TUWEI™

TWG-ⅢAP Roll Grooving Machine

CE

User's Manual

Familiar yourself with this Manual prior to operation

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Table of Contents

I. Major applications and scope

This machine is applicable for forming circular channel at the end of seamless steel tubing, galvanized pipes, plastic-lining pipes and stainless steel pipes etc, to facilitate the mounting of circular pipe clamps. It's an ideal tool for construction industry and pipeline construction sectors.

II. Technological Parameters

Max. diameter allowed for pipes to be channeled……114mm

Min. diameter allowed for pipes to be channeled……33mm

Max. wall thickness allowed for pipes to be channeled……5mm

Max. working pressure……6000kg

Max. oil cylinder pressure ……30Mpa

Capacity of oil tank……150ml

speed …… 23 rpm

Electric motor ……single phase/three phase

Overall dimensions (W×D×H) ……540mm×560mm×950mm

Net weight……98kg

III. Major parts

TWG-ⅢA Roll Grooving Machine

1.Switch 2.Safety cover 3.Head

4.Handle 5.Limit mut 6.Limit Lock nut

7.Pressure relief valve 8.Oil tank

9.Roller frame 10.Axle 11.Hexagon set screw with cylindrical end 12.Roller 13. Knurl wheel

14.Motor 15.Foot rack

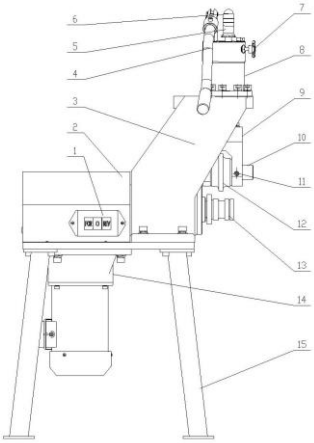
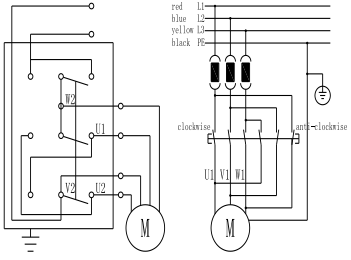


Fig.1

IV. Driving System

The major moving unit of this machine consists of a rotating spindle directly driven by a reduction motor through cross slide coupling, resulting in a reduced loss of mechanic power. The feeding movement is realized by manual hydraulic system



single phase motor three phase motor

Fig. 2

V. Electric System

Fig.2

Refer to Fig.2 for the Electric Circuit Diagram of this Grooving Machine. Consists of an electric motor,a clockwise/ anti-clockwise switch and cables. Turning clockwise, anticlockwise and stop are controlled by the switch. The power supply shall agree with the requirements of motor. Sound earthing of ground wire (black) is required prior to starting the machine.

VI. Operation and Adjustment

1. Let the machine run idle to check whether it's normal(Fig.3).

Fig.3

Fig.4

Fig.5

2. Place the steel tubes on the knurlshaft and bracket.Turn the handle to vary the height of bracket so that the steel tube and spindle are parallel. The bracket shall be placed at a position equal to 3/4 of the length of whole tube(Fig.3).
3. At the beginning of operation, let the steel tube rotate without further action to observe whether the tube will move outward. If it moves, you shall either vary the direction and height of bracket or toggle the clockwise/anti-clockwise witch to change the rotating direction of motor to keep the tube unmoved and tighten the relief valve before applying pressure.Turn the handle at a faster speed at the beginning to form the initial channel. And later on, you shall turn slowly. The steel tube shall be rotated at least one turn for each applying of pressure.

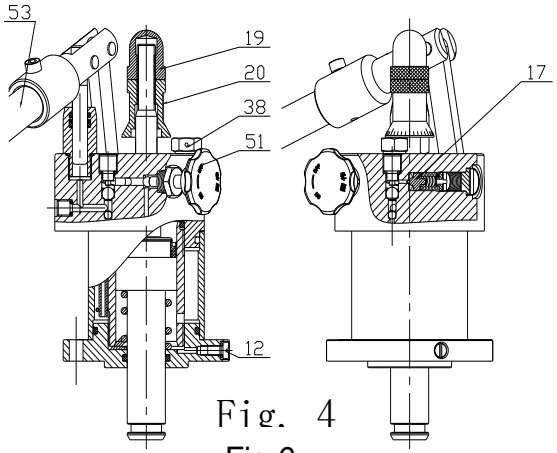


Fig. 4
Fig.6

4. Limit and depth adjustment of channel. First loosen the limit nut. Measure and cut the first channel followed by fastening of limit nut (Fig.5). For the following channels, it

means the desired channeling depth has been attained when the force to apply to the handle increases, and you shall stop turning the handle to let the pinch roller roll at the original position for 1-2 turns before opening the relief valve (Refer to Fig.6:51#) to allow the pinch roller leave the tube. The pinch roller holder will return to its highest position automatically. The above procedure shall occur while the machine is kept on.

