

# PENTACLE OIL FIELD SUPPLY INC.

16689-113 Avenue Edmonton, Alberta T5M 2X2 Canada Phone: (780) 902-3485 Fax: (780) 459-6530

Email: pentacleoilfieldsupply@shaw.ca

www.pentacleoilfield.com

MODEL: XYQ28/2.6

HYDRAULIC SUCKER ROD TONG

# MAINTENANCE AND OPERATION MANUAL



# **CONTENTS**

- 1 SUMMARY
- 2 SPECIFICATION
- 3 INSTALLATION
- **4 HYDRAULIC CIRCUIT**
- **5 OPERATION**
- **6 MAINTENANCE & LUBRICATION**
- 7 ORDINARY PROBLEMS AND TROUBLESHOOTING GUIDE
- 8 FIGURES AND DETAILED PART TABLES

#### 1. Summary

Model XQ28/2.6 hydraulic power tong is an improved type of XYQ1.8 which is used to make up and break out sucker rod thread in Well Service. This product has the following features:

- A. The structure is compact ,concise and light. Master tong is driven by low speed large torque hydraulic motor which matching with manual control valve. The backup tong just like a spanner. Total weight is approximately equal to XYQ1.8.
- B. The operating is briefness and convenience with high efficiency. Put the respondence size jaw set into master tong and the respondence size glutting into backup tong, turning the reset knob in correct direction then can make up and break out sucker rod by operating manual control valve. Two speed, snapping at low speed, spinning at high speed.
- C. Large low gear torque, especially suitable for the instance that is difficult to break out sucker rod thread.

#### 2. Specification

a. Application Range:Sucker Rod: 16. 19. 22. 25. 28 mm

b. High Gear Rated Torque: 0.8 kN.m (590 lbf.ft)

c. Low Gear Rated Torque: 2.6 kN.m (1900 lbf.ft)

d. High Gear Maximum Torque: ≥1.2 kN.m (740 lbf.ft)

e. Low Gear Maximum Torque: ≥3.2 kN.m (2400 lbf.ft)

f. High Gear Maximum Rotation Speed: 98 (r/min)

g. Low Gear Maximum Rotation Speed: 32 (r/min)

h. Opening of Tong Head: 62 (mm)

i. Overall Dimension (L $\times$ W $\times$ H) 670 $\times$ 383 $\times$ 490 (mm)

j. Weight: 100 (Kg)

k. Rated system Pressure: 10 (MPa)

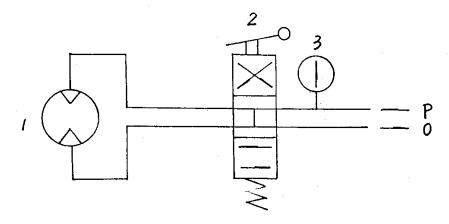
I. Max Oil Supply: 80 (L/min)

#### 3. Installation

- A. Hanging: Connect mechanical lift assembly (2.6DT) with tong hanger of master tong and hang the lift assembly on the mast of workover rig. The hanging point is 15m above ground and the hanging should be in free condition. The distance between tong center and the center of the well is recommended to be about 0.5m, just the Jaw set of the master tong meet the quadrate of sucker rod above the hoop. Adjust the distance between the tong and backup tong, to get the quadrate of Spanner Head meet the quadrate of sucker rod below the hoop.
- B. Level :Adjust the screw to level the Master tong and backup tong.If it is not levelled,it will cause malfunction .
- C. Tieing: Tie one end of cable or chain on mast and the other end on pin shaft of back guide seat (2.6.Z-34) of power tong. The cable or chain should be capable of bearing a load of 2 ton. The cable or chain should be at a right angle to the tong and on the opposite side of the operator of the tong. This insures a safe operation.
- D. Pressure hoses:Power supply hose line marked "P",the return hose line marked "O" (See Figure 1). The hose's internal diameter could not less than  $\Phi$ 20 mm.

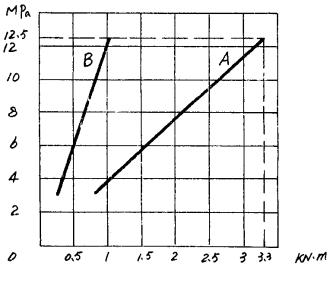
#### **4 HYDRAULIC CIRCUIT**

Figure 1 is the figure of hydraulic circuit of power tong



Figue a

Manual control vavle (2) controls power tong hydraulic motor (1). Hydraulic motor drives tong head to make up and brake out sucker rod. Pressure gauge (3) shows the pressure in the hydraulic circuit. The figure 2 is the correspondence of pressure and torque. Line A is low gear rated torque, line B is high gear rated torque.



