

# Pneumatic Installation Guidelines

## Appendix I

### Optional Equipment

#### Section 1, Cooling Fins

For situations where the number of single strokes needed per minute (or hour) exceed the allowable number of single strokes per minute (or hour) based on the thermal capacity of the clutch/brake, it may be possible to meet the single stroking requirement by installing cooling fins. The cooling fins are bolted to the clutch plate and increase the cooling air flow through the clutch/brake. Please contact Orttech in these cases so that an Orttech application engineer can determine if cooling fins will work in the situation.

There are 8 cooling fins used on a 2 Point plate and 10 cooling fins used on a 12 Point plate. The clutch plate must be drilled and tapped per Figures I2 & I3 and Tables I2 & I3 to mount the cooling fins. Please notice that in most sizes there are two versions of the cooling fin available. The version that is required for a specific installation depends on the brake plate suspension arrangement. If the brake plate is a 12 Point plate, or a 2 Point plate with long straps, the standard version cooling fin is to be used. If the brake plate is a 2 Point plate with short straps, or with special straps shorter than the standard long straps the short version cooling fin is to be used if indicated on Table I1.

Typical installations of both versions of the cooling fins are shown in Figure I1. Please note that when installing the cooling fins that Loctite #242 or #262 is to be used on the threads of the socket head cap screws that fasten the cooling fins to the clutch plate. Four socket head cap screws are used for each cooling fin.

Cooling fins are only to be used as recommended by Orttech. When cooling fins are used it is very important that there be sufficient clearance around the clutch/brake for the cooling air flow, and that the flywheel has the proper configuration to allow unrestricted flow of the cooling air. Any guards around or enclosing the clutch/brake and flywheel must have provisions to permit the air to pass around the assembly. Cooling fins cannot be used to compensate for lack of cooling air flow or the restriction of cooling air flow.

Table I1 lists the proper cooling fin to use for the sizes and configurations (2 Point or 12 Point clutch plate) of sizes 67 and larger. Cooling fins are not available for sizes smaller than this.

Figure I2 and Table I2 are for the drilling and tapping of 2 Point plates (Series 0-420, 0-406, and 0-400) to accept cooling fins. There are 32 tapped holes per plate (16 per half).

Figure I3 and Table I3 are for the drilling and tapping of 12 Point plates (Series 0-420, 0-406, and 0-400) to accept cooling fins, there are 40 tapped holes per plate (20 per half).

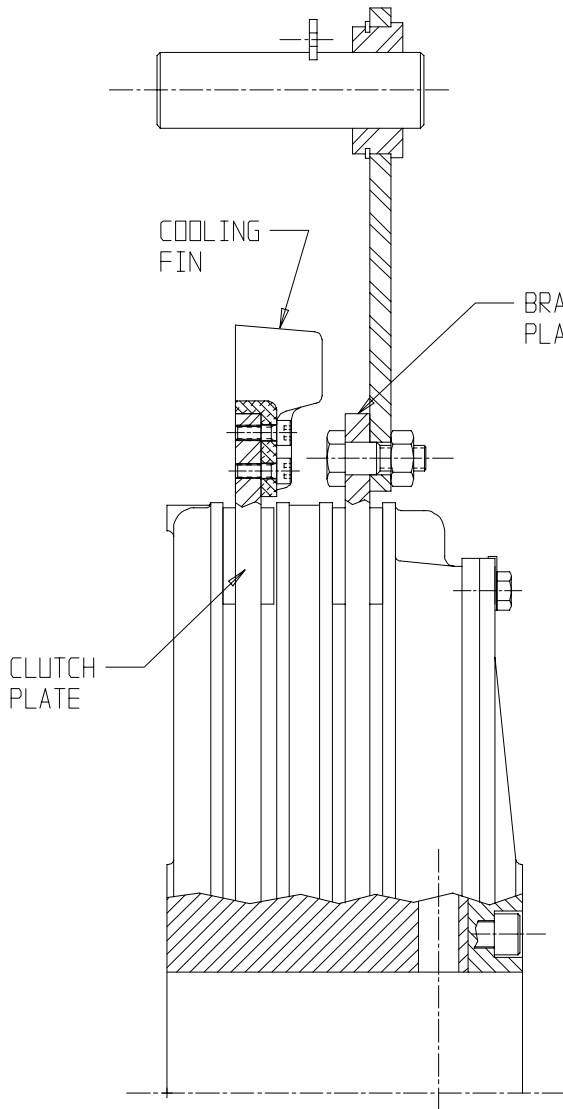
If you have any questions, please contact Orttech or your local Orttech representative.

