ALTRA INDUSTRIAL MOTION

Ameriloc®
Hydraulic Shaft Locking Devices

Ameridrives® Couplings

An Altra Industrial Motion Company

Ameriloc® hydraulic shaft locking devices provide secure shaft/hub connections

Through an exclusive agreement with TAS Schafer GmbH, Ameridrives Couplings now offers hydraulic shaft locking devices which are custom-manufactured to precise tolerances per customer specifications. Ameriloc locking devices are highly engineered to provide years of trouble-free service with features including:

- Zero backlash
- Reduced shaft stress
- High contact pressure for greater torque
- Easily installed and removed
- Elimination of keyways or splines
- Unlimited shaft positioning

The great advantage of the hydraulic SHS device lies in the significant time savings during installation. This system can be tensioned at a pressure of between 1740 and 2900 PSI (120 and 200 bar). With larger diameters, such as 20.8 in. (530 mm), the SHS can be tensioned within only a few minutes, compared to several hours required for a mechanical locking device. This time reduction increases exponentially with the diameter of the connection.

The hydraulic pump required for assembly can be a stationary unit, e.g. at test stations and assembly areas, but the use of a hydraulic hand pump is also possible. In this way, the system can also be tensioned at difficult-to-reach places such as the turret of a wind turbine. Dismantling of the SHS is also supported by the hydraulic system.

If the seals no longer work after many years of operation, the SHS can be removed like a mechanical locking device by loosening the screw connection to release pressurization.

- All units are pre-assembled, ready to install
- Torque range from 25 to 4303 ft.lbs. (34 to 5,835 kNm)
- Outer diameters from 12.5 to 53 in. (320 to 1,350 mm)
- Shaft diameters from 6.5 to 29.5 in. (165 to 750 mm)
- Additional sizes are available upon request

State-of-the-art Facilities

Our plant is equipped with the latest manufacturing technology and features an on-site engineering department. Our manufacturing capacity allows us to meet even the most stringent customer production delivery schedules.

Applications

Ameridrives hydraulic shaft locking devices are offered in a wide range of sizes for use on all types of industrial applications including:

- Test Stands
- Printing Presses
- Ski Lifts
- Mining Crushers
- Meat Processing
- Drilling
- Milling
- Moving Sidewalks
- Industrial Sewing
- Wind Turbines
- Winches
- Compressors
- Pulp & Paper
- Steel
- Cranes
- Fans
- Weaving

Surface Finish:

Recommended surface finish for shafts and hubs to be used is at maximum 63 RMS or 16 µm.

Imperial Tolerances

Basic Shaft Size	4.725 to 7.086	7.087 to 9.842	9.843 to 12.401	12.402 to 15.748	15.749 to 19.685	19.686 to 24.803
Shaft OD	-.0005 -.0015	-.0006 -.0017	-.0006 -.0019	-.0007 -.0021	-.0007 -.0023	-.0008 -.0025
Hub ID	+.0015 -.0000	+.0018 -.0000	+.0020 -.0000	+.0022 -.0000	+.0024 -.0000	+.0027 -.0000

Metric Tolerances

Shaft OD: <150mm h6
>155mm g6
Hub ID: H7
Hub OD: f7

Values of Various Materials

.2% Yield Stress (N/mm^2)	150	180	200	220	250	270	300	350	400
.2% Yield Stress PSI	21,756	26,107	29,008	31,909	36,260	39,160	43,512	50,764	58,016
Material	GG-22	GG-26 GS-38 V2A-S A-216 4340	GG-30 V2A-E V4A-S GTS-35 CLASS45 32510	GS-45 ST35 ST37-3 V4A-E	GS-52 GGG-38 ST42-3 C22 1022	GGG-42 ST50-2 C35 AlCuNiC 1035	GS-60 ST60-2 ST55 GTS-45 40010	GS-62 GGG-50 ST70-2 C45 1045 80-55-06	GS-70 GGG-60 C60 1060

Torque:

For proper selection of hydraulic locking devices, nominal torque and peak torque must be established. Nominal drive torque can be calculated as follows:

$$\text{*Tn (Torque Nominal)} \quad \text{ft.lbs.} = \frac{5252 \times HP}{rpm} \qquad (Nm) = \frac{7097 \times HP}{rpm}$$

$$\text{*Tp (Torque Peak)} = Tn \times \text{Safety Factor}$$

Always select a unit where Mt is greater than Tp.

