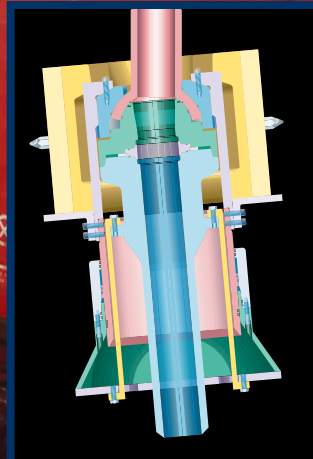
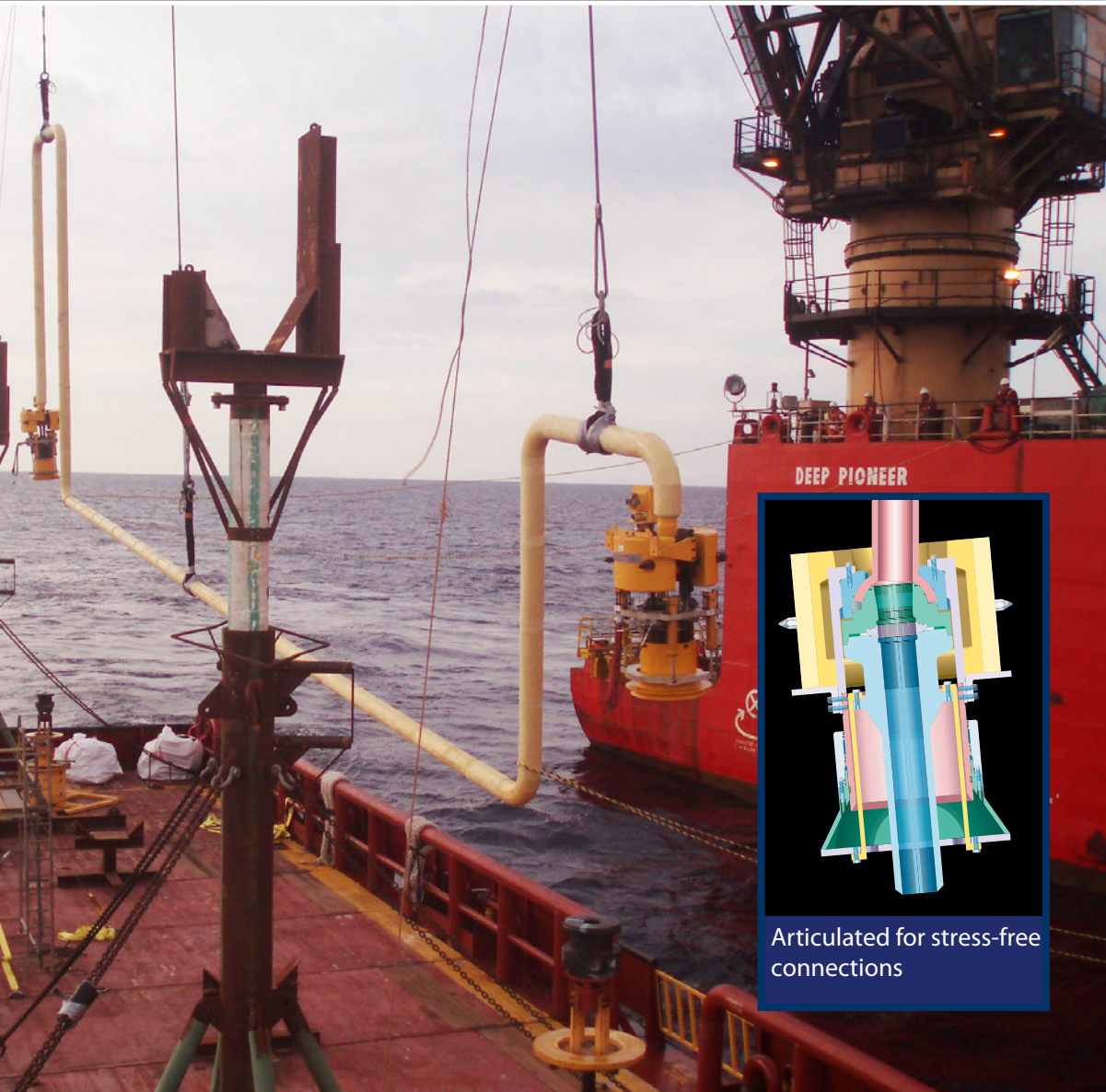
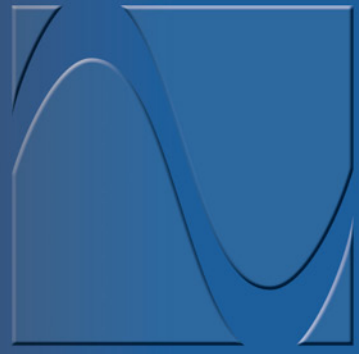


