

QUICK STROKING DEVICE USED IN HPLP BYPASS SYSTEM

Document No : TDC :5:197

Rev No :03

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Page 1 OF 3

Revision record:**Rev.01:** New requirement of SSB-16-1 added.**Rev 02:** Cl 3.1 modified, Cl 7.5, 7.7, 8.1, 8.3.1, 10.1, 11.1 & 11.2 corrected. Page 3 – sketch for test setup modified.**Rev 03:** New requirement of QSD-16 added, Heading modified, Cl 2.8 added, Cl 4.5 deleted, Cl 5 to 9, 11,13 modified to address QSD-16 and Page 3-sketch for test setup modified.**1. SCOPE:**

This Technical Delivery Condition (TDC) specifies the Quality requirements for Quick Stroking Device used in HPLP Bypass system.

2. GENERAL REQUIREMENTS:

- 2.1 The supplier shall use the raw material for manufacture of **Quick Stroking Device** in accordance with BHEL drawings. No substitution of material shall be done without prior written approval of BHEL.
- 2.2 The supplier shall submit a Quality Plan indicating various checks carried out on raw materials, in process, sub delivery components, assembly and testing etc.
- 2.3 All the dimensions and the required surface finish shall be as per BHEL drawing. Any deviation either with respect to drawing or material testing requirements shall have prior approval of BHEL.
- 2.4 Heat-treatment done on any of the components shall be properly documented with the help of heat-treatment charts and other records.
- 2.5 All inspection shall be done as per supplier's QP approved by BHEL.
- 2.6 BHEL or its Authorized Representative shall have access to the supplier's works at all times to verify whether the components are manufactured in accordance with BHEL drawings and this TDC.
- 2.7 The fasteners used shall be as per drawing and shall be procured from reputed manufacturers.
- 2.8 O-rings & seals shall be procured from reputed sources and shall meet BHEL specification & drawing requirements.

3. MANUFACTURE:

- 3.1 The tolerances shall be maintained strictly as per BHEL drawings. For the untoleranced dimensions, IS 2102 medium tolerance class shall be followed.
- 3.2 The run-out and face-out wherever required shall not exceed 0.05 mm Total Indicator Reading (T.I.R.).
- 3.3 All components shall be checked 100% for dimensions. The dimension report shall be furnished to BHEL or its authorized representative during inspection.

4. ASSEMBLY:

- 4.1 Assembly shall be carried out ensuring proper assembly requirements and cleanliness.
- 4.2 Only accepted components shall be used for assembly.
- 4.3 Prior to assembly all the components shall be cleaned off oil, dirt, grease and other foreign materials by ultrasonic cleaning using trichloroethylene.
- 4.4 All assemblies shall be preserved properly. All machined surfaces shall be protected with PVC or similar material.

5. TEST SETUP:

- 5.1 Hydraulic unit capable of pumping minimum 40 liters/min liquid at min 160 kg/sq. cm pressure.
- 5.2 Connecting plate.
- 5.3 Pressure gauges.
- 5.4 D.C. Current supply unit with 48V with on-off switch.
- 5.5 Piping system and measuring instruments.
- 5.6 Mineral oil Servo CONVAL-46 of M/s IOC make. The oil shall be filtered through a 5-micron filter before admitting to the test object.

6. PREPARATION & VISUAL INSPECTION:

- 6.1 Remove the plug of pilot control valve.
- 6.2 Remove the PVC cover plate check whether O-ring is fixed or not, accordingly fix the O-ring.
- 6.3 Loosen the cap nut in P & T connections indicated in sketch-1.
- 6.4 Inspect the mating parts and the surfaces for damages.
- 6.5 Ensure the **Quick Stroking Device** and the connecting plate must be dry in order to detect possible leaks.
- 6.6 Fit the **Quick Stroking Device** to connecting plate.
- 6.7 Connect the high pressure hoses to the points PE & TA (refer sketch-1).
- 6.8 Adjust the power supply to the voltage of solenoid, if required.
- 6.9 Connect the pilot control valve to the power supply.

QUICK STROKING DEVICE USED IN HPLP BYPASS SYSTEM

Document No : TDC :5:197

Rev No :03

Effective Date: 18-08-2015

Page 2 OF 3

6.10 Open the throttle- 5 (refer sketch- 1) fully.

6.11 Switch on the pilot control valve and check the voltage. Measure the power consumption of the pilot control valve and record the same. Check also the cold current.

7.PRESSURE TEST:

7.1 Leak proofness and Pressure test shall be done at supplier's works.

7.2 Allow oil to flow through the Quick Stroking Device slowly (bleeding the air out).

7.3 Close the inlet PE and outlet TA.

7.4 Close Quick Stroking Device by using the switch.

7.5 Raise the pressure to 240 kg/sq. cm using hand pump. Hold the pressure for 2 minutes. The pressure shall not drop by more than 5 kg/sq. cm. The pressure in by-pass hose and at outlet TA shall not increase.

7.6 Open Quick Stroking Device by means of switch in pilot control valve.

7.7 Now raise the pressure to 240 kg/sq. cm using hand pump. Hold the pressure for 2 minutes and check the tightness of Quick Stroking Device. The pressure shall not drop more than 5 kg/sq. cm.

7.8 Open the inlet PE.

7.9 Open the outlet TA.

7.10 Observe the pressure in the by-pass hose for 2 minutes. The pressure here shall remain constant. In case of drop of pressure the same shall not exceed 5 kg/sq.cm.

