

HYDRAULIC DISC BRAKES LB, LBS, LBV- Wet



APPLICATION

- » Heavy Duty machinery
- » Wheel drives
- » Material handling
- » Mining
- » Agricultural machines
- » Conveyors
- » Door openers and swing drives etc.



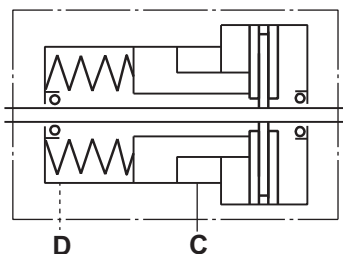
GENERAL

Fluid type	Mineral based- HLP(DIN 51524) or HM(ISO 6743/4)
Temperature range, °C [°F]	-40÷140 [-40÷284]
Viscosity range, mm²/s	20÷75 [98÷347]
Filtration	ISO code 20/16 (nominal filtration of 25 microns)
Maintenance	Changed after the first 50-100 h, then after every 500-1500 h.

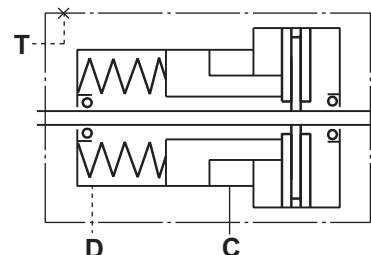
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LB, LBS

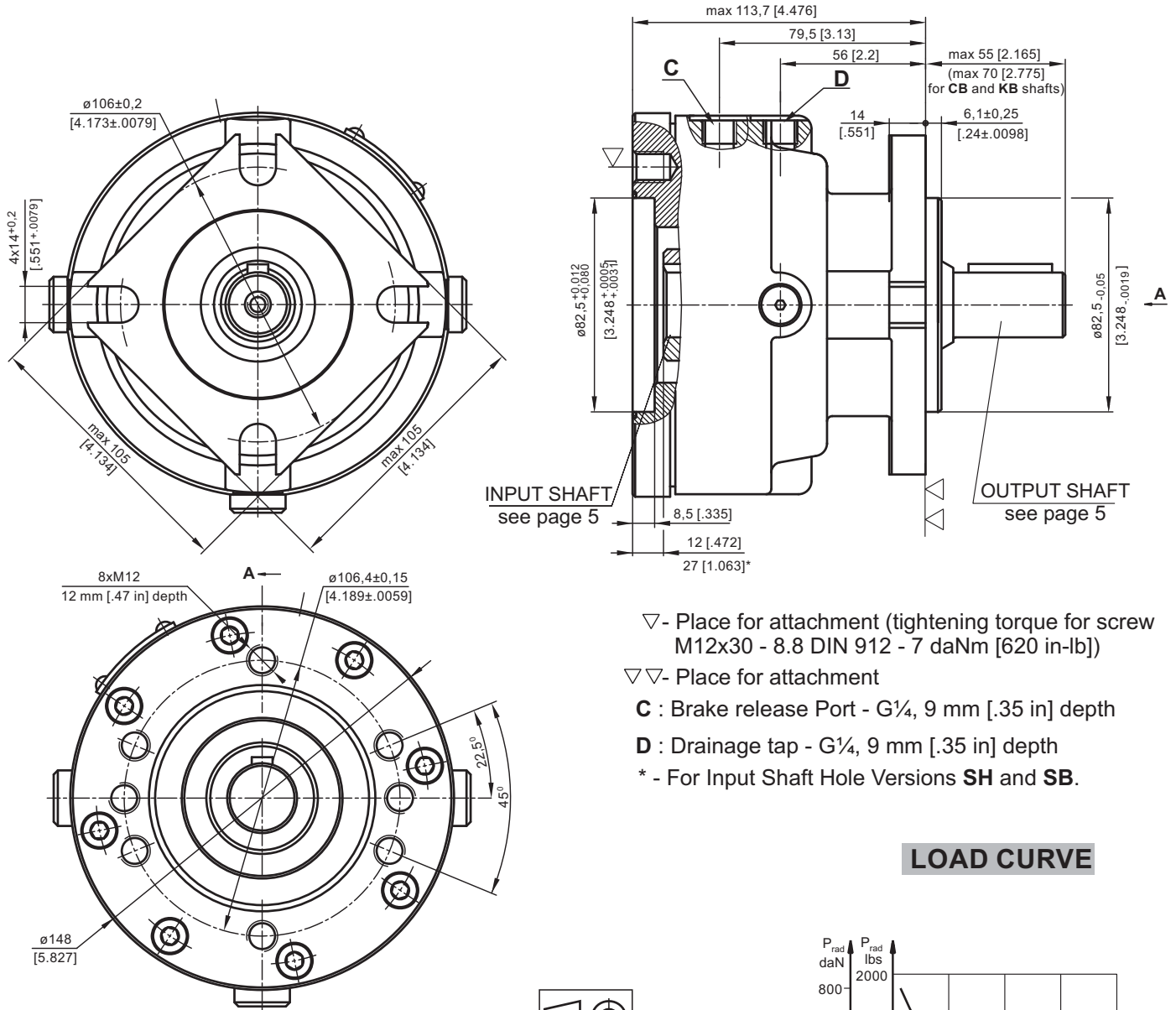


LBV



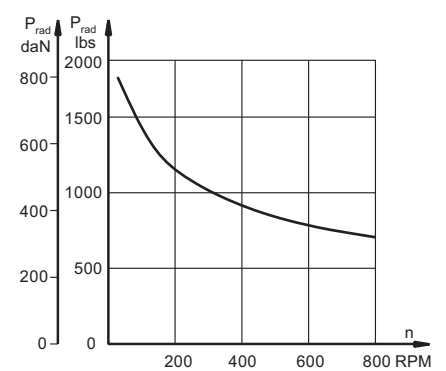
HYDRAULIC DISC BRAKE FOR FLANGE ATTACHMENT TO MP, MR AND MS HYDRAULIC MOTORS

TYPE LB/288



- ▽ - Place for attachment (tightening torque for screw M12x30 - 8.8 DIN 912 - 7 daNm [620 in-lb])
- ▽▽ - Place for attachment
- C : Brake release Port - G 1/4, 9 mm [.35 in] depth
- D : Drainage tap - G 1/4, 9 mm [.35 in] depth
- * - For Input Shaft Hole Versions SH and SB.

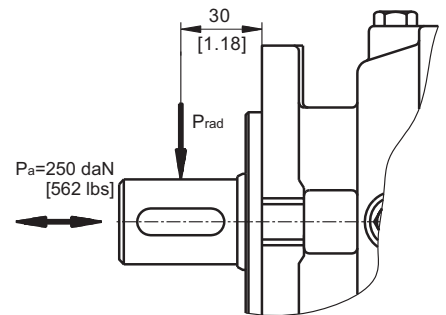
LOAD CURVE



SPECIFICATION DATA

Description LB/288...	7	14	21	32	43	63
*Min. Static Torque, daNm [lb-in]	6-8 [531-708]	13-15 [1150-1327]	20-22 [1770-1947]	31-34 [2743-3009]	41-45 [3628-3982]	61-64 [5399-5665]
Opening Pressure, min bar [PSI]	4-5 [58-73]	8-9 [116-130]	12-13 [174-188]	18-20 [260-290]	24-26 [348-377]	38-39 [550-565]
max	300 [4350]					
Min. oil quantity for brake releasing, cm ³ [in ³]	7 - 8 [4.27 - .488]					
Oil volume, cm ³ [in ³]	50 - 120 [3.5 - 7.35]					
Max. Pressure in drain space, bar [PSI]	0,5 [7.25]					
Weight, kg [lb]	9 [19.8]					

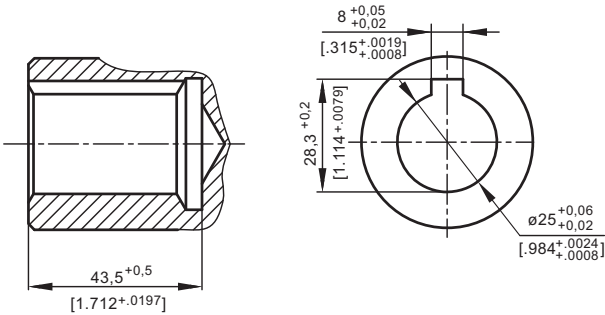
*Static torque is obtained at working pressure - 0 bar [0 PSI].