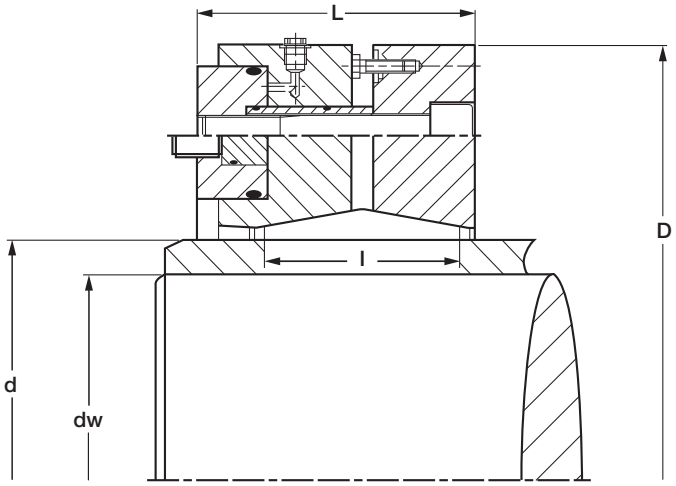
With the simultaneous transmission torque and axial force, the torque is reduced according to the following formula:

$$M_{red} = \sqrt{M_t^2 - \left(F_{ax} \bullet \frac{d_W}{2}\right)^2}$$

M_t = maximum transmissible torque
M_{red} = reduced maximum torque with simultaneous axial force
F_{ax} = maximum transmissible axial force
d_w = shaft diameter