8.FUNCTIONAL TEST:

8.1 Open Quick Stroking Device and adjust the pumped quantity using the flow controller to 40 liter/min.

8.2 Measure the pressure drop across the Quick Stroking Device and record it.

8.3 After completion of all tests, connect the inlet and outlet hoses directly. Record the pressure drop in hoses alone.

8.4 The actual pressure drop across the Quick Stroking Device is the difference between 8.2 and 8.3.

9 TESTING THE LEAKAGE:

9.1 Close Quick Stroking Device.

9.2 Maintain a pressure of 80 kg/sq. cm.

9.3 No oil flow shall be there in the outlet TA.

10 ADJUSTMENT OF OIL FLOW (applicable to SSB-10 only):

10.1 SSB with flow controller.

10.1.1 Using flow controller-5 with supply pressure of 80 kg/sq cm, adjust the oil flow to the value of 32 litre/ minute Record the value.

10.1.2 Now lock and seal the controller.

11 ACCEPTANCE CRITERIA:

11.1 Cold current (I) of pilot control valve shall not exceed following.

48 V DC Solenoid; I cold = 440 ± 40 mA.

11.2 Pressure drop (dp) across SSB with throttle fully opened shall not exceed following at 40 liter/min.

SSB-10 : dp = 26 ± 2 kg/sq.cm.

SSB-16-1: dp = 16 ± 2 kg/sq.cm.

QSD16: dp = 21 ± 2 kg/sq.cm

12 CERTIFICATION:

12.1 The test results shall be recorded. The test details/ records at supplier's works shall be duly signed by BHEL/Authorized Inspection Agency

13 PACKING:

13.1 After successful tests the Quick Stroking Device shall be packed in a plastic bag. The bag shall be sealed and packed in cardboard box with silica gel.

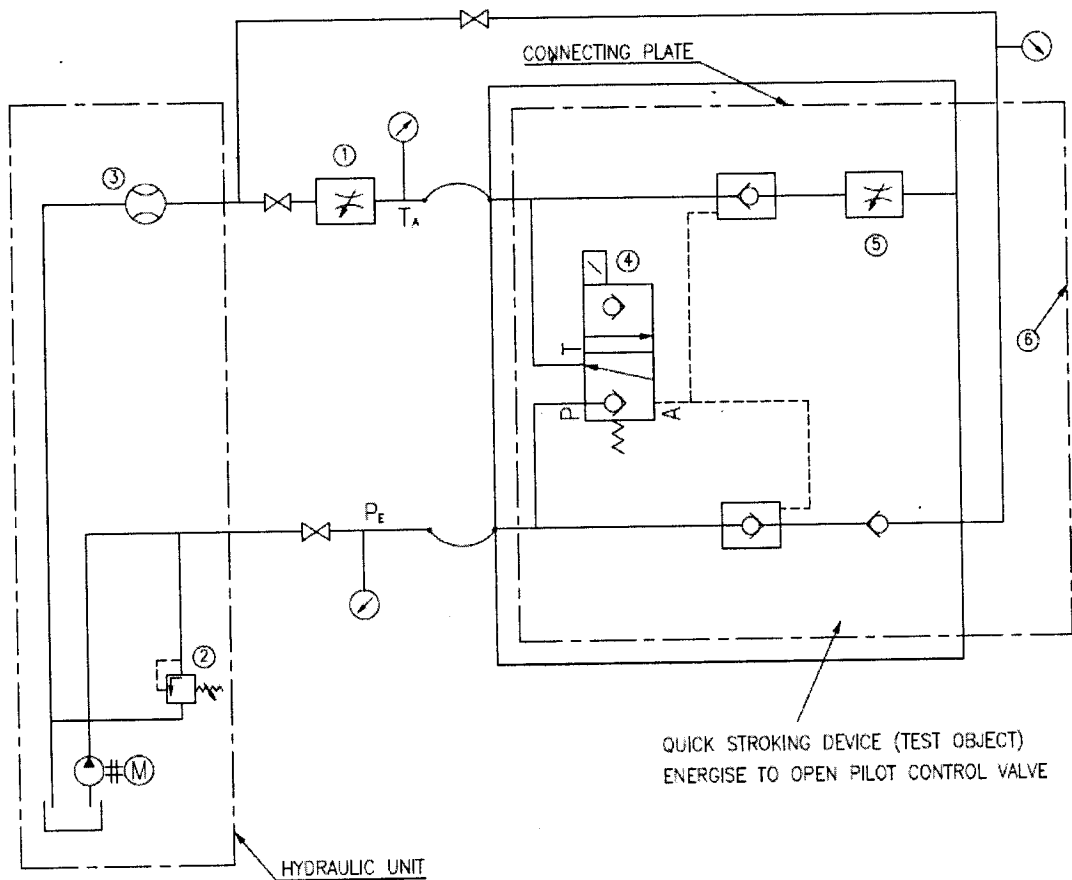
QUICK STROKING DEVICE USED IN HPLP BYPASS SYSTEM

Document No : TDC :5:197

Rev No :03

Effective Date: 18-08-2015

Page 3 OF 3

Sketch-1: Common TEST SETUP FOR TESTING OF Quick Stroking Device

1. FLOW CONTROLLER
2. PRESSURE LIMITING VALVE
3. FLOW METER
4. PILOT CONTROL VALVE
5. THROTTLE OR FLOW CONTROLLER
6. TEST PLATE

<i>R Venkanna</i> 18/08/2015	<i>G.Panneerselvam</i> 18/08/15	<i>N.Rajasekar</i>	<i>U.Revisankaran</i>
Venkanna Rupani/QA	G.Panneerselvam/QA	N.Rajasekar/Engg	U.Revisankaran/QA
Prepared By	Reviewed By		Approved By