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3, 5, 7 SERIES LIQUDI GAS BUFFER

Specification of Usage and Repair

(07 Edition)

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Working Principle

In essence, buffer is a liquid or gas secondary buffer unit which consumes energy, its section shown as Fig.



When buffer head is received a sudden wallop, pistol rod will move into the oil cylinder to make the oil pressure increase rapidly and also make oil go into pistol rod cave through the circular orifice between throttle shaft and pistol rod . When oil pressure is over gas pressure, the gas pressure will increase because the nitrogen is compressed through separator. When the oil with high speed passing through the circular orifice with small area, damp force is bound to form, which is the reason that buffer has buffer function. Work done by the wallop of buffer is received by oil and is transformed into heat to make oil temperature increase and disperse outside of buffer.

Use Rules

The correct installation and use of buffers is the guarantee of the necessary conditions for life. Therefor the installation and tasting we must pay attention to the following two elements: 1 A buffer pistol rod running from the collision with the direction of the angle shoule be less than $2^\circ\,$.

2 The angle between the collision head of buffer and collision shoule be less than $2^\circ\,$.

Unreasonable installation



As the installation of causing unreasonable piston rod bending will not be reset.

Each unit has been installed in accordance with the buffer range of percussive quality and speed to choice equipment.So only by correctly use can guarantee the unique function of buffer not be destroyed. As follows, It exceeded the original design of the functional impact.

Condition	The first	The second
Peralssive wnditions		
Equivalent velocity	$\frac{\nu_1 + \nu_3}{2}$	V
Equivalent quality	$\frac{2 m_1 (m_2 + m_3)}{m_1 + (m_2 + m_3)}$	$m_2 + m_3$

Daily Repair

The aim of usage of buffer is to make the whole machine safer, so sealing is very important. Once leakage happens, buffer function will no longer exist, which will cause loss to clients, so it is regulated that air seal be checked every half year. If wallop is often, check period should be shortened to guarantee safety. If any failure found, machine should be send back to manufacturer to repair.

When buffer is installed at sea or on port, the manufacture should plate chromium to exposed pistol rod to protect it from corrosion. When buffer is not equipped with bellows protection sheath, the client should coat machine oil on its surface and wrap it with a layer of thin plastic so as to avoid the absorption of dirt or particles in air.

Check the extended length and size at free state, see Fig.2 and Table.2

Fig.2..



Table.2

Model	L2	Model	L2	Model	L2
3/400	469	5/300	375	7/500	612
5/250	325	5/400	475	7/600	712

Gas inflation and examination

Screw the inner hexangular bolt (2) with inner hexangular wrench of 8mm and dismantle buffer head (1) to expose bolt (6). Take off bolt and screw the gas

inflation joint on liquid gas buffer examination tool (see Figure. 3) onto valve shaft (8) and make it close with copper gasket (7). Then screw down M14×1.5 nut with gas inflation joint to make pressure gauge in vertical position and to make M5×10 bolt in screwing state. Turn the valve shaft (8) by half circle anticlockwise, and then air pressure value in buffer body can be shown in air pressure gauge. After examination, screw down valve shaft (8) clockwise, then screw M14×1.5 nut open, take off examination and inflation tool of liquid gas buffer, dismantle inflation joint and screw up bolt (6).

When air pressure in liquid gas buffer body is below 0.48Mpa (0.98Mpa for 7 series), it is needed to check the reason of leakage. After failure is gotten rid of, inflate once again.

Liquid and gas examination and inflation tool can be also used in nitrogen



inflation. Screw the gas inflation joint onto valve shaft (8), then screw down M14×1.5 nut with gas inflation joint. Screw off M14×1.5 bolt at lower position, connect the pressure resistant glue pipe with inner diameter of ø8 with pipe joint of examination and

inflation tool and connect the other end of glue pipe with air source. Turn valve

shaft (8) by semi-circle anticlockwise, and then gas inflation can be preformed. When air pressure reaches to 0.5Mpa (1Mpa for 7 series), stop inflation and then screw down valve shaft (8) clockwise, pull the glue pipe out and screw $M5 \times 10$ bolt on.

When inflation is over 0.5Mpa (1Mpa for 7 series), it is allowed to screw $M5 \times 10$ bolt open a little to deflate to make air pressure reach to the set value, and then screw down the $M5 \times 10$ bolt.

After inflation, M14×1.5 nut should be screw open. Take the examination and inflation tool off, dismantle gas inflation joint and screw the bolt (6) on. Then use the inner hexangular bolt (2) to install buffer head (1). Pay attention to coat 242 screw thread lock agent on screw thread.

Dismantle

In general, it is not allowed to dismantle buffer.

Warning: before dismantlement, compressed air must be deflated completely.

