DZ500 BOP Handling System

(DZ5001A/B)

Operation and Maintenance Manual

version stamp：161122

I. Profile

BOP Handling System is designed to meet the requirement of installing and removing BOP stacks. The system adopts full-hydraulic control and can be used for large and medium drilling equipment. The main function of system is to lift and install single BOP or BOP stacks. The system features with explosion-proof, easy operating, good reliability, and safety. Controlled by hydraulic operating box, the two lift devices hung on two guide rails each below the drilling floor can achieve the movement of rise, lowering, move forward and backward synchronously, or move forward and backward asynchronously, rise and lowering with limited separation distance (less than 1m). It is convenient for installing and removing BOP stacks.

II. Type and Specifications

1. BOP Handling System mainly consists of left / right lift devices and hydraulic system.
2. BOP Handling System is powered by hydraulic station for floor mechanical tools of drilling rig.
3. BOP Handling System is easy to install and dismount. All hydraulic hoses adopt snap joints as connections. It not only makes it easy to install and dismount system but also keep inner hoses clean.
4. Technical Specifications
   a. Max. Lift Capacity: 2x250=500kN
   b. Max. Lift Height: 3.2m
   c. Max. Lift Speed: 26.3mm per second
   d. Max. Lowering Speed: 55.8mm per second
   e. Max. Horizontal Moving Speed (Dual Direction): 12m per minute
   f. Cylinder Bore Diameter: 220mm
   g. Max. W.P. Hydraulic System: 16MPa
   h. Max. Flow Hydraulic System: 120L per minute
   i. Wire Line Diameter: 28mm
   j. Model Wire Line: 6x37
   k. Pulley Diameter: 419mm

III. Structure and Features

1. BOP Handling System is combined by two single lift devices which hung on the guide rails below the drilling floor. The maximum lift capacity of each lift device is 250kN.
2. Each lift device consists of the following parts:
   - Running mechanism power by hydraulic motors
   - Lift cylinder
   - Lift wire lines and pulley block
   - Bracket to connect running mechanism with cylinder
   - Brake valves set
3. Operator can operate and control system by hydraulic control box to achieve the

fol1owing actions:

- Rise and lowering synchronously
- Move forward and backward synchronously
- Move forward and backward asynchronously
- Rise and lowering with limited separation distance (less than 1m)

4. As is full hydraulic control, it has high performance on explosion-proof.
5. Easy operating valves on hydraulic control box make it easy to control the speed of rise, lowering, move forward and backward.
6. BOP Handling System is easy to install and transport. All hydraulic hoses needed to connect or disconnect on installation or dismounting adopt snap joints as connections. It not only makes it easy to install and dismount system but also keep inner hoses clean.

IV. Installation and Test

1. Infix two lift devices separately from the ends of guide rails below the drilling floor, and mount stop pins on the end of the guide rails to prevent lift devices from sliding out of the guide rails.
2. Weld backing plate of pipe hanger matched with wed plates on the middle of guide rails and mount pipe hanger.
3. According to the matching codes stamped on the snap joints, connect all hydraulic hoses with two lift devices.
4. According to the matching codes stamped on the snap joints, connect all hydraulic hoses with hydraulic control box and lift devices, and fix the middle of hoses on the pipe hanger.
   Note: The length of hoses between pipe hanger and lift device should meet the requirement of lift devices on moving forward and backward.
5. Connect oil inlets and outlets on the hydraulic control box with oil inlets and outlets on the hydraulic station of power tongs on the drilling floor.
6. Ensure all pipe connections in good condition, start hydraulic station to provide 0 BOP Handling System with oil at 16MPa.
7. Push handles of control valves according to the direction marked on the nameplates of the control box and check if all actions are right. Only after all actions must be checked with no any mistakes, then the system can be put into operation.
8. ***Caution:***

   On the operation of moving forward and backward asynchronously, the distance between two lift devices must be less than one meter, otherwise it will cause serious accident.