Figue b

#### **5 OPERATION**

- A. Adjust distances between the maser tong and backup tong: To get the Jaw set of the master tong and Spanner Head meet the quadrate of sucker rod above or blow the hoop by turning the nut (2.6.b-20) and put the Cotter Pin in the hole of Back Guide Arm.
- B. Drive the power tong very slowly using manual control vavle, press down handle (2.6.z.3-10) change gear to get high speed, pull up handle (2.6.z.3-10) change gear to get low speed. To avoid the gear damaged accidentally, please change gear when the open gear runing at low speed.
- C. Make up: After aligning the opening tong head with the backup tong, turn the reset knobs (2.6.z-54) and switch the arrow to point the direction of make up. Locate the tong on to the sucker rod. Once the Jaw set of the master tong and Spanner Head have been meeted the quadrate of sucker rod above or blow the hoop, commence make up with the tong. After the rod is made up, reverse rotation of the tong to align the opening of the tong with the sucker rod.
- D. Break out: After aligning the opening tong head with the backup tong, turn the reset knobs (2.6.z-54) and switch the arrow to point the direction of break out. Locate the tong on to the sucker rod. Once the Jaw set of the master tong and Spanner Head have been meeted the quadrate of sucker rod above or blow the hoop, commence break out with the tong. After the rod is broken out, reverse rotation of the tong to align the opening of the tong with the sucker rod.

E. Replacing Jaw set and glutting:The Jaw set and glutting are retained in place with springs.There are locating holes on the outside edge of the master tong. A small screw driver or drive tool (Diameter less than  $\Phi 8 \text{ mm}$ ) must be pushed into inside of the tong head.The jaw set unit must be pushed to a point where removed. When this is accomplished the jaw set will slide out of the jaw set unit easily. Replace the jaw set ,and place the Retaining Pin (2.6.z.1-5) back into position and tighten.Press down Retaining Pin (2.6.B-8) then can Replace the glutting.

1 1940 0 10 1110 001101	rigae o le tile correspondence of carrier, glatting and cacherred			
Sucker Rod :	Jaw Set	Glutting		
CYG16	16. 19. 22	16		
CYG 19. 22	16. 19. 22	19. 22		
CYG 25	25	25		
CYG 28	28	28		

Figue 3 is the correspondence of Jaw set, glutting and sucker rod

#### **6 MAINTENANCE & LUBRICATION**

It is suggested that a regular maintenance program be established, to assure dependable operation of the sucker rod tong. The following recommendations concerning cleaning, lubrication, and cleaning will enhance the life expectancy of the tong and assure safety to operating personnel.

- **A.** Lubrication procedures at the completion of each job prior to storage.
- **B.** All grease should have 2 to 5 shouts of grease after each job.
- **C.** Rotary gear cam surface should be greased well applying with a rag or a brush.
- **D.** Case plates / rings should be coated with grease both through the grease nipples and coated on the rings.
- **E.** Gears can be greased by removing the side inspection cover plate and apply grease directly to the gear teeth.
- F. Don't use steam to clean tong. If steam is used ,the bearing will be damaged .
- **G.**Temperature of system hydraulic oil can not exceed 65 C $^{\circ}$  .If the temperature is too high ,the sealing will be failure .
- **H.** Hydraulic oil should be clean and replaced when it becomes dirty. Keep the Oil Filter clean.
- I. Selection of Hydraulic Oil:
- a.YC-N46 Low Freezing Hydraulic Oil , suitable for the Ambient Temperature -20 C  $^\circ$  -+20 C  $^\circ$  .
- b.YB-N46 Wear Resistant Hydraulic Oil , suitable for the Ambient Temperature -10 C  $^{\circ}$  - +40 C  $^{\circ}$  .
- c.YA-N46 Common Hydraulic Oil , suitable for the Ambient Temperature 0 C  $^{\circ}\,$  +40 C  $^{\circ}\,$  .

Just select the Hydraulic Oil as you needed.