5. Remove the filler plug to add hydraulic oil. (loosen the relief valve)(Refer to Fig. 6:38#). Unscrew the discharge screw before discharging all the dirt used oil.
6. If you want to remove the whole oil cylinder from the unit head, you shall press the slide and move it downward to the lower position, followed by removal of two socket slot type bolt M8 (see Fig.8) on the piston fastening ring, and 10 socket inner hexagonal bolt M10.the whole oil cylinder would be removed from the unit head(See Fig.9)

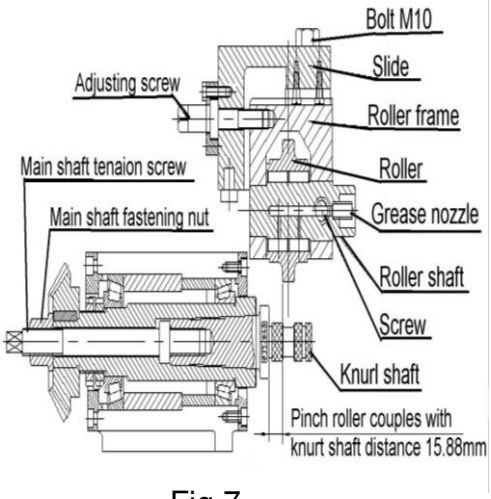


Fig.7

7. For the replacement of pinch roller, you shall return the pinch roller holder to the highest position (See Fig.8) and remove the screws before pulling out the roller shaft

while holding the roller with your hand.(make sure the needles on the needle bearing of pinch roller are complete and not missing.) Replace with a new roller. For the relocating of pinch roller, you shall loosen 2 M10 bolts on the slide and turn the adjustment bolts 5(Fig.10) to move the pinch roller holder forward/backward.Refer to Fig.5 for specific location requirements. Followed by tightening the 2 M10 bolts.

Fig.8

Fig.9

Fig.10

8. In case removal of whole pinch roller holder is required, similar to the above, the two socket slot type screws M8 on the piston fastening ring shall be loosen (Fig.11-12)

and then 8 socket inner hexagonal screws M10 on the two rails shall be removed . Now the whole pinch roller holder can be removed from the unit head(Fig.13).

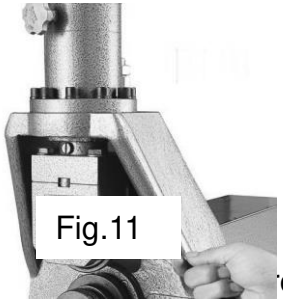


Fig.11


Fig.12


Fig.13

9. O| e loosen the spindle of M16 bol shall be light tapped to facilitate the replacing of pinch roller and matching knurl shaft, The knurl shaft would be exchanged(See Fig. 14-17).

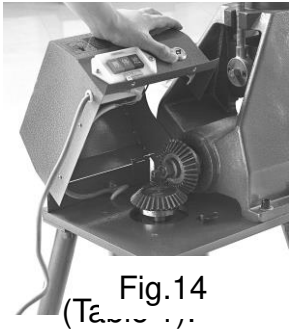


Fig.14


Fig.15


Fig.16

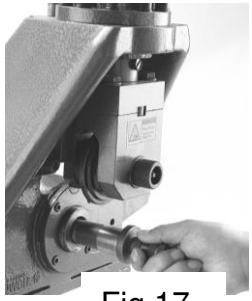
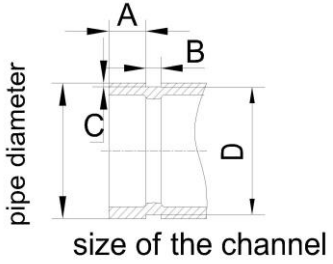


Fig.17

(Ta .