V. Operation, Maintenance and Safety

1. Watch the manometer on the hydraulic control box to check if oil-feeding pressure meets the requirement (16MPa).
2. According to the directions marked on the nameplates of hydraulic control box, operate two lift devices to rise, lower, move forward and backward.
   Caution:

The BOP Hydraulic System has the function of rise, lowering, moving forward and backward in synchronous or asynchronous method by controlling handles of two ball valves on the hydraulic control box. ***The operator should know: on the operation of moving forward and backward asynchronously, the distance between two lift devices must be less than one meter, otherwise it will cause serious accident.***

3. Maintenance is the needed procedure before installation of two lift devices. There are seven lubrication ports on the lift device each, five for pulleys and two for movable gears. All lubrication ports should be fed by lithium base grease.
4. Before each lifting operation, operator should check if all cables are in good conditions. All cables should be reliable connection before operation. On lifting operation, workers should be far away from the goods to avoid accidents.

VI. Spare Parts List

Item	Code	Description	Qty.	Components
1	DZ5002-01.04.02	Cupper Bushing	20	Pulley
2	DZ5001-10.02	Lift Cable	2	Lift Device
3	GB276-82	Bearing 306	4	Gear Reducer
4	GB278-64	Bearing 60307	4	Gear Reducer
5	GB276-82	Bearing 106	1	Pipe hanger
6	GB301-84	Bearing 8205	1	Pipe hanger
7	GB276-82	Bearing 312	16	Drive / driven Wheel
8		Contact with Supplier	4	Hydraulic System
9	DB10-2-30/315/2	Overflow Valve	2	Ditto
10	RVP10-10	Check Valve	8	Ditto
11	FD12FA12/B30	Compensation Valve	2	Ditto
12	GB1235-76	O-ring 12x1.9	38	Ditto
13	Ditto	O-ring 16x2.4	4	Ditto
14	Ditto	O-ring 20x2.4	2	Ditto
15	Ditto	O-ring 24x2.4	2	Ditto
16	Ditto	O-ring 30x3.1	2	Ditto
17	JB982-77	Combined Gasket 22	12	Ditto
18	Ditto	Combined Gasket 18	4	Ditto
19	Ditto	Combined Gasket 14	18	Ditto

VII. Attached Drawings

1. Fig.1: Lift Diagrammatic Sketch
2. Fig.2: Structure of BOP Handling System
3. Fig.3: Hydraulic Principle of BOP Handling System