# 7 ORDINARY PROBLEMS AND TROUBLESHOOTING GUIDE

Ordinary Troubles	Cause	Remedy
	A. Die set are selected improperly.	Change suitable die set
Master tong die	B. Tong die set are much worn	Change new die set
set slippage.	C. The brake moment of tong head is a little small	Tighten spring properly
	D.The tong body is not level.	Level tong body
Backup tong could	A. Glutting are selected improperly.	Change suitable glutting
not clip sucker rod	B. Glutting are much worn	Change new glutting
	C.The tong body is not level	Level tong body
Head of master tong doesn't align with the opening of housing	Retaining pins are not wrapped by reset knob shaft	Turn reset knob then reset.
Engaging a gear is not firm and it drops out easily.	Locking effort is a little small	Add adjusting pad and increase the pressure of spring
Jaw set does not retract	Jaw set's shape has changed because of high system pressure	Adjust the system pressure in proper range.Change jaw set

#### **8 FIGURES AND DETAILED PART TABLES**

- **8.1 ASSEMBLY** (Fig1, Table 1)
- **8.2 MASTER TONG** (Fig 2, Table 2)
  - 8. 2. 1 Tong head assembly (Fig 3, Table 3)
  - 8. 2. 2 Tong head cover assy. (Fig 4, Table 4)
  - 8. 2. 3 Safety door and its fittings (Fig 5, Table 5)
  - 8. 2. 4 Shell and its fittings (Fig 6, Table 6)
  - 8. 2. 5 Transmission gear and its fittings (Fig 7, Table 7)
  - 8. 2. 6 Shifter assembly (Fig 8, Table 8)
  - 8. 2. 7 Hydraulic motor and its control valve and fittings (Fig 9, Table 9)
- **8.3 BACKUP TONG** (Fig 10, Table 10)
  - 8. 3. 1 Fore guide rod assy. (Fig 11, Table 11)
- **8.4 MECHANICAL LIFT** (Fig 12, Table 12)

# **8.1 ASSEMBLY** (Fig 1, Table 1)

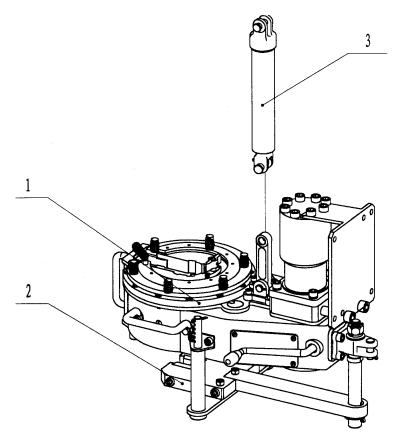


Fig1

Table 1. assembly

Item	P/N	Drawing NO.	Description	Qty
1	2.6.Z.0	XYQ2.6.Z.0	Master tong	1
2	2.6.B.0	XYQ2.6.B.0	Backup tong	1
3	2.6.DT.0	XYQ1.8.DT.0	Mechanical lift	1

# **8.2 Mater tong** (Fig 2, Table2)

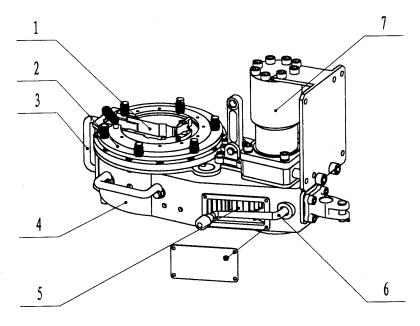


Fig 2

Table 2. master tong

Item	P/N	Drawing NO.	Description	Qty
1	2.6.Z-2	XYQ2.6.Z.1	Tong head assembly	1
2			Tong head cover assy.	1
3			Safety door and its fittings	1
4			Shell and its fittings	1
5			Transmission gear and its fittings	1
6	2.6.Z-88	XYQ2.6.Z.3	Shifter assmbly	1
7			Hydraulic motor and its control valve and fittings	1

# **9.2.1 Tong head assembly** (Fig 3, Table 3)

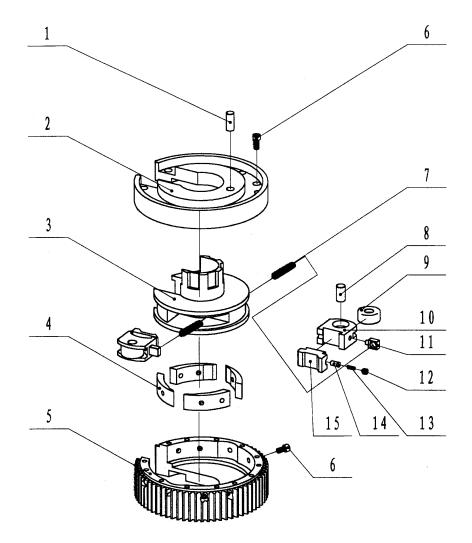


Fig 3

Table 3 tong head assembly

Item	P/N	Drawing NO.	Description	Qty
1	2.6.Z.1-15	XYQ3C.Z.1-2	Cylindrical Pin	1
2	2.6.Z.1-12	XYQ2.6.Z.1-9	Open Gear Cover	1
3	2.6.Z.1-1	XYQ2.6.Z.1-1	Jaw Set Shelf	1
4	2.6.Z.1-10	XYQ2.6.Z.1-7	Spring Seat	4
5	2.6.Z.1-11	XYQ2.6.Z.1-8	Open Gear	1
6	2.6.Z.1-9	GB70-85	Hexagon Socket Head Cap Screw M8×16-8.8	21
7	2.6.Z.1-8	XYQ1.8.Z.1-8	Spring	2
8	2.6.Z.1-3	XYQ2.6.Z.1-3	Roller Pin	2