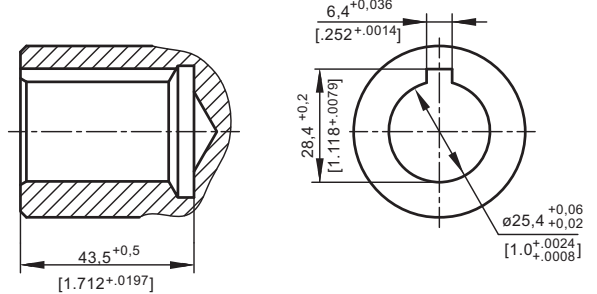
INPUT SHAFT HOLES

OUTPUT SHAFT EXTENSIONS

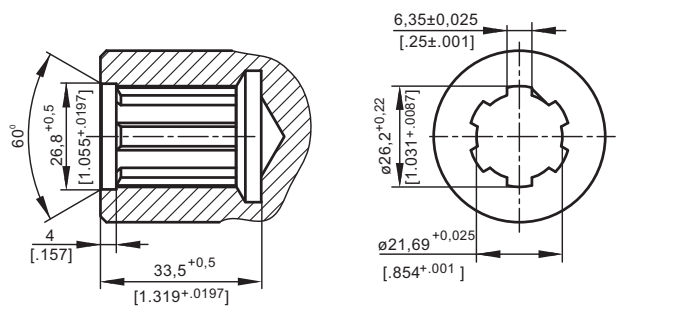
C



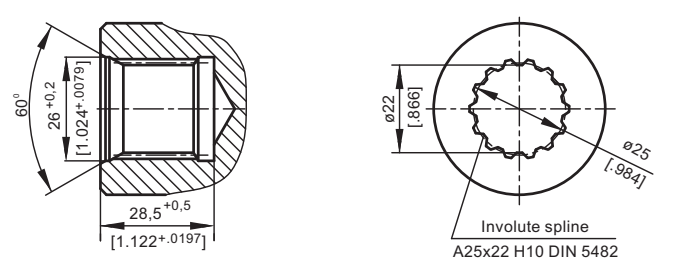
CO



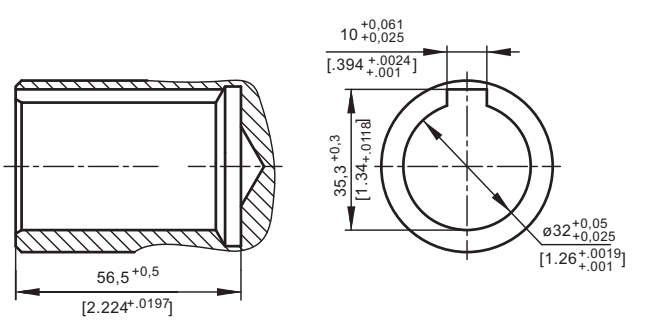
SH



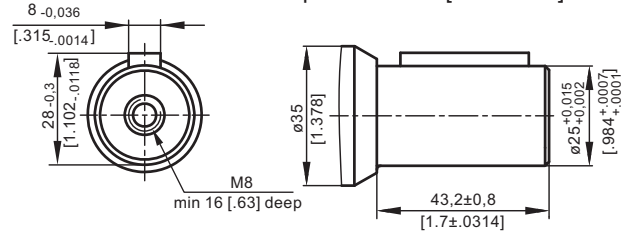
SB



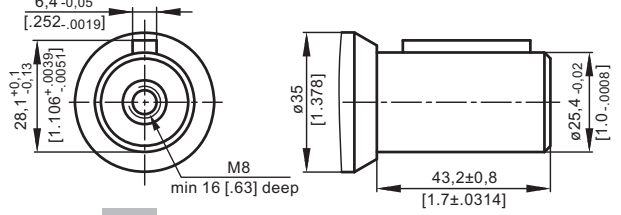
CB



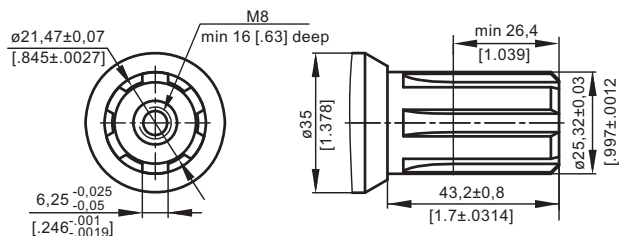
C - ϕ 25 straight, Parallel key A8x7x32 DIN 6885
Max. Torque 34 daNm [3010 lb-in]



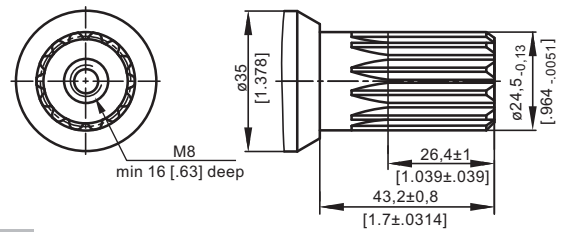
CO - ϕ 1" straight, Parallel key 1/4"x1/4"x1/4" BS46
Max. Torque 34 daNm [3010 lb-in]



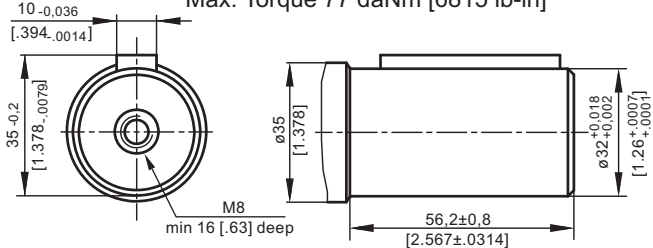
SH - splined, BS 2059 (SAE 6B)
Max. Torque 40 daNm [3540 lb-in]



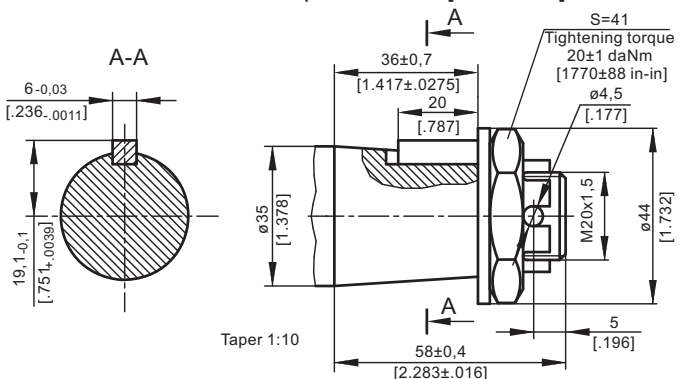
SA - splined, B25x22h9 DIN 5482
Max. Torque 40 daNm [3540 lb-in]



CB - ϕ 32 straight, Parallel key A10x8x45 DIN 6885
Max. Torque 77 daNm [6815 lb-in]

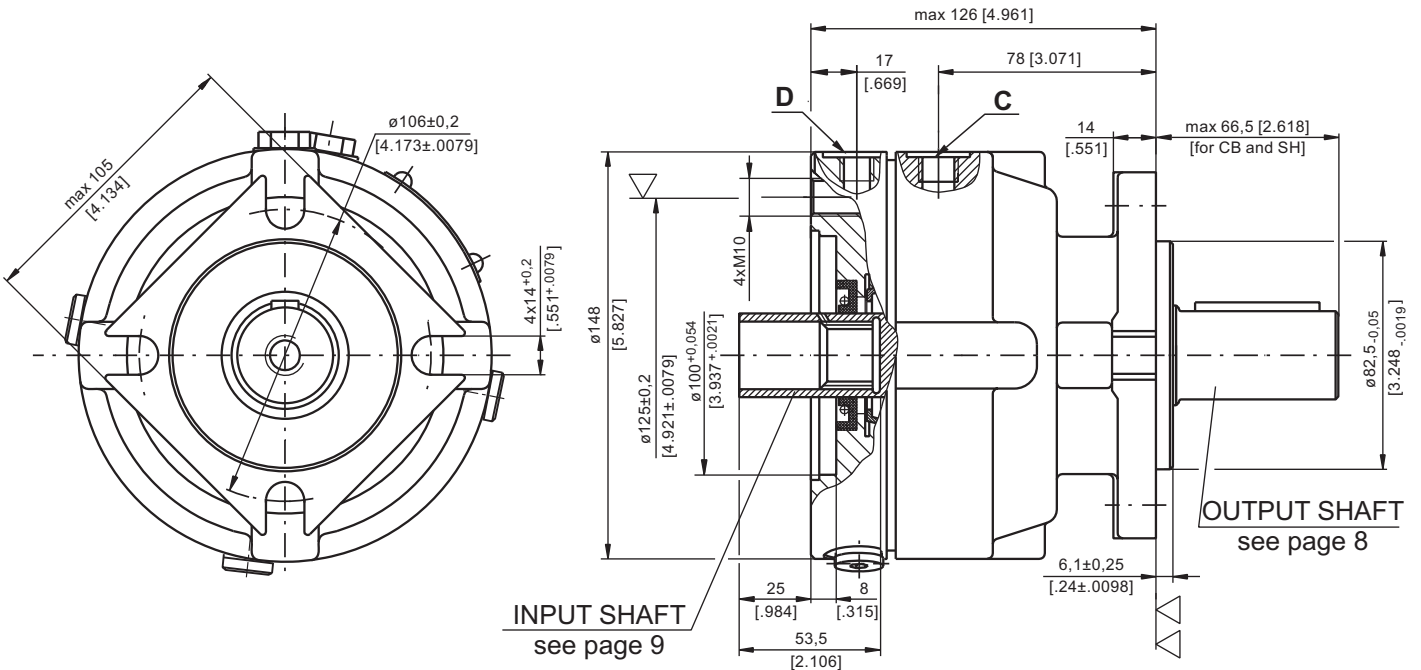


KB - tapered 1:10, Parallel key B6x6x20 DIN 6885
Max. Torque 95 daNm [8400 lb-in]



**HYDRAULIC DISC BRAKE FOR FLANGE ATTACHMENT
TO MSS AND MSV HYDRAULIC MOTORS**

TYPE LBS/289

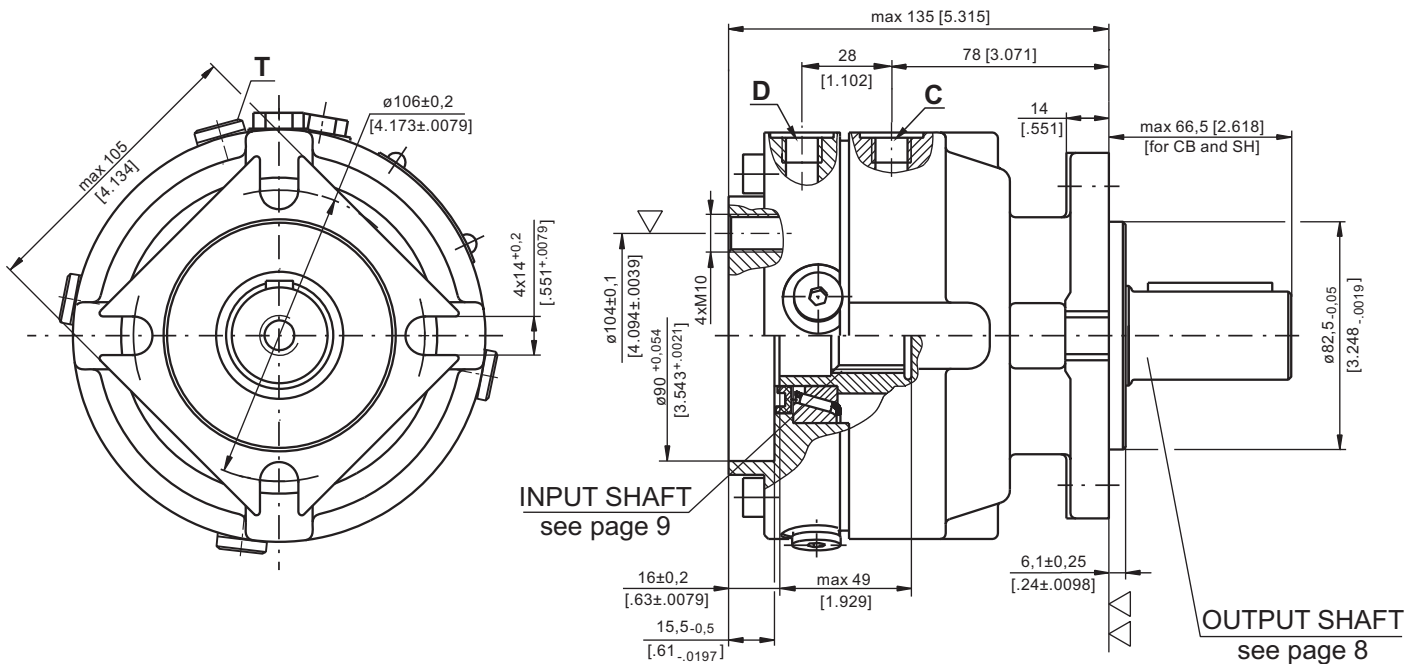


▽ - Place for attachment (tightening torque for screw M10x35 - 8.8 DIN 912 - 5 daNm [440 lb-in])