## Table I1 Cooling Fin Application and Part Numbers

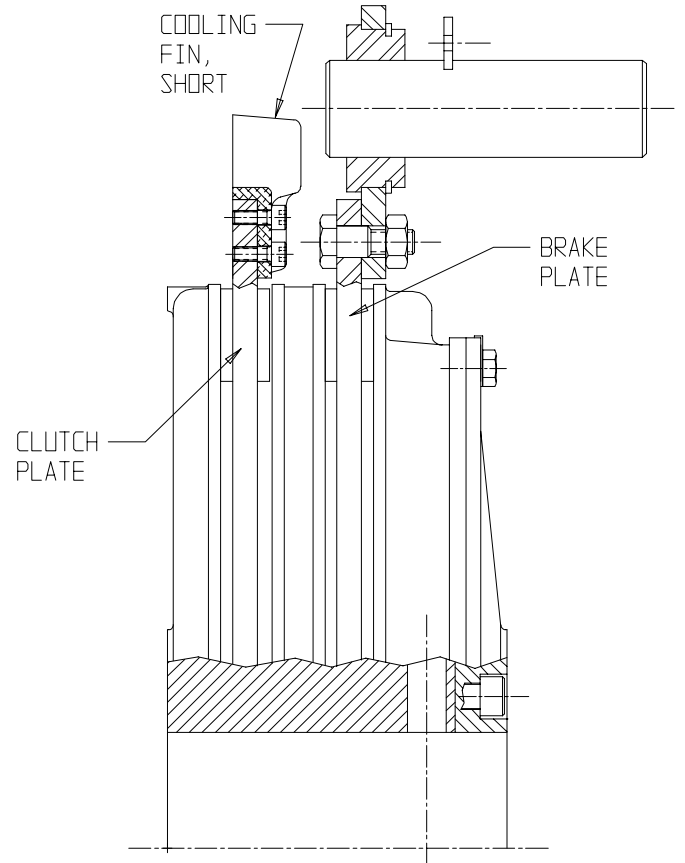
C/B Size			Cooling Fin Part No.		Cooling Fin Qty		Socket Head Cap Screw Used
0-420	0-406	0-400	Std. Version	Short Version	2 Point	12 Point	
67			64A 511503	64A 512763	8	10	M 6 x 1, 16 mm lg
72	71	71	1-400-526-71-001	64A 512762	8	10	M 6 x 1, 16 mm lg
		74	1-400-526-74-001	---	8	10	M 6 x 1, 16 mm lg
77	76	76	1-400-526-76-001	64A 550453	8	10	M 6 x 1, 16 mm lg
80	79	79	1-400-526-79-001	64A 551375	8	10	M 8 x 1.25, 20 mm lg
83	82	82	1-400-526-82-001	64A 551392	8	10	M 8 x 1.25, 20 mm lg
87		85	1-400-526-85-001	64A 551391	8	10	M 10 x 1.5, 25 mm lg
90	90		64A 551182	64A 551101	8	10	M 10 x 1.5, 25 mm lg
91			1-400-526-91-001	64A 551183	8	10	M 10 x 1.5, 30 mm lg
92			1-400-526-91-001	64A 551183	8	10	M 10 x 1.5, 30 mm lg
93			1-400-526-91-001	---	8	10	M 10 x 1.5, 30 mm lg

Please Note:

1. There are four socket head cap screws for each cooling fin.
2. Where no part number for a short version is listed, use the std. version.