9	2.6.Z.1-4	XYQ2.6.Z.1-4	Roller	2
10	2.6.Z.1-2	XYQ2.6.Z.1-2	Jaw Set Seat	2
11	2.6.Z.1-7	XYQ2.6.Z.1-6	Spring Seat	2
12	2.6.Z.1-14	GB77-85	Set Screw M10×10	8
13	2.6.Z.1-13	XYQ3C.Z.1-14	Spring	8
14	2.6.Z.1-5	XYQ3C.Z.1-15	Cylindrical Pin	6
15	2.6.Z.1-6	XYQ2.6.Z.1-5	Jaw Set (1)-(3)	Each 2

# **9.2.2 Tong head cover assy.** (Fig 4, Table 4)

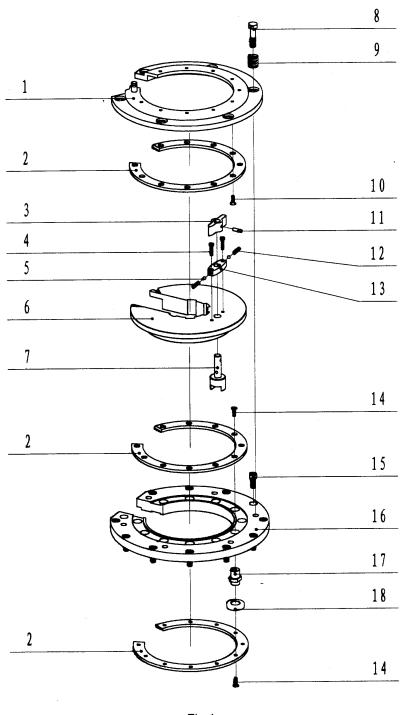


Fig 4

Table 4 Tong head cover assy.

Item	P/N	Drawing NO.	Description	Qty
1	2.6.Z-50	XYQ2.6.Z.5	Brake plate	1
2	2.6.Z-51	XYQ2.6.Z-14	Friction Disc	3
3	2.6.Z-54	XYQ3C.Z-32	Reset Knob	1
4	2.6.Z-60	GB65-85	Hexagon Socker Head Cap Screw M5×20	2
5	2.6.Z-58	GB308-89	Steel Ball ⊕5	2
6	2.6.Z-53	XYQ2.6.Z-15	Joint Board (1)	1
7	2.6.Z-56	XYQ2.6.Z-16	Reset Knob Shaft	1
8	2.6.Z-61	GB32.1-88	Hex-Head Bolt M10×40	6
9	2.6.Z-33	XYQ3C.Z-21	Spring	6
10	2.6.Z-52	GB819-85	Countersunk Screw M5×8	11
11	2.6.Z-55	GB119-86	Cylindrical Pin 5×18	1
12	2.6.Z-59	XYQ3C.Z-35	Spring	2
13	2.6.Z-57	XYQ3C.Z-34	Locating Seat	1
14	2.6.Z-6	GB819-85	Countersunk Screw M5×10	22
15	2.6.Z-48	GB70-85	Hexagon Socket Head Cap Screw M8×20-8.8	11
16	2.6.Z-49	XYQ2.6.Z-12	Tong Head Cover	1
17	2.6.Z-7	XYQ2.6.Z-3	Roller Shaft	11
18	2.6.Z-4	XYQ2.6.Z-2	Roller	11