Model of Pinch Roller	Model of Knurl Shaft	Nominal Pipe Dia.		Actual Pipe Dia .(mm)	A±0.5 (mm)	B±0.5 (mm)	C (mm)	Diameter of Groove Bottom D	
		(inch)	(mm)					Max	Min
Small pinch roller	Small knurl shaft	1″	25	33	15.8	7.1	1.7	30.23	29.85
		1 1/4″	32	42	15.8	7.1	1.7	38.99	38.61
		1 1/2″	40	48	15.8	7.1	1.7	45.09	44.70
Large pinch roller	Large Knurl shaft	2″	50	57	15.8	8.7	2.0	53.85	53.47
		2″	50	60	15.8	8.7	2.0	57.15	56.77
		2 1/2″	65	76	15.8	8.7	2.1	72.26	71.80
		3″	80	89	15.8	8.7	2.1	84.94	84.48
		4″	100	108	15.8	8.7	2.2	103.73	103.22
		4″	100	114	15.8	8.7	2.2	110.08	109.57



·VII. Precautions

1. You are required to familiar yourself with structure of machine, functions of various handles as well as the driving and lubrication system through reading the Manual prior to operation.
2. Before starting the machine, you shall add oil as instructed in the Manual, check whether the hydraulic cylinder has been filled with oil (20# oil in the summer and 10 # oil in the winter). The machine has been readily pre-set before being delivered.
3. Earthing and fuse are required in the circuit. The motor shall be properly wired. Never run the machine overload.
4. The pinch roller and knurl shaft shall be selected properly in line with Table 1 to ensure the channeling result.
5. Any steel tube shall have smooth ends and surface by grinding before being channeled. Otherwise bur may occur to the tube, the machine's service life will be significantly shortened, and leakage may occur to the pipeline.
6. During servicing of grooving machine, be sure no needle on the needle bearing has been missing. In case of missing, a new needle shall be adhered to the bearing with lubrication grease before re-assembly.
7.

·VIII. Maintenance

1. Check whether the moving units and the machine can work normally or not. Check whether the hydraulic is sufficient. If not, fill it. After each use, clean the working surface and coat with anti-rust oil. Add lubrication grease to all the joints of moving units.
2. The grease nozzle in front of the pinch roller shaft shall be lubricated each shift.Various moving units shall be lubricated at least 1-2 times each shift.
3. The replaced knurl shaft and pinch roller (with the needles on the needle bearing, fastened with butter, lined with plastic cover) shall be properly kept after being coated with anti-rust oil for next use.
4. Use hydraulic oil of proper brand number as instructed in the Manual. Remove all the dusts near the filler aperture before adding oil.

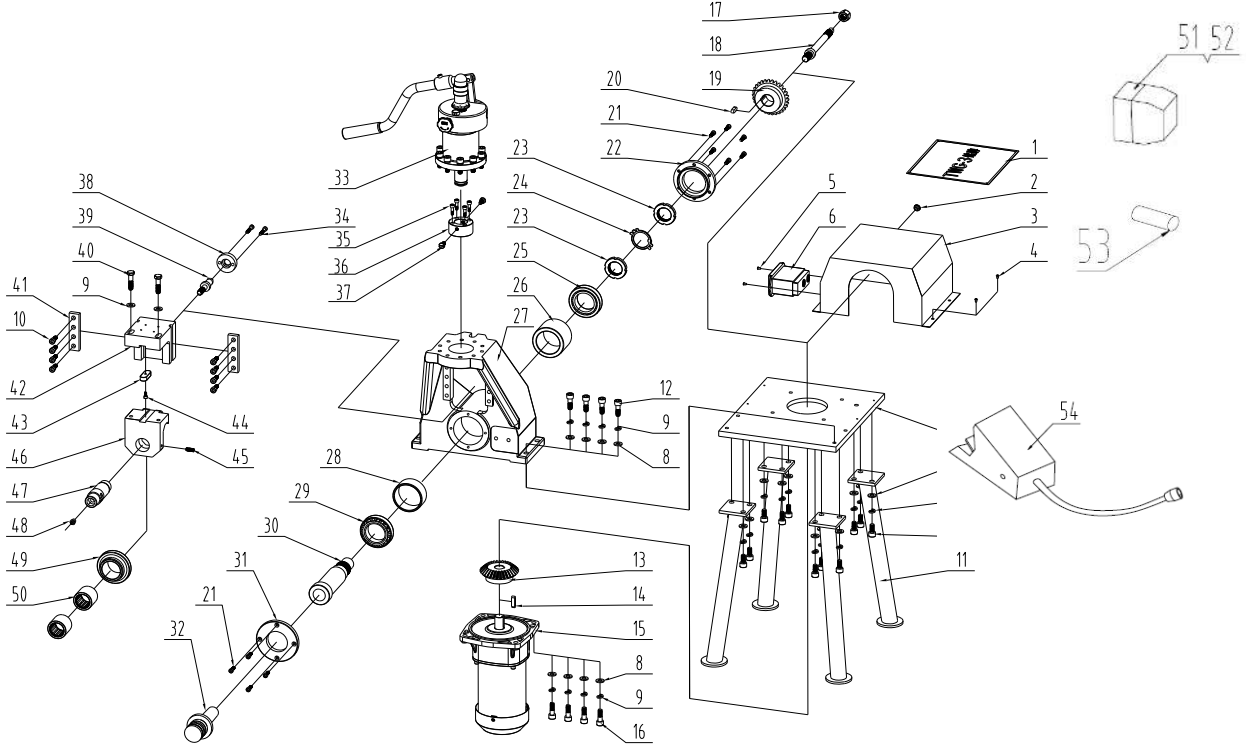
·Ⅸ Troubleshooting:

Problem	Causes	Solutions
No pressure in the oil cylinder. No action resulted from turning the handle.	1.Insufficient hydraulic oil.	Add hydraulic oil
	2. Dirt oil blocks the hole	Replace the hydraulic oil (See Fig. 5)
	3. Leakage occurs to the check valve	Remove the screws and spring. Knock the small steel balls lightly to force out the air-tight surface. (See Fig. 4)
The piston will move forward when the handle is forced downward, but it will return when the handle is released.	1. Dirt oil blocks the hole	Replace the hydraulic oil (See Fig. 5)
	2. Leakage occurs to the check valve	Remove the screws and spring. Knock the small steel balls lightly to force out the air-tight surface. (See Fig. 4)
	3. Leakage occurs to other position	Trace the problem and correct.
Insufficient oil cylinder pressure	The spring of safety valve breaks down	Replace the safety valve. (See Fig. 5)

The tube escapes	1. Improper direction and height of bracket	Vary the direction and height of bracket.
	2. Improper direction of steel tube	Toggle the clock-wise/anti-clockwise switch to change the rotation direction of spindle.
	3. Rough end face of steel tube	Grind the end face.

X.Assembly drawing of grooving machine and parts form

1.TWG-ⅢAP Roll grooving machine component and parts form



S/N	Code name	Name	Qty	Interchangeability
1		Nameplate	1	Aluminum alloy
2		Loop	1	
3	TWG/3-01-003	Safety cover	1	Sheet t=1.2
4	GB67-2000	Slotting screw M5×8	2	
5	GB67-2000	Slotting screw M4×16	2	
6		Switch	1	
7	TWG/3A-01-002	Base	1	45#
8	GB93-87	Spring washer 10	20	
9	GB97.1-2002	Flat washer A level 10	22	
10	GB70.1-2000	Hexagonal screw M10×20	20	
11	TWG/3-01-001	Support foot	4	Jointing assembled
12	GB70.1-2000	Hexagonal screw M10×35	4	
13	TWG/3A-01-003	Motor bevel gear	1	40Cr
14	GB/T 1096-1979	Flat key 8×25	1	
15		750W Reduction motor	1	
16	GB70.1-2000	Hexagonal screw M10×30	4	
17	GB/T 6175-2000	Hexagonal nut M16	1	
18	TWG/3-01-005	Spindle extension rod	1	45#

19	TWG/3-01-004	Spindle bevel gear	1	40Cr
20	GB/T 1096-1979	Flat key 8×20	1	
21	GB70.1-2000	Hexagonal screw M6×12	10	
22	TWG/3-01-009	Rear cover	1	HT200
23	GB/T 812-1998	Round nut M36×1.5	2	
24	GB/T 858-1988	Limit spring washer 36	1	
25	GB/T 297-1994	Roller bearing 30208	1	
26	TWG/3-01-010	Bushing Φ80	1	45#
27	TWG/2-01-001	Unit head	1	HT200
28	TWG/3-01-011	Bushing Φ75	1	45#
29	GB/T 297-1994	Roller bearing 32009	1	
30	TWG/3-01-007	Main shaft	1	40Cr
31	TWG/3-01-012	Fore cover	1	HT200
32	TWG/3-01-008	Pinch roller shaft	1	20CrMnTi
33	TWG/2P-02-000	Oil pump assembly	1	Subassembly
34	GB70.1-2000	Hexagonal screw M6×25	2	
35	GB70.1-2000	Hexagonal screw M5×30	4	
36	TWG/3-02-018	Piston fixed ring	1	45#
37	TWG/2-02-009	Piston fixed ring screw	2	45#
38	TWG/2-02-004	Screw fixed ring	1	45#
39	TWG/2-04-003	Adjust screw	1	45#