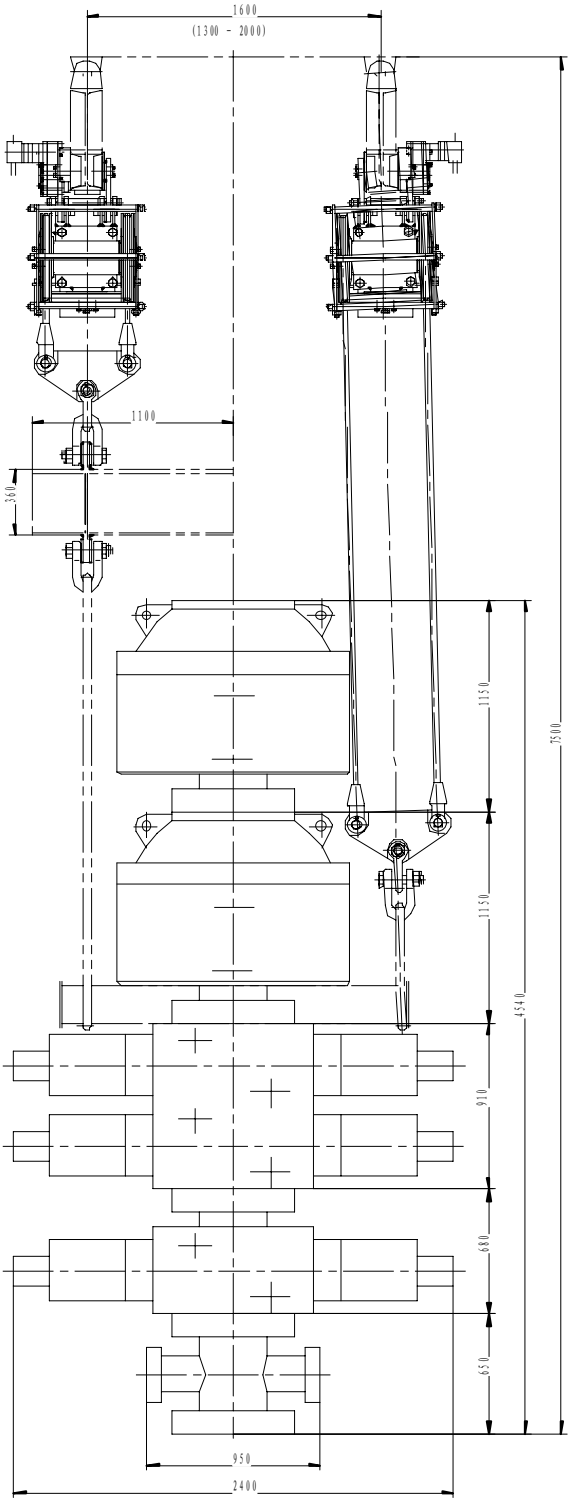

Fig.1: Lift Diagrammatic Sketch

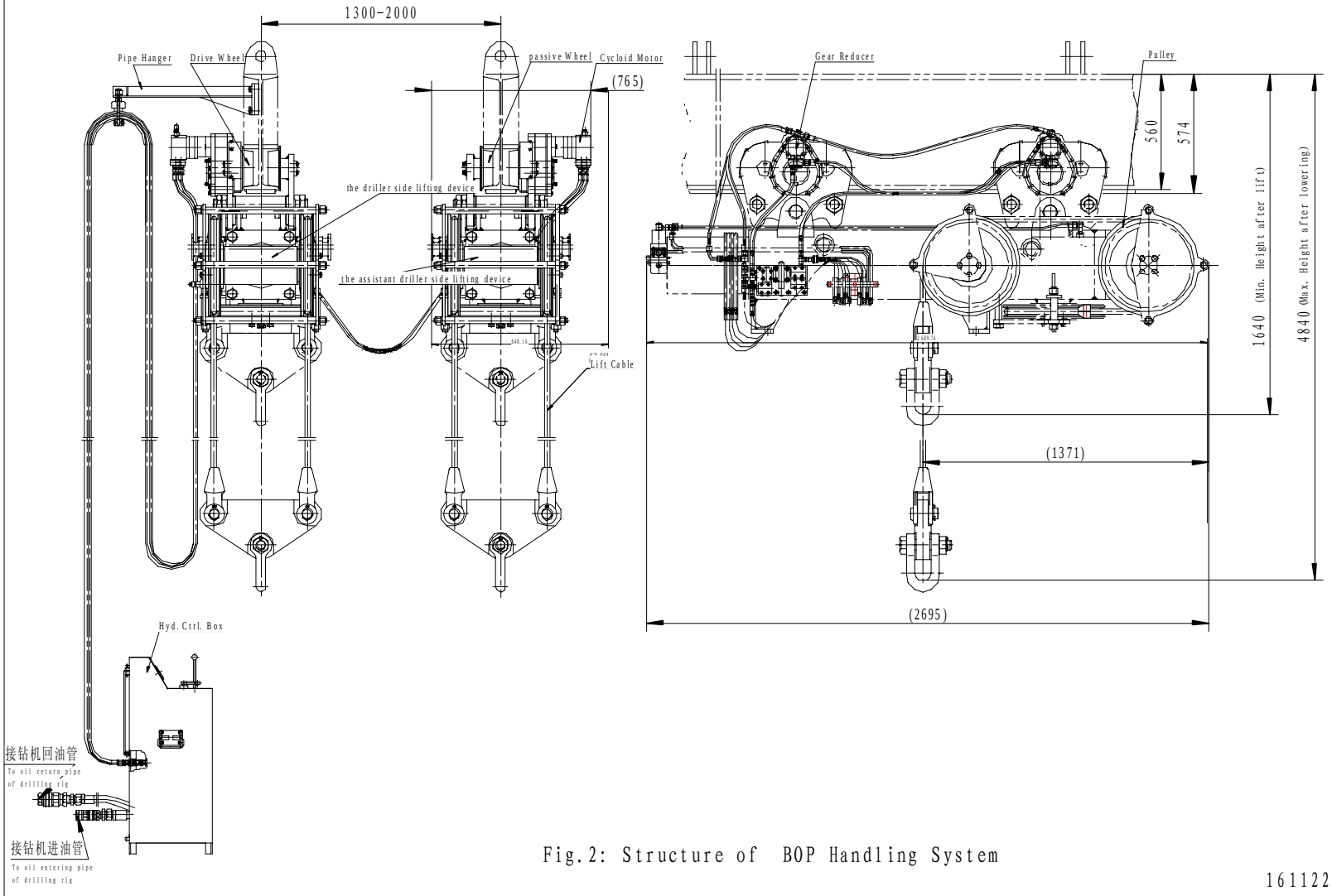

Fig.2: Structure of BOP Handling System