# **9.2.3 Safety door and its fittings** (fig.5, Table 5)

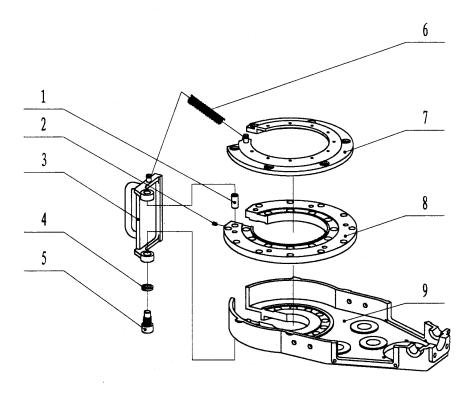


Fig 5

Table 5 Safety door and its fittings

Item	P/N	Drawing NO.	Description	Qty
1	2.6.Z-74	XYQ2.6.Z-28	Door Pin (2)	1
2	2.6.Z-75	GB71-85	Coniform Fastening Screw M8 ×16	1
3	2.6.Z-65	XYQ2.6.Z.4	Safty door	1
4	2.6.Z-64	GB93-87	Spring Washer 16	1
5	2.6.Z-63	XYQ2.6.Z-25	Door Pin (1)	1
6	2.6.Z-91		Tension spring	1
7		XYQ2.6.Z.5	Brake plate	
8		XYQ2.6.Z-12	Tong Head Cover	
9		XYQ2.6.Z-1	Shell	

# **9.2.4 Shell and its fittings** (Fig 6, Table 6)

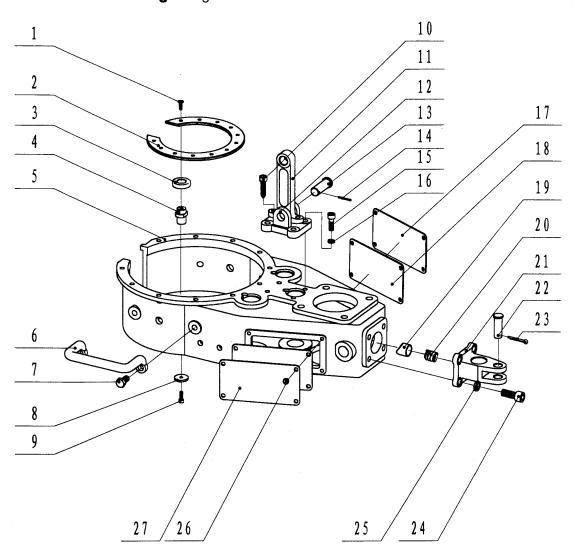


Fig 6

Table 6 Shell and its fittings

Item	P/N	Drawing NO.	Description	Qty
1	2.6.Z-6	GB819-85	Countersunk Screw M5×10	12
2	2.6.Z-5	XYQ1.8.Z-3	Bearing Disc	1
3	2.6.Z-4	XYQ2.6.Z-2	Roller	12
4	2.6.Z-7	XYQ2.6.Z-3	Roller Shaft	12
5	2.6.Z-3	XYQ2.6.Z-1	Shell	1
6	2.6.Z-62	XYQ3C.Z.3-2	Fore Handle (Left)	2
7	2.6.Z-1	GB5782-86	Hex Head Bolt M10×20-8.8	4
8	2.6.Z-8	GB892-86	Retaining Ring B18	12

9	2.6.Z-9	GB70-85	Hexagon Socket Head Cap Screw M5×16-8.8	12
10	2.6.Z-89	XYQ3C.Z-50	Set Screw	2
11	2.6.Z-47	XYQ1.8.Z-27	Hanging rod	1
12	2.6.Z-66	XYQ3C.Z-38	Hanging Support	1
13	2.6.Z-67	XYQ3C.Z-39	Hanging Pin	1
14	2.6.Z-68	GB91-86	Cotter Pin 2.5×20	1
15	2.6.Z-70	GB70-85	Hexagon Socket Head Cap Screw M8×25-8.8	4
16	2.6.Z-71	GB93-87	Spring Washer 8	4
17	2.6.Z-84	XYQ2.6.Z-29	Nameplate	1
18	2.6.Z-69	XYQ1.8.Z-26	Cover	2
19	2.6.Z-32	XYQ3C.Z-20	Sliding Block	1
20	2.6.Z-33	XYQ3C.Z-21	Spring	1
21	2.6.Z-34	XYQ1.8.Z-19	Trailling Seat	1
22	2.6.Z-35	XYQ1.8.Z-20	Back Guy Pin	1
23	2.6.Z-36	GB91-86	Cotter Pin 4×25	1
24	2.6.Z-37	GB70-85	Hexagon Socket Head Cap Screw M12×30-8.8	4
25	2.6.Z-38	GB93-87	Spring Washer 12	4
26	2.6.Z-72	GB65-85	Hexagon Socker Head Cap Screw M6×10	8
27	2.6.Z-92	XYQ2.6.Z-30B	Torque gauge	1