# Oil States - BIMS® Products Remote Inline and Articulating Connectors



Articulated for stress-free connections



# Economical, permanent deepwater connections

Oil States Diverless Clamp Connectors deliver economical, reliable, ROV-assisted pipeline or flowline connections from 4" to 24" and up to 15,000 psi working pressure.

## Articulated or Nonarticulated Versions

The Diverless Clamp Connector is available in two versions:

- The Remote Articulated Connector (RAC) accommodates misalignment between the male and female hubs, virtually eliminating stresses caused by the original misalignment. The RAC incorporates the design elements of the Oil States Ball Flange Connector, which has been used since 1983 for connecting misaligned pipe ends.

- The Remote Inline Connector (RIC) is used in typical flexible jumper and flowline connections for a quick, reliable connection where misalignment is not a significant factor.

## Features

Oil States Diverless Clamp Connectors have the following features:

- A proven, reliable design
- Available with articulation capability to accommodate up to 5° axial misalignment
- Fast installation and testing with ROV
- Metal seals
- High bending/torsional capacity
- Reversible operation
- Compact, lightweight running tool

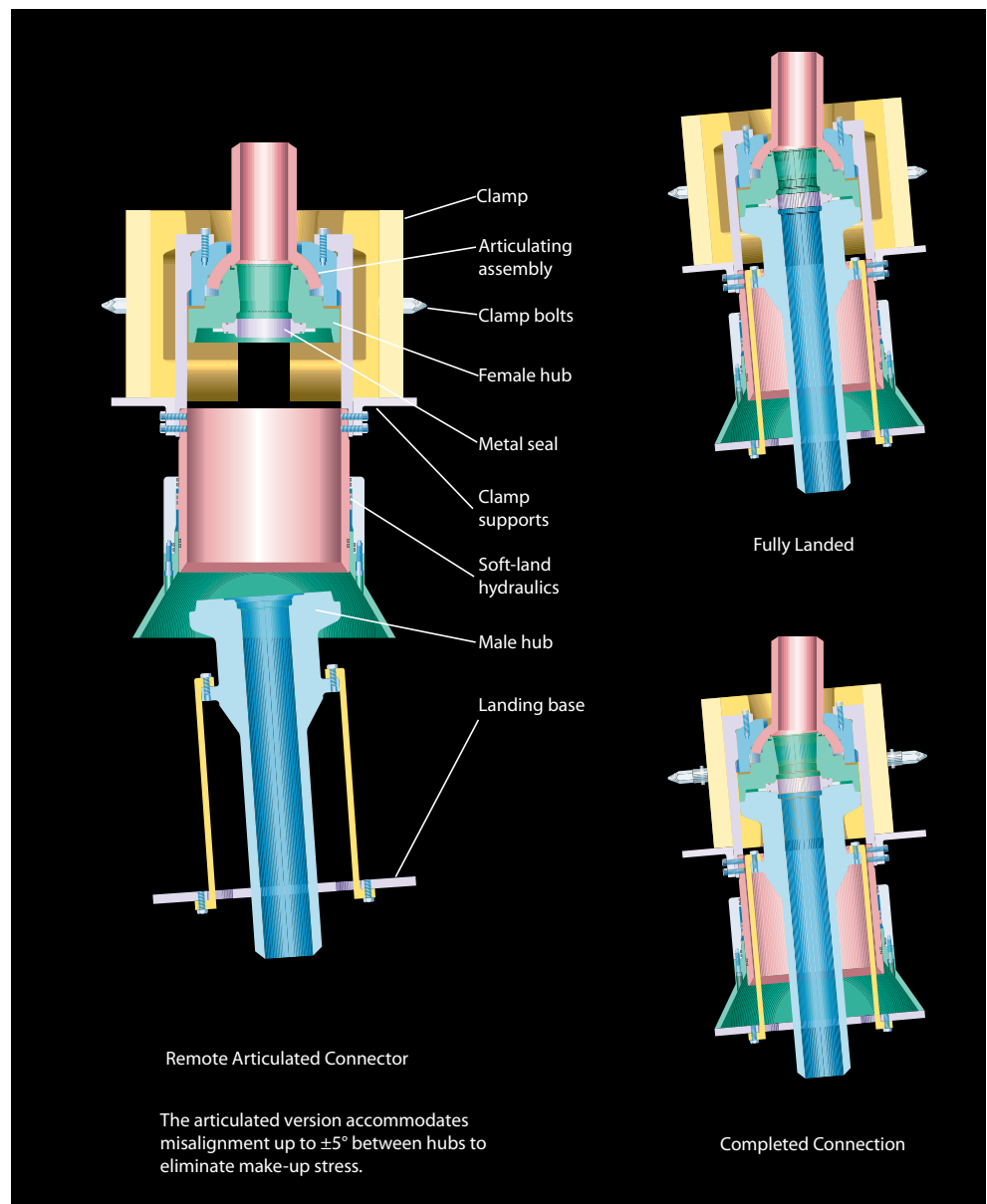
## Typical applications

Oil States Diverless Clamp Connectors are commonly used for final hook-up of small-diameter subsea production systems using hard-pipe or flexible jumper-pipe between pipeline end manifold (PLEMs) and other manifolds or production trees. They can also be used with diverless pipeline repair systems and future tie-in systems.

## System components

The components of a Oil States Diverless Clamp Connector include:

- Female Hub and Clamp Connector Assembly



- Male Hub and Landing Base Assembly
- Clamp Connector Torque Tool (ROV operable)
- ROV operable caps, end closures and pig launchers/receivers, as needed.
- High Pressure/Low Pressure, Venting, Flooding. With Metrology Capabilities

## An economical connection

Diverless Clamp Connectors are light, compact and can be installed using ROV support vessels. Simple design makes Connectors and Running Tools smaller, lighter and less costly than comparably sized collet connectors.

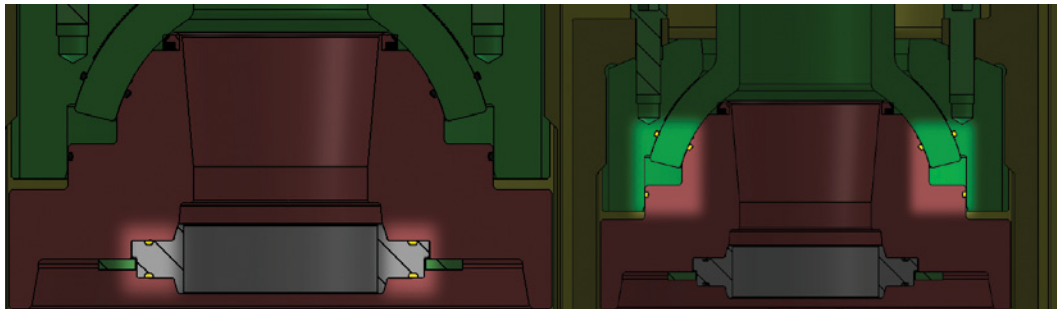
## Fast installation and testing

Both the RAC and RIC, can be installed and tested very quickly with a typical jumper installation requiring only a few hours, including deployment time and seal testing.