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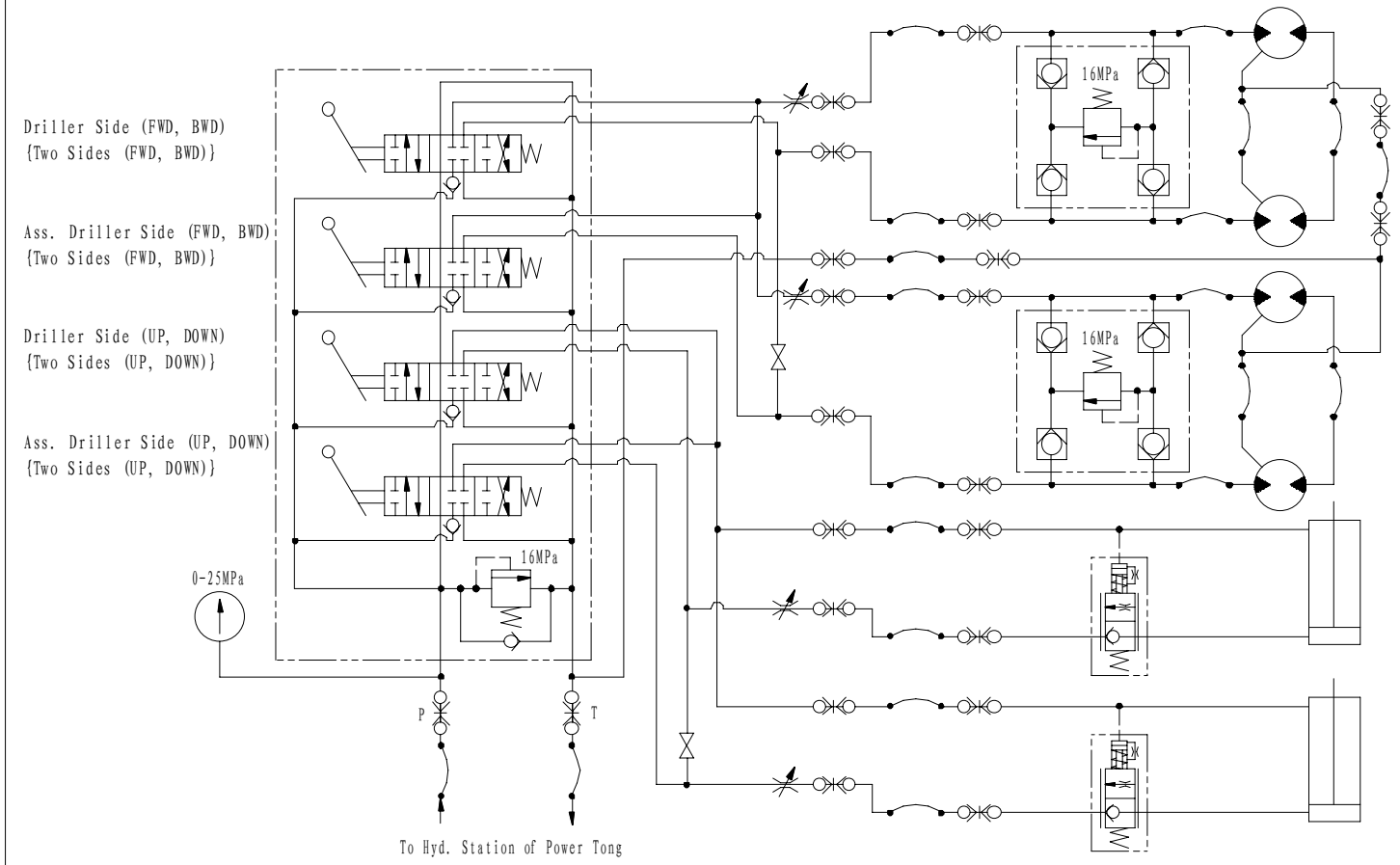

Fig. 3: Hydraulic Principle of BOP Handling System

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