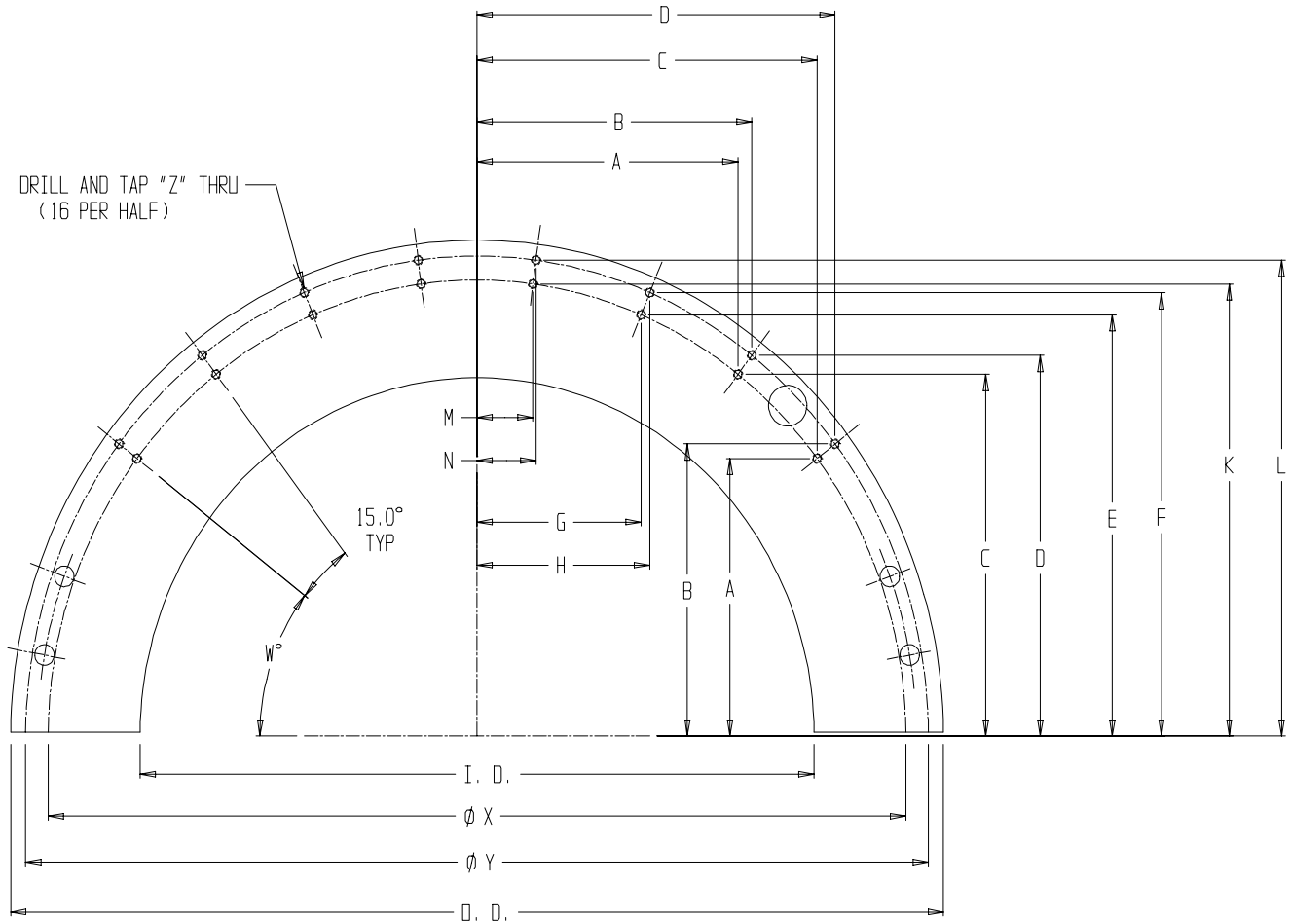


**Figure I1a**



**Figure I1b**

### Typical Cooling Fin Installation

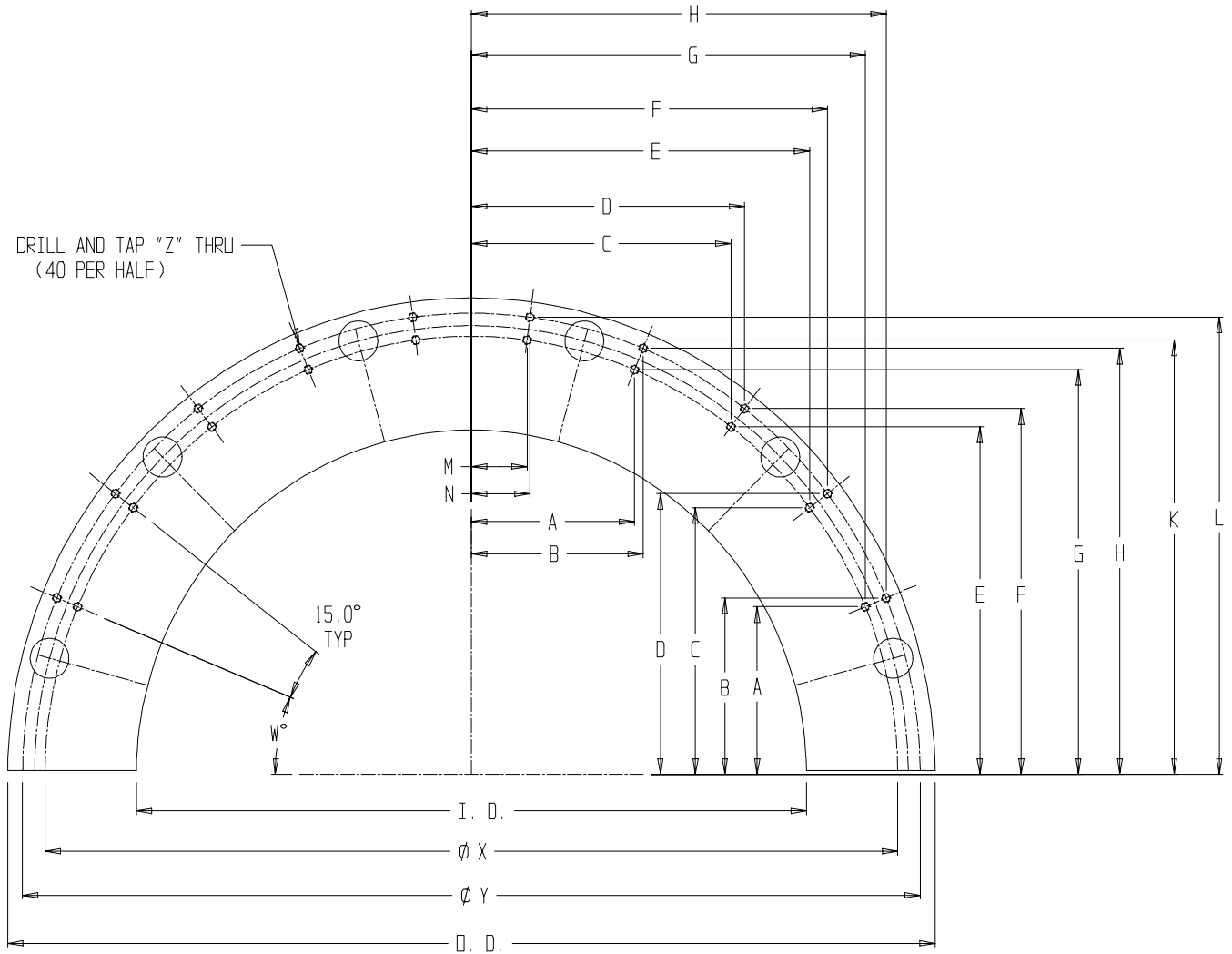


**Figure I2**  
**Dimensions for Drilling and Tapping a 2 Point Plate**  
**for Cooling Fins**

**Note:**  
 Dimensions W, X, and Y are not valid for sizes 67, 90, 92, and 93.

## Table I2 Dimensions for Drilling and Tapping a 2 Point Plate for Cooling Fins

Dimension	C/B Size											
	67		71/72		74		76/77		79/80		82/83	
	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches
A	130.05	5.120	149.15	5.872	159.80	6.291	173.50	6.831	188.72	7.430	216.11	8.508
B	130.19	5.126	158.28	6.231	168.93	6.651	182.63	7.190	200.89	7.909	228.29	8.988
C	175.28	6.901	194.37	7.652	208.26	8.199	226.11	8.902	245.94	9.683	281.64	11.088
D	187.18	7.369	206.27	8.121	220.16	8.668	238.01	9.370	261.81	10.307	297.51	11.713
E	200.27	7.885	226.35	8.911	242.52	9.548	263.31	10.367	286.40	11.276	327.98	12.913
F	214.13	8.430	240.21	9.457	256.38	10.094	277.16	10.912	304.88	12.003	346.45	13.640