40	GB5782-2000	Hexagonal head tap bolt M10×45	2	
41	TWG/2-01-002	Guide rail bar	2	45#
42	TWG/2-04-009	Slide	1	
43	GB79-2000	Hexagonal fasten screw M10×30	1	
44	GB70.1-2000	Hexagonal screw M5×10	1	ZG200-400
45	TWG/2-04-008	Feather key	1	45#
46	TWG/2-04-001	Pinch roller holder	1	ZG200-400
47	TWG/2-04-002	Pinch roller shaft	1	20CrMnTi
48	JB7940.1-95	Oil cup M10×1	1	
49	TWG/2-04-007	Pinch roller	1	40Cr
50		Needle bearing 4074105	1	
61		AC contraltor	1	
62		Thermal protector	1	
63		Fuse	1	
64		Footswitch	1	

2.TWG-ⅢAP　Oil pump parts form

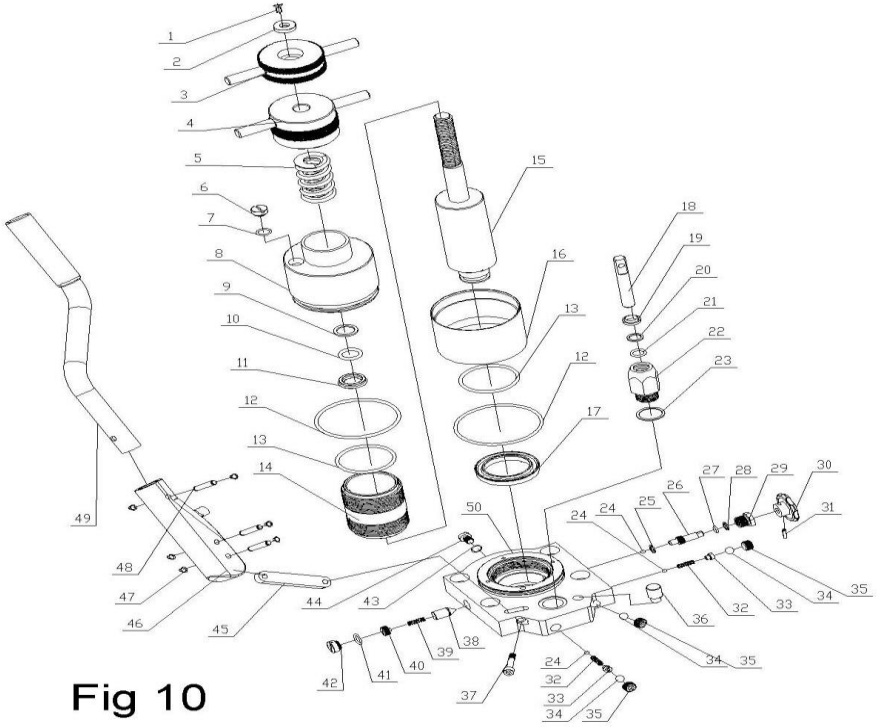


Fig 10

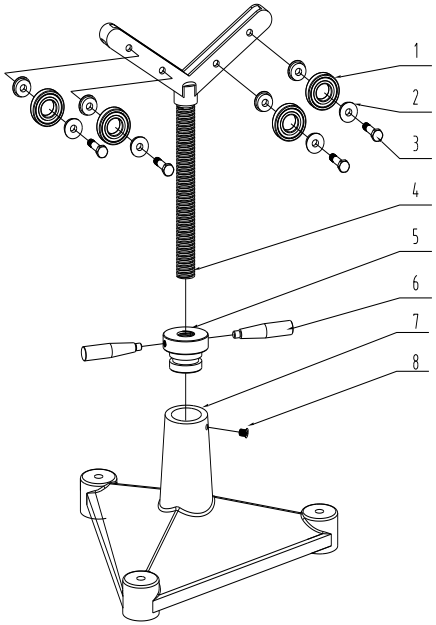
2. Oil pump parts form

S/N	Code name	Name	Qty	Material
1	GB/T819-2000	Cross slot countersuhr head screw M6X10	1	
2	TWG2P-02-008	Bead flange	1	45#
3	TWG2P-02-007	Limit locking nut	1	45#
4	TWG2P-02-006	Limit mut	1	45#
5	TWG6.04-006	Big spring	1	65Mn
6	TWG/2-02-024	Safety vakve bulk head	1	A3
7	GB3452.1-1992	Universal O-ring rubber D15X1.5	1	Buna-N rubber
8	TWG/2P-02-004	Cylinder cover	1	45#
9	TWG6.04-010	Fore cover 24X20 X 1.5	1	F4
10	GB/T3452.1-1992	Universal O-ring rubber D24x2.4	1	Buna-N rubber
11	GB/T10708.1-2000	Y-type piston ring d22XD28X5..5	1	
12	GB/T3452.1-1992	Universal O-ring rubber D85x3.1	2	Buna-N rubber
13	GB/T3452.1-1992	Universal O-ring rubber D50X3.5	2	Buna-N rubber
14	TWG/2P-02-003	Cylinder	1	45#
15	TWG/2P-02-005	Limit piston	1	40Cr
16	TWG/2P-02-002	Tank	1	45#
17	GB/T10708.3-2000	Y-type piston ring Und50X40X10	1	

S/N	Code name	Name	Qty	Material
18	TWG/2-02-007	Small piston rong	1	45#
19	GB/T10708.3-2000	Scraper seal	1	
20	TWG/2-02-028	Fore cover D16X1	1	F4
21	GB/T3452.1-1992	Viton O-ring 16X2.4	1	
22	TWG/2-02-010	Hexagonal cylinder cover	1	45#
23	TWG/2-02-011	Copper backing ¢28X ¢22X1mm	1	
24	GB/T308-84	Steel ball ¢6	3	
25		Copper backing ¢12X ¢7X1mm	1	