# **9.2.5 Transmission gear and its fittings** (Fig 7, Table 7)

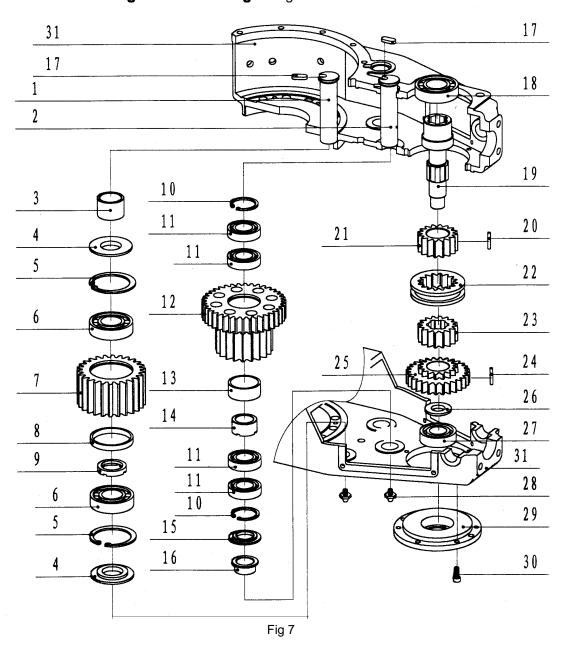


Table 7 Transmission gear and its fittings

Item	P/N	Drawing NO.	Description	Qty
1	2.6.Z-77	XYQ2.6.Z-18	Idler Gear Shaft	2
2	2.6.Z-19	XYQ2.6.Z-7	Shaft of Duplex Gear	1
3	2.6.Z-76	XYQ2.6.Z-17	Sleeve (3)	2
4	2.6.Z-78	XYQ2.6.Z-19	Bearing Disc	4
5	2.6.Z-79	GB893.1-86	Circlip of Hole 62	4

6	2.6.Z-80	GB283-87	Short Roller Bearing 42206E	4
7	2.6.Z-81	XYQ2.6.Z-20	Idler Gear	2
8	2.6.Z-82	XYQ2.6.Z-21	Sleeve (4)	2
9	2.6.Z-83	XYQ2.6.Z-22	Sleeve (5)	2
10	2.6.Z-17	GB893.1-86	Circlip of Hole 47	2
11	2.6.Z-14	GB276-94	Ball Bearing 105	4
12	2.6.Z-11	XYQ2.6.Z-4	Duplex Gear	1
13	2.6.Z-12	XYQ2.6.Z-5	Sleeve (1)	1
14	2.6.Z-13	XYQ2.6.Z-6	Sleeve (2)	1
15	2.6.Z-15	XYQ3C.Z-9	Bearing Disc (1)	1
16	2.6.Z-16	XYQ3C.Z-10	Bearing Disc (2)	1
17	2.6.Z-10	XYQ1.8.Z-25	Key	3
18	2.6.Z-43	GB276-94	Ball Bearing 208	1
19	2.6.Z-26	XYQ2.6.Z-10	Main Shaft	1
20	2.6.Z-41	GB309-84	Needle Roller 4×25.8	22
21	2.6.Z-22	XYQ2.6.Z-8	Gear	1
22	2.6.Z-21	XYQ1.8.Z-12	Internal Gear	1
23	2.6.Z-23	XYQ2.6.Z-9	Spline Gear	1
24	2.6.Z-39	GB309-84	Needle Roller 4×31.8	22
25	2.6.Z-24	XYQ2.6.Z.2	Cluch Gear Unit	1
26	2.6.Z-25	XYQ1.8.Z-17	Bearing Disc	1
27	2.6.Z-28	GB276-94	Ball Bearing 204	1
28	2.6.Z-18	GB1152-89	Grease Cup M8×1	3
29	2.6.Z-30	XYQ2.6.Z-11	Bottom Cover	1
30	2.6.Z-31	GB70-85	Hexagon Socket Head Cap Screw M6×16-8.8	6
31		XYQ2.6.Z-1	Shell	
		I.	i .	

# **9.2.6 Shift assmbly** (Fig 8, Table 8)

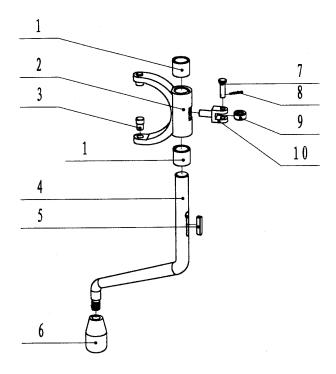


Fig 8

#### Table 8 Shift assmbly

Item	P/N	Drawing NO.	Description	Qty
1	2.6.Z.3-1	XYQ1.8.Z.3-1	Sleeve	2
2	2.6.Z.3-2	XYQ1.8.Z.3-2	Shift Fork	1
3	2.6.Z.3-9	XYQ1.8.Z.3-5	Sliding Block	2
4	2.6.Z.3-8	XYQ2.6.Z.3-4	Shift Fork Shaft	1
5	2.6.Z.3-7	XYQ1.8.Z.3-3	Key	1
6	2.6.Z.3-10	XYQ3C.Z.5-10	Handle	1
7	2.6.Z.3-4	XYQ3C.Z.6-4	Roller Shaft	1
8	2.6.Z.3-5	GB91-86	Cotter Pin 2×10	1
9	2.6.Z.3-3	XYQ3C.Z.6-3	Roller	1
10	2.6.Z.3-6	XYQ3C.Z.6-5	Roller Seat	1