Dimensions

Type SHS



Mt= Transmissible torque per locking device
p= pressure on nominal dia. d

Dimensions

Model No.	dw* in. (mm)	Transmissible Torque in/Lbs x 1000 (kNm)	d in. (mm)	D in. (mm)	L in. (mm)	l in. (mm)	Pressure PSI (N/mm^2)	Weight LBS (kg)	Hydraulic Pressure PSI (Bar)
SHS-165	4.50 (115)	301 (34)	6.4944/6.4928 (165)	12.60 (320)	3.82 (97)	2.21 (56)	34,083 (235)	84 (38)	2,611 (180)
	4.75 (120)	336 (38)							
	4.88 (125)	372 (42)							
SHS-175	4.88 (125)	389 (44)	6.8881/6.8865 (175)	13.39 (340)	3.82 (97)	2.21 (56)	35,969 (248)	95 (43)	2,611 (180)
	5.12 (130)	425 (48)							
	5.25 (135)	469 (53)							
SHS-185	5.25 (135)	584 (66)	7.2814/7.2797 (185)	13.98 (355)	4.21 (107)	2.80 (71)	35,969 (248)	115 (52)	2,611 (180)
	5.50 (140)	620 (70)							
	5.75 (145)	682 (77)							
SHS-195	5.50 (140)	646 (73)	7.6751/7.6734 (195)	15.35 (390)	4.61 (117)	2.80 (71)	36,984 (255)	157 (71)	2,611 (180)
	5.75 (150)	752 (85)							
	6.00 (155)	805 (91)							
SHS-200	5.75 (150)	770 (87)	7.8720/7.8703 (200)	15.35 (390)	4.61 (117)	2.80 (71)	38,000 (262)	155 (70)	2,466 (170)
	6.00 (155)	814 (92)							
	6.25 (160)	885 (100)							
SHS-220	6.25 (160)	991 (112)	8.6594/8.6577 (220)	16.93 (430)	5.39 (137)	3.46 (88)	35,389 (244)	225 (102)	2,611 (180)
	6.50 (165)	1,062 (120)							
	6.75 (170)	1,141 (129)							
SHS-240	6.75 (170)	1,062 (120)	9.4468/9.4451 (240)	17.72 (450)	5.79 (147)	3.62 (92)	31,908 (220)	238 (108)	2,611 (180)
	7.00 (180)	1,221 (138)							
	7.50 (190)	1,372 (155)							
SHS-260	7.50 (190)	1,496 (169)	10.2340/10.2320 (260)	18.90 (480)	6.22 (158)	4.06 (103)	31,763 (219)	282 (128)	2,611 (180)
	7.75 (200)	1,637 (185)							
	8.25 (210)	1,903 (215)							
SHS-280	8.25 (210)	1,814 (205)	11.0214/11.0194 (280)	20.27 (515)	6.89 (175)	4.49 (114)	28,282 (195)	348 (158)	2,611 (180)
	8.50 (220)	2,035 (230)							
	9.00 (230)	2,257 (255)							
SHS-300	9.00 (230)	2,495 (282)	11.8088/11.8068 (300)	21.26 (540)	7.44 (189)	4.80 (122)	29,297 (202)	465 (211)	2,611 (180)
	9.50 (240)	2,743 (310)							
	9.75 (245)	2,876 (325)							
SHS-320	9.50 (240)	2,655 (300)	12.5960/12.5938 (320)	21.85 (555)	7.44 (189)	4.80 (122)	29,152 (201)	476 (216)	2,611 (180)
	10.00 (250)	2,903 (328)							
	10.25 (260)	3,186 (360)							
SHS-340	10.00 (250)	3,168 (358)	13.3834/13.3812 (340)	24.02 (610)	8.19 (208)	5.28 (134)	29,007 (200)	639 (290)	2,755 (190)
	10.25 (260)	3,434 (388)							
	10.50 (270)	3,761 (425)							

dw*- Imperial units are not a direct conversion of the metric shafts, these are examples of standard shaft sizes. The metric dimensions are the true range.