G	92.51	3.642	93.76	3.691	100.45	3.955	109.06	4.294	118.63	4.670	135.85	5.348
H	86.77	3.416	99.50	3.917	106.19	4.181	114.81	4.520	126.29	4.972	143.51	5.650
K	216.82	8.536	242.90	9.563	260.25	10.246	282.56	11.124	307.35	12.100	351.96	13.857
L	231.70	9.122	257.78	10.149	275.13	10.832	297.43	11.710	327.18	12.881	371.79	14.637
M	24.99	0.984	31.98	1.259	34.26	1.349	37.20	1.465	40.46	1.593	46.34	1.824
N	26.95	1.061	33.94	1.336	36.22	1.426	39.16	1.542	43.07	1.696	48.95	1.927
W	---		37.5		37.5		37.5		37.5		37.5	
X	---		490	19.29	525	20.67	570	22.44	620	24.41	710	27.95
Y	---		520	20.47	555	21.85	600	23.62	660	25.98	750	29.53
Z	M 6 x 1		M 6 x 1		M 6 x 1		M 6 x 1		M 8 x 1.25		M 8 x 1.25	
I. D.	343	13.50	385	15.16	408	16.06	448	17.64	490	19.29	560	22.05
O. D.	482	18.98	535	21.06	570	22.44	620	24.41	680	26.77	775	30.51
	85/87		90		91		92		93			
	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches		
A	240.45	9.467	260.77	10.267	287.64	11.324	330.29	13.004	379.84	14.954		
B	255.68	10.066	277.51	10.926	304.38	11.983	347.03	13.663	396.58	15.613		