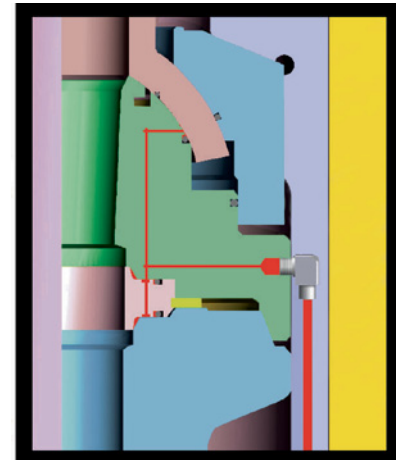
## Metal seal

The primary pressure-energized metal seal is an AX seal ring, which is captured between the male and female hubs during clamp make up. On the articulated version, there is another seal area between the ball nose and the seal housing. In both cases, O-rings provide backup elastomeric sealing for the annulus seal test.

# Quick, reliable proven technology



**Metal Sealing** - An AX seal ring provides a pressure-energized metal seal in both the inline and articulated versions. The seal is installed in the female hub at the surface and is fully protected during stabbing. In the RAC, there is an additional metal seal between the ball nose and the seal housing. Like the AX seal, this seal is energized when the hub clamp is tightened.



**Reliable annulus seal test** - The annulus seal test provision assures a reliable test, free of guesswork. The seal test area is completely protected during the connector installation to prevent damage to the elastomer and metal seal surfaces.



clamp bolts, which closes and mechanically locks the clamp and energizes the metal seal. The mechanical lock eliminates the need for integral hydraulics or additional backup systems to resist potential loss of setting load. After the ROV tests the seal, it removes the running tool for relocation to another Connector or recovery to the surface.

## ROV-operable end closures

Oil States provides ROV-operable end closures as needed:

- non-pressure containing debris barriers
- pressure containing blind closures for manifold or flowline testing
- vent valve/measurement interface cups
- closures adaptable to pig launchers and receivers

## Measurement interface caps and fabrication jigs

Oil States provides caps for the male hubs that are compatible with orientation and measuring devices. Systems can also include jigs for fabricating jumpers at the surface using orientation and measurement data.

## A reversible connection

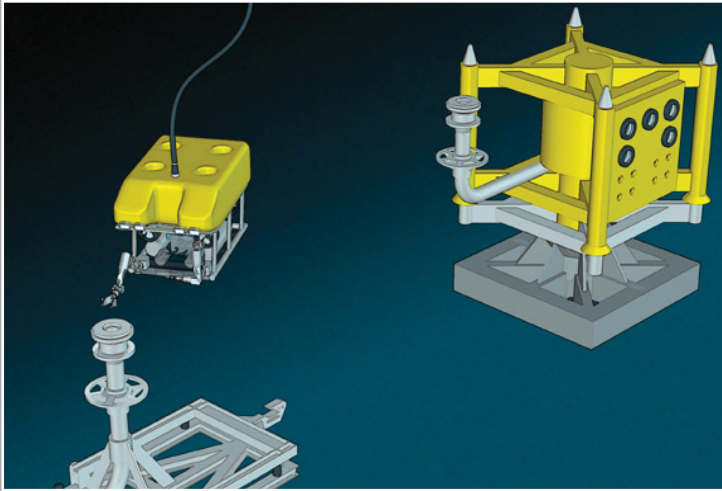
If a situation arises that requires a jumper or connector to be retrieved, the Oil States Diverless Clamp Connector can be reversed and released. The AX seal ring is retrieved with the female hub so the seal can be replaced before reinstallation.