Dimensions

Type SHS

Model No.	dw* in. (mm)	Transmissible Torque in/Lbs x 1000 (kNm)	d in. (mm)	D in. (mm)	L in. (mm)	l in. (mm)	Pressure PSI (N/mm^2)	Weight LBS (kg)	Hydraulic Pressure PSI (Bar)
SHS-350	10.75 (270)	3,762 (425)	13.7771/13.7749 (350)	24.21 (615)	8.62 (219)	5.51 (140)	28,137 (194)	670 (304)	2,900 (200)
	11.00 (280)	4,089 (462)							
	11.25 (285)	4,266 (482)							
SHS-360	11.00 (280)	4,195 (474)	14.1708/14.1686 (360)	24.80 (630)	8.62 (219)	5.51 (140)	28,717 (198)	701 (318)	2,900 (200)
	11.50 (290)	4,549 (514)							
	11.75 (295)	4,735 (535)							
SHS-390	12.00 (300)	5,044 (570)	15.3519/15.3497 (390)	27.76 (705)	8.70 (221)	4.49 (114)	29,442 (203)	904 (410)	2,755 (190)
	12.25 (310)	5,443 (615)							
	12.50 (320)	5,841 (660)							
SHS-420	13.00 (330)	6,682 (755)	16.5328/16.5303 (420)	29.53 (750)	9.25 (235)	6.46 (164)	28,137 (194)	1,058 (480)	2,900 (200)
	13.50 (340)	7,169 (810)							
	13.75 (350)	7,655 (865)							
SHS-440	13.50 (340)	7,523 (850)	17.3202/17.3177 (440)	30.91 (785)	10.43 (265)	6.97 (177)	27,702 (191)	1,338 (607)	2,611 (180)
	13.75 (350)	8,054 (910)							
	14.00 (360)	8,585 (970)							
SHS-460	14.00 (360)	8,585 (970)	18.1076/18.1051 (460)	31.89 (810)	10.43 (265)	6.97 (177)	27,992 (193)	1,422 (645)	2,611 (180)
	14.50 (370)	9,116 (1030)							
	15.00 (380)	9,735 (1100)							
SHS-480	15.00 (380)	10,798 (1220)	18.8950/18.8925 (480)	33.66 (855)	11.22 (285)	7.40 (188)	29,877 (206)	1,721 (781)	2,611 (180)
	15.50 (390)	11,506 (1300)							
	15.75 (400)	12,214 (1380)							
SHS-500	15.75 (400)	12,302 (1390)	19.6824/19.6799 (500)	34.65 (880)	11.22 (285)	7.40 (188)	30,022 (207)	1,909 (866)	2,611 (180)
	16.00 (410)	12,833 (1450)							
	16.50 (420)	13,630 (1540)							
SHS-530	17.00 (430)	16,595 (1875)	20.8631/20.8604 (530)	37.00 (940)	11.81 (300)	8.46 (215)	30,603 (211)	2,097 (951)	2,611 (180)
	17.25 (440)	17,347 (1960)							
	17.75 (450)	18,365 (2075)							
SHS-560	17.75 (450)	17,524 (1980)	20.0443/20.0415 (560)	37.99 (965)	11.81 (300)	8.46 (215)	29,587 (204)	2,138 (970)	2,900 (200)
	18.00 (460)	18,409 (2080)							
	18.50 (470)	19,339 (2185)							
SHS-590	18.50 (470)	18,763 (2120)	23.2254/23.2226 (590)	38.98 (990)	12.80 (325)	9.25 (235)	26,541 (183)	2,299 (1043)	2,900 (200)
	19.00 (480)	19,649 (2220)							
	19.25 (490)	20,533 (2320)							
SHS-620	19.75 (500)	20,976 (2370)	24.4065/24.4037 (620)	40.16 (1020)	12.80 (325)	9.25 (235)	26,251 (181)	2,509 (1138)	2,900 (200)
	20.00 (510)	21,772 (2460)							
	20.50 (520)	22,835 (2580)							
SHS-640	20.50 (520)	23,808 (2690)	25.1937/25.1906 (640)	40.94 (1040)	12.80 (325)	9.25 (235)	27,557 (190)	2,590 (1175)	2,611 (180)
	20.75 (530)	24,782 (2800)							
	21.25 (540)	25,932 (2930)							
SHS-660	20.75 (530)	25,313 (2860)	25.9811/25.9780 (660)	44.49 (1130)	14.96 (380)	10.24 (260)	28,282 (195)	3,836 (1740)	2,611 (180)
	21.25 (540)	26,375 (2980)							
	21.50 (550)	27,437 (3100)							
SHS-700	22.00 (560)	24,516 (2770)	27.5559/27.5528 (700)	49.21 (1250)	14.06 (357)	10.83 (275)	26,977 (186)	5,952 (2700)	2,611 (180)
	22.75 (580)	26,579 (3003)							
	23.50 (600)	28,676 (3240)							
SHS-720	22.75 (580)	28,410 (3210)	28.3433/28.3402 (720)	48.82 (1240)	13.39 (340)	9.84 (250)	25,526 (176)	5,313 (2410)	2,611 (180)
	23.50 (600)	30,623 (3460)							
	24.25 (620)	32,924 (3720)							
SHS-750	23.50 (600)	44,873 (5070)	29.5244/29.5213 (750)	53.15 (1350)	16.93 (430)	11.02 (280)	28,427 (196)	6,438 (2920)	2,611 (180)
	24.25 (620)	48,148 (5440)							
	25.00 (640)	51,644 (5835)							