▽▽ - Place for attachment



TYPE LBV/289



▽ - Place for attachment (tightening torque for screw M10 - 8.8 DIN 912 - 5 daNm [440 lb-in])

▽▽ - Place for attachment

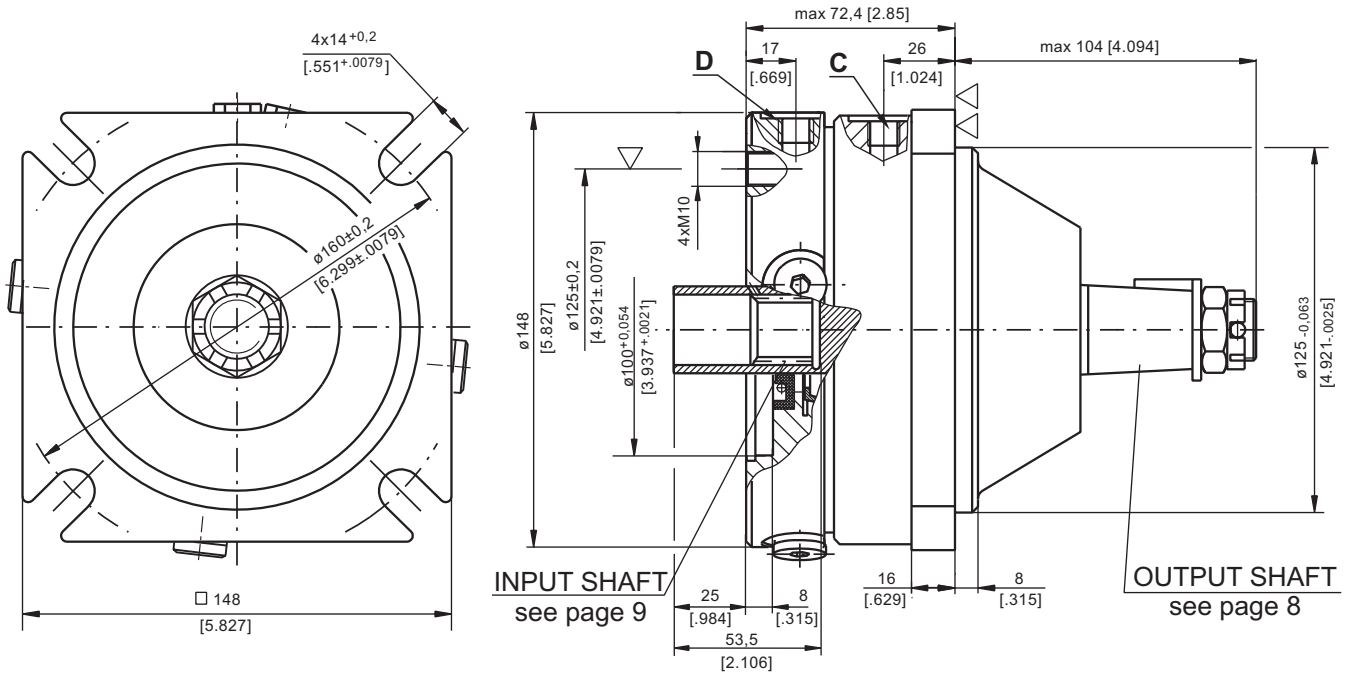
C : Brake release Port - G $\frac{1}{4}$, 9 mm [.35 in] depth

D : Drain plug for the Brake - G $\frac{1}{4}$, 9 mm [.35 in] depth

T : Drain plug for the Motor - G $\frac{1}{4}$, 9 mm [.35 in] depth

HYDRAULIC DISC BRAKE FOR FLANGE ATTACHMENT TO MSS AND MSV HYDRAULIC MOTORS

TYPE LBS/290

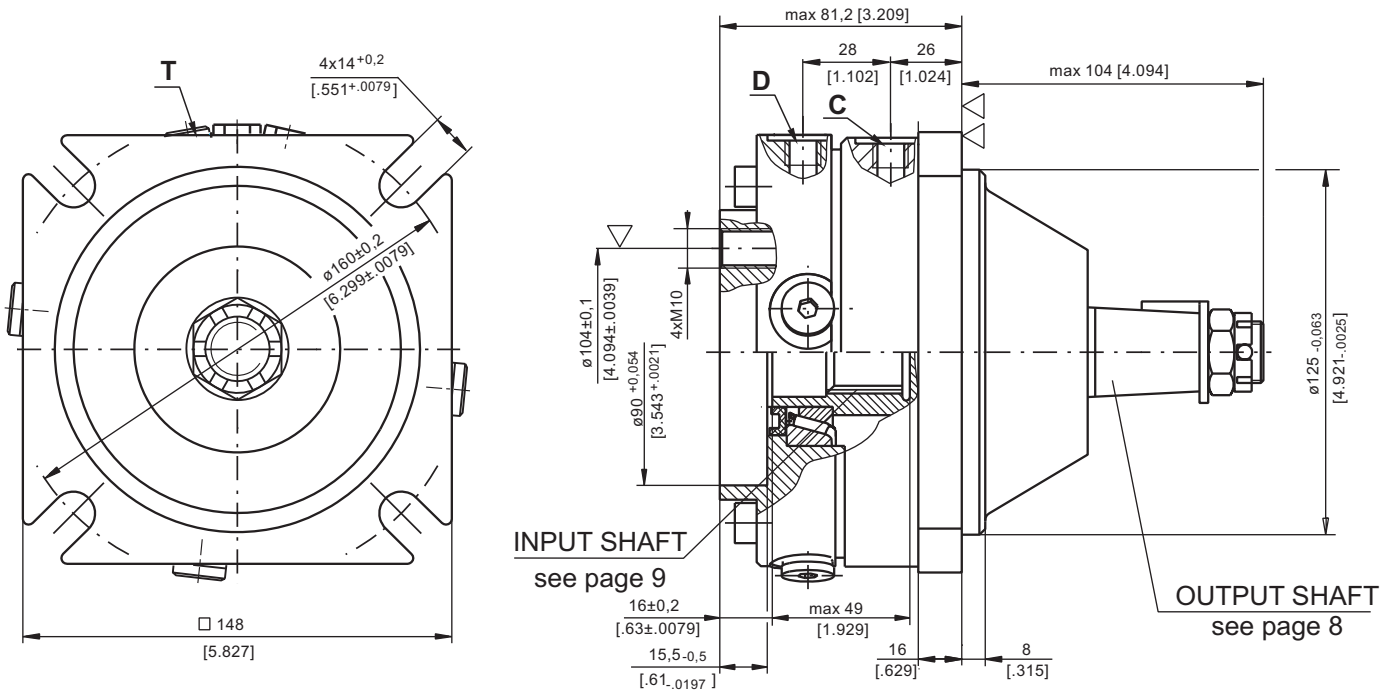


▽ - Place for attachment
(tightening torque for screw M10x35 - 8.8 DIN 912 - 5 daNm [440 lb-in])

▽▽ - Place for attachment



TYPE LBV/290



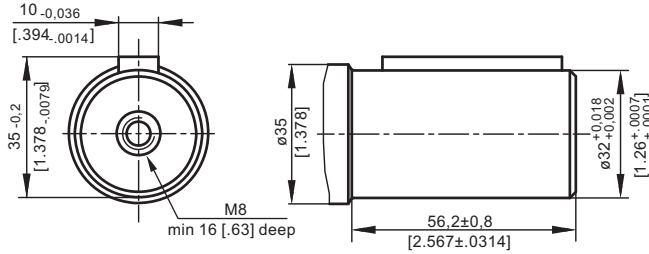
▽ - Place for attachment
(tightening torque for screw M10 - 8.8 DIN 912 - 5 daNm [440 lb-in])

▽▽ - Place for attachment

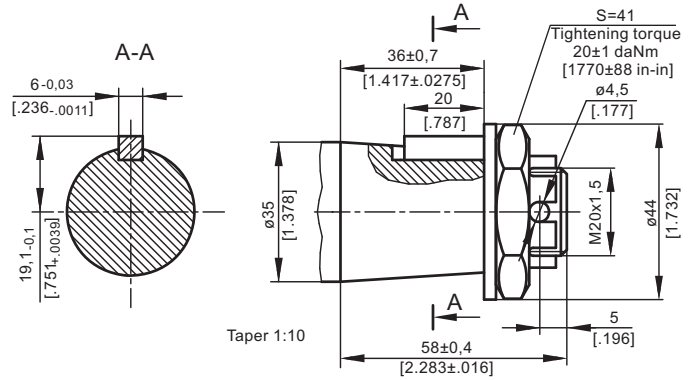
C : Brake release Port - G $\frac{1}{4}$, 9 mm [.35 in] depth
D : Drain plug for the Brake - G $\frac{1}{4}$, 9 mm [.35 in] depth
T : Drain plug for the Motor - G $\frac{1}{4}$, 9 mm [.35 in] depth

OUTPUT SHAFT EXTENSIONS

CB - $\phi 32$ straight, Parallel key A10x8x45 DIN 6885
Max. Torque 77 daNm [6815 lb-in]

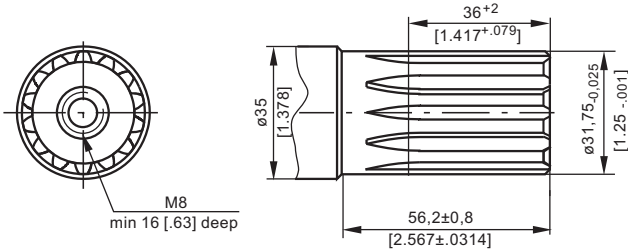


KB - tapered 1:10, Parallel key B6x6x20 DIN 6885
Max. Torque 95 daNm [8400 lb-in]



SPECIFICATION DATA

SH - $\phi 1\frac{1}{4}$ " splined 14T, DP12/24 ANS B92.1-1970
Max. Torque 95 daNm [8400 lb-in]



Description LBS/289(290) LBV/289(290)	21	32	43	63
*Min. Static Torque, daNm [lb-in]	20-22 [1770-1947]	31-34 [2743-3009]	41-45 [3628-3982]	61-64 [5399-5665]
Opening Pressure, bar [PSI]	min [174-188]	18-20 [260-290]	24-26 [348-377]	38-39 [550-565]
	max 300 [4350]			
Min. oil quantity for brake releasing cm ³ [in ³]	7 - 8 [0.427 - .488]			
Oil volume cm ³ [in ³]	50 - 120 [3.05 - 7.35]			
Max. Pressure in drain space bar [PSI]	5 [72]			
Weight kg [lb]	9 [19.8]			

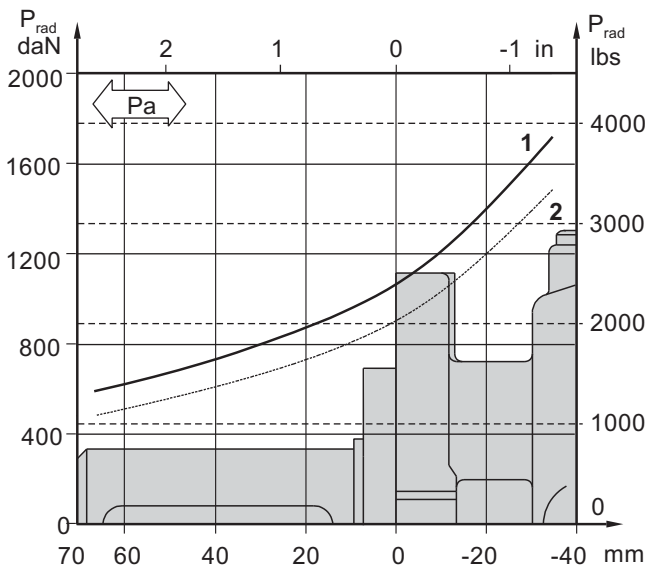
*Static torque is obtained at working pressure - 0 bar [0 PSI].

