



# DROP IN CHECK VALVES OPERATION AND MAINTENANCE PROCEDURE REV 2 –

06/11

## MAINTENANCE ASSEMBLY PROCEDURE FOR THE DROP IN CHECK VALVE

### 1.0 SCOPE

- 1.1 This procedure will provide the general instructions for the assembly procedure of a Drop In Check Valve.

### 2.0 REFERENCES

- 2.1 The latest revision of these specifications may be used to obtain additional information regarding this procedure.
- API Specification 7-1 latest edition.
  - Bill of materials.

### 3.0 ASSEMBLY PROCEDURE

- 3.1 Clean all metal parts with paint thinner, acetone, or by steam cleaning.
- 3.2 Visually inspect all steel components for sign of damage or wear.
- 3.3 If V packings and packing rings are used on the check valve, discard them and use the new type (energized seals) with the supplied packing sleeve.  
Note: there is no need for the packing sleeve if the Check Valve was delivered with the new seal type already installed on the Packing Mandrel.
- 3.4 Visually check the energized seals for cracking or embrittlement.
- 3.5 Replace the energized seals as required.
- 3.6 Install the packing sleeve on the Packing Mandrel (if required).
- 3.7 Before assembling, grease plug (or ball) and threads with a light coat of Texaco Marfax Heavy Duty 2 or an equivalent API grade.
- 3.8 Assemble Cage, with plug (or ball) and Spring inside, to Seal Sub.
- 3.9 Screw Cage and Seal Sub assembly into Packing Mandrel and hand tighten until snug (20-30 Nm).
- 3.10 Store the Check Valve in an area protected from elemental conditions

## 4.0 HYDROSTATIC TEST

- 4.1 Hydrostatic Testing shall be performed in accordance with the test pressure and the procedures outlined in API Specification 7-1 latest edition.

| HYDROSTATIC TESTING PRESSURES      |       |  |       |
|------------------------------------|-------|--|-------|
| MINIMUM PRESSURE<br>WORKING RATING |       | MAXIMUM HYDROSTATIC<br>SHELL TEST PRESSURE |       |
| psi                                | MPa   | psi  | MPa   |
| 5000                               | 34.5  | 10,000                                     | 68.9  |
| 10,000                             | 68.9  | 15,000                                     | 103.4 |
| 15,000                             | 103.4 | 22,500                                     | 155.1 |

Note: testing pressure shall be stabilized prior to the timing start for holding pressure.

### 4.2 Hydrostatic Test Procedure

- 4.2.1 Install the Check Valve into the Landing Sub, ensuring it is seated. Install the Test Cap on the pin end and fill with water making sure to bleed off any trapped air.
- 4.2.2 Conduct the Hydrostatic Test per the latest revision of API Specification 7-1.
  - 4.2.2.1 Engage the pump and increase pressure to 250 psi and allow the pressure to stabilize. Upon stabilization of the low test pressure, the valve will be held at pressure for five (5) minutes minimum with no detectable pressure drop or leakage.
  - 4.2.2.2 At an elapsed period of five minutes, the pressure will be reduced to zero.
  - 4.2.2.3 Engage the pump a second time to increase the pressure to the working pressure per Table 1.1 and hold for a minimum of 5 minutes with no detectable pressure drop or leakage.
- 4.2.3 Release the pressure on the assembly, assign the serial number, and complete the test chart.



**DISASSEMBLY INSTRUCTIONS FOR THE DROP IN CHECK VALVE**

**1.0 SCOPE**

1.1. This procedure will provide the general instructions for the disassembly procedure of the Drop In Check Valve Assembly.

**2.0 REFERENCES**

2.1. The latest revision of the following specifications may be used to obtain additional information regarding this procedure.

- API Specification 7-1 latest edition.
- Bill of materials.

**3.0 DISASSEMBLY PROCEDURE**

**3.1. Disassembly Procedure of the DICV Assembly.**

3.1.1. Ensure the Check Valve Assembly is inserted as far as possible by placing a metal rod against the top of the Running Neck and gently tapping against it. A distinctive ring may be heard once it moves as far as it can.

