



**LOW INERTIA
STEEL WATER COOLED BRAKES
INSTALLATION AND MAINTENANCE
INSTRUCTIONS
FOR 6" THRU 60"**

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INSTALLATION & MAINTENANCE INSTRUCTIONS

I. INSTALLATION

1. Slide hub (5) into correct position on shaft.
2. It is preferable that the hub (5) of the clutch be axially restrained. This may be achieved by using a stepped shaft and an end plate, a taper key or a set screw fitted in a tapped hole in the hub (5).
3. **If clutch/brake is to be mounted as an assembled unit**, slide the unit over the hub (5) ensuring that the teeth on the center plate (4) are properly engaged in the teeth of the hub (5).
4. Insert mounting bolts in ring (16) and tighten. (See Table 2, page 6 for torque values.)
5. Connect air supply to clutch/brake using a flexible hose (13). The lower holes in each row of 4 holes on the 3-way roto coupling (24) should be unrestricted.
6. Although clutches/brakes are correctly set before leaving our factory, the clearance should be checked before being put into operation. (See limits in Table 1, page 5.)
7. Clearance can be checked by applying and releasing air to the clutch and measuring the total axial movement of the release spring bolt (12).
8. If clearance is incorrect, the removal or addition of shims (9) is required.
9. To modify shim thickness, unscrew all cap screws (15) and remove airtube holding plate (11), airtube (10) and pressure plate (8) as sub-assembly. Modify shim thickness and replace cap screws (15). Tighten cap screws (15). (See Table 2, page 6 for torque values.)
10. Water outlet on a brake MUST be vertically above the water inlet.
11. Use flexible hoses to connect supply pipes and waste pipes to clutch/brake. Do not use rigid piping for floating water jacket (1) (21).
12. To prevent condensation on friction surface, the temperature of water inlet should be between 10°C and 38°C (50°F and 100°F).
13. The required water flow rate of the clutch/brake should be as stated on the assembly drawing.
14. There must be an adequate amount of water flow through clutch/brake before engaging machine.
15. **If the clutch/brake is to be mounted disassembled follow Part I, steps 1, 2, and 4.**
16. Slide ring (16) over hub (5), insert mounting bolts through ring (16) into mating surface and tighten bolts. (See Table 2, page 6 for torque values.)
17. Follow steps in Part IV.

II. GUARDING

1. CLUTCHES - Personnel must be fully protected from rotating parts. Use mesh or slotted guards so that air flow is not restricted.
2. BRAKES- ventilating slots must be protected if access to moving parts is possible.

III. LUBRICATION

1. CLUTCH/BRAKE: No lubrication is required.
2. ROTO-COUPLING (25): Normally no lubrication is required. Rotating air unions which are equipped with grease fittings or oil cups require periodic lubrication, and in this instance any good bearing oil (depending on type of nipple, grease) can be used, but care should be taken not to over lubricate.

IV. AIR SUPPLY CONTROLS

1. Use flexible hose (13) between control valve and clutch.
2. When fast engagement/disengagement is required, use ample diameter pipe and valves and always use bends rather than elbows to ensure good airflow. Keep length of pipe as short as possible to shorten reaction time.

V. WATER CIRCULATION

1. A closed loop cooling system with tank, pump and a heat exchanger is most effective for providing coolant. An open loop cooling system must have a strainer to catch particles which could block water passages.
2. Minimum length, number of bends, and adequate size piping should be on all systems.
3. The pump should be capable of the minimum flow at the total back pressure of the system. Back pressure will be less than 1 bar (14.50 psi) for a well designed system. If needed WPT Power Transmission can advise on expected back pressures.
4. Machines should have flow alarms, which cause them to shut down if the flow drops.

VI. REPLACEMENT OF FRICTION DISCS (3)

1. Friction discs (3) should be replaced when the maximum clearance (see Table 1, page 5) has been reached.
2. Disconnect air supply to clutch/brake. Remove cap screws (15).
3. Remove as a sub-assembly: airtube holding plate (11), airtube (10), and pressure plate (8).
4. Slide out friction discs (3) and center plates (4). Re-assemble in reverse order, using new discs. Torque cap screws (15). (See Table 2, page 6 for torque values.)
5. When friction discs (3) are replaced, also replace all release springs (13). If release springs are fitted between the friction discs, insure that the springs are correctly located in their counter bores.