LOAD CURVE

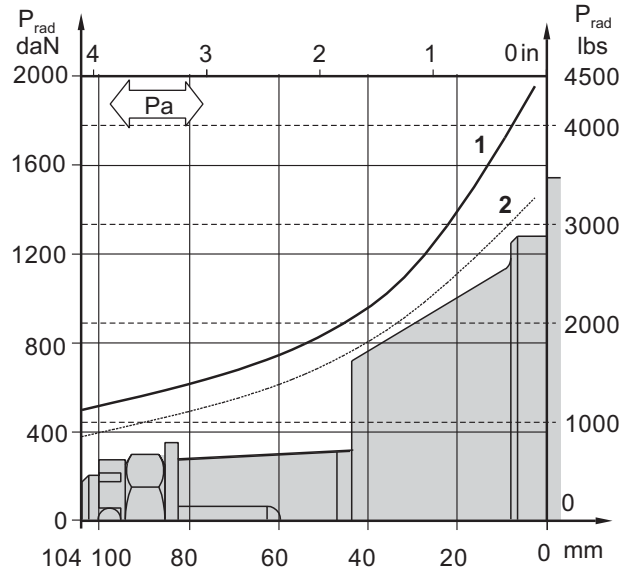
The curve applies to a B10 bearing life of 3000 hours at 200 RPM.

- 1: Pa < 350 daN [787 lbs]
- 2: Pa = 500 daN [1125 lbs]

LBS(V)/289



LBS(V)/290

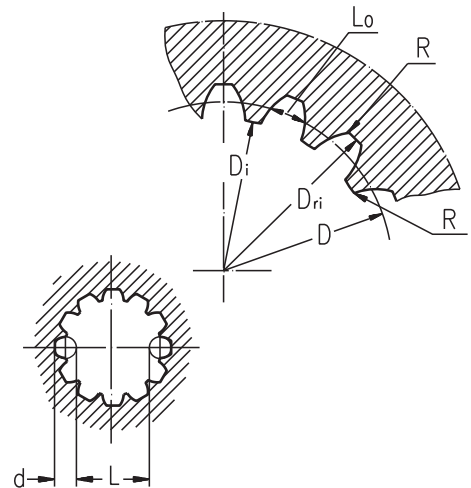


INTERNAL SPLINE DATA FOR THE ATTACHED COMPONENT

Standard ANS B92.1-1970, class 5

[$m=2.1166$]

Fillet Root Side Fit		LBS(V)/289 LBS(V)/290		LBS(V)/314 LBS(V)/315	
		mm	inch	mm	inch
Number of Teeth	z	12	12	16	16
Diametral Pitch	DP	12/24	12/24	12/24	12/24
Pressure Angle		30°	30°	30°	30°
Pitch Dia.	D	25,4	1	33,8656	1.3333
Major Dia.	D _{ri}	28,0 ^{-0,1}	1.1 ± 1.098	38,4 ^{+0,4}	1.5118±1.5275
Minor Dia.	D _i	23,0 ^{+0,033}	.907 ± .905	32,15 ^{+0,06}	1.2657±1.2673
Space Width [Circular]	Lo	4,308±0,020	.1704 ± .1688	4,516±0,037	.1763±.1791
Fillet Radius	R	0,2	.008	0,5	.02
Max. Measurement between Pins	L	17,62 ^{+0,15}	.699 ± .694	26,9 ^{+0,10}	1.063±1.059
Pin Dia.	d	4,835±0,001	.19039±.19031	4,835±0,001	.19026±.19034
Corrected	x.m	+0,8	+0.031	+1,0	+0.039



ORDER CODE - LB/288

	1	2	3	4	5
LB/288		-			

Pos.1 - Input Shaft Hole

C, CO, SH, CB, SB

Pos.2 - Static Torque code (See Specification data)

7, 14, 21, 32, 43, 63

Pos.3 - Output Shaft Extensions*

C - $\varnothing 25$ straight, Parallel key A8x7x32 DIN 6885CO - $\varnothing 1$ " straight, Parallel key $\frac{1}{4}$ "x $\frac{1}{4}$ "x $\frac{1}{4}$ " BS46SH - $\varnothing 25,32$ splined BS 2059 (SAE 6B)SA - $\varnothing 24,5$ splined B25x22 DIN 5482CB - $\varnothing 32$ straight, Parallel key A10x8x45 DIN 6885KB - $\varnothing 35$ tapered 1:10, Parallel key B6x6x20 DIN6885

Pos.4 - Option (Paint)**

omit - no Paint

P - Painted

PC - Corrosion Protected Paint

Pos.5 - Design Series

omit - Factory specified

ORDER CODE - LBS, LBV

	1	2	3	4	5	6
LB		/	-			

Pos.1 - Type

S - Disc Brake for short motor S- MSS

V - Disc Brake for very short motor V- MSV

Pos.2 - Design code

289 - for MSS and MSV Motors

290 - for MSS and MSV Motors (Wheel Mount)

Pos.3 - Static Torque code (See Specification data)

21, 32, 43, 63

Pos.4 - Output Shaft Extensions*

CB - $\varnothing 32$ straight, Parallel key A10x8x45 DIN 6885KB - $\varnothing 35$ tapered 1:10, Parallel key B6x6x20 DIN6885SH - $\varnothing 1\frac{1}{4}$ " splined 14T ANS B92.1-1970

Pos.5 - Option (Paint)**

omit - no Paint

P - Painted

PC - Corrosion Protected Paint

Pos.6 - Design Series

omit - Factory specified

NOTES:

* The permissible output torque for shafts must not be exceeded! For Max. Torque values see data on page 5 and 8.

** The color is by customer's request.

The Disc Brakes are manganophosphatized as standard.

ATTENTION:

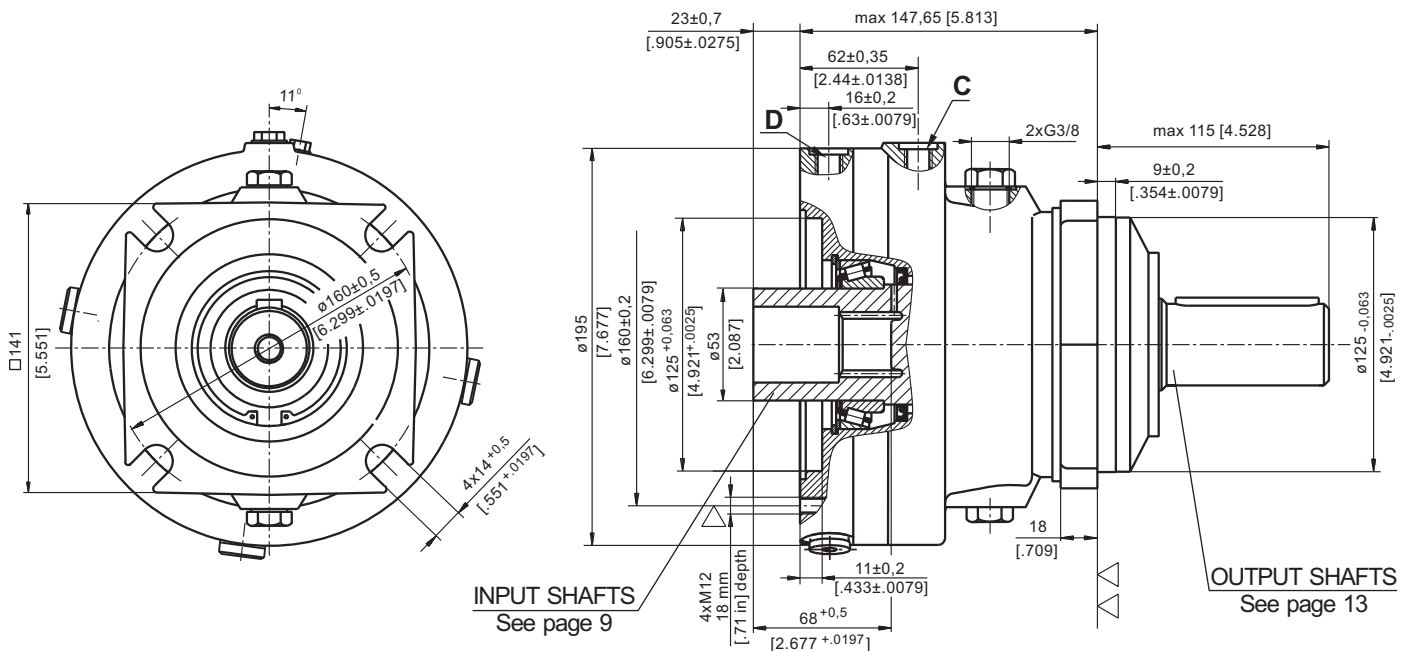
1. Hydraulic brake is delivered without oil (it is lubricated only).

2. Hydraulic brake is filled through the drain port D. Space is filled with 50 ± 120 cm³ [3.05±7.32 in³] mineral oil HLP (DIN 51524) or HM (ISO 6743/4). For LB/288 fill oil after hydraulic motor assembly.