C	313.37	12.337	347.99	13.700	374.86	14.758	417.51	16.437	467.06	18.388		
D	333.21	13.119	369.81	14.559	396.68	15.617	439.33	17.296	488.88	19.247		
E	364.93	14.367	399.83	15.741	436.53	17.186	494.80	19.480	562.48	22.145		
F	388.03	15.277	425.23	16.741	461.94	18.187	520.20	20.480	587.89	23.145		
G	151.16	5.951	170.98	6.731	180.82	7.119	196.43	7.733	214.57	8.448		
H	160.73	6.328	181.51	7.146	191.34	7.533	206.95	8.148	225.09	8.862		
K	391.62	15.418	431.75	16.998	468.46	18.443	526.72	20.737	594.40	23.402		
L	416.41	16.394	459.02	18.072	495.72	19.517	553.99	21.811	621.67	24.475		
M	51.56	2.030	51.84	2.041	61.67	2.428	77.29	3.043	95.42	3.757		
N	54.82	2.158	55.43	2.182	65.26	2.569	80.88	3.184	99.01	3.898		
W	37.5		---		37.50		---		---			
X	790	31.10	---		945	37.20	---		---			
Y	840	33.07	---		1000	39.37	---		---			
Z	M 10 x 1.5		M 10 X 1.5		M 10 X 1.5		M 10 X 1.5		M 10 X 1.5			
I. D.	628	24.72	685	26.97	755	29.72	855	33.66	954	37.56		
O. D.	866	34.09	950	37.40	1025	40.35	1145	45.08	1285	50.59		



