

Pneumatic Installation Guidelines

Appendix C

Locking Device Considerations

Locking devices such as the Ringfeder 7012 Series and B-Loc B 400 Series may be used to mount the **Ortlinghaus** 0-420, 0-406, 0-400, 0-440, and 0-450 Series clutch/brakes, clutches and brakes to a shaft. Please refer to Orttech Bulletin 688 for the recommended bore and counterbore limits. The Series 0-420, 0-400, 0-440, and 0-450 are counterbored on the clutch end to accept the locking device, and the Series 0-406 is counterbored on the brake end to accept the locking device. Orttech Bulletin 688 lists the maximum shaft size and locking device that can be used in a particular unit, and the maximum depth of counterbore recommended for normal applications.

Locking devices can be easier to install than keys. A locking device can also provide a better connection than keys. Installation is also easier if the clutch/brake, clutch, or brake bore can be machined for O-rings and an annular groove for the air inlet and sealing when a locking device is used, as the angular alignment of the shaft and hub air ports is not as critical as when shaft to hub air seals are used

If an internal type of locking device cannot be used in the application, please contact Orttech, as there are other devices and variations that can be used in some situations. These include the use of a torque tube with a shrink disc, reverse mounted designs, and other special applications.

Some things to note:

- O-rings are recommended for sealing the air if standard air delivery is used. If O-rings cannot be used due to conditions such as existing keyways in the shaft, shaft to hub air seals may have to be used, and a short key, pin, or other device must be used to assure that the shaft and hub air holes are in proper alignment.
- The designer must determine that the safety factor of the connection is suitable for the application. Normally a safety factor of 1.4 is recommended, but a lower or higher value may be warranted based on the installation conditions and procedure, the application, and the service conditions.
- The locking device manufacturers installation instructions must be followed.
- The locking device must be capable of transmitting at least the full torque of the clutch/brake, clutch, or brake at the recommended operating pressure of the application. If the locking device is sized based on shaft diameter alone, the torque transmission capability must be sufficient for the application.

If torque transmission of the connection is an issue, there are several ways to address it. For the Ringfeder 7012 Series and B-Loc B 400 Series, the locking device screws may be tightened up to 20% above the catalog listing for a corresponding increase in transmitted torque. For other Series, and other brands please consult the manufacturer. Another possibility is that a locking device sized to meet the torque requirement and still fit the clutch/brake, clutch, or brake be selected, and the difference between the locking device bore and the shaft be made up with a split spacer that is at least as long as the inner ring of the locking device is wide. The full torque can be transmitted as long as the ratio of the spacer OD / ID is less than 1.25. If the ratio of the spacer OD / ID is 1.25 or greater, the transmitted torque is found by multiplying the catalog torque of the locking device by the factor [diameter of the shaft under the sleeve divided by the nominal inside diameter of the locking device]. This is based on the shaft and sleeve being clean and dry, with all oil, grease, and moisture wiped off of the surfaces of the these parts.

Caution:

Do not assume that the allowable depth of counterbore is equal to the L₁ (Ringfeder) or L₂ (B-Loc) dimension given for the locking device, as often it is less. Please refer to Orttech Bulletin 688 for the maximum allowable depth of counterbore.

In normal installations the tolerances used are:

- Shaft diameter at hub and locking device – h6
- Hub bore, at the shaft – H7
- Hub counterbore at the locking device – H7

Table C1 lists the maximum thru bore, counterbore, and counterbore depth allowable for the Series 420, 406, & 400 clutch/brakes. For special applications please contact Orttech.

If you have any questions about the use of a locking device with an **Ortlinghaus** clutch/brake, clutch, or brake please contact Orttech or your local Orttech Representative

Table C1

Maximum Thru Bore, Counterbore, and Counterbore Depth Limits

C/B Series/Size	Max. Thru Bore		Max. Counterbore		Max. C'Bore Depth	
	mm	inches	mm	inches	mm	inches
420 / 23	---	---	---	---	---	---
420 / 29	---	---	---	---	---	---
420 / 40	---	---	---	---	---	---
420 / 50	55	2.17	85	3.35	26	1.02
420 / 61	65	2.56	95	3.74	26	1.02
420 / 62	70	2.76	110	4.33	30	1.18
420 / 67	85	3.35	125	4.92	30	1.18
420 / 72	95	3.74	135	5.31	30	1.18
420 / 77	120	4.72	165	6.50	49	1.93
420 / 80	130	5.12	180	7.09	40	1.57
420 / 83	150	5.91	200	7.87	40	1.57
420 / 87	170	6.69	225	8.86	46	1.81
420 / 90	190	7.48	250	9.84	54	2.13
420 / 91	200	7.87	260	10.24	54	2.13
420 / 92	220	8.66	285	11.22	58	2.28
420 / 93	260	10.24	325	12.80	58	2.28
406 / 29	40	1.57	65	2.56	22	0.87
406 / 40	50	1.97	80	3.15	26	1.02
406 / 50	70	2.76	110	4.33	30	1.18
406 / 61	90	3.54	130	5.12	30	1.18
406 / 71	120	4.72	165	6.50	35	1.38
406 / 76	140	5.51	190	7.48	40	1.57
406 / 79	150	5.91	200	7.87	40	1.57
406 / 82	170	6.69	225	8.86	46	1.81
406 / 90	200	7.87	260	10.24	54	2.13
400 / 71	85	3.35	125	4.92	32	1.26
400 / 74	90	3.54	130	5.12	32	1.26
400 / 76	100	3.94	145	5.71	38	1.50
400 / 79	120	4.72	165	6.50	38	1.50
400 / 82	130	5.12	180	7.09	43	1.69
400 / 85	150	5.91	200	7.87	43	1.69

Please Note:

For certain applications a locking device can be used in the Series 0-420 Sizes 23, 29, & 40 with the addition of a bolted ring. If a locking device is required on these sizes please contact Orttech