3. In all brakes, friction discs and separators should be lubricated.

**HYDRAULIC DISC BRAKES
FOR FLANGE ATTACHMENT TO MTS AND MTV HYDRAULIC MOTORS**

TYPE LBS/314



▽ - Place for attachment
(tightening torque for screw M12x30- 8.8 DIN 912,
7 daNm [620 lb-in])

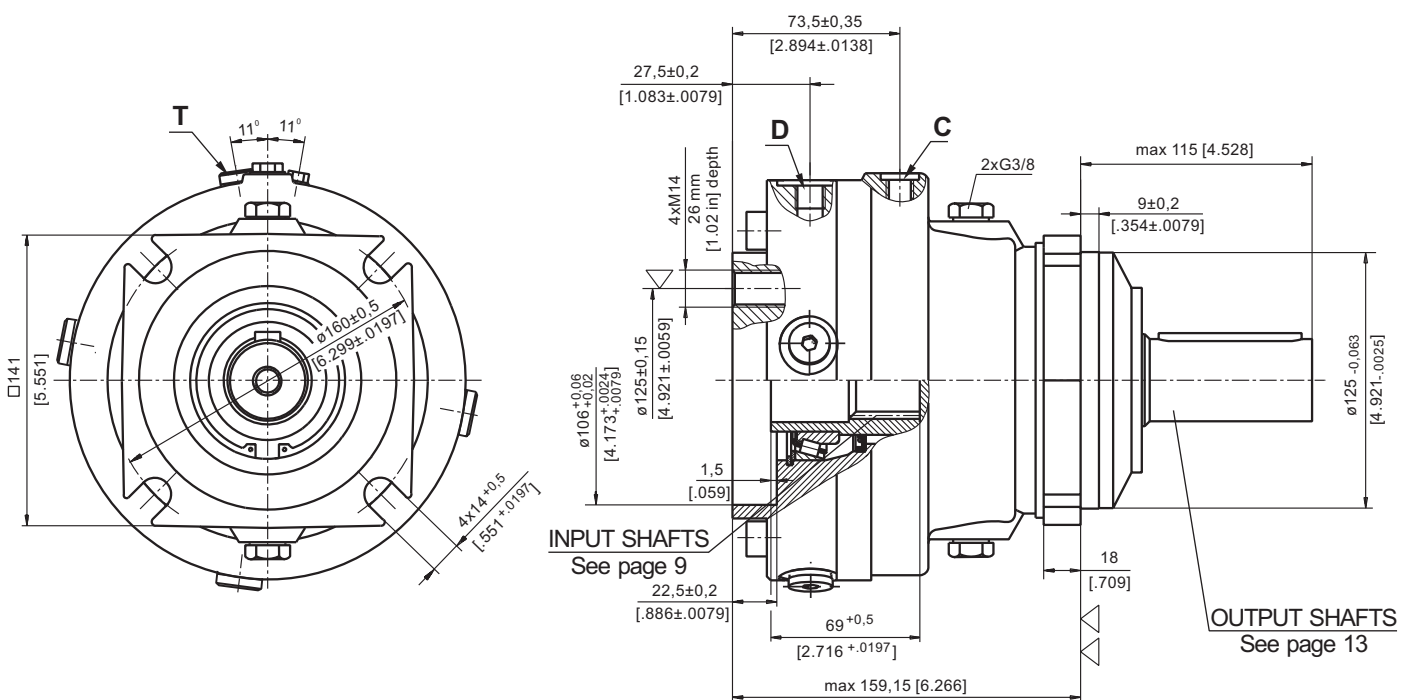
▽▽ - Place for attachment

C : Brake release Port - G $\frac{1}{4}$, 12 mm [.47 in] depth

D : Drainage tap - G $\frac{1}{4}$, 12 mm [.47 in] depth



TYPE LBV/314



▽ - Place for attachment
(tightening torque for screw M14 - 8.8 DIN 912,
11,5 daNm [1020 lb-in])

▽▽ - Place for attachment

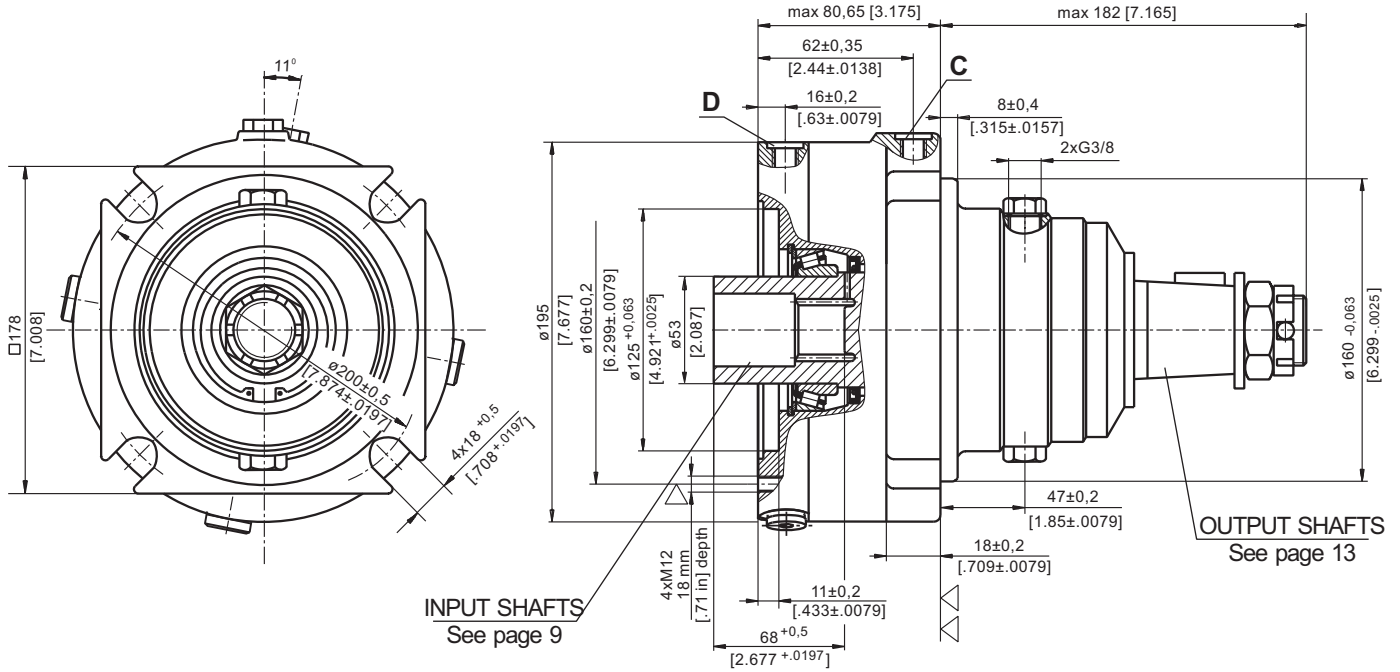
C : Brake release Port - G $\frac{1}{4}$, 9 mm [.35 in] depth

D : Drain plug for the Brake - G $\frac{1}{4}$, 9 mm [.35 in] depth

T : Drain plug for the Motor - G $\frac{1}{4}$, 9 mm [.35 in] depth

**HYDRAULIC DISC BRAKES
FOR FLANGE ATTACHMENT TO MTS AND MTV HYDRAULIC MOTORS**

TYPE LBS/315



INPUT SHAFTS
See page 9

OUTPUT SHAFTS
See page 13

▽ - Place for attachment
(tightening torque for screw M12x30- 8.8 DIN 912,
7 daNm [620 lb-in])

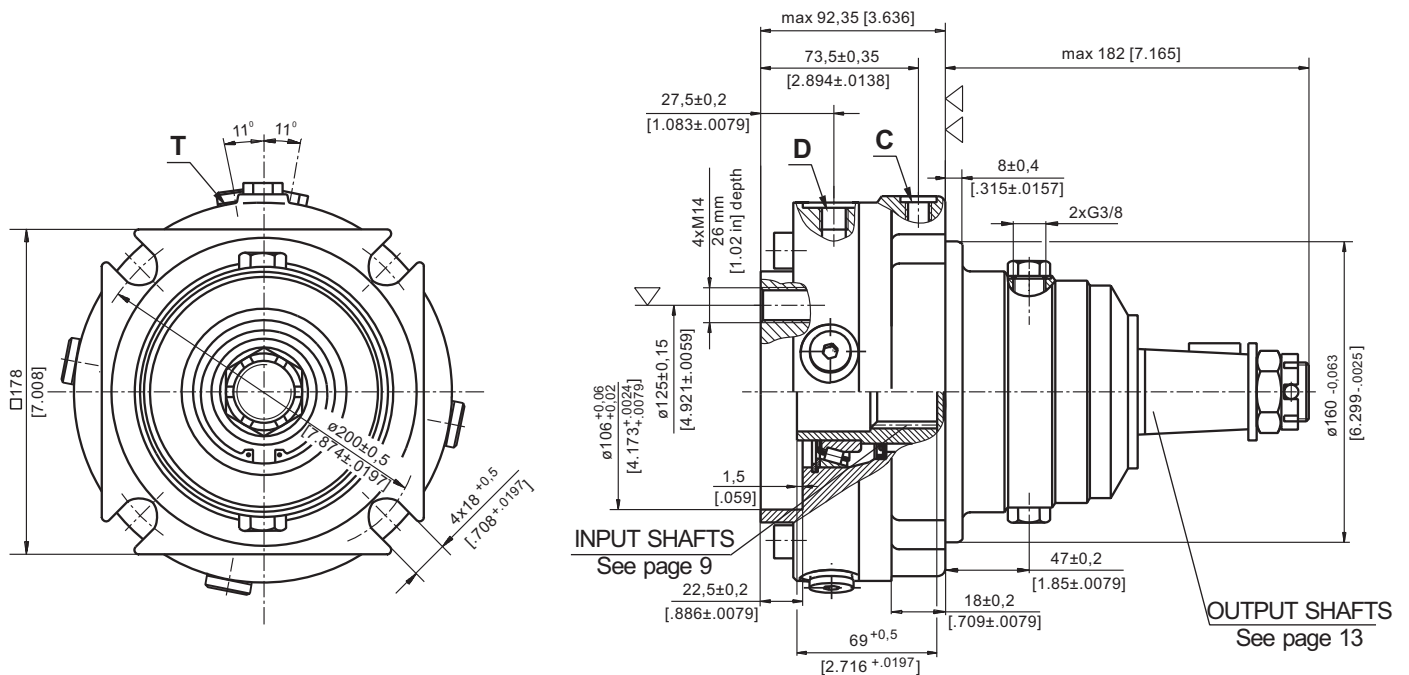
▽▽ - Place for attachment

C : Brake release Port - G $\frac{1}{4}$, 12 mm [.47 in] depth

D : Drainage tap - G $\frac{1}{4}$, 12 mm [.47 in] depth



TYPE LBV/315



INPUT SHAFTS
See page 9

OUTPUT SHAFTS
See page 13

▽ - Place for attachment
(tightening torque for screw M14 - 8.8 DIN 912,
11,5 daNm [1020 lb-in])