Dismantlement steps are as followed,

1. When discharging oil, make the throttle shaft nut (25) face upward, dismantle nut (25), compression ring (23) and O-type sealing gasket (24), push throttle shaft (22) and discharge oil.

2. Face the buffer head upward and dismantle buffer head (1), take off stop ring (3) and end cover (4).

3. Screw the steel stick by length of 1m on M6 inner screw thread of throttle shaft (22), and former has head with M6 screw thread, which is 15mm by length.

Push throttle shaft (22) and make separator (13) out, and get throttle shaft (22) unit part out.

4. Screw off orientation bolt at tapering end (11), pull pistol rod (15) with supporting sheath (10) and throttle shaft (22) out of oil cylinder (16).

5. Dismantle end cover (4), pistol rod (15), separator (13), supporting body (18), O-type sealing ring (5) and (19) on supporting sheath (10), supporting parts (12), (17) and (21), Glyd sealing ring (14) with rectangle shape used for hole, T-type TEKANG Glyd ring (20), J-type dust prevention ring without frame (9). For plastic part and rubber part are prone to be damaged, if any damage is found after examination, they are not allowed to be used and should be replaced by new parts.

Attention: end cover (4) and valve core (8) should be wrapped with plastic and

bound with thread to prevent dust and other impurities.

Assembling

1. Clean all parts. No smear or adhered things are allowed. Dry with compressed air and cottony cloth is not allowed to rub.

2. Assemble every combined unit according to figures. Before assembling, coat lubricant oil on sealing parts and supporting parts.

3. Lubricate the inner surface of oil cylinder (16) with a little clean lubricant oil. Slightly shake pistol rod (15) unit part, but rotation is not allowed. Enclose it into oil cylinder (16) body and make the distance L1 (see Fig.1) between pistol rod (15) end and supporting sheath end (10) meet the requirement of Table.1.

4. Enclose the supporting part (12) and dust prevention ring (9) into groove of supporting sheath (10). Then cover supporting sheath (10) on pistol rod (15) and push it into oil cylinder (16) opening. Following that, use tapering end orientation bolt (11) to lock it in circular groove of supporting sheath (10). At last, lock it completely.

5. Screw the steel stick by length of 1m on throttle shaft (22), and former has head with M6 screw thread, which is 15mm by length. Pull throttle shaft unit parts into cave of pistol rod (15).

6. Lubricate the inner surface of pistol rod (15) with a little clean oil. Enclose separator (13) into cave of pistol rod (15) and make the distance L (see Fig.1) between pistol rod (15) end and separator end (13) meet the requirement of Table.1.

Table.1

Model	L1	L	Model	L1	L	Model	L1	L
3/400	65	93	5/300	60	84	7/500	104	209
5/250	63	78	5/400	65	111	7/600	96	77.5

7. Add 5ml lubricant oil into air chamber, and then assemble end cover (4), stop ring (3), valve core (8), copper gasket (7) and bolt (6) (pay attention to protect valve core from impurities going into).

8. Make the tail of buffer upward and push throttle shaft (22) inward. Then infuse compression oil L-HL32 and slightly shake and knock buffer to discharge

the air in oil cylinder (16). When oil runs out, slowly lift throttle shaft (21) and put O-type sealing ring (24), compression ring (23), nut (25). Screw down the nut and screwing moment should be 340N·m. Flange of nut should be pressed into groove of throttle shaft (22) to lock after the fastened screwing.

9. Inflate gas (see the above given). At this time, pistol rod (15) should extend outward and meet the requirement of Fig.2 and Table.2.

10. Install buffer head (1). Coat 242 screw thread lock agent when screwing bolt (2). In the screwing process, moment should be 92N·m..

Dismantlingand assembling part list



No.	Name	Remark
1	Head of buffer	
2	Bolt	M10×35
3	Stop ring	
4	End cover	
5	O-type sealing	90×5.3 (80×5.3)
	ring	
6	Bolt	M6×8
7	Copper gasket	
8	Valve core	
9	J-type dust	d115 (d105)
	prevention ring	
10	Supporting	
	sheath	
11	Tapering end	$M6 \times 8$
	orientation bolt	
12	Supporting part	
13	Separator	
14	Glyd ring	D100 (D90)
15	Pistol rod	
16	Oil cylinder	
17	Supporting part	
18	Supporting body	
19	O-type sealing	103×5.3 (95 \times
	ring	5.3)
20	Glyd ring	D115 (D105)
21	Supporting part	
22	Throttle shaft	
23	Compression	
	ring	
24	O-type sealing	21.2×2.65
	ring	
25	Nut	

Notice: It is 5 series in bracket in the aboveremark

Fig.1