## Compact torque tool

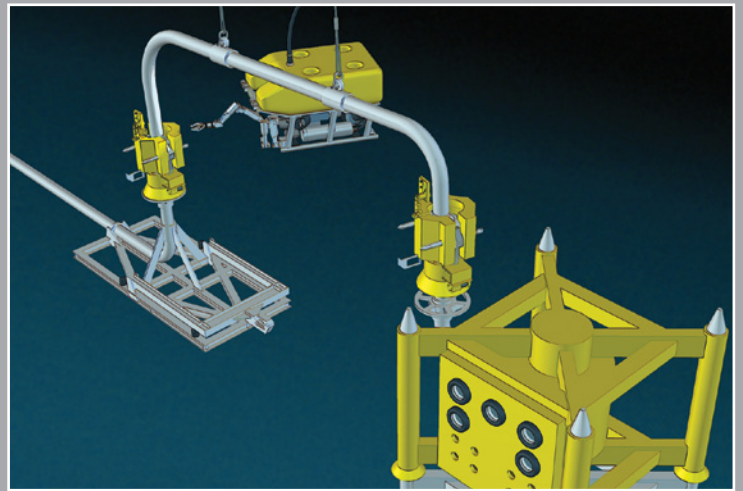
The torque tool is a compact, retrievable device that the ROV delivers and installs on the Connector. The ROV actuates dual hydraulic torque wrenches to turn the

## Soft-Land System

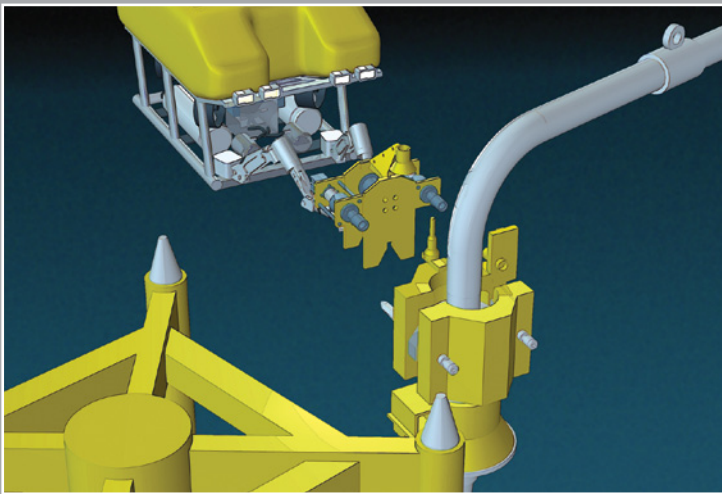
Oil States Diverless Clamp Connectors can incorporate a hydraulic soft-land system that protects the hubs and seals. After the female hub/clamp assembly is hard landed, the ROV uses a hot-stab to lower the female hub at a controlled rate.



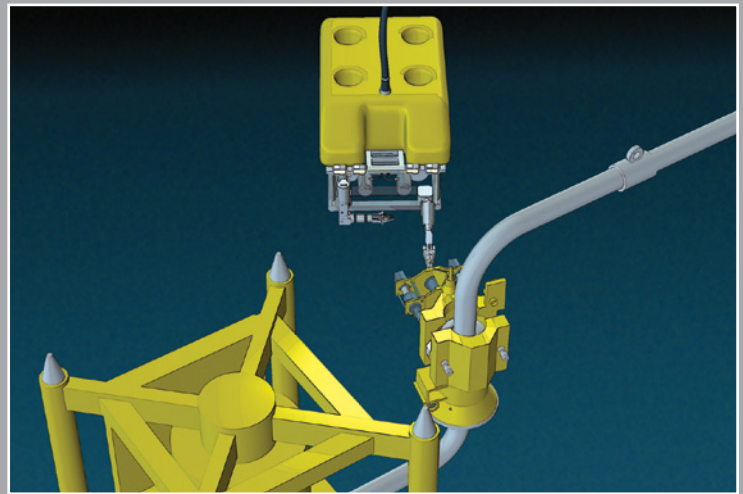
The ROV removes the protective caps and inspects the male hubs and connector landing structures.



The spoolpiece with RAC connectors is landed.



The ROV installs the compact, retrievable running tool.



The ROV actuates the RAC clamp bolts, securing the connection and energizing the metal seals. After testing the seals, the ROV retrieves the running tool and the installation is complete.



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