VII. REPLACEMENT OF AIRTUBE

1. To replace airtube (10), disconnect air supply to clutch/brake. Disconnect flexible air hose (13) on clutch/brake and remove quick release valves (22) and/or elbows (15) from airtube connections.
2. If release springs (13) are fitted between the friction discs (3), wedge or clamp friction discs so that release springs (13) stay in place.
3. Remove cap screws. Remove as a sub-assembly: airtube holding plate (11), airtube (10), pressure plate (8), and pressure plate lugs (11) (lugs used on sizes 24" and larger only). To remove airtube (10) from airtube holding plate (11): remove release spring nuts (14) from release spring bolts (12), remove release springs (13), remove release spring bolts (12) and pressure plate lugs (11), remove pressure plate (8), remove airtube (10) from airtube holding plate (11). Replace with new airtube. Re-assemble in reverse order. Where release springs (13) are fitted in the airtube holding plate (11) make sure that the nuts are tightened equally so that only 1-2 threads show through the nut. Check clearance by following steps 6-8 in Part I. Tighten cap screws. (See Table 2, page 6 for torque values.)

VIII. WATER JACKETS – REPLACEABLE STEEL WEAR PLATE

1. Remove all screws and the steel wear plate. Broken screws may require heating the area of the screw with an oxy-acetylene torch. Moderate heating will not harm the jacket. It may be necessary to drill a broken screw and use a broken screw extractor (EZ OUT).
2. Thoroughly clean tapped holes and all sealing surfaces using the proper size tap and wire brush. Inspect the sealing surfaces for flatness and irregularities.
3. Apply a bead of high temperature silicone sealant (approx. 1/16" dia.) to the sealing surfaces on the cavity side of the bolt circles.
4. Immediately place the steel wear plate in position and fasten using several screws in each bolt circle. Silicone sealant will develop a "skin" in a short period of time so it is important to join the parts quickly.
5. Install the remainder of the screws using a removable thread locking compound and tighten each to the appropriate torque.

Screw Size	Torque (lb in)	Torque (Kg m)
#6	7.5	0.8
#8	15	1.7
#10	22	2.5
1/4"	48	5.4

6. Allow a minimum of 24 hours for the sealer to set up. Pressure test the jacket to not more than 60 PSI (4.0 bar).
7. If leaks are found, check the torque on all screws. If the leak cannot be stopped by tightening the screws, the jacket must be disassembled and the above steps repeated. Inspect the sealing surfaces again for flatness and irregularities.

RECOMMENDED SPARES

Recommended spares should be held by customer to greatly reduce costly “down time”, with the exception of the airtubes, which have a limited shelf life. The airtubes may deteriorate faster on the shelf than in service. These are normally stock items at the factory or local distributor and can be shipped from stock.

Due to the many variations obtainable in a basic type and size of clutch, spare parts lists are issued against specific serial numbers. Anytime you require information about your unit or place an order for parts from the factory or your distributor, please furnish the serial number of the unit which is located on the face of the airtube holding plate. For general guidance, the normal recommended spares are listed below.

FRICION DISCS (3)

Discs should be replaced when the maximum clearance, as stated in Table 1, page 6, has been reached. Discs should be kept clean, dry, and free from oil or grease and stored flat to prevent warping.

RELEASE SPRINGS (13)

It is strongly recommended that release springs are renewed every time the friction discs are replaced.

AIRTUBE (10)

Failures may occasionally occur if the airtube becomes excessively hot, over-expanded or saturated by lubrication oil. Over-expansion is usually due to excessively worn friction linings. Store airtubes flat in a cool dry place.

QUICK RELEASE VALVES (22)

If the quick release valves are fitted, they should be dismantled and cleaned about every 6 months.

To dismantle: Hold valve body with spanner and disconnect air hose. Unscrew valve from airtube. Place body of valve in a vice and remove end cap. DO NOT attempt to remove the end cap while valve is fitted to airtube as valve may break at thread neck. Keep complete replacement unit in stock.