# **9.2.7 Hyraulic motor and its control valve and fittings** (Fig 9, Table 9)

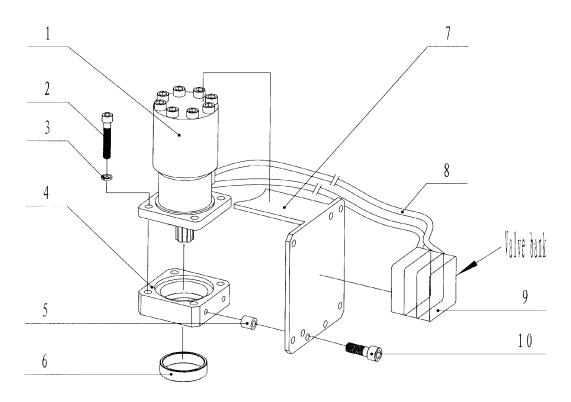


Fig 9

Table 9 Hydraulic motor and its control valve and fittings

Item	P/N	Drawing NO.	Description	Qty
1	2.6.Z-46		Hydraulic Motor BM-D315	1
2	2.6.Z-73	GB70-85	Hexagon Socket Head Cap Screw M12×70-8.8	4
3	2.6.Z-38	GB93-87	Spring Washer 12	4
4	2.6.Z-44	XYQ2.6.Z-23	Joint Board (2)	1
5	2.6.Z-42	XYQ2.6.Z-27	Sleeve (6)	2
6	2.6.Z-20	XYQ3C.Z-12	Sleeve of Hydraulic Motor	1
7	2.6.Z-45	XYQ2.6.Z.6	Frisket	1
8	2.6.Z-93	JB/ZQ4427-86	Hose 13I-500	2
9	2.6.Z-94		Control valve bank assembly	1
10	2.6.Z-40	GB70-85	Hexagon Socket Head Cap Screw M10×40-8.8	2

# **9.2.7 Hyraulic motor and its control valve and fittings (1)** (Fig 9, Table 9)

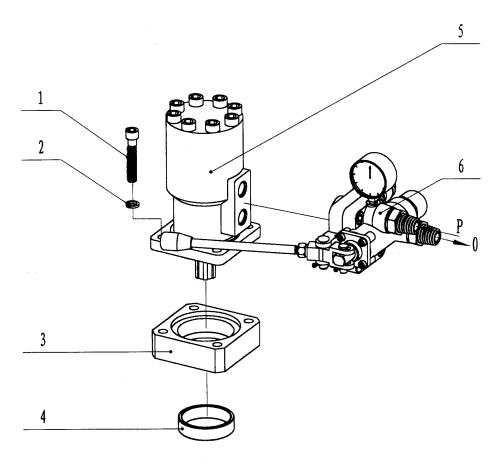


Fig 9

Table 9 Hyraulic motor and its control valve and fittings (1)

Item	P/N	Drawing NO.	Description	Qty
1	2.6.Z-73	GB70-85	Hexagon Socket Head Cap Screw M12×70-8.8	4
2	2.6.Z-38	GB93-87	Spring Washer 12	4
3	2.6.Z-44	XYQ2.6.Z-23	Joint Board (2)	1
4	2.6.Z-20	XYQ3C.Z-12	Sleeve of Hydraulic Motor	1
5	2.6.Z-46		Hydraulic Motor BM-D315	1
6	2.6.Z-95	XYQ3C.Z.5	Type H hand control valve and its valve bank	1