▽▽ - Place for attachment

C : Brake release Port - G $\frac{1}{4}$, 9 mm [.35 in] depth

D : Drain plug for the Brake - G $\frac{1}{4}$, 9 mm [.35 in] depth

T : Drain plug for the Motor - G $\frac{1}{4}$, 9 mm [.35 in] depth

SPECIFICATION DATA

Description	LBS/314,315	21	29	43	65	85	110	130
*Min. Static Torque, daNm [lb-in]		18-23 [1593-2036]	28-33 [2478-2921]	42-46 [3717-4071]	61-70 [5399-6196]	83-92 [7346-8143]	108-118 [9559-10444]	126-136 [11152-12037]
Opening Pressure bar [PSI]	min**	4-5 [58-72]	6-7 [87-101]	9-10 [130-145]	13-15 [188-217]	18-20 [261-290]	23-25 [333-362]	27-29 [391-420]
	max	300 [4350]						
Min. oil quantity for brake releasing	cm ³ [in ³]	8-9 [.488-.549]						
Oil volume	cm ³ [in ³]	250						
Max. Pressure in drain space	bar [PSI]	5 [72]						
Weight for .../314 .../315	kg [lb]	24 [52.9]						
		25 [55.1]						

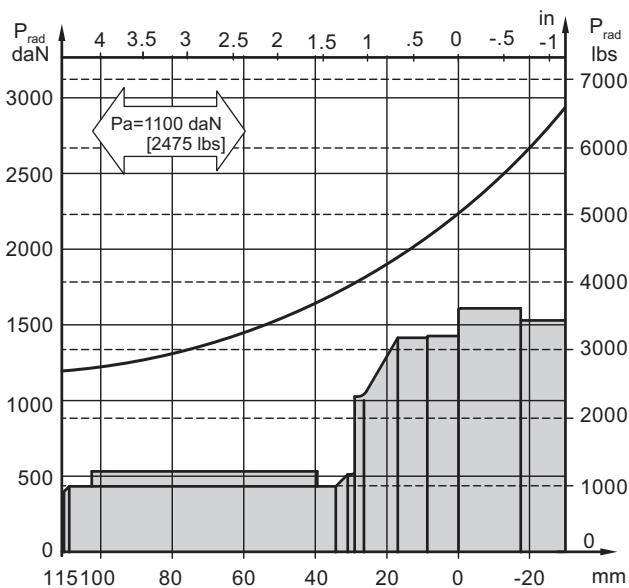
*Static torque is obtained at working pressure - 0 bar.

**The indicated value is a difference between the inlet pressure for driving of the brake and the drain pressure.

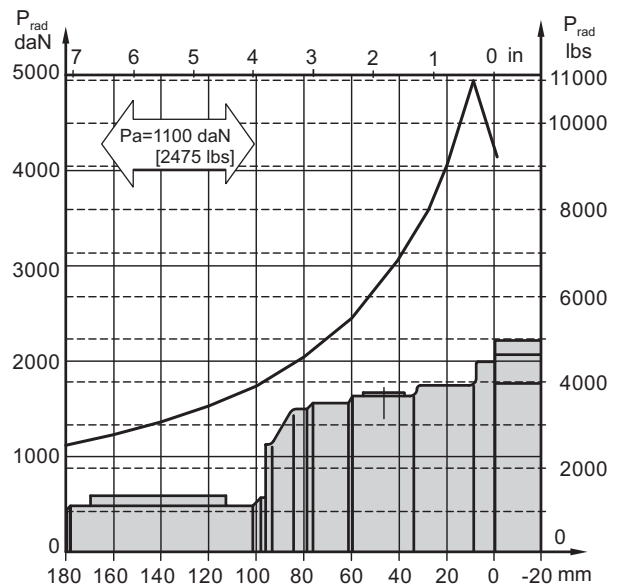
Brakes must always have a drain line

LOAD CURVE

LBS(V) ... /314

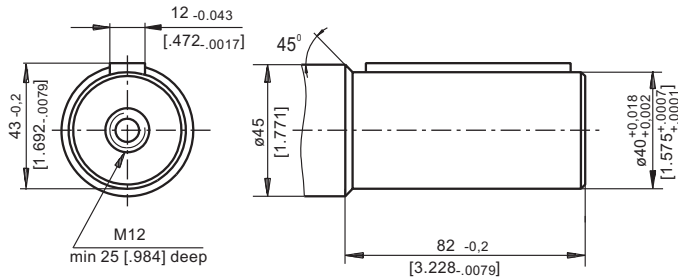


LBS(V) ... /315

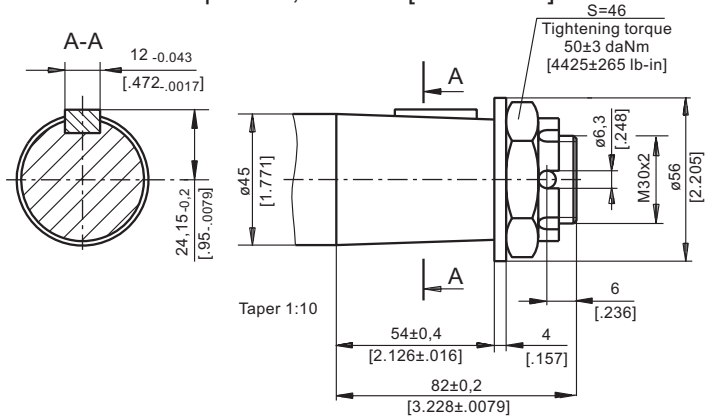


OUTPUT SHAFT EXTENSIONS

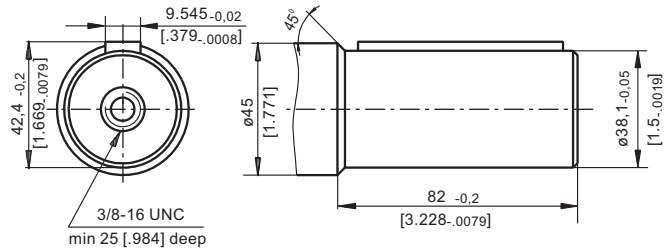
C - \varnothing 40 straight, Parallel key A12x8x70 DIN 6885
Max. Torque 132,8 daNm [11755 In-in]



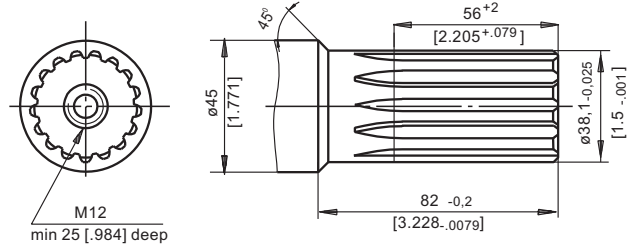
K -tapered 1:10, Parallel key B12x8x28 DIN 6885
Max. Torque 210,7 daNm [18650 lb-in]



CO - \varnothing 1½" straight, Parallel key 3/8" x 3/8" x 2¼" BS46
Max. Torque 132,8 daNm [11755 In-in]



SH - \varnothing 1½" splined 17T, DP 12/24 ANSI B92.1-1976
Max. Torque 132,8 daNm [11755 In-in]



ORDER CODE

1	2	3	4	5	6
LB	/	-			

Pos.1 - Type

- S** - Disc Brake for short motor **S** - MTS
- V** - Disc Brake for very short motor **V** - MTV

Pos.2 - Design code

- 314** - for MTS and MTV Motors
- 315** - for MTS and MTV Motors (Wheel Mount)

Pos.3 - Static Torque code (See Specification data)

21, 29, 43, 65, 85, 110, 130

Pos. 4 - Output Shaft Extensions*

- C** - \varnothing 40 straight, Parallel key A12x8x70 DIN 6885
- CO** - \varnothing 1½" straight, Parallel key 3/8" x 3/8" x 2¼" BS46
- SH** - \varnothing 1½" splined 17T, ANSI B92.1-1976
- K** - \varnothing 45 tapered 1:10, Parallel key B12x8x28 DIN6885

Pos. 5 - Option (Paint)**

- omit - no Paint
- P** - Painted
- PC** - Corrosion Protected Paint

Pos. 6 - Design Series

- omit - Factory specified

NOTES:

- * The permissible output torque for shafts must not be exceeded!
- ** The color is by customer's request.

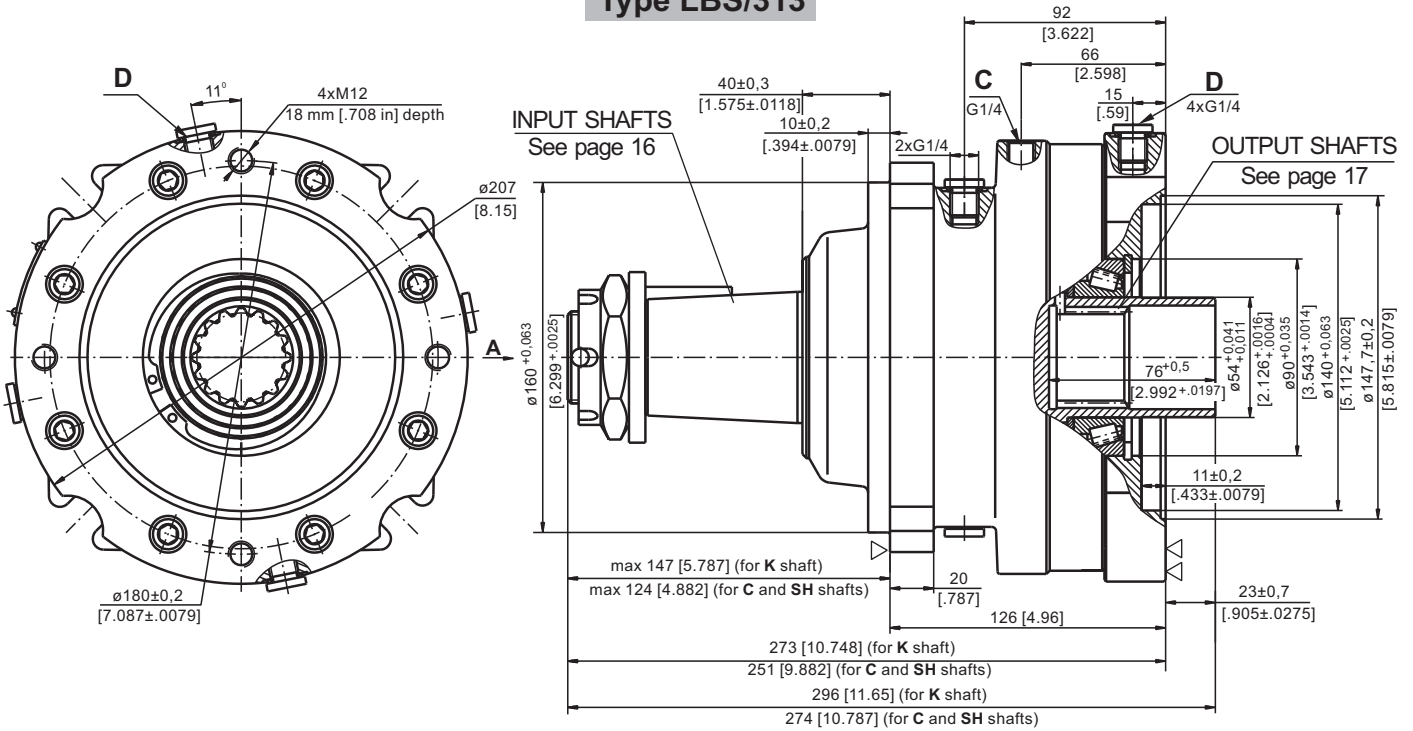
The Disc Brakes are mangano-phosphatized as standard.