3.1.2. Screw a sucker rod to the Fish Neck upper threaded connection<sup>1</sup>

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| DICV Size     | Fishneck connection |
|---------------|---------------------|
| 022 & 027     | 5/8-12UN-2A         |
| 035,043 & 048 | 1-1/16-12UN-2A      |

3.1.3. Insert the Retrieval Tool in the Landing Sub until it locks into the Retrieval Cylinder of the Check Valve.

3.1.4. Pull the Retrieval tool and Check Valve from the Landing Sub.

3.1.5. Disengage the Retrieval tool from the check valve by pressing the dog ring towards the fish neck using a flat screw driver.

3.1.6. Clean thoroughly all parts and inspect for wear or damage.

3.1.7. Clean and lubricate the Landing Sub the same as any other tool joint.

3.1.8. Thread protectors should be used on the Landing Sub in order to protect the end connections.

**3.2. Disassembly Procedure of the Check Valve.**

3.2.1. Secure the top of the Packing Mandrel in a table vise (with aluminum protectors) or use a ¼” rod inserted through two of the four holes in the packing mandrel, and insert a small screw driver blade through the cage.

3.2.2. Unscrew the Cage from the Seal Sub by turning the Cage counter clockwise.

3.2.3. Remove the Spring and Plug (or Ball) from inside the Cage.

3.2.4. Clean and inspect plug or (ball) for wear or damage.

3.2.5. Use a strap wrench to remove the Seal Sub.

3.2.6. Clean and inspect Seal Sub for wear or damage.

3.2.7. Gently remove the energized seals (and packing sleeve if any) from Packing Mandrel.

3.2.8. Clean and inspect the packing sleeve (if any) for wear or damage.

3.2.9. Thoroughly clean the remaining parts.

**3.3. Do not attempt further disassembly.**

**PREPARING THE DROP IN CHECK VALVE FOR  
INSTALLATION**

**1.0 SCOPE**

- 1.1 This procedure will provide the general instructions for installation of the DiCV Landing Sub and the Check Valve Assembly.

**2.0 REFERENCES**

- 2.1 The latest revision of the following specifications may be used to obtain additional information regarding this procedure.

- API Specification 7-1 latest edition.
- Bill of materials.

**3.0 INSTALLATION PROCEDURE**

- 3.1 Clean the shipping thread compound from the threaded connections and apply a suitable compound for drill string use.
- 3.2 Recommended: The Thread Compound base to include 40% to 60% (by weight) finely powdered zinc.
- 3.3 Install the Landing Sub on the lower end of the drill string while tripping into the hole. Apply the recommended make-up torque.
- 3.4 Install the Check Valve Assembly before installation for immediate downhole protection or by dropping it into an open tool joint when required.

**NOTE: Failure to follow the above procedure explicitly may result in damage and subsequent premature valve failure.**

**REMOVAL OF THE CHECK VALVE ASSEMBLY**

**1.0 SCOPE**

- 1.1 This procedure will provide the general instructions for removal of the Check Valve Assembly.

**2.0 REFERENCES**

- 2.1 The latest revision of the following specifications may be used to obtain additional information regarding this procedure.

- API Specification 7-1 latest edition.
- Bill of materials.

**3.0 REMOVAL PROCEDURE**

- 3.1 Attach a wireline Rope Socket (not included) to the thread<sup>1</sup> at the top of the Fish Neck.
- 3.2 Pump the Rope Socket and Retrieval Tool down until it engages the check valve assembly.
- 3.3 Once the Retrieval Tool is engaged, continue mudflow in the normal direction until the Check Valve is clear of the Landing Sub.
- 3.4 If the Check Valve does not disengage, jar the wireline to loosen it.
- 3.5 If the jarring does not loosen the Check Valve, the Landing Sub will require tripping for removal. The Retrieval Tool is equipped with a shear pin that can be broken by pulling. Once the shear pin is broken, the Retrieval tool will automatically disengage from the Check Valve.
- 3.6 In a worst case scenario, if the jarring does not loosen the check valve and the shear pin breakage does not release the Retrieval tool, the thread on the Fish Neck can be sheared by pulling.
- 3.7 Once the Retrieval Tool and Check Valve are on the rig floor they can be separated using a screw driver to move the Dog Ring upwards which will disengage the Retrieval Dogs. Clean the parts thoroughly and refer to the Maintenance section above.
- 3.8 Shear pin replacement or replacement of items not identified in these procedures should be referred to an Authorized repair facility.



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