# **9.3 Backup tong** (Fig 10, Table 10)

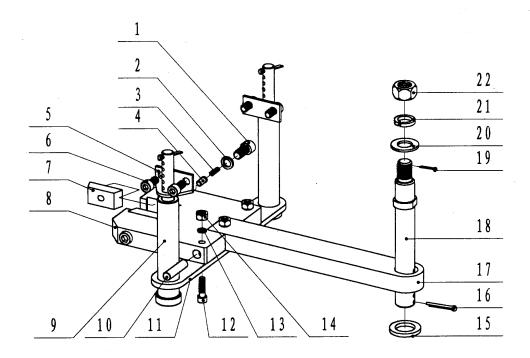


Fig 10

#### Table 10 Backup tong

Item	P/N	Drawing NO.	Description	Qty
1	2.6.B-9	GB70-85	Hexagon Socket Head Cap Screw M12×25-8.8	2
2	2.6.B-10	GB93-87	Spring Washer 12	2
3	2.6.B-7	XYQ3C.Z.1-14	Spring	2
4	2.6.B-8	XYQ3C.Z.1-15	Retaining Pin	2
5	2.6.B-12	XYQ2.6.B-5	Supporting Seat (2)	2
6	2.6.B-13	GB70-85	Hexagon Socket Head Cap Screw M10×20-8.8	4
7	2.6.B-6	XYQ2.6.B-3(1)-(4)	Glutting (1)-(4)	Each 2
8	2.6.B-4	XYQ2.6.B-1	Spanner Head	1
9	2.6.B-22	XYQ1.8.QD.0	Fore guide rod assy.	2
10	2.6.B-14	XYQ2.6.B-6	Roller	2
11	2.6.B-11	XYQ2.6.B-4	Cupporting Coat (1)	1
	Z.U.D-11	↑1Q2.0.D-4	Supporting Seat (1)	
12	2.6.B-1	GB70-85	Hexagon Socket Head Cap Screw M8×150-8.8	3
			Hexagon Socket Head Cap Screw	

(780) 902-3485 www.pentacleoilfield.com

15	2.6.B-16	XYQ2.6.B-7	Flat washer	1
16	2.6.B-15	GB91-86	Cotter Pin 5×35	1
17	2.6.B-5	XYQ2.6.B-2	Spanner handle	1
18	2.6.B-20	XYQ2.6.B-8	Steel Rope Head	1
19	2.6.B-21	GB91-86	Cotter Pin 2.5×25	1
20	2.6.B-18	GB95-85	Flat washer 20	1
21	2.6.B-19	GB93-87	Spring Washer 20	1
22	2.6.B-17	GB6170-86	Nut M20	1

# **9.3.1 Fore guide rod assy.** (Fig 11, Table 11)

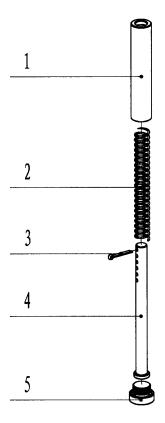


Fig 11

Table 11 Fore guide rod assy.

Item	P/N	Drawing NO.	Description	Qty
1	2.6.B.1-1	XYQ1.8.QD-4	Fore guide rod sleeve	1
2	2.6.B.1-2	XYQ1.8.QD-3	Spring	1
3	2.6.B.1-3	GB91-86	Cotter Pin 4×20	1
4	2.6.B.1-4	XYQ1.8.QD-2	Fore guide rod	1
5	2.6.B.1-5	XYQ1.8.QD-1	Fore guide rod seat	1

# **9.4 Mechanical lift** (Fig 12, Table 12)

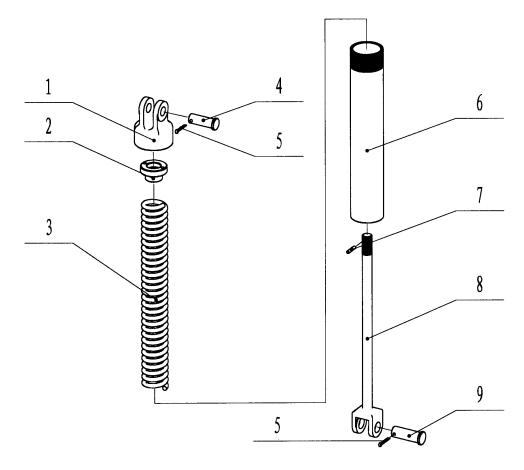


Fig 12

Table 12 Mechanical lift

Item	P/N	Drawing NO.	Description	Qty
1	2.6.DT-2	XYQ1.8.DT-1	Clevis	1
2	2.6.DT-3	XYQ1.8.DT-2	Spring Seat	1
3	2.6.DT-6	XYQ1.8.DT-3	Spring	1
4	2.6.DT-1	GB882-96	Cotter Pin B14×40	1
5	2.6.DT-9	GB91-86	Cotter Pin 3.2×20	2
6	2.6.DT-5	XYQ1.8.DT.1	Lift Casing	1
7	2.6.DT-4	GB119-86	Cylindrical Pin 4×20	1
8	2.6.DT-7	XYQ1.8.DT.2	Hanging Bar	1
9	2.6.DT-8	GB882-86	Pin Shaft B16×45	1