**Figure I3**  
**Dimensions for Drilling and Tapping a 12 Point Plate**  
**for Cooling Fins**

Note:  
 Dimensions W, X, and Y are not valid for sizes 67, 90, 92, and 93

## Table I3

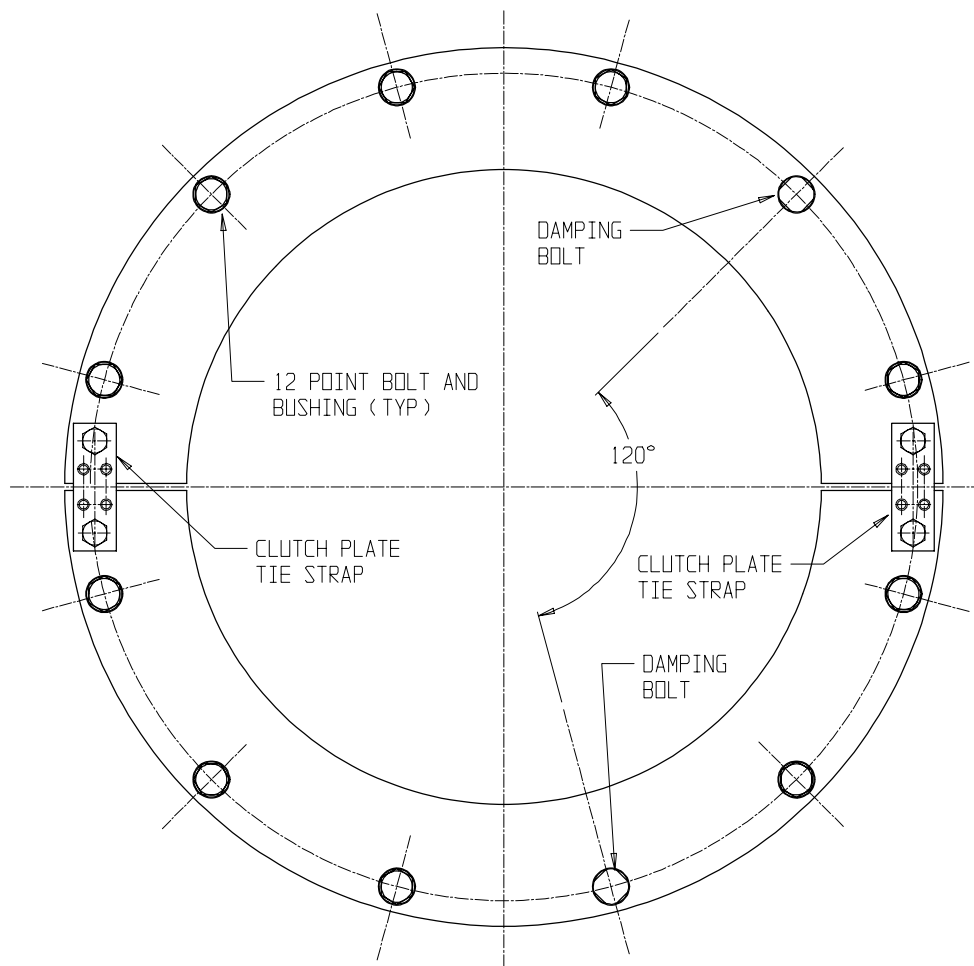
### Dimensions for Drilling and Tapping a 12 Point Plate for Cooling Fin

Dimension	C/B Size											
	67		71/72		74		76/77		79/80		82/83	
	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches
A	80.26	3.160	93.76	3.691	100.45	3.955	109.06	4.294	118.63	4.670	135.85	5.348
B	86.00	3.386	99.50	3.917	106.19	4.181	114.81	4.520	126.29	4.972	143.51	5.650
C	135.65	5.341	149.15	5.872	159.80	6.291	173.50	6.831	188.72	7.430	216.11	8.508
D	144.78	5.700	158.28	6.231	168.93	6.651	182.63	7.190	200.89	7.909	228.29	8.988
E	170.99	6.732	194.37	7.652	208.26	8.199	226.11	8.902	245.94	9.683	281.64	11.088
F	182.89	7.200	206.27	8.121	220.16	8.668	238.01	9.370	261.81	10.307	297.51	11.713
G	202.97	7.991	226.35	8.911	242.52	9.548	263.31	10.367	286.40	11.276	327.98	12.913
H	216.83	8.537	240.21	9.457	256.38	10.094	277.16	10.912	304.88	12.003	346.45	13.640
K	215.90	8.500	242.90	9.563	260.25	10.246	282.56	11.124	307.35	12.100	351.96	13.857
L	230.78	9.086	257.78	10.149	275.13	10.832	297.43	11.710	327.18	12.881	371.79	14.637
M	31.98	1.259	31.98	1.259	34.26	1.349	37.20	1.465	40.46	1.593	46.34	1.824
N	33.94	1.336	33.94	1.336	36.22	1.426	39.16	1.542	43.07	1.696	48.95	1.927
W	---		22.5		22.5		22.5		22.5		22.5	
X	---		490	19.29	525	20.67	570	22.44	620	24.41	710	27.95
Y	---		520	20.47	555	21.85	600	23.62	660	25.98	750	29.53
Z	M 6 x 1		M 6 x 1		M 6 x 1		M 6 x 1		M 8 x 1.25		M 8 x 1.25	
I. D.	343	13.50	385	15.16	408	16.06	448	17.64	490	19.29	560	22.05
O. D.	482	18.98	535	21.06	570	22.44	620	24.41	680	26.77	775	30.51
	85/87		90		91		92		93			
	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches		
A	151.16	5.951	161.82	6.371	180.82	7.119	210.98	8.306	246.01	9.685		
B	160.73	6.328	172.34	6.785	191.34	7.533	221.50	8.720	256.54	10.100		
C	240.46	9.467	268.64	10.576	287.64	11.324	317.80	12.512	352.83	13.891		
D	255.68	10.066	285.38	11.235	304.38	11.983	334.54	13.171	369.58	14.550		
E	313.37	12.337	341.95	13.463	374.86	14.758	427.10	16.815	487.78	19.204		
F	333.21	13.119	363.77	14.322	396.68	15.617	448.92	17.674	509.60	20.063		
G	364.93	14.367	403.62	15.891	436.53	17.186	488.77	19.243	549.45	21.632		
H	388.03	15.277	429.03	16.891	461.94	18.187	514.18	20.243	574.86	22.632		
K	391.62	15.418	430.46	16.947	468.46	18.443	528.78	20.818	598.85	23.577		
L	416.41	16.394	457.72	18.020	495.72	19.517	556.04	21.891	626.11	24.650		
M	51.56	2.030	61.67	2.428	61.67	2.428	61.67	2.428	61.67	2.428		
N	54.82	2.158	65.26	2.569	65.26	2.569	65.26	2.569	65.26	2.569		
W	22.5		---		22.5		---		---			
X	790	31.10	---		945	37.20	---		---			
Y	840	33.07	---		1000	39.37	---		---			
Z	M 10 x 1.5		M 10 X 1.5		M 10 X 1.5		M 10 X 1.5		M 10 X 1.5			
I. D.	628	24.72	685	26.97	755	29.72	855	33.66	954	37.56		
O. D.	866	34.09	950	37.40	1025	40.35	1145	45.08	1285	50.59		

