

Hydraulic 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* 0123, 0224, and 0225 Series clutch/brakes, clutches and brakes sizes 63 – 90 to a shaft. For versions with the long (16 or 18 friction surface) clutch, if the permissible depth of counterbore allows, the Ringfeder 7015 or 7014 Series may need to be used, as the clutch torque may be too great for the Ringfeder 7012 Series and B-Loc B 400 Series. Please contact Orttech if this is the case. The Series 0123 Series is counterbored on the clutch end to accept the locking device while the 0224 and 0225 are counterbored on the end opposite the cylinder to accept the locking device.

Dimensions given in Table C1 are the maximum counterbores and depths of counterbore that can be used.

Locking devices can be easier to install than keys. A locking device can also provide a better connection than keys. An annular groove for the actuating fluid inlet is used when an internal locking device is used so that angular alignment of the shaft and hub actuating fluid ports is not critical. Inner cooling also uses annular grooves, as it does with keyways.

Some things to note:

- Shaft finish and the condition of the shaft are very important as a very rough shaft or one with gouges and axial grooves will allow leakage of the actuating fluid and a resulting drop in pressure. Also, it is not practical to use an annular groove for the actuating fluid if the shaft has an existing keyway.
- 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 multiplied by an appropriate safety factor. 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) catalog dimension given for the locking device, as often it is less.

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

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 Size	Qty of Clutch Friction Surfaces	Max. Thru Bore		Max. Counterbore		Max. C'Bore Depth	
		mm	inches	mm	inches	mm	inches
75	12 or less	95	3.74	135	5.31	28	1.10
75	16 or more	95	3.74	135	5.31	28	1.10
80	12 or less	130	5.12	180	7.09	38	1.50
80	16 or more	130	5.12	170	6.69	60	2.36
86	12 or less	160	6.30	210	8.27	38	1.50
86	16 or more	160	6.30	200	7.87	74	2.91
90	12 or less	200	7.87	260	10.24	52	2.05
90	16 or more	200	7.87	260	10.24	52	2.05

This table is based on maximum bore. Different counterbore depths may be possible at bores less than maximum bore. Please contact Orttech for additional information.