ROTO-COUPLING (25)

Roto-couplings are sometimes damaged by an external blow or can wear out prematurely if restrained by non-flexible hose connections. It is recommended that a replacement unit be kept in stock.

TABLE 1: OPERATING CLEARANCES FOR LOW INERTIA CLUTCHES/BRAKES

CLUTCH SIZE: INCHES	MINIMUM – MAXIMUM CLEARANCES						TOTAL MAXIMUM CLEARANCE ALLOWED (INDEPENDENT OF QUANTITY OF DISC)	
	1 DISC UNITS		2 DISC UNITS		3 DISC UNITS		DIMENSION:	DIMENSION:
	DIM: IN	DIM: mm	DIM: IN	DIM: mm	DIM: IN	DIM: mm	INCH	MILLIMETER
6	1/16 - 3/32	1.59 - 2.38	1/16 - 3/32	1.59 - 2.38	3/32 - 1/8	2.38 - 3.18	5/16	7.94
8,11,14,14H,16	1/16 - 1/8	1.59 - 3.18	3/32 - 5/32	2.38 - 3.97	1/8 - 5/32	3.18 - 3.97	7/16	11.11
18,18H,21	1/16 - 1/8	1.59 - 3.18	3/32 - 5/32	2.38 - 3.97	1/8 - 3/16	3.18 - 4.76	7/16	11.11
24,24H,27	3/32 - 5/32	2.38 - 3.97	1/8 - 3/16	3.18 - 4.76	5/32 - 7/32	3.97 - 5.56	1/2	12.70
30,30H,36	3/32 - 5/32	2.38 - 3.97	1/8 - 3/16	3.18 - 4.76	3/16 - 1/4	4.76 - 6.35	1/2	12.70
42,48	1/8 - 3/16	3.18 - 4.76	5/32 - 7/32	3.97 - 5.56	3/16 - 1/4	4.76 - 6.35	5/8	15.88

60	1/8 - 1/4	3.18 - 6.35	3/16 - 5/16	4.76 - 7.94	1/4 - 3/8	6.35 - 9.53	3/4	19.05
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TABLE 2: BOLT TORQUE VALUES

TORQUE VALUES FOR SOCKET HEAD AND HEX HEAD CAPSCREWS						
SOCKET HEAD CAP SCREWS						
BOLT SIZE INCHES	As Received			Lubricated**		
	lbf-ft	lbf-in	N-m	lbf-ft	lbf-in	N-m
1/4	13	150	17	10	120	13
5/16	23	305	34	18	244	27
3/8	45	545	62	36	436	49
7/16	70	840	95	56	672	76
1/2	108	1300	147	86	1040	117
9/16	155	1860	210	124	1488	168
5/8	211	2530	286	168	2024	228
3/4	367	4400	497	293	3520	397
7/8	583	7000	791	466	5600	632
1	867	10400	1175	693	8320	940
1 1/8	1242	14900	1684	993	11920	1347
1 1/4	1750	21000	2374	1400	16800	1899
1 3/8	2317	27800	3142	1853	22240	2513
1 1/2	3042	36500	4125	2433	29200	3300
1 3/4	4950	59400	6714	3960	47520	5371
2	7492	89900	10161	5993	71920	8128
HEX HEAD CAP SCREWS - Grade 8						
BOLT SIZE INCHES	As Received			Lubricated**		
	lbf-ft	lbf-in	N-m	lbf-ft	lbf-in	N-m
1/4	8	100	11	6	80	9
5/16	17	200	23	13	160	18
3/8	30	360	41	24	288	32
7/16	48	570	64	38	456	51
1/2	83	990	112	66	792	89
9/16	107	1285	145	85	1028	116
5/8	143	1714	194	114	1371	155
3/4	256	3070	347	204	2456	277
7/8	417	5000	565	333	4000	452
1	625	7500	848	500	6000	678
HEX HEAD CAP SCREWS - Grade 5						
BOLT SIZE INCHES	As Received			Lubricated**		
	lbf-ft	lbf-in	N-m	lbf-ft	lbf-in	N-m
1/4	6	71	8	5	56	6
5/16	12	142	16	9	113	12
3/8	22	260	29	17	208	23
7/16	34	410	46	27	328	36
1/2	53	636	72	42	508	57
9/16	74	890	101	59	712	80
5/8	104	1250	141	83	1000	112
3/4	183	2200	249	146	1760	199
7/8	298	3570	403	238	2856	322
1	440	5280	597	352	4224	477
1 1/8	553	6640	750	442	5312	600
1 1/4	775	9300	1051	620	7440	840
1 3/8	1012	12140	1372	809	9712	1097
1 1/2	1350	16200	1831	1080	12960	1464