ATTENTION:

- Hydraulic brake is delivered without oil (it is lubricated only).
- Hydraulic brake is filled through the drain port **D**. Space is filled with 50 ÷ 120 cm³ [3.05÷7.32 in³] mineral oil HLP (DIN 51524) or HM (ISO 6743/4). For LB/288 fill oil after hydraulic motor assembly.
- In all brakes, friction discs and separators should be lubricated.

**HYDRAULIC DISC BRAKES
FOR FLANGE ATTACHMENT TO MVS HYDRAULIC MOTORS**

Type LBS/313

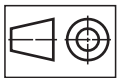
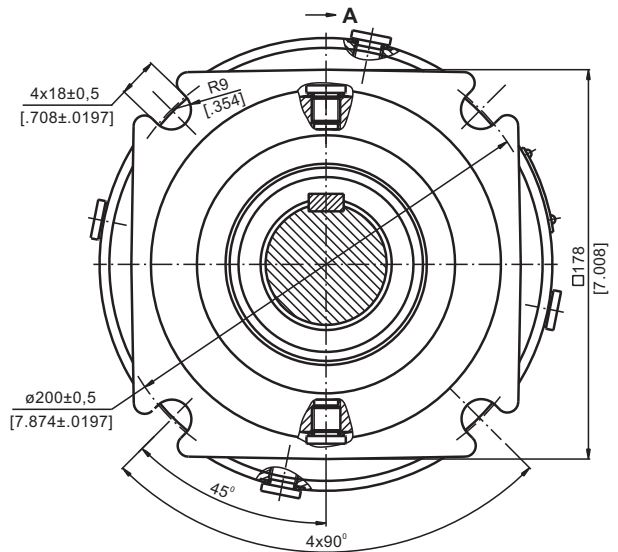


C : Brake release Port - G $\frac{1}{4}$, 12 mm [0.47 in] depth

D : Drainage tap - G $\frac{1}{4}$, 12 mm [0.47 in] depth

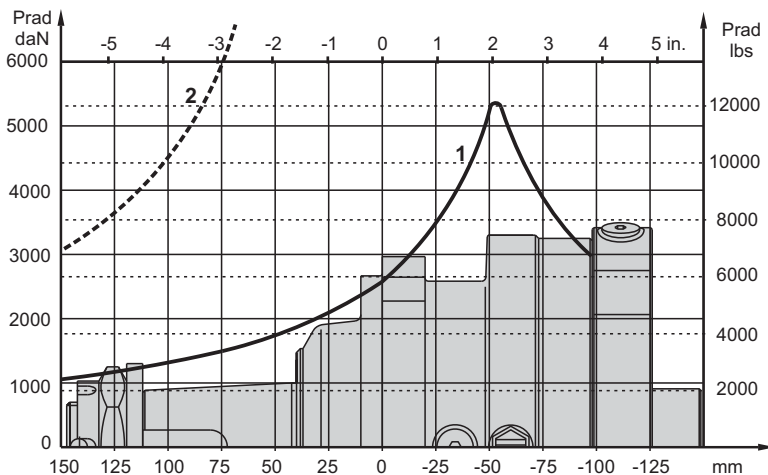
▽- Place for attachment

▽▽- Place for attachment
(tightening torque for screw M12x35 - 8.8 DIN 912,
7 daNm [620 lb-in])



mm [in]

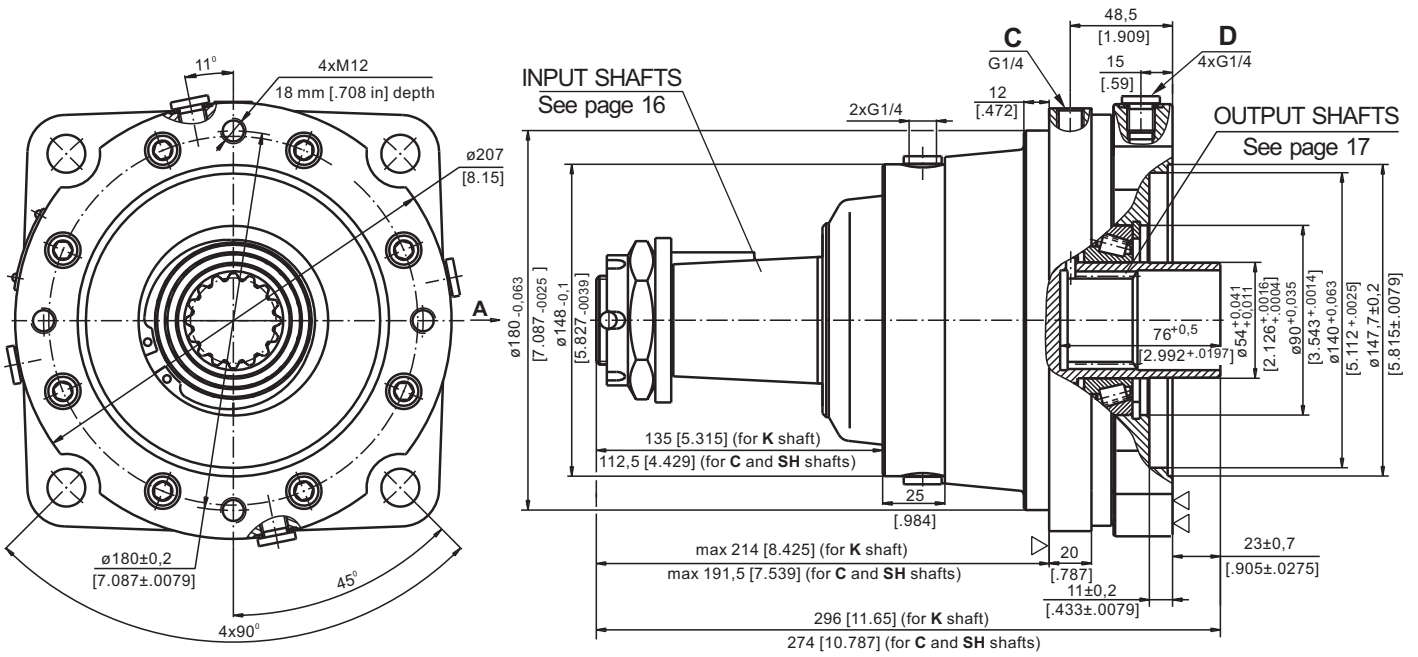
PERMISSIBLE SHAFT LOADS



- 1 - Bearing curve:** The curve applies to a B10 bearing life of 3000 hours at 200 RPM.
- 2 - Shaft curve:** The curve represents Max. permissible radial shaft load with safety factor 3:1.

HYDRAULIC DISC BRAKES FOR FLANGE ATTACHMENT TO MVS HYDRAULIC MOTORS

Type LBS/316

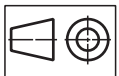
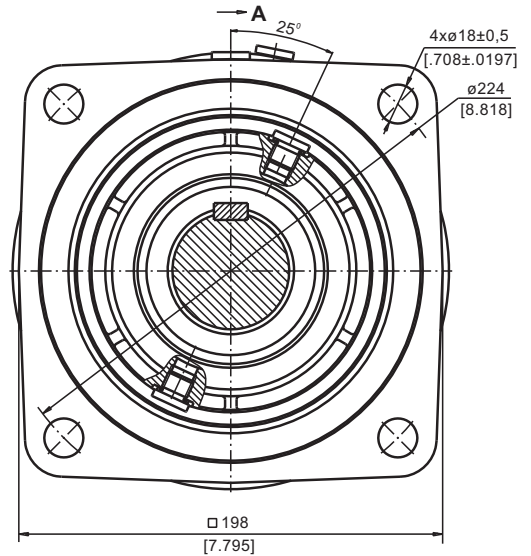


C : Brake release Port - G $\frac{1}{4}$, 12 mm [.47 in] depth

D : Drainage tap - G $\frac{1}{4}$, 12 mm [.47 in] depth

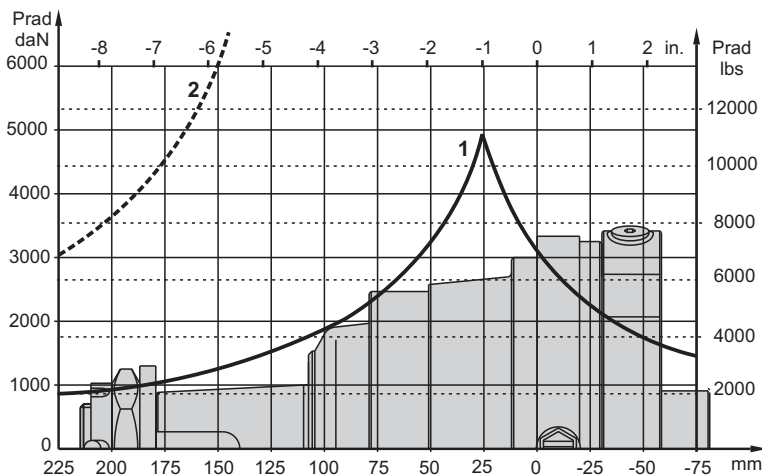
▽ - Place for attachment

▽▽ - Place for attachment
(tightening torque for screw M12x35 - 8.8 DIN 912,
7 daNm [620 lb-in])



mm [in]

PERMISSIBLE SHAFT LOADS



1 - Bearing curve: The curve applies to a B10 bearing life of 3000 hours at 200 RPM.

2 - Shaft curve: The curve represents Max. permissible radial shaft load with safety factor 3:1.

SPECIFICATION DATA

Description LBS/313,316	21	29	43	65	85	110	130
*Min. Static Torque, daNm [lb-in]	18-23 [1593-2036]	28-33 [2478-2921]	42-47 [3717-4160]	61-71 [5399-6285]	83-94 [7346-8320]	108-118 [9559-10444]	127-137 [11240-12125]
Opening Pressure min** bar [PSI]	4-5 [58-72]	6-7 [87-101]	9-10 [130-145]	13-15 [188-217]	18-20 [261-290]	23-25 [333-362]	27-29 [391-420]
	max 300 [4350]						
Min. oil quantity for brake releasing cm ³ [in ³]	8 ÷ 9 [.488 ÷ .549]						
Oil volume cm ³ [in ³]	250 [15.25]						
Max. Pressure in drain space bar [PSI]	5 [72]						

*Static torque is obtained at working pressure - 0 bar.