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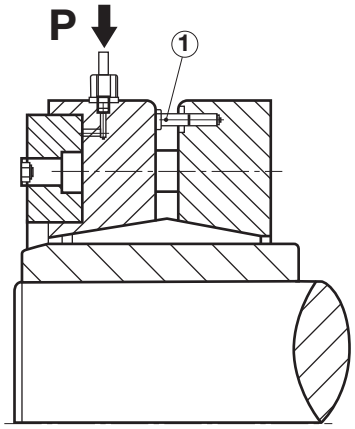
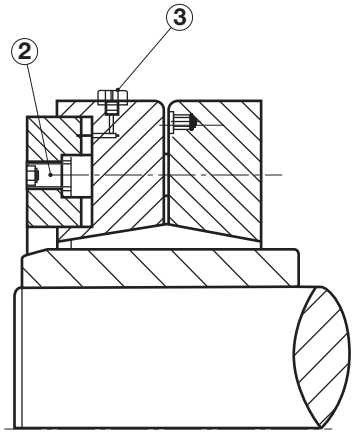
Installation

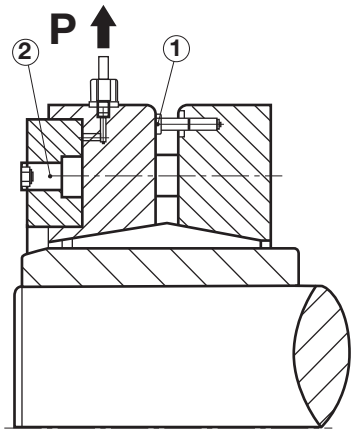




The shrink discs are supplied assembled and ready to install.

Assembly

1. The hub bore and the solid shaft must be clean and grease free.
2. Locate the shrink disc in the appropriate position. **Attention:** Do not activate hydraulic pressure before the shaft is in place in the hub bore.
3. Tighten jacking screw Item 1 back into position.
4. Connect the hydraulic pump (hand or electric) via a hose coupling to the hydraulic port (R 1/4“).
5. Activate the shrink disc by applying hydraulic pressure approx. 2,610 psi (180 bar).
6. Tighten all bolts Item 2 so that they are firmly seated. **Important:** Make sure to fasten all bolts before releasing the hydraulic pressure.
7. Release the hydraulic pressure. Open the second hydraulic port Item 3 to aid drainage. The hydraulic fluid will flow back to the pump reservoir.
8. Assemble hydraulic port plugs Item 3.



Disassembly

1. Remove hydraulic port plug Item 3 and connect the pump hose.
2. Apply 2,500-2,900 psi (170-200 bar) pressure. Loosen all bolts Item 2.
3. Release the hydraulic pressure and unscrew the jacking screws Item 1 until the locking device releases.
4. Tighten the jacking screws Item 1 back into original position.
5. Remove the hydraulic hose coupling and assemble the (2) port plugs Item 3. Remove the locking device.

Application Data Sheet

Contact Information:

Date _____

Company _____

Address _____

City _____ State _____ Zip _____

Name _____

Title _____ Phone (____) _____

Mail or Fax to:

Ameridrives Couplings
Application Engineering
1802 Pittsburgh Ave.
Erie, PA 16502

FAX: 814-453-5891
Phone: 814-480-5000

Specifications and Dimensions:

Max torque _____ ft.lbs _____ kNm
Max. bending moment _____ ft.lbs. _____ kNm
Max. axial load _____ lbs. _____ kg
Max. radial load _____ lbs. _____ kg
Dimensions
Height _____ inches _____ mm
Width _____ inches _____ mm
Depth _____ inches _____ mm

Shaft diameter _____ inches _____ mm
In case of hollow shaft, internal diameter _____ inches _____ mm
Speed _____ rpm
Hub outside diameter _____ inches _____ mm
Hub width _____ inches _____ mm
Hub material yield strength _____ psi _____ N/mm²
Shaft material yield strength _____ psi _____ N/mm²
Ambient temperature _____ ° F _____ ° C

Additional Information:

_____
_____
_____
_____
_____
_____
_____
_____

Sketch of Application:

Ameridrives offers a wide variety of shaft locking devices and couplings

Ameriloc® Internal Locking Devices
See Catalog P-1971-AC

Ameriloc® External Locking Devices
See Catalog P-1972-AC

Ameriloc® Shaft Couplings
See Catalog P-1973-AC

Altra Industrial Motion

All Customer Service phone numbers shown in bold

Electromagnetic Clutches and Brakes

Warner Electric

Electromagnetic Clutches and Brakes

New Hartford, CT - USA
1-800-825-6544

For application assistance: 1-800-825-9050

St Barthelemy d'Anjou, France
+33 (0) 2 41 21 24 24

Precision Electric Coils and Electromagnetic Clutches and Brakes

Columbia City, IN - USA
1-260-244-6183

Matrix International

Electromagnetic Clutches and Brakes, Pressure Operated Clutches and Brakes

Brechin, Scotland
+44 (0) 1356 602000

New Hartford, CT - USA
1-800-825-6544

Inertia Dynamics

Spring Set Brakes; Power On and Wrap Spring Clutch/Brakes

New Hartford, CT - USA
1-800-800-6445

Overrunning Clutches

Formsprag Clutch

Overrunning Clutches and Holdbacks

Warren, MI - USA
1-800-348-0881 – Press #1

For application assistance: 1-800-348-0881 – Press #2

Marland Clutch

Roller Ramp and Sprag Type Overrunning Clutches and Backstops

Burr Ridge, IL - USA
1-800-216-3515

Stieber Clutch

Overrunning Clutches and Holdbacks

Heidelberg, Germany
+49 (0) 6221 30 47 0

Engineered Couplings

Ameridrives Couplings

Mill Spindles, Ameriflex, Ameridisc

Erie, PA - USA
1-814-480-5000

Gear Couplings

San Marcos, TX - USA
1-800-458-0887

Bibby Transmissions

Disc, Gear, Grid Couplings, Overload Clutches

Dewsbury, England
+44 (0) 1924 460801

Boksburg, South Africa
+27 11 918 4270

TB Wood's

Elastomeric Couplings

Chambersburg, PA - USA
1-888-829-6637 – Press #5

For application assistance: 1-888-829-6637 – Press #7

General Purpose Disc Couplings

San Marcos, TX - USA
1-888-449-9439

Ameridrives Power Transmission

Universal Joints, Drive Shafts, Mill Gear Couplings

Green Bay, WI - USA
1-920-593-2444

Huco Dynatork

Precision Couplings and Air Motors

Hertford, England
+44 (0) 1992 501900

Charlotte, NC - USA
1-800-825-6544

Linear Products

Warner Linear

Linear Actuators and Guideways

Belvidere, IL - USA
1-800-825-6544

For application assistance: 1-800-825-9050

St Barthelemy d'Anjou, France
+33 (0) 2 41 21 24 24

Heavy Duty Clutches and Brakes

Wichita Clutch

Pneumatic Clutches and Brakes

Wichita Falls, TX - USA
1-800-964-3262

Bedford, England
+44 (0) 1234 350311

Twiflex Limited

Caliper Brakes and Thrusters

Twickenham, England
+44 (0) 20 8894 1161

Industrial Clutch

Pneumatic and Oil Immersed Clutches and Brakes

Waukesha, WI - USA
1-262-547-3357

Gearing

Boston Gear

Enclosed and Open Gearing, Electrical and Mechanical P.T. Components

Charlotte, NC - USA
1-800-825-6544

For application assistance: 1-800-816-5608

Nuttall Gear and Delroyd Worm Gear

Worm Gear and Helical Speed Reducers

Niagara Falls, NY - USA
1-716-298-4100

Belted Drives and Sheaves

TB Wood's

Belted Drives

Chambersburg, PA - USA
1-888-829-6637 – Press #5

For application assistance: 1-888-829-6637 – Press #7

Engineered Bearing Assemblies

Kilian Manufacturing

Engineered Bearing Assemblies

Syracuse, NY - USA
1-315-432-0700

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P-1974-AC 12/10 Printed in USA