## Pneumatic Installation Guidelines Appendix I Optional Equipment Section 2, Damping Bolts

When a 12 Point clutch plate is used at certain critical speeds (dependent on the clutch plate size and the installation) a resonance may cause noisy operation when the clutch is disengaged. If this happens on an installation, damping bolts are available and can be used to reduce the noise. Two damping bolts are used per clutch plate. The damping bolt replaces the 12 Point bushing and bolt in two positions that are 120° apart on the 12 Point clutch plate. See Figure I4.

The damping bolt uses a spring loaded ball to take up the running clearance between the bushings and the holes in the 12 Point clutch plate. They are only to be used on the clutch plate, and the clutch plate tie straps must be properly installed on the plate. Damping bolts are available for all of the available sizes in the 0-420, 0-406, and 0-400 Series. If you have any questions about the use or availability of damping bolts please contact Orttech or your local Orttech representative.



**Figure I4**  
**Damping Bolt Installation**

# Pneumatic Installation Guidelines

## Appendix I

### Optional Equipment

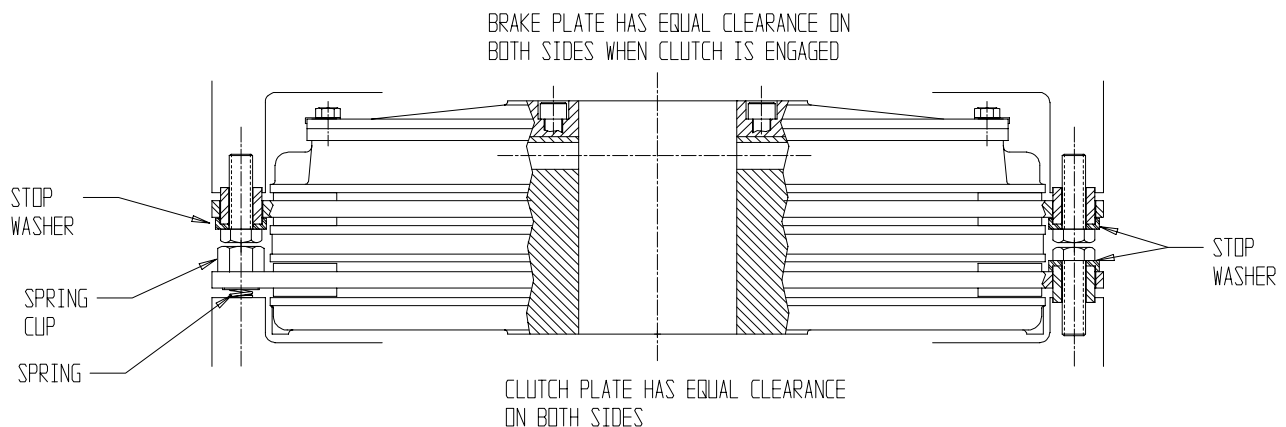
#### Section 3, Plate Positioning Springs