**** NOTE: For Loctite use lubricated values**

FIGURE 1

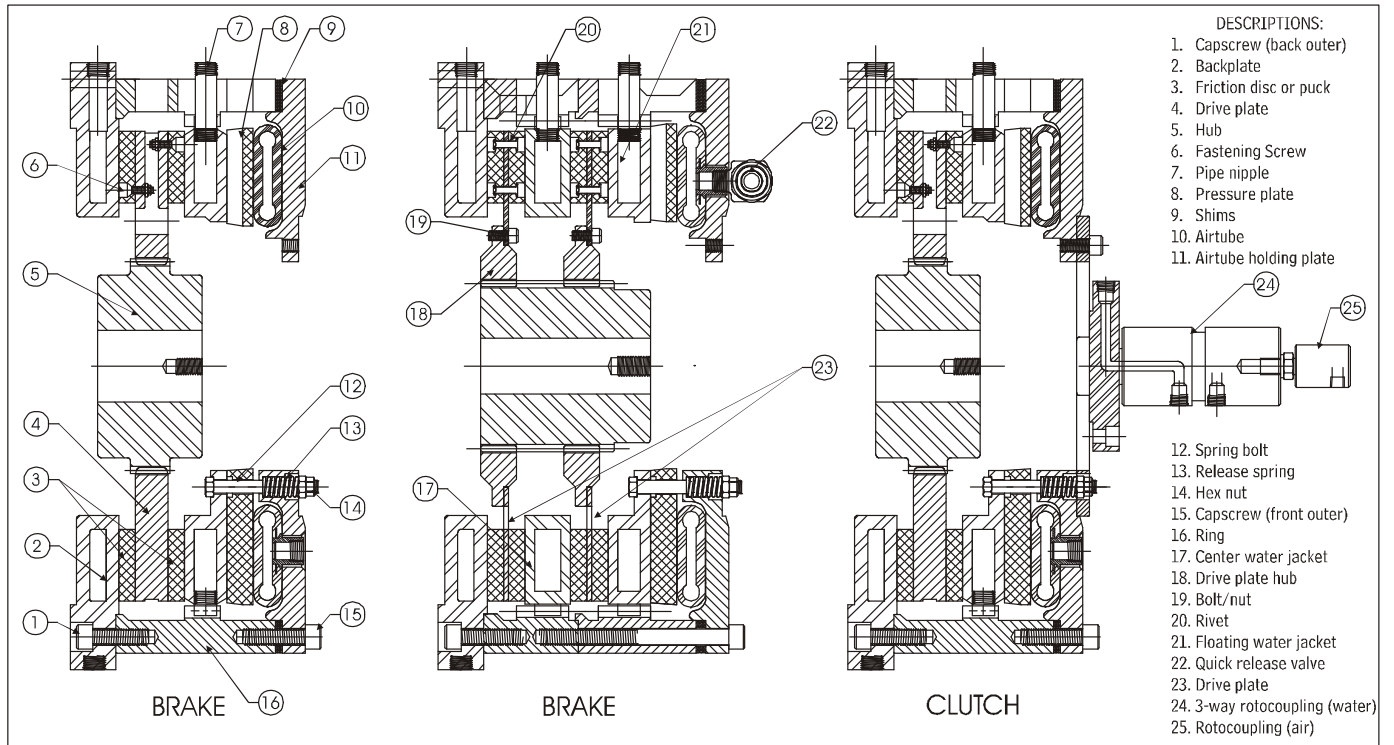


FIGURE 2 - HOSE ARRANGEMENT