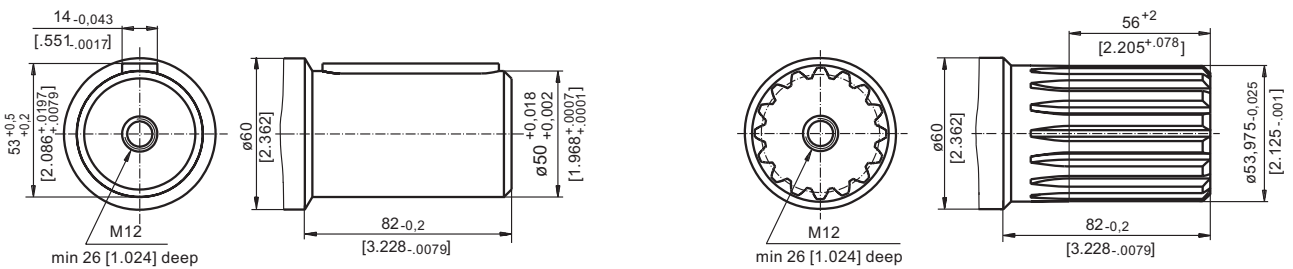
**The indicated value is a difference between the inlet pressure for driving of the brake and the drain pressure.

Brakes must always have a drain line

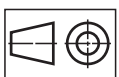
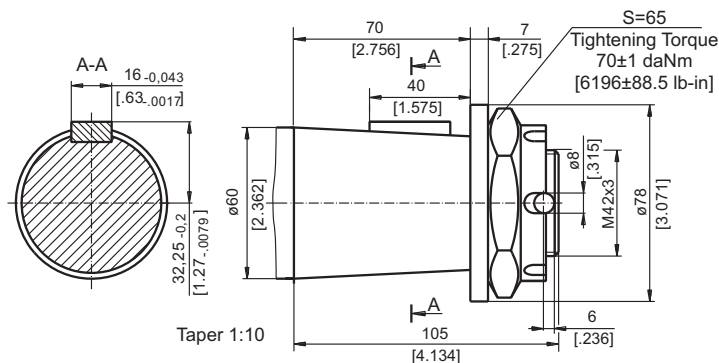
SHAFT EXTENSIONS

C - ø50 straight, Parallel key A14x9x70 DIN 6885

SH - ø21/8"splined, 16 DP 8/16 ANS B92.1-1976



K -tapered 1:10, Parallel key B16x10x32 DIN 6885

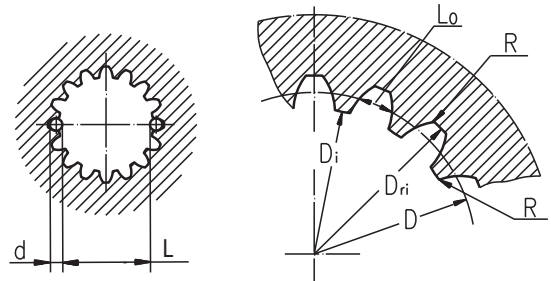


mm [in]

INTERNAL SPLINE DATA FOR THE ATTACHED COMPONENT

Standard ANS B92.1-1970, class 5
[$m=2.54$; corrected $x.m=+1,0$]

Fillet Root Side Fit		mm	inch
Number of Teeth	z	16	16
Diametral Pitch	DP	10/20	10/20
Pressure Angle		30°	30°
Pitch Dia.	D	40,640	1.6
Major Dia.	D _{ri}	45,2 ^{+0,4}	1.796÷1.780
Minor Dia.	D _i	38,5 ^{+0,039}	1.5175÷1.516
Space Width [Circular]	L _o	5,18±0,037	.2055±.2025
Fillet Radius	R	0,4	.015
Max. Measurement between Pins	L	32,47 ^{+0,15}	1.284±1.278
Pin Dia.	d	5,6±0,001	.22051±.22043



Hardening Specification:
HV=750±50 on the surface.
HV=560 at 0,7±0,2 mm [.035±.019in] case depth
Material: 20 MoCr4 EN 10084 or better.

ORDER CODE

	1	2	3	4	5
LBS/		-			

Pos.1 - Designe code

313 - for MVS Motors

316 - for MVS Motors (Wheel mount)

Pos.2 - Static Torque code (See Specification data)

21, 29, 43, 65, 85, 110, 130

Pos.3 - Output Shaft Extensions*

C - ø50 straight, Parallel key A14x9x70 DIN6885

SH - ø2 1/8" splined, ANSI B92.1-1976

K - ø60 tapered 1:10, Parallel key B16x10x32 DIN6885

Pos.4 - Option (Paint)**

omit - no Paint

P - Painted

PC - Corrosion Protected Paint

Pos.5 - Design Series

omit - Factory specified

NOTES:

* The permissible output torque for shafts must be not exceeded!

** The color is by customer's request.

The Disc Brakes are mangano-phosphatized as standard.

ATTENTION:

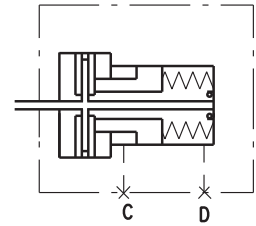
1. Hydraulic brake is delivered without oil (it is lubricated only).

2. In all brakes, friction discs and separators should be lubricated. Space is filled with 150 ÷ 300 cm³ [9.15 ÷ 18.3 in³] mineral oil HLP (DIN 51524) or HM (ISO 6743/4).

HYDRAULIC DISC BRAKES B...T- Wet

B..T brake is designed to be mounted to the wheels of low-speed agricultural and construction vehicles.

The advantage of these brakes is that despite the smallest possible dimensions they preserve long-term life of the bearings at high radial shaft load.



SPECIFICATION DATA

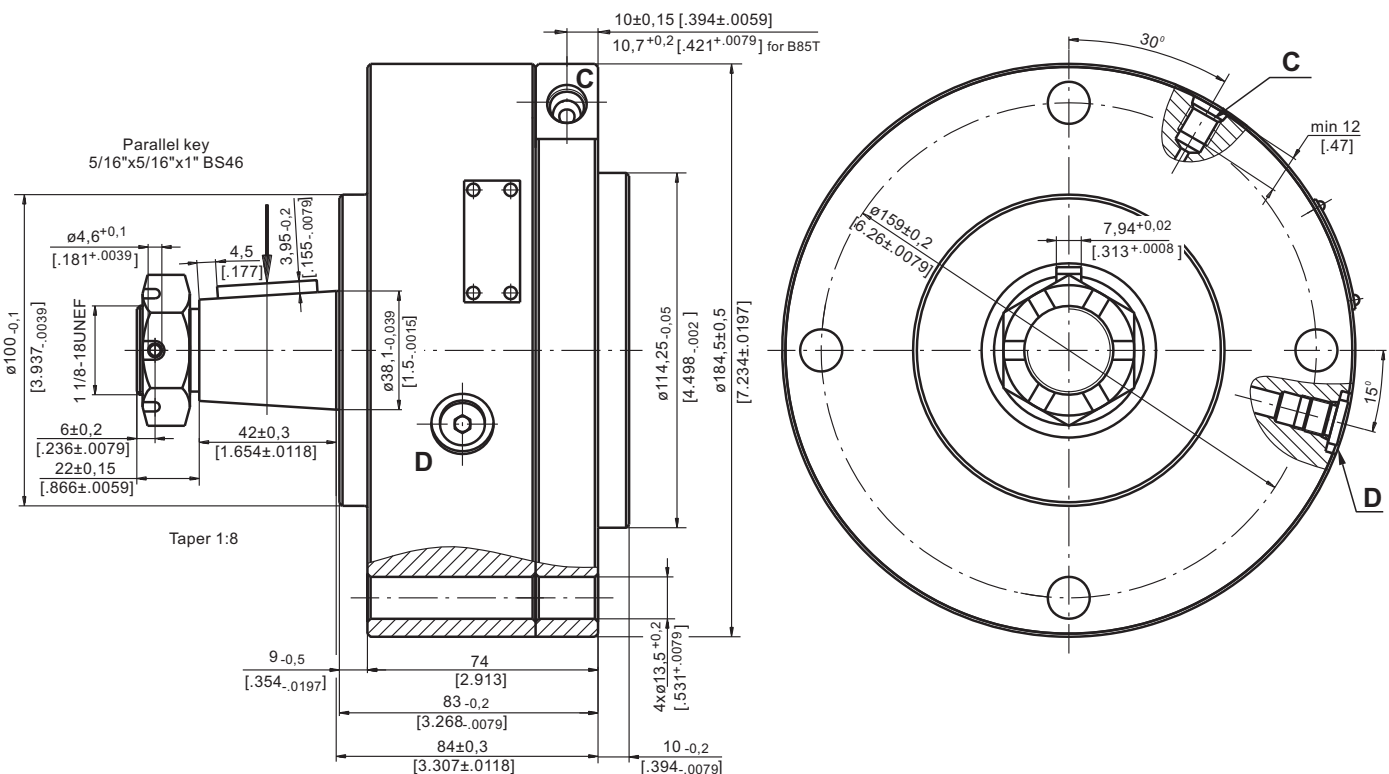
Type	B50T	B55T	B60T	B65T	B85T
Static Torque of Brake, daNm [lb-in]*	50 [4425]	55 [4870]	60 [5310]	65 [5750]	85 [7525]
Initial Release Pressure, bar [PSI]	16 [232]	16 [232]	16 [232]	17 [246]	18 [260]
Full Release Pressure, bar [PSI]	19 [275]	19 [275]	19 [275]	20 [290]	22 [320]
Max. Operating Pressure, bar [PSI]	240 [3480]	240 [3480]	240 [3480]	240 [3480]	240 [3480]
Max. Speed, RPM	60	60	60	60	60
Cont. Radial Shaft Load daN [lbs]**	1000 [2250]	1000 [2250]	1000 [2250]	1000 [2250]	1500 [3370]
Max. Radial Shaft Load daN [lbs]***	2150 [4830]	2150 [4830]	2150 [4830]	2150 [4830]	2250 [5060]

* At 0 bar [0 PSI] back pressure

** At radial shaft load of 1000 daN [2250 lbs], applied at center-line of the key and speed of rotation 60 RPM, the bearing life is 1000 hours.

*** The permissible values of radial shaft load may occur for max. 10% of every minute

DIMENSIONS AND MOUNTING DATA



C : Brake Release Port - 7/16-20 UNF
SAE J1926-1/ISO 11926-1

D : Drainage Tap - 7/16-20 UNF