When an **Ortlinghaus** pneumatic clutch/brake, clutch, or brake is mounted on a shaft that is at an angle other than horizontal, there must be some means that prevents the clutch or brake plate from dragging when disengaged. Generally, plate positioning springs and associated hardware are used to suspend the plates in a neutral position.

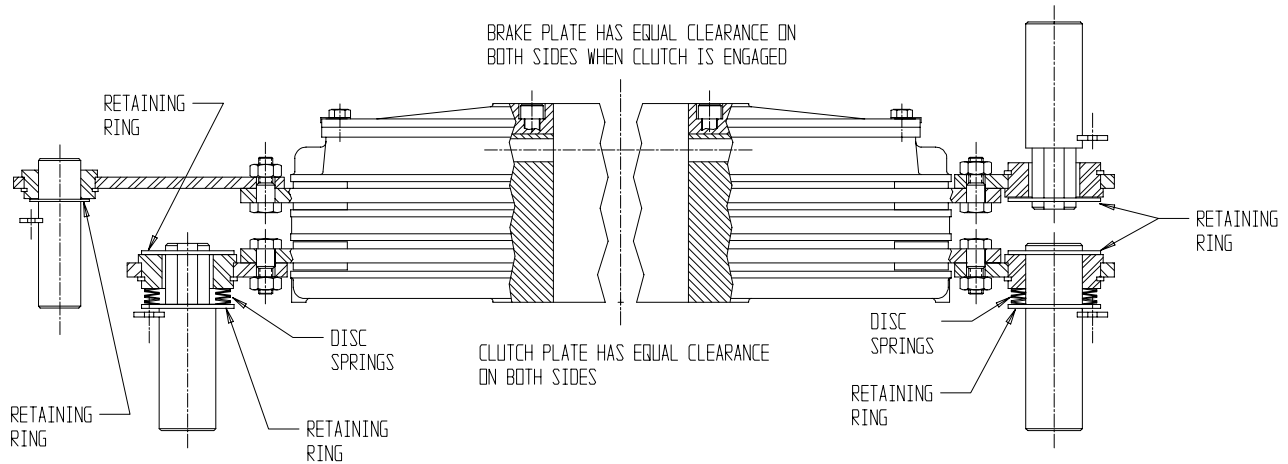
On 12 Point plates, springs that are held in spring cups which are screwed into the plate in six places keep the plate against stop washers installed between the head of the 12 Point bolt and the top of the 12 Point bushing. In some cases, only the stop washers are used, as the force of gravity is used instead of springs. See Figure I5 for a typical arrangement.

On 2 Point plates, disc springs (Bellville Washers) and retaining rings are generally used. The retaining rings fit in grooves in the suspension pins, and the disc springs suspend the plate as required. In some cases special length suspension pins are needed. See Figure I6 a typical arrangement.

Please note – plate positioning springs are to be used to prevent plate dragging in off angle mountings and other special applications. They are not to be used to make up for out of position 12 Point bushings or suspension pins. Using these arrangements where they are not necessary adds needless cost and complexity.



**Figure I5**  
**Vertical Shaft Mount, Clutch End Down, 12 Point Plates**  
**Showing Typical Use of Spring Cups, Springs, and Stop Washers**



**Figure I6**  
**Vertical Shaft Mount, Clutch End Down, 2 Point Plates**  
**Showing Typical Use of Retaining Rings and Disc Springs**

## **IMPORTANT !**

All mounting dimensions must be strictly followed when using plate positioning springs. At installation it must be verified that the clutch and brake plates have an equal clearance (air gap) on both sides when they are released. There are several styles of stop washer used with the 12 Point plates, depending on size and configuration. Stop washers or the 12 Point bushings may have to be fitted at assembly to obtain the proper position of the 12 Point plate.

If you have any questions about the application, installation, or use of plate positioning springs please contact Orttech.