26	TWG2P.02-006	Relier valve screw	1	45#
27	GB3452.1-1992	Universal O-ring rubber D11X1.9	1	Buna-N rubber
28	TWG/2-02-027	Fore cover D11X1	1	F4
29	TWG/2-02-019(1)	Relief valve nut	1	45#
30	TWG/2-02-019(3)	Relief valve handle	1	Zl101
31	GB/T879.1-2000	Elastic cylindrical pin ¢3X20	1	
32	TWG/4-05-003	Oil outlet valve spring	2	65Mn
33	TWG/4-05-004	Cylinder clamping sctrew sets	2	45#
34	GB/T308-84	Steel ball ¢9	3	
35	TWG/2-02-002	The new oil pump screw	3	45#
36	TWG2.02-006-01	Handle limit nails	1	45#

S/N	Code name	Name	Qty	Material
37	GB/T70.1-2000	Hexagonal screw M6x30	1	
38	TWQ/5-03-008	cone valve	1	45#
39	TWQ/5-03-005	safety valve spring	1	65Mn
40	TWQ/5-03-006	safety valve screw	1	45#
41	GB3452.1-1992	Universal O-ring rubber D10X1.9	1	Buna-N rubber
42	TWG/2-02-024	New safety valve blank cap	1	45#
43	GB3452.1-1992	Universal O-ring rubber D8X1.9	1	Buna-N rubber
44	TWG/2-02-021	Oil drain stooper	1	45#
45	TWG/2-02-009	Connecting plate	1	A3
46	TWG/2-02-005	Handle seat	1	ZG200-400
47		Lock washers	3	
48	TWG/2-02-008	Pin roll	3	45#
49	TWG/2-02-007	Handle	1	
50	TWG/2P-02-001	Pump body	1	ZQ800-2
51				
52				
53				
54				

4.TWG-ⅢAP The parts diagram of Hi-support



S/N	Code name	Name	Qty	Material
1	GB/T 276-1994	Bearing 6205	4	
2	TWG/2A-05-006	Tripod bearing retainer ring	8	
3	GB/T 5781-2000	Hexagonal screw M10×30	4	
4	TWG/2-05-005	Tripod	1	Jointing assembled
5	TWG/2-05-004	Adjust screw cap	1	45#
6	TWG/2A-05-003	Handle	2	HT200
7	TWG/2A-05-001	Triangle bracket	1	Jointing assembled
8	GB/T 846-1985	C-type cross screw bolt M8×16	1	

1. Our company reserves the authority of changing the products and specification, if any alteration we don't inform specially.

2. Difference between the picture and the object, please be subject to the object.

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