
Cut and prepare casing	0	2.0
Install tubing head	0	2.0
Nipple-up and test BOP	0	8.0
Retrieve hanger running tool	1.0	0
Washout bore, run and test pack-off bushing	1.0	0

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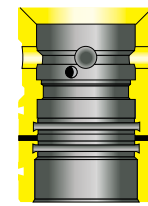


**FBD 100 System**

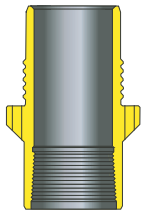


**Primary**

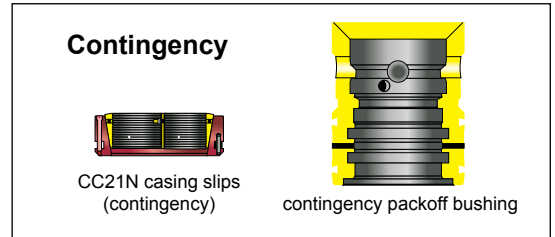
mandrel casing hanger running tool



standard packoff bushing

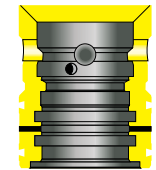


mandrel casing hanger

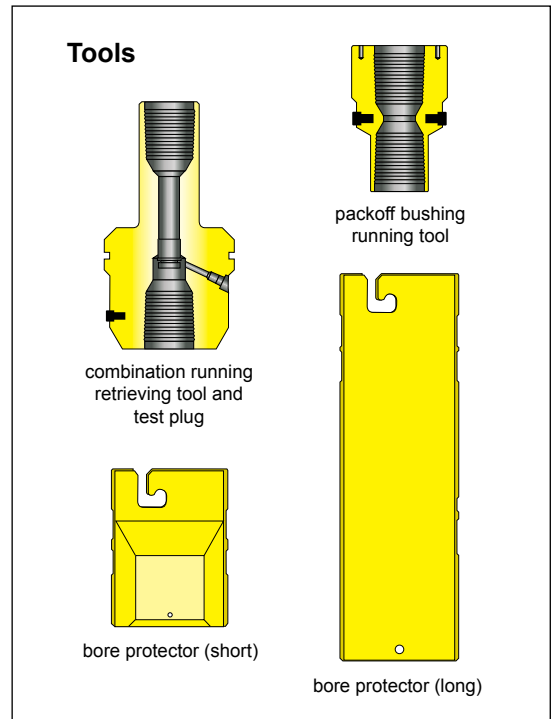


**Contingency**

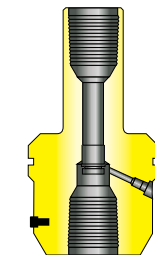
CC21N casing slips (contingency)



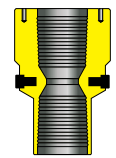
contingency packoff bushing



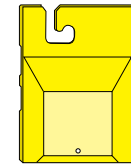
**Tools**



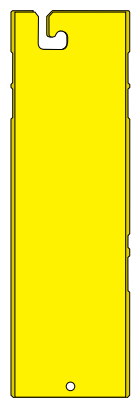
combination running retrieving tool and test plug



packoff bushing running tool



bore protector (short)



bore protector (long)

**Casing Head**

The casing head is attached to the surface casing using a Slip-On Weld connection. The tubing/intermediate head comes tested and preassembled to the casing head. An O-Ring is used to provide an inner seal between the casing head and the surface casing.

**Casing Hanger**

The FBD100 Multi-bowl System uses a high strength mandrel hanger to support casing loads. The casing hanger is available in several sizes to allow for different casing sizes and weights. The hanger also contains flow-by-ports to allow for cement circulation while the hanger is landed.

**Pack-off Bushing**

The FBD100 System uses a pack-off bushing to provide an annular seal between the surface and production casing strings, as well as provide a load shoulder for the next string. The dual elastomeric seals provide a seal without external energizing and allows for pressure testing.

**Contingency Equipment**

If problems are encountered and the casing cannot be landed, manual casing slips may be run. In this case, the tubing/intermediate head is separated from the casing head. The casing is then cut and prepared, as it would be with conventional equipment. A contingency pack-off bushing is used to provide a seal between the production and surface casing strings. The pack-off bushing uses dual FS-Seals inside to provide a seal against the casing. The seals between the pack-off bushing OD and head use o-rings.

**Completion**

After the pack-off bushing has been landed, the well can be completed in the upper spool, or a second string of casing can be run and tied back with